UNDERGROUND INJECTION CONTROL
PERMIT APPLICATION

Ute Tribal # 04-04
1205' FNL & 660' FWL
Sec. 4, T5S-R3W
Duchesne County, Utah
API # 43-013-31574

July 2015

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

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

LIST OF ATTACHMENTS

Attachment No. 1	Area Topography Map
Attachment No. 2	Site Map
Attachment No. 3	Map of the A-Marker surface
Attachment No. 4	Cross-Sections of the injection formation
Attachment No. 5	Water Analysis
Attachment No. 6	Completion data for all wells in the AOR
Attachment No. 7	CBL for the UIC well
Attachment No. 8	Open hole log for the UIC well
Attachment No. 9	List of owners and Affidavit Notification
Attachment No. 10	Well bore diagrams for the UIC well
Attachment No. 11	P&A procedure
Attachment No. 12	MIT procedure
Attachment No. 13	Surety Bond letter

SUMMARY DOCUMENT
UIC WELL APPLICATION
Ute Tribal 04-04
API # 43-013-31574

The following document contains information provided in support of the application for the conversion of the Ute Tribal 04-04 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 04-04 is 1205' FNL & 660' FWL Lot 5 Sec. 4, 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 04-04 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 33-13N-D3, Ute Tribal 05-01, Ute Tribal 04-06B, and Ute Tribal 04-08A well(s) located in its ¼ mile radius.

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

(5) Injection Zone – The injection intervals are between 4080' and 6082' True Vertical Depth and located in the lower portion of the Green River Formation. The injection zone is confined within a 2002' 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 04-04 is 243 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 04-05, the most recent analysis of the water being injected into the Green River formation at this location is 3302 mg/L TDS. This analysis is also included in Attachment No. 5.

(7) A summary of completion data from the Ute Tribal 04-04 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 04-04 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 04-04 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 **1900**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 04-04:
2032psi = (0.88psi/ft - 0.43(1.00)) 4516ft

EPA Area Permit No. 20736-00000 further caps maximum surface pressure at 1900psi.

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

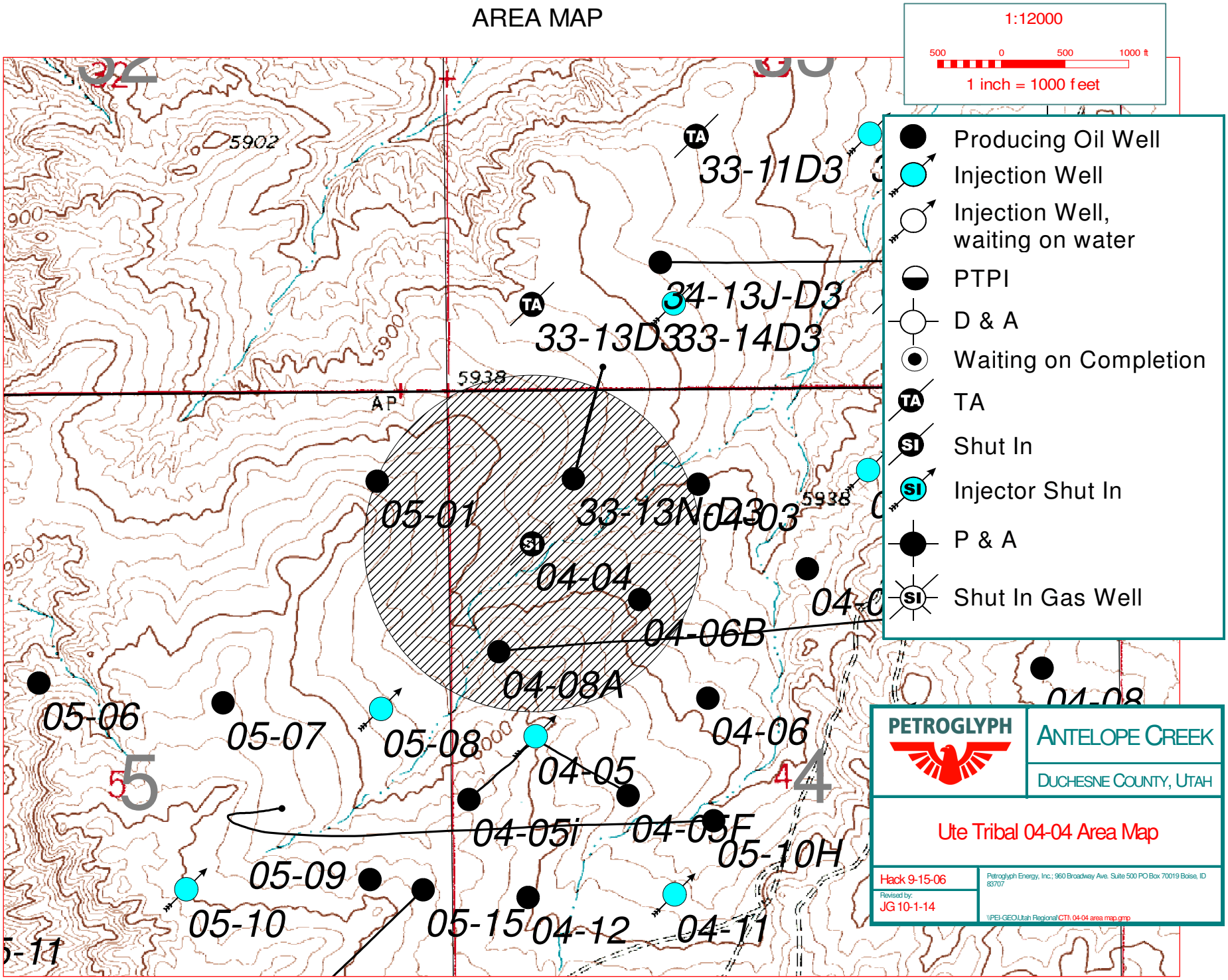
(15) Petroglyph will give proof of financial responsibility by posting a surety bond for the UIC well prior to final permit approval. A copy of this letter is contained in Attachment No. 13.

(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

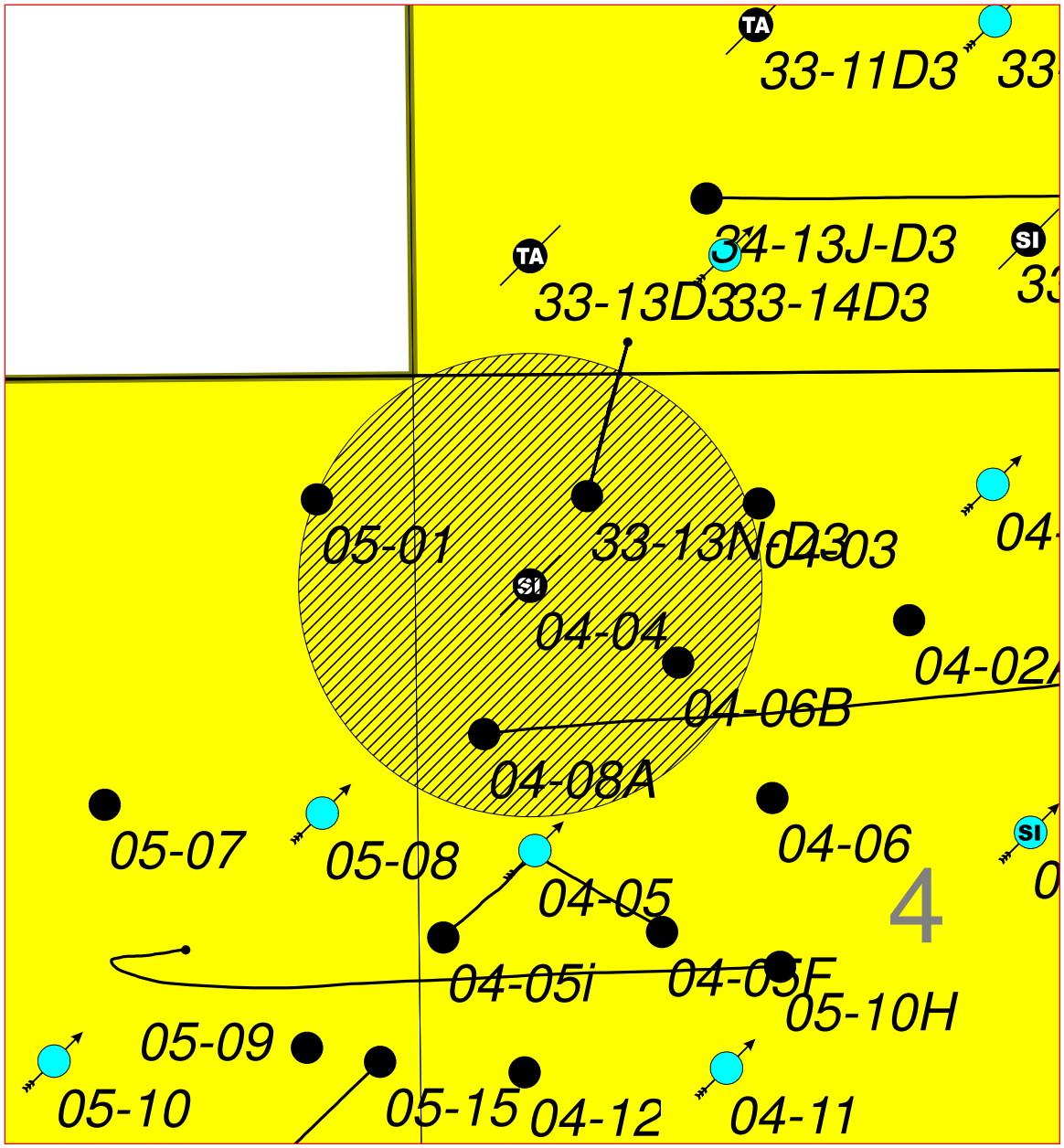
RADIUS MAP OF ADJACENT WELLS

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 04-04 Plat and Quarter-mile radius map. Ute Indian lands under Petroglyph lease shown in yellow

Hack 9-15-06

Revised by:
JG 9-2-14

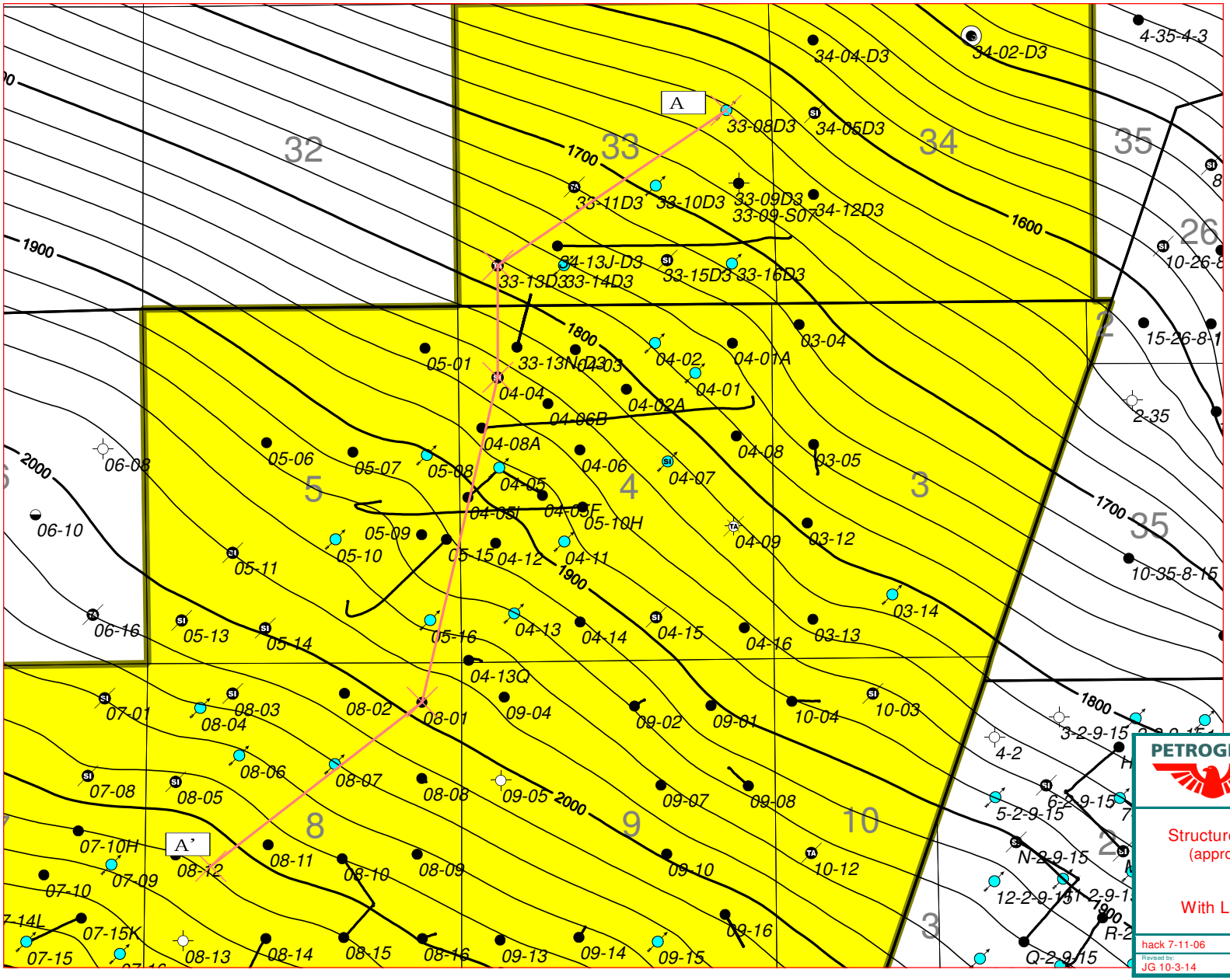
Petroglyph Energy, Inc.; 960 Broadway Ave. Suite 500 PO Box 70019 Boise, ID 83707

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

ATTACHMENT NO. 3

MAP OF THE A-LIME MARKER SURFACE

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



1:30000

1000 0 1000 2000 ft

1 inch = 2500 feet

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

PETROGLYPH

ANTELOPE CREEK

DUCHESNE COUNTY, UTAH

Structure Map of the "A" Lime Marker
(approximate top of Injection Zone)
in the Vicinity of the
Ute Tribal 04-04
With Line of Cross Section A to A'

hack 7-11-06

Revised by:
JG 10-3-14

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

\\SERV\Geo\Utah Regional\ CTI\04-04 structure map.gmp

ATTACHMENT NO. 4

CROSS SECTIONS OF THE INJECTION FORMATION

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

43013319560000 — PETROGLYPH OPERATING COMPANY INC, Ute Tribal 33-08D3, 1848 FNL 762 FEL, TWP: 4 S - Range: 3 W - Sec. 33

4621 ft

43013319580000 — PETROGLYPH OPERATING COMPANY INC, Ute Tribal 33-13D3, 660 FSL 660 FWL, TWP: 4 S - Range: 3 W - Sec. 33

1878 ft

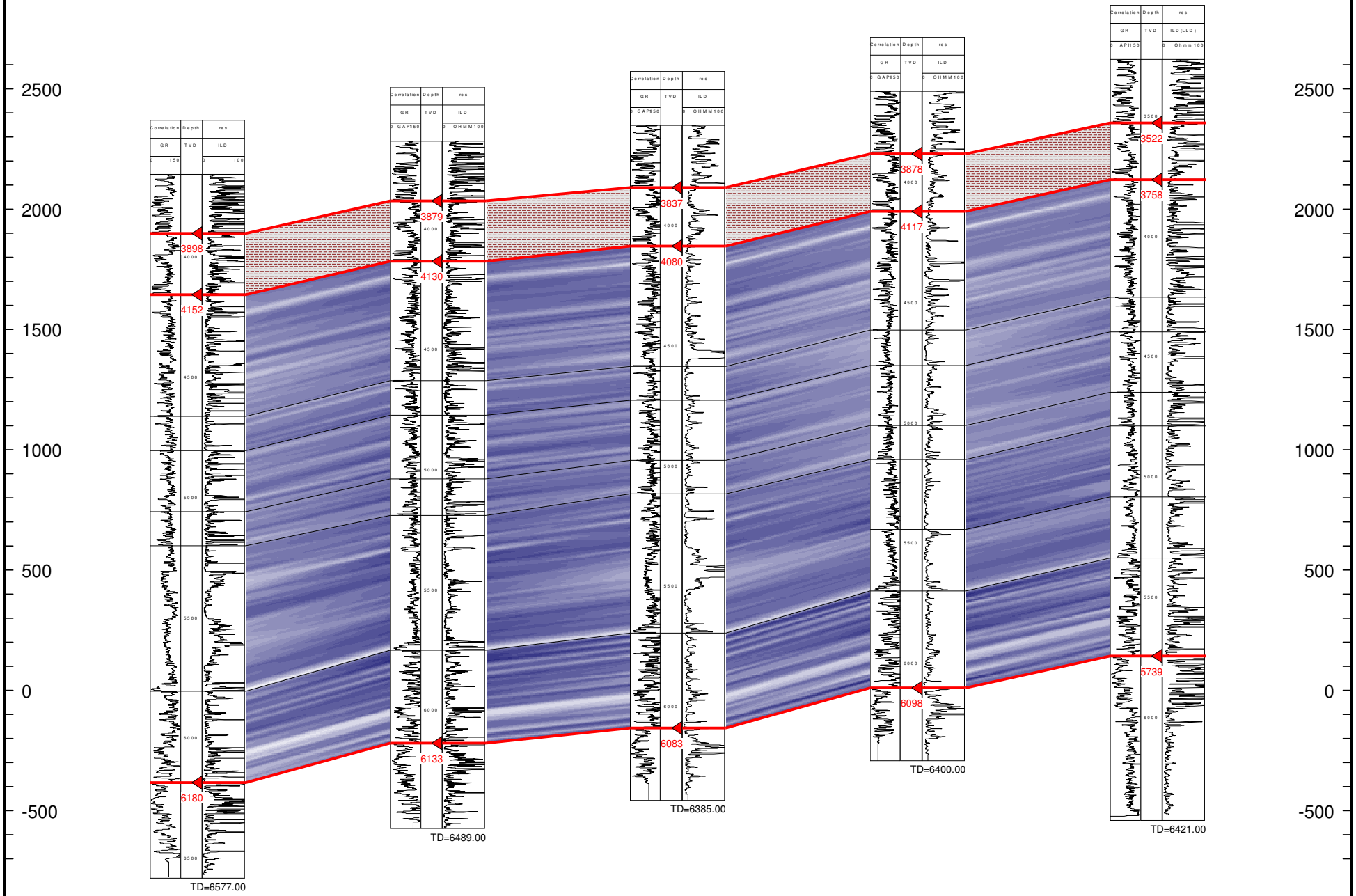
43013315740000 — PETROGLYPH OPERATING COMPANY INC, Ute Tribal 04-04, 1205 FNL 660 FWL, TWP: 5 S - Range: 3 W - Sec. 4

5589 ft

43013315680000 — PETROGLYPH OPERATING COMPANY INC, Ute Tribal 08-01, 660 FNL 660 FEL, TWP: 5 S - Range: 3 W - Sec. 8

4856 ft

43013311640000 — PETROGLYPH OPERATING, Ute Tribal 08-12, 2100 FSL 515 FWL, TWP: 5 S - Range: 3 W - Sec. 8



ATTACHMENT NO. 5

WATER ANALYSIS

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

multi-chem
A HALLIBURTON SERVICE

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)

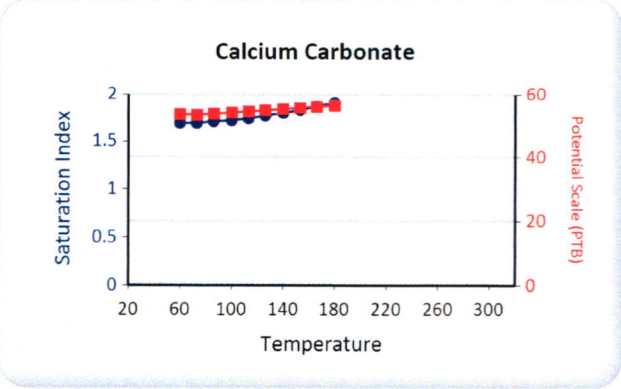
		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.91	56.41	0.09	0.09	0.00	0.00	2.59	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.87	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

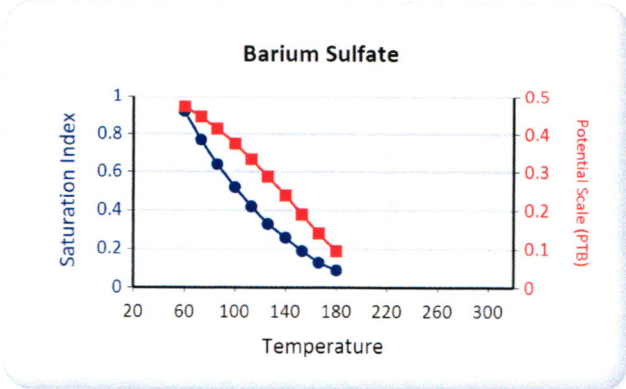
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	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

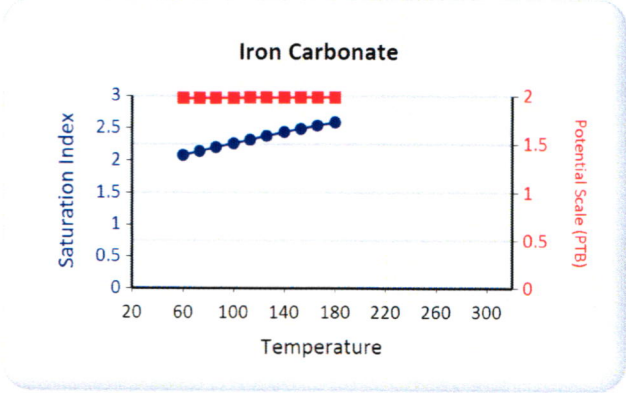
Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

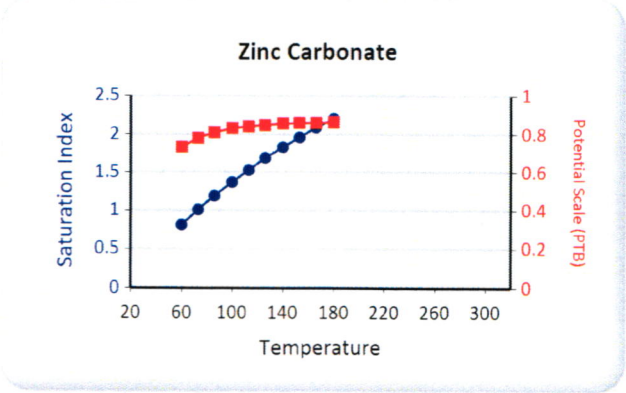
multi-chem
A HALLIBURTON SERVICE

Water Analysis Report









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

multi-chem
A HALLIBURTON SERVICE

Water Analysis Report

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

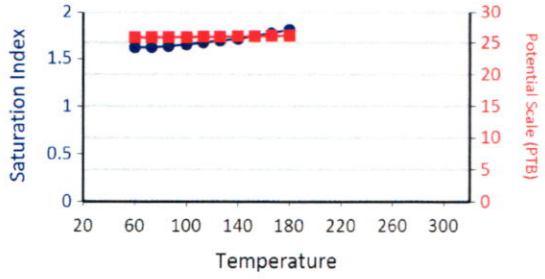
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	3.15	4.62	10.72	0.03	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	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

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

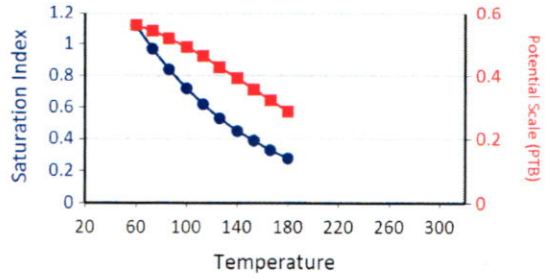
multi-chem
A HALLIBURTON SERVICE

Water Analysis Report

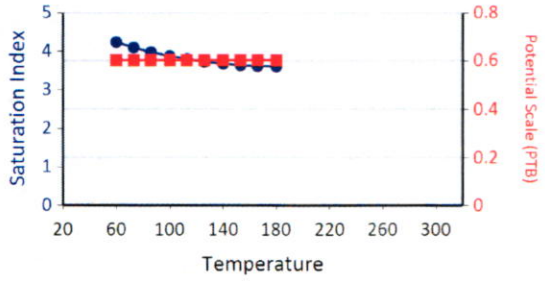
Calcium Carbonate



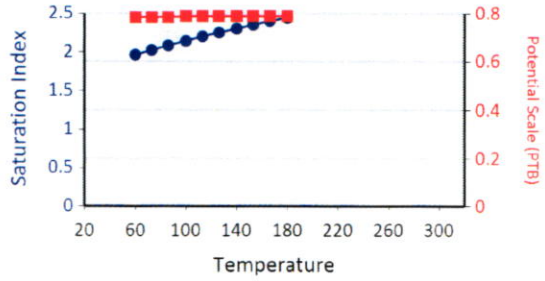
Barium Sulfate



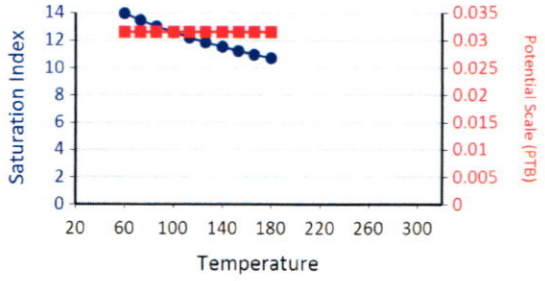
Iron Sulfide



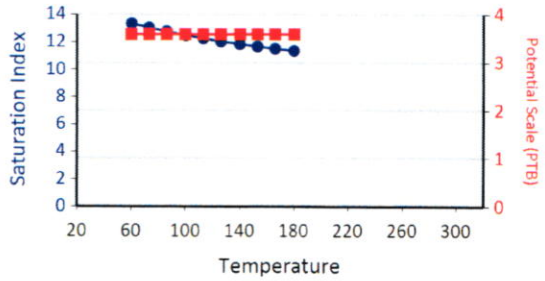
Iron Carbonate



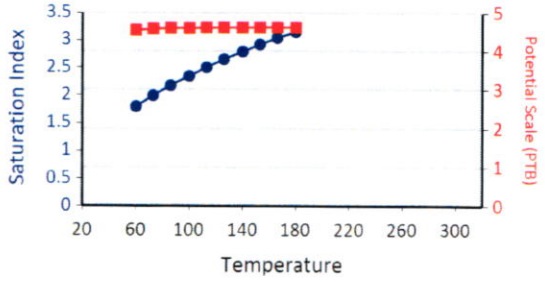
Lead Sulfide



Zinc Sulfide



Zinc Carbonate



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

multi-chem
A HALLIBURTON SERVICE

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

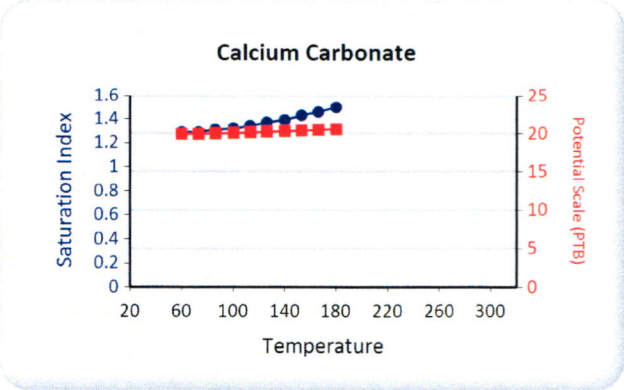
Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	5277.36	Chloride (Cl):	7000.00
Potassium (K):	65.03	Sulfate (SO_4):	0.00
Magnesium (Mg):	7.80	Bicarbonate (HCO_3):	2196.00
Calcium (Ca):	24.60	Carbonate (CO_3):	
Strontium (Sr):	5.20	Acetic Acid (CH_3COO)	
Barium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

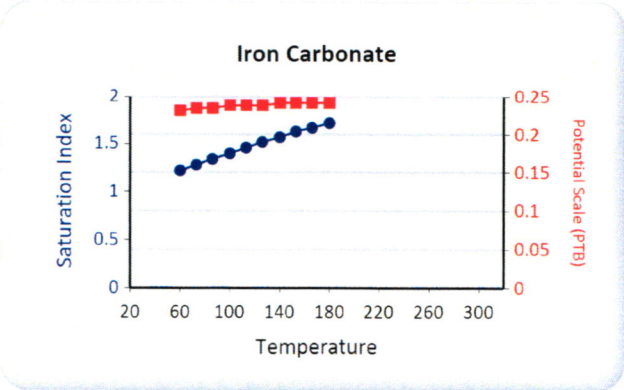
Notes:

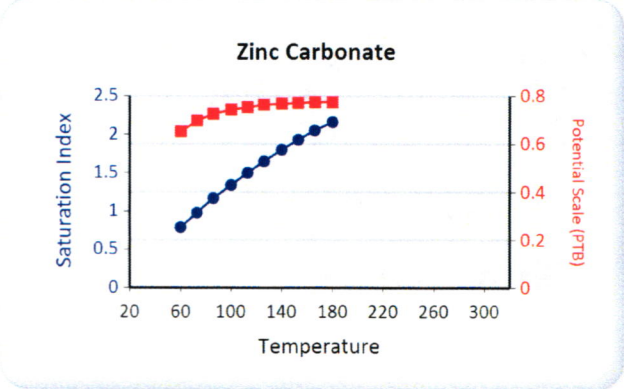
(PTB = Pounds per Thousand Barrels)

		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

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

multi-chem®
A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**PETROGLYPH TRIBE 04-05 , DUCHESNE**	Lab Tech:	**Gary Winegar**
Sample Point:	**WELLHEAD**		
Sample Date:	**1/7/2015**		
Sample ID:	**WA-298185**		

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

Sample Specifics	
Test Date:	1/21/2015
System Temperature 1 (°F):	160
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	80
System Pressure 2 (psig):	15
Calculated Density (g/ml):	0.9996
pH:	6.80
Calculated TDS (mg/L):	3302.16
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H2S in Gas (%):	
H2S in Water (mg/L):	5.00

Analysis @ Properties in Sample Specifics			
Cations	***mg/L***	***Anions***	***mg/L***
Sodium (Na):	1026.10	Chloride (Cl):	1000.00
Potassium (K):	21.77	Sulfate (SO_4):	341.00
Magnesium (Mg):	57.88	Bicarbonate (HCO_3):	732.00
Calcium (Ca):	88.98	Carbonate (CO_3):	
Strontium (Sr):	4.81	Acetic Acid (CH_3COO)	
Barium (Ba):	1.15	Propionic Acid (C_2H_5COO)	
Iron (Fe):	1.39	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	0.26	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.03	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.04	Silica (SiO_2):	26.75

Notes:
B=2.64 Al=0 Li=.78

(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	0.00	0.00	1.58	0.67	1.21	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.72	0.14
88.00	157.00	0.00	0.00	1.50	0.66	1.07	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.47	0.14
97.00	300.00	0.00	0.00	1.42	0.66	1.05	0.68	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	8.35	0.14
106.00	443.00	0.00	0.00	1.35	0.66	1.04	0.68	0.07	0.16	0.00	0.00	0.00	0.00	0.00	0.00	8.24	0.14
115.00	585.00	0.00	0.00	1.29	0.65	1.04	0.68	0.14	0.28	0.00	0.00	0.00	0.00	0.00	0.00	8.14	0.14
124.00	728.00	0.04	3.16	1.23	0.64	1.04	0.68	0.21	0.38	0.00	0.00	0.00	0.00	0.00	0.00	8.04	0.14
133.00	871.00	0.09	6.50	1.18	0.64	1.05	0.69	0.27	0.47	0.00	0.00	0.00	0.00	0.00	0.00	7.96	0.14
142.00	1014.00	0.13	9.94	1.14	0.63	1.07	0.69	0.34	0.54	0.00	0.00	0.00	0.00	0.00	0.00	7.88	0.14
151.00	1157.00	0.18	13.45	1.10	0.63	1.09	0.69	0.40	0.61	0.00	0.00	0.00	0.00	0.00	0.00	7.81	0.14
160.00	1300.00	0.23	17.01	1.06	0.62	1.12	0.70	0.47	0.66	0.00	0.00	0.00	0.00	0.00	0.00	7.74	0.14

		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	0.00	0.00	10.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.69	0.01	0.00	0.00	0.00	0.00	0.00	0.00
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.47	0.01	0.00	0.00	0.00	0.00	0.00	0.00
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.87	0.01	0.00	0.00	0.00	0.00	0.00	0.00
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.01	0.00	0.00	0.00	0.00	0.00	0.00
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.54	0.01	0.00	0.00	0.00	0.00	0.00	0.00
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.38	0.01	0.00	0.00	0.00	0.00	0.00	0.00
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.24	0.01	0.00	0.00	0.00	0.00	0.00	0.00

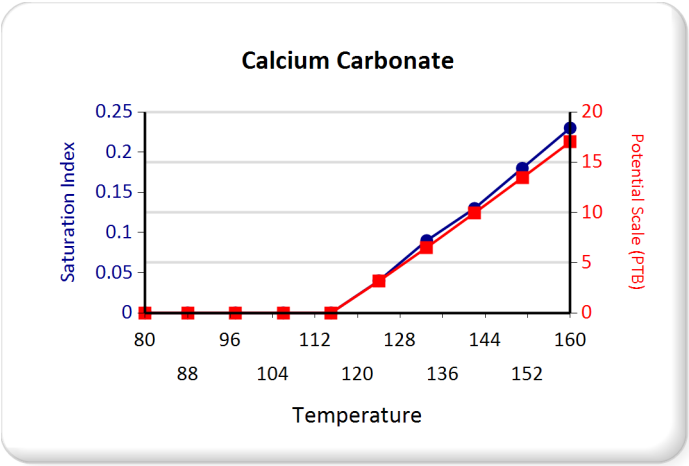
Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

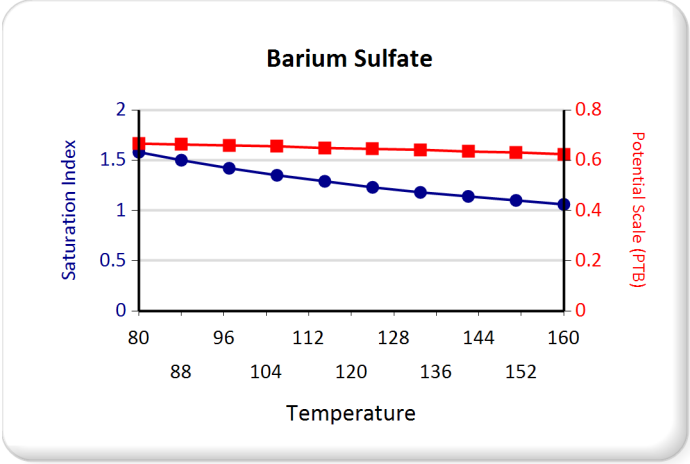
multi-chem®
A HALLIBURTON SERVICE

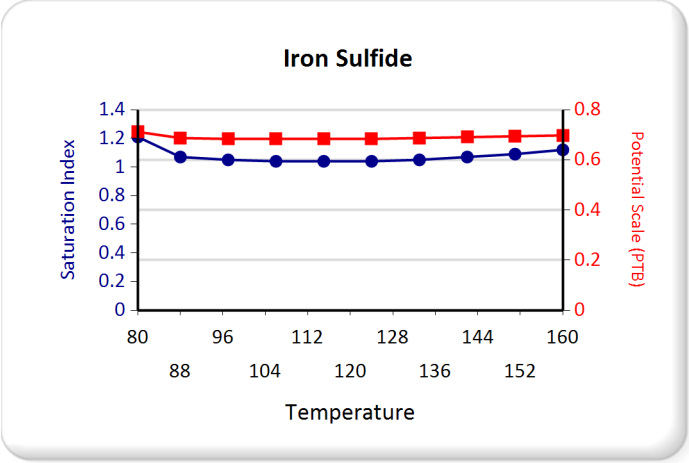
Water Analysis Report

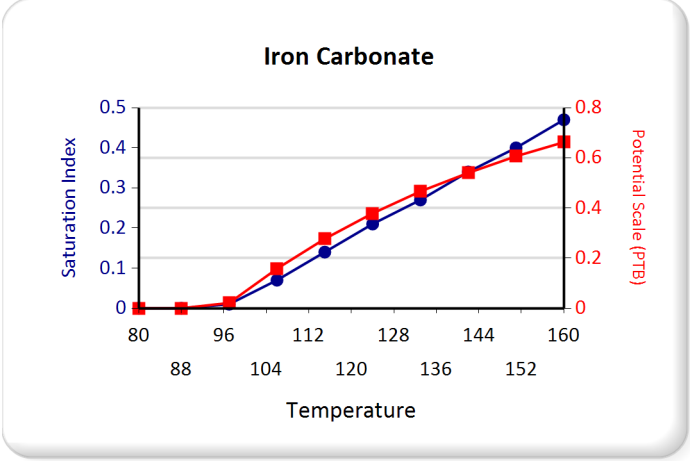
These scales have positive scaling potential under initial temperature and pressure: Barium Sulfate Iron Sulfide Zinc Sulfide Lead Sulfide

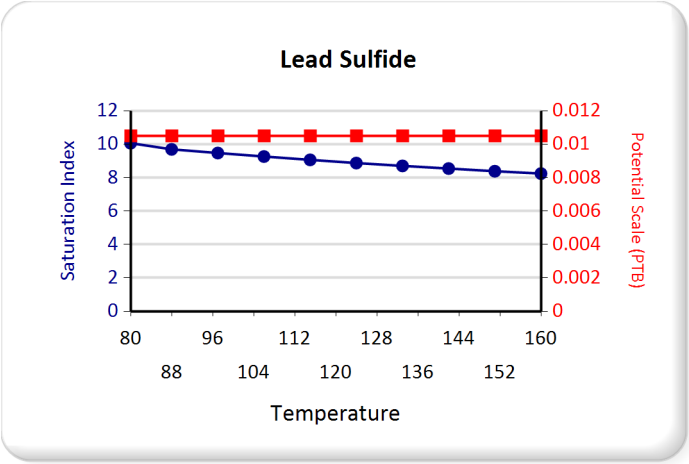
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Lead Sulfide

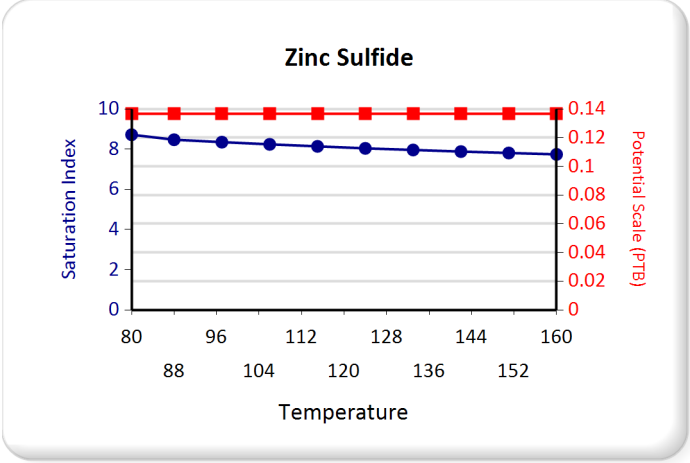












ATTACHMENT NO. 6

COMPLETION DATA FOR ALL WELLS IN THE AOR

Well Completion Data
Ute Tribal 04-04

	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 04-04	**8-5/8**	**258**	**150**	**surface**	**5-1/2**	**5697**	**350**	**2485**
Ute Tribal 04-08A[1]	10-3/4	556	300	surface	7	6003	685	surface
Ute Tribal 04-06B	8-5/8	417	250	surface	5-1/2	6413	455	2526
Ute Tribal 05-01	8-5/8	426	250	surface	5-1/2	6442	405	2790
Ute Tribal 04-01	8-5/8	416	350	surface	5-1/2	6680	1500	1050

[1] Horizontal well with a uncemented, 4-1/2" liner

ATTACHMENT NO. 7

CBL FOR THE UIC WELL

CONFIDENTIAL

RECEIVED
JUL 1 0 1996
DIV. OF OIL, GAS & MINING

Schlumberger

CEMENT BOND LOG

COMPANY PETROGLYPH OPERATING CO.

WELL UTE TRIBAL #04-04 (4A-4)

FIELD ANTELOPE CREEK

COUNTY DUCHESNE STATE UTAH

County DUCHESNE
Field ANTELOPE CREEK
Location 1205 FNL & 660 FEL
Well UTE TRIBAL # 4A-4
Company PETROGLYPH OPERATING CO

Location: 1205 FNL & 660 FEL

Other Services:

API Serial No.	Sect.	Twp.	Range
43 013 31574	4	5S	3W

Permanent Datum	GL	Elev. 5927.3	
Log Measured From	KB	10	above Perm. Datum
Drilling Measured From	KB		

Elev. K.B. 5937.3
D.F. 5936.3
G.L. 5927.3

Date	1 24 96	Casing Fluid		WATER	
Run No.	ONE	Fluid Level		FULL	
Depth-Driller	6385	Max. Rec. Temp.		139	
Depth-Logger	5627	Est. Cement Top		2485	
Btm. Log Interval	5624	Unit	District	181	VERNAL
Top Log Interval	3500	Recorded By		R SHOCKLEY	
Open Hole Size	7.785	Witnessed By		MR. DAN LINDSLEY	

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String						
Prot. String						
Prod. String	5.5				0	ED
Liner						

PRIMARY CEMENTING DATA

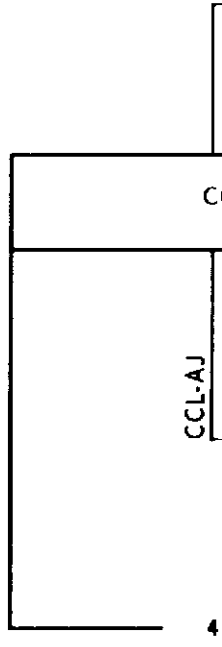
STRING	Surface	Protection	Production	Liner
Vol. of Cement				
Type of Cement				
Additive				
Retarder				
Wt. of slurry				
Water loss				
Type fluid in csg.				
Fluid wt.				

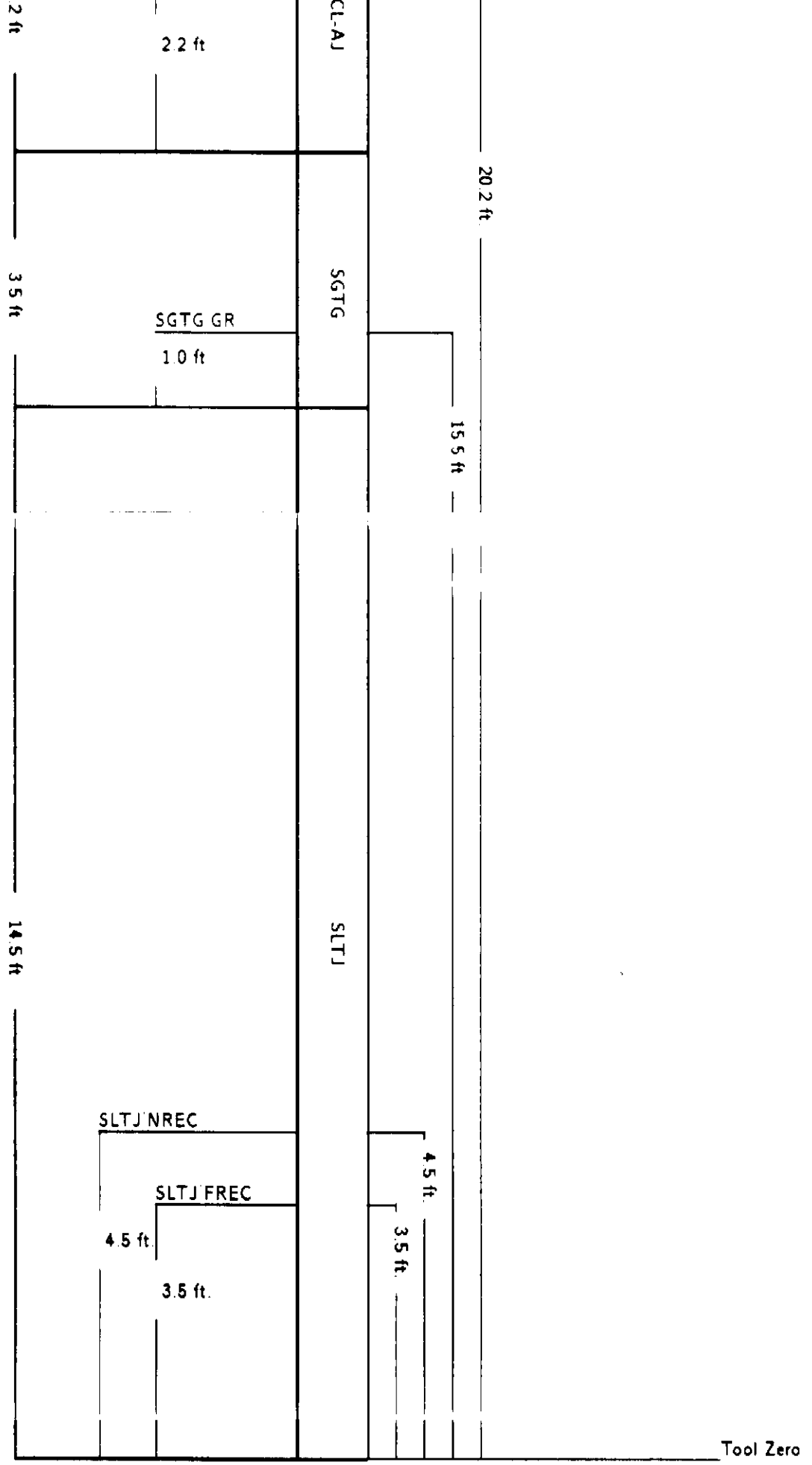
REMARKS

LOG CORRELATED TO SWS DENSITY LOG 1-14-96
THANK YOU FOR USING SCHLUMBERGER!!!
SHORT JOINT AT 4002- 4015

Software Version UX126

TOOL SKETCH




2 ft
2.2 ft
CL-AJ
20.2 ft
3.5 ft
SGTG GR
1.0 ft
SGTG
15.5 ft
14.5 ft
SLTJ
SLTJ NREC
4.5 ft
SLTJ FREC
4.5 ft
3.5 ft
3.5 ft
Tool Zero

Software Version UX126
Logging Pass Start Depth 2543.7 ft.
Logging Pass Stop Depth 2228.4 ft

Pass No. 5
Job Name PETRO.24

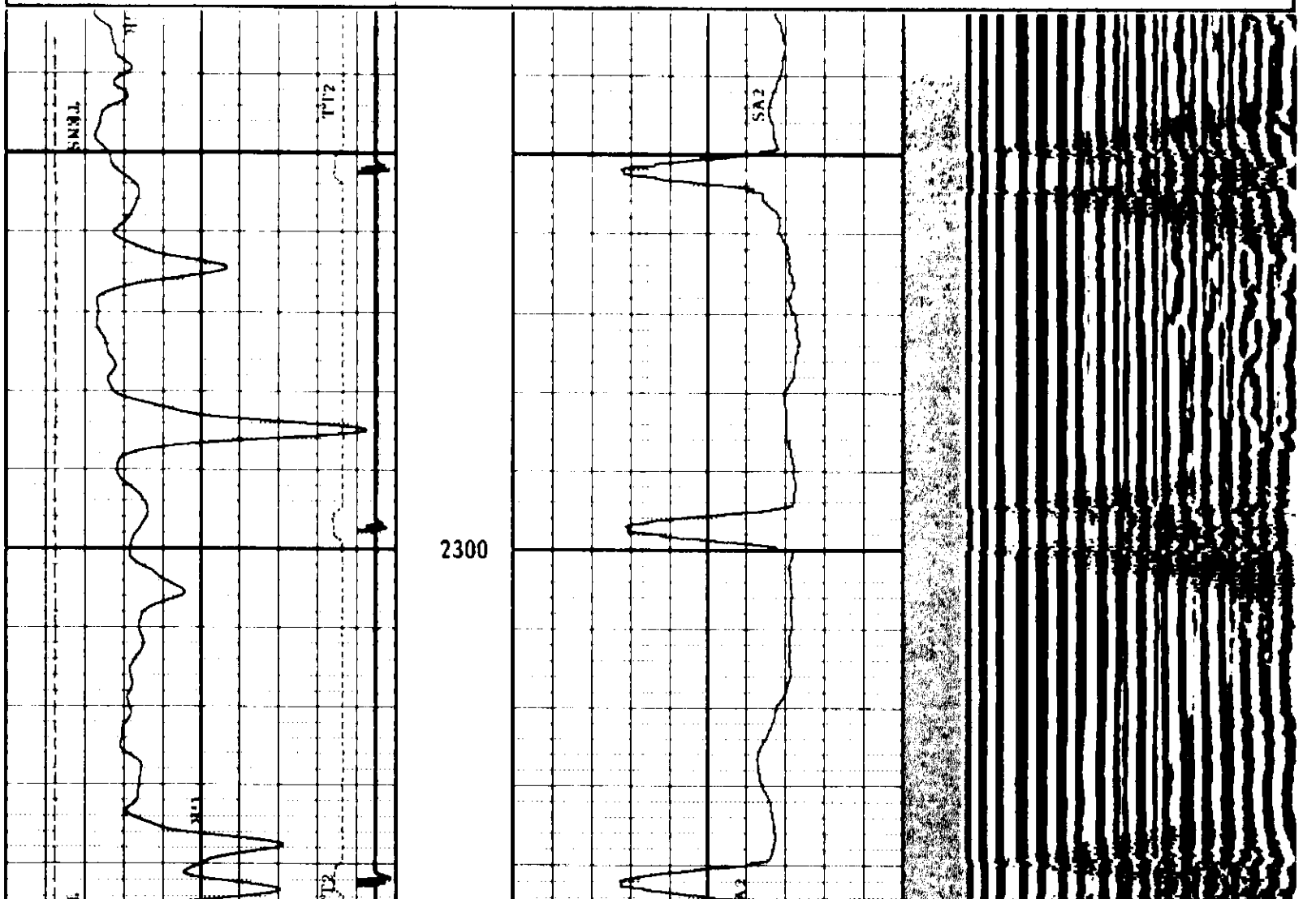
PLAYBACK OFFSET REPORT

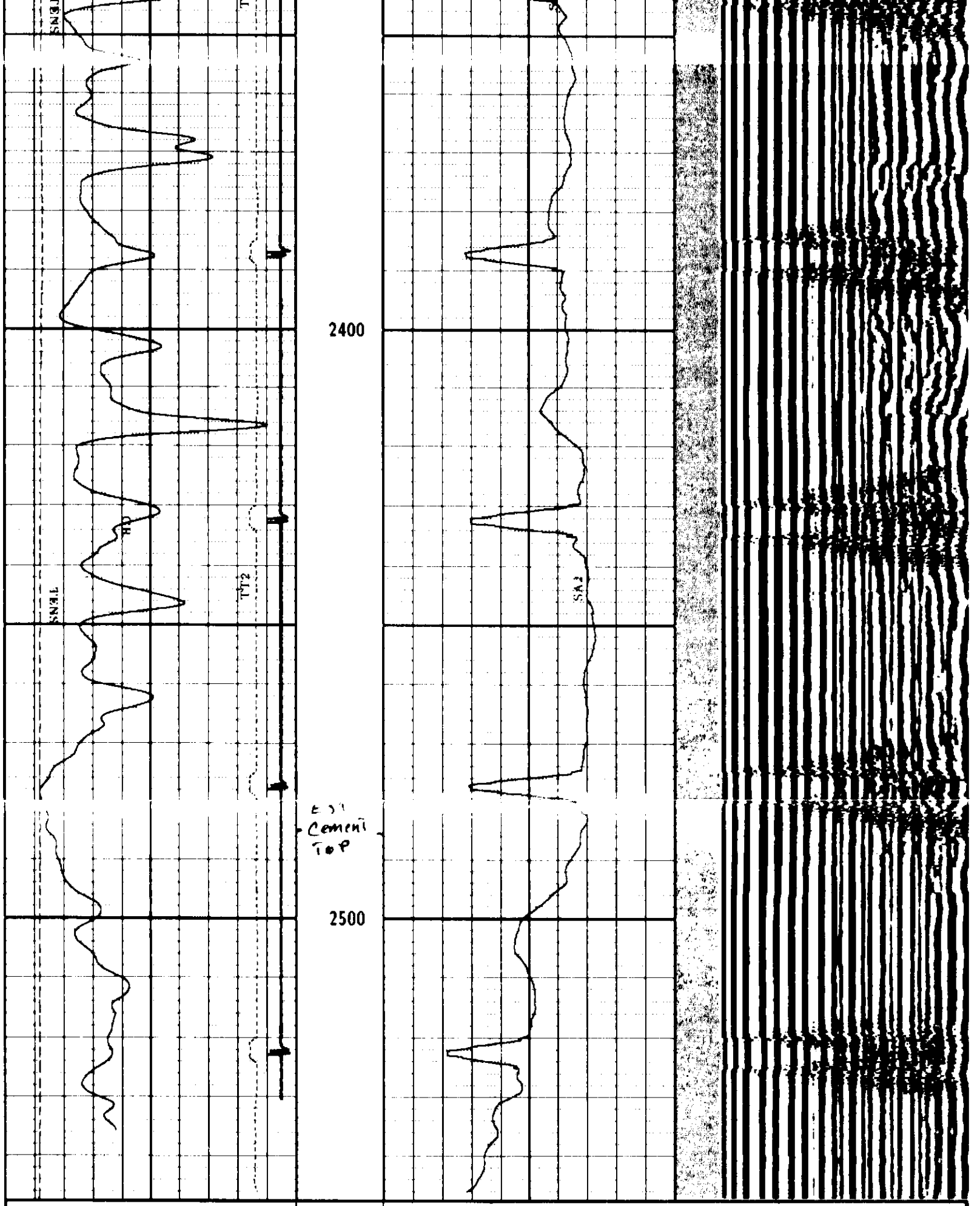
File Offset = 7.0 ft.

TGS

SCALE CHANGE REPORT
NO SCALE CHANGES THIS FILE

-250	CCL (LINE)	250						
0	GR (LINE)	150						
430	TT2 (DOT)	230		0	ASA2 (DOT)	20		
0	TENS (DASH)	4000		0	SA2 (LINE)	100	200	VDL (LINE) 1200





2400
2500
Est Cement Top
-250 CCL (LINE) 250
0 GR (LINE) 150

430	TT2 (DOT)	230		0	ASA2 (DOT)	20			
0	TENS (DASH)	4000		0	SA2 (LINE)	100	200	VDL (LINE)	1200

Film Scale 5 in = 100 feet (5 inch)

Sensor Measure Point to Tool Zero

SLTJ FREC	3.5	ft.
SLTJ NREC	4.5	ft
[illegible]	[illegible]	ft
CCL-AJ	20.2	ft.
TENS	0.0	ft.
SPEED	0.0	ft.

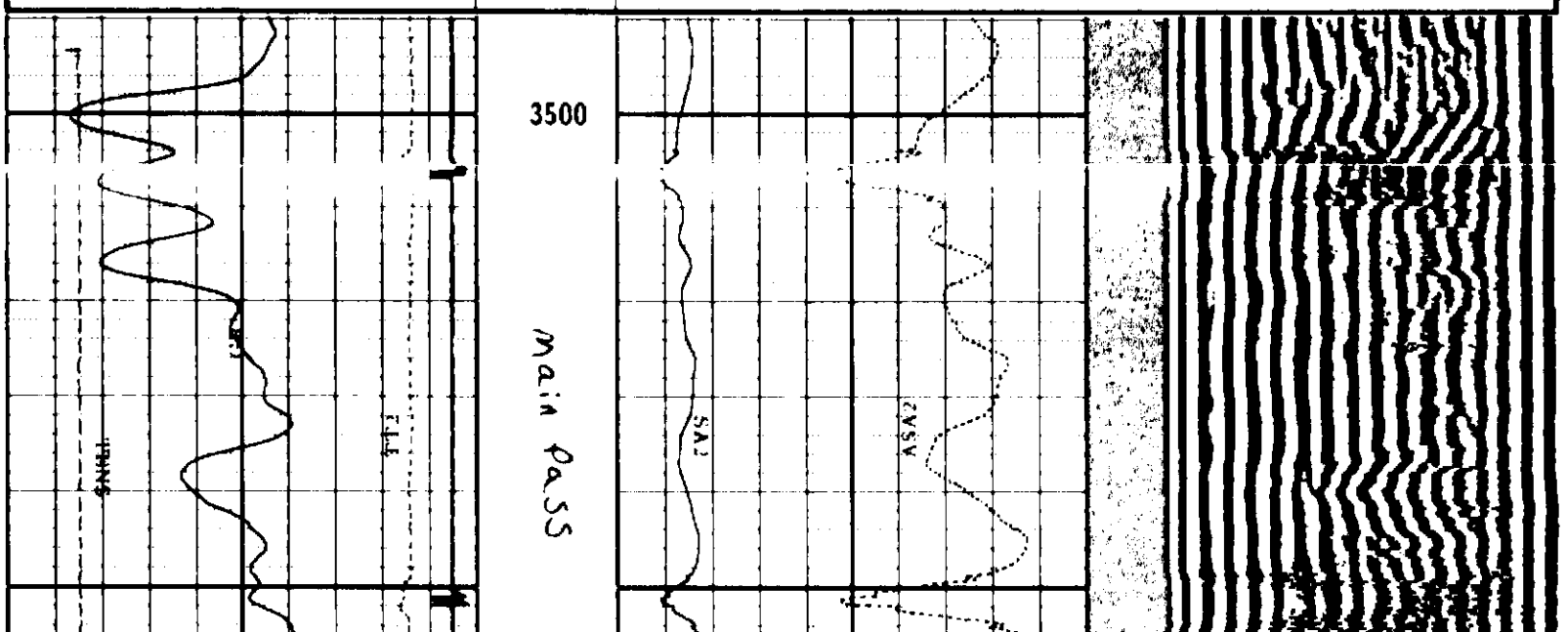
Software Version UX126
Logging Pass Start Depth 5641.4 ft.
Logging Pass Stop Depth 3493.2 ft.

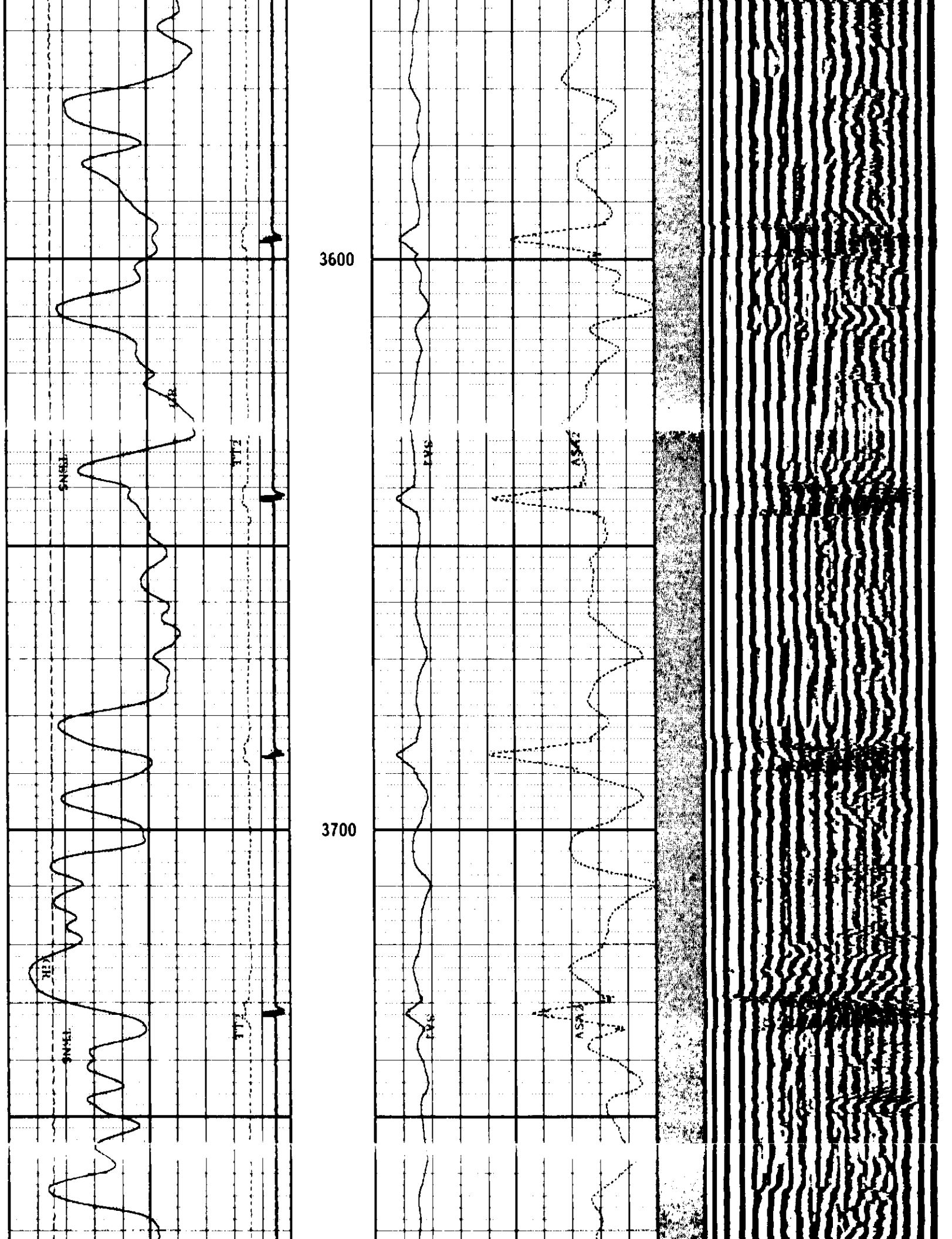
Pass No. 4
Job Name PETRO.24

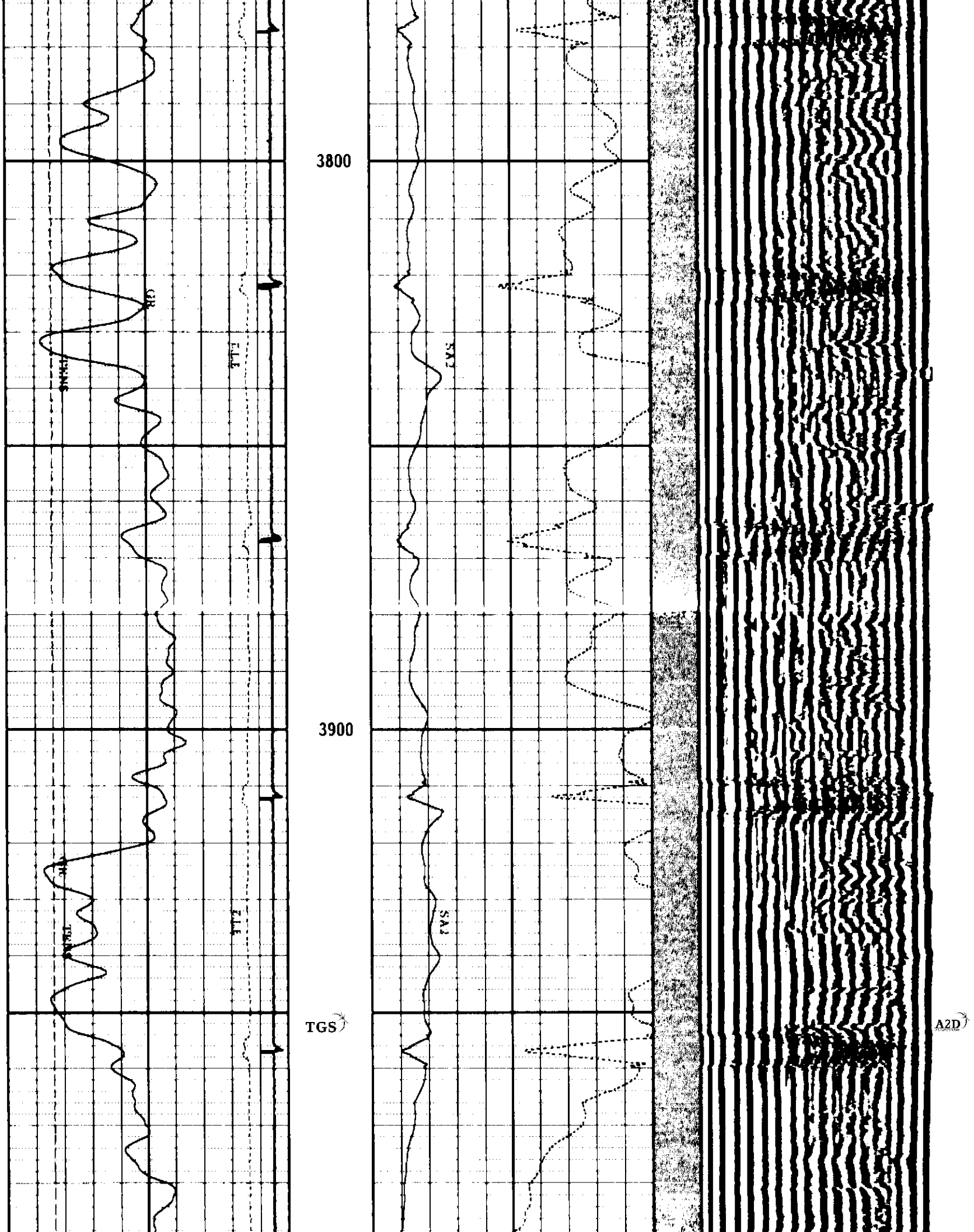
SCALE CHANGE REPORT
NO SCALE CHANGES THIS FILE

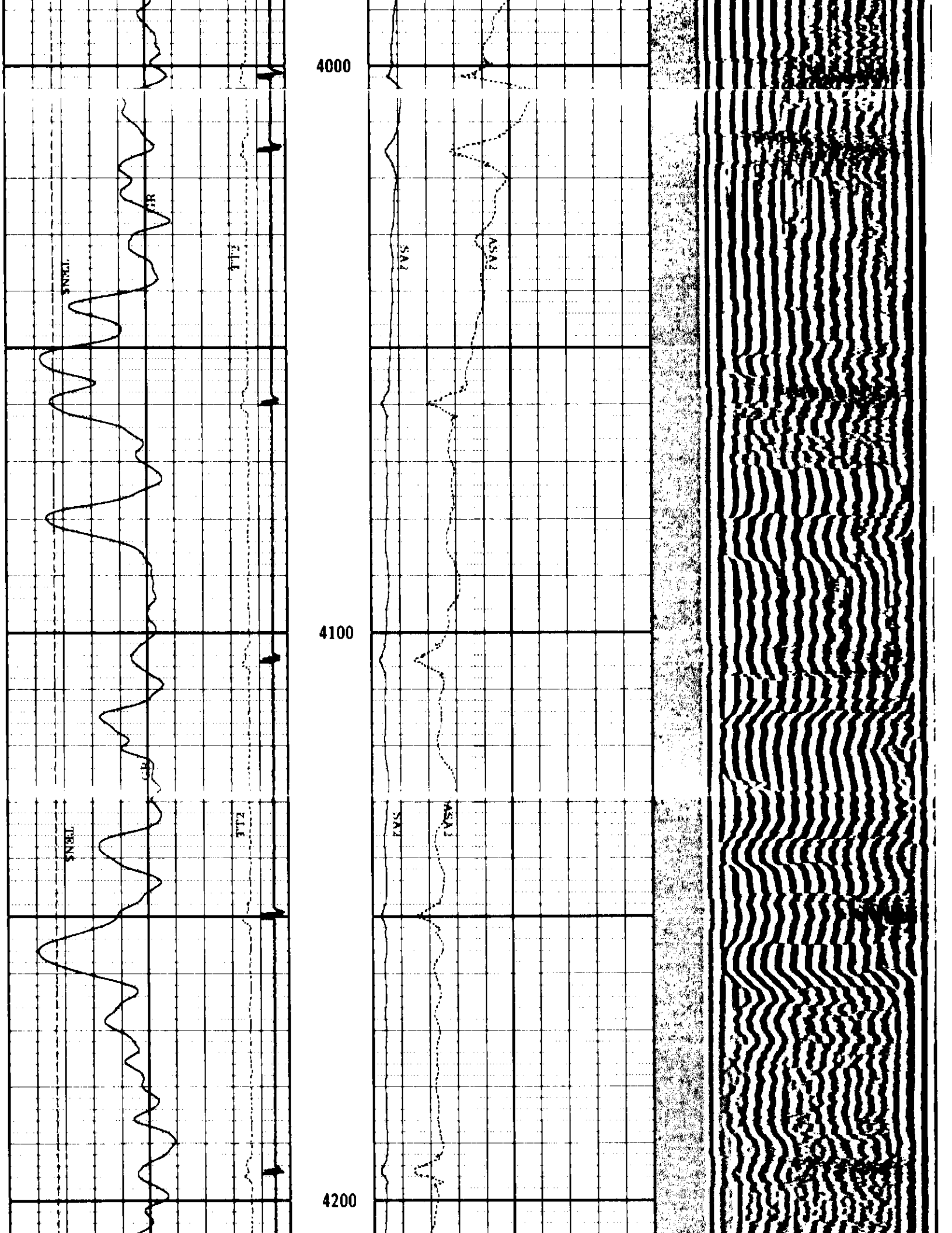
TGS

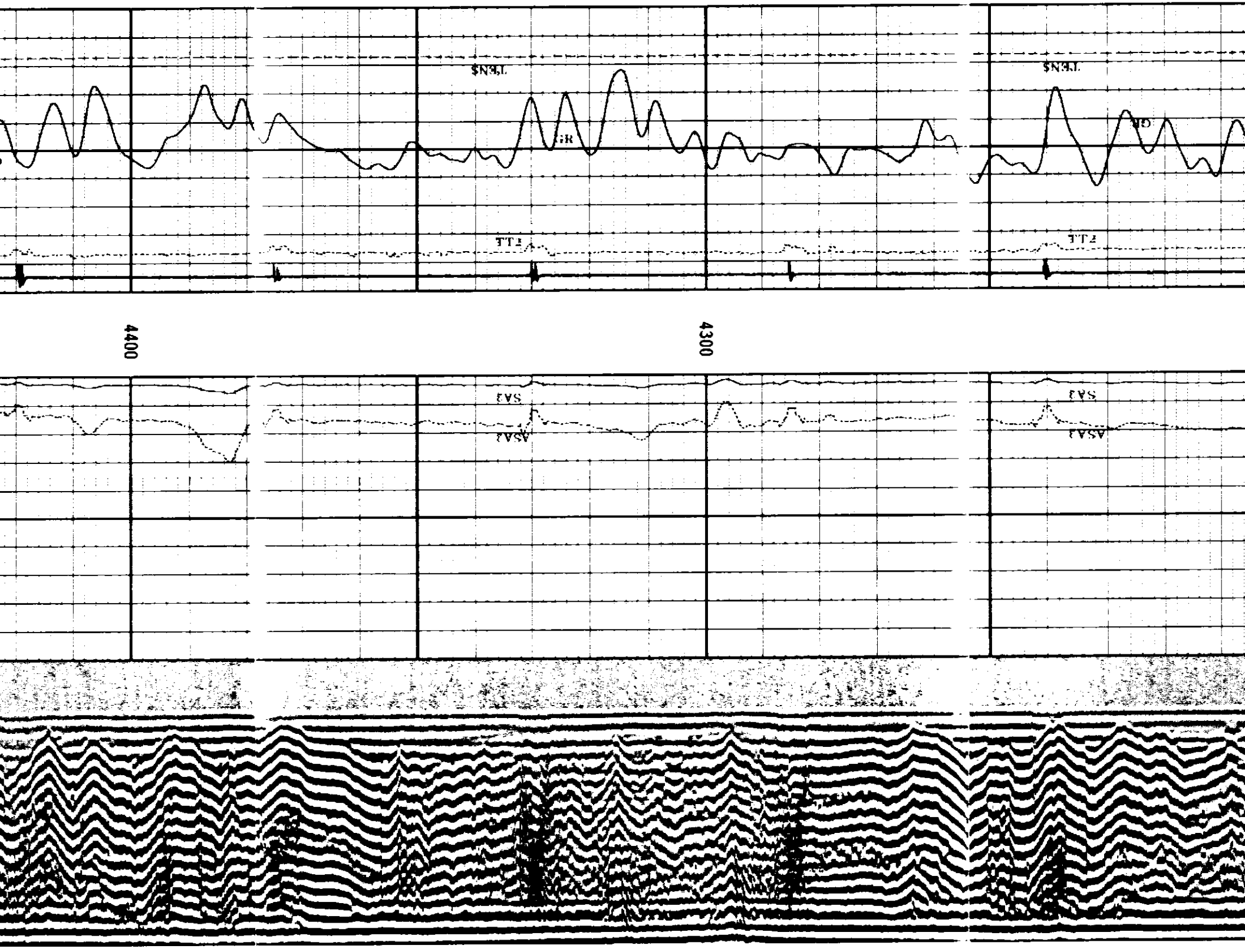
-250	CCL (LINE)	250							
0	GR (LINE)	150							
430	TT2 (DOT)	230		0	ASA2 (DOT)	20			
0	TENS (DASH)	4000		0	SA2 (LINE)	100	200	VDL (LINE)	1200

