

Schlumberger

Company: **Orr Energy LLC**

Well: **South 6-21D**

Field: **Wattenburg**

County: **Weld**

State: **Colorado**

Orr Energy LLC

South 6-21D

Wattenburg

Weld

State: Colorado

Platform Express Triple Combo

Orr Energy LLC

Range

— 100 —

②

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1001

— 100 —

Run 3

1000

— 100 —

Rig: Ensign 7	
Crew: Matt Baldwin, Ian Derry, & David Marquez	

RUN 1			RUN 2		
SERVICE ORDER #:		11989844	SERVICE ORDER #:		
PROGRAM VERSION:		15C0-309	PROGRAM VERSION:		
FLUID LEVEL:		5 ft	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		

SURFACE EQUIPMENT	
WITM (CTS)-A	NCS-VB
GSR-U/Y	
NCT-B	
CNB-AB	

DOWNHOLE EQUIPMENT	
LEH-QT	
LEH-QT	40.6
HGNS HTEM	
HMCA	
TelStatus	
CTEM	37.6
HILTB-CTS	37.6
HGNSC-B	36.9
HMCA	
TCC-B	
HGNH	
NLS-KL	
NSR-F 940	
HACCZ	
HCNT	
HGR	
HRCC-B	
HRMS-B	HGNS Neut 31.1
HRGD-B	HGNS Neut 30.6
GLS-VJ 5094	
MCFL Device	
HILT Nucl. LS 42767	
HILT Nucl. SS 42767	HGNS sens 28.2
HILT Nucl. BS 42767	
AIT-H	
AHIS-BA 374	
AHRM-A	
NPV-N	
HRCC cart	24.2
MCFL	
HILT cali	18.8
HRDD-LS	18.3
HRDD-SS	
HRDD-BS	17.9

Induction
Temperatu
Power Sup

7.9

SP SENSOR
HTEN HMAS
Accelerom HV
Mud Resis
Tension

0.1

0.0

TOOL ZERO

MAXIMUM STRING DIAMETER 4.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

(in)

(ft)

Production String

OD

ID

MD

Well Schematic

(ft)

(in)

Casing String

MD

OD

ID

Casing String, 24.0 lbm/ft

Casing Shoe
Borehole Segment

0.0

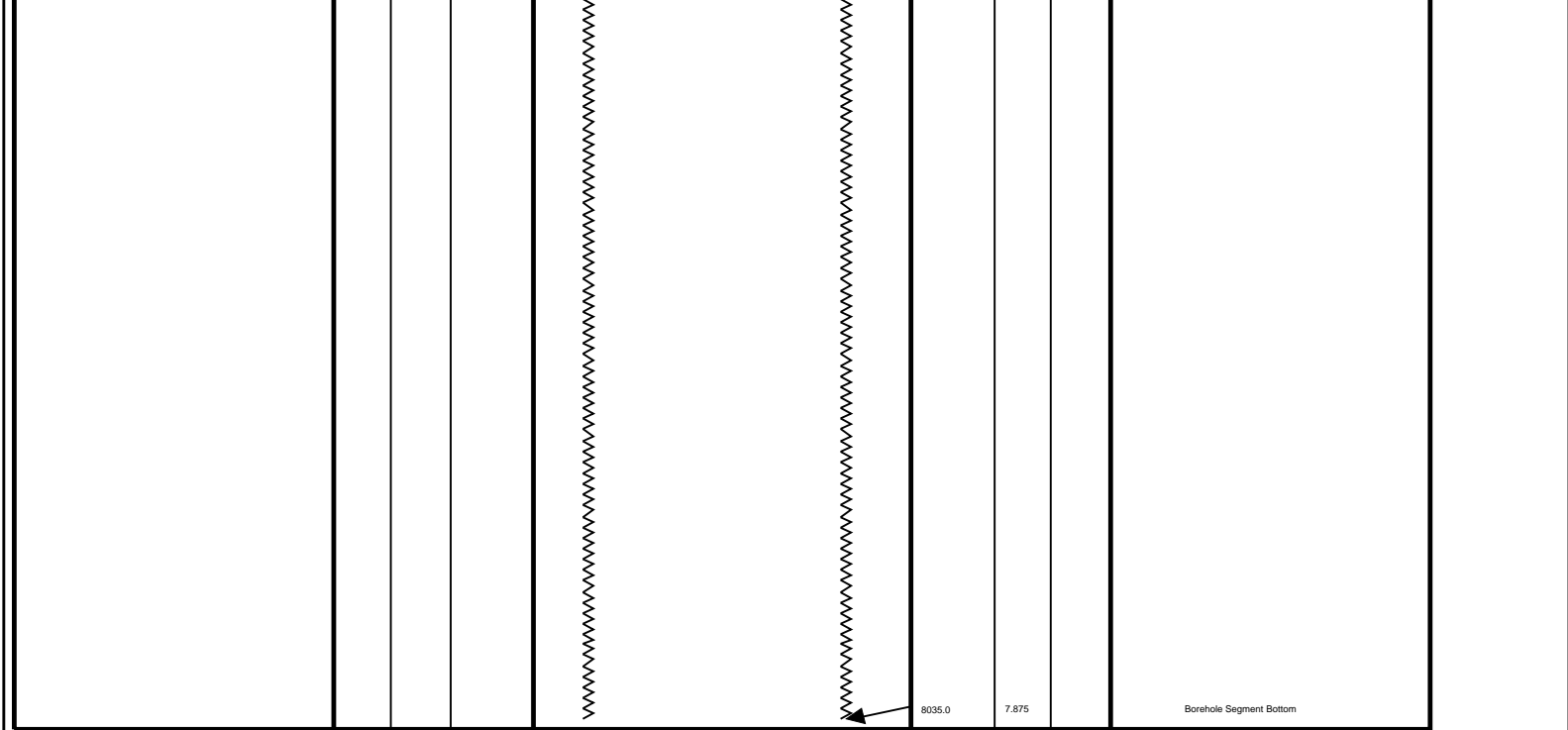
8.625

847.0

8.625

847.0

7.875



ALL DEPTHS AS PER DRILLER

Company: Orr Energy LLC Well: South 6-21D

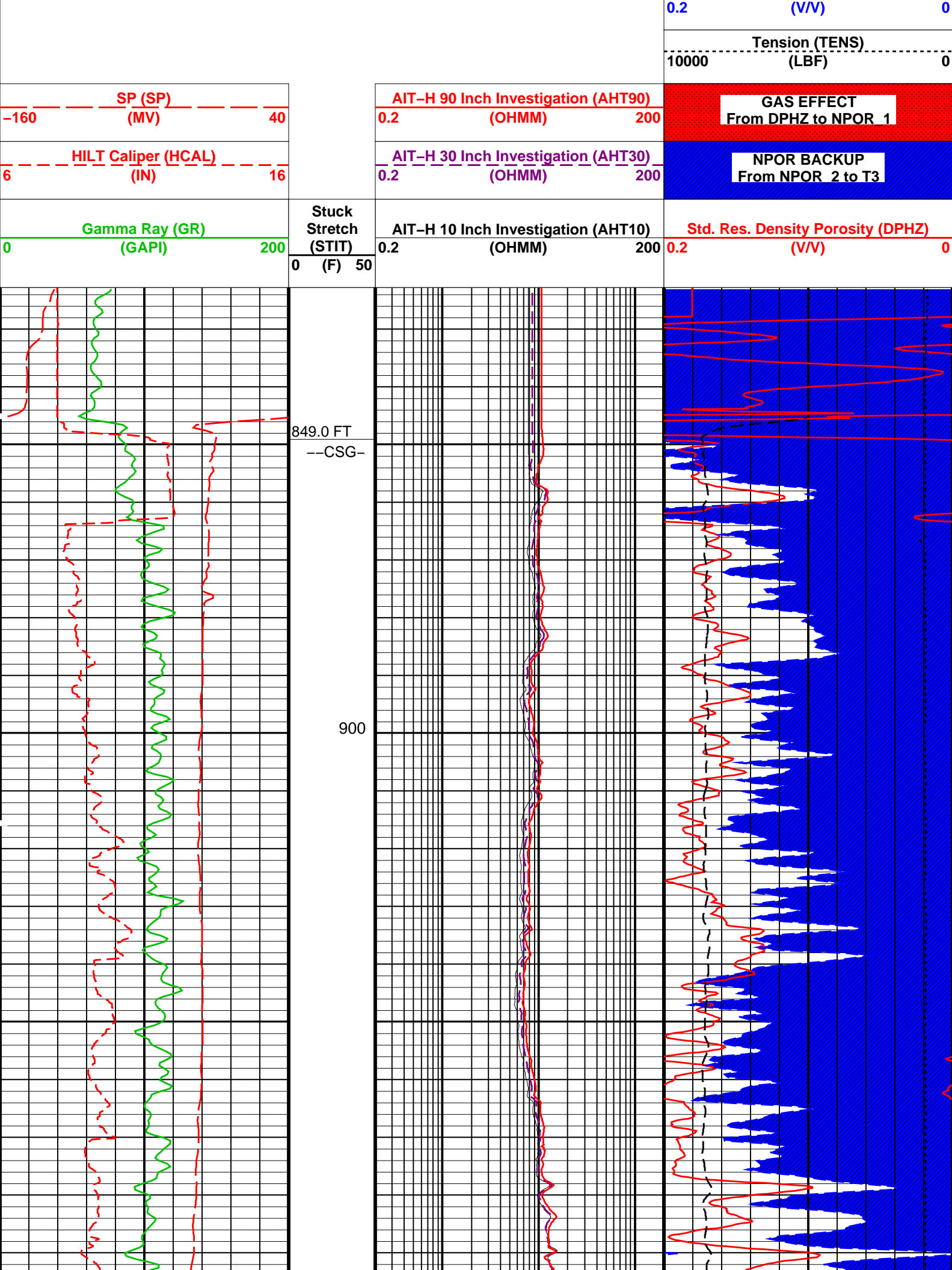
Input DLIS Files						
DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	13-Dec-2007 19:00	8070.0 FT	818.0 FT
Output DLIS Files						
DEFAULT	AIT_TLD_MCFL_CNL_019PUP	FN:18	PRODUCER	13-Dec-2007 20:45	8070.5 FT	822.5 FT

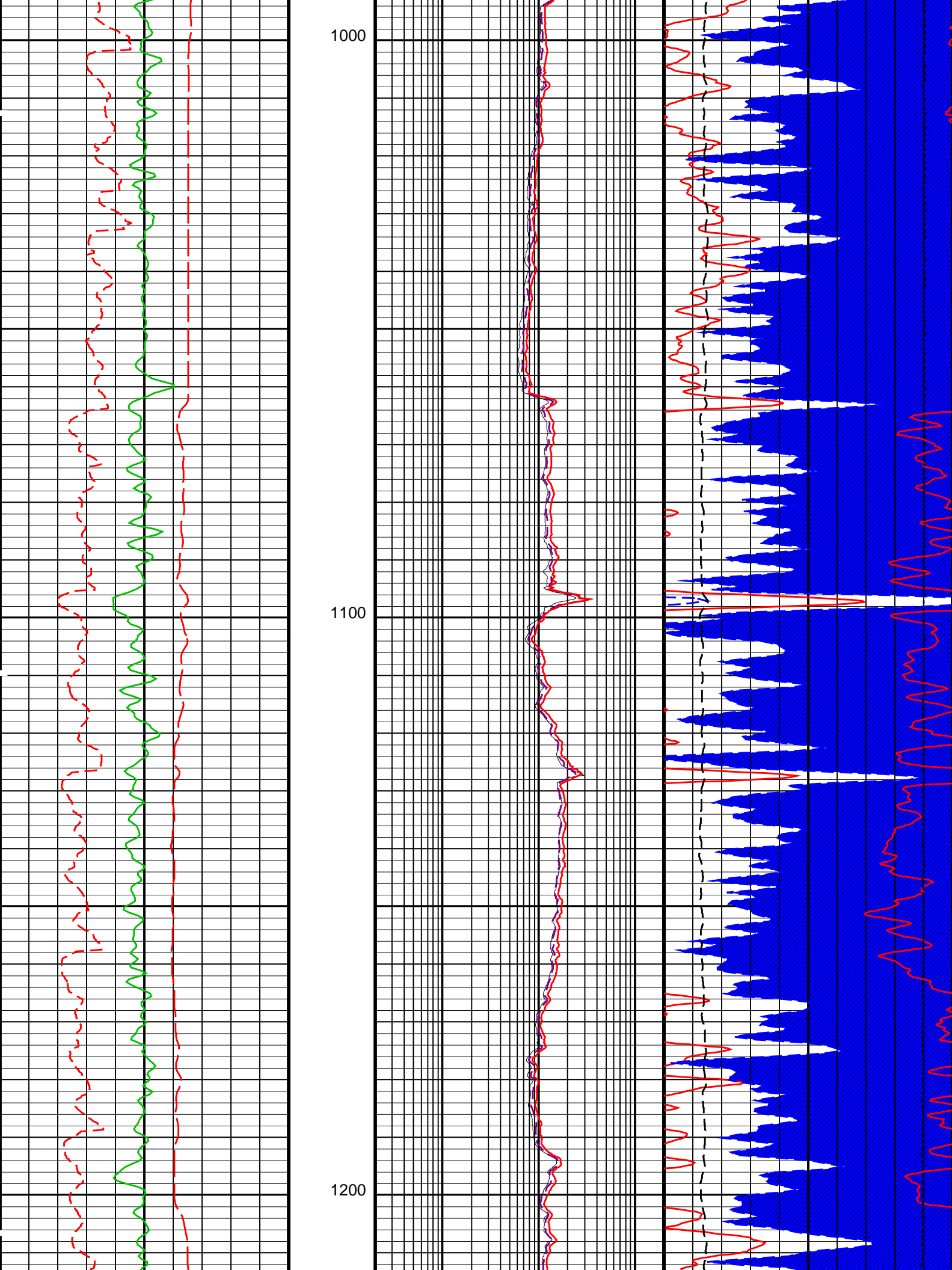
OP System Version: 15C0-309	
MCM	
HILTB-CTS	SRPC-3497-NOV_2007

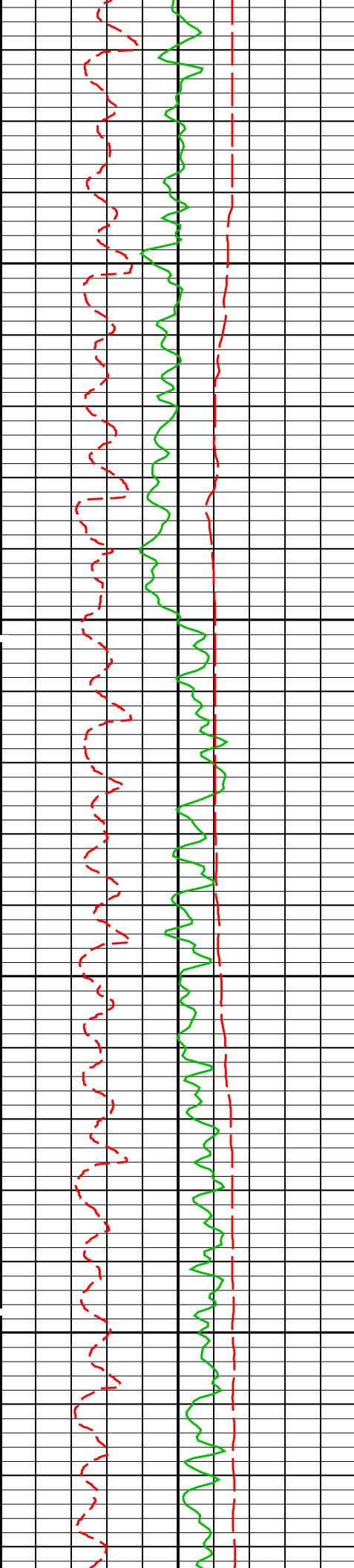
Changed Parameter Summary			
DLIS Name	New Value	Previous Value	Depth & Time
MATR	SANDSTONE	SANDSTONE	8070.5 20:45:35
	SANDSTONE	SANDSTONE	7709.0 20:45:47
	LIMESTONE	SANDSTONE	7425.0 20:45:56
MDEN	2.65 G/C3	2.68 G/C3	8070.5 20:45:35
	2.68 G/C3	2.65 G/C3	7709.0 20:45:47
	2.71 G/C3	2.68 G/C3	7425.0 20:45:56

PIP SUMMARY	
<div><div></div>Time Mark Every 60 S</div>	

Std. Res. Formation Pe (PEFZ)	
0 (----) 10	
Alpha Processed Neutron Porosity (NPOR)	

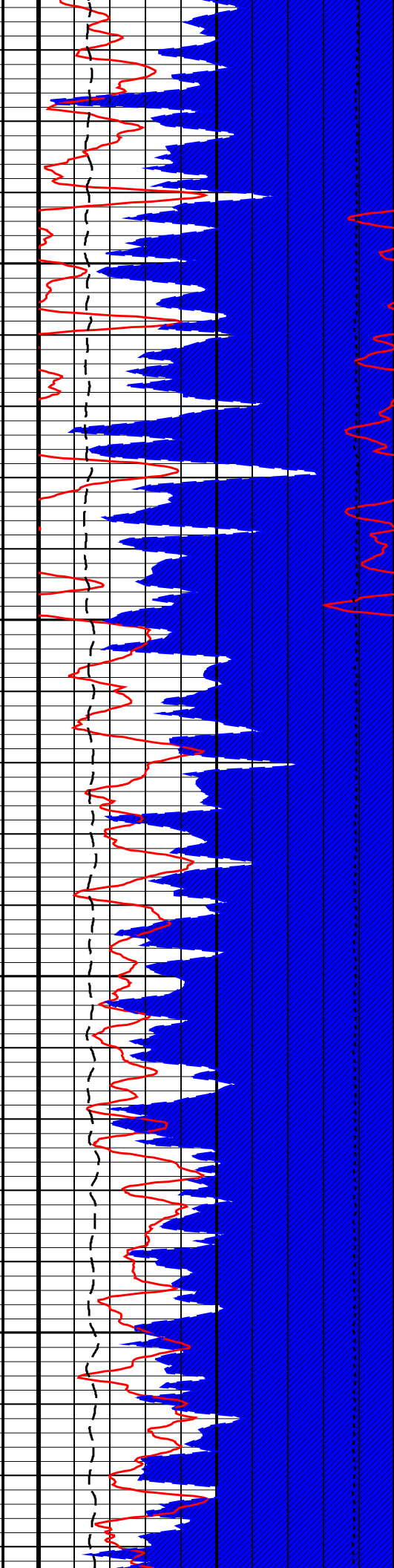
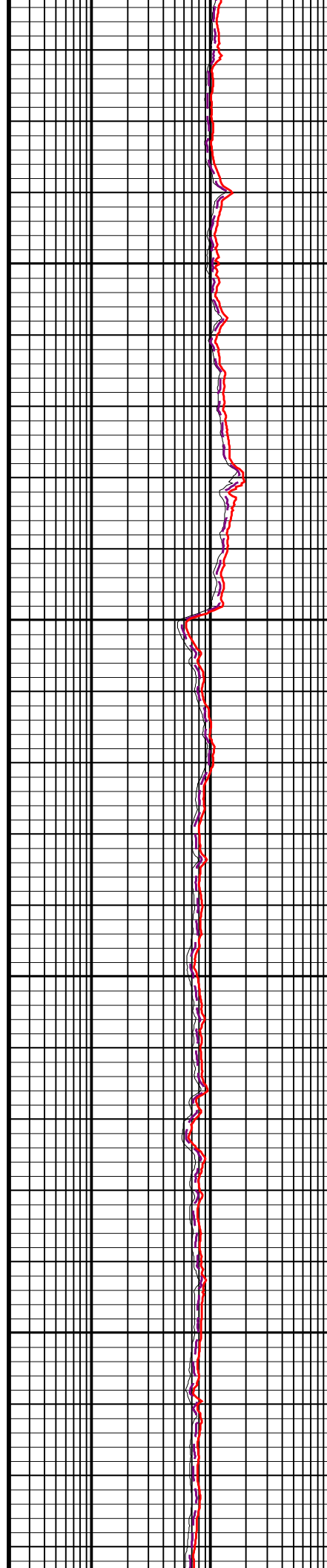


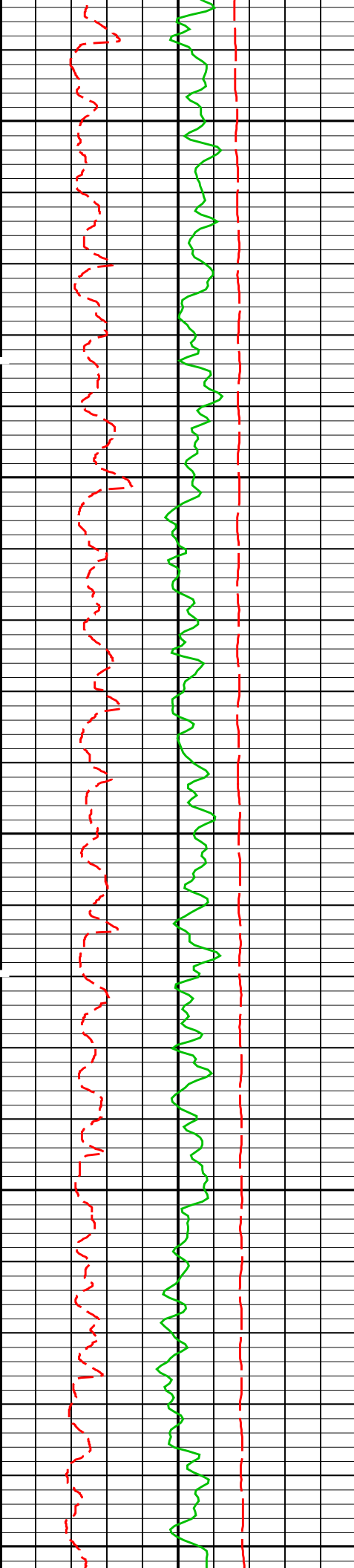




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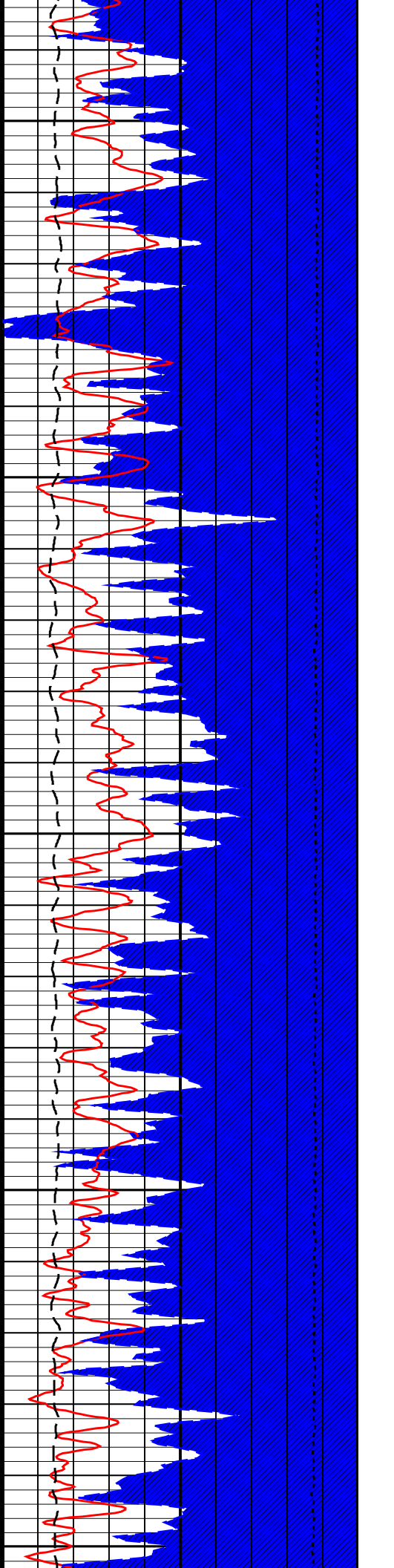
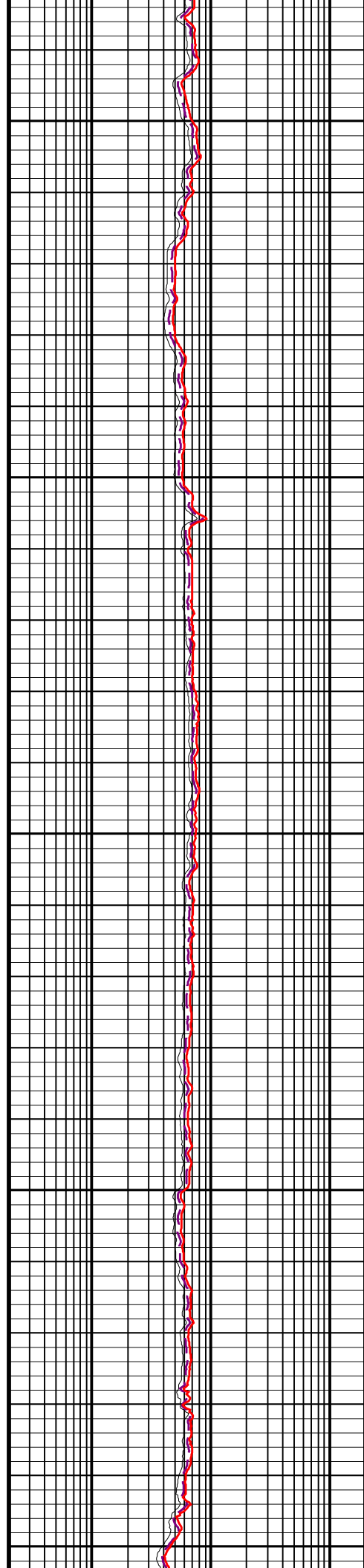
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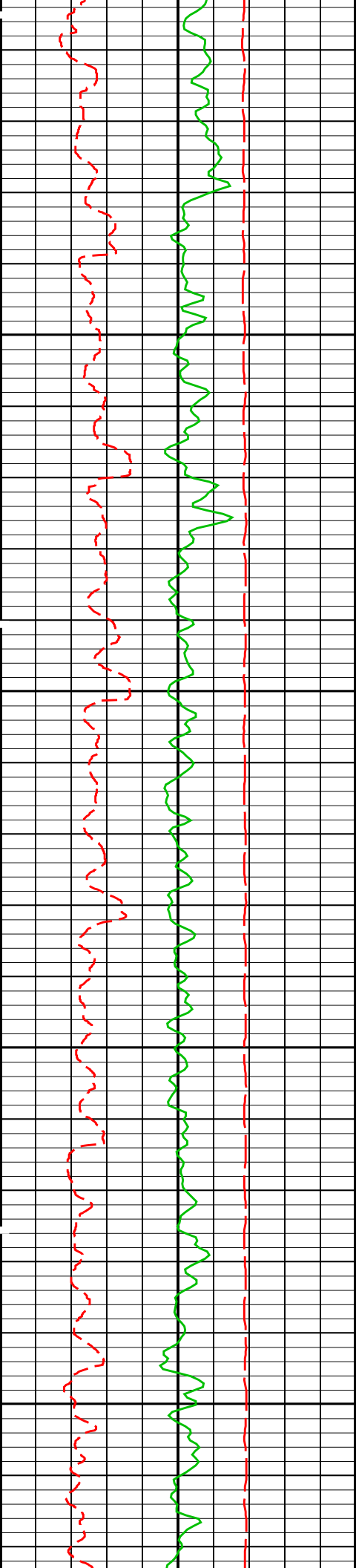




