UNDERGROUND INJECTION CONTROL
PERMIT APPLICATION

Ute Tribal # 31-12
1999' FSL & 748' FWL
Sec. 31, T5S-R3W
Duchesne County, Utah
API # 43-013-32038

July 2015

Prepared for:
Bruce Suchomel
Groundwater Program, Mail Code 8P-W-UIC
U.S. Environmental Protection Agency
1595 Wynkoop St
Denver, CO 80202-1129

Prepared by:
Petroglyph Energy, INC.
960 Broadway Avenue, Suite 500, P.O. Box 70019
Boise, Idaho 83707
(208) 685-7600
FAX (208) 685-7605

LIST OF ATTACHMENTS

Attachment No. 1	Area Topography Map
Attachment No. 2	Site Map
Attachment No. 3	Map of the A-Marker surface
Attachment No. 4	Cross-Sections of the injection formation
Attachment No. 5	Water Analysis
Attachment No. 6	Completion data for all wells in the AOR
Attachment No. 7	CBL for the UIC well
Attachment No. 8	Open hole log for the UIC well
Attachment No. 9	List of owners and Affidavit Notification
Attachment No. 10	Well bore diagrams for the UIC well
Attachment No. 11	P&A procedure
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Attachment No. 13	Surety Bond letter

SUMMARY DOCUMENT
UIC WELL APPLICATION
Ute Tribal 31-12
API # 43-013-32038

The following document contains information provided in support of the application for the conversion of the Ute Tribal 31-12 well to an injection well in the Green River formation in the Antelope Creek Field in Duchesne County, Utah.

The Antelope Creek Field falls within the Uintah and Ouray Indian reservations and is within Indian Country; therefore, for facilities located on the reservation, only EPA-issued UIC permits are necessary for compliance with UIC regulations.

The EPA has issued an Area Permit #UT20736-00000 for the Underground Injection Control for the Antelope Creek Field. This area permit allows for additional producing wells to be converted to injection wells for enhanced recovery.

(1) Petroglyph Energy, Inc. (Petroglyph) is the operator and only working interest owner of wells located in the Antelope creek Field, Duchesne County, Utah. Petroglyph's business address is provided below:

Petroglyph Energy, Inc.
960 Broadway Avenue, Suite 500
P.O. Box 70019
Boise, ID 83707

(2) Enclosed as Attachment No. 1 is a topographic map of a portion of the Antelope Creek Field, identifying all wells located in this area. The legal location for the Ute Tribal 31-12 is 1999' FSL & 748' FWL NW/SW Sec. 31, T5S-R3W.

(3) Attachment No. 2 is a map of the well. This map shows a circle with a ¼ mile radius centered on the Ute Tribal 31-12 well. The ¼ mile radius encompasses the area of review, AOR, within which Petroglyph is required to investigate all wells for mechanical integrity. The ¼ mile radius also identifies mineral ownership; those lands, and the the owners thereof, which must be provided notice of this application. The AOR has Ute Tribal 31-05 well(s) located in its ¼ mile radius.

(4) Petroglyph proposes to utilize the Ute Tribal 31-12 as an injection well for enhanced recovery in the Antelope Creek Field.

(5) Injection Zone – The injection intervals are between 3390' and 5352' True Vertical Depth and located in the lower portion of the Green River Formation. The injection zone is confined within a 1962' section between the Green River "A" Lime marker bed and the top of the Basal Carbonate in the lower part of the formation. The injection zone is composed of lenticular calcareous sandstones interbedded with low permeable carbonates and calcareous shales. The lenticular sandstones vary in thickness from 1 to 30 feet.

Confining Zone – The overall confining strata above the injection zone consists of impermeable Green River calcareous shales and continuous beds of microcrystalline dolostone. The confining zone in the Ute Tribal 31-12 is 226 feet thick.

Attachment No. 3 is a structure map of the A-Marker surface.

Attachment No. 4 is a cross-section of the injection interval and confining zone.

(6) Enclosed as Attachment No. 5 are standard analyses of produced water from three batteries that currently serve as central handling facilities for all project producing wells. The analysis of the Green River formation water from the Ute Tribal 18-08 Satellite Battery is 12805 mg/L of total dissolved solids (TDS), Ute Tribal 21-11 Satellite Battery is 15659 mg/L TDS, and Ute Tribal 34-12-D3 Satellite Battery is 14590 mg/L TDS.

Injectate in the field is a mixture of produced water and fresh make-up water. The nearest injection well is the Ute Tribal 19-13, the most recent analysis of the water being injected into the Green River formation at this location is 7342 mg/L TDS. This analysis is also included in Attachment No. 5.

(7) A summary of completion data from the Ute Tribal 31-12 and offset wells in the AOR are included in Attachment No. 6

(8) The cement bond log is included in Attachment No. 7.

(9) The open hole log for the Ute Tribal 31-12 is included in Attachment No. 8.

(10) The Antelope Creek Field is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy. At the Ute Tribal 31-12 location, all mineral owners, surface owners and operators located within the AOR ¼ mile radius have been notified of the submitted EPA application to convert to injection. Attachment No. 9 is the Affidavit of Notification to all owners.

(11) Petroglyph requests a maximum surface injection pressure of **1695**psi. The EPA Area Permit No. UT20736-00000 uses the formula:

Pm = (0.88psi/ft - 0.43psi/ft(Sg)) D

Where:
Pm = Maximum surface injection pressure
0.88psi/ft = Fracture gradient
D = Top perforation depth
0.43psi/ft = Hydrostatic pressure/hydraulic head
Sg = Specific gravity of injection fluid

For the Ute Tribal 31-12:
1695psi = (0.88psi/ft - 0.43(1.00)) 3767ft

(12) Three wellbore diagrams for the Ute Tribal 31-12 are in Attachment No. 10. One diagram is for production, one for injection, and one for Plug & Abandonment (P&A).

(13) The P&A procedure for this well is shown in Attachment No. 11.

(14) Once the draft permit is issued, Petroglyph will conduct a Mechanical Integrity Test and a static bottom-hole pressure test. The MIT procedure is contained in Attachment No. 12. The conversion work will be satisfactorily completed and submitted to the EPA on Form 7520-12. A wellbore schematic will be included with this form.

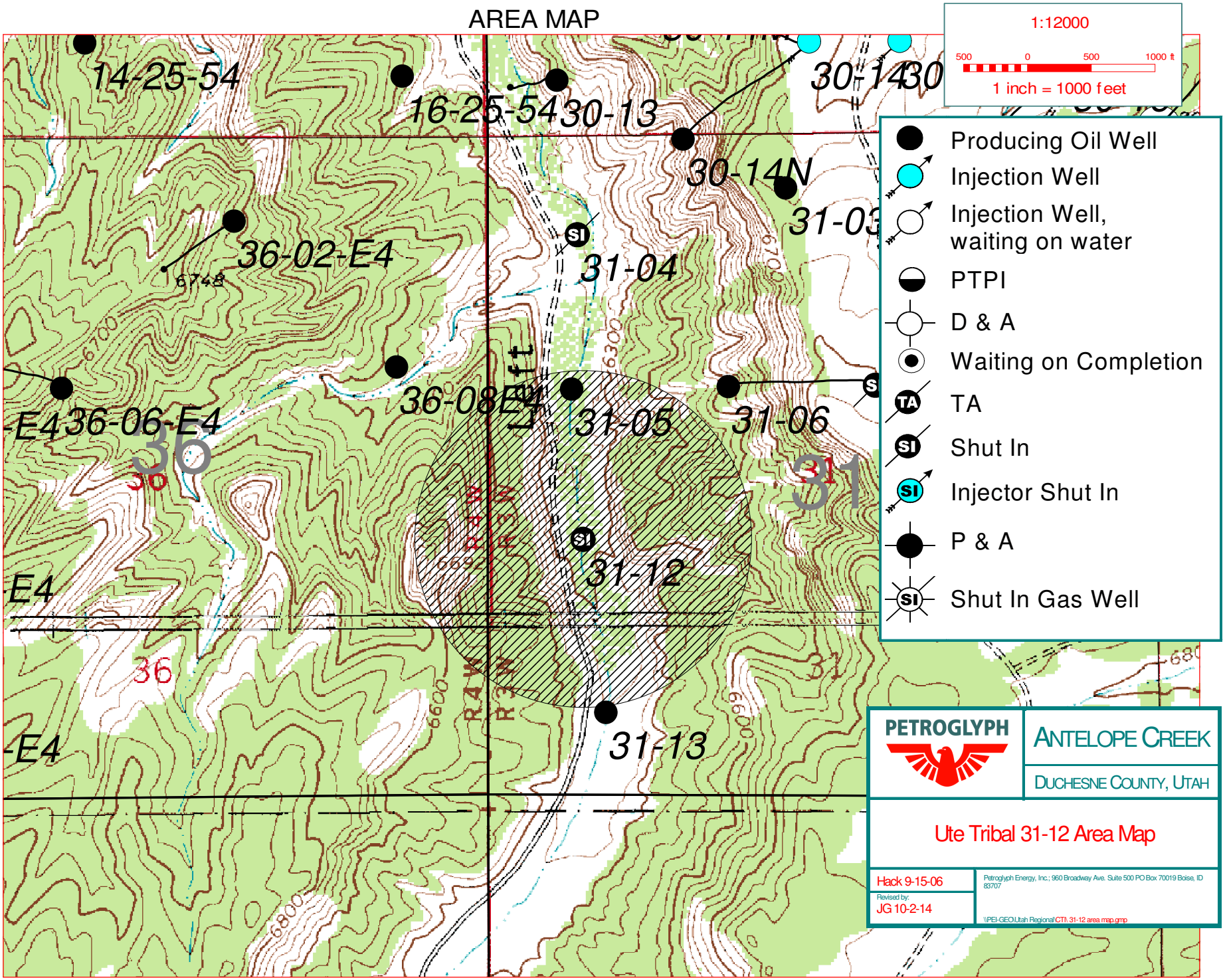
(15) Petroglyph will give proof of financial responsibility by posting a surety bond for the UIC well prior to final permit approval. A copy of this letter is contained in Attachment No. 13.

(16) Petroglyph will install various gauges on the well so that the injection pressure and tubing/casing annulus pressure can be monitored. The well will be equipped with a flow meter with a cumulative volume recorder.

ATTACHMENT NO. 1

AREA MAP

ATTACHMENT NO. 1:
AREA MAP



ATTACHMENT NO. 2

SITE MAP

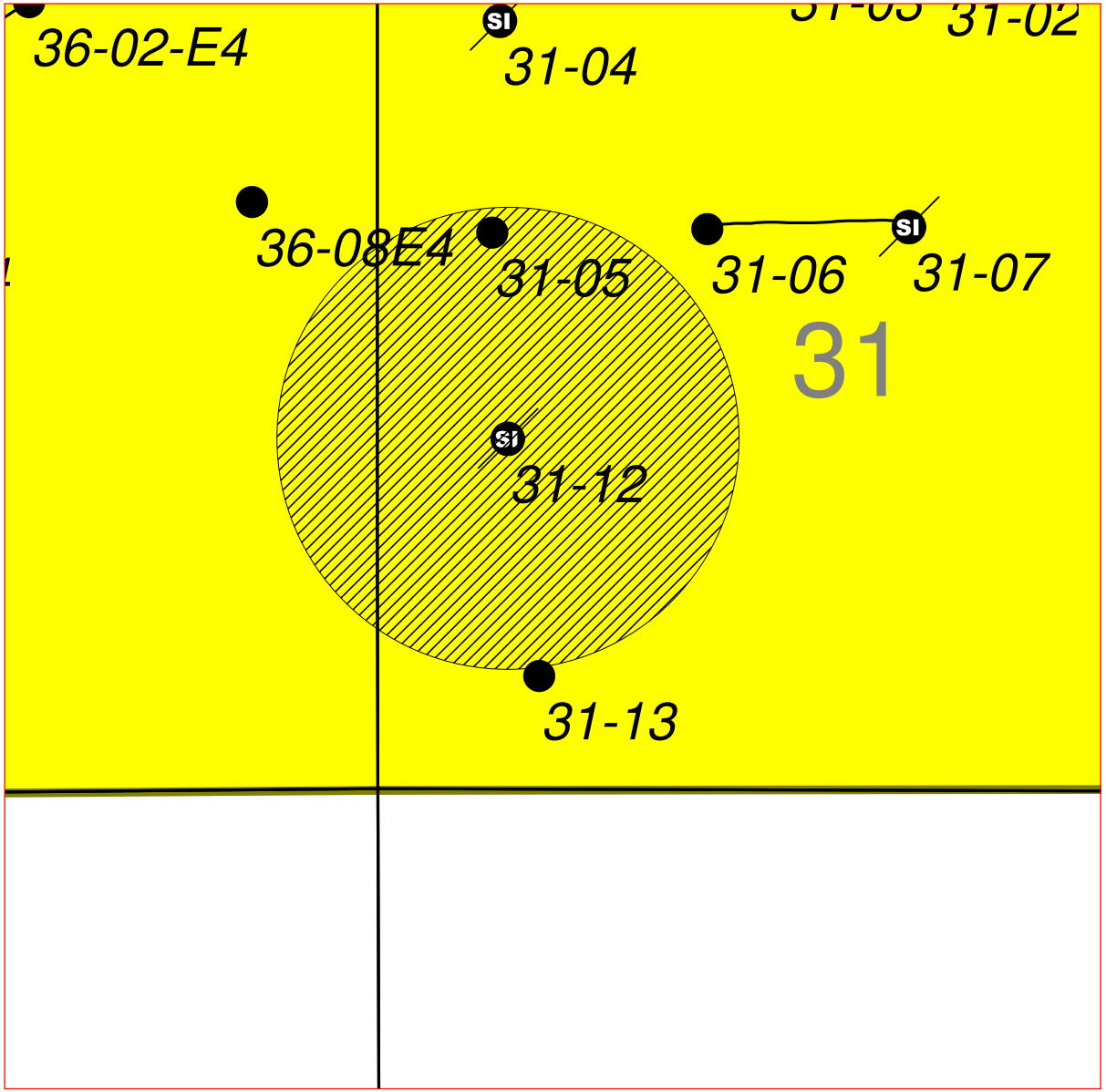
RADIUS MAP OF ADJACENT WELLS

ATTACHMENT NO. 2:
SITE MAP

1:12000

500 0 500 1000 ft

1 inch = 1000 feet



- Producing Oil Well
- Injection Well
- Injection Well, waiting on water
- PTPI
- D & A
- Waiting on Completion
- TA
- Shut In
- Injector Shut In
- P & A
- Shut In Gas Well

PETROGLYPH

ANTELOPE CREEK

DUCHESNE COUNTY, UTAH

Ute Tribal 31-12 Plat and Quarter-mile radius map. Ute Indian lands under Petroglyph lease shown in yellow

Hack 9-15-06

Revised by:
JG 9-3-14

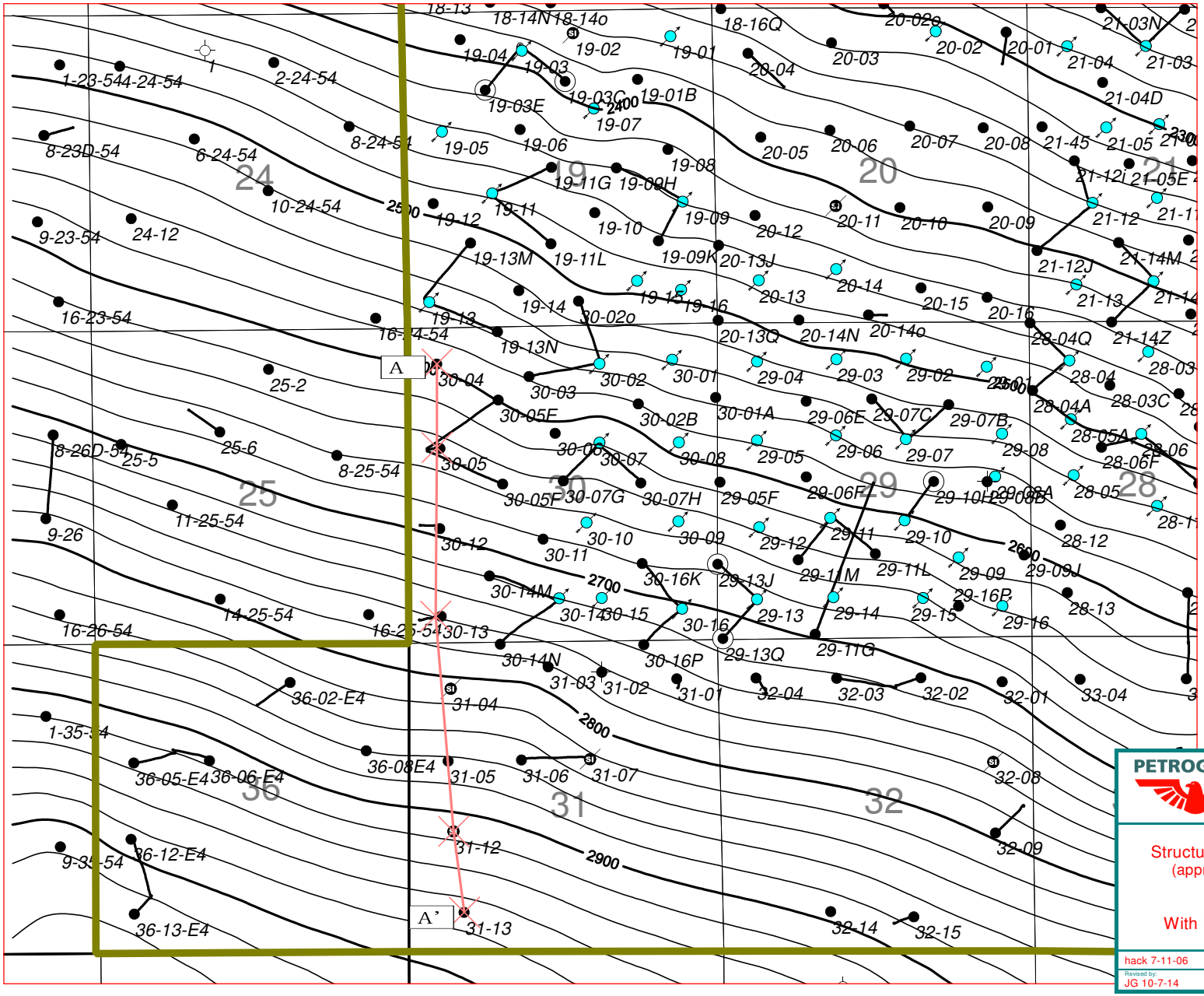
Petroglyph Energy, Inc.; 960 Broadway Ave. Suite 500 PO Box 70019 Boise, ID 83707

\\PEI-GEO\Utah Regional\CTI\ 31-12 quarter mile map.gmp

ATTACHMENT NO. 3

MAP OF THE A-LIME MARKER SURFACE

ATTACHMENT NO. 3:
Map of the "A" Lime Marker



1:30000

1000 0 1000 2000 ft

1 inch = 2500 feet

- Producing Oil Well
- Injection Well
- Injection Well, waiting on water
- PTPI
- D & A
- Waiting on Completion
- TA
- Shut In
- Injector Shut In
- P & A
- Shut In Gas Well

PETROGLYPH

ANTELOPE CREEK

DUCHESNE COUNTY, UTAH

Structure Map of the "A" Lime Marker
(approximate top of Injection Zone)
in the Vicinity of the
Ute Tribal 31-12
With Line of Cross Section A to A'

hack 7-11-06

Revised by:
JG 10-7-14

Petroglyph Energy, Inc.; 555 S. Cole Rd., Boise, ID 83709

\\SERV\Geo\Utah Regional\CTI\31-12 structure map.gmp

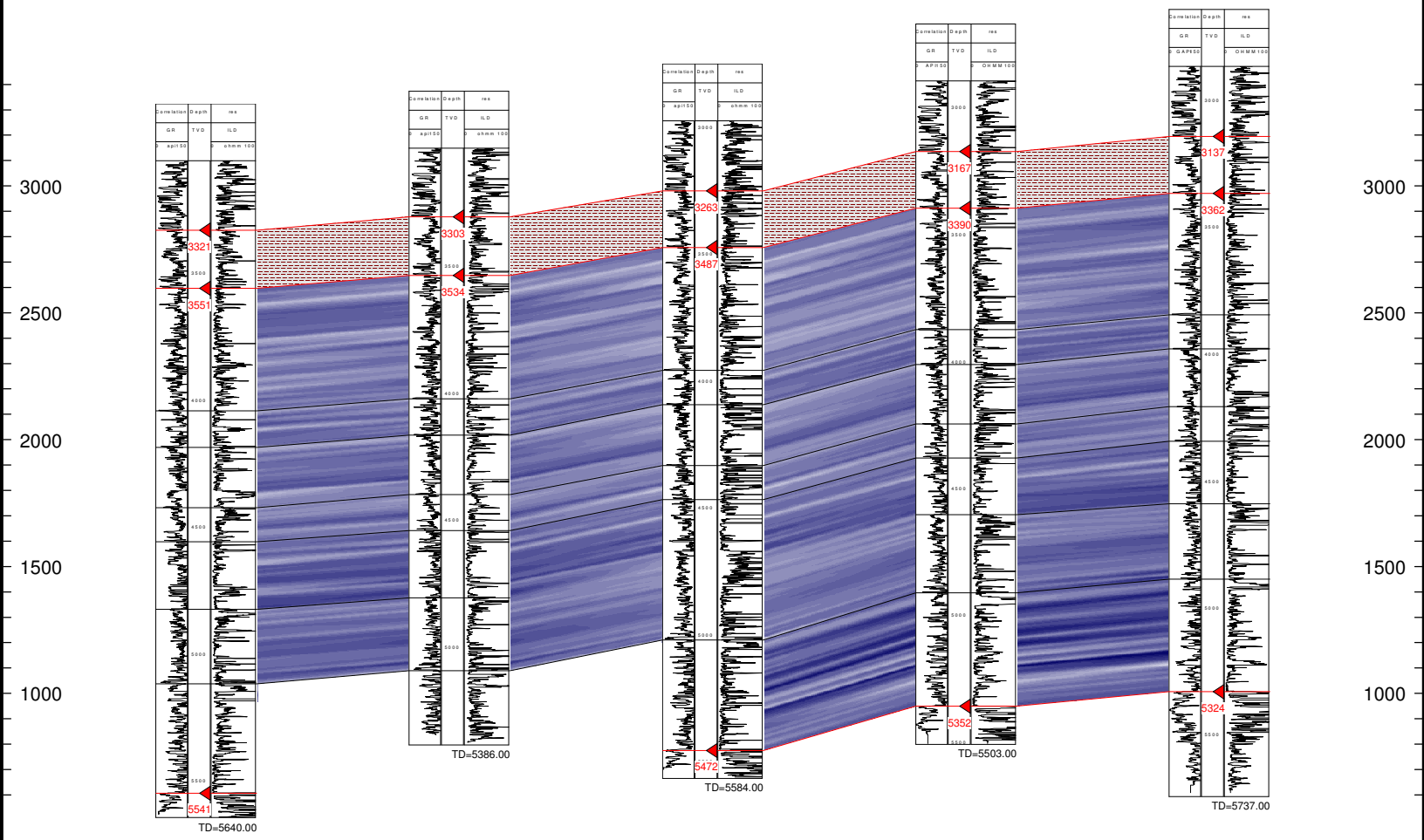
ATTACHMENT NO. 4

CROSS SECTIONS OF THE INJECTION FORMATION

Structural Cross Section A to A' in the Vicinity of Ute Tribal 31-12

43013340550000 — 1400 ft — 43013509350000 — 2825 ft — 43013340540000 — 3617 ft — 43013320380000 — 1368 ft — 43013320390000

43013340550000	43013509350000	43013340540000	43013320380000	43013320390000
PETROGLYPH OPERATING COMPANY INC	PETROGLYPH OPERATING COMPANY	PETROGLYPH OPERATING COMPANY INC	PETROGLYPH OPERATING COMPANY INC	PETROGLYPH OPERATING COMPANY INC
Ute Tribal 30-04	UTE TRIBAL 30-05	UTE TRIBAL 30-13	Ute Tribal 31-12	Ute Tribal 31-13
606 FNL 526 FWL	2042 FNL 353 FWL	390 FSL 183 FWL	1999 FSL 748 FWL	644 FSL 929 FWL
TWP: 5S - Range: 3W - Sec. 30	TWP: 5 S - Range: 3 W - Sec. 30	TWP: 5 S - Range: 3 W - Sec. 30	TWP: 5 S - Range: 3 W - Sec. 31	TWP: 5 S - Range: 3 W - Sec. 31



ATTACHMENT NO. 5

WATER ANALYSIS

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem
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Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 18-08 SATELLITE, DUCHESN**	Lab Tech:	**Gary Winegar**
Sample Point:	**PLANT DISCHARGE COMPLETE**		
Sample Date:	**4/21/2015**		
Sample ID:	**WA-307075**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0061
pH:	8.50
Calculated TDS (mg/L):	12805.08
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	4541.75	Chloride (Cl):	6000.00
Potassium (K):	41.78	Sulfate (SO_4):	163.00
Magnesium (Mg):	28.63	Bicarbonate (HCO_3):	1952.00
Calcium (Ca):	67.44	Carbonate (CO_3):	
Strontium (Sr):	5.41	Acetic Acid (CH_3COO)	
Barium (Ba):	0.90	Propionic Acid (C_2H_5COO)	
Iron (Fe):	2.74	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	1.29	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.05	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.09	Silica (SiO_2):	

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.91	56.41	0.09	0.09	0.00	0.00	2.59	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.87	56.05	0.13	0.14	0.00	0.00	2.54	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	1.83	55.66	0.19	0.19	0.00	0.00	2.49	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	1.80	55.27	0.26	0.24	0.00	0.00	2.44	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	1.77	54.86	0.33	0.29	0.00	0.00	2.38	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	1.74	54.46	0.42	0.33	0.00	0.00	2.32	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	1.72	54.08	0.52	0.38	0.00	0.00	2.26	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	1.71	53.72	0.64	0.41	0.00	0.00	2.20	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	1.69	53.39	0.77	0.45	0.00	0.00	2.14	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	1.69	53.56	0.92	0.47	0.00	0.00	2.08	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	1.19	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Multi-Chem Analytical Laboratory
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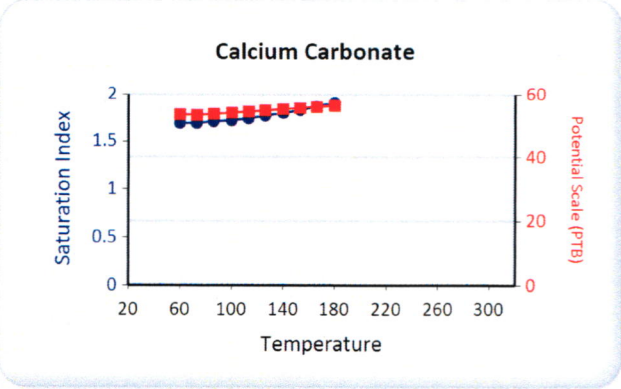
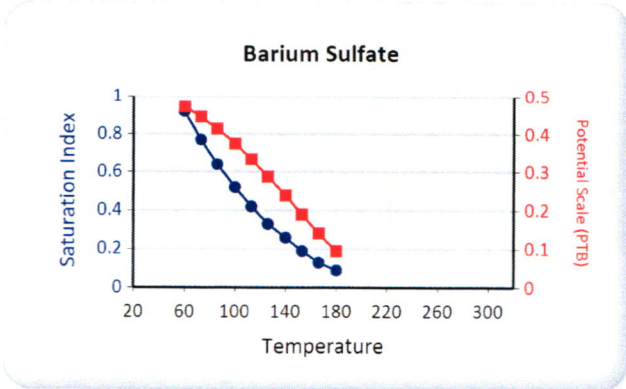
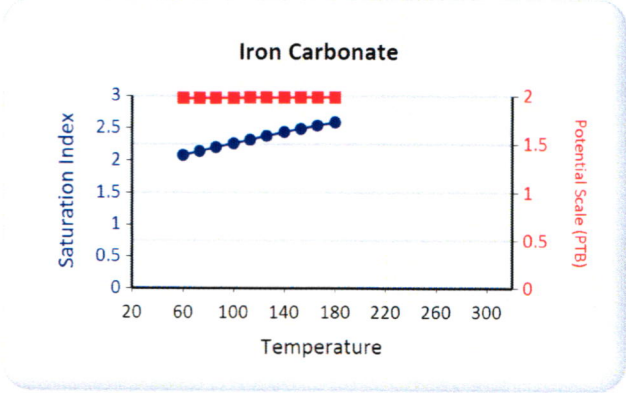
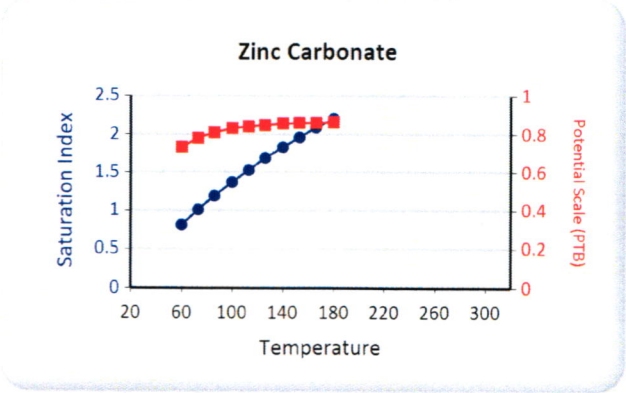
Water Analysis Report









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Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 21-11 SATELLITE, DUCHESN**	Lab Tech:	**Gary Winegar**
Sample Point:	**PLANT DISCHARGE COMPLETE**		
Sample Date:	**4/21/2015**		
Sample ID:	**WA-307071**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0081
pH:	8.70
Calculated TDS (mg/L):	15659.01
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	35.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	5585.76	Chloride (Cl):	7000.00
Potassium (K):	55.43	Sulfate (SO_4):	277.00
Magnesium (Mg):	10.62	Bicarbonate (HCO_3):	2684.00
Calcium (Ca):	30.52	Carbonate (CO_3):	
Strontium (Sr):	6.47	Acetic Acid (CH_3COO)	
Barium (Ba):	1.02	Propionic Acid (C_2H_5COO)	
Iron (Fe):	1.09	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	6.88	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.08	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.14	Silica (SiO_2):	

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.81	26.18	0.28	0.29	3.60	0.60	2.44	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.37	3.59
166	1779	1.77	26.13	0.33	0.32	3.61	0.60	2.40	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.52	3.59
153	1558	1.74	26.09	0.39	0.36	3.63	0.60	2.35	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.68	3.59
140	1338	1.71	26.05	0.45	0.39	3.67	0.60	2.30	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.86	3.59
126	1117	1.69	26.00	0.53	0.43	3.72	0.60	2.25	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.05	3.59
113	897	1.67	25.97	0.62	0.46	3.79	0.60	2.20	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.27	3.59
100	676	1.65	25.93	0.72	0.49	3.87	0.60	2.14	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.50	3.59
86	455	1.63	25.91	0.84	0.52	3.97	0.60	2.08	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.76	3.59
73	235	1.62	25.88	0.97	0.54	4.09	0.60	2.02	0.79	0.00	0.00	0.00	0.00	0.00	0.00	13.04	3.59
60	14	1.62	25.87	1.12	0.56	4.23	0.60	1.96	0.79	0.00	0.00	0.00	0.00	0.00	0.00	13.34	3.59

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	3.15	4.62	10.72	0.03	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	3.04	4.62	10.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	2.92	4.62	11.24	0.03	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	2.79	4.62	11.54	0.03	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	2.65	4.62	11.86	0.03	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	2.50	4.61	12.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	2.34	4.61	12.60	0.03	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	2.17	4.60	13.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	1.99	4.58	13.46	0.03	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.00	1.79	4.55	13.95	0.03	0.00	0.00	0.00	0.00	0.00	0.00

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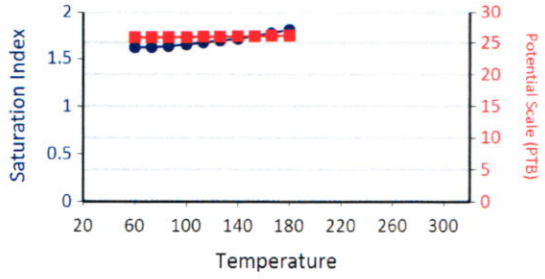
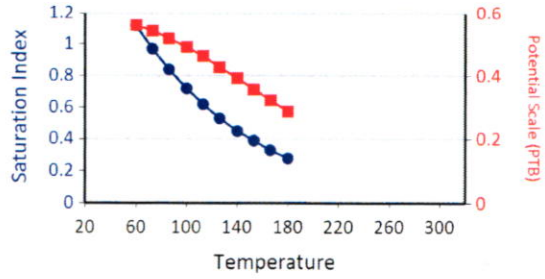
Water Analysis Report

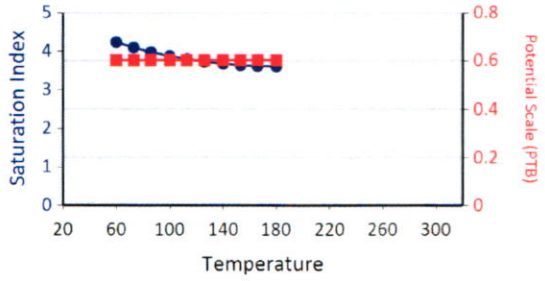
Calcium Carbonate



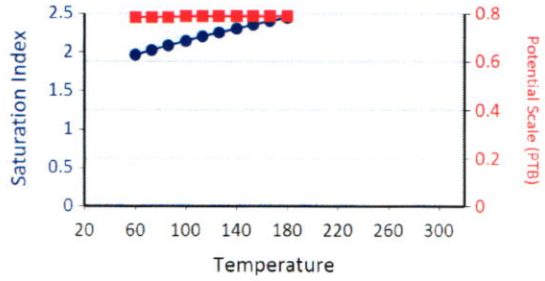
Barium Sulfate



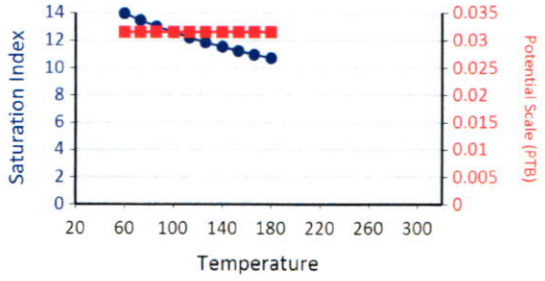
Iron Sulfide



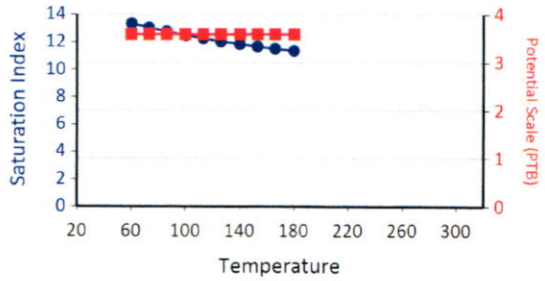
Iron Carbonate



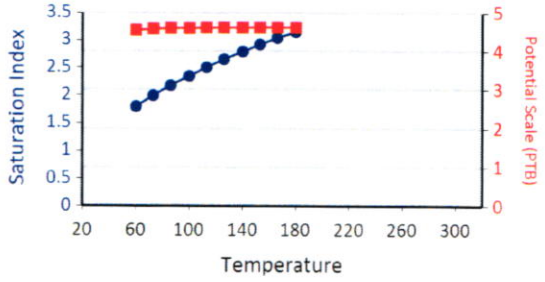
Lead Sulfide



Zinc Sulfide



Zinc Carbonate



Multi-Chem Analytical Laboratory
1553 East Highway 40
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Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 34-12D3 SATELLITE, DUCHE**	Lab Tech:	**Gary Winegar**
Sample Point:	**PLANT DISCHARGE**		
Sample Date:	**4/21/2015**		
Sample ID:	**WA-307067**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0073
pH:	8.50
Calculated TDS (mg/L):	14589.98
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00

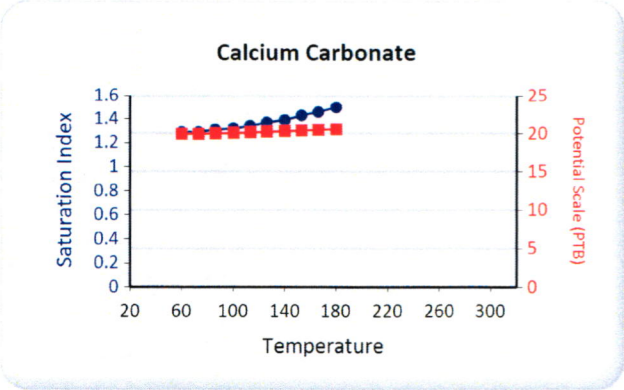
Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	5277.36	Chloride (Cl):	7000.00
Potassium (K):	65.03	Sulfate (SO_4):	0.00
Magnesium (Mg):	7.80	Bicarbonate (HCO_3):	2196.00
Calcium (Ca):	24.60	Carbonate (CO_3):	
Strontium (Sr):	5.20	Acetic Acid (CH_3COO)	
Barium (Ba):	12.37	Propionic Acid (C_2H_5COO)	
Iron (Fe):	0.34	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	1.16	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.04	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.08	Silica (SiO_2):	

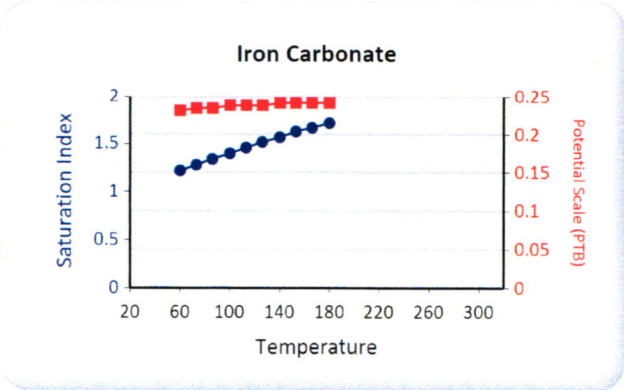
Notes:

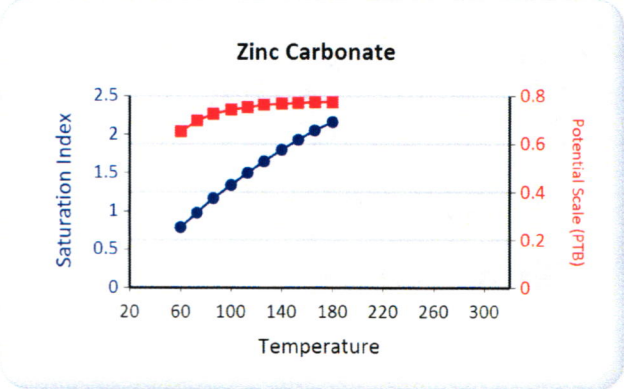
(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.50	20.58	0.00	0.00	0.00	0.00	1.72	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.46	20.48	0.00	0.00	0.00	0.00	1.67	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	1.43	20.39	0.00	0.00	0.00	0.00	1.63	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	1.39	20.30	0.00	0.00	0.00	0.00	1.57	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	1.37	20.21	0.00	0.00	0.00	0.00	1.52	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	1.34	20.13	0.00	0.00	0.00	0.00	1.46	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	1.32	20.05	0.00	0.00	0.00	0.00	1.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	1.31	19.99	0.00	0.00	0.00	0.00	1.34	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	1.29	19.93	0.00	0.00	0.00	0.00	1.28	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	1.29	19.93	0.00	0.00	0.00	0.00	1.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	2.05	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00


Calcium Carbonate
Saturation Index
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
25
20
15
10
5
0
Potential Scale (PTB)
20 60 100 140 180 220 260 300
Temperature


Iron Carbonate
Saturation Index
2
1.5
1
0.5
0
0.25
0.2
0.15
0.1
0.05
0
Potential Scale (PTB)
20 60 100 140 180 220 260 300
Temperature


Zinc Carbonate
Saturation Index
2.5
2
1.5
1
0.5
0
0.8
0.6
0.4
0.2
0
Potential Scale (PTB)
20 60 100 140 180 220 260 300
Temperature

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Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 19-13 INJ, DUCHESNE**	Lab Tech:	**Gary Winegar**
Sample Point:	**WELLHEAD**		
Sample Date:	**1/7/2015**		
Sample ID:	**WA-297434**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	1/14/2015
System Temperature 1 (°F):	160
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	80
System Pressure 2 (psig):	15
Calculated Density (g/ml):	1.0020
pH:	8.10
Calculated TDS (mg/L):	7341.89
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	5.00

Analysis @ Properties in Sample Specifics			
Cations	***mg/L***	***Anions***	***mg/L***
Sodium (Na):	1955.67	Chloride (Cl):	4000.00
Potassium (K):	33.86	Sulfate (SO_4):	141.00
Magnesium (Mg):	43.17	Bicarbonate (HCO_3):	1048.00
Calcium (Ca):	78.01	Carbonate (CO_3):	
Strontium (Sr):	5.06	Acetic Acid (CH_3COO)	
Barium (Ba):	4.37	Propionic Acid (C_2H_5COO)	
Iron (Fe):	5.10	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	0.58	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.00	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.09	Silica (SiO_2):	26.98

Notes:
B=3.97 Al=.03 Li=1.18

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	**PSI**	**SI**	**PTB**	SI	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**
80.00	14.00	1.26	44.14	1.57	2.53	3.33	2.81	1.91	3.66	0.00	0.00	0.00	0.00	0.00	0.00	10.56	0.30
88.00	157.00	1.24	42.24	1.49	2.52	3.23	2.81	1.92	3.66	0.00	0.00	0.00	0.00	0.00	0.00	10.35	0.30
97.00	300.00	1.26	43.30	1.41	2.50	3.17	2.81	1.97	3.66	0.00	0.00	0.00	0.00	0.00	0.00	10.20	0.30
106.00	443.00	1.29	44.44	1.34	2.48	3.13	2.81	2.02	3.67	0.00	0.00	0.00	0.00	0.00	0.00	10.05	0.30
115.00	585.00	1.31	45.64	1.28	2.46	3.09	2.81	2.07	3.67	0.00	0.00	0.00	0.00	0.00	0.00	9.91	0.30
124.00	728.00	1.34	46.88	1.22	2.44	3.06	2.81	2.12	3.68	0.00	0.00	0.00	0.00	0.00	0.00	9.78	0.30
133.00	871.00	1.37	48.16	1.17	2.42	3.04	2.81	2.17	3.68	0.00	0.00	0.00	0.00	0.00	0.00	9.66	0.30
142.00	1014.00	1.40	49.46	1.12	2.40	3.02	2.80	2.22	3.68	0.00	0.00	0.00	0.00	0.00	0.00	9.55	0.30
151.00	1157.00	1.43	50.78	1.08	2.38	3.01	2.80	2.27	3.68	0.00	0.00	0.00	0.00	0.00	0.00	9.45	0.30
160.00	1300.00	1.46	52.09	1.04	2.36	3.01	2.80	2.31	3.69	0.00	0.00	0.00	0.00	0.00	0.00	9.35	0.30

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	**PSI**	**SI**	**PTB**	SI	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**	**SI**	**PTB**
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.19	0.00	0.00	0.78	3.45	0.07	0.45	6.57	3.92
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.23	0.00	0.00	0.94	3.87	0.12	0.64	6.57	3.91
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.27	0.00	0.00	1.34	5.61	0.34	1.60	6.81	3.92
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.30	0.00	0.00	1.75	7.48	0.56	2.61	7.06	3.93
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.32	0.00	0.00	2.17	9.51	0.79	3.68	7.33	3.94
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.34	0.00	0.00	2.58	11.68	1.03	4.79	7.60	3.94
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.35	0.00	0.00	3.01	14.00	1.26	5.96	7.88	3.95
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.36	0.00	0.00	3.43	16.43	1.50	7.15	8.17	3.95
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.36	0.00	0.00	3.86	18.94	1.75	8.37	8.46	3.96
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.37	0.00	0.00	4.28	21.45	1.99	9.58	8.76	3.96

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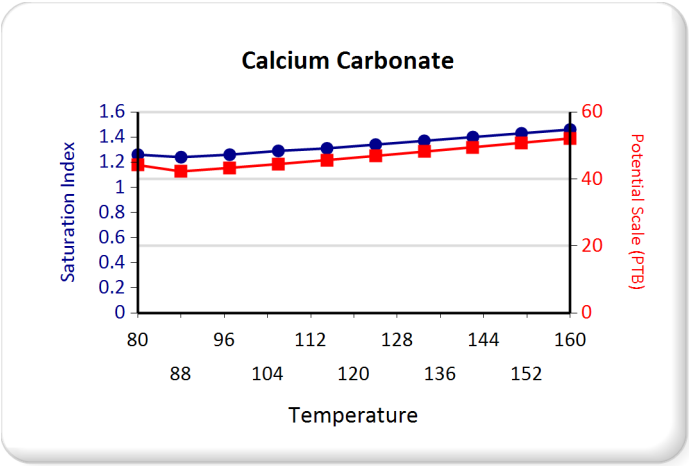
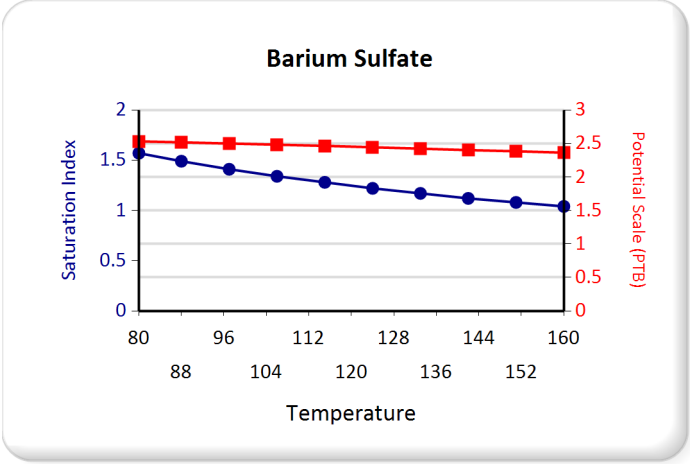
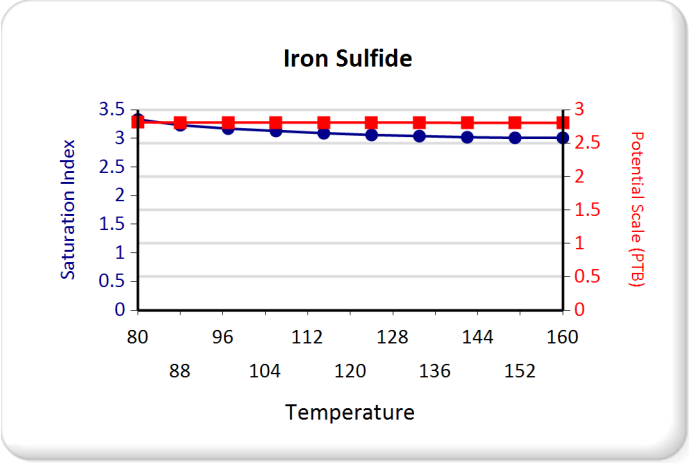
Water Analysis Report

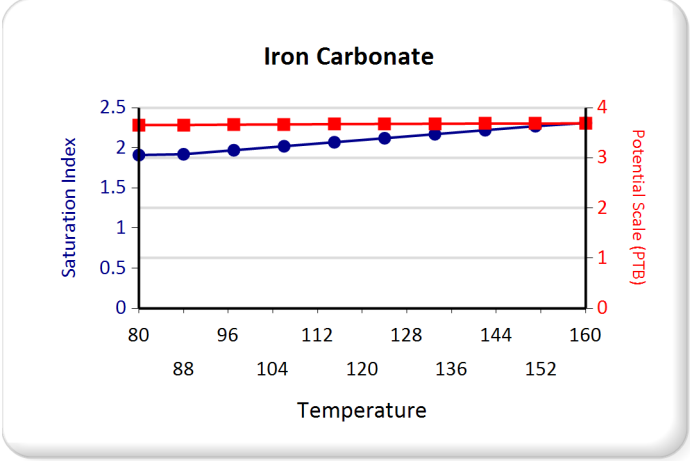
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

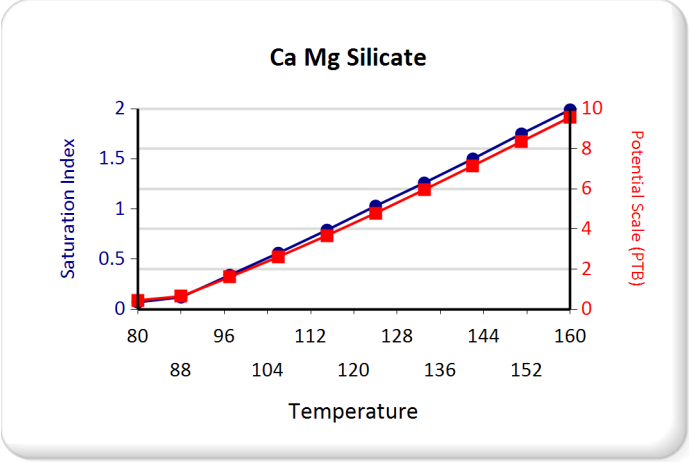
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

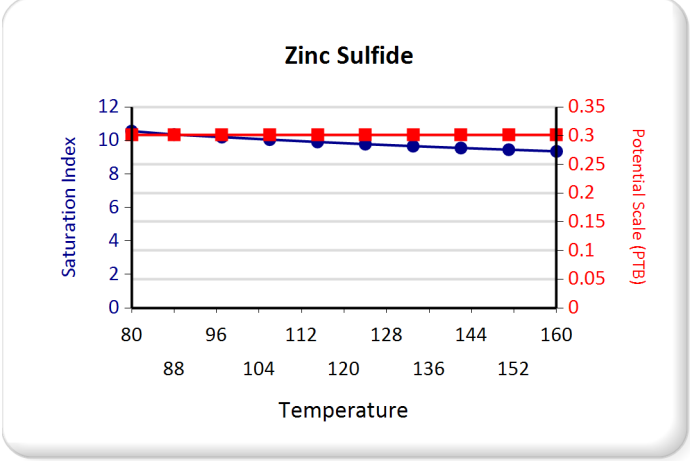


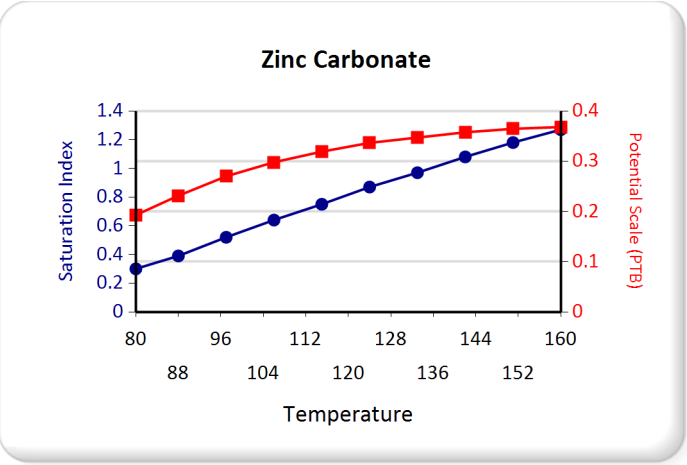


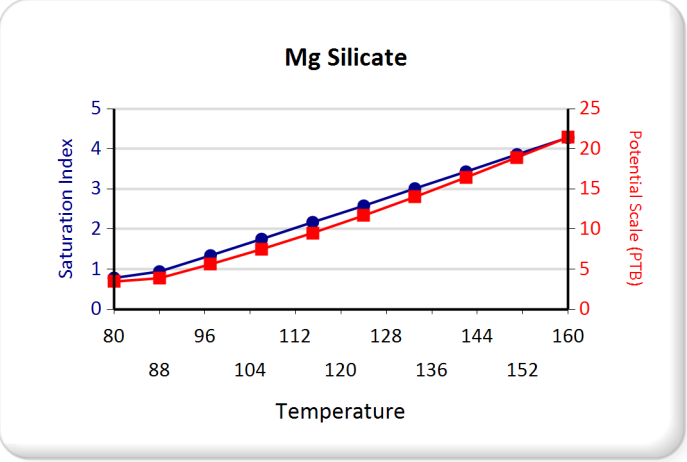


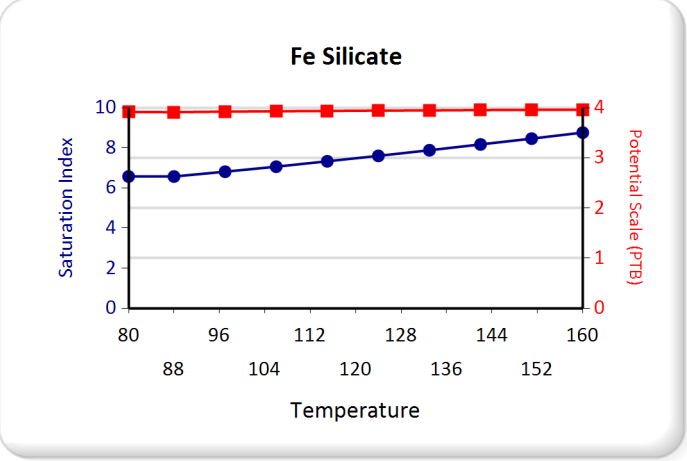







Zinc Carbonate
Saturation Index
Potential Scale (PTB)
Temperature
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.4
0.3
0.2
0.1
0
80
88
96
104
112
120
128
136
144
152
160


Mg Silicate
Saturation Index
Potential Scale (PTB)
Temperature
5
4
3
2
1
0
25
20
15
10
5
0
80
88
96
104
112
120
128
136
144
152
160


Fe Silicate
Saturation Index
Potential Scale (PTB)
Temperature
10
8
6
4
2
0
4
3
2
1
0
80
88
96
104
112
120
128
136
144
152
160

ATTACHMENT NO. 6

COMPLETION DATA FOR ALL WELLS IN THE AOR

Well Completion Data
Ute Tribal 31-12

	Surface Casing				Production Casing			
Well	**Size (inches)**	**Depth (ft KB)**	**Cement Amount (sx)**	**Cement Top**	**Size (inches)**	**Depth (ft KB)**	**Cement Amount (sx)**	**Estimated Cement Top**
Ute Tribal 31-12	**8-5/8**	**371**	**300**	**surface**	**5-1/2**	**5452**	**450**	**1780**
Ute Tribal 31-05	8-5/8	368	300	surface	5-1/2	5483	430	1565

ATTACHMENT NO. 7

CBL FOR THE UIC WELL

COMPANY: **PETROGLYPH OPERATING COMPANY, INC.**

WELL: **UTE TRIBAL 31-12**

FIELD: **ANTELOPE CREEK**

COUNTY: **DUCHESNE** STATE: **UTAH**

Schlumberger

CEMENT BOND LOG WITH GAMMARAY & COLLARS

Field	ANTELOPE CREEK
Location	1999' FSL & 529' FWL
Well	UTE TRIBAL 31-12
Company	PETROGLYPH OPERATING

Permanent Datum	GROUND LEVEL	Elev.	[illegible]
Log Measured From	[illegible]		[illegible]
Drilling Measured From	[illegible]		

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-32033	3	5S	[illegible] W

Logging Date	16-APR-1998
Run Number	[illegible]
Depth Driller	[illegible]
Schlumberger Depth	5974
Bottom Log Interval	[illegible]
Top Log Interval	[illegible]
Casing Driller Size @ Depth	[illegible]
Casing Schlumberger	
Bit Size	[illegible]
Type Fluid in Hole	WATER
Density / Viscosity	[illegible]
Fluid Loss	
Source of Sample	
RM @ Measured Temperature	
RMF @ Measured Temperature	
RMC @ Measured Temperature	
Source: RMF / RMC	
RM @ BHT	[illegible] @ [illegible]
Maximum Recorded Temperature	[illegible]
Circulation Stopped	
Logger On Bottom	[illegible]-1998 [illegible]
Unit Number	[illegible] VERNAL, UTAH
Truck Number	[illegible]
Witnessed By	[illegible]

Logging Unit	
Bulk Density	
Delta Density	
Schlumberger Field Engineer	
Simultaneous Logging	
[illegible]	
[illegible] Depth	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ACCEPTED MEASUREMENTS AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE HARD OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSES OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES 1

OS1

OS2

OS3

OS4

OS5

REMARKS: TICK NUMBER 1

EST CEMENT TOP 1780 [illegible]

[illegible]

MAX TEMP [illegible]

[illegible]

[illegible]

OTHER SERVICES 2

OS1

OS2

OS3

OS4

OS5

REMARKS: TICK NUMBER 2

RUN 1

SERVICE ORDER #

[illegible]

[illegible]

RUN 2

SERVICE ORDER #

[illegible]

[illegible]

EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

[illegible]

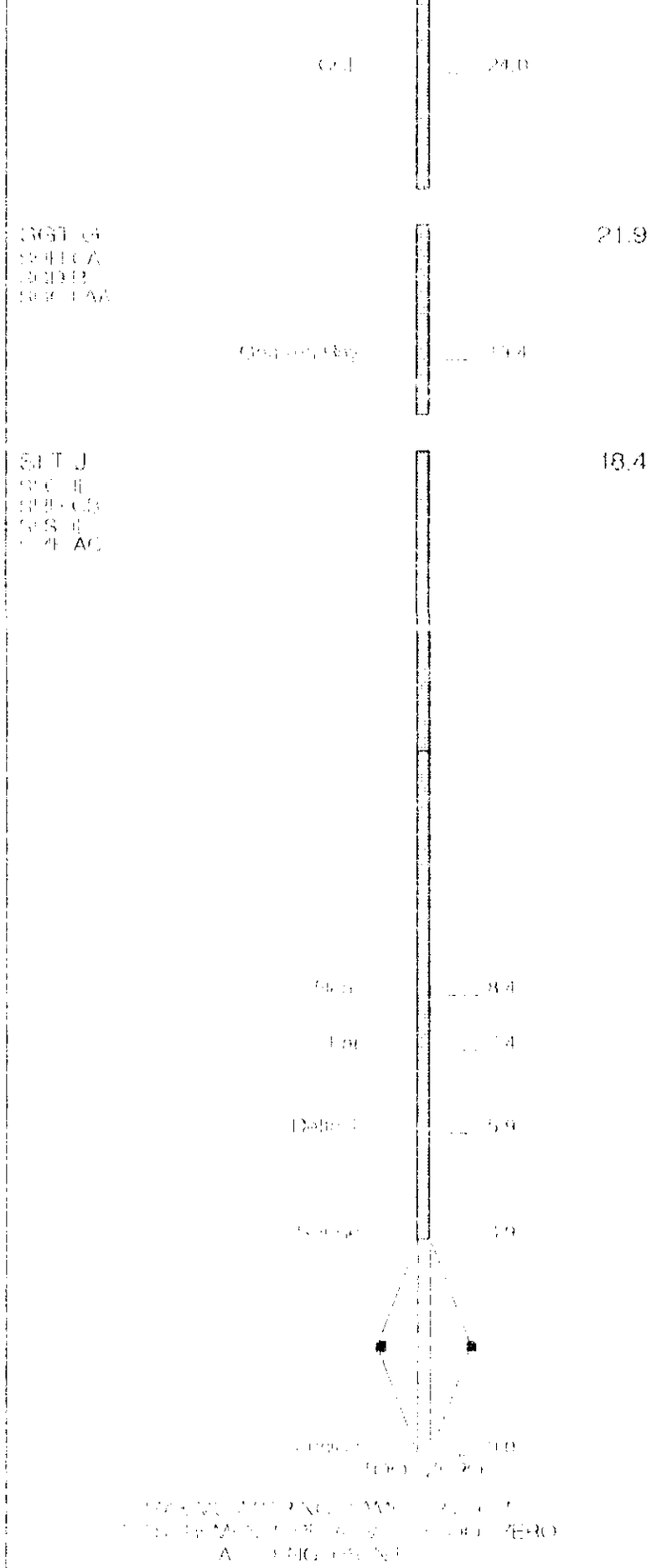
[illegible]

RUN 2

DOWNHOLE EQUIPMENT

[illegible]

[illegible]


21.9
18.4

Input DLIS Files

DEFAULT	SLTJ .006	FN:5	FIELD	16-Apr-1998 15:38	5387.5 FT	1547.2 FT

Output DLIS Files

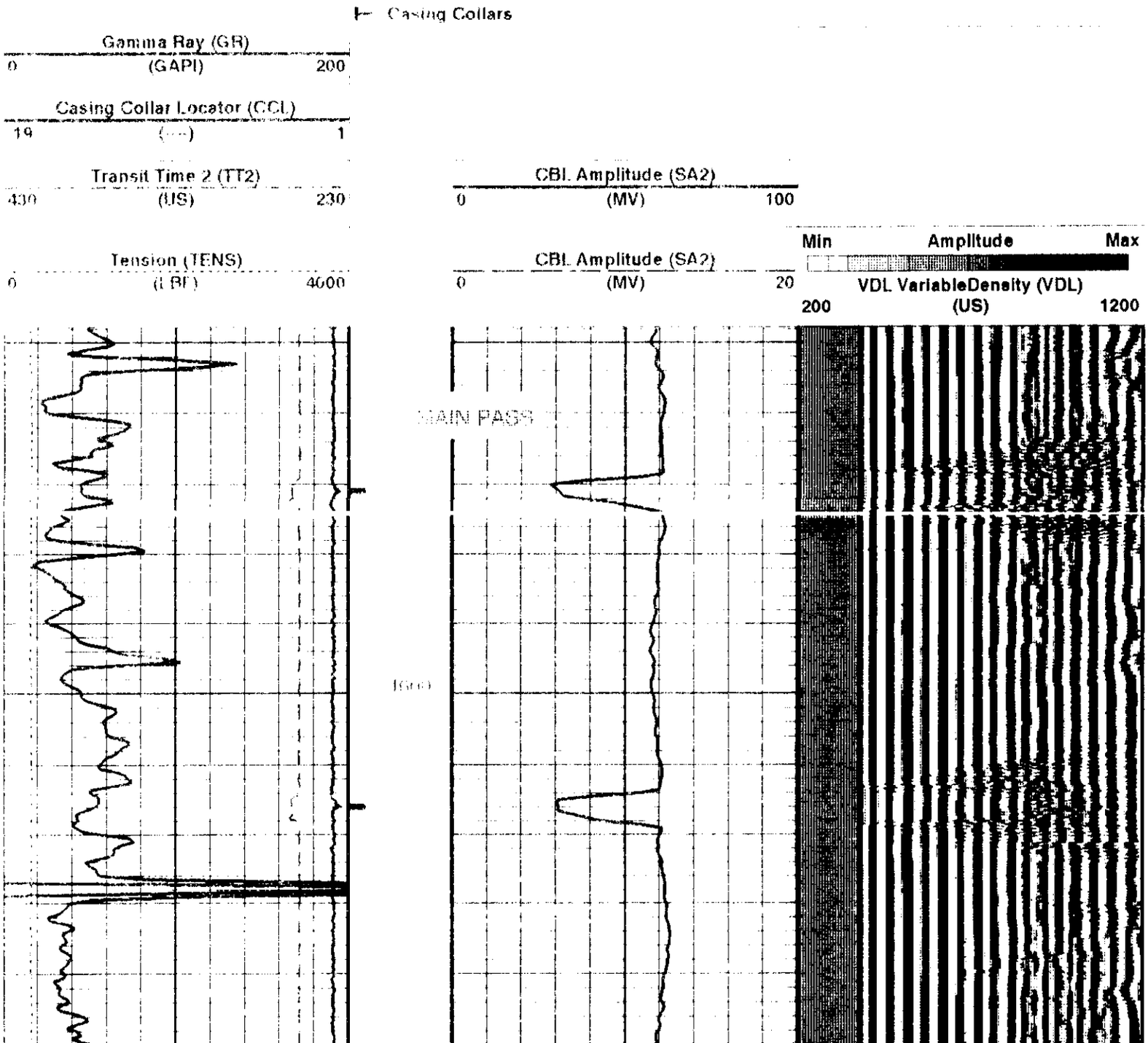
DEFAULT	SLTJ .008	FN:7	FIELD	16-Apr-1998 16:49	5387.5 FT	1547.5 FT

OP System Version: 8C0-609

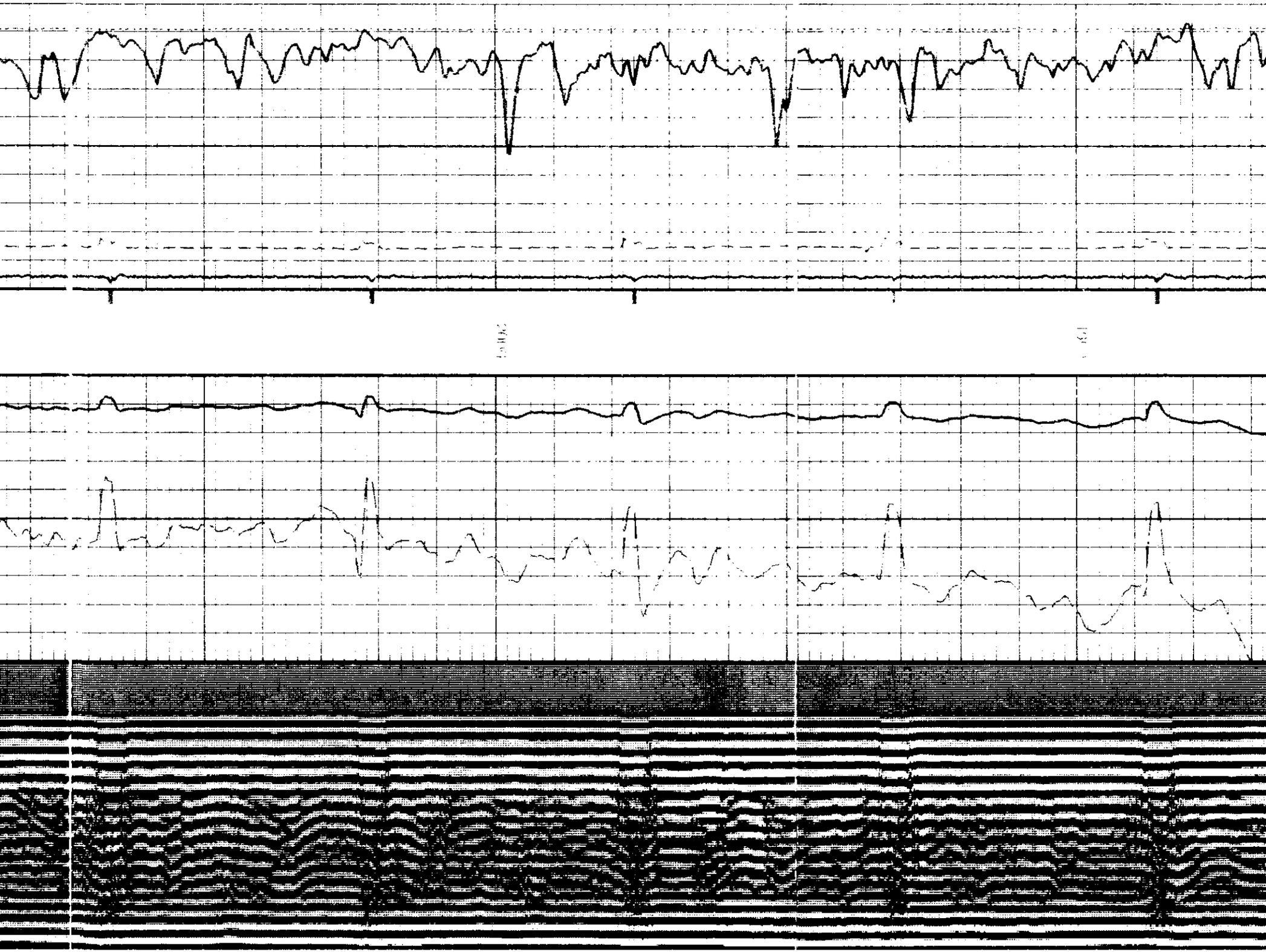
MCM

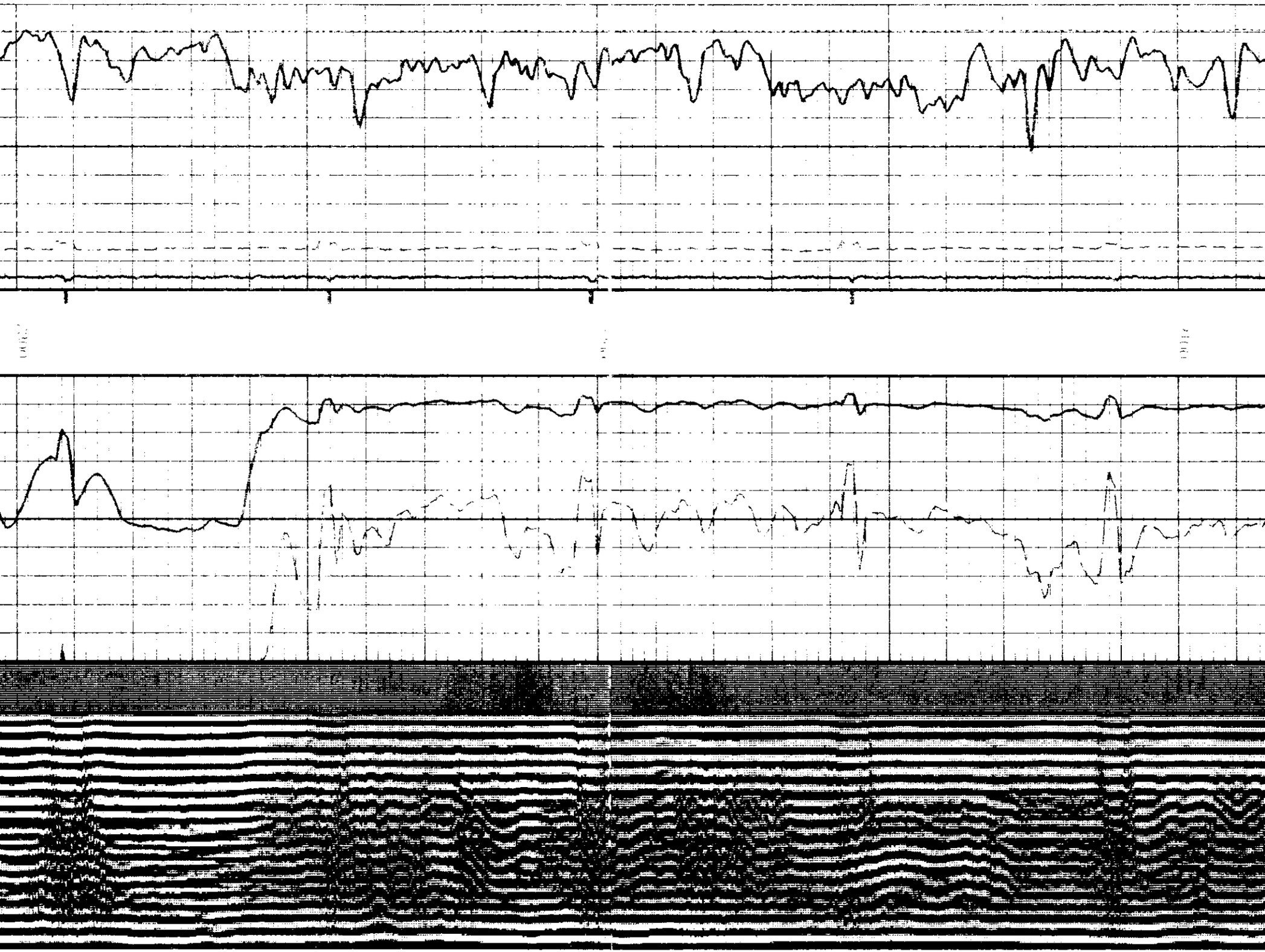
SLTJ	8C0-609	SGT-G	8C0-609
CCL-AJ	8C0-609		

