BAKER HUGHES

HIGH DEFINITION INDUCTION LOG SM
COMPENSATED DENSILOG SM
COMPENSATED NEUTRON LOG
GAMMA RAY LOG
CALIPER LOG

LOGS

FILE NO: CH106355

API NO: 05045226020000

COMPANY WPX ENERGY

WELL FEDERAL RU 413-6

FIELD RULISON

COUNTY GARFIELD STATE CO

Ver. 4.06

6 7S 93W

RU 13-6 PAD

H&P 318

LOCATION:

SHL: 1936' FSL & 521' FWL

BHL: 703' FSL & 1268' FWL

SEC 6 TWP 7S RGE 93W

OTHER SERVICES

BHP

PERMANENT DATUM GL ELEVATION 6985 FT

LOG MEASURED FROM KB 24 FT ABOVE P.D.

DRILL. MEAS. FROM KB

ELEVATIONS:

KB 7009 FT

DF

GL 6895 FT

DATE		20-Mar-2016			
RUN	TRIP	1	1		
SERVICE ORDER		US106355			
DEPTH DRILLER		9299 FT			
DEPTH LOGGER		9300 FT			
BOTTOM LOGGED INTERVAL		9299 FT			
TOP LOGGED INTERVAL		24 FT			
CASING DRILLER		9.625 IN @ 1130 FT		@	
CASING LOGGER		1129 FT			
BIT SIZE		8.75 IN			
TYPE OF FLUID IN HOLE		LSND			
DENSITY	VISCOSITY	10.9 LB/G	65 CP		
PH	FLUID LOSS	8.5	5 C3		
SOURCE OF SAMPLE		MUD TANK			
RM AT MEAS. TEMP.		0.74 OHMM @ 65.21 DEGF		@	
RMF AT MEAS. TEMP.		0.55 OHMM @ 65.21 DEGF		@	
RMC AT MEAS. TEMP.		0.925 OHMM @ 65.21 DEGF		@	
SOURCE OF RMF	RMC	CALCULATED	CALCULATED		
RM AT BHT		0.46 OHMM @ 200 DEGF		@	
TIME SINCE CIRCULATION		8.5 HOURS			
MAX. RECORDED TEMP.		200 DEGF			
EQUIP. NO.	LOCATION	HL-6670	GRAND JCT.		
RECORDED BY		T. NEWELL			
WITNESSED BY		BEAUDE OAKS			

CASING RECORD

SIZE	WEIGHT	GRADE	FROM	TO
9.625 IN	32.3 LB/F		24 FT	1130 FT

BOREHOLE RECORD

BIT SIZE	FROM	TO
8.75 IN	1130 FT	9299 FT

REMARKS

RUN 1 TRIP 1: BVOL AND CVOL CALCULATED IN CUBIC FEET
CVOL CALCULATED USING PROPOSED 4.5" CASING
CALIPER VERIFIED IN CASING

RHO MATRIX: 2.68 G/CC
RHO FLUID: 1.00 G/CC

CN MATRIX: SANDSTONE
CN RAN DECENTRALIZED

HDIL RAN WITH STANDOFFS
ABC TO CALCULATE: MUD CONDUCTIVITY

THANK YOU FOR CHOOSING BAKER HUGHES ... THE BEST CHOICE!

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	SWIVEL	3950XA	10102176	FREE
1	1	TTMA	3980XA	10121559	FREE
1	1	COMM REMOTE	3518FB	10137522	FREE
1	1	GR	3518EB	10139870	FREE
1	1	CN	2436XA	10522099	DECENTRALIZED
1	1	ZDL	2223XA	10123024	PAD DEVICE
1	1	KNUCKLE	3930XA/3930XA	10139400/10087279	FREE
1	1	HDIL	1530XA	10103013	STOODOFF

MAIN LOG 2"/100FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013
Updates: 1 Patches: 9

Plotted: Sun Mar 20 10:24:29 2016

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/0H106355/n970a03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1022.750 ft BOTTOM DEPTH: 9310.496 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR MED RES	FILTER ()	medium (1)		TOP	BOTTOM
CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
SP-SPDH	FILTER ()	medium (1)		"	"

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
BIT SIZE	BIT SIZE	8.750	in	TOP	BOTTOM
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (mbh*)	8.750	in	"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	65.2	degF	"	"
	MUD SAMPLE RES	0.742	ohm.m	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
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	"	"

ACCELERATION PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
ACCEL CORR SWITCH	ACCEL DEPTH CORR	CORRECTION ON		TOP	BOTTOM

HDIL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORRECTION	ON		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		"	"
	ABC to CALCULATE	MUD CONDUCTIVITY		"	"
	STANDOFF	1.50	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

CURVE DESCRIPTION REPORT

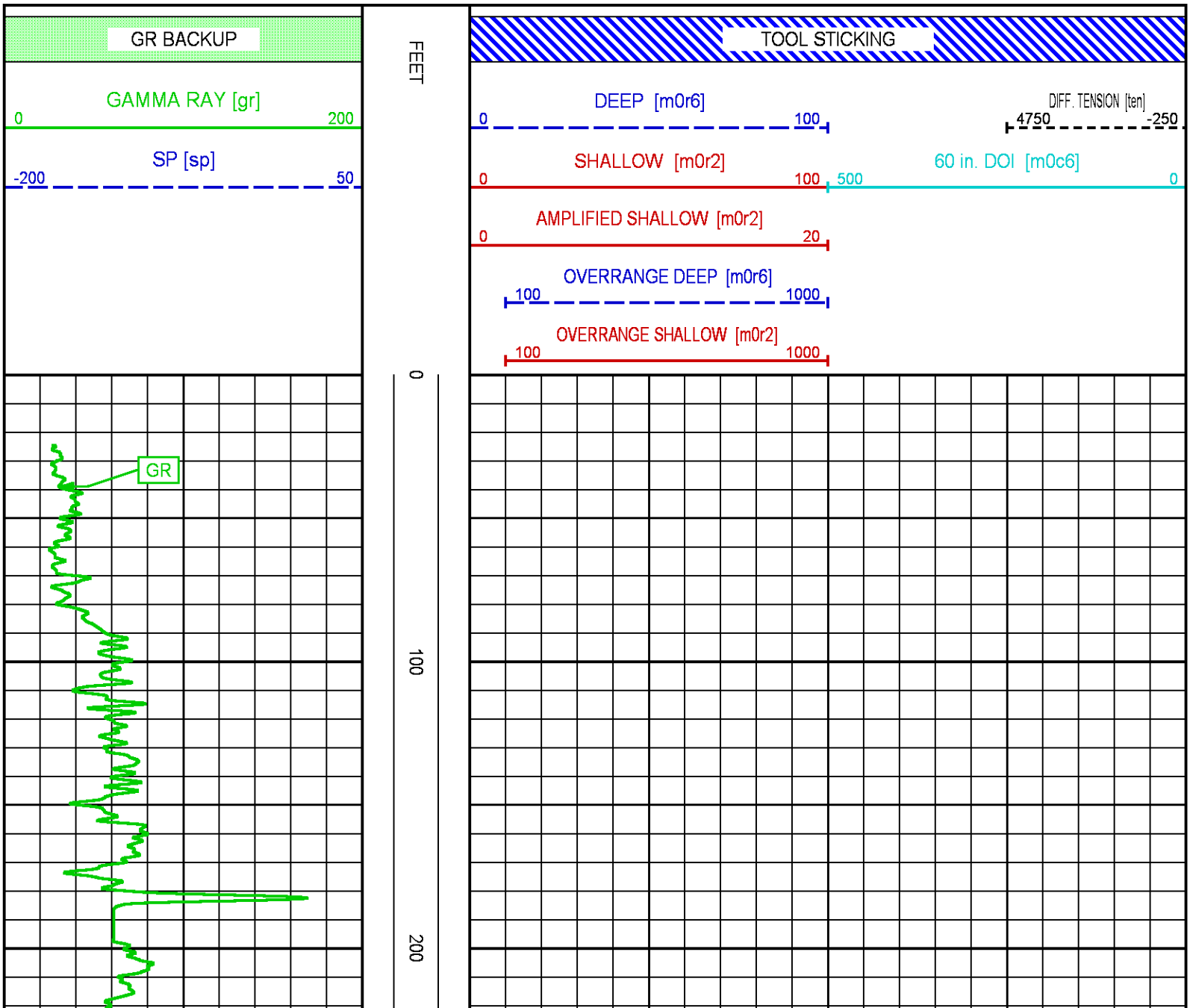
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:GR	Mar 20 06:02:16 2016	GAMMA RAY
F1:M0C6	Mar 20 06:02:16 2016	FOCUSED CONDUCTIVITY, 60-INCH DOI
F1:M0R2	Mar 20 06:02:16 2016	TRUE FOCUSED RESISTIVITY FOR HDIL, 20-INCH DOI
F1:M0R6	Mar 20 06:02:16 2016	TRUE FOCUSED RESISTIVITY FOR HDIL, 60-INCH DOI
F1:SP	Mar 20 06:02:16 2016	SPONTANEOUS POTENTIAL
F1:TEN	Mar 20 06:02:16 2016	DIFFERENTIAL TENSION

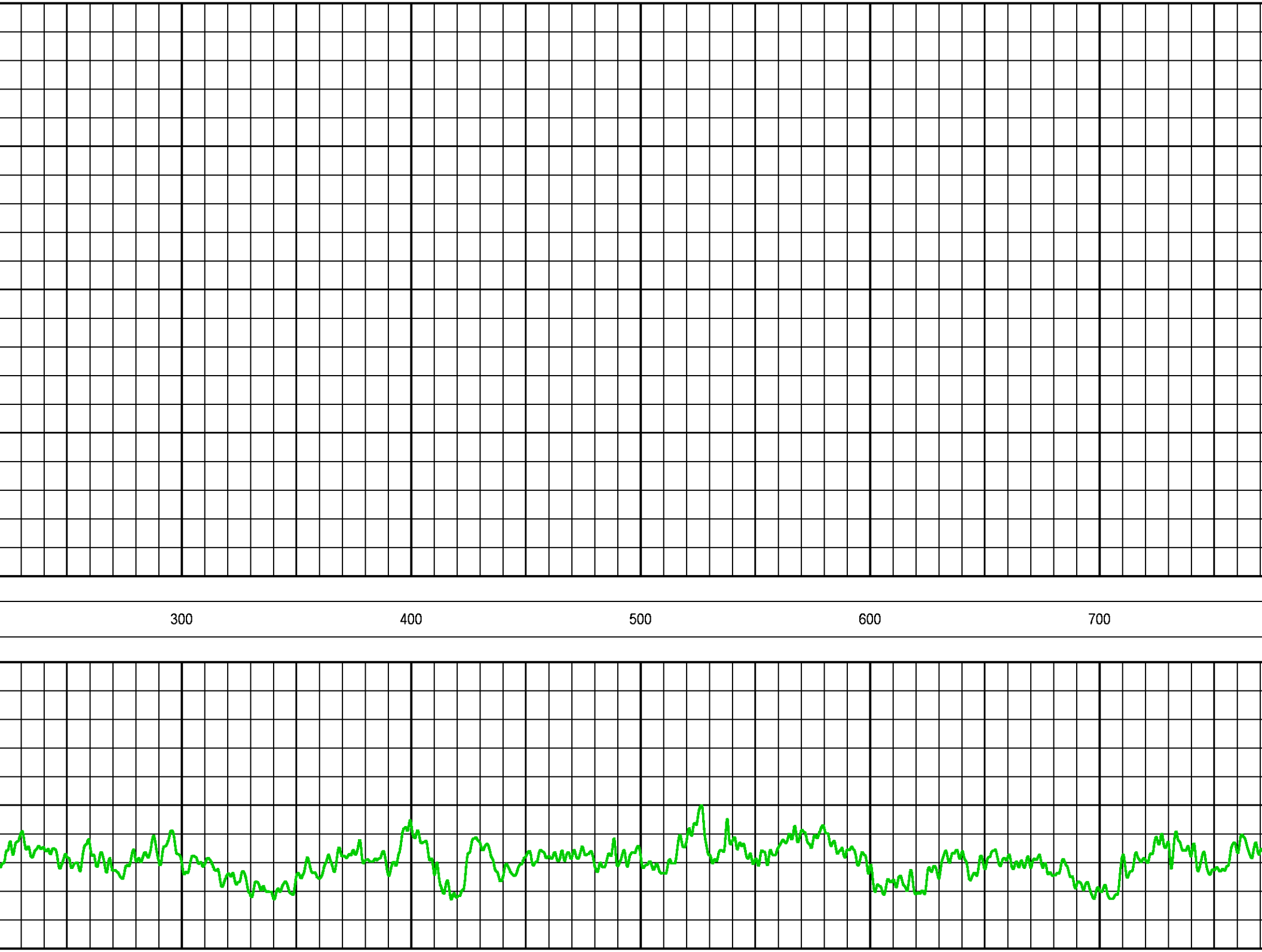
CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
GR	35.00	M0R2	2.75	SP	1.25		
M0C6	2.75	M0R6	2.75	TEN	0.00		

Presentation : cpu100:/dat1a/0H106355/WPX_2IN.fvpdf [2"/100' Scale]
Plot Interval : 0 - 9320 Feet

Data File 1 : F1 : cpu100:/dat1a/0H106355/413_MAIN.xtf
Created On : Mar 20 06:02:16 2016
Company : WPX ENERGY
Well : FEDERAL RU 413-6
Field : RULISON
File Interval : 0 - 10430 Feet
OCT : n970a