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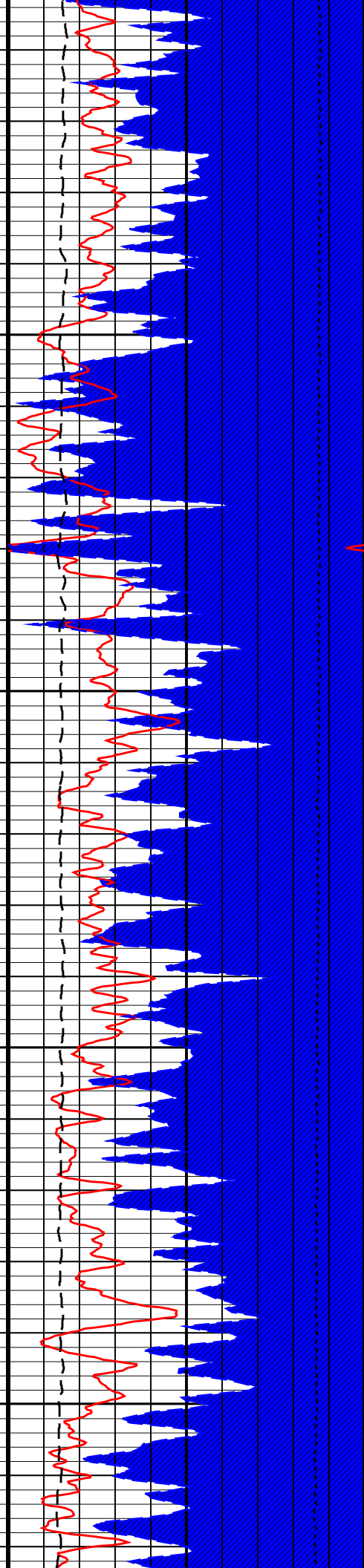
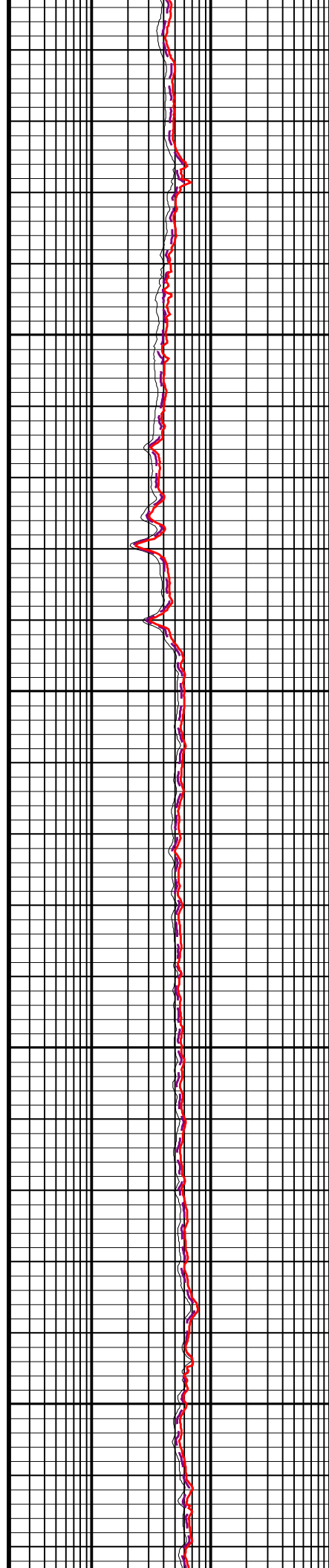
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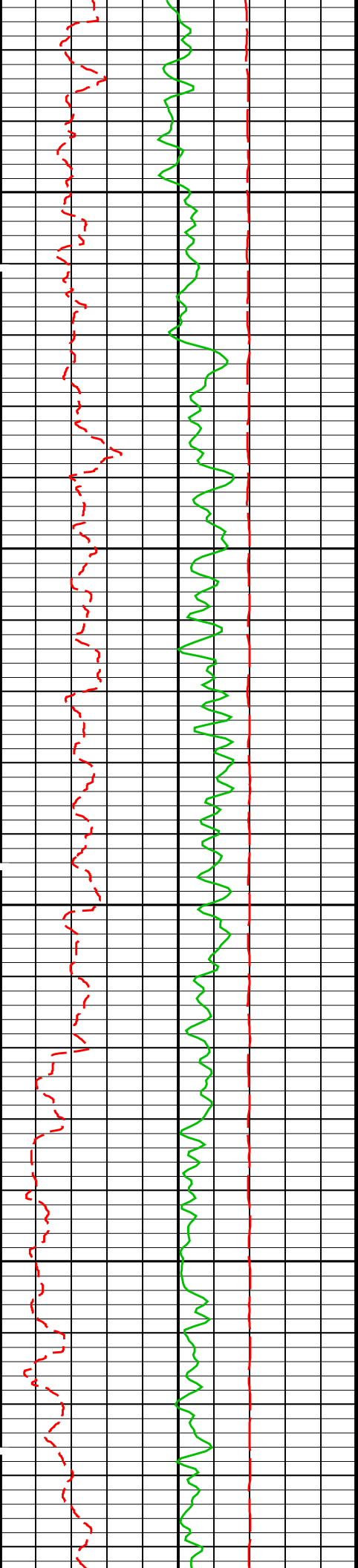




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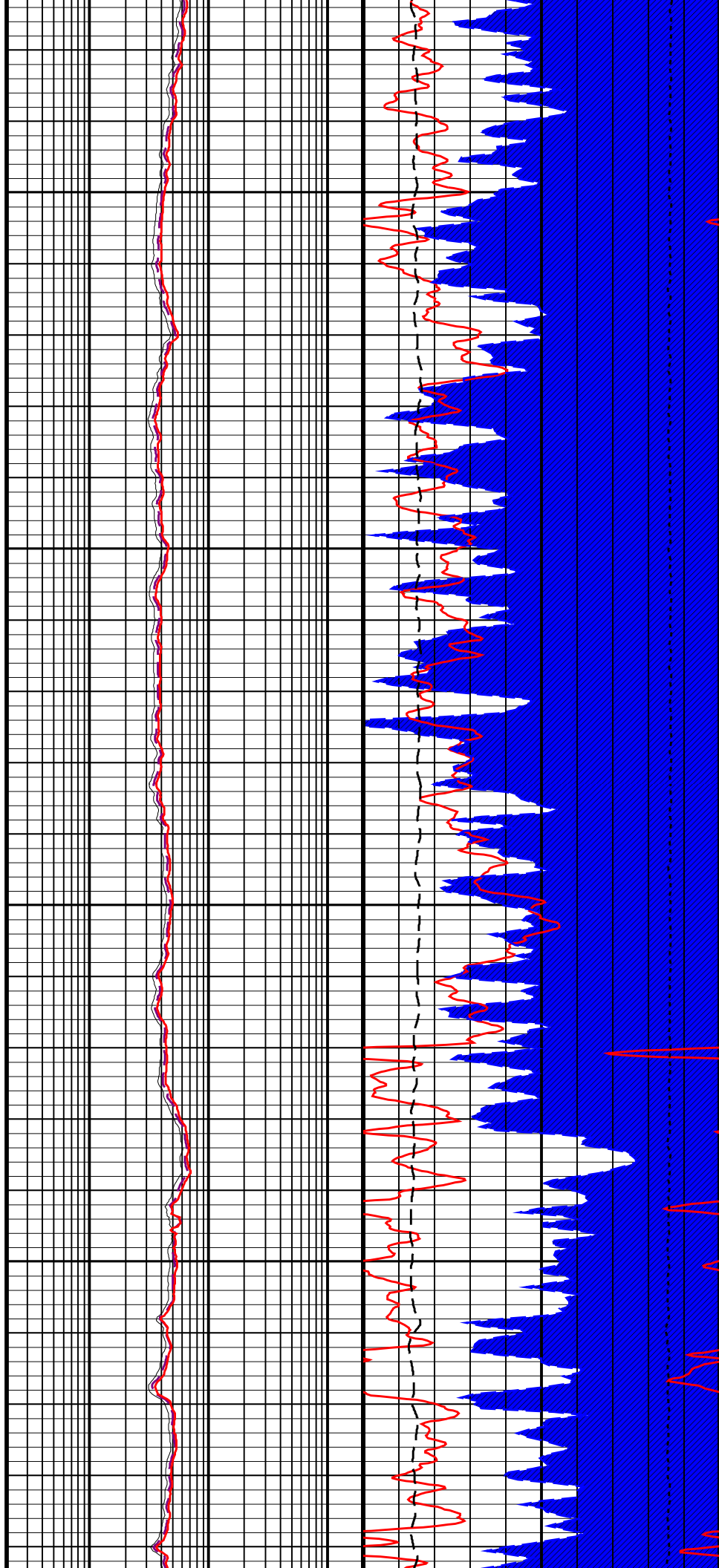
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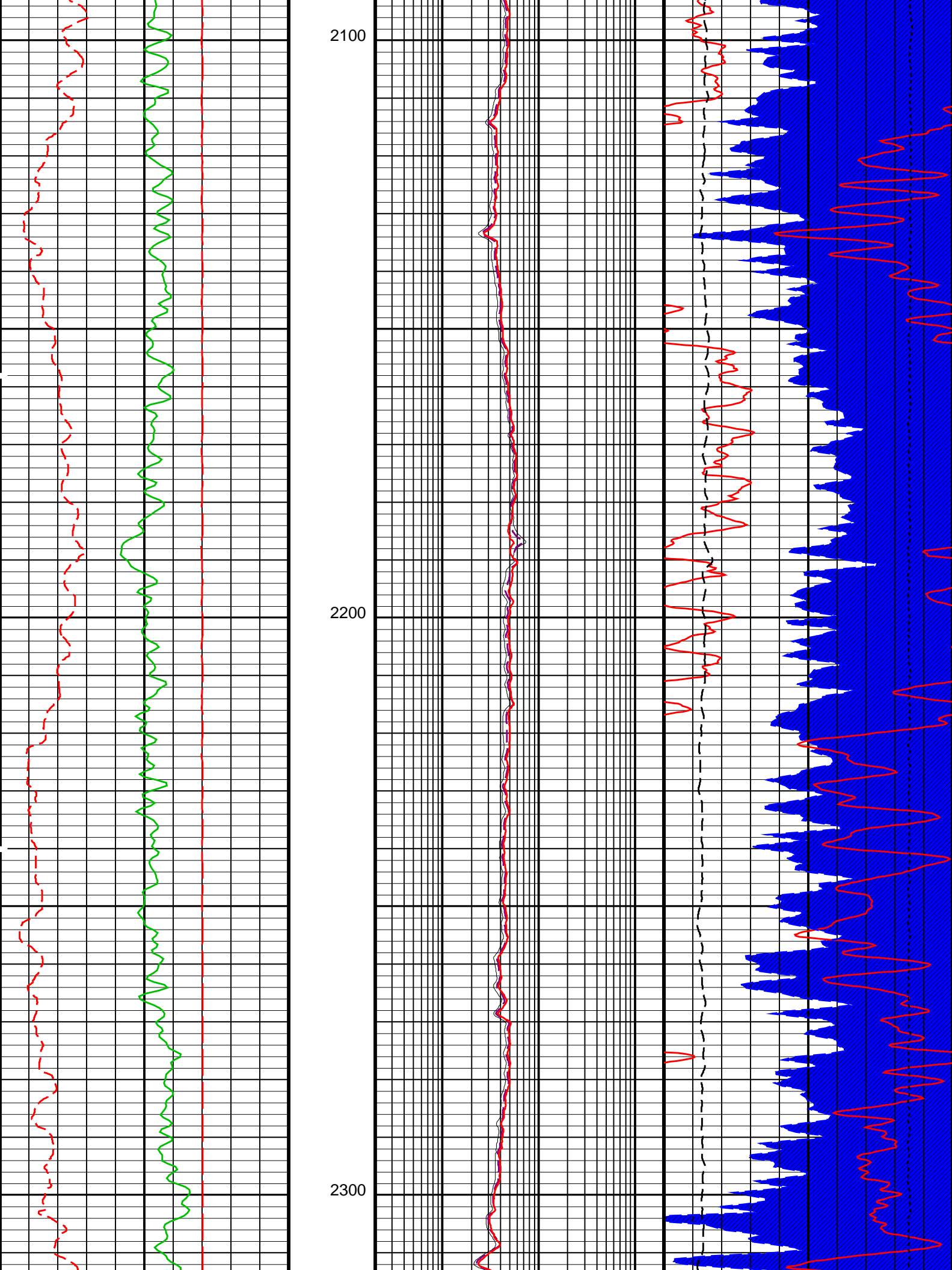


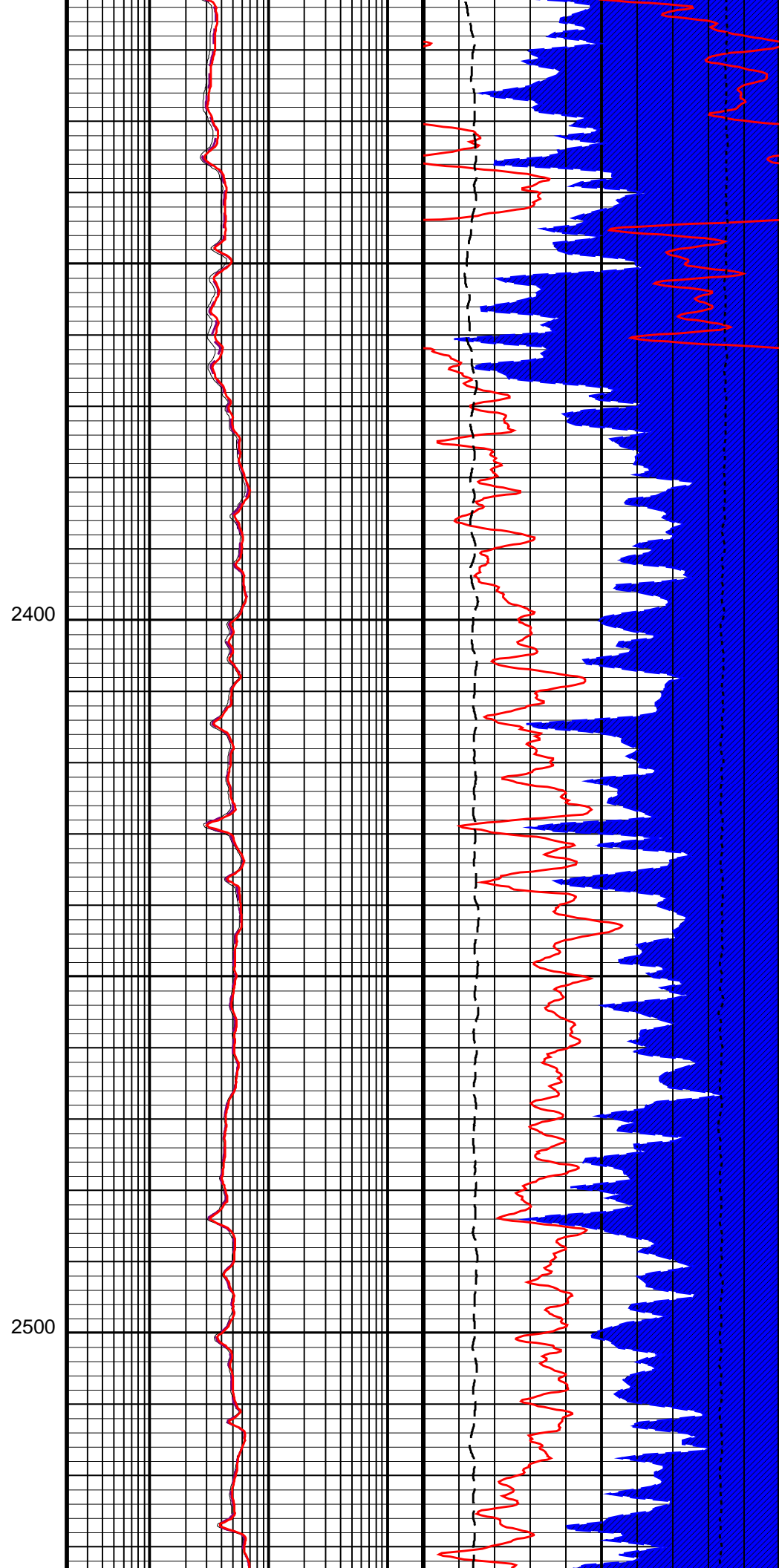
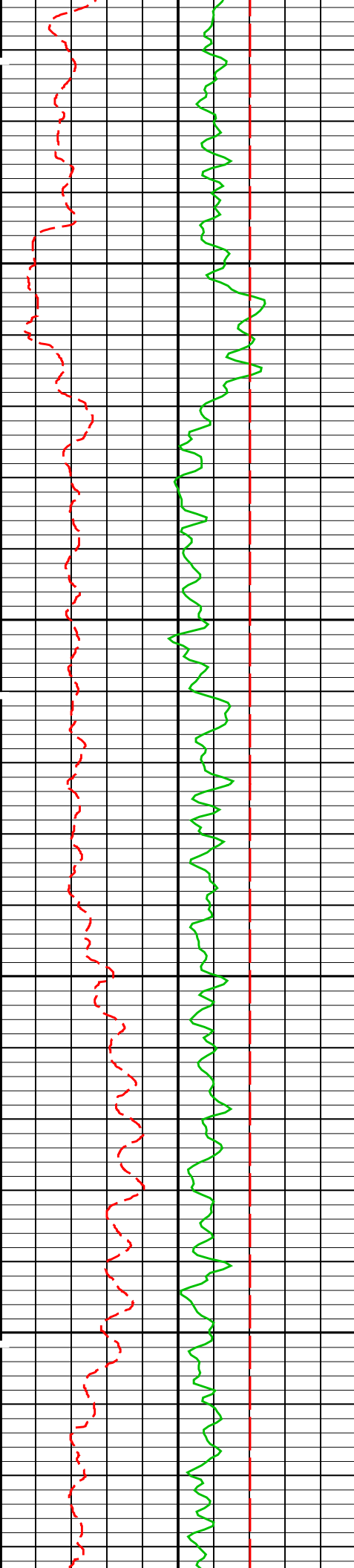


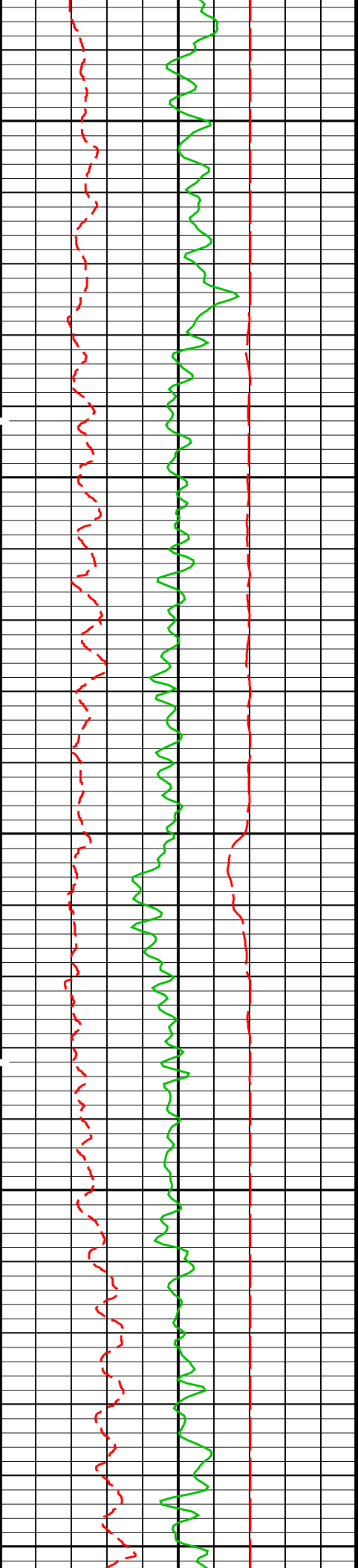
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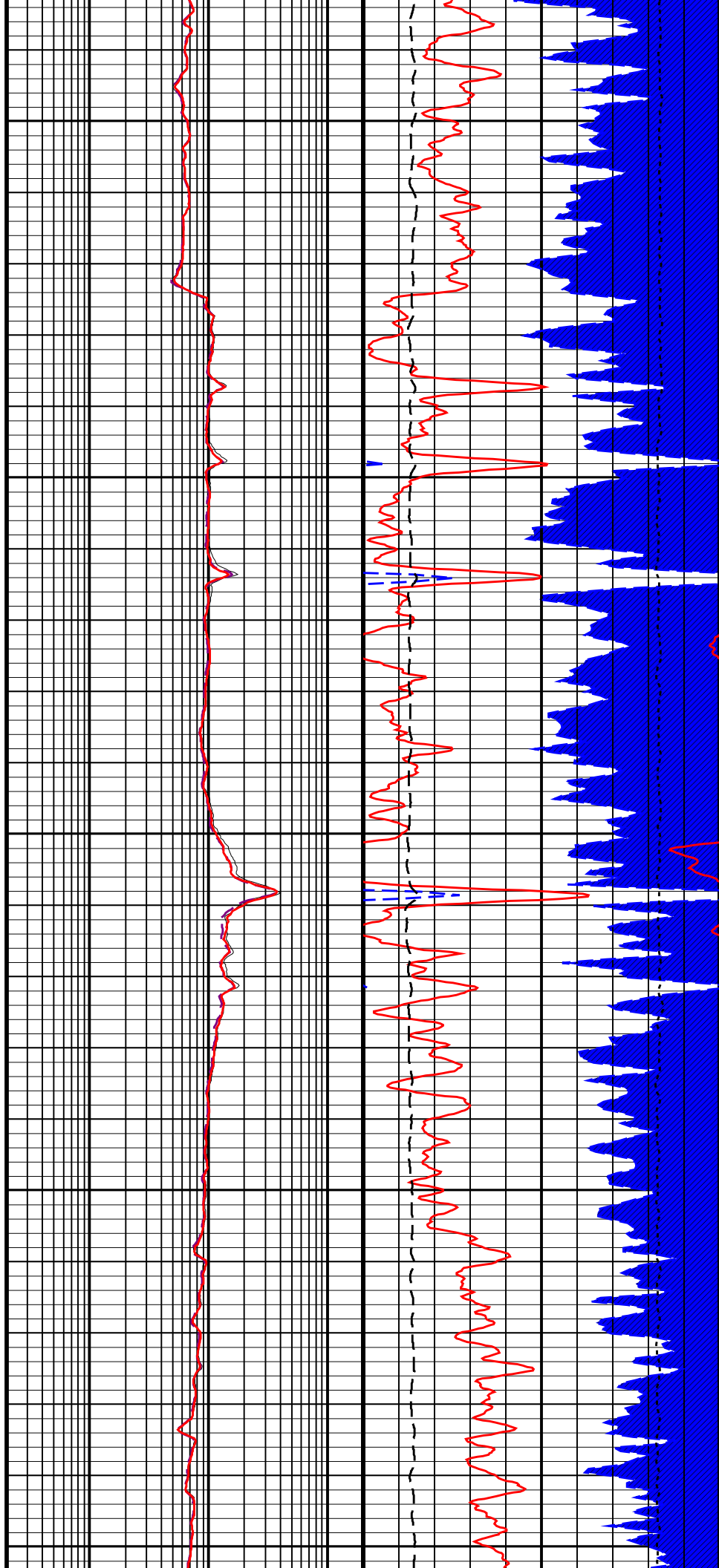