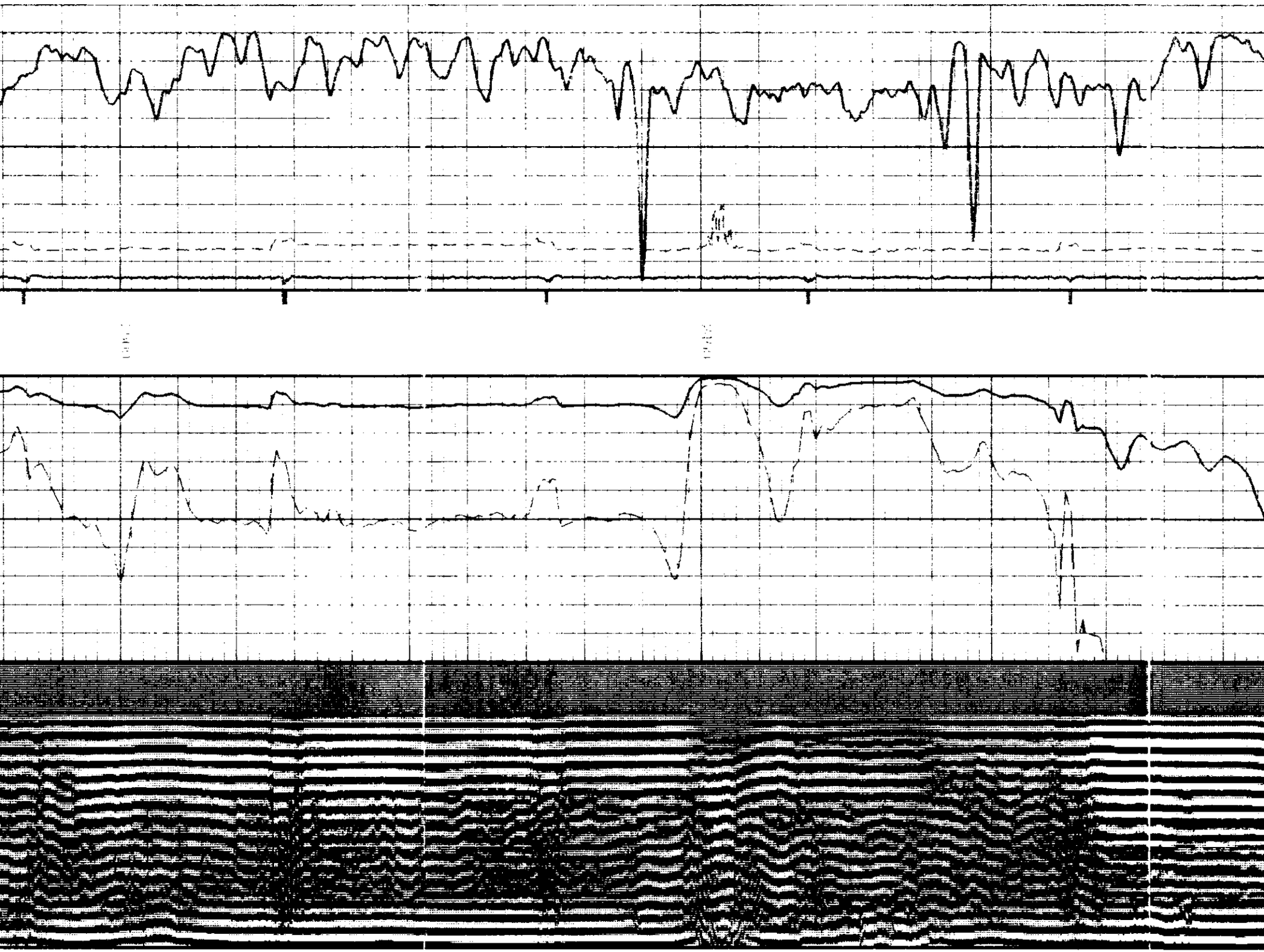
PIP SUMMARY

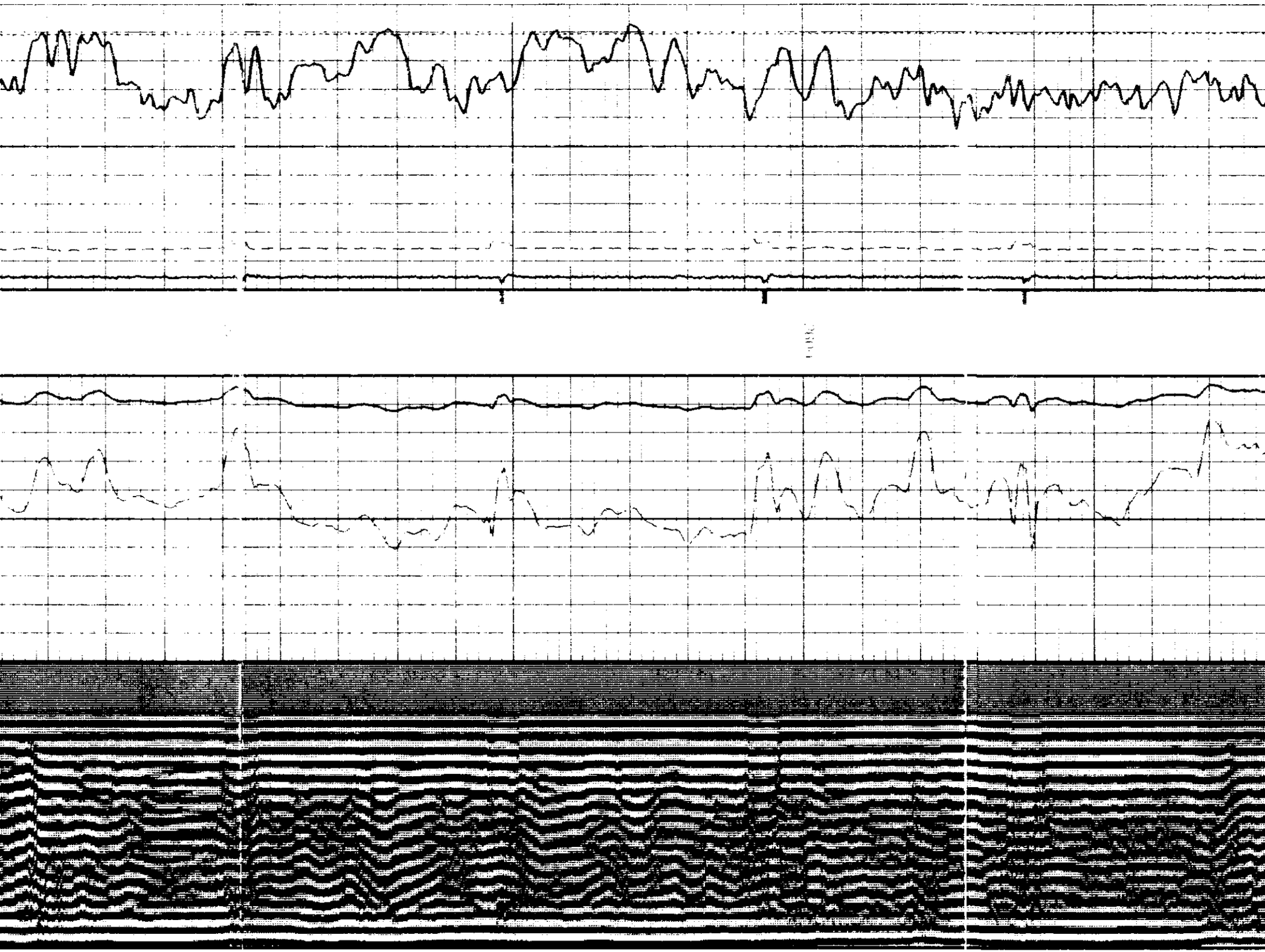


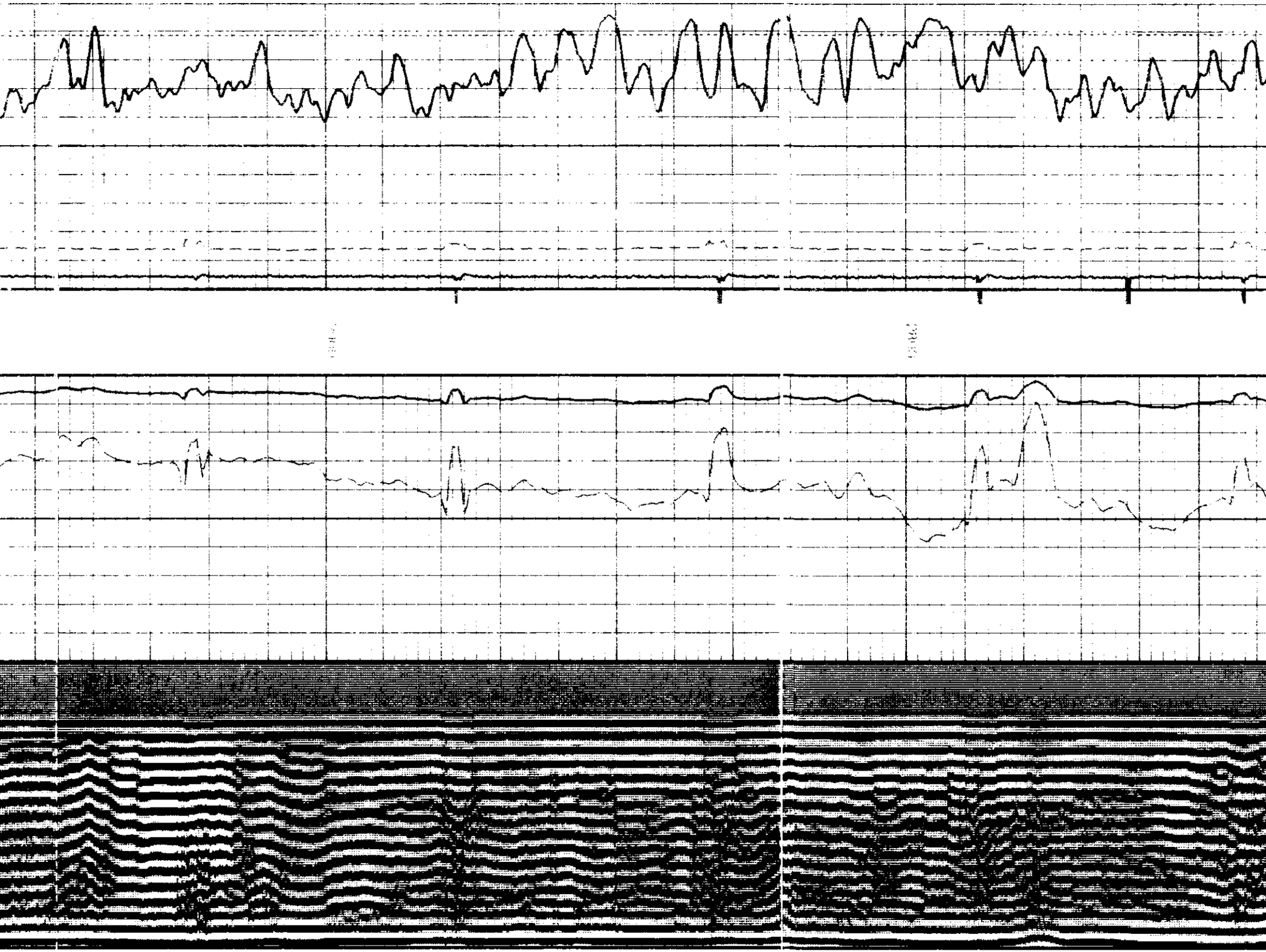
CEMENT TOP
1800

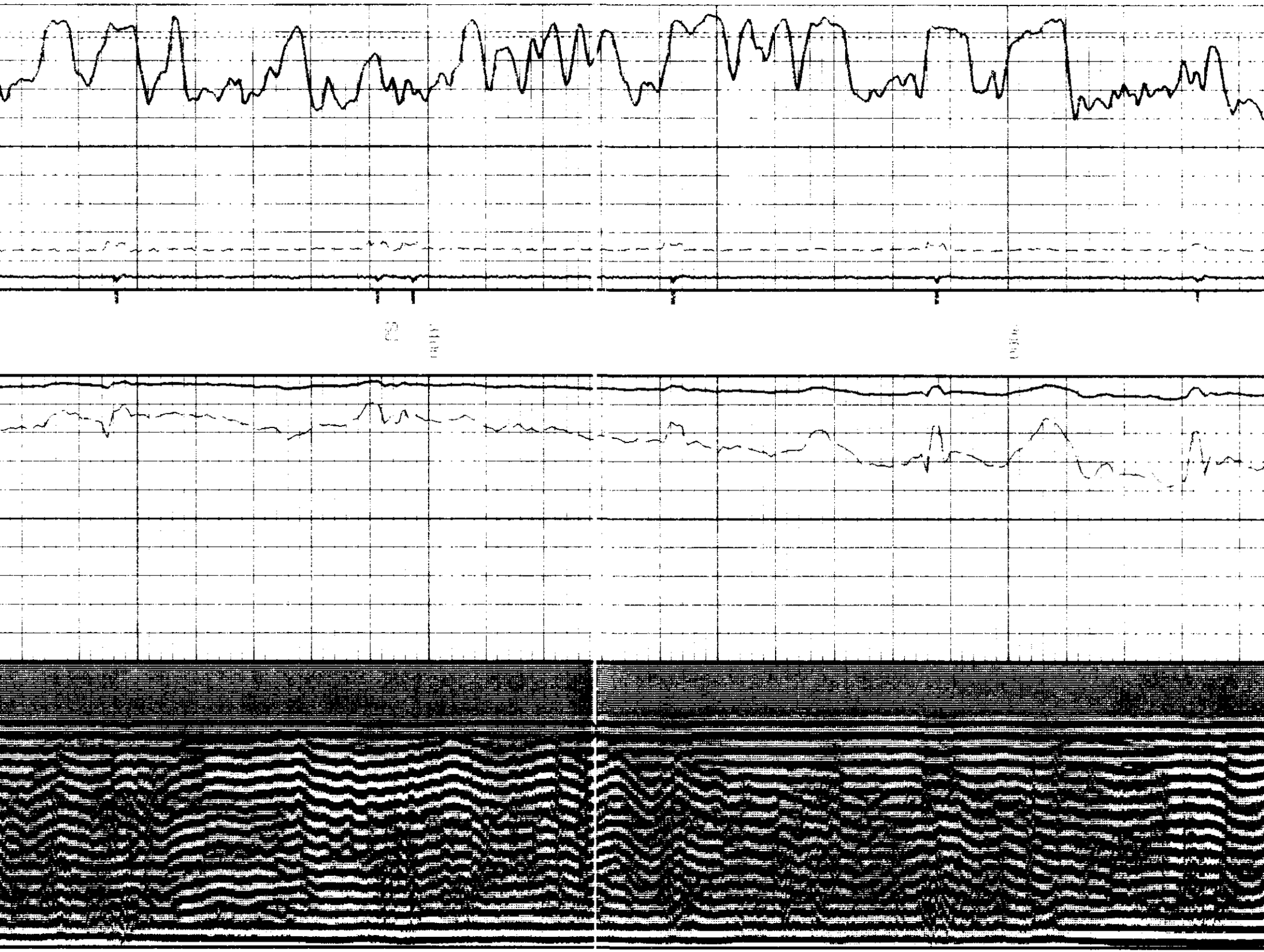


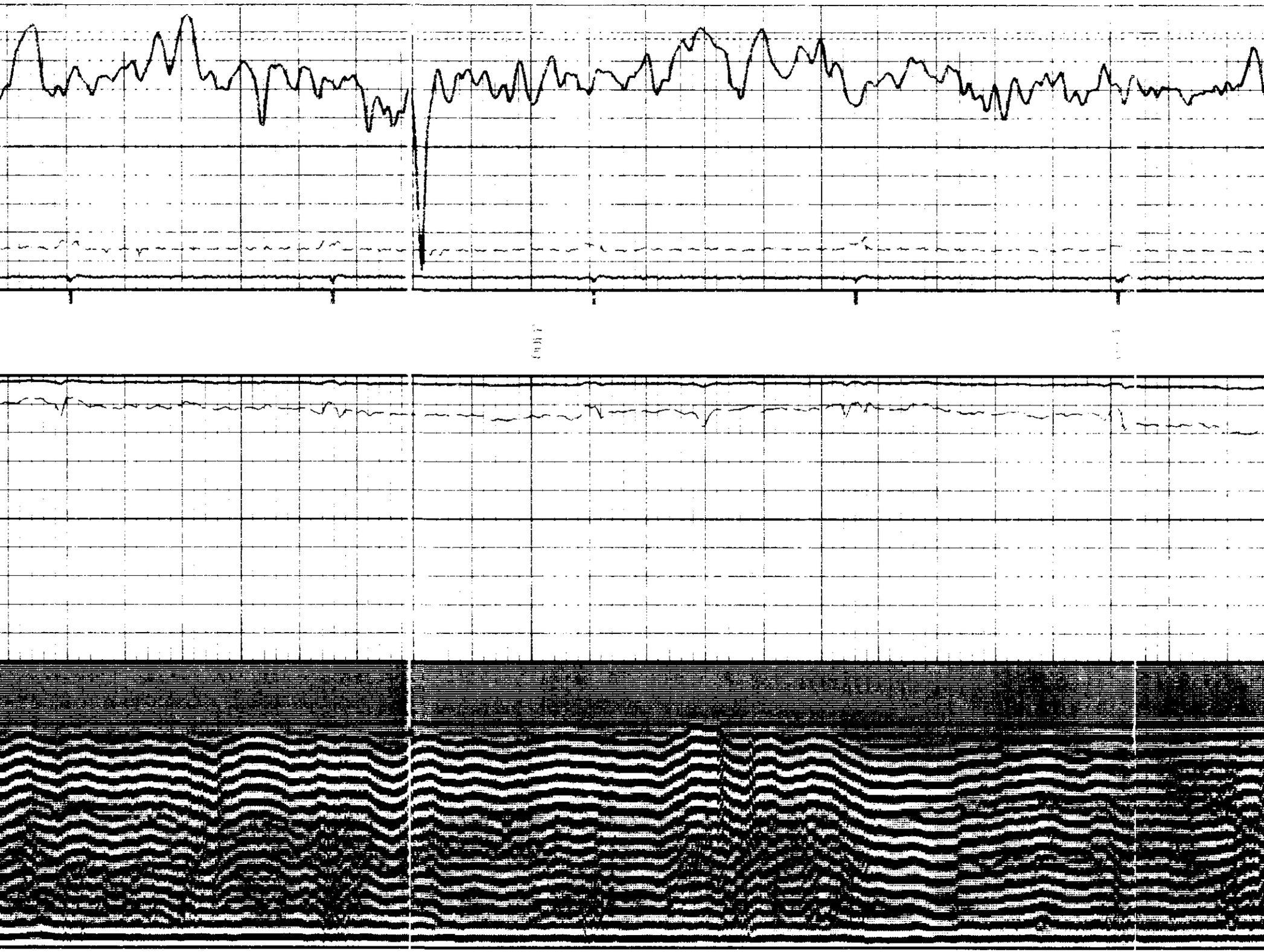


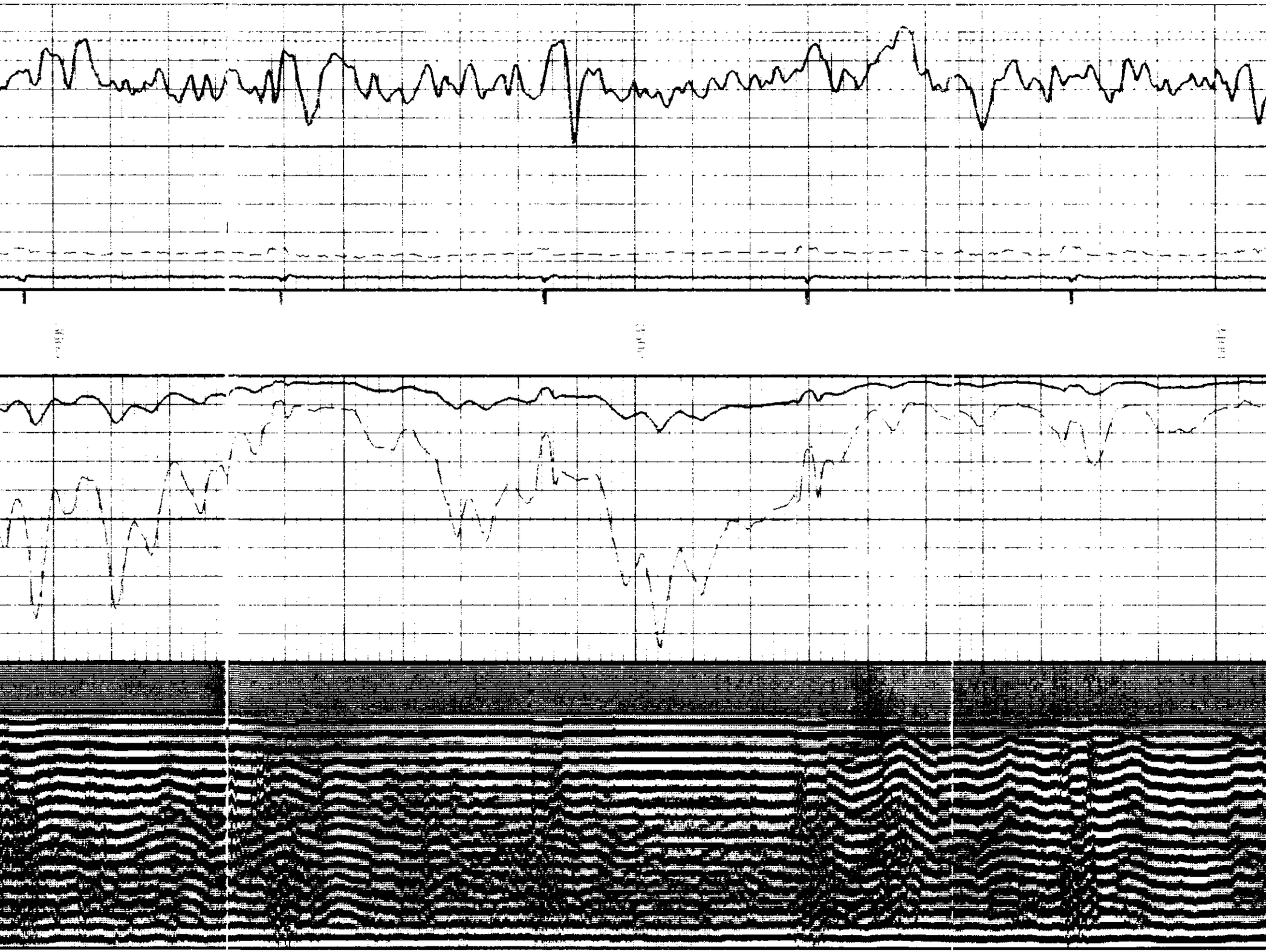


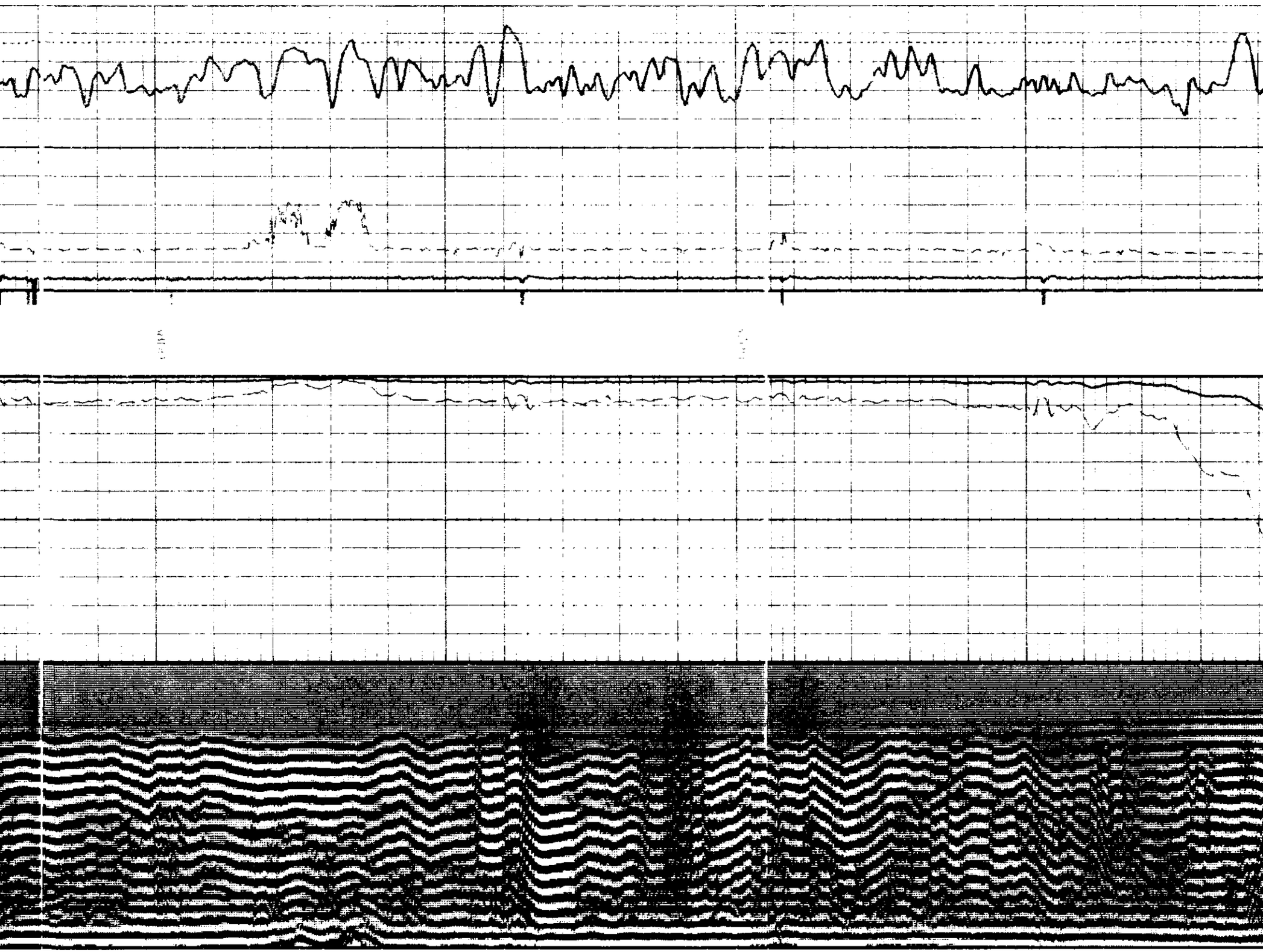


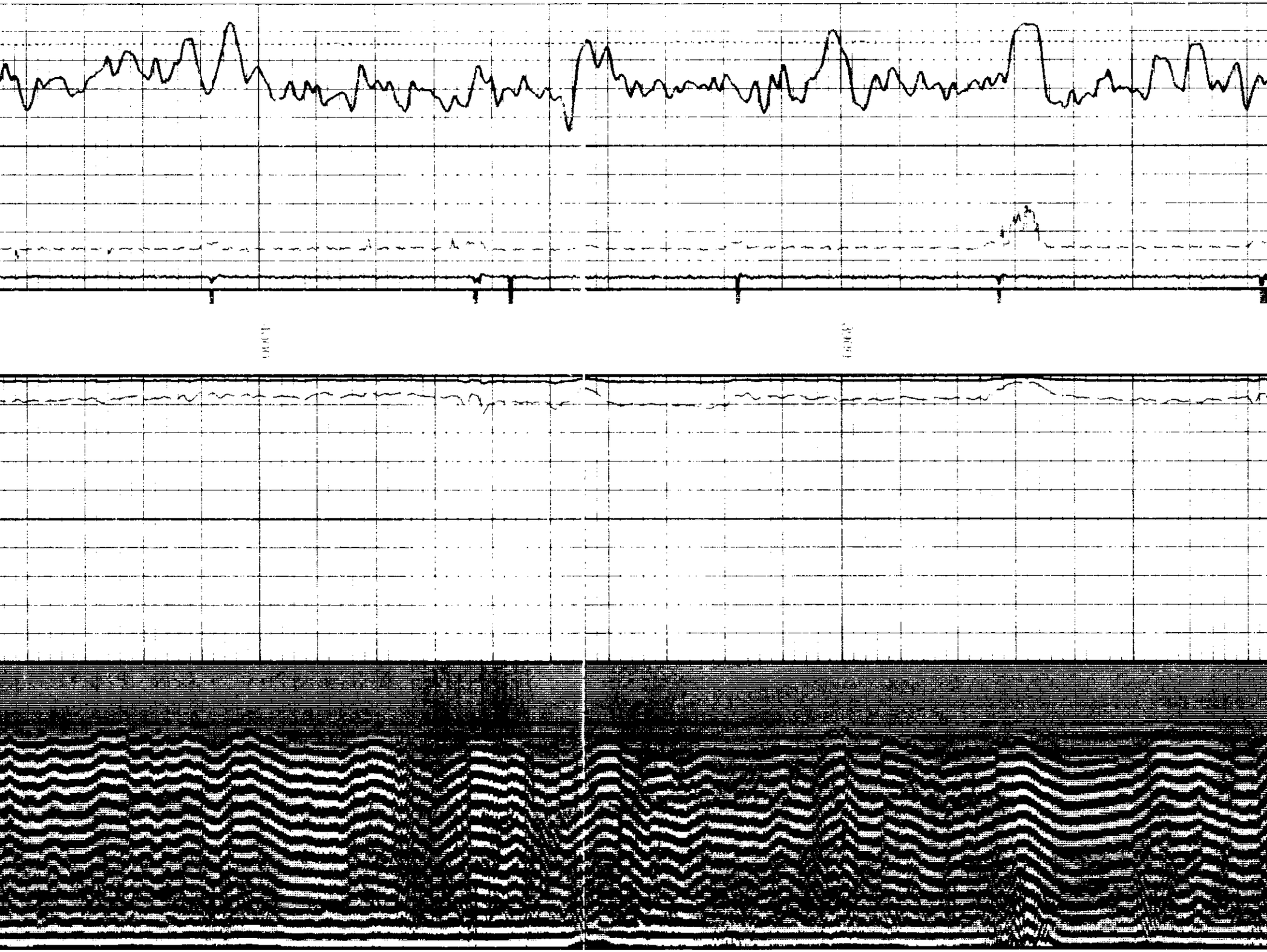


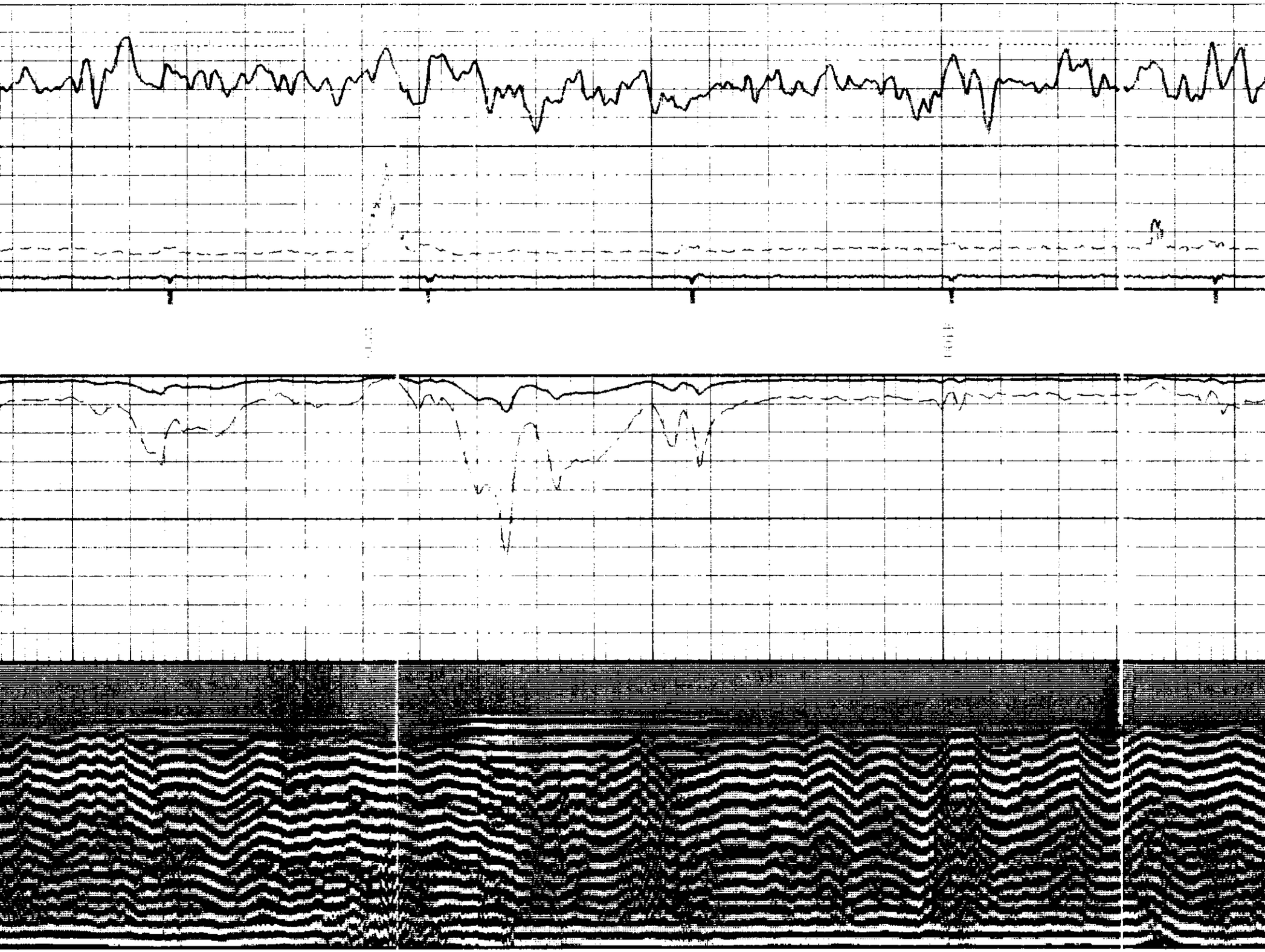


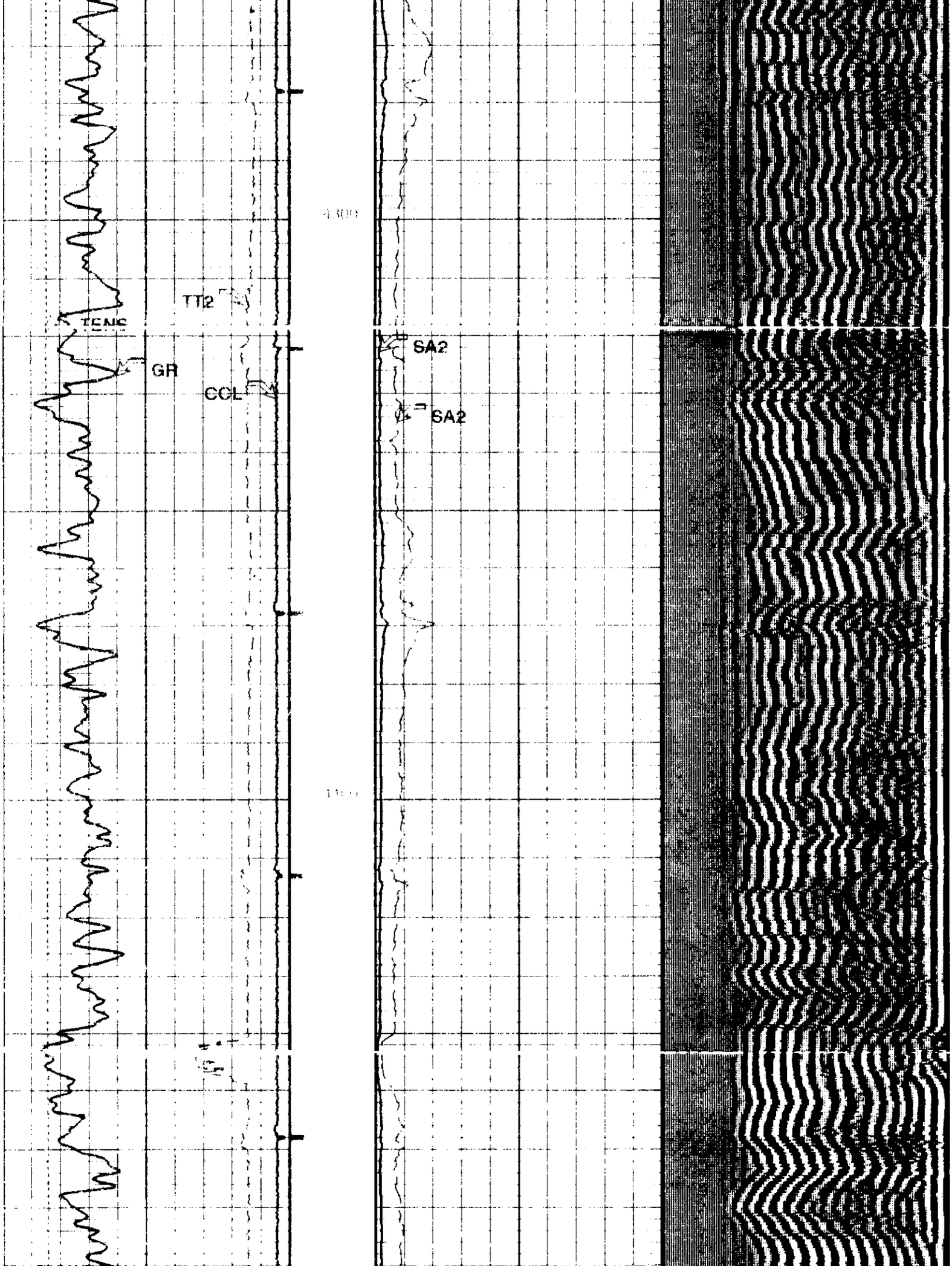


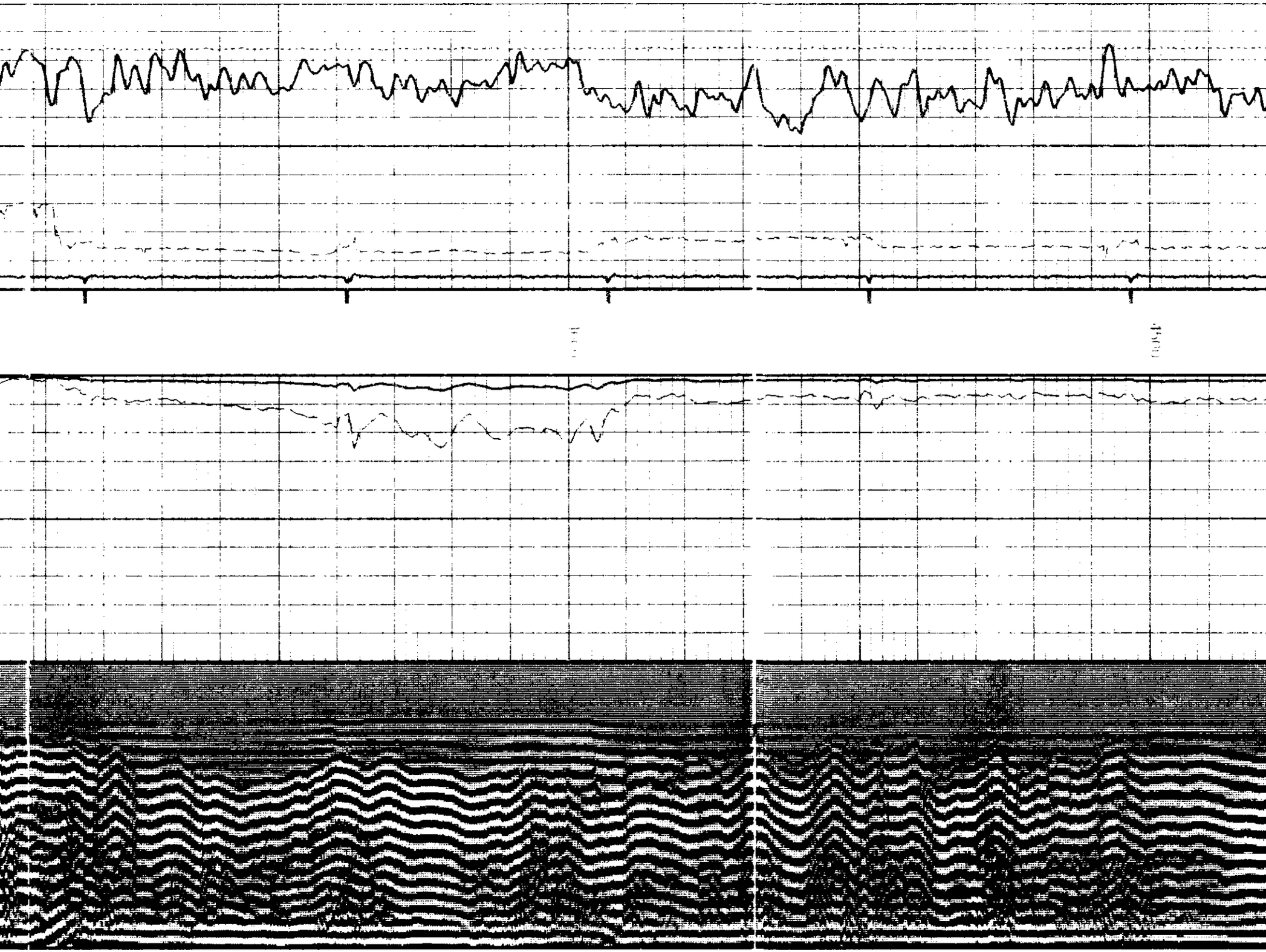


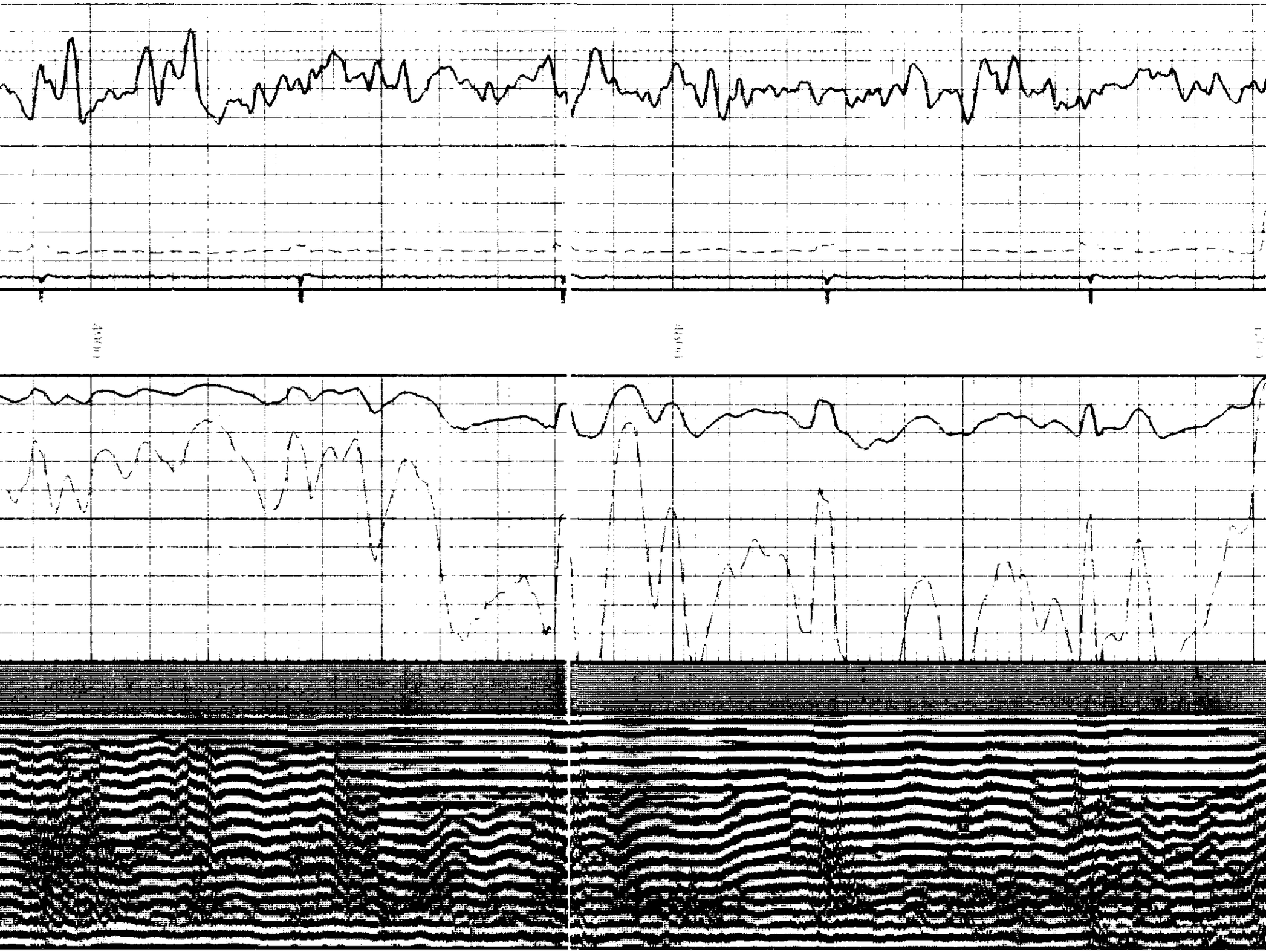


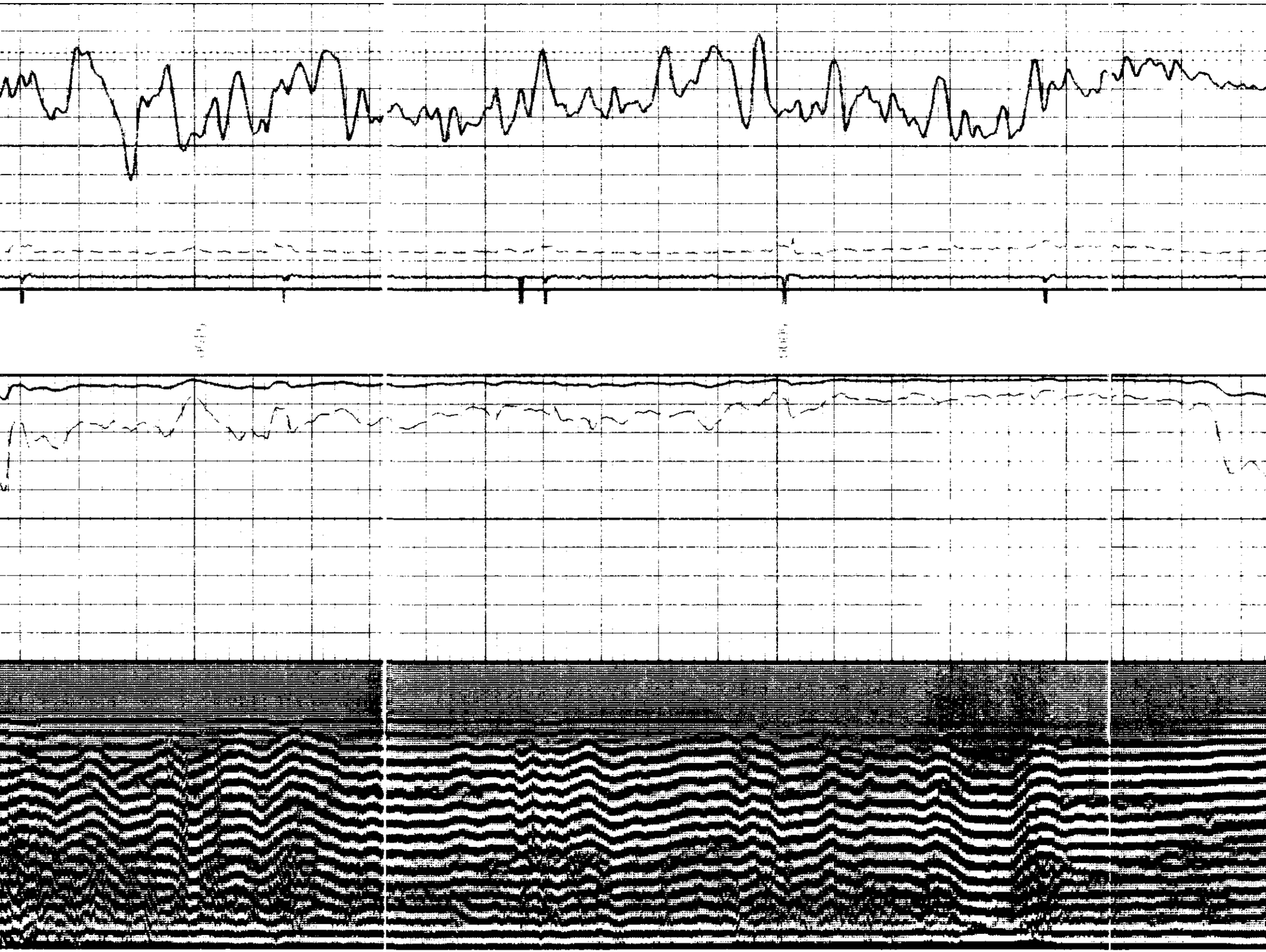


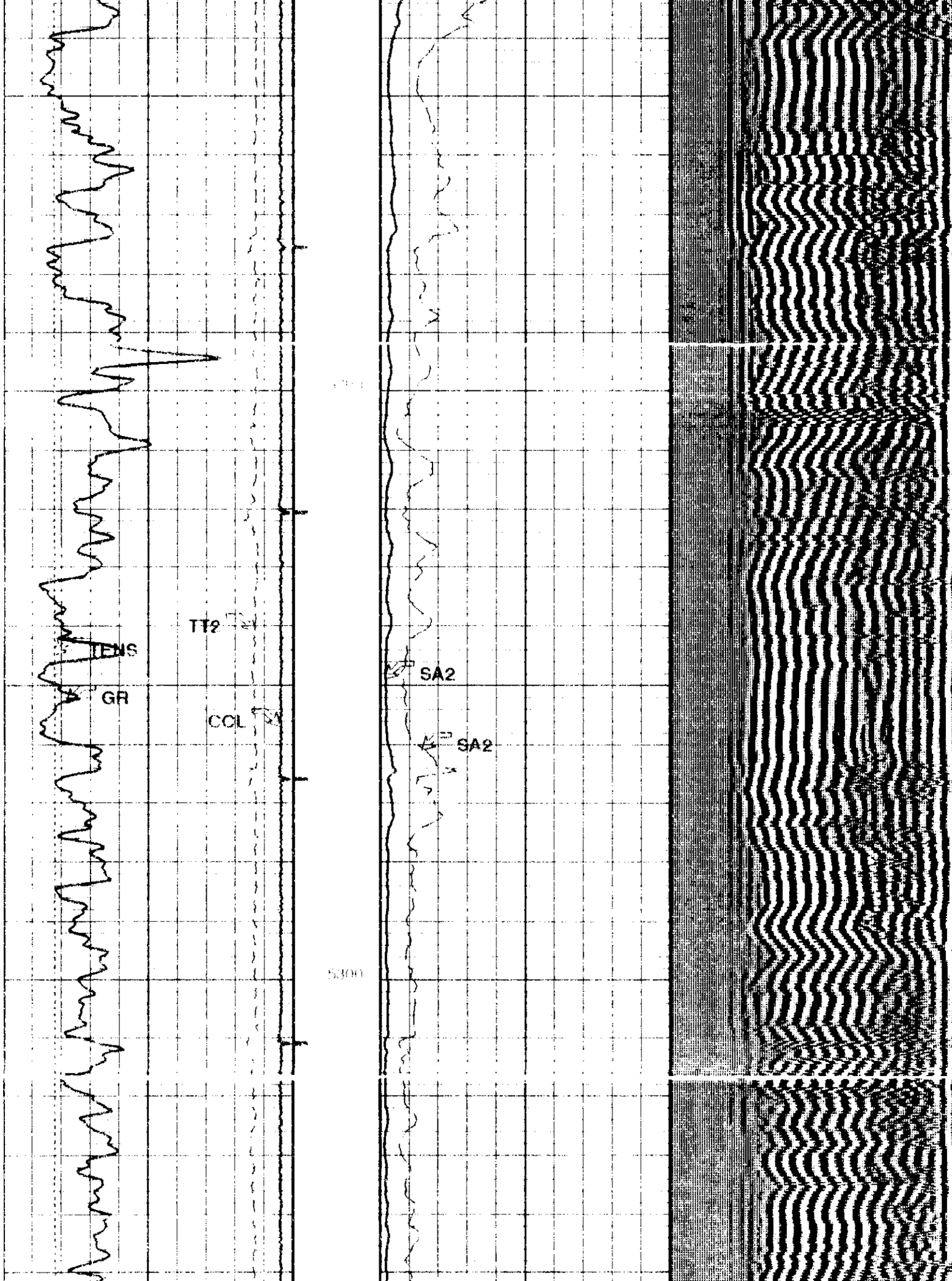


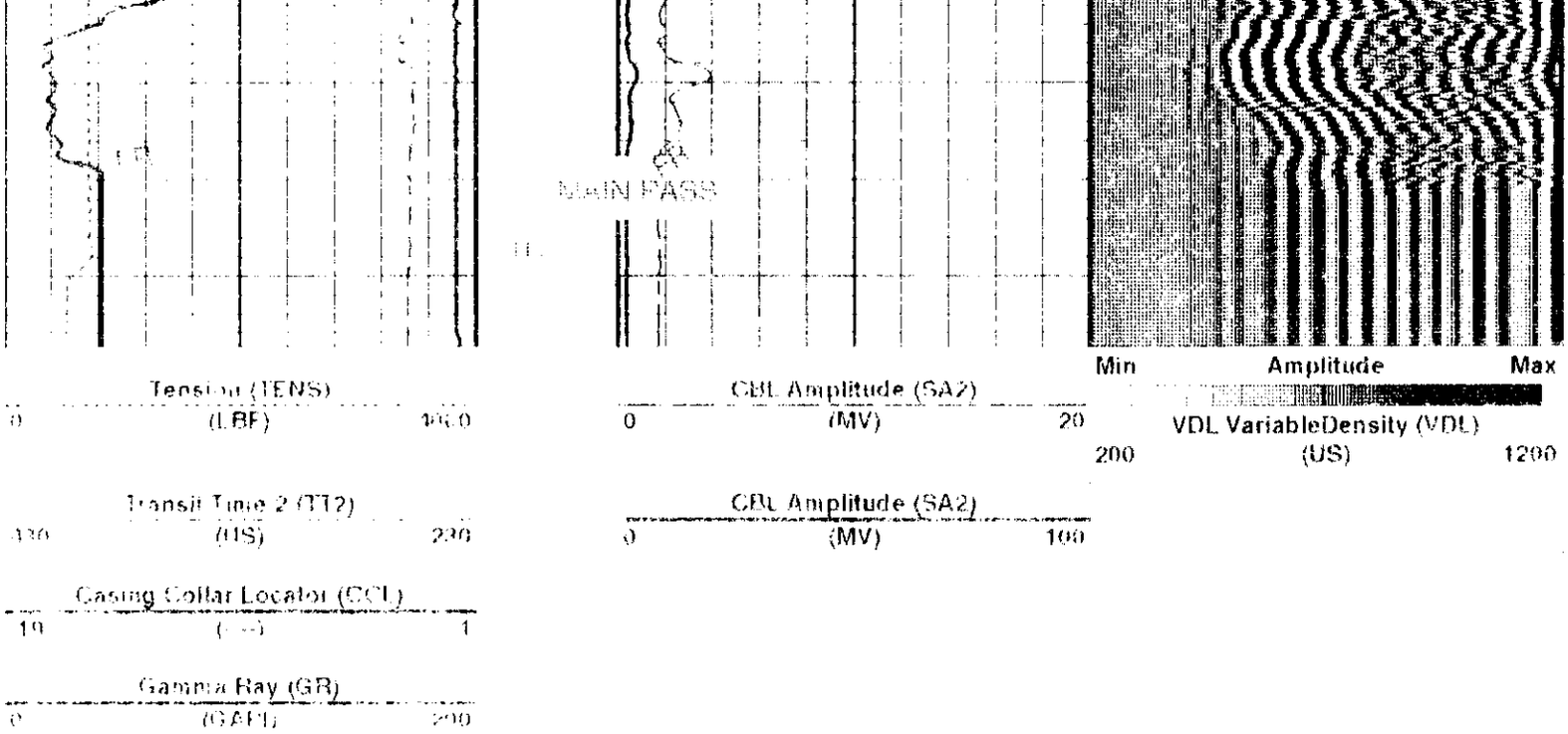

TT2
TENIC
GR
CCL
SA2
SA2








TT2
TENS
GR
CCL
SA2
SA2



PIP SUMMARY

Casing Collars

Parameters

DLIS Name	Description	Value	
CCLD	CCL reset delay	12	IN
CCLT	CCL detection level	0.3	V
DO	Depth Offset	0.0	FT
PP	Playback Processing	NORMAL	

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 16-Apr-1998 16:49

OP System Version: 8C0-609

MCM

SLTJ	8C0-609	SGT-G	8C0-609
CCL-AJ	8C0-609		

Input DLIS Files

DEFAULT	SLTJ .006	FN:5	FIELD	16-Apr-1998 15:38	5387.5 FT	1547.2 FT

Output DLIS Files

DEFAULT	SLTJ .008	FN:7	FIELD	16-Apr-1998 16:49

Input DLIS Files

DEFAULT	SLTJ .005	FN:4	FIELD	16-Apr-1998 15:31	5381.0 FT	5104.0 FT

Output DLIS Files

DEFAULT	SLTJ .009	FN:8	FIELD	16-Apr-1998 17:00	5381.0 FT	5104.0 FT

OP System Version: 8C0-609

MCM

SLTJ	8C0-609	SGT-G	8C0-609
CCL-AJ	8C0-609		

PIP SUMMARY

Casing Collars

Gamma Ray (GR)
0 (GAPI) 200

Casing Collar Locator (CCL)
-19 (--) 1

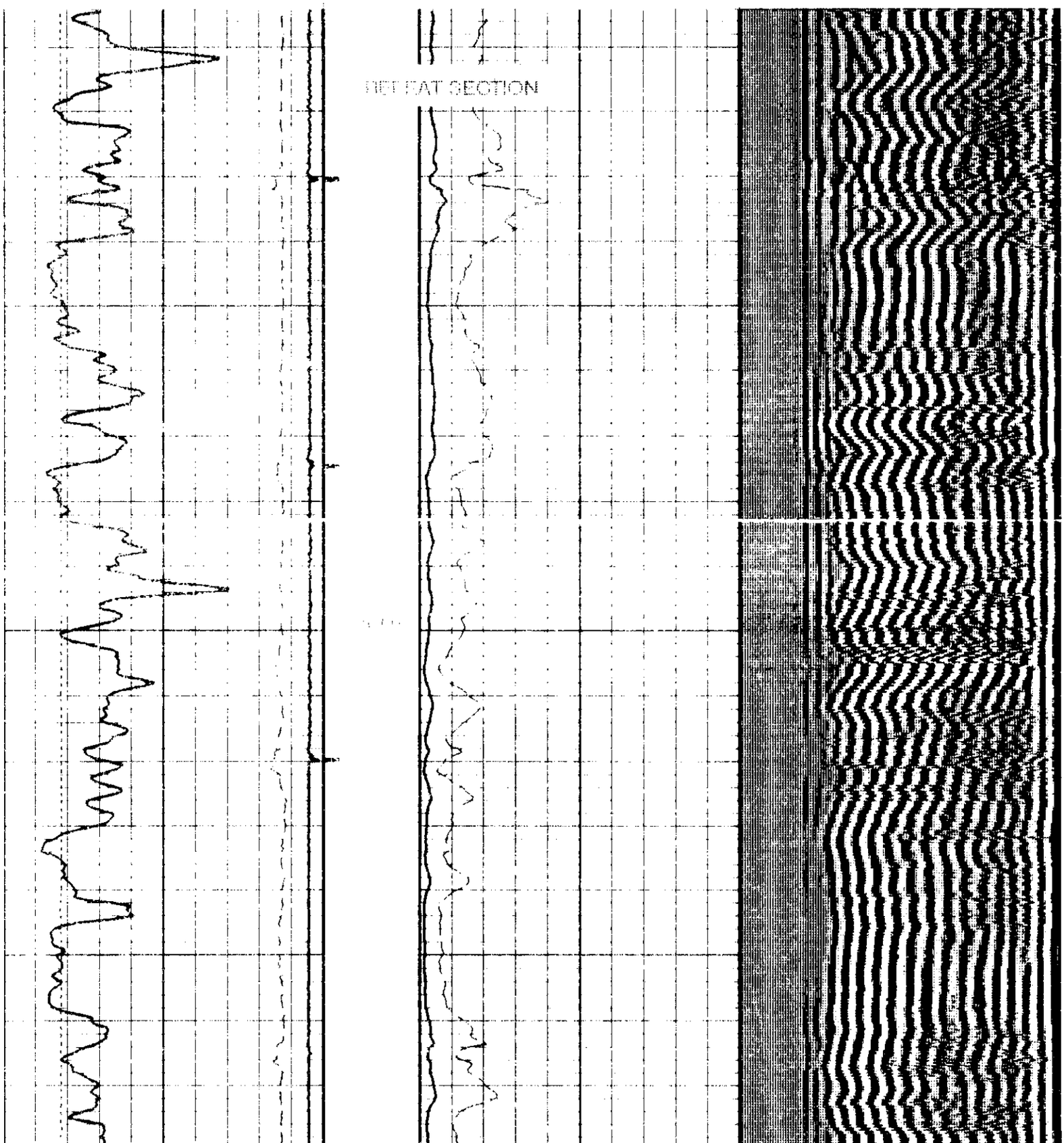
Transit Time 2 (TT2)
430 (US) 230

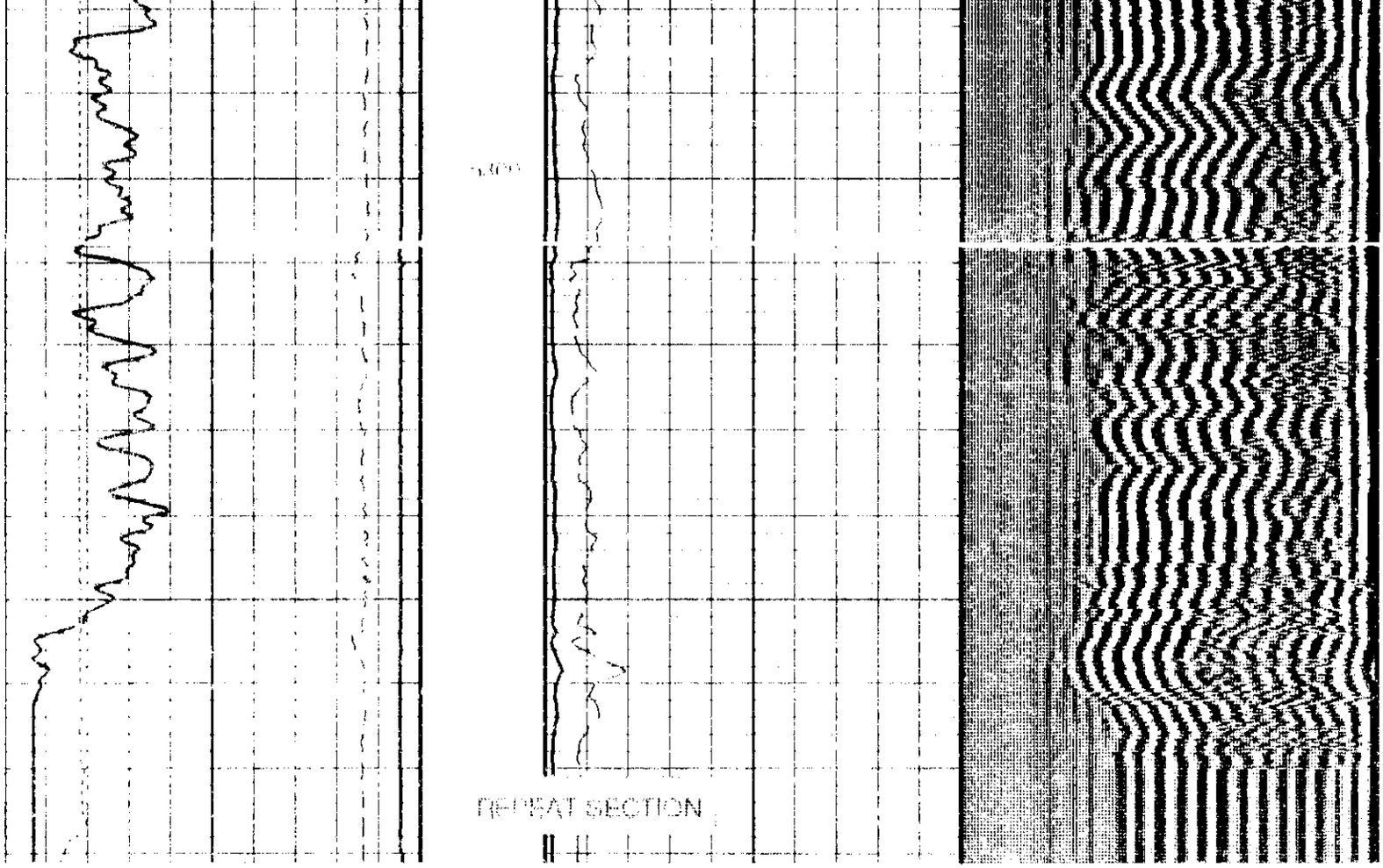
Tension (TENS)
0 (LBF) 4000

CBL Amplitude (SA2)
0 (MV) 100

CBL Amplitude (SA2)
0 (MV) 20

Min Amplitude Max
VDL VariableDensity (VDL)
200 (US) 1200





PIP SUMMARY

Casing Collars

Parameters

DLIS Name	Description	Value	
CCLD	CCL reset delay	12	IN
CCLT	CCL detection level	0.3	V
DO	Depth Offset	0.0	FT
PP	Playback Processing	NORMAL	

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 16-Apr-1998 17:03

OP System Version: 8C0-609

MCM

SLT-J	8C0-609	SGT-G	8C0-609
CCL-AJ	8C0-609		

Input DLIS Files

DEFAULT	SLTJ .005	FN:4	FIELD	16-Apr-1998 15:31	5381.0 FT	5104.0 FT

Output DLIS Files

Output DLIS Files

DEFAULT SLTJ .009 FN:8 FIELD 16-Apr 1998 17:00

COMPANY:	PETROGLYPH OPERATING COMPANY, INC.
WELL:	UTE TRIBAL 31-12
FIELD:	ANTELOPE CREEK
COUNTY:	DUCHESNE
STATE:	UTAH

Schlumberger

CEMENT BOND LOG
WITH GAMMARAY
& COLLARS

ATTACHMENT NO. 8

OPEN HOLE LOG FOR THE UIC WELL

COMPANY: PETROGLYPH OPERATING COMPANY, INC.