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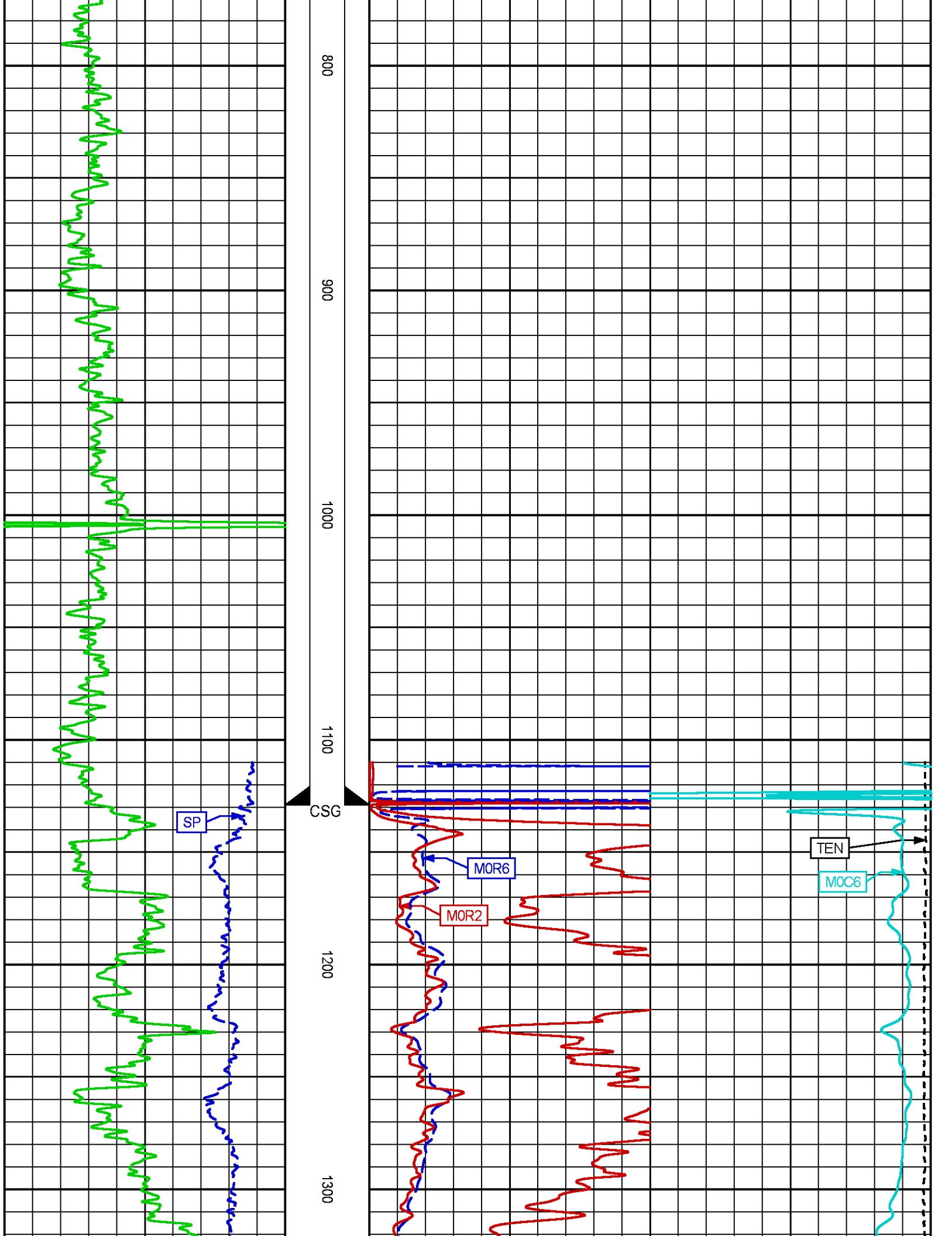
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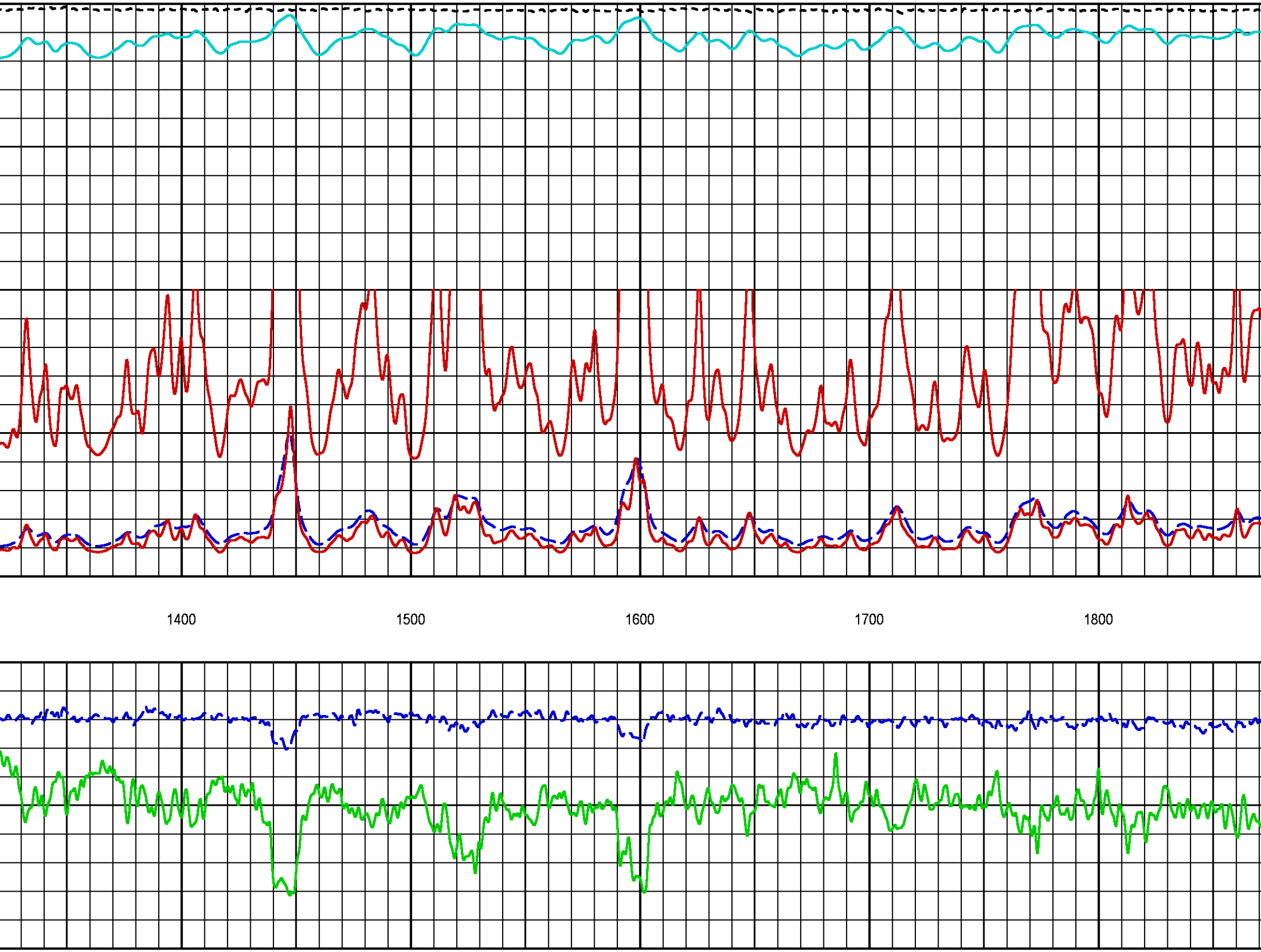
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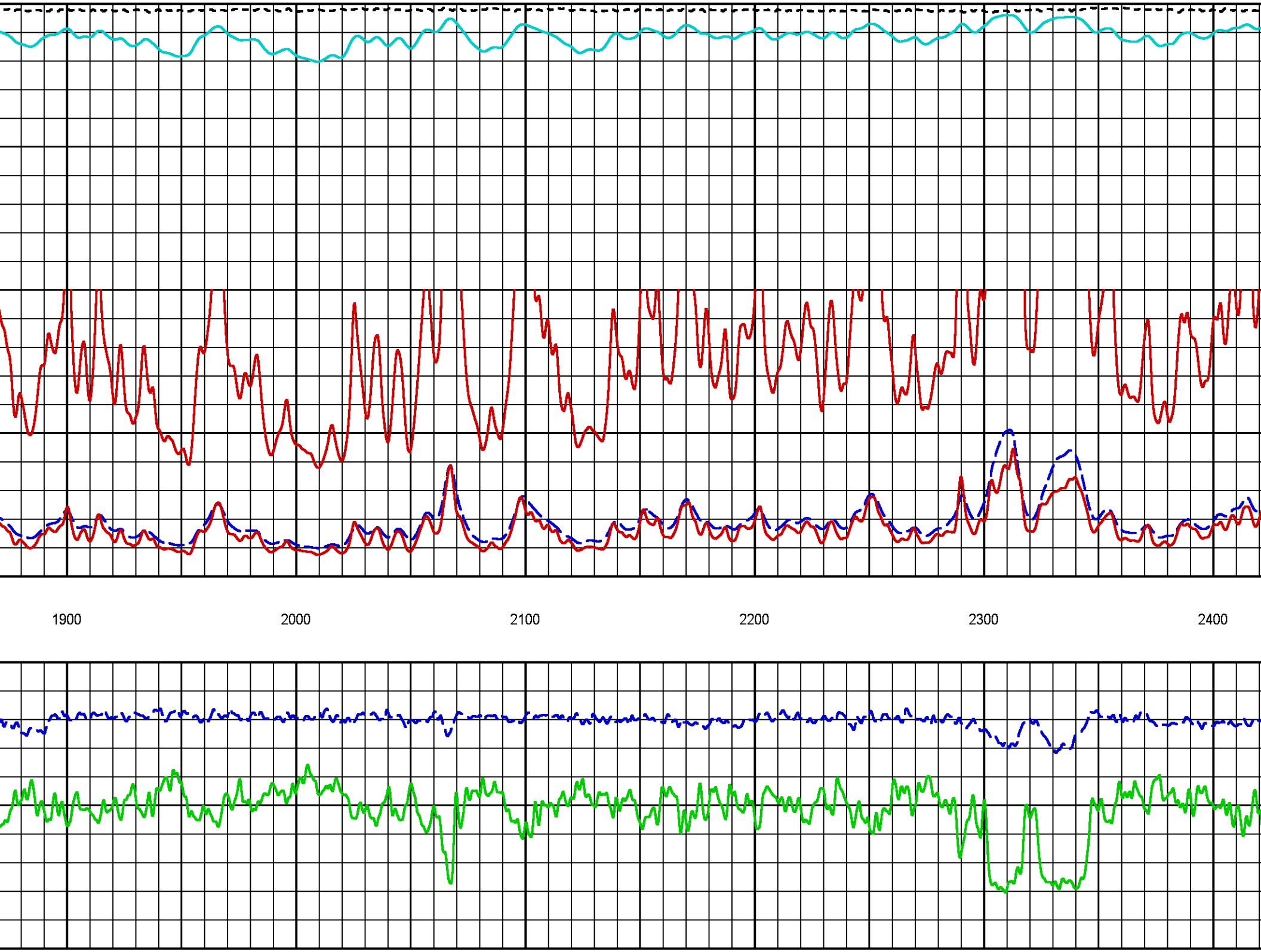
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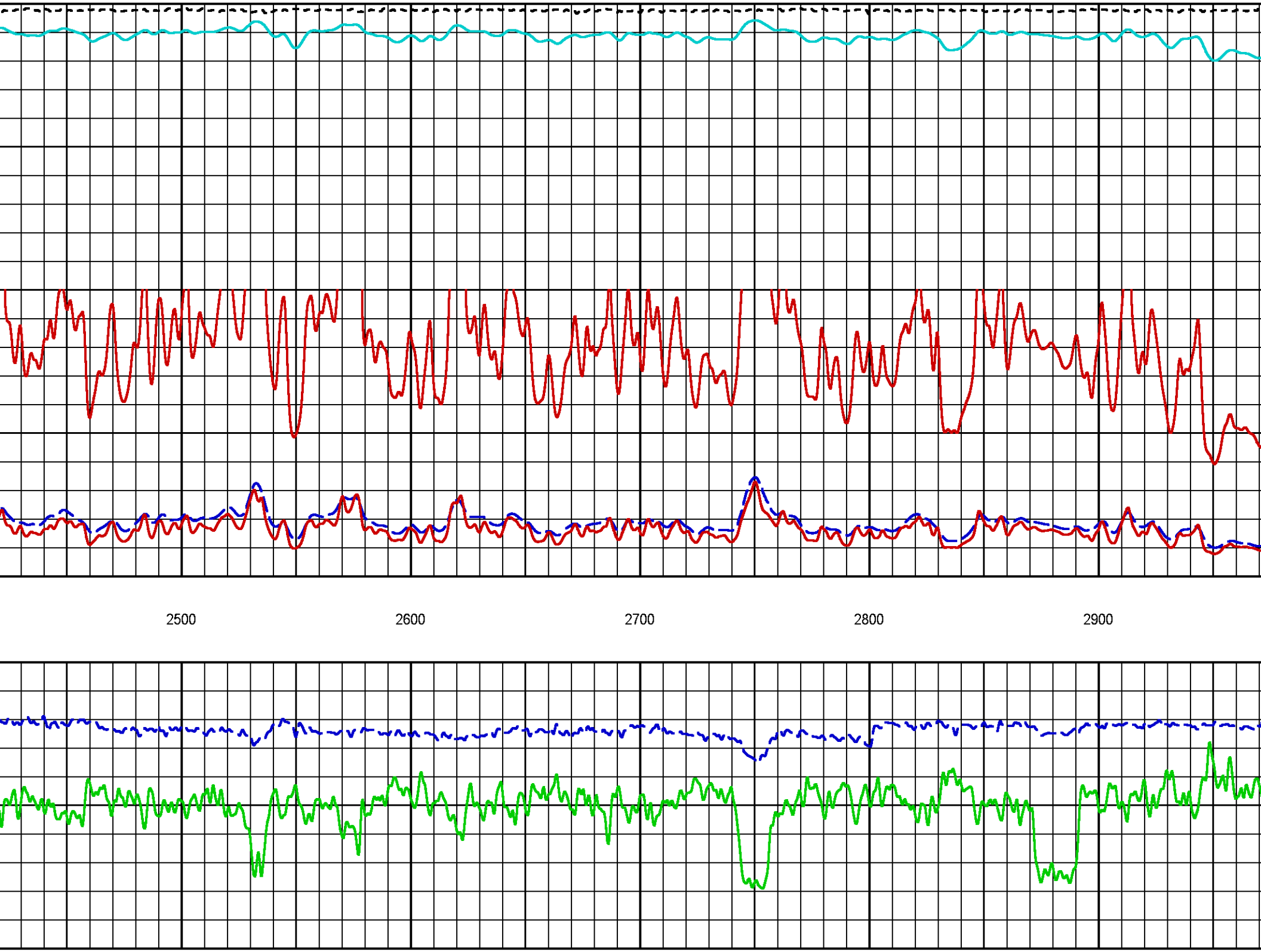
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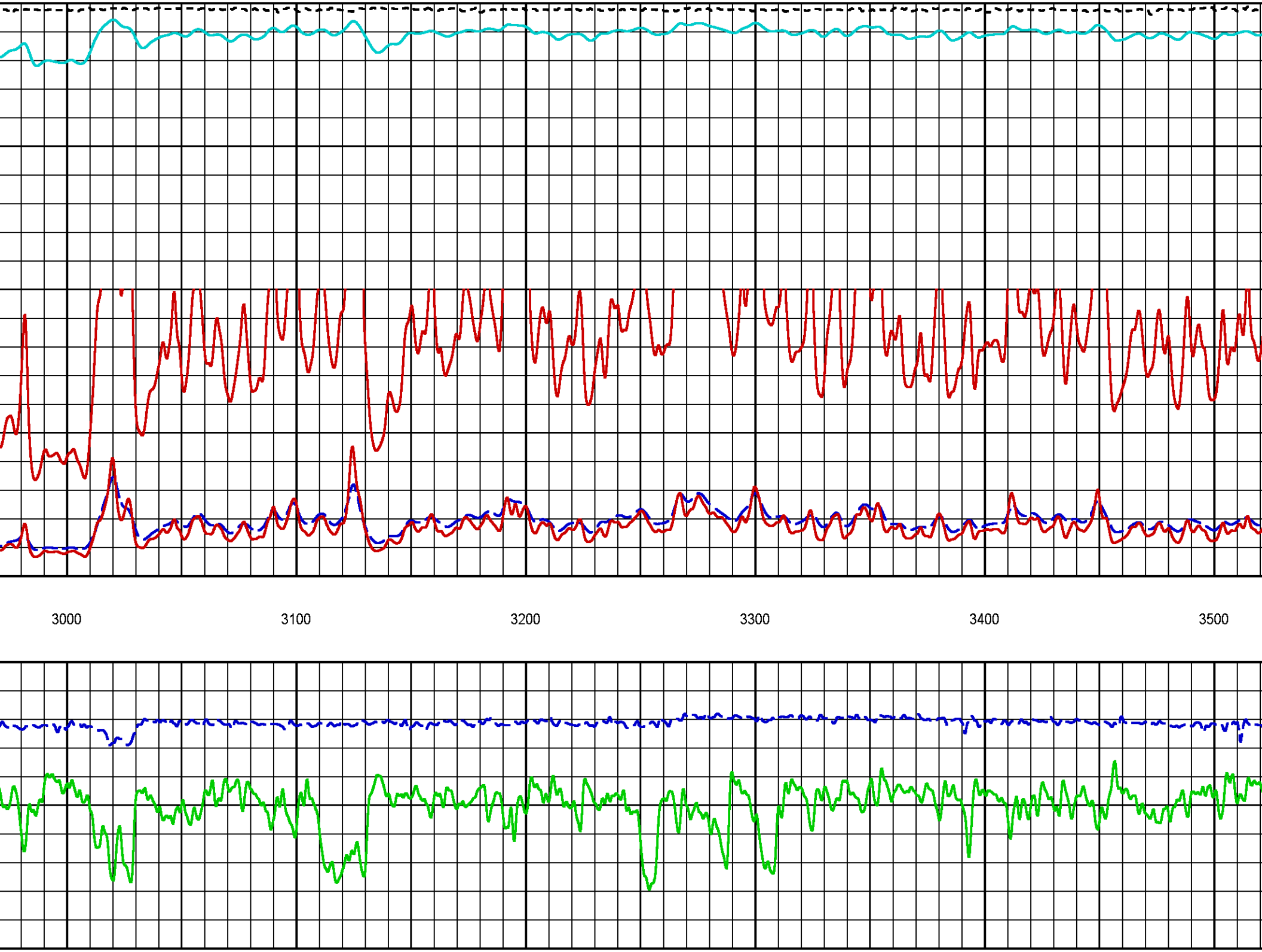
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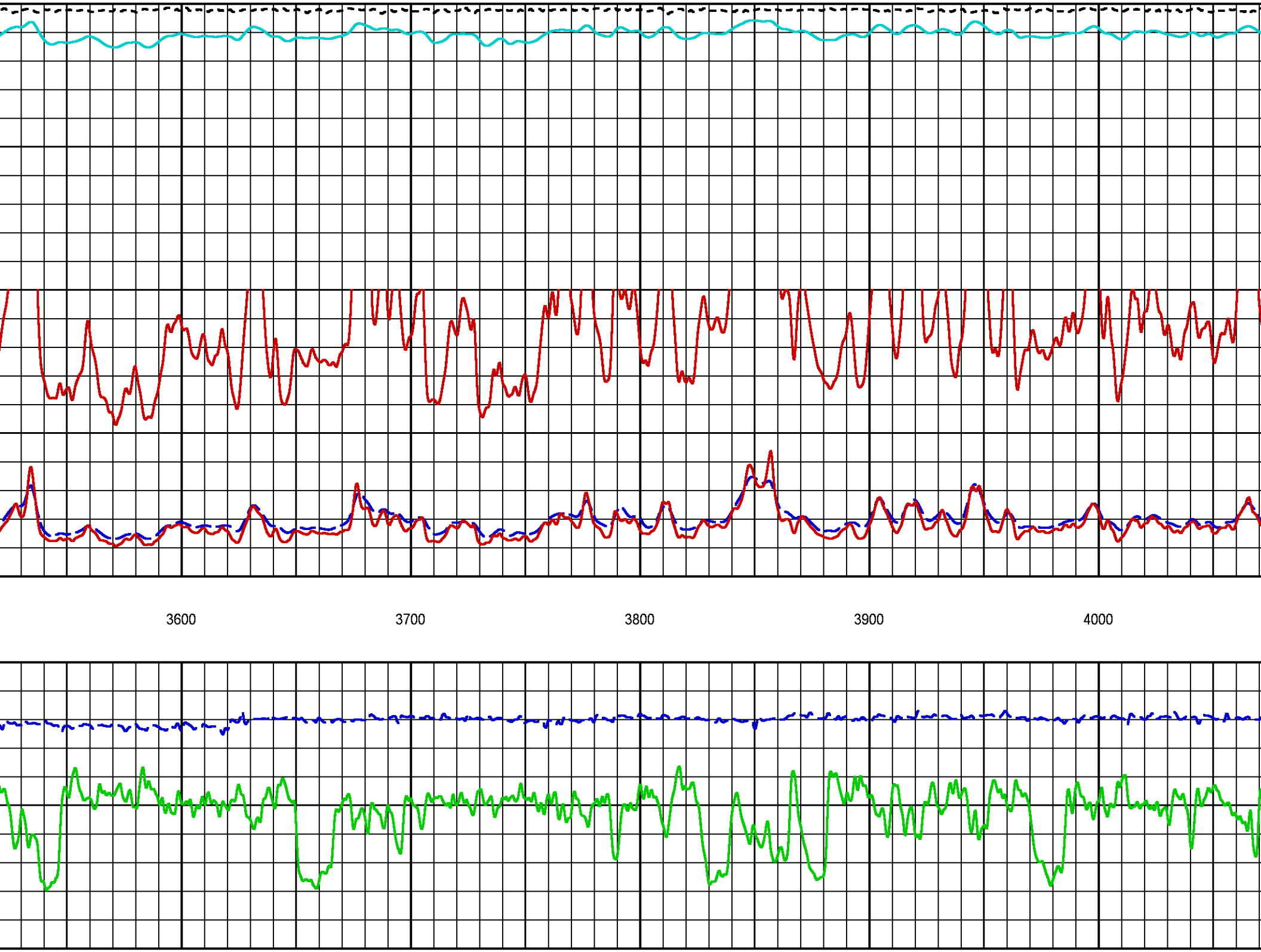
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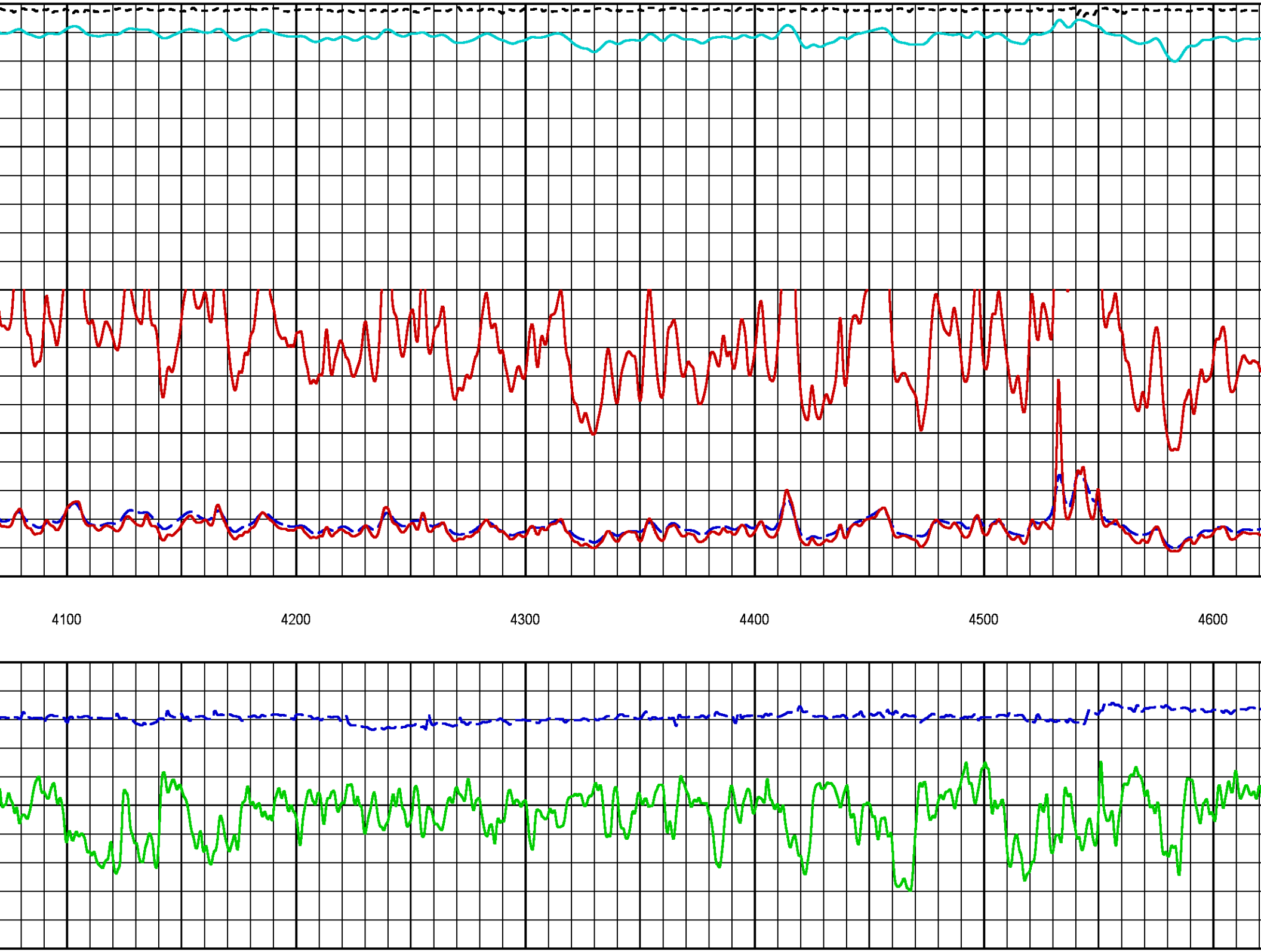
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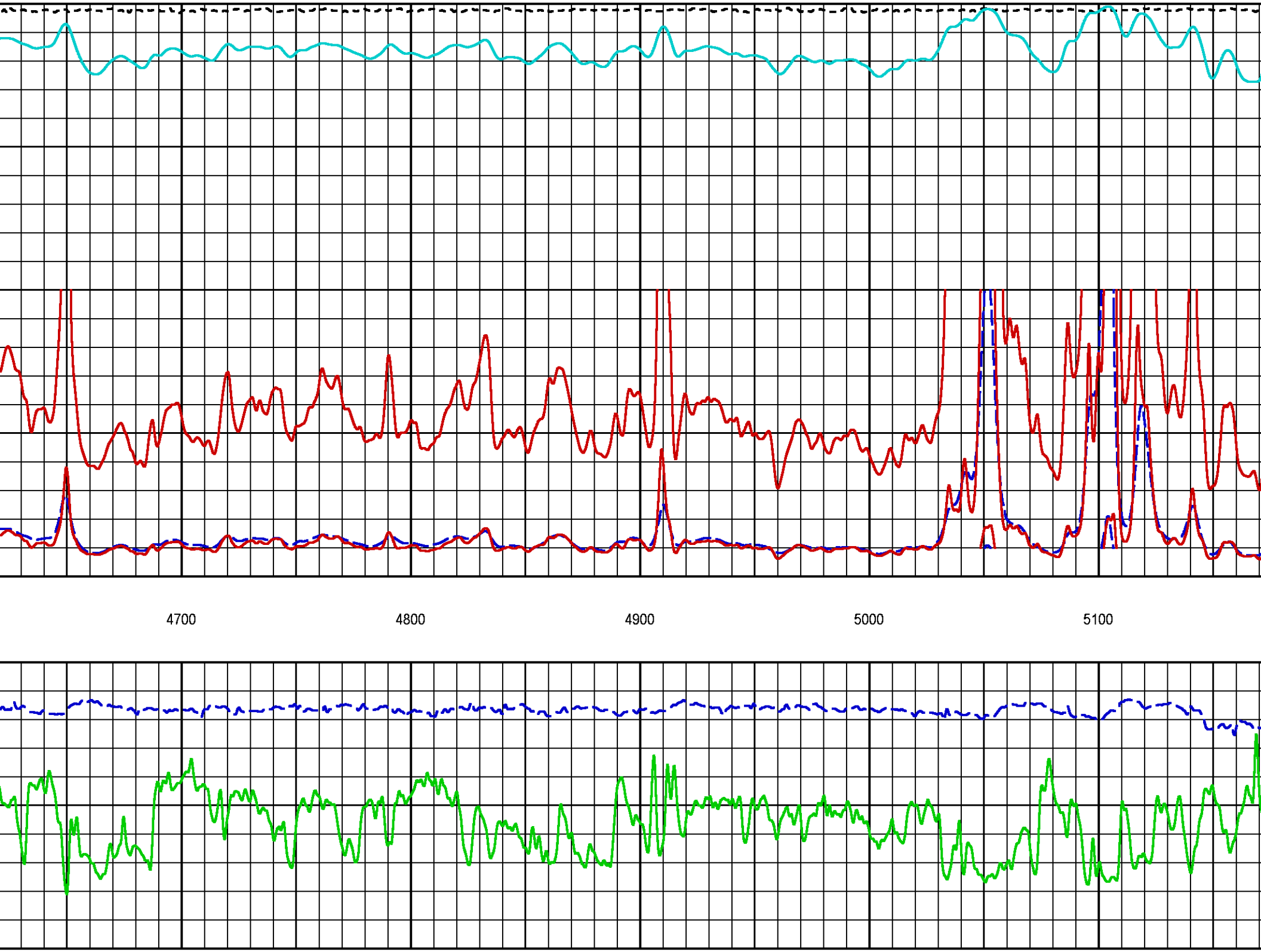
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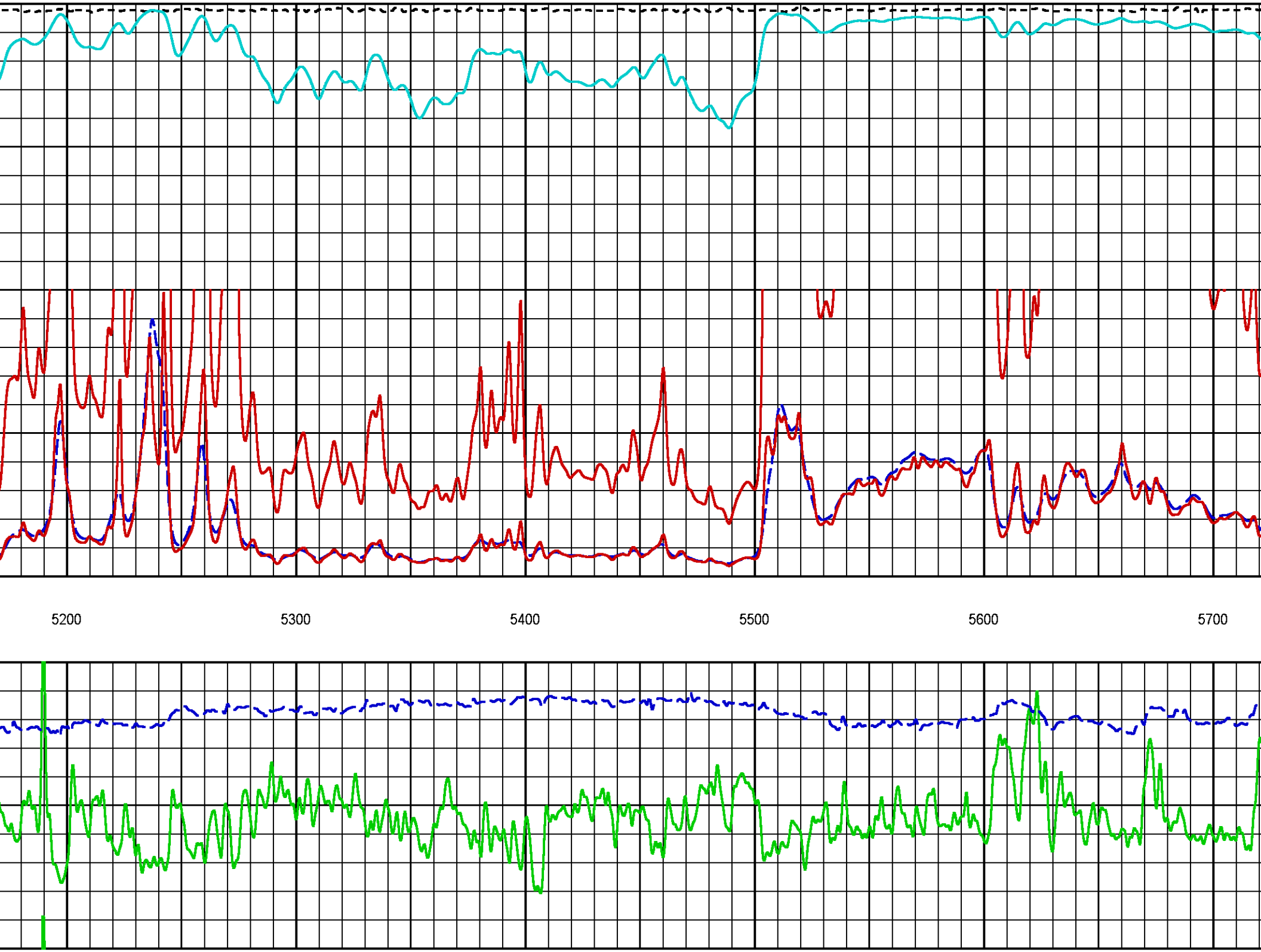
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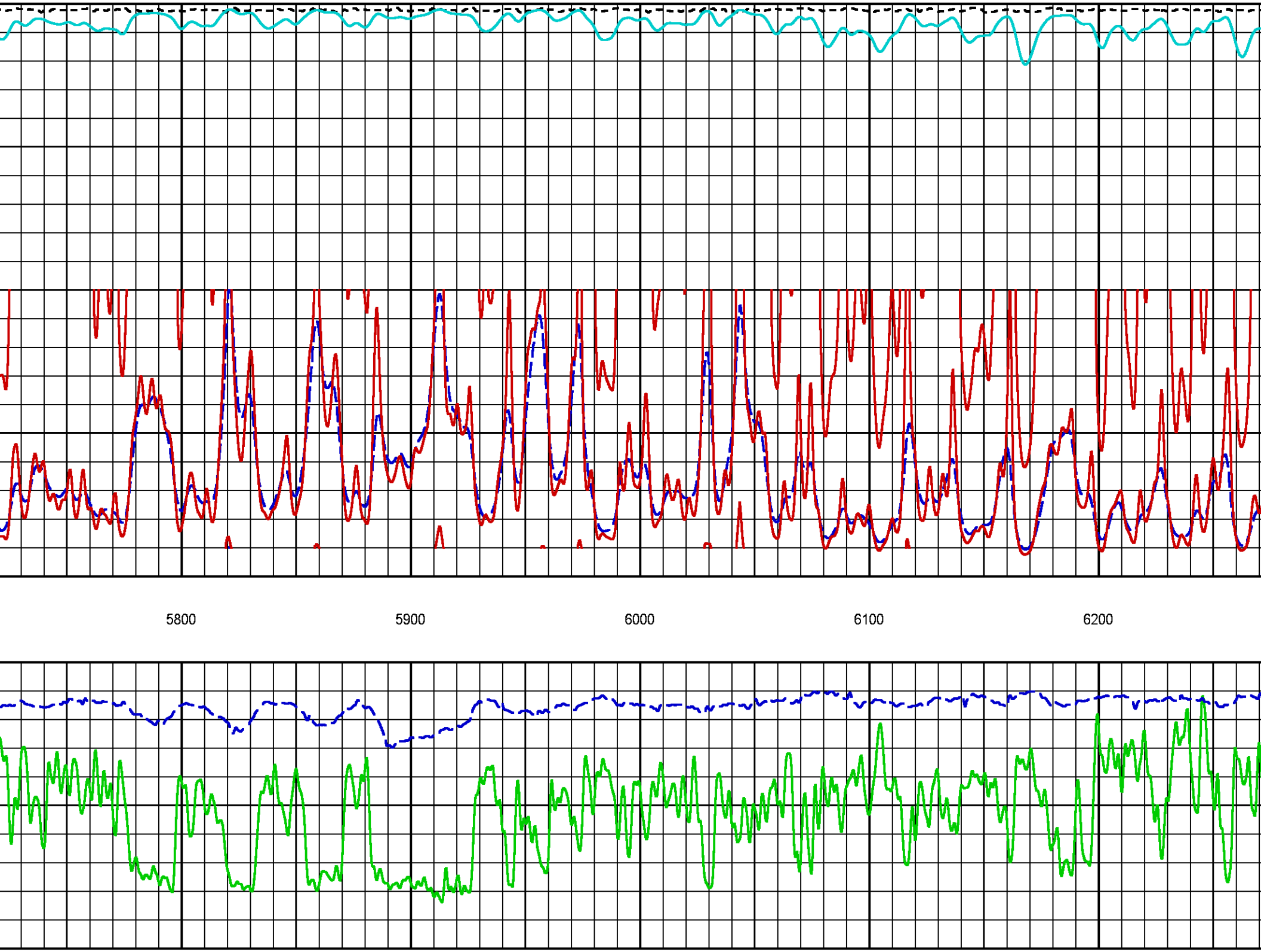
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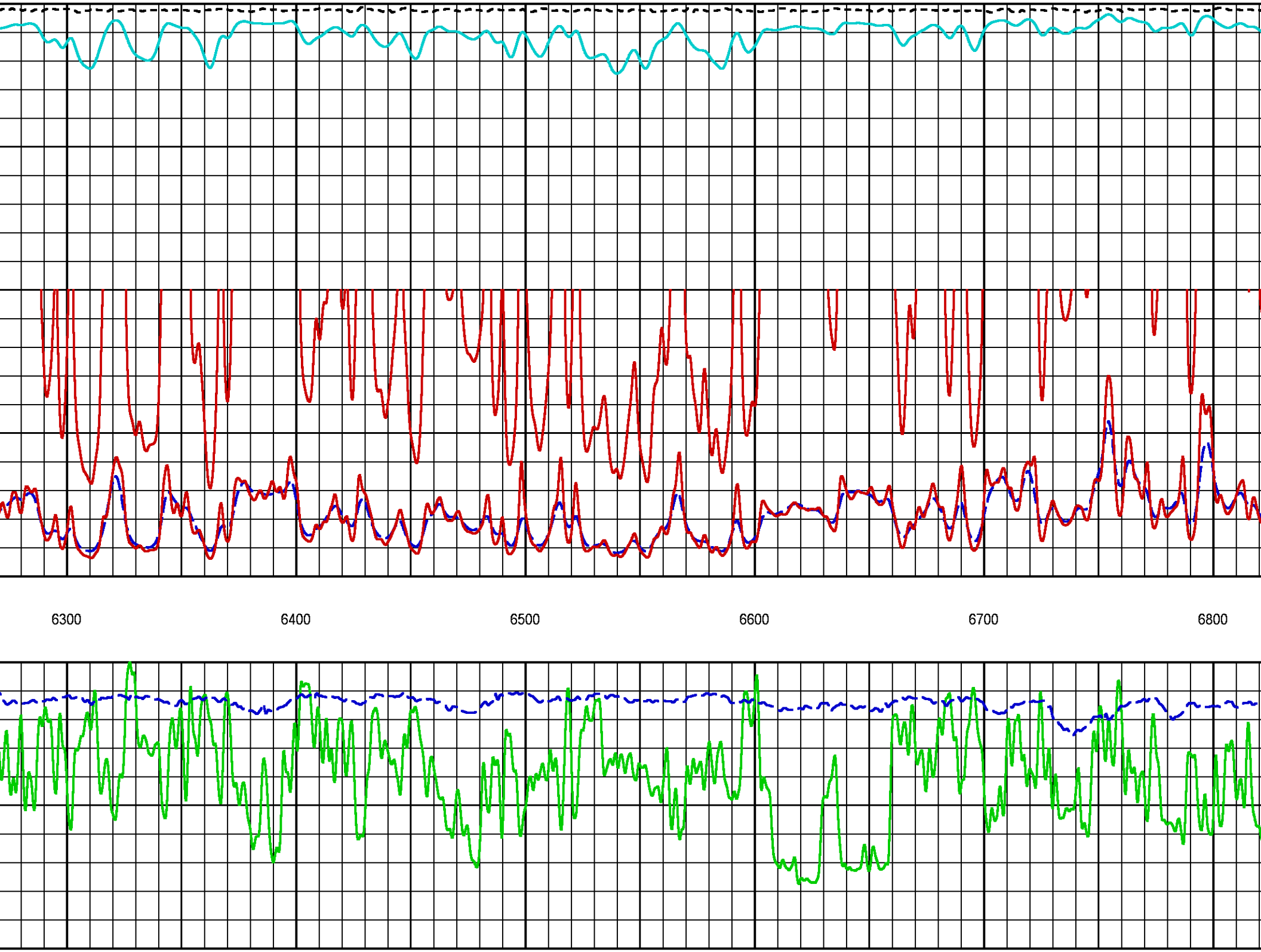
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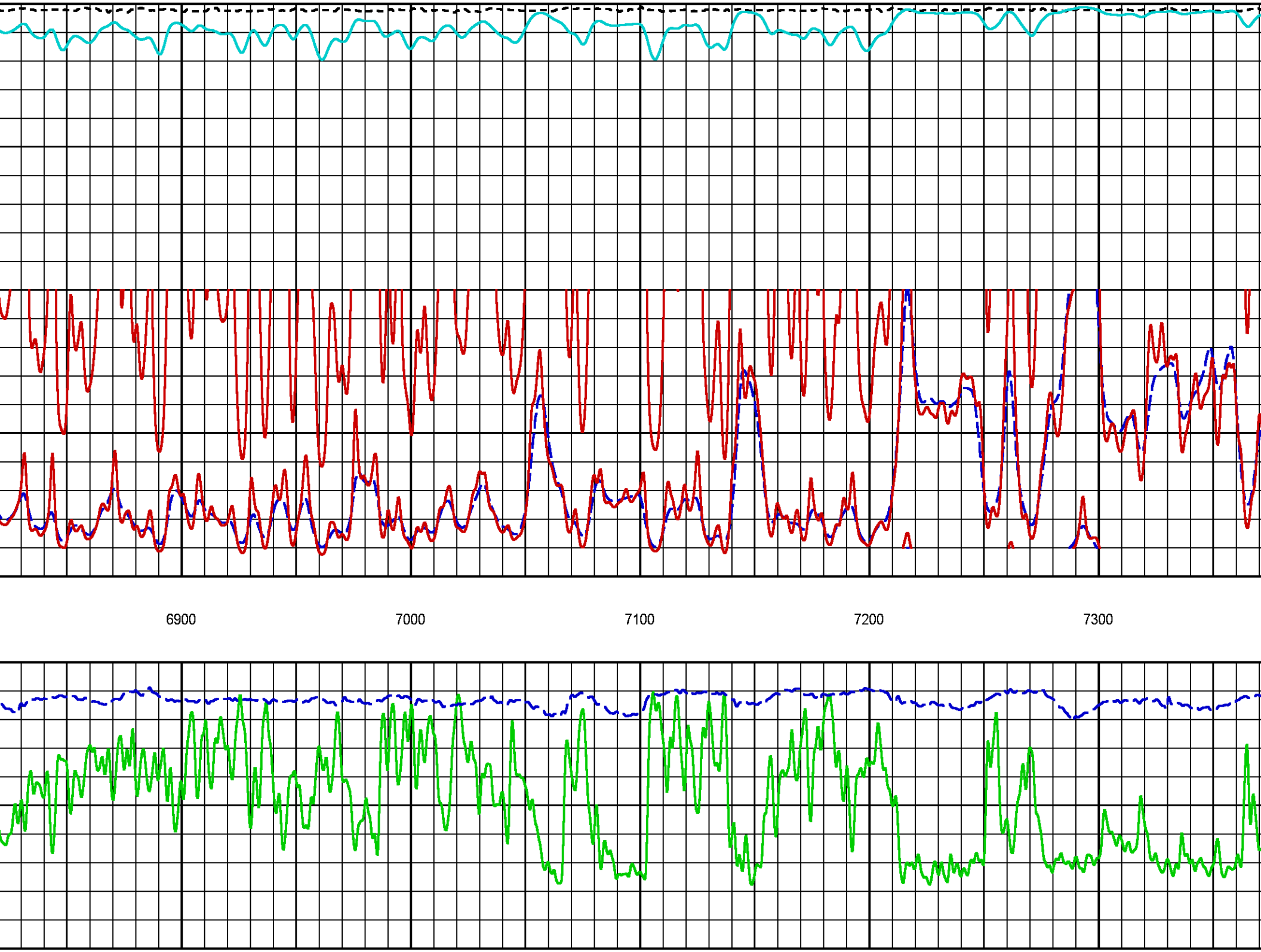
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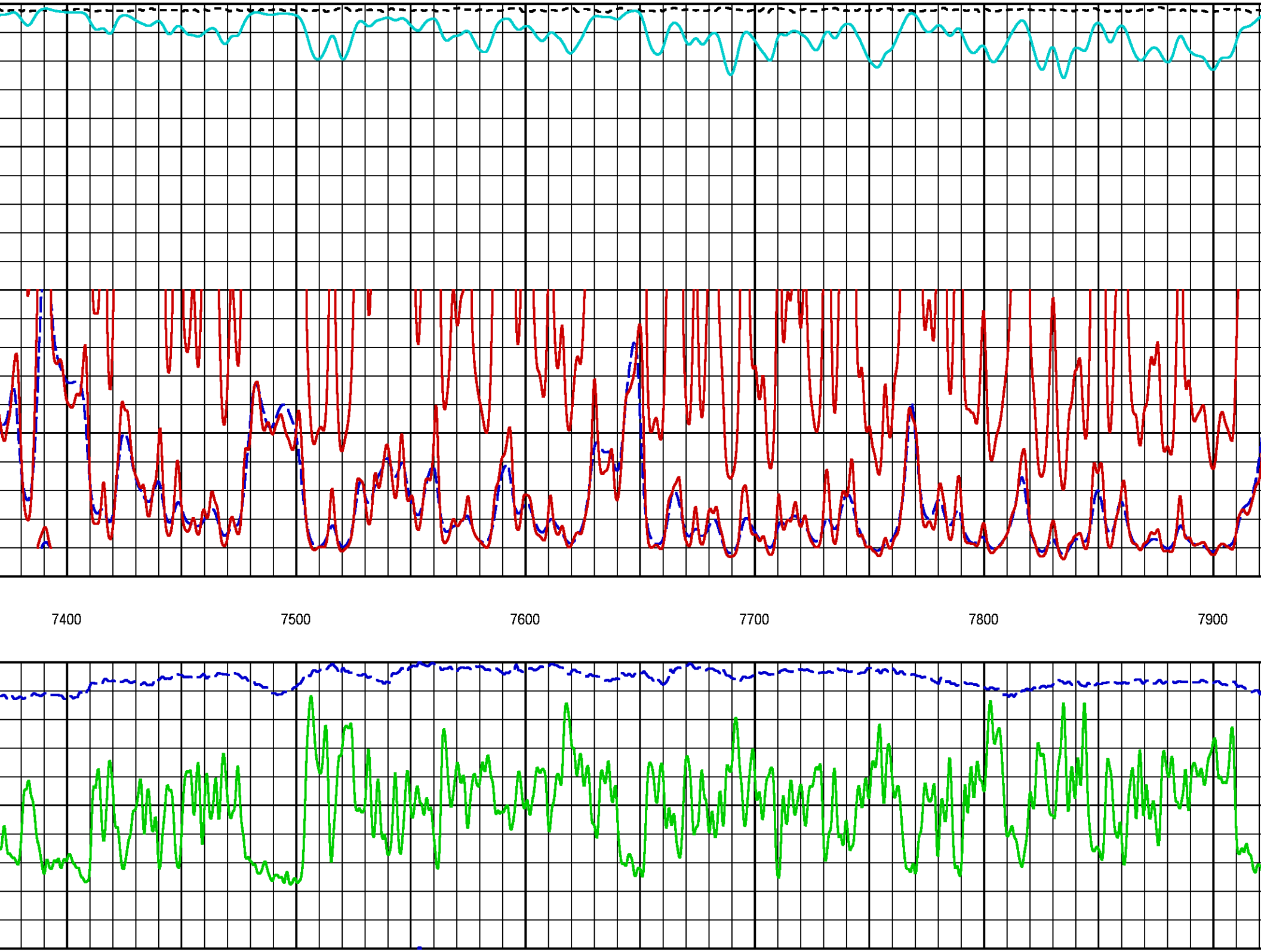
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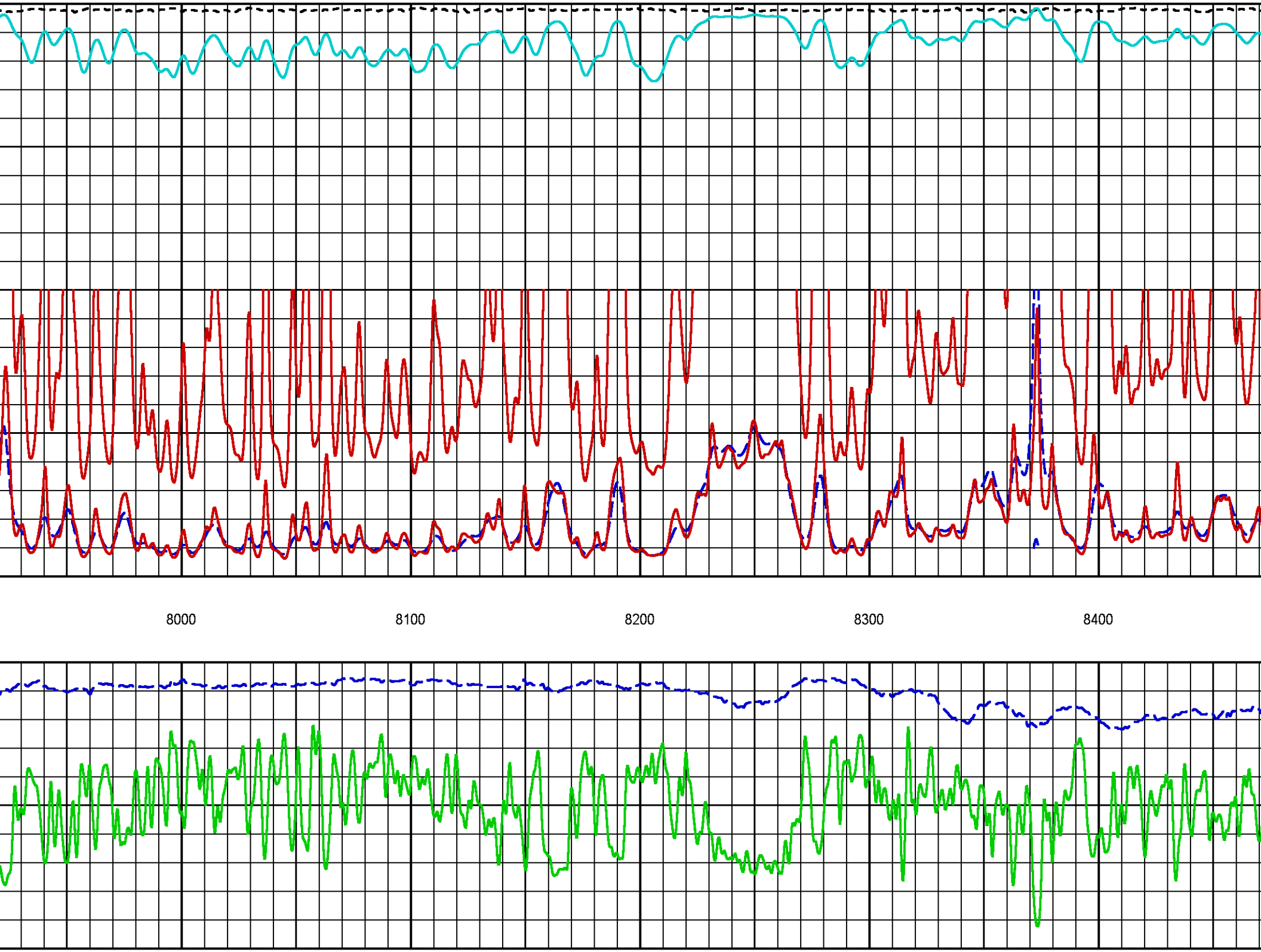
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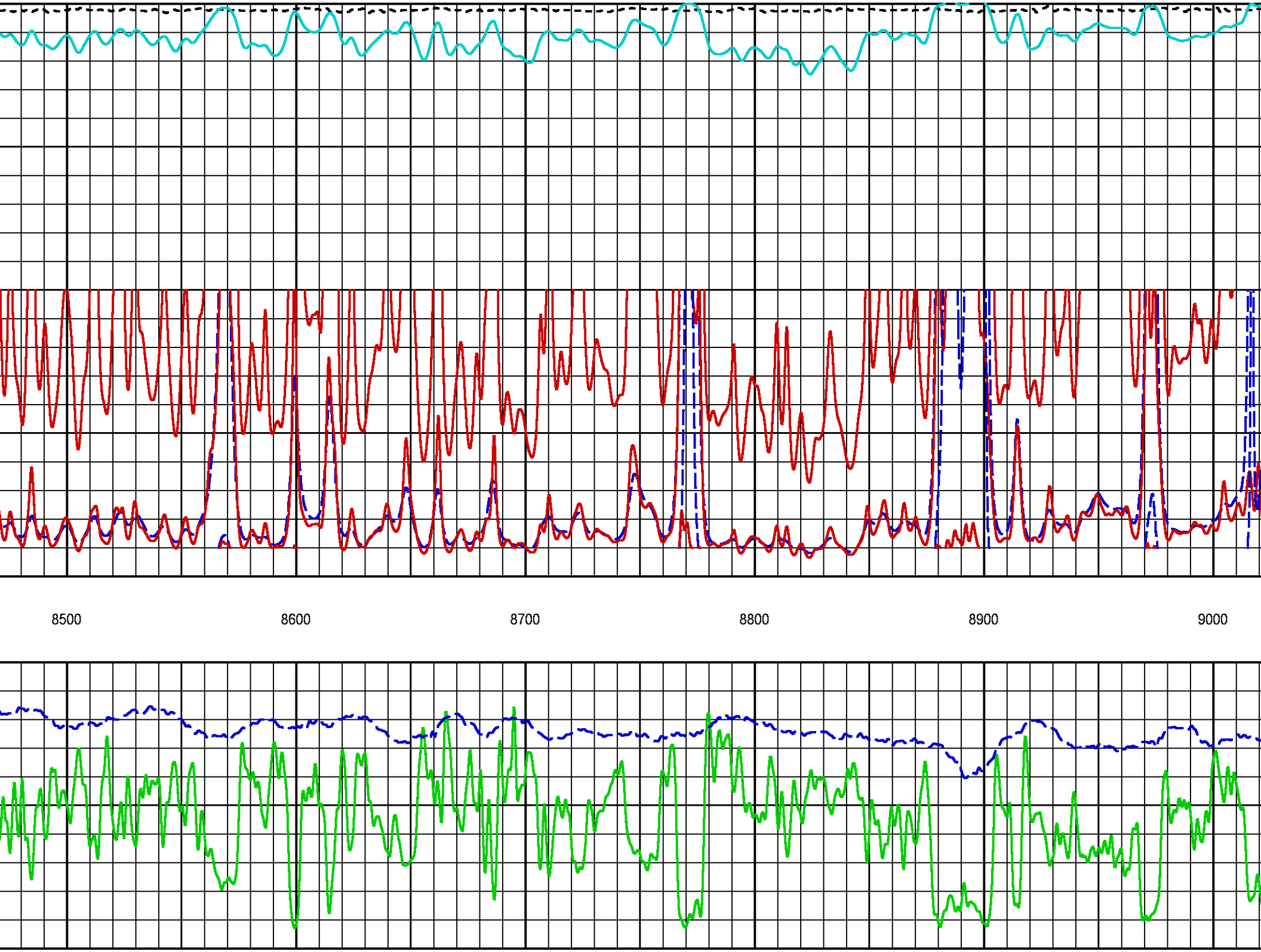
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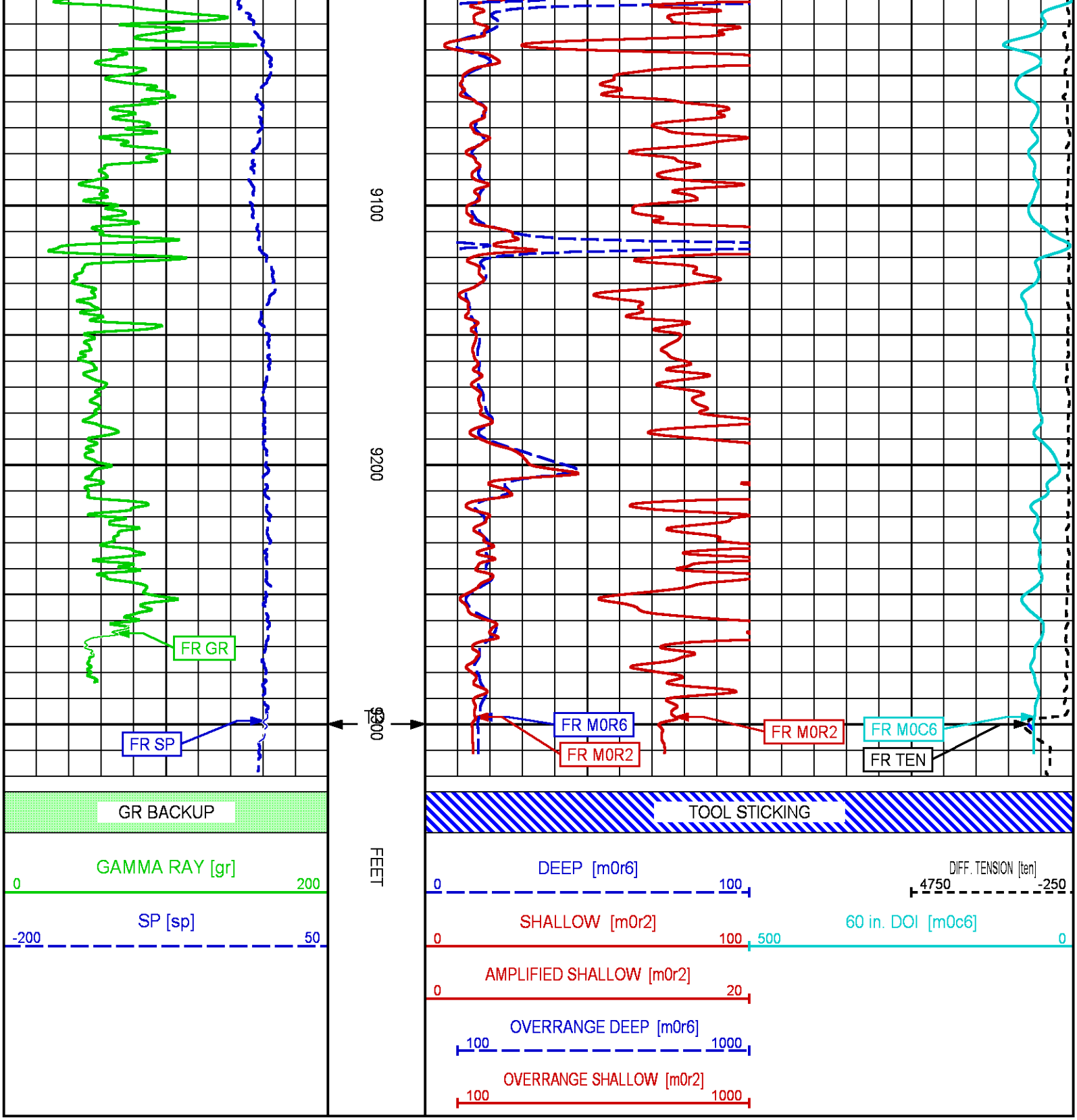