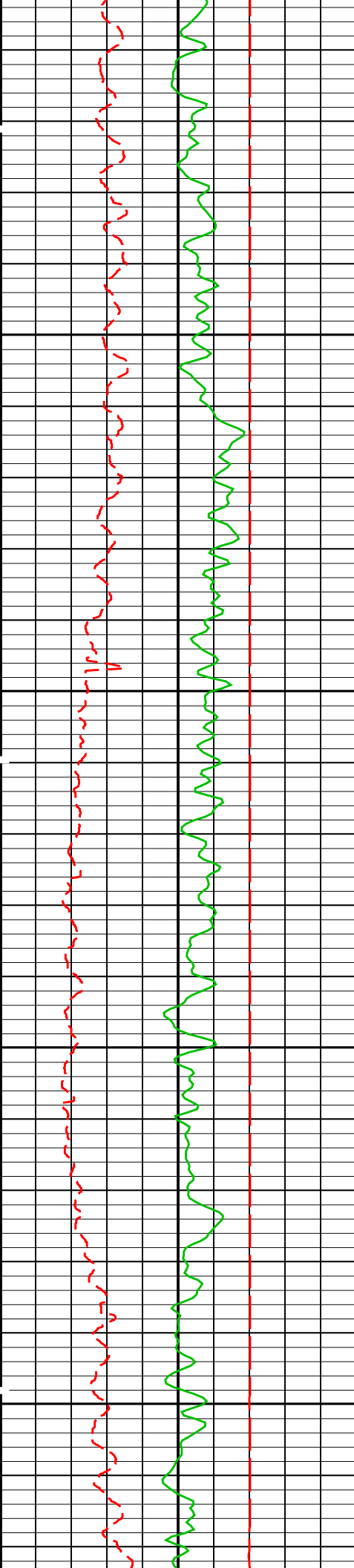




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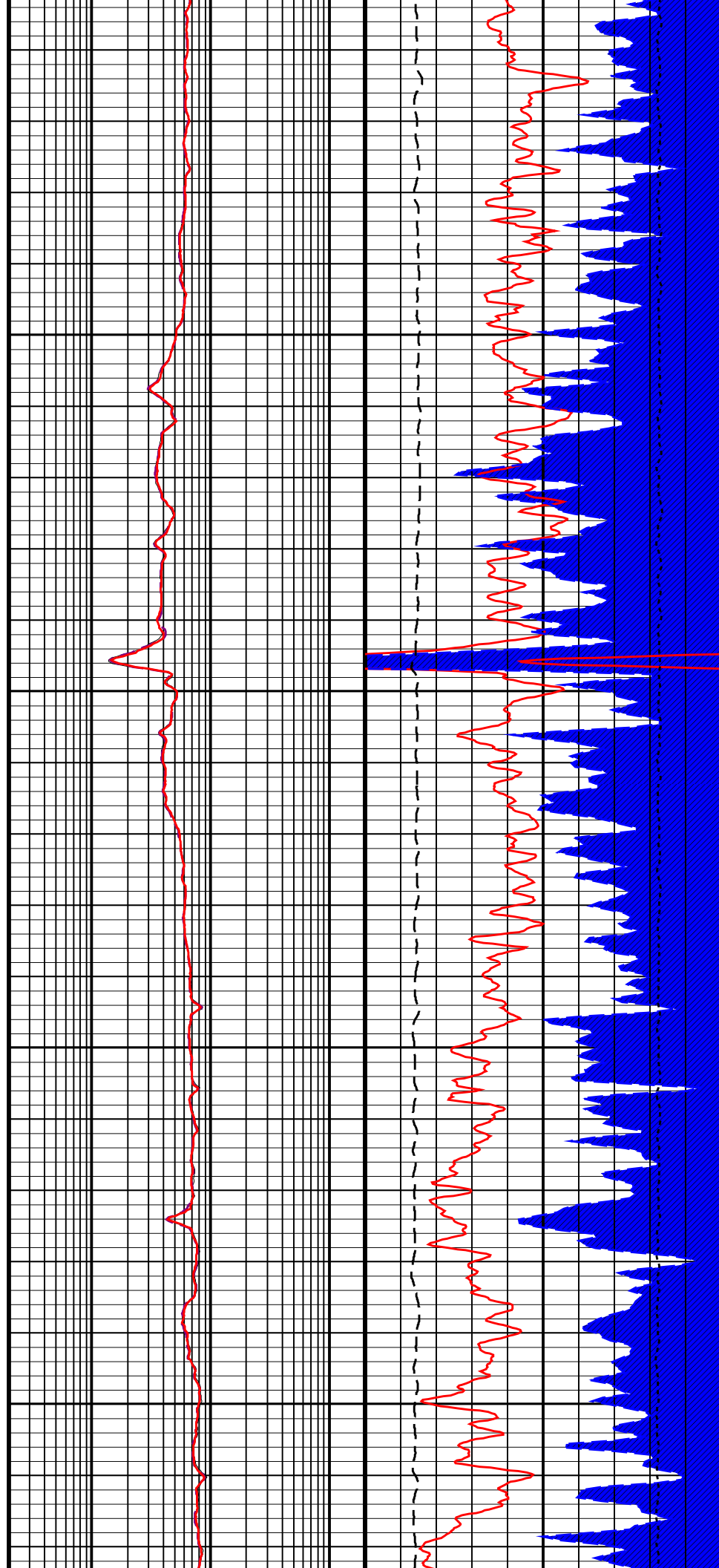
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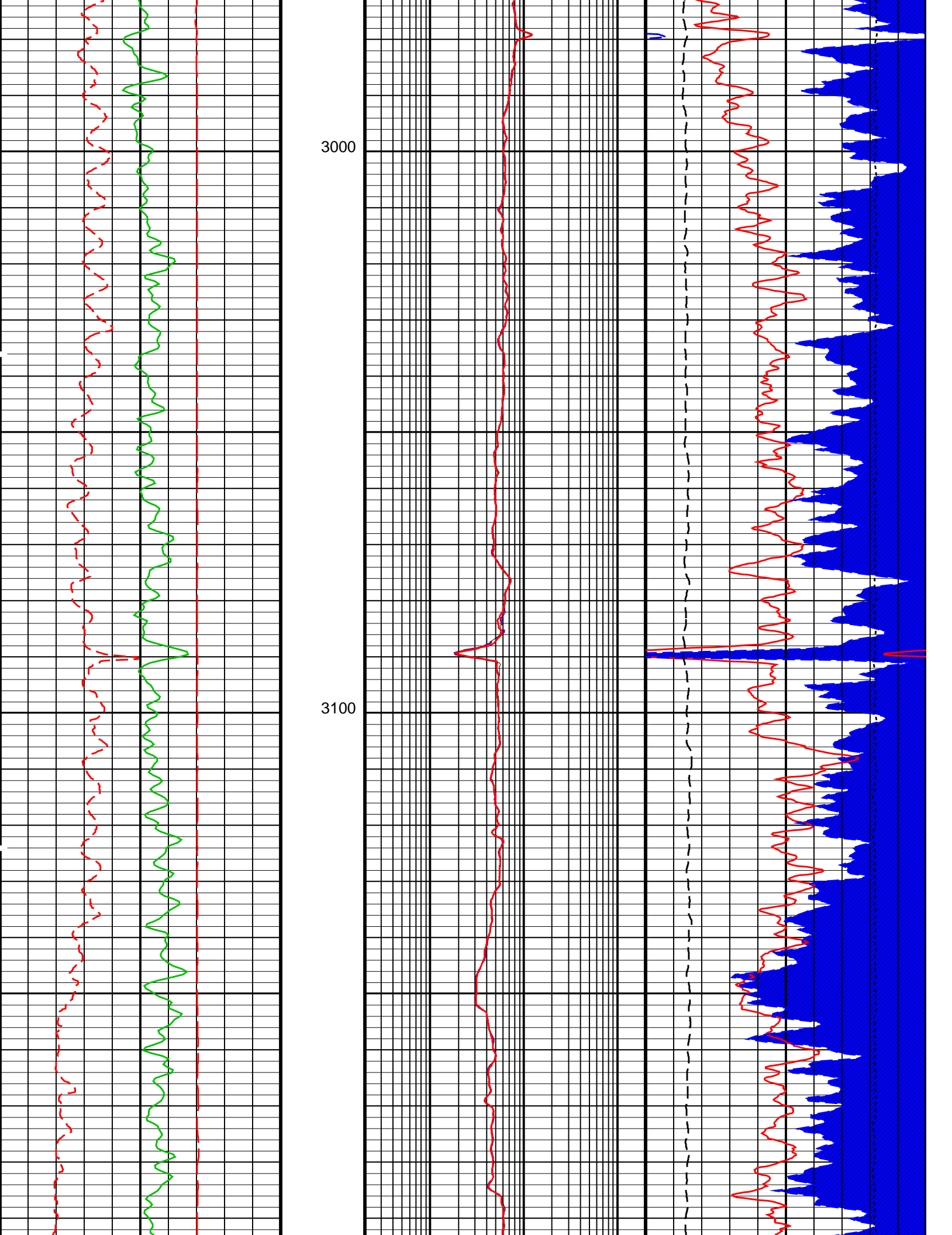


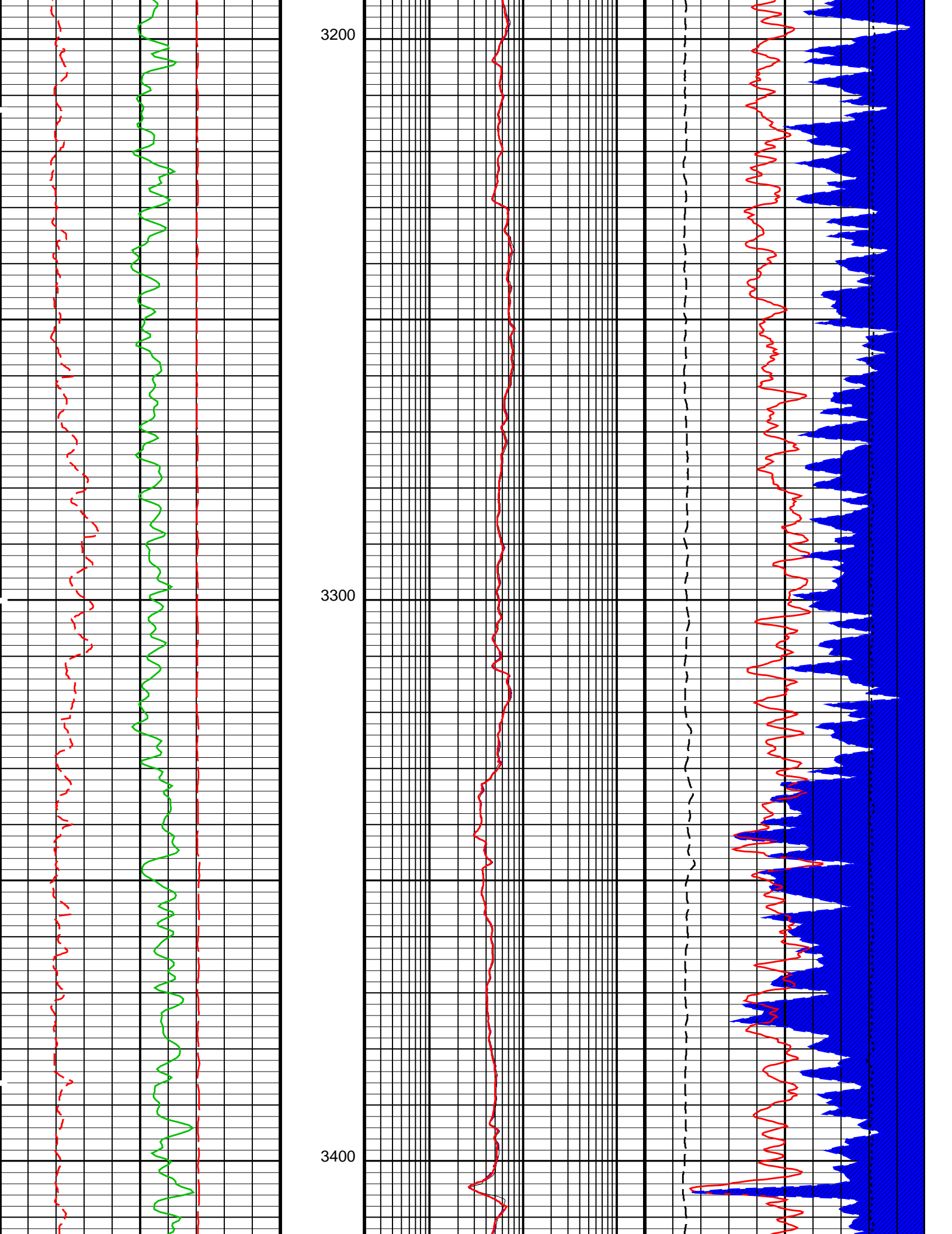


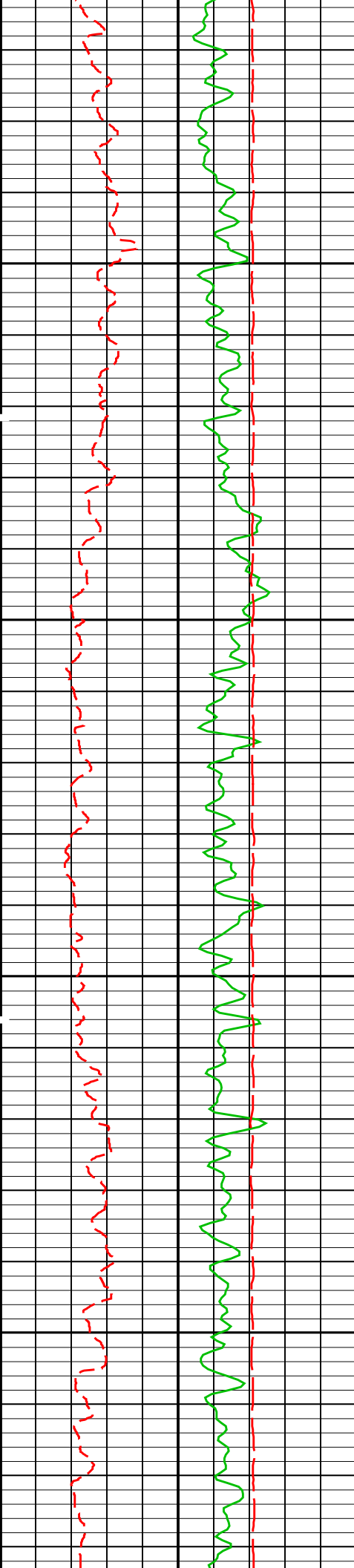
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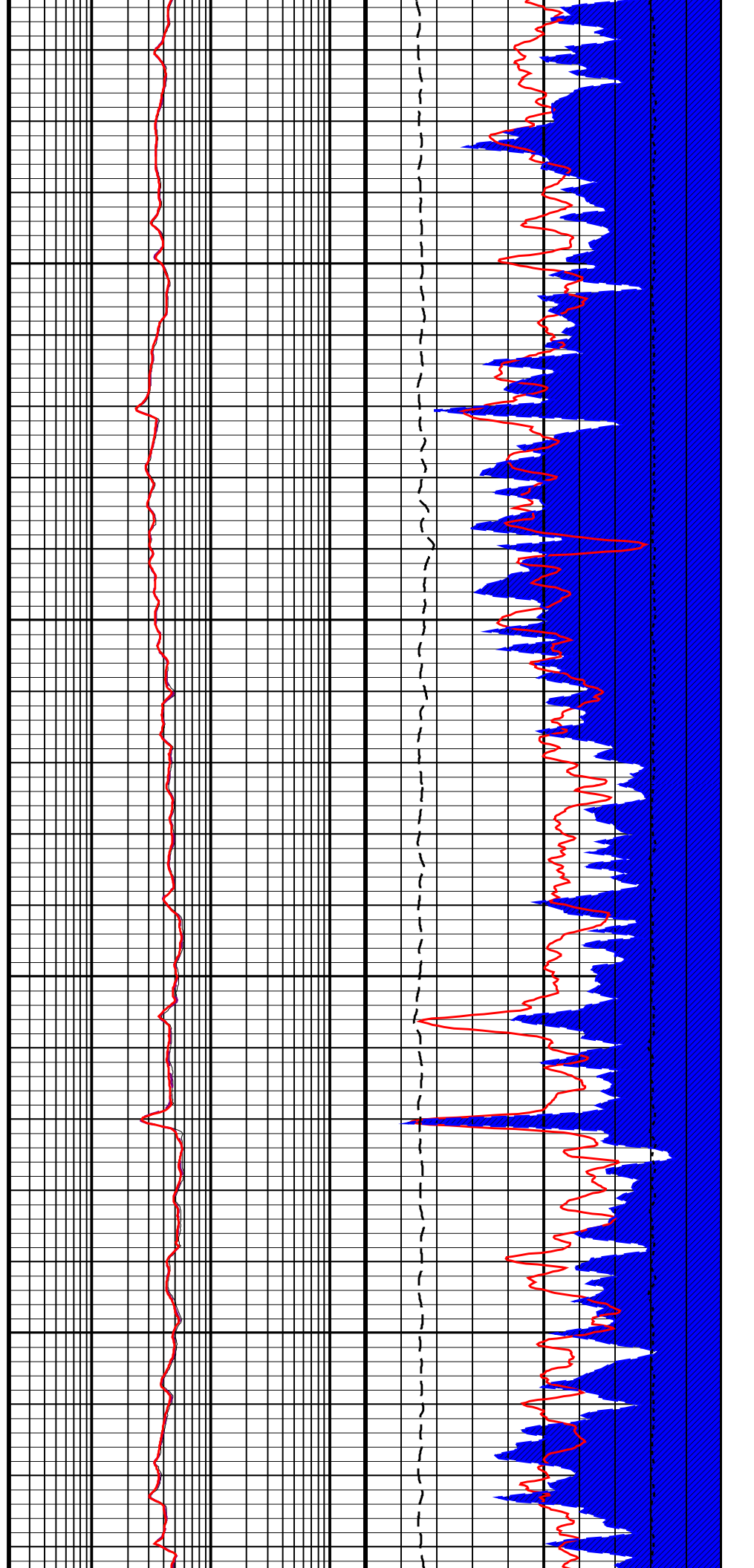