WELL: UTE TRIBAL #31-12

FIELD: ANTELOPE CREEK

COUNTY: UINTAH STATE: UTAH

Schlumberger

COMPENSATED NEUTRON LITHODENSITY GAMMA RAY

COUNTY: UINTAH
Field: ANTELOPE CREEK
Location: 1999' FSL & 748' FWL
Well: UTE TRIBAL #31-12
Company: PETROGLYPH OPERATING

LOCATION

1999' FSL & 748' FWL
NW SW
POW

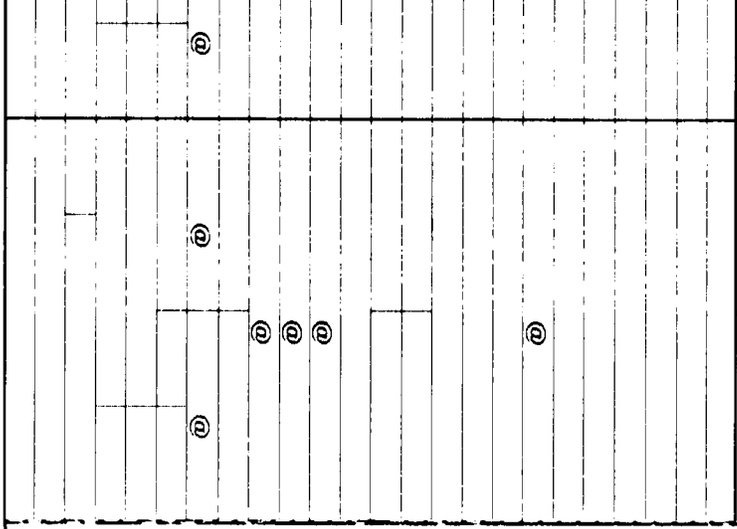
Elev.: K.B. 6302.6 F
G.L. 6292.6 F
D.F. 6301.6 F

Permanent Datum: GROUND LEVEL Elev.: 6292.6 F
Log Measured From: KELLY BUSHING 10.0 F above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-32038	31	5S	3W

	Run 1	Run 2	Run 3
Logging Date	30-MAR-1998		
Run Number	ONE		
Depth Driller	5506 F		
Schlumberger Depth	5494 F		
Bottom Log Interval	5466 F		
Top Log Interval	369 F		
Casing Driller Size @ Depth	8.625 IN @ 369 F	@	@
Casing Schlumberger	369 F		
Bit Size	7.875 IN		
Type Fluid In Hole	AMMONIUM CHLORIDE		
MUD Density / Viscosity	8.3 LB/G / 27 S		
MUD Fluid Loss / PH	/ 10.5		
MUD Source Of Sample	PIT		
RM @ Measured Temperature	0.812 OHMM @ 48 DEGF	@	@
RMF @ Measured Temperature	0.812 OHMM @ 48 DEGF	@	@
RMC @ Measured Temperature	@	@	@
Source RMF / RMC	PIT		
RM @ MRT / RMF @ MRT	0.356 @ 118 / 0.356 @ 118	@	@
Maximum Recorded Temperatures	118 DEGF / 118		
Circulation Stopped / Time	30-MAR-1998 / 11:45		
Logger On Bottom / Time	30-MAR-1998 / 19:56		
Unit Number / Location	3017 / VERNAL, UTAH		
Recorded By	KEITH NELSON		
Witnessed By	GENE SEARLE		

	Run 1	Run 2	Run 3
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth	@		
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
MUD Density / Viscosity			
MUD Fluid Loss / PH			
MUD Source Of Sample			
RM @ Measured Temperature	@		
RMF @ Measured Temperature	@		
RMC @ Measured Temperature	@		
Source RMF / RMC			
RM @ MRT / RMF @ MRT	@		
Maximum Recorded Temperatures			
Circulation Stopped / Time			
Logger On Bottom / Time			
Unit Number / Location			
Recorded By			
Witnessed By			



Run 2

Run 3

Run 4

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OTHER SERVICES1	OTHER SERVICES2
OS1: ARRAY INDUCTION	OS1:
OS2: ANSWER PRODUCT	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

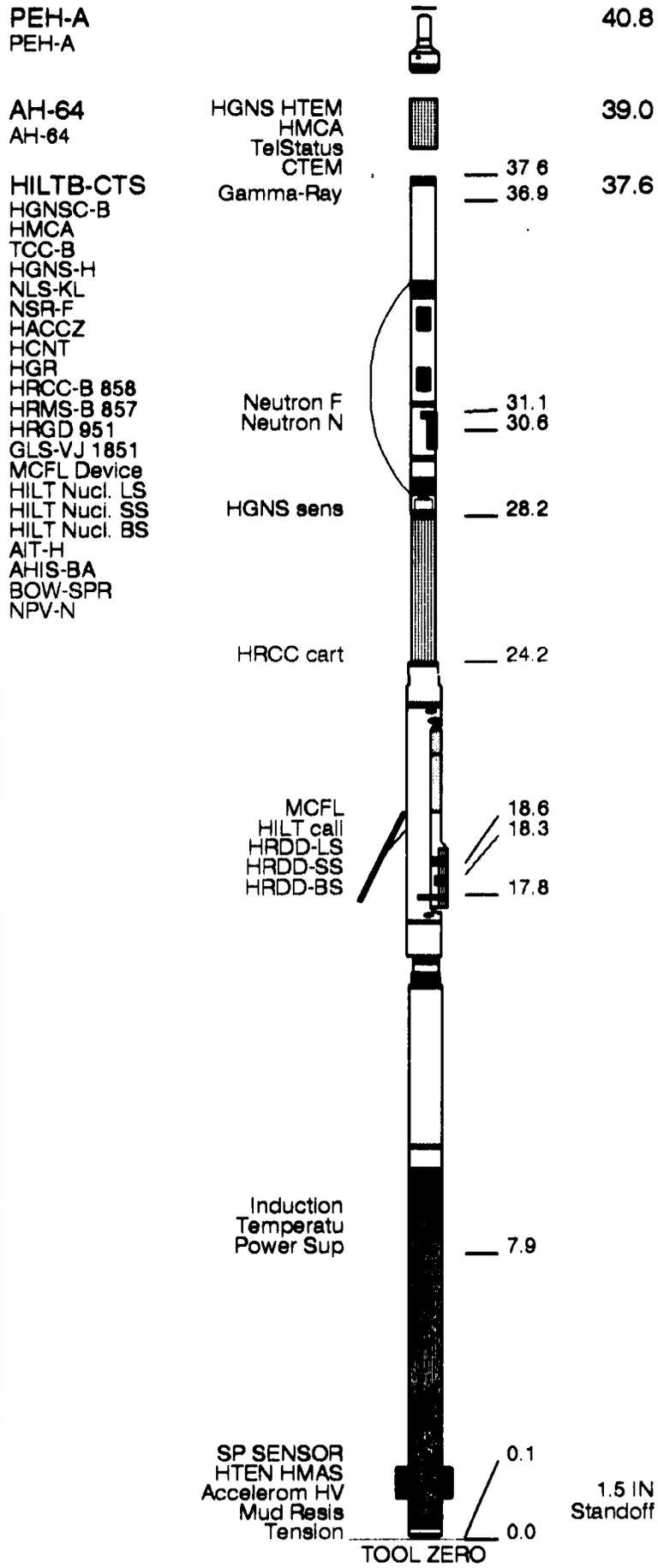
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
BOW SPRING USED ON NEUTRON	
1.5" STAND-OFFS USED ON AIT	
USED PRIMARY DEPTH AS REFERENCE	
DRILLING SALINITY WAS 2600 PPM.	
.	
SANDSTONE MATRIX (2.68 G/CC) USED	
.	
.	
.	
.	
.	
..	
.	
.	
TODAYS CREW:	
B. SLAMA AND K. JOHNS	

RUN 1		RUN 2	
SERVICE ORDER #:	1168613	SERVICE ORDER #:	
PROGRAM VERSION:	7C0-712	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1	RUN 2
SURFACE EQUIPMENT	
TCM-AB GSR-U/Y NCT-B CNB-AB NCS-VB	
DOWNHOLE EQUIPMENT	



MAXIMUM STRING DIAMETER 6.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT HILTC .008 FN:5 FIELD 30-MAR-1998 20:28

Integrated Hole/Cement Volume Summary

Hole Volume = 1951.77 F3

Cement Volume = 1104.84 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

		DPHZ >= 10 p.u. From DPHZ to SpareConstant	Tension (TENS) 10000 (LBF) 0
	Std. Res. Density Standoff (DSOZ) (IN) 2.5 0.5	GAS EFFECT From DPHZ to NPOR	
MAIN PASS			

Tool/Tot. Drag From D3T to STIA

Std. Res. Formation Pe (PEFZ) 0 (----) 10

Density Correction (HDRA) -0.25 (G/C3) 0.25

Caliper (HCAL) 6 (IN) 16

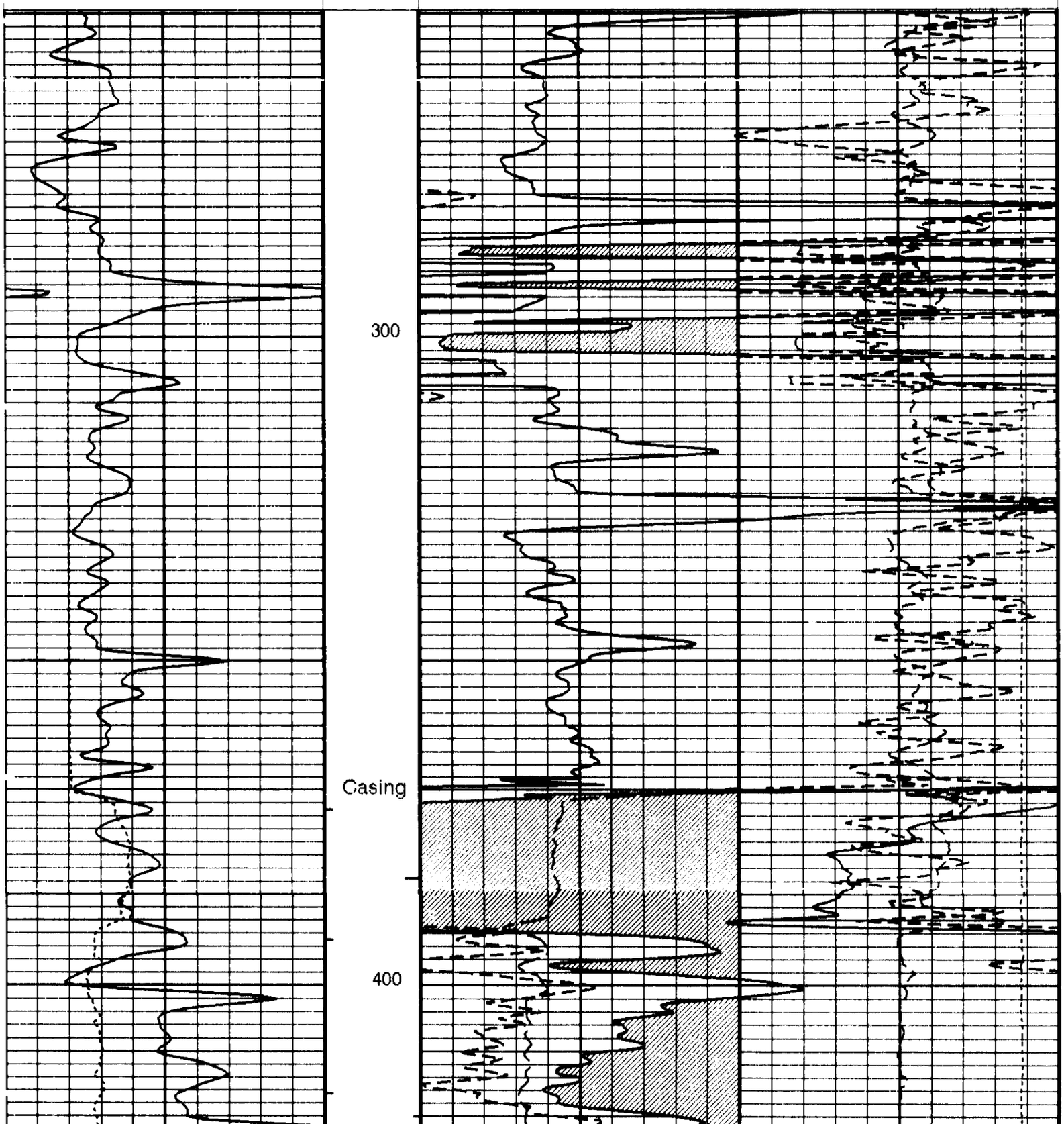
Cable Drag From STIA to STIT

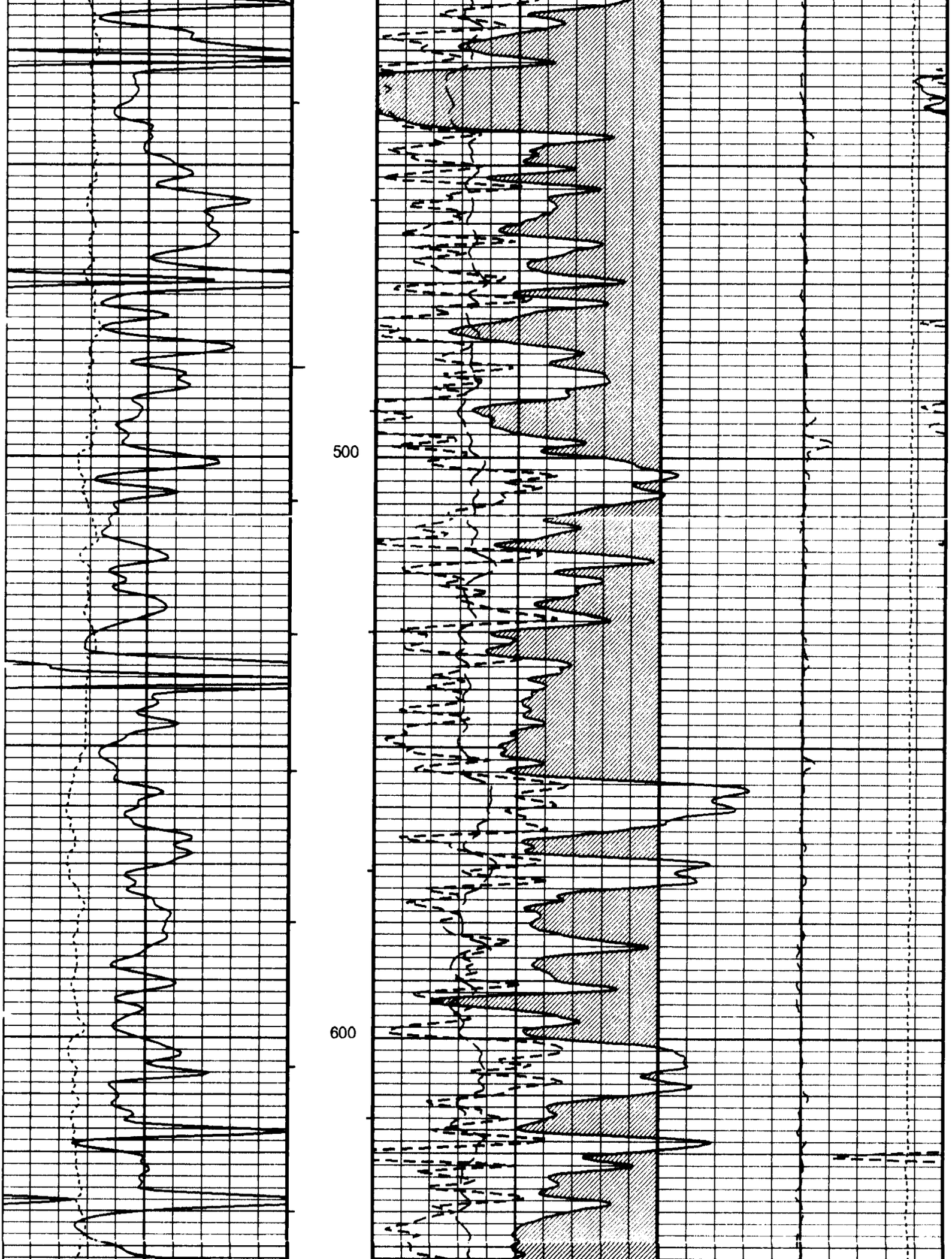
Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) -0.1

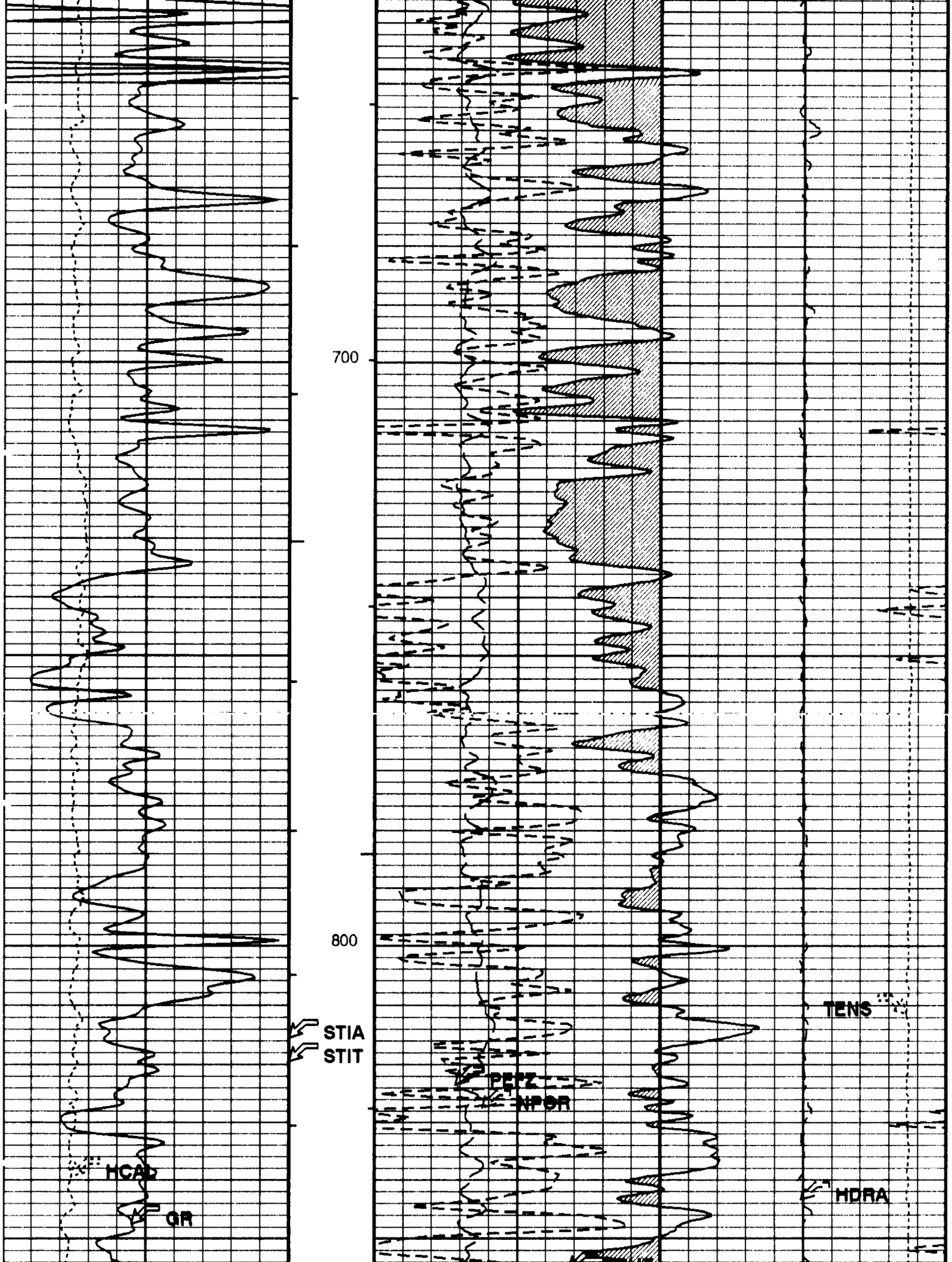
Gamma Ray (GR) 0 (GAPI) 200

Stuck Stretch (STIT) 0 (F) 50

Std. Res. Density Porosity (DPHZ) 0.3 (V/V) -0.1




500
600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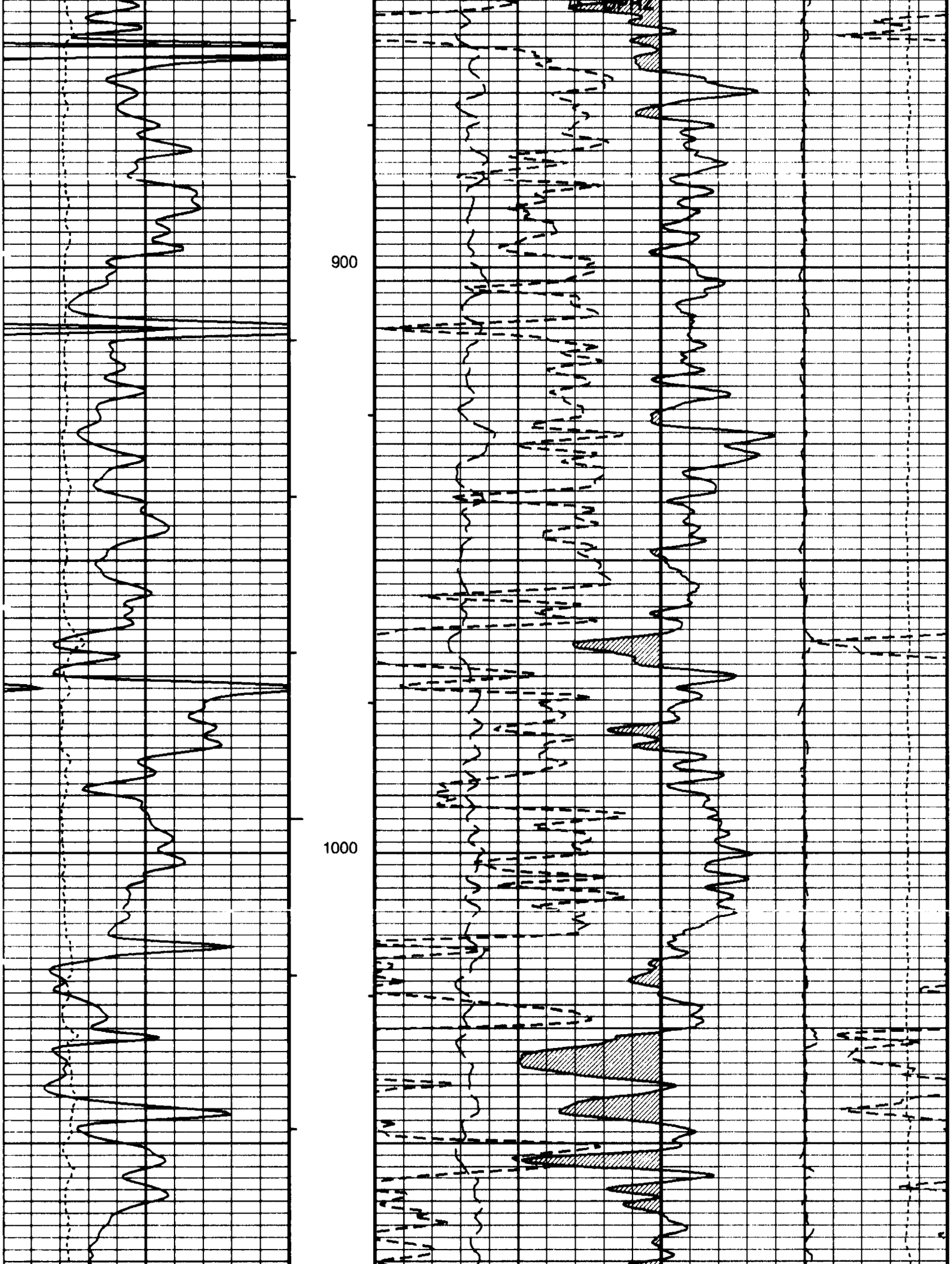
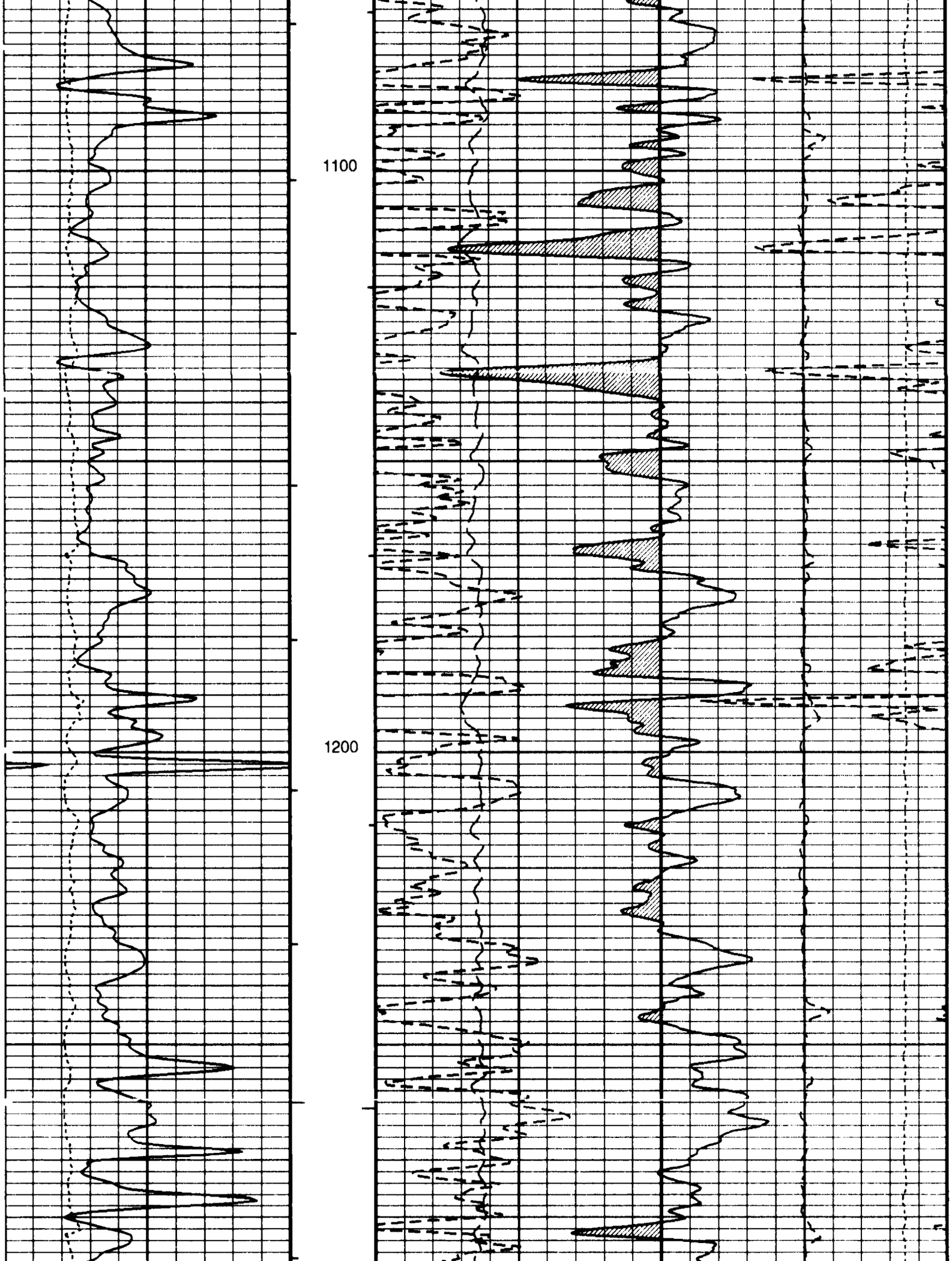
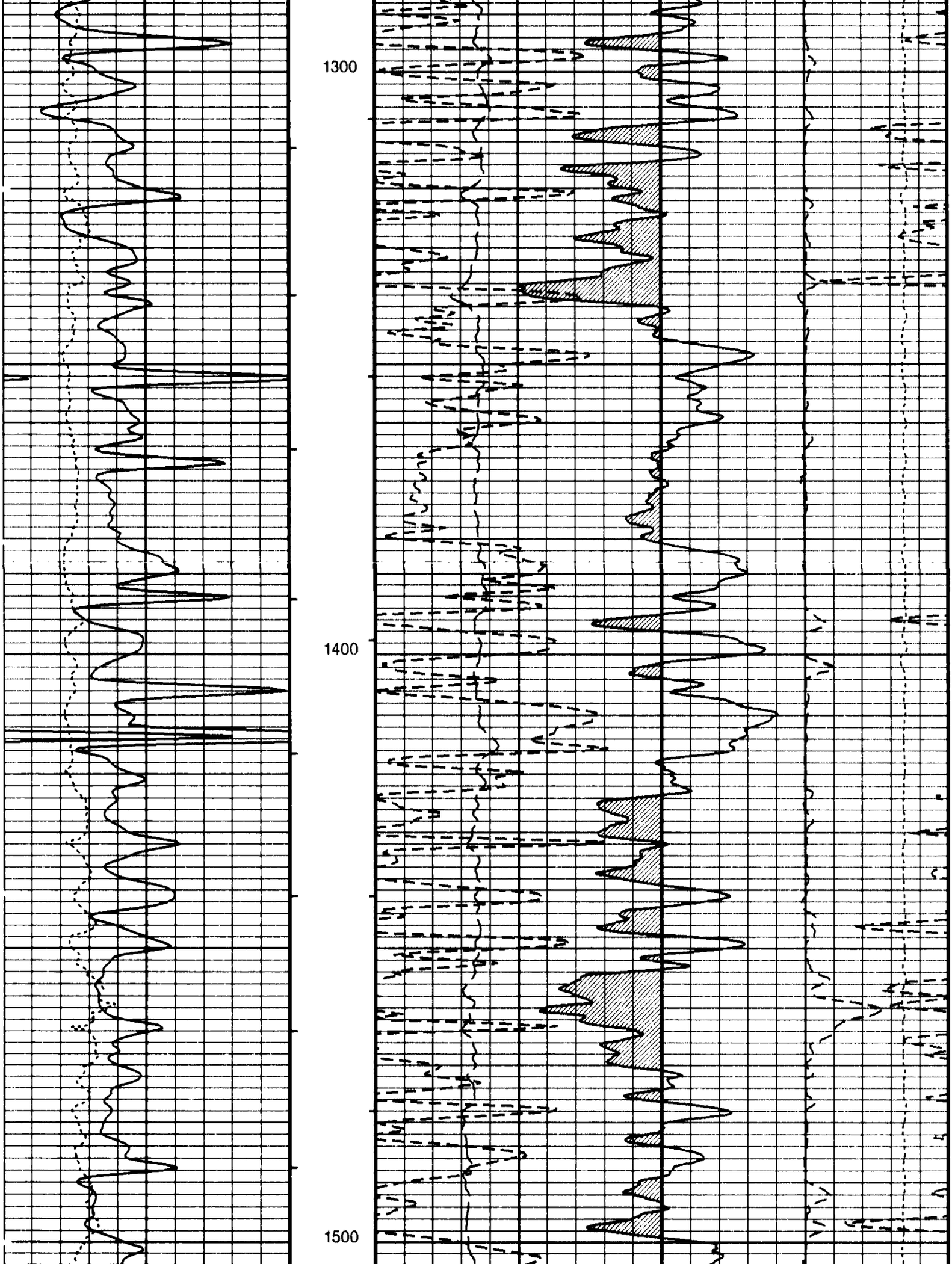
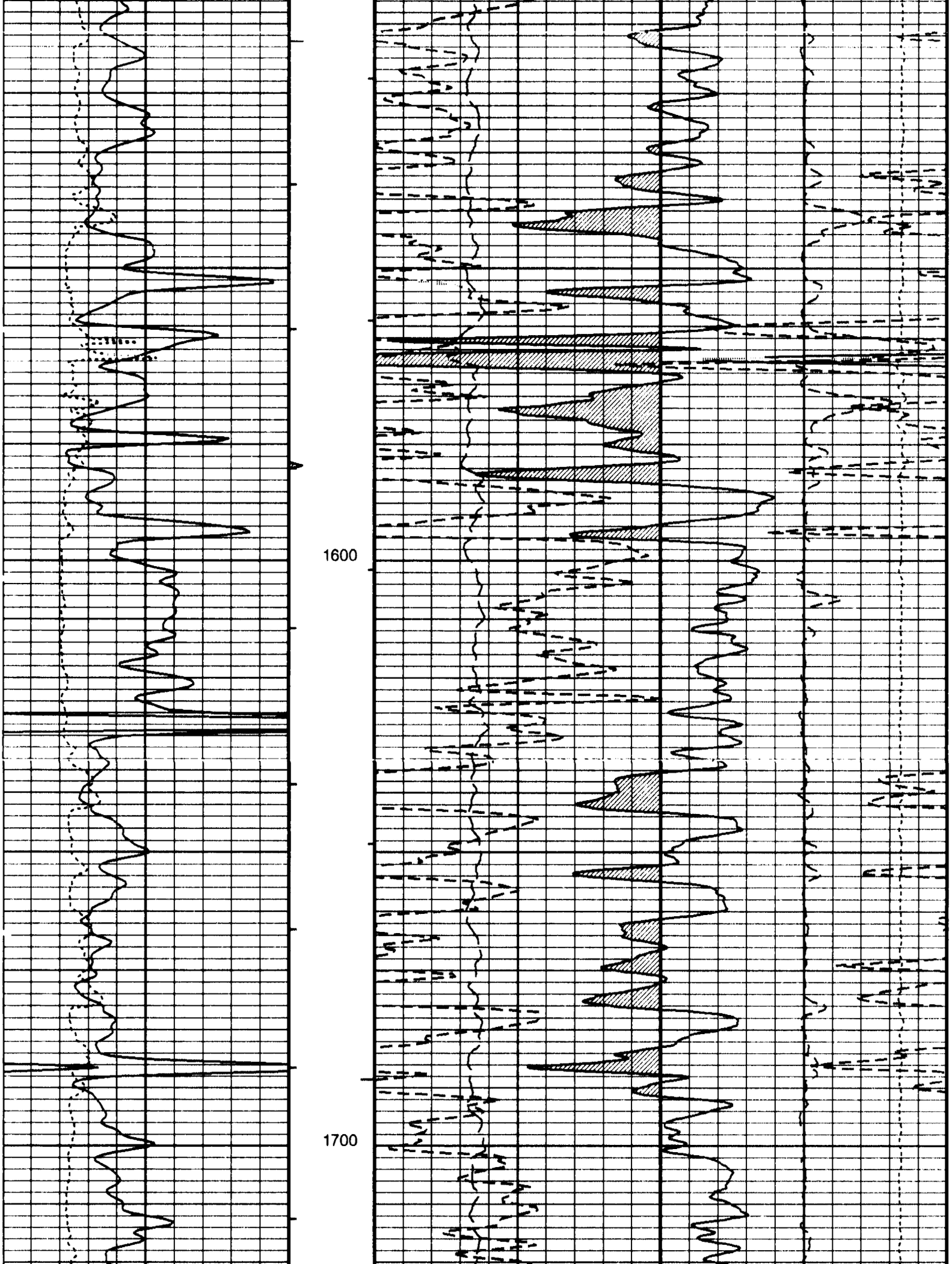
800
STIA
STIT
PEFZ
NPOR
HCAL
GR
TENS
HDRA


900
1000


1100
1200


1300
1400
1500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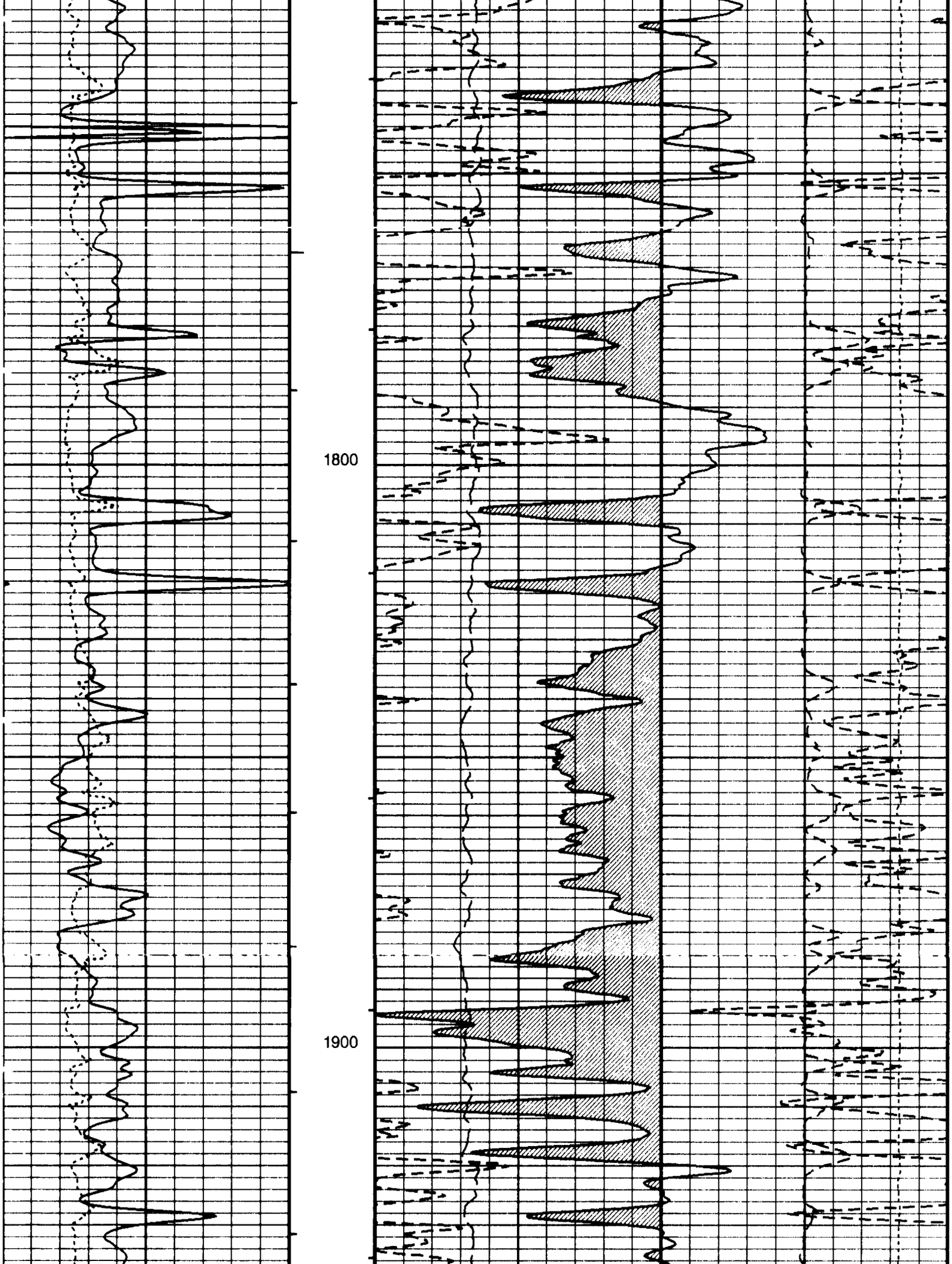
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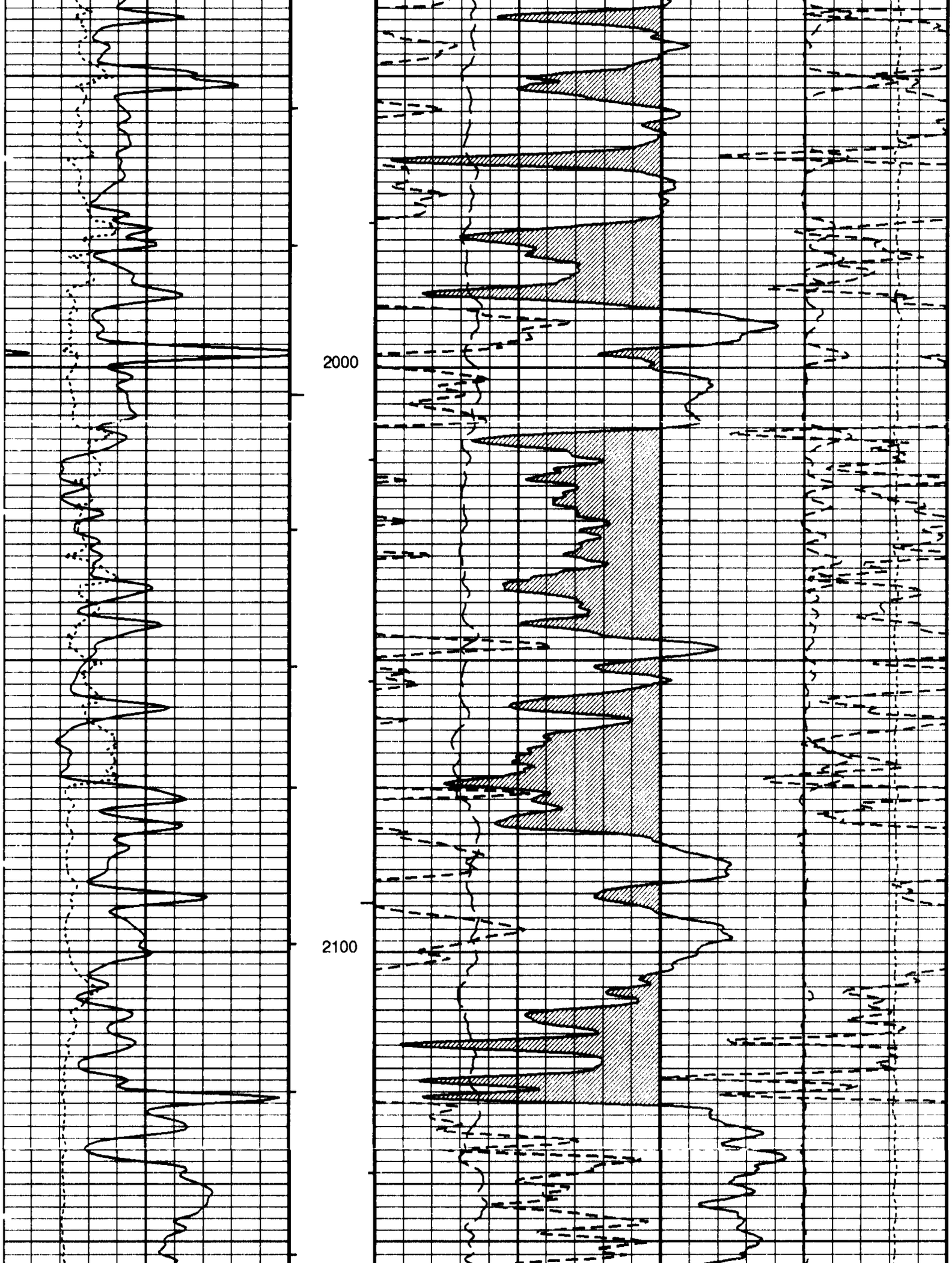
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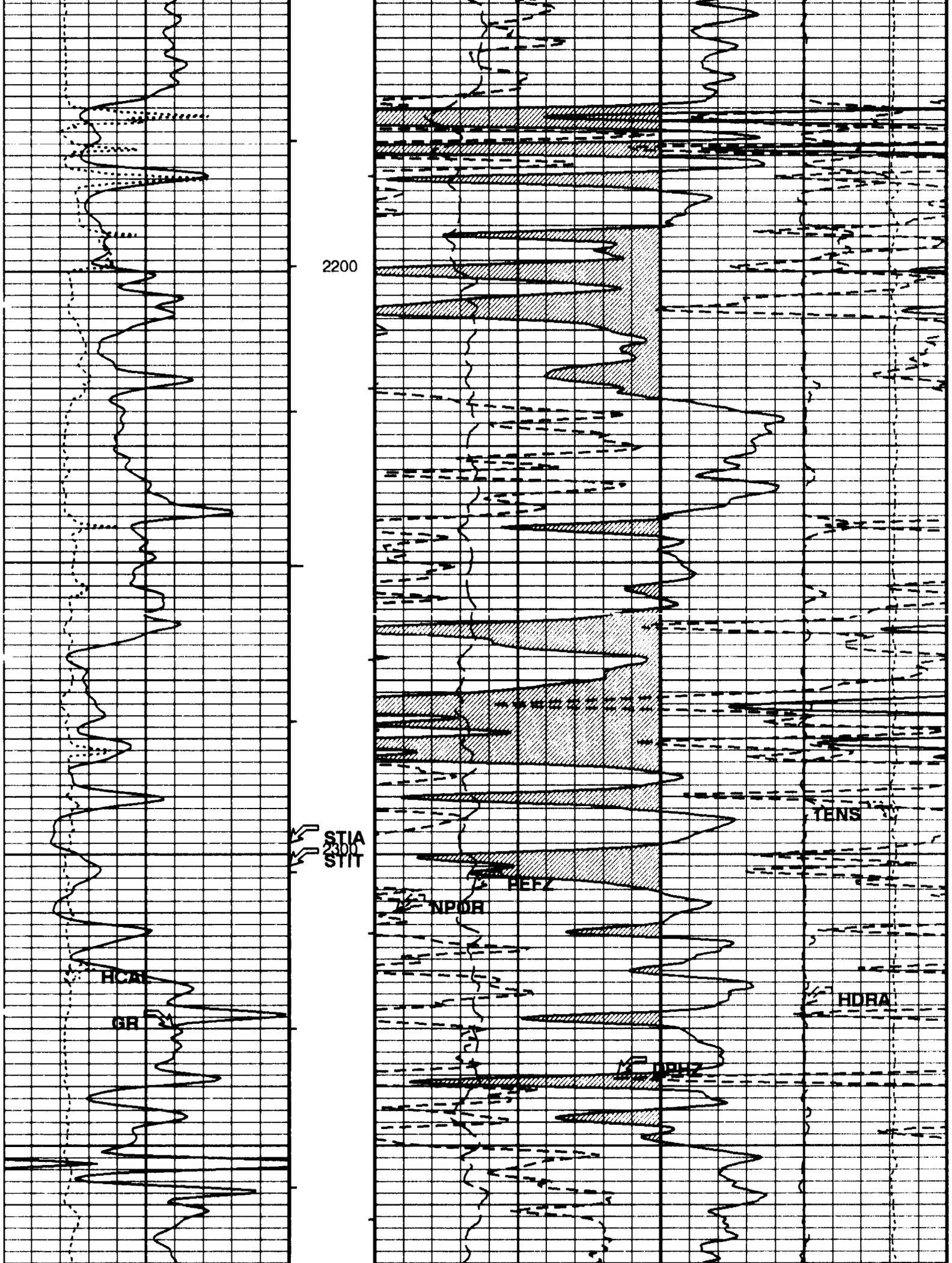
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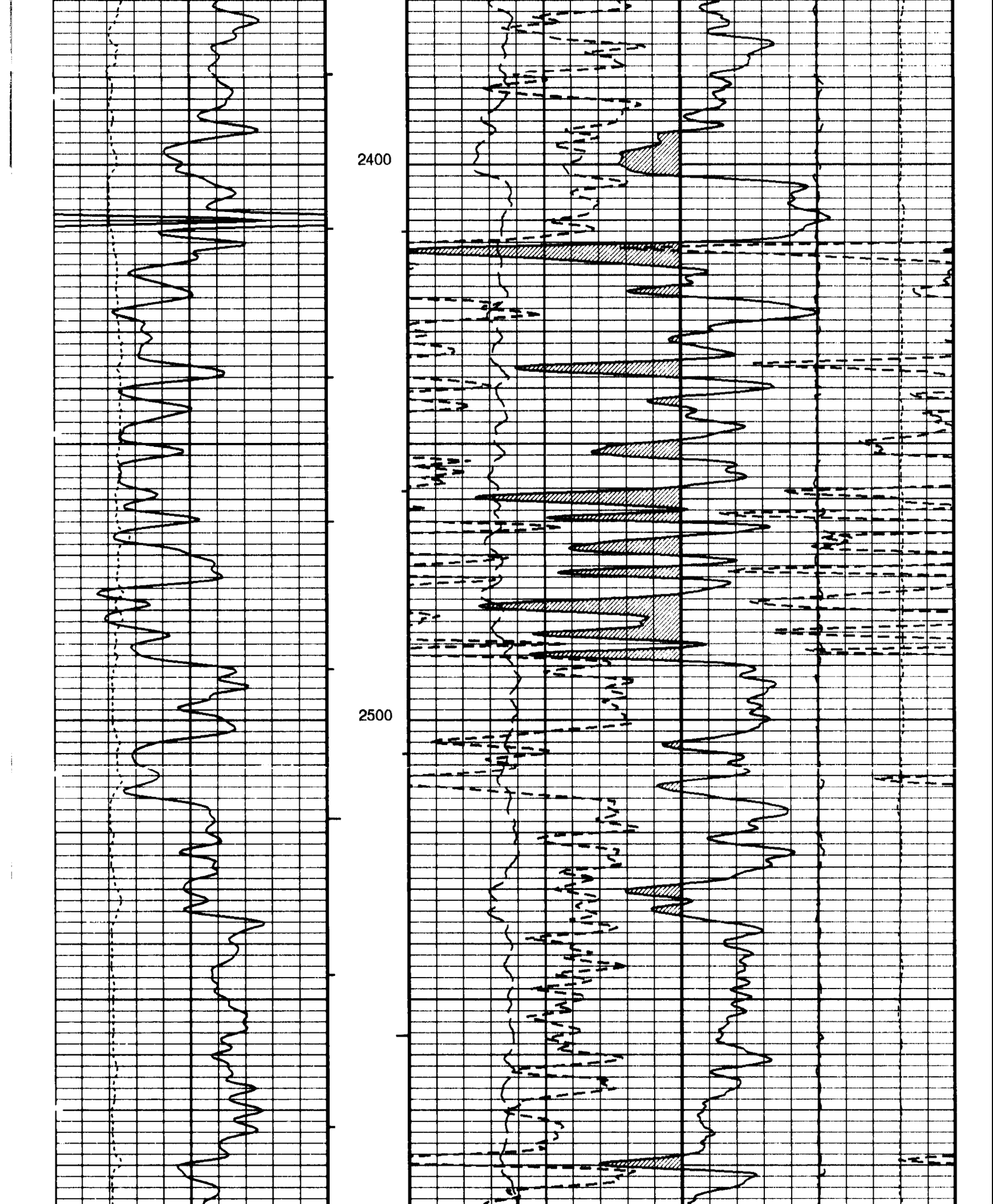
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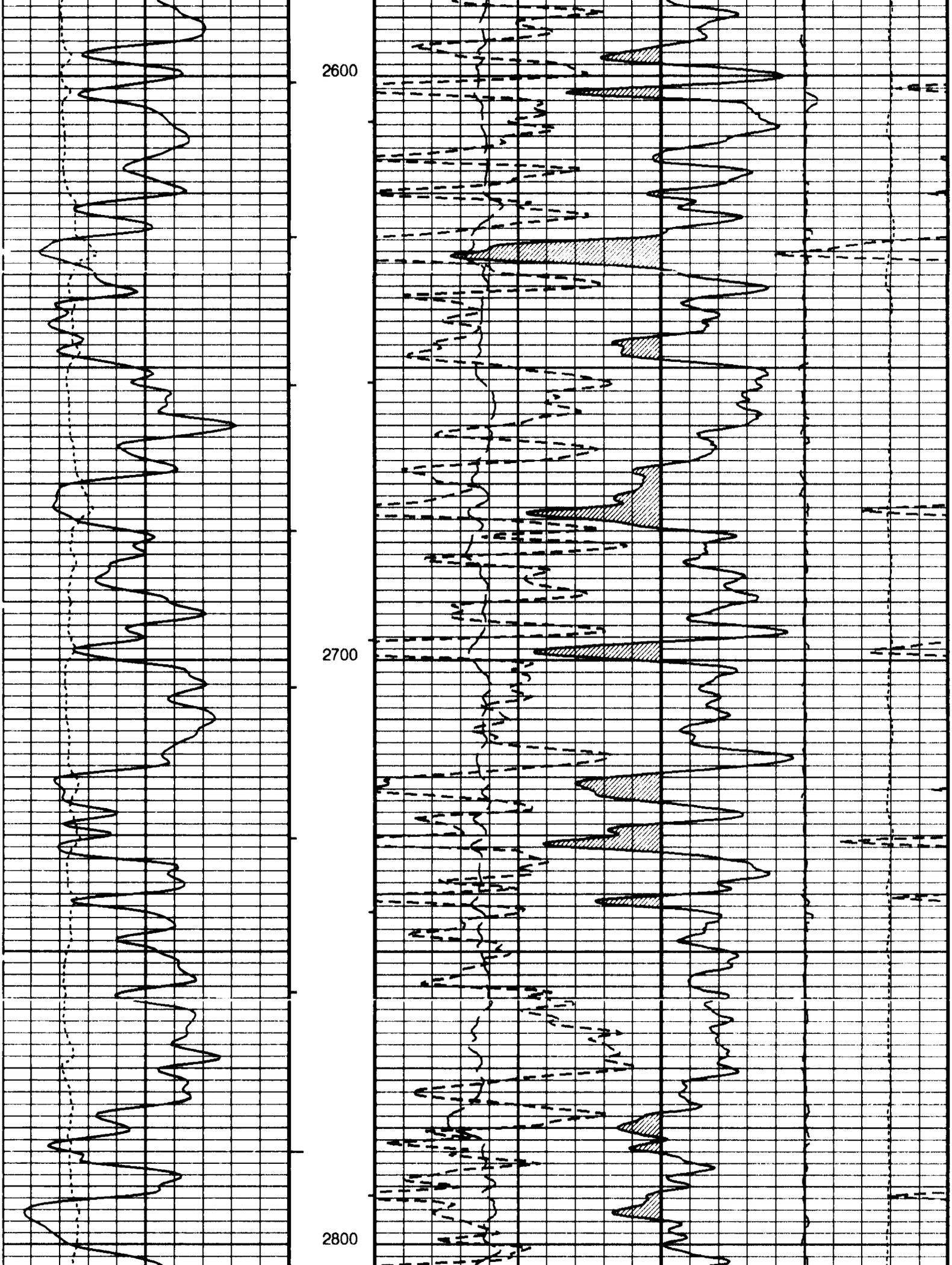
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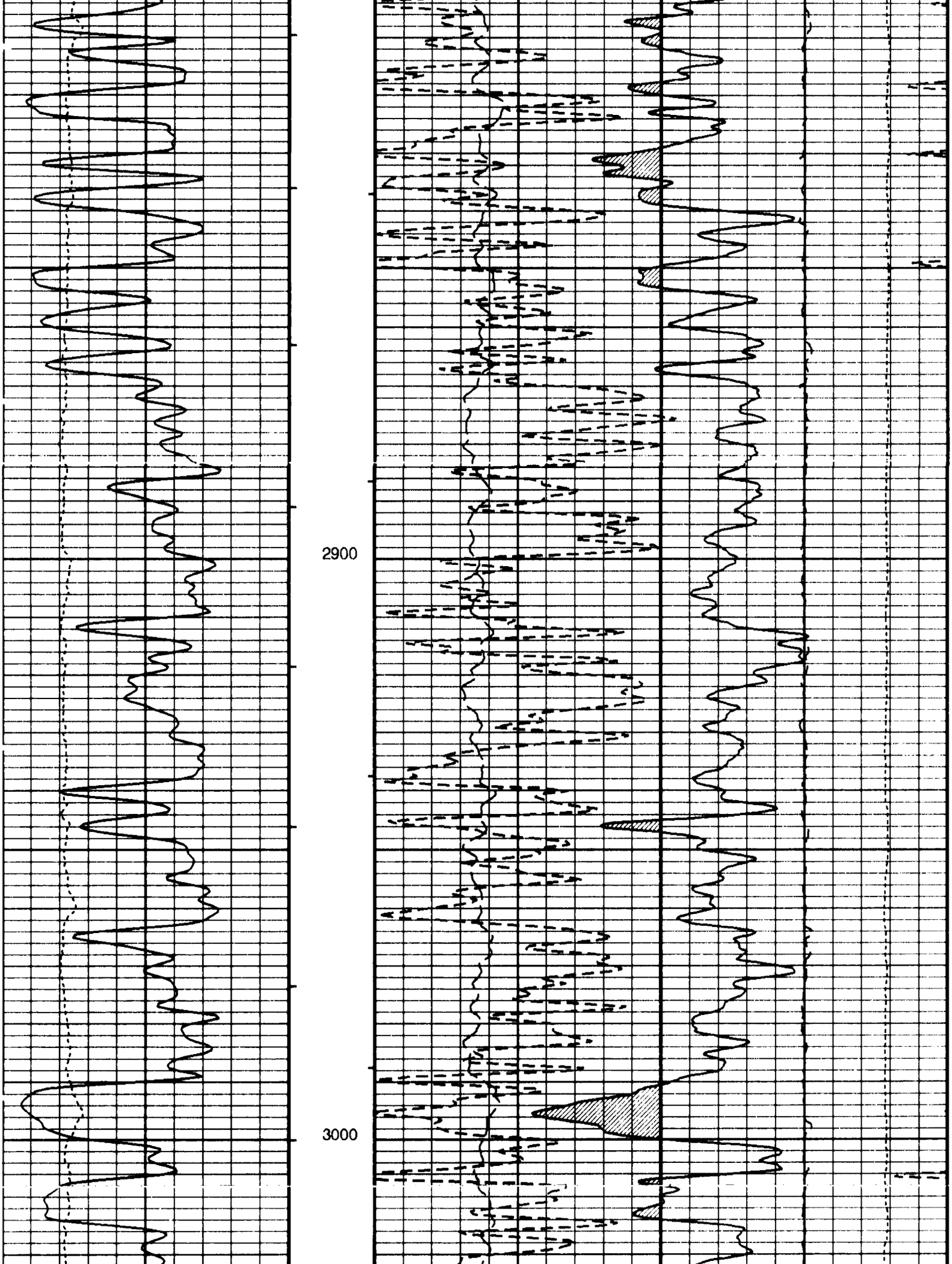
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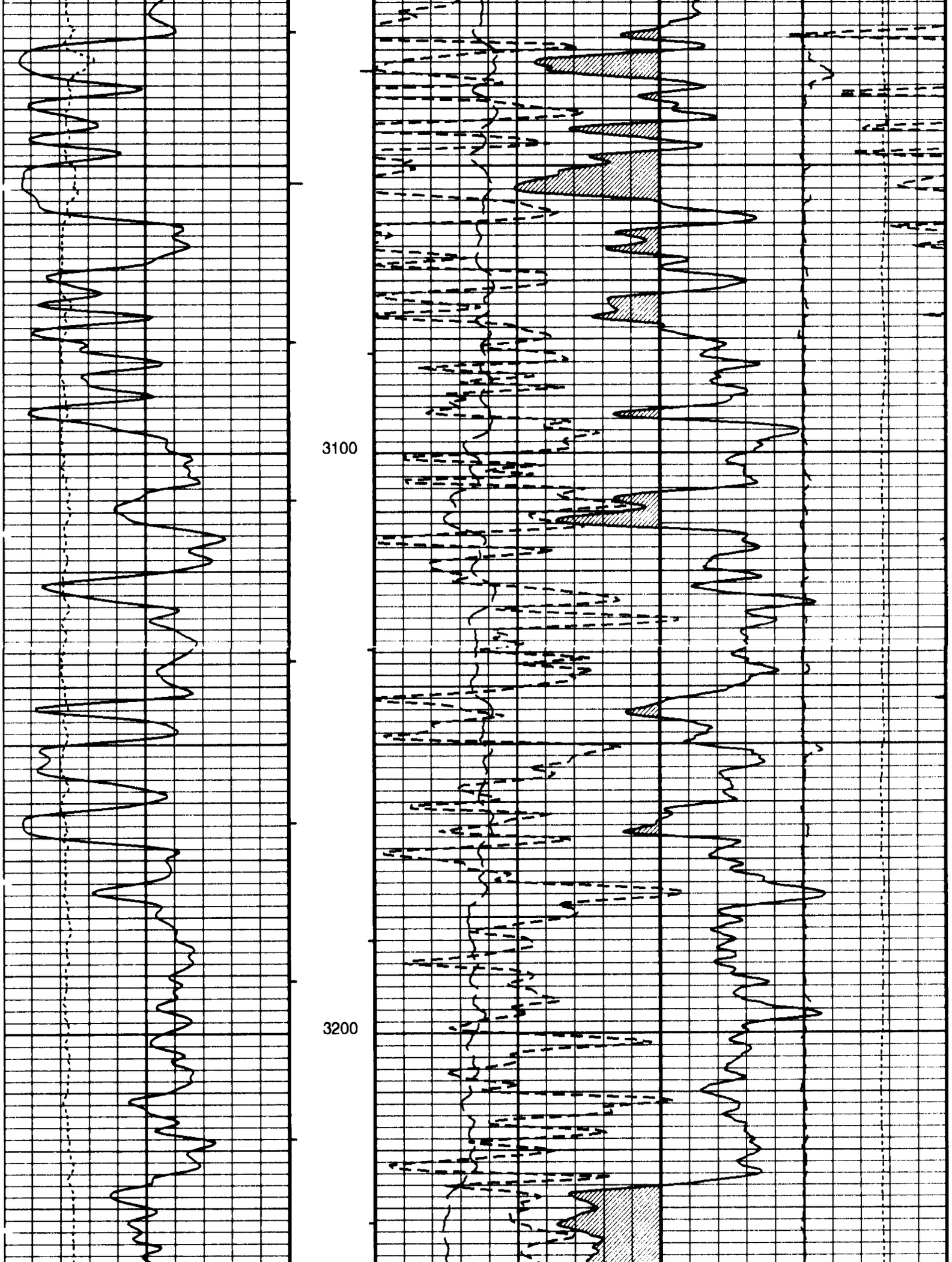
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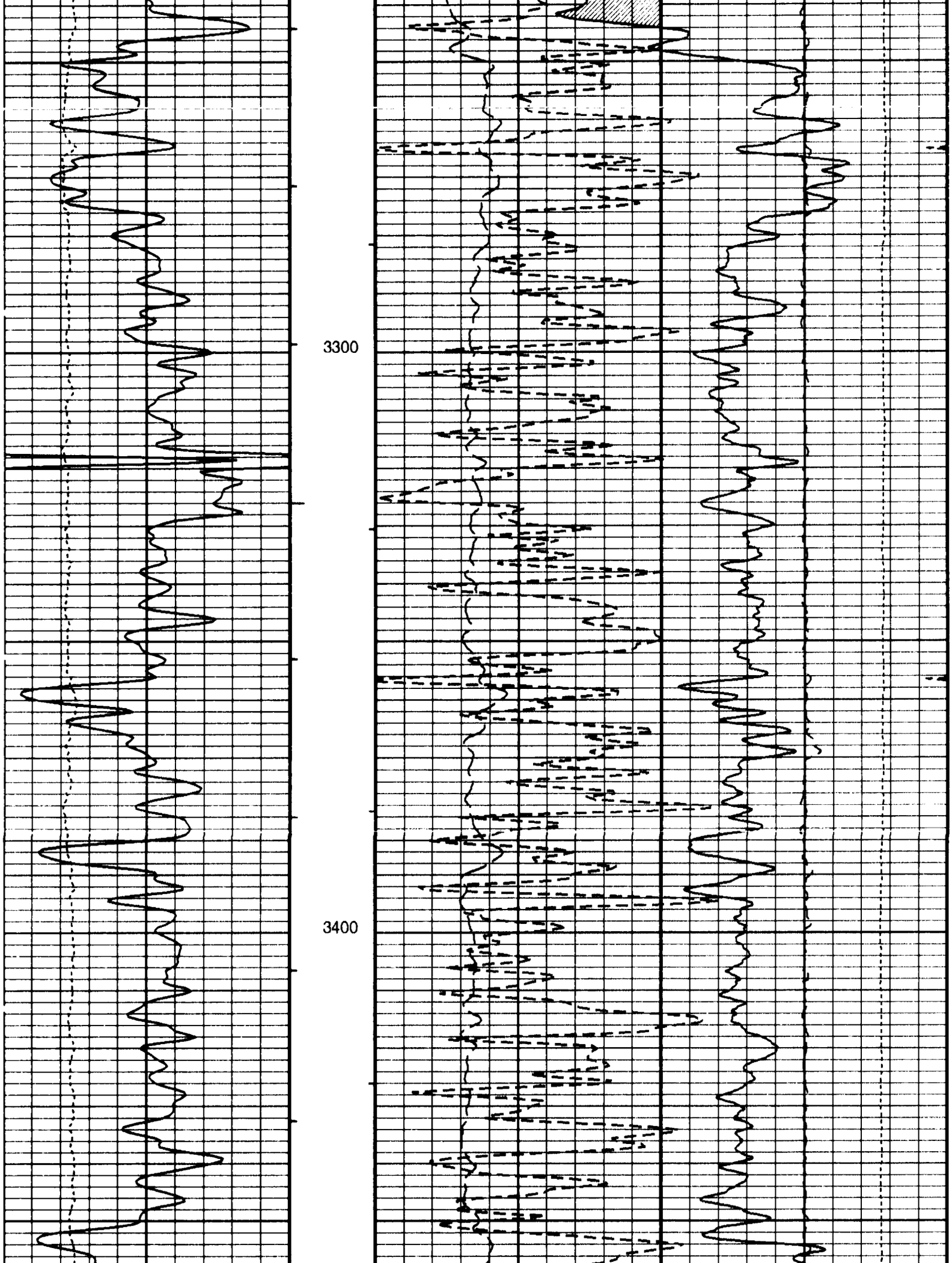
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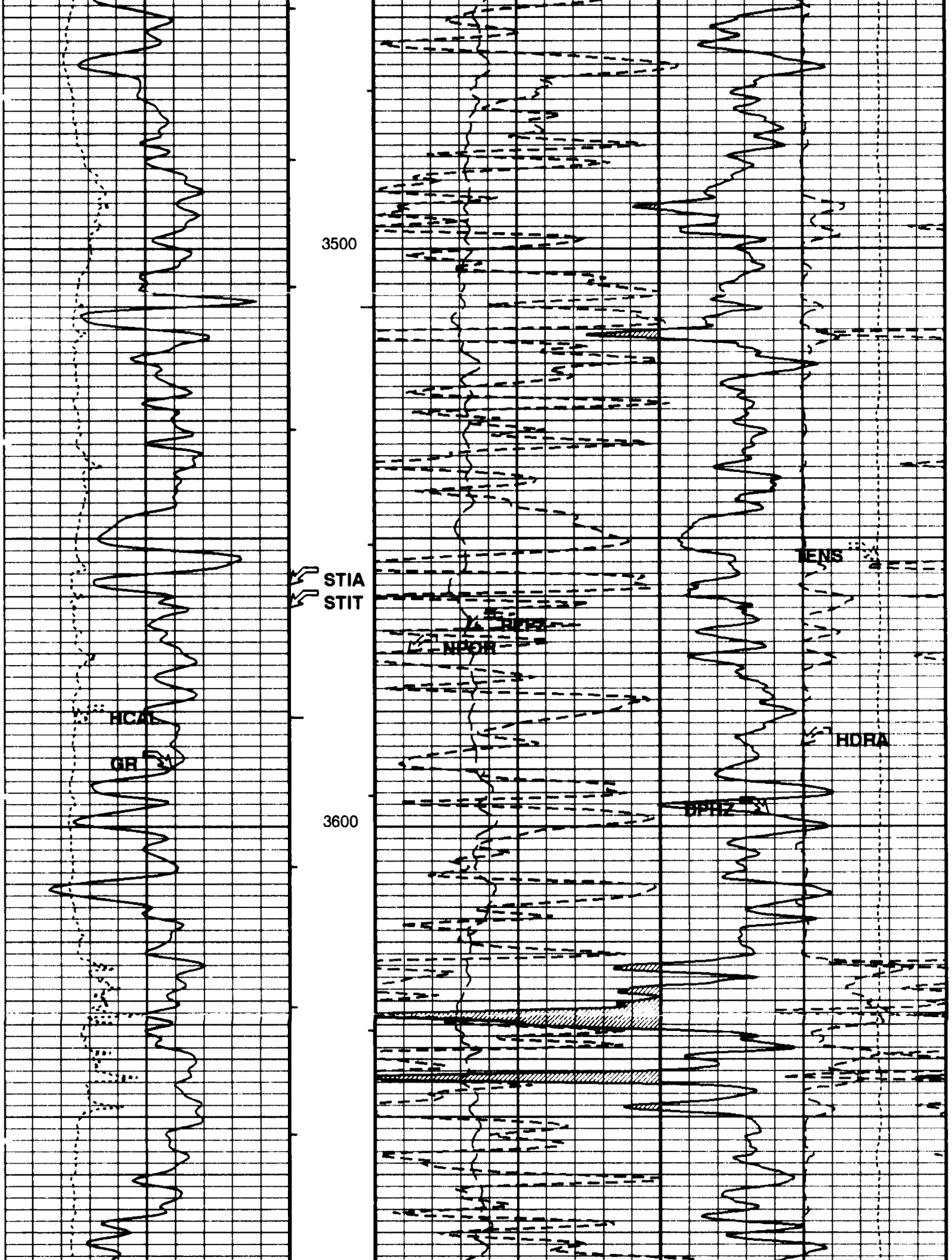
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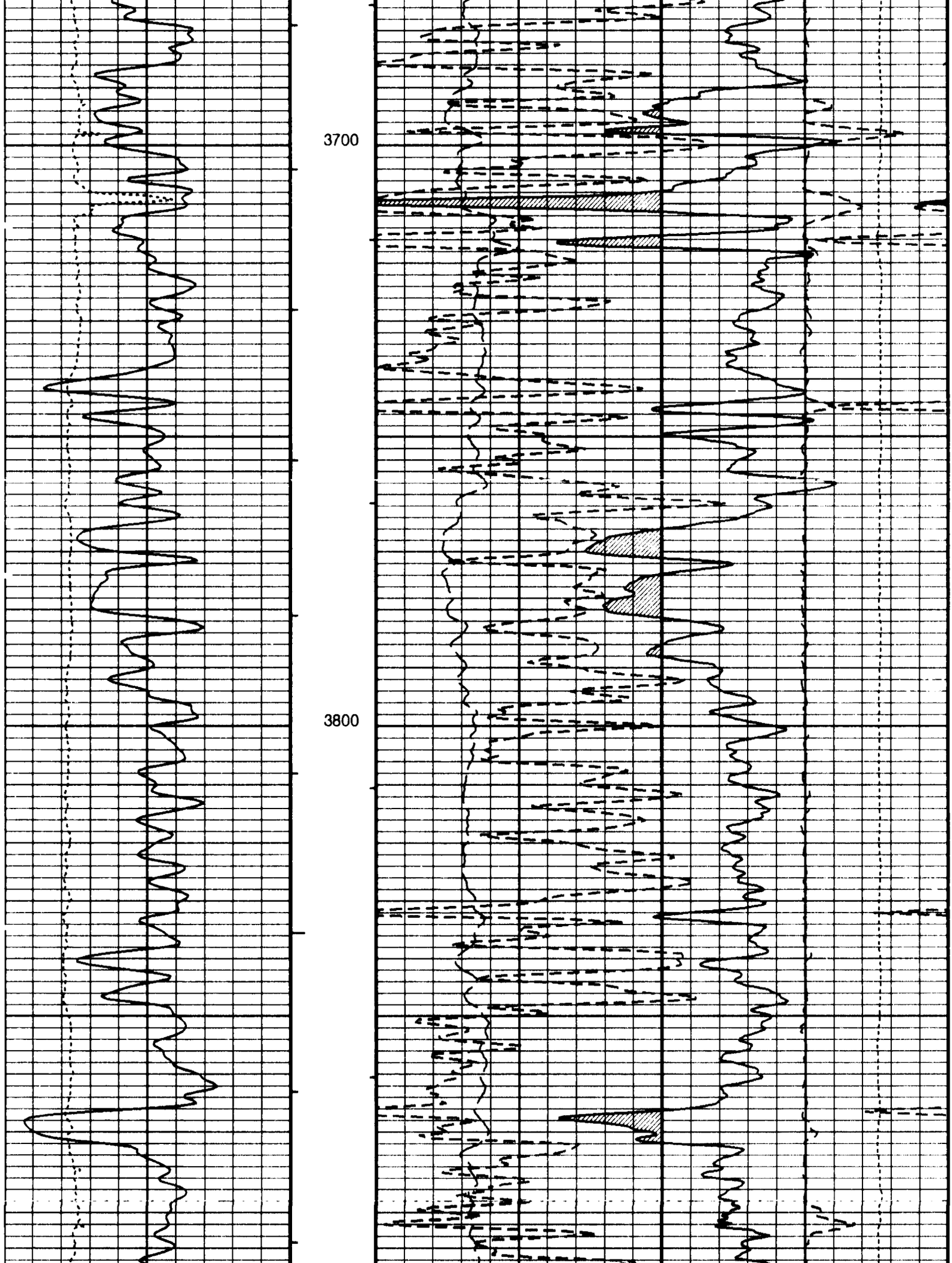
HCAL
GR
NPOR
TENS
HDRA
DPHZ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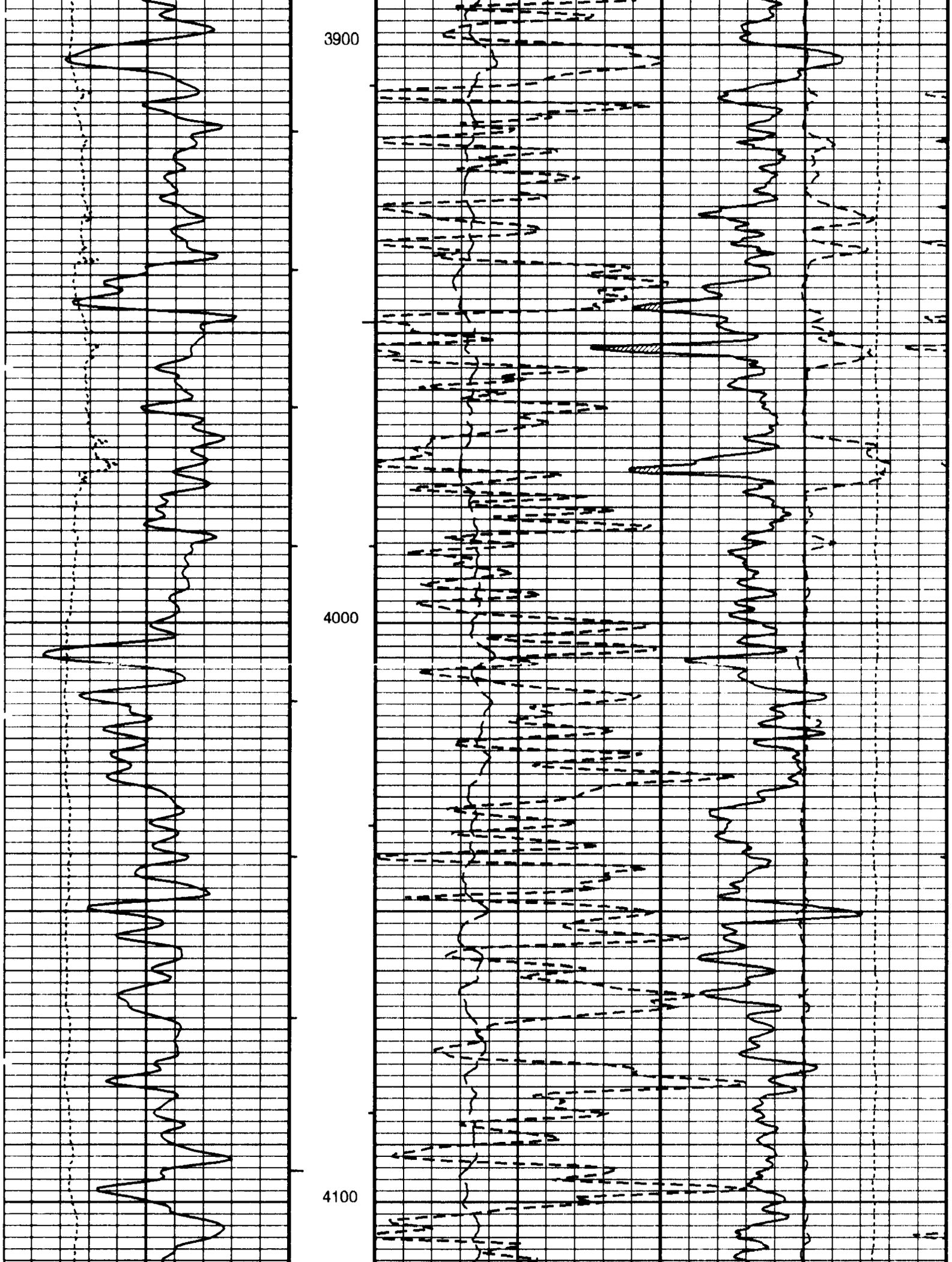
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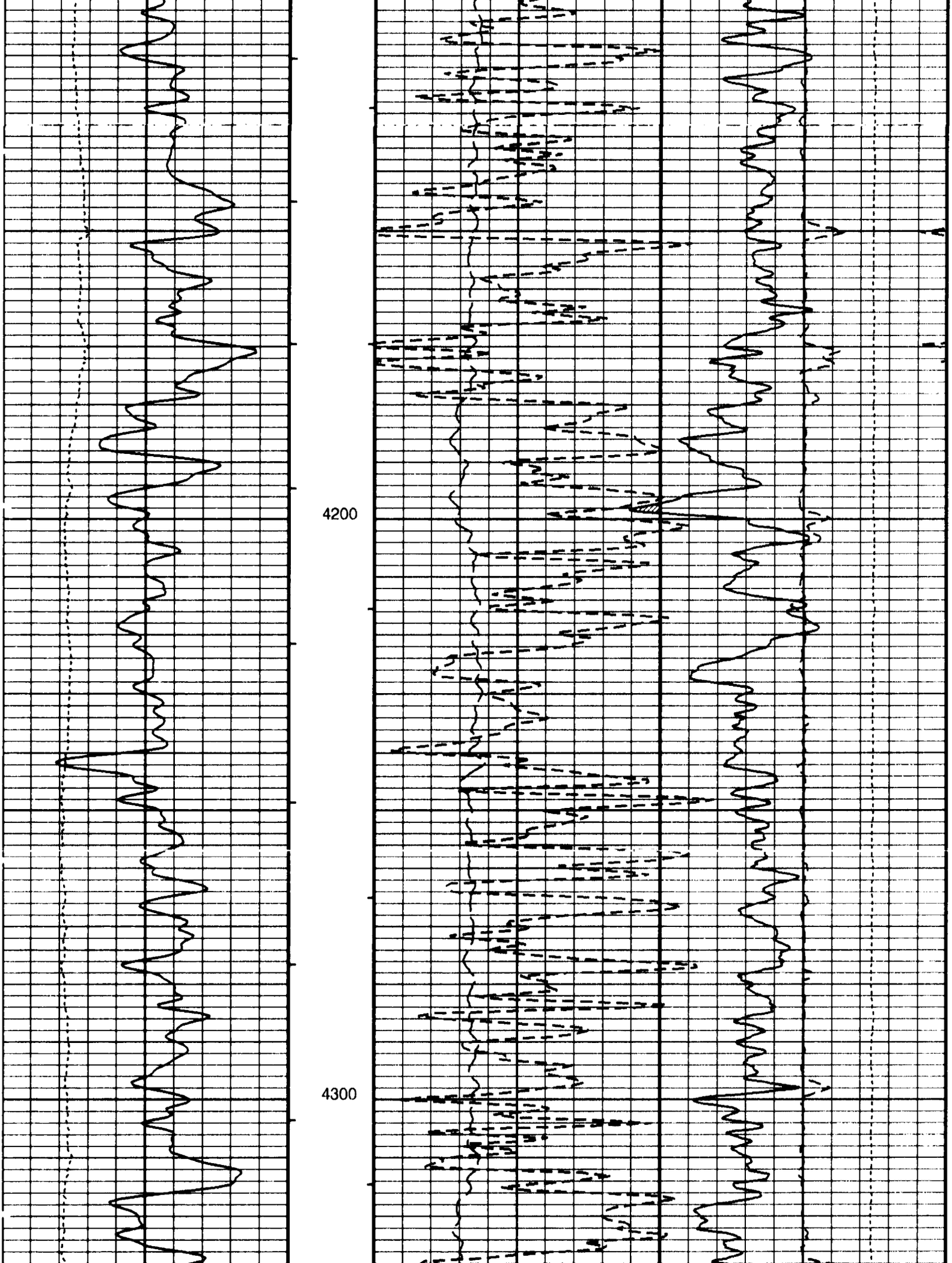
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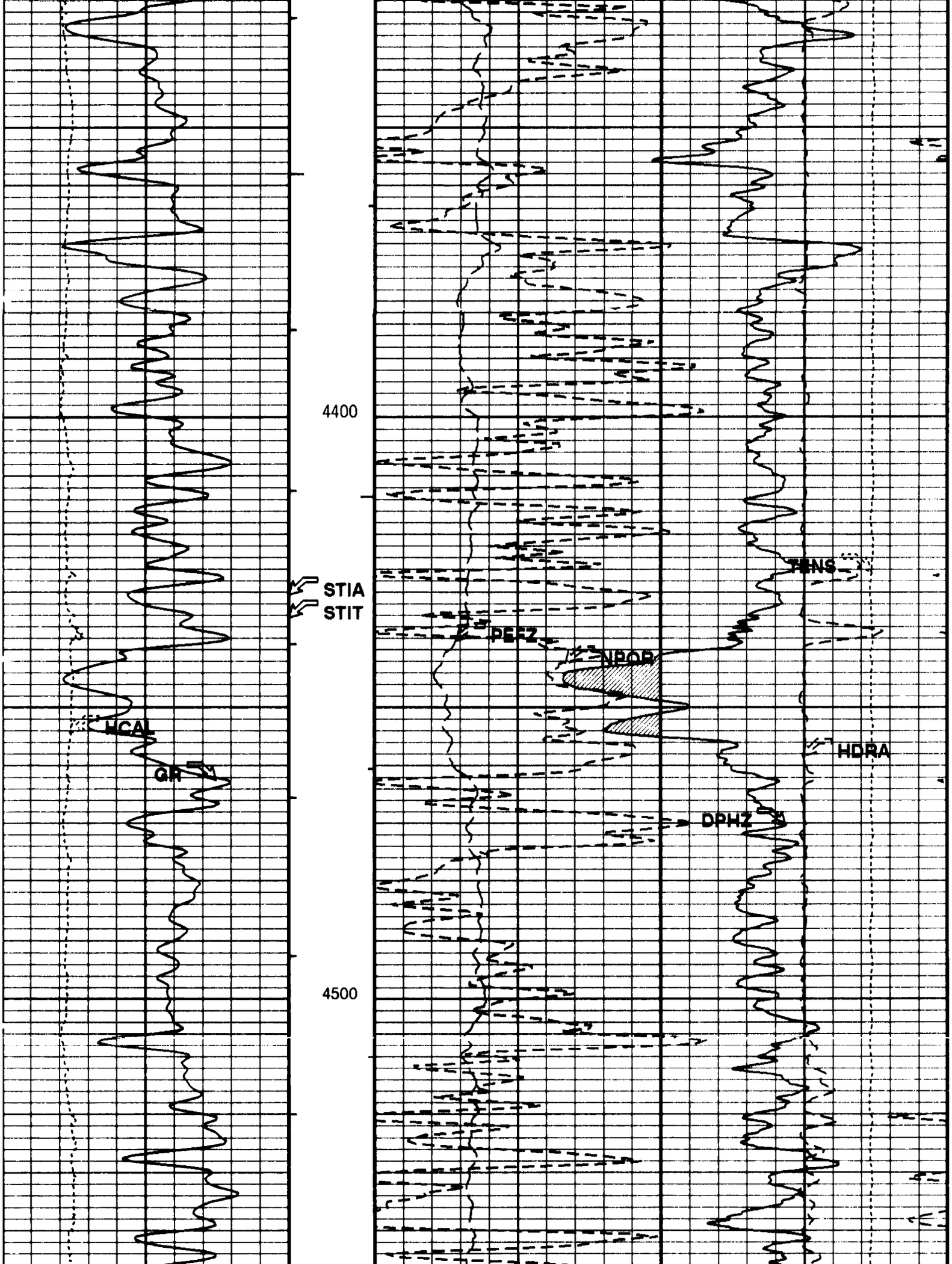
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GR
DPHZ
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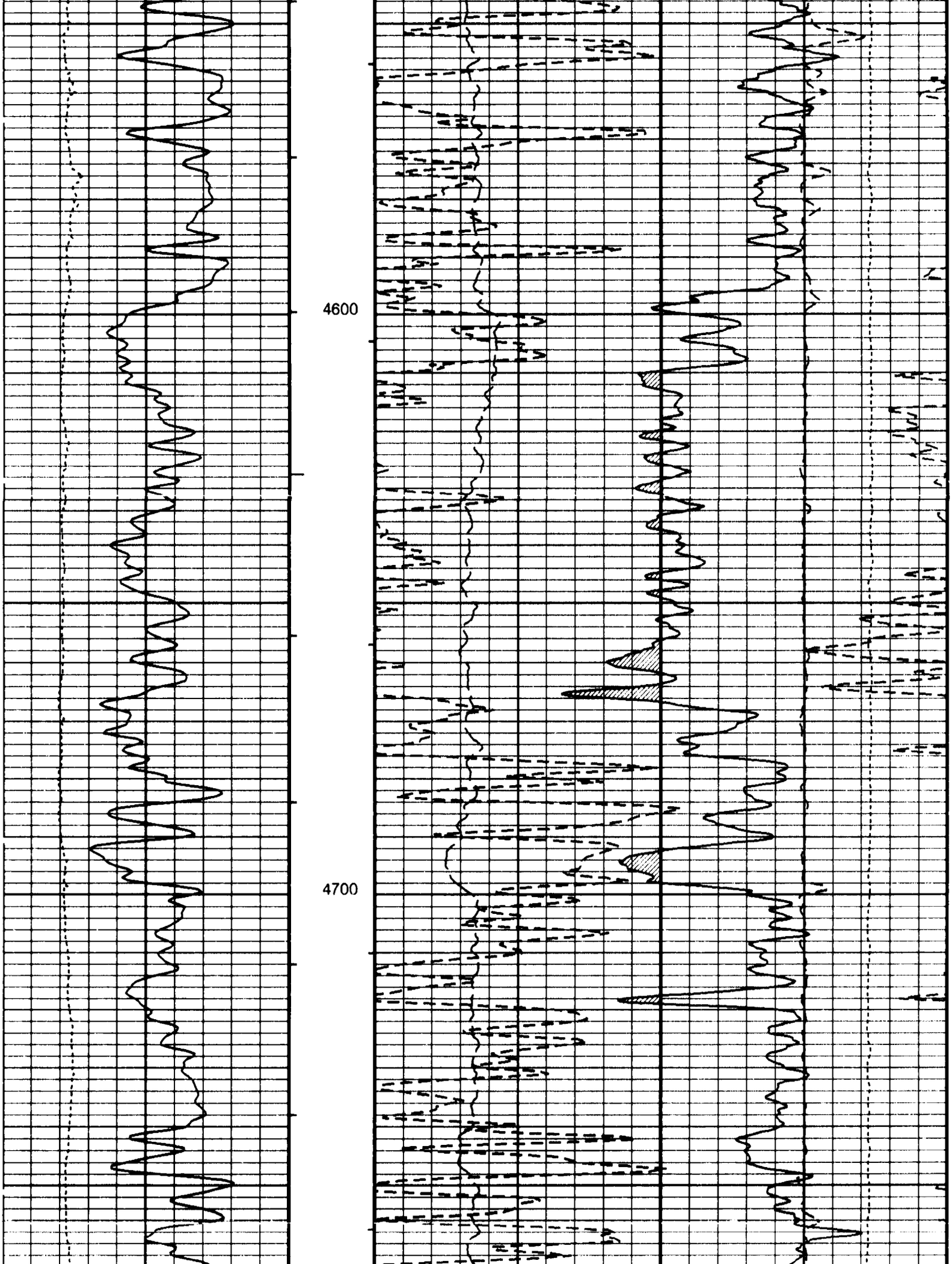
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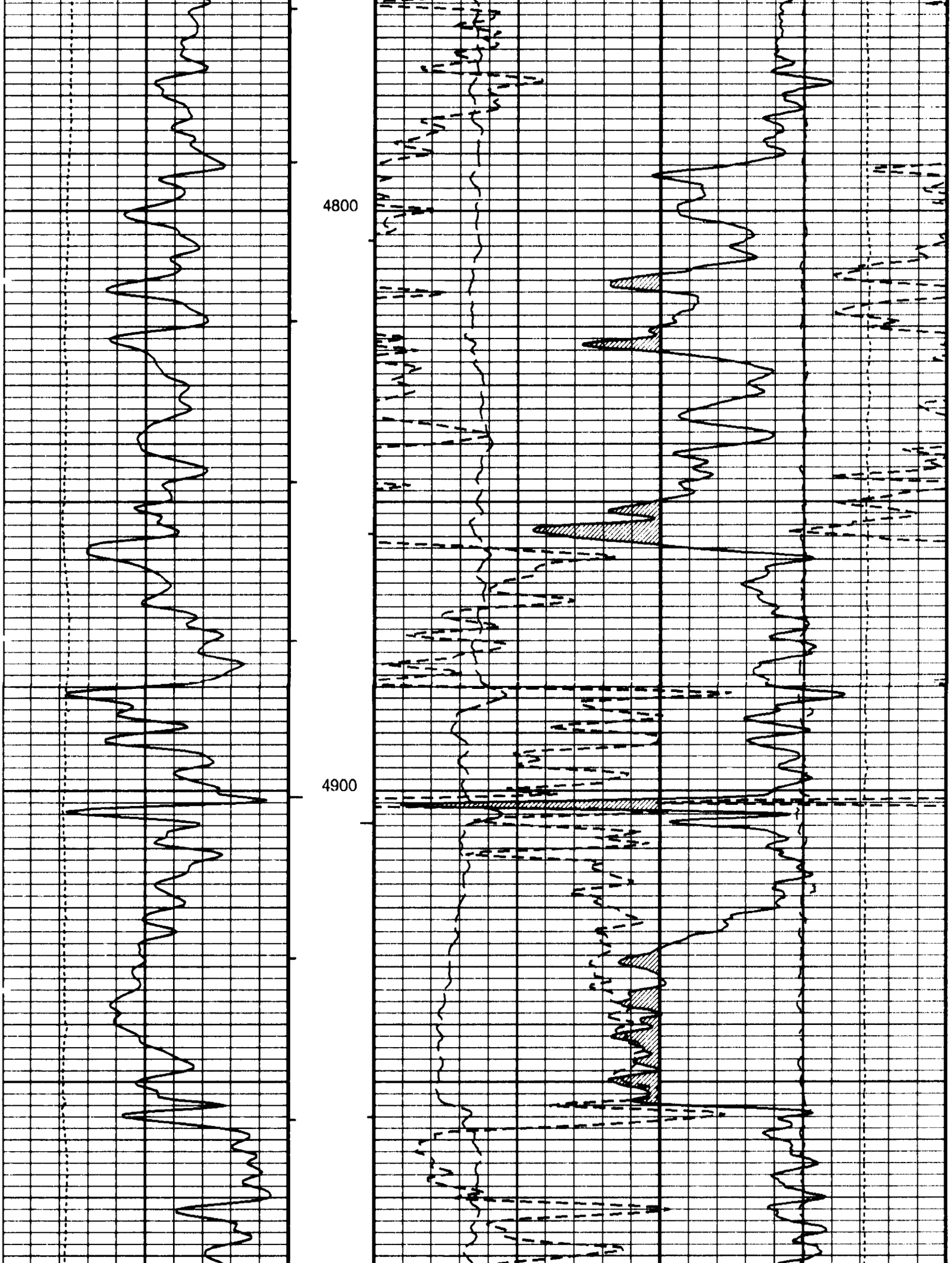
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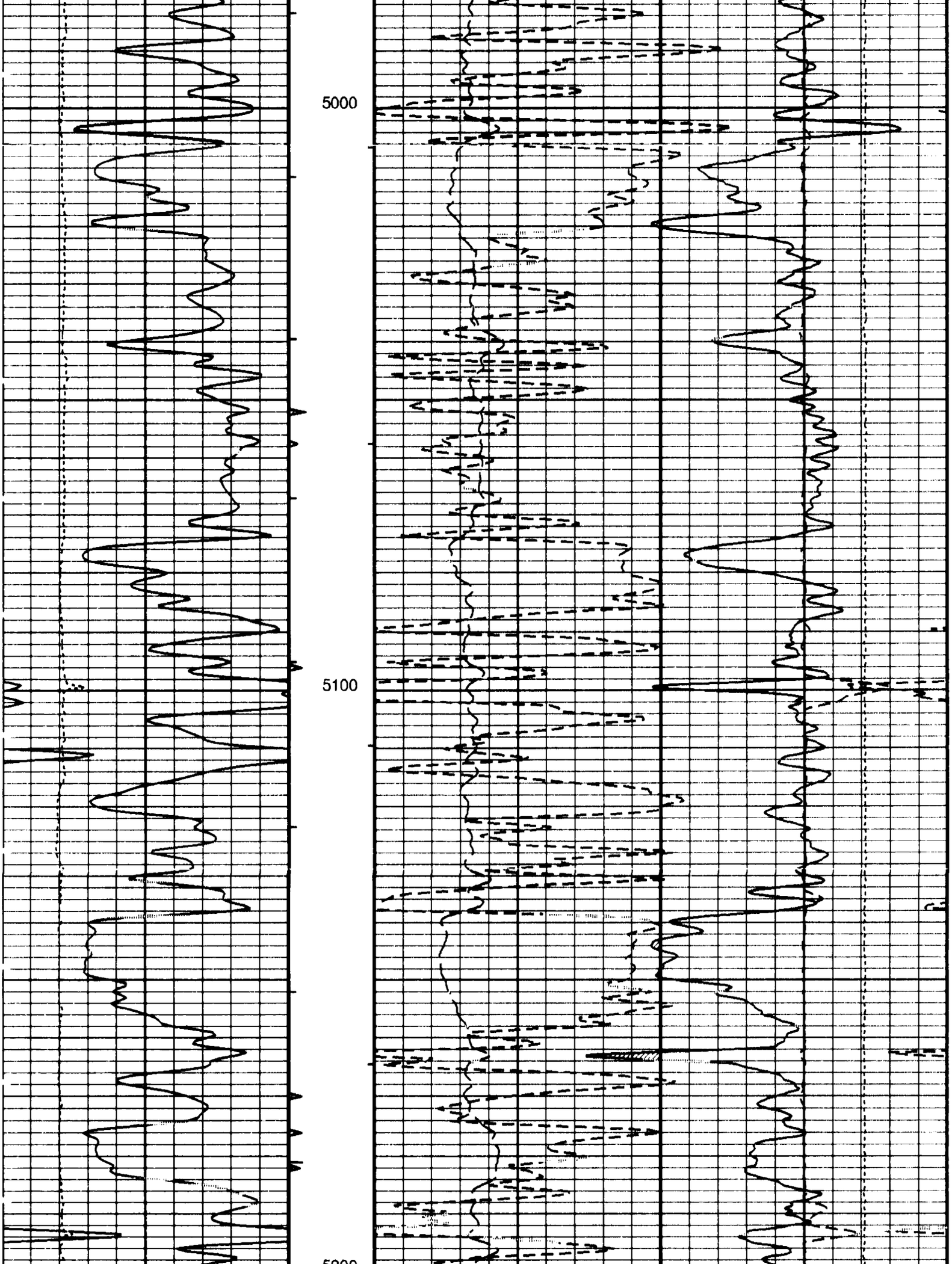
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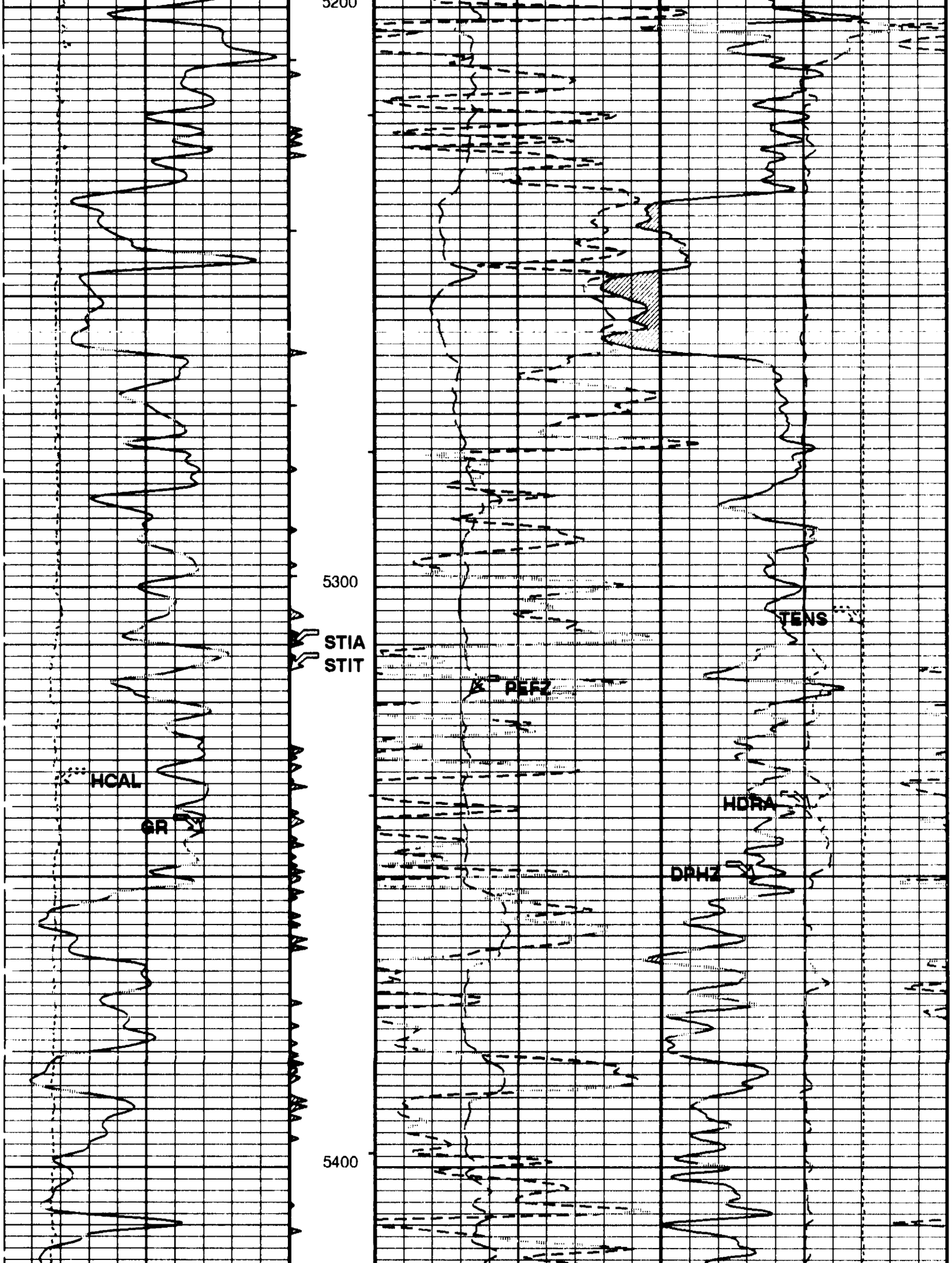
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GR
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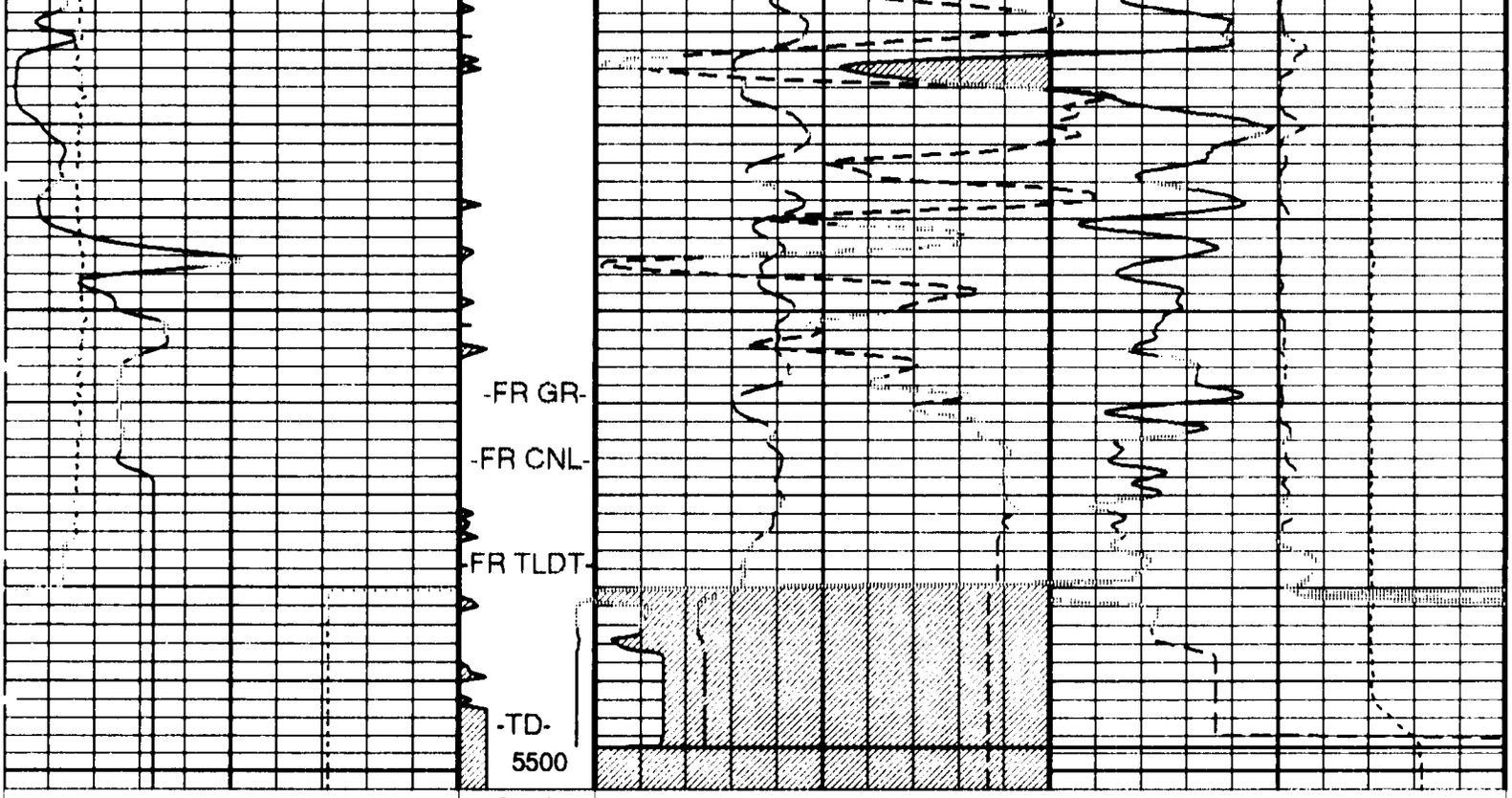
TENS
HDRA
DPHZ



