



FILE NO:	COMPANY	LARAMIE ENERGY
	WELL	BRUTON 30-04W
API NO:	FIELD	VEGA
05077104570000	COUNTY	MESA
		STATE COLORADO
Ver. 4.06	LOCATION:	OTHER SERVICES
	LAT: 39.252566 N	NONE
	LONG: 107.814245 W	
	SEC 30 TWP 9S RGE 93W	
PERMANENT DATUM	GL	ELEVATION 7512 FT
LOG MEASURED FROM	KB	30 FT ABOVE P.D.
DRILL. MEAS. FROM	KB	
		ELEVATIONS:
		KB 7542 FT
		DF
		GL 7512 FT

DATE	09-SEP-2017
RUN	1
TRIP	1
SERVICE ORDER	US127172
DEPTH DRILLER	8396 FT
DEPTH LOGGER	8396 FT
BOTTOM LOGGED INTERVAL	8396 FT
TOP LOGGED INTERVAL	0 FT
CASING DRILLER	8.625 IN @ 1554 FT
CASING LOGGER	1551 FT
BIT SIZE	7.875 IN
TYPE OF FLUID IN HOLE	LSND
DENSITY	9.8 LB/G
VISCOSITY	70 CP
PH	9.4
FLUID LOSS	7.8 C3
SOURCE OF SAMPLE	WELLBORE
RM AT MEAS. TEMP.	2.697 OHMM @ 100.7 DEGF
RMF AT MEAS. TEMP.	2.449 OHMM @ 100.7 DEGF
RMC AT MEAS. TEMP.	2.182 OHMM @ 100.7 DEGF
SOURCE OF RMF	RMC
RM AT BHT	1.398 OHMM @ 198.2 DEGF
TIME SINCE CIRCULATION	7.5 HOURS
MAX. RECORDED TEMP.	198.2 DEGF
EQUIP. NO.	HL-6670
LOCATION	WOODWARD
RECORDED BY	L. SINICKI
WITNESSED BY	MR. SHANE HEARD

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS
RUN 1 TRIP 1: *TWO OPERATIONS IN WELL*
**OPERATION 1: HDIL/ZDL/CN/GR RUN IN COMBINATION** **BRIDGED OFF AT 6746' AND LOGGED OUT**
**OPERATION 2: HDIL/ZDL/CN/GR RUN IN COMBINATION** **LOGGED FROM TD TO 6746'***
LOGS SPLICED TOGETHER AT 6675'
MATRIX = SANDSTONE RHO MATRIX = 2.68 G/CC
BVOL AND CVOL ARE PRESENTED IN CUBIC FEET CVOL CALCULATED USING A FUTURE CASING SIZE OF 4.5"
STICK AND PULL IN THE LOWER SECTION OF THE HOLE MAY HAVE AFFECTED DATA QUALITY.
RIG: H&P 522 CREW: J. PENA, K. REED



# CURVE DESCRIPTION REPORT

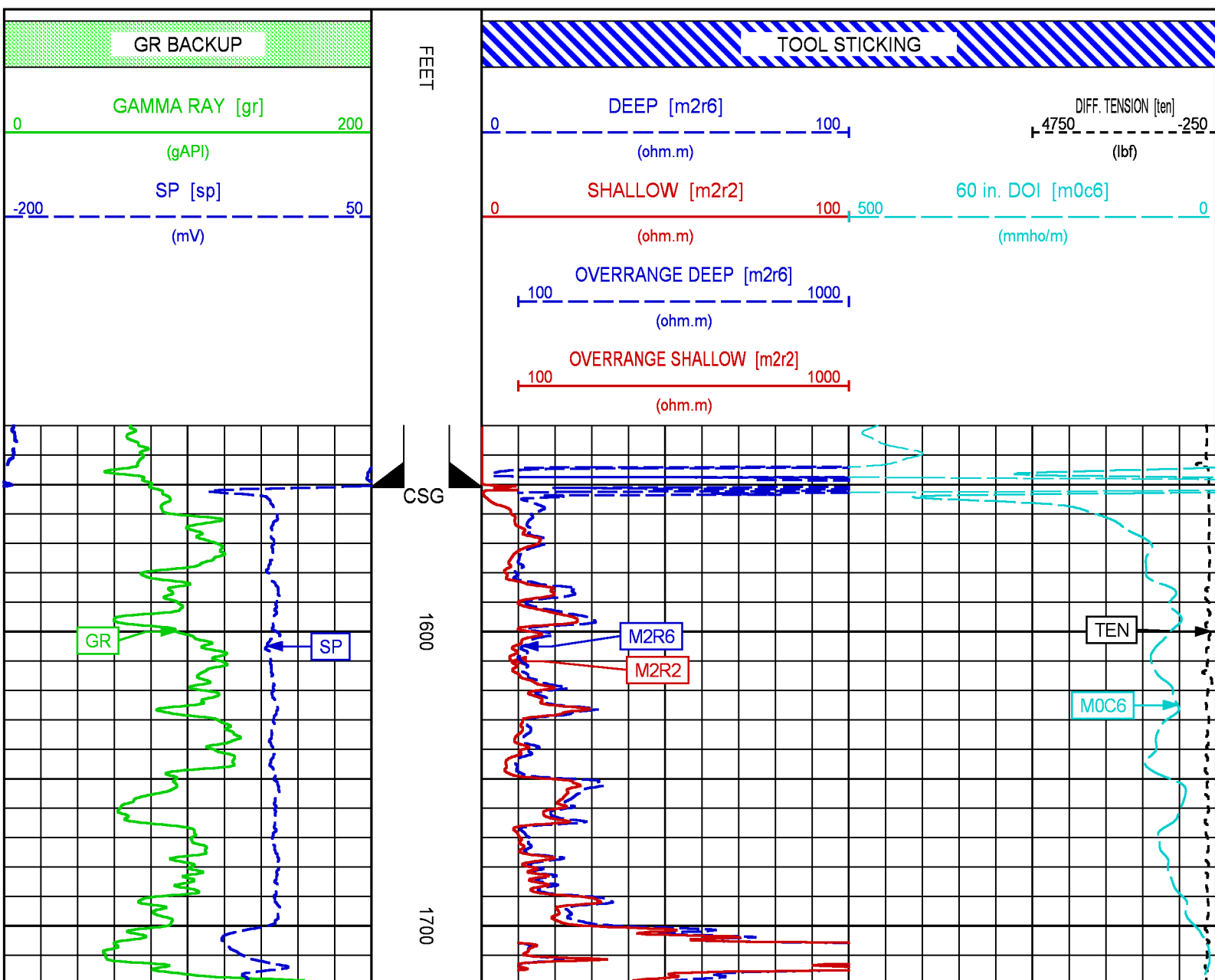
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:GR	Sep 10 18:35:28 2017	GAMMA RAY
F1:M0C6	Sep 10 18:35:30 2017	FOCUSED CONDUCTIVITY, 60-INCH DOI
F1:M2R2	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
F1:M2R6	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:SP	Sep 10 18:35:38 2017	SPONTANEOUS POTENTIAL
F1:TEN	Sep 10 18:35:39 2017	DIFFERENTIAL TENSION

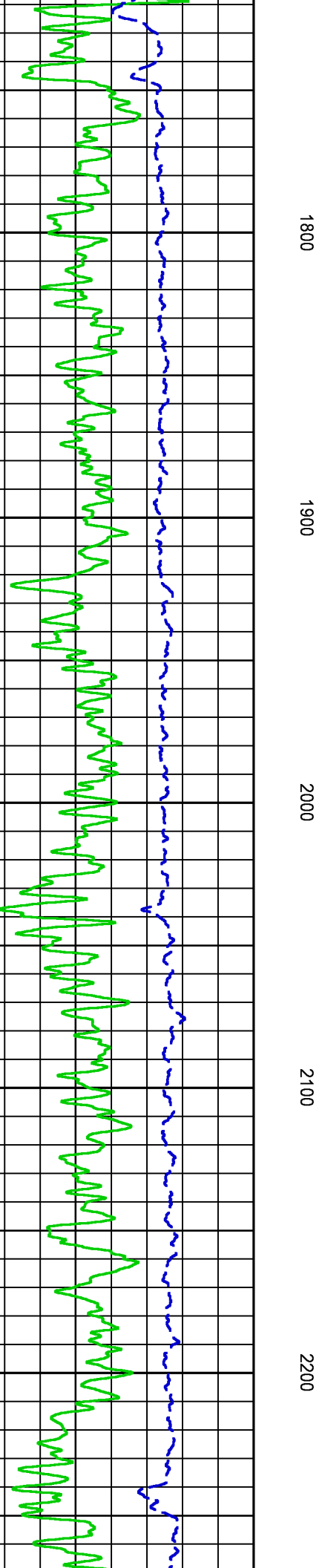
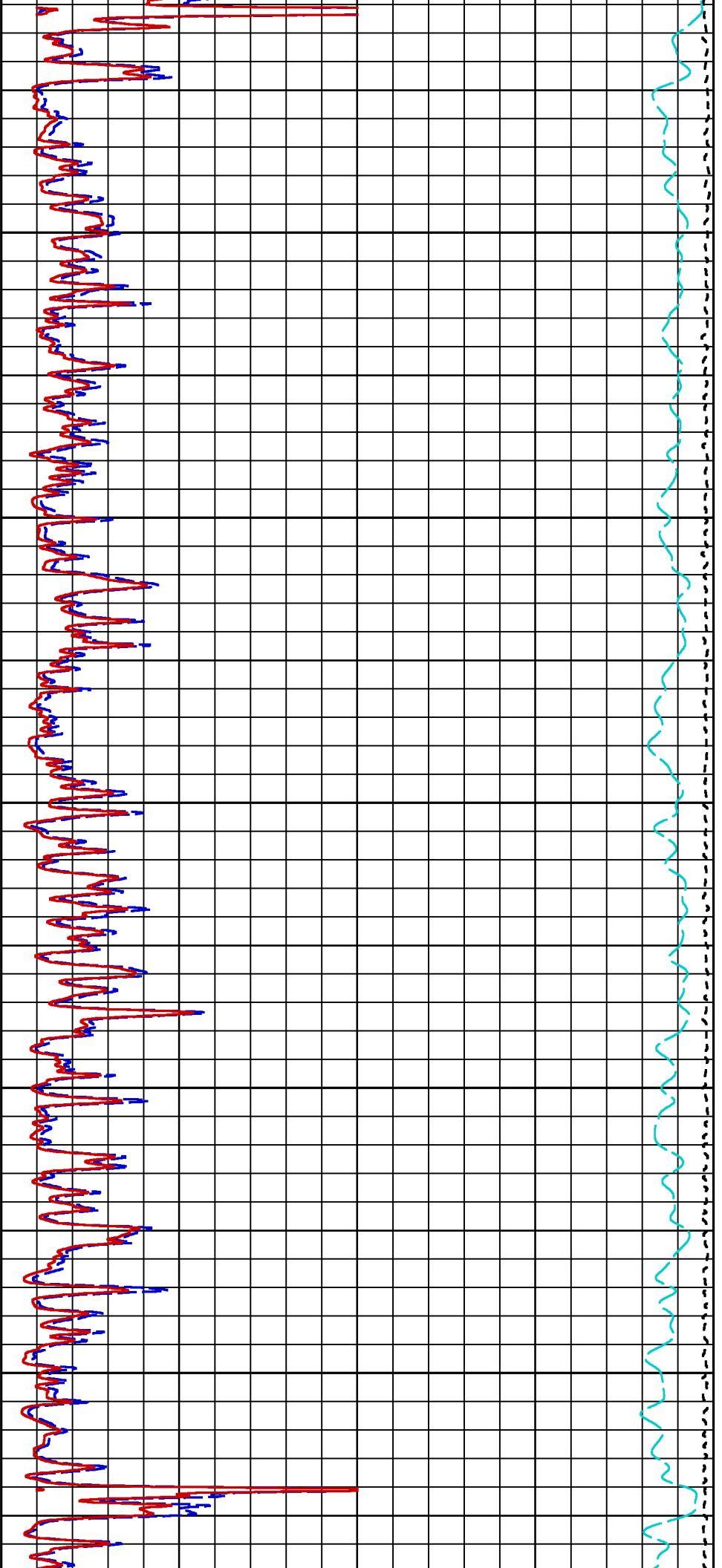
## CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
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M0C6	8.00	M2R6	8.00	TEN	0.00		

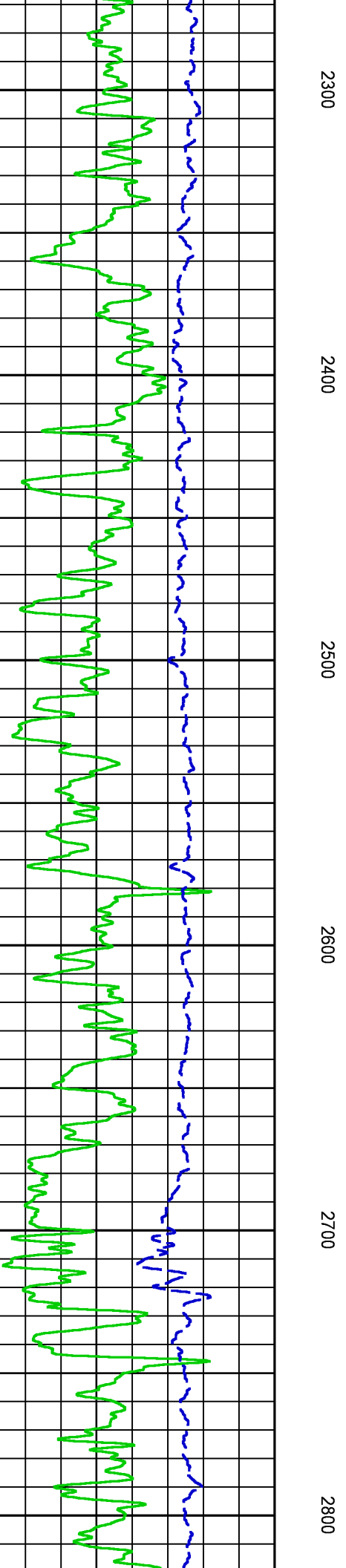
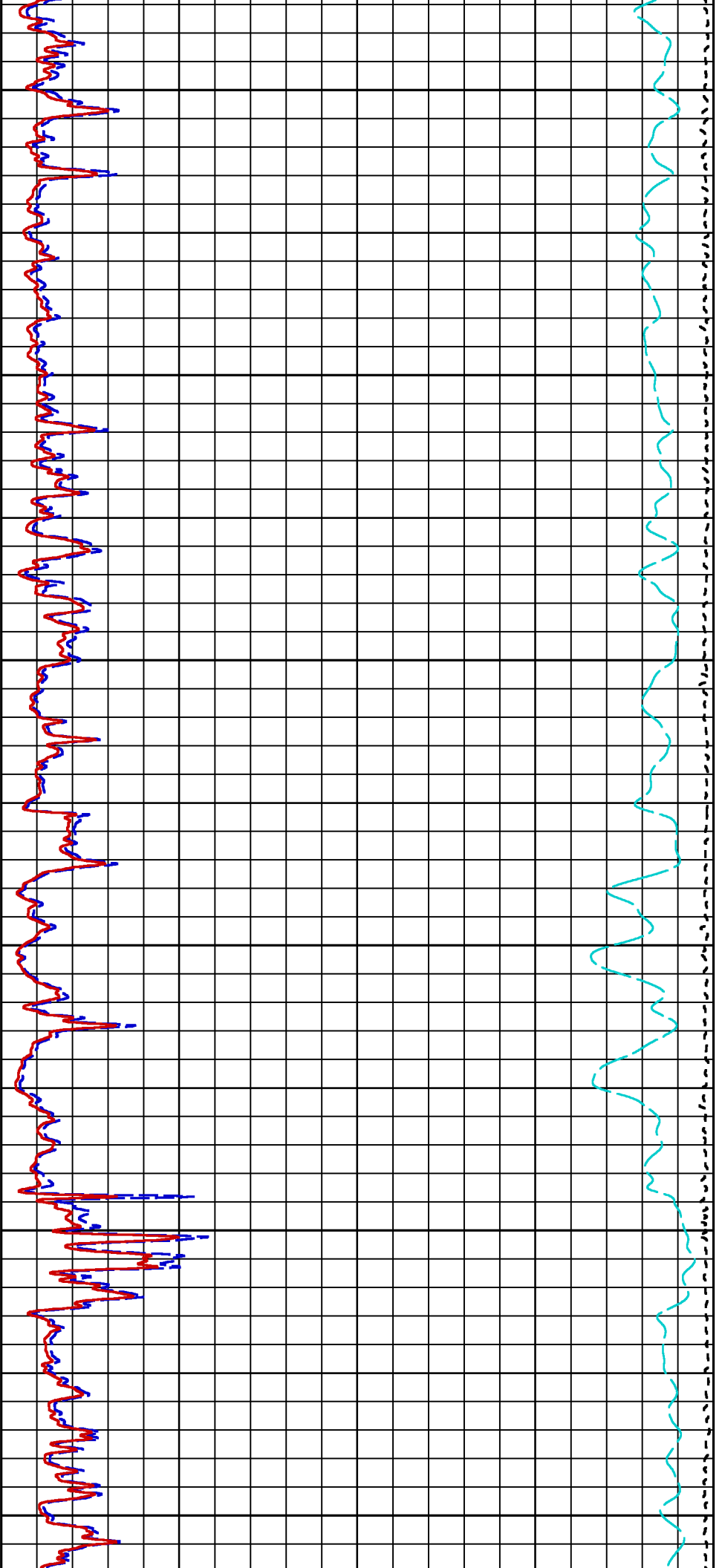
**Presentation** : cpu100:/dat1a/LARAMIE\_BRUTON\_30\_04W/MAIN\_HDILLIN.fvpdf [2"/100' Scale]  
**Plot Interval** : 1530 - 8425.75 Feet

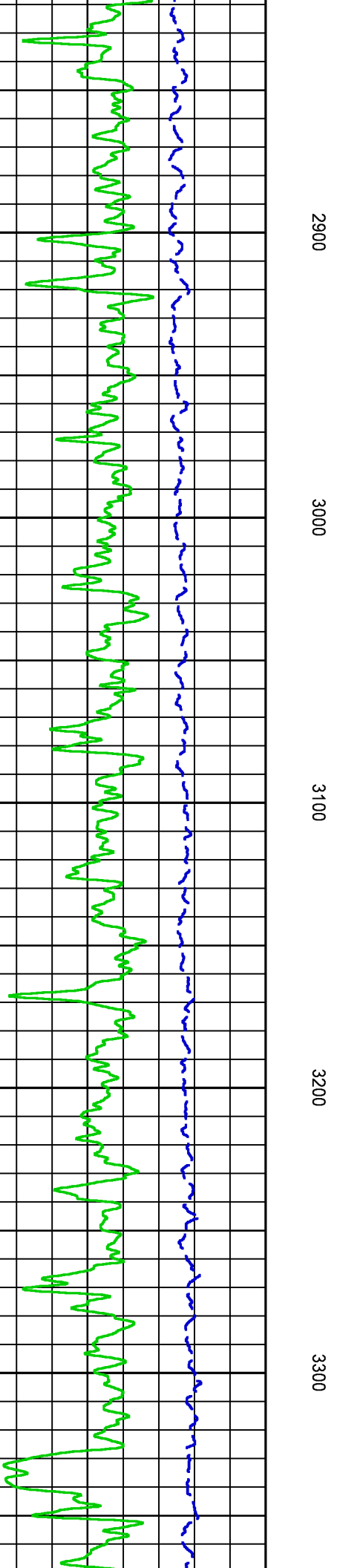
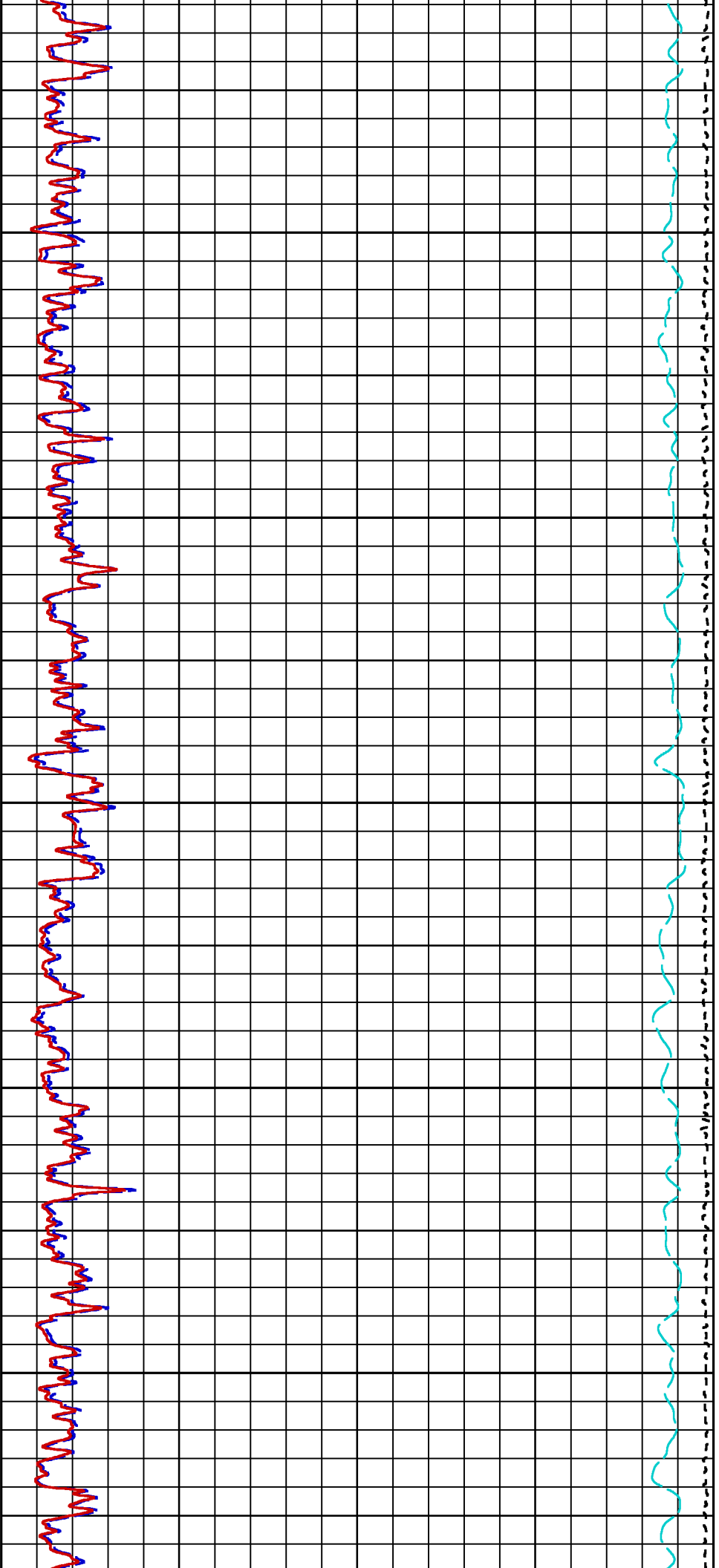
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**Created On** : Sep 10 18:35:26 2017  
**Company** : LARAMIE ENERGY  
**Well** : BRUTON 30-04W  
**Field** : VEGA  
**File Interval** : -27.75 - 8425.75 Feet  
**OCT** : HZ

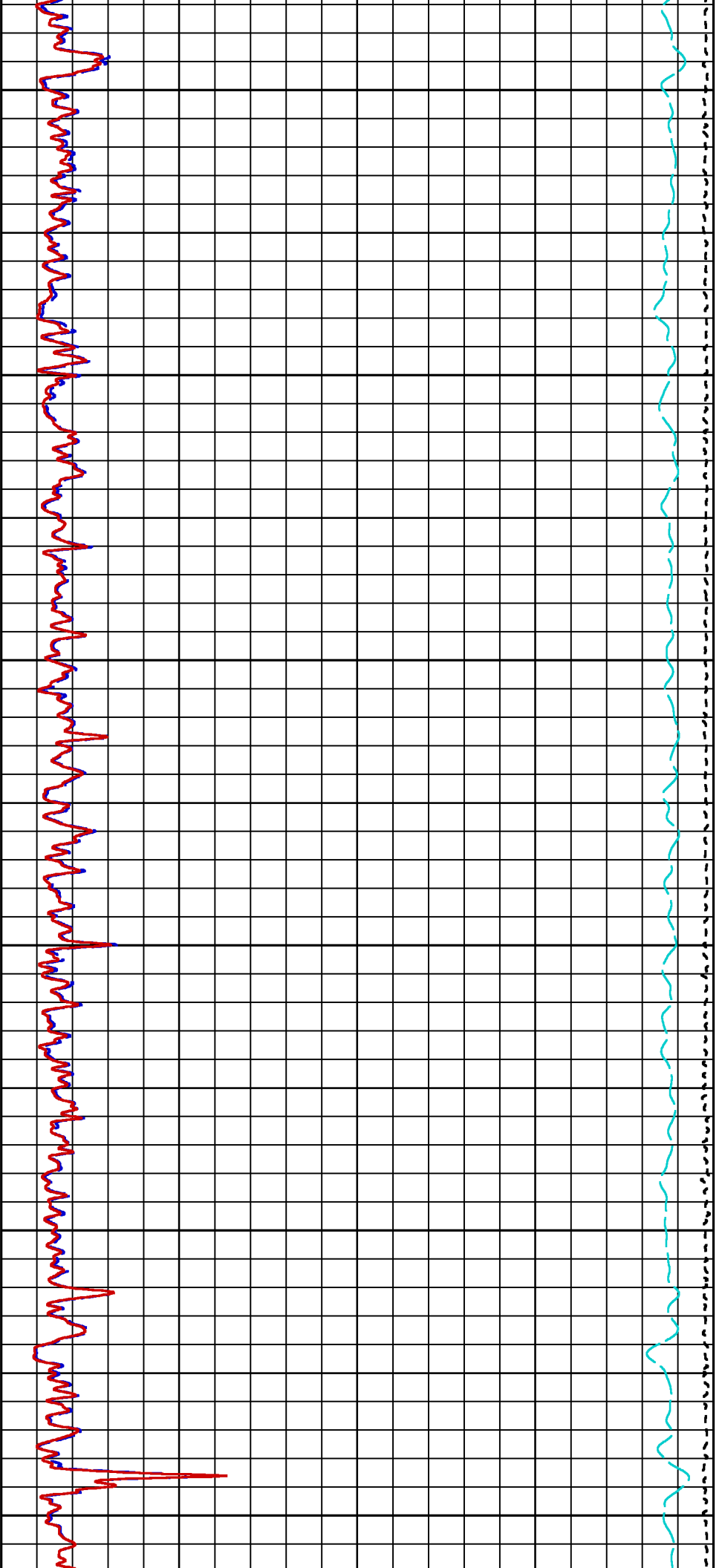




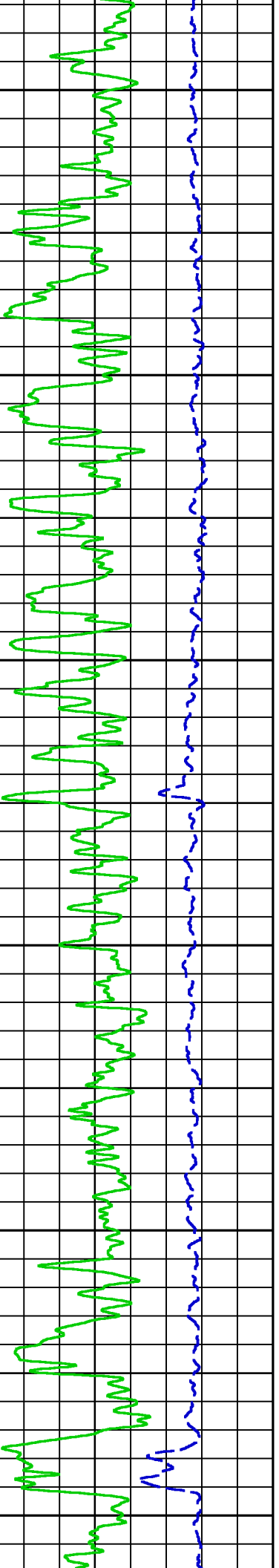


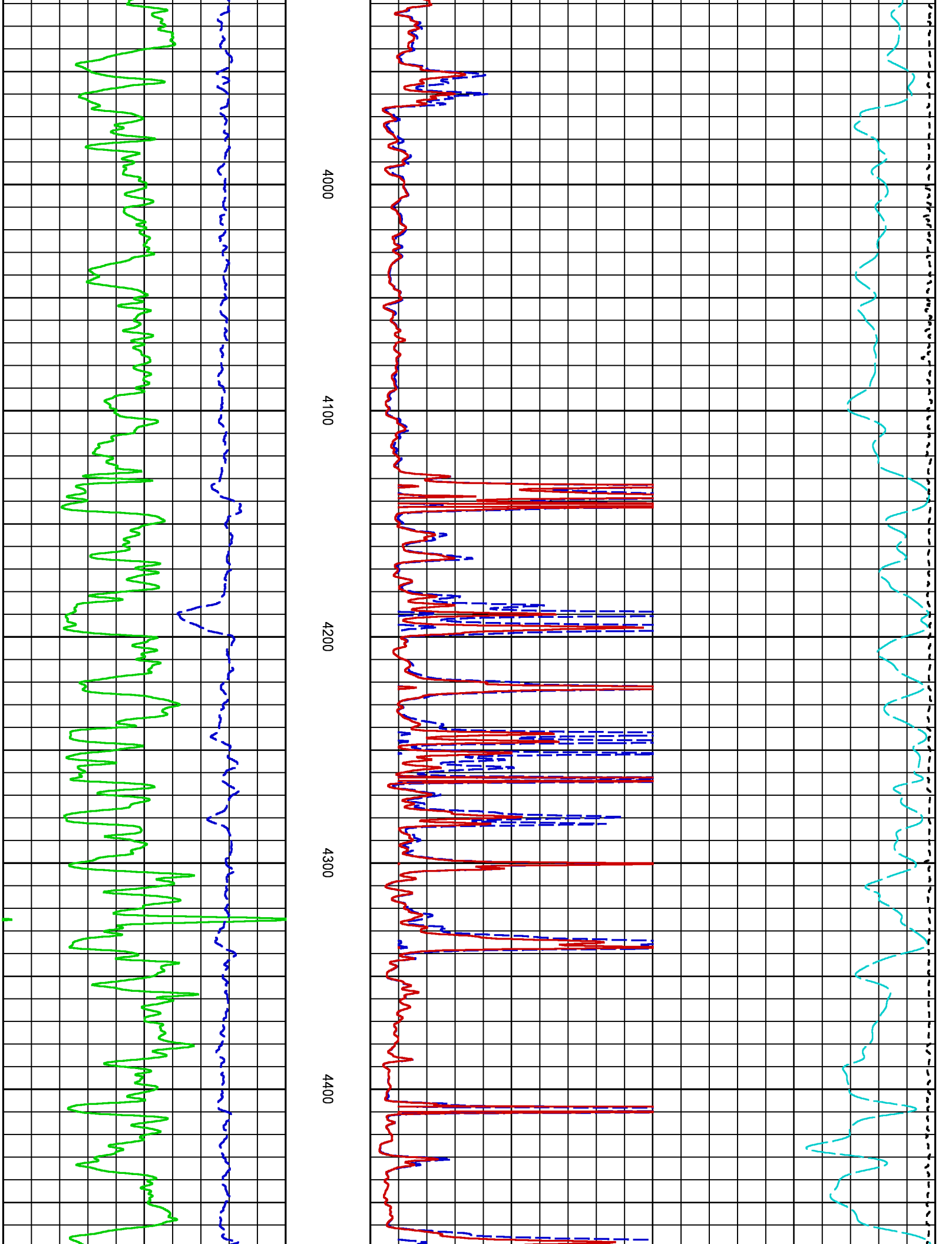


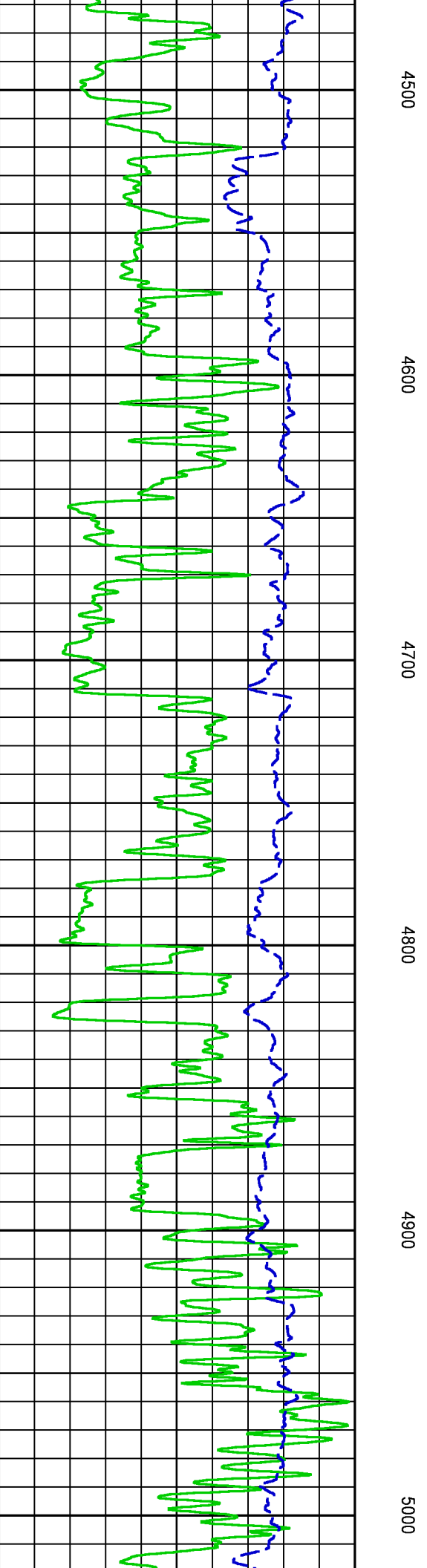
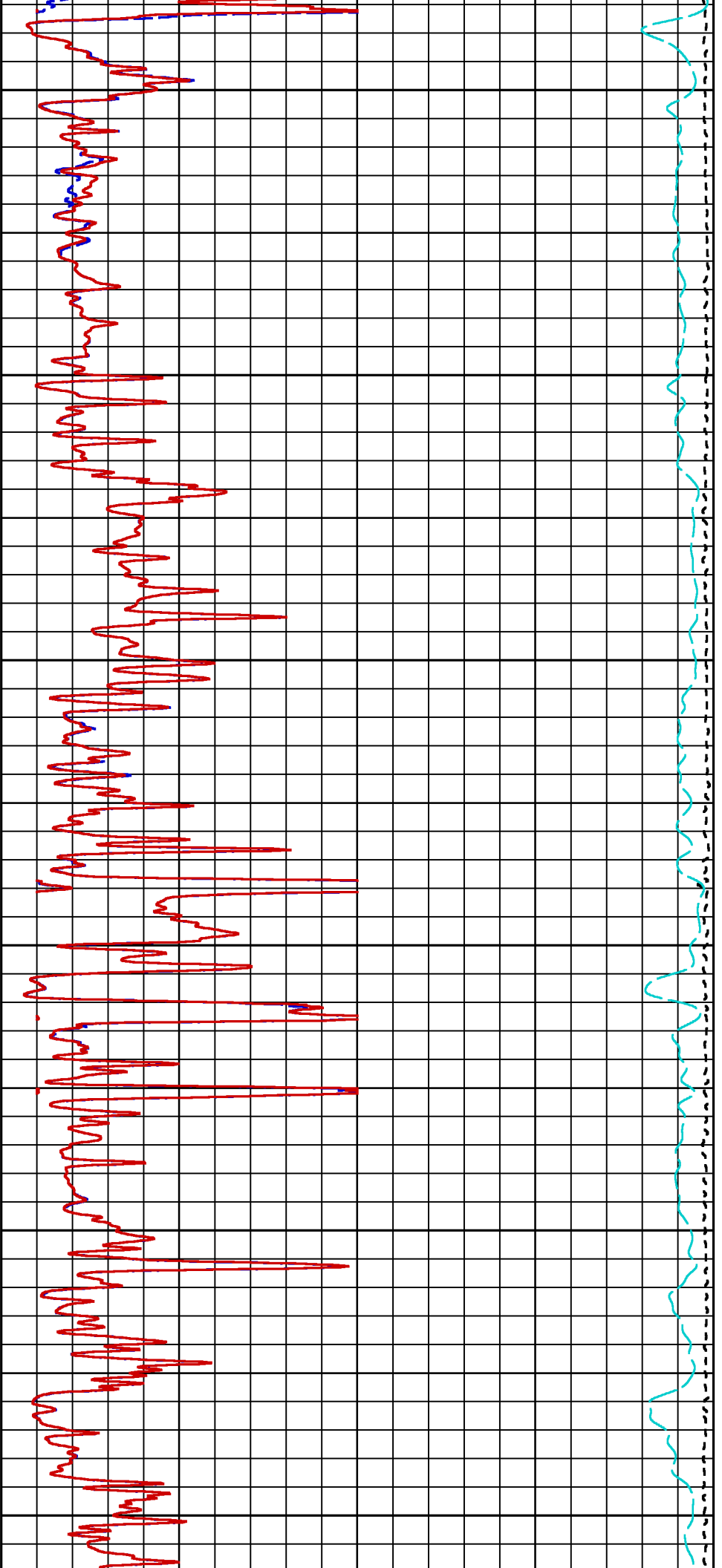