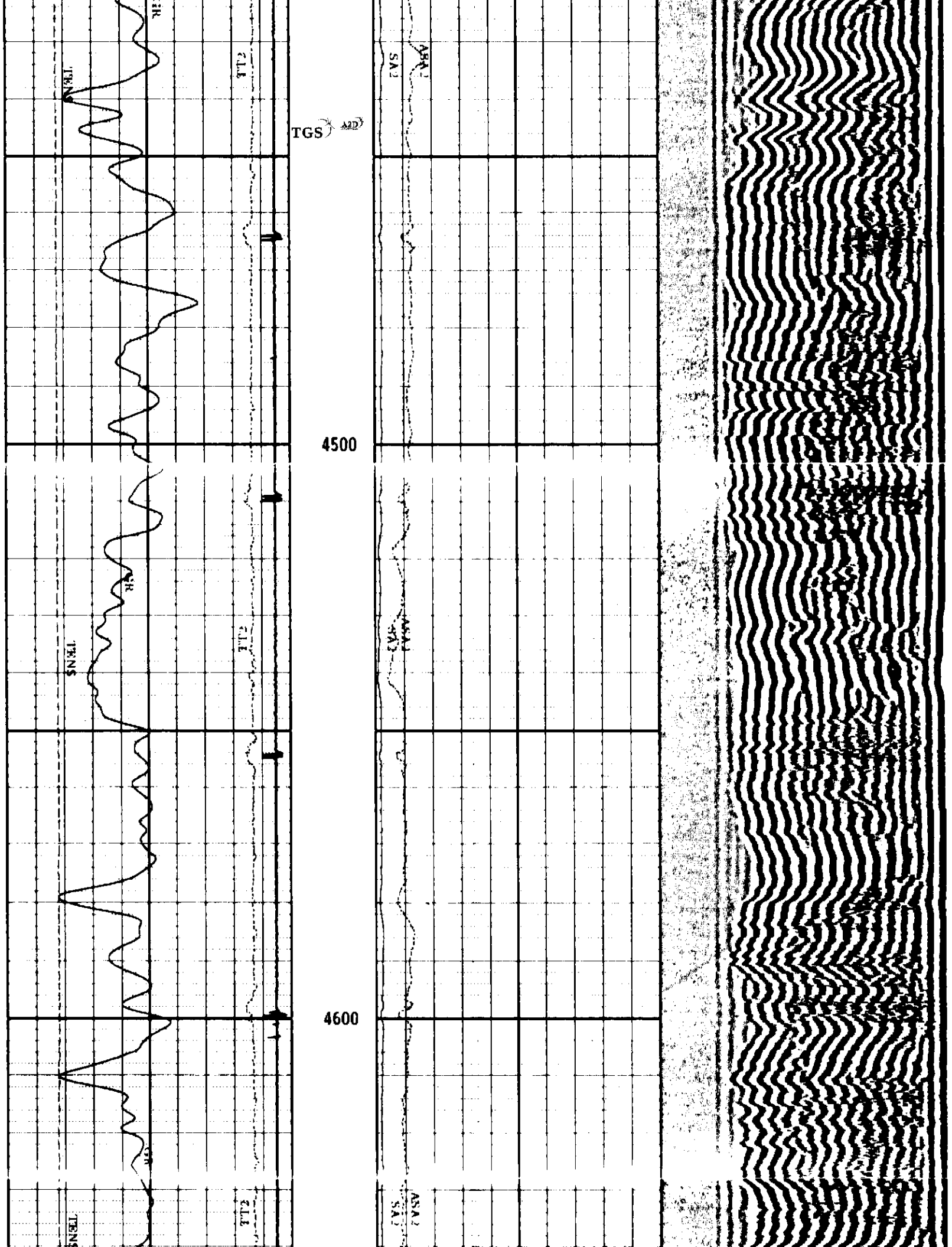


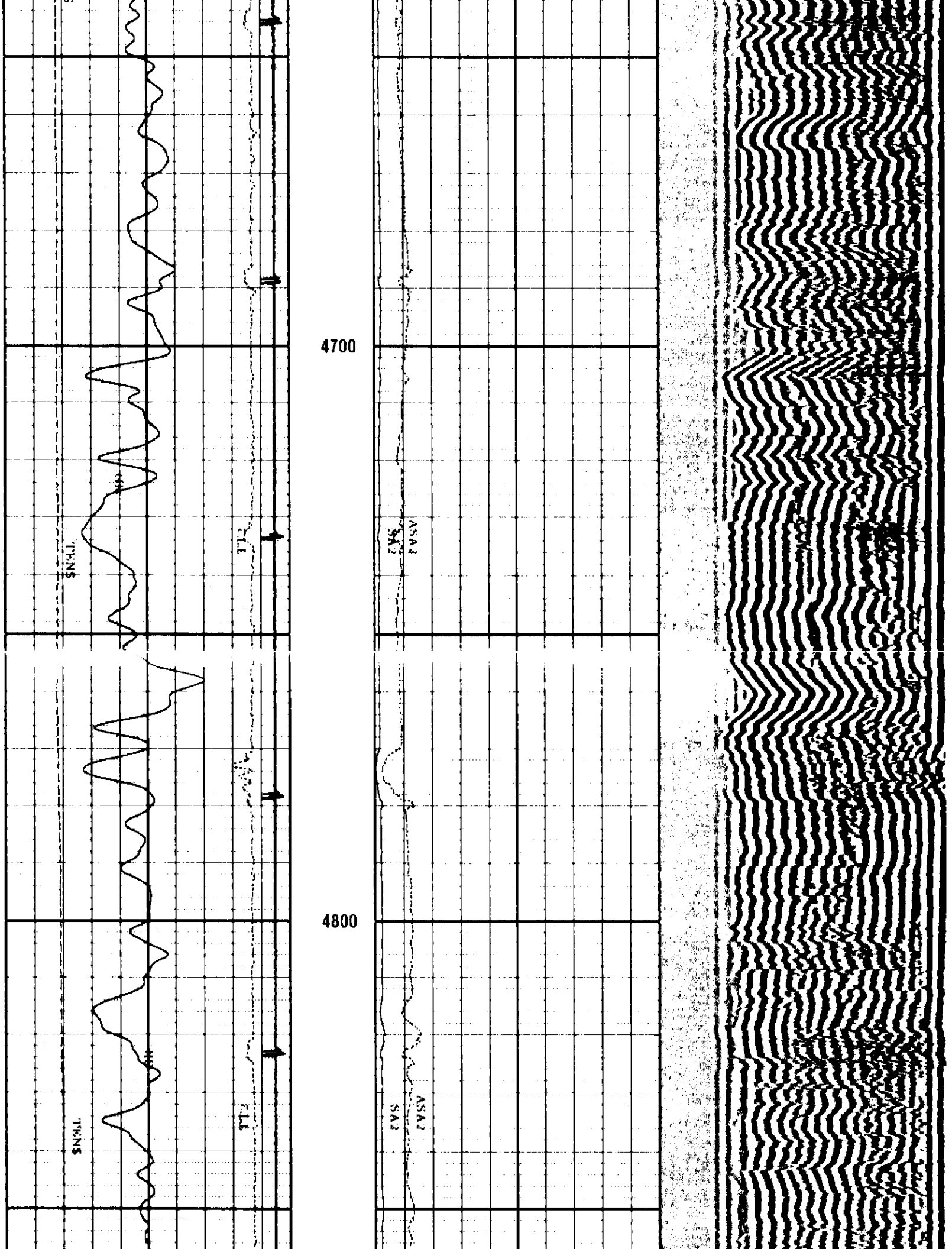

3600
3700

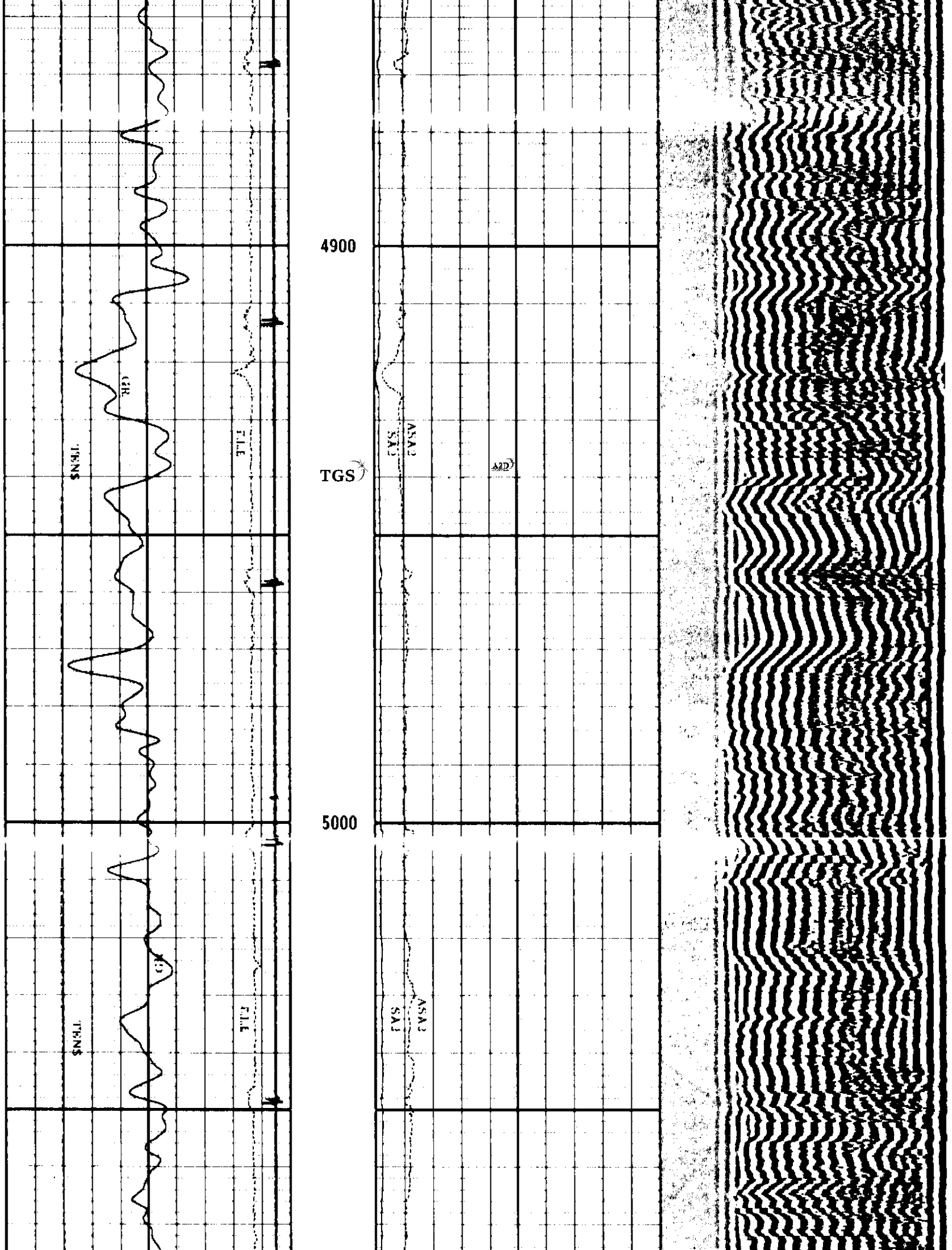

3800
3900
TGS
A2D

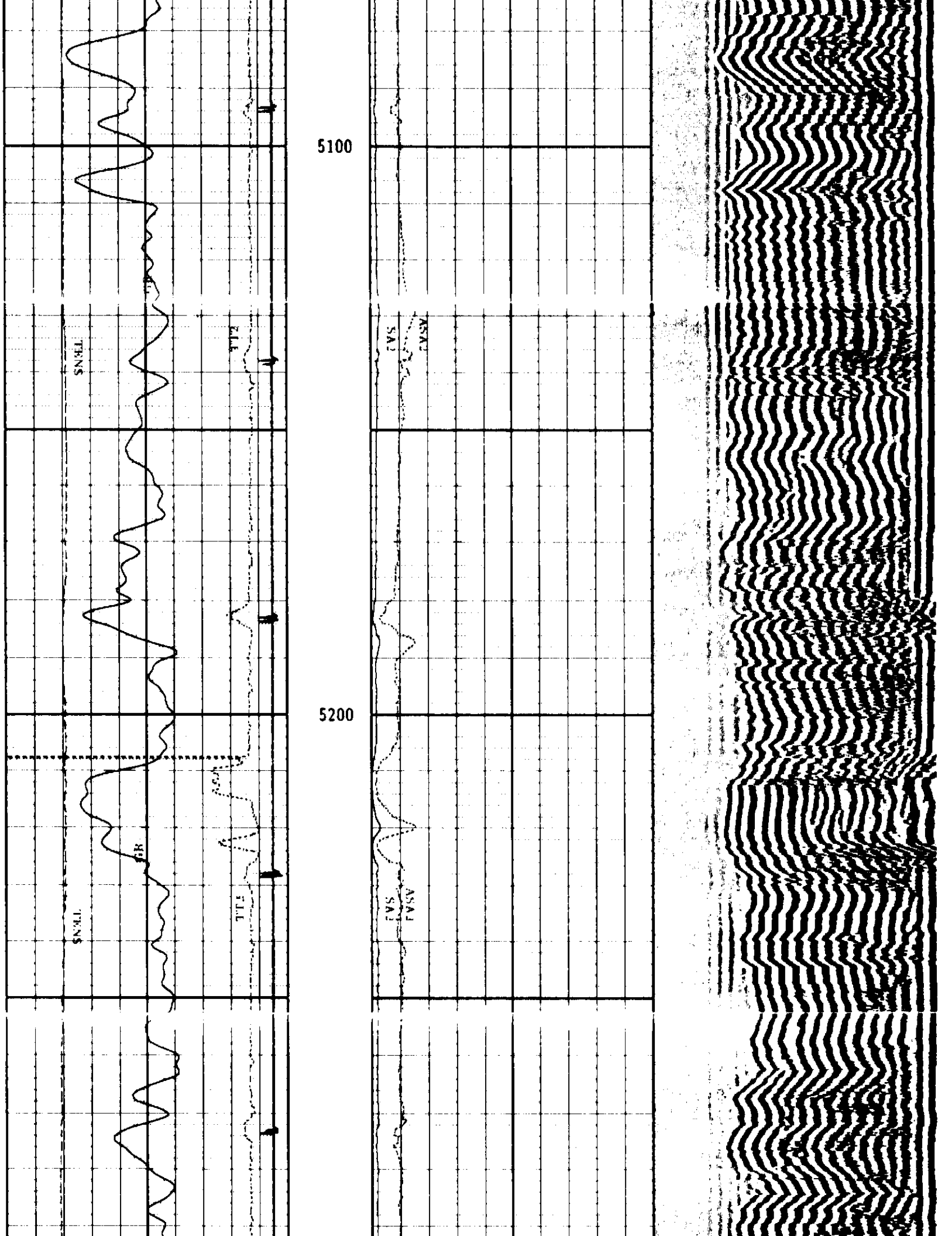

4000
4100
4200
TENS
GR
TT2
SA2
ASA2

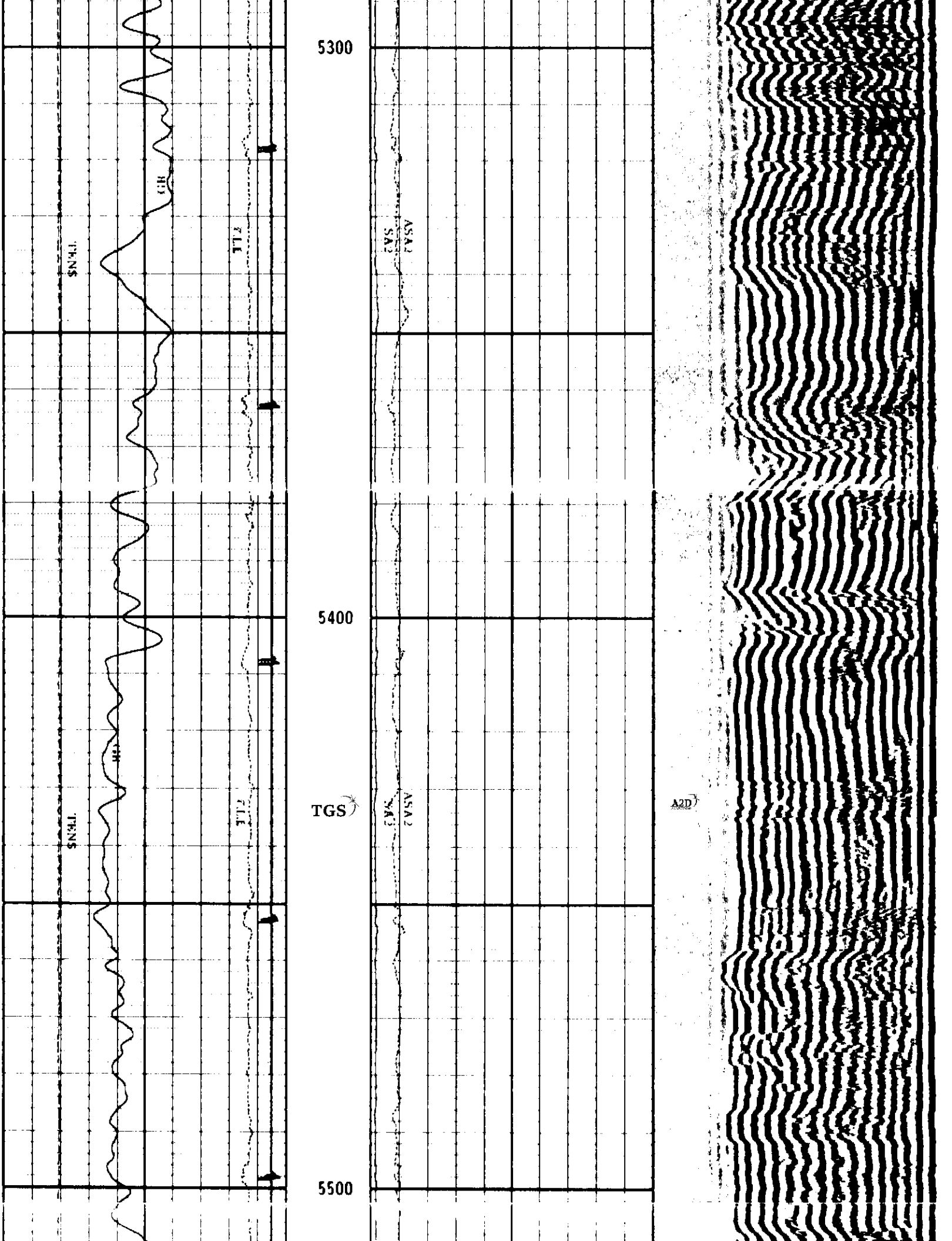

TENS
GR
TT2
4400
4300
SA2
ASA2

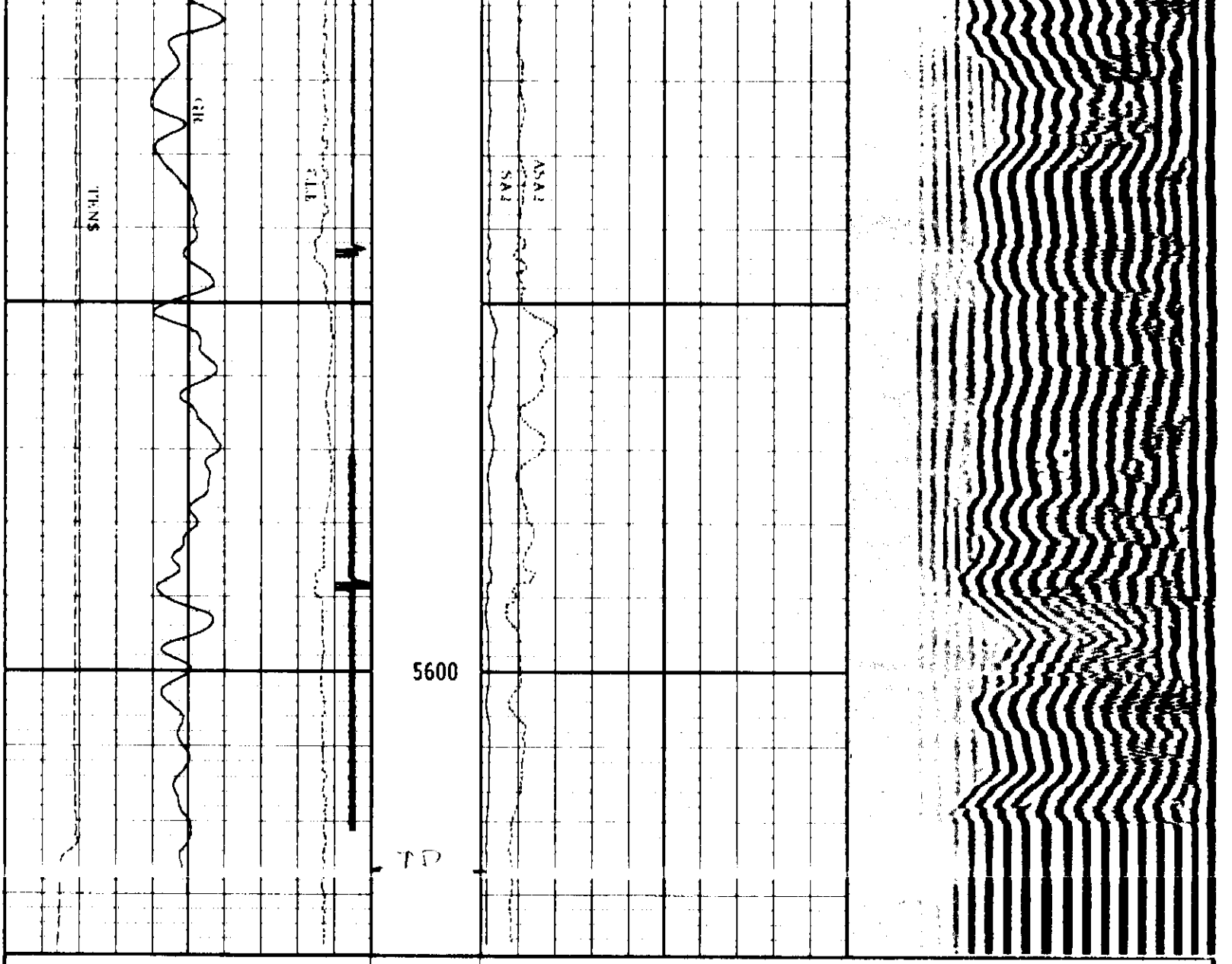

TGS
A2D
4500
4600
TENS
TENS
SA2
ASA2
SA2
ASA2
SA2
ASA2


4700
4800
TENS
CLE
ASA2
SA2


4900
TGS
5000
GR
TENS
F.L.E
ASA2
SA2
A2D


5100
5200
TENS
TENS
ELE
ELE
SA2
ASA2
SA2
ASA2


5300
5400
5500
TGS
A2D
TENS
TENS
ASA2
SA2
ASA2
SA2



-250	CCL (LINE)	250						
0	GR (LINE)	150						
430	TT2 (DOT)	230	0	ASA2 (DOT)	20			
0	TENS (DASH)	4000	0	SA2 (LINE)	100	200	VDL (LINE)	1200

Film Scale 5 in = 100 feet (5 inch)

Sensor Measure Point to Tool Zero

SLTJ FREC	3 5	ft
SLTJ NREC	4 5	ft
SGTG GR	15 5	ft
CCL-AJ	20 2	ft
TENS	0 0	ft
SPEED	0 0	ft

Software Version UX126
Logging Pass Start Depth 5661.4 ft
Logging Pass Stop Depth 5386.4 ft

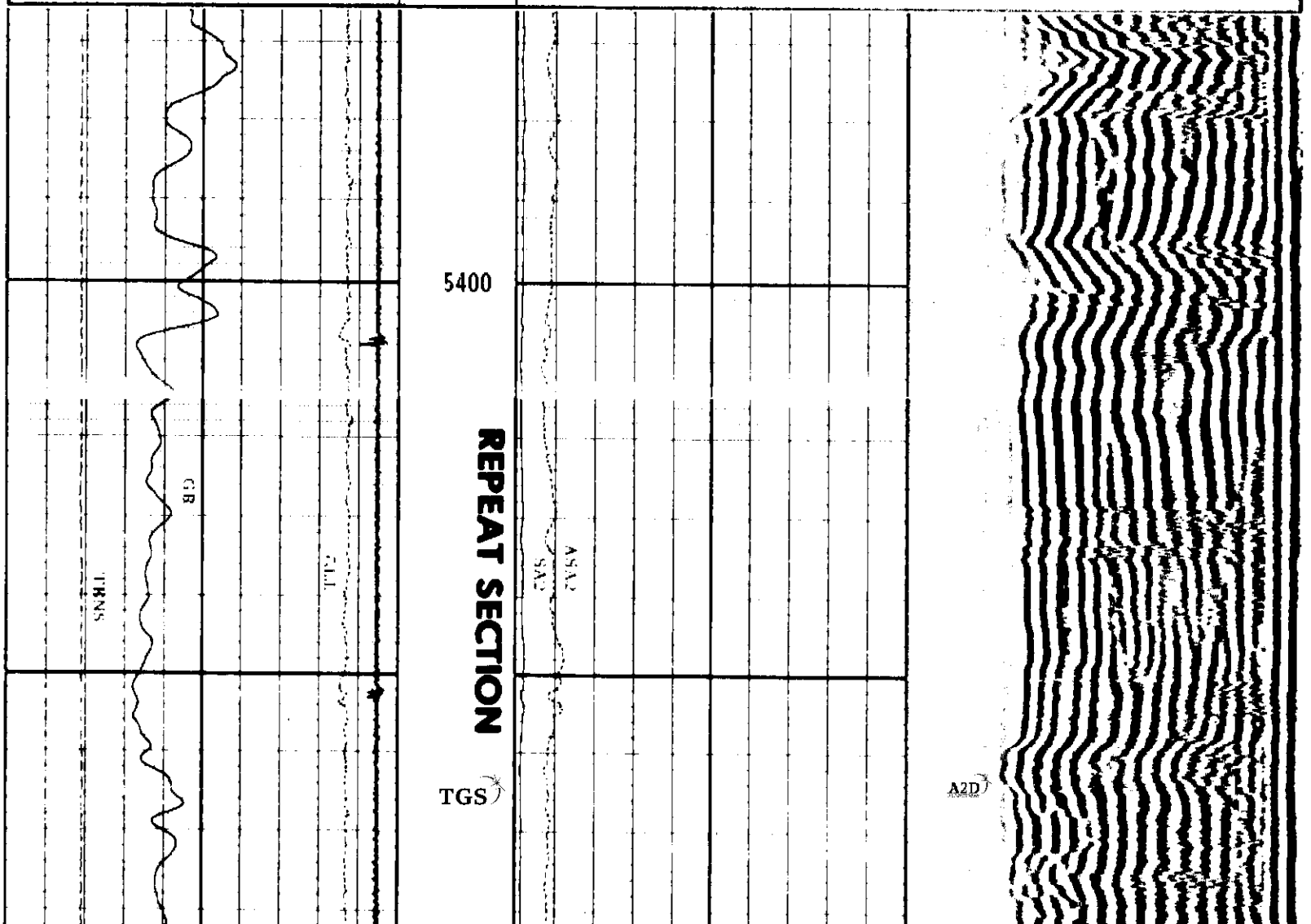
Pass No. 2
Job Name PETRO.24

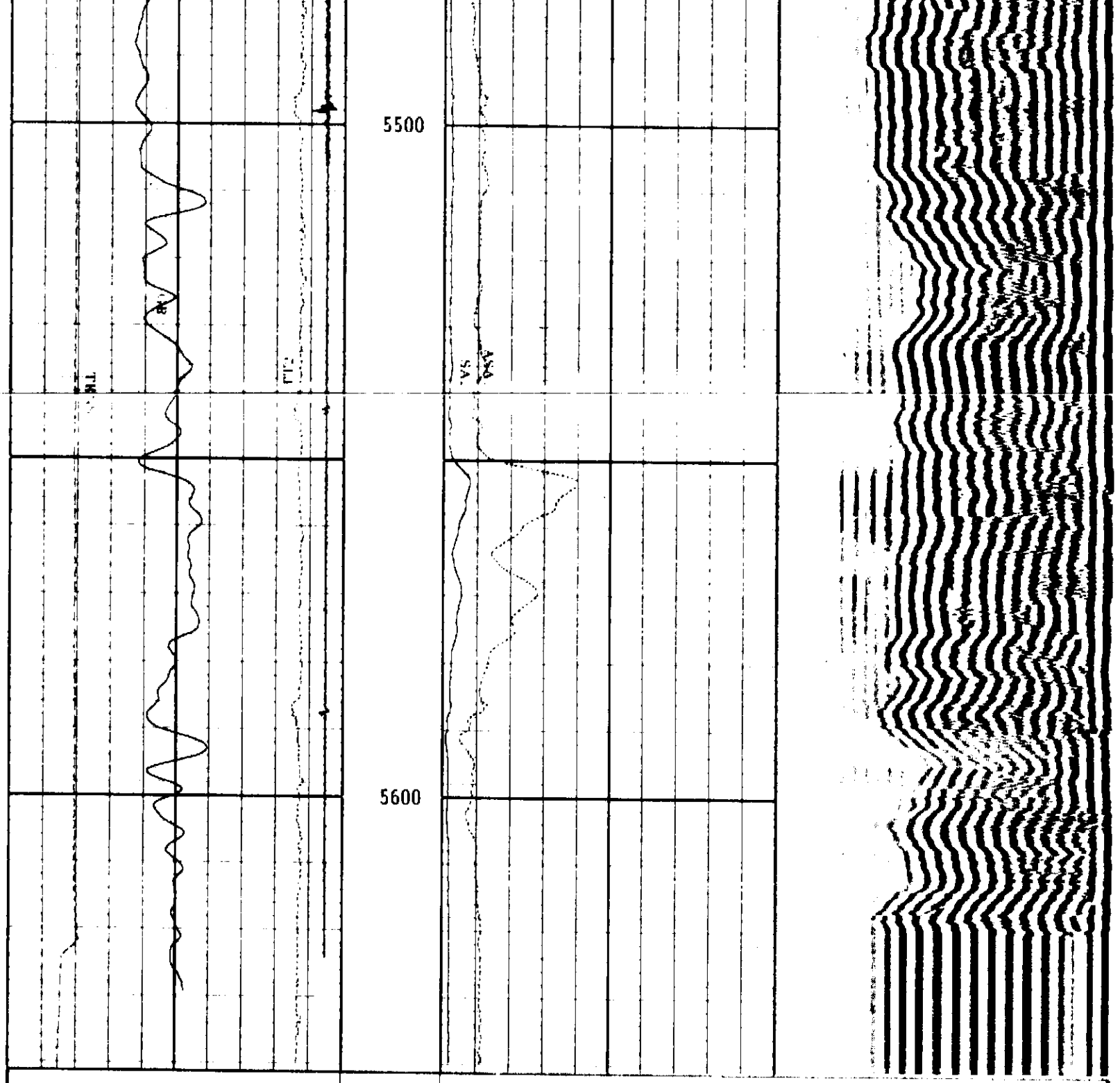
PLAYBACK OFFSET REPORT

File Offset = -17.0 ft

SCALE CHANGE REPORT
NO SCALE CHANGES THIS FILE

-250	CCL (LINE)	250		0	ASA2 (DOT)	20	
0	GR (LINE)	150		0	SA2 (LINE)	100	200 VDL (LINE) 1200
430	TT2 (DOT)	230					
0	TENS (DASH)	4000					





Film Scale 5 in = 100 feet (5 inch)

Sensor Measure Point to Tool Zero

SLTJ FREC	3.5	ft
SLTJ NREC	4.5	ft
SGTG GR	15.5	ft

CCL-AJ	20 2	ft
TENS	0 0	ft
SPEED	0 0	ft

Riley®

ATTACHMENT NO. 8

OPEN HOLE LOG FOR THE UIC WELL

Dual

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

WELL: **UTE TRIBAL #04-04** (4A-4)

FIELD: **ANTELOPE CREEK**

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

COUNTY: DUCHESNE
Field: ANTELOPE CREEK
Location: 1205' FNL & 660' FWL
Well: UTE TRIBAL #4A-4
Company: PETROGLYPH OPERATING CO

Schlumberger

COMPENSATED NEUTRON
LITHO-DENSITY
GAMMA RAY

LOCATION

1205' FNL & 660' FWL
LOT #5

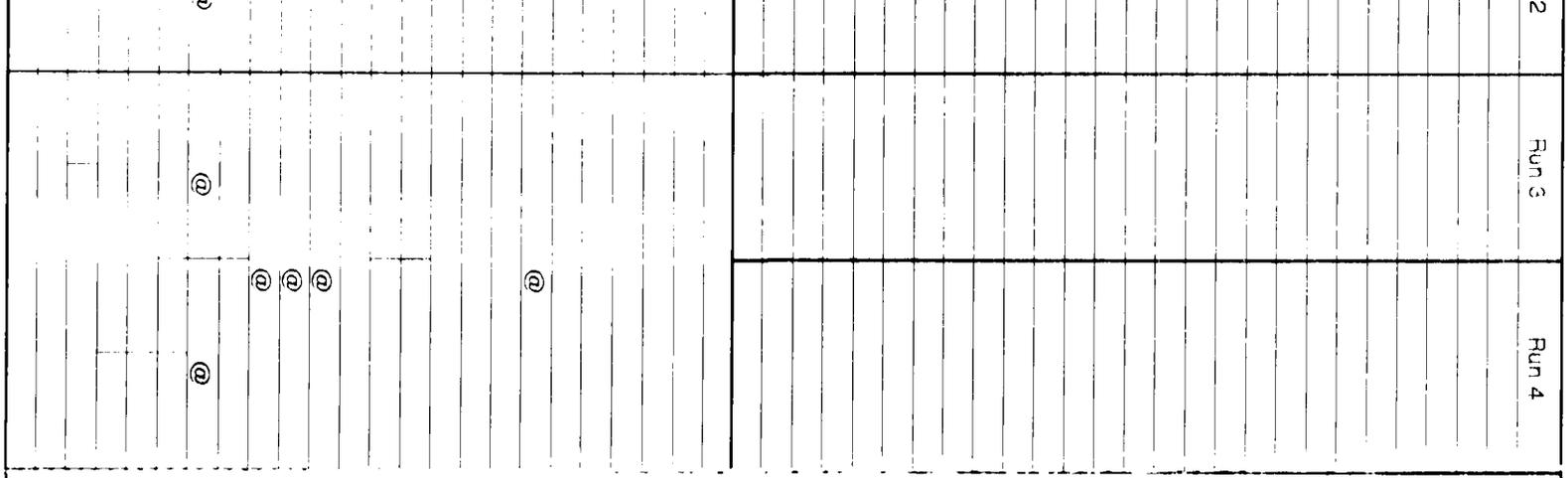
Elev.: K.B. 5937.3 F
G.L. 5927.3 F
D.F. 5936.3 F

Permanent Datum: GROUND LEVEL Elev.: 5927.3 F
Log Measured From: KELLY BUSHING 10.0 F above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-31574	4	5 S	3 W

	Run 1	Run
Logging Date	14-JAN-1996	
Run Number	ONE	
Depth Driller	6385 F	
Schlumberger Depth	6371 F	
Bottom Log Interval	6337 F	
Top Log Interval	50 F	
Casing Driller Size @ Depth	8.625 IN @ 256 F	@
Casing Schlumberger	257 F	
Bit Size	7.875 IN	
Type Fluid In Hole	KCL/WATER	
MUD Density / Viscosity	8.3 LB/G / 27 S	
MUD Fluid Loss / PH	/ 10.3	
Source Of Sample	MUD TANK	
RM @ Measured Temperature	3.210 OHMM @ 67 DEGF	@
RMF @ Measured Temperature	@	@
RMC @ Measured Temperature	@	@
Source RMF / RMC		
RM @ MRT / RMF @ MRT	1.624 @ 139 / @ 139	@ / @
Maximum Recorded Temperatures	139 DEGF	
Circulation Stopped / Time	14-JAN-1996 / 6:00	
Logger On Bottom / Time	14-JAN-1996 / 10:09	
Unit Number / Location	2018 VERNAL, UTAH	
Recorded By	A. WHITE	
Witnessed By	GENE SEARLE/DAN LINDSEY	

	Run 1	Run
Logging Date		
Run Number		
Depth Driller		
Schlumberger Depth		
Bottom Log Interval		
Top Log Interval		
Casing Driller Size @ Depth	@	
Casing Schlumberger		
Bit Size		
Type Fluid In Hole		
MUD Density / Viscosity		
MUD Fluid Loss / PH		
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		



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

OTHER SERVICES1	OTHER SERVICES2
OS1: DIL/ML/GR	OS1:
OS2: FMI/GR	OS2:
OS3: SDT/GR	OS3:
OS4:	OS4:
OS5:	OS5:

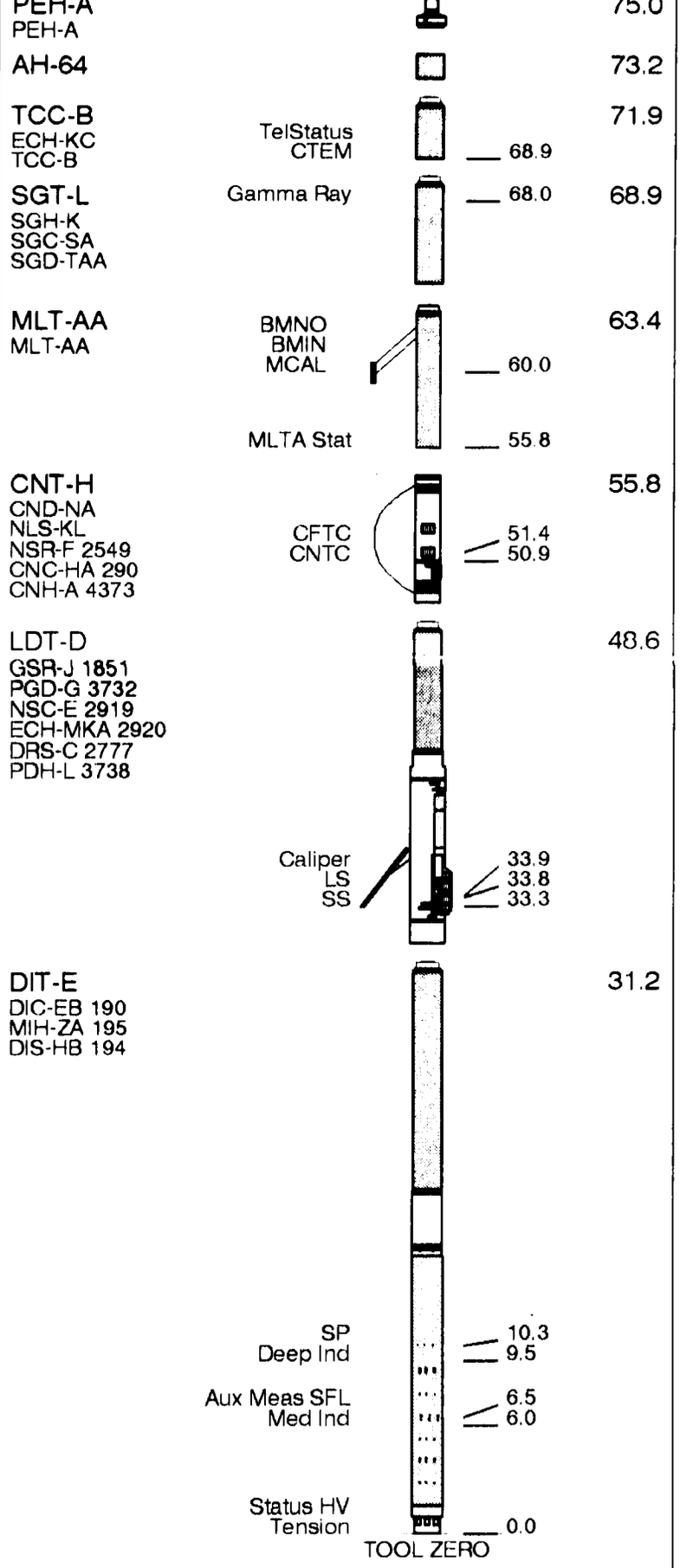
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
NO BOWSPRING USED ON NEUTRON TOOL.	
MATRIX = SANDSTONE, 2.68 G/CC	
THANKS FOR USING SCHLUMBERGER!!	
SWS CREW: D HALL/D JOHNSON	

RUN 1		RUN 2	
SERVICE ORDER #:	670102	SERVICE ORDER #:	
PROGRAM VERSION:	7C0-427	PROGRAM VERSION:	
FLUID LEVEL:	0 F	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1	RUN 2
SURFACE EQUIPMENT	
CNB-AB 3221 TCM-AB	
NCT-B 320	
NCS-VB	
GSR-U/Y	
DOWNHOLE EQUIPMENT	
BELLA	



MAXIMUM STRING DIAMETER 5.82 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29	6382.5 FT	47.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2303.75 F3

Cement Volume = 1292.92 F3 (assuming 5.50 IN casing O.D.)

Computed from 6382.5 FT to 256.0 FT using data channel(s) CALI (per GCSE parameter setting)

OP System Version: 7C0-427

DBM

Changed Parameter Summary

DLIS Name	New Value		Previous Value		Depth & Time
MST	67.00	DEGF	-50000.00	DEGF	4881.8 11:21:19
RMFS	-50000.0000	OHMM	-50000.0000	OHMM	4880.5 11:21:21

PIP SUMMARY

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

Time Mark Every 60 S

Tension (TENS)
10000 (LBF) 0

Bulk Density Correction (DRHO)
-0.25 (G/C3) 0.25

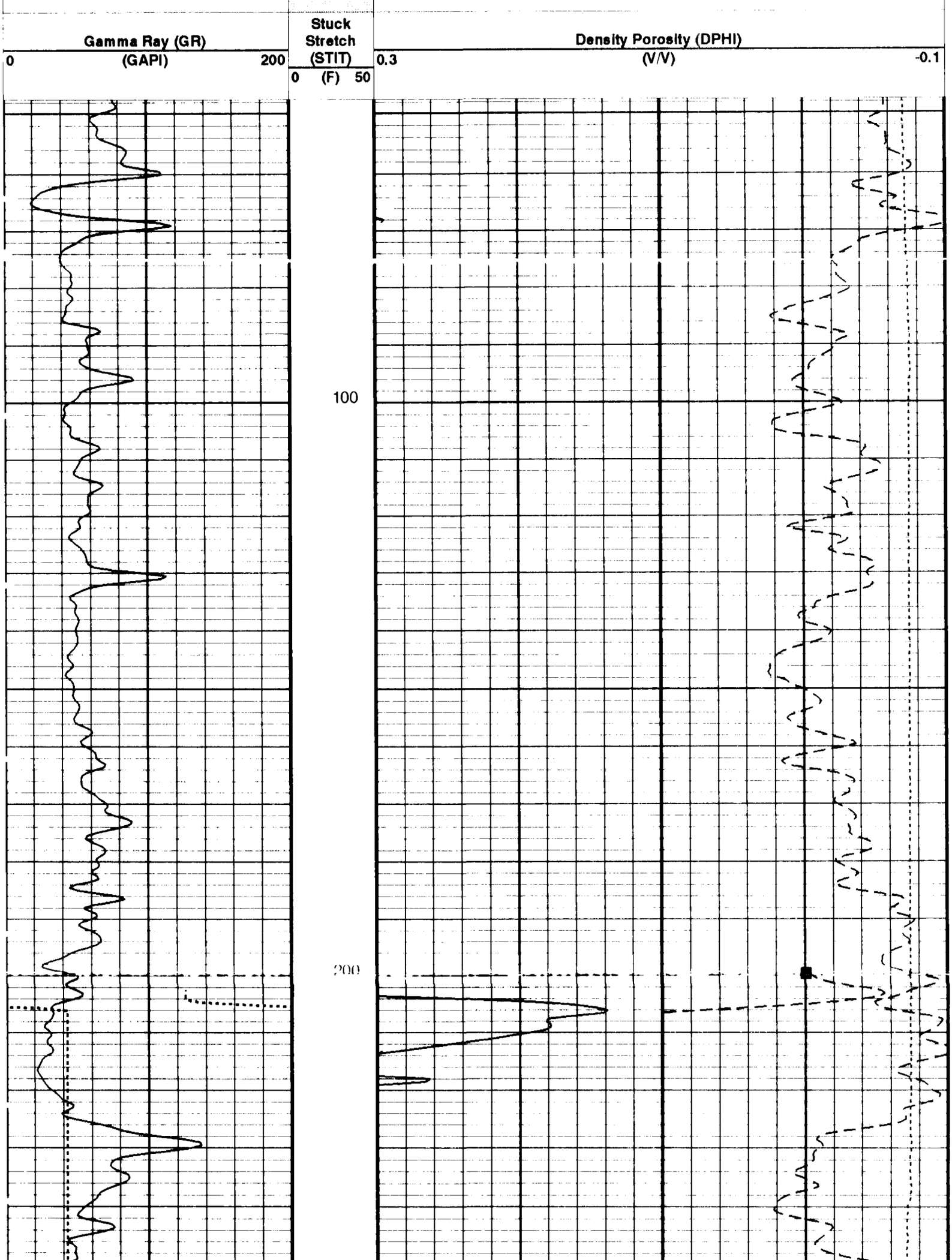
Tool/Tot. Drag From D3T to STIA

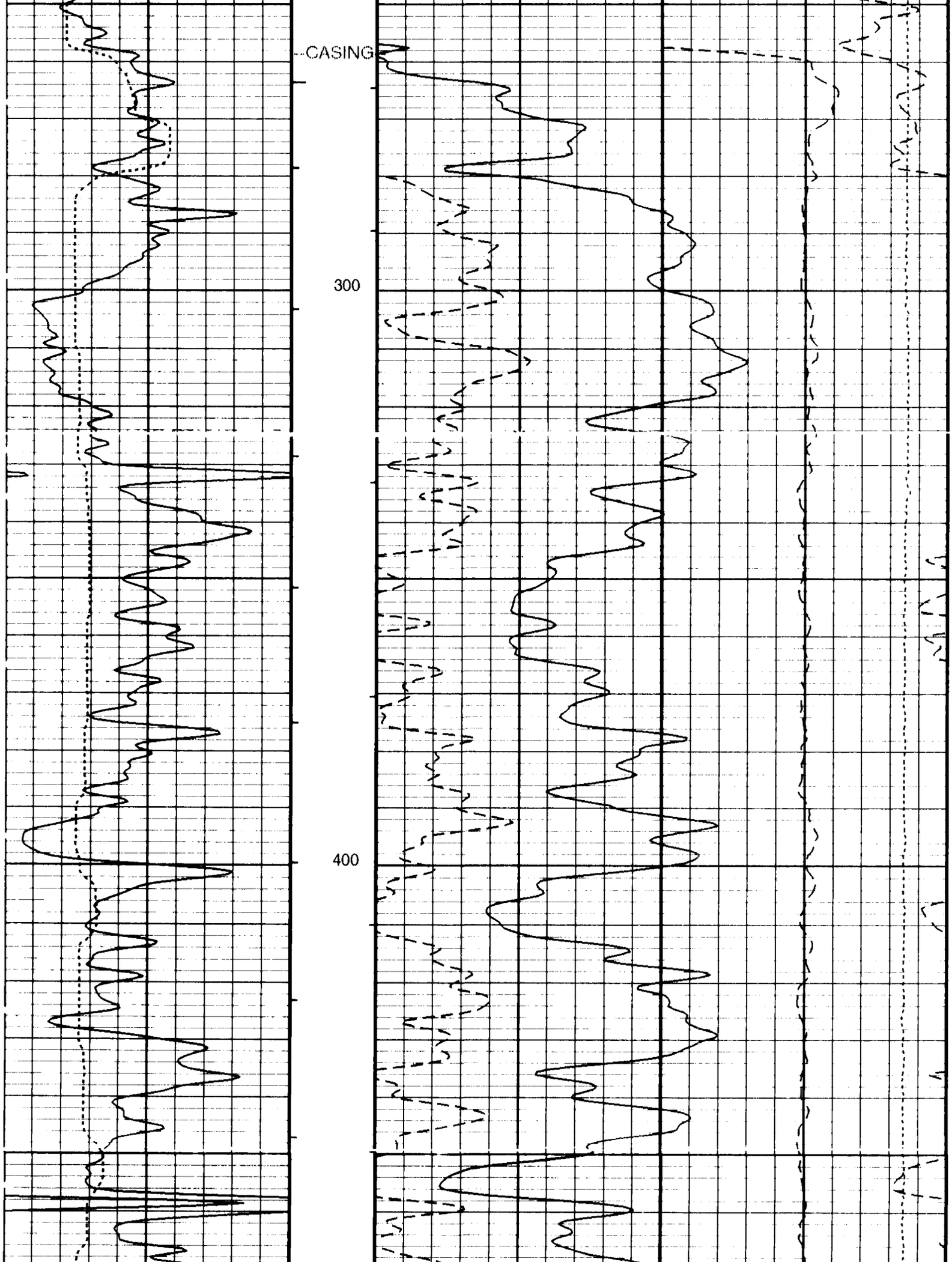
Gas Effect From DPHI to NPOR

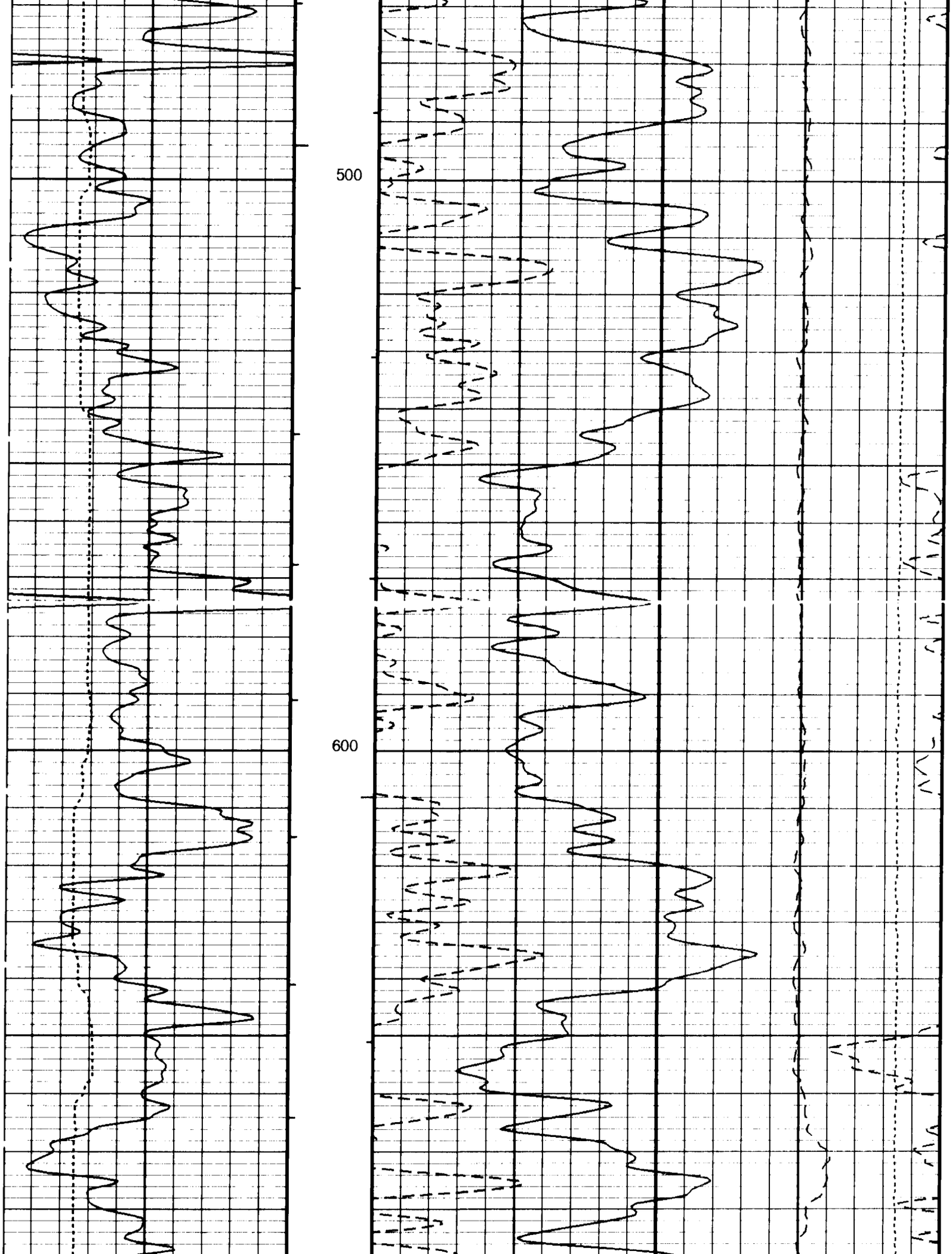
Caliper (CALI)
6 (IN) 16

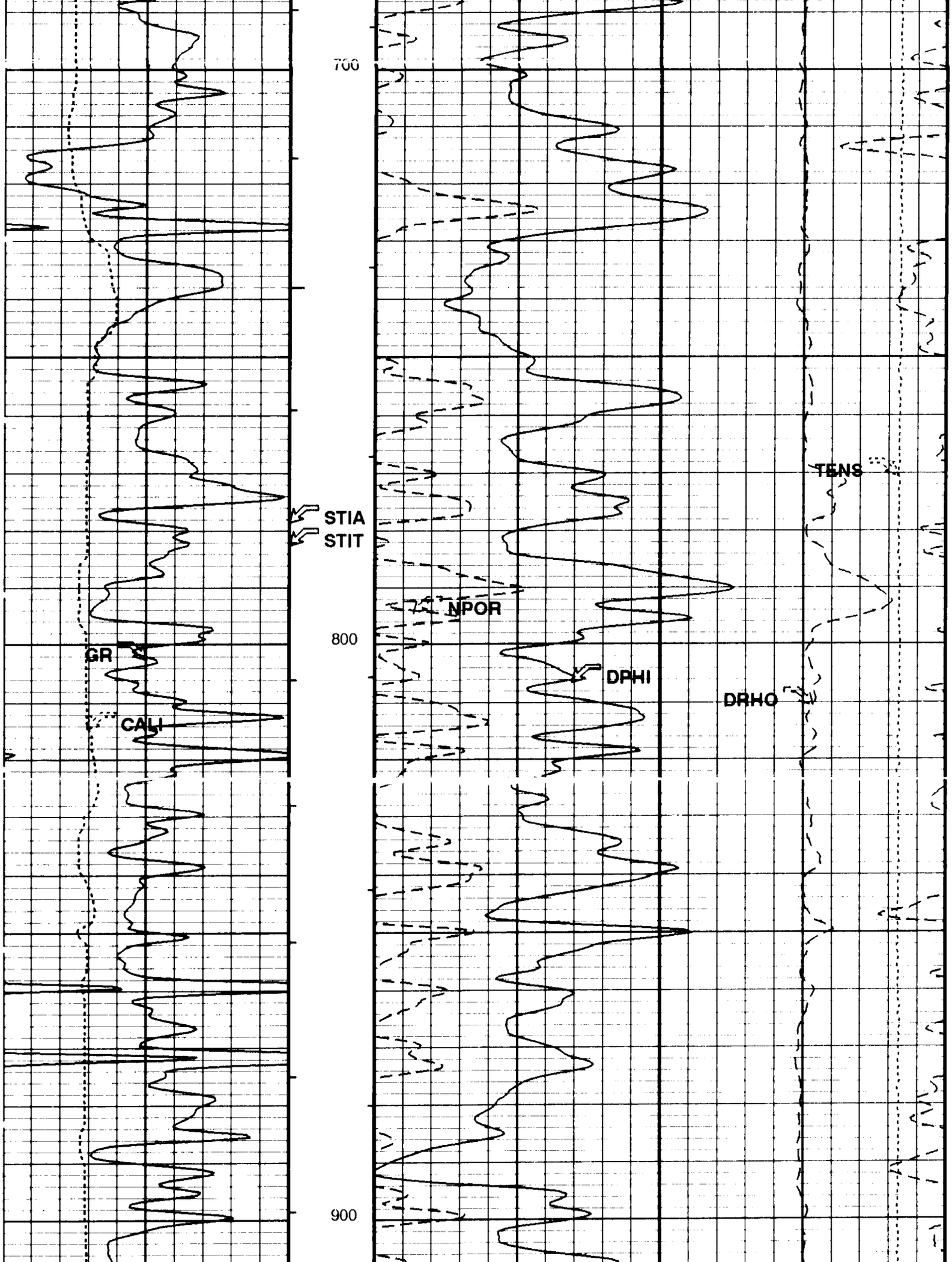
Cable Drag From STIA to STIT

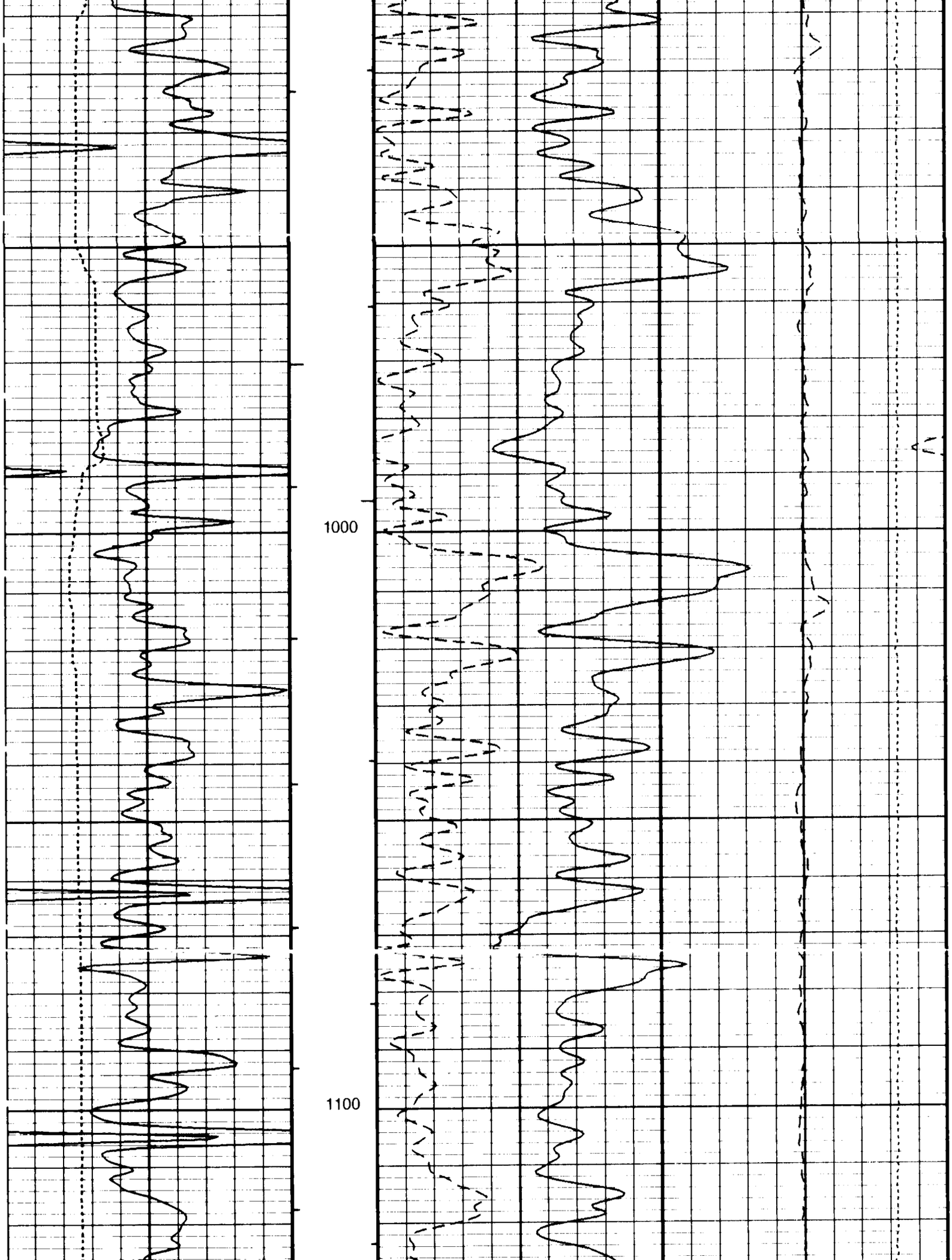
Alpha Processed Neutron Porosity (NPOR)
0.3 (V/V) -0.1

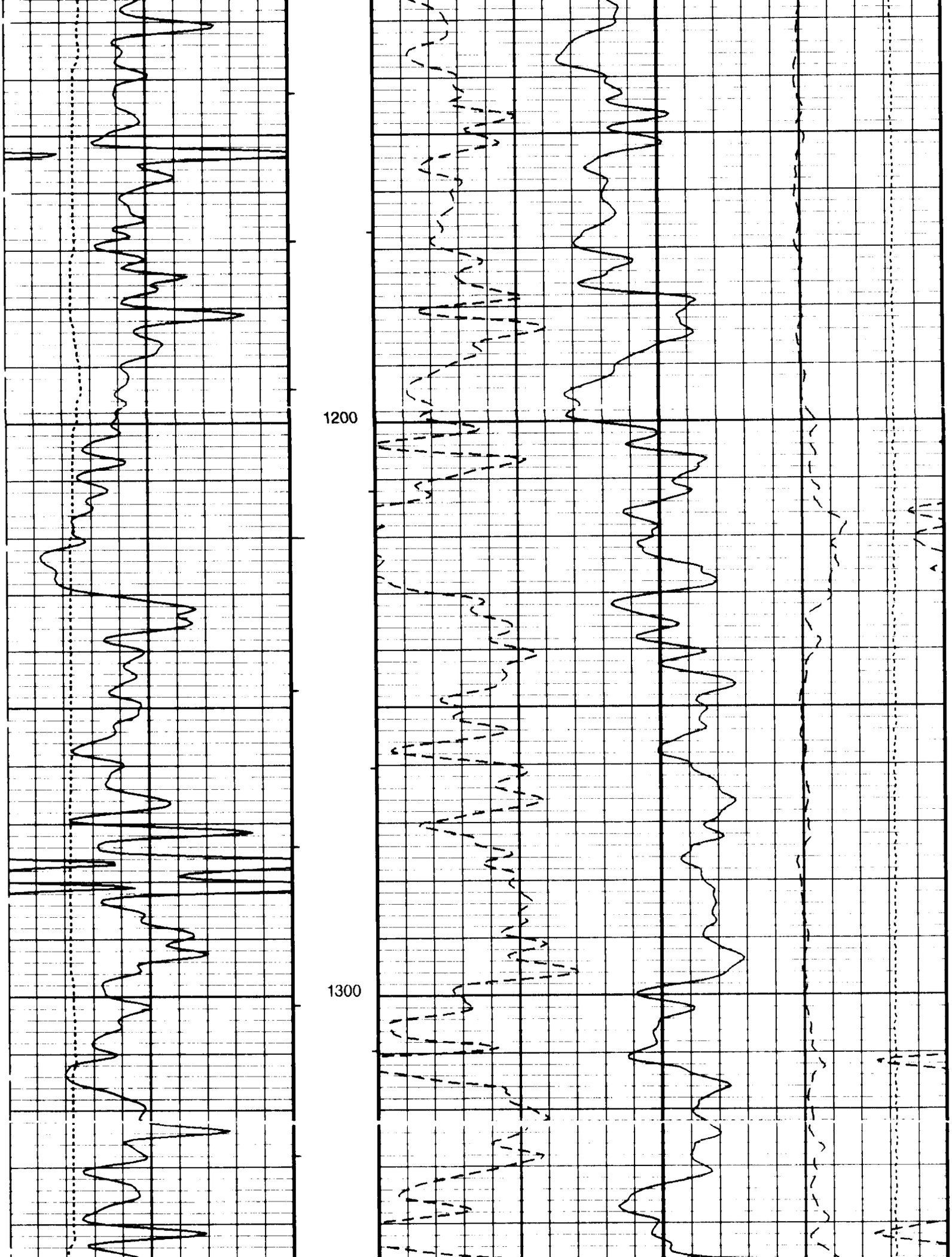

Gamma Ray (GR)
0
(GAPI)
200
Stuck Stretch (STIT)
0
(F)
50
Density Porosity (DPHI)
0.3
(V/V)
-0.1
100
200