Gamma Ray (GR)	Stuck Stretch (STIT)	Std. Res. Density Porosity (DPHZ)
0 (GAPI) 200	0 (F) 50	0.3 (V/V) -0.1

Caliper (HCAL)	Cable Drag From STIA to STIT	Alpha Processed Neutron Porosity (NPOR)
6 (IN) 16		0.3 (V/V) -0.1

	Tool/Tot. Drag From D3T to STIA	Std. Res. Formation Pe (PEFZ)	Density Correction (HDRA)
		0 (----) 10	-0.25 (G/C3) 0.25

	Std. Res. Density Standoff (DSOZ) (IN)	GAS EFFECT From DPHZ to NPOR
MAIN PASS	2.5 0.5	

DPHZ >= 10 p.u. From DPHZ to SpareConstant	Tension (TENS)
	10000 (LBF) 0

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BHFL	Borehole Fluid Type	WATER	
BHS	Bore Hole Status	OPEN	
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	2600.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.30	LB/G

DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MST	Mud Sample Temperature	48.00	DEGF
MWCO	Mud Weight Correction Option	NO	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
STKT	STI Stuck Threshold	2.5	FT

Format: PORO Vertical Scale: 5" per 100' Graphics File Created: 30-MAR-1998 20:28

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Input DLIS Files

DEFAULT	HILTC .007	FN:4	FIELD	30-MAR-1998 20:11	5502.0 FT	5062.5 FT

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Integrated Hole/Cement Volume Summary

Hole Volume = 140.44 F3

Cement Volume = 68.43 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

REPEAT ANALYSIS

TENS_REP Curve (TENS_REP)

10000 (LBF) 0

HDRA_REP Curve (HDRA_REP)

-0.25 (G/C3) 0.25

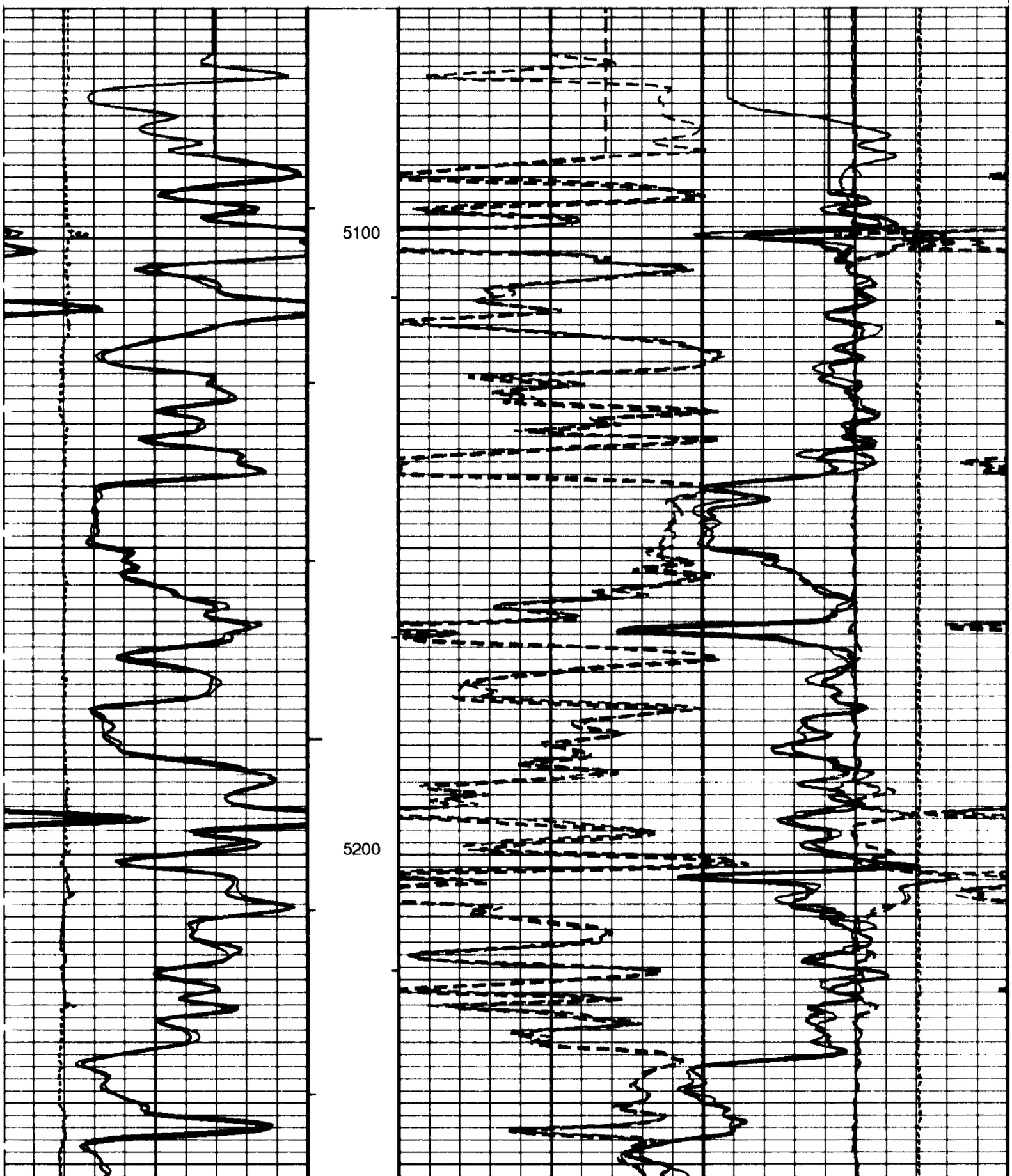
GAS EFFECT
From DPHZ to NPOR

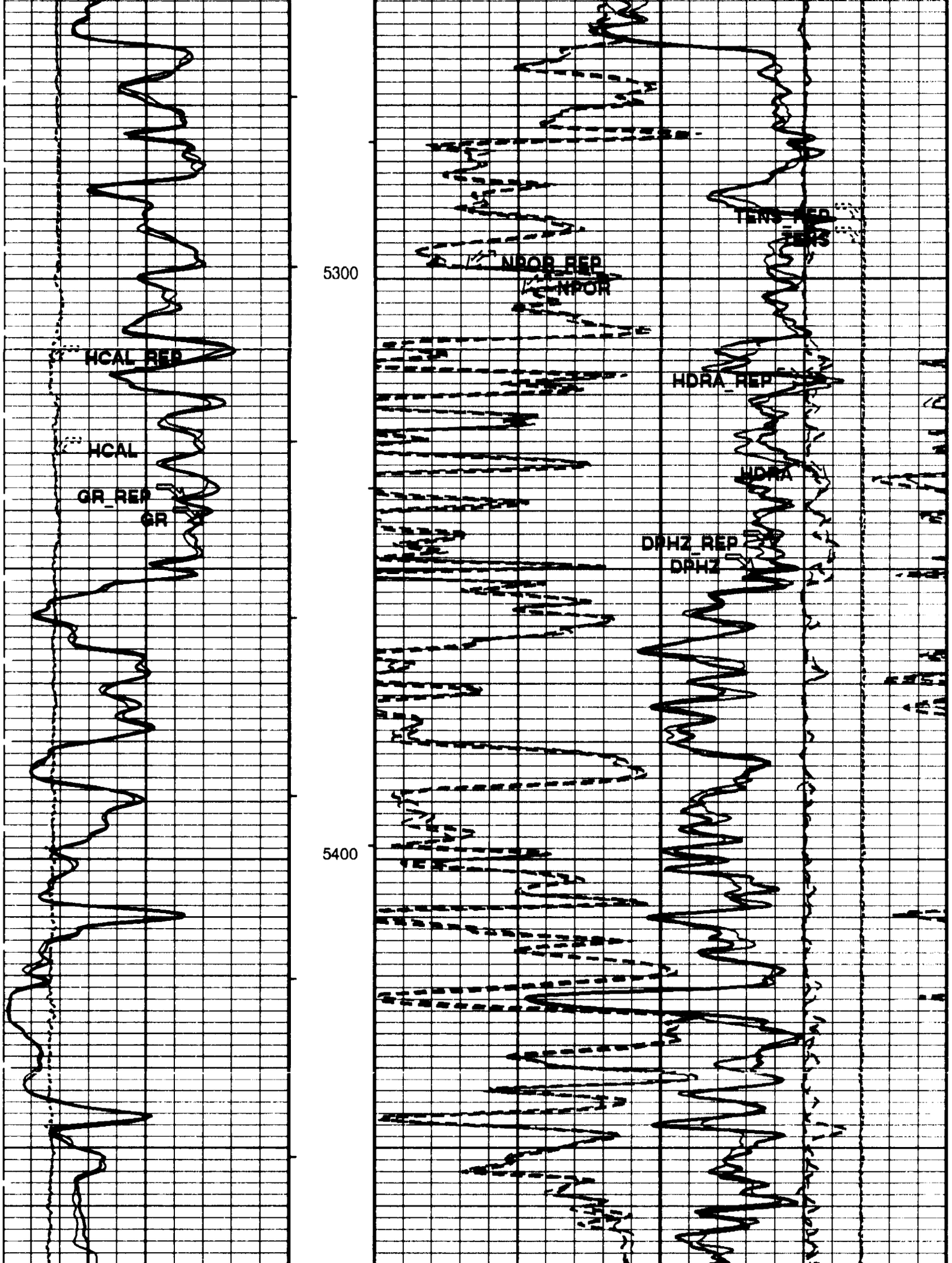
HCAL_REP Curve (HCAL_REP)
6 (IN) 16

GR_REP Curve (GR_REP)
0 (GAPI) 200

NPOR_REP Curve (NPOR_REP)
0.3 (V/V) -0.1

DPHZ_REP Curve (DPHZ_REP)
0.3 (V/V) -0.1




HCAL_REP
HCAL
GR_REP
GR
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NPOR
TENS_REP
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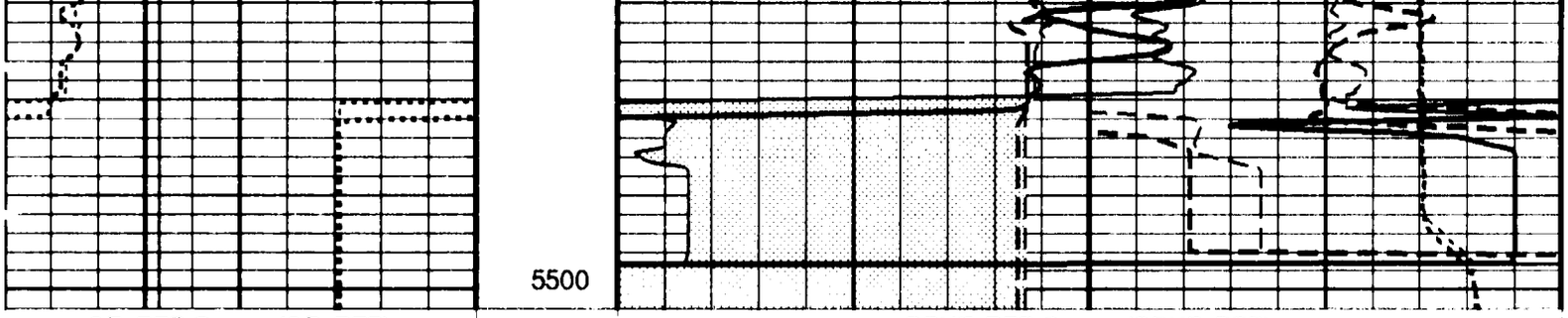
HDRA
DPHZ_REP
DPHZ



GR_REP Curve (GR_REP)
0 (GAPI) 200

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

DPHZ_REP Curve (DPHZ_REP)
0.3 (V/V) -0.1

NPOR_REP Curve (NPOR_REP)
0.3 (V/V) -0.1

GAS EFFECT
From DPHZ to NPOR

REPEAT ANALYSIS

HDRA_REP Curve (HDRA_REP)
-0.25 (G/C3) 0.25

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- *Integrated Cement Volume Minor Pip Every 10 F3*
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BHFL	Borehole Fluid Type	WATER	
BHS	Bore Hole Status	OPEN	
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	2600.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MST	Mud Sample Temperature	48.00	DEGF
MWCO	Mud Weight Correction Option	NO	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	

Format: PORO_REP Vertical Scale: 5" per 100' Graphics File Created: 30-MAR-1998 20:28

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Input DLIS Files

DEFAULT	HILTC .007	FN:4	FIELD	30-MAR-1998 20:11	5502.0 FT	5062.5 FT

Output DLIS Files

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Integrated Hole/Cement Volume Summary

Hole Volume = 1951.77 F3

Cement Volume = 1104.84 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
BHT	120 DEGF	135 DEGF	5304.3 20:30:52
	118 DEGF	120 DEGF	5343.1 20:31:08

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- *Integrated Cement Volume Major Pip Every 100 F3*