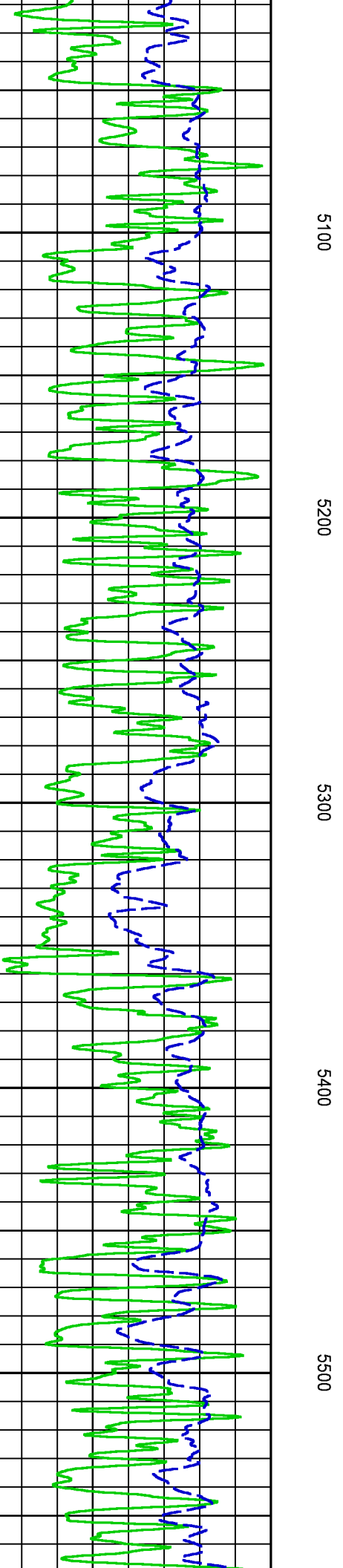
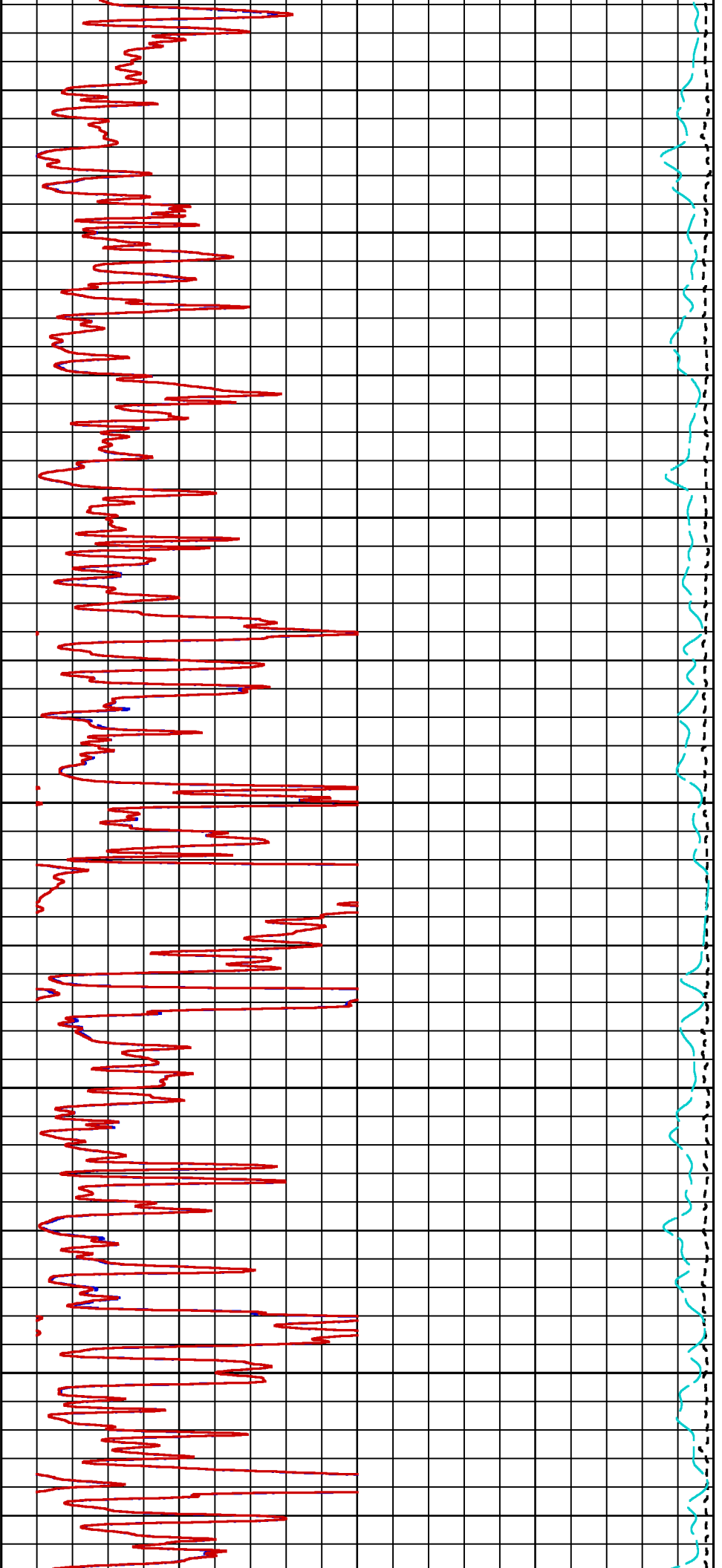


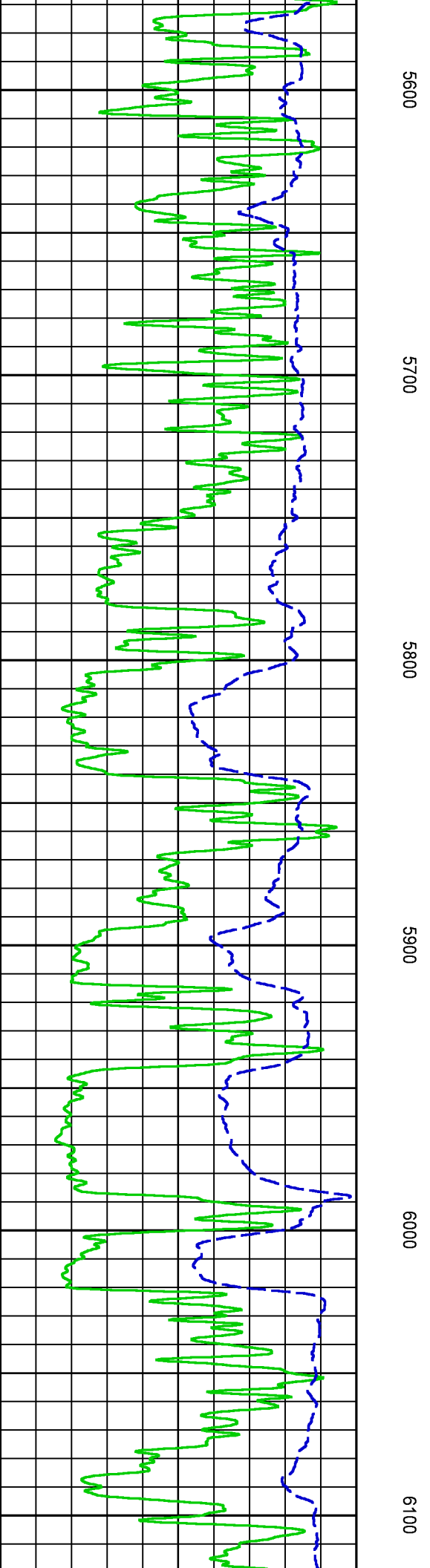
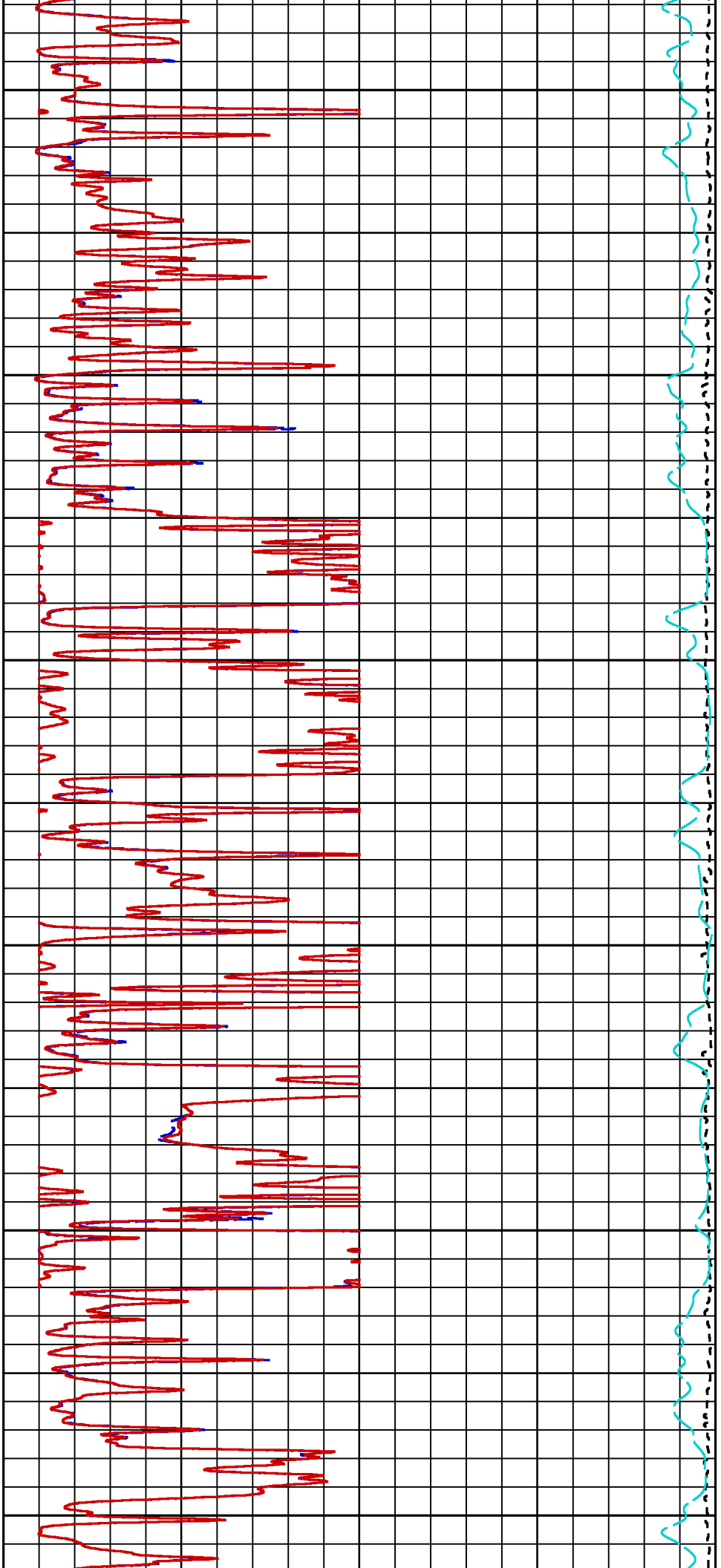
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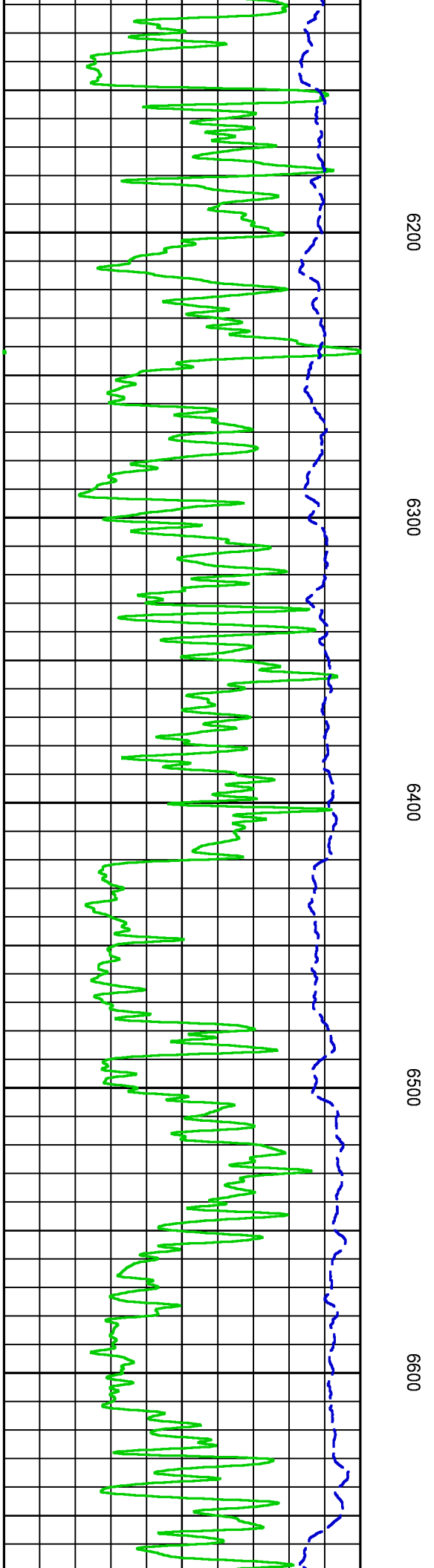
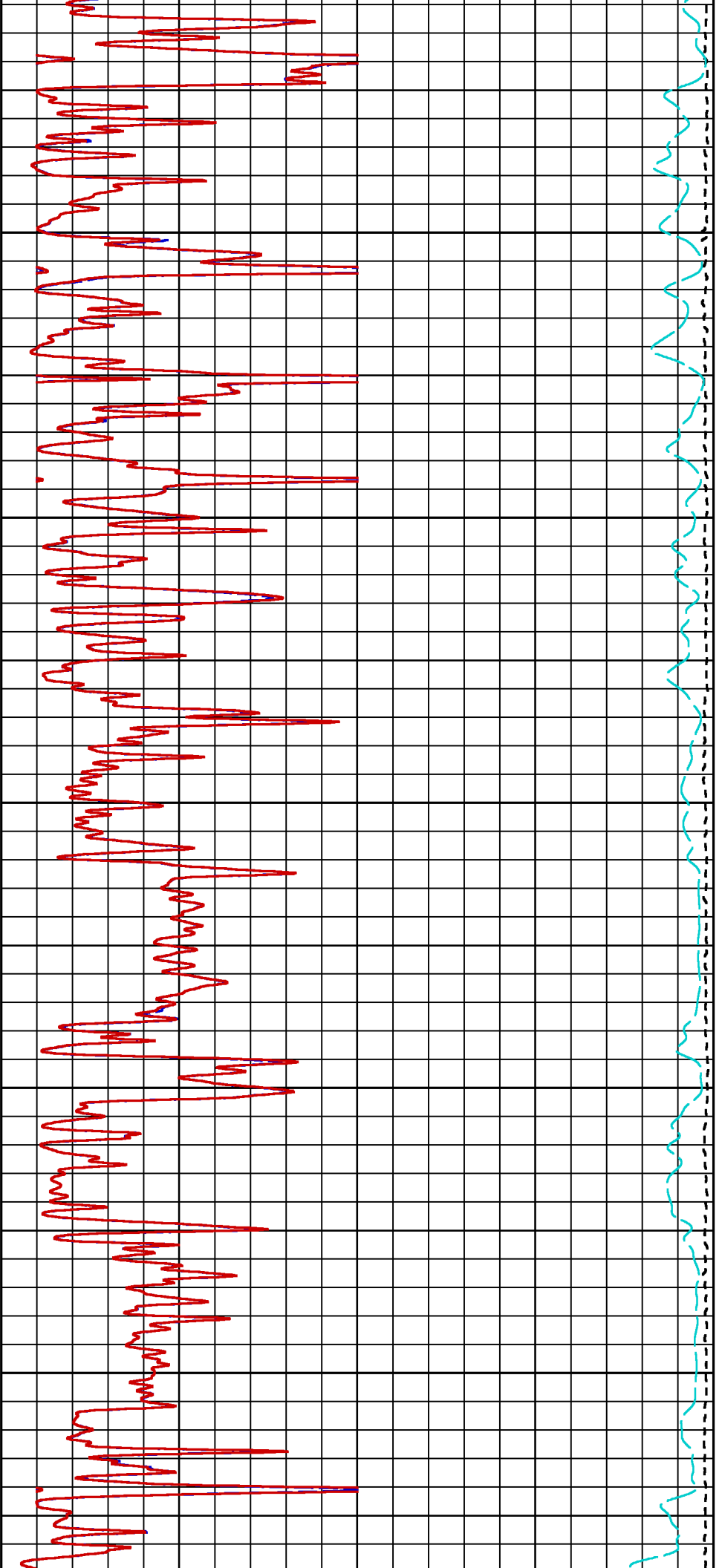




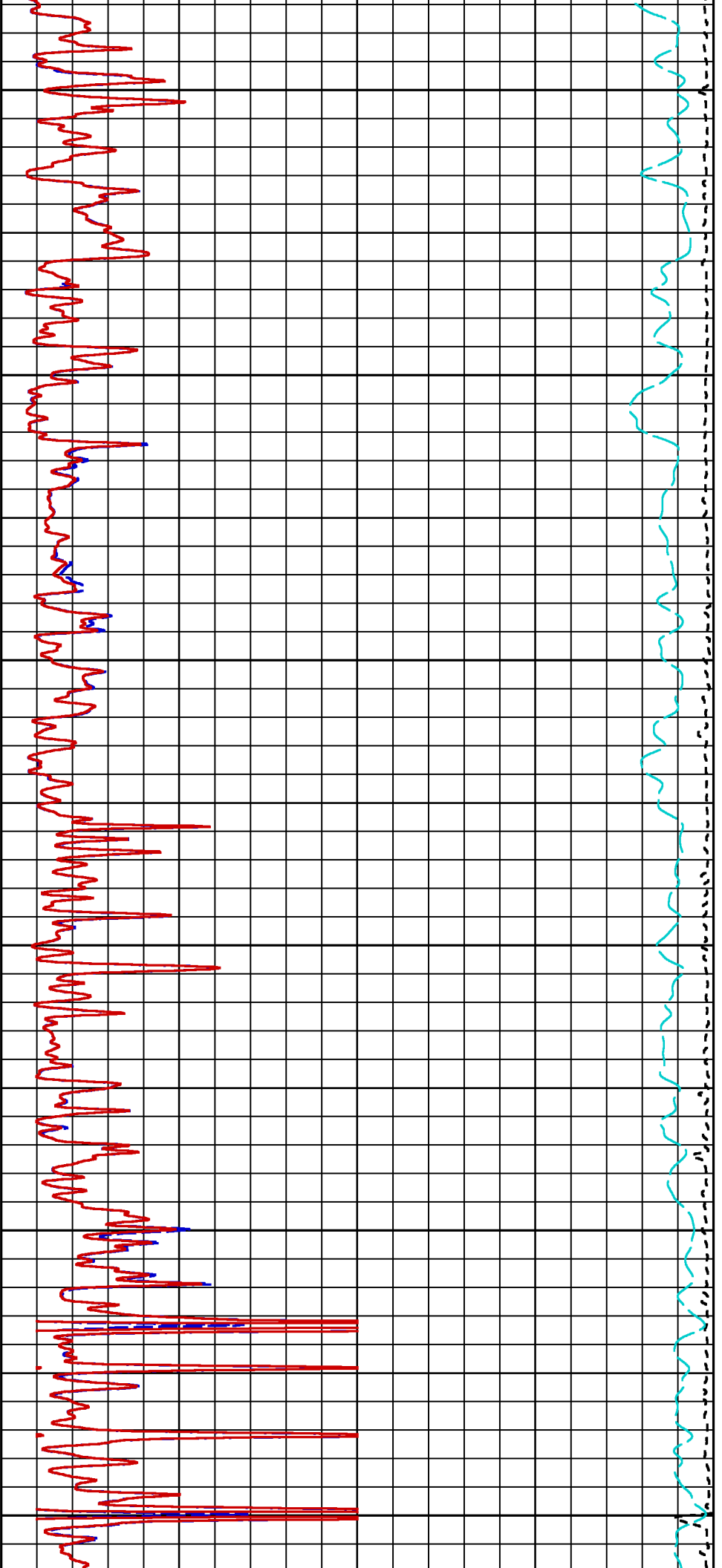












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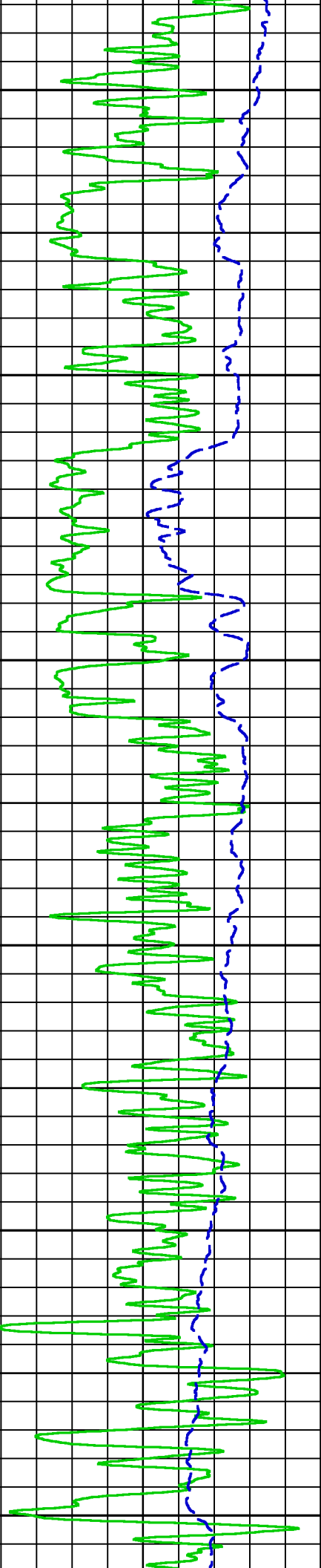
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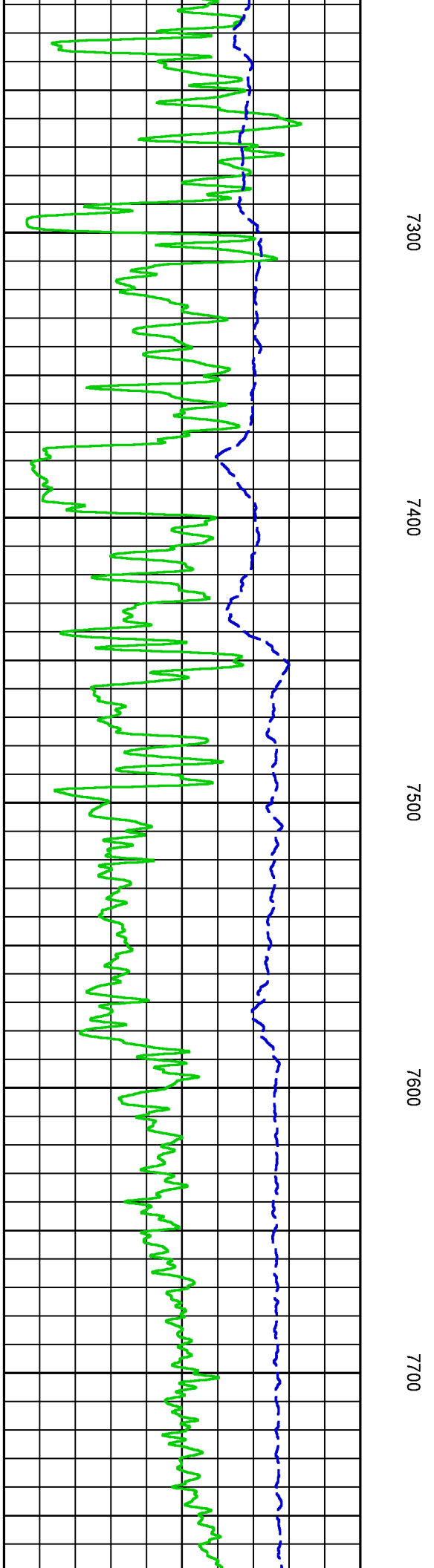
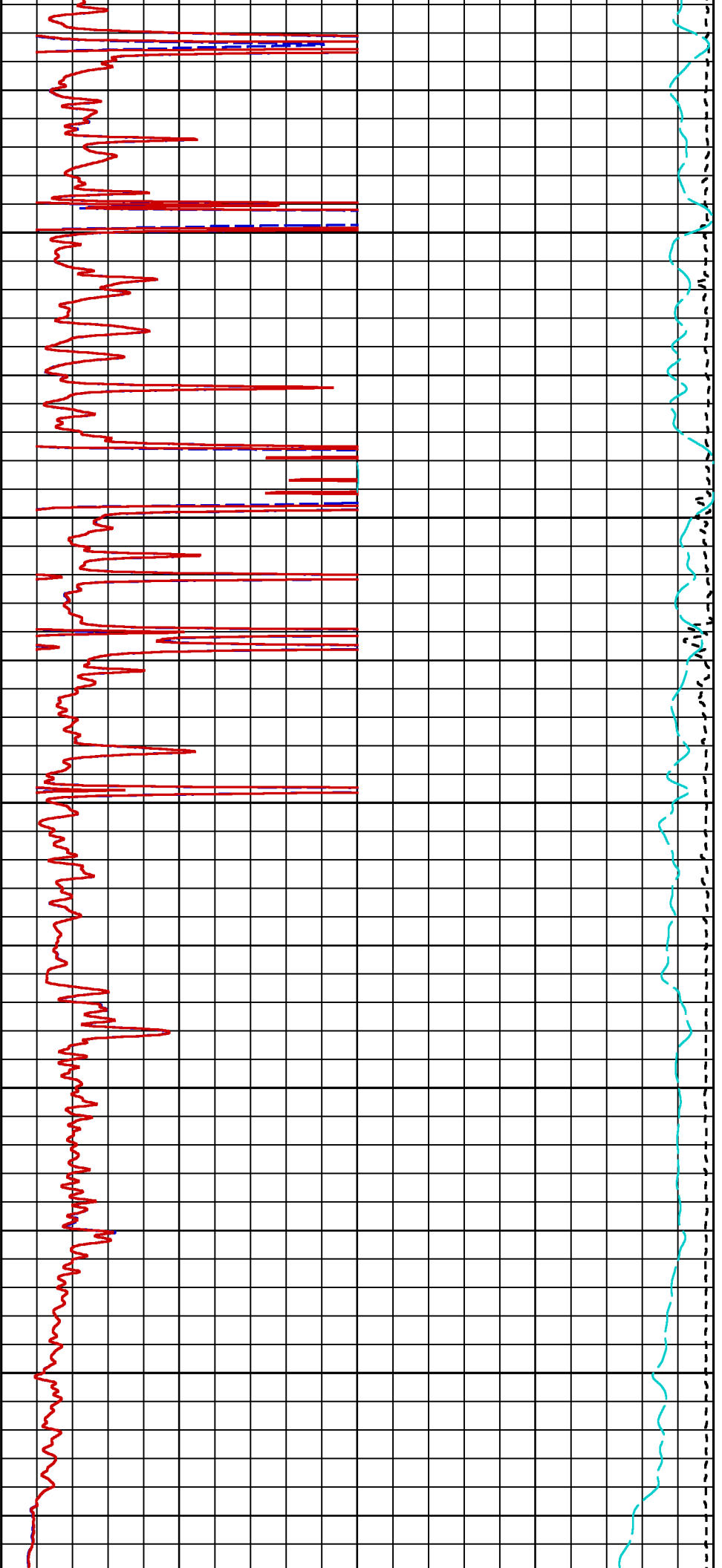
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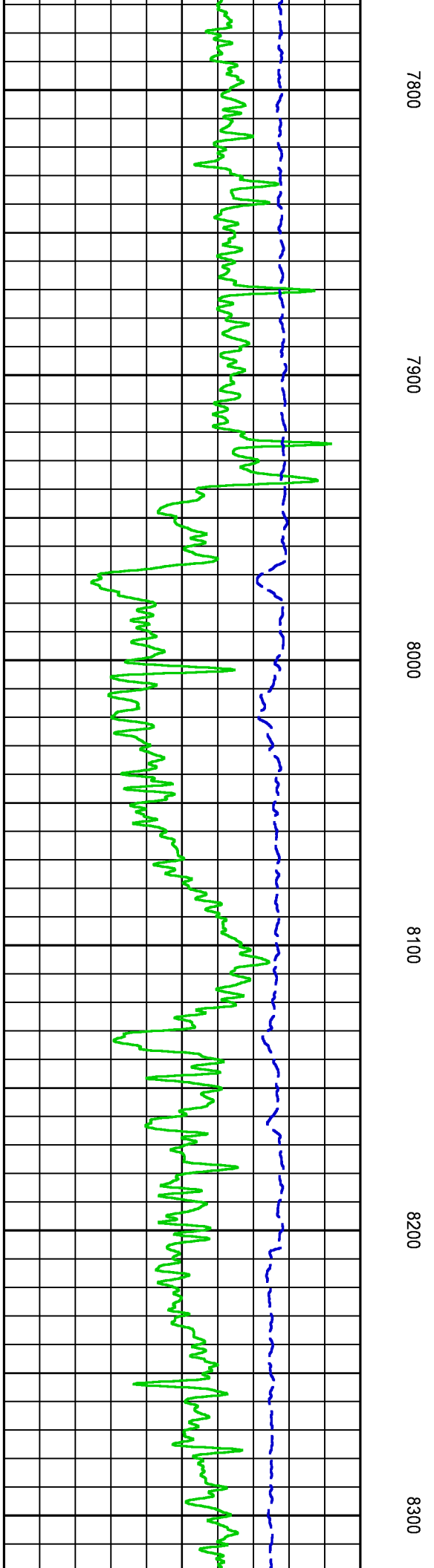
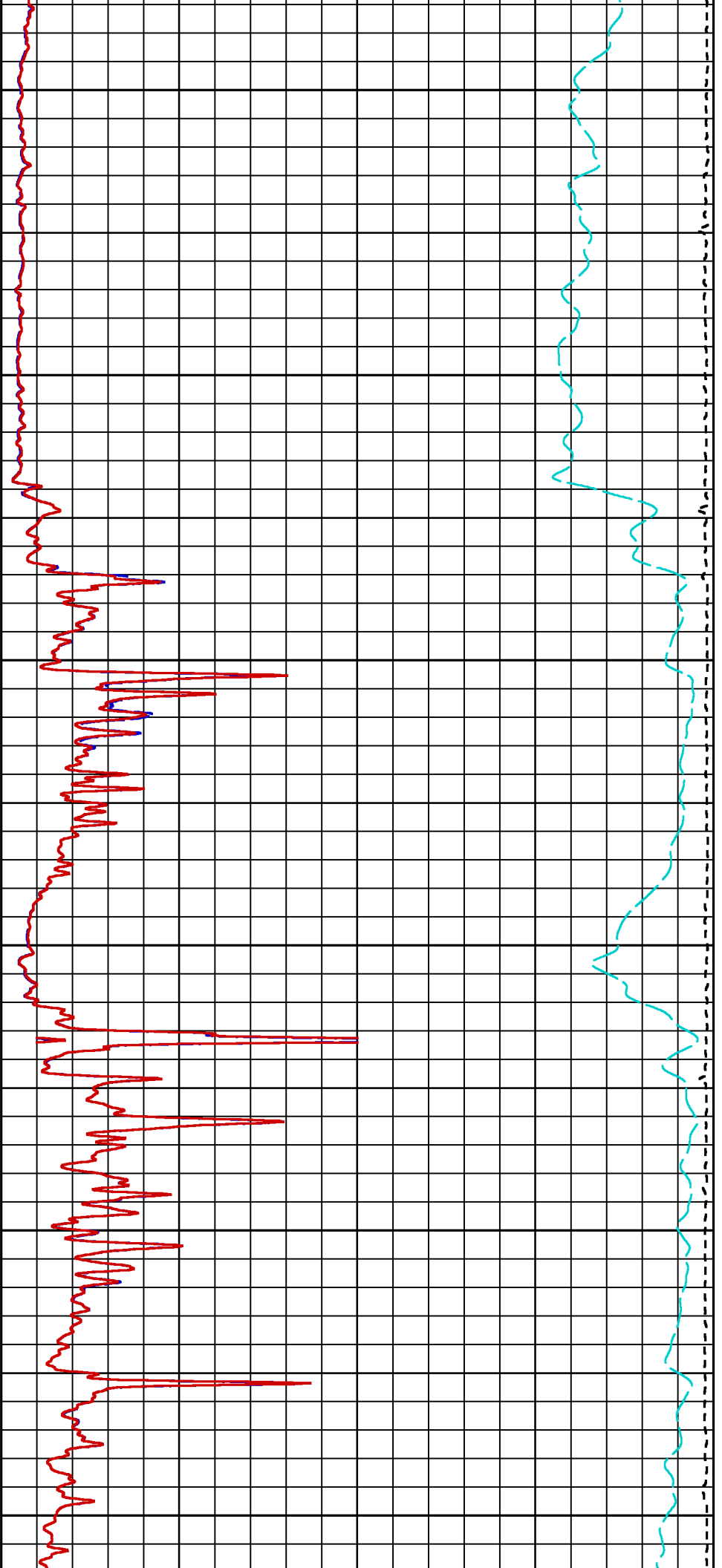
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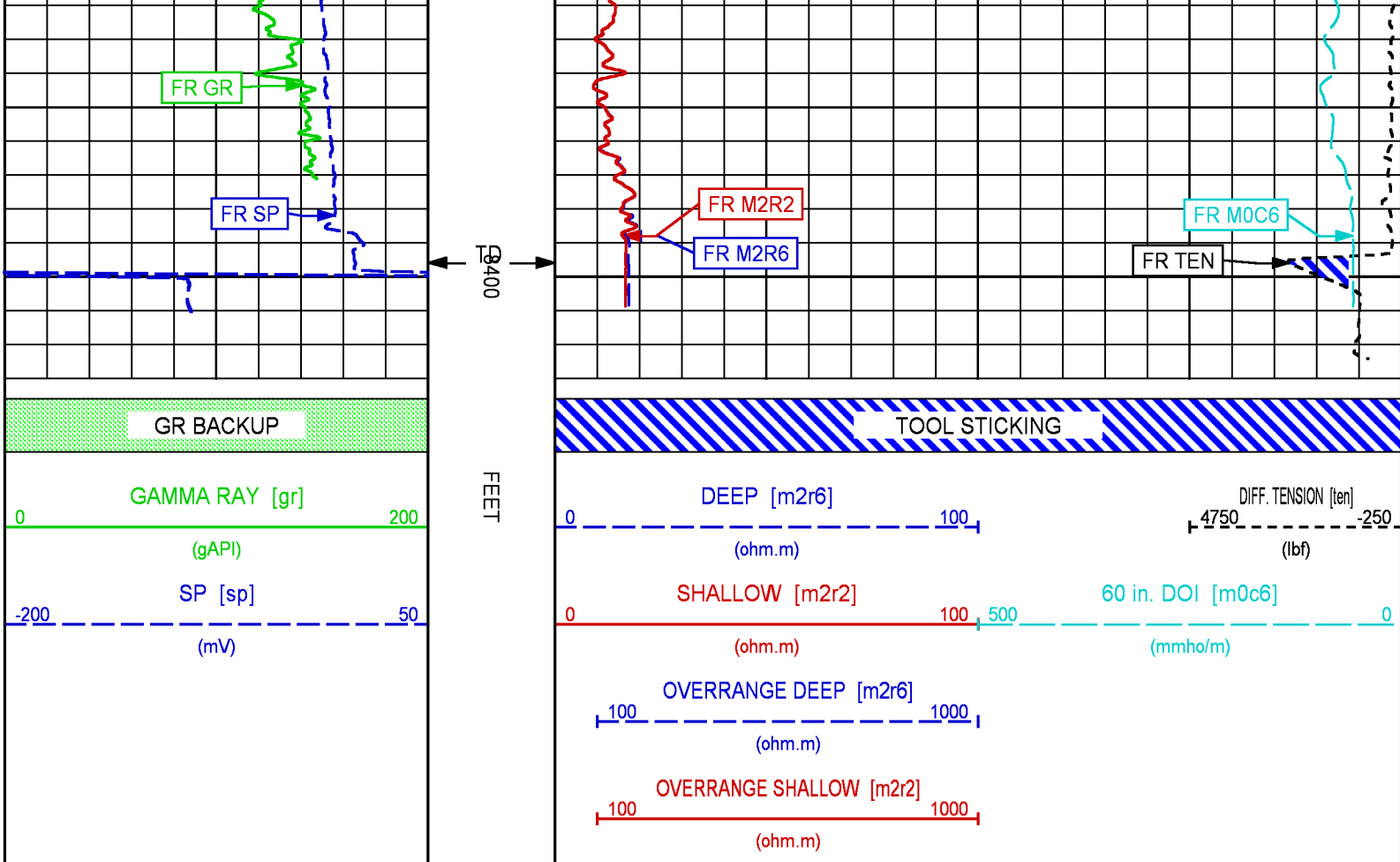
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7200









