UNDERGROUND INJECTION CONTROL
PERMIT APPLICATION

Ute Tribal # 31-04
770' FNL & 703' FWL
Sec. 31, T5S-R3W
Duchesne County, Utah
API # 43-013-32034

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
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SUMMARY DOCUMENT
UIC WELL APPLICATION
Ute Tribal 31-04
API # 43-013-32034

The following document contains information provided in support of the application for the conversion of the Ute Tribal 31-04 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 31-04 is 770' FNL & 703' FWL NW/NW 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 31-04 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 30-13, Ute Tribal 30-14N, and Ute Tribal 31-05 well(s) located in its ¼ mile radius.

(4) Petroglyph proposes to utilize the Ute Tribal 31-04 as an injection well for enhanced recovery in the Antelope Creek Field.

(5) Injection Zone – The injection intervals are between 3456' and 5432' True Vertical Depth and located in the lower portion of the Green River Formation. The injection zone is confined within a 1976' 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 31-04 is 223 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 31-04 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 31-04 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 31-04 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 **1705**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 31-04:
1705psi = (0.88psi/ft - 0.43(1.00)) 3789ft

(12) Three wellbore diagrams for the Ute Tribal 31-04 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.

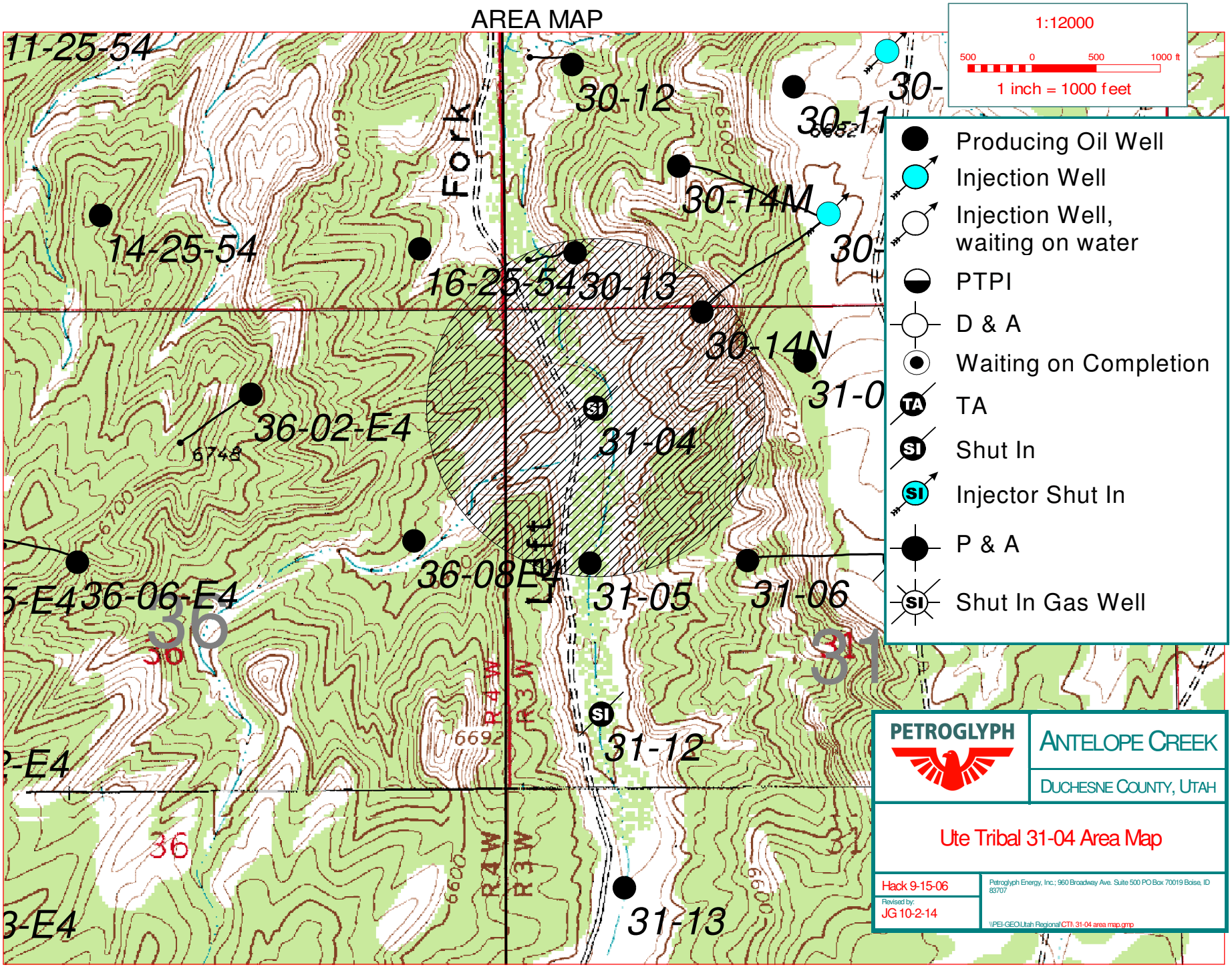
(15) Petroglyph will give proof of financial responsibility by posting a surety bond for the UIC well prior to final permit approval. A copy of this letter is contained in Attachment No. 13.

(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

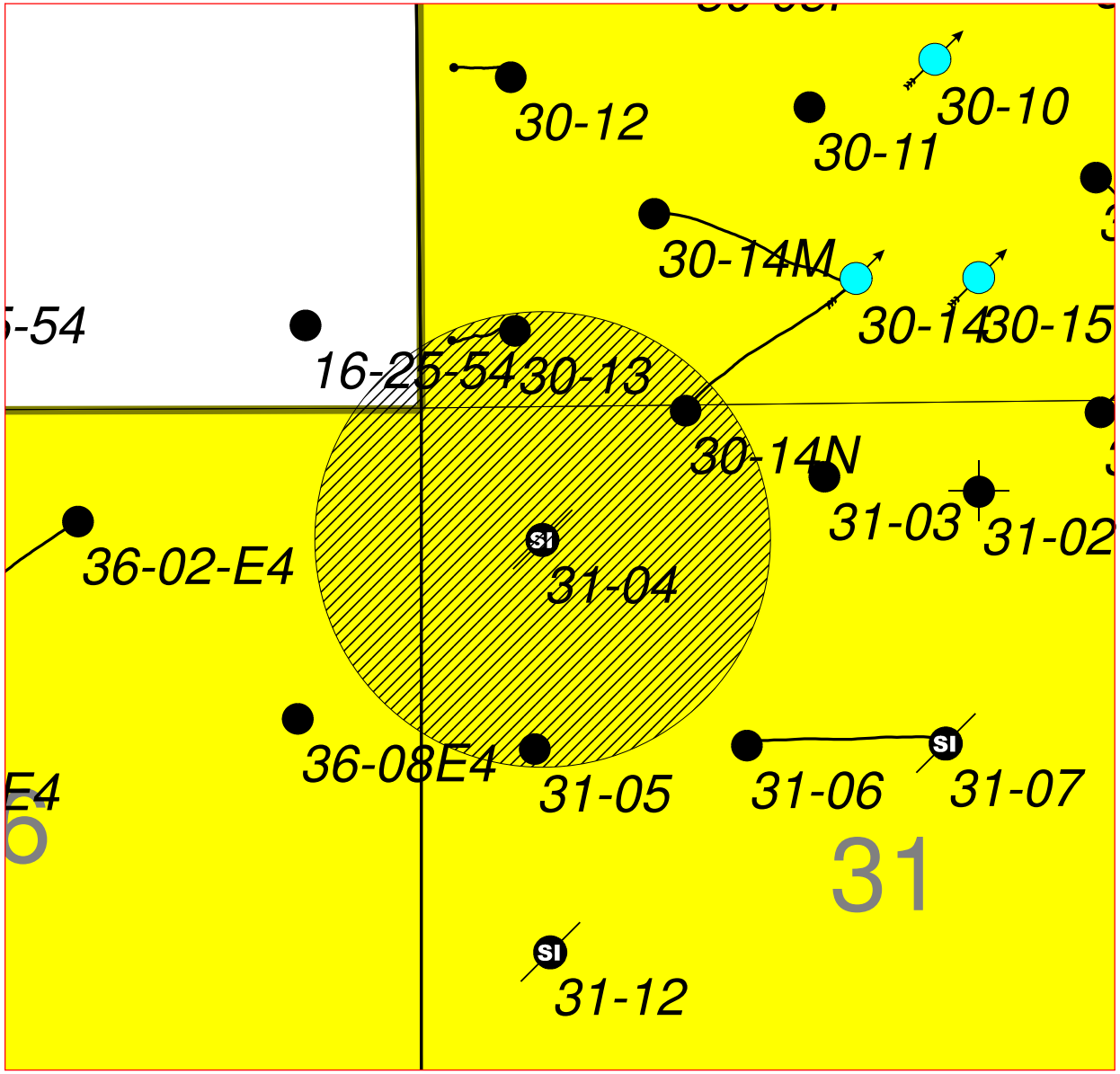
RADIUS MAP OF ADJACENT WELLS

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 31-04 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

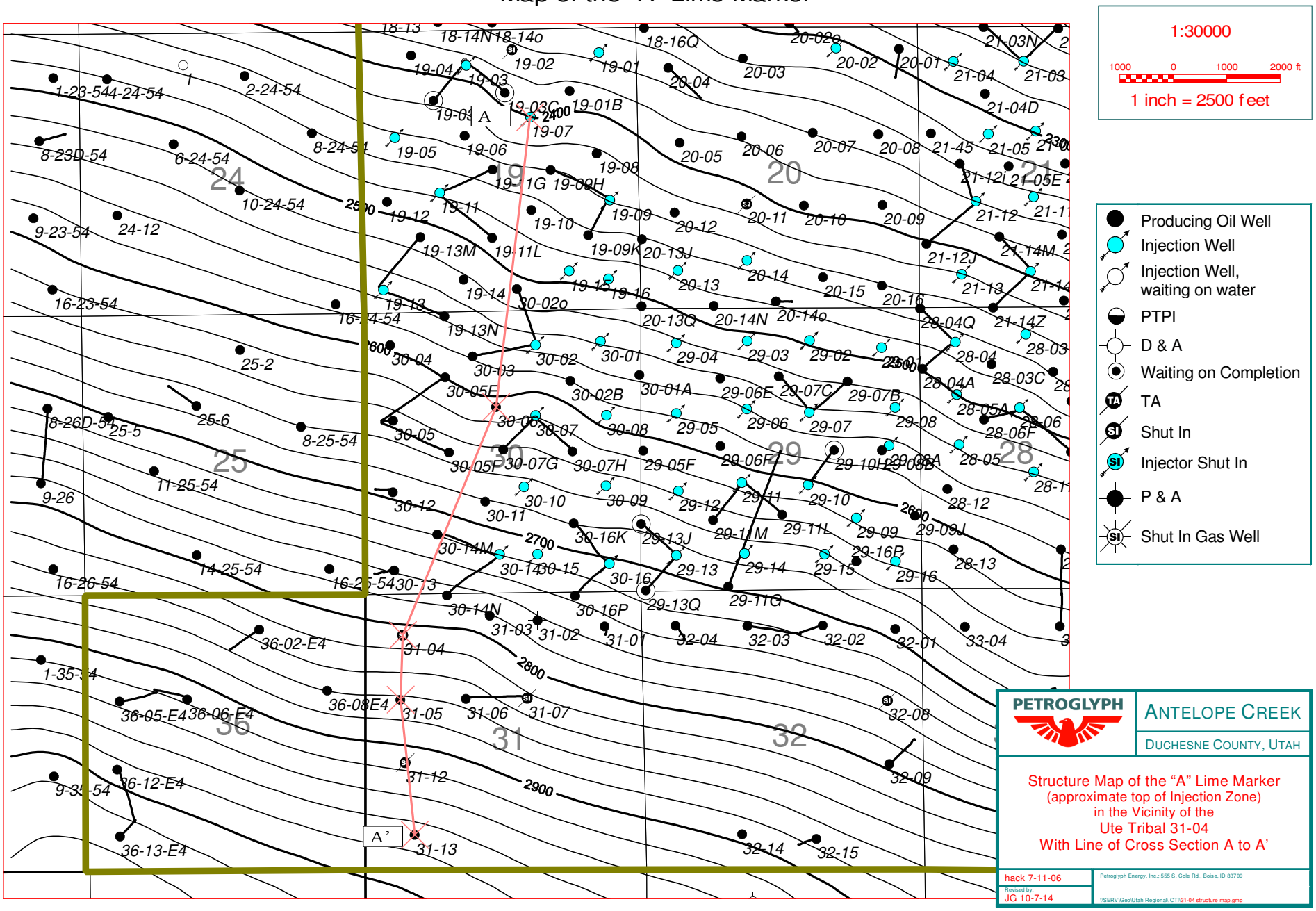
Petroglyph Energy, Inc.; 960 Broadway Ave. Suite 500 PO Box 70019 Boise, ID 83707

\\PEI-GEO\Utah Regional\CTI\ 31-04 quarter mile map.gmp

ATTACHMENT NO. 3

MAP OF THE A-LIME MARKER SURFACE

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



ATTACHMENT NO. 4

CROSS SECTIONS OF THE INJECTION FORMATION

Structural Cross Section A to A' in the Vicinity of Ute Tribal 31-04

43013319650000 — 5467 ft — 43013319700000 — 4624 ft — 43013320340000 — 1211 ft — 43013320350000 — 2548 ft — 43013320390000

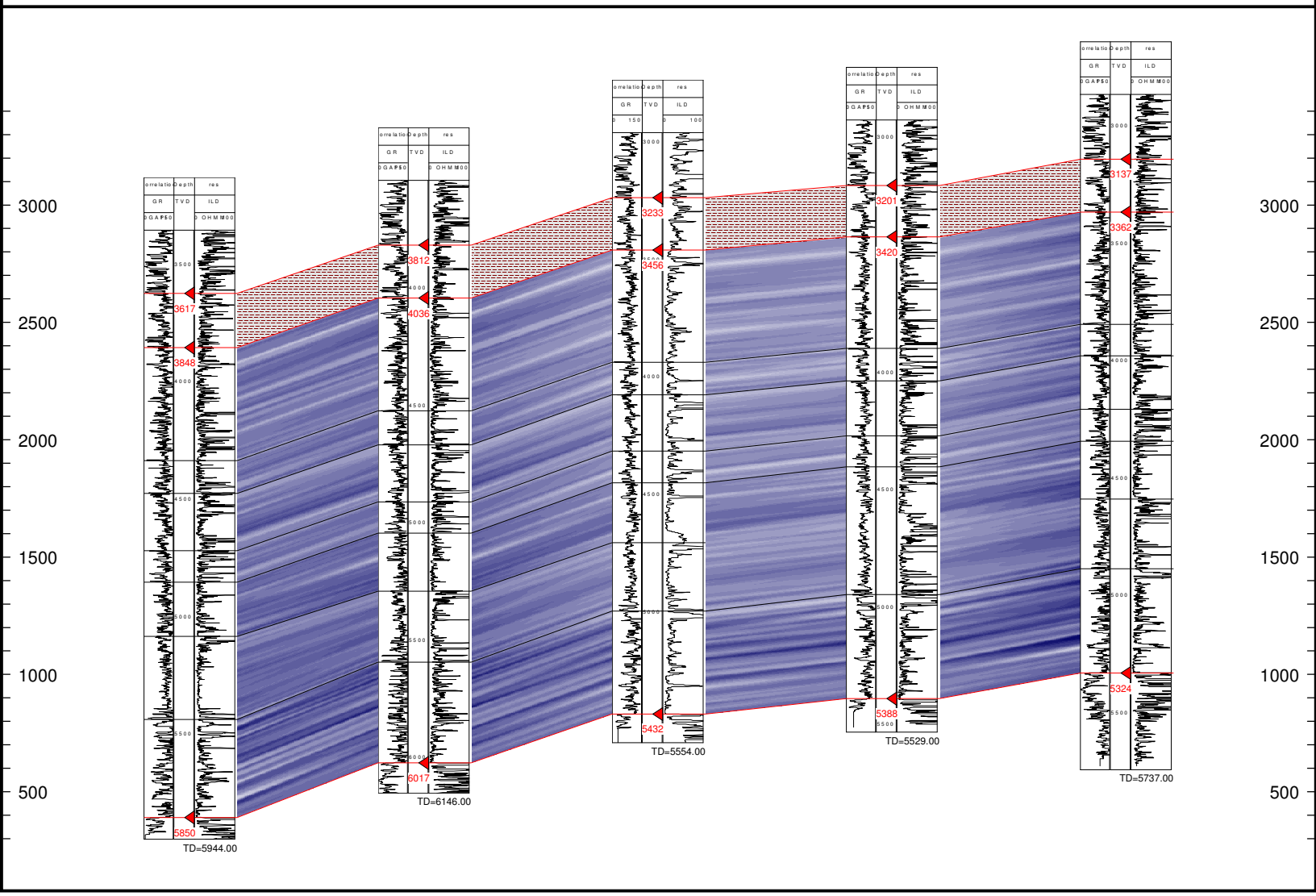
PETROGLYPH OPERATING COMPANY INC
Ute Tribal 19-07
1661 FNL 2013 FEL
TWP: 5 S - Range: 3 W - Sec. 1

PETROGLYPH OPERATING COMPANY INC
Ute Tribal 30-06
1802 FNL 2500 FWL
TWP: 5 S - Range: 3 W - Sec. 30

PETROGLYPH OPERATING COMPANY INC
Ute Tribal 31-04
770 FNL 703 FWL
TWP: 5 S - Range: 3 W - Sec. 31

PETROGLYPH OPERATING COMPANY INC
Ute Tribal 31-05
1980 FNL 660 FWL
TWP: 5 S - Range: 3 W - Sec. 31

PETROGLYPH OPERATING COMPANY INC
Ute Tribal 31-13
644 FSL 929 FWL
TWP: 5 S - Range: 3 W - Sec. 31



ATTACHMENT NO. 5

WATER ANALYSIS

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

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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
1553 East Highway 40
Vernal, UT 84078

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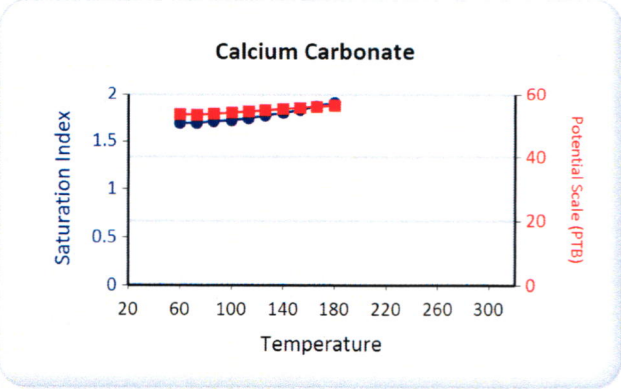
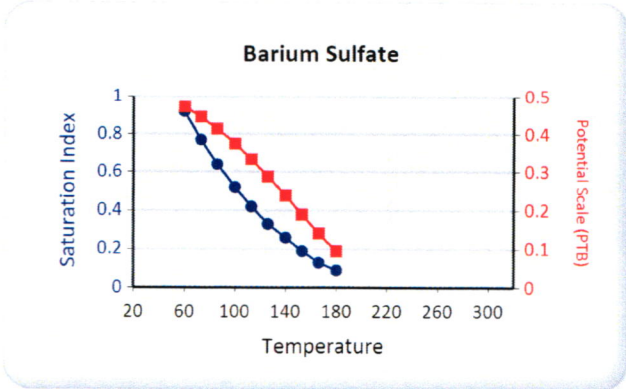
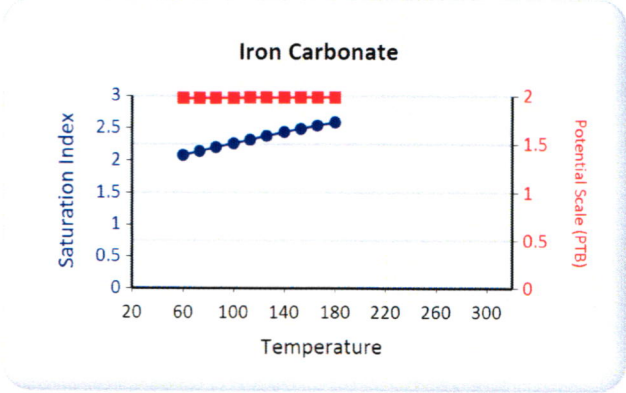
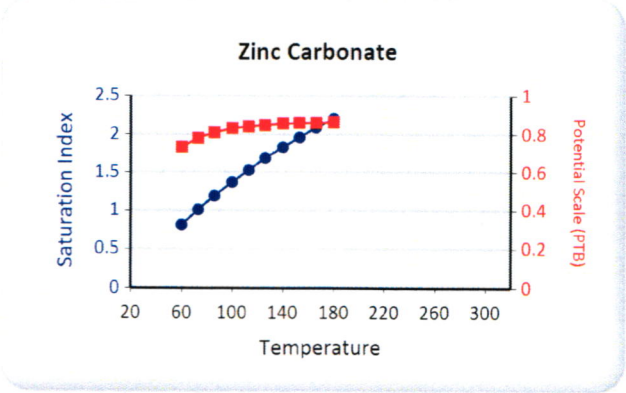
Water Analysis Report









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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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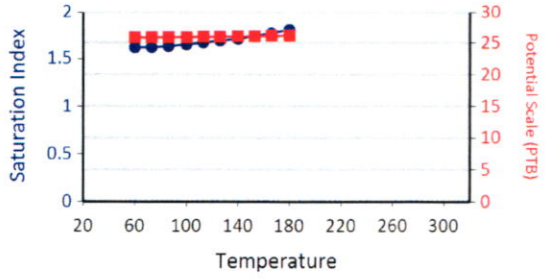
Vernal, UT 84078

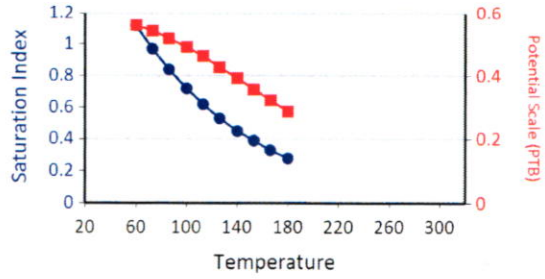
multi-chem
A HALLIBURTON SERVICE

Water Analysis Report

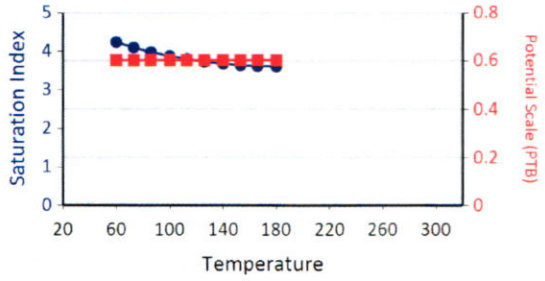
Calcium Carbonate



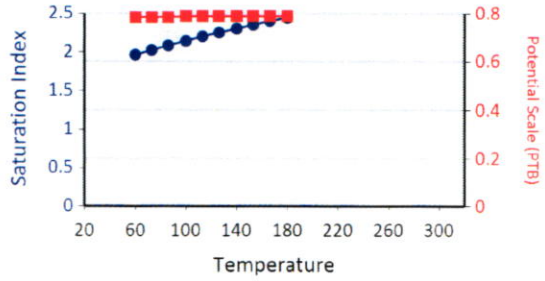
Barium Sulfate



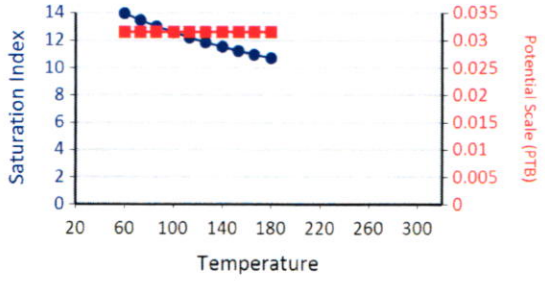
Iron Sulfide



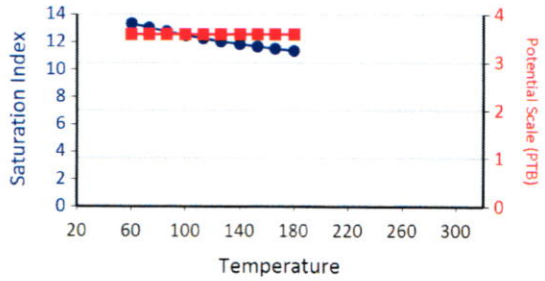
Iron Carbonate



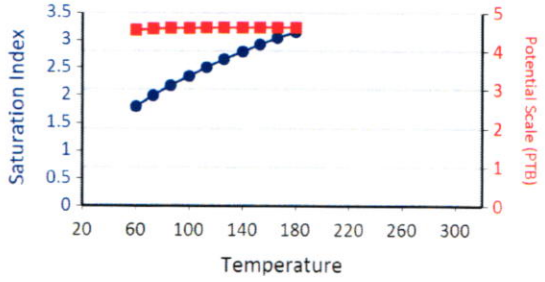
Lead Sulfide



Zinc Sulfide



Zinc Carbonate



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

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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

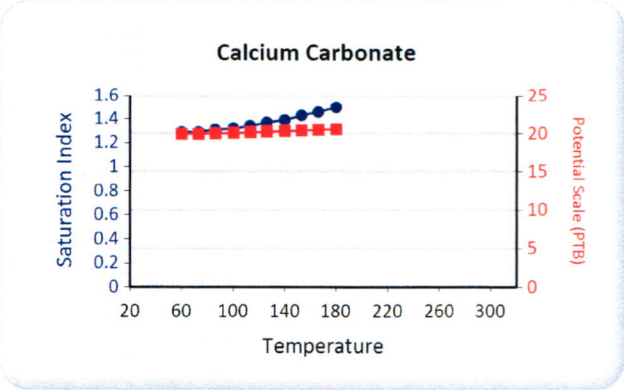
Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	5277.36	Chloride (Cl):	7000.00
Potassium (K):	65.03	Sulfate (SO_4):	0.00
Magnesium (Mg):	7.80	Bicarbonate (HCO_3):	2196.00
Calcium (Ca):	24.60	Carbonate (CO_3):	
Strontium (Sr):	5.20	Acetic Acid (CH_3COO)	
Barium (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):	

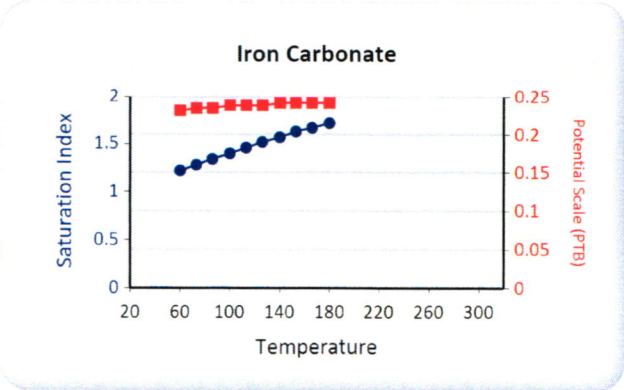
Notes:

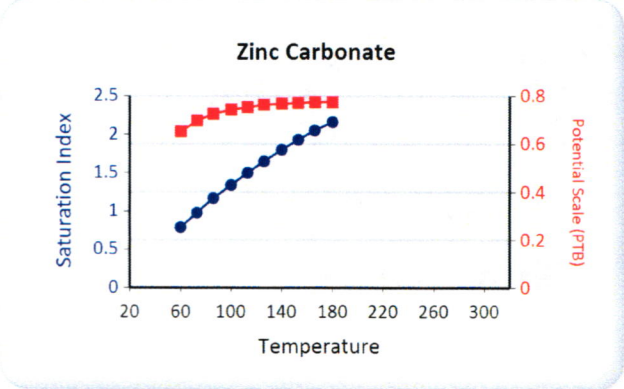
(PTB = Pounds per Thousand Barrels)

		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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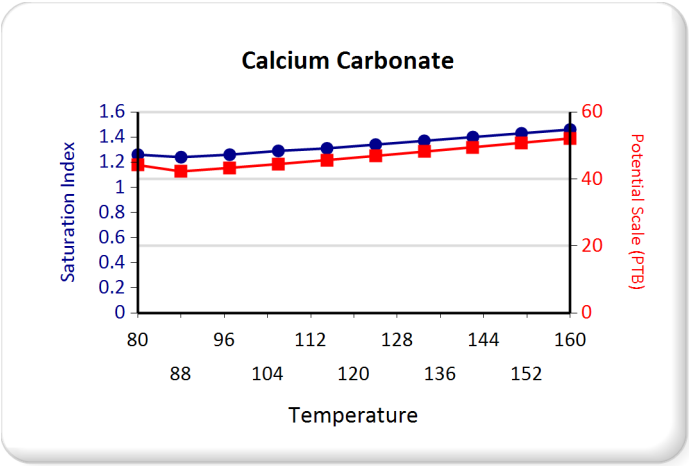
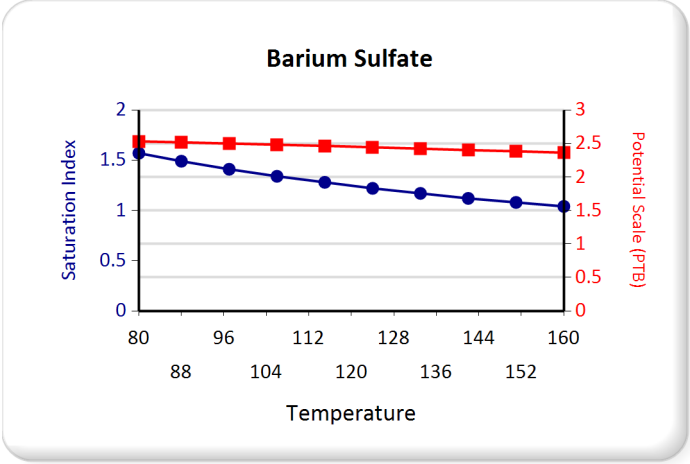
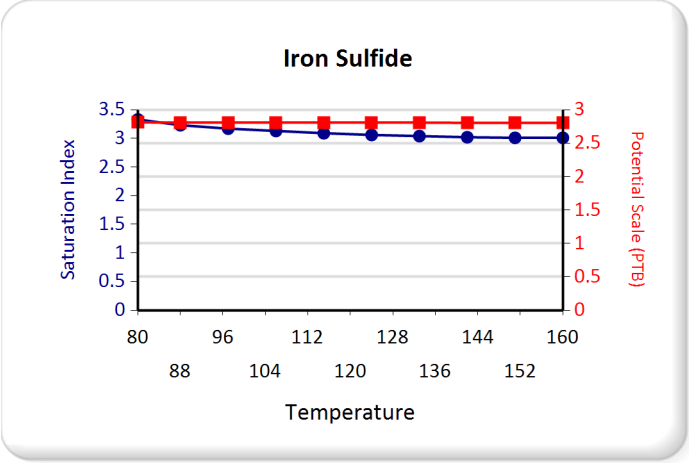
Water Analysis Report

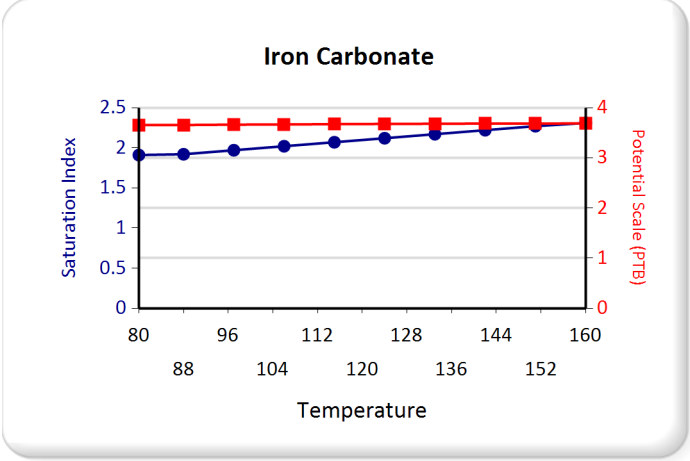
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

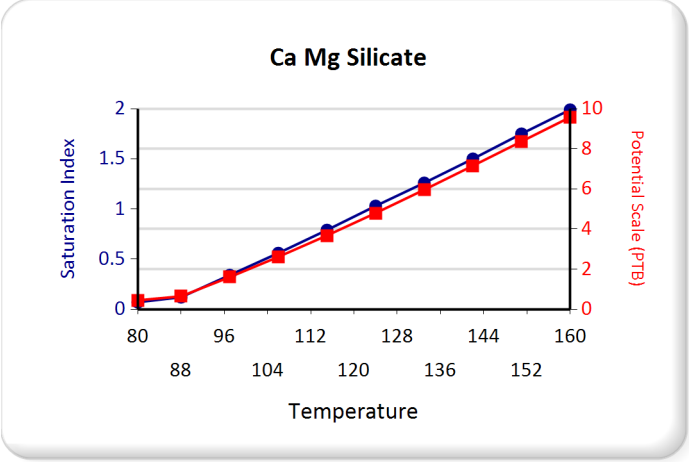
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

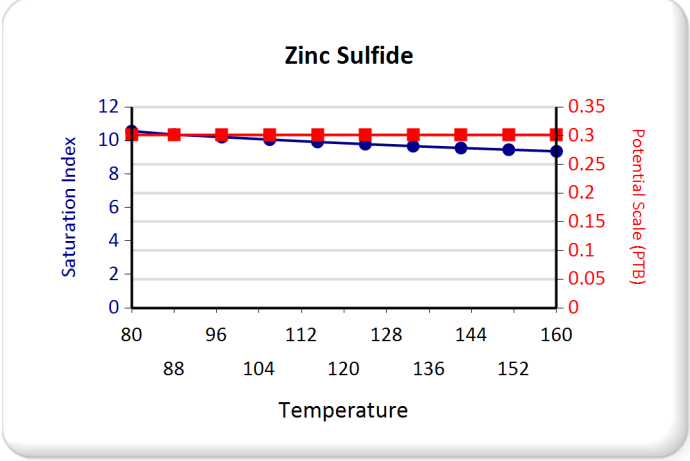


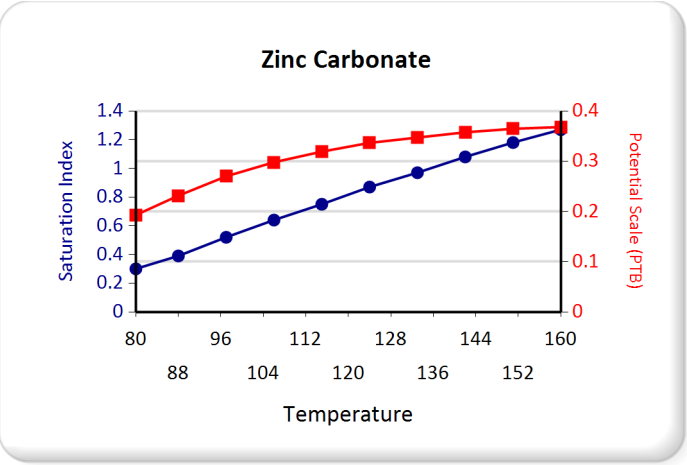


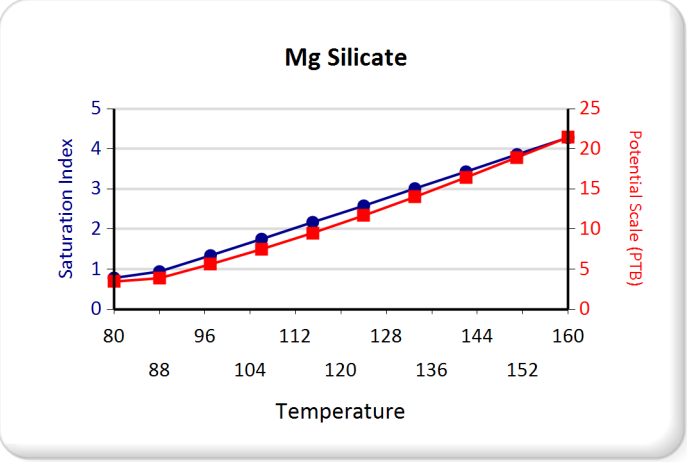


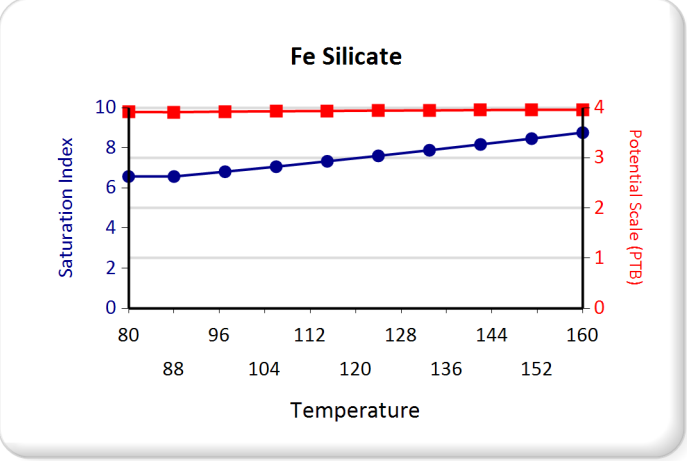







Zinc Carbonate
Saturation Index
Potential Scale (PTB)
Temperature
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.4
0.3
0.2
0.1
0
80
88
96
104
112
120
128
136
144
152
160


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 31-04

	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 31-04	**8-5/8**	**355**	**300**	**surface**	**5-1/2**	**5517**	**565**	**170**
Ute Tribal 30-13	8-5/8	500	285	surface	5-1/2	5584	555	surface
Ute Tribal 30-14N	8-5/8	430	270	surface	5-1/2	6347	915	surface
Ute Tribal 31-05	8-5/8	368	300	surface	5-1/2	5483	430	1565

ATTACHMENT NO. 7

CBL FOR THE UIC WELL

WE LE

COMPANY: PETROGLYPH OPERATING COMPANY

WELL: UTE TRIBAL #31-04

FIELD: ANTELOPE CREEK

COUNTY: DUCHESNE STATE: UTAH

COUNTY: DUCHESNE
Field: ANTELOPE CREEK
Location: 770FNL 703FWL
Well: UTE TRIBAL #31-04
Company: PETROGLYPH OPERATING CO

Schlumberger

CEMENT BOND LOG WITH GAMMARAY & COLLARS

LOCATION

770FNL 703FWL

Elev.: K.B. 6264 F
G.L. 6254 F
D.F.

Permanent Datum: GROUND LEVEL Elev.: 6254 F
Log Measured From: K.B. 10.0 F above Perm. Datum
Drilling Measured From: K.B.

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-32034	31	5S	3W

	Run 1	Run 2
Logging Date	20-MAR 1998	
Run Number	1	
Depth Driller	5554 F	
Schlumberger Depth	5561 F	
Bottom Log Interval	5442 F	
Top Log Interval	50 F	
Casing Driller Size @ Depth	5.500 IN @	@
Casing Schlumberger		
Bit Size	7.875 IN	
MUD: Type Fluid In Hole	WATER	
MUD: Density / Viscosity	8.6 LB/G	
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	20 MAR-1998 12:50	
Unit Number / Location	161 VERNAL UTAH	
Recorded By	LOVLETT /SHOCKEY	
Witnessed By	MR. GENE SEARLE	

	Run 1	Run 2
Logging Date		
Run Number		
Depth Driller		
Schlumberger Depth		
Bottom Log Interval		
Top Log Interval		
Casing Driller Size @ Depth	@	
Casing Schlumberger		
Bit Size		
MUD: 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 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
OS1:
OS2:
OS3:
OS4:
OS5:

OTHER SERVICES2
OS1:
OS2:
OS3:
OS4:
OS5:

REMARKS: RUN NUMBER 1
LOG CORRELATED TO HLS DENSITY LOG
DATED 13-MAR-1998
EST CEMENT TOP @ 170'
SHORT JOINT @ 3268'
THANK YOU FOR USING SCHLUMBERGER
MAXIMUM READING TEMPERATURE 158 DEGREES

REMARKS: RUN NUMBER 2

RUN 1

SERVICE ORDER #:
PROGRAM VERSION: 8C0-609
FLUID LEVEL: 20 F

LOGGED INTERVAL	START	STOP

RUN 2

SERVICE ORDER #:
PROGRAM VERSION:
FLUID LEVEL:

LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1

RUN 2

SURFACE EQUIPMENT

WDM-AB
SMM-AA

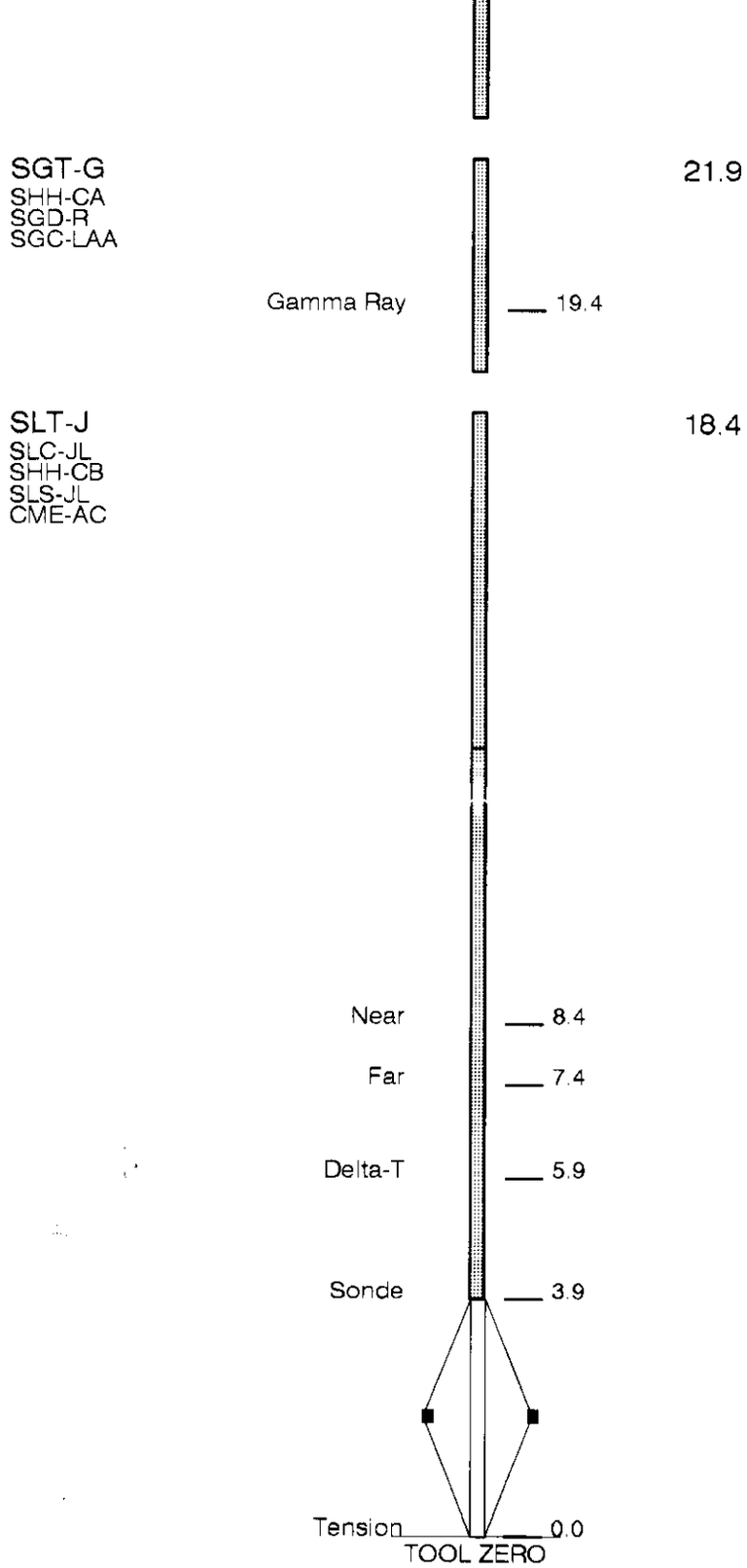
DOWNHOLE EQUIPMENT

CCL-AJ
CCL-AJ

26.1

CCL

24.0



MAXIMUM STRING DIAMETER 2.92 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT	SLTJ .004	FN:3	FIELD	20-Mar-1998 10:59	5449.5 FT	20.5 FT

OP System Version: 8C0-609

MCM

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

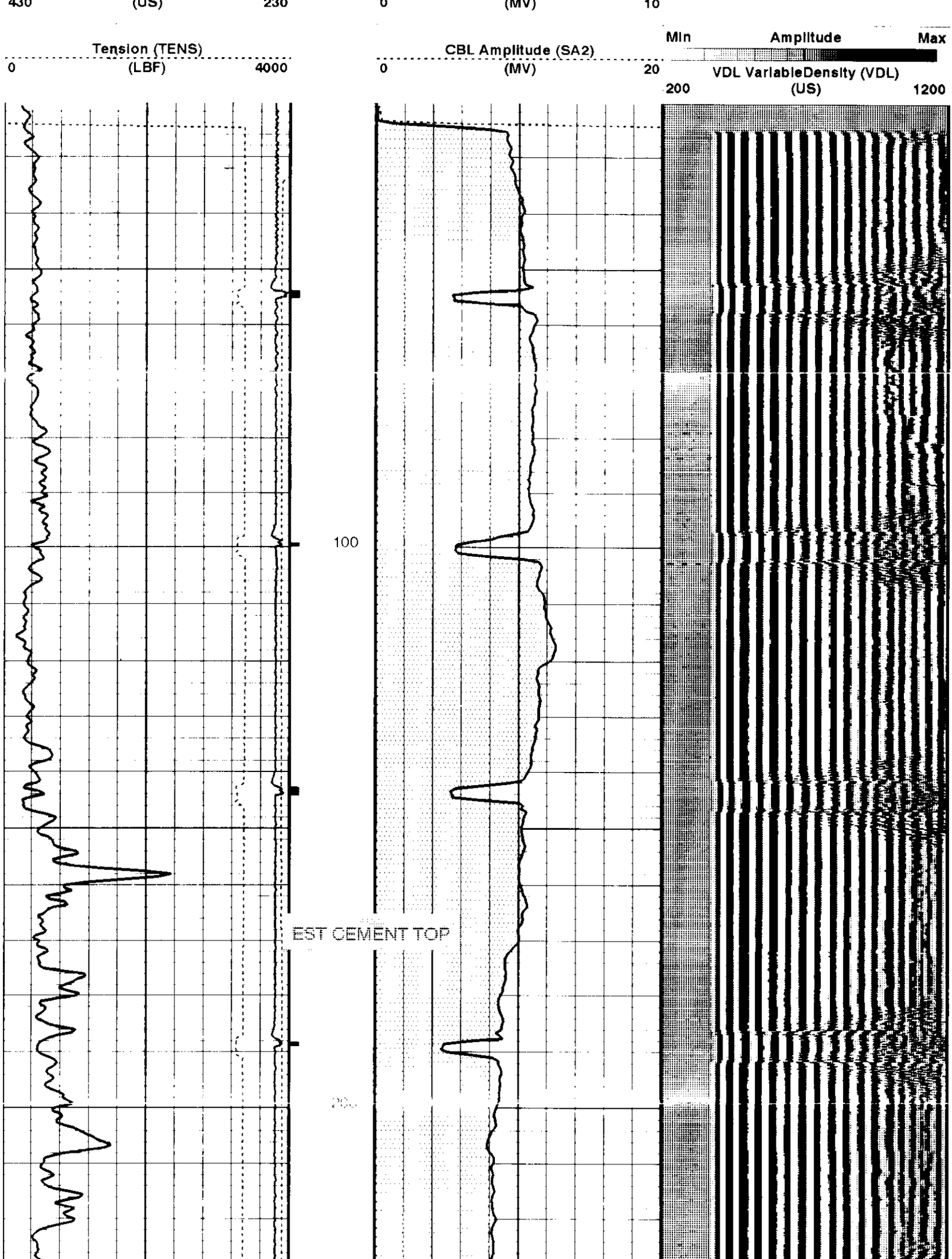
PIP SUMMARY

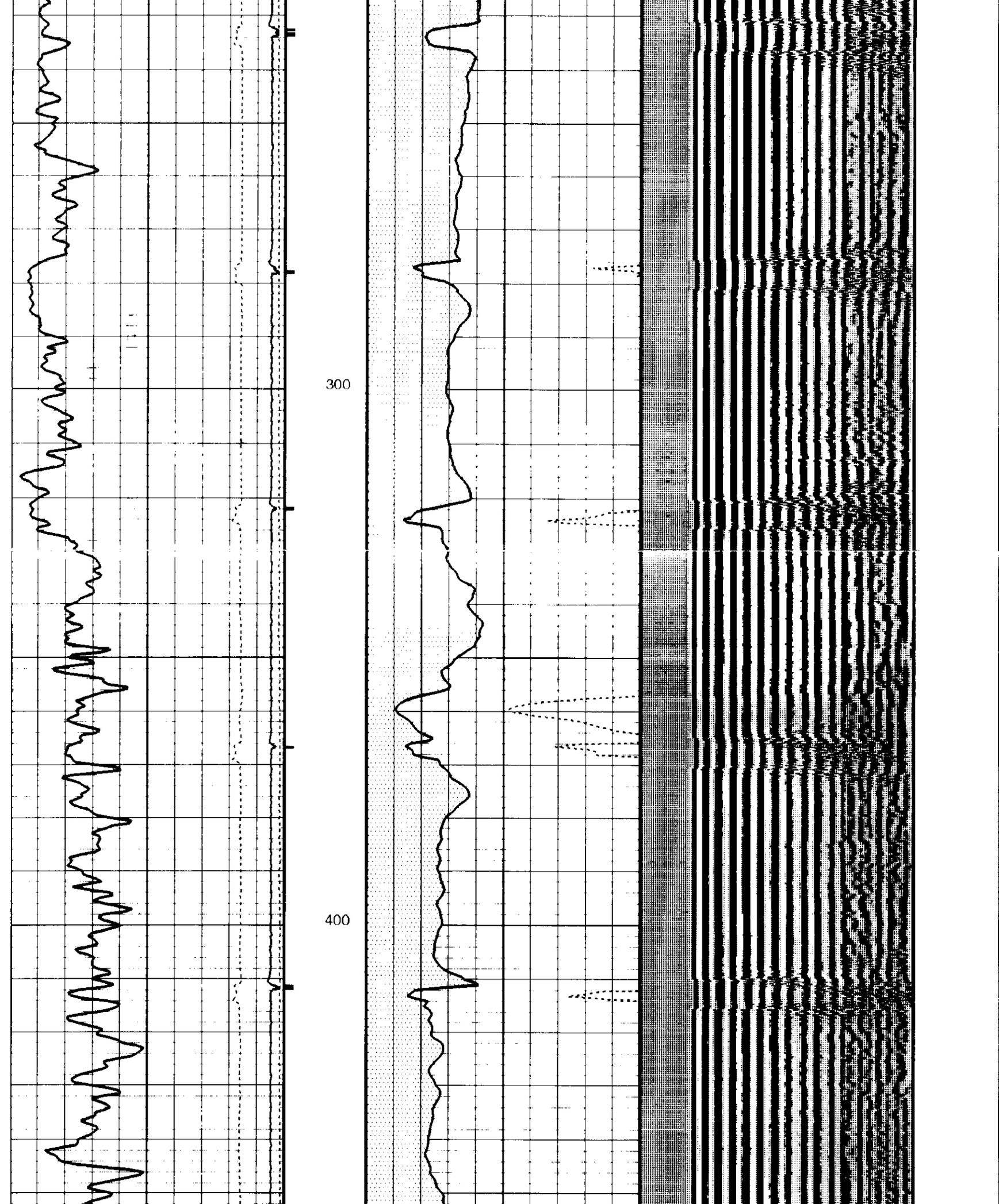
Casing Collars

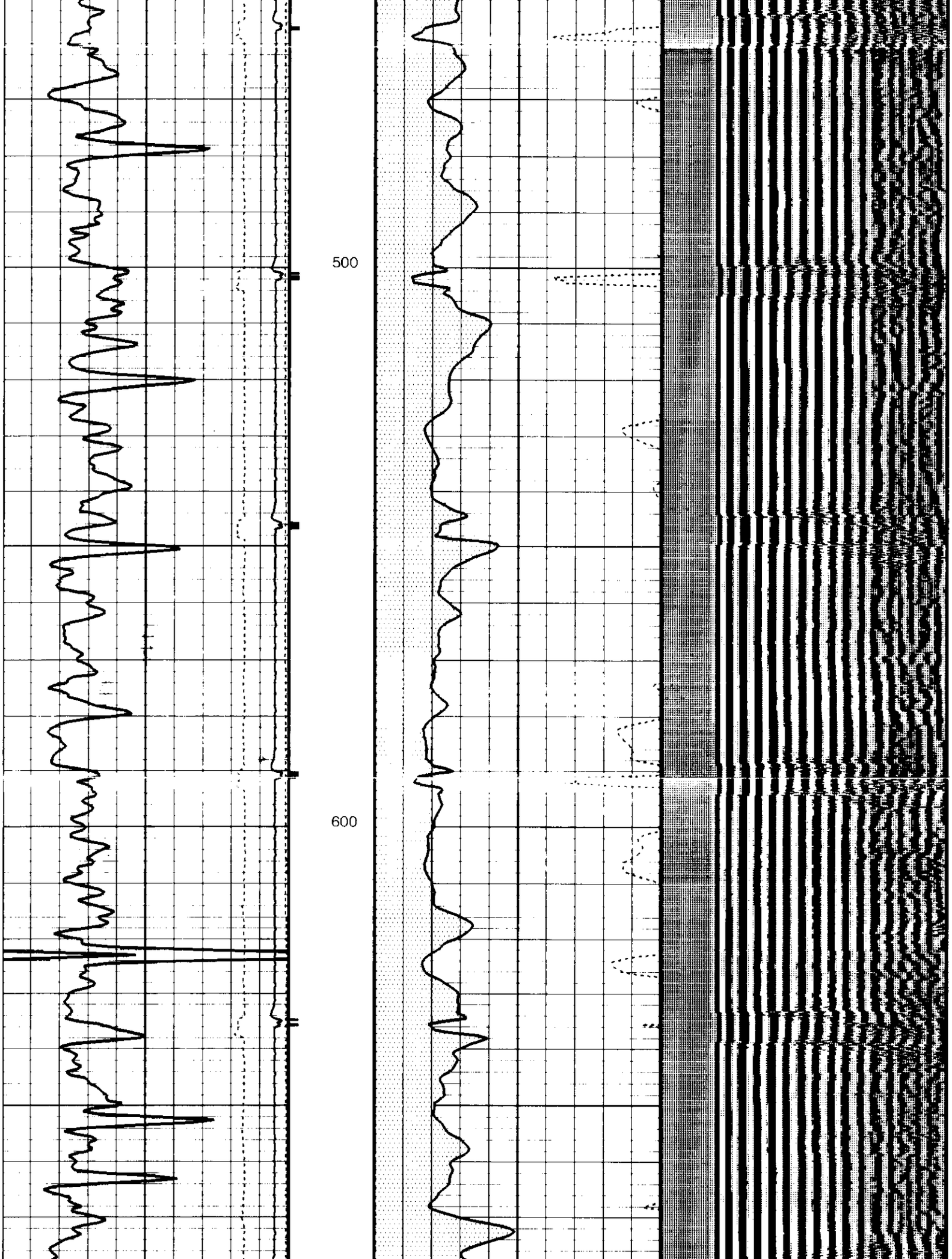
Gamma Ray (GR)		
0	(GAPI)	200
Casing Collar Locator (CCL)		
-19	(----)	1
Transit Time 2 (TT2)		

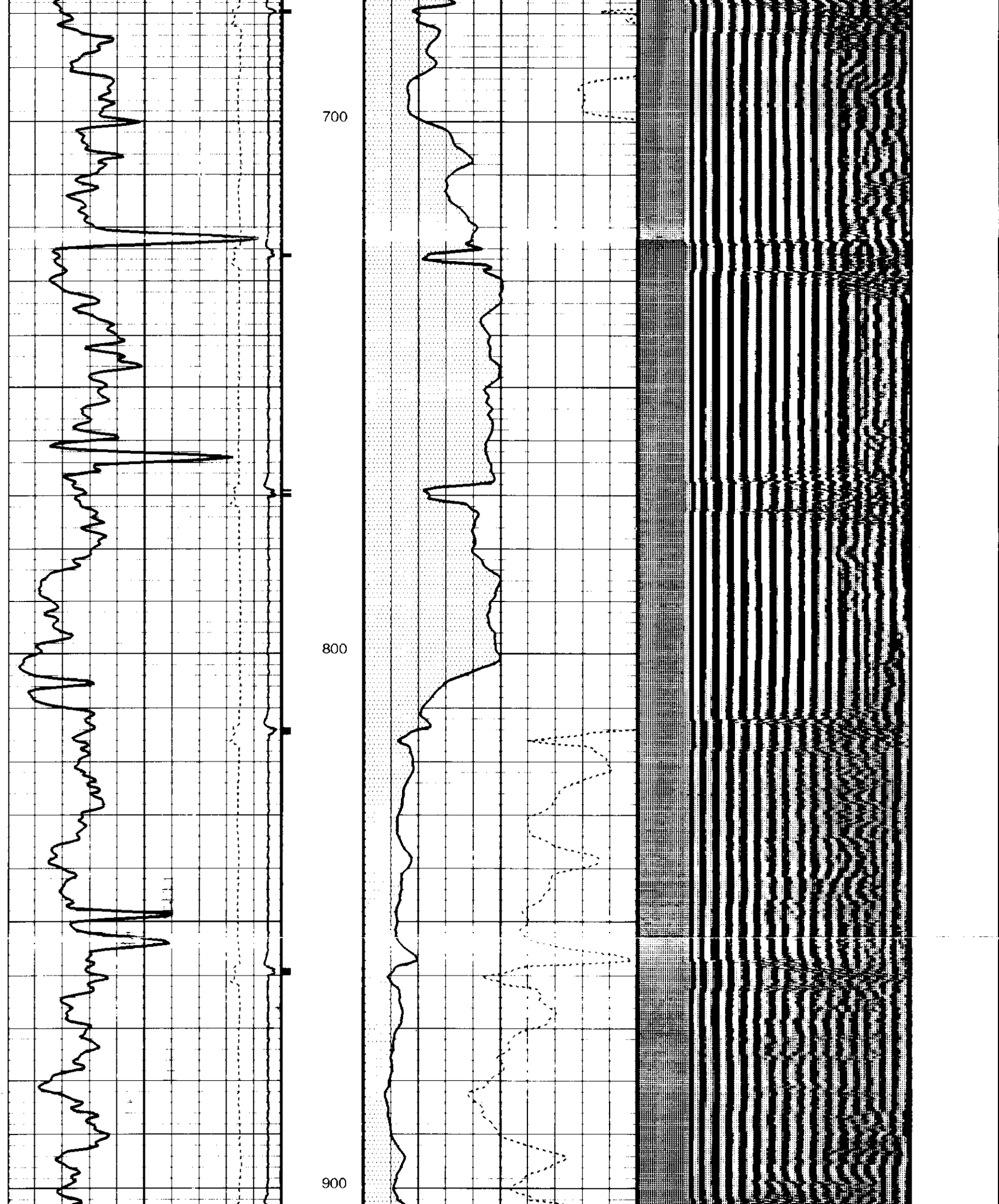
GoodBond
From T2 to SA2

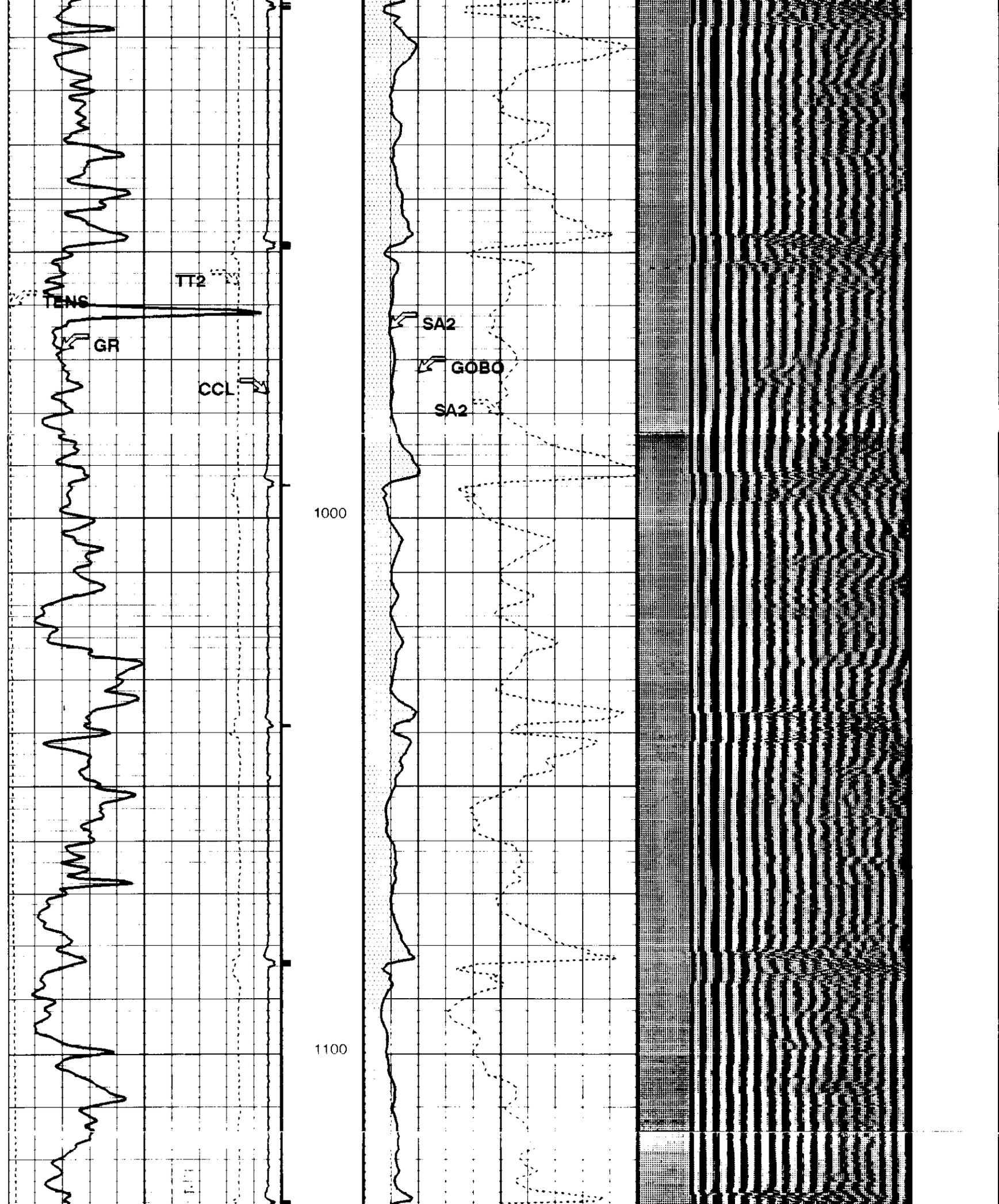
CBL Amplitude (SA2)		
0	(MV)	100
Good Bond (GOBO)		

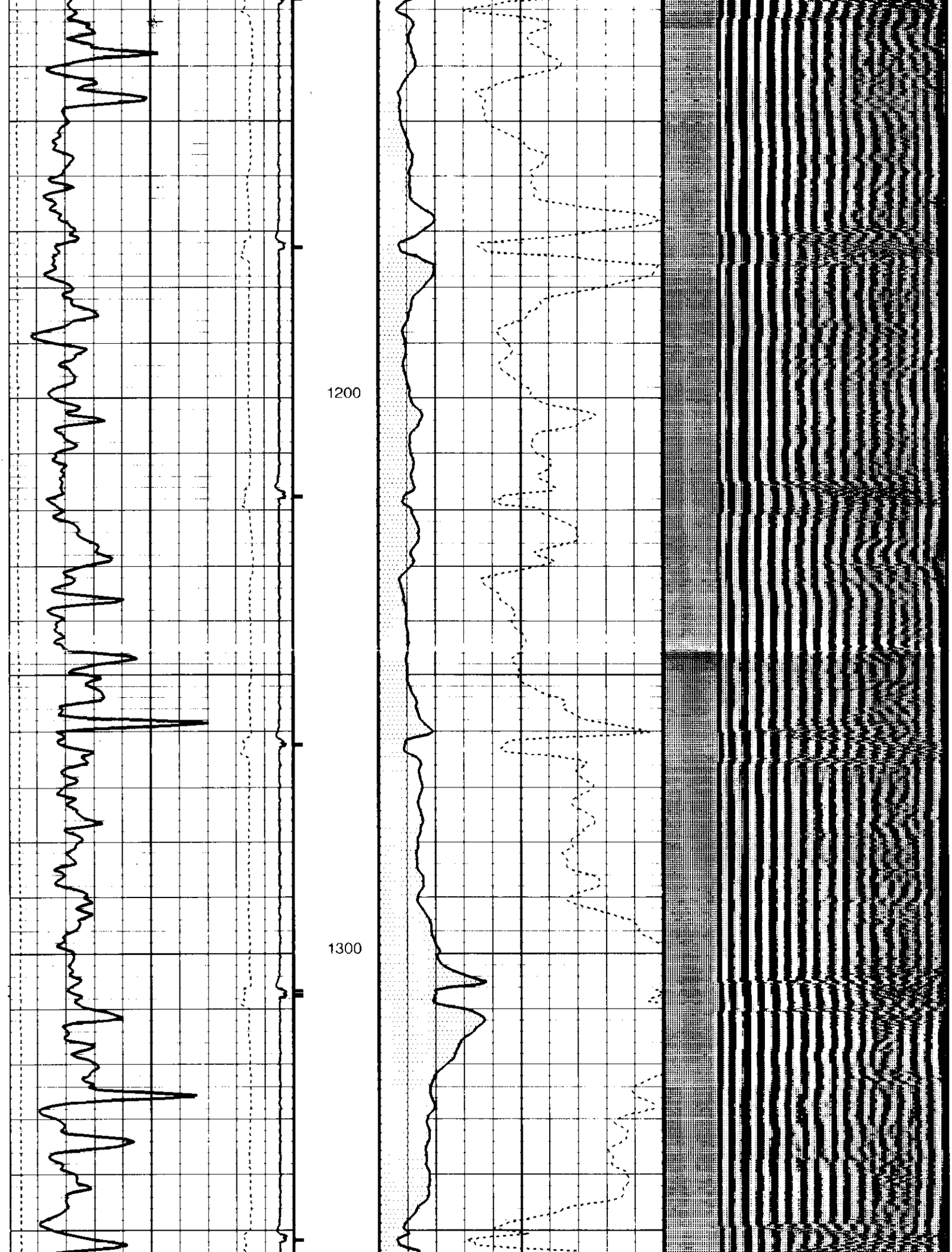

430
(US)
230
0
(MV)
10
Tension (TENS)
0
(LBF)
4000
CBL Amplitude (SA2)
0
(MV)
20
Min
Amplitude
Max
VDL VariableDensity (VDL)
200
(US)
1200
100
EST CEMENT TOP