Time Mark Every 60 S

MAIN PASS

SANDSTONE MATRIX: 2.68 G/CO

Tension (TENS) 10000 (LBF) 0

Density Correction (HDRA) -0.25 (G/C3) 0.25

Dolomite/Shale From RHT1 to MP3

Quartz From MP2 to RHT1

Calcite From MP3 to MP2

Tool/Tot. Drag From D3T to STIA

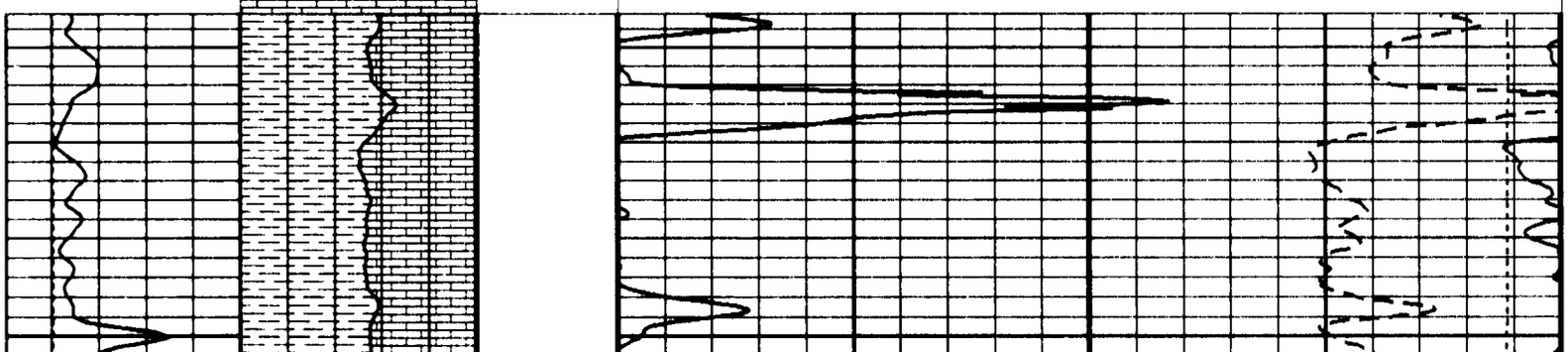
Stuck Stretch (STIT) 0 (F) 50

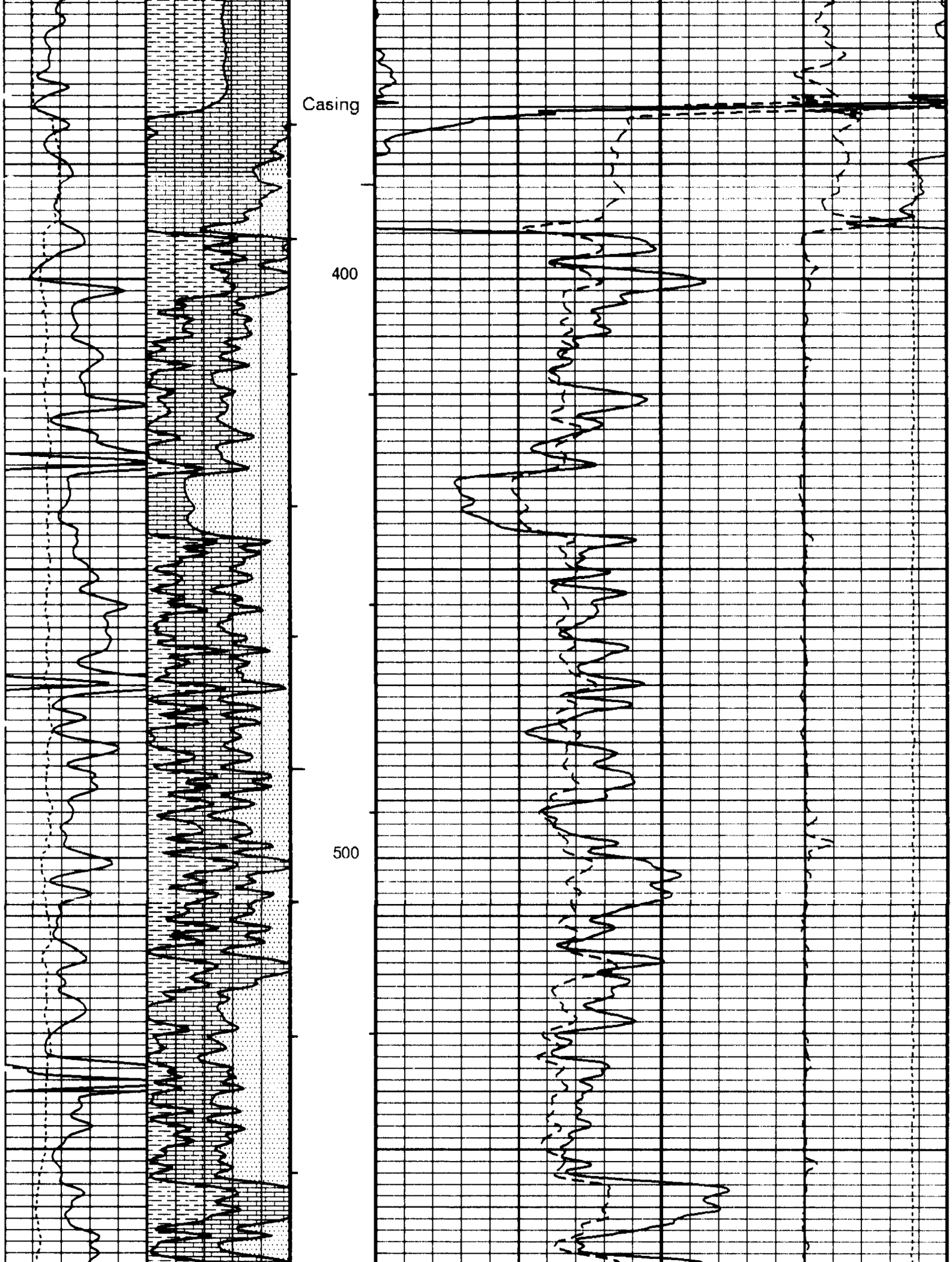
Caliper (HCAL) 6 (IN) 16

Gamma Ray (GR) 0 (GAPI) 200

Std. Res. Formation Density (RHOZ) 2 (G/C3) 3

Std. Res. Formation Pe (PEFZ) 0 (----) 10




Casing
400
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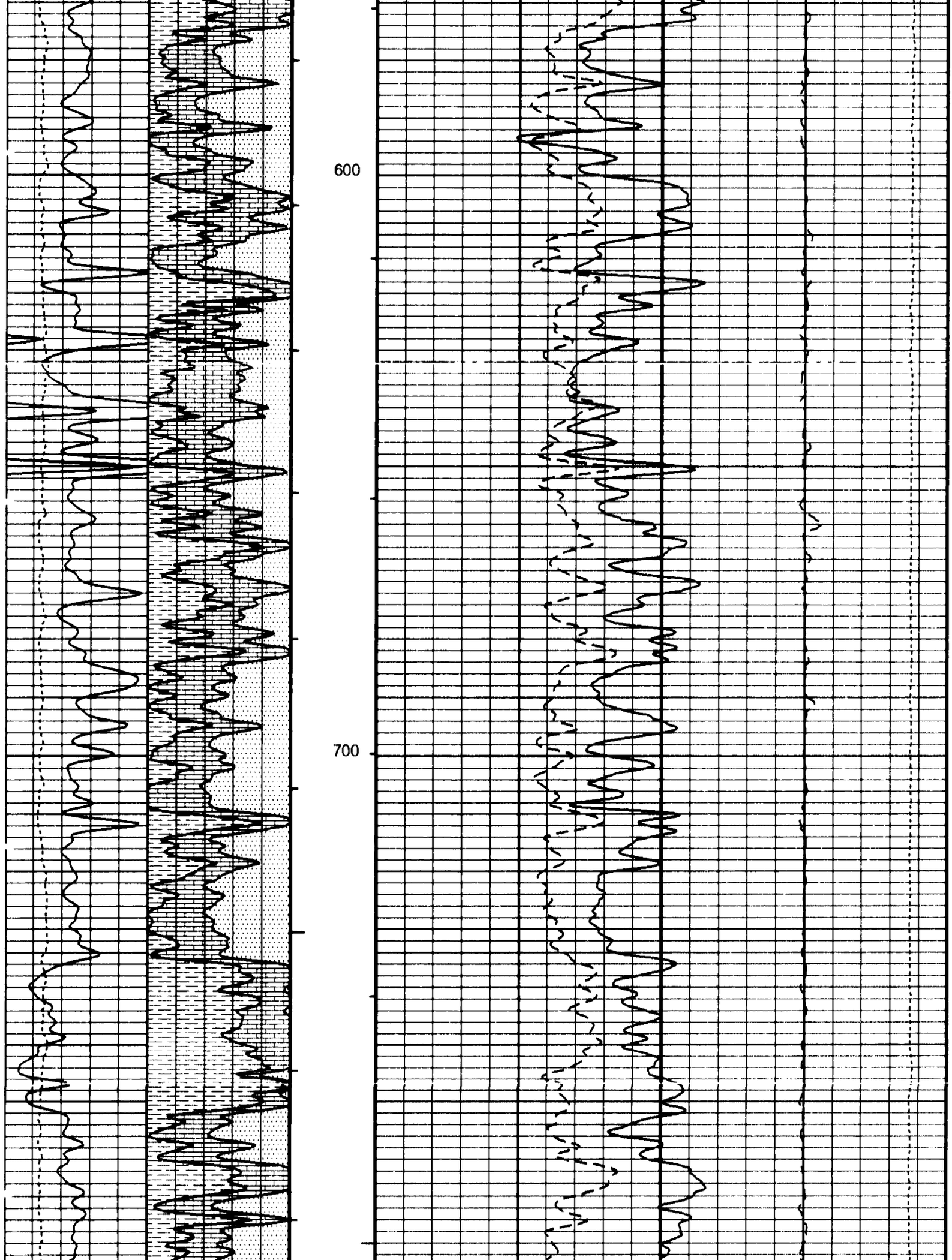
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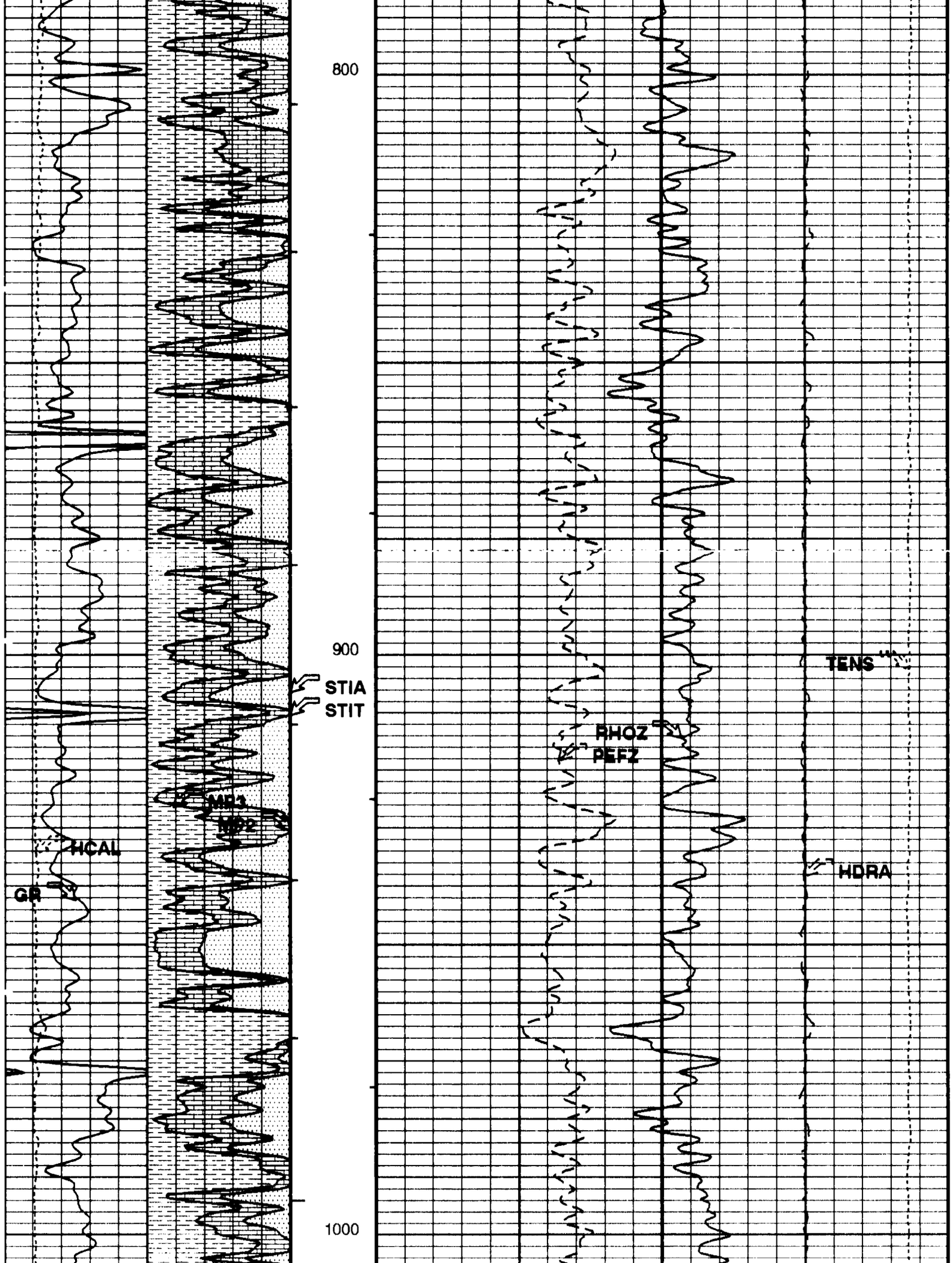
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900
1000
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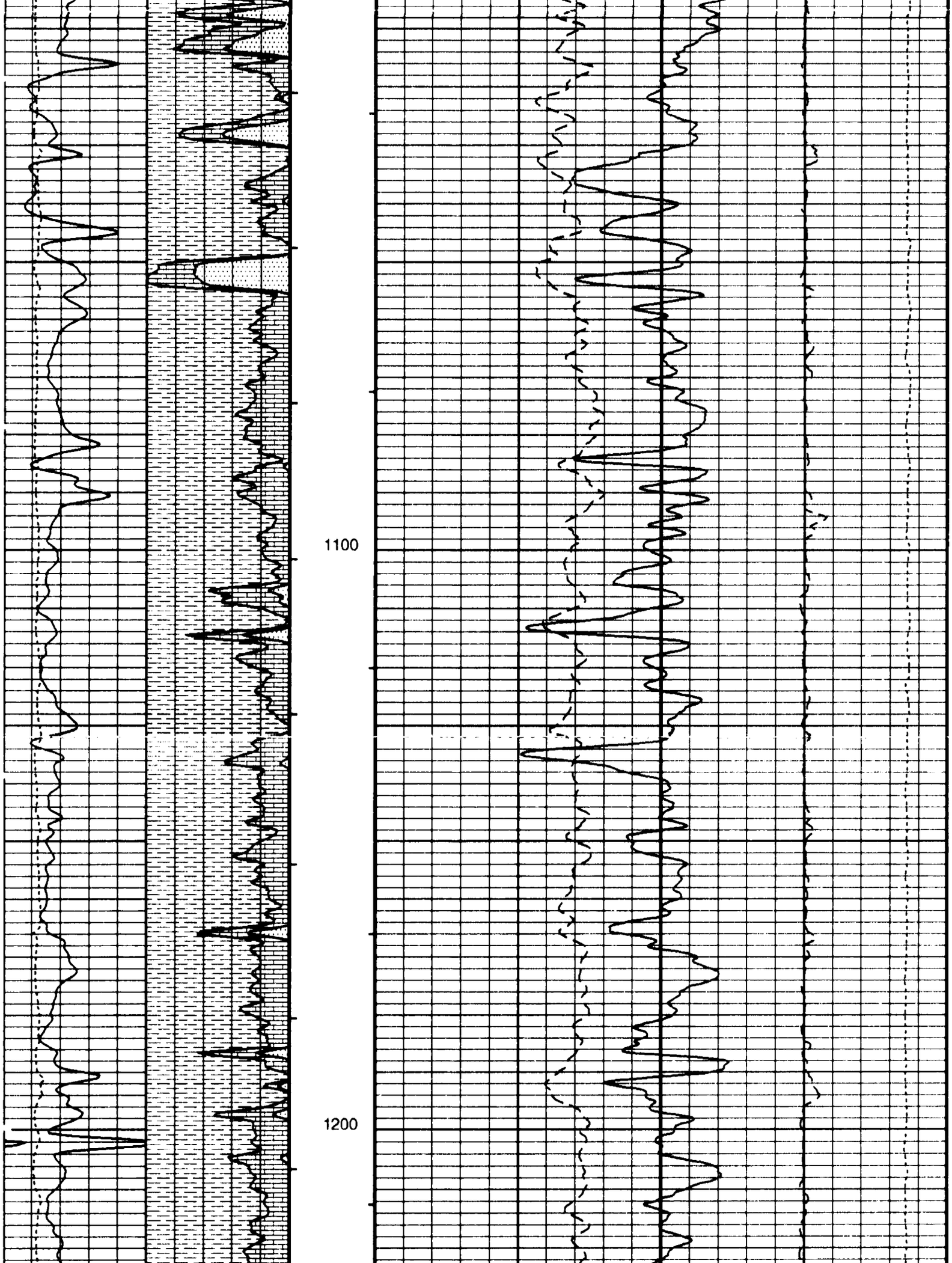
GR
RHOZ
PEFZ
TENS
HDRA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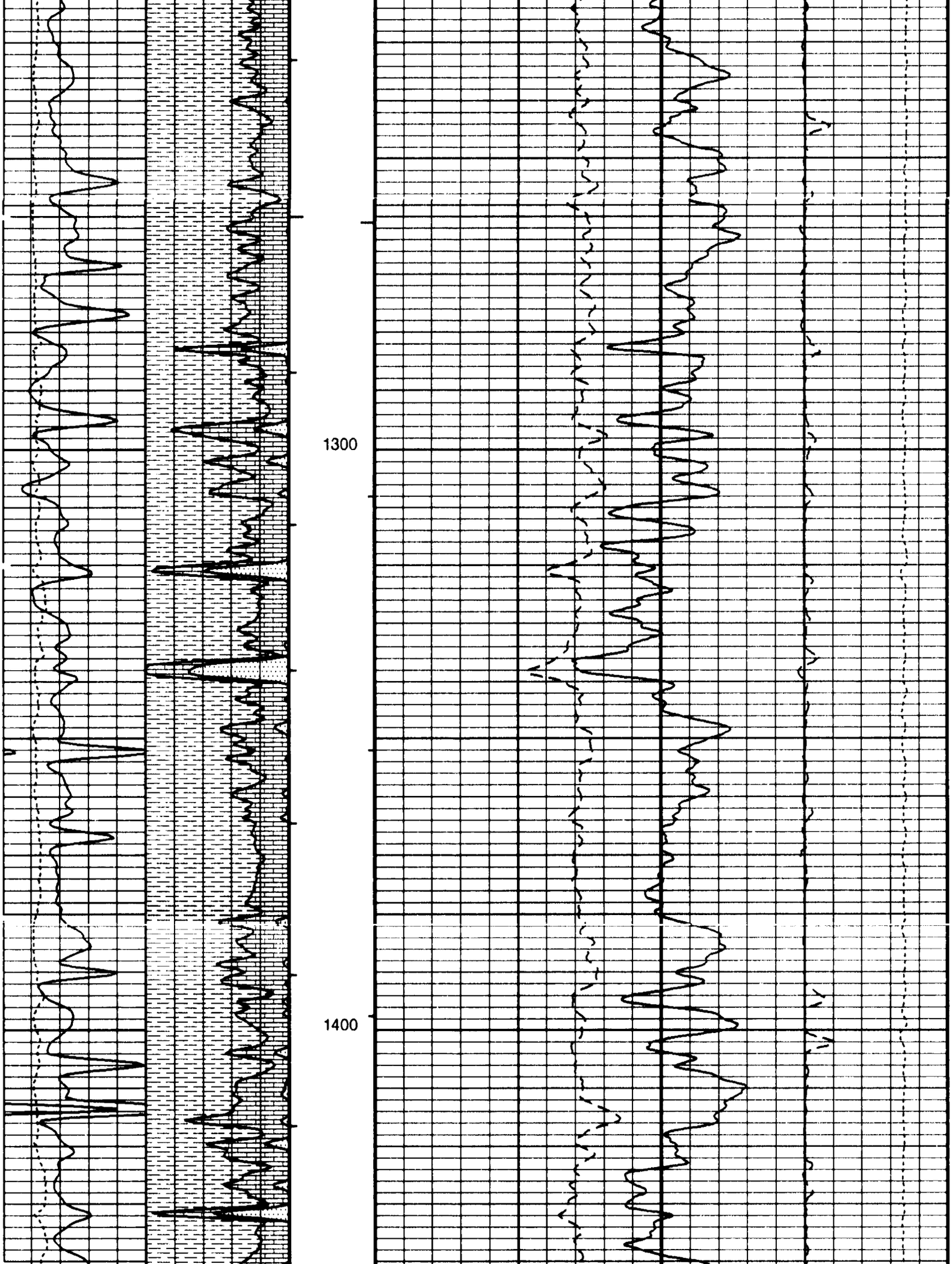
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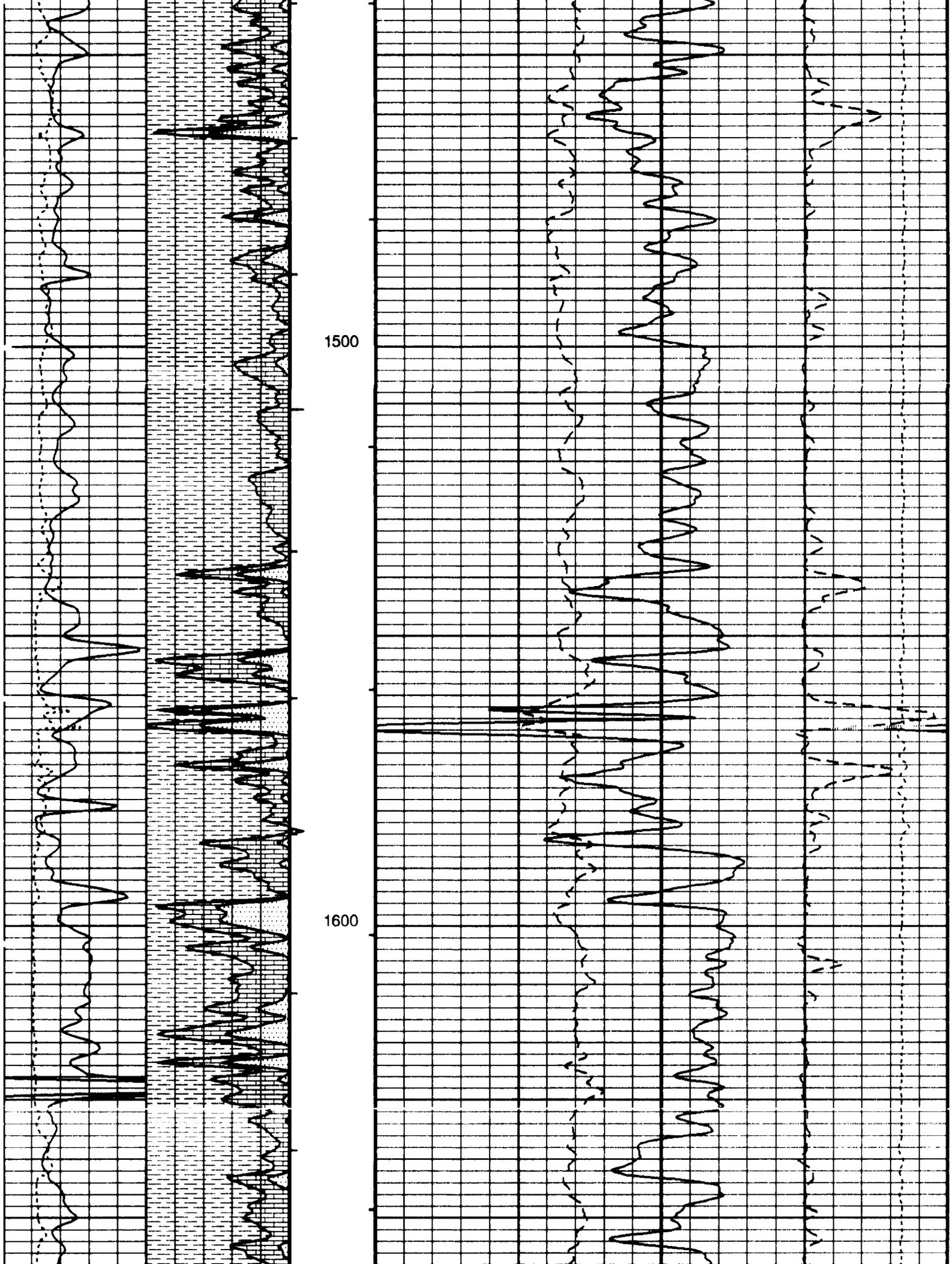
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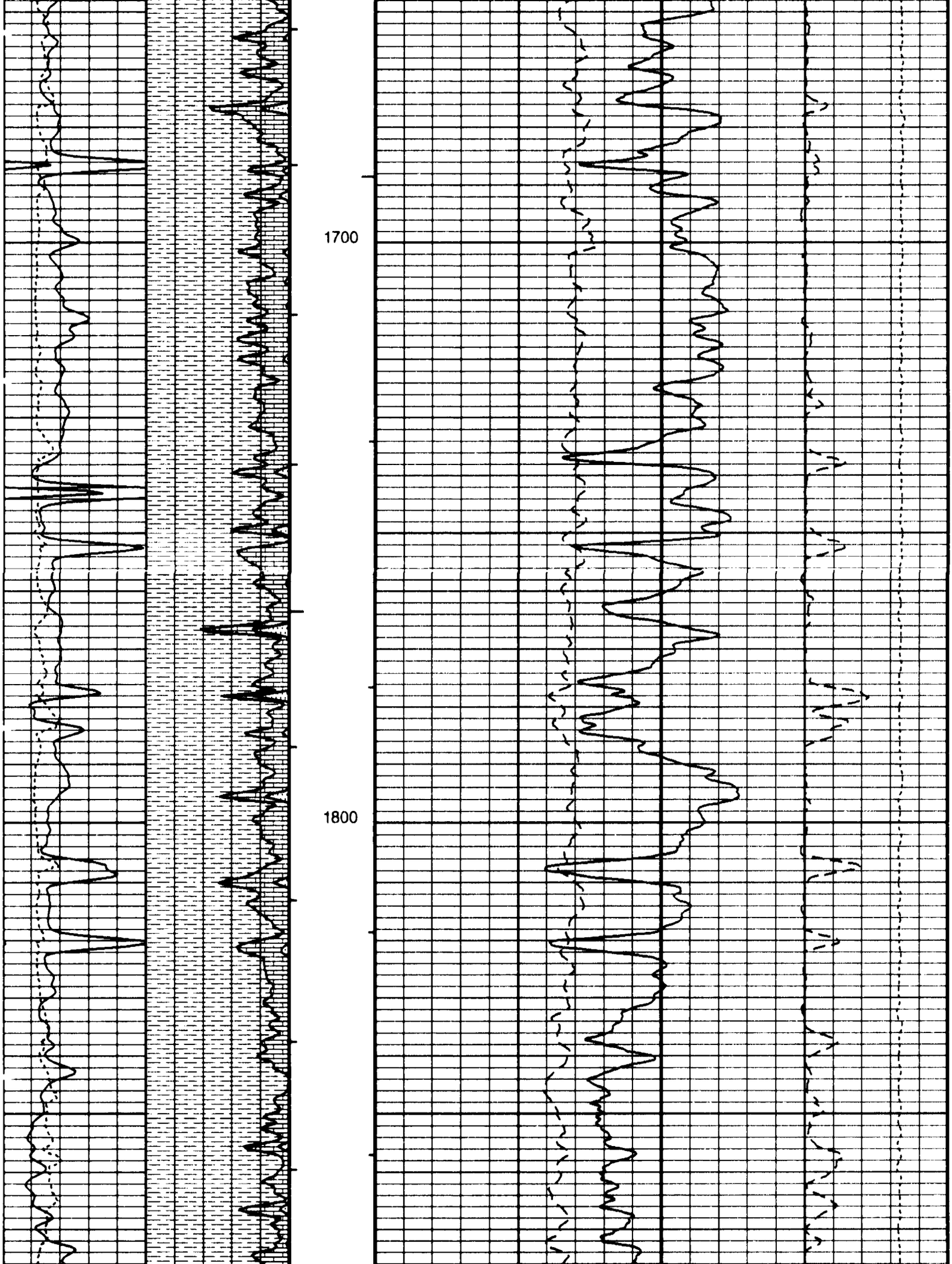
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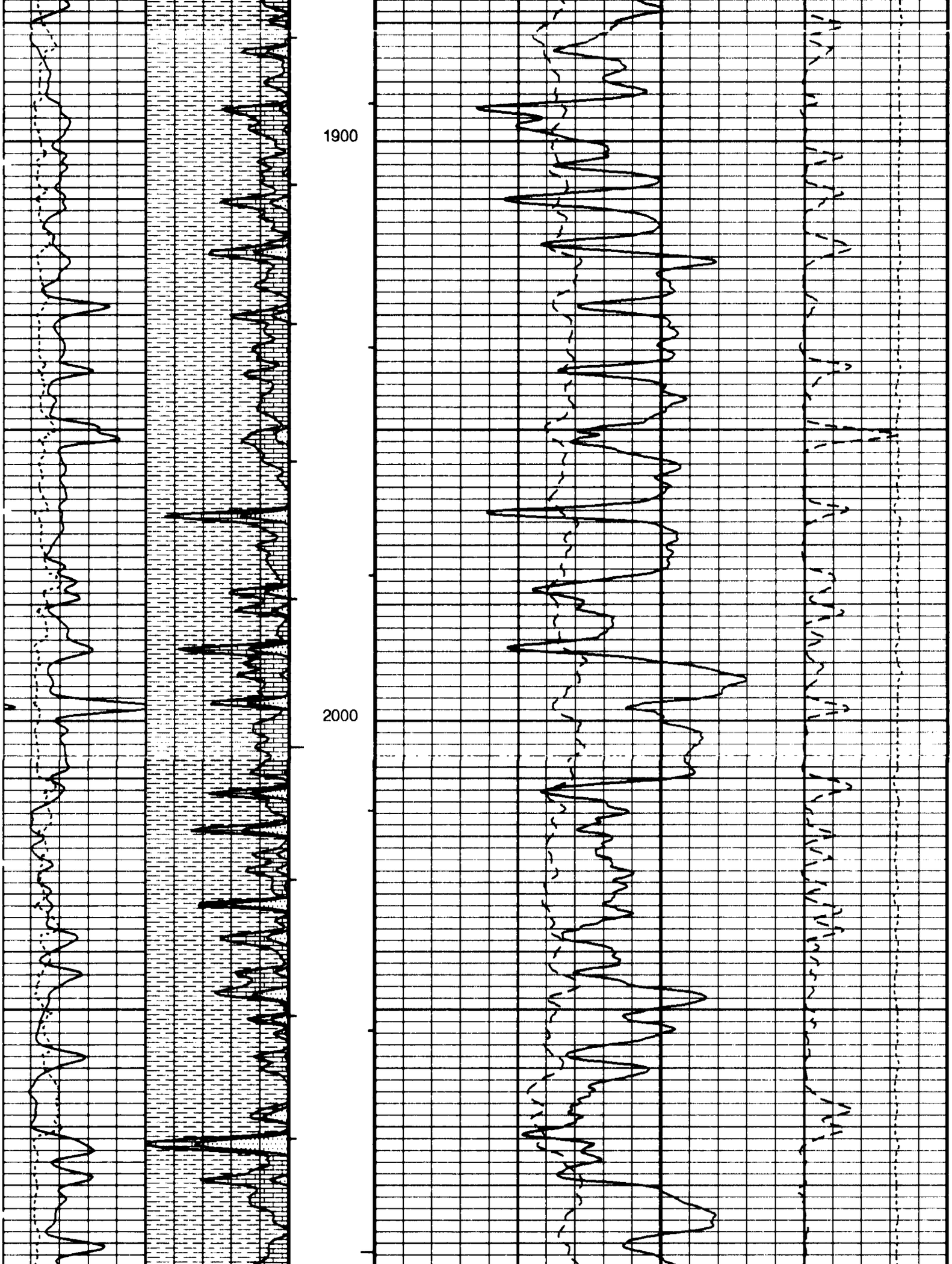
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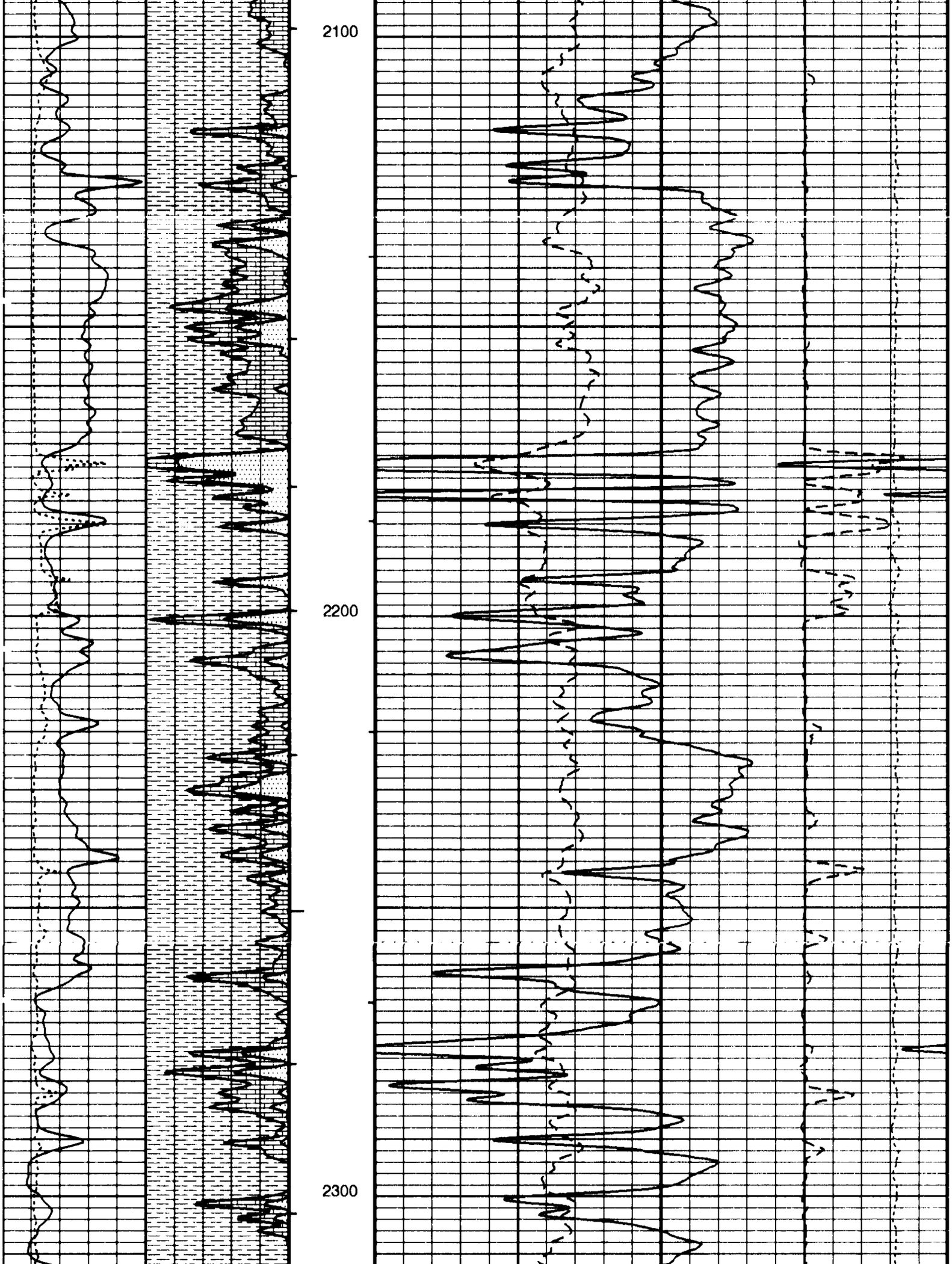
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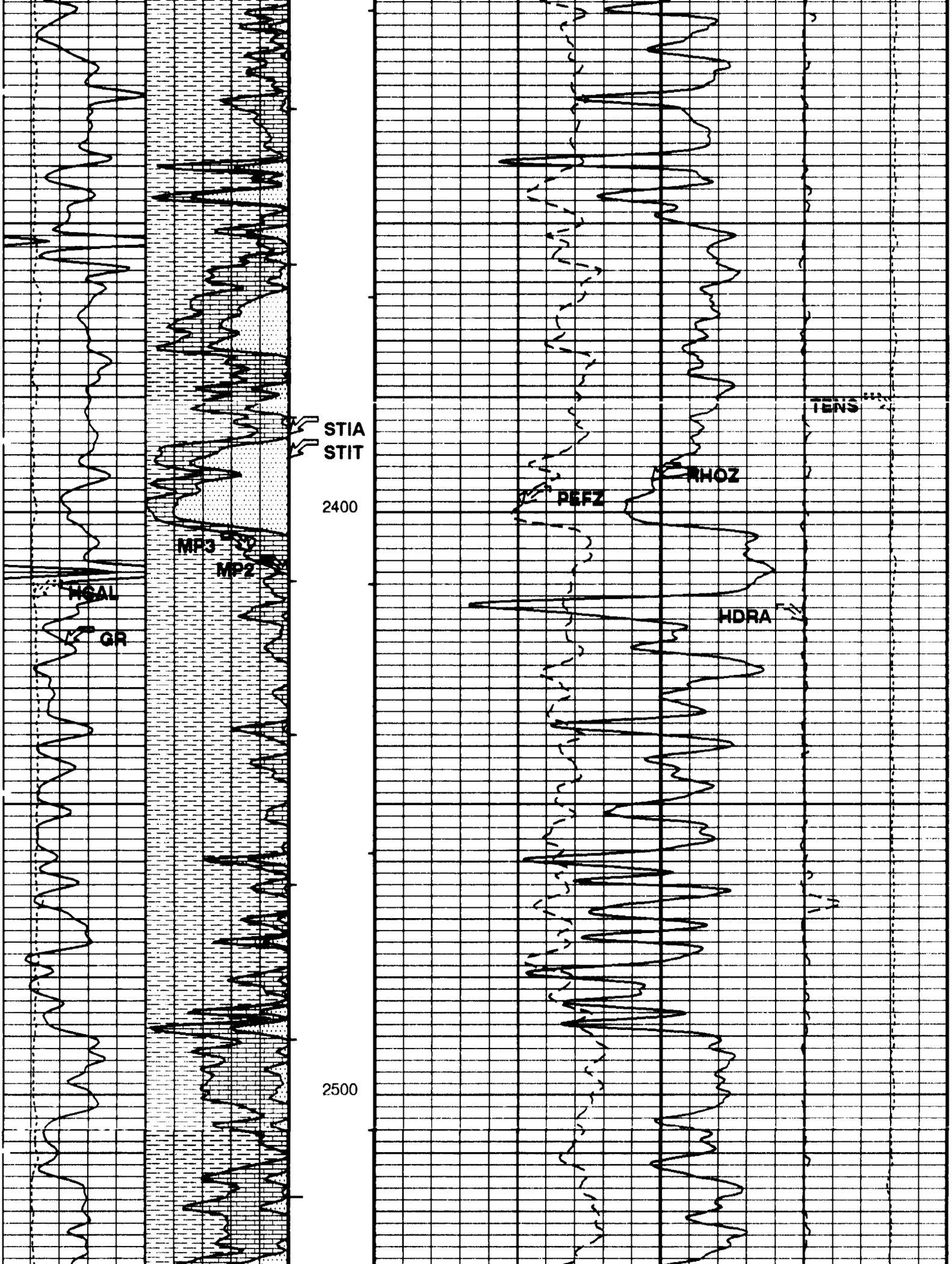
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STIT
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MP2
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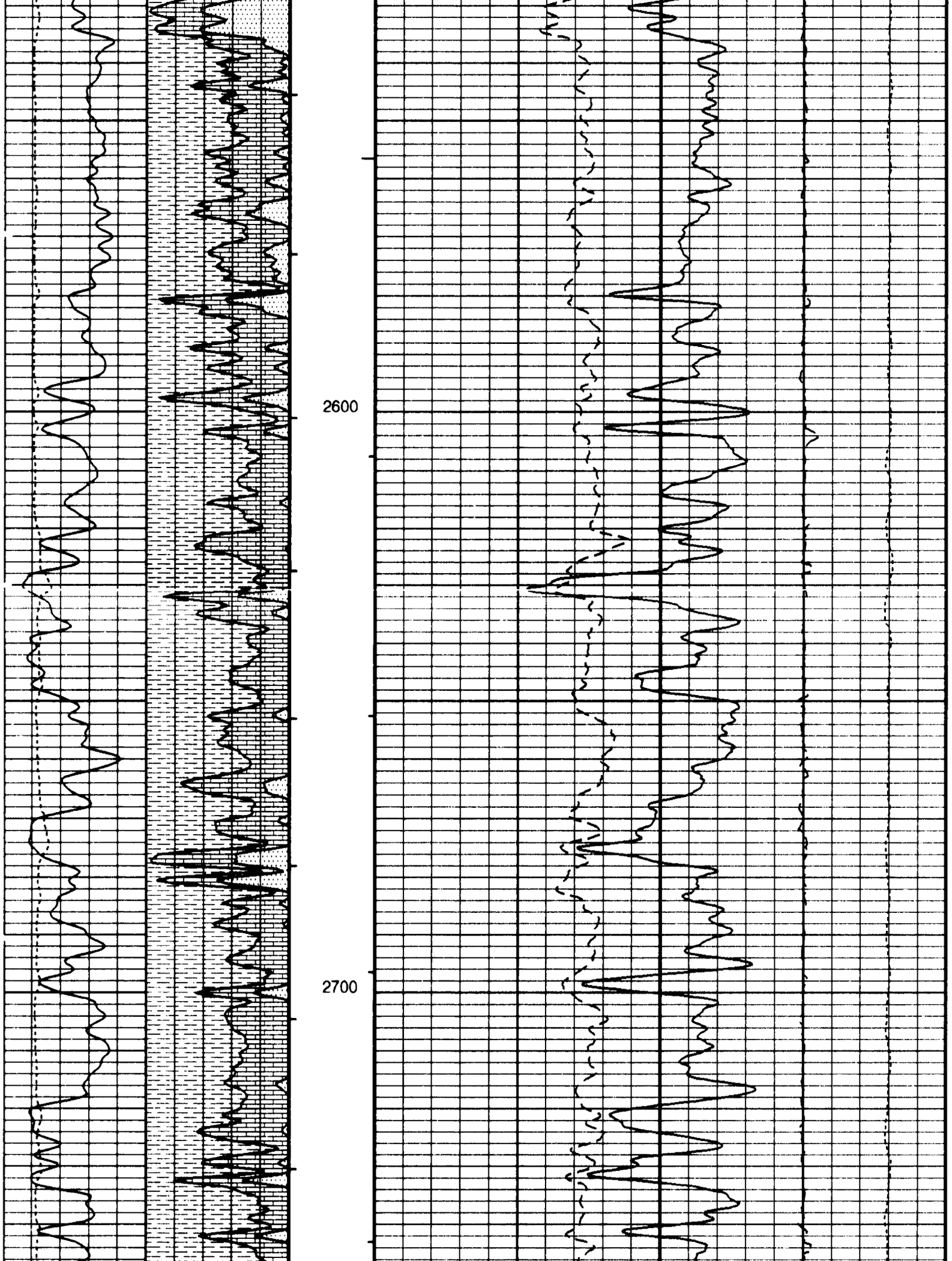
RHOZ
HDRA
TENS
2500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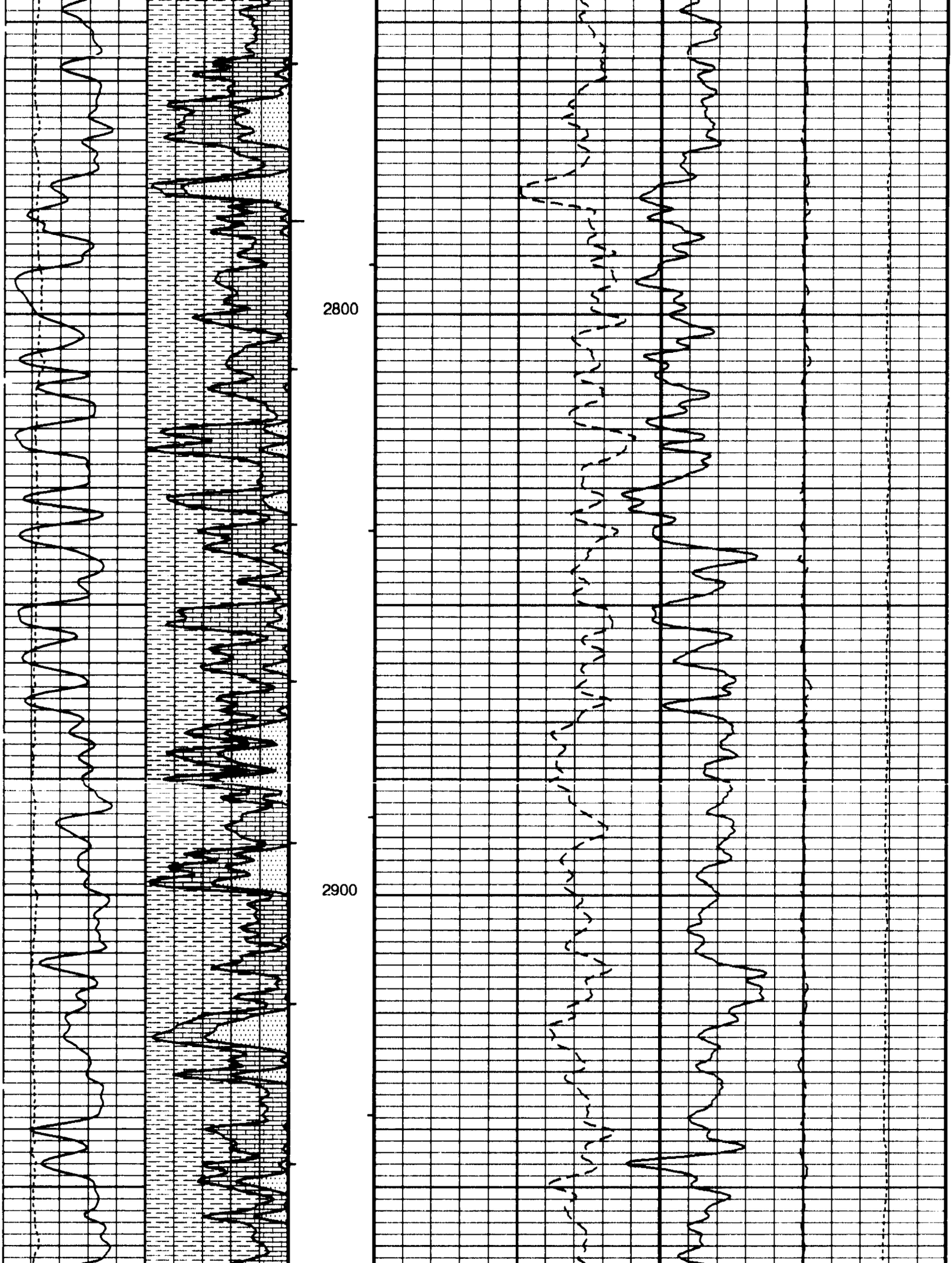
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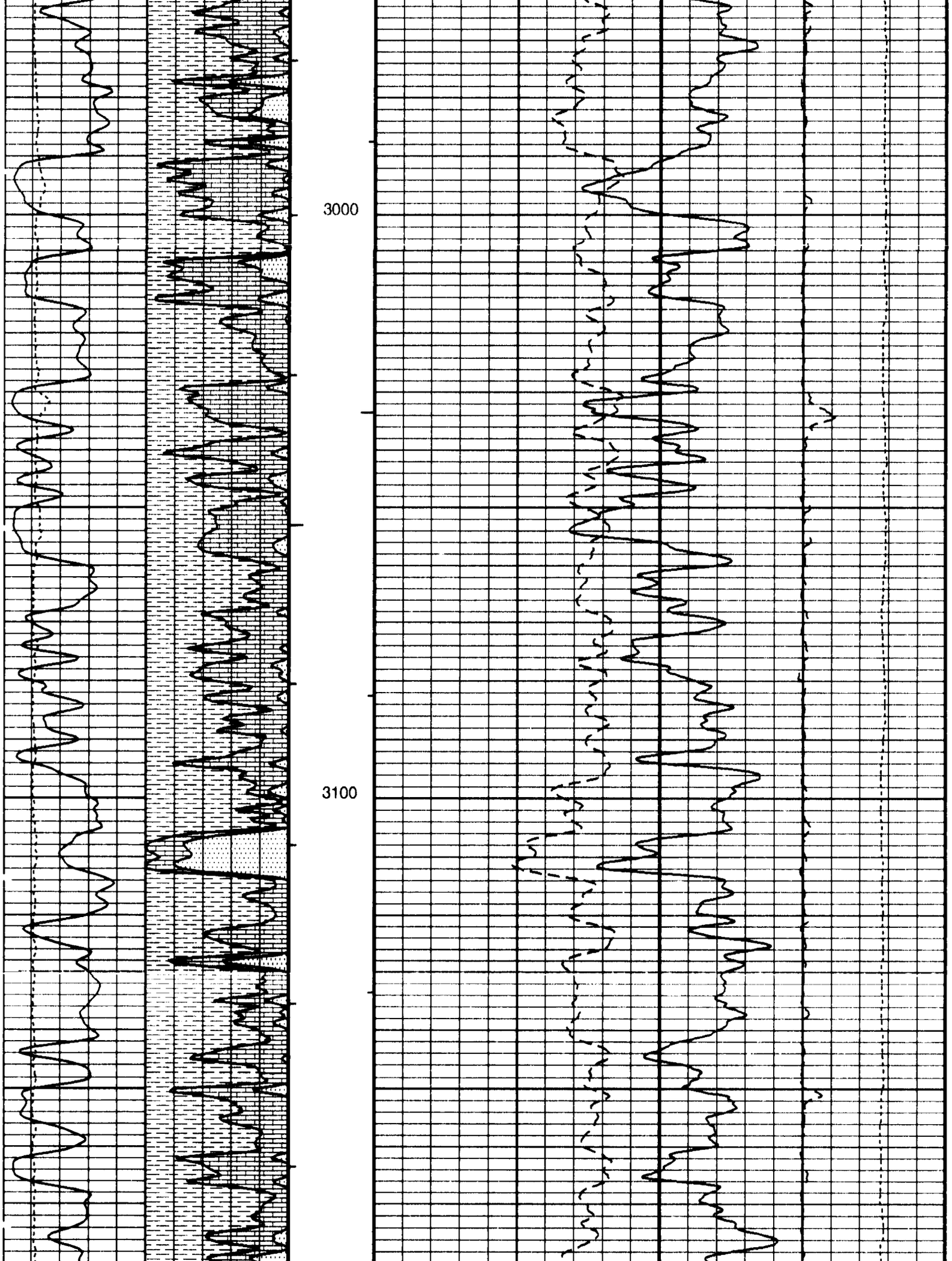
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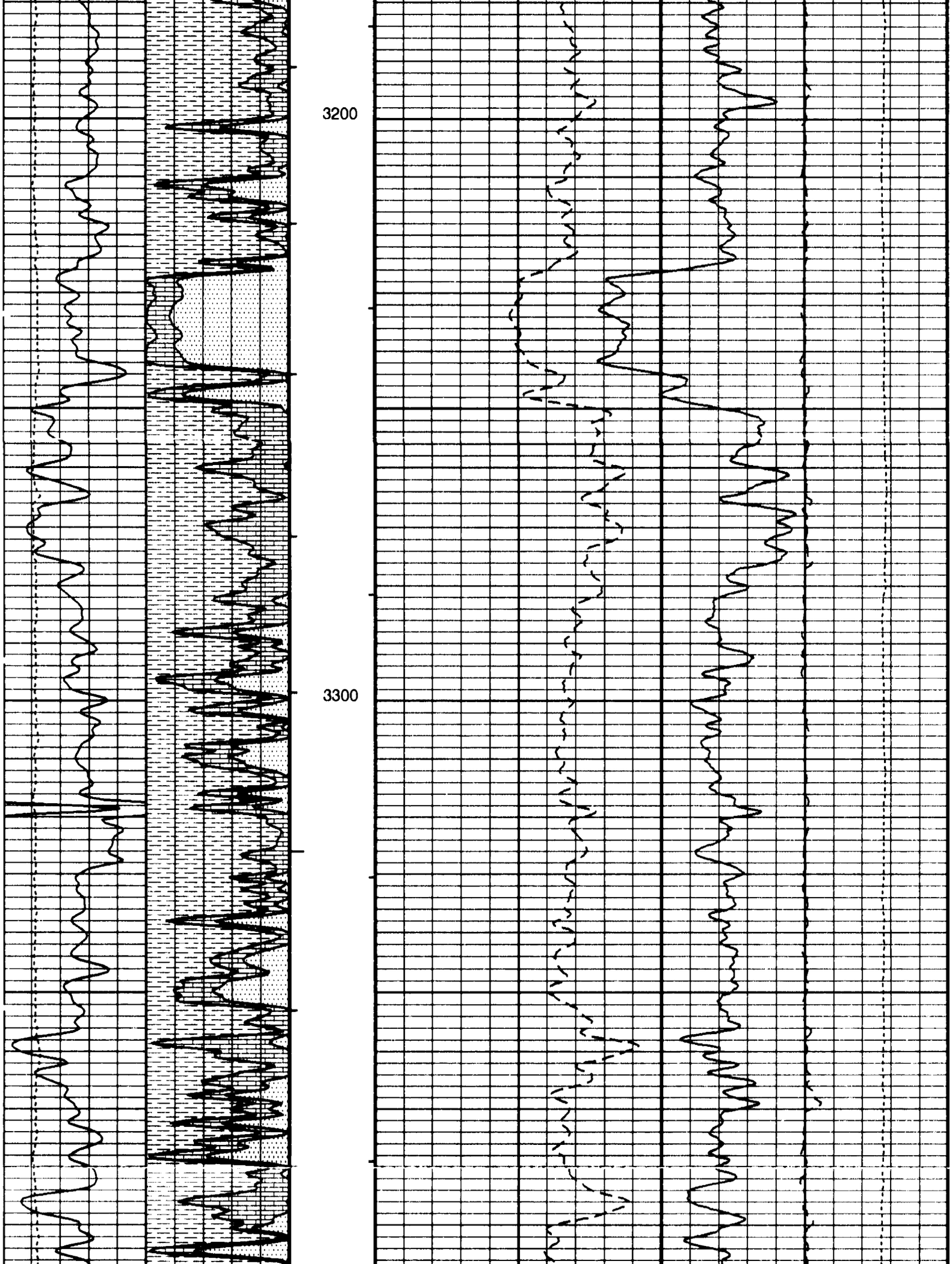
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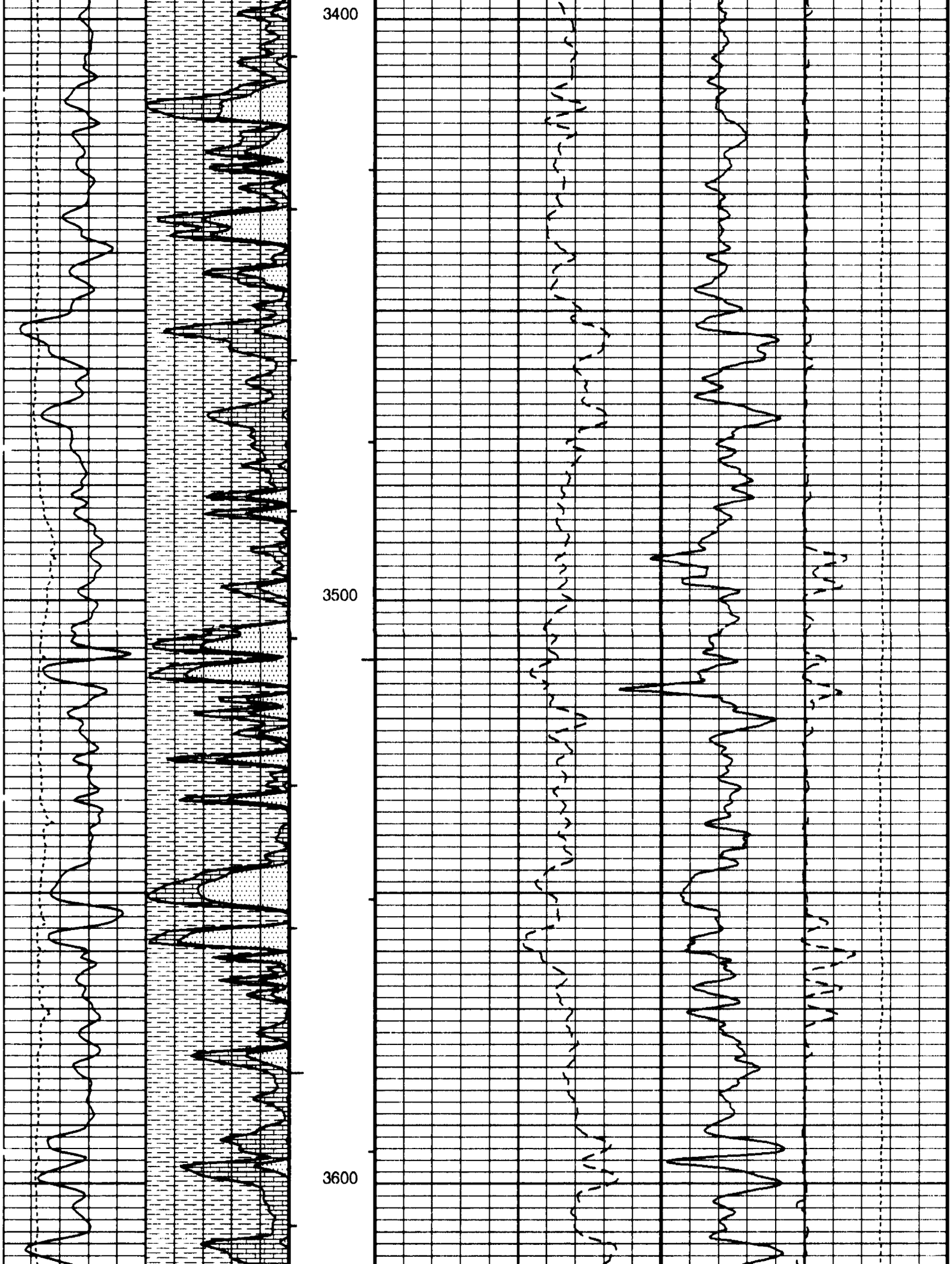
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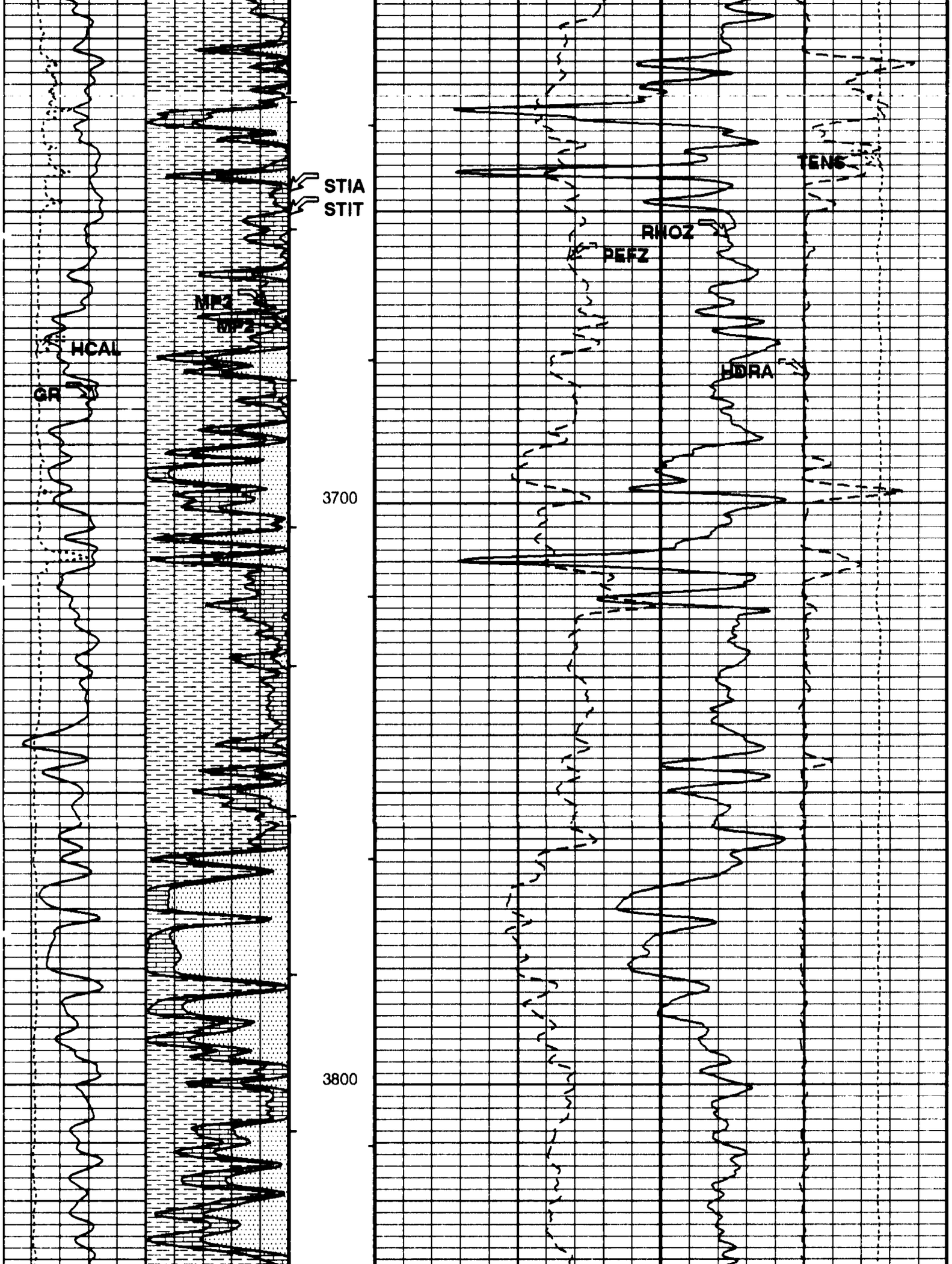
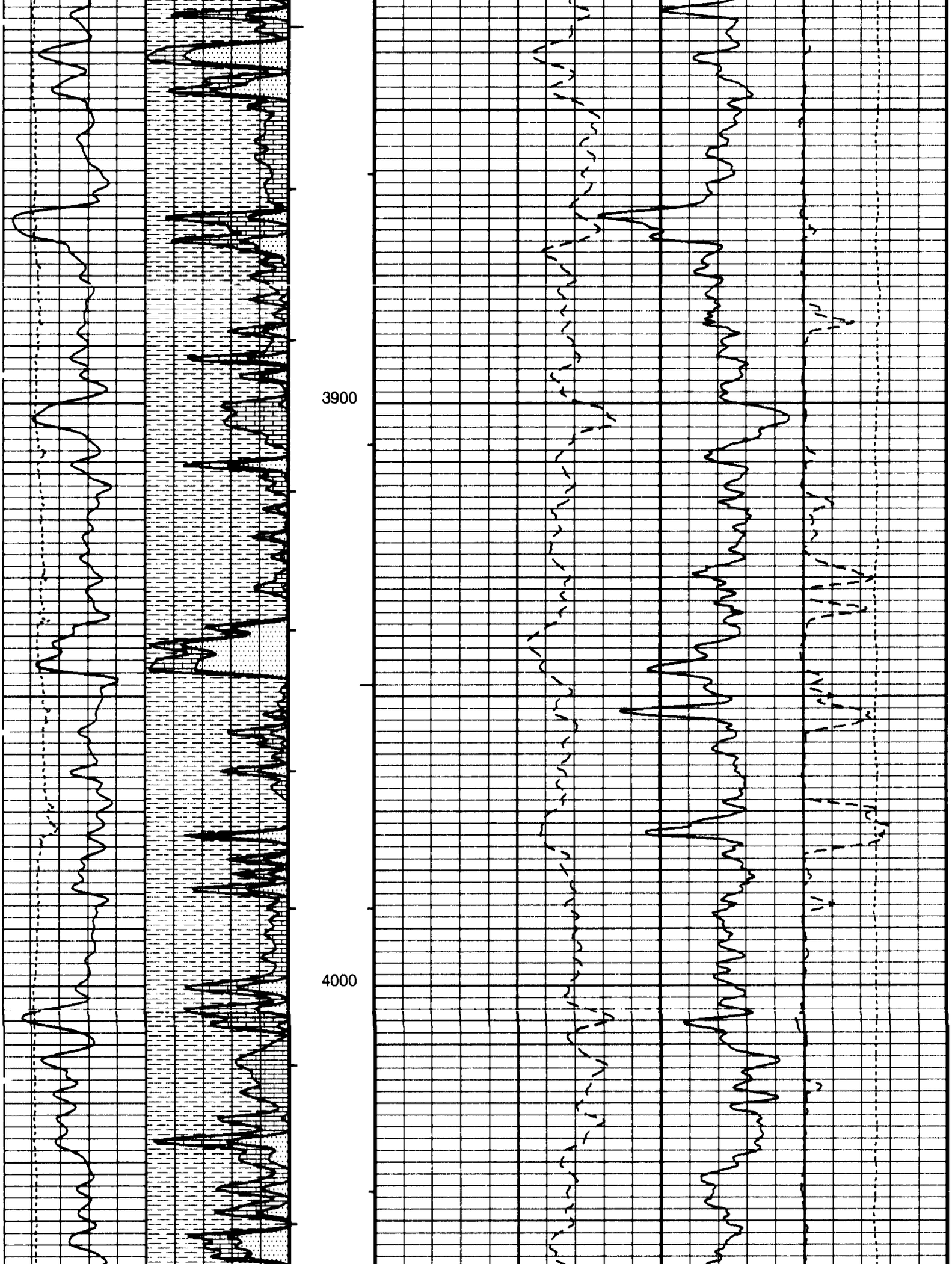

STIA
STIT
MP2
MP2
HCAL
GR
3700
3800
TENS
RHOZ
PEFZ
HDRA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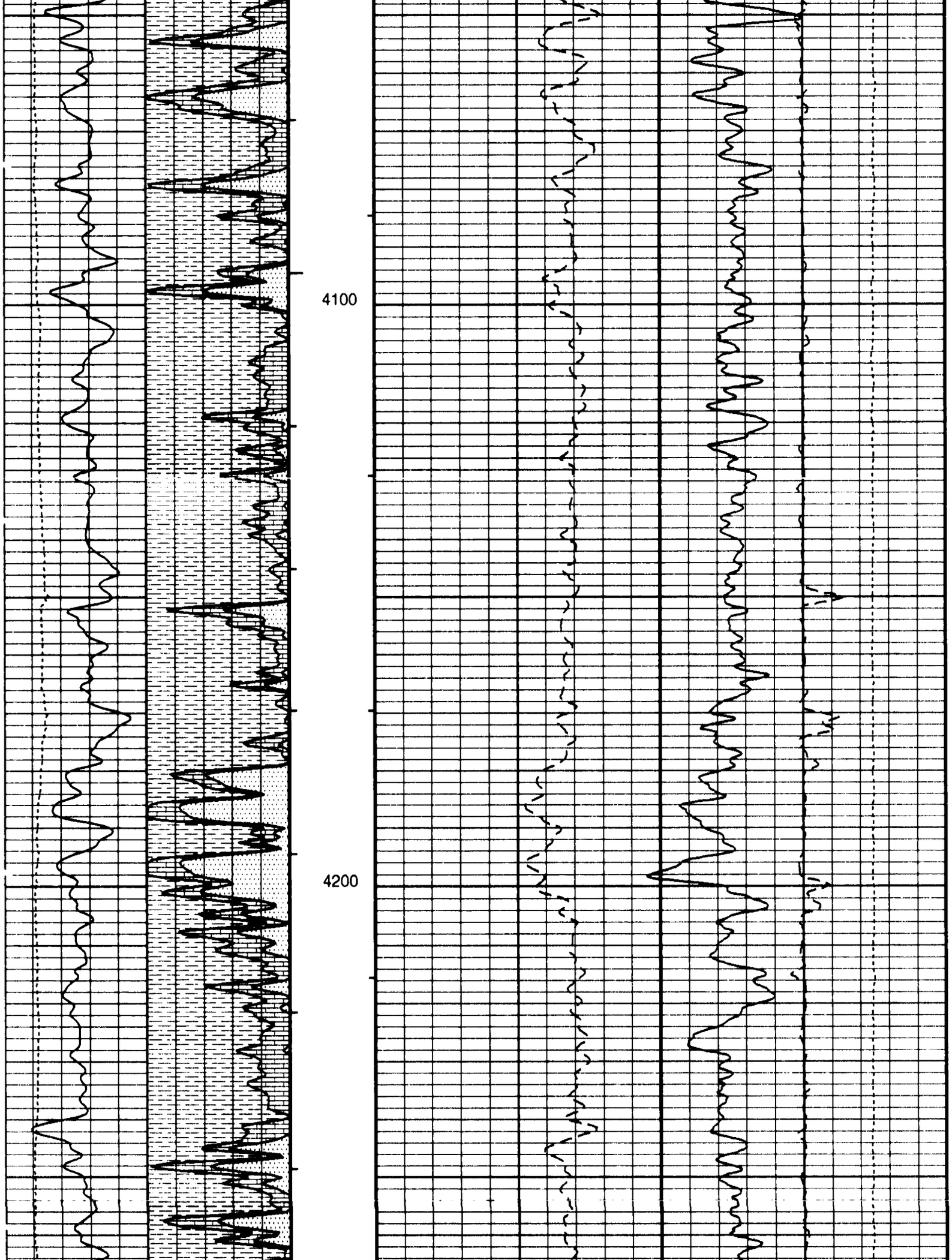
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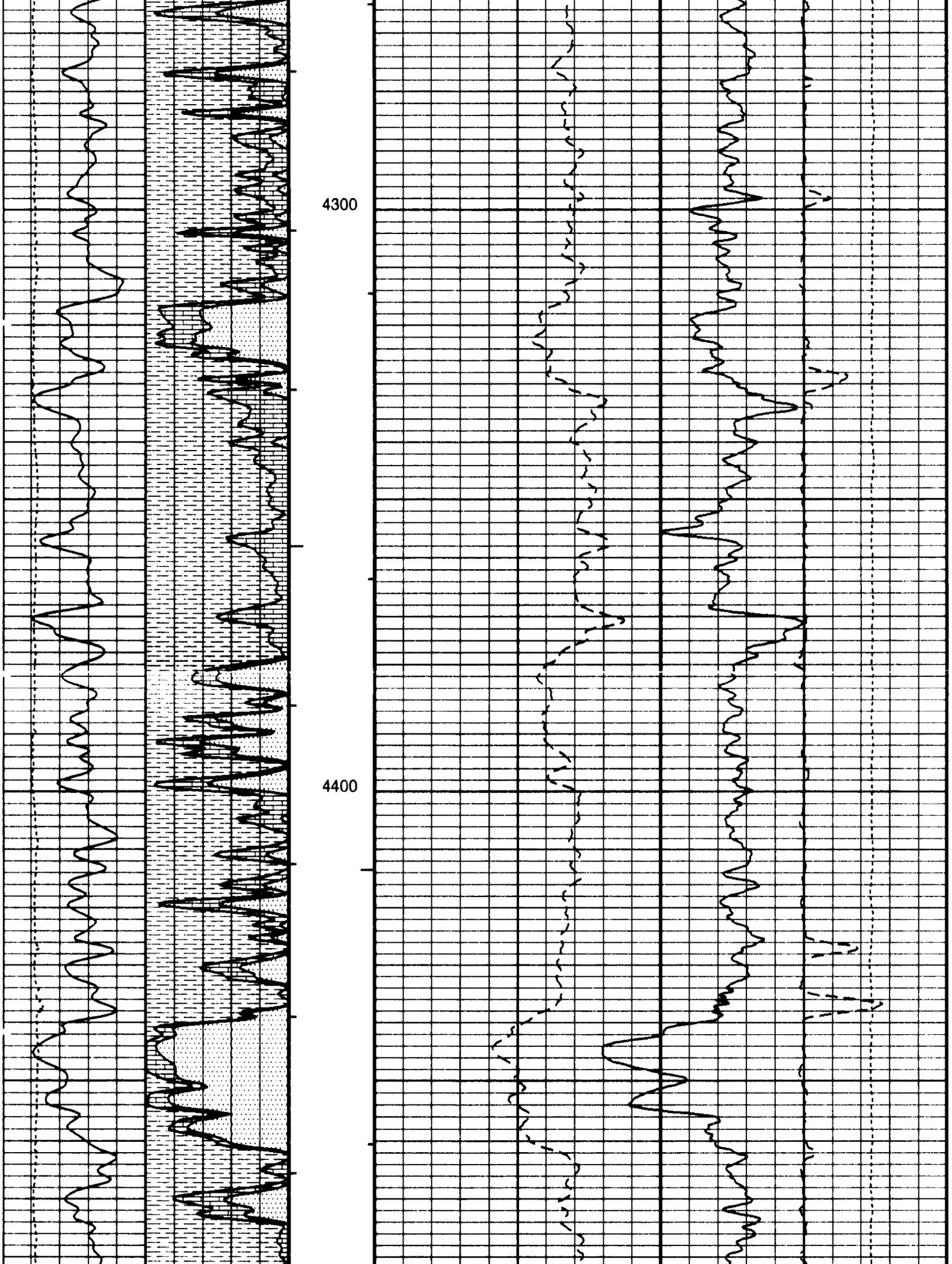
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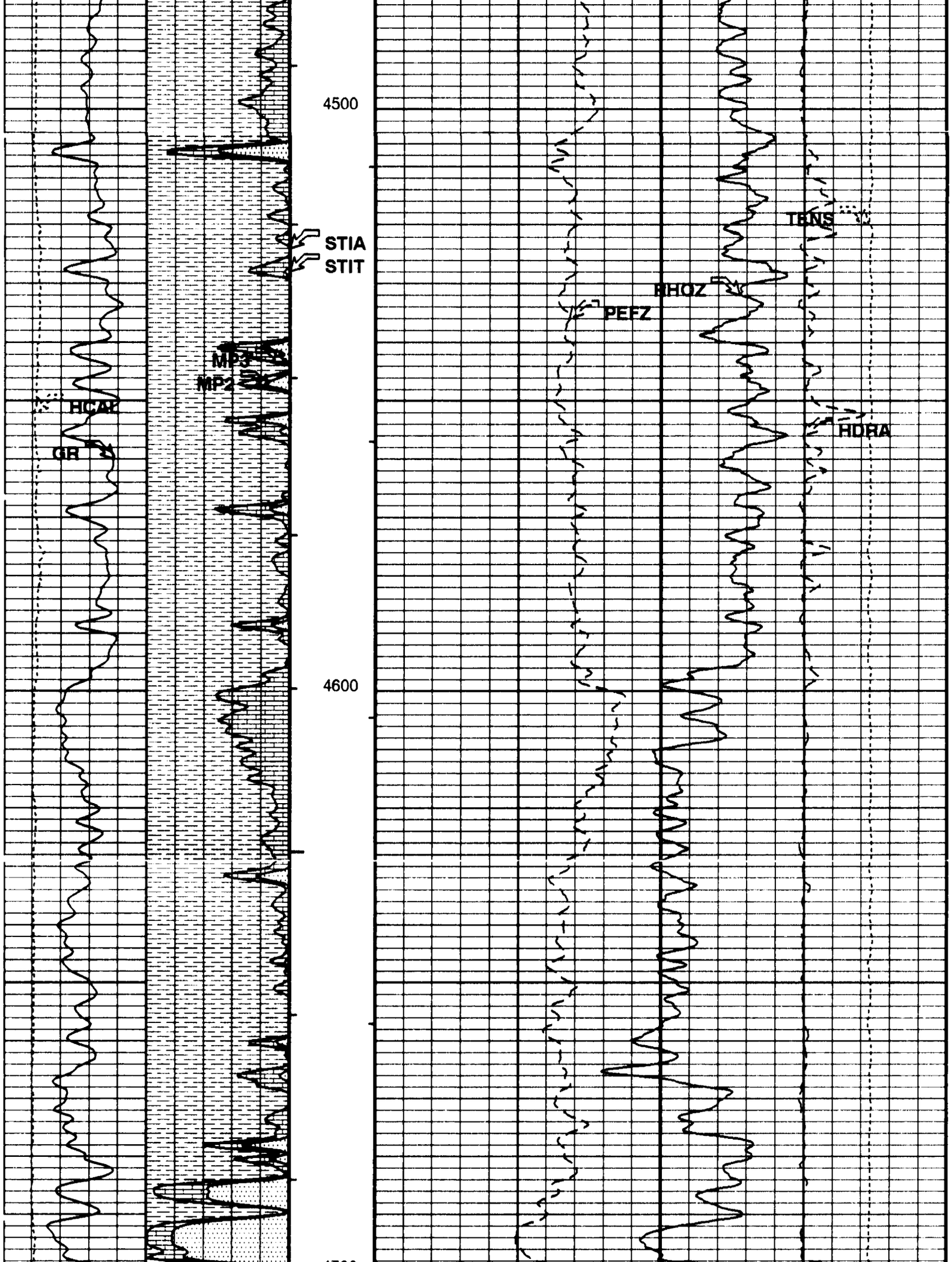
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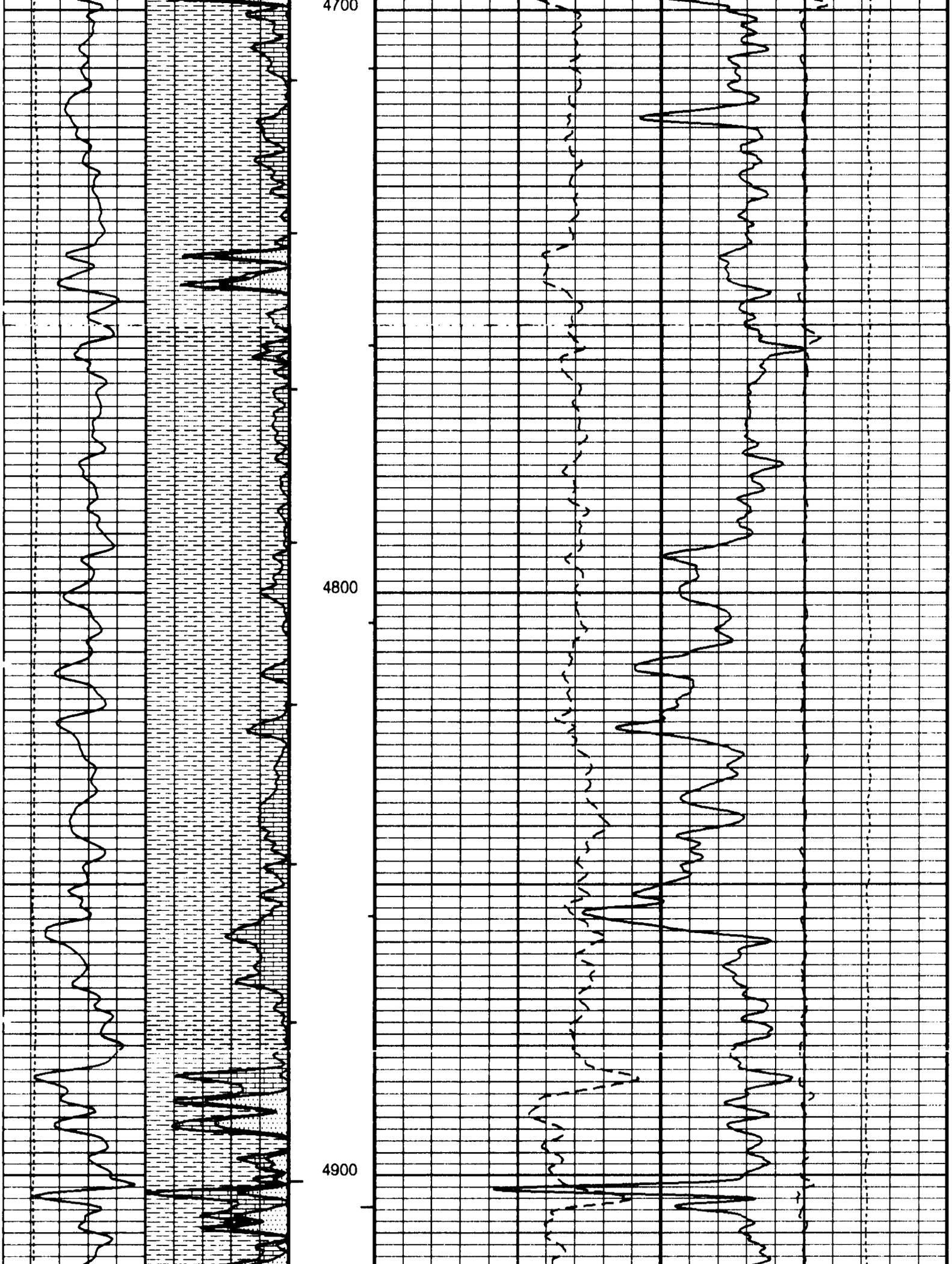
MP3
MP2
HCAL
GR
4600
TENS
RHOZ
PEFZ
HDRA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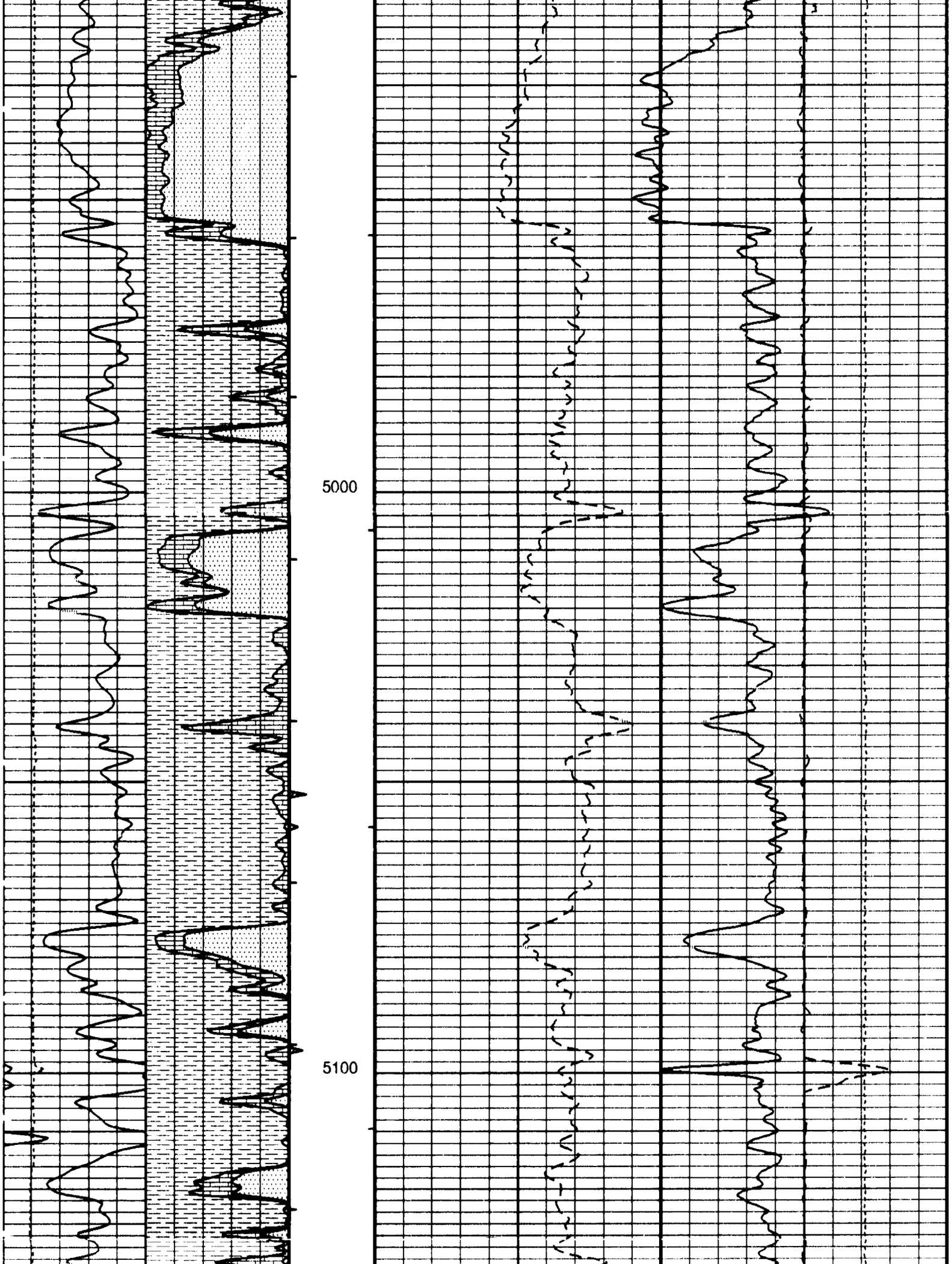
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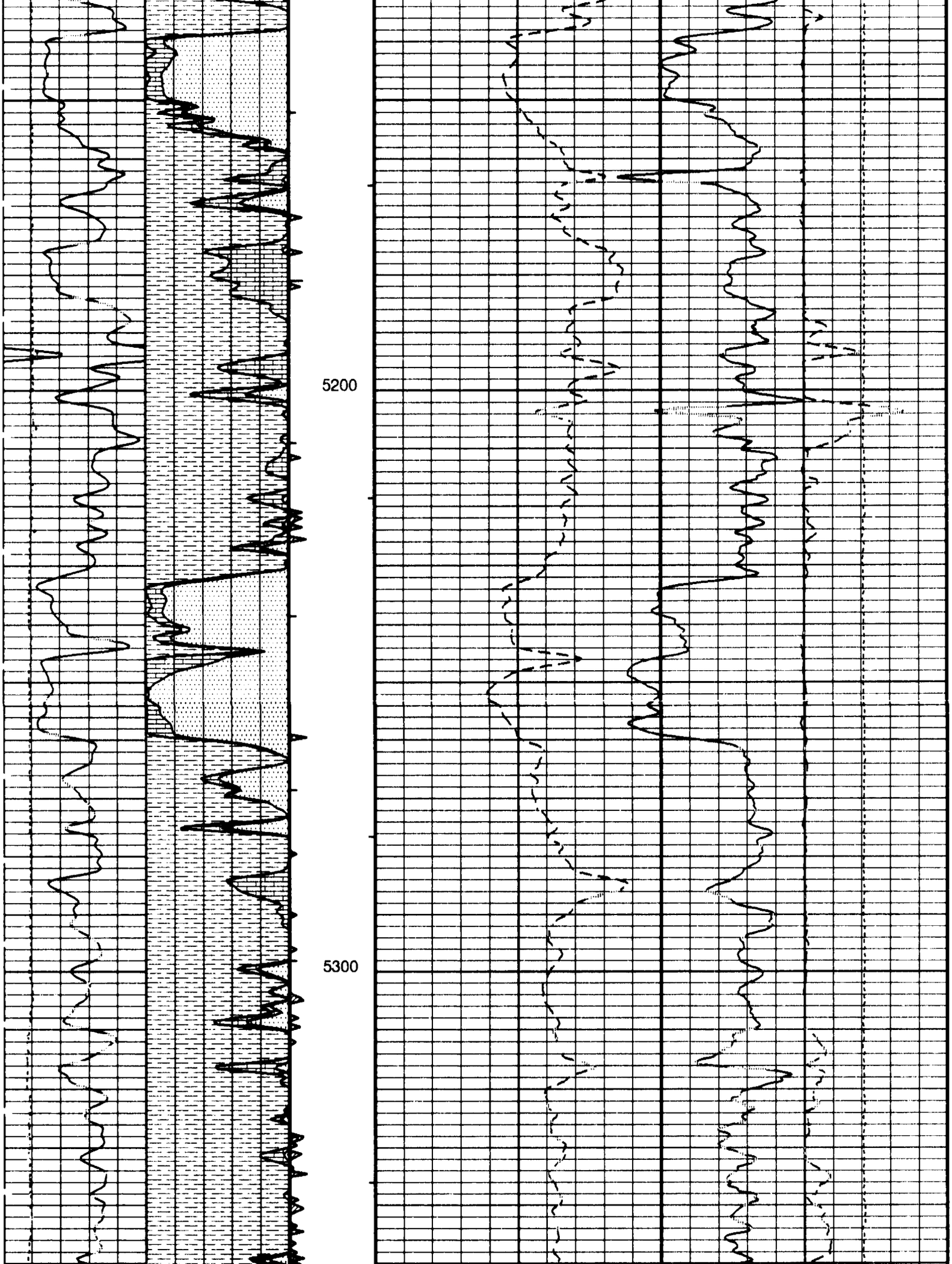
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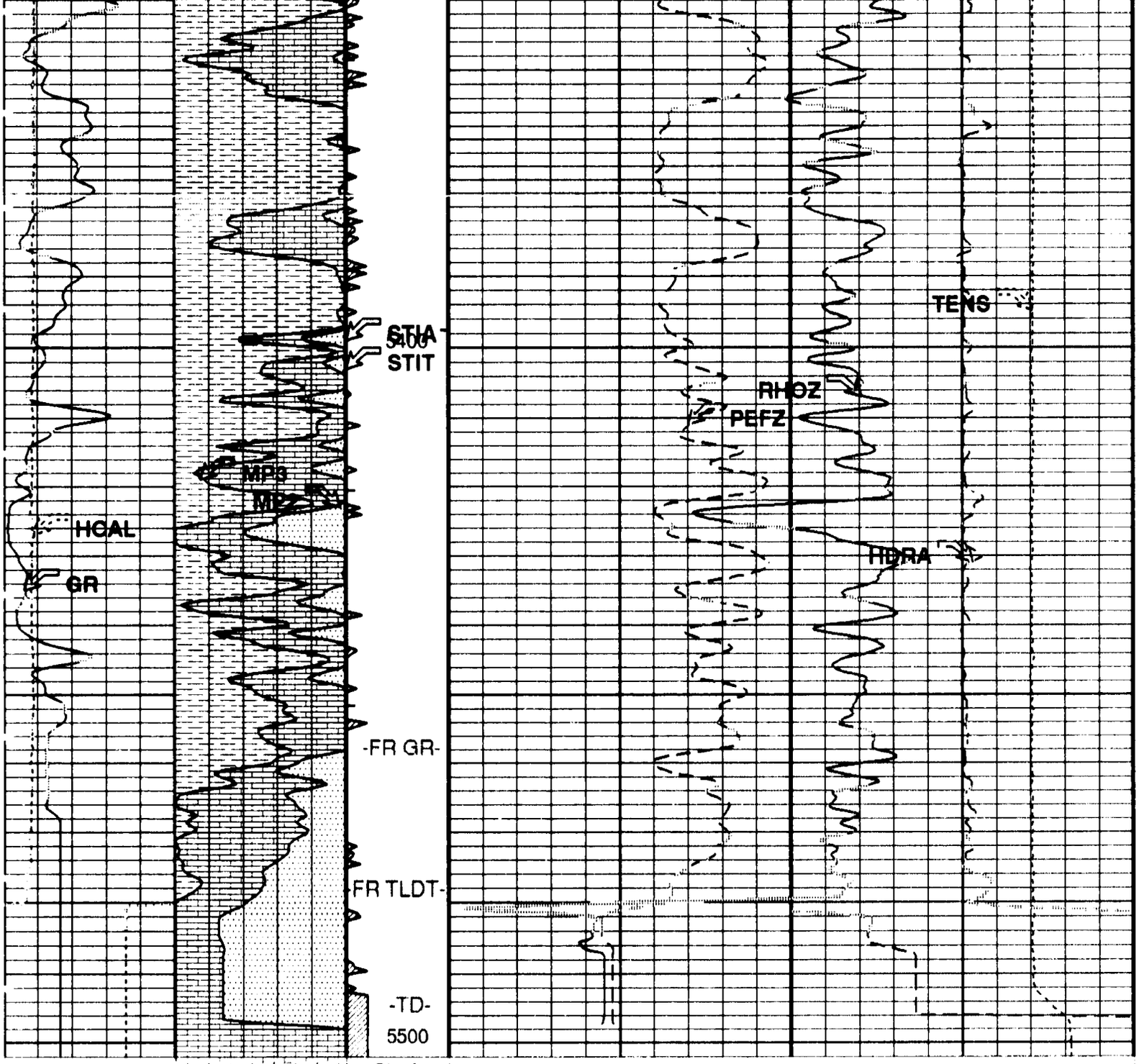


Gamma Ray (GR) 0 (GAPI) 200	Calcite From MP3 to MP2	Stuck Stretch (STIT) 0 (F) 50	Std. Res. Formation Pe (PEFZ) 0 (----) 10
Caliper (HCAL) 6 (IN) 16	Quartz From MP2 to RHT1	Tool/Tot. Drag From D3T to STIA	Std. Res. Formation Density (RHOZ) 2 (G/C3) 3
	Dolomite/Shale From RHT1 to MP3	MAIN PASS SANDSTONE MATRIX: 2.65 G/CC	Density Correction (HDRA) -0.25 (G/C3) 0.25 Tension (TENS) 10000 (LBF) 0

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3

Integrated Cement Volume Minor Pip Every 10 F3
Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BDPS	Bulk Density Processing Selector	RHOB	
BHT	Bottom Hole Temperature (used in calculations)	135	DEGF
BS	Bit Size	7.875	IN
CLIM	Caliper Limit for Bad Hole	999	IN
CNPS	Corrected Neutron Porosity Selector	NPOR	
DFD	Drilling Fluid Density	8.30	LB/G
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DRUL	DRHO Upper Limit	999	G/C3
FCAL	Caliper Presence Flag	PRESENT	
FCGR	CGR Presence Flag	PRESENT	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FLDT	LDT Presence Flag	PRESENT	
FNUM	Form Factor Numerator	1	
FSON	Sonic Presence Flag	ABSENT	
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	SANDSTONE	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PMAX	PHI Maximum	50	PU
POUT	Porosity Output Lithology	SANDSTONE	
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71	G/C3
RG22	RHO Grain (2-Mineral Model, Min-2)	2.68	G/C3
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877	G/C3
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71	G/C3
RG32	RHO Grain (3-Mineral Model, Min-2)	2.68	G/C3
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877	G/C3
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
RTLF	RT Limit Flag	NO_LIMIT	
RWF	Resistivity of Free Water	2.000000e-02	OHMM
SHT	Surface Hole Temperature	68	DEGF
STKT	STI Stuck Threshold	2.5	FT
TD	Total Depth	5506	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF
UF	U Fluid	0.398	B/C3
UM21	U Matrix (2-Mineral Model, Min-1)	13.77	B/C3
UM22	U Matrix (2-Mineral Model, Min-2)	5.5	B/C3
UM23	U Matrix (2-Mineral Model, Min-3)	8.997	B/C3
UM31	U Matrix (3-Mineral Model, Min-1)	13.77	B/C3
UM32	U Matrix (3-Mineral Model, Min-2)	5.5	B/C3
UM33	U Matrix (3-Mineral Model, Min-3)	8.997	B/C3

Format: DENS_MIN Vertical Scale: 5" per 100' Graphics File Created: 30-MAR-1998 20:28

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Input DLIS Files

DEFAULT	HILTC .007	FN:4	FIELD	30-MAR-1998 20:11	5502.0 FT	5062.5 FT

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Integrated Hole/Cement Volume Summary