## MAIN PASS SANDSTONE MATRIX 5"/100 FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Updates: 1 Patches: 9

Plotted: Sun Sep 10 18:41:39 2017

### PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/LARAMIE\_BRUTON\_30\_04W/HZ02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 24.500 ft BOTTOM DEPTH: 6759.500 ft

#### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TTRM	FILTER ()	medium (1)		TOP	BOTTOM
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
Y AXIS CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
GR	FILTER ()	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
CN	FILTER ()	medium (1)		"	"
CALIPER	FILTER ()	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
ZDL MED RES	FILTER (.hrd1*)	medium		"	"

ZDL MED RES	FILTER (hrd1*) FILTER (hrd2*) FILTER (hrd2s*) FILTER (soft*)	medium medium medium medium	" " " "	" " " "	
SP-SPDH	FILTER () FILTER (.i)	medium (1) medium (1)	" "	" "	
BOREHOLE & CEMENT					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	4.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	7.875	in	"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	100.7	degF	"	"
	MUD SAMPLE RES	2.697	ohm.m	"	"
BOREHOLE TEMP from GRADIENT	Known BH REF TEMP	77.0	degF	"	"
	at BH REF DEPTH	0.0	ft	"	"
	with TEMP GRADIENT	1.200	0.01 degF/ft	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	"	"
	FIXED DIAMETER (mbh*)	7.875	in	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
CN PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	SANDSTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY	675	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"
ZDL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOmatrix	2.680	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"
TRACKING TIME	Logging Spd for Gain	Over 10 ft/min		"	"
HDIL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORR SOURCE	USE RXTEMP		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		"	"
	ABC to CALCULATE	STANDOFF		"	"
	STANDOFF	0.00	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"
CURVE DESCRIPTION REPORT					
CURVE NAME	CREATION DATE	CURVE DESCRIPTION			
F1:BIT	Sep 10 18:35:26 2017	BIT SIZE			
F1:BVOL	Sep 10 18:35:26 2017	BOREHOLE VOLUME			
F1:CAL	Sep 10 18:35:26 2017	CALIPER			
F1:CNCF	Sep 10 18:35:26 2017	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY			
F1:CVOL	Sep 10 18:35:27 2017	CEMENT VOLUME			
F1:GR	Sep 10 18:35:28 2017	GAMMA RAY			
F1:M2R1	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI			
F1:M2R2	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI			
F1:M2R3	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI			
F1:M2R6	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI			
F1:M2R9	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI			
F1:M2RX	Sep 10 18:35:31 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 120-INCH DOI			
F1:PE	Sep 10 18:35:33 2017	PHOTO ELECTRIC CROSS-SECTION			
F1:PORZC	Sep 10 18:35:34 2017	CORRECTED POROSITY			
F1:SP	Sep 10 18:35:38 2017	SPONTANEOUS POTENTIAL			

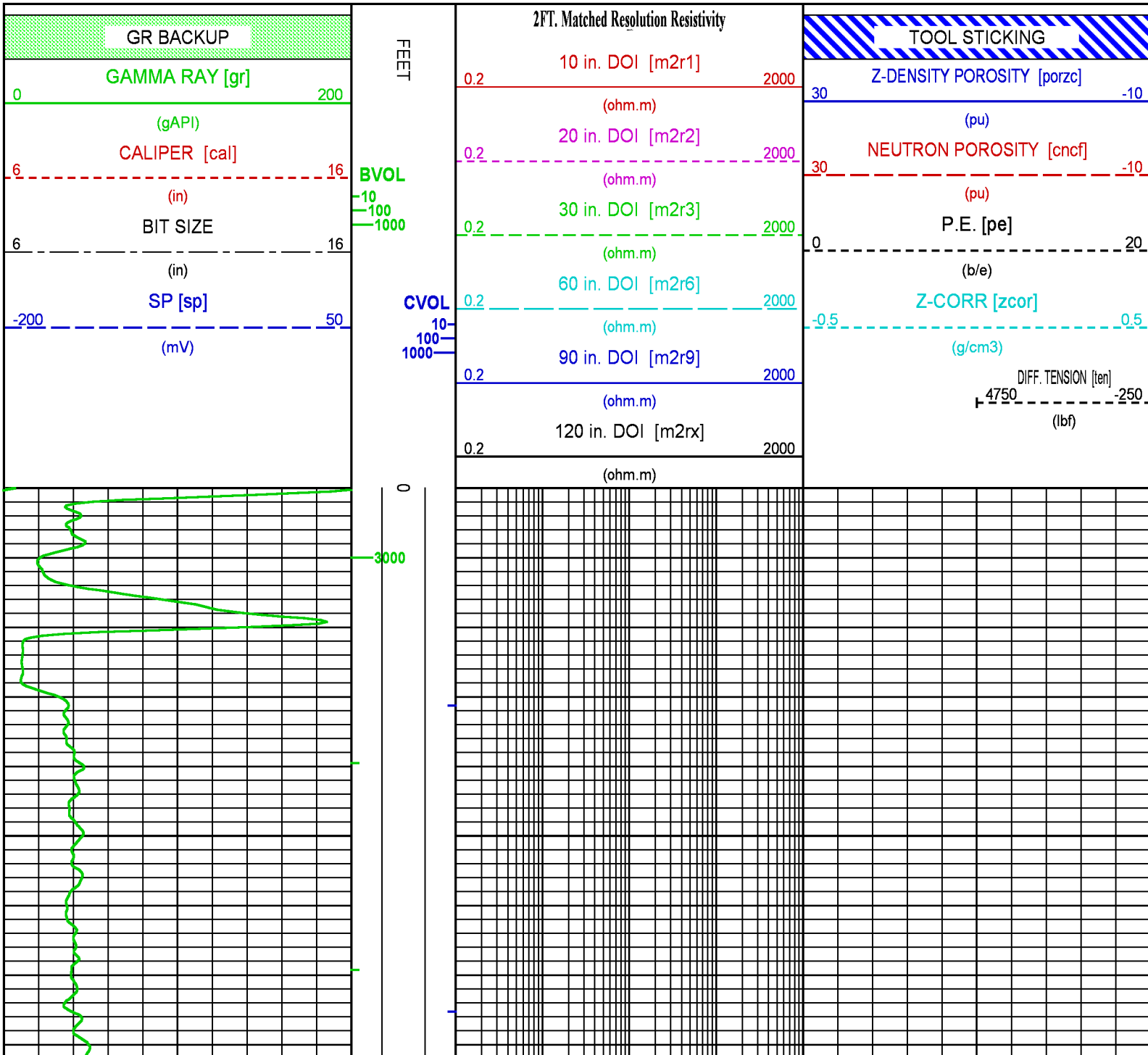
CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	M2R1	8.00	M2R9	8.00	SP	14.00
CAL	35.00	M2R2	8.00	M2RX	8.00	TEN	0.00
CNCF	45.25	M2R3	8.00	PE	34.25	ZCOR	34.25
GR	52.25	M2R6	8.00	PORZC	34.25		

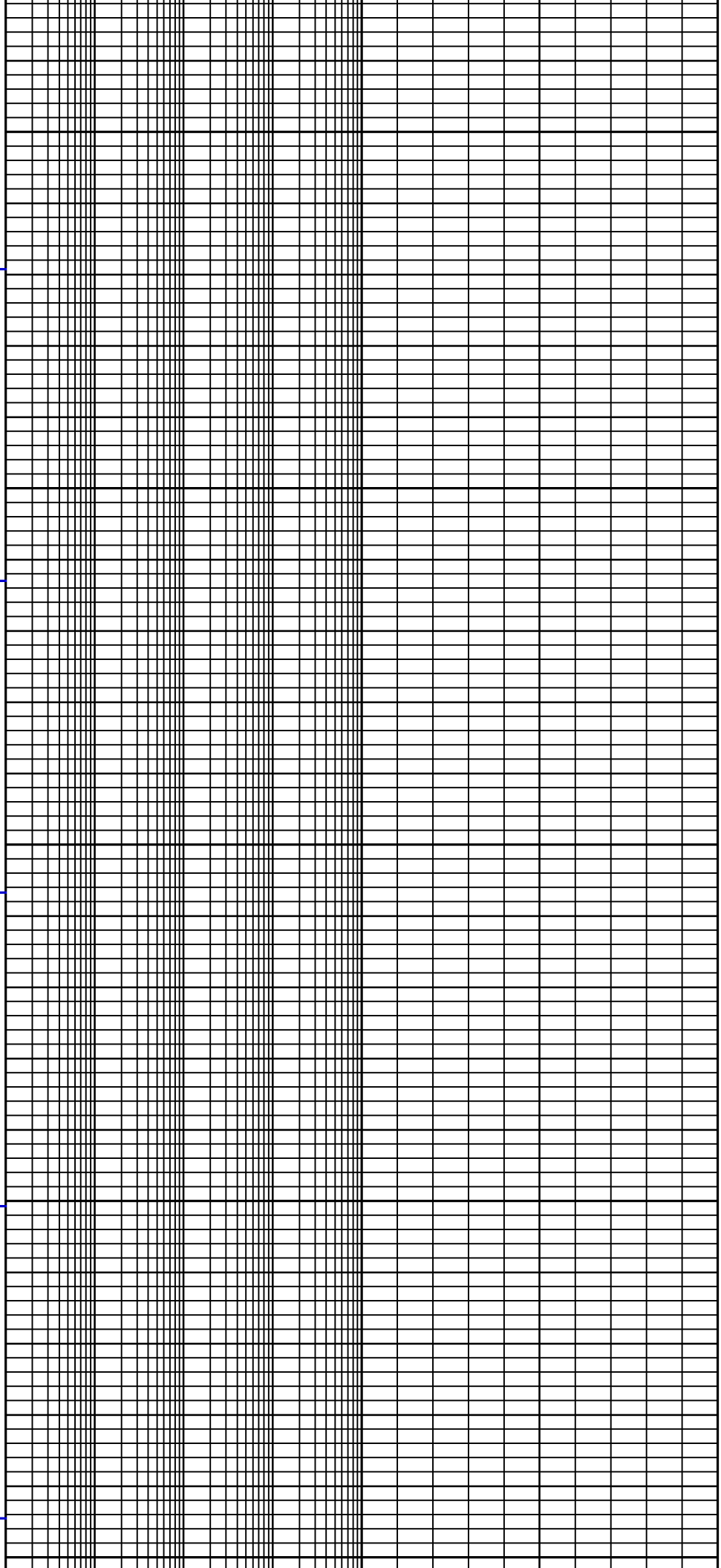
Presentation  
Plot Interval

: cpu100:/dat1a/LARAMIE\_BRUTON\_30\_04W/MAIN.fvpdf [5"/100' Scale]  
: 0 - 8425.75 Feet

Data File 1  
Created On  
Company  
Well  
Field  
File Interval  
OCT

: F1 : cpu100:/dat1a/LARAMIE\_BRUTON\_30\_04W/MAIN.xtf  
: Sep 10 18:35:26 2017  
: LARAMIE ENERGY  
: BRUTON 30-04W  
: VEGA  
: -27.75 - 8425.75 Feet  
: HZ

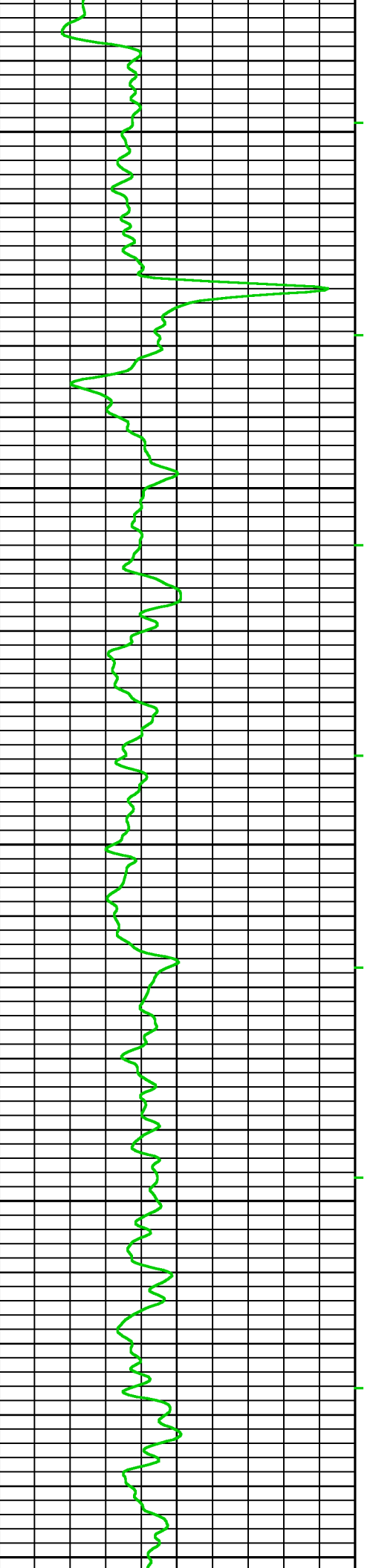


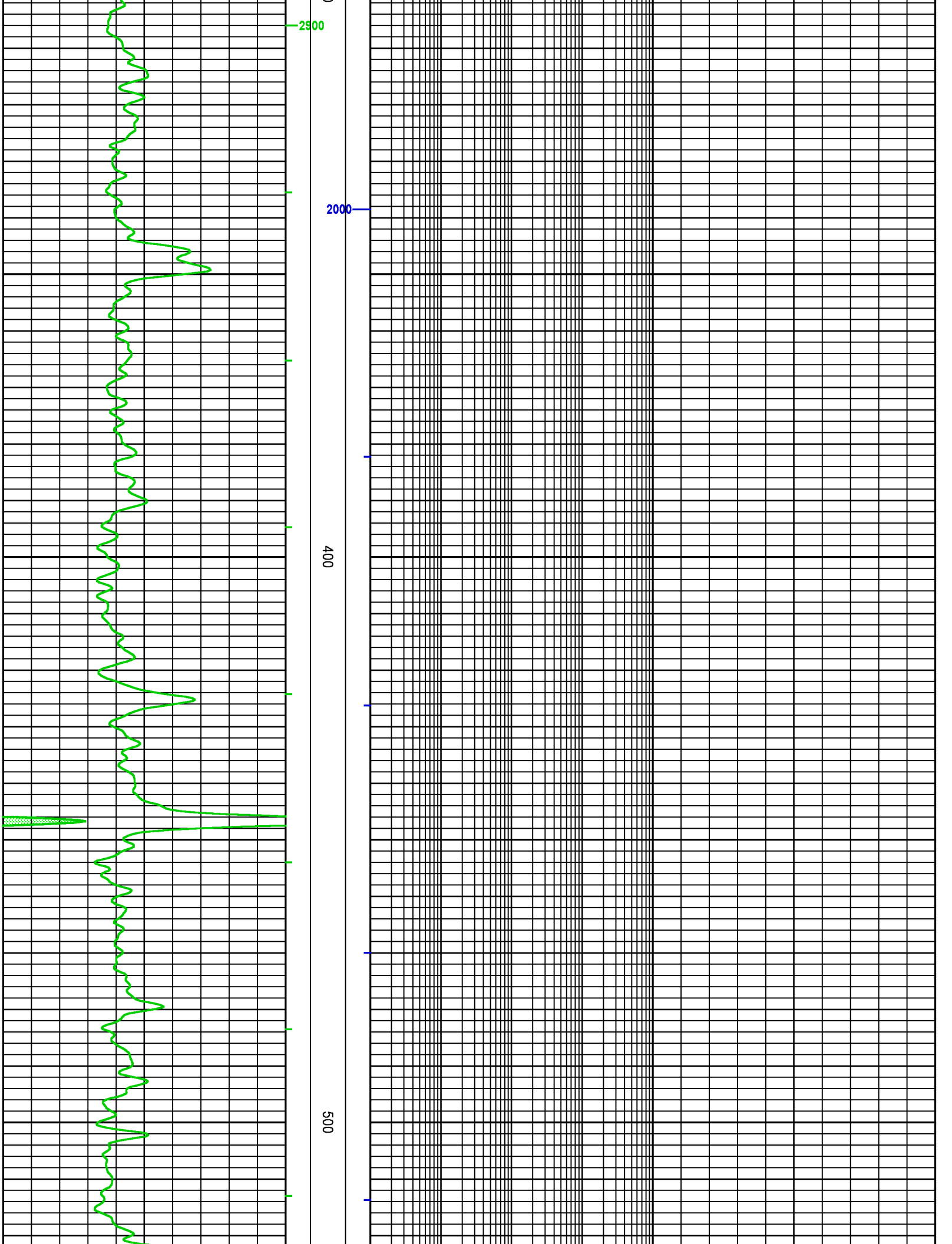


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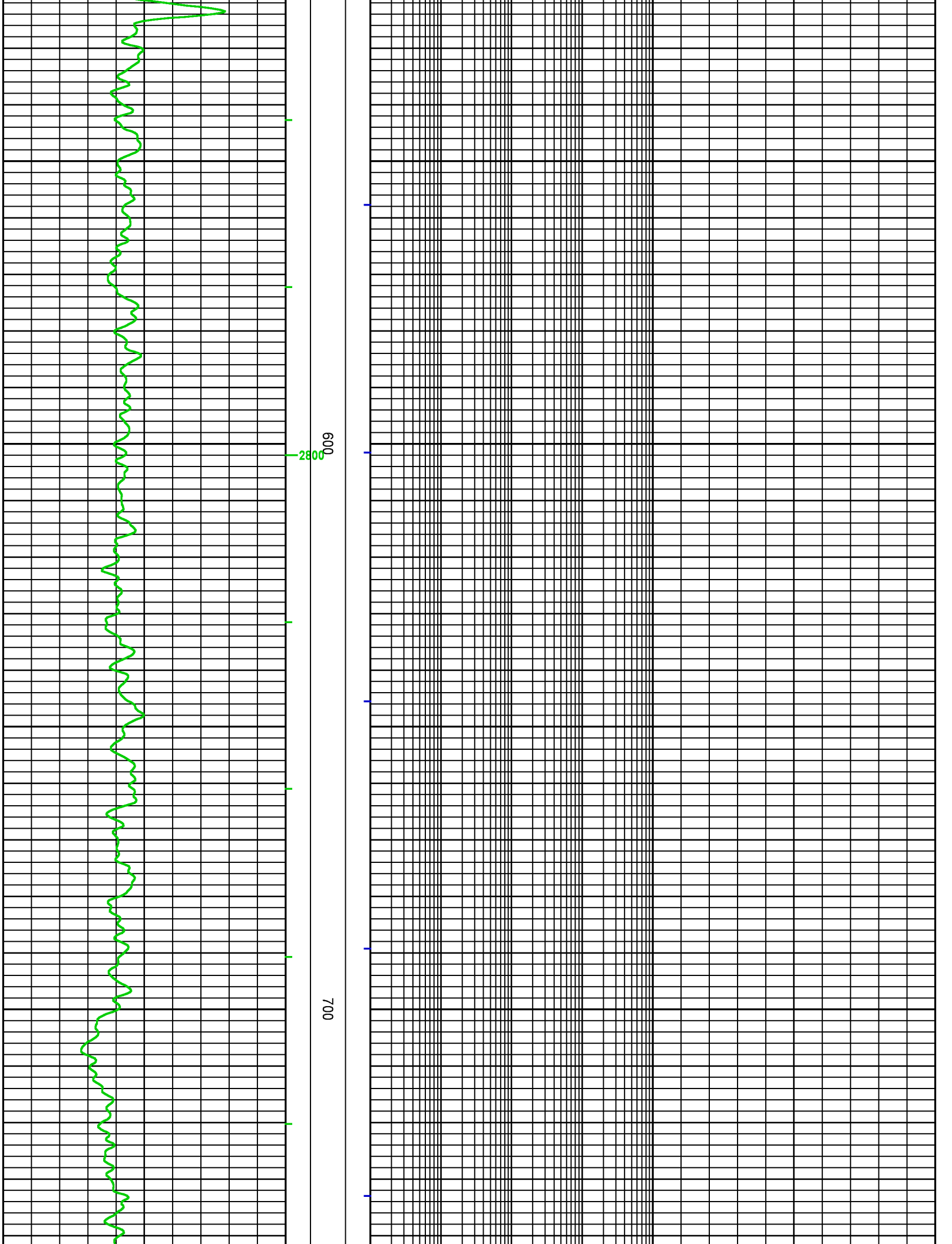
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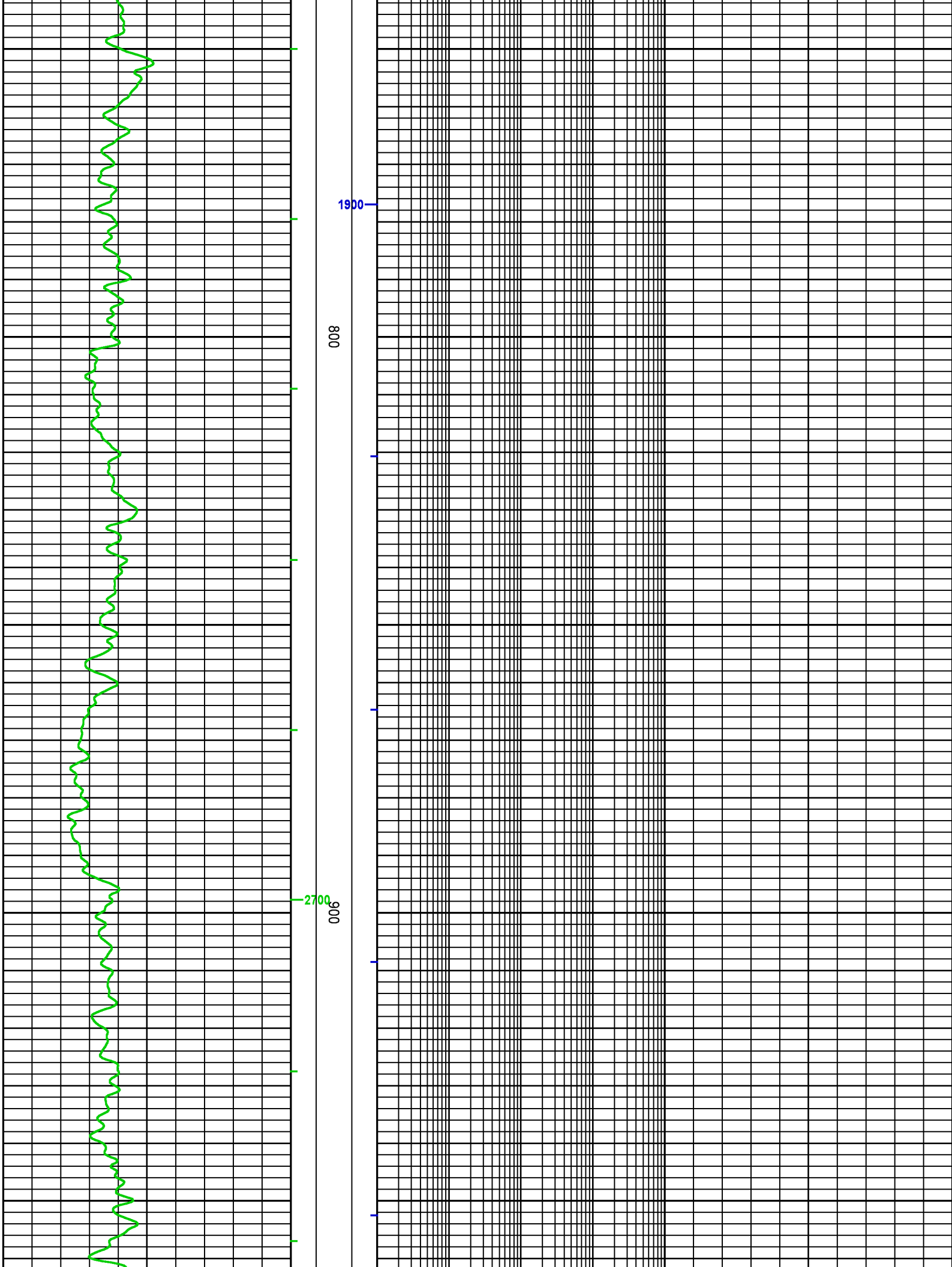
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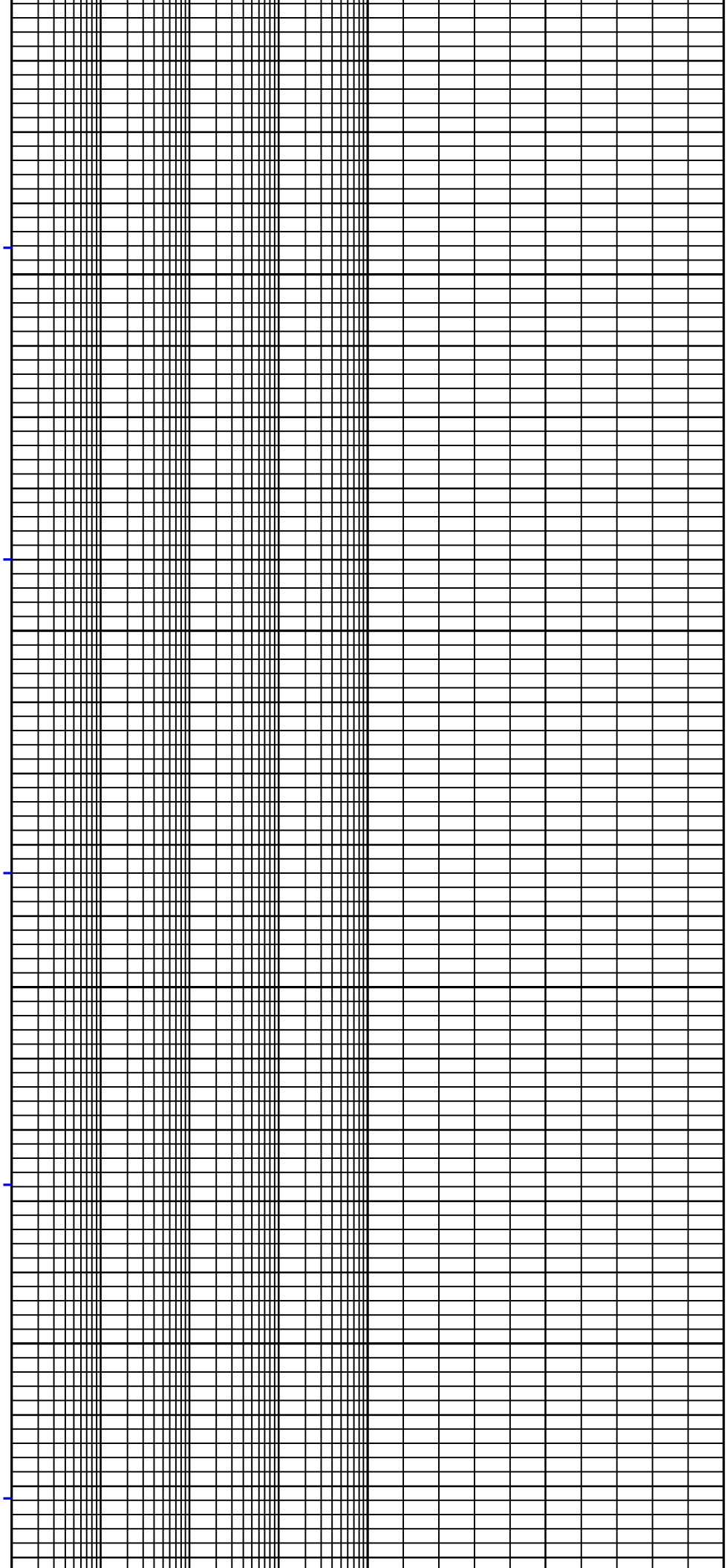






