

HALLIBURTON

WAVESONIC

COMPANY				CONOCO PHILLIPS COMPANY			
WELL				ZUKOWSKI 17-1P			
FIELD/BLOCK				WILDCAT			
COUNTY				ARAPAHOE			
STATE				CO			
Permanent Datum				GL			
Log measured from				KB			
Drilling measured from				KB			
Date				11-Jul-13			
Run No.				ONE			
Depth - Driller				7996.00 ft			
Depth - Logger				8000.0 ft			
Bottom - Logged Interval				7968 ft			
Top - Logged Interval				200 ft			
Casing - Driller				9.625 in @ 1975.0 ft			
Casing - Logger				1973.0 ft			
Bit Size				8.750 in @			
Type Fluid in Hole				OIL BASED MUD			
Density				9.4 ppg 49.00 s/qt			
Alkalinity				1.42 pcf 14.0 cP			
HTHP @ Meas. Temperature				4.8 cpm @ 250.00 degF			
Solids				Wgt. Material 5.8 % BARITE @			
Oil				Water Ratio 62 38			
Water Phase Salinity				79000.00 ppm Cl-			
Oil Type				Brine Type DIESEL CaCl2			
Electrical Stability				482 V			
Time Since Circulation				12.0000 hr			
Time on Bottom				11-Jul-13 19:33			
Max. Rec. Temperature				218.0 degF @ 8000.0 ft			
Equipment				Location 11454566 BRIGHTON @			
Recorded By				J. SCHMIDT J. PINKETT			
Witnessed By				W. EVANS R. MITCHELL			

Service Ticket No.: N/A				API Serial No.: 05005072080000				PGM Version: WL INSITE R3.8.4 (Build 5)									
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE								RESISTIVITY SCALE CHANGES									
Date		Sample No.						Type Log		Depth		Scale Up Hole		Scale Down Hole			
Depth-Driller																	
Type Fluid in Hole																	
Density		F. Viscosity															
Alkalinity		P. Viscosity															
HTHP @ Meas. Temp. @								RESISTIVITY EQUIPMENT DATA									
Solids		Wgt. Mat.						Run No.		Tool Type & No.		Pad Type		Tool Pos.		Other	
Oil		Water Ratio						ONE		ACRT		N/A		CENT.		N/A	
Water Phase Salinity								11302817									
Oil Type		Water Type						11294353									
Electrical Stability																	
EQUIPMENT DATA																	
GAMMA				ACOUSTIC				DENSITY				NEUTRON					
Run No.		ONE		Run No.		ONE		Run No.		ONE		Run No.		ONE			
Serial No.		11812883		Serial No.		90296673		Serial No.		11795867		Serial No.		11812167			
Model No.		GTET		Model No.		WSTT		Model No.		SDLT		Model No.		DSNT			
Diameter		3.625"		No. of Cent.		2		Diameter		4.5"		Diameter		3.625"			
Detector Model No.		GTET		Spacing		0.5'		Log Type		GAM-GAM		Log Type		NEU-NEU			
Type		SCINT						Source Type		Cs-137		Source Type		Am241Be			
Length		8"		LSA [Y/N]		YES		Serial No.		5471GW		Serial No.		DSN434			
Distance to Source		18'		FWDA [Y/N]		YES		Strength		1.5 Ci		Strength		15 Ci			

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix	
No.	From	To	ft/min	L	R	L	R		L	R		L	R		
ONE	8000 ft	200 ft	REC	0	200	240	40	47.6	1.95	2.95	2.71	0.45	-0.15	LIME	
DIRECTIONAL INFORMATION															
Maximum Deviation								@	KOP @						
Remarks: RWCH-GTET-CSNG-DSNT-SDLT-FXIS-IDT-ICT-WSTT-ACRT-TEMP SUB RUN IN COMBINATION.															
ANNULAR HOLE VOLUME CALCULATED USING 7-INCH CASING.															
TENSION PULLS, WASHOUTS AND BOREHOLE RUGOSITY AFFECT LOG RESPONSE.															
BHT AVERAGED FROM 4 MAX TEMP MERCURY THERMOMETERS.															
YOUR CREW: A. AXE, B. RIEDEL RIG: H&P 280															
THANK YOU FOR USING HALLIBURTON LOGGING SERVICES - BRIGHTON, CO - (303) 825-4346															
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.															
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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	8.750	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Oil	
	SHARED	MDWT	Borehole Fluid Weight	9.400	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	SHARED	BSAL	Borehole salinity	79000.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	WPHS	OBM Water Phase Salinity NaCl	0.00	ppm
	SHARED	OFOV	Base Oil Fraction from Oil/Water Ratio	0.62	
	SHARED	OBMT	Oil based Mud Type	Diesel	
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	7.000	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	8000.00	ft
	SHARED	BHT	Bottom Hole Temperature	218.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	IDT	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	IDT	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	ICT	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	

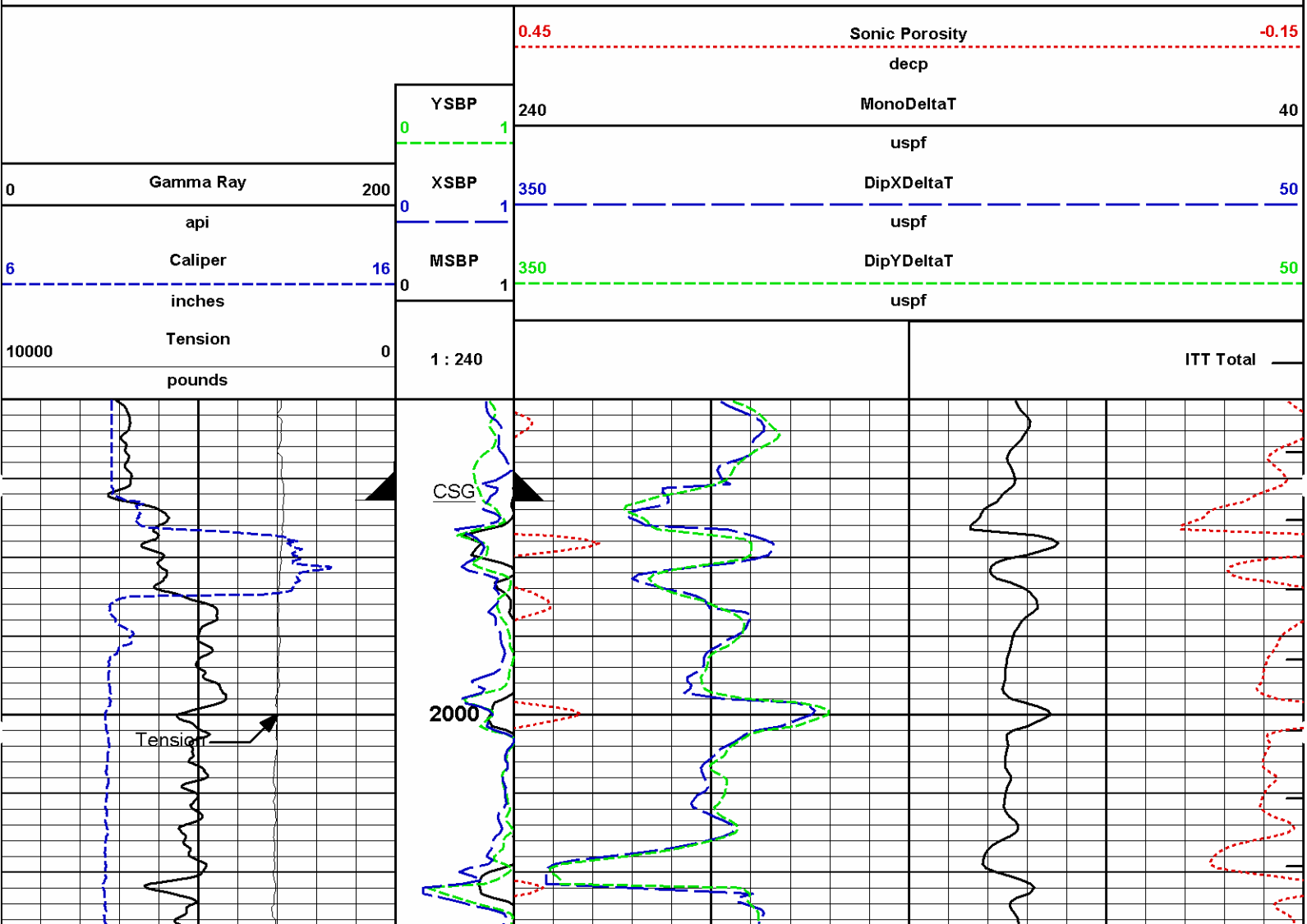
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
CSNG	ORDG	Use Fixed Gain	No	
CSNG	ORDO	Use Fixed Offset	No	
CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
IDT	WRTI	Survey Writing Interval	30	ft
IDT	SOPT	Smoothing Option	None	
ICT	CLOK	Process Caliper Outputs?	Yes	
ICT	DARM	Disable Caliper Arm	No	
ICT	ATDS	Arm To Disable	0	
ICT	REPM	Method to replace arm?	Caliper Average	
ICT	ARMV	Diameter to use for disabled arm	0.00	in
ICT	DARM	Disable Second Caliper Arm	No	
ICT	ATDS	Second Arm To Disable	0	
ICT	REPM	Method to replace second arm?	Caliper Average	
ICT	ARMV	Diameter to use for second disabled arm	0.00	in
ICT	NAVS	Navigation Source Tool	IDT	
ICT	CL1O	Radius 1 Offset	0.0	in
ICT	CL2O	Radius 2 Offset	0.0	in
ICT	CL3O	Radius 3 Offset	0.0	in
ICT	CL4O	Radius 4 Offset	0.0	in
ICT	CL5O	Radius 5 Offset	0.0	in
ICT	CL6O	Radius 6 Offset	0.0	in
ICT	BHVC	Radius type for borehole volume calcuations	Elliptical	
Wavesonic-I	WSOK	Process WSTT?	Yes	
Wavesonic-I	AFIL	Adaptive Filtering?	No	
Wavesonic-I	PINT	Process 1 Sample and Skip	0	
Wavesonic-I	PROM	Process Mode: M=1,MX=2,MY=3,MXY=4	4	
Wavesonic-I	DTSH	Delta -T Shale	100.00	uspf
Wavesonic-I	DTMT	Delta -T Matrix Type	User define	
Wavesonic-I	DTMA	Delta -T Matrix	47.60	uspf
Wavesonic-I	DTFL	Delta -T Fluid	189.00	uspf
Wavesonic-I	RHOM	Matrix Density	2.7100	g/cc
Wavesonic-I	RHOF	Fluid Density	1.0000	g/cc
Wavesonic-I	SMTH	Semblance Threshold	0.25	
Wavesonic-I	VPVS	VPVS Ratio for Porosity	1.40	

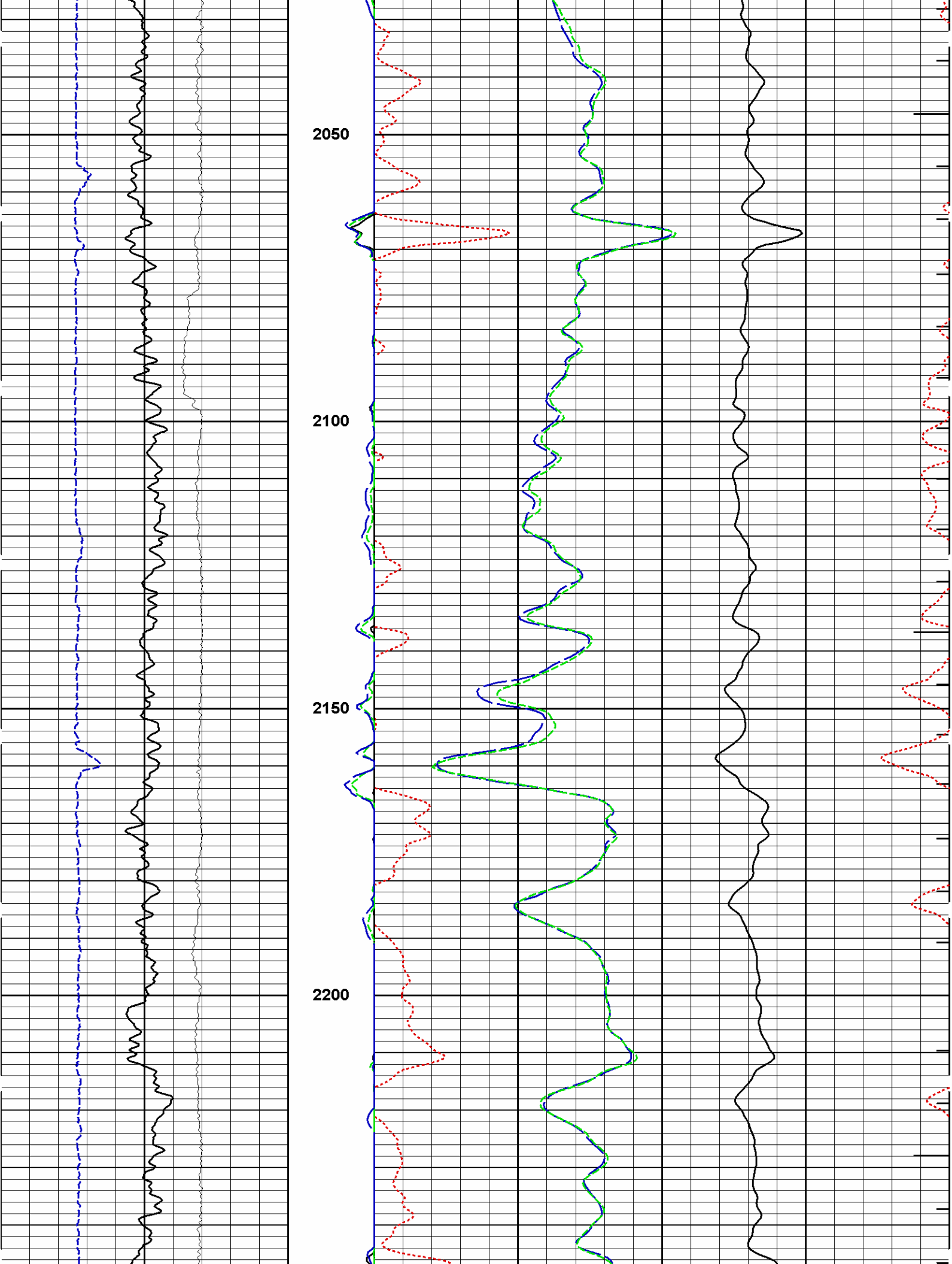
BOTTOM

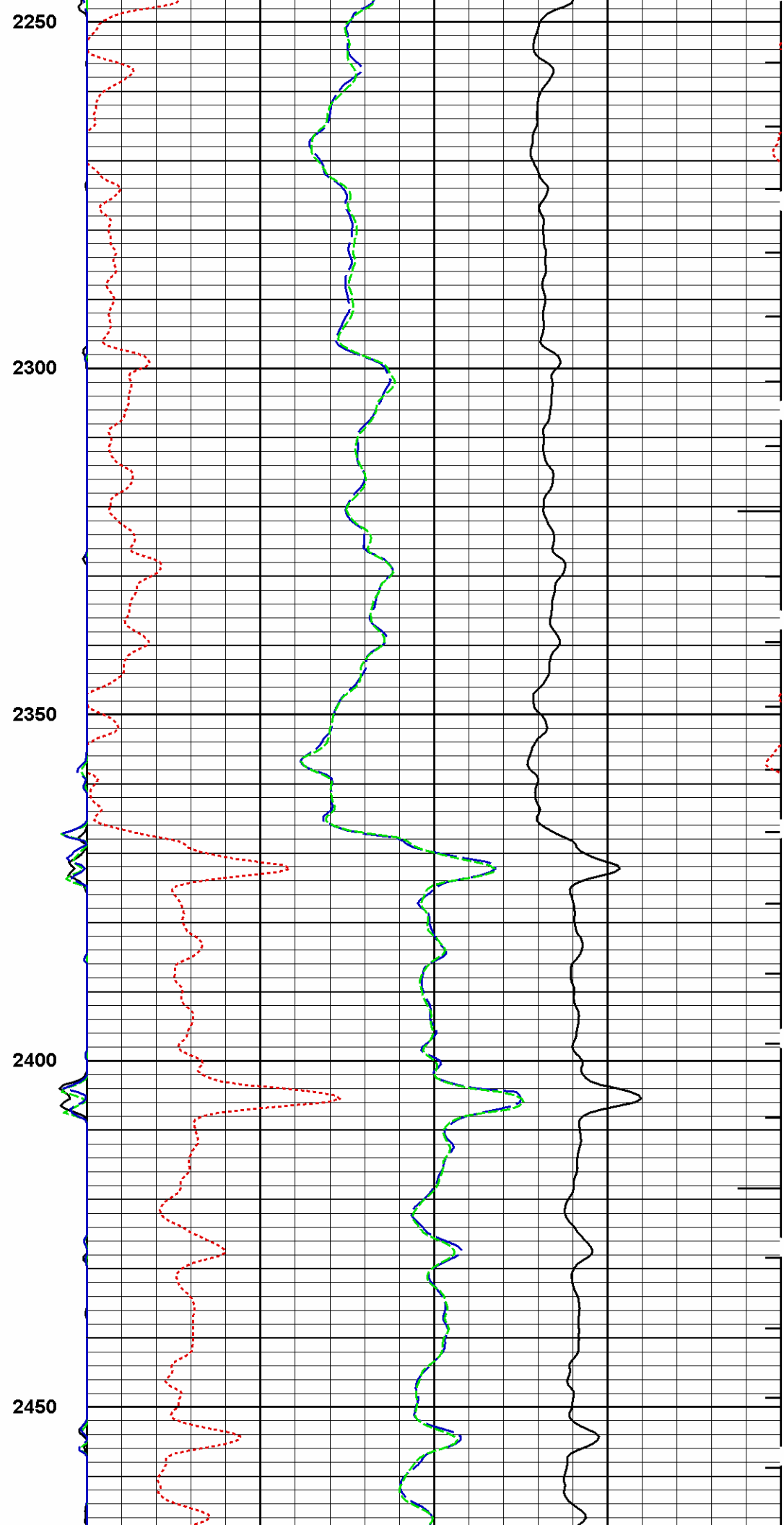
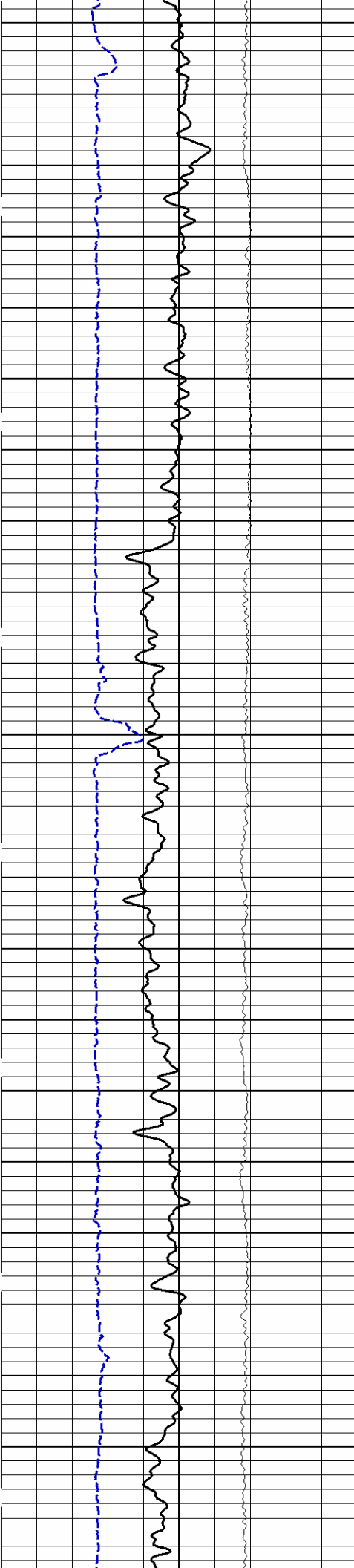
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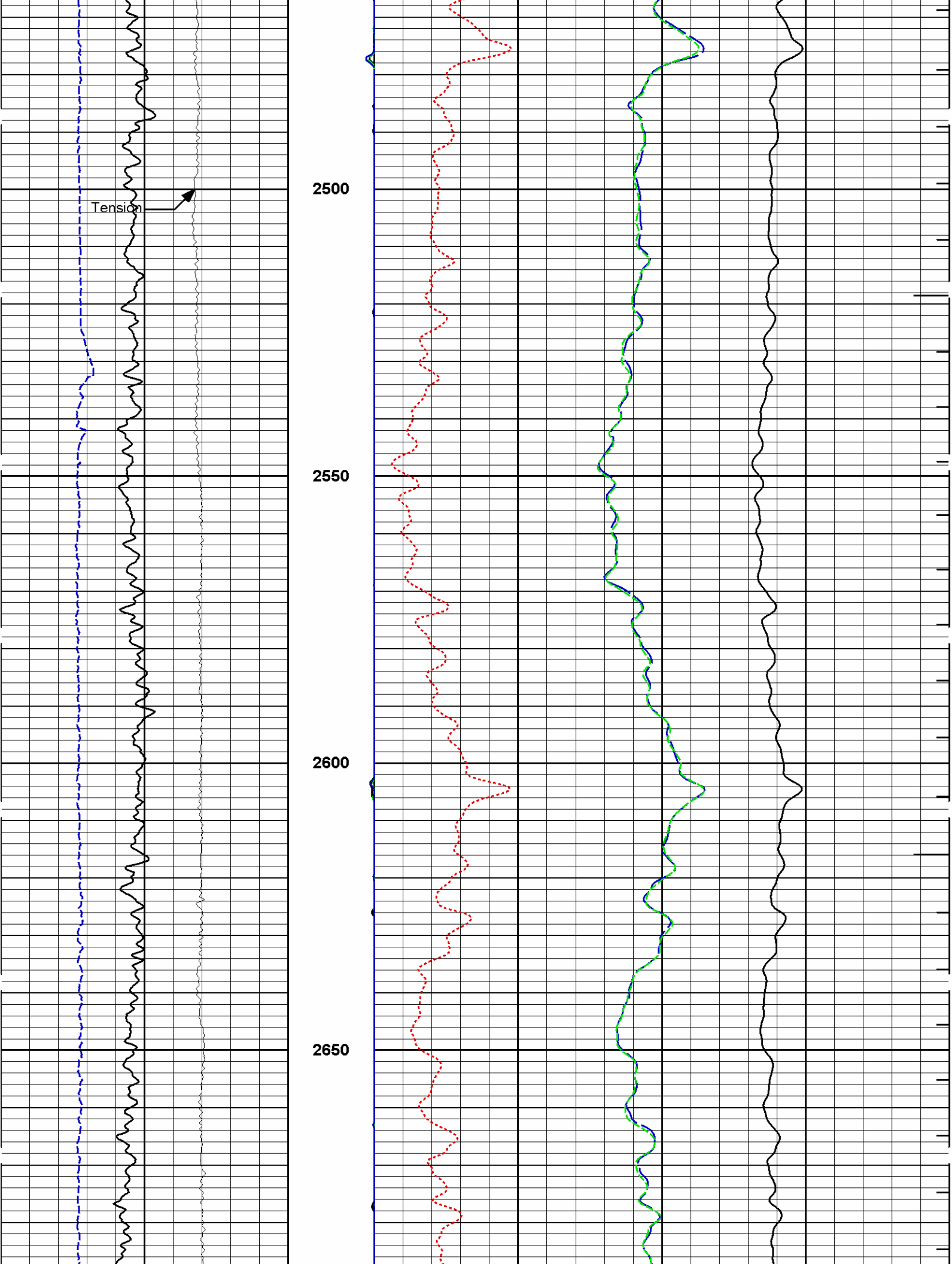
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Plot File: \\WSTT\WSTT_5IN_M

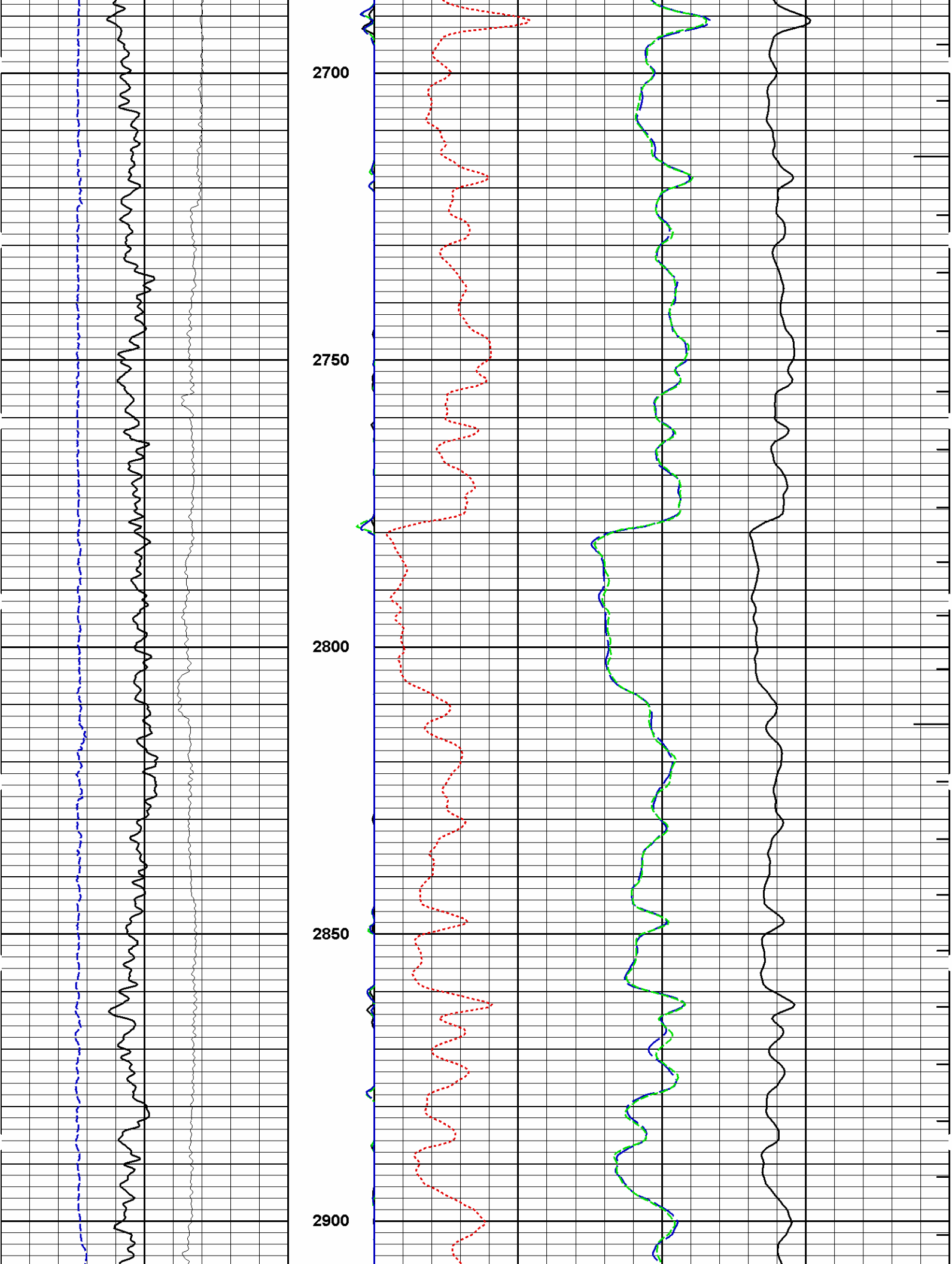
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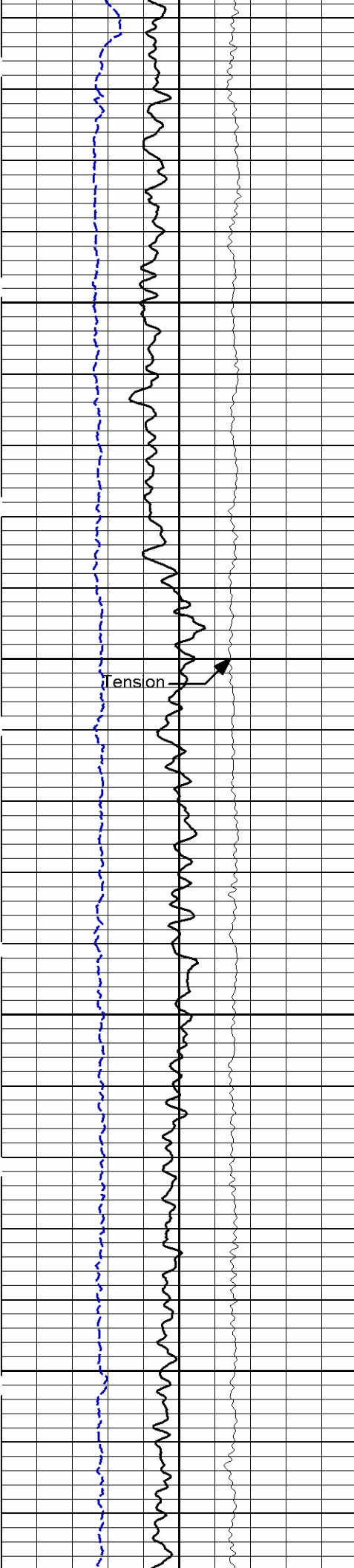