Hole Volume = 141.71 F3

Cement Volume = 69.11 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

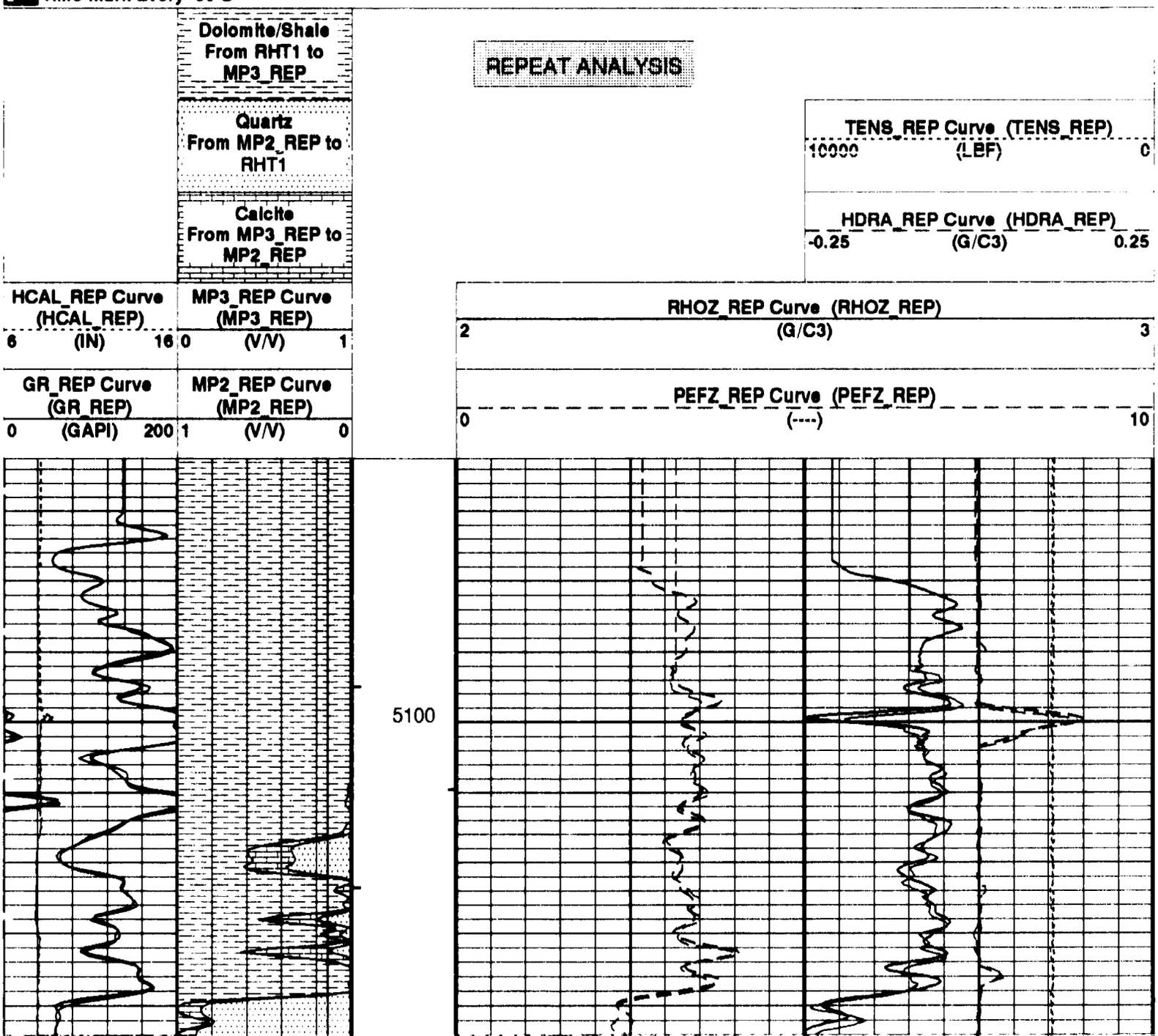
Changed Parameter Summary

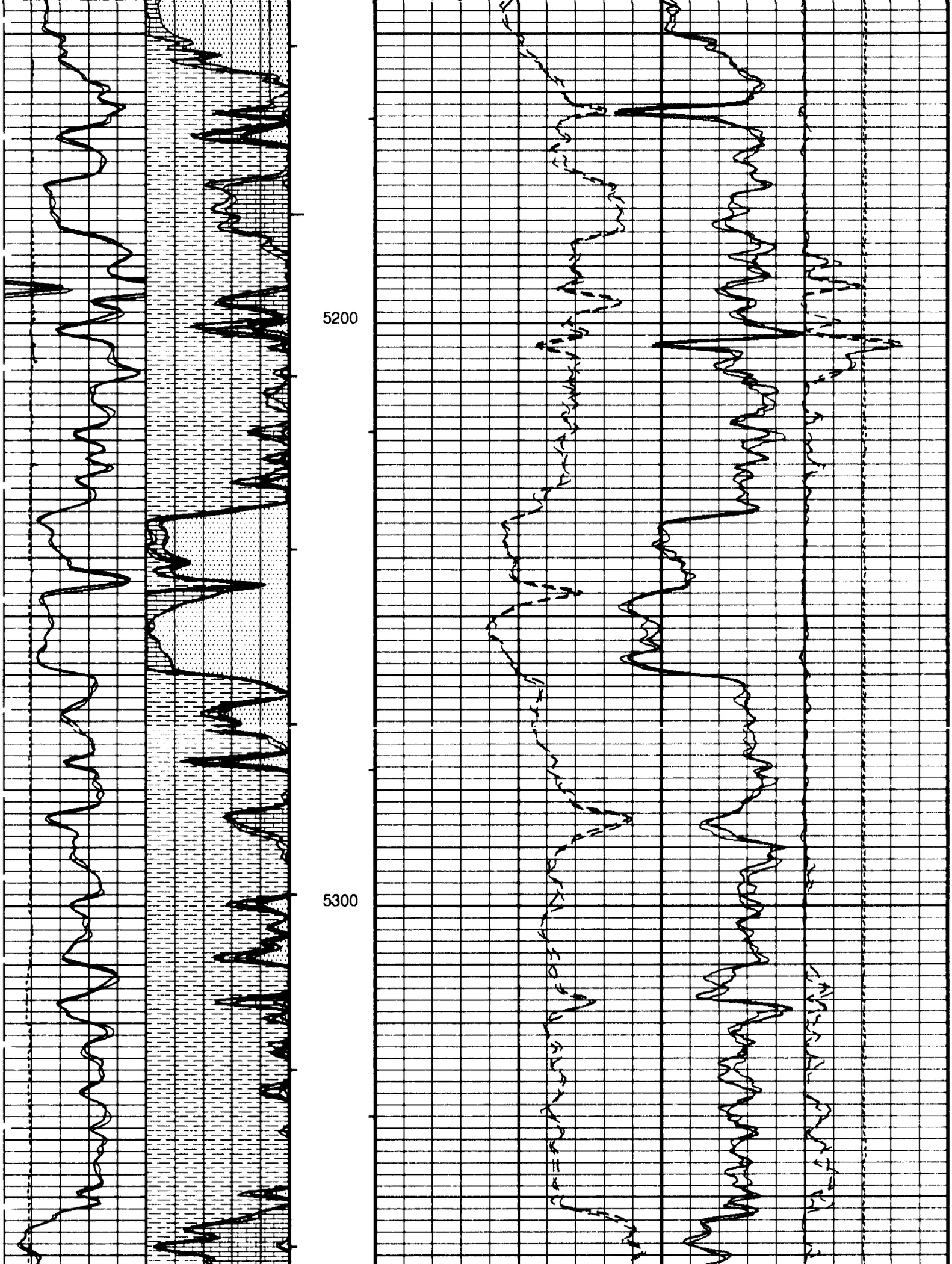
DLIS Name	New Value	Previous Value	Depth & Time
BHT	120 DEGF	135 DEGF	5304.3 20:30:52
	118 DEGF	120 DEGF	5343.1 20:31:08

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

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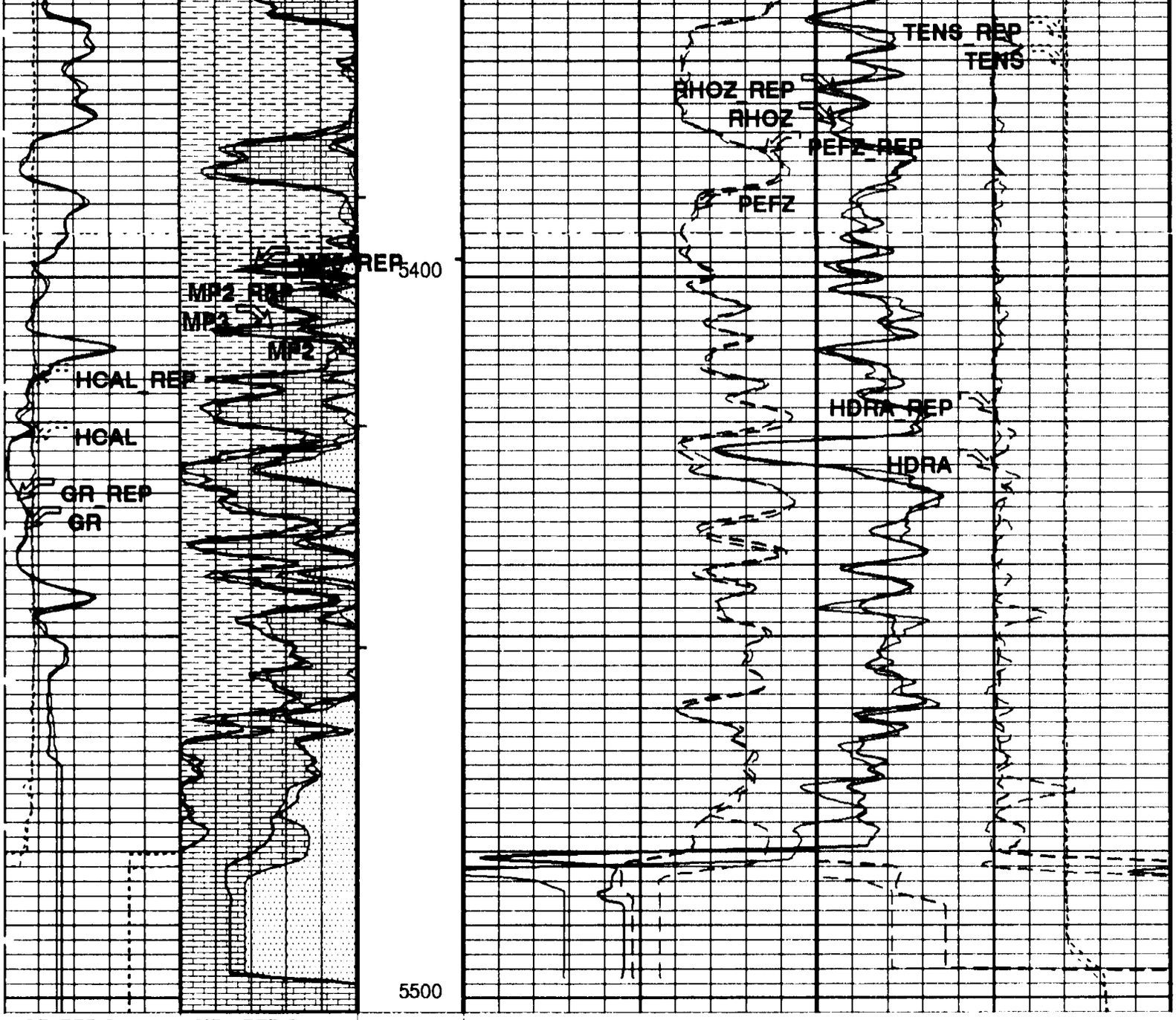


GR_REP Curve (GR_REP)	MP2_REP Curve (MP2_REP)	PEFZ_REP Curve (PEFZ_REP)
0 (GAPI) 200	1 (V/V) 0	0 (----) 10
HCAL_REP Curve (HCAL_REP)	**MP3_REP Curve (MP3_REP)**	**RHOZ_REP Curve (RHOZ_REP)**
6 (IN) 16	0 (V/V) 1	2 (G/C3) 3

Calcite From MP3_REP to MP2_REP

Quartz From MP2_REP to RHT1

Dolomite/Shale From RHT1 to MP3_REP

REPEAT ANALYSIS

HDRA_REP Curve (HDRA_REP)
-0.25 (G/C3) 0.25

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3

⊣ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BDPS	Bulk Density Processing Selector	RHOB	
BHT	Bottom Hole Temperature (used in calculations)	135	DEGF
BS	Bit Size	7.875	IN
CLIM	Caliper Limit for Bad Hole	999	IN
CNPS	Corrected Neutron Porosity Selector	NPOR	
DFD	Drilling Fluid Density	8.30	LB/G
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DRUL	DRHO Upper Limit	999	G/C3
FCAL	Caliper Presence Flag	PRESENT	
FCGR	CGR Presence Flag	PRESENT	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FLDT	LDT Presence Flag	PRESENT	
FNUM	Form Factor Numerator	1	
FSON	Sonic Presence Flag	ABSENT	
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	SANDSTONE	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PMAX	PHI Maximum	50	PU
POUT	Porosity Output Lithology	SANDSTONE	
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71	G/C3
RG22	RHO Grain (2-Mineral Model, Min-2)	2.68	G/C3
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877	G/C3
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71	G/C3
RG32	RHO Grain (3-Mineral Model, Min-2)	2.68	G/C3
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877	G/C3
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
RTLF	RT Limit Flag	NO_LIMIT	
RWF	Resistivity of Free Water	2.000000e-02	OHMM
SHT	Surface Hole Temperature	68	DEGF
TD	Total Depth	5506	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF
UF	U Fluid	0.398	B/C3
UM21	U Matrix (2-Mineral Model, Min-1)	13.77	B/C3
UM22	U Matrix (2-Mineral Model, Min-2)	5.5	B/C3
UM23	U Matrix (2-Mineral Model, Min-3)	8.997	B/C3
UM31	U Matrix (3-Mineral Model, Min-1)	13.77	B/C3
UM32	U Matrix (3-Mineral Model, Min-2)	5.5	B/C3
UM33	U Matrix (3-Mineral Model, Min-3)	8.997	B/C3

Format: DENS_MIN_REP Vertical Scale: 5" per 100' Graphics File Created: 30-MAR-1998 20:28

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Input DLIS Files

DEFAULT	HILTC .007	FN:4	FIELD	30-MAR-1998 20:11	5502.0 FT	5062.5 FT

Output DLIS Files

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998							
Thru Cal Magnitude - 0	0	0.6062	0.6065	N/A	N/A	N/A	V

Thru Cal Magnitude - 1	0	1.243	1.243	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6177	0.6180	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.6984	0.6988	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.309	1.310	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.896	1.897	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.895	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.360	1.362	N/A	N/A	N/A	V
Phase - 0	0	51.07	51.24	N/A	N/A	N/A	DEG
Phase - 1	0	49.98	50.16	N/A	N/A	N/A	DEG
Phase - 2	0	46.22	46.40	N/A	N/A	N/A	DEG
Phase - 3	0	45.44	45.63	N/A	N/A	N/A	DEG
Phase - 4	0	39.08	39.28	N/A	N/A	N/A	DEG
Phase - 5	0	37.22	37.43	N/A	N/A	N/A	DEG
Phase - 6	0	37.21	37.42	N/A	N/A	N/A	DEG
Phase - 7	0	33.39	33.68	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxilliary
Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998

AIT-H SPA Plus	990.5	992.8	993.0	N/A	N/A	N/A	MV
AIT-H SPA Zero	0	0.3998	0.3957	N/A	N/A	N/A	MV
AIT-H Temperature Plus	0.9150	0.9197	0.9199	N/A	N/A	N/A	V
AIT-H Temperature Zero	0	0.0004027	0.0003914	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction
Master: Mar 3 15:38 1998

Test Loop Gain Magnitude - 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9914	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9925	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.016	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.3987	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.5347	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.2321	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.1539	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.3521	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.2901	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.1364	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.2994	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction
Master: Mar 3 15:38 1998

R Sonde Error Correction - 0	0	-93.66	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	161.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	107.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	64.57	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	25.88	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	14.54	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.814	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.6669	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	5.647	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-43.27	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	-133.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	83.37	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-8.148	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	-9.012	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	5.059	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	9.732	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction
Master: Mar 3 15:38 1998

Coarse - Mag, Real, Imag - 0	0	1.099	N/A	N/A	N/A	N/A
Coarse - Mag, Real, Imag - 1	0	1.099	N/A	N/A	N/A	N/A
Coarse - Mag, Real, Imag - 2	0	1.099	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 0	0	1.097	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 1	0	1.097	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 2	0	1.097	N/A	N/A	N/A	N/A

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary
Before: Mar 30 11:44 1998

BS Window Ratio	1.006	N/A	1.009	N/A	N/A	N/A	
BS Window Sum	18060	N/A	18060	N/A	N/A	N/A	CPS
SS Window Ratio	0.4686	N/A	0.4687	N/A	N/A	N/A	
SS Window Sum	10640	N/A	10610	N/A	N/A	N/A	CPS
LS Window Ratio	0.2965	N/A	0.2962	N/A	N/A	N/A	
LS Window Sum	1232	N/A	1229	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations
Before: Mar 30 11:44 1998

BS PM High Voltage (Command)	1562	N/A	1597	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1981	N/A	1986	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1879	N/A	1883	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration
Before: Mar 30 11:44 1998

BS Crystal Resolution	11.53	N/A	11.74	N/A	N/A	N/A	%
SS Crystal Resolution	10.18	N/A	10.28	N/A	N/A	N/A	%
LS Crystal Resolution	9.543	N/A	9.562	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration
Before: Mar 30 11:46 1998

Raw B0 Resistivity	3875	N/A	3826	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3806	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3799	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration
Before: Mar 30 11:42 1998

HILT Caliper Zero Measurement	8.000	N/A	8.684	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.83	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration
Before: Mar 30 11:40 1998

Gamma Ray Background	30.00	N/A	46.84	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	178.3	N/A	178.3	N/A	N/A	16.21	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement
Master: Dec 31 10:02 1997 Before: Mar 30 11:42 1998

CNTC Background	25.62	25.62	26.50	N/A	N/A	3.843	CPS
CFTC Background	24.39	24.39	24.60	N/A	N/A	3.658	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration
Before: Mar 30 22:30 1998

Z-Axis Acceleration	32.19	N/A	32.15	N/A	N/A	N/A	F/S2

The GLS-VJ source activity is acceptable.

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

NCT-B Water Temperature 69.0 DEGF.
Thermal Housing Size 3.360 IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H	
Array Induction Sonde	AHIS - BA	
HILT high-Resolution Mechanical Sonde	HRMS - B	857
HILT Rxo Gamma-ray Device	HRGD -	951
HILT Nuclear Back-Scatter Detector	HILT -	
HILT Nuclear Short-Spacing Detector	HILT -	
HILT Nuclear Long-Spacing Detector	HILT -	
Micro Cylindrically Focused Log Device	MCFL -	

Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration
Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6062		0.6050	51.07		71.00
	Before	0.6065			51.24		
1	Master	1.243		1.270	49.98		70.00
	Before	1.243			50.16		
2	Master	0.6177		0.6230	46.22		66.00
	Before	0.6180			46.40		
3	Master	0.6984		0.7010	45.44		65.00

3	Before	0.6988	0.7040	45.63	65.00	
4	Master	1.309	1.337	39.08	59.00	
	Before	1.310		39.28		
5	Master	1.896	1.955	37.22	57.00	
	Before	1.897		37.43		
6	Master	1.895	1.955	37.21	57.00	
	Before	1.896		37.42		
7	Master	1.360	1.415	33.39	53.00	
	Before	1.362		33.68		
		60.00 % (Minimum) (Nominal) 140.0 % (Maximum)		Nom -60.00 (Minimum) (Nominal) Nom + 60.00 (Maximum)		

Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Auxilliary

Phase	AIT-H SPA Plus MV	Value	Phase	AIT-H SPA Zero MV	Value
Master		992.6	Master		0.3998
Before		993.0	Before		0.3957
	941.0 (Minimum) 990.5 (Nominal) 1040 (Maximum)			-50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	AIT-H Temperature Plus V	Value	Phase	AIT-H Temperature Zero V	Value
Master		0.9197	Master		0.0004027
Before		0.9199	Before		0.0003914
	0.8700 (Minimum) 0.9150 (Nominal) 0.9600 (Maximum)			-0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG
0	1.015	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.3987	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.012	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.5347	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.019	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	-0.2321	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.015	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	-0.1539	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	0.9914	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.3521	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9925	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	-0.2901	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	1.004	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.1364	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.016	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	-0.2994	-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M
0	93.66		5.847	

0	-93.66				5.647			
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	161.8				-43.27			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	107.6				-133.4			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	64.57				83.37			
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.88				-8.148			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	14.54				-9.012			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.814				5.059			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.6669				9.732			
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
0	1.099				1.097			
		0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)		0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
1	1.099				1.097			
		0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)		0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
2	1.099				1.097			
		0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)		0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value	Phase	LS Window Ratio			Value
Before				1.009	Before				0.4687	Before				0.2962
	0.9561 (Minimum)	1.006 (Nominal)	1.057 (Maximum)			0.4451 (Minimum)	0.4686 (Nominal)	0.4920 (Maximum)			0.2817 (Minimum)	0.2965 (Nominal)	0.3113 (Maximum)	

Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before				18060	Before				10610	Before				1229
	17160 (Minimum)	18060 (Nominal)	18960 (Maximum)			10110 (Minimum)	10640 (Nominal)	11170 (Maximum)			1170 (Minimum)	1232 (Nominal)	1293 (Maximum)	

Before: Mar 30 11:44 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Photo-multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
Before				1597	Before				1966	Before				1883
	1482 (Minimum)	1582 (Nominal)	1682 (Maximum)			1861 (Minimum)	1961 (Nominal)	2061 (Maximum)			1779 (Minimum)	1879 (Nominal)	1979 (Maximum)	

Before: Mar 30 11:44 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %			Value	Phase	SS Crystal Resolution %			Value	Phase	LS Crystal Resolution %			Value
Before				11.74	Before				10.28	Before				9.562
	10.53 (Minimum)	11.53 (Nominal)	12.53 (Maximum)			9.176 (Minimum)	10.18 (Nominal)	11.18 (Maximum)			8.543 (Minimum)	9.543 (Nominal)	10.54 (Maximum)	

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

Before: Mar 30 11:44 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3826	Before		3808	Before		3799
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: Mar 30 11:46 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value
Before		8.684	Before		12.83
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: Mar 30 11:42 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		46.84	Before		178.3	Before		165.0
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	162.1 (Minimum)	178.3 (Nominal)	194.5 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: Mar 30 11:40 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		25.62	Master		24.39
Before		26.50	Before		24.60
5.000 (Minimum)	25.62 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	24.39 (Nominal)	40.00 (Maximum)

Master: Dec 31 10:02 1997 Before: Mar 30 11:42 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		32.15
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)

Before: Mar 30 22:30 1998

RECEIVED
JUN 23 1998
DIV. OF OIL, GAS & MINING

RECEIVED

COMPANY:	PETROGLYPH OPERATING COMPANY, INC.	BOTTOM LOG INTERVAL	5465 F
		SCHLUMBERGER DEPTH	5494 F
WELL:	UTE TRIBAL #31-12	DEPTH DRILLER	5506 F
FIELD:	ANTELOPE CREEK	KELLY BUSHING	[illegible] F
COUNTY:	UINTAH	DRILL FLOOR	[illegible] F
STATE:	UTAH	GROUND LEVEL	[illegible] F

COMPENSATED NEUTRON LITHODENSITY

Schlumberger

LITHODENSITY
GAMMA RAY

COMPANY: PETROGLYPH OPERATING COMPANY, INC.

WELL: UTE TRIBAL #31-12

FIELD: ANTELOPE CREEK

COUNTY: UINTAH STATE: UTAH

COUNTY: UINTAH
Field: ANTELOPE CREEK
Location: 1999' FSL & 748' FWL
Well: UTE TRIBAL #31-12
Company: PETROGLYPH OPERATING

Schlumberger

PLATFORM EXPRESS
ARRAY INDUCTION
GAMMA RAY

LOCATION

1999' FSL & 748' FWL
NW SW

POW

Elev.: K.B. 6302.6 F
G.L. 6292.6 F
D.F. 6301.6 F

Permanent Datum: GROUND LEVEL Elev.: 6292.6 F
Log Measured From: KELLY BUSHING 10.0 F above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-32038	31	5S	3W

	Run 1	Run 2	Run 3
Logging Date	30-MAR-1998		
Run Number	ONE		
Depth Driller	5506 F		
Schlumberger Depth	5494 F		
Bottom Log Interval	5500 F		
Top Log Interval	369 F		
Casing Driller Size @ Depth	8.625 IN @ 369 F	@	@
Casing Schlumberger	369 F		
Bit Size	7.875 IN		
Type Fluid In Hole	AMMONIUM CHLORIDE		
MUD Density / Viscosity	8.3 LB/G / 27 S		
MUD Fluid Loss / PH	10.5		
MUD Source Of Sample	PIT		
RM @ Measured Temperature	0.812 OHMM @ 48 DEGF	@	@
RMF @ Measured Temperature	0.812 OHMM @ 48 DEGF	@	@
RMC @ Measured Temperature	@	@	@
Source RMF / RMC	PIT		
RM @ MRT / RMF @ MRT	0.356 @ 118 / 0.356 @ 118	@ / @	@ / @
Maximum Recorded Temperatures	118 DEGF / 118		
Circulation Stopped / Time	30-MAR-1998 / 11:45		
Logger On Bottom / Time	30-MAR-1998 / 19:56		
Unit Number / Location	8426 VERNAL, UTAH		
Recorded By	KEITH NELSON		
Witnessed By	GENE SEARLE		

	Run 4	Run 5
Logging Date		
Run Number		
Depth Driller		
Schlumberger Depth		
Bottom Log Interval		
Top Log Interval		
Casing Driller Size @ Depth	@	
Casing Schlumberger		
Bit Size		
Type Fluid In Hole		
MUD Density / Viscosity		
MUD Fluid Loss / PH		
MUD Source Of Sample		
RM @ Measured Temperature	@	
RMF @ Measured Temperature	@	
RMC @ Measured Temperature	@	
Source RMF / RMC		
RM @ MRT / RMF @ MRT	@	
Maximum Recorded Temperatures		
Circulation Stopped / Time		
Logger On Bottom / Time		
Unit Number / Location		
Recorded By		
Witnessed By		

	Run 2	Run 3	Run 4

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1	OTHER SERVICES2
OS1: COMPENSATED NEUTRON	OS1:
OS2: ANSWER PRODUCT	OS2:
OS3: LITHODENSITY	OS3:
OS4: GAMMA RAY	OS4:
OS5:	OS5:

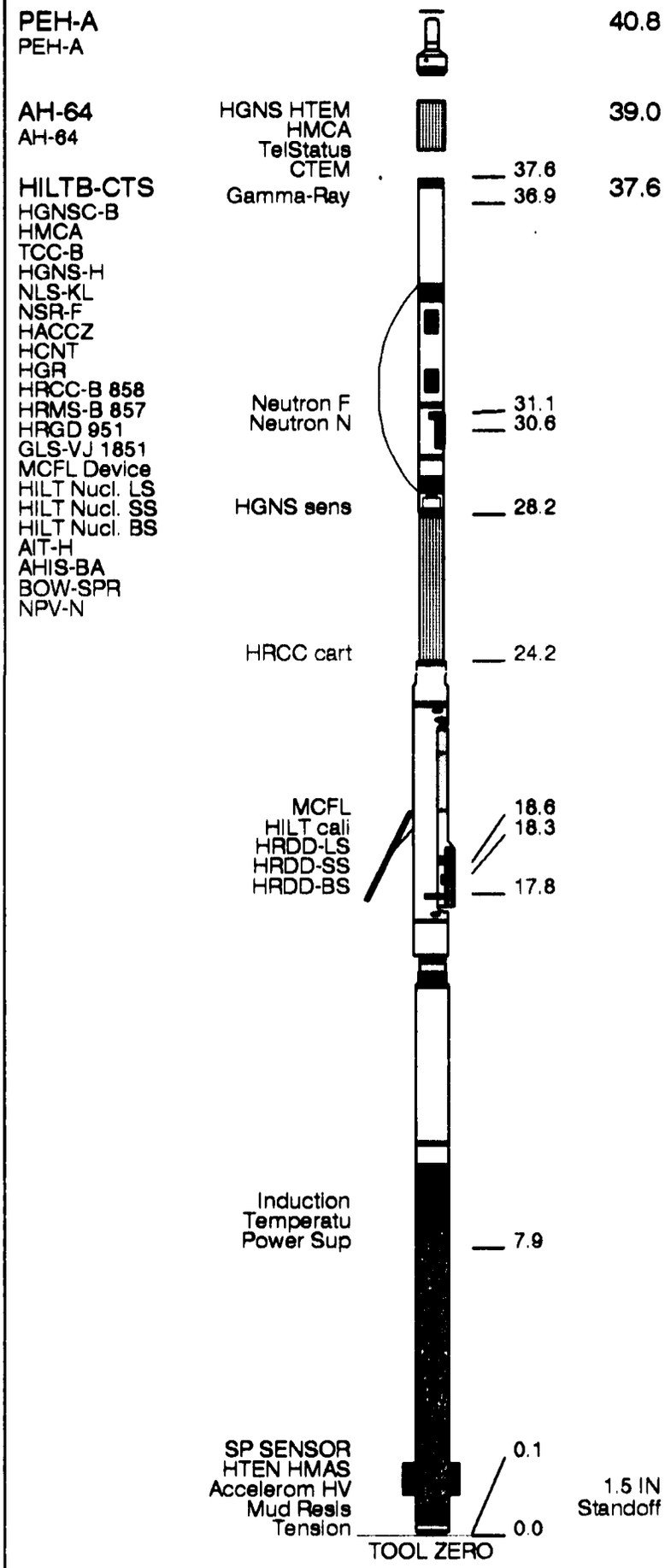
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
BOW SPRING USED ON NEUTRON	
1.5" STAND-OFFS USED ON AIT	
USED PRIMARY DEPTH AS REFERENCE	
DRILLING SALINITY WAS 2600 PPM.	
SANDSTONE MATRIX (2.68 G/CC) USED	
TODAYS CREW:	
B. SLAMA AND K. JOHNS	

RUN 1		RUN 2	
SERVICE ORDER #:	1168613	SERVICE ORDER #:	
PROGRAM VERSION:	7C0-712	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1	RUN 2
SURFACE EQUIPMENT	
TCM-AB GSR-U/Y NCT-B CNB-AB NCS-VB	
DOWNHOLE EQUIPMENT	



MAXIMUM STRING DIAMETER 6.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28	5502.0 FT	6.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 1951.77 F3

Cement Volume = 1104.84 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
BHT	120 DEGF	125 DEGF	5304.2 20:20:52

BHT	120 DEGF		135 DEGF		5304.3 20:30:52
	118 DEGF		120 DEGF		5343.1 20:31:08

PIP SUMMARY

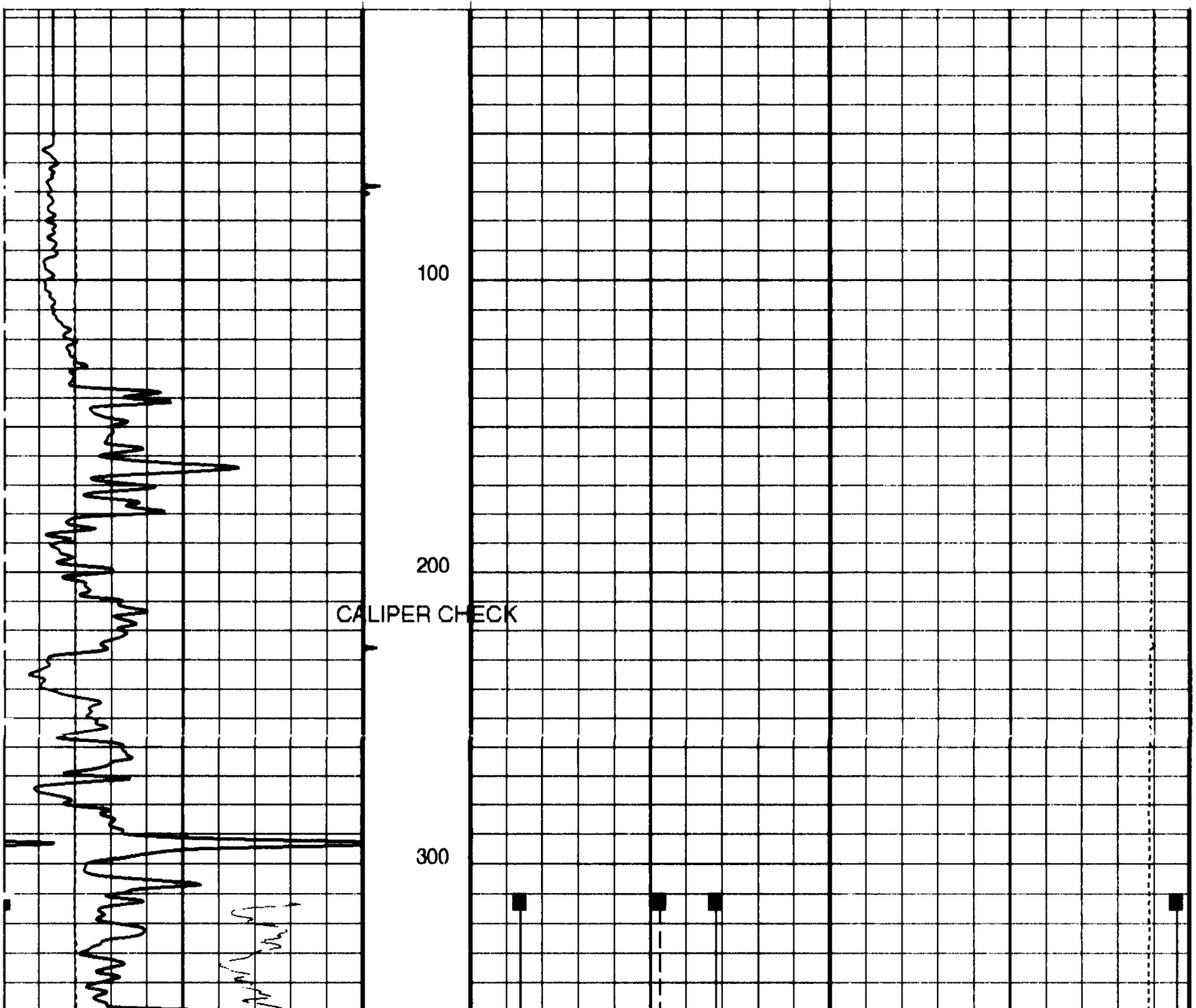
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

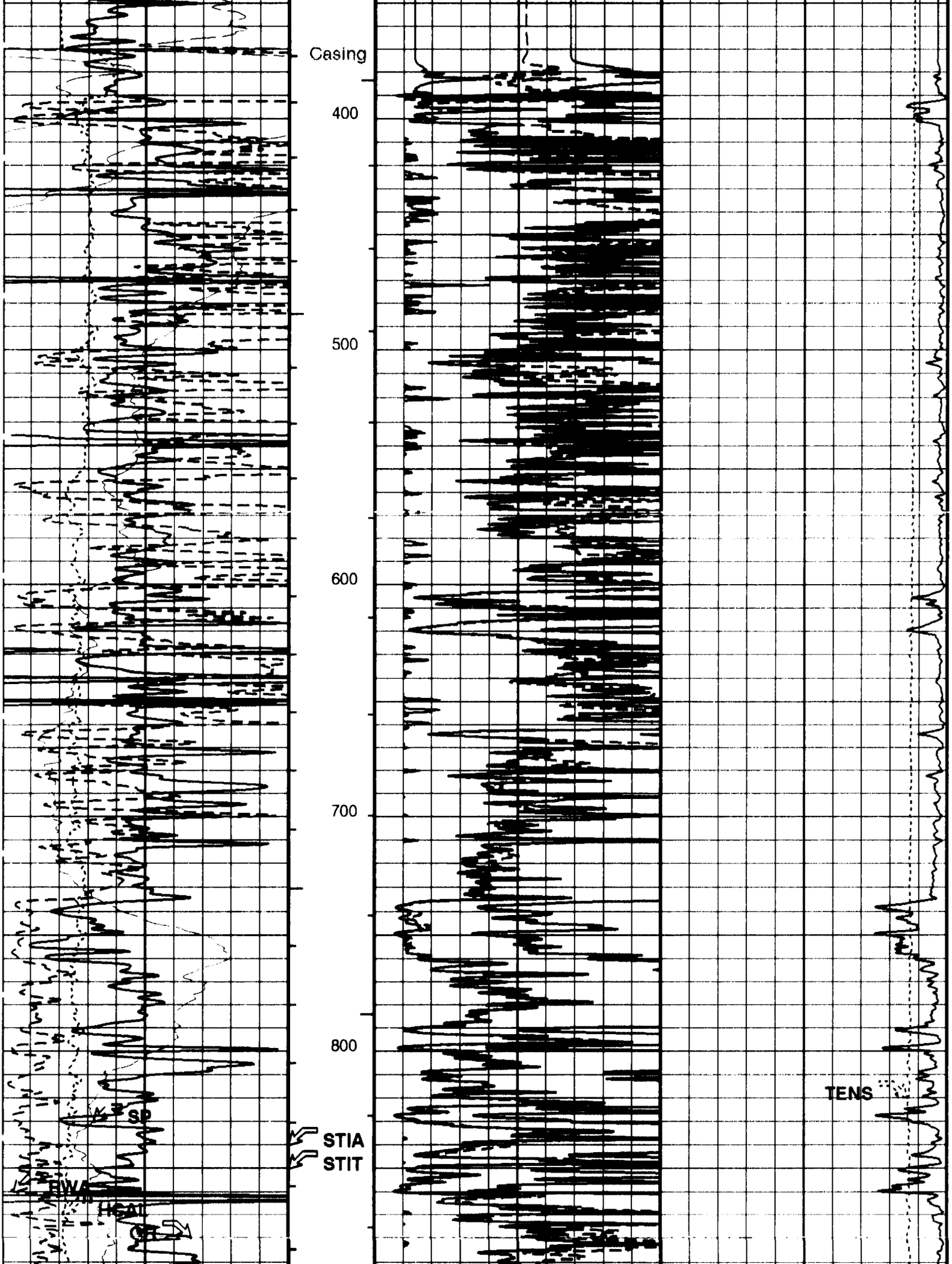
Time Mark Every 60 S

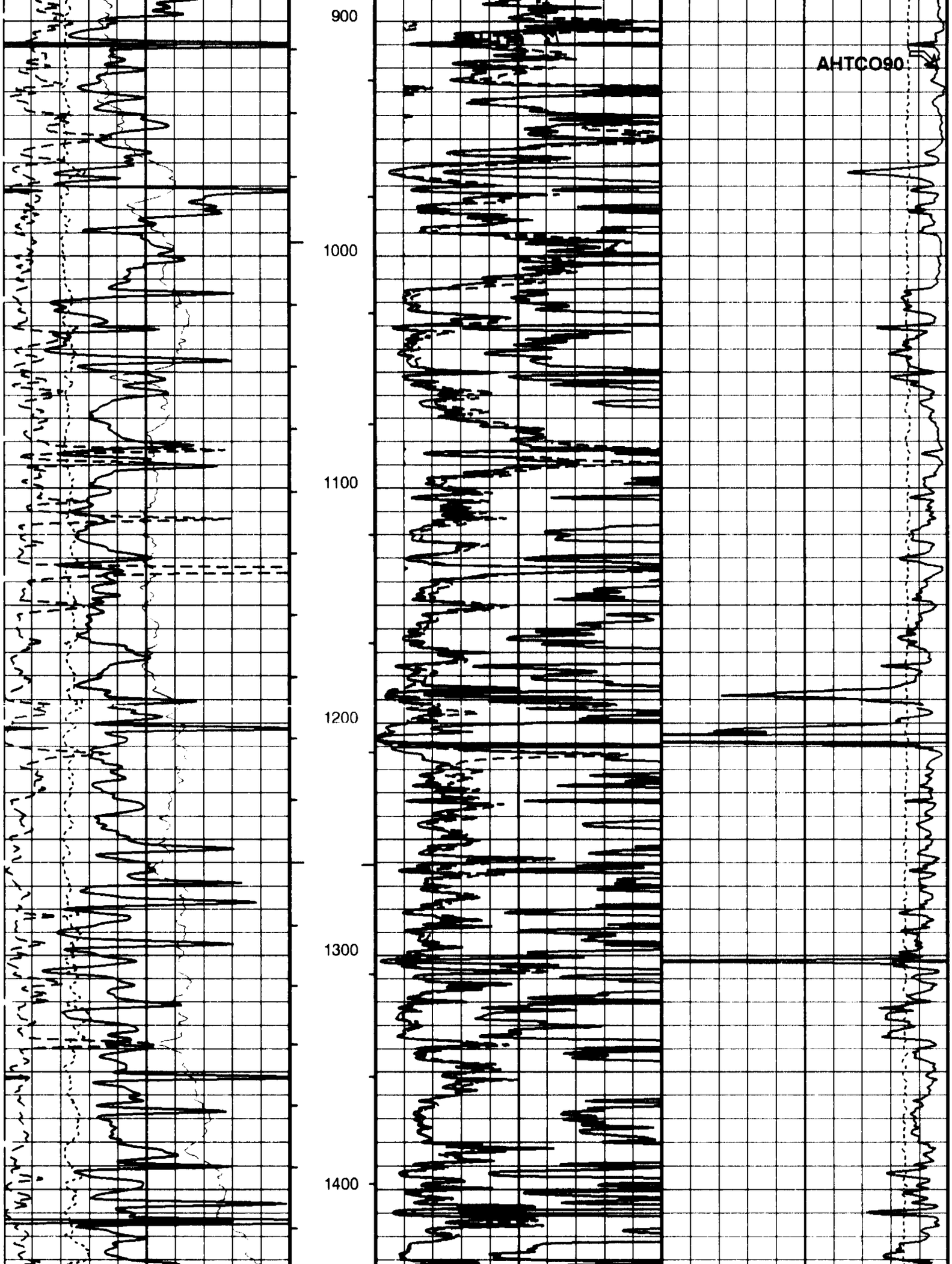
MAIN PASS 2" = 100'

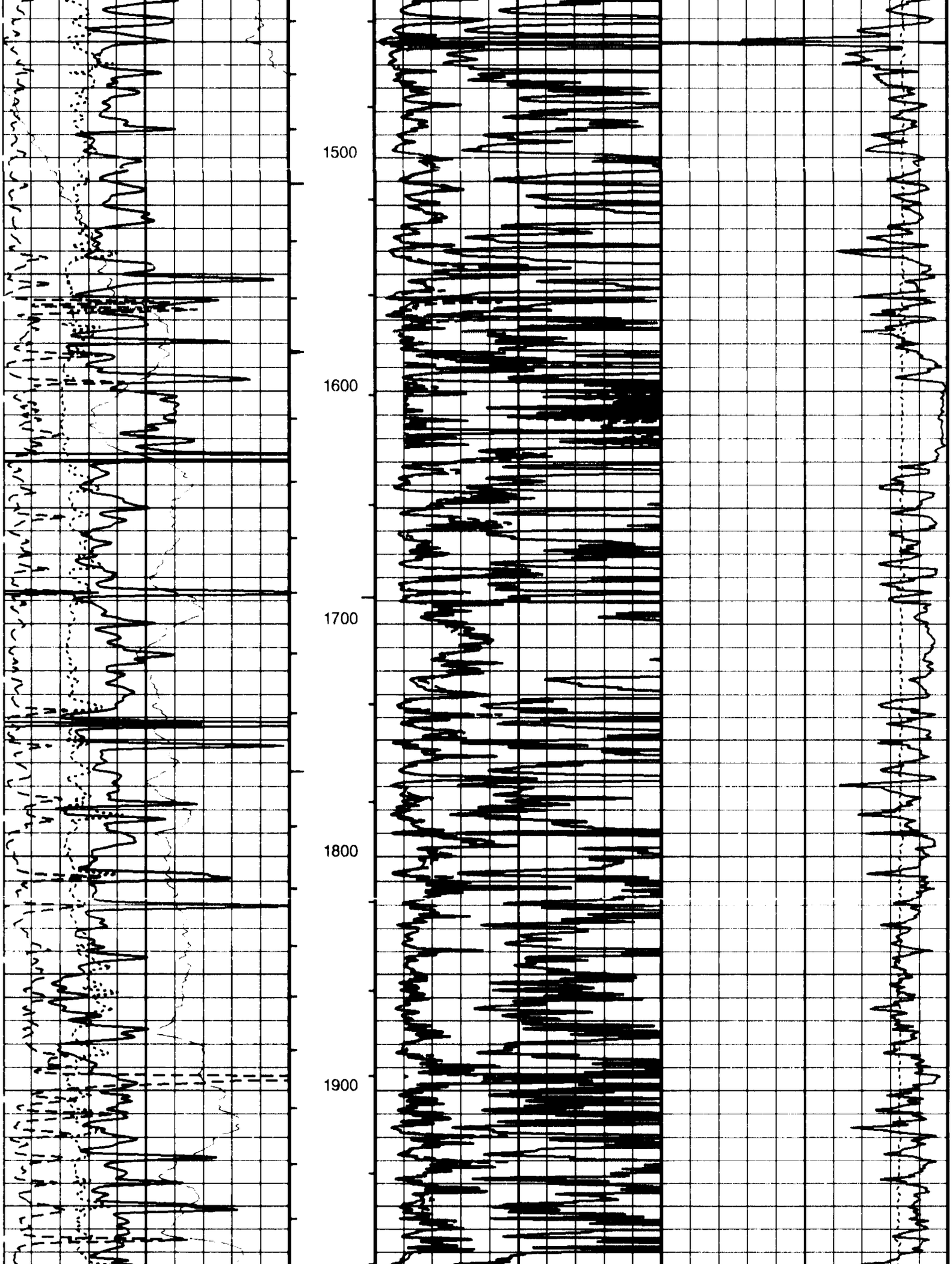
RWA (RWA) 0 (OHMM) 3		
Caliper (HCAL) 6 (IN) 16	Tool/Tot. Drag From D3T to STIA	AIT-H 10 Inch Investigation (AHT10) 0 (OHMM) 20
Gamma Ray (GR) 0 (GAPI) 200	Cable Drag From STIA to STIT	AIT-H 90 Inch Investigation (AHT90) 0 (OHMM) 100
SP (SP) -80 (MV) 20	Stuck Stretch (STIT) 0 (F) 50	AIT-H 10 Inch Investigation (AHT10) 0 (OHMM) 100

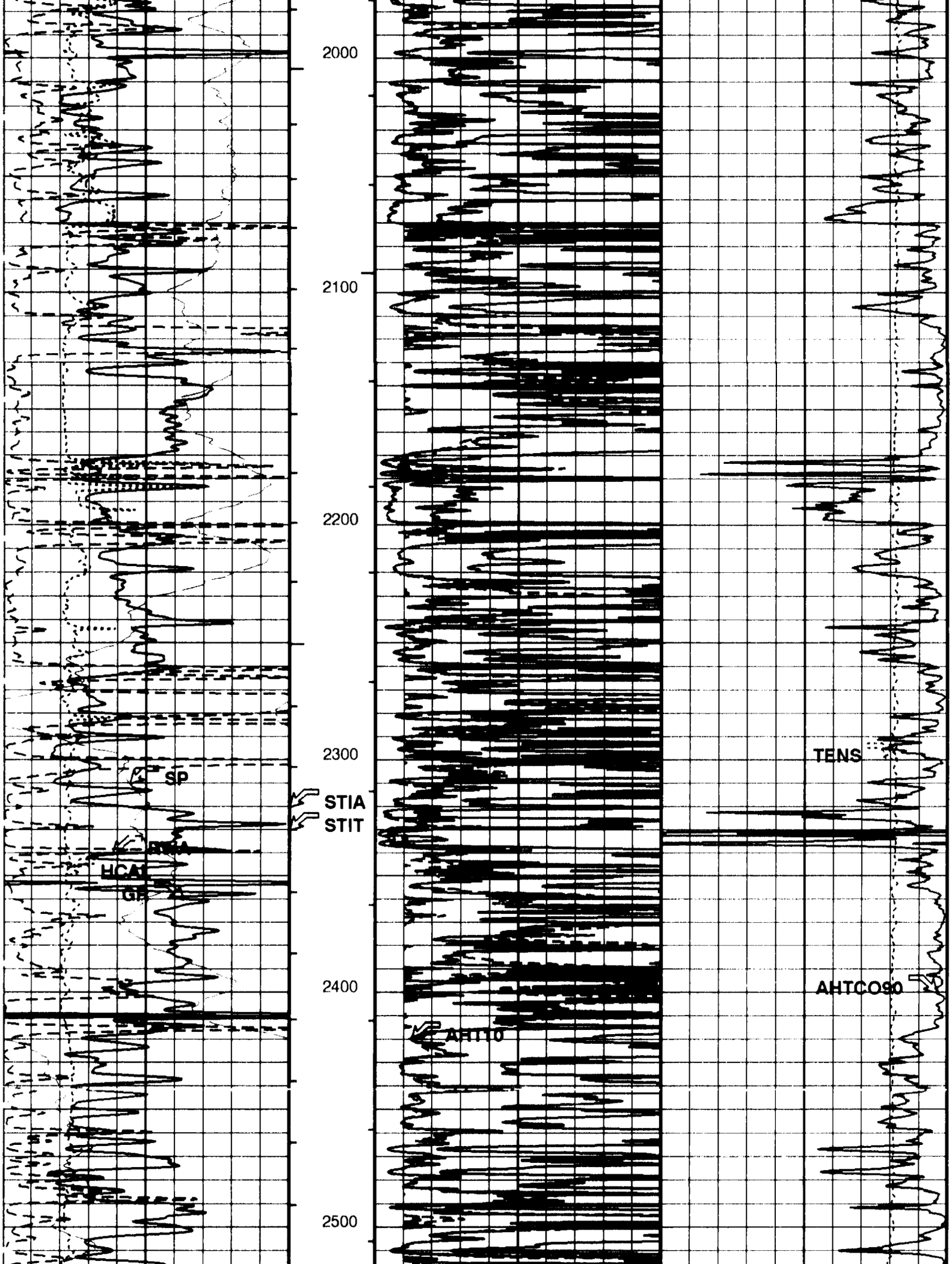
Tension (TENS) 10000 (LBF) 0
AIT-H 90 Inch Investigation Conductivity (AHTCO90) 500 (MM/M) 0




Casing
400
500
600
700
800
SP
STIA
STIT
RWA
HGAI
GR
TENS


900
1000
1100
1200
1300
1400
AHTCO90


1500
1600
1700
1800
1900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2400
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SP
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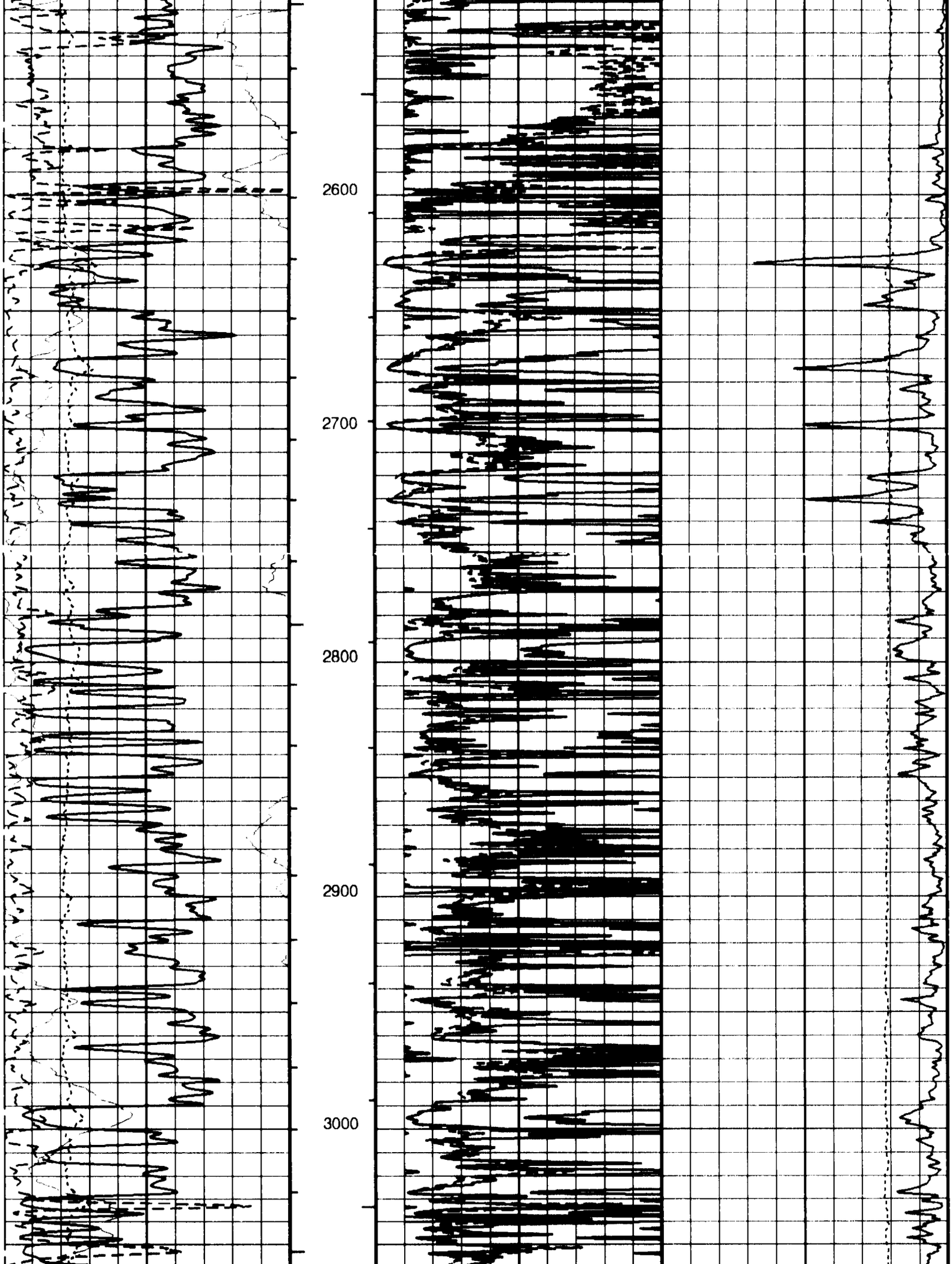
STIT
HCAL
GR
AHTT10
TENS
AHTCO90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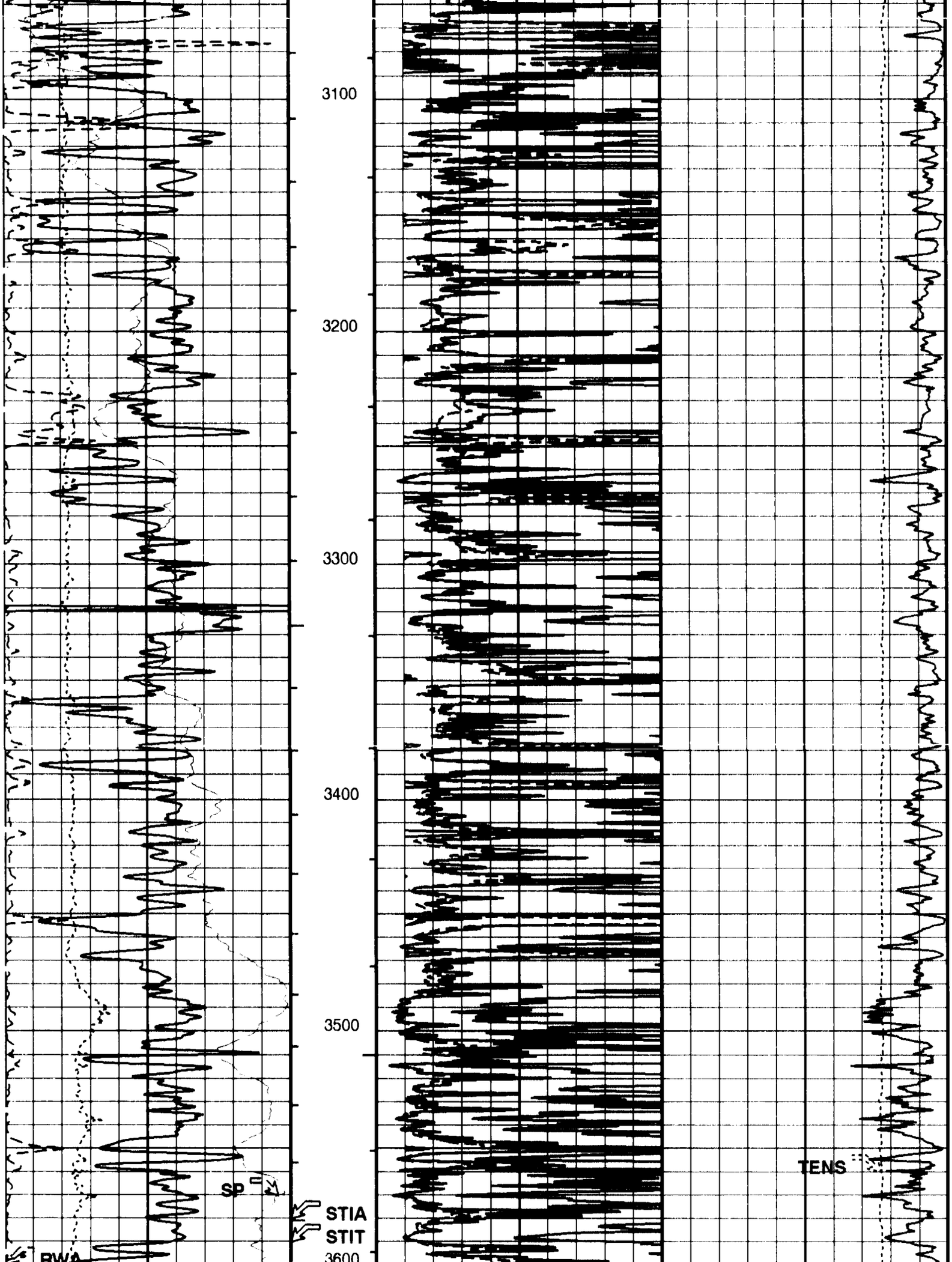
2800
2900
3000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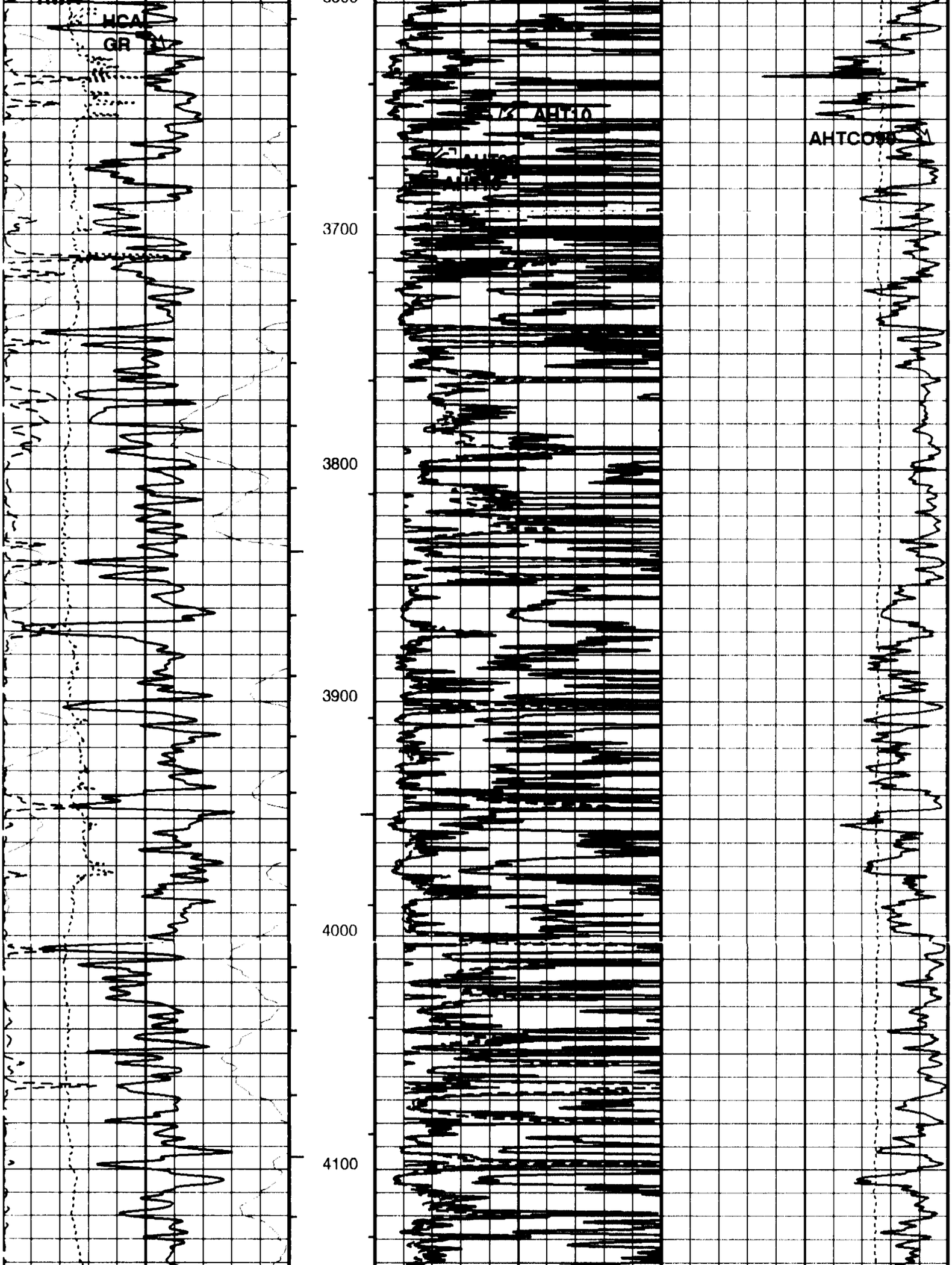
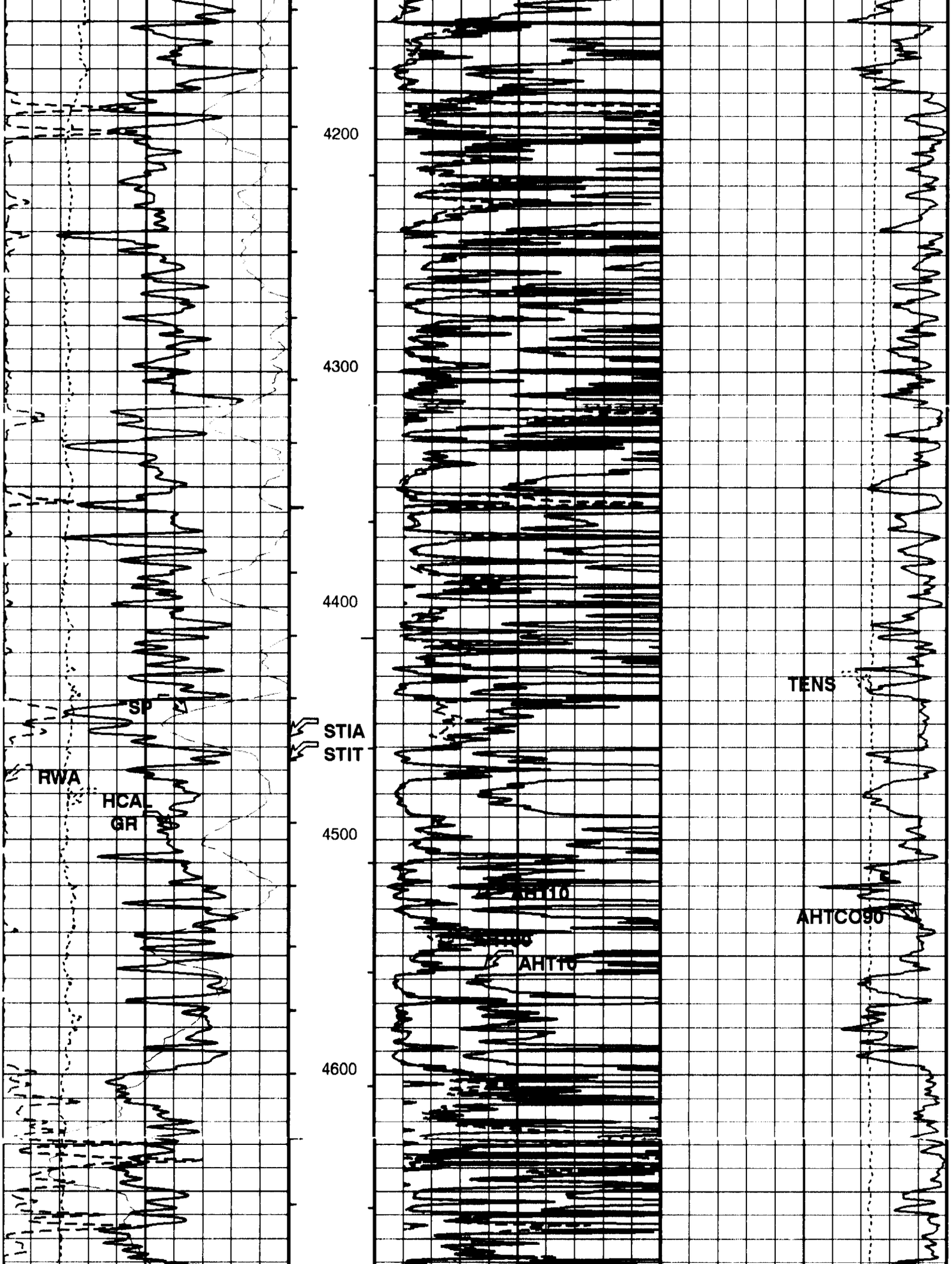
3200
3300
3400
3500
3600
SP
STIA
STIT
TENS


HCAL
GR
AHT10
AHTCO50
3700
3800
3900
4000
4100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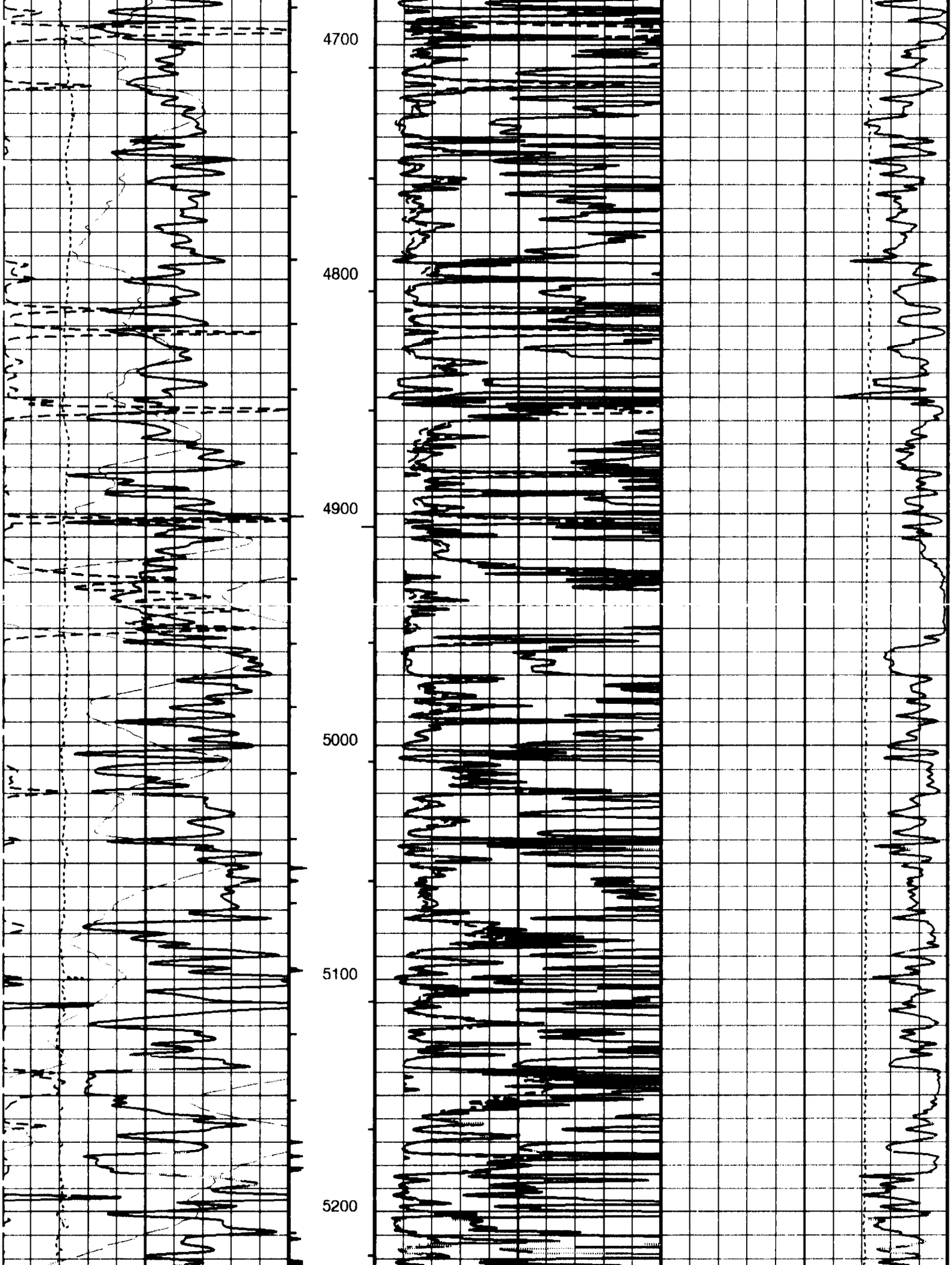
STIT
RWA
HCAL
GR
TENS
AHT10
AHTCO90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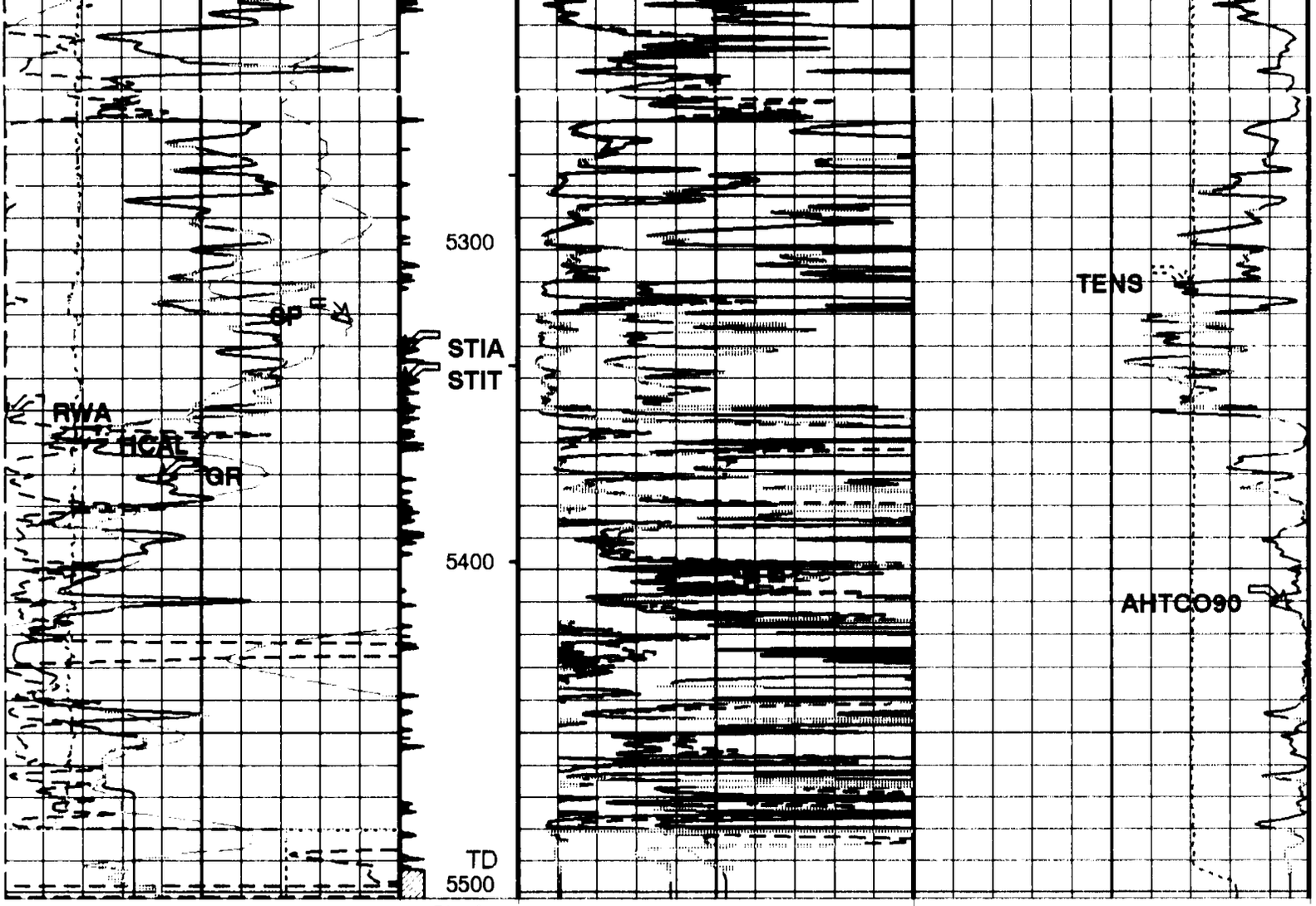
4800
4900
5000
5100
5200



SP (SP) -80 (MV) 20	Stuck Stretch (STIT) 0 (F) 50	AIT-H 10 Inch Investigation (AHT10) 0 (OHMM) 100	AIT-H 90 Inch Investigation Conductivity (AHTCO90) 500 (MM/M) 0
Gamma Ray (GR) 0 (GAPI) 200	Cable Drag From STIA to STIT	AIT-H 90 Inch Investigation (AHT90) 0 (OHMM) 100	Tension (TENS) 10000 (LBF) 0
Caliper (HCAL) 6 (IN) 16	Tool/Tot. Drag From D3T to STIA	AIT-H 10 Inch Investigation (AHT10) 0 (OHMM) 20	
RWA (RWA) 0 (OHMM) 3		MAIN PASS 2" = 100'	

