# UNDERGROUND INJECTION CONTROL
# PERMIT APPLICATION

**Ute Tribal # 20-15**
**574' FSL & 1806' FEL**
**Sec. 20, T5S-R3W**
**Duchesne County, Utah**
**API # 43-013-34051**

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 20-15**
**API # 43-013-34051**

The following document contains information provided in support of the application for the conversion of the Ute Tribal 20-15 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 20-15 is 574' FSL & 1806' FEL SW/SE Sec. 20, 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 20-15 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; all lands within the AOR are leased to Petroglyph by the Ute Tribe as indicated by yellow shading. The AOR has Ute Tribal 20-14o, Ute Tribal 20-16, and Ute Tribal 29-02 well(s) located in its ¼ mile radius.

(4) Petroglyph proposes to utilize the Ute Tribal 20-15 as an injection well for enhanced recovery in the Antelope Creek Field.

(5) Injection Zone – The injection intervals are between 4042' and 6025' True Vertical Depth and located in the lower portion of the Green River Formation. The injection zone is confined within a 1983' 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 20-15 is 231 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 21-13, the most recent analysis of the water being injected into the Green River formation at this location is 10309 mg/L TDS. This analysis is also included in Attachment No. 5.

(7) A summary of completion data from the Ute Tribal 20-15 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 20-15 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 20-15 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 **1894**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 20-15:
**1894psi = (0.88psi/ft - 0.43(1.00)) 4208ft**

(12) Three wellbore diagrams for the Ute Tribal 20-15 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.

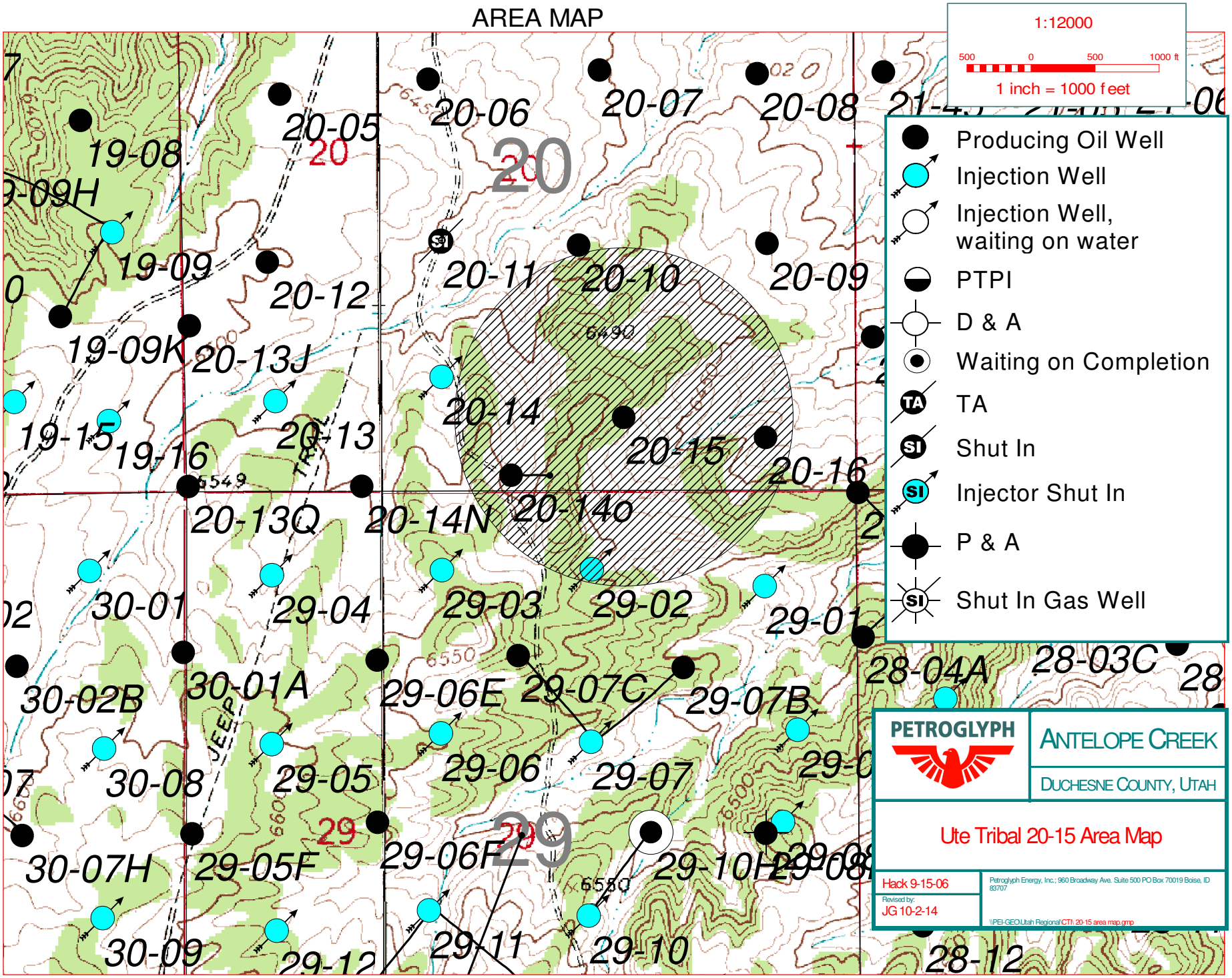
(15) Petroglyph will give proof of financial responsibility by posting a surety bond for the UIC well prior to final permit approval. A copy of this letter is contained in Attachment No. 13.

(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

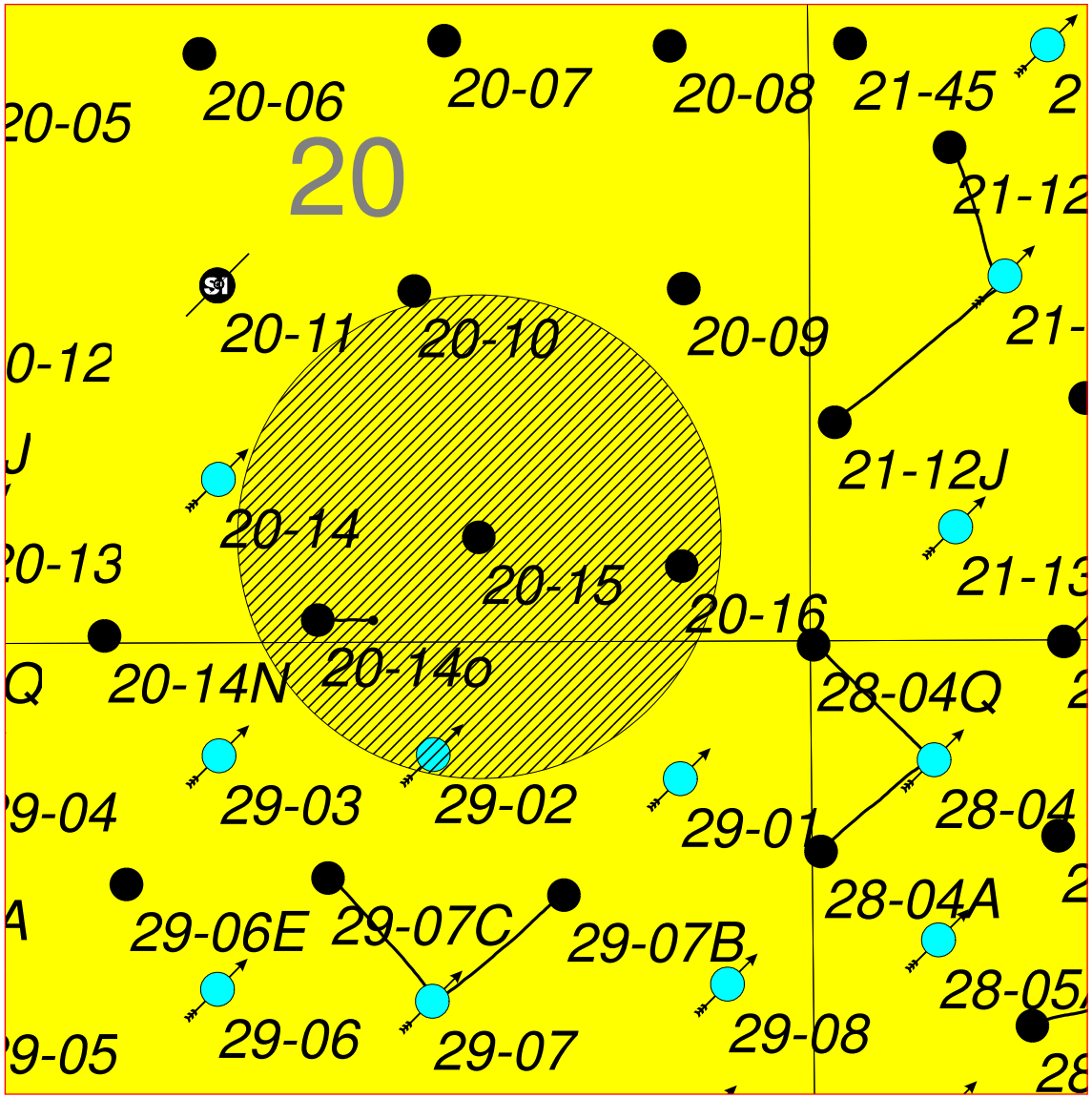


ATTACHMENT NO. 2

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 20-15 Plat and Quarter-mile radius map. Ute Indian lands under Petroglyph lease shown in yellow

Hack 9-15-06

Revised by:
JG 8-29-14

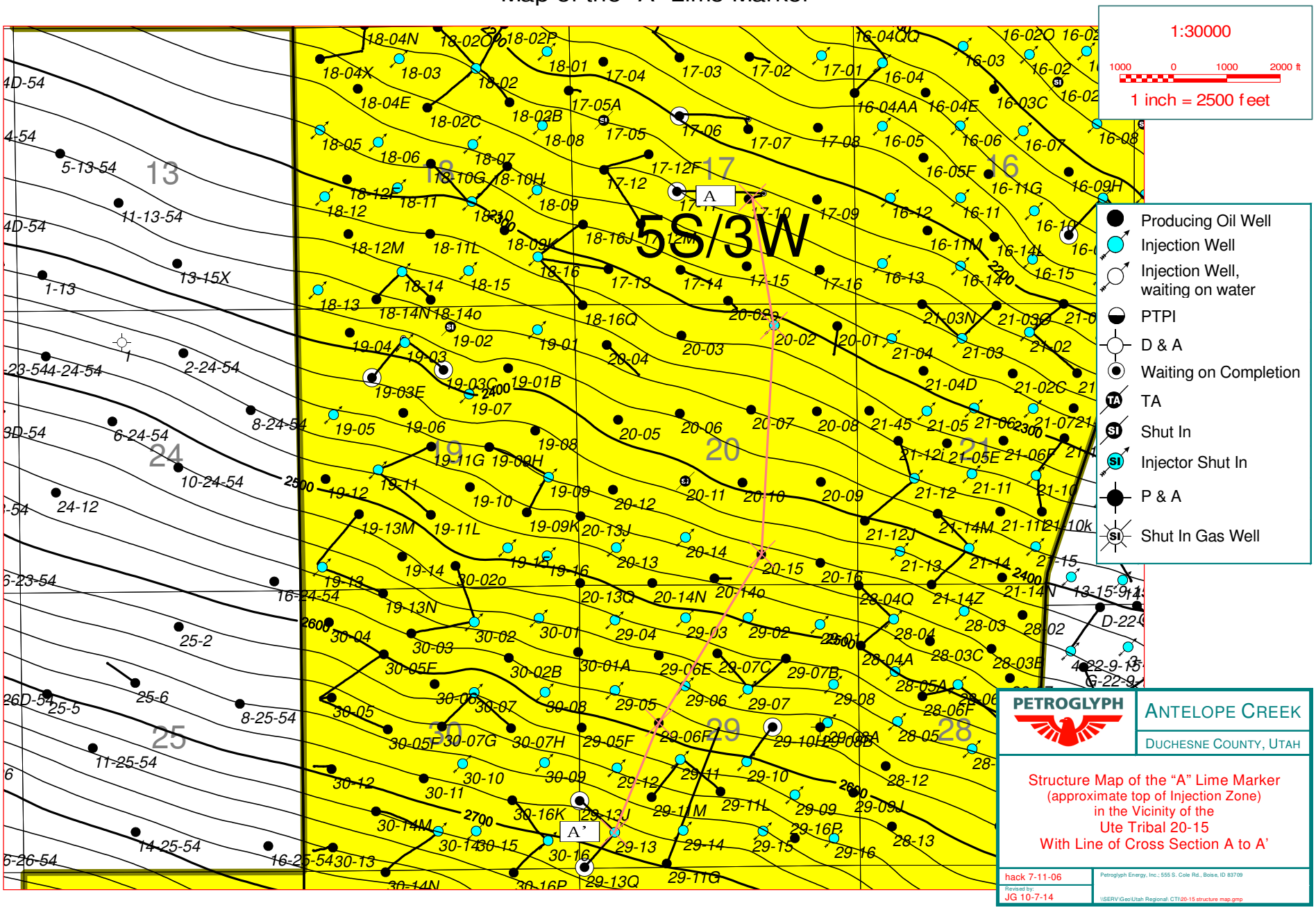
Petroglyph Energy, Inc.; 960 Broadway Ave. Suite 500 PO Box 70019 Boise, ID 83707

\\PEI-GEO\Utah Regional\CTI\ 20-15 quarter mile map.gmp

ATTACHMENT NO. 3

MAP OF THE A-LIME MARKER SURFACE

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



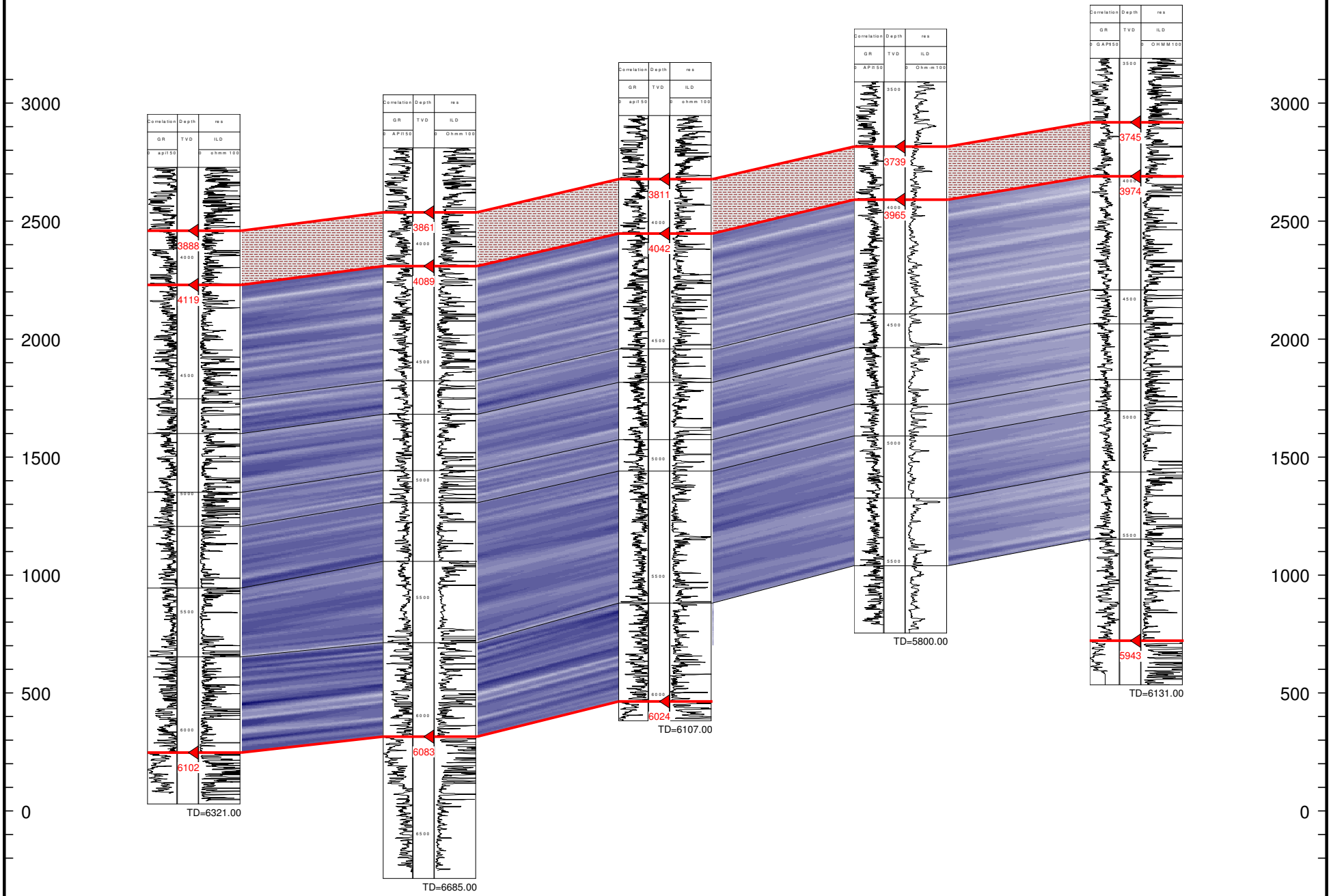
ATTACHMENT NO. 4

CROSS SECTIONS OF THE INJECTION FORMATION

# Structural Cross Section A to A' in the Vicinity of Ute Tribal 20-15

43013515220000 — 2437 ft — 43013307640000 — 4296 ft — 43013340510000 — 3701 ft — 43013325340000 — 2227 ft — 43013322000000

| 43013515220000 | 43013307640000 | 43013340510000 | 43013325340000 | 43013322000000 |
|---|---|---|---|---|
| PETROGLYPH OPERATING COMPANY | PETROGLYPH OPERATING COMPANY INC | PETROGLYPH OPERATING COMPANY INC | PETROGLYPH OPERATING COMPANY INC | PETROGLYPH OPERATING COMPANY INC |
| UTE TRIBAL 17-10 | Ute Tribal 20-02 | UTE TRIBAL 20-15 | Ute Tribal 29-06F | Ute Tribal 29-13 |
| 2036 FSL 1751 FEL | 404 FNL 1539 FEL | 574 FSL 1806 FEL | 2624 FNL 1486 FWL | 660 FSL 660 FWL |
| TWP: 5 S - Range: 3 W - Sec. 17 | TWP: 5 S - Range: 3 W - Sec. 20 | TWP: 5 S - Range: 3 W - Sec. 20 | TWP: 5S - Range: 3W - Sec. 29 | TWP: 5 S - Range: 3 W - Sec. 29 |



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)

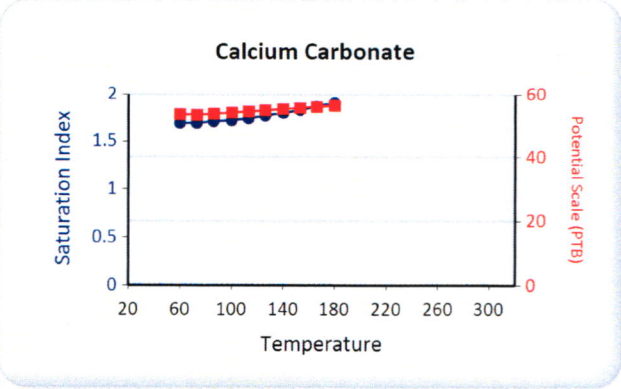
| | | Calcium Carbonate | | Barium Sulfate | | Iron Sulfide | | Iron Carbonate | | Gypsum CaSO4·2H2O | | Celestite SrSO4 | | Halite NaCl | | Zinc Sulfide | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp (°F) | PSI | SI | PTB | SI | PTB | SI | PTB | SI | PTB | SI | 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 |

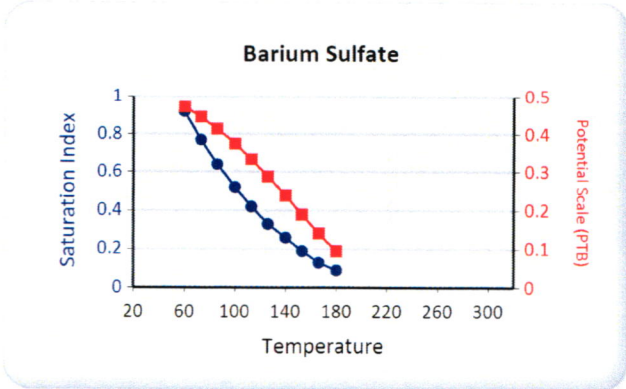
| | | Hemihydrate CaSO4~0.5H2O | | Anhydrate CaSO4 | | Calcium Fluoride | | Zinc Carbonate | | Lead Sulfide | | Mg Silicate | | Ca Mg Silicate | | Fe Silicate | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp (°F) | PSI | SI | PTB | SI | PTB | SI | PTB | SI | PTB | 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 |

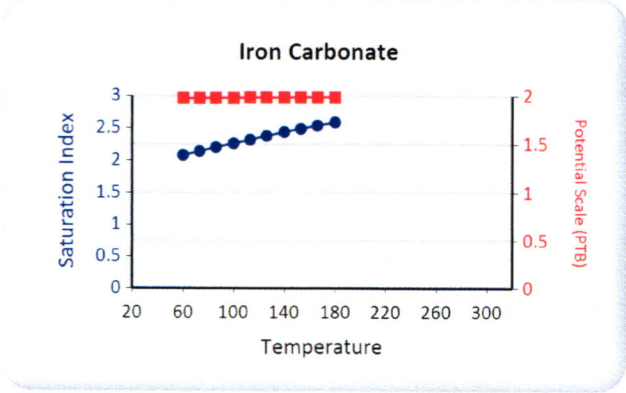
**Multi-Chem Analytical Laboratory**
1553 East Highway 40
Vernal, UT 84078

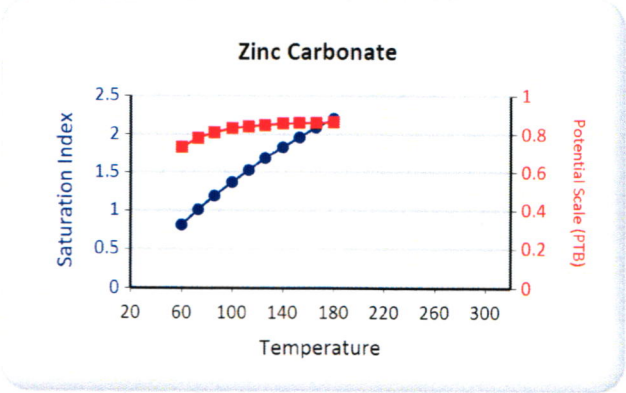
multi-chem
A HALLIBURTON SERVICE

## 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 |

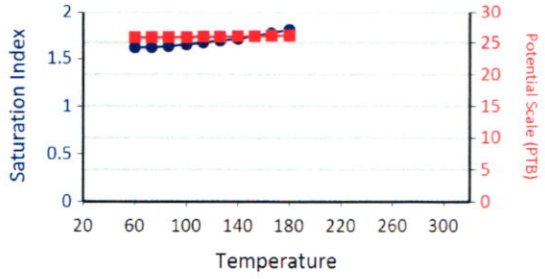
| | | Hemihydrate CaSO4~0.5H2O | | Anhydrate CaSO4 | | Calcium Fluoride | | Zinc Carbonate | | Lead Sulfide | | Mg Silicate | | Ca Mg Silicate | | Fe Silicate | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp (°F) | PSI | SI | PTB | SI | PTB | SI | PTB | SI | PTB | 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

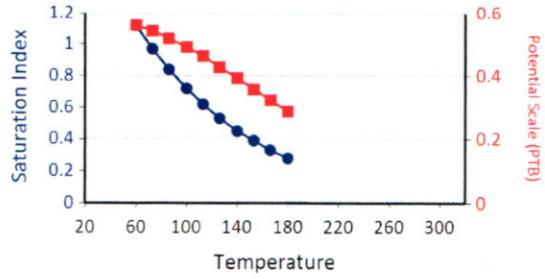
multi-chem
A HALLIBURTON SERVICE

## Water Analysis Report

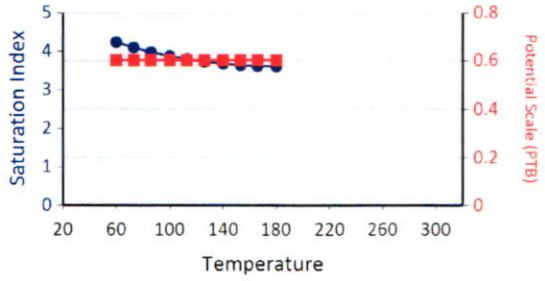
### Calcium Carbonate



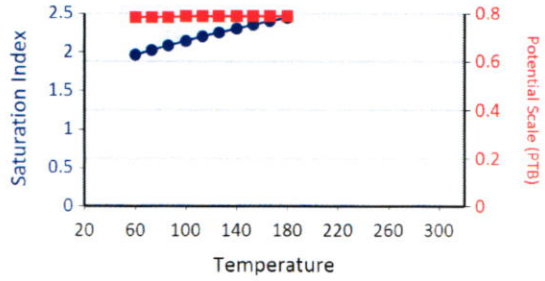

### Barium Sulfate



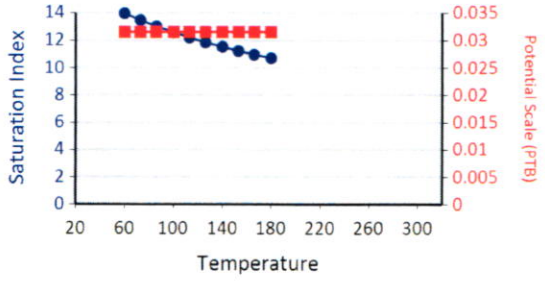

### Iron Sulfide



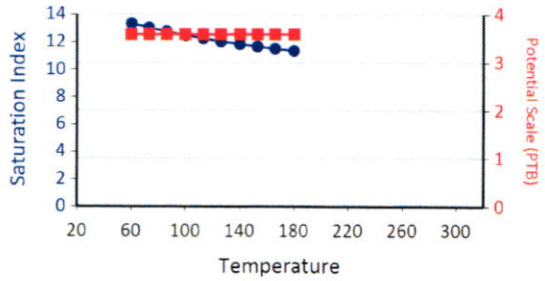

### Iron Carbonate



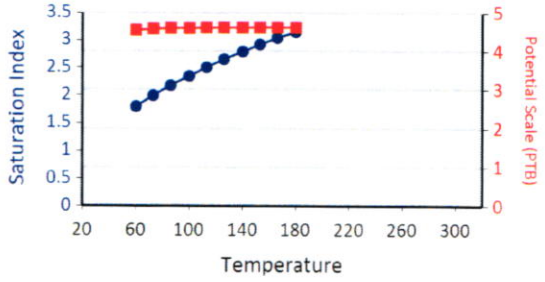

### Lead Sulfide




### 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 |

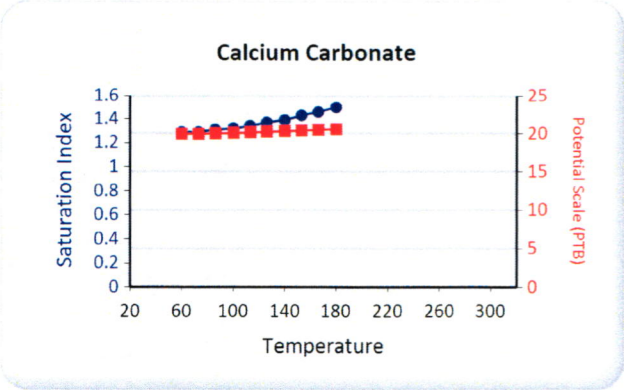
| Analysis @ Properties in Sample Specifics | | | |
|---|---|---|---|
| *Cations* | *mg/L* | *Anions* | *mg/L* |
| Sodium (Na): | 5277.36 | Chloride (Cl): | 7000.00 |
| Potassium (K): | 65.03 | Sulfate ($SO_4$): | 0.00 |
| Magnesium (Mg): | 7.80 | Bicarbonate ($HCO_3$): | 2196.00 |
| Calcium (Ca): | 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 ($SiO_2$): | |

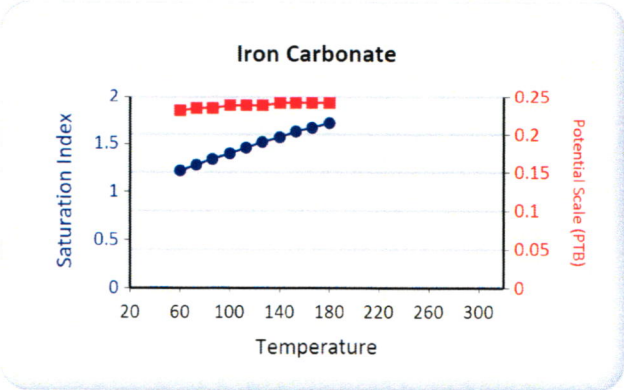
**Notes:**

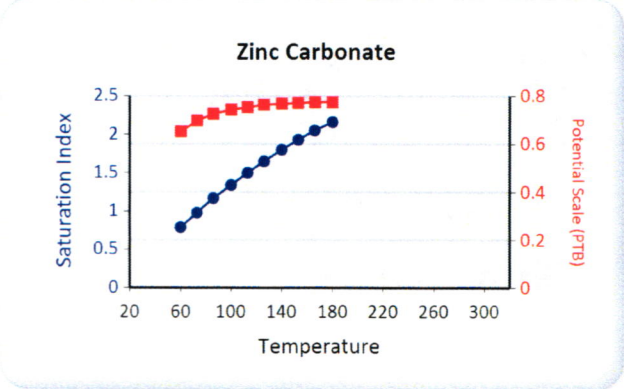
(PTB = Pounds per Thousand Barrels)

| | | 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: | **UTE TRIBAL 21-13 INJ, DUCHESNE** | Lab Tech: | **Gary Winegar** |
| Sample Point: | **WELLHEAD** | | |
| Sample Date: | **1/7/2015** | | |
| Sample ID: | **WA-297485** | | |

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

| Sample Specifics | |
|---|---|
| Test Date: | 1/14/2015 |
| System Temperature 1 (°F): | 160 |
| System Pressure 1 (psig): | 1300 |
| System Temperature 2 (°F): | 80 |
| System Pressure 2 (psig): | 15 |
| Calculated Density (g/ml): | 1.0040 |
| pH: | 8.70 |
| Calculated TDS (mg/L): | 10309.26 |
| CO2 in Gas (%): | |
| Dissolved $CO_2$ (mg/L)): | 0.00 |
| H2S in Gas (%): | |
| H2S in Water (mg/L): | 40.00 |

| Analysis @ Properties in Sample Specifics | | | |
|---|---|---|---|
| ***Cations*** | ***mg/L*** | ***Anions*** | ***mg/L*** |
| Sodium (Na): | 2585.80 | Chloride (Cl): | 5000.00 |
| Potassium (K): | 39.24 | Sulfate ($SO_4$): | 605.00 |
| Magnesium (Mg): | 27.85 | Bicarbonate ($HCO_3$): | 1830.00 |
| Calcium (Ca): | 42.23 | Carbonate ($CO_3$): | |
| Strontium (Sr): | 5.29 | Acetic Acid ($CH_3COO$) | |
| Barium (Ba): | 10.62 | Propionic Acid ($C_2H_5COO$) | |
| Iron (Fe): | 121.31 | Butanoic Acid ($C_3H_7COO$) | |
| Zinc (Zn): | 20.74 | Isobutyric Acid ($(CH_3)_2CHCOO$) | |
| Lead (Pb): | 0.00 | Fluoride (F): | |
| Ammonia $NH_3$: | | Bromine (Br): | |
| Manganese (Mn): | 0.34 | Silica ($SiO_2$): | 20.84 |

**Notes:**
**B=5.65 Al=.14 Li=1.16**

(PTB = Pounds per Thousand Barrels)

| | | Calcium Carbonate | | Barium Sulfate | | Iron Sulfide | | Iron Carbonate | | Gypsum CaSO4·2H2O | | Celestite SrSO4 | | Halite NaCl | | Zinc Sulfide | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp (°F) | PSI | SI | PTB | SI | PTB | SI | PTB | SI | PTB | SI | PTB | SI | PTB | SI | PTB | SI | PTB |
| 80.00 | 14.00 | 1.72 | 35.73 | 2.45 | 6.30 | 6.16 | 36.20 | 4.01 | 88.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.55 | 10.83 |
| 88.00 | 157.00 | 1.73 | 35.73 | 2.36 | 6.30 | 6.09 | 36.20 | 4.05 | 88.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.37 | 10.83 |
| 97.00 | 300.00 | 1.74 | 35.77 | 2.28 | 6.29 | 6.02 | 36.20 | 4.09 | 88.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.20 | 10.83 |
| 106.00 | 443.00 | 1.75 | 35.81 | 2.21 | 6.29 | 5.96 | 36.20 | 4.13 | 88.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.04 | 10.83 |
| 115.00 | 585.00 | 1.77 | 35.85 | 2.15 | 6.28 | 5.92 | 36.20 | 4.17 | 88.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.90 | 10.83 |
| 124.00 | 728.00 | 1.78 | 35.89 | 2.09 | 6.27 | 5.88 | 36.20 | 4.21 | 88.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.76 | 10.83 |
| 133.00 | 871.00 | 1.80 | 35.94 | 2.03 | 6.27 | 5.84 | 36.20 | 4.25 | 88.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.63 | 10.83 |
| 142.00 | 1014.00 | 1.82 | 35.99 | 1.98 | 6.26 | 5.81 | 36.20 | 4.29 | 88.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.50 | 10.83 |
| 151.00 | 1157.00 | 1.85 | 36.05 | 1.94 | 6.25 | 5.79 | 36.20 | 4.32 | 88.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.39 | 10.83 |
| 160.00 | 1300.00 | 1.87 | 36.10 | 1.90 | 6.25 | 5.78 | 36.20 | 4.36 | 88.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.28 | 10.83 |

| | | 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 | 2.55 | 13.90 | 0.00 | 0.00 | 3.41 | 21.67 | 1.64 | 9.92 | 13.89 | 22.60 |
| 88.00 | 157.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.67 | 13.91 | 0.00 | 0.00 | 3.73 | 22.47 | 1.80 | 10.38 | 14.04 | 22.60 |
| 97.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.79 | 13.92 | 0.00 | 0.00 | 4.07 | 23.26 | 1.98 | 10.86 | 14.22 | 22.60 |
| 106.00 | 443.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.90 | 13.93 | 0.00 | 0.00 | 4.43 | 23.86 | 2.16 | 11.27 | 14.41 | 22.60 |
| 115.00 | 585.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.01 | 13.93 | 0.00 | 0.00 | 4.78 | 24.31 | 2.35 | 11.63 | 14.61 | 22.60 |
| 124.00 | 728.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.11 | 13.93 | 0.00 | 0.00 | 5.14 | 24.63 | 2.54 | 11.93 | 14.82 | 22.60 |
| 133.00 | 871.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.21 | 13.94 | 0.00 | 0.00 | 5.50 | 24.85 | 2.73 | 12.18 | 15.04 | 22.60 |
| 142.00 | 1014.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.30 | 13.94 | 0.00 | 0.00 | 5.87 | 25.00 | 2.93 | 12.38 | 15.26 | 22.60 |
| 151.00 | 1157.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.39 | 13.94 | 0.00 | 0.00 | 6.23 | 25.10 | 3.12 | 12.55 | 15.49 | 22.60 |
| 160.00 | 1300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.47 | 13.94 | 0.00 | 0.00 | 6.60 | 25.16 | 3.32 | 12.68 | 15.72 | 22.60 |

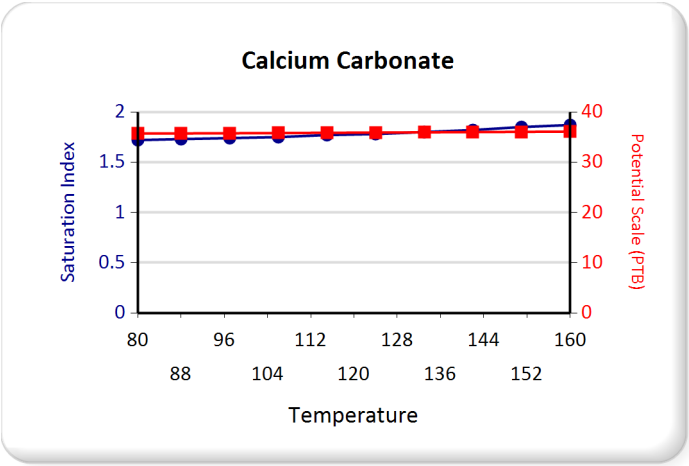
**Multi-Chem Analytical Laboratory**
1553 East Highway 40
Vernal, UT 84078

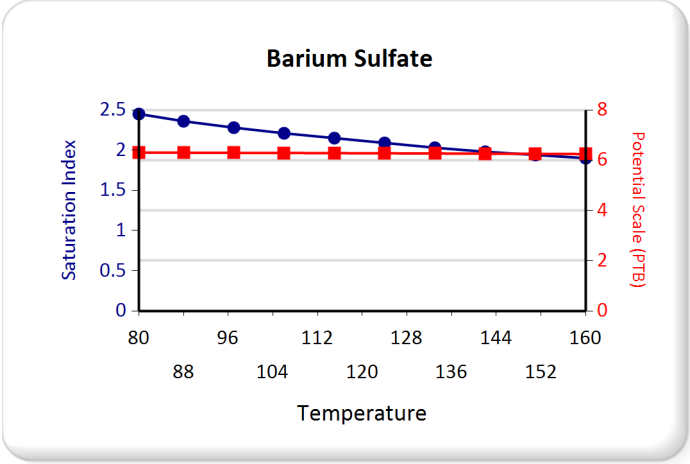
multi-chem®
A HALLIBURTON SERVICE

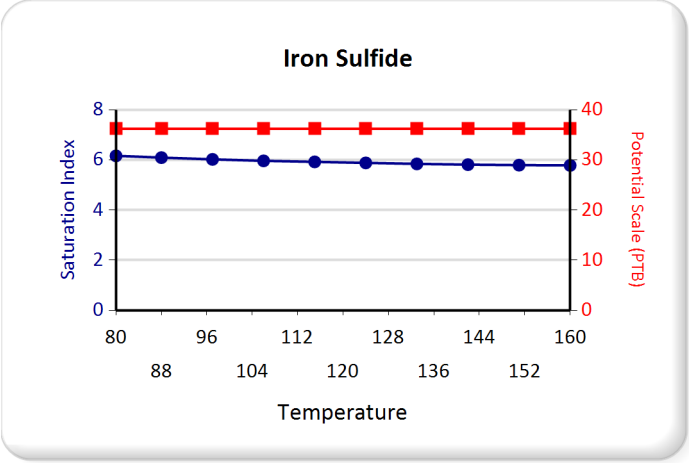
## Water Analysis Report

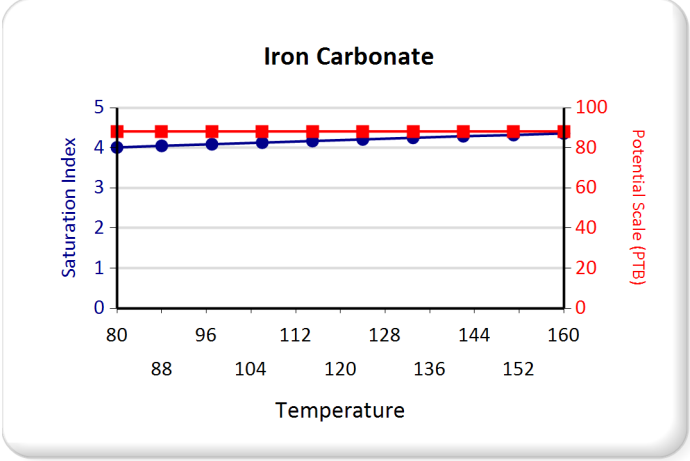
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

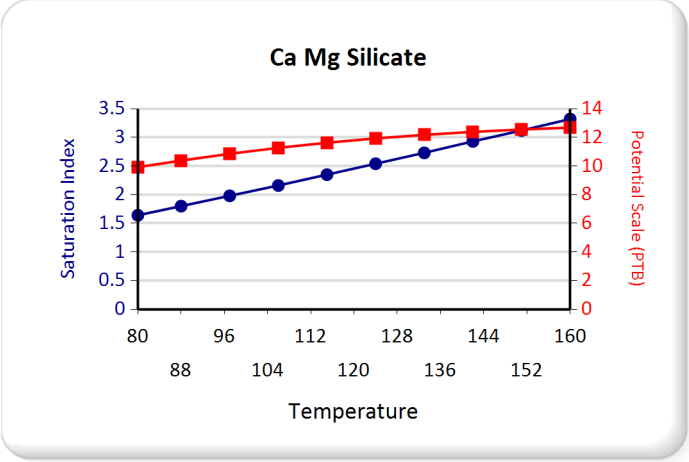
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

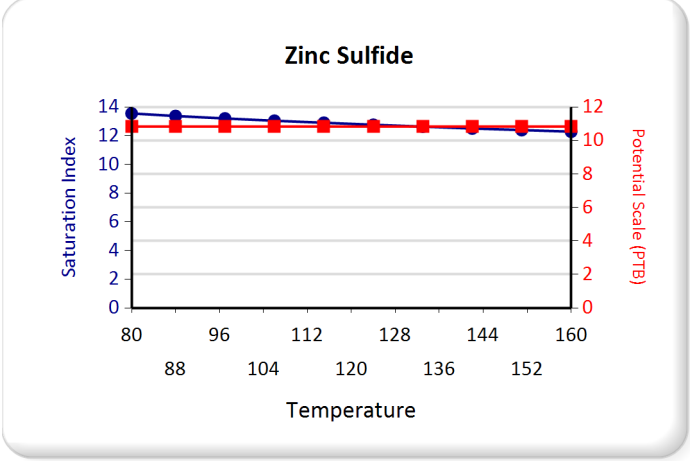


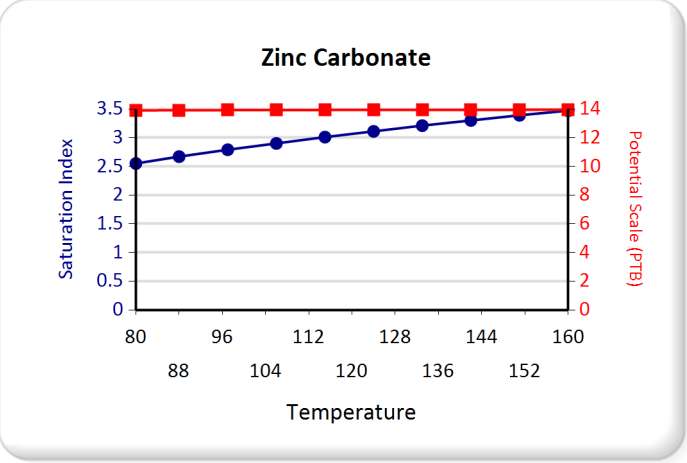



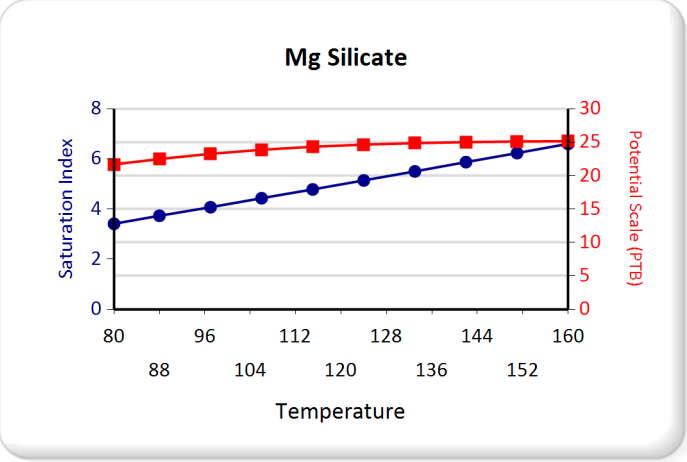



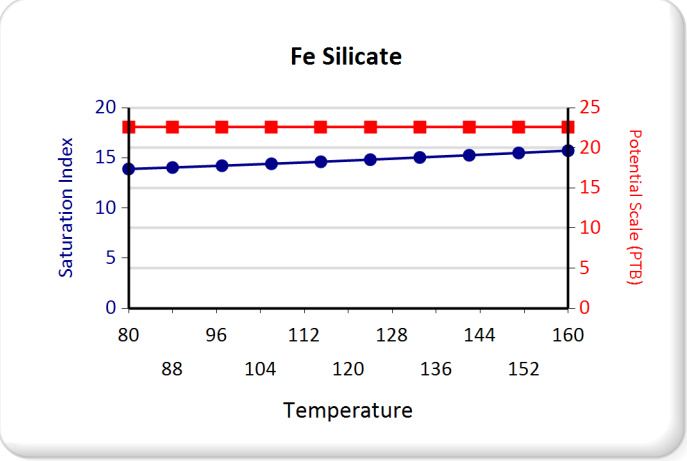
**Multi-Chem Analytical Laboratory**
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE

## Water Analysis Report



ATTACHMENT NO. 6

COMPLETION DATA FOR ALL WELLS IN THE AOR

# Well Completion Data
# Ute Tribal 20-15

| | 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 20-15** | **8-5/8** | **514** | **395** | **surface** | **5-1/2** | **6196** | **865** | **770** |
| Ute Tribal 20-14o | 8-5/8 | 551 | 355 | surface | 5-1/2 | 6157 | 910 | surface |
| Ute Tribal 20-16 | 8-5/8 | 522 | 360 | surface | 5-1/2 | 5980 | 950 | surface |
| Ute Tribal 29-02 | 8-5/8 | 362 | 200 | surface | 5-1/2 | 6188 | 695 | 100 |

ATTACHMENT NO. 7

CBL FOR THE UIC WELL

CASEDHOLE SOLUTIONS

# CONFIDENTIAL CEMENT BOND LOG

| | |
|---|---|
| Company | PETYROGLYPH OPERATING COMPANY |
| Well | UTE TRIBAL #20-15 |
| Field | ANTELOPE CREEK |
| County | DUCHESNE State UTAH |
| Location: | API #: 43013340510000 |
| | 574' FSL & 1806' FEL SW/SW |
| | SEC 20 TWP 5S RGE 3W |

Other Services

| | | |
|---|---|---|
| Permanent Datum | G.L. | Elevation 64' |
| Log Measured From | K.B. 14 FT. AGL | |
| Drilling Measured From | K.B. | |

| | |
|---|---|
| Date | 4-20-10 |
| Run Number | 1 |
| Depth Driller | 6182' |
| Depth Logger | 6129' |
| Bottom Logged Interval | 6119' |
| Top Log Interval | |
| Open Hole Size | |
| Type Fluid | |
| Density / Viscosity | |
| Max Recorded Temp. | 160 DEGREES F |
| Estimated Cement Top | |
| Time Logger at Bottom | Already |
| Equipment Number | 114 |
| Location | VERNAL, UT. |
| Recorded By | Cliff Edmunds |
| Witnessed By | Leon Roush |

| Borehole Record | | | | Tubing Record | | | |
|---|---|---|---|---|---|---|---|
| Run Number | Bit | From | To | Size | Weight | From | To |

| Casing Record | Wgt/Ft | Top | Bottom |
|---|---|---|---|
| Surface String | | SURF. | 500' |
| Prot. String | | | |
| Production String | 15.50 | SURF. | T.D. |
| Liner | | | |

RECEIVED
JUN 03 2010
DIV. OF OIL, GAS & MINING

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 interpretation, 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 our general terms and conditions set out in our current Price Schedule.