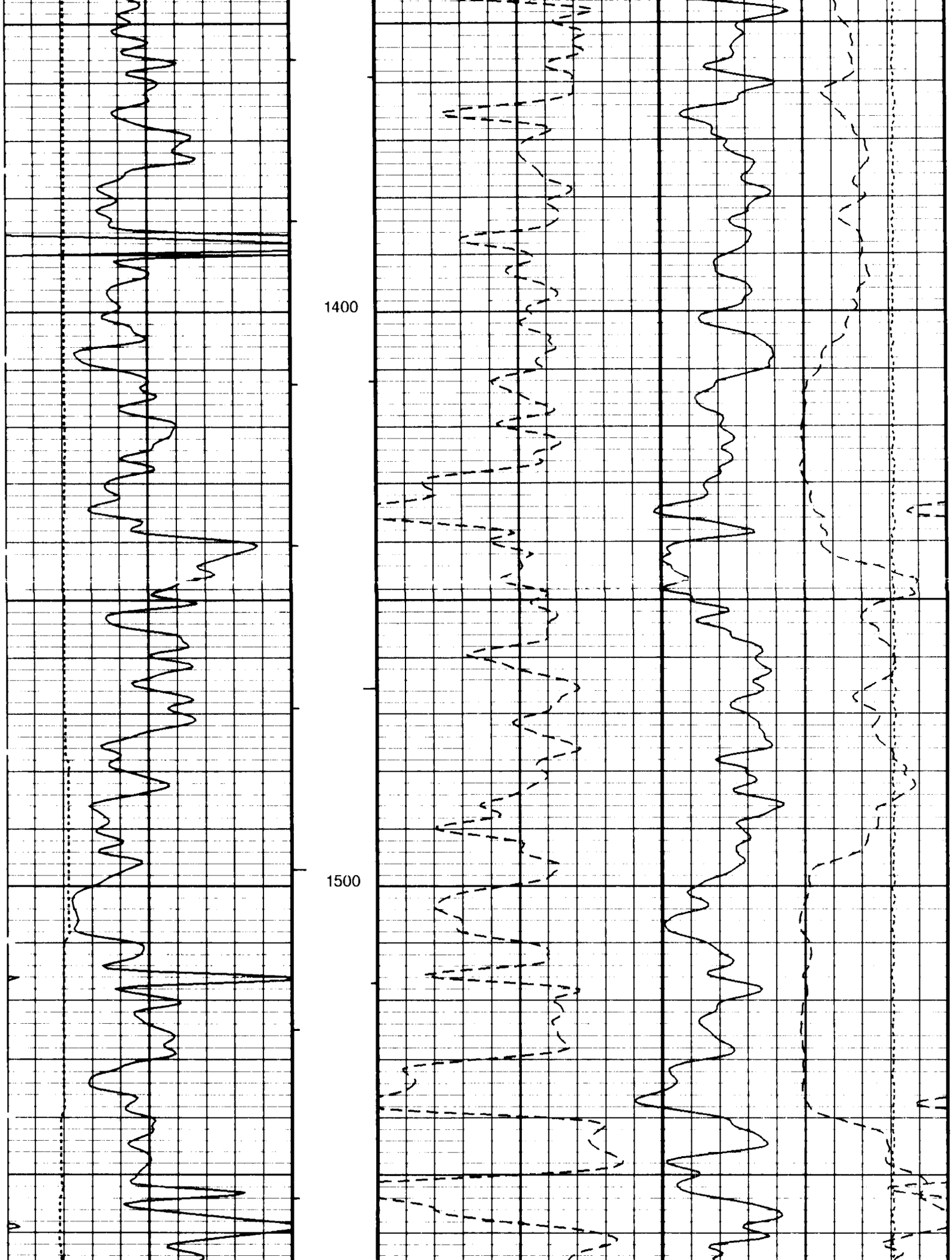

CASING
300
400

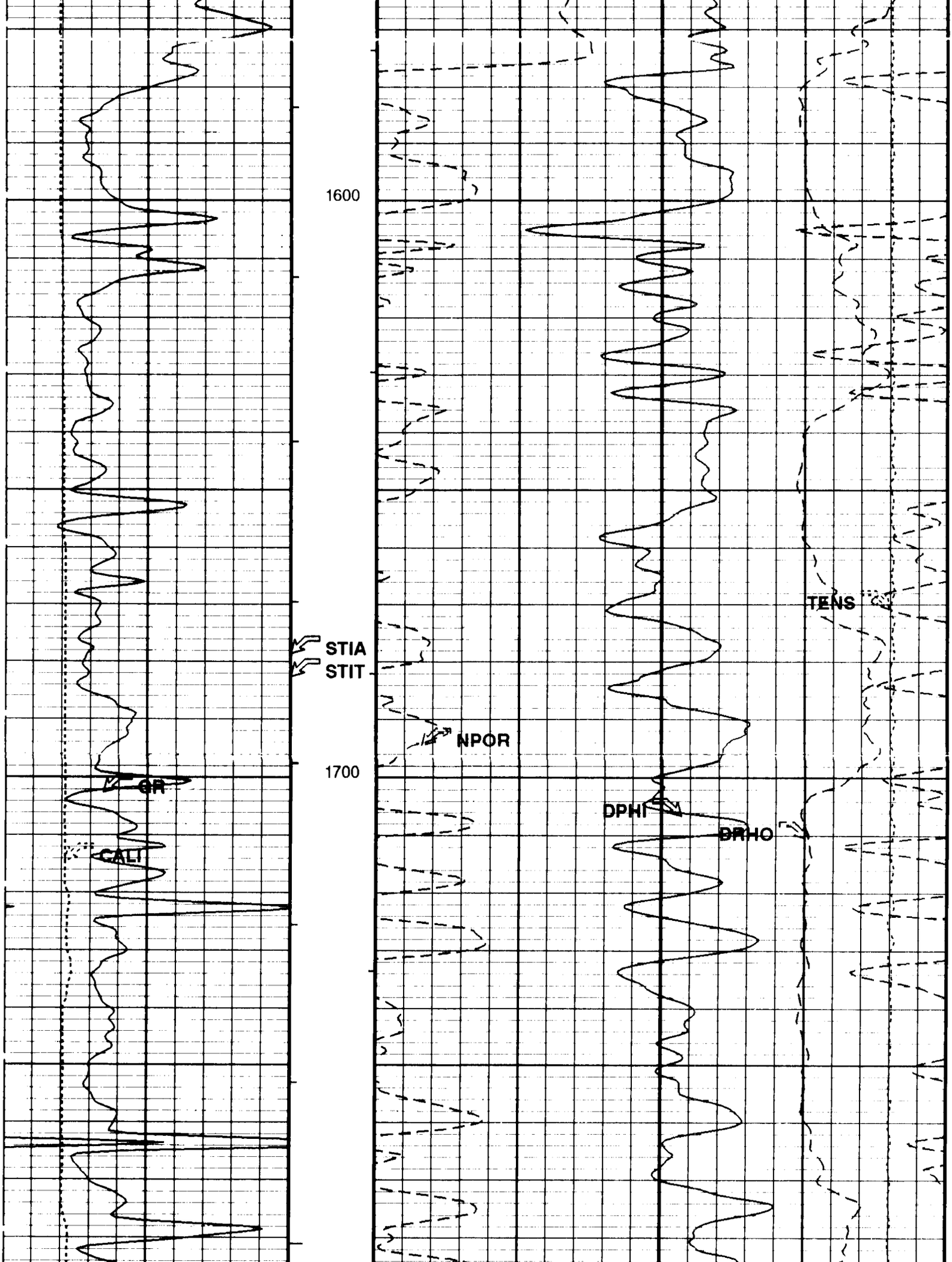

500
600

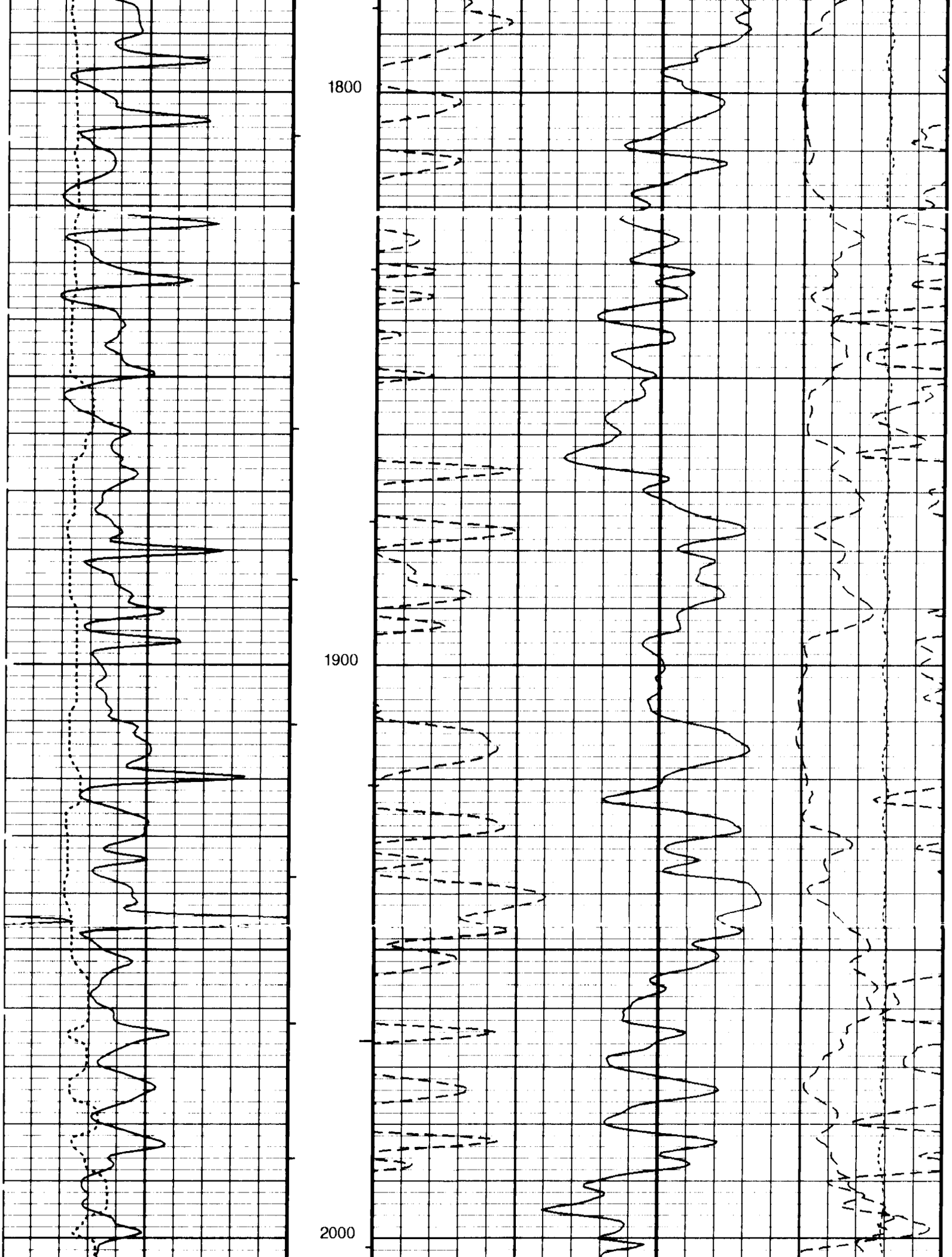

700
STIA
STIT
TENS
NPOR
800
GR
DPHI
DRHO
CALI
900

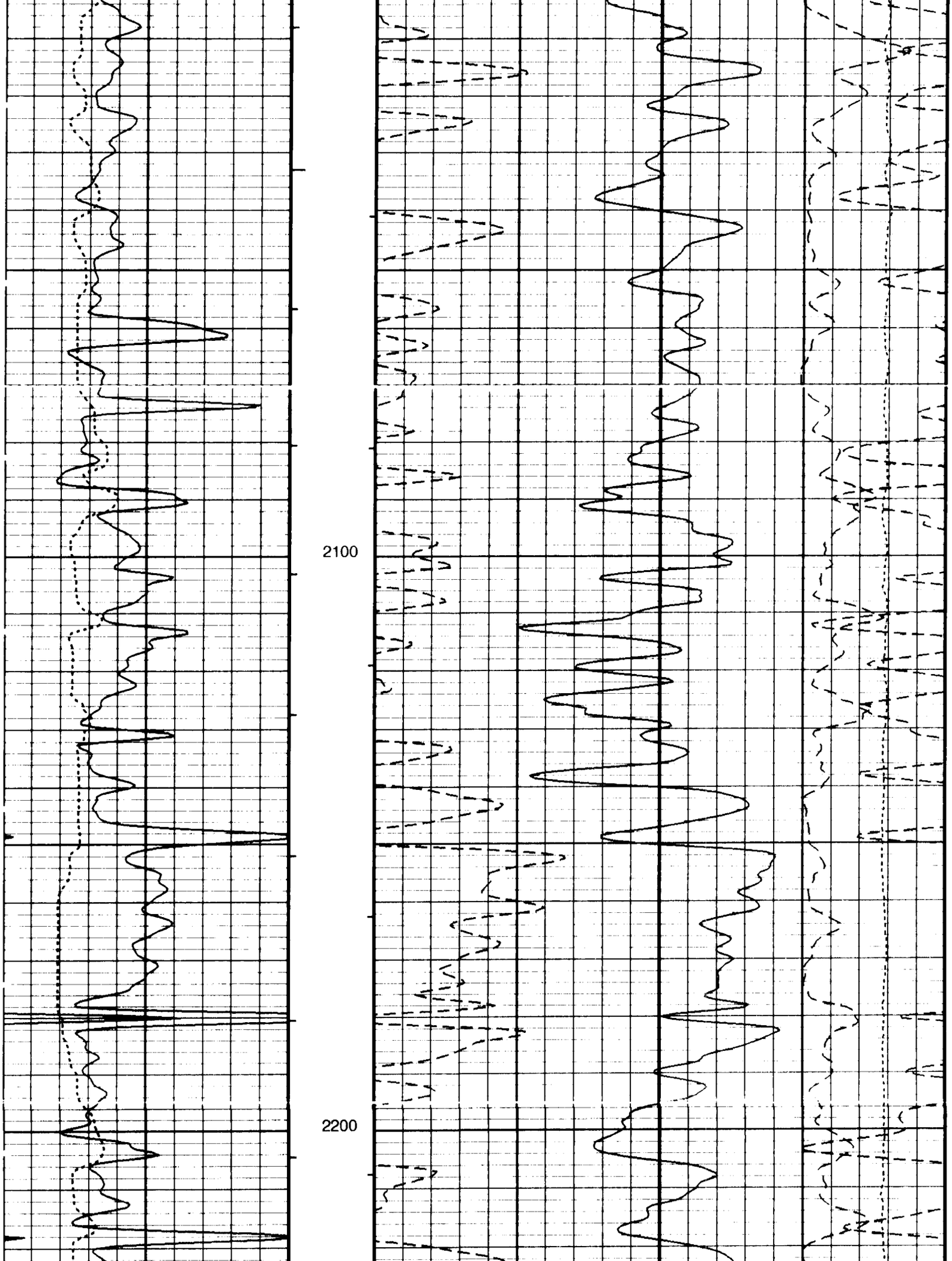

1000
1100

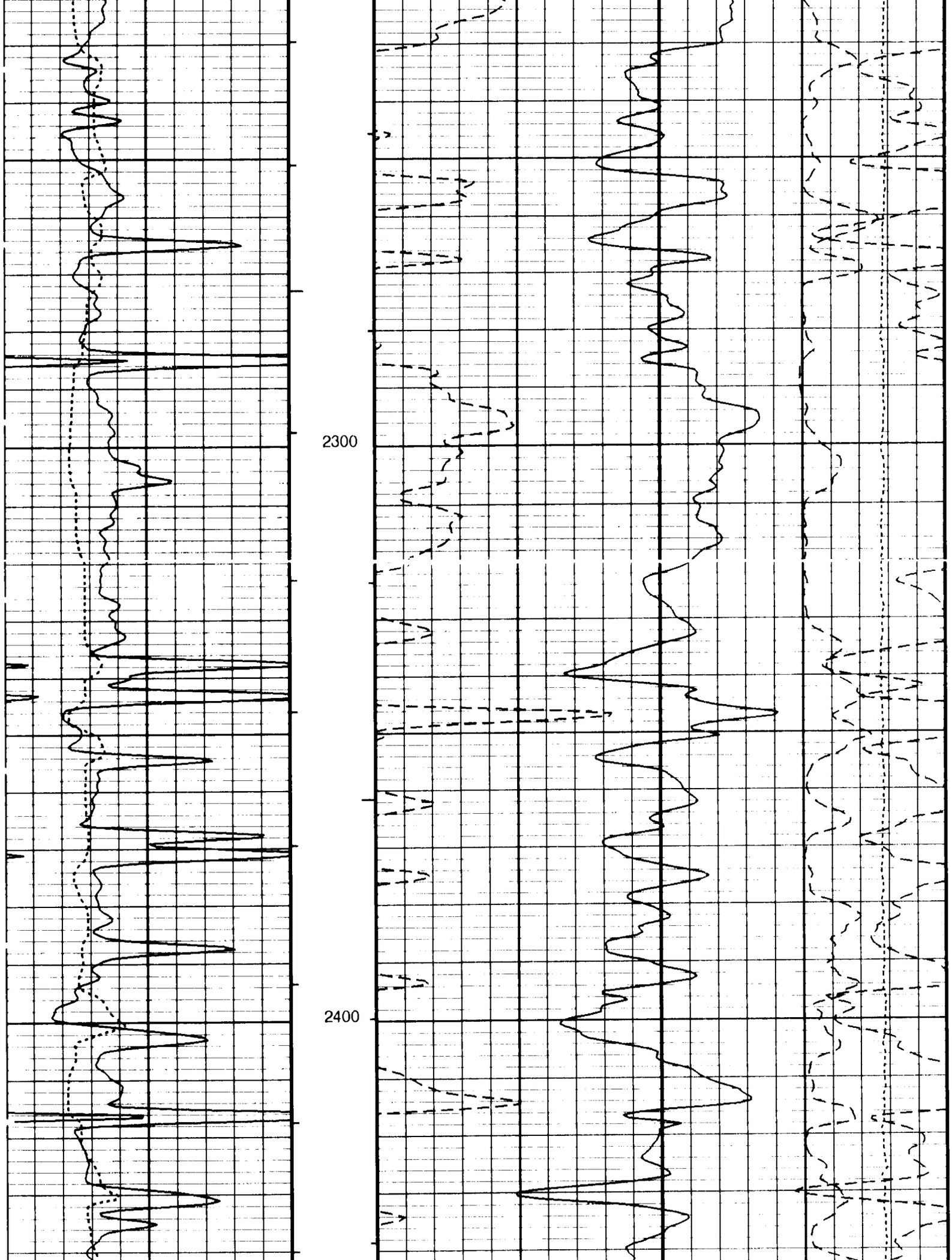

1200
1300

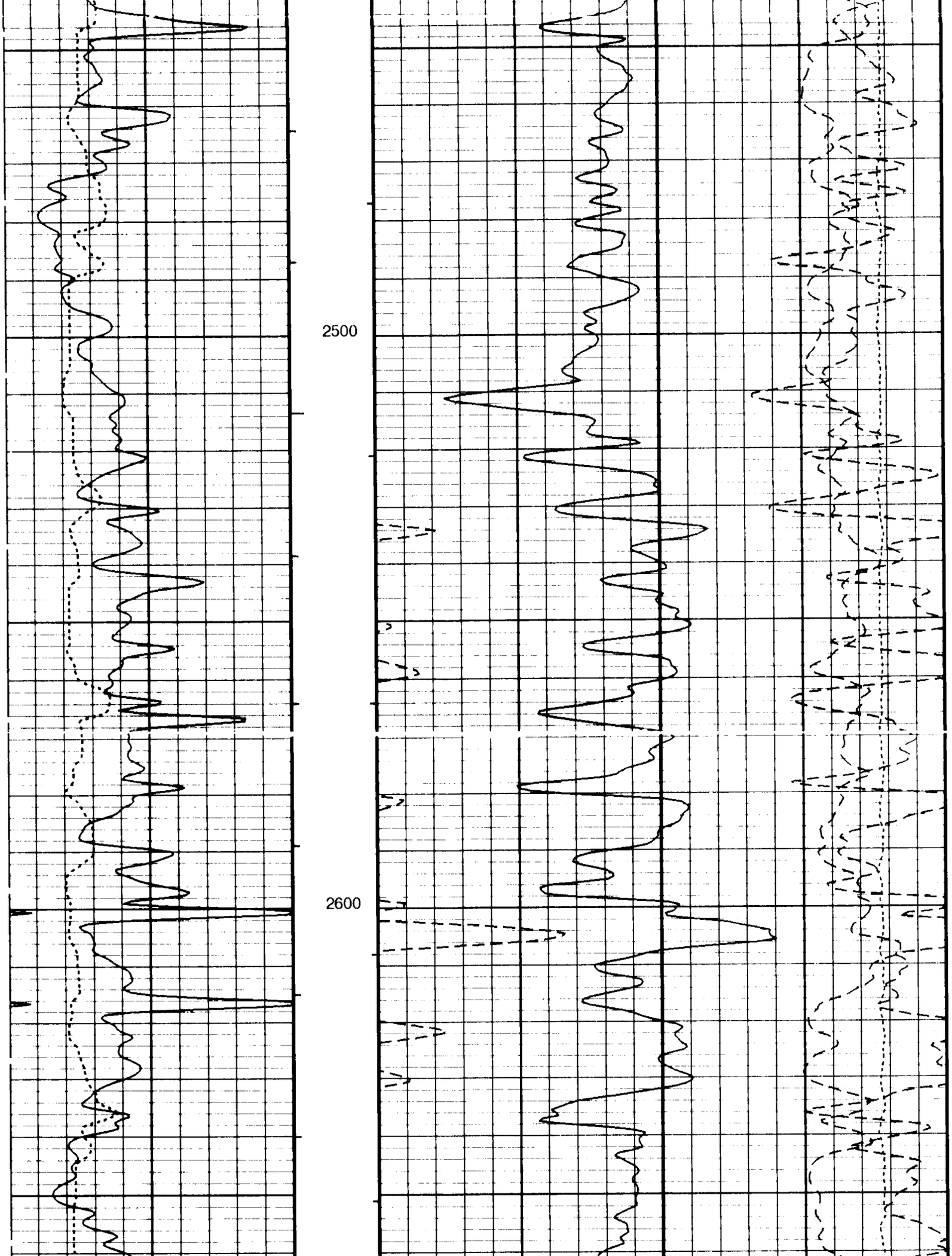

1400
1500

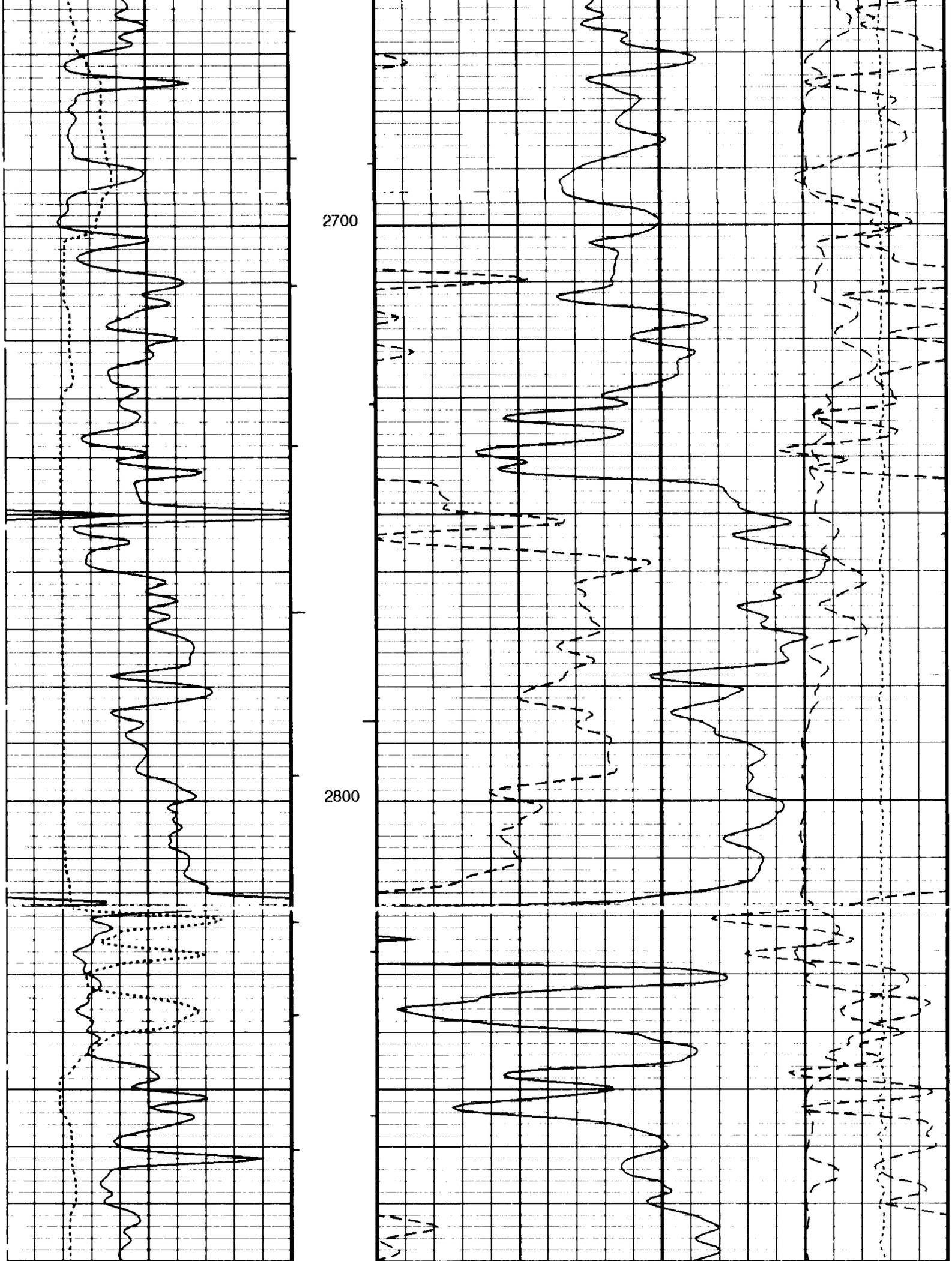

1600
STIA
STIT
NPOR
1700
GR
CALI
DPHI
DRHO
TENS

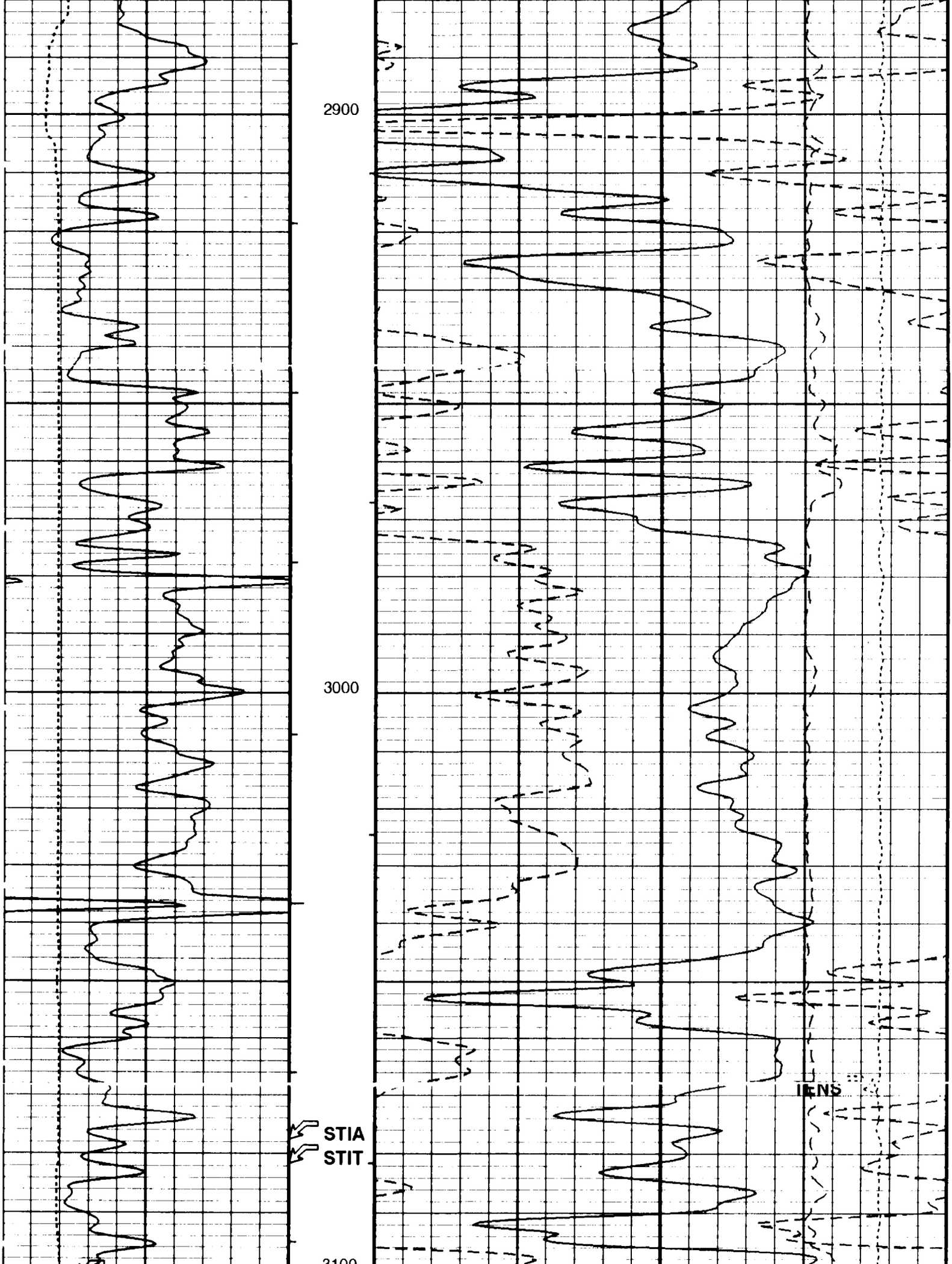

1800
1900
2000

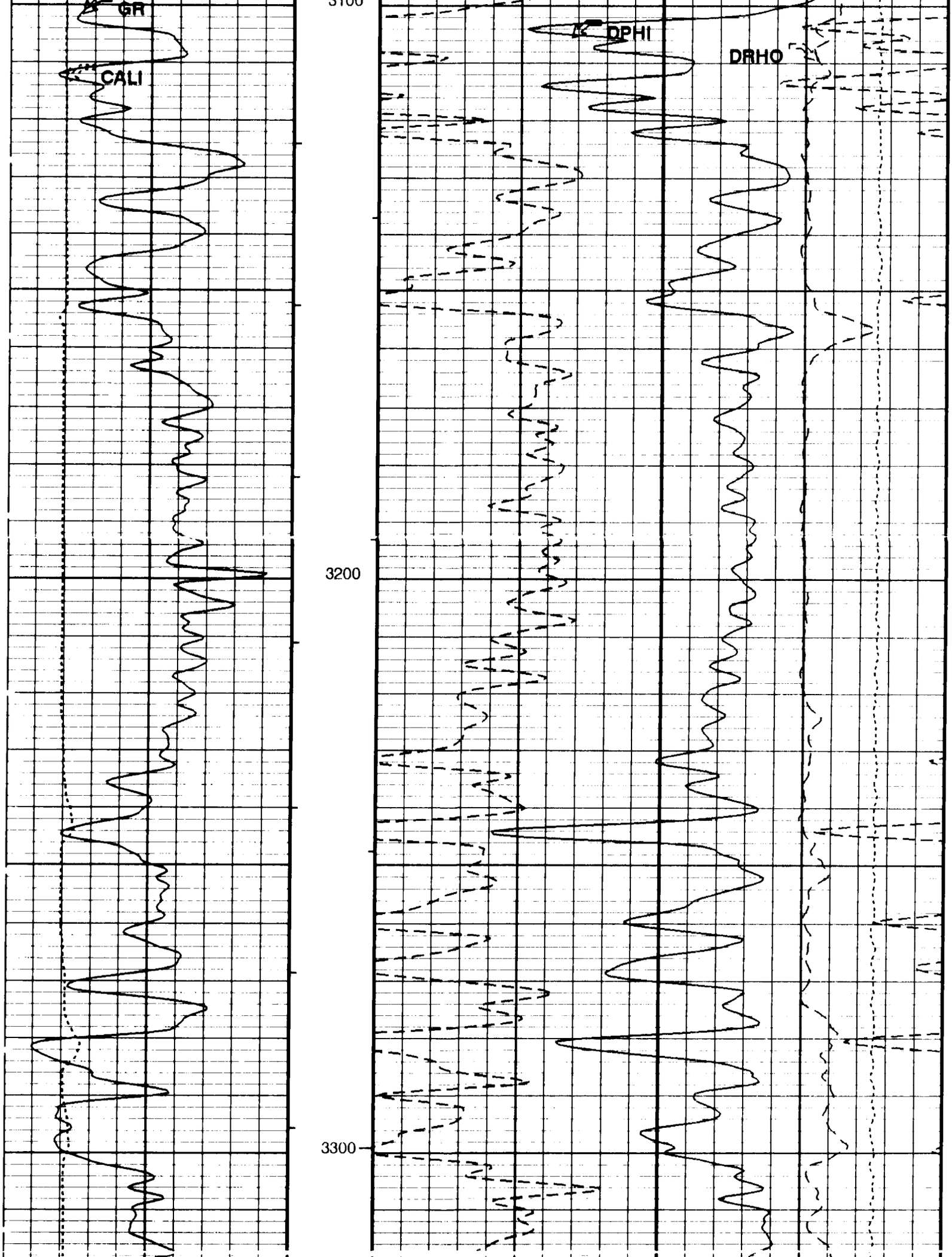

2100
2200

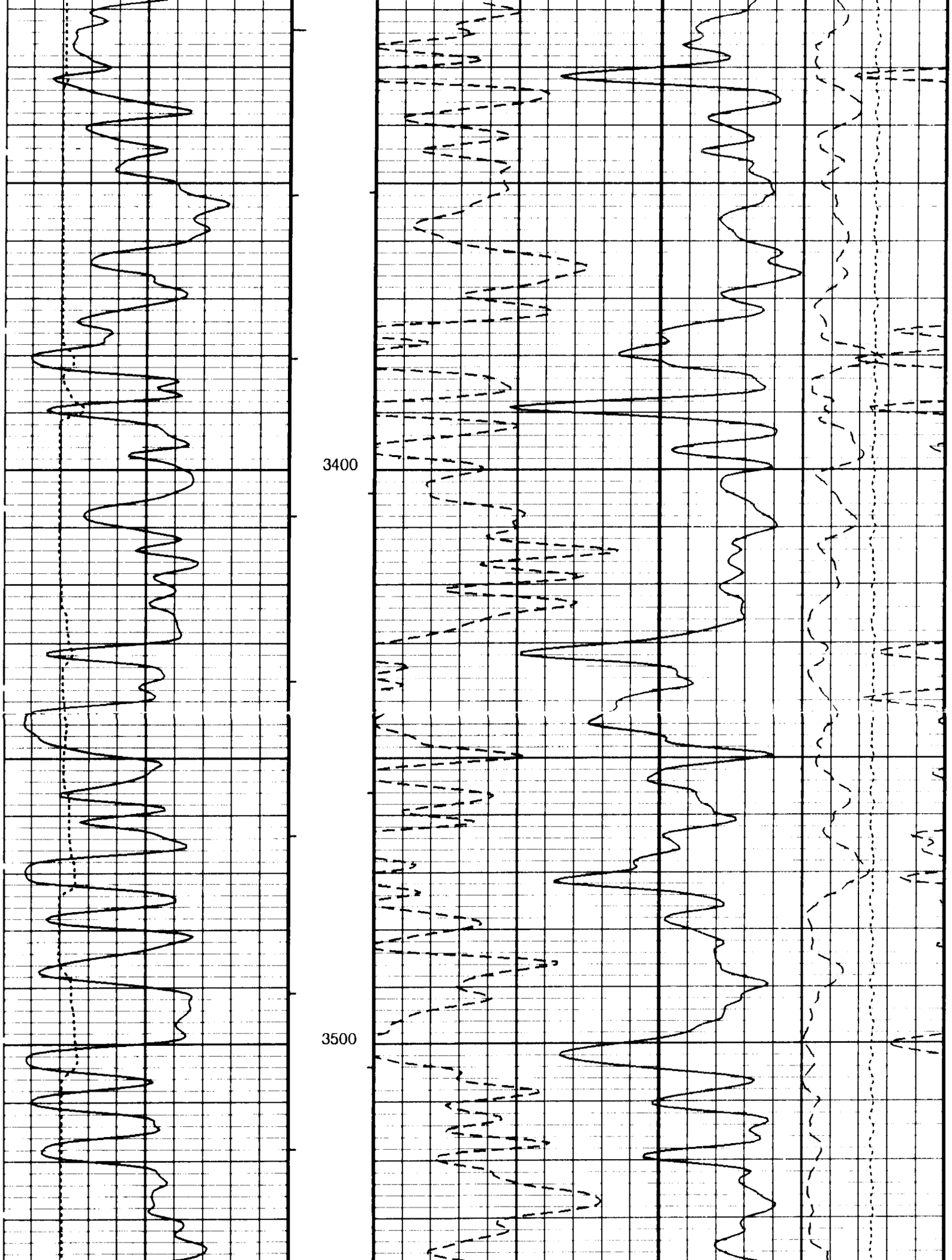

2300
2400

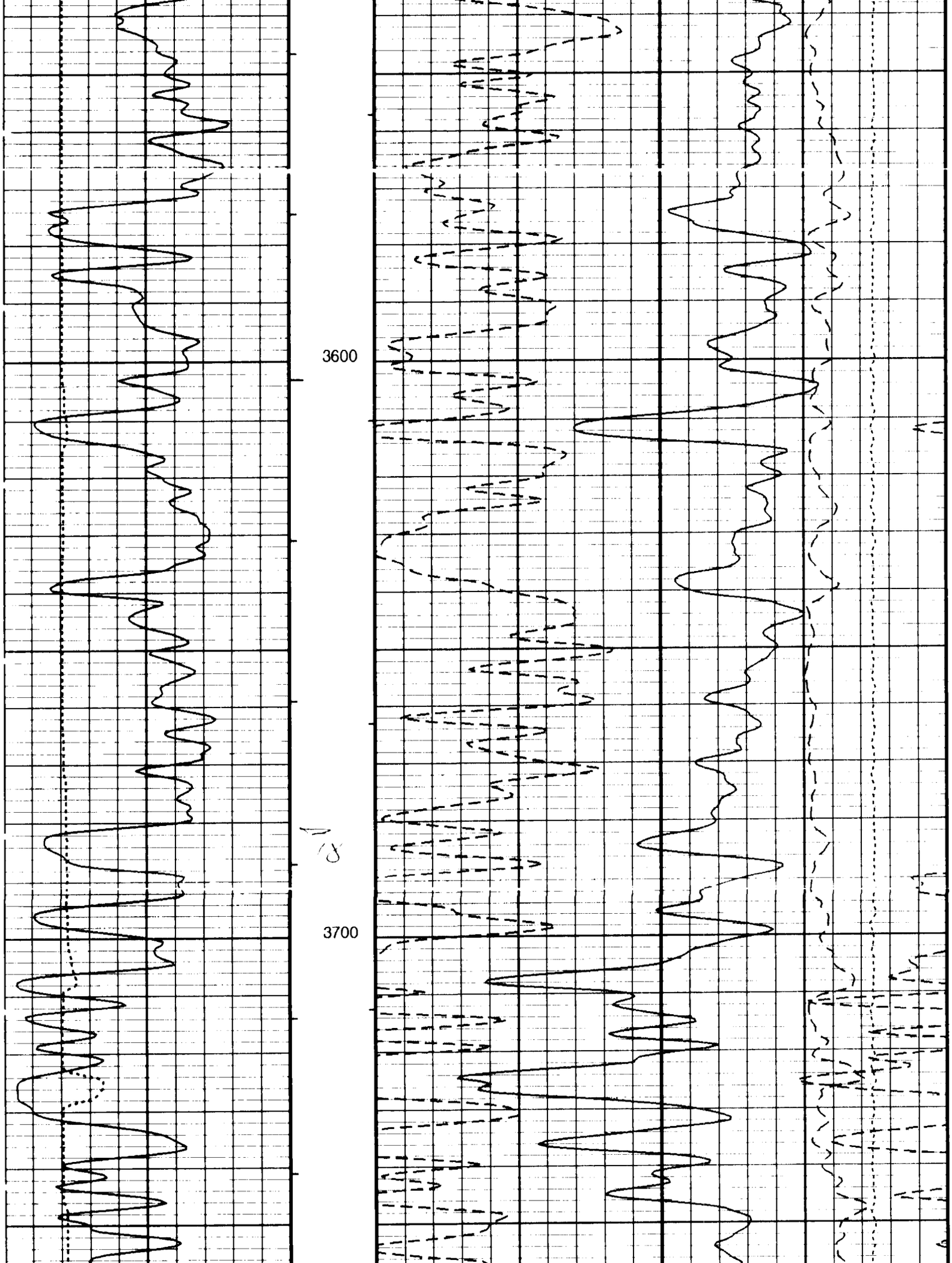

2500
2600

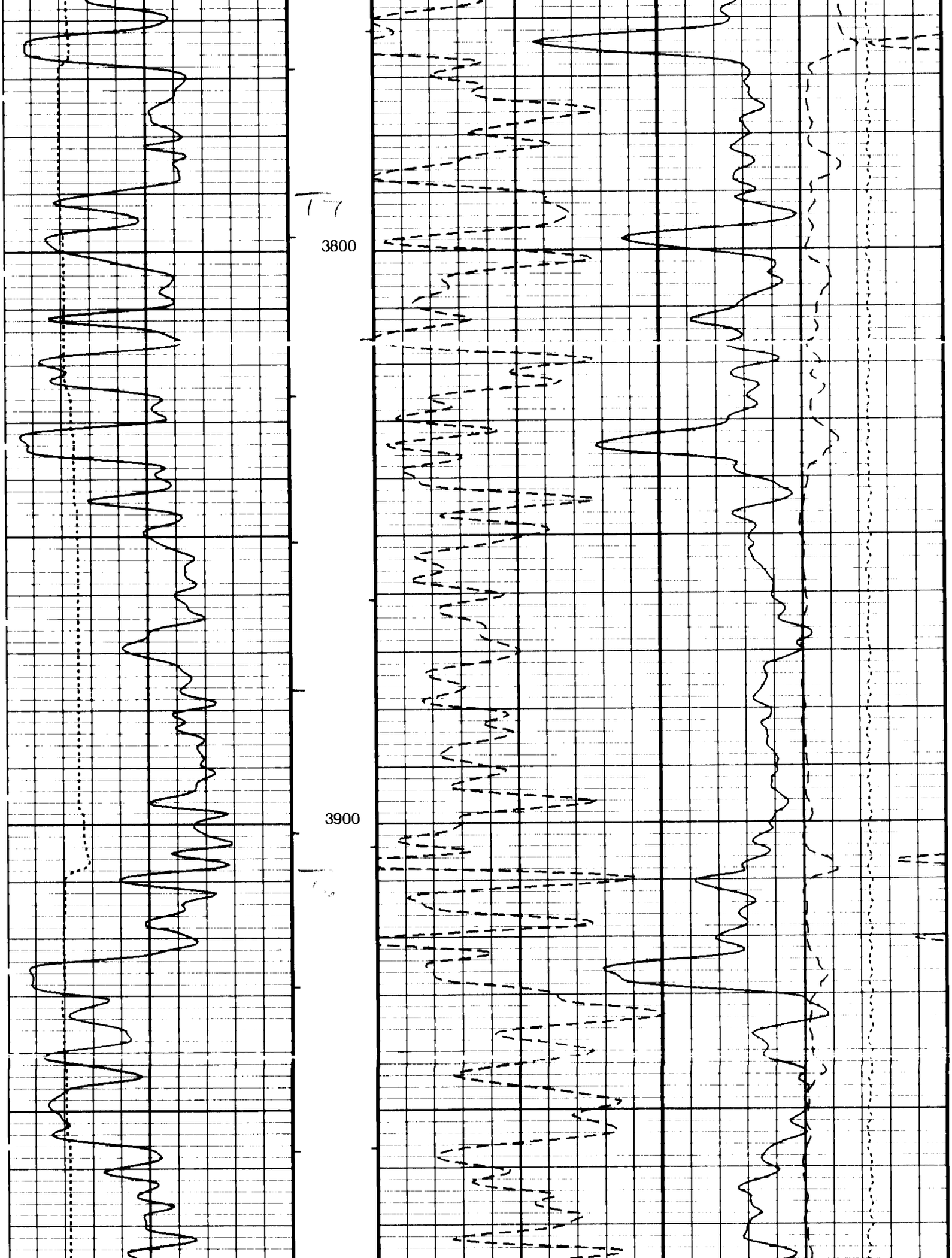

2700
2800

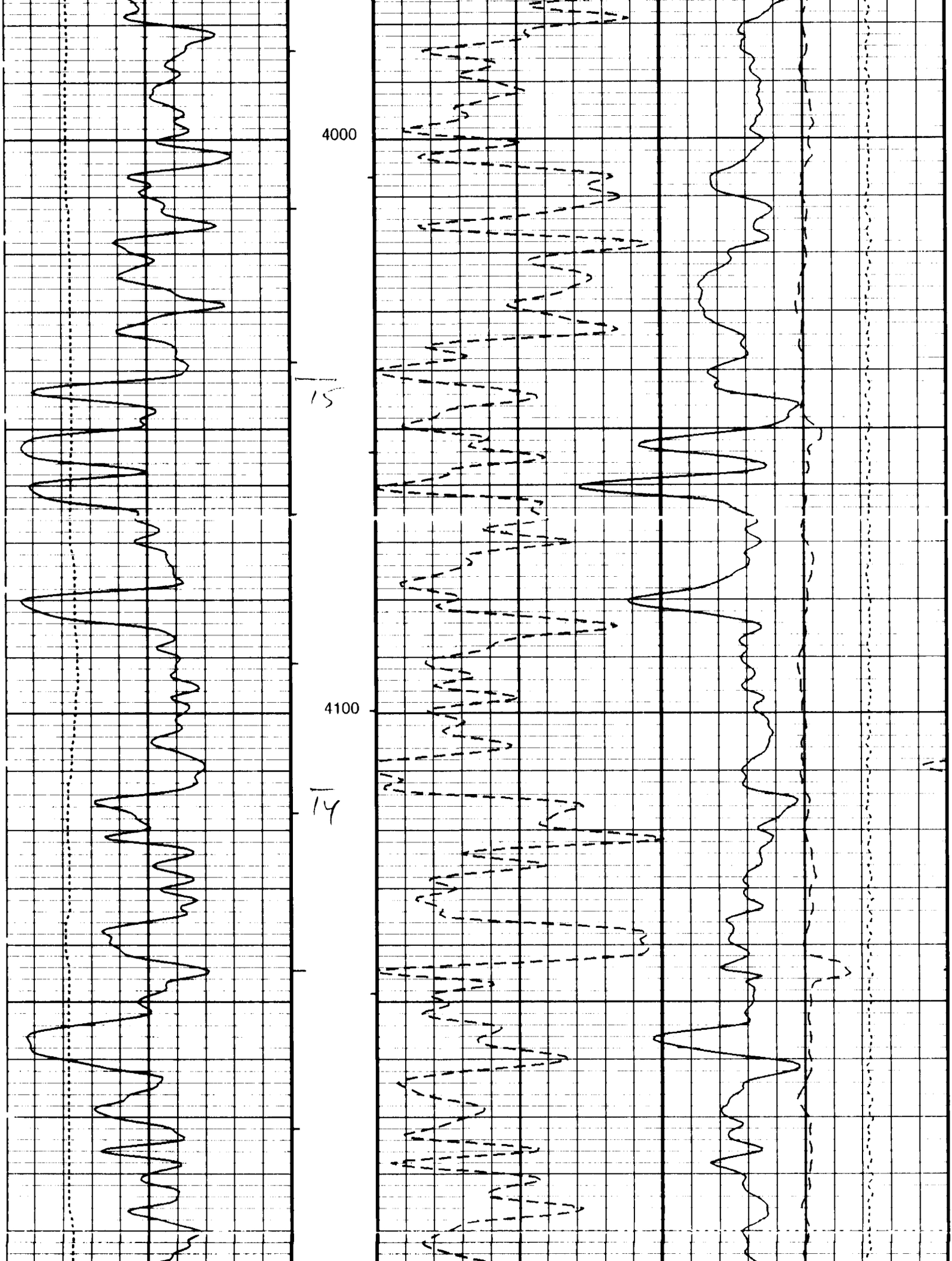

2900
3000
STIA
STIT
IENS

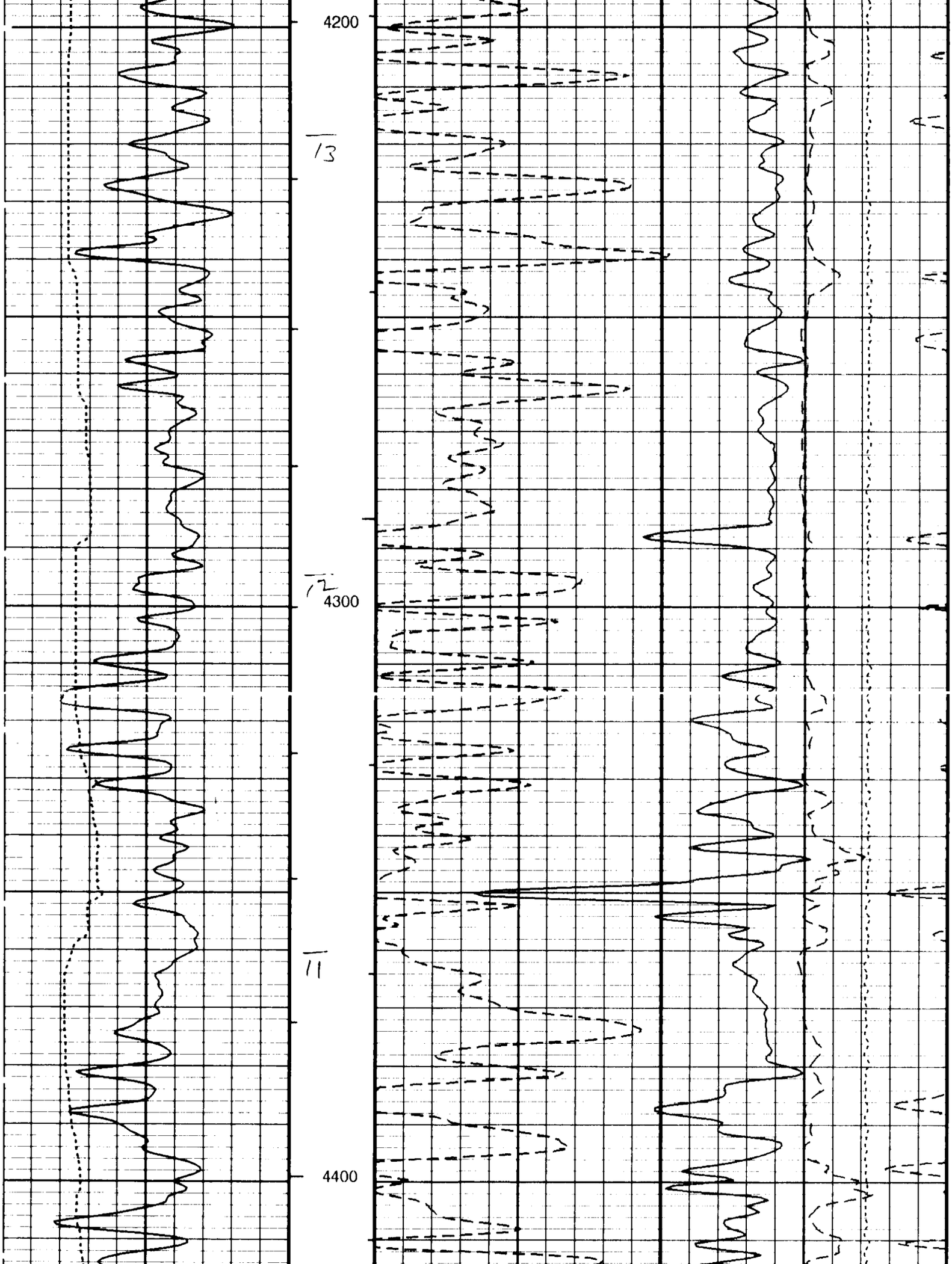

GR
CALI
3100
DPHI
DRHO
3200
3300

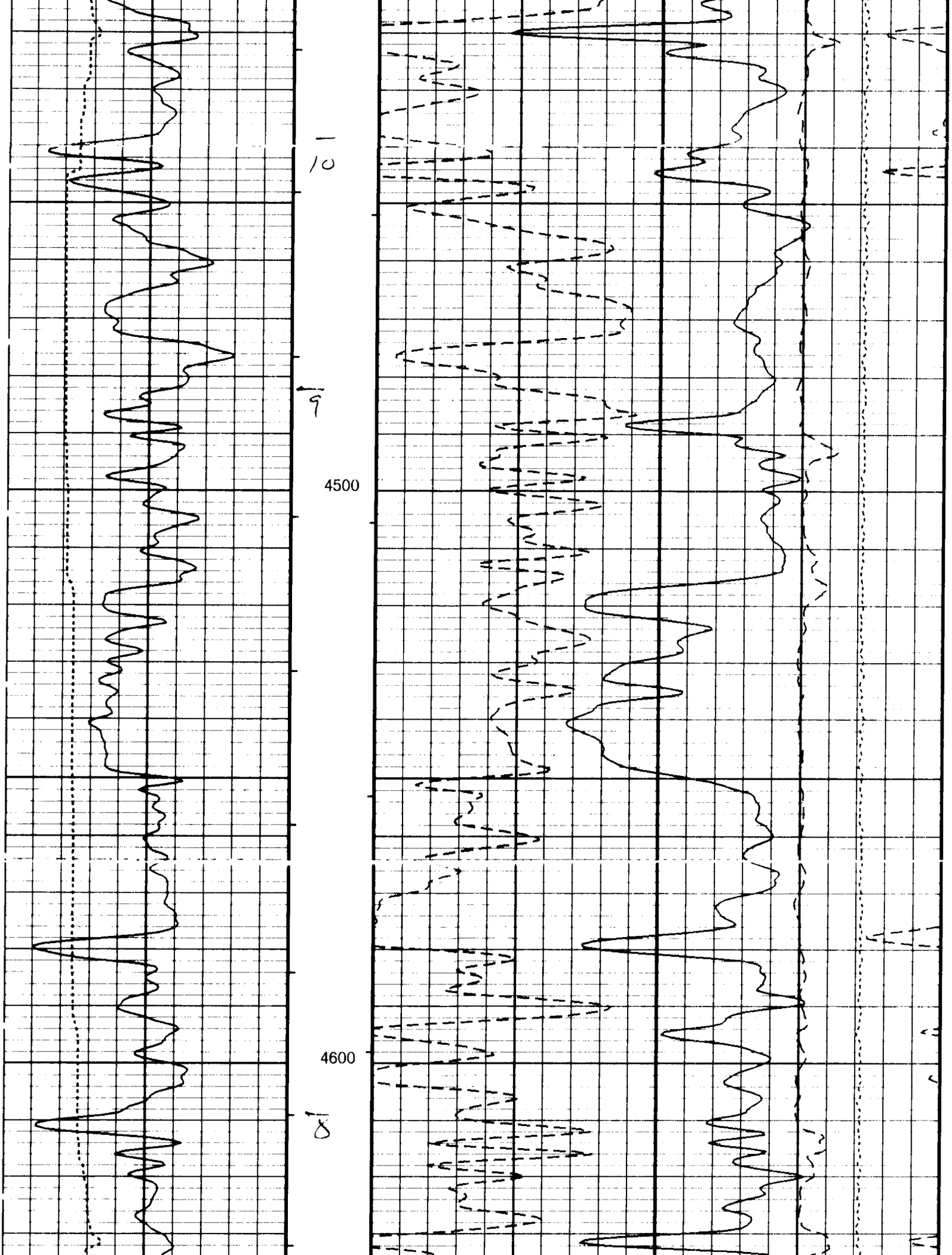

3400
3500

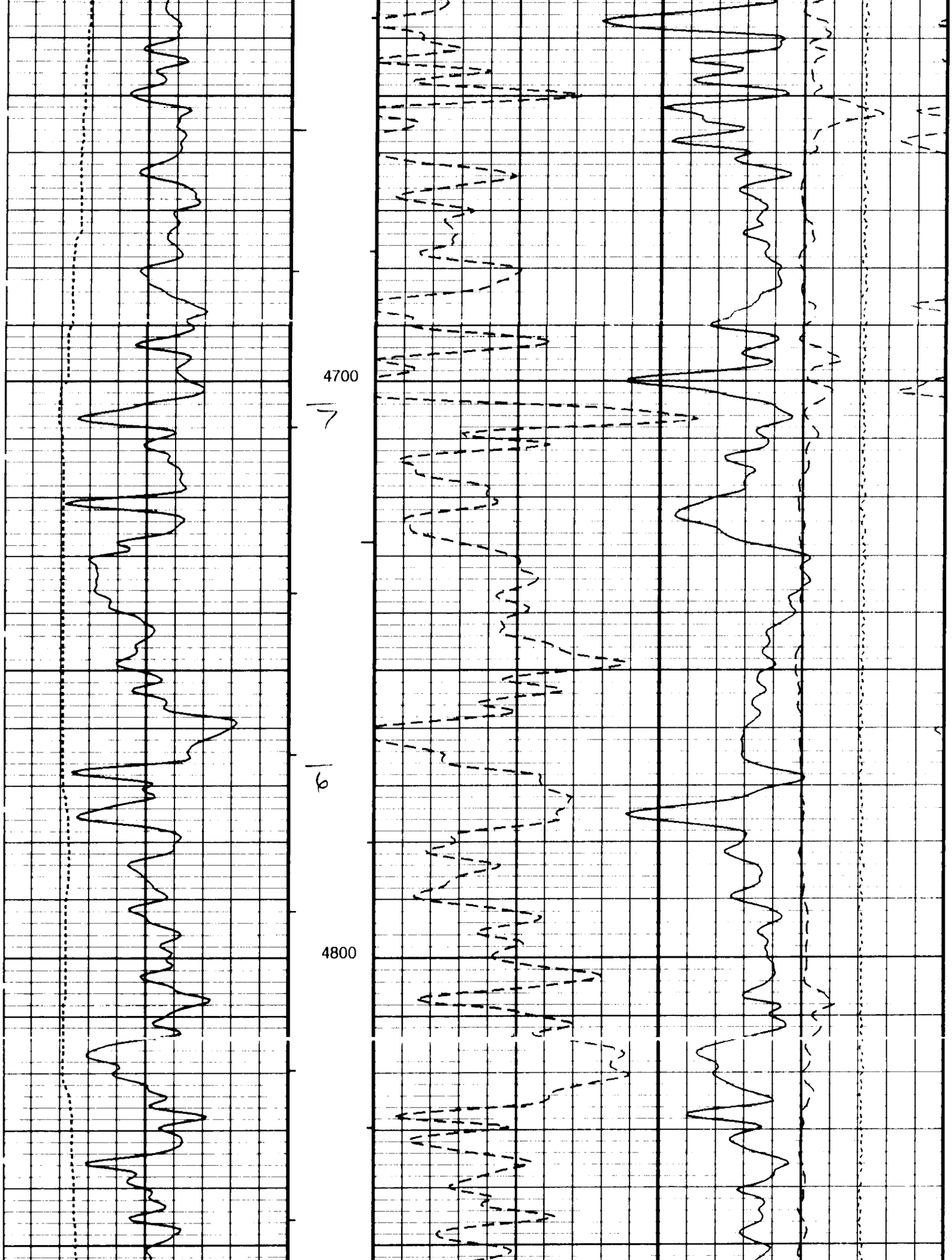

3600
3700

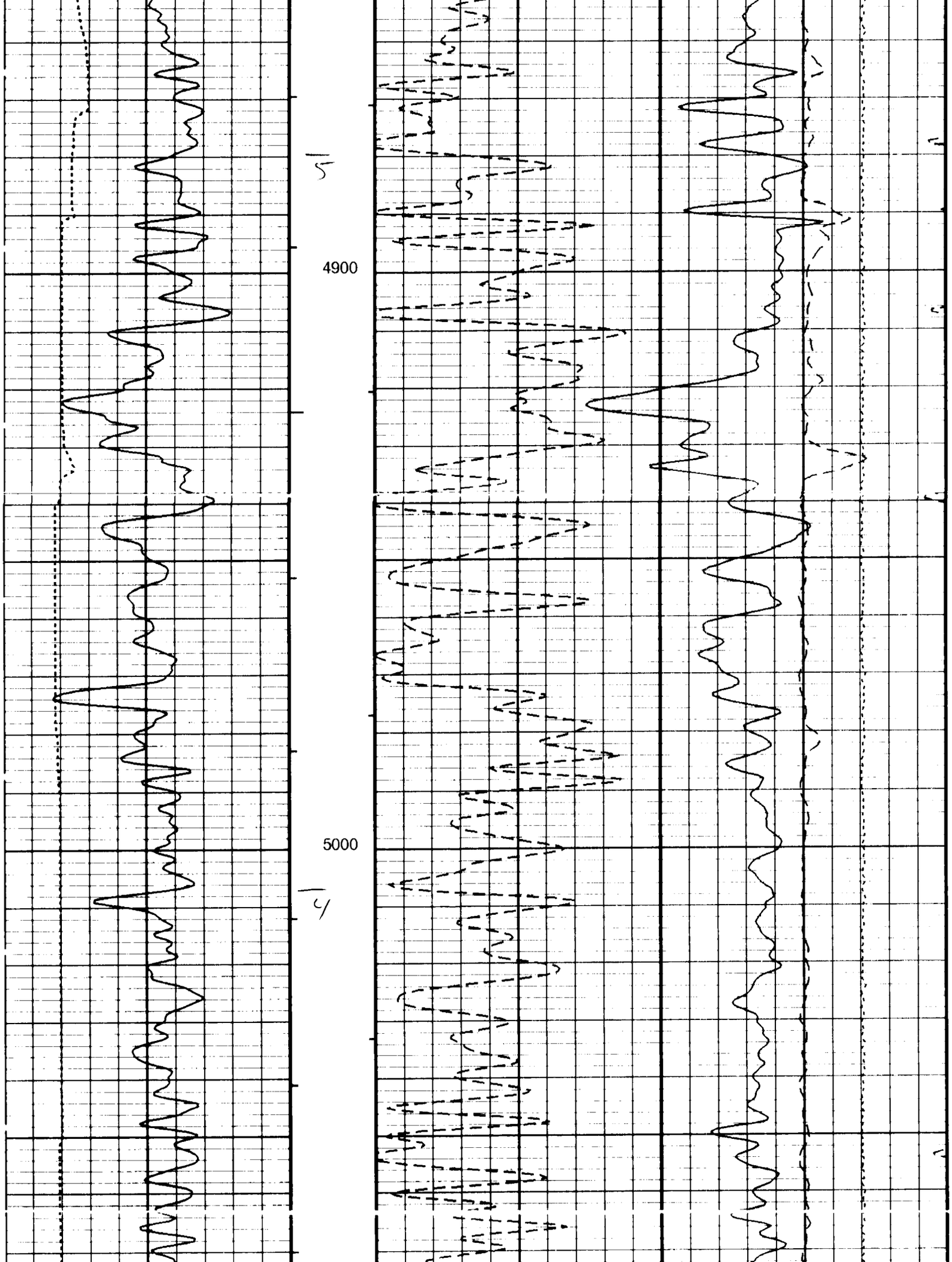

3800
3900

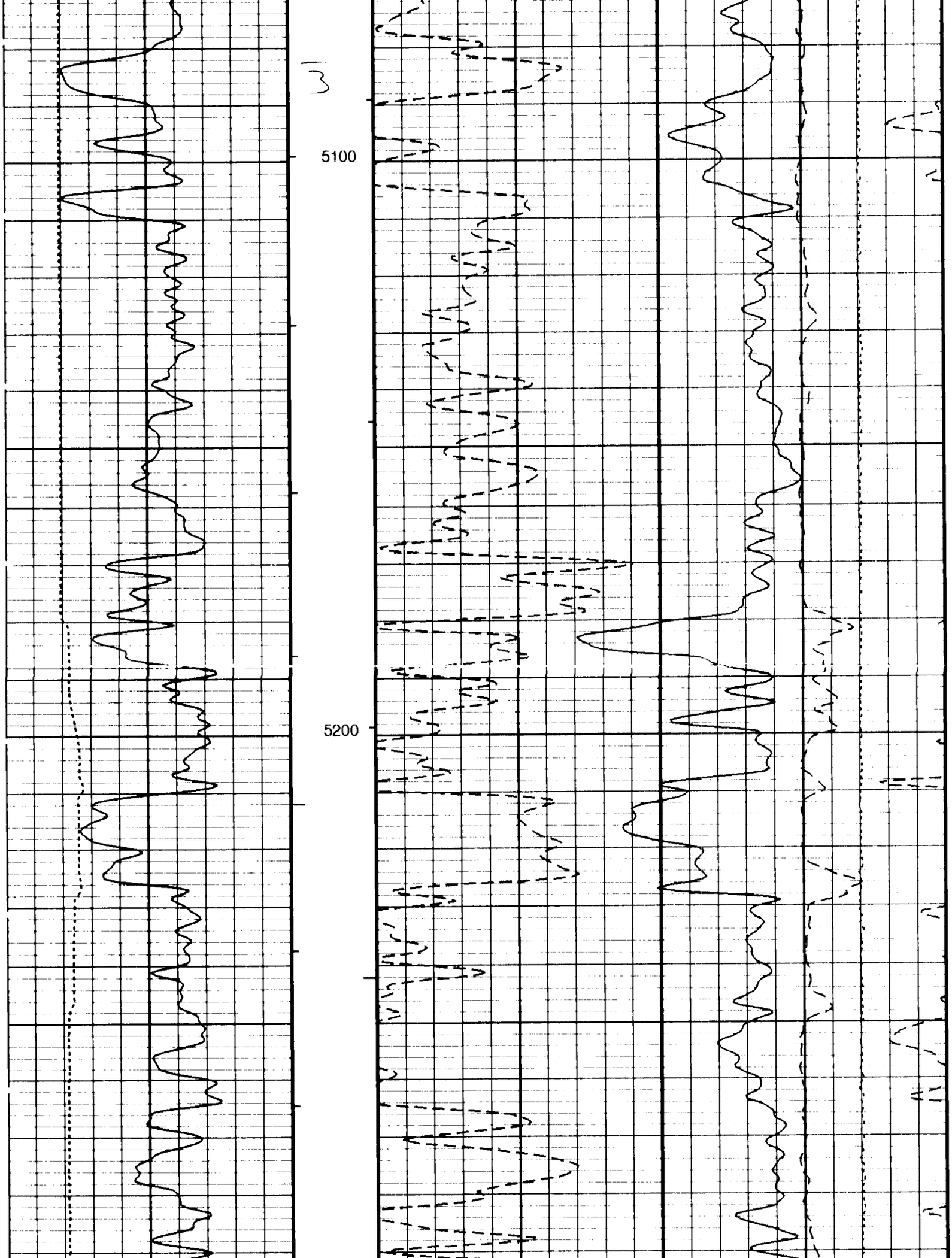

4000
15
4100
14

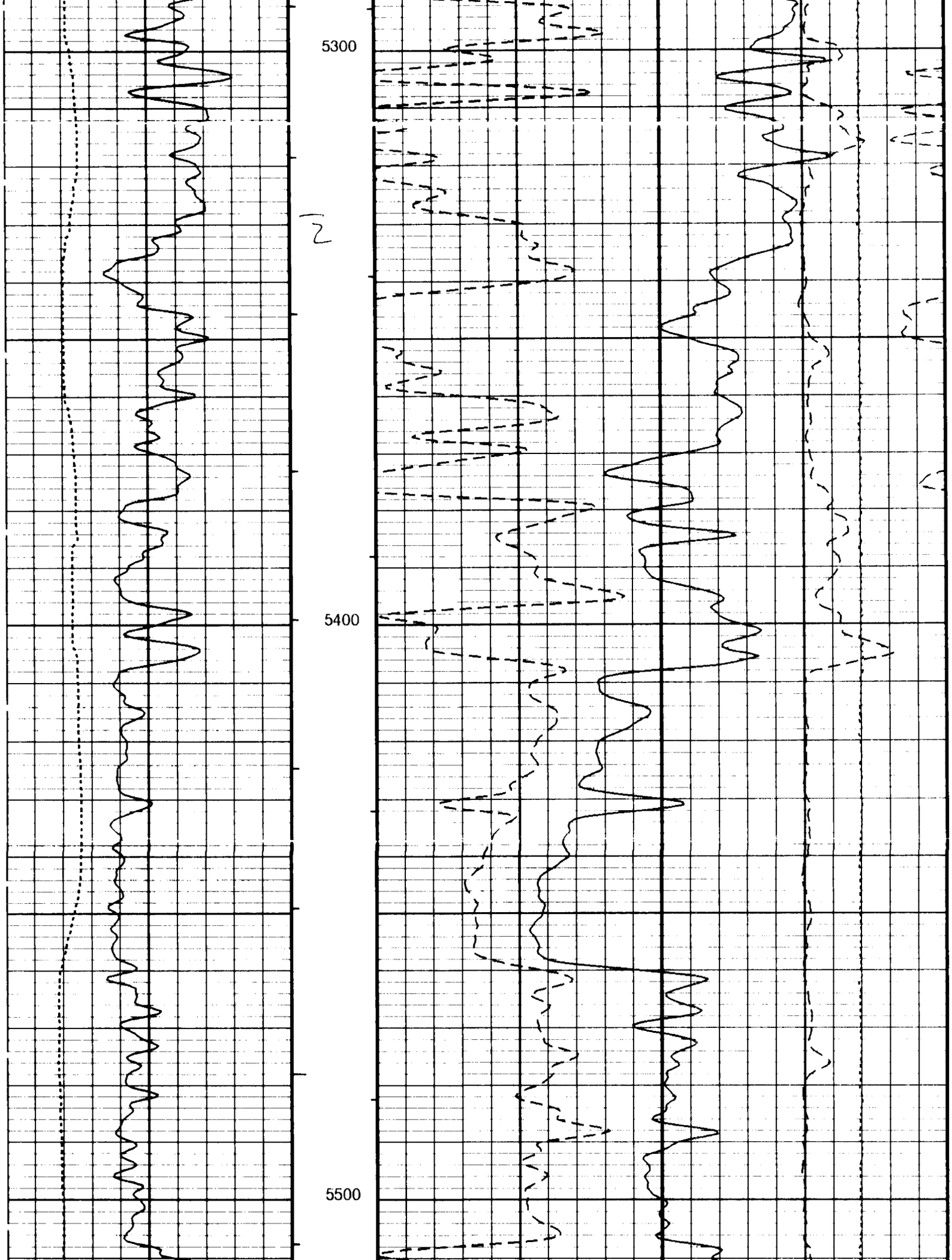

4200
13
12
4300
11
4400

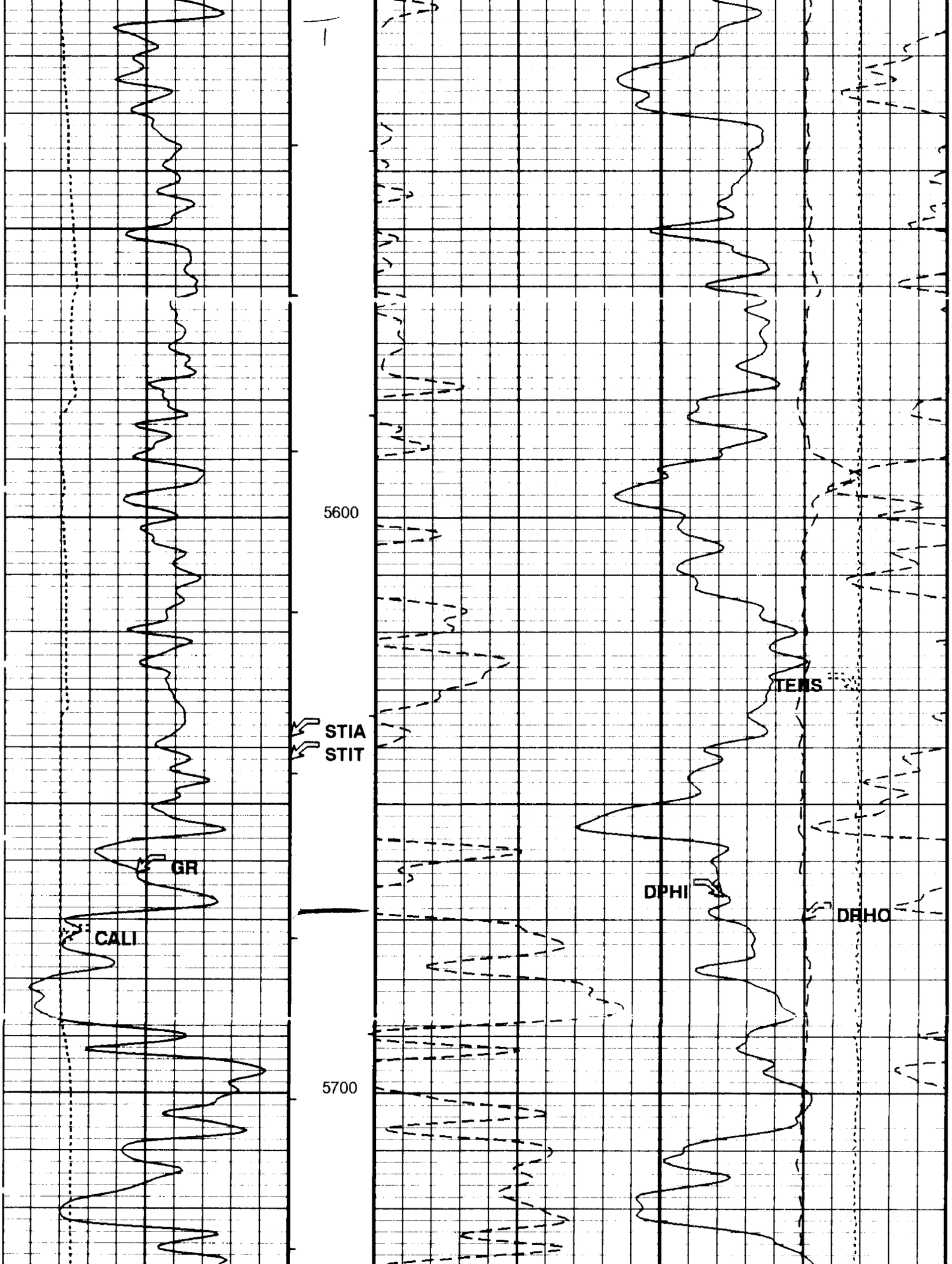

10
9
4500
4600
8

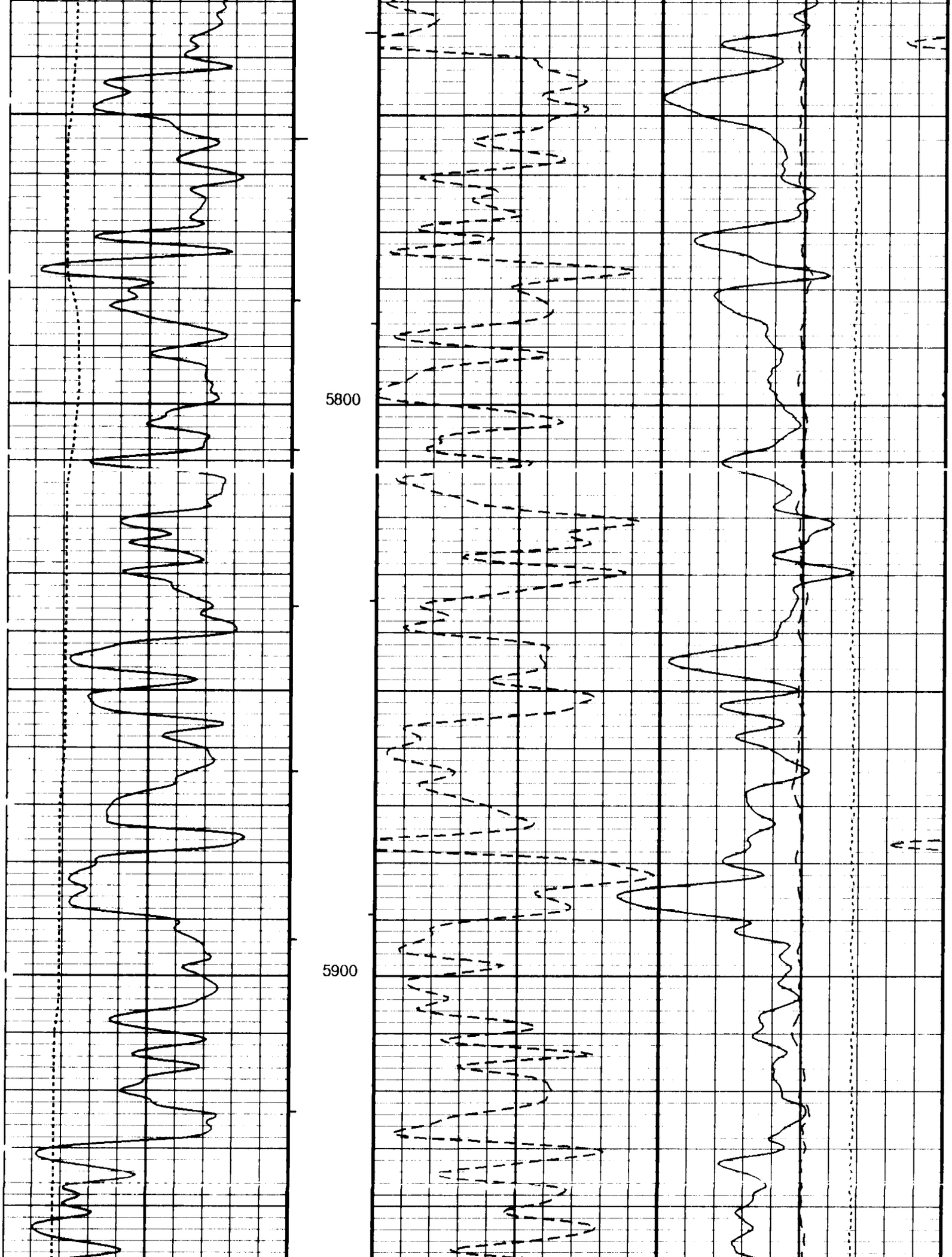

4700
7
6
4800

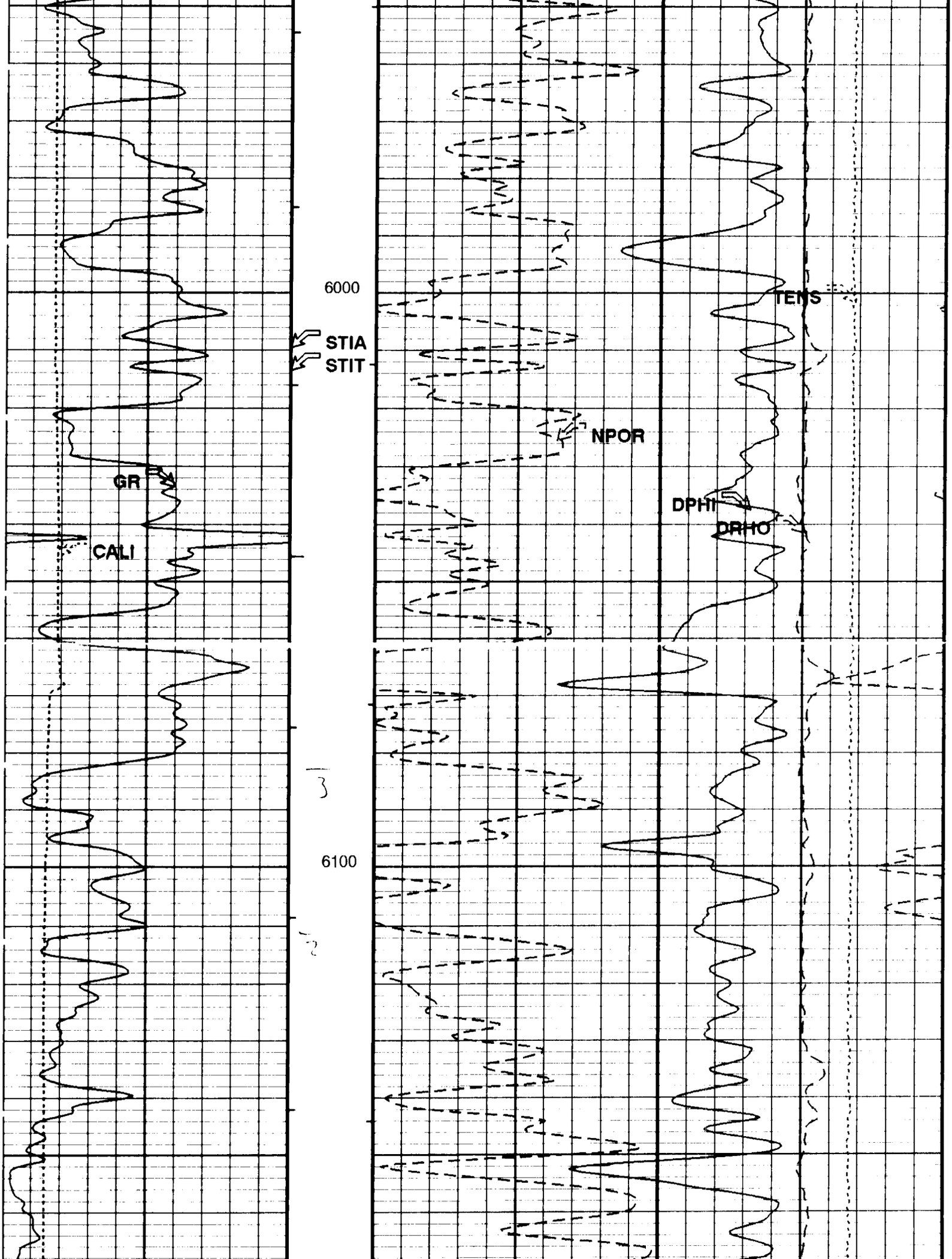

4900
5000

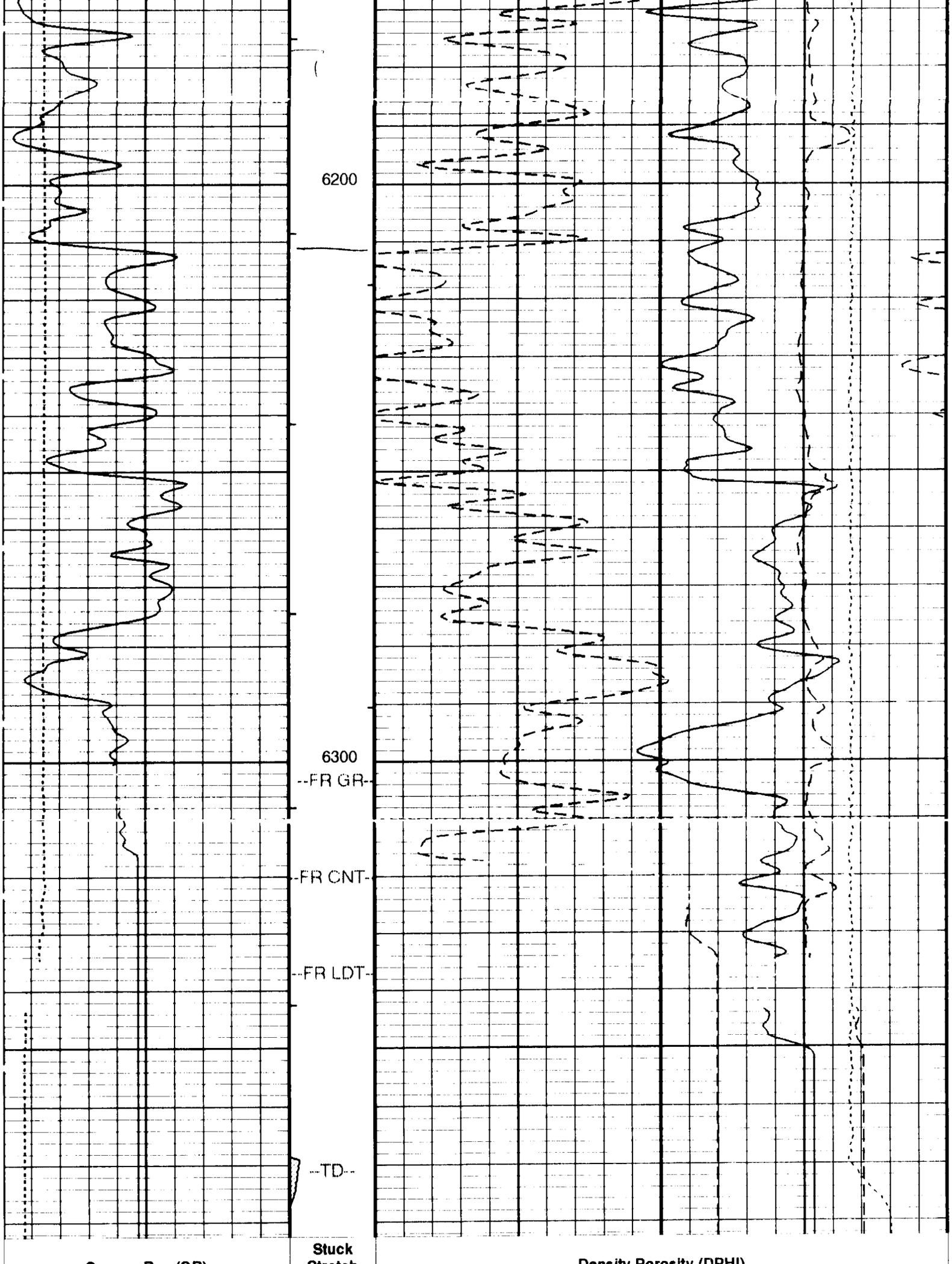

5100
5200


5300
5400
5500


5600
STIA
STIT
GR
CALI
TENS
DPHI
DRHO
5700


5800
5900


6000
STIA
STIT
GR
CALI
NPOR
TENS
DPHI
DRHO
6100


6200
6300
--FR GR--
--FR CNT--
--FR LDT--
--TD--
Stuck
Stretch
Density Porosity (DPHI)

Gamma Ray (GR)	Stretch (STIT)	Density Porosity (DPHI)
0 (GAPI) 200	0 (F) 50	0.3 (V/V) -0.1
Caliper (CALI) 6 (IN) 16	Cable Drag From STIA to STIT	Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) -0.1
	Tool/Tot. Drag From D3T to STIA	Gas Effect From DPHI to NPOR

MAIN PASS

Bulk Density Correction (DRHO) 0.25 (G/C3) 0.25

Tension (TENS) 10000 (LBF) 0

PIP SUMMARY

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BFM	Borehole Fluid Medium	LIQUID	
BHFL	Borehole Fluid Type	WATER	
BHS	Bore Hole Status	OPEN	
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	1000.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPPM	Density Porosity Processing Mode	HISP	
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix Type	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MST	Mud Sample Temperature	-50000.00	DEGF
MWCO	Mud Weight Correction Option	NO	
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
SDAT	Standoff Data Source	SOCN	
SOCN	Standoff Distance	0.5	IN
SOCO	Standoff Correction Option	NO	
STKT	STI Stuck Threshold	2.5	FT
WMUD	Mud Weight	8.3	LB/G

Format: PORO Vertical Scale: 5" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427

DBM

Output DLIS Files

DEFAULT DITE .006 FN:5 FIELD 14-JAN-1996 10:29

Input DLIS Files

DEFAULT DITE .005 FN:4 FIELD 14-JAN-1996 10:09 6385.0 FT 6033.0 FT

Output DLIS Files

DEFAULT DITE .006 FN:5 FIELD 14-JAN-1996 10:29

Integrated Hole/Cement Volume Summary

OP System Version: 7C0-427

DBM

PIP SUMMARY

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

Time Mark Every 60 S

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

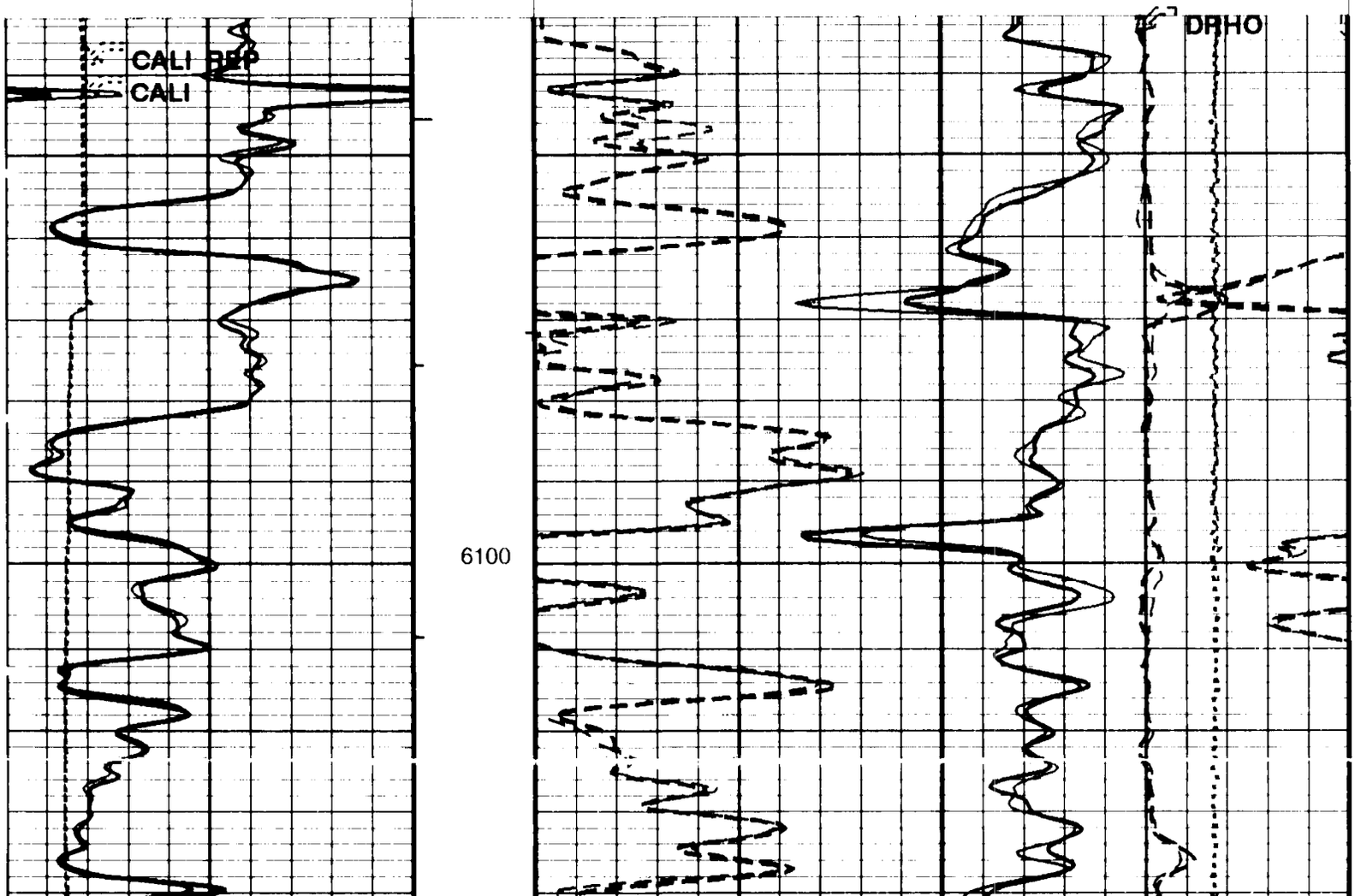
DRHO_REP Curve (DRHO_REP)
-0.25 (G/C3) 0.25

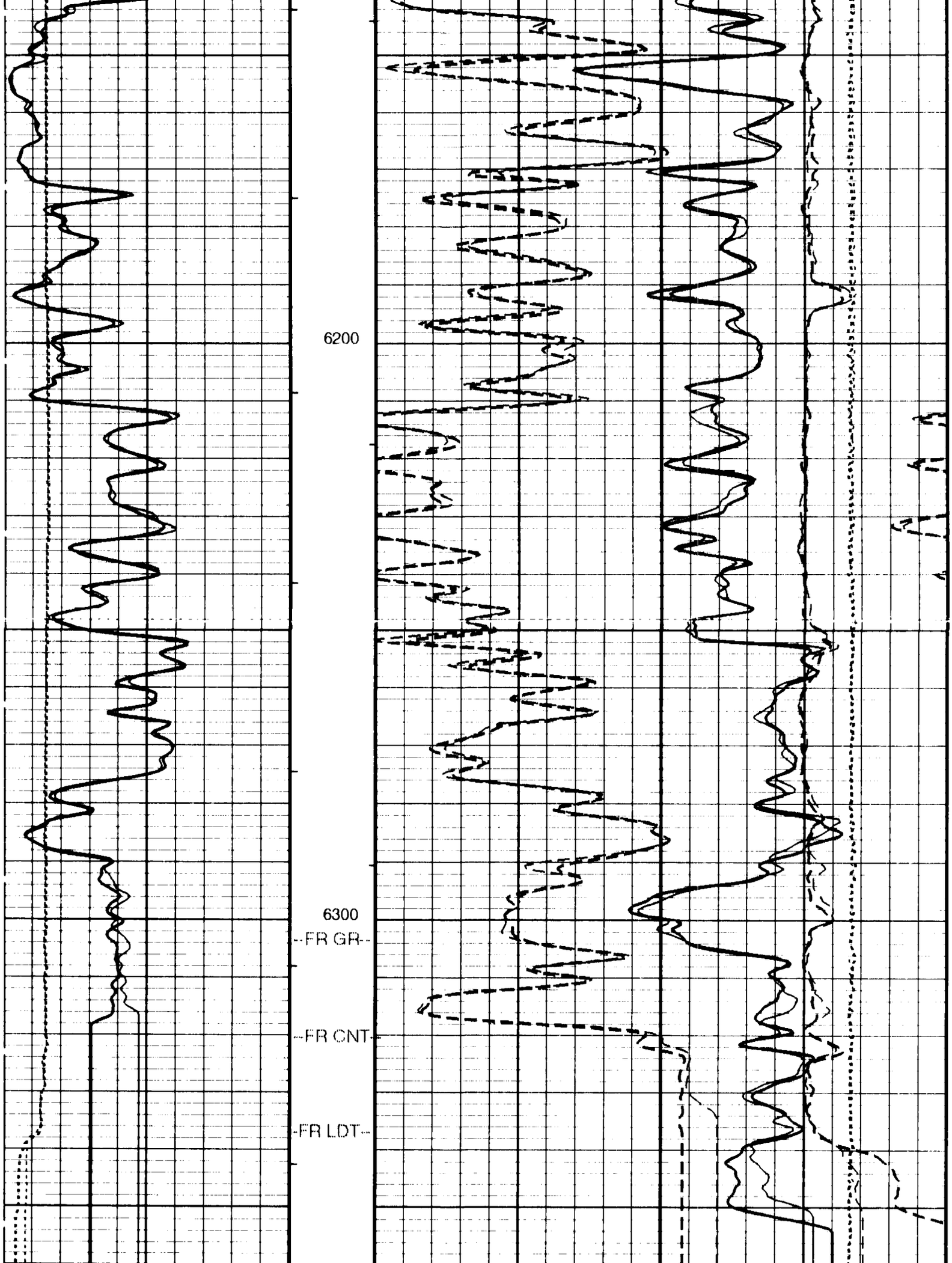
GR_REP Curve (GR_REP)
0 (GAPI) 200

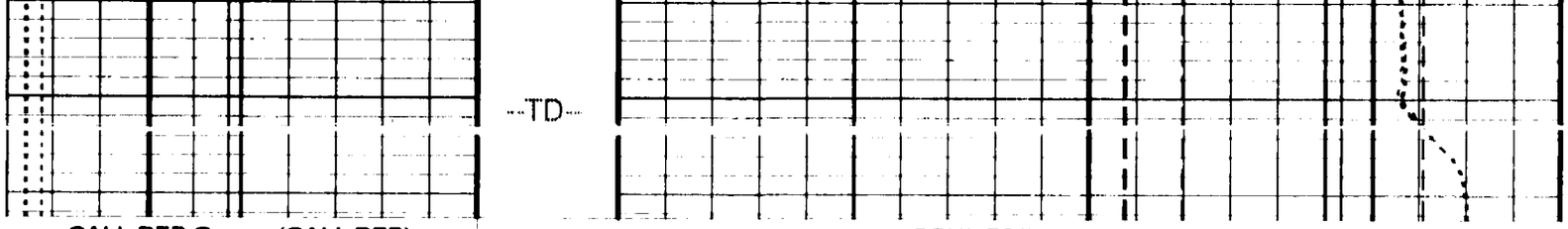
CALI_REP Curve (CALI_REP)
6 (IN) 16

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

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




6200
6300
FR GR
FR CNT
FR LDT



CALI_REP Curve (CALI_REP)
6 (IN) 16

GR_REP Curve (GR_REP)
0 (GAPI) 200

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

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

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

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

REPEAT ANALYSIS

PIP SUMMARY

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BFM	Borehole Fluid Medium	LIQUID	
BHFL	Borehole Fluid Type	WATER	
BHS	Bore Hole Status	OPEN	
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	1000.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPPM	Density Porosity Processing Mode	HISP	
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	1.000000e-02	DF/F
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix Type	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MST	Mud Sample Temperature	-50000.00	DEGF
MWCO	Mud Weight Correction Option	NO	
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
SDAT	Standoff Data Source	SOCN	
SOCN	Standoff Distance	0.5	IN
SOCO	Standoff Corrrection Option	NO	
WMUD	Mud Weight	8.3	LB/G

Format: PORO_REP Vertical Scale: 5" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427

DBM

Input DLIS Files

DEFAULT	DITE .005	FN:4	FIELD	14-JAN-1996 10:09	6385.0 FT	6033.0 FT

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Output DLIS Files

DEFAULT DITE .006 FN:5 FIELD 14-JAN-1996 10:29

Integrated Hole/Cement Volume Summary

Hole Volume = 2303.75 F3

Cement Volume = 1292.92 F3 (assuming 5.50 IN casing O.D.)

Computed from 6382.5 FT to 256.0 FT using data channel(s) CALI (per GCSE parameter setting)

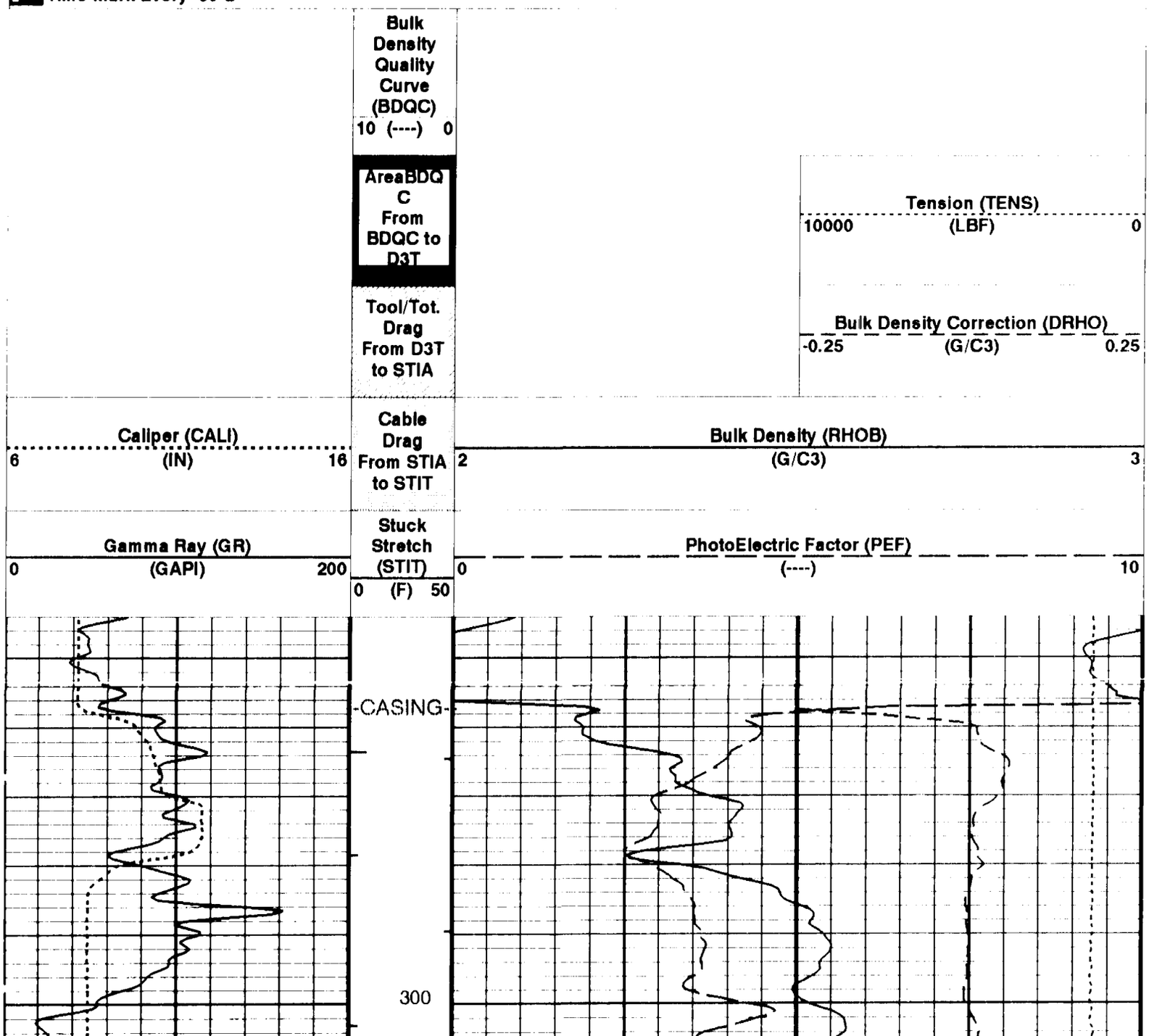
CP System Version: 7C0-427

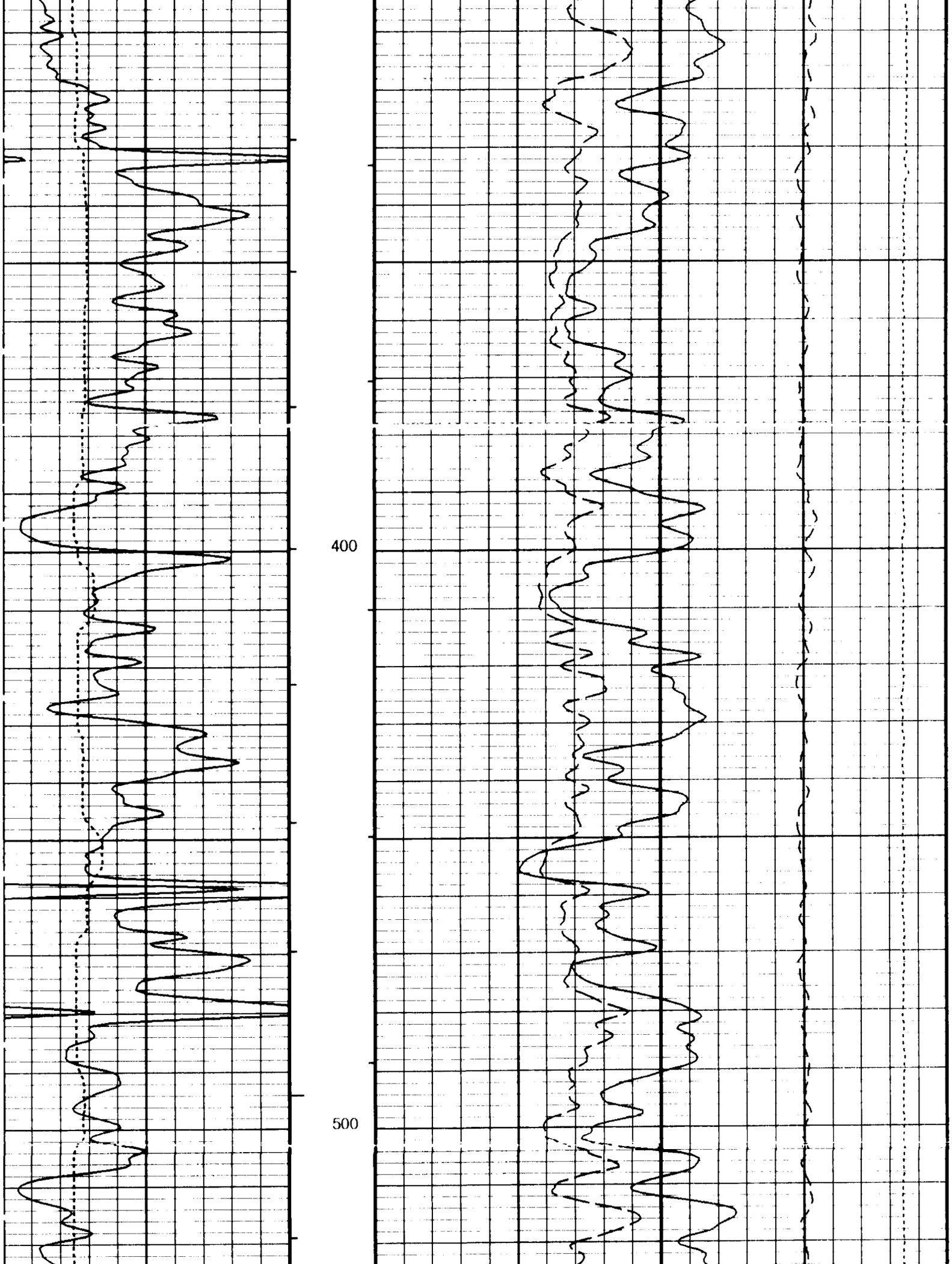
DBM

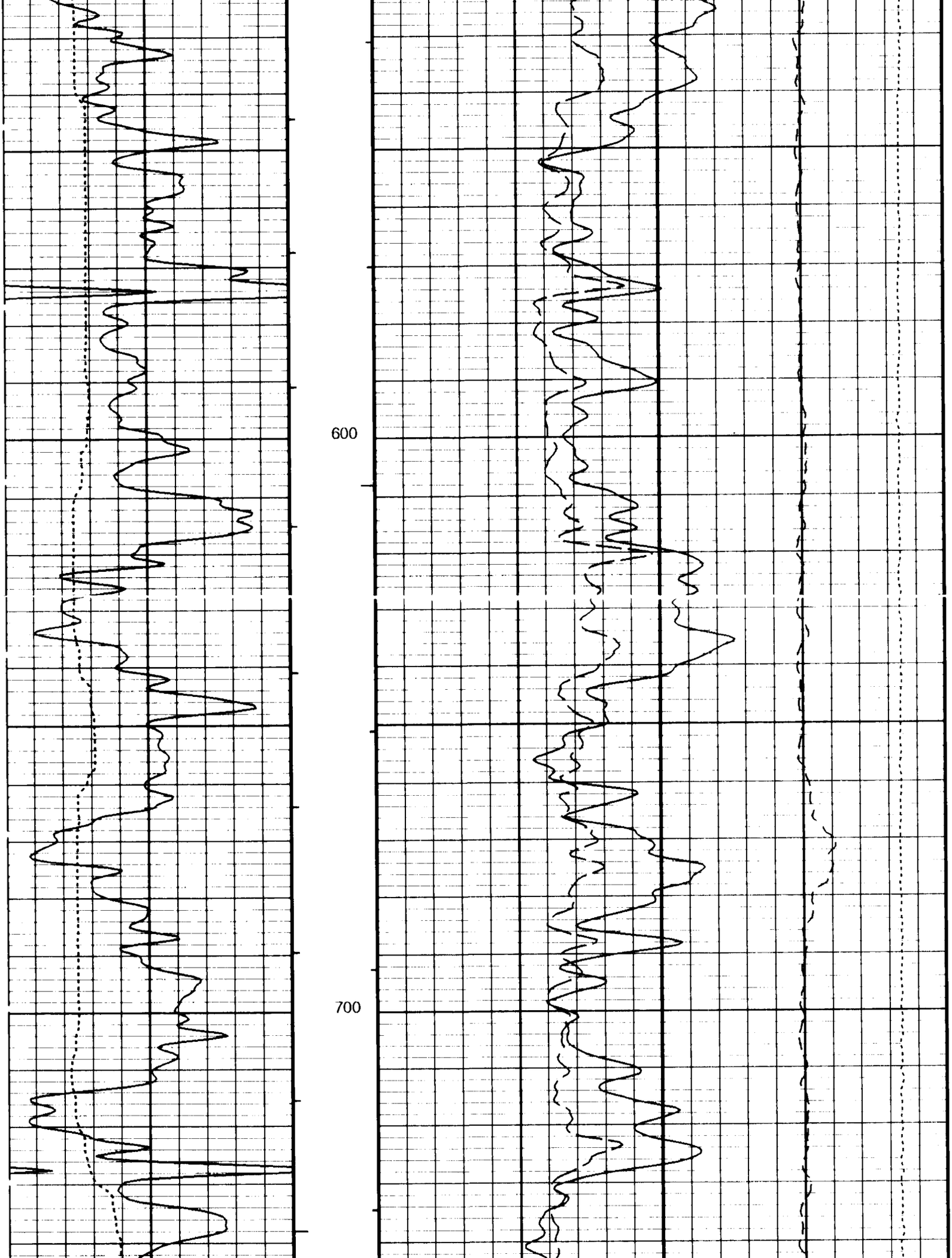
PIP SUMMARY

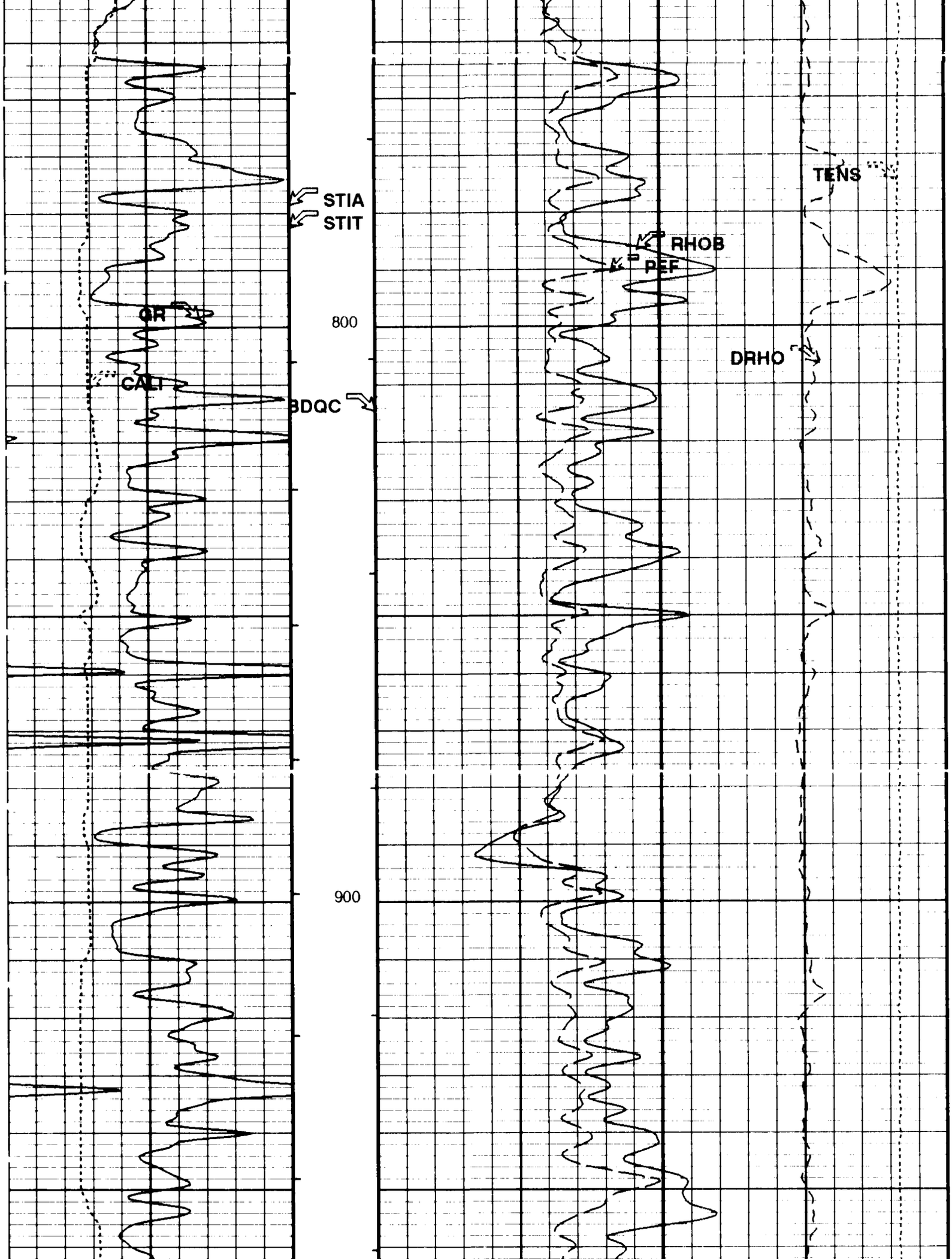
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