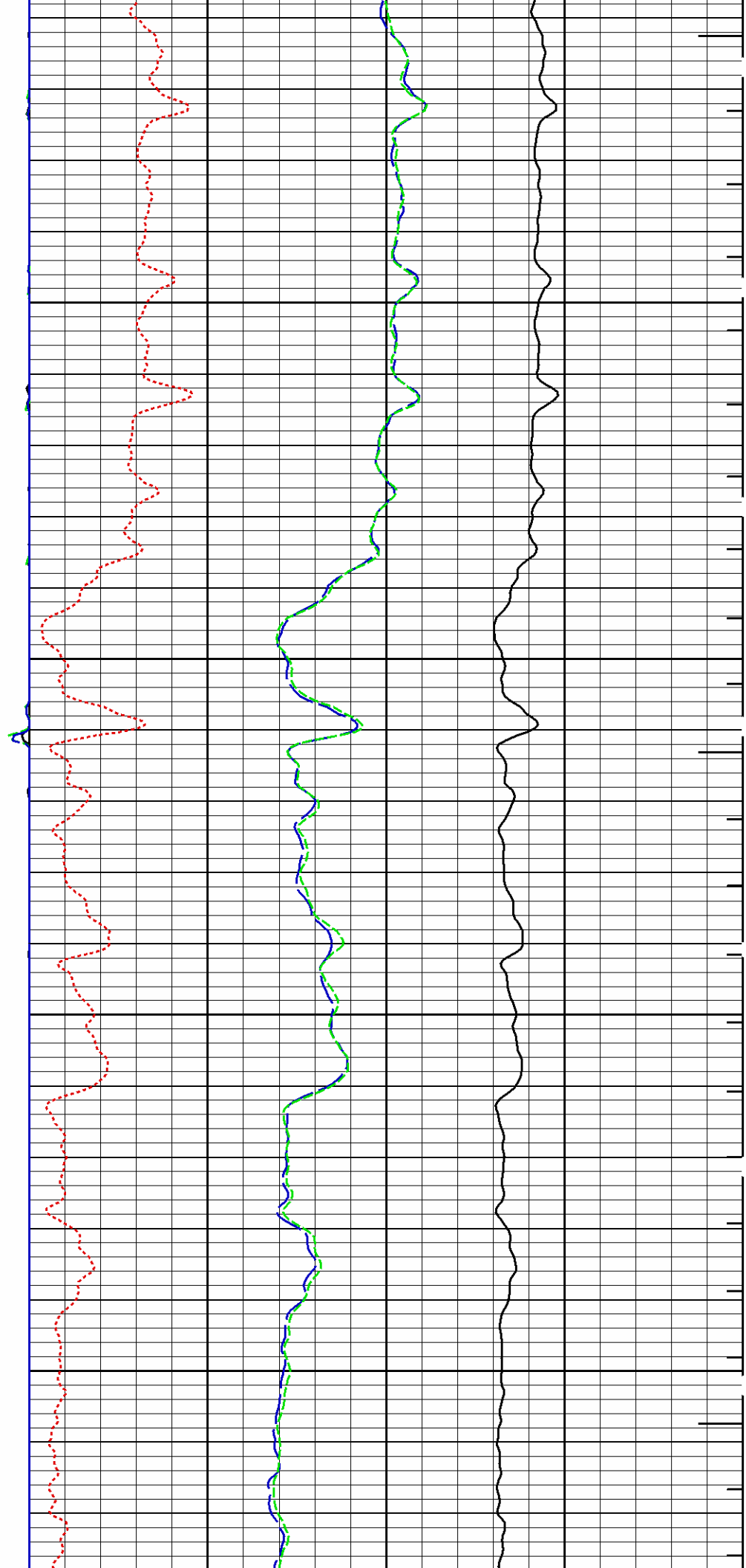


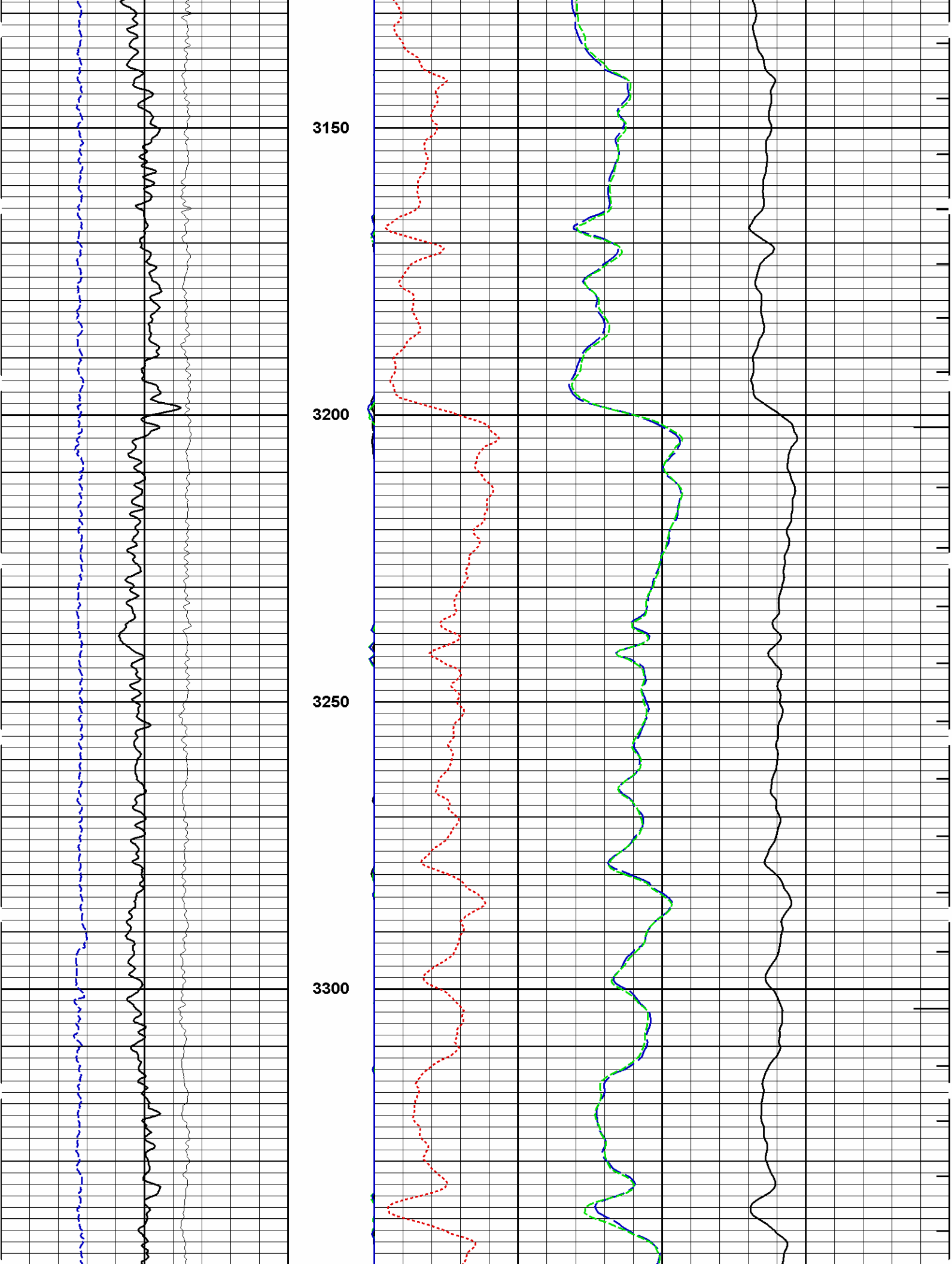
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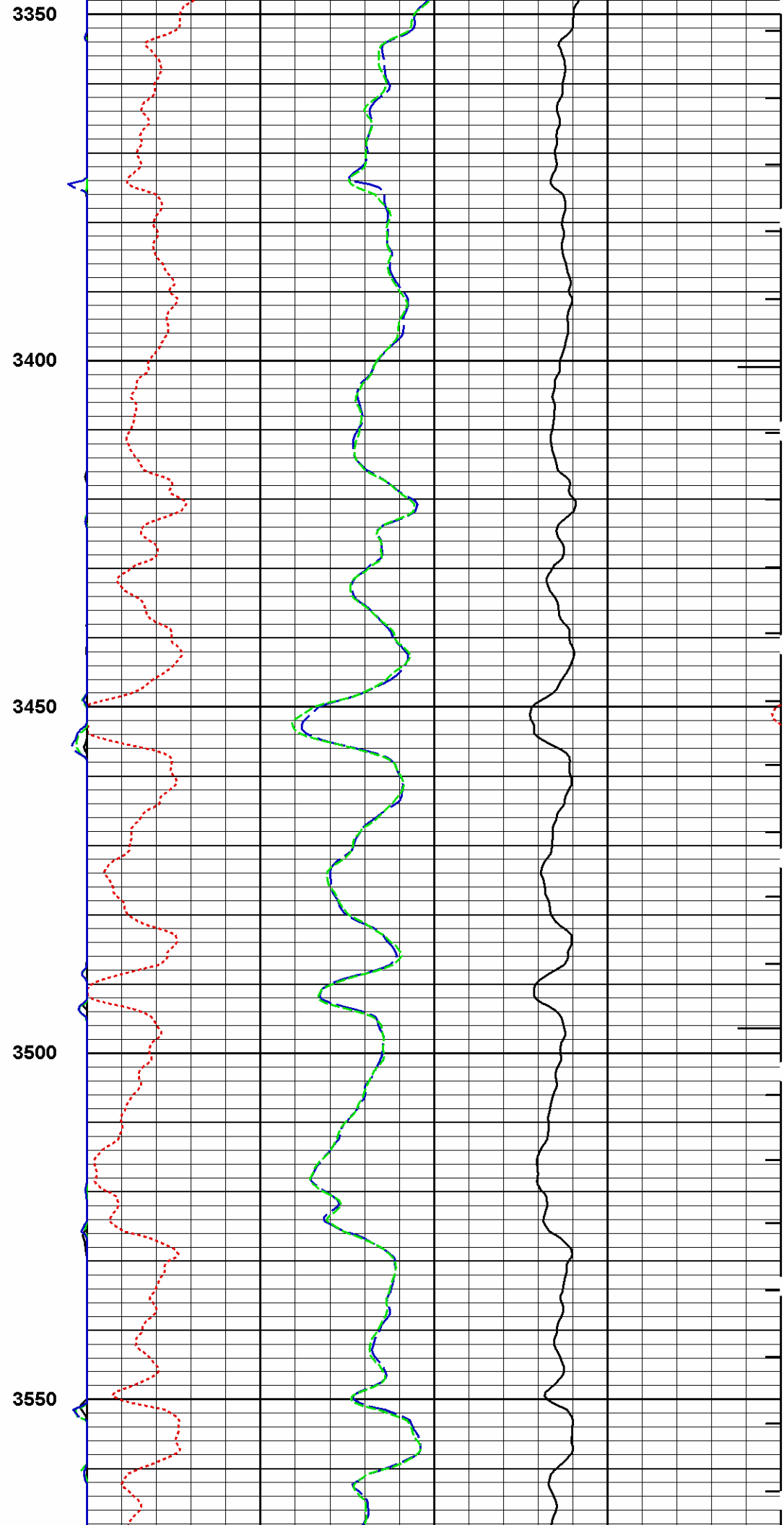
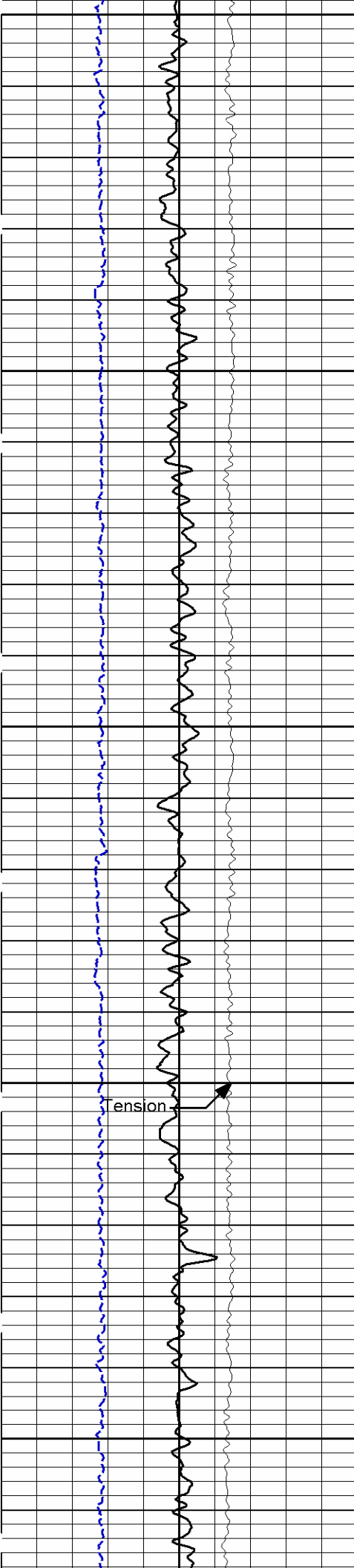
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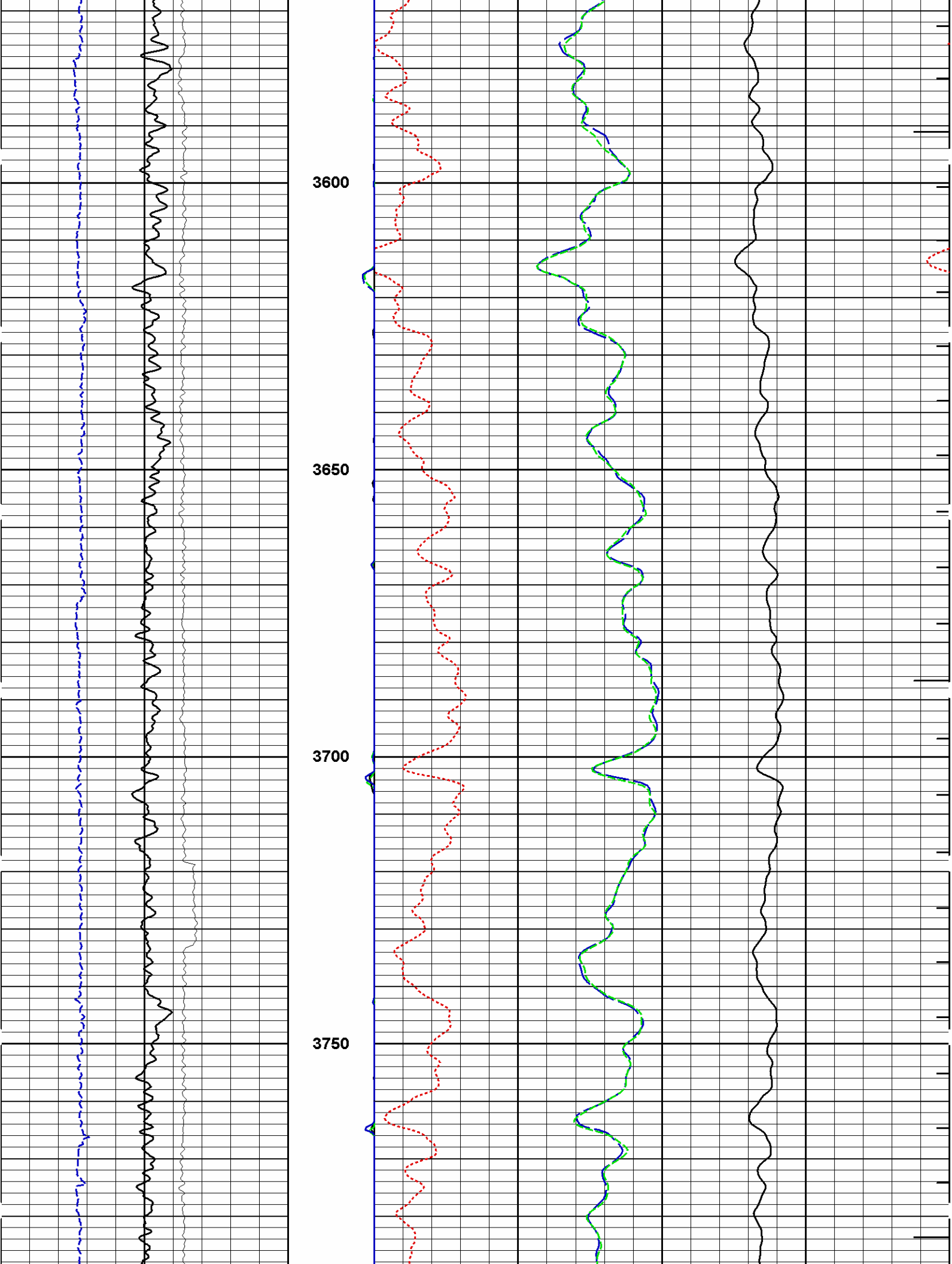
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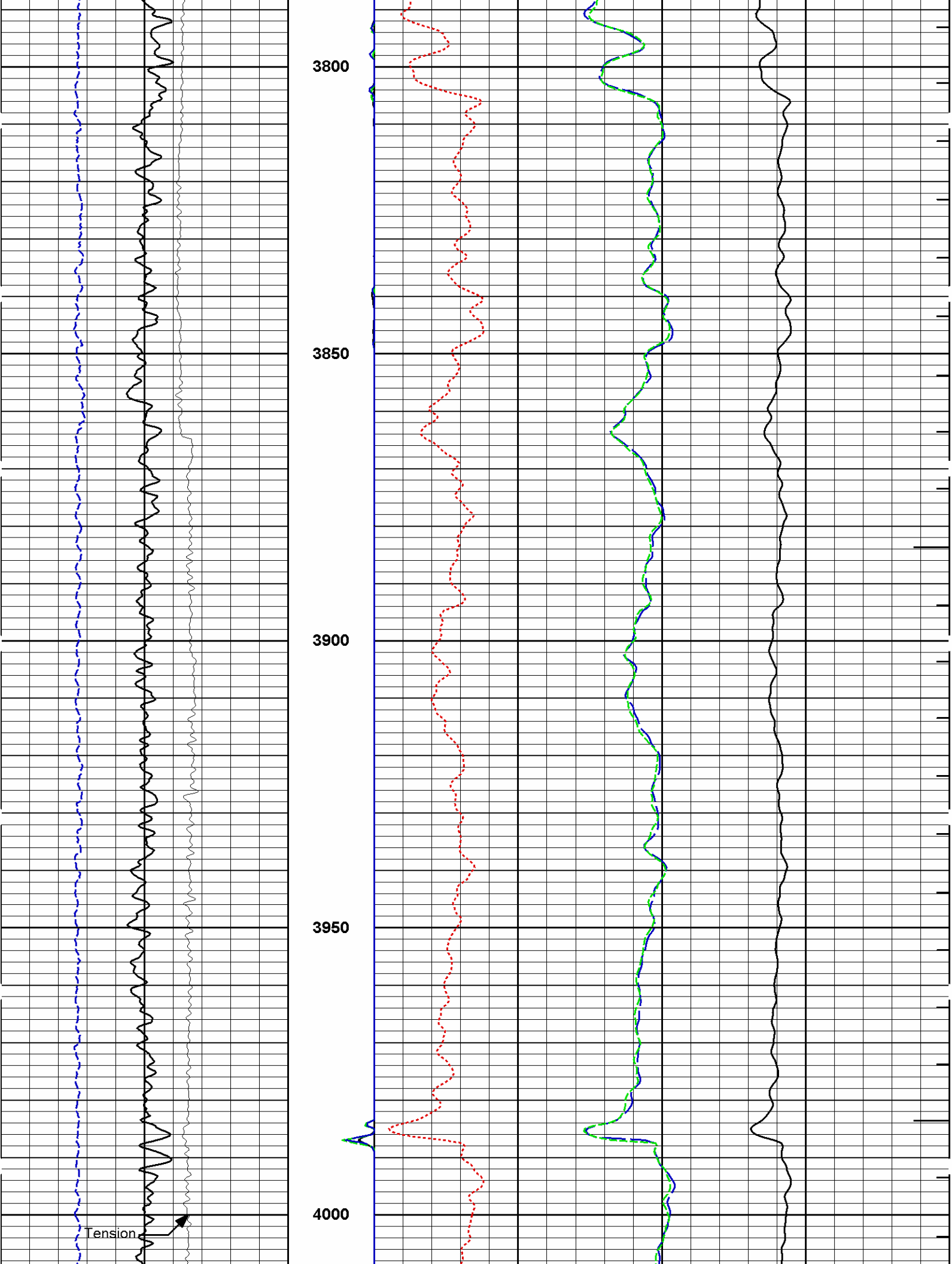
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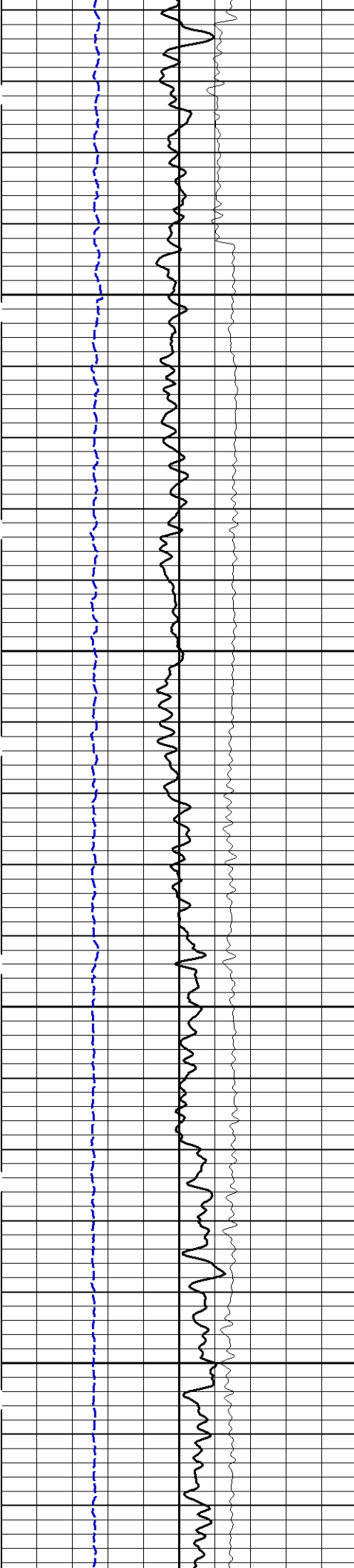










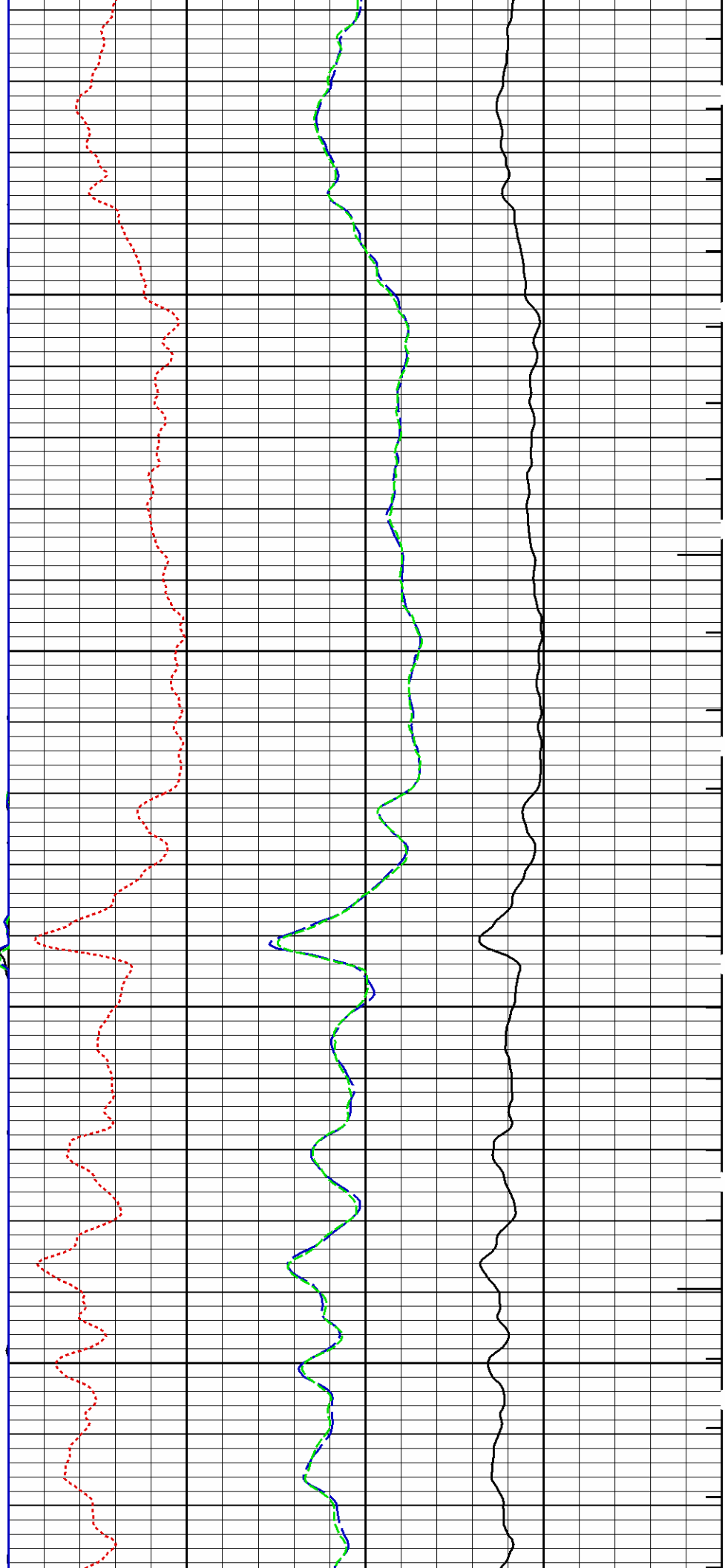


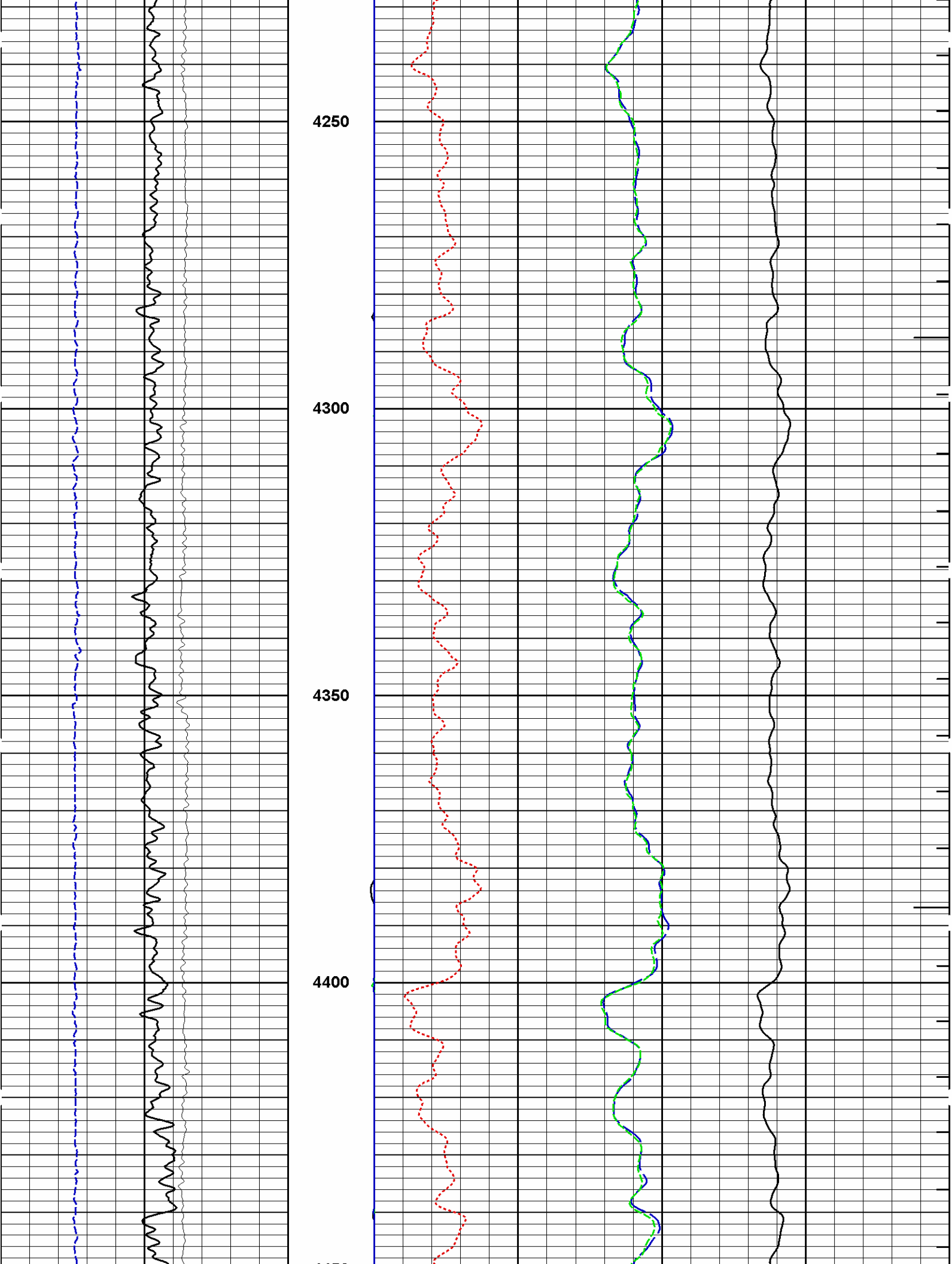
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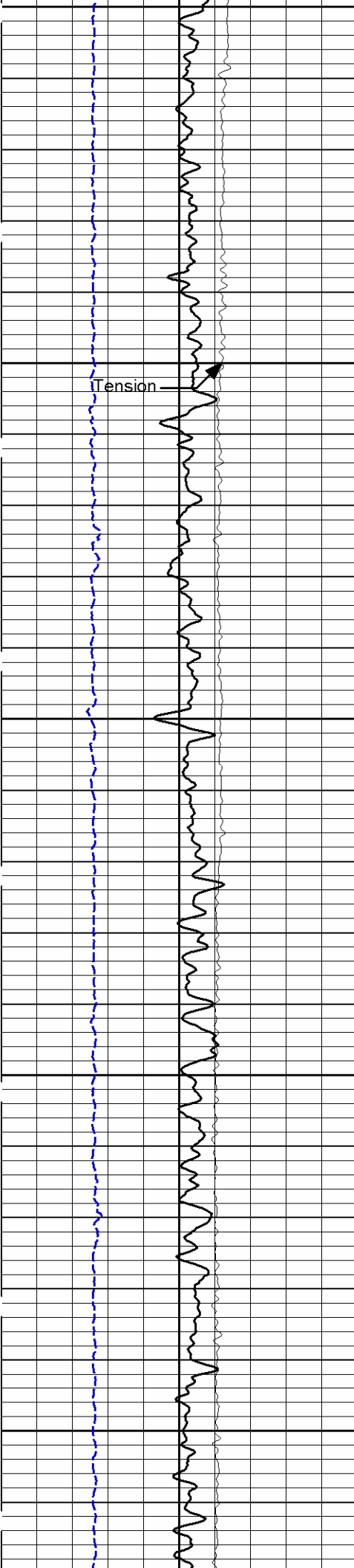
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4150