Comments

CORRELATED TO HES OH LOG DATED 4-8-10
SHORT JOINT: 4277' -- 4300'

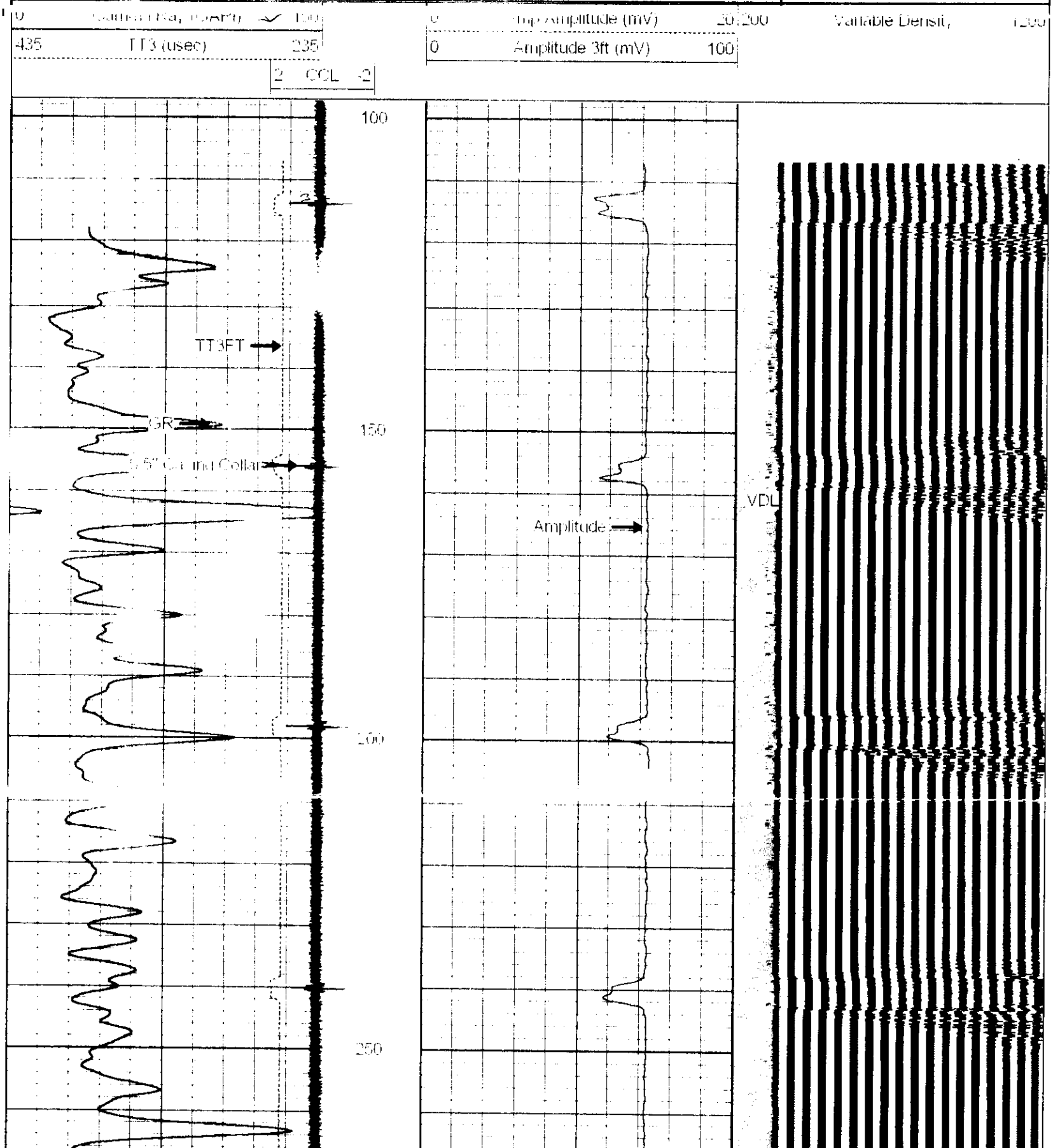
Company PETYROGLYPH OPERATING COMPANY
Well UTE TRIBAL #20-15
Field ANTELOPE CREEK
County DUCHESNE
State UTAH

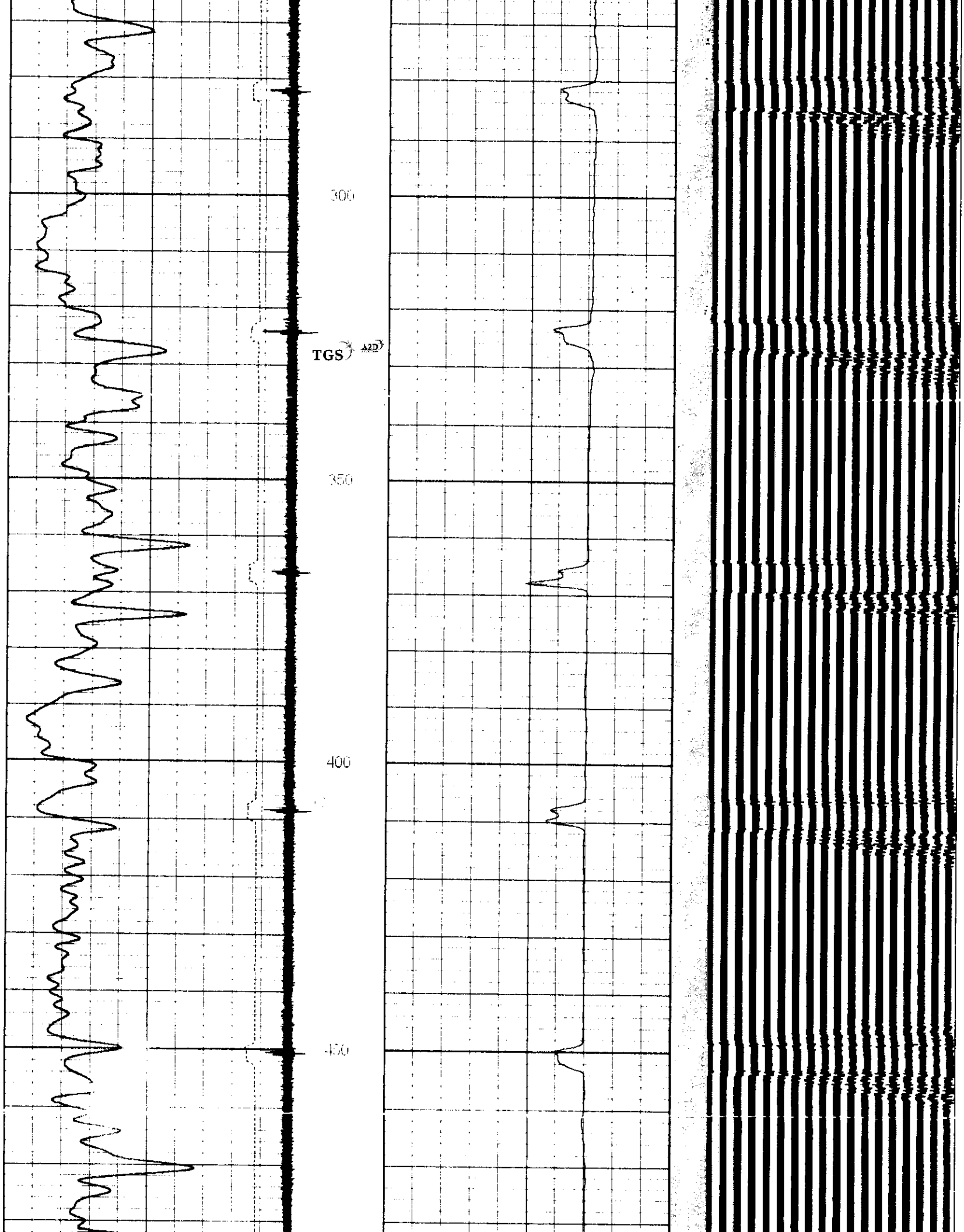
CASEDHOLE

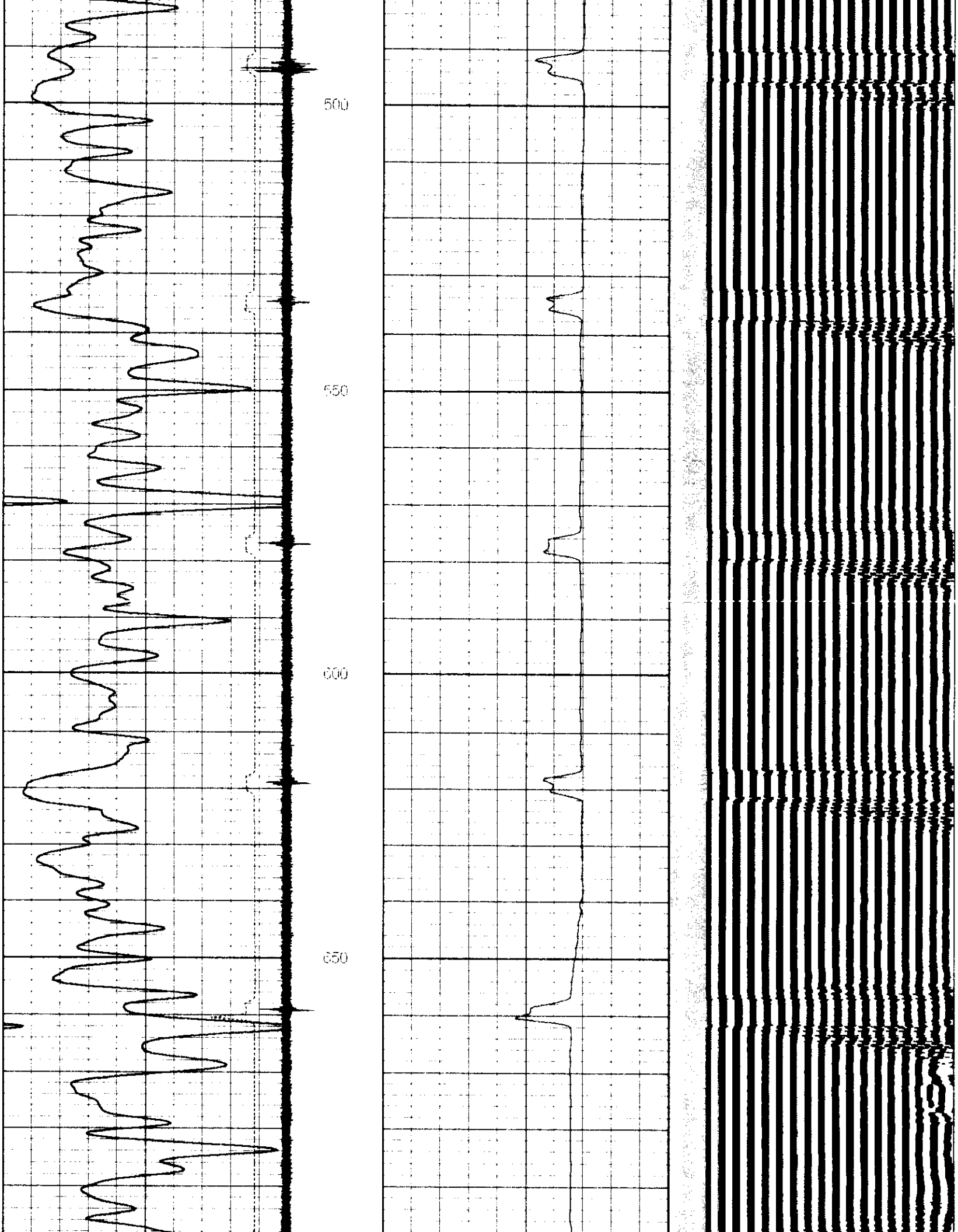
SOLUTIONS

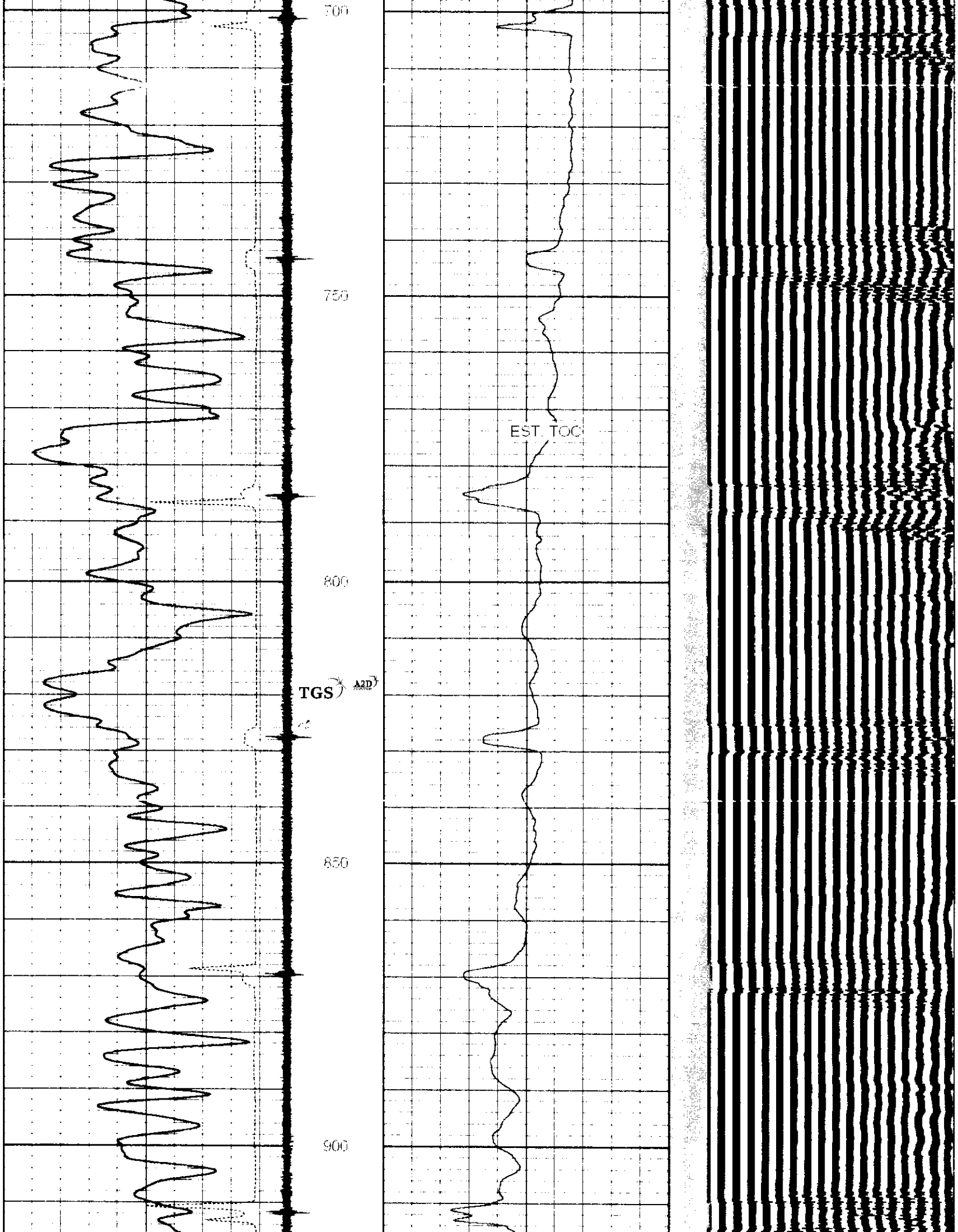
# MAIN LOG "0" PSI

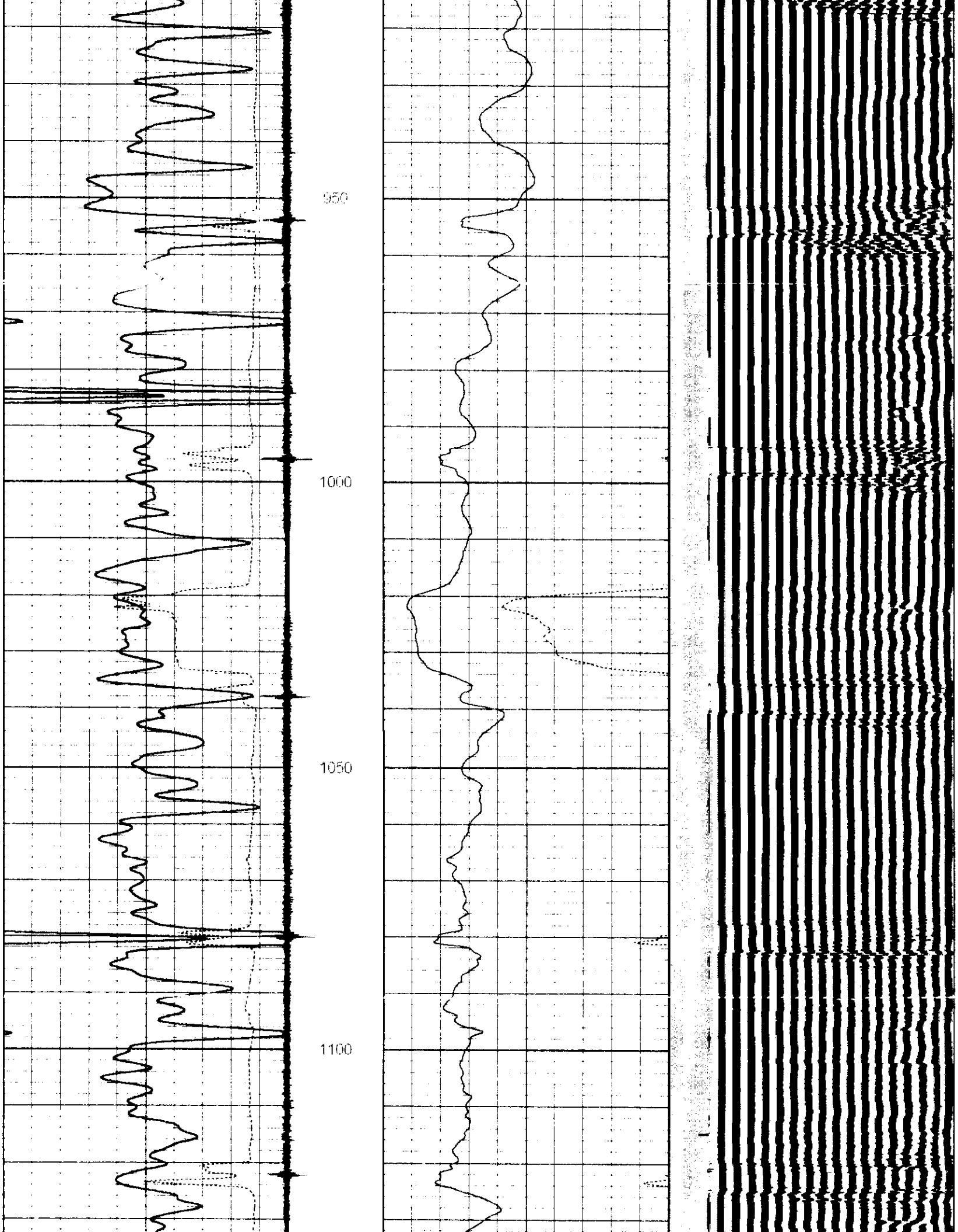
| | |
|---|---|
| Database File: | v-4506petro.db |
| Dataset Pathname: | pass5.1 |
| Presentation Format: | vcbl |
| Dataset Creation: | Tue Apr 20 10:12:24 2010 by Calc Std Casedhole 09061 |
| Charted by: | Depth in Feet scaled 1:240 |