MAIN LOG 5"/100FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013
Updates: 1 Patches: 9

Plotted: Sun Mar 20 10:12:46 2016

Plotted: Sun Mar 20 10:12:46 2016

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/0H106355/n970a03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1022.750 ft BOTTOM DEPTH: 9310.496 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR MED RES	FILTER ()	medium (1)		TOP	BOTTOM
CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
CN MED RES	FILTER ()	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)		"	"

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	8.750	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	8.750	in	"	"
	FIXED DIAMETER (mbh*)	8.750	in	"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	65.2	degF	"	"
	MUD SAMPLE RES	0.742	ohm.m	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
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	"	"

ACCELERATION PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
ACCEL CORR SWITCH	ACCEL DEPTH CORR	CORRECTION ON		TOP	BOTTOM

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CN MATRIX	2436 MATRIX	SANDSTONE		TOP	BOTTOM
CN BOREHOLE CORRECTION	SALINITY	2500	ppm	"	"
	BOREHOLE CORRECTION	ON		"	"
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)	
DENSITY POROSITY	Air Filled Borehole	NO		TOP	BOTTOM
	RHOmatrix	2.680	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"

HDIL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORRECTION	ON		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		"	"
	ABC to CALCULATE	MUD CONDUCTIVITY		"	"
	STANDOFF	1.50	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

CURVE DESCRIPTION REPORT

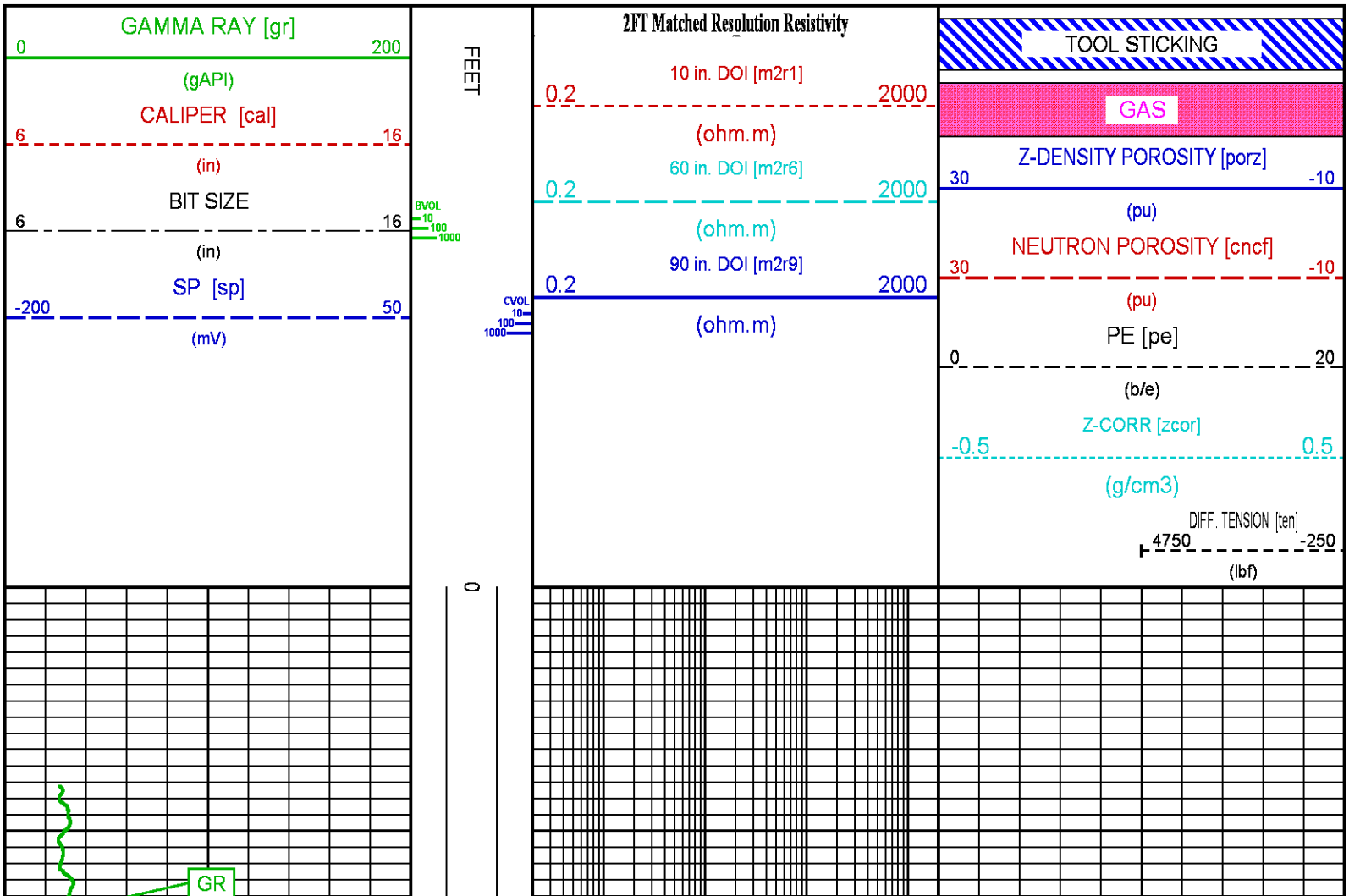
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 20 06:02:16 2016	BIT SIZE
F1:BVOL	Mar 20 06:02:16 2016	BOREHOLE VOLUME
F1:CAL	Mar 20 06:02:16 2016	CALIPER
F1:CNCF	Mar 20 06:02:16 2016	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Mar 20 06:02:16 2016	CEMENT VOLUME
F1:GR	Mar 20 06:02:16 2016	GAMMA RAY
F1:M2R1	Mar 20 06:02:16 2016	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R6	Mar 20 06:02:16 2016	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Mar 20 06:02:16 2016	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:PE	Mar 20 06:02:16 2016	PHOTO ELECTRIC CROSS-SECTION
F1:PORZ	Mar 20 06:02:16 2016	POROSITY FOR SELECTABLE MATRIX
F1:SP	Mar 20 06:02:16 2016	SPONTANEOUS POTENTIAL
F1:TEN	Mar 20 06:02:16 2016	DIFFERENTIAL TENSION
F1:ZCOR	Mar 20 06:02:16 2016	DENSITY CORRECTION

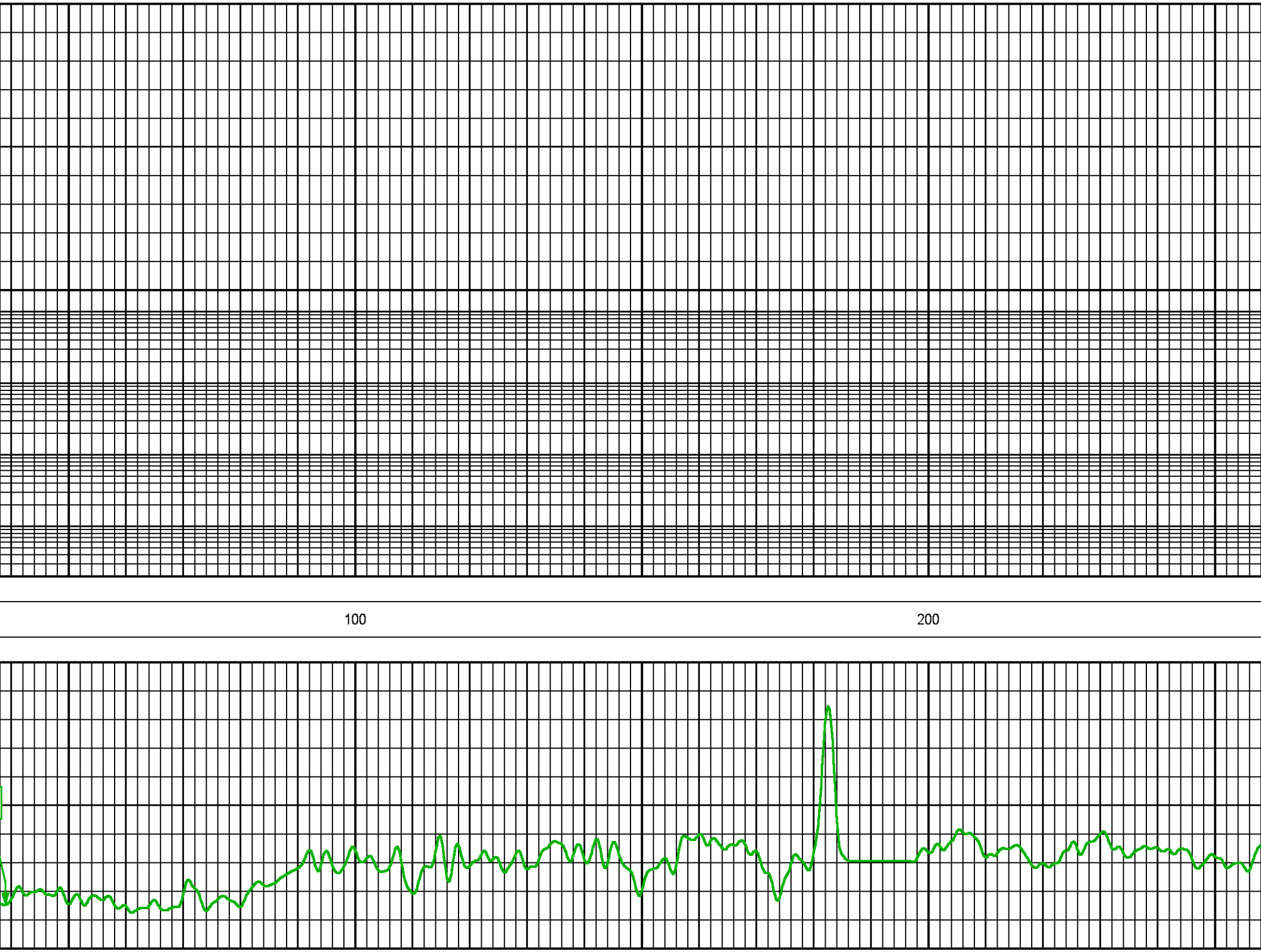
CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	GR	35.00	M2R9	2.75	SP	1.25
CAL	18.12	M2R1	2.75	PE	18.00	TEN	0.00
CNCF	27.38	M2R6	2.75	PORZ	18.00	ZCOR	18.00

Presentation : cpu100:/dat1a/0H106355/HDILZDLCN_MAIN.fvpdf [5"/100' Scale]
Plot Interval : 0 - 9310 Feet

Data File 1 : F1 : cpu100:/dat1a/0H106355/413_MAIN.xtf
Created On : Mar 20 06:02:16 2016
Company : WPX ENERGY
Well : FEDERAL RU 413-6
Field : RULISON
File Interval : 0 - 10430 Feet
OCT : n970a