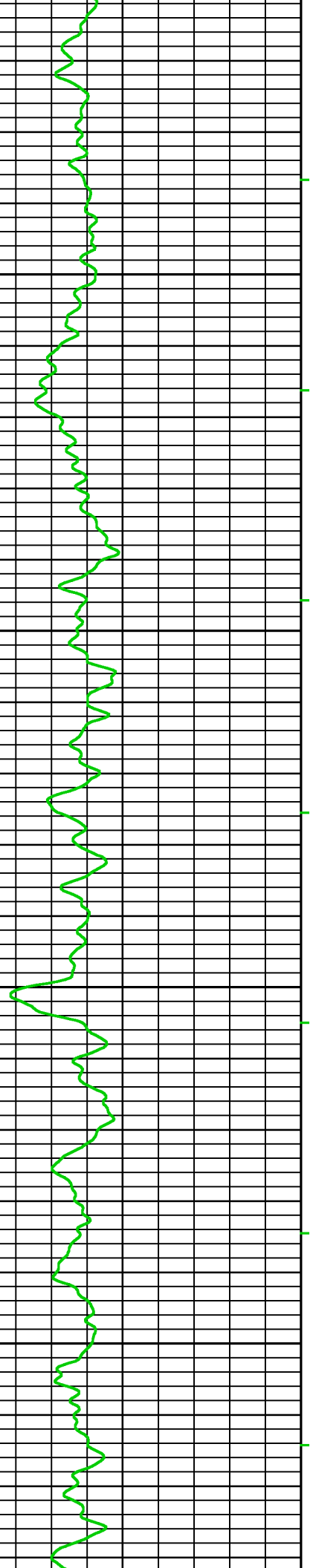


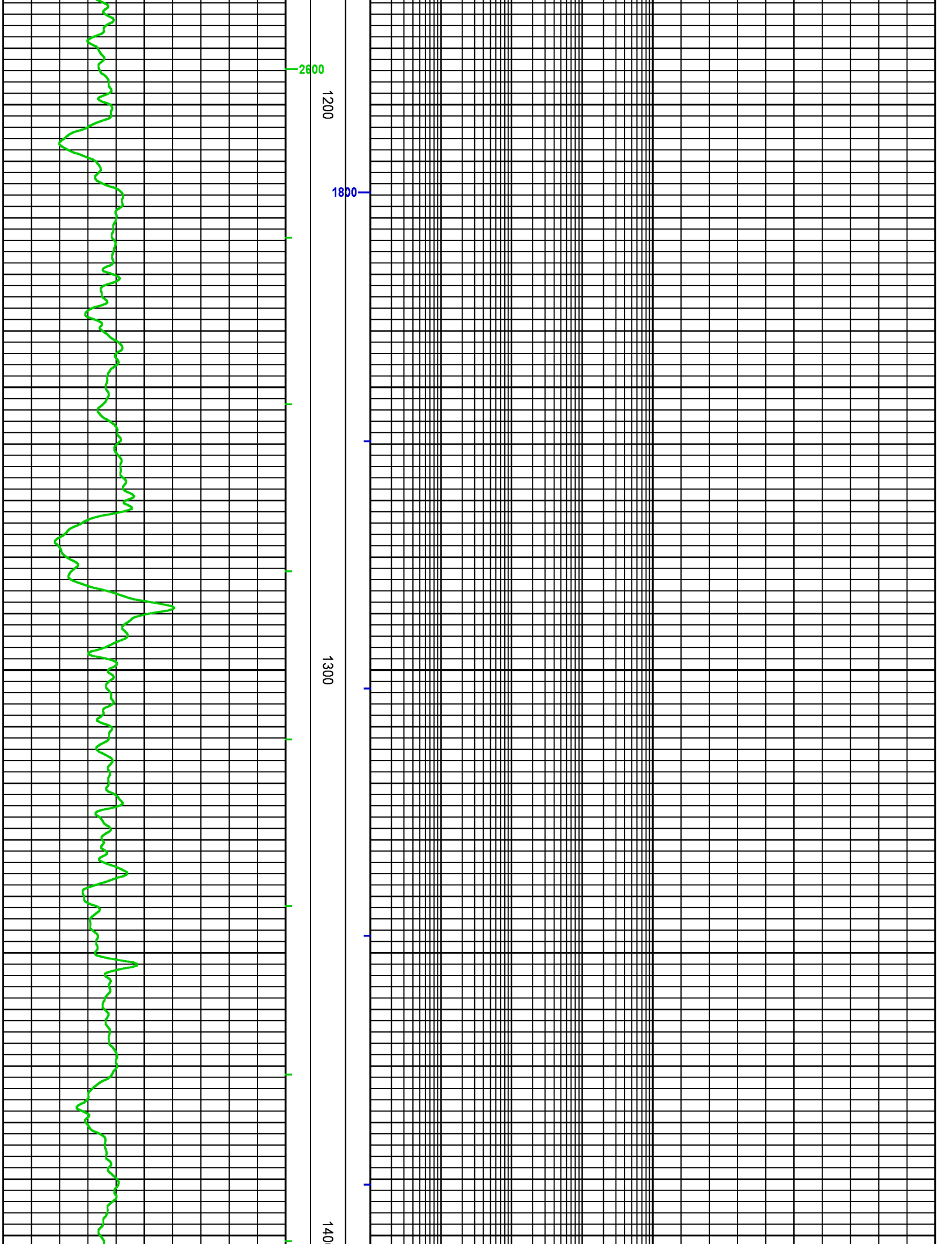


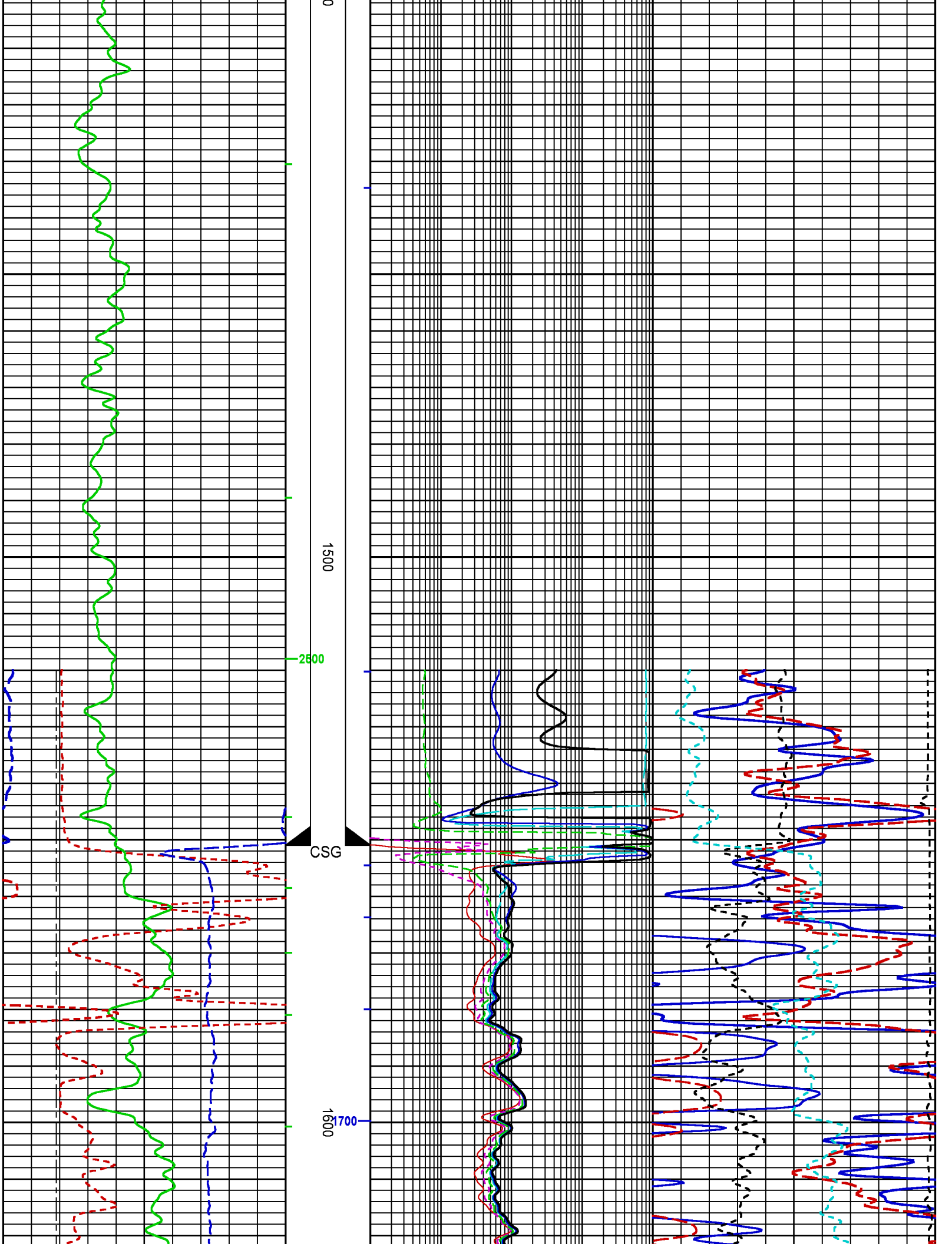


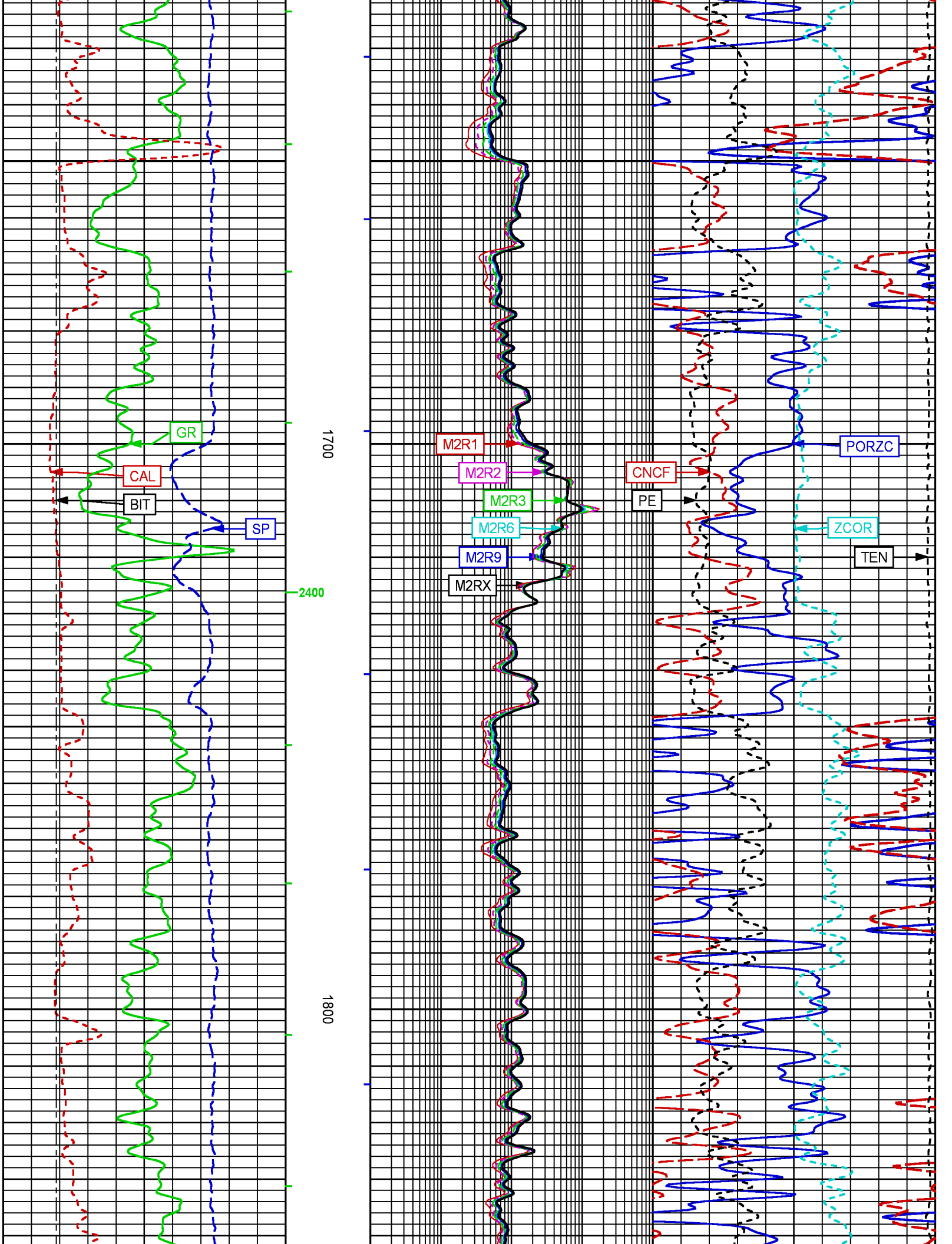
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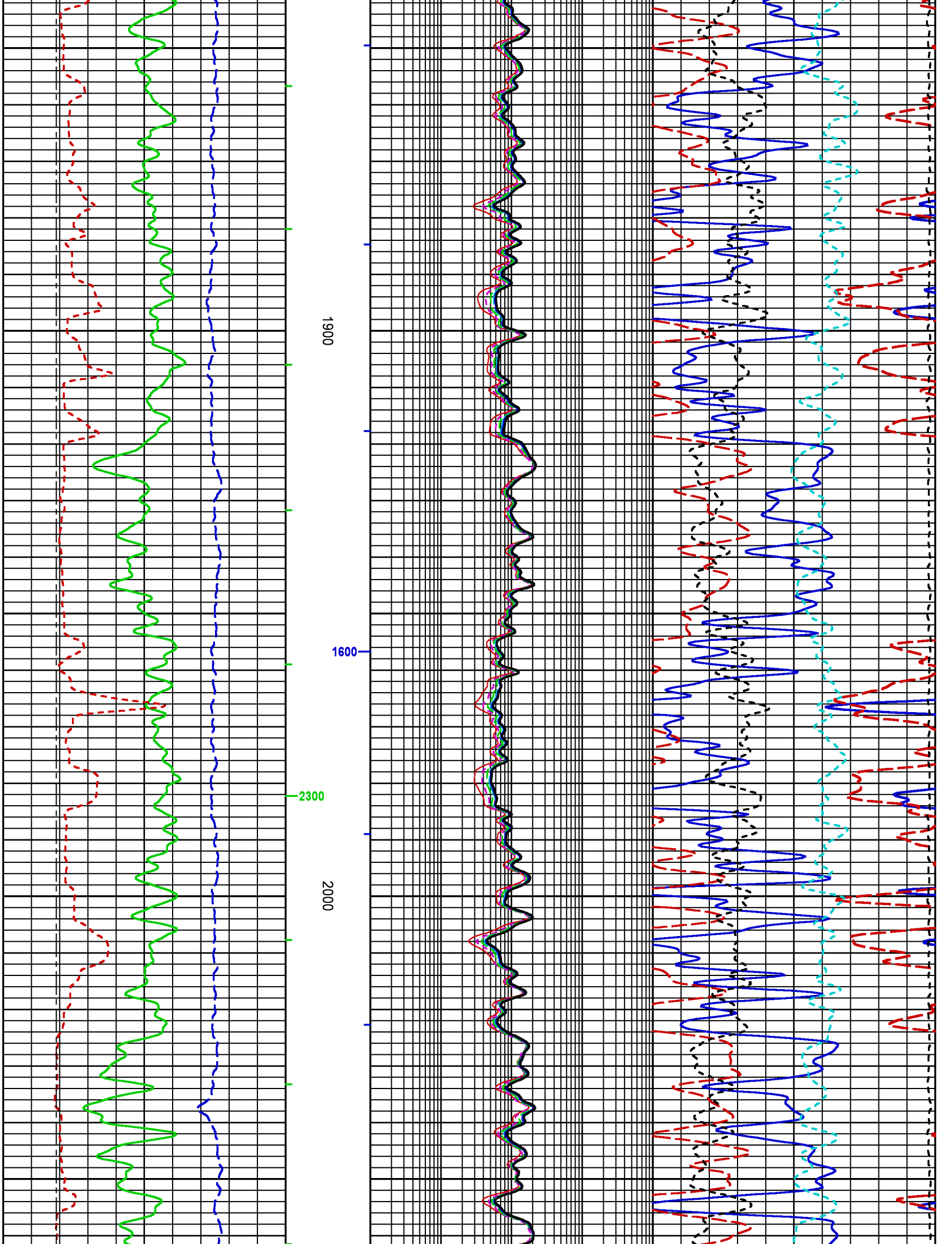
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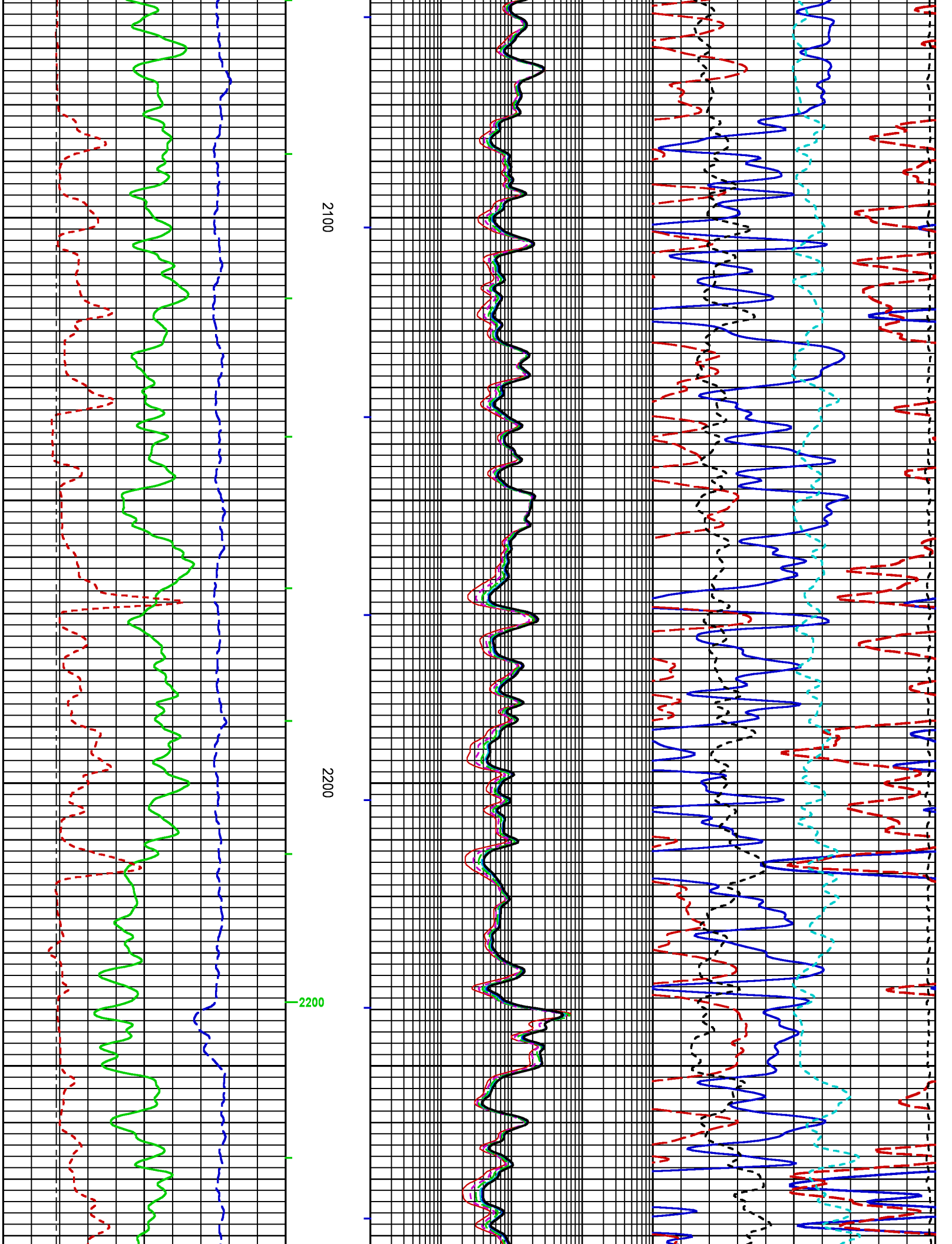