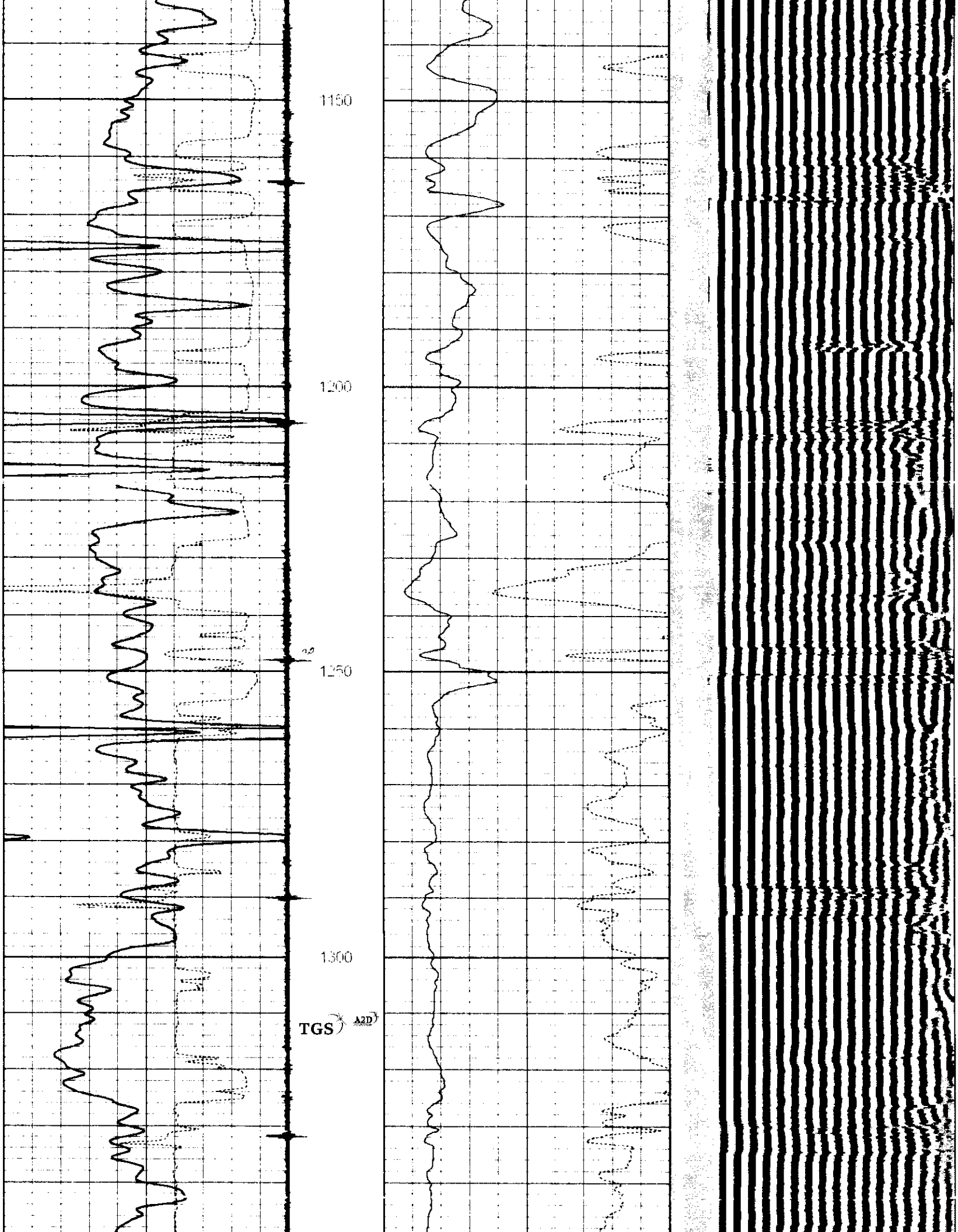


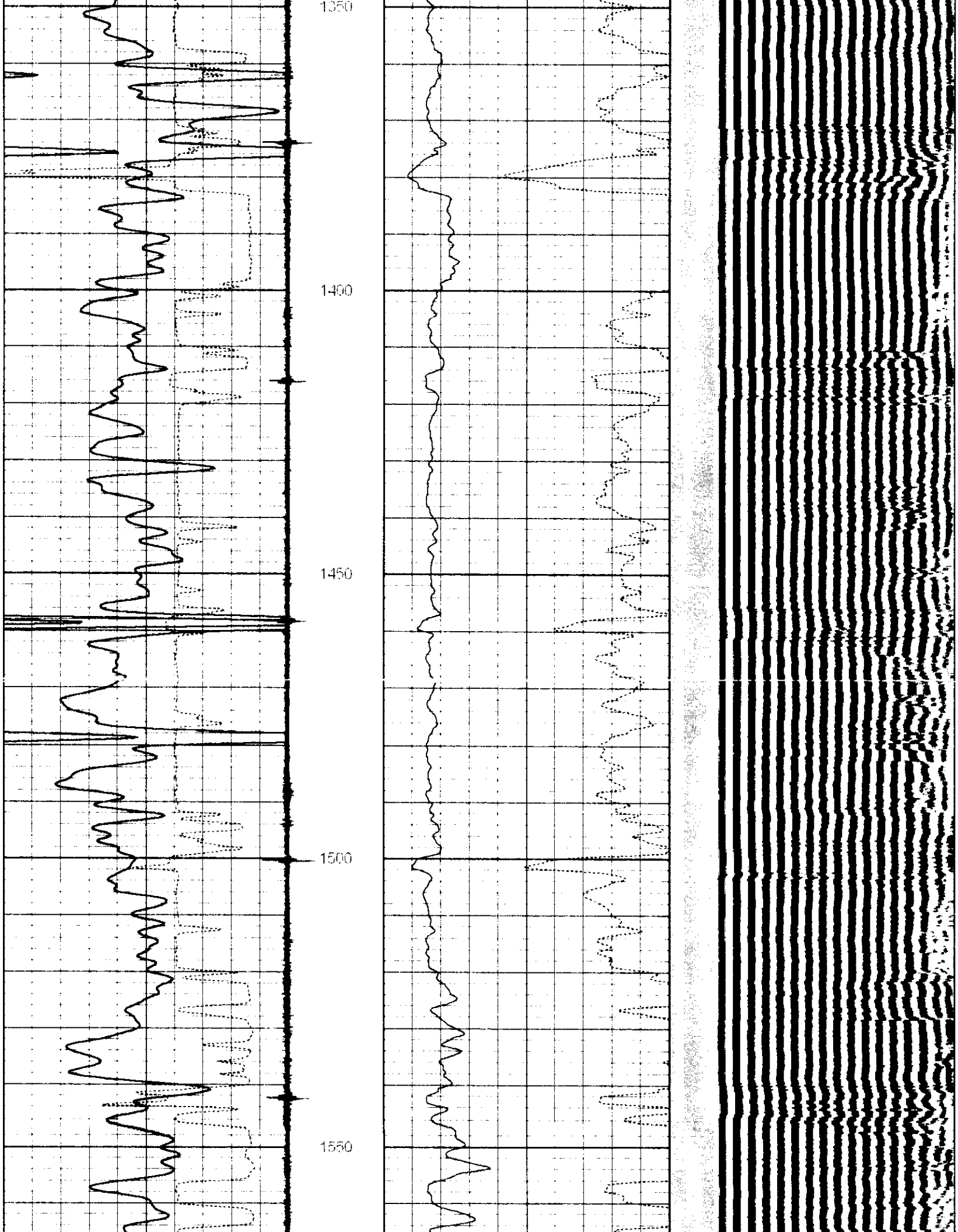

300
TGS
A2D
350
400
450

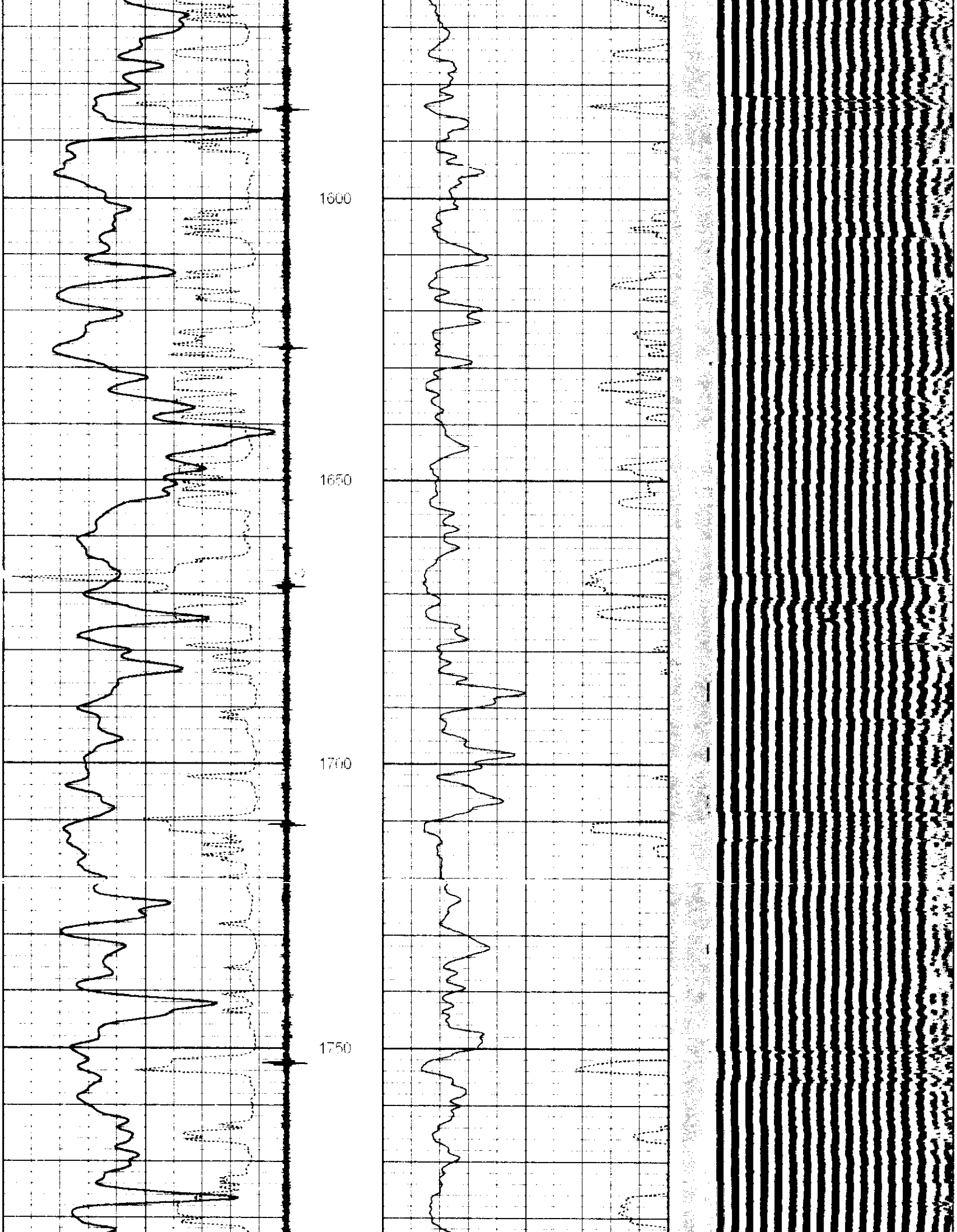

500
550
600
650

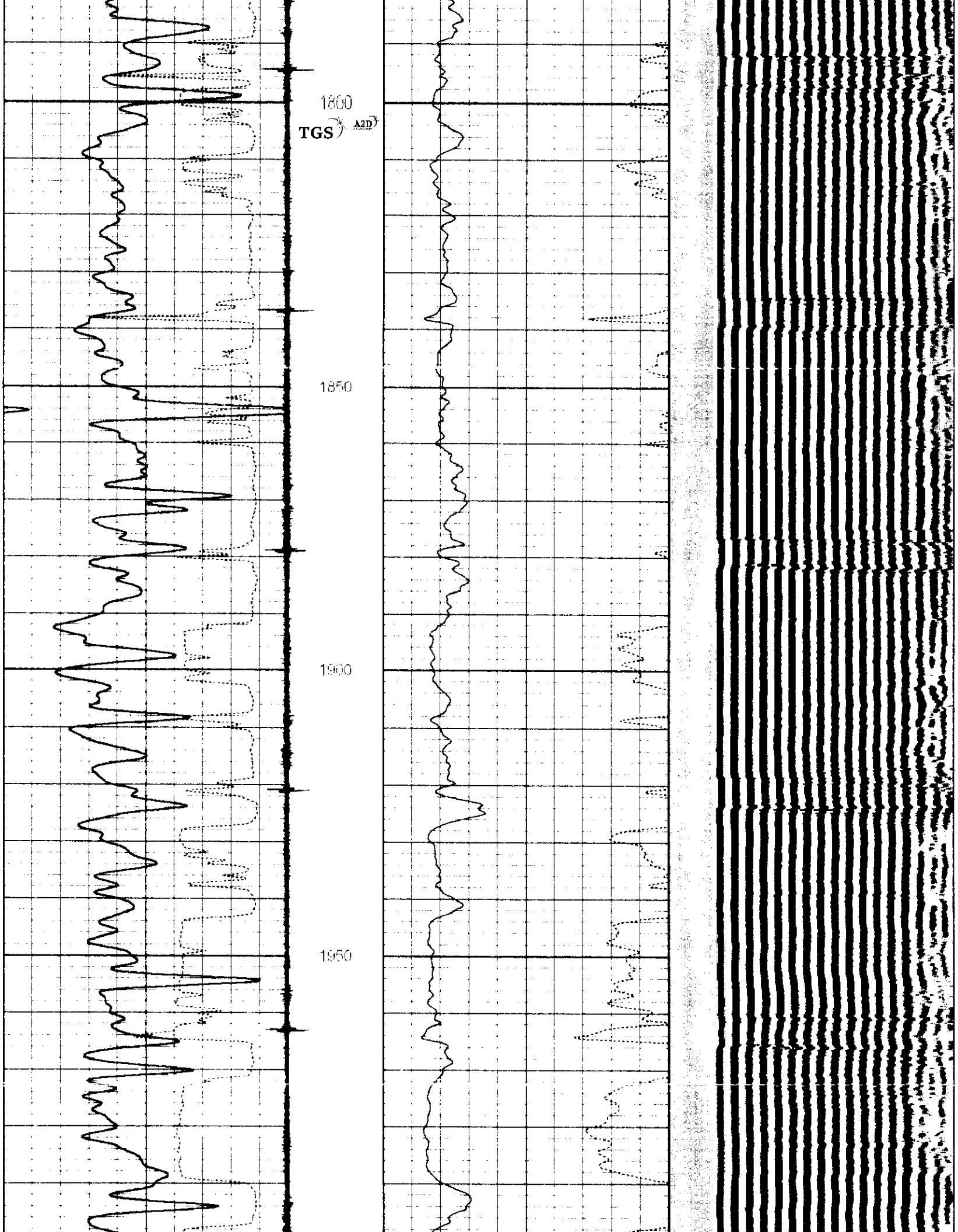

700
750
EST. TOC
800
TGS
A2D
850
900

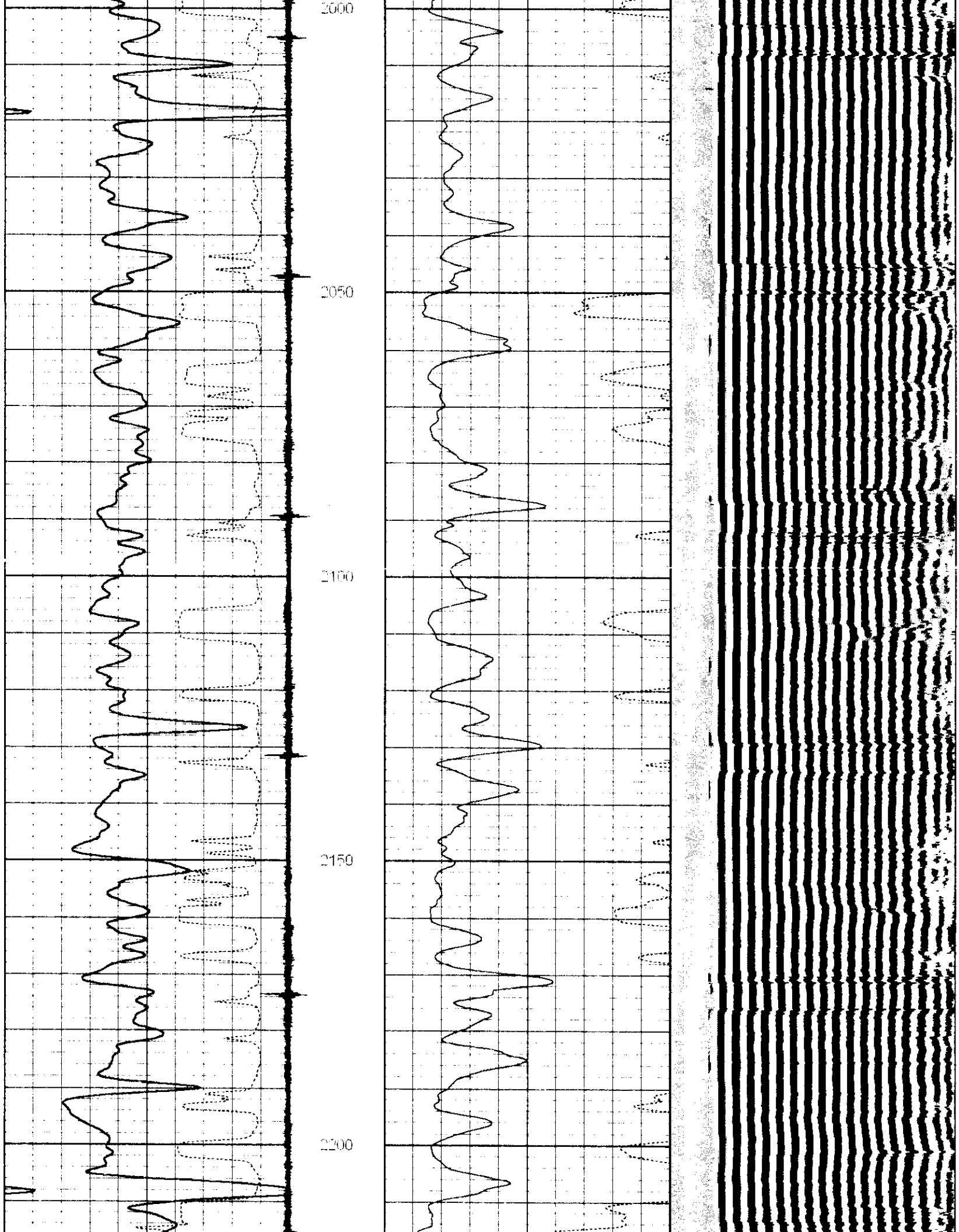

950
1000
1050
1100

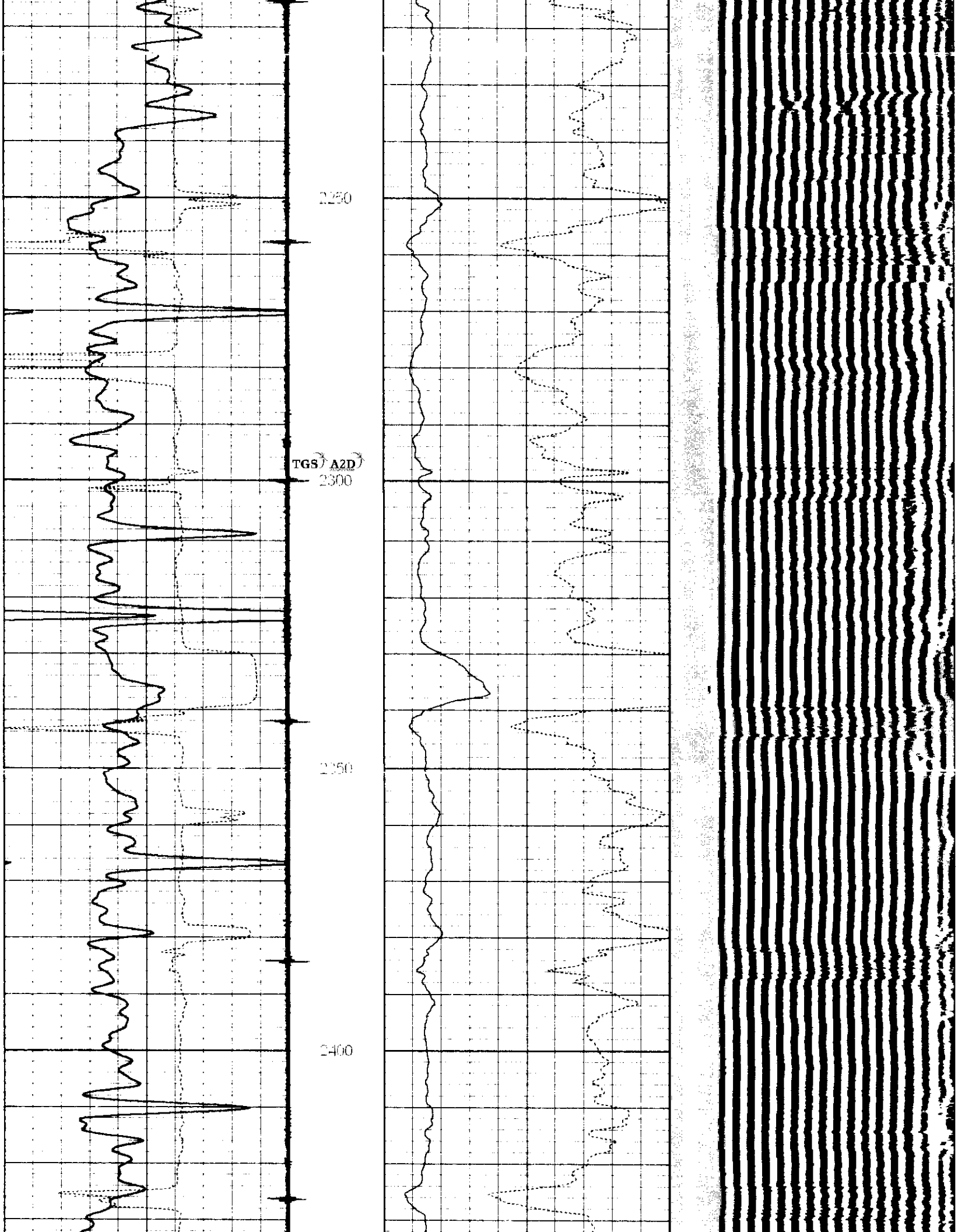

1150
1200
1250
1300
TGS
A2D

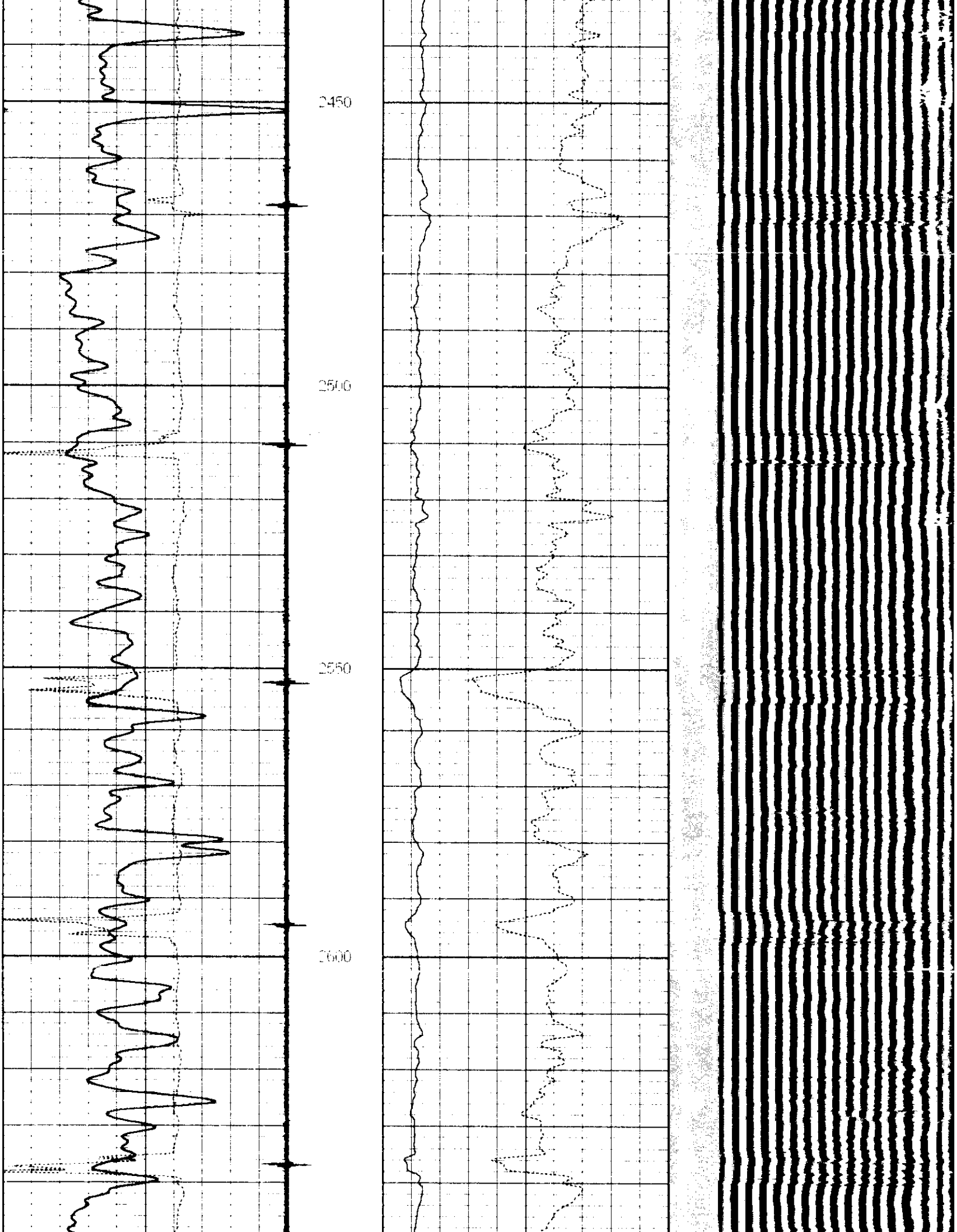

1350
1400
1450
1500
1550

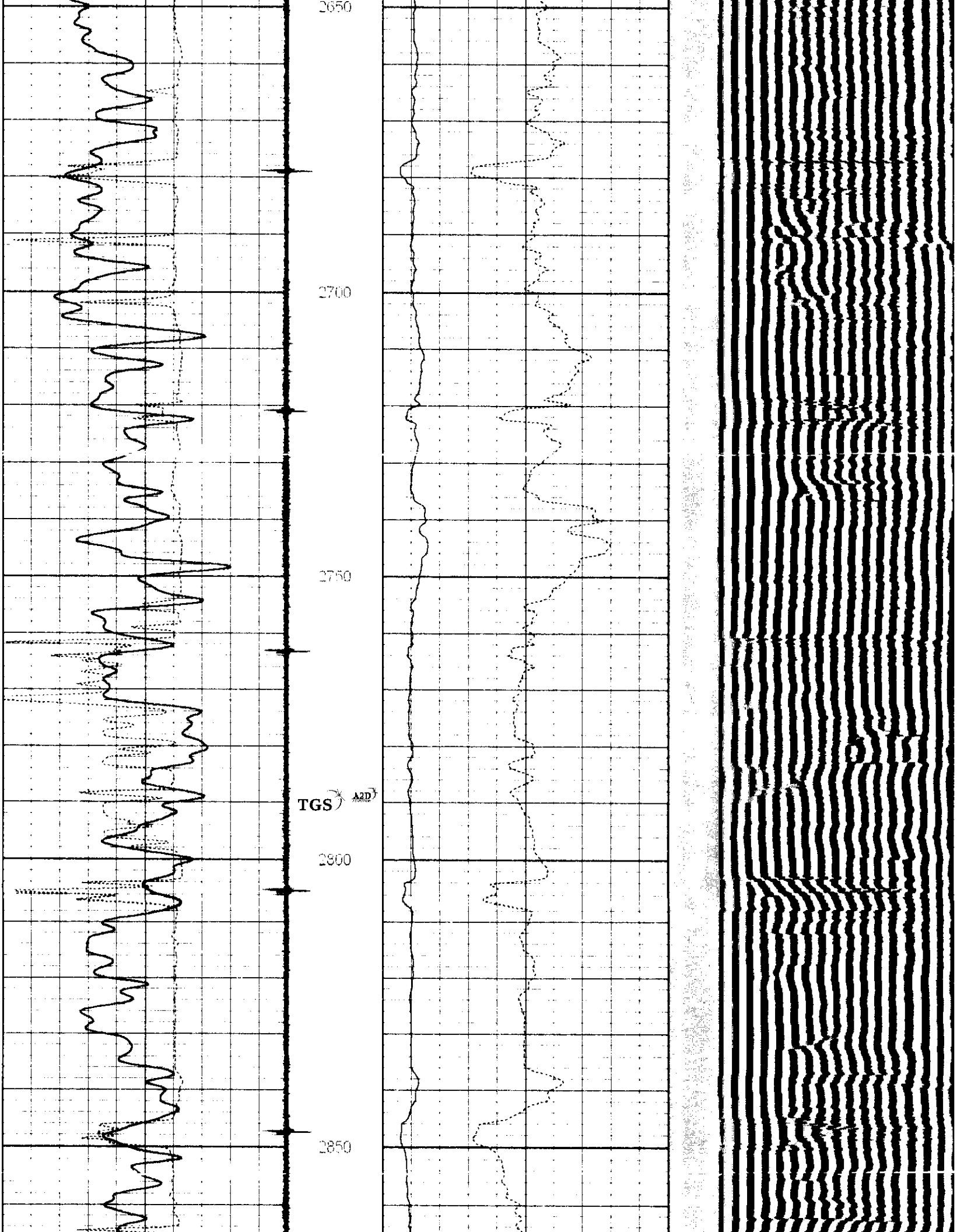

1600
1650
1700
1750

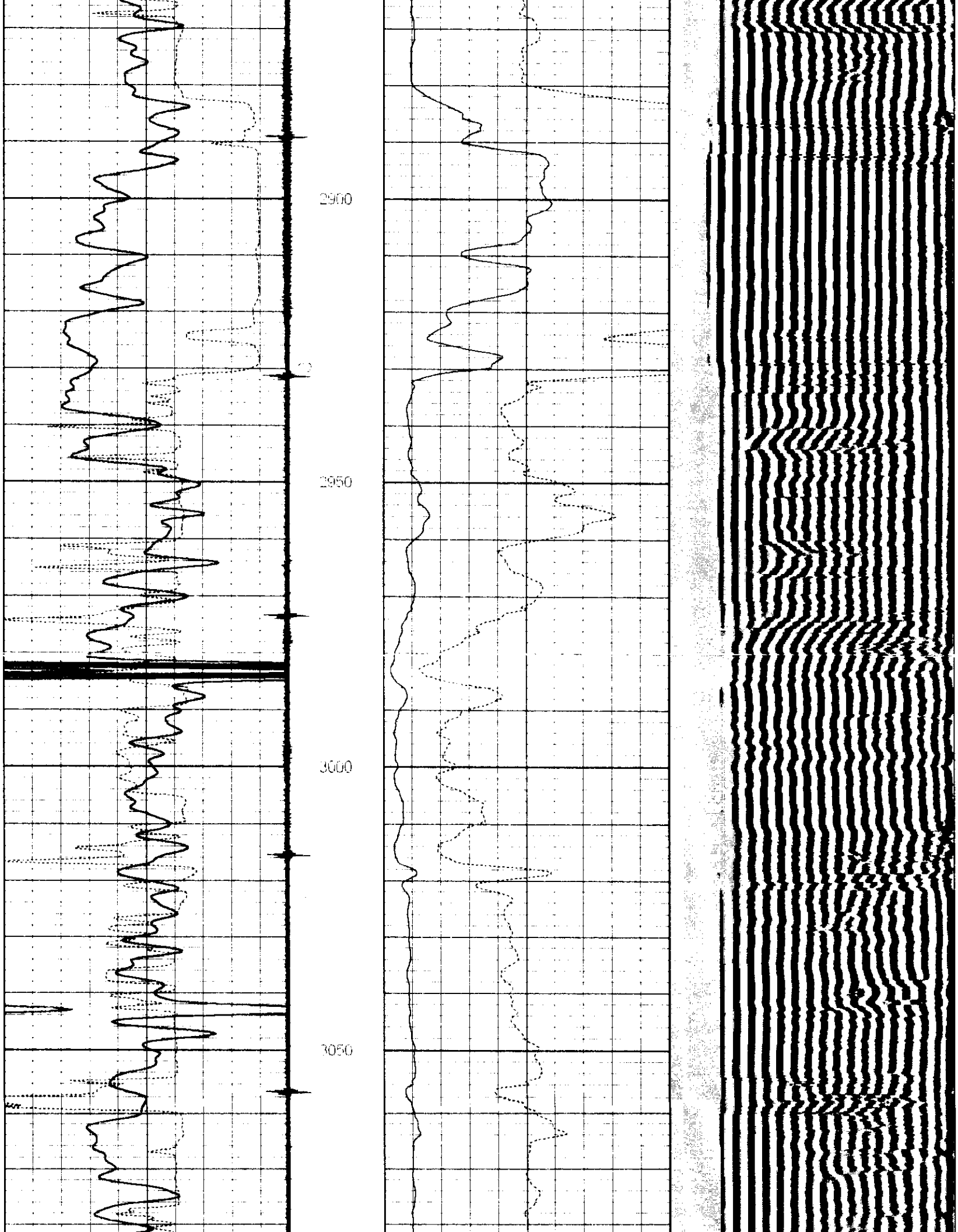

1800
TGS
A2D
1850
1900
1950

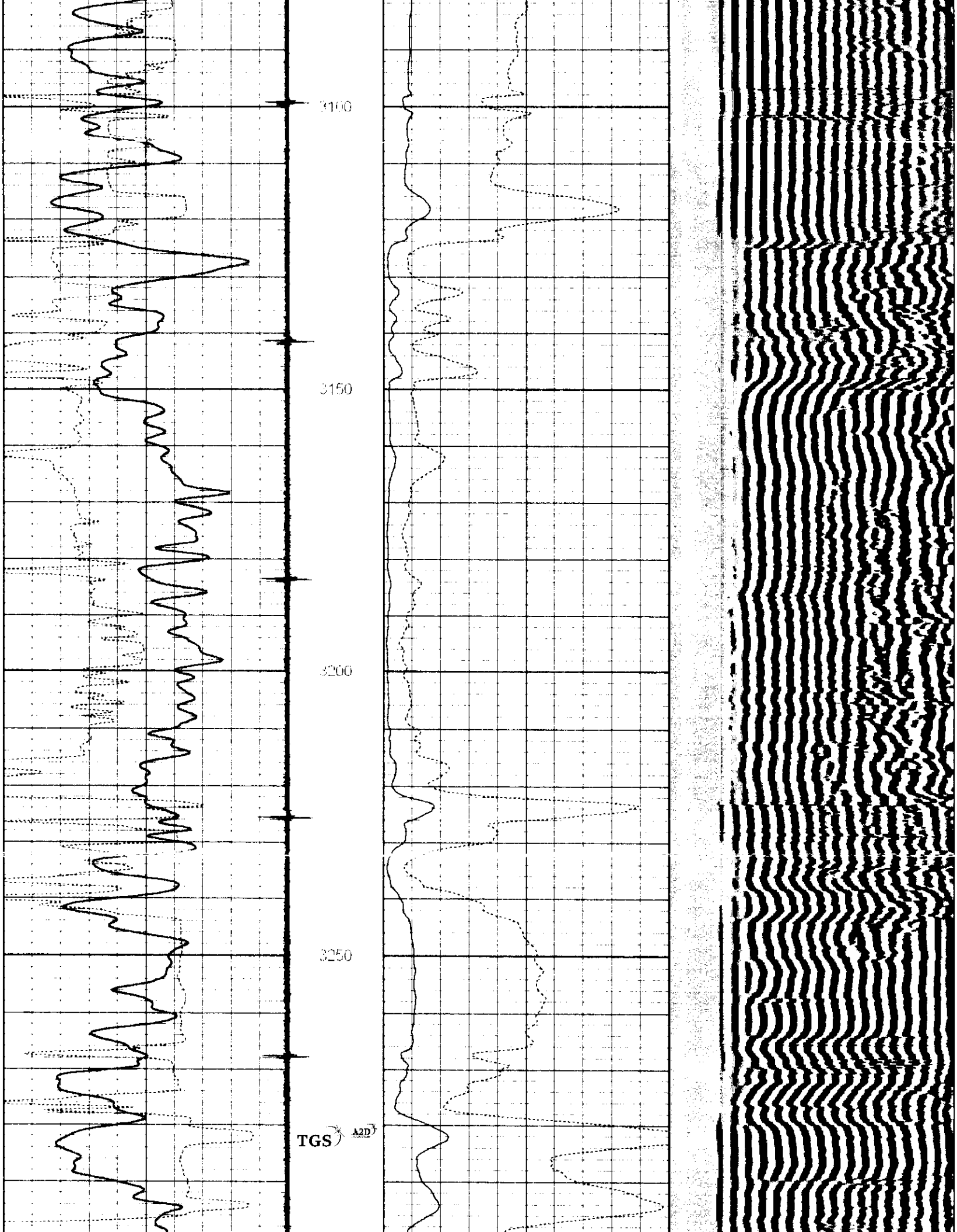

2000
2050
2100
2150
2200

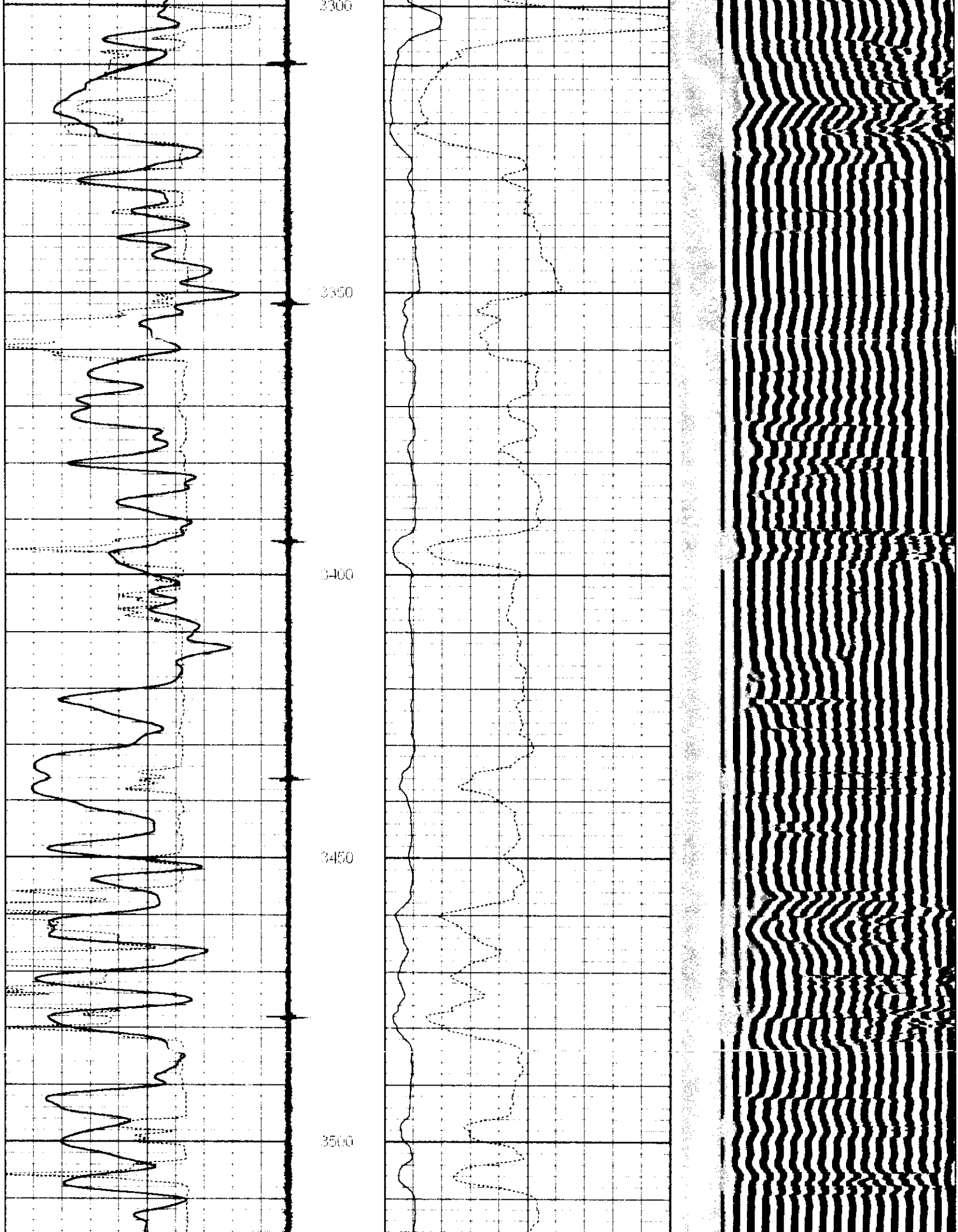

2250
TGS
A2D
2300
2350
2400

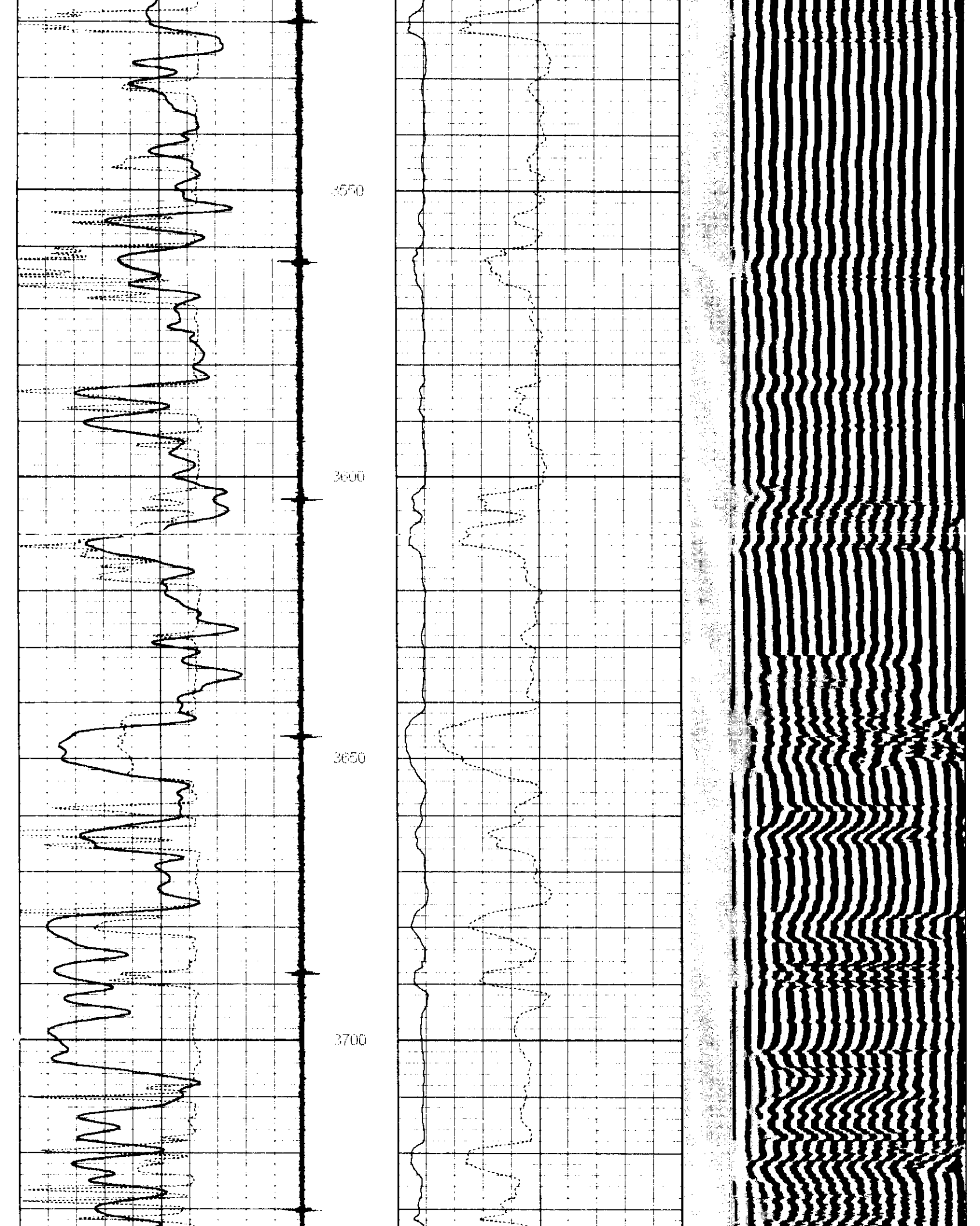

2450
2500
2550
2600

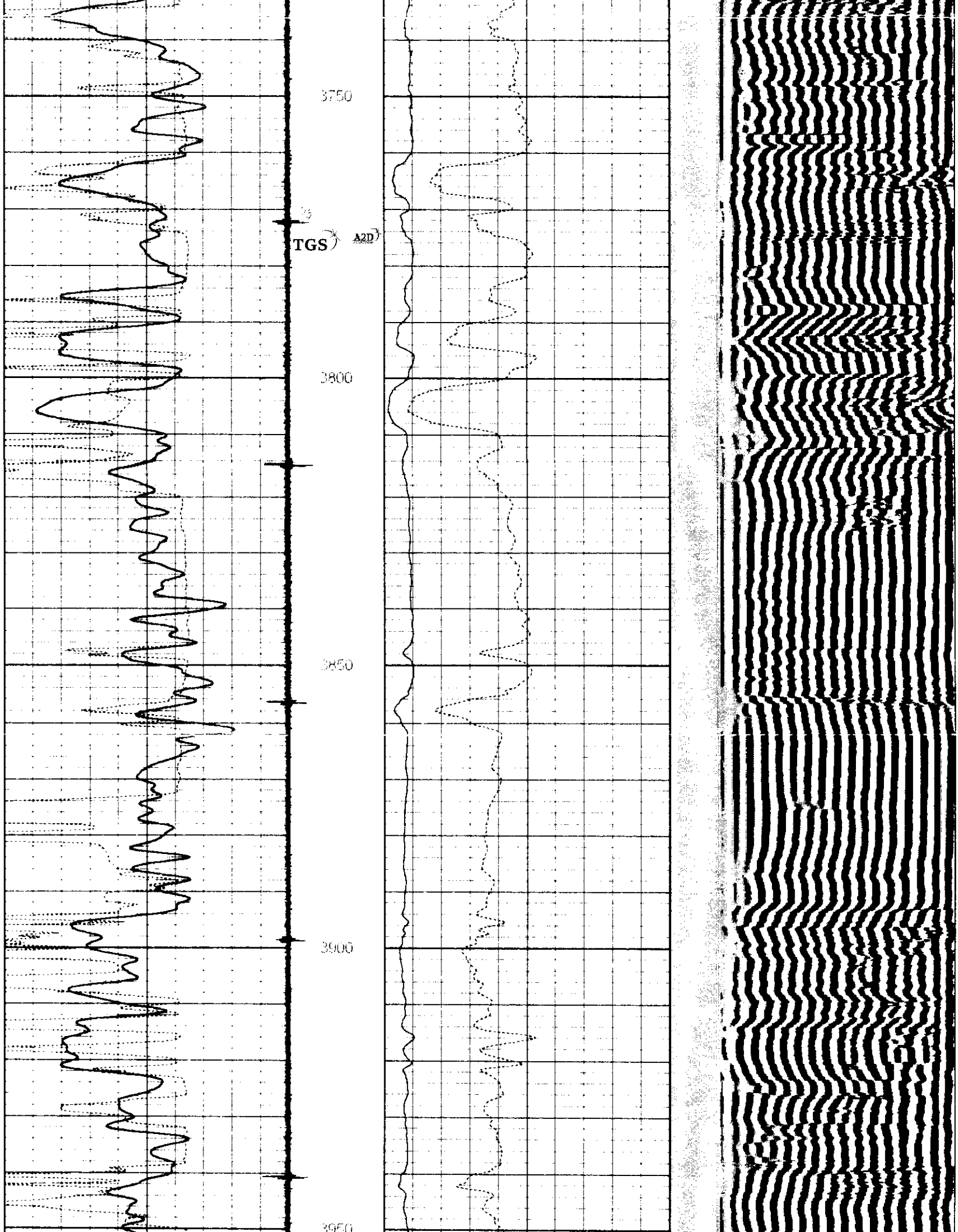

2650
2700
2750
TGS A2D
2800
2850

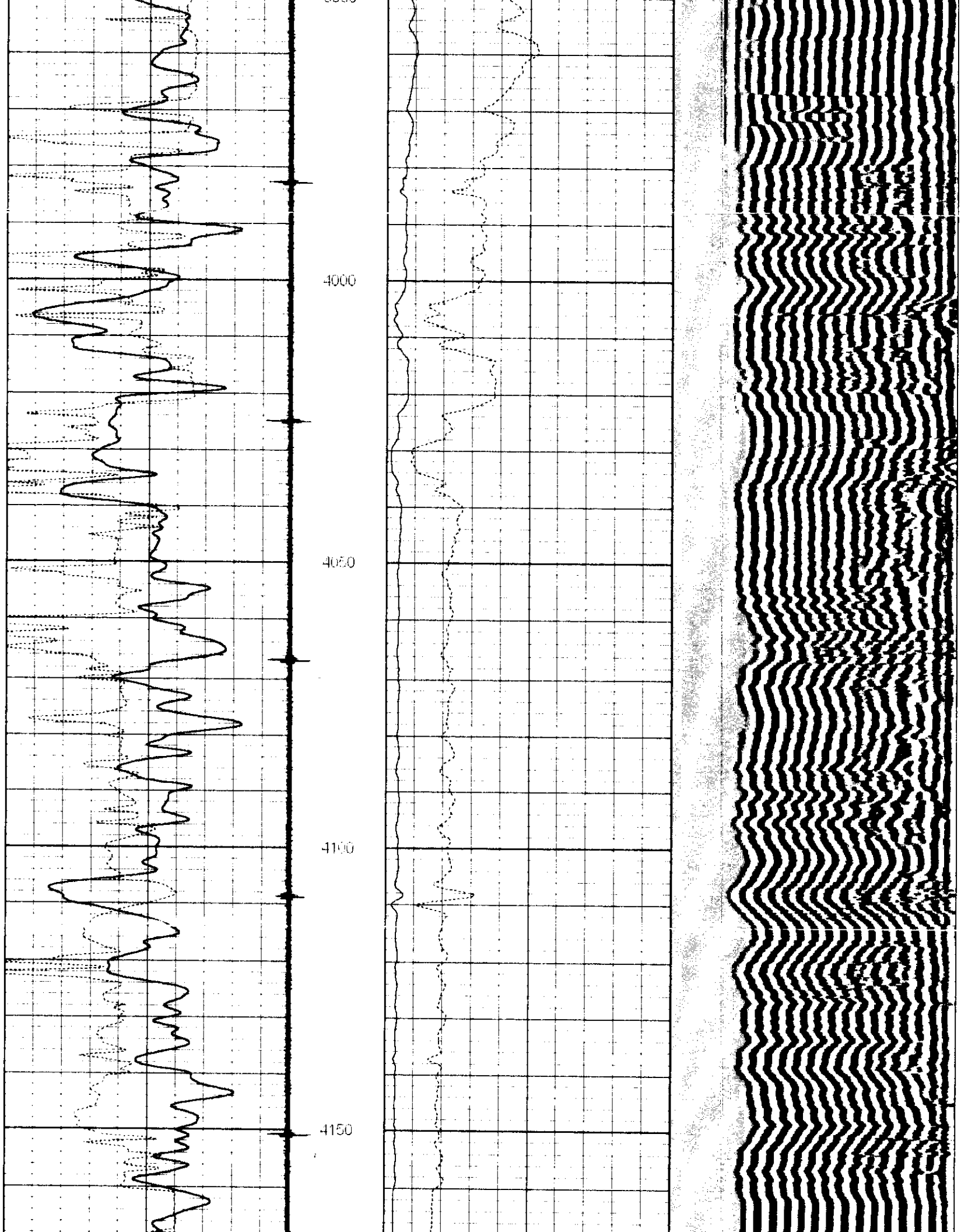

2900
2950
3000
3050

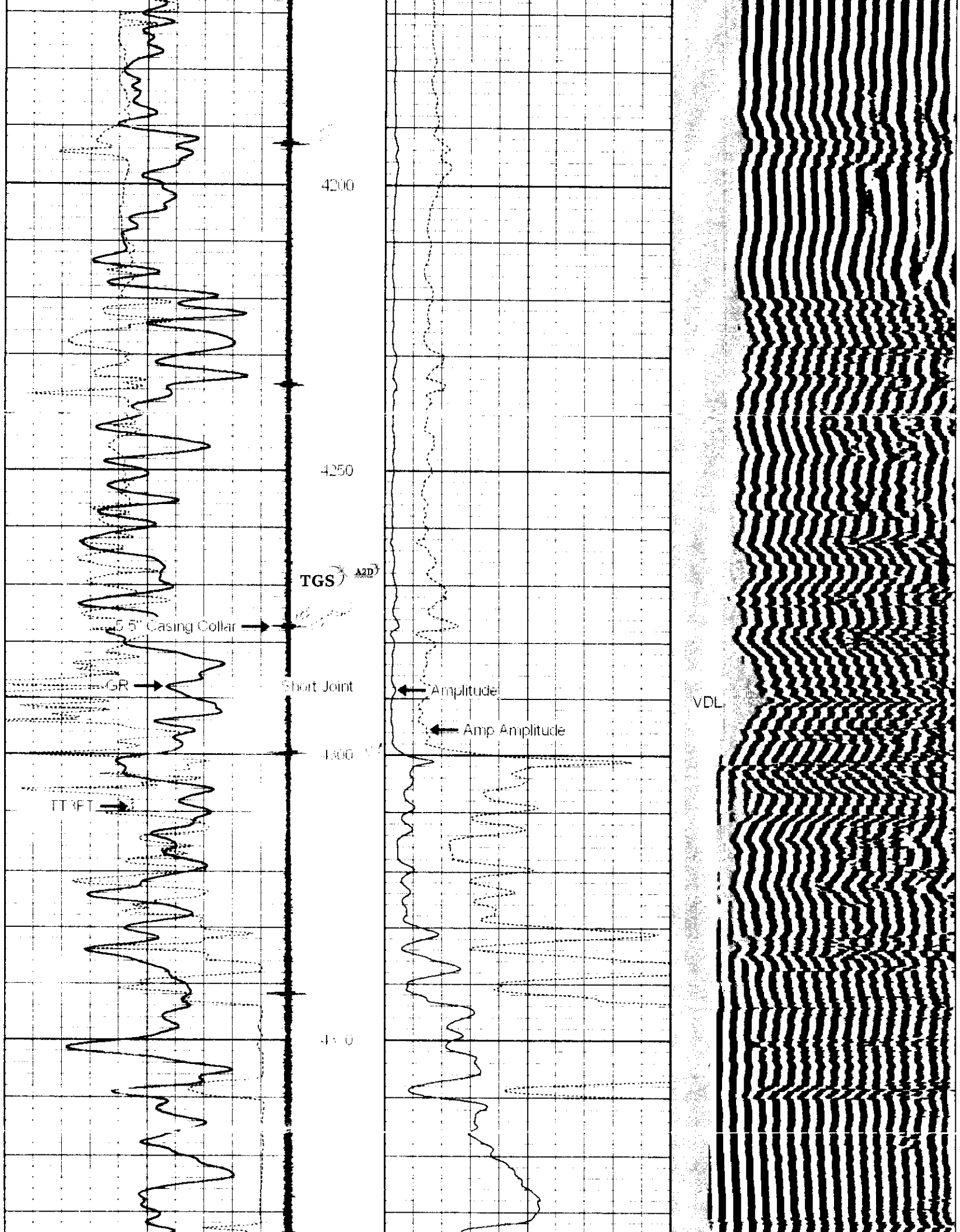

3100
3150
3200
3250
TGS
A2D

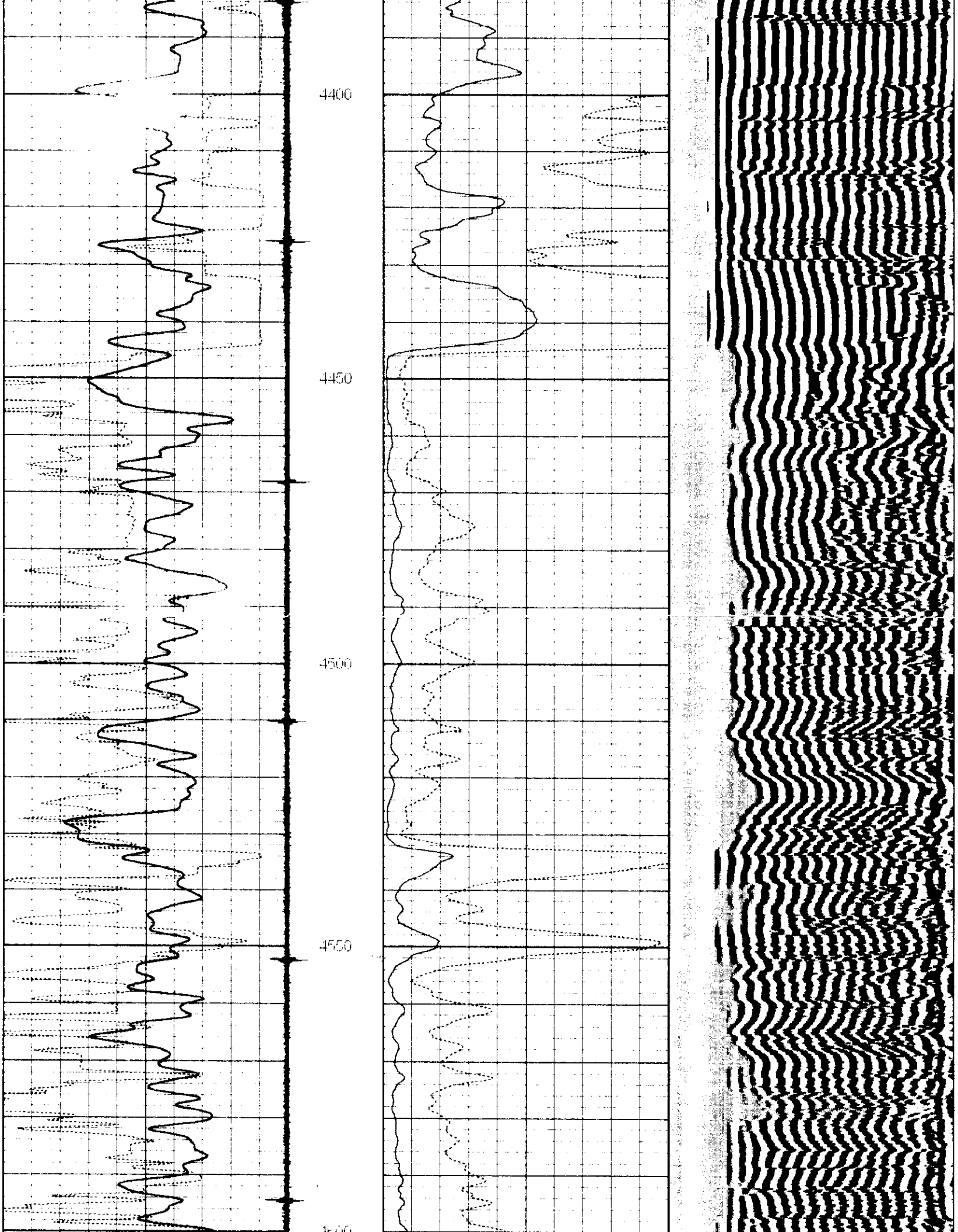

3300
3350
3400
3450
3500

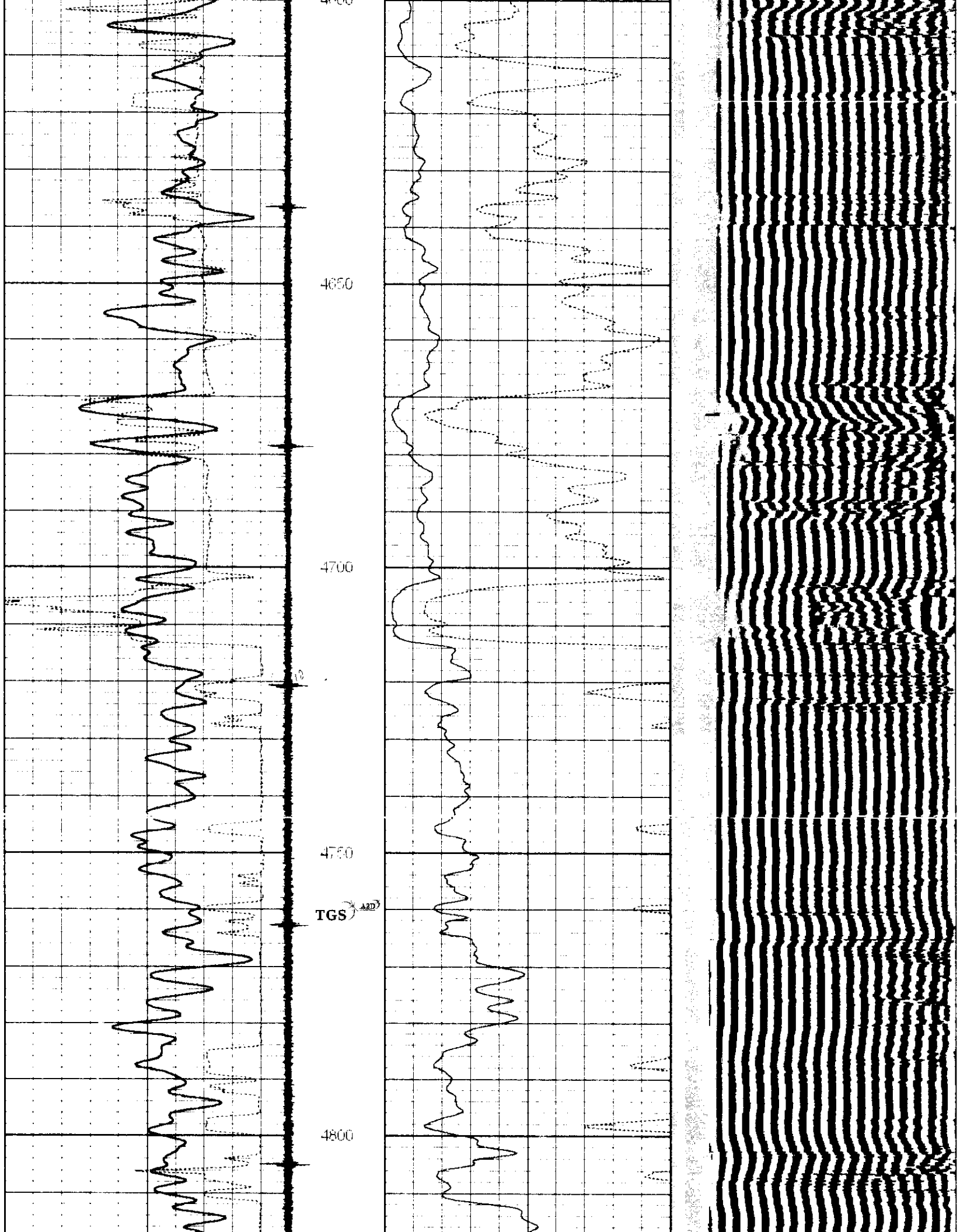

3550
3600
3650
3700

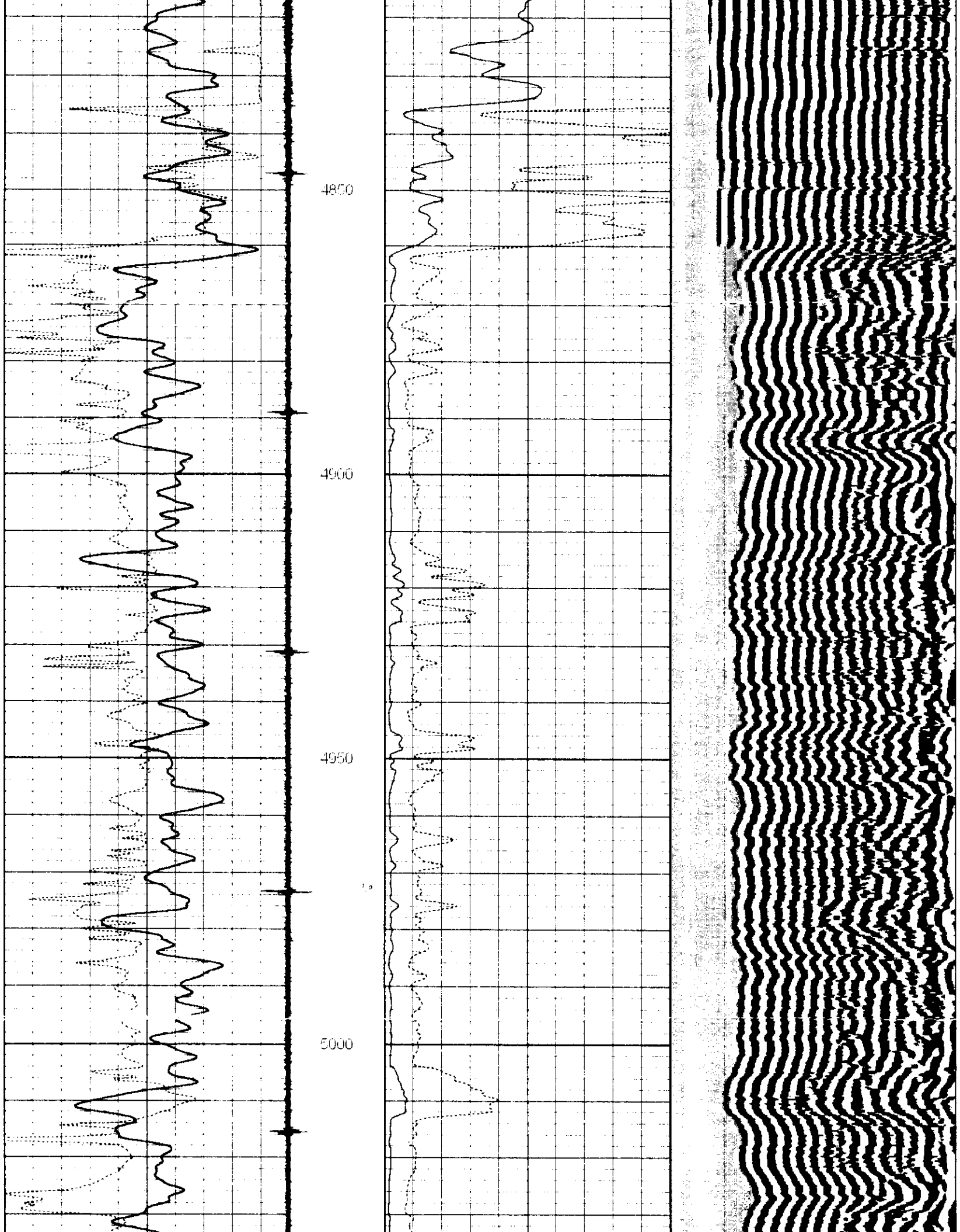

3750
TGS
A2D
3800
3850
3900
3950

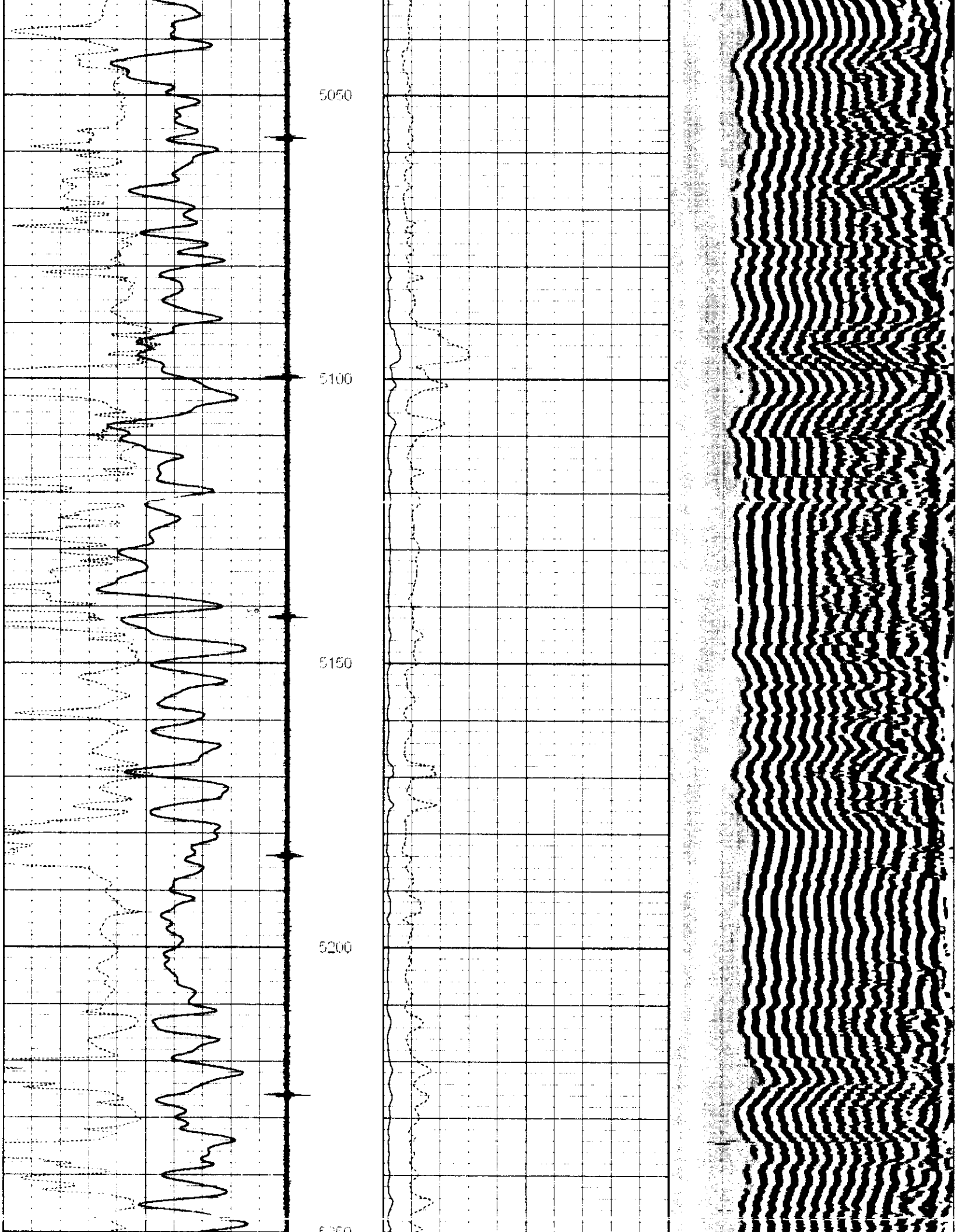

4000
4050
4100
4150

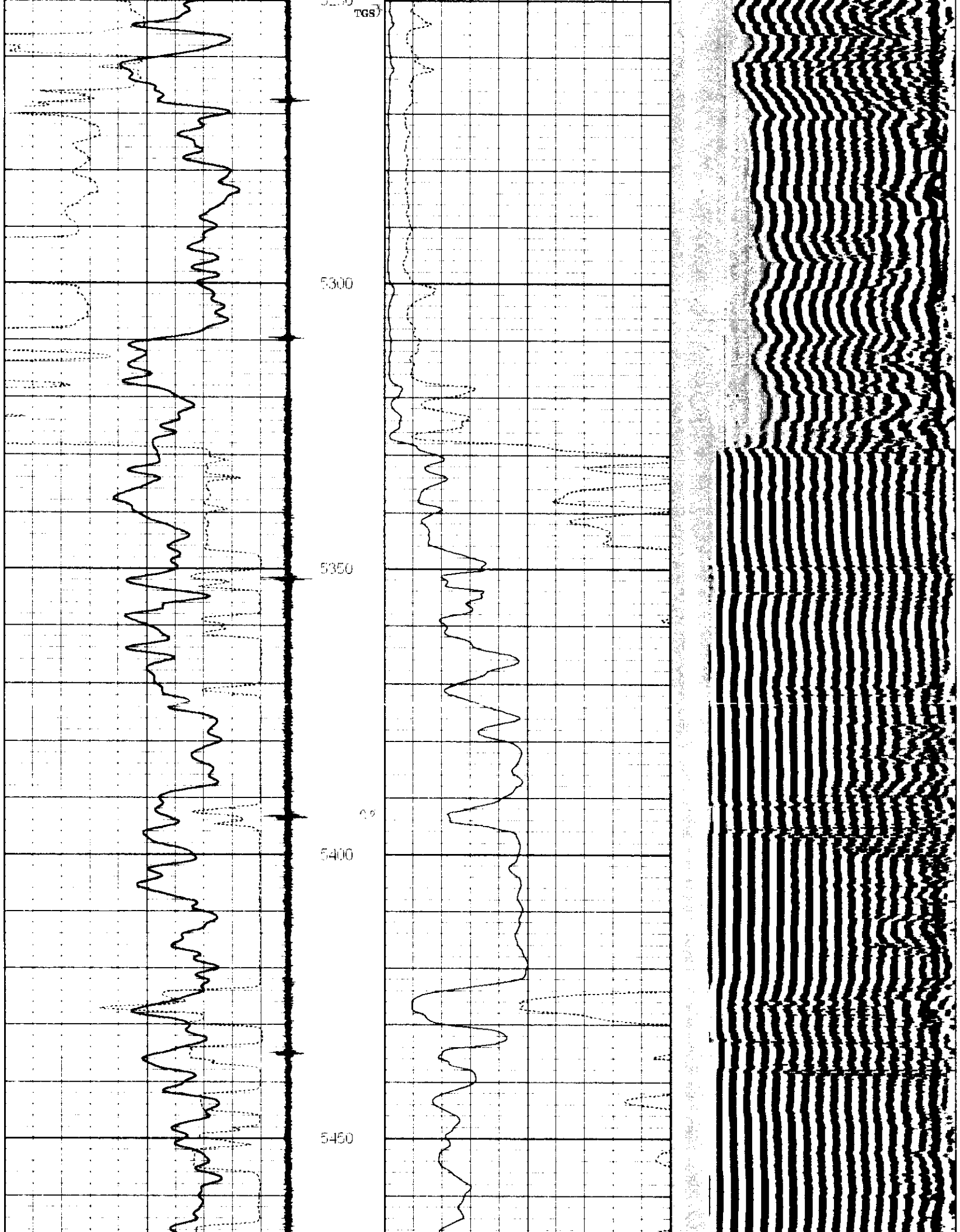

4200
4250
TGS
A2D
5.5" Casing Collar
GR
Short Joint
Amplitude
Amp Amplitude
VDL
TT 3FT

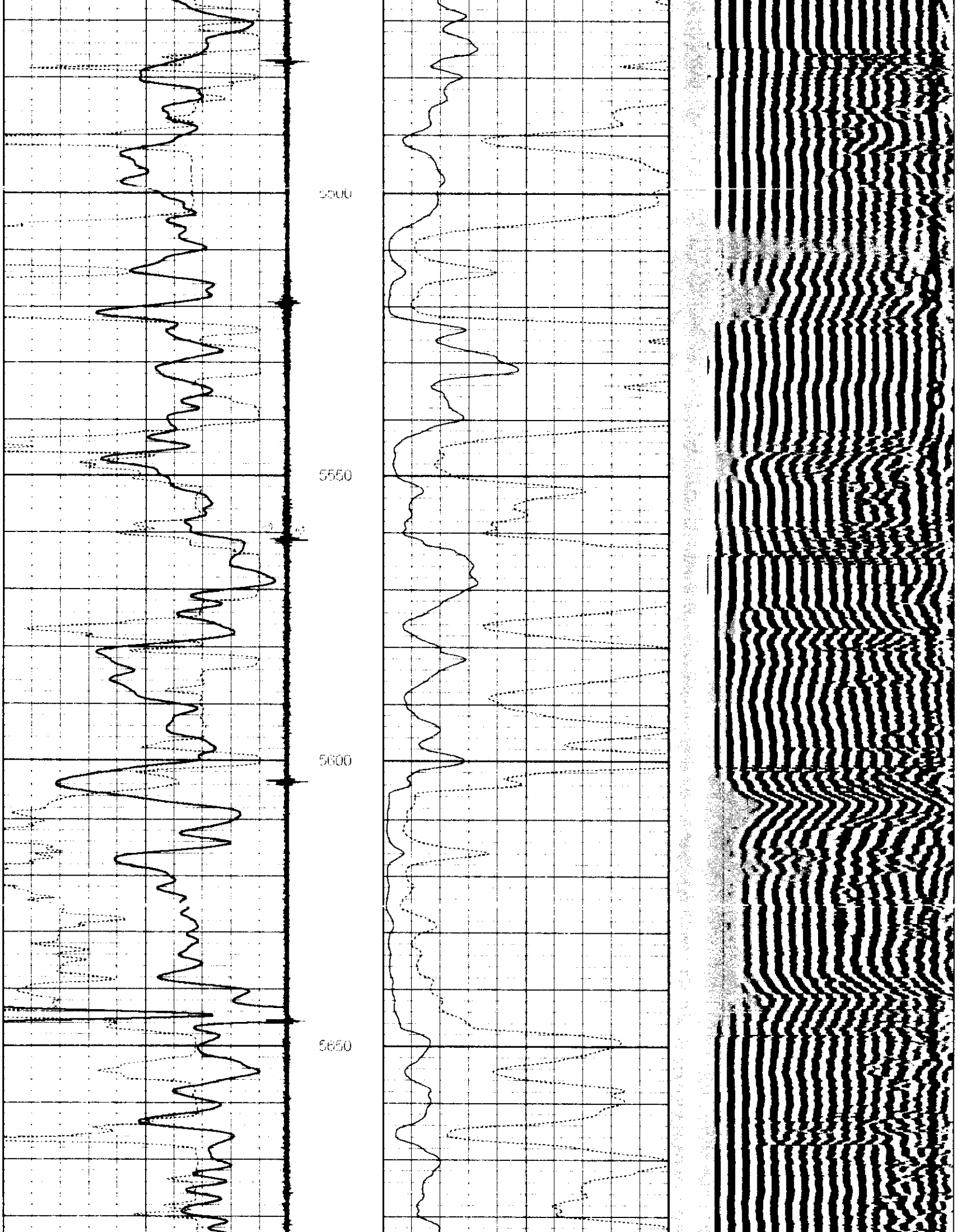

4400
4450
4500
4550

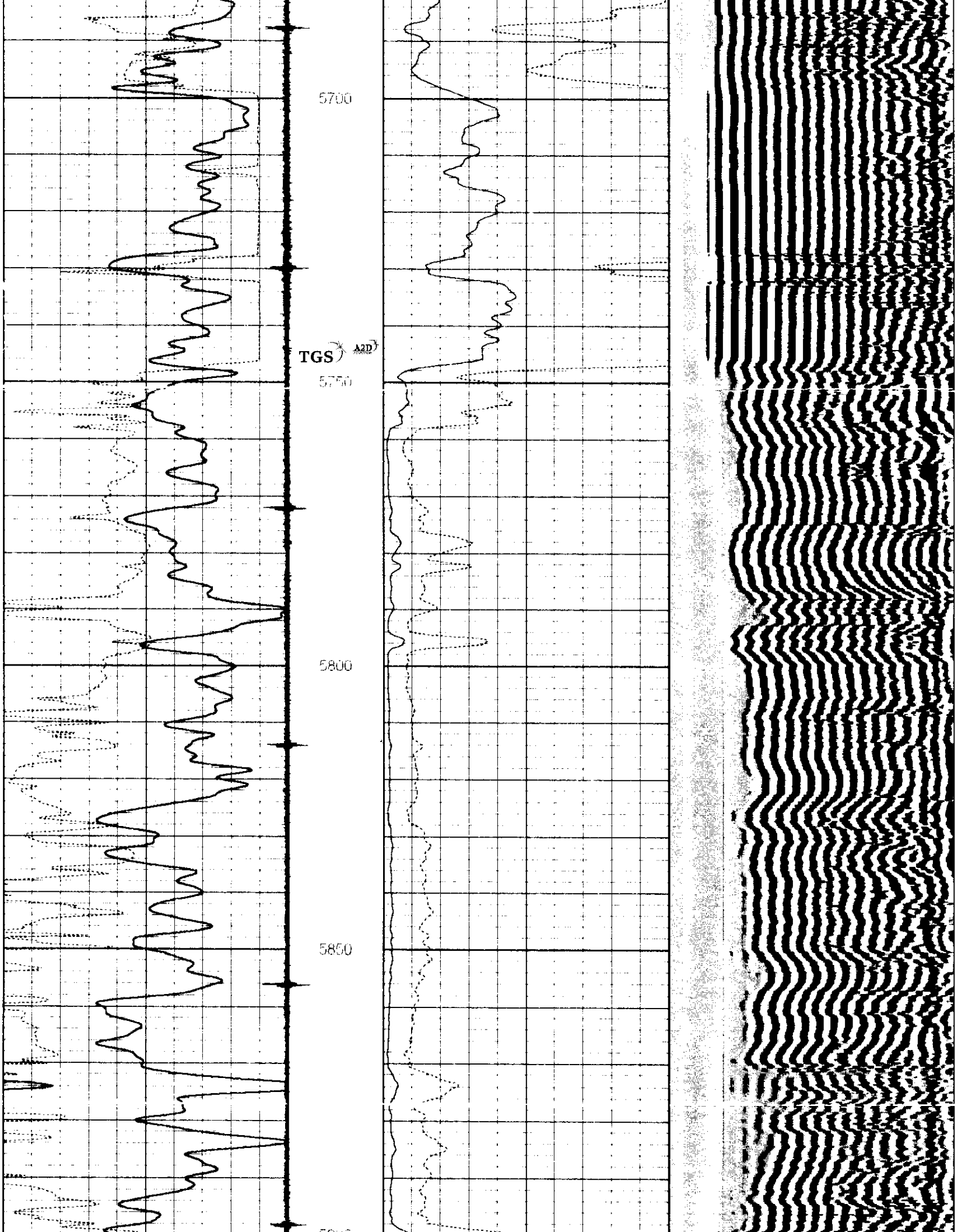

4650
4700
4750
TGS
4800

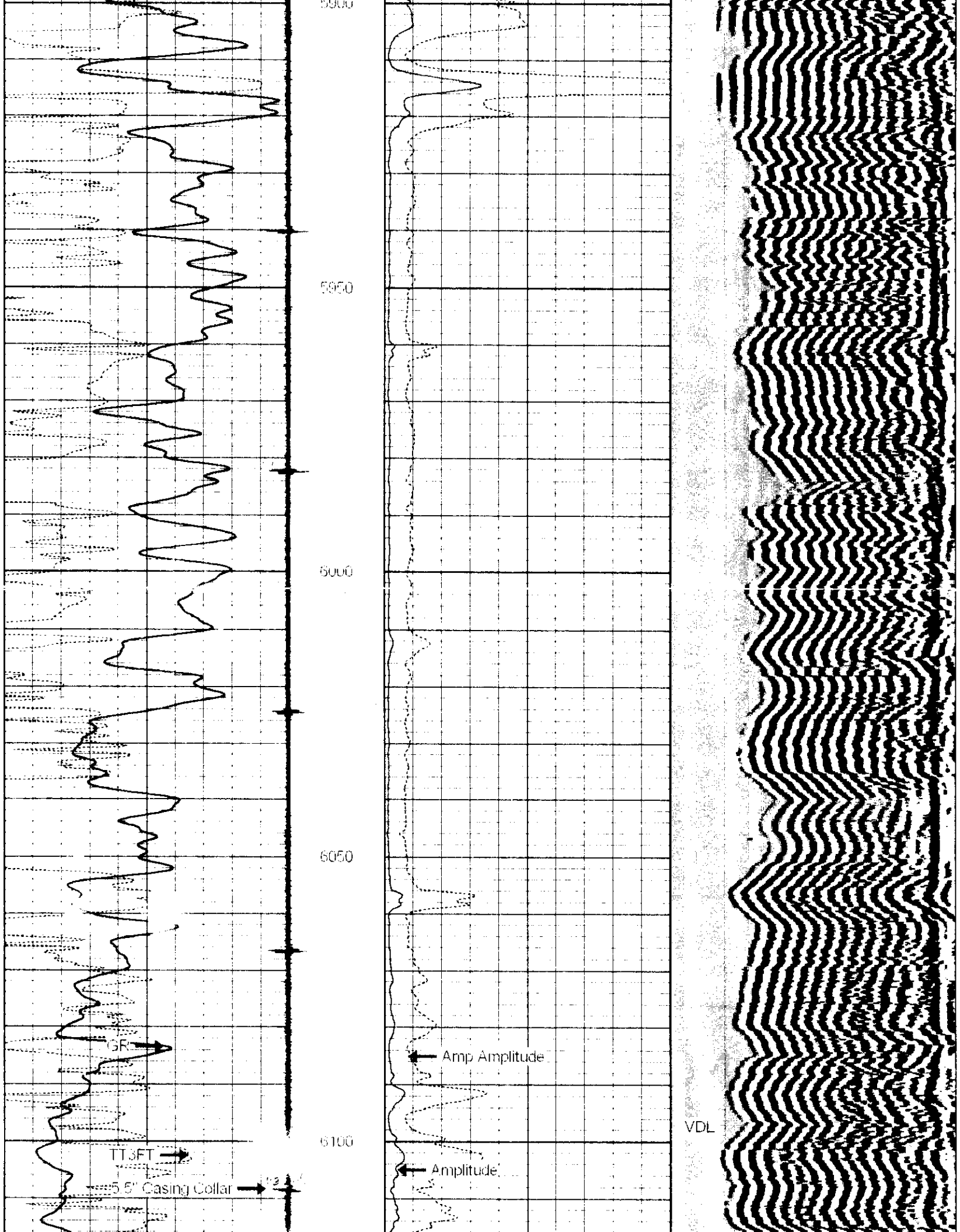

4850
4900
4950
5000

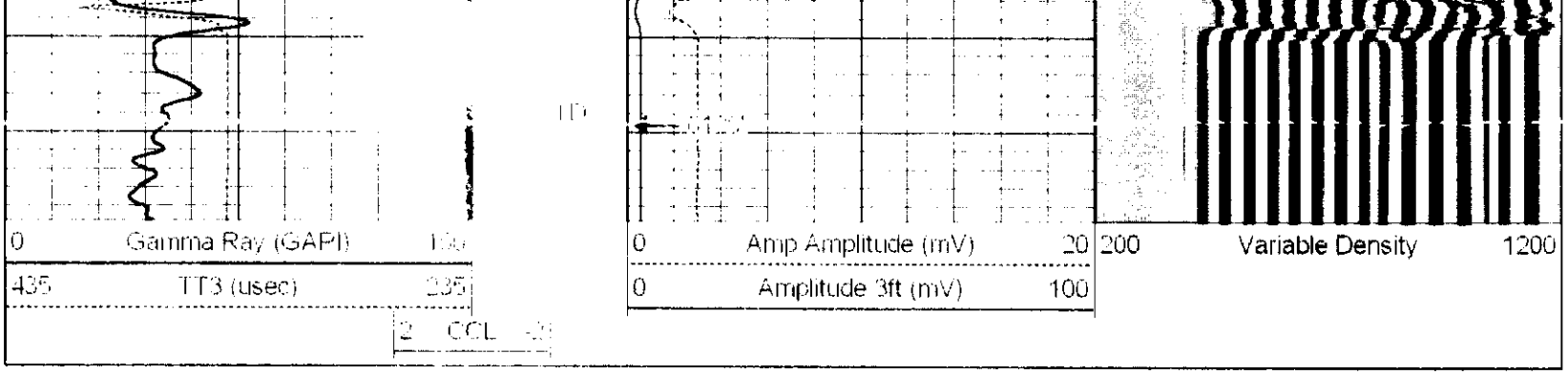

5050
5100
5150
5200


TGS
5300
5350
5400
5450


5500
5550
5600
5650


5700
TGS
A2D
5750
5800
5850

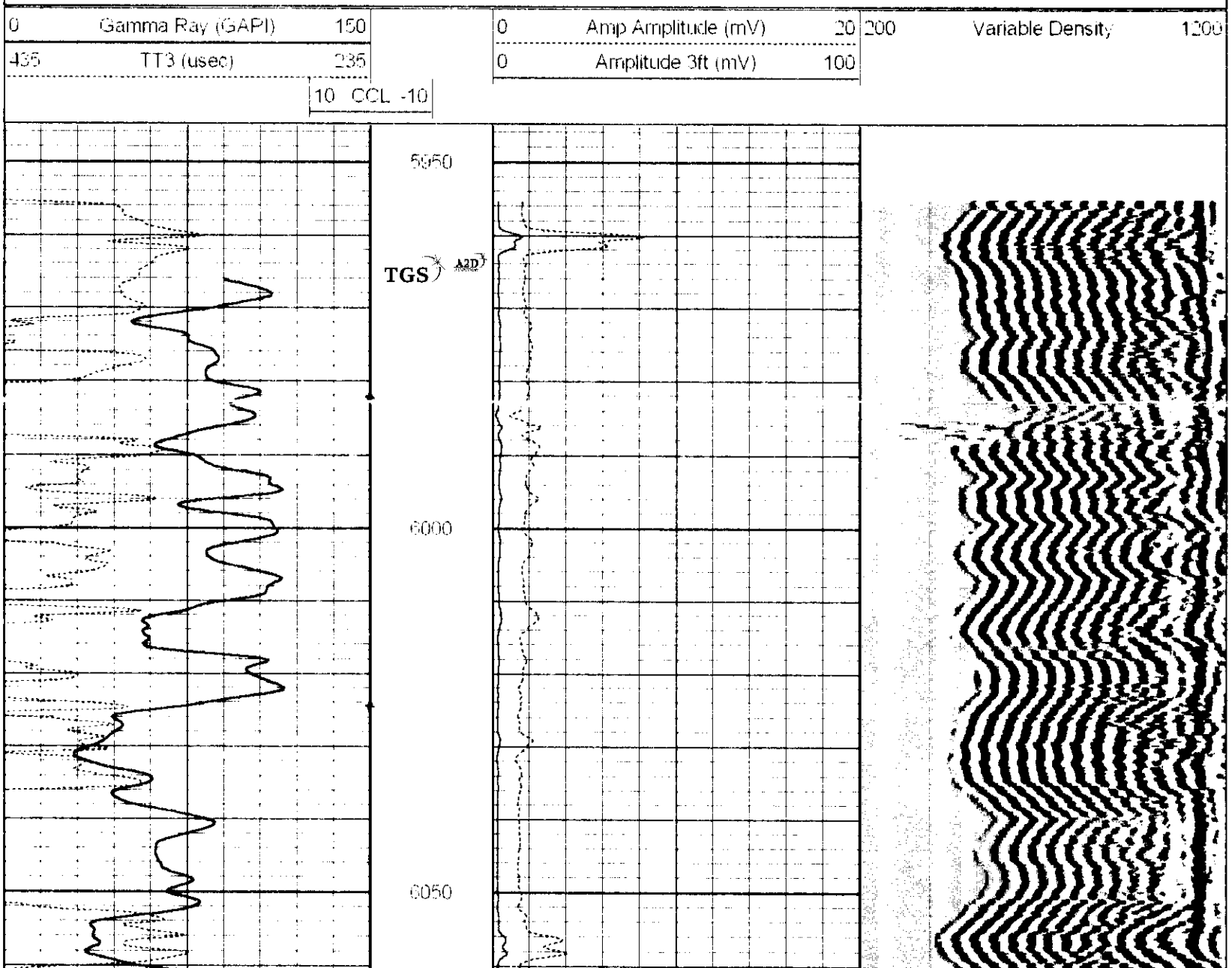

5900
5950
6000
6050
6100
GR
TT3FT
5.5" Casing Collar
Amp Amplitude
Amplitude
VDL

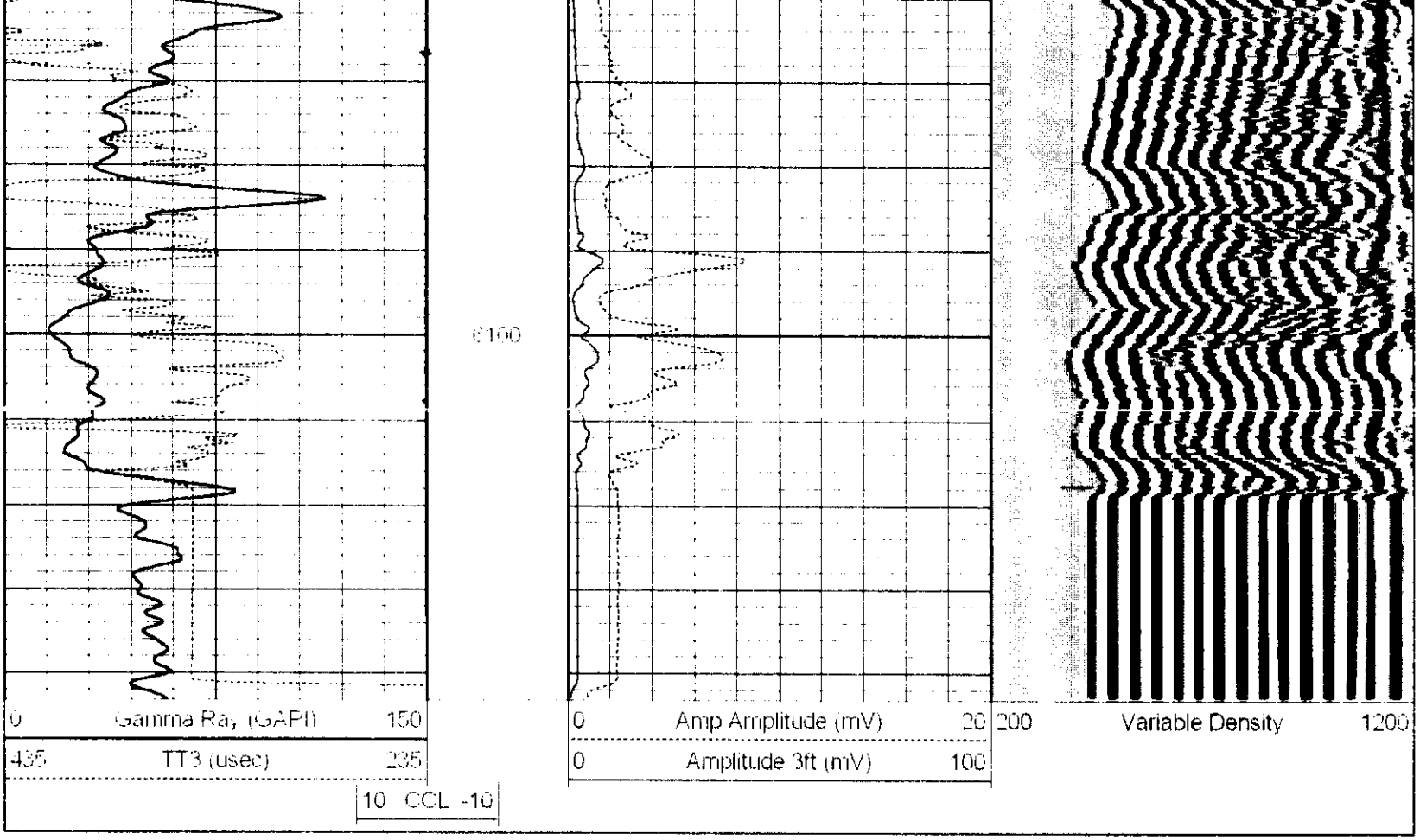



# CASEDHOLE SOLUTIONS

# REPEAT SECTION "0" PSI

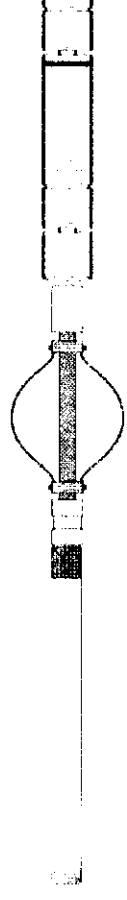
| | |
|---|---|
| Database File | v-4506petro.db |
| Dataset Pathname | pass4 |
| Presentation Format: | vcbl |
| Dataset Creation: | Tue Apr 20 08:32:53 2010 by Log Std Casedhole 09061 |
| Charted by: | Depth in Feet scaled 1:240 |






| Sensor | Offset (ft) | Schematic | Description | Len (ft) | OD (in) | Wt (lb) |
|---|---|---|---|---|---|---|
| | | | STNDRD<br>Standard Cable Head | 1.00 | 1.44 | 10.00 |
| CCL | 0.00 | | CCL-CCLTEK275 (4CCL2.75)<br>2 3/4" TEKCO LOGGING COLLAR LOCATOR | 1.83 | 2.75 | 20.00 |