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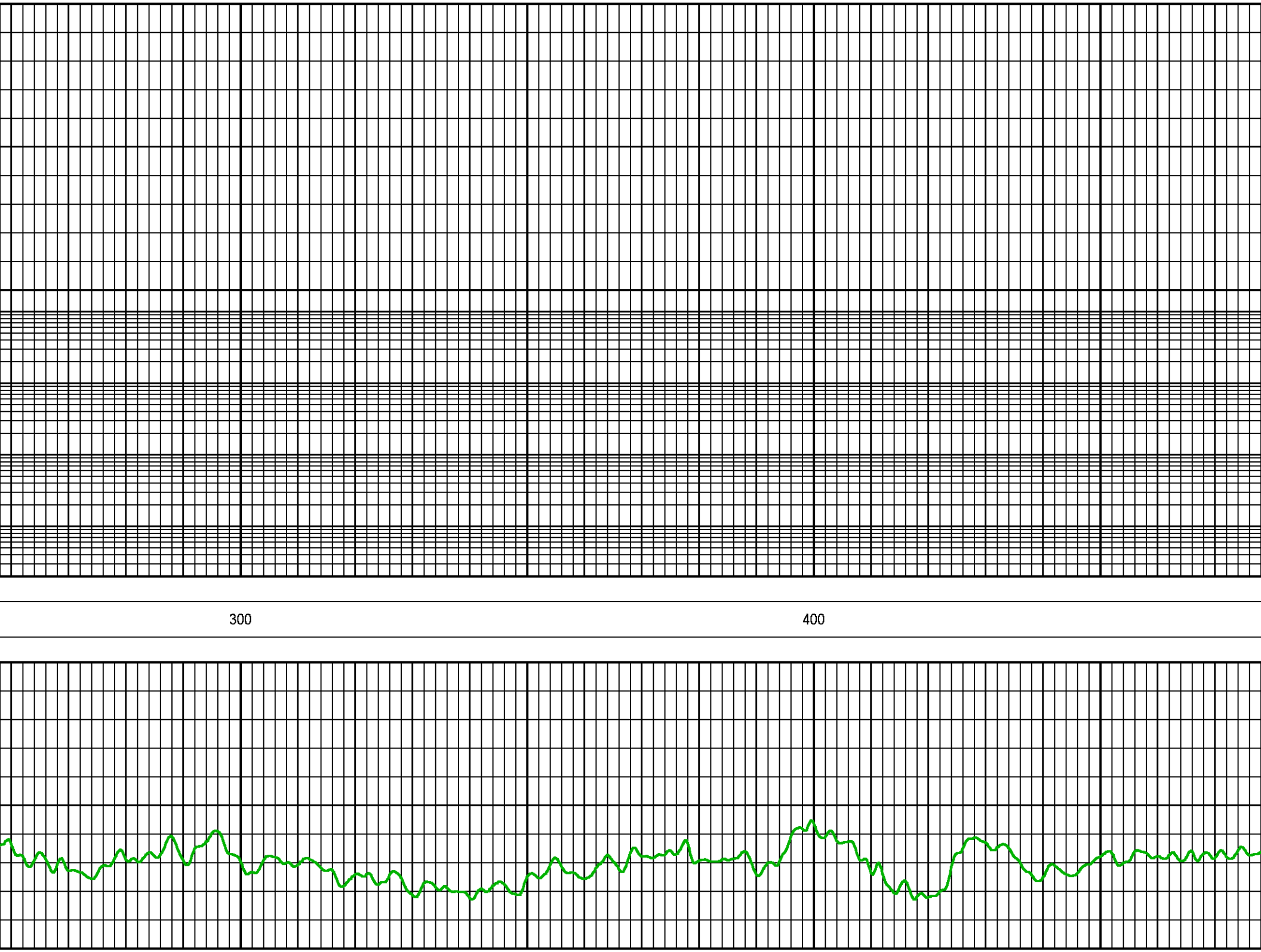
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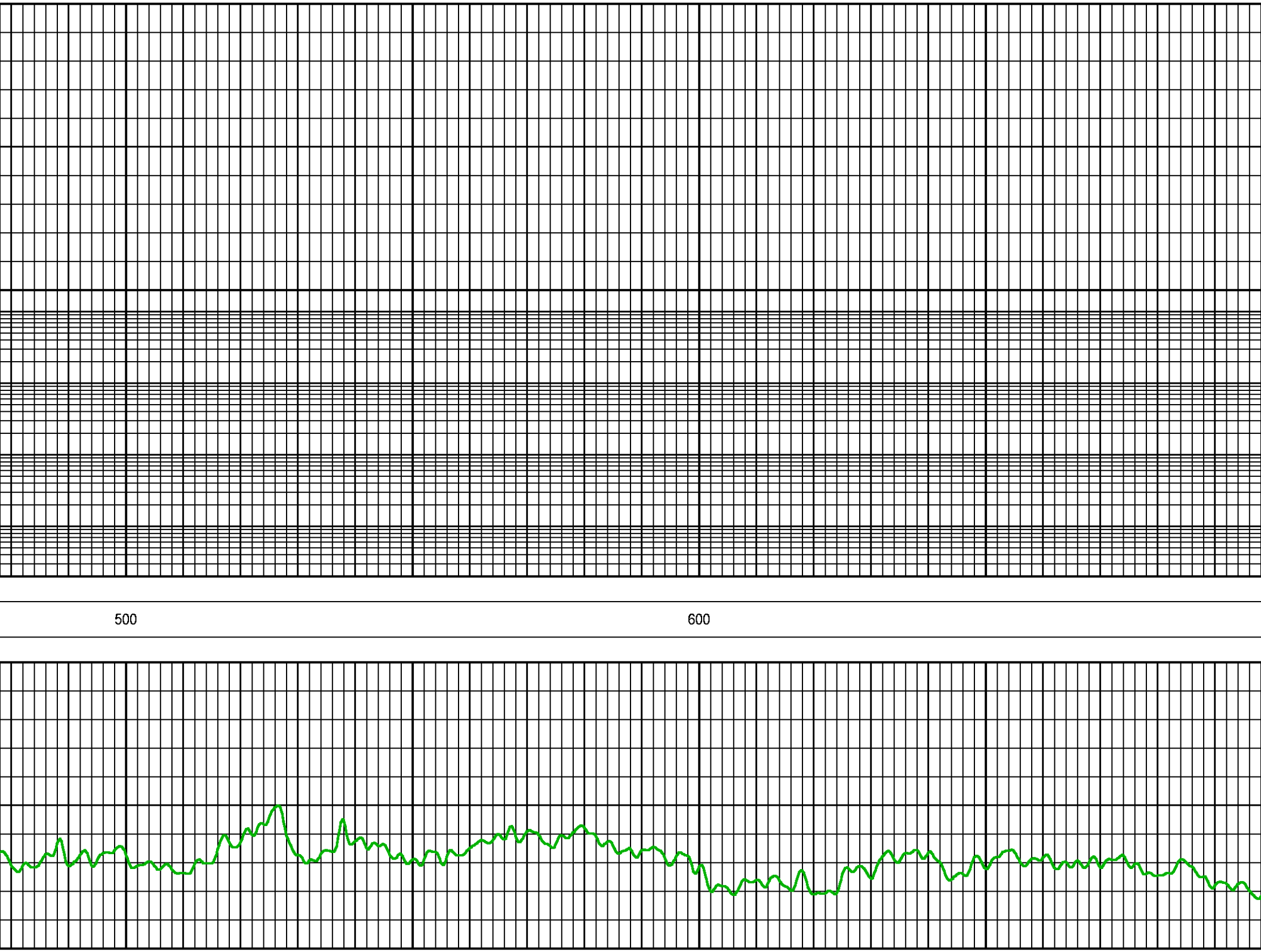
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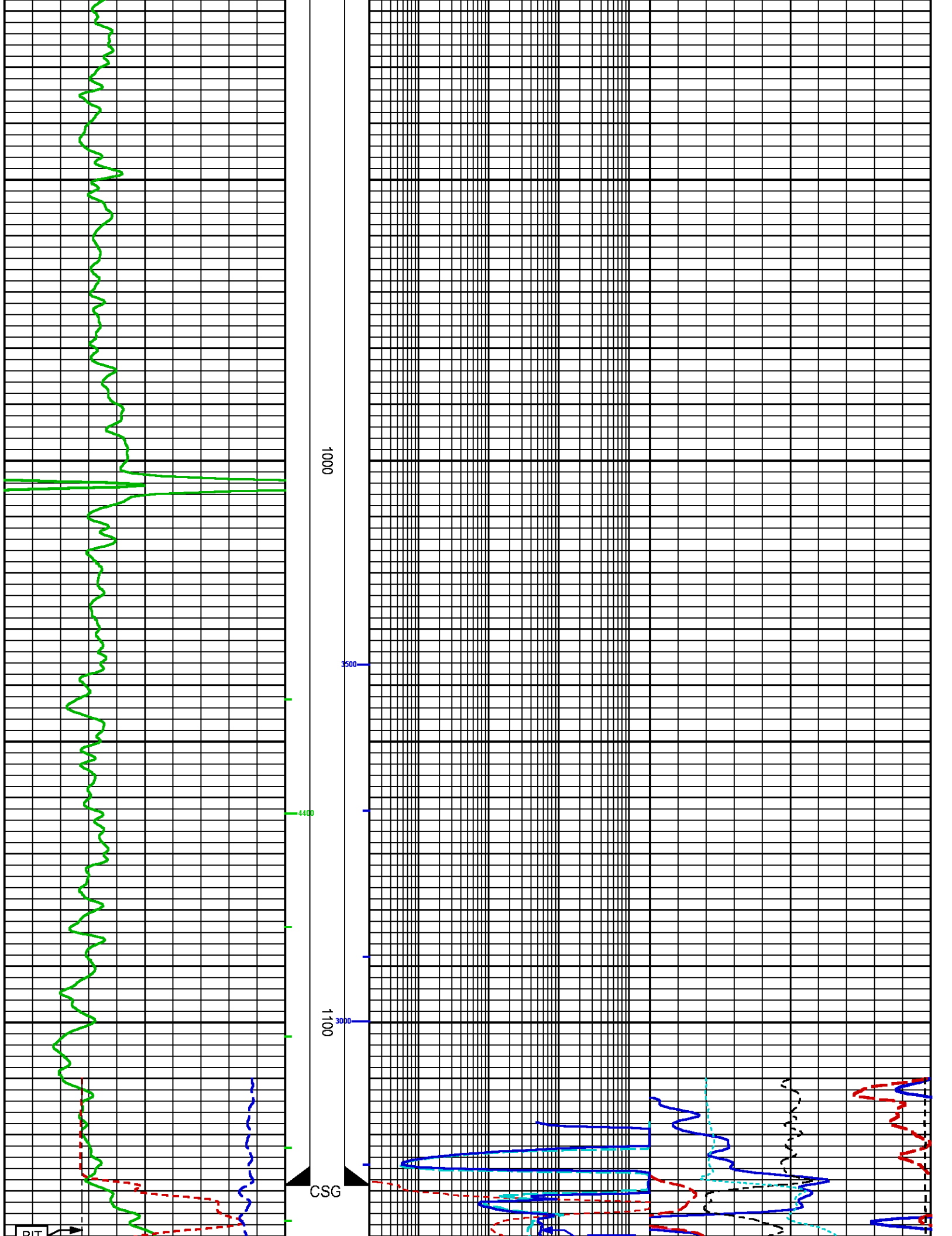
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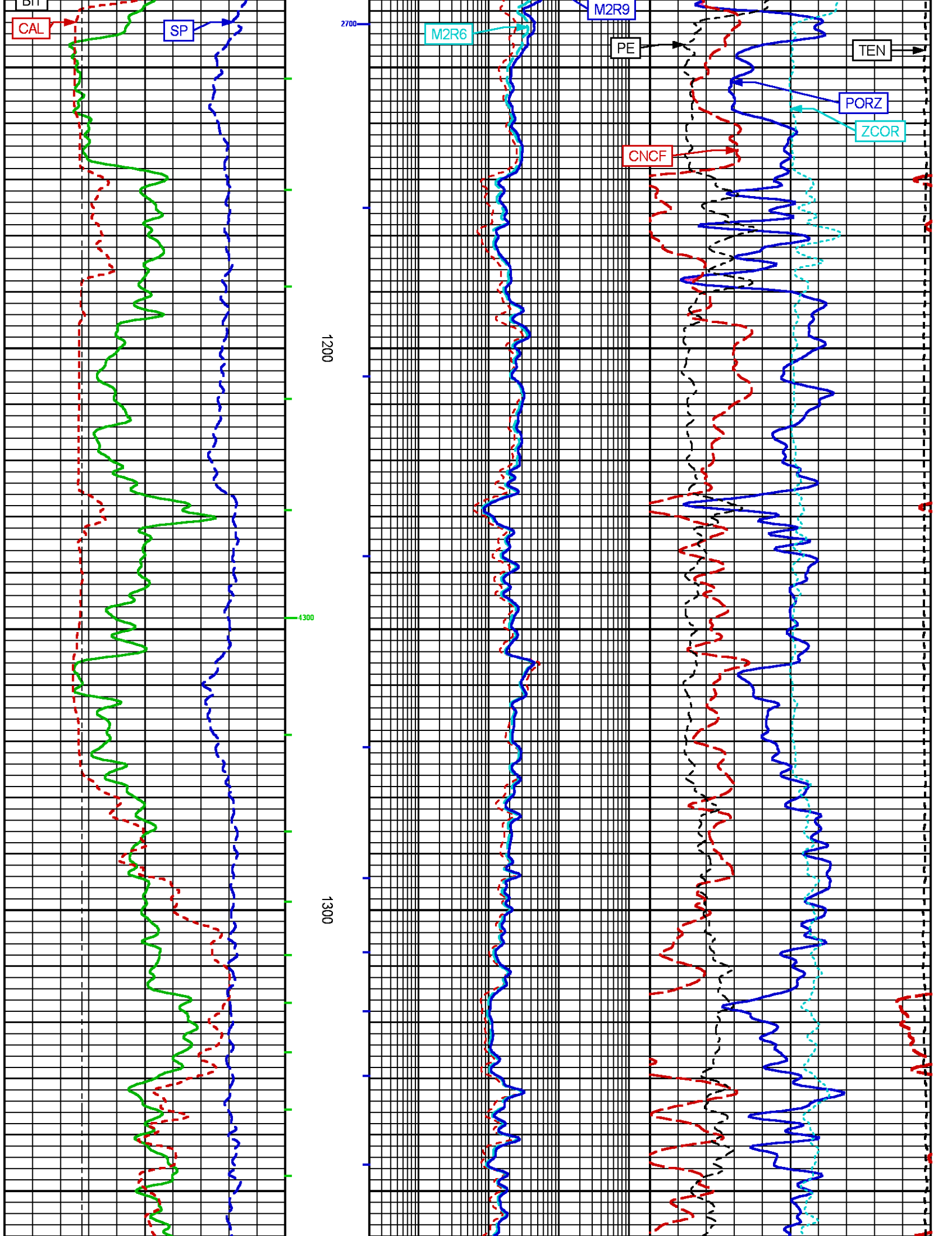
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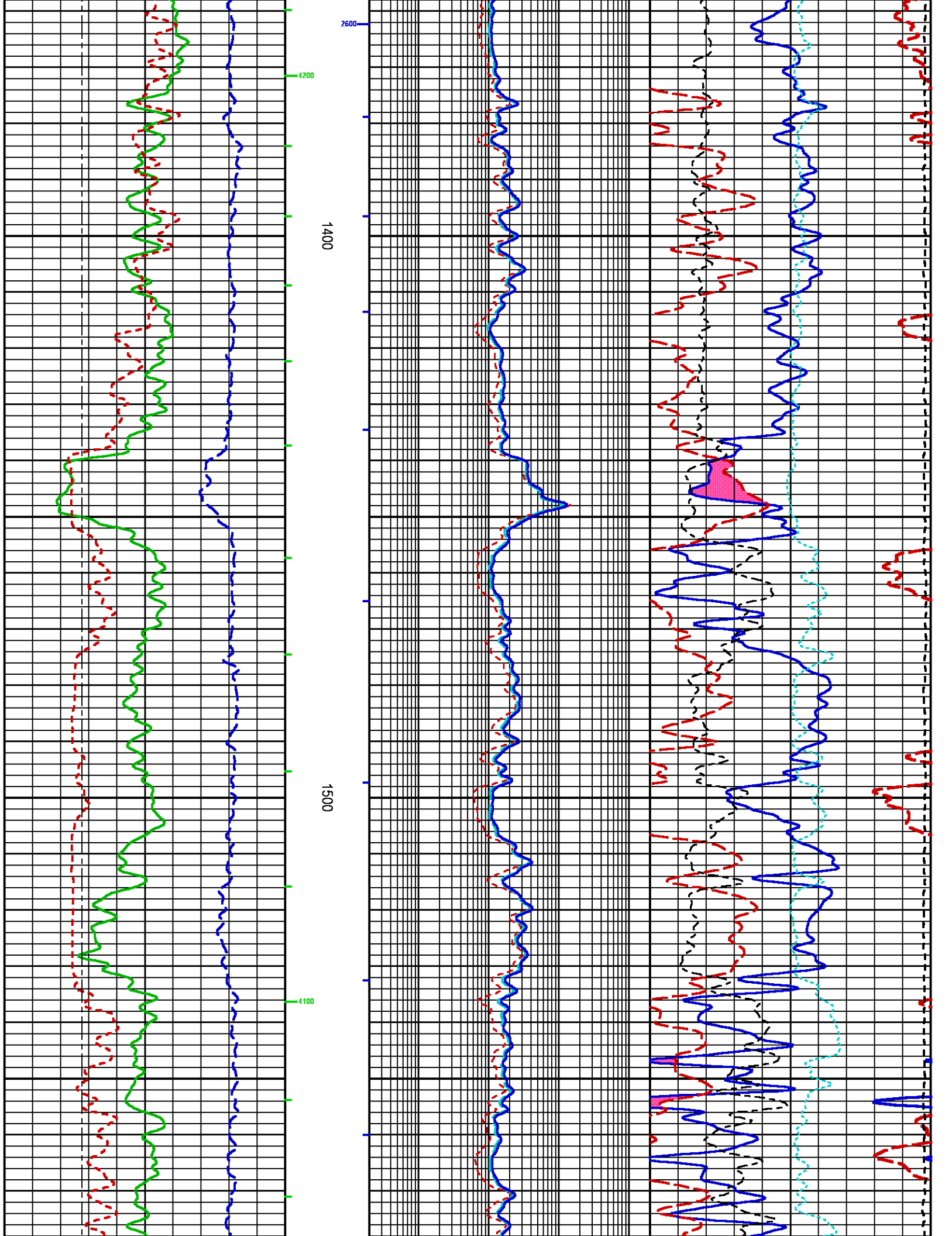
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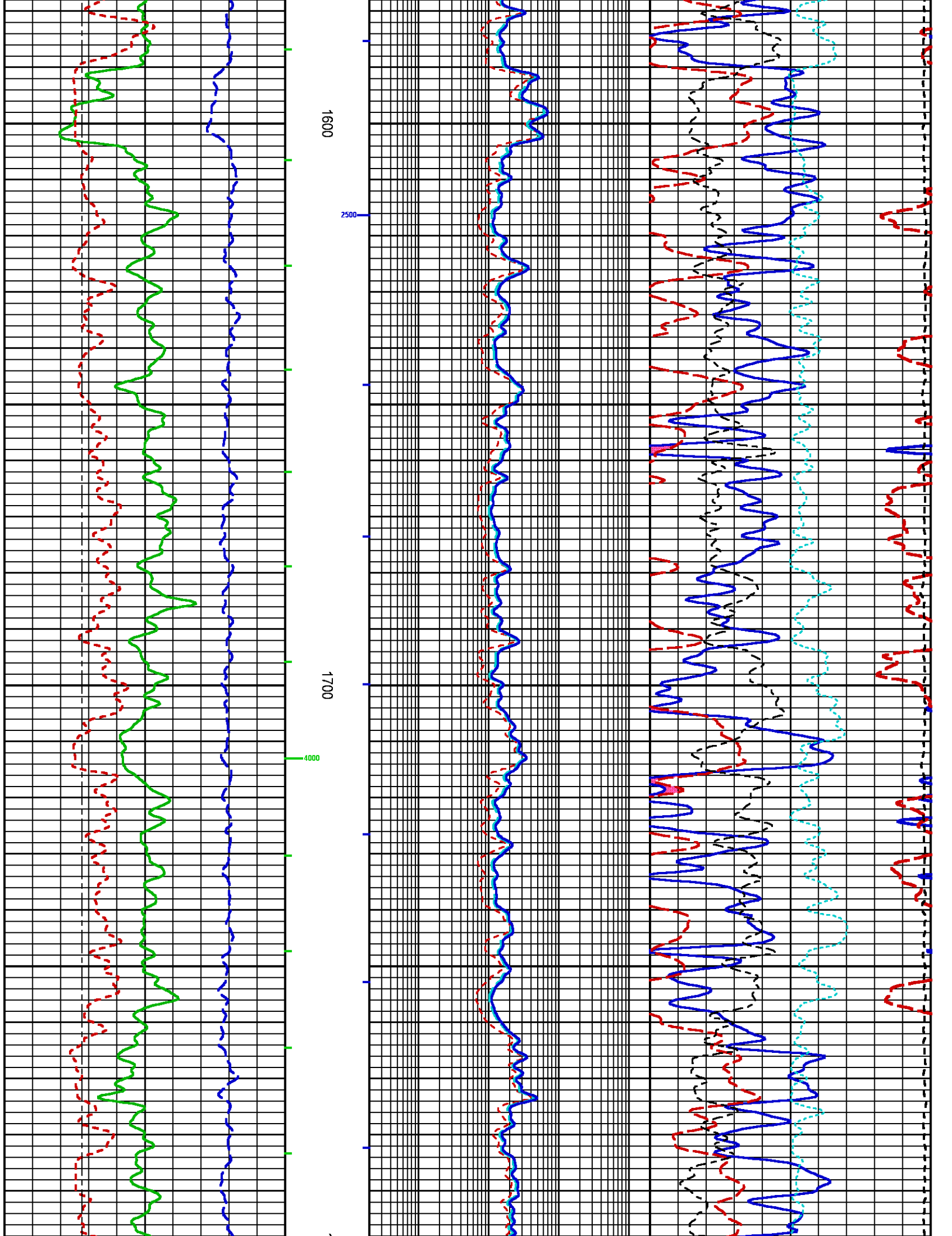
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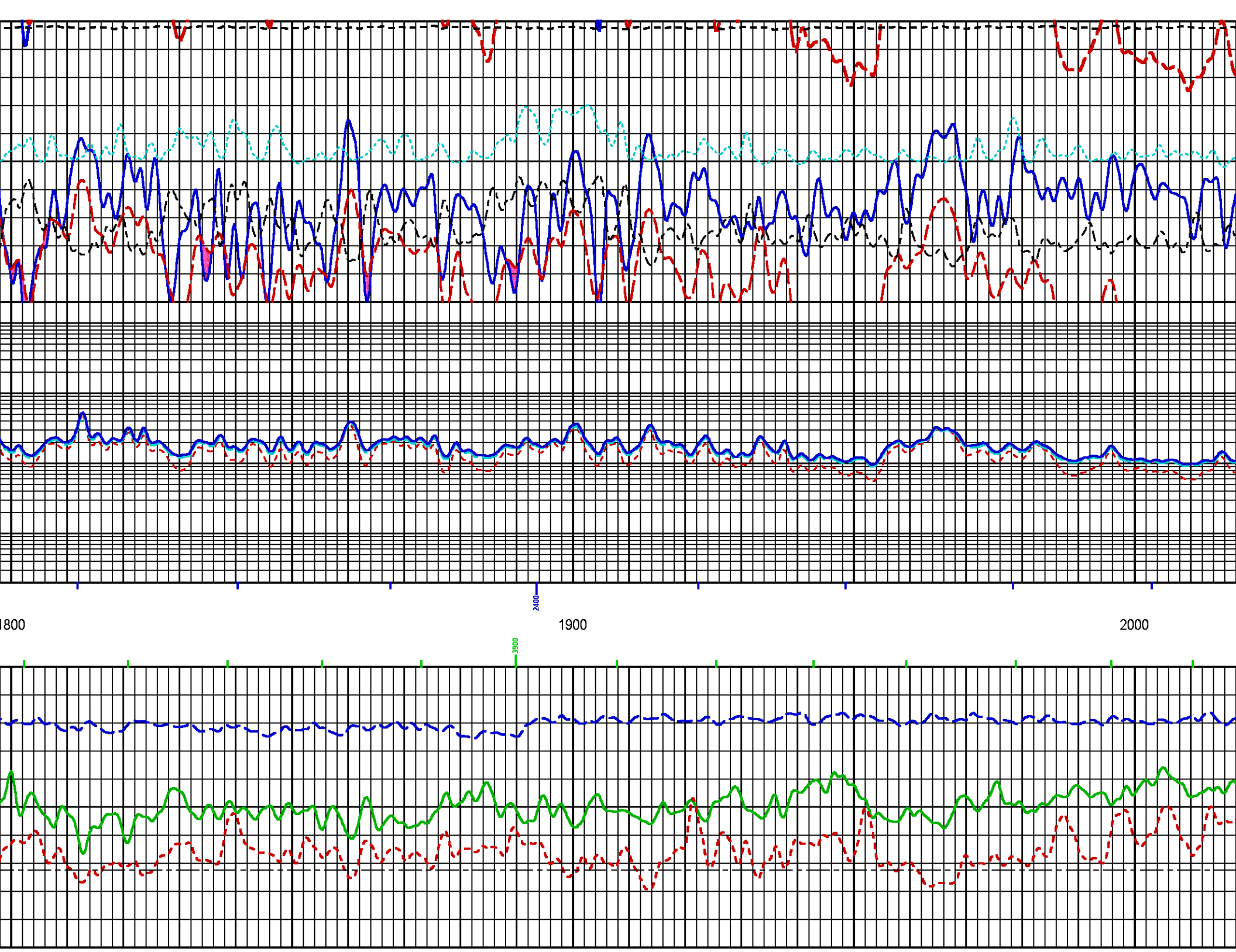
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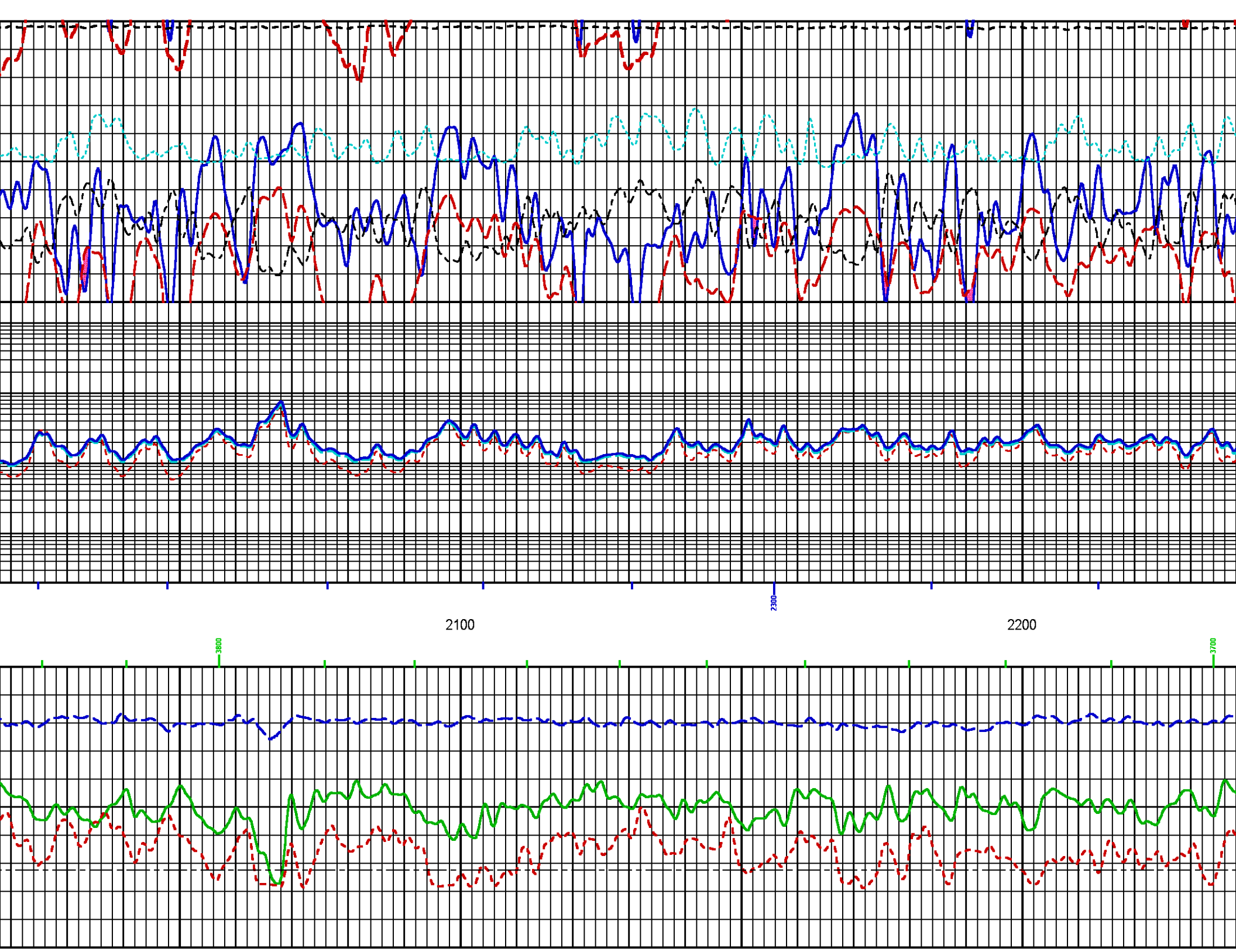
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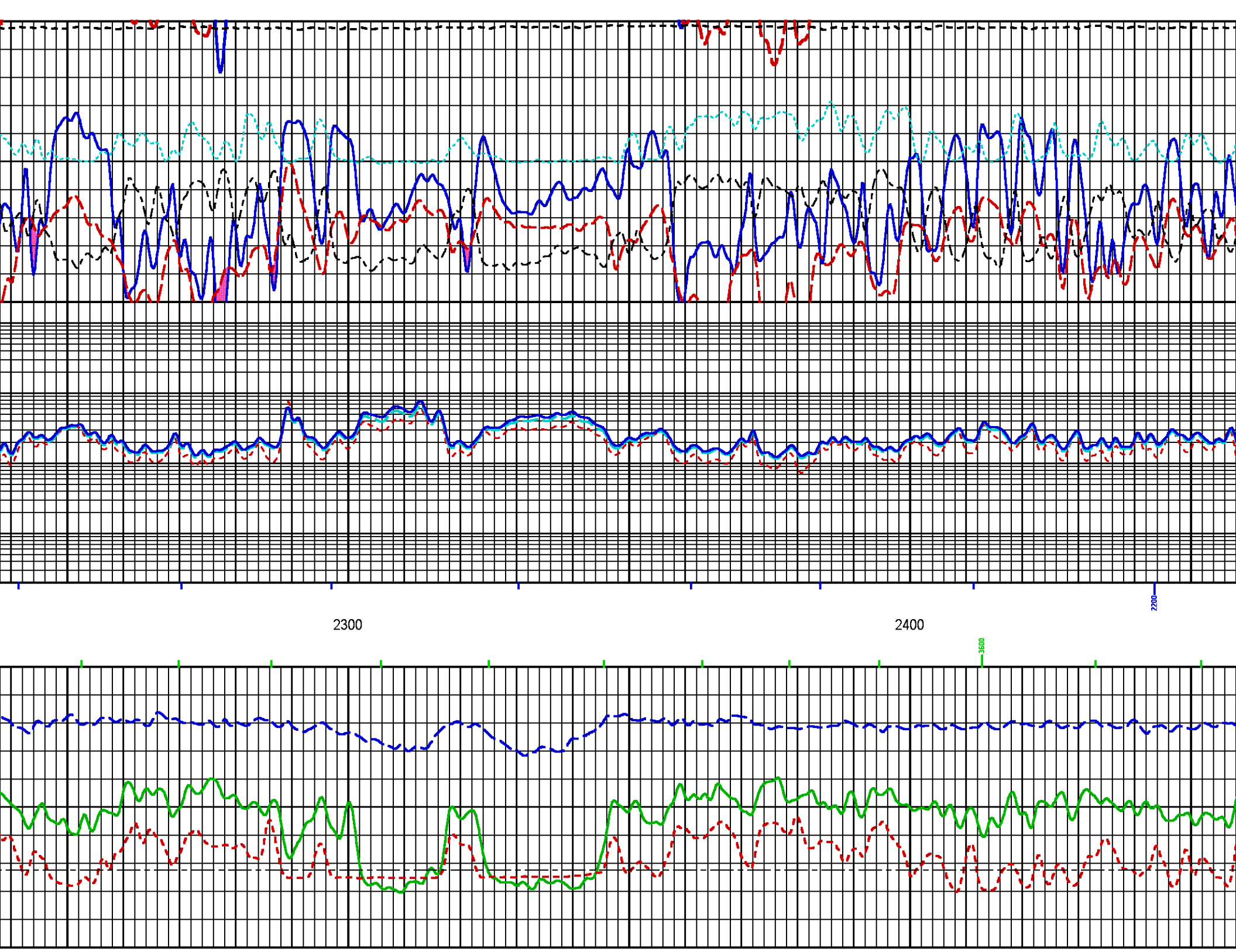
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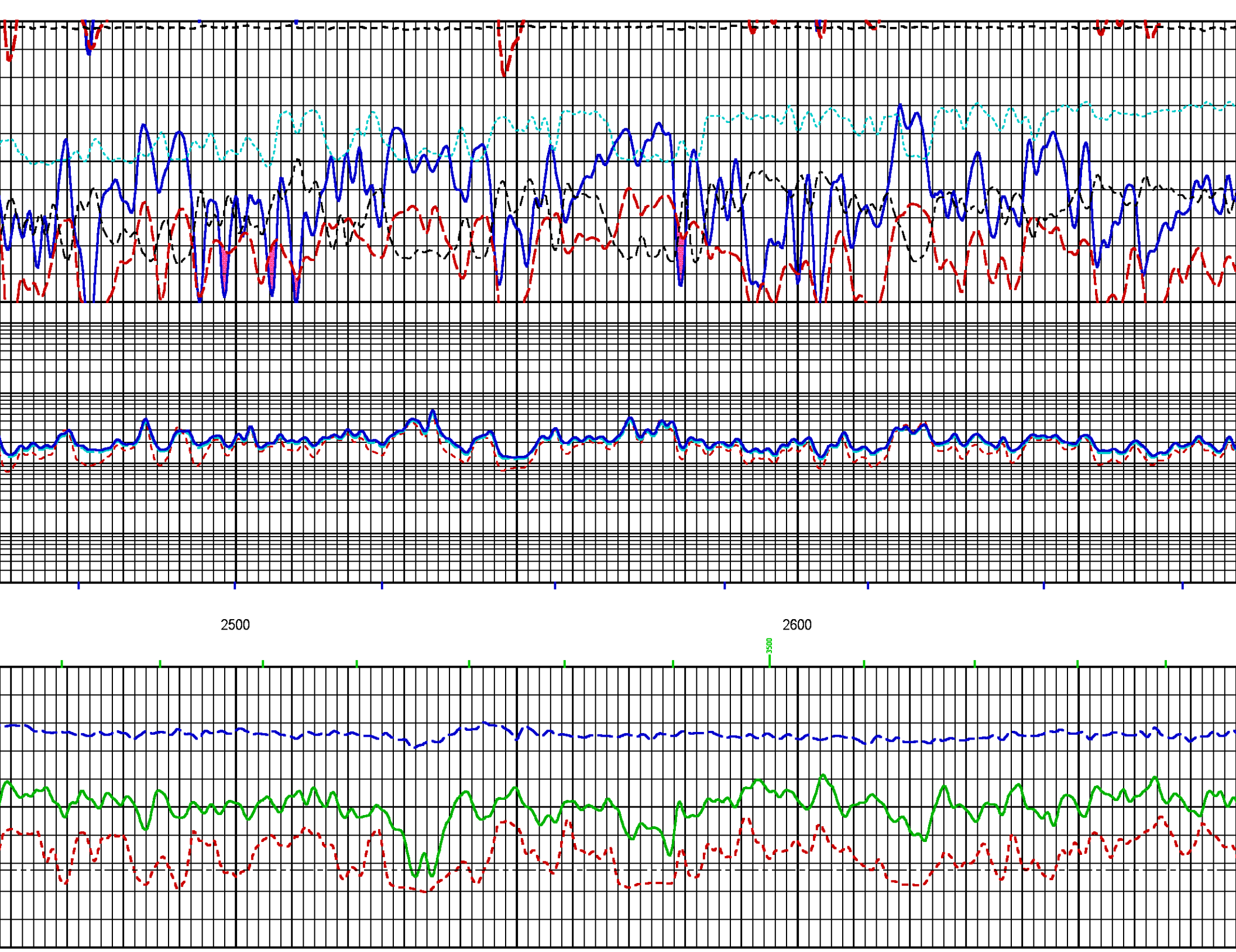
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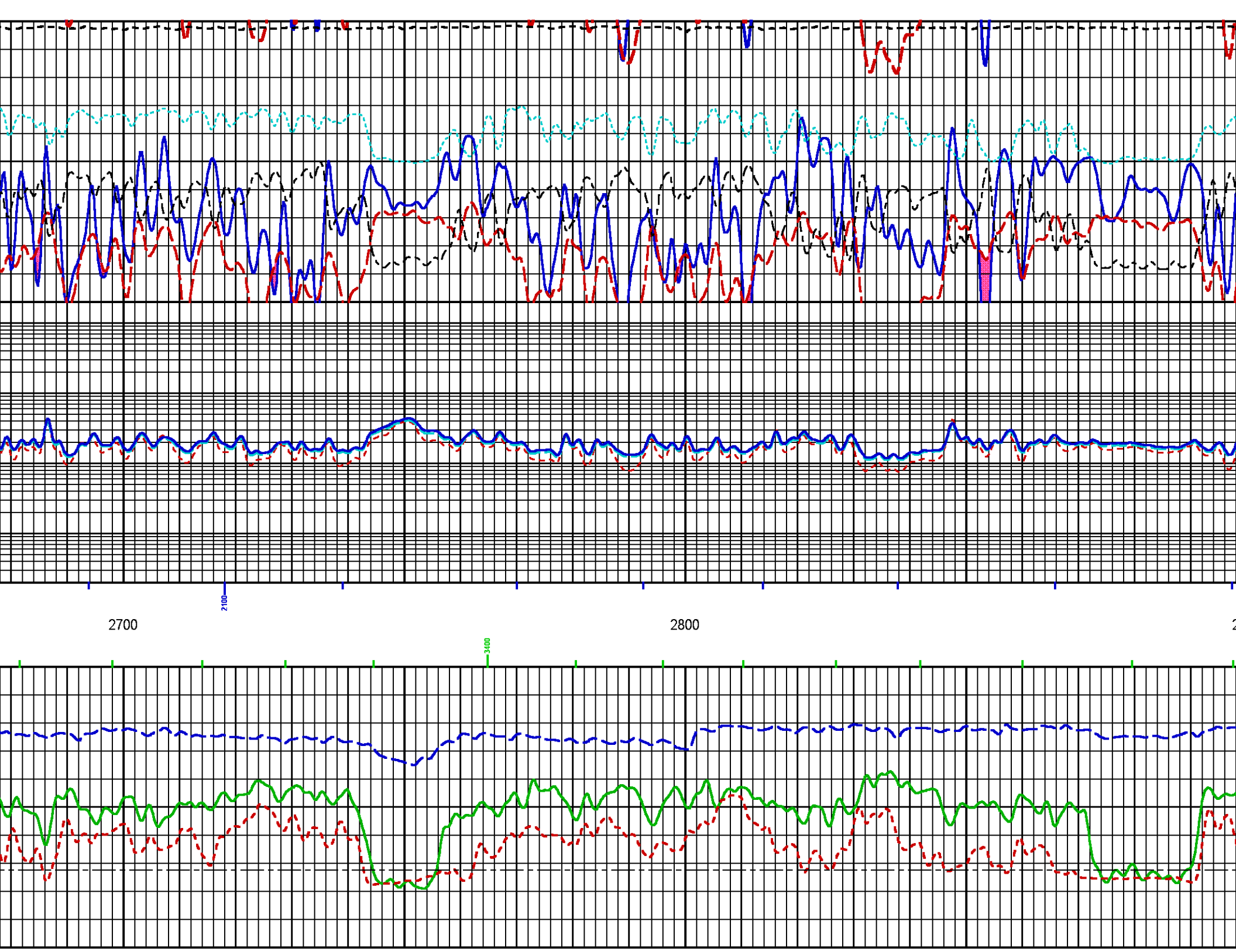
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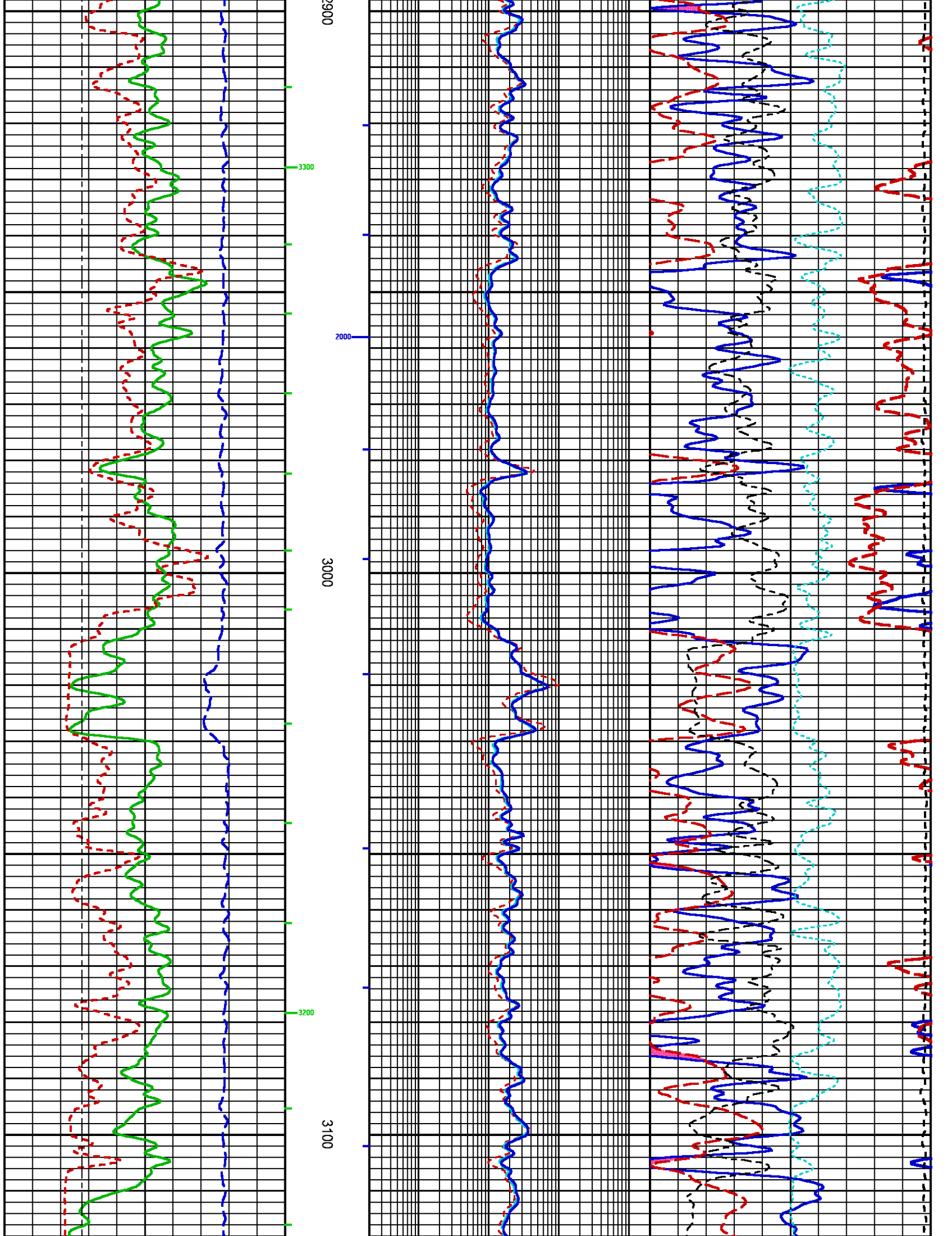
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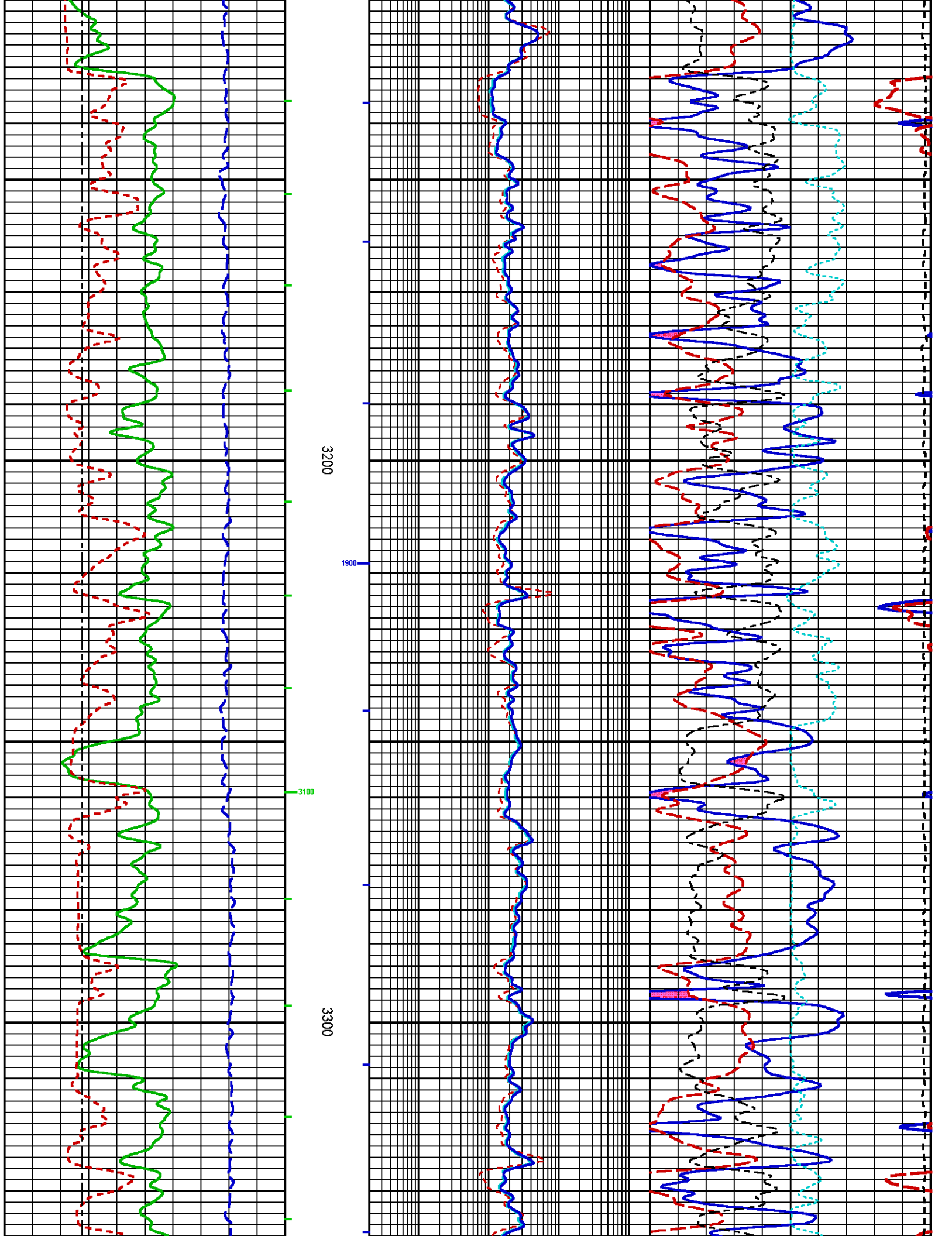