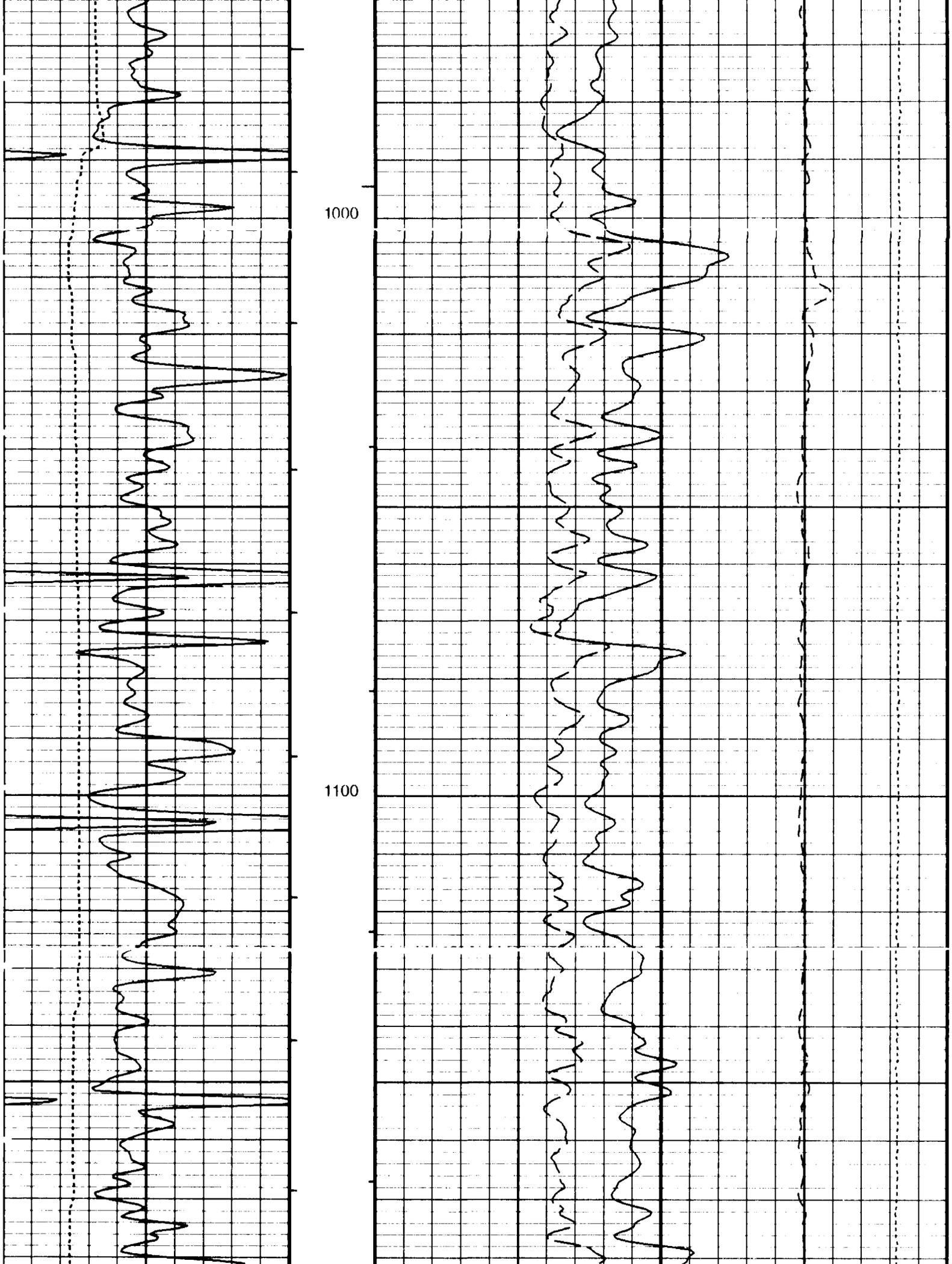
Time Mark Every 60 S

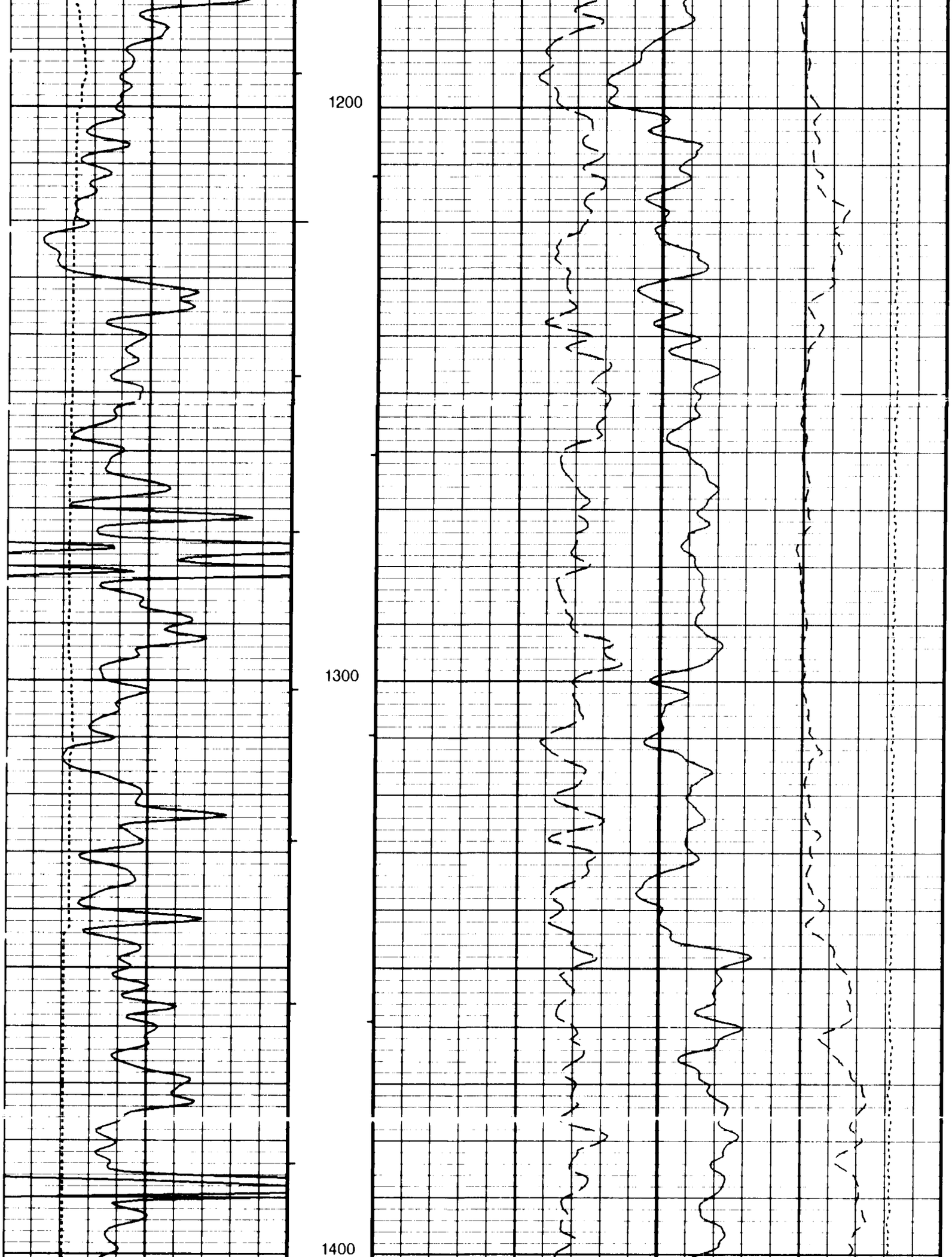


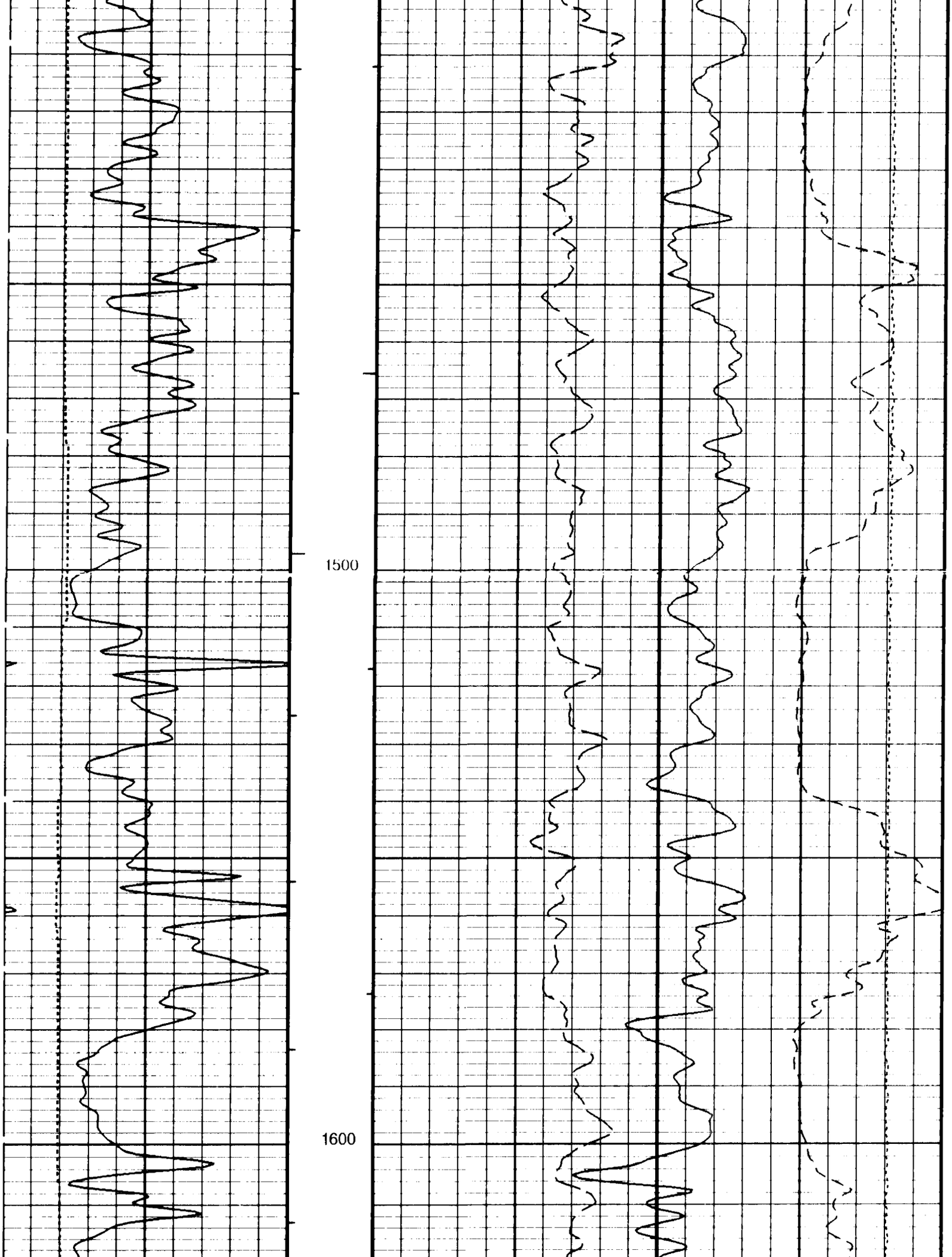

400
500

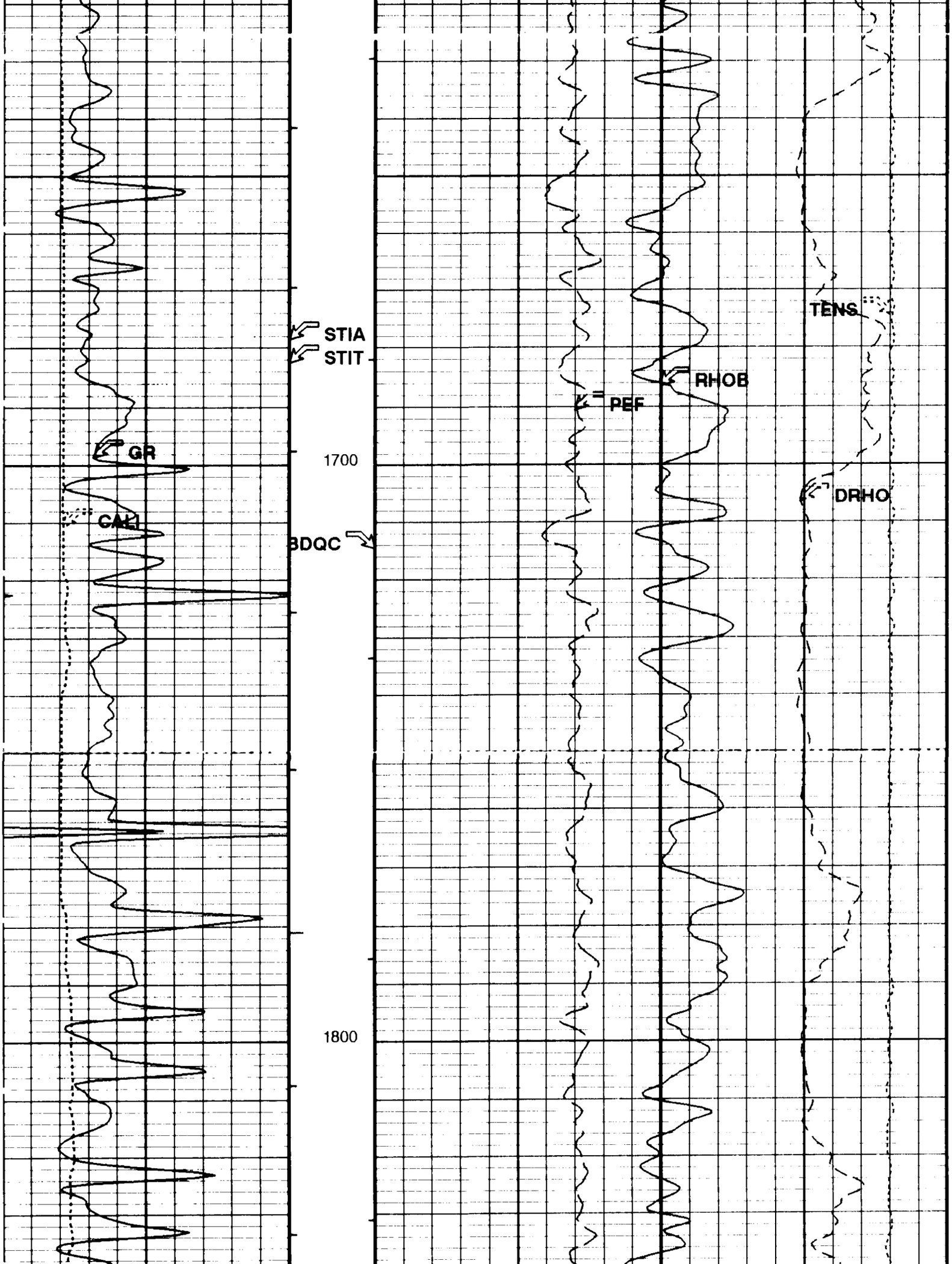

600
700

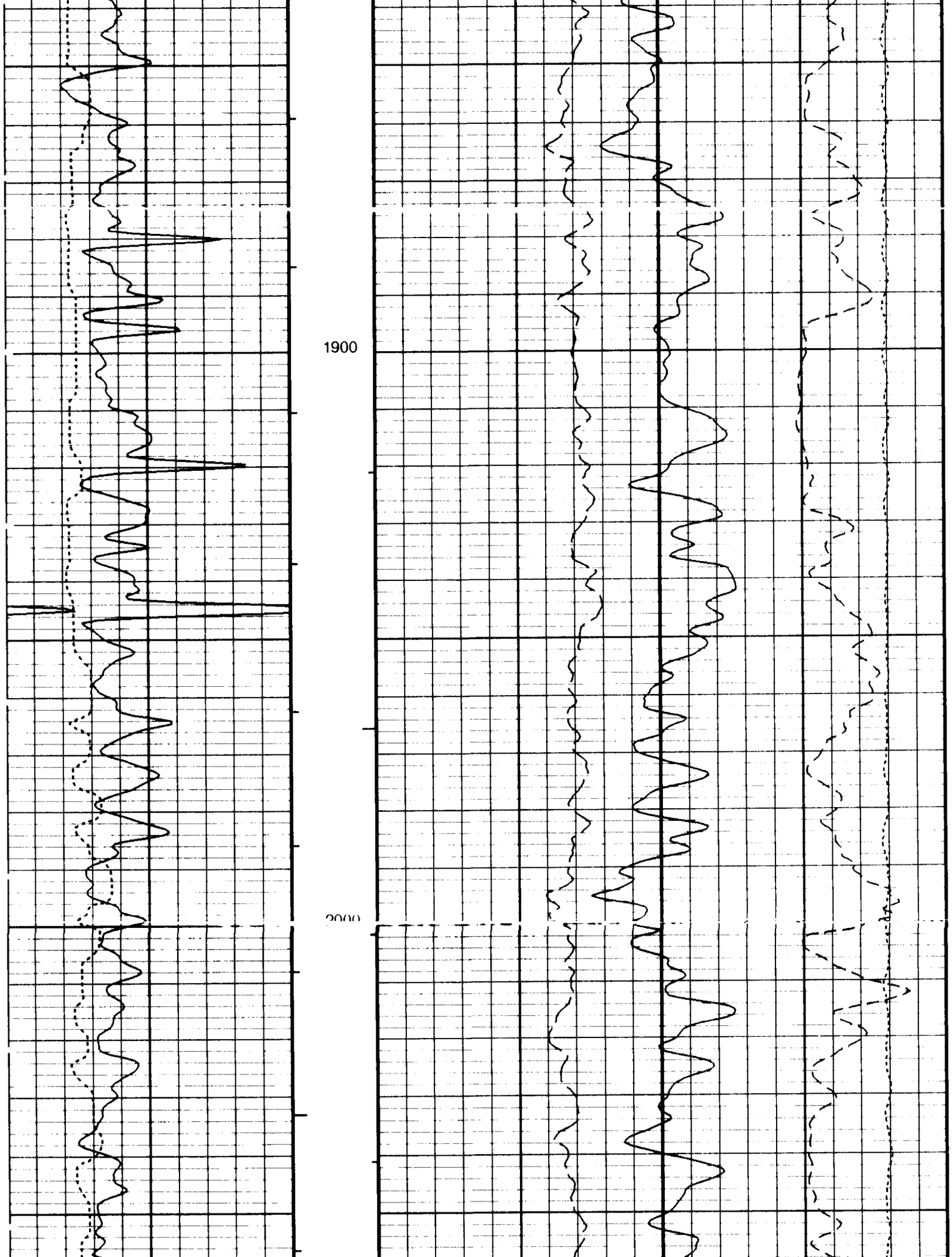

STIA
STIT
GR
CALI
BDQC
RHOB
PEF
DRHO
TENS
800
900

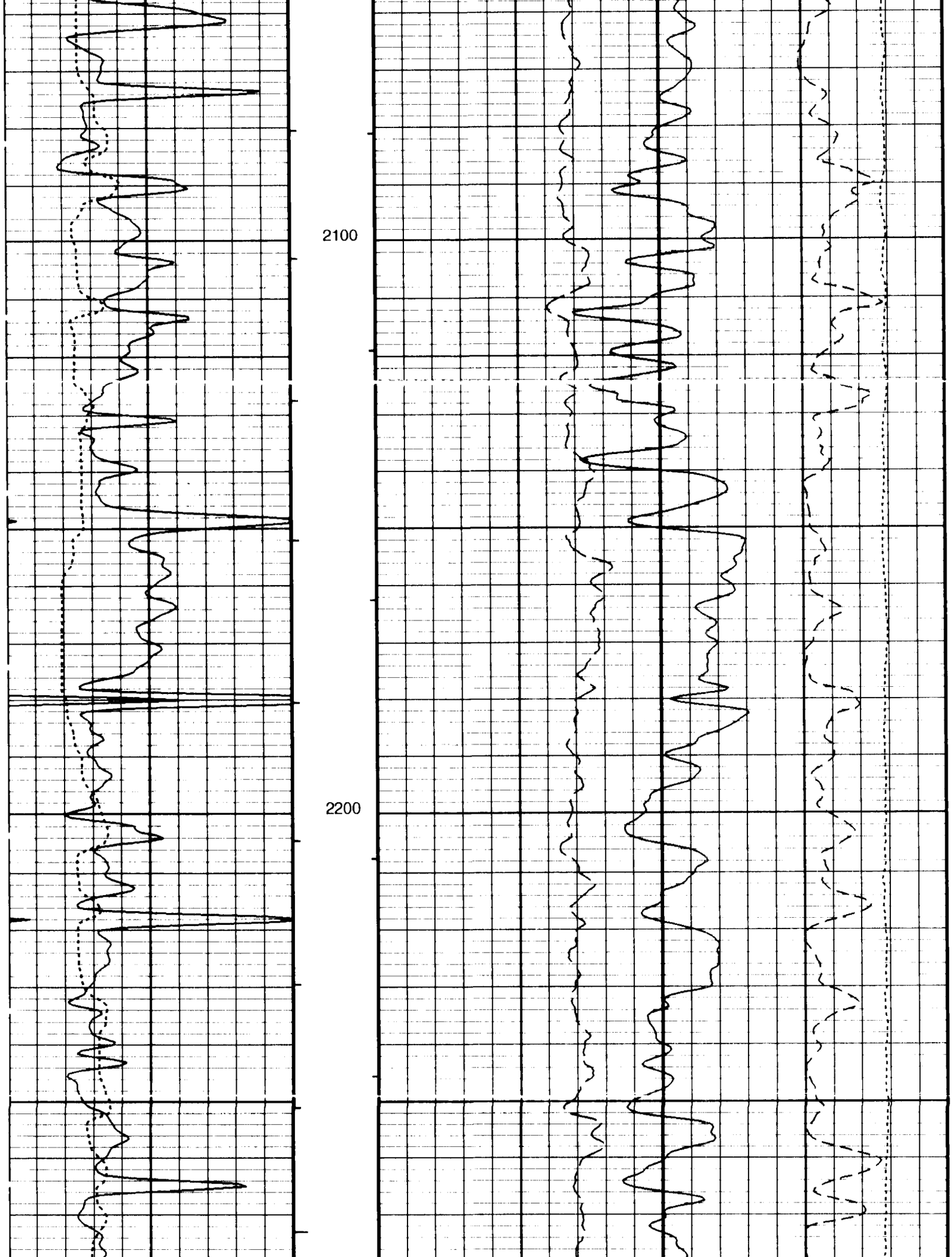

1000
1100


1200
1300
1400

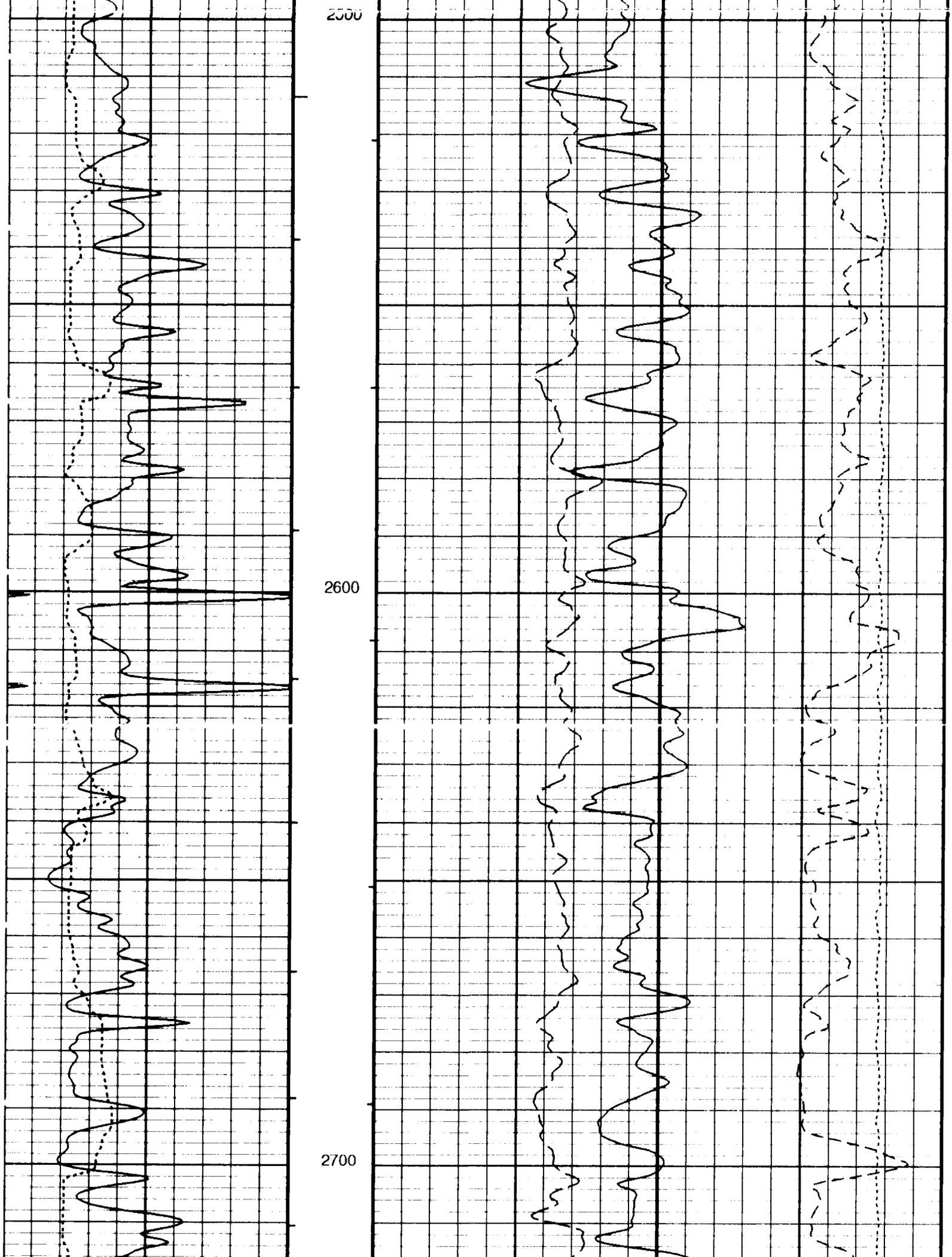

1500
1600

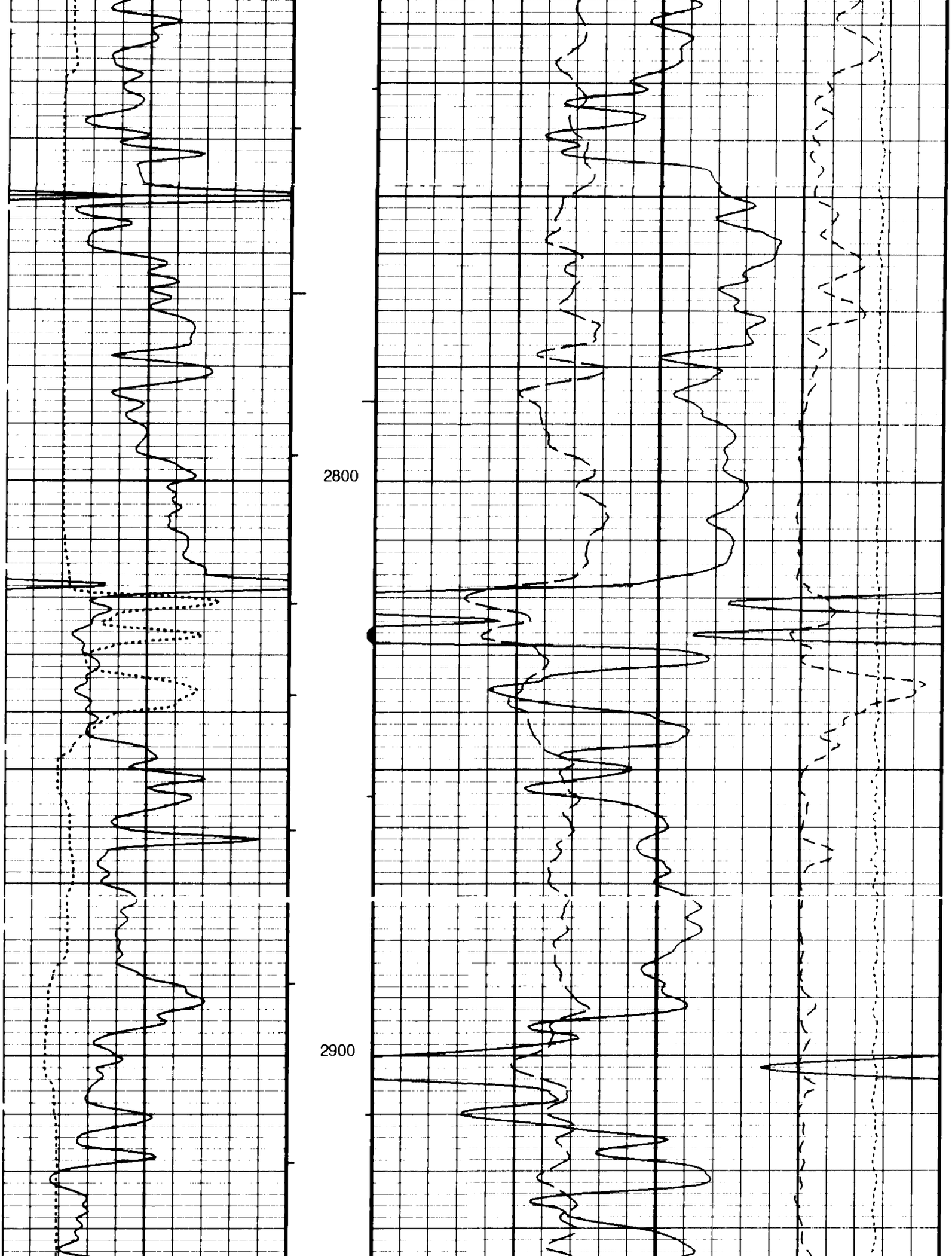

STIA
STIT
GR
CALI
BDQC
1700
1800
RHOB
PEF
TENS
DRHO

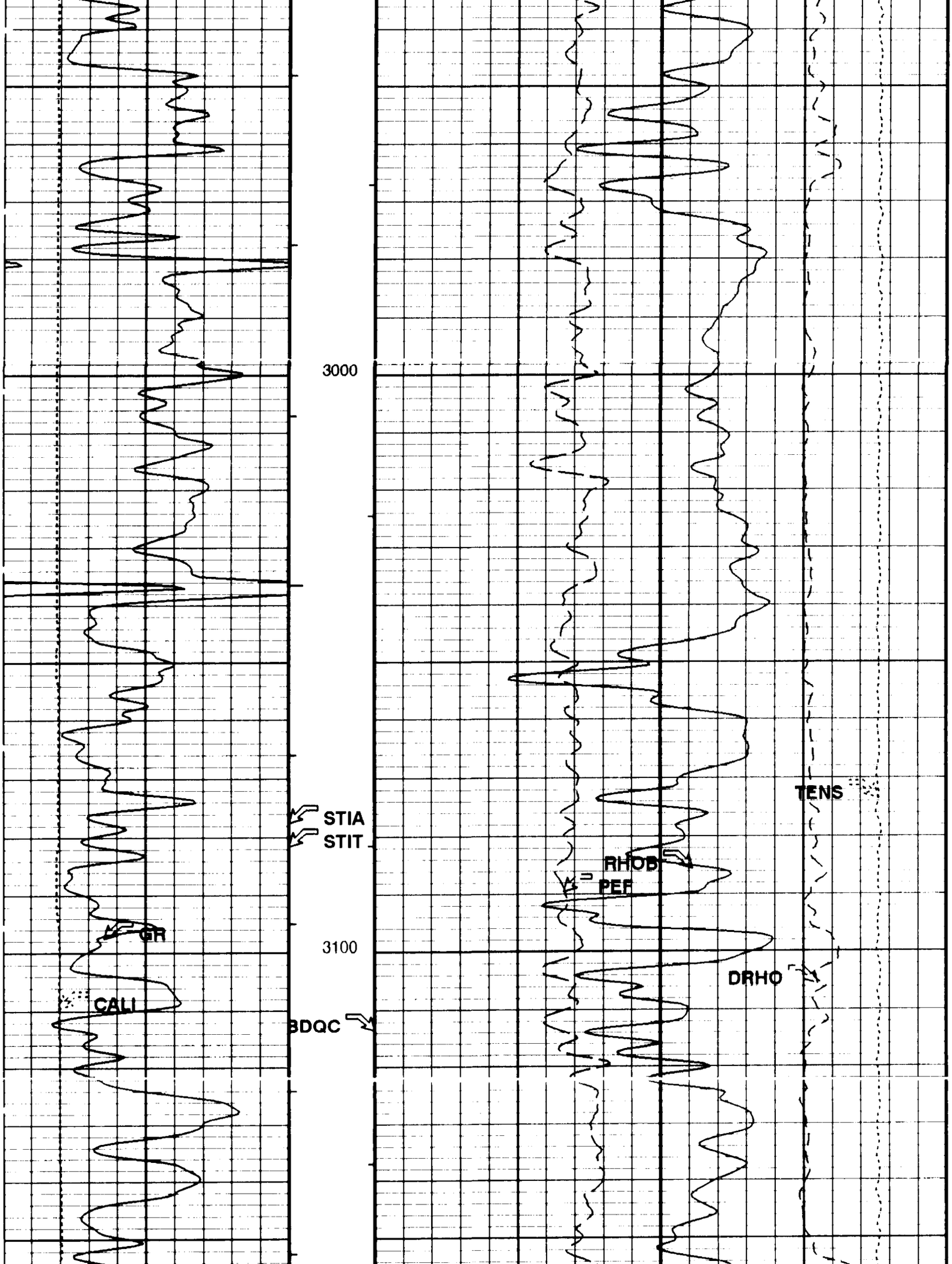

1900
2000

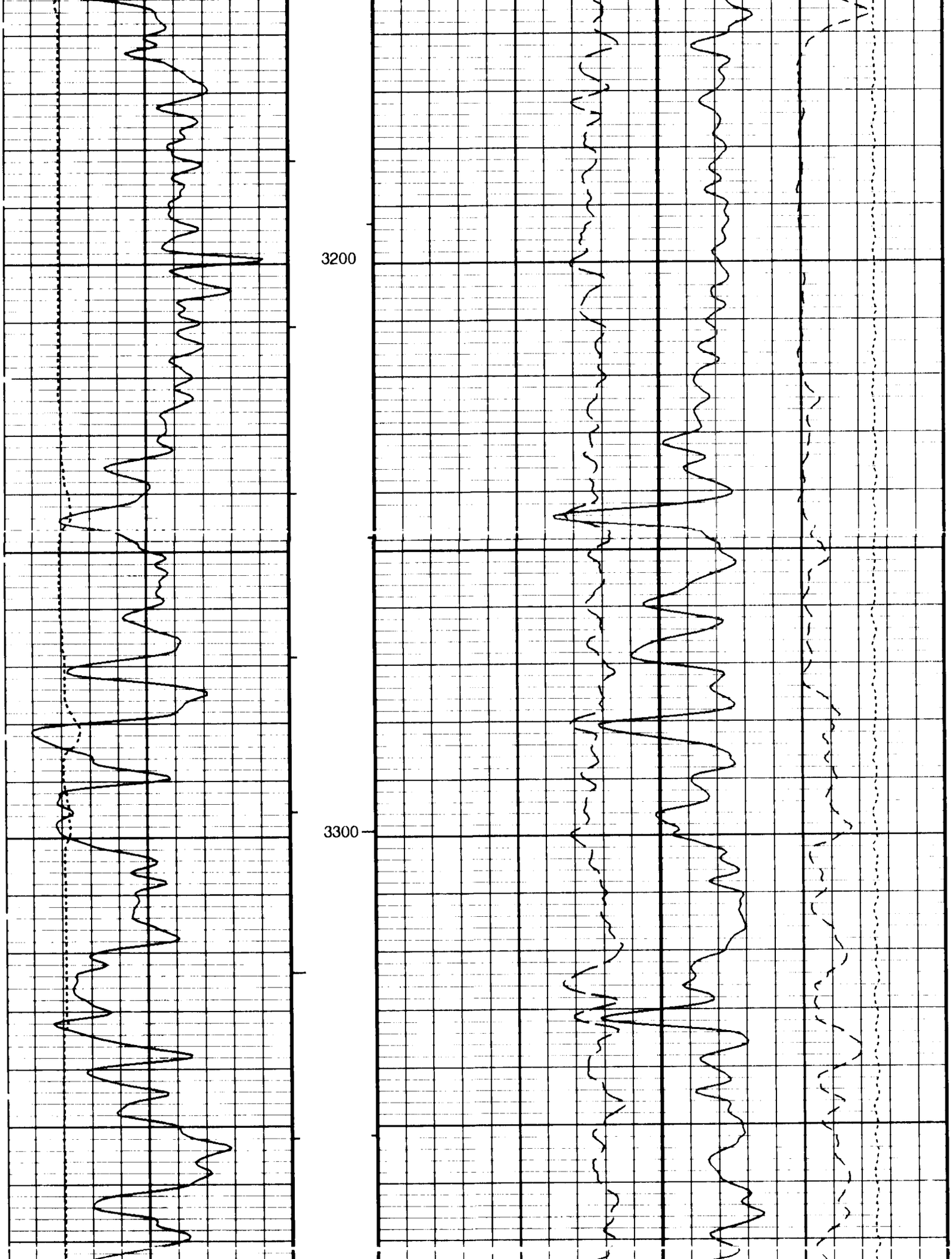

2100
2200

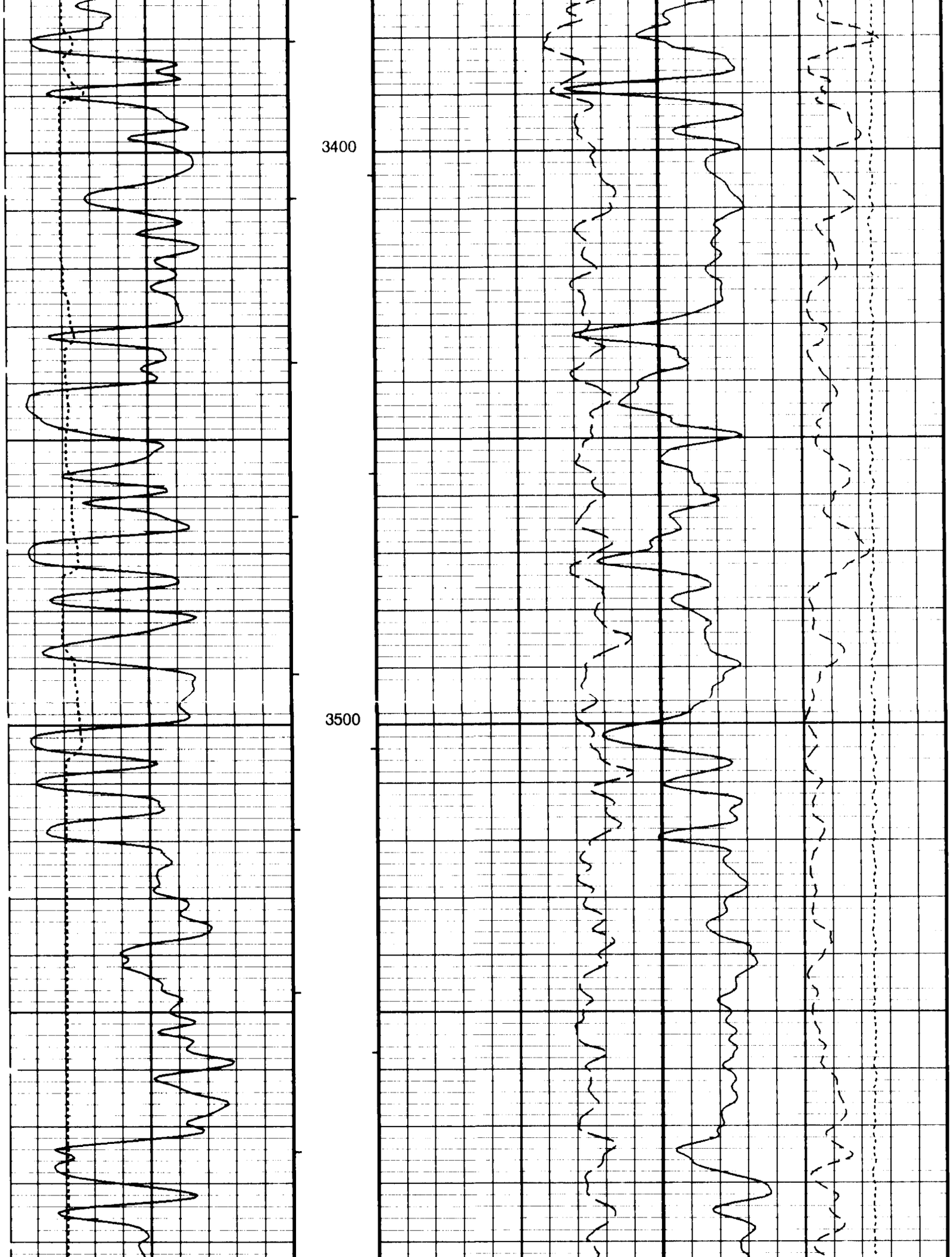
2300
2400

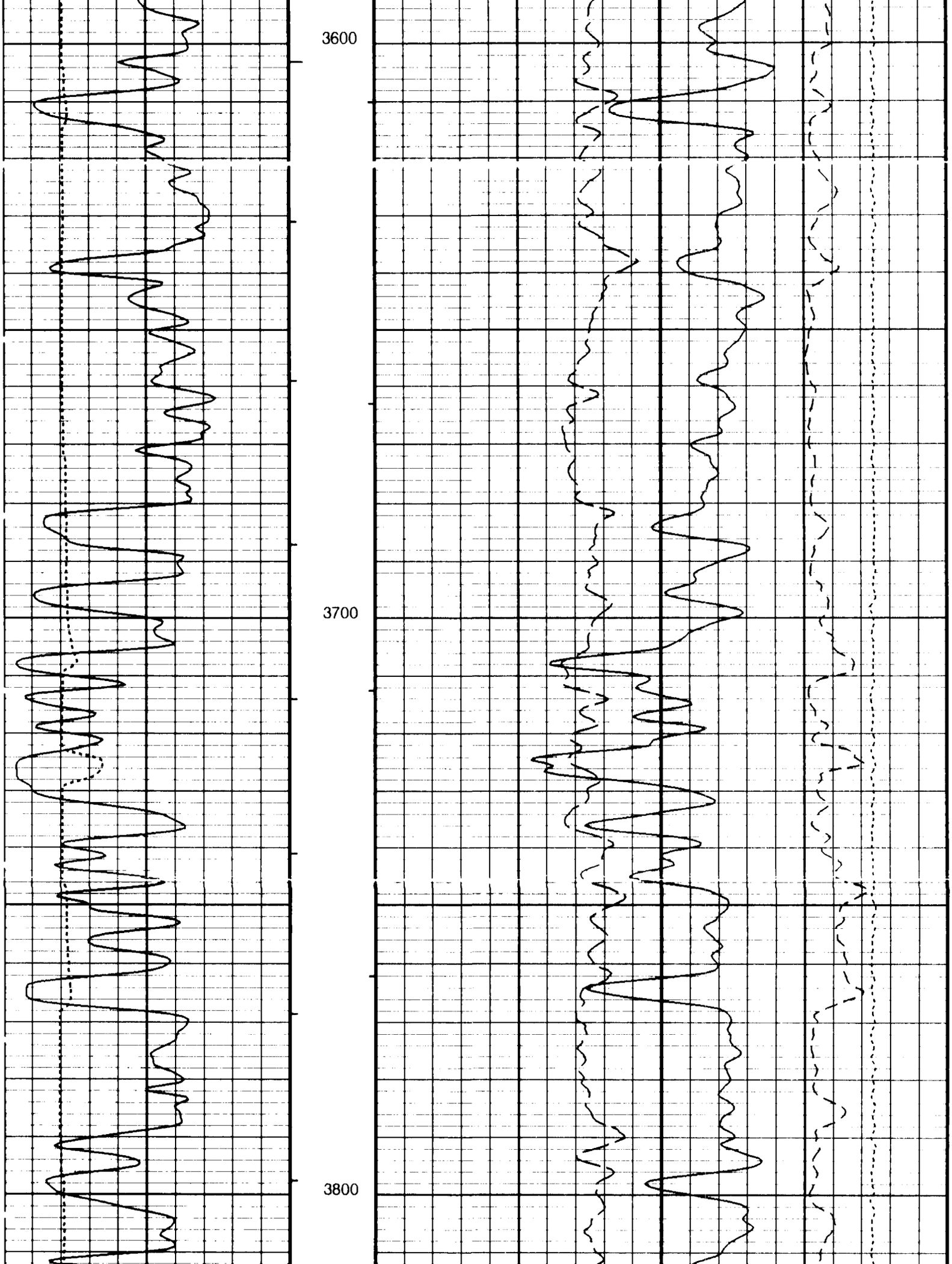

2500
2600
2700

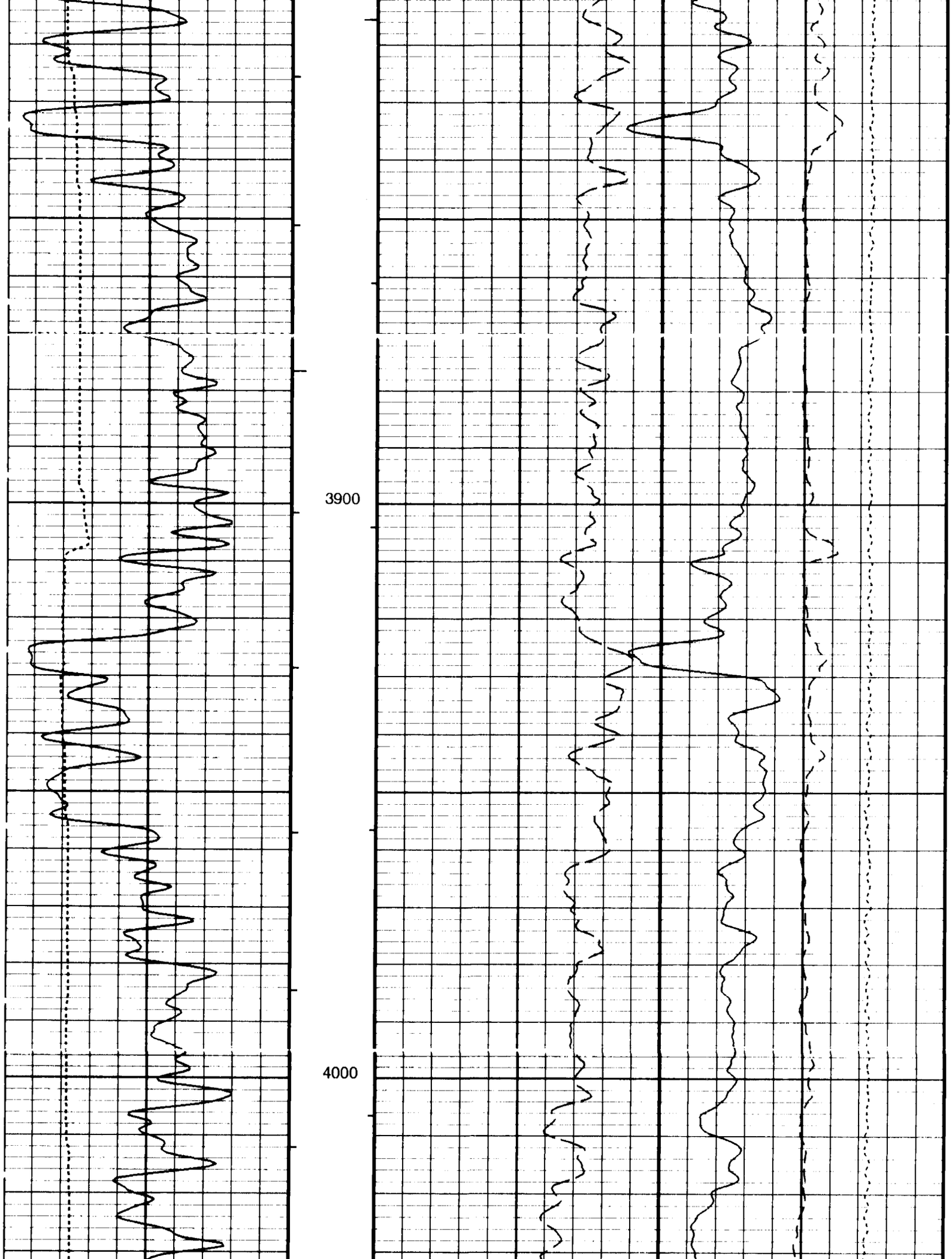

2800
2900

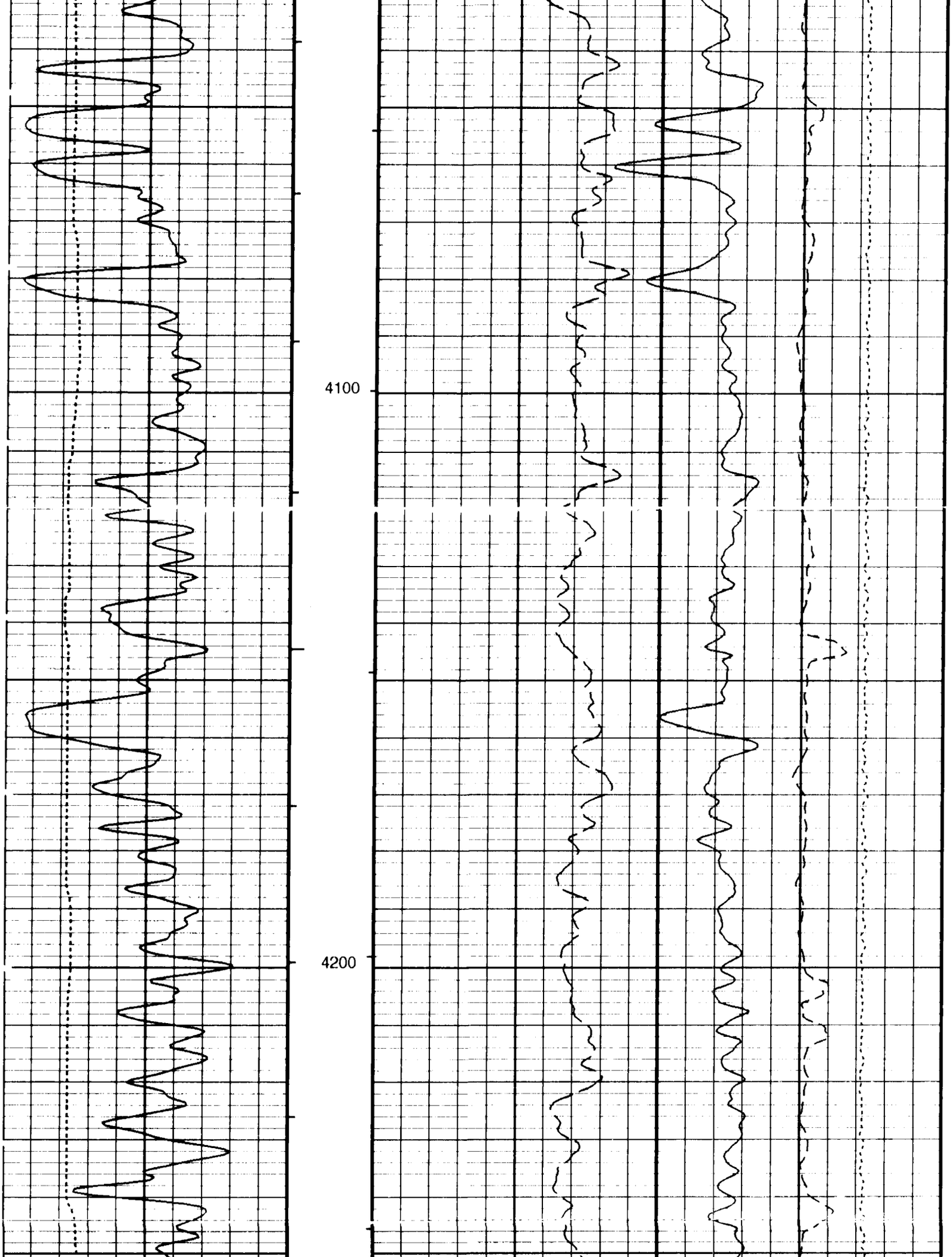

3000
STIA
STIT
GR
3100
CALI
BDQC
TENS
RHOB
PEF
DRHO

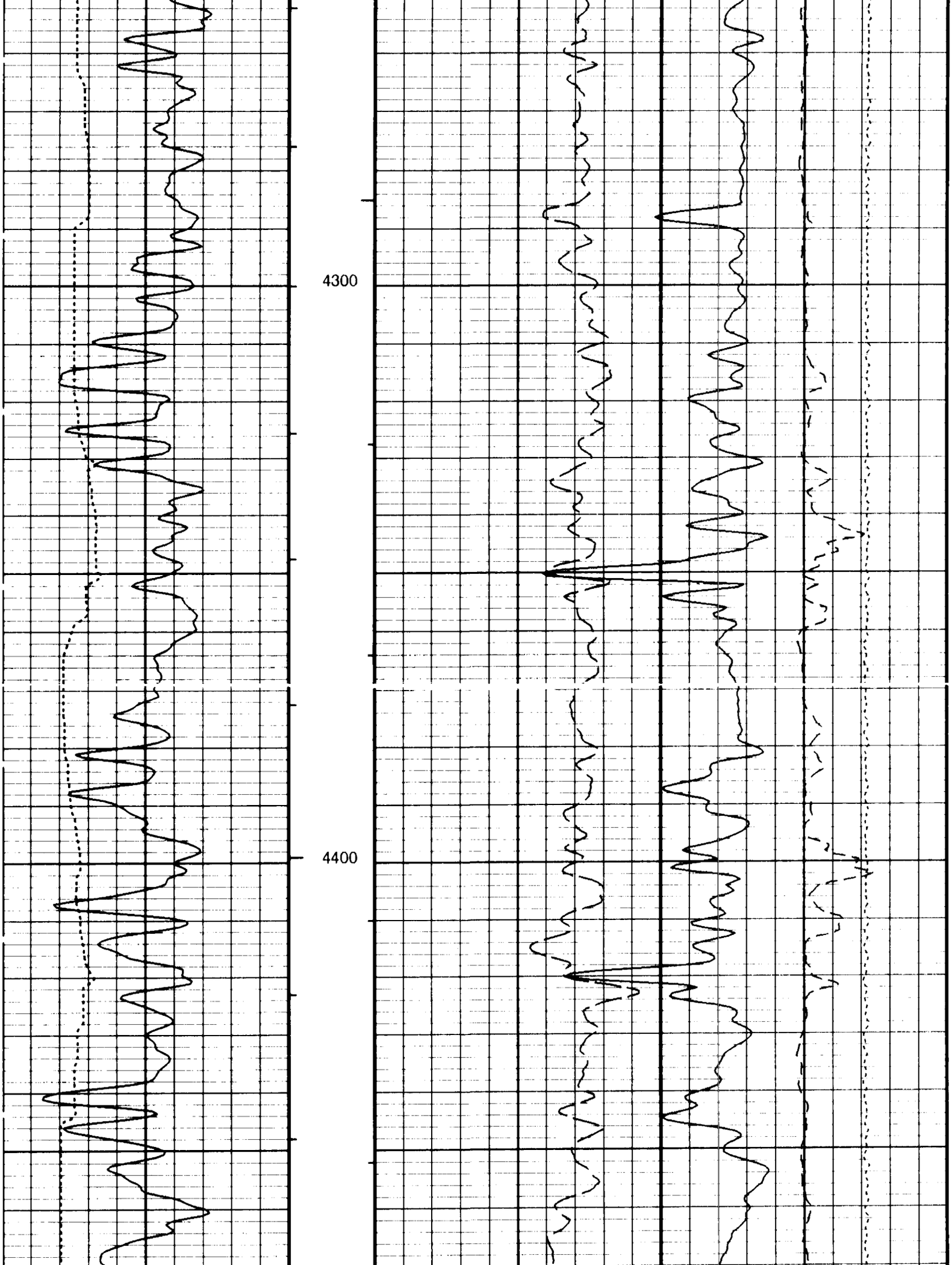

3200
3300

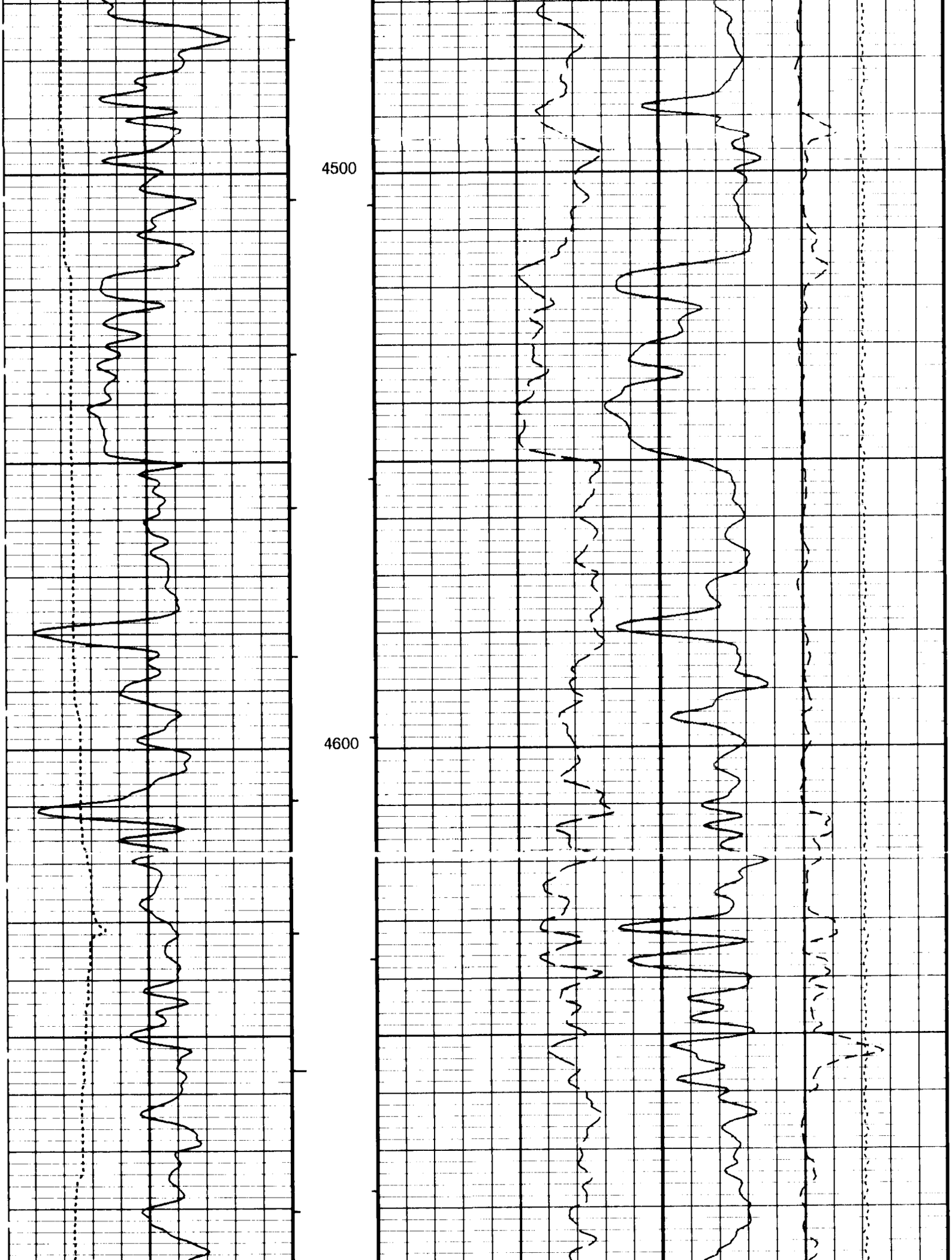

3400
3500

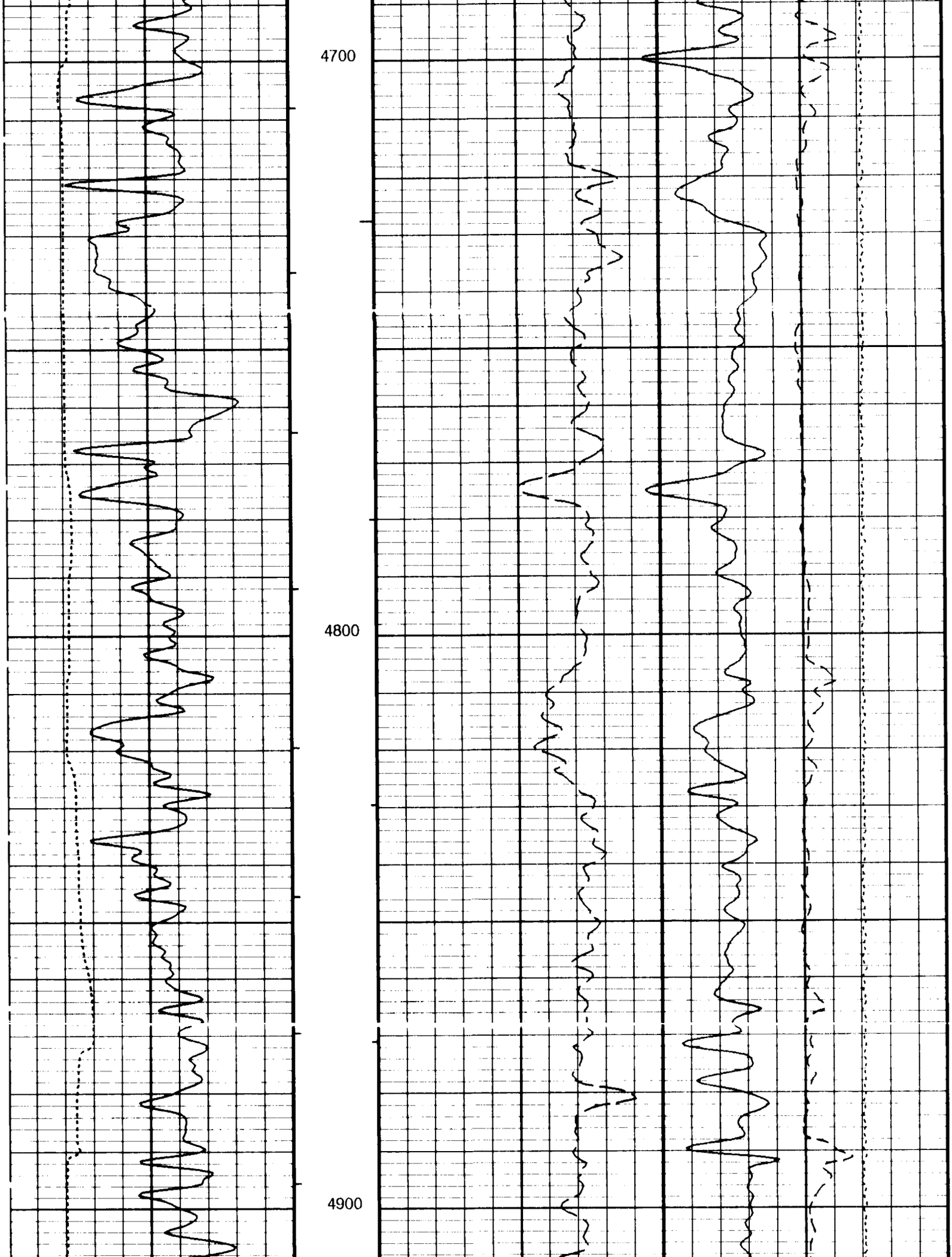

3600
3700
3800

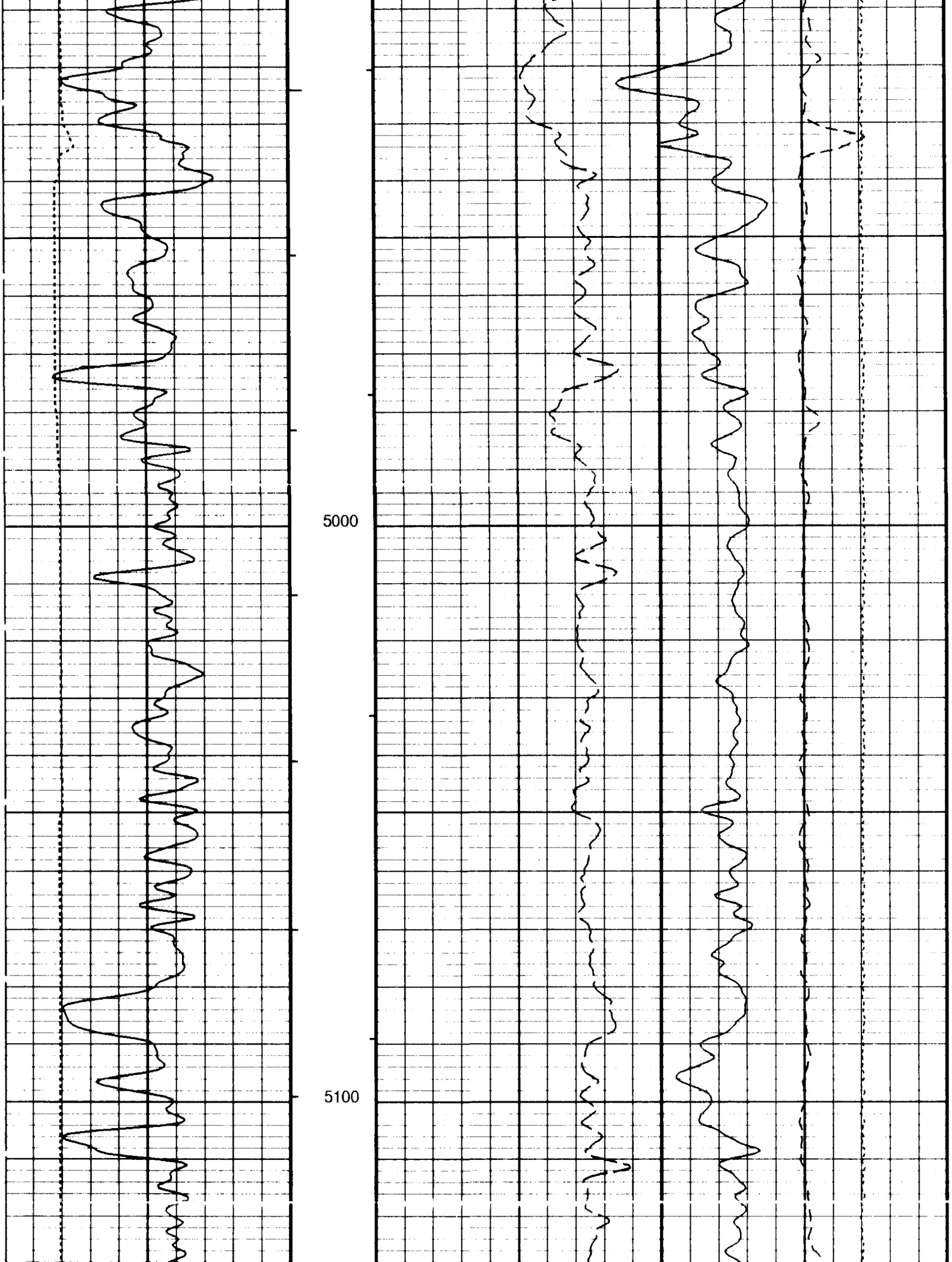

3900
4000

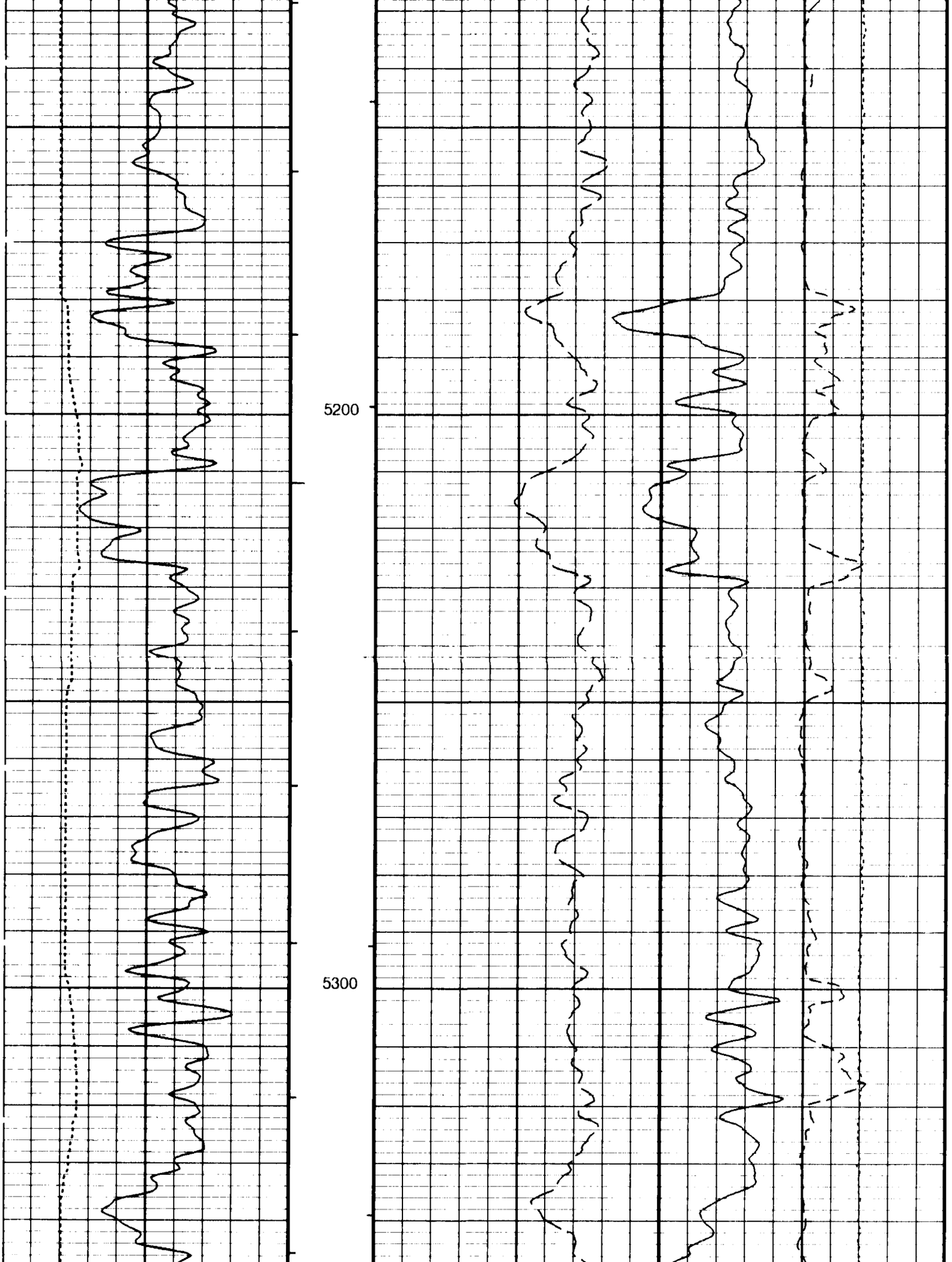

4100
4200

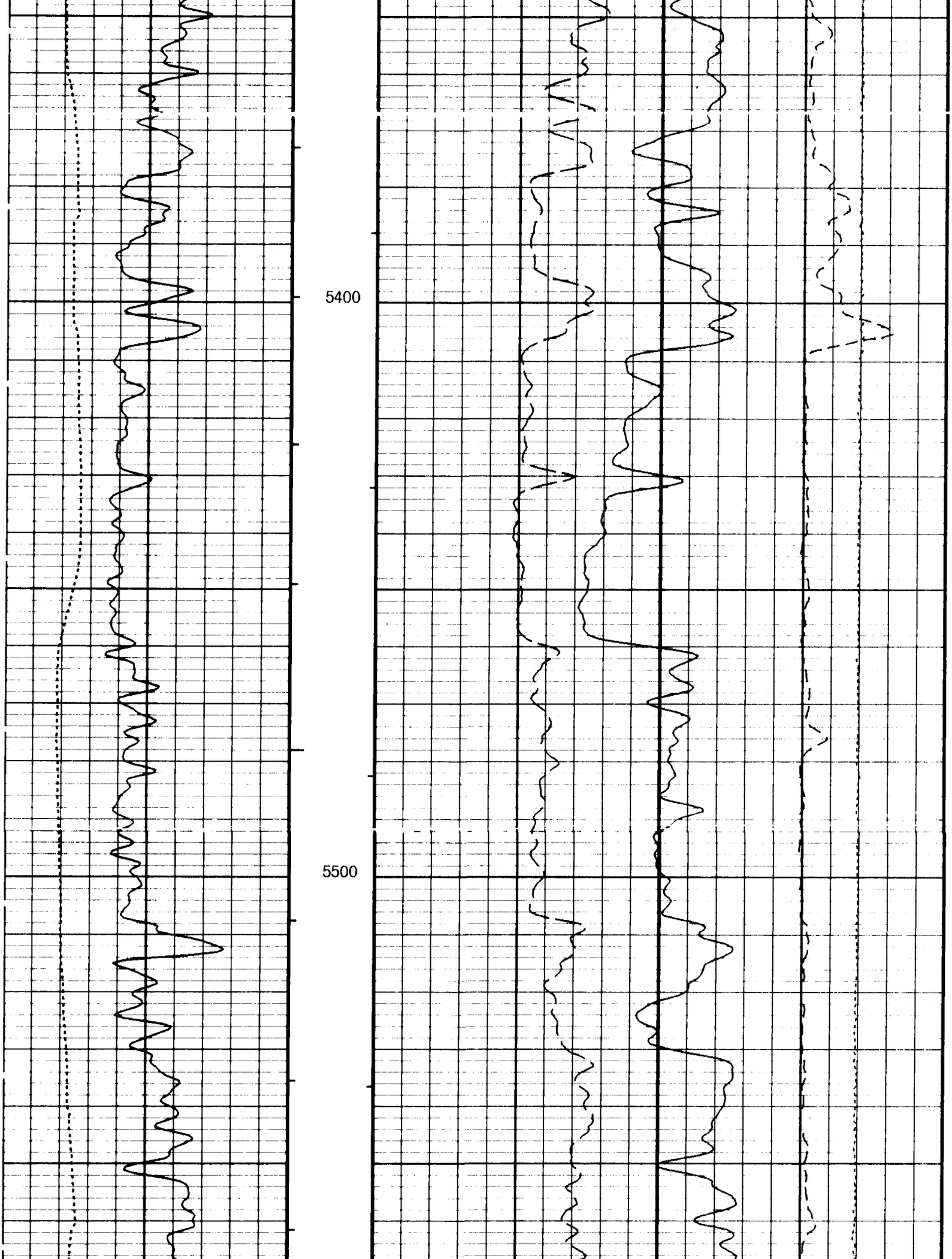

4300
4400

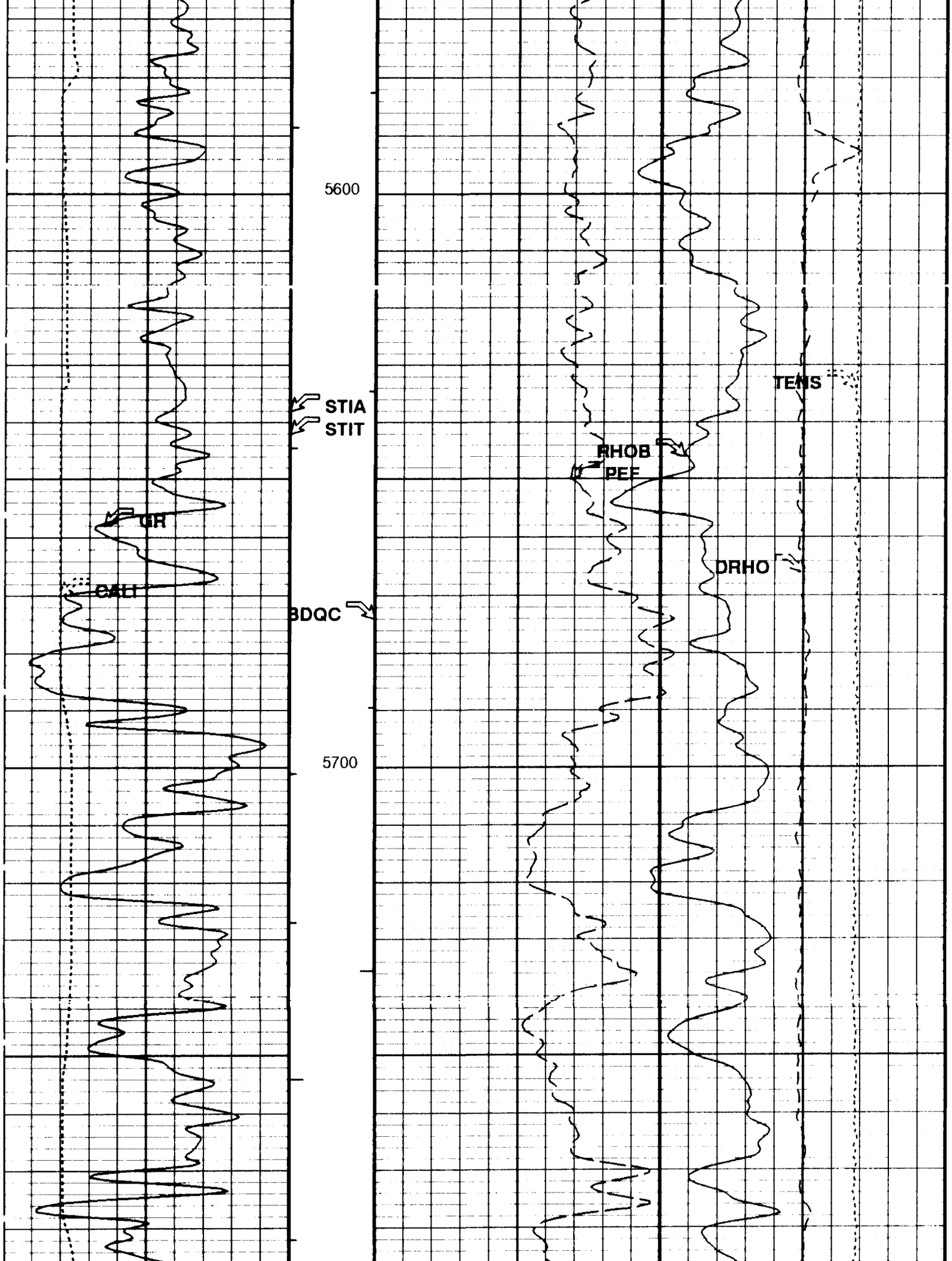

4500
4600

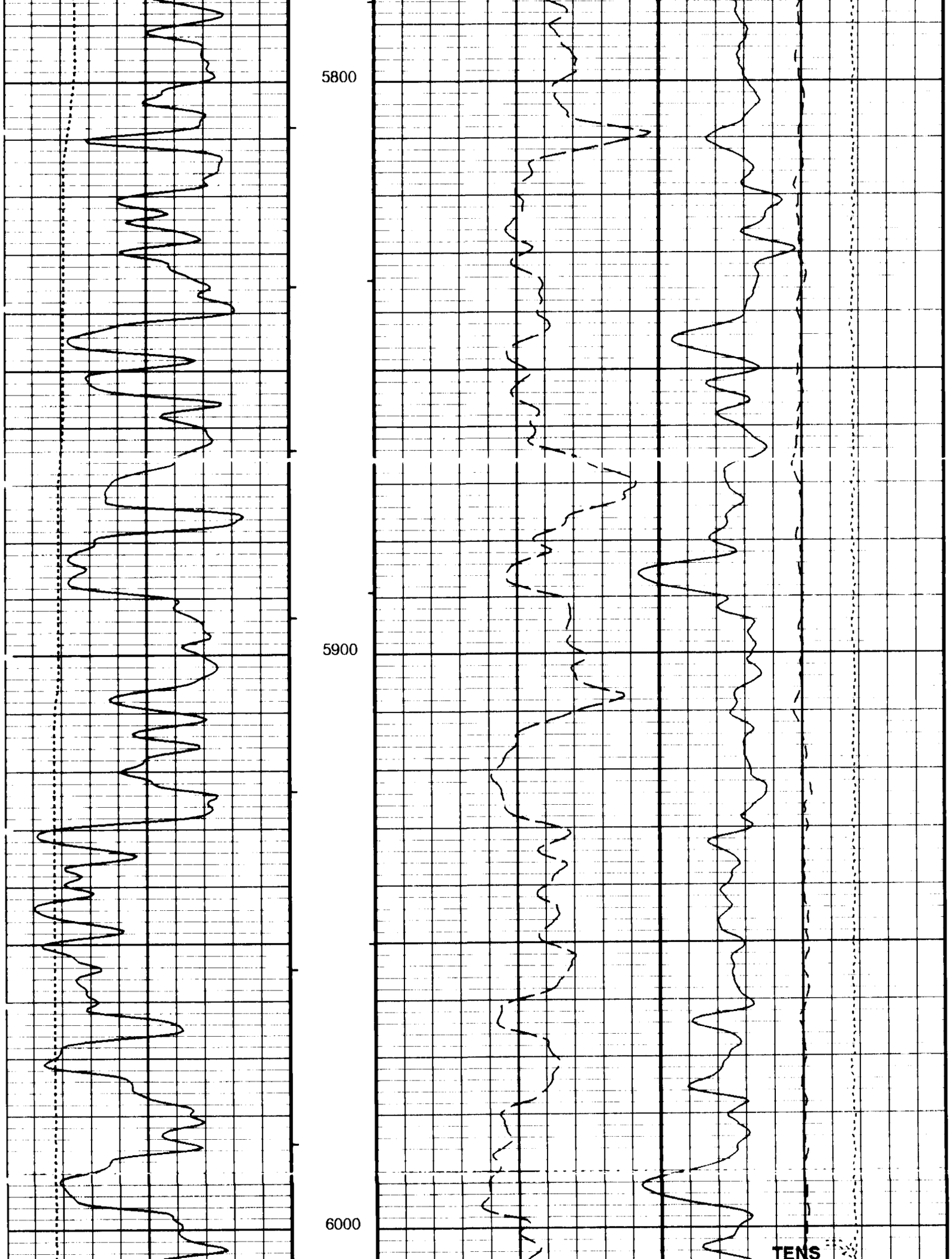

4700
4800
4900

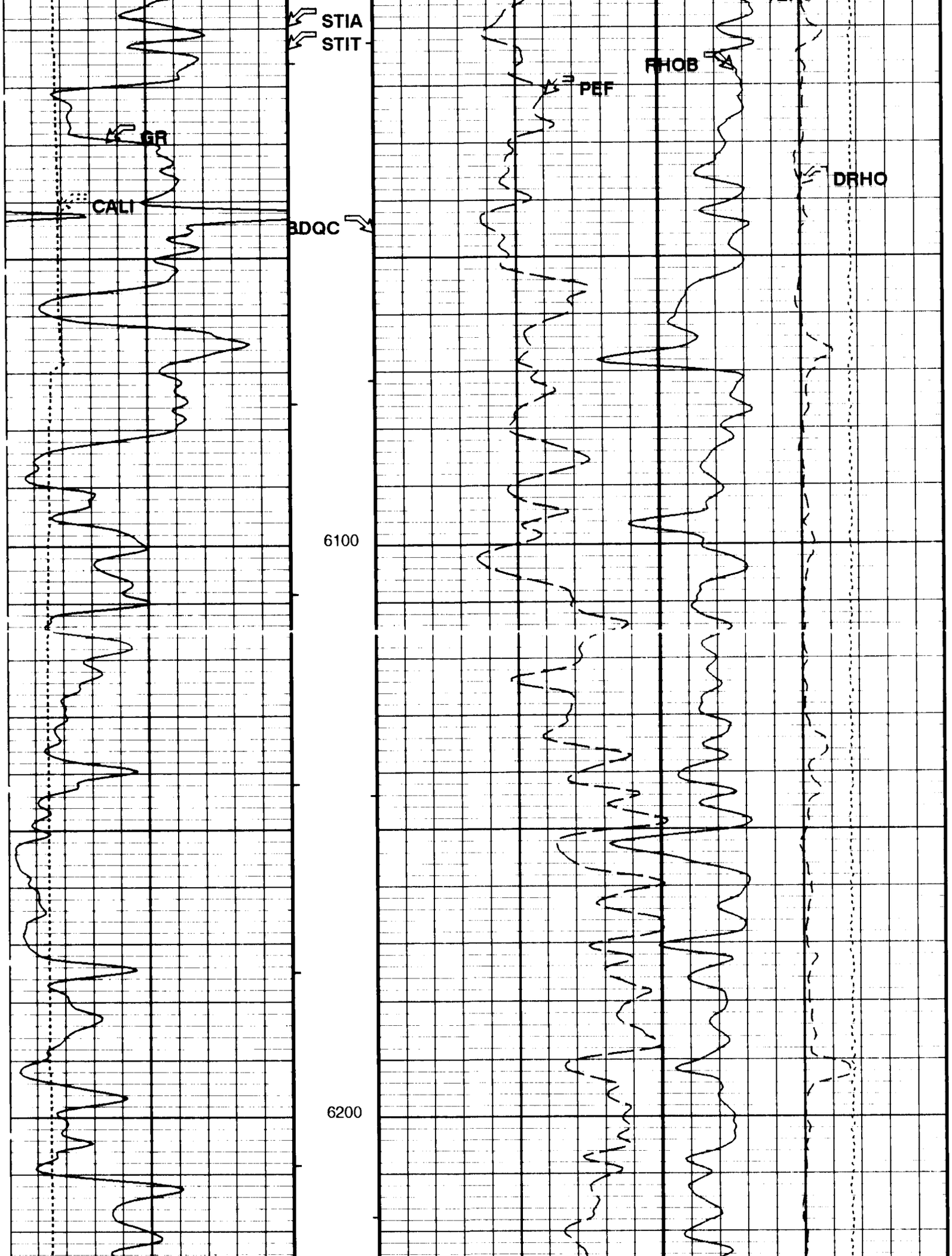

5000
5100

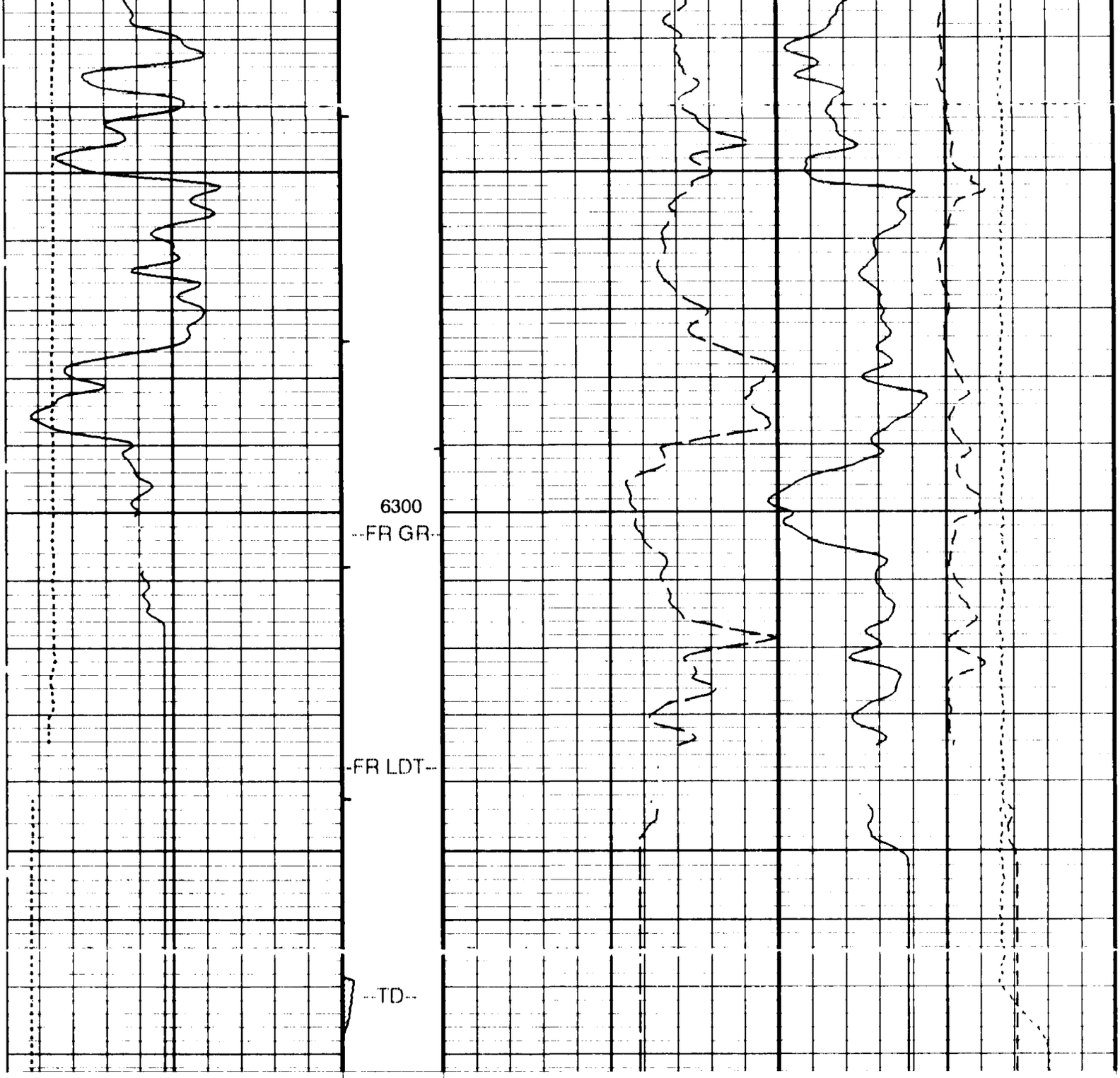

5200
5300


5400
5500


5600
STIA
STIT
GR
CALI
BDQC
5700
TENS
RHOB
PEF
DRHO


5800
5900
6000
TENS


STIA
STIT
GR
CALI
BDQC
PEF
RHOB
DRHO
6100
6200



Gamma Ray (GR)
0 (GAPI) 200

Stuck Stretch (STIT)
0 (F) 50

PhotoElectric Factor (PEF)
0 (----) 10

Caliper (CALI)
6 (IN) 16

Cable Drag From STIA to STIT

Bulk Density (RHOB)
2 (G/C3) 3

Tool/Tot. Drag From D3T to STIA

Bulk Density Correction (DRHO)
-0.25 (G/C3) 0.25

MAIN PASS

AreaBDQC From BDQC to

Tension (TENS)
10000 (LBF) 0

D3T

Bulk Density Quality Curve (BDQC)

10 (----) 0

PIP SUMMARY

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BFM	Borehole Fluid Medium	LIQUID	
BS	Bit Size	7.875	IN
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPPM	Density Porosity Processing Mode	HISP	
FD	Fluid Density	1	G/C3
MDEN	Matrix Density	2.68	G/C3
STKT	STI Stuck Threshold	2.5	FT
WMUD	Mud Weight	8.3	LB/G

Format: DENS Vertical Scale: 5" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427

DBM

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Input DLIS Files

DEFAULT	DITE .005	FN:4	FIELD	14-JAN-1996 10:09	6385.0 FT	6033.0 FT

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Integrated Hole/Cement Volume Summary

OP System Version: 7C0-427

DBM

PIP SUMMARY

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

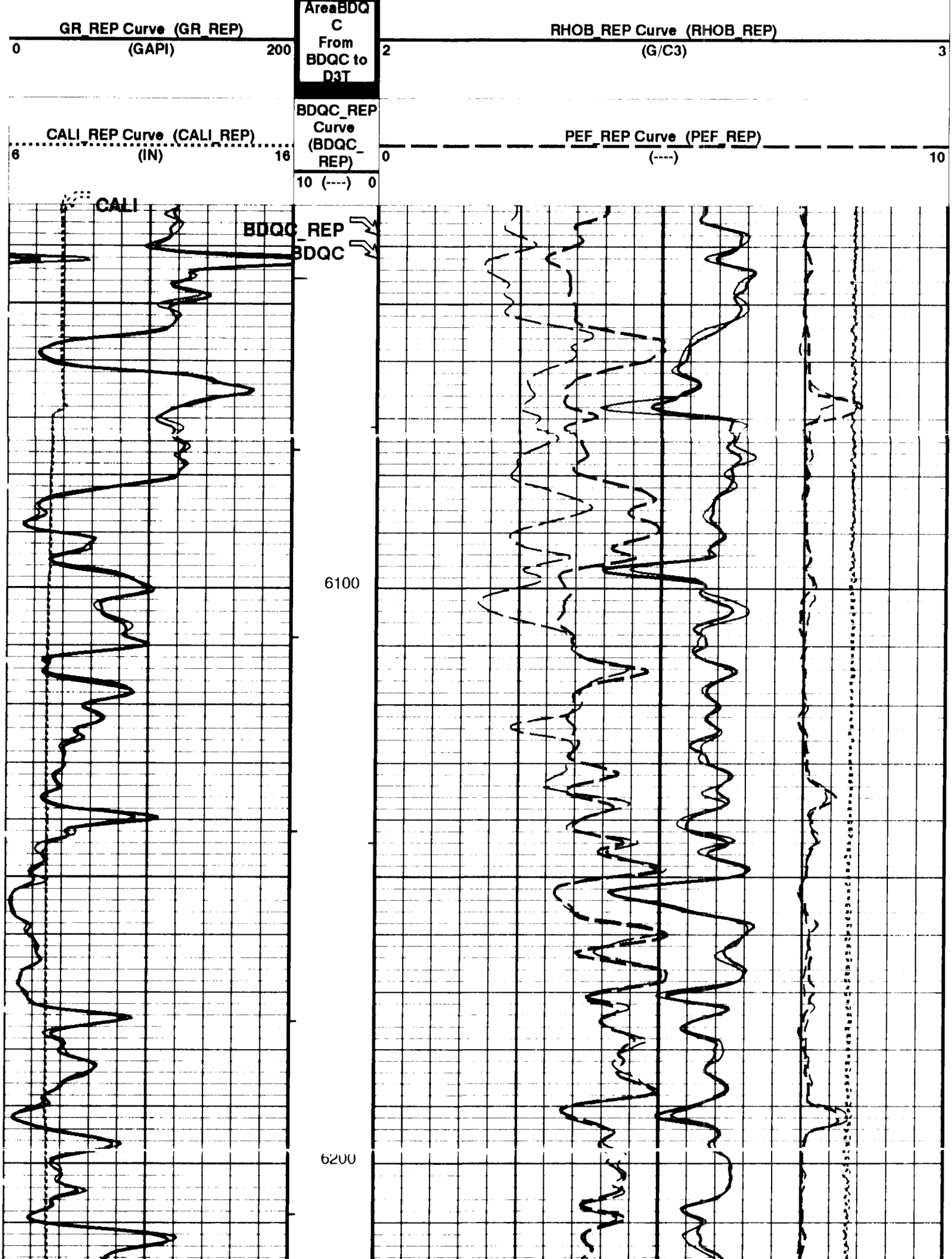
Time Mark Every 60 S

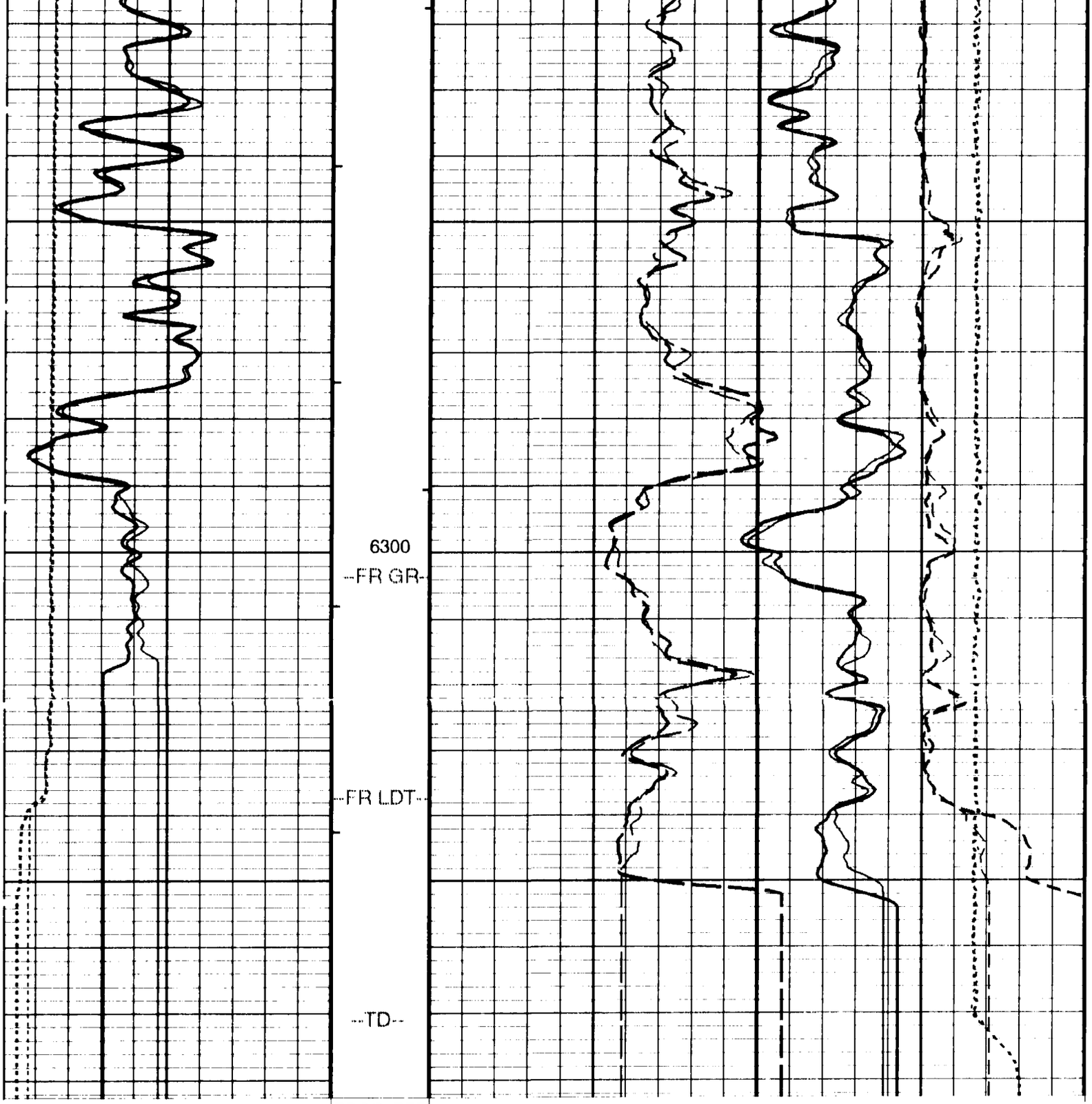
TENS_REP Curve (TENS_REP)

10000 (LBF) 0

DRHO_REP Curve (DRHO_REP)

-0.25 (G/C3) 0.25


GR_REP Curve (GR_REP)
0 (GAPI) 200
AreaBDQC From BDQC to D3T
RHOB_REP Curve (RHOB_REP)
2 (G/C3) 3
CALI_REP Curve (CALI_REP)
6 (IN) 16
BDQC_REP Curve (BDQC_REP)
10 (----) 0
PEF_REP Curve (PEF_REP)
0 (----) 10
CALI
BDQC_REP
BDQC
6100
6200



CALI_REP Curve (CALI_REP)
6 (IN) 16

BDQC_REP Curve (BDQC_REP)
10 (----) 0

PEF_REP Curve (PEF_REP)
0 (----) 10

GR_REP Curve (GR_REP)
0 (GAPI) 200

AreaBDQC From BDQC to D3T

RHOB_REP Curve (RHOB_REP)
2 (G/C3) 3

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

REPEAT ANALYSIS

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

PIP SUMMARY

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BFM	Borehole Fluid Medium	LIQUID	
BS	Bit Size	7.875	IN
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPPM	Density Porosity Processing Mode	HISP	
FD	Fluid Density	1	G/C3
MDEN	Matrix Density	2.68	G/C3
WMUD	Mud Weight	8.3	LB/G

Format: DENS_REP Vertical Scale: 5" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427

DBM

Input DLIS Files

DEFAULT	DITE .005	FN:4	FIELD	14-JAN-1996 10:09	6385.0 FT	6033.0 FT

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Litho Density - D Wellsite Calibration - Background Measurement							
Master: Jan 12 13:43 1996 Before: Jan 14 08:52 1996 After: Jan 14 14:14 1996							
LL Background	20.00	20.26	20.19	20.13	0.05902	1.000	CPS
LU Background	76.00	77.10	77.53	77.21	-0.3221	1.000	CPS
LS Background	57.00	58.81	58.95	58.73	-0.2201	1.000	CPS
LITH Background	5.500	5.844	5.787	5.811	0.02403	0.3000	CPS
SS1 Background	16.00	17.11	17.11	17.12	0.009390	0.5000	CPS
SS2 Background	11.00	11.38	11.48	11.39	-0.08953	0.5000	CPS
Litho Density - D Wellsite Calibration - Tool Quality Control Information HV							
Master: Jan 12 13:43 1996 Before: Jan 14 08:52 1996 After: Jan 14 14:14 1996							
LSHV Background	1500	1221	1222	1216	-5.252	N/A	V
SSHV Background	1500	1177	1180	1180	0.2112	N/A	V
Litho Density - D Wellsite Calibration - Detectors Resolution From BKG Measurments							
Master: Jan 12 13:43 1996 Before: Jan 14 08:52 1996 After: Jan 14 14:14 1996							
LS Resolution Background	8.000	8.686	8.721	8.701	-0.01939	N/A	
SS Resolution Background	8.000	8.383	8.359	8.401	0.04132	N/A	
Litho Density - D Wellsite Calibration - Caliper Calibration							
Before: Jan 14 08:50 1996							
Caliper Small Ring	8.000	N/A	9.490	N/A	N/A	N/A	IN
Caliper Large Ring	12.00	N/A	13.57	N/A	N/A	N/A	IN
Litho Density - D Master Calibration - Aluminum Measurement							
Master: Jan 12 15:05 1996							
LL Aluminum	90.00	92.85	--	--	--	--	CPS
LU Aluminum	135.0	138.2	--	--	--	--	CPS
LS Aluminum	155.0	162.0	--	--	--	--	CPS
LITH Aluminum	50.00	60.84	--	--	--	--	CPS
SS1 Aluminum	175.0	176.4	--	--	--	--	CPS
SS2 Aluminum	260.0	254.2	--	--	--	--	CPS
Litho Density - D Master Calibration - Litholog Measurement							

Master: Jan 12 14:56 1996

LL Iron	80.00	81.79	--	--	--	--	CPS
LU Iron	120.0	122.1	--	--	--	--	CPS
LS Iron	135.0	142.8	--	--	--	--	CPS
LITH Iron	30.00	38.06	--	--	--	--	CPS
SS1 Iron	155.0	156.6	--	--	--	--	CPS
SS2 Iron	245.0	229.7	--	--	--	--	CPS

Litho Density - D Master Calibration - Spectrum Quality Ratios
Master: Jan 12 15:05 1996

QRLS Calculated	0.6500	0.6717	--	--	--	--
QRSS Calculated	0.7200	0.6940	--	--	--	--
QRLI Calculated	0.3900	0.3756	--	--	--	--
QLIR Calculated	1.390	1.410	--	--	--	--
QR Calculated	1.000	1.007	--	--	--	--

Compensated Neutron - H Wellsite Calibration - Zero Measurement
Master: Nov 5 17:26 1995 Before: Jan 14 08:50 1996

CNTC Background	1.000	0.2500	0.5209	N/A	N/A	N/A	CPS
CFTC Background	0	0.7672	3.462	N/A	N/A	N/A	CPS

Compensated Neutron - H Wellsite Calibration - Jig Measurement
Master: Nov 5 17:42 1995 Before: Jan 14 08:59 1996

CNTC Jig	2872	2872	2852	N/A	N/A	N/A	CPS
CFTC Jig	1218	1218	1195	N/A	N/A	N/A	CPS
CNTC/CFTC (Jig)	2.357	2.357	2.387	N/A	N/A	N/A	

Compensated Neutron - H Master Calibration - Tank Measurement
Master: Nov 5 17:33 1995

Thermal Near Corr. (Tank)	6031	6412	--	--	--	--	CPS
Thermal Far Corr. (Tank)	2793	2687	--	--	--	--	CPS
CNTC/CFTC (Tank)	2.159	2.387	--	--	--	--	

Scintillation Gamma-Ray - L Wellsite Calibration - Detector Calibration
Before: Jan 14 08:49 1996

Gamma Ray Background	30.00	N/A	45.78	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	163.5	N/A	163.5	N/A	N/A	14.86	GAPI
Gamma Ray (Calibrated)	167.0	N/A	167.0	N/A	N/A	15.00	GAPI

The CNT Master Calibration Was Done With The Following Parameters :

NCT-B Water Temperature 68.0 DEGF.
Thermal Housing Size 3.369 IN.