4200







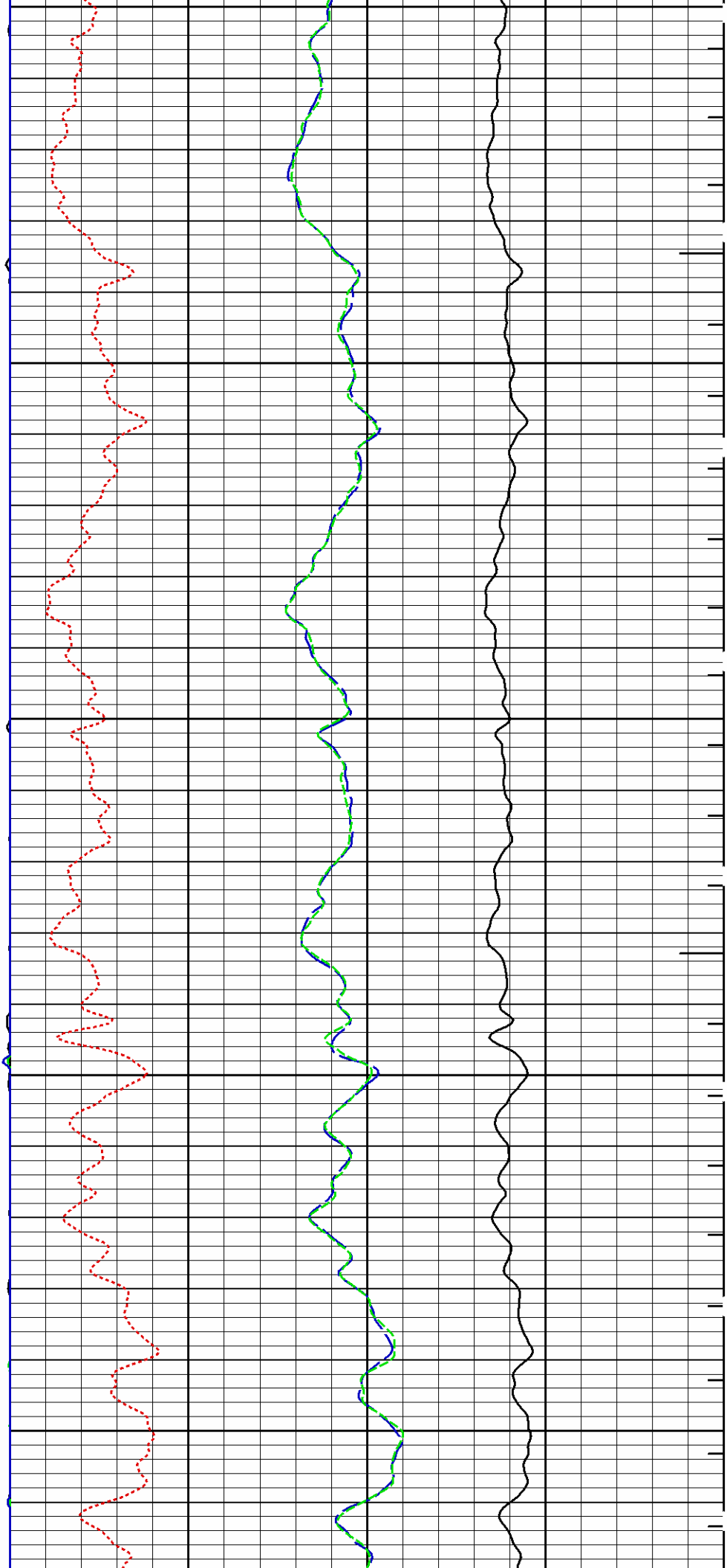
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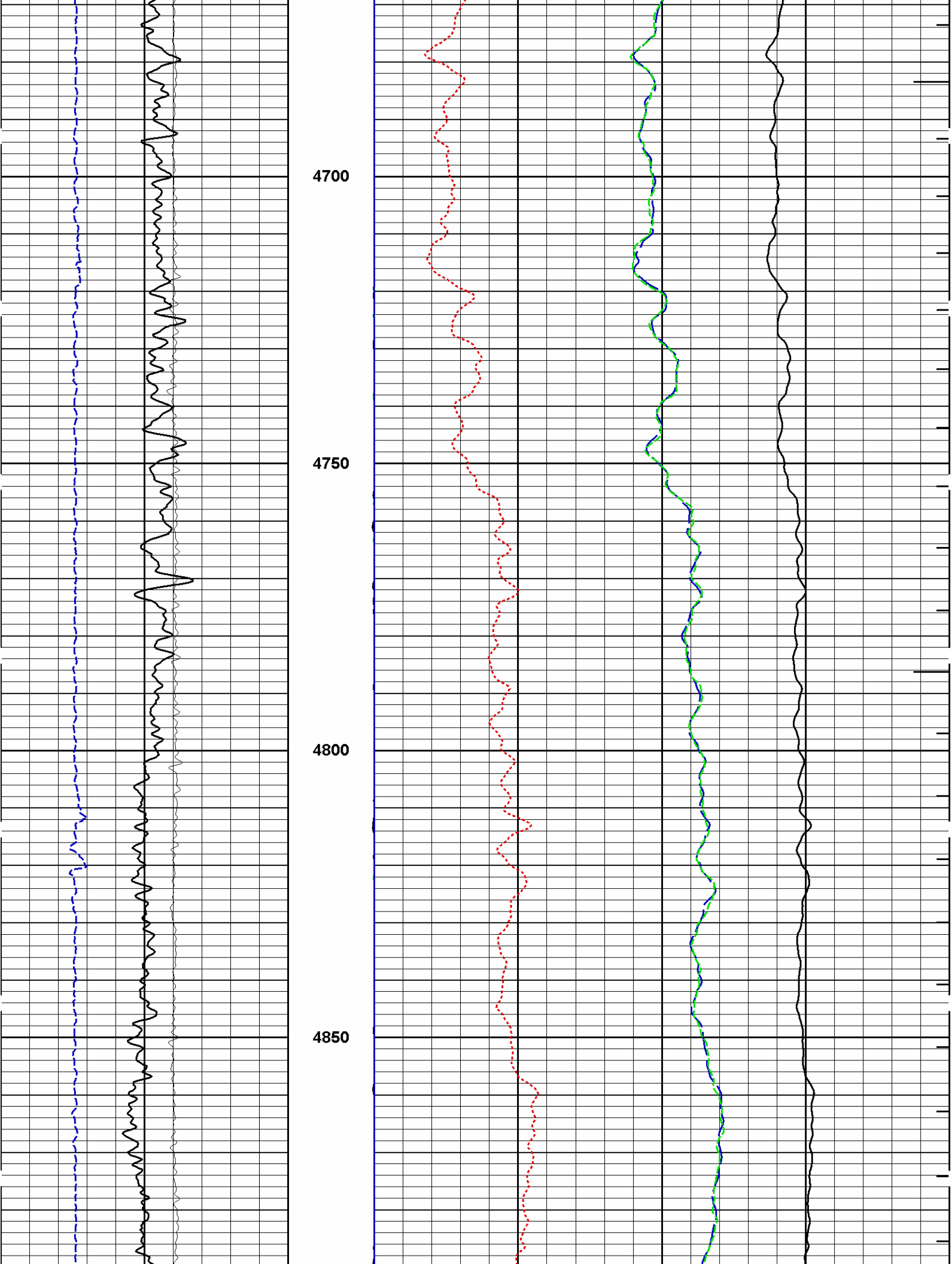
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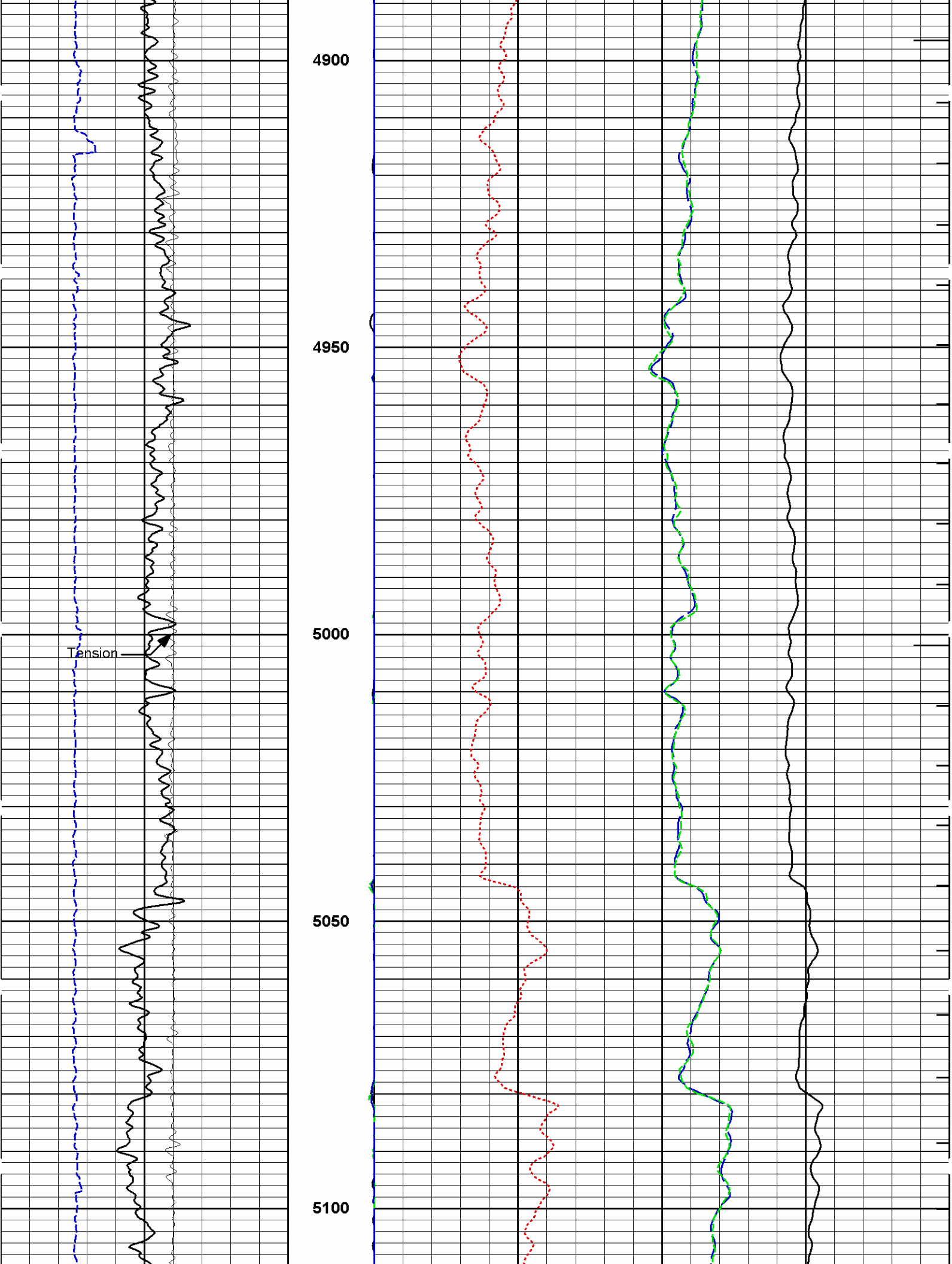
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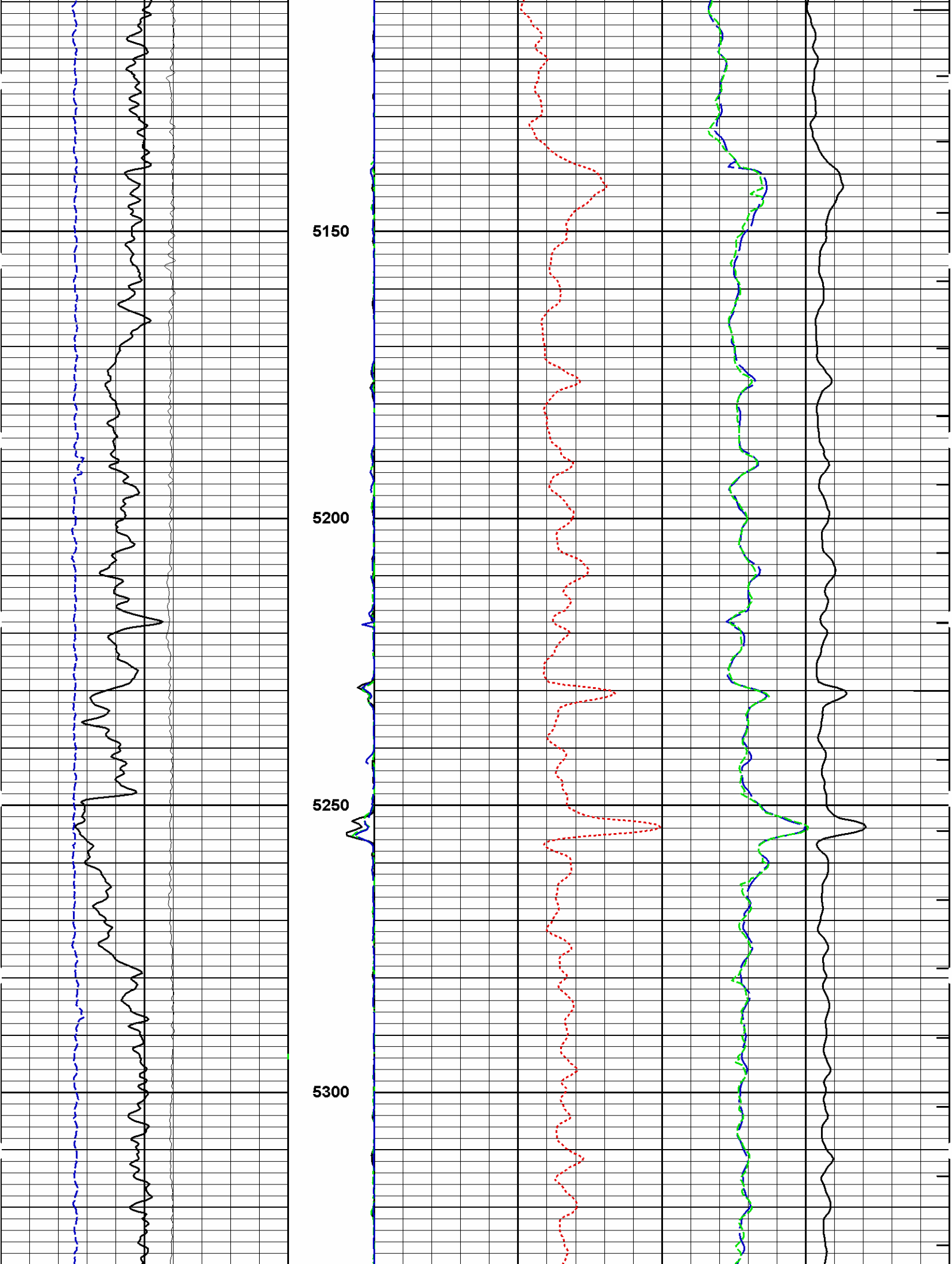
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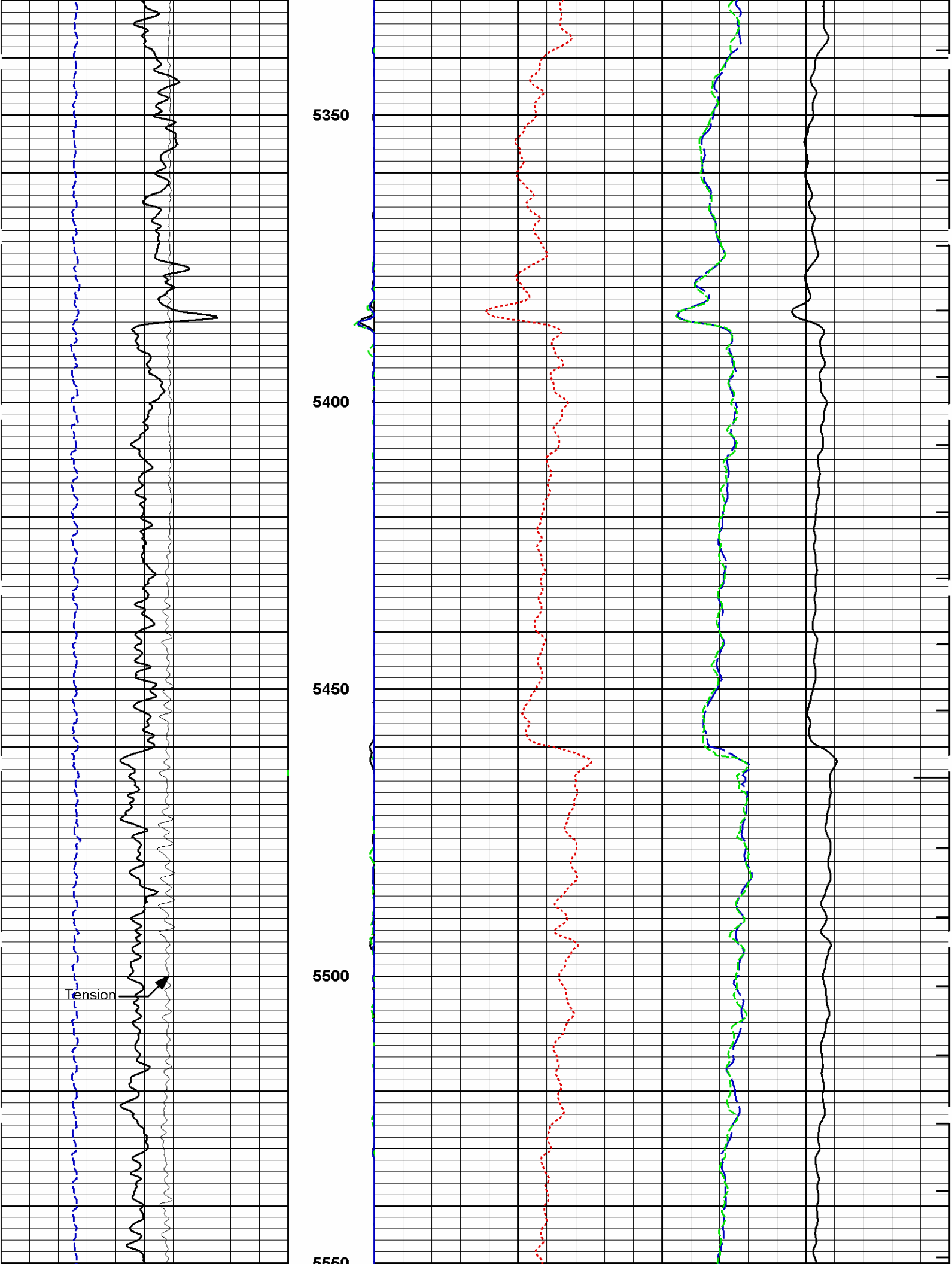
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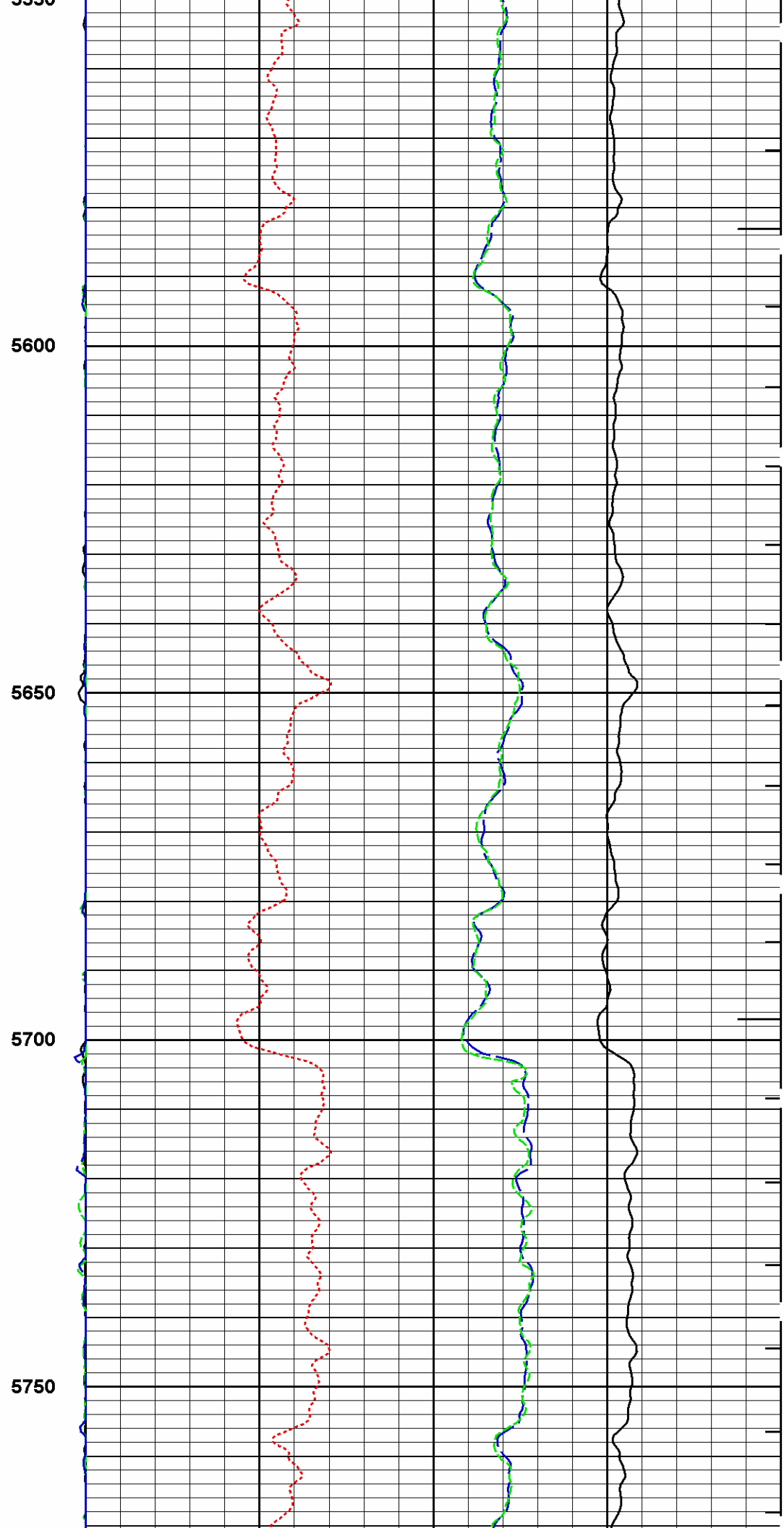
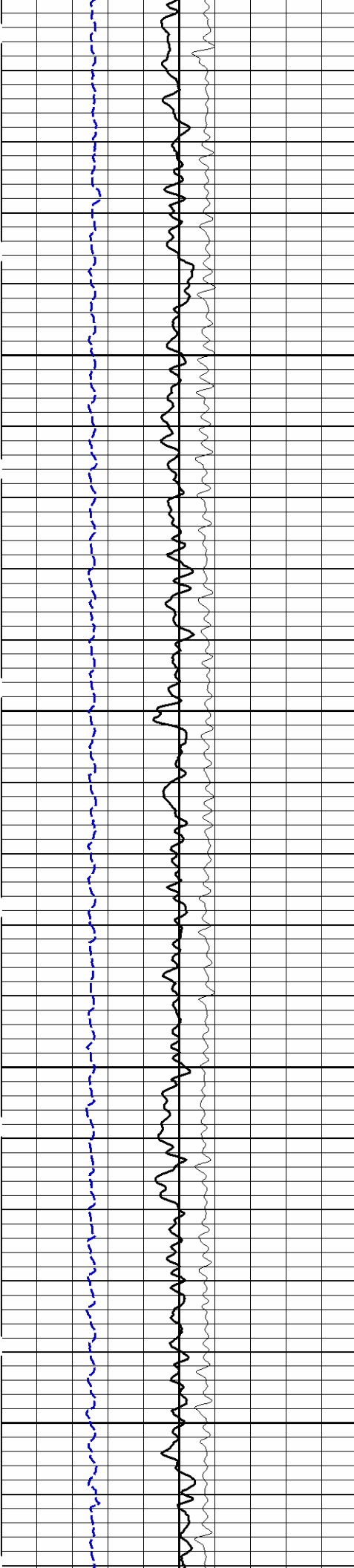


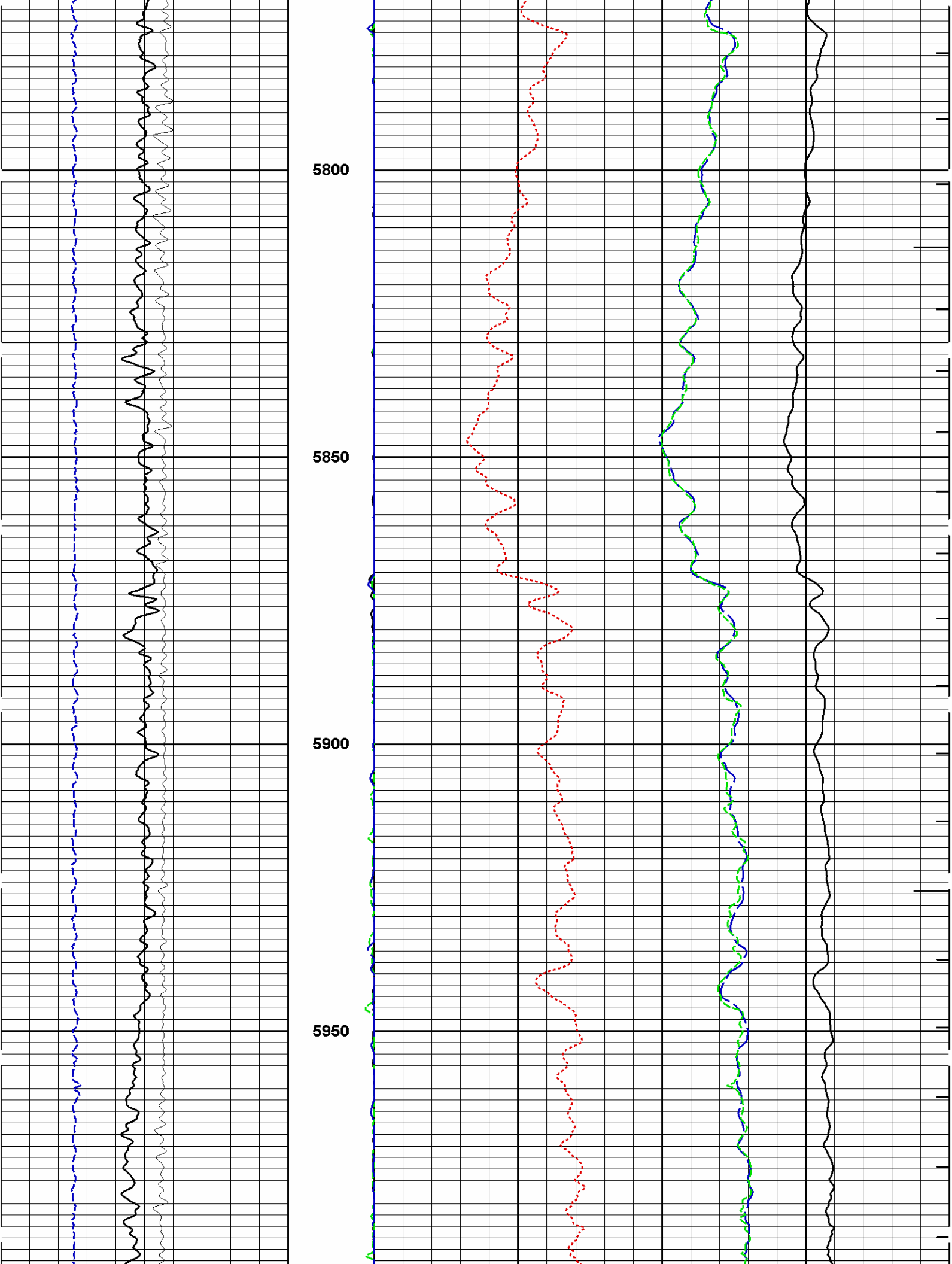


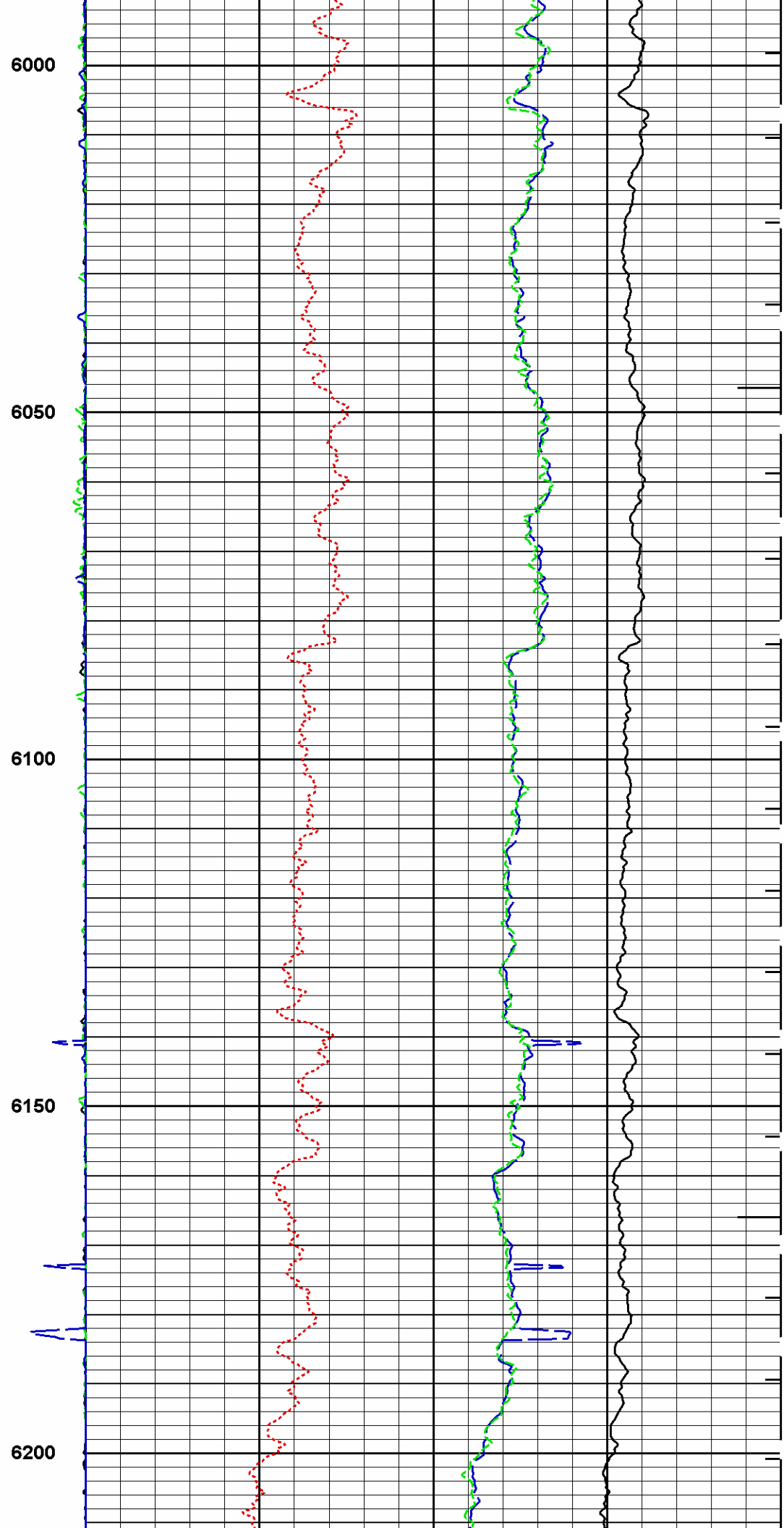
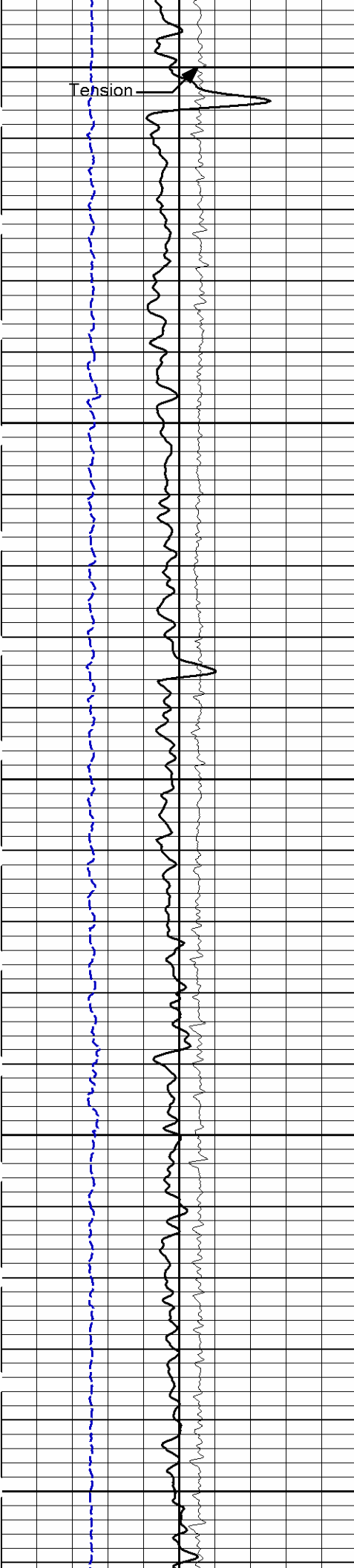