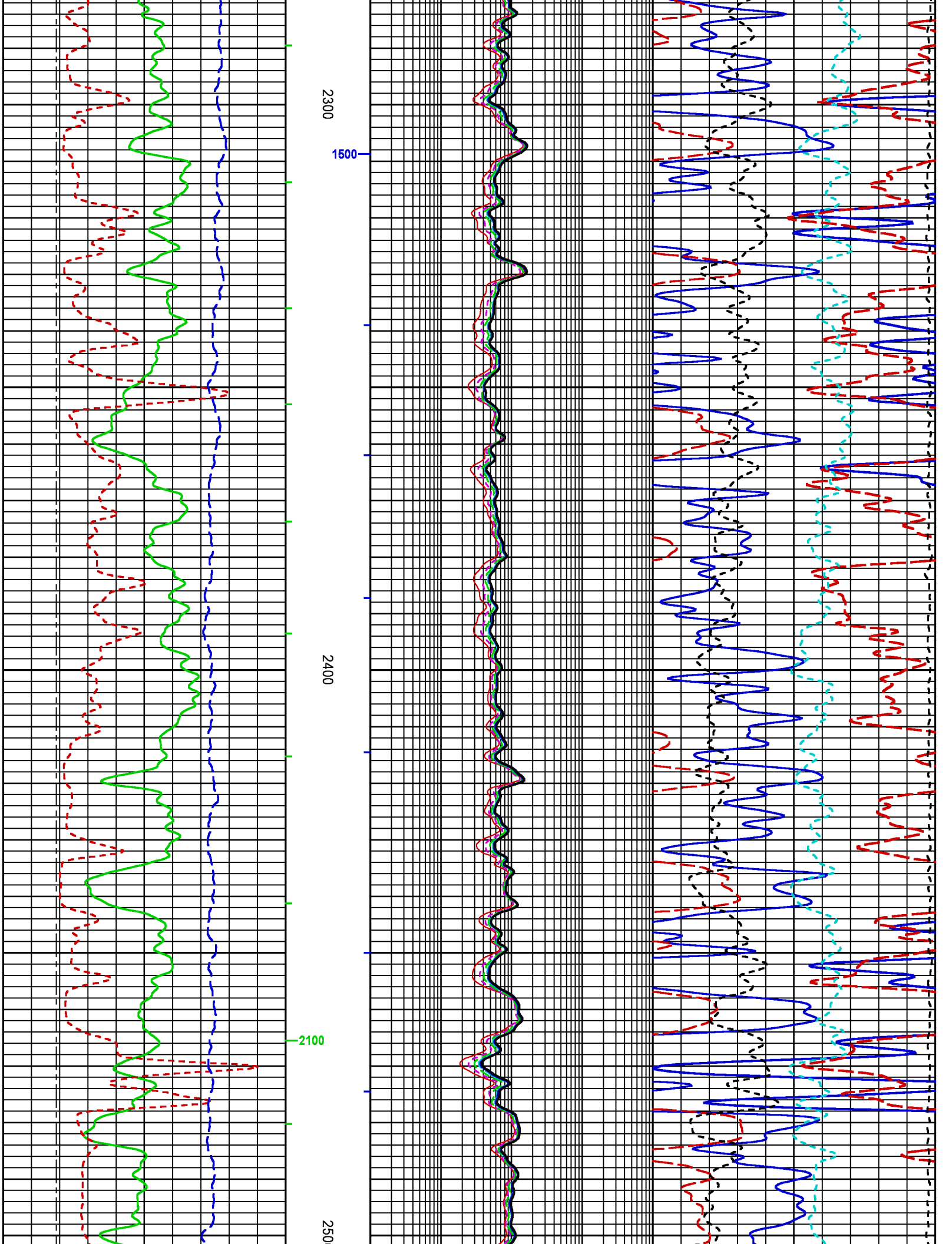


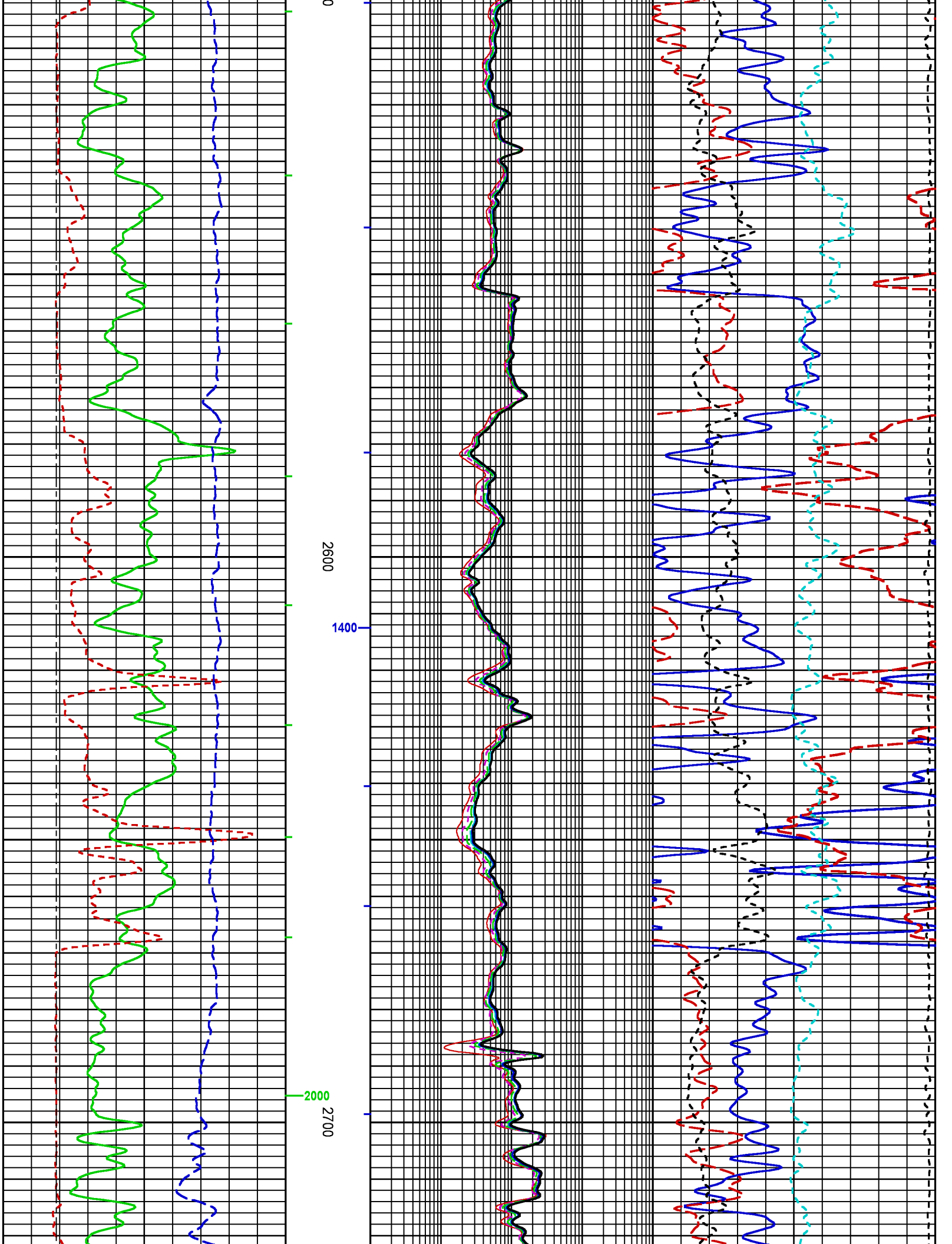


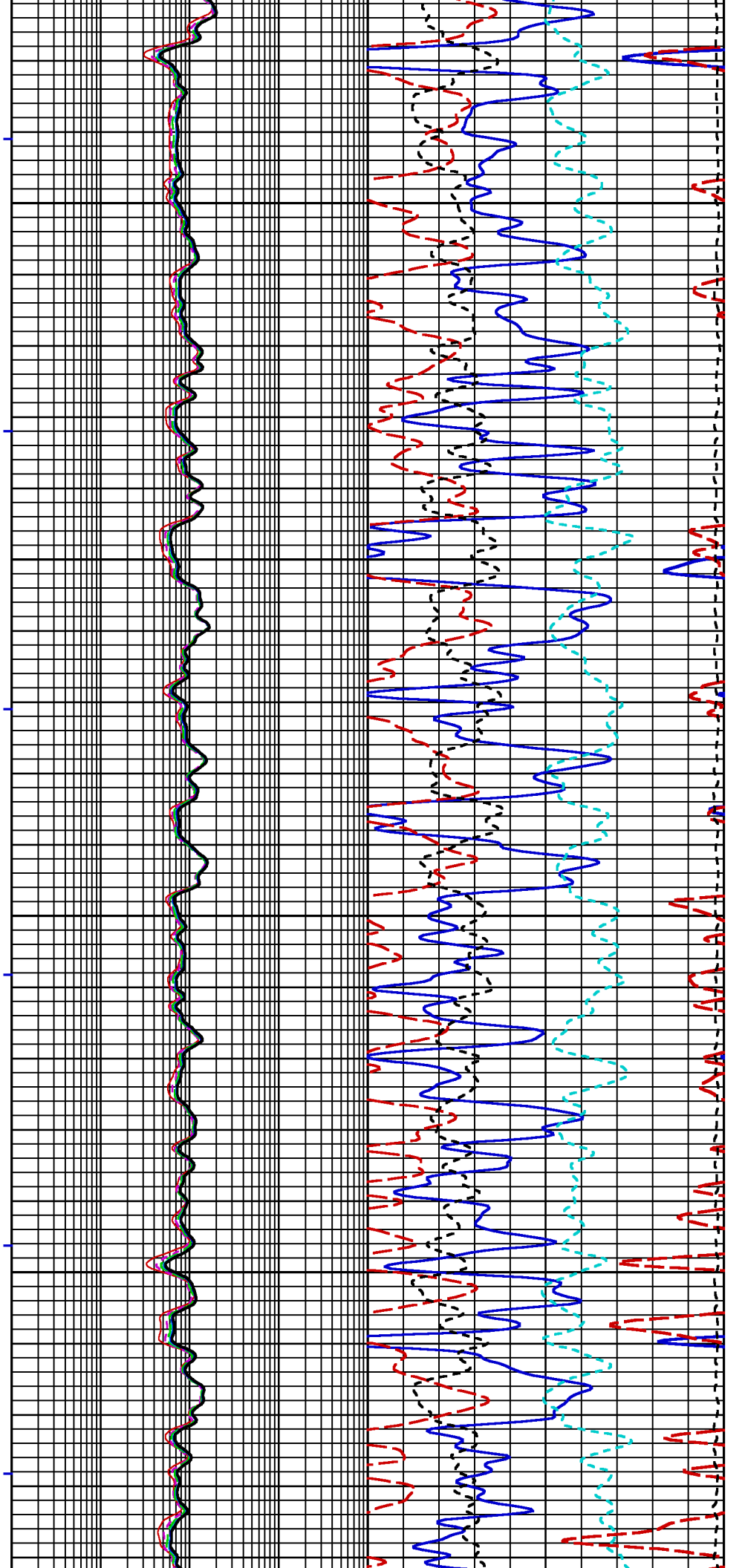






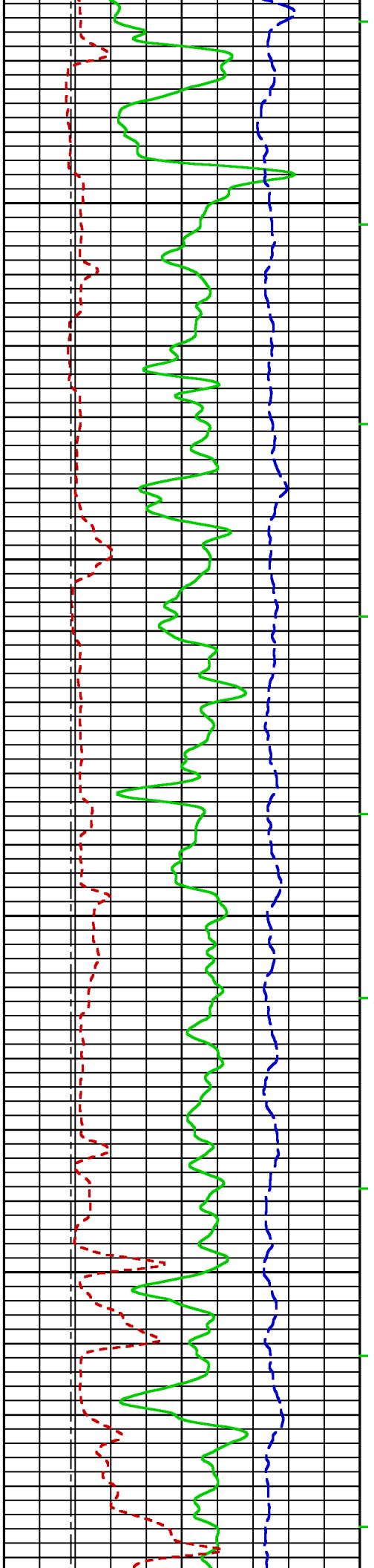


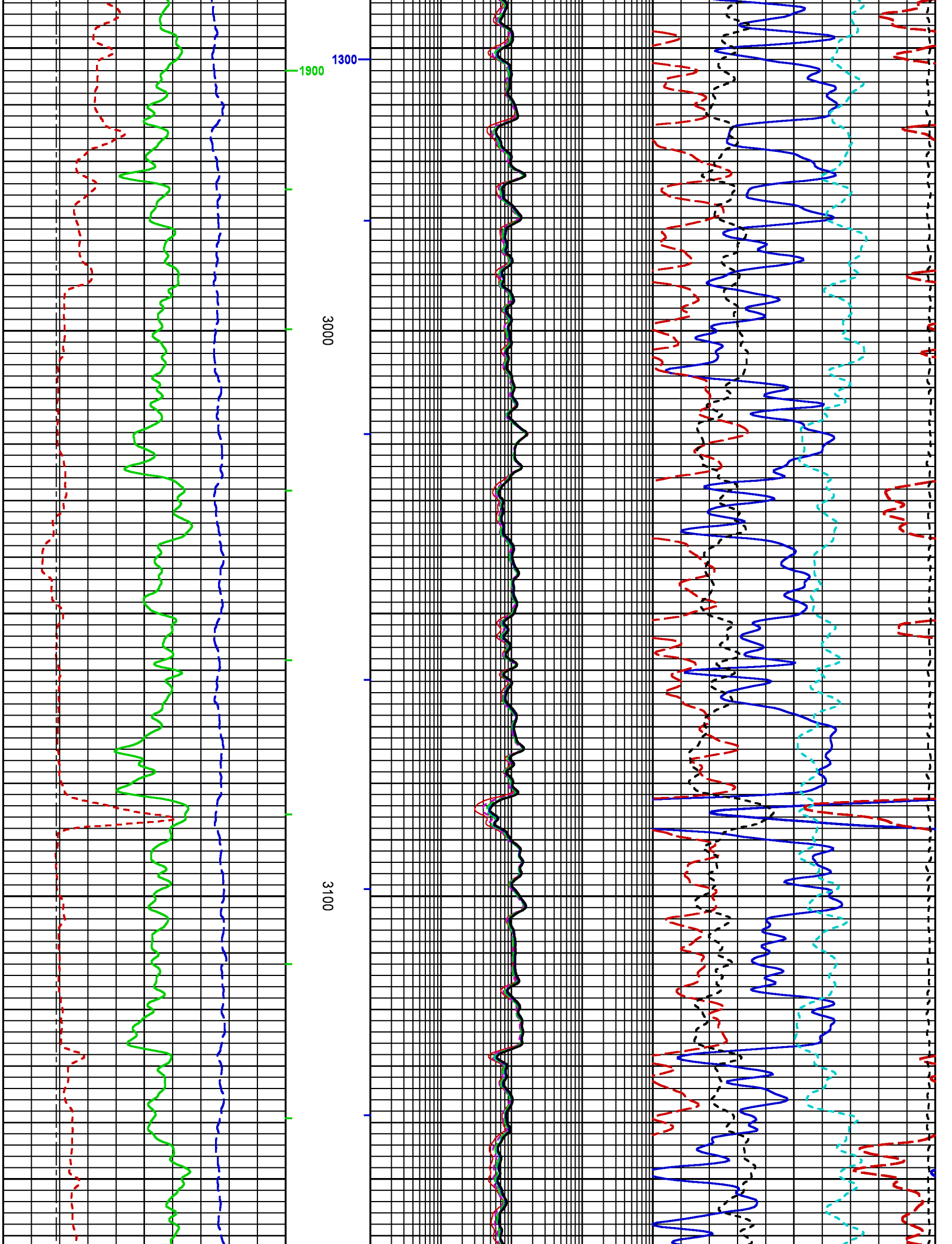


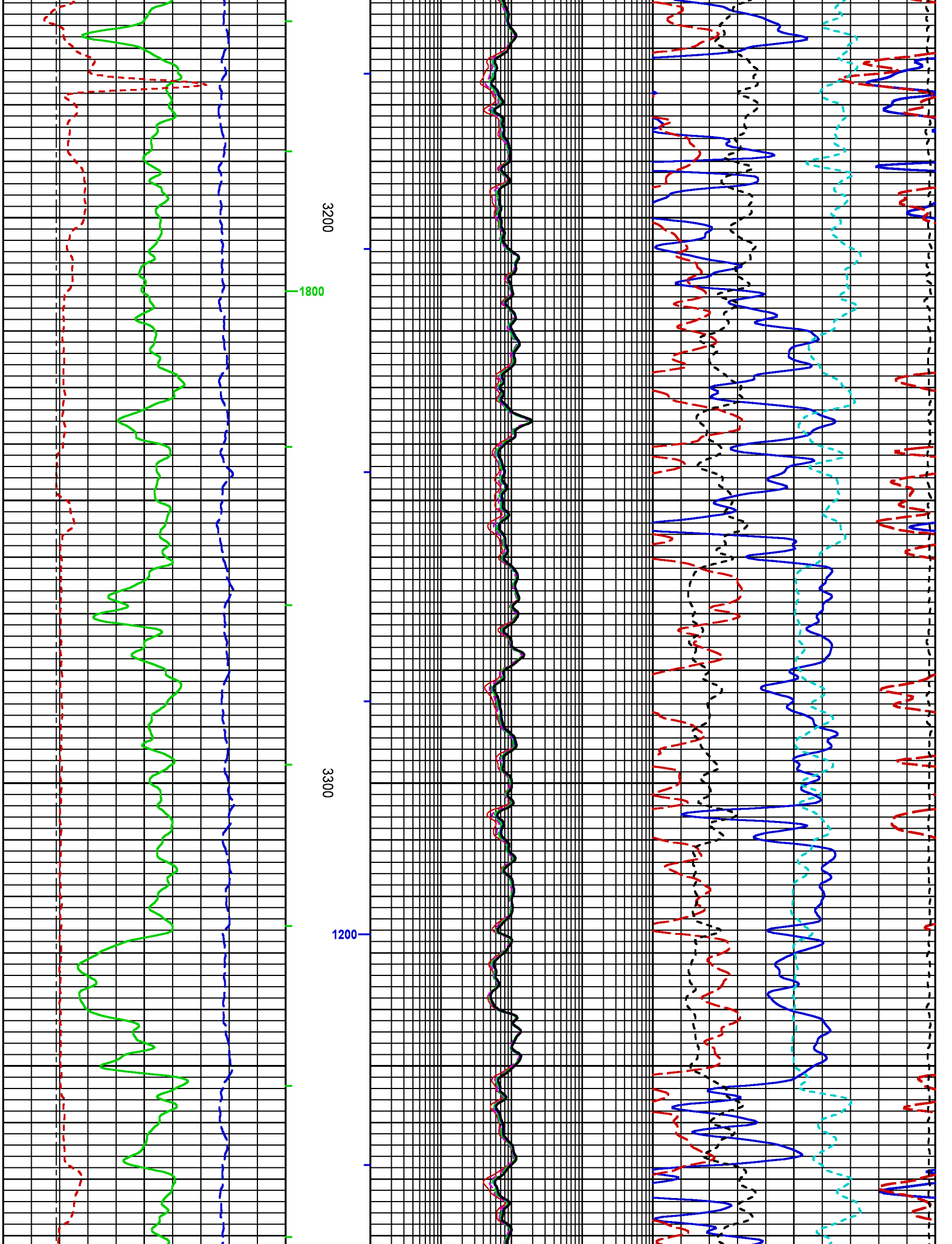


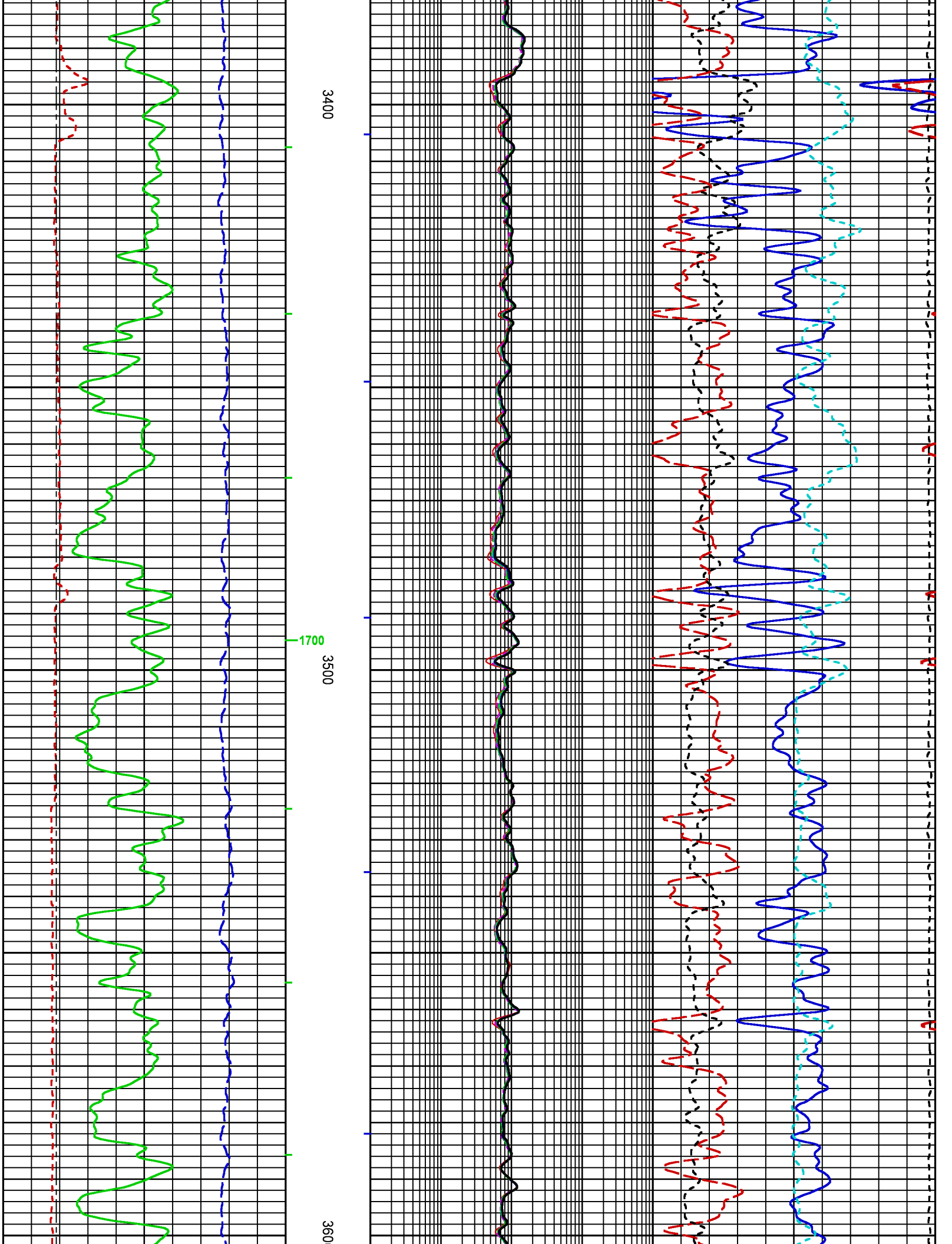
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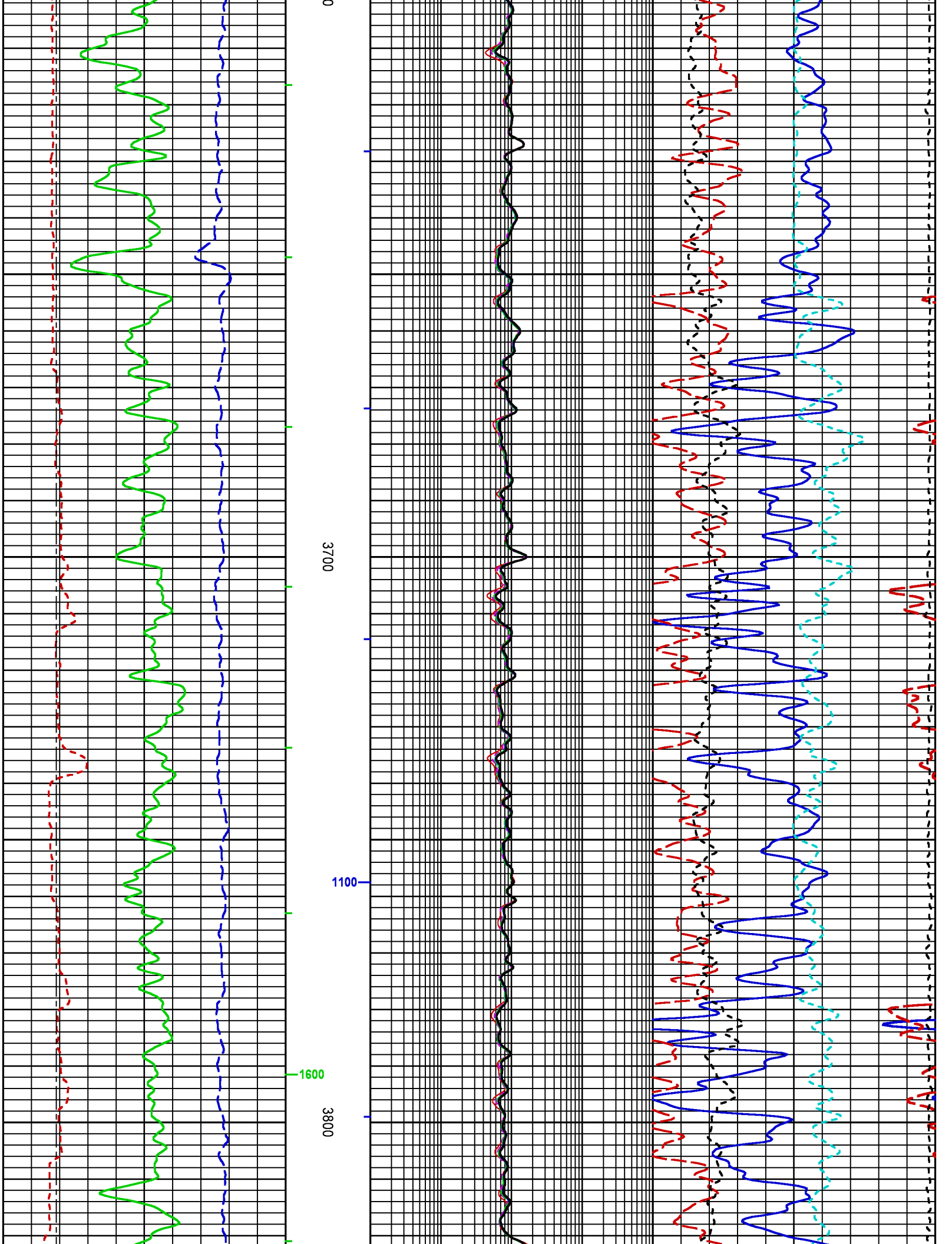
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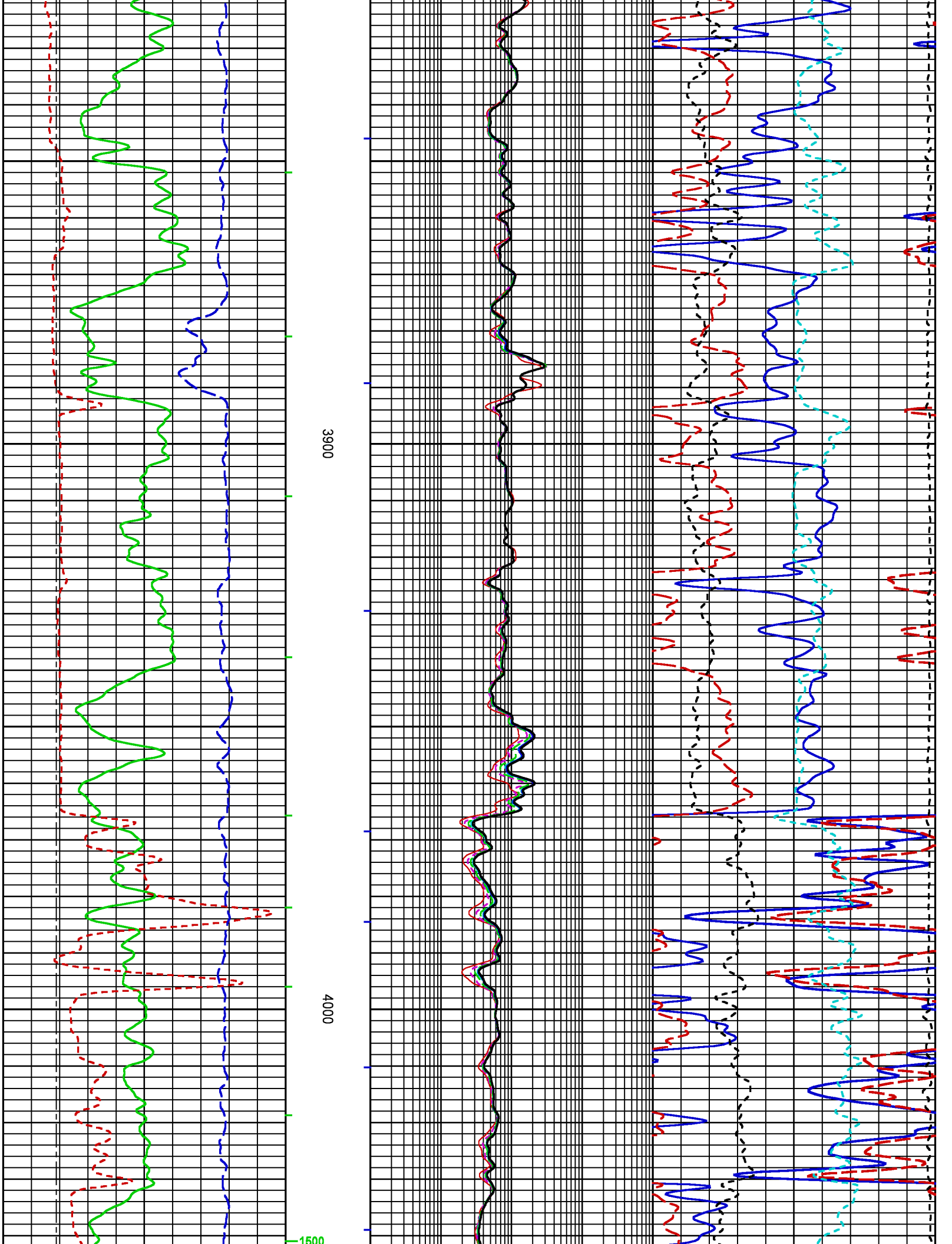