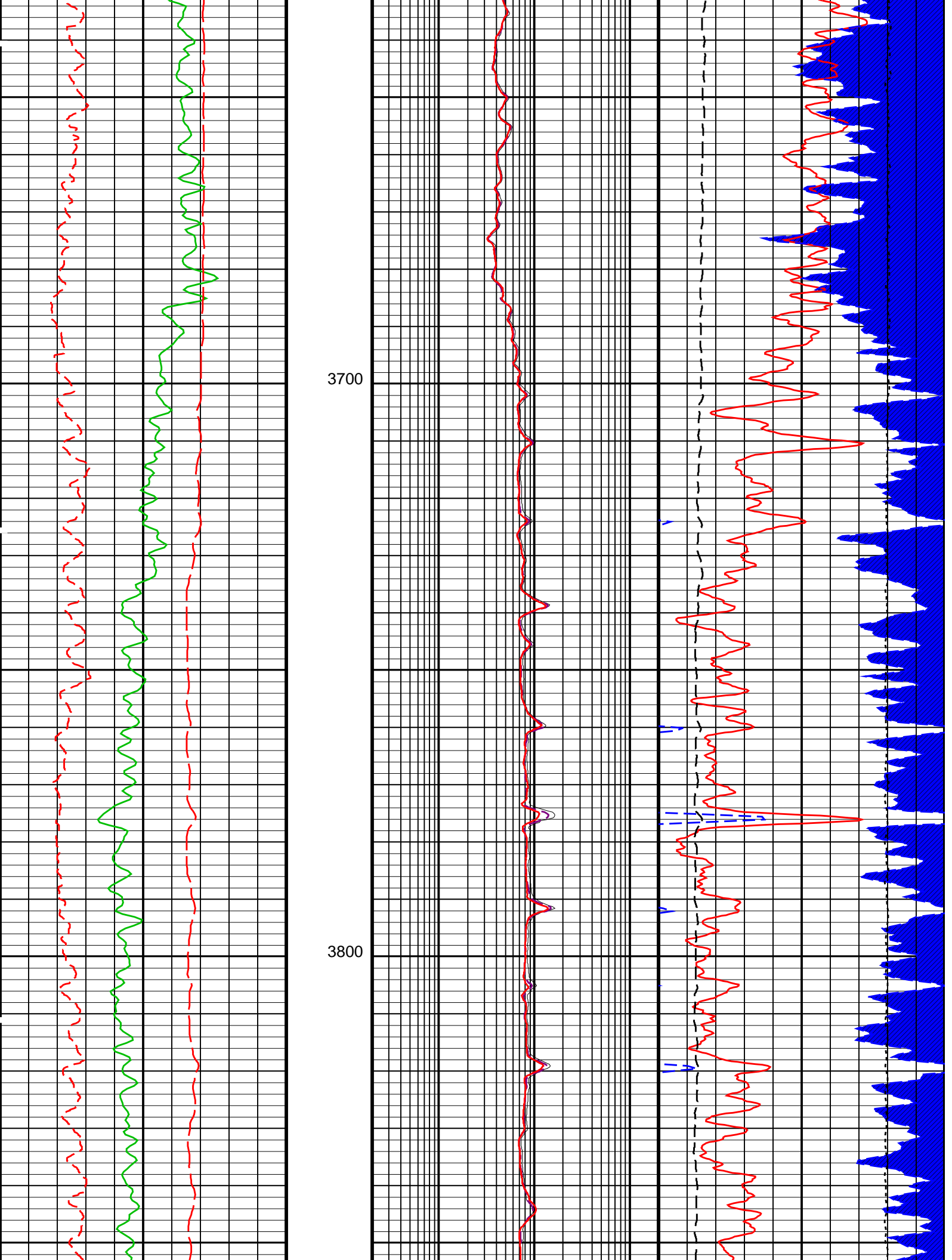


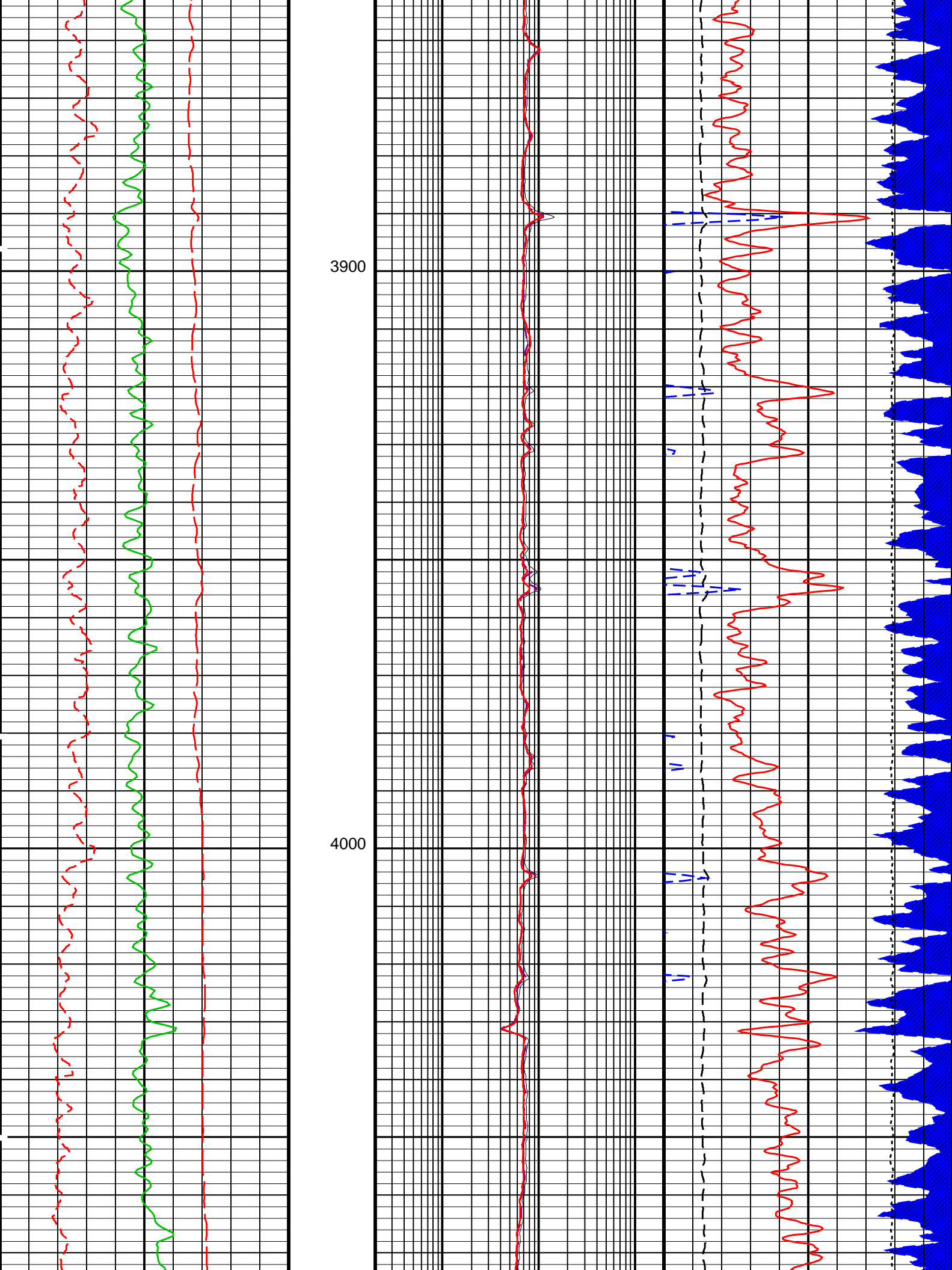


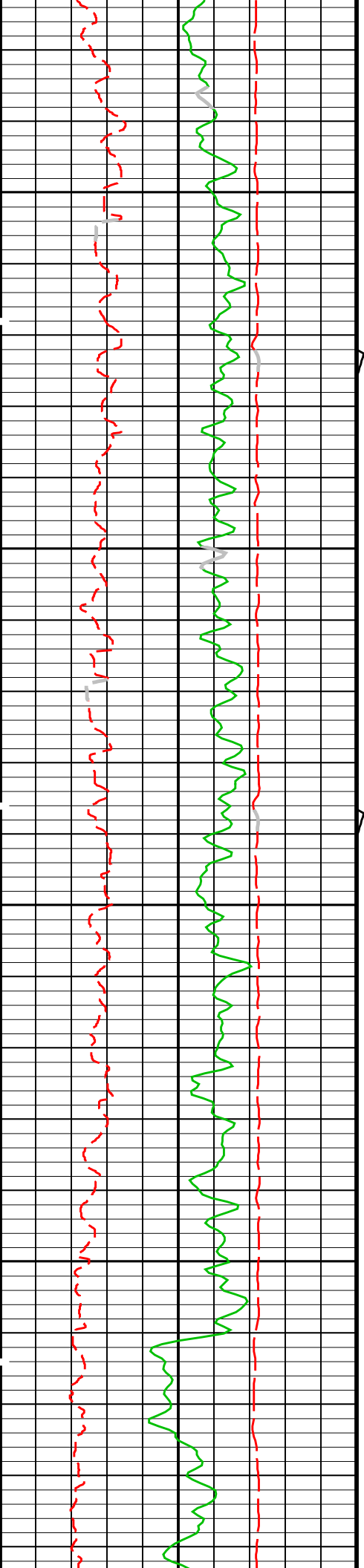
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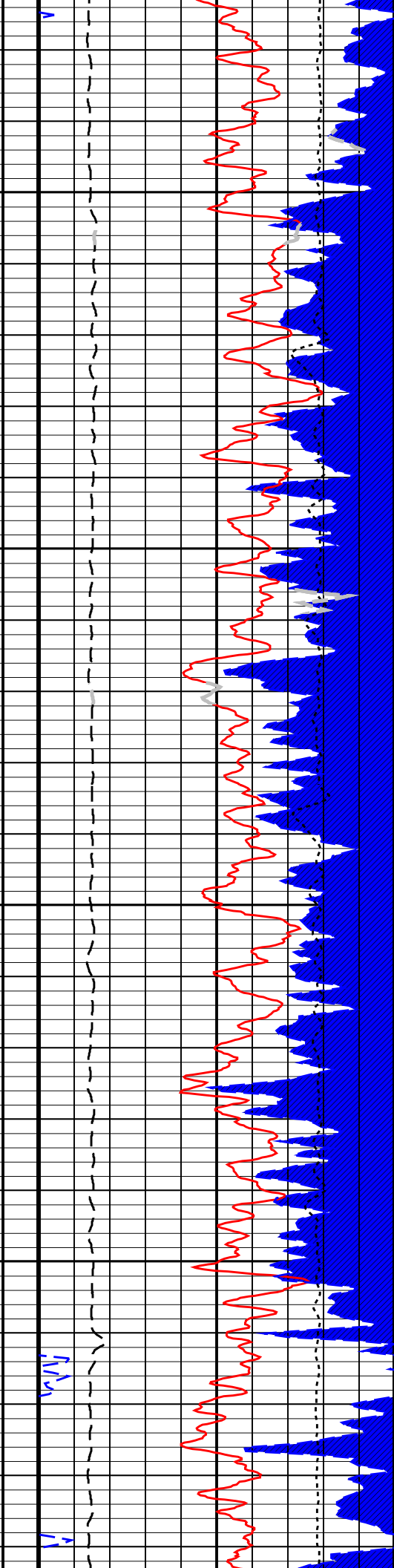
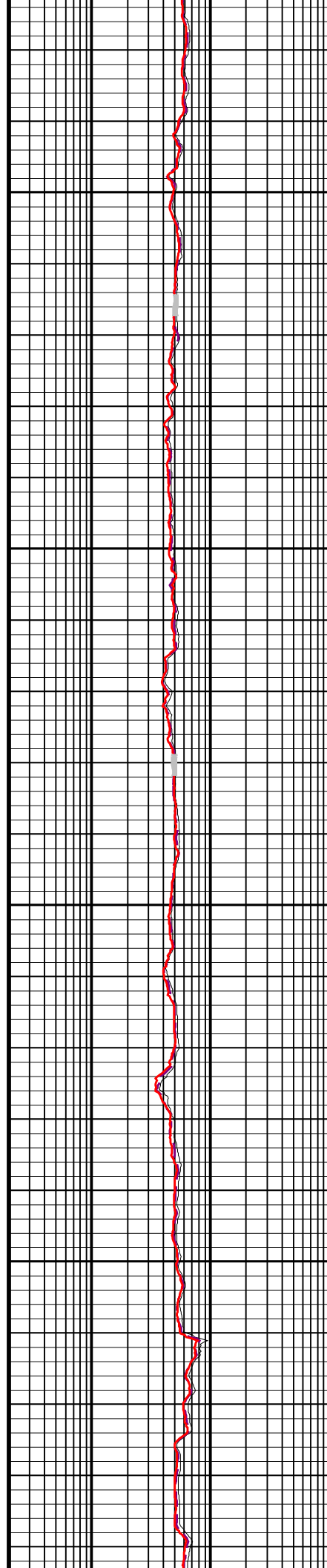


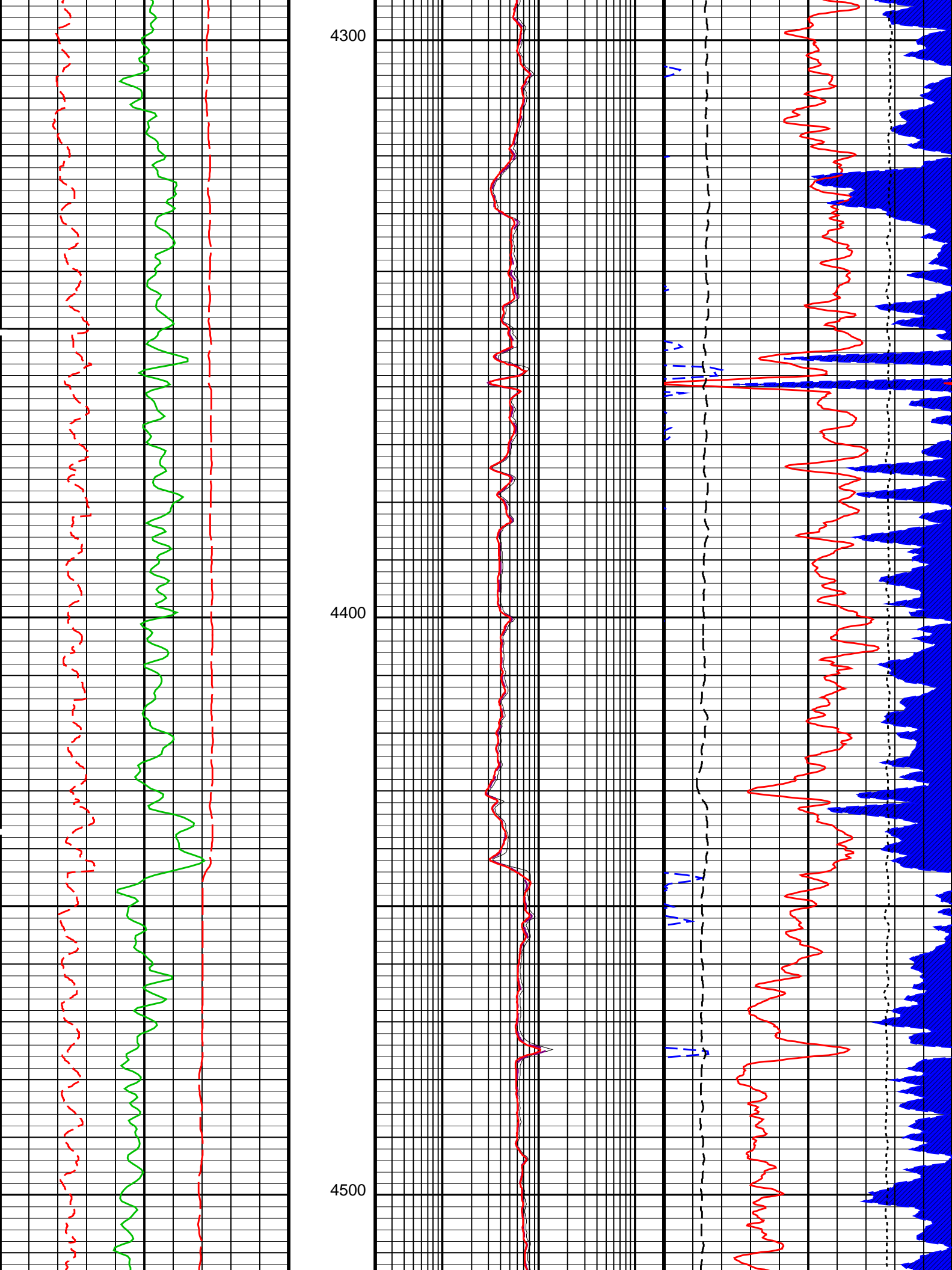


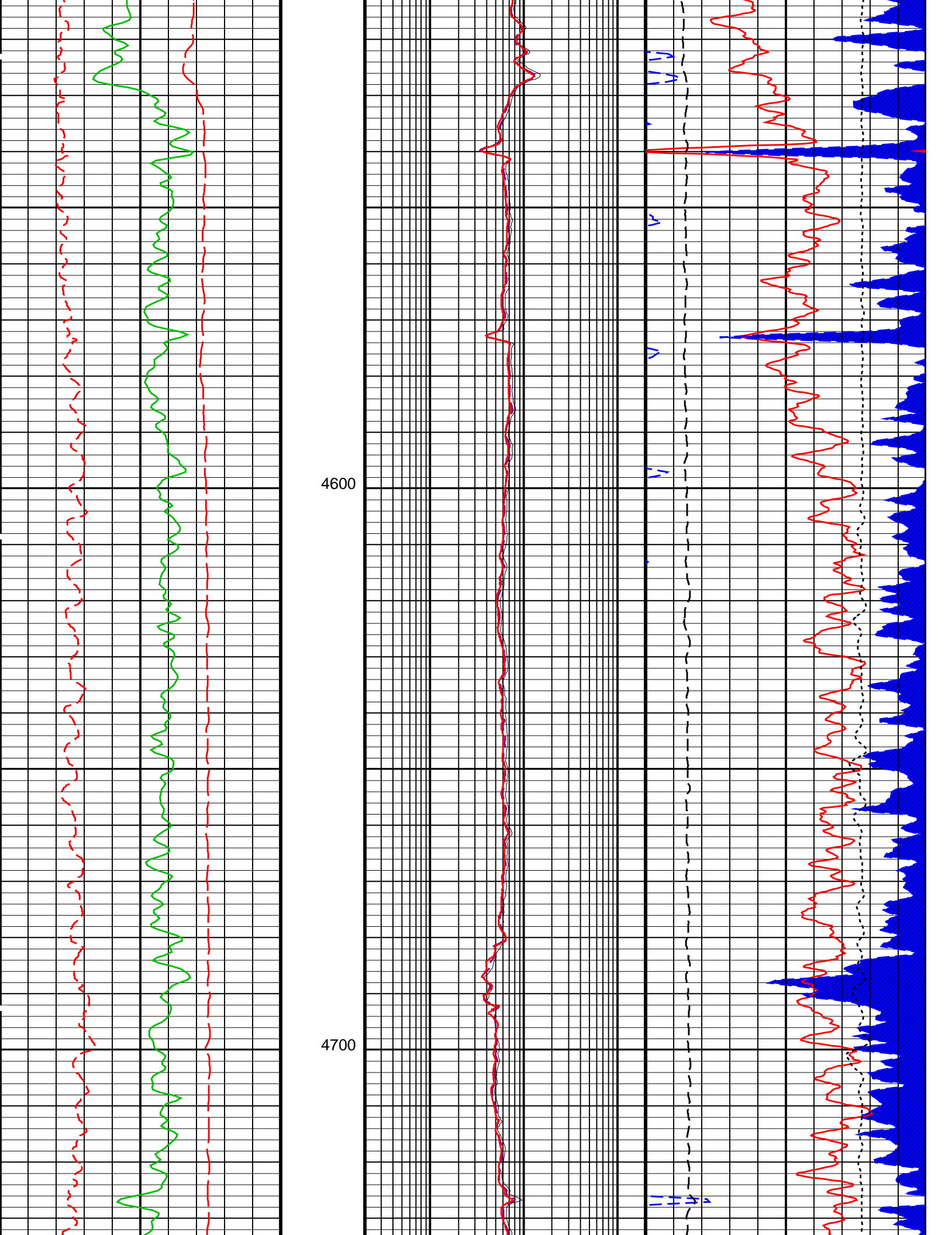


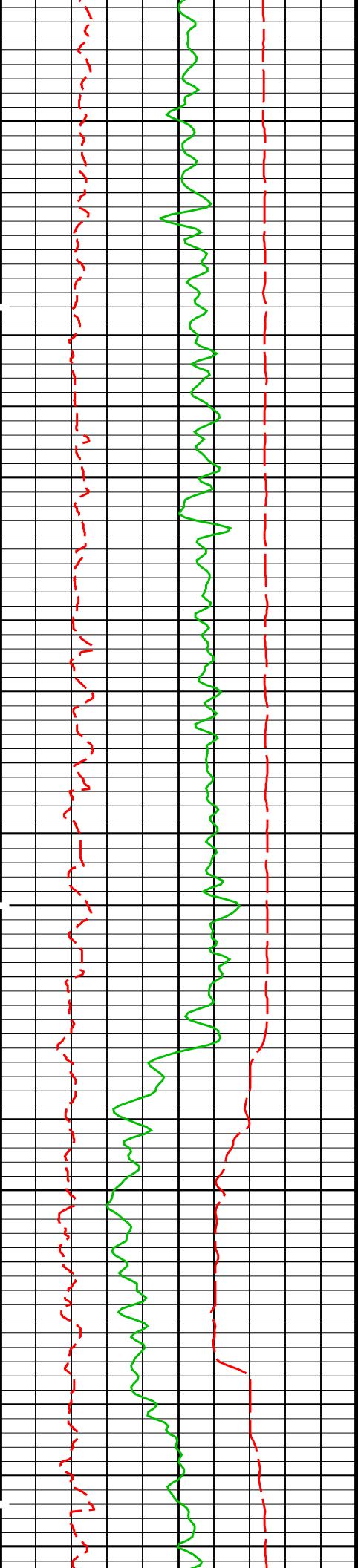
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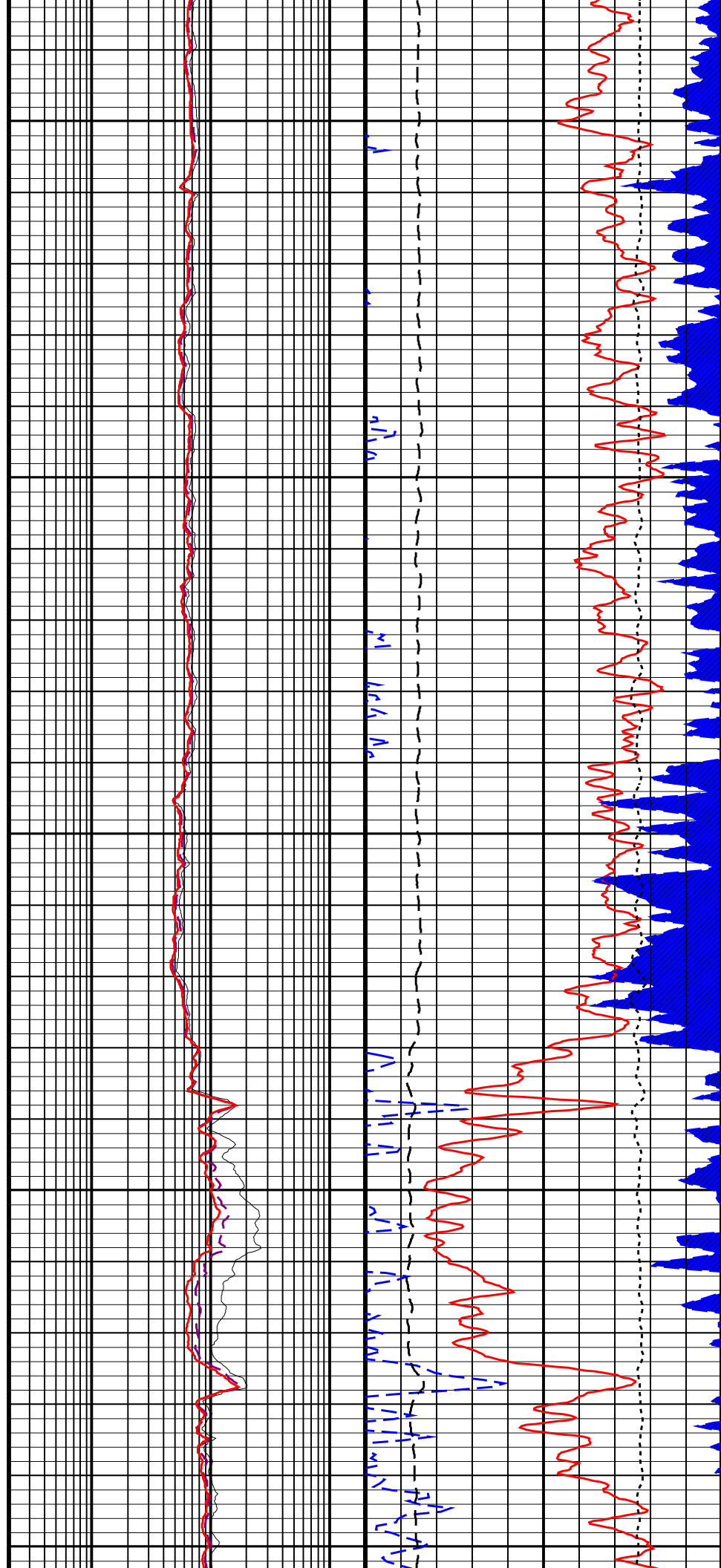