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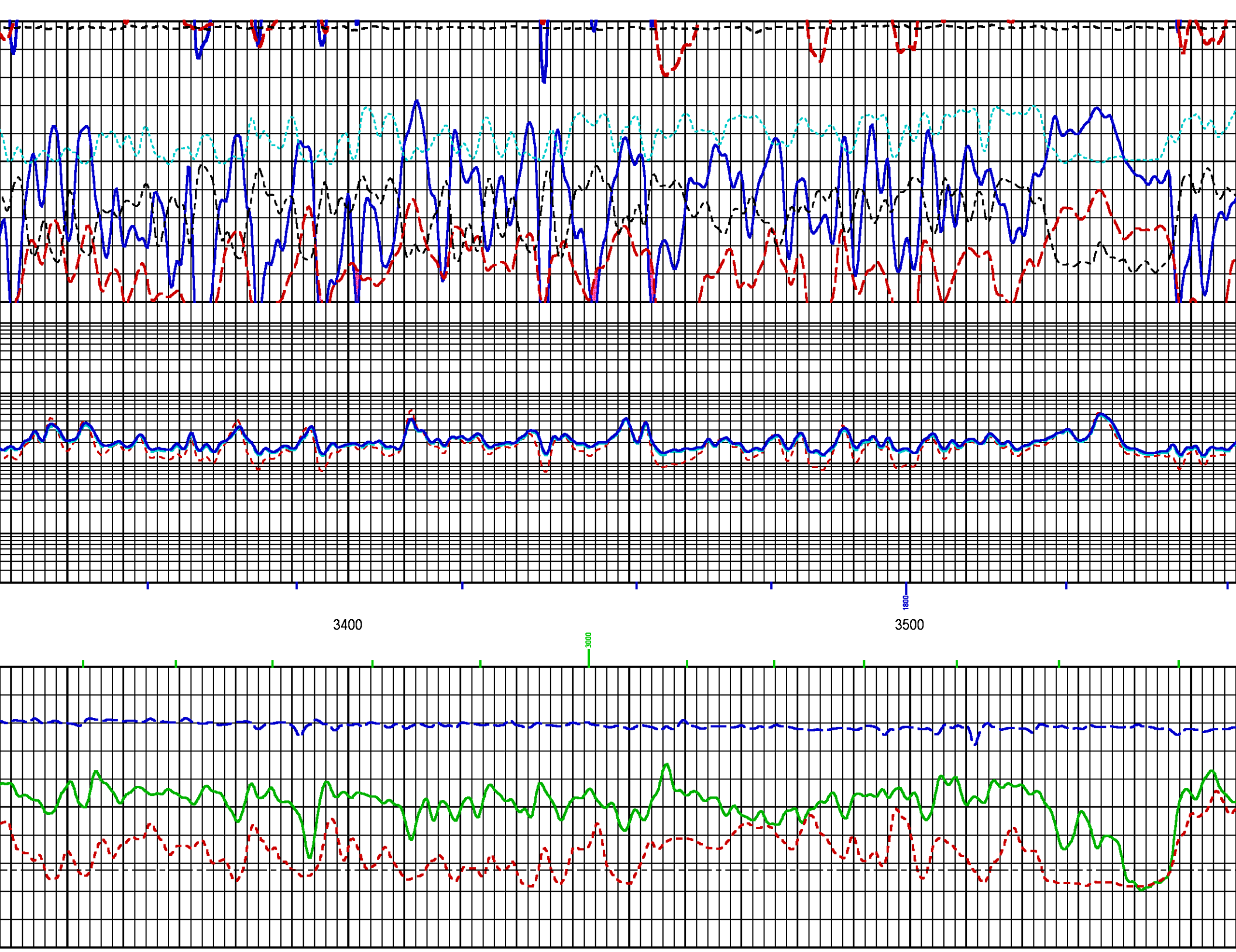
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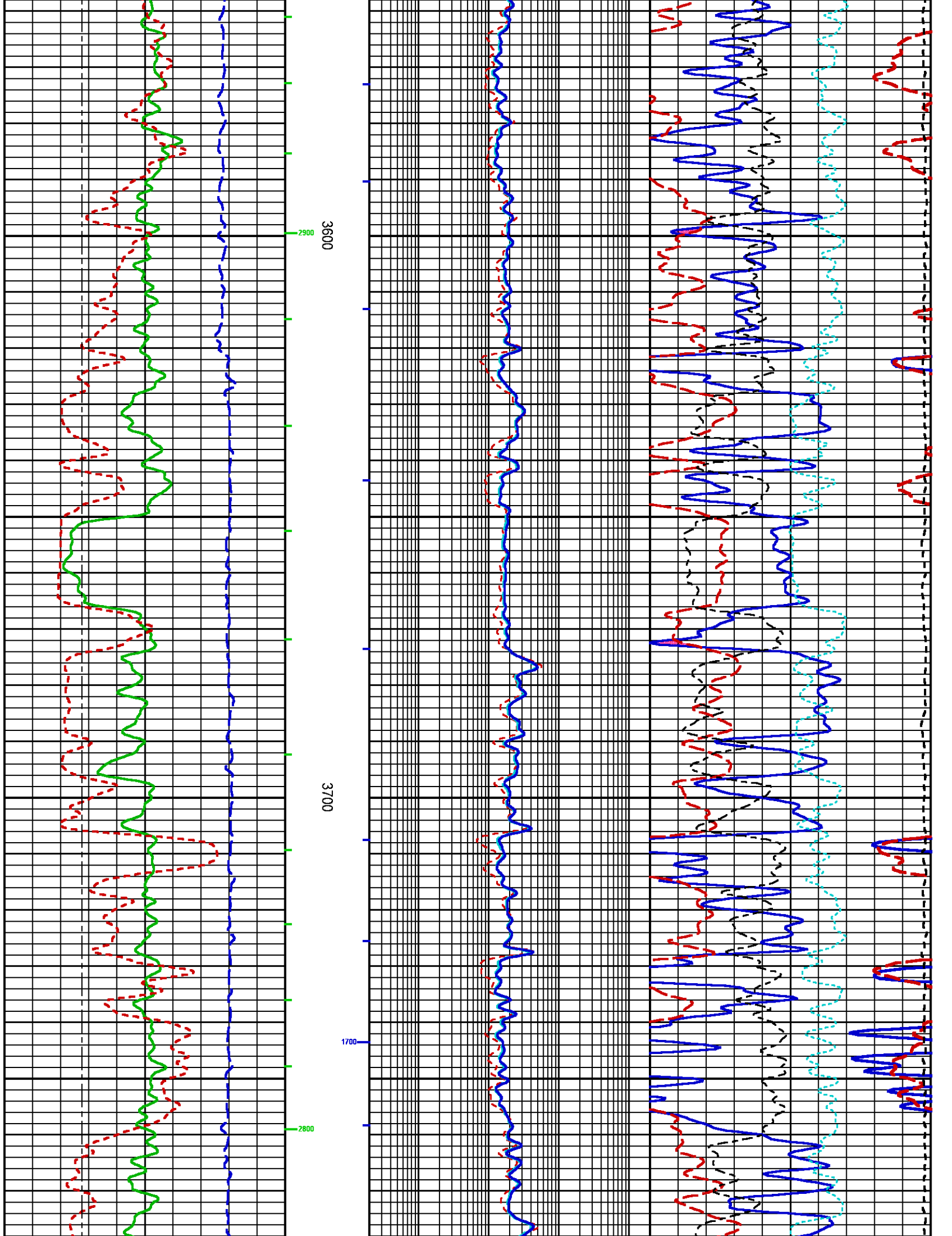
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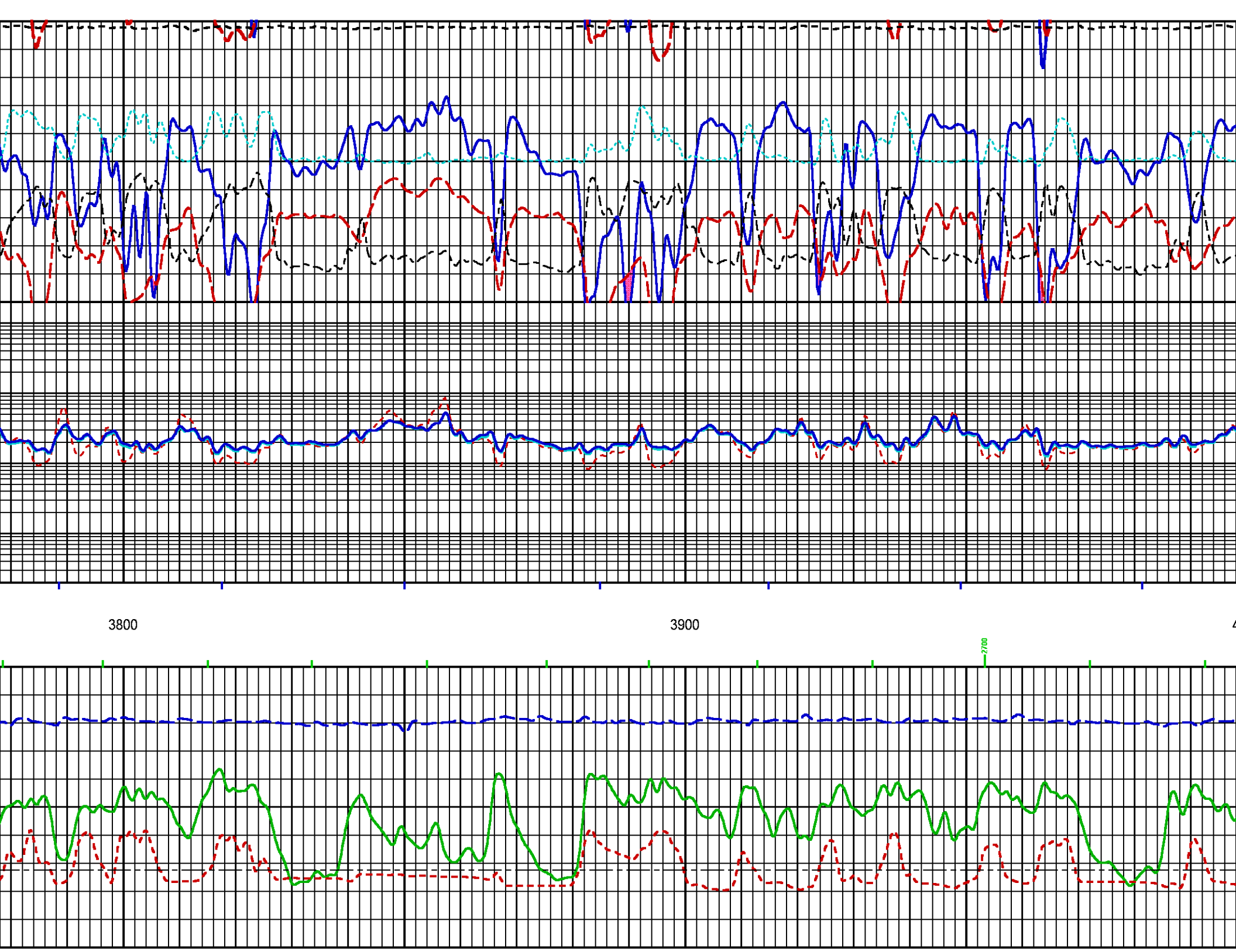
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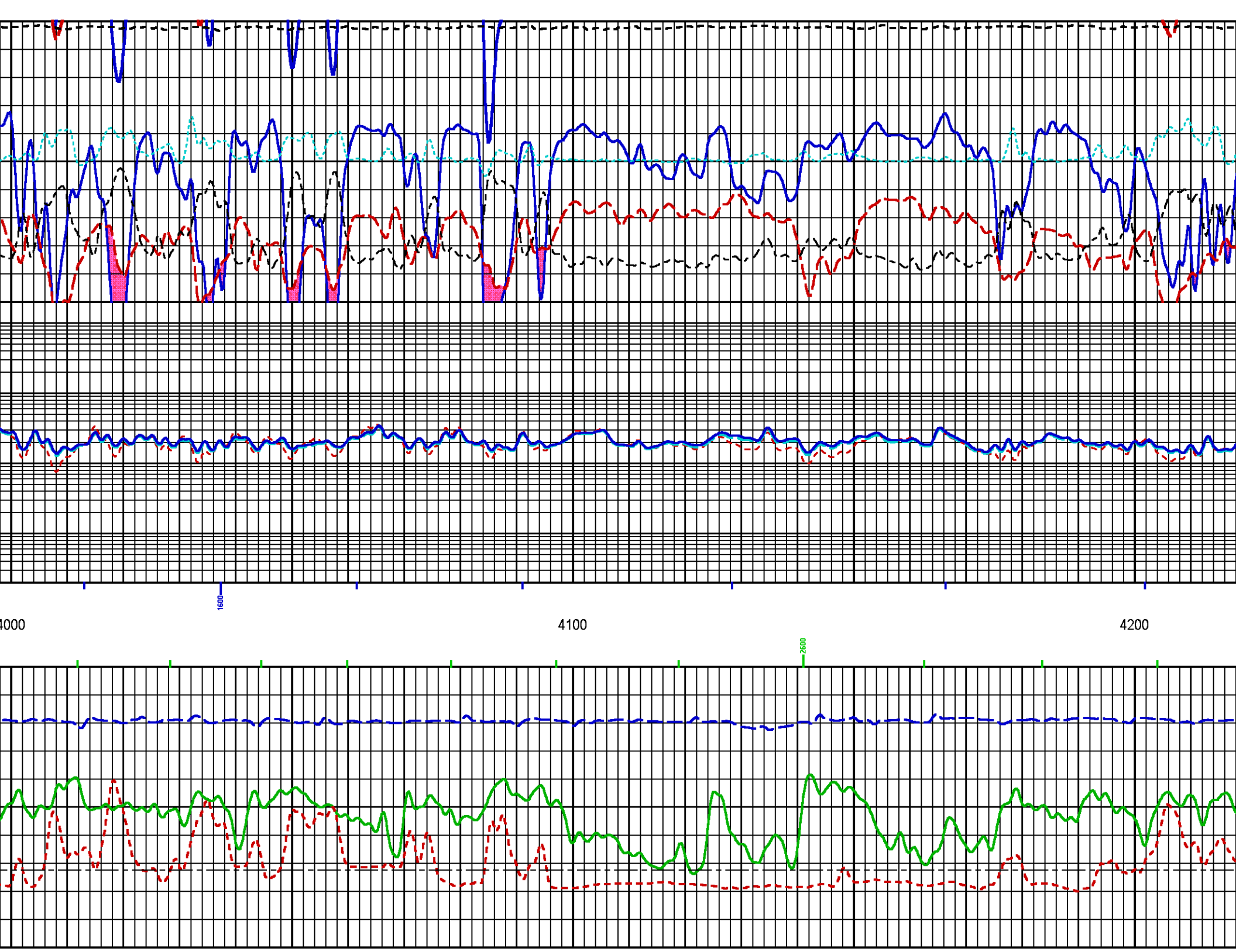
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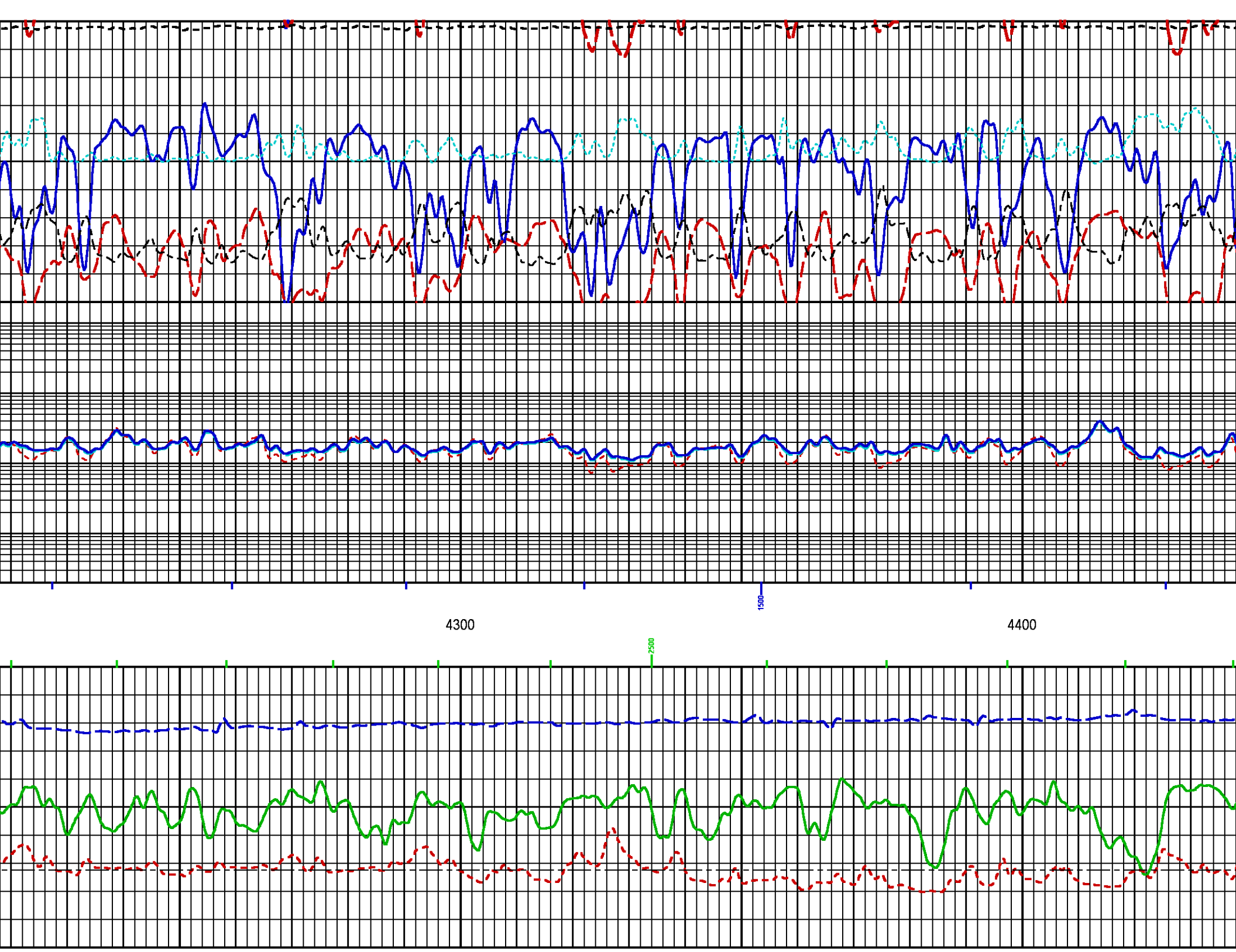
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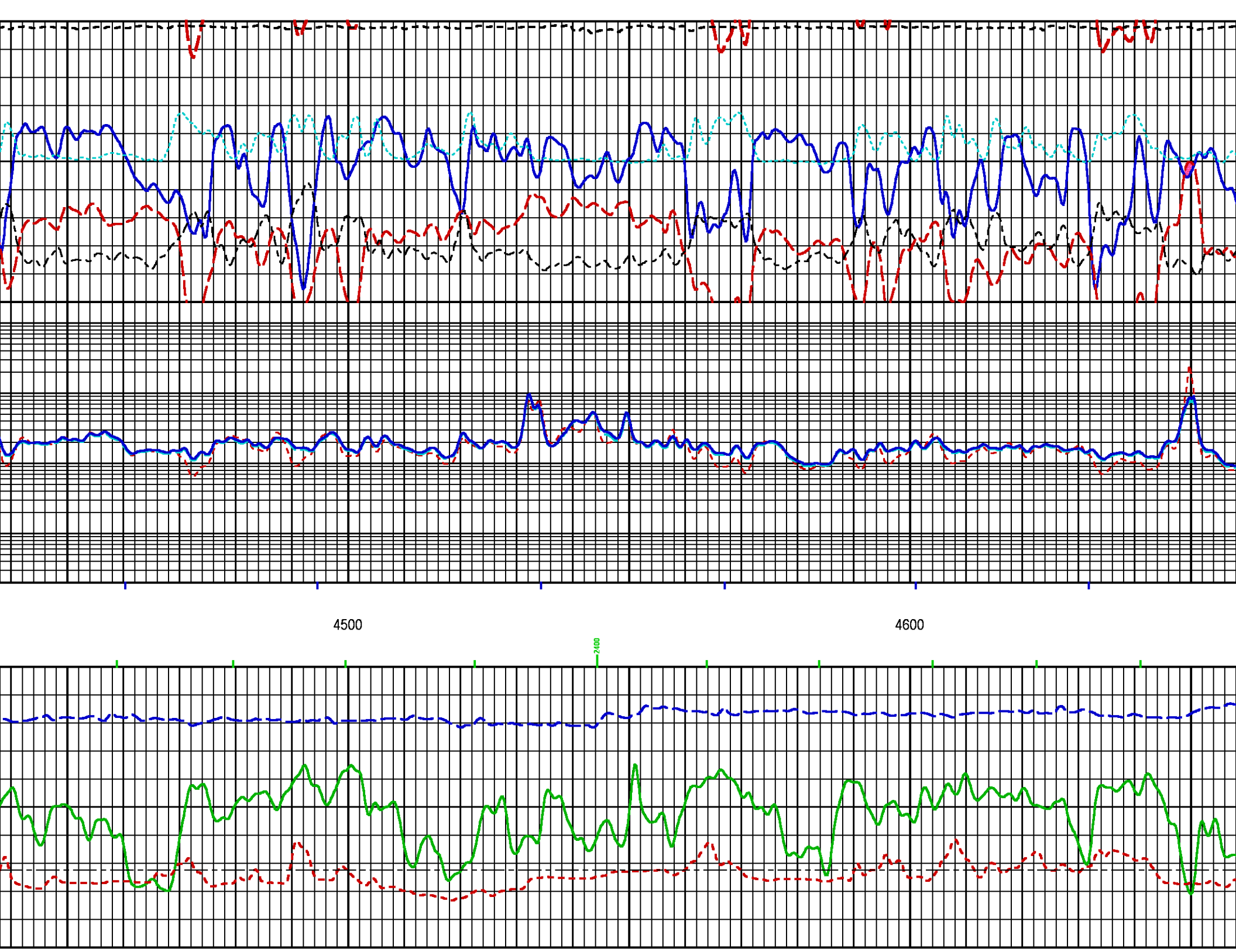
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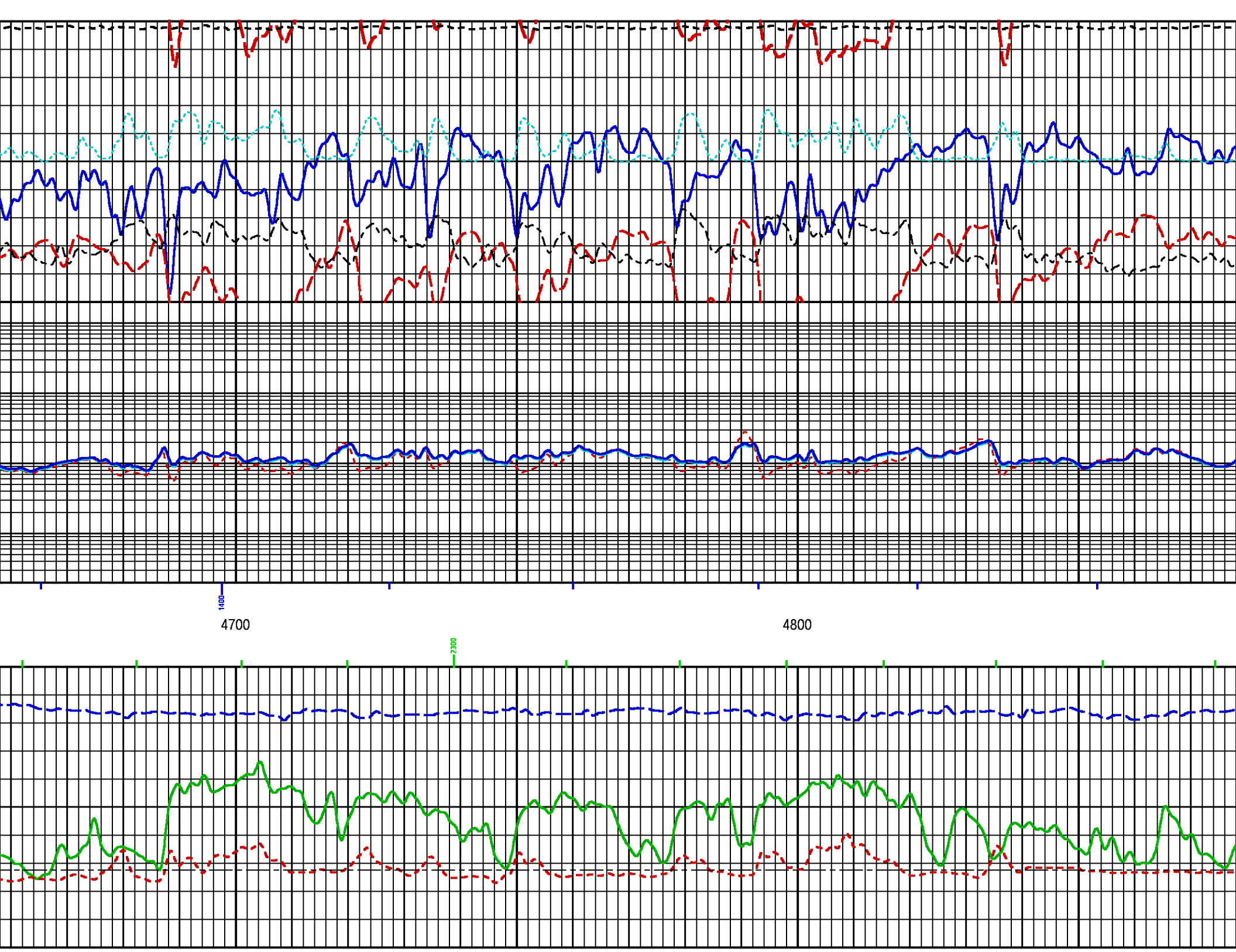
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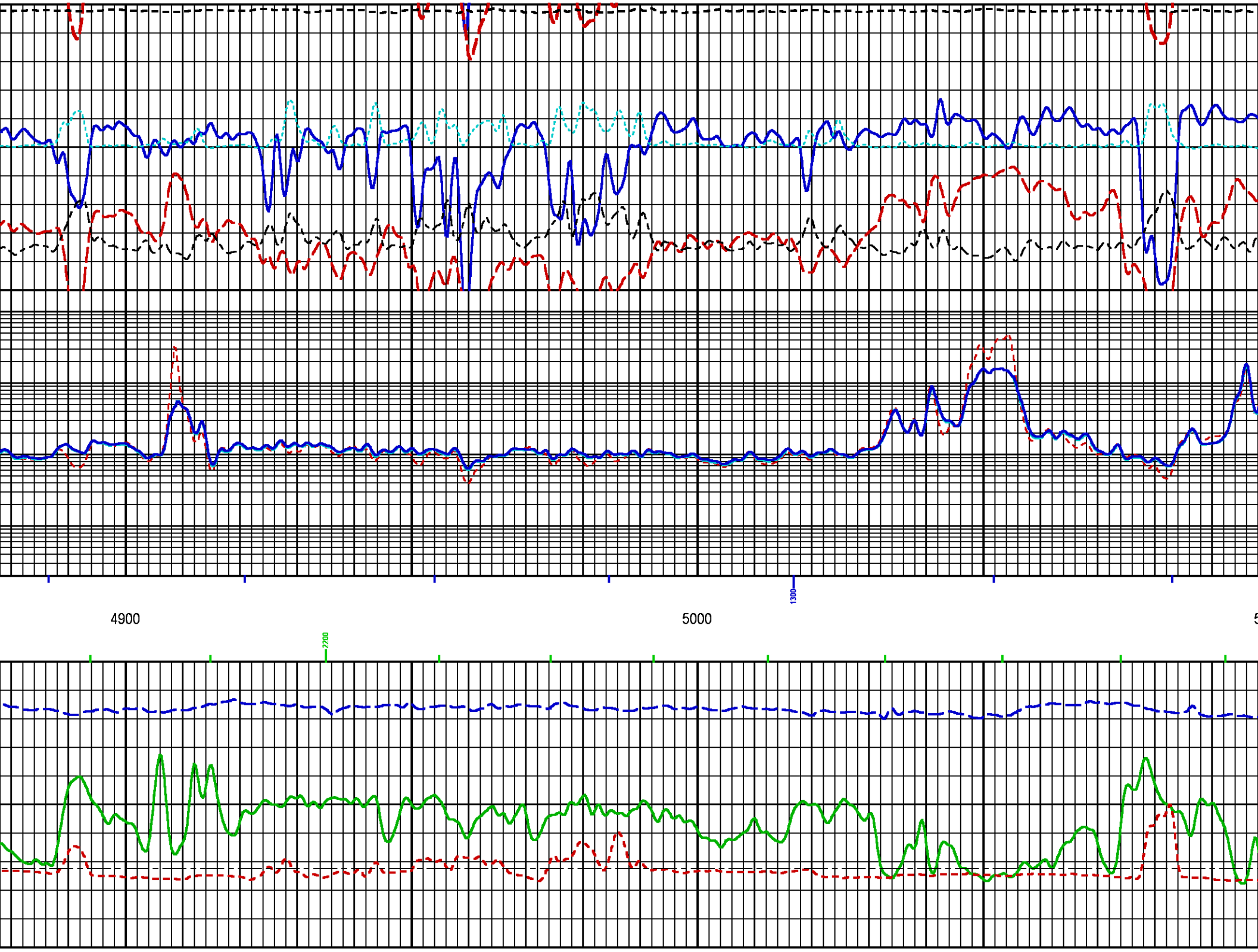
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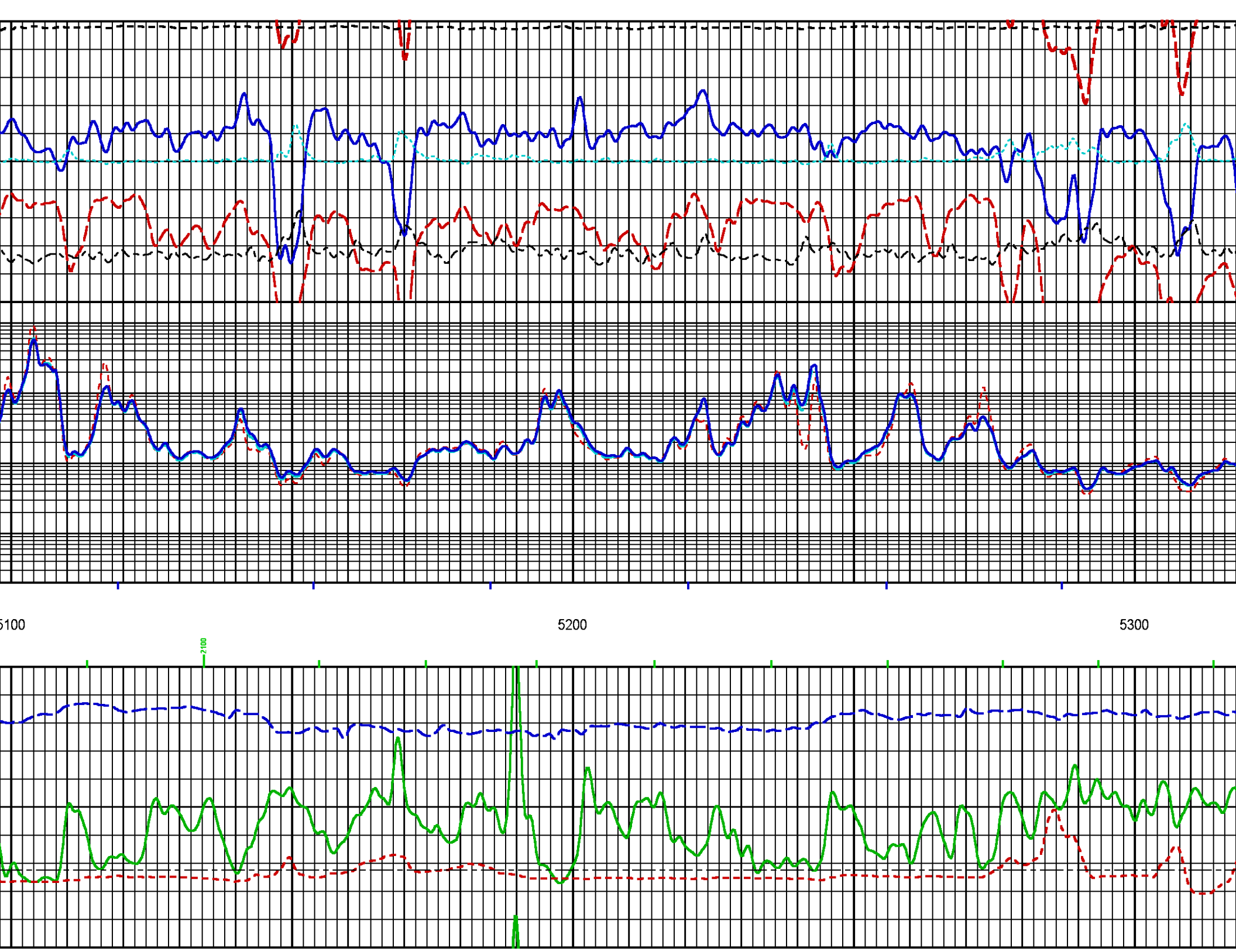
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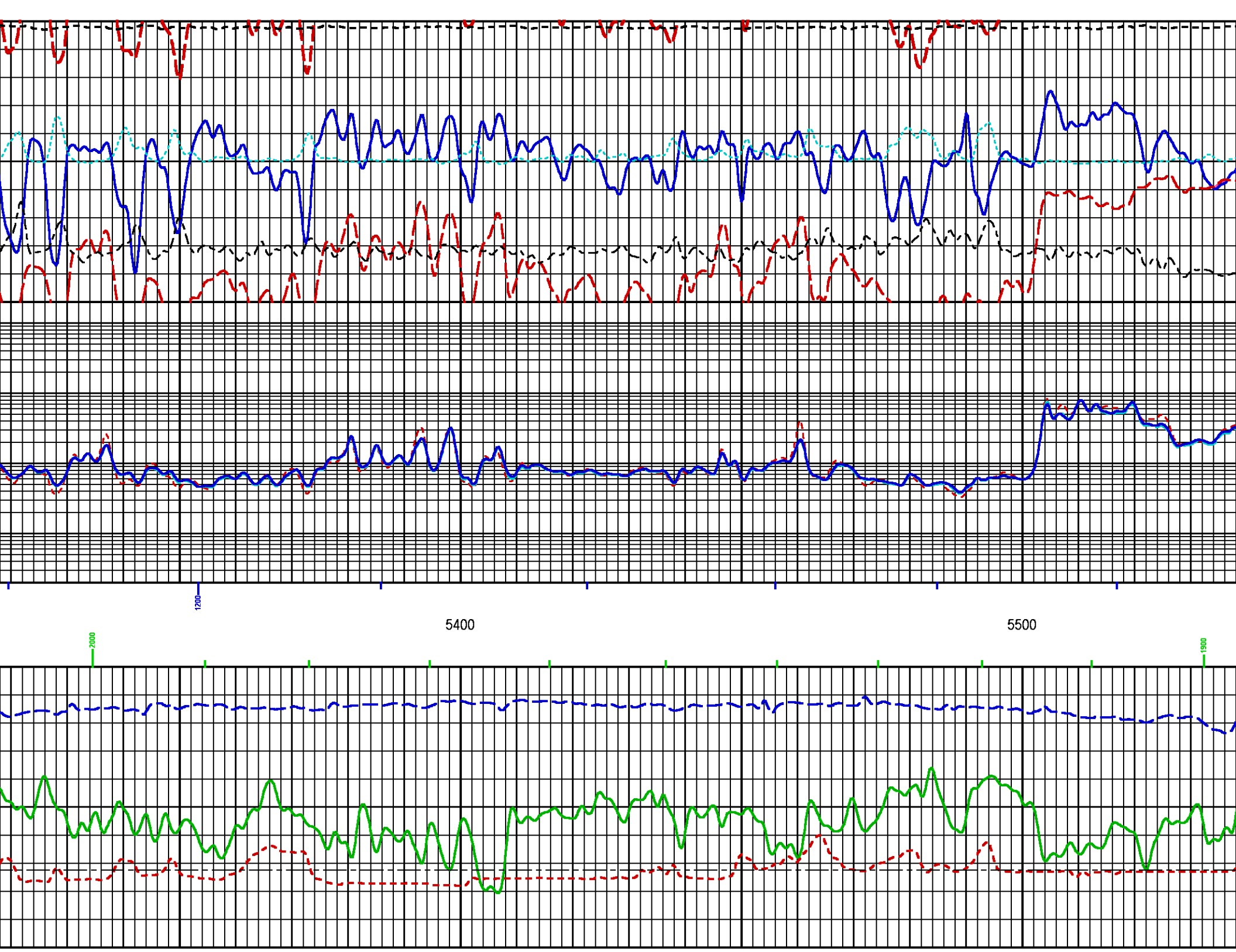
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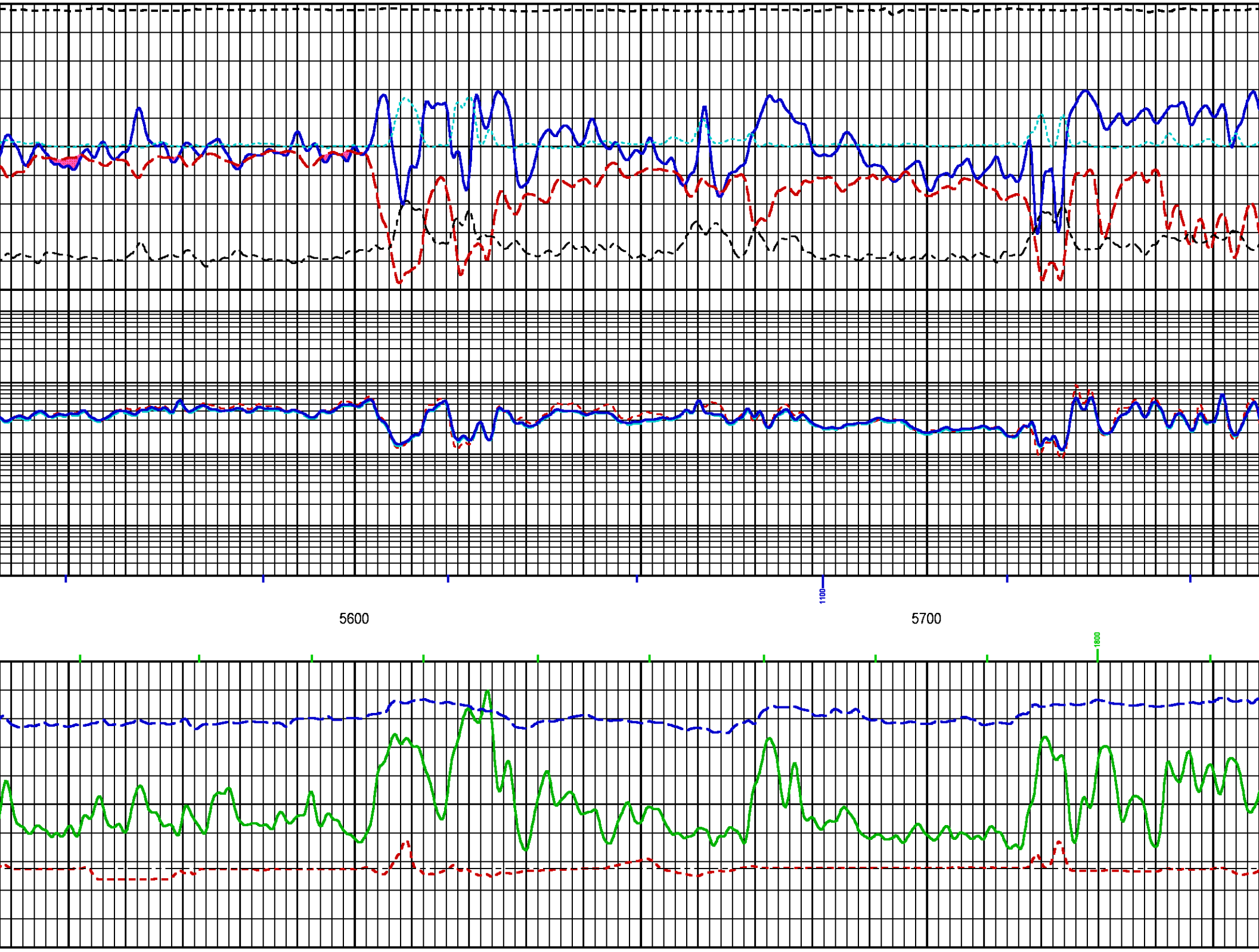
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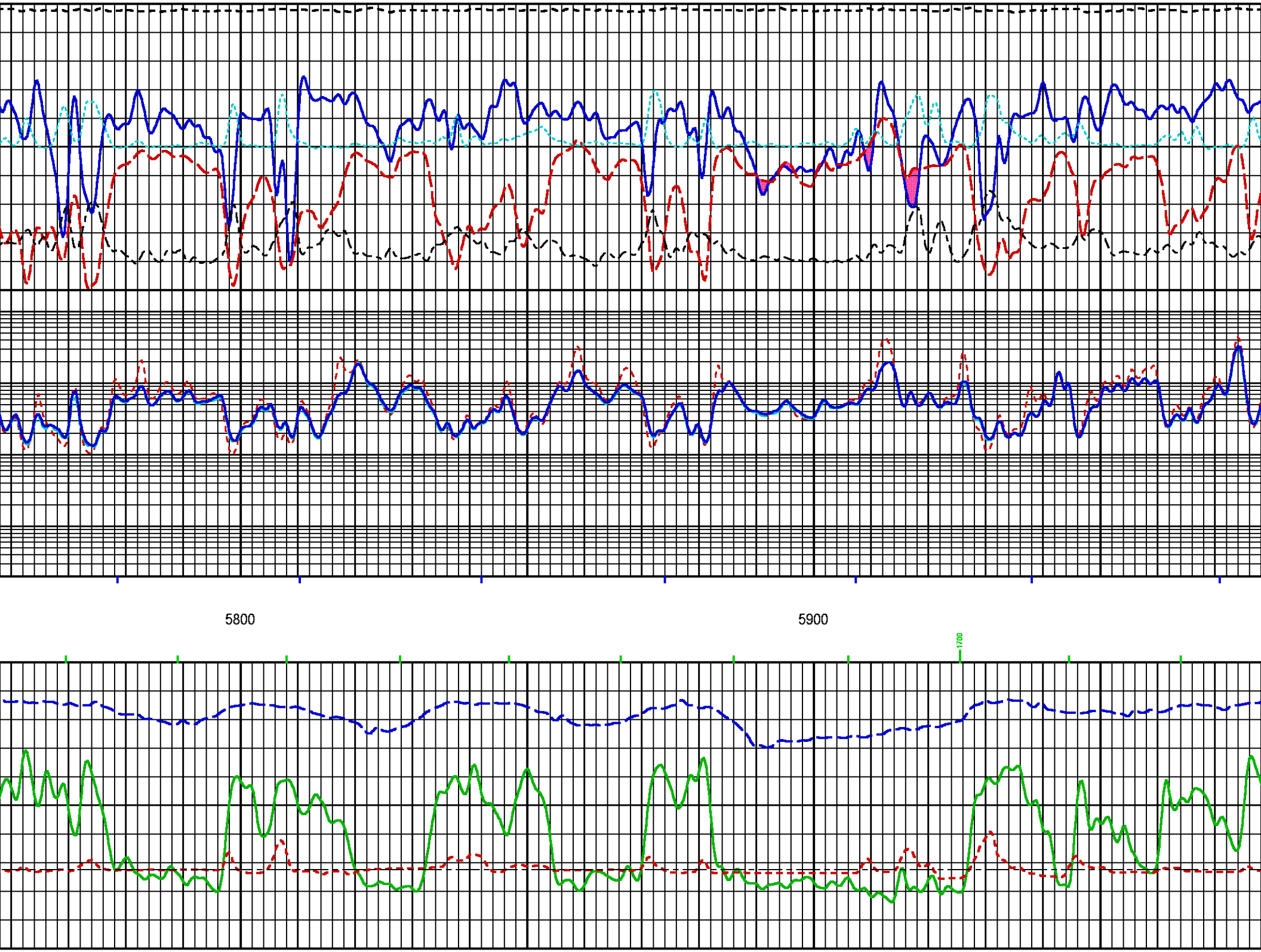
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6000
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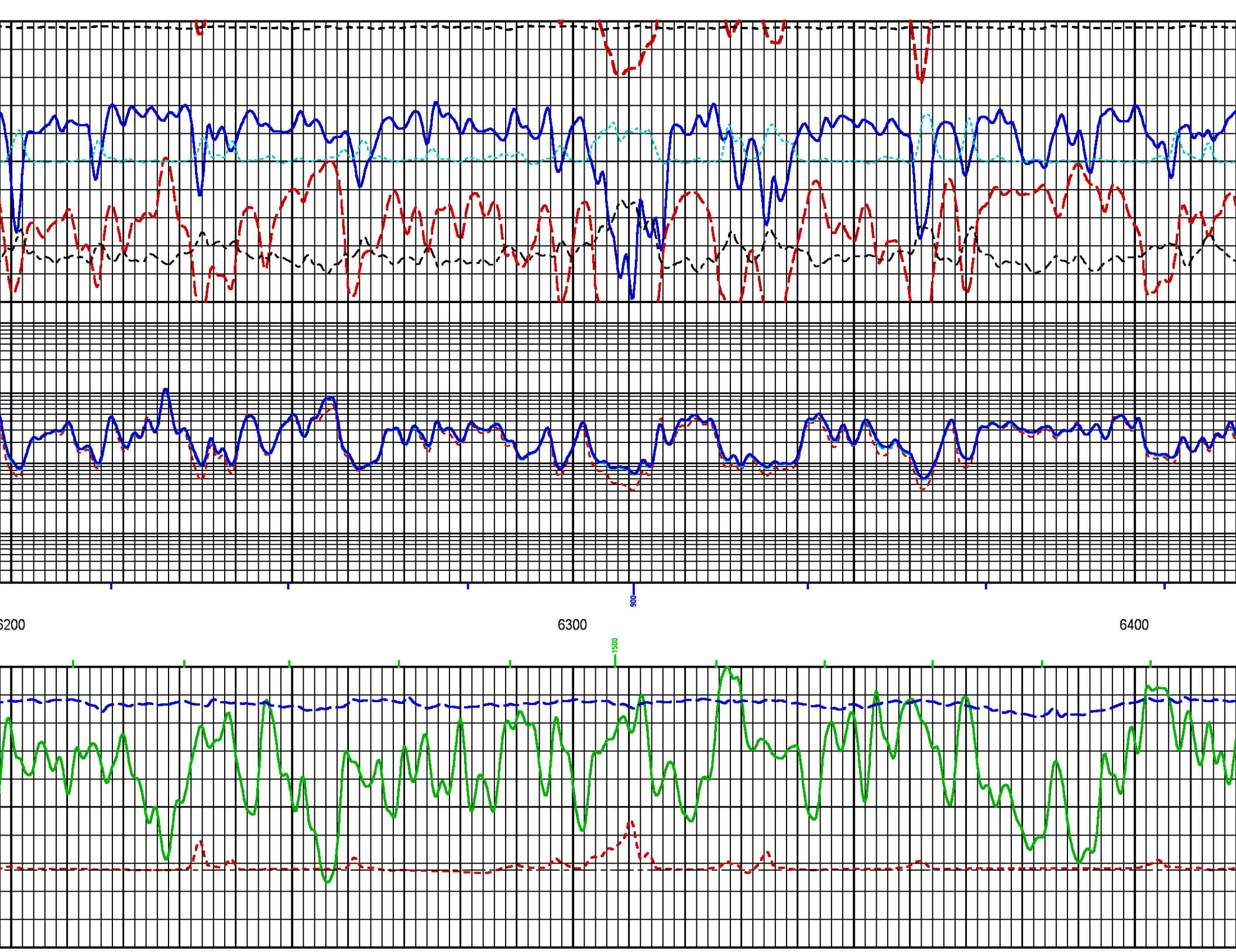