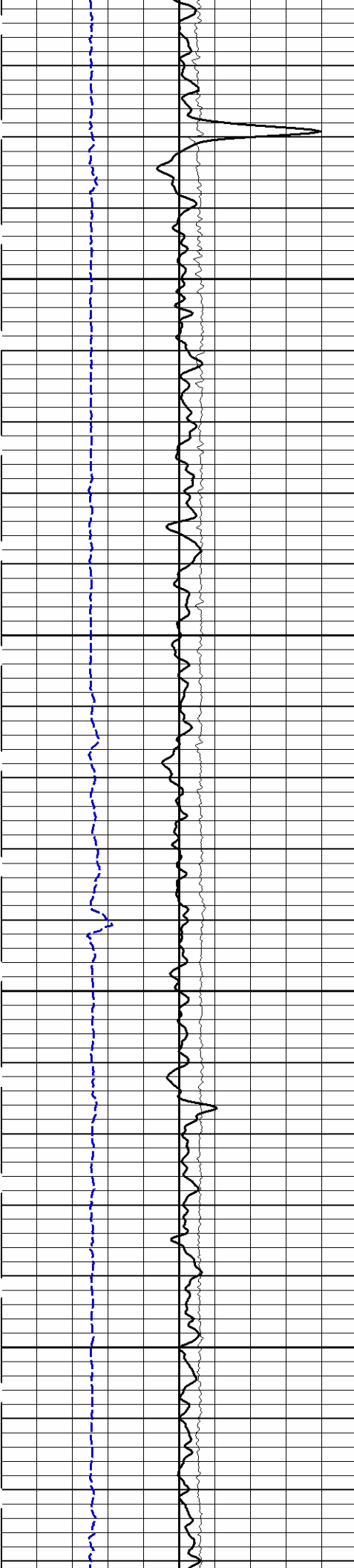










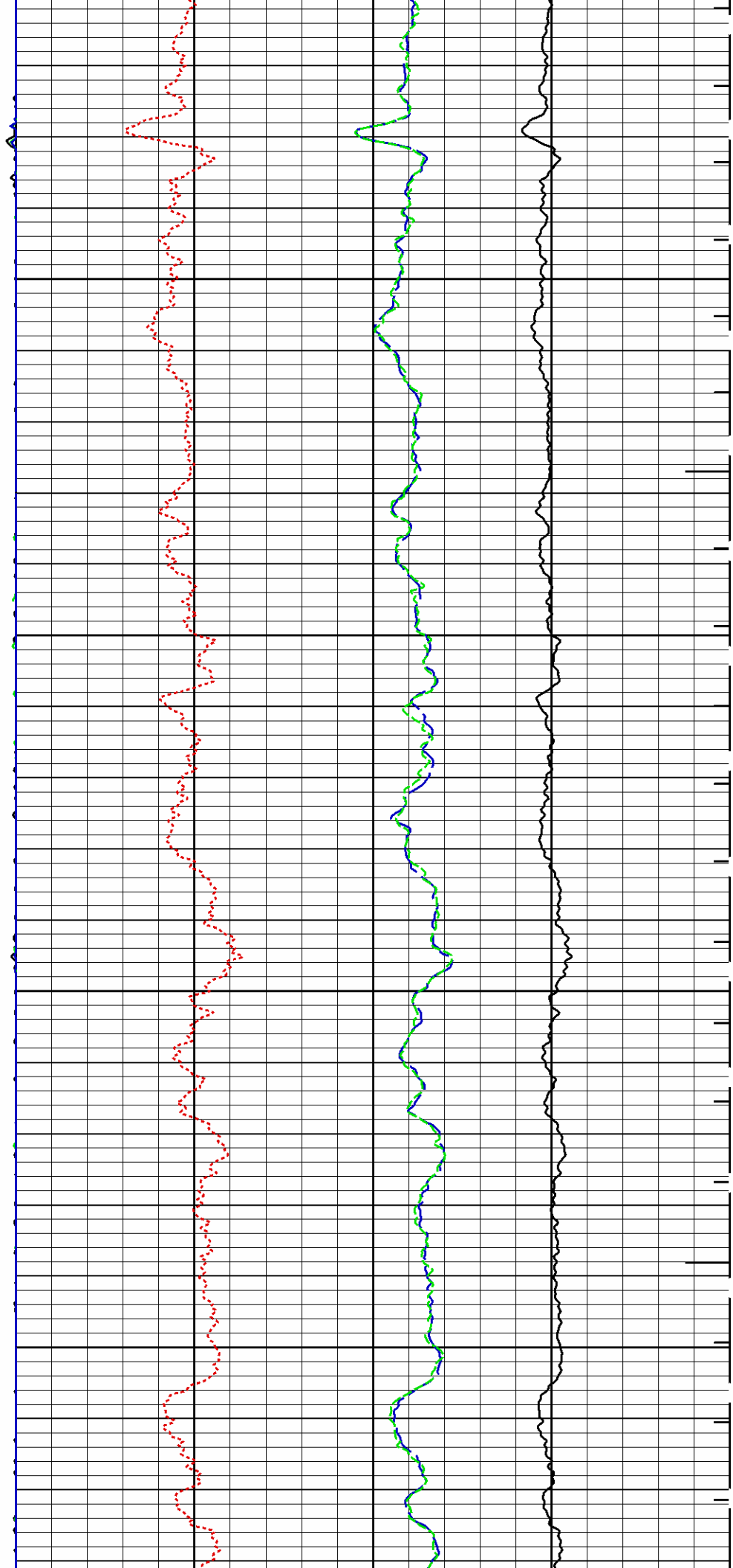


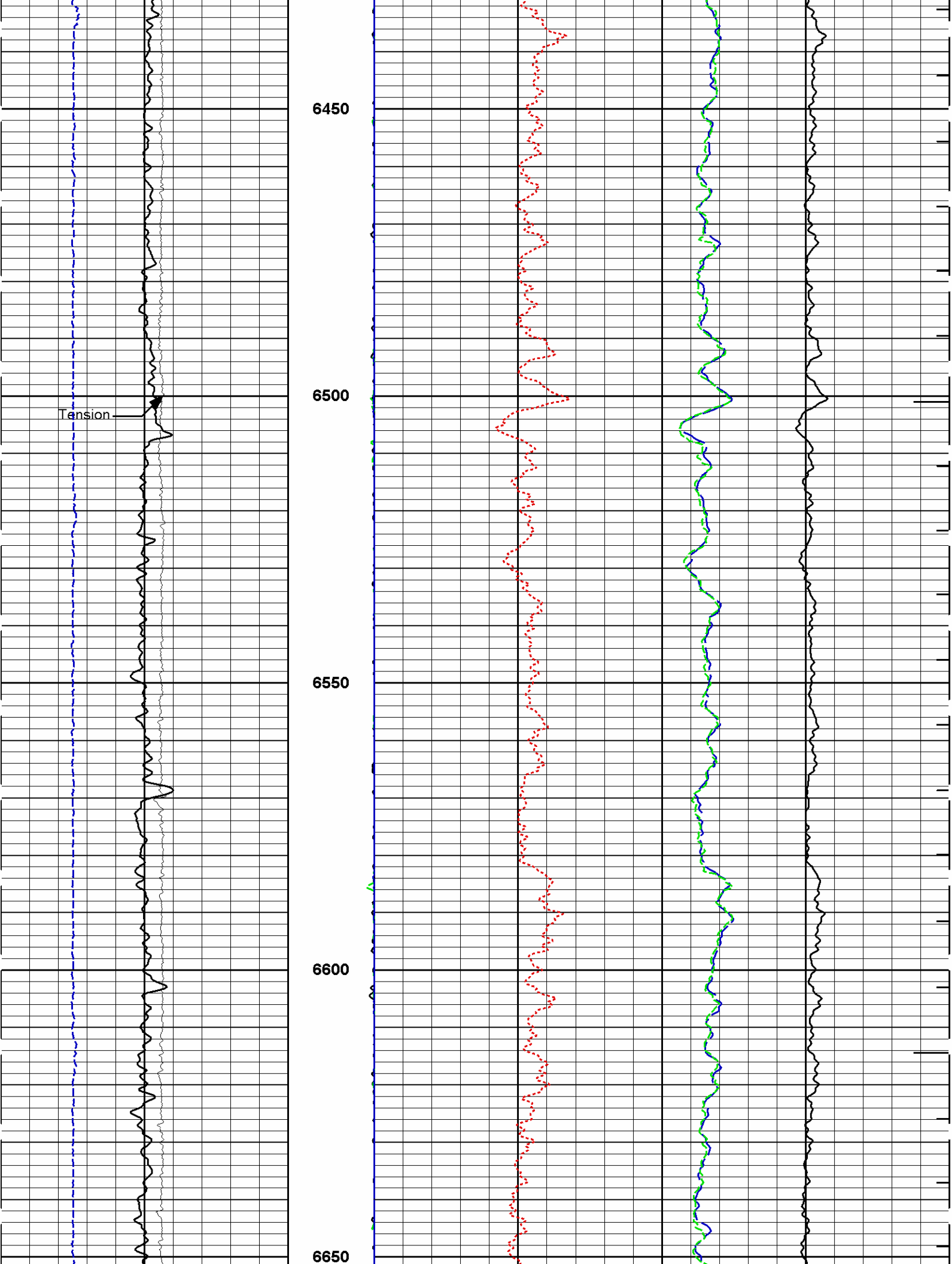
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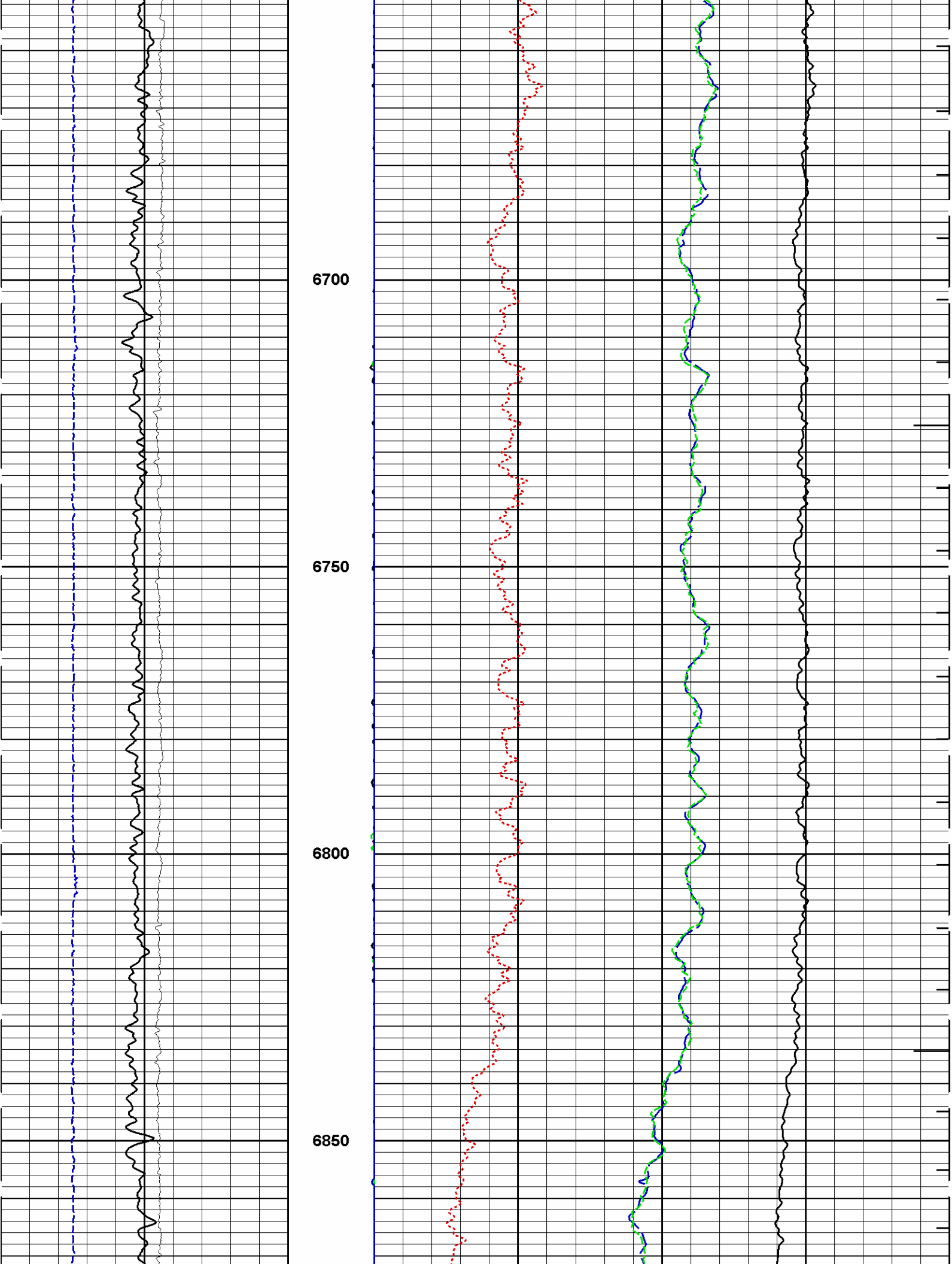
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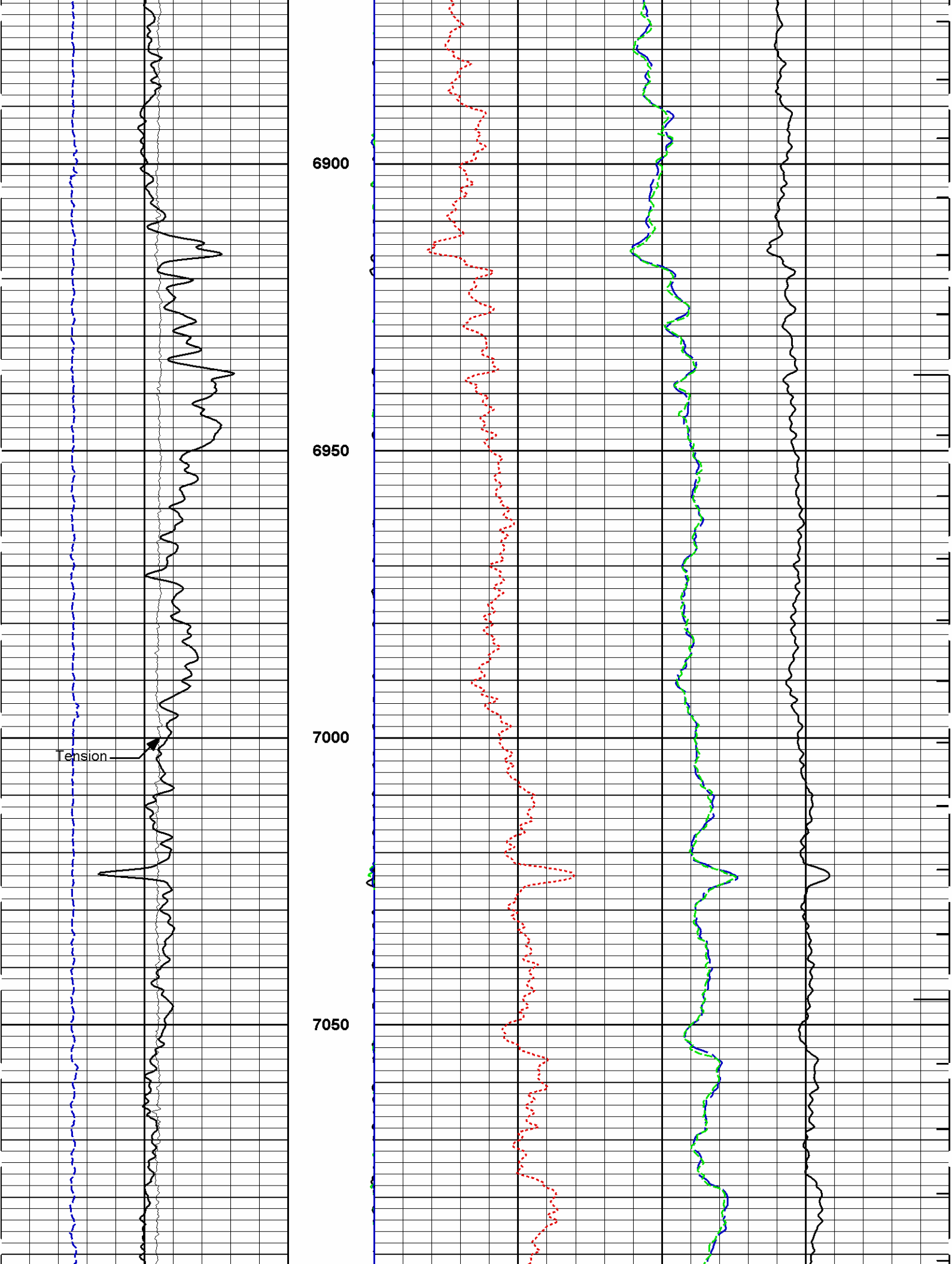
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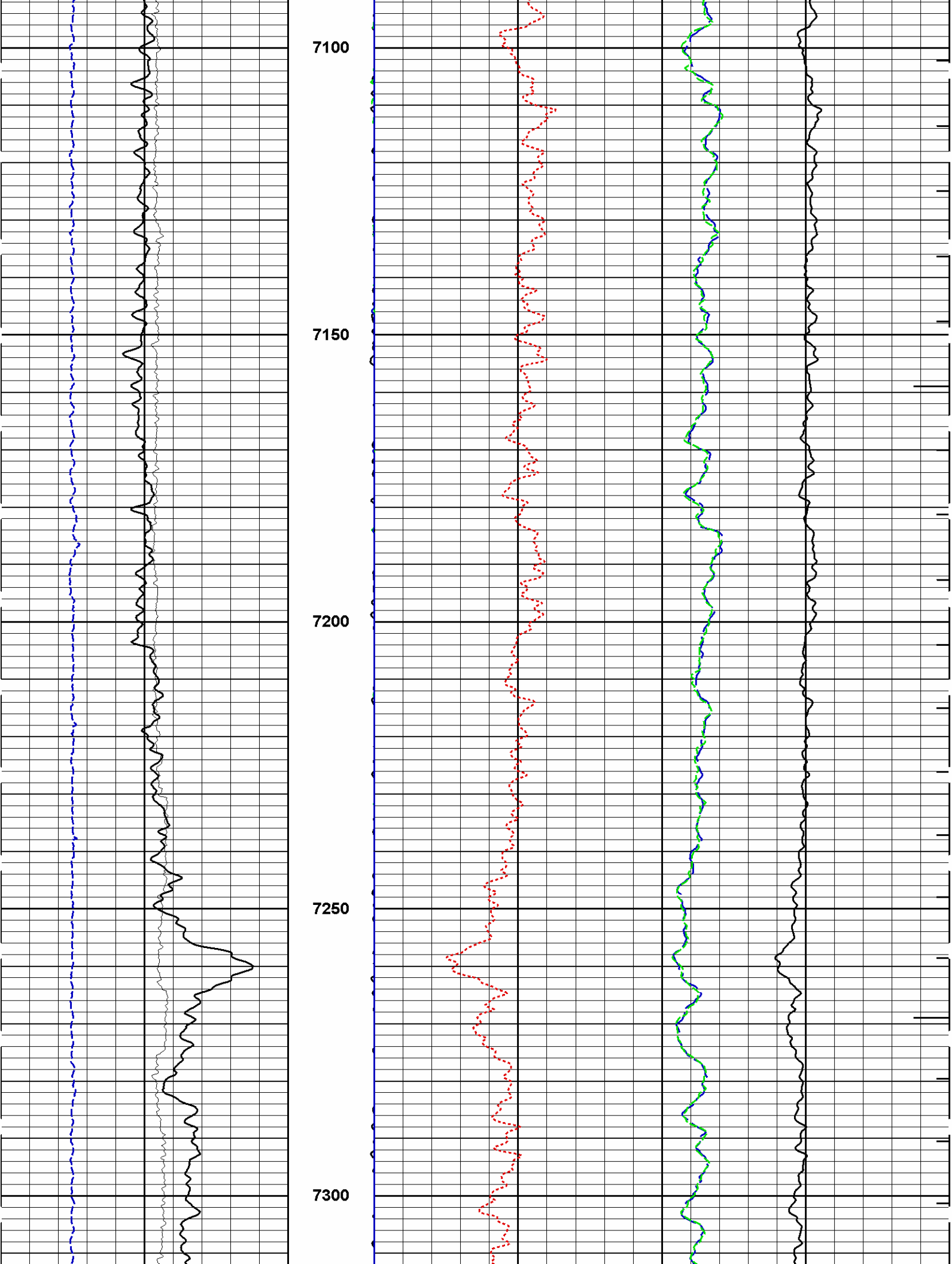
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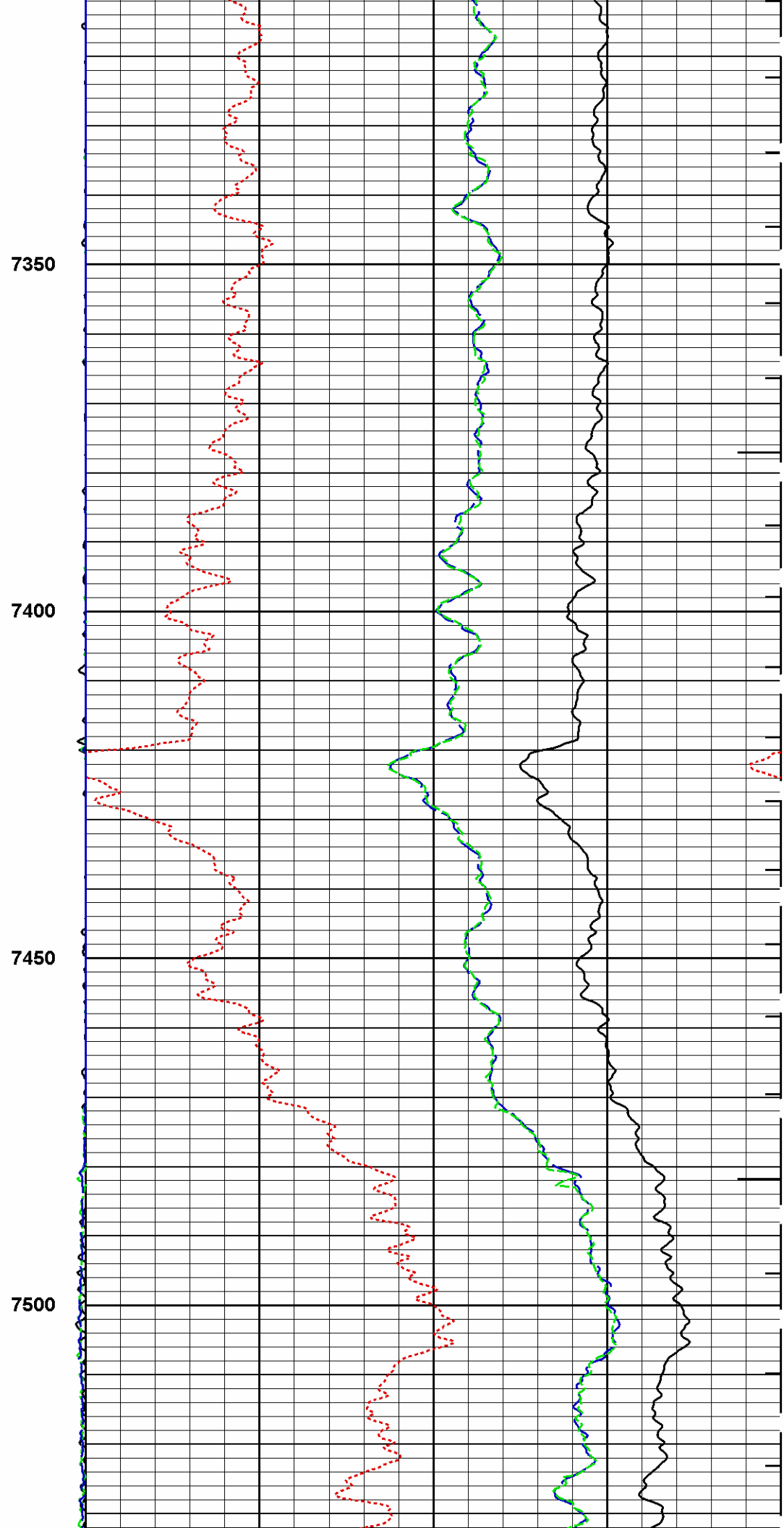
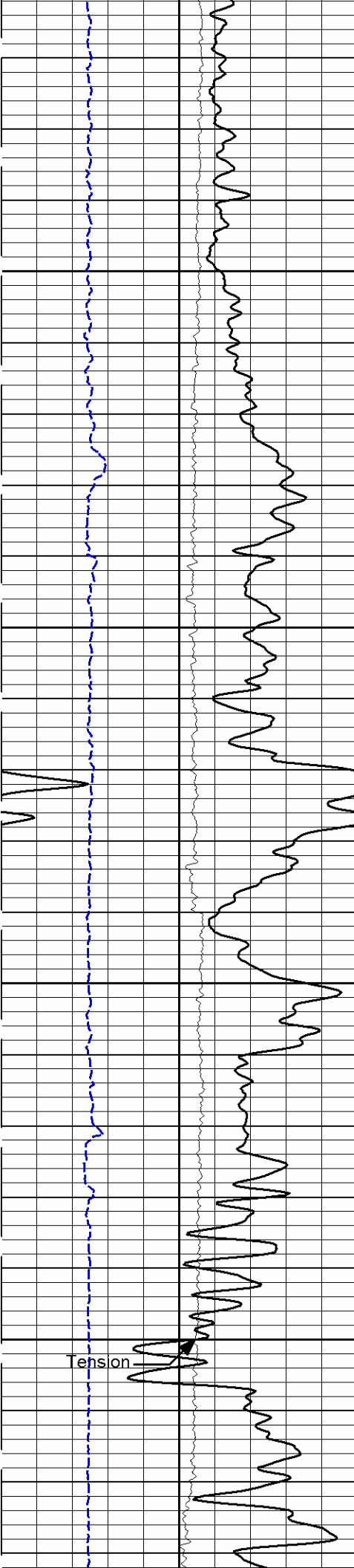


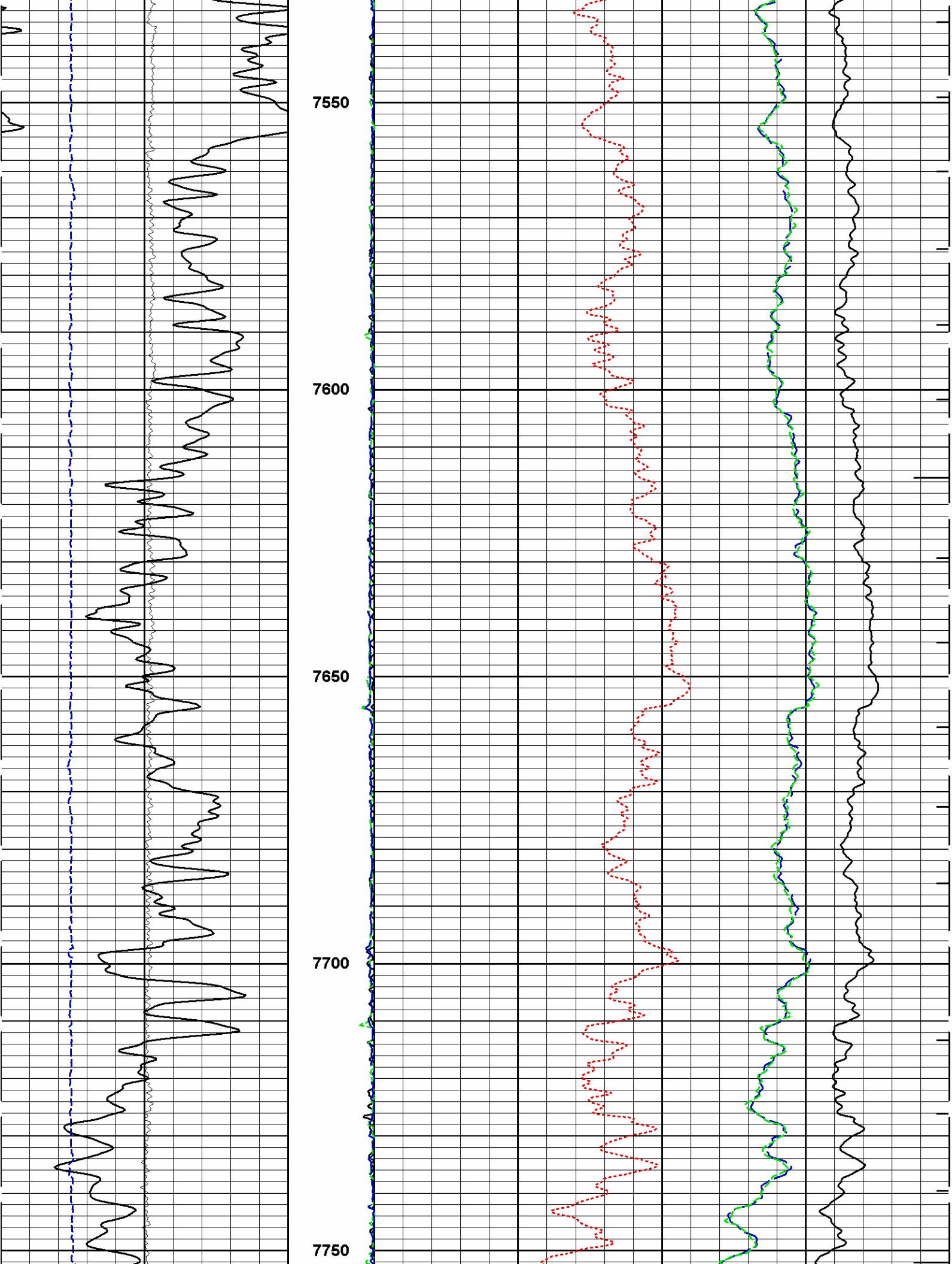


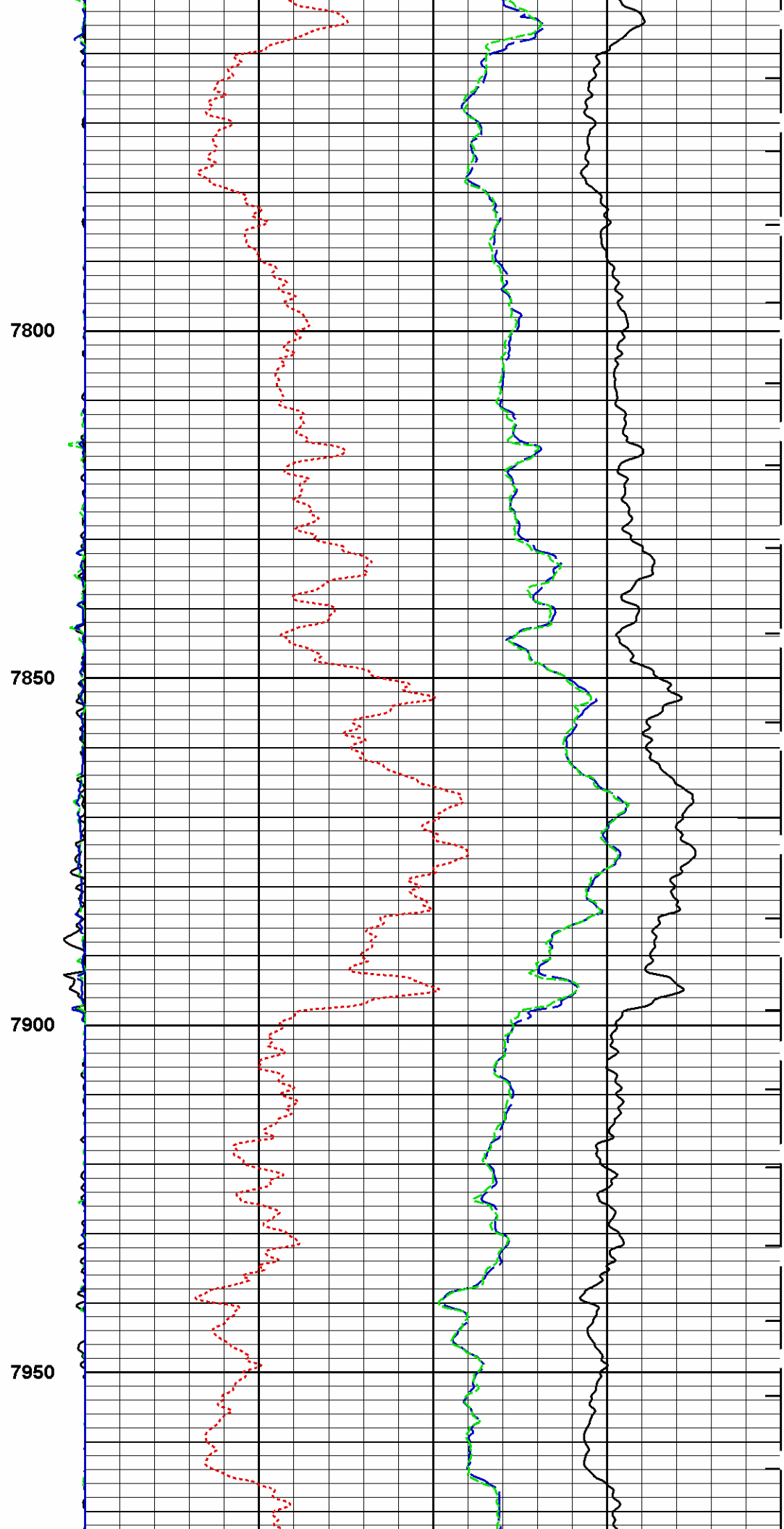
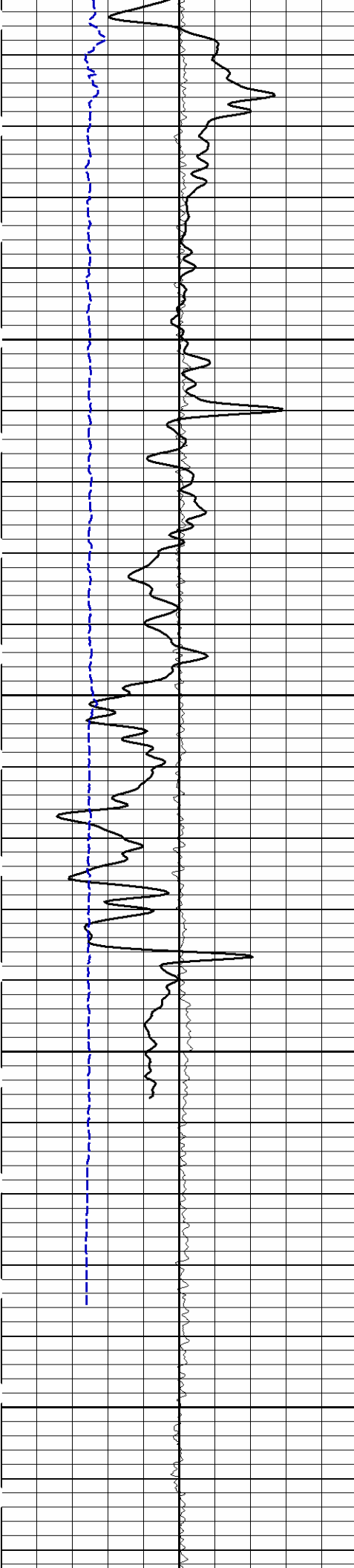


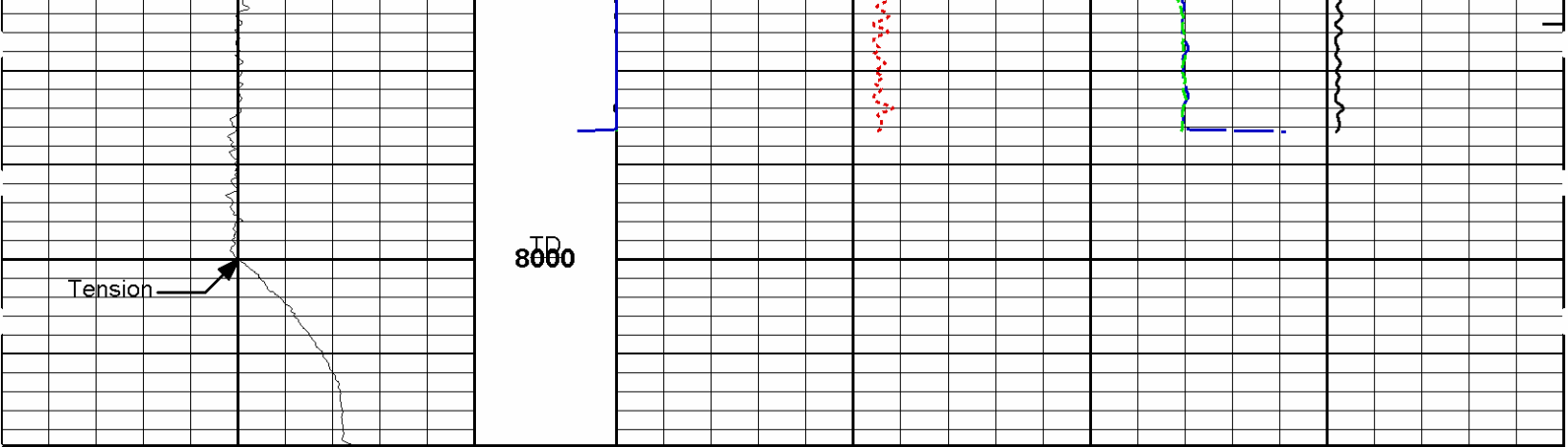












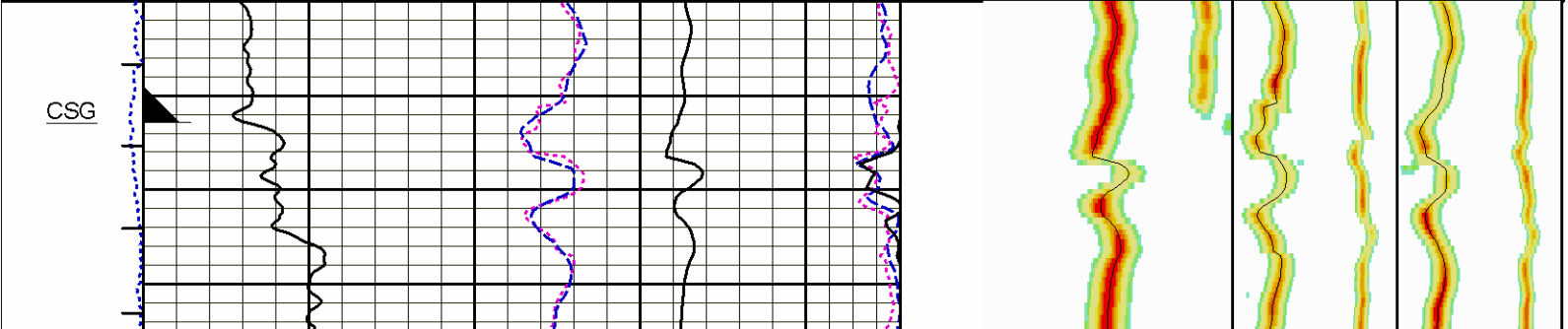
10000	Tension	0	1 : 240		ITT Total
	pounds				
6	Caliper	16	MSBP	350	DipYDeltaT 50
	inches				uspf
0	Gamma Ray	200	XSBP	350	DipXDeltaT 50
	api				uspf
			YSBP	240	MonoDeltaT 40
					uspf
				0.45	Sonic Porosity -0.15
					decP