Litho Density - D / Equipment Identification

Primary Equipment:		
Nuclear Services Cartridge	NSC - E	2919
Powered Gamma Detector	PGD - G	3732
Gamma Source Radioactive	GSR - J	1851
Auxiliary Equipment:		
Density Resistivity Sonde	DRS - C	2777
Electronics Cartridge Housing	ECH - MKA	2920
Powered Detector Housing	PDH - L	3738

Litho Density - D Wellsite Calibration
Background Measurement

Phase	LL Background CPS	Value	Phase	LU Background CPS	Value	Phase	LS Background CPS	Value
Master		20.26	Master		77.10	Master		58.81
Before		20.19	Before		77.53	Before		58.95
After		20.13	After		77.21	After		58.73
	15.00 (Minimum) 20.00 (Nominal) 25.00 (Maximum)			58.00 (Minimum) 76.00 (Nominal) 94.00 (Maximum)			43.00 (Minimum) 57.00 (Nominal) 72.00 (Maximum)	

Phase	LITH Background CPS	Value	Phase	SS1 Background CPS	Value	Phase	SS2 Background CPS	Value
Master		5.844	Master		17.11	Master		11.38
Before		5.787	Before		17.11	Before		11.48
After		5.811	After		17.12	After		11.39

4.000 (Minimum)	5.500 (Nominal)	7.000 (Maximum)	12.00 (Minimum)	16.00 (Nominal)	19.50 (Maximum)	8.000 (Minimum)	11.00 (Nominal)	13.50 (Maximum)

Master: Jan 12 13:43 1996 Before: Jan 14 08:52 1996 After: Jan 14 14:14 1996

Litho Density - D Wellsite Calibration
Detectors Resolution From BKG Measurments

Phase	LS Resolution Background	Value	Phase	SS Resolution Background	Value
Master		8.686	Master		8.383
Before		8.721	Before		8.359
After		8.701	After		8.401
	5.000 (Minimum) / 8.000 (Nominal) / 11.50 (Maximum)			5.000 (Minimum) / 8.000 (Nominal) / 11.50 (Maximum)	

Master: Jan 12 13:43 1996 Before: Jan 14 08:52 1996
After: Jan 14 14:14 1996

Litho Density - D Master Calibration
Aluminum Measurement

Phase	LL Aluminum CPS	Value	Phase	LU Aluminum CPS	Value	Phase	LS Aluminum CPS	Value
Master		92.85	Master		138.2	Master		162.0
	70.00 (Minimum) / 90.00 (Nominal) / 125.0 (Maximum)			100.0 (Minimum) / 135.0 (Nominal) / 194.0 (Maximum)			120.0 (Minimum) / 155.0 (Nominal) / 217.0 (Maximum)	

Phase	LITH Aluminum CPS	Value	Phase	SS1 Aluminum CPS	Value	Phase	SS2 Aluminum CPS	Value
Master		60.84	Master		176.4	Master		254.2
	35.00 (Minimum) / 50.00 (Nominal) / 74.00 (Maximum)			125.0 (Minimum) / 175.0 (Nominal) / 256.0 (Maximum)			210.0 (Minimum) / 260.0 (Nominal) / 353.0 (Maximum)	

Master: Jan 12 15:05 1996

Litho Density - D Master Calibration
Litholog Measurement

Phase	LL Iron CPS	Value	Phase	LU Iron CPS	Value	Phase	LS Iron CPS	Value
Master		81.79	Master		122.1	Master		142.8
	60.00 (Minimum) / 80.00 (Nominal) / 114.0 (Maximum)			85.00 (Minimum) / 120.0 (Nominal) / 177.0 (Maximum)			100.0 (Minimum) / 135.0 (Nominal) / 193.0 (Maximum)	

Phase	LITH Iron CPS	Value	Phase	SS1 Iron CPS	Value	Phase	SS2 Iron CPS	Value
Master		38.06	Master		156.6	Master		229.7
	15.00 (Minimum) / 30.00 (Nominal) / 51.00 (Maximum)			105.0 (Minimum) / 155.0 (Nominal) / 234.0 (Maximum)			190.0 (Minimum) / 245.0 (Nominal) / 325.0 (Maximum)	

Master: Jan 12 14:56 1996

Litho Density - D Master Calibration
Spectrum Quality Ratios

Phase	QRLS Calculated	Value	Phase	QRSS Calculated	Value	Phase	QRLI Calculated	Value
Master		0.6717	Master		0.6940	Master		0.3756
	0.6000 (Minimum) / 0.6500 (Nominal) / 0.7000 (Maximum)			0.6200 (Minimum) / 0.7200 (Nominal) / 0.8200 (Maximum)			0.2900 (Minimum) / 0.3900 (Nominal) / 0.4500 (Maximum)	

Phase	QLIR Calculated	Value	Phase	QR Calculated	Value
Master		1.410	Master		1.007
	1.290 (Minimum) / 1.390 (Nominal) / 1.450 (Maximum)			0.9800 (Minimum) / 1.000 (Nominal) / 1.020 (Maximum)	

Master: Jan 12 15:05 1996

Compensated Neutron - H / Equipment Identification

Primary Equipment:		
Compensated Neutron Cartridge	CNC - HA	290
Neutron Logging Source	NLS - KL	
Neutron Source Radioactive	NSR - F	2549
Compensated Neutron Box	CNB - AB	3221
Neutron Detector without Alpha Source	CND - NA	
Compensated Neutron Box	CNB - AB	3221
Auxiliary Equipment:		
Compensated Neutron Housing	CNH - A	4373
Neutron Calibration Tank	NCT - B	320

Compensated Neutron - H Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		0.2500	Master		0.7672
Before		0.5209	Before		3.462
	-0.010000 (Minimum) 1.000 (Nominal) 5.000 (Maximum)			-0.010000 (Minimum) 0 (Nominal) 5.000 (Maximum)	

Master Nov 5 17:26 1995 Before: Jan 14 08:50 1996

Compensated Neutron - H Wellsite Calibration

Jig Measurement

Phase	CNTC Jig CPS	Value	Phase	CFTC Jig CPS	Value	Phase	CNTC/CFTC (Jig)	Value
Master		2872	Master		1218	Master		2.357
Before		2852	Before		1195	Before		2.387
	2728 (Minimum) 2872 (Nominal) 3015 (Maximum)			1157 (Minimum) 1218 (Nominal) 1279 (Maximum)			2.317 (Minimum) 2.357 (Nominal) 2.397 (Maximum)	

Master: Nov 5 17:42 1995 Before: Jan 14 08:59 1996

Compensated Neutron - H Master Calibration

Tank Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master		6412	Master		2687	Master		2.387
	5000 (Minimum) 6031 (Nominal) 7200 (Maximum)			2075 (Minimum) 2793 (Nominal) 3125 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: Nov 5 17:33 1995

Scintillation Gamma-Ray - L / Equipment Identification

Primary Equipment:	
Scintillation Gamma Cartridge	SGC - SA
Scintillation Gamma Detector	SGD - TAA
Auxiliary Equipment:	
Scintillation Gamma Housing	SGH - K
Gamma Source Radioactive	GSR - U/Y

Scintillation Gamma-Ray - L Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		45.78	Before		163.5	Before		167.0
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			148.6 (Minimum) 163.5 (Nominal) 178.4 (Maximum)			152.0 (Minimum) 167.0 (Nominal) 182.0 (Maximum)	

Before: Jan 14 08:49 1996

COMPANY:	PETROGLYPH OPERATING CO., INC.	BOTTOM LOG INTERVAL	6337 F
		SCHLUMBERGER DEPTH	6371 F
WELL:	UTE TRIBAL #4A-4	DEPTH DRILLER	6386 F
FIELD:	ANTELOPE CREEK	KELLY BUSHING	[illegible]
COUNTY:	DUCHESNE	DRILL FLOOR	[illegible]
STATE:	UTAH	GROUND LEVEL	[illegible]

COMPENSATED NEUTRON
LITHO DENSITY

Schlumberger

LITHO-DENSITY
GAMMA RAY

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

WELL: **UTE TRIBAL #04-04** (4A-4)

FIELD: **ANTELOPE CREEK**

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

COUNTY: DUCHESNE
Field: ANTELOPE CREEK
Location: 1205' FNL & 660' FWL
Well: UTE TRIBAL #4A-4
Company: PETROGLYPH OPERATING CO

Schlumberger

DUAL INDUCTION
with Linear Correlation
GAMMA RAY

LOCATION

1205' FNL & 660' FWL		Elev.:	K.B. 5937.3 F
LOT #5			G.L. 5927.3 F
			D.F. 5936.3 F
Permanent Datum:	GROUND LEVEL	Elev.:	5927.3 F
Log Measured From:	KELLY BUSHING	10.0 F	above Perm. Datum
Drilling Measured From:	KELLY BUSHING		

API Serial No.	SECTION	TOWNSHIP	RANGE
43-013-31574	4	5 S	3 W

Logging Date			14-JAN-1996				
Run Number			ONE				
Depth Driller			6385 F				
Schlumberger Depth			6371 F				
Bottom Log Interval			6365 F				
Top Log Interval			257 F				
Casing Driller Size @ Depth			8.625 IN	@	256 F	@	
Casing Schlumberger			257 F				
Bit Size			7.875 IN				
Type Fluid In Hole			KCL/WATER				
MUD	Density	Viscosity	8.3 LB/G	27 S			
MUD	Fluid Loss	PH		10.3			
MUD	Source Of Sample		MUD TANK				
RM @ Measured Temperature			3.210 OHMM	@	67 DEGF	@	
RMF @ Measured Temperature				@		@	
RMC @ Measured Temperature				@		@	
Source RMF	RMC						
RM @ MRT	RMF @ MRT		1.624 @ 139		@ 139	@	@
Maximum Recorded Temperatures			139 DEGF				
Circulation Stopped		Time	14-JAN-1996		6:00		
Logger On Bottom		Time	14-JAN-1996		10:09		
Unit Number	Location		2018	VERNAL, UTAH			
Recorded By			A. WHITE				
Witnessed By			GENE SEARLE/DAN LINDSEY				

Logging Date		
Run Number		
Depth Driller		
Schlumberger Depth		
Bottom Log Interval		
Top Log Interval		
Casing Driller Size @		
Casing Schlumberger		
Bit Size		
Type Fluid In Hole		
MUD	Density	Vis
MUD	Fluid Loss	PH
MUD	Source Of Sample	
RM @ Measured Tem		
RMF @ Measured Te		
RMC @ Measured Te		
Source RMF	RM	
RM @ MRT	RM	
Maximum Recorded T		
Circulation Stopped		
Logger On Bottom		
Unit Number		
Recorded By		
Witnessed By		

Run 1	Run 2	Run 3	Run 4
Depth	@	@	@
Viscosity			
Temperature	@	@	@
Temperature	@	@	@
Temperature	@	@	@
MC			
MF @ MRT	@	@	@
Temperatures			
Time			
Time			
Location			

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: LDL/CNL/ML/GR
OS2: FMI/GR
OS3: SDT/GR
OS4:
OS5:

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

REMARKS: RUN NUMBER 1
NO STANDOFFS USED ON INDUCTION TOOL.

THANKS FOR USING SCHLUMBERGER!!

SWS CREW: D HALL/D JOHNSON

REMARKS: RUN NUMBER 2

RUN 1
SERVICE ORDER #: 670102
PROGRAM VERSION: 7C0-427
FLUID LEVEL: 0 F

LOGGED INTERVAL	START	STOP

RUN 2
SERVICE ORDER #:
PROGRAM VERSION:
FLUID LEVEL:

LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

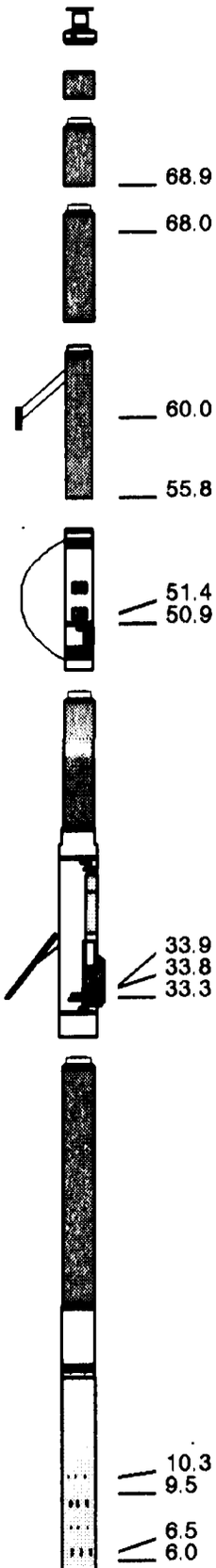
RUN 1 | RUN 2

SURFACE EQUIPMENT

CNB-AB 3221
NCT-B 320
NCS-VB
GSR-U/Y

TCM-AB

DOWNHOLE EQUIPMENT



PEH-A PEH-A	75.0
AH-64	73.2
TCC-B ECH-KC TCC-B	71.9
SGT-L SGH-K SGC-SA SGD-TAA	68.9
MLT-AA MLT-AA	63.4
CNT-H CND-NA NLS-KL NSR-F 2549 CNC-HA 290 CNH-A 4373	55.8
LDT-D GSR-J 1851 PGD-G 3732 NSC-E 2919 ECH-MKA 2920 DRS-C 2777 PDH-L 3738	48.6
DIT-E DIC-EB 190 MIH-ZA 195 DIS-HB 194	31.2

MAXIMUM STRING DIAMETER 5.82 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT DITE .006 FN:5 FIELD 14-JAN-1996 10:29

Integrated Hole/Cement Volume Summary

Hole Volume = 1398.98 F3

Cement Volume = 761.08 F3 (assuming 5.50 IN casing O.D.)

Computed from 6382.5 FT to 2516.5 FT using data channel(s) CALI (per GCSE parameter setting)

OP System Version: 7C0-427

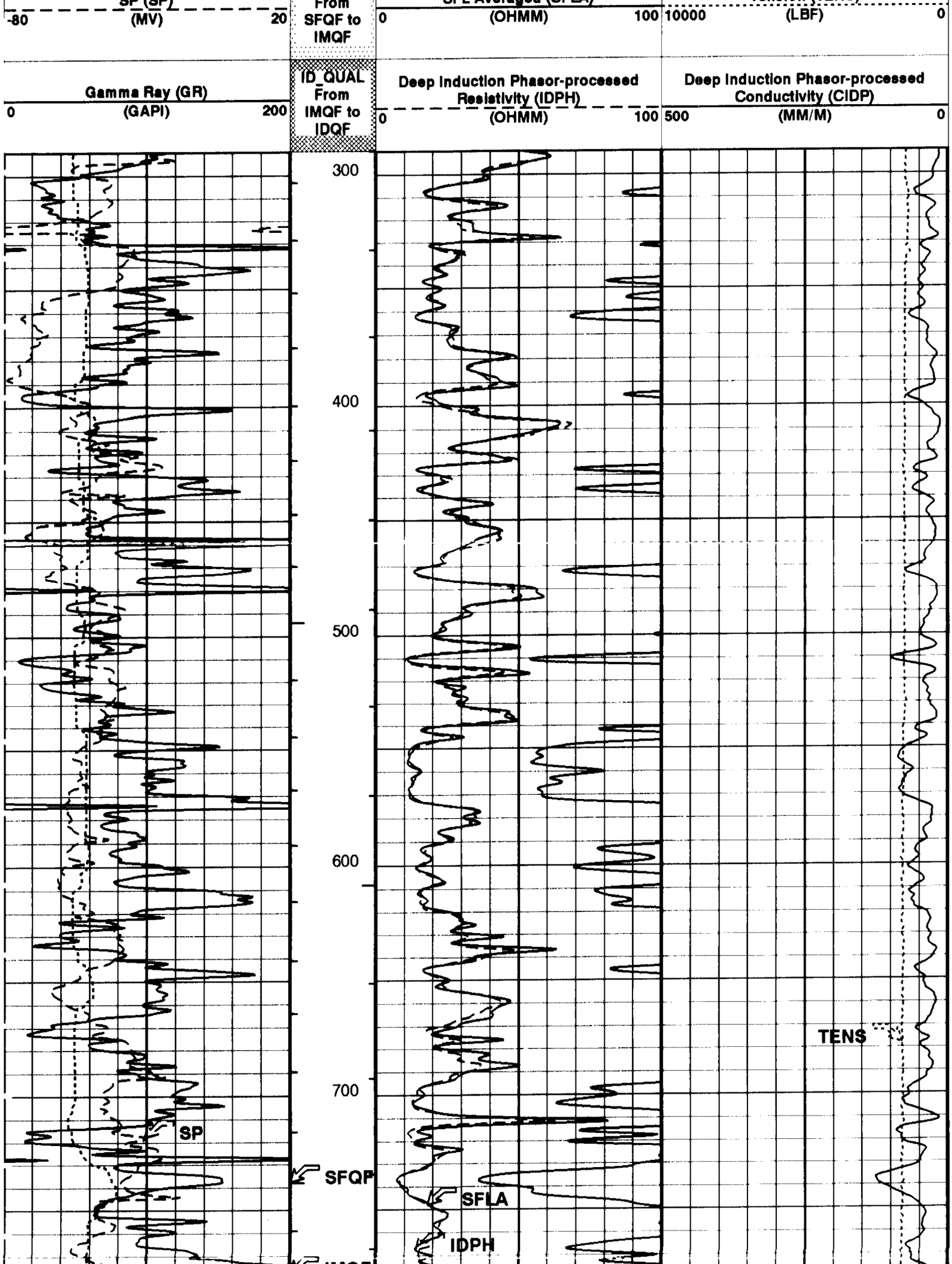
DBM

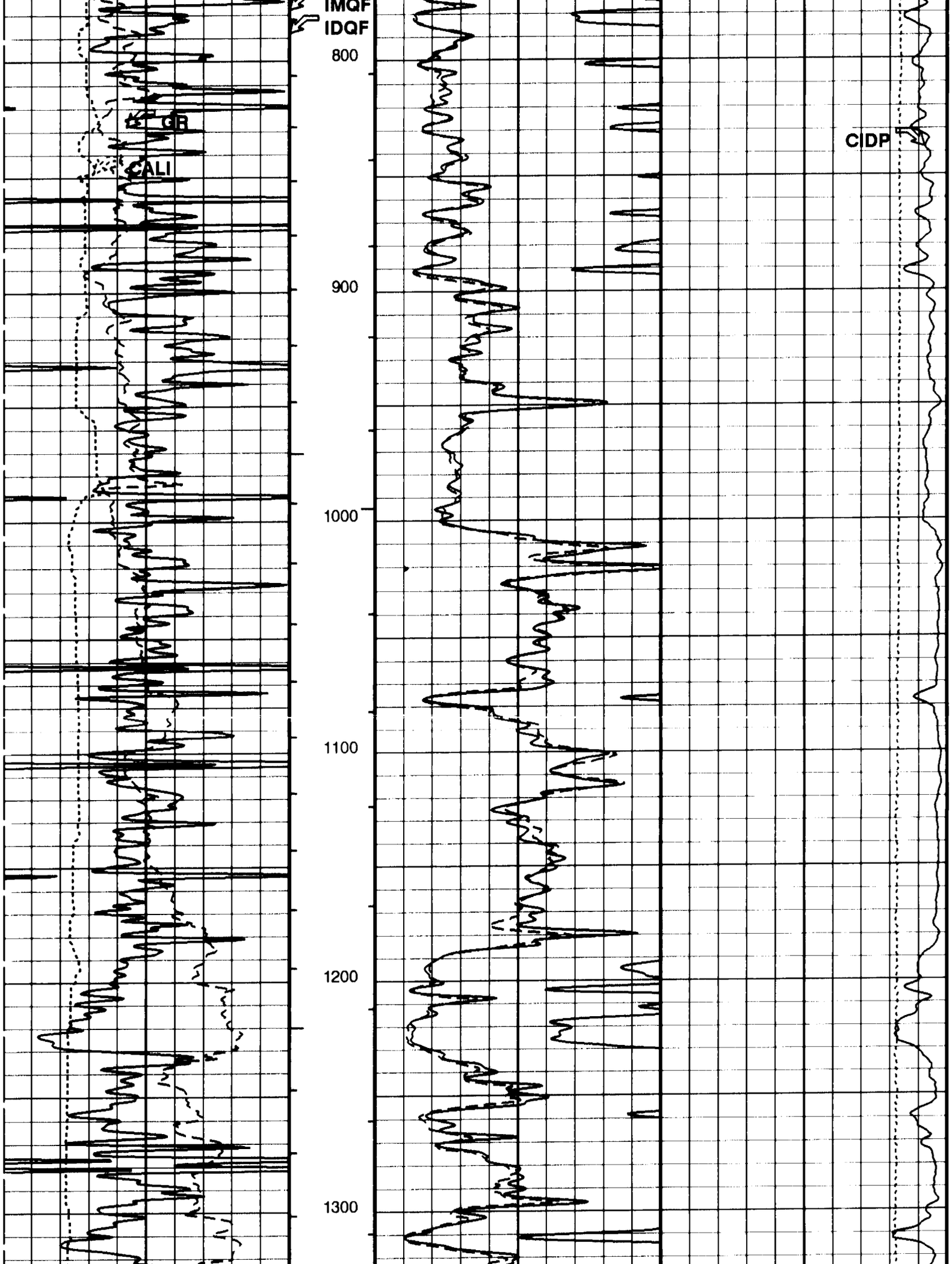
PIP SUMMARY

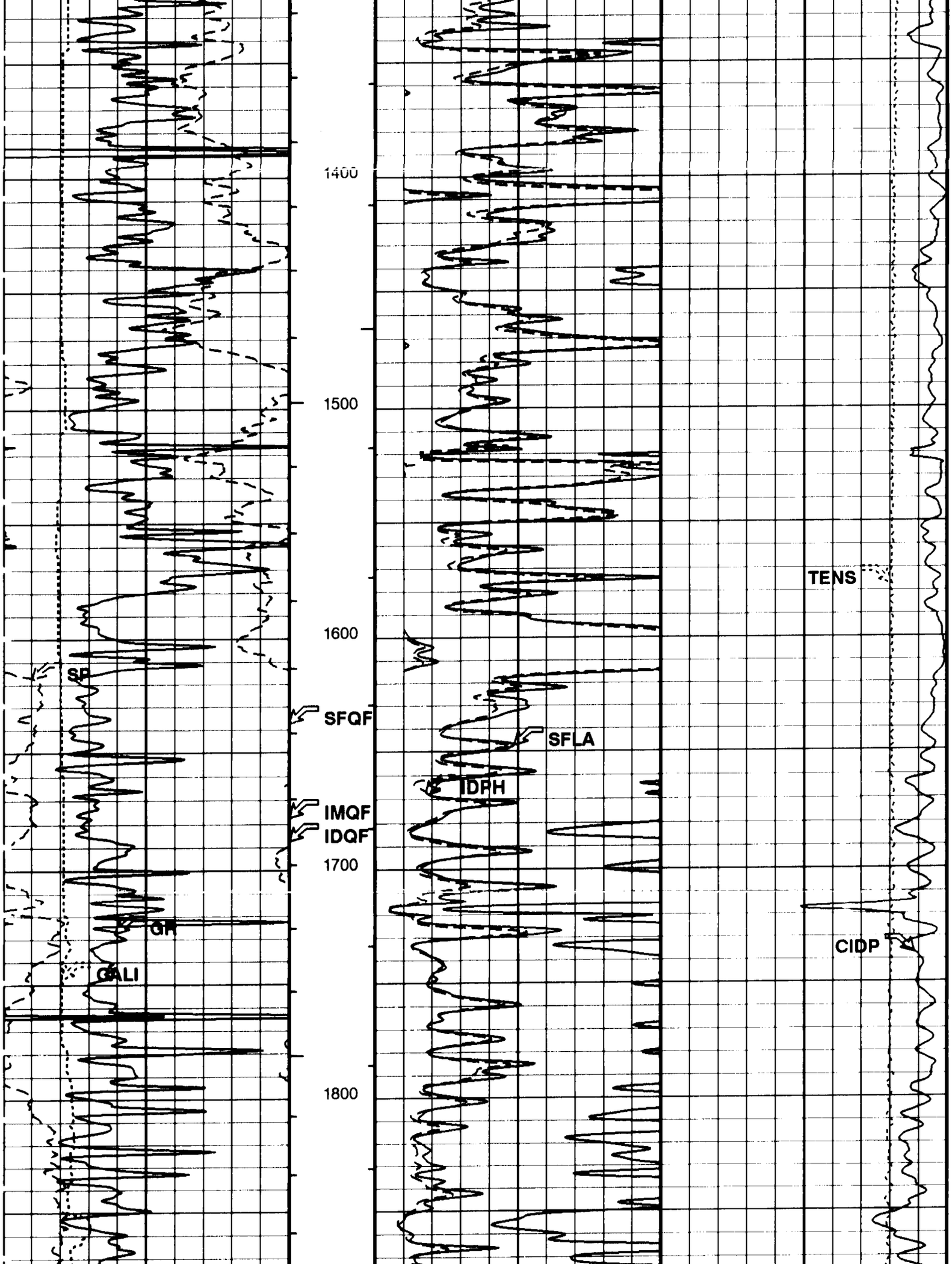
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

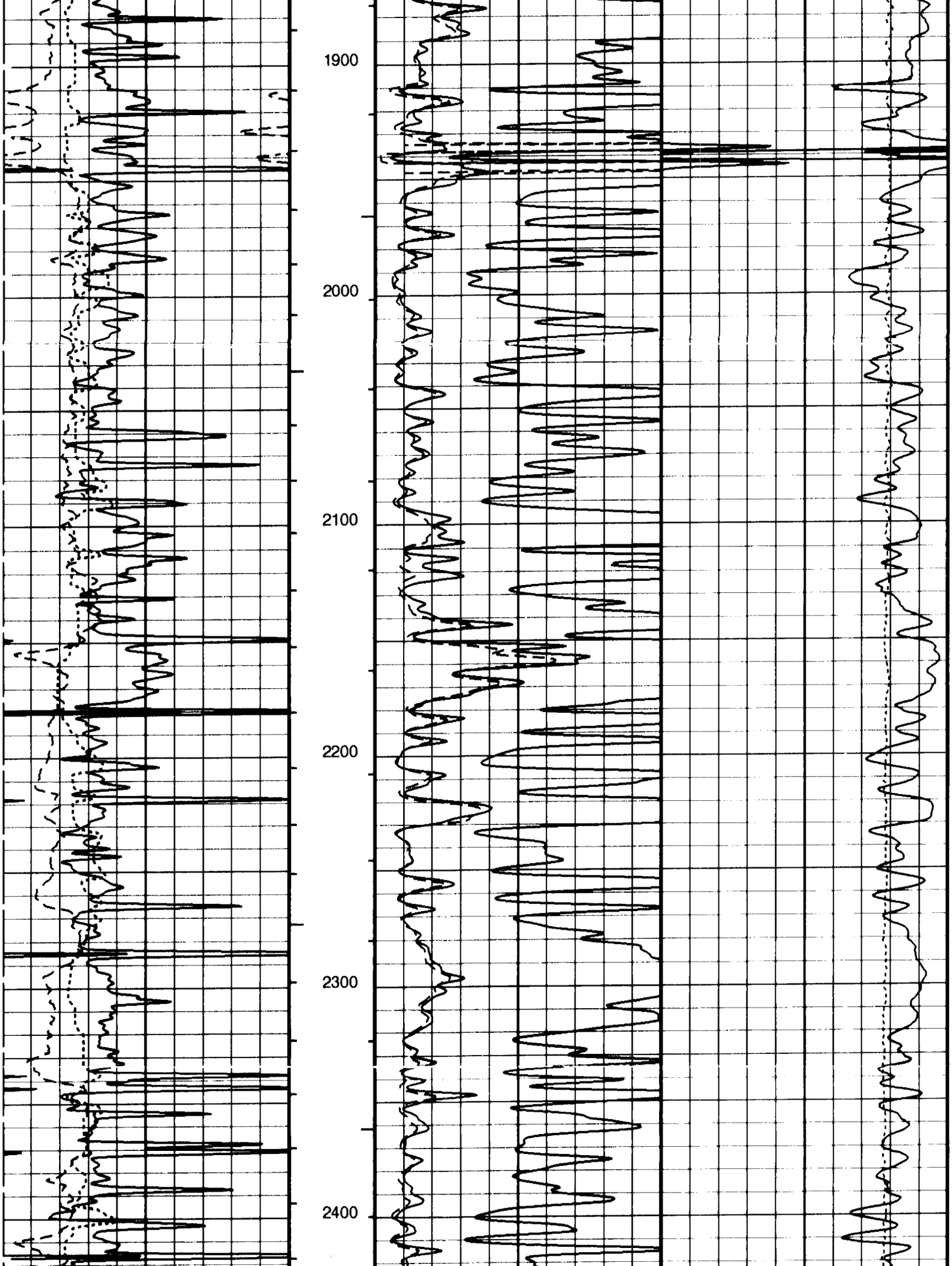
Time Mark Every 60 S

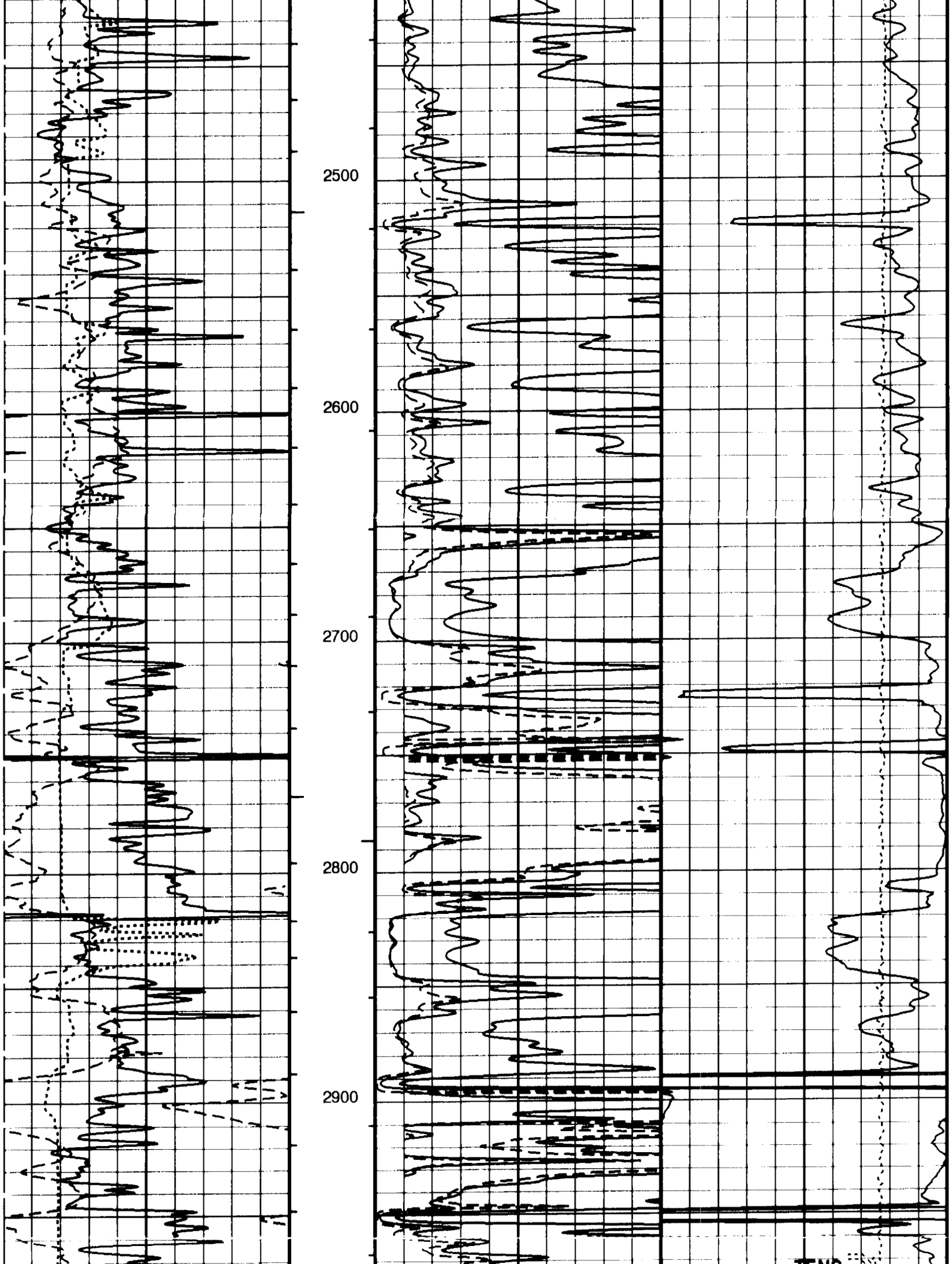
Caliper (CALI)	SFL_QUAL From D3T to SFQF	SFL Averaged (SFLA)	
6 (IN) 16		0 (OHMM) 20	
SP (SP)	IM_QUAL From D3T to SFQF	SFL Averaged (SFLA)	Tension (TENS)

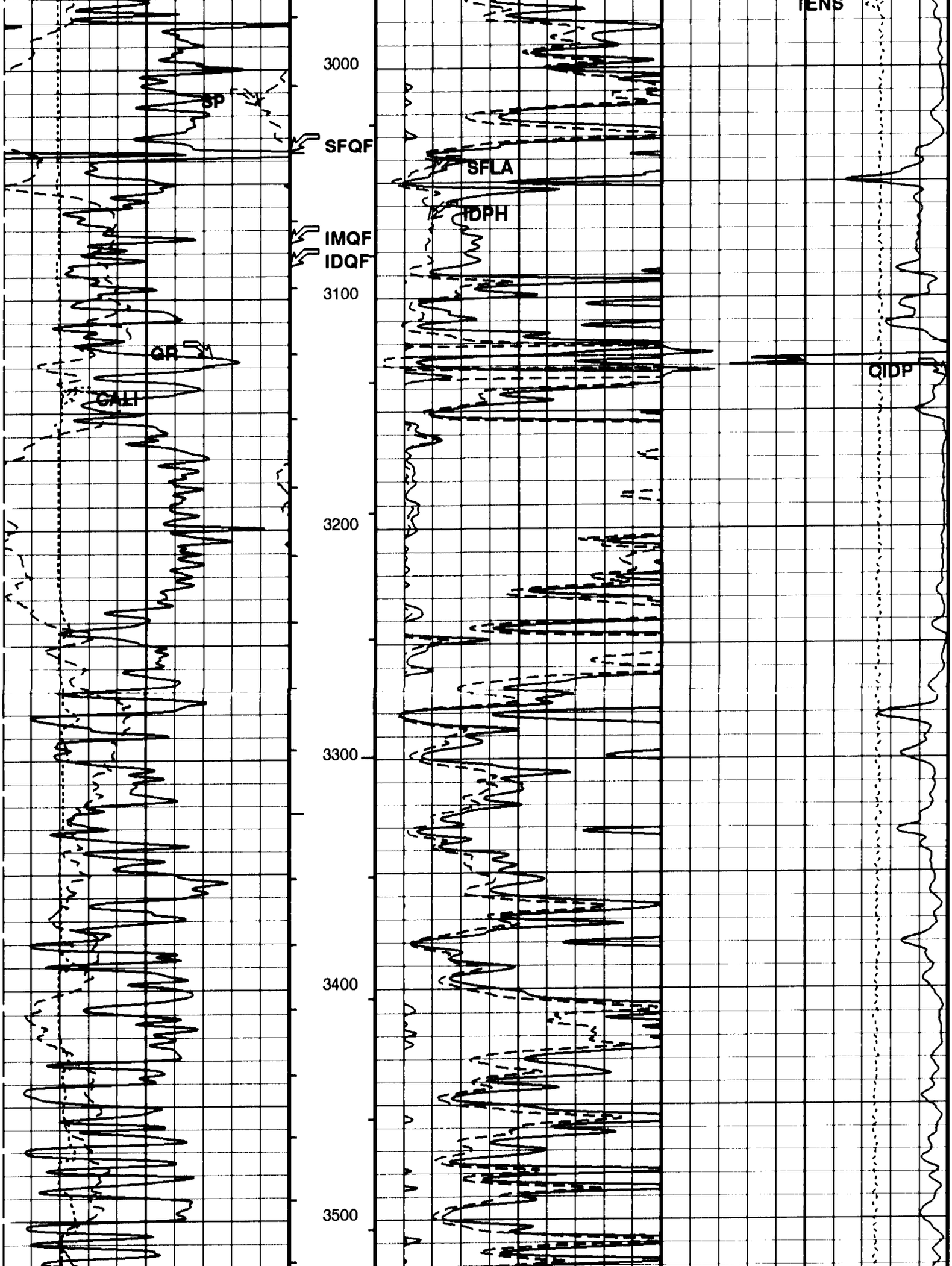

SP (SP)
-80 (MV) 20
From SFQF to IMQF
SFL Averaged (SFLA)
0 (OHMM) 100
10000 (LBF) 0
Gamma Ray (GR)
0 (GAPI) 200
ID_QUAL From IMQF to IDQF
Deep Induction Phasor-processed Resistivity (IDPH)
0 (OHMM) 100
Deep Induction Phasor-processed Conductivity (CIDP)
500 (MM/M) 0
300
400
500
600
700
SP
SFQF
SFLA
IDPH
TENS

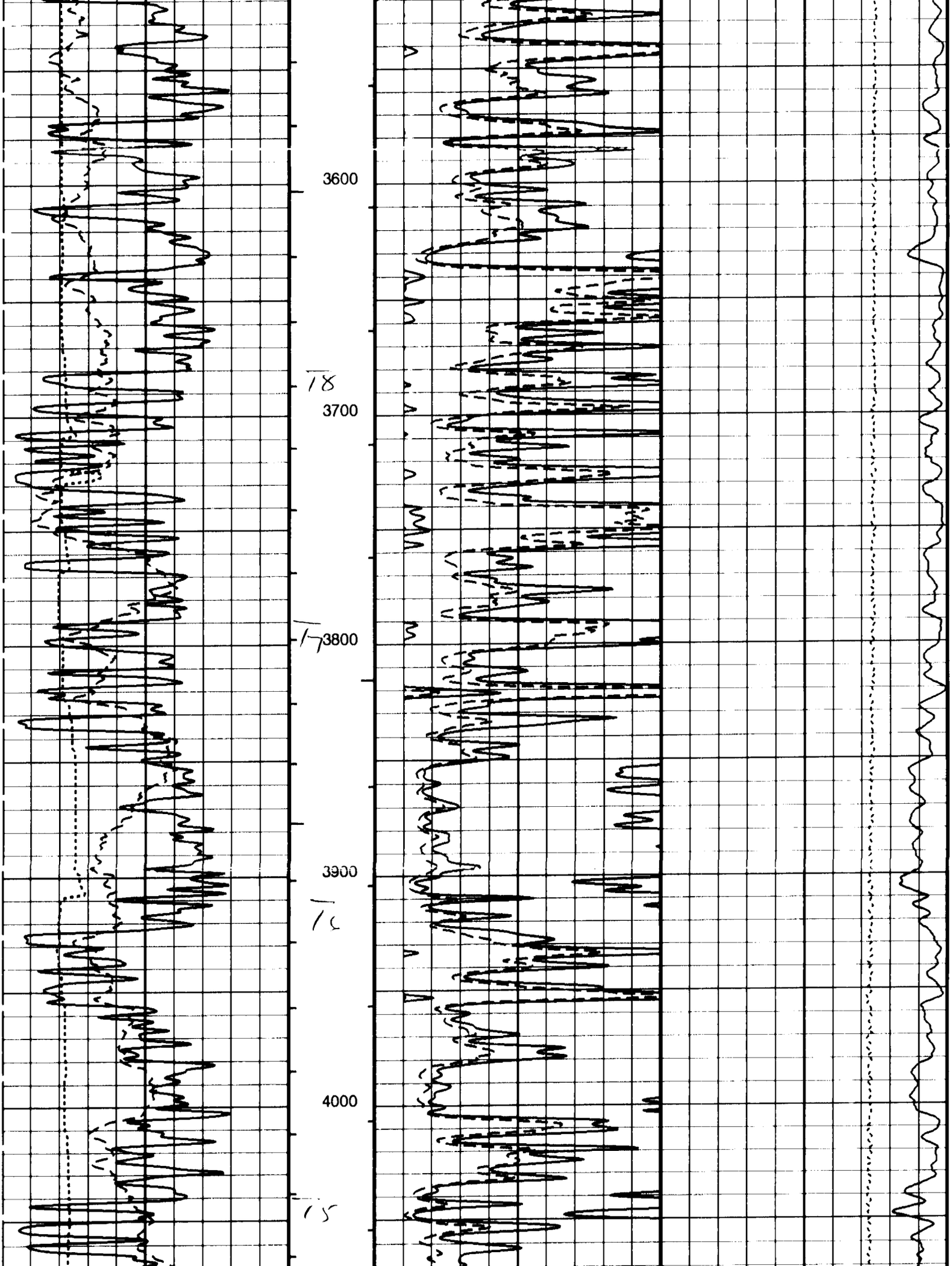

IMQF
IDQF
800
GR
CALI
CIDP
900
1000
1100
1200
1300

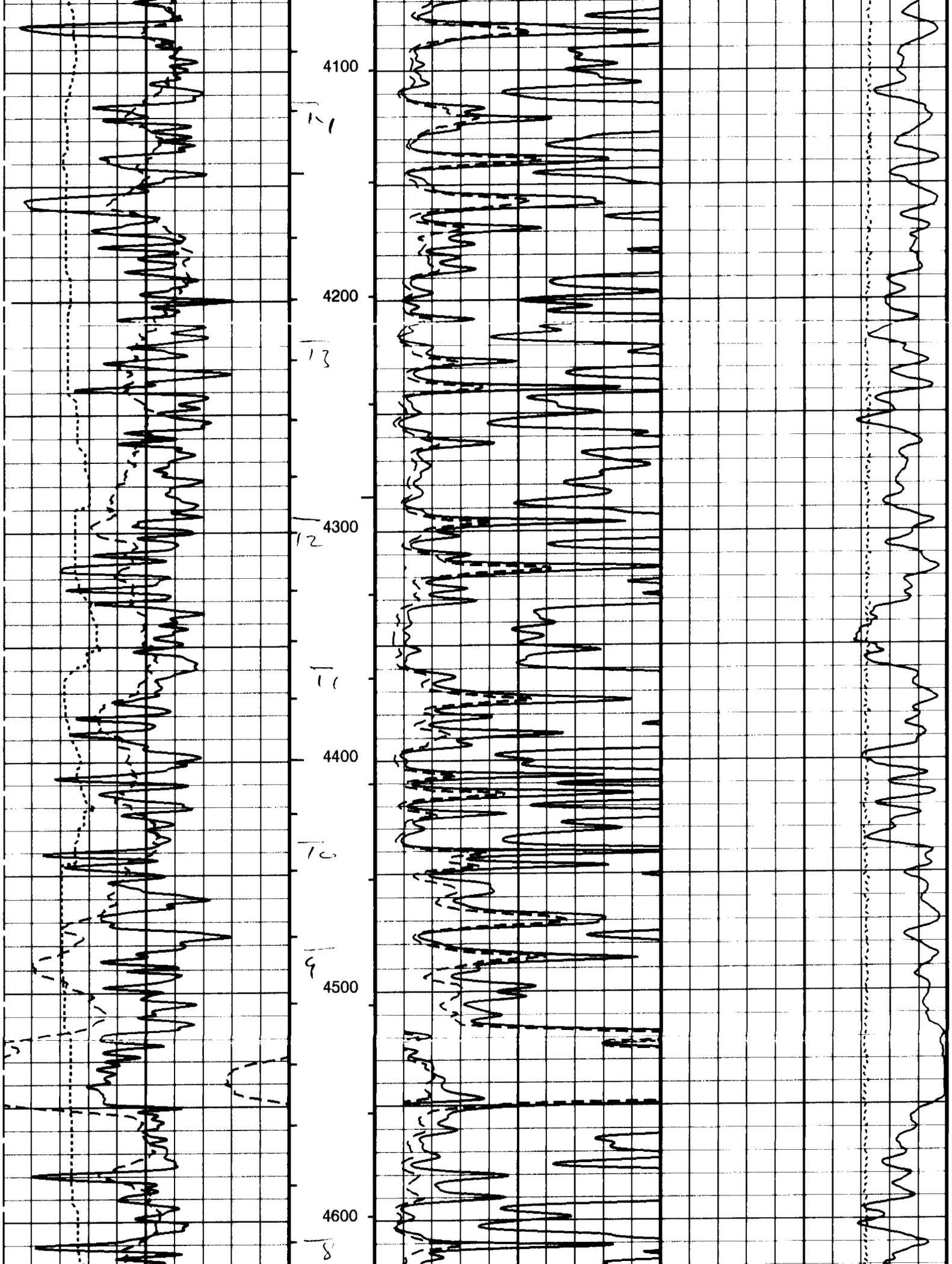

1400
1500
1600
1700
1800
SP
SFQF
SFLA
IDPH
IMQF
IDQF
GR
CALI
TENS
CIDP

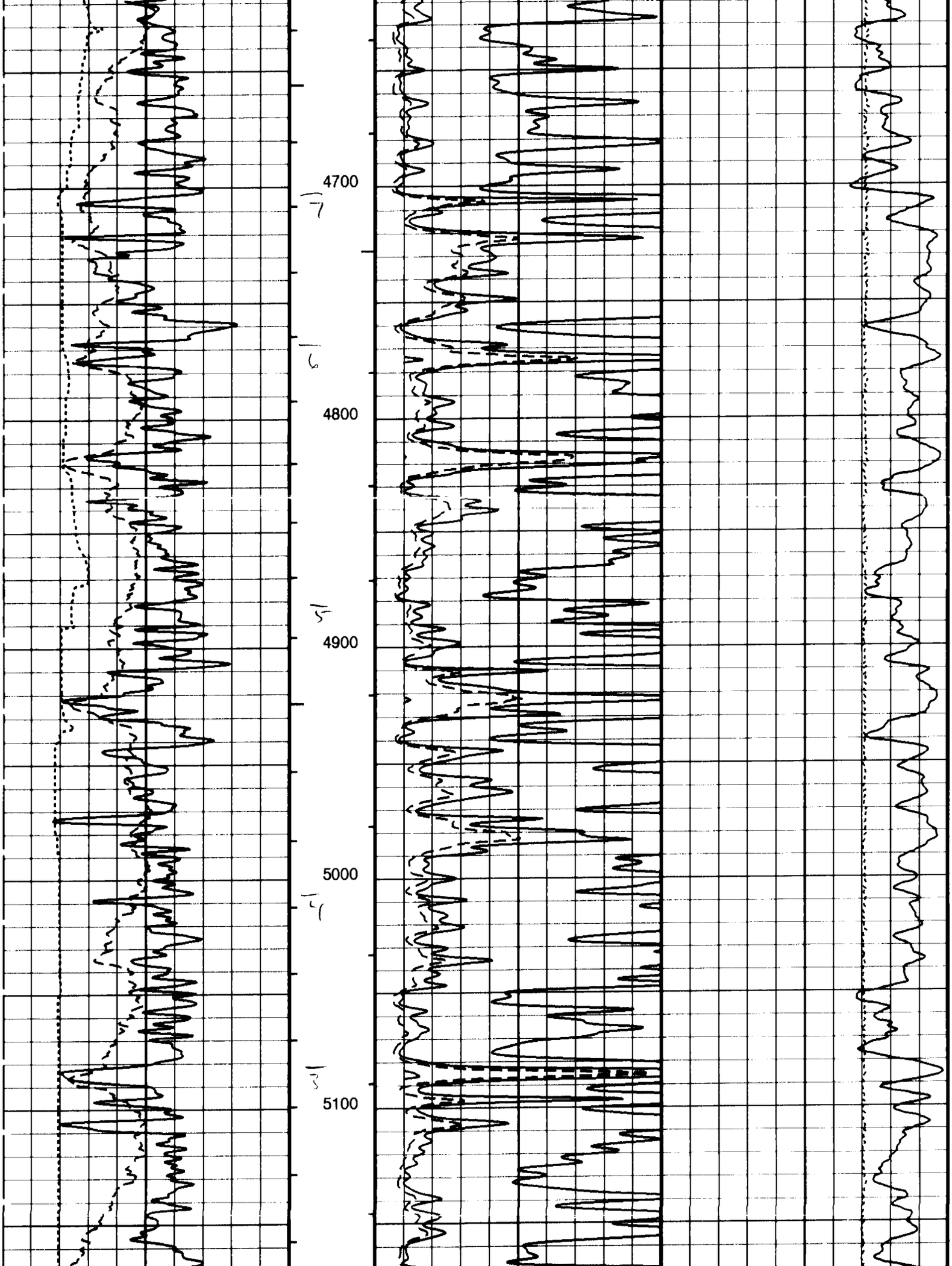

1900
2000
2100
2200
2300
2400

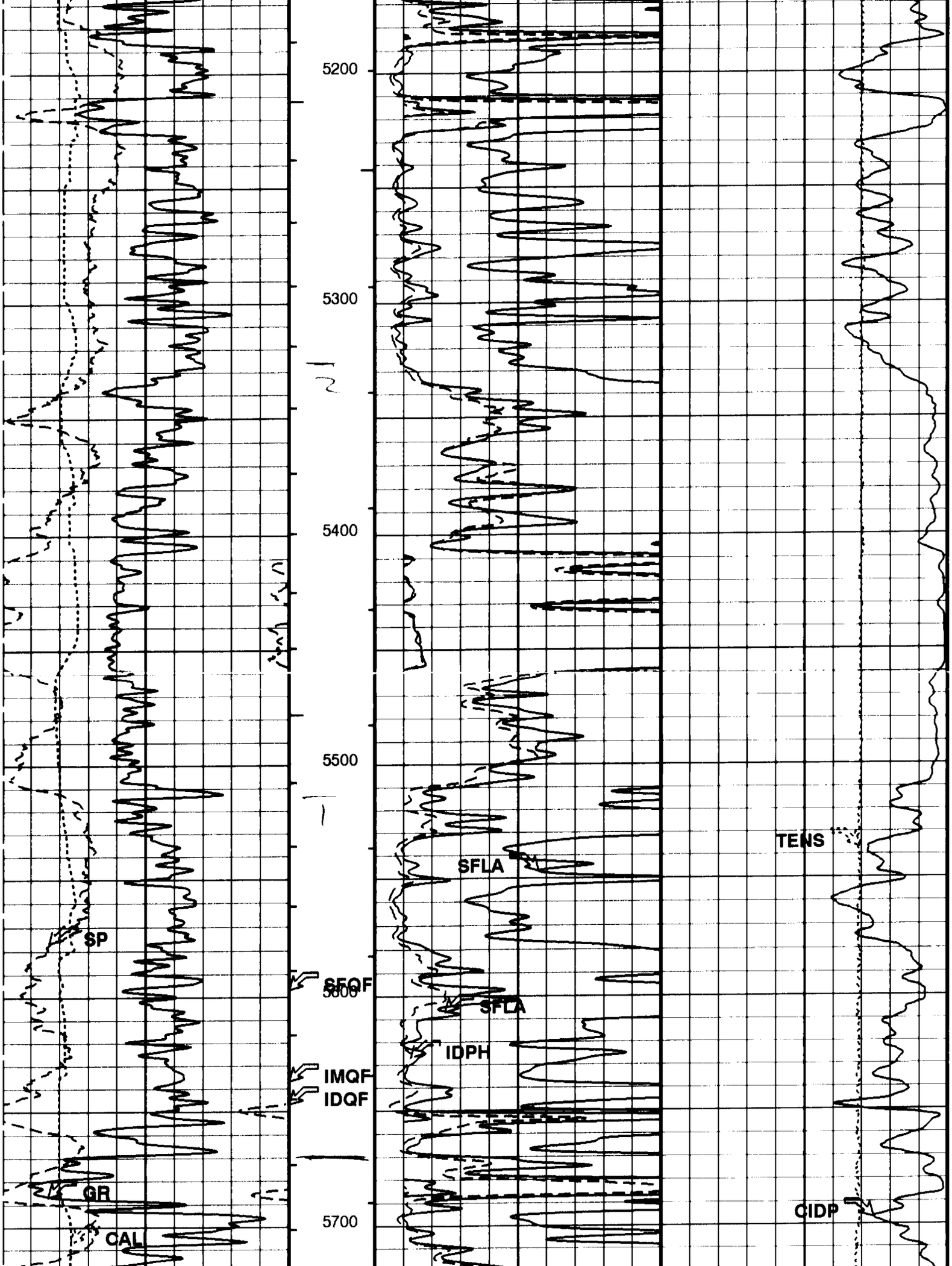

2500
2600
2700
2800
2900

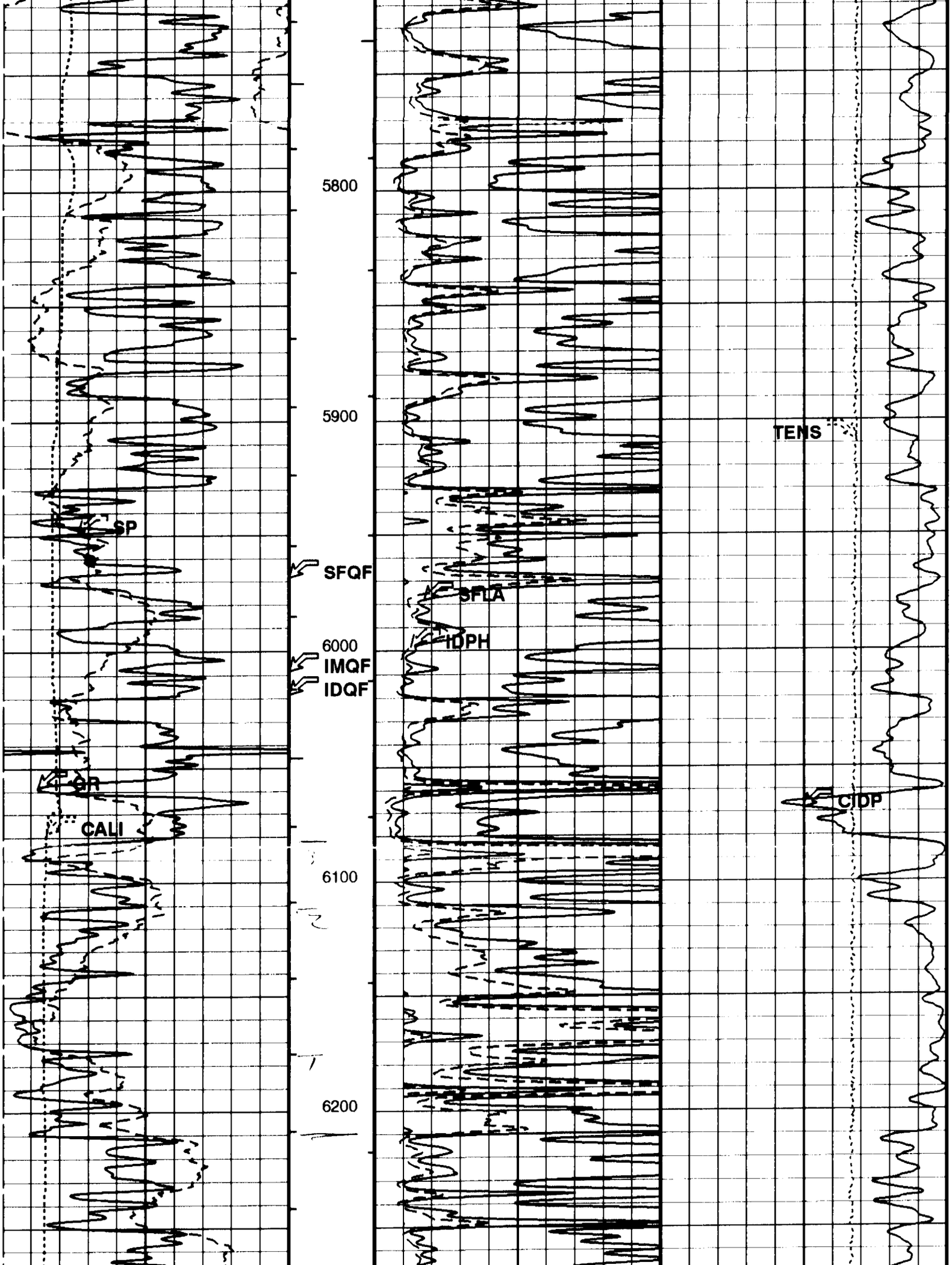

IENS
3000
SP
SFQF
SFLA
IDPH
IMQF
IDQF
3100
QR
QIDP
CALI
3200
3300
3400
3500

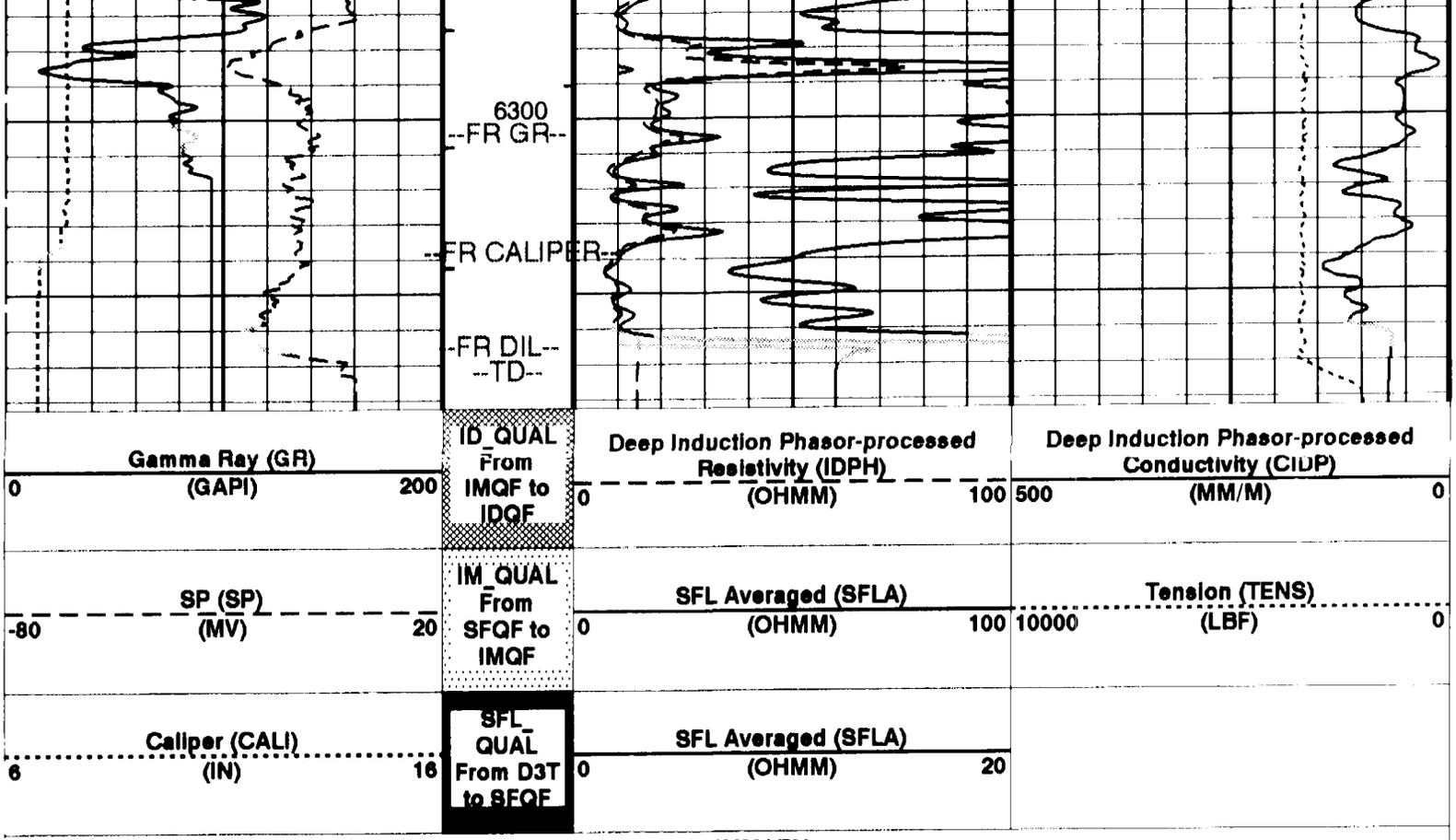

3600
18
3700
17
3800
3900
16
4000
15


4100
4200
4300
4400
4500
4600


4700
4800
4900
5000
5100


5200
5300
5400
5500
5600
5700
SP
SFQF
SFLA
IDPH
IMQF
IDQF
GR
CAL
TENS
CIDP


5800
5900
6000
6100
6200
SP
SFQF
SFLA
IDPH
IMQF
IDQF
GR
CALI
TENS
CIDP



PIP SUMMARY

MAIN PASS

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
DFD	Drilling Fluid Density	8.30	LB/G
DGF2	Deep 20 kHz Gain Factor	1.00198	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPH2	Deep 20 kHz Phase Shift	-6.312986e-02	DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	16.0532	MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843	MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	57.2113	MM/M
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
IFRS	DIT-E Induction Frequency Selector	20	
IPHA	DIT-E Phasor Processing Mode	ALL	
IPRO	DIT-E Induction Processing Selector	PHASOR	
ITEN	DIT-E Temperature Enable	ENABLE	
MGF2	Medium 20 kHz Gain Factor	1.01335	
MPH2	Medium 20 kHz Phase Shift	-1.03565	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	20.5788	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	80.9827	MM/M
SFCR	SFL Channel Ratio	1000	
SHT	Surface Hole Temperature	30	DEGF
SPNV	SP Next Value	0	MV
TD	Total Depth	6385	FT

Format: LinStandard Vertical Scale: 2" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427

DBM

Output DLIS Files

DEFAULT DITE .006 FN:5 FIELD 14-JAN-1996 10:29

Output DLIS Files

DEFAULT DITE .006 FN:5 FIELD 14-JAN-1996 10:29

Integrated Hole/Cement Volume Summary

Hole Volume = 1398.98 F3

Cement Volume = 761.08 F3 (assuming 5.50 IN casing O.D.)