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff	
AHBLM	AIT-H Basic Logs Mode	1_Two	
AHCDE	AIT-H Casing Detection Enable	Yes	
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered	
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000	FT
AHMPF	AIT-H Mud Resistivity Factor	1	

AHMRF	AIT-H Mud Resistivity Factor	1	
AHSTA	AIT-H Tool Standoff	1.5	IN
ARTS	AIT Rt Selection (for ALLRES computation)	13_AHT90	
BHT	Bottom Hole Temperature (used in calculations)	135	DEGF
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset Repeat Analysis	0.0	FT
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSTI	STI Uses HILT Acceleration	YES	
MST	Mud Sample Temperature	45.00	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
RTCO	RTCO - Rt Invasion Correction	YES	
RW	Resistivity of Connate Water	0.2100	OHMM
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
STKT	STI Stuck Threshold	2.5	FT
TD	Total Depth	5506	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: AIT_LINEAR Vertical Scale: 2" per 100' Graphics File Created: 30-MAR-1998 20:28

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Output DLIS Files

DEFAULT HILTC .008 FN:5 FIELD 30-MAR-1998 20:28

Output DLIS Files

DEFAULT HILTC .008 FN:5 FIELD 30-MAR-1998 20:28

Integrated Hole/Cement Volume Summary

Hole Volume = 1951.77 F3

Cement Volume = 1104.84 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
BHT	120 DEGF	135 DEGF	5304.3 20:30:52
	118 DEGF	120 DEGF	5343.1 20:31:08

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

	Tension (TENS)	
10000	(LBF)	0

MAIN PASS

AIT-H 90 Inch Investigation (AHT90)		
0.2	(OHMM)	2000

RWA (RWA)
0 (OHMM) 3

Caliper (HCAL)
6 (IN) 16

Gamma Ray (GR)
0 (GAPI) 200

SP (SP)
-80 (MV) 20

Tool/Tot. Drag From D3T to STIA

Cable Drag From STIA to STIT

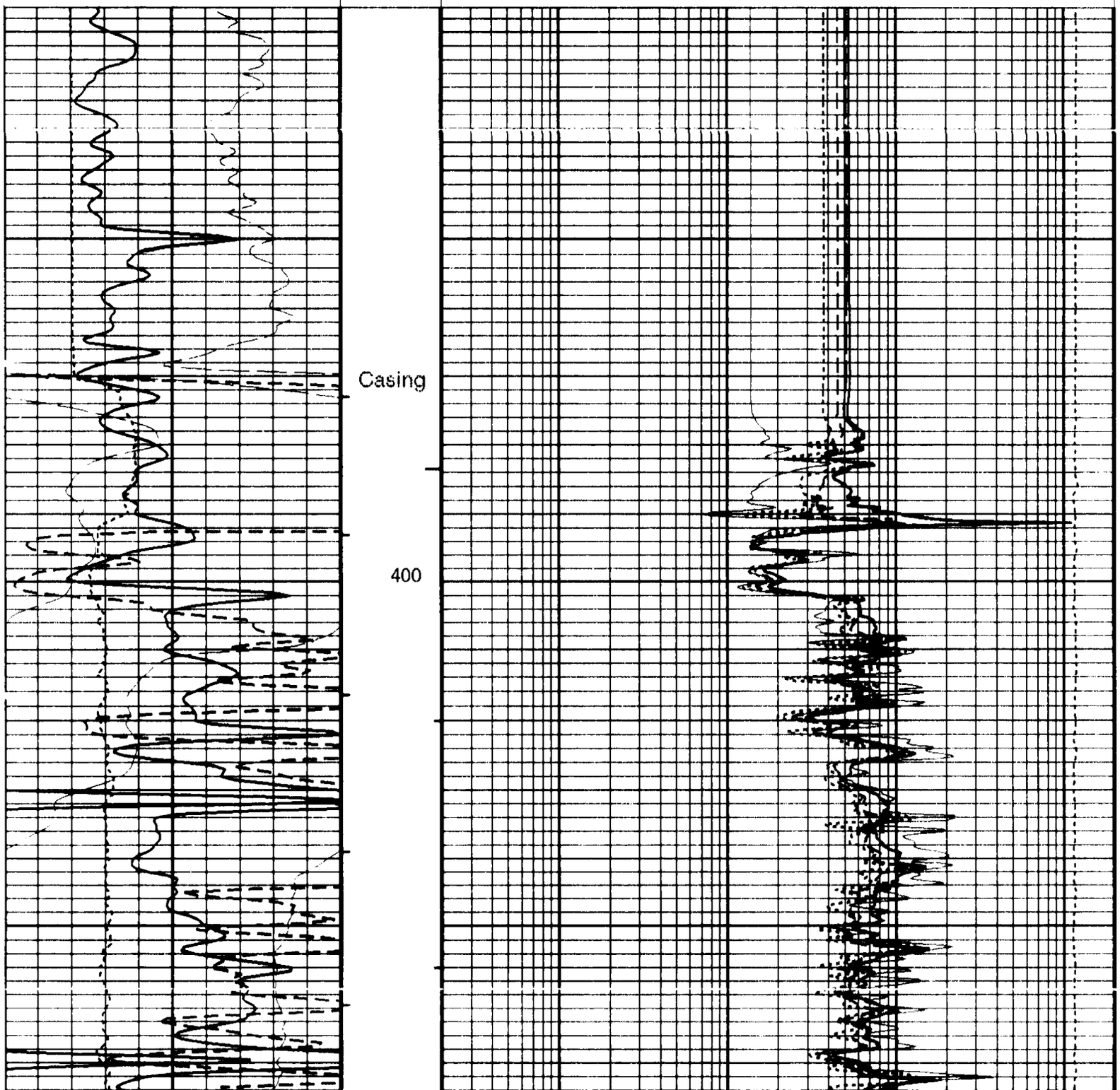
Stuck Stretch (STIT)
0 (F) 50

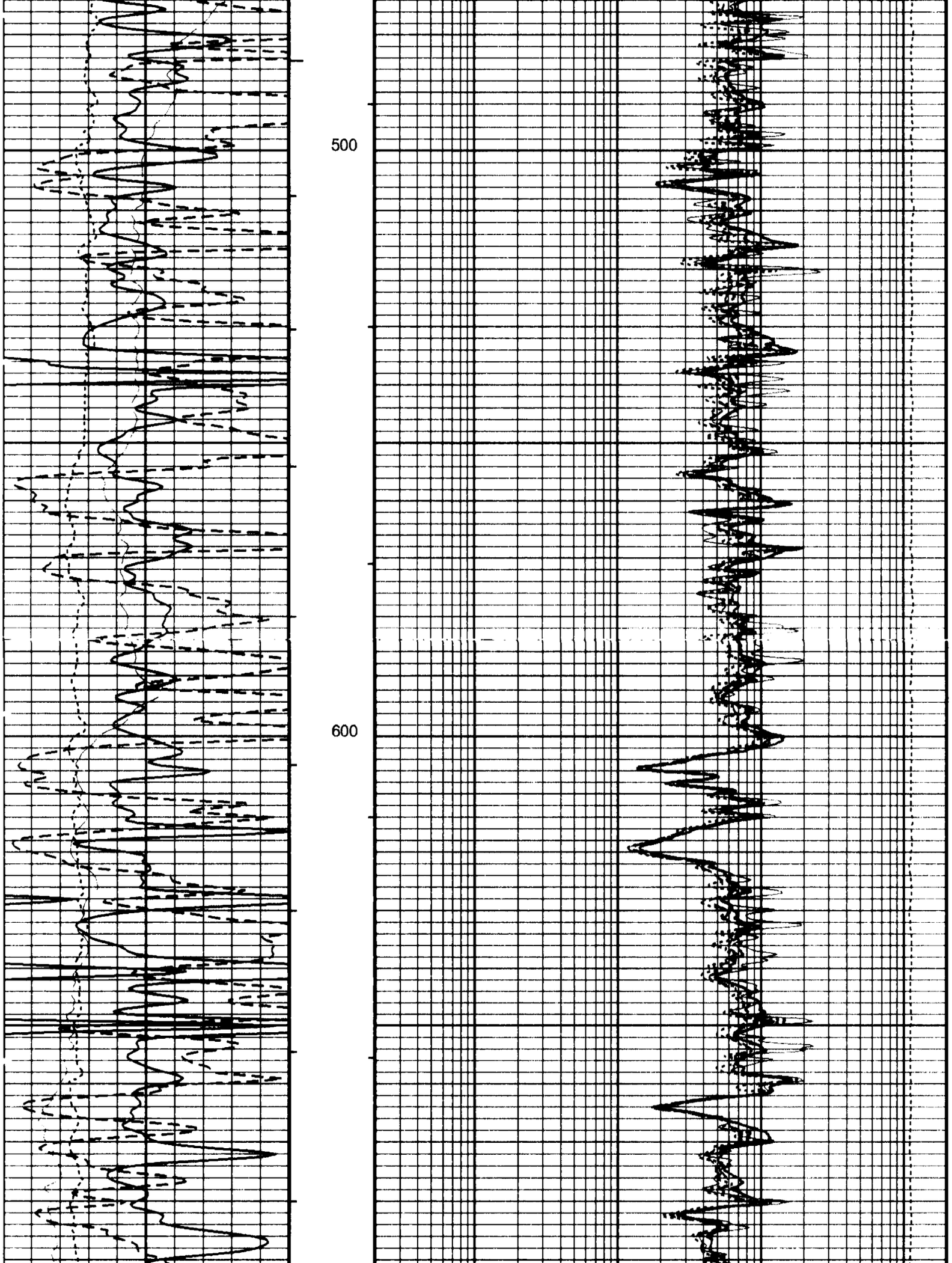
AIT-H 60 Inch Investigation (AHT60)
0.2 (OHMM) 2000

AIT-H 30 Inch Investigation (AHT30)
0.2 (OHMM) 2000

AIT-H 20 Inch Investigation (AHT20)
0.2 (OHMM) 2000

AIT-H 10 Inch Investigation (AHT10)
0.2 (OHMM) 2000

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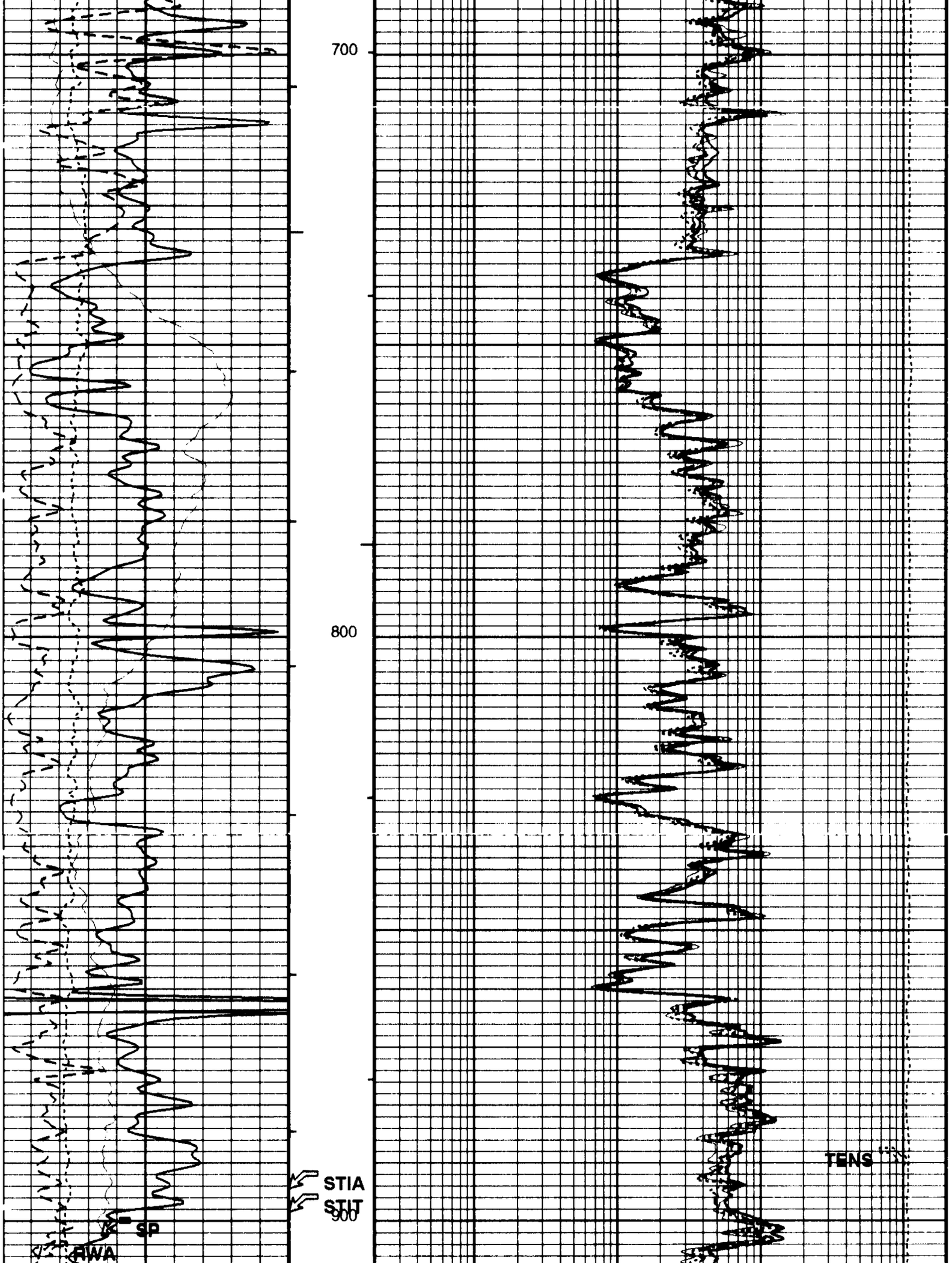
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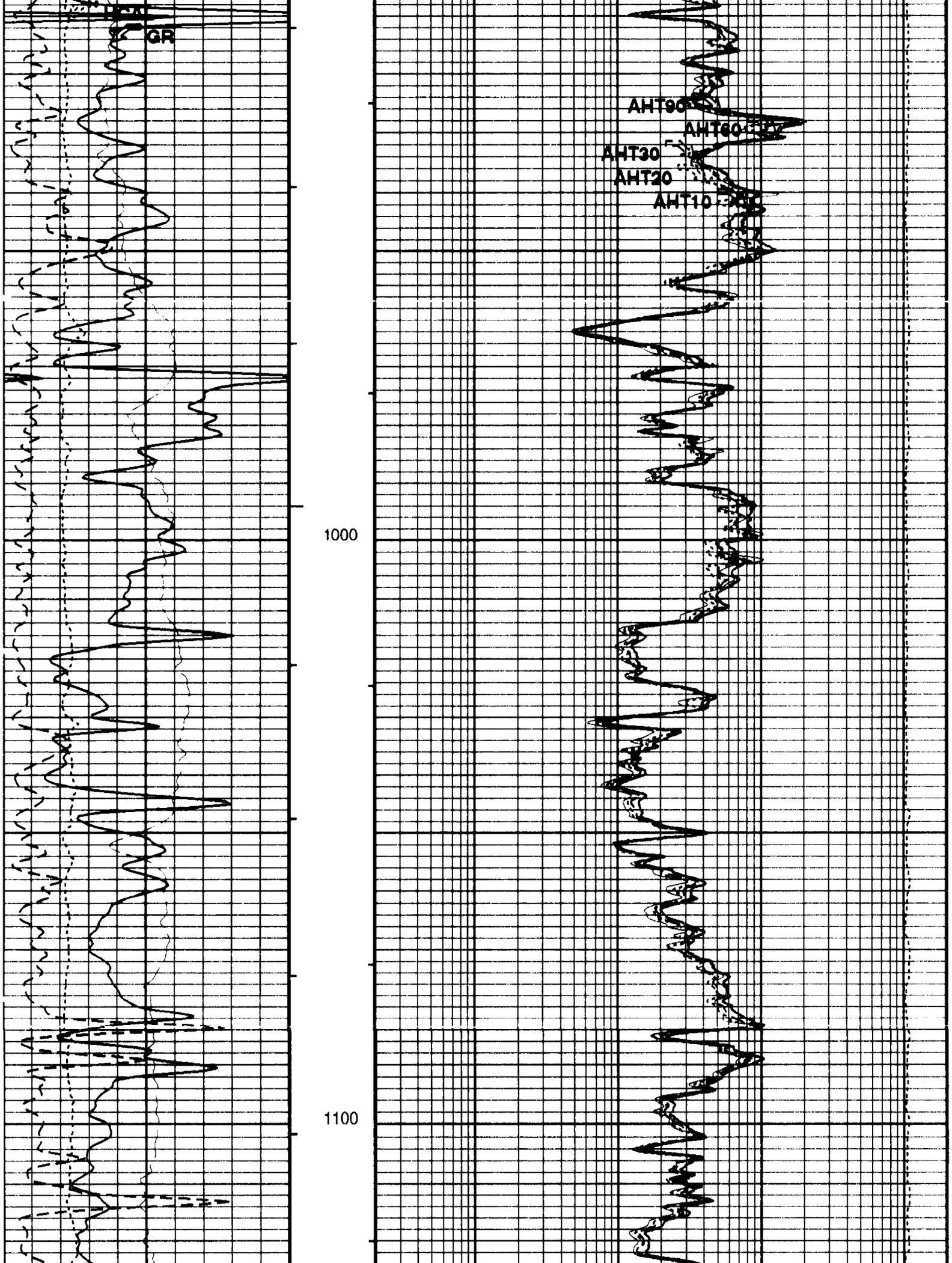
900
STIA
STIT
SP
RWA
TENS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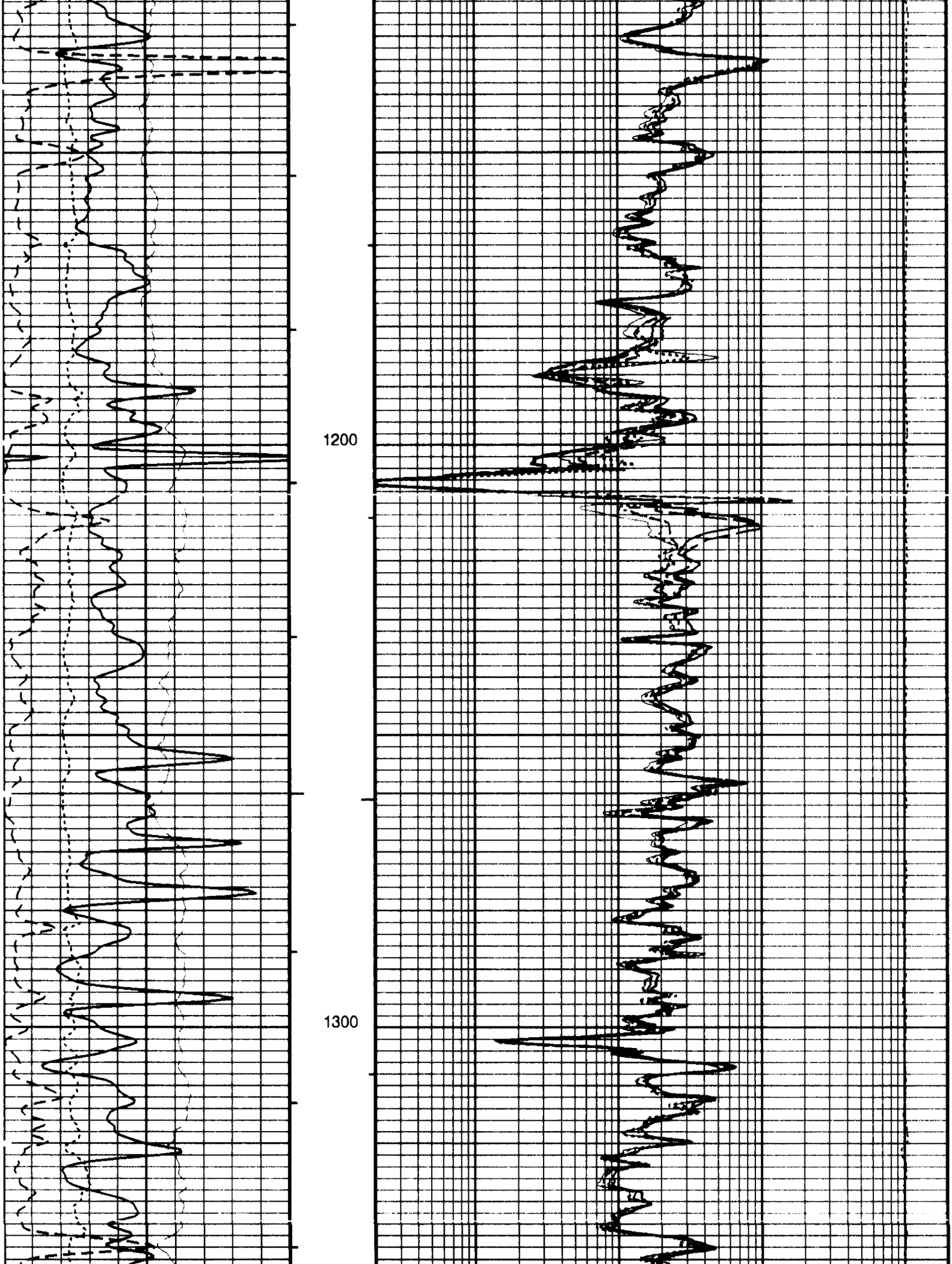
AHT90
AHT60
AHT30
AHT20
AHT10
1000
1100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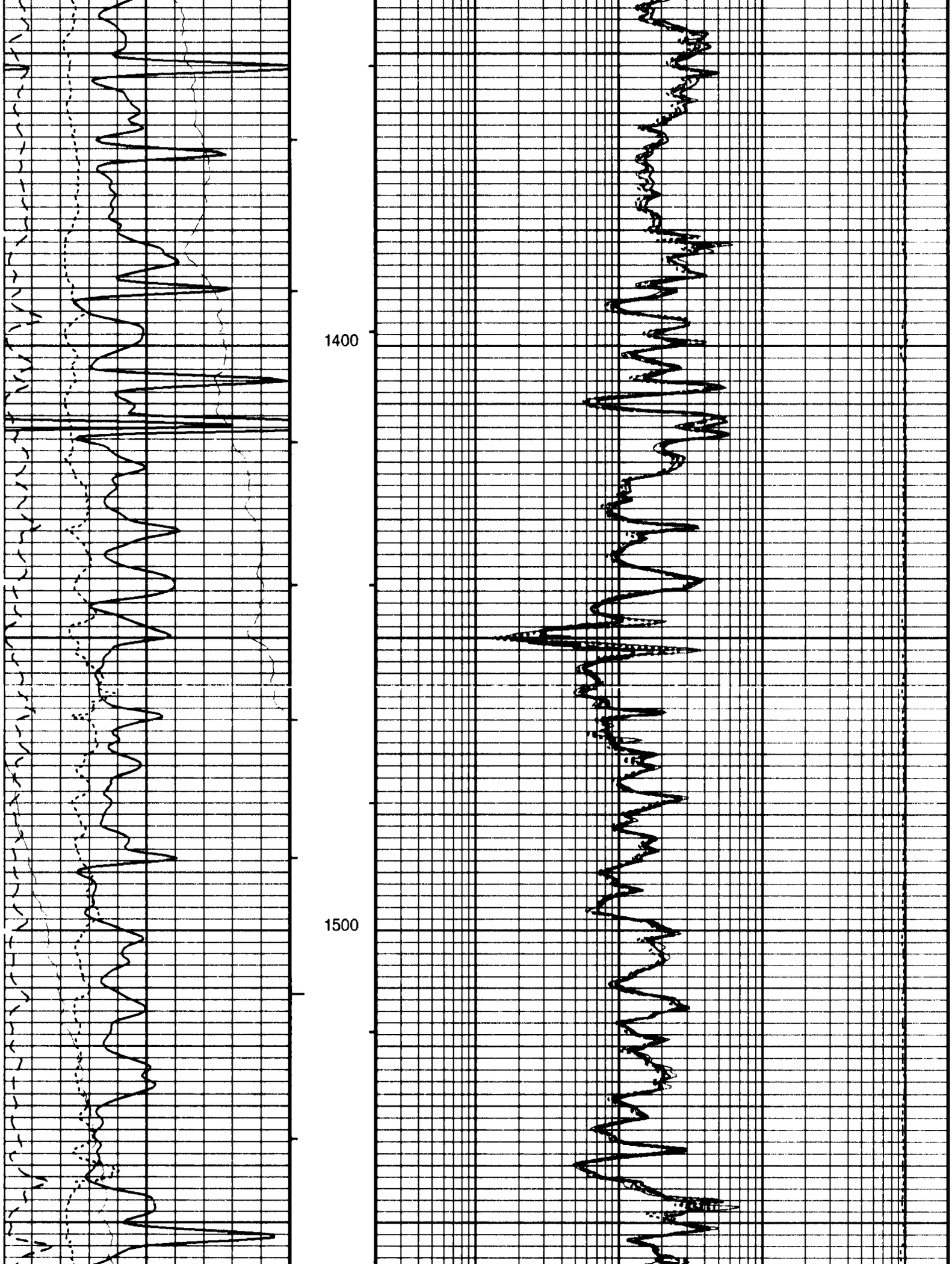
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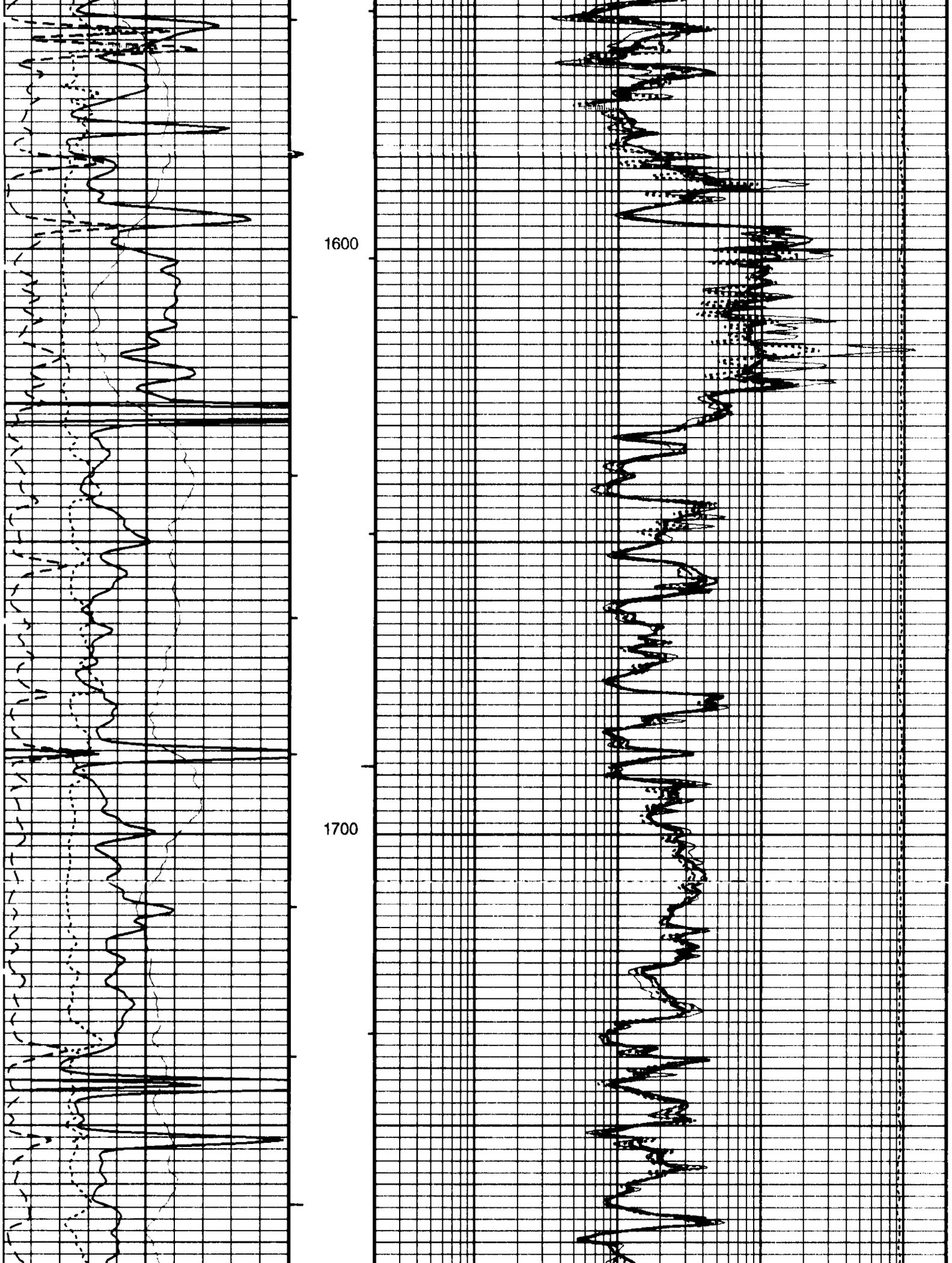
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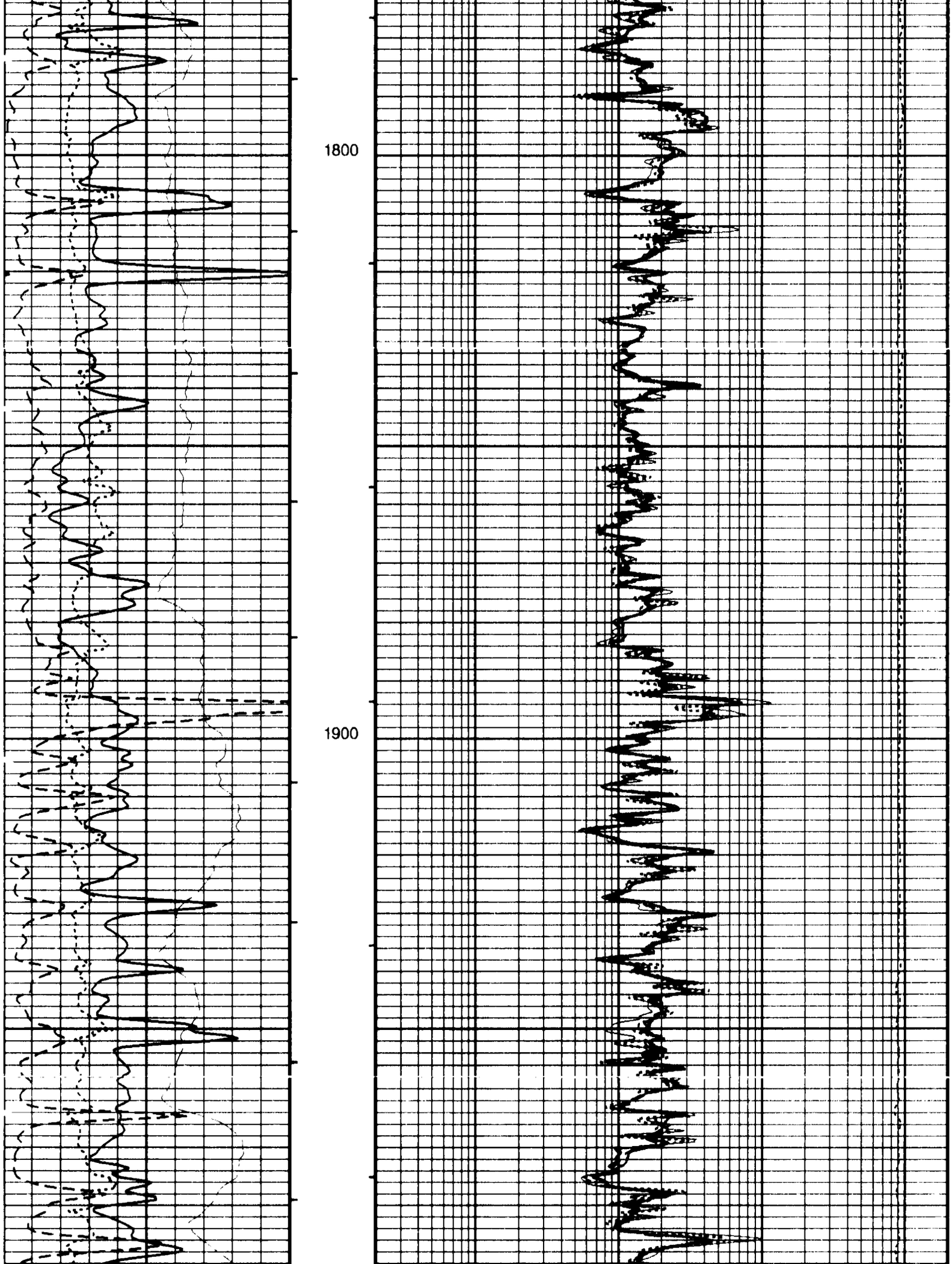
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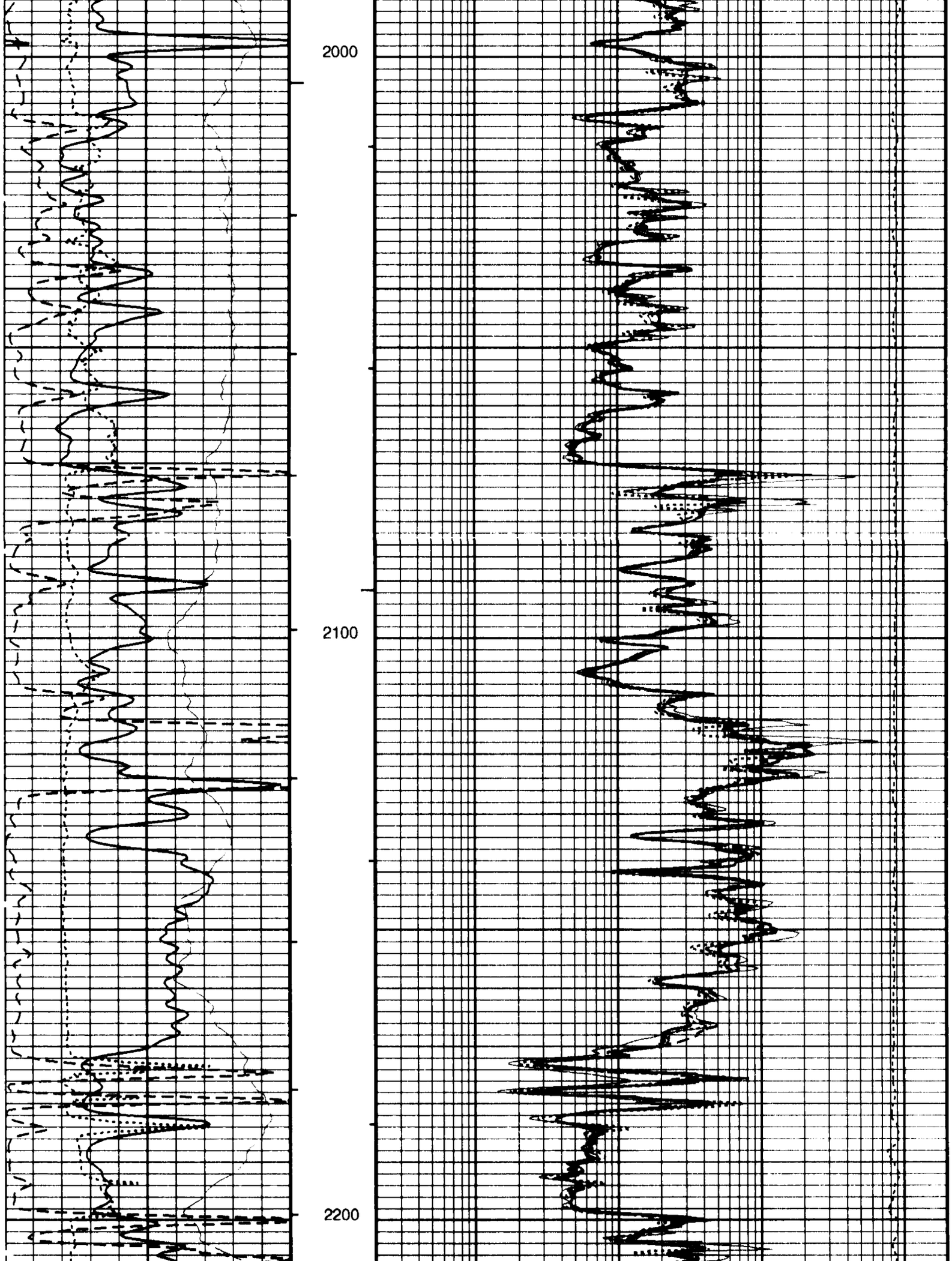
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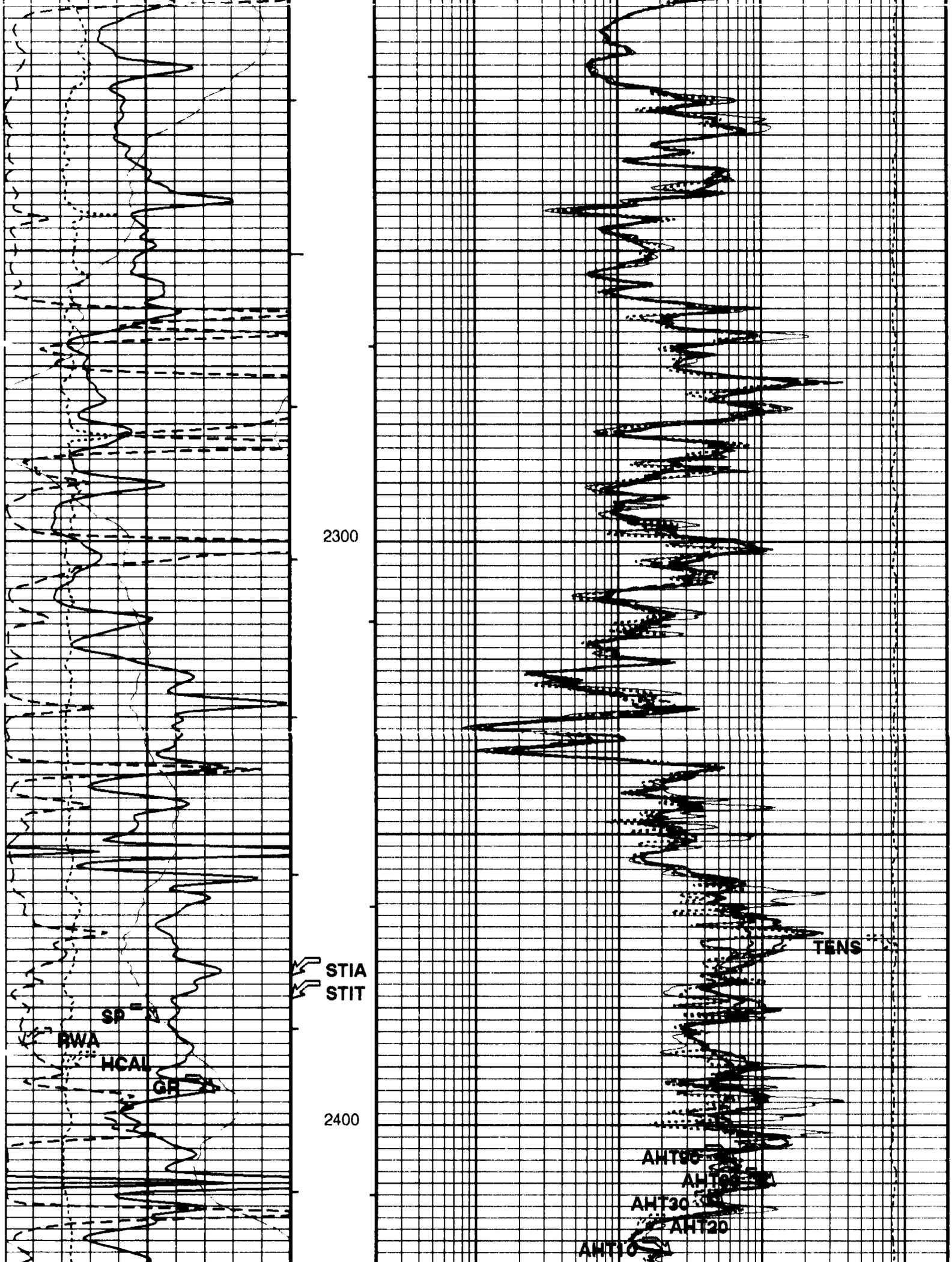
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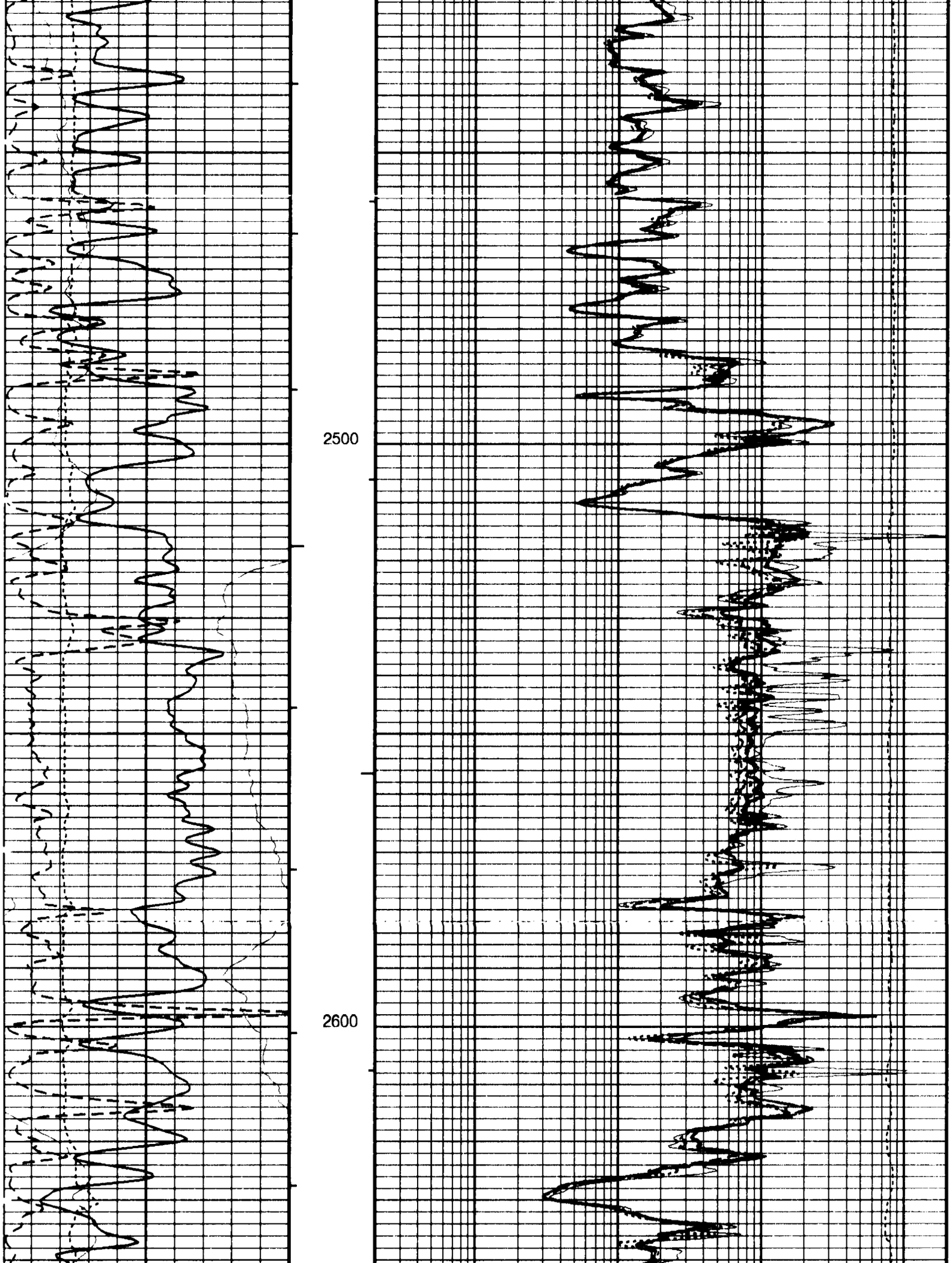
SP
RWA
HCAL
GR
2400
TENS
AHT30
AHT20
AHT10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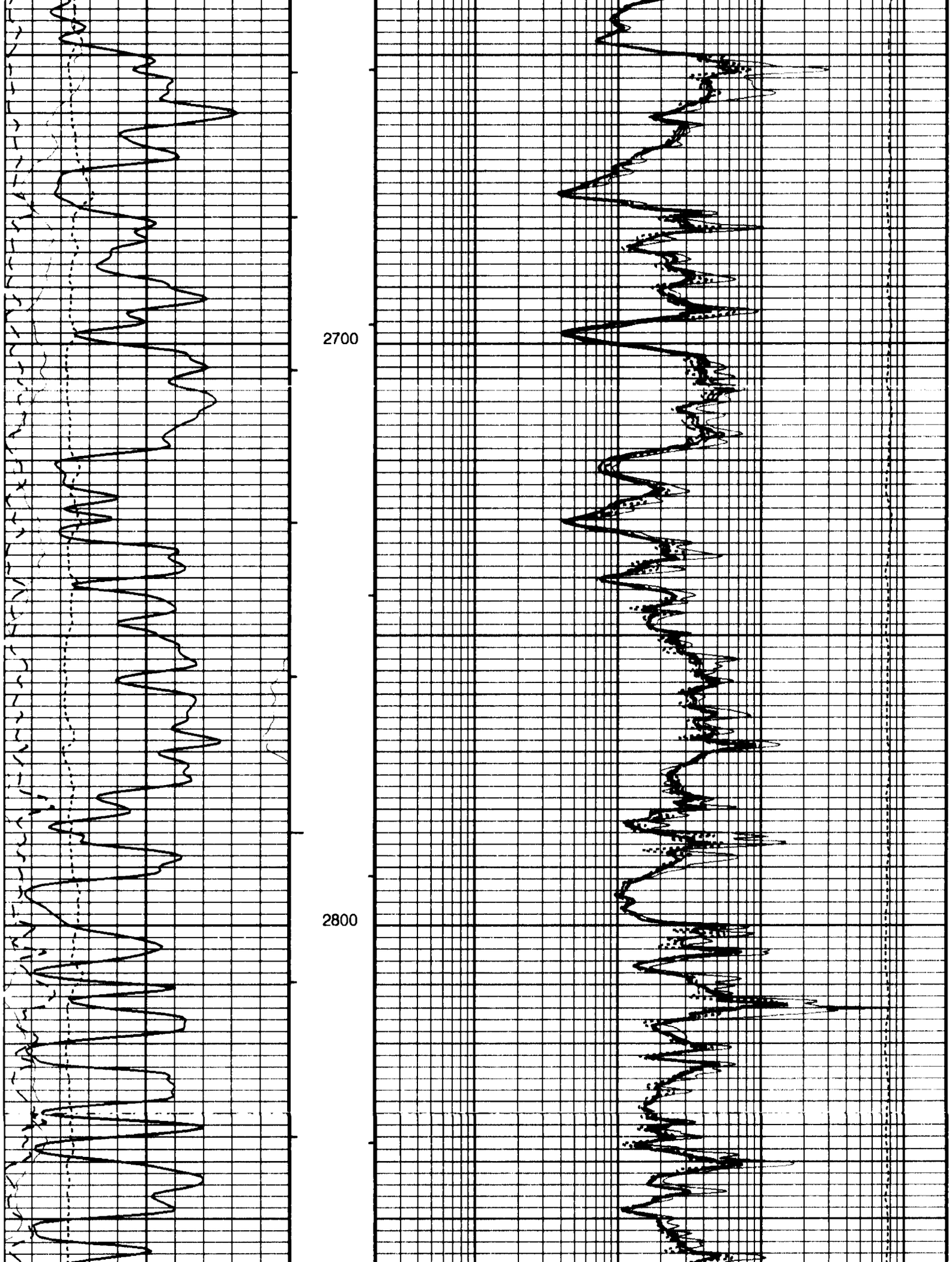
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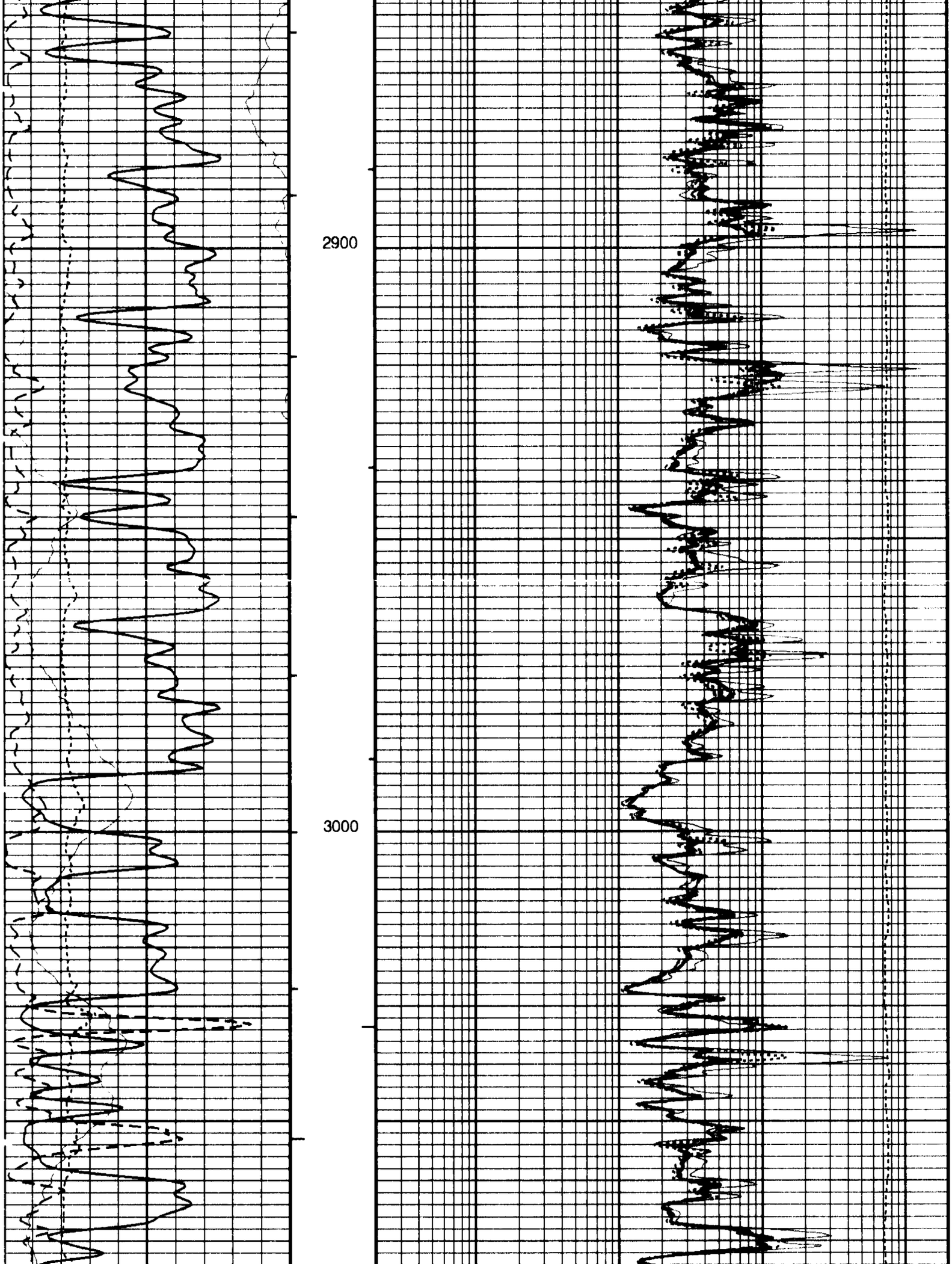
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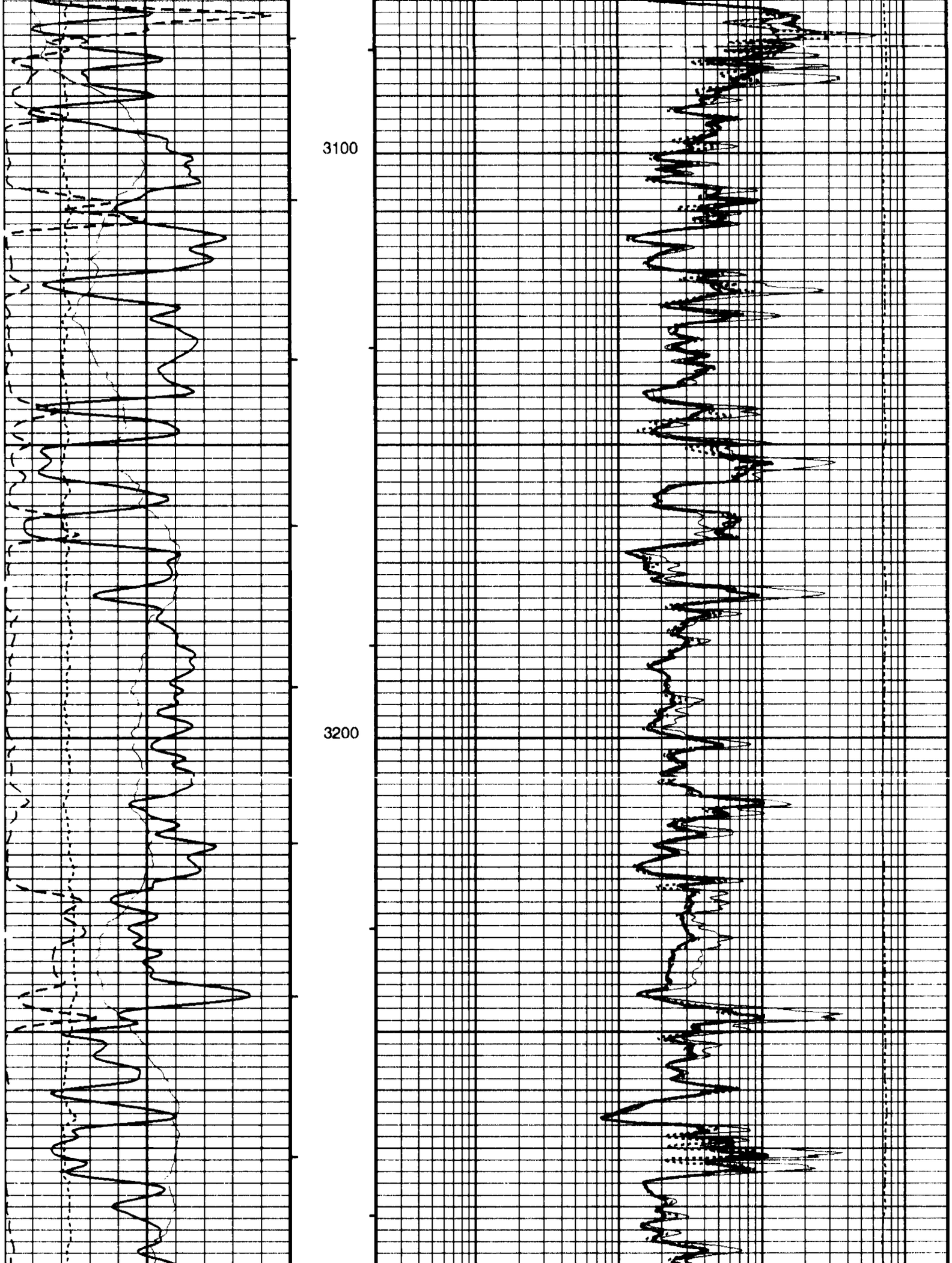
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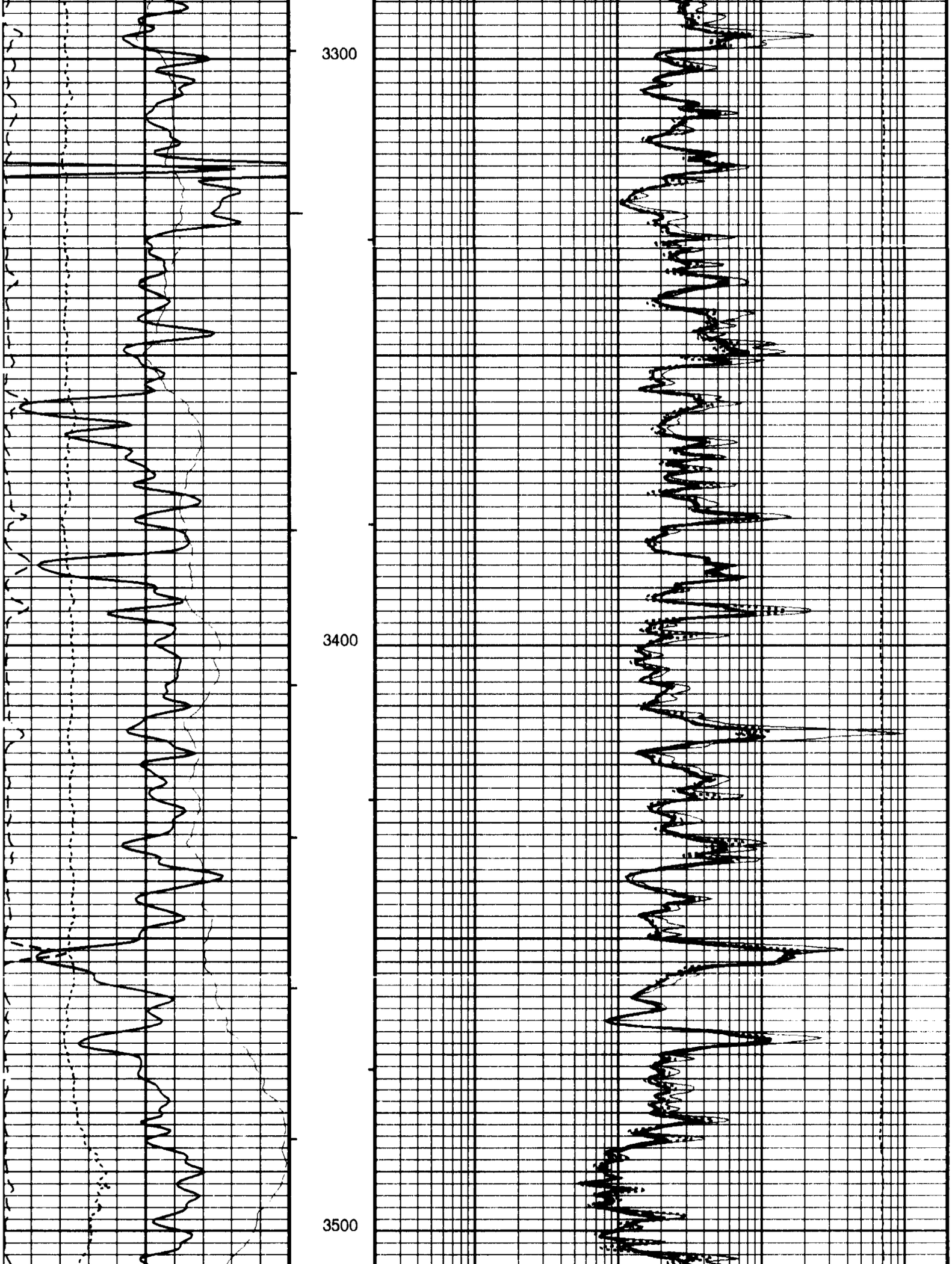
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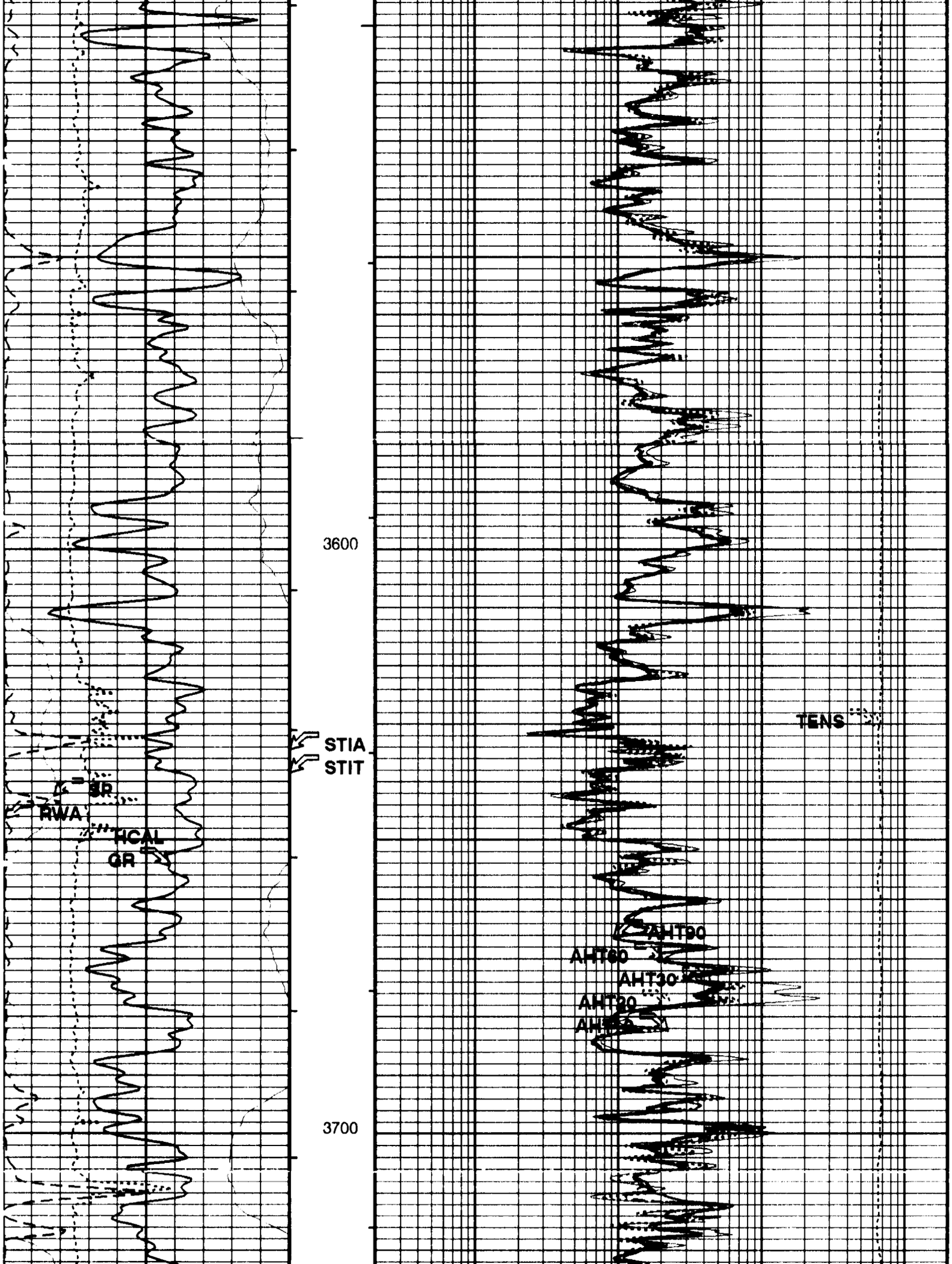
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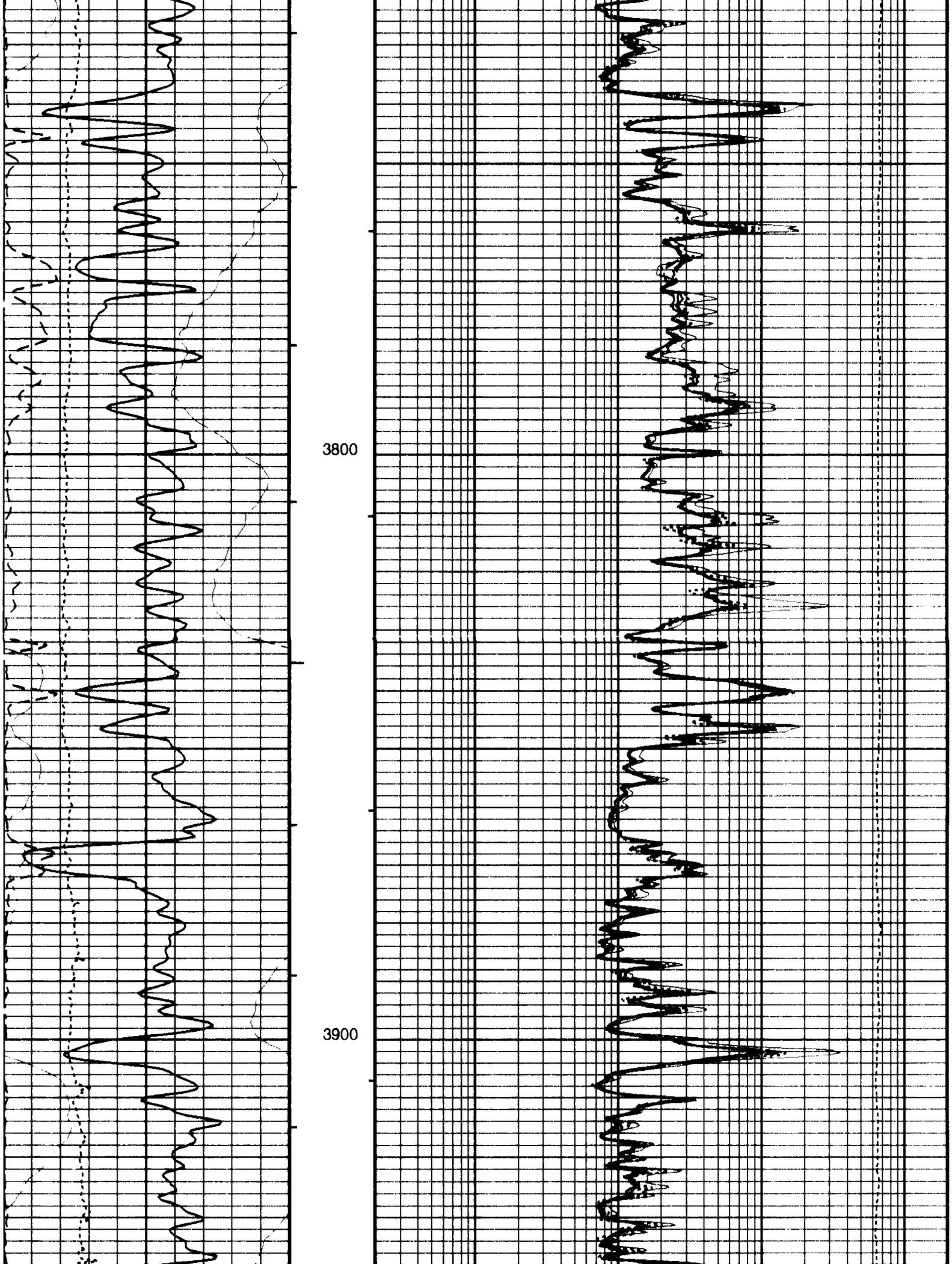
STIA
STIT
RWA
HCAL
GR
TENS
AHT90
AHT60
AHT30
AHT20
3700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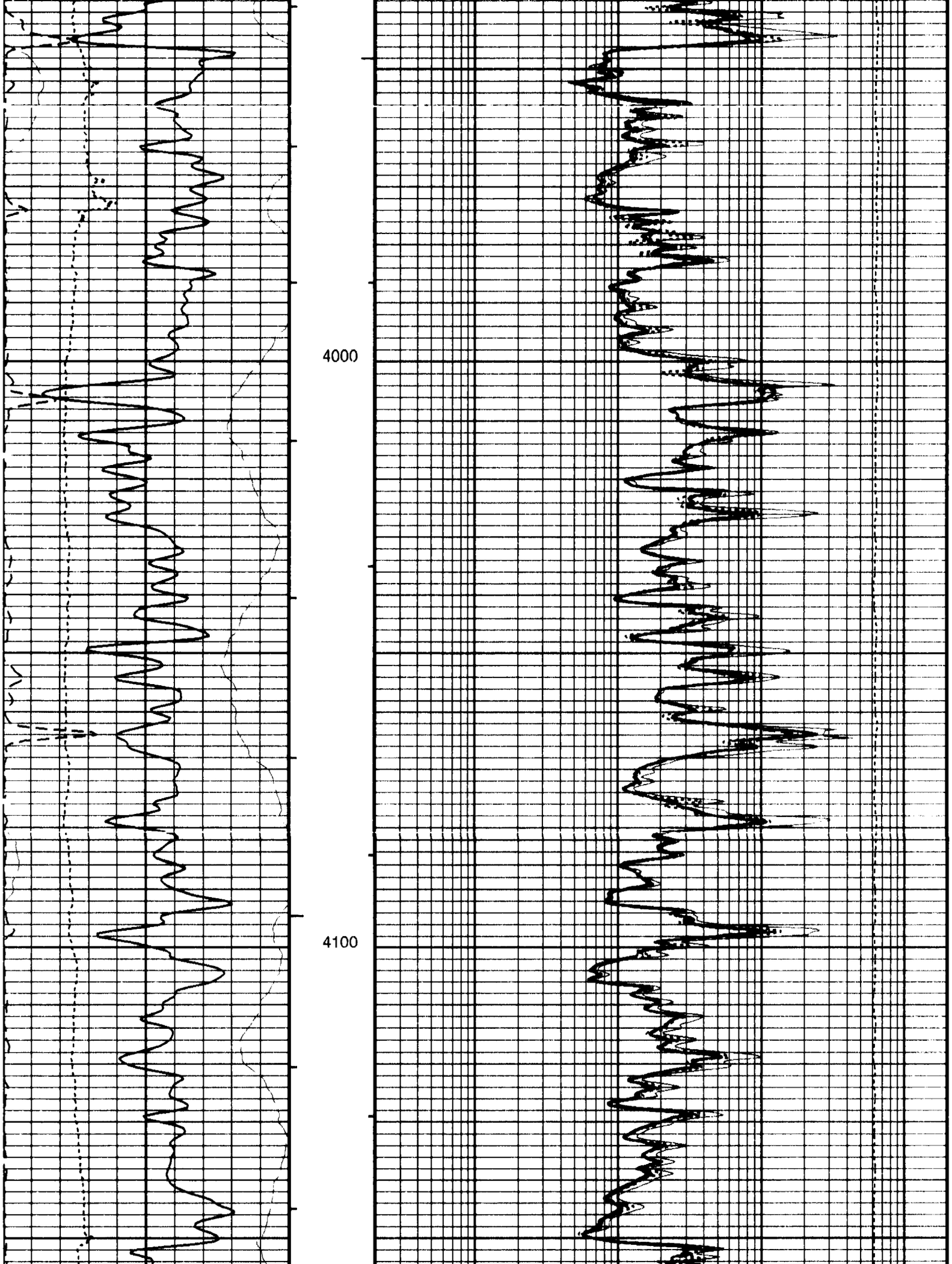
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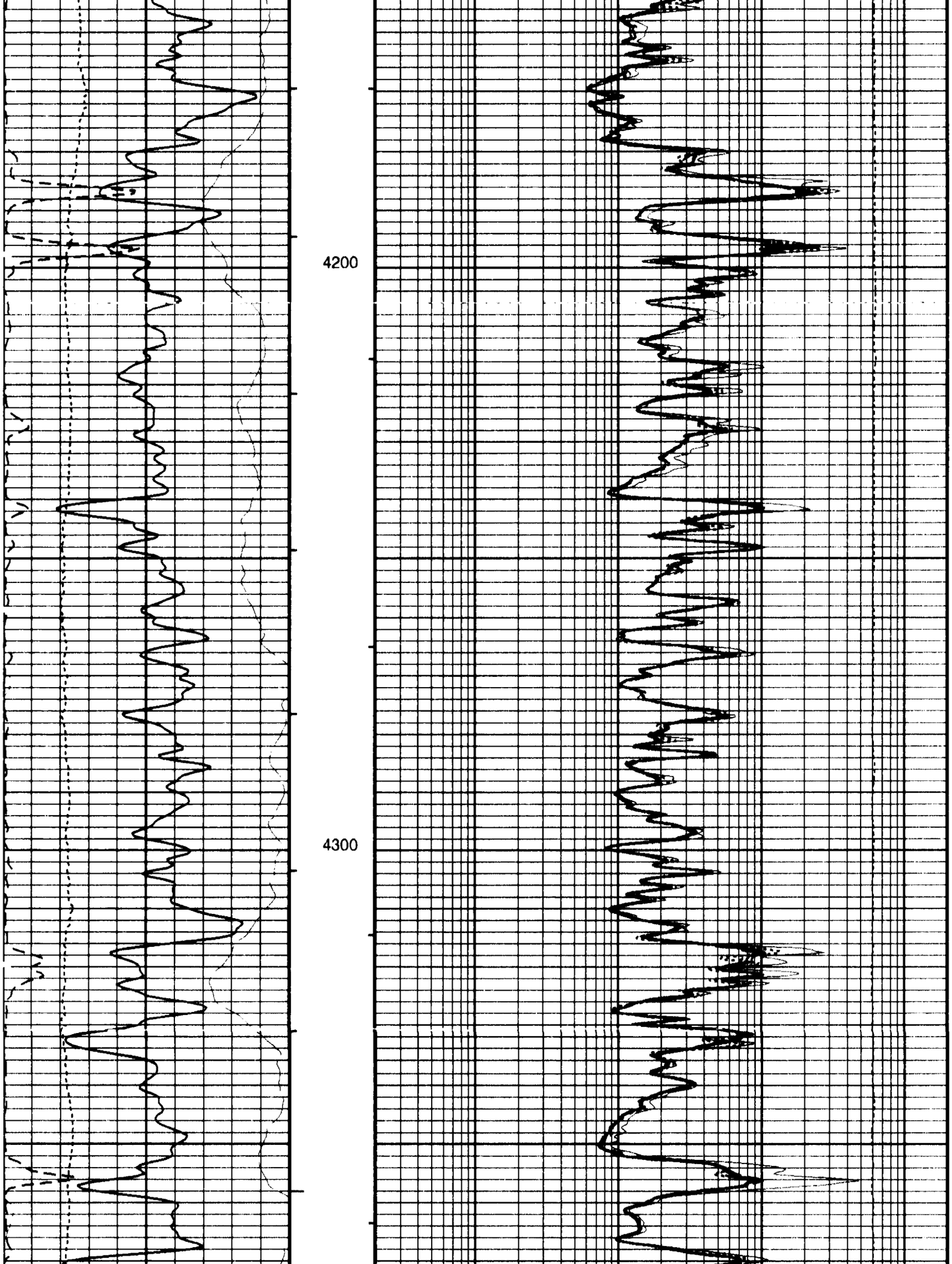
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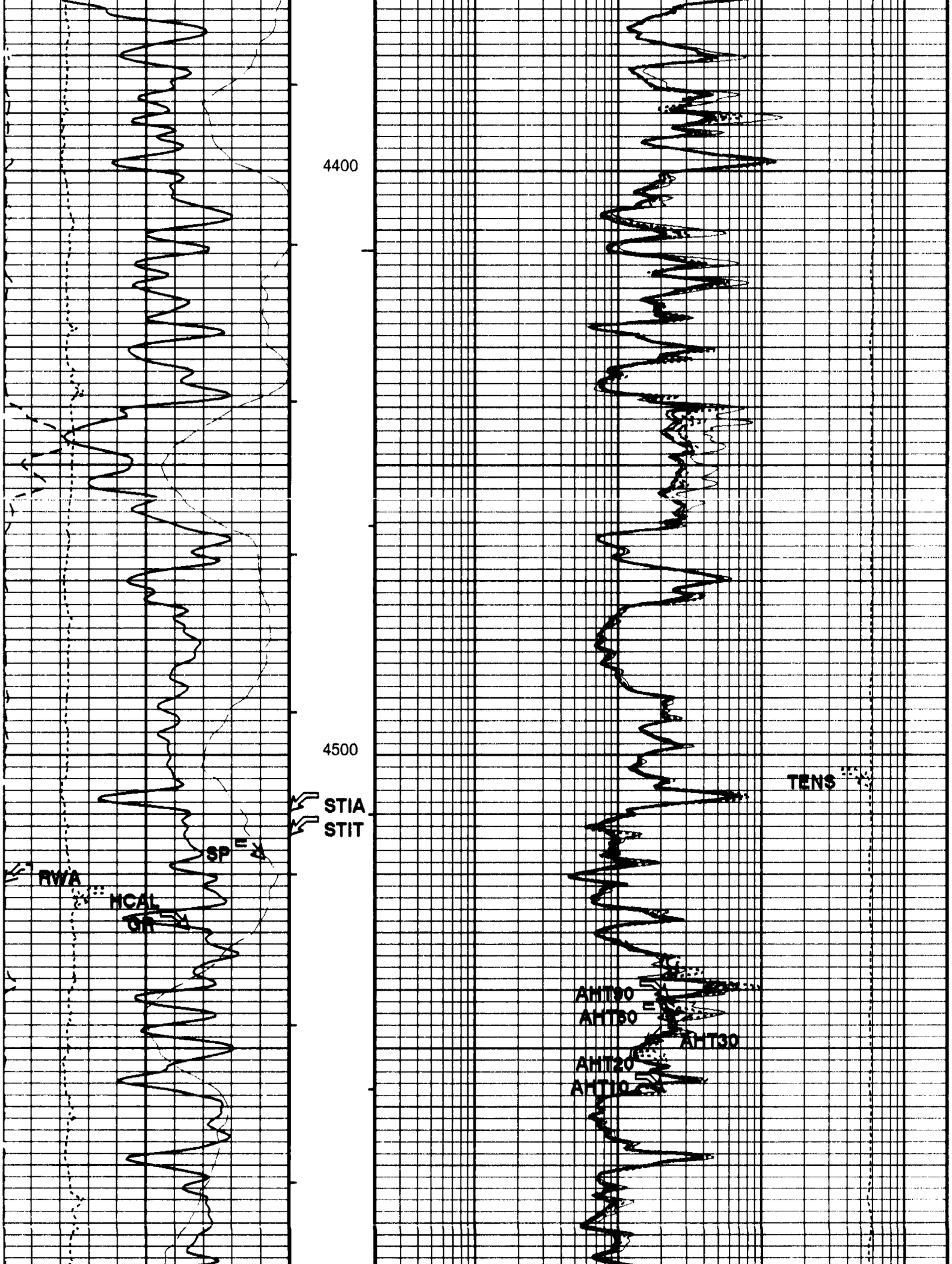
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RWA
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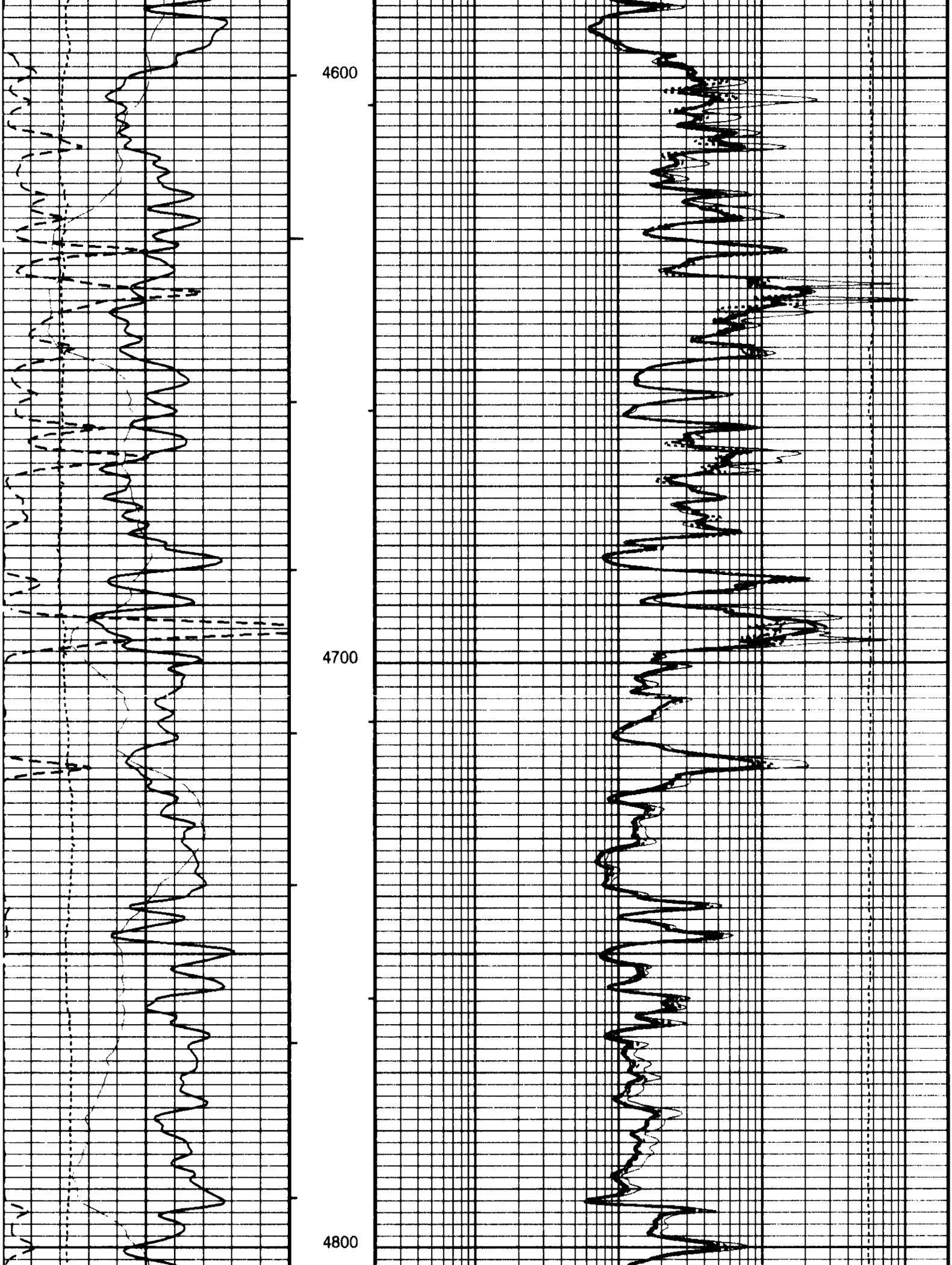
TENS
AHT90
AHT50
AHT30
AHT20
AHT10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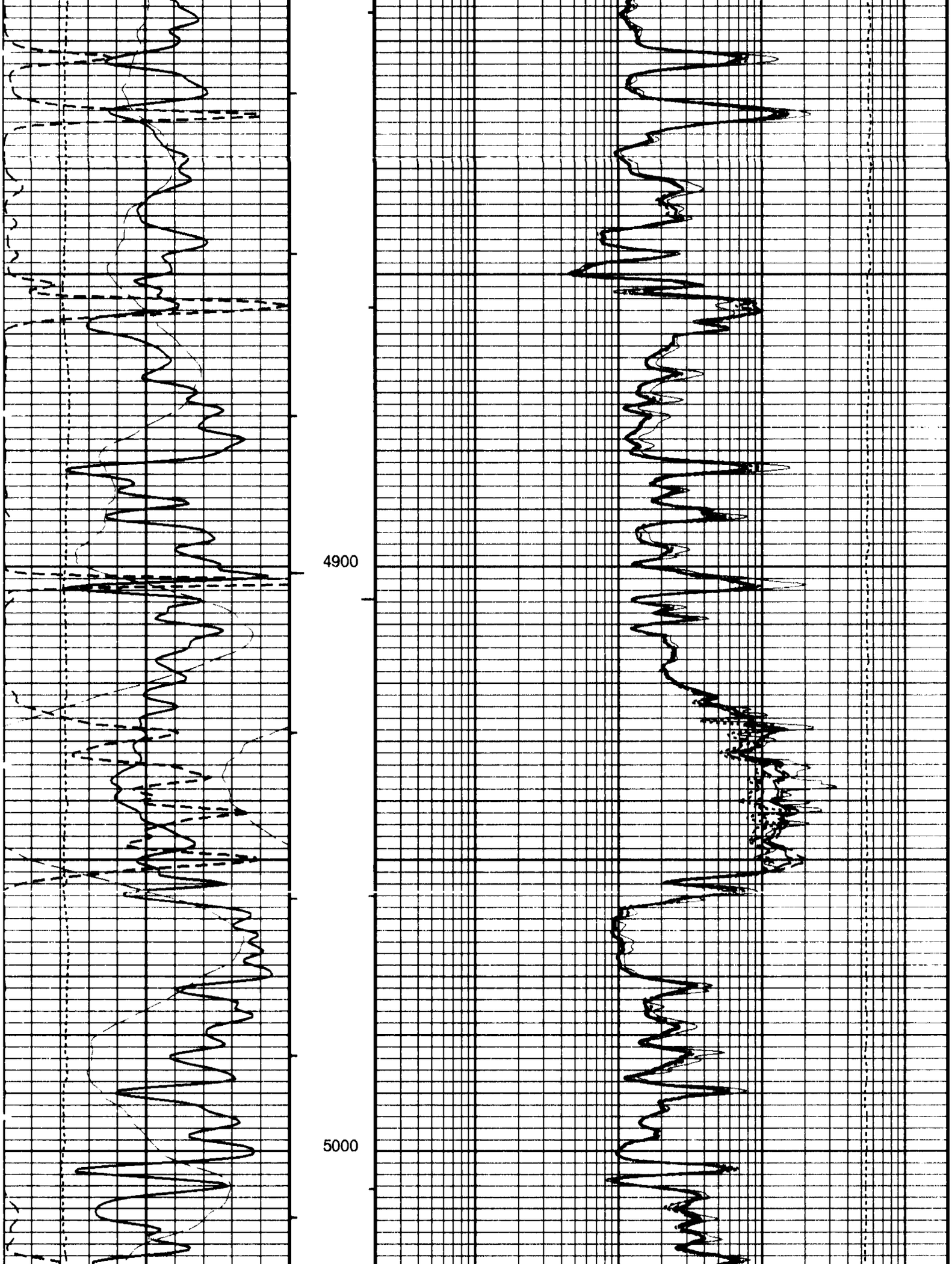
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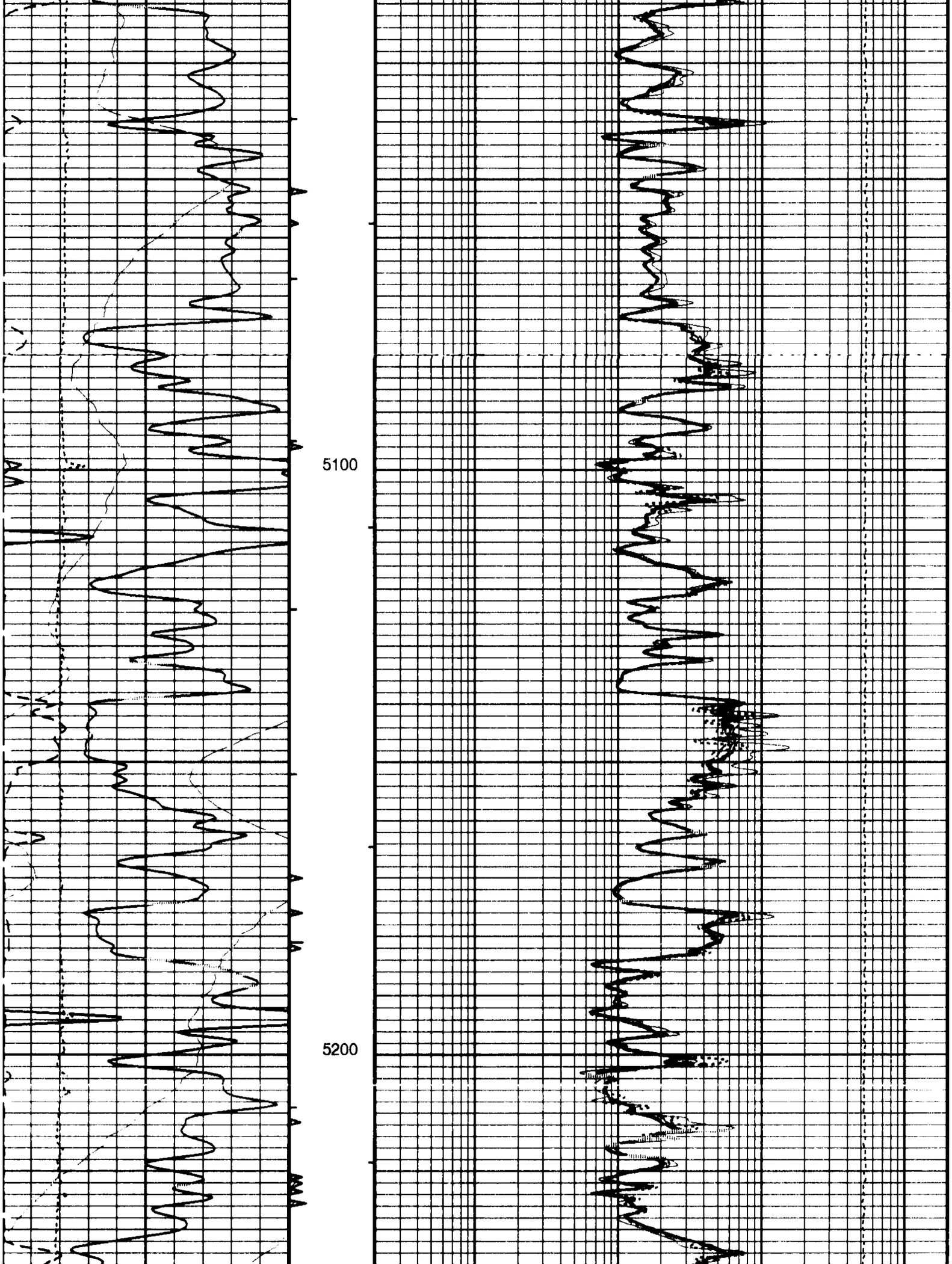
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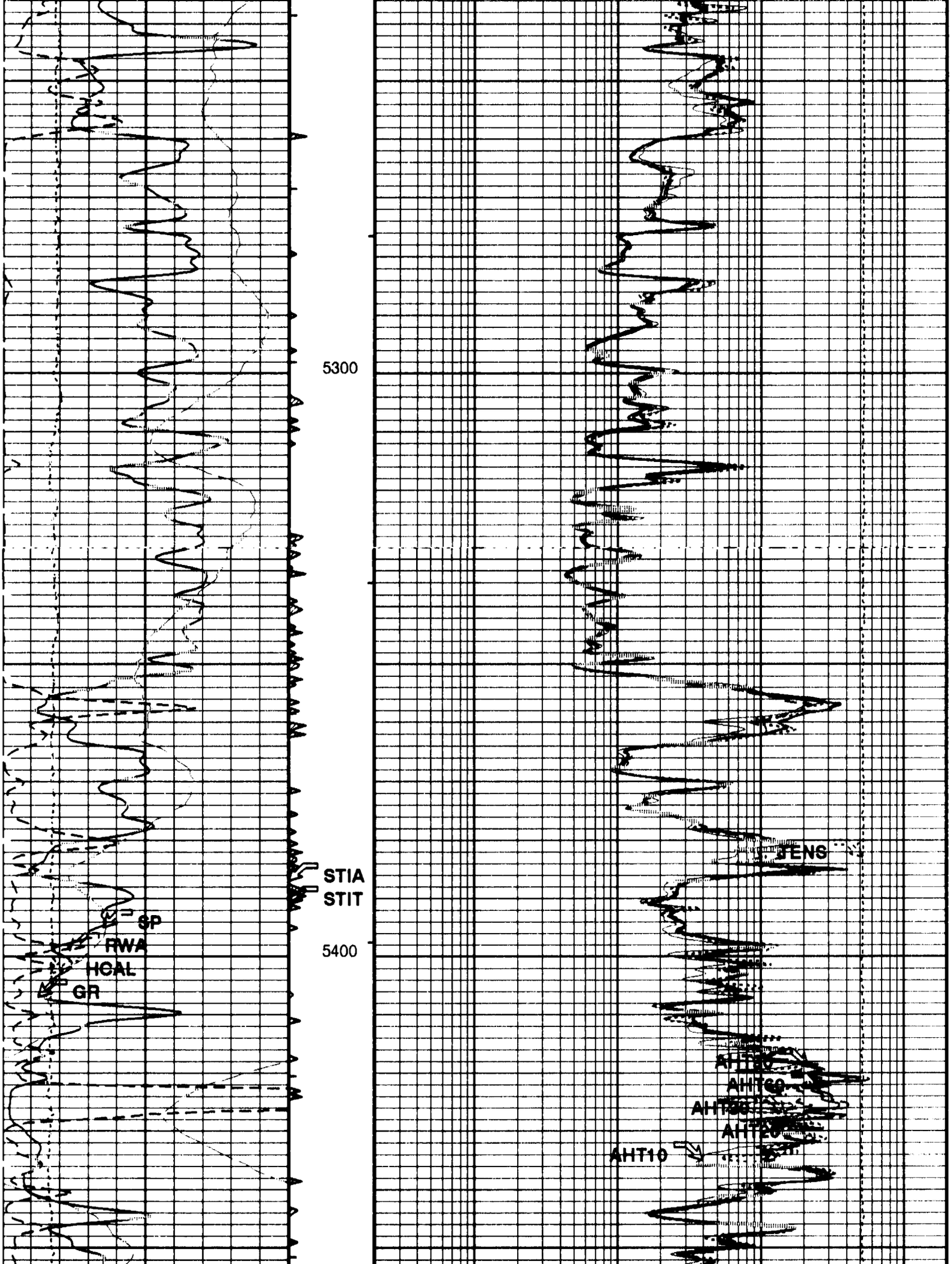
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STIT
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RWA
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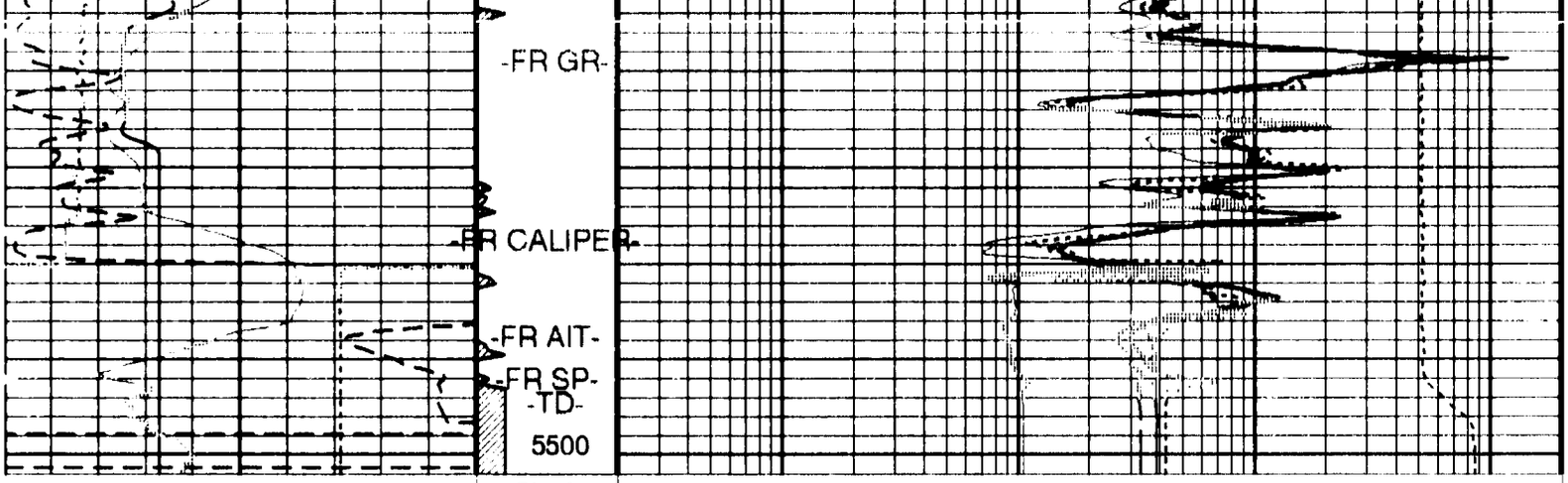
GR
5400
JENS
AHT10