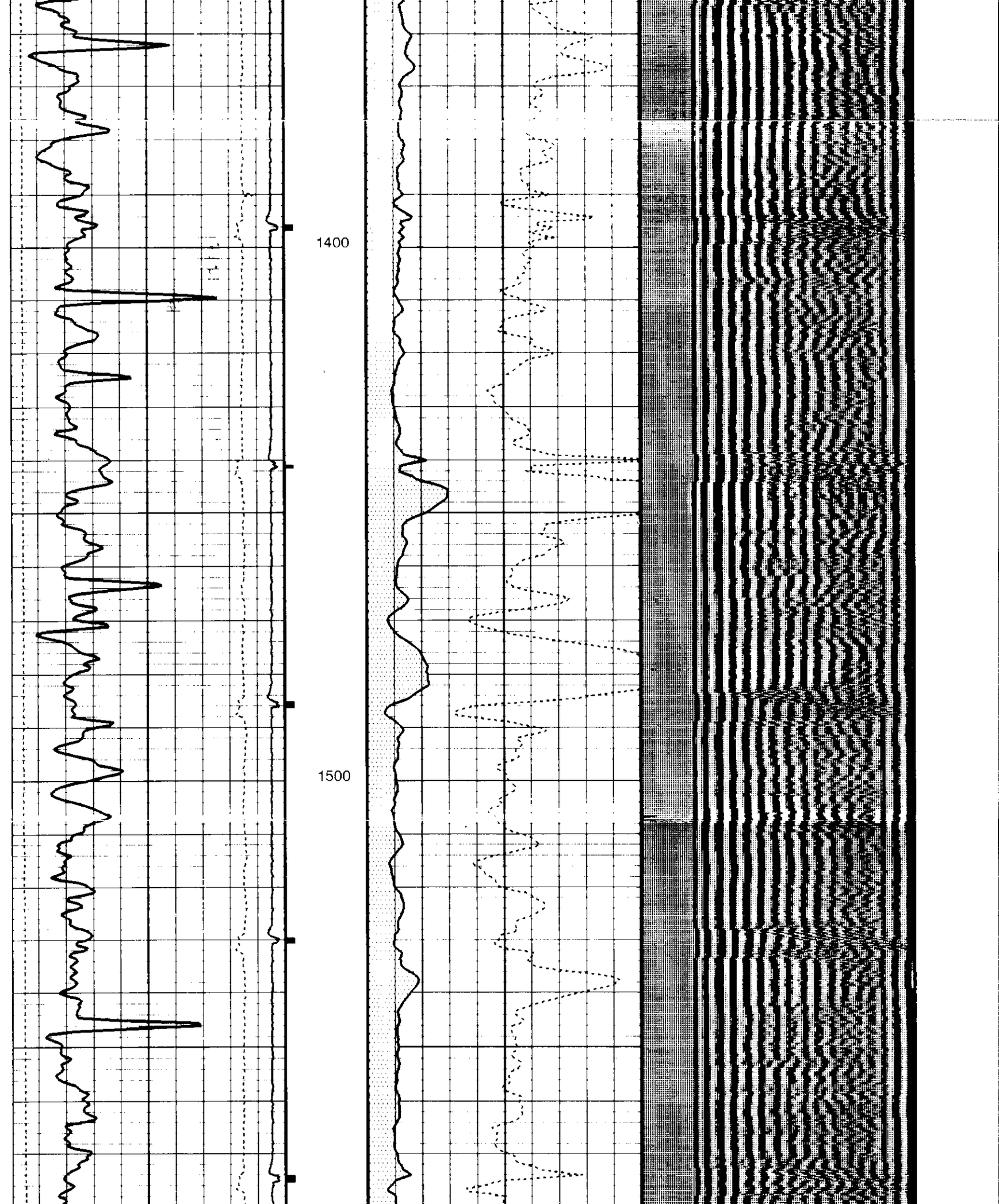

300
400

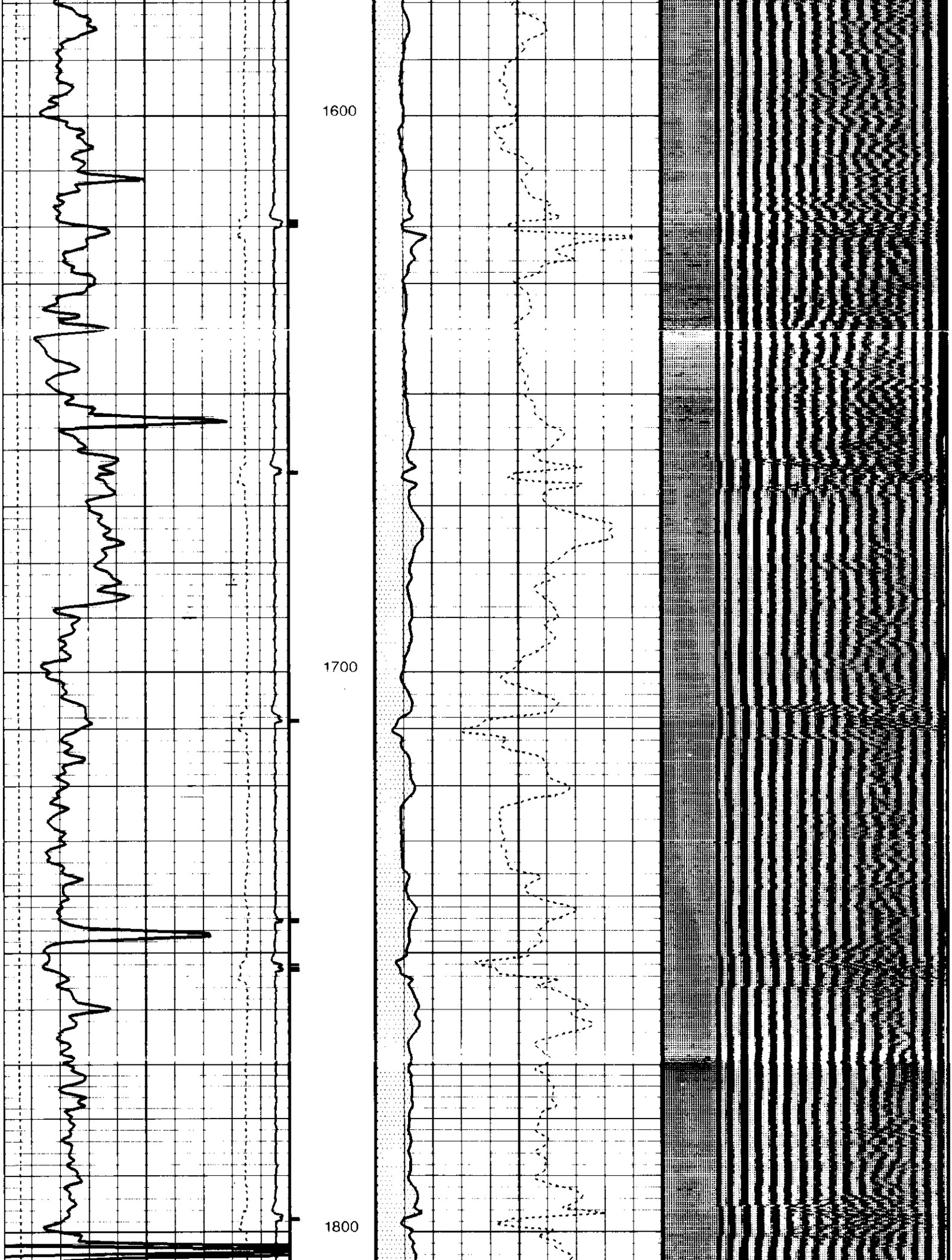

500
600

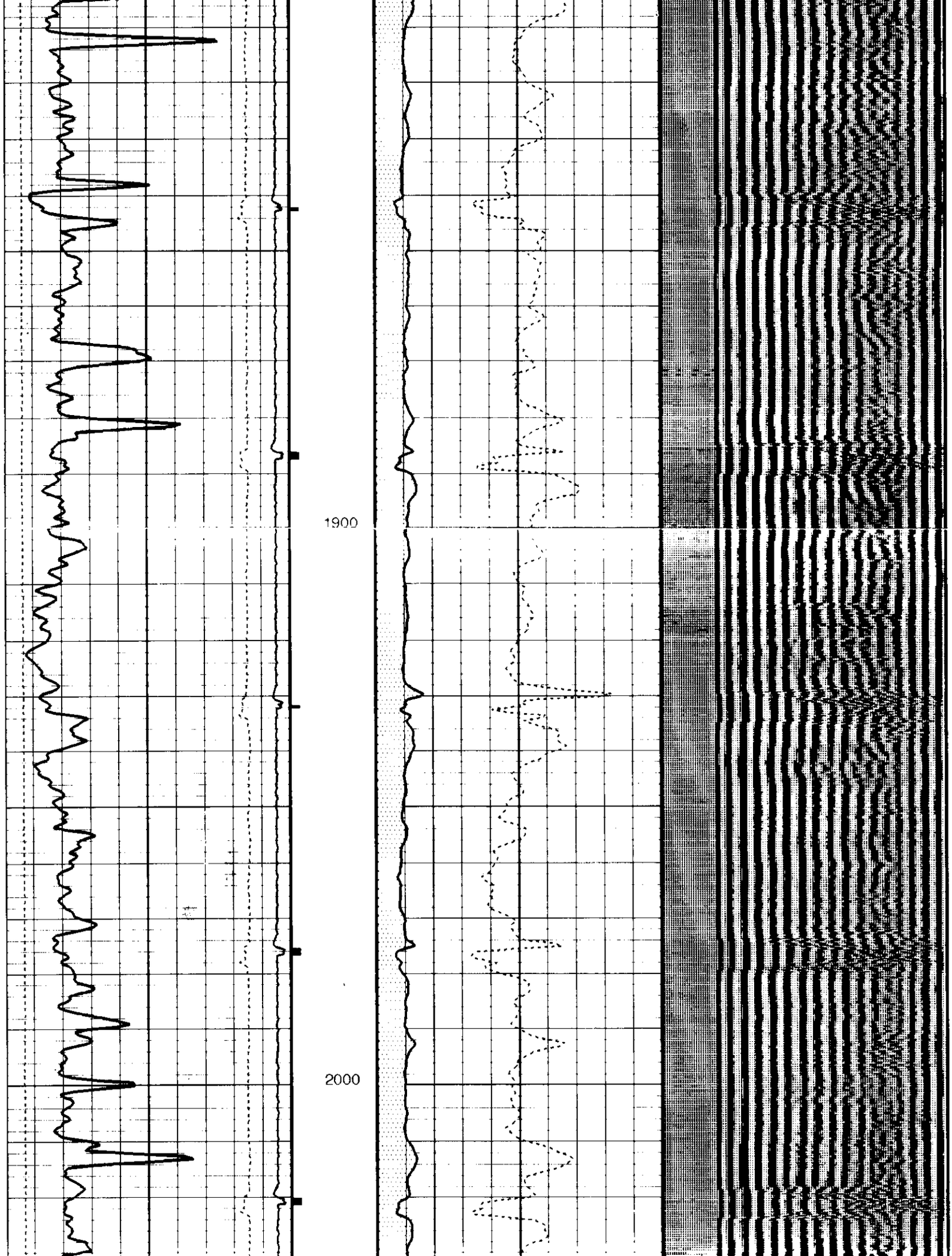

700
800
900


TT2
TENS
GR
CCL
SA2
GOBO
SA2
1000
1100


1200
1300


1400
1500


1600
1700
1800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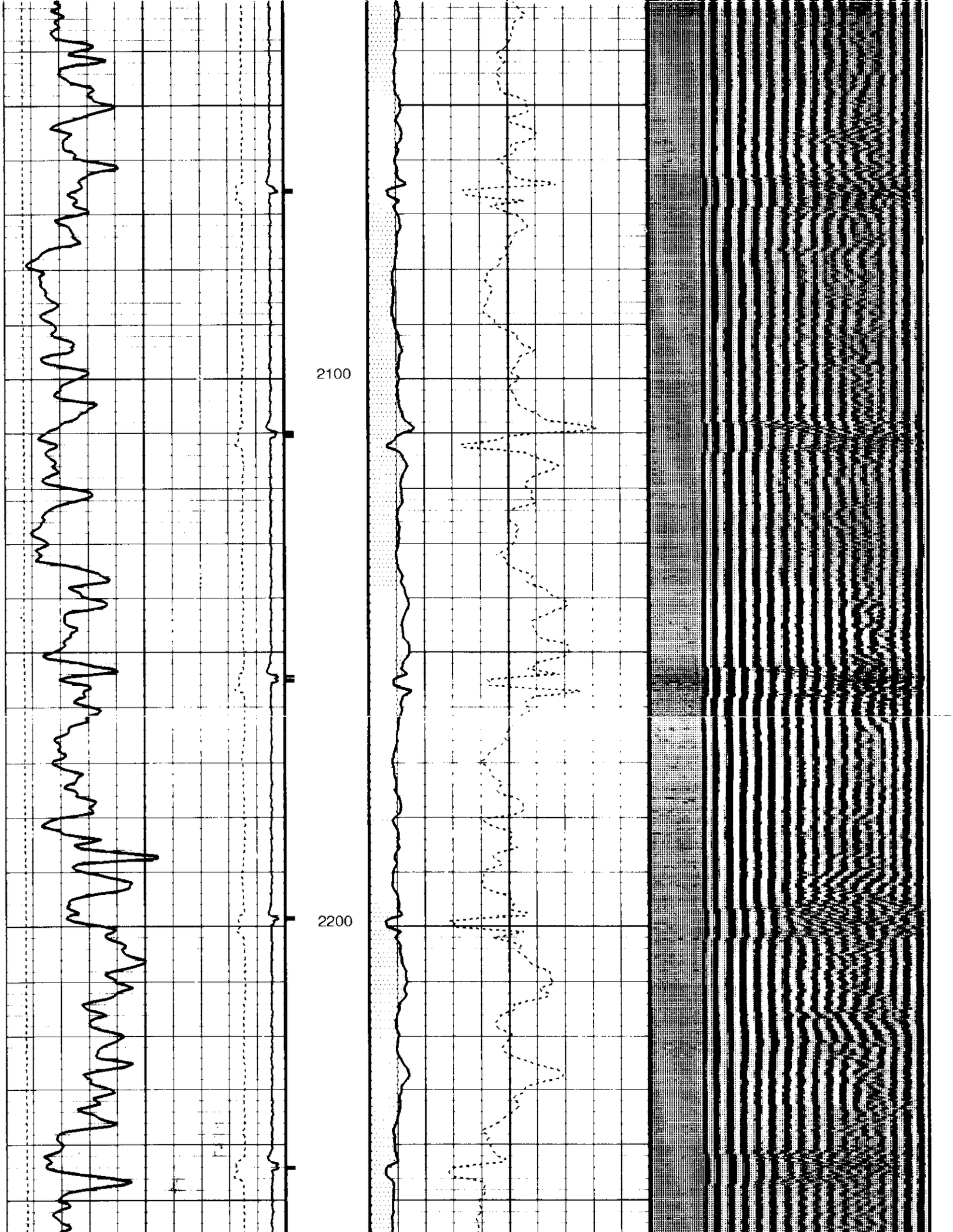
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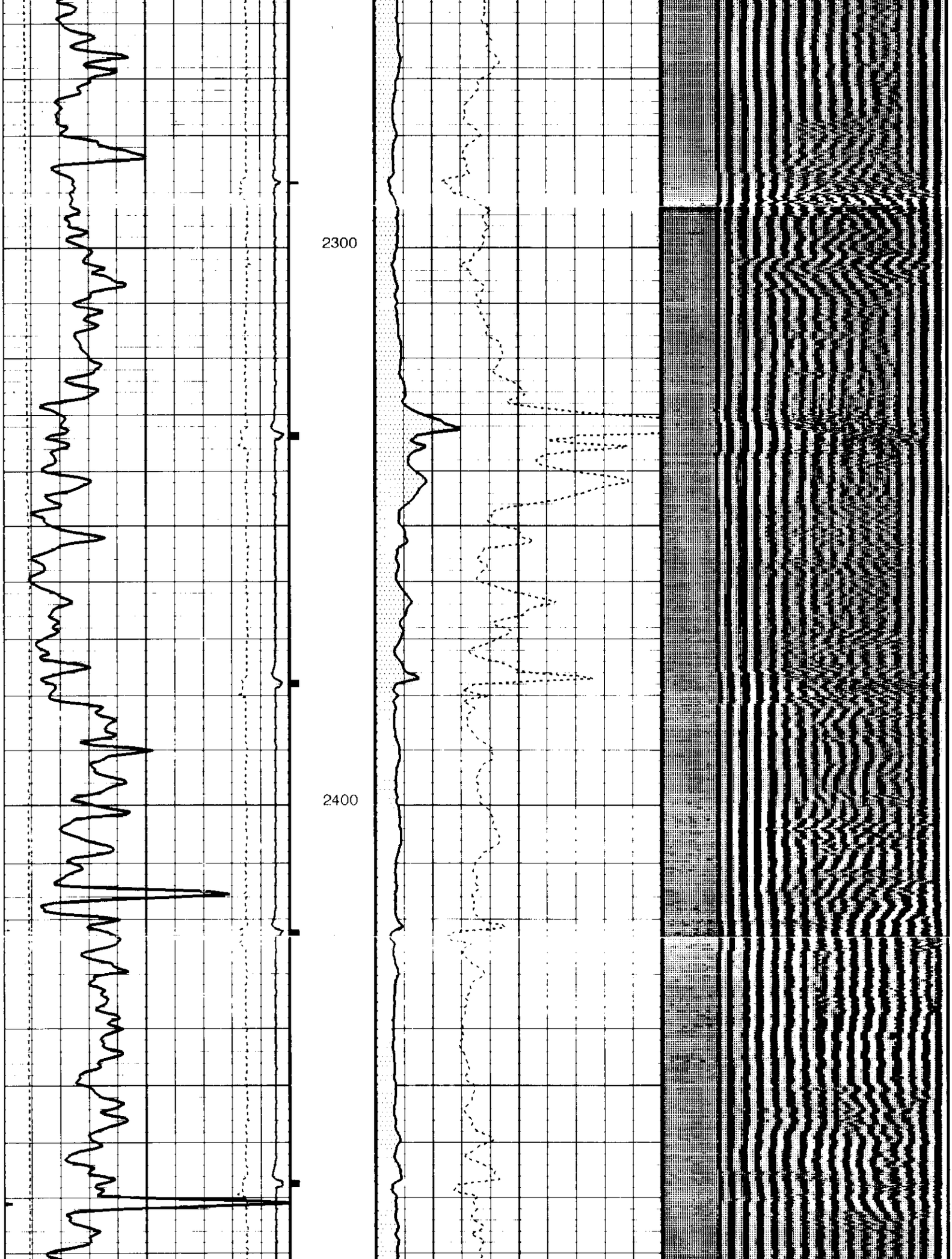
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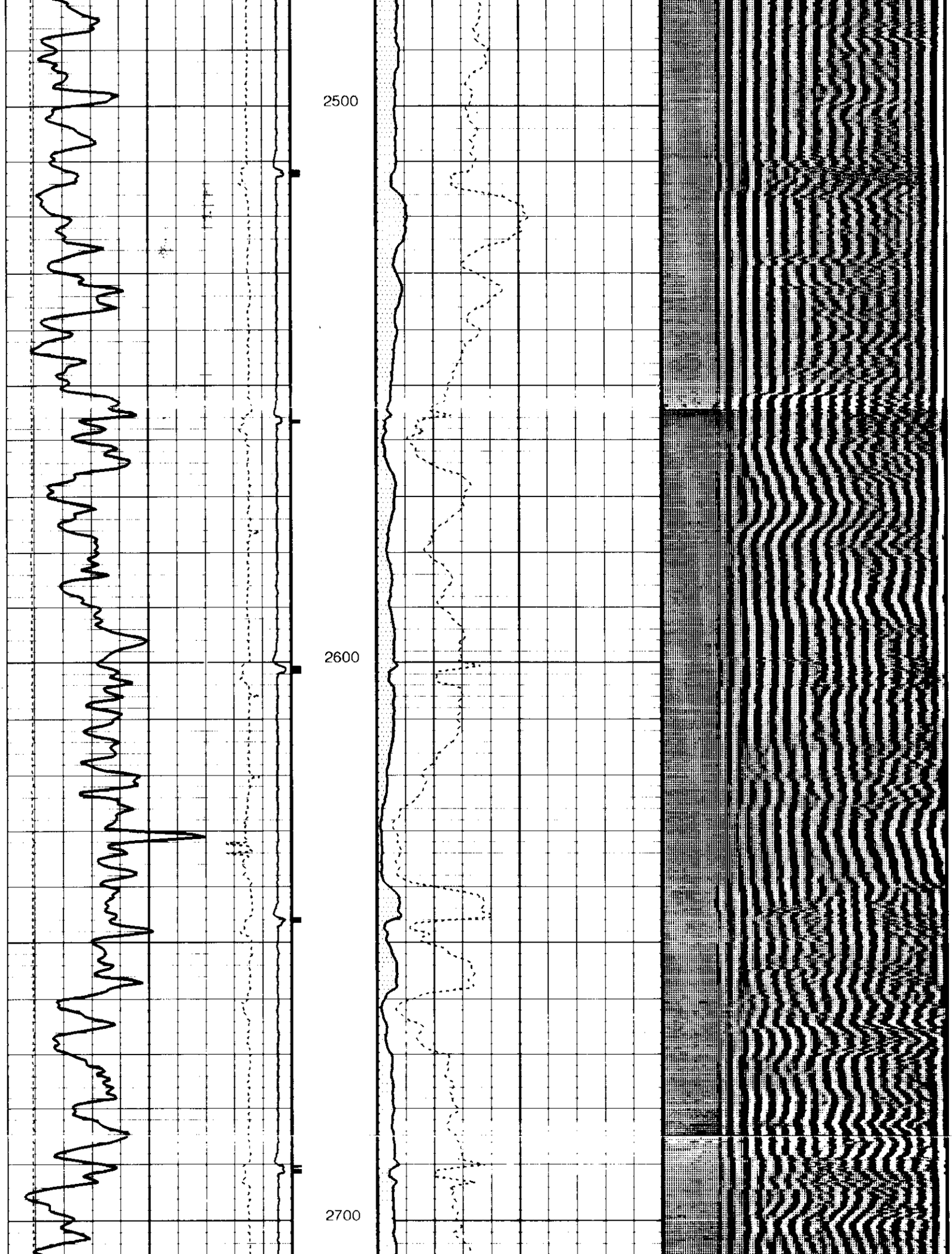
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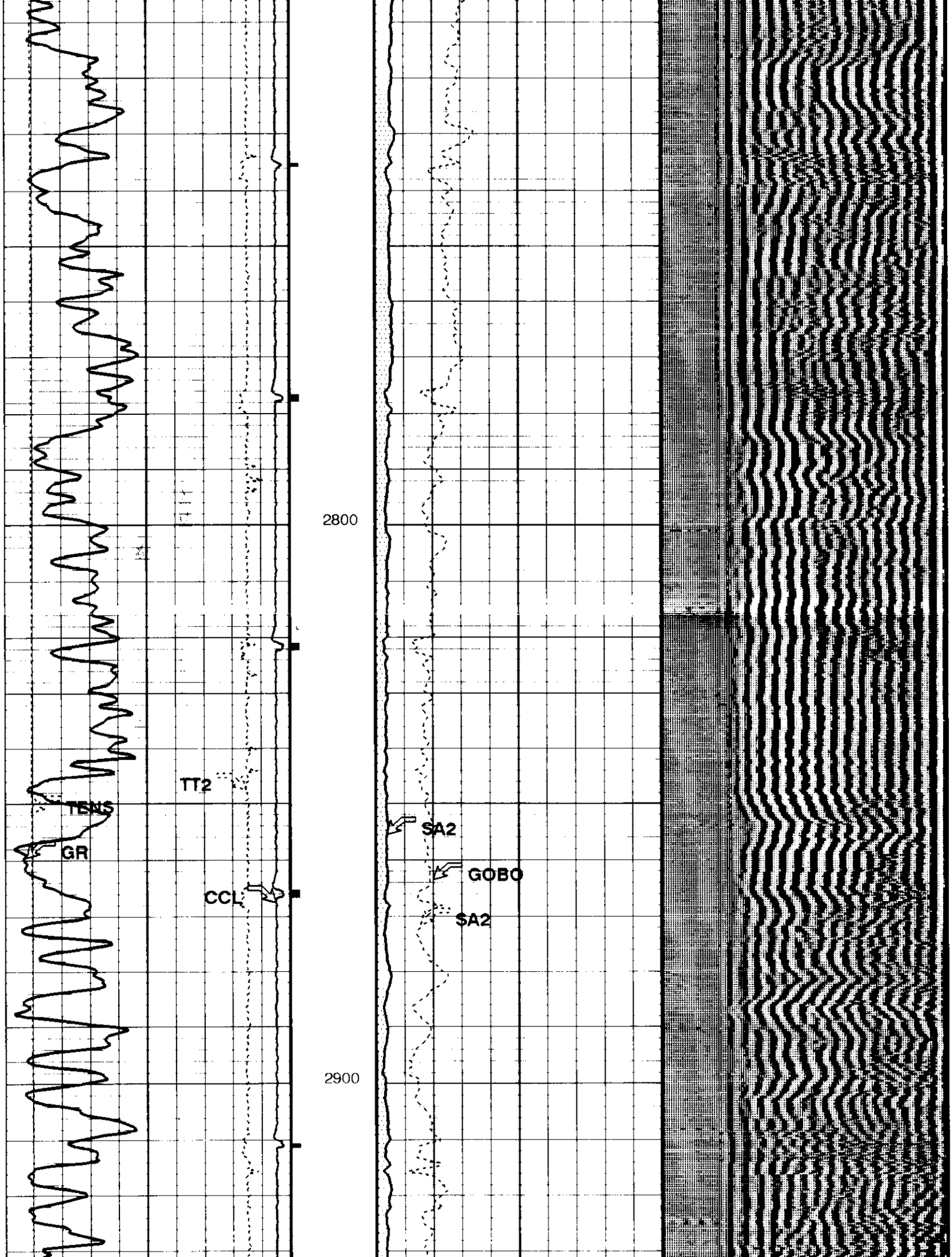
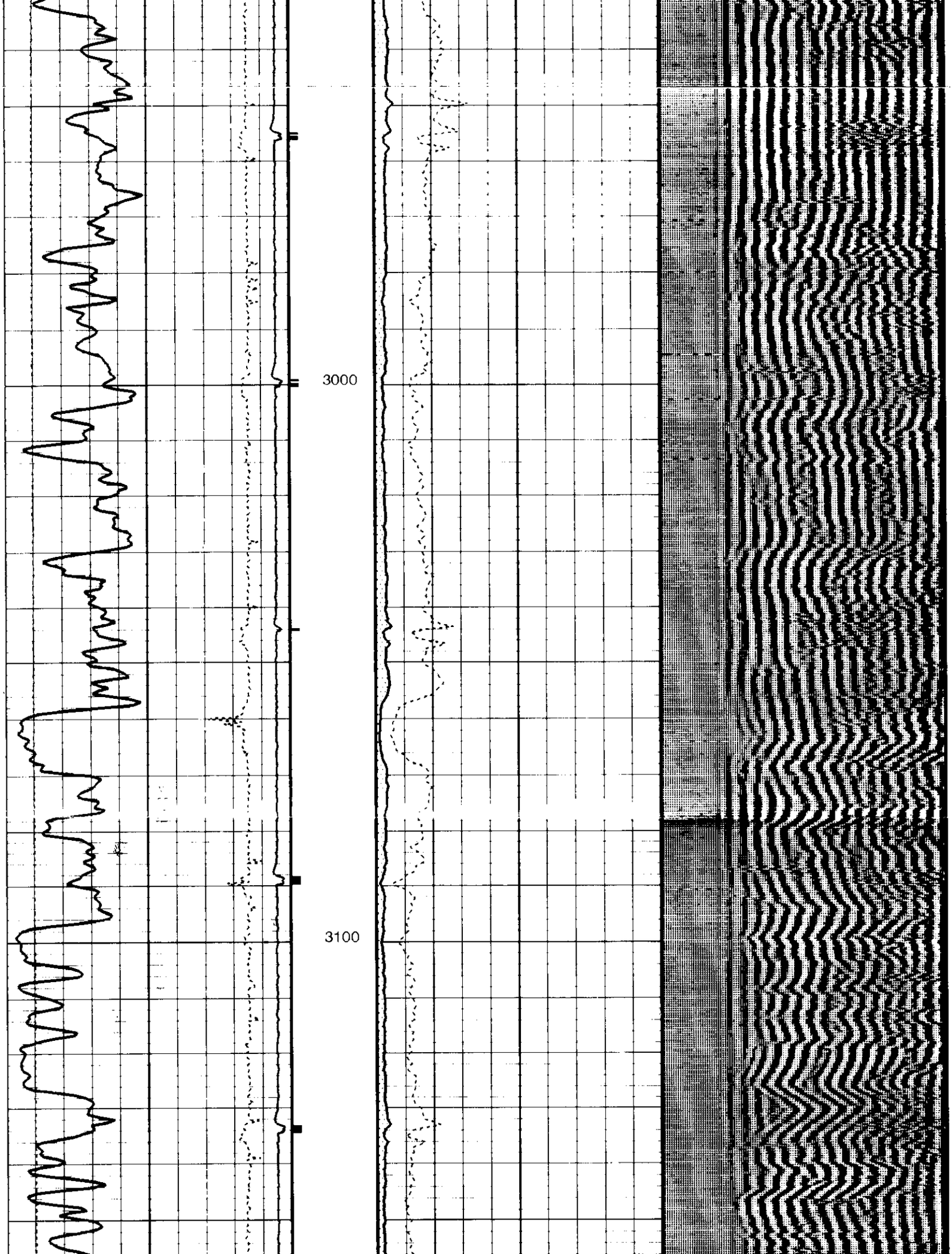
2700


2800
2900
TT2
TENS
GR
CCL
SA2
GOBO
SA2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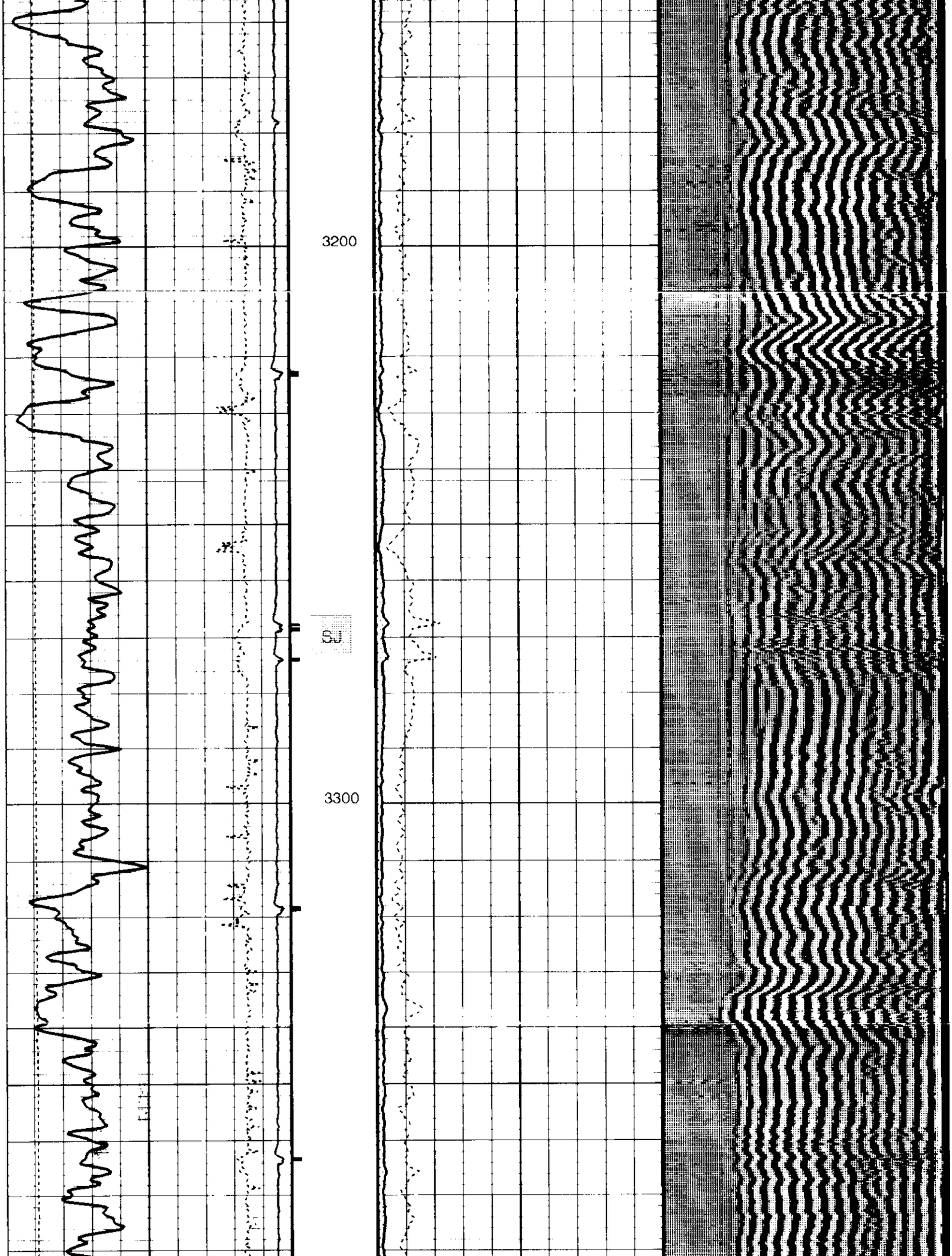
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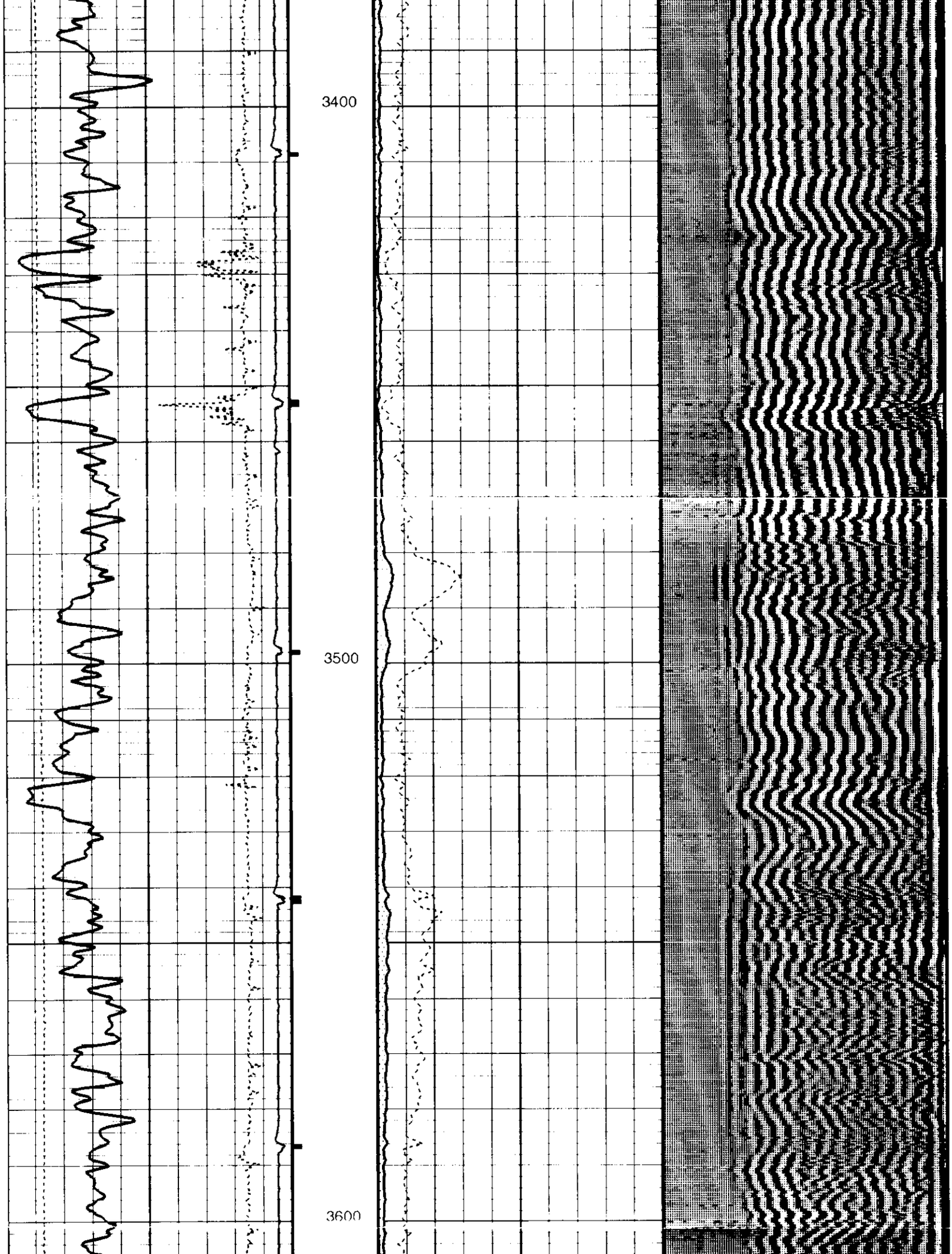
SJ
3300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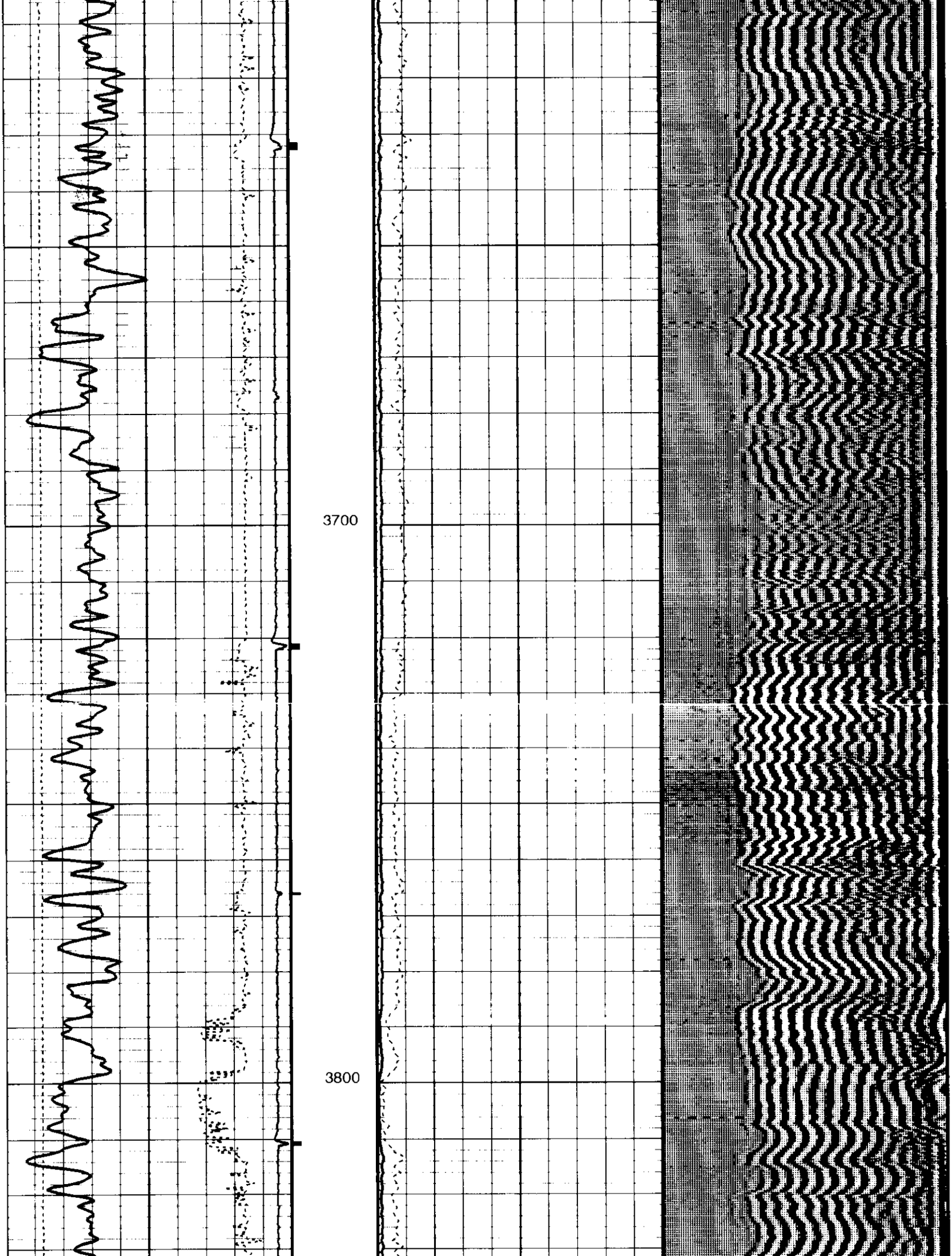
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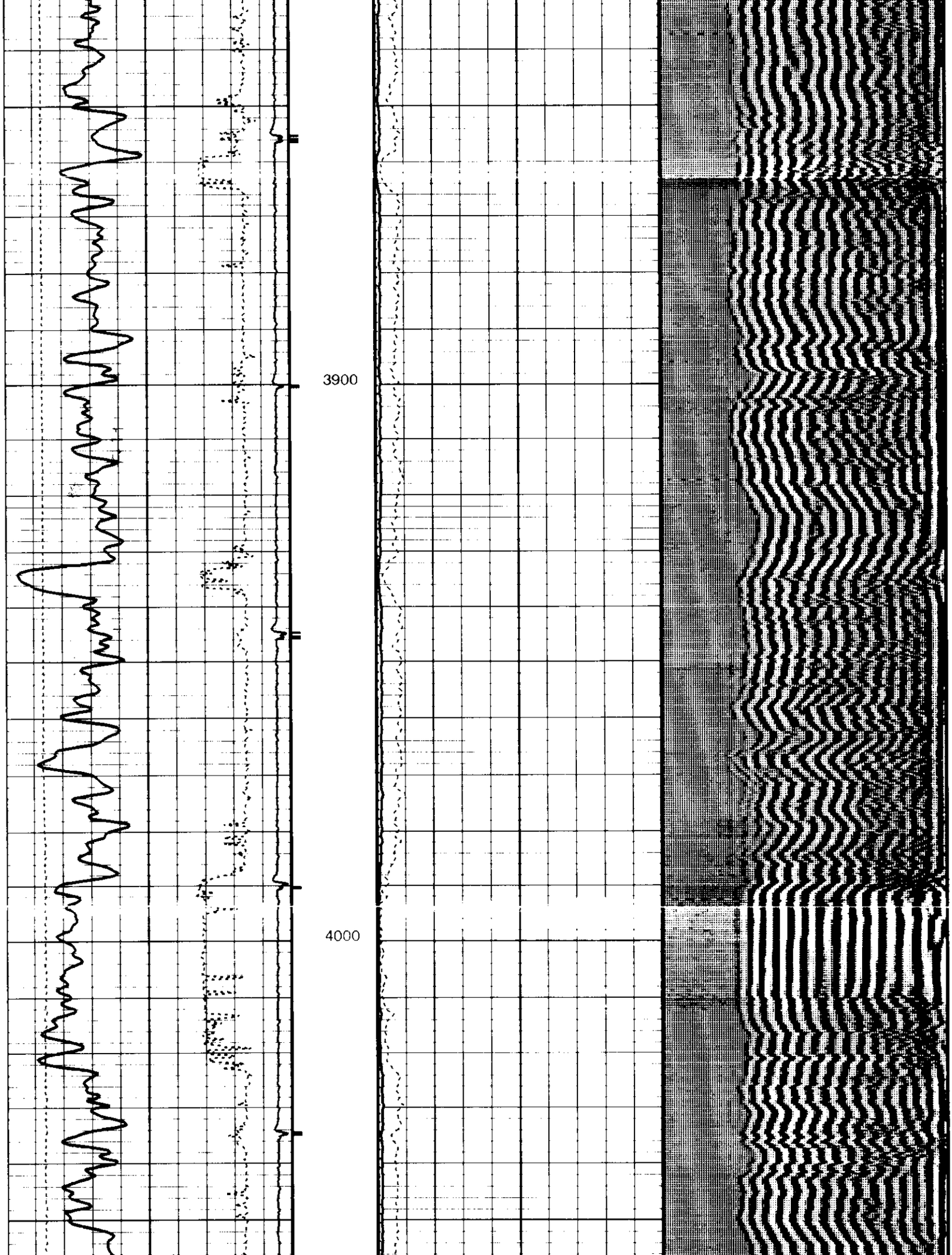
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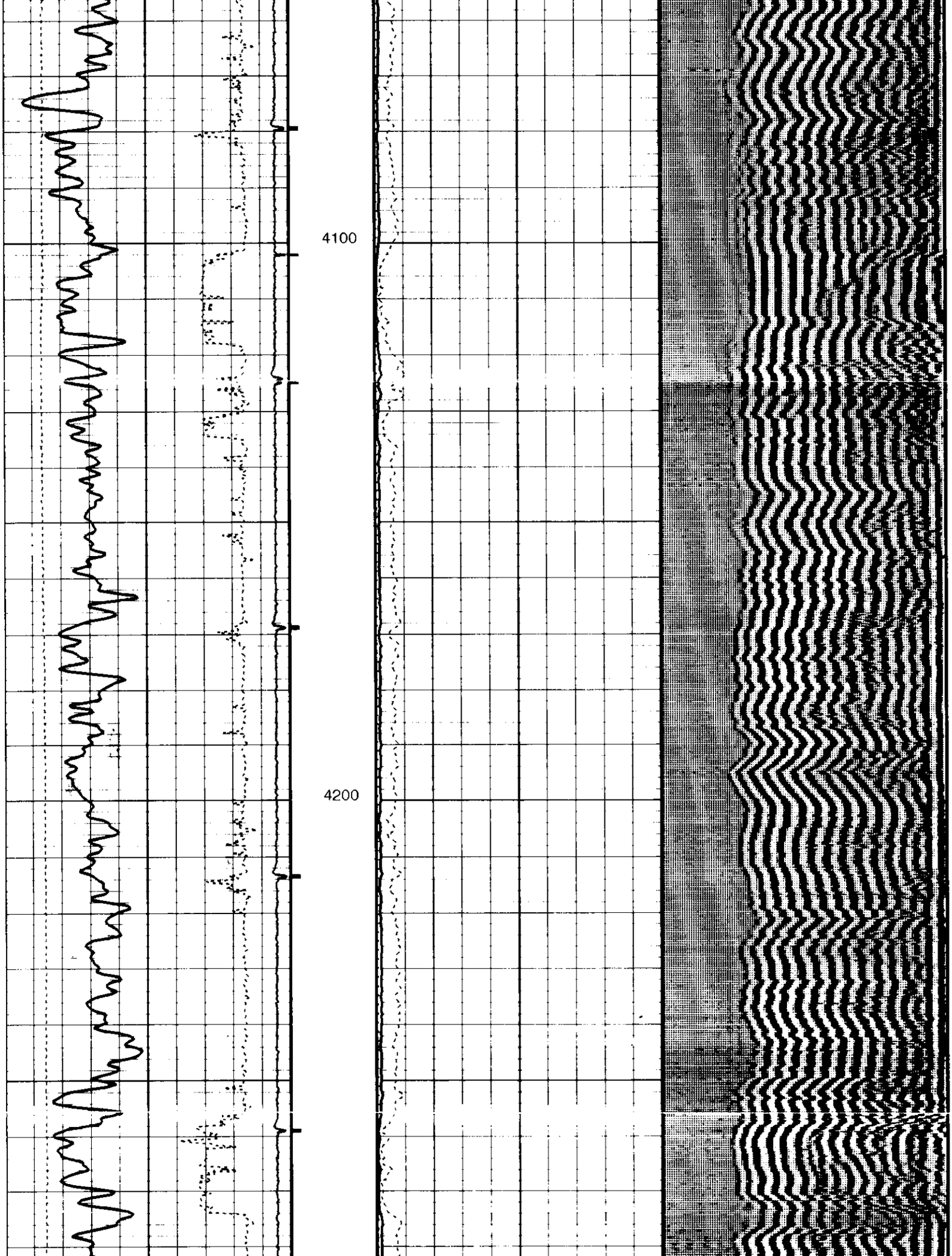
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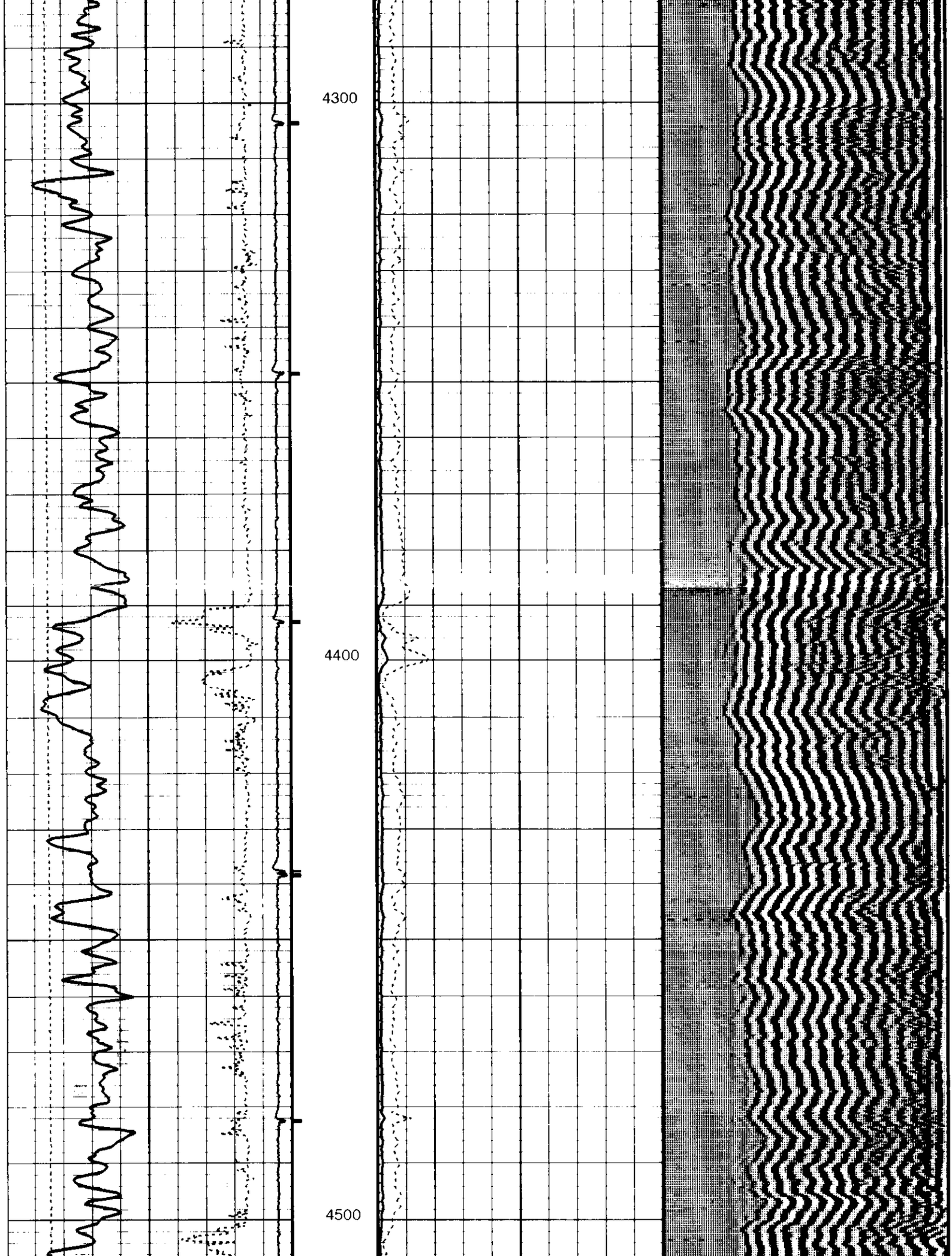
4200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4400
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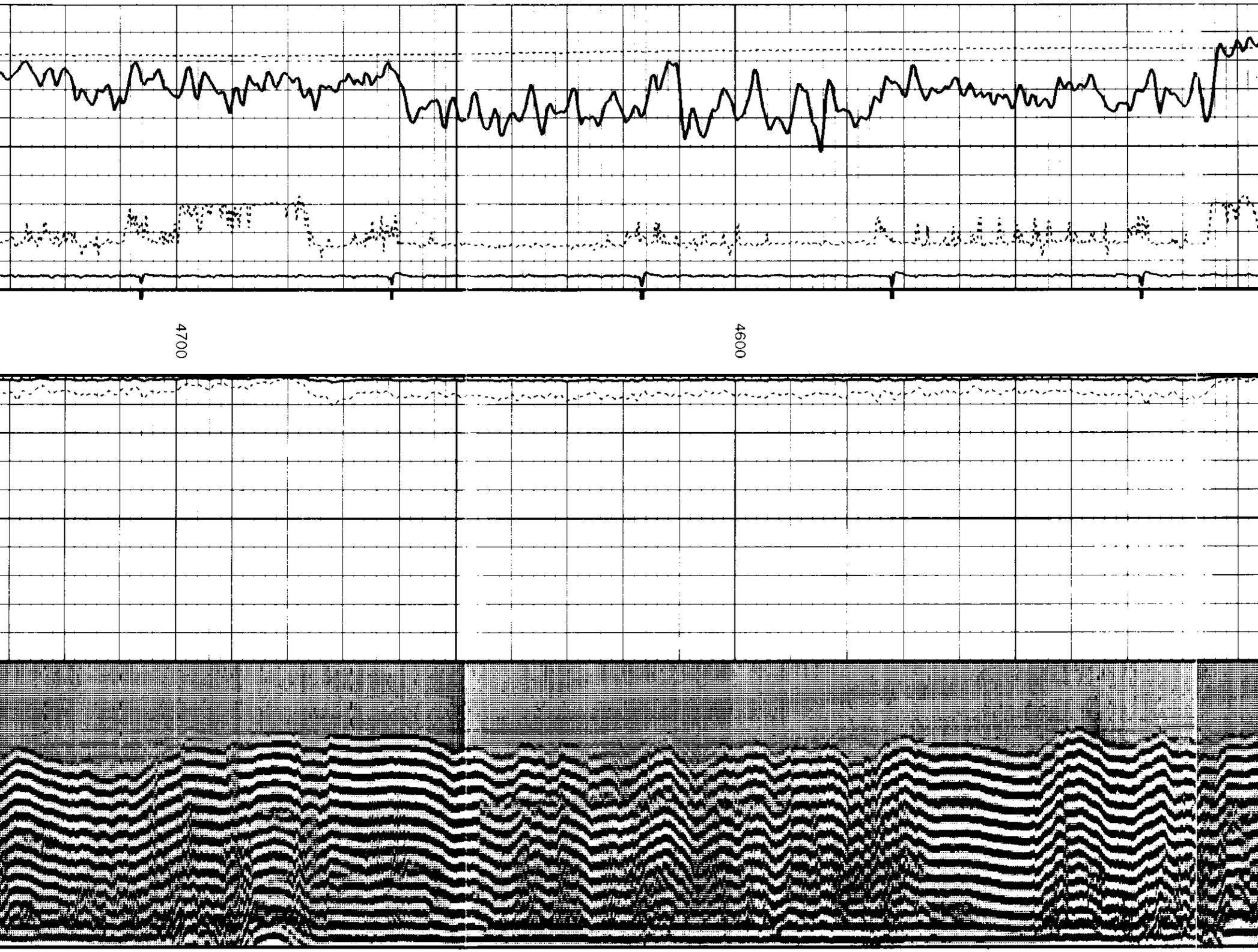
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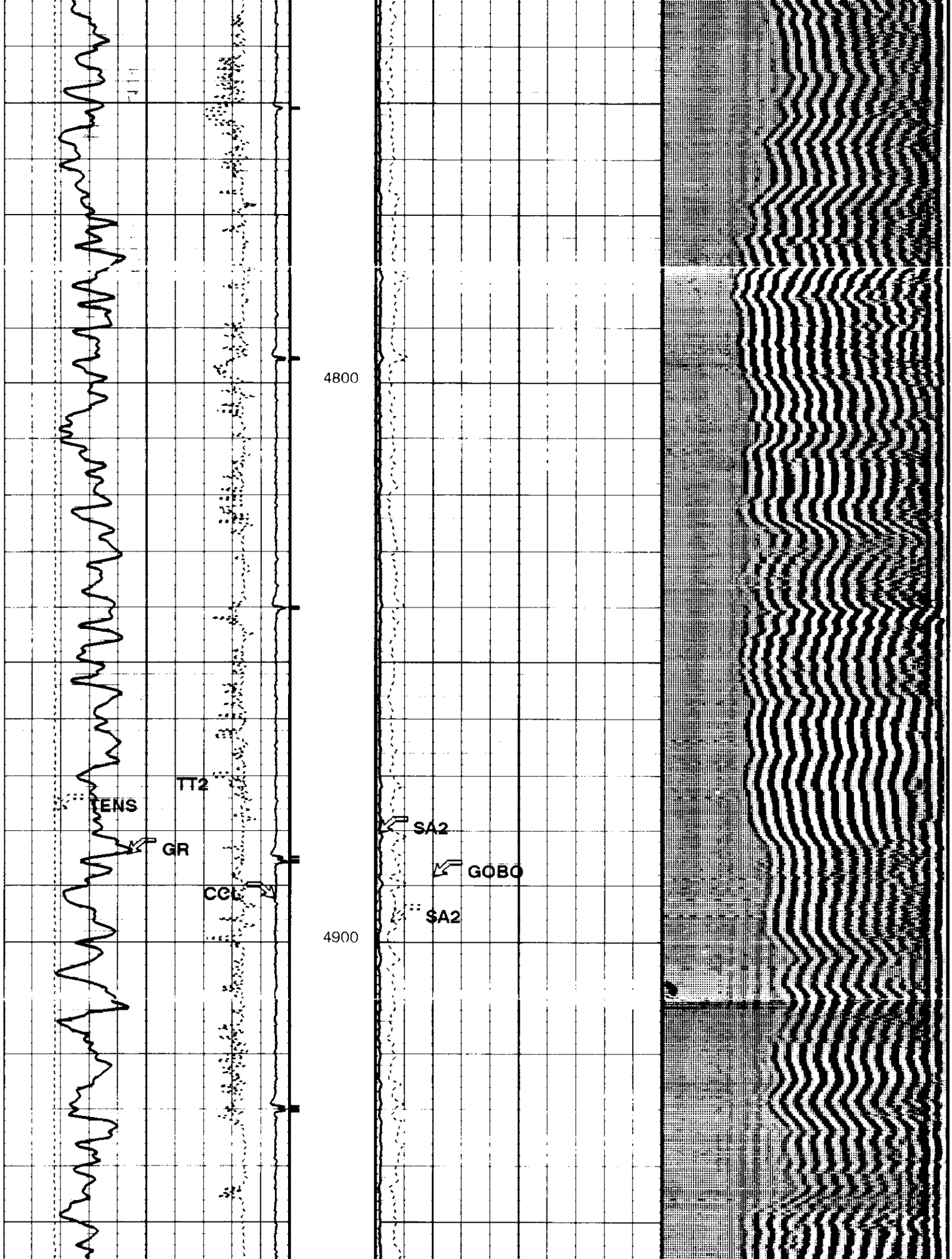
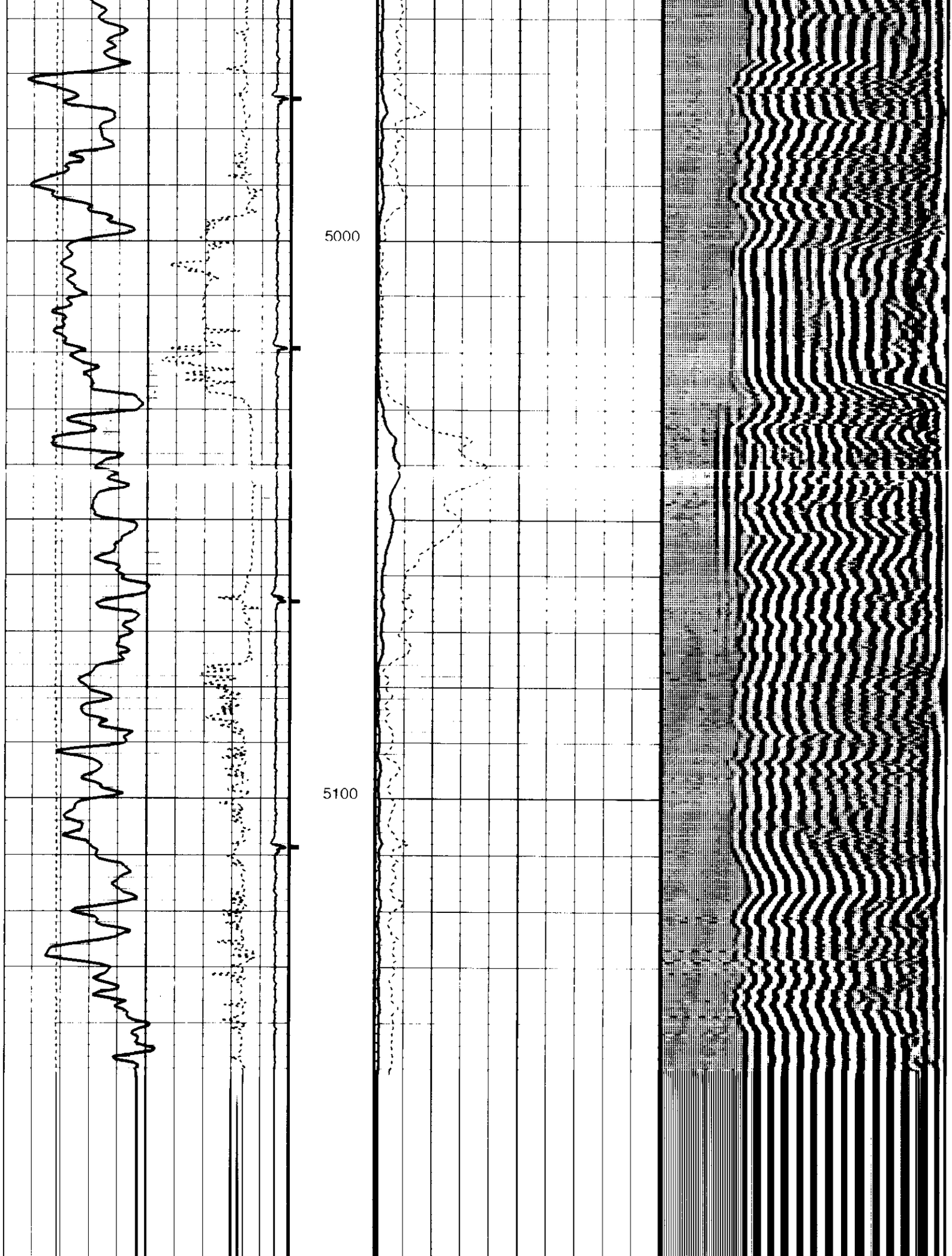
4600


4800
4900
TT2
TENS
GR
CCL
SA2
GOBO
SA2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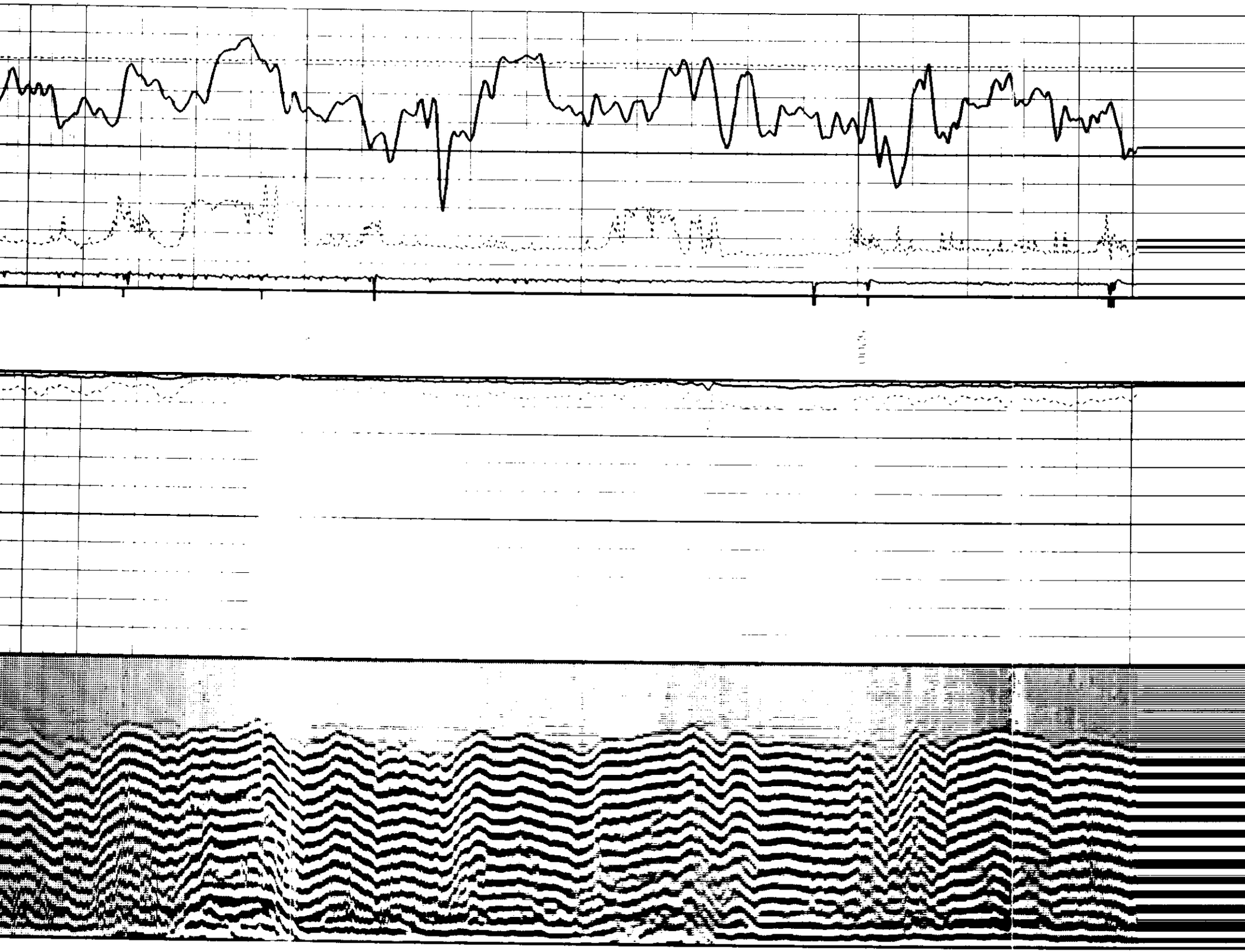
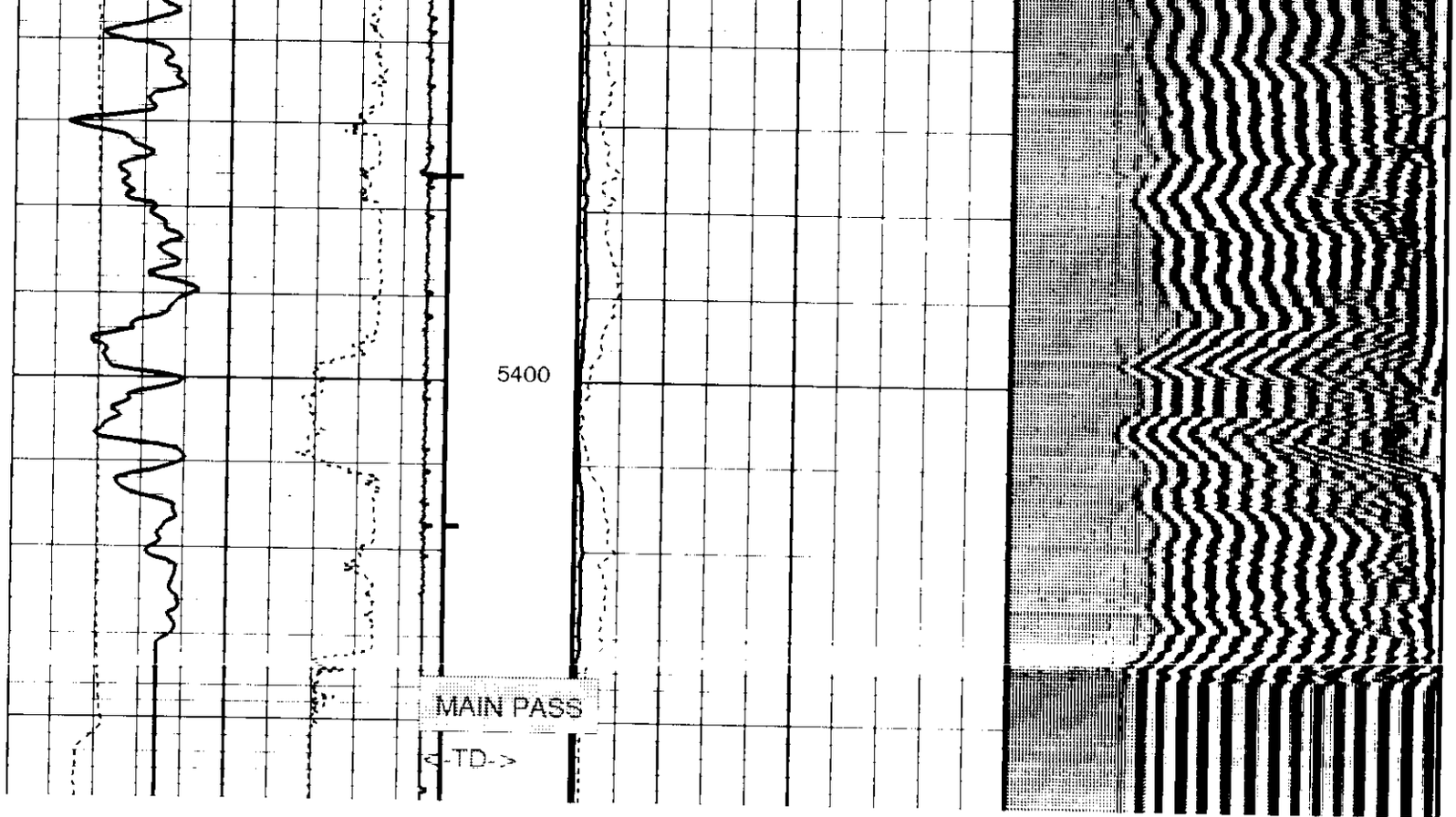
5100





Tension (TENS)
0 (LBF) 4000

CBL Amplitude (SA2)
0 (MV) 20

VDL VariableDensity (VDL)
200 (US) 1200

Transit Time 2 (TT2)
430 (US) 230

Good Bond (GOBO)
0 (MV) 10

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

CBL Amplitude (SA2)
0 (MV) 100

Gamma Ray (GR)
0 (GAPI) 200

GoodBond
From T2 to SA2

PIP SUMMARY

⊢ Casing Collars

Parameters

DLIS Name	Description	Value	
CCLD	CCL reset delay	12	IN
CCLT	CCL detection level	0.3	V
GOBO	Good Bond	2	MV