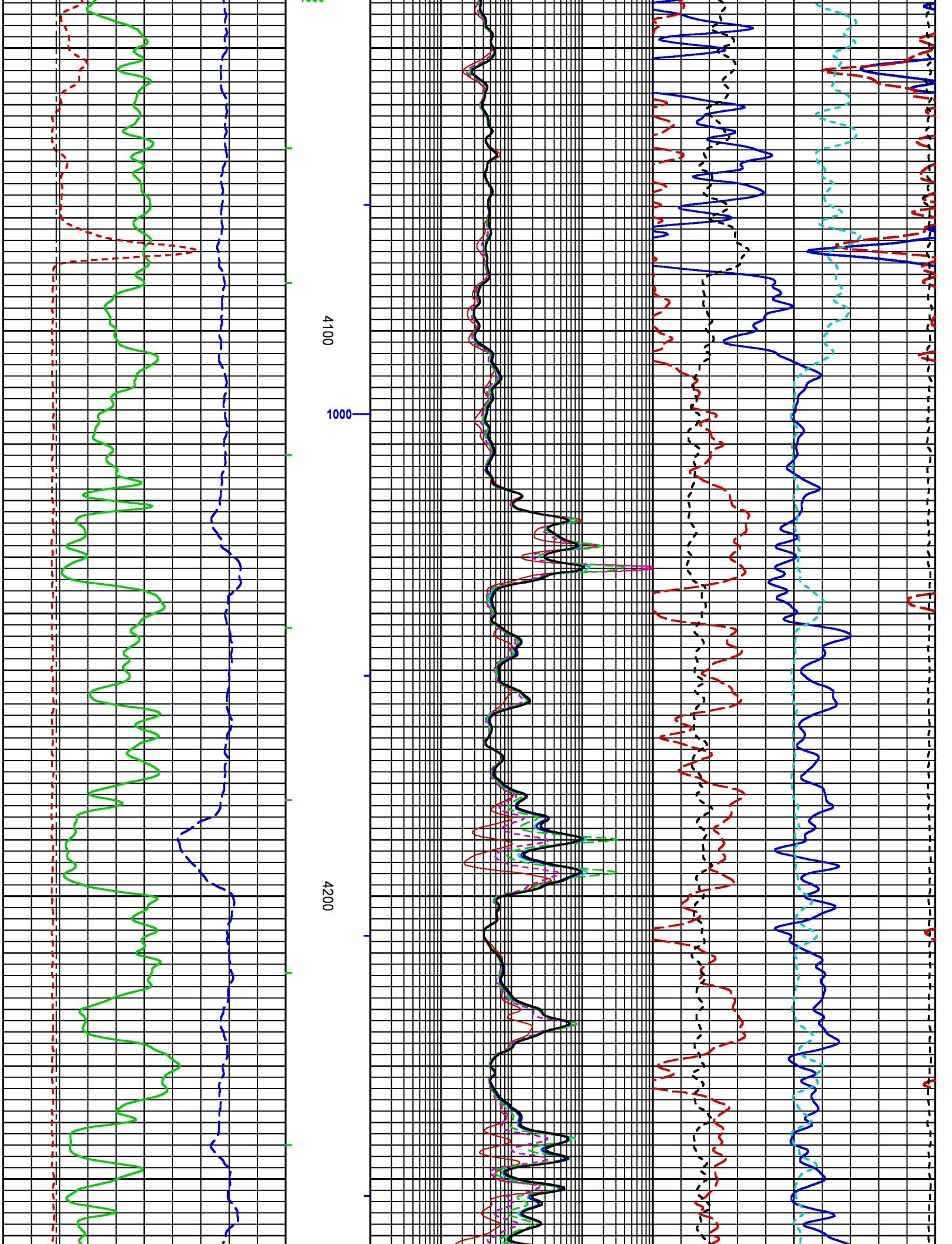


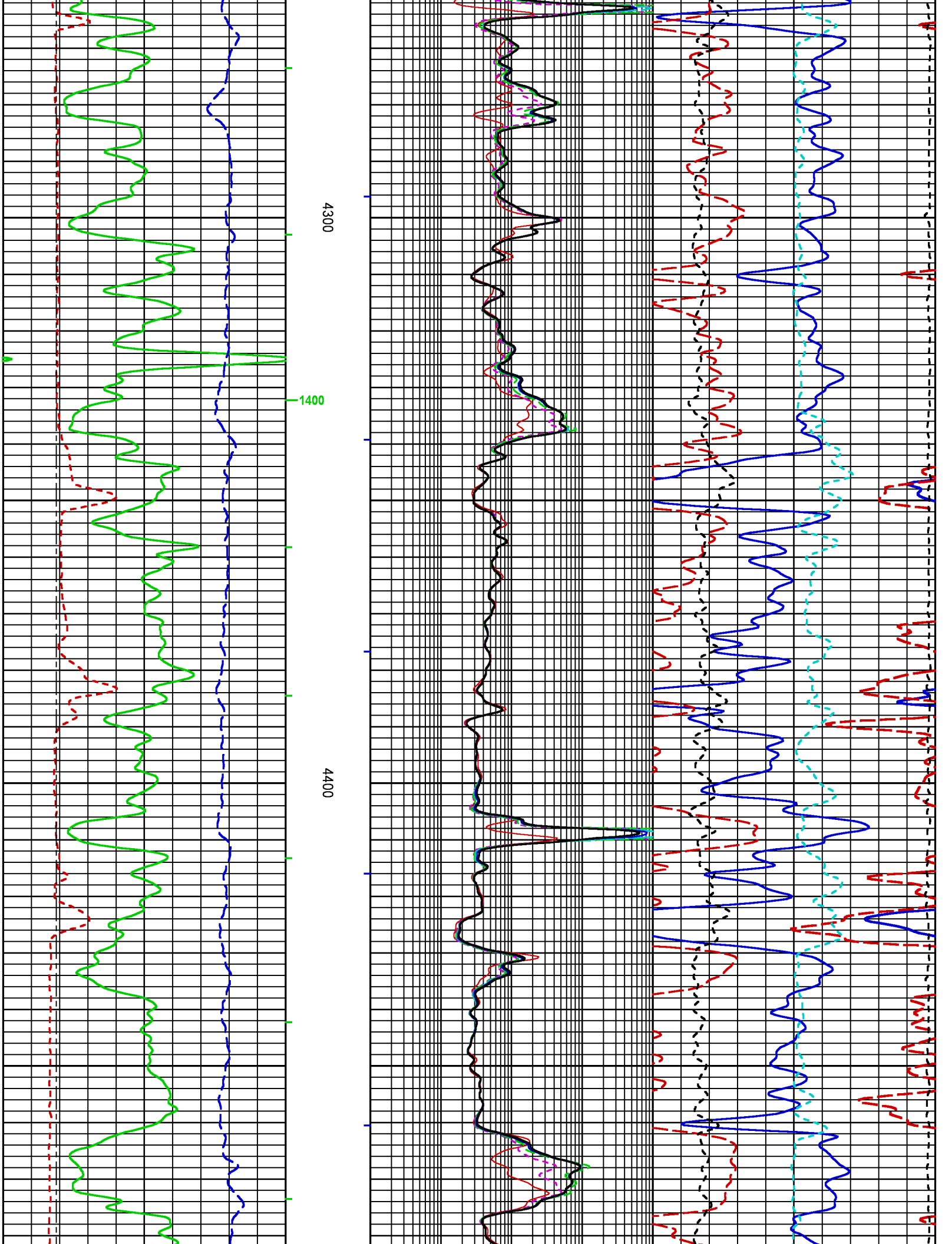


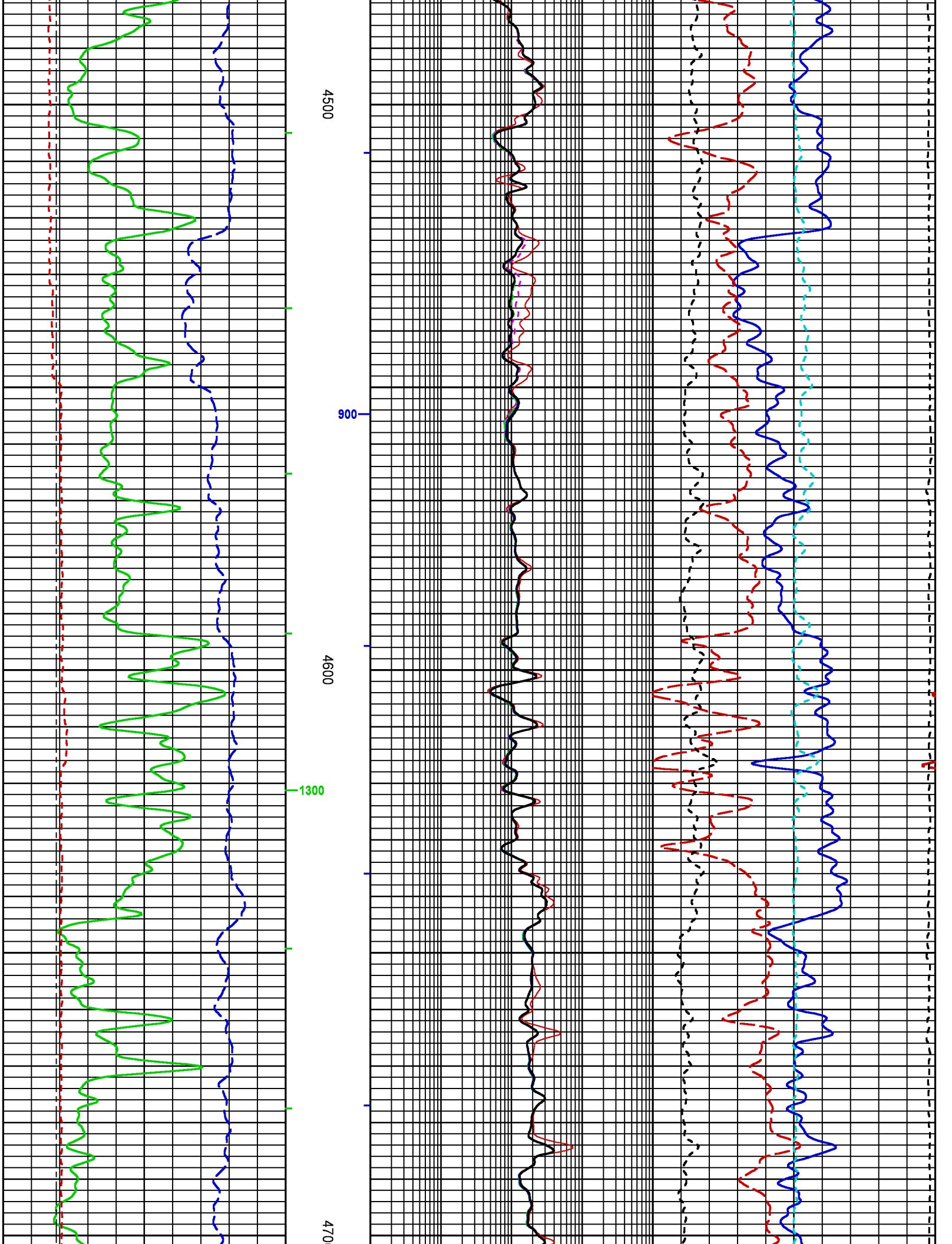


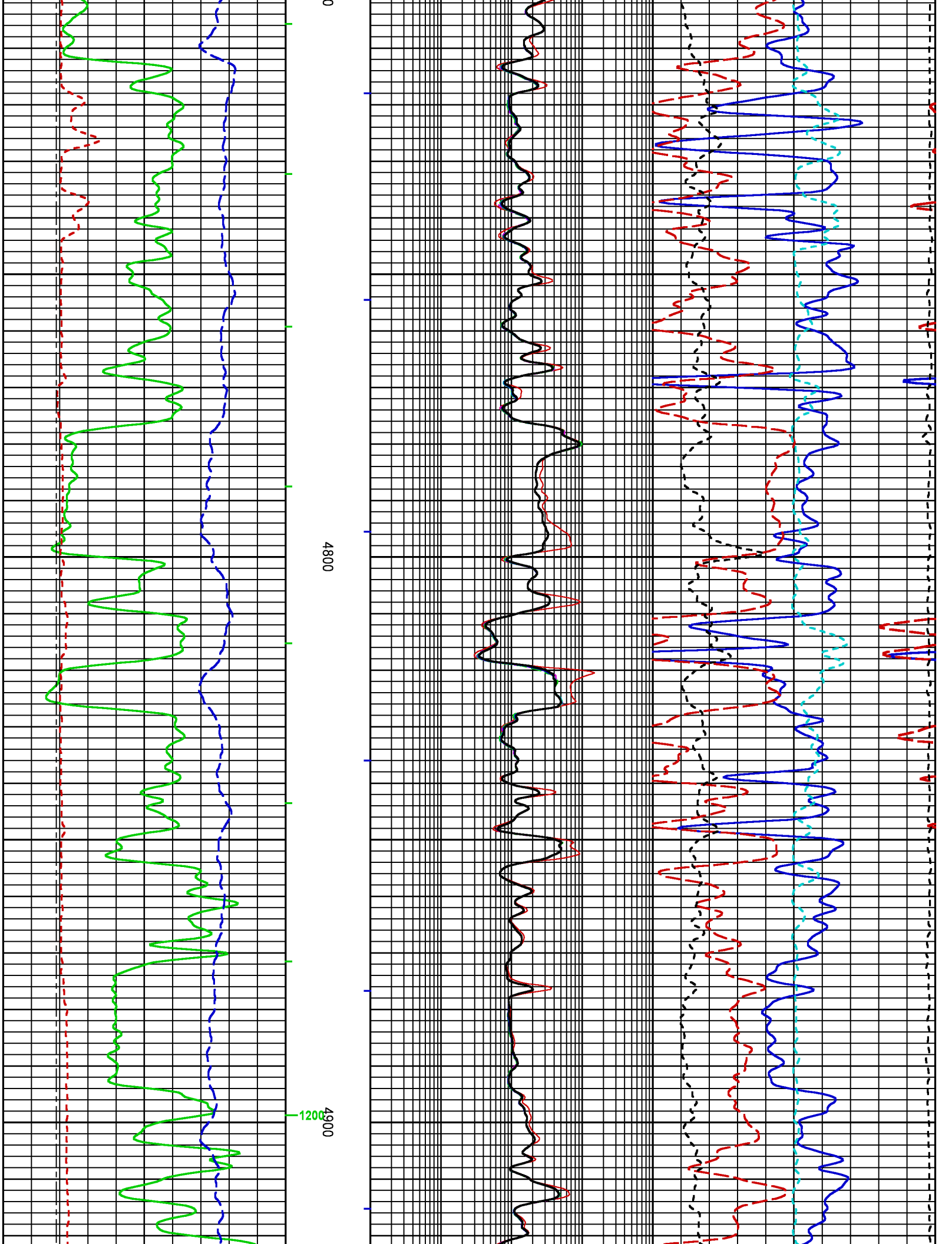


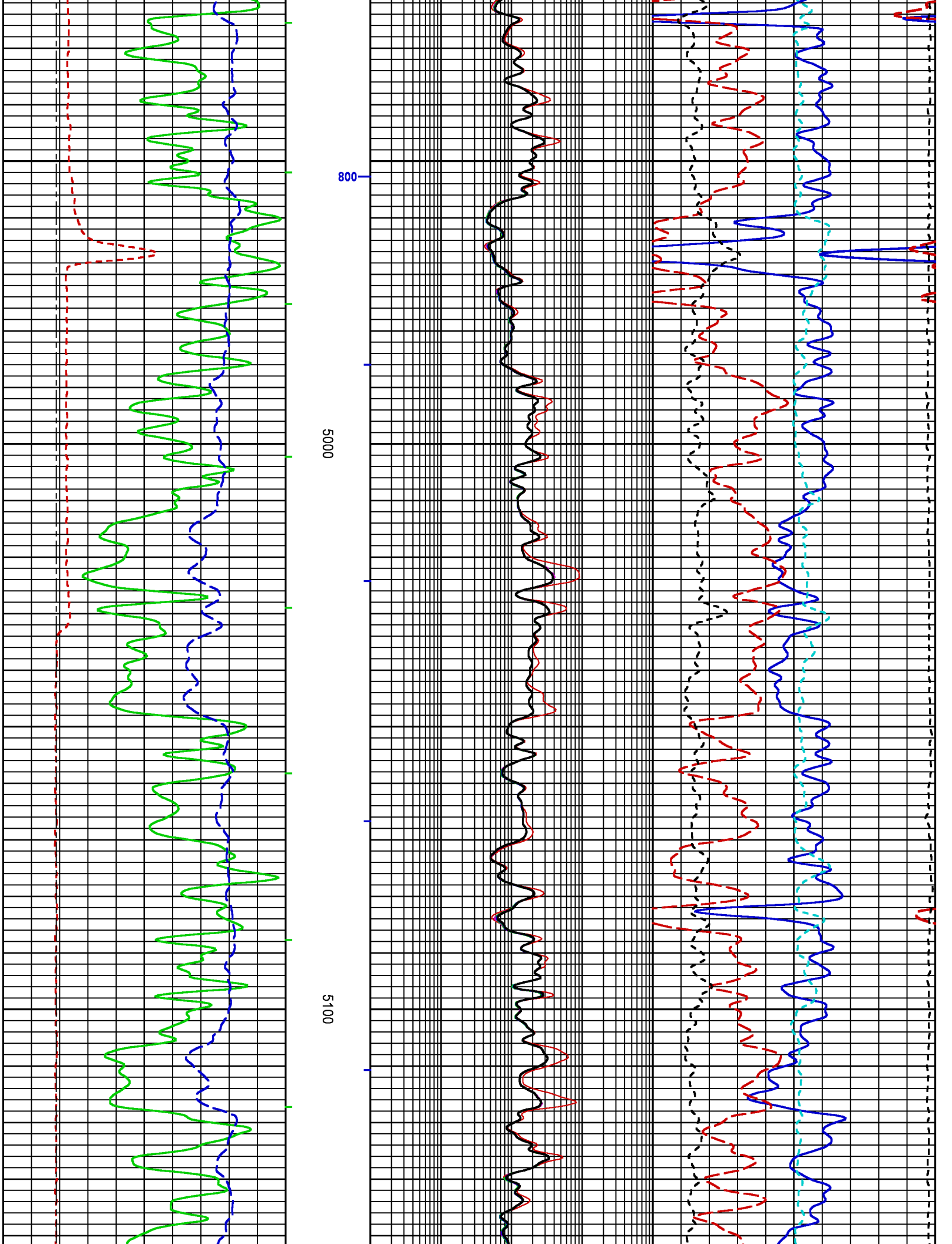


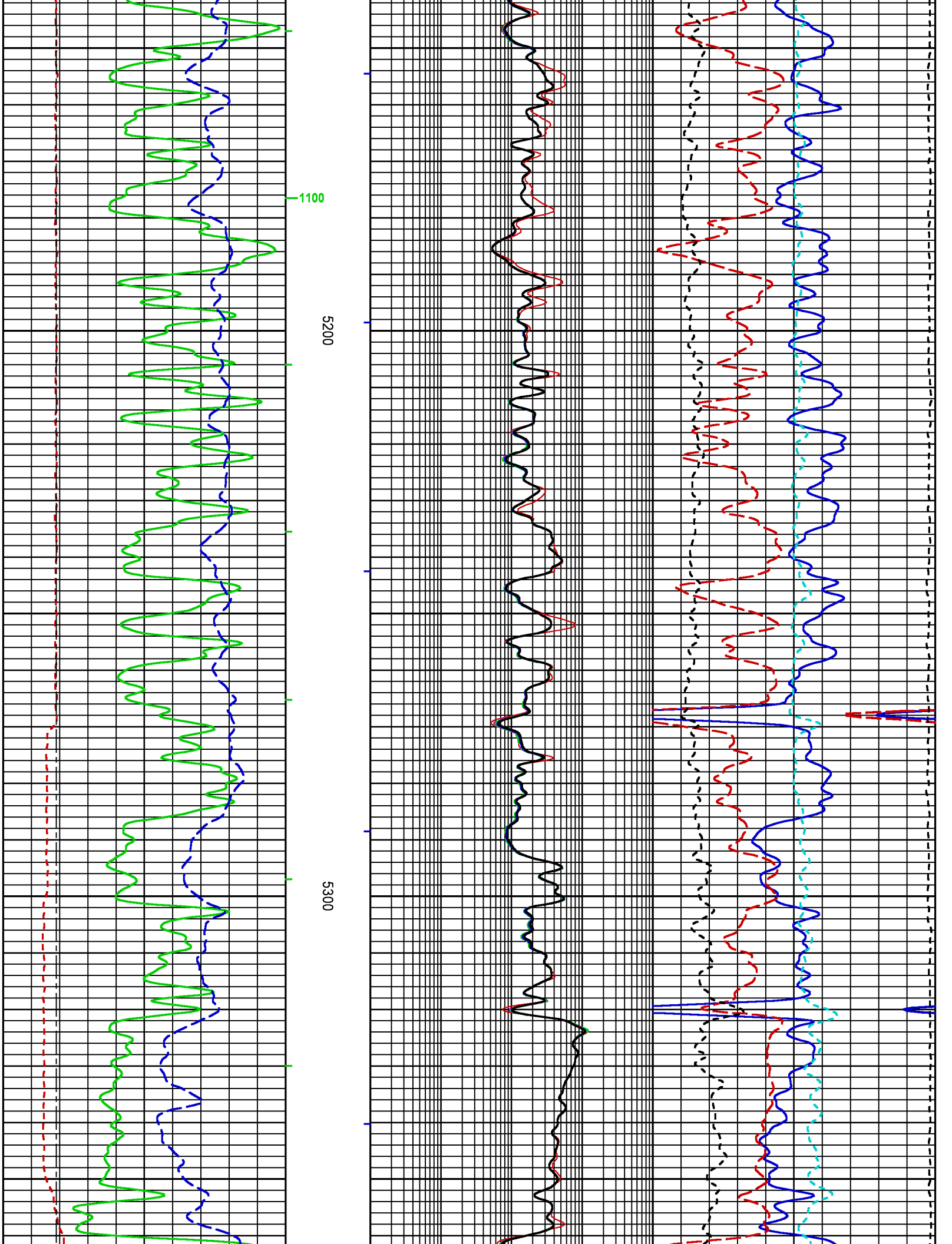


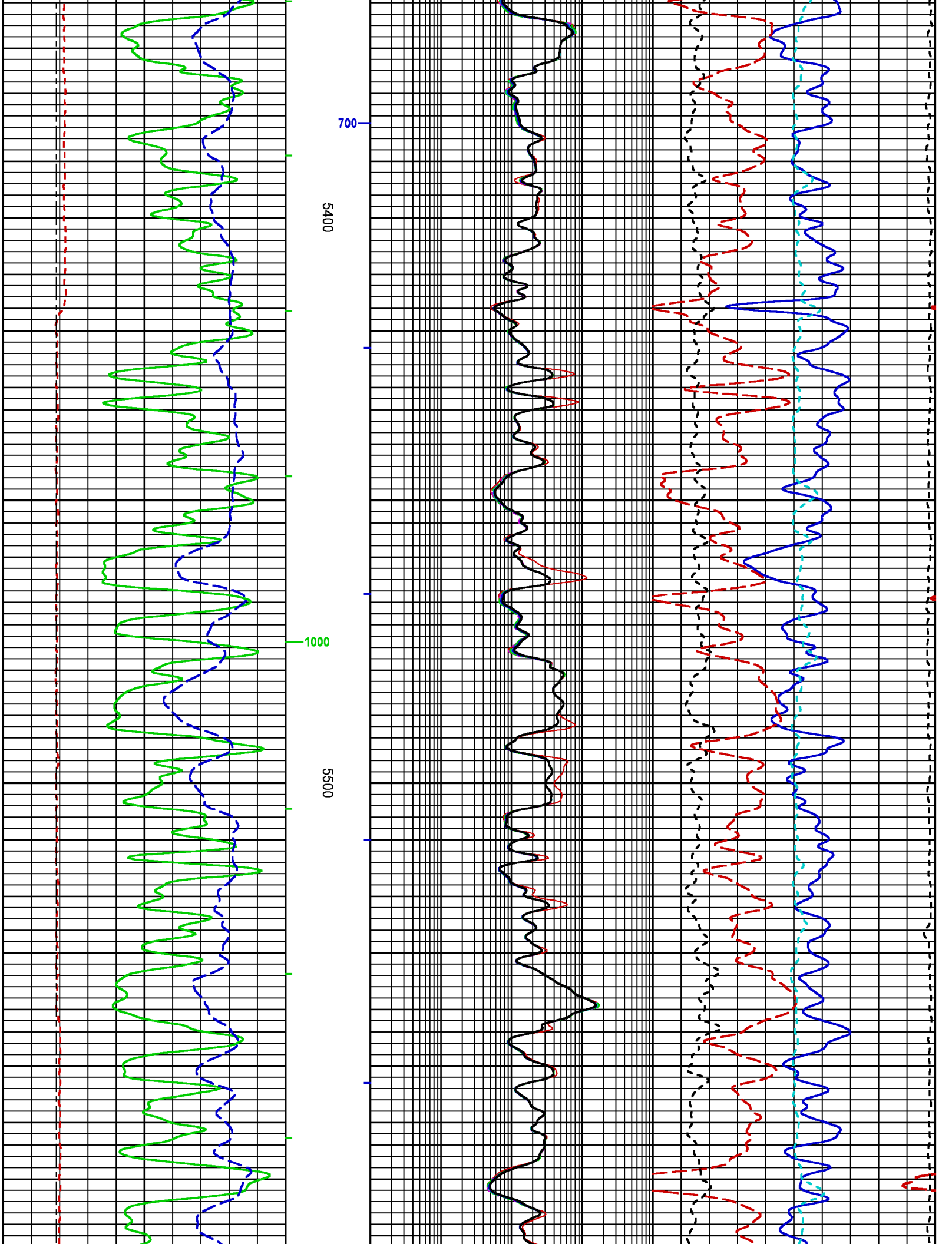




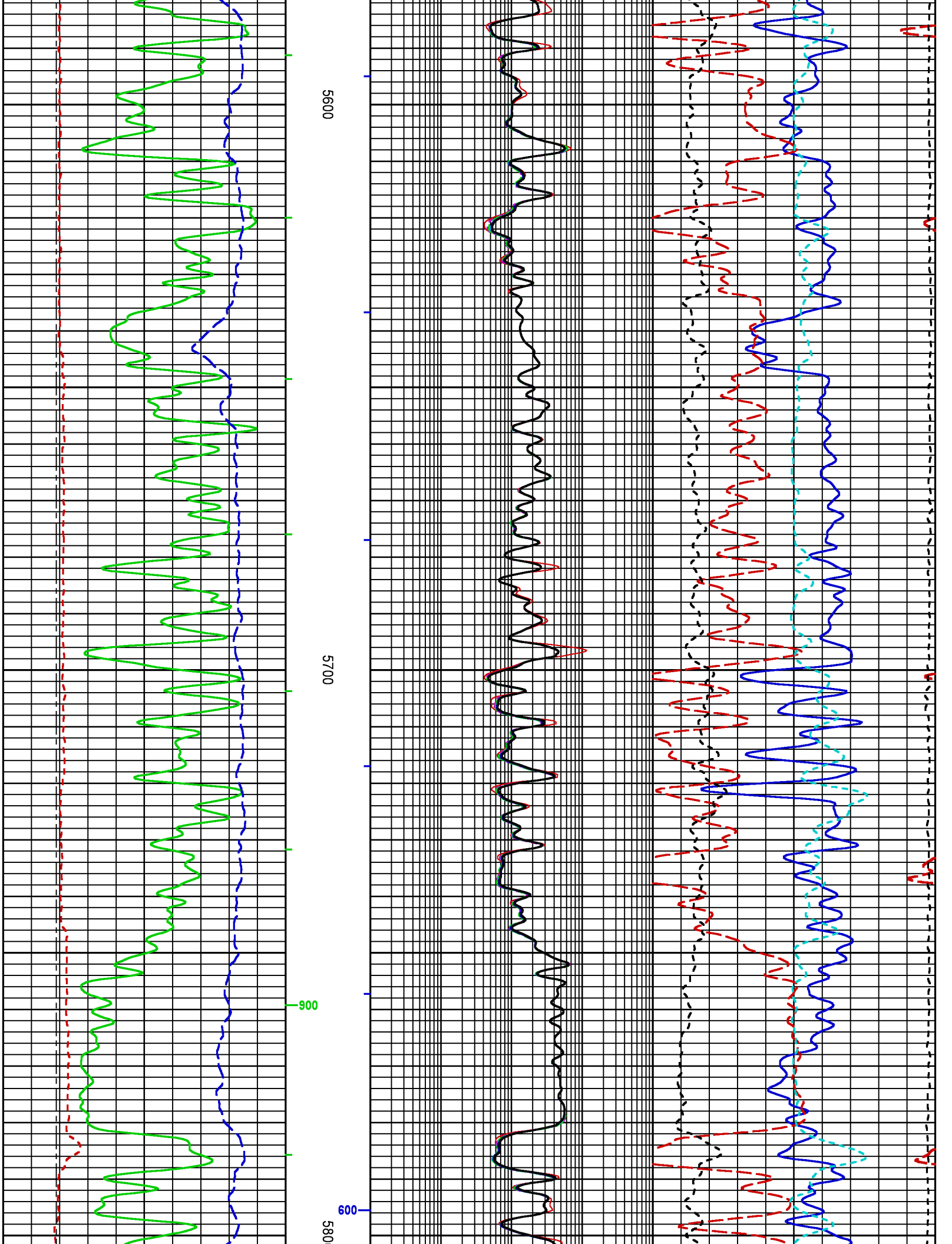




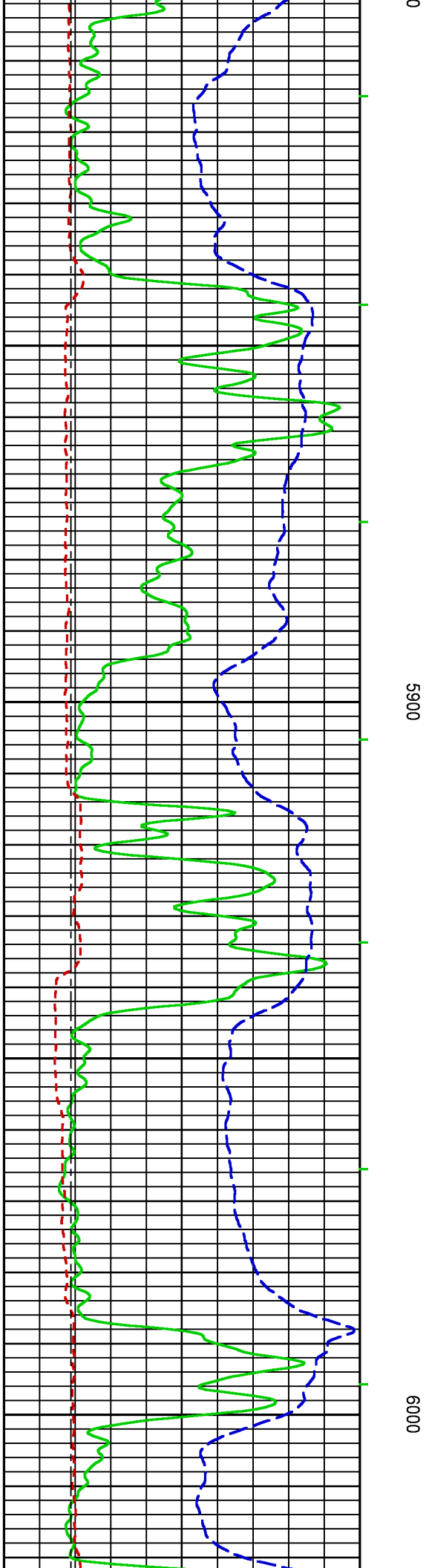
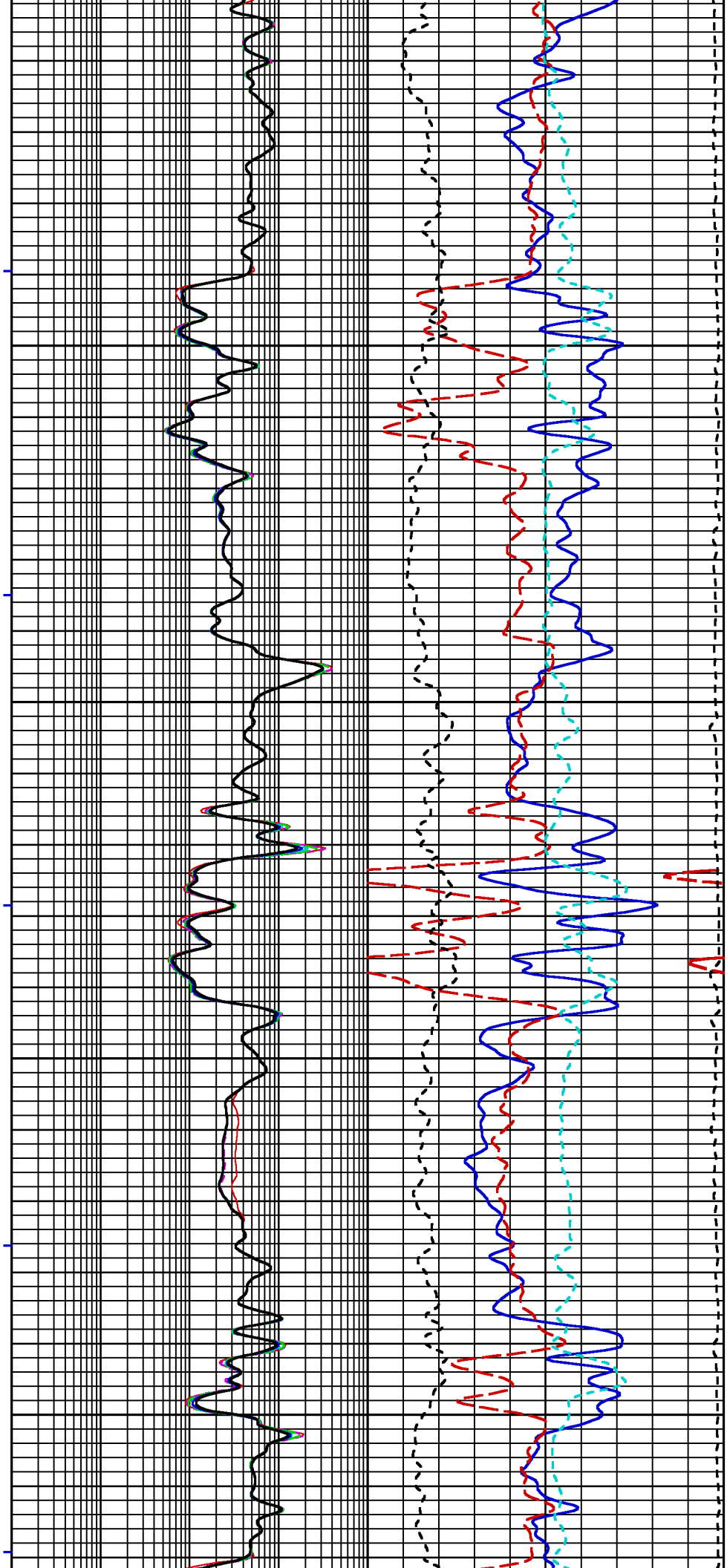


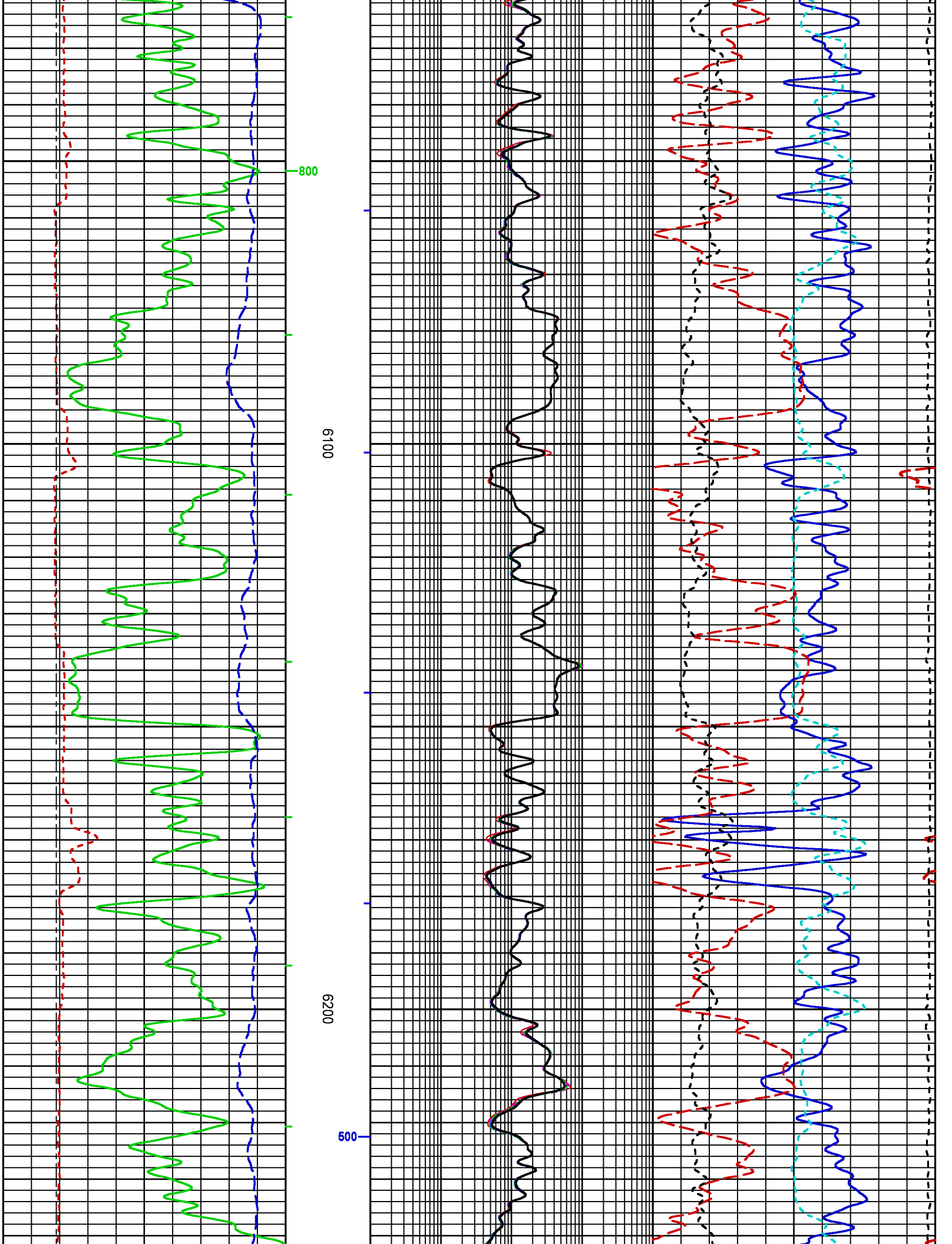


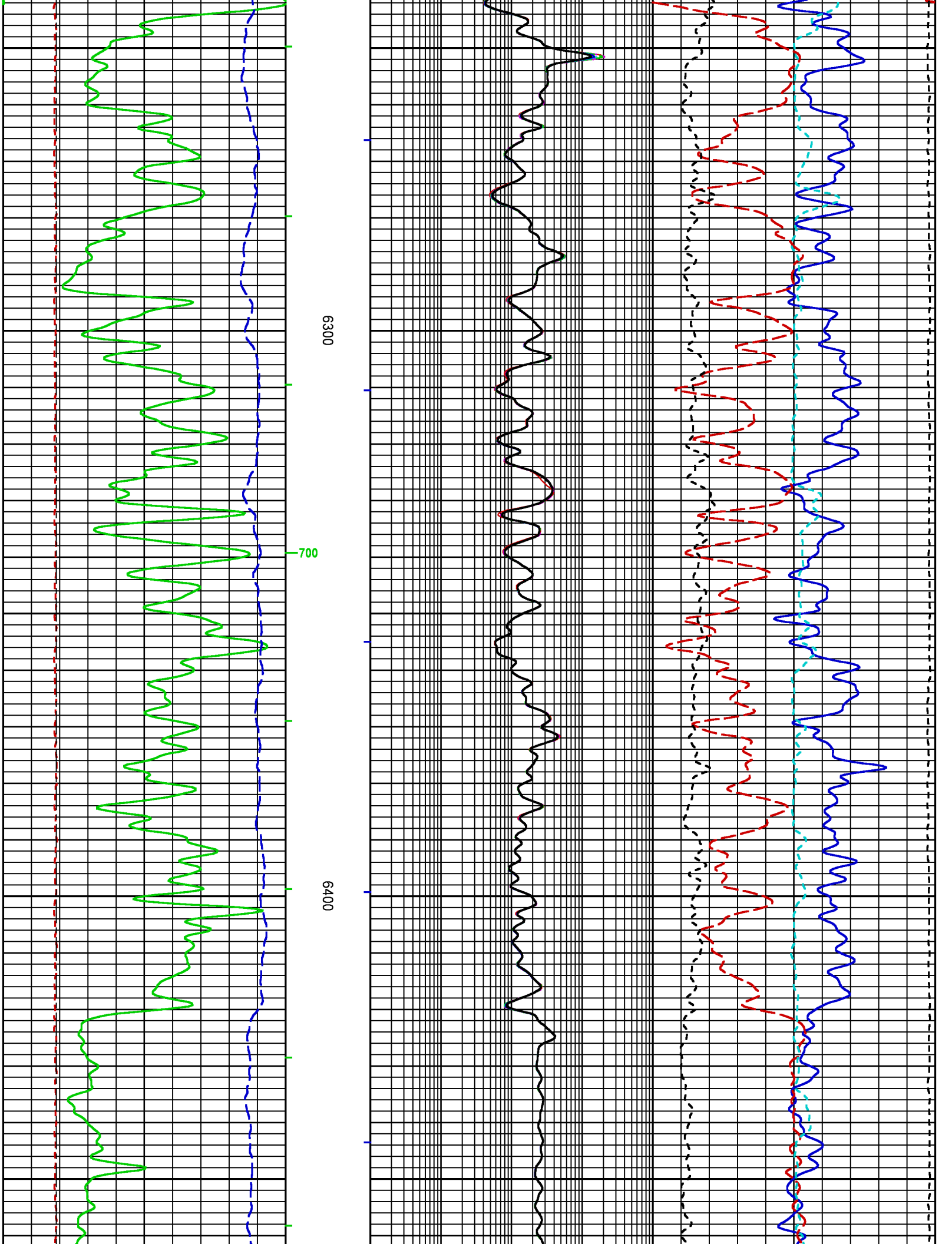


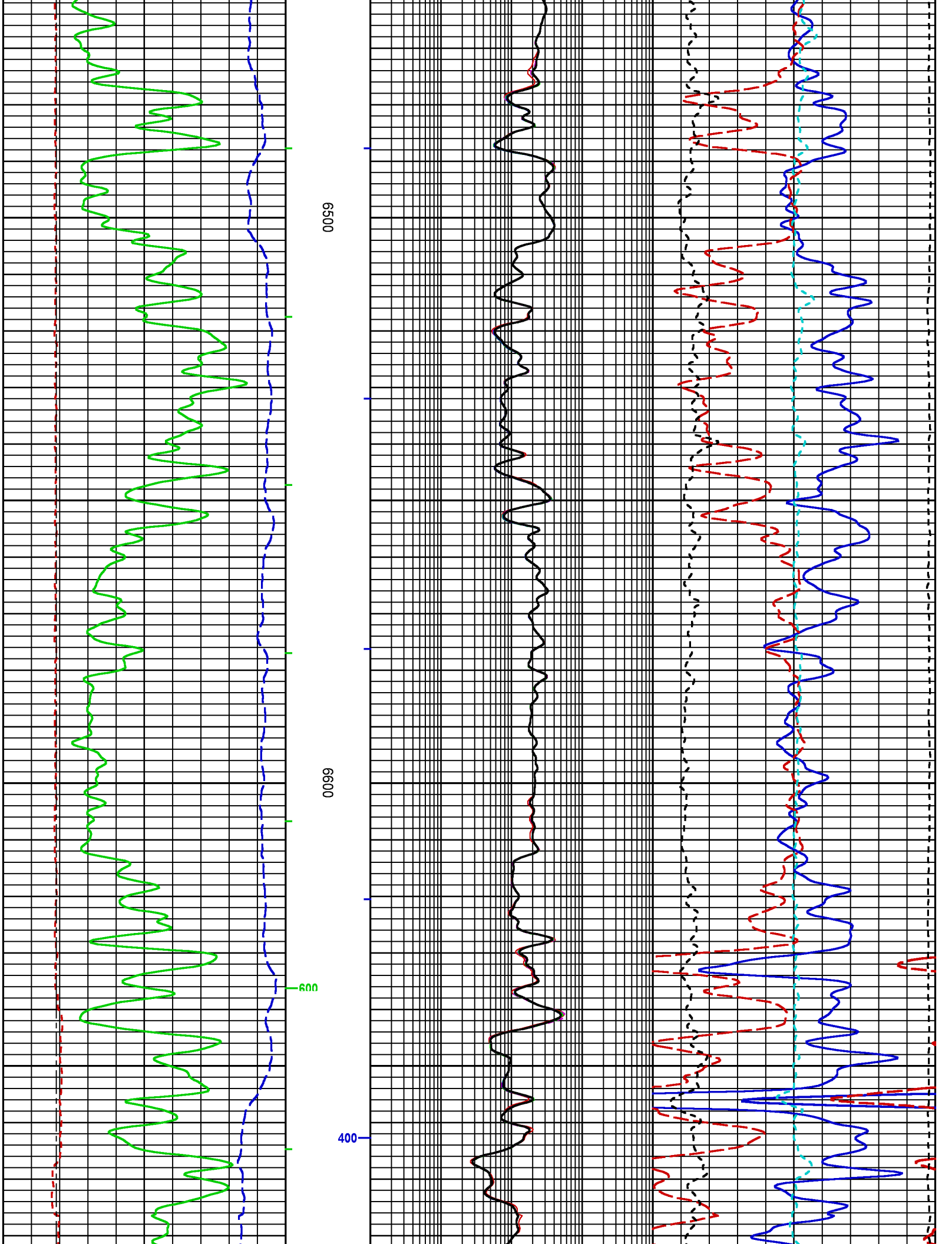


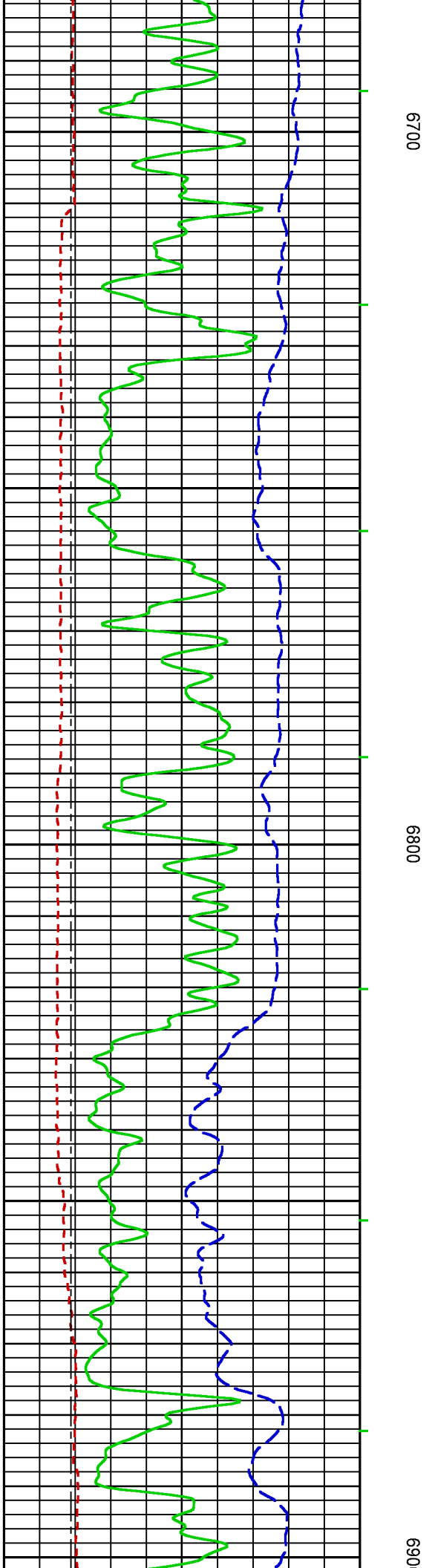
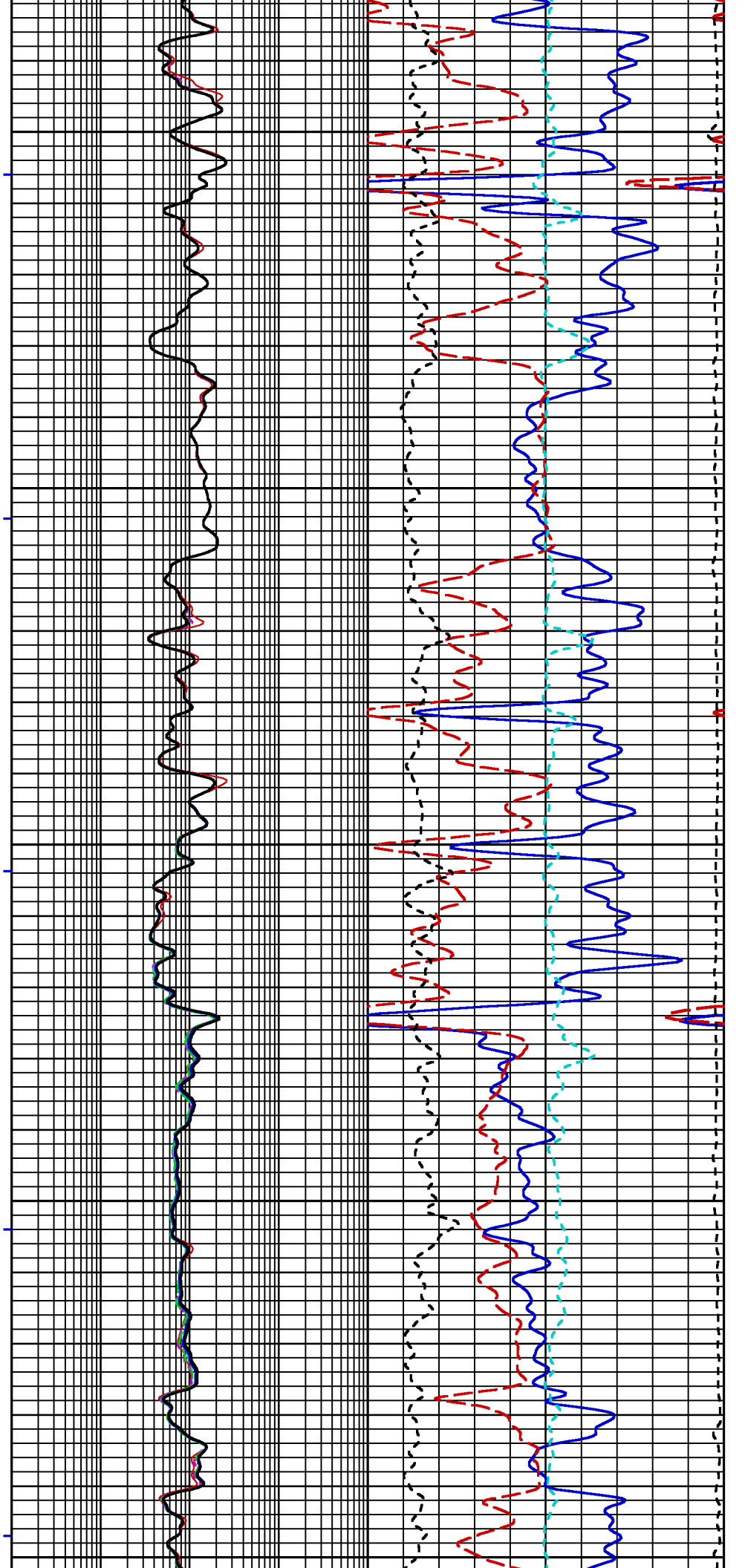


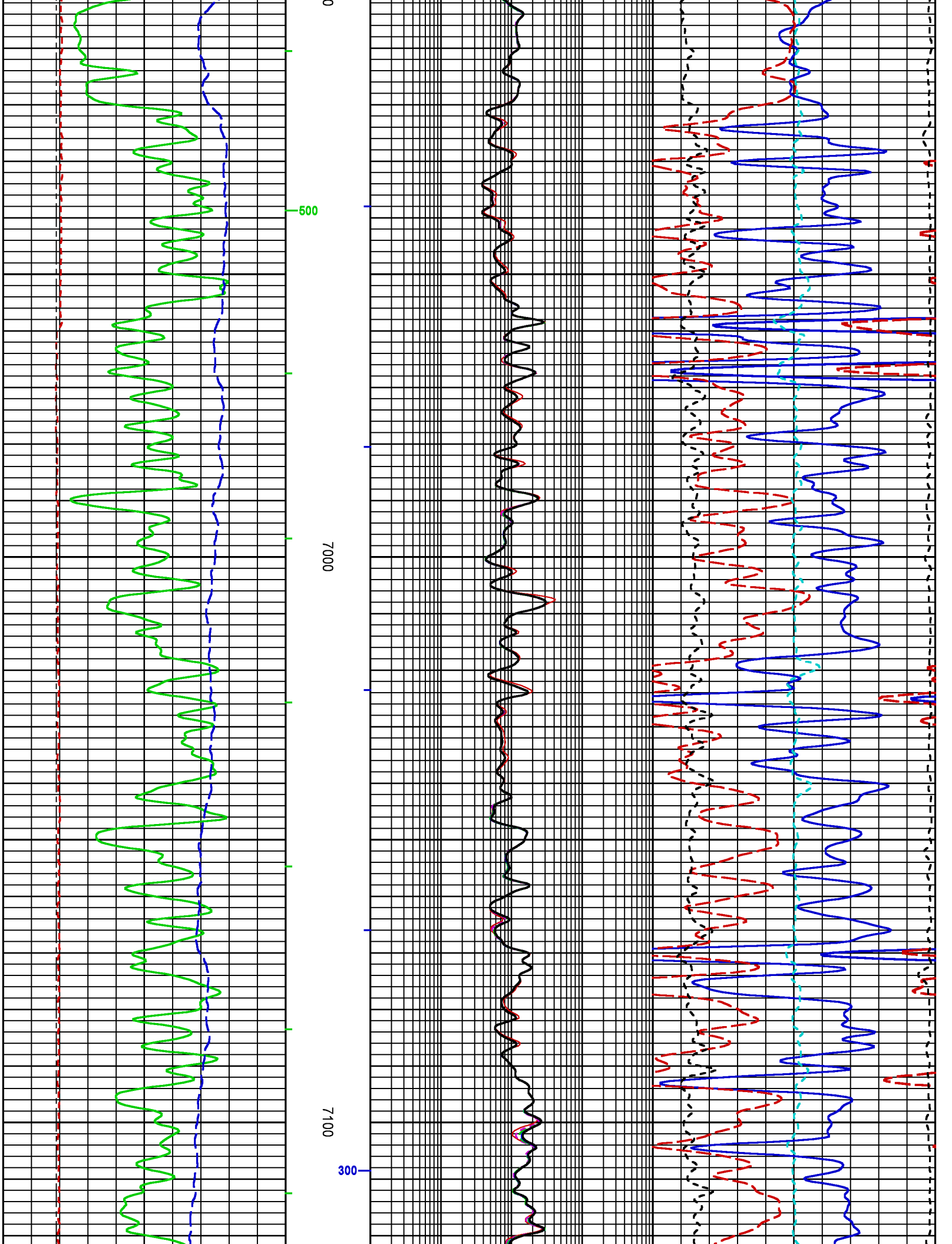


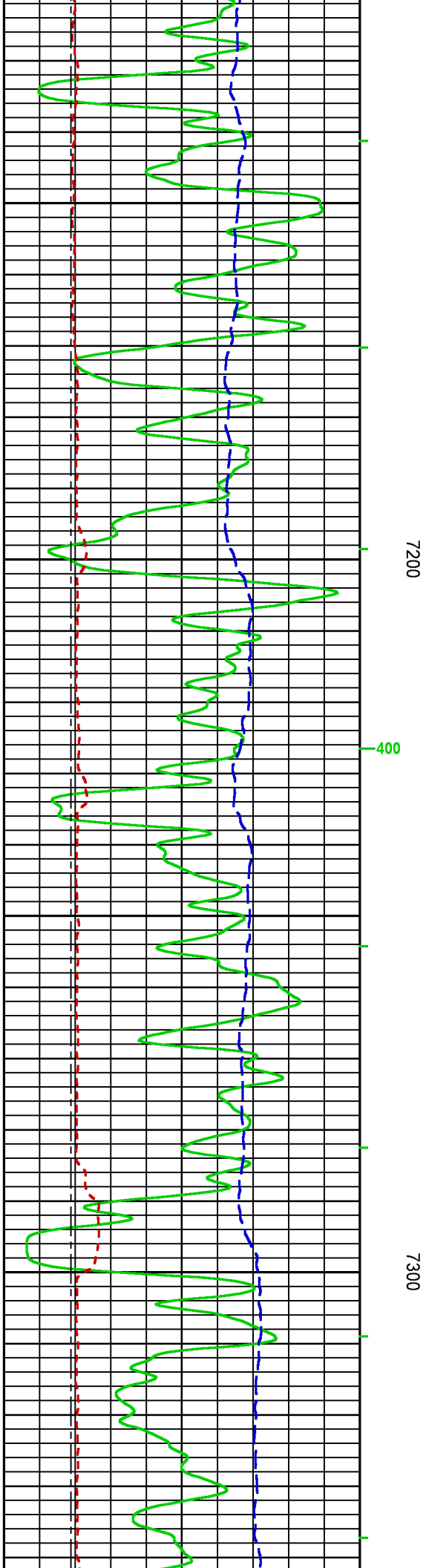
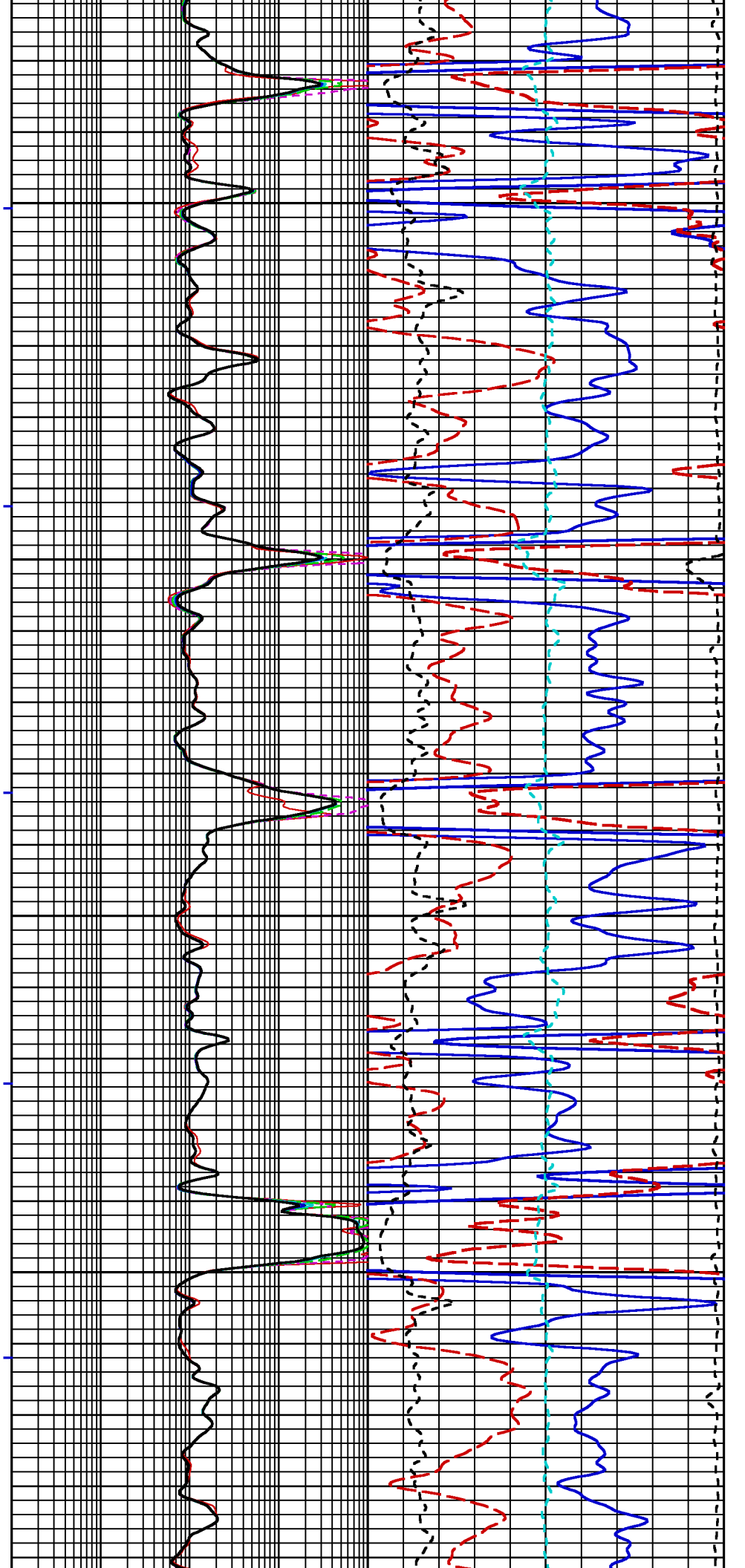