| | | | CENTTEK1.1<br>1 3/4" APPLIED CENTRALIZER | 2.90 | 1.75 | 10.00 |
| TEMP | -6.23 | | | | | |
| WVF3FT | -8.40 | | CBLTEKCOTEMP-TEKCOTEMP (7CBLT2.75 | 9.08 | 2.75 | 102.00 |
| WVF5FT | -9.40 | | Tekco 2 3/4" Dual Receiver with Temp | | | |

| | | | | | |
|---|---|---|---|---|---|
| WVFCAL | -12.65 | CENTTEK1.3<br>1 3/4" APPLIED CENTRALIZER | 2.90 | 1.75 | 10.00 |
| WVFTEMP | -12.65 | | | | |
| WVFSYNC | -12.65 | | | | |
| GR | -18.33 | GR-GRSTEK1.6 (GRS1.1)<br>1 11/16" TEKCO SCINT. LOGGING GAMMA RAY | 3.79 | 1.69 | 20.00 |



| | |
|---|---|
| Dataset | [illegible]/run1/pass5.1 |
| Total Length | 21.50 ft |
| Total Weight | 172.05 lb |
| O.D. | 2.75 in |

ATTACHMENT NO. 8

OPEN HOLE LOG FOR THE UIC WELL

**CONFIDENTIAL**

# HALLIBURTON

## SPECTRAL DENSITY DUAL SPACED NEUTRON

## TIGHT HOLE

| | |
|---|---|
| COMPANY | PETROGLYPH OPERATING COMPANY |
| WELL | UTE TRIBAL 20-15 |
| FIELD | ANTELOPE CREEK |
| COUNTY | DUCHESNE |
| STATE | UTAH |

COMPANY **PETROGLYPH OPERATING COMPANY**
WELL **UTE TRIBAL 20-15**
FIELD **ANTELOPE CREEK**
COUNTY **DUCHESNE** STATE **UTAH**

API No. 43013340510000
Location SURFACE HOLE LOCATION: 574' FSL & 1806' FEL (SW/SW)

Sect. 20 Twp. 5S Rge. 3W

Other Services: RWCH, GR, ACRt

| | | | | |
|---|---|---|---|---|
| Permanent Datum | GL | Elev. 6475.0 ft | Elev.: K.B. | 6489.0 ft |
| Log measured from | KB | 14.0 ft above perm. Datum | D.F. | 6488.0 ft |
| Drilling measured from | KB | | G.L. | 6475.0 ft |

| | | | | |
|---|---|---|---|---|
| Date | 08-Apr-10 | | | |
| Run No. | ONE | | | |
| Depth - Driller | 6182.00 ft | | | |
| Depth - Logger | 6198.0 ft | | | |
| Bottom - Logged Interval | 6186.0 ft | | | |
| Top - Logged Interval | 100.0 ft | | | |
| Casing - Driller | 8.625 in @ 500.0 ft | @ | | |
| Casing - Logger | 509.0 ft | | | |
| Bit Size | 7.875 in | @ | | |
| Type Fluid in Hole | FRESH WATER / BRINE | | | |
| Density / Viscosity | 8.4 ppg / 27.00 s/qt | | | |
| PH / Fluid Loss | 7.00 pH / 0.0 cptm | | | |
| Source of Sample | MUD TANK | | | |
| Rm @ Meas. Temperature | 1.22 ohmm @ 53.00 degF | @ | | |
| Rmf @ Meas. Temperature | @ | @ | | |
| Rmc @ Meas. Temperature | @ | @ | | |
| Source Rmf / Rmc | | | | |
| Rm @ BHT | 0.44 ohmm @ 160.0 degF | @ | | |
| Time Since Circulation | | | | |
| Time on Bottom | 08-Apr-10 02:10 | | | |
| Max. Rec. Temperature | 160.0 degF @ 6198.0 ft | @ | | |
| Equipment / Location | 11392047 / VERNAL, UT | | | |
| Recorded By | J. MELANCON | | | |
| Witnessed By | D. DAVIS | | | |