SP (SP) -80 (MV) 20	Stuck Stretch (STIT) 0 (F) 50	AIT-H 10 Inch Investigation (AHT10) 0.2 (OHMM) 2000
Gamma Ray (GR) 0 (GAPI) 200	Cable Drag From STIA to STIT	AIT-H 20 Inch Investigation (AHT20) 0.2 (OHMM) 2000
Caliper (HCAL) 6 (IN) 16	Tool/Tot. Drag From D3T to STIA	AIT-H 30 Inch Investigation (AHT30) 0.2 (OHMM) 2000
RWA (RWA) 0 (OHMM) 3		AIT-H 60 Inch Investigation (AHT60) 0.2 (OHMM) 2000
		AIT-H 90 Inch Investigation (AHT90) 0.2 (OHMM) 2000

MAIN PASS

Tension (TENS) 10000 (LBF) 0

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

AIT-H Answer Product Processing Summary. Data taken with tool # 144 (AHTNO)

...Acquired data from HILT/HAIT

***** Bhole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 1.50 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT Answer Product processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other parameters used by AIT-H Answer Product processing *****

Surface Hole Temperature (SHT) 68.000 DEGF Bottom Temperature (BHT) 135.000 DEGF

Total Depth (TD) 5506.000 FT

***** AIT-H Answer Product processing control parameters *****

(AHAPL): 2_BholeCorr_BasicLogs

(AHBHM): 2_ComputeStandoff (AHBLM): 1_Two

Parameters

DLIS Name	Description	Value

AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff	
AHBLM	AIT-H Basic Logs Mode	1_Two	
AHCDE	AIT-H Casing Detection Enable	Yes	
AHCEN	AIT-H Tool Centering Flag (In Borehole)	Eccentered	
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000	FT
AHMRF	AIT-H Mud Resistivity Factor	1	
AHSTA	AIT-H Tool Standoff	1.5	IN
ARTS	AIT Rt Selection (for ALLRES computation)	13_AHT90	
BHT	Bottom Hole Temperature (used in calculations)	135	DEGF
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset Repeat Analysis	0.0	FT
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSTI	STI Uses HILT Acceleration	YES	
MST	Mud Sample Temperature	48.00	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
RTCO	RTCO - Rt Invasion Correction	YES	
RW	Resistivity of Connate Water	0.2100	OHMM
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
STKT	STI Stuck Threshold	2.5	FT
TD	Total Depth	5506	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: AIT_S5 Vertical Scale: 5" per 100' Graphics File Created: 30-MAR-1998 20:28

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Speed Corrected - Depth Matched LOG

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Input DLIS Files

DEFAULT	HILTC .007	FN:4	FIELD	30-MAR-1998 20:11	5502.0 FT	5062.5 FT

Output DLIS Files

DEFAULT	HILTC .008	FN:5	FIELD	30-MAR-1998 20:28

Integrated Hole/Cement Volume Summary

Hole Volume = 141.71 F3

Cement Volume = 69.11 F3 (assuming 5.50 IN casing O.D.)

Computed from 5502.0 FT to 5086.5 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
BHT	120 DEGF	135 DEGF	5304.3 20:30:52

118 DEGF 120 DEGF 5343.1 20:31:08

PIP SUMMARY

Integrated Hole Volume Minor Pip Every 10 F3
Integrated Hole Volume Major Pip Every 100 F3
Integrated Cement Volume Minor Pip Every 10 F3
Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

REPEAT ANALYSIS

AHT90_REP Curve (AHT90_REP)
0.2 (OHMM) 2000

RWA_REP Curve (RWA_REP)
0 (OHMM) 3

AHT60_REP Curve (AHT60_REP)
0.2 (OHMM) 2000

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

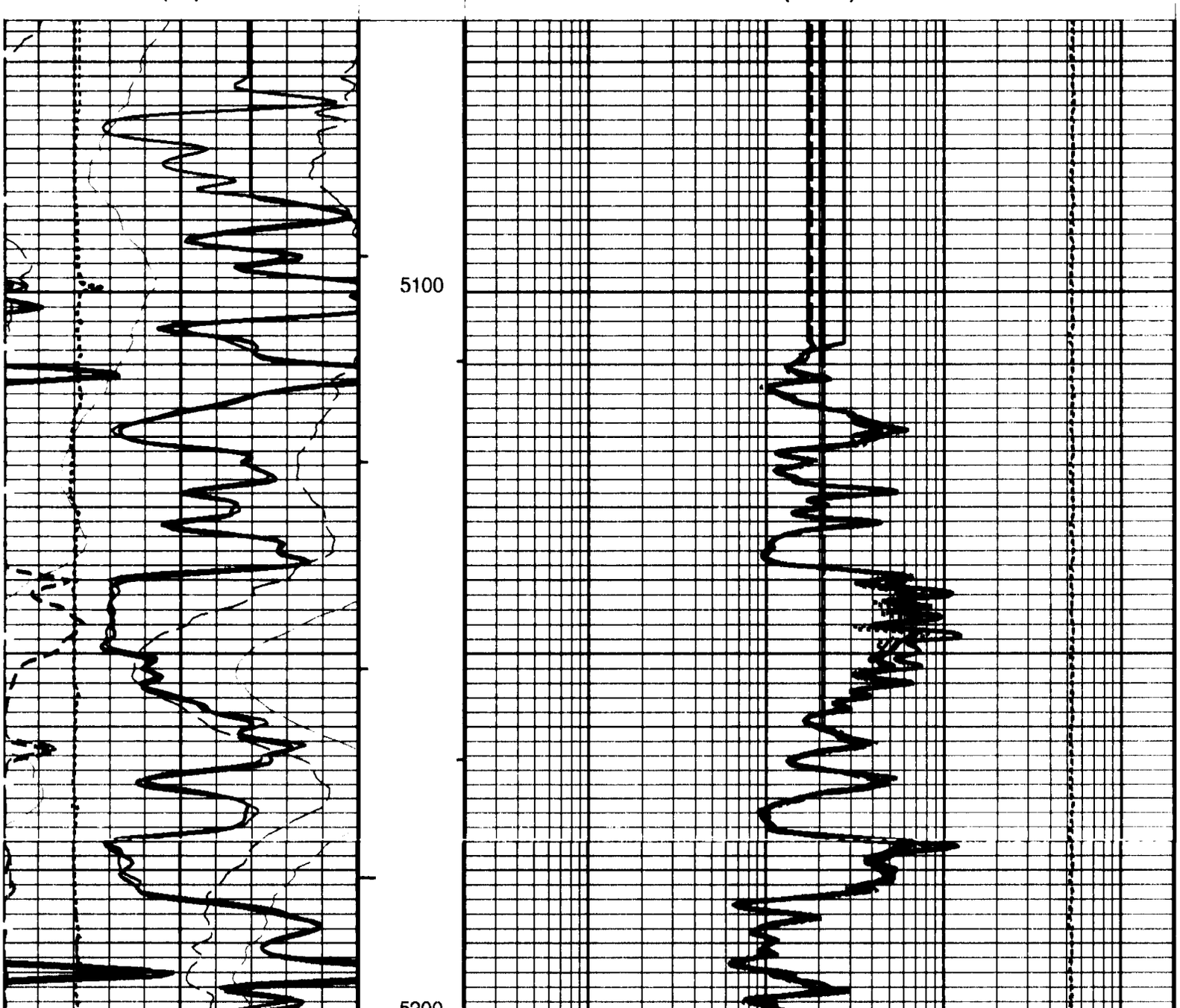
AHT30_REP Curve (AHT30_REP)
0.2 (OHMM) 2000

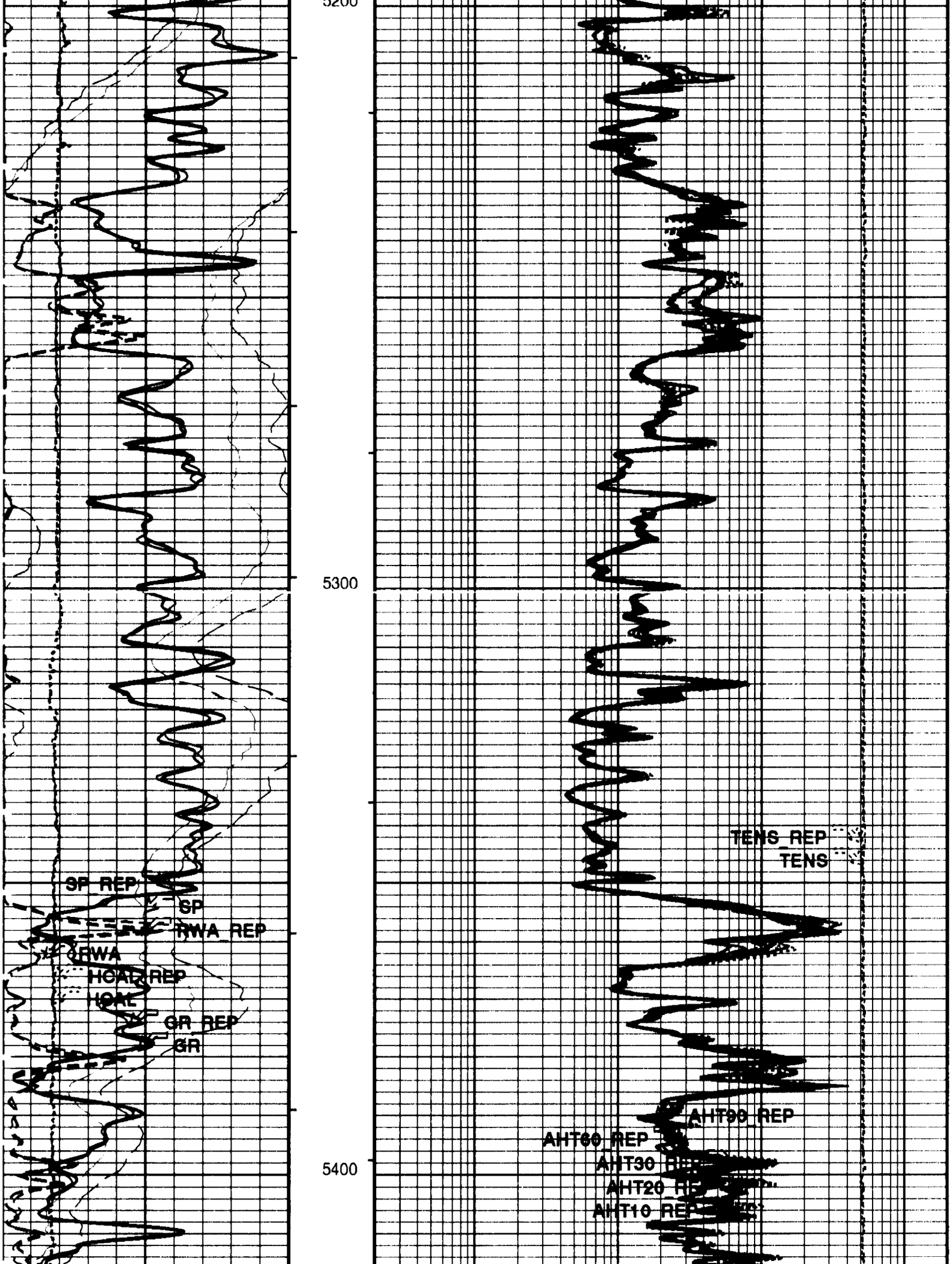
GR_REP Curve (GR_REP)
0 (GAPI) 200

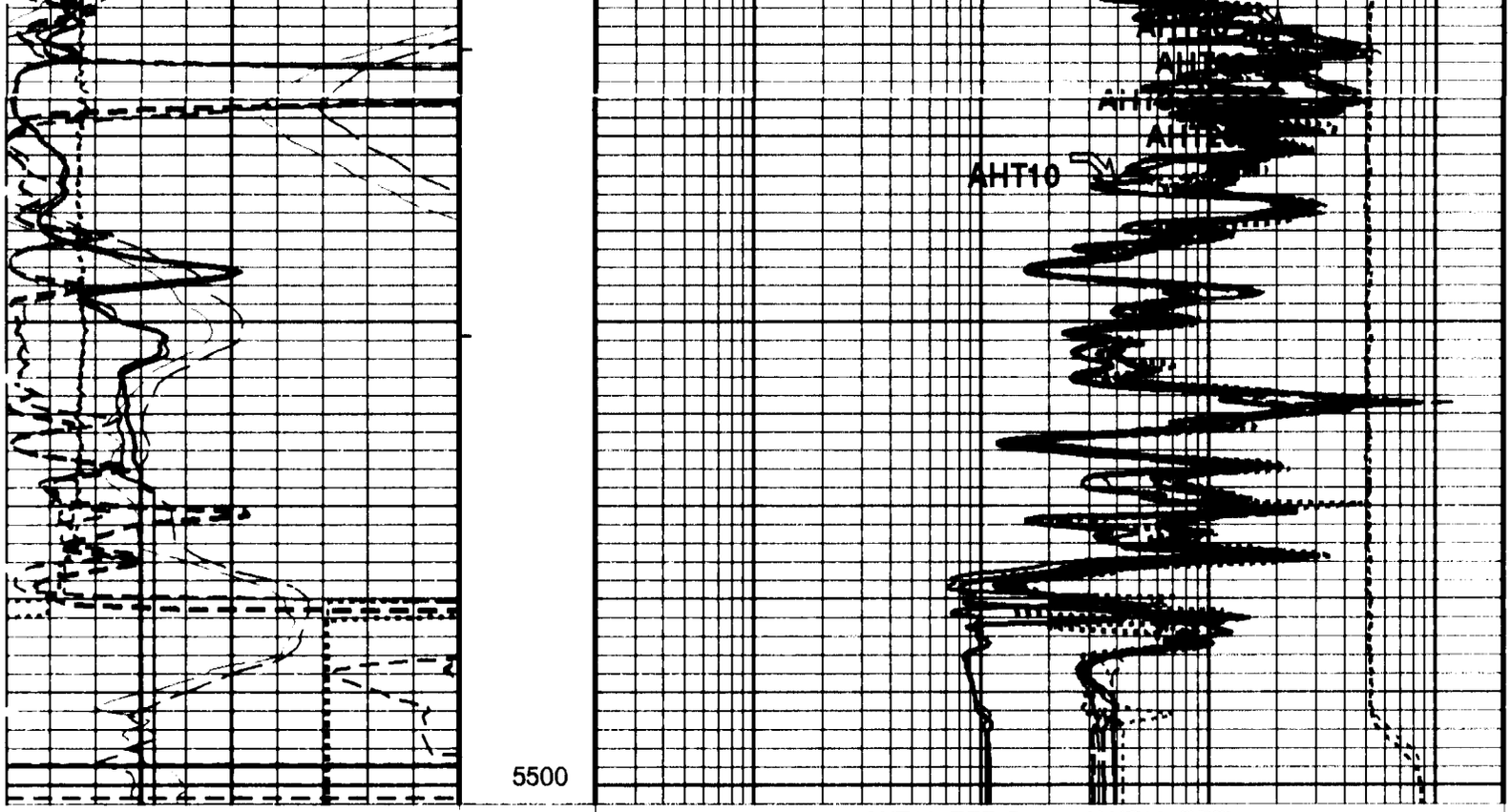
AHT20_REP Curve (AHT20_REP)
0.2 (OHMM) 2000

SP_REP Curve (SP_REP)
-80 (MV) 20

AHT10_REP Curve (AHT10_REP)
0.2 (OHMM) 2000




5200
5300
5400
SP_REP
SP
RWA_REP
RWA
HCAL_REP
HCAL
GR_REP
GR
TENS_REP
TENS
AHT90_REP
AHT60_REP
AHT30_REP
AHT20_REP
AHT10_REP



SP_REP Curve (SP_REP)	-80 (MV) 20	
GR_REP Curve (GR_REP)	0 (GAPI) 200	
HCAL_REP Curve (HCAL_REP)	6 (IN) 16	
RWA_REP Curve (RWA_REP)	0 (OHMM) 3	
AHT10_REP Curve (AHT10_REP)	0.2 (OHMM) 2000	
AHT20_REP Curve (AHT20_REP)	0.2 (OHMM) 2000	
AHT30_REP Curve (AHT30_REP)	0.2 (OHMM) 2000	
AHT60_REP Curve (AHT60_REP)	0.2 (OHMM) 2000	
AHT90_REP Curve (AHT90_REP)	0.2 (OHMM) 2000	
TENS_REP Curve (TENS_REP)	10000 (LBF) 0	

REPEAT ANALYSIS

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

AIT-H Answer Product Processing Summary. Data taken with tool # 144 (AHTNO)

...Acquired data from HILT/HAIT

***** Bhole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 1.50 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT Answer Product processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other parameters used by AIT-H Answer Product processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	135.000 DEGF
Total Depth (TD)	5506.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	0.812 OHMM	Mud Filtrate Sample Temperature (MFST)	48.000 DEGF
Resitivity Connate Water (RW)	0.210 OHMM		

***** AIT-H Answer Product processing control parameters *****

Playback Mode: NORMAL

Parameters

DLIS Name	Description	Value	
AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff	
AHBLM	AIT-H Basic Logs Mode	1_Two	
AHCDE	AIT-H Casing Detection Enable	Yes	
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered	
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000	FT
AHMRF	AIT-H Mud Resistivity Factor	1	
AHSTA	AIT-H Tool Standoff	1.5	IN
ARTS	AIT Rt Selection (for ALLRES computation)	13_AHT90	
BHT	Bottom Hole Temperature (used in calculations)	135	DEGF
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset Repeat Analysis	0.0	FT
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSTI	STI Uses HILT Acceleration	YES	
MST	Mud Sample Temperature	48.00	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.8120	OHMM
RTCO	RTCO - Rt Invasion Correction	YES	
RW	Resistivity of Connate Water	0.2100	OHMM
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
TD	Total Depth	5506	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: AIT_S5_REP **Vertical Scale: 5" per 100'** **Graphics File Created: 30-MAR-1998 20:28**

OP System Version: 7C0-712

DBM

HILTB-CTS	RPCV-999	HOLEV	RPCV-999
RWA	RPCV-999		

Speed Corrected - Depth Matched LOG

Input DLIS Files

DEFAULT	HILTC .007	FN:4	FIELD	30-MAR-1998 20:11	5502.0 FT	5062.5 FT

Output DLIS Files

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Mar 3 15:36 1998 Before: Mar 30 11:41 1998							
Thru Cal Magnitude - 0	0	0.6062	0.6065	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.243	1.243	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6177	0.6180	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.6984	0.6988	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.309	1.310	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.896	1.897	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.895	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.360	1.362	N/A	N/A	N/A	V
Phase - 0	0	51.07	51.24	N/A	N/A	N/A	DEG

Phase - 1	0	49.98	50.16	N/A	N/A	N/A	DEG
Phase - 2	0	46.22	46.40	N/A	N/A	N/A	DEG
Phase - 3	0	45.44	45.63	N/A	N/A	N/A	DEG
Phase - 4	0	39.08	39.28	N/A	N/A	N/A	DEG
Phase - 5	0	37.22	37.43	N/A	N/A	N/A	DEG
Phase - 6	0	37.21	37.42	N/A	N/A	N/A	DEG
Phase - 7	0	33.39	33.68	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxilliary
Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998

AIT-H SPA Plus	990.5	992.8	993.0	N/A	N/A	N/A	MV
AIT-H SPA Zero	0	0.3998	0.3957	N/A	N/A	N/A	MV
AIT-H Temperature Plus	0.9150	0.9197	0.9199	N/A	N/A	N/A	V
AIT-H Temperature Zero	0	0.0004027	0.0003914	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction
Master: Mar 3 15:38 1998

Test Loop Gain Magnitude - 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9914	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9925	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.016	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.3987	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.5347	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.2321	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.1539	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.3521	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.2901	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.1364	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.2994	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction
Master: Mar 3 15:38 1998

R Sonde Error Correction - 0	0	-93.66	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	161.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	107.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	64.57	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	25.88	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	14.54	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.814	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.6669	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	5.647	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-43.27	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	-133.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	83.37	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-8.148	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	-9.012	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	5.059	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	9.732	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction
Master: Mar 3 15:38 1998

Coarse - Mag, Real, Imag - 0	0	1.099	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.099	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.099	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.097	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.097	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.097	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary
Before: Mar 30 11:44 1998

BS Window Ratio	1.006	N/A	1.009	N/A	N/A	N/A	
BS Window Sum	18060	N/A	18060	N/A	N/A	N/A	CPS
SS Window Ratio	0.4686	N/A	0.4687	N/A	N/A	N/A	
SS Window Sum	10640	N/A	10610	N/A	N/A	N/A	CPS
LS Window Ratio	0.2965	N/A	0.2962	N/A	N/A	N/A	
LS Window Sum	1232	N/A	1229	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations
Before: Mar 30 11:44 1998

BS PM High Voltage (Command)	1582	N/A	1597	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1981	N/A	1986	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1879	N/A	1883	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration
Before: Mar 30 11:44 1998

BS Crystal Resolution	11.53	N/A	11.74	N/A	N/A	N/A	%
SS Crystal Resolution	10.18	N/A	10.28	N/A	N/A	N/A	%

SS Crystal Resolution	10.18	N/A	10.28	N/A	N/A	N/A	%
LS Crystal Resolution	9.543	N/A	9.562	N/A	N/A	N/A	%
High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration							
Before: Mar 30 11:46 1998							
Raw B0 Resistivity	3875	N/A	3826	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3806	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3799	N/A	N/A	N/A	OHMM
High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration							
Before: Mar 30 11:42 1998							
HILT Caliper Zero Measurement	8.000	N/A	8.684	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.83	N/A	N/A	N/A	IN
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration							
Before: Mar 30 11:40 1998							
Gamma Ray Background	30.00	N/A	46.84	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	178.3	N/A	178.3	N/A	N/A	16.21	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement							
Master: Dec 31 10:02 1997 Before: Mar 30 11:42 1998							
CNTC Background	25.62	25.62	26.50	N/A	N/A	3.843	CPS
CFTC Background	24.39	24.39	24.60	N/A	N/A	3.658	CPS
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration							
Before: Mar 30 22:30 1998							
Z-Axis Acceleration	32.19	N/A	32.15	N/A	N/A	N/A	F/S2

The GLS-VJ source activity is acceptable.

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

NCT-B Water Temperature 69.0 DEGF.
Thermal Housing Size 3.360 IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H	
Array Induction Sonde	AHIS - BA	
HILT high-Resolution Mechanical Sonde	HRMS - B	857
HILT Rxo Gamma-ray Device	HRGD -	951
HILT Nuclear Back-Scatter Detector	HILT -	
HILT Nuclear Short-Spacing Detector	HILT -	
HILT Nuclear Long-Spacing Detector	HILT -	
Micro Cylindrically Focused Log Device	MCFL -	

Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6062		0.6050	51.07		71.00
	Before	0.6065			51.24		
1	Master	1.243		1.270	49.98		70.00
	Before	1.243			50.16		
2	Master	0.6177		0.6230	46.22		66.00
	Before	0.6180			46.40		
3	Master	0.6984		0.7040	45.44		65.00
	Before	0.6988			45.63		
4	Master	1.309		1.337	39.08		59.00
	Before	1.310			39.28		
5	Master	1.896		1.955	37.22		57.00

5	Before	1.897	1.955	37.43		57.00
6	Master	1.895	1.955	37.21		57.00
	Before	1.896		37.42		
7	Master	1.360	1.415	33.39		53.00
	Before	1.362		33.68		
		60.00 % (Minimum)	140.0 % (Maximum)	Nom -60.00 (Minimum)	Nom + 60.00 (Maximum)	

(Nominal)

Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Auxilliary

Phase	AIT-H SPA Plus MV	Value	Phase	AIT-H SPA Zero MV	Value
Master		992.8	Master		0.3998
Before		993.0	Before		0.3957
	941.0 (Minimum) / 990.5 (Nominal) / 1040 (Maximum)			-50.00 (Minimum) / 0 (Nominal) / 50.00 (Maximum)	

Phase	AIT-H Temperature Plus V	Value	Phase	AIT-H Temperature Zero V	Value
Master		0.9197	Master		0.0004027
Before		0.9199	Before		0.0003914
	0.8700 (Minimum) / 0.9150 (Nominal) / 0.9600 (Maximum)			-0.05000 (Minimum) / 0 (Nominal) / 0.05000 (Maximum)	

Master: Mar 3 15:38 1998 Before: Mar 30 11:41 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG
0	1.015	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	0.3987	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
1	1.012	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	0.5347	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
2	1.019	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	-0.2321	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
3	1.015	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	-0.1539	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
4	0.9914	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	0.3521	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
5	0.9925	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	-0.2901	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
6	1.004	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	0.1364	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)
7	1.016	0.9500 (Minimum) / 1.000 (Nominal) / 1.050 (Maximum)	-0.2994	-3.000 (Minimum) / 0 (Nominal) / 3.000 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M
0	-93.66	-231.0 (Minimum) / -56.00 (Nominal) / 119.0 (Maximum)	5.647	-2250 (Minimum) / 0 (Nominal) / 2250 (Maximum)
1	161.8	114.0 (Minimum) / 159.0 (Nominal) / 204.0 (Maximum)	-43.27	-625.0 (Minimum) / 0 (Nominal) / 625.0 (Maximum)

2	107.6	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-133.4	-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	64.57	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	83.37	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.88	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-8.148	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	14.54	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-9.012	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.814	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	5.059	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.6669	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	9.732	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
0	1.099	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	1.097	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
1	1.099	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	1.097	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
2	1.099	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	1.097	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value	Phase	LS Window Ratio			Value
Before	0.9561 (Minimum)	1.006 (Nominal)	1.057 (Maximum)	1.009	Before	0.4451 (Minimum)	0.4686 (Nominal)	0.4920 (Maximum)	0.4687	Before	0.2817 (Minimum)	0.2965 (Nominal)	0.3113 (Maximum)	0.2962
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before	17160 (Minimum)	18060 (Nominal)	18960 (Maximum)	18060	Before	10110 (Minimum)	10640 (Nominal)	11170 (Maximum)	10610	Before	1170 (Minimum)	1232 (Nominal)	1293 (Maximum)	1229

Before: Mar 30 11:44 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Photo-multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
Before	1482 (Minimum)	1582 (Nominal)	1682 (Maximum)	1597	Before	1881 (Minimum)	1981 (Nominal)	2081 (Maximum)	1986	Before	1779 (Minimum)	1879 (Nominal)	1979 (Maximum)	1883

Before: Mar 30 11:44 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %			Value	Phase	SS Crystal Resolution %			Value	Phase	LS Crystal Resolution %			Value
Before	10.53 (Minimum)	11.53 (Nominal)	12.53 (Maximum)	11.74	Before	9.176 (Minimum)	10.18 (Nominal)	11.18 (Maximum)	10.28	Before	8.543 (Minimum)	9.543 (Nominal)	10.54 (Maximum)	9.562

Before: Mar 30 11:44 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value

Phase		Value	Phase		Value	Phase		Value
Before		3828	Before		3808	Before		3799
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: Mar 30 11:46 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value
Before		8.684	Before		12.83
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: Mar 30 11:42 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		46.84	Before		178.3	Before		165.0
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	162.1 (Minimum)	178.3 (Nominal)	194.5 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: Mar 30 11:40 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		25.62	Master		24.39
Before		26.50	Before		24.60
5.000 (Minimum)	25.62 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	24.39 (Nominal)	40.00 (Maximum)

Master: Dec 31 10:02 1997 Before: Mar 30 11:42 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		32.15
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)

Before: Mar 30 22:30 1998

RECEIVED
APR 21 1998
DIV. OF OIL, GAS & MINING

RECEIVED APR 01 1998

COMPANY:	PETROGLYPH OPERATING COMPANY, INC.	BOTTOM LOG INTERVAL	5500 F
		SCHLUMBERGER DEPTH	5494 F
WELL:	UTE TRIBAL #31-12	DEPTH DRILLER	5506 F
FIELD:	ANTELOPE CREEK	KELLY BUSHING	6302 F
COUNTY:	UINTAH	DRILL FLOOR	6301 F
STATE:	UTAH	GROUND LEVEL	6292 F

Schlumberger

PLATFORM EXPRESS
ARRAY INDUCTION
GAMMA RAY

ATTACHMENT NO. 9

LIST OF OWNERS AND AFFIDAVIT NOTIFICATION

AFFIDAVIT OF MAILING

I, Kevin Dickey, Vice President, Operations, Petroglyph Energy, being first duly sworn, depose and state as follows: On July 24th, 2015, I caused to be mailed by certified mail, postage prepaid, return receipt requested, a copy of the Application to convert 1 well that appears on the attached sheet to water injection for enhanced recovery. It was sent to all parties who have an interest within ¼ mile radius from this well. The attached list contains the names of all parties who were notified.

Dated on this 24th day of July, 2015

Kevin Dickey

Vice President, Operations

Petroglyph Energy

The forgoing affidavit was subscribed and sworn to before me by Kevin Dickey.

This 24 day of July, 2015.

EDNA SYES NOTARY PUBLIC STATE OF IDAHO

Edna Syes

Notary Public

PETROGLYPH EXECUTIVE OFFICES

July 24th, 2015

Mineral, Surface, and Working Interest Owners

To Whom It May Concern,

On July 24th, 2015 Petroglyph Energy Inc. submitted to the Environmental Protection Agency an application requesting approval to convert 19 wells to water injection wells in an enhanced recovery program. The well(s) which were submitted are all located in Antelope Creek Field which is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy.

Owners at Well's Location	Owners within Well's ¼ mile radius
Mineral: Ute Tribe	No others
Operator: Petroglyph	No others
Surface: Ute Tribe	No others
Working Interest: Petroglyph 100%	

Anyone who would be directly and adversely affected by the authorization of the underground disposal into the Upper Green River formation may file a written request for a public hearing before the EPA. Logs and additional information on the subject wells are on file with the EPA, Groundwater Program, Mail Code 8P-W-UIC, 1595 Wynkoop St, Denver, Colorado 80202-1129.

Please contact Kevin Dickey at 208-685-7600 if you have any questions.

Sincerely,

Kevin Dickey

Vice President, Operations, Petroglyph Energy

Enclosure

PETROGLYPH OPERATING COMPANY, INC.

960 Broadway Avenue, Suite 500 ▪ P.O. Box 70019 ▪ Boise, Idaho 83707 ▪ (208) 685-7600 ▪ Fax: (208) 685-7605 ▪ www.petroglyphenergy.com

ANTELOPE CREEK FIELD

WELLS TO BE CONVERTED TO INJECTION

Well Name and Number	Footages	Section, Township, and Range
Ute Tribal 03-05	SHL: 2871' FNL & 752' FWL BHL: 2340' FNL & 684' FWL	3, T5S-R3W
Ute Tribal 03-12	2272' FSL & 575' FWL	3, T5S-R3W
Ute Tribal 08-11	2187' FSL 2011' FWL	8, T5S-R3W
Ute Tribal 08-12	2100' FSL & 515' FWL	8, T5S-R3W
Ute Tribal 09-01	770' FNL & 1059' FEL	9, T5S-R3W
Ute Tribal 09-04	585' FNL & 722' FWL	9, T5S-R3W
Ute Tribal 10-03	600' FNL & 1650' FWL	10, T5S-R3W
Ute Tribal 17-04	697' FNL & 636' FWL	17, T5S-R3W
Ute Tribal 17-05	1797' FNL & 620' FWL	17, T5S-R3W
Ute Tribal 17-12	2527' FSL & 612' FWL	17, T5S-R3W
Ute Tribal 20-06	2050' FNL & 1950' FWL	20, T5S-R3W
Ute Tribal 20-07	1980' FNL & 1980' FEL	20, T5S-R3W
Ute Tribal 20-11	1959' FSL & 2033' FWL	20, T5S-R3W
Ute Tribal 20-15	574' FSL & 1806' FEL	20, T5S-R3W
Ute Tribal 31-03	422' FNL & 2338' FWL	31, T5S-R3W
Ute Tribal 31-05	1980' FNL & 660' FWL	31, T5S-R3W
Ute Tribal 31-07	1976' FNL & 2168' FEL	31, T5S-R3W
Ute Tribal 31-12	1999' FSL & 748' FWL	31, T5S-R3W
Ute Tribal 36-08-E4	1796' FNL & 713' FEL	36, T5S-R4W

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 03-05

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						3	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes i, ii, iii, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

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A. Name and Title *(Type or Print)*	B. Phone No. *(Area Code and No.)*
Kevin Dickey Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 03-12

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						3	5S	3W	SW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

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B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

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United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 08-11

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						8	5S	3W	SW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes i, ii, iii, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 08-12

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						8	5S	3W	SW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes i, ii, iii, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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C. Signature: Kevin Dickey

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United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 09-01

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						9	5S	3W	NE				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 09-04

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						9	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

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United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached instructions Before Starting

For Official Use Only

Application approved (mo day year)	Date received (mo day year)	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started (mo day year):
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 10-03

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						10	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

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For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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C. Signature:

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United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 17-04

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						17	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

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EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 17-05

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						17	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature:

D. Date Signed: 07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 17-12

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						17	5S	3W	SW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

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A. Name and Title *(Type or Print)*	B. Phone No. *(Area Code and No.)*
Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved (mo day year)	Date received (mo day year)	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started (mo day year):
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 20-06

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						20	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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A. Name and Title *(Type or Print)*: Kevin Dickey, Vice President, Operations

B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 20-07

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						20	5S	3W	NE				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 20-11

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						20	5S	3W	SW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes i, ii, iii, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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A. Name and Title *(Type or Print)*: Kevin Dickey, Vice President, Operations

B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 20-15

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						20	5S	3W	SE				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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A. Name and Title *(Type or Print)*: Kevin Dickey, Vice President, Operations

B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 31-03

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						31	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

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Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

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United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 31-05

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						31	5S	3W	NW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

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Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed
	07/27/2015

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United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started mo day year:
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 31-07

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						31	5S	3W	NE				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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Kevin Dickey, Vice President, Operations	(208) 685-7600
C. Signature	D. Date Signed: 07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved (mo day year)	Date received (mo day year)	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019 | Phone Number: (208) 685-7600

City: Boise | State: ID | ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started (mo day year):
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 31-12

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						31	5S	3W	SW				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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A. Name and Title *(Type or Print)*: Kevin Dickey, Vice President, Operations

B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved (mo day year)	Date received (mo day year)	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

III. Operator Name and Address

Owner Name: Petroglyph Energy, Inc.

Street Address: 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [ ] Owner
- [x] Operator

VII. SIC Codes

VIII. Well Status *(Mark "x")*

- [x] A. Operating — Date Started (mo day year):
- [x] B. Modification/Conversion
- [ ] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
111	1	Antelope Creek Ute Tribal 36-08-E4

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	R		1 well, type R

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						36	5S	4W	NE				

XII. Indian Lands (Mark 'x')

- [x] Yes
- [ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, ii, iii, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

A. Name and Title *(Type or Print)*: Kevin Dickey, Vice President, Operations

B. Phone No. *(Area Code and No.)*: (208) 685-7600

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

ATTACHMENT NO. 10

WELL BORE DIAGRAMS FOR THE UIC WELL

Ute Tribal 31-12 Well History

Well History:

Spud Well: 3/24/1998

Completed: 4/24/1998

First Production: 5/3/1998

Tops (KB):

BMSW* Found at 1303'

Green River 929'

A Marker 3390'

X Marker 3868'

Douglas Creek 4006'

B Limestone 4374'

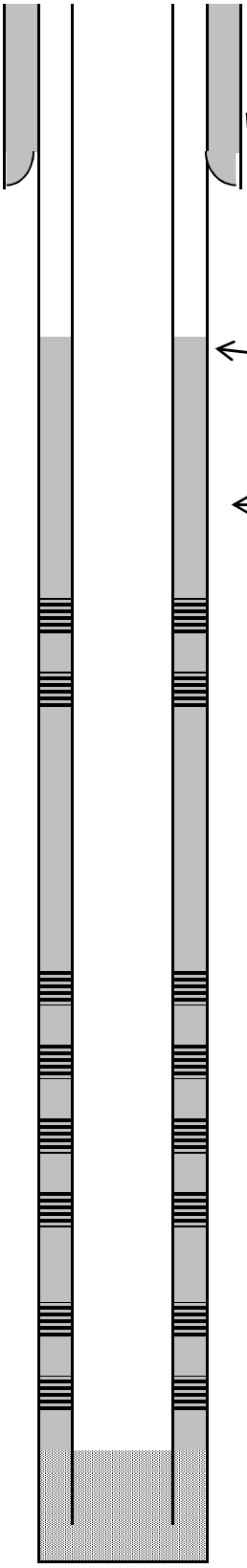
Castle Peak 4856'

Basal Carbonate 5352'

Perf History

4/21/1998

B10	3767' to 3770'
B10	3776' to 3779'
D08	4693' to 4697'
E01.1	4935' to 4941'
E07	5247' to 5251'



GL: 6293'

KB: 6303'

8 5/8" 24# Surface CSG @ 371' KB

cmt'd w/300 sx

Surface Hole size 12 1/4"

Cement top @ 1780'

5 1/2" 15.5# J-55 CSG @ 5452'

cmt'd w/450 sx

Hole Size 7 7/8" bit

Perf's:

B10 3767' to 3770'

B10 3776' to 3779'

D08 4693' to 4697'

E01.1 4935' to 4941'

E07 5247' to 5251'

PBTD @ 5378' KB

TD @ 5503' KB

(Not to Scale)

Petroglyph Operating Co., Inc.

Ute Tribal #31-12

(1999' FSL & 748' FWL)

NW SW Section 31, 5S- 3W

Antelope Creek Field

Duchesne Co. Utah

API#: 43013320380000

*Plate 1 Utah Geological Survey Special Study 144. (2012). *BMSW Elevation Contour Map, Uinta Basin, Utah.* [map]. (CA 1:200,000)

Ute Tribal 31-12 Injection

Well History:

Spud Well: 3/24/1998

Completed: 4/24/1998

First Production: 5/3/1998

Tops (KB):

BMSW* Found at 1303'

Green River 929'

A Marker 3390'

X Marker 3868'

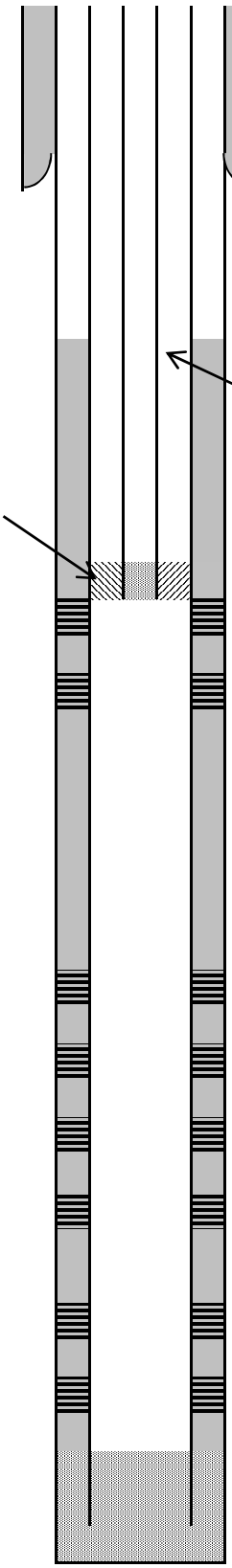
Douglas Creek 4006'

B Limestone 4374'

Castle Peak 4856'

Basal Carbonate 5352'

Injection packer @ 3676'



GL: 6293'

KB: 6303'

8 5/8" 24# Surface CSG @ 371' KB

cmt'd w/300 sx

Surface Hole size 12 1/4"

Cement top @ 1780'

5 1/2" 15.5# J-55 CSG @ 5452'

cmt'd w/450 sx

Tubing 2 7/8" 6.5# J55

Hole Size 7 7/8" bit

Perf's:

B10 3767' to 3770'

B10 3776' to 3779'

Add B10 3786' to 3788'

Add C02 3944' to 3946'

Add C05 4063' to 4066'

Add C06 4185' to 4188' and 4195' to 4199'

Add C09.2 4317' to 4324'

Add D3 4440' to 4456'

D08 4693' to 4697'

Add E01.1 4925' to 4935'

E01.1 4935' to 4941'

Add E01.1 4941' to 4954'

Add E02.1 5009' to 5011' and 5018' to 5020'

Add E04 5976' to 5979'

Add E05.1 5139' to 5150'

Add E07 5233' to 5240'

E07 5247' to 5251'

Add E07 5251' to 5260'

PBTD @ 5378' KB

TD @ 5503' KB

Petroglyph Operating Co., Inc.

Ute Tribal #31-12

(1999' FSL & 748' FWL)

NW SW Section 31, 5S- 3W

Antelope Creek Field

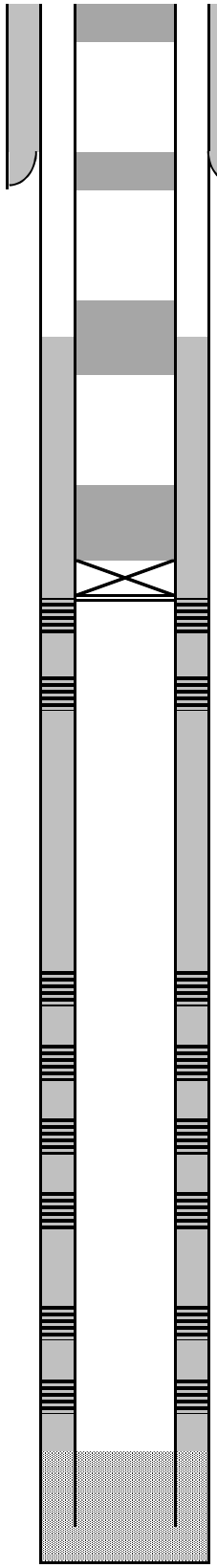
Duchesne Co. Utah

API#: 43013320380000

*Plate 1 Utah Geological Survey Special Study 144. (2012). *BMSW Elevation Contour Map, Uinta Basin, Utah.* [map]. (CA 1:200,000)

(Not to Scale)

Ute Tribal 31-12 Plug and Abandonment



GL: 6293'
KB: 6303'

8sx Class G Cement-50' plug

8 5/8" 24# Surface CSG @ 371' KB
cmt'd w/300 sx

15sx Class G Cement-100' plug

Surface Hole size 12 1/4"

Cement top @ 1780'
5 1/2" 15.5# J-55 CSG @ 5452'
cmt'd w/450 sx

30sx Class G Cement-200' plug

Hole Size 7 7/8" bit

30sx Class G Cement-200' plug
CIBP @ 3676'

Perf's:
B10 3767' to 3770'
B10 3776' to 3779'
D08 4693' to 4697'
E01.1 4935' to 4941'
E07 5247' to 5251'

Petroglyph Operating Co., Inc.
Ute Tribal #31-12
(1999' FSL & 748' FWL)
NW SW Section 31, 5S- 3W
Antelope Creek Field
Duchesne Co. Utah
API#: 43013320380000

PBTD @ 5378' KB
TD @ 5503' KB

*Plate 1 Utah Geological Survey Special Study 144. (2012). *BMSW Elevation Contour Map, Uinta Basin, Utah.* [map]. (CA 1:200,000)

(Not to Scale)

ATTACHMENT NO. 11

P&A PROCEDURE

Plug and Abandonment Procedure

Ute Tribal 31-12

43-013-32038

1. Obtain authorization from regulatory agencies for P&A procedures.

2. Set deadman. Rig up pulling unit. Rig down wellhead. Install BOP. Release packer. Trip out of hole with tubing and packer.

3. RIH Set CIBP @ 3676‘.

4. Trip in hole with tubing. Establish pump rate, spot 30sxs Class G cement on top of CIBP. This will be a 200’ plug.

5. Raise the tubing to 1780’ and set balanced 200’ cement plug using 30sxs of Class G cement.

6. Raise the tubing to 371’ and set balanced 100’ cement plug using 15sxs of Class G cement.

7. Set balanced 50’ cement plug (8sxs of Class G cement) from 50’ to surface.

8. Cut off wellhead. Install plate and identification P&A post marker. Weld to casing.

9. File reports with the agencies and reclaim surface locations.

ATTACHMENT NO. 12

MIT PROCEDURE

Mechanical Integrity Test Procedure

Ute Tribal 31-12

43-013-32038

Integrity testing can be accomplished by pressuring up the annulus between the casing and the tubing. The pressure and duration of the test will be as required by the EPA.

Test Procedure Details:

1. Two weeks prior, notify EPA of pending work. Shut well in.
2. Record fluid level with echometer.
3. MIRU Service Unit.
4. POOH laying down rods and pump.
5. ND Wellhead. NU BOPs. POOH laying down 2 7/8" tubing.
6. RU Wireline. Add new perfs: B10 3786' to 3788', C02 3944' to 3946', C05 4063' to 4066', C06 4185' to 4188', 4195' to 4199', C09.2 4317' to 4324', D3 4440' to 4456', E01.1 4925' to 4935', E02.1 5009' to 5011', 5018' to 5020', E04 5976' to 5979', E05.1 5139' to 5150', E07 5233' to 5240', and 5251' to 5260'.
7. RD Wireline.
8. PU plug and packer and new tubing. RIH and breakdown perfs.
9. POOH. RIH with injection packer to 3676'.
10. Reverse circulate in packer fluid.
11. Set packer and ND BOPs and NU wellhead.
12. Pressure test casing-tubing annulus to 1500psi for 15 minutes.
13. RDMO.
14. Notify EPA of test, wait for approval.
15. Return to injection.

ATTACHMENT NO. 13

SURETY BOND LETTER

SURETY BOND STATEMENT

July 27, 2015

Petroglyph currently operates 111 injection wells in Antelope Creek Field under EPA UIC Area Permit UT2736-00000. The existing wells are covered by UIC Bond No. LPM 4138351.

Prior to final permit approval, Petroglyph will add a rider to the existing bond to include this well along with the other wells being submitted to EPA at this time.

Kevin Dickey

V.P., Operations

Petroglyph Energy, Inc.