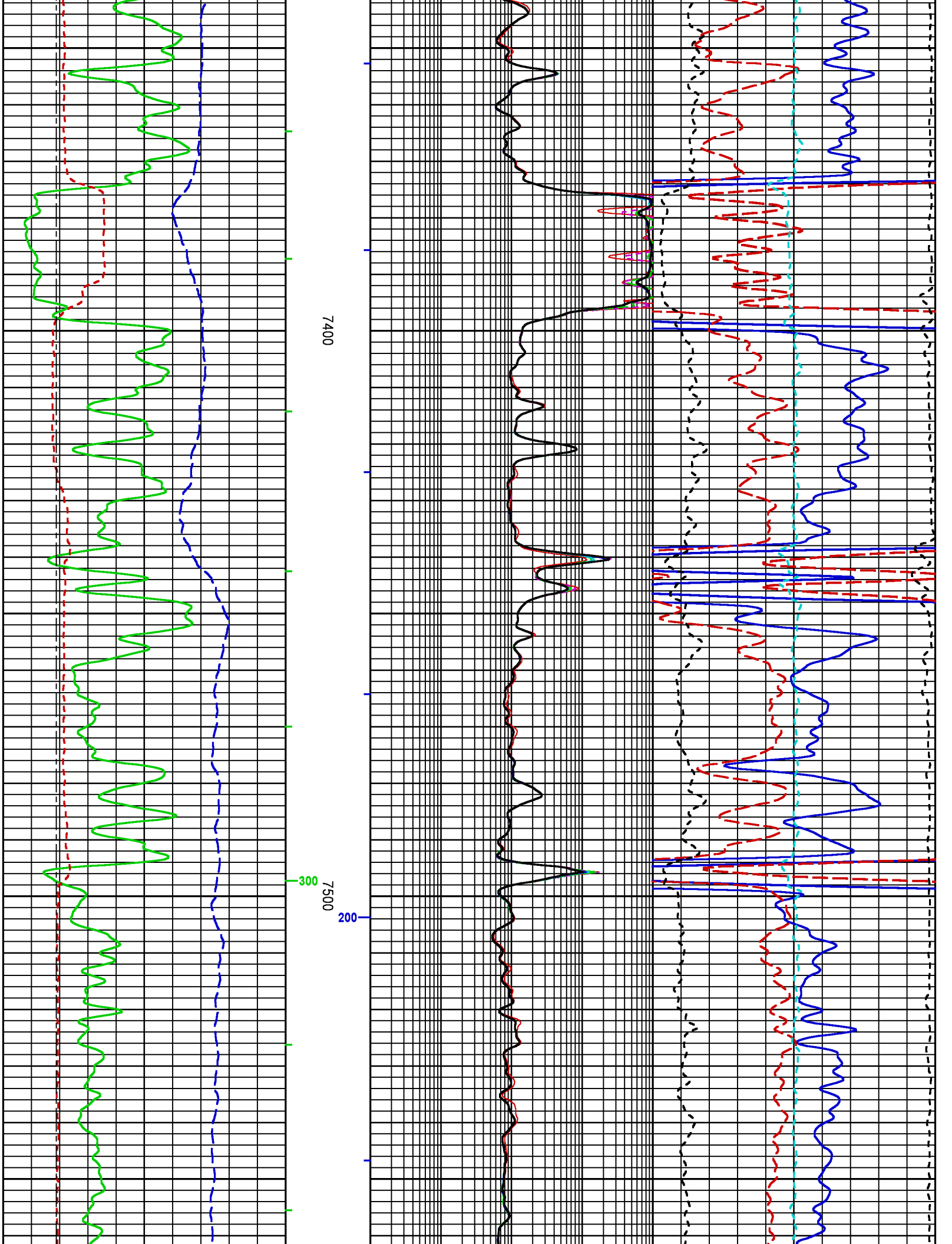




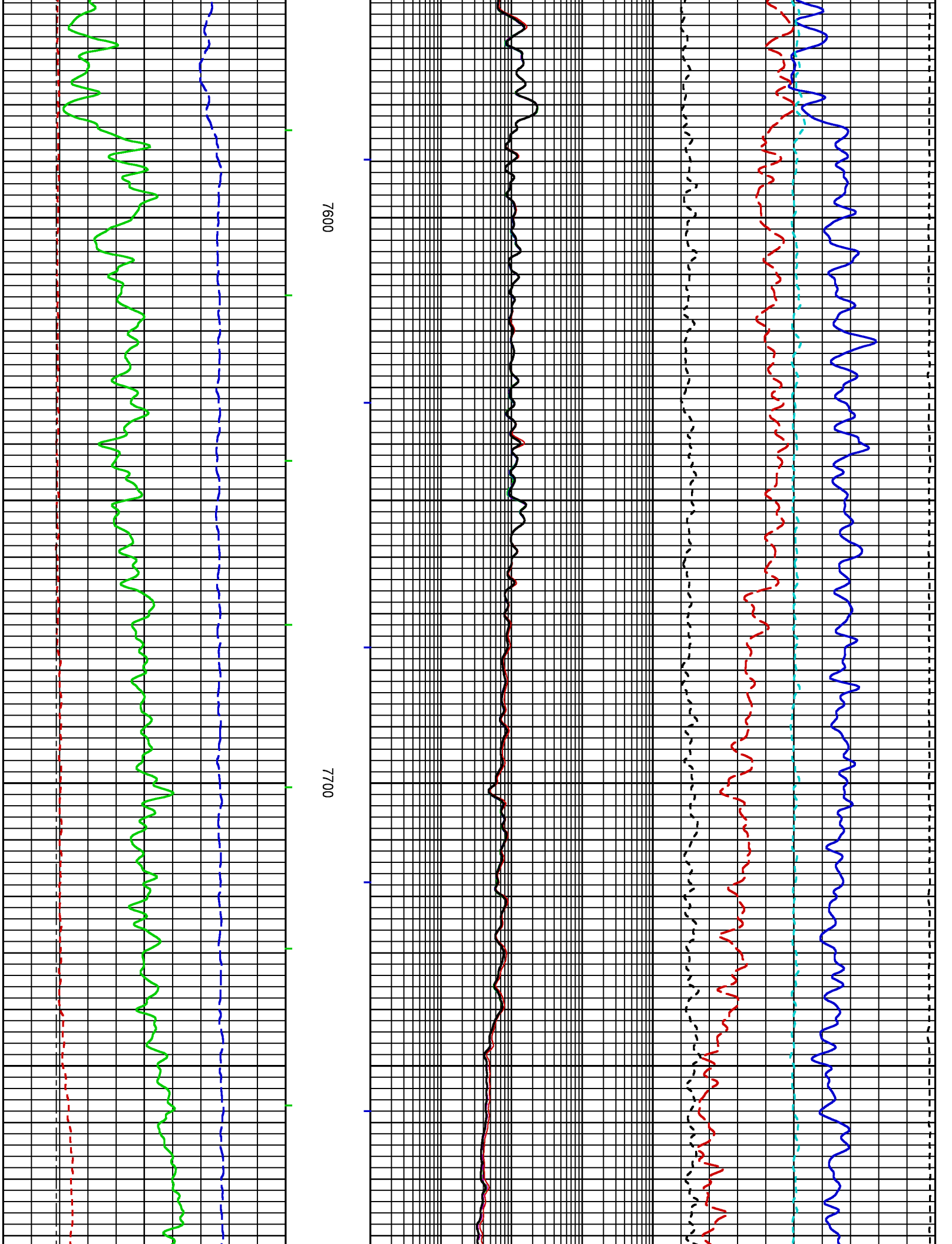


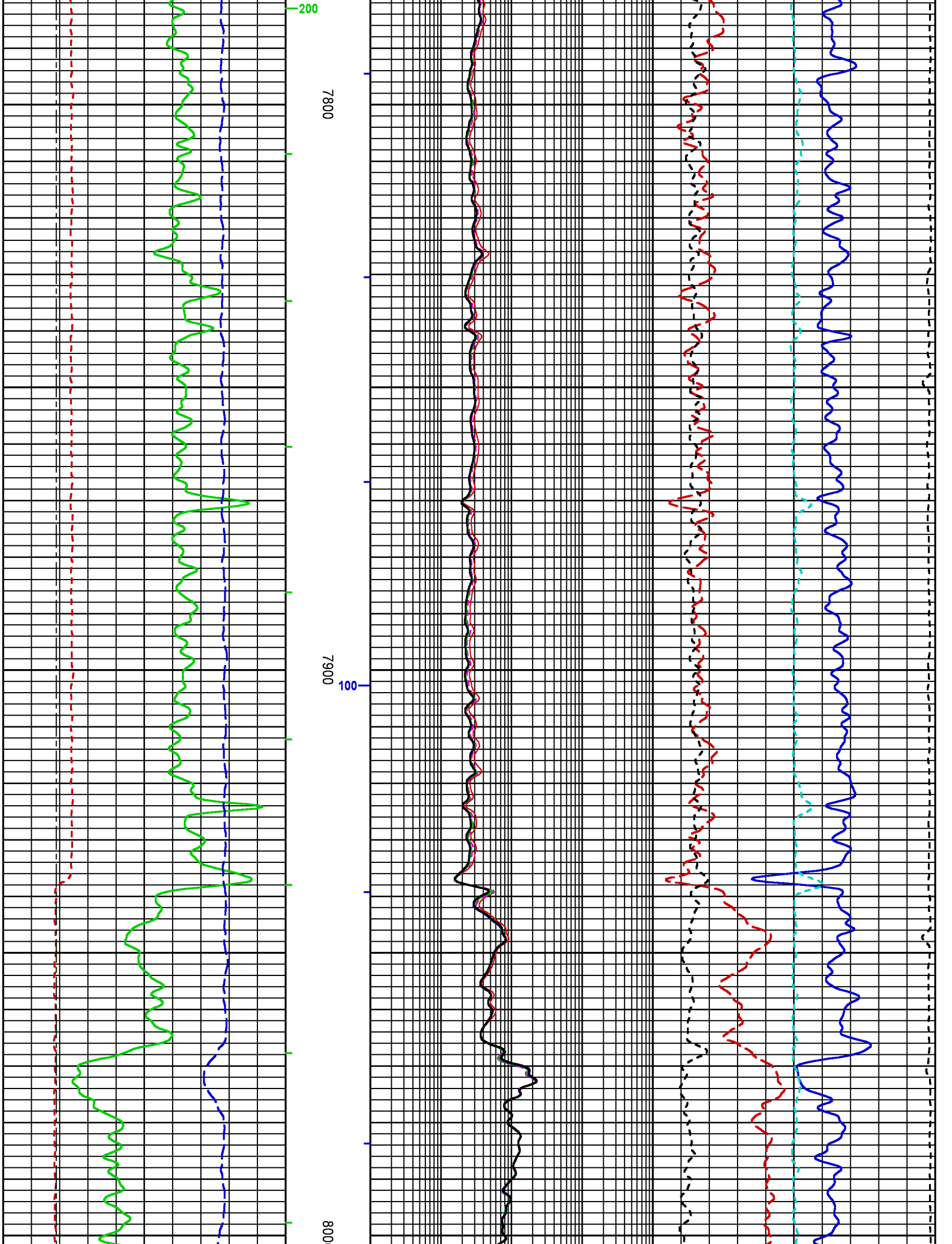


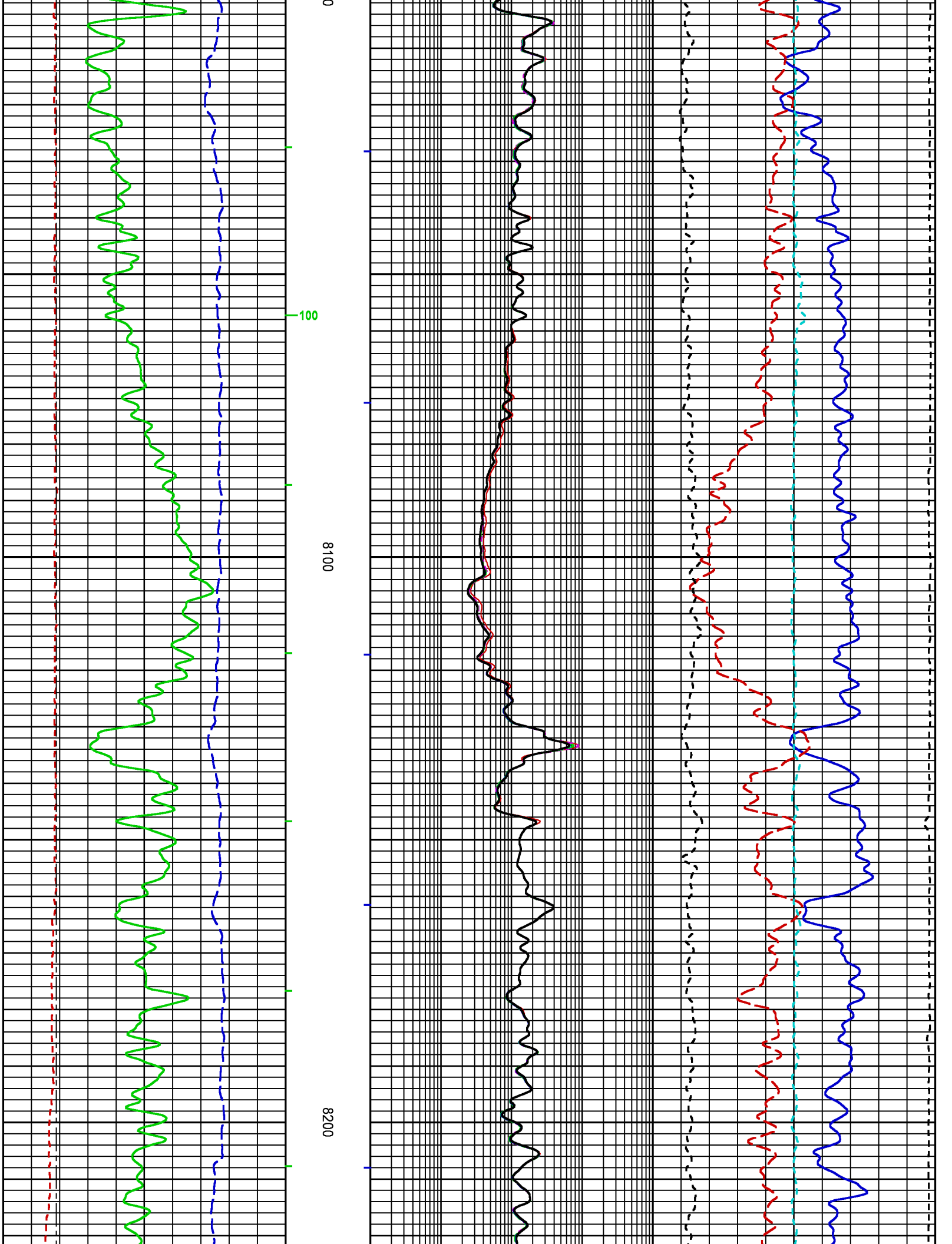


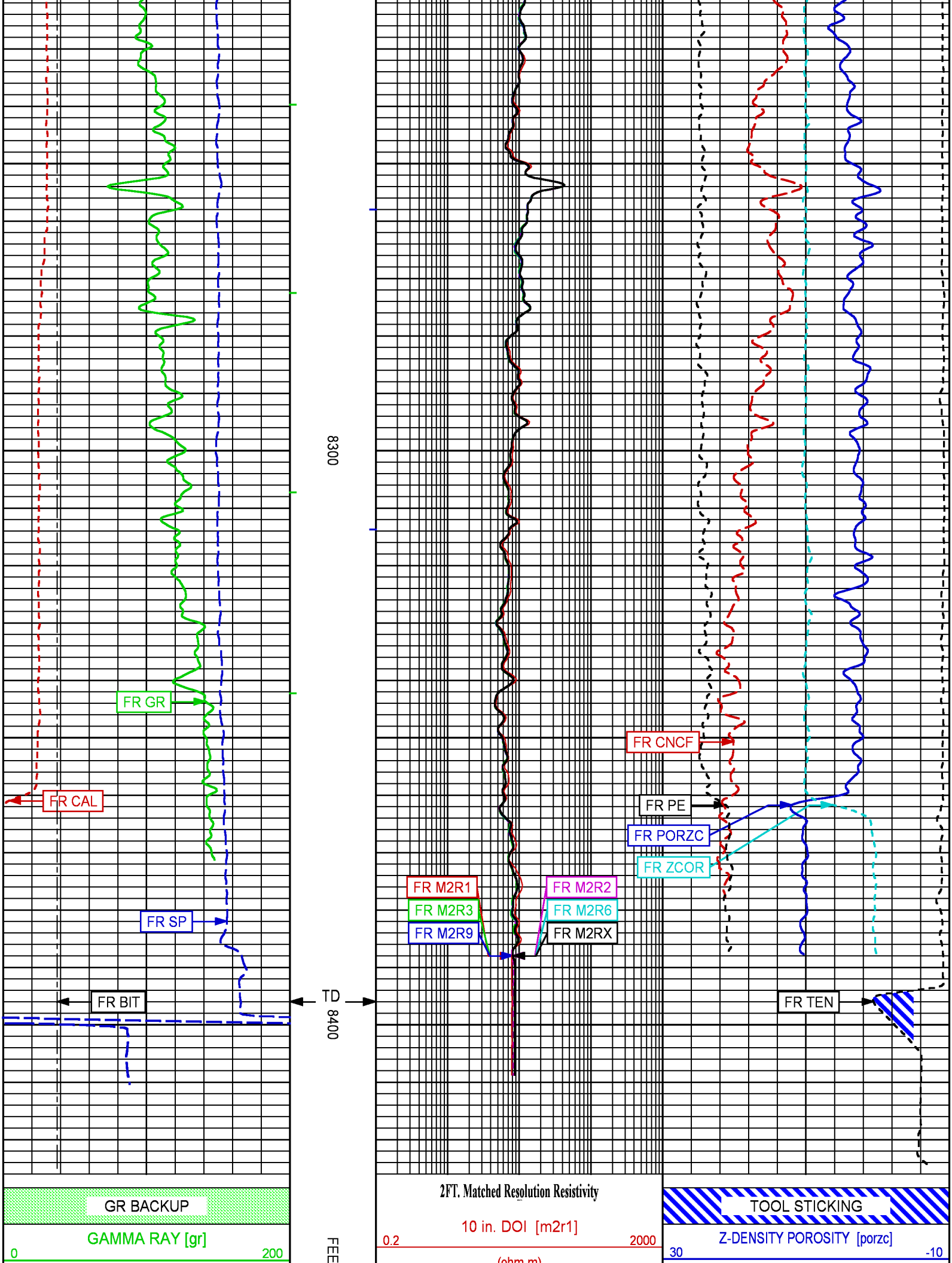


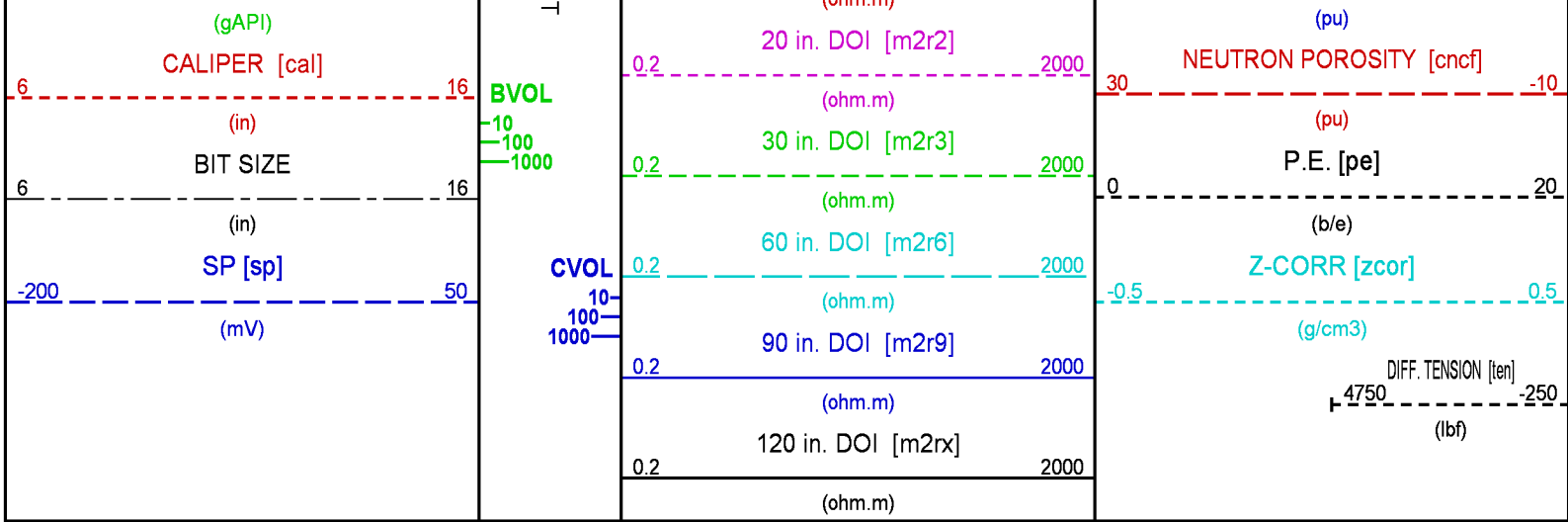












REPEAT PASS SANDSTONE MATRIX 5"/100 FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013  
Updates: 1 Patches: 9  
Plotted: Sat Sep 9 21:41:59 2017

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BRUTON\_30\_04W/HZ01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 1458.500 ft BOTTOM DEPTH: 1791.250 ft

SYMMETRIC FILTER					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TTRM	FILTER ()	medium (1)		TOP	BOTTOM
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
Y AXIS CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
GR	FILTER ()	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
CN	FILTER ()	medium (1)		"	"
CALIPER	FILTER ()	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"
SP-SPDH	FILTER ()	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"

BOREHOLE & CEMENT					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	4.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	7.875	in	"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	100.7	degF	"	"
	MUD SAMPLE RES	2.697	ohm.m	"	"

BOREHOLE TEMP from GRADIENT	Known BH REF TEMP	77.0	degF	"	"
	at BH REF DEPTH	0.0	ft	"	"
	with TEMP GRADIENT	1.200	0.01 degF/ft	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	"	"
	FIXED DIAMETER (mbh*)	7.875	in	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"

CN PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	SANDSTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY	675	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

ZDL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOmatrix	2.680	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"
TRACKING TIME	Logging Spd for Gain	Over 10 ft/min		"	"

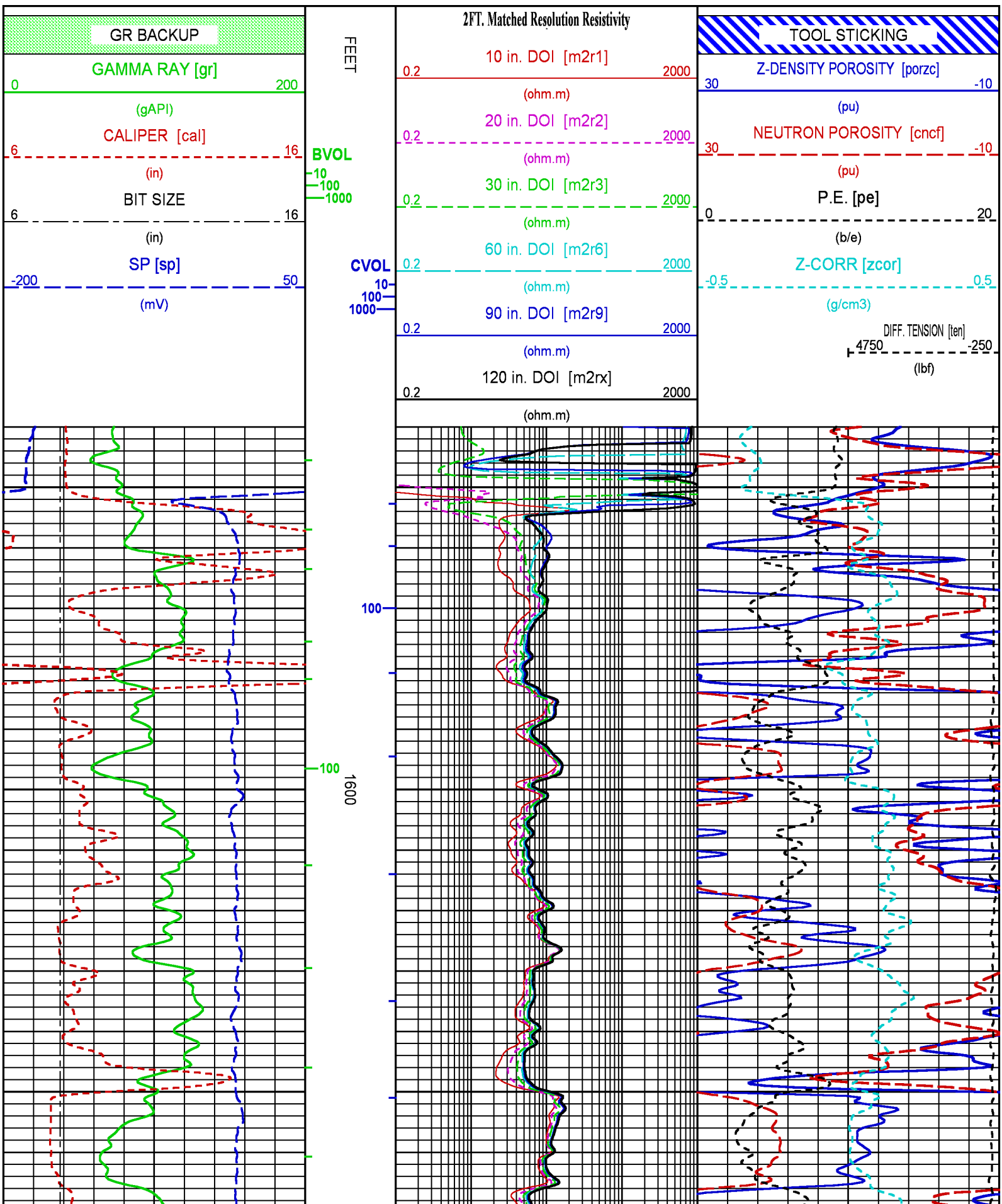
HDIL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORR SOURCE	USE RXTEMP		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		"	"
	ABC to CALCULATE	STANDOFF		"	"
	STANDOFF	0.00	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

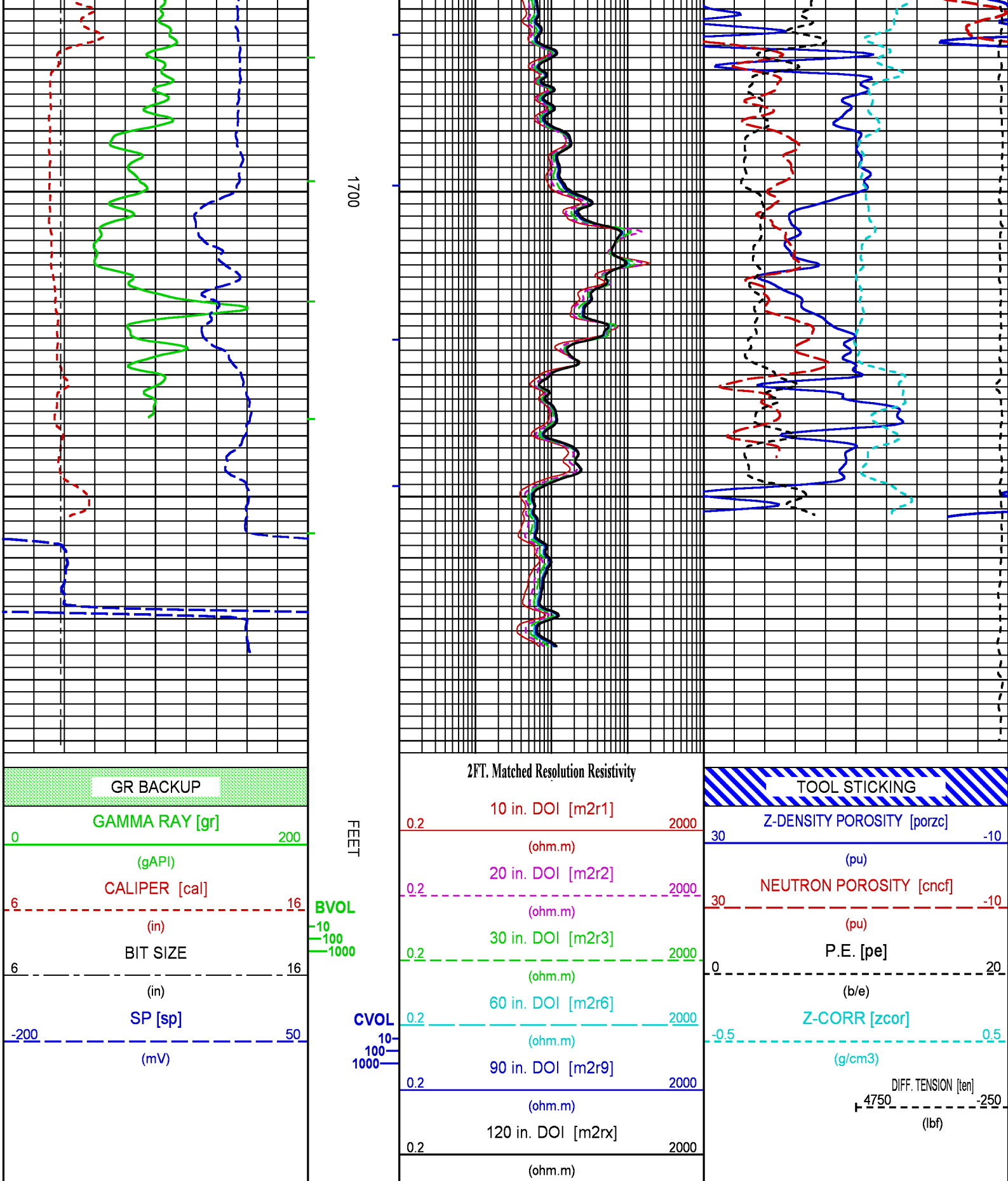
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Sep 9 21:25:26 2017	BIT SIZE
F1:BVOL	Sep 9 21:25:26 2017	BOREHOLE VOLUME
F1:CAL	Sep 9 21:25:26 2017	CALIPER
F1:CNCF	Sep 9 21:25:26 2017	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Sep 9 21:25:26 2017	CEMENT VOLUME
F1:GR	Sep 9 21:25:26 2017	GAMMA RAY
F1:M2R1	Sep 9 21:25:26 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R2	Sep 9 21:25:26 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
F1:M2R3	Sep 9 21:25:26 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI
F1:M2R6	Sep 9 21:25:26 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Sep 9 21:25:26 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:M2RX	Sep 9 21:25:26 2017	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 120-INCH DOI
F1:PE	Sep 9 21:25:26 2017	PHOTO ELECTRIC CROSS-SECTION
F1:PORZC	Sep 9 21:25:26 2017	CORRECTED POROSITY
F1:SP	Sep 9 21:25:26 2017	SPONTANEOUS POTENTIAL
F1:TEN	Sep 9 21:25:26 2017	DIFFERENTIAL TENSION
F1:ZCOR	Sep 9 21:25:26 2017	DENSITY CORRECTION

CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	M2R1	8.00	M2R9	8.00	SP	14.00
CAL	35.00	M2R2	8.00	M2RX	8.00	TEN	0.00
CNCF	45.25	M2R3	8.00	PE	34.25	ZCOR	34.25
GR	52.25	M2R6	8.00	PORZC	34.25		