1600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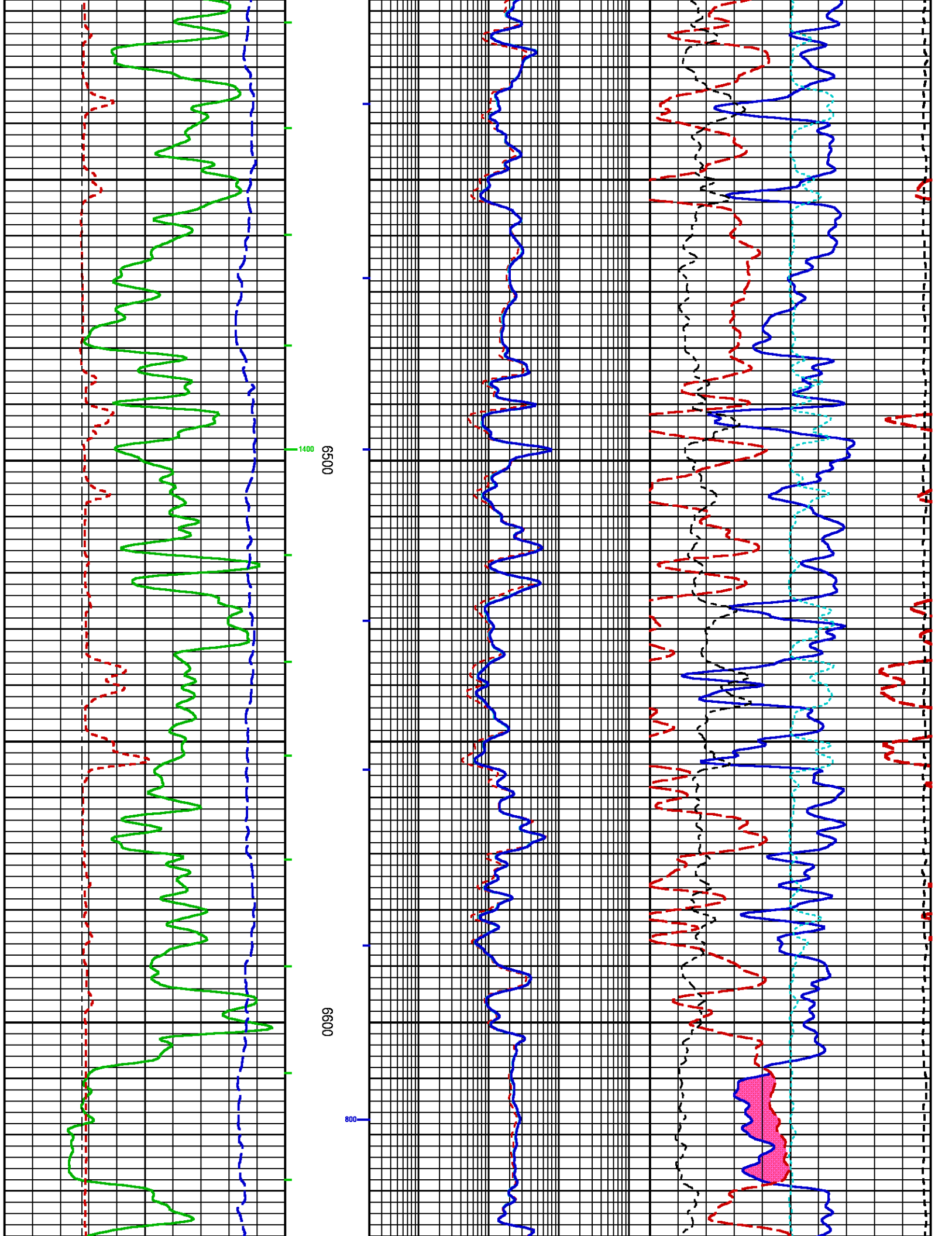
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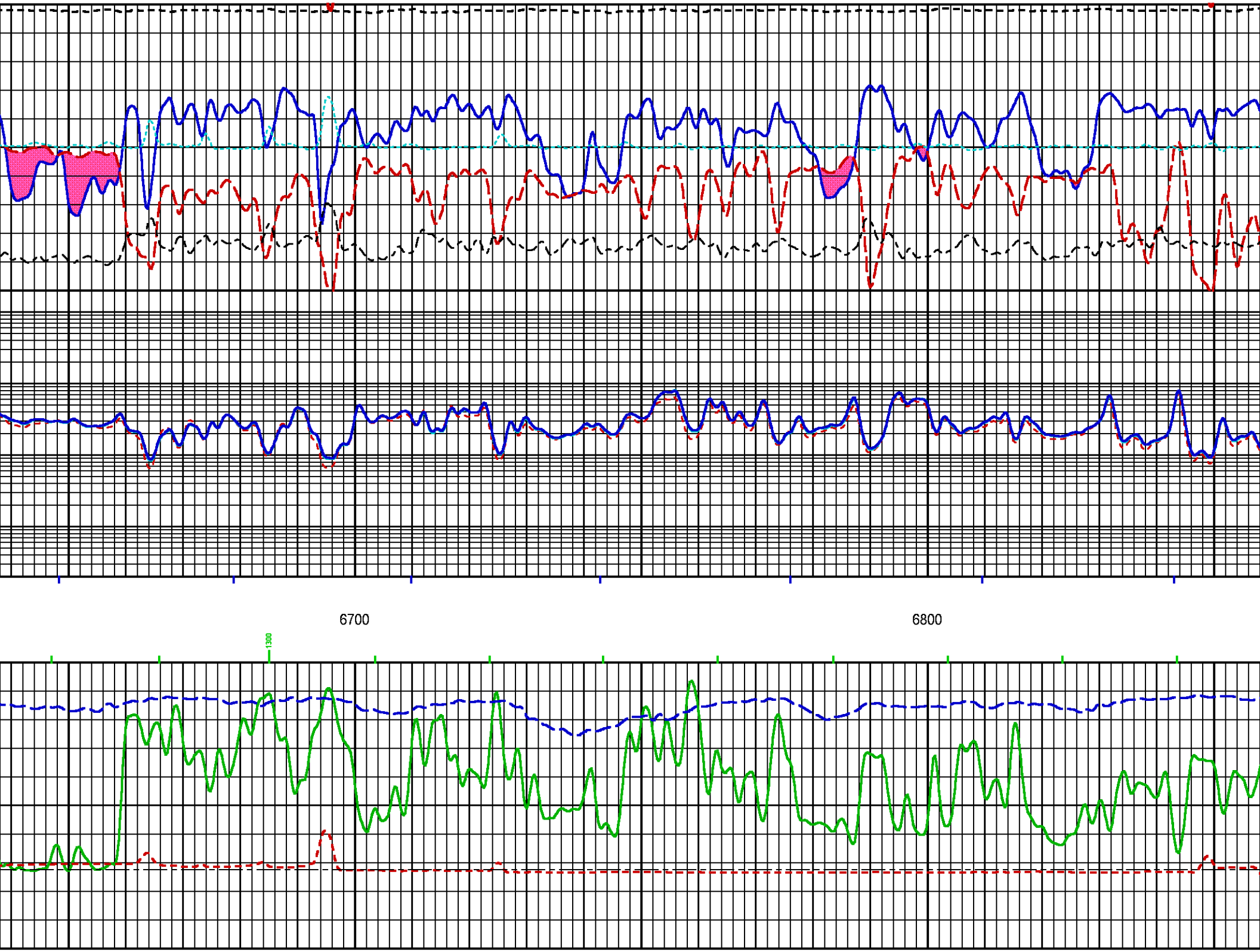
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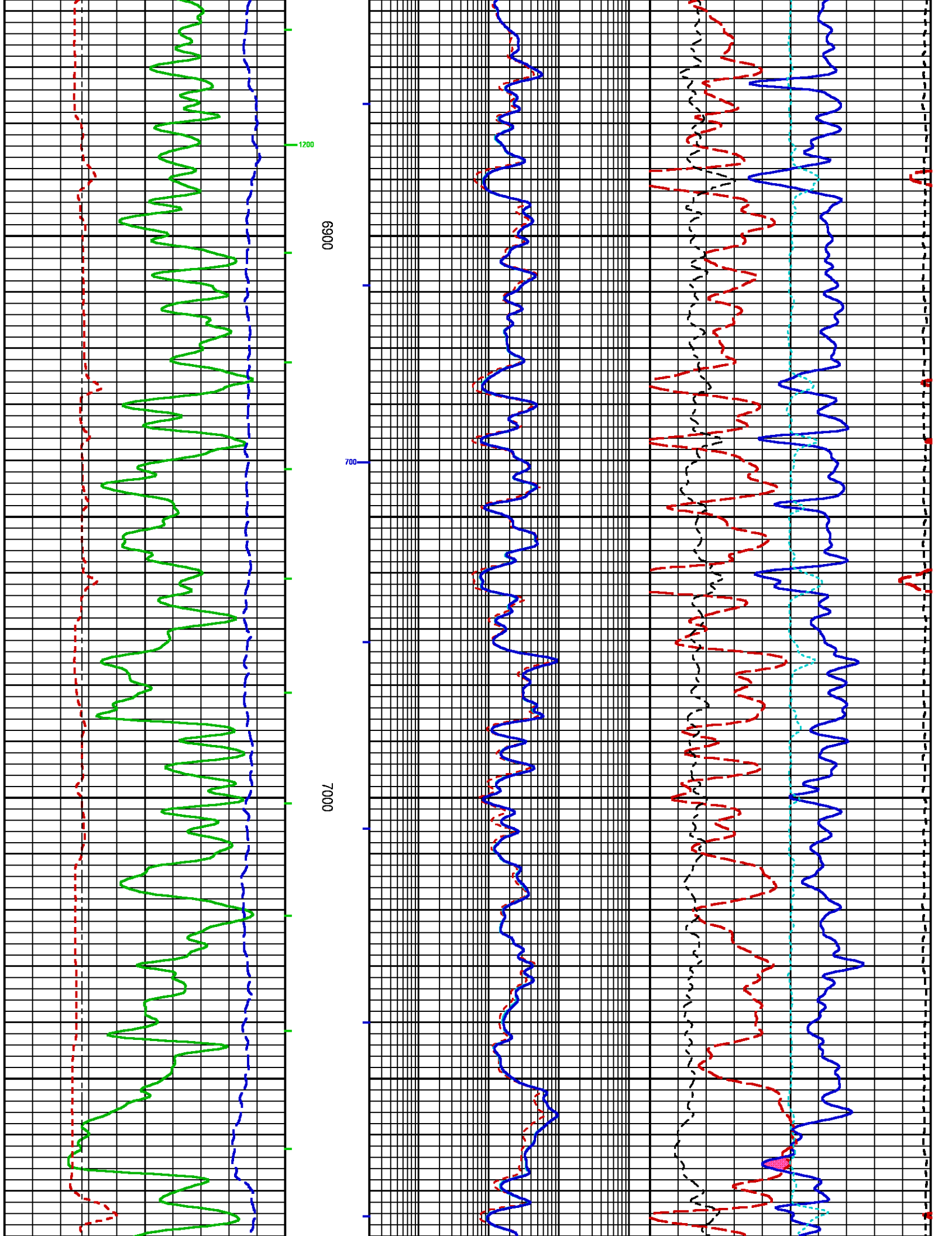
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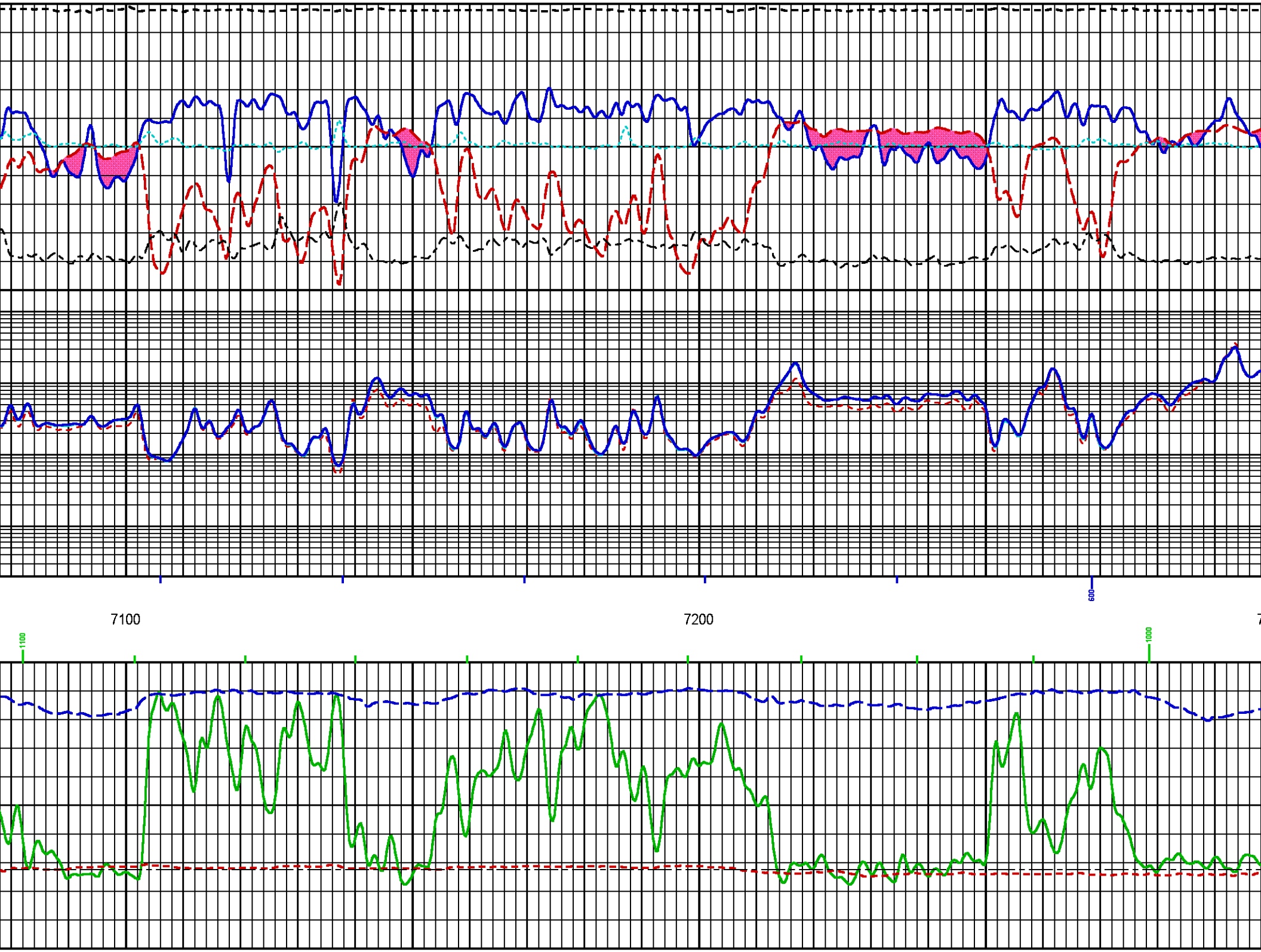
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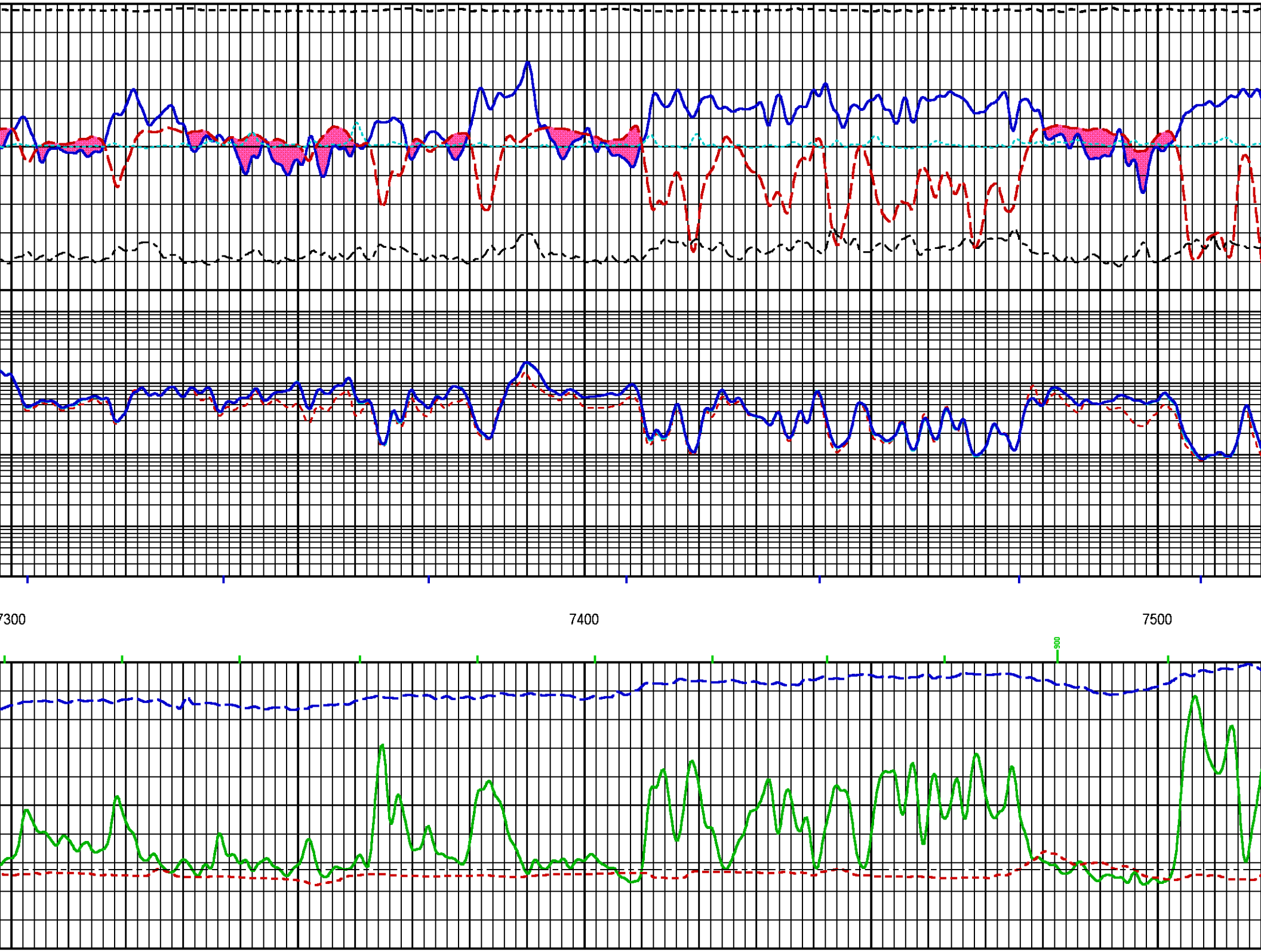
1100
1000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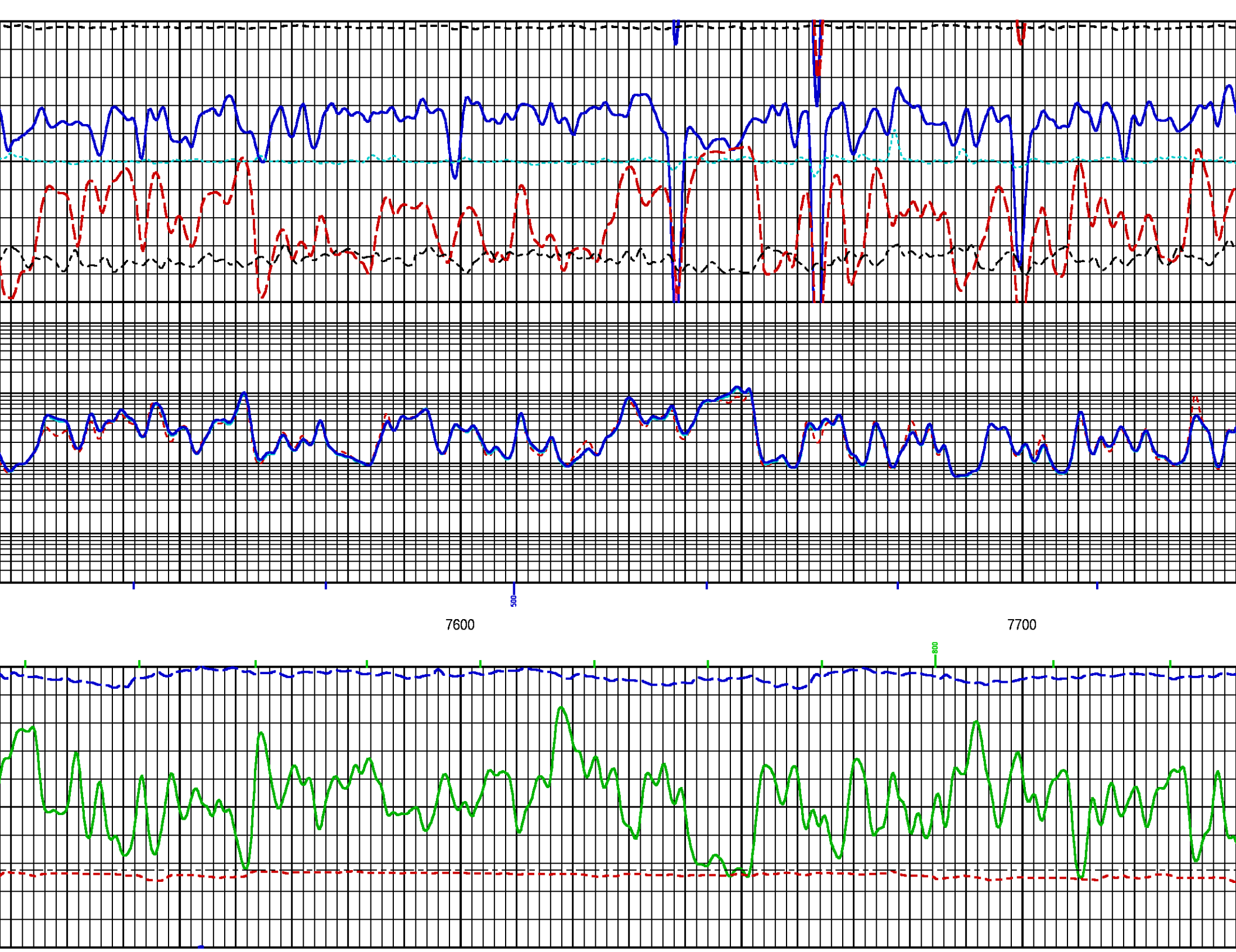
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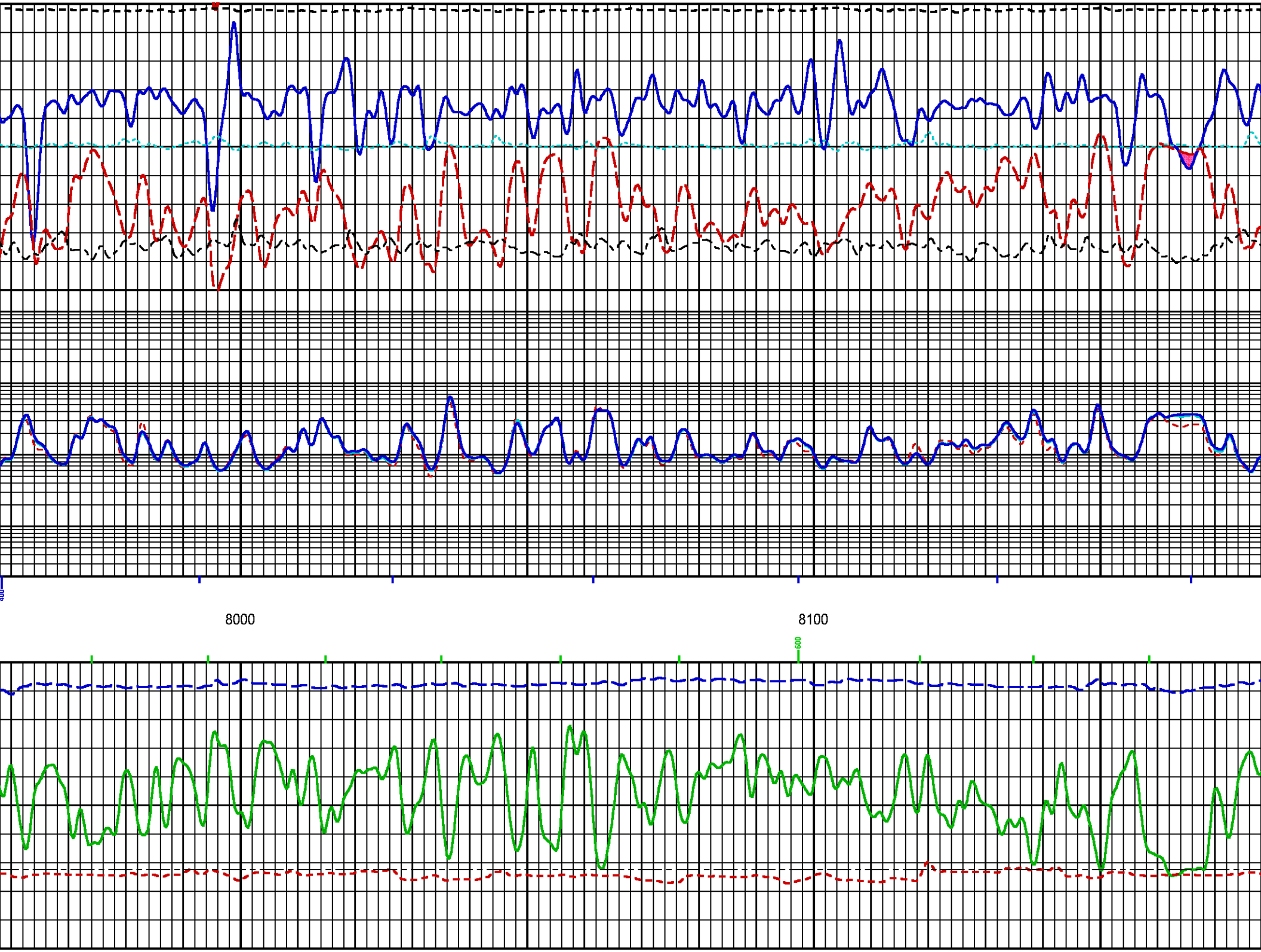
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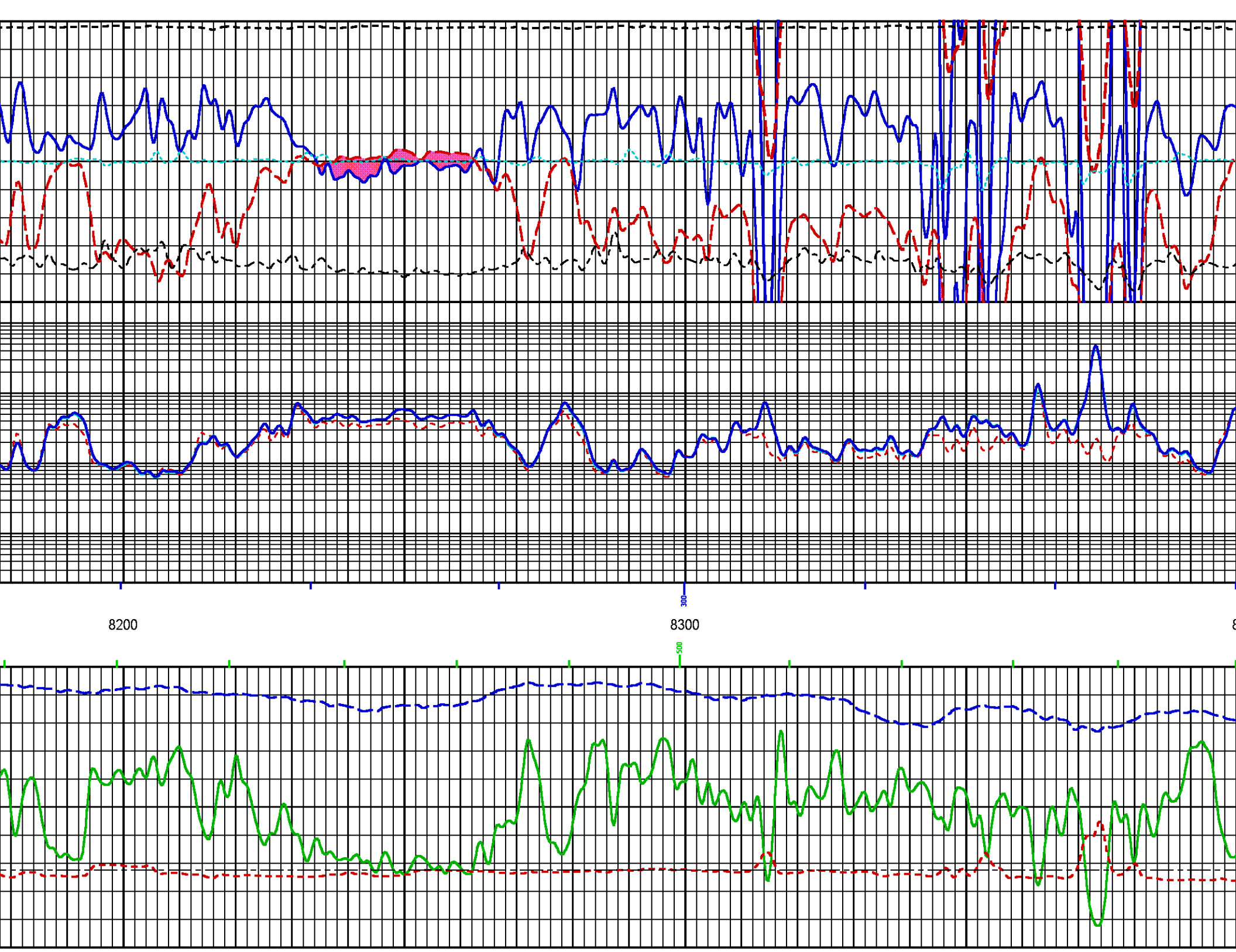
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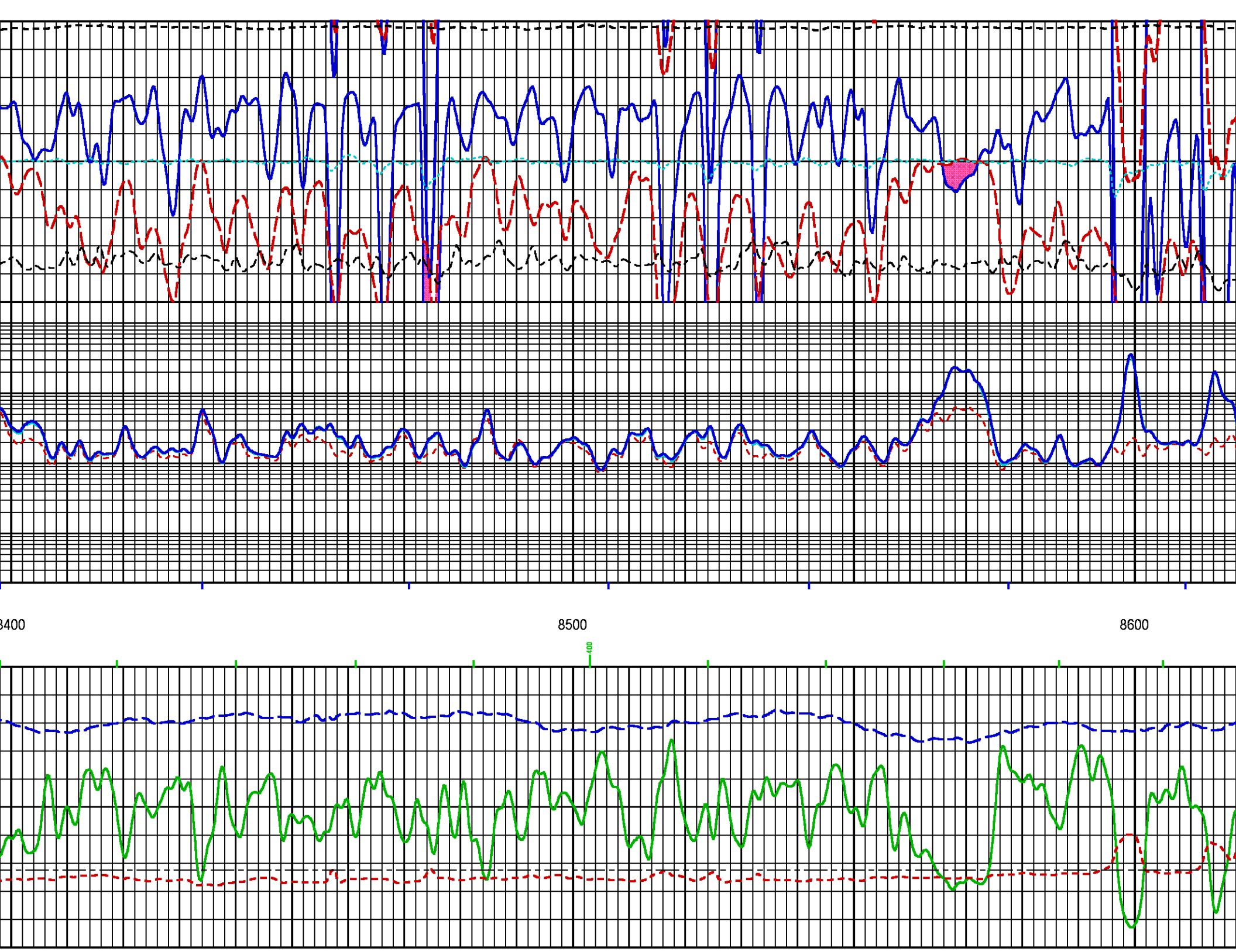
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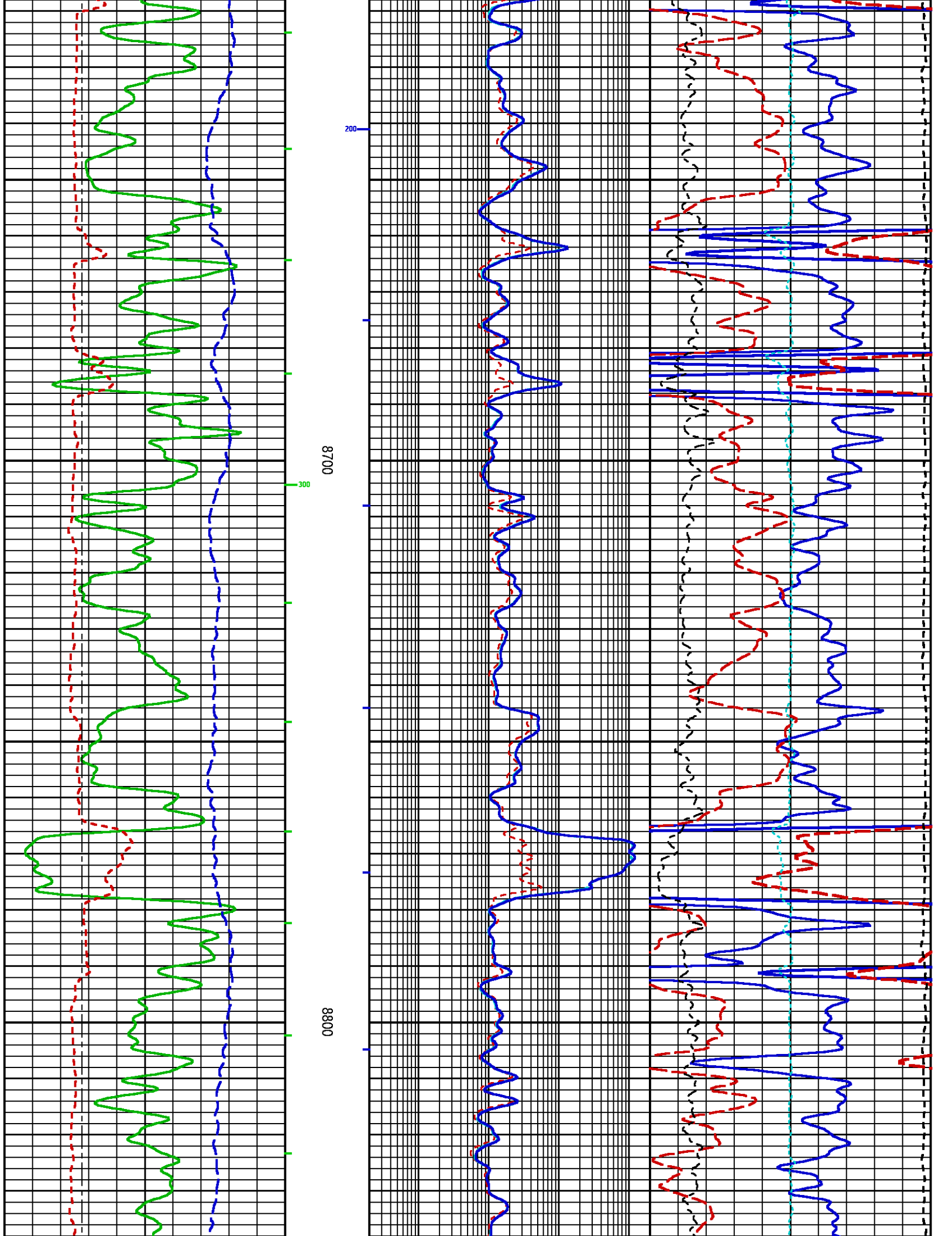
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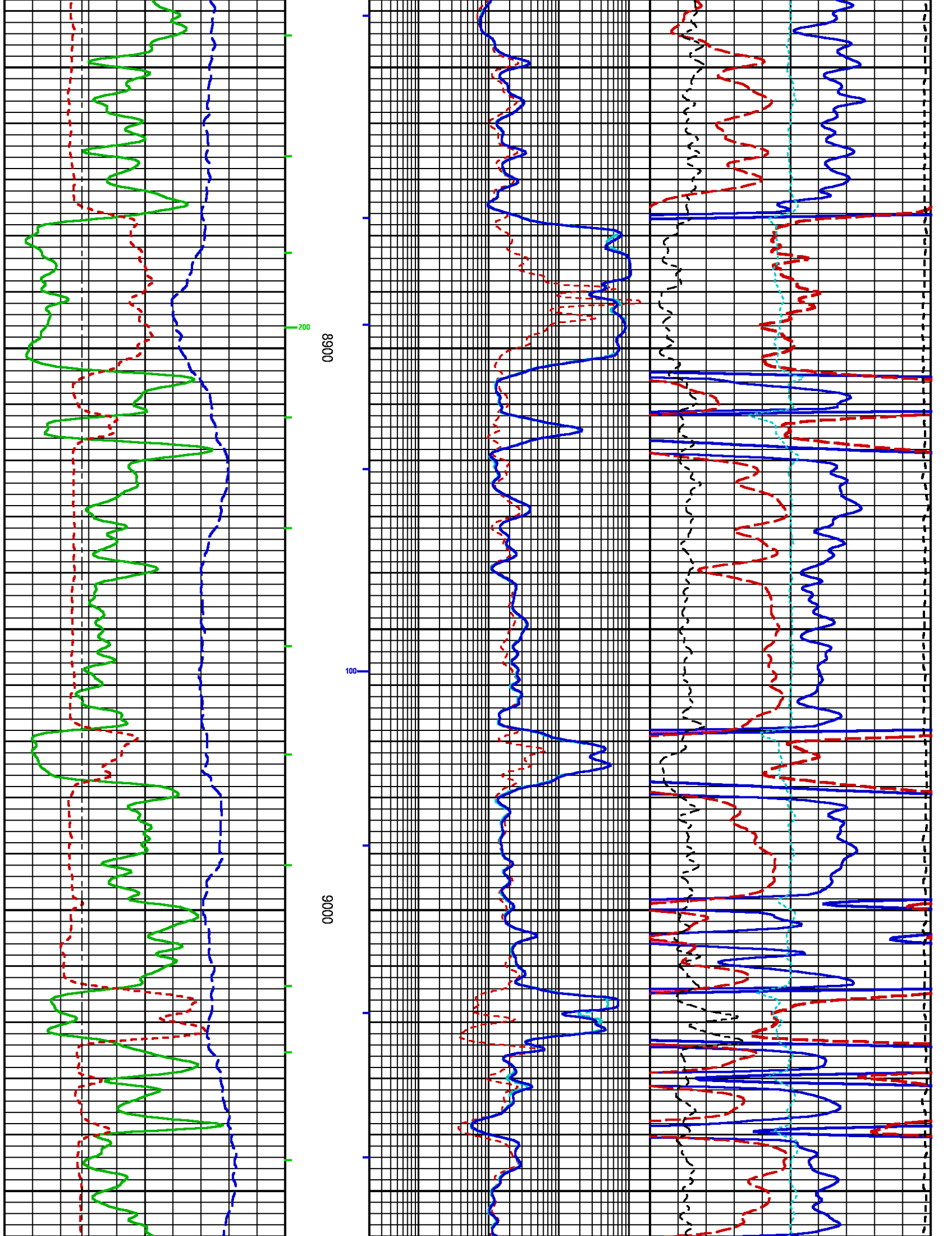
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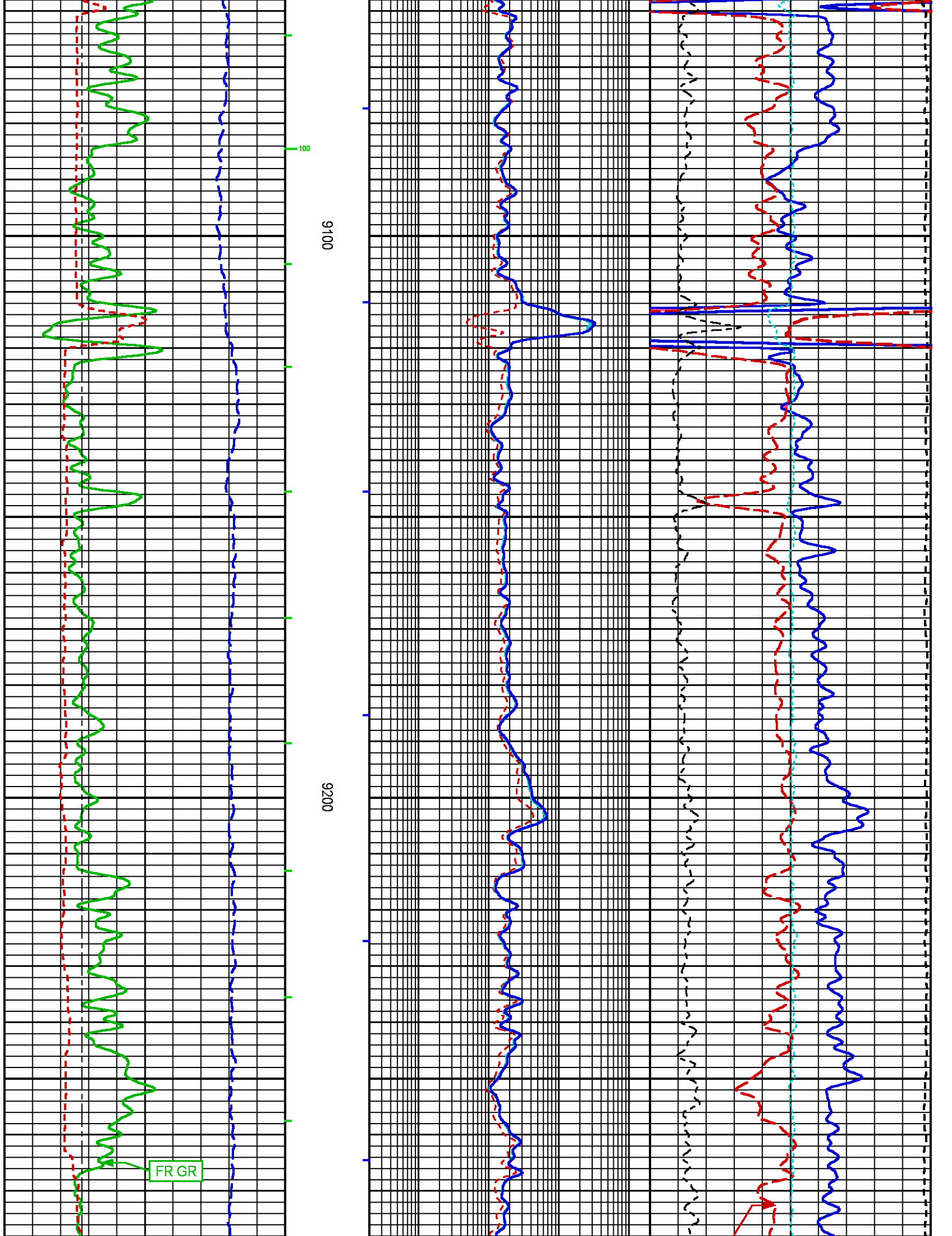
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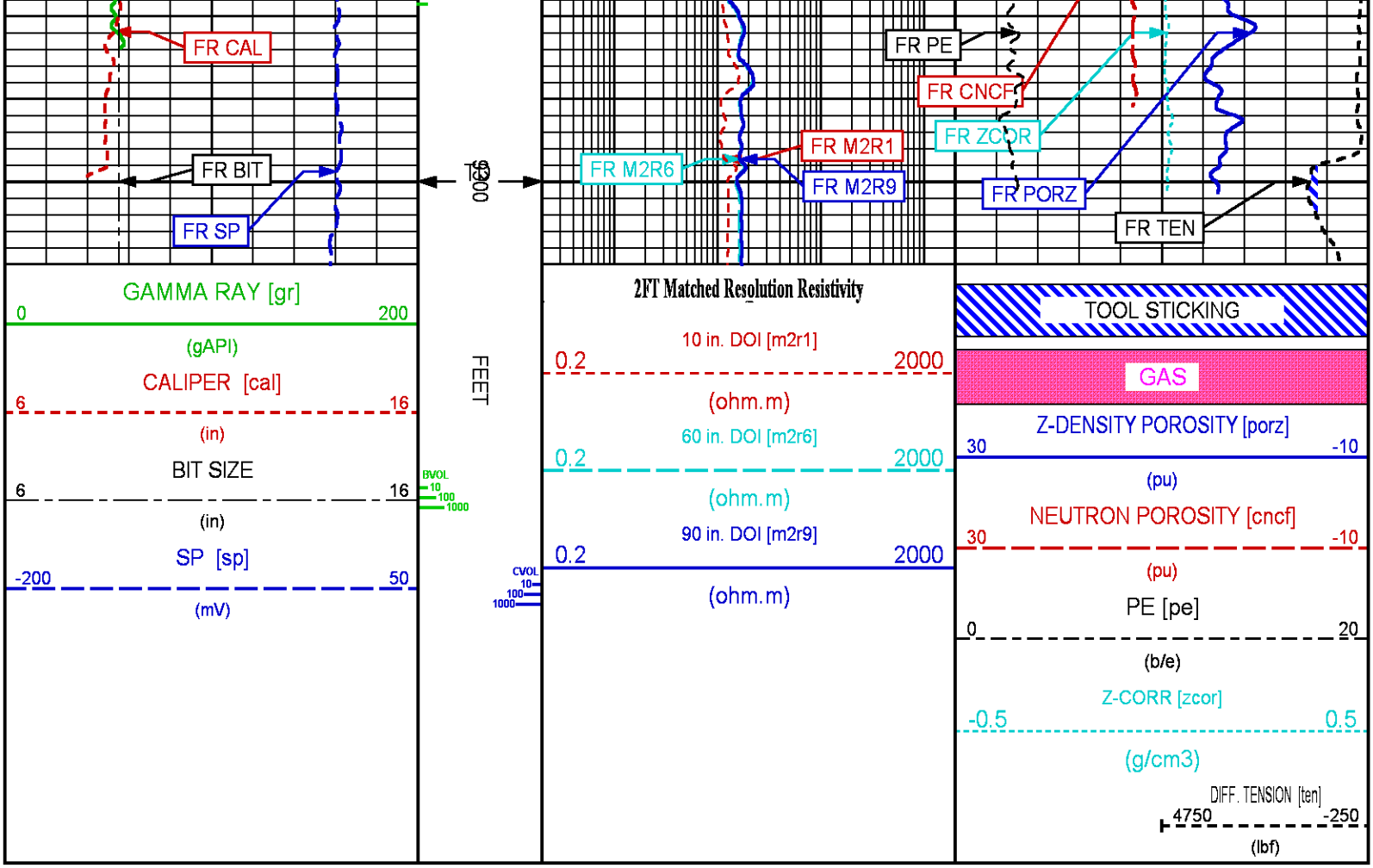