Format: CBL_VDL_1 Vertical Scale: 5" per 100' Graphics File Created: 20-Mar-1998 10:59

OP System Version: 8C0-609

MCM

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

Output DLIS Files

DEFAULT SLTJ .004 FN:3 FIELD 20-Mar-1998 10:59

Output DLIS Files

DEFAULT SLTJ .003 FN:2 FIELD 20-Mar-1998 10:49 5461.0 FT 5222.0 FT

OP System Version: 8C0-609

MCM

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

SGT-G 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

GoodBond
From T2 to SA2

CBL Amplitude (SA2)
0 (MV) 100

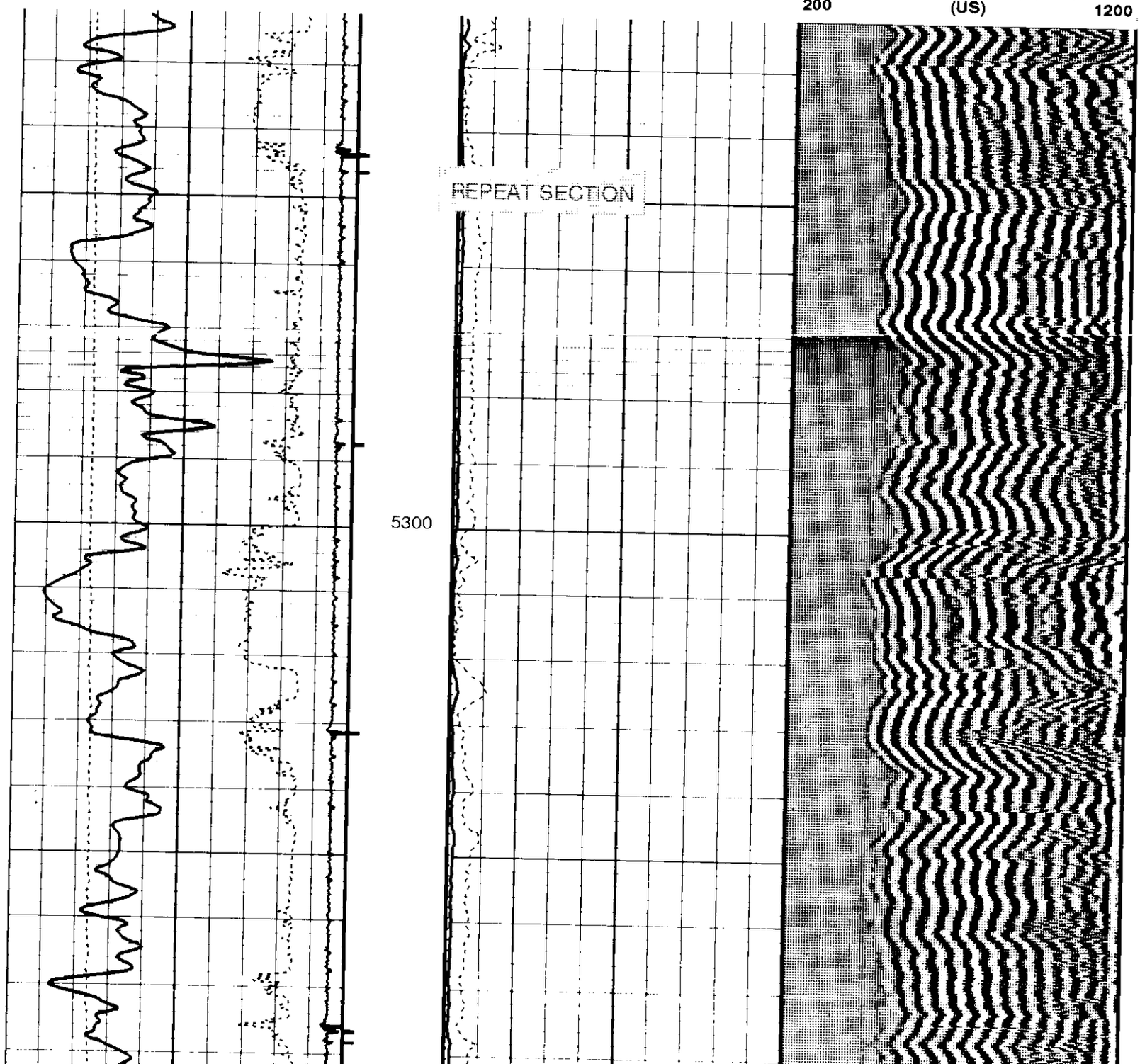
Good Bond (GOBO)
0 (MV) 10

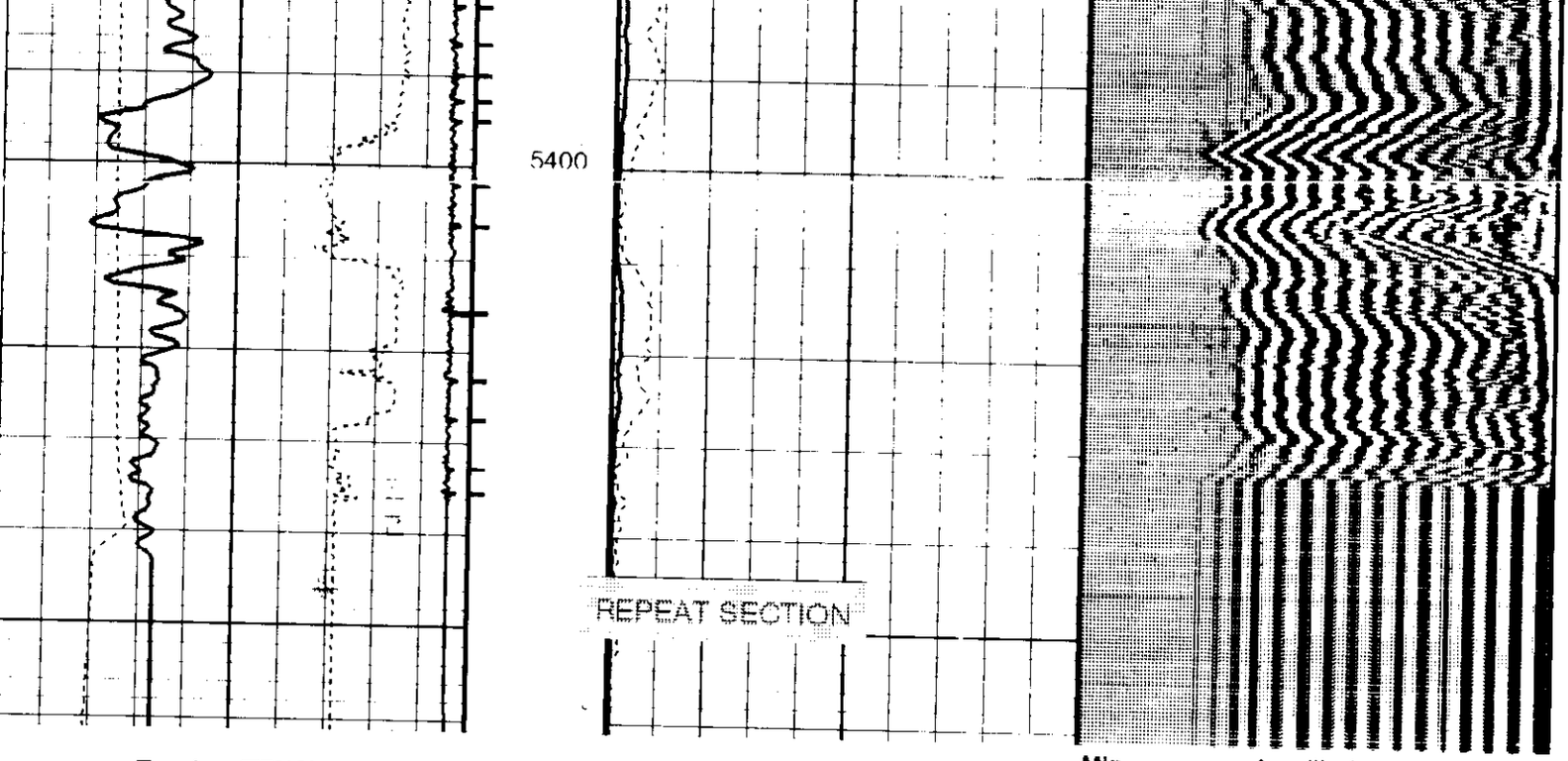
Tension (TENS)
0 (LBF) 4000

CBL Amplitude (SA2)
0 (MV) 20

Min Amplitude Max

VDL VariableDensity (VDL)
200 (US) 1200





Tension (TENS)
0 (LBF) 4000

Transit Time 2 (TT2)
430 (US) 230

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

Gamma Ray (GR)
0 (GAPI) 200

CBL Amplitude (SA2)
0 (MV) 20

Good Bond (GOBO)
0 (MV) 10

CBL Amplitude (SA2)
0 (MV) 100

GoodBond
From T2 to SA2

PIP SUMMARY

Min Amplitude Max

VDL VariableDensity (VDL)
200 (US) 1200

Casing Collars

Parameters

DLIS Name	Description	Value	
CCLD	CCL reset delay	12	IN
CCLT	CCL detection level	0.5	V
GOBO	Good Bond	2	MV

ormat: CBL_VDL_1 Vertical Scale: 5" per 100' Graphics File Created: 20-Mar-1998 10:49

OP System Version: 8C0-609

MCM

LT-J	8C0-609	SGT-G	8C0-609
CL-AJ	8C0-609		

Output DLIS Files

DEFAULT SLTJ .003 FN:2 FIELD 20-Mar-1998 10:49

COMPANY:	PETROGLYPH OPERATING COMPANY
VELL:	UTE TRIBAL #31-04
IELD:	ANTELOPE CREEK
OUNTY:	DUCHESNE
TATE:	UTAH

BOTTOM LOG INTERVAL
DEPTH DRILLER
KELLY BUSHING

Schlumberger

CEMENT BOND LOG WITH GAMMARAY & COLLARS

ATTACHMENT NO. 8

OPEN HOLE LOG FOR THE UIC WELL

DOGM

HALLIBURTON

EXCELL 2000

SPECTRAL DENSITY DUAL SPACED NEUTRON LOG

COMPANY PETROGLYPH OPERATING COMPANY
WELL UTE TRIBAL #31-04
FIELD ANTELOPE CREEK
COUNTY DUCHESNE STATE UT

COMPANY PETROGLYPH OPERATING COMPANY

WELL UTE TRIBAL #31-04

FIELD ANTELOPE CREEK

COUNTY DUCHESNE STATE UT

API No. 43-013-32034

Location 770' FNL 705' FWL

NWNW POW

Sect 31 Twp 5S Rge 3W

Other Services

DIL-GR

Permanent Datum G.L. Elev 6254

Log measured from K.B. , 10 ft. above perm. datum

Drilling measured from K.B.

Elev.: K.B. 6264

D.F.

G.L. 6254

Date	3-13-98			
Run No.	ONE			
Depth – Driller	5554			
Depth – Logger	5561			
Bottom – Logged Interval	5559			
Top – Logged Interval	CSG			
Casing – Driller	8.675 @ 355	@	@	@
Casing – Logger	354			
Bit Size	7.785			
Type Fluid in Hole	KCL WATER			
Dens. | Visc.	8.3 | 27	|	|	|
Ph | Fluid Loss	10 | N/A	|	|	|
Source of Sample	FLOWLINE			
Rm @ Meas. Temp.	1.7 @ 56	@	@	@
Rmf @ Meas. Temp.	3.0 @ 62	@	@	@
Rmc @ Meas. Temp.	3.4 @ 62	@	@	@
Source Rmf | Rmc	MEAS | MEAS	|	|	|
Rm @ BHT	0.76 @ 125	@	@	@
Time Since Circ.	7.5 HOURS			
Time on Bottom	20:30			
Max Rec Temp.	125 @ TD	@	@	@
Equip. Location	51943 | G.J.	|	|	|
Recorded By	C. REDMOND	S. GOODNOUGH		
Witnessed By	C. WHITE			

Fold Here

Service Ticket No.: 271225 API Serial No.: 43-013-32034 PGM Version: XL v3.40

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.	Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth – Driller				
Type Fluid in Hole				
Dens. | Visc.	—			
Ph | Fluid Loss	—			

RESISTIVITY SCALE CHANGES

RESISTIVITY EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
Source of Sample					
Rm @ Meas. Temp.	⊖				
Rmf @ Meas. Temp.	⊖	ONE	DILT #332127	N/A	1.5" SO	N/A
Rmc @ Meas. Temp.	⊖	ONE	SGRD #108809	N/A	1.5" SO	N/A
Source Rmf | Rmc	—				
Rm @ BHT	⊖	0.76 @ 125			
Rmf @ BHT	⊖	1.49 @ 125			
Rmc @ BHT	⊖	1.69 @ 125			

EQUIPMENT DATA

	GAMMA	ACOUSTIC	DENSITY	NEUTRON
Run No.	ONE		ONE	ONE
Serial No.	108631		1659P03'	108736

Model No.	NGRT-A	Model No.		Model No.	SDL_BC	Model No.	DSNT_A
Diameter	3.625	No. of Cent.		Diameter	4.5"	Diameter	3.625
Detector Model No.	102A	Spacing		Log Type	GAM-GAM	Log Type	THERMAL
Type	SCINT			Source Type	CS-137	Source Type	AM241 BE
Length	4"	LSA [Y / N]		Serial No.	2189	Serial No.	DSN_80
Distance to Source	12'	FWDA [Y / N]		Strength	1.5 Ci	Strength	19 Ci

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale			Scale			Scale		
No.	From	To	Ft / Min	L	R	L	R	Matrix	L	R	Matrix	L	R	Matrix
ONE	TD	CSG	REC	0	200				30	-10	2.68	30	-10	SAND
											GM/CC			

Remarks:

DIL-SDL-DSN-GR RAN IN COMBINATION
AHV CALCULATED USING 5.5" CASING.
CHLORIDES: 1200 PPM

RIG: UNION RIG #16
CREW: M.ROBLES, J. NOLAN
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, GRAND JUNCTION 970 523 1661

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

HALLIBURTON

Current EXCELL-2000 Parameter Values
Depth: 92.917
Date: 13-Mar-1998 19:59

Mnemonic	Tool	Parameter Description	Value	Units
PERF	DITSHD	PERFORATED INTERVAL	NO	
TD	DITSHD	TOTAL DEPTH	5554.	FT
GR_OK	GAMMA	DO GAMMA CALCULATIONS?	YES	
CASED	SHARED	CASED HOLE?	NO	
CASEOD	SHARED	CASING DIAMETER (OD)	5.5	Inches
MUDWT	SHARED	BOREHOLE FLUID WEIGHT	8.3	Pounds/Gal.
GRSO	GAMMA	GAMMA RAY STANDOFF	0.	Inches
BS	SHARED	BIT SIZE	7.875	Inches
DSN_OK	DSN_II	DO DSN II CALCULATIONS?	YES	
DRILL	DSN_II	TPL - NEUTRON IN SLEEVE?	NO	
BADHOL	DSN_II	DSN BAD HOLE CORRECTION	NO	
NLITH	DSN_II	NEUTRON LITHOLOGY	SAND	
DSNSO	DSN_II	DSN STANDOFF	0.	Inches
DSNTMP	DSN_II	DSN II TEMPERATURE CORRECTION	NONE	
DSNPRS	DSN_II	DSN II PRESSURE CORRECTION	NONE	
SDL_OK	SDL_BC	DO SDL CALCULATIONS?	YES	
BARITE	SDL_BC	ANY BARITE IN MUD?	NO	
AIR	SDL_BC	AIR FILLED BOREHOLE?	NO	
RHOFLU	SHARED	FLUID DENSITY	1.	G/CC
RHOMAT	SDL_BC	MATRIX DENSITY	2.68	Grams/CC
CAL_OK	CAL_BC	DO CALIPER CALCULATIONS?	YES	
AHVOK	CAL_BC	DO ANNULAR VOLUME CALCULATION?	YES	
DI_OK	DIND	DO DUAL INDUCTION CALCULATION?	YES	
SG_OK	SGRD	DO SHORT GUARD CALCULATIONS?	YES	
XPHLOC	XP_RWA	CROSSPLOT SELECTION FOR XPHI	XPLT	
ARCHA	XP_RWA	ARCHIE A	0.62	
ARCHM	XP_RWA	ARCHIE M	2.15	
FSEL	XP_RWA	POROSITY SELECTION FOR F	DEN	

MAIN LOG 5"=100'

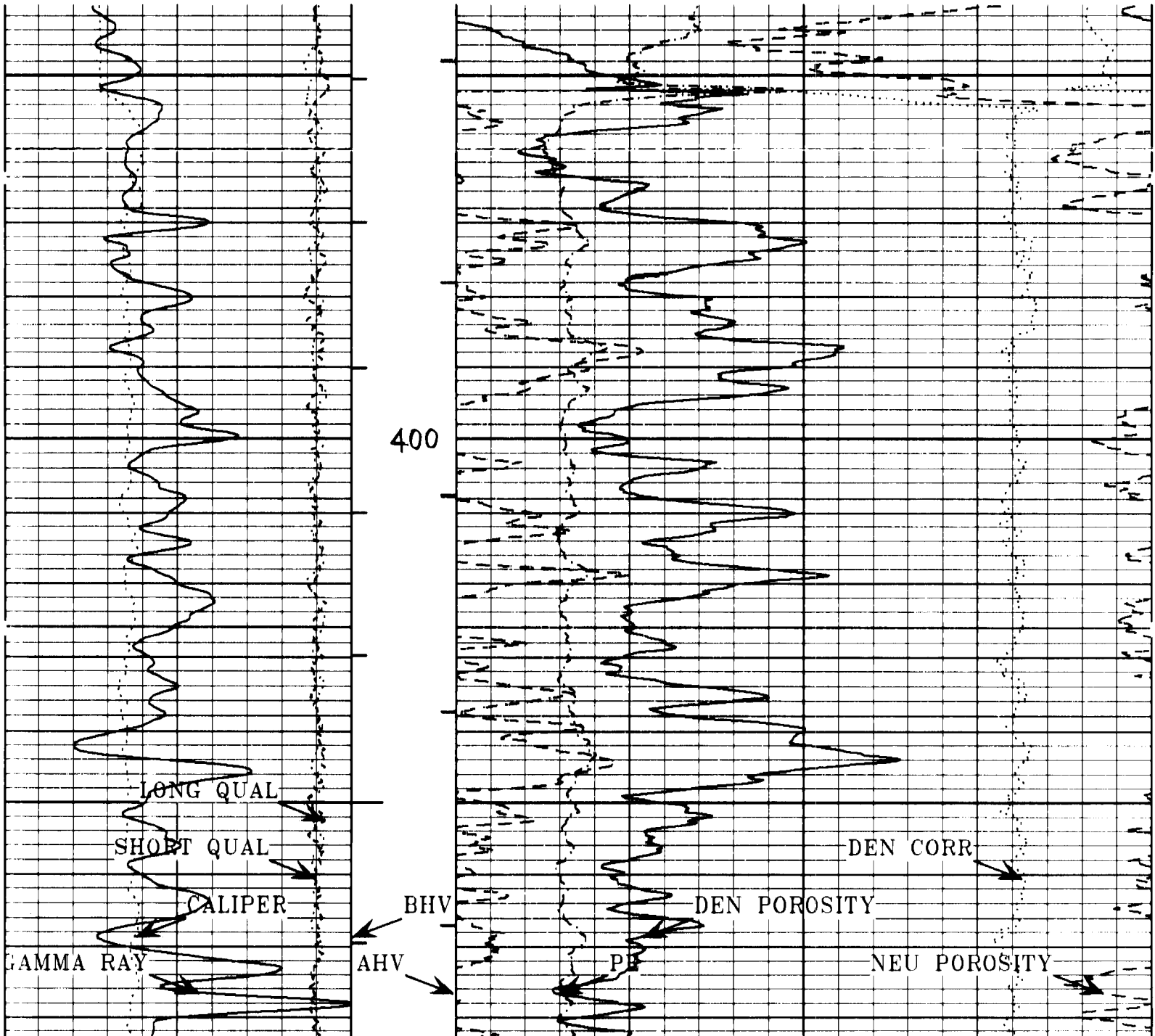
HALLIBURTON
EXCELL

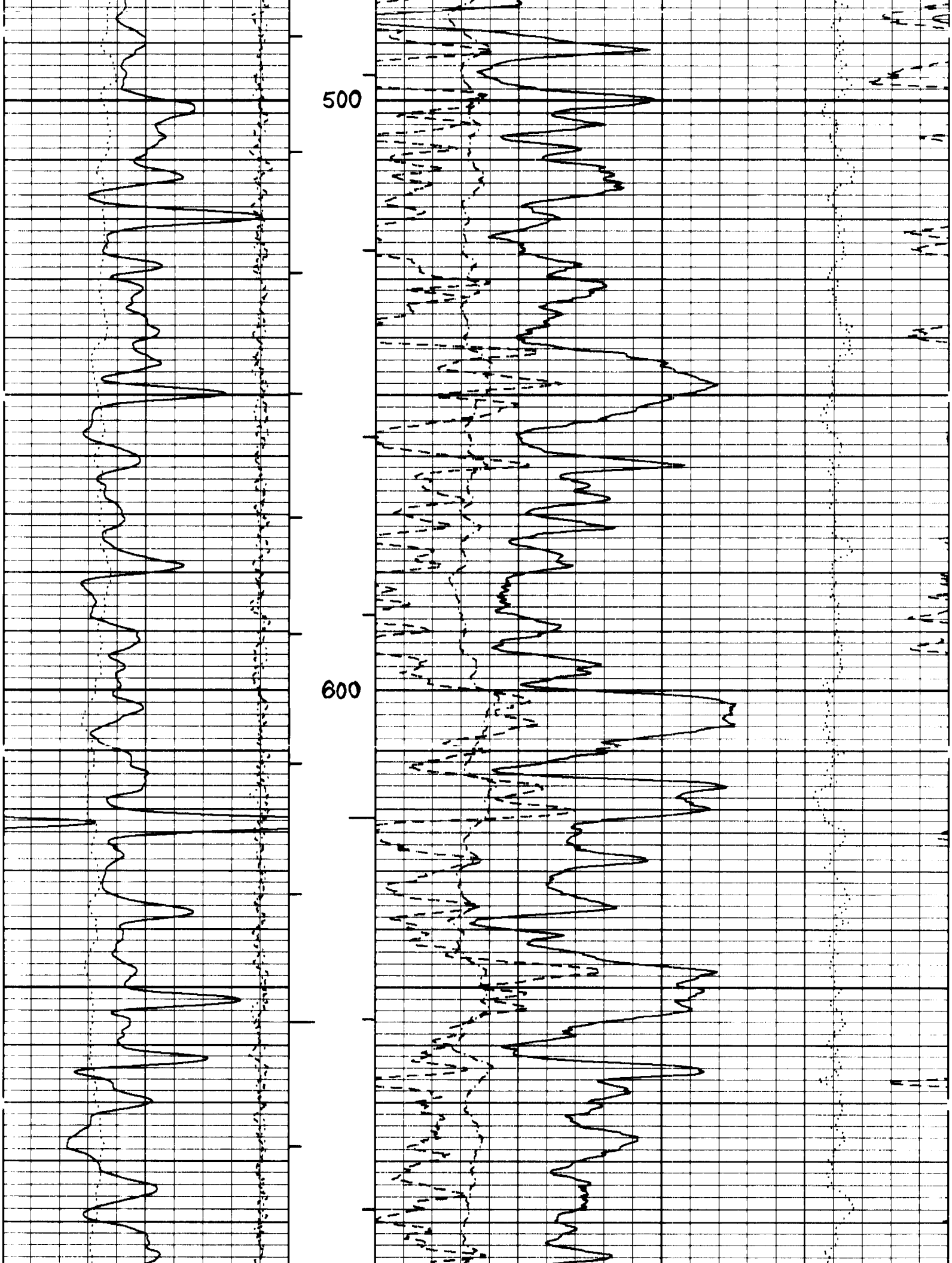
Version No: 3.40 | hc:3.0
Data File: ute_tribal31_04.2.cls
Format File: /field_data/data2/ute_tribal31_04/plot_1.2.spc

Top Depth: 340.00
Bottom Depth: 5565.25

Plot Time: 03-14-98 00:11:59
Log Time: 03-13-98 20:39:50

GAMMA RAY	AHV	NEU POROSITY
0 API COUNTS 200		30. % -10
CALIPER	BHV	DEN POROSITY
6 INCHES 16		30. % -10
SHORT QUAL		PE / DEN CORR
-4.5 .5	1:240 Ft.	0 10 / -.25 GM/CC .25
LONG QUAL		
4.5 -.5		

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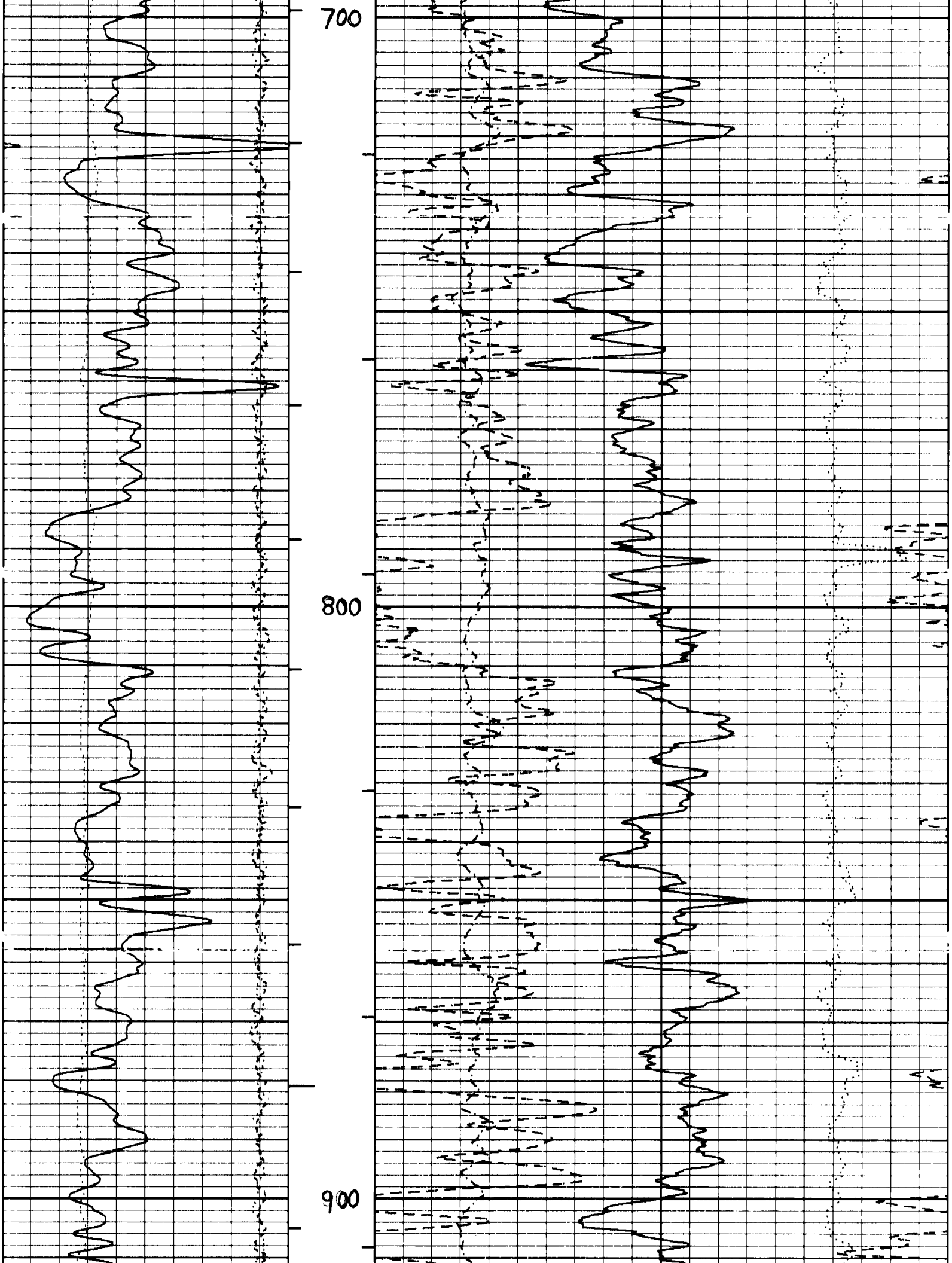
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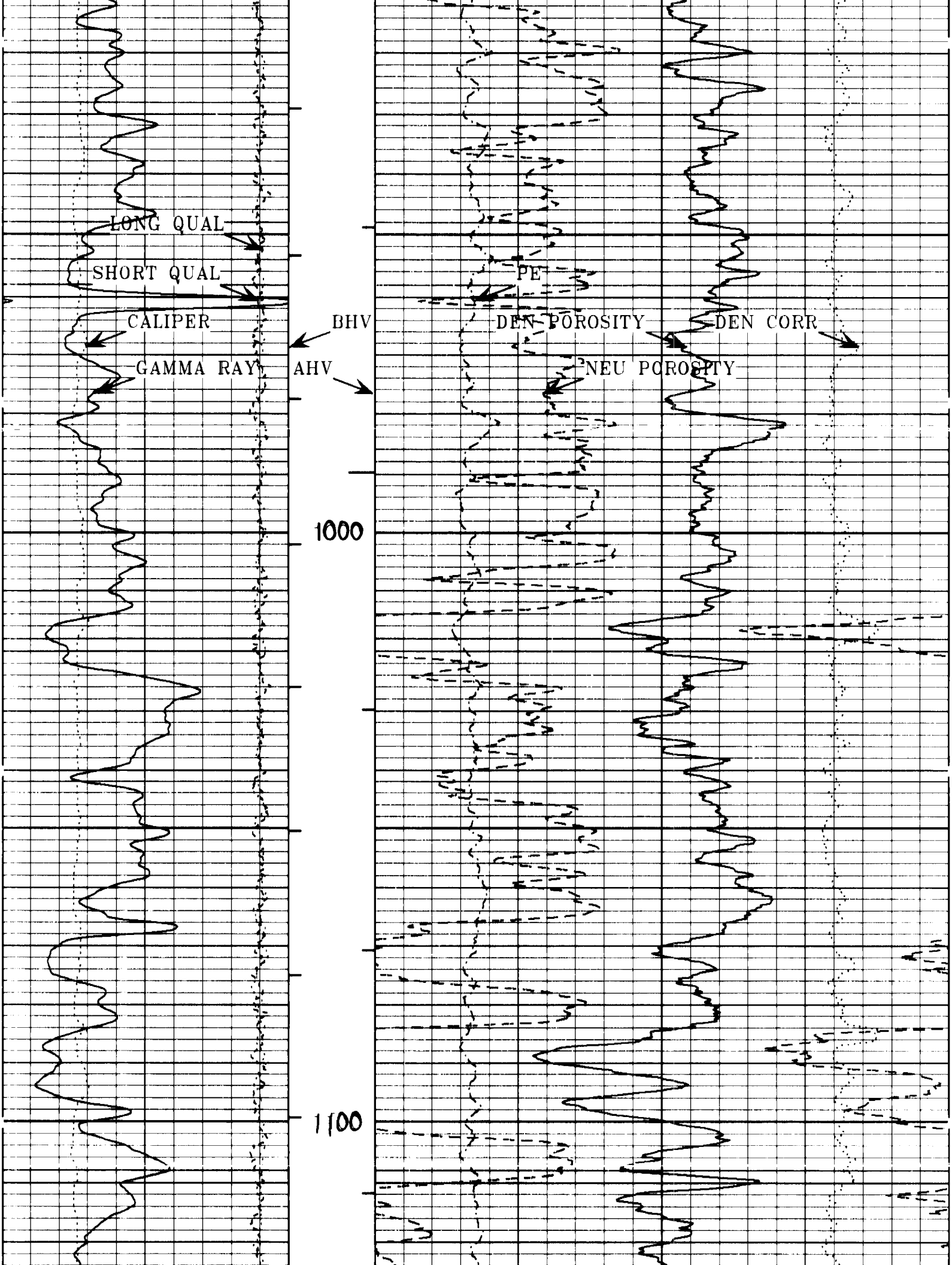
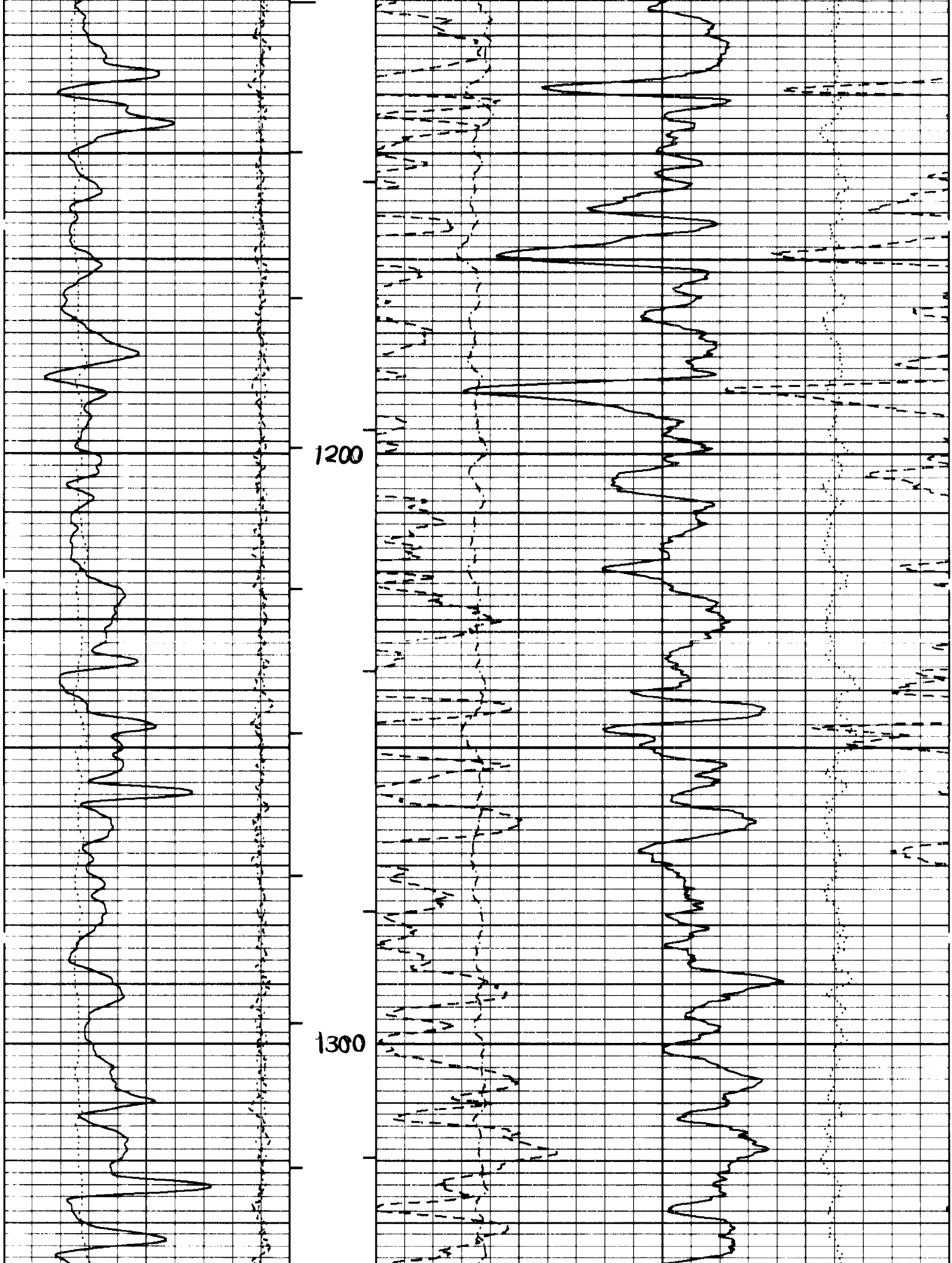
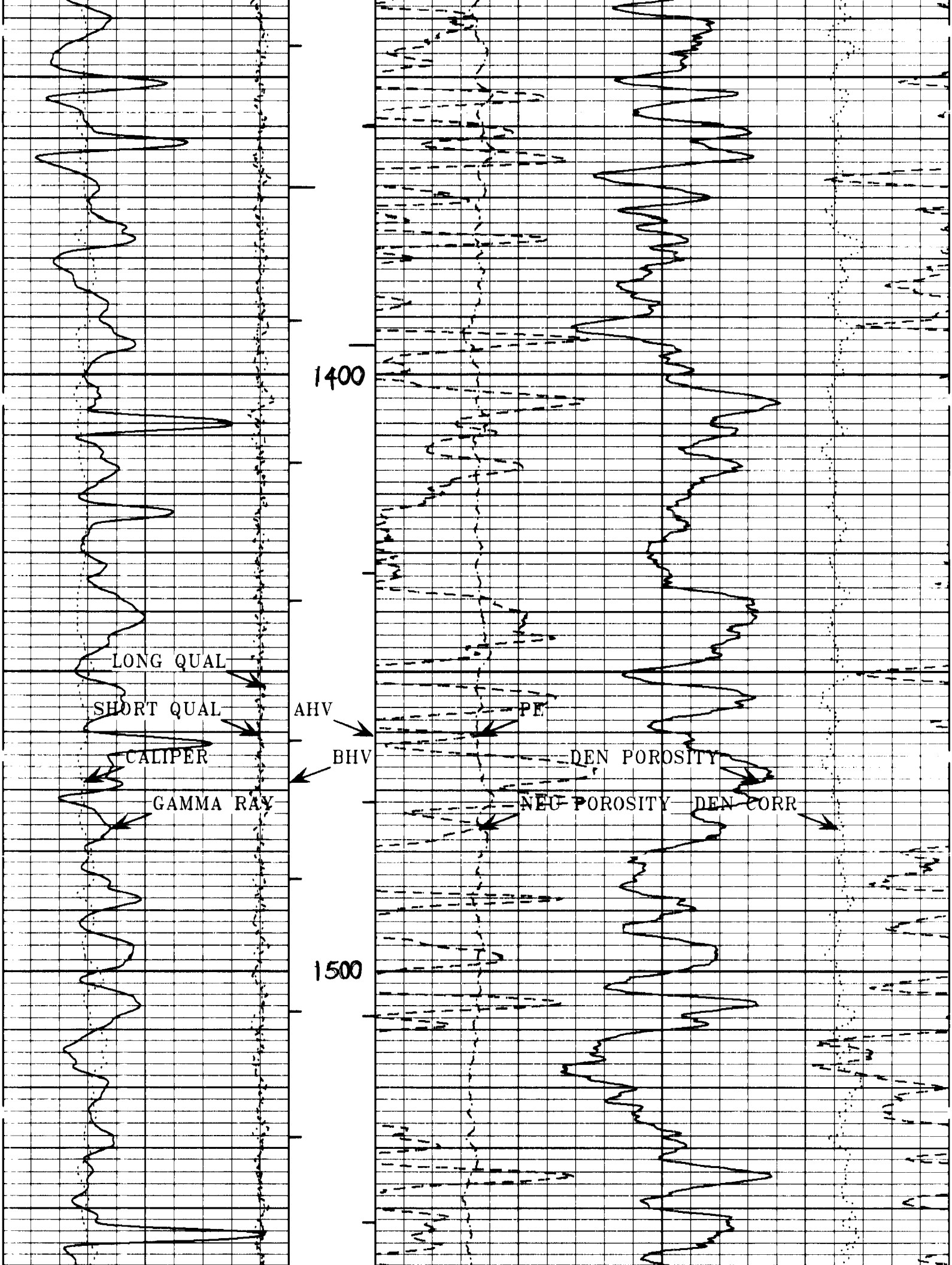
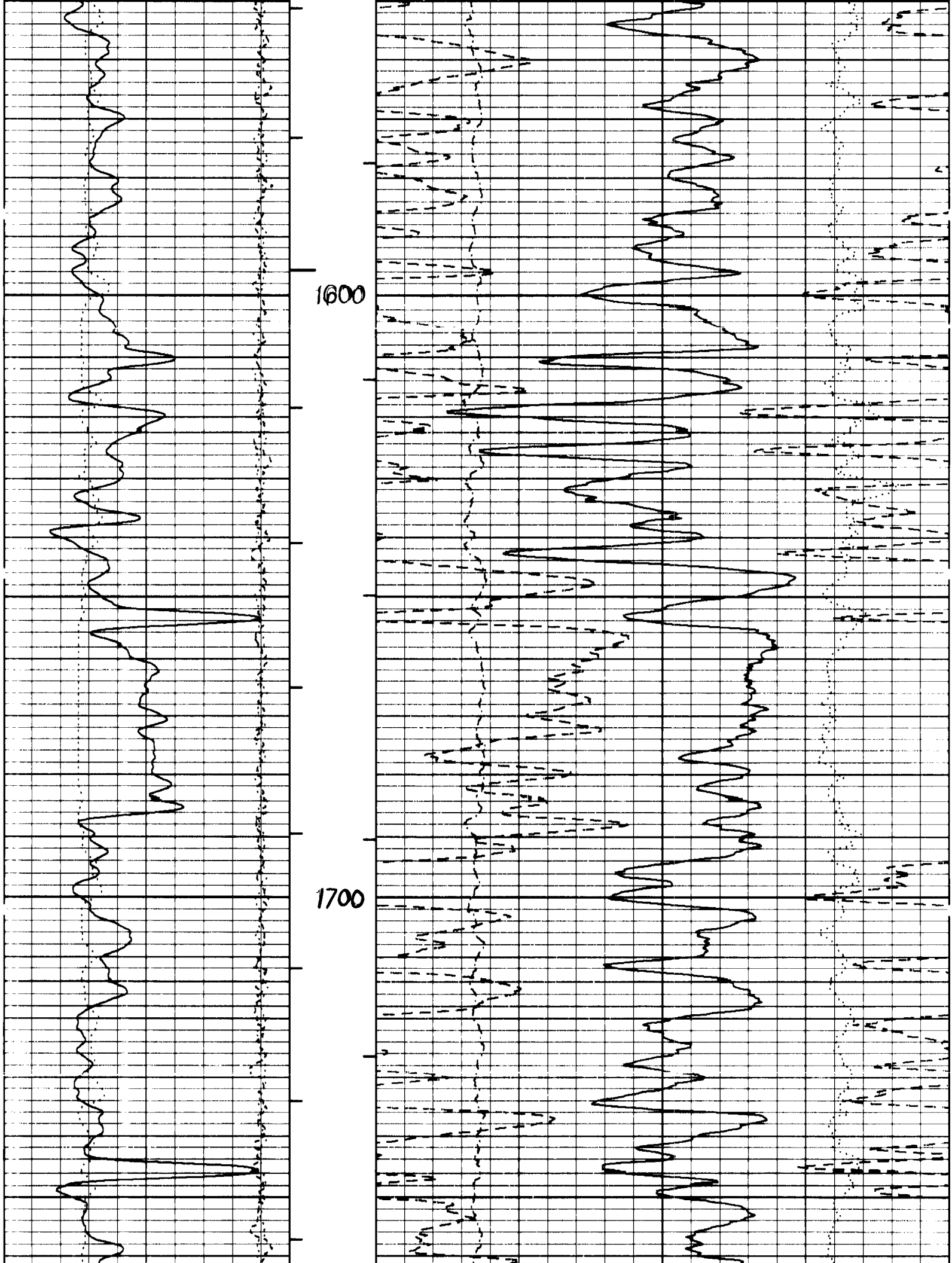
800
900


LONG QUAL
SHORT QUAL
CALIPER
GAMMA RAY
BHV
AHV
PE
DEN POROSITY
DEN CORR
NEU POROSITY
1000
1100


1200
1300


1400
1500
LONG QUAL
SHORT QUAL
CALIPER
GAMMA RAY
AHV
BHV
PE
DEN POROSITY
NEU POROSITY
DEN CORR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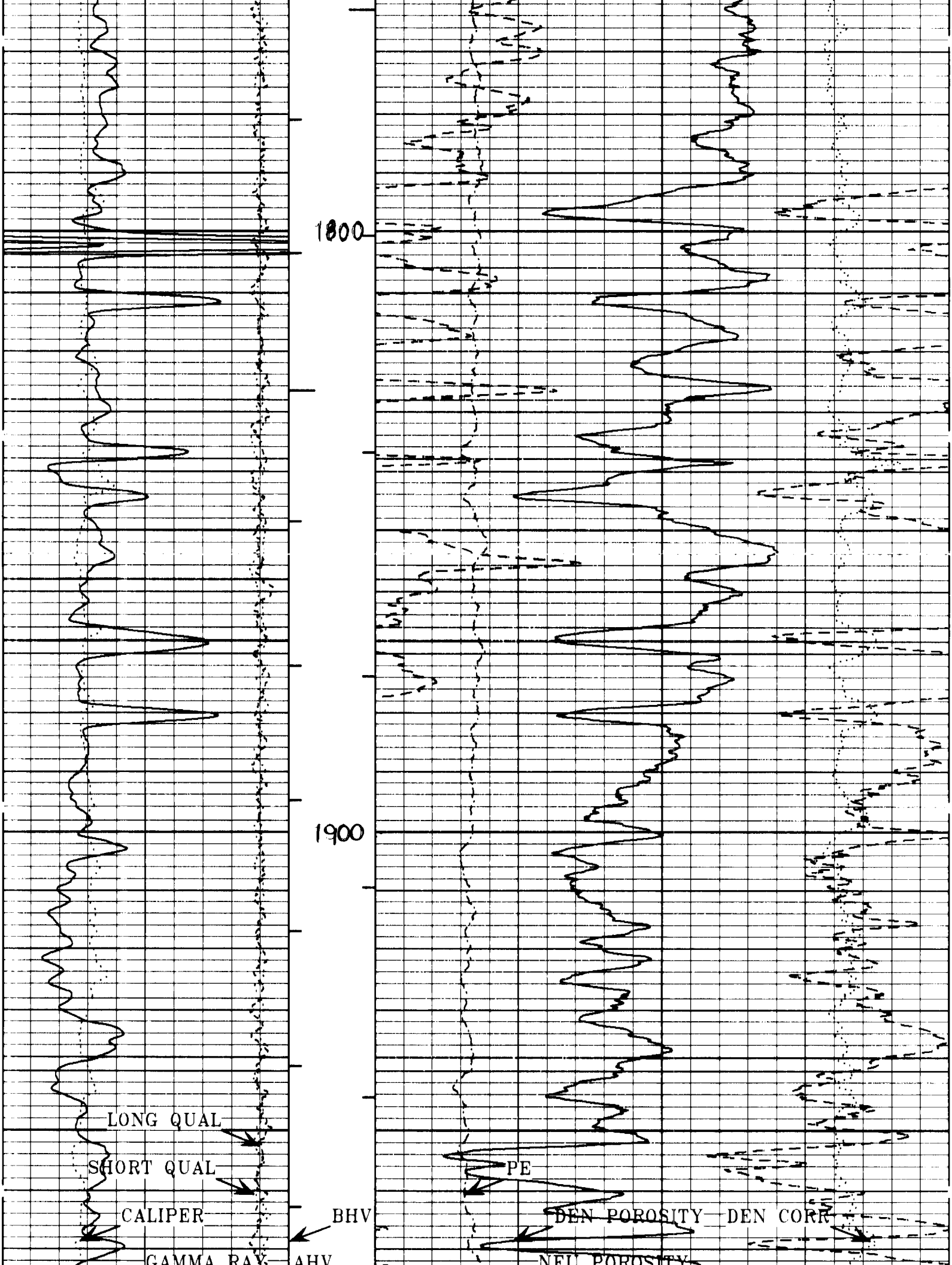
1700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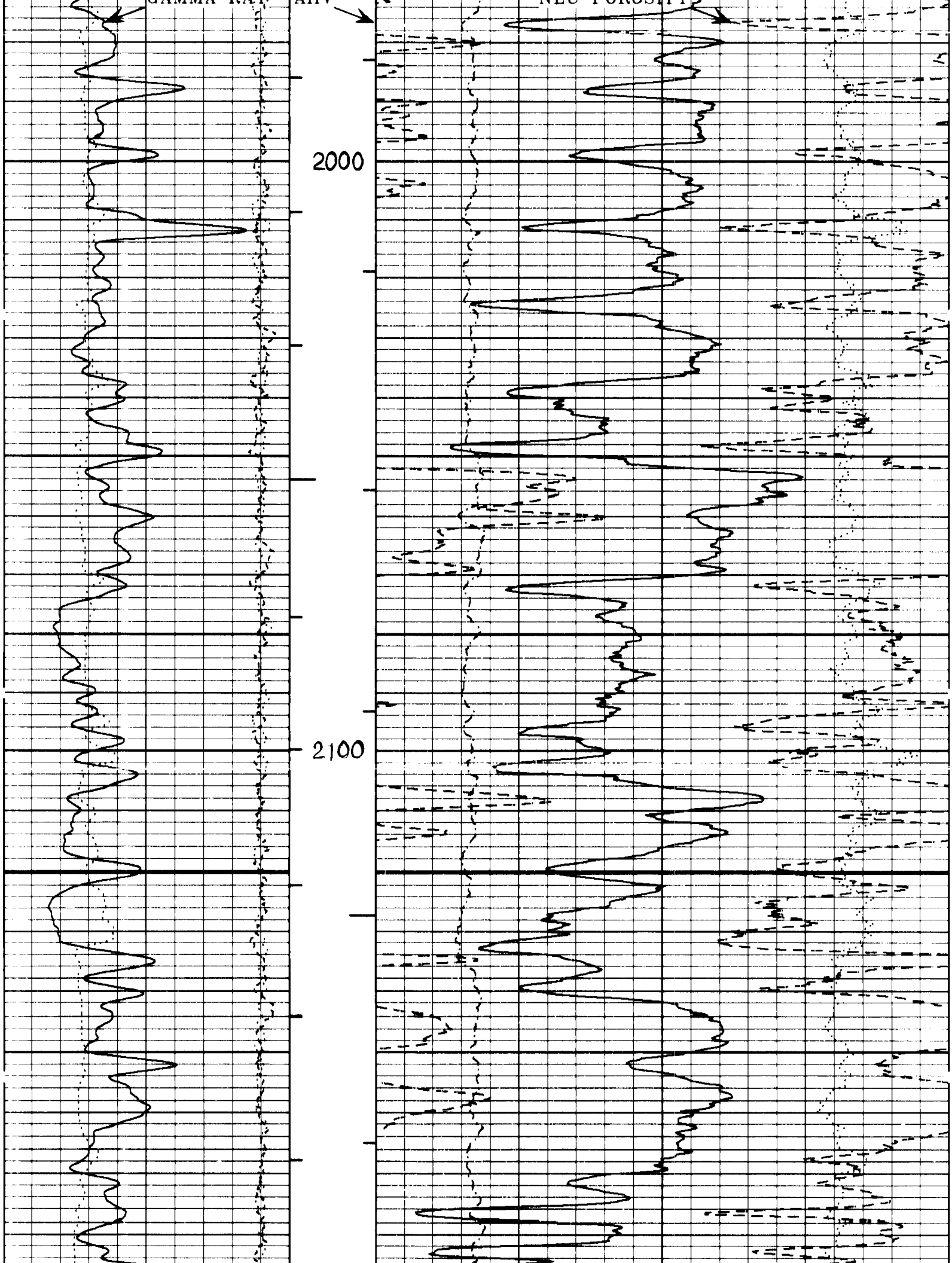
SHORT QUAL
CALIPER
BHV
GAMMA RAY
AHV
PE
DEN POROSITY
DEN CORR
NEU POROSITY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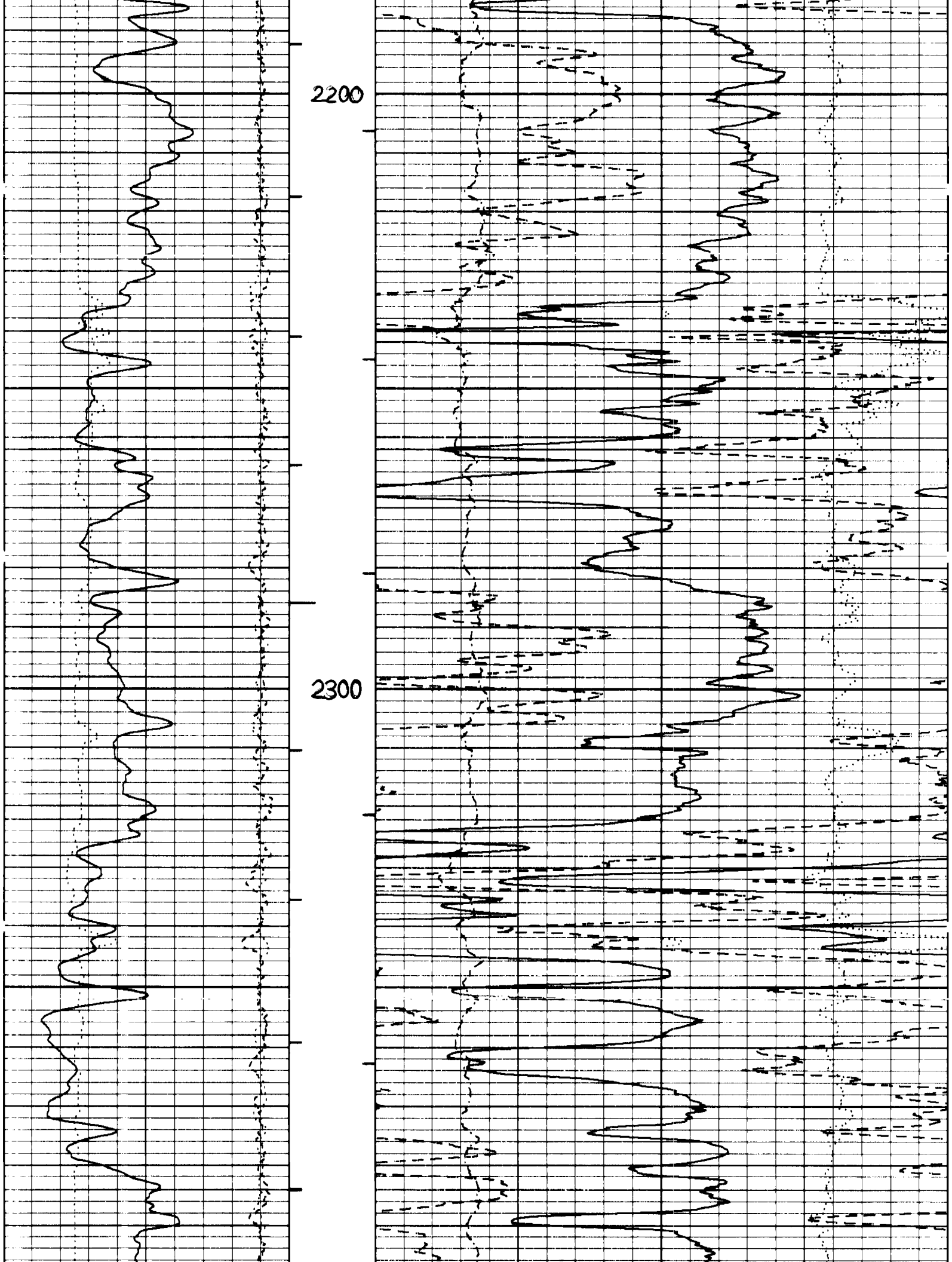
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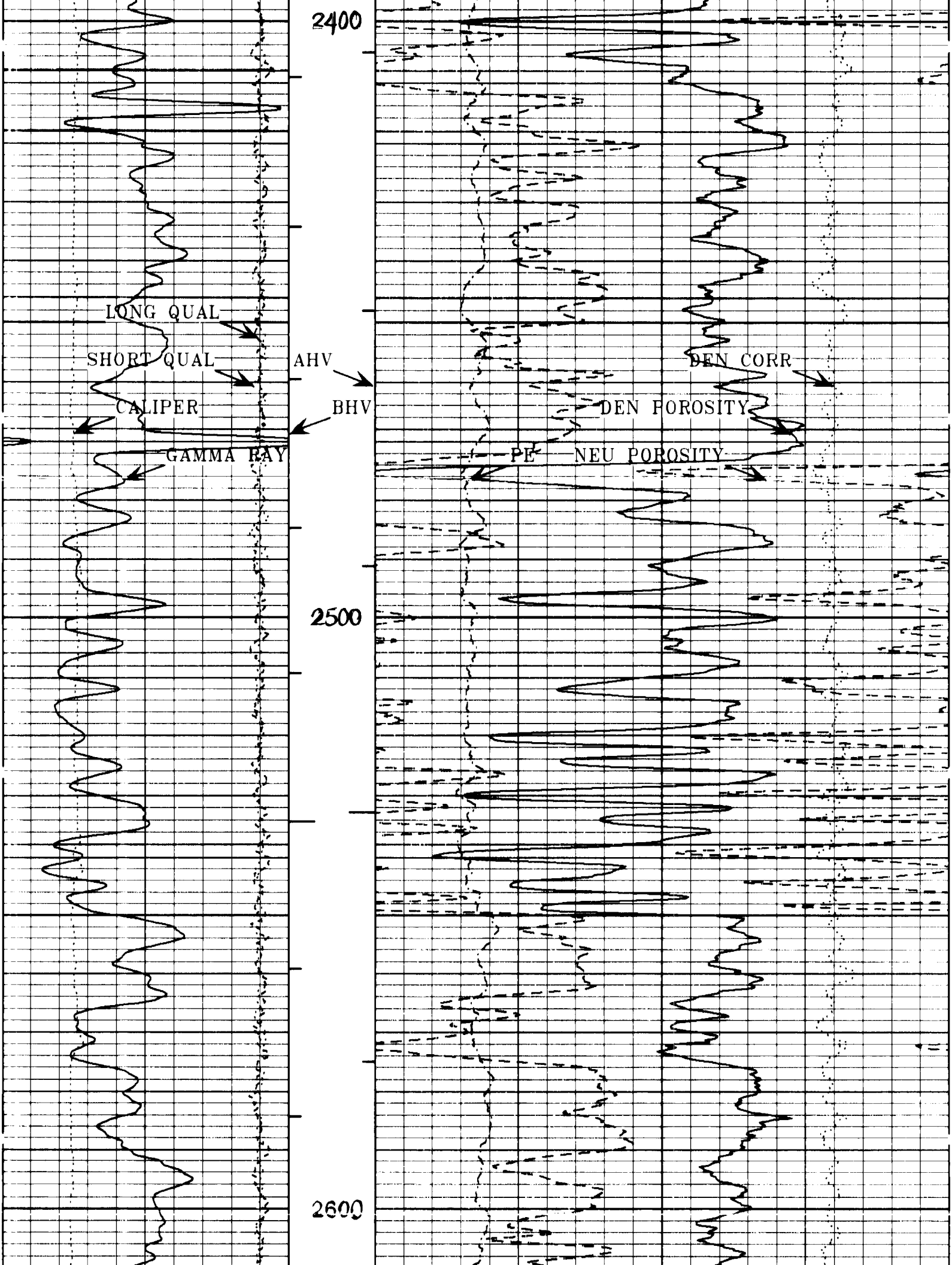
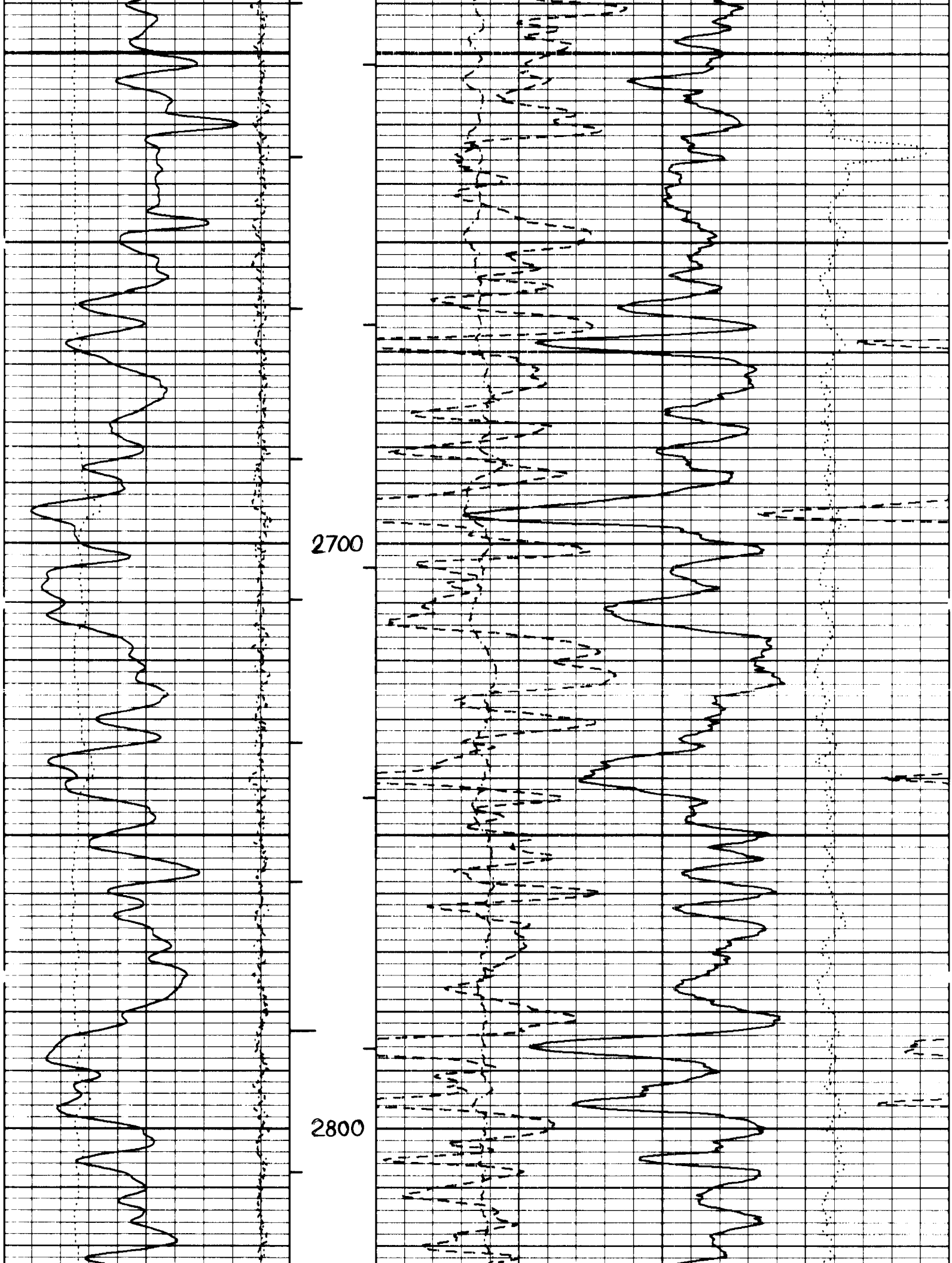
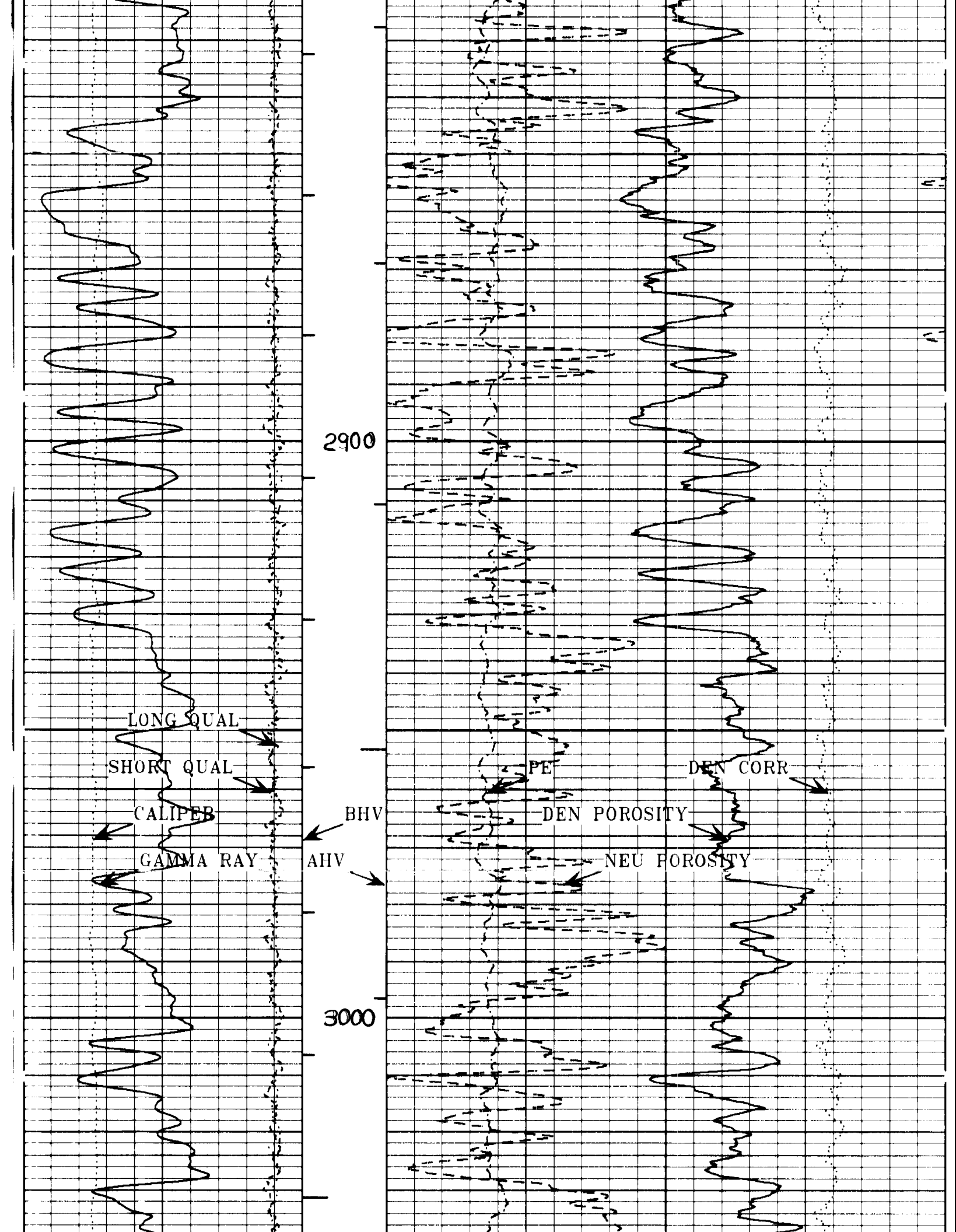
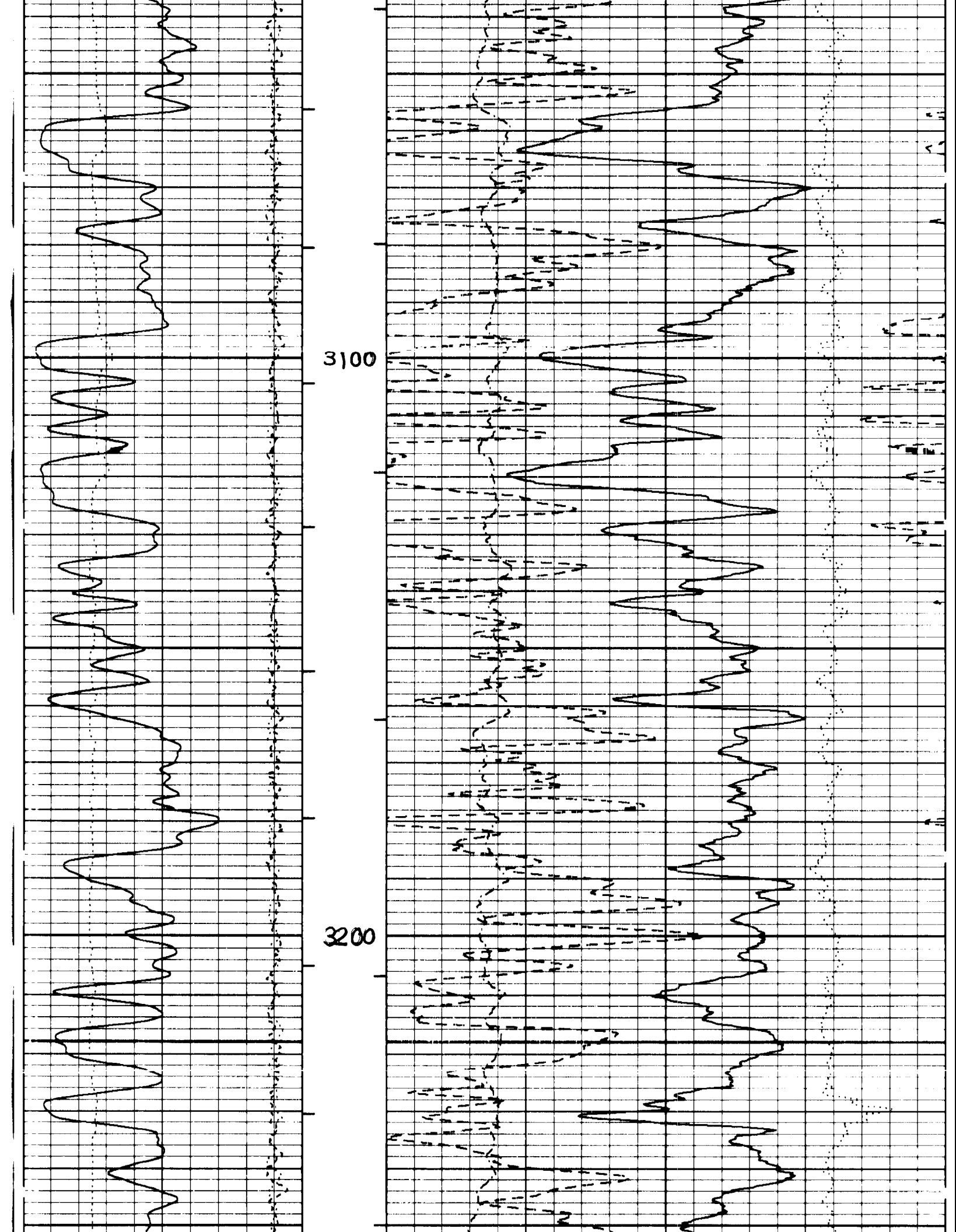
2300