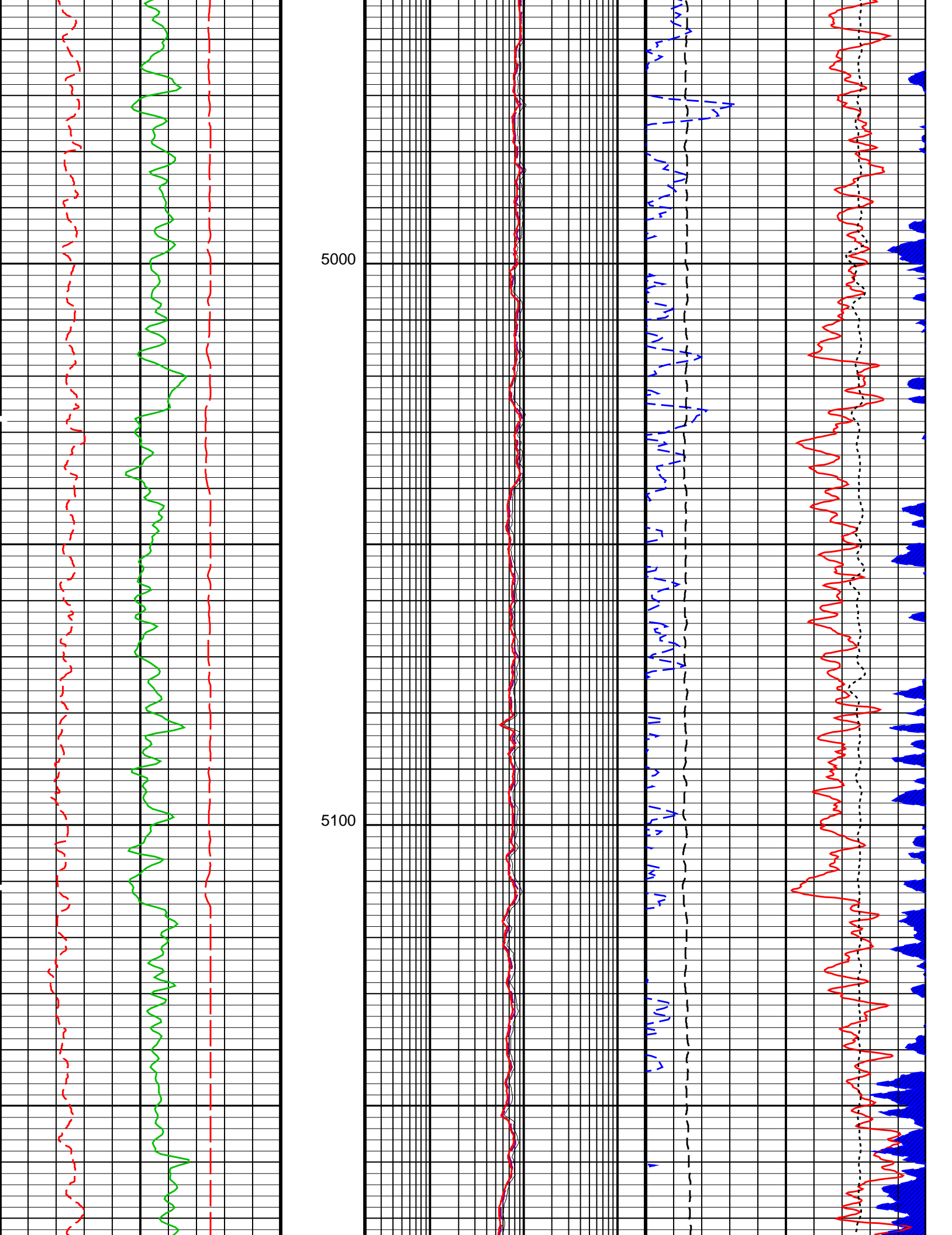


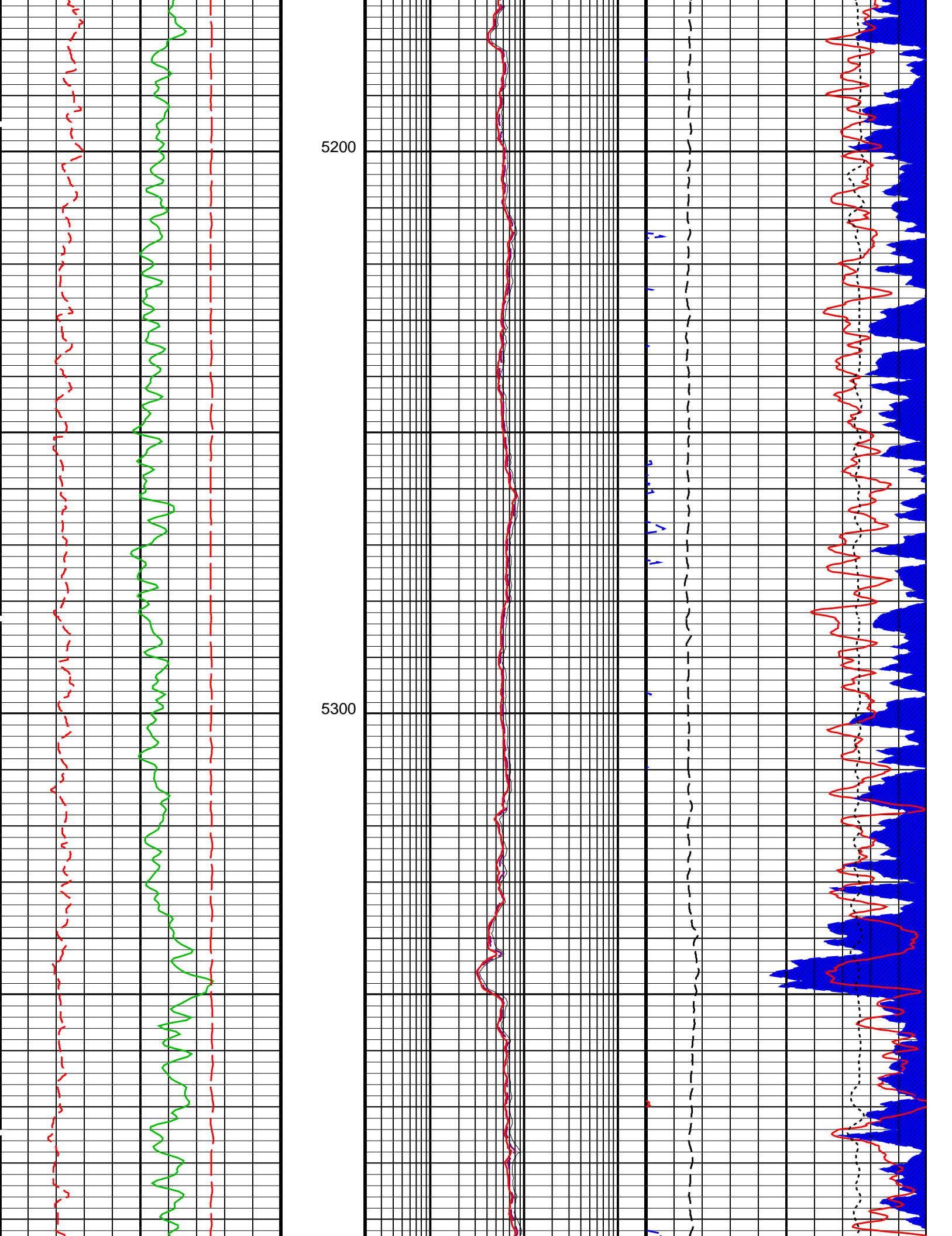


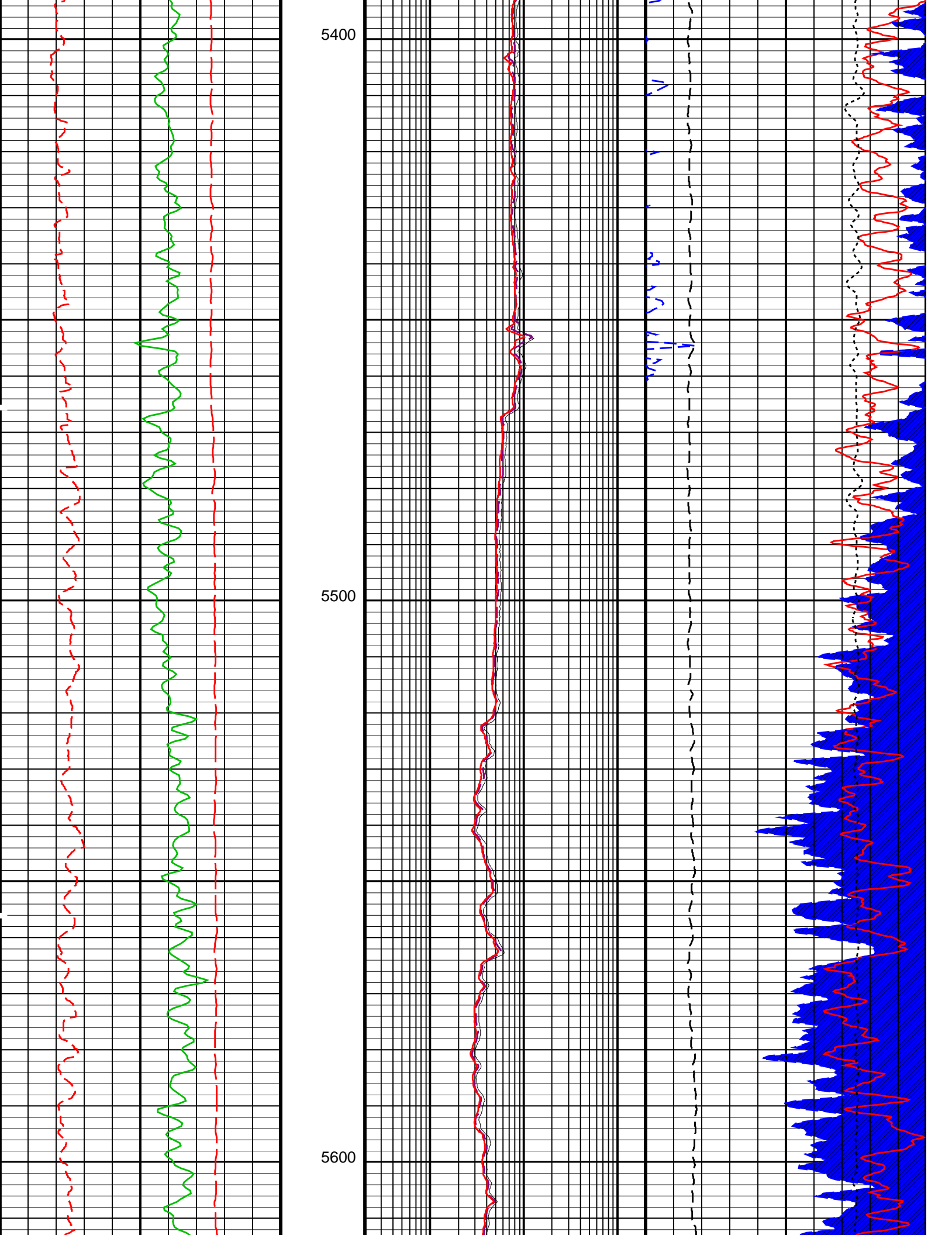
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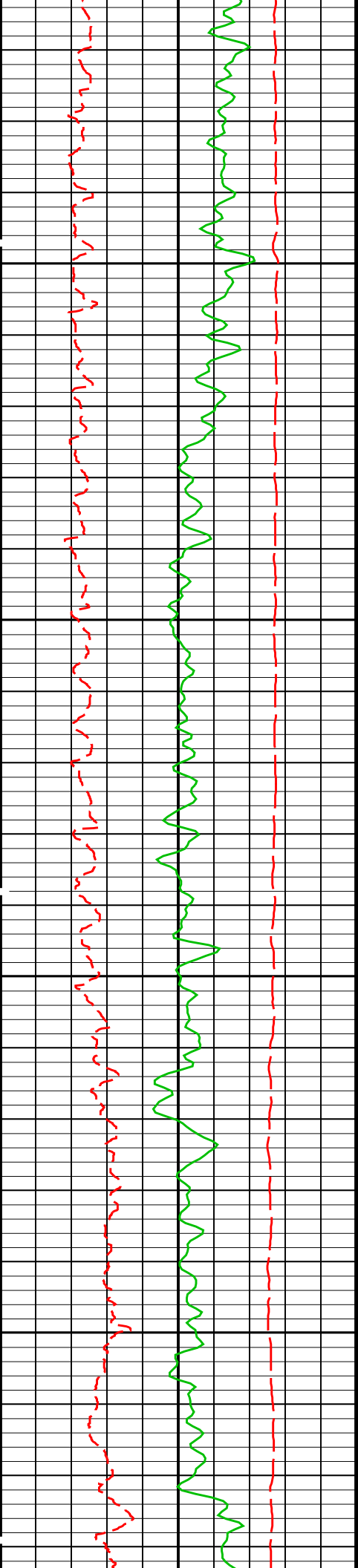
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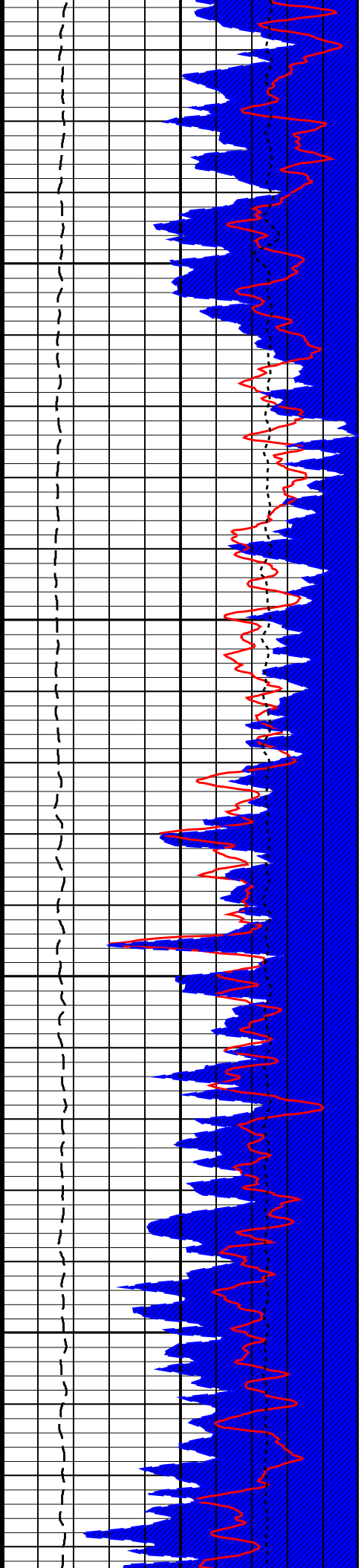
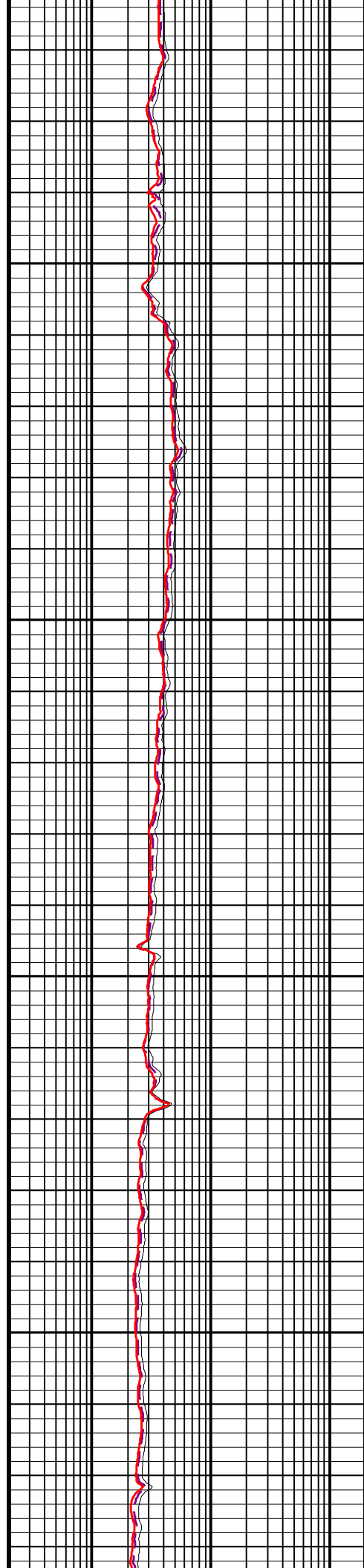


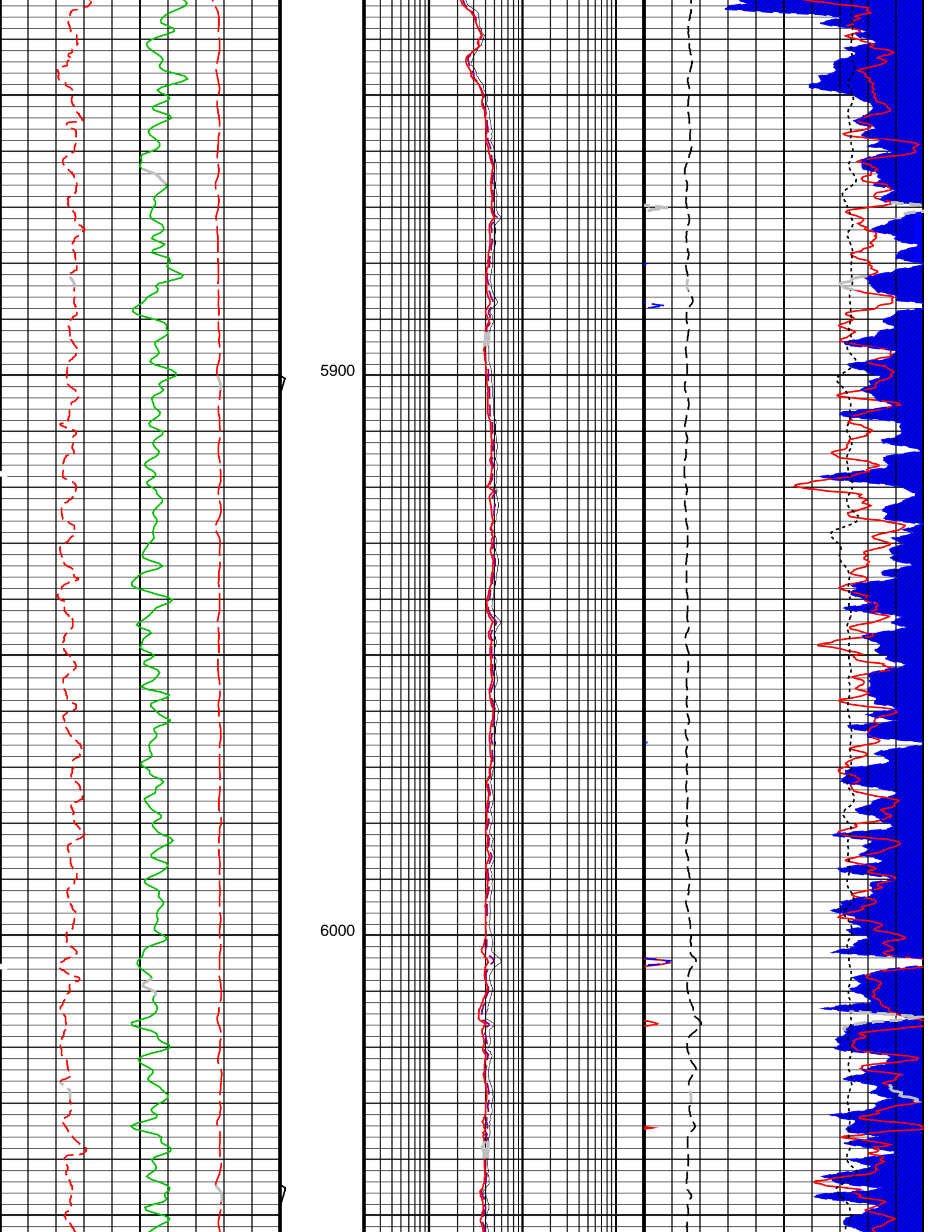


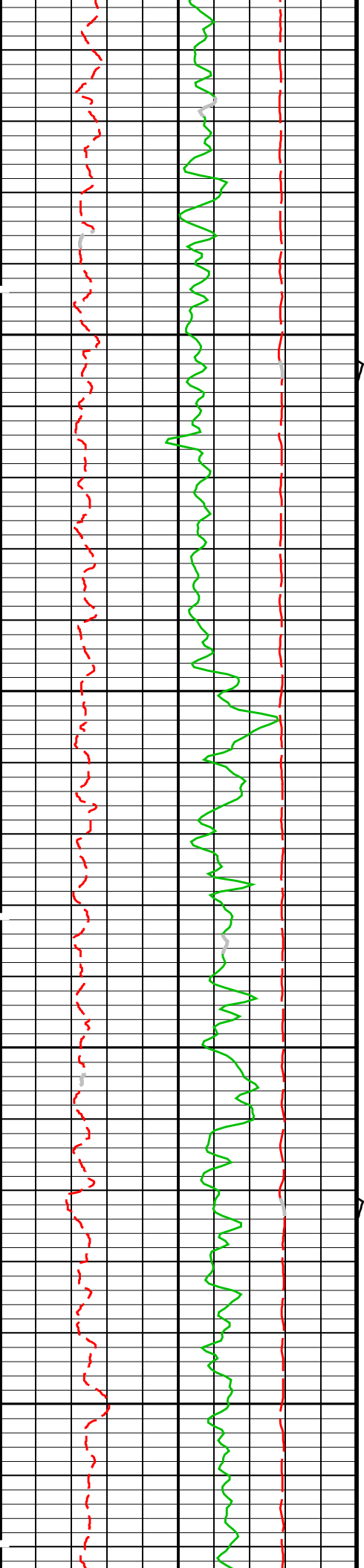


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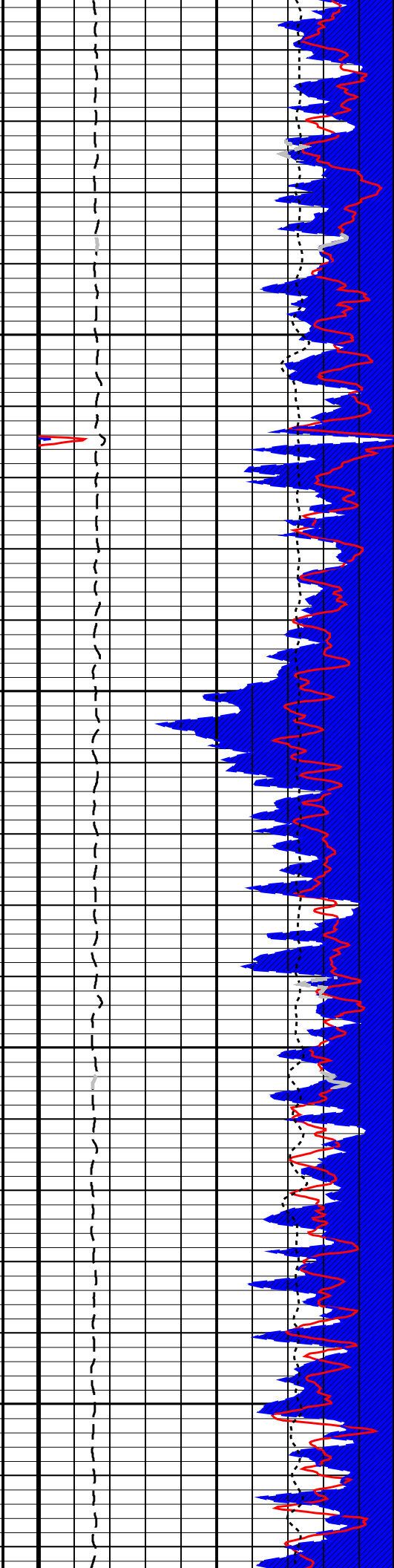
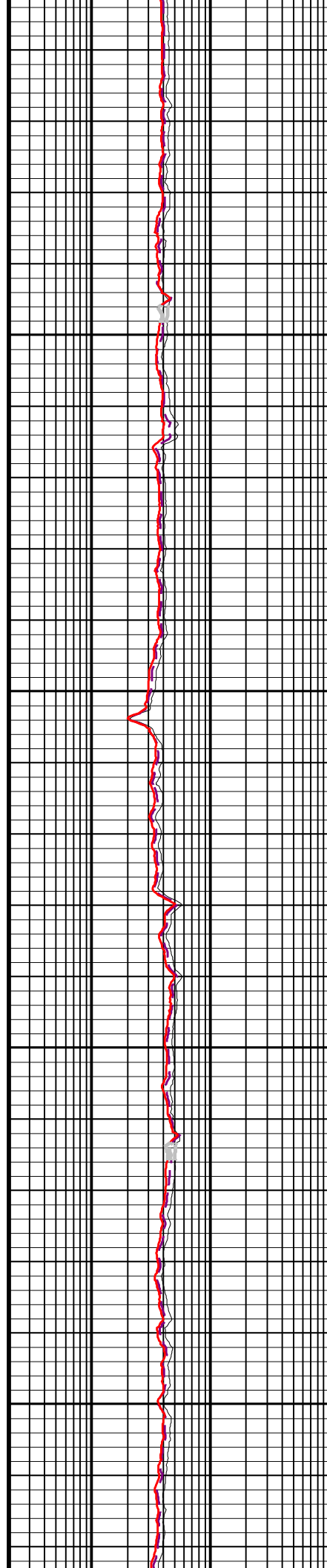


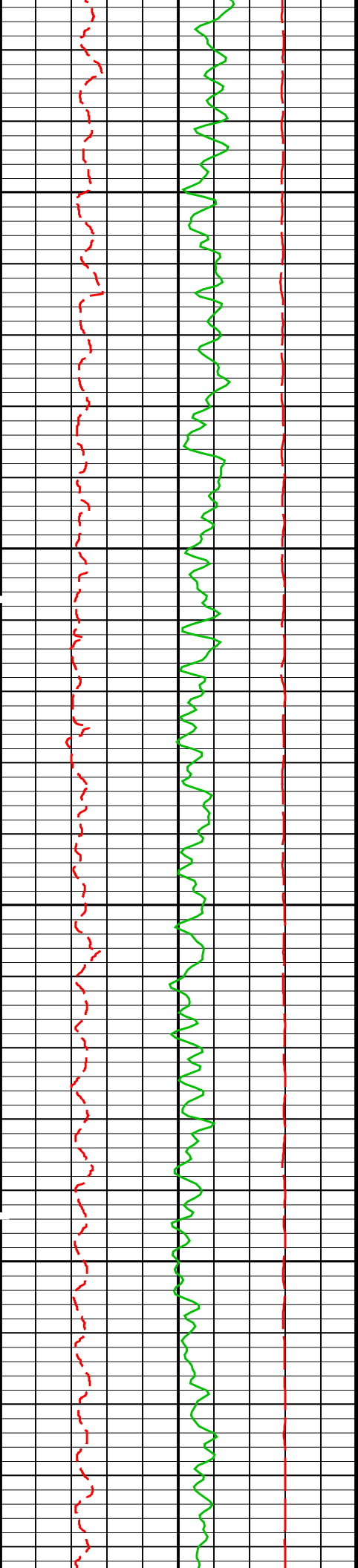




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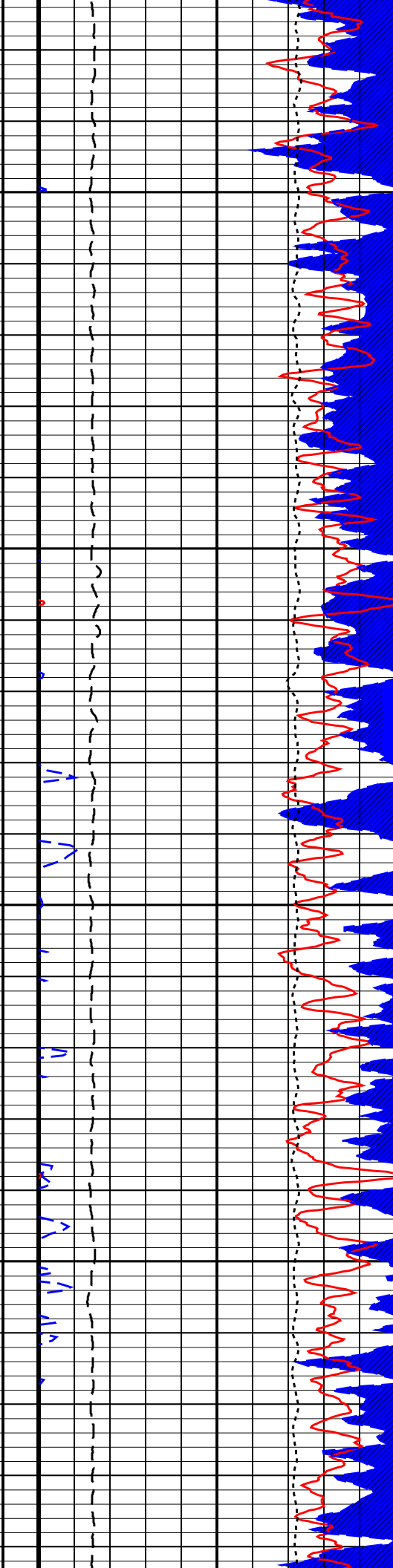
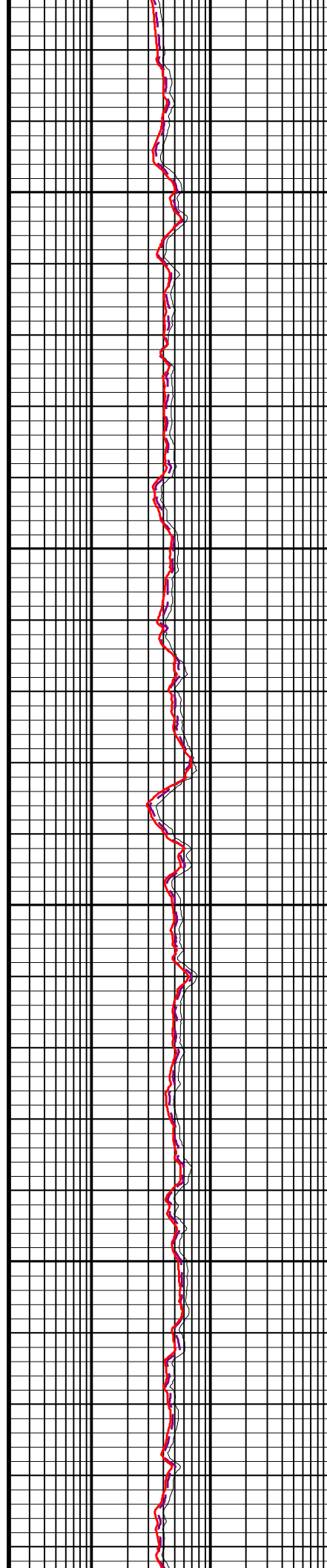
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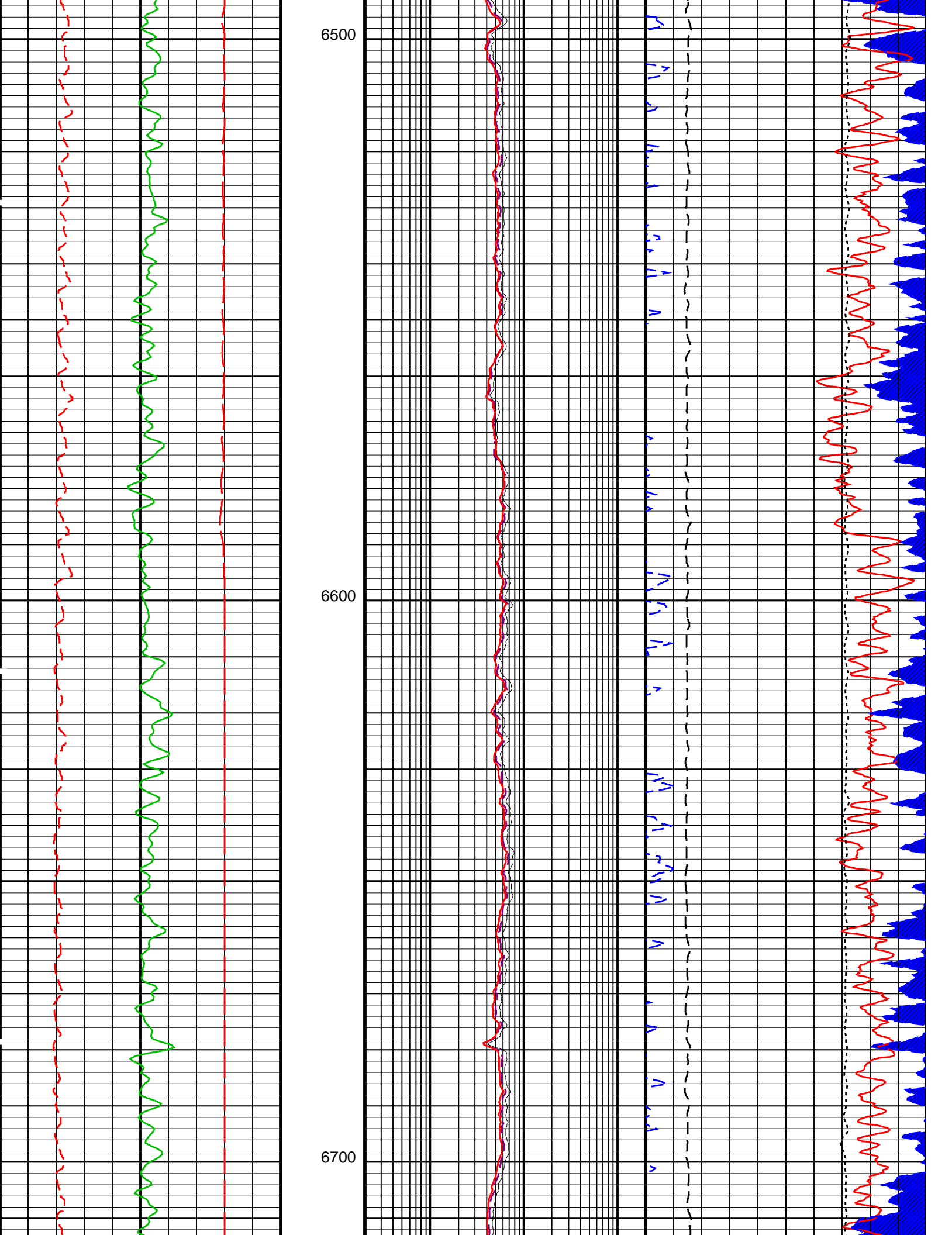