Computed from 6382.5 FT to 2516.5 FT using data channel(s) CALI (per GCSE parameter setting)

OP System Version: 7C0-427

DBM

PIP SUMMARY

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

Time Mark Every 60 S

Tension (TENS) 10000 (LBF) 0

Caliper (CALI) 6 (IN) 16

SFL_QUAL From D3T to SFQF

SFL Unaveraged (SFLU) 0.2 (OHMM) 2000

SP (SP) -80 (MV) 20

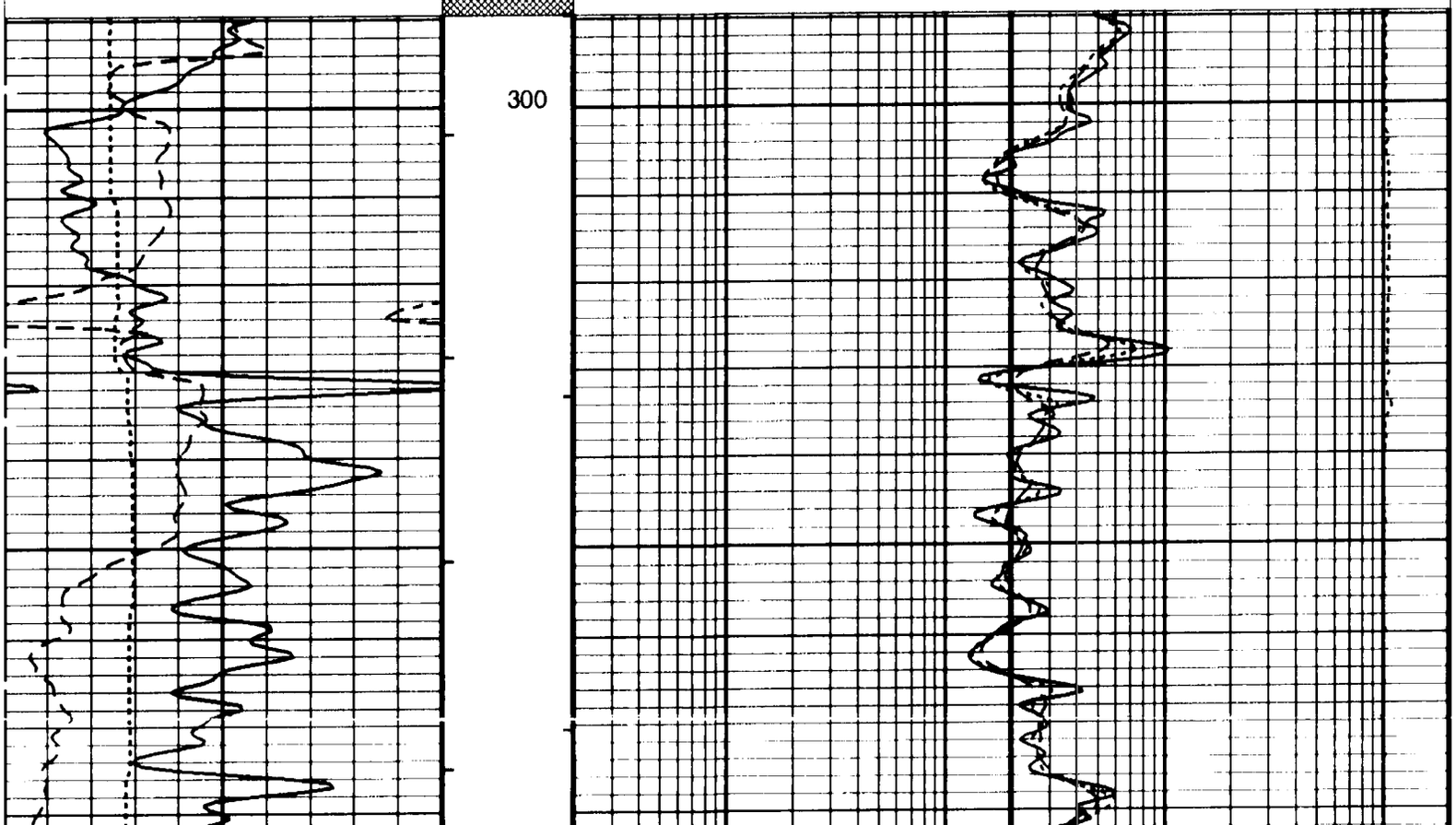
IM_QUAL From SFQF to IMQF

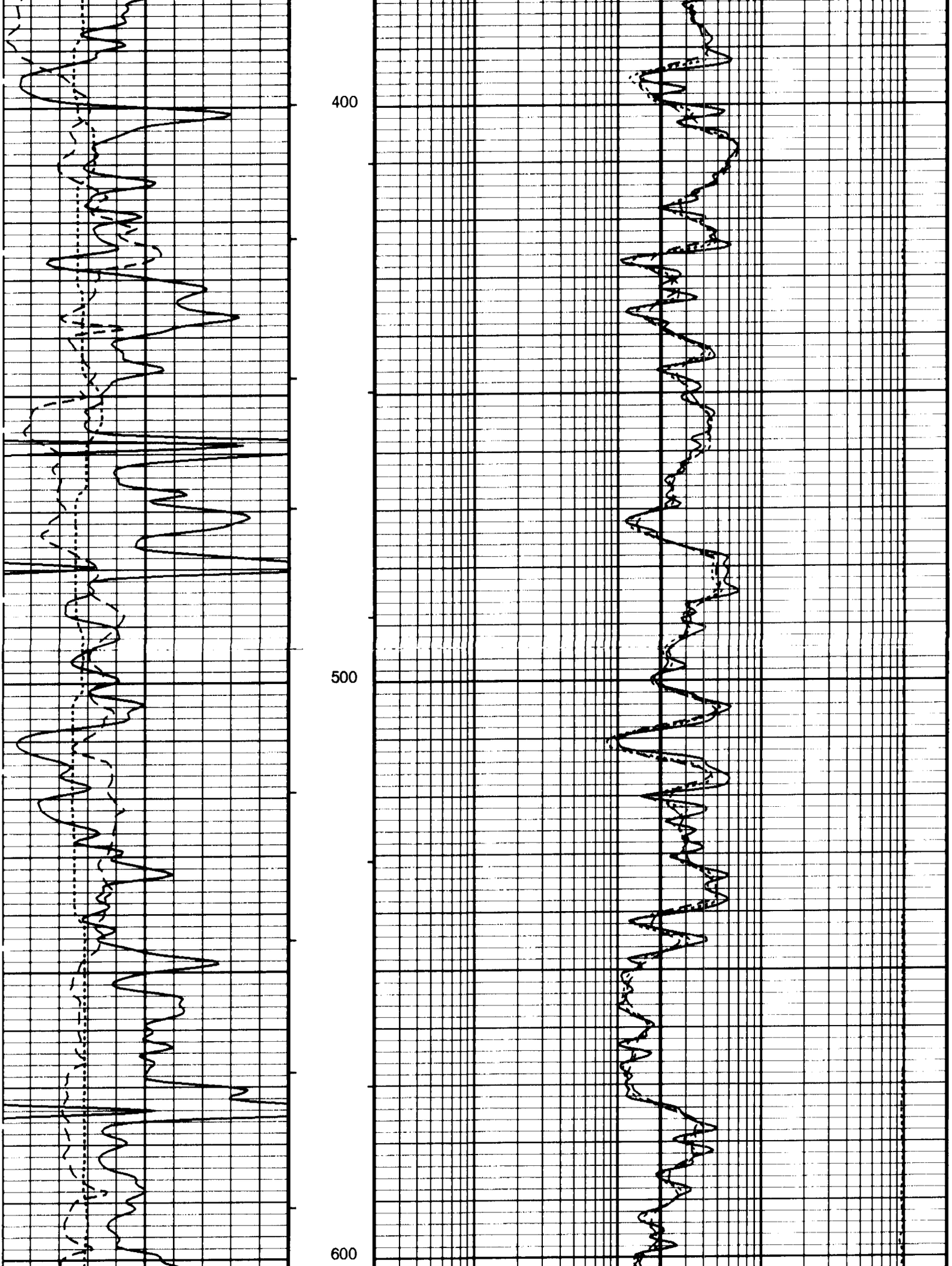
Medium Induction Phasor-processed Resistivity (IMPH) 0.2 (OHMM) 2000

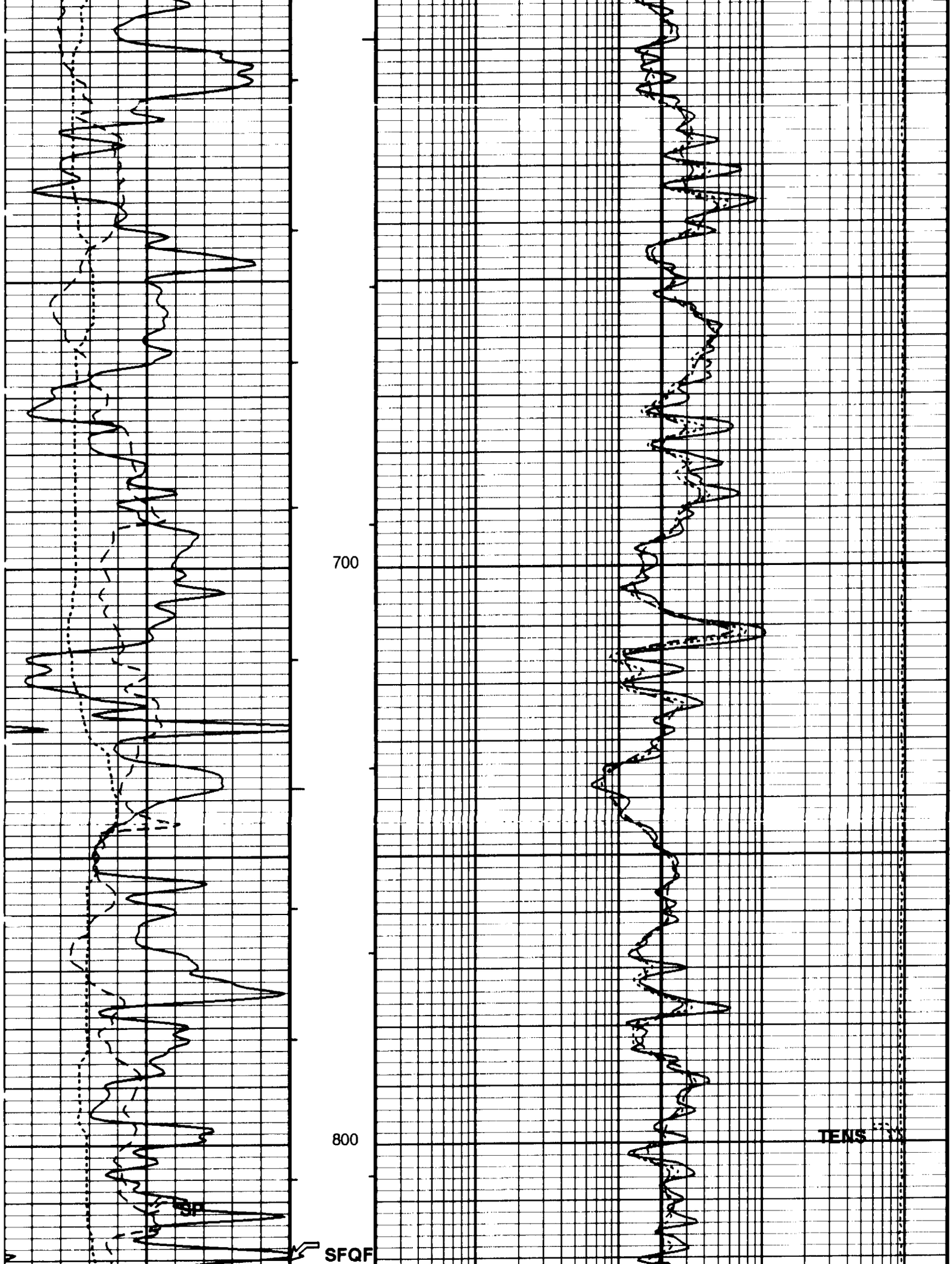
Gamma Ray (GR) 0 (GAPI) 200

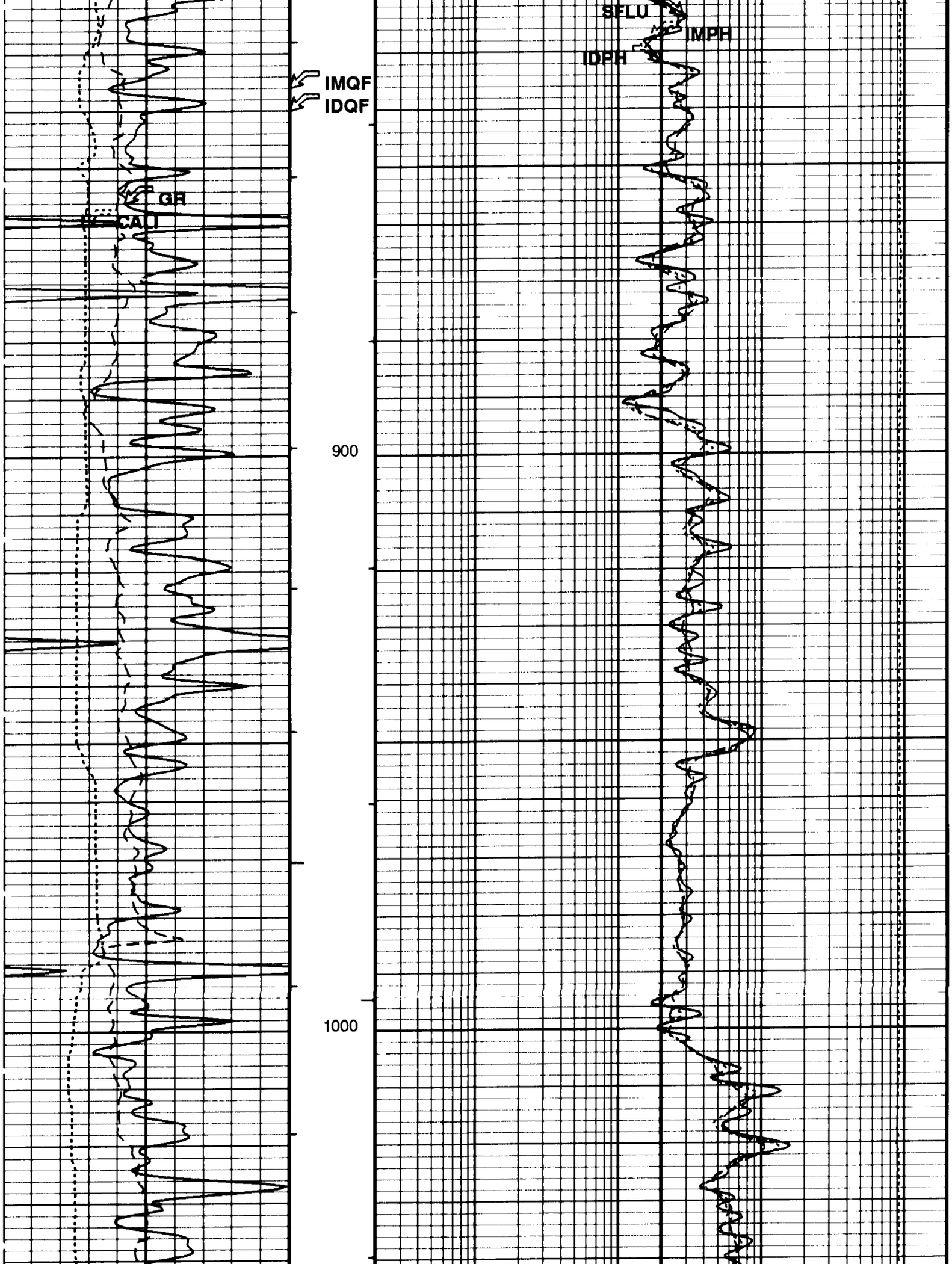
ID_QUAL From IMQF to IDQF

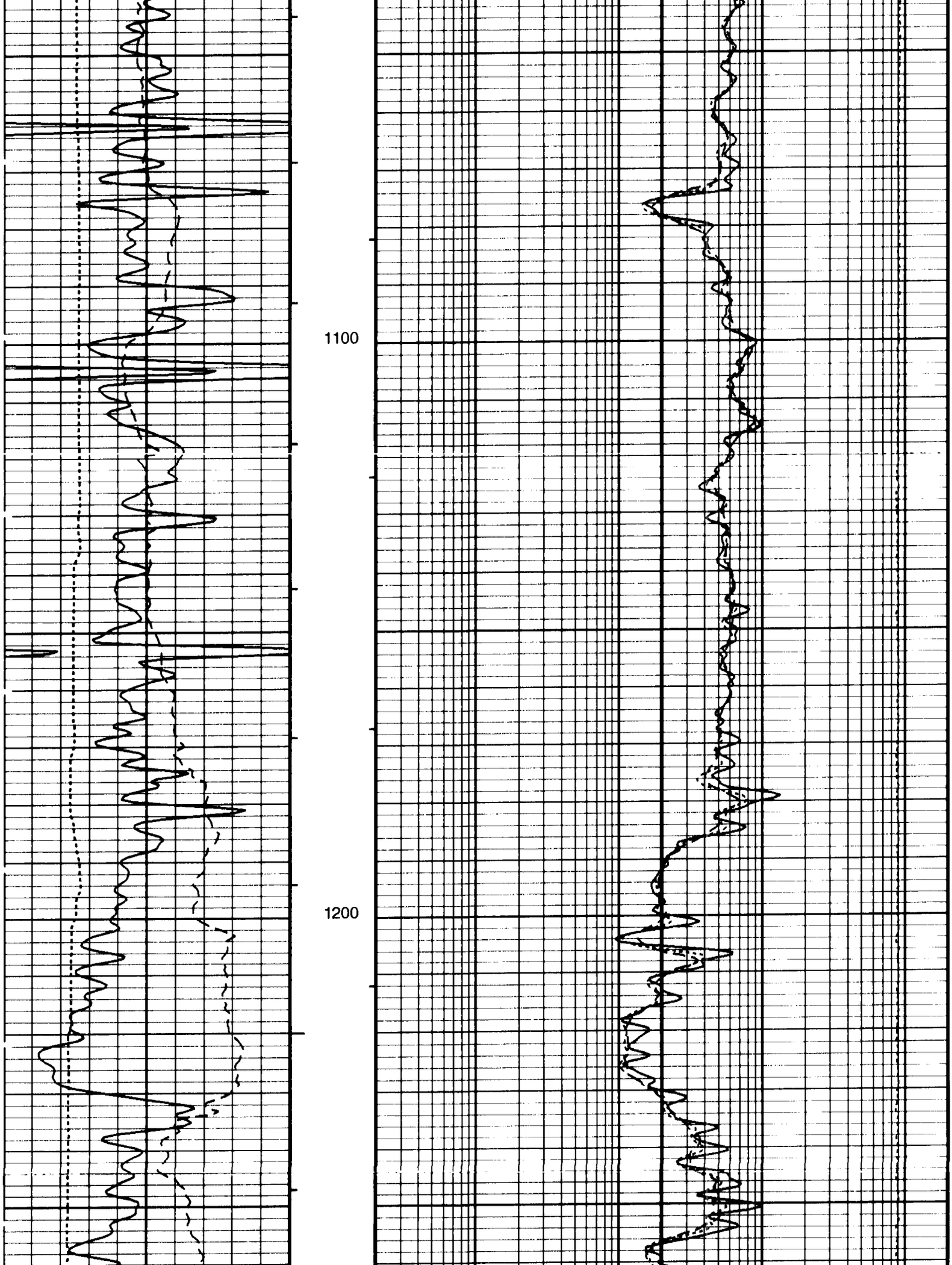
Deep Induction Phasor-processed Resistivity (IDPH) 0.2 (OHMM) 2000