2400
2500
2600
LONG QUAL
SHORT QUAL
CALIPER
GAMMA RAY
AHV
BHV
DEN CORR
DEN POROSITY
PE
NEU POROSITY


2700
2800


2900
3000
LONG QUAL
SHORT QUAL
CALIPER
GAMMA RAY
BHV
AHV
PE
DEN POROSITY
NEU POROSITY
DEN CORR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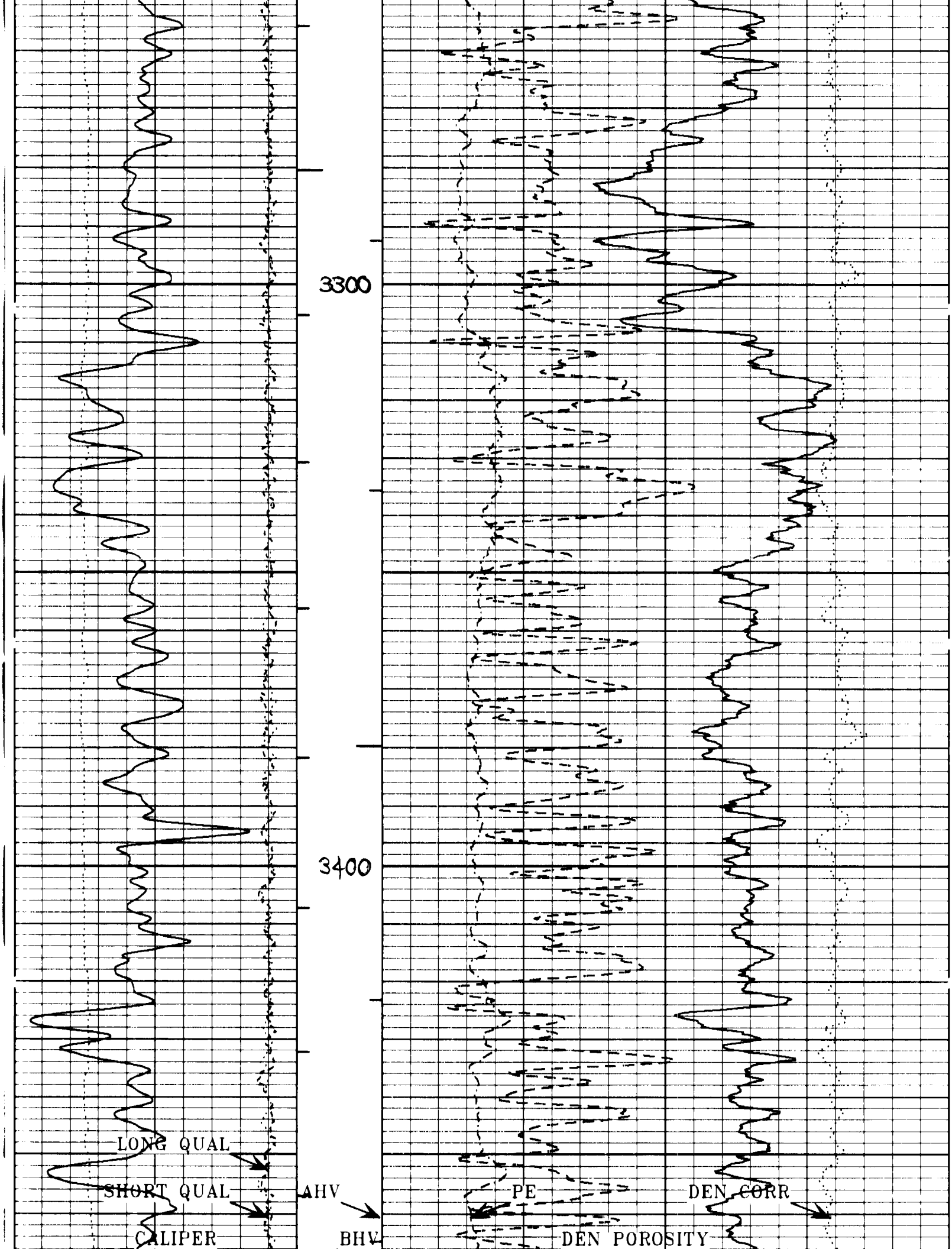
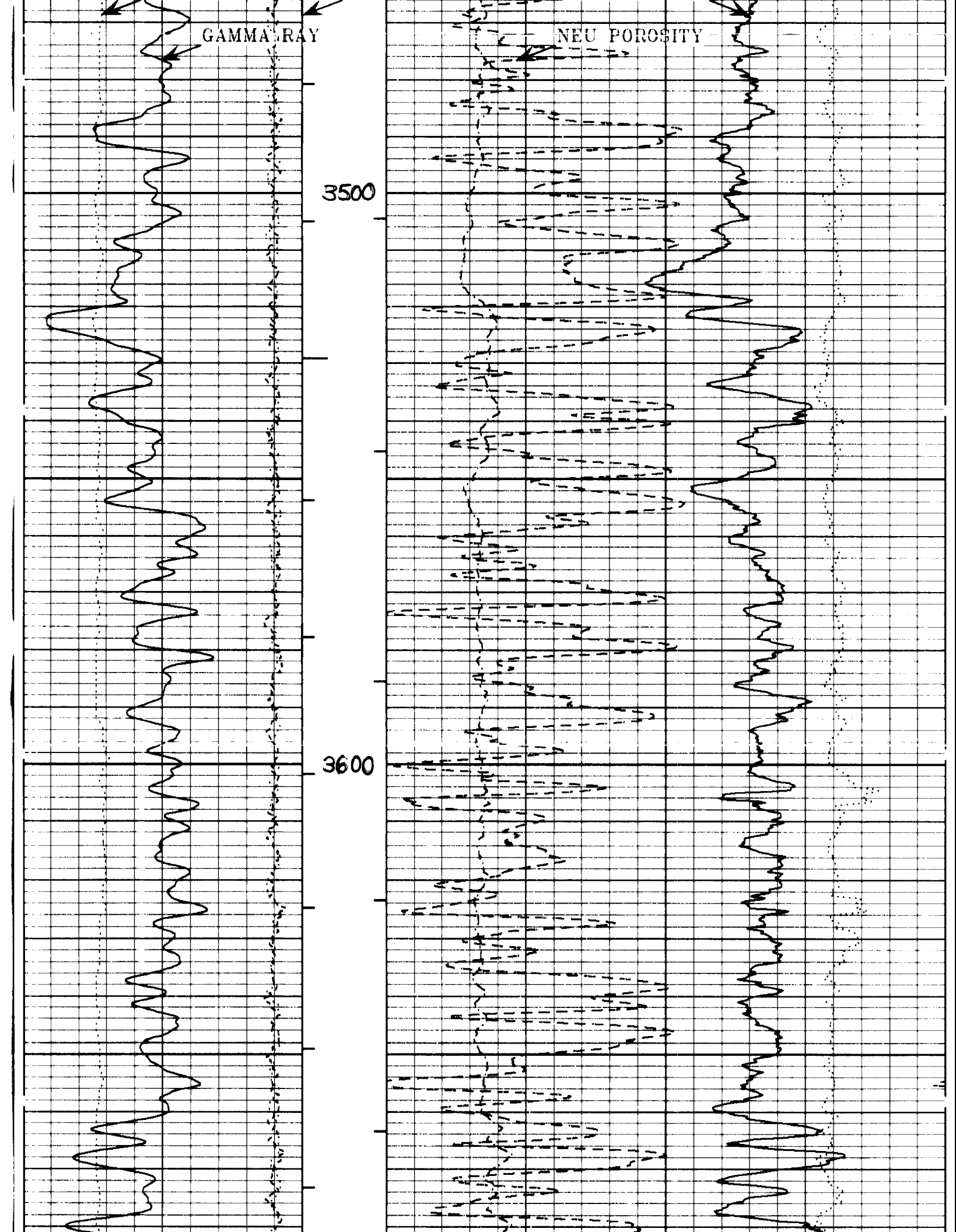
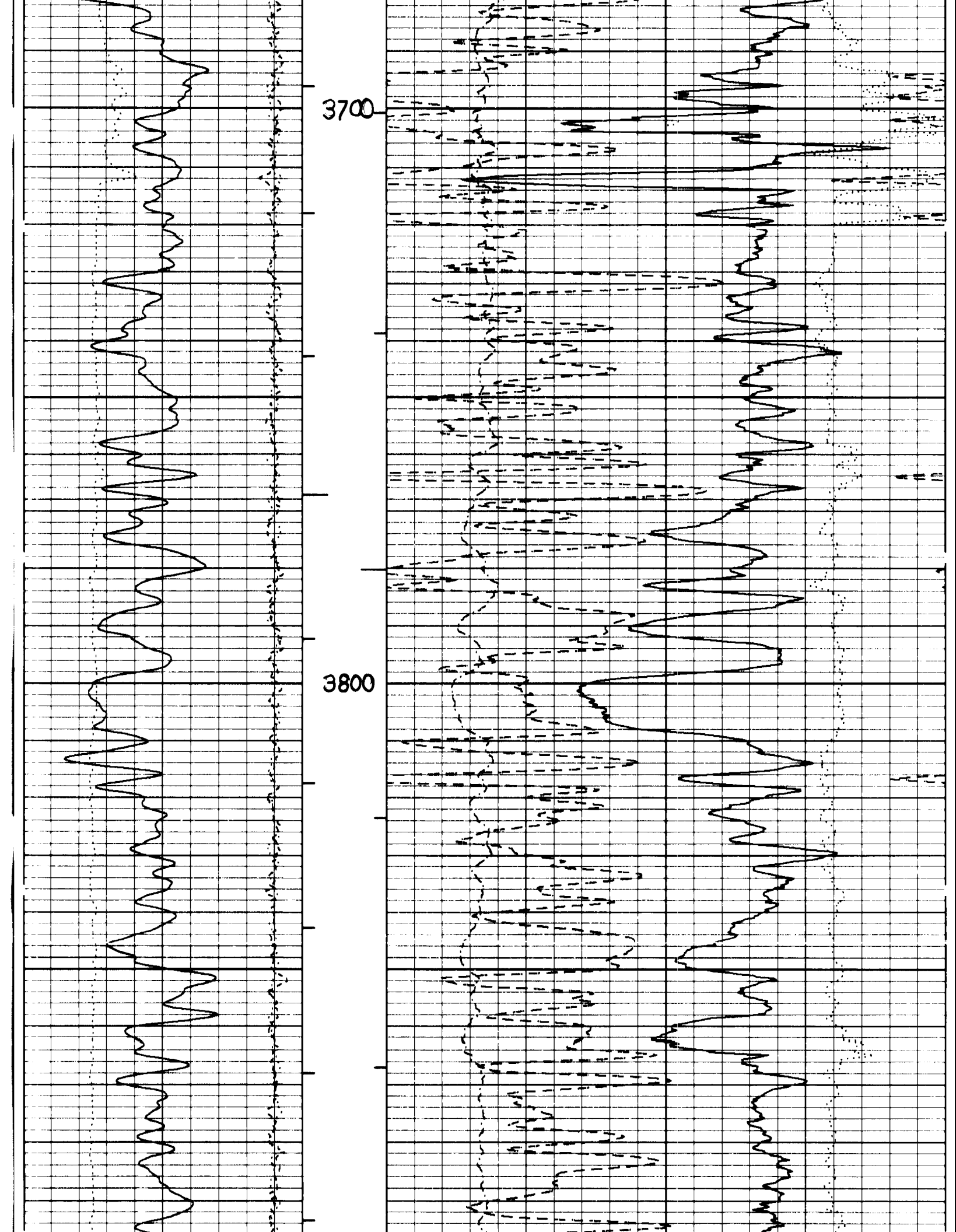
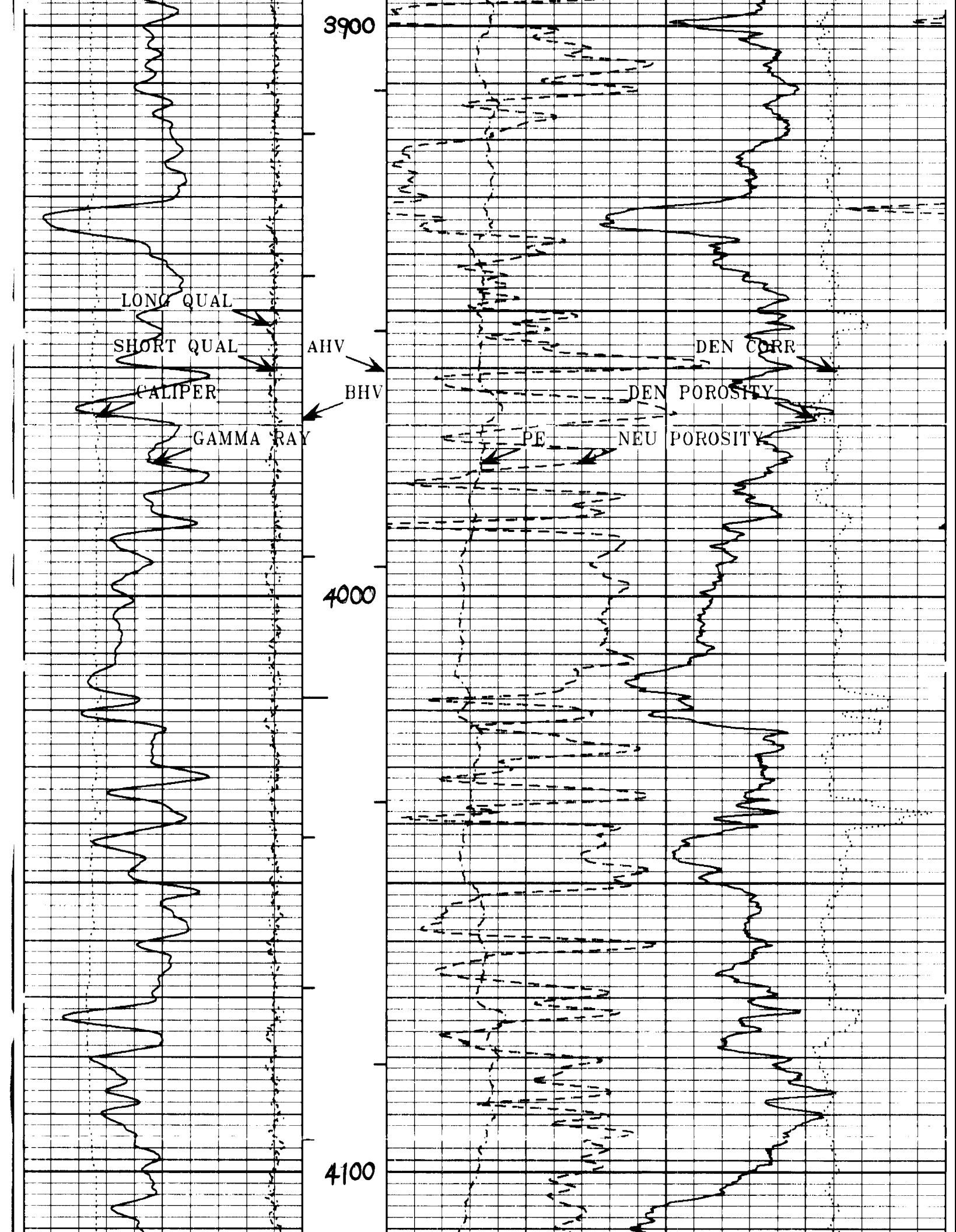
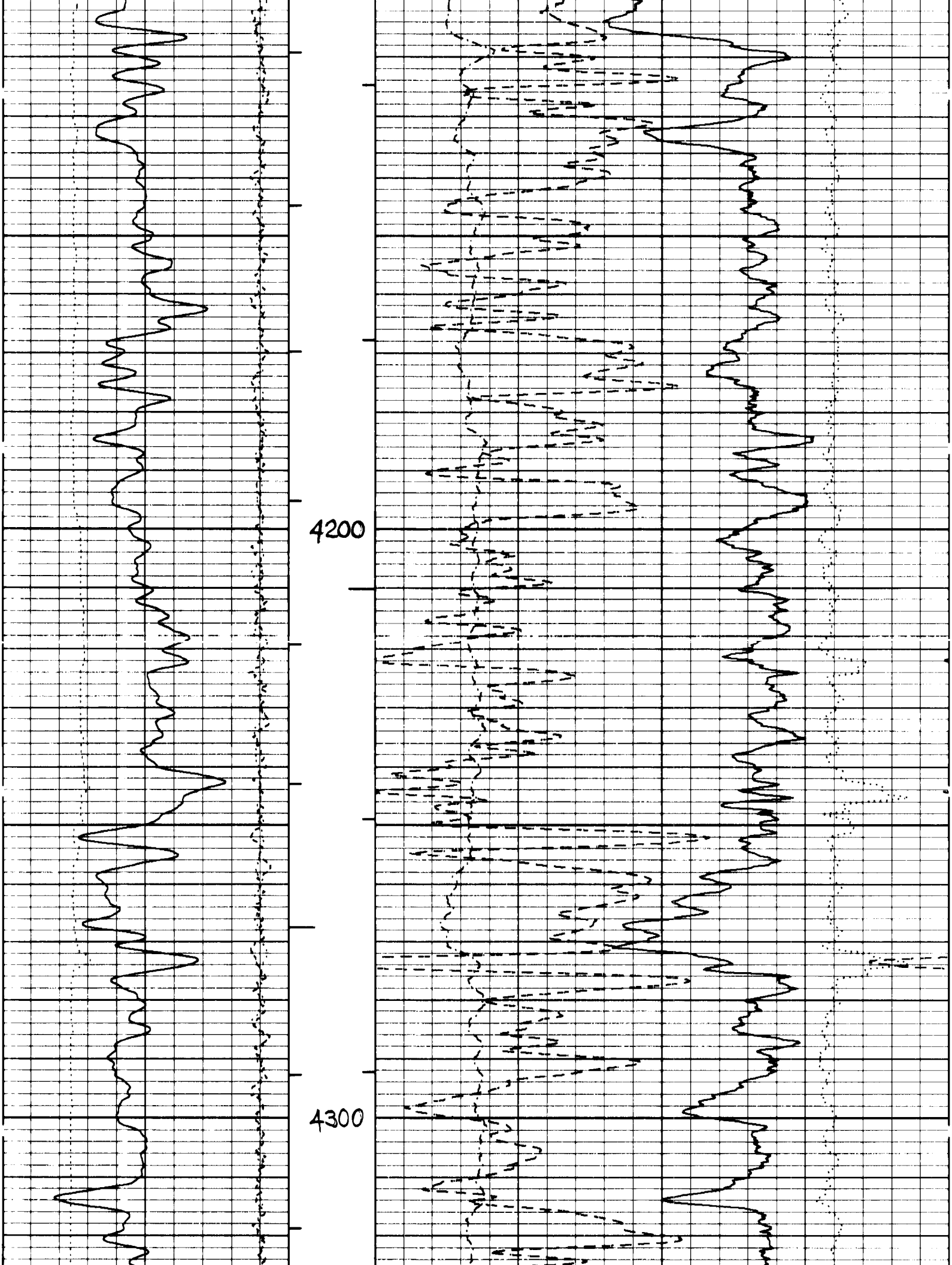
3200


3300
3400
LONG QUAL
SHORT QUAL
CALIPER
AHV
BHV
PE
DEN POROSITY
DEN CORR


GAMMA RAY
NEU POROSITY
3500
3600


3700
3800


3900
LONG QUAL
SHORT QUAL
AHV
DEN CORR
CALIPER
BHV
DEN POROSITY
GAMMA RAY
PE
NEU POROSITY
4000
4100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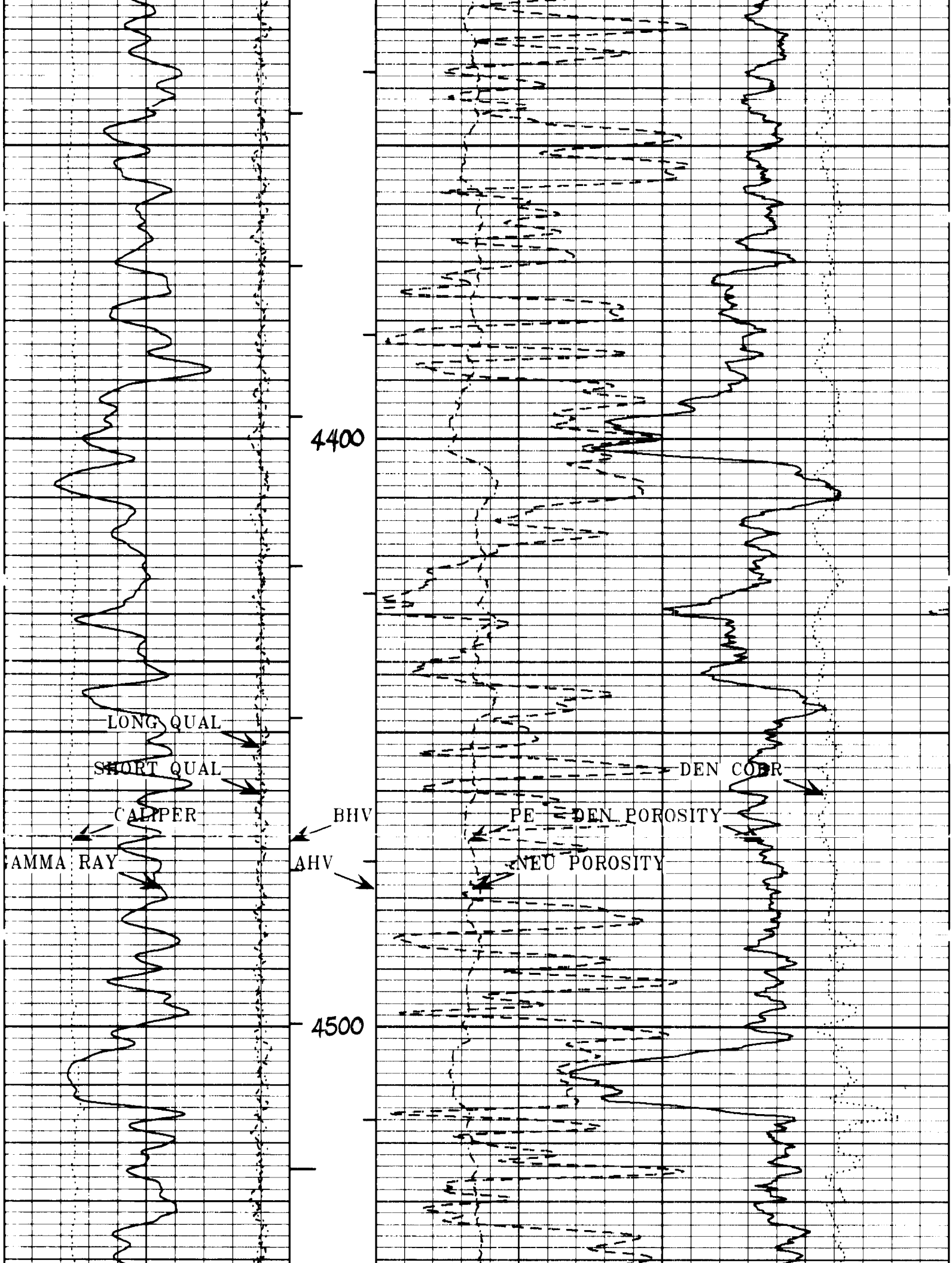
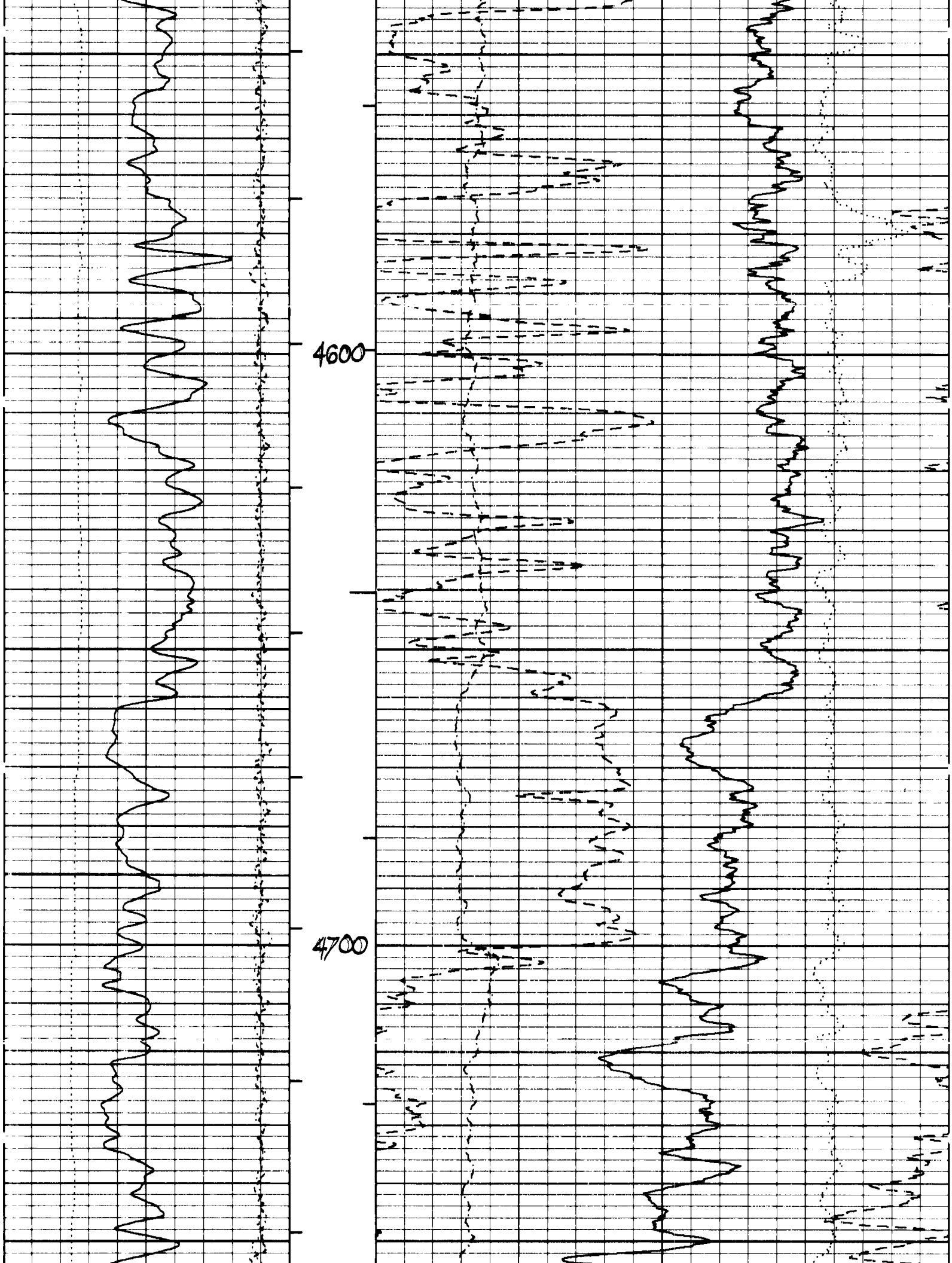
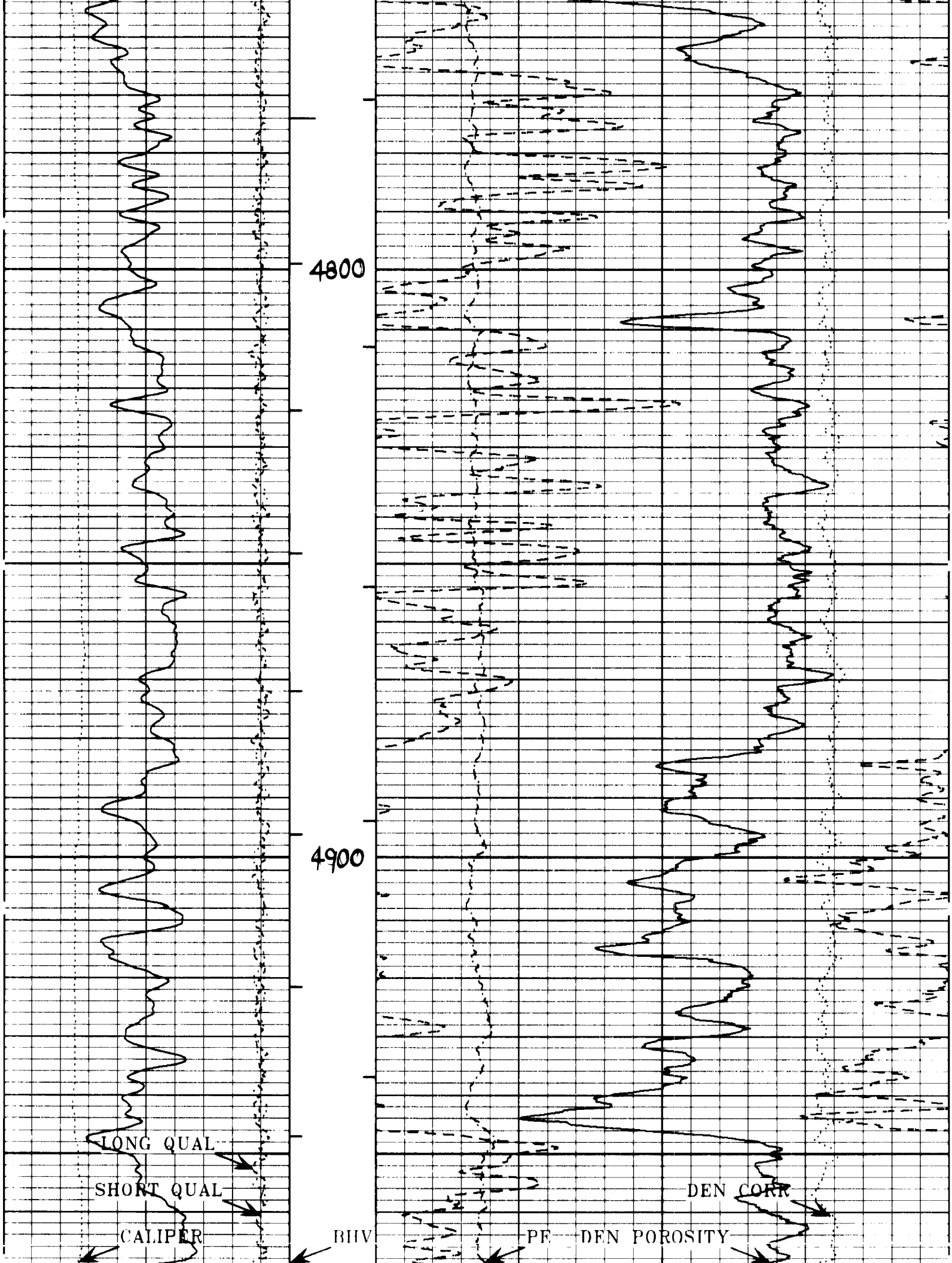
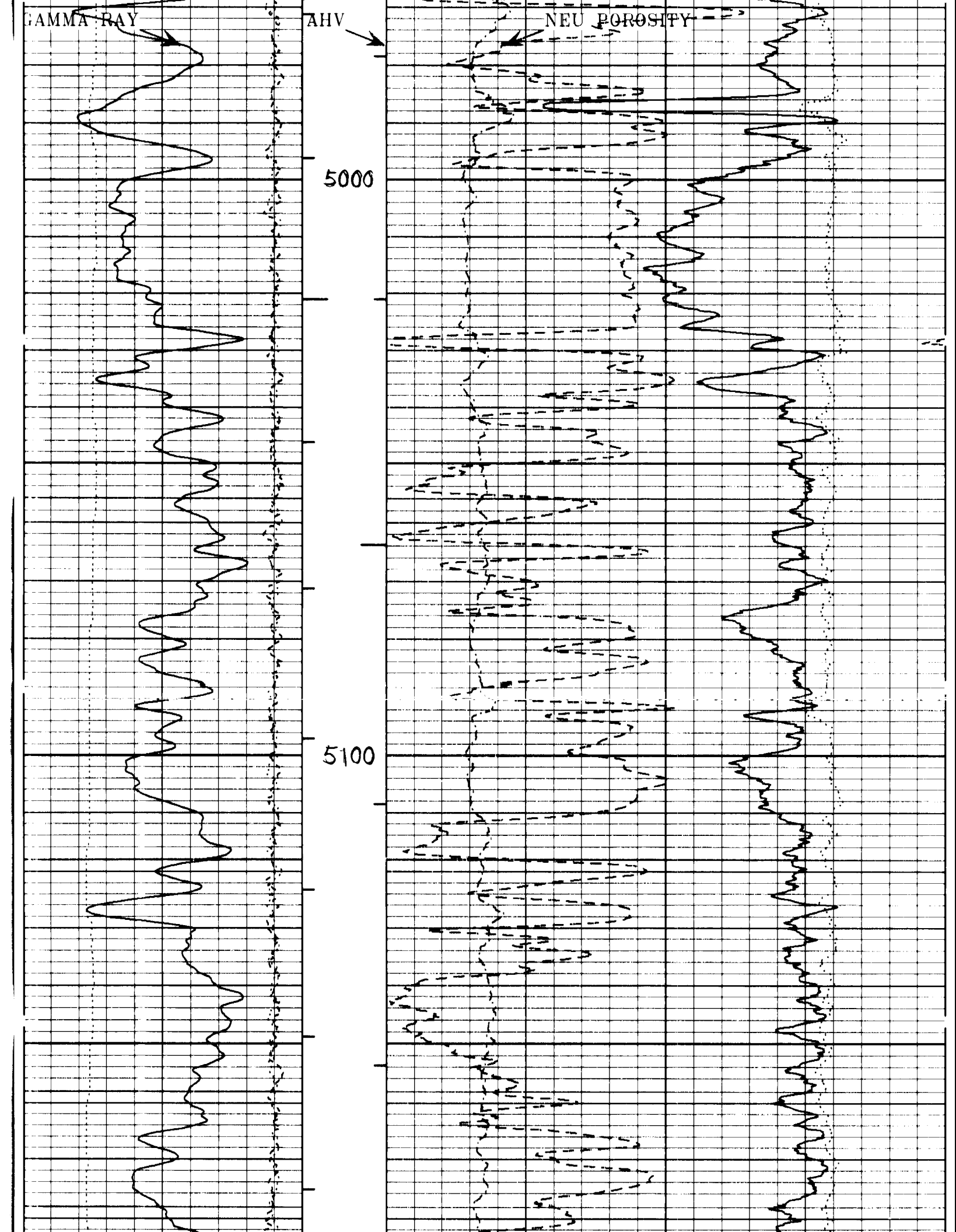
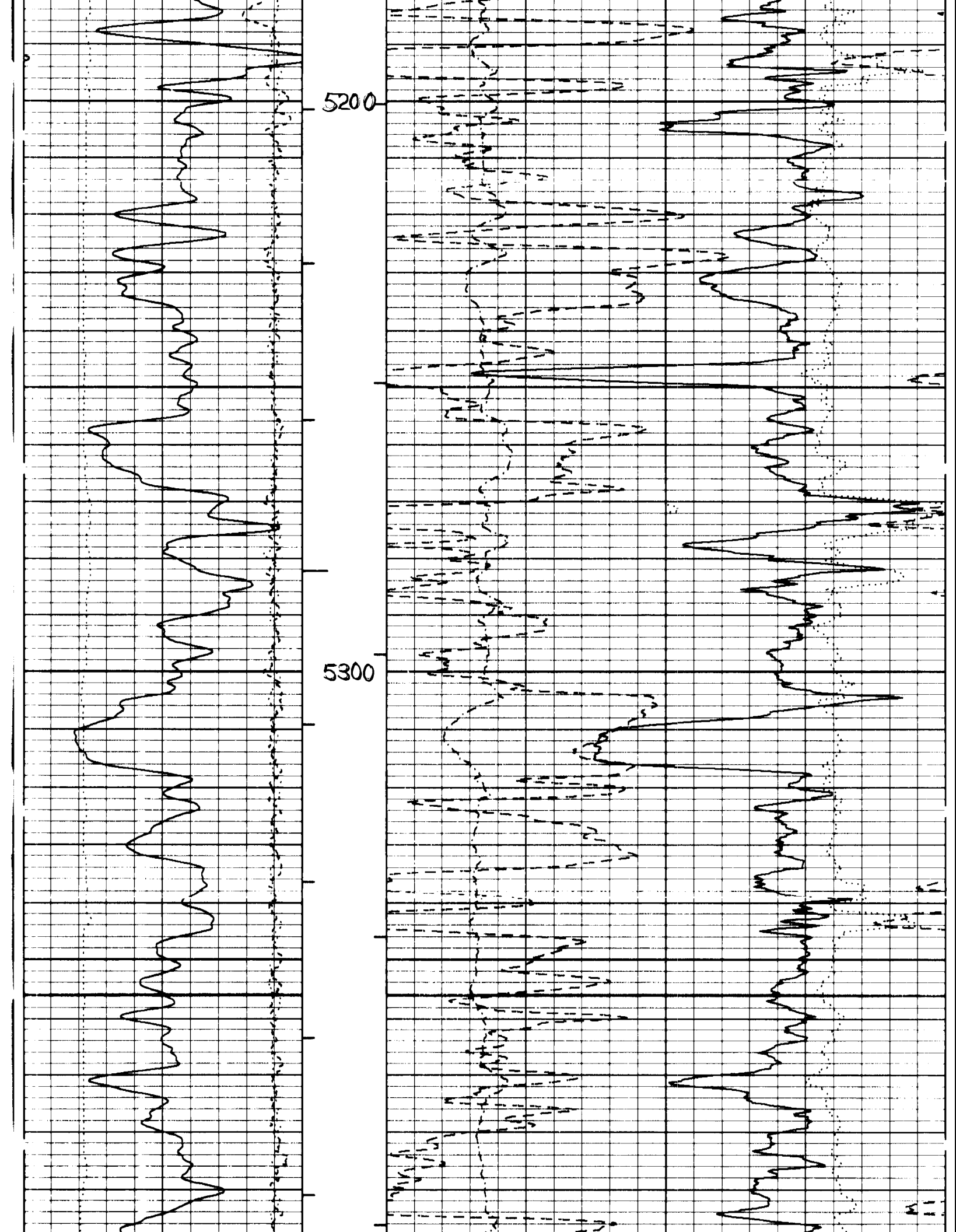
4300

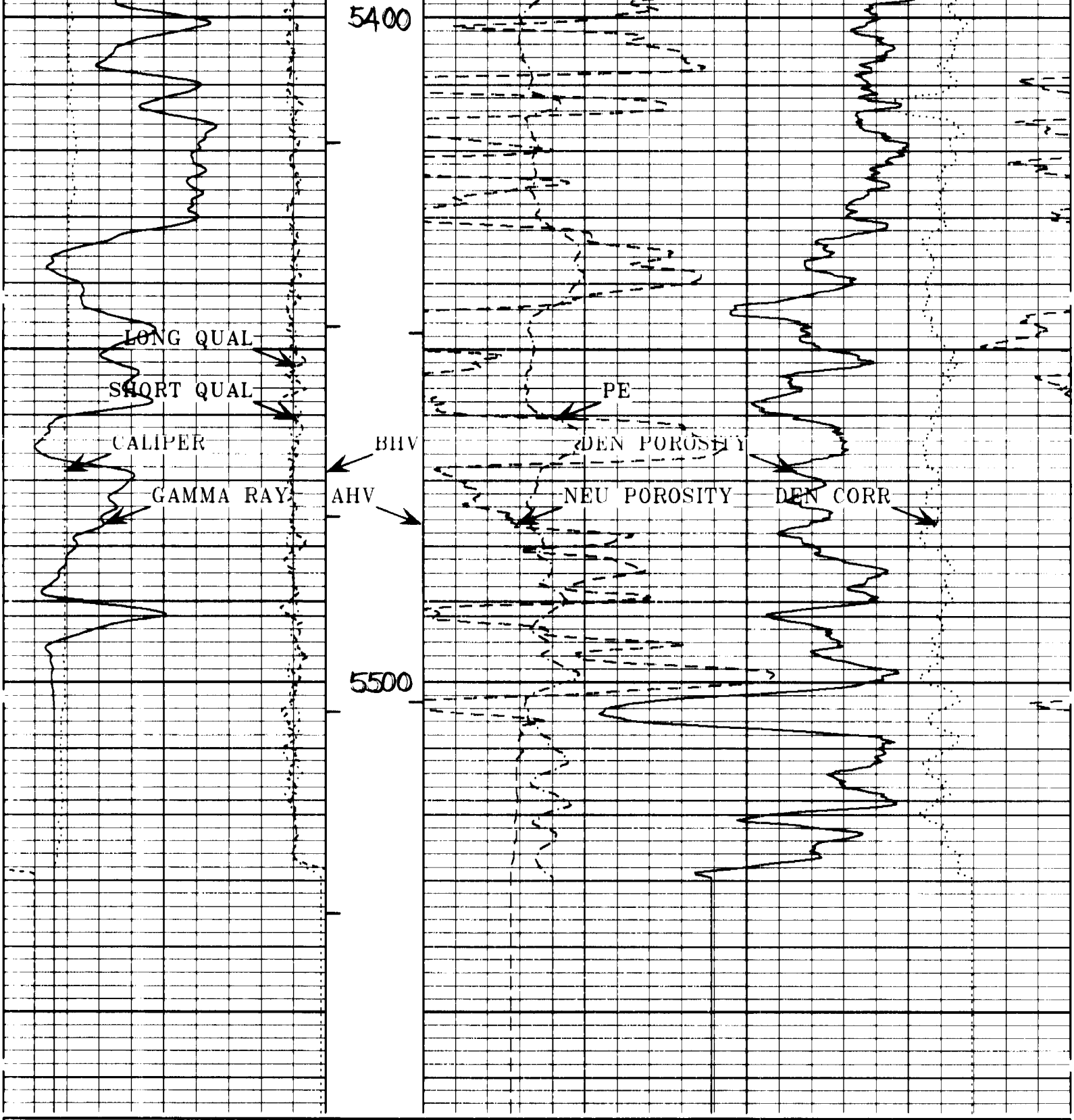

4400
4500
LONG QUAL
SHORT QUAL
CALIPER
GAMMA RAY
BHV
AHV
DEN CORR
PE
DEN POROSITY
NEU POROSITY


4600
4700


4800
4900
LONG QUAL
SHORT QUAL
CALIPER
BHV
PE
DEN POROSITY
DEN CORR


GAMMA RAY
AHV
NEU POROSITY
5000
5100


5200
5300



LONG QUAL 4.5 – 5	1:240 Ft	PE 0 – 10 / DEN CORR GM/CC -.25 – .25
SHORT QUAL 4.5 – 5		
CALIPER INCHES 6 – 16	BHV	DEN POROSITY % 30 – -10
GAMMA RAY API COUNTS 0 – 200	AHV	NEU POROSITY % 30 – -10

HALLIBURTON

Version No: 3.40 | hc 3.0
Data File: ute_tribal31_04.2.cls
Format File: /field_data/data2/ute_tribal31_04/plot_1.2.spc

Top Depth: 340.00
Bottom Depth: 5565.25

EXCELL

Plot Time 03-14-98 00:06:10
Log Time 03-13-98 20:39:50

REPEAT SECTION

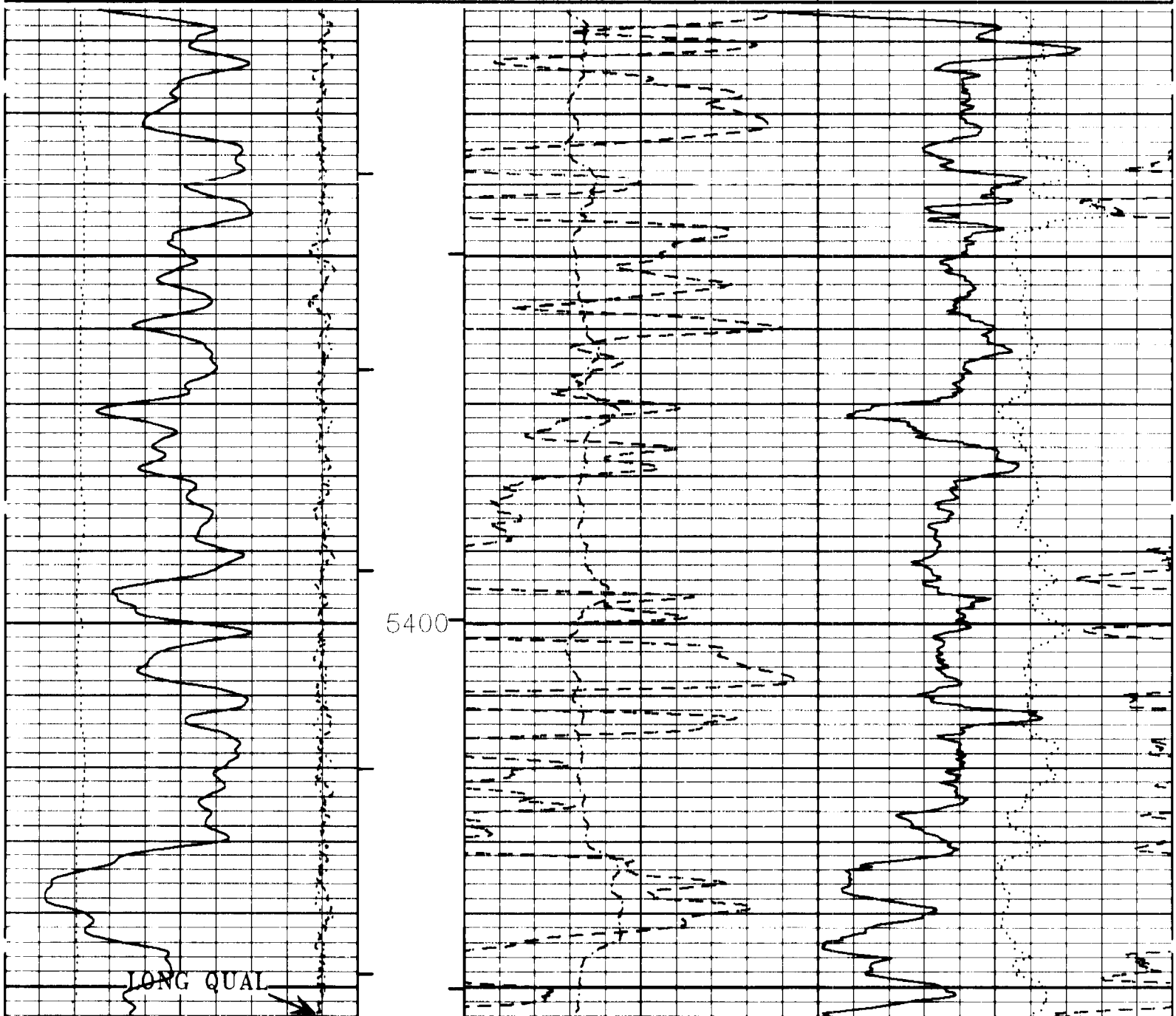
HALLIBURTON
EXCELL

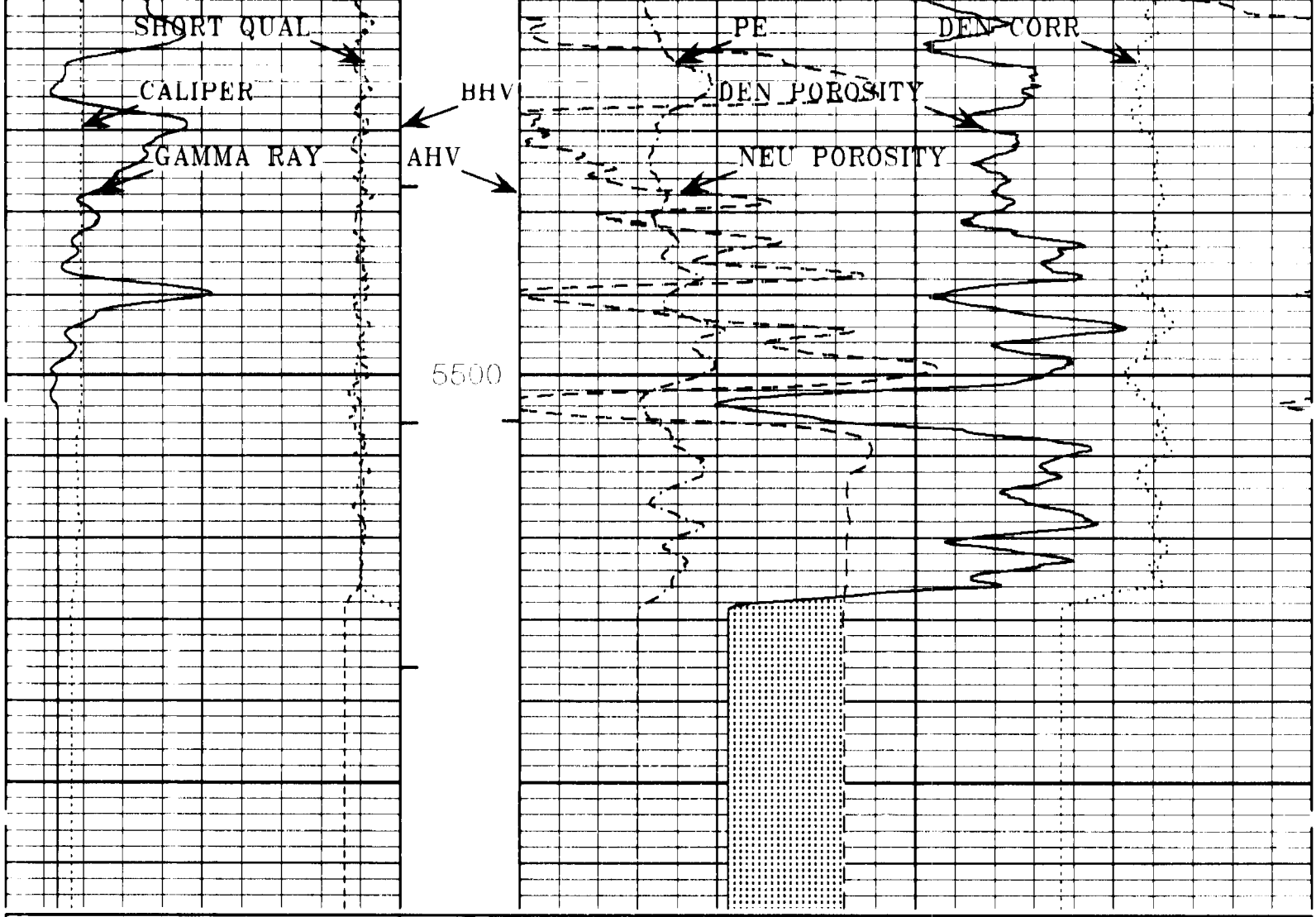
Version No 3.40 | hc 3.0
Data File ute_tribal31_04.1 cls
Format File /field_data/data2/ute_tribal31_04/plot_1.2 spc

Top Depth 5315.25
Bottom Depth 5565.50

Plot Time 03-14-98 00:13:06
Log Time 03-13-98 20:31:17

GAMMA RAY	AHV	NEU POROSITY	
0 API COUNTS 200		30 % -10	
CALIPER	BHV	DEN POROSITY	
6 INCHES 16		30 % -10	
SHORT QUAL		PE	DEN CORR
-4.5 5	1:240 Ft.	0 10	-.25 GM/CC .25
LONG QUAL			
+.5 -.5			





LONG QUAL 4.5 – 5	1:240 Ft	
SHORT QUAL 4.5 – 5		PE 0 – 10 / DEN CORR GM/CC 1.25 – 2.5
CALIPER INCHES 6 – 16	BHV	DEN POROSITY 30 % -10
GAMMA RAY API COUNTS 0 – 200	AHV	NEU POROSITY 30 % -10

HALLIBURTON EXCELL

Version No 3.40 : hc 3.0
Data File ute_tribal31_04 1 cls
Format File /field_data/data2/ute_tribal31_04/plot_1 2 spc

Top Depth 5315.25
Bottom Depth 5565.50

Plot Time 03-14-98 00 12:43
Log Time 03-13-98 20 31 17

MAIN LOG 5"=100'

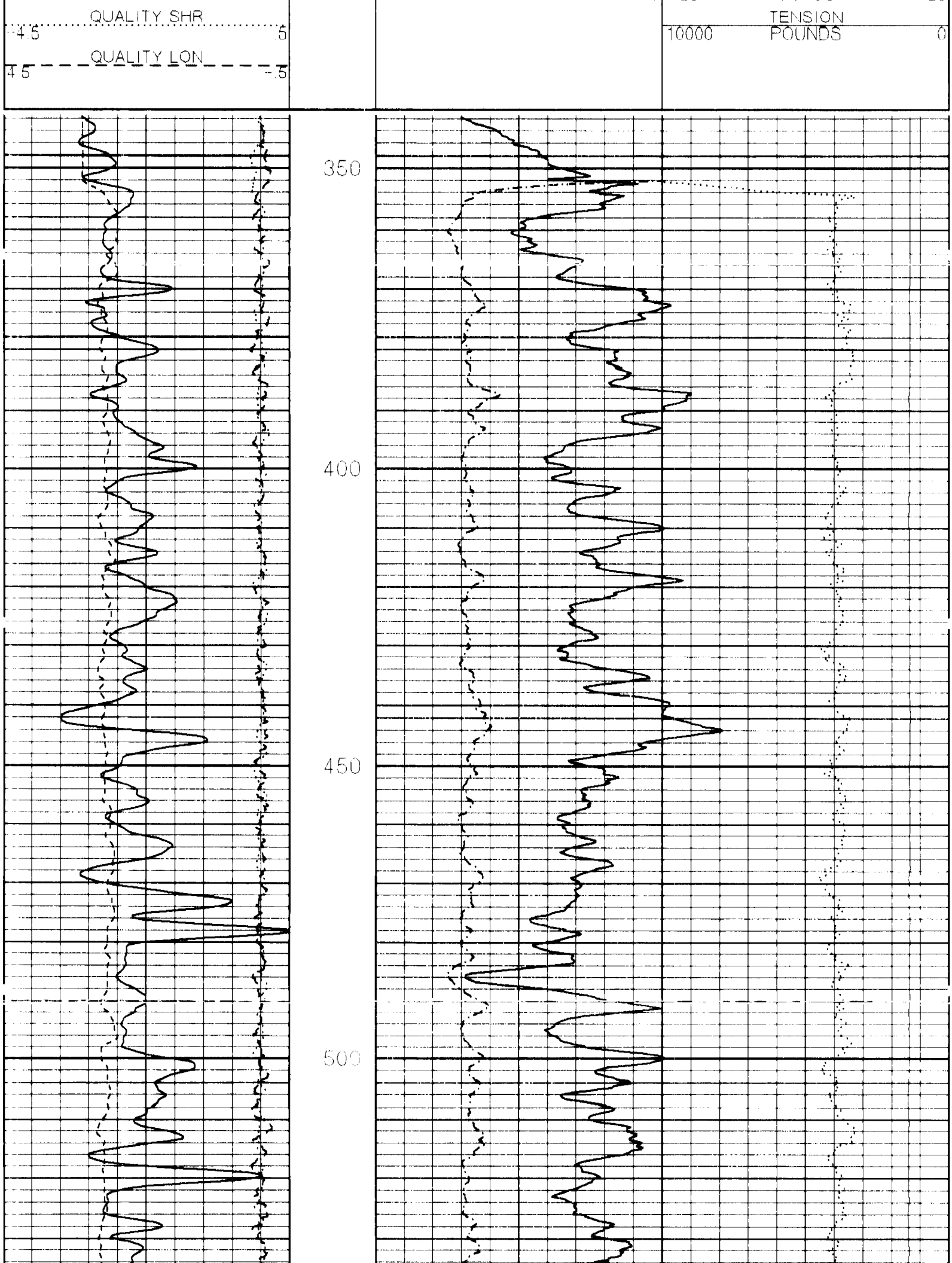
HALLIBURTON EXCELL

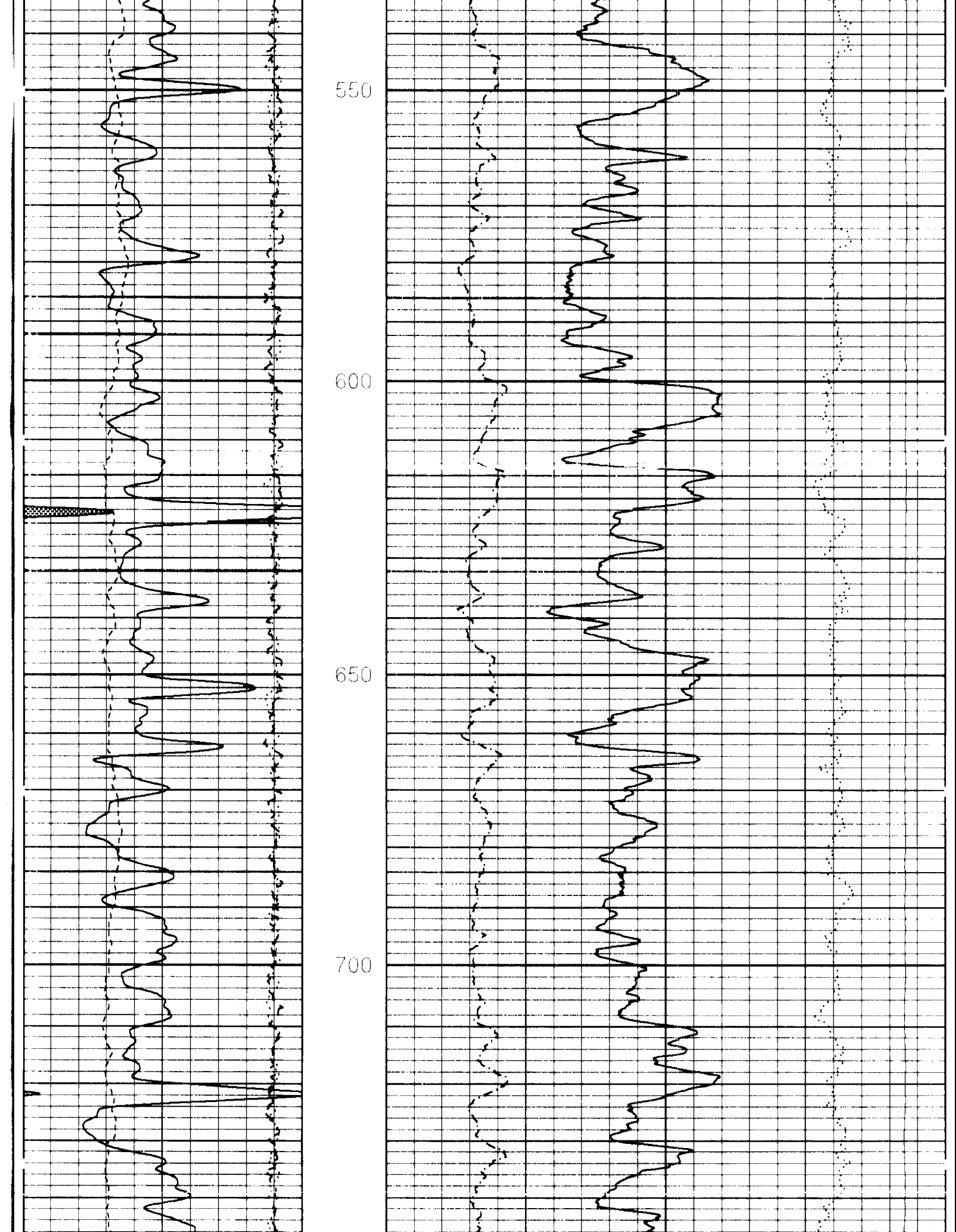
Version No 3.40 : hc.3.0
Data File ute_tribal31_04 2 cls
Format File /field_data/data2/VERNAL_SPC/RHOB spc

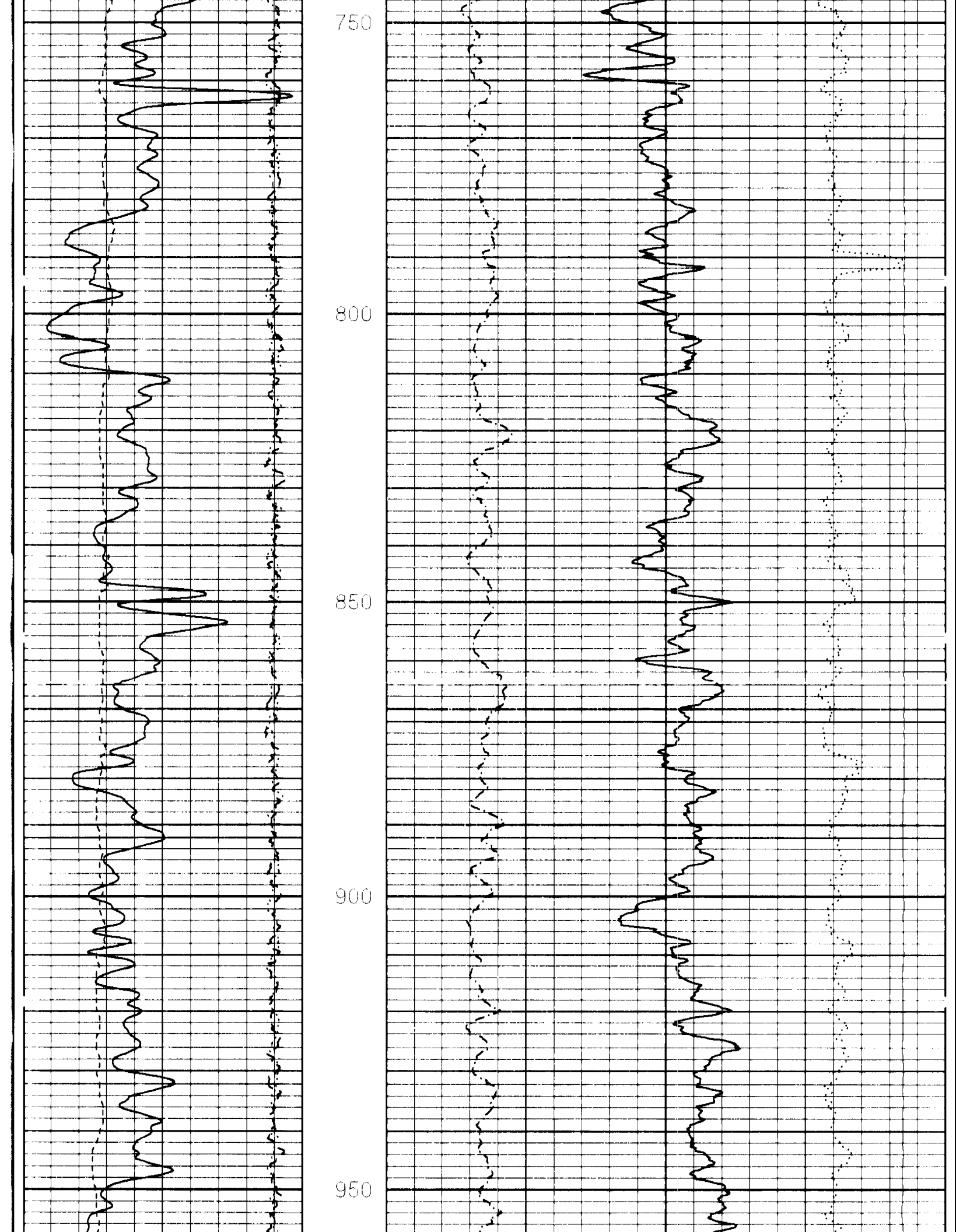
Top Depth 341.00
Bottom Depth 5565.25

Plot Time 03-14-98 00 19:19
Log Time 03-13-98 20:39:50

GAMMA RAY GAMMAAPI 0 – 200	1:240 Ft	BULK DENSITGM/CC 2 – 3 GM/CC
CALIPER X INCHES 6 – 16		PE 0 – 10 / DEN CORR GM/CC 1.25 – 2.5