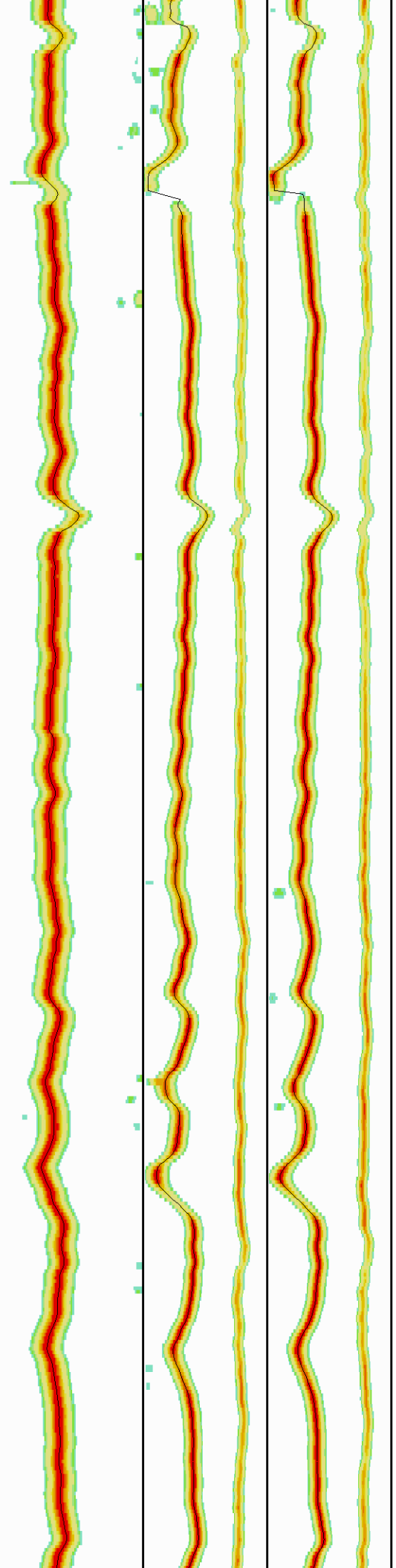
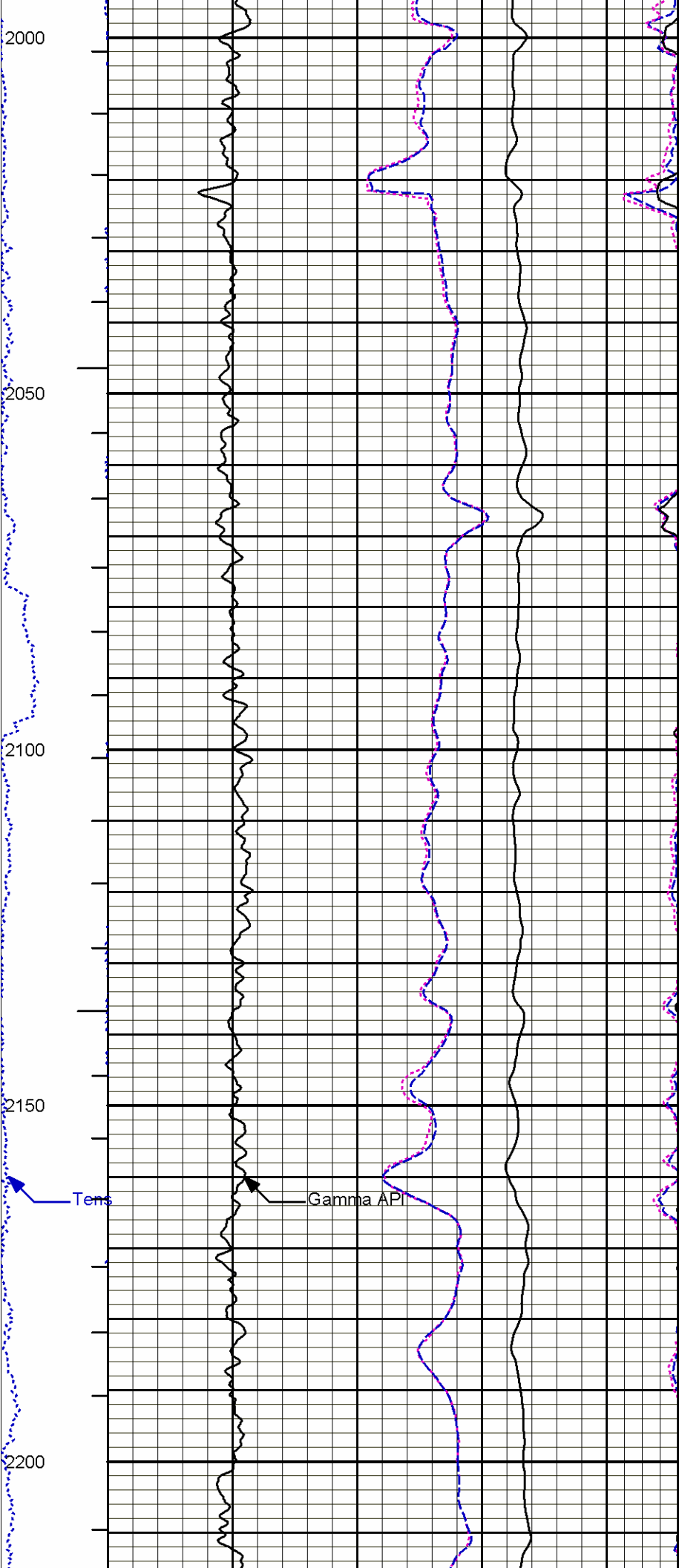
HALLIBURTON Plot Time: 12-Jul-13 18:33:58
Plot Range: 1960 ft to 8019.75 ft
Data: ZUKOWSKI 17-1H\Well Based\WSTT-ACRT\
Plot File: \\WSTT\WSTT_5IN_M

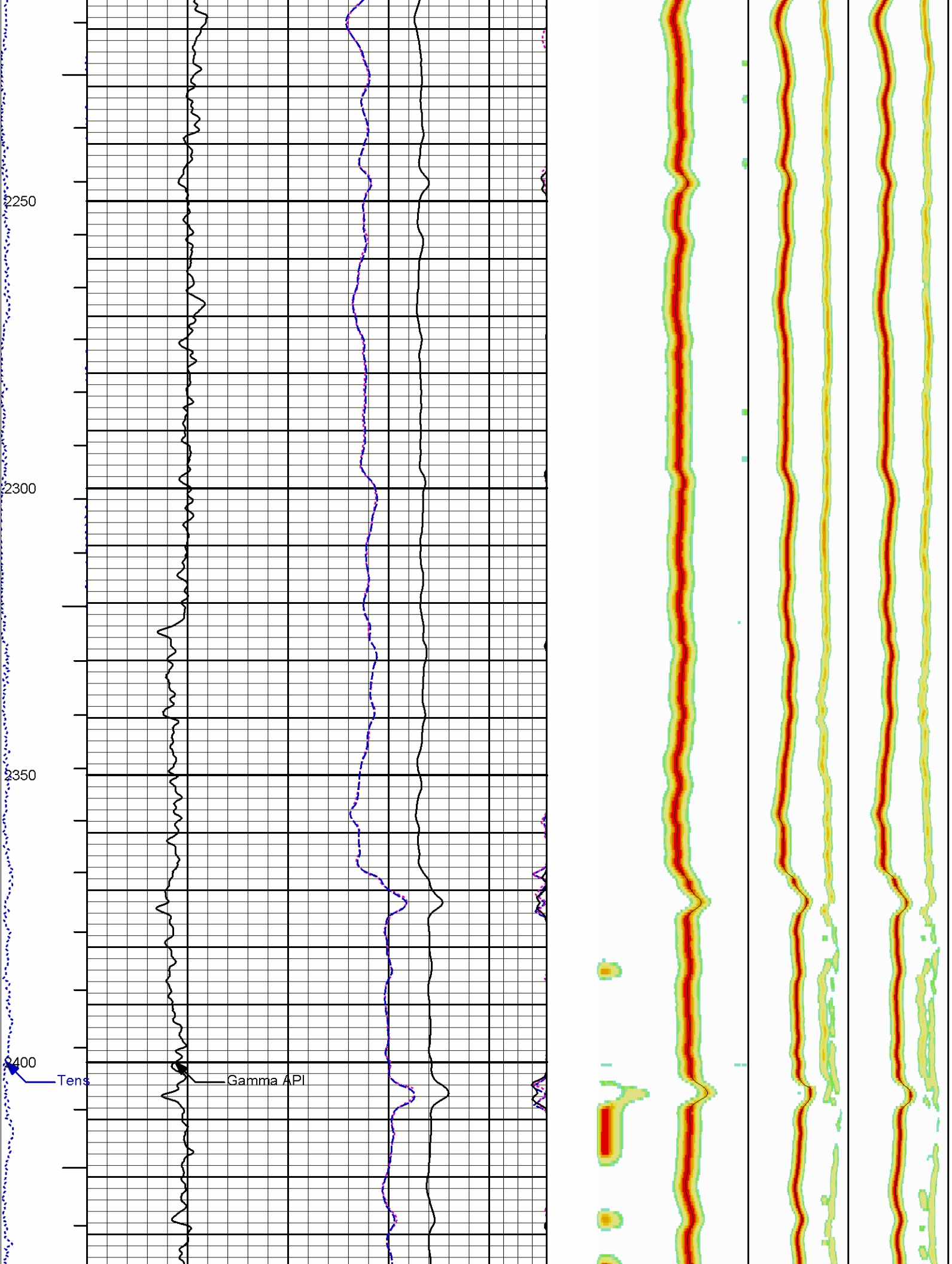
MAIN PASS 5" = 100'

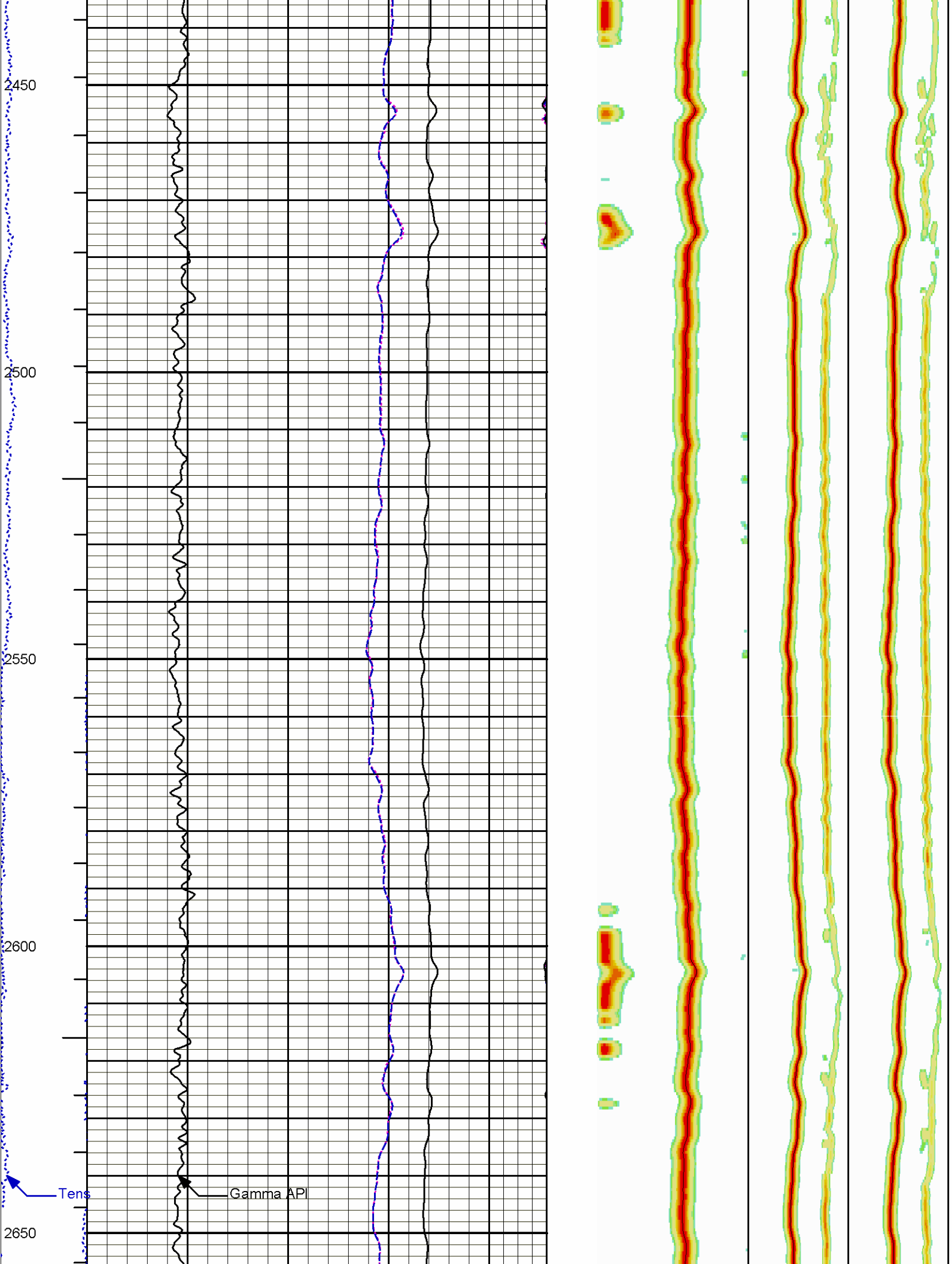
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Plot File: \\WSTT\WST-I Hard 1-240

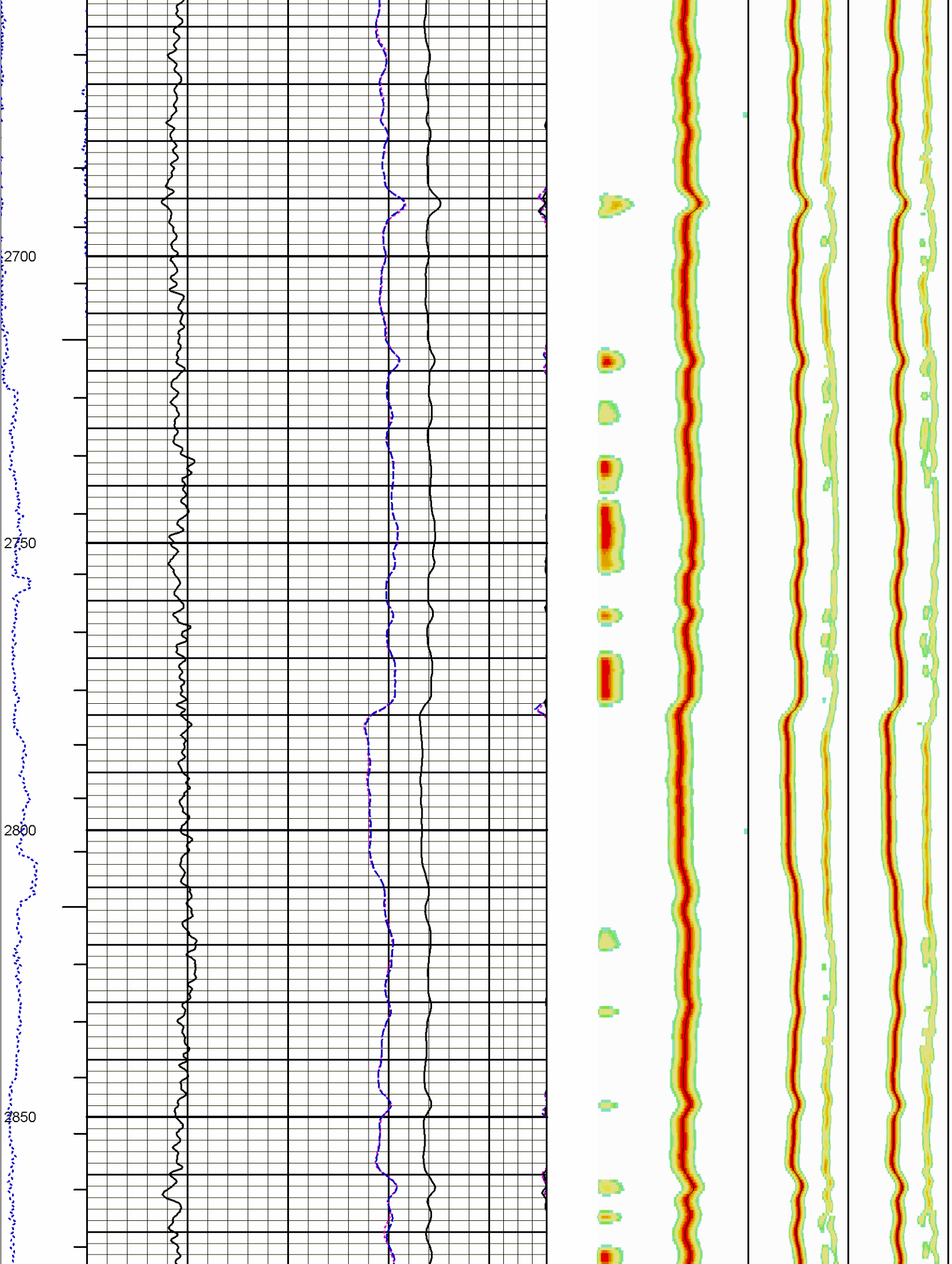
ITTTotal		350	DipYDeltaT 1 50	0	YSBP1	
			microsec per ft			
1K Tens 3K pounds		350	DipXDeltaT 1 50	0	XSBP1	240 MonoDeltaT 40 350 DipXDeltaT50 350 DipYDeltaT50
			microsec per ft			microsec per ft microsec per ft microsec per ft
1 : 240	0 Gamma API 200	240	MonoDeltaT 1 40	0	MSBP1	240 Mono Semb Vec 40 340 Dip X Semb Wave 340 Dip Y Semb Wave 340
	api		microsec per ft			

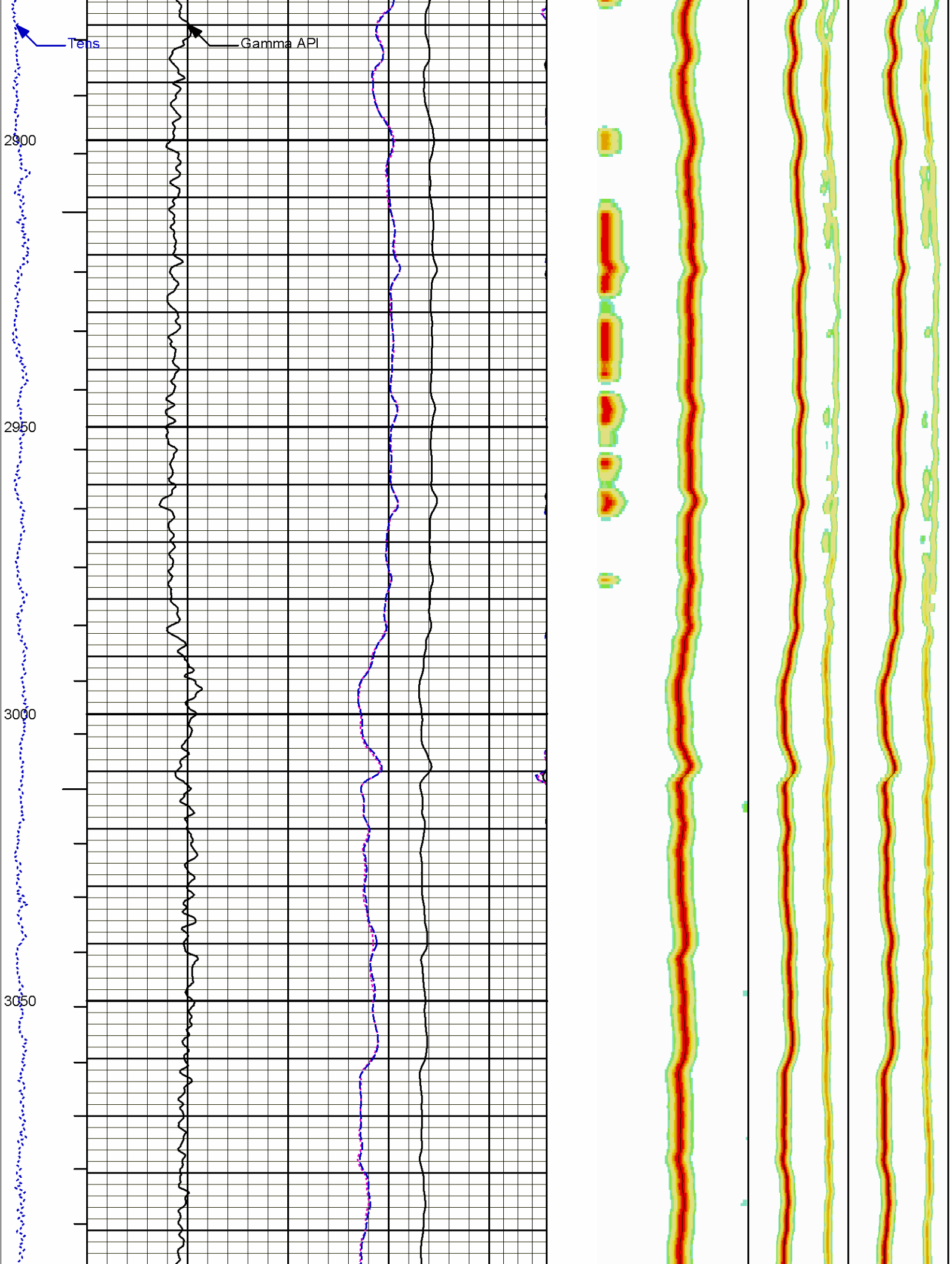


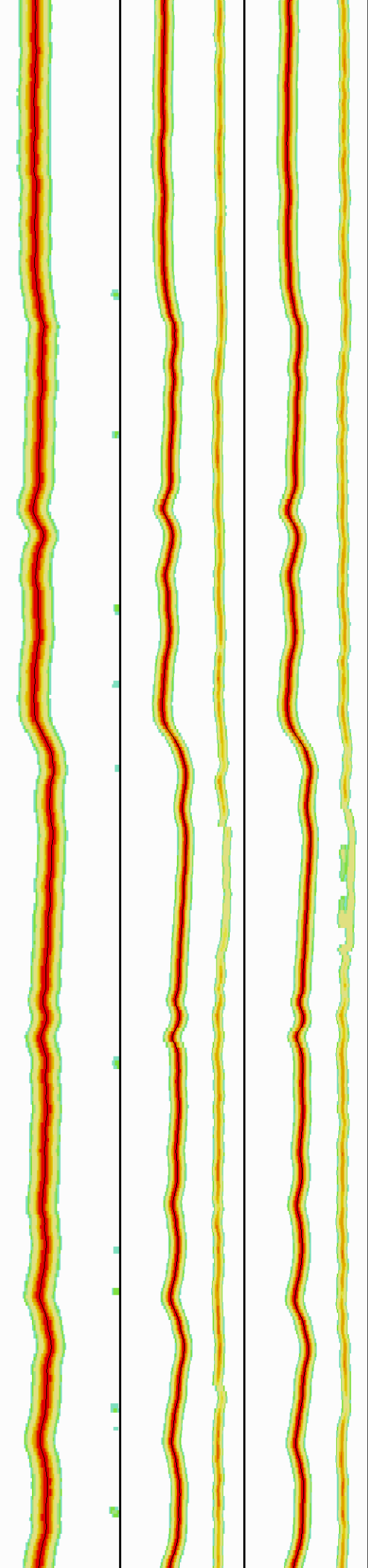
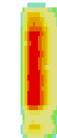
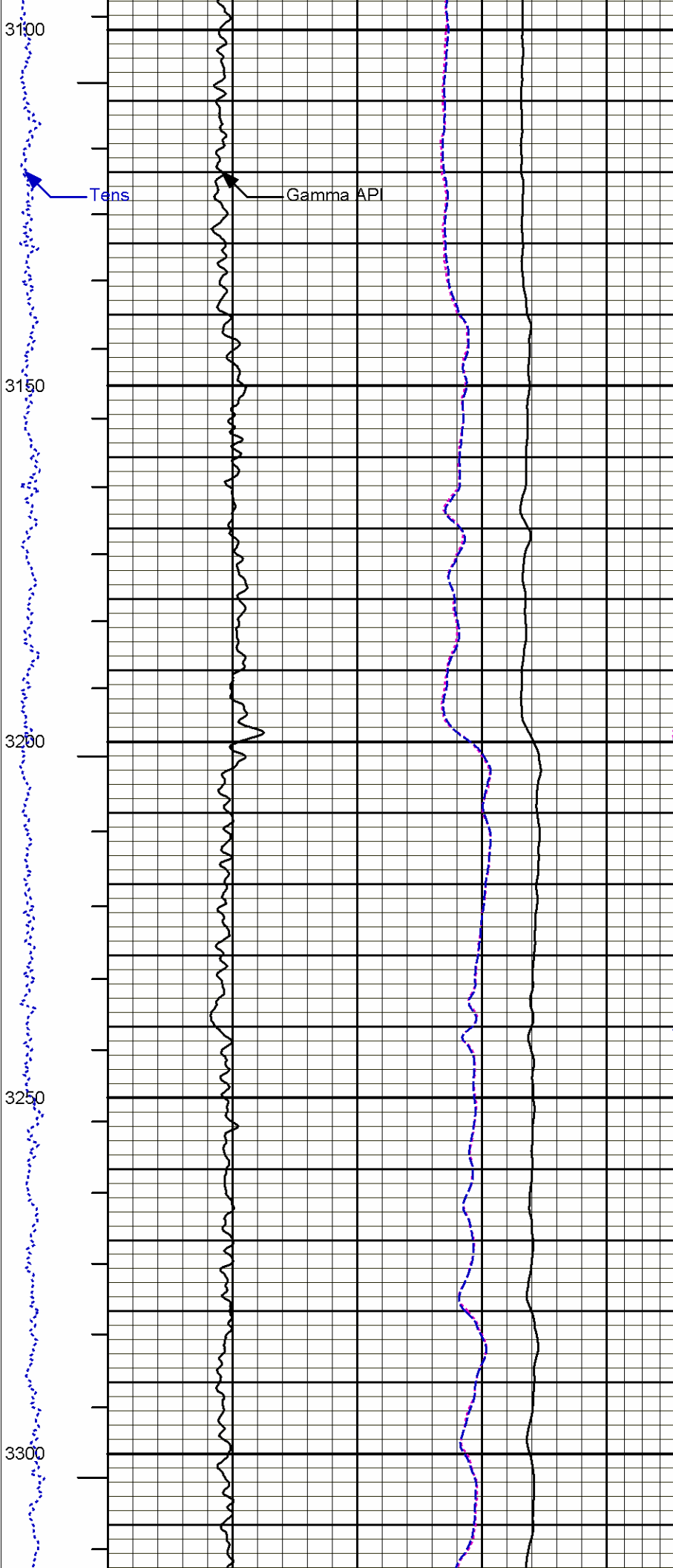


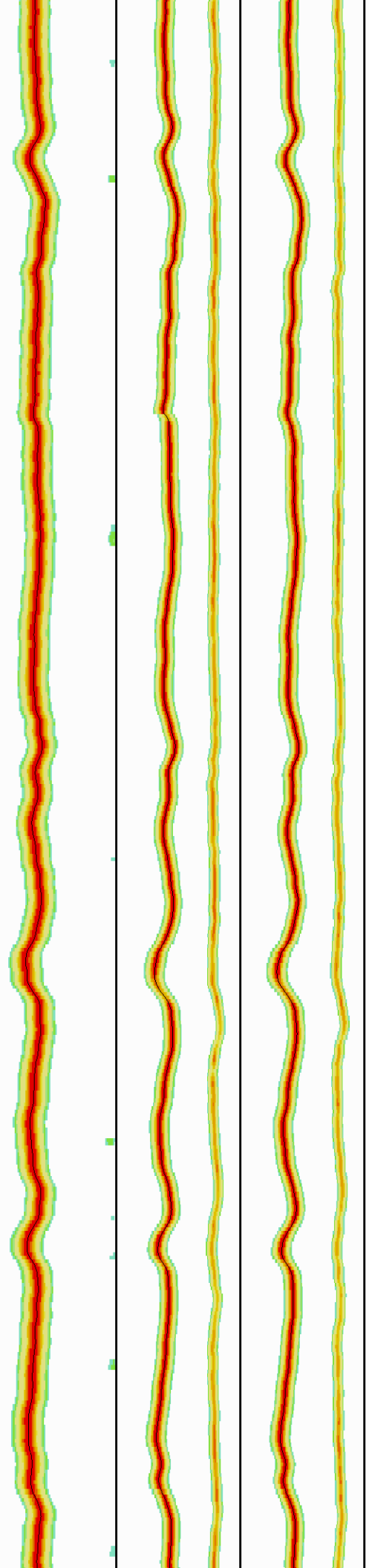
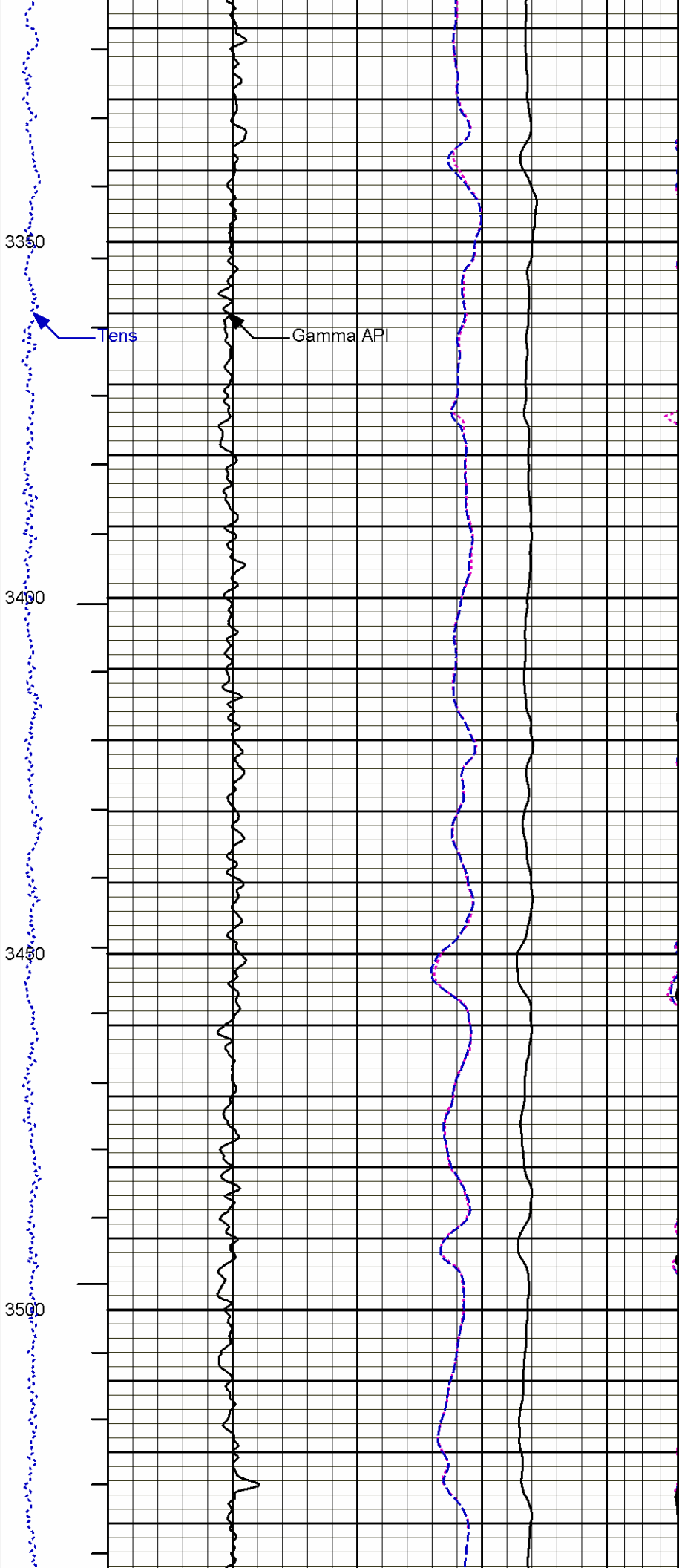


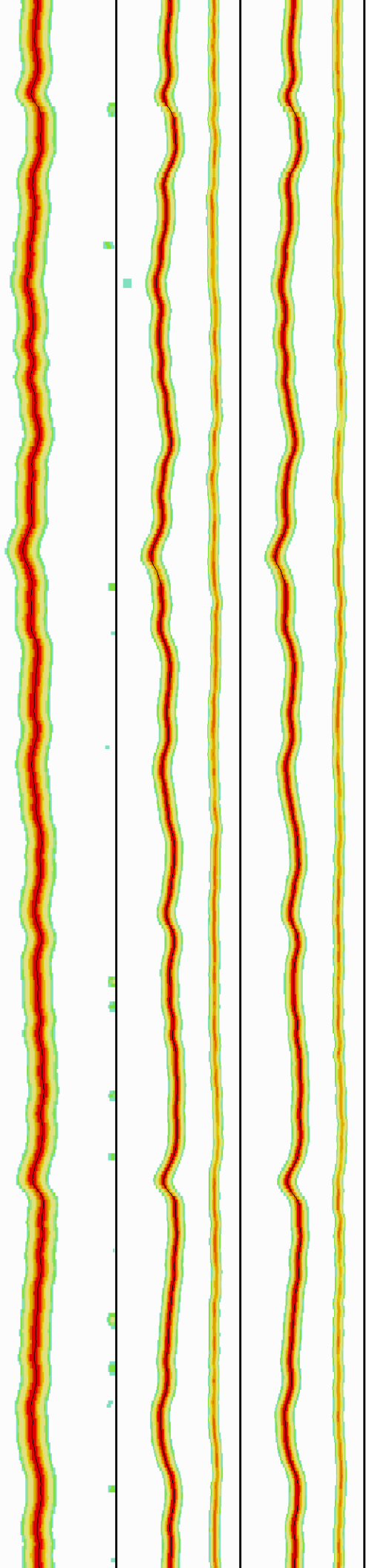
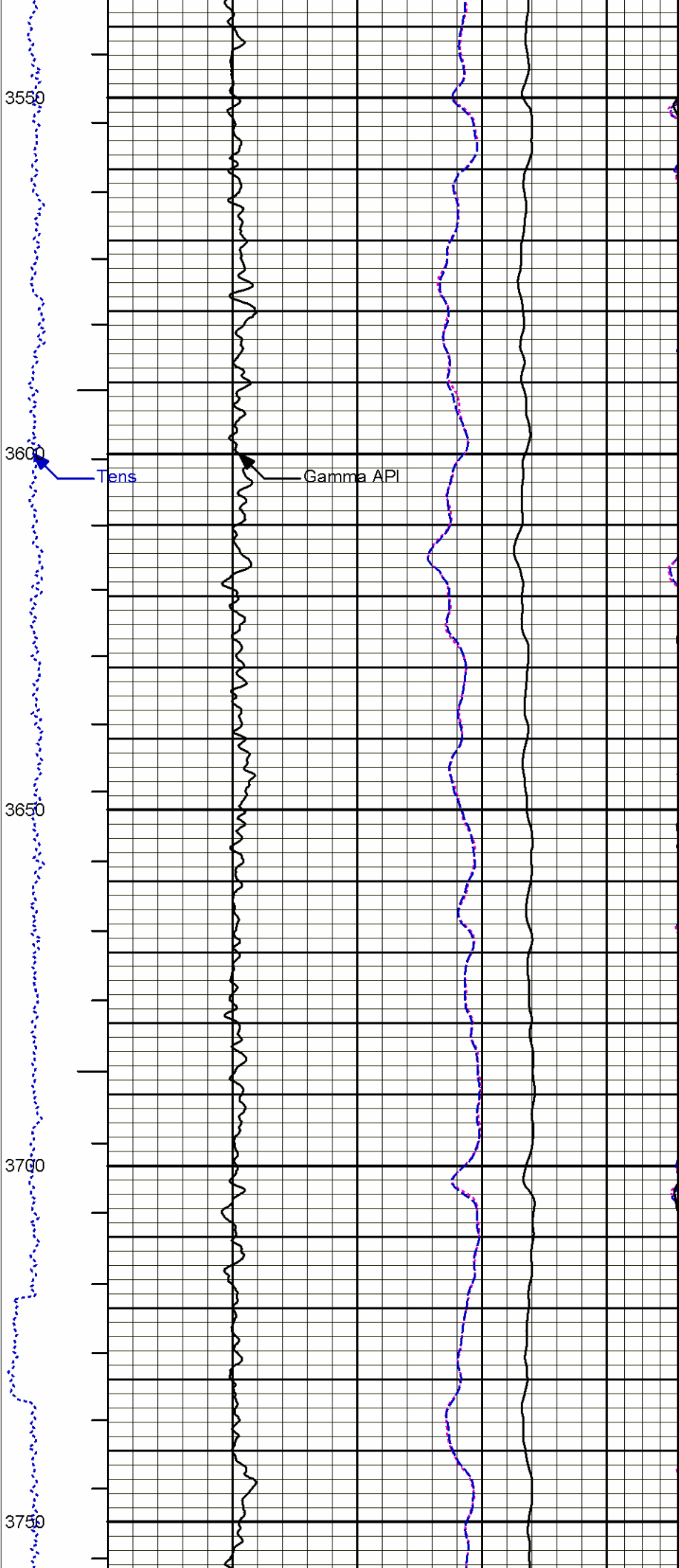