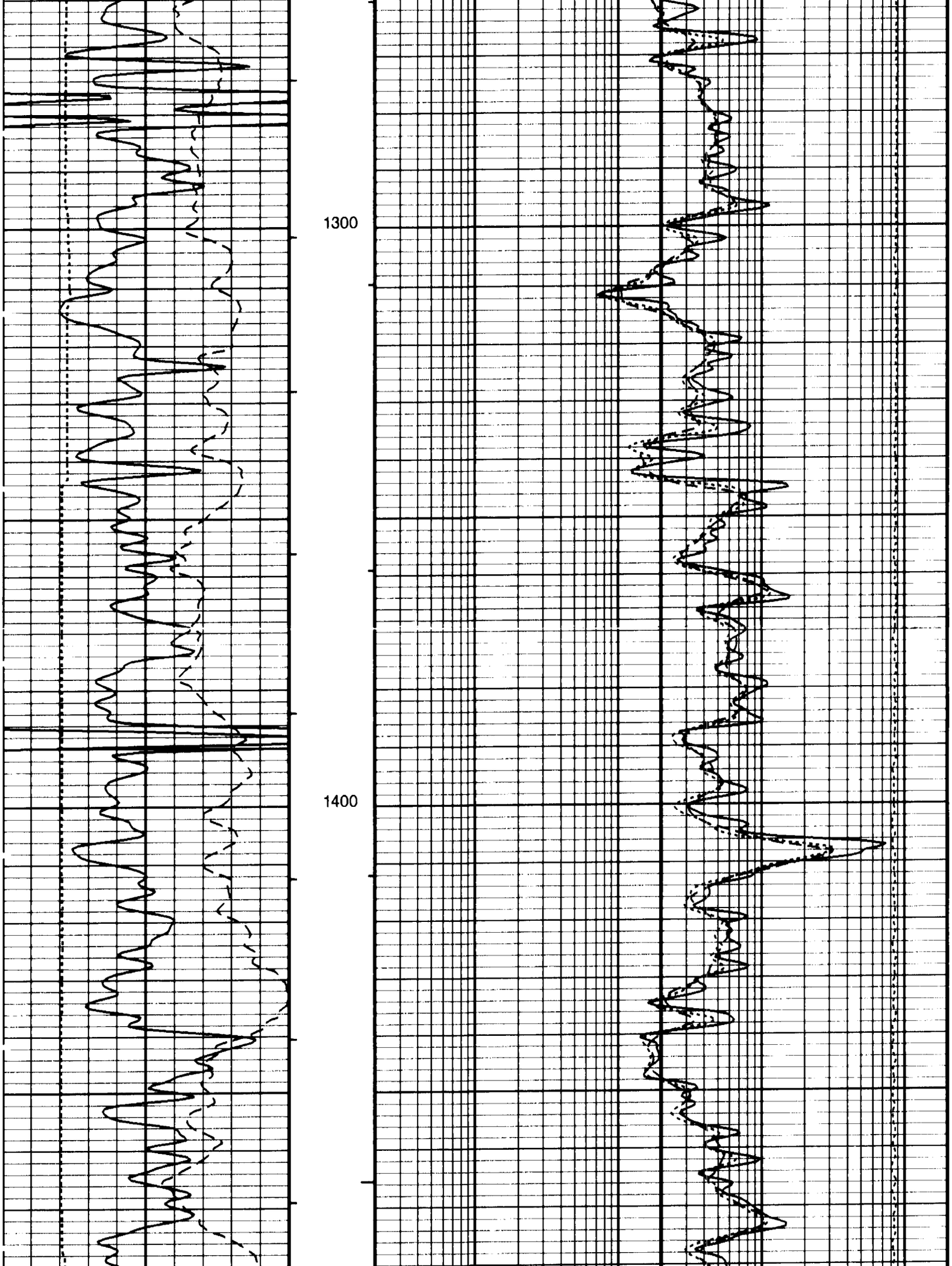


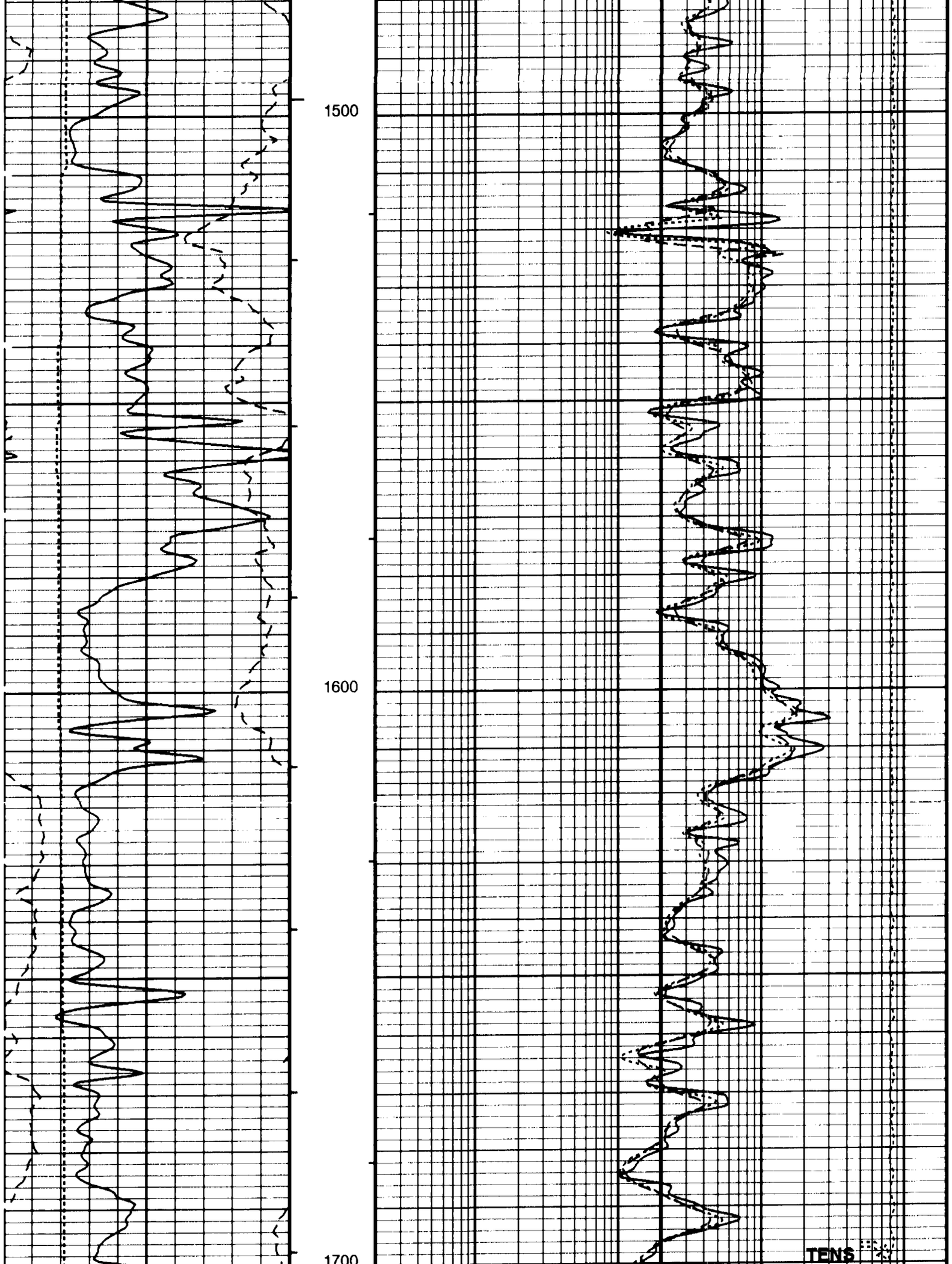

400
500
600

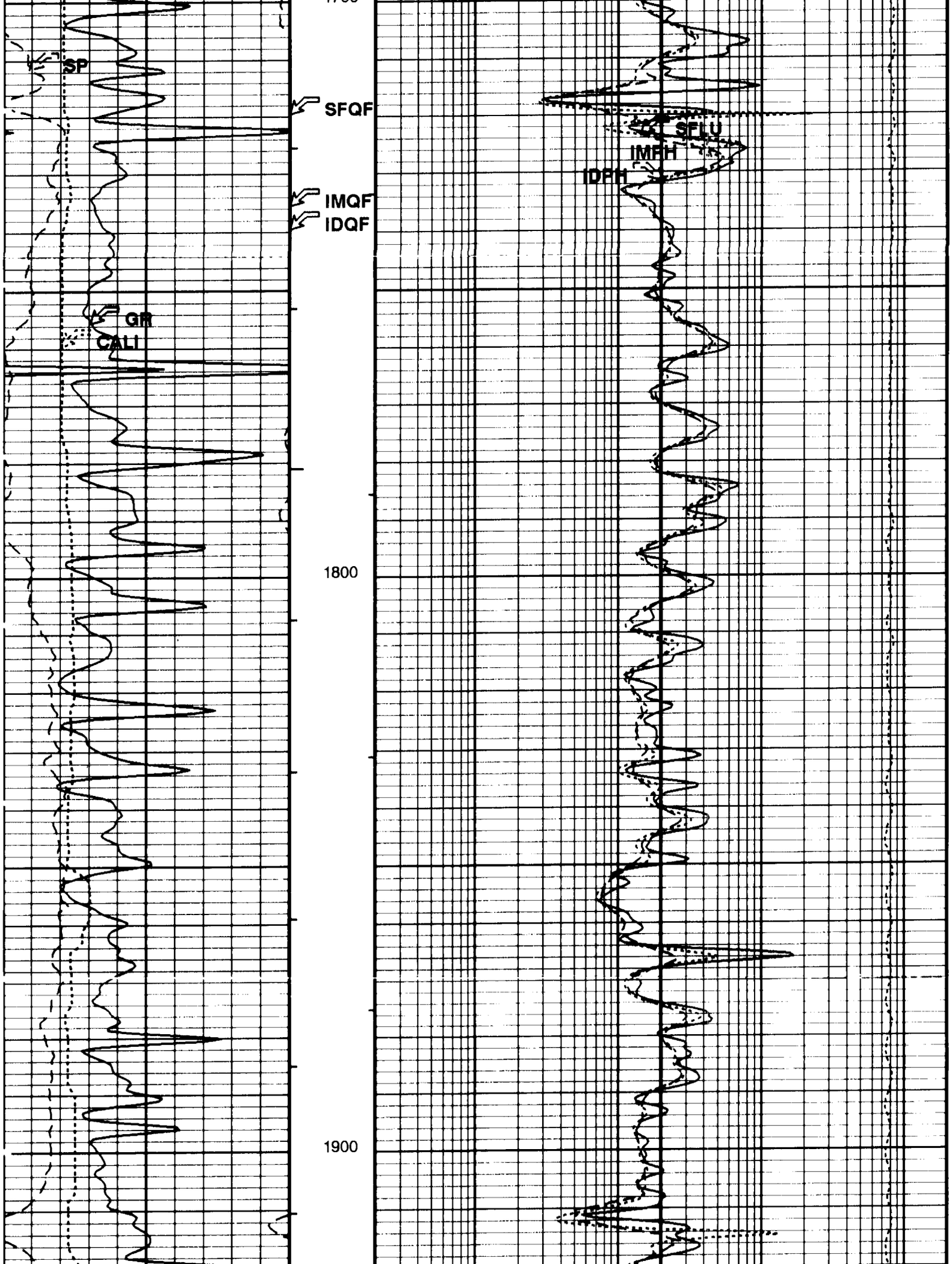

700
800
TENS
SP
SFQF

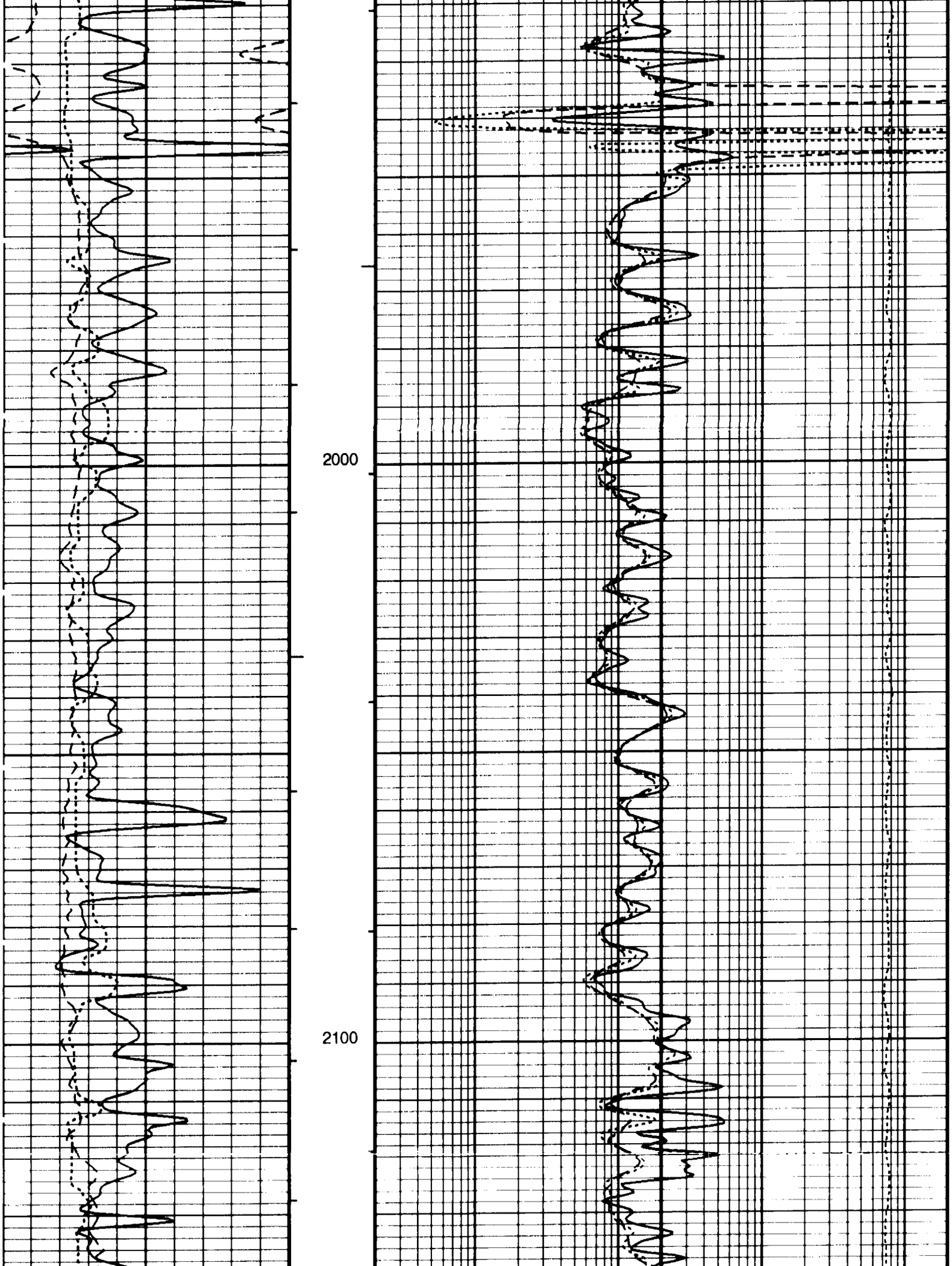

SFLU
IMPH
IDPH
IMQF
IDQF
GR
CALI
900
1000

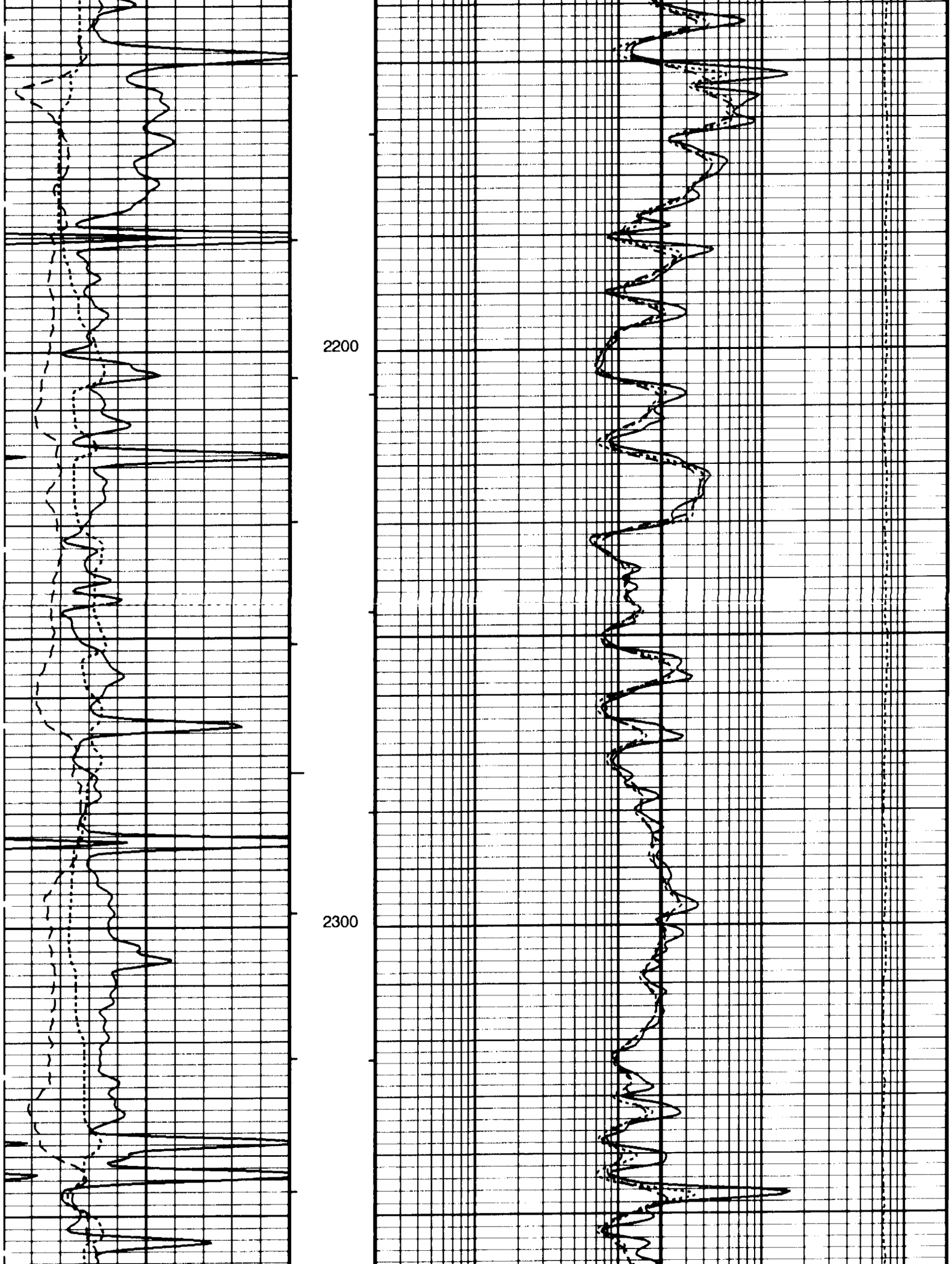

1100
1200

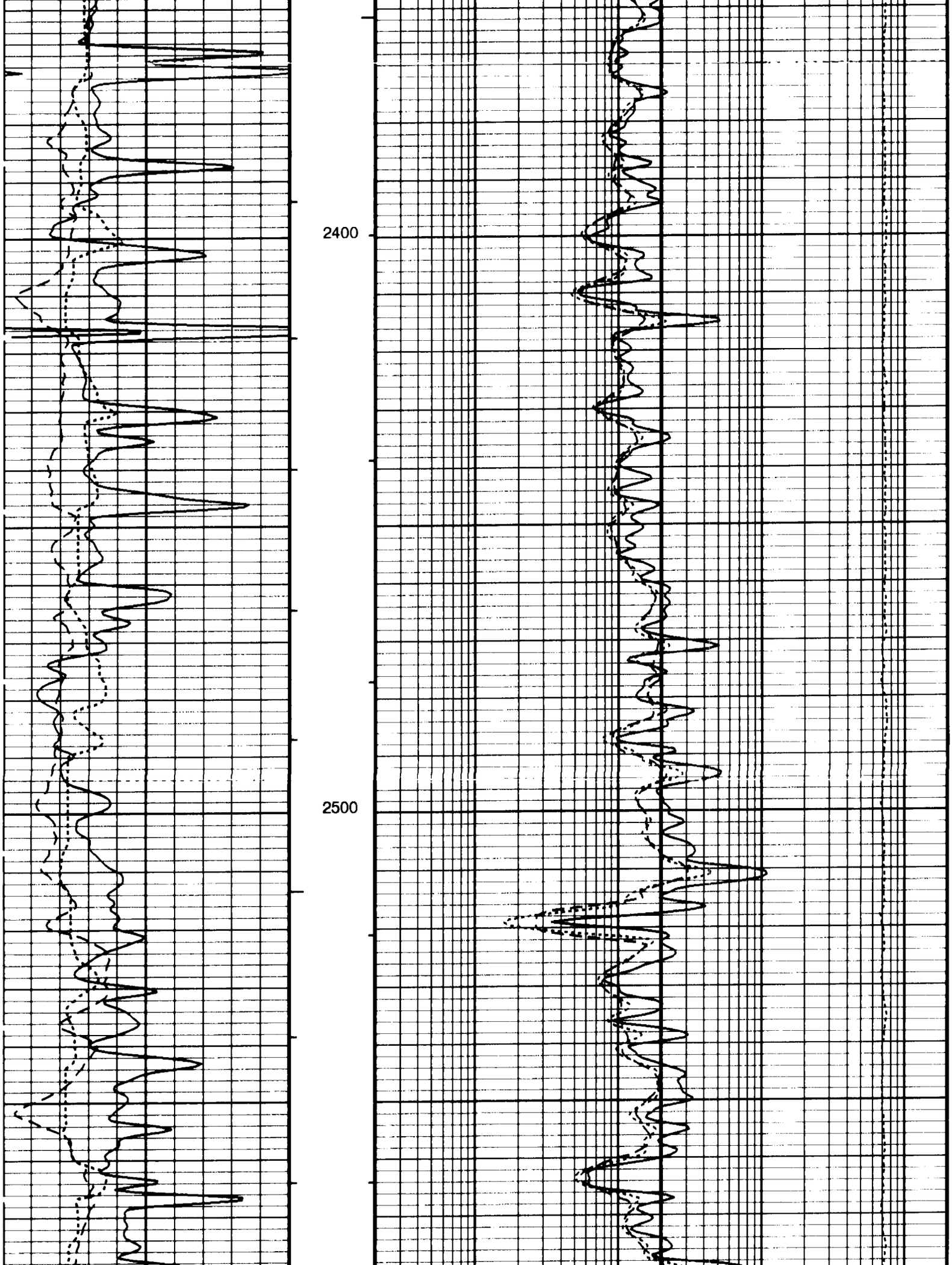

1300
1400

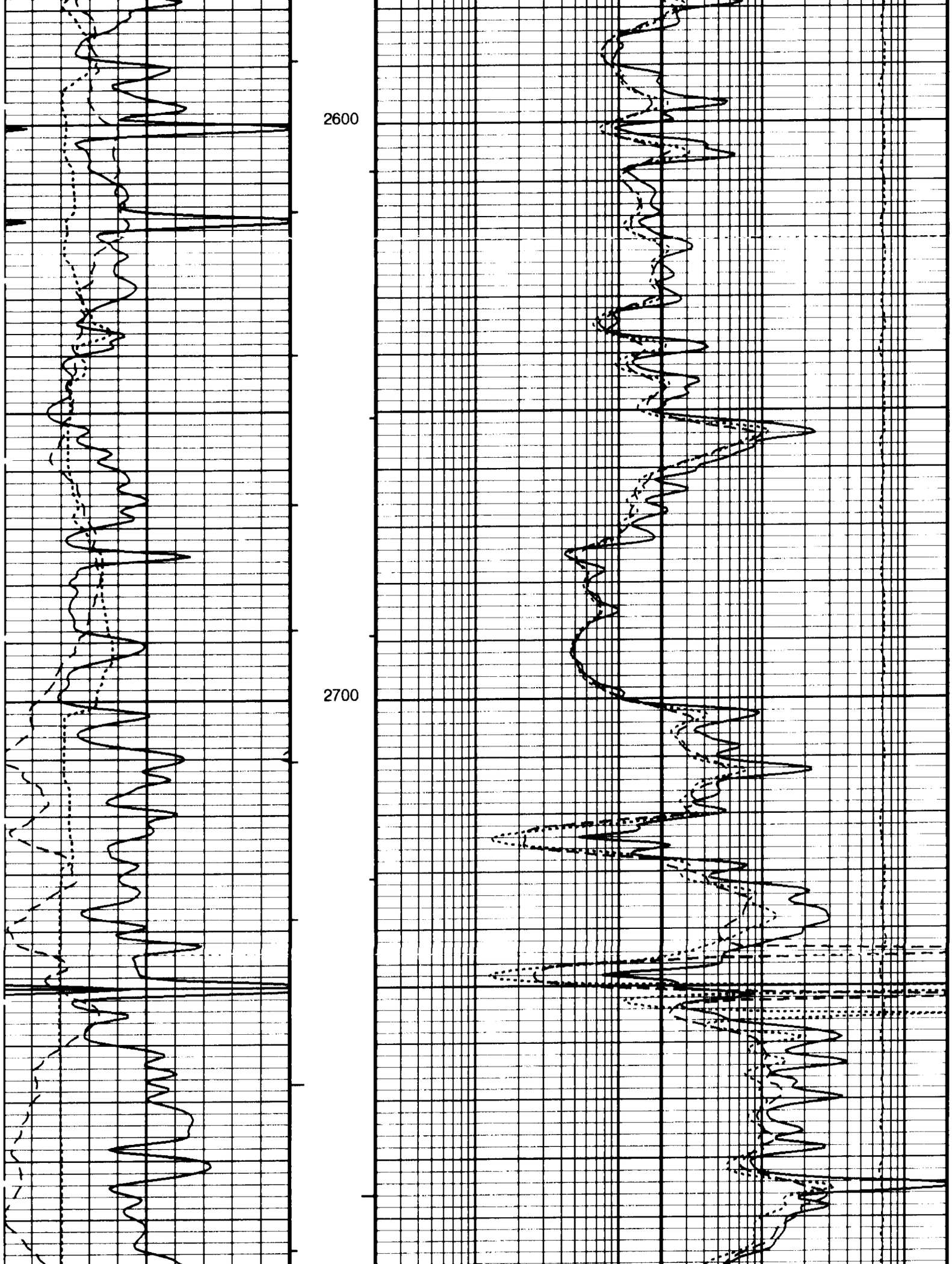

1500
1600
1700
TENS

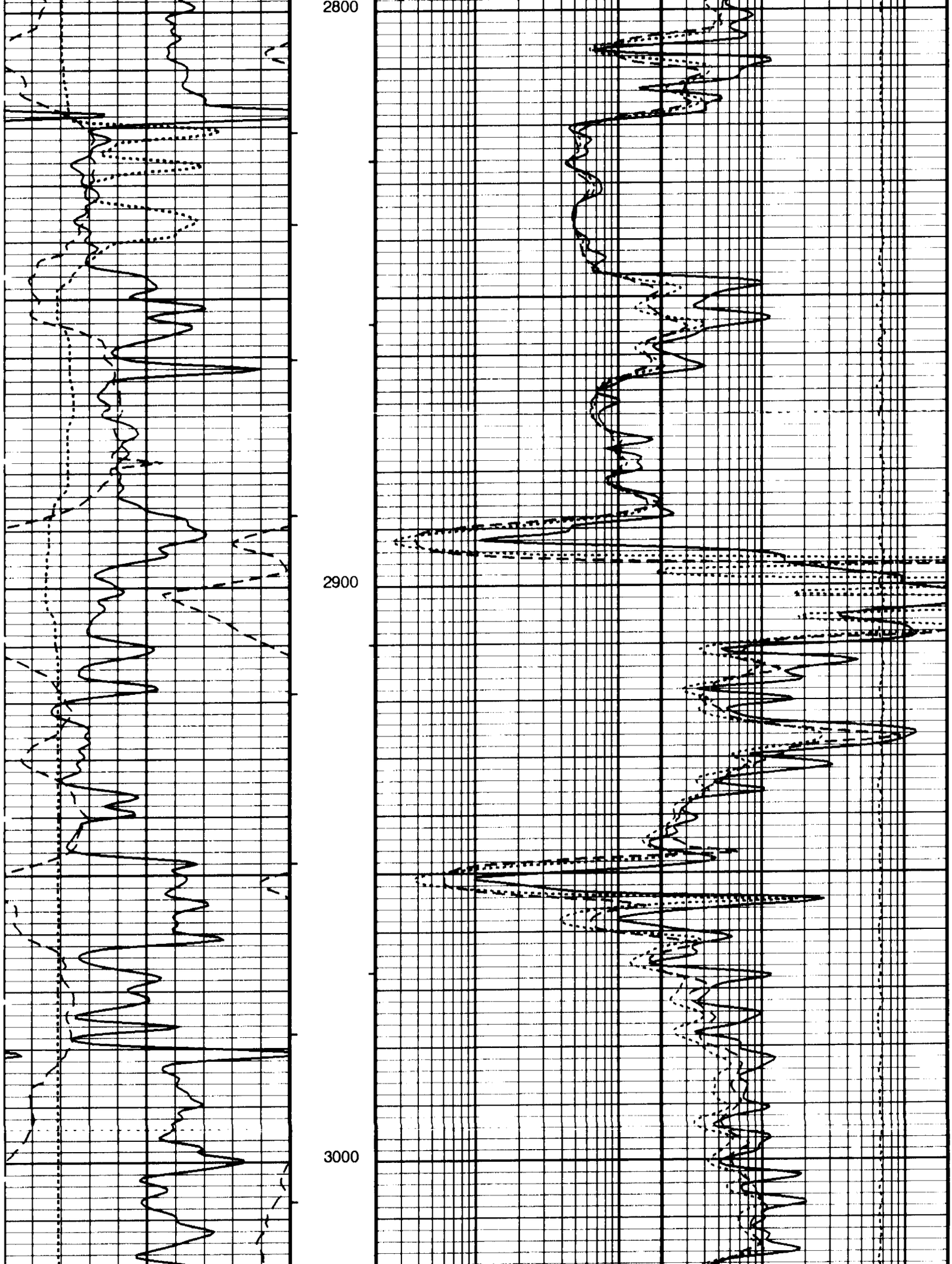

SP
SFQF
SFLU
IMPH
IDPH
IMQF
IDQF
GR
CALI
1800
1900

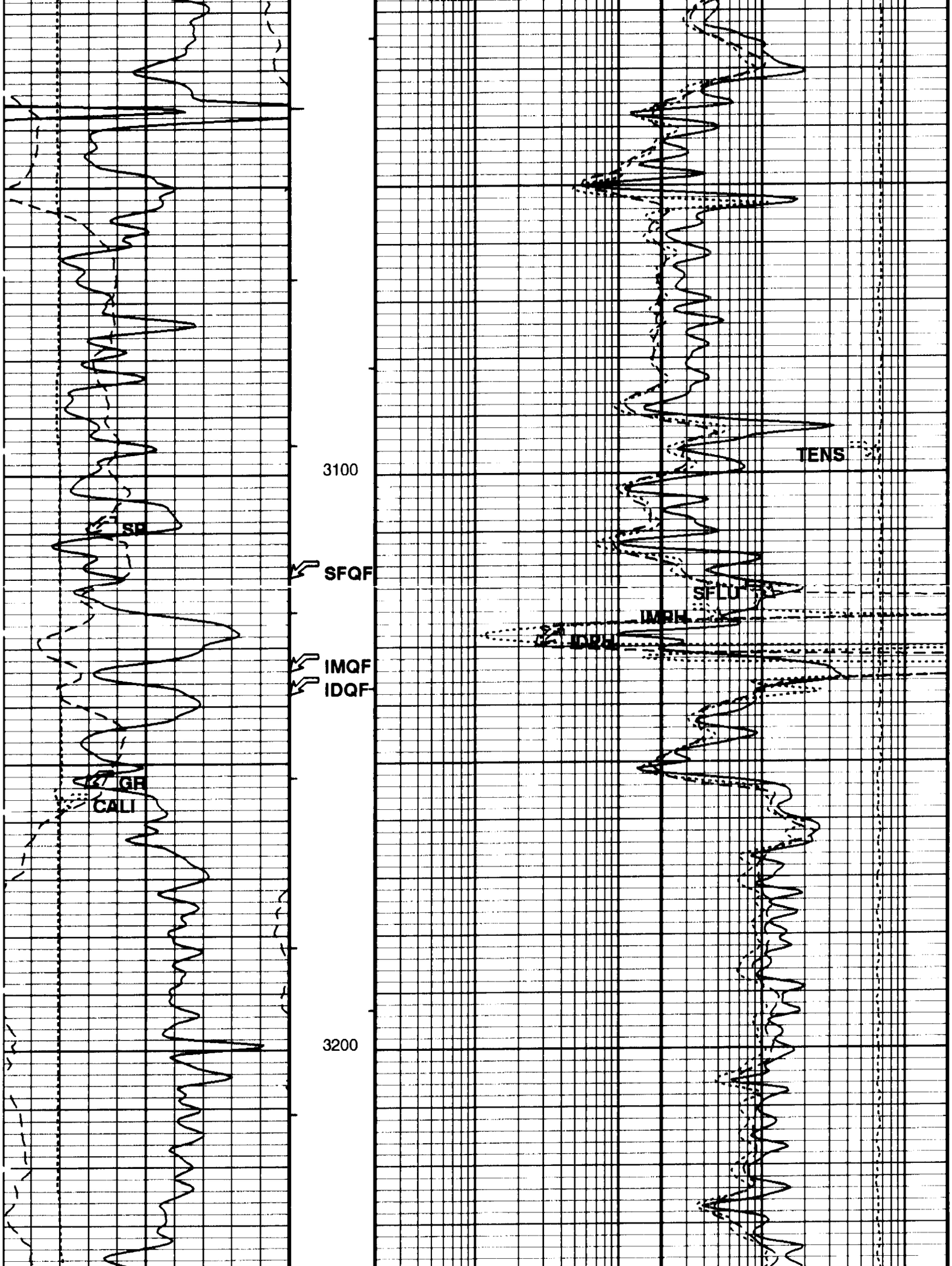

2000
2100

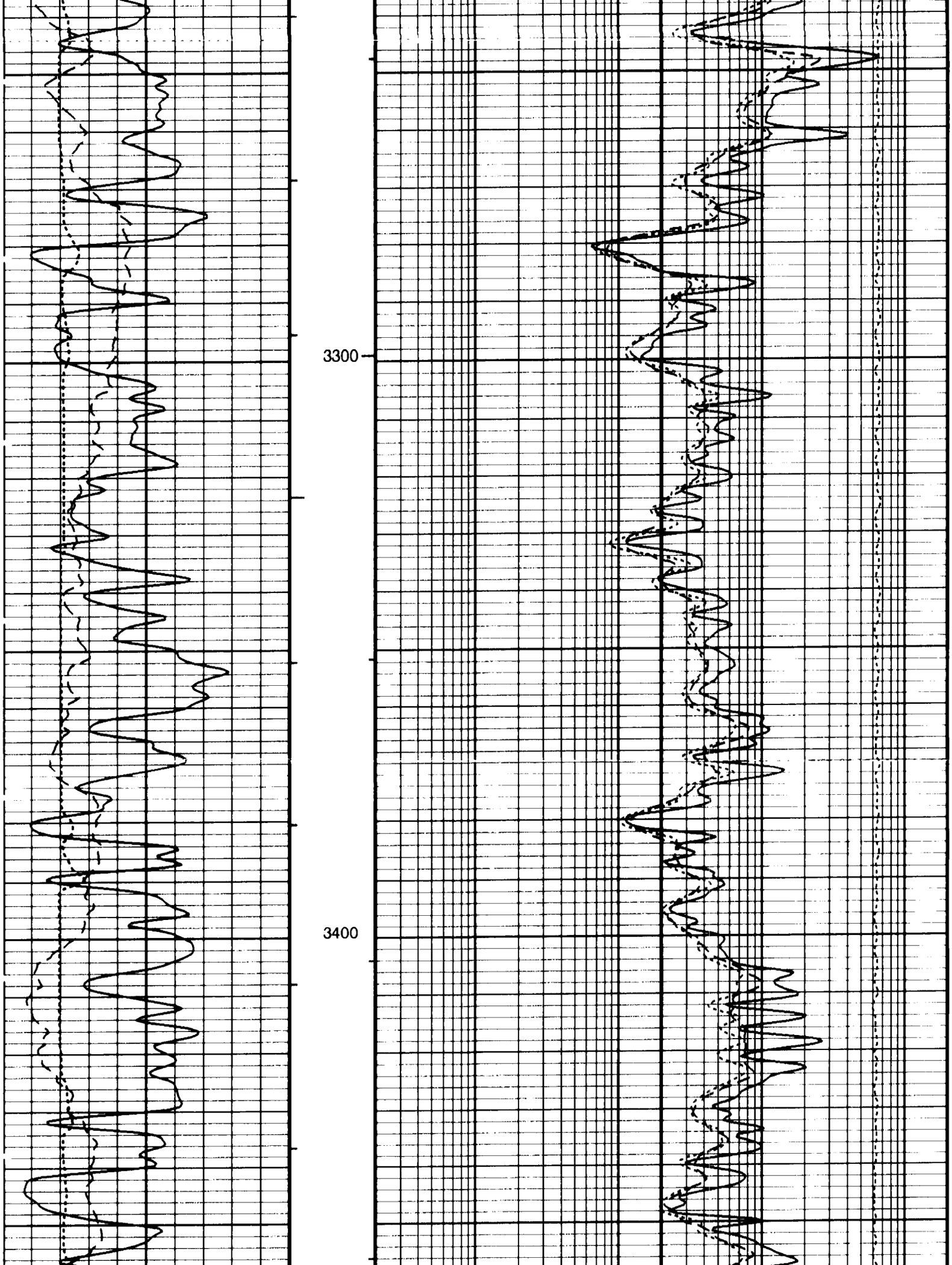

2200
2300

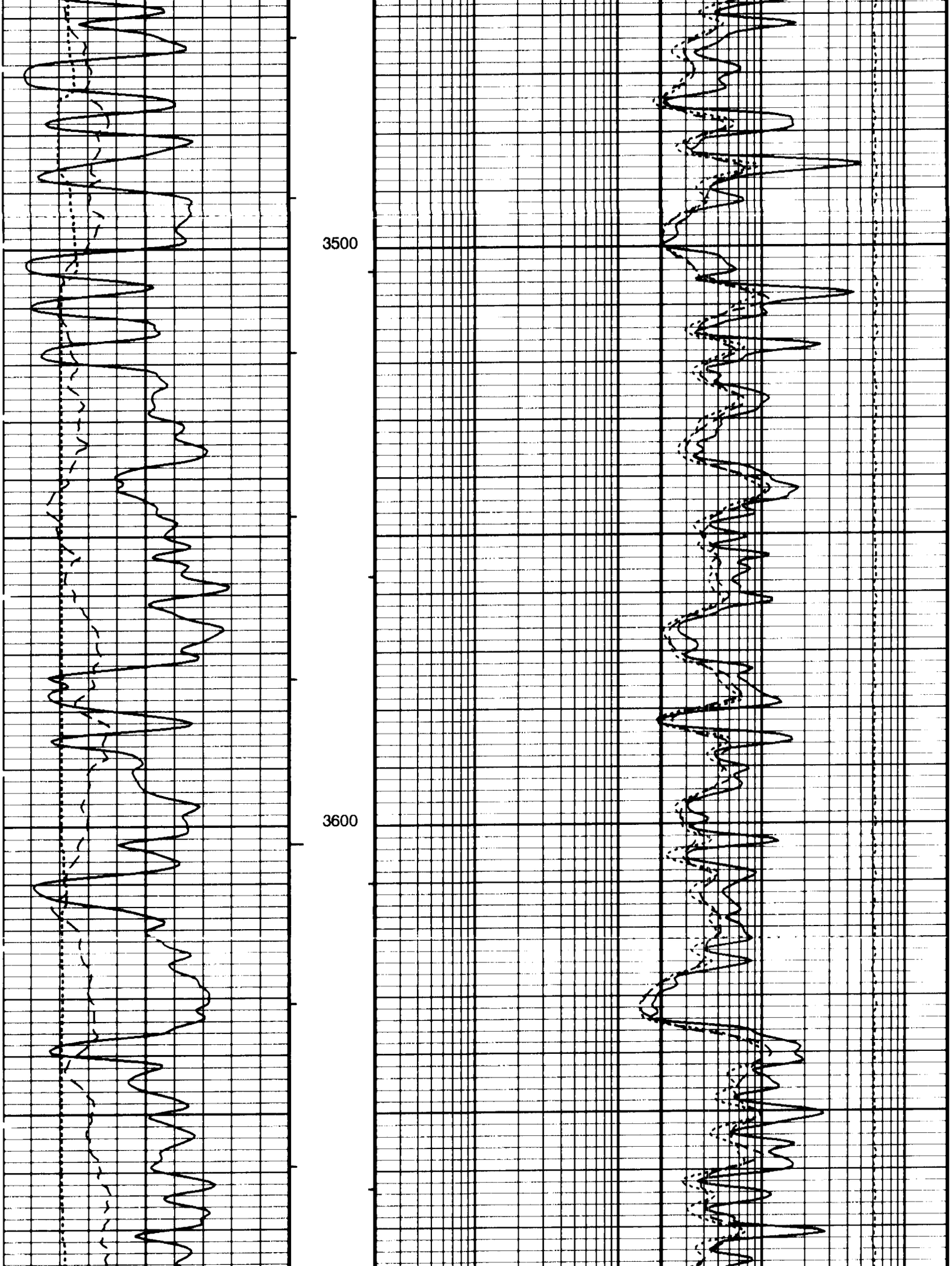

2400
2500

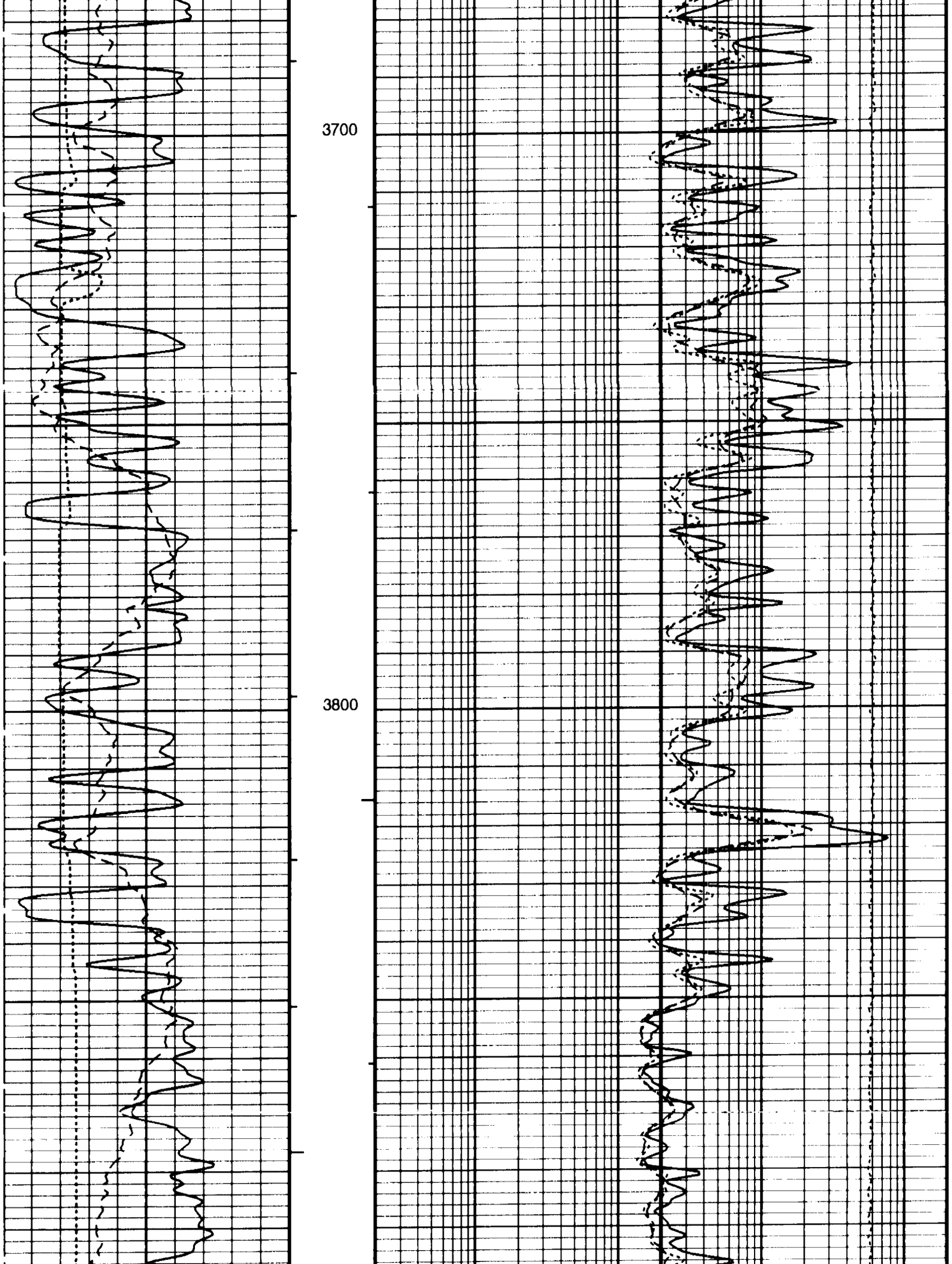

2600
2700

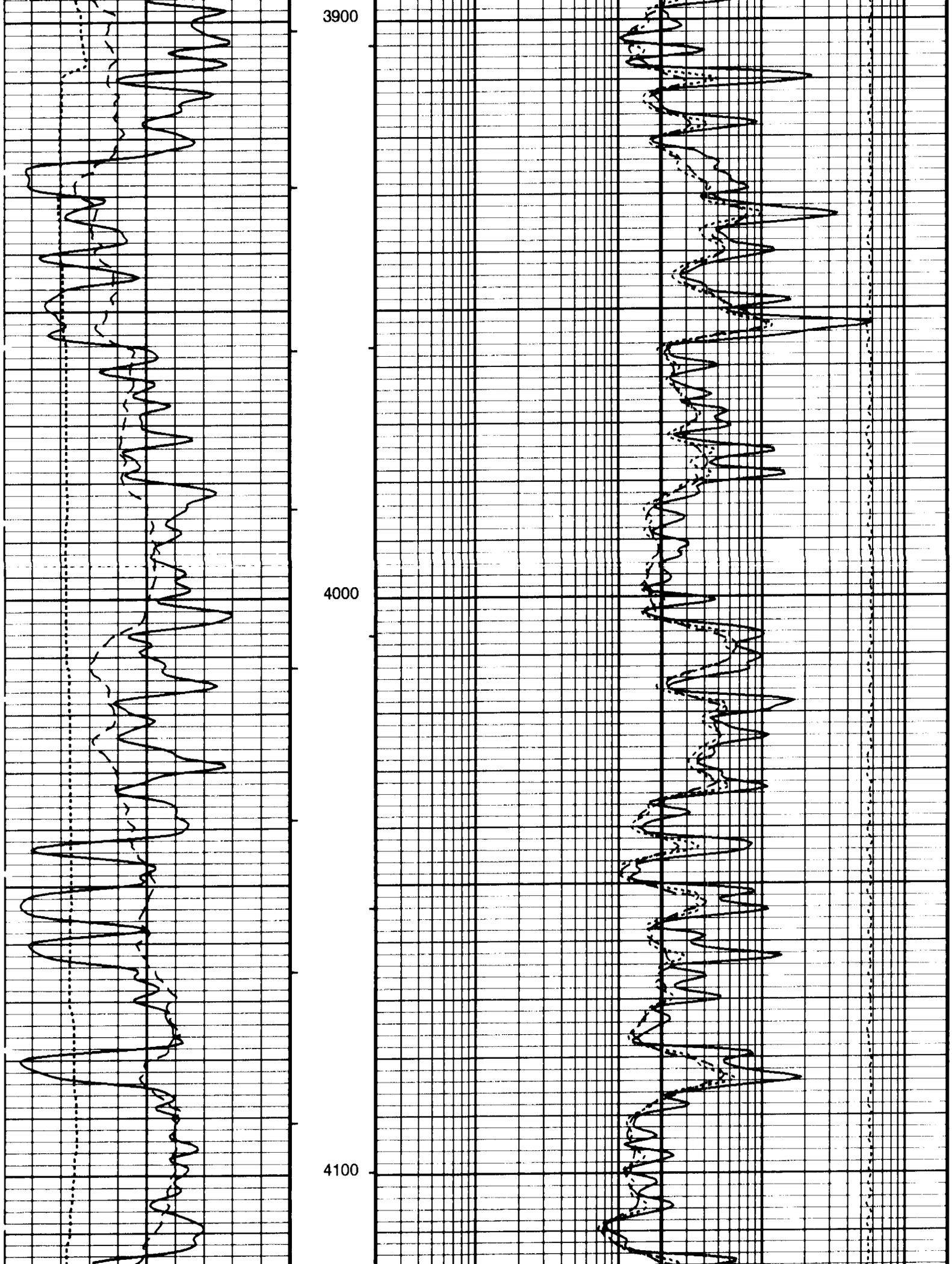

2800
2900
3000

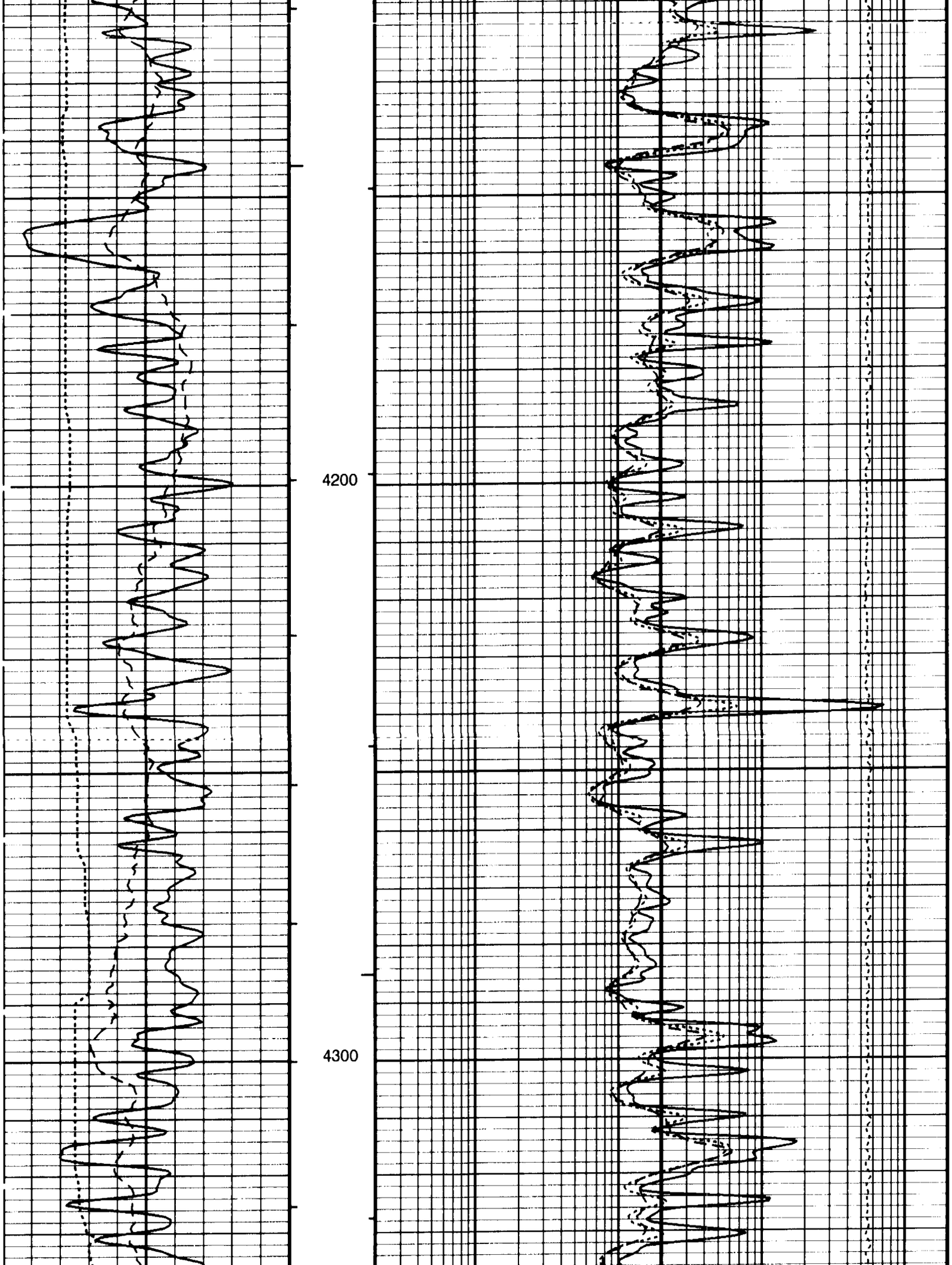

3100
3200
SP
SFQF
IMQF
IDQF
GR
CALI
TENS
SFLU
IMPH
IDPH

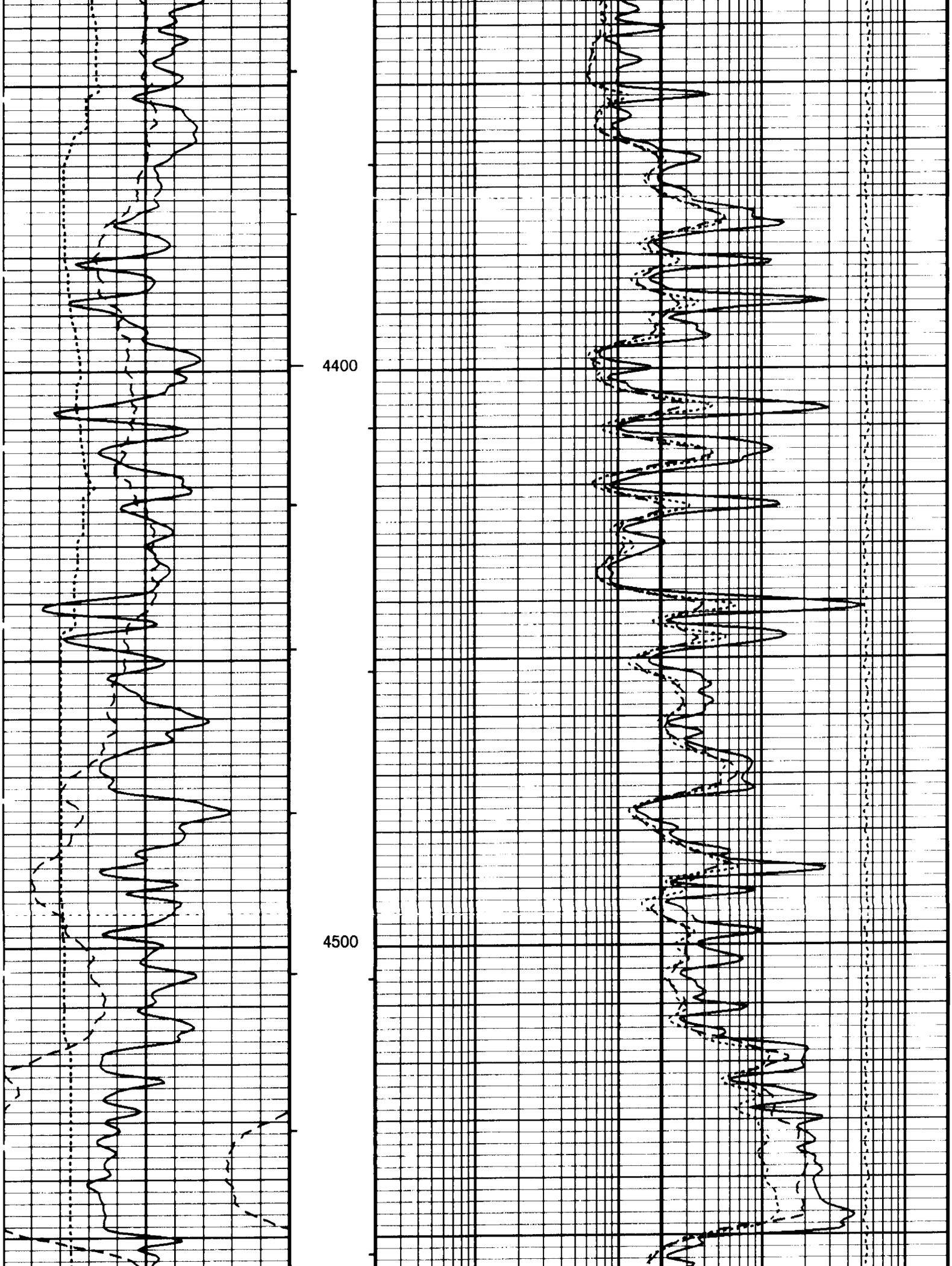

3300
3400

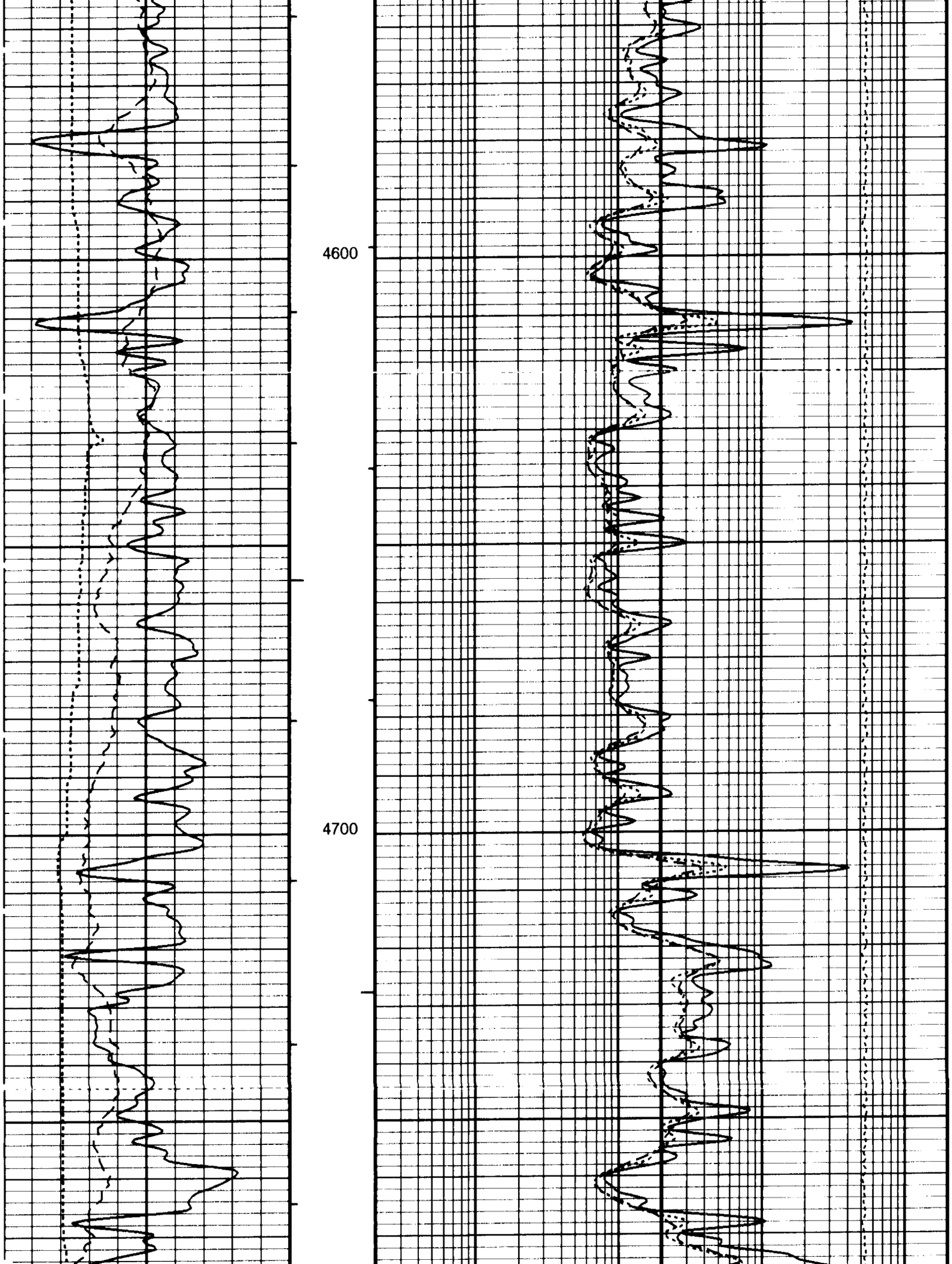

3500
3600

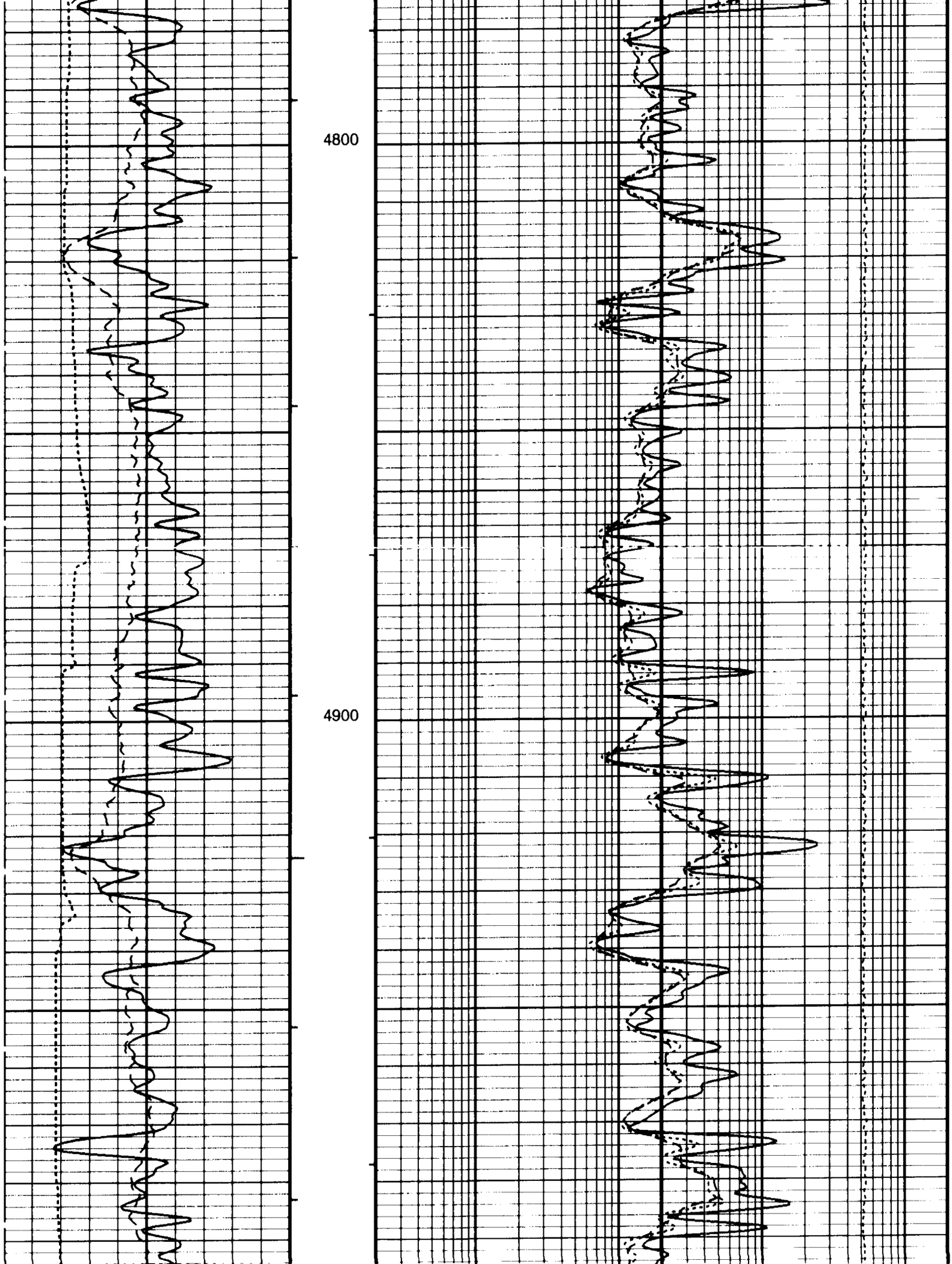

3700
3800

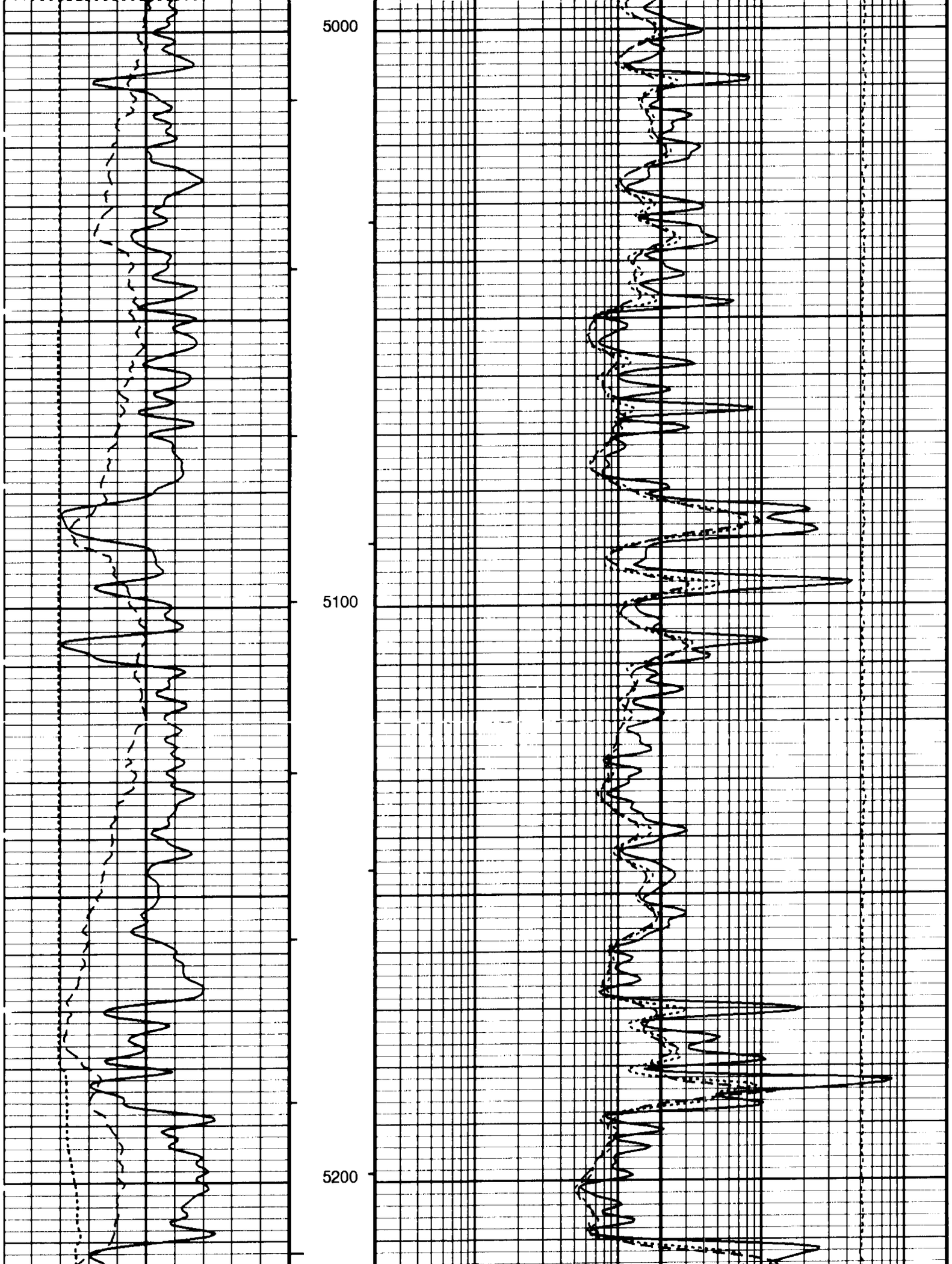

3900
4000
4100

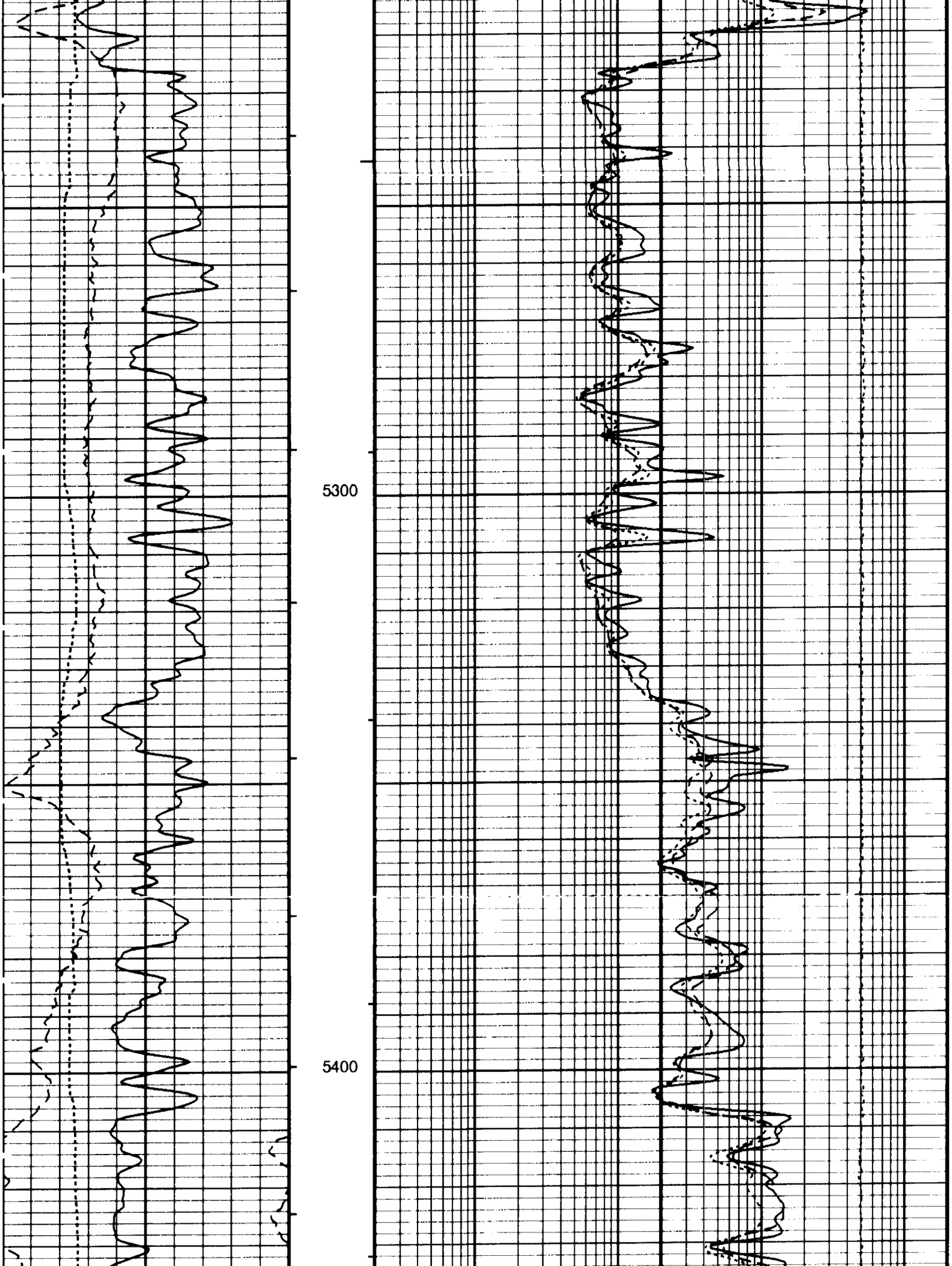

4200
4300

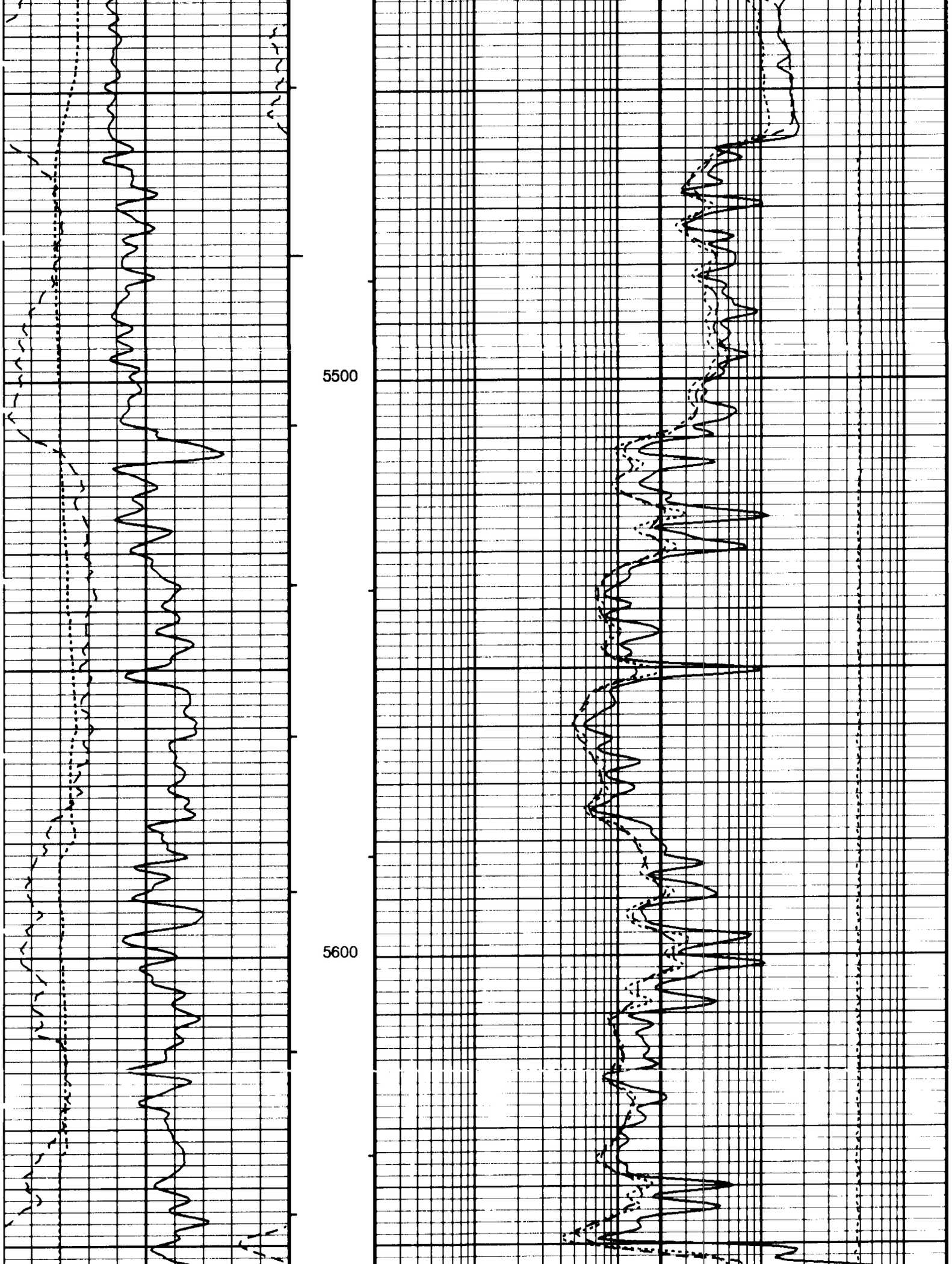

4400
4500

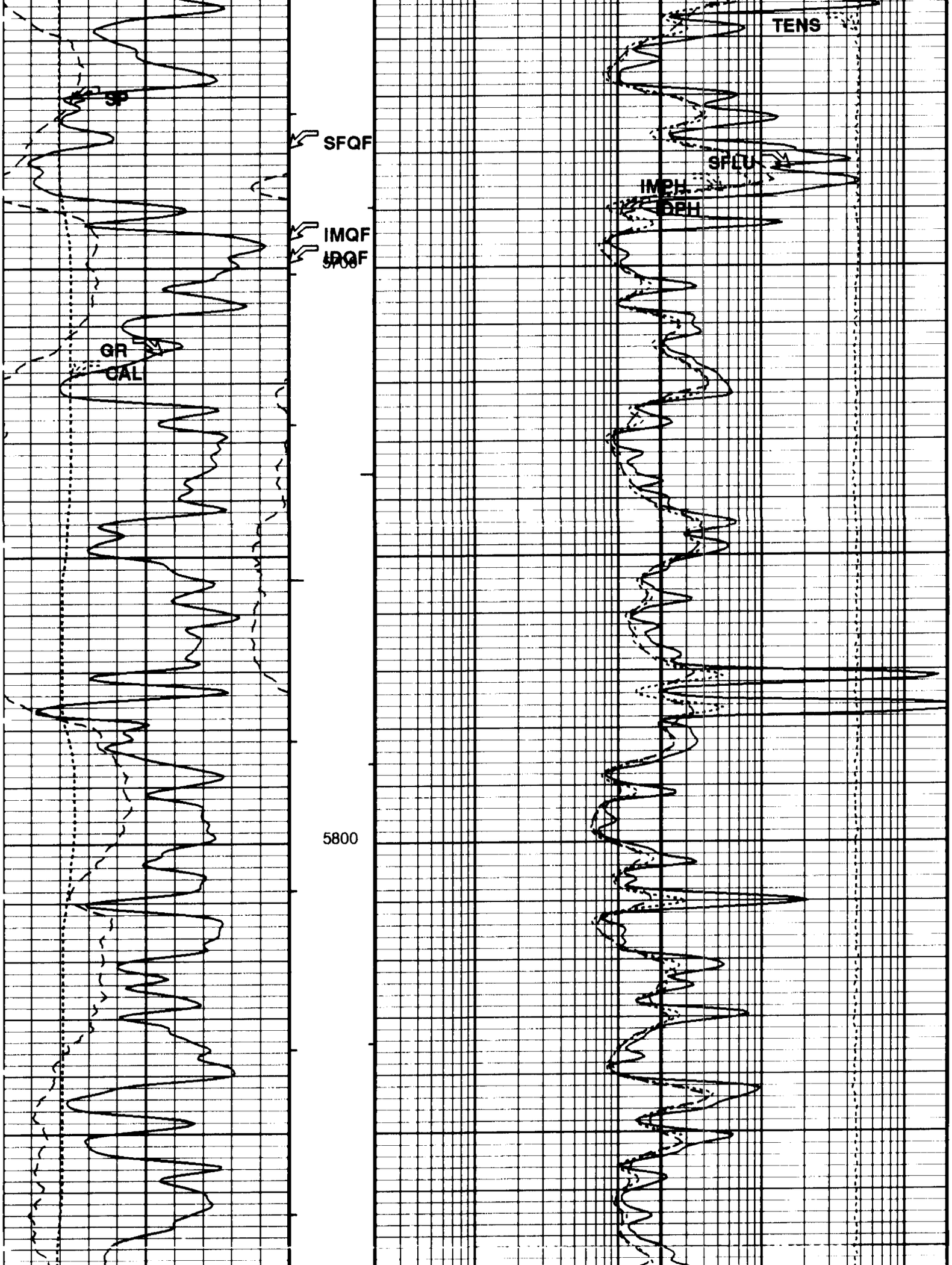

4600
4700

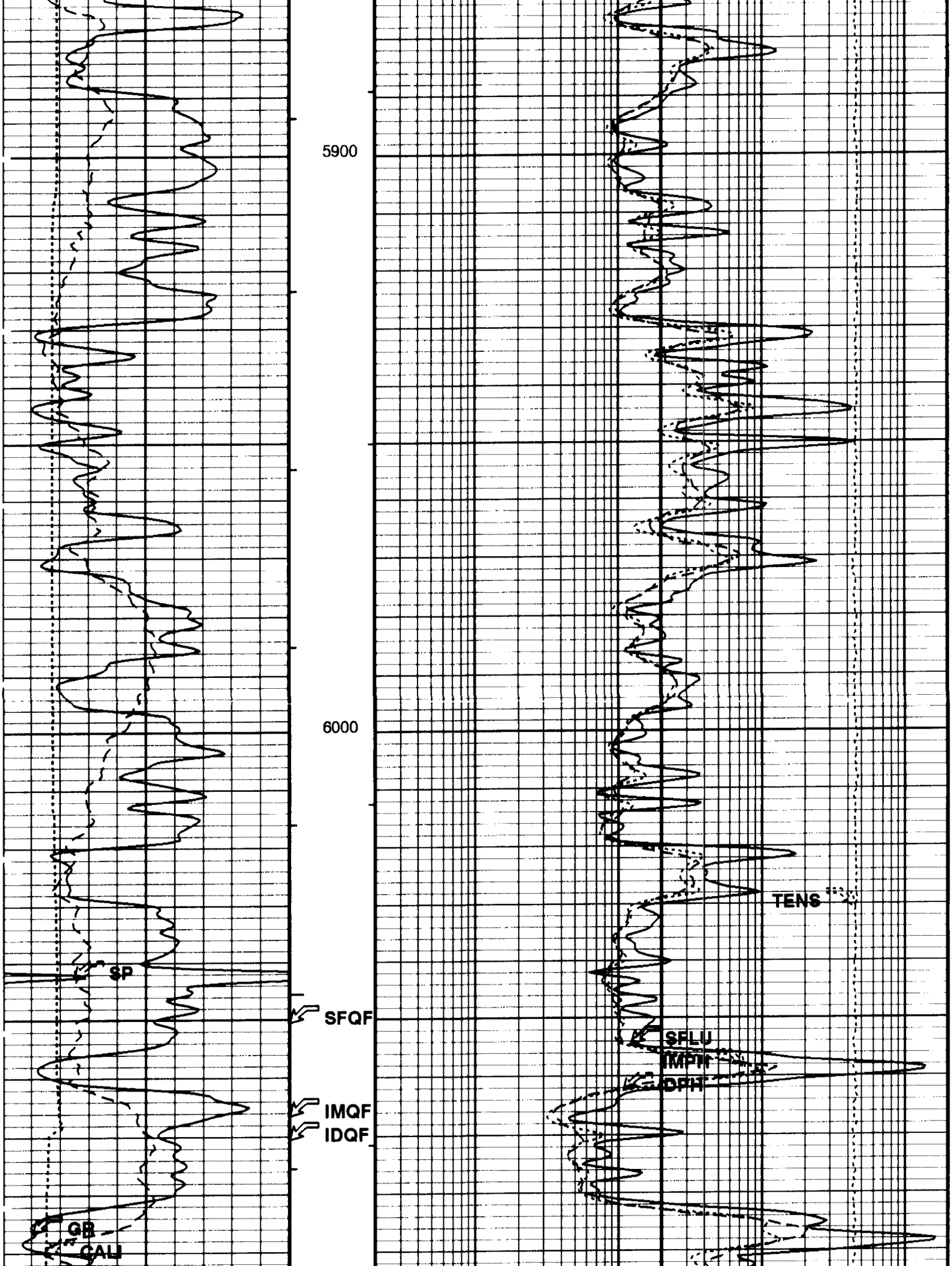

4800
4900

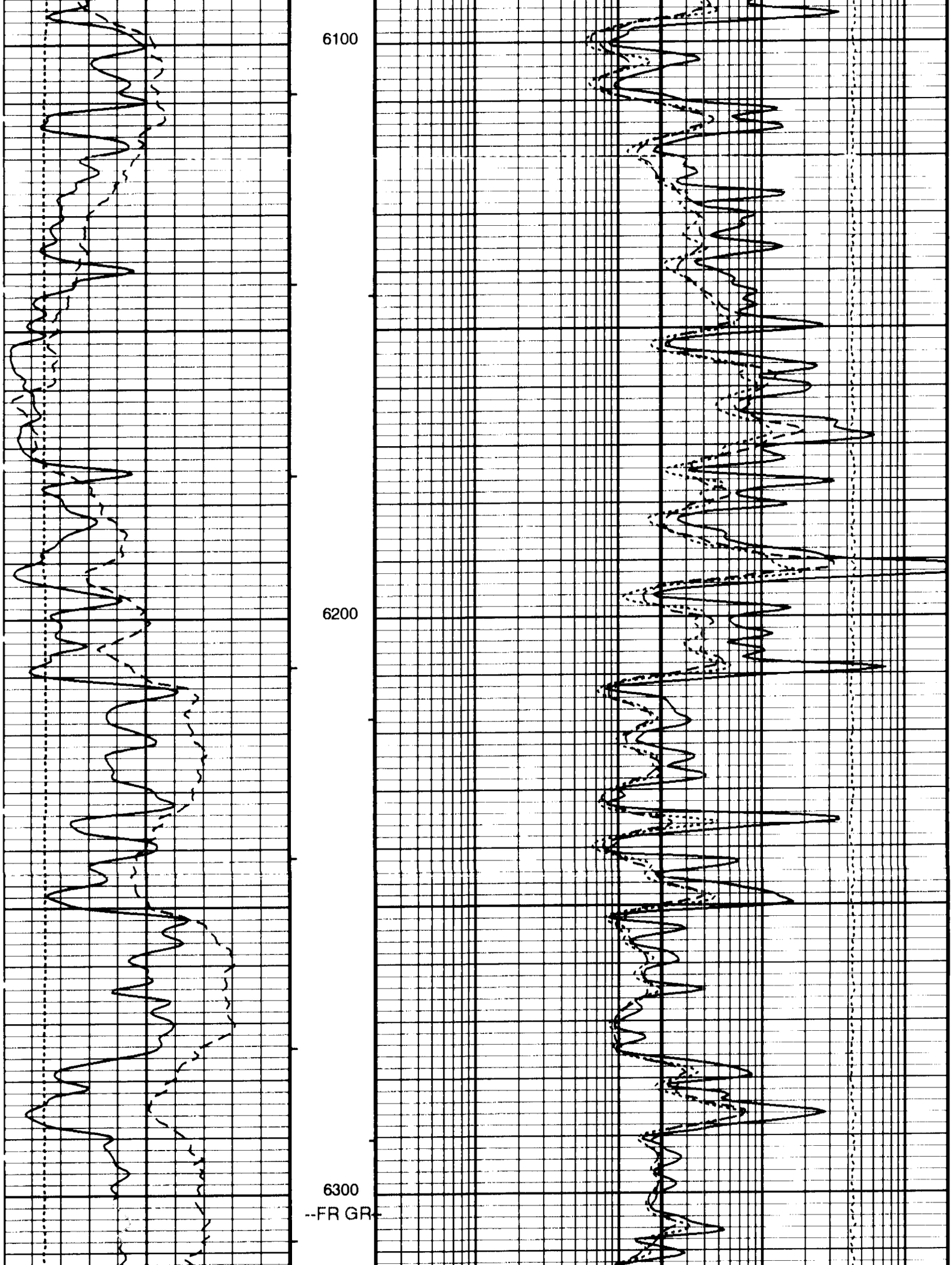

5000
5100
5200

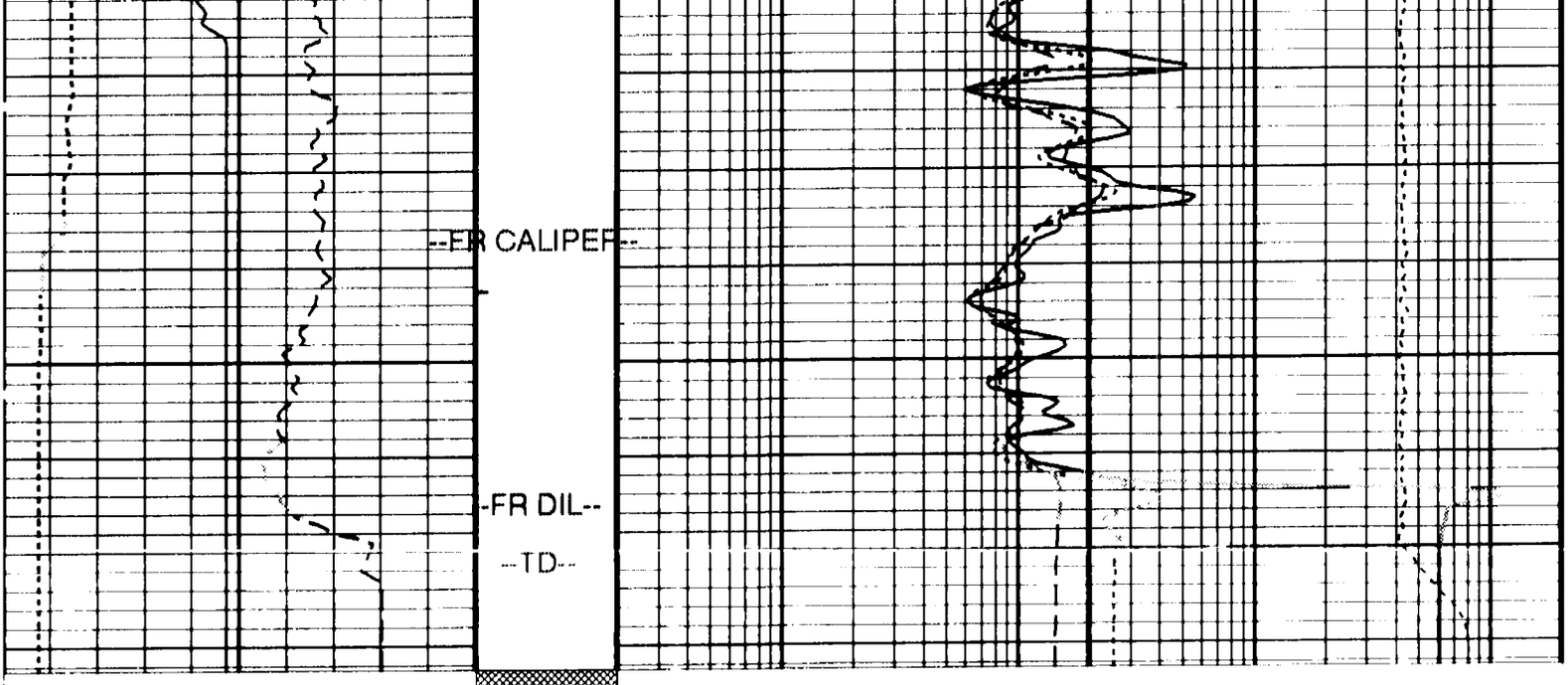

5300
5400


5500
5600


SP
SFQF
IMQF
IDQF
GR
CAL
5800
TENS
SFLU
IMPH
IDPH


5900
6000
TENS
SP
SFQF
SFLU
IMPH
DPH
IMQF
IDQF
GR
CALI


6100
6200
6300
--FR GR-



Gamma Ray (GR) 0 (GAPI) 200	ID_QUAL From IMQF to IDQF	Deep Induction Phasor-processed Resistivity (IDPH) 0.2 (OHMM) 2000
SP (SP) -80 (MV) 20	IM_QUAL From SFQF to IMQF	Medium Induction Phasor-processed Resistivity (IMPH) 0.2 (OHMM) 2000
Caliper (CALI) 6 (IN) 16	SFL_QUAL From D3T to SFQF	SFL Unaveraged (SFLU) 0.2 (OHMM) 2000
		Tension (TENS) 10000 (LBF) 0

MAIN PASS

PIP SUMMARY

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
DFD	Drilling Fluid Density	8.30	LB/G
DGF2	Deep 20 kHz Gain Factor	1.00198	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPH2	Deep 20 kHz Phase Shift	-6.312986e-02	DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	16.0532	MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843	MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	57.2113	MM/M
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
IFRS	DIT-E Induction Frequency Selector	20	
IPHA	DIT-E Phasor Processing Mode	ALL	
IPRO	DIT-E Induction Processing Selector	PHASOR	
ITEN	DIT-E Temperature Enable	ENABLE	
MGF2	Medium 20 kHz Gain Factor	1.01335	
MPH2	Medium 20 kHz Phase Shift	-1.03565	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	20.5788	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	80.9827	MM/M
SFCR	SFL Channel Ratio	1000	
SHT	Surface Hole Temperature	30	DEGF
SPNV	SP Next Value	0	MV

TD	Total Depth	6385	FT

Format: LogStandard Vertical Scale: 5" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427
DBM

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Input DLIS Files

DEFAULT	DITE .005	FN:4	FIELD	14-JAN-1996 10:09	6385.0 FT	6033.0 FT

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Integrated Hole/Cement Volume Summary

Hole Volume = 104.71 F3

Cement Volume = 46.80 F3 (assuming 5.50 IN casing O.D.)

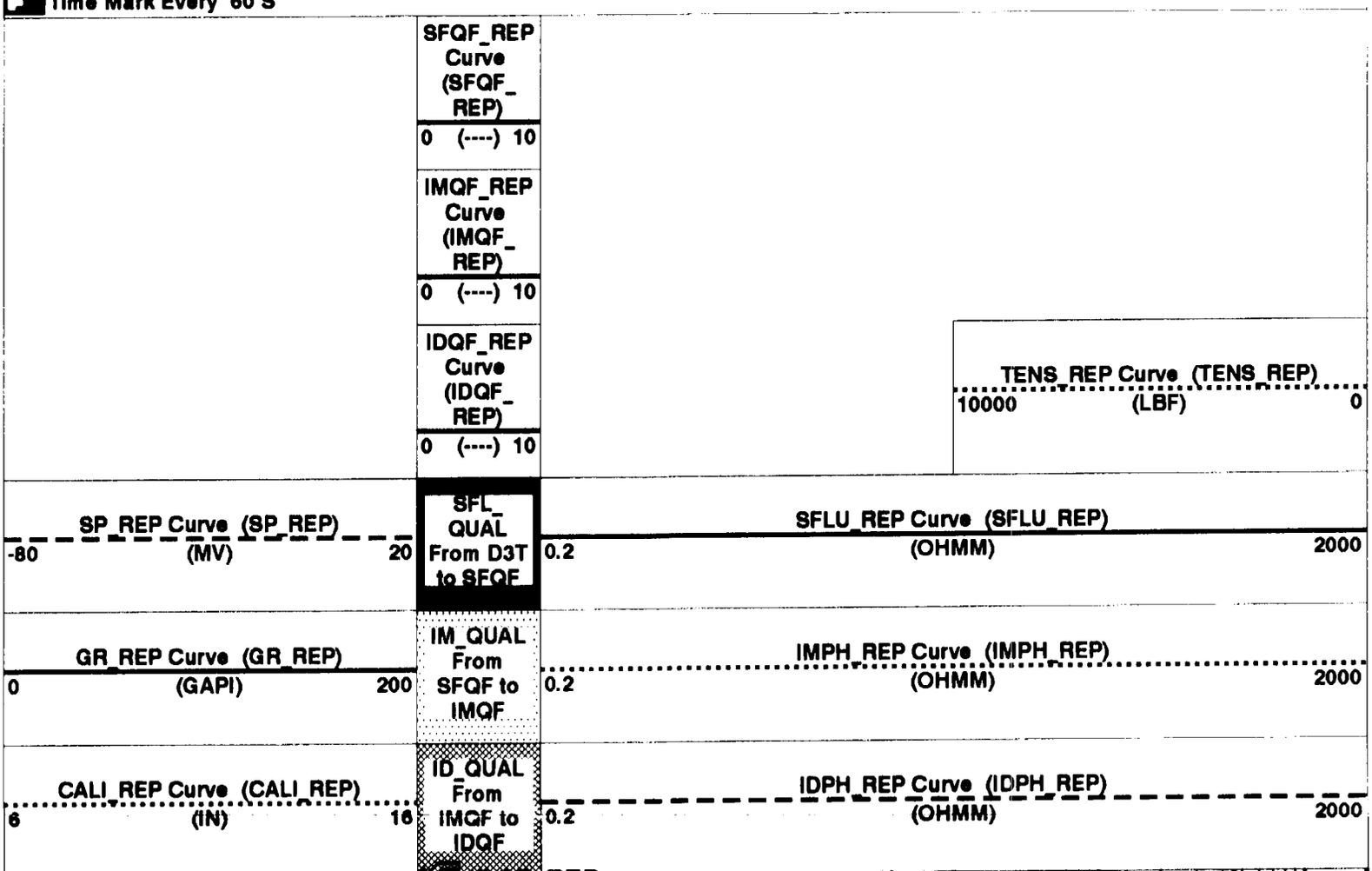
Computed from 6382.5 FT to 6032.0 FT using data channel(s) CALI (per GCSE parameter setting)

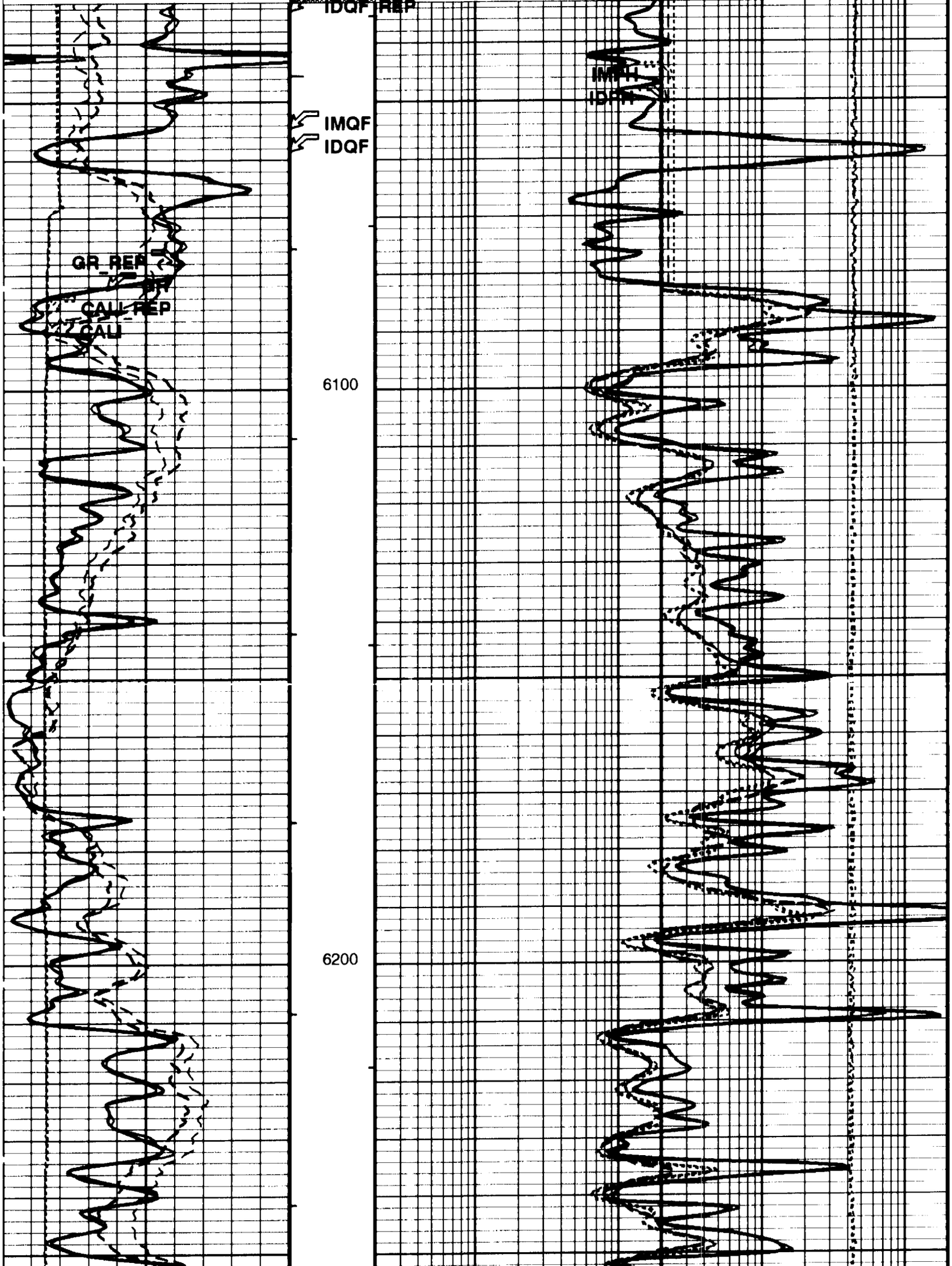
OP System Version: 7C0-427
DBM

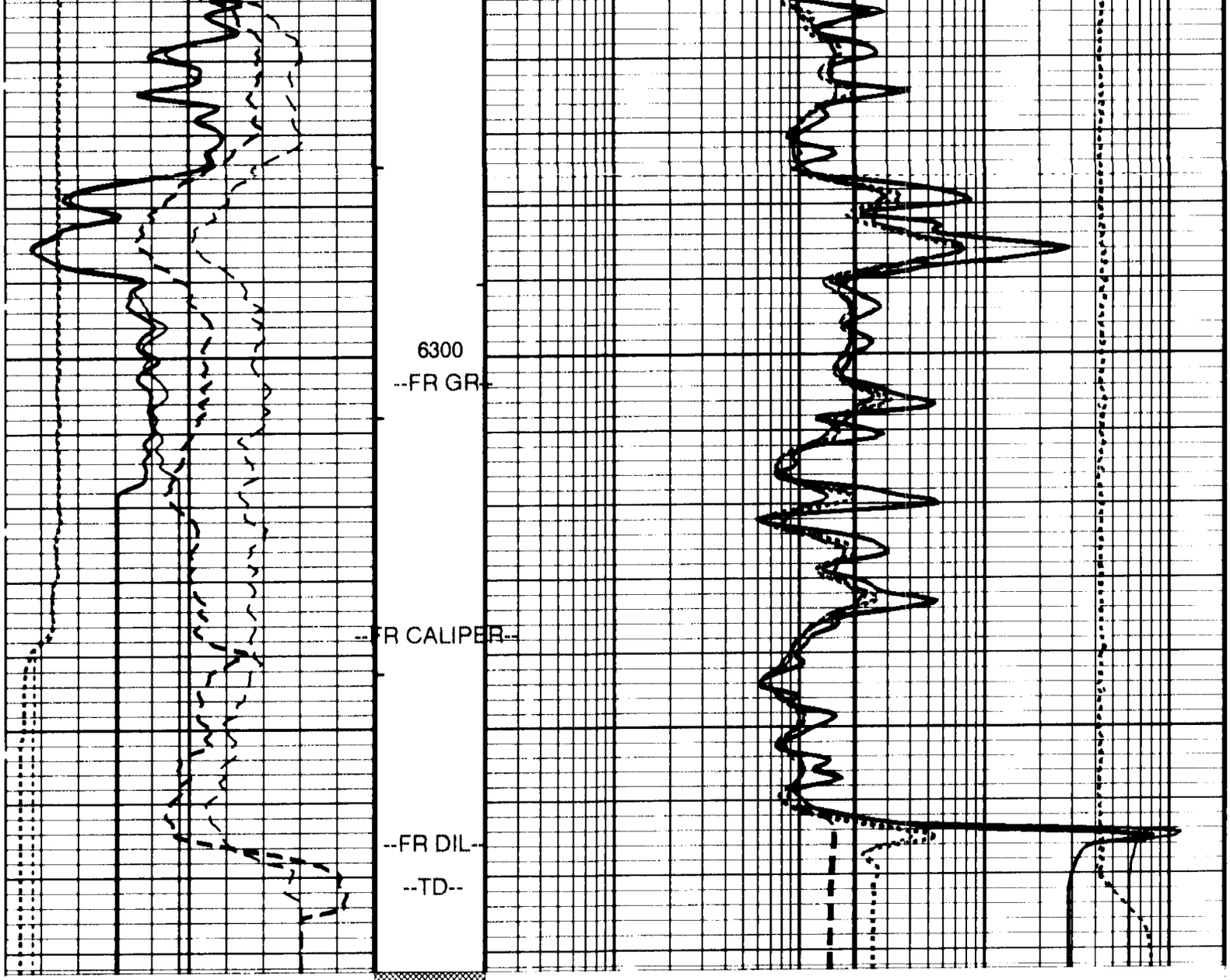
PIP SUMMARY

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

Time Mark Every 60 S




IDQF_REP
IMQF
IDQF
GR_REP
CALI_REP
CALI
6100
6200



CALI_REP Curve (CALI_REP)
6 (IN) 16

ID_QUAL From IMQF to IDQF

IDPH_REP Curve (IDPH_REP)
0.2 (OHMM) 2000

GR_REP Curve (GR_REP)
0 (GAPI) 200

IM_QUAL From SFQF to IMQF

IMPH_REP Curve (IMPH_REP)
0.2 (OHMM) 2000

SP_REP Curve (SP_REP)
-80 (MV) 20

SFL_QUAL From D3T to SFQF

SFLU_REP Curve (SFLU_REP)
0.2 (OHMM) 2000

REPEAT ANALYSIS

IDQF_REP Curve (IDQF_REP)
0 (----) 10

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

IMQF_REP Curve (IMQF_REP)
0 (----) 10

SFQF_REP

Curve (SFQF_REP)
0 (----) 10

PIP SUMMARY

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

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
BHT	Bottom Hole Temperature (used in calculations)	140	DEGF
DFD	Drilling Fluid Density	8.30	LB/G
DGF2	Deep 20 kHz Gain Factor	1.00198	
DORL	Depth Offset Repeat Analysis	0.0	FT
DPH2	Deep 20 kHz Phase Shift	-6.312986e-02	DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	16.0532	MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843	MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	57.2113	MM/M
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
IFRS	DIT-E Induction Frequency Selector	20	
IPHA	DIT-E Phasor Processing Mode	ALL	
IPRO	DIT-E Induction Processing Selector	PHASOR	
ITEN	DIT-E Temperature Enable	ENABLE	
MGF2	Medium 20 kHz Gain Factor	1.01335	
MPH2	Medium 20 kHz Phase Shift	-1.03565	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	20.5788	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	80.9827	MM/M
SFCR	SFL Channel Ratio	1000	
SHT	Surface Hole Temperature	30	DEGF
SPNV	SP Next Value	0	MV
TD	Total Depth	6385	FT

Format: LogStandard_REP Vertical Scale: 5" per 100' Graphics File Created: 14-JAN-1996 10:29

OP System Version: 7C0-427

DBM

Input DLIS Files

DEFAULT	DITE .005	FN:4	FIELD	14-JAN-1996 10:09	6385.0 FT	6033.0 FT

Output DLIS Files

DEFAULT	DITE .006	FN:5	FIELD	14-JAN-1996 10:29

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Scintillation Gamma-Ray - L Wellsite Calibration Detector Calibration							
Before: Jan 14 08:49 1996							
Gamma Ray Background	30.00	N/A	45.78	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	163.5	N/A	163.5	N/A	N/A	14.86	GAPI
Gamma Ray (Calibrated)	167.0	N/A	167.0	N/A	N/A	15.00	GAPI

Dual Induction - E / Equipment Identification

Primary Equipment:		
Dual Induction Sonde	DIS - HB	194
Dual Induction Cartridge	DIC - EB	190

Dual Induction - E Wellsite Calibration

Induction Electronics (10 kHz)

Phase	ID Elect Real Offset 10 kHz MM/M	Value	Phase	ID Elect Real Gain 10 kHz	Value	Phase	ID Elect Phase 10 kHz DEG	Value
Before		34.99	Before		0.9812	Before		10.24
	-264.9 (Minimum) 35.06 (Nominal) 335.1 (Maximum)			0.8343 (Minimum) 0.9843 (Nominal) 1.178 (Maximum)			0.3654 (Minimum) 10.37 (Nominal) 20.37 (Maximum)	
Phase	ID Elect Quad Offset 10 kHz MM/M	Value	Phase	ID Elect Quad Gain 10 kHz	Value	Phase	IM Elect Phase 10 kHz DEG	Value
Before		-23.96	Before		0.9478	Before		10.43
	-323.6 (Minimum) -23.63 (Nominal) 276.4 (Maximum)			0.8055 (Minimum) 0.9555 (Nominal) 1.137 (Maximum)			0.5591 (Minimum) 10.56 (Nominal) 20.56 (Maximum)	
Phase	IM Elect Real Offset 10 kHz MM/M	Value	Phase	IM Elect Real Gain 10 kHz	Value			
Before		48.88	Before		0.9617			
	-500.7 (Minimum) 49.26 (Nominal) 599.3 (Maximum)			0.8171 (Minimum) 0.9671 (Nominal) 1.154 (Maximum)				
Phase	M Elect Quad Offset 10 kHz MM/M	Value	Phase	IM Elect Quad Gain 10 kHz	Value			
Before		34.59	Before		0.9570			
	-514.8 (Minimum) 35.15 (Nominal) 585.2 (Maximum)			0.8132 (Minimum) 0.9632 (Nominal) 1.148 (Maximum)				

Before: Jan 14 09:36 1996

Dual Induction - E Wellsite Calibration

Induction Electronics (20 kHz)

Phase	ID Elect Real Offset 20 kHz MM/M	Value	Phase	ID Elect Real Gain 20 kHz	Value	Phase	ID Elect Phase 20 kHz DEG	Value
Before		13.48	Before		0.9850	Before		6.229
	-111.5 (Minimum) 13.52 (Nominal) 138.5 (Maximum)			0.8376 (Minimum) 0.9876 (Nominal) 1.183 (Maximum)			-8.651 (Minimum) 6.349 (Nominal) 21.35 (Maximum)	
Phase	ID Elect Quad Offset 20 kHz MM/M	Value	Phase	ID Elect Quad Gain 20 kHz	Value	Phase	IM Elect Phase 20 kHz DEG	Value
Before		-9.682	Before		0.9514	Before		7.774
	-134.6 (Minimum) -9.635 (Nominal) 115.4 (Maximum)			0.8087 (Minimum) 0.9587 (Nominal) 1.142 (Maximum)			-7.109 (Minimum) 7.891 (Nominal) 22.89 (Maximum)	
Phase	IM Elect Real Offset 20 kHz MM/M	Value	Phase	IM Elect Real Gain 20 kHz	Value			
Before		19.58	Before		0.9860			
	-205.3 (Minimum) 19.74 (Nominal) 244.7 (Maximum)			0.8379 (Minimum) 0.9879 (Nominal) 1.183 (Maximum)				
Phase	M Elect Quad Offset 20 kHz MM/M	Value	Phase	IM Elect Quad Gain 20 kHz	Value			
Before		14.02	Before		0.9810			
	-210.8 (Minimum) 14.23 (Nominal) 239.2 (Maximum)			0.8338 (Minimum) 0.9838 (Nominal) 1.177 (Maximum)				

Before: Jan 14 09:37 1996

Dual Induction - E Wellsite Calibration

Induction Electronics (40 kHz)

Phase	ID Elect Real Offset 40 kHz MM/M	Value	Phase	ID Elect Real Gain 40 kHz	Value	Phase	ID Elect Phase 40 kHz DEG	Value
Before		8.709	Before		0.9534	Before		20.31
	-78.28 (Minimum) 8.721 (Nominal) 93.72 (Maximum)			0.8108 (Minimum) 0.9608 (Nominal) 1.145 (Maximum)			0.6900 (Minimum) 20.69 (Nominal) 40.69 (Maximum)	
Phase	ID Elect Quad Offset 40 kHz MM/M	Value	Phase	ID Elect Quad Gain 40 kHz	Value	Phase	IM Elect Phase 40 kHz DEG	Value
Before		-6.389	Before		0.9201	Before		22.15
	-91.38 (Minimum) -6.383 (Nominal) 78.62 (Maximum)			0.7821 (Minimum) 0.9321 (Nominal) 1.104 (Maximum)			2.521 (Minimum) 22.52 (Nominal) 42.52 (Maximum)	
Phase	IM Elect Real Offset 40 kHz MM/M	Value	Phase	IM Elect Real Gain 40 kHz	Value			
Before		12.53	Before		0.9817			
	-117.4 (Minimum) 12.64 (Nominal) 142.6 (Maximum)			0.8342 (Minimum) 0.9842 (Nominal) 1.178 (Maximum)				
Phase	M Elect Quad Offset 40 kHz MM/M	Value	Phase	IM Elect Quad Gain 40 kHz	Value			
Before		9.051	Before		0.9764			
	-120.8 (Minimum) 9.179 (Nominal) 139.2 (Maximum)			0.8298 (Minimum) 0.9798 (Nominal) 1.172 (Maximum)				

Before: Jan 14 09:38 1996

Dual Induction - E Wellsite Calibration

SFL Electronics

Phase	SFL Voltage Offset MV	Value	Phase	SFL Voltage Gain	Value
Before		1.950	Before		0.9953
	-15.00 (Minimum) / 0 (Nominal) / 15.00 (Maximum)			0.8500 (Minimum) / 1.000 (Nominal) / 1.200 (Maximum)	
Phase	**SFL Current Offset MA**	**Value**	**Phase**	**SFL Current Gain**	**Value**
Before		-0.04843	Before		0.9845
	-0.6000 (Minimum) / 0 (Nominal) / 0.6000 (Maximum)			0.8500 (Minimum) / 1.000 (Nominal) / 1.200 (Maximum)	

Before: Jan 14 09:38 1996

Dual Induction - E Wellsite Calibration

Electronics Calibration Changes Files/Depth Intervals: 1: 443.5 - 240.0 5: 6385.0 - 6033.0 6: 6382.5 - 47.5

Phase	ID (R > 27 OHM-M) MM/M	Value	Phase	ID (R < 27 OHM-M) %	Value	Phase	SFL (R < 1 OHM-M) OHMM	Value
After		0.05112	After		0.0008634	After		0.0003130
	0 (Minimum) / 0 (Nominal) / 0.7500 (Maximum)			0 (Minimum) / 0 (Nominal) / 2.000 (Maximum)			0 (Minimum) / 0 (Nominal) / 0.02000 (Maximum)	