QUALITY SHR
4.5
5
QUALITY LON
4.5
-.5
TENSION
10000
POUNDS
0
350
400
450
500


550
600
650
700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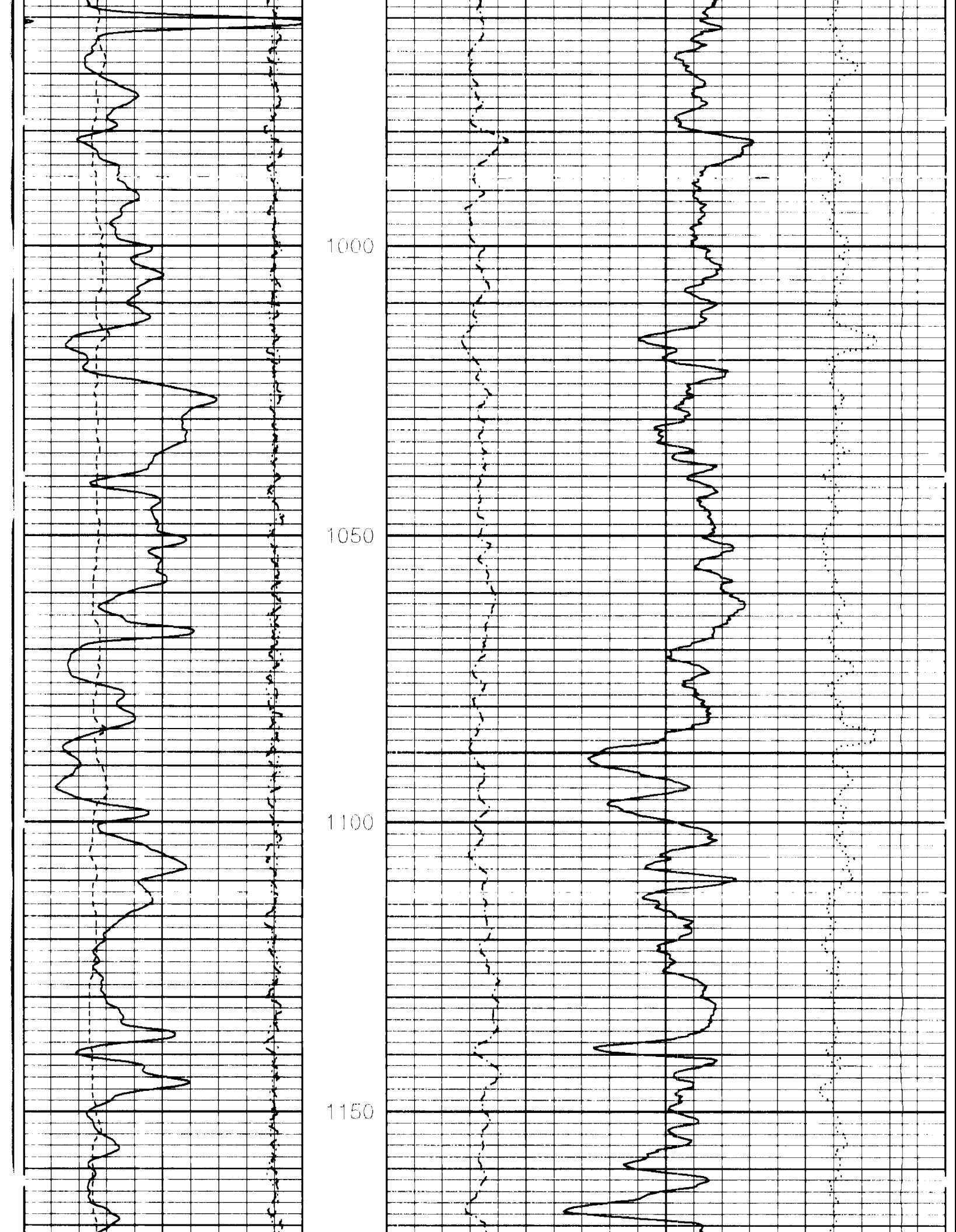
800
850
900
950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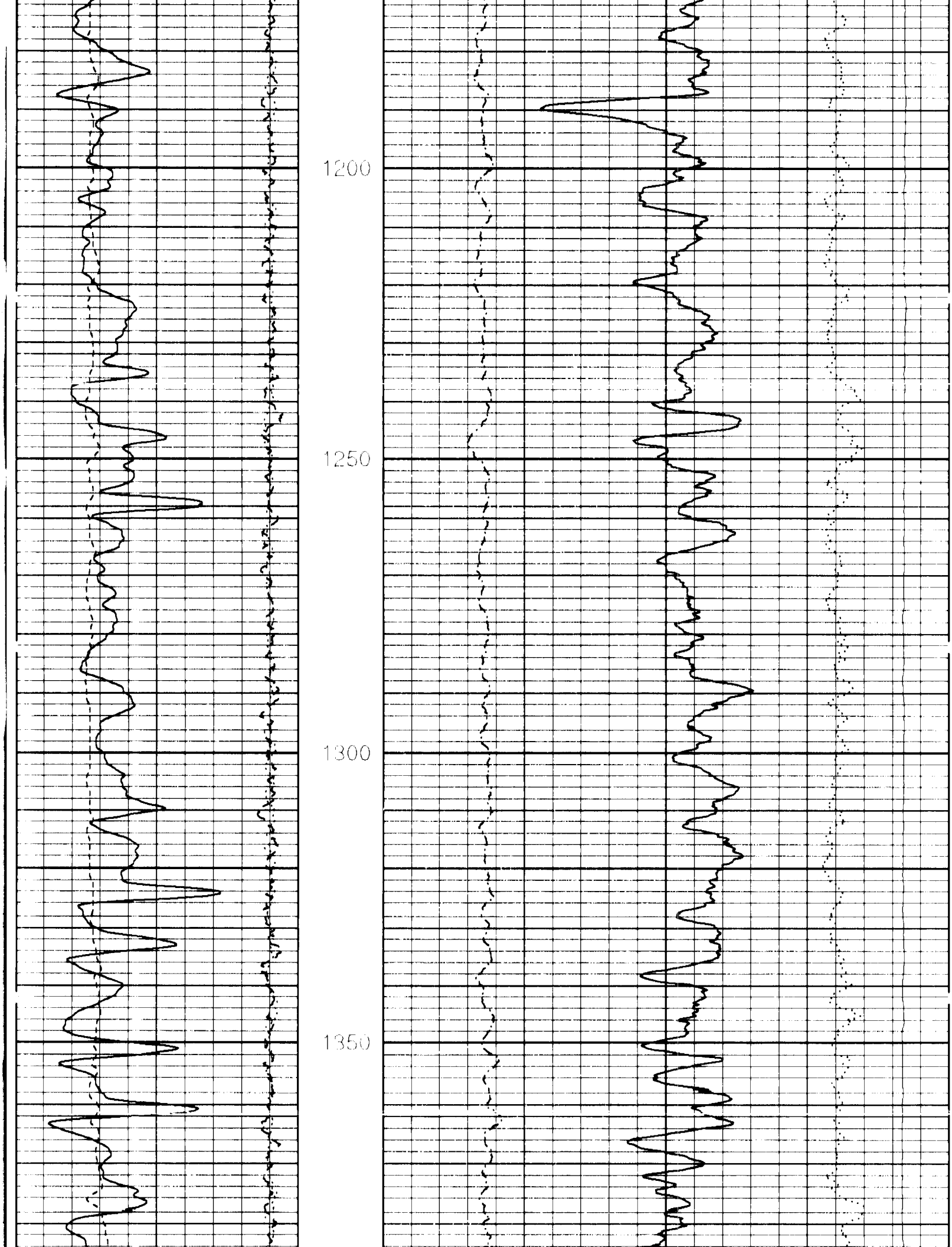
1050
1100
1150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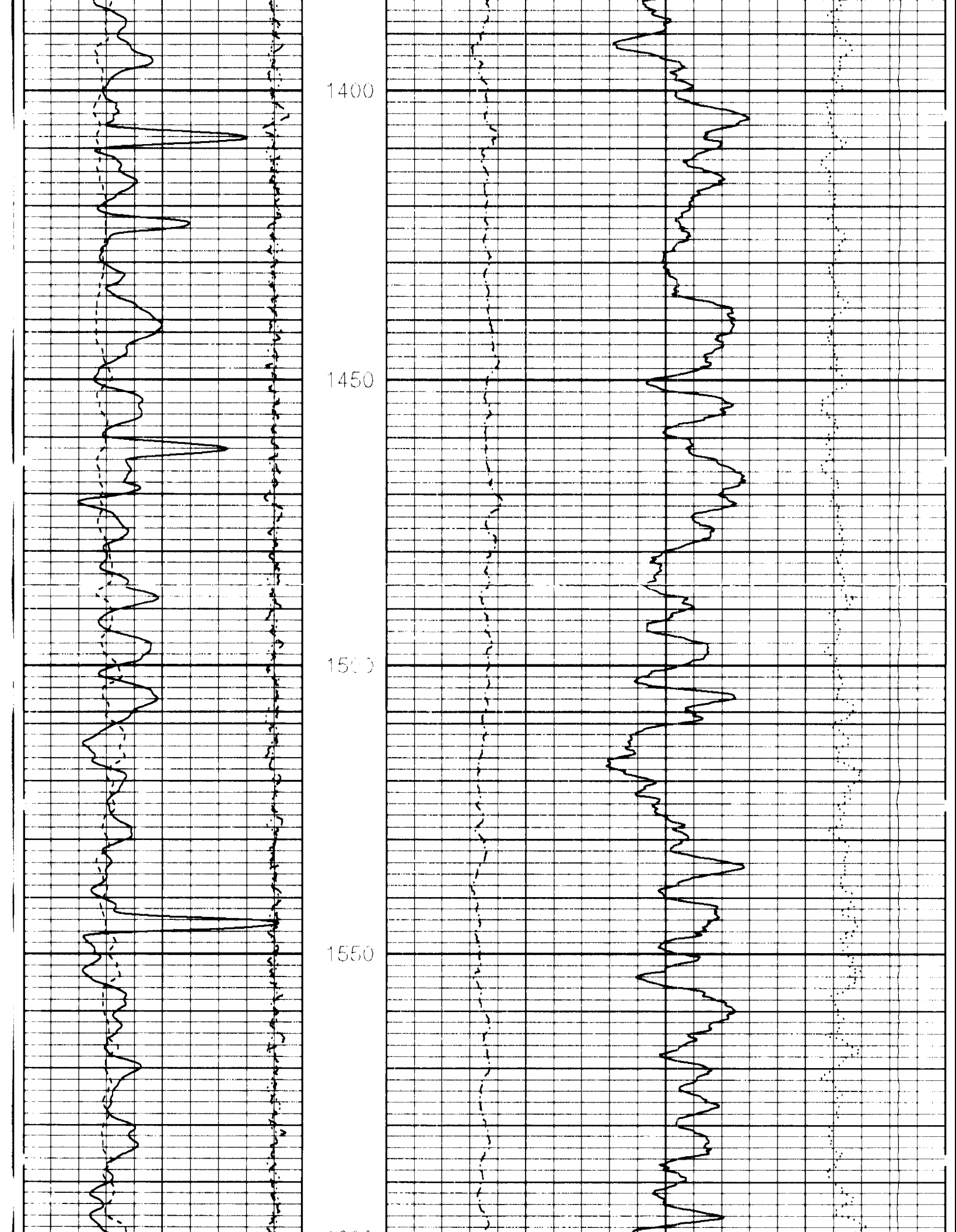
1250
1300
1350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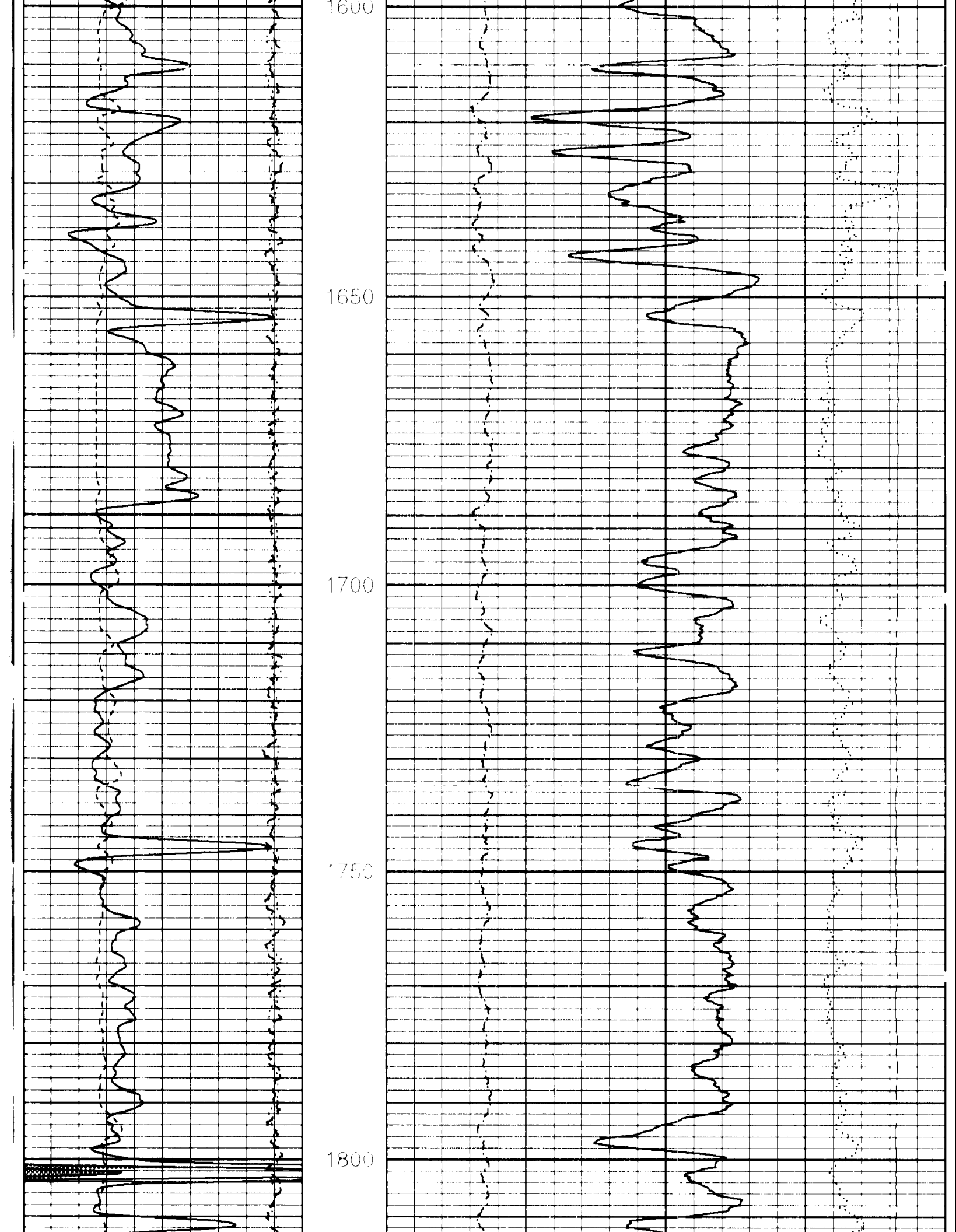
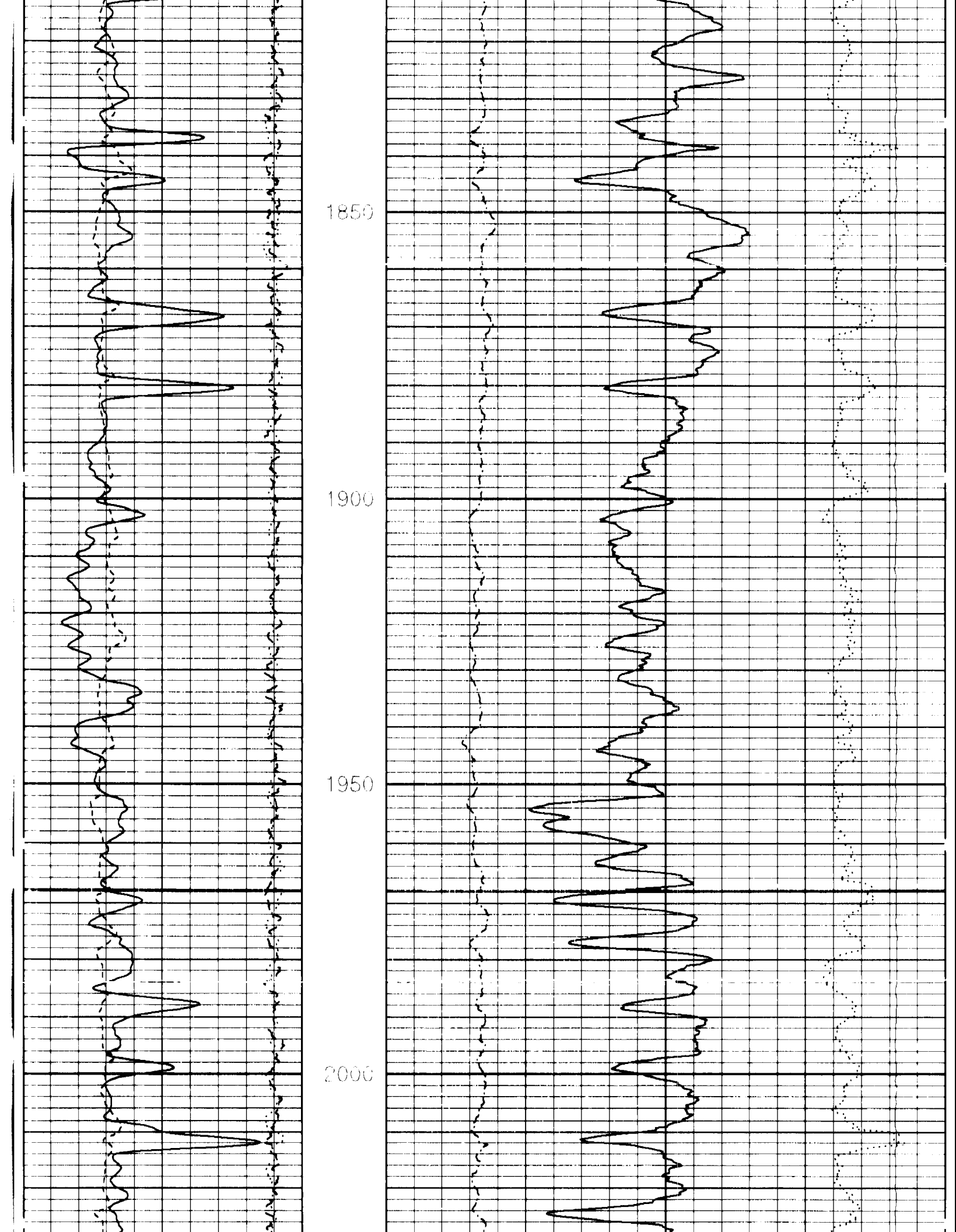
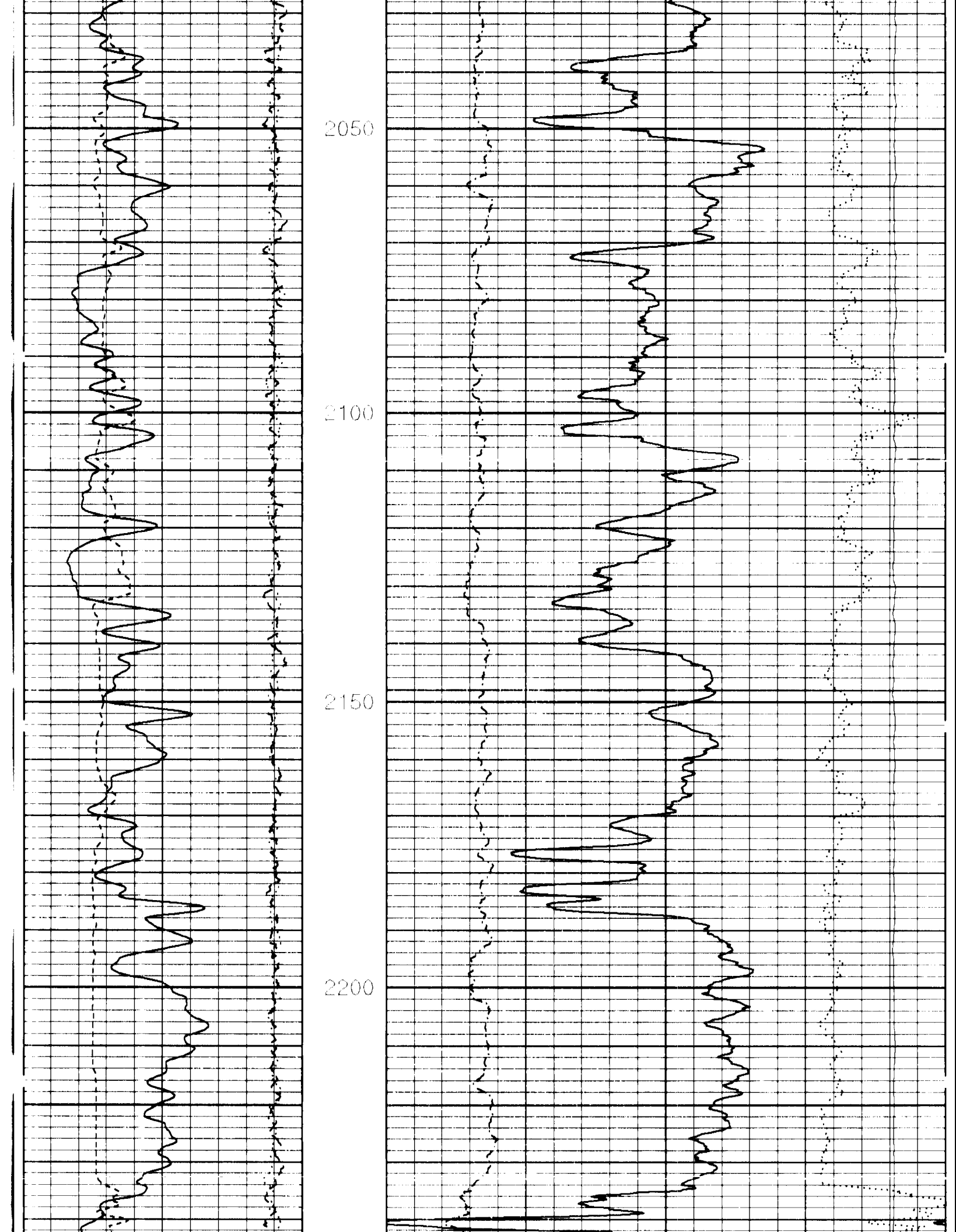
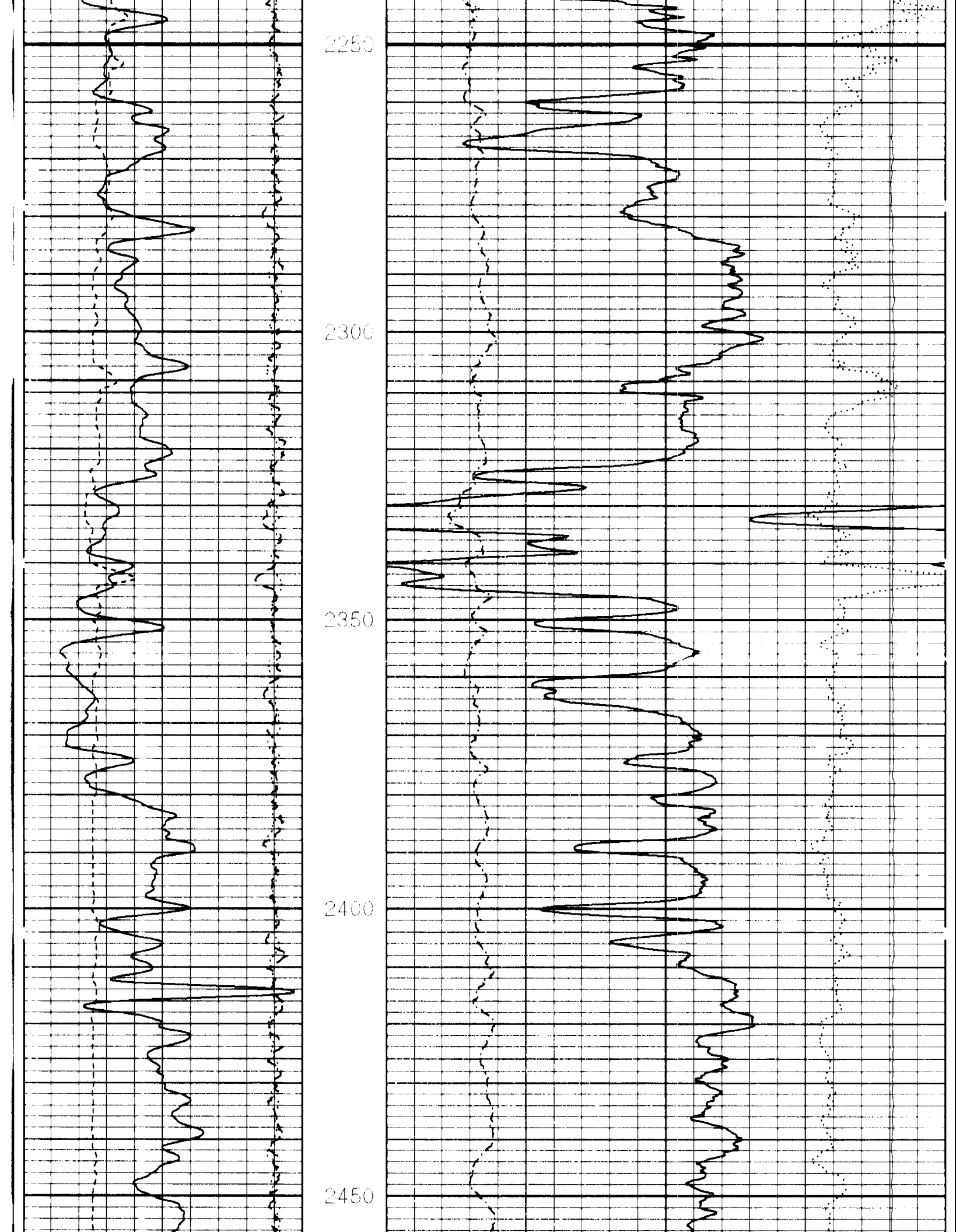
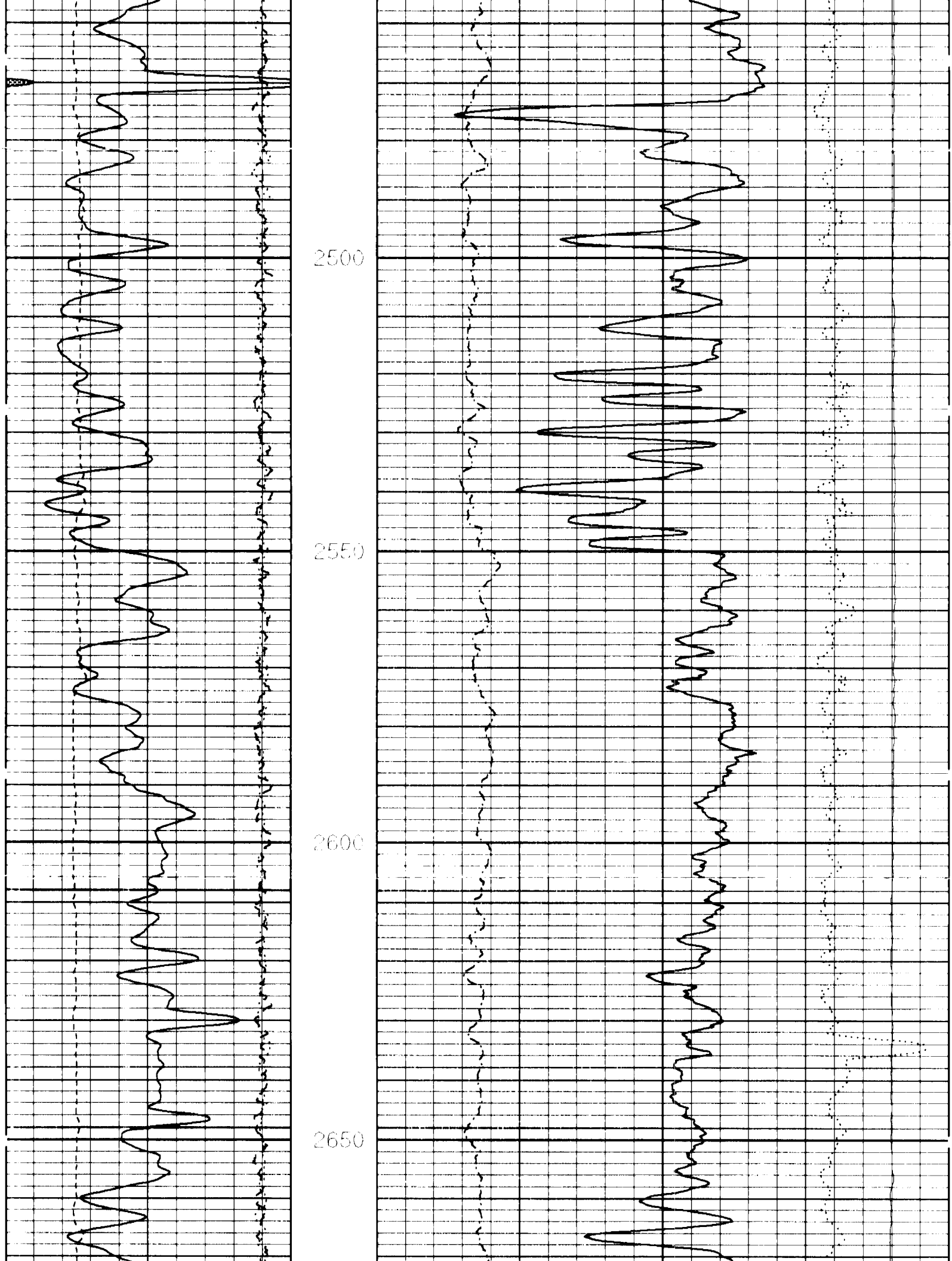
1450
1500
1550


1600
1650
1700
1750
1800


1850
1900
1950
2000


2050
2100
2150
2200


2250
2300
2350
2400
2450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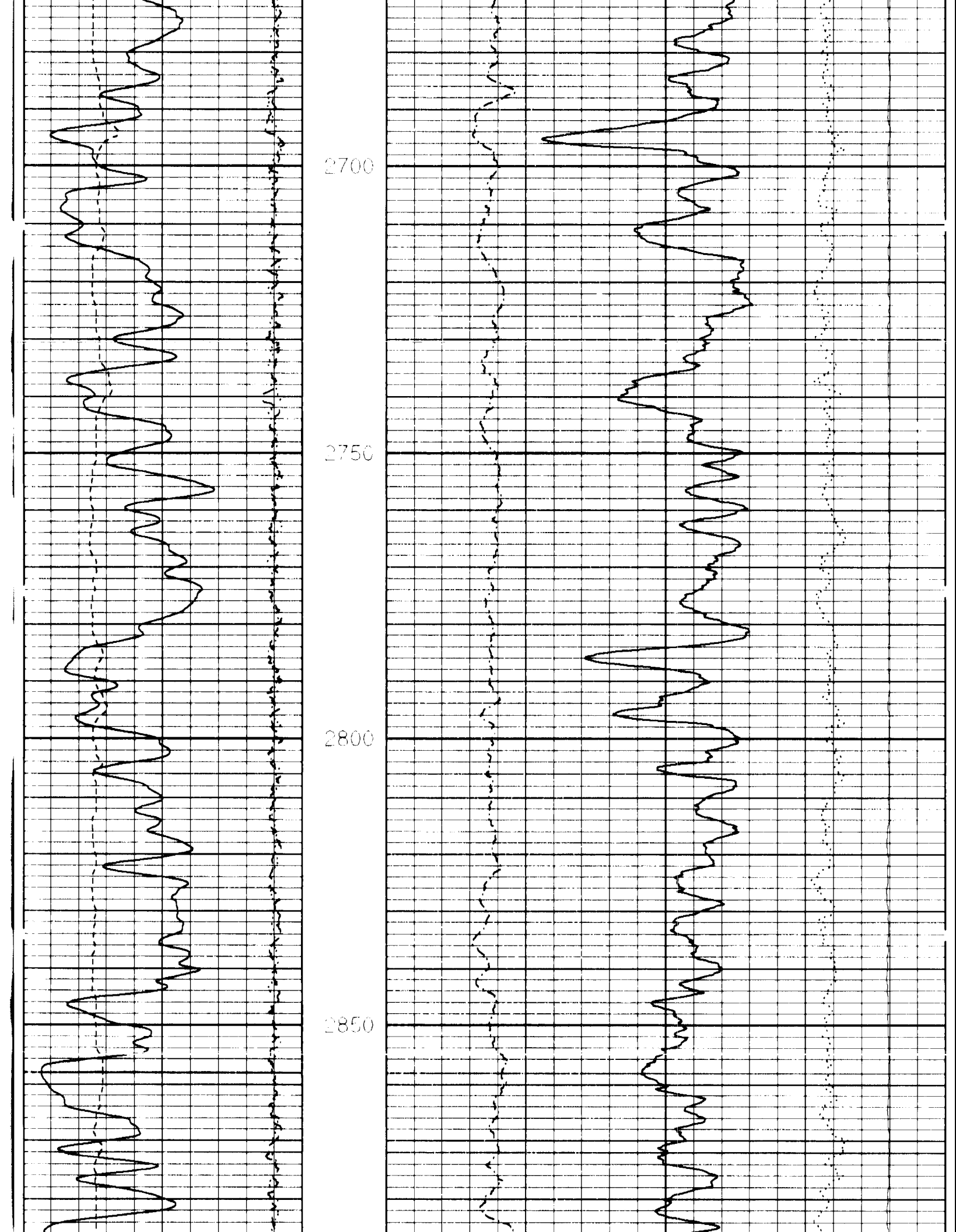
2550
2600
2650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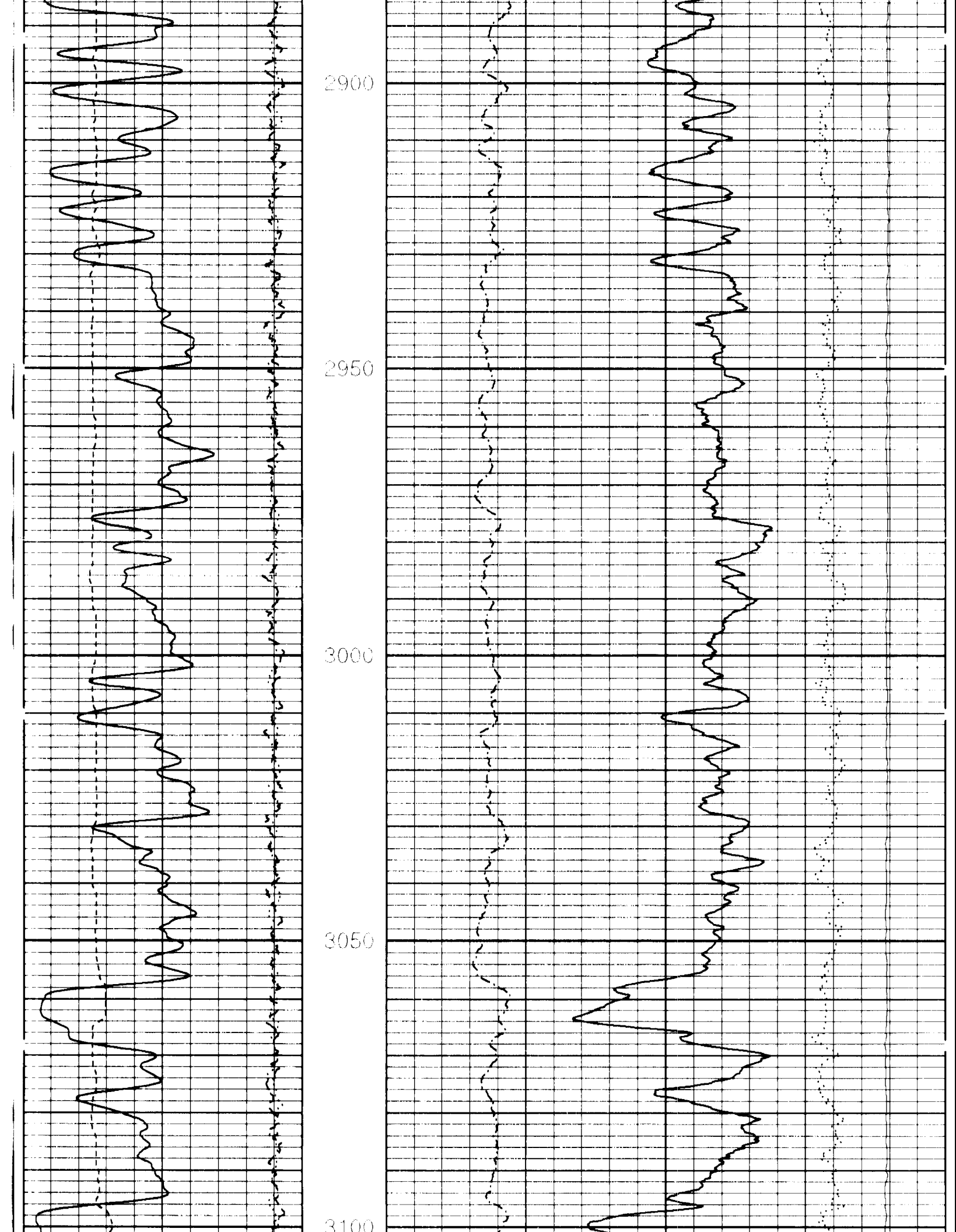
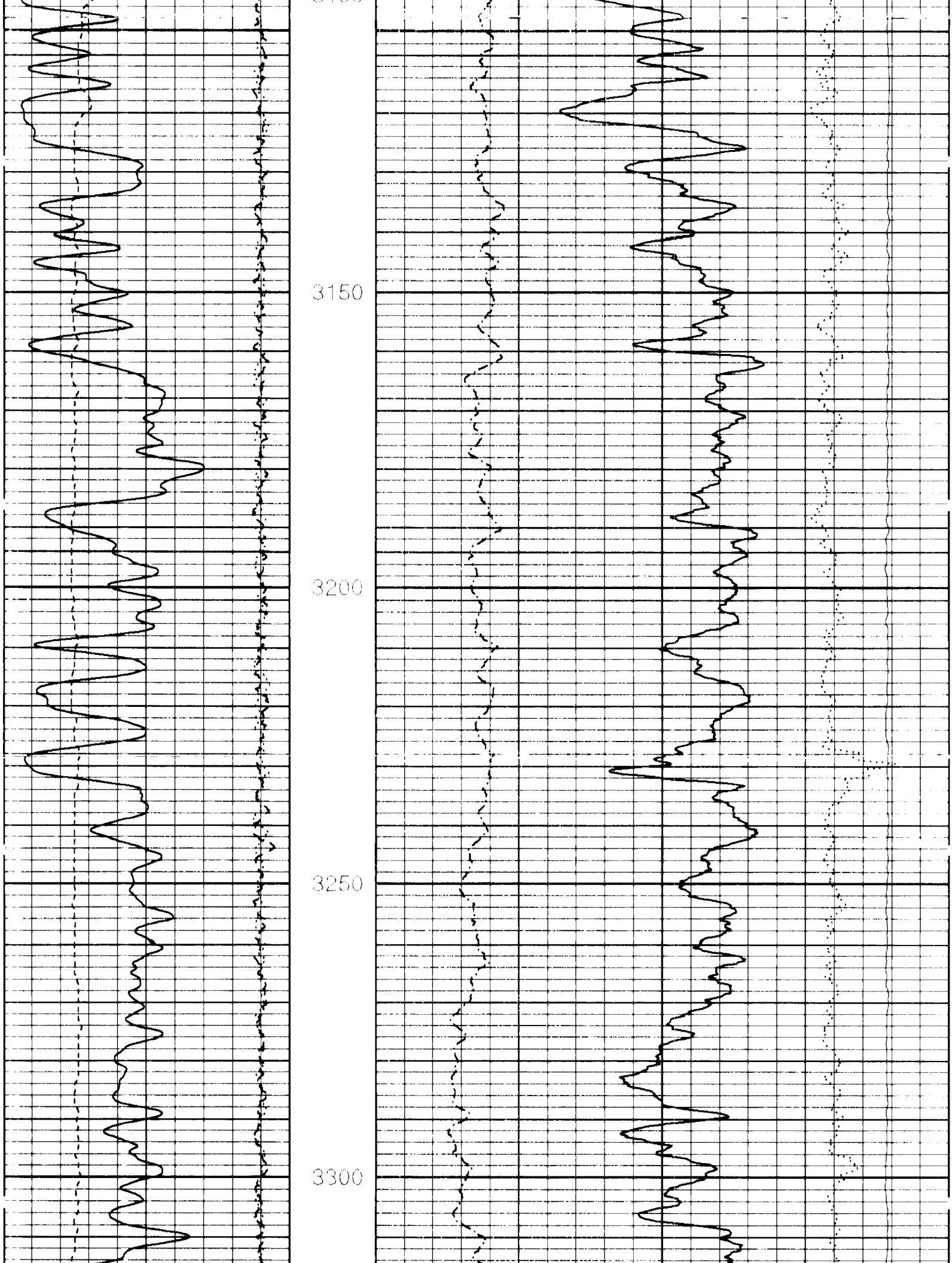
2750
2800
2850


2900
2950
3000
3050
3100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3200
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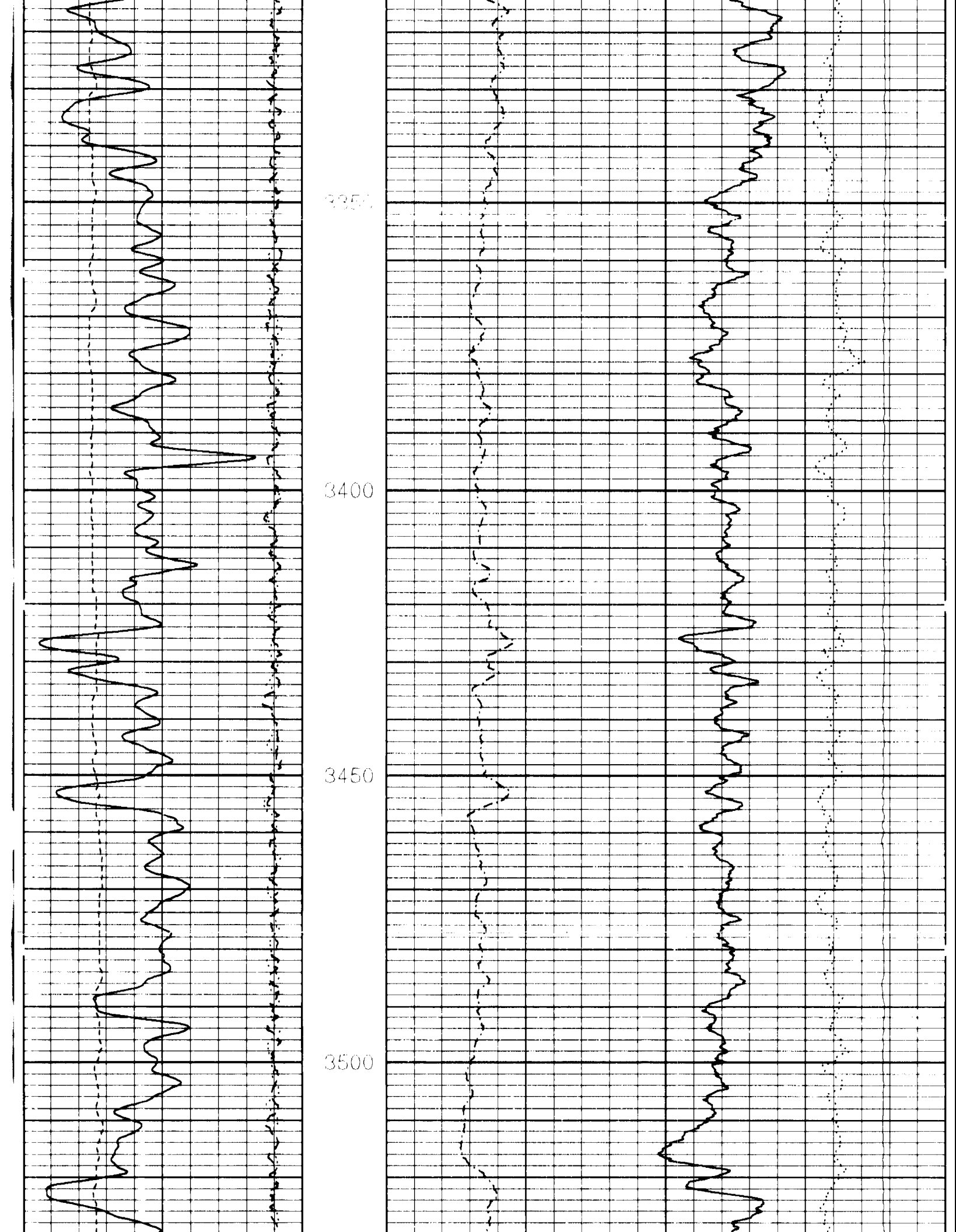
3300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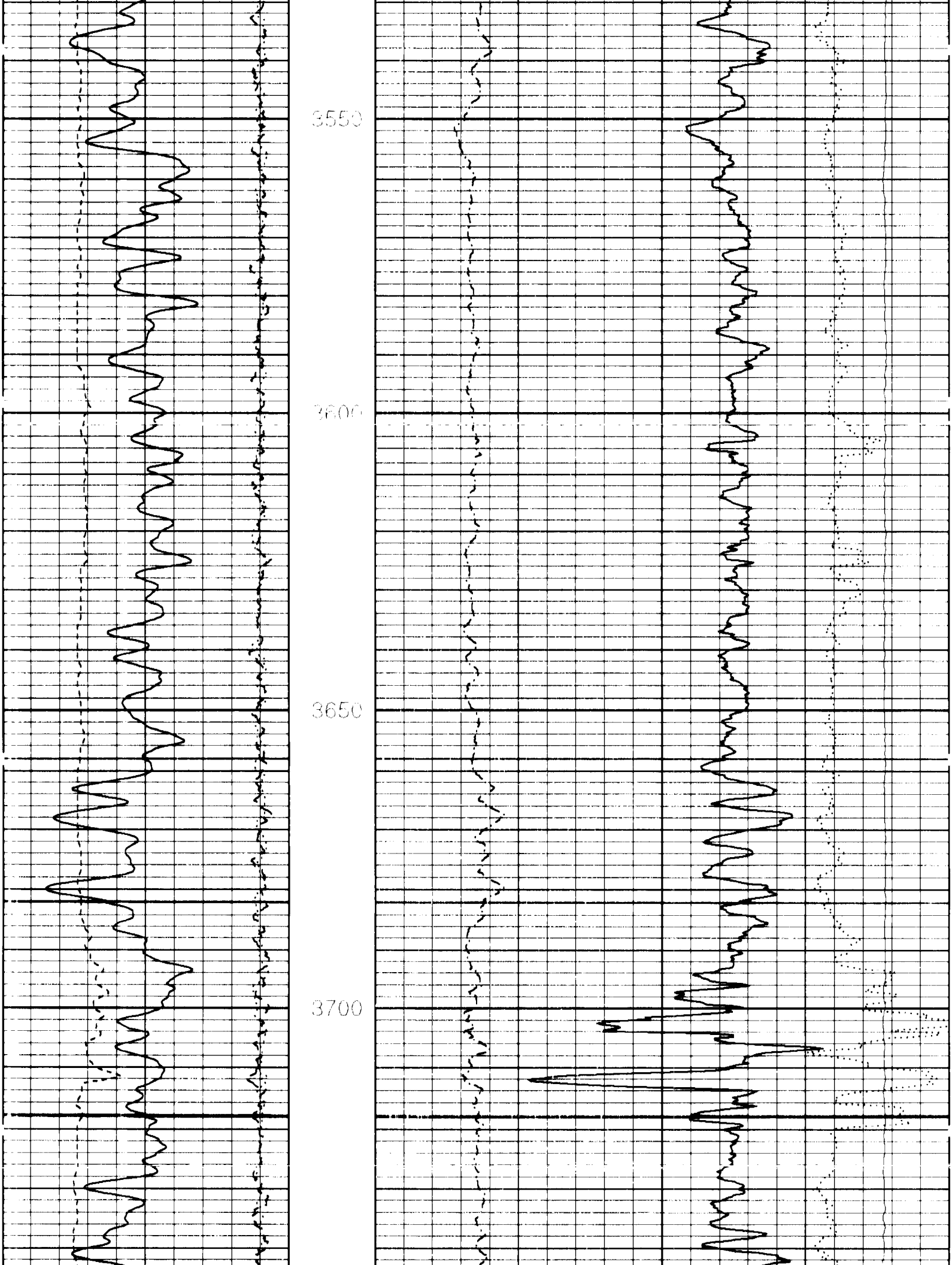
3450
3500


3550
3600
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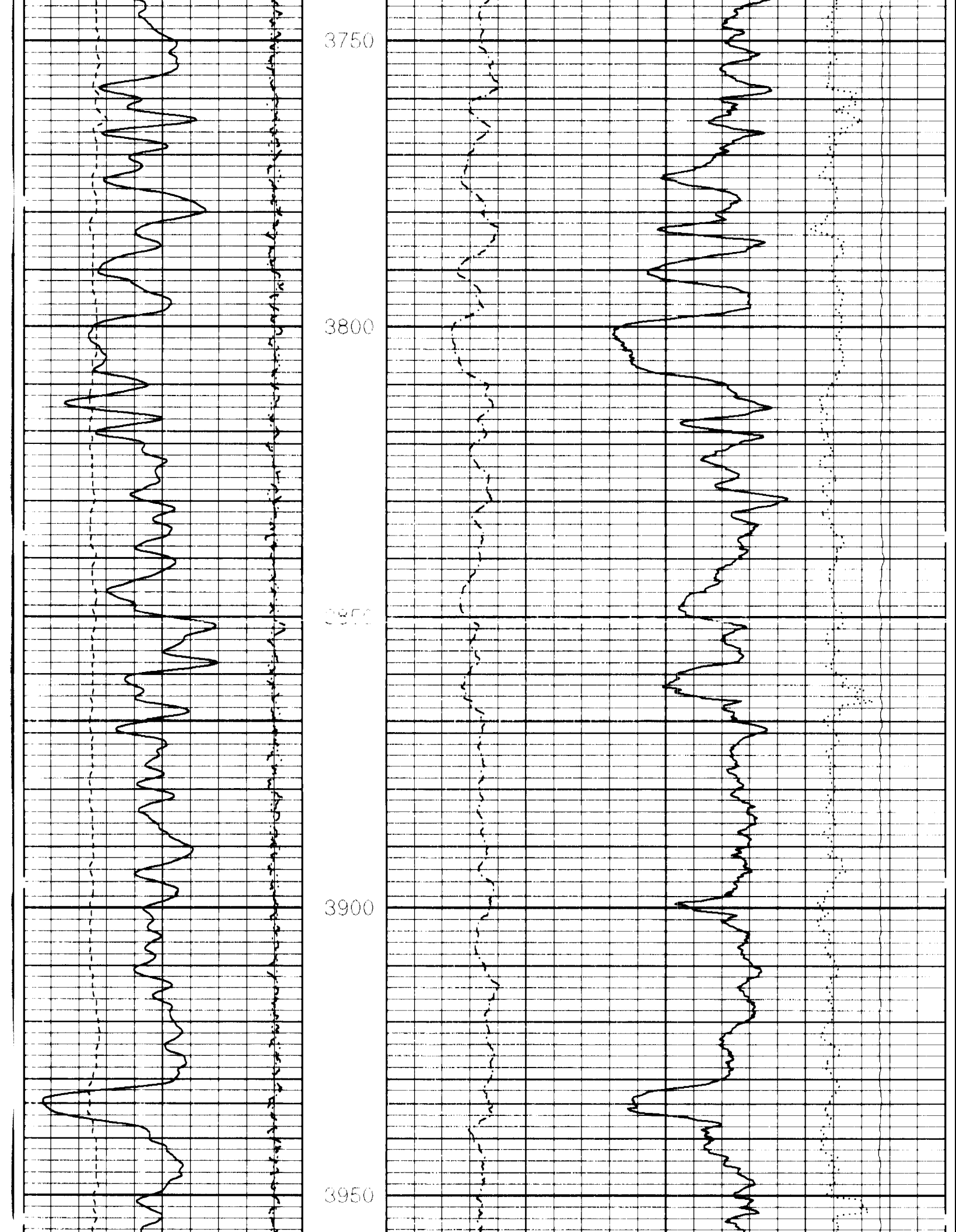
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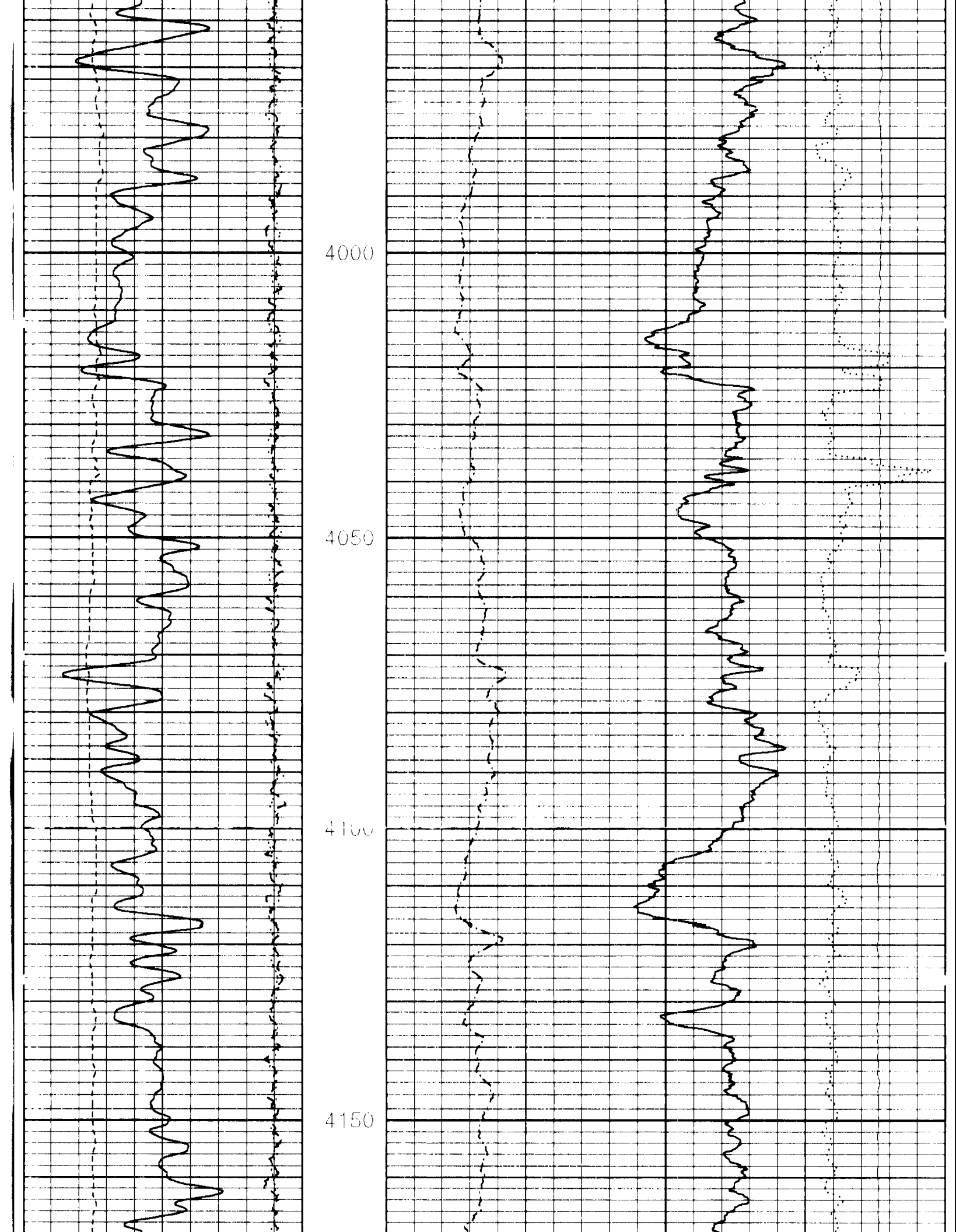
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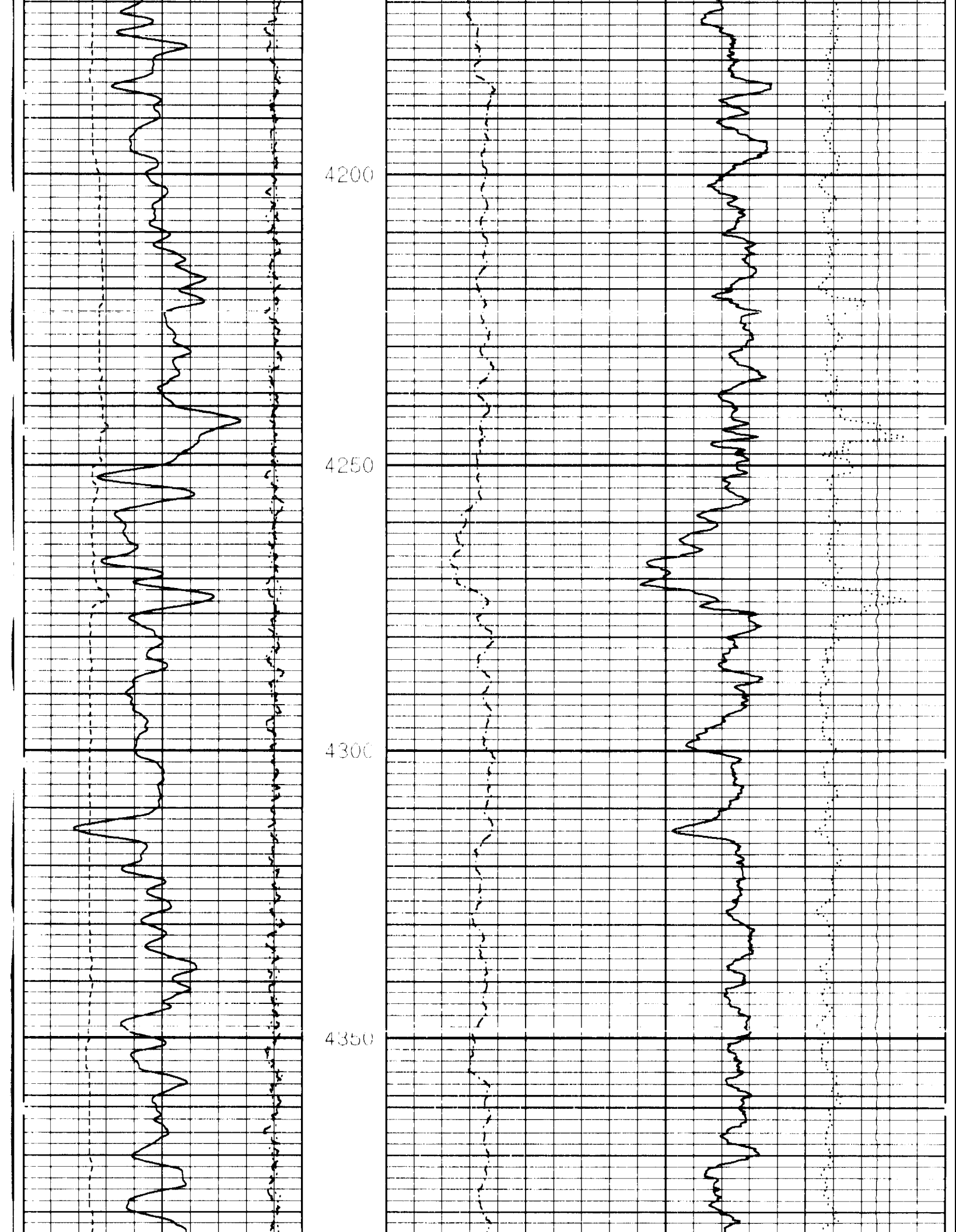
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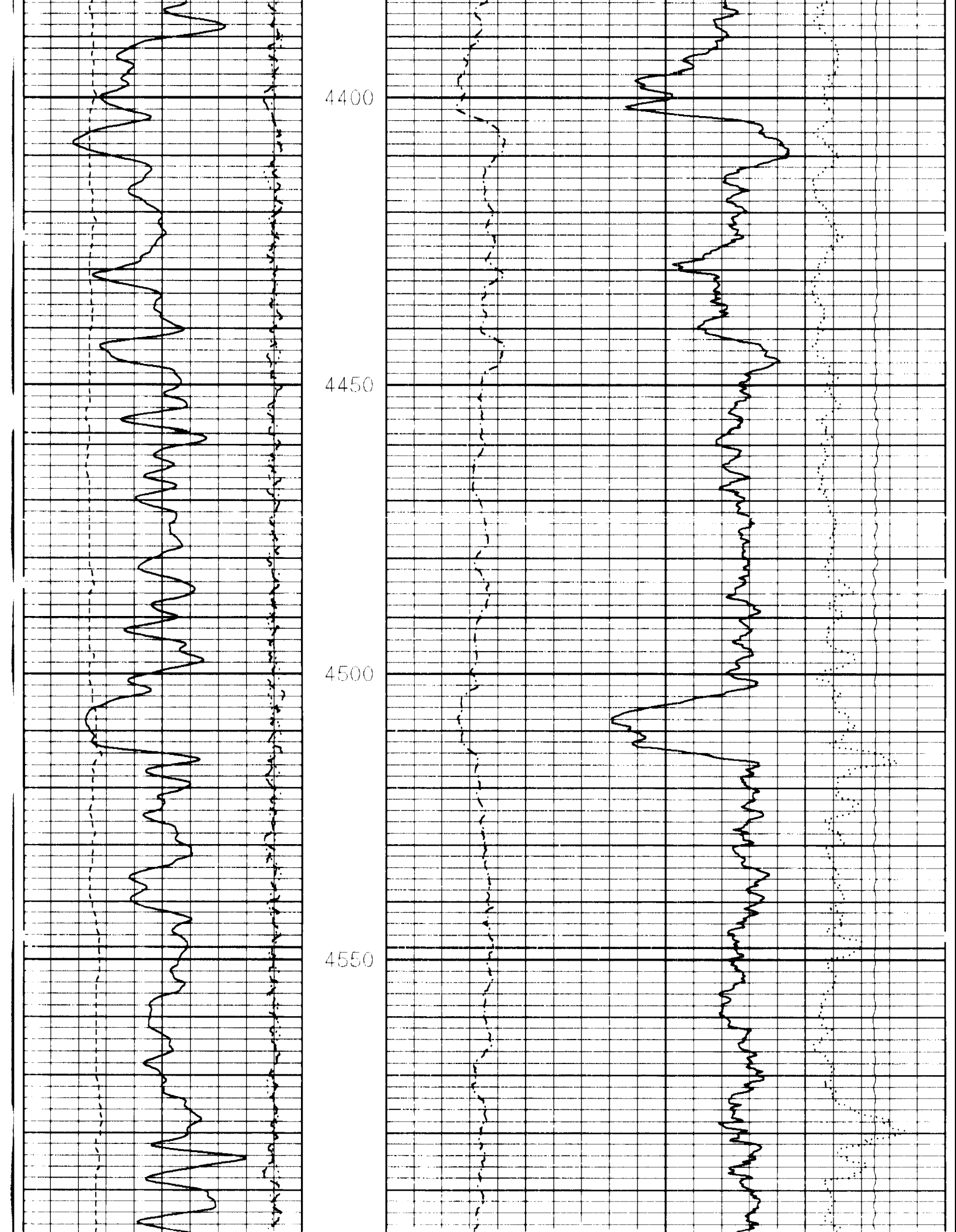
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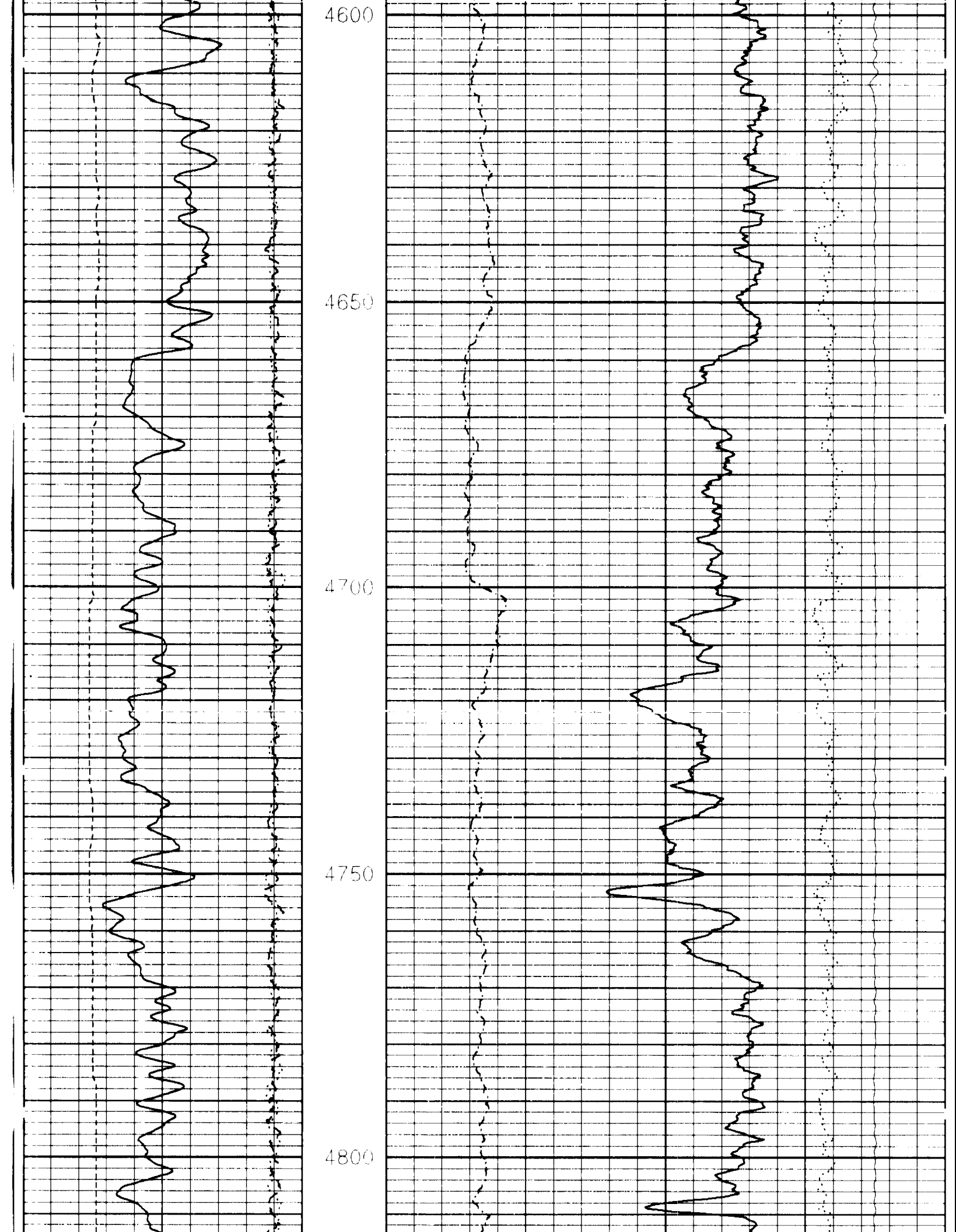
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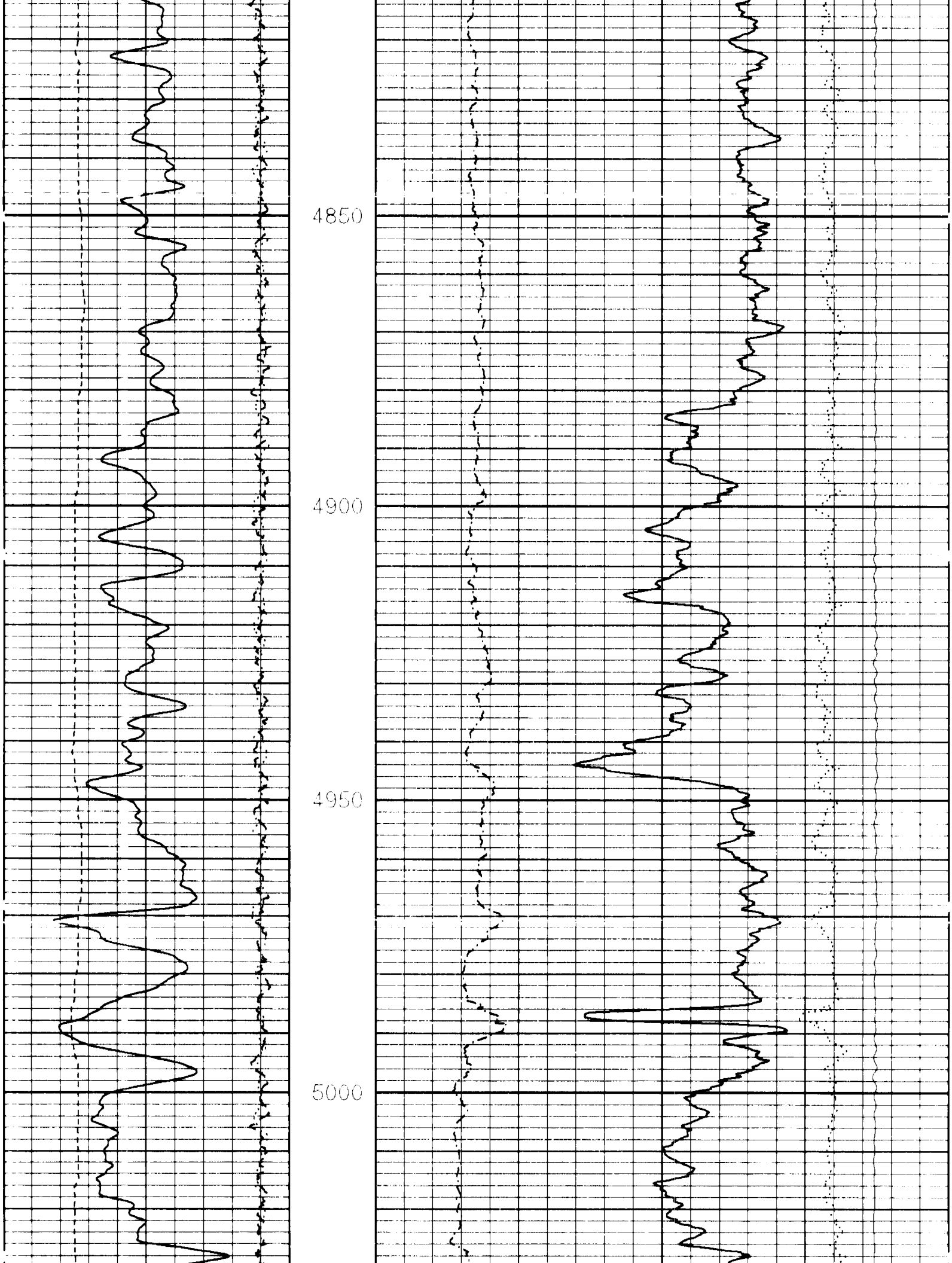
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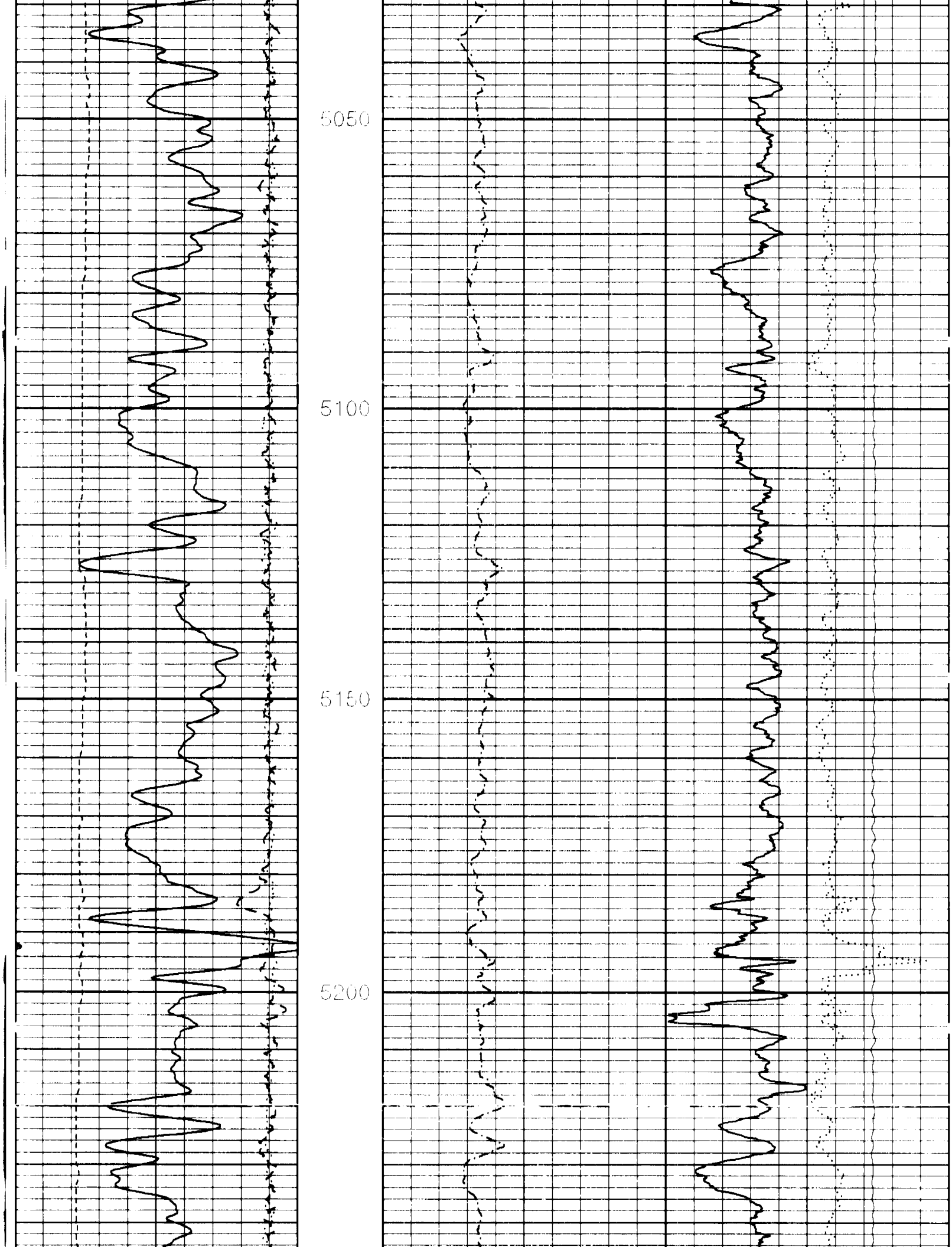
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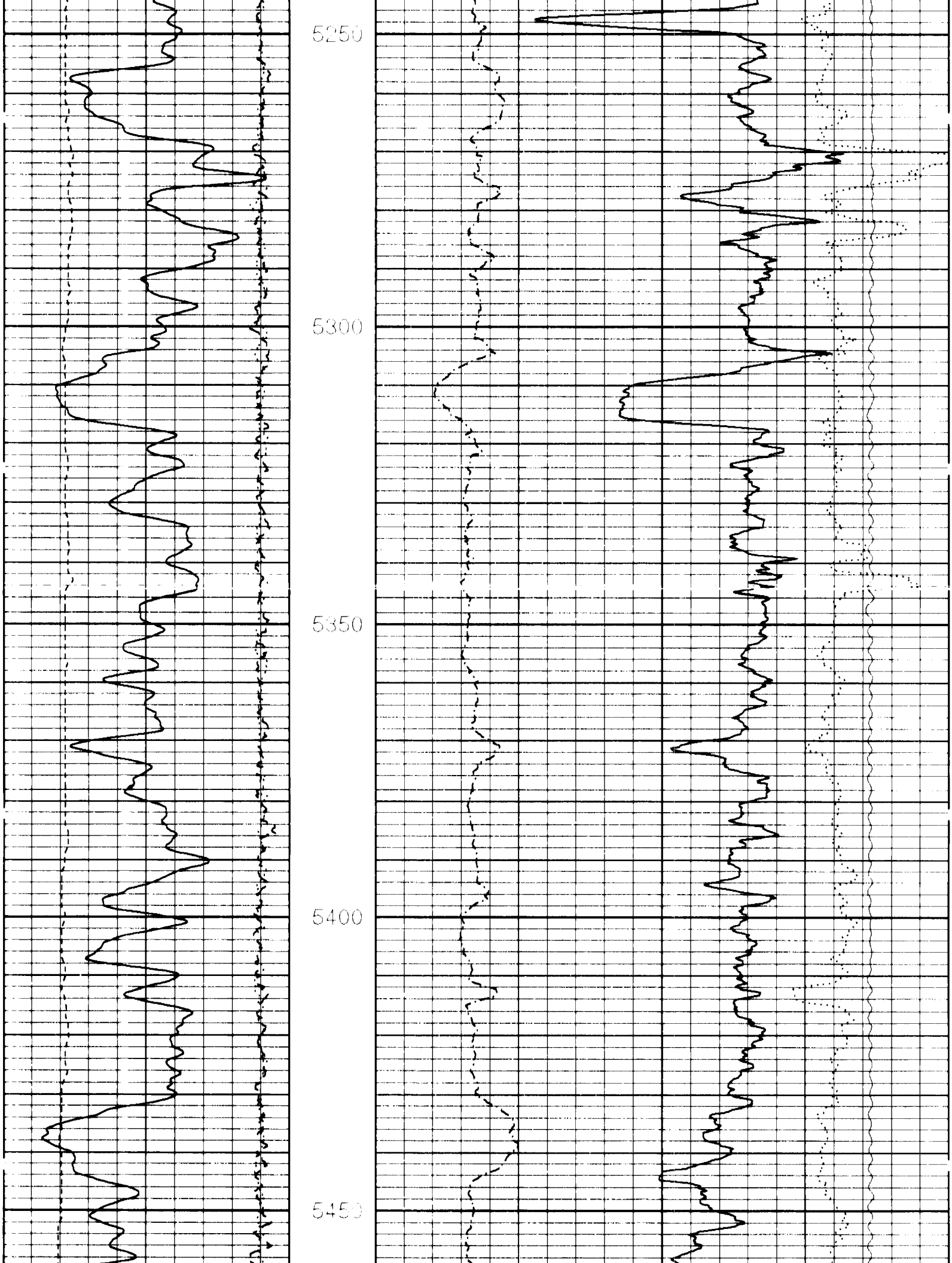
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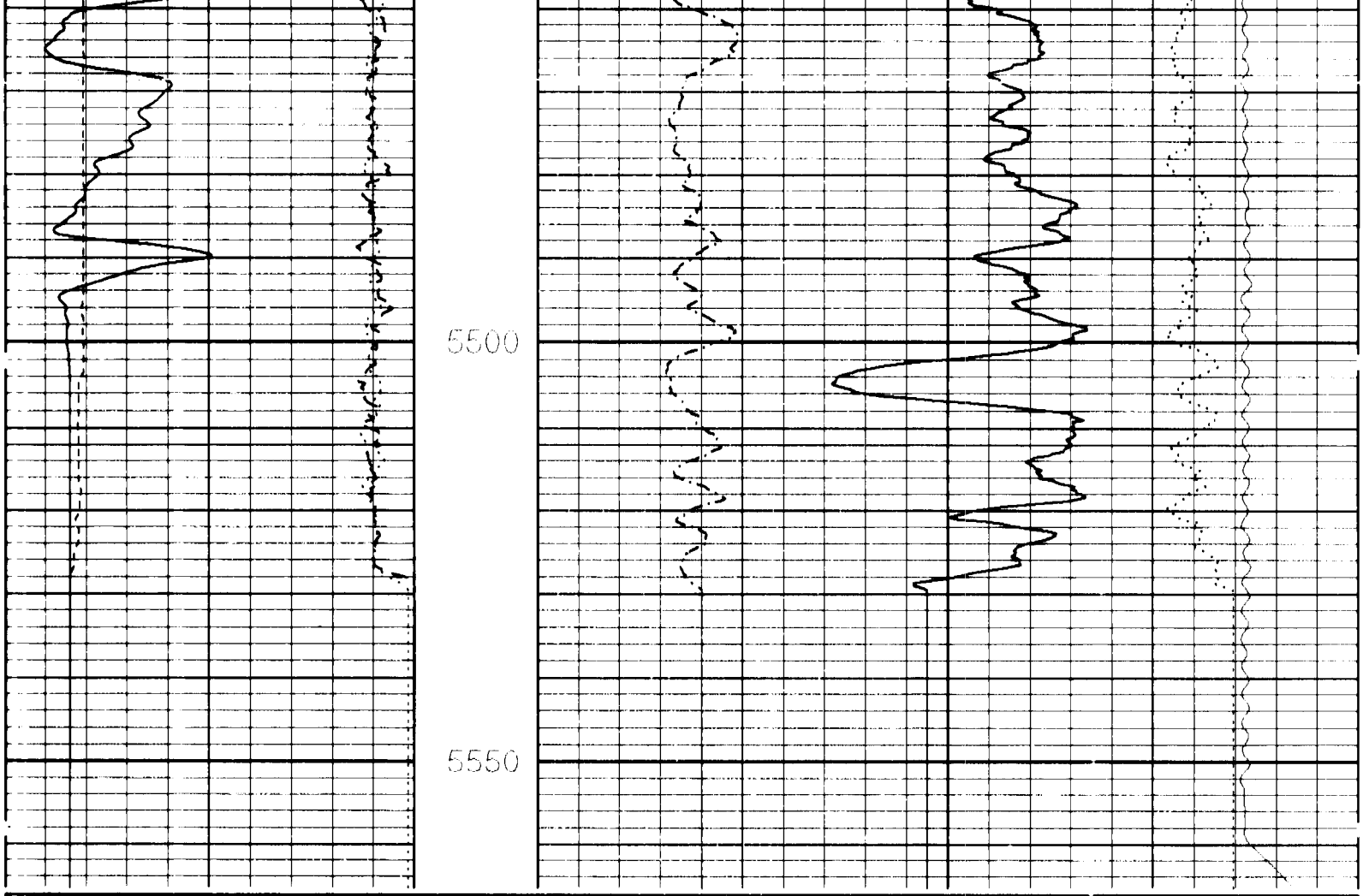