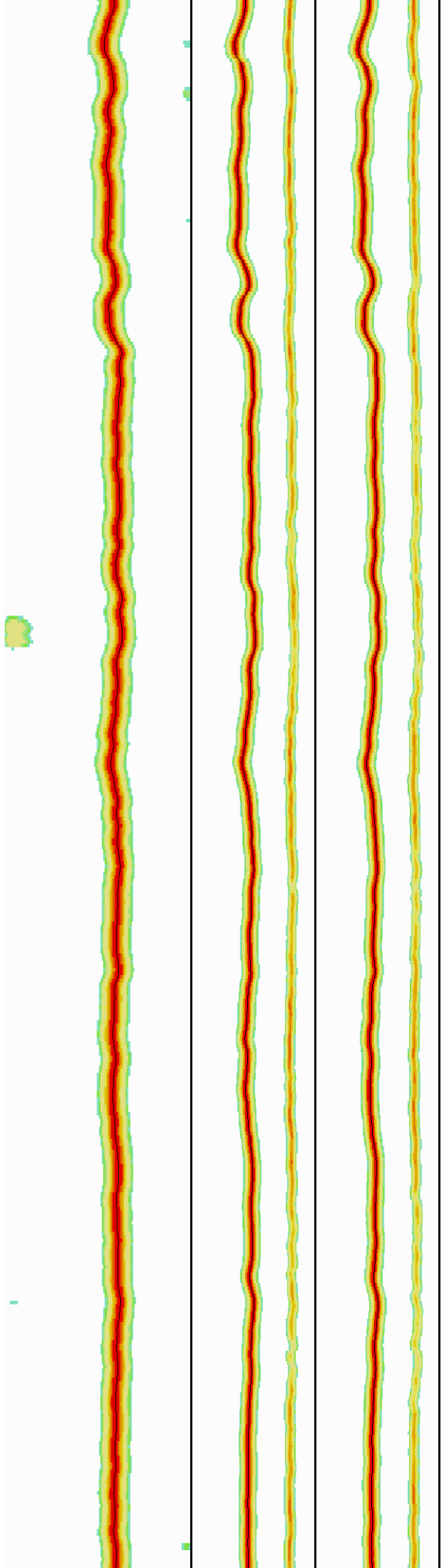
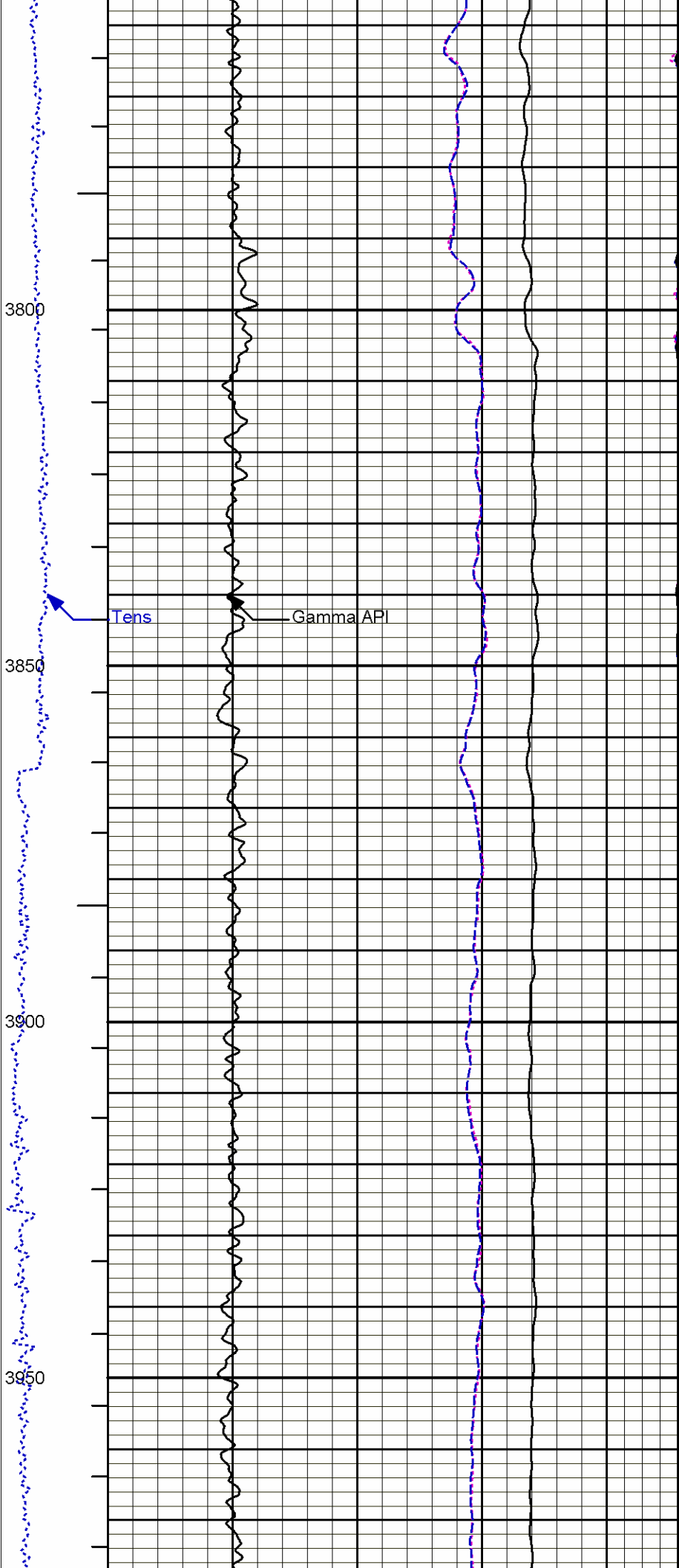