RECEIVED
JUN 0 3 2010
DIV. OF OIL, GAS & MINING

Fold here

Service Ticket No.: 7277849 API Serial No.: 43013340510000 PGM Version: WL INSITE R2.6.1 (Build 9)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

| | | | |
|---|---|---|---|
| Date / Sample No. | | | |
| Depth-Driller | | | |
| Type Fluid in Hole | | | |
| Density / Viscosity | | | |
| Ph / Fluid Loss | | | |
| Source of Sample | | | |
| Rm @ Meas. Temp | @ | @ | |
| Rmf @ Meas. Temp. | @ | @ | |
| Rmc @ Meas. Temp. | @ | @ | |
| Source Rmf / Rmc | | | |
| Rm @ BHT | @ | @ | |
| Rmf @ BHT | @ | @ | |
| Rmc @ BHT | @ | @ | |

RESISTIVITY SCALE CHANGES

| Type Log | Depth | Scale Up Hole | Scale Down Hole |
|---|---|---|---|
| | | | |

RESISTIVITY EQUIPMENT DATA

| Run No. | Tool Type & No. | Pad Type | Tool Pos. | Other |
|---|---|---|---|---|
| ONE | ACRt I907S909 | N/A | 1.5" STANDOFF | N/A |

EQUIPMENT DATA

| GAMMA | | ACOUSTIC | | DENSITY | | NEUTRON | |
|---|---|---|---|---|---|---|---|
| Run No. | ONE | Run No. | | Run No. | ONE | Run No. | ONE |
| Serial No. | 10842354 | Serial No. | | Serial No. | 11107339 | Serial No. | 11277437 |
| Model No. | GTET | Model No. | | Model No. | SDLT-I | Model No. | DSNT-I |
| Diameter | 3.625" | No. of Cent. | | Diameter | 4.5" | Diameter | 3.625" |
| Detector Model No. | GTET | Spacing | | Log Type | GAMMA-GAMMA | Log Type | THERMAL |
| Type | SCINTILLATION | | | Source Type | Cs-137 | Source Type | Am241Be |
| Length | 8" | LSA [Y/N] | | Serial No. | 24520B | Serial No. | 08-040 |
| Distance to Source | 10' | FWDA [Y/N] | | Strength | 1.5 Ci | Strength | 15 Ci |

LOGGING DATA

| GENERAL | | | | GAMMA | | ACOUSTIC | | | DENSITY | | | NEUTRON | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Run | Depth | | Speed | Scale | | Scale | | Matrix | Scale | | Matrix | Scale | | Matrix |
| No. | From | To | ft/min | L | R | L | R | | L | R | | L | R | |
| ONE | 6198 | 100 | REC | 0 | 200 | | | | 30% | -10% | 2.68 g/cc | 30% | -10% | SAND |

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks:

HOLE RUGOSITY AND TENSION PULLS MAY AFFECT LOG QUALITY

ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING

NEUTRON DECENTRALIZER NOT RUN PER COMPANY MAN REQUEST

LATITUDE: 40.02843° N

LONGITUDE: 110.24320° W

CREW: J. HERBERT, M. LEISTER, A. HAKEEM

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, VERNAL, UTAH (435)789-2550 RIG: AZTEC DRILLING #184

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

HALLIBURTON

**HALLIBURTON**

## PARAMETERS REPORT

| Depth (ft) | Tool Name | Description | Value | Units |
|---|---|---|---|---|
| TOP | | | | |
| | SHARED | Bit Size | 7.875 | in |
| | SHARED | Use Bit Size instead of Caliper for all applications. | No | |
| | SHARED | Borehole Fluid Weight | 8.400 | ppg |
| | SHARED | Oil Based Mud System? | No | |
| | SHARED | Mud Resistivity | 1.220 | ohmm |
| | SHARED | Temperature of Mud | 53.0 | degF |
| | SHARED | Logging Interval is Cased? | No | |
| | SHARED | AHV Casing OD | 5.500 | in |
| | SHARED | Surface Temperature | 30.0 | degF |
| | SHARED | Total Well Depth | 6198.00 | ft |
| | SHARED | Bottom Hole Temperature | 160.0 | degF |
| | Rwa / CrossPlot | Process Crossplot? | Yes | |
| | Rwa / CrossPlot | Select Source of F | Automatic | |
| | Rwa / CrossPlot | Archie A factor | 0.6200 | |
| | Rwa / CrossPlot | Archie M factor | 2.1500 | |
| | Rwa / CrossPlot | Rmf Reference | 0.10 | ohmm |
| | Rwa / CrossPlot | Rmf Ref Temp | 75.00 | degF |
| | Rwa / CrossPlot | Resistivity of Formation Water | 0.05 | ohmm |
| | GTET | Process Gamma Ray? | Yes | |
| | GTET | Gamma Tool Standoff | 0.000 | in |
| | GTET | Process Gamma Ray EVR? | Yes | |
| | DSNT | Process DSN? | Yes | |

| | | | | |
|---|---|---|---|---|
| DSNT | Process DSN EVR? | Yes | | |
| DSNT | Neutron Lithology | Sandstone | | |
| DSNT | DSN Standoff - 0.25 in (6.35 mm) Recommended | 0.000 | | in |
| DSNT | Temperature Correction Type | None | | |
| DSNT | DSN Pressure Correction Type | None | | |
| DSNT | View More Correction Options | No | | |
| DSNT | Use TVD for Gradient Corrections? | No | | |
| DSNT | Logging Horizontal Water Tank? | No | | |
| SDLT | Process Density? | Yes | | |
| SDLT | Process Density EVR? | Yes | | |
| SDLT | Is Hole Air Drilled? | No | | |
| SDLT | Logging Calibration Blocks? | No | | |
| SDLT | SDLT Pad Temperature Valid? | Yes | | |
| SDLT | Disable temperature warning | No | | |
| SDLT | Weighted Mud Correction Type? | None | | |
| SDLT | Formation Density Matrix | 2.680 | TGS | g/cc A2D |
| SDLT | Formation Density Fluid | 1.000 | | g/cc |
| SDLT | Process Caliper Outputs? | Yes | | |
| SDLT | Process MicroLog Outputs? | Yes | | |
| ACRt | Process ACRt? | Yes | | |
| ACRt | Minimum Tool Standoff | 1.50 | | in |
| ACRt | Temperature Correction Source | FP Lwr & FP Upr | | |
| ACRt | Tool Position | Free Hanging | | |
| ACRt | Rmud Source | Mud Cell | | |
| ACRt | Minimum Resistivity for MAP | 0.20 | | ohmm |
| ACRt | Maximum Resistivity for MAP | 200.00 | | ohmm |

BOTTOM

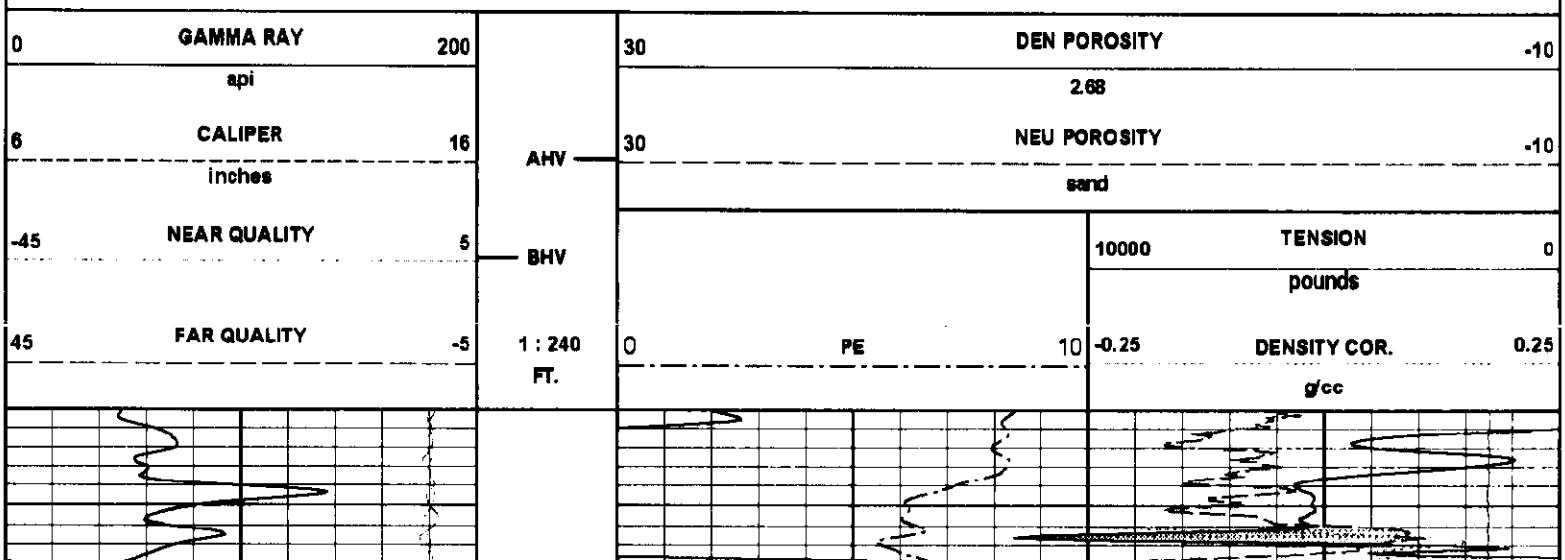
Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\DLE

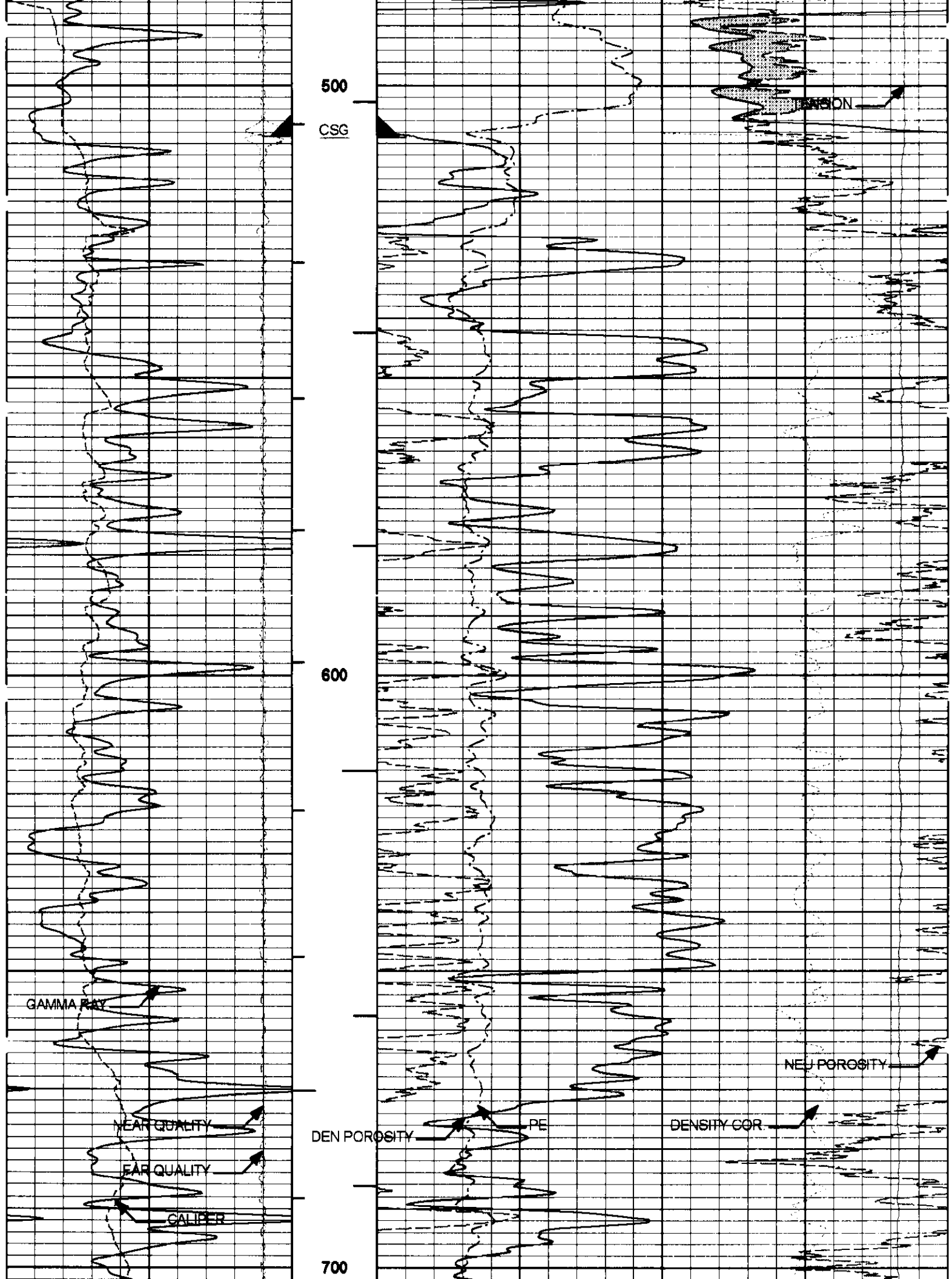
Date: 08-Apr-10 04:31:55

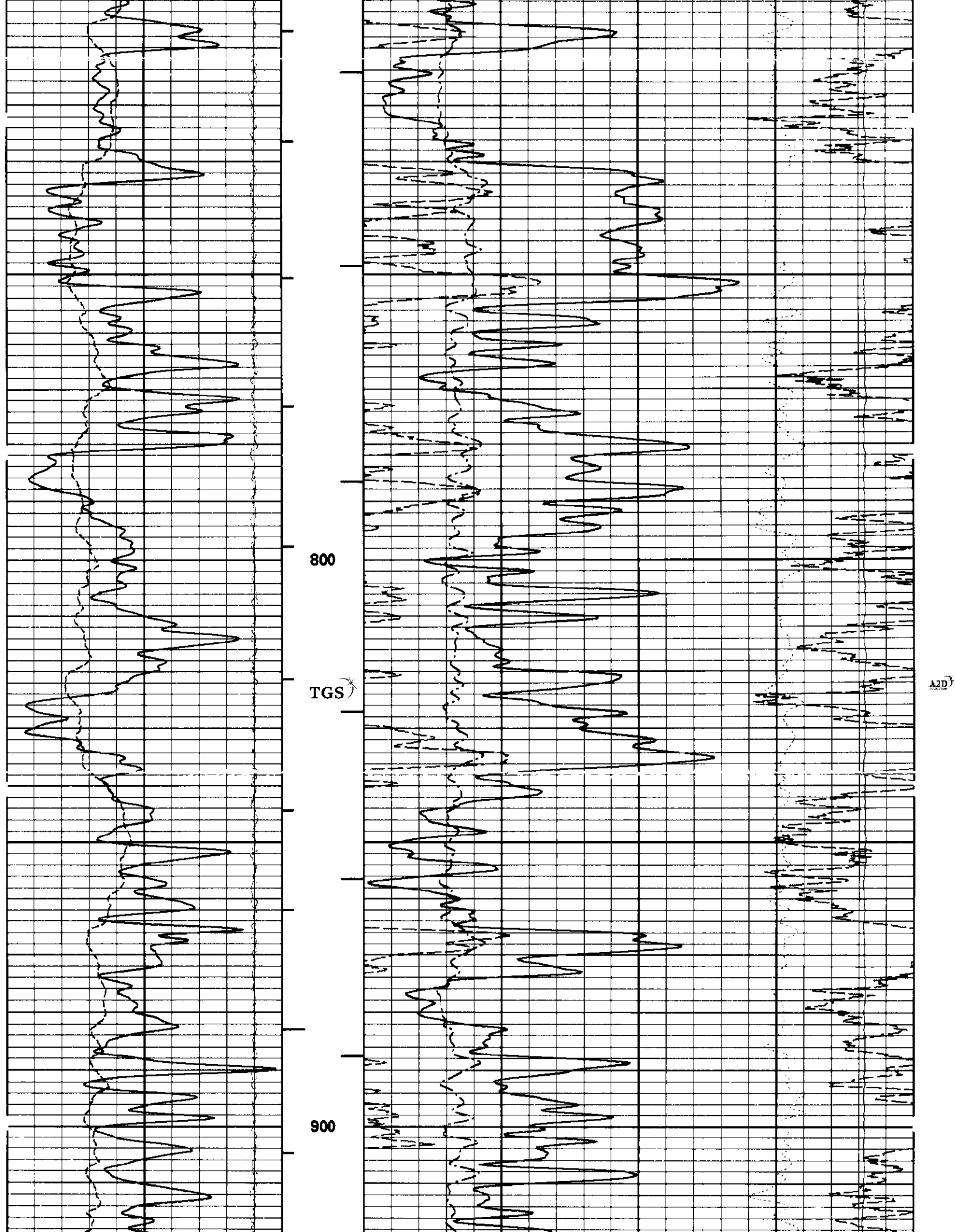
**HALLIBURTON**

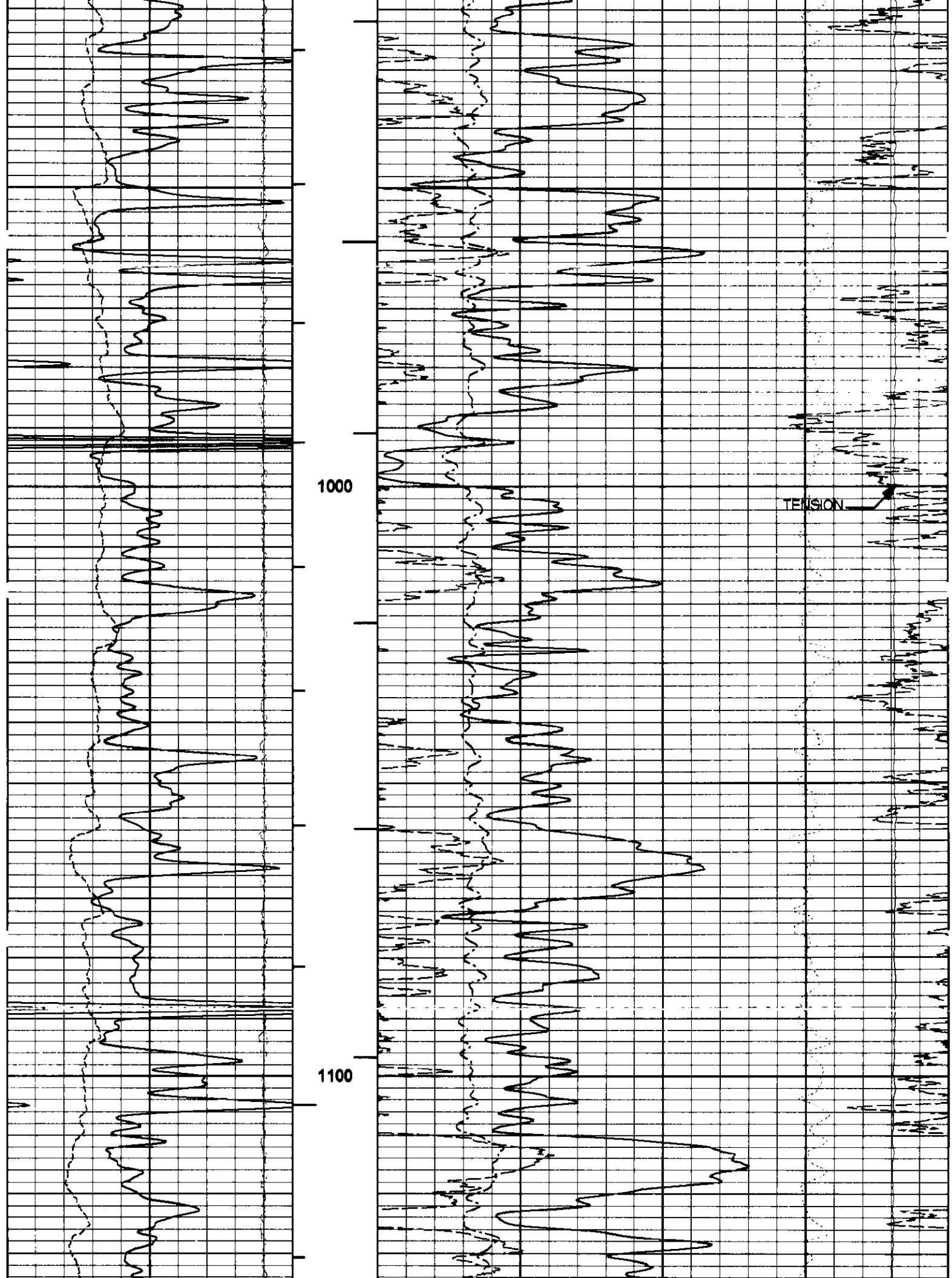
Plot Time: 08-Apr-10 05:34:13
Plot Range: 470 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\DAQ-0001-004\
Plot File: \\SDL\I_POR5IN_M

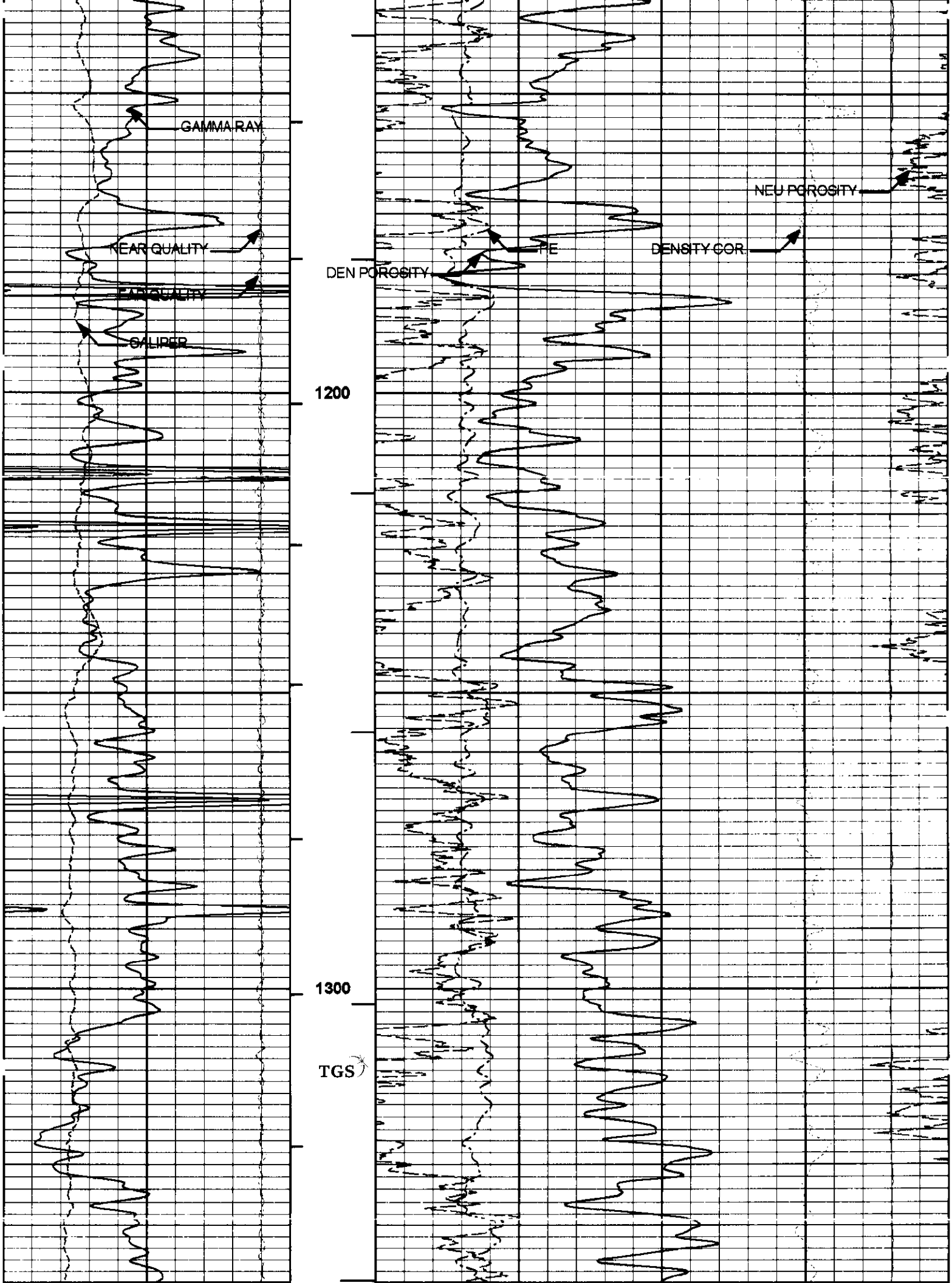
## MAIN PASS 5" = 100'