QUALITY LON
4.5 -5
QUALITY SHR
-4.5 5
CALIPER X
6 INCHES 16
GAMMA RAY
0 GAMMAAPI 200

1:240 Ft

PE
0 10
BULK DENSITGM/CC
2 GM/CC 3

TENSION
10000 POUNDS 0
DEN CORR
-.25 GM/CC .25

HALLIBURTON
EXCELL

Version No: 3.40.1 hc 3.0
Data File: ute_tribal31_04.2.cls
Format File: /field_data/data2/VERNAL_SPC/RHOB.spc

Top Depth: 341.00
Bottom Depth: 5565.25

Plot Time: 03-14-98 00:13:48
Log Time: 03-13-98 20:39:50

REPEAT SECTION

HALLIBURTON
EXCELL

Version No: 3.40.1 hc 3.0
Data File: ute_tribal31_04.1.cls
Format File: /field_data/data2/VERNAL_SPC/RHOB.spc

Top Depth: 5316.00
Bottom Depth: 5565.50

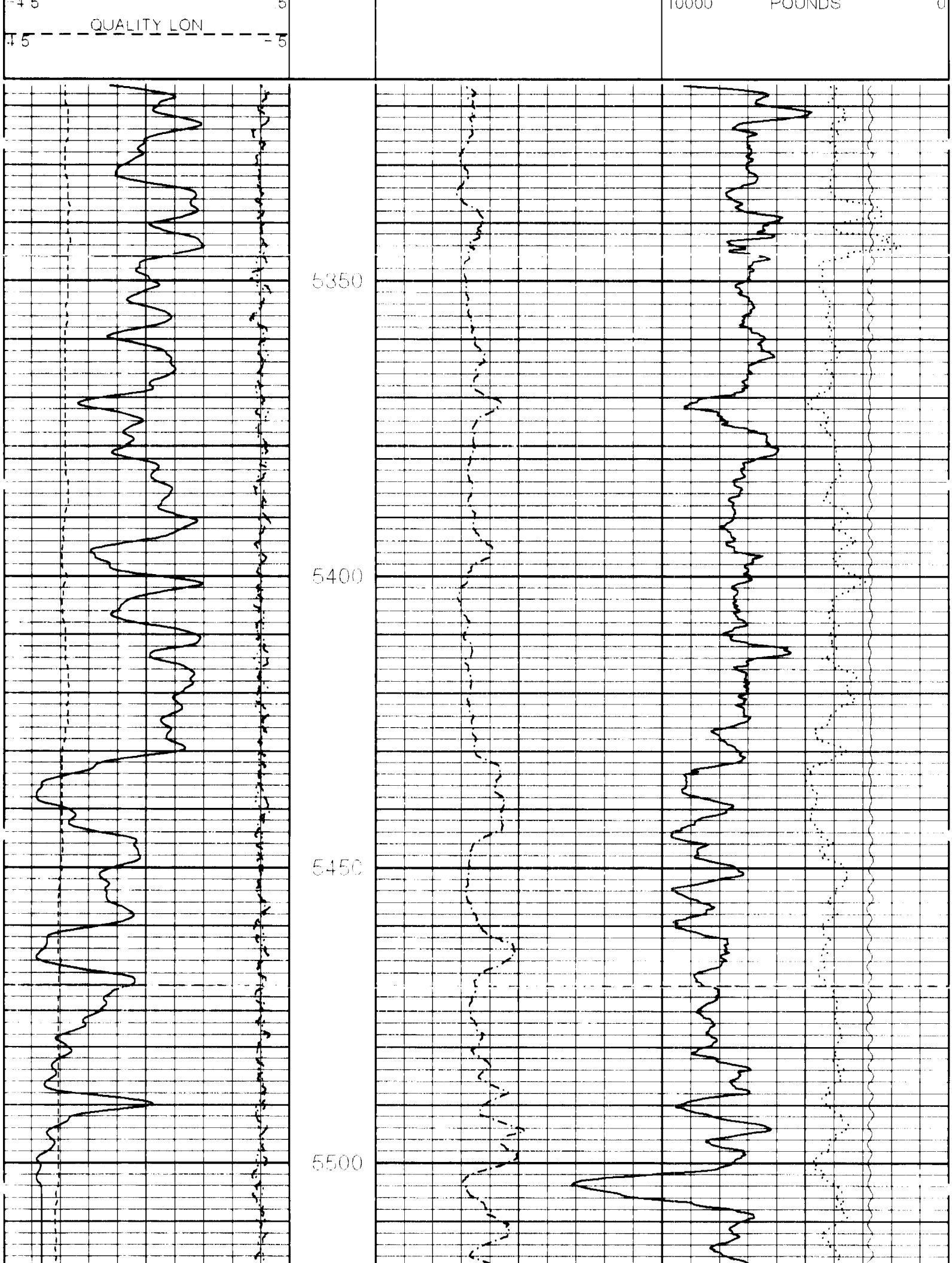
Plot Time: 03-14-98 00:20:18
Log Time: 03-13-98 20:31:17

GAMMA RAY
0 GAMMAAPI 200
CALIPER X
6 INCHES 16
QUALITY SHR

1:240 Ft

BULK DENSITGM/CC
2 GM/CC 3
PE
0 10

DEN CORR
-.25 GM/CC .25
TENSION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4 5
-5
10000
POUNDS
0
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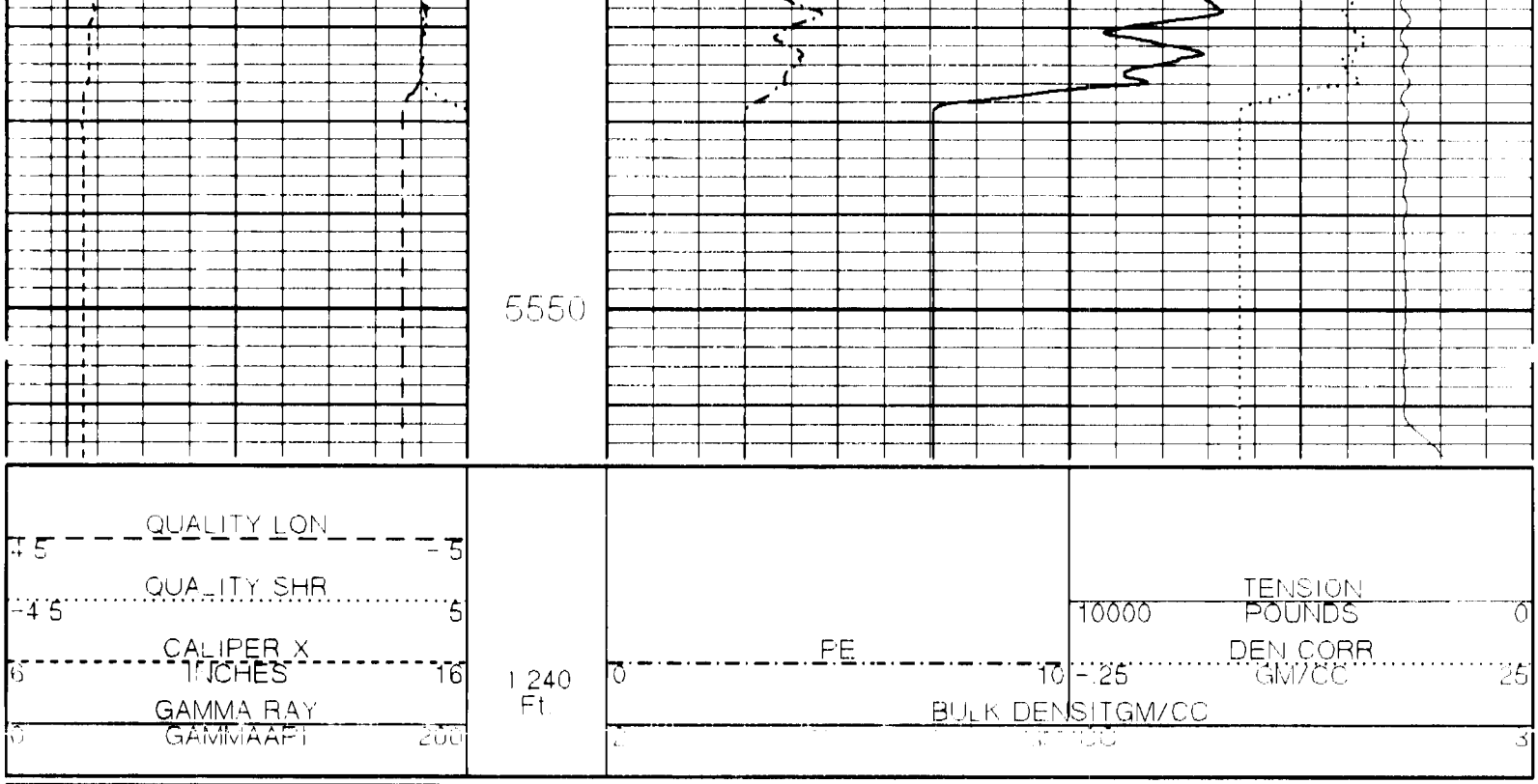
5400
5450
5500



HALLIBURTON
EXCELL

Version No 3 40 : hc 3 0
Data File ute_tribal31_04 1 dls
Format File /field_data/data2/VERNAL_SPC/RHOB spc

Top Depth 5316 00
Bottom Depth 5565 50

Plot Time 03-14-98 00 19 57
Log Time 03-13-98 20 31 17

EXCELL-2000 Calibration Report
Date: 14-Mar-1998 00:02

GAMMA RAY TOOL SHOP CALIBRATION SUMMARY

PERFORMED: 09-Mar-1998 14:33 LAST SHOP CALIBRATION: 10-Feb-1998 16:38
SERIAL NUMBER: 108631 MODEL: NGRT-A
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: GOODNOUGH

	MEASURED	CALIBRATED	UNITS
BACKGROUND	114	118	GAPI
BACKGROUND+CALIBRATOR	319	331	GAPI
CALIBRATOR	205	213	GAPI
GAPI CONVERSION FACTOR	0.530		GAPI/CPS

GAMMA RAY TOOL BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 19:39 LAST SHOP CALIBRATION: 09-Mar-1998 14:33

	SHOP	FIELD	UNITS
BACKGROUND	118	36	GAPI
BACKGROUND+CALIBRATOR	331	262	GAPI
CALIBRATOR	213	216	GAPI

DUAL SPACED NEUTRON II SHOP CALIBRATION SUMMARY

PERFORMED: 09-Mar-1998 15:19 LAST SHOP CALIBRATION: 09-Mar-1998 14:51
SERIAL NUMBER: 108736 MODEL: DSNT-A
SOURCE NUM: DSN-80 CALIBR NUM: 51943
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: GOODNOUGH

PRIMARY CALIBRATOR

	MEASURED	CALIBRATED	UNITS
RATIO:	6.437	6.450	
POROSITY:	24.265	24.327	%

FIELD CHECK BLOCK

CHECK RATIO:	6.291	6.304	
CHECK POROSITY:	23.587	23.648	%
SENSITIVITY:	1.0582		

DUAL SPACED NEUTRON II BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 19:46 LAST SHOP CALIBRATION: 09-Mar-1998 15:19

	SHOP	FIELD	UNITS
CHECK RATIO	6.304	6.276	
CHECK POROSITY	23.648	23.518	%

DUAL SPACED NEUTRON II AFTER SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 23:34 LAST SHOP CALIBRATION: 09-Mar-1998 15:19

	BEFORE	AFTER	UNITS
CHECK RATIO	6.276	6.283	
CHECK POROSITY	23.518	24.411	%

SDL (B) WITH (C) MANDREL SHOP CALIBRATION SUMMARY

PERFORMED: 09-Mar-1998 17:09 LAST SHOP CALIBRATION: 09-Mar-1998 17:02
SERIAL NUMBER: I659P031 MODEL: SDLT-B
SOURCE NUM: 2189 CALIBR NUM: 51943
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: GOODNOUGH

PRIMARY CALIBRATOR

MAGNESIUM BLOCK

	MEASURED	CALIBRATED	UNITS
DENSITY	1.673	1.684	GM/CC
CORRECTION	0.006	0.017	GM/CC
Pe SHORT	3.251	3.175	
Pe LONG	2.877	2.880	

ALUMINUM BLOCK

	MEASURED	CALIBRATED	UNITS
DENSITY	2.597	2.606	GM/CC
CORRECTION	0.035	0.044	GM/CC
Pe SHORT	3.273	3.230	
Pe LONG	3.239	3.260	

ALUMINUM BLOCK W/SLEEVE

	MEASURED	CALIBRATED	UNITS
DENSITY	2.593	2.596	GM/CC
CORRECTION	-0.074	-0.071	GM/CC
Pe SHORT	6.538	6.140	
Pe LONG	6.377	6.410	

CALIBRATION COEFFICIENTS

	EXPECTED RANGE	CALIBRATED	UNITS
SHORT SPACE			
DENSITY SLOPE	-6.40 -> -7.60	-7.364	GM/CC
DENSITY INTERCEPT	27.00 -> 37.00	33.467	GM/CC
PE SLOPE	1.20 -> 2.30	1.717	
PE INTERCEPT	-2.20 -> -4.00	-2.873	
LONG SPACE			
DENSITY SLOPE	-1.29 -> -1.39	-1.368	GM/CC
DENSITY INTERCEPT	7.00 -> 8.10	7.727	GM/CC
PE SLOPE	1.30 -> 2.50	1.884	
PE INTERCEPT	-0.70 -> -2.10	-1.497	

PRIMARY BLOCK BACKGROUND
CESIUM - LITHOLOGY - BARITE - DENSITY

	SS VALUE	STD DEV	LS VALUE	STD DEV	UNITS
HI CESIUM WINDOW	53	8	53	8	CPS
LO CESIUM WINDOW	53	7	54	8	CPS
BARITE WINDOW	249	16	212	15	CPS
DENSITY WINDOW	283	17	223	15	CPS
LITHOLOGY WINDOW	71	9	52	8	CPS

FIELD CHECK BLOCK

ALUMINUM SLIDE IN

	MEASURED	CALIBRATED	UNITS
DENSITY	2.214	2.225	GM/CC
CORRECTION	0.063	0.074	GM/CC
Pe SHORT	5.261	5.185	
Pe LONG	4.351	4.376	

SDL (B) WITH (C) MANDREL BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 19:50 LAST SHOP CALIBRATION: 09-Mar-1998 17:09

ALUMINUM SLIDE IN	SHOP	FIELD	UNITS
ALUMINUM DENSITY	2.225	2.223	GM/CC
ALUMINUM CORRECTION	0.074	0.067	GM/CC
ALUMINUM PE SHORT	5.185	5.227	
ALUMINUM PE LONG	4.376	4.200	

SDL (B) WITH (C) MANDREL AFTER SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 23:55 LAST SHOP CALIBRATION: 09-Mar-1998 17:09

ALUMINUM SLIDE IN	BEFORE	AFTER	UNITS
ALUMINUM DENSITY	2.223	2.221	GM/CC
ALUMINUM CORRECTION	0.067	0.064	GM/CC
ALUMINUM PE SHORT	5.227	4.999	
ALUMINUM PE LONG	4.200	4.101	

SDL CALIBER SHOP CALIBRATION SUMMARY

SDL CALIPER SHOP CALIBRATION SUMMARY

PERFORMED: 09-Mar-1998 15:38 LAST SHOP CALIBRATION: 11-Feb-1998 08:31
SERIAL NUMBER: A031 MODEL: SDLT-A
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: GOODNOUGH

	MEASURED	CALIBRATED	UNITS
VALUE 1	5.934	6.000	INCH
VALUE 2	14.612	14.250	INCH
GAIN	0.01146		
OFFSET	-6.146		

SDL CALIPER BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 19:37 LAST SHOP CALIBRATION: 09-Mar-1998 15:38

	SHOP	FIELD	UNITS
VALUE 1	6.000	5.885	INCH

EXCELL-2000 Calibration Summary Table
Date: 14-Mar-1998 00:02

Service or Signal	Shop	Before	After	Change	Tolerance
GAMMA	213	216		-3	+/- 9.0
DSN POROSITY	23.648	23.518	24.411	-0.893	+/-0.9
BULK DENSITY	2.225	2.223	2.221	0.002	+/-.015
DENSITY CORRECTION	0.074	0.067	0.064	0.003	+/-.015
DENSITY PE SHORT	5.185	5.227	4.999	0.229	+/-.3
DENSITY PE LONG	4.376	4.200	4.101	0.099	+/-.3
CALIPER VALUE 1	6.000	5.885		0.115	+/-0.5

EXCELL-2000 CUSTOMER EVENT LOG
Date: 13-Mar-1998 22:54

Event	Time	Section	Depth	Event Description	Data	Repeat
0001	19:07:04	0	0.00	Engineer is: GOOD		
0002	19:30:38	0	92.91	TD PARAM CHANGE 0. -->FP	5554.0000	
0003	19:30:38	0	92.91	CASEOD PARAM CHANGE 4.5 -->FP	5.5000	
0004	19:30:38	0	92.91	MUDWT PARAM CHANGE 9.1 -->FP	8.3000	
0005	19:50:40	0	92.91	Exiting EXCELL-2000 tool calibrations.	FIELD	
0006	20:22:23	0	2579.75	Exiting EXCELL-2000 tool calibrations.	FIELD	
0007	20:31:18	1	5565.58	Begining new Uplog section.	1	
0008	20:36:29	1	5313.83	End logging section	1	
0009	20:39:51	2	5565.33	Begining new Uplog section.	2	
0010	22:07:51	2	300.00	CASED PARAM CHANGE FALSE -->LP	TRUE	
0011	22:07:51	2	300.00	CASEOD PARAM CHANGE 5.5000 -->FP	8.6250	
0012	22:07:51	2	300.00	CASEWT PARAM CHANGE 17.0000 -->FP	24.0000	
0013	22:07:51	2	300.00	DSN_OK PARAM CHANGE TRUE -->LP	FALSE	
0014	22:07:51	2	300.00	SDL_OK PARAM CHANGE TRUE -->LP	FALSE	
0015	22:07:51	2	300.00	CAL_OK PARAM CHANGE TRUE -->LP	FALSE	
0016	22:07:51	2	300.00	AHVOK PARAM CHANGE TRUE -->LP	FALSE	
0017	22:07:51	2	300.00	DI_OK PARAM CHANGE TRUE -->LP	FALSE	
0018	22:07:51	2	300.00	SG_OK PARAM CHANGE TRUE -->LP	FALSE	
0019	22:11:41	2	76.41	End logging section	2	
0020	22:13:44	2	76.41	Exiting EXCELL-2000 tool calibrations.	POST	

COMPANY **PETROGLYPH OPERATING COMPANY**

WELL	UTE TRIBAL #31-04		
FIELD	ANTELOPE CREEK		
COUNTY	DUCHESNE	STATE	UT

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED
NEUTRON LOG

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

RECEIVED MAR 17 1998

DOGM

HALLIBURTON

EXCELL 2000

DUAL INDUCTIOM SHORT GUARD

COMPANY PETROGLYPH OPERATING COMPANY
WELL UTE TRIBAL #31-04
FIELD ANTELOPE CREEK
COUNTY DUCHESNE STATE UT

COMPANY PETROGLYPH OPERATING COMPANY

WELL UTE TRIBAL #31-04

FIELD ANTELOPE CREEK

COUNTY DUCHESNE STATE UT

API No. 43-013-32034
Location 770' FNL 705' FWL
NWNW
Sect 31 Twp 5S Rge 3W
POW

Other Services
SDL-DSN-GR

Permanent Datum G.L. Elev 6254
Log measured from K.B. 10 ft above perm datum
Drilling measured from K.B.

Elev.: K.B 6264
D.F
G.L. 6254

Date	[illegible]			
Run No.	ONE			
Depth – Driller	[illegible]			
Depth – Logger	[illegible]			
Bottom – Logged Interval	3559'			
Top – Logged Interval	CSG			
Casing – Driller	[illegible] @ 355'	@	@	@
Casing – Logger				
Bit Size	7 7/8"			
Type Fluid in Hole	SALT WATER			
Dens. | Visc.	8.3 | 27	|	|	|
Ph | Fluid Loss	10 | N/A	|	|	|
Source of Sample	FLOWLINE			
Rm @ Meas. Temp.	1.7 @ 56	@	@	@
Rmf @ Meas. Temp.	3.0 @ 62	@	@	@
Rmc @ Meas. Temp.	3.4 @ 62	@	@	@
Source Rmf | Rmc	MEAS | MEAS	|	|	|
Rm @ BHT	0.76 @ 125	@	@	@
Time Since Circ.	7.5 HOURS			
Time on Bottom	20:30			
Max. Rec. Temp.	125 @ TD	@	@	@
Equip. | Location	5943 | GJ	|	|	|
Recorded By	C. REDMOND	S. GOODNOUGH		
Witnessed By	C. WHITE			

Service Ticket No. 271225 API Serial No. 43-013-32034 PGM Version XL v3.40

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No.	|	|
Depth – Driller		
Type Fluid in Hole		
Dens. | Visc.	— —	
Ph | Fluid Loss	— —	
Source of Sample		
Rm @ Meas. Temp.	@	@
Rmf @ Meas. Temp.	@	@
Rmc @ Meas. Temp.	@	@
Source Rmf | Rmc	— —	
Rm @ BHT	0.76 @ 125	@
Rmf @ BHT	1.49 @ 125	@
Rmc @ BHT	1.69 @ 125	@

RESISTIVITY SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA

Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
ONE	DILT #332127	N/A	1.5" SO	N/A
ONE	SGRD #108809	N/A	1.5" SO	N/A

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	10863'	Serial No.		Serial No.	1659P031	Serial No.	108736

Model No	NGRT-A	Model No		Model No	SDL_BC	Model No	DSNT_A
Diameter	3.625	No. of Cent.		Diameter	4.5"	Diameter	3.625
Detector Model No.	102A	Spacing		Log Type	GAM-GAM	Log Type	THERMAL
Type	SCINT			Source Type	CS-137	Source Type	AM241BE
Length	4"	LSA [Y / N]		Serial No	2139	Serial No	DSN_80
Distance to Source	12'	FWDA [Y / N]		Strength	1.5 Ci	Strength	19 Ci

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale			Scale			Scale		
No.	From	To	Ft / Min	L	R	L	R	Matrix	L	R	Matrix	L	R	Matrix
ONE	TD	CSG	REC	0	200				30	-10	2.68	30	-10	SAND
											GM/CC			

Remarks:

DIL-SDL-DSN-GR RAN IN COMBINATION
AHV CALCULATED USING 5.5" CASING.
CHLORIDES: 1200 PPM

RIG: UNION RIG #16
CREW: M.ROBLES, J. NOLAN
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, GRAND JUNCTION 970 523 1661

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

HALLIBURTON

Current EXCELL-2000 Parameter Values
Depth: 92.917
Date: 13-Mar-1998 19:59

Mnemonic	Tool	Parameter Description	Value	Units
PERF	DITSHD	PERFORATED INTERVAL	NO	
TD	DITSHD	TOTAL DEPTH	5554.	FT
GR_OK	GAMMA	DO GAMMA CALCULATIONS?	YES	
CASED	SHARED	CASED HOLE?	NO	
CASEOD	SHARED	CASING DIAMETER (OD)	5.5	Inches
MUDWT	SHARED	BOREHOLE FLUID WEIGHT	8.3	Pounds/Gal.
GRSO	GAMMA	GAMMA RAY STANDOFF	0.	Inches
BS	SHARED	BIT SIZE	7.875	Inches
DSN_OK	DSN_II	DO DSN II CALCULATIONS?	YES	
DRILL	DSN_II	TPL - NEUTRON IN SLEEVE?	NO	
BADHOL	DSN_II	DSN BAD HOLE CORRECTION	NO	
NLITH	DSN_II	NEUTRON LITHOLOGY	SAND	
DSNSO	DSN_II	DSN STANDOFF	0.	Inches
DSNTMP	DSN_II	DSN II TEMPERATURE CORRECTION	NONE	
DSNPRS	DSN_II	DSN II PRESSURE CORRECTION	NONE	
SDL_OK	SDL_BC	DO SDL CALCULATIONS?	YES	
BARITE	SDL_BC	ANY BARITE IN MUD?	NO	
AIR	SDL_BC	AIR FILLED BOREHOLE?	NO	
RHOFLU	SHARED	FLUID DENSITY	1.	G/CC
RHOMAT	SDL_BC	MATRIX DENSITY	2.68	Grams/CC
CAL_OK	CAL_BC	DO CALIPER CALCULATIONS?	YES	
AHVOK	CAL_BC	DO ANNULAR VOLUME CALCULATION?	YES	
DI_OK	DIND	DO DUAL INDUCTION CALCULATION?	YES	
SG_OK	SGRD	DO SHORT GUARD CALCULATIONS?	YES	
XPHLOC	XP_RWA	CROSSPLOT SELECTION FOR XPHI	XPLT	
ARCHA	XP_RWA	ARCHIE A	0.62	
ARCHM	XP_RWA	ARCHIE M	2.15	
FSEL	XP_RWA	POROSITY SELECTION FOR F	DEN	

MAIN LOG 2"=100'

HALLIBURTON

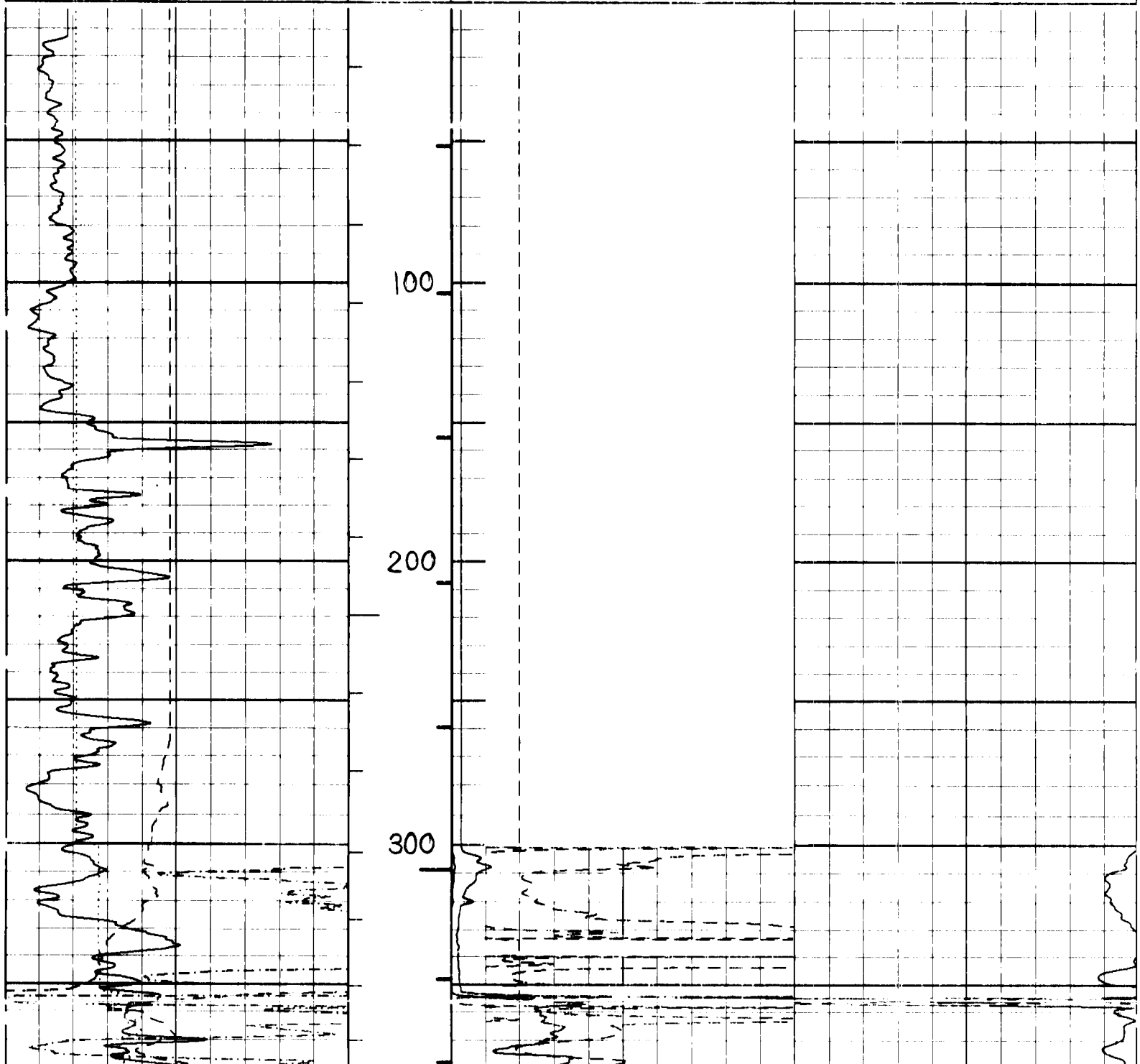
EXCELL

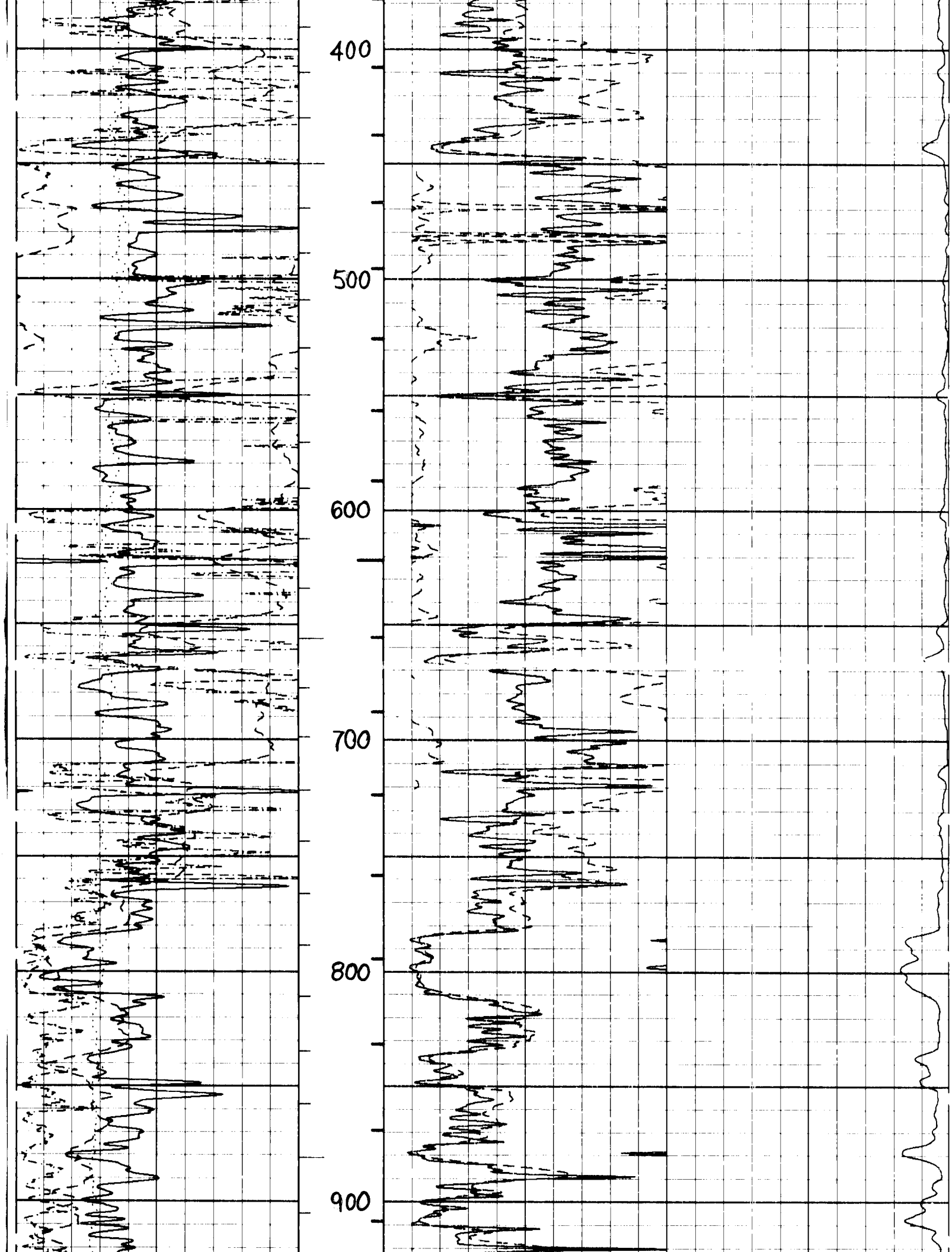
Version No: 3.40 [ncs 3.0]
Data File: ute_tribal31-04.2.dls
Format File: /field_data/data2/VERTICAL_SPC/DIL2INCH.spc

Top Depth: 160
Bottom Depth: 5565.25

First Time: 03-13-98 [illegible]
Log Time: 03-13-98 [illegible]

GAMMA RAY	ANNULUS VOLFT3	DEEP	DEEP COND.
0 APICOUNTS 200	50 FT3 0	0 OHM-M 100	500 MMHO 0
CALIPER X	BOREHOLE VOLFT3	AMP GUARD	
6 INCHES 16	0 FT3 50	0 OHM-M 10	
SP		GUARD RES	
-100	1:600 Ft	0 OHM-M 100	
RWA			
0 3			

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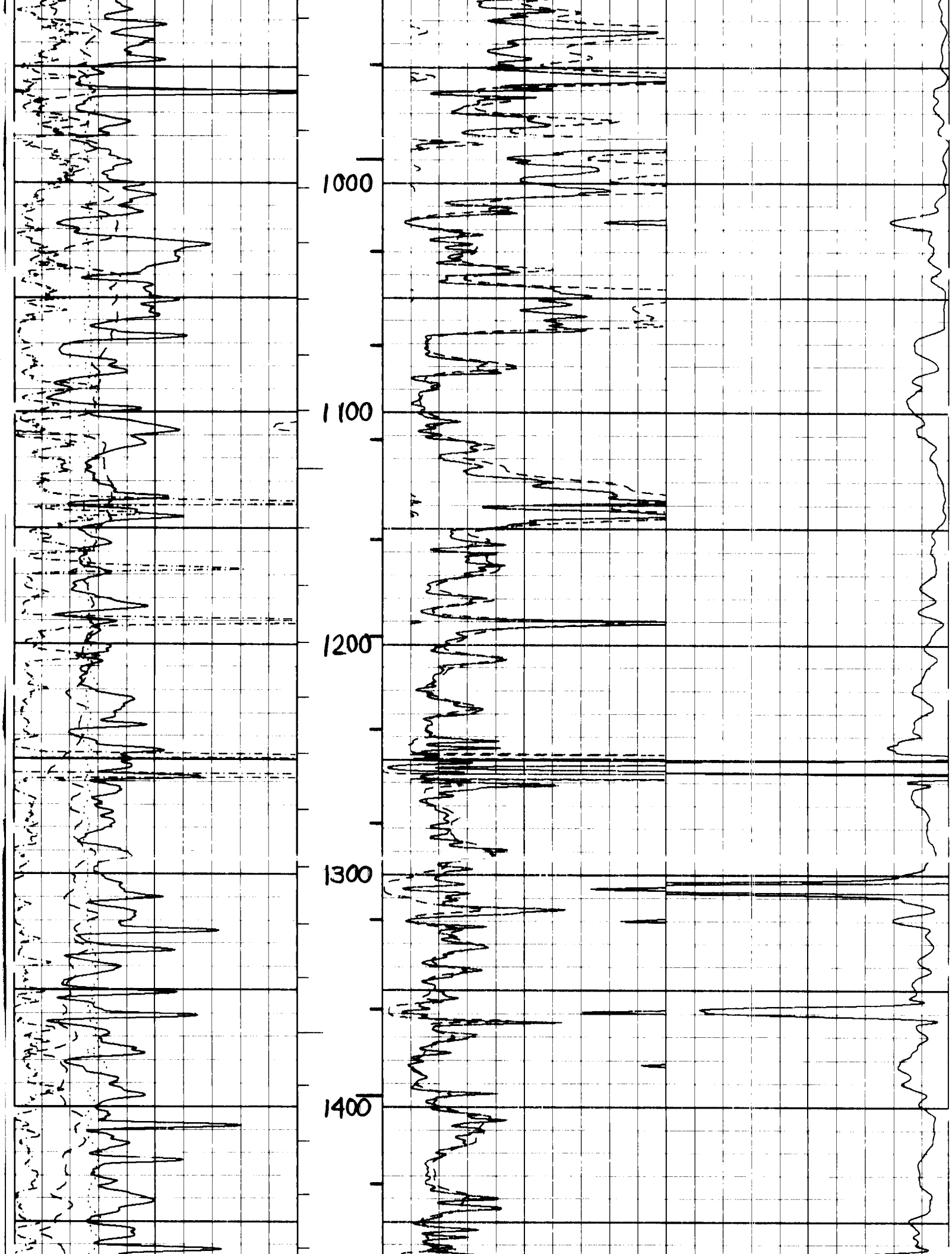
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1200
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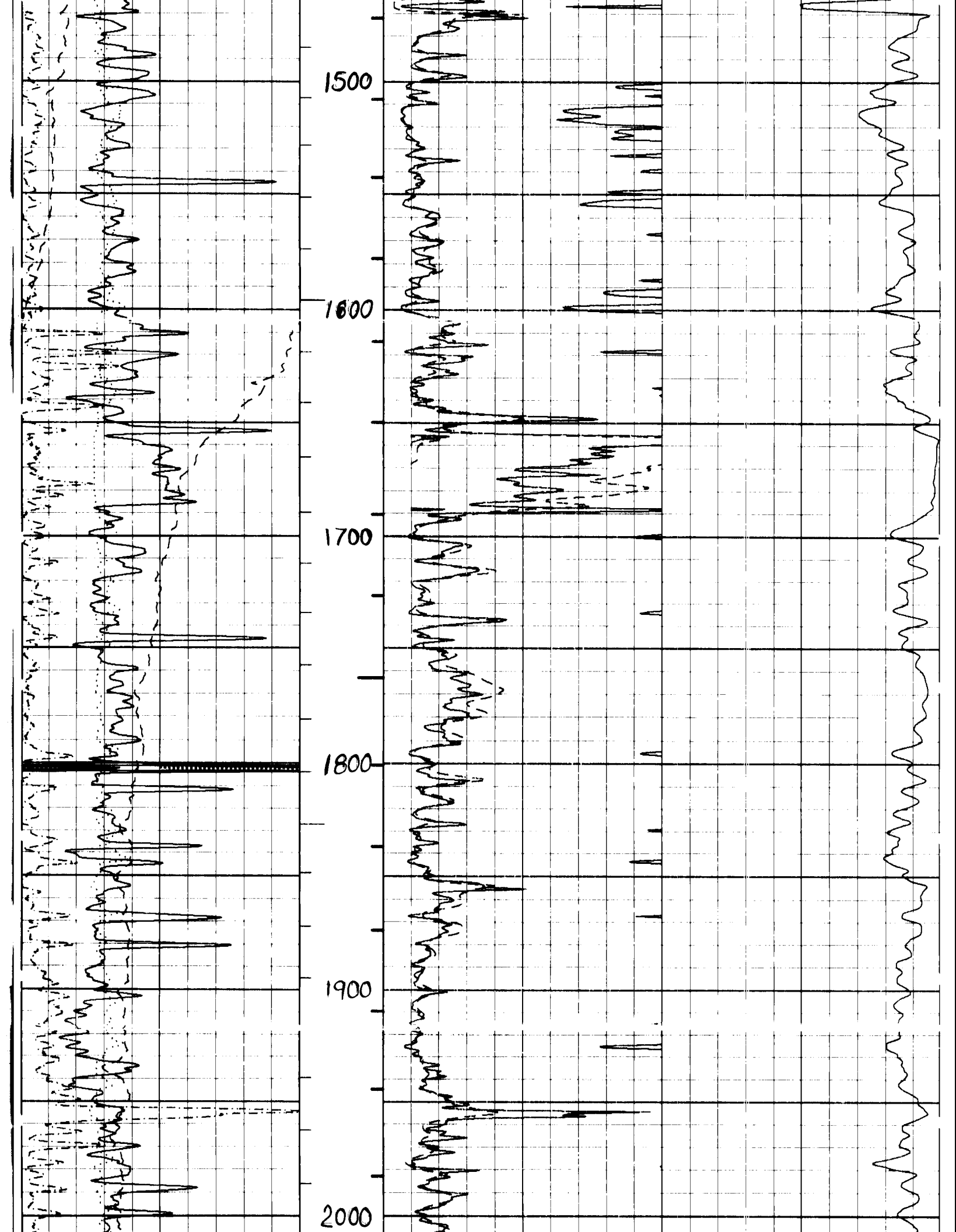
1400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1700
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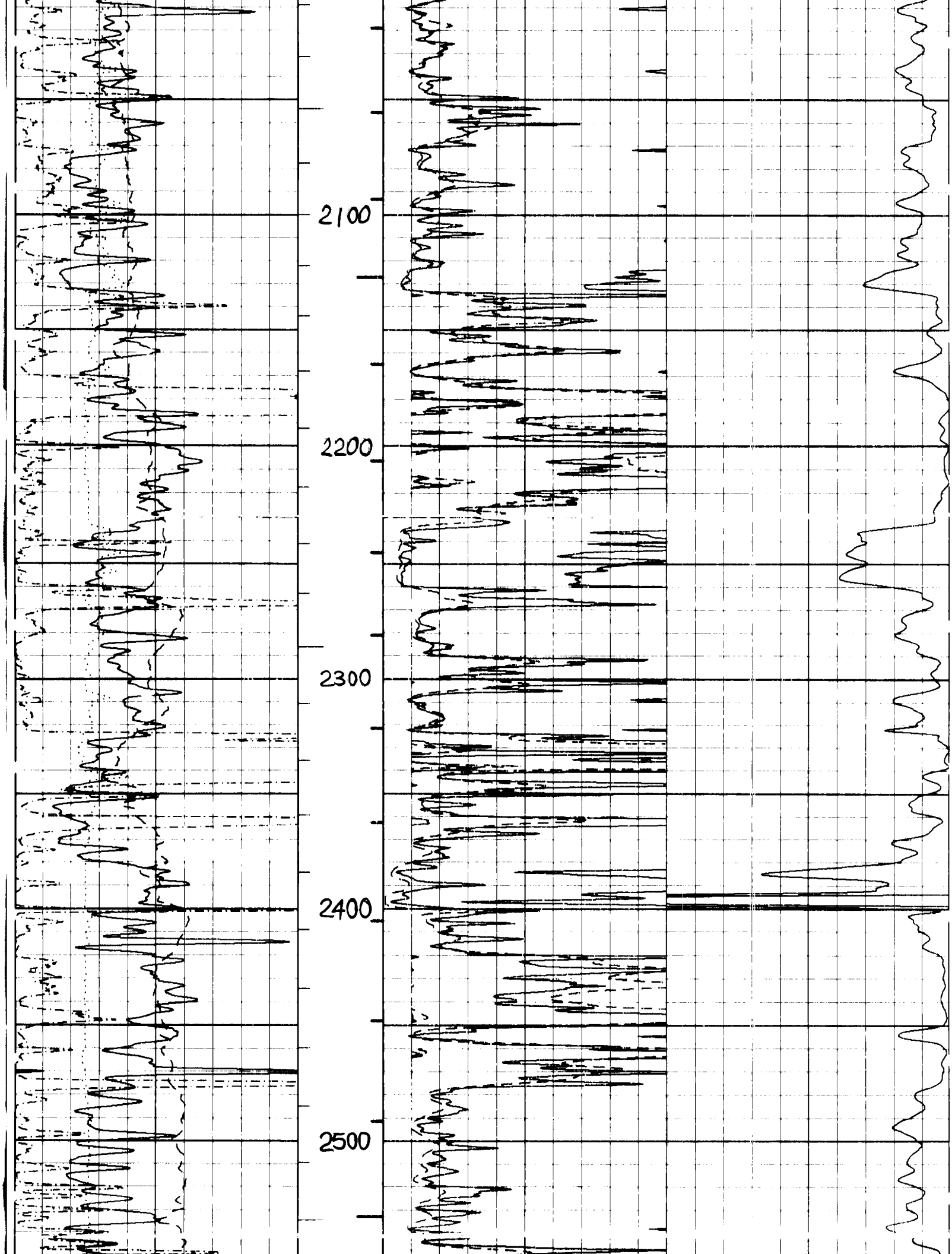
1900
2000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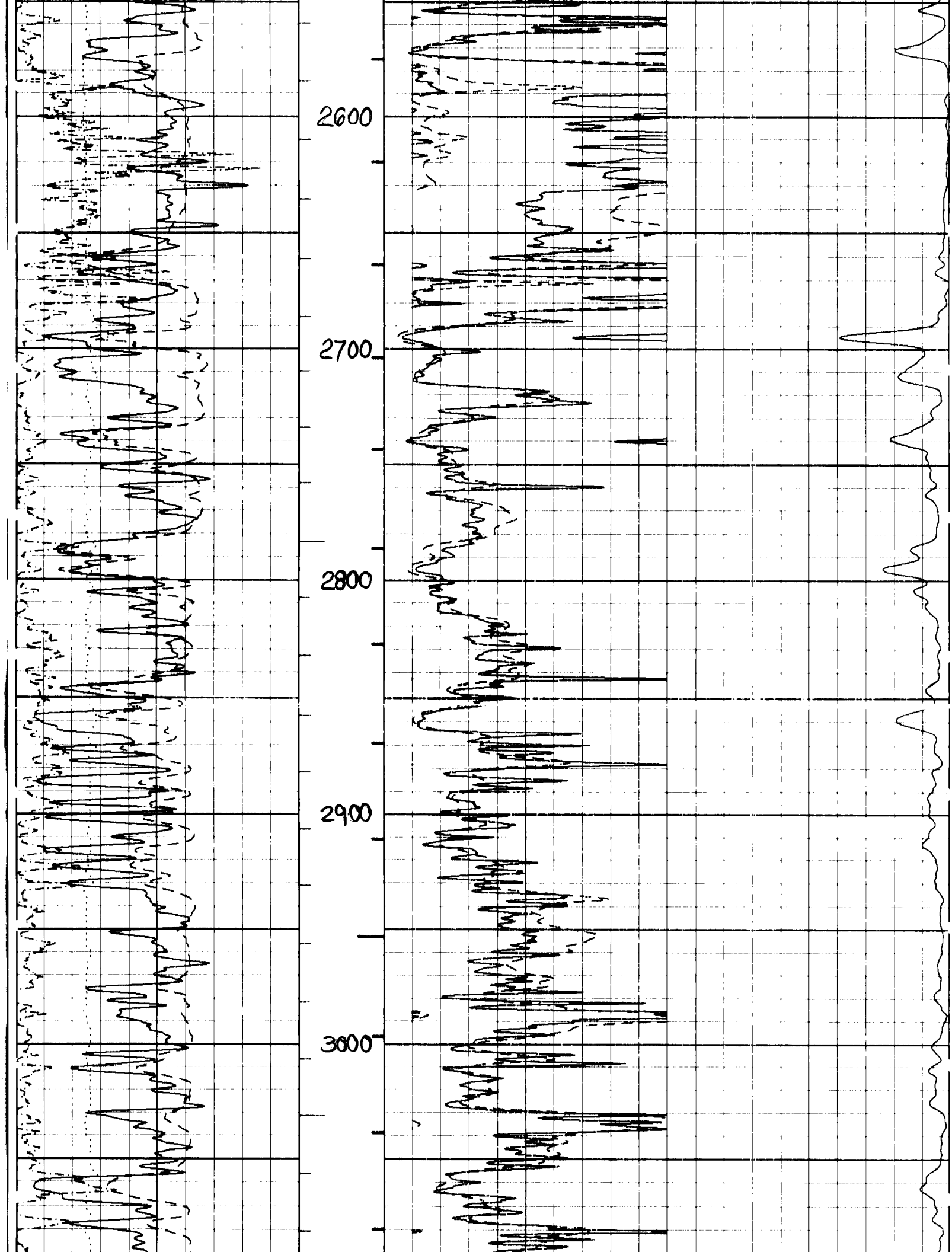
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2700
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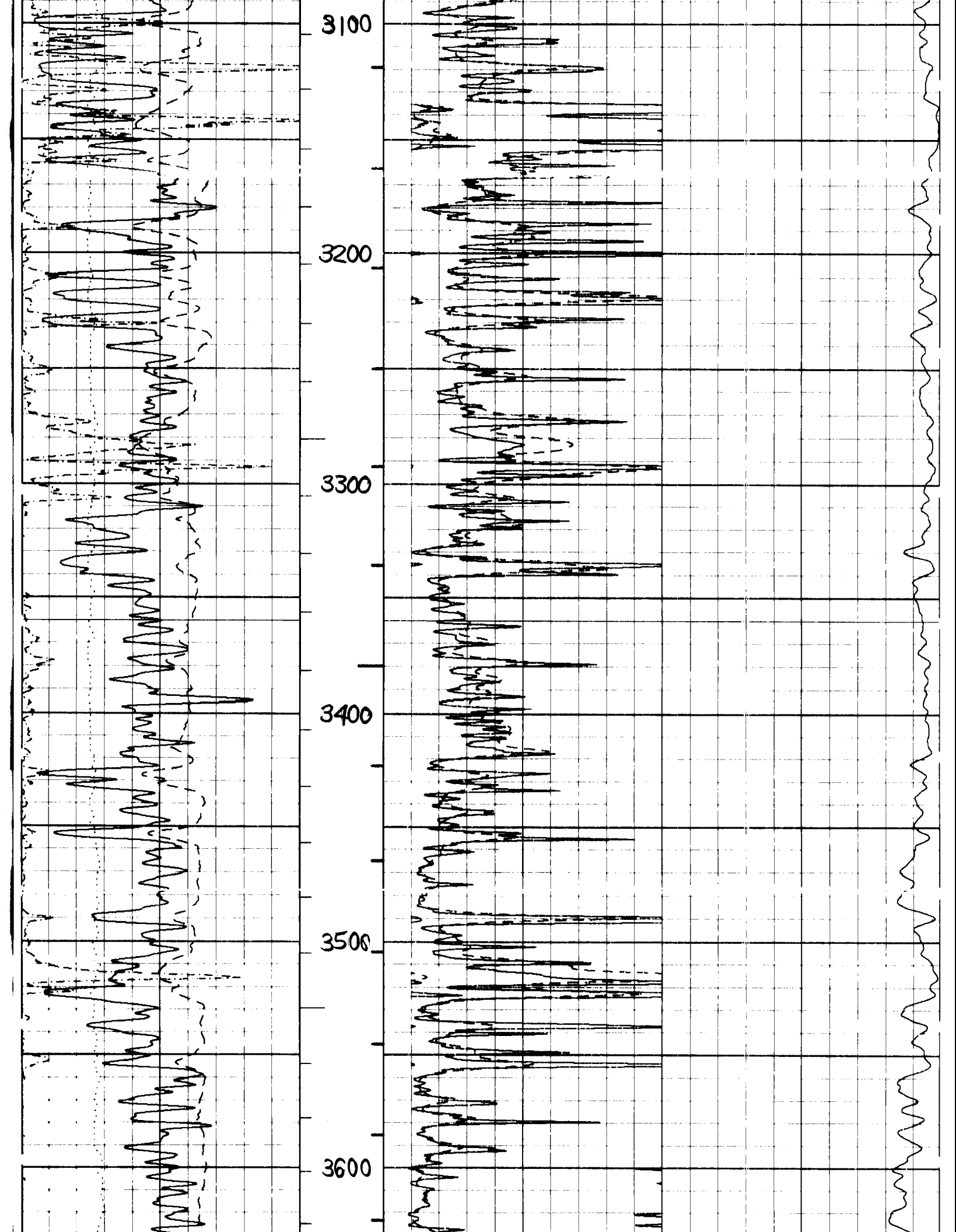
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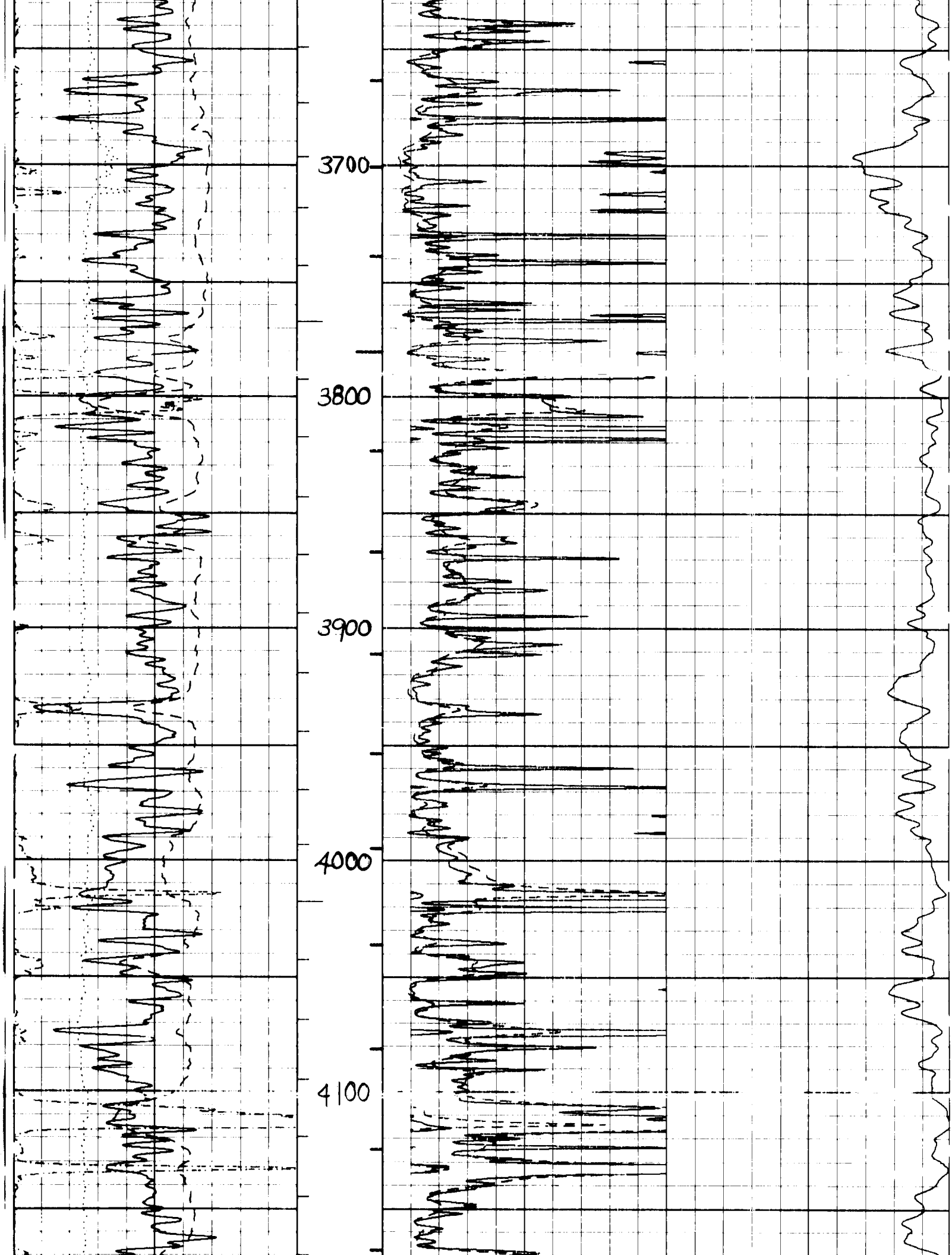
3200
3300
3400
3500
3600