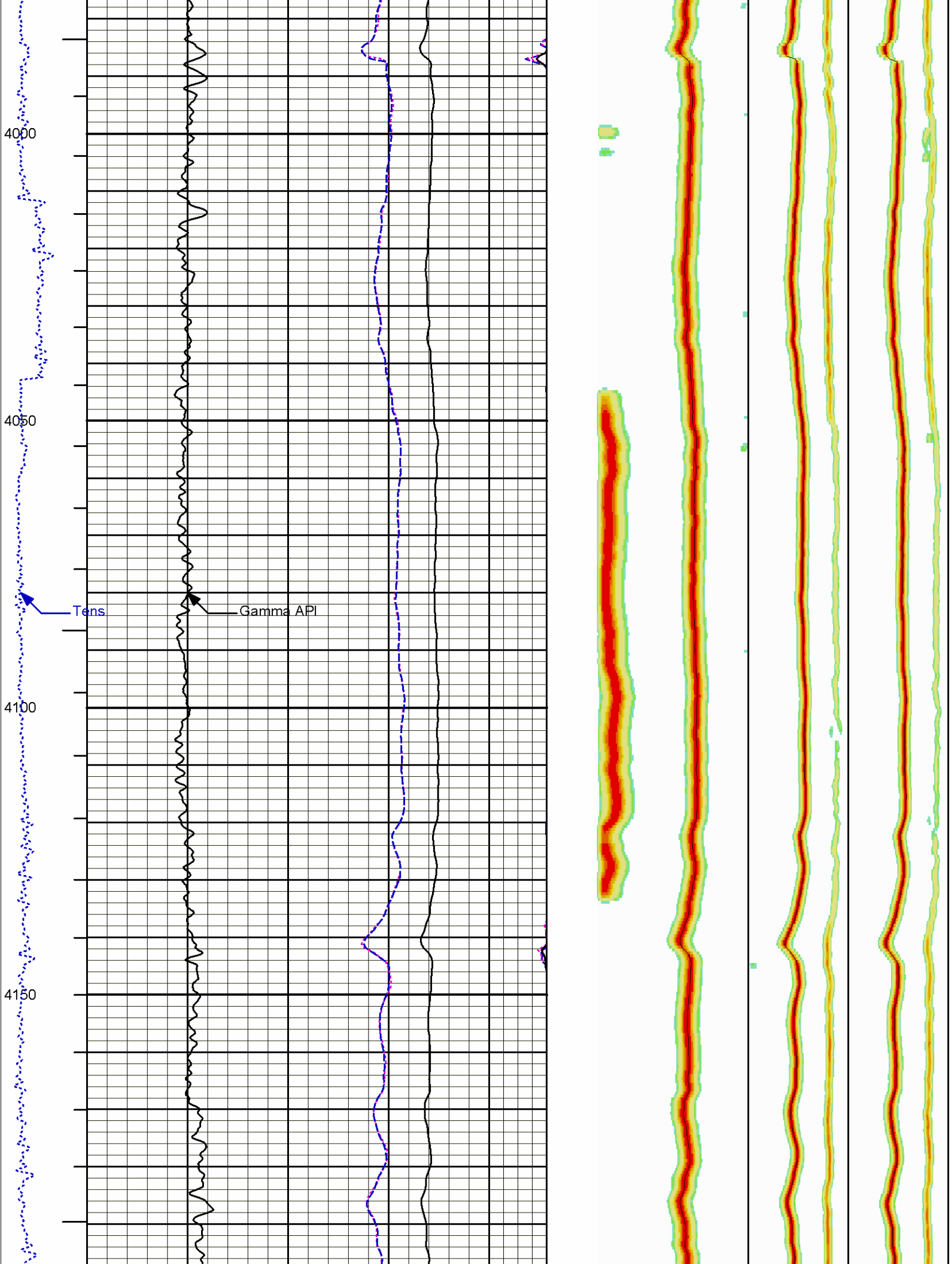


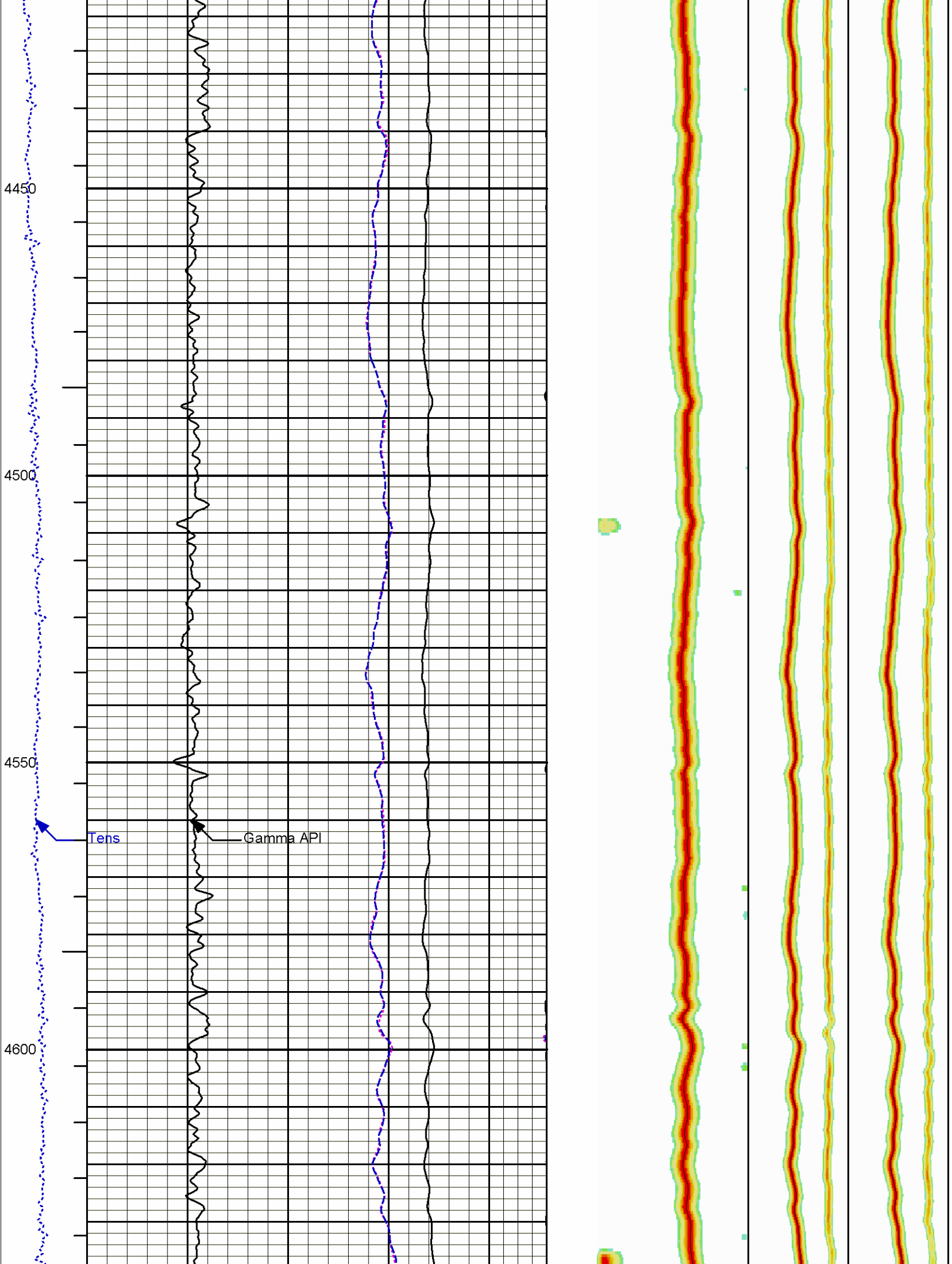


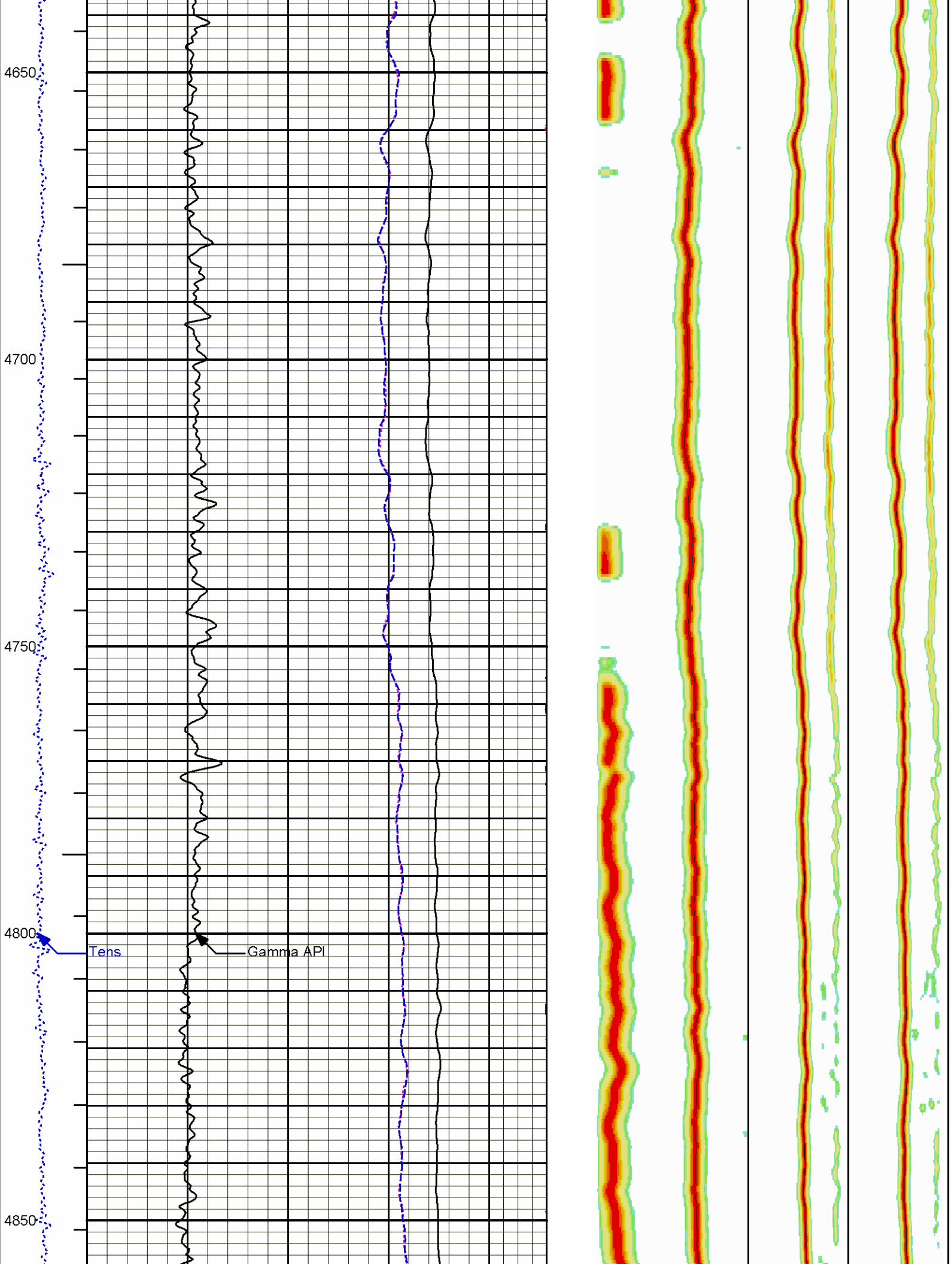


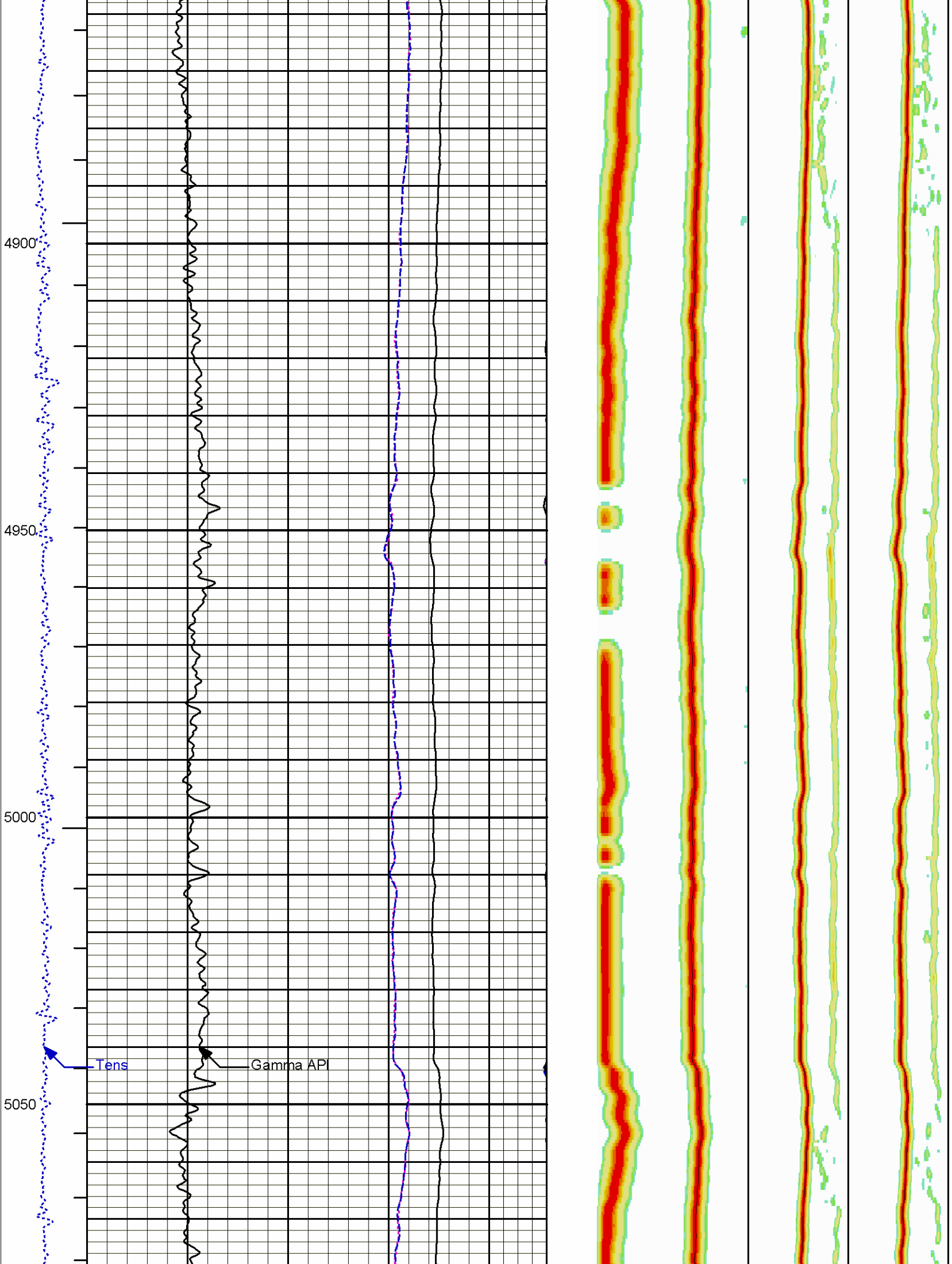


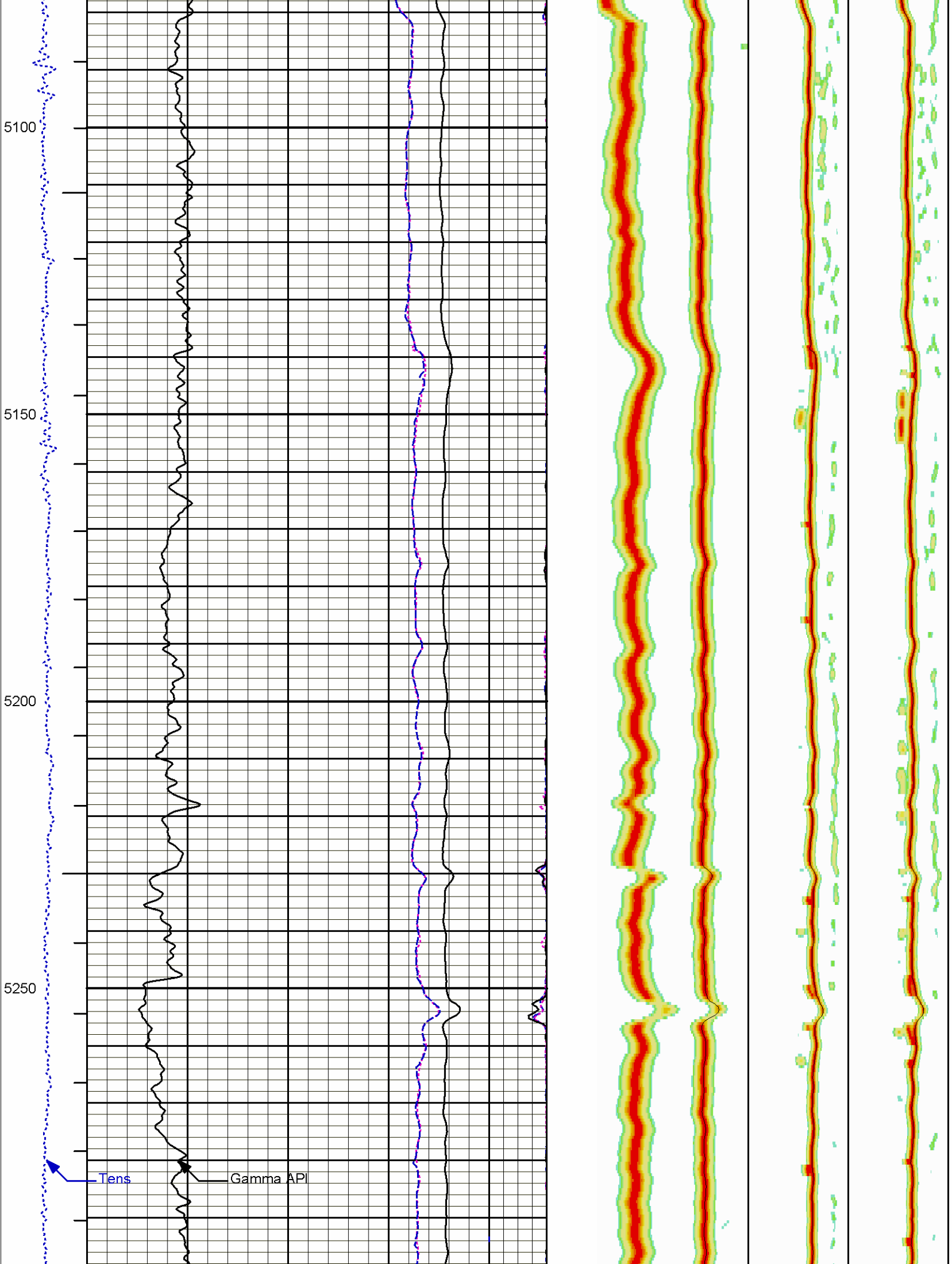


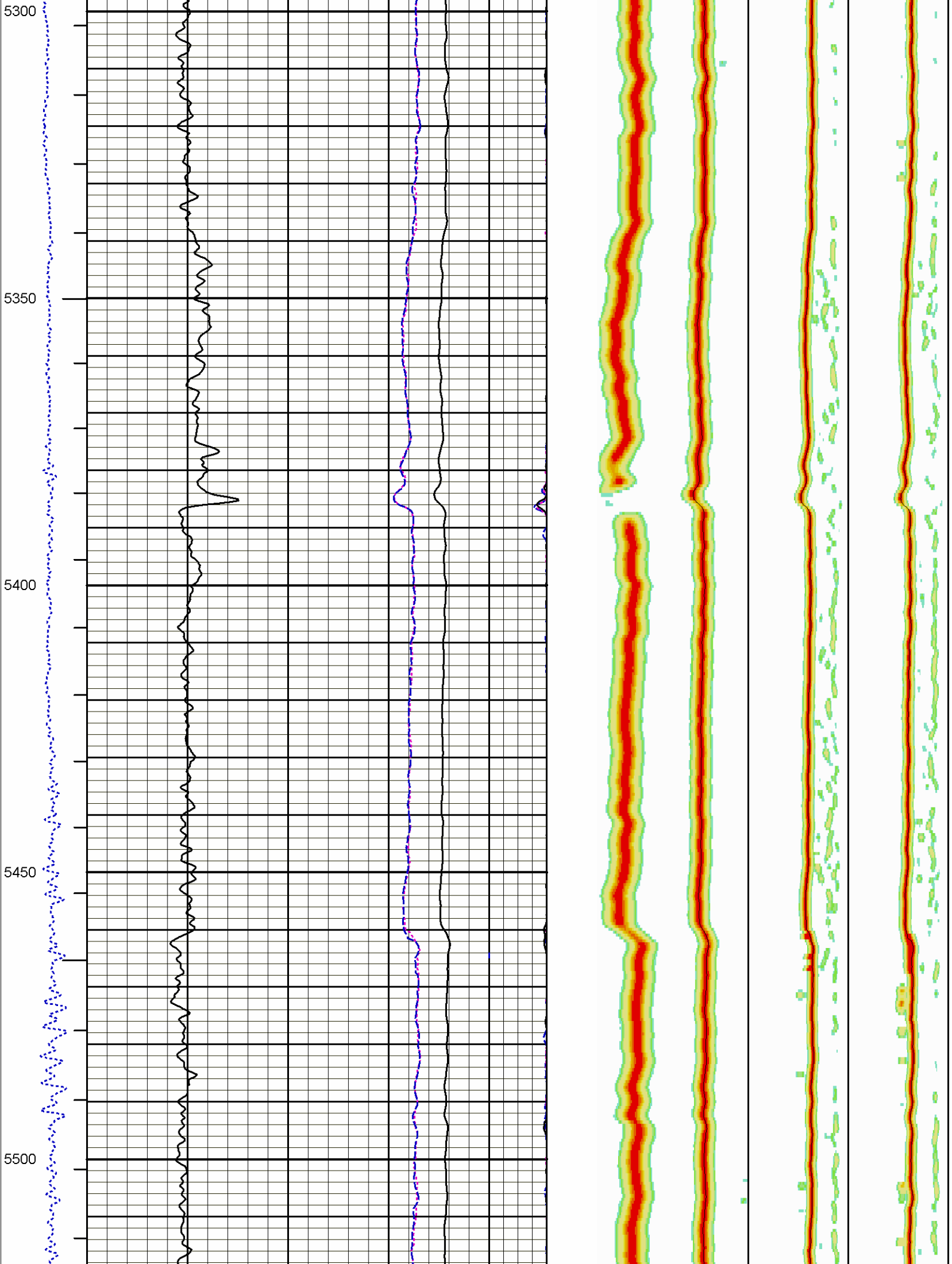


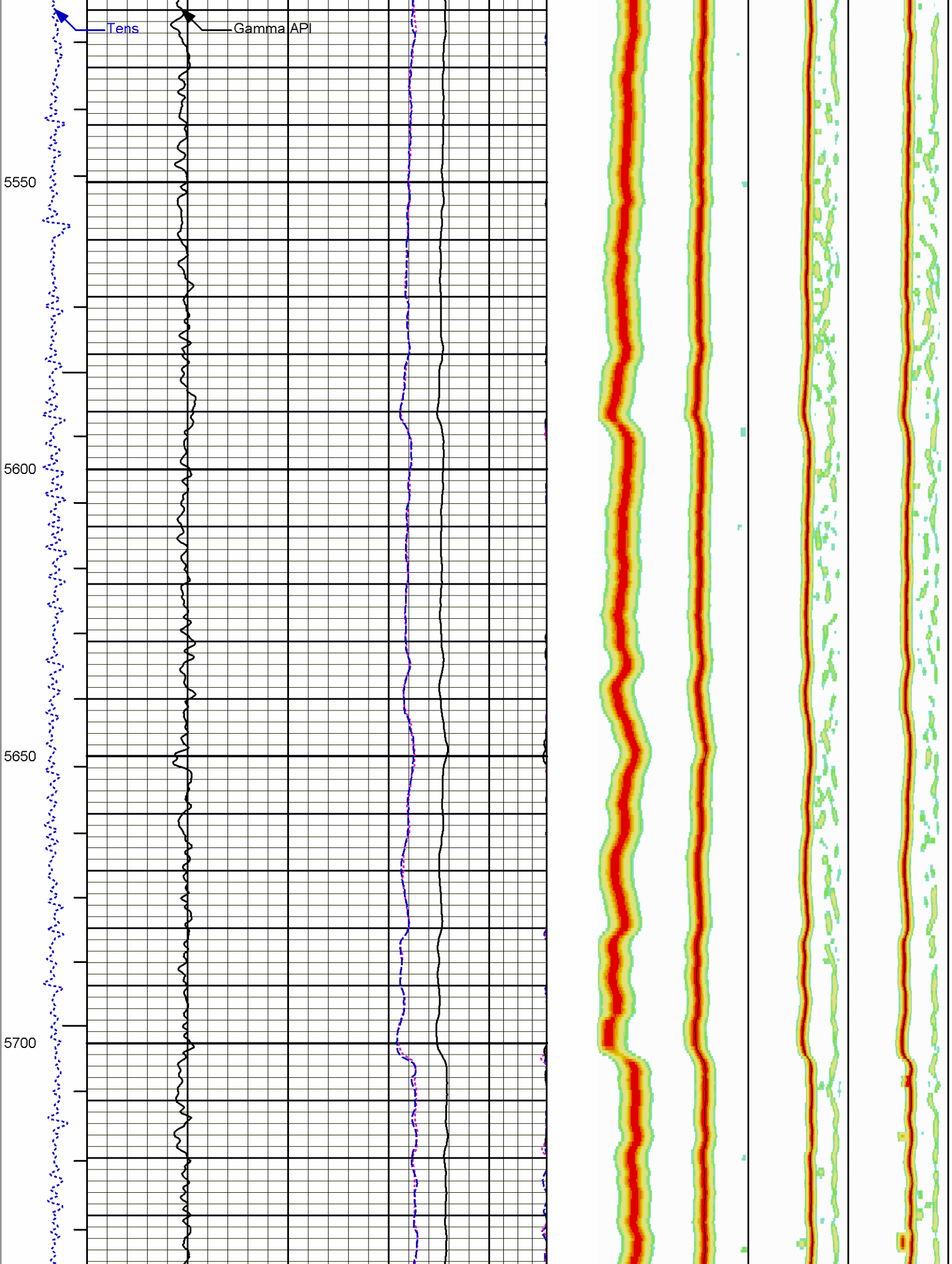


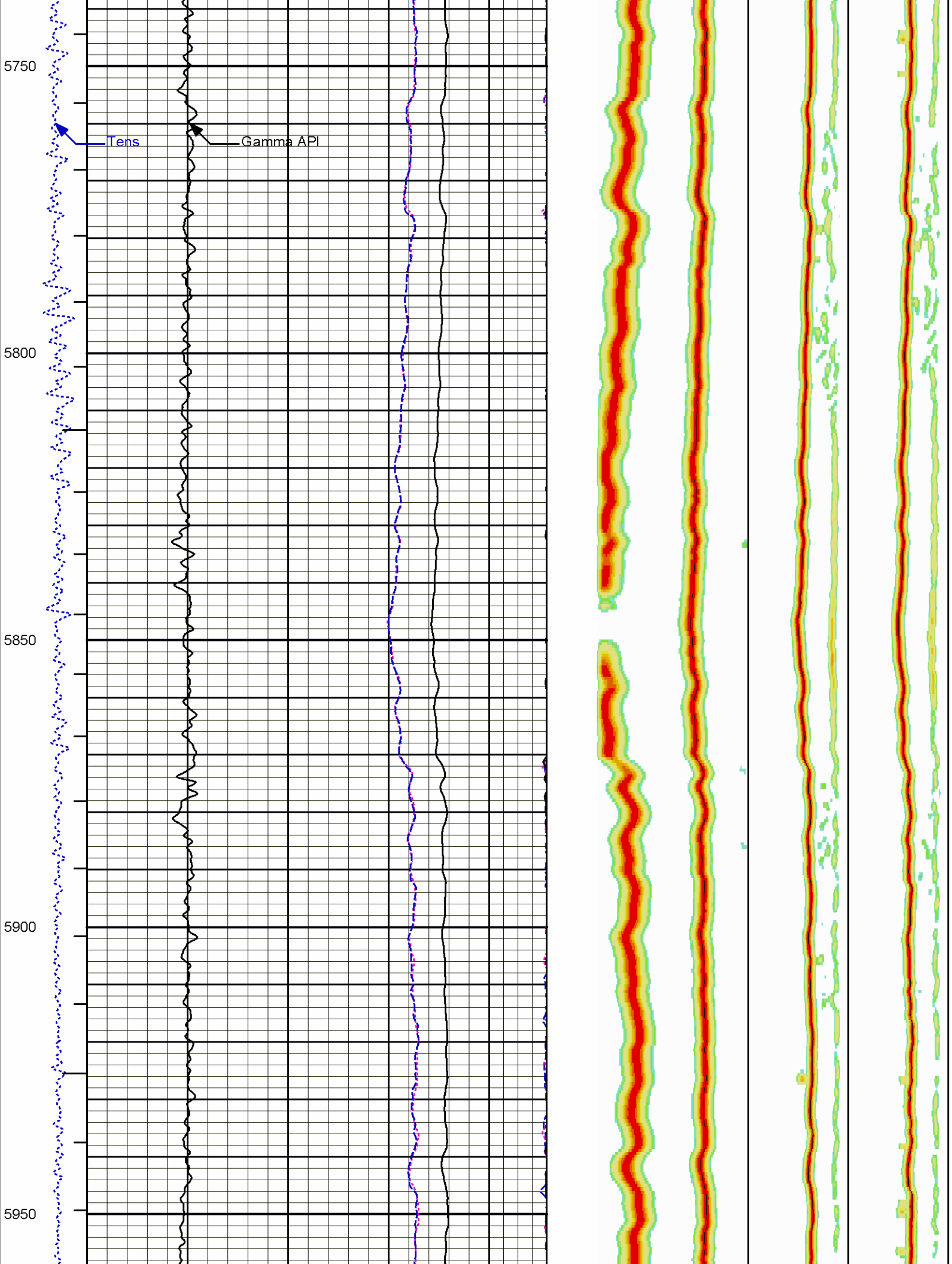


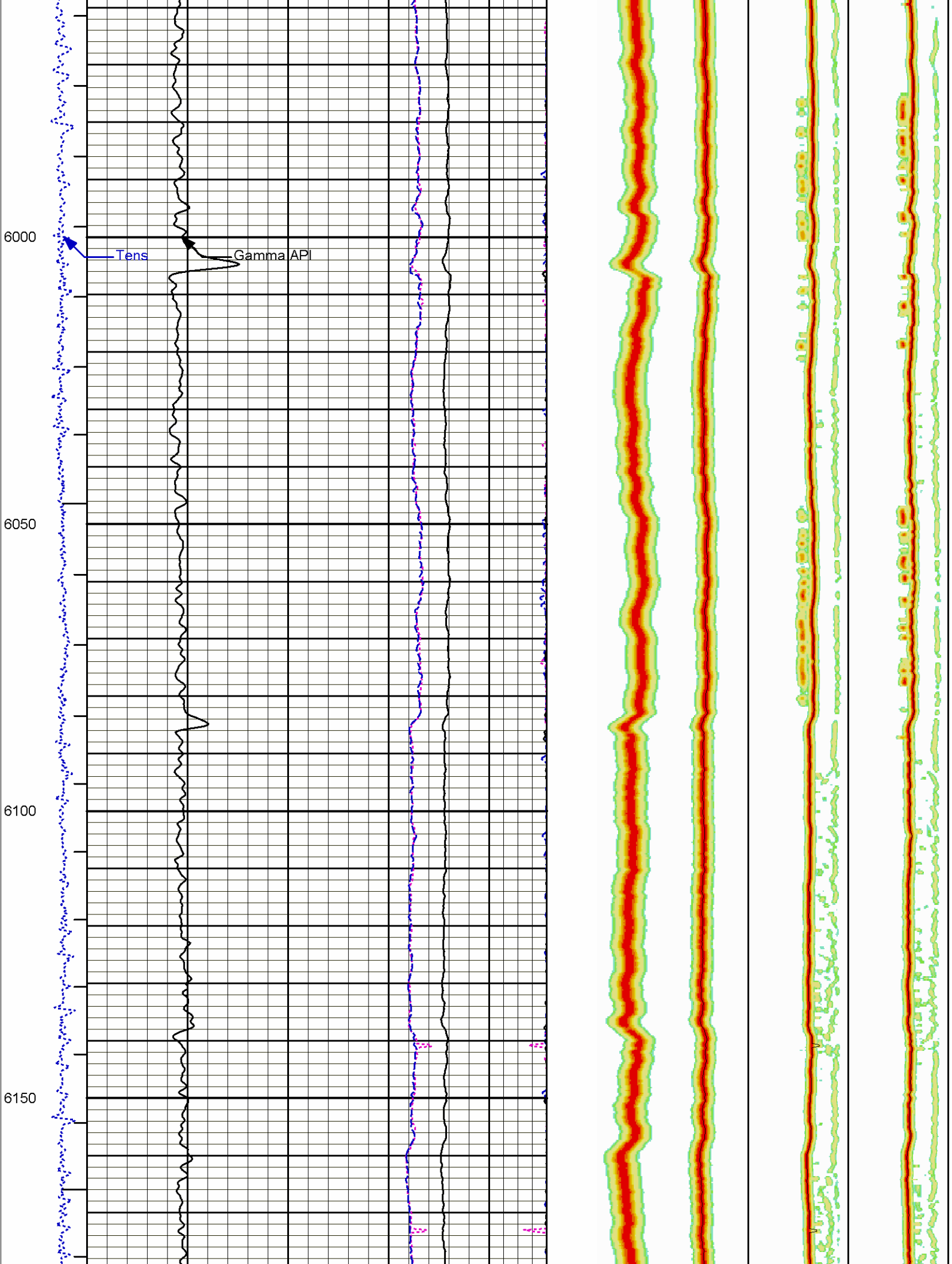


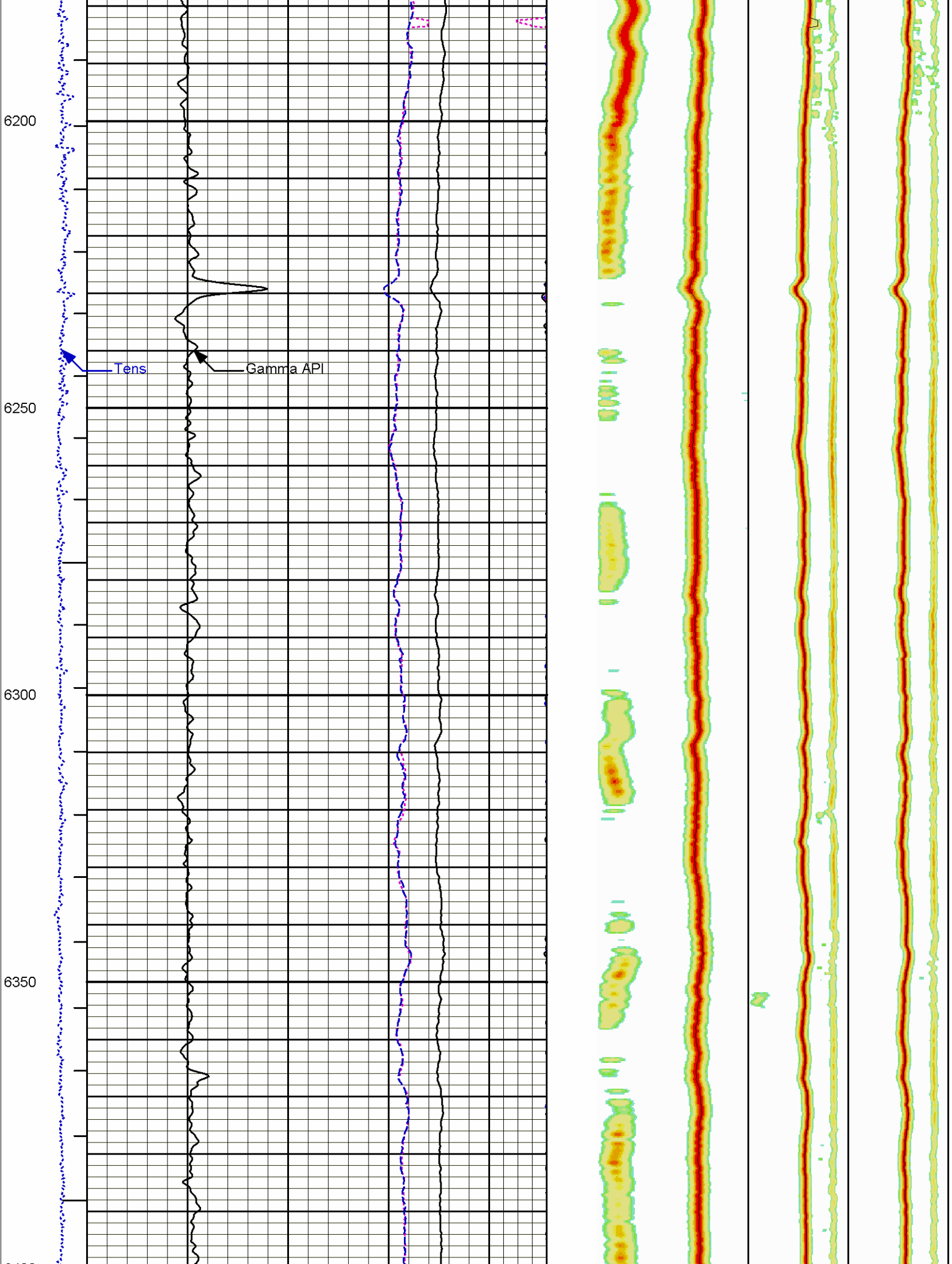


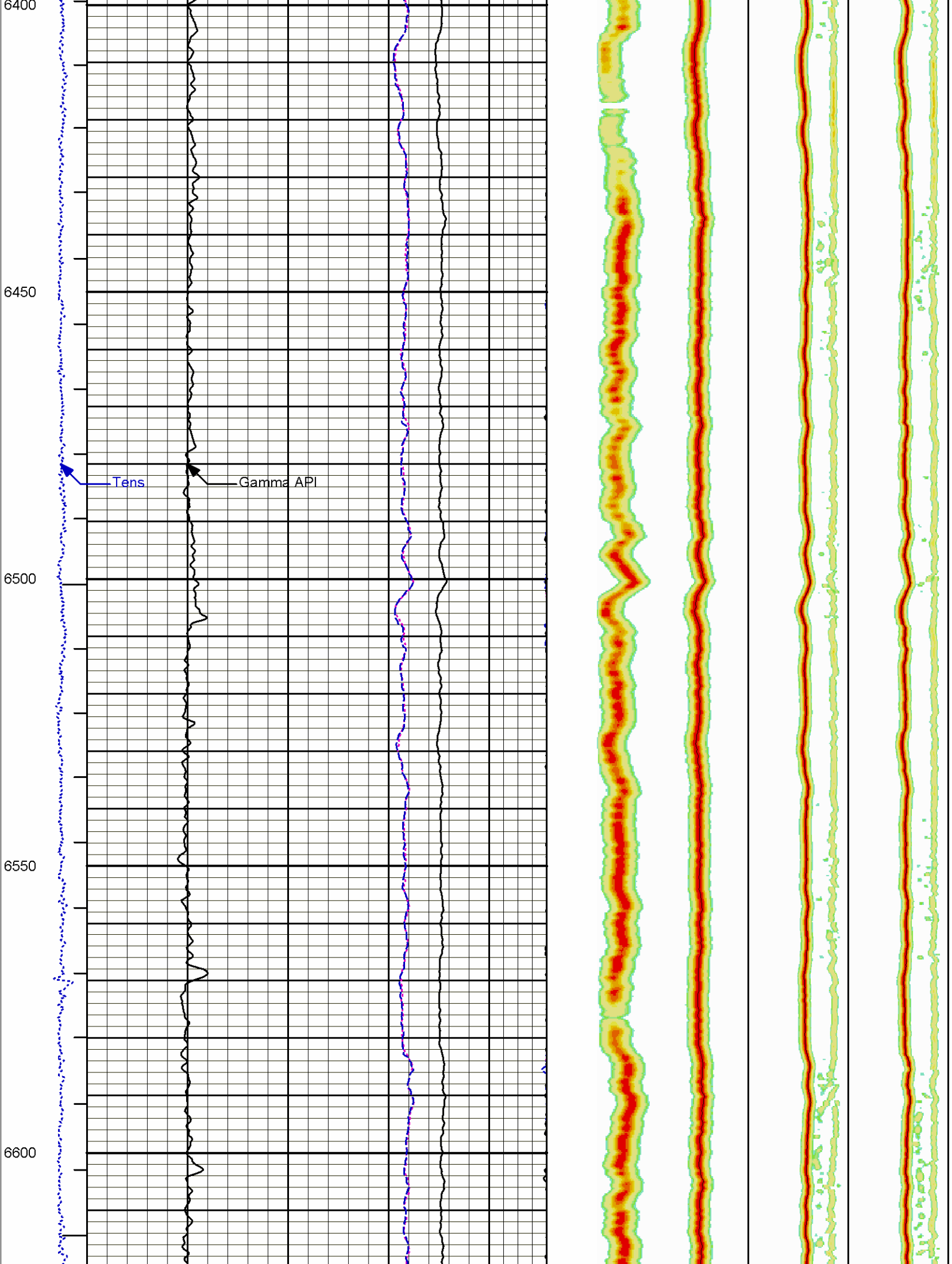


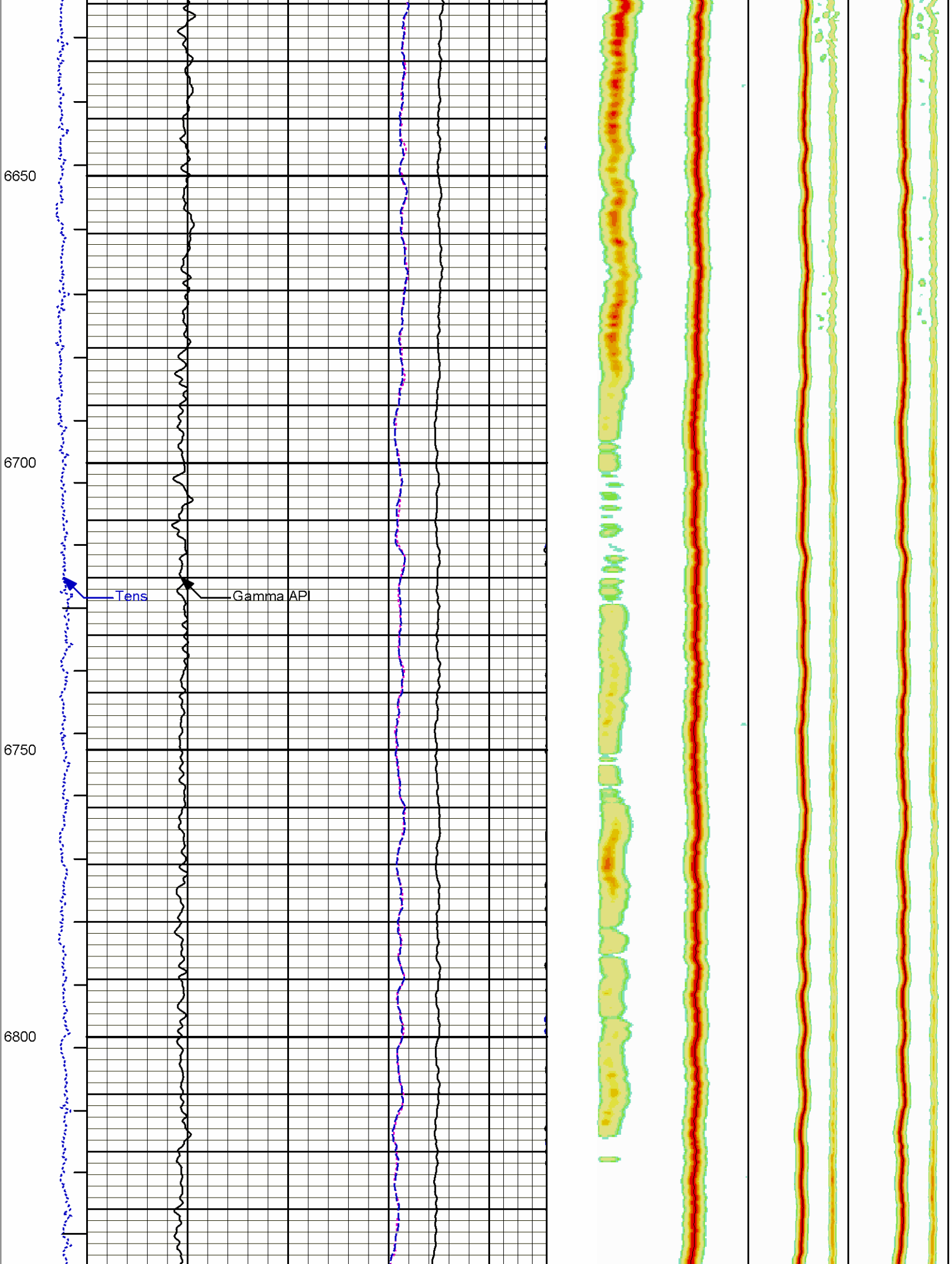


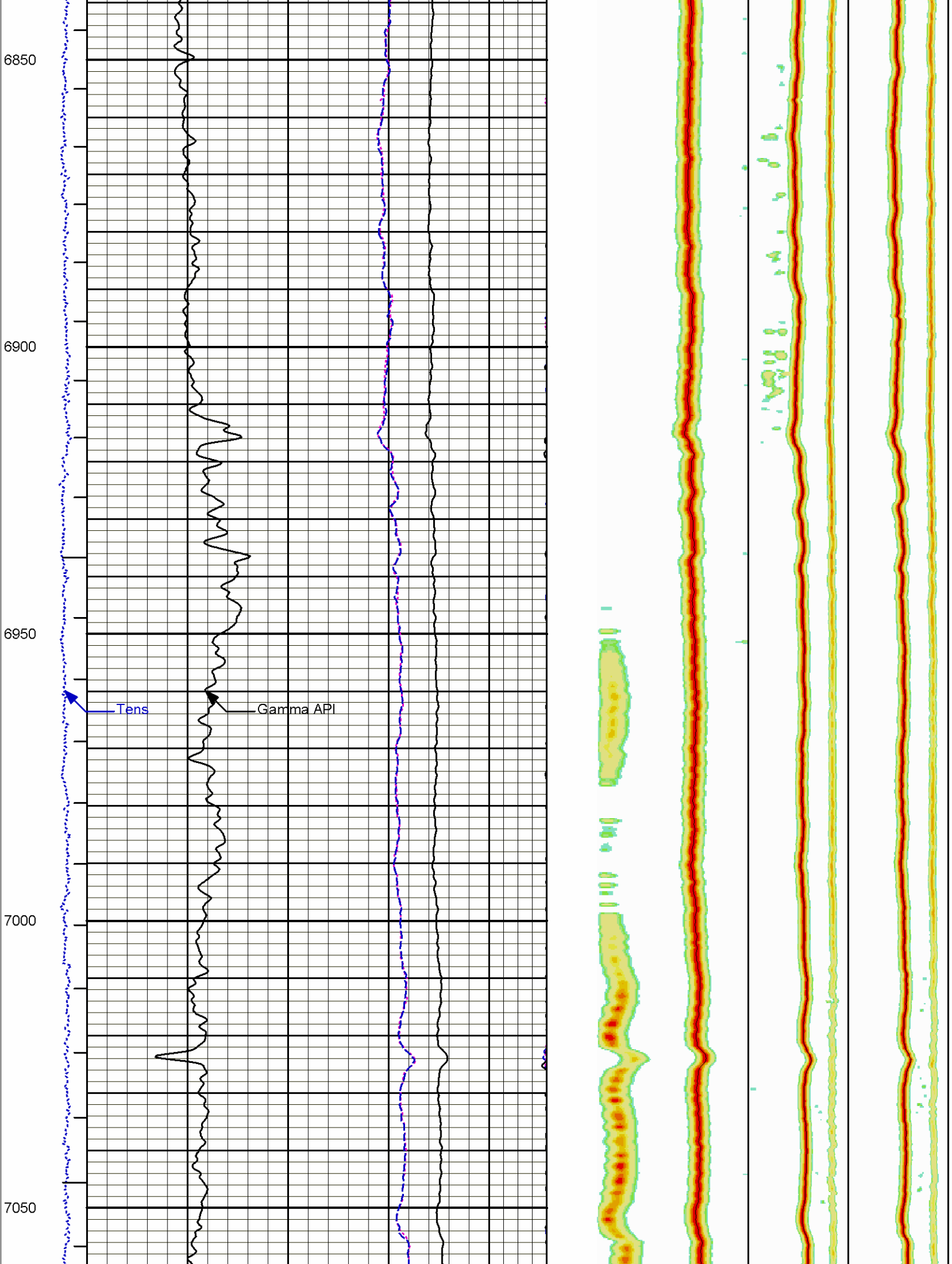


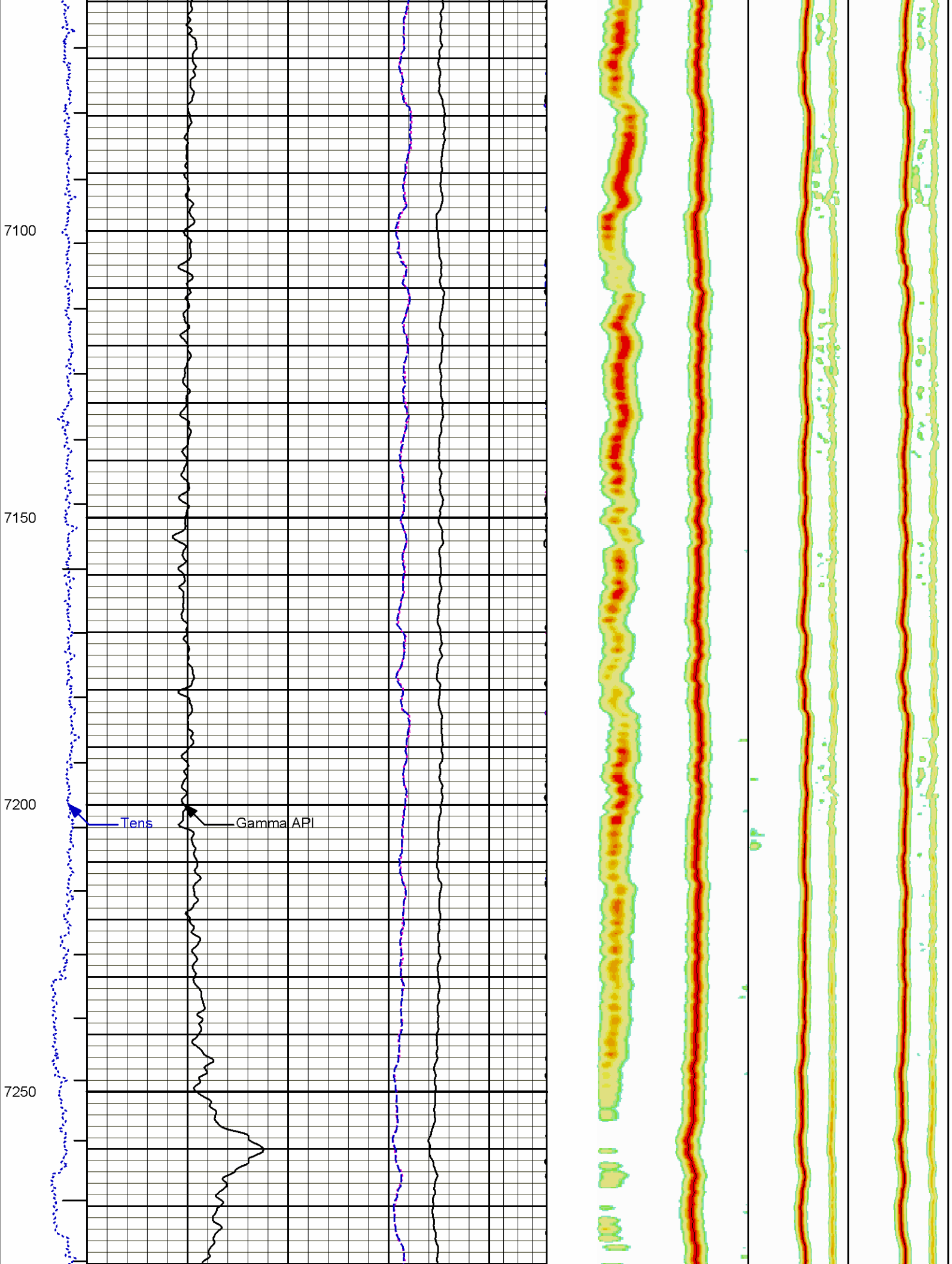


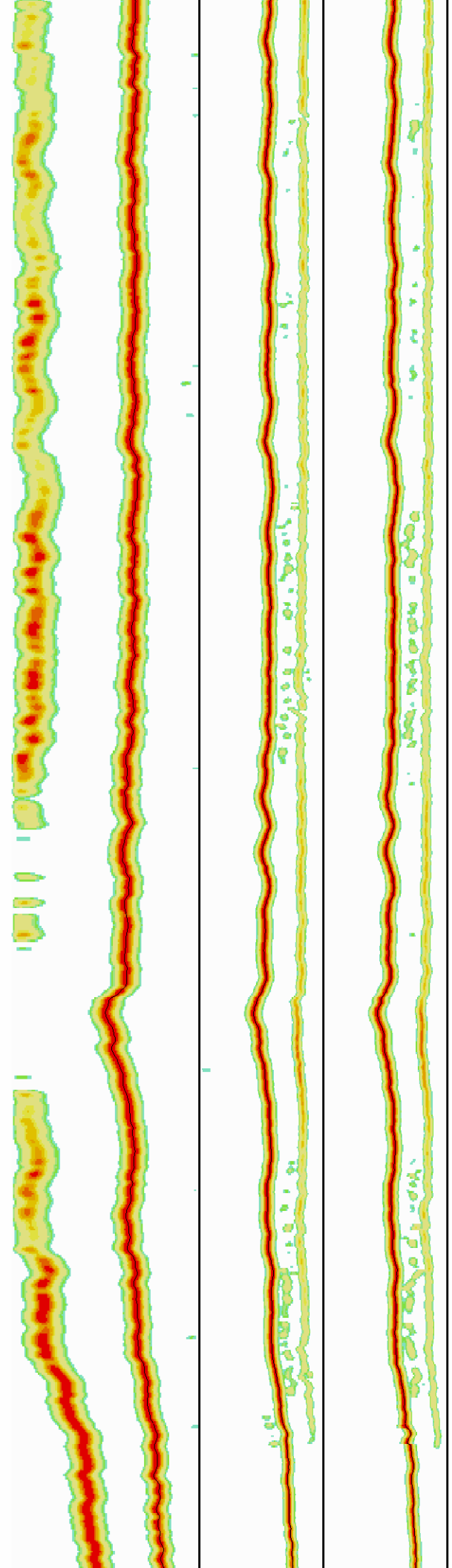
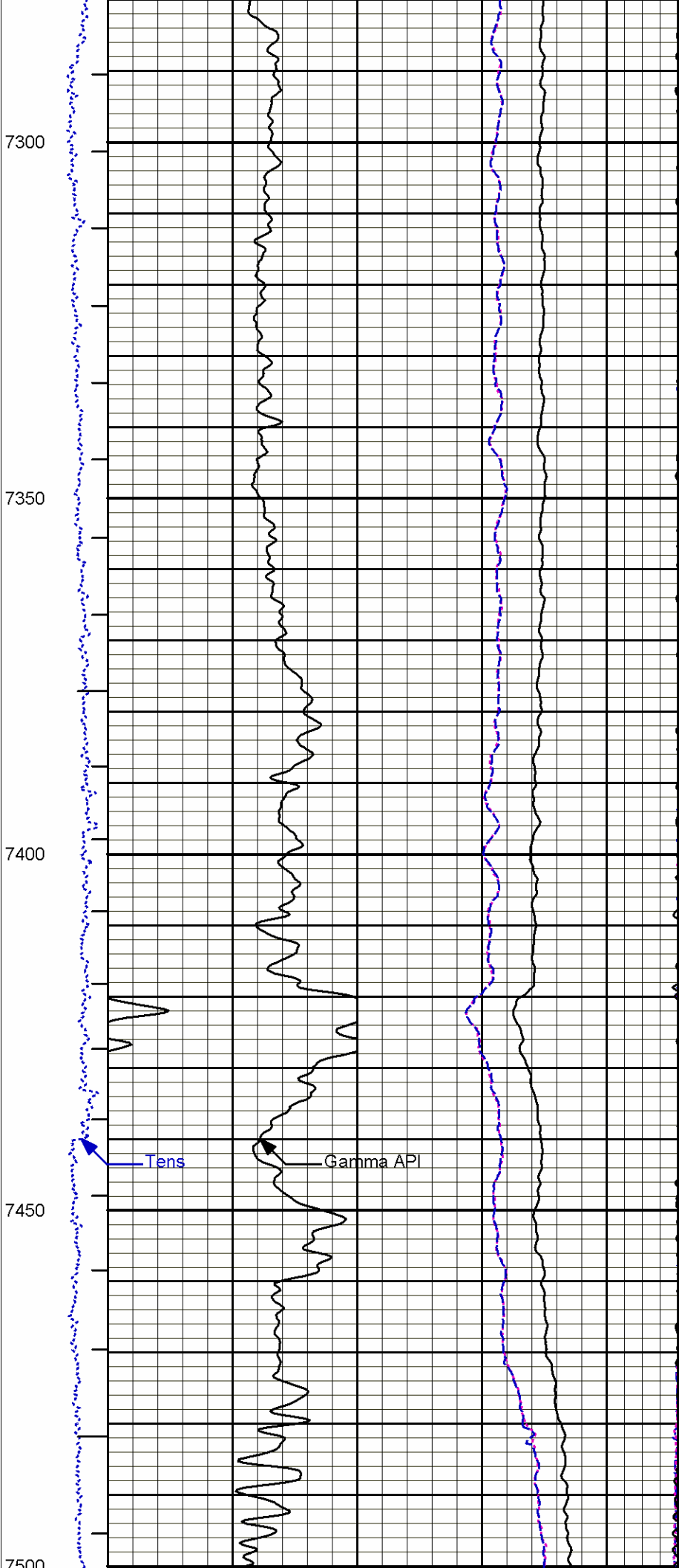


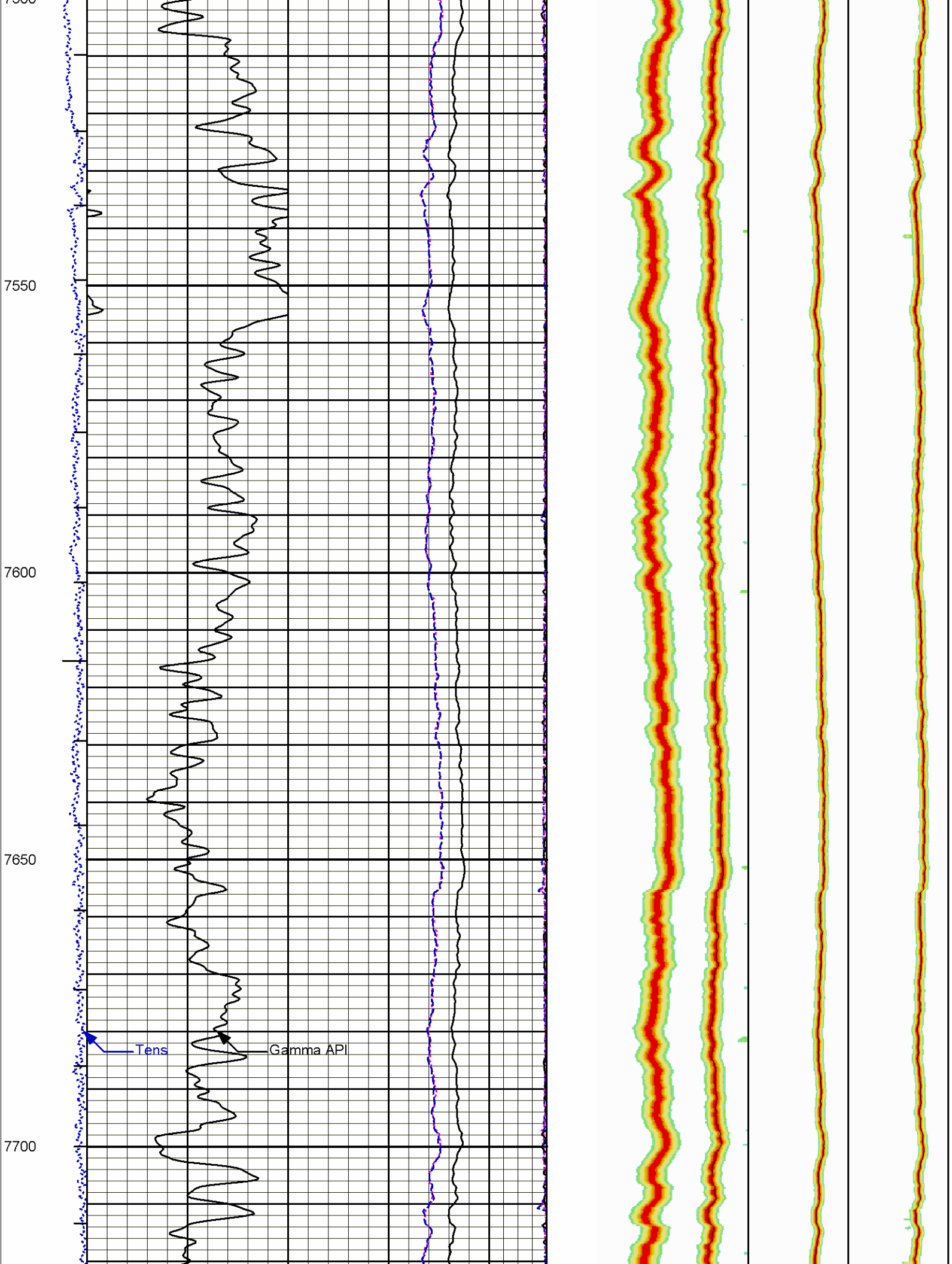


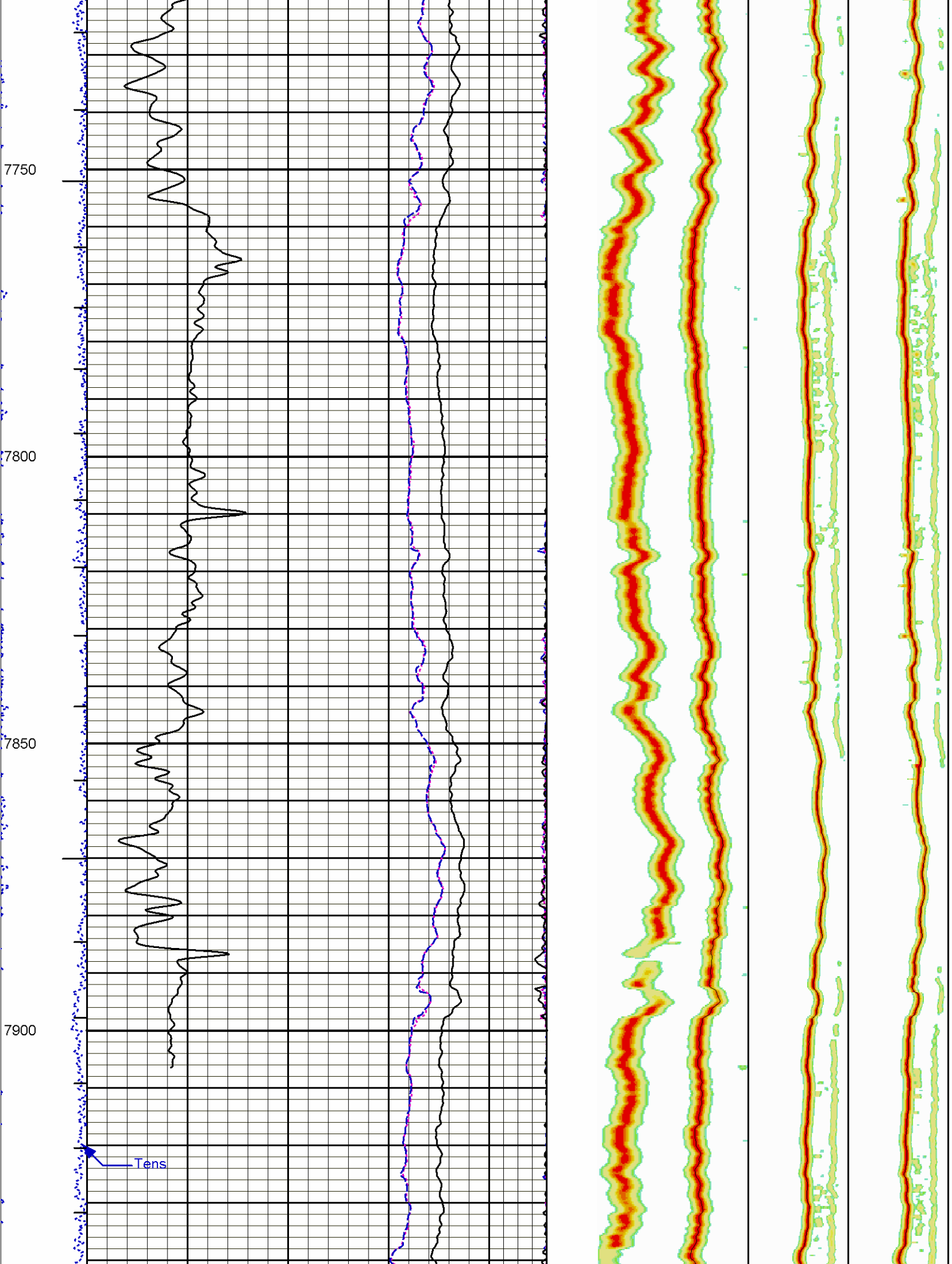


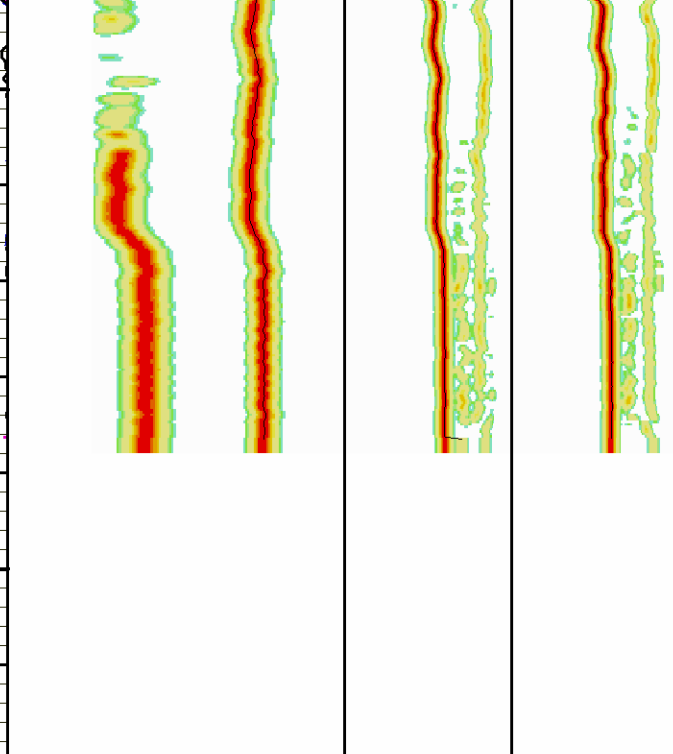
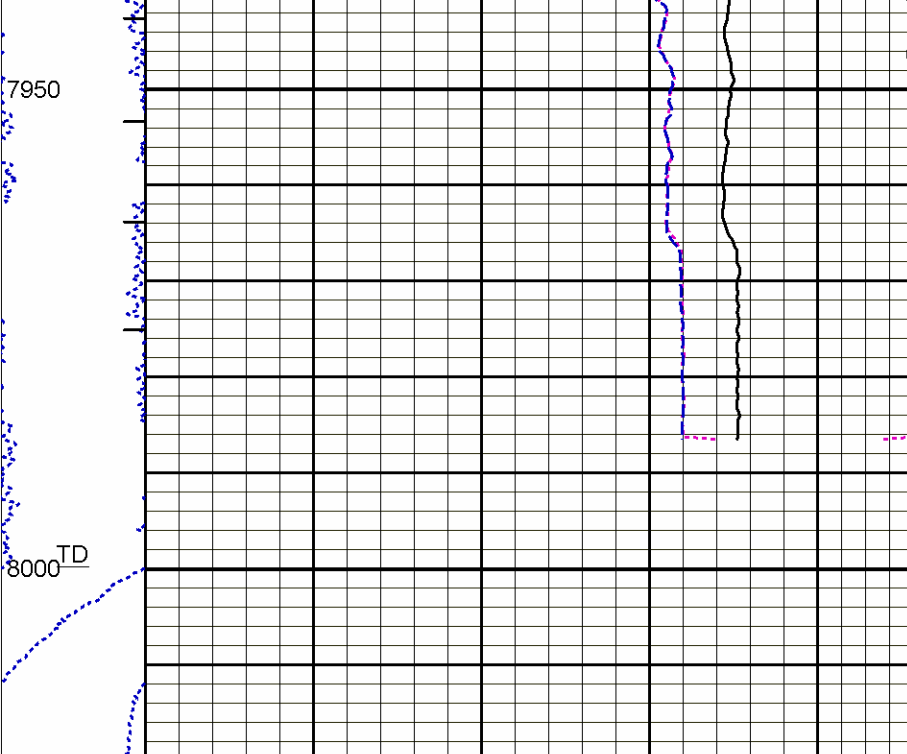












1 : 240	0	Gamma API	200	240	MonoDeltaT 1	40	0MSBP1	240	Mono Semb Vec	40	Dip X Semb Wave	50	Dip Y Semb Wave	50
		api			microsec per ft									
1K Tens 3K pounds				350	DipXDeltaT 1	50	0XSBP1	240	MonoDeltaT	40	350DipXDeltaT50	350DipYDeltaT50	350DipYDeltaT50	350DipYDeltaT50
					microsec per ft				microsec per ft		microsec per ft	microsec per ft	microsec per ft	microsec per ft
ITTTTotal				350	DipYDeltaT 1	50	0YSBP1							
					microsec per ft									

HALLIBURTON Plot Time: 12-Jul-13 18:34:05
 Plot Range: 1960 ft to 8019.75 ft
 Data: ZUKOWSKI 17-1H\Well Based\WSTT-ACRT\
 Plot File: \\WSTT\WST-I Hard 1-240

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11812883	Reference Calibration Date:	04-Jun-13 10:44:28
Engineer:	J. PINKETT	Calibration Date:	03-Jul-13 12:28:58
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Calibrator Source S/N: TB-289			
Calibrator API Reference:243.00 api			
Equivalent Calibrator API Reference:247.3 api			
Measurement	Measured	Calibrated	Units
Background	73.5	73.3	api
Background + Calibrator	321.3	320.6	api
Calibrator	247.8	247.3	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 11812883	Reference Calibration Date:	03-Jul-13 12:28:58
Engineer:	J. PINKETT	Calibration Date:	10-Jul-13 17:24:13
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Calibrator Source S/N: TB-289
 Calibrator API Reference:243.00 api

Field Verification	Shop	Field	Units
Background	73.3	71.8	api
Background + Calibrator	320.6	317.1	api
Calibrator	247.3	245.3	api

Shop	Field	Difference	Tolerance
247.3	245.3	2.0	+/- 9.00

CSNG-FS SHOP CALIBRATION

Tool Name:	CSNG - 10846351	Reference Calibration Date:	04-Jun-13 11:35:17
Engineer:	J. PINKETT	Calibration Date:	03-Jul-13 13:45:32
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1
Source SN:	TB-289		

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.7	23.8	Channel #
583 KEV Peak Channel #	53.1	53.6	Channel #
2614 KEV Peak Channel #	219.7	220.5	Channel #
Calibrate Temperature	74.2	81.8	degF

Pass/Fail Summary	Centroid
239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 243.00 API

Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1845.8	CPS	337.4	342.0	API
Background	356.4	CPS	61.4	66.0	API

Gamma Ray Gain: 0.93

Expected Gain Range: 0.85 - 1.15

Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name:	CSNG - 10846351	Reference Calibration Date:	03-Jul-13 13:45:32
Engineer:	J. SCHMIDT	Calibration Date:	10-Jul-13 17:34:05
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.8	23.6	Channel #
583 KEV Peak Channel #	53.6	52.7	Channel #
2614 KEV Peak Channel #	220.5	217.1	Channel #
Calibrate Temperature	81.8	97.5	degF

Pass/Fail Summary	Centroid
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Pass/Fail Summary

239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 243.00 API

Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1773.9	CPS	342.0	338.6	API
Background	328.2	CPS	66.0	62.7	API

Gamma Ray Gain: 0.96

Expected Gain Range: 0.85 - 1.15

Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11812167

Reference Calibration Date: 04-Jun-13 11:44:03

Engineer: J. PINKETT

Calibration Date: 03-Jul-13 13:14:28

Software Version: WL INSITE R3.8.4 (Build 5)

Calibration Version: 1

Logging Source S/N: DSN434

Tank Serial Number: 11068236

Reference value assigned to Tank: 53.720

Snow Block S/N: BRIGHTON

Calibration Tank Water Temperature: 65 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.005	1.001	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (dec):	0.2236	0.2224	0.0013	+/- 0.0020
Calibrated Ratio:	10.15	10.11	0.043	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (dec):	0.0744	0.02000 - 0.09000

PASS/FAIL SUMMARY

Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: DSNT - 11812167

Reference Calibration Date: 03-Jul-13 13:14:28

Engineer: J. SCHMIDT

Calibration Date: 10-Jul-13 17:45:57

Software Version: WL INSITE R3.8.4 (Build 5)

Calibration Version: 1

Logging Source S/N: DSN434

Snow Block S/N: BRIGHTON

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0744	0.0850	0.0107	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - 11812177	Reference Calibration Date:	04-Jun-13 15:08:56
Engineer:	J. PINKETT	Calibration Date:	03-Jul-13 14:28:03
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1
Host Tool Name:	DSNT - 11812167		

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3909.07	-3660.76	-7000.00 - -1000.00
Pad Gain	0.0003892	0.0003813	0.000200 - 0.000600
Arm Offset	-4240.54	-4402.43	-5000.00 - 3000.00
Arm Gain	0.0005484	0.0005632	0.000300 - 0.000700
Arm Power	-0.000003727	-0.000004890	-0.000010000 - 0.000010000

The ring diameter is computed from: $\text{DIAMETER} = \text{PAD EXTENSION} + \text{ARM EXTENSION} + \text{TOOL DIAMETER}$

Tool Diameter: 4.50 in

CALIBRATION RINGS

Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	1.94	2.00	0.06	+/- 0.20
Medium Ring (in)	3.73	3.75	0.02	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.45	6.50	0.05	+/- 0.20
Medium Ring (in)	8.17	8.25	0.08	+/- 0.20
Large Ring (in)	14.98	15.00	0.02	+/- 0.20

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
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SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 11812177	Reference Calibration Date:	03-Jul-13 14:28:03
Engineer:	J. SCHMIDT	Calibration Date:	10-Jul-13 17:32:19
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.75	0.00	+/- 0.10
Ring Diameter	8.25	8.29	0.04	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:

Passed

Diameter Check:

Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - 11795867

Reference Calibration Date: 04-Jun-13 12:34:43

Engineer: J. PINKETT

Calibration Date: 03-Jul-13 14:06:34

Software Version: WL INSITE R3.8.4 (Build 5)

Calibration Version: 1

Logging Source S/N: 5471GW

Aluminum Block S/N: 63066

Density: 2.602g/cc

Pe: 3.100

Magnesium Block S/N: 12345

Density: 1.690g/cc

Pe: 2.650

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0527	1.0851	0.90 - 1.10
Near Dens Gain	1.0116	1.0470	0.90 - 1.10
Near Peak Gain	0.9900	1.0318	0.90 - 1.10
Near Lith Gain	0.9513	0.9908	0.90 - 1.10
Far Bar Gain	1.0118	1.0153	0.90 - 1.10
Far Dens Gain	0.9981	1.0018	0.90 - 1.10
Far Peak Gain	0.9911	0.9946	0.90 - 1.10
Far Lith Gain	0.9748	0.9822	0.90 - 1.10
Near Bar Offset	-0.5444	-0.8458	NONE
Near Dens Offset	-0.1479	-0.4663	NONE
Near Peak Offset	0.0436	-0.3118	NONE
Near Lith Offset	0.3424	0.0002	NONE
Far Bar Offset	-0.2155	-0.2435	NONE
Far Dens Offset	-0.0811	-0.1113	NONE
Far Peak Offset	-0.0290	-0.0577	NONE
Far Lith Offset	0.1158	0.0502	NONE
Near Bar Background	833.57	834.39	700 - 1450
Near Dens Background	278.07	276.52	230 - 480
Near Peak Background	121.14	119.68	100 - 210
Near Lith Background	146.92	147.05	125 - 260
Far Bar Background	653.89	651.14	450 - 900
Far Dens Background	255.60	255.84	175 - 345
Far Peak Background	101.21	102.54	70 - 140
Far Lith Background	105.04	103.28	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.686	1.690	0.004	+/- 0.015
Pe	2.582	2.609	0.027	+/- 0.150
ALUMINUM				
Density (g/cc)	2.603	2.602	-0.001	+/- 0.01500
Pe	3.019	3.069	0.050	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector	Far Detector
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	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0009	+/- 0.0110	-0.0002	+/- 0.0140
Magnesium Block	-0.0011	+/- 0.0110	-0.0029	+/- 0.0140
Aluminum Block	0.0000	+/- 0.0110	-0.0003	+/- 0.0140
Resolution	8.46	6.00 - 11.50	8.71	6.00 - 11.50
Internal Verifier(B+D+P+L)	1378	1200 - 2700	1113	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK			
Tool Name:	SDLT Pad - 11795867	Reference Calibration Date:	03-Jul-13 14:06:34
Engineer:	J. SCHMIDT	Calibration Date:	10-Jul-13 17:39:21
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Pad Temperature: 92.9 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1377.635	1376.453	-1.182	14.998
Far (B+D+P+L) cps	1112.797	1115.851	3.054	17.580
Near Resolution	8.46	8.49	0.030	0.50
Far Resolution	8.71	8.88	0.170	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

ICT SHOP CALIBRATION			
Tool Name:	ICT - 11294351	Reference Calibration Date:	12-Jun-13 11:56:52
Engineer:	J. SCHMIDT	Calibration Date:	05-Jul-13 23:34:50
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

CALIPERS AND RINGS			
Ring	Measured	Calibrated	Units
CALIPER 1:			
Small Ring	3.67	3.65	in
Medium Ring	8.00	8.00	in
Large Ring	15.01	15.00	in
X-Large Ring	20.99	21.00	in
CALIPER 2:			
Small Ring	3.71	3.65	in
Medium Ring	8.01	8.00	in
Large Ring	15.12	15.00	in
X-Large Ring	21.06	21.00	in

X-Large Ring				21.00	in
CALIPER 3:					
Small Ring				3.70	3.65 in
Medium Ring				8.02	8.00 in
Large Ring				15.09	15.00 in
X-Large Ring				21.08	21.00 in
CALIPER 4:					
Small Ring				3.75	3.65 in
Medium Ring				8.07	8.00 in
Large Ring				15.11	15.00 in
X-Large Ring				21.02	21.00 in
CALIPER 5:					
Small Ring				3.66	3.65 in
Medium Ring				7.98	8.00 in
Large Ring				14.93	15.00 in
X-Large Ring				21.01	21.00 in
CALIPER 6:					
Small Ring				3.62	3.65 in
Medium Ring				7.96	8.00 in
Large Ring				14.92	15.00 in
X-Large Ring				20.94	21.00 in

ICT FIELD CALIBRATION			
Tool Name:	ICT - 11294351	Reference Calibration Date:	05-Jul-13 23:34:50
Engineer:	J. SCHMIDT	Calibration Date:	10-Jul-13 17:27:07
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

CALIPERS			
Caliper	Shop	Field	Units
Caliper 1	8.00	8.03	in
Caliper 2	8.00	8.03	in
Caliper 3	8.00	8.01	in
Caliper 4	8.00	7.92	in
Caliper 5	8.00	7.90	in
Caliper 6	8.00	8.04	in

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION			
Tool Name:	ACRt Sonde - 11294353	Reference Calibration Date:	02-Jun-13 16:44:14
Engineer:	J. SCHMIDT	Calibration Date:	05-Jul-13 15:38:14
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11302817		

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.02	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A2 (50")	0.95	1.02	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A3 (29")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A4 (17")	0.95	1.02	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.01	1.05	0.95	1.01	1.05
A6 (6")	N/A	N/A	N/A	0.95	1.00	1.05	0.95	1.00	1.05

TYPICAL SONDE OFFSET RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper

	Lower	(mm/m)	Upper	Lower	(mm/m)	Upper	Lower	(mm/m)	Upper
A1 (80")	-5	-1.77	2	-6	-4.96	-2	-8	-5.42	-2
A2 (50")	-7	-1.27	0	-7	-3.07	0	-7	-4.98	0
A3 (29")	-27	-13.13	-9	-9	-3.78	-3	-7	-3.85	-1
A4 (17")	-180	-91.35	-60	-45	-29.41	-15	-39	-25.47	-13
A5 (10")	N/A	N/A	N/A	-150	-100.09	-50	-80	-47.86	-10
A6 (6")	N/A	N/A	N/A	175	350.07	525	90	178.75	270

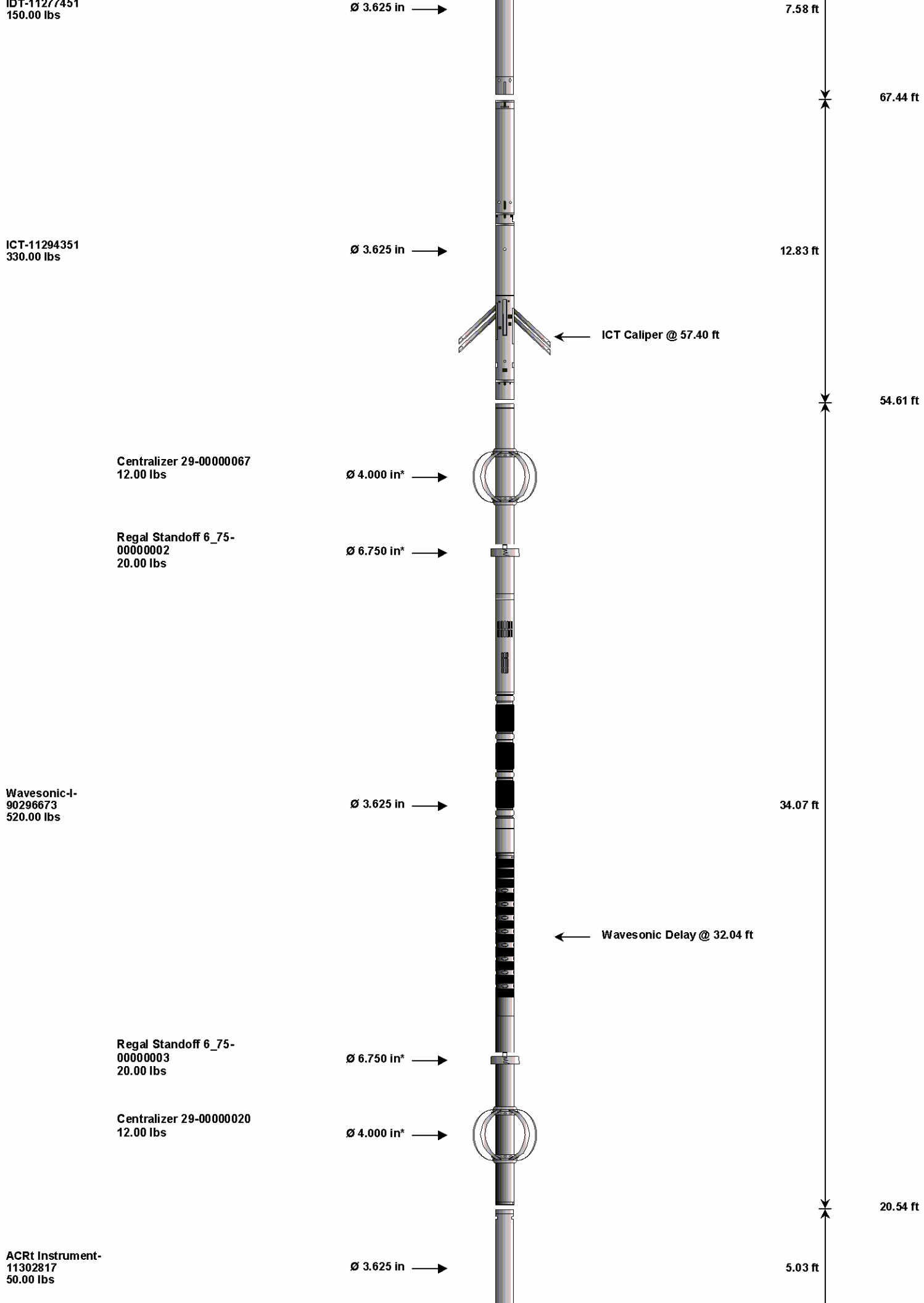
TRANSMITTER CURRENT GAIN					R-MUD VERIFICATION			
Signal	Lower	R	Upper		Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.97	1.3		Mud Cell	0.95	1.00	1.05
36K	1.0	1.85	2.0					
72K	1.0	1.21	2.0					

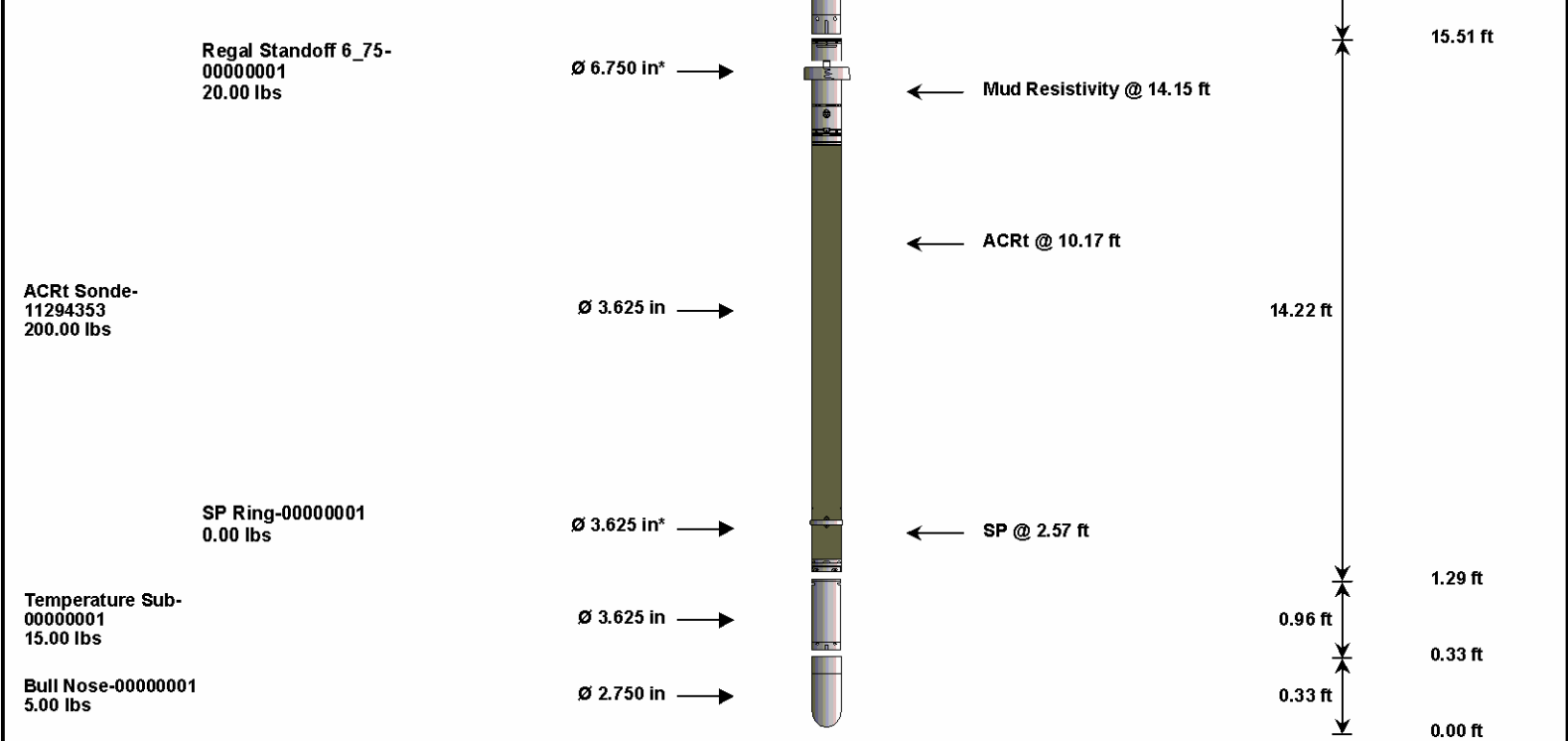
PASS/FAIL SUMMARY	
GAIN RANGE CHK	PASS
SONDE OFFSET RANGE CHK	PASS
Tx CURRENT GAIN	PASS
Rmud VERIFICATION	PASS
TOOL OK TO LOG	

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11812883						
Gamma Ray Calibrator	247.3	245.3	-----	2.0	+/- 9.00	api
CSNG-10846351						
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #
239 KEV Peak Channel #	23.8	23.6	-----	0.2	-----	Channel #
583 KEV Peak Channel #	53.6	52.7	-----	0.9	-----	Channel #
2614 KEV Peak Channel #	220.5	217.1	-----	3.4	-----	Channel #
DSNT-11812167						
Snow-Block Porosity	0.0744	0.0850	-----	-0.0106	+/- 0.0150	decp
SDLT-11812177						
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.29	-----	-0.04	+/-0.15	in
SDLT Pad-11795867						
Near(B+D+P+L)	1377.635	1376.453	-----	1.182	+/-14.998	cps
Far(B+D+P+L)	1112.797	1115.851	-----	-3.054	+/-17.580	cps
ICT-11294351						
Caliper 1	8.00	8.03	-----	-0.03	+/-0.25	in
Caliper 2	8.00	8.03	-----	-0.03	+/-0.25	in
Caliper 3	8.00	8.01	-----	-0.01	+/-0.25	in
Caliper 4	8.00	7.92	-----	0.08	+/-0.25	in
Caliper 5	8.00	7.90	-----	0.10	+/-0.25	in
Caliper 6	8.00	8.04	-----	-0.04	+/-0.25	in
ACRt Sonde-11294353						
Mud Cell	1.00	-----	-----	0.00	-----	ohm-m

HALLIBURTON	
TOOL STRING DIAGRAM REPORT	

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length	
RWCH-10409638 135.00 lbs		Ø 3.625 in →		Load Cell @ 120.75 ft BH Temperature @ 120.18 ft	6.25 ft	124.43 ft	
GTET-11812883 165.00 lbs		Ø 3.625 in →		GammaRay @ 112.12 ft	8.52 ft	118.18 ft	
	UnivWearRing3.6-00000001 5.00 lbs	Ø 4.200 in* →					109.66 ft
CSNG-10846351 114.00 lbs	UnivWearRing3.6-00000003 5.00 lbs	Ø 4.200 in* → Ø 3.625 in →		CSNG @ 104.04 ft	8.17 ft	101.50 ft	
DSNT-11812167 174.00 lbs	DSN Decentralizer-00000001 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		DSN Far @ 94.56 ft DSN Near @ 93.81 ft	9.69 ft	91.81 ft	
	UnivWearRing3.6-00000002 5.00 lbs	Ø 4.200 in* →					81.00 ft
SDLT-11812177 360.00 lbs	SDLT Pad-11795867 65.00 lbs	Ø 4.500 in → Ø 4.750 in* →		SDL Caliper @ 83.81 ft SDL @ 83.80 ft	10.81 ft	75.03 ft	
Flex Joint - Pressure Comp-11208102 140.00 lbs		Ø 3.625 in →			5.97 ft		





Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	10409638	135.00	6.25	118.18	300.00
GTET	Gamma Telemetry Tool	11812883	165.00	8.52	109.66	60.00
UWR3P6	Universal Wear Ring 3 5-8 inch	00000001	5.00	0.35	* 109.97	300.00
CSNG	Compensated Spectral Natural Gamma	10846351	114.00	8.17	101.50	15.00
UWR3P6	Universal Wear Ring 3 5-8 inch	00000003	5.00	0.35	* 105.58	300.00
DSNT	Dual Spaced Neutron	11812167	174.00	9.69	91.81	60.00
UWR3P6	Universal Wear Ring 3 5-8 inch	00000002	5.00	0.35	* 92.06	300.00
DCNT	DSN Decentralizer	00000001	6.60	5.13	* 95.14	300.00
SDLT	Spectral Density Tool	11812177	360.00	10.81	81.00	60.00
SDLP	Density Insite Pad	11795867	65.00	2.55	* 83.21	60.00
FLEX	Flex Joint - Pressure Compensated	11208102	140.00	5.97	75.03	300.00
IDT	Insite Directional Tool	11277451	150.00	7.58	67.44	30.00
ICT	Six Independent Arm Caliper	11294351	330.00	12.83	54.61	30.00
WSTT	WaveSonic Insite	90296673	520.00	34.07	20.54	30.00
RSOF	Regal Standoff 6.75in	00000003	20.00	0.52	* 26.56	300.00
OBCEN	Centralizer - 29 in.Overbody	00000020	12.00	2.42	* 22.45	300.00
RSOF	Regal Standoff 6.75in	00000002	20.00	0.52	* 48.02	300.00
OBCEN	Centralizer - 29 in.Overbody	00000067	12.00	2.42	* 50.27	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11302817	50.00	5.03	15.51	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11294353	200.00	14.22	1.29	300.00
SP	SP Ring	00000001	0.00	0.25	* 2.57	300.00
RSOF	Regal Standoff 6.75in	00000001	20.00	0.52	* 14.43	300.00
TMAX	Temperature Sub - 3_625 OD	00000001	15.00	0.96	0.33	300.00
BLNS	Bull Nose	00000001	5.00	0.33	0.00	300.00

Total	2,528.60	124.43	* Not included in Total Length and Length Accumulation.			
Data: ZUKOWSKI 17-1H\0001 TRIPLE_CSNG_IDT ICT_WSTT_TEMP SUB\IDLE						Date: 11-Jul-13 17:24:32

COMPANY	CONOCO PHILLIPS COMPANY					
WELL	ZUKOWSKI 17-1P					
FIELD	WILDCAT					
COUNTY	ARAPAHOE	STATE	CO			

HALLIBURTON

WAVESONIC