REPEAT LOG 5"/100FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013
Updates: 1 Patches: 9

Plotted: Sun Mar 20 10:19:03 2016

PARAMETER AND FILTER SUMMARY REPORT

FIl F: /dat1a/0H106355/n970a02.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 8964.000 ft BOTTOM DEPTH: 9304.354 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR MED RES	FILTER ()	medium (1)		TOP	BOTTOM
CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
CN MED RES	FILTER ()	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)		"	"

BOREHOLE & CEMENT

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	8.750	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	8.750	in	"	"
	FIXED DIAMETER (mbh*)	8.750	in	"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	65.2	degF	"	"
	MUD SAMPLE RES	0.742	ohm.m	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
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	"	"

ACCELERATION PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
ACCEL CORR SWITCH	ACCEL DEPTH CORR	CORRECTION ON		TOP	BOTTOM

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CN MATRIX	2436 MATRIX	SANDSTONE		TOP	BOTTOM
CN BOREHOLE CORRECTION	SALINITY	2500	ppm	"	"
	BOREHOLE CORRECTION	ON		"	"
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)	
DENSITY POROSITY	Air Filled Borehole	NO		TOP	BOTTOM
	RHOmatrix	2.680	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"

HDIL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORRECTION	ON		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		"	"
	ABC to CALCULATE	MUD CONDUCTIVITY		"	"
	STANDOFF	1.50	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

CURVE DESCRIPTION REPORT

CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 20 05:18:16 2016	BIT SIZE
F1:BVOL	Mar 20 05:18:16 2016	BOREHOLE VOLUME
F1:CAL	Mar 20 05:18:16 2016	CALIPER
F1:CNCF	Mar 20 05:18:16 2016	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Mar 20 05:18:16 2016	CEMENT VOLUME
F1:GR	Mar 20 05:18:16 2016	GAMMA RAY
F1:M2R1	Mar 20 05:18:16 2016	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R6	Mar 20 05:18:16 2016	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Mar 20 05:18:16 2016	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:PE	Mar 20 05:18:16 2016	PHOTO ELECTRIC CROSS-SECTION
F1:PORZ	Mar 20 05:18:16 2016	POROSITY FOR SELECTABLE MATRIX
F1:SP	Mar 20 05:18:16 2016	SPONTANEOUS POTENTIAL
F1:TEN	Mar 20 05:18:16 2016	DIFFERENTIAL TENSION
F1:ZCOR	Mar 20 05:18:16 2016	DENSITY CORRECTION

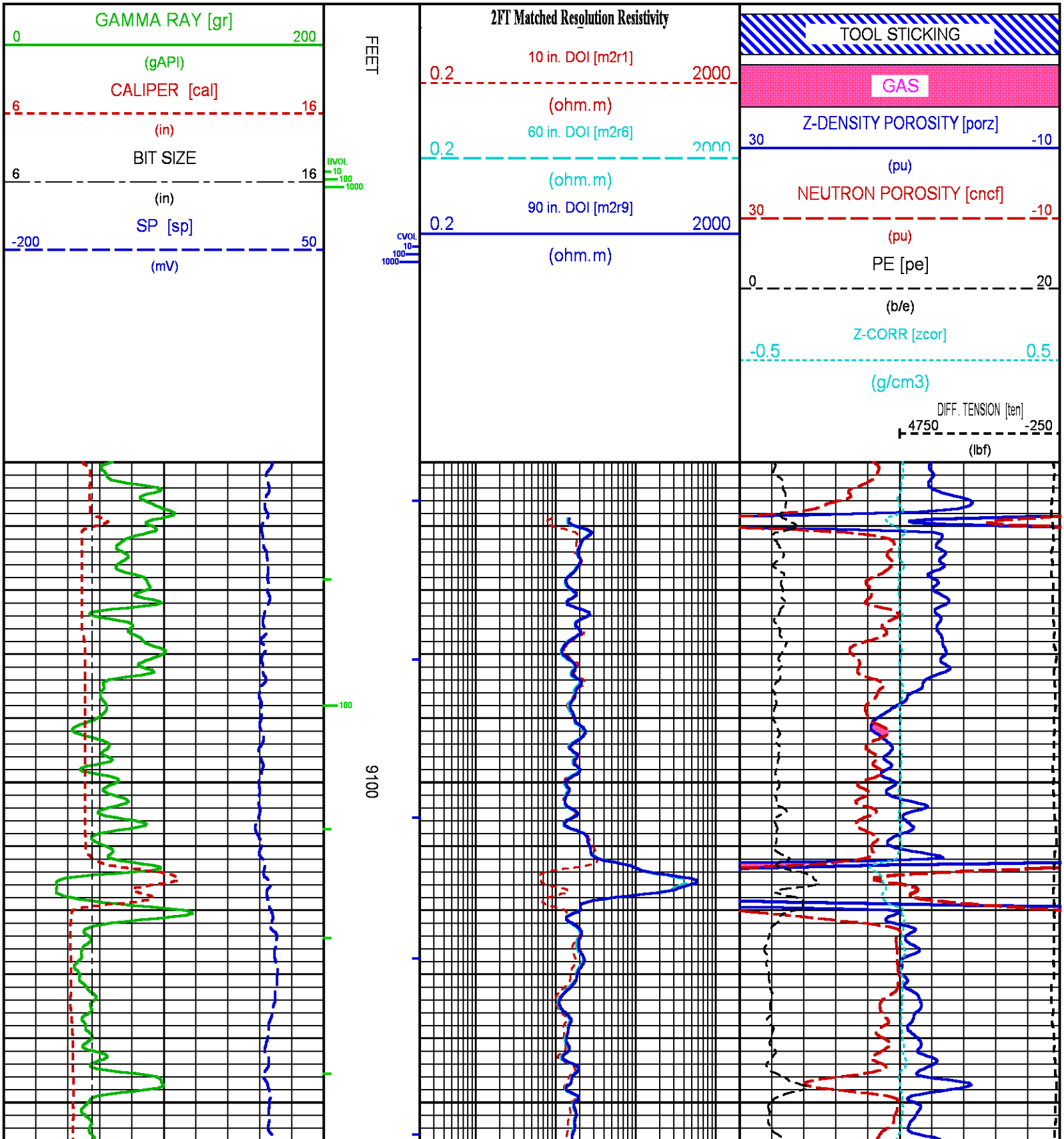
CURVE MEASURE POINT OFFSET

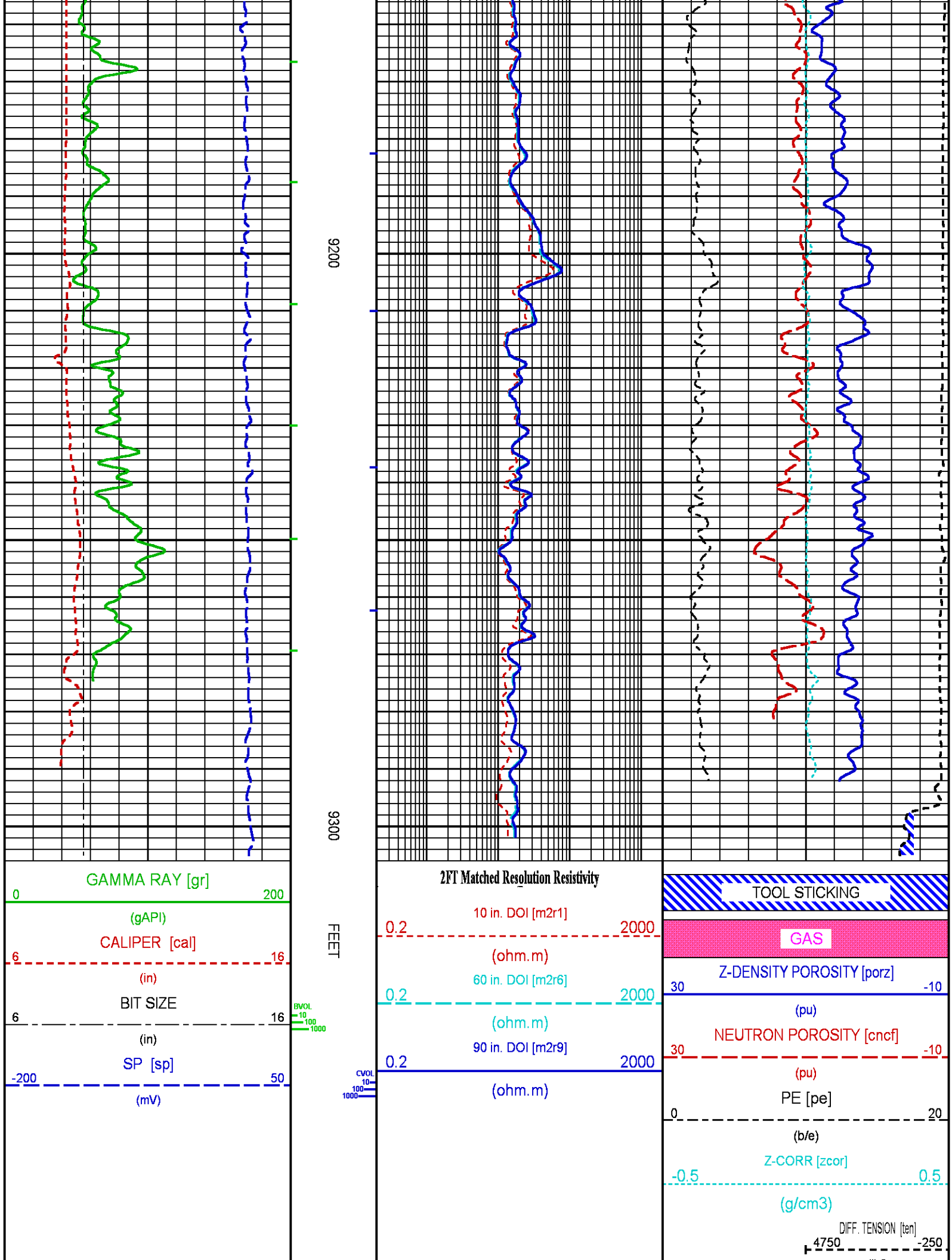
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)

BIT	0.00	GR	35.00	M2R9	2.75	SP	1.25
CAL	18.12	M2R1	2.75	PE	18.00	TEN	0.00
CNCF	27.38	M2R6	2.75	PORZ	18.00	ZCOR	18.00

Presentation : cpu100:/dat1a/0H106355/HDILZDLCN_REPEAT.fvpdf [5"/100' Scale]
Plot Interval : 9050 - 9305 Feet

Data File 1 : F1 : cpu100:/dat1a/0H106355/413_REPEAT.xtf
Created On : Mar 20 09:13:44 2016
Company : WPX ENERGY
Well : FEDERAL RU 413-6
Field : RULISON
File Interval : 8937.25 - 9326.25 Feet
OCT : n970a




9200
9300
FEET
GAMMA RAY [gr]
0
200
(gAPI)
CALIPER [cal]
6
16
(in)
BIT SIZE
6
16
BVOL
10
100
1000
(in)
SP [sp]
-200
50
(mV)
2FT Matched Resolution Resistivity
10 in. DOI [m2r1]
0.2
2000
(ohm.m)
60 in. DOI [m2r6]
0.2
2000
(ohm.m)
90 in. DOI [m2r9]
0.2
2000
(ohm.m)
CVOL
10
100
1000
TOOL STICKING
GAS
Z-DENSITY POROSITY [porz]
30
-10
(pu)
NEUTRON POROSITY [cncf]
30
-10
(pu)
PE [pe]
0
20
(b/e)
Z-CORR [zcor]
-0.5
0.5
(g/cm3)
DIFF. TENSION [ten]
4750
-250

			(lbf)

CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/0H106355/n970a.tp1

GR PRIMARY CALIBRATION SUMMARY

Tool #: 3518EG 10139870 DATE/TIME PERFORMED: Mon Mar 7 11:49:54 2016

Unit #: 3880TA HL6670 Jig Series: 4702NK WA-612

Background	Calibrator ON	Jig Value (gAPI)	Mult	Background (gAPI)	Calibrator ON (gAPI)
224.17	929.46	185	0.262 (0.230 – 0.280)	58.80	243.80

GR PRIMARY VERIFICATION SUMMARY

NOT DONE

GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 3518EG 10139870 DATE/TIME PERFORMED: Sun Mar 20 03:48:51 2016 DAYS SINCE CAL: 12

UNIT #: 3880TA HL6670 Jig: INTRNL N/A

Counts	TEMP (degF)	HV (V)
976.67 (929.00 – 1027.00)	48.10 (536.00)	1361.74 (1237.00 – 1512.00)

GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 3518EG 10139870 DATE/TIME PERFORMED: Sun Mar 20 09:00:28 2016 DAYS SINCE CAL: 12

UNIT #: 3880TA HL6670 Jig: INTRNL N/A

Counts	TEMP (degF)	HV (V)
976.67 (929.00 – 1027.00)	117.06 (536.00)	1352.13 (1237.00 – 1512.00)

CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2436XA 10522099 DATE/TIME PERFORMED: Tue Mar 8 13:40:40 2016

UNIT #: 3880TA HL6670 CALIBRATOR #: 2437XB 112674 SOURCE #: 4718XA N-0897

SSN DT CPS	LSN DT CPS	SSN/LSN	MCF	CNRATIO	CN PU
4665.69	815.97	5.71798	1.00333 (0.95000 – 1.05000)	5.73700	25.241

CN BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2436XA 10522099 DATE/TIME PERFORMED: Sun Mar 20 03:48:38 2016 DAYS SINCE CAL: 11

UNIT #: 3880TA HL6670 CALIBRATOR #: INTRNL N/A

SSN DT CPS	LSN DT CPS	SSN/LSN	TEMP (degF)	HV (V)	LV (V)
991.40	993.76	0.99762 (0.95000 – 1.05000)	43.9 (280.4)	1322.0 (1250.0 – 1450.0)	4.624 (4.300 – 5.000)

CN AFTER LOG VERIFICATION SUMMARY

TOOL #: 2436XA 10522099 DATE/TIME PERFORMED: Sun Mar 20 09:00:35 2016 DAYS SINCE CAL: 11

UNIT #: 3880TA HL6670 CALIBRATOR #: INTRNL N/A

SSN DT CPS	LSN DT CPS	SSN/LSN	TEMP (degF)	HV (V)	LV (V)
991.74	993.75	0.99797	114.6	1323.5	4.624
		0.95000 1.05000	280.4	1250.0 1450.0	4.300 5.000

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2223XA 10123024 DATE/TIME PERFORMED: Tue Feb 23 09:42:02 2016

UNIT #: 3885TD MI4230

	SIZE (in)	VALUE	MULTIPLIER	ADD
SMALL RING (Arm)	7.000	1473.6		
LARGE RING (Arm)	11.000	2683.6	0.00331	2.12860
PAD CLOSED		1332.0	0.00250	-3.33000

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10123024 DATE/TIME PERFORMED: Sun Mar 20 04:18:33 2016 DAYS SINCE CAL: 25