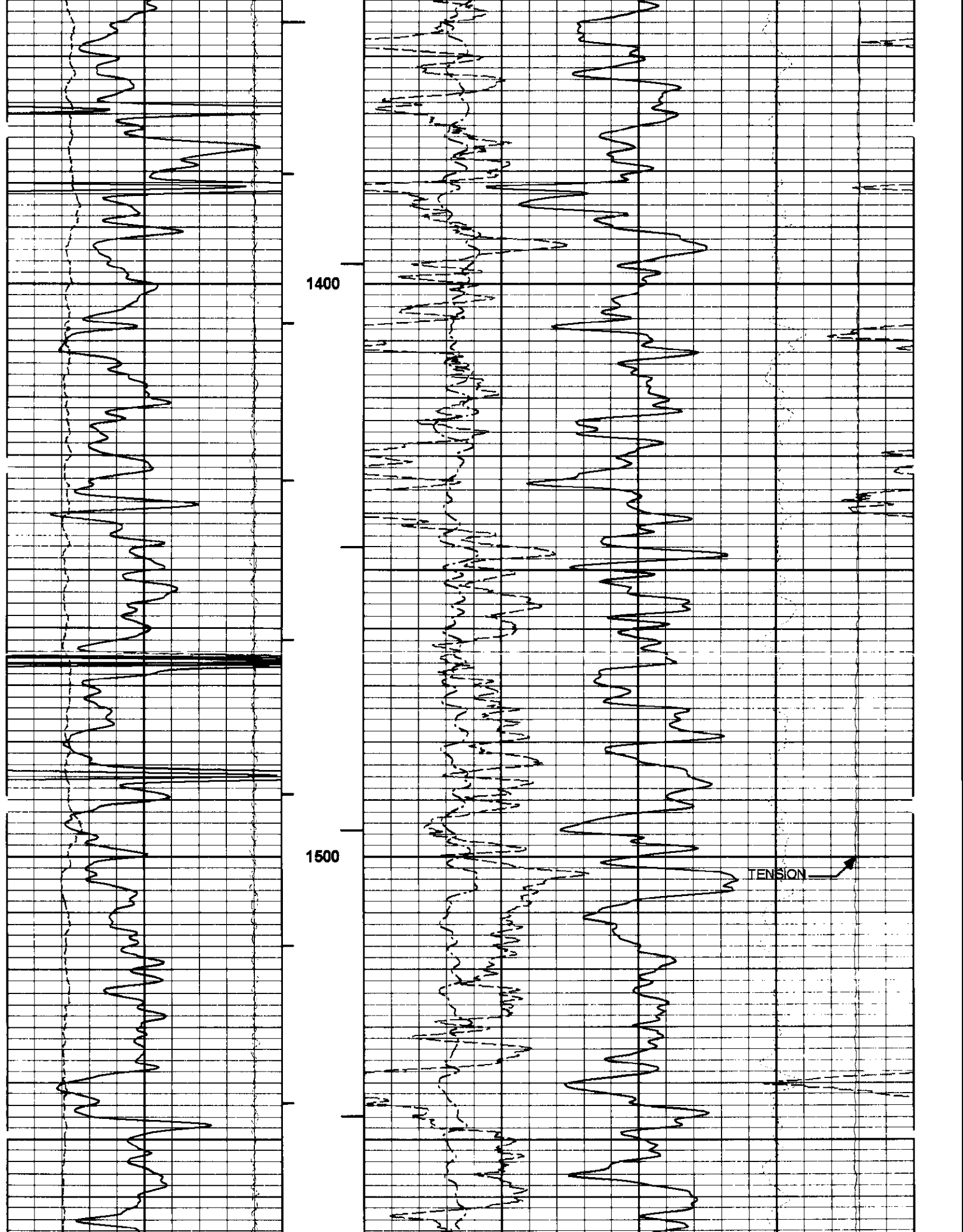


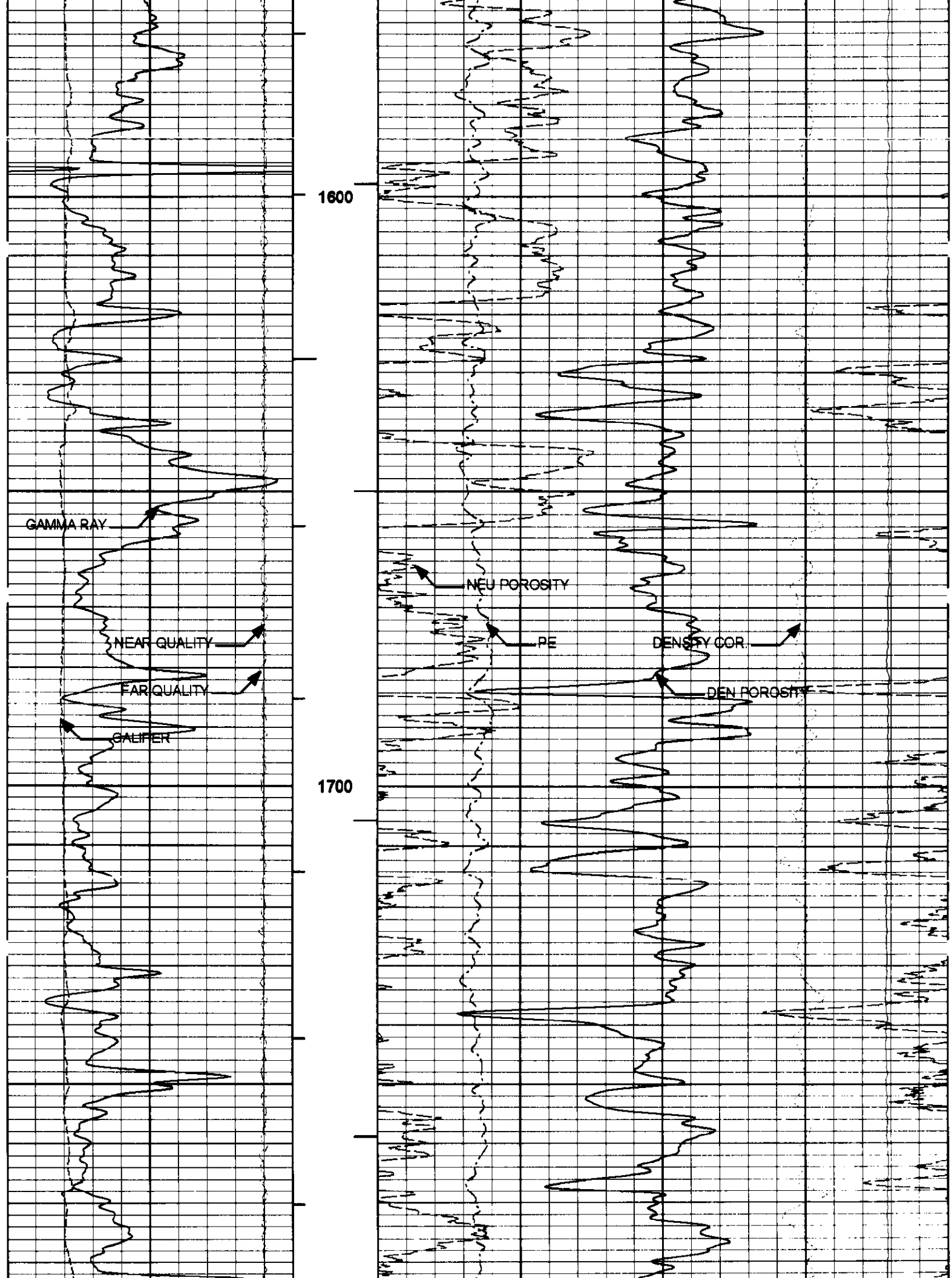

500
CSG
600
700
GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
DEN POROSITY
PE
DENSITY COR
NEU POROSITY

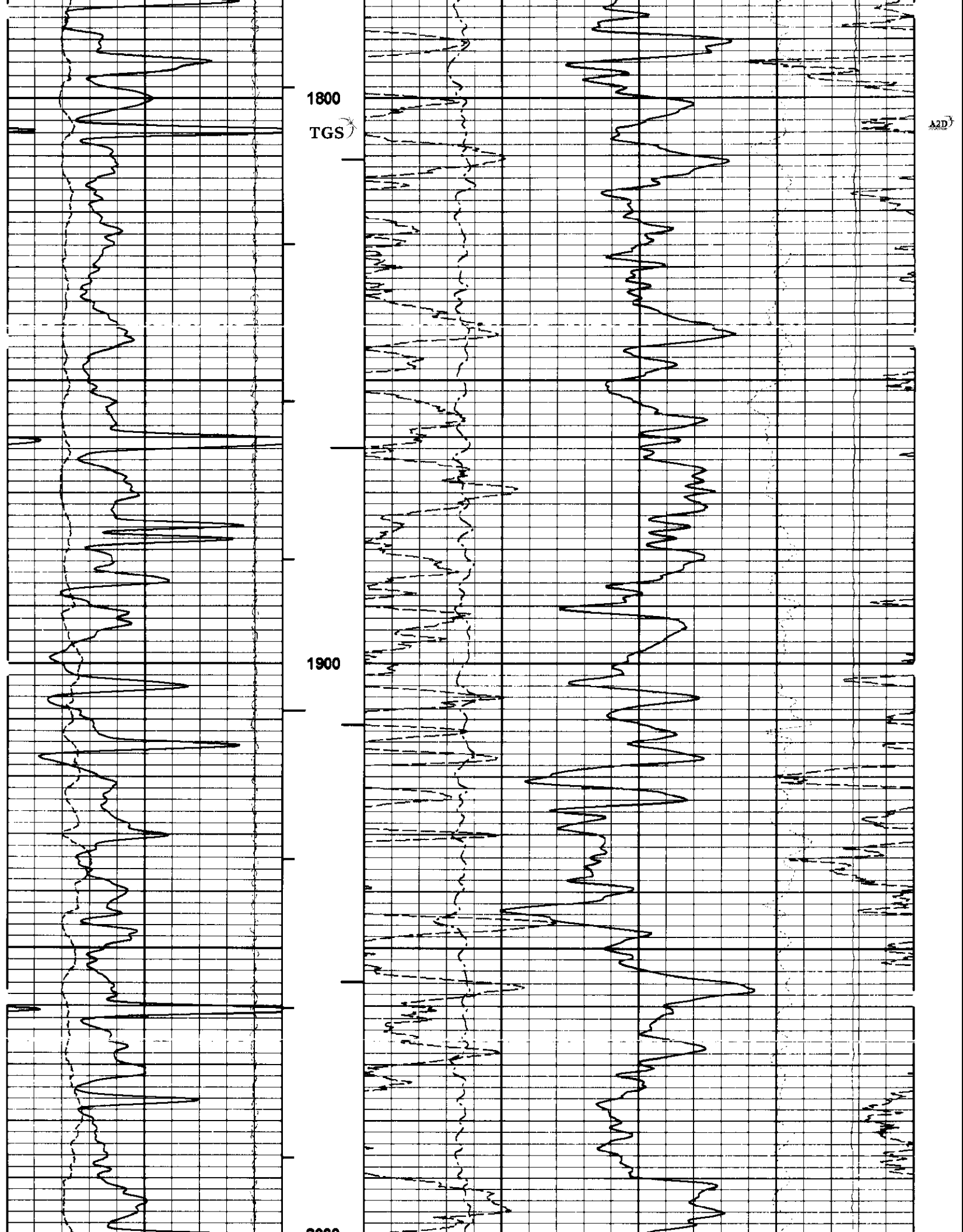

800
TGS
A2D
900

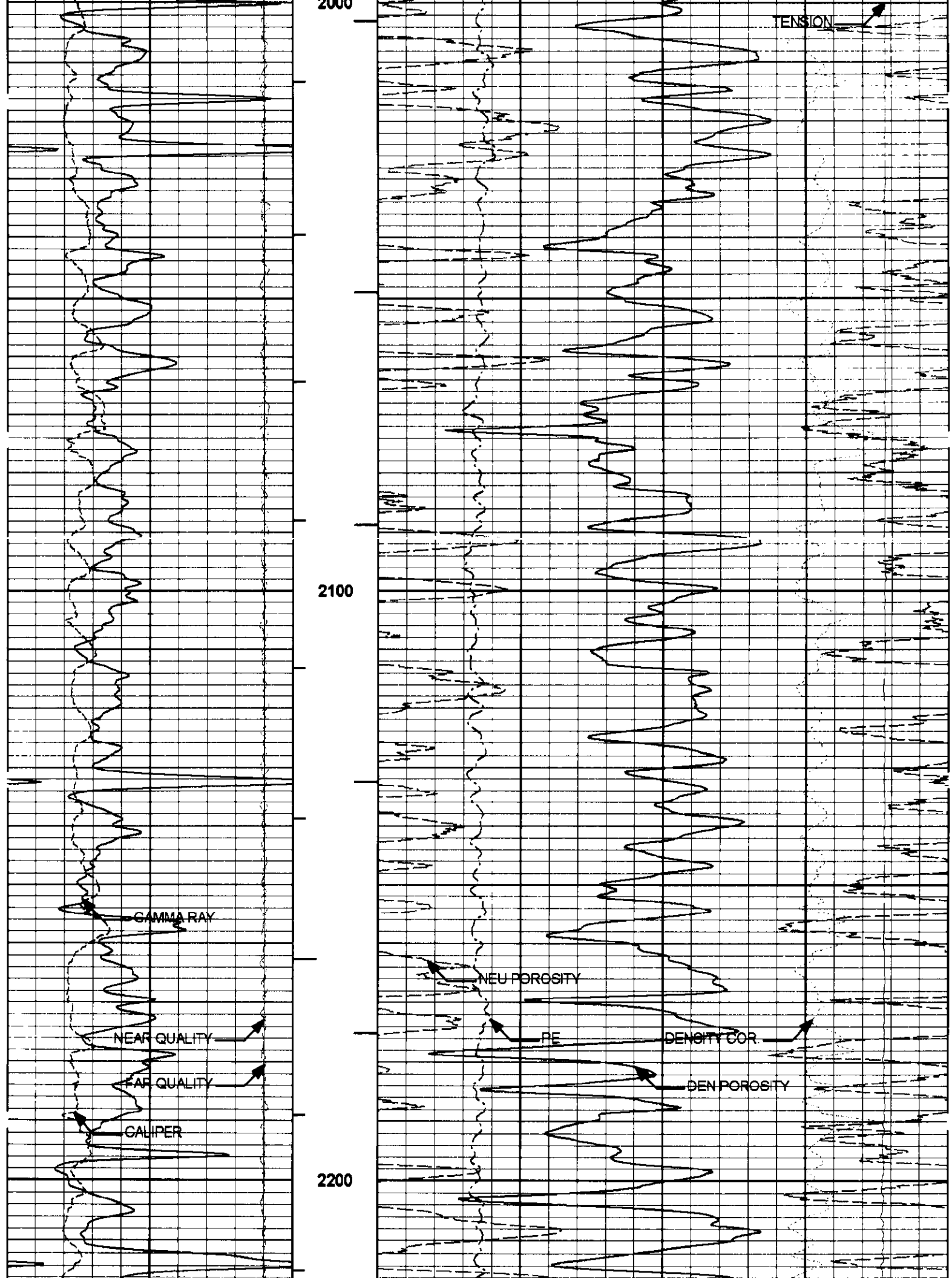

1000
1100
TENSION

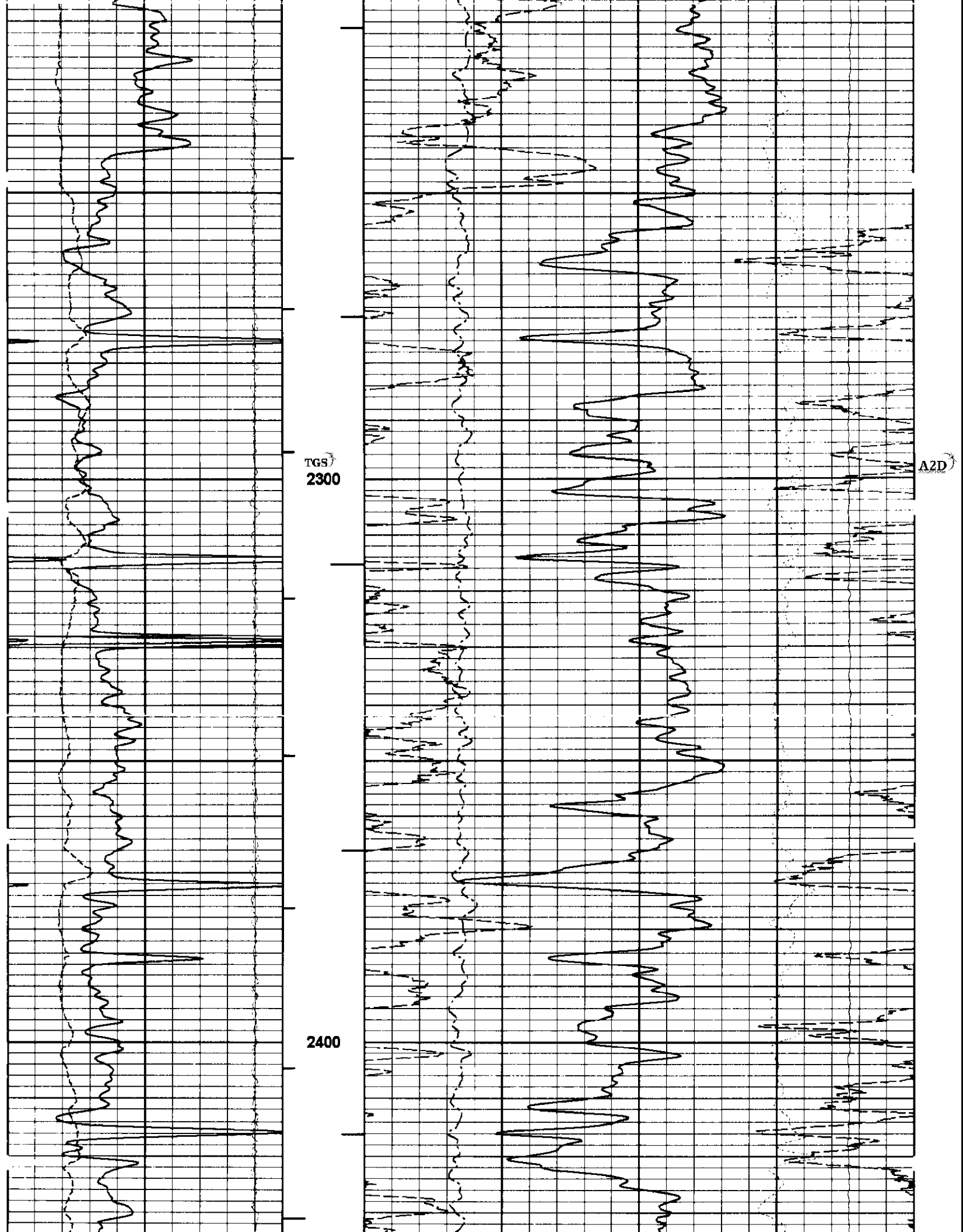

GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
DEN POROSITY
PE
DENSITY COR.
NEU POROSITY
1200
1300
TGS
A2D

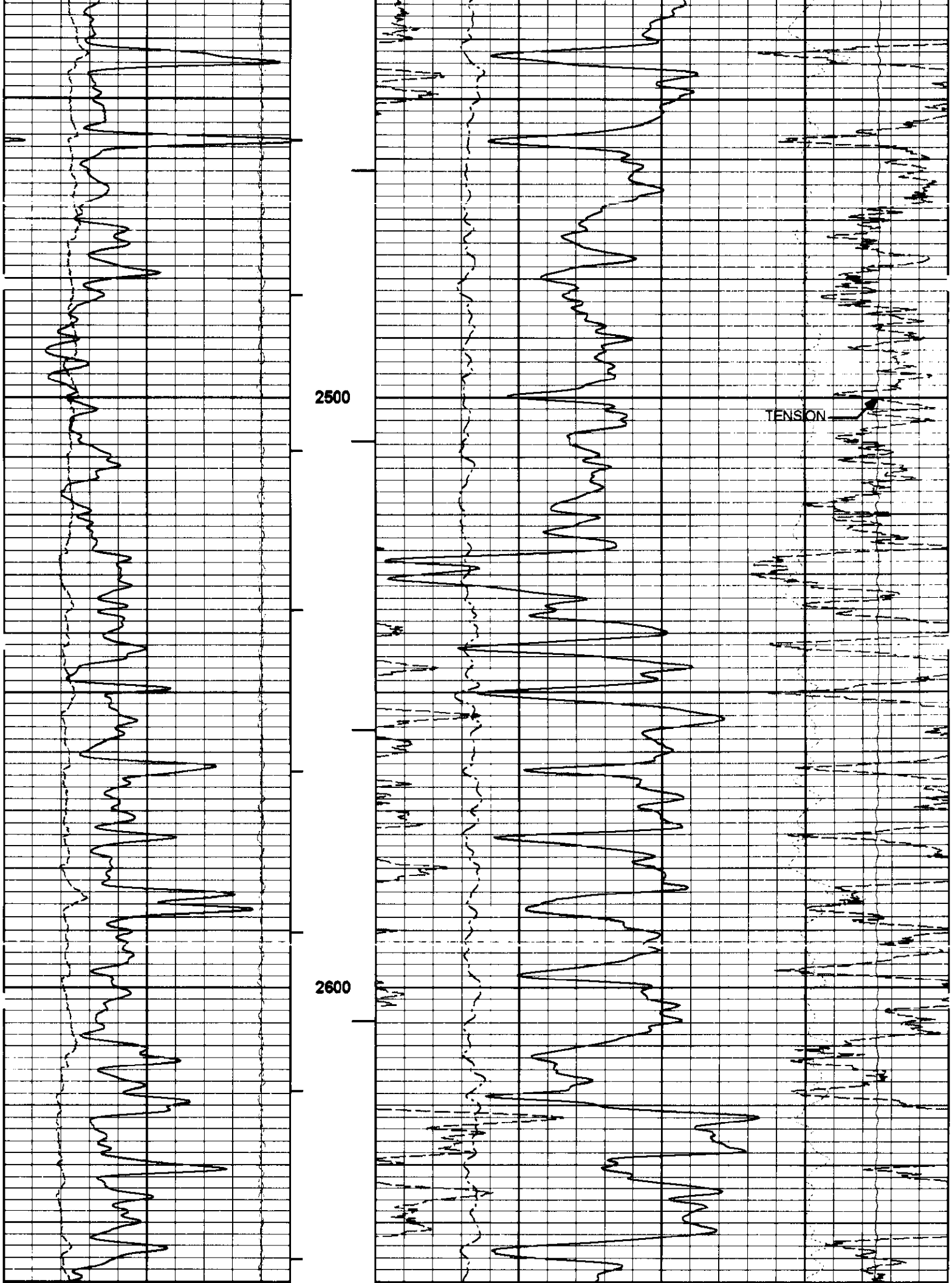

1400
1500
TENSION

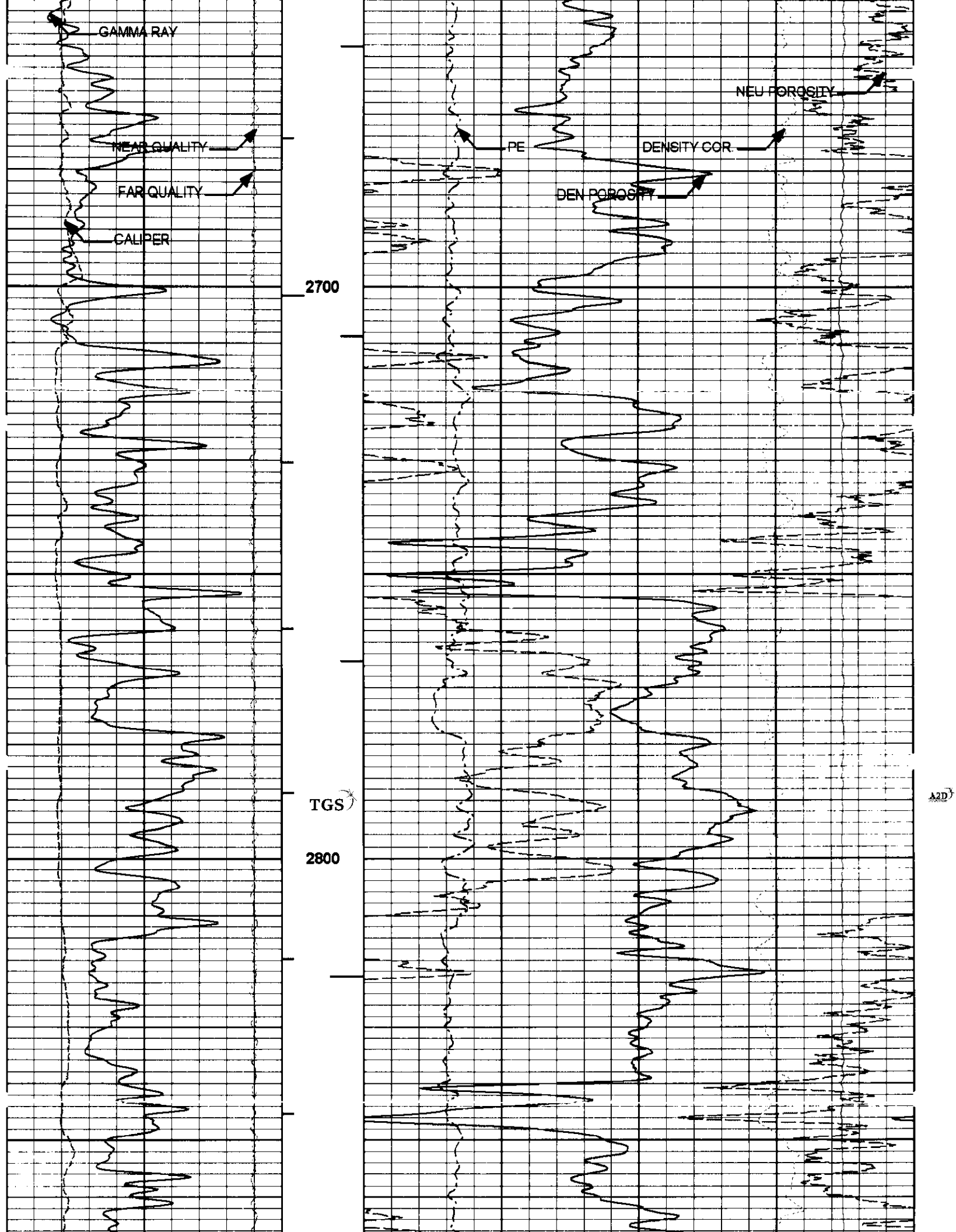

1600
1700
GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
NEU POROSITY
PE
DENSITY COR.
DEN POROSITY

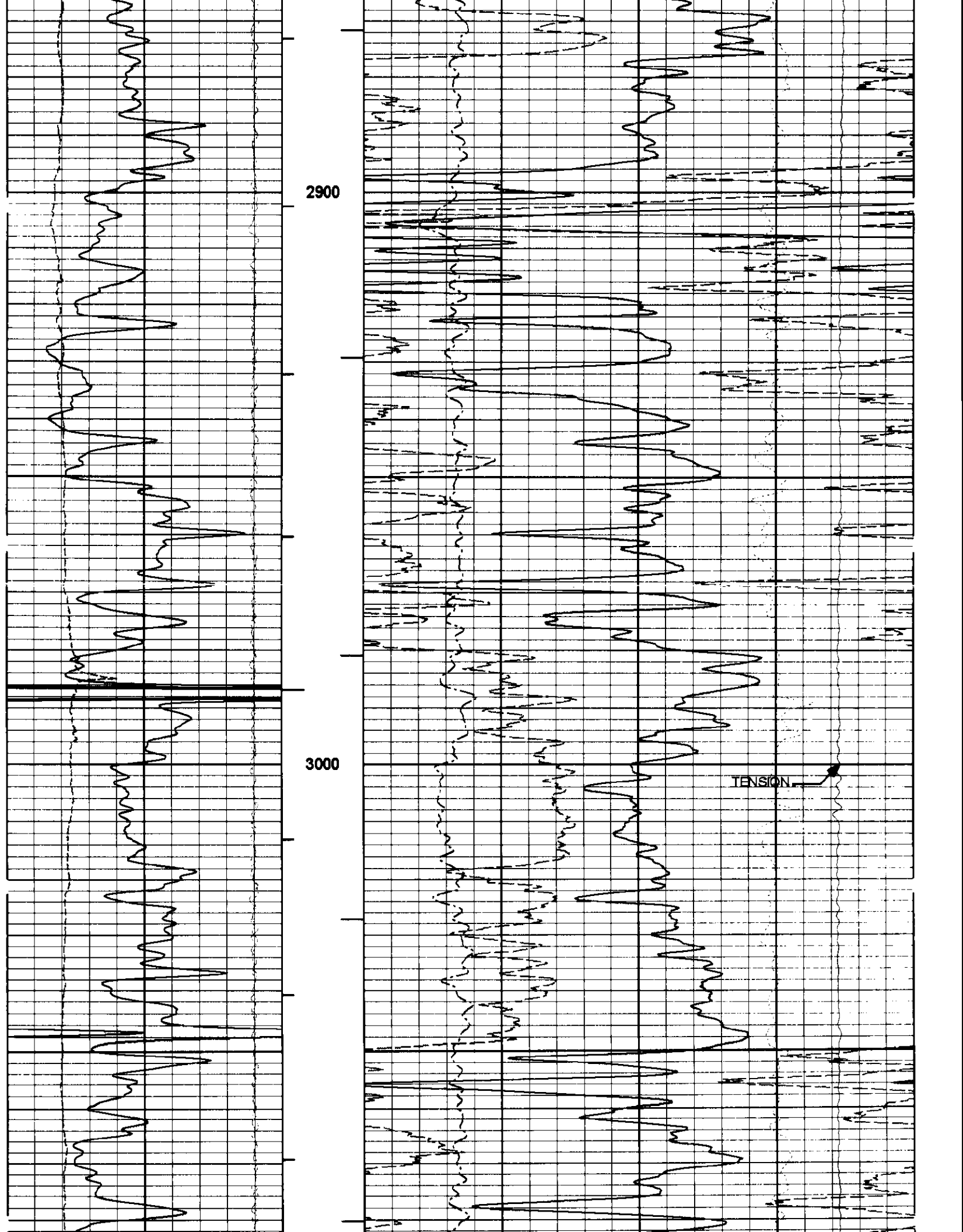

1800
TGS
A2D
1900

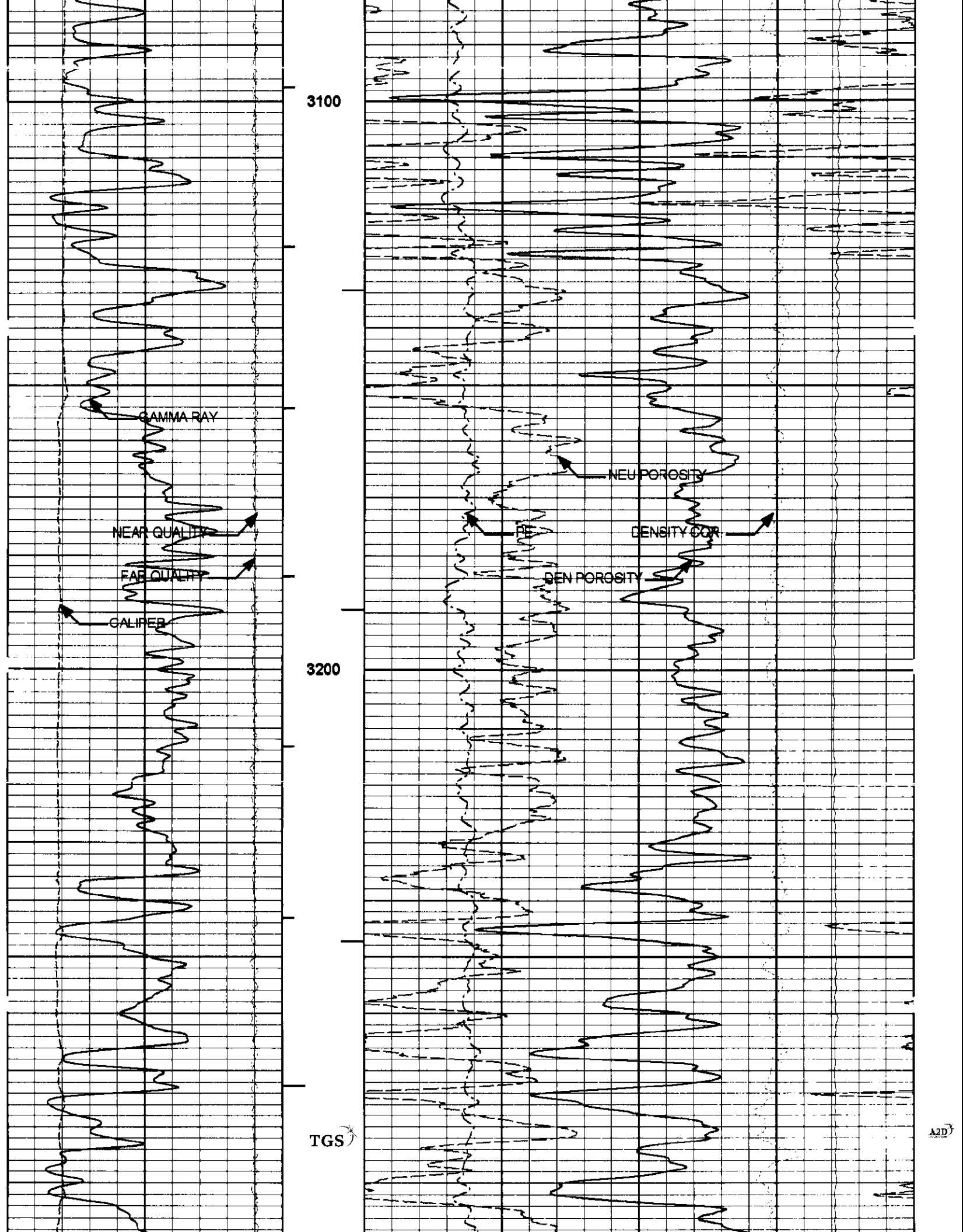

2000
2100
2200
TENSION
GAMMA RAY
NEU POROSITY
NEAR QUALITY
PE
DENSITY COR.
FAR QUALITY
DEN POROSITY
CALIPER

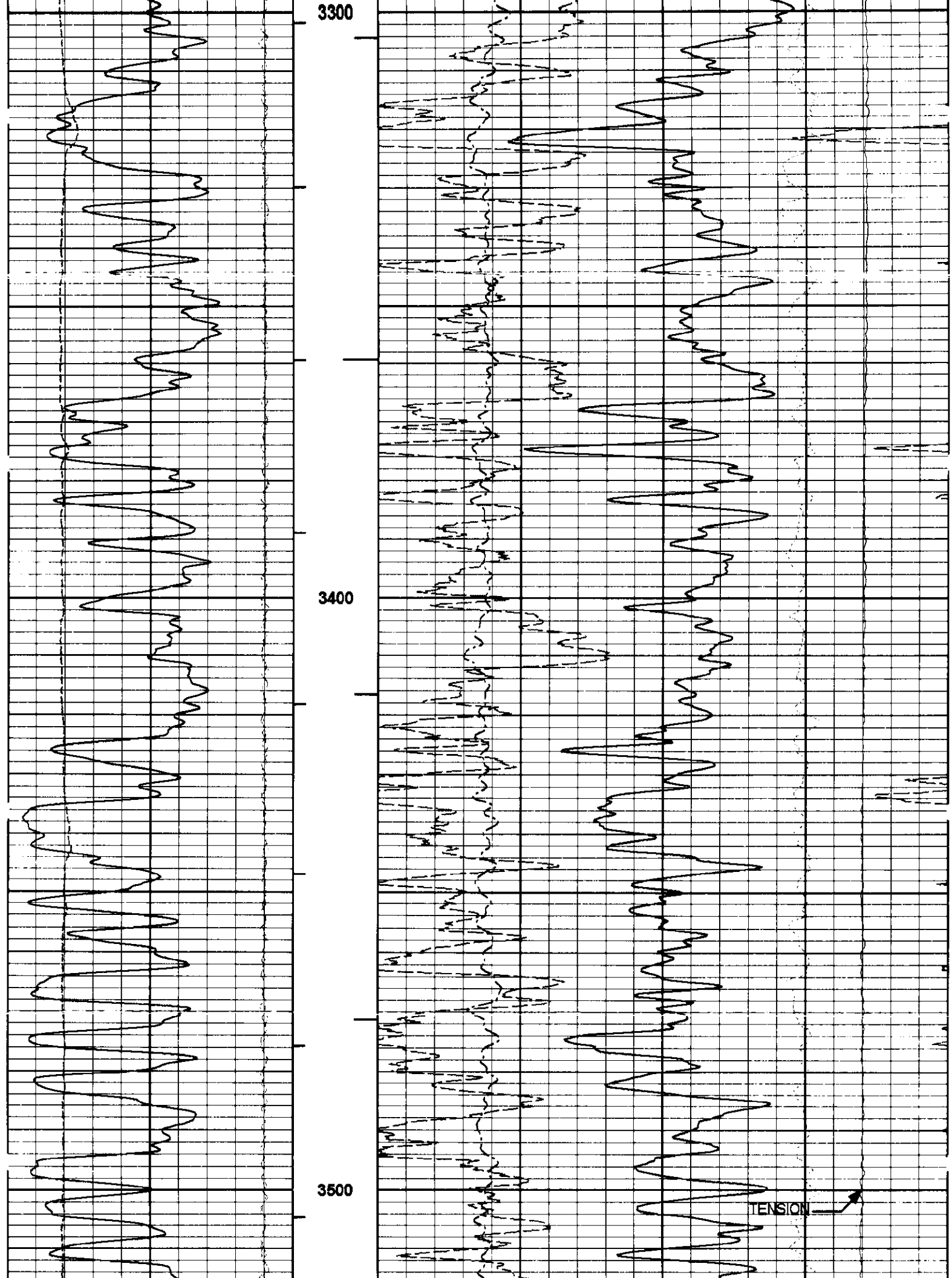

TGS
2300
A2D
2400

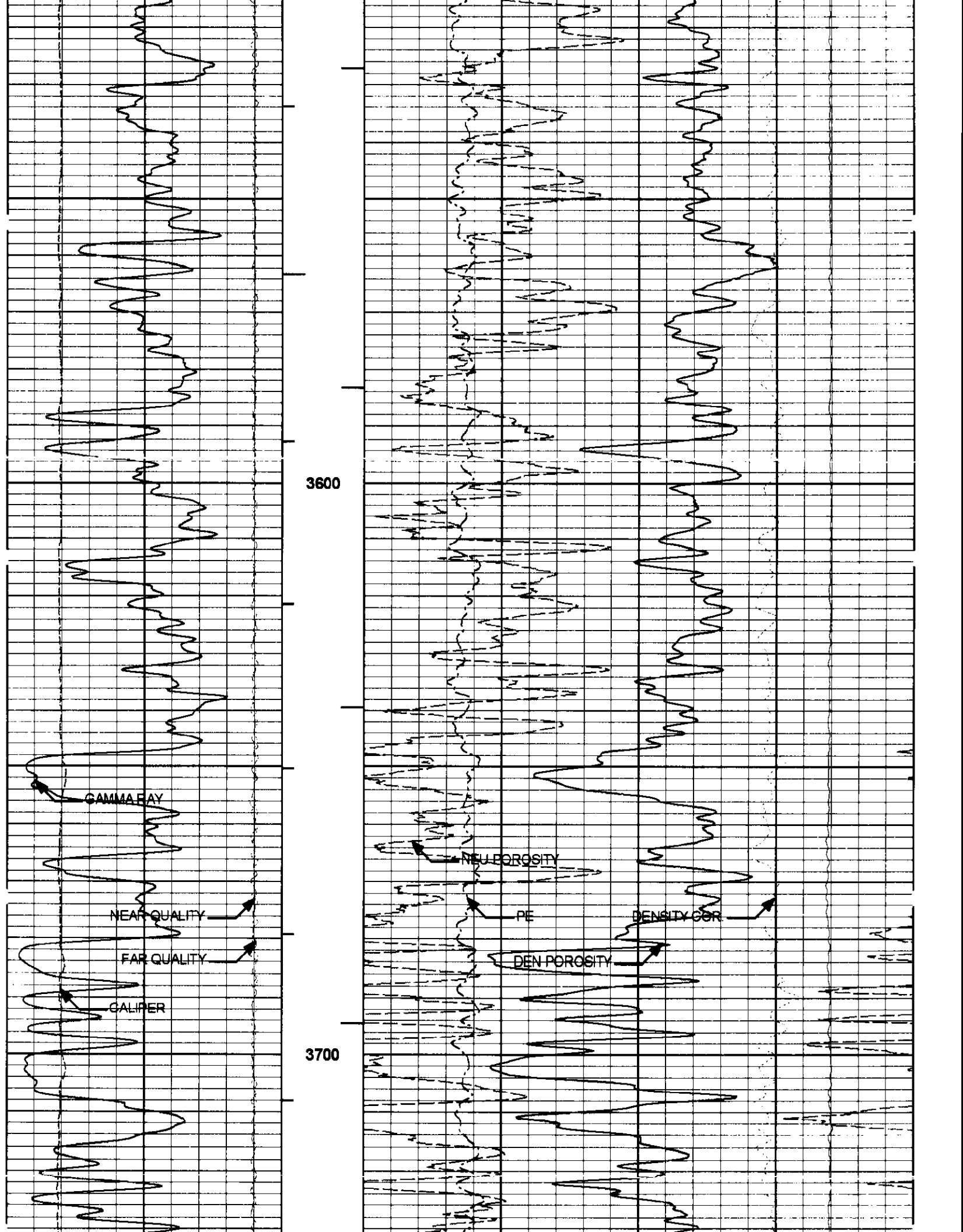

2500
2600
TENSION

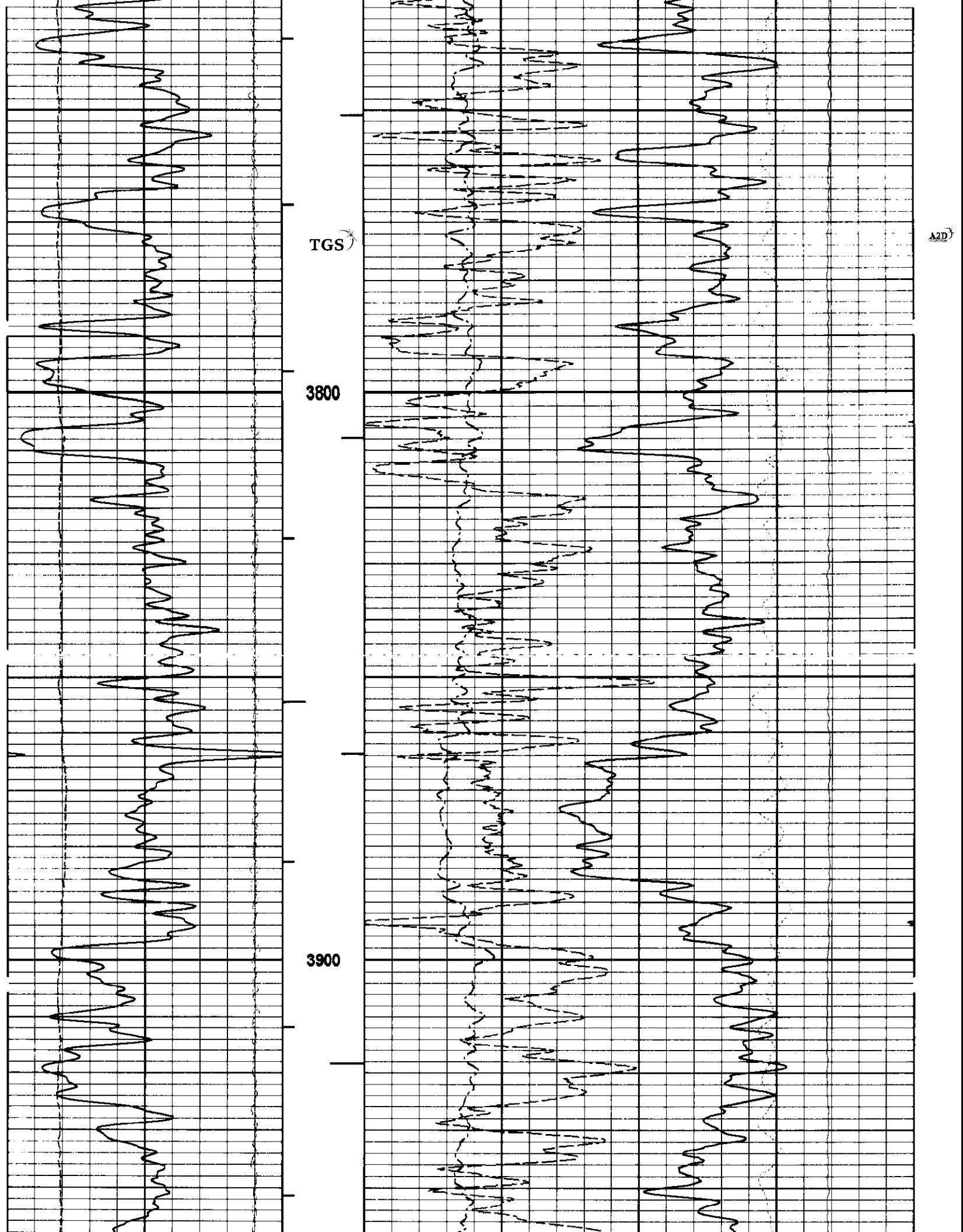

GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
2700
TGS
2800
PE
DENSITY COR
DEN POROSITY
NEU POROSITY
A2D

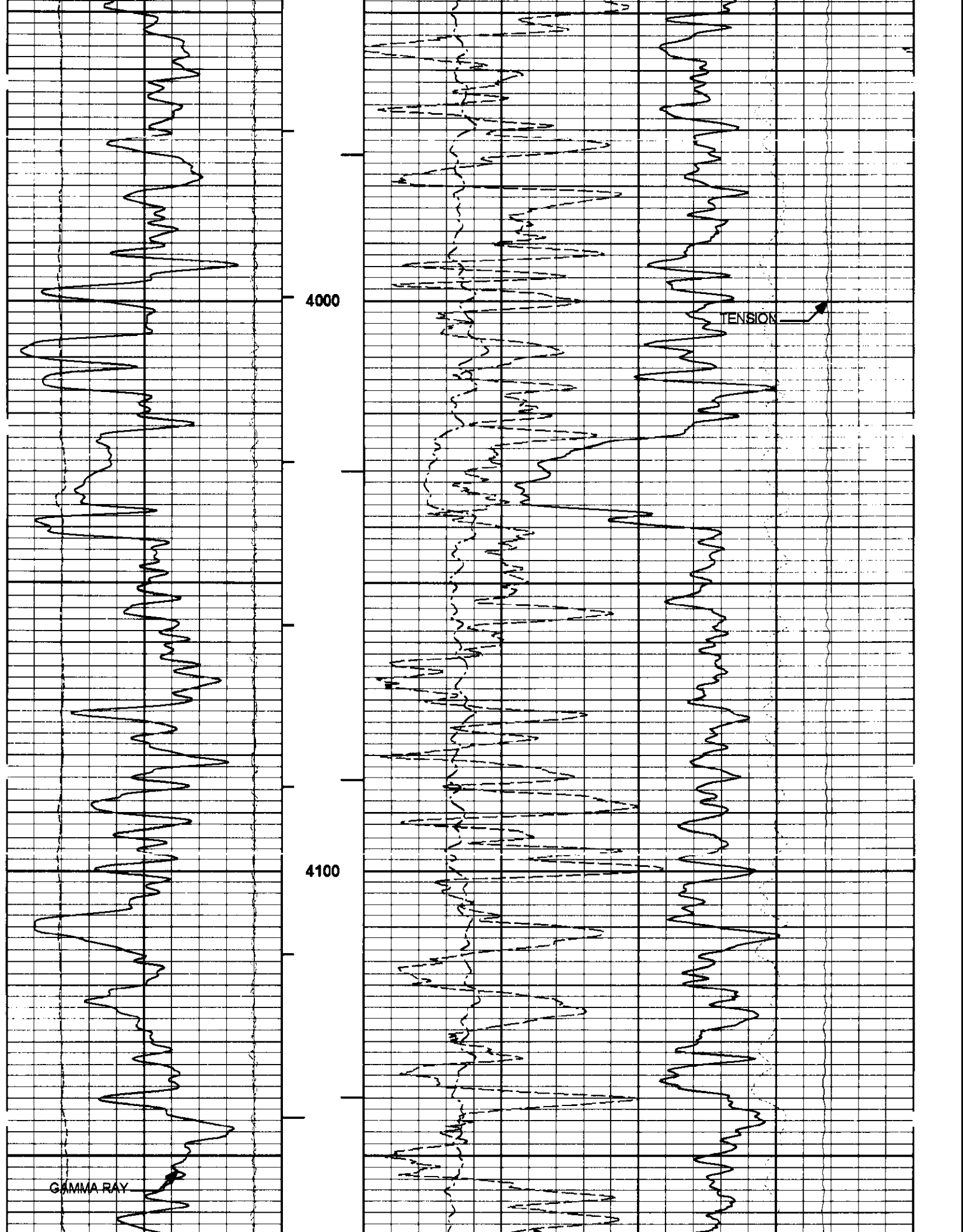

2900
3000
TENSION

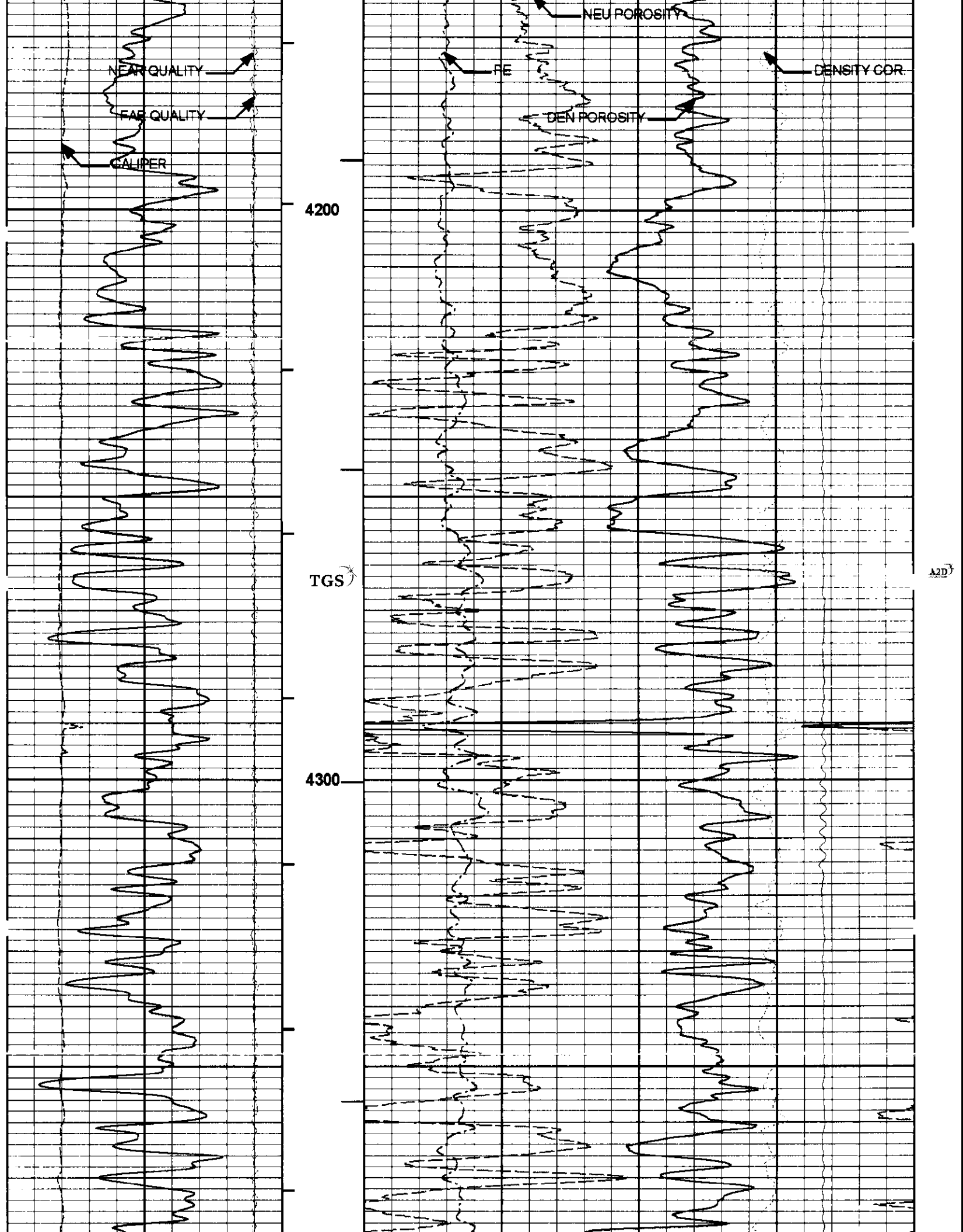

3100
GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
3200
NEU POROSITY
PE
DENSITY COR
DEN POROSITY
TGS
A2D

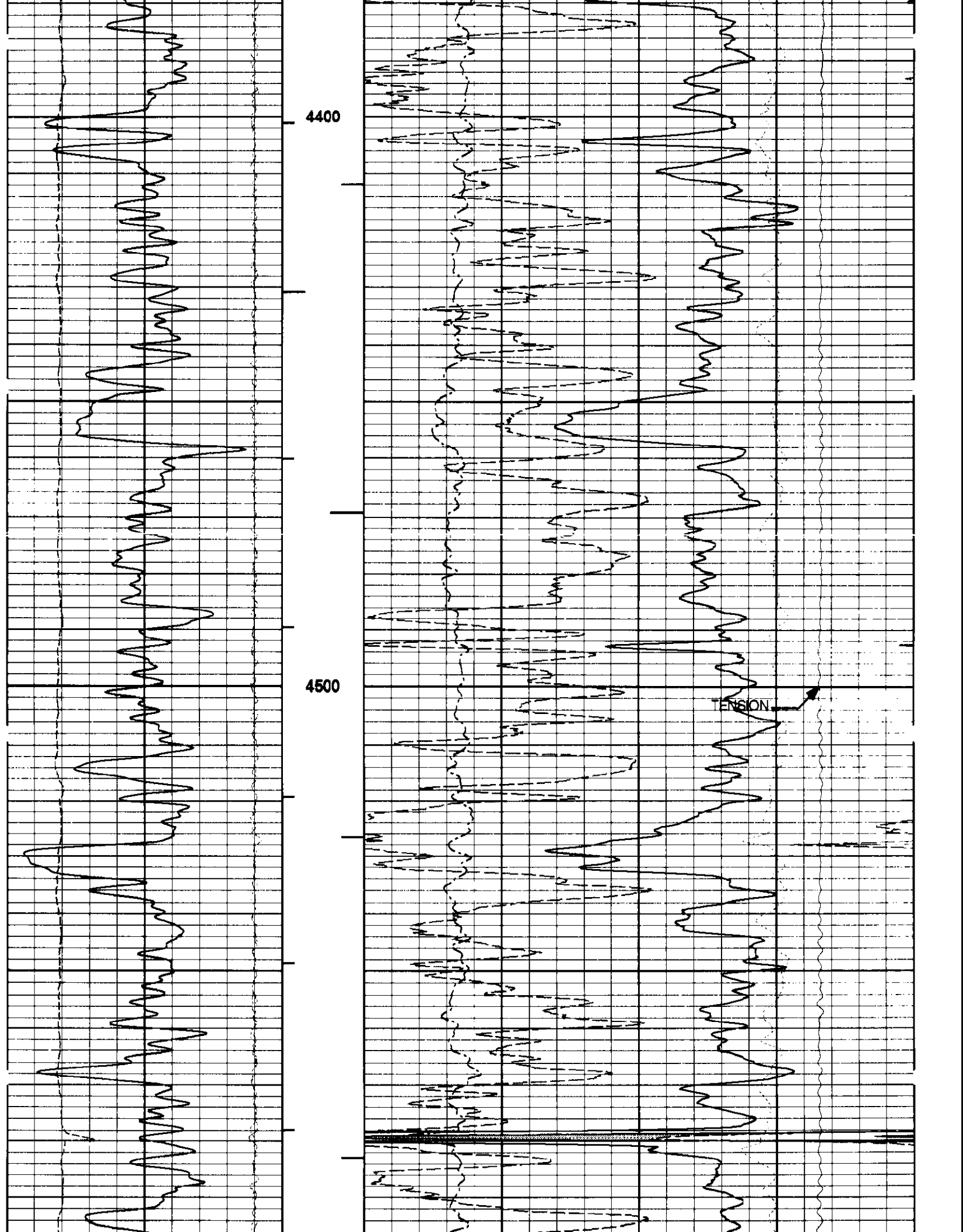

3300
3400
3500
TENSION

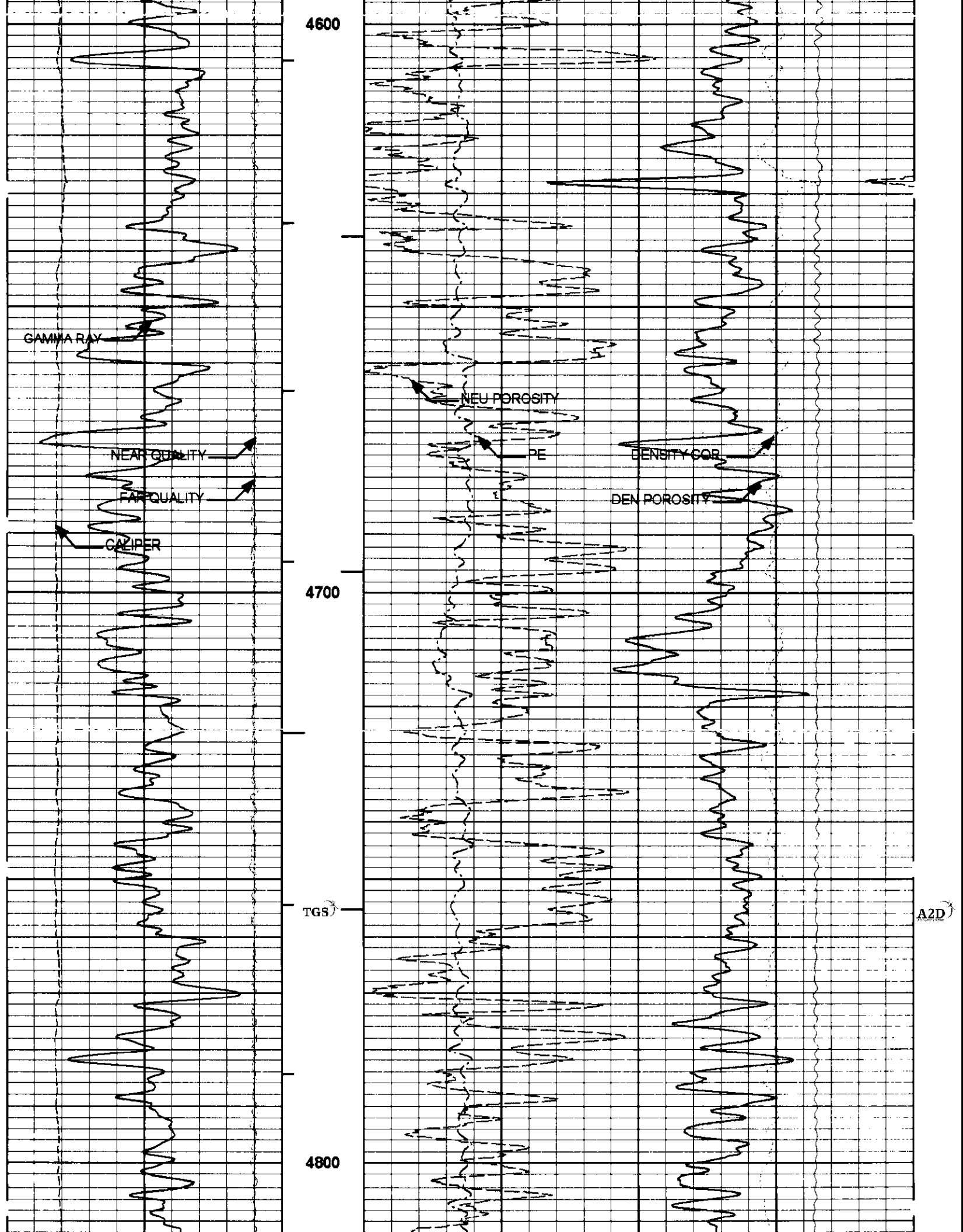

3600
3700
GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
NEU POROSITY
PE
DENSITY COR
DEN POROSITY