Phase	**IM (R > 27 OHM-M) MM/M**	**Value**	**Phase**	**IM (R < 27 OHM-M) %**	**Value**			
After		0.04855	After		0.0008283			
	0 (Minimum) / 0 (Nominal) / 0.7500 (Maximum)			0 (Minimum) / 0 (Nominal) / 2.000 (Maximum)				
Phase	**SFL (R > 27 OHM-M) MM/M**	**Value**	**Phase**	**SFL (R < 27 OHM-M) %**	**Value**			
After		0.003875	After		0.0002256			
	0 (Minimum) / 0 (Nominal) / 0.7500 (Maximum)			0 (Minimum) / 0 (Nominal) / 2.000 (Maximum)				

After: Jan 14 14:10 1996

Dual Induction - E Master Calibration

Test Loop Calibration: Calibration of Internal Reference to Test Loop Standard

Phase	Deep 10 kHz Gain Factor	Value	Phase	Deep 20 kHz Gain Factor	Value	Phase	Deep 40 kHz Gain Factor	Value
Master		0.9907	Master		1.002	Master		1.025
	0.9000 (Minimum) / 1.000 (Nominal) / 1.100 (Maximum)			0.9000 (Minimum) / 1.000 (Nominal) / 1.100 (Maximum)			0.9000 (Minimum) / 1.000 (Nominal) / 1.100 (Maximum)	
Phase	**Medium 10 kHz Gain Factor**	**Value**	**Phase**	**Medium 20 kHz Gain Factor**	**Value**	**Phase**	**Medium 40 kHz Gain Factor**	**Value**
Master		1.007	Master		1.013	Master		1.039
	0.9000 (Minimum) / 1.000 (Nominal) / 1.100 (Maximum)			0.9000 (Minimum) / 1.000 (Nominal) / 1.100 (Maximum)			0.9000 (Minimum) / 1.000 (Nominal) / 1.100 (Maximum)	
Phase	**Deep 10 kHz Phase Shift**	**Value**	**Phase**	**Deep 20 kHz Phase Shift**	**Value**	**Phase**	**Deep 40 kHz Phase Shift**	**Value**
Master		0.04891	Master		-0.06313	Master		-1.051
	-1.500 (Minimum) / 0 (Nominal) / 1.500 (Maximum)			-2.000 (Minimum) / 0 (Nominal) / 2.000 (Maximum)			-4.000 (Minimum) / -1.000 (Nominal) / 2.000 (Maximum)	
Phase	**Medium 10 kHz Phase Shift**	**Value**	**Phase**	**Medium 20 kHz Phase Shift**	**Value**	**Phase**	**Medium 40 kHz Phase Shift**	**Value**
Master		-0.3207	Master		-1.036	Master		-2.411
	-1.500 (Minimum) / 0 (Nominal) / 1.500 (Maximum)			-3.000 (Minimum) / -1.000 (Nominal) / 1.000 (Maximum)			-5.000 (Minimum) / -2.000 (Nominal) / 1.000 (Maximum)	

Master: Oct 27 03:45 1995

Dual Induction - E Master Calibration

Sonde Error Corrections: Correction for sonde response in zero conductivity environment. (Normalized to 25C).

Phase	Real Deep 10 kHz S.E. Corr.	Value	Phase	Real Deep 20 kHz S.E. Corr.	Value	Phase	Real Deep 40 kHz S.E. Corr.	Value
Master		35.58	Master		16.05	Master		4.762
	-50.00 (Minimum) / 0 (Nominal) / 125.0 (Maximum)			-30.00 (Minimum) / 0 (Nominal) / 30.00 (Maximum)			-15.00 (Minimum) / 0 (Nominal) / 15.00 (Maximum)	
Phase	**Quad Deep 10 kHz S.E. Corr.**	**Value**	**Phase**	**Quad Deep 20 kHz S.E. Corr.**	**Value**	**Phase**	**Quad Deep 40 kHz S.E. Corr.**	**Value**
Master		99.19	Master		57.21	Master		39.99
	-250.0 (Minimum) / 0 (Nominal) / 350.0 (Maximum)			-125.0 (Minimum) / 0 (Nominal) / 200.0 (Maximum)			-75.00 (Minimum) / 0 (Nominal) / 125.0 (Maximum)	
Phase	**Real Medium 10 kHz S.E. Corr.**	**Value**	**Phase**	**Real Medium 20 kHz S.E. Corr.**	**Value**	**Phase**	**Real Medium 40 kHz S.E. Corr.**	**Value**
Master		86.82	Master		20.58	Master		4.684
	-50.00 (Minimum) / 0 (Nominal) / 140.0 (Maximum)			-50.00 (Minimum) / 0 (Nominal) / 50.00 (Maximum)			-30.00 (Minimum) / 0 (Nominal) / 30.00 (Maximum)	
Phase	**Quad Medium 10 kHz S.E. Corr.**	**Value**	**Phase**	**Quad Medium 20 kHz S.E. Corr.**	**Value**	**Phase**	**Quad Medium 40 kHz S.E. Corr.**	**Value**
Master		127.3	Master		80.98	Master		66.43
	-1300 (Minimum) / 0 (Nominal) / 1300 (Maximum)			-650.0 (Minimum) / 0 (Nominal) / 650.0 (Maximum)			-350.0 (Minimum) / 0 (Nominal) / 350.0 (Maximum)	

Master: Oct 27 04:05 1995

Scintillation Gamma-Ray - L / Equipment Identification

Primary Equipment:	
Scintillation Gamma Cartridge	SGC - SA
Scintillation Gamma Detector	SGD - TAA
Auxiliary Equipment:	
Scintillation Gamma Housing	SGH - K
Gamma Source Radioactive	GSR - U/Y

Scintillation Gamma-Ray - L Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI			Value
Before	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	45.78

Phase	Gamma Ray (Jig - Bkg) GAPI			Value
Before	148.6 (Minimum)	163.5 (Nominal)	178.4 (Maximum)	163.5

Phase	Gamma Ray (Calibrated) GAPI			Value
Before	152.0 (Minimum)	167.0 (Nominal)	182.0 (Maximum)	167.0

Before: Jan 14 08:49 1996

COMPANY	PETROGLYPH OPERATING CO., INC.	BOTTOM LOG INTERVAL	6365 F
		SCHLUMBERGER DEPTH	6371 F
WELL:	UTE TRIBAL #4A-4	DEPTH DRILLER	6385 F
FIELD:	ANTELOPE CREEK	KELLY BUSHING	5937.3 F
COUNTY:	DUCHESNE	DRILL FLOOR	5936.3 F
STATE:	UTAH	GROUND LEVEL	5927.3 F

Schlumberger

DUAL INDUCTION with Linear Correlation GAMMA RAY

ATTACHMENT NO. 9

LIST OF OWNERS AND AFFIDAVIT NOTIFICATION

AFFIDAVIT OF MAILING

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

Dated on this 24th day of July, 2015

Kevin Dickey

Vice President, Operations

Petroglyph Energy

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

This 24 day of July, 2015.

EDNA SYES NOTARY PUBLIC STATE OF IDAHO

Edna 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 located in Antelope Creek Field which is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy.

Owners at Well's Location	Owners within Well's ¼ mile radius
Mineral: Ute Tribe	No others
Operator: Petroglyph	No others
Surface: Ute Tribe	Lee H.Moon and Kathy Moon
Working Interest: 100% Petroglyph	

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

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

Sincerely,

Kevin Dickey

Vice President, Operations Petroglyph Energy

Enclosure

PETROGLYPH OPERATING COMPANY, INC.

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

ANTELOPE CREEK FIELD

WELLS TO BE CONVERTED TO INJECTION

Well Name and Number	Footages	Section, Township, and Range
Ute Tribal 04-04	1205' FNL & 660' FWL	4, 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 04-04

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

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

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

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						4	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: Kevin Dickey

D. Date Signed: 07/27/2015

ATTACHMENT NO. 10

WELL BORE DIAGRAMS FOR THE UIC WELL

Ute Tribal 04-04 Well History

Well History:

Spud Well: 1/6/1996
Completed: 3/29/1996
First Production: 3/30/1996

Tops (KB):

BMSW* Found at	937'
Green River	1405'
A Marker	**4080'**
X Marker	4578'
Douglas Creek	4720'
B Limestone	5110'
Castle Peak	5686'
Basal Carbonate	**6082'**

Perf History:

3/14/1996

D7	5447' to 5453'
D7	5418' to 5422'
D7	5408' to 5412'
D7	5387' to 5390'
D7	5380' to 5382'
CICR	set at 5634'

3/15/1996

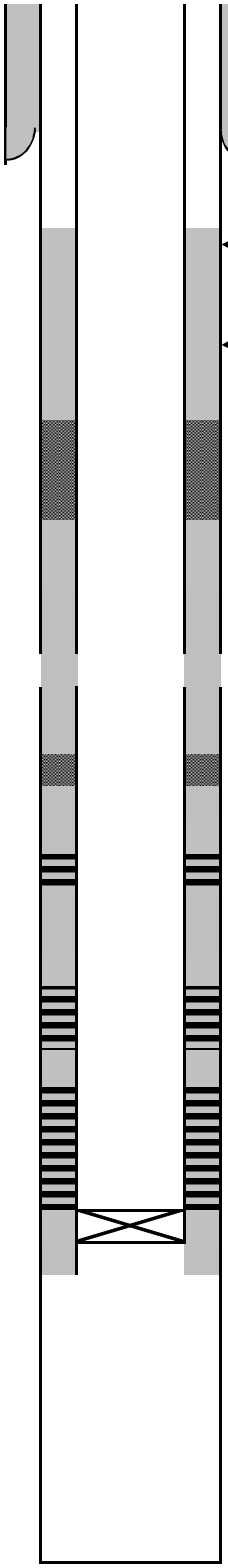
D3	5212' to 5216'
D3	5182' to 5186'

3/19/1996

C6	4921' to 4925'	Squeezed 9/14/2001

3/22/1996

B11	4538 to 4546'	Squeezed 9/14/2001
B11	4530 to 4533'	Squeezed 9/14/2001
B11	4516 to 4521'	Squeezed 9/14/2001



GL: 5927'
KB: 5937'

8 5/8" 24# Surface CSG @258'
cmt'd w/150 sx G

Surface Hole size 12 1/4"

Hole Size 7 7/8" bit

Cement top @ 2485' KB
5 1/2" 15.5# J-55 CSG @ 5697'
cmt'd w/350 sx

Perf's:
Squeezed B11 4516' to 4521'
Squeezed B11 4530' to 4533'
Squeezed B11 4538' to 4546'
Squeezed C6 4921' to 4925'
D3 5212' to 5216'
D7 5380' to 5382'
D7 5380' to 5382'
D7 5387' to 5390'
D7 5408' to 5412'
D7 5418' to 5422'
D7 5447' to 5453'

CICR @ 5634'

PBTD @ 5651'
TD @ 6385' KB

(Not to Scale)

Petroglyph Operating Co., Inc.
Ute Tribal #04-04
(660' FWL & 1205' FNL)
Lot 5 Section 4 - 5S - 3W
Antelope Creek Field
Duchesne Co. Utah
API#: 43013315740000

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

Ute Tribal 04-04 Injection

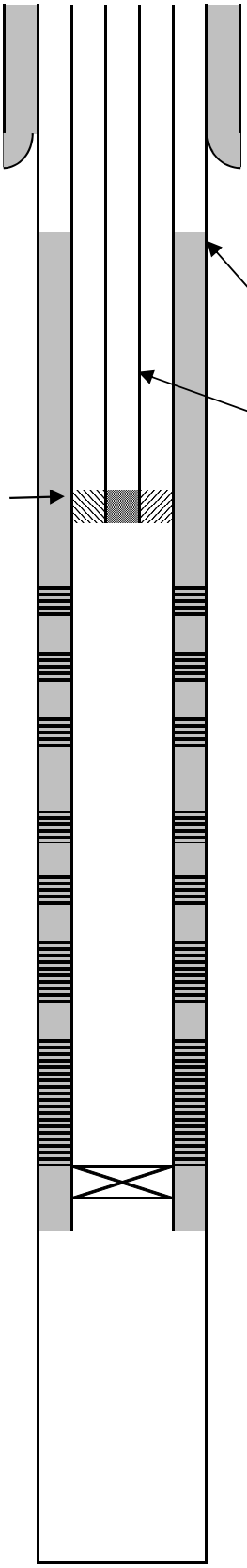
Well History:

1/6/96 Spud Well
3/29/96 Completed
3/30/96 First Production

Tops (KB):

BMSW* Found at 937'
Green River 1405'
A Marker 4080'
X Marker 4578'
Douglas Creek 4720'
B Limestone 5110'
Castle Peak 5686'
Basal Carbonate 6082'

Injection Packer @ 4426'



GL: 5927'
KB: 5937'

8 5/8" 24# Surface CSG @258'
cmt'd w/150 sx G

Surface Hole size 12 1/4"

Hole Size 7 7/8" bit

Cement top @ 2485' KB
5 1/2" 15.5# J-55 CSG @ 5697'
cmt'd w/350sx

Tubing 2 7/8" 6.5# J55

Perfs:
Re-perf B11 4516' to 4522'
Re-perf B11 4530' to 4534'
Re-perf B11 4537' to 4549'
Add C5 4774' to 4776'
Re-perf C6 4921' to 4925'
D3 5212' to 5216'
D7 5380' to 5382'
D7 5387' to 5390'
Add D7 5390' to 5394'
D7 5387' to 5390'
D7 5408' to 5412'
D7 5418' to 5422'
Add D7 5422' to 5428'
D7 5418' to 5422'
Add D7 5433' to 5447'
D7 5447' to 5453'
Add D7 5453' to 5459'
Add D7 5485' to 5487'
Add D7 5495' to 5499'

CICR @ 5634'

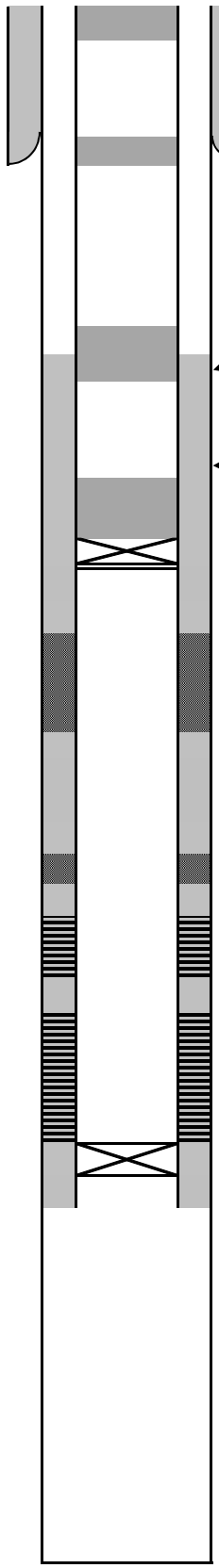
PBTD @ 5651'
TD @ 6385' KB

(Not to Scale)

Petroglyph Operating Co., Inc.
Ute Tribal #04-04
(660' FWL & 1205' FNL)
Lot 5 Section 4 - 5S - 3W
Antelope Creek Field
Duchesne Co. Utah
API#: 43013315740000

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

Ute Tribal 04-04 Plug and Abandonment



GL: 5927'
KB: 5937'

8 sx Class G cement-50' plug

8 5/8" 24# Surface CSG @258'
cmt'd w/150 sx G

15 sx Class G cement-100' plug

Surface Hole size 12 1/4"

30 sx Class G cement-200' plug

Cement top @ 2485' KB
Hole Size 7 7/8" bit

5 1/2" 15.5# J-55 CSG @ 5697'
cmt'd w/90 sx Hilift- 260sx RFC

30 sx Class G cement-200' plug
CIBP @ 4426'

Perf's:
Squeezed B11 4516' to 4521'
Squeezed B11 4530' to 4533'
Squeezed B11 4538' to 4546'
Squeezed C6 4921' to 4925'
D3 5212' to 5216'
D7 5380' to 5382'
D7 5380' to 5382'
D7 5408' to 5412'
D7 5418' to 5422'
D7 5447' to 5453'

CICR @ 5634'

Petroglyph Operating Co., Inc.
Ute Tribal #04-04
(660' FWL & 1205' FNL)
Lot 5 Section 4 - 5S - 3W
Antelope Creek Field
API#: 43013315740000

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

PBTD @ 5651'
TD @ 6385' KB

(Not to Scale)

ATTACHMENT NO. 11

P&A PROCEDURE

Plug and Abandonment Procedure

Ute Tribal 04-04

43-013-31574

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 @ 4426‘.

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 2485’ and set balanced 200’ cement plug using 30sxs of Class G cement.

6. Raise the tubing to 258’ and set balanced 100’ cement plug using 15sxs of Class G cement.

7. Set balanced 50’ cement plug (8 sxs 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 04-04

43-013-31574

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: Reperf B11 4516' to 4522', 4530' to 4534', 4537' to 4549', and C6 4921' to 4925'. Add perfs C05 4774' to 4776', D7 5390' to 5394', 5422' to 5428', 5433' to 5447', 5453' to 5459', 5485' to 5487', and 5495' to 5499' .
7. RD Wireline.
8. PU plug and packer and new tubing. RIH and breakdown perfs.
9. POOH. RIH with injection packer to 4426'.
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.