3700
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4000
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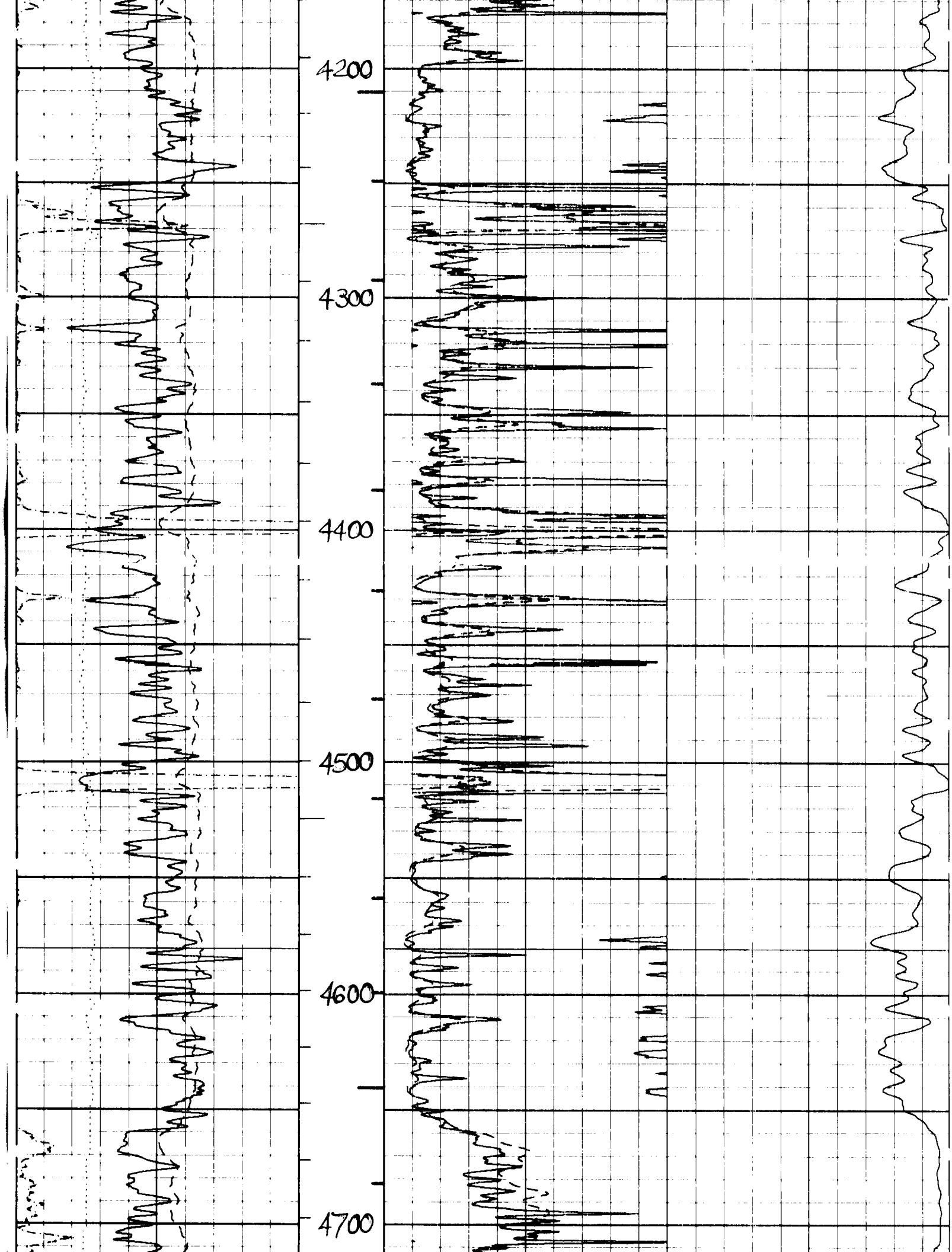
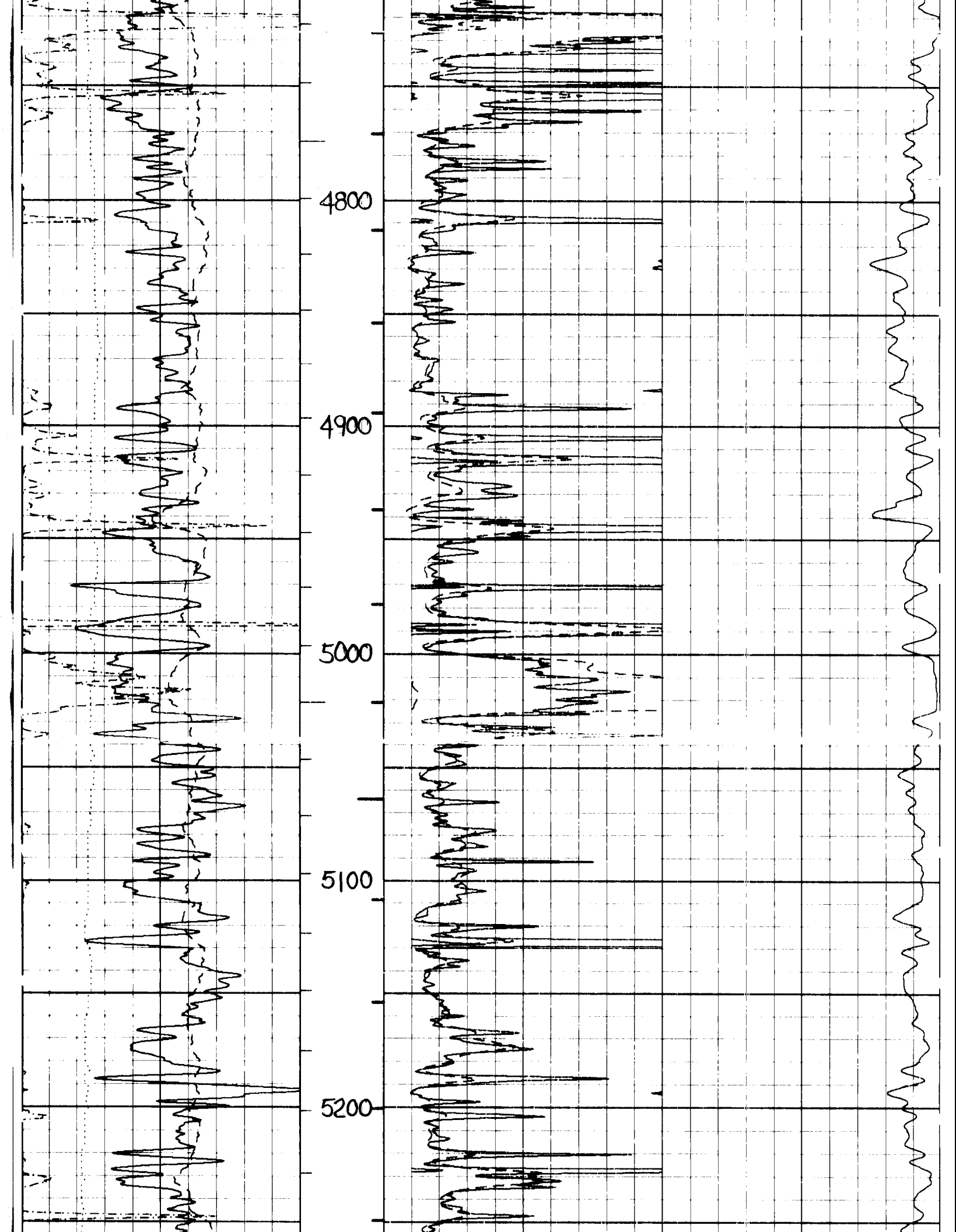
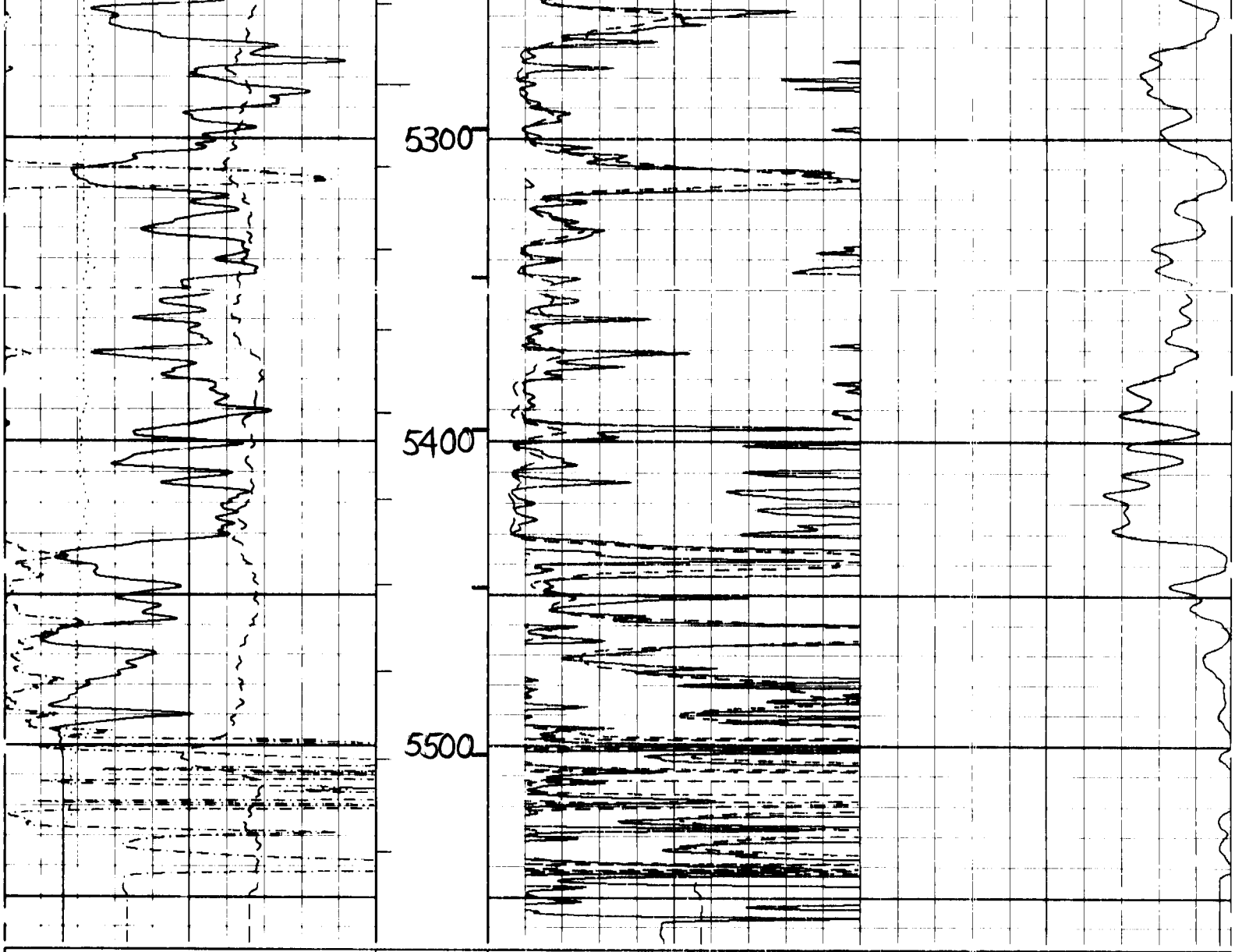

4200
4300
4400
4500
4600
4700


4800
4900
5000
5100
5200



RWA 0 3	1:600 FT		
SP -100+		GUARD RES OHM-M 0 100	
CALIPER INCHES 6 16		AMP GUARD OHM-M 0 10	
GAMMA RAY API COUNTS 0 200	AMPERES VOLTS 50 FT 3 0	DEEP OHM-M 0 100	DEEP COND MMHO 500 0

HALLIBURTON EXCELL

Data File: ute_tribal31_04.2.cls
Format File: /field_data/data2/VERNAL_SPS/DIL2INCH.spc
Bottom Depth: 5565.75
Plot Time: 03-13-98 22:26:01
Log Time: 03-13-98 20:30:50

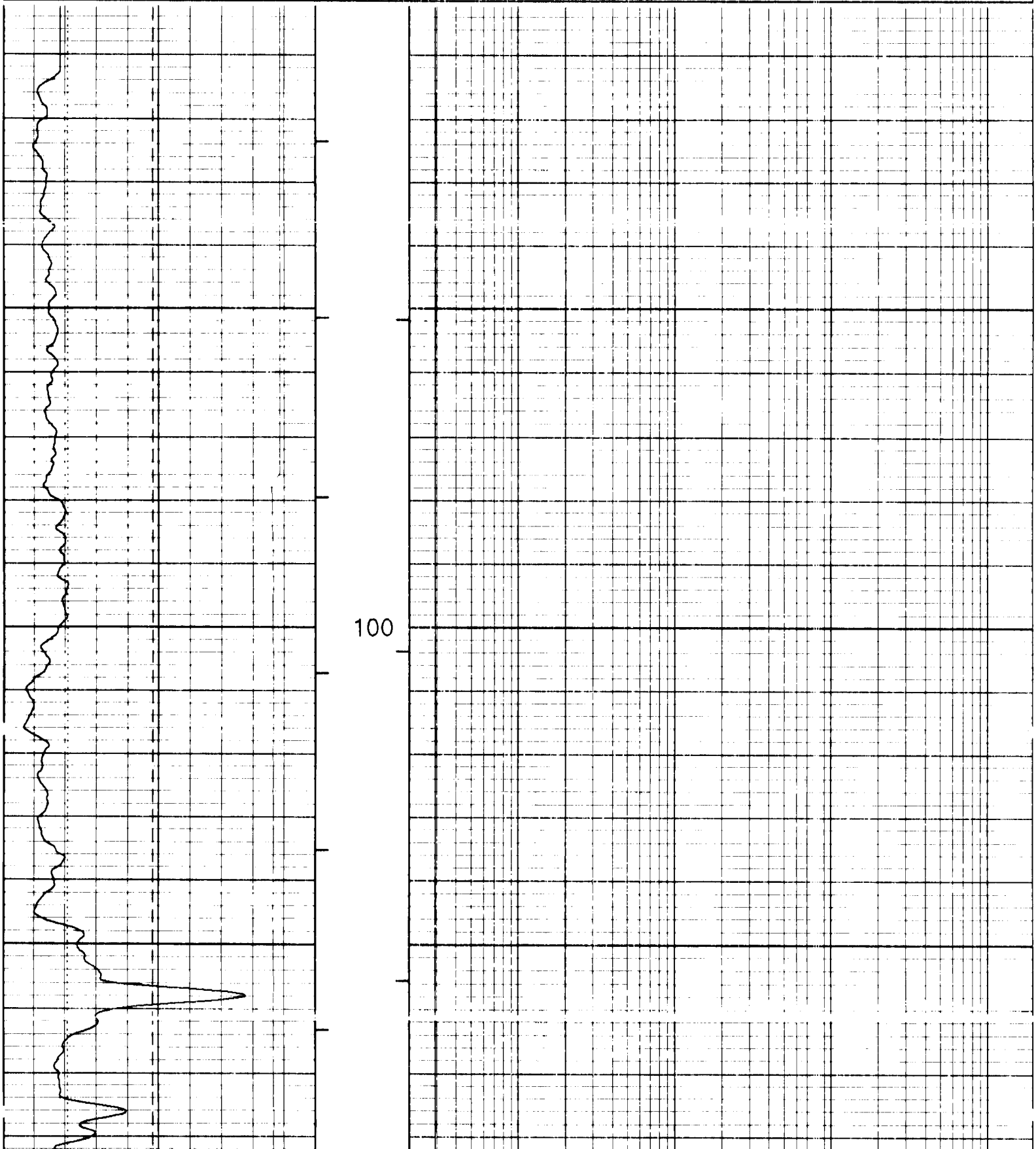
MAIN LOG 5"=100'

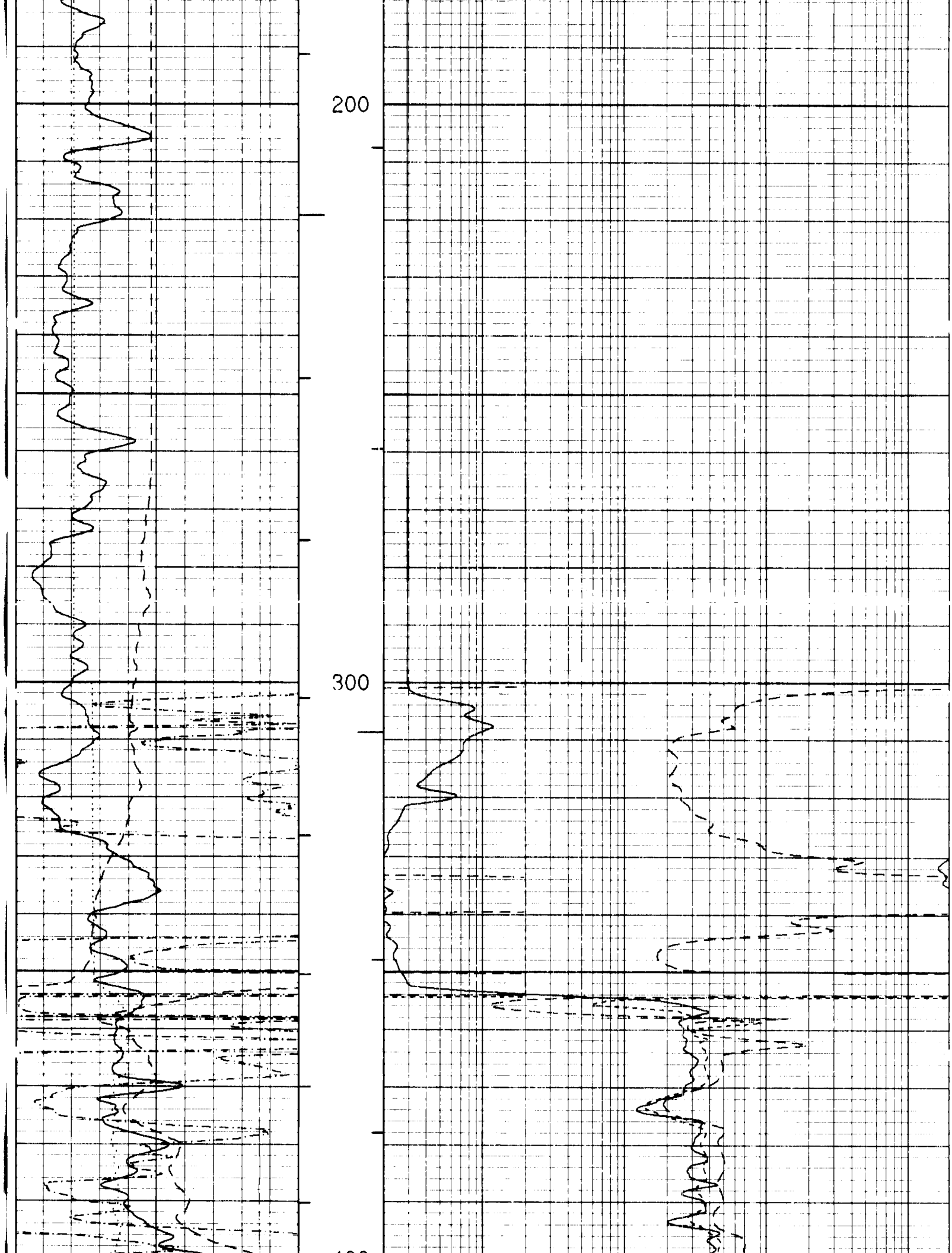
HALLIBURTON EXCELL

Version No: 3.49.1 hc 5.0
Data File: ute_tribal31_04.2.cls
Format File: /field_data/data2/ute_tribal31_04/plot_2_2.spc
Top Depth: 2.00
Bottom Depth: 5565.75
Plot Time: 03-13-98 [illegible]
Log Time: 03-13-98 [illegible]

GAMMA RAY	ALIV	DEEP

GAMMA RAY			AHV	DEEP	
0	API COUNTS	200		.2 OHM-M	2000
	CALIPER		BHV	MEDIUM	
6	INCHES	16		.2 OHM-M	2000
	SP			GUARD	
	-]10[+		1:240 Ft.	.2 OHM-M	2000
	RWA				
0	OHMM	3			
	TENSION				
10000	POUNDS	0			

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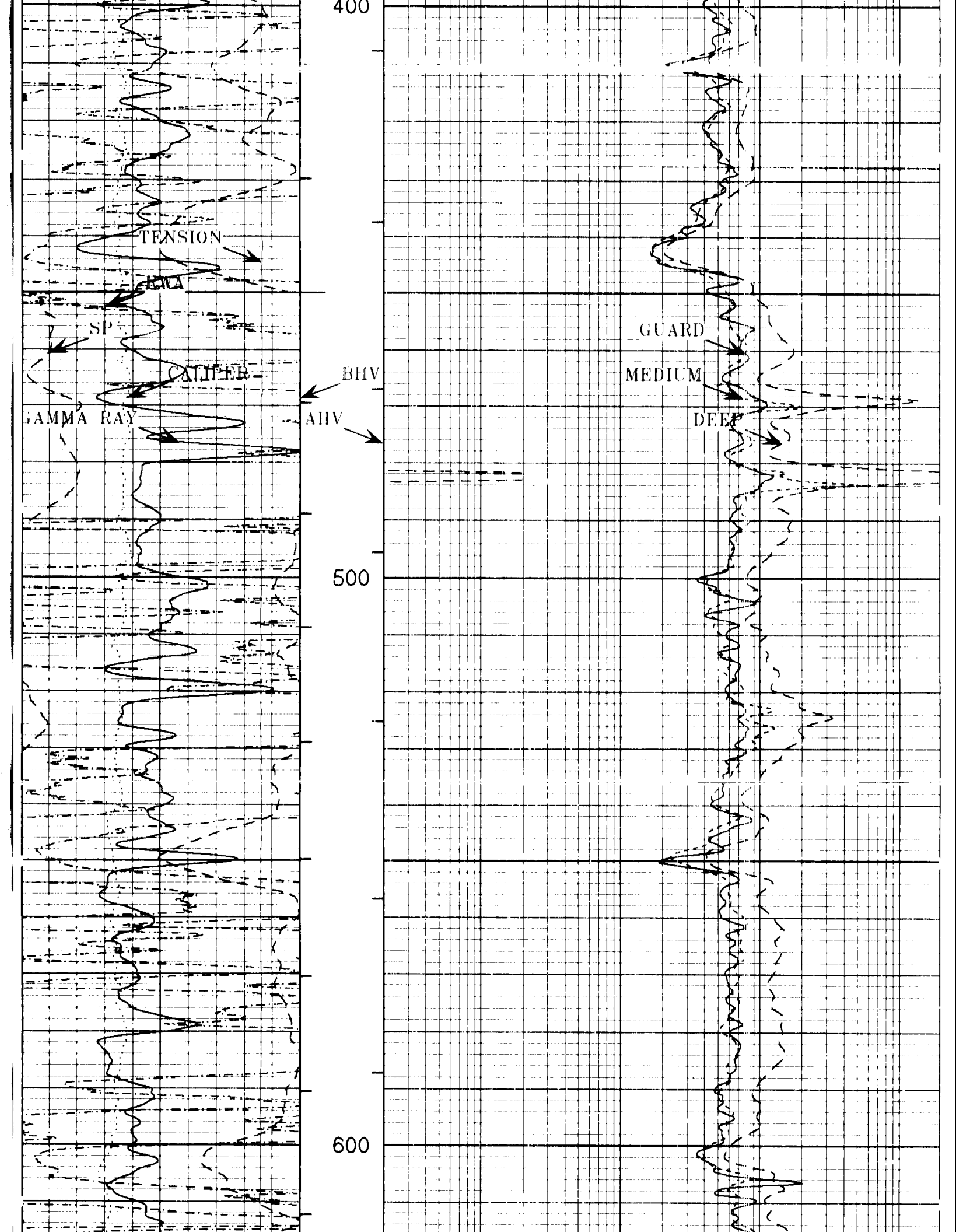
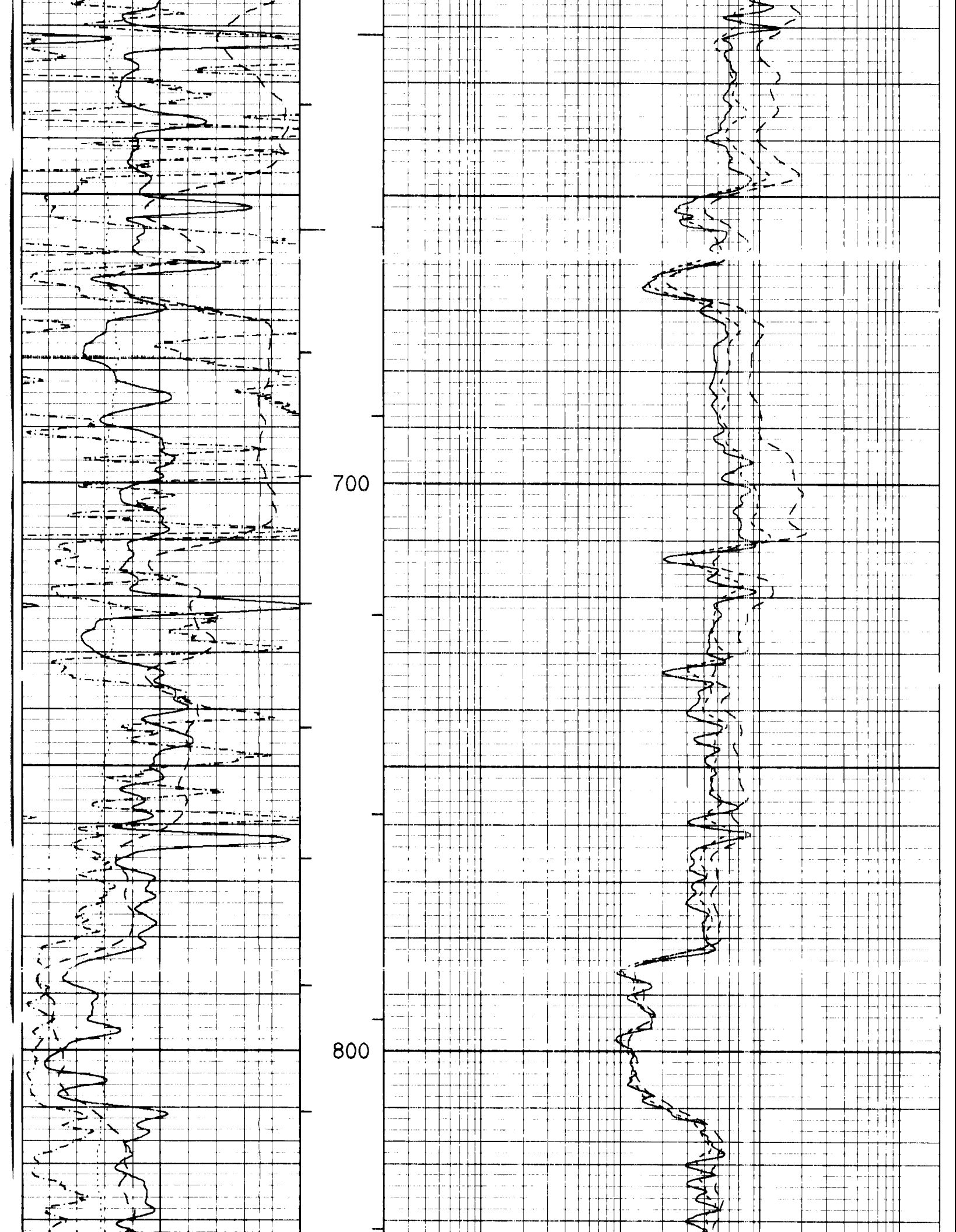

400
TENSION
SP
CALIPER
BHV
GAMMA RAY
AHV
500
600
GUARD
MEDIUM
DEEP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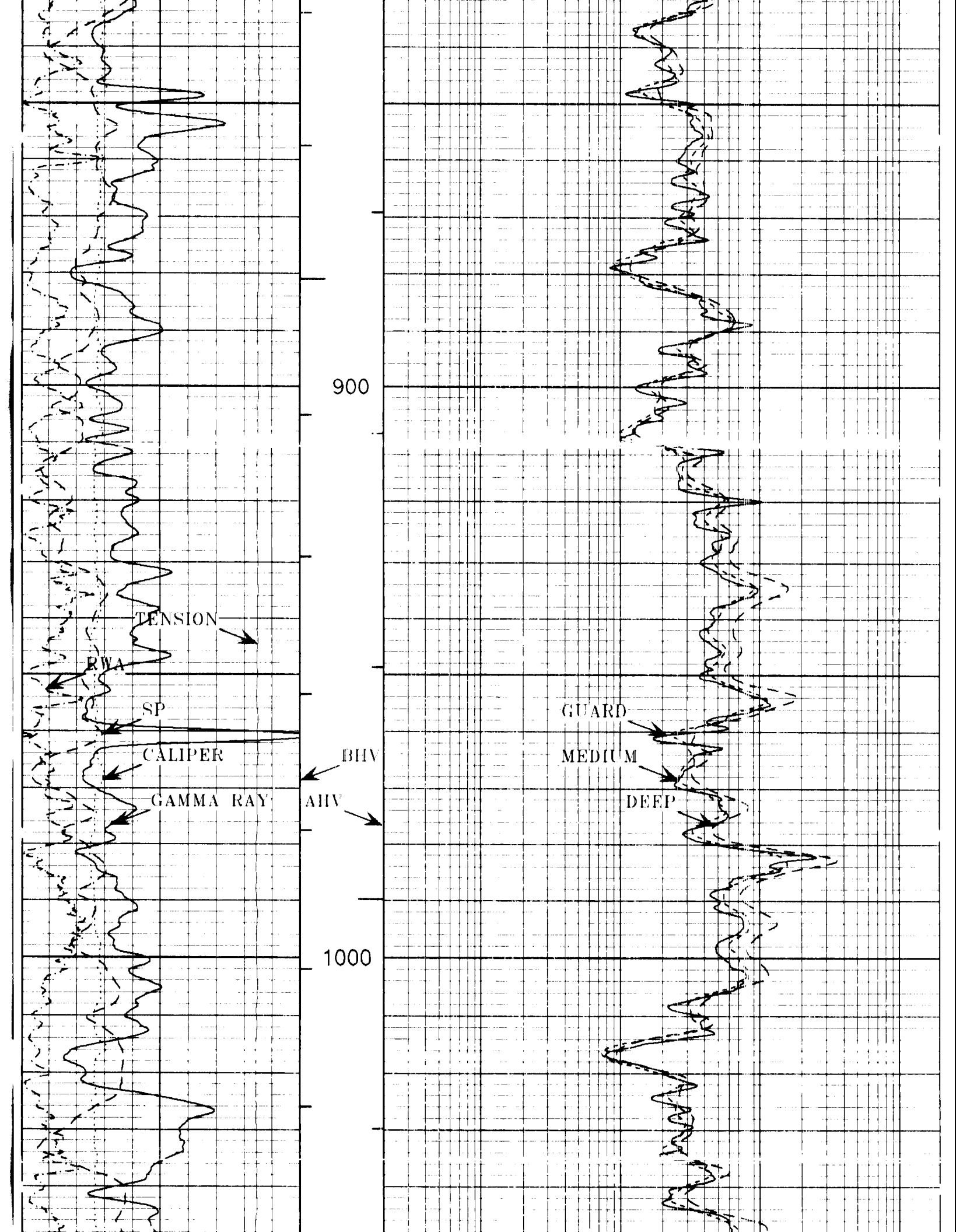
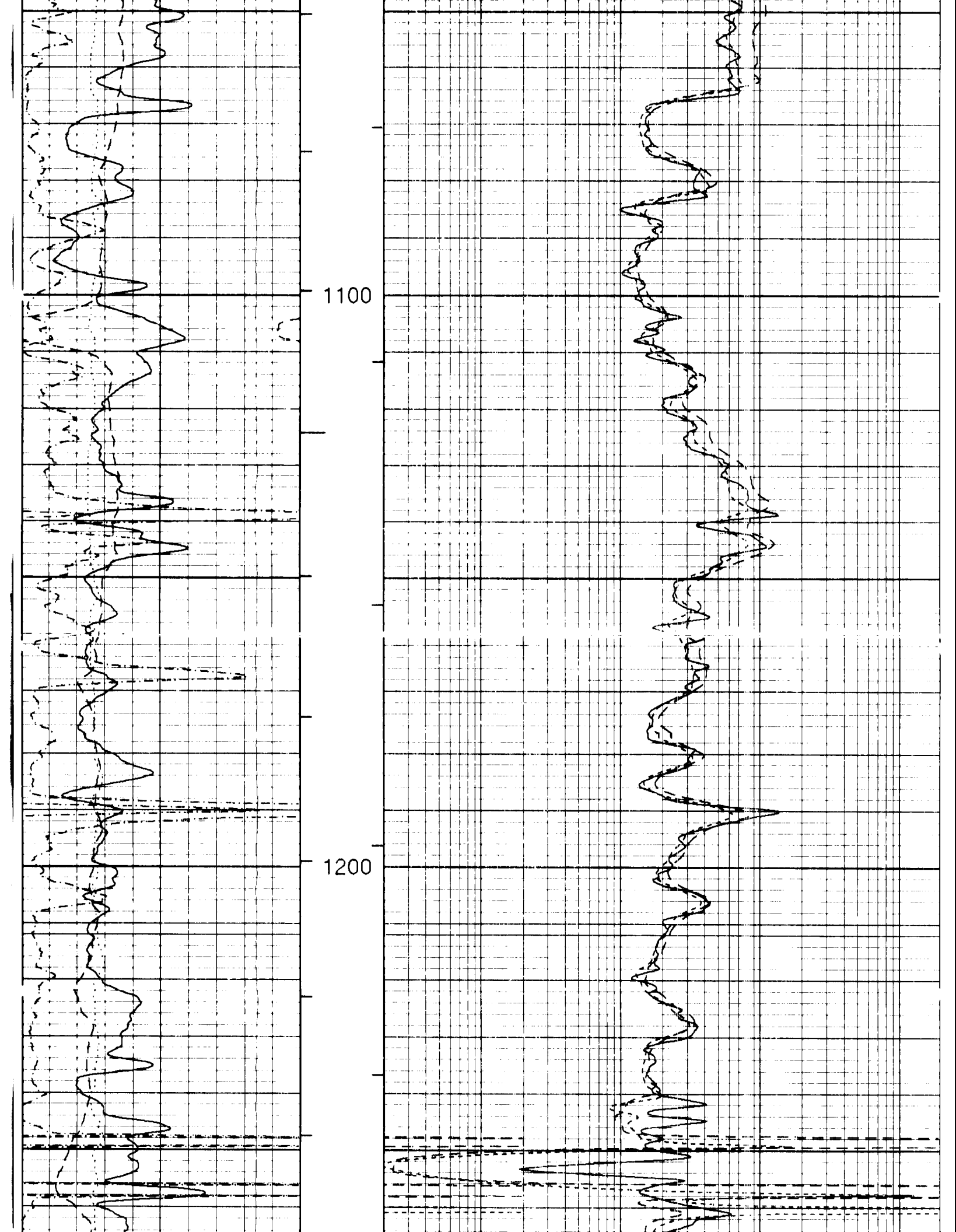
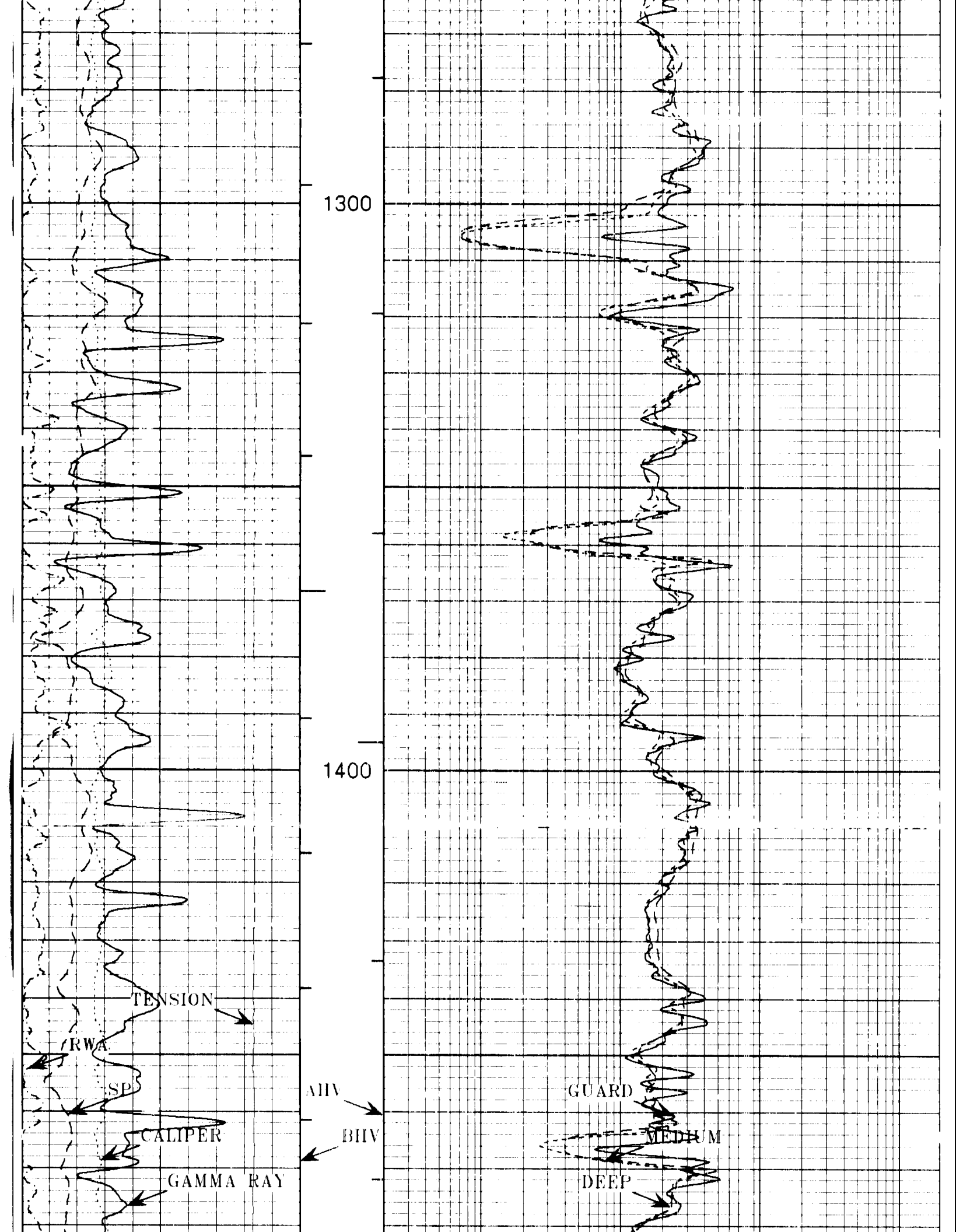
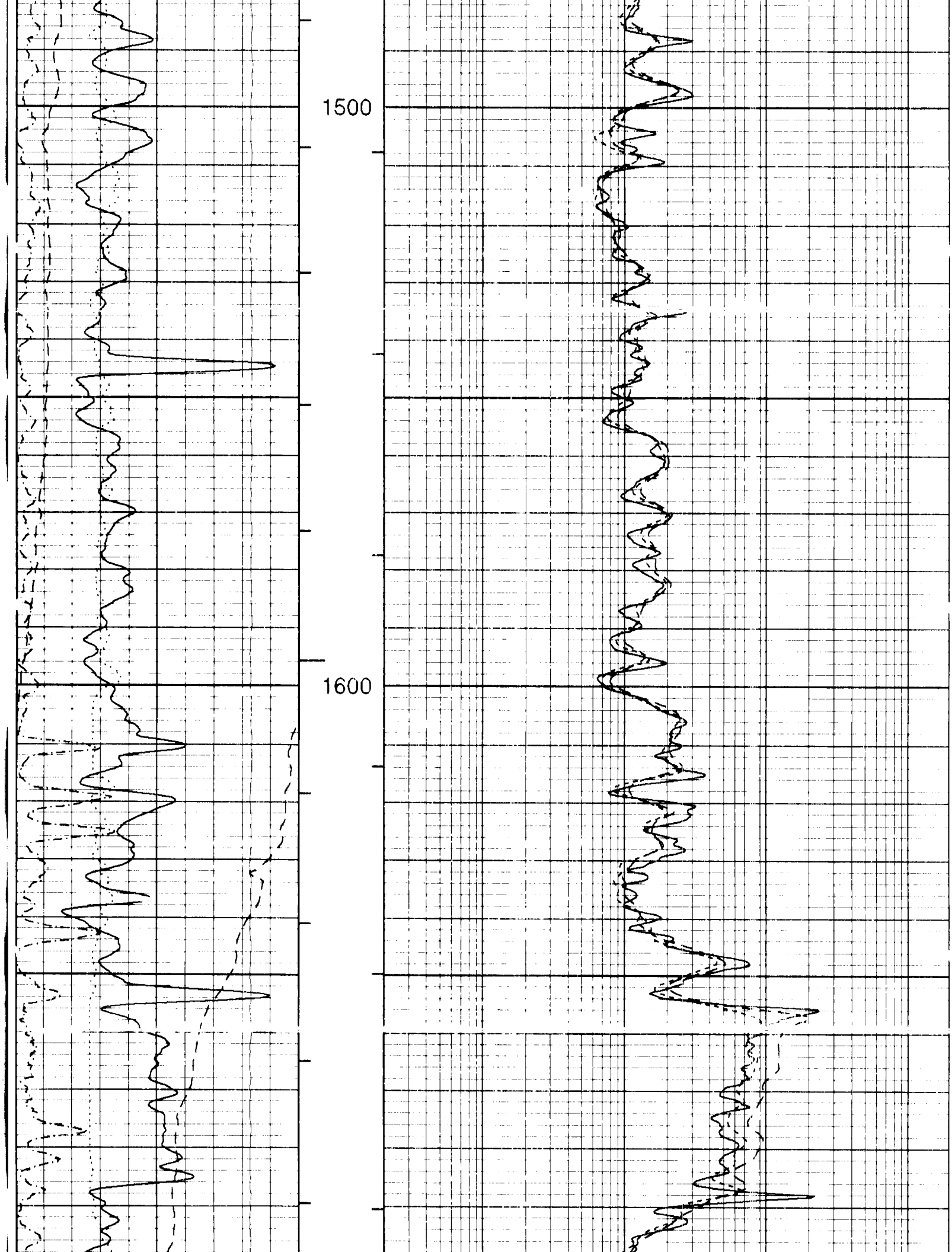
800


900
1000
TENSION
RWA
SP
CALIPER
GAMMA RAY
BHV
AHV
GUARD
MEDIUM
DEEP


1100
1200


1300
1400
TENSION
RWA
SP
CALIPER
GAMMA RAY
AHV
BHV
GUARD
MEDIUM
DEEP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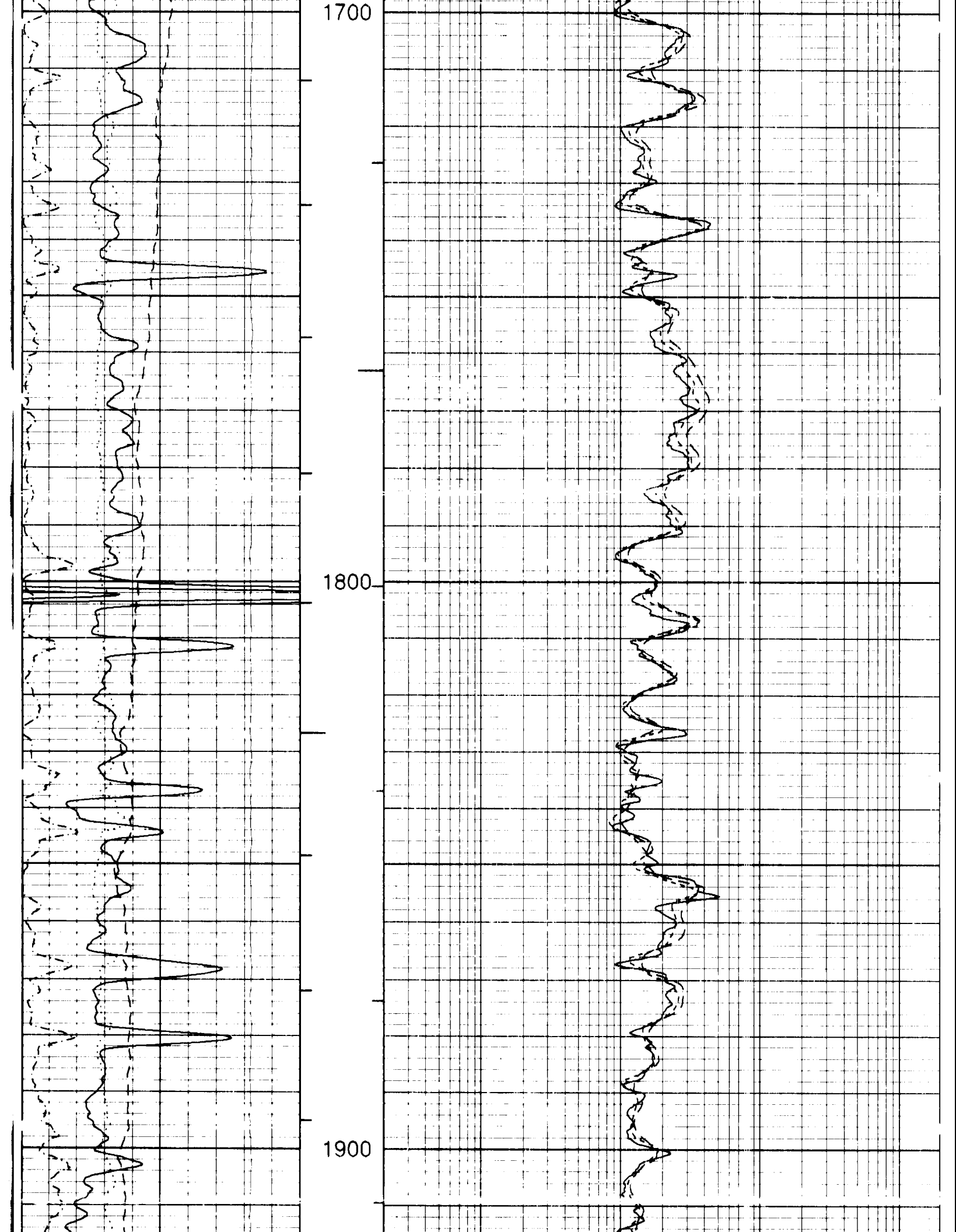
1600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1800
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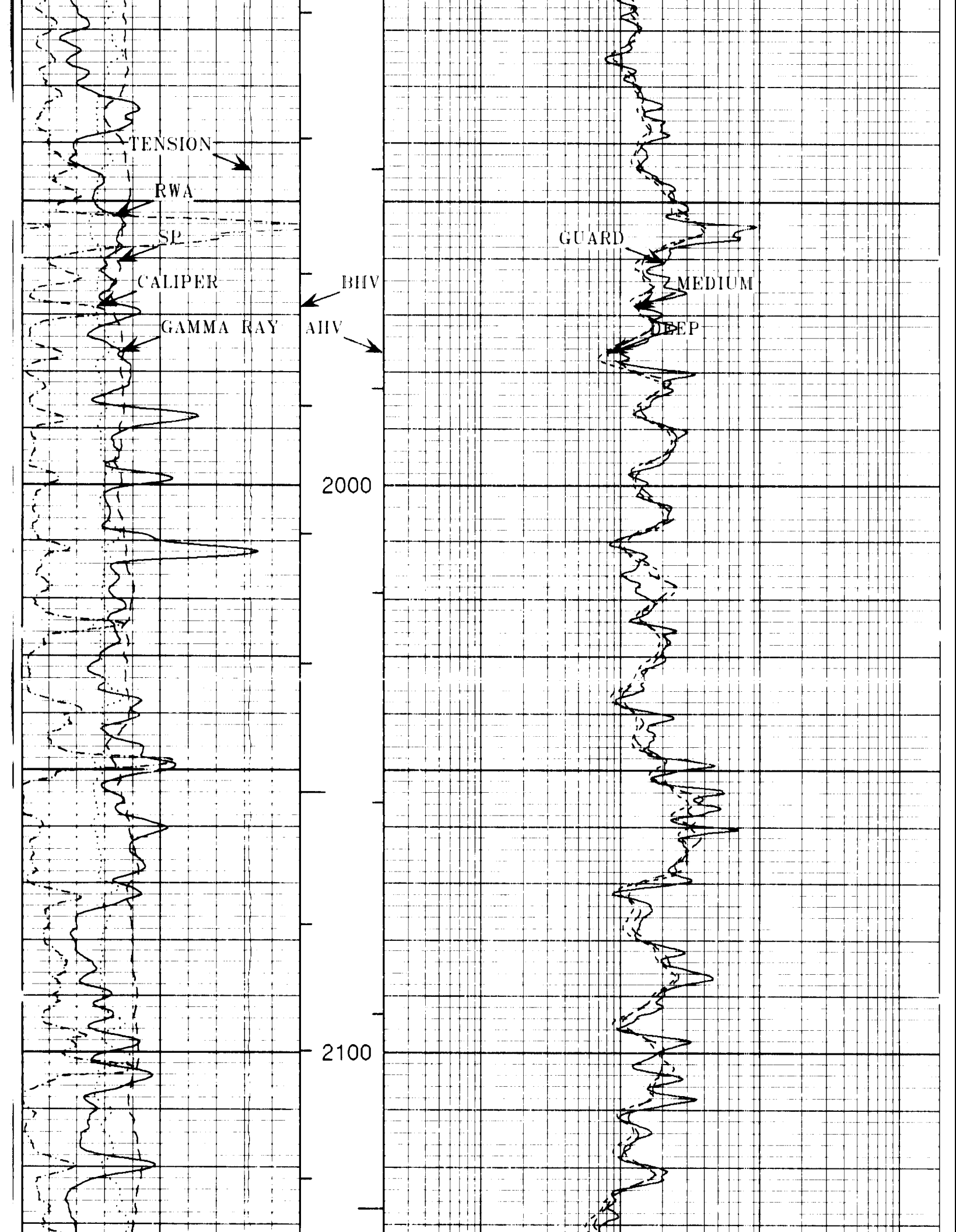
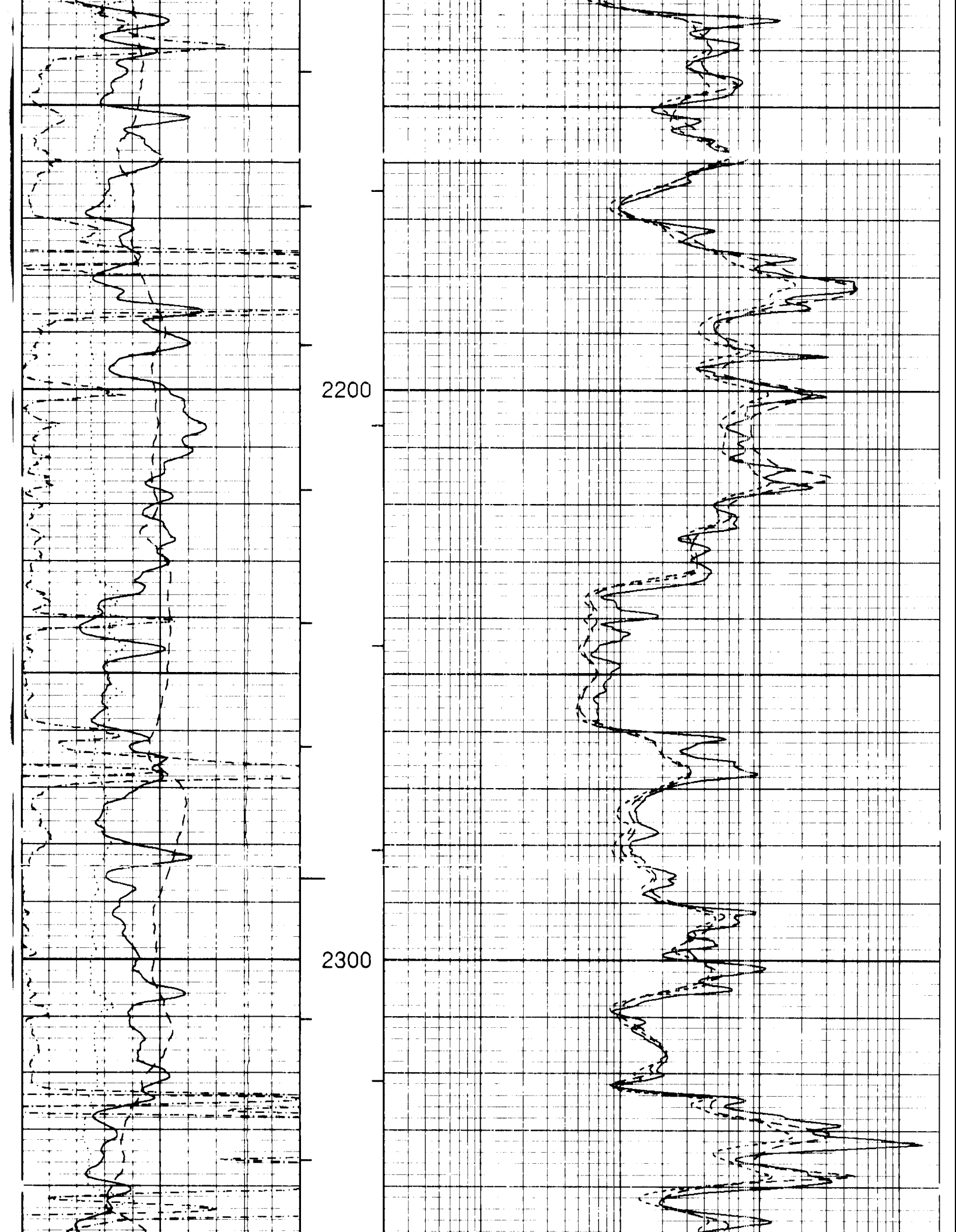
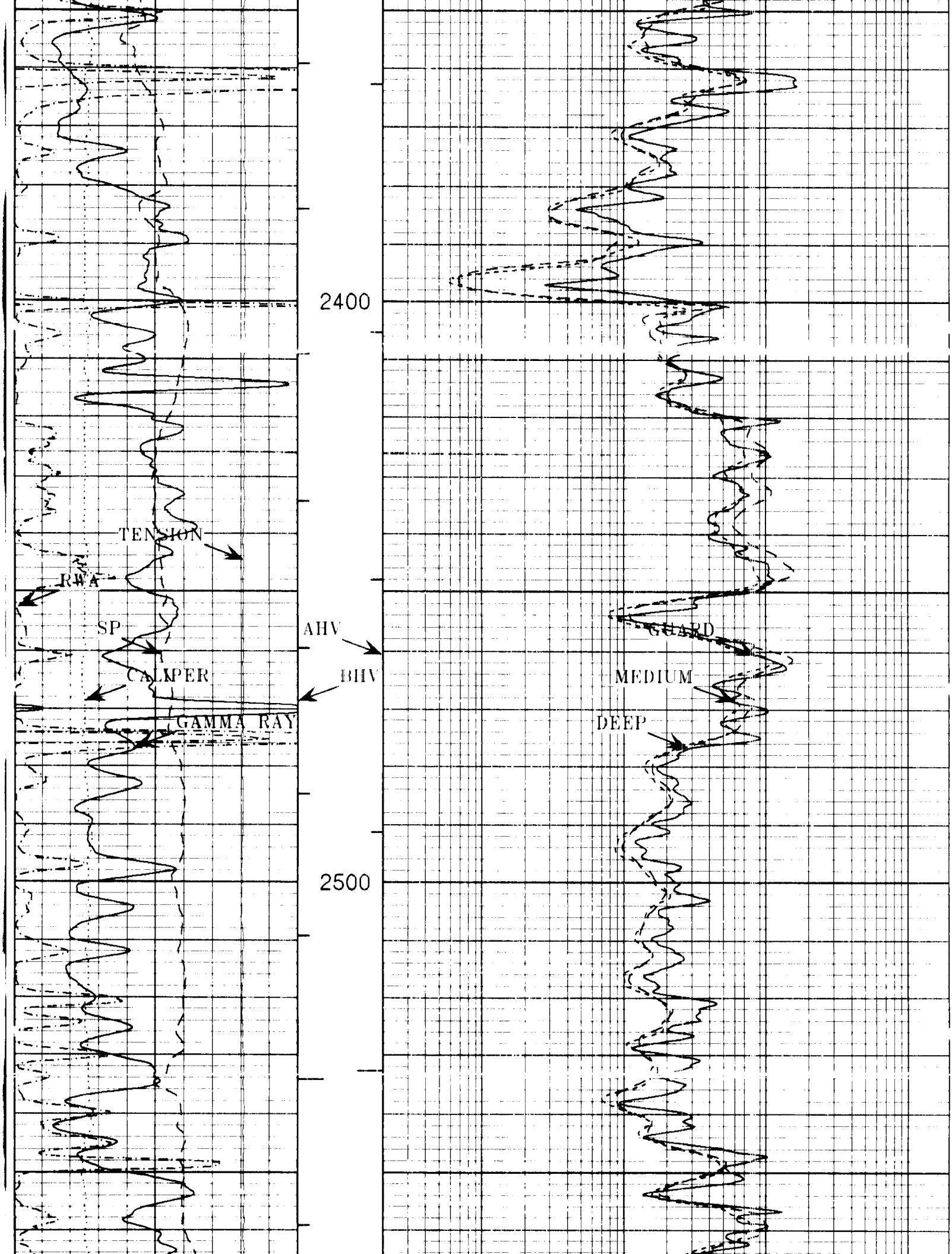
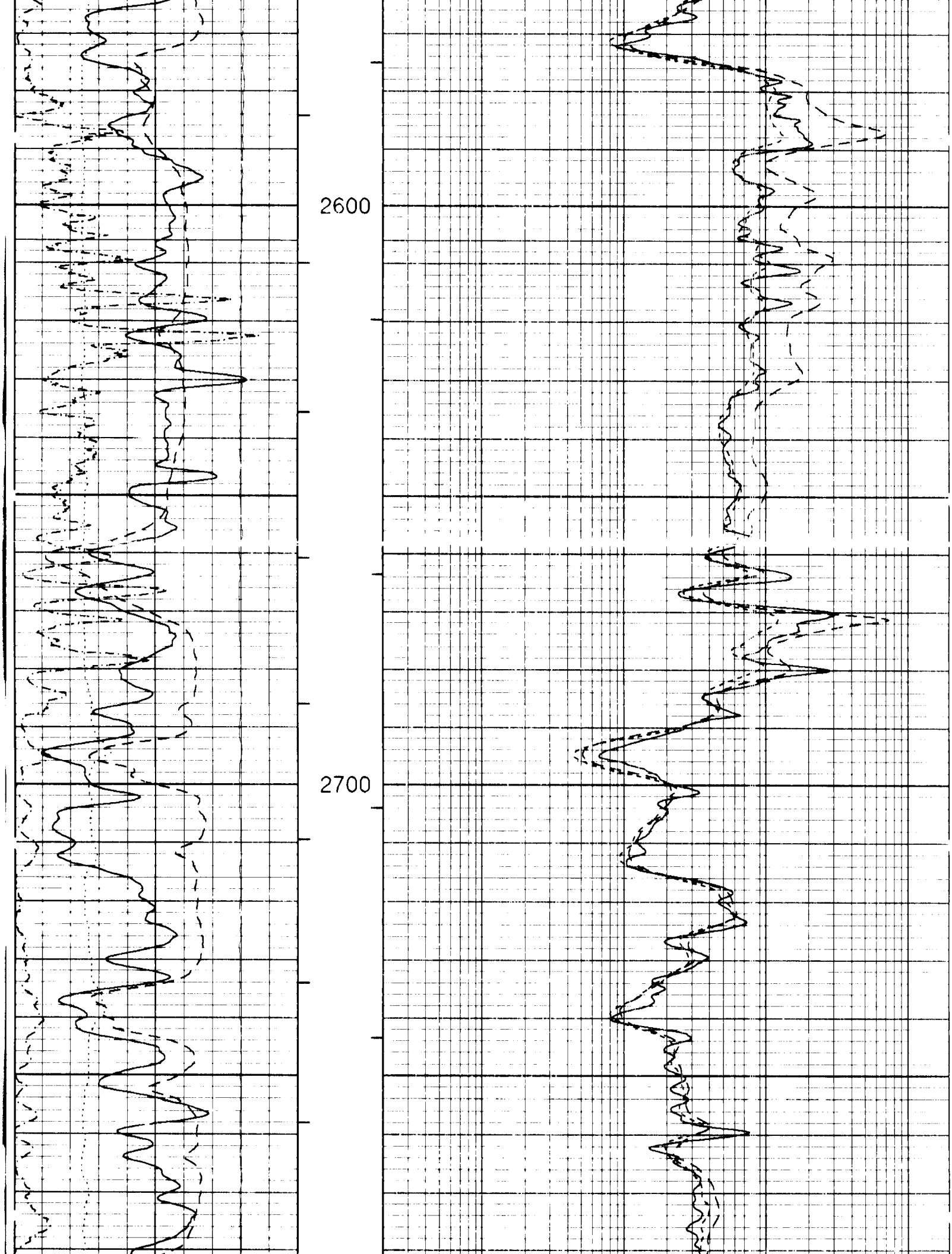
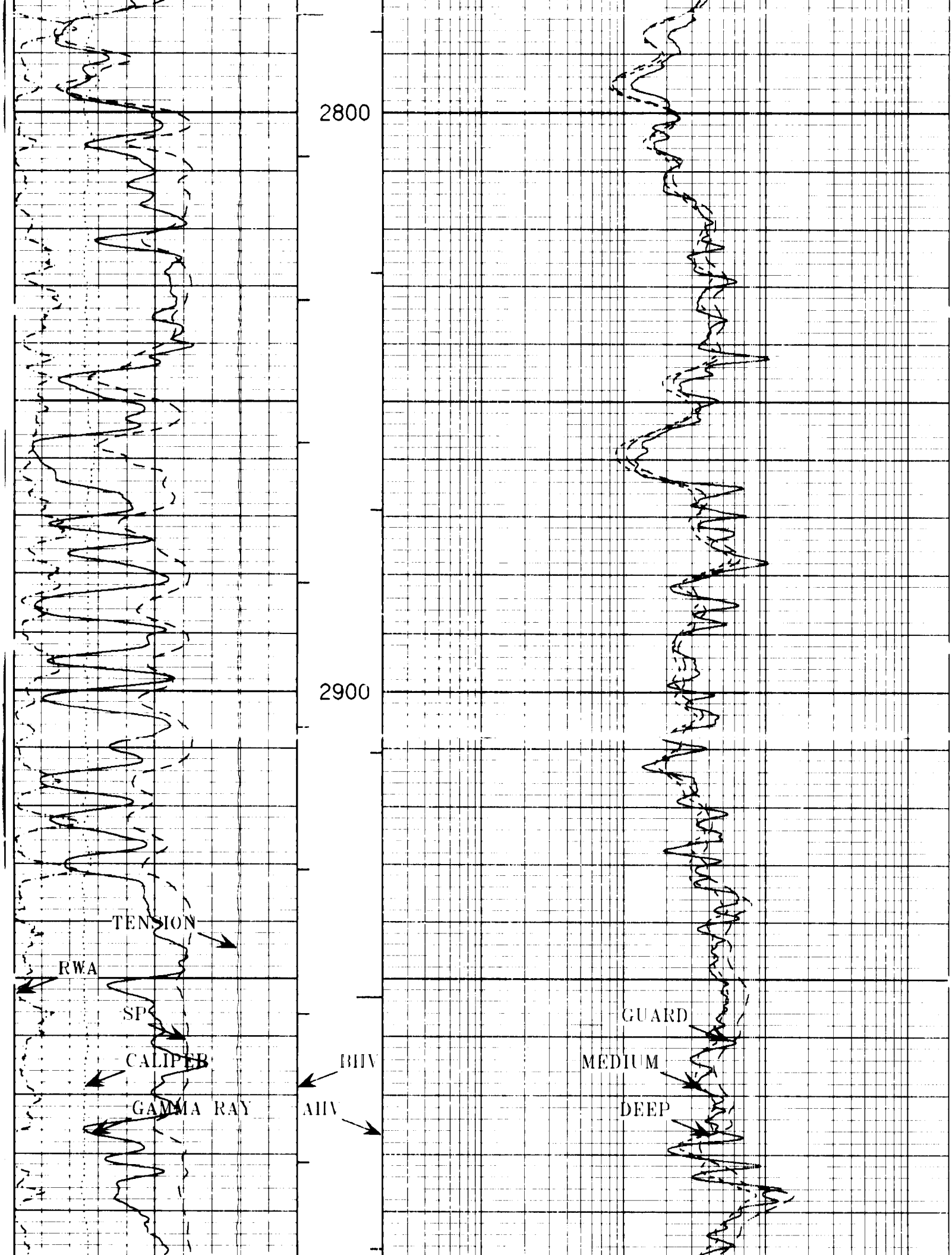
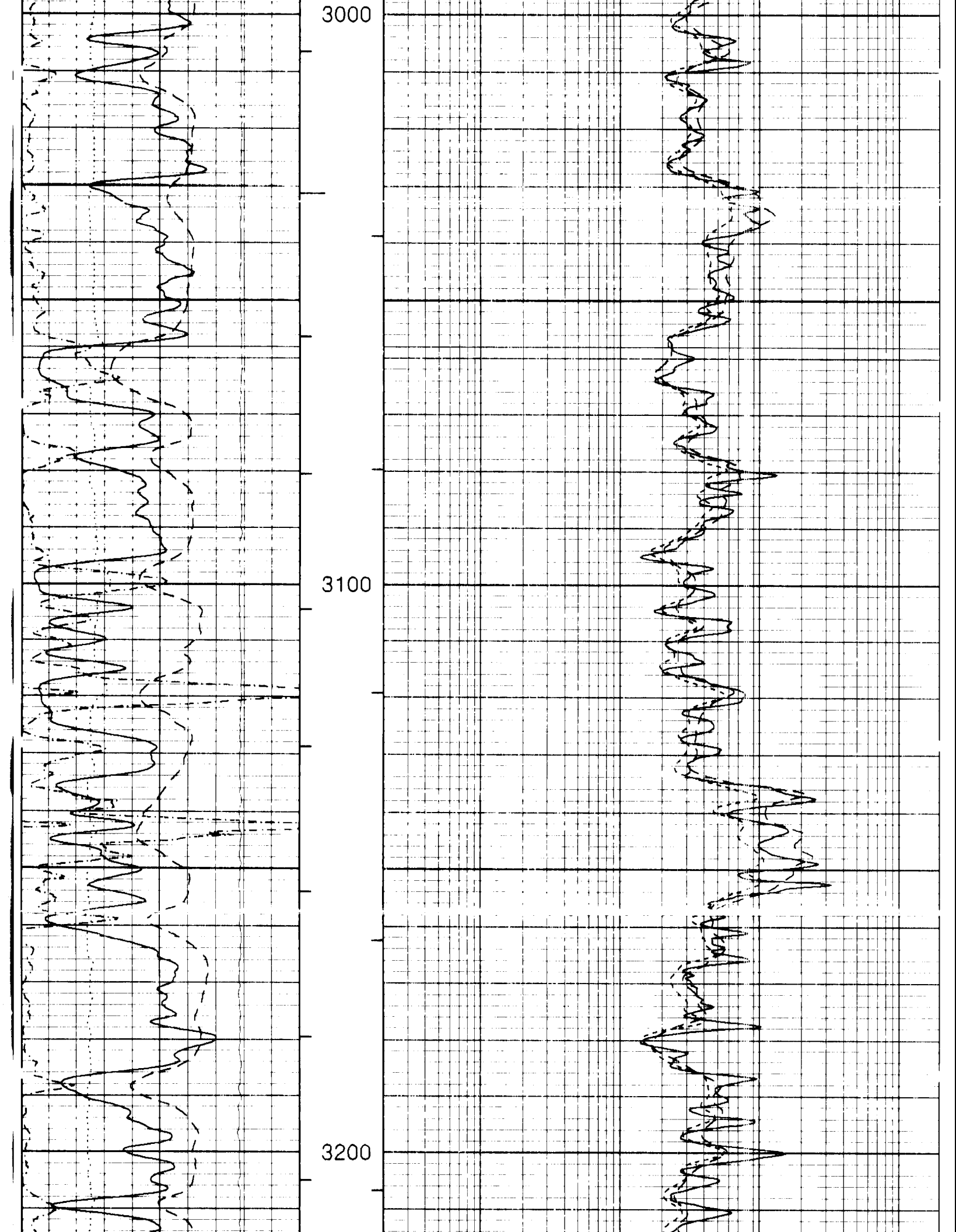