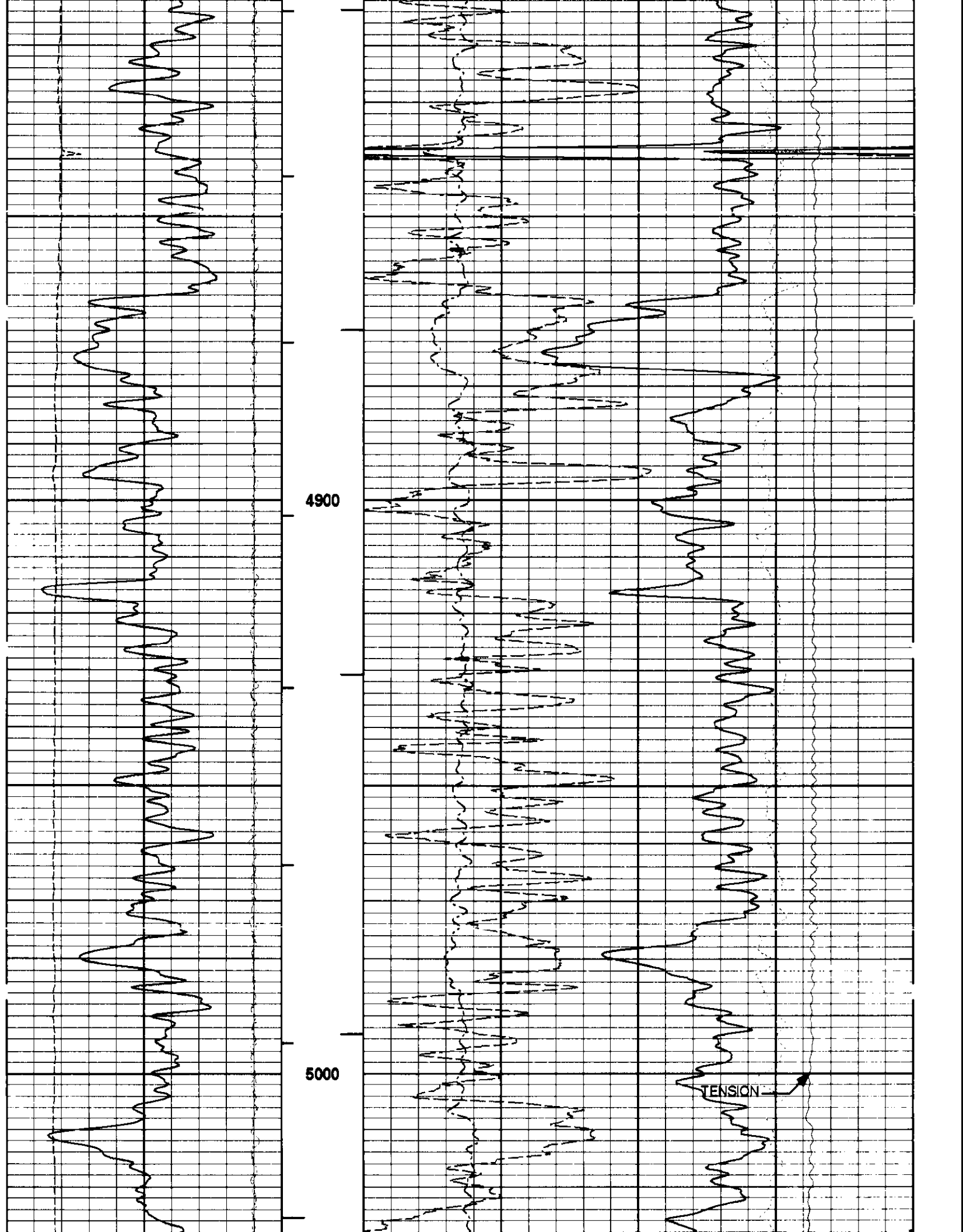

TGS
A2D
3800
3900

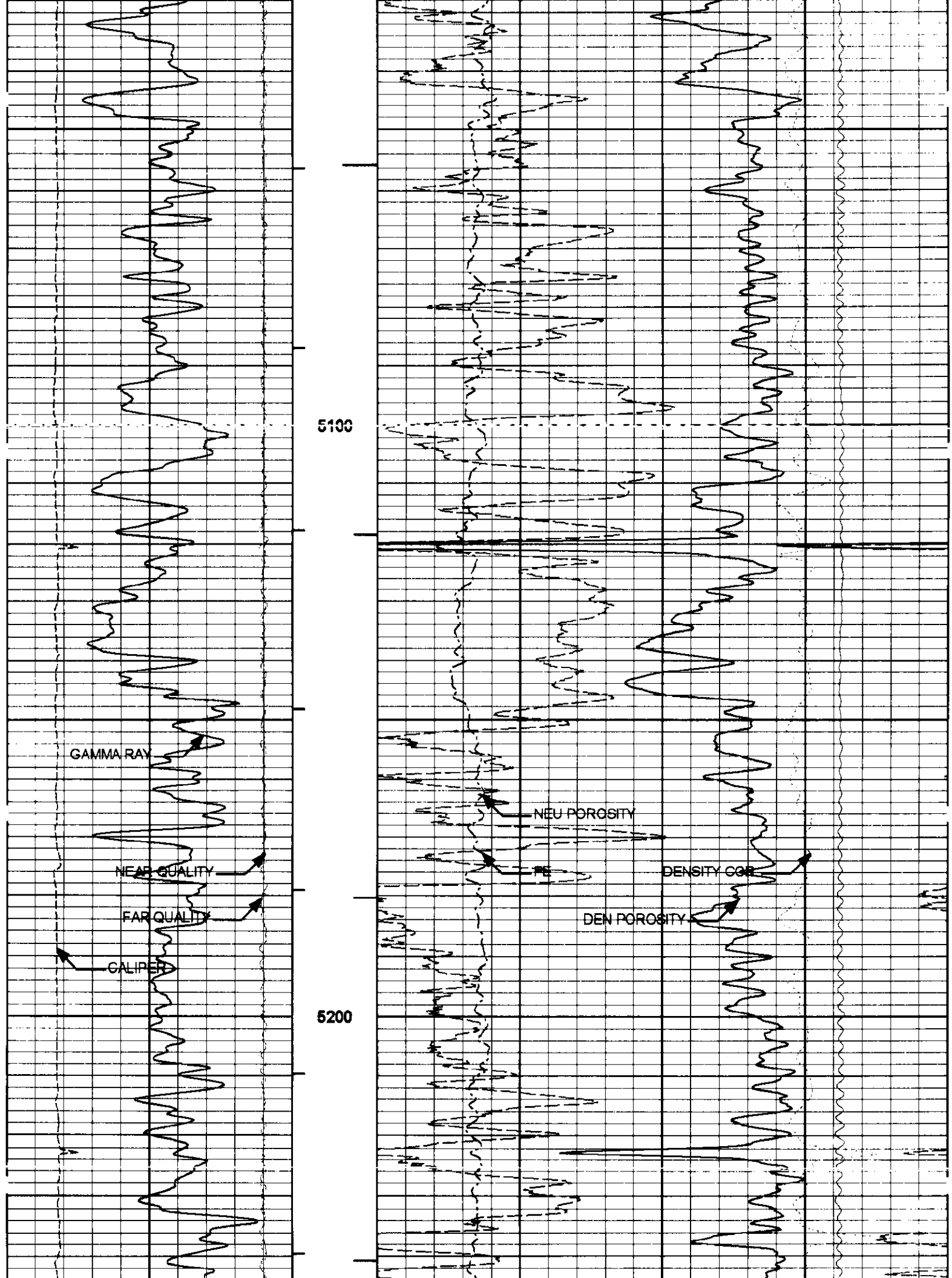

4000
4100
TENSION
GAMMA RAY

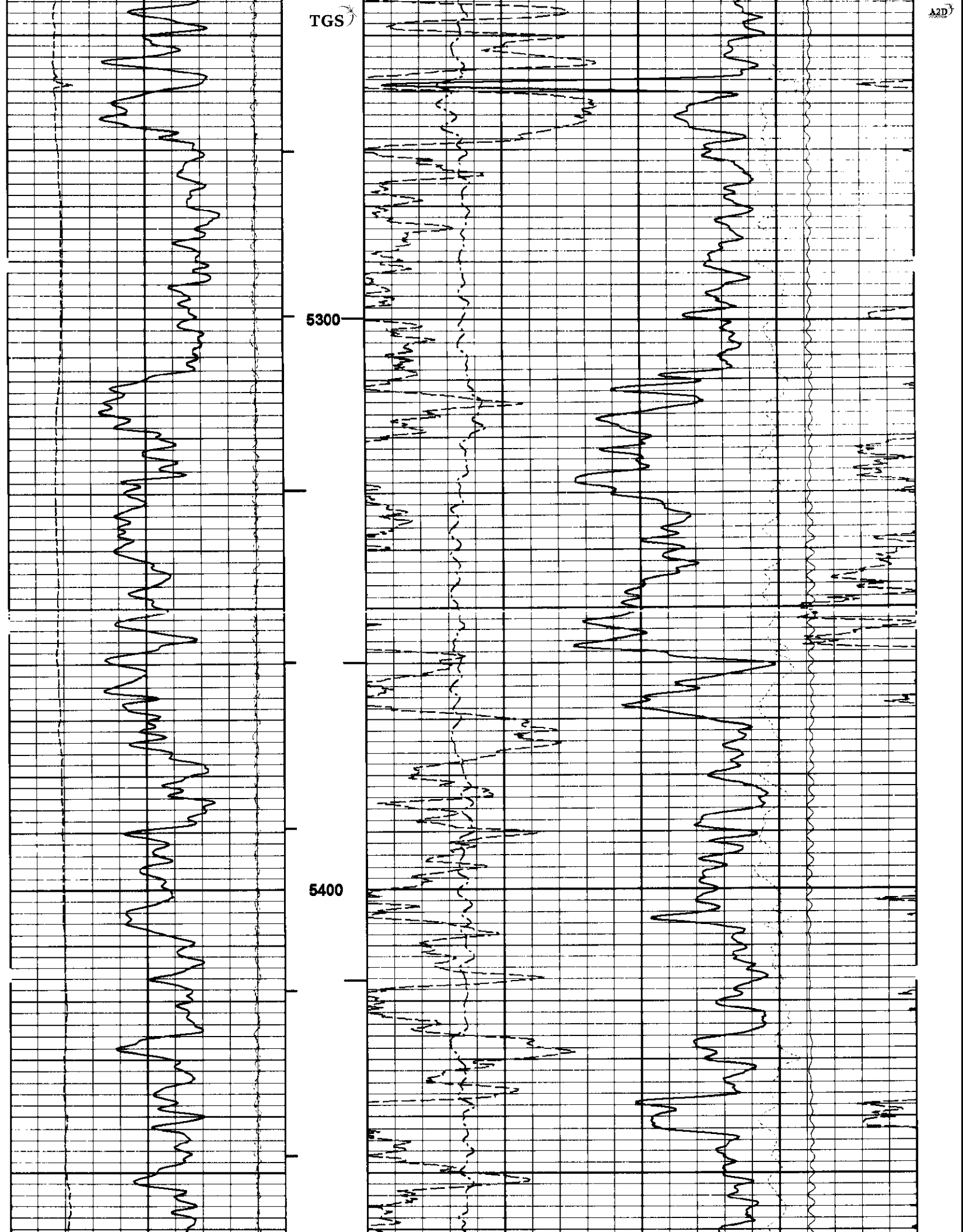

NEAR QUALITY
FAR QUALITY
CALIPER
NEU POROSITY
PE
DENSITY COR.
DEN POROSITY
4200
TGS
A2D
4300

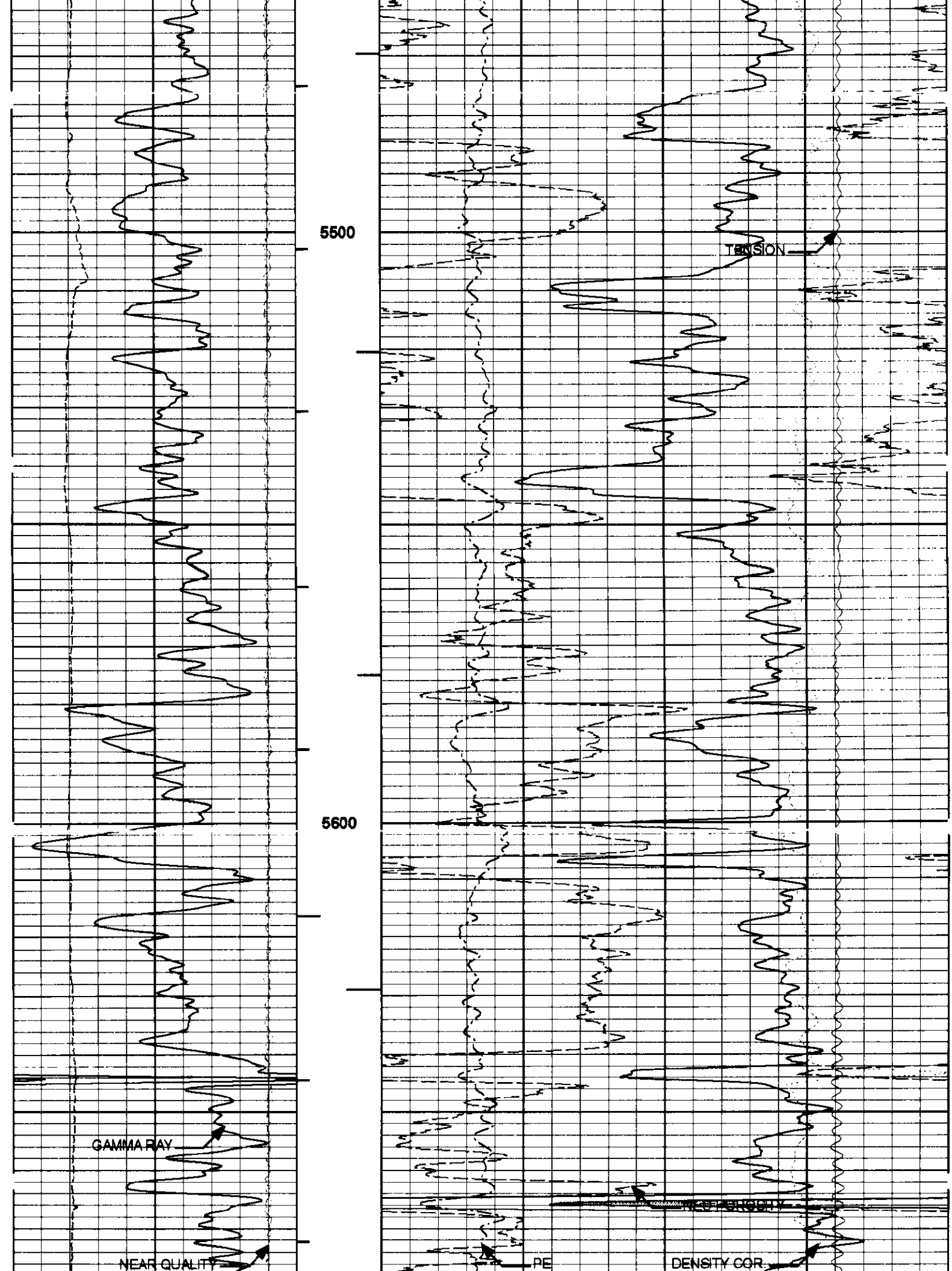

4400
4500
TENSION

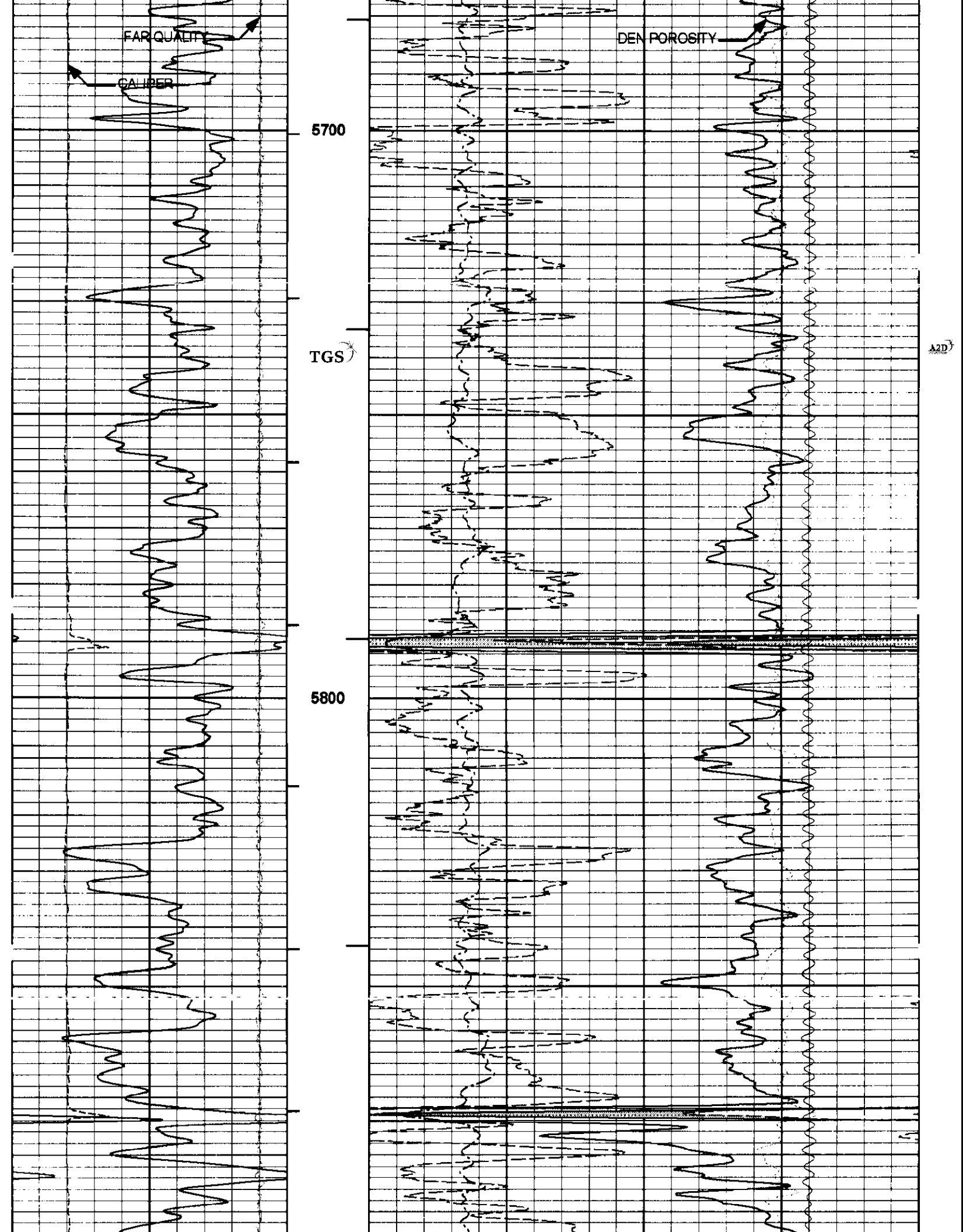

4600
GAMMA RAY
NEU POROSITY
NEAR QUALITY
PE
DENSITY COR
FAR QUALITY
DEN POROSITY
CALIPER
4700
TGS
A2D
4800

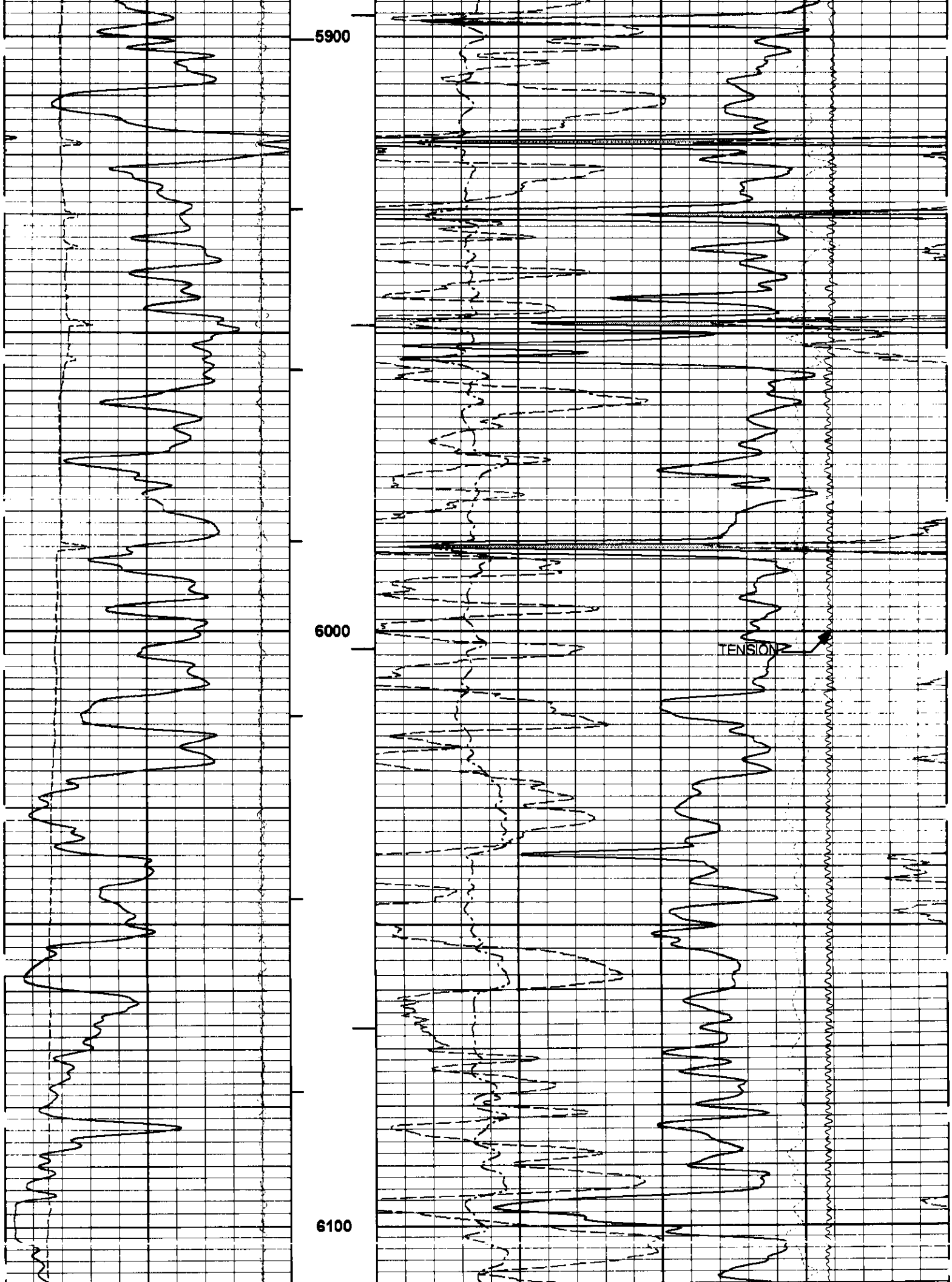

4900
5000
TENSION

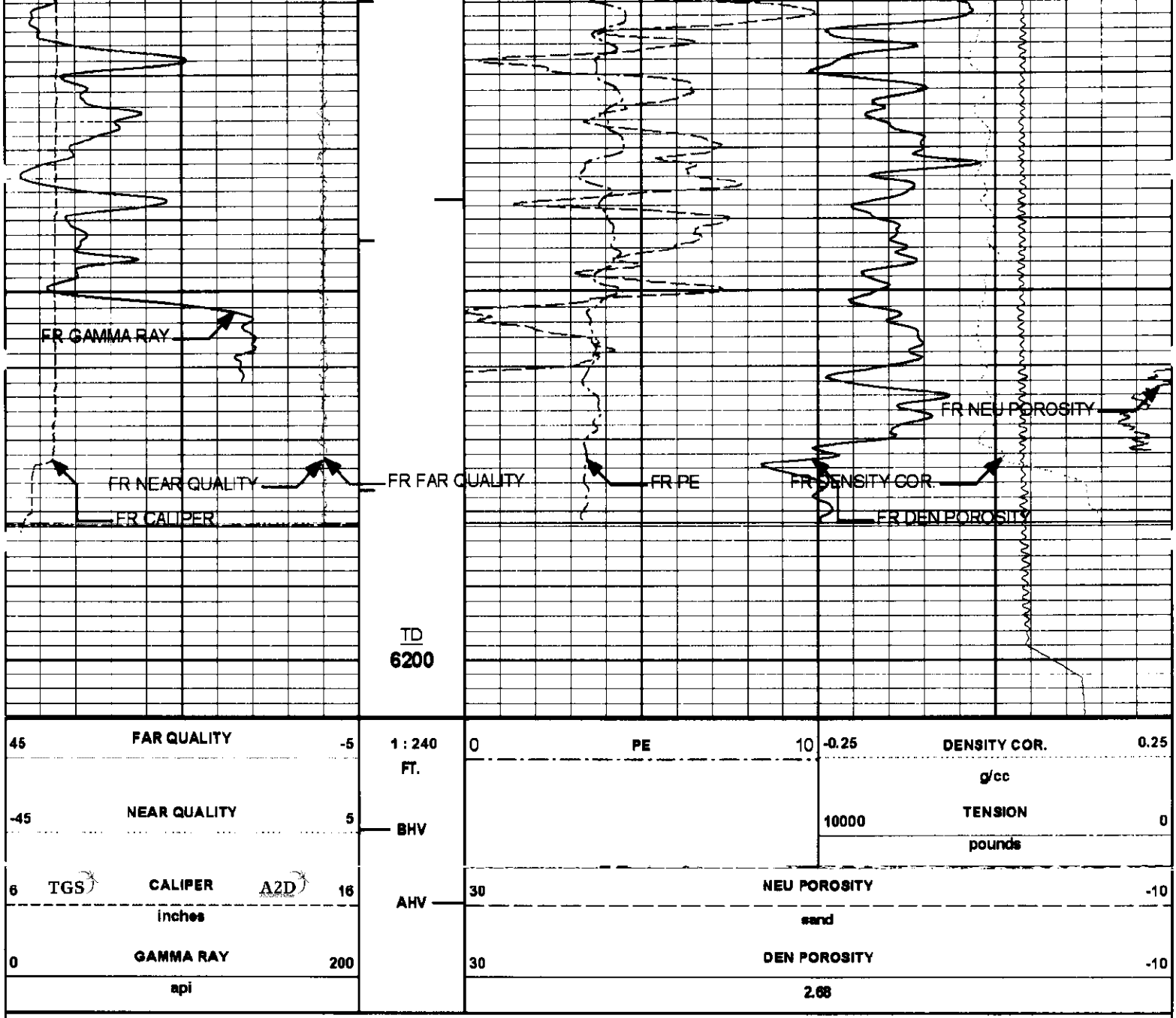

5100
5200
GAMMA RAY
NEAR QUALITY
FAR QUALITY
CALIPER
NEU POROSITY
PE
DENSITY CORR
DEN POROSITY


TGS
A2D
5300
5400


5500
5600
TENSION
GAMMA RAY
NEAR QUALITY
PE
DENSITY COR


FAR QUALITY
CALIPER
DEN POROSITY
5700
TGS
A2D
5800


5900
6000
6100
TENSION




**HALLIBURTON**

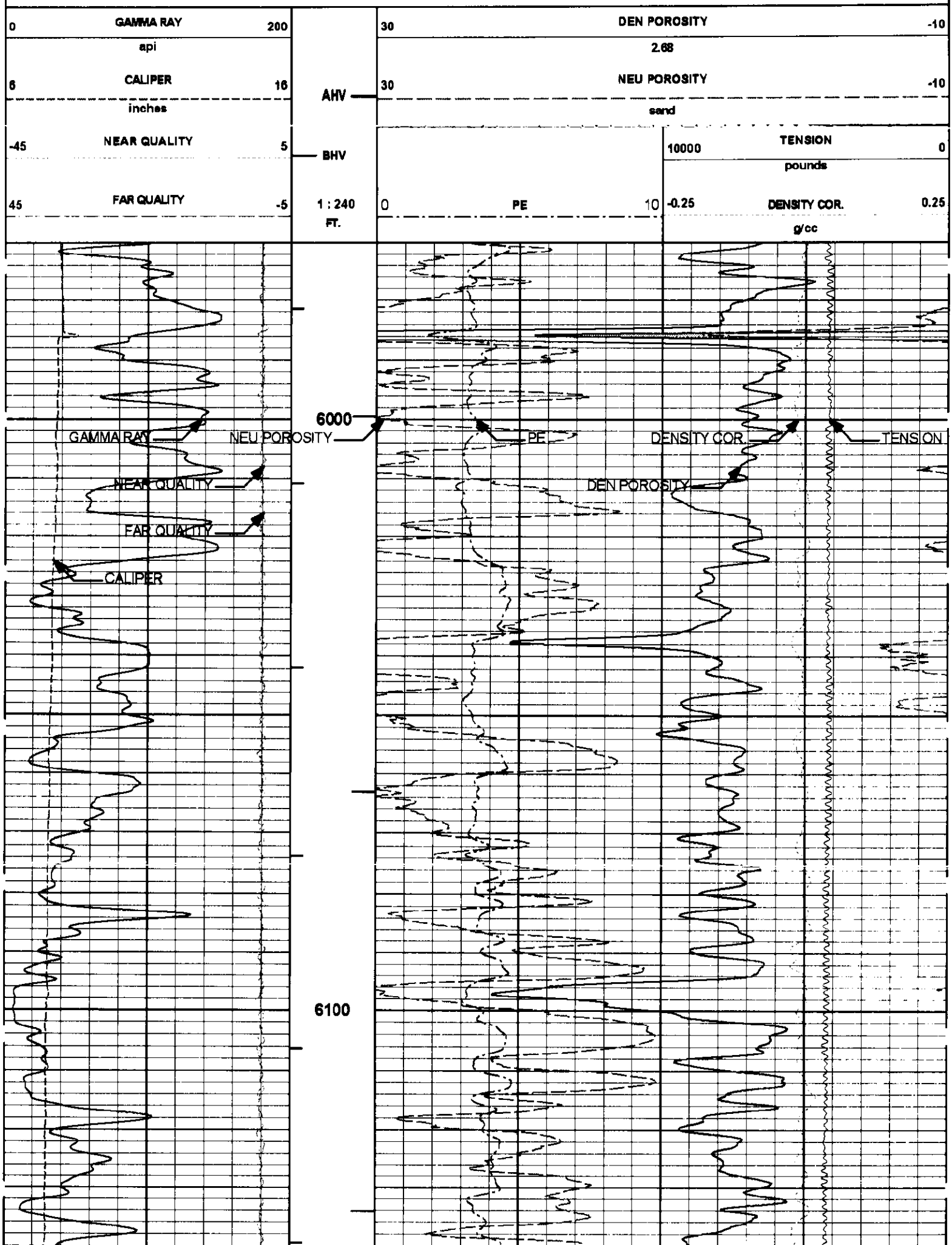
Plot Time: 08-Apr-10 05:34:17
Plot Range: 470 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\DAQ-0001-004\
Plot File: \\SDL\I_POR5IN_M

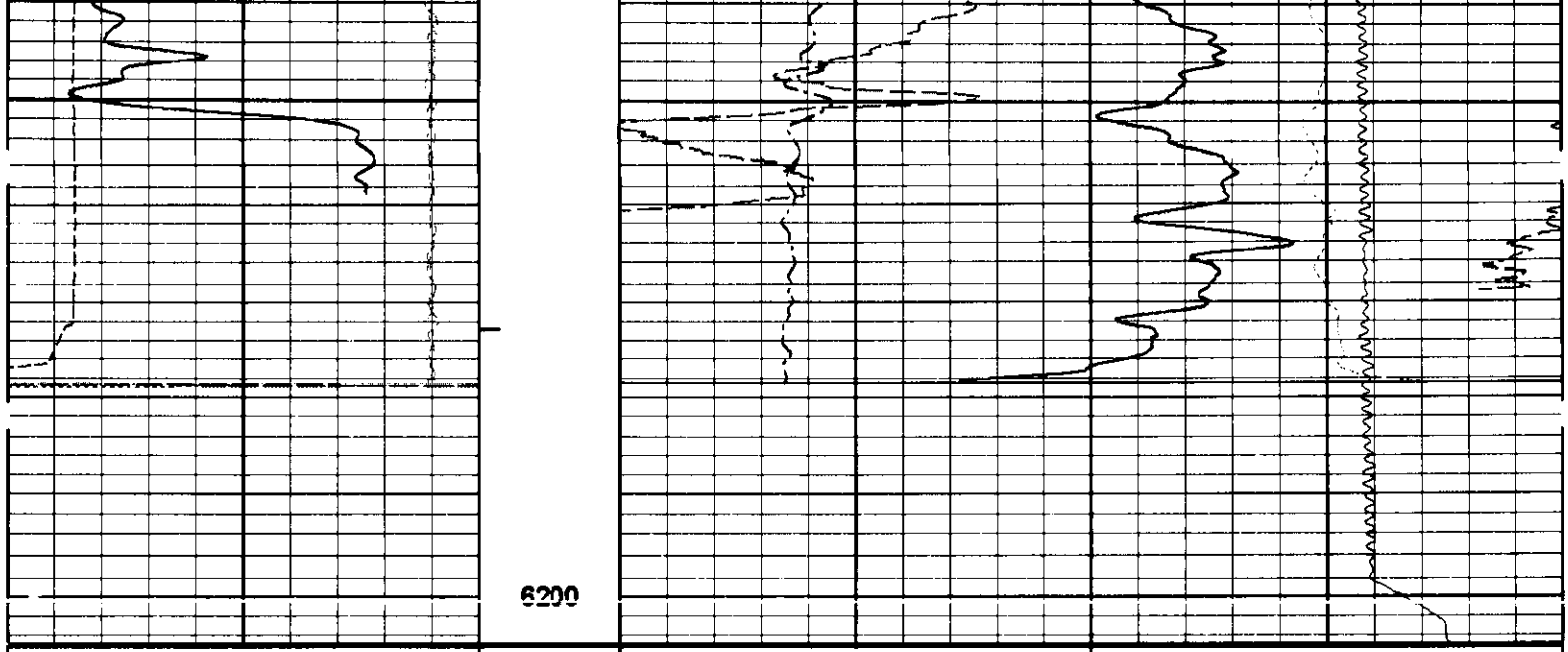
## MAIN PASS 5" = 100'

**HALLIBURTON**

Plot Time: 08-Apr-10 05:34:17
Plot Range: 5970 ft to 6204.92 ft
Data: UTE_TRIBAL_2015\Well Based\REPEAT\
Plot File: \\SDL\I_POR5IN_R

## REPEAT SECTION 5" = 100'


0 GAMMA RAY 200
api
6 CALIPER 16
inches
-45 NEAR QUALITY 5
45 FAR QUALITY -5
AHV
BHV
1 : 240
FT.
30 DEN POROSITY -10
2.68
30 NEU POROSITY -10
sand
10000 TENSION 0
pounds
0 PE 10
-0.25 DENSITY COR. 0.25
g/cc
6000
6100
GAMMA RAY
NEU POROSITY
PE
DENSITY COR.
TENSION
NEAR QUALITY
DEN POROSITY
FAR QUALITY
CALIPER




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 45 | FAR QUALITY | -5 | 1 : 240 FT. | 0 | PE | 10 | -0.25 DENSITY COR. 0.25 g/cc |
| -45 | NEAR QUALITY | 5 | BHV | | | | 10000 TENSION 0 pounds |
| 6 | CALIPER inches | 16 | AHV | 30 | NEU POROSITY sand | -10 | |
| 0 | GAMMA RAY api | 200 | | 30 | DEN POROSITY 2.68 | -10 | |

**HALLIBURTON**

Plot Time: 08-Apr-10 05:34:18
Plot Range: 5970 ft to 6204.92 ft
Data: UTE_TRIBAL_2015\Well Based\REPEAT\
Plot File: \\SDL\I_POR5IN_R

## REPEAT SECTION 5" = 100'

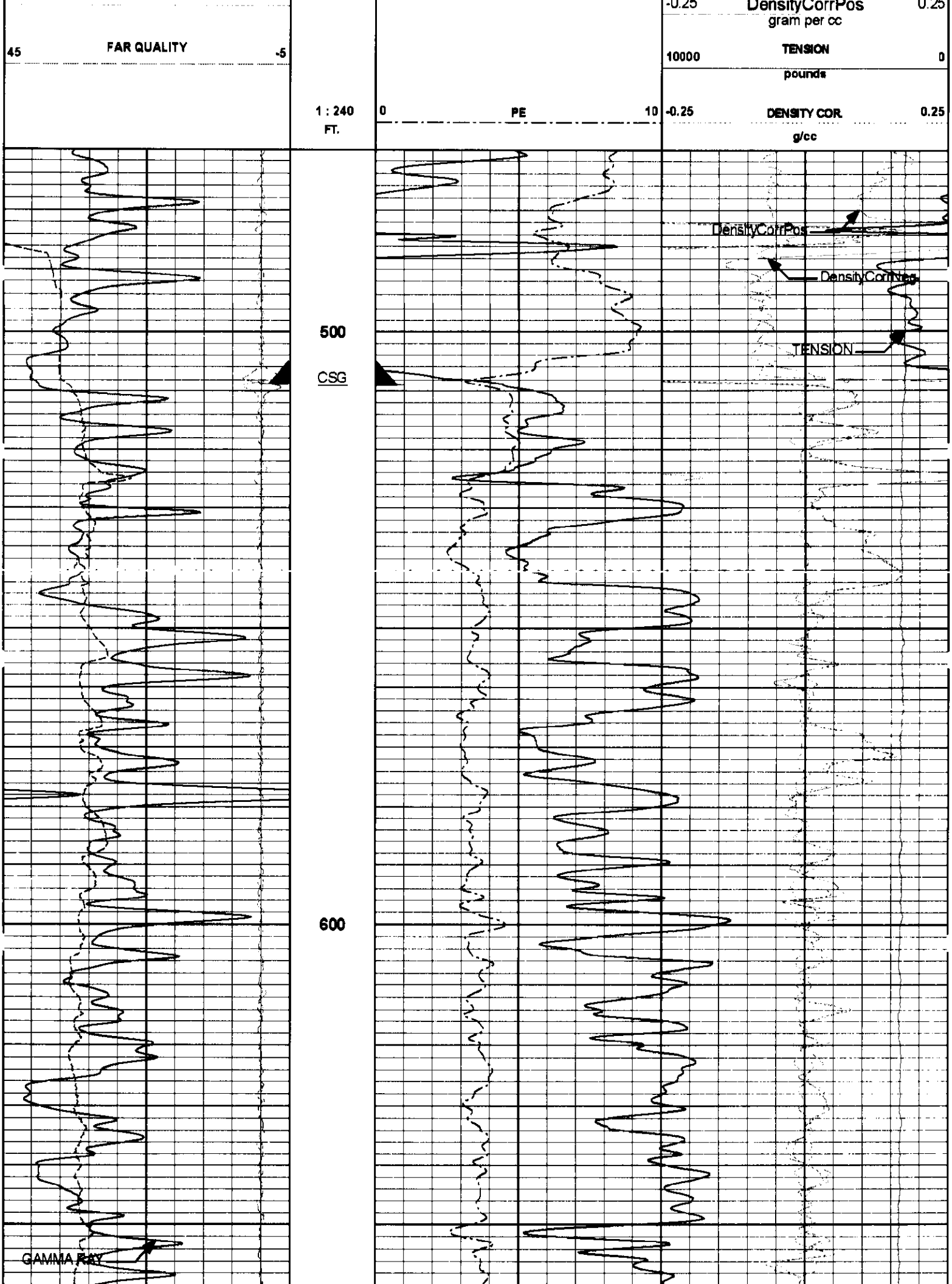
**HALLIBURTON**

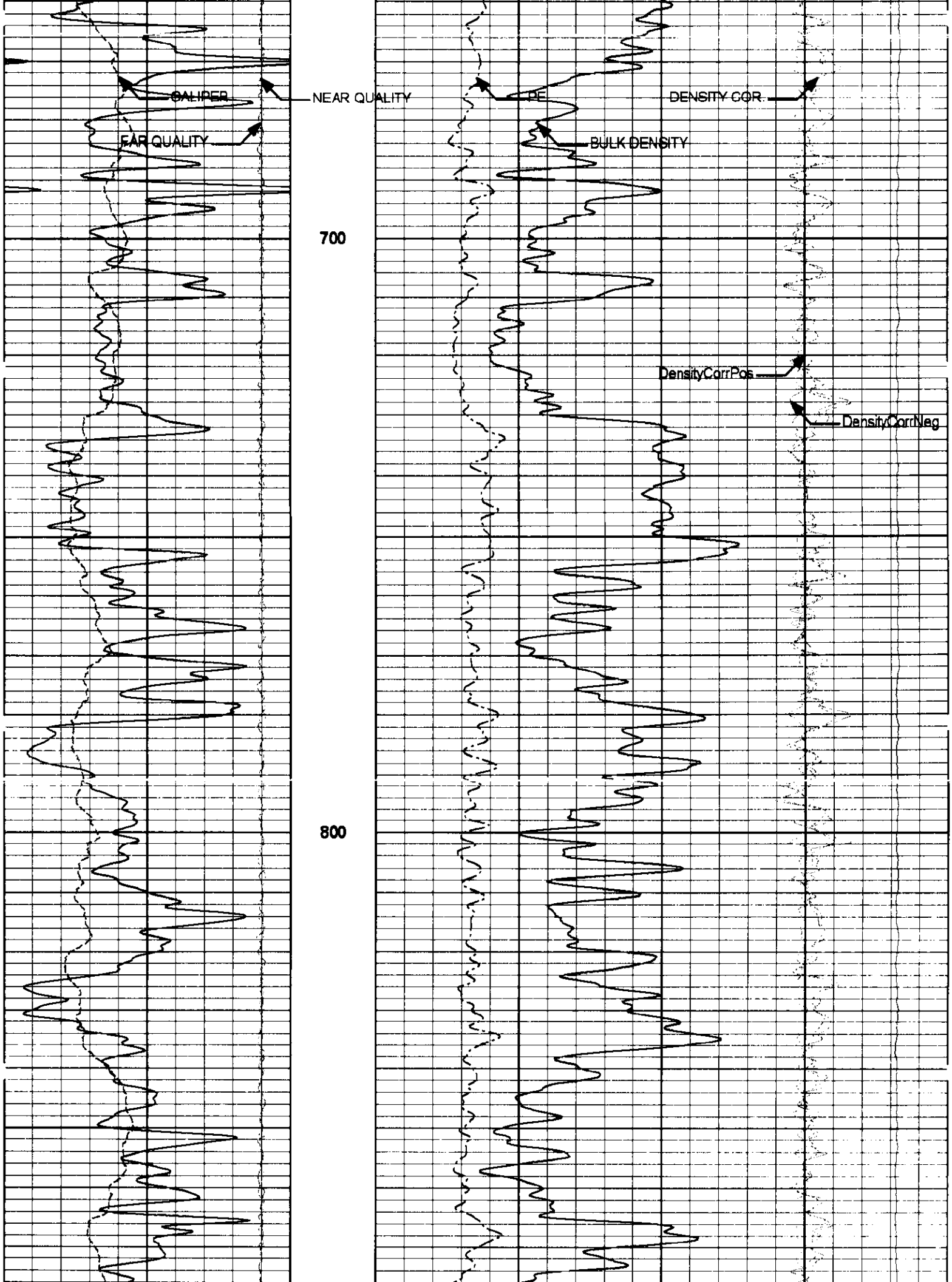
Plot Time: 08-Apr-10 05:34:18
Plot Range: 470 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\DAQ-0001-004\
Plot File: \\SDL\I_RHOB_M