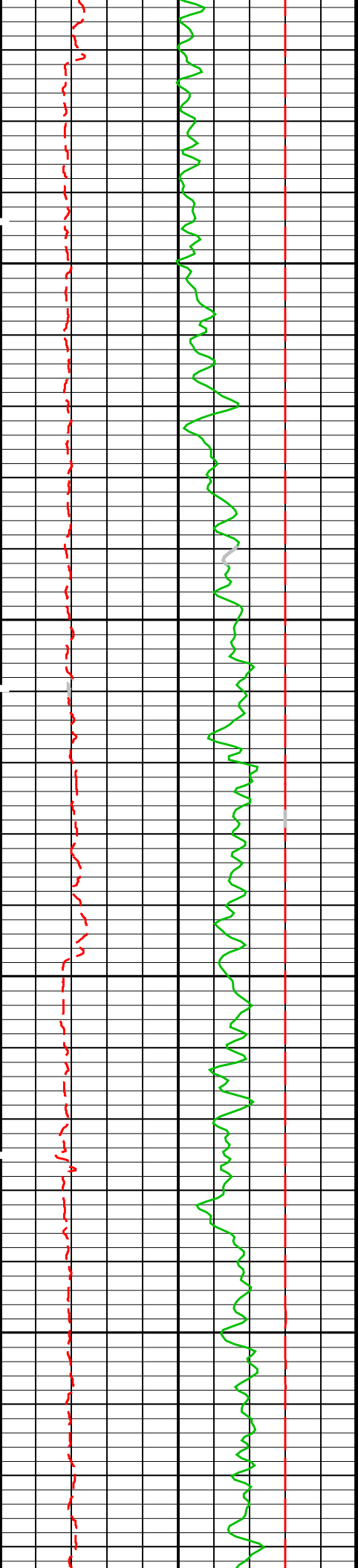


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6400

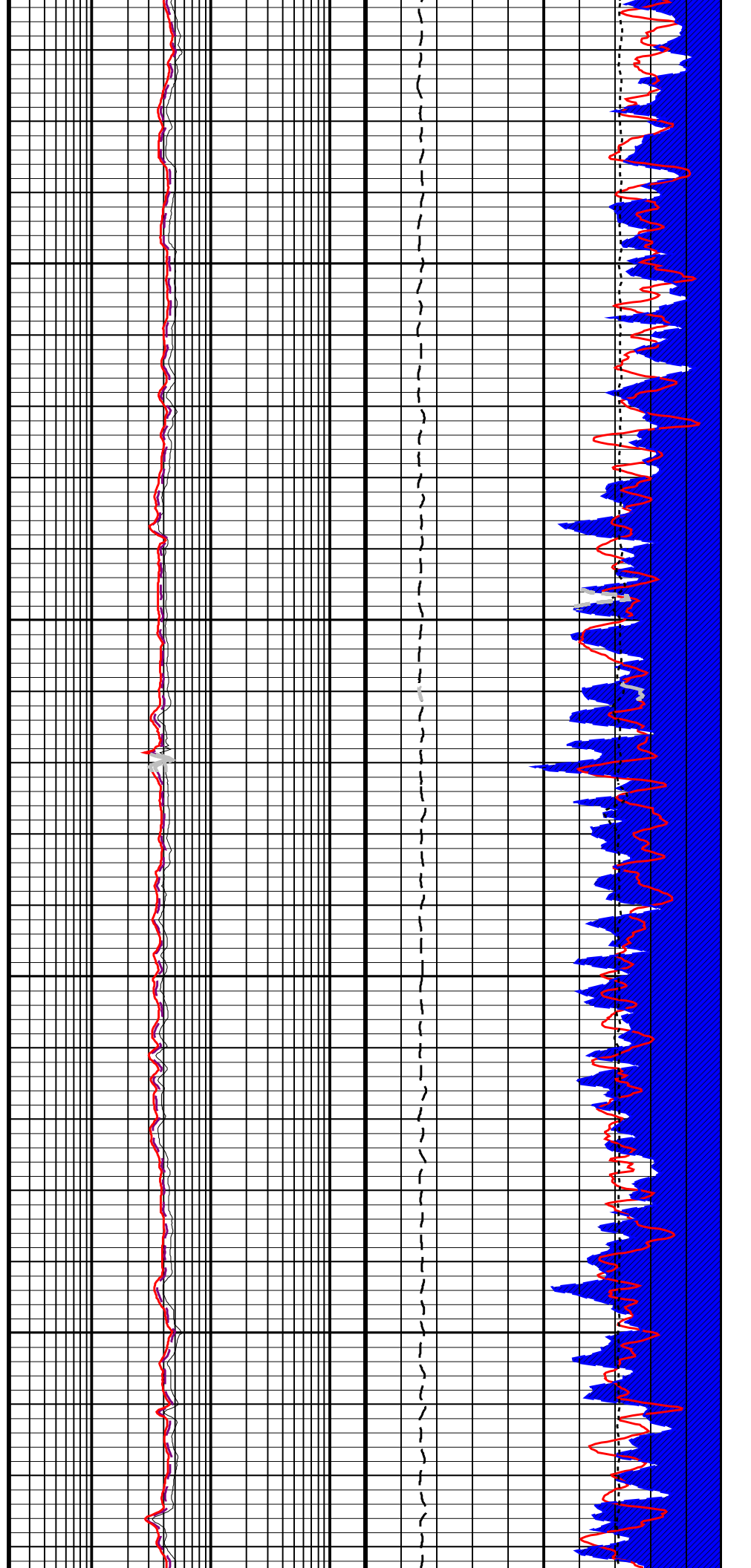


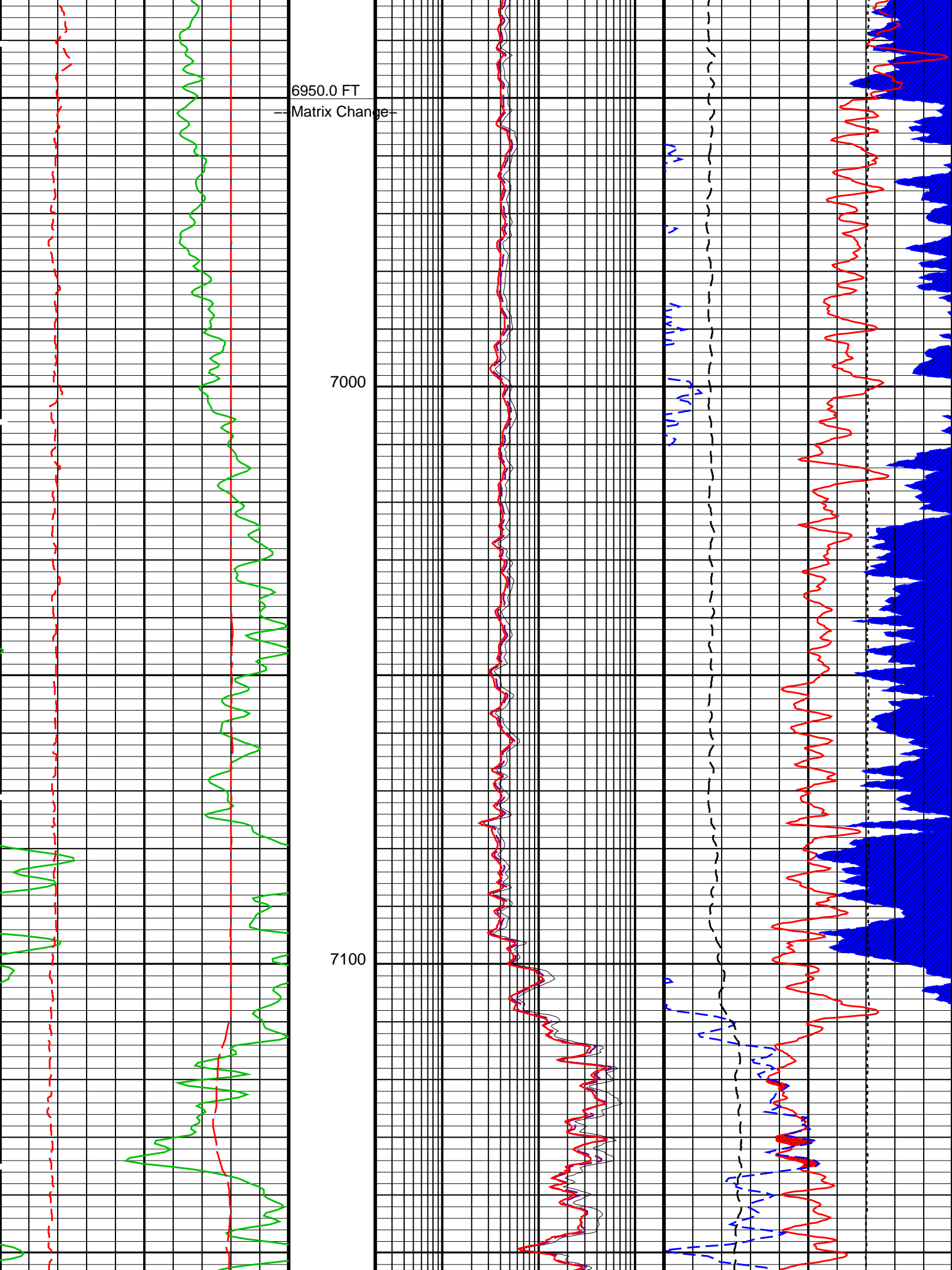


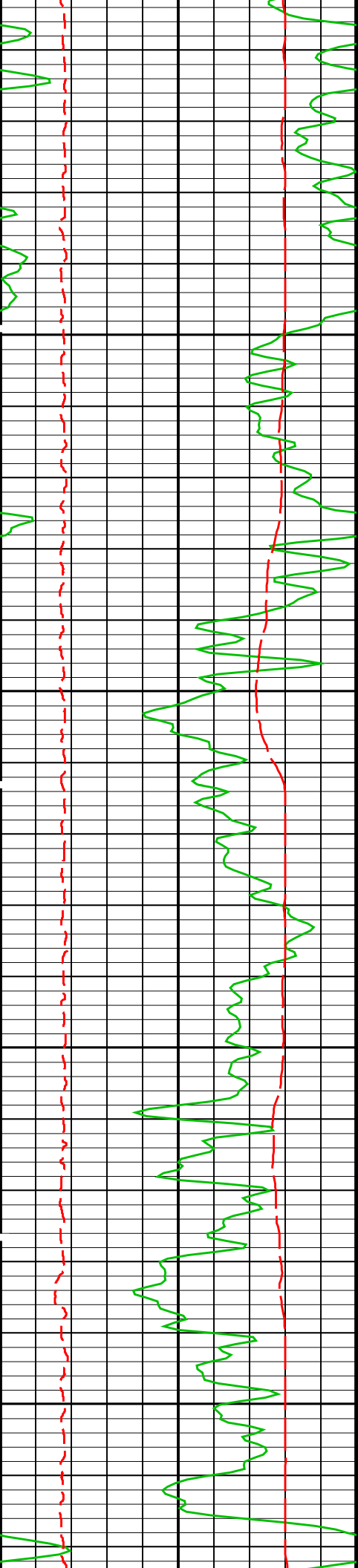


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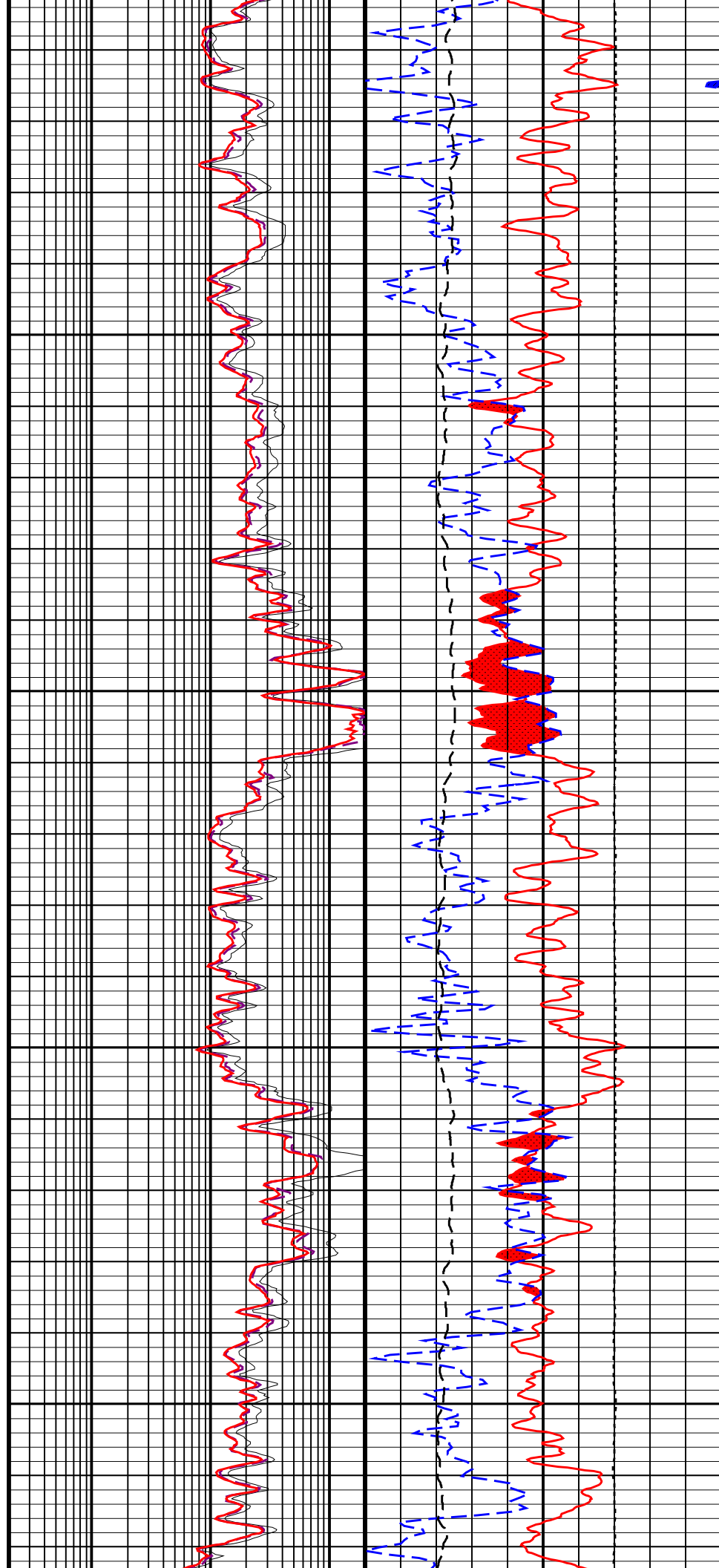