UNIT #: 3880TA HL6670

	VALUE	MULTIPLIER	ADD	SIZE (in)
ARM	1940.4	0.00331	2.48446	8.9
PAD	1372.8	0.00250	-3.33000	0.1

	ACTUAL (in)	MEASURED (in)
DIAMETER (arm+pad)	9.001	9.0
		8.6 9.4

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10123024 DATE/TIME PERFORMED: Sun Mar 20 08:59:15 2016 DAYS SINCE CAL: 25

UNIT #: 3880TA HL6670

	VALUE	MULTIPLIER	ADD	SIZE (in)
ARM	1996.0	0.00331	2.48446	9.1
PAD	1348.0	0.00250	-3.33000	0.0

	ACTUAL (in)	MEASURED (in)
DIAMETER (arm+pad)	9.001	9.1
		8.6 9.4

ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2223XA 10123024 DATE/TIME PERFORMED: Tue Feb 23 10:37:07 2016

UNIT: 3885TD MI4230 CALB BLKS: 2225XA 094292F CS SRC: 4705XA 16068B PAD TYPE: PADTYP 7.5" PAD

SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)
224.5 (220.0 – 230.0)	224.6 (220.0 – 230.0)	1320.0	1315.3

	SS (cps)	LS (cps)	SHR	DEN (g/cm3)	CORR (g/cm3)	PE (b/e)
MG (LO PE)	30887.6	11283.1	0.723 (0.720 – 0.890)	1.679	0.000	1.900
AL	19256.3	1257.9		2.667	-0.016	
AL + SHIM	25645.7	2171.5		2.558	0.098	
MG + SHIM (HI PE)	15117.8	5371.0	0.286 (0.280 – 0.360)			8.550
RATIO AL + SHIM/AL	1.33 (1.30 – 1.40)	1.73 (1.60 – 1.80)				
RATIO MG/AL	1.60 (1.58 – 1.70)	8.97 (8.55 – 9.55)				

ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10123024 DATE/TIME PERFORMED: Sun Mar 20 03:50:26 2016 DAYS SINCE CAL: 25

UNIT #: 3880TA HL6670

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	3342.1 (3332.1 – 3352.1)	225.3 (220.0 – 230.0)	1423.9 (1250.0 – 1550.0)
SS	22355.0 (22344.8 – 22364.8)	225.5 (220.0 – 230.0)	1302.9 (1250.0 – 1550.0)

LV (V)	PAD CURRENT (mA)
5.0 (4.8 – 5.2)	99.2 (50.0 – 120.0)

ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10123024 DATE/TIME PERFORMED: Sun Mar 20 09:00:31 2016 DAYS SINCE CAL: 25

UNIT #: 3880TA HL6670

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	3342.1 (3332.1 – 3352.1)	224.6 (220.0 – 230.0)	1435.1 (1250.0 – 1550.0)
SS	22354.6 (22344.8 – 22364.8)	224.2 (220.0 – 230.0)	1311.4 (1250.0 – 1550.0)

LV (V)	PAD CURRENT (mA)
5.0 (4.8 – 5.2)	100.8 (50.0 – 120.0)

HDIL PRIMARY CALIBRATION SUMMARY

TOOL #: 1530XA 10103013 DATE/TIME PERFORMED: Tue Jun 30 07:23:21 2015

UNIT #: 3885TC 6685 GRCOND ID & DATE: 86 101801

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	0.0001 (-0.2000 – 0.2000)	-0.0006 (-0.1000 – 0.1000)	0.0003 (-0.1000 – 0.1000)	0.0012 (-0.1000 – 0.1000)	-0.0006 (-0.1000 – 0.1000)	0.0002 (-0.1000 – 0.1000)	0.0002 (-0.1000 – 0.1000)	0.0000 (-0.1000 – 0.1000)
Coil 0 Q	-0.0122 (-0.5000 – 0.5000)	0.0002 (-0.2000 – 0.2000)	-0.0006 (-0.1000 – 0.1000)	0.0009 (-0.1000 – 0.1000)	-0.0001 (-0.1000 – 0.1000)	0.0001 (-0.1000 – 0.1000)	-0.0011 (-0.1000 – 0.1000)	-0.0012 (-0.1000 – 0.1000)
Coil 1 R	-0.0053 (-0.2000 – 0.2000)	-0.0007 (-0.1000 – 0.1000)	0.0007 (-0.1000 – 0.1000)	-0.0026 (-0.1000 – 0.1000)	0.0018 (-0.1000 – 0.1000)	0.0006 (-0.1000 – 0.1000)	-0.0024 (-0.1000 – 0.1000)	-0.0002 (-0.1000 – 0.1000)
Coil 1 Q	-0.0291 (-0.5000 – 0.5000)	0.0038 (-0.2000 – 0.2000)	-0.0008 (-0.1000 – 0.1000)	0.0004 (-0.1000 – 0.1000)	0.0007 (-0.1000 – 0.1000)	-0.0000 (-0.1000 – 0.1000)	-0.0002 (-0.1000 – 0.1000)	-0.0010 (-0.1000 – 0.1000)
Coil 2 R	0.0004 (-0.2000 – 0.2000)	-0.0056 (-0.1000 – 0.1000)	0.0022 (-0.1000 – 0.1000)	-0.0002 (-0.1000 – 0.1000)	0.0016 (-0.1000 – 0.1000)	-0.0002 (-0.1000 – 0.1000)	-0.0000 (-0.1000 – 0.1000)	-0.0009 (-0.1000 – 0.1000)

Coil 2 Q	-0.0108	-0.0055	-0.0074	0.0009	-0.0038	-0.0007	0.0000	-0.0026
	-0.5000 0.5000	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 3 R	0.0048	0.0004	0.0053	-0.0045	0.0030	0.0004	-0.0002	-0.0020
	-0.3000 0.3000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 3 Q	-0.0265	0.0001	-0.0018	-0.0034	-0.0008	-0.0010	0.0020	0.0002
	-0.5000 0.5000	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 4 R	-0.0145	0.0077	-0.0065	0.0045	0.0055	0.0041	0.0045	-0.0025
	-0.5000 0.5000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000
Coil 4 Q	-0.0231	0.0042	0.0019	-0.0041	-0.0005	0.0026	0.0051	-0.0063
	-1.0000 1.0000	-0.4000 0.4000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000
Coil 5 R	-0.0718	-0.0207	-0.0085	-0.0044	-0.0103	0.0190	0.0064	0.0166
	-1.2000 1.2000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000
Coil 5 Q	-0.1232	0.0018	0.0241	0.0009	0.0018	-0.0130	-0.0120	0.0035
	-1.5000 1.5000	-0.8000 0.8000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	160.43	158.92	155.91	151.47	145.62	138.54	130.20	120.73
	136.00 186.00	134.00 184.00	131.00 181.00	126.00 176.00	122.00 170.00	118.00 161.00	112.00 150.00	105.00 139.00
Coil 0 P	7.791	25.703	43.149	60.526	77.892	95.271	112.612	129.998
	6.000 9.000	21.000 30.000	35.000 50.000	49.000 71.000	63.000 91.000	77.000 109.000	92.000 130.000	106.000 151.000
Coil 1 M	291.56	288.52	282.49	273.76	262.41	248.98	233.35	216.15
	238.00 328.00	235.00 325.00	230.00 320.00	225.00 312.00	218.00 302.00	208.00 288.00	196.00 266.00	184.00 244.00
Coil 1 P	7.869	25.954	43.536	61.008	78.401	95.733	113.008	130.196
	6.000 9.000	21.000 30.000	35.000 51.000	49.000 71.000	63.000 92.000	78.000 112.000	93.000 130.000	107.000 151.000
Coil 2 M	574.76	569.44	558.74	543.02	522.36	497.32	467.80	434.40
	479.00 659.00	474.00 654.00	463.00 643.00	450.00 622.00	432.00 602.00	412.00 572.00	390.00 540.00	359.00 499.00
Coil 2 P	7.784	25.835	43.393	60.874	78.345	95.815	113.291	130.768
	6.000 9.000	21.000 31.000	35.000 51.000	49.000 71.000	63.000 92.000	76.000 115.000	92.000 135.000	105.000 155.000
Coil 3 M	936.96	928.58	911.54	886.70	853.62	813.42	765.75	711.90
	772.00 1060.00	764.00 1050.00	752.00 1030.00	728.00 1010.00	700.00 970.00	665.00 925.00	628.00 868.00	589.00 799.00
Coil 3 P	7.805	25.828	43.375	60.860	78.355	95.863	113.375	130.901
	6.000 10.000	21.000 30.000	35.000 51.000	49.000 72.000	63.000 93.000	76.000 114.000	90.000 135.000	104.000 156.000
Coil 4 M	1489.6	1475.1	1445.6	1402.1	1345.0	1277.1	1197.7	1109.4
	1210.0 1700.0	1205.0 1690.0	1180.0 1650.0	1140.0 1590.0	1120.0 1530.0	1070.0 1450.0	1000.0 1350.0	942.0 1240.0
Coil 4 P	7.947	26.205	43.992	61.666	79.309	96.897	114.455	131.970
	6.000 10.000	21.000 31.000	35.000 52.000	49.000 73.000	63.000 93.000	77.000 114.000	91.000 135.000	105.000 156.000
Coil 5 M	3027.0	2999.8	2942.2	2855.8	2744.3	2609.0	2451.3	2275.5
	2450.0 3450.0	2420.0 3400.0	2410.0 3320.0	2350.0 3200.0	2280.0 3080.0	2150.0 2950.0	2020.0 2750.0	1870.0 2570.0
Coil 5 P	7.963	26.286	44.165	61.932	79.662	97.392	115.082	132.756
	6.000 10.000	20.000 31.000	35.000 52.000	49.000 73.000	63.000 94.000	79.000 113.000	93.000 134.000	106.000 156.000

AM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-1184	-665	-521	-442	-391	-353	-324	-303
	-3200 940	-1400 -20	-930 -150	-760 -160	-660 -130	-600 -120	-550 -110	-520 -92
Coil 0 Q	-1596	-879	-666	-571	-518	-487	-466	-454
	-15000 11000	-5800 3800	-3700 2100	-2700 1400	-2200 1000	-1800 790	-1600 620	-1500 490
Coil 1 R	-248	-184	-156	-138	-124	-113	-103	-97
	-750 460	-360 83	-280 9	-230 -10	-200 -26	-180 -35	-160 -46	-150 -49
Coil 1 Q	-541	-259	-189	-160	-144	-132	-125	-119
	-3300 3300	-1100 960	-630 530	-470 360	-380 260	-320 190	-290 150	-260 120
Coil 2 R	-5.2	-34.1	-35.0	-33.0	-30.5	-27.9	-25.4	-24.0
	-85.0 76.0	-64.0 -0.4	-57.0 -12.0	-51.0 -16.0	-46.0 -17.0	-42.0 -16.0	-39.0 -15.0	-37.0 -13.0
Coil 2 Q	-104.4	-36.3	-25.2	-20.3	-17.2	-14.3	-11.4	-9.0
	-1500.0 1900.0	-500.0 610.0	-290.0 350.0	-220.0 260.0	-160.0 190.0	-140.0 160.0	-110.0 130.0	-99.0 120.0
Coil 3 R	0.1	-9.8	-10.7	-10.2	-9.5	-8.8	-8.3	-7.4
	-23.0 21.0	-22.0 1.6	-21.0 -1.3	-20.0 -1.8	-19.0 -2.0	-19.0 -1.3	-19.0 -0.8	-19.0 -0.0
Coil 3 Q	-63.6	-17.4	-7.8	-2.5	1.6	5.2	8.4	12.2
	-540.0 530.0	-180.0 180.0	-100.0 110.0	-71.0 81.0	-51.0 66.0	-37.0 58.0	-28.0 53.0	-21.0 51.0
Coil 4 R	2.91	-4.88	-4.85	-4.58	-4.02	-3.85	-3.79	-3.54
	-18.00 13.00	-12.00 2.70	-11.00 1.50	-9.80 0.52	-9.90 0.96	-10.00 1.50	-11.00 2.30	-11.00 2.60
Coil 4 Q	-7.80	0.79	4.50	7.69	10.43	13.64	16.54	19.67
	-250.00 280.00	-79.00 98.00	-43.00 64.00	-27.00 51.00	-18.00 46.00	-11.00 42.00	-5.50 42.00	-1.00 42.00
Coil 5 R	-0.64	-2.57	-2.78	-2.71	-2.35	-2.05	-2.24	-1.97
	-56.00 51.00	-8.40 3.60	-6.90 1.10	-6.90 1.20	-9.30 2.90	-14.00 6.30	-19.00 9.60	-24.00 13.00
Coil 5 Q	-9.56	0.46	4.74	7.98	11.19	14.17	17.55	20.10
	-88.00 69.00	-26.00 27.00	-14.00 22.00	-7.00 22.00	-2.50 24.00	1.10 26.00	4.10 29.00	7.10 32.00

MM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	0.980	0.985	0.987	0.988	0.989	0.989	0.989	0.988
	0.850 1.100	0.860 1.100	0.870 1.100	0.880 1.100	0.880 1.100	0.880 1.100	0.880 1.100	0.880 1.100
Coil 0 P	-0.173	-0.231	-0.148	-0.069	-0.023	0.045	0.059	0.132
	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500
Coil 1 M	0.977	0.983	0.985	0.986	0.986	0.986	0.986	0.985
	0.850 1.100	0.860 1.100	0.870 1.100	0.880 1.100	0.880 1.100	0.880 1.100	0.880 1.100	0.880 1.100
Coil 1 P	-0.163	-0.231	-0.137	-0.054	0.011	0.047	0.091	0.134
	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500	-1.500 1.500
Coil 2 M	0.995	0.995	0.995	0.994	0.994	0.994	0.993	0.992
	0.890 1.100	0.890 1.100	0.890 1.100	0.890 1.100	0.890 1.100	0.890 1.100	0.890 1.100	0.890 1.100

Coil 2 P	0.038 (-1.500 1.500)	0.047 (-1.500 1.500)	0.096 (-1.500 1.500)	0.129 (-1.500 1.500)	0.151 (-1.500 1.500)	0.169 (-1.500 1.500)	0.176 (-1.500 1.500)	0.205 (-1.500 1.500)
Coil 3 M	1.004 (0.900 1.100)	1.004 (0.900 1.100)	1.004 (0.900 1.100)	1.003 (0.900 1.100)	1.003 (0.900 1.100)	1.003 (0.900 1.100)	1.002 (0.900 1.100)	1.001 (0.900 1.100)
Coil 3 P	0.047 (-1.500 1.500)	0.085 (-1.500 1.500)	0.140 (-1.500 1.500)	0.175 (-1.500 1.500)	0.226 (-1.500 1.500)	0.282 (-1.500 1.500)	0.313 (-1.500 1.500)	0.367 (-1.500 1.500)
Coil 4 M	1.008 (0.900 1.100)	1.009 (0.900 1.100)	1.009 (0.900 1.100)	1.008 (0.900 1.100)	1.008 (0.900 1.100)	1.007 (0.900 1.100)	1.006 (0.900 1.100)	1.005 (0.900 1.100)
Coil 4 P	0.024 (-1.500 1.500)	0.049 (-1.500 1.500)	0.109 (-1.500 1.500)	0.133 (-1.500 1.500)	0.200 (-1.500 1.500)	0.229 (-1.500 1.500)	0.263 (-1.500 1.500)	0.344 (-1.500 1.500)
Coil 5 M	1.004 (0.900 1.100)	1.004 (0.900 1.100)	1.004 (0.900 1.100)	1.004 (0.900 1.100)	1.003 (0.900 1.100)	1.001 (0.900 1.100)	1.001 (0.900 1.100)	0.999 (0.900 1.100)
Coil 5 P	0.024 (-1.500 1.500)	0.031 (-1.500 1.500)	0.086 (-1.500 1.500)	0.114 (-1.500 1.500)	0.149 (-1.500 1.500)	0.235 (-1.500 1.500)	0.185 (-1.500 1.500)	0.196 (-1.500 1.500)

PARMS	TCID 0	TCID 1	Cal Temp (degF)	T Factor
IDs	2.874	0.940	87.5	1.00

HDIL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1530XA 10103013 DATE/TIME PERFORMED: Sun Mar 20 05:09:05 2016 DAYS SINCE CAL: 263

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 (-0.200 0.200)	-0.000 (-0.100 0.100)	0.001 (-0.100 0.100)	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)
Coil 0 Q	-0.010 (-0.500 0.500)	-0.000 (-0.200 0.200)	-0.002 (-0.100 0.100)	0.001 (-0.100 0.100)	0.000 (-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	-0.004 (-0.200 0.200)	-0.002 (-0.100 0.100)	-0.000 (-0.100 0.100)	-0.000 (-0.100 0.100)	0.001 (-0.100 0.100)	0.001 (-0.100 0.100)	-0.000 (-0.100 0.100)	-0.000 (-0.100 0.100)
Coil 1 Q	-0.015 (-0.500 0.500)	0.002 (-0.200 0.200)	0.002 (-0.100 0.100)	0.001 (-0.100 0.100)	-0.000 (-0.100 0.100)	-0.000 (-0.100 0.100)	0.001 (-0.100 0.100)	-0.001 (-0.100 0.100)
Coil 2 R	-0.001 (-0.200 0.200)	0.004 (-0.100 0.100)	-0.001 (-0.100 0.100)	0.000 (-0.100 0.100)	-0.001 (-0.100 0.100)	-0.000 (-0.100 0.100)	-0.003 (-0.100 0.100)	0.000 (-0.100 0.100)
Coil 2 Q	-0.003 (-0.500 0.500)	-0.003 (-0.200 0.200)	-0.002 (-0.100 0.100)	-0.003 (-0.100 0.100)	0.000 (-0.100 0.100)	0.003 (-0.100 0.100)	-0.003 (-0.100 0.100)	0.001 (-0.100 0.100)
Coil 3 R	0.021 (-0.300 0.300)	0.006 (-0.100 0.100)	0.005 (-0.100 0.100)	-0.004 (-0.100 0.100)	-0.003 (-0.100 0.100)	0.003 (-0.100 0.100)	-0.001 (-0.100 0.100)	0.005 (-0.100 0.100)
Coil 3 Q	-0.011 (-0.500 0.500)	-0.007 (-0.200 0.200)	0.008 (-0.100 0.100)	0.001 (-0.100 0.100)	-0.005 (-0.100 0.100)	0.001 (-0.100 0.100)	-0.001 (-0.100 0.100)	0.000 (-0.100 0.100)
Coil 4 R	-0.022 (-0.500 0.500)	-0.011 (-0.200 0.200)	-0.008 (-0.200 0.200)	0.000 (-0.200 0.200)	0.005 (-0.200 0.200)	-0.012 (-0.200 0.200)	-0.007 (-0.200 0.200)	-0.003 (-0.200 0.200)
Coil 4 Q	-0.011 (-1.000 1.000)	-0.009 (-0.400 0.400)	-0.000 (-0.200 0.200)	0.004 (-0.200 0.200)	-0.009 (-0.200 0.200)	0.002 (-0.200 0.200)	0.002 (-0.200 0.200)	0.002 (-0.200 0.200)
Coil 5 R	0.021 (-1.200 1.200)	0.021 (-0.400 0.400)	-0.017 (-0.400 0.400)	-0.000 (-0.400 0.400)	-0.000 (-0.400 0.400)	0.004 (-0.400 0.400)	0.014 (-0.400 0.400)	0.010 (-0.400 0.400)
Coil 5 Q	-0.004 (-1.500 1.500)	-0.027 (-0.800 0.800)	0.031 (-0.400 0.400)	0.019 (-0.400 0.400)	0.014 (-0.400 0.400)	0.027 (-0.400 0.400)	-0.008 (-0.400 0.400)	-0.002 (-0.400 0.400)

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	159.69 (136.00 186.00)	158.20 (134.00 184.00)	155.19 (131.00 181.00)	150.73 (126.00 176.00)	144.92 (122.00 170.00)	137.84 (118.00 161.00)	129.54 (112.00 150.00)	120.15 (105.00 139.00)
Coil 0 P	6.922 (-1.000 12.000)	25.541 (19.000 30.000)	43.208 (35.000 50.000)	60.739 (49.000 71.000)	78.222 (63.000 91.000)	95.720 (77.000 110.000)	113.175 (92.000 130.000)	130.623 (105.000 151.000)
Coil 1 M	290.83 (237.00 327.00)	287.82 (235.00 325.00)	281.82 (230.00 320.00)	273.04 (225.00 312.00)	261.76 (218.00 302.00)	248.31 (208.00 288.00)	232.80 (196.00 266.00)	215.61 (184.00 244.00)
Coil 1 P	7.011 (-1.000 12.000)	25.791 (19.000 30.000)	43.591 (35.000 51.000)	61.205 (49.000 71.000)	78.715 (63.000 92.000)	96.167 (77.000 112.000)	113.529 (92.000 132.000)	130.805 (105.000 153.000)
Coil 2 M	573.02 (479.00 659.00)	567.76 (474.00 654.00)	557.08 (463.00 643.00)	541.29 (450.00 622.00)	520.72 (432.00 602.00)	495.71 (412.00 572.00)	466.25 (390.00 540.00)	432.93 (359.00 499.00)
Coil 2 P	6.881 (-1.000 12.000)	25.666 (19.000 31.000)	43.447 (35.000 51.000)	61.086 (49.000 71.000)	78.668 (63.000 92.000)	96.276 (77.000 114.000)	113.844 (92.000 135.000)	131.412 (105.000 156.000)
Coil 3 M	934.81 (772.00 1060.00)	926.54 (764.00 1050.00)	909.60 (752.00 1030.00)	884.40 (728.00 1010.00)	851.54 (700.00 970.00)	811.26 (665.00 925.00)	763.85 (628.00 868.00)	709.73 (589.00 799.00)
Coil 3 P	6.922 (-2.000 13.000)	25.681 (19.000 31.000)	43.457 (35.000 52.000)	61.117 (49.000 72.000)	78.735 (63.000 93.000)	96.374 (77.000 114.000)	114.007 (92.000 135.000)	131.616 (105.000 156.000)
Coil 4 M	1491.4 (1210.0 1700.0)	1477.1 (1205.0 1690.0)	1447.4 (1180.0 1650.0)	1403.6 (1140.0 1590.0)	1347.2 (1120.0 1530.0)	1279.0 (1070.0 1450.0)	1199.5 (1000.0 1350.0)	1110.8 (942.0 1240.0)
Coil 4 P	7.069 (-2.000 13.000)	26.047 (19.000 31.000)	44.053 (35.000 52.000)	61.897 (49.000 73.000)	79.665 (63.000 93.000)	97.391 (78.000 114.000)	115.032 (92.000 135.000)	132.626 (105.000 156.000)
Coil 5 M	3018.4 (2450.0 3450.0)	2991.3 (2420.0 3400.0)	2933.8 (2410.0 3320.0)	2847.3 (2350.0 3200.0)	2736.5 (2280.0 3080.0)	2602.9 (2150.0 2950.0)	2445.4 (2020.0 2750.0)	2268.0 (1870.0 2570.0)
Coil 5 P	7.089 (-2.000 13.000)	26.157 (19.000 31.000)	44.252 (35.000 52.000)	62.207 (49.000 73.000)	80.056 (63.000 94.000)	97.944 (79.000 114.000)	115.768 (93.000 135.000)	133.611 (106.000 156.000)

HDIL AFTER LOG VERIFICATION SUMMARY

TOOL #: 1530XA 10103013 DATE/TIME PERFORMED: Sun Mar 20 09:00:25 2016 DAYS SINCE CAL: 264

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 -0.084 0.076	0.000 -0.060 0.060	0.000 -0.029 0.031	-0.001 -0.030 0.030	0.001 -0.030 0.030	-0.001 -0.031 0.029	0.000 -0.031 0.029	0.001 -0.029 0.031
Coil 0 Q	-0.010 -0.050 0.030	0.000 -0.120 0.120	-0.001 -0.032 0.028	0.001 -0.029 0.031	-0.001 -0.030 0.030	0.001 -0.030 0.030	0.001 -0.029 0.031	0.000 -0.030 0.030
Coil 1 R	-0.004 -0.084 0.076	0.003 -0.052 0.048	-0.000 -0.030 0.030	-0.000 -0.030 0.030	-0.001 -0.029 0.031	0.003 -0.029 0.031	0.000 -0.030 0.030	-0.000 -0.030 0.030
Coil 1 Q	-0.027 -0.415 0.385	0.001 -0.098 0.102	0.002 -0.028 0.032	-0.000 -0.029 0.031	-0.000 -0.030 0.030	-0.001 -0.030 0.030	-0.000 -0.029 0.031	0.001 -0.031 0.029
Coil 2 R	0.002 -0.071 0.069	0.004 -0.026 0.034	-0.004 -0.031 0.029	-0.002 -0.030 0.030	0.002 -0.031 0.029	-0.001 -0.030 0.030	0.001 -0.033 0.027	-0.001 -0.030 0.030
Coil 2 Q	-0.007 -0.353 0.347	-0.002 -0.103 0.097	0.004 -0.032 0.028	0.003 -0.033 0.027	0.005 -0.030 0.030	-0.003 -0.027 0.033	-0.002 -0.033 0.027	0.004 -0.029 0.031
Coil 3 R	0.022 -0.019 0.061	-0.011 -0.034 0.046	0.001 -0.035 0.045	-0.005 -0.044 0.036	-0.003 -0.043 0.037	-0.004 -0.037 0.043	-0.000 -0.041 0.039	-0.002 -0.035 0.045
Coil 3 Q	-0.021 -0.211 0.189	-0.010 -0.087 0.073	0.009 -0.032 0.048	-0.010 -0.039 0.041	0.003 -0.045 0.035	-0.001 -0.039 0.041	-0.004 -0.041 0.039	-0.001 -0.040 0.040
Coil 4 R	-0.004 -0.082 0.038	0.005 -0.071 0.049	0.005 -0.068 0.052	-0.001 -0.060 0.060	0.005 -0.055 0.065	0.001 -0.072 0.048	-0.002 -0.067 0.053	0.003 -0.063 0.057
Coil 4 Q	-0.014 -0.311 0.289	-0.006 -0.109 0.091	-0.013 -0.060 0.060	0.002 -0.056 0.064	-0.002 -0.069 0.051	0.007 -0.058 0.062	0.001 -0.058 0.062	-0.005 -0.058 0.062
Coil 5 R	-0.043 -0.099 0.141	-0.019 -0.099 0.141	0.006 -0.137 0.103	0.018 -0.120 0.120	0.002 -0.120 0.120	0.016 -0.116 0.124	0.013 -0.106 0.134	-0.007 -0.110 0.130
Coil 5 Q	-0.078 -0.604 0.596	-0.020 -0.277 0.223	0.015 -0.089 0.151	-0.018 -0.101 0.139	-0.006 -0.106 0.134	-0.014 -0.093 0.147	0.018 -0.128 0.112	-0.012 -0.122 0.118

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	159.94 156.50 162.89	158.43 155.03 161.36	155.41 152.09 158.30	150.96 147.72 153.75	145.13 142.02 147.82	138.04 135.08 140.59	129.71 126.95 132.13	120.30 117.75 122.56
Coil 0 P	7.506 3.922 9.922	25.677 22.541 28.541	43.218 40.208 46.208	60.661 57.739 63.739	78.100 75.222 81.222	95.519 92.720 98.720	112.930 110.175 116.175	130.323 127.623 133.623
Coil 1 M	291.16 285.01 296.64	288.10 282.06 293.57	282.10 276.18 287.46	273.31 267.57 278.50	262.04 256.53 267.00	248.48 243.35 253.28	233.01 228.14 237.46	215.76 211.29 219.92
Coil 1 P	7.597 4.011 10.011	25.931 22.791 28.791	43.603 40.591 46.591	61.135 58.205 64.205	78.592 75.715 81.715	95.970 93.167 99.167	113.290 110.529 116.529	130.518 127.805 133.805
Coil 2 M	573.24 561.56 584.48	567.92 556.41 579.12	557.23 545.94 568.22	541.44 530.46 552.11	520.85 510.31 531.14	495.89 485.80 505.62	466.41 456.92 475.57	432.93 424.27 441.58
Coil 2 P	7.464 3.881 9.881	25.799 22.666 28.666	43.456 40.447 46.447	61.010 58.086 64.086	78.545 75.668 81.668	96.081 93.276 99.276	113.612 110.844 116.844	131.104 128.412 134.412
Coil 3 M	935.67 916.12 953.51	927.28 908.01 945.07	910.27 891.41 927.80	885.18 866.71 902.09	852.33 834.51 868.57	811.91 795.04 827.49	764.45 748.57 779.12	710.32 695.53 723.92
Coil 3 P	7.501 3.922 9.922	25.806 22.681 28.681	43.459 40.457 46.457	61.016 58.117 64.117	78.577 75.735 81.735	96.158 93.374 99.374	113.729 111.007 117.007	131.276 128.616 134.616
Coil 4 M	1490.5 1461.6 1521.3	1476.0 1447.6 1506.7	1446.1 1418.4 1476.3	1402.5 1375.5 1431.7	1345.6 1320.2 1374.1	1277.8 1253.4 1304.5	1198.4 1175.5 1223.5	1109.6 1088.5 1133.0
Coil 4 P	7.661 4.069 10.069	26.181 23.047 29.047	44.060 41.053 47.053	61.811 58.897 64.897	79.506 76.665 82.665	97.169 94.391 100.391	114.784 112.032 118.032	132.303 129.626 135.626
Coil 5 M	3022.2 2958.0 3078.7	2994.8 2931.5 3051.1	2937.0 2875.1 2992.5	2851.8 2790.4 2904.2	2739.3 2681.7 2791.2	2604.4 2550.9 2655.0	2446.7 2396.5 2494.3	2271.5 2222.7 2313.4
Coil 5 P	7.681 4.089 10.089	26.280 23.157 29.157	44.241 41.252 47.252	62.078 59.207 65.207	79.909 77.056 83.056	97.672 94.944 100.944	115.500 112.768 118.768	133.234 130.611 136.611

INSTRUMENT CONFIGURATION

Source File: /dat1a/0H106355/WPX_OH-tdg

50.84'

FOCUS CABLEHEAD
Diameter : 3.12"
Length : 3.17'
Weight : 15 lbs
Series : CABL318
Mnemonic : CBLH

FOCUS SWIVEL
Diameter : 3.13"
Length : 2.58'
Weight : 50 lbs
Series : 3950XA

FOCUS TEN/TEMP/MUD RES/ACCEL
Diameter : 3.13"
Length : 4.31'
Weight : 61 lbs
Series : 3980XA
Mnemonic : TTMA

FOCUS TELEMETRY (POWER SECTION)
Diameter : 3.13"
Length : 3.71'
Weight : 48 lbs
Series : 3518FB
Mnemonic : TMGR

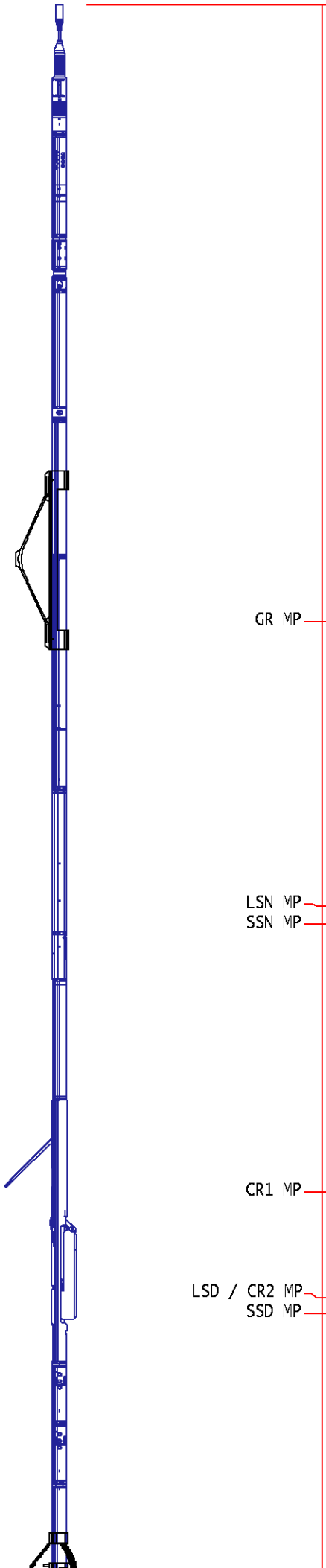
FOCUS EB/EG TELEMETRY GAMMA RAY
Diameter : 3.12"
Length : 5.83'
Weight : 63 lbs
Series : 3518EG
Mnemonic : GR
Measure Point: 4.24': GR MP

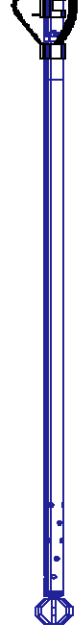
FOCUS COMPENSATED NEUTRON
Diameter : 3.13"
Length : 4.81'
Weight : 65 lbs
Series : 2436XA
Mnemonic : CN
Measure Point: 1.92': LSN MP
Measure Point: 1.46': SSN MP

FOCUS Z-DENSILOG
Diameter : 3.75"
Length : 9.58'
Weight : 200 lbs
Series : 2223XA
Mnemonic : ZDL
Measure Point: 4.33': CR1 MP
Measure Point: 1.69': LSD / CR2 MP
Measure Point: 1.29': SSD MP

FOCUS KNUCKLE JOINT
Diameter : 3.13"
Length : 1.50'

FOCUS KNUCKLE JOINT
Diameter : 3.13"
Length : 1.50'





FOCUS HIGH DEFINITION INDUCTION TOOL
- Diameter : 3.13"
- Length : 13.33'
- Weight : 115 lbs
- Series : 1530XA
- Mnemonic : HDIL
- Measure Point: 7.17': COIL 5 MP
- Measure Point: 5.67': COIL 4 MP
- Measure Point: 4.17': COIL 3 MP
- Measure Point: 3.67': COIL 2 MP
- Measure Point: 3.17': COIL 1 MP
- Measure Point: 2.67': COIL 0 MP
- Measure Point: 1.14': SP MP

FOCUS PINEAPPLE / CABBAGE

TOTAL LENGTH: 50.84'
TOTAL WEIGHT: 701 lbs
MAX DIAMETER: 0'6.13"

COIL 5 MP — 7.67'
COIL 4 MP — 6.17'
COIL 3 MP — 4.67'
COIL 2 MP — 4.17'
COIL 1 MP — 3.67'
COIL 0 MP — 3.17'
SP MP — 1.64'
0.00'

BAKER HUGHES
FOLIPS

COMPANY	WPX ENERGY		FILE NO: CH106355
WELL	FEDERAL RU 413-6		API NO: 05045226020000
FIELD	RULISON		
COUNTY	GARFIELD	STATE CO	

LOCATION:
SHL: 1936' FSL & 521' FWL
BHL: 703' FSL & 1268' FWL

SEC 6 TWP 7S RGE 93W

ELEVATIONS:
KB 7009 FT
DF
GL 6895 FT

6 7S 93W
RU 13-6 PAD
H&P 318

DATE 20-Mar-2016