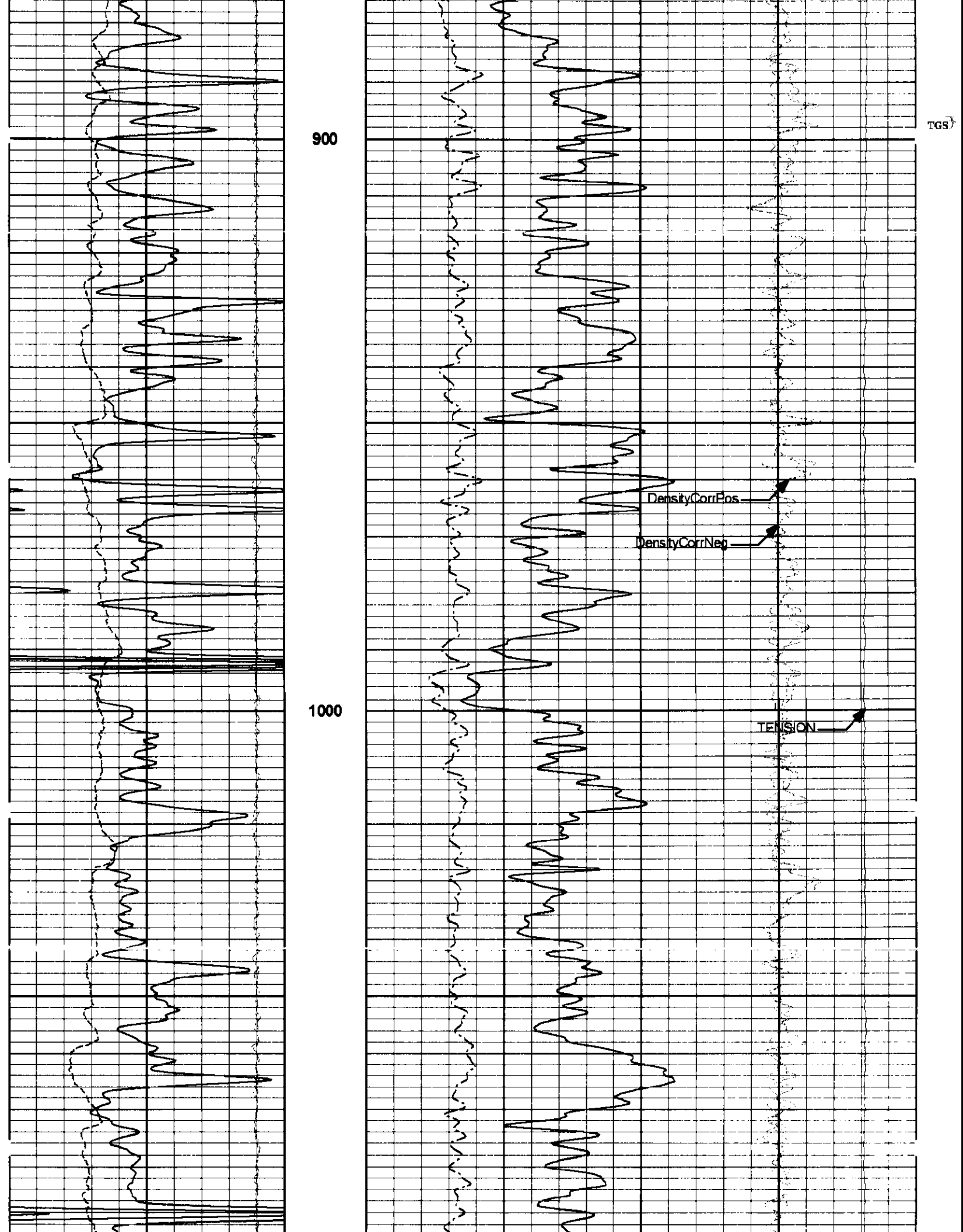
## MAIN PASS 5" = 100'

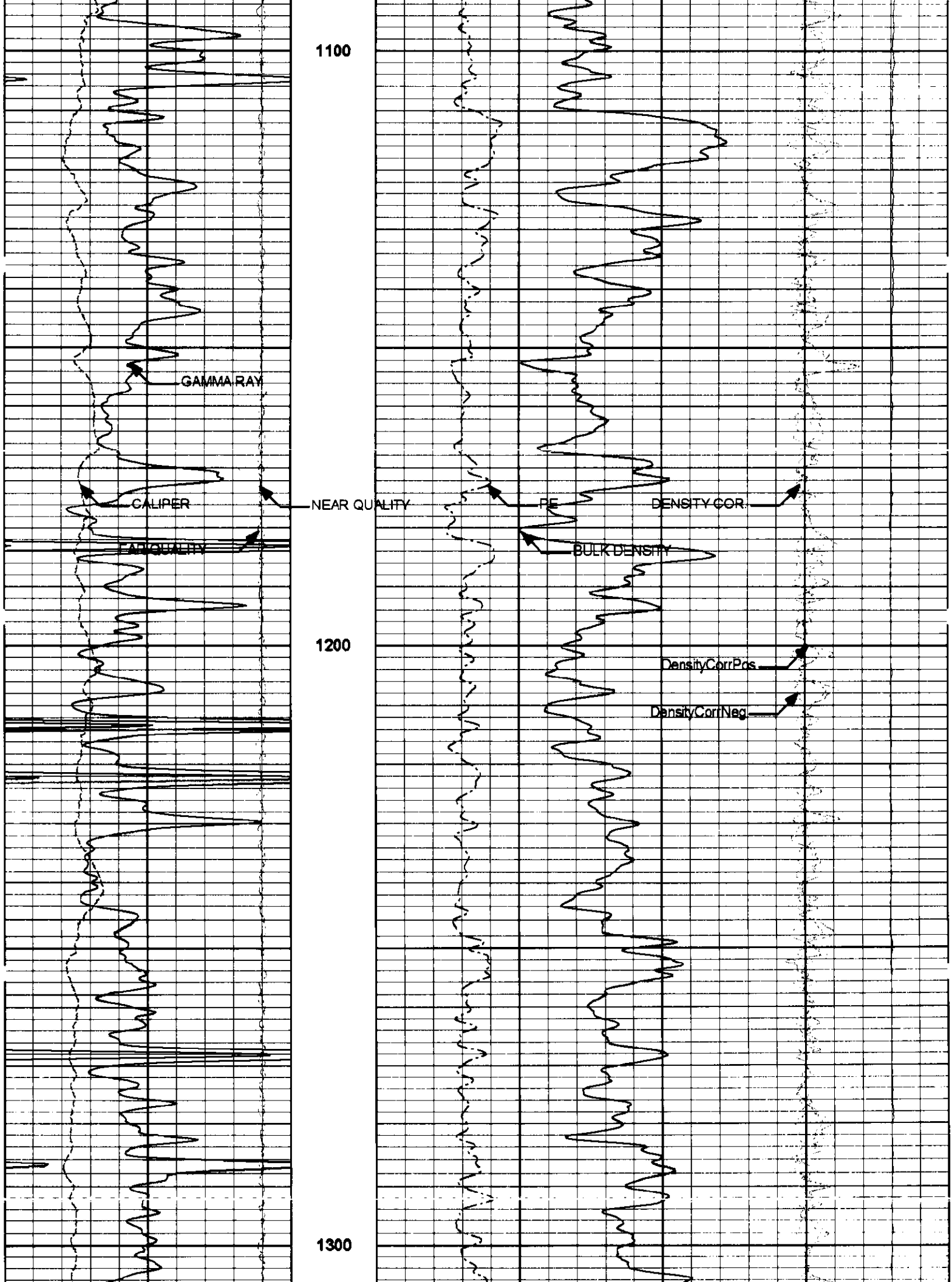
TGS A2D

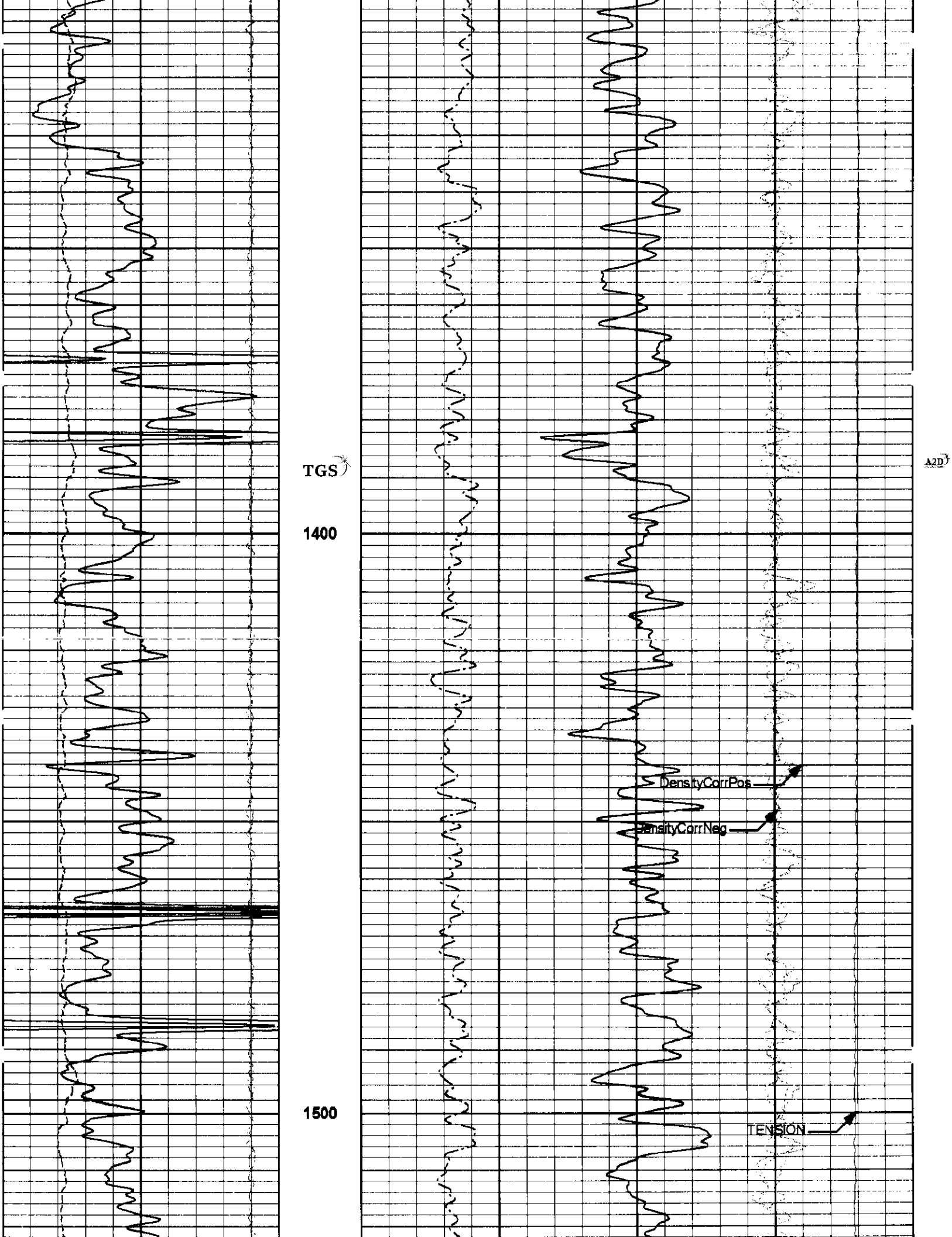
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | GAMMA RAY api | 200 | | 2 | BULK DENSITY g/cc | 3 | |
| 6 | CALIPER inches | 16 | | | | | -0.25 DensityCorrNeg gram per cc 0.25 |
| -45 | NEAR QUALITY | 5 | | | | | |

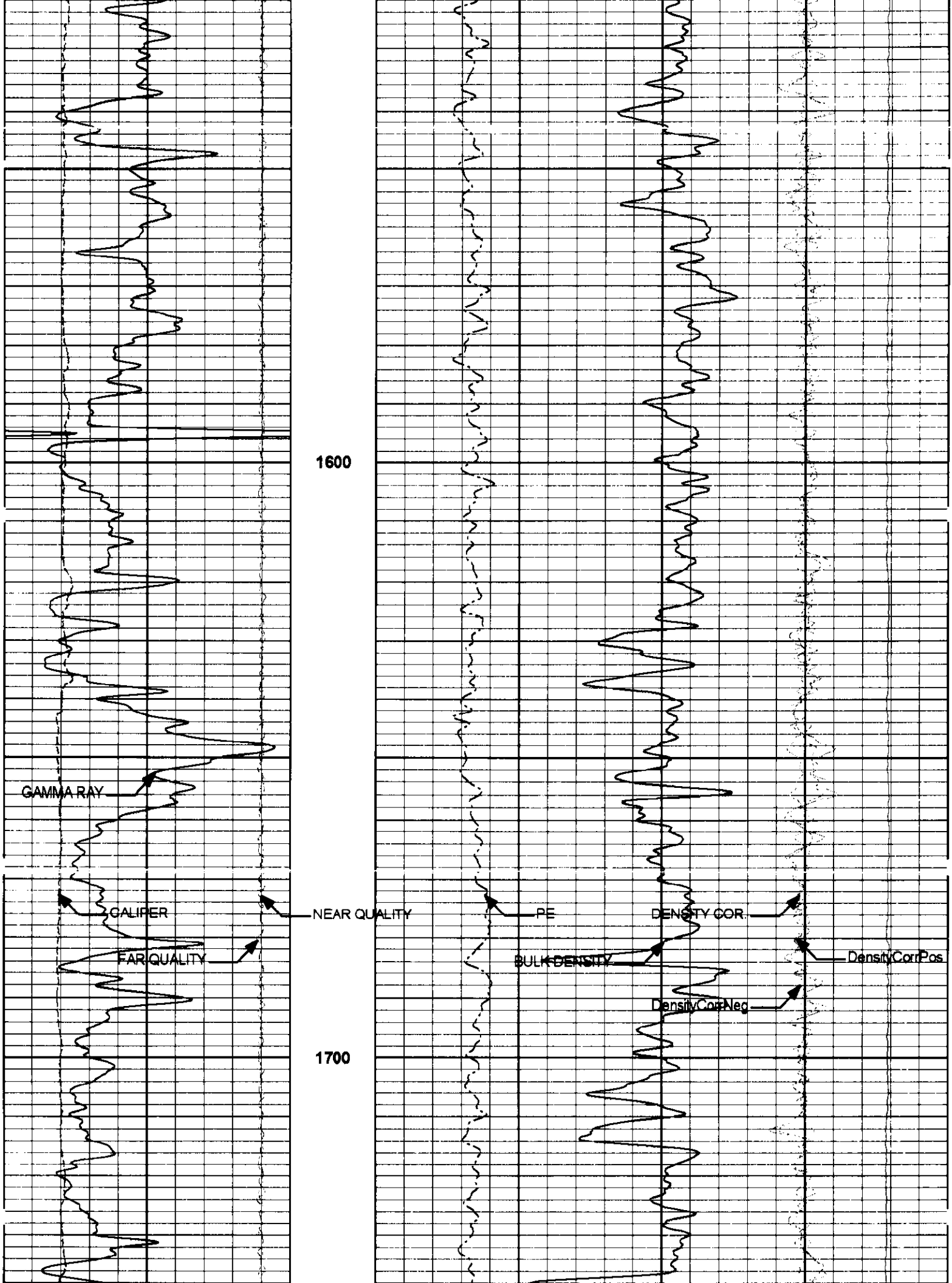

45
FAR QUALITY
-5
1 : 240
FT.
0
PE
10
-0.25
DensityCorrPos
0.25
gram per cc
10000
TENSION
0
pounds
-0.25
DENSITY COR.
0.25
g/cc
DensityCorrPos
DensityCorrNeg
TENSION
500
CSG
600
GAMMA RAY

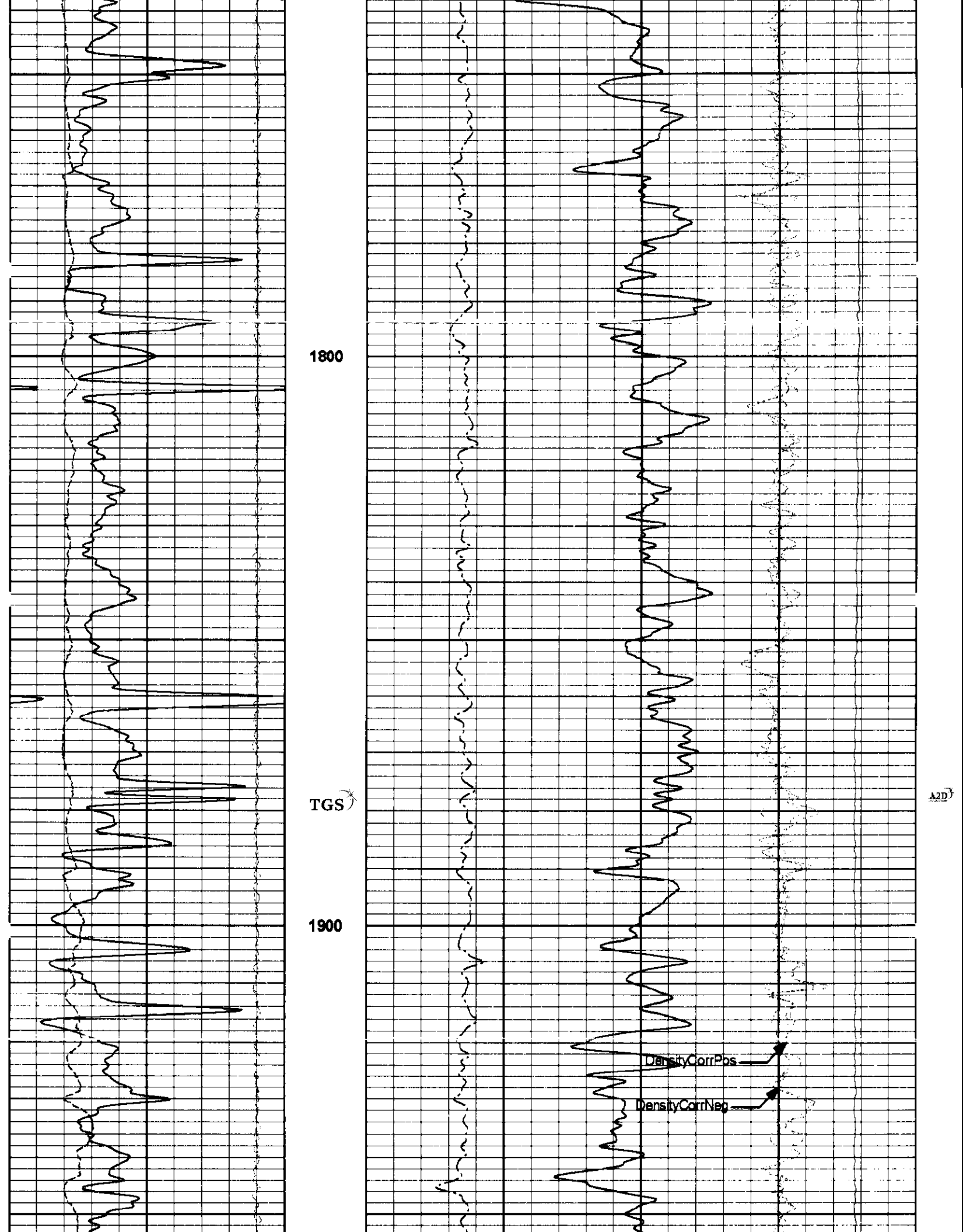

CALIPER
NEAR QUALITY
FAR QUALITY
700
800
PE
DENSITY COR
BULK DENSITY
DensityCorrPos
DensityCorrNeg

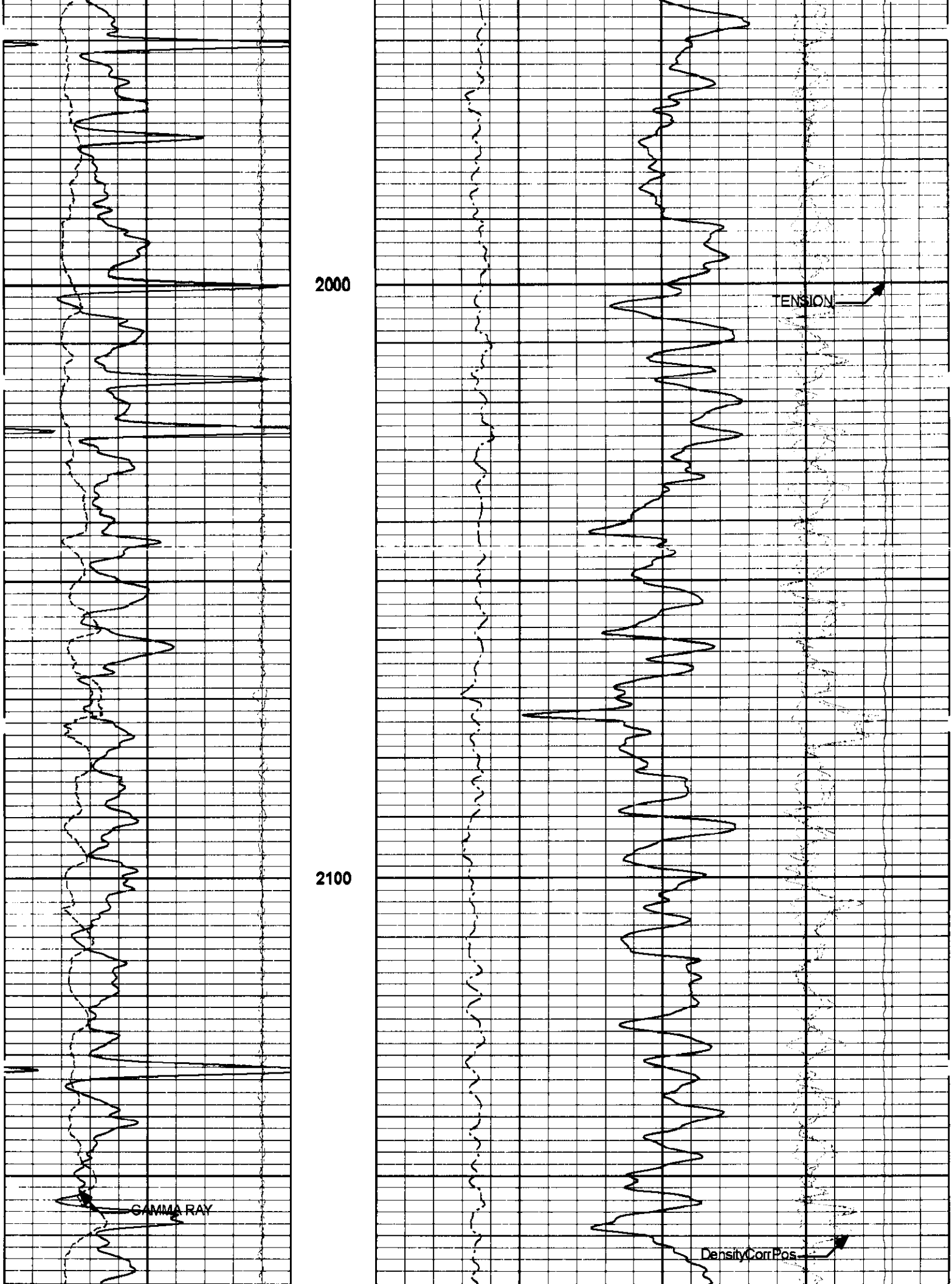

900
1000
TGS
DensityCorrPos
DensityCorrNeg
TENSION

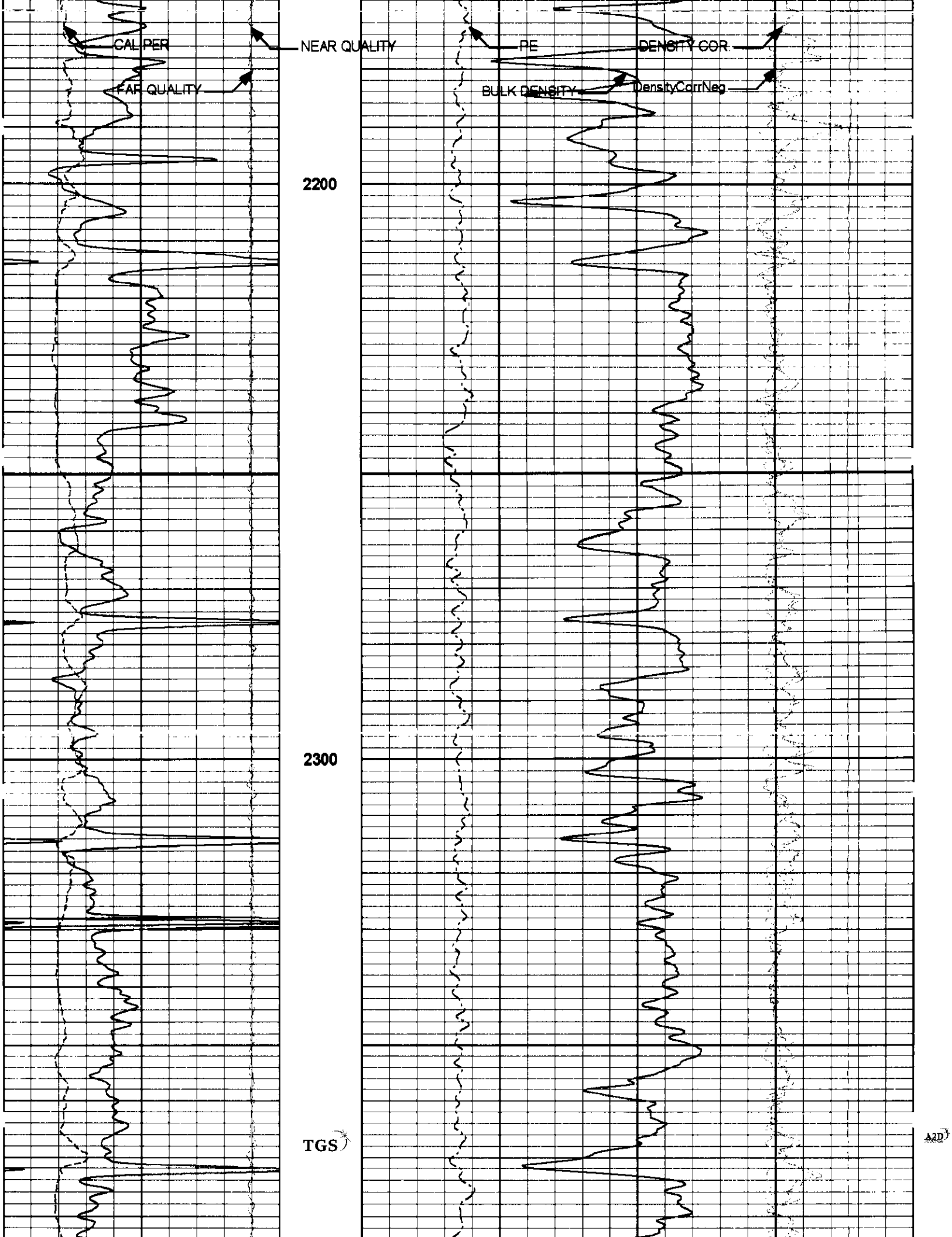

1100
GAMMA RAY
CALIPER
NEAR QUALITY
FAR QUALITY
PE
DENSITY COR
BULK DENSITY
1200
DensityCorrPos
DensityCorrNeg
1300

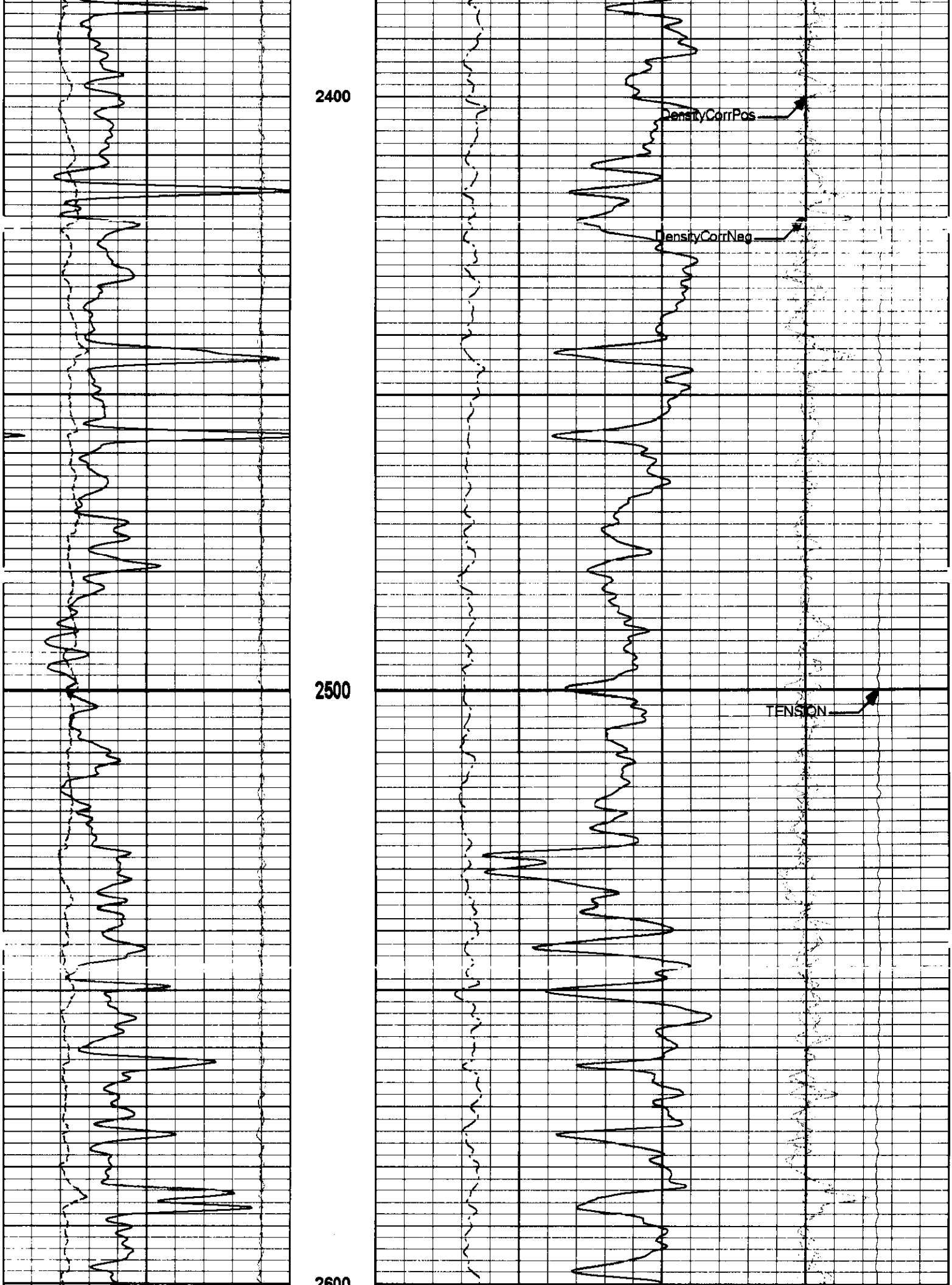

TGS
1400
1500
A2D
DensityCorrPos
DensityCorrNeg
TENSION

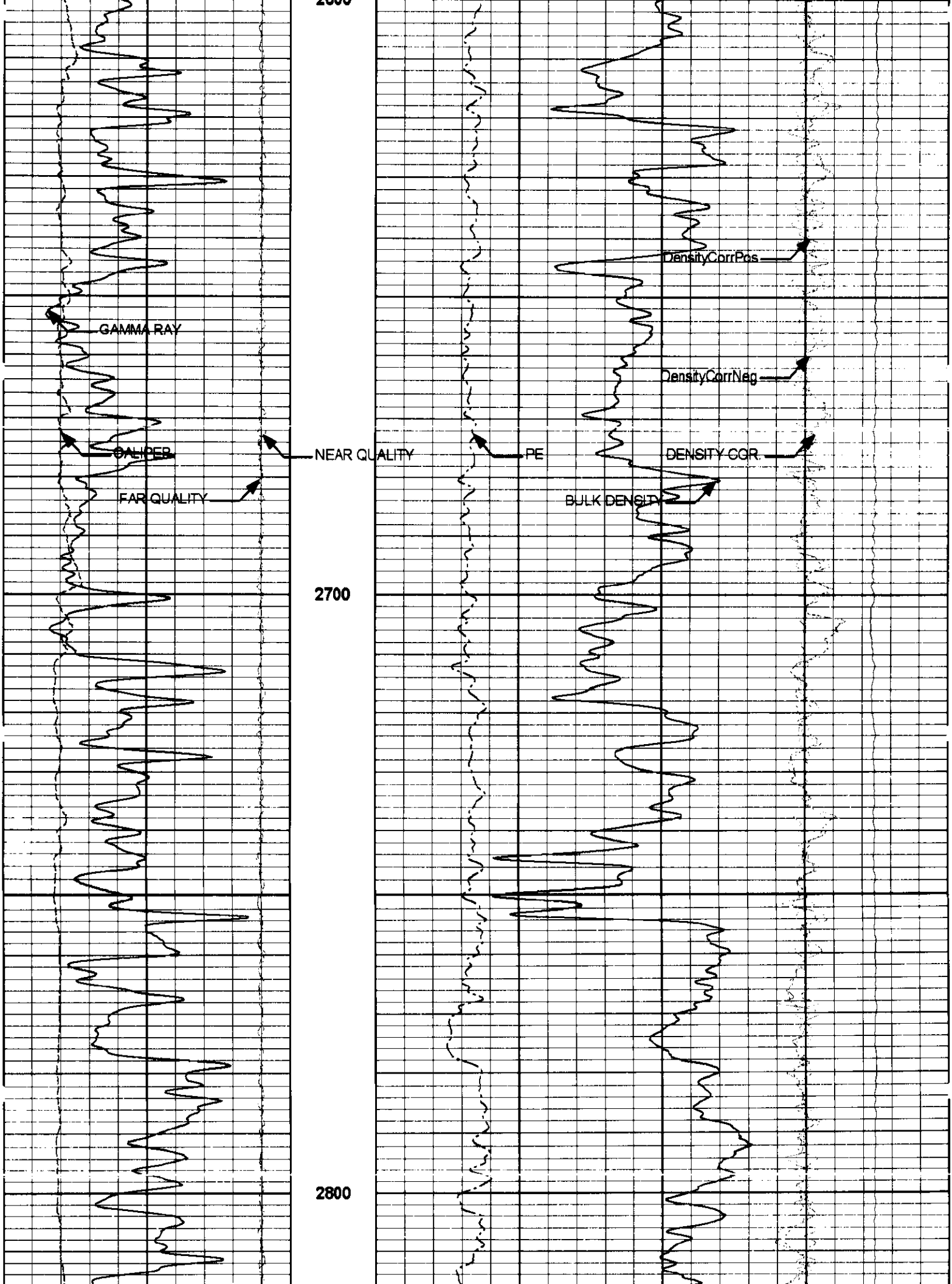

1600
1700
GAMMA RAY
CALIPER
NEAR QUALITY
FAR QUALITY
PE
DENSITY COR.
BULK DENSITY
DensityCorrPos
DensityCorrNeg

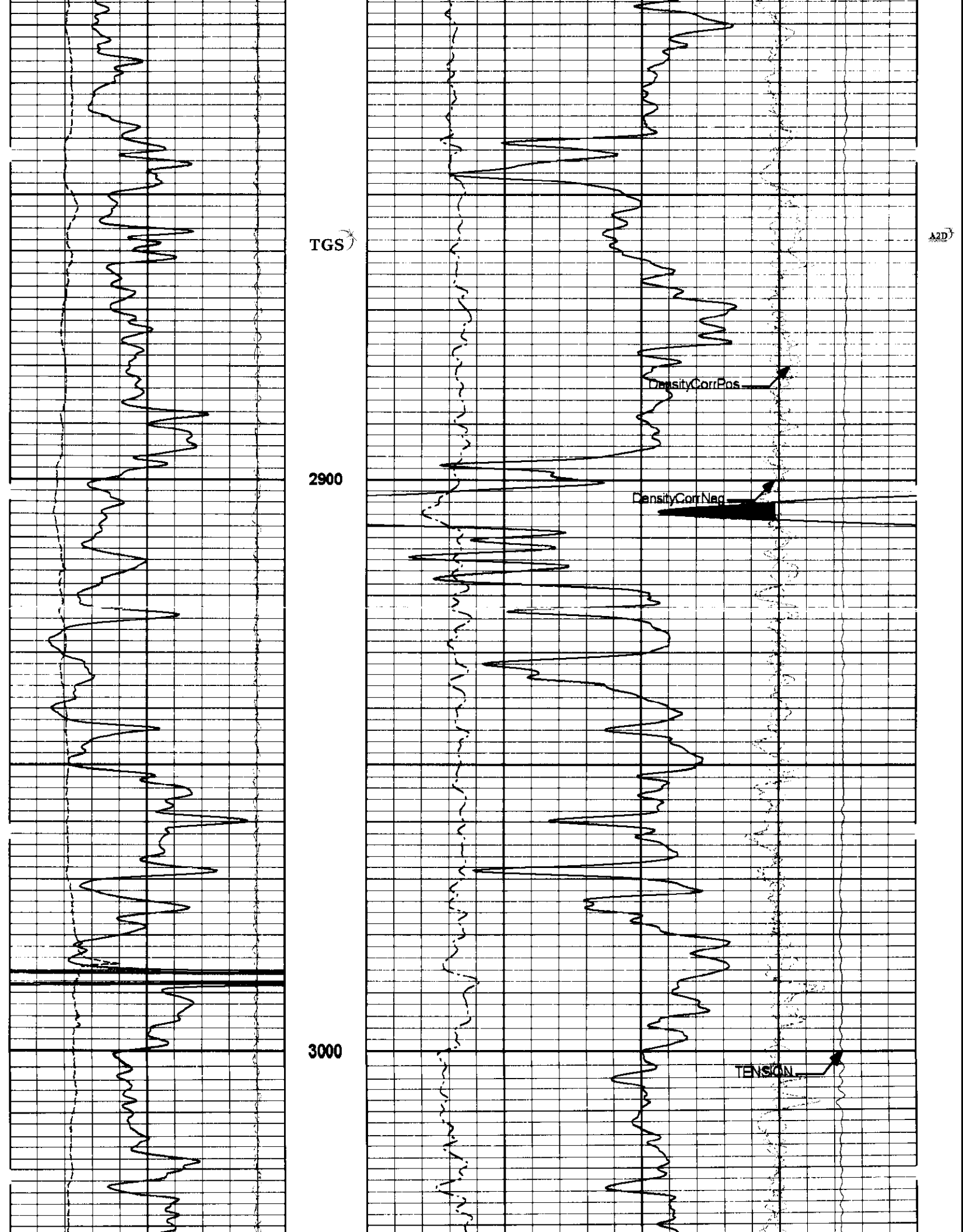

1800
TGS
1900
A2D
DensityCorrPos
DensityCorrNeg