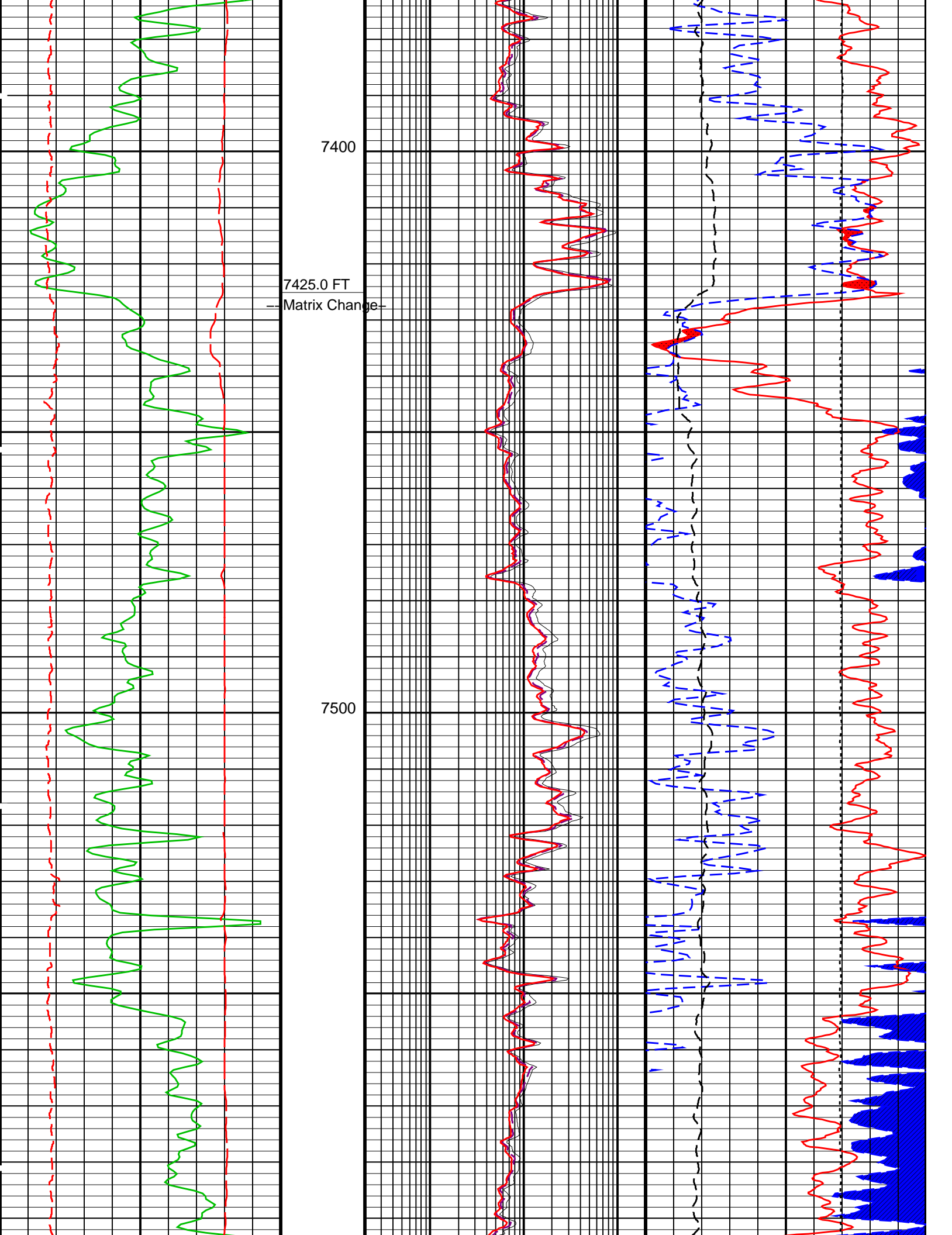


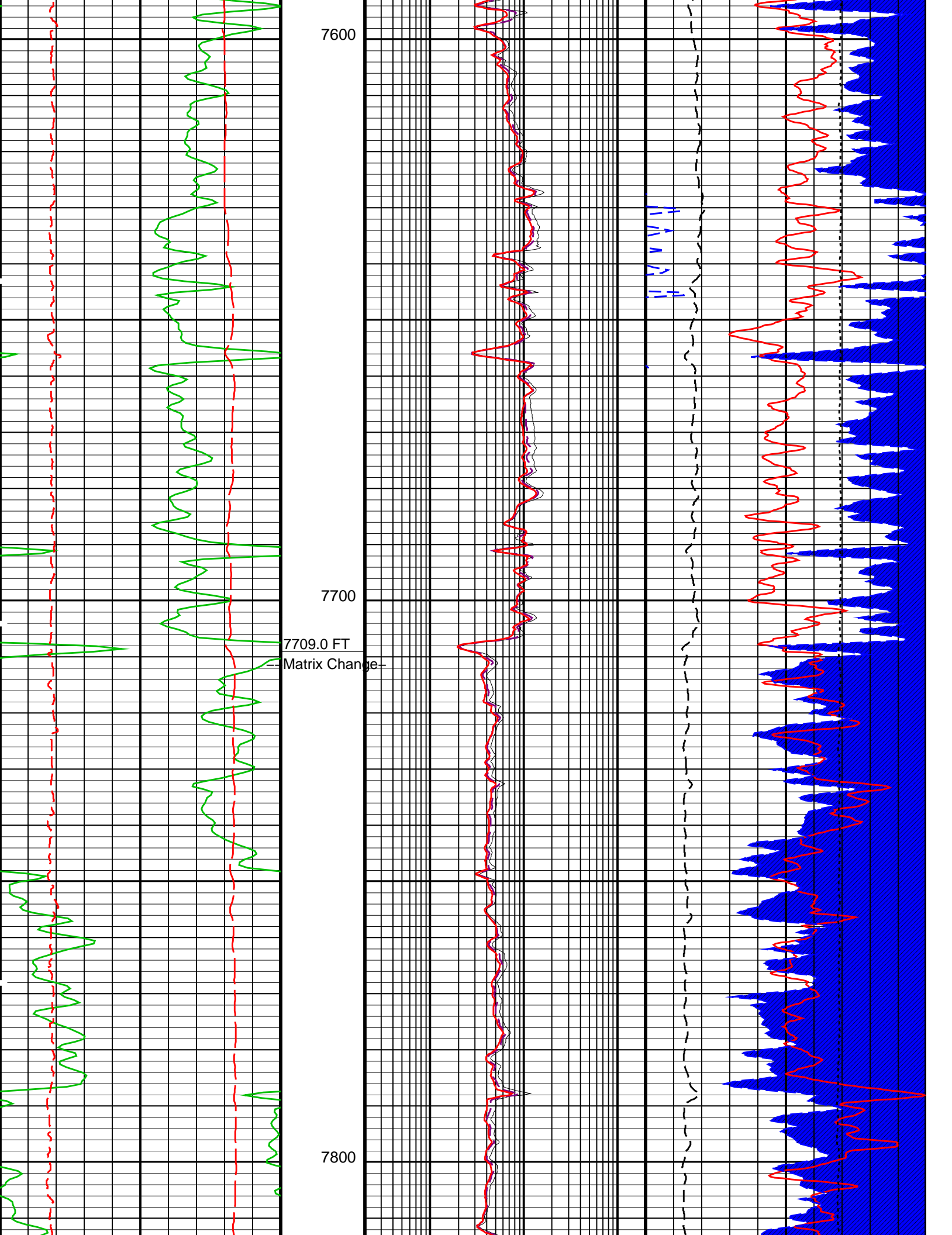


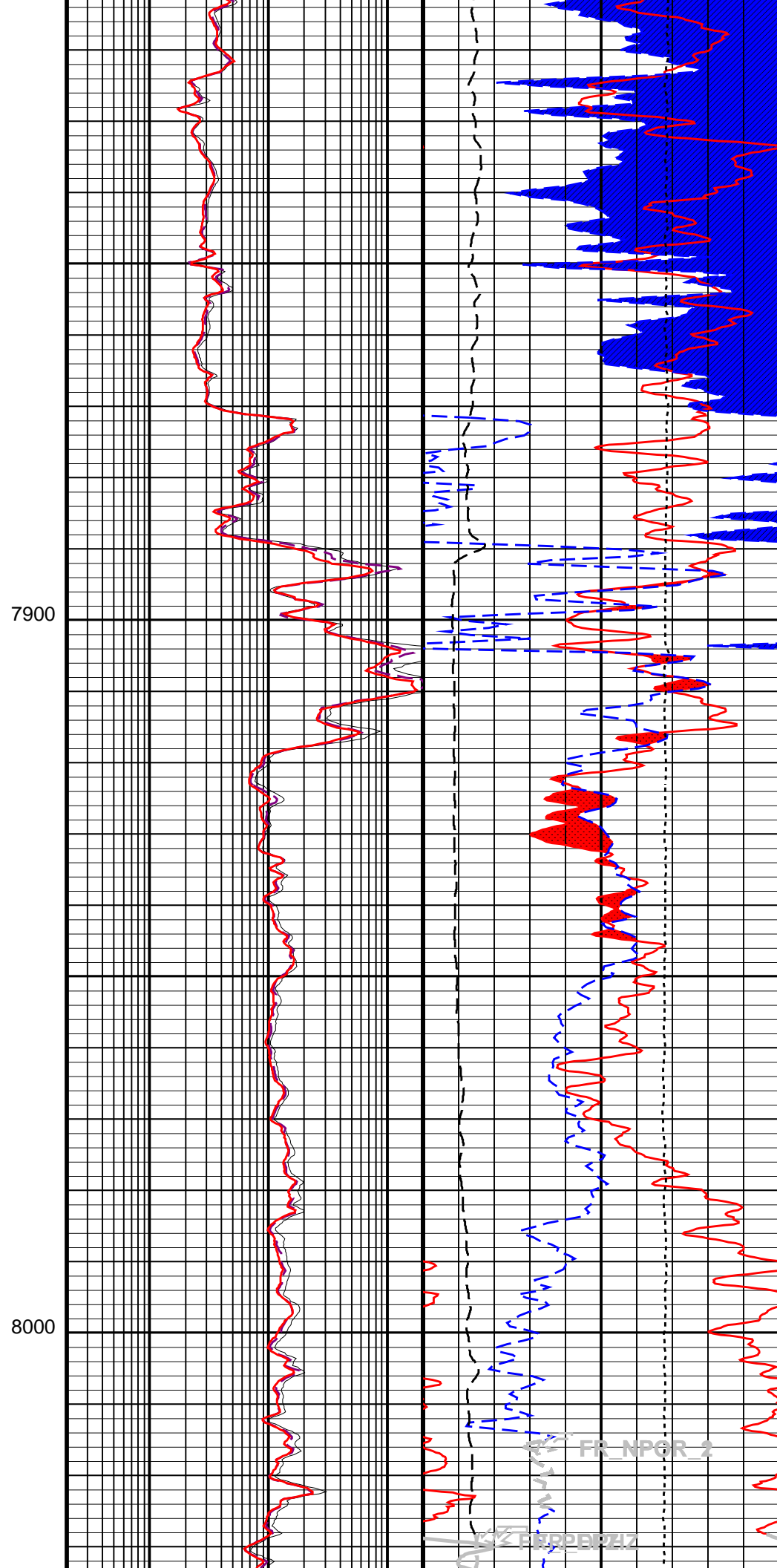
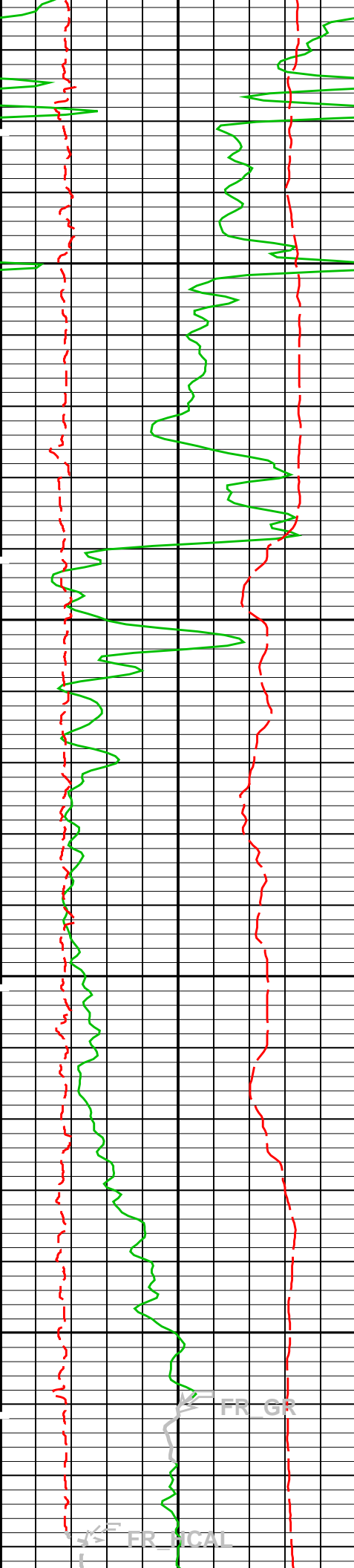
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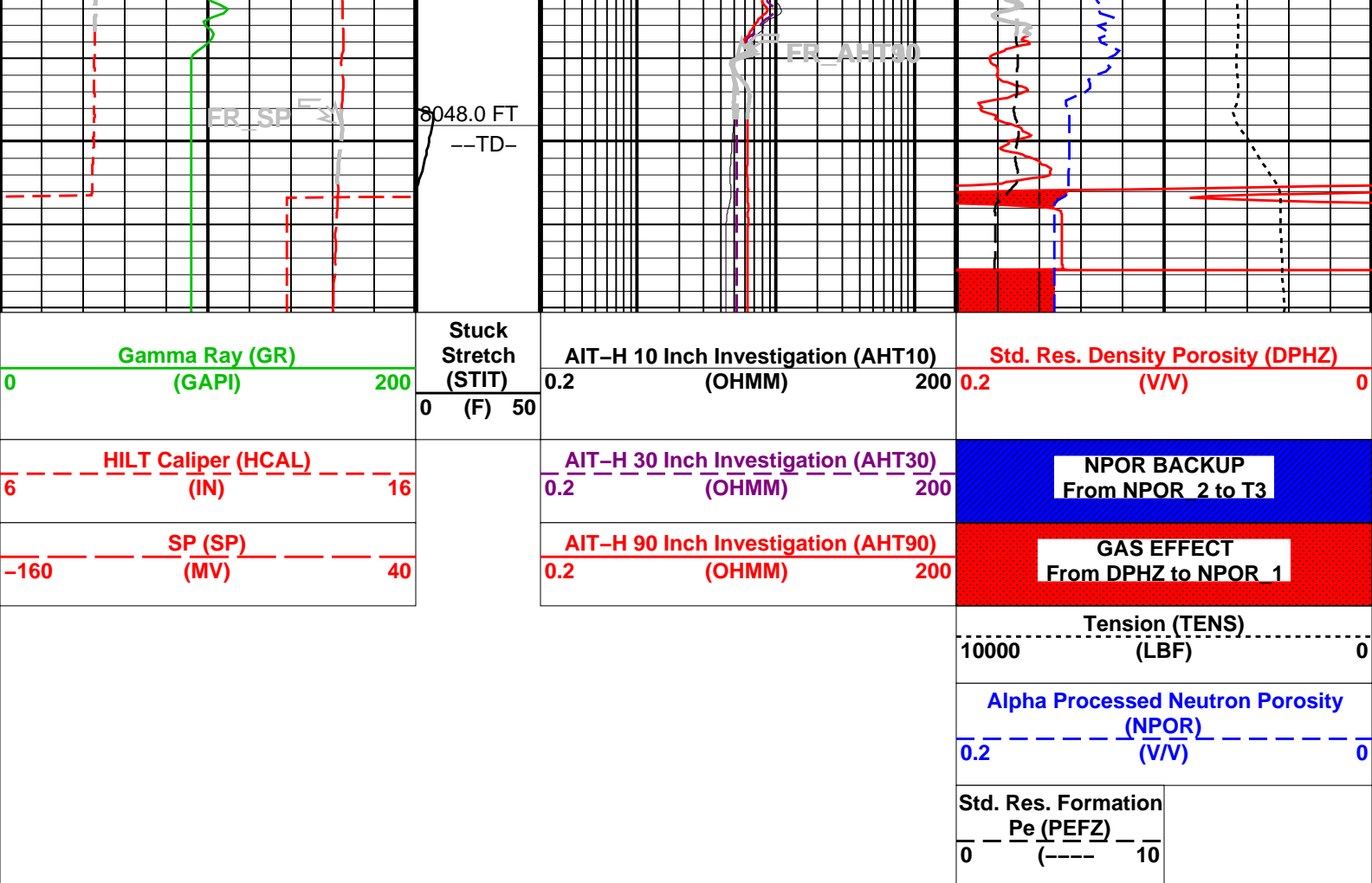
7300











PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
HILTB-CTS: High resolution Integrated Logging Tool-CTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff
AHBHV	Array Induction Borehole Correction Code Version Number	900
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four
AHBLV	Array Induction Basic Logs Code Version Number	223
AHCDE	Array Induction Casing Detection Enable	Yes
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20
AHMRF	Array Induction Mud Resistivity Factor	1
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20
AHRFV	Array Induction Radial Profiling Code Version Number	701
AHRPV	Array Induction Radial Parametrization Code Version Number	232
AHSTA	Array Induction Tool Standoff	0.125 IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20
BHFL	Borehole Fluid Type	WATER
BHFL_TLD	HILT Nuclear Mud Base	WATER
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	225 DEGF
BSCO	Borehole Salinity Correction Option	NO
CCCO	Casing & Cement Thickness Correction Option	NO
DHC	Density Hole Correction	BS
FD	Fluid Density	1 G/C3
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
FSAL	Formation Salinity	-50000 PPM
FSCO	Formation Salinity Correction Option	NO
GCLF	Germany Coal-like Formation Option	NO
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST
GTSE	Generalized Temperature Selection	HSTS_HTEM
HSCO	Hole Size Correction Option	YES
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE
MCCO	Mud Cake Correction Option	NO

MCOR	Matrix Correction	NATU	2.68	G/C3
MDEN	Matrix Density			
MWCO	Mud Weight Correction Option	NO		
NAAC	HRDD APS Activation Correction	OFF		
NMT	HILT Nuclear Mud Type	NOBARITE		
NPRM	HRDD Processing Mode	StdRes		
NSAR	HRDD Depth Sampling Rate	1	IN	
PTCO	Pressure/Temperature Correction Option	NO		
SDAT	Standoff Data Source	SOCN		
SHT	Surface Hole Temperature	68	DEGF	
SOCN	Standoff Distance	0.125	IN	
SOCO	Standoff Correction Option	YES		
SPNV	SP Next Value	0	MV	
FEQL: Formation Evaluation Quick Look				
FEXP	Form Factor Exponent	2		
FNUM	Form Factor Numerator	1		
HOLEV: Integrated Hole/Cement Volume				
BHS	Borehole Status	OPEN		
BHT	Bottom Hole Temperature (used in calculations)	225	DEGF	
GCSE	Generalized Caliper Selection	HCAL		
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG	
GGRD	Geothermal Gradient	0.01	DF/F	
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST		
GTSE	Generalized Temperature Selection	HSTS_HTEM		
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
SHT	Surface Hole Temperature	68	DEGF	
PERT: Preliminary Evaluation - Real Time				
BHS	Borehole Status	OPEN		
BHT	Bottom Hole Temperature (used in calculations)	225	DEGF	
FEXP	Form Factor Exponent	2		
FNUM	Form Factor Numerator	1		
GCSE	Generalized Caliper Selection	HCAL		
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG	
GGRD	Geothermal Gradient	0.01	DF/F	
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST		
GTSE	Generalized Temperature Selection	HSTS_HTEM		
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
SHT	Surface Hole Temperature	68	DEGF	
STI: Stuck Tool Indicator				
LBFR	Trigger for MAXIS First Reading Label	TDL		
STKT	STI Stuck Threshold	2.5	FT	
TDD	Total Depth - Driller	8035.00	FT	
TDL	Total Depth - Logger	8048.00	FT	
System and Miscellaneous				
BS	Bit Size	7.875	IN	
BSAL	Borehole Salinity	-50000.00	PPM	
CSIZ	Current Casing Size	8.625	IN	
CWEI	Casing Weight	24.00	LB/F	
DFD	Drilling Fluid Density	9.30	LB/G	
DO	Depth Offset for Playback	0.5	FT	
DORL	Depth Offset for Repeat Analysis	0.0	FT	
FLEV	Fluid Level	5.00	FT	
MST	Mud Sample Temperature	115.00	DEGF	
PP	Playback Processing	NORMAL		
RMFS	Resistivity of Mud Filtrate Sample	1.0400	OHMM	
TD	Total Depth	8048	FT	

Format: COMBO Vertical Scale: 5" per 100' Graphics File Created: 13-Dec-2007 20:45

OP System Version: 15C0-309

MCM

HILTB-CTS SRPC-3497-NOV_2007

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	13-Dec-2007 19:00	8070.0 FT	818.0 FT
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Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_019PUP	FN:18	PRODUCER	13-Dec-2007 20:45		
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Company: Orr Energy LLC Well: South 6-21D

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	13-Dec-2007 19:03	8073.0 FT	7190.5 FT
DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	13-Dec-2007 19:00	8070.0 FT	818.0 FT

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_019PUP FN:18 PRODUCER 13-Dec-2007 20:45

OP System Version: 15C0-309 MCM

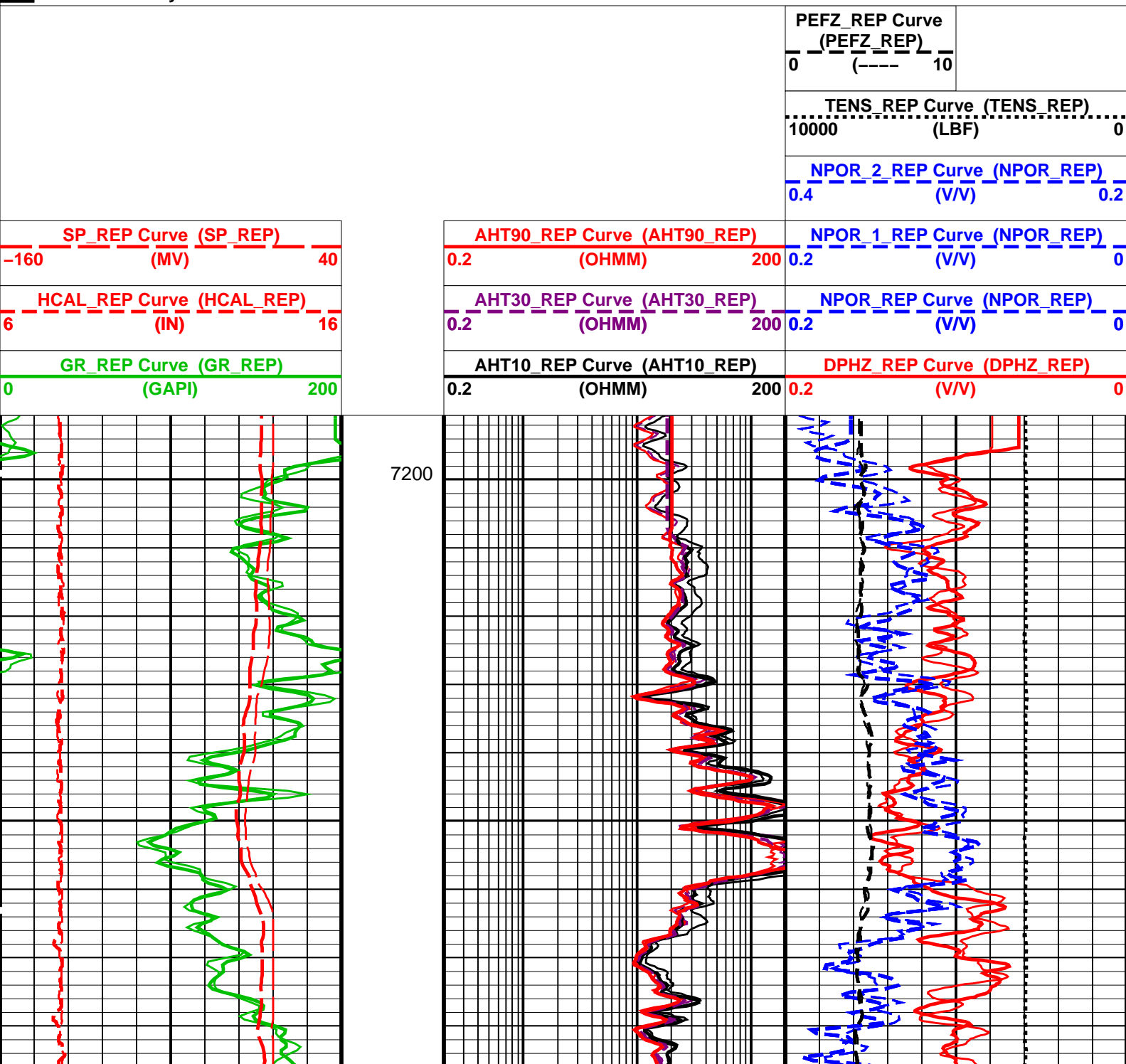
HILTB-CTS SRPC-3497-NOV_2007

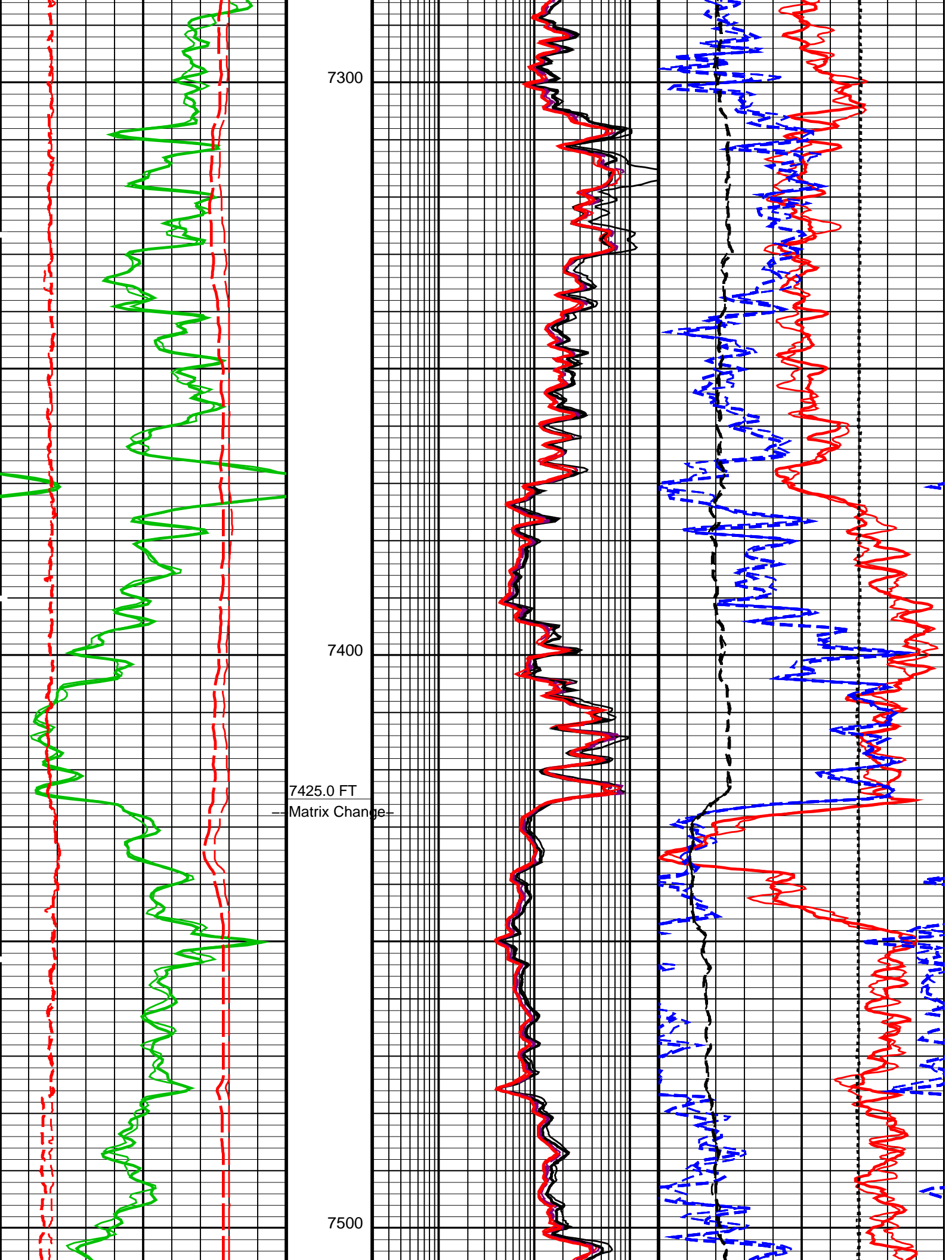
Changed Parameter Summary

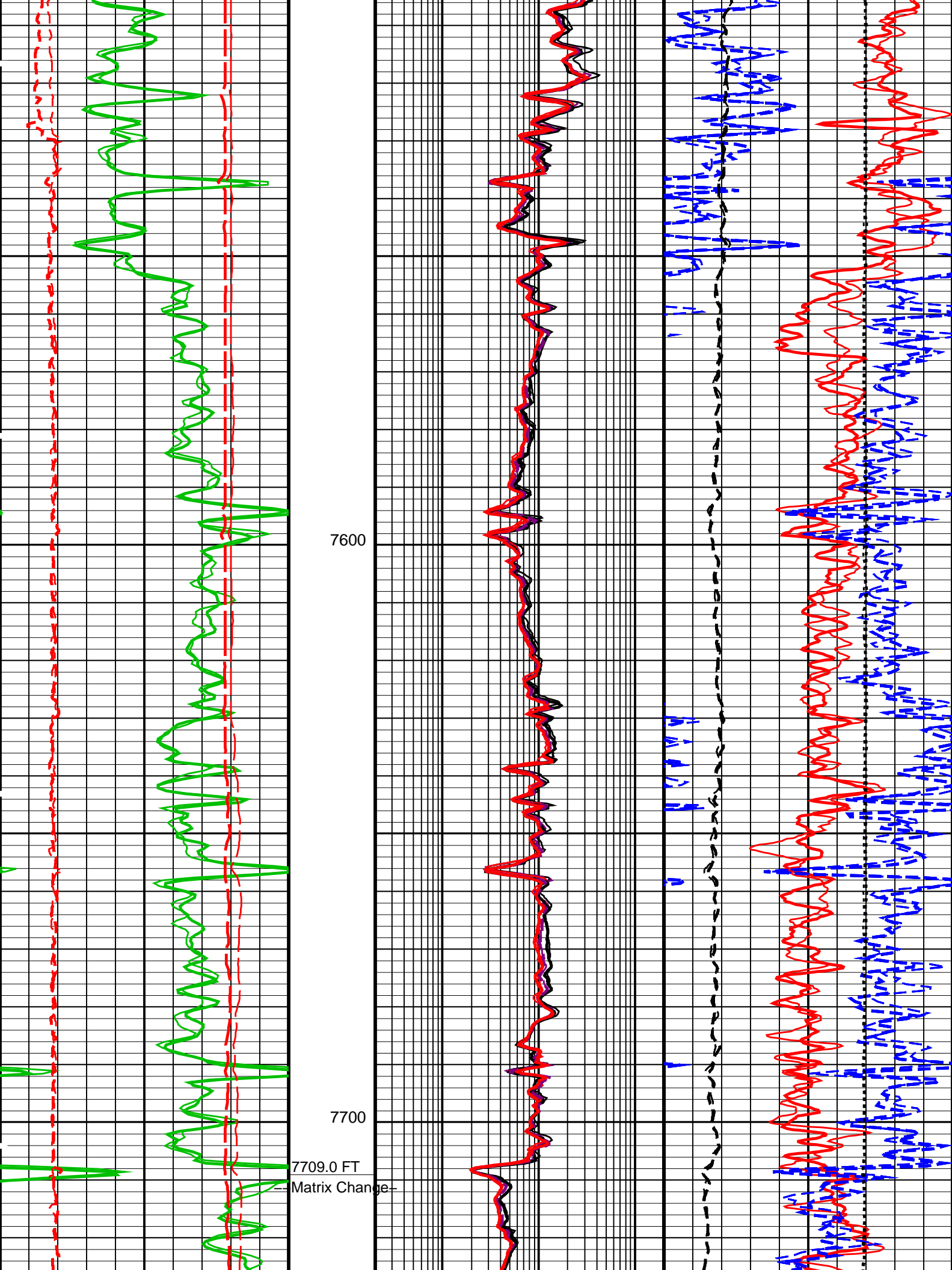
DLIS Name	New Value	Previous Value	Depth & Time
MATR	SANDSTONE	SANDSTONE	8070.5 20:45:35
	SANDSTONE	SANDSTONE	7709.0 20:45:47
	LIMESTONE	SANDSTONE	7425.0 20:45:56
MDEN	2.65 G/C3	2.68 G/C3	8070.5 20:45:35
	2.68 G/C3	2.65 G/C3	7709.0 20:45:47
	2.71 G/C3	2.68 G/C3	7425.0 20:45:56