TENSION
RWA
SP
CALIPER
GAMMA RAY
BHV
AHV
GUARD
MEDIUM
DEEP
2000
2100

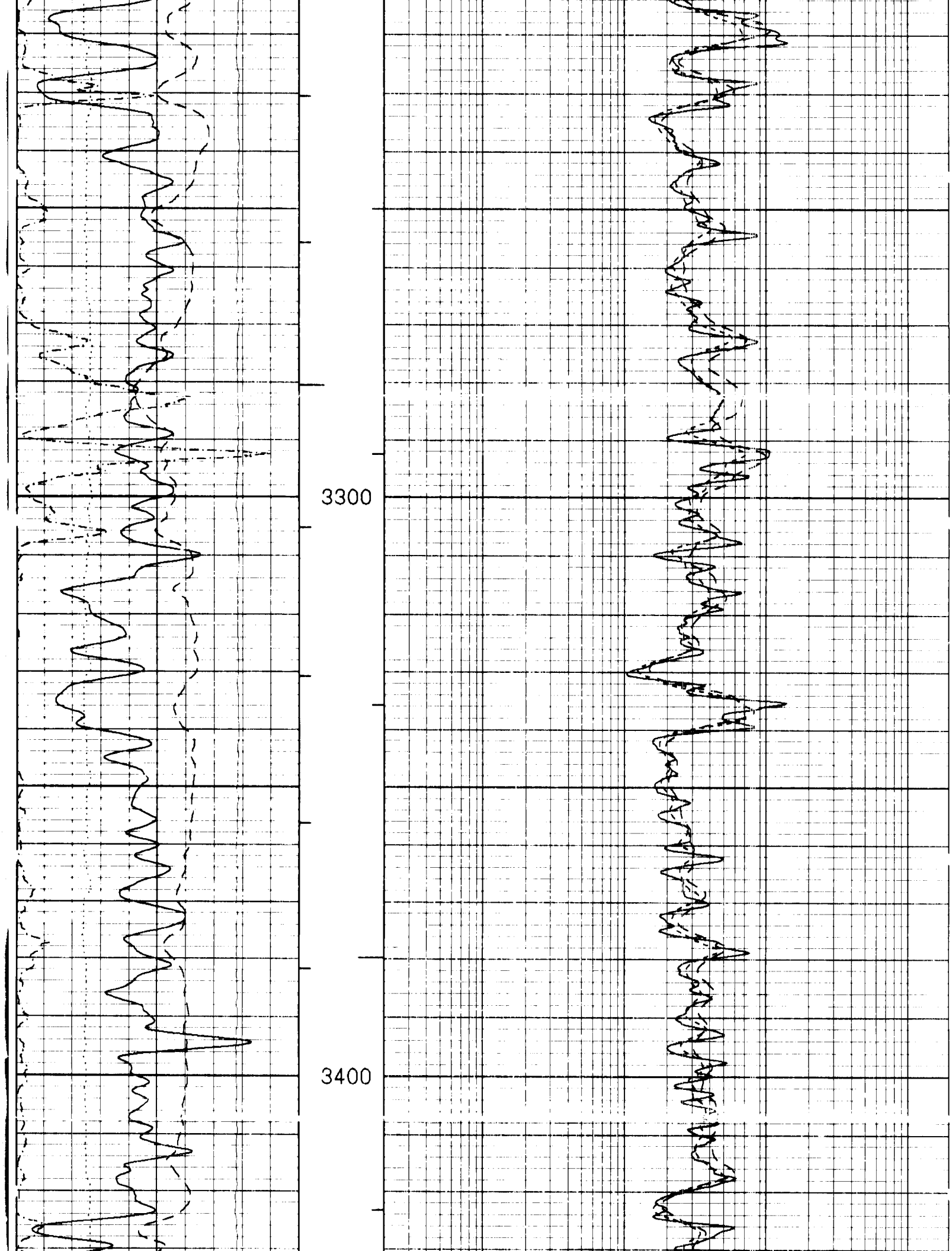

2200
2300


2400
2500
TENSION
RWA
SP
CALIPER
GAMMA RAY
AHV
BHV
GUARD
MEDIUM
DEEP


2600
2700


2800
2900
TENSION
RWA
SP
CALIPER
GAMMA RAY
BHV
AHV
GUARD
MEDIUM
DEEP


3000
3100
3200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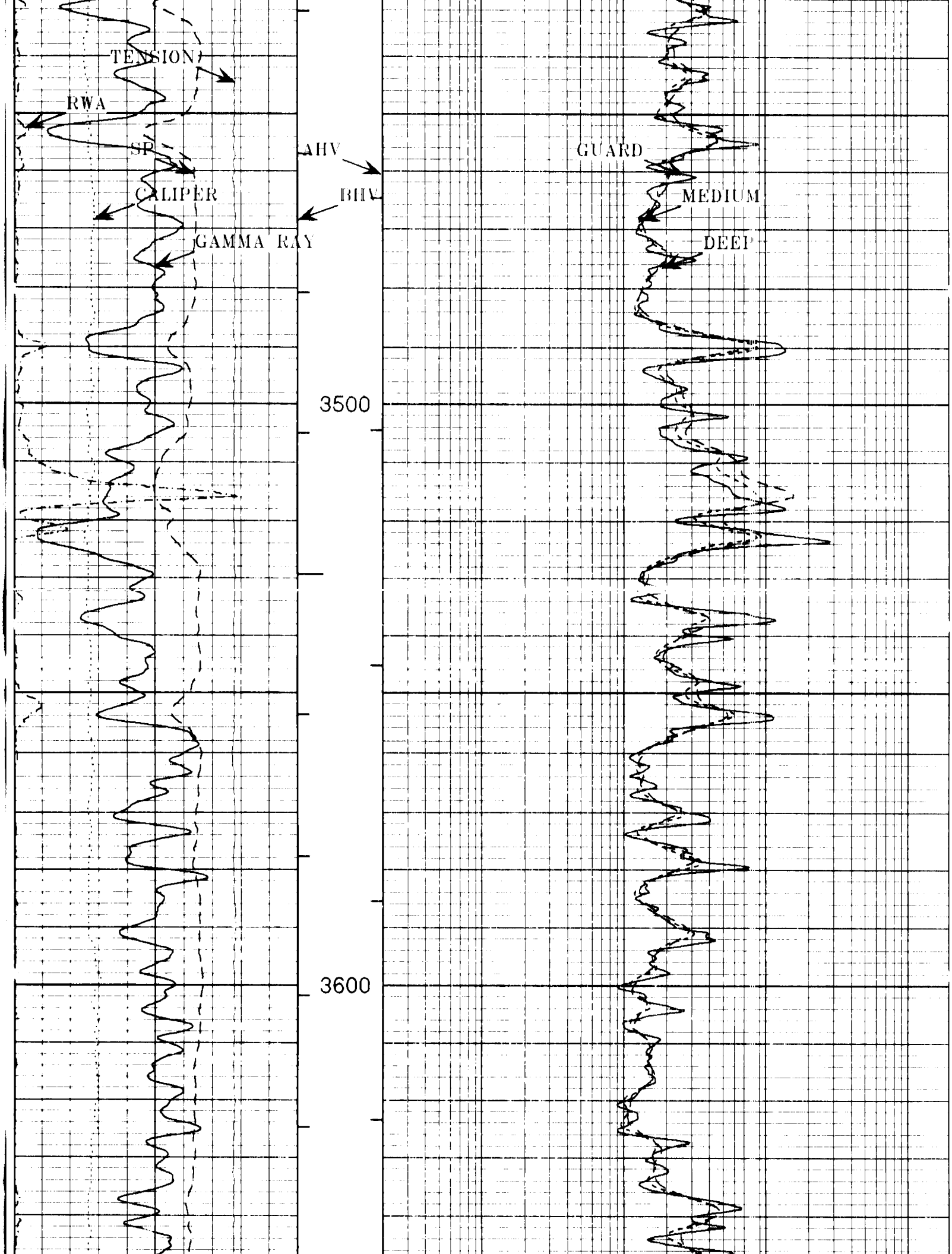
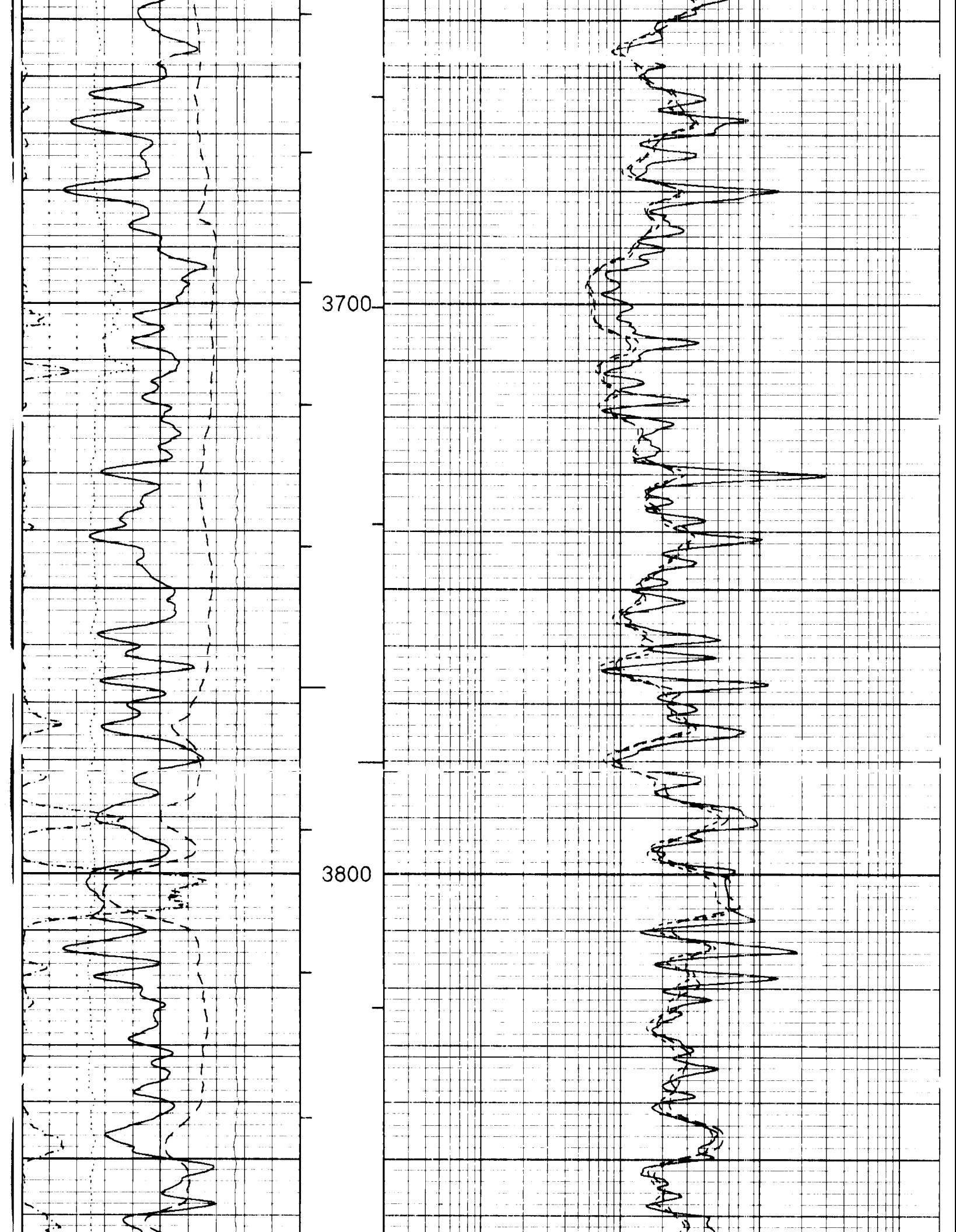
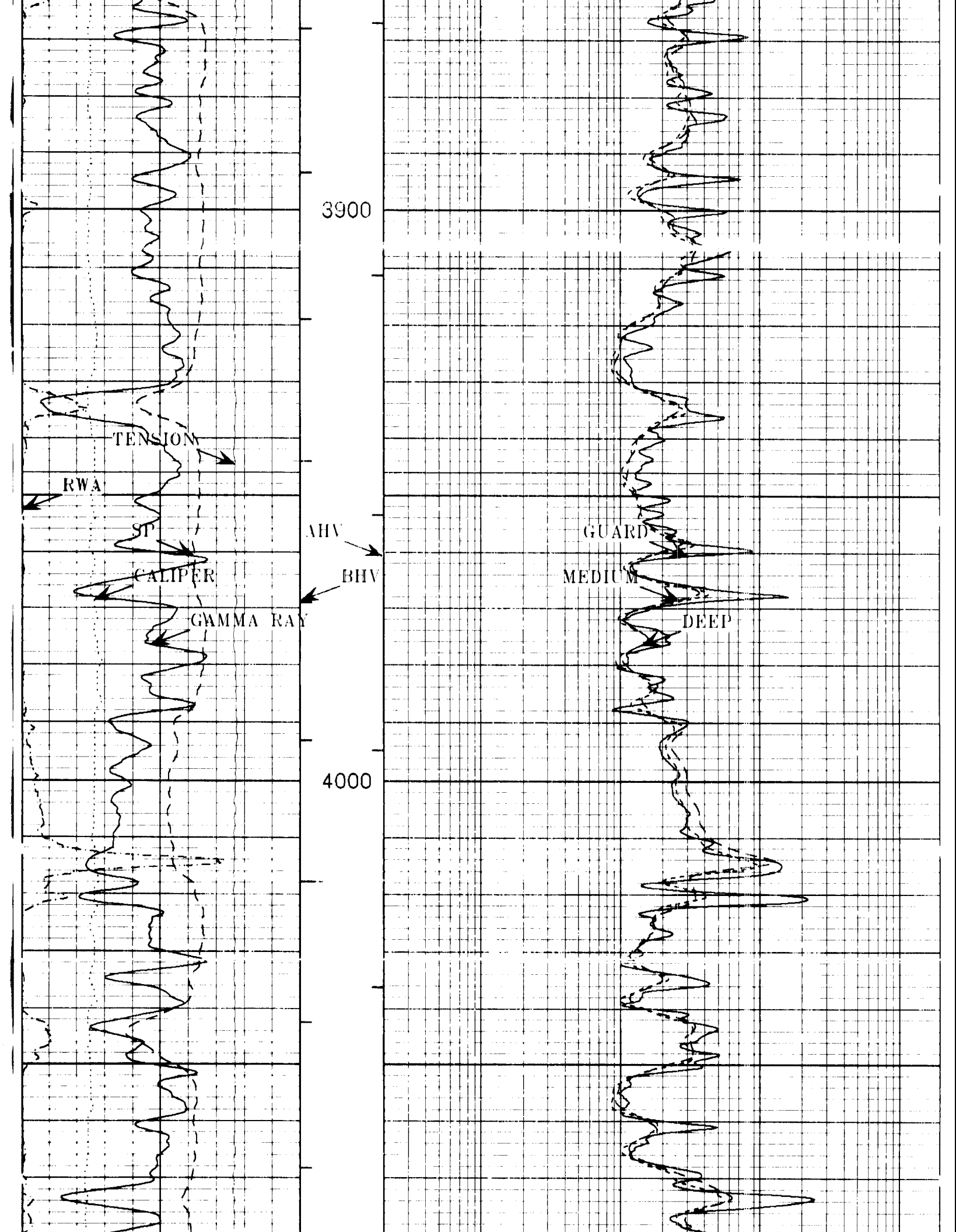
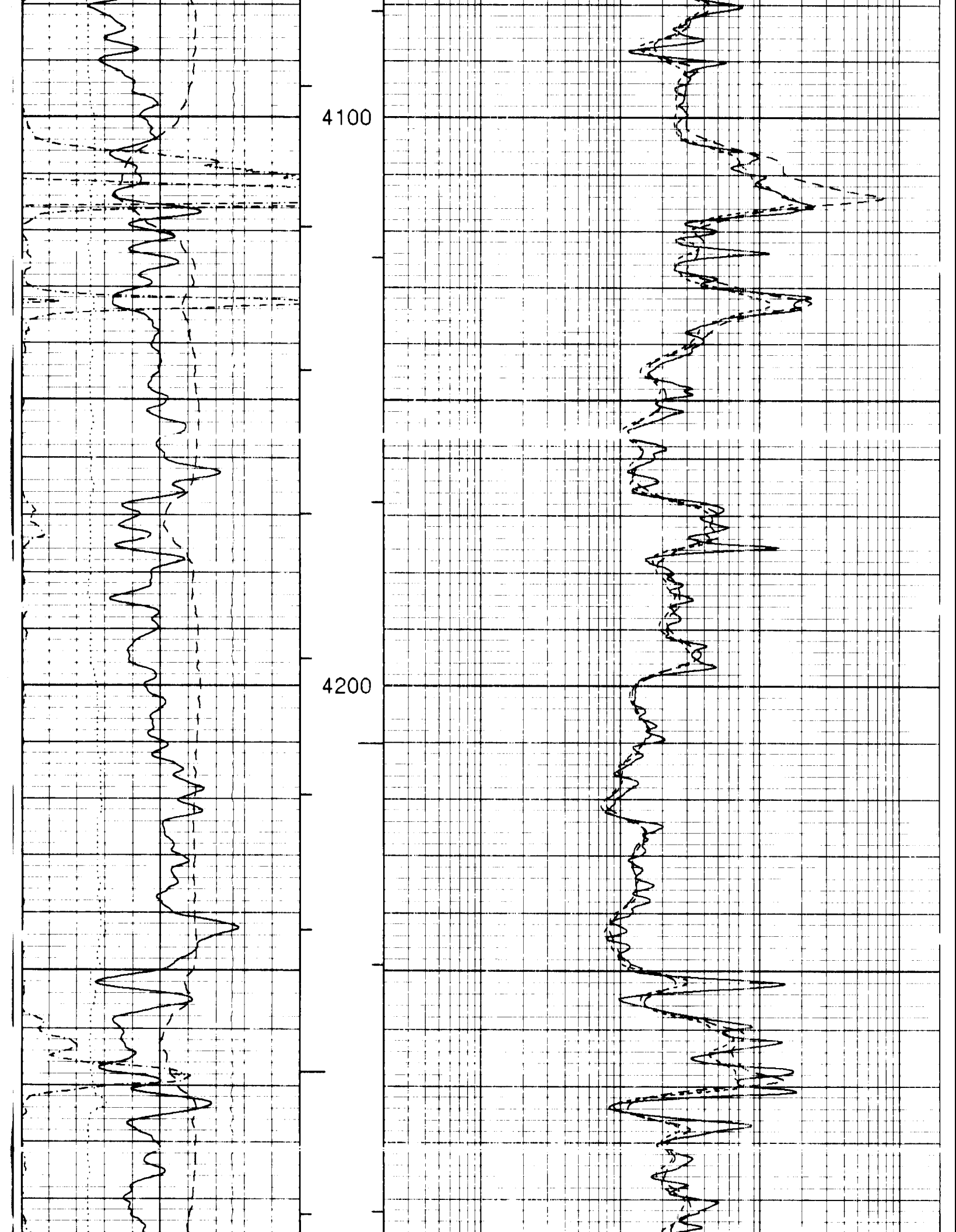

TENSION
RWA
SP
CALIPER
GAMMA RAY
AHV
BHV
GUARD
MEDIUM
DEEP
3500
3600


3700
3800


3900
4000
TENSION
RWA
SP
CALIPER
GAMMA RAY
AHV
BHV
GUARD
MEDIUM
DEEP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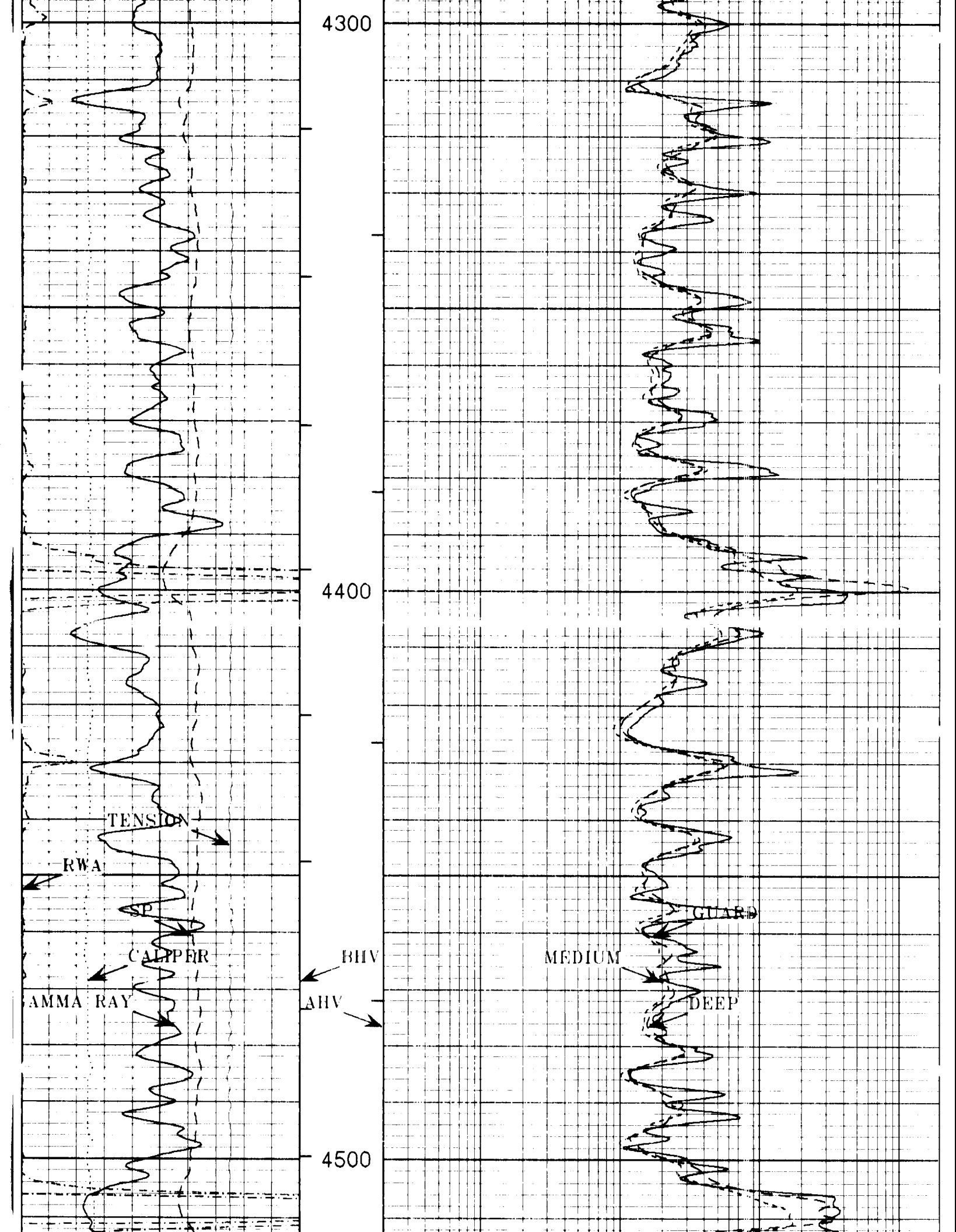
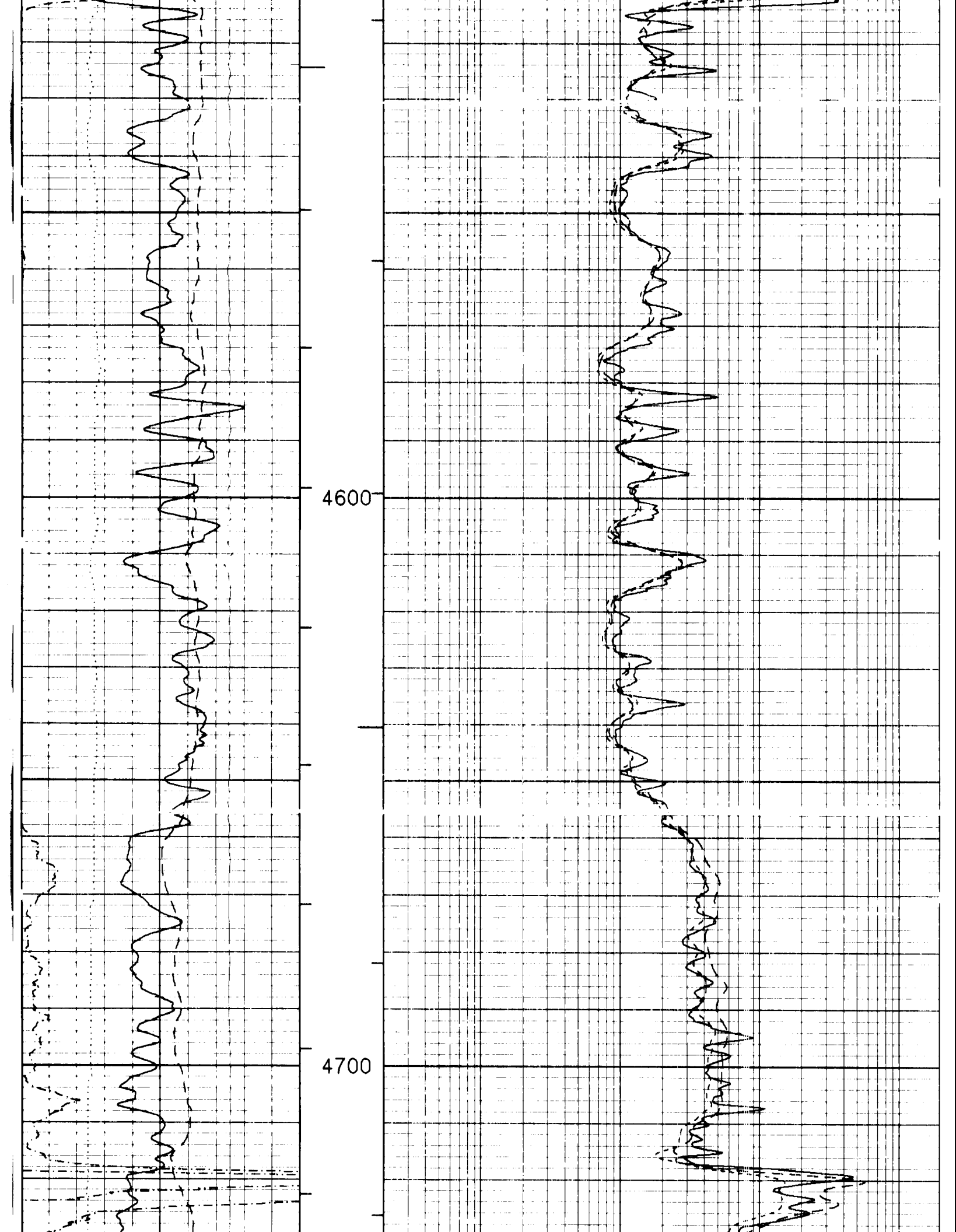
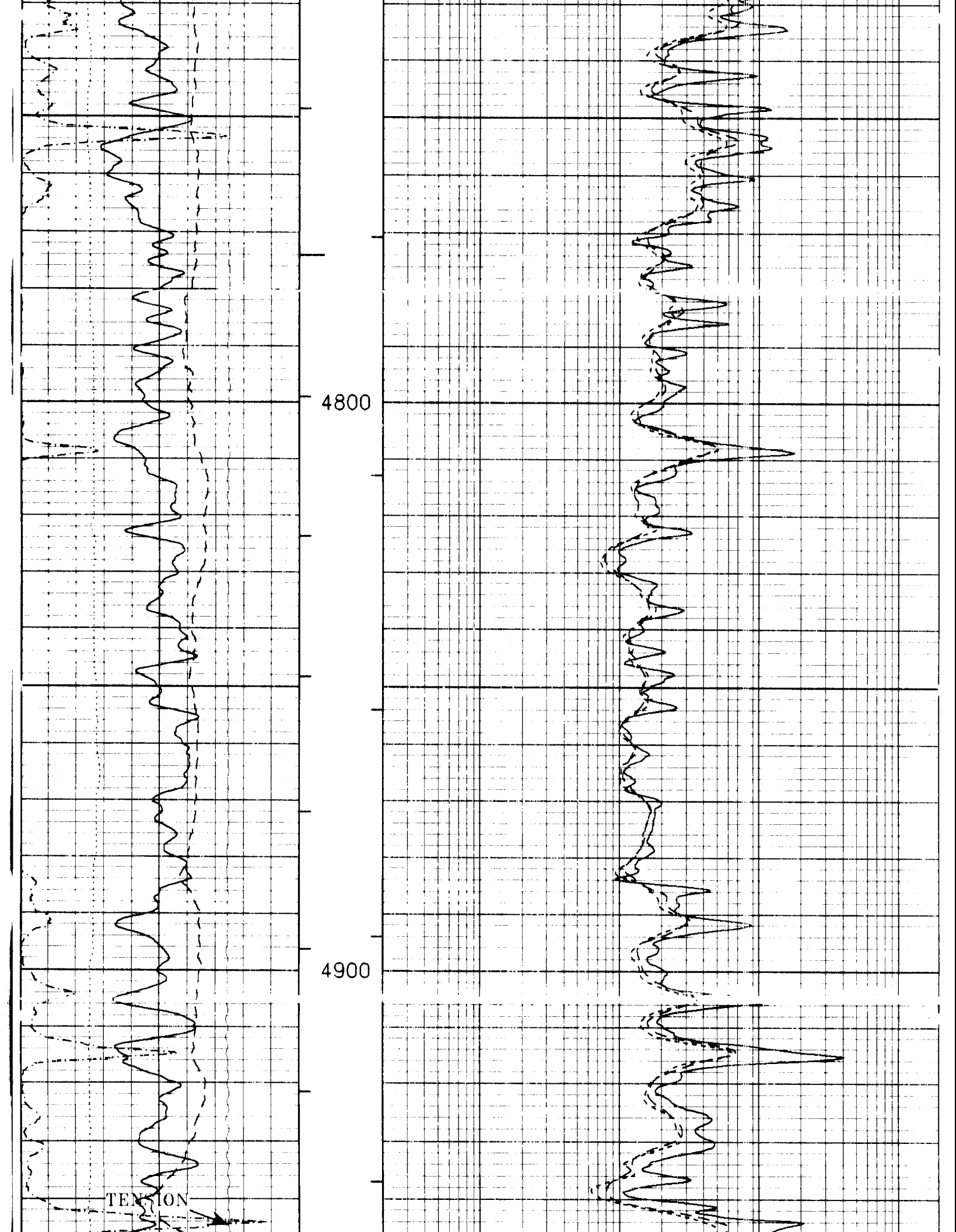
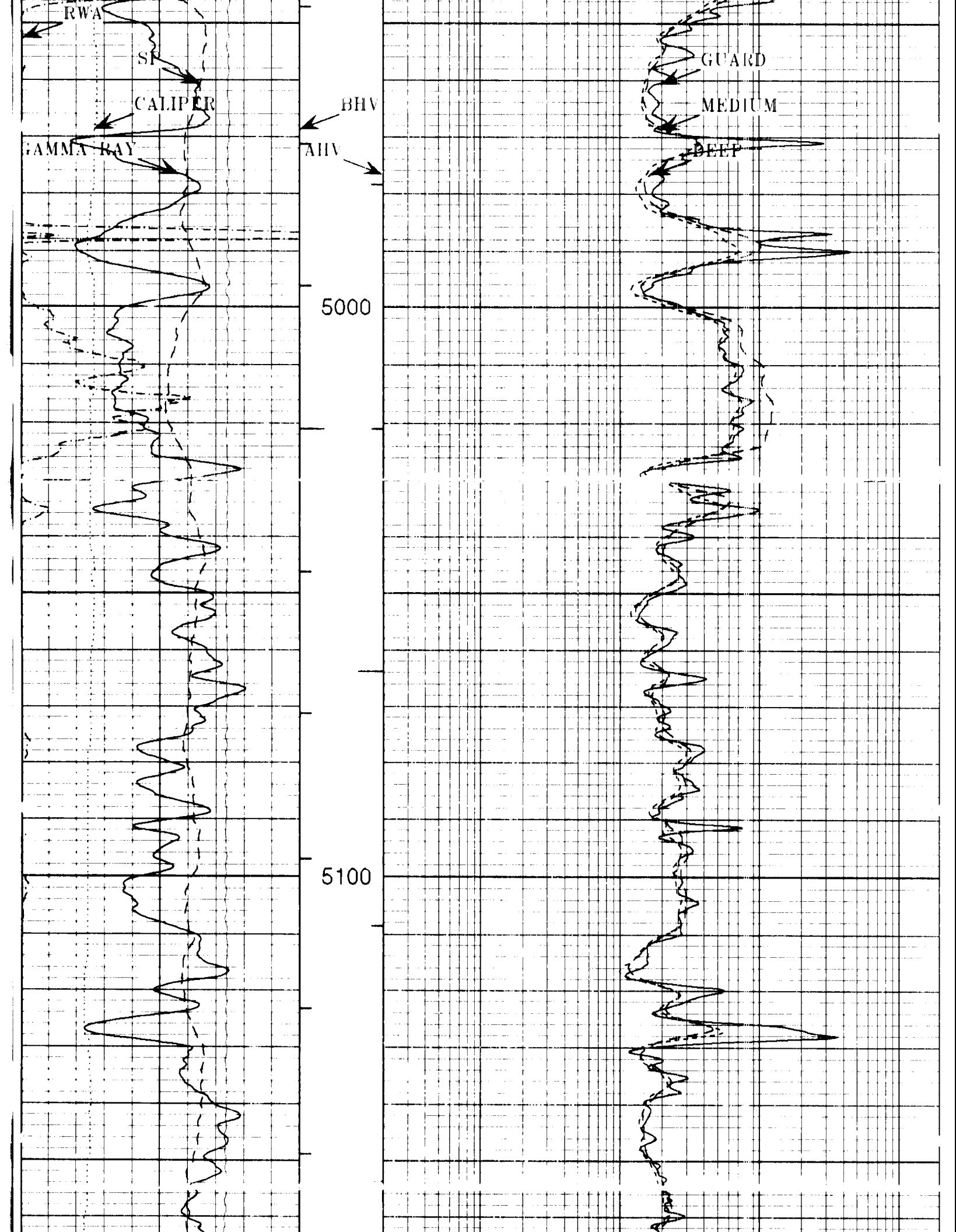
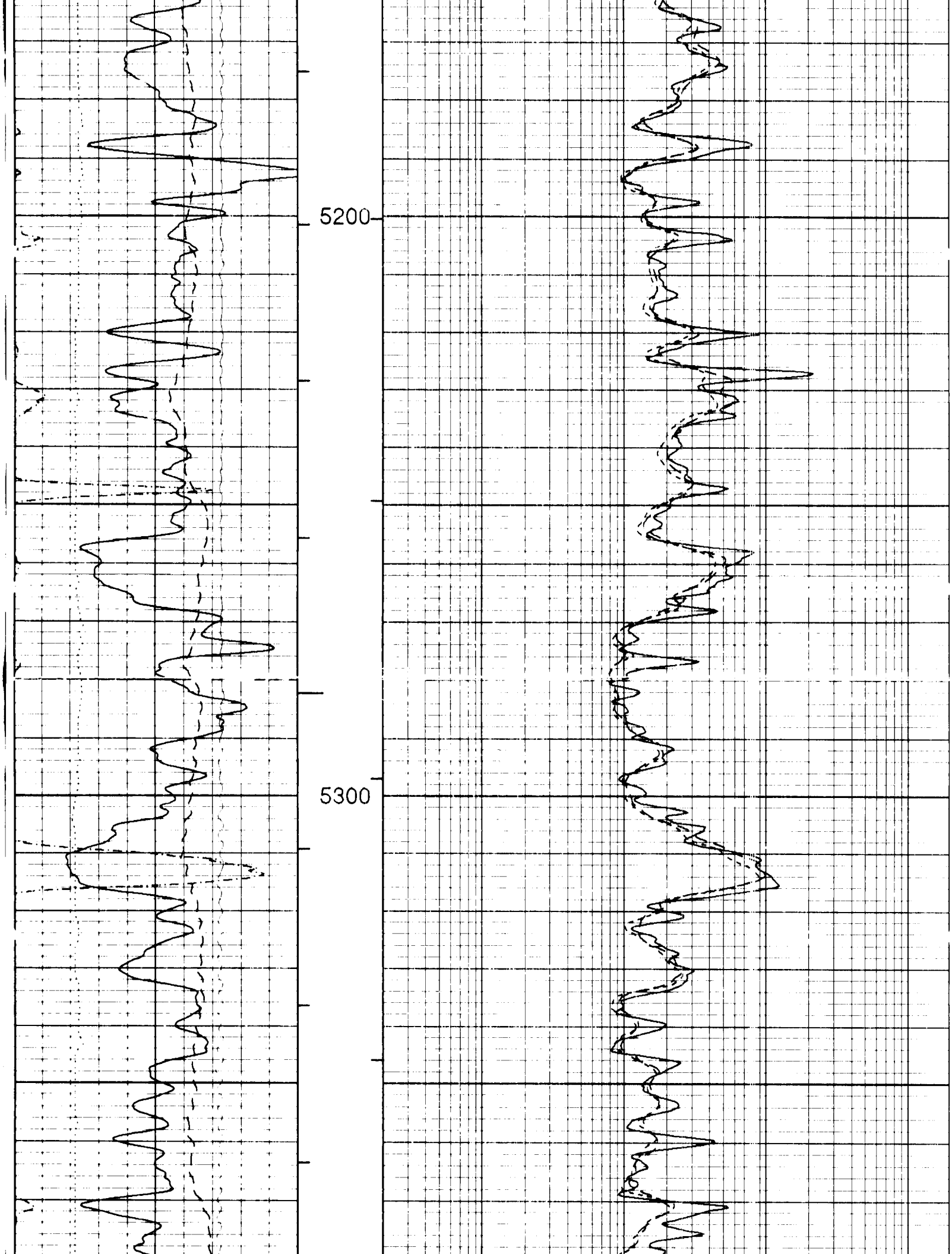
4200


4300
4400
4500
TENSION
RWA
SP
CALIPER
AMMA RAY
BHV
AHV
GUARD
MEDIUM
DEEP


4600
4700


4800
4900
TENSION


RWA
SP
CALIPER
GAMMA RAY
BHV
AHV
GUARD
MEDIUM
DEEP
5000
5100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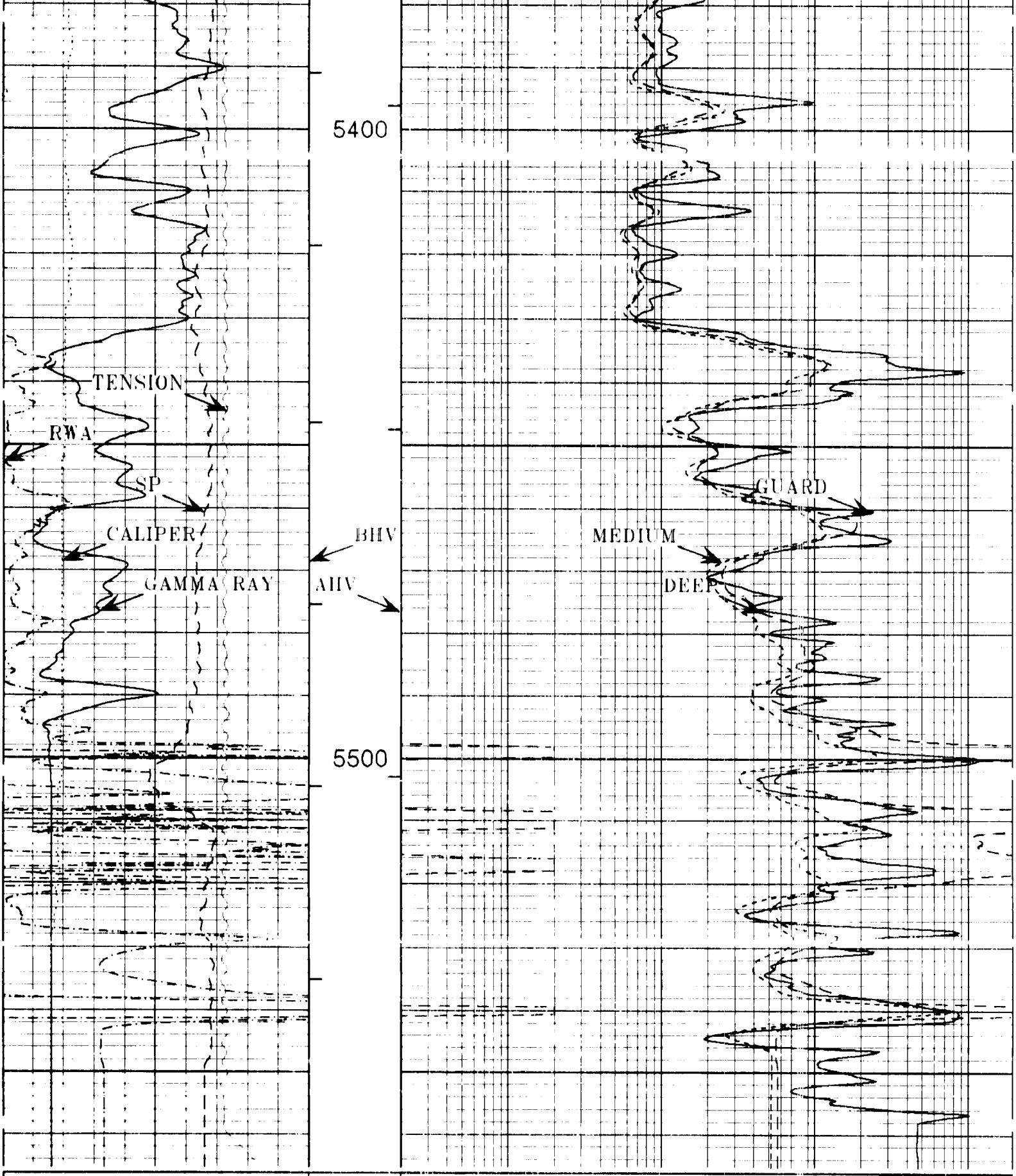
5300



10000	TENSION POUNDS	0	
0	RWA OHMM	3	1:240 Ft.
	SP -]10[+		
6	CALIPER INCHES	16	BHV

.2	GUARD OHM-M	2000
.2	MEDIUM OHM-M	2000

	GAMMA RAY	AHV		DEEP	
0	API COUNTS	200	.2	OHM-M	2000

HALLIBURTON

EXCELL

Data File: ute_fnbal31_04.2.dls

Format File: /field_data/data2/ute_fnb_ar51_04/plot_2_2.spc

Top Depth: 2.00

Bottom Depth: 5565.25

Plot Time: 03-13-98 22:42:17

Log Time: 03-13-98 20:39:50

REPEAT SECTION

HALLIBURTON

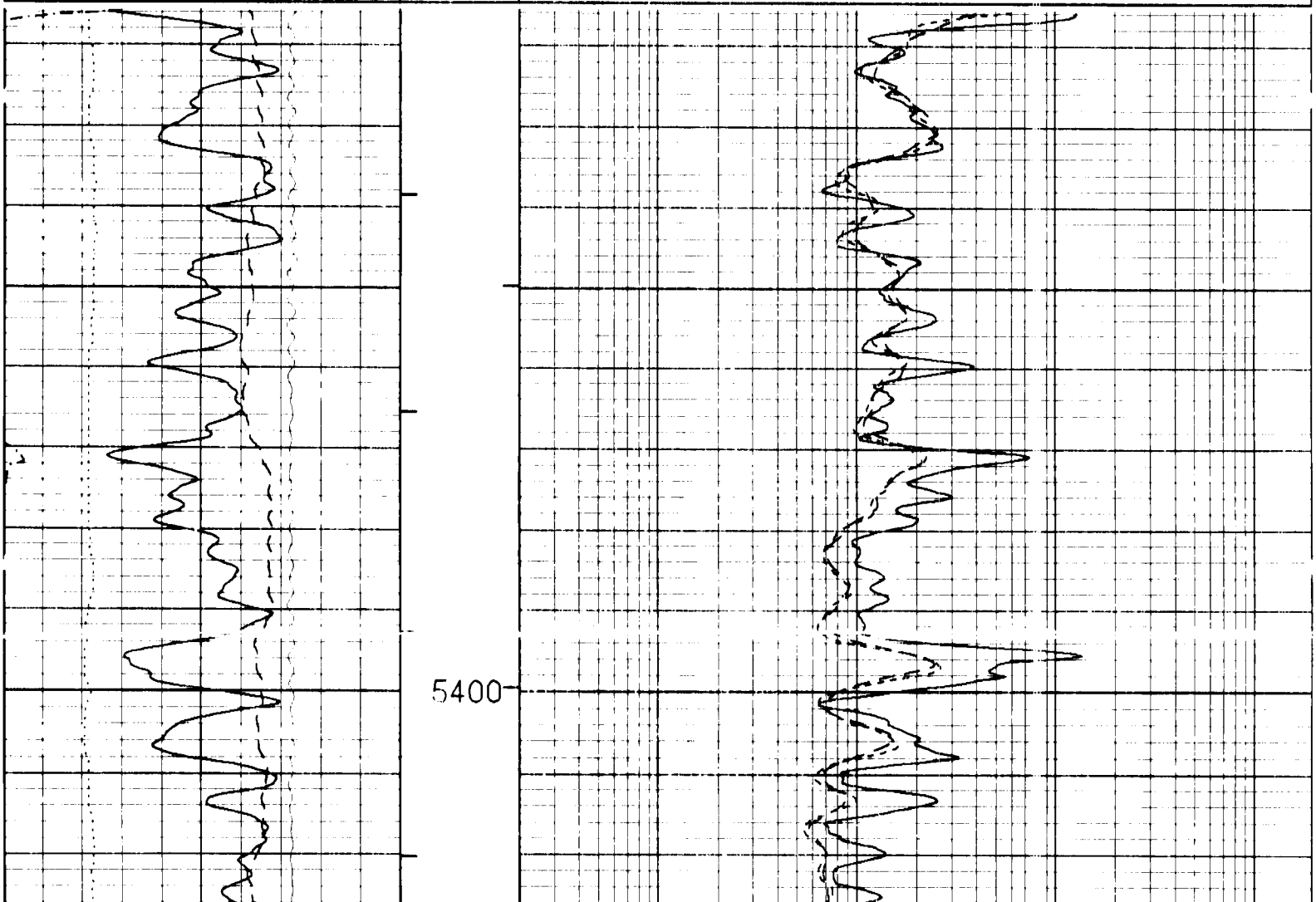
EXCELL

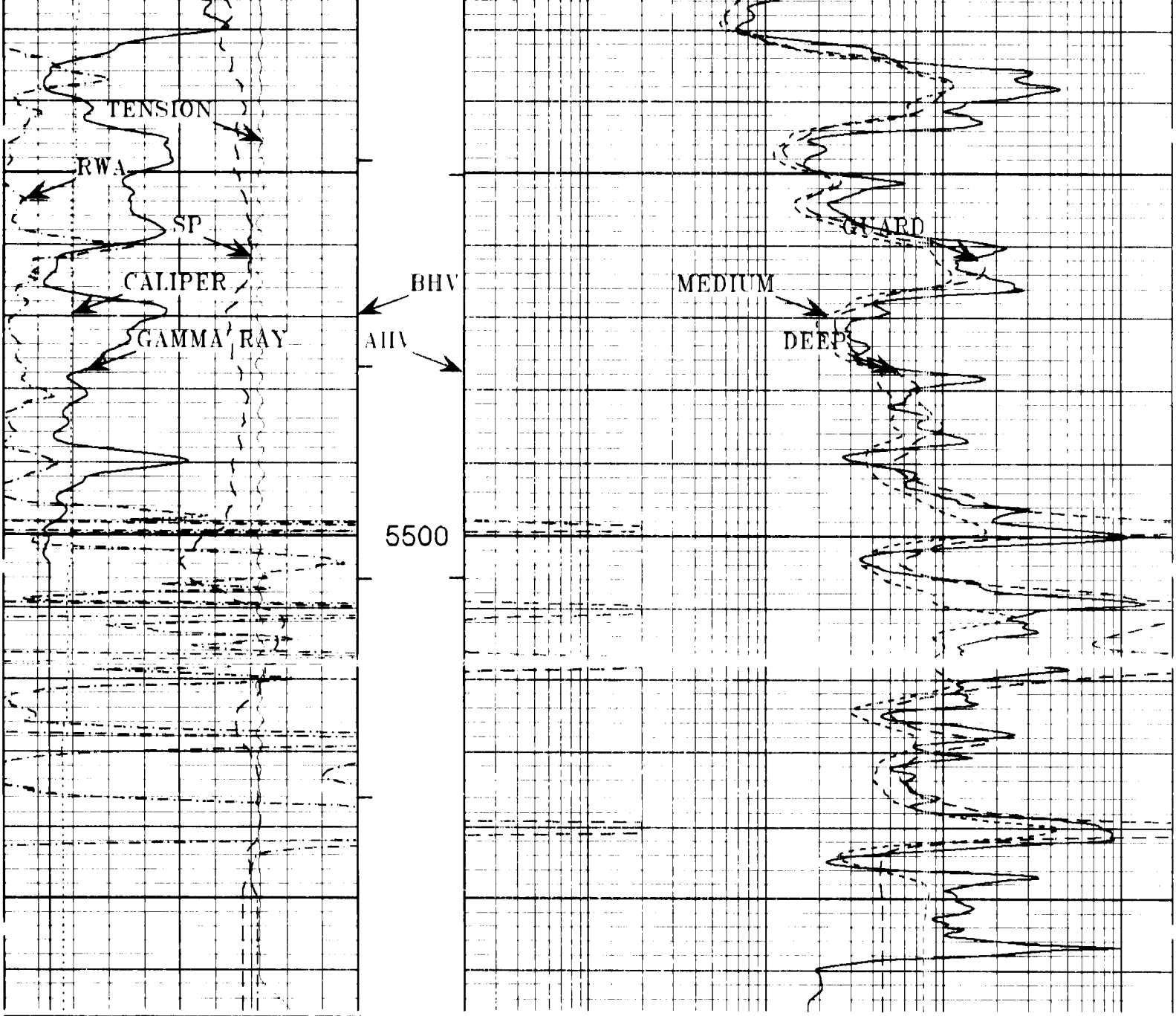
Top Depth: 5316.25

Bottom Depth: 5565.50

Log Time: 03-13-98 20:31:17

	GAMMA RAY	AHV		DEEP	
0	API COUNTS	200	.2	OHM-M	2000
	CALIPER	BHV		MEDIUM	
6	INCHES	16	.2	OHM-M	2000
	SP			GUARD	
	-]10[+	1:240 Ft.	.2	OHM-M	2000
	RWA				
0	OHMM	3			
	TENSION				
10000	POUNDS	0			





10000	TENSION POUNDS	0			
0	RWA OHMM	3	1:240 Ft.		
	SP -]10[+			.2 GUARD OHM-M	2000
6	CALIPER INCHES	16	BHV	.2 MEDIUM OHM-M	2000
0	GAMMA RAY API COUNTS	200	AHV	.2 DEEP OHM-M	2000

HALLIBURTON

EXCELL 2000

Version [illegible]

Data File [illegible]

Format File [illegible]

Top Depth 5315.25

Bottom Depth 5565.5[illegible]

Plot Time 03-13-98 22:5[illegible]

Log Time 03-13-98 [illegible]

EXCELL-2000 Calibration Report
Date: 13-Mar-1998 22:24

GAMMA RAY TOOL SHOP CALIBRATION SUMMARY

PERFORMED: 09-Mar-1998 14:33 LAST SHOP CALIBRATION: 10-Feb-1998 16:38
SERIAL NUMBER: 108631 MODEL: NGRT-A
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: GOODNOUGH

	MEASURED	CALIBRATED	UNITS
BACKGROUND	114	118	GAPI
BACKGROUND+CALIBRATOR	319	331	GAPI
CALIBRATOR	205	213	GAPI
GAPI CONVERSION FACTOR	0.530		GAPI/CPS

GAMMA RAY TOOL BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 19:39 LAST SHOP CALIBRATION: 09-Mar-1998 14:33

	SHOP	FIELD	UNITS
BACKGROUND	118	36	GAPI
BACKGROUND+CALIBRATOR	331	262	GAPI
CALIBRATOR	213	216	GAPI

DITS DUAL INDUCTION SHOP CALIBRATION SUMMARY

PERFORMED: 09-Mar-1998 14:20 LAST SHOP CALIBRATION: 09-Mar-1998 14:17
SERIAL NUMBER: 332127 MODEL: DILT-A B
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: GOODNOUGH

	DEEP INDUCTION		MEDIUM INDUCTION		
	MEASURED	CALIBRATED	MEASURED	CALIBRATED	UNITS
TOOL ZERO	-0.093	0.000	0.049	0.000	MMHOS/M
INTERNAL REFERENCE	508.286	508.262	509.081	508.728	MMHOS/M
WHEEL	500.066	500.000	500.378	500.000	MMHOS/M
MANDREL BASE	7.072	7.080	4.781	4.849	MMHOS/M

DITS DUAL INDUCTION BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 20:22 LAST SHOP CALIBRATION: 09-Mar-1998 14:20

	DEEP INDUCTION		MEDIUM INDUCTION		
	SHOP	FIELD	SHOP	FIELD	UNITS
TOOL ZERO	0.000	0.420	0.000	0.896	MMHOS/M
INTERNAL REFERENCE	508.262	517.982	508.728	487.546	MMHOS/M
MANDREL BASE	7.080	7.080	4.849	4.849	MMHOS/M

DITS DUAL INDUCTION AFTER SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 22:12 LAST SHOP CALIBRATION: 09-Mar-1998 14:20

	DEEP INDUCTION		MEDIUM INDUCTION		
	BEFORE	AFTER	BEFORE	AFTER	UNITS
TOOL ZERO	0.420	0.008	0.896	0.344	MMHOS/M
INTERNAL REFERENCE	517.982	518.816	487.546	492.419	MMHOS/M
MANDREL BASE	7.080	7.080	4.849	4.849	MMHOS/M

SHORT GUARD SHOP CALIBRATION SUMMARY

PERFORMED: 11-Feb-1998 11:13 LAST SHOP CALIBRATION: 28-Jan-1998 11:13
SERIAL NUMBER: 108809 MODEL: DSGT-A B
TRUCK UNIT NUMBER: 51943 PROGRAM VERSION: 3.40
PERFORMED BY: RED

	MEASURED	CALIBRATED	UNITS
EXT. CAL. POINT #1	0.500	0.500	OHM-M
EXT. CAL. POINT #2	19.982	20.000	OHM-M
EXT. CAL. POINT #3	1979.433	2000.000	OHM-M
INTERNAL REFERENCE	16.891	16.906	OHM-M

SHORT GUARD BEFORE SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 20:18 LAST SHOP CALIBRATION: 11-Feb-1998 11:13

	SHOP	FIELD	UNITS
INTERNAL REFERENCE	16.906	16.875	OHM-M

SHORT GUARD AFTER SURVEY FIELD CHECK SUMMARY

PERFORMED: 13-Mar-1998 22:13 LAST SHOP CALIBRATION: 11-Feb-1998 11:13

	BEFORE	AFTER	UNITS
INTERNAL REFERENCE	16.875	16.854	OHM-M

EXCELL-2000 Calibration Summary Table
Date: 13-Mar-1998 22:24

Service or Signal	Shop	Before	After	Change	Tolerance
GAMMA	213	216		-3	+/- 9.0
DEEP INTERNAL REFERENCE	508.262	517.982	518.816	-0.834	+/-20
MEDIUM INTERNAL REFERENCE	508.728	487.546	492.419	-4.873	+/-20
DEEP TOOL ZERO	0.000	0.420	0.008	0.413	+/-2
MEDIUM TOOL ZERO	0.000	0.896	0.344	0.552	+/-2
GUARD	16.906	16.875	16.854	0.022	+/-0.8

EXCELL-2000 CUSTOMER EVENT LOG
Date: 13-Mar-1998 22:54

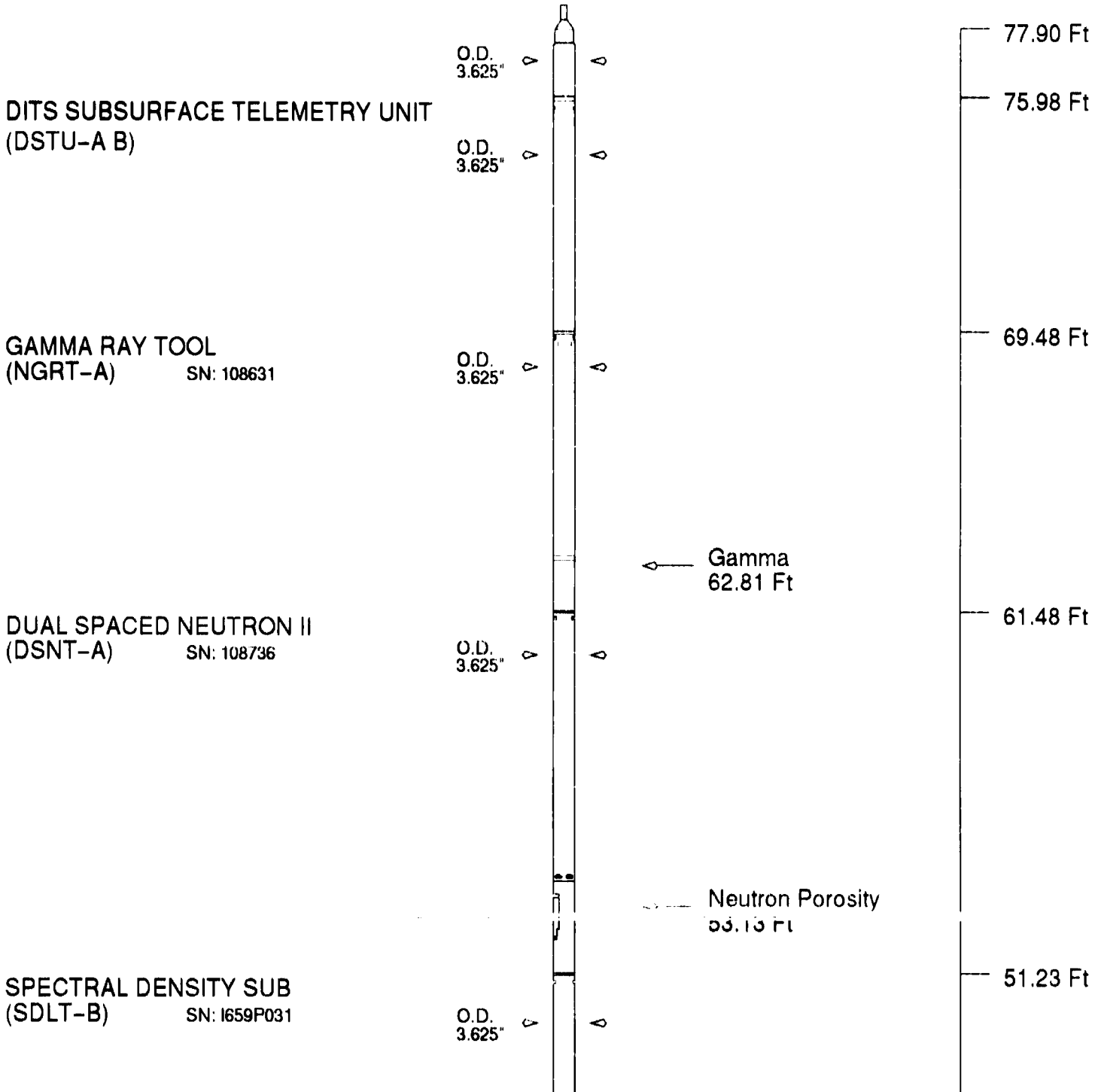
Event	Time	Section	Depth	Event Description	Data	Repeat
0001	19:07:04	0	0.00	Engineer is: GOOD		
0002	19:30:38	0	92.91	TD PARAM CHANGE 0. -->FP	5554.0000	
0003	19:30:38	0	92.91	CASEOD PARAM CHANGE 4.5 -->FP	5.5000	
0004	19:30:38	0	92.91	MUDWT PARAM CHANGE 9.1 -->FP	8.3000	
0005	19:50:40	0	92.91	Exiting EXCELL-2000 tool calibrations.	FIELD	
0006	20:22:23	0	2579.75	Exiting EXCELL-2000 tool calibrations.	FIELD	
0007	20:31:18	1	5565.58	Begining new Uplog section.	1	
0008	20:36:29	1	5313.83	End logging section	1	
0009	20:39:51	2	5565.33	Begining new Uplog section.	2	
0010	22:07:51	2	300.00	CASED PARAM CHANGE FALSE -->LP	TRUE	
0011	22:07:51	2	300.00	CASEOD PARAM CHANGE [illegible] -->FP	8.6250	

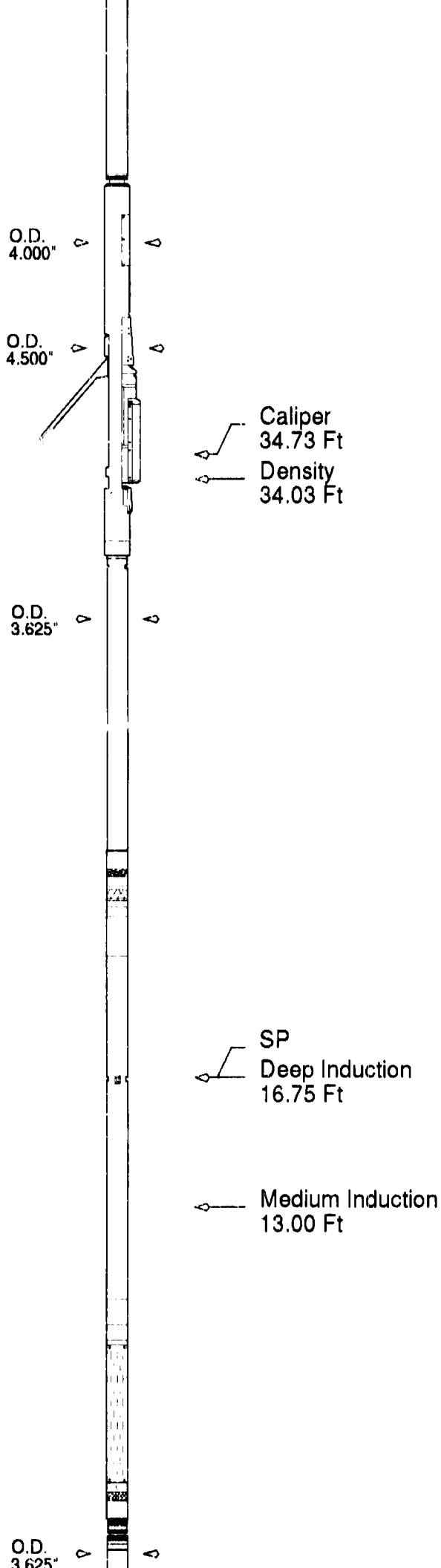
0011	22:07:51	2	300.00	CASEOD PARAM CHANGE	5.5000 -->FP	8.6250	
0012	22:07:51	2	300.00	CASEWT PARAM CHANGE	17.0000 -->FP	24.0000	
0013	22:07:51	2	300.00	DSN_OK PARAM CHANGE	TRUE -->LP	FALSE	
0014	22:07:51	2	300.00	SDL_OK PARAM CHANGE	TRUE -->LP	FALSE	
0015	22:07:51	2	300.00	CAL_OK PARAM CHANGE	TRUE -->LP	FALSE	
0016	22:07:51	2	300.00	AHVOK PARAM CHANGE	TRUE -->LP	FALSE	
0017	22:07:51	2	300.00	DI_OK PARAM CHANGE	TRUE -->LP	FALSE	
0018	22:07:51	2	300.00	SG_OK PARAM CHANGE	TRUE -->LP	FALSE	
0019	22:11:41	2	76.41	End logging section		2	
0020	22:13:44	2	76.41	Exiting EXCELL-2000 tool calibrations.		POST	

HALLIBURTON

Excell 2000 Tool String Diagram

DUAL INDUCTION
SPECTRAL DENSITY
DUAL SPACED NEUTRON





DITS DUAL INDUCTION
(DILT-A B) SN: 332127

31.80 Ft

SHORT GUARD
(DSGT-A B) SN: 108809

4.00 Ft

Short Guard
2.00 Ft

0.00 Ft

Tool Mnemonic	Length (Ft)	Weight In Air (lbs)	Logging Speed (Ft/min)
DSTU-A B	6.50	116.50	N/A
NGRT-A	8.00	151.80	120.00
DSNT-A	10.25	195.80	45.00
SDLT-B	19.43	358.50	30.00
DILT-A B	27.80	359.50	120.00
DSGT-A B	4.00	89.80	120.00
Tool String	75.98	1271.90	30.00

COMPANY PETROGLYPH OPERATING COMPANY

WELL UTE TRIBAL #31-04

FIELD ANTELOPE CREEK

COUNTY DUCHESNE **STATE** UT

HALLIBURTON

DUAL INDUCTIOM
SHORT GUARD

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 Sy

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 1 well to water injection wells in an enhanced recovery program. The wells 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 the Well's Location	Owners within Well's ¼ mile radius
Mineral: Ute Tribe	No others
Operator: Petroglyph	Linn Operating, INC
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

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 31-04	770' FNL & 703' FWL	31, T5S-R3W

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 31-04

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	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)

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:

D. Date Signed: 07/27/2015

ATTACHMENT NO. 10

WELL BORE DIAGRAMS FOR THE UIC WELL

Ute Tribal 31-04 Well History

Well History:

Spud Well: 3/5/1998

Completed: 4/7/1998

First Production: 4/14/1998

Tops (KB):

BMSW* Found at 1264'

Green River 982'

A Marker 3456'

X Marker 3934'

Douglas Creek 4072'

B Limestone 4447'

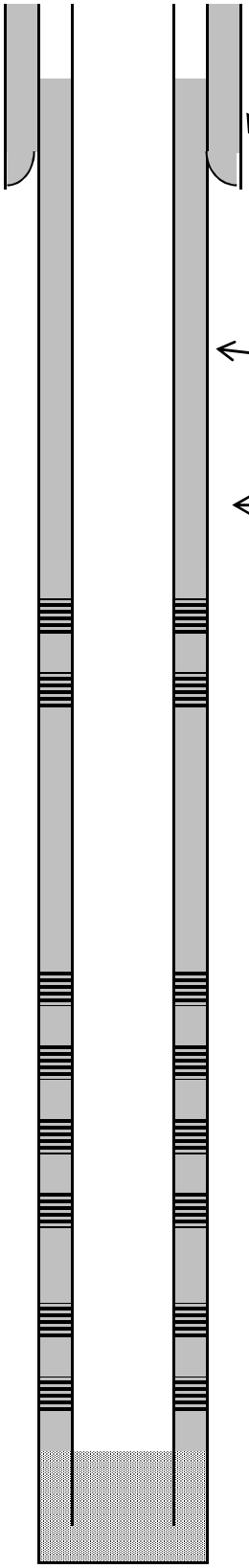
Castle Peak 4945'

Basal Carbonate 5432'

Perf History

3/31/1998

B08.2	3800' to 3804'
C02	4013' to 4017'
C04	4108' to 4112'
C06	4267' to 4271'
C09.2	4397' to 4401'
D3	4506' to 4510'
E07	5310' to 5314'



(Not to Scale)

GL: 6254'

KB: 6264'

8 5/8" 24# Surface CSG @ 355' KB

cmt'd w/300 sx

Surface Hole size 12 1/4"

Cement top @ 170'

5 1/2" 15.5# J-55 CSG @ 5517'

cmt'd w/565sx

Hole Size 7 7/8" bit

Perf's:

B08.2 3800' to 3804'

C02 4013' to 4017'

C04 4108' to 4112'

C06 4267' to 4271'

C09.2 4397' to 4401'

D3 4506' to 4510'

E07 5310' to 5314'

PBTD @ 5442' KB

TD @ 5554' KB

Petroglyph Operating Co., Inc.

Ute Tribal #31-04

(770' FNL & 703' FWL)

NW NW Section 31, 5S- 3W

Antelope Creek Field

Duchesne Co. Utah

API#: 43013320340000

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

Ute Tribal 31-04 Injection

Well History:

Spud Well: 3/5/1998

Completed: 4/7/1998

First Production: 4/14/1998

Tops (KB):

BMSW* Found at 1264'

Green River 982'

A Marker 3456'

X Marker 3934'

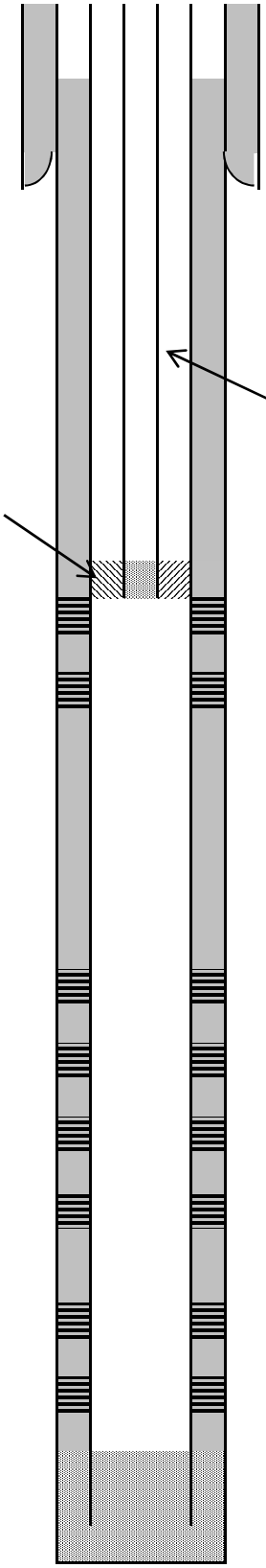
Douglas Creek 4072'

B Limestone 4447'

Castle Peak 4945'

Basal Carbonate 5432'

Injection packer @ 3700'



GL: 6254'

KB: 6264'

8 5/8" 24# Surface CSG @ 355' KB

cmt'd w/300 sx

Surface Hole size 12 1/4"

Cement top @ 170'

5 1/2" 15.5# J-55 CSG @ 5517'

cmt'd w/565sx

Tubing 2 7/8" 6.5# J55

Hole Size 7 7/8" bit

Perf's:

Add B08.2 3789' to 3792'

B08.2 3800' to 3804'

Add B08.2 3804' to 3808'

Add B10 3846' to 3850' and 3860' to 3863'

C02 4013' to 4017'

Add C04 4105' to 4108'

C04 4108' to 4112'

Add C04 4112' to 4115'

Add C05 4132' to 4135'

Add C06 4262' to 4267'

C06 4267' to 4271'

Add C09.2 4393' to 4397'

C09.2 4397' to 4401'

Add C09.2 4401' to 4403'

D3 4506' to 4510'

Add D3 4510' to 4513'

Add D7 4664' to 4669'

Add E01.1 5001' to 5022'

Add E07 5308' to 5310'

E07 5310' to 5314'

Add E07 5314' to 5316'

PBTD @ 5442' KB

TD @ 5554' KB

Petroglyph Operating Co., Inc.

Ute Tribal #31-04

(770' FNL & 703' FWL)

NW NW Section 31, 5S- 3W

Antelope Creek Field

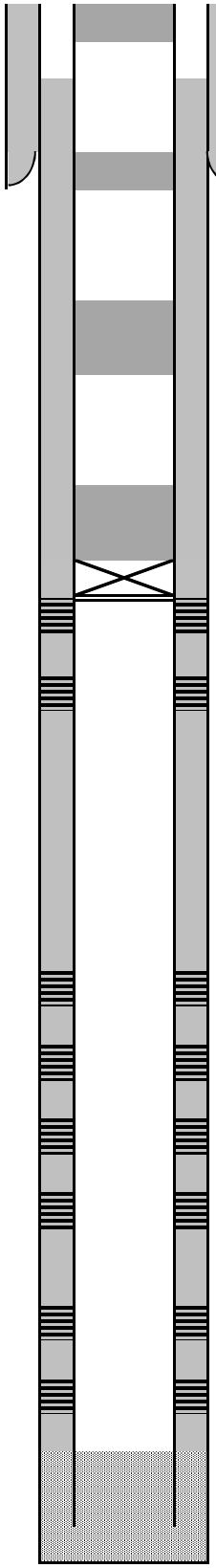
Duchesne Co. Utah

API#: 43013320340000

*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 31-04 Plug and Abandonment



GL: 6254'
KB: 6264'

8sx Class G Cement-50' plug

8 5/8" 24# Surface CSG @ 355' KB
cmt'd w/300 sx

15sx Class G Cement-100' plug

Surface Hole size 12 1/4"

Cement top @ 170'
5 1/2" 15.5# J-55 CSG @ 5517'
cmt'd w/565sx

30sx Class G Cement-200' plug

Hole Size 7 7/8" bit

30sx Class G Cement-200' plug
CIBP @ 3710'

Perf's:
B08.2 3800' to 3804'
C02 4013' to 4017'
C04 4108' to 4112'
C06 4267' to 4271'
C09.2 4397' to 4401'
D3 4506' to 4510'
E07 5310' to 5314'

PBTD @ 5442' KB
TD @ 5554' KB

Petroglyph Operating Co., Inc.
Ute Tribal #31-04
(770' FNL & 703' FWL)
NW NW Section 31, 5S- 3W
Antelope Creek Field
Duchesne Co. Utah
API#: 43013320340000

*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 31-04

43-013-32034

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 @ 3710‘.

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 170’ and set balanced 200’ cement plug using 30sxs of Class G cement.

6. Raise the tubing to 355’ 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 31-04

43-013-32034

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: B08.2 3789' to 3792', 3804' to 3808', B10 3846' to 3850', 3860' to 3863', C04 4105' to 4108', C04 4112' to 4115', C05 4132' to 4135', C06 4262' to 4267', C09.2 4393' to 4397', C09.2 4401' to 4403', D3 4510' to 4513', D7 4664' to 4669', E01.1 5001' to 5022', E07 5308' to 5310', and 5314' to 5316.
7. RD Wireline.
8. PU plug and packer and new tubing. RIH and breakdown perfs.
9. POOH. RIH with injection packer to 3700'.
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.