Presentation	: cpu100:/dat1a/LARAMIE_BRUTON_30_04W/REPEAT.fvpdf [5"/100' Scale]
Plot Interval	: 1540 - 1791.25 Feet
Data File 1	: F1 : cpu100:/dat1a/LARAMIE_BRUTON_30_04W/HZ01_REPEAT.vtf

Data File : FT : c:\p100\data\LARAMIE\_BRUTON\_30\_04W\H201\_REPEAT1.xt  
Created On : Sep 9 21:25:26 2017  
Company : LARAMIE ENERGY  
Well : BRUTON 30-04W  
Field : VEGA  
File Interval : 1393 - 1791.25 Feet  
OCT : HZ





CALIBRATION / VERIFICATION SUMMARY



### CHT PRIMARY CALIBRATION SUMMARY

TOOL #: 3981XA 10045153

DATE/TIME PERFORMED: Thu Jul 27 22:12:51 2017

UNIT #: 3882TD HL6741

CHT	Signal Low (raw)	Signal High (raw)	Scale Mult	Scale Add	Engr Low (lbf)	Engr High (lbf)
	24.93	774.79	3.33	-183.12	-100.00	2400.00

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 179184

DATE/TIME PERFORMED: Wed Jul 26 14:09:42 2017

UNIT #: 3882TD HL6741

CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	166.89	1096.27	929.4	0.161	26.94	176.94	150
			830.0 960.0				

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 179184

DATE/TIME PERFORMED: Wed Jul 26 14:34:22 2017

UNIT #: 3882TD HL6741

VERI JIG #: 4702NK DA\_228

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	170.53	1085.69	0.161	27.52	175.23	147.70
						140.00 160.00

### CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2446XA 173079

DATE/TIME PERFORMED: Mon Jul 31 10:31:21 2017

UNIT #: 3882TD HL6741

CALIBRATOR #: 2437XB 120052

SOURCE #: 4717XS N\_923

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	NOMINAL SSN/LSN	CORRECTION FACTOR	POROSITY (pu)
LSN	554.10	561.57				
SSN	1497.02	1543.22				
RATIO			2.74807	2.75100	1.00107	
					0.97000 1.07000	
CN						21.358

### CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 173079

DATE/TIME PERFORMED: Mon Jul 31 10:37:13 2017

UNIT #: 3882TD HL6741

ICE BLOCK #: 4717ND D\_043

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	2035.32	2139.89				
SSN	4652.92	5130.45				
RATIO			2.39753	1.00107	2.40095	
CN						16.535

## CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 179939

DATE/TIME PERFORMED: Mon Jul 31 14:26:01 2017

UNIT #: 3882TD HL6741

	SMALL RING	LARGE RING	MULT	ADD	SMALL RING (in)	LARGE RING (in)
CALIPER	1604.8	2438.4	0.00855	-5.84165	7.875	15.000

## CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 179939

DATE/TIME PERFORMED: Sat Sep 9 21:37:05 2017

DAYS SINCE CAL: 40

UNIT #: 3880TA HL6670

	I.D.	MULT	ADD	I.D. (in)
CALIPER	1787.6	0.00855	-7.18209	8.097

## CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 179939

DATE/TIME PERFORMED: Sun Sep 10 18:47:13 2017

DAYS SINCE CAL: 41

UNIT #: 3880TA HL6670

	I.D.	MULT	ADD	I.D. (in)
CALIPER	1796.8	0.00855	-7.18209	8.176
				7.597 8.597

## ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2234XA 179939

DATE/TIME PERFORMED: Mon Jul 31 15:15:03 2017

UNIT: 3882TD HL6741

CALB BLKS: 2225XA B94287

CS SRC: 4703NT 11344B

	SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)		
	225.5	225.0	1237.2	1412.8		
	220.0 230.0	220.0 230.0				
	SS (cps)	LS (cps)	SHR	DEN (g/cm3)	CORR (g/cm3)	PE (b/e)
MG (LO PE)	21950.2	11210.2	0.649	1.700	0.003	2.160
			0.585 0.685			
AL	12880.4	1140.9		2.698	-0.010	
AL + SHIM	17549.1	1988.5		2.619	0.158	
MG + SHIM (HI PE)	10372.1	5133.2	0.260			8.500
			0.210 0.270			
RATIO AL + SHIM/AL	1.36	1.74				
	1.32 1.42	1.64 1.84				
RATIO MG/AL	1.70	9.83				
	1.65 1.78	9.40 10.20				

## ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 179939

DATE/TIME PERFORMED: Sat Sep 9 20:56:36 2017

DAYS SINCE CAL: 40

UNIT #: 3880TA HL6670

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	1403.1	223.4	1238.0
	1312.8 1512.8	220.0 230.0	1100.0 1550.0
SS	1237.2	222.2	1217.4
	1220.0 1250.0	220.0 230.0	1100.0 1550.0

SS

1137.2	1232.2	1337.2	220.0	223.0	230.0	1100.0	1217.4	1550.0
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LV (V)	PAD CURRENT (mA)
5.0	63.3
4.8	5.2
50.0	120.0

## ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 179939

DATE/TIME PERFORMED: Sun Sep 10 19:09:21 2017

DAYS SINCE CAL: 41

UNIT #: 3880TA HL6670

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	1399.4	225.9	1245.8
	1312.8	1512.8	220.0
		230.0	1100.0
			1550.0
SS	1235.2	225.0	1232.1
	1137.2	1337.2	220.0
		230.0	1100.0
			1550.0
	LV (V)	PAD CURRENT (mA)	
	5.0	62.9	
	4.8	5.2	
		50.0	120.0

## HDIL PRIMARY CALIBRATION SUMMARY

TOOL #: 1515MA 183381

DATE/TIME PERFORMED: Sat Dec 24 12:14:11 2016

UNIT #: 3882TD HL6728

GRCOND ID &amp; DATE: 37 083096

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-0.002	0.001	0.004	0.005	0.004	0.005	0.003	0.000
	-0.200	0.200	-0.100	0.100	-0.100	0.100	-0.100	0.100
Coil 0 Q	0.002	0.001	-0.002	-0.002	0.002	0.003	0.002	0.003
	-1.000	1.000	-0.200	0.200	-0.100	0.100	-0.100	0.100
Coil 1 R	-0.001	0.001	0.005	0.004	0.004	0.003	0.000	-0.001
	-0.200	0.200	-0.100	0.100	-0.100	0.100	-0.100	0.100
Coil 1 Q	-0.000	0.000	-0.002	-0.001	0.002	0.004	0.002	0.004
	-1.000	1.000	-0.200	0.200	-0.100	0.100	-0.100	0.100
Coil 2 R	0.003	0.001	-0.002	-0.002	-0.000	0.005	0.006	0.006
	-0.200	0.200	-0.100	0.100	-0.100	0.100	-0.100	0.100
Coil 2 Q	-0.004	-0.003	-0.003	-0.004	-0.004	-0.004	-0.005	-0.001
	-1.000	1.000	-0.200	0.200	-0.100	0.100	-0.100	0.100
Coil 3 R	0.003	0.004	0.007	0.006	0.003	0.003	0.001	0.000
	-0.100	0.100	-0.100	0.100	-0.100	0.100	-0.100	0.100
Coil 3 Q	-0.009	-0.006	0.001	0.000	0.001	0.001	-0.001	-0.001
	-0.500	0.500	-0.200	0.200	-0.100	0.100	-0.100	0.100
Coil 4 R	-0.013	0.001	-0.002	0.003	0.000	0.003	0.003	0.004
	-0.200	0.200	-0.200	0.200	-0.200	0.200	-0.200	0.200
Coil 4 Q	-0.014	-0.003	-0.004	-0.006	-0.000	-0.001	0.003	0.000
	-1.000	1.000	-0.400	0.400	-0.200	0.200	-0.200	0.200
Coil 5 R	-0.006	-0.002	0.015	0.001	-0.001	0.003	-0.003	-0.008
	-0.400	0.400	-0.400	0.400	-0.400	0.400	-0.400	0.400
Coil 5 Q	-0.010	0.005	0.003	-0.004	0.002	0.008	0.005	0.006
	-2.000	2.000	-0.800	0.800	-0.400	0.400	-0.400	0.400
Coil 6 R	-0.050	0.012	0.019	-0.007	-0.027	-0.008	-0.024	-0.010
	-1.000	1.000	-1.000	1.000	-1.000	1.000	-1.000	1.000
Coil 6 Q	-0.027	-0.009	0.011	0.009	0.002	0.023	-0.000	0.006
	-5.000	5.000	-2.000	2.000	-1.000	1.000	-1.000	1.000

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	125.90	124.37	121.46	117.08	111.62	104.87	97.46	88.88
	100.00	150.00	100.00	150.00	98.00	140.00	87.00	130.00
Coil 0 P	7.801	24.617	41.135	57.537	73.781	89.982	105.860	121.720
	6.000	9.000	19.000	28.000	32.000	47.000	44.000	66.000
Coil 1 M	220.96	218.30	213.24	205.57	196.03	184.25	171.18	156.13
	180.00	270.00	180.00	270.00	170.00	260.00	180.00	230.00
Coil 1 P	7.819	24.712	41.296	57.770	74.107	90.382	106.370	122.287
	6.000	9.000	19.000	28.000	32.000	48.000	45.000	67.000
Coil 2 M	439.04	434.03	424.63	410.16	392.01	369.11	343.45	313.71
	360.00	540.00	360.00	540.00	350.00	530.00	340.00	510.00
Coil 2 P	7.931	24.970	41.747	58.473	75.088	91.682	108.039	124.358

Coil 3 M	6.000	9.000	19.000	29.000	32.000	48.000	45.000	67.000	58.000	87.000	71.000	110.000	84.000	130.000	96.000	140.000
	713.58		707.87		696.78		679.04		655.57		623.73		586.61		540.49	
	590.00	880.00	580.00	870.00	570.00	850.00	550.00	830.00	530.00	800.00	500.00	760.00	470.00	710.00	440.00	650.00
Coil 3 P	7.567		23.966		40.173		56.452		72.784		89.279		105.685		122.230	
	6.000	10.000	20.000	29.000	33.000	49.000	46.000	69.000	59.000	89.000	72.000	110.000	85.000	130.000	98.000	150.000
	1118.0		1103.4		1075.9		1034.6		983.6		920.8		851.5		771.7	
Coil 4 M	900.0	1400.0	900.0	1300.0	900.0	1300.0	850.0	1300.0	800.0	1200.0	800.0	1200.0	750.0	1100.0	700.0	1000.0
	8.313		26.157		43.689		61.106		78.342		95.559		112.445		129.312	
	6.000	10.000	20.000	30.000	33.000	50.000	46.000	70.000	60.000	90.000	73.000	110.000	86.000	130.000	99.000	150.000
Coil 5 M	2322.7		2299.8		2256.0		2187.3		2097.5		1983.8		1852.8		1697.8	
	1900.0	2800.0	1800.0	2800.0	1800.0	2700.0	1800.0	2600.0	1700.0	2500.0	1600.0	2400.0	1500.0	2200.0	1400.0	2100.0
	7.919		25.037		41.915		58.778		75.580		92.476		109.093		125.753	
Coil 5 P	6.000	10.000	20.000	31.000	34.000	51.000	48.000	72.000	62.000	93.000	76.000	110.000	89.000	130.000	100.000	150.000
	5982.7		5893.0		5721.0		5470.7		5169.1		4812.6		4423.2		4014.5	
	4700.0	7100.0	4700.0	7000.0	4600.0	6900.0	4400.0	6800.0	4200.0	6400.0	4000.0	6000.0	3700.0	5600.0	3400.0	5100.0
Coil 6 P	8.401		26.748		44.648		62.347		79.789		96.944		113.741		130.581	
	7.000	10.000	22.000	32.000	36.000	54.000	51.000	76.000	65.000	98.000	80.000	120.000	94.000	140.000	110.000	160.000

AM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	460	-58	-129	-152	-163	-169	-173	-174
	-200 800	-500 200	-600 100	-600 50	-500 20	-500 20	-500 20	-500 20
Coil 0 Q	1007	408	230	137	73	24	-17	-53
	-3000 6000	-1000 2000	-1000 1200	-500 900	-400 700	-400 600	-400 500	-400 400
Coil 1 R	538	91	26	2	-11	-17	-21	-24
	450 650	20 130	-30 60	-50 40	-55 30	-60 20	-60 10	-60 10
Coil 1 Q	1460	576	362	262	203	163	134	113
	0 2500	0 900	0 600	0 450	0 350	0 300	0 250	0 250
Coil 2 R	185.0	27.5	8.7	1.6	-0.6	-2.8	-4.1	-5.1
	140.0 230.0	0.0 51.0	-10.0 25.0	-15.0 15.0	-16.0 10.0	-16.0 7.0	-16.0 5.0	-16.0 3.0
Coil 2 Q	442.4	175.0	111.3	83.6	68.2	59.1	51.8	48.4
	-200.0 1000.0	0.0 350.0	0.0 220.0	0.0 160.0	0.0 130.0	0.0 110.0	0.0 100.0	0.0 90.0
Coil 3 R	48.7	6.7	1.8	-0.4	-0.4	-1.4	-1.9	-1.8
	37.0 62.0	0.0 12.0	-3.0 6.0	-4.0 4.0	-5.0 2.0	-5.0 1.0	-6.0 1.0	-6.0 1.0
Coil 3 Q	31.6	19.3	16.2	15.9	16.7	17.6	18.5	19.2
	-140.0 280.0	-40.0 100.0	-20.0 70.0	-10.0 60.0	-10.0 50.0	-10.0 50.0	-10.0 50.0	-10.0 50.0
Coil 4 R	9.46	-0.30	-0.50	-0.99	-1.22	-1.18	-1.08	-1.47
	2.00 18.00	-3.00 6.00	-3.50 3.00	-3.90 2.00	-4.20 2.00	-4.50 2.00	-4.70 2.00	-5.00 2.00
Coil 4 Q	-9.65	0.52	4.43	7.97	10.58	13.29	16.10	18.38
	-100.00 100.00	-30.00 50.00	-20.00 40.00	-10.00 40.00	-10.00 40.00	-10.00 45.00	-10.00 50.00	-10.00 60.00
Coil 5 R	0.15	-1.44	-1.02	-1.22	-0.93	-0.87	-0.59	-1.01
	-2.00 5.80	-3.20 2.40	-4.50 3.10	-4.70 3.20	-4.80 3.20	-5.00 3.30	-5.20 3.40	-5.40 3.50
Coil 5 Q	10.56	6.13	7.17	9.37	11.53	13.90	15.65	18.39
	-60.00 70.00	-20.00 30.00	-20.00 30.00	-20.00 35.00	-20.00 45.00	-20.00 50.00	-20.00 60.00	-30.00 70.00
Coil 6 R	-3.10	-1.40	-0.83	-0.74	-0.83	-0.98	-0.54	-1.19
	-4.80 1.00	-5.70 3.80	-6.50 4.90	-6.90 5.40	-7.30 5.80	-7.50 6.00	-7.70 6.10	-7.90 6.30
Coil 6 Q	-13.22	-2.48	1.63	5.09	7.53	9.99	12.52	14.63
	-30.00 30.00	-20.00 25.00	-20.00 35.00	-30.00 50.00	-35.00 60.00	-40.00 70.00	-50.00 80.00	-60.00 100.00

MM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	0.950	0.971	0.981	0.987	0.989	0.990	0.992	0.991
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 0 P	-0.872	-1.476	-1.232	-1.011	-0.888	-0.777	-0.702	-0.632
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 1 M	0.930	0.952	0.963	0.969	0.971	0.972	0.973	0.973
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 1 P	-0.914	-1.528	-1.293	-1.031	-0.850	-0.735	-0.654	-0.628
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 2 M	0.999	0.996	0.996	0.995	0.994	0.993	0.992	0.991
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 2 P	0.072	0.075	0.093	0.133	0.167	0.147	0.122	0.137
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 3 M	0.999	0.998	0.998	0.997	0.996	0.995	0.996	0.996
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 3 P	0.049	0.061	0.086	0.101	0.086	0.030	0.020	0.095
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 4 M	1.015	1.014	1.013	1.012	1.012	1.010	1.009	1.008
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 4 P	0.088	0.100	0.081	0.125	0.106	0.114	0.056	0.041
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 5 M	1.021	1.020	1.020	1.018	1.017	1.018	1.017	1.017
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 5 P	0.022	0.054	0.098	0.110	0.089	0.095	0.099	0.115
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 6 M	1.021	1.022	1.022	1.021	1.025	1.030	1.029	1.020
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 6 P	0.024	0.044	-0.110	0.023	0.256	0.362	0.876	1.393
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000

PARMS		ICID 0	ICID 1	Cal Temp (degF)	T Factor			
IDs		1.015	0.740	57.7	1.04			
HDIL BEFORE LOG VERIFICATION SUMMARY								
TOOL #:	1515MA 183381	DATE/TIME PERFORMED:		Sat Sep 9 21:23:56 2017	DAYS SINCE CAL:	259		
UNIT #:		3880TA HL6670						
ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	0.002 -0.200 0.200	0.003 -0.100 0.100	0.002 -0.100 0.100	0.002 -0.100 0.100	-0.000 -0.100 0.100	0.002 -0.100 0.100	0.002 -0.100 0.100	-0.000 -0.100 0.100
Coil 0 Q	0.002 -1.000 1.000	0.004 -0.200 0.200	0.000 -0.100 0.100	0.001 -0.100 0.100	0.002 -0.100 0.100	-0.000 -0.100 0.100	-0.001 -0.100 0.100	0.000 -0.100 0.100
Coil 1 R	-0.000 -0.200 0.200	0.003 -0.100 0.100	0.002 -0.100 0.100	0.001 -0.100 0.100	-0.001 -0.100 0.100	0.001 -0.100 0.100	-0.000 -0.100 0.100	-0.000 -0.100 0.100
Coil 1 Q	-0.000 -1.000 1.000	0.002 -0.200 0.200	0.000 -0.100 0.100	0.000 -0.100 0.100	0.001 -0.100 0.100	0.001 -0.100 0.100	-0.001 -0.100 0.100	-0.001 -0.100 0.100
Coil 2 R	0.003 -0.200 0.200	0.003 -0.100 0.100	-0.002 -0.100 0.100	-0.000 -0.100 0.100	0.001 -0.100 0.100	0.002 -0.100 0.100	0.005 -0.100 0.100	0.008 -0.100 0.100
Coil 2 Q	-0.004 -1.000 1.000	-0.002 -0.200 0.200	-0.000 -0.100 0.100	-0.001 -0.100 0.100	-0.005 -0.100 0.100	-0.006 -0.100 0.100	-0.004 -0.100 0.100	-0.002 -0.100 0.100
Coil 3 R	-0.003 -0.100 0.100	0.004 -0.100 0.100	-0.001 -0.100 0.100	0.001 -0.100 0.100	-0.004 -0.100 0.100	-0.004 -0.100 0.100	-0.006 -0.100 0.100	-0.003 -0.100 0.100
Coil 3 Q	-0.010 -0.500 0.500	-0.003 -0.200 0.200	0.001 -0.100 0.100	0.003 -0.100 0.100	0.004 -0.100 0.100	-0.001 -0.100 0.100	-0.000 -0.100 0.100	-0.002 -0.100 0.100
Coil 4 R	-0.010 -0.200 0.200	0.001 -0.200 0.200	-0.001 -0.200 0.200	-0.004 -0.200 0.200	-0.005 -0.200 0.200	-0.004 -0.200 0.200	-0.002 -0.200 0.200	-0.001 -0.200 0.200
Coil 4 Q	-0.006 -1.000 1.000	0.004 -0.400 0.400	-0.002 -0.200 0.200	0.000 -0.200 0.200	0.002 -0.200 0.200	-0.005 -0.200 0.200	-0.006 -0.200 0.200	-0.002 -0.200 0.200
Coil 5 R	-0.008 -0.400 0.400	0.012 -0.400 0.400	0.003 -0.400 0.400	-0.009 -0.400 0.400	-0.011 -0.400 0.400	0.002 -0.400 0.400	-0.002 -0.400 0.400	-0.004 -0.400 0.400
Coil 5 Q	-0.013 -2.000 2.000	0.005 -0.800 0.800	-0.003 -0.400 0.400	-0.001 -0.400 0.400	0.021 -0.400 0.400	0.001 -0.400 0.400	0.005 -0.400 0.400	-0.002 -0.400 0.400
Coil 6 R	-0.014 -1.000 1.000	-0.003 -1.000 1.000	-0.004 -1.000 1.000	0.001 -1.000 1.000	-0.008 -1.000 1.000	-0.014 -1.000 1.000	-0.024 -1.000 1.000	-0.020 -1.000 1.000
Coil 6 Q	-0.017 -5.000 5.000	0.017 -2.000 2.000	-0.001 -1.000 1.000	-0.003 -1.000 1.000	0.031 -1.000 1.000	0.013 -1.000 1.000	0.006 -1.000 1.000	-0.011 -1.000 1.000
ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	125.85 100.00 150.00	124.33 100.00 150.00	121.42 98.00 150.00	117.03 96.00 140.00	111.62 92.00 140.00	104.88 87.00 130.00	97.47 82.00 120.00	88.86 76.00 110.00
Coil 0 P	7.810 6.000 9.000	24.642 19.000 28.000	41.174 32.000 47.000	57.605 44.000 66.000	73.846 57.000 85.000	90.093 70.000 100.000	106.004 82.000 120.000	121.920 95.000 140.000
Coil 1 M	220.68 180.00 270.00	218.05 180.00 270.00	212.96 170.00 260.00	205.30 170.00 250.00	195.88 160.00 250.00	184.09 160.00 230.00	170.98 150.00 220.00	155.95 140.00 200.00
Coil 1 P	7.831 6.000 9.000	24.745 19.000 28.000	41.345 32.000 48.000	57.844 45.000 67.000	74.189 57.000 86.000	90.530 70.000 110.000	106.534 83.000 120.000	122.486 96.000 140.000
Coil 2 M	439.23 360.00 540.00	434.20 360.00 540.00	424.74 350.00 530.00	410.28 340.00 510.00	392.23 330.00 500.00	369.37 310.00 470.00	343.73 300.00 440.00	313.66 270.00 410.00
Coil 2 P	7.945 6.000 9.000	24.998 19.000 29.000	41.798 32.000 48.000	58.537 45.000 67.000	75.147 58.000 87.000	91.785 71.000 110.000	108.206 84.000 130.000	124.534 96.000 140.000
Coil 3 M	714.82 590.00 880.00	709.12 580.00 870.00	698.08 570.00 850.00	680.47 550.00 830.00	657.28 530.00 800.00	625.55 500.00 760.00	588.40 470.00 710.00	542.42 440.00 650.00
Coil 3 P	7.575 6.000 10.000	23.974 20.000 29.000	40.177 33.000 49.000	56.473 46.000 69.000	72.785 59.000 89.000	89.327 72.000 110.000	105.761 85.000 130.000	122.361 98.000 150.000
Coil 4 M	1120.2 900.0 1400.0	1105.6 900.0 1300.0	1078.3 900.0 1300.0	1037.2 850.0 1300.0	986.7 800.0 1200.0	923.9 800.0 1200.0	854.4 750.0 1100.0	775.1 700.0 1000.0
Coil 4 P	8.319 6.000 10.000	26.155 20.000 30.000	43.679 33.000 50.000	61.104 46.000 70.000	78.341 60.000 90.000	95.583 73.000 110.000	112.516 86.000 130.000	129.429 99.000 150.000
Coil 5 M	2330.4 1900.0 2800.0	2307.7 1800.0 2800.0	2264.0 1800.0 2700.0	2194.7 1800.0 2600.0	2107.4 1700.0 2500.0	1992.4 1600.0 2400.0	1860.8 1500.0 2200.0	1706.1 1400.0 2100.0
Coil 5 P	7.929 6.000 10.000	25.059 20.000 31.000	41.940 34.000 51.000	58.835 48.000 72.000	75.669 62.000 93.000	92.574 76.000 110.000	109.236 89.000 130.000	125.932 100.000 150.000
Coil 6 M	5981.4 4700.0 7100.0	5892.0 4700.0 7000.0	5723.4 4600.0 6900.0	5477.8 4400.0 6600.0	5181.0 4200.0 6400.0	4828.0 4000.0 6000.0	4445.2 3700.0 5600.0	4031.5 3400.0 5100.0
Coil 6 P	8.413 7.000 10.000	26.775 22.000 32.000	44.698 36.000 54.000	62.395 51.000 76.000	79.860 65.000 98.000	97.128 80.000 120.000	114.062 94.000 140.000	130.861 110.000 160.000
HDIL AFTER LOG VERIFICATION SUMMARY								
TOOL #:	1515MA 183381	DATE/TIME PERFORMED:		Sun Sep 10 18:45:16 2017	DAYS SINCE CAL:	260		
UNIT #:		3880TA HL6670						

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	0.004 -0.078 0.082	0.003 -0.057 0.063	0.003 -0.028 0.032	0.003 -0.028 0.032	0.000 -0.030 0.030	0.002 -0.028 0.032	0.002 -0.028 0.032	0.000 -0.030 0.030
Coil 0 Q	0.002 -0.038 0.042	0.006 -0.116 0.124	0.001 -0.030 0.030	0.002 -0.029 0.031	0.002 -0.028 0.032	0.001 -0.030 0.030	-0.000 -0.031 0.029	0.001 -0.030 0.030
Coil 1 R	0.002 -0.080 0.080	0.003 -0.047 0.053	0.002 -0.028 0.032	0.001 -0.029 0.031	0.001 -0.031 0.029	0.001 -0.029 0.031	-0.000 -0.030 0.030	-0.001 -0.030 0.030
Coil 1 Q	0.000 -0.400 0.400	0.002 -0.098 0.102	0.000 -0.030 0.030	0.002 -0.030 0.030	0.003 -0.029 0.031	0.000 -0.029 0.031	0.001 -0.031 0.029	-0.001 -0.031 0.029
Coil 2 R	0.002 -0.067 0.073	0.003 -0.027 0.033	-0.000 -0.032 0.028	-0.001 -0.030 0.030	0.002 -0.029 0.031	0.003 -0.028 0.032	0.004 -0.025 0.035	0.007 -0.022 0.038
Coil 2 Q	-0.003 -0.354 0.346	-0.002 -0.102 0.098	-0.004 -0.030 0.030	0.001 -0.031 0.029	-0.003 -0.035 0.025	-0.004 -0.036 0.024	-0.004 -0.034 0.026	-0.002 -0.032 0.028
Coil 3 R	0.005 -0.043 0.037	0.005 -0.036 0.044	0.004 -0.041 0.039	-0.001 -0.039 0.041	-0.002 -0.044 0.036	-0.005 -0.044 0.036	-0.004 -0.046 0.034	-0.003 -0.043 0.037
Coil 3 Q	-0.006 -0.210 0.190	-0.004 -0.083 0.077	0.004 -0.039 0.041	0.005 -0.037 0.043	0.003 -0.036 0.044	0.004 -0.041 0.039	0.001 -0.040 0.040	-0.003 -0.042 0.038
Coil 4 R	-0.005 -0.070 0.050	0.002 -0.059 0.061	0.005 -0.061 0.059	-0.006 -0.064 0.056	-0.001 -0.065 0.055	-0.000 -0.064 0.056	-0.002 -0.062 0.058	-0.002 -0.061 0.059
Coil 4 Q	-0.008 -0.306 0.294	-0.000 -0.096 0.104	0.004 -0.062 0.058	0.002 -0.060 0.060	-0.002 -0.058 0.062	-0.007 -0.065 0.055	-0.002 -0.066 0.054	0.001 -0.062 0.058
Coil 5 R	-0.007 -0.128 0.112	0.013 -0.108 0.132	0.019 -0.117 0.123	-0.002 -0.129 0.111	0.002 -0.131 0.109	-0.004 -0.118 0.122	-0.010 -0.122 0.118	0.001 -0.124 0.116
Coil 5 Q	-0.002 -0.613 0.587	-0.004 -0.245 0.255	0.010 -0.123 0.117	0.009 -0.121 0.119	0.001 -0.099 0.141	0.008 -0.119 0.121	0.001 -0.115 0.125	-0.005 -0.122 0.118
Coil 6 R	-0.037 -0.314 0.286	0.022 -0.303 0.297	0.002 -0.304 0.296	0.004 -0.299 0.301	-0.002 -0.308 0.292	-0.007 -0.314 0.286	-0.008 -0.324 0.276	-0.023 -0.320 0.280
Coil 6 Q	-0.013 -1.517 1.483	0.017 -0.583 0.617	0.013 -0.301 0.299	0.001 -0.303 0.297	-0.023 -0.269 0.331	0.034 -0.287 0.313	-0.022 -0.294 0.306	-0.001 -0.311 0.289

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	125.77 123.33 128.36	124.26 121.84 126.82	121.38 118.99 123.85	116.99 114.68 119.37	111.55 109.39 113.85	104.86 102.79 106.98	97.36 95.52 99.42	88.77 87.09 90.64
Coil 0 P	7.826 4.810 10.810	24.696 21.642 27.642	41.260 38.174 44.174	57.731 54.605 60.605	74.059 70.846 76.846	90.366 87.093 93.093	106.296 103.004 109.004	122.322 118.920 124.920
Coil 1 M	220.57 216.26 225.09	217.95 213.69 222.41	212.88 208.70 217.22	205.20 201.20 209.41	195.72 191.96 199.79	184.03 180.41 187.78	170.84 167.56 174.40	155.91 152.83 159.07
Coil 1 P	7.848 4.831 10.831	24.804 21.745 27.745	41.446 38.345 44.345	57.996 54.844 60.844	74.402 71.189 77.189	90.776 87.530 93.530	106.864 103.534 109.534	122.901 119.486 125.486
Coil 2 M	439.57 430.45 448.02	434.50 425.51 442.88	425.09 416.25 433.24	410.57 402.07 418.48	392.29 384.39 400.08	369.56 361.98 376.75	343.64 336.86 350.61	313.68 307.39 319.94
Coil 2 P	7.962 4.945 10.945	25.060 21.998 27.998	41.891 38.798 44.798	58.692 55.537 61.537	75.330 72.147 78.147	92.044 88.785 94.785	108.485 105.206 111.206	124.919 121.534 127.534
Coil 3 M	716.18 700.52 729.11	710.44 694.94 723.31	699.43 684.12 712.04	681.85 666.87 694.08	658.42 644.13 670.43	626.88 613.04 638.06	589.38 576.63 600.17	543.16 531.57 553.27
Coil 3 P	7.592 4.575 10.575	24.022 20.974 26.974	40.255 37.177 43.177	56.588 53.473 59.473	72.955 69.785 75.785	89.537 86.327 92.327	106.027 102.761 108.761	122.682 119.361 125.361
Coil 4 M	1122.9 1097.8 1142.6	1108.1 1083.5 1127.7	1080.9 1056.7 1099.9	1039.7 1016.4 1057.9	989.0 966.9 1006.4	926.5 905.5 942.4	856.8 837.3 871.5	776.9 759.6 790.6
Coil 4 P	8.337 5.319 11.319	26.199 23.155 29.155	43.744 40.679 46.679	61.194 58.104 64.104	78.479 75.341 81.341	95.754 92.583 98.583	112.741 109.516 115.516	129.725 126.429 132.429
Coil 5 M	2337.7 2283.8 2377.0	2314.8 2261.5 2353.8	2271.2 2218.7 2309.3	2202.0 2150.8 2238.6	2113.3 2065.2 2149.5	1999.3 1952.5 2032.2	1866.6 1823.5 1898.0	1710.8 1672.0 1740.3
Coil 5 P	7.949 4.929 10.929	25.115 22.059 28.059	42.035 38.940 44.940	58.966 55.835 61.835	75.839 72.669 78.669	92.810 89.574 95.574	109.557 106.236 112.236	126.290 122.932 128.932
Coil 6 M	5983.9 5861.8 6101.1	5893.4 5774.2 6009.8	5725.5 5608.9 5837.9	5479.6 5368.3 5587.4	5182.0 5077.4 5284.6	4833.5 4731.5 4924.6	4451.0 4356.3 4534.2	4038.8 3950.9 4112.1
Coil 6 P	8.436 5.413 11.413	26.834 23.775 29.775	44.774 41.698 47.698	62.514 59.395 65.395	79.965 76.860 82.860	97.263 94.128 100.128	114.268 111.062 117.062	131.133 127.861 133.861

## INSTRUMENT CONFIGURATION

#### CABLEHEAD

Diameter : 3.38"  
Length : 5.50'  
Weight : 24 lbs  
Series : CABL338  
Mnemonic : CBLH  
Measure Point: 2.75': CABLEHEAD TOP

#### TTRM SUB

Diameter : 3.63"  
Length : 3.83'  
Weight : 62 lbs  
Series : 3981XA  
Mnemonic : TTRM  
Measure Point: 1.38': TEMP MP  
Measure Point: 1.13': RM MP

#### WTS COMMON REMOTE

Diameter : 3.63"  
Length : 6.36'  
Weight : 126 lbs  
Series : 3514XB  
Mnemonic : WTS

#### DIGITAL SPECTRALOG

Diameter : 3.63"  
Length : 7.31'  
Weight : 130 lbs  
Series : 1329XA  
Mnemonic : DSL  
Measure Point: 1.60': GR MP

#### COMPENSATED NEUTRON

Diameter : 3.63"  
Length : 7.59'  
Weight : 150 lbs  
Series : 2446XA  
Mnemonic : CN  
Measure Point: 2.63': LSN MP  
Measure Point: 2.24': SSN MP

#### Z-DENSILOG

Diameter : 4.88"  
Length : 11.22'  
Weight : 360 lbs  
Series : 2234XA  
Mnemonic : ZDL  
Measure Point: 3.19': CAL MP  
Measure Point: 2.47': LSD MP  
Measure Point: 2.07': SSD MP

CABLEHEAD TOP — 71.13'

TEMP MP — 65.93'  
RM MP — 65.68'

GR MP — 52.48'

LSN MP — 45.92'  
SSN MP — 45.52'

CAL MP — 35.26'

KNUCKLE JOINT (DOUBLE)

Diameter : 3.38"  
Length : 4.65'  
Weight : 90 lbs  
Series : 3939XA  
Mnemonic : KNJT

HIGH DEFINITION INDUCTION TOOL

Diameter : 3.62"  
Length : 27.13'  
Weight : 415 lbs  
Series : 1515XA  
Mnemonic : HDIL  
Measure Point: 13.91': SP MP  
Measure Point: 7.44': XMTR MP

BULL PLUG 3 3/8

TOTAL LENGTH: 73.88'  
TOTAL WEIGHT: 1374 lbs  
MAX DIAMETER: 0'4.88"

LSD MP 34.54'  
SSD MP 34.14'


SP MP 14.19'

XMTR MP 7.72'

0.00'





	COMPANY	LARAMIE ENERGY		FILE NO:	
	WELL	BRUTON 30-04W			
	FIELD	VEGA		API NO:	
	COUNTY	MESA	STATE	COLORADO	05077104570000
LOCATION:		ELEVATIONS:			
LAT: 39.252566 N		KB 7542 FT			
LONG: 107.814245 W		DF			
SEC 30 TWP 9S RGE 93W		GL 7512 FT			
		DATE		09-SEP-2017	