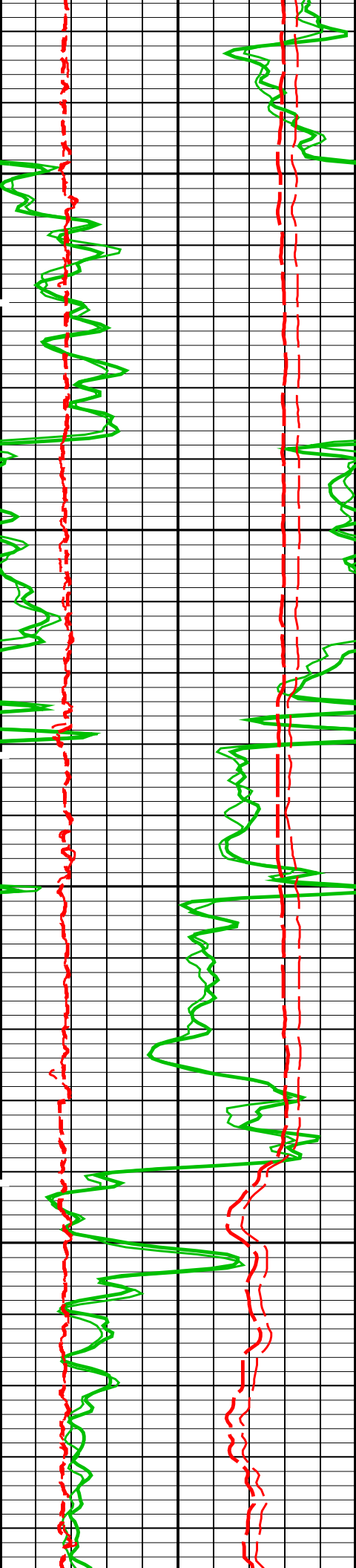
PIP SUMMARY

Time Mark Every 60 S



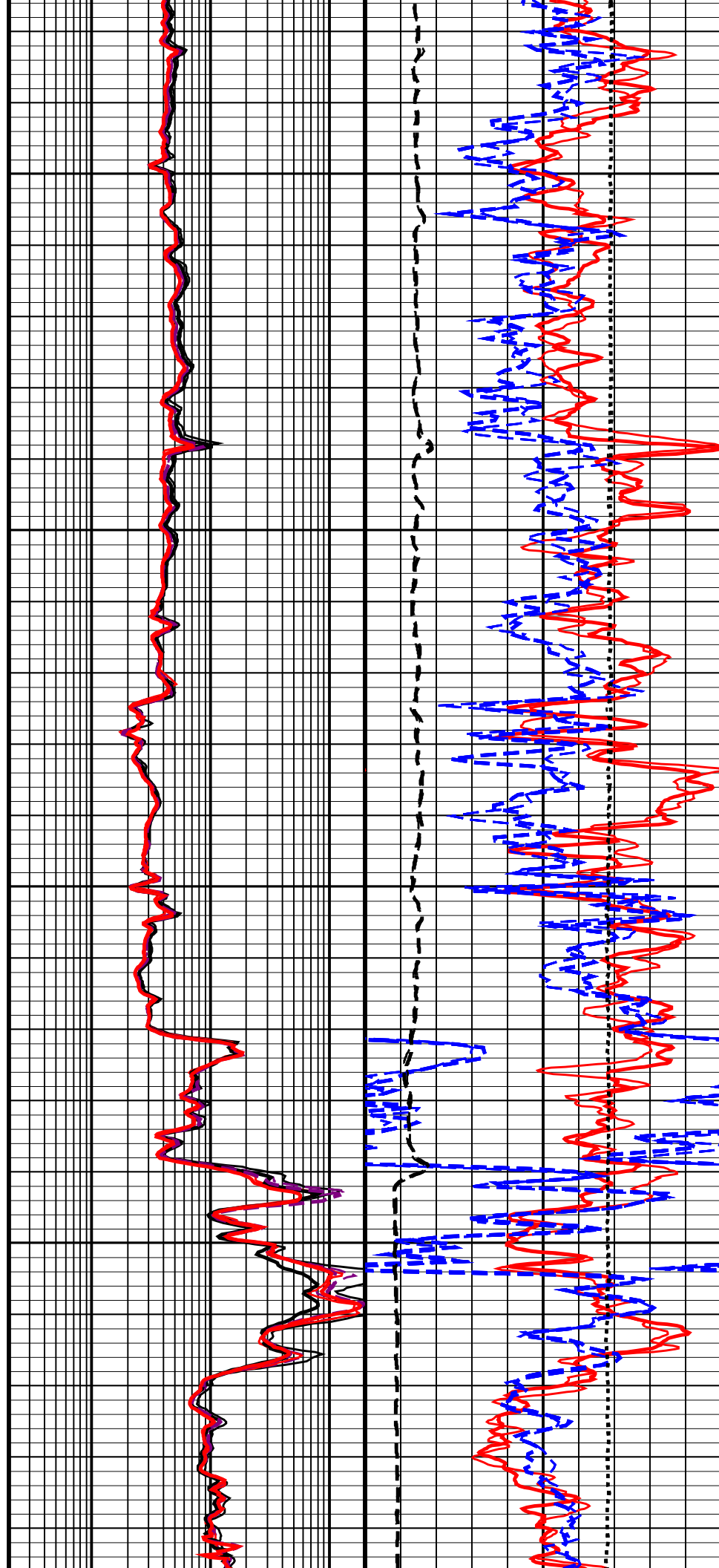


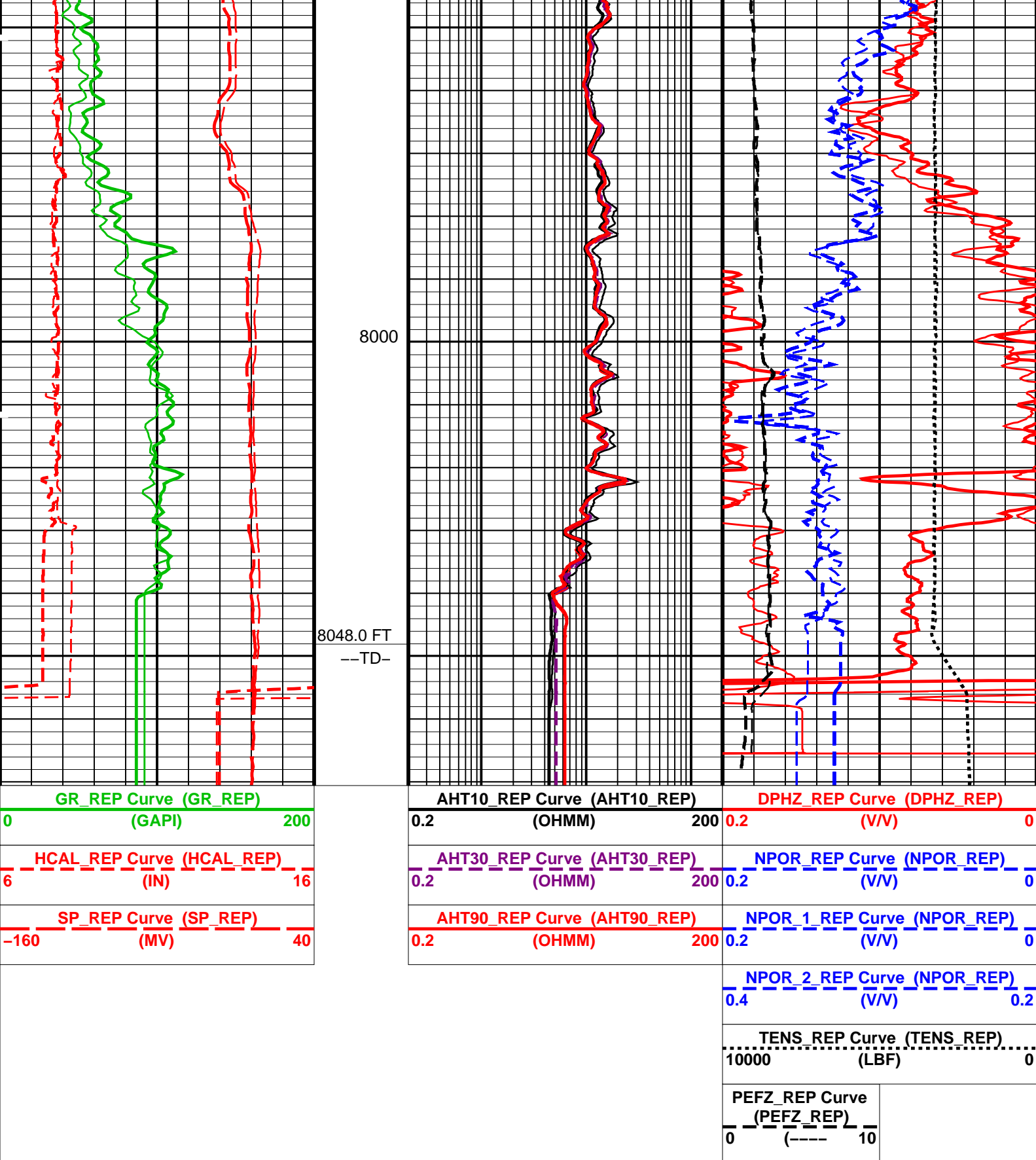




7800

7900





PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
HILTB-CTS: High resolution Integrated Logging Tool-CTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff
AHBHV	Array Induction Borehole Correction Code Version Number	900
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four
AHBLV	Array Induction Basic Logs Code Version Number	223

AHCDE	Array Induction Casing Logo Code Version Number	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	225	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal-like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
SPNV	SP Next Value	0	MV
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	225	DEGF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation - Real Time			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	225	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
TDL	Total Depth - Logger	8048.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	9.30	LB/G
DO	Depth Offset for Playback	0.5	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	5.00	FT
MST	Mud Sample Temperature	115.00	DEGF
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	1.0400	OHMM
TD	Total Depth	8048	FT

OP System Version: 15C0-309

MCM

HILTB-CTS SRPC-3497-NOV_2007

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	13-Dec-2007 19:03	8073.0 FT	7190.5 FT
DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	13-Dec-2007 19:00	8070.0 FT	818.0 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_019PUP	FN:18	PRODUCER	13-Dec-2007 20:45
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Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
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High resolution Integrated Logging Tool-CTS Wellsite Calibration – Electronics Calibration Check – Thru Cal Mag. & Phase

Master: 27-Sep-2007 11:01 Before: 11-Dec-2007 1:30

Thru Cal Magnitude – 0	0	0.6092	0.6098	N/A	N/A	N/A	V
Thru Cal Magnitude – 1	0	1.249	1.250	N/A	N/A	N/A	V
Thru Cal Magnitude – 2	0	0.6210	0.6216	N/A	N/A	N/A	V
Thru Cal Magnitude – 3	0	0.7034	0.7042	N/A	N/A	N/A	V
Thru Cal Magnitude – 4	0	1.311	1.313	N/A	N/A	N/A	V
Thru Cal Magnitude – 5	0	1.894	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude – 6	0	1.898	1.900	N/A	N/A	N/A	V
Thru Cal Magnitude – 7	0	1.335	1.338	N/A	N/A	N/A	V
Phase – 0	0	49.73	49.80	N/A	N/A	N/A	DEG
Phase – 1	0	48.71	48.79	N/A	N/A	N/A	DEG
Phase – 2	0	44.61	44.69	N/A	N/A	N/A	DEG
Phase – 3	0	43.74	43.82	N/A	N/A	N/A	DEG
Phase – 4	0	36.98	37.08	N/A	N/A	N/A	DEG
Phase – 5	0	34.80	34.93	N/A	N/A	N/A	DEG
Phase – 6	0	34.77	34.90	N/A	N/A	N/A	DEG
Phase – 7	0	28.85	29.12	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Electronics Calibration Check – Auxilliary

Master: 27-Sep-2007 11:01 Before: 11-Dec-2007 1:30

Array Induction SPA Plus	990.5	990.0	989.7	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.1585	0.1567	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9150	0.9167	0.9165	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0001591	0.0001640	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Test Loop Gain Correction

Master: 27-Sep-2007 11:01

Test Loop Gain Magnitude – 0	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 1	0	1.020	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 2	0	1.024	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 3	0	1.021	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 4	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 5	0	0.9951	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 6	0	1.005	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 7	0	1.012	N/A	N/A	N/A	N/A	V
Phase – 0	0	0.5429	N/A	N/A	N/A	N/A	DEG
Phase – 1	0	0.5581	N/A	N/A	N/A	N/A	DEG
Phase – 2	0	-0.03639	N/A	N/A	N/A	N/A	DEG
Phase – 3	0	-0.005282	N/A	N/A	N/A	N/A	DEG
Phase – 4	0	-0.03332	N/A	N/A	N/A	N/A	DEG
Phase – 5	0	-0.08879	N/A	N/A	N/A	N/A	DEG
Phase – 6	0	0.1686	N/A	N/A	N/A	N/A	DEG
Phase – 7	0	-0.4128	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Sonde Error Correction

Master: 27-Sep-2007 11:01

R Sonde Error Correction – 0	0	-110.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	161.5	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 2	0	116.0	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 3	0	59.72	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 4	0	23.64	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 5	0	12.92	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	9.047	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	-0.7151	N/A	N/A	N/A	N/A	MM/M

X Sonde Error Correction – 7	0	0.7131	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	-219.3	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	-205.6	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	-40.24	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	34.19	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	20.51	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	11.70	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	5.787	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	0.9127	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Mud Gain Correction

Master: 27–Sep–2007 11:01							
Coarse – Mag, Real, Imag – 0	0	0.8865	N/A	N/A	N/A	N/A	
Coarse – Mag, Real, Imag – 1	0	0.8865	N/A	N/A	N/A	N/A	
Coarse – Mag, Real, Imag – 2	0	0.8865	N/A	N/A	N/A	N/A	
Fine – Mag, Real, Imag – 0	0	0.8929	N/A	N/A	N/A	N/A	
Fine – Mag, Real, Imag – 1	0	0.8929	N/A	N/A	N/A	N/A	
Fine – Mag, Real, Imag – 2	0	0.8929	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Stab Measurement Summary

Before: 11–Dec–2007 1:33							
BS Window Ratio	0.7104	N/A	0.7122	N/A	N/A	N/A	
BS Window Sum	8992	N/A	8974	N/A	N/A	N/A	CPS
SS Window Ratio	0.4968	N/A	0.4965	N/A	N/A	N/A	
SS Window Sum	10290	N/A	10260	N/A	N/A	N/A	CPS
LS Window Ratio	0.2932	N/A	0.2946	N/A	N/A	N/A	
LS Window Sum	1080	N/A	1068	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Photo–multiplier High Voltages Calibrations

Before: 11–Dec–2007 1:33							
BS PM High Voltage (Command)	1446	N/A	1446	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1580	N/A	1582	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1411	N/A	1426	N/A	N/A	N/A	V

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Crystal Quality Resolutions Calibration

Before: 11–Dec–2007 1:33							
BS Crystal Resolution	10.31	N/A	10.33	N/A	N/A	N/A	%
SS Crystal Resolution	9.688	N/A	9.680	N/A	N/A	N/A	%
LS Crystal Resolution	8.772	N/A	8.700	N/A	N/A	N/A	%

High resolution Integrated Logging Tool–CTS Wellsite Calibration – MCFL Calibration

Before: 11–Dec–2007 1:33							
Raw B0 Resistivity	3875	N/A	3852	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3793	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3792	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool–CTS Wellsite Calibration – HILT Caliper Calibration

Before: 11–Dec–2007 1:30							
HILT Caliper Zero Measurement	8.000	N/A	8.311	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.47	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Detector Calibration

Before: 11–Dec–2007 1:43							
Gamma Ray Background	30.00	N/A	81.58	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkg)	174.1	N/A	174.1	N/A	N/A	15.83	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Zero Measurement

Master: 14–Sep–2007 17:57 Before: 11–Dec–2007 1:31							
CNTC Background	27.59	27.59	27.71	N/A	N/A	4.139	CPS
CFTC Background	29.13	29.13	27.95	N/A	N/A	4.370	CPS

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Ratio Measurement

Master: 14–Sep–2007 17:57							
Thermal Near Corr. (Tank)	5800	5348	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2176	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.458	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool–CTS Wellsite Calibration – Accelerometer Calibration

Before: 13–Dec–2007 18:06							
Z–Axis Acceleration	32.19	N/A	32.21	N/A	N/A	N/A	F/S2

High resolution Integrated Logging Tool–CTS Master Calibration – Inversion results

Master: 25–Nov–2007 15:21							
Rho Aluminum	2.596	2.600	---	---	---	---	G/C3
Rho Magnesium	1.686	1.687	---	---	---	---	G/C3
Pe Aluminum	2.570	2.555	---	---	---	---	
Pe Magnesium	2.650	2.631	---	---	---	---	

High resolution Integrated Logging Tool–CTS Master Calibration – Deviation Summary

Master: 25–Nov–2007 15:21							
BS Average Deviation	0	0.3446	---	---	---	---	%

BS Max Deviation	0	1.006	--	--	--	--	%
SS Average Deviation	0	0.2535	--	--	--	--	%
SS Max Deviation	0	0.8238	--	--	--	--	%
LS Average Deviation	0	0.4908	--	--	--	--	%
LS Max Deviation	0	0.9686	--	--	--	--	%

The GLS-VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT-B Water Temperature 71.0 DEGF.
Thermal Housing Size 3.363 IN.
NSR-F serial number 940

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool – H	AIT – H	
Rm/SP Bottom Nose	AHRM – A	
Array Induction Sonde	AHIS – BA	374
HILT high-Resolution Mechanical Sonde	HRMS – B	
HILT Rxo Gamma-ray Device	HRGD – B	
HILT Micro Cylindrically Focused Log Dev	MCFL –	
GR Logging Source	GLS – VJ	5094
HILT High Res. Control Cartridge	HRCC – B	

Auxiliary Equipment:







High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6092		0.6050	49.73		71.00
	Before	0.6098			49.80		
1	Master	1.249		1.270	48.71		70.00
	Before	1.250			48.79		
2	Master	0.6210		0.6230	44.61		66.00
	Before	0.6216			44.69		
3	Master	0.7034		0.7040	43.74		65.00
	Before	0.7042			43.82		
4	Master	1.311		1.337	36.98		59.00
	Before	1.313			37.08		
5	Master	1.894		1.955	34.80		57.00
	Before	1.896			34.93		
6	Master	1.898		1.955	34.77		57.00
	Before	1.900			34.90		
7	Master	1.335		1.415	28.85		53.00
	Before	1.338			29.12		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 27-Sep-2007 11:01				Before: 11-Dec-2007 1:30			







High resolution Integrated Logging Tool-CTS Wellsite Calibration					
Electronics Calibration Check – Auxilliary					
Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		990.0	Master		0.1585
Before		989.7	Before		0.1567





941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase Array Induction Temperature Plus V			Value	Phase Array Induction Temperature Zero V		
Master			0.9167	Master		0.0001591
Before			0.9165	Before		0.0001640
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 27-Sep-2007 11:01				Before: 11-Dec-2007 1:30		





High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG
0	1.019				0.5429	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.020				0.5581	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.024				-0.03639	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.021				-0.005282	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	1.004				-0.03332	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9951				-0.08879	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	1.005				0.1686	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.012				-0.4128	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
Master: 27-Sep-2007 11:01						





High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Sonde Error Correction						
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M
0	-110.7				-219.3	
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum) 0 (Nominal) 2250 (Maximum)
1	161.5				-205.6	
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum) 0 (Nominal) 625.0 (Maximum)
2	116.0				-40.24	
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum) 0 (Nominal) 350.0 (Maximum)
3	59.72				34.19	
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		-250.0 (Minimum) 0 (Nominal) 250.0 (Maximum)
4	23.64				20.51	
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum) 0 (Nominal) 63.00 (Maximum)
5	12.92				11.70	
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)
6	9.047				5.787	
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum) 0 (Nominal) 30.00 (Maximum)
7	-0.7151				0.9127	
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum) 0 (Nominal) 30.00 (Maximum)



High resolution Integrated Logging Tool–CTS Wellsite Calibration							
Mud Gain Correction							
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag	
0	0.8865				0.8929		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
1	0.8865				0.8929		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
2	0.8865				0.8929		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
Master: 27–Sep–2007 11:01							





High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Stab Measurement Summary									
Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value
Before				0.7122	Before				0.4965
	0.6749 (Minimum)	0.7104 (Nominal)	0.7459 (Maximum)			0.4719 (Minimum)	0.4968 (Nominal)	0.5216 (Maximum)	
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value
Before				8974	Before				10260
	8542 (Minimum)	8992 (Nominal)	9442 (Maximum)			9773 (Minimum)	10290 (Nominal)	10800 (Maximum)	
Phase	LS Window Ratio			Value	Phase	LS Window Sum CPS			Value
Before				0.2946	Before				1068
	0.2786 (Minimum)	0.2932 (Nominal)	0.3079 (Maximum)			1026 (Minimum)	1080 (Nominal)	1134 (Maximum)	
Before: 11-Dec-2007 1:33									

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Photo-multiplier High Voltages Calibrations									
Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value
Before				1446	Before				1582
	1346 (Minimum)	1446 (Nominal)	1546 (Maximum)			1480 (Minimum)	1580 (Nominal)	1680 (Maximum)	
Phase	LS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
Before				1426	Before				1426
	1311 (Minimum)	1411 (Nominal)	1511 (Maximum)			1311 (Minimum)	1411 (Nominal)	1511 (Maximum)	
Before: 11-Dec-2007 1:33									

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Crystal Quality Resolutions Calibration									
Phase	BS Crystal Resolution %			Value	Phase	SS Crystal Resolution %			Value
Before				10.33	Before				9.680
	9.315 (Minimum)	10.31 (Nominal)	11.31 (Maximum)			8.688 (Minimum)	9.688 (Nominal)	10.69 (Maximum)	
Phase	LS Crystal Resolution %			Value	Phase	LS Crystal Resolution %			Value
Before				8.700	Before				8.700
	7.772 (Minimum)	8.772 (Nominal)	9.772 (Maximum)			7.772 (Minimum)	8.772 (Nominal)	9.772 (Maximum)	
Before: 11-Dec-2007 1:33									

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
MCFL Calibration									
Phase	Raw B0 Resistivity OHMM			Value	Phase	Raw B1 Resistivity OHMM			Value
Before				3852	Before				3793
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	
Phase	Raw B2 Resistivity OHMM			Value	Phase	Raw B2 Resistivity OHMM			Value
Before				3792	Before				3792
	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	
Before: 11-Dec-2007 1:33									

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
HILT Caliper Calibration									
Phase	HILT Caliper Zero Measurement IN			Value	Phase	HILT Caliper Plus Measurement IN			Value
Before				8.311	Before				12.47
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)			9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	
Before: 11-Dec-2007 1:30									


High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Detector Calibration									
Phase	Gamma Ray Background GAPI			Value	Phase	Gamma Ray (Jig – Bkg) GAPI			Value
Before				81.58	Before				174.1
0	30.00	120.0			158.3	174.1	189.9		
Phase	Gamma Ray (Calibrated) GAPI			Value	Phase	Gamma Ray (Calibrated) GAPI			Value
Before				165.0	Before				165.0
	150.0	165.0	180.0			150.0	165.0	180.0	

(Minimum) (Nominal) (Maximum) (Minimum) (Nominal) (Maximum) (Minimum) (Nominal) (Maximum)

Before: 11-Dec-2007 1:43

High resolution Integrated Logging Tool-CTS Wellsite Calibration										
Zero Measurement										
Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value	
Master				27.59	Master				29.13	
Before				27.71	Before				27.95	
5.000 (Minimum)				27.59 (Nominal)	5.000 (Minimum)				29.13 (Nominal)	40.00 (Maximum)
Master: 14-Sep-2007 17:57					Before: 11-Dec-2007 1:31					

High resolution Integrated Logging Tool—CTS Wellsite Calibration																	
Ratio Measurement																	
Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value			
Master				5348	Master				2176	Master				2.458			
4700 (Minimum)				5800 (Nominal)	6900 (Maximum)	1900 (Minimum)				2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)				2.159 (Nominal)	2.540 (Maximum)
Master: 14-Sep-2007 17:57																	





High resolution Integrated Logging Tool-CTS Wellsite Calibration		
Accelerometer Calibration		
Phase	Z-Axis Acceleration F/S2	Value
Before		32.21
	31.53 (Minimum)	32.84 (Maximum)
Before: 13-Dec-2007 18:06		







High resolution Integrated Logging Tool-CTS Master Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6092		0.6050	49.73		71.00
1	Master	1.249		1.270	48.71		70.00
2	Master	0.6210		0.6230	44.61		66.00
3	Master	0.7034		0.7040	43.74		65.00
4	Master	1.311		1.337	36.98		59.00
5	Master	1.894		1.955	34.80		57.00
6	Master	1.898		1.955	34.77		57.00
7	Master	1.335		1.415	28.85		53.00
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
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High resolution Integrated Logging Tool-CTS Master Calibration									
Electronics Calibration Check – Auxilliary									
Phase	Array Induction SPA Plus MV			Value	Phase	Array Induction SPA Zero MV			Value
Master				990.0	Master				0.1585
	941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)	-50.00 (Minimum)		0 (Nominal)	50.00 (Maximum)		
Phase	Array Induction Temperature Plus V			Value	Phase	Array Induction Temperature Zero V			Value
Master				0.9167	Master				0.0001591
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	-0.05000 (Minimum)		0 (Nominal)	0.05000 (Maximum)		
Master: 27-Sep-2007 11:01									

High resolution Integrated Logging Tool—CTS Master Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG
0	1.019				0.5429	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)

Master: 27-Sep-2007 11:01Master: 27-Sep-2007 11:01Master: 27-Sep-2007 11:01

High resolution Integrated Logging Tool—CTS Master Calibration							
Inversion results							
Phase	Rho Aluminum G/C3		Value	Phase	Rho Magnesium G/C3		Value
Master			2.600	Master			1.687
2.586 (Minimum)		2.596 (Nominal)	2.606 (Maximum)	1.676 (Minimum)		1.686 (Nominal)	1.696 (Maximum)
Phase	Pe Aluminum		Value	Phase	Pe Magnesium		Value
Master			2.555	Master			2.631
2.470 (Minimum)		2.570 (Nominal)	2.670 (Maximum)	2.550 (Minimum)		2.650 (Nominal)	2.750 (Maximum)
Master: 25—Nov—2007 15:21							

High resolution Integrated Logging Tool–CTS Master Calibration												
Deviation Summary												
Phase	BS Average Deviation %		Value	Phase	SS Average Deviation %		Value	Phase	LS Average Deviation %		Value	
Master			0.3446	Master			0.2535	Master			0.4908	
–0.6000 (Minimum)			0 (Nominal)	–1.000 (Minimum)			0 (Nominal)	–1.500 (Minimum)			0 (Nominal)	1.500 (Maximum)
			0.6000 (Maximum)				1.000 (Maximum)				1.500 (Maximum)	
Phase	BS Max Deviation %		Value	Phase	SS Max Deviation %		Value	Phase	LS Max Deviation %		Value	
Master			1.006	Master			0.8238	Master			0.9686	
–1.600 (Minimum)			0 (Nominal)	–2.500 (Minimum)			0 (Nominal)	–3.500 (Minimum)			0 (Nominal)	3.500 (Maximum)
			1.600 (Maximum)				2.500 (Maximum)				3.500 (Maximum)	
Master: 25–Nov–2007 15:21												

High resolution Integrated Logging Tool–CTS Master Calibration							
Zero Measurement							
Phase	CNTC Background CPS		Value	Phase	CFTC Background CPS		Value
Master			27.59	Master			29.13
5.000 (Minimum)		27.59 (Nominal)	40.00 (Maximum)	5.000 (Minimum)		29.13 (Nominal)	40.00 (Maximum)
Master: 14–Sep–2007 17:57							

High resolution Integrated Logging Tool–CTS Master Calibration														
Tank Measurement														
Phase	Thermal Near Corr. (Tank) CPS		Value	Phase	Thermal Far Corr. (Tank) CPS		Value	Phase	CNTC/CFTC (Tank)		Value			
Master	<div><div></div></div>		5348	Master	<div><div></div></div>		2176	Master	<div><div></div></div>		2.458			
4700 (Minimum)			5800 (Nominal)	6900 (Maximum)	1900 (Minimum)			2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)			2.159 (Nominal)	2.540 (Maximum)
Master: 14–Sep–2007 17:57														

Company: **Orr Energy LLC**

Schlumberger

Well: **South 6–21D**

Field: **Wattenburg**

County: **Weld**

State: **Colorado**

Platform Express

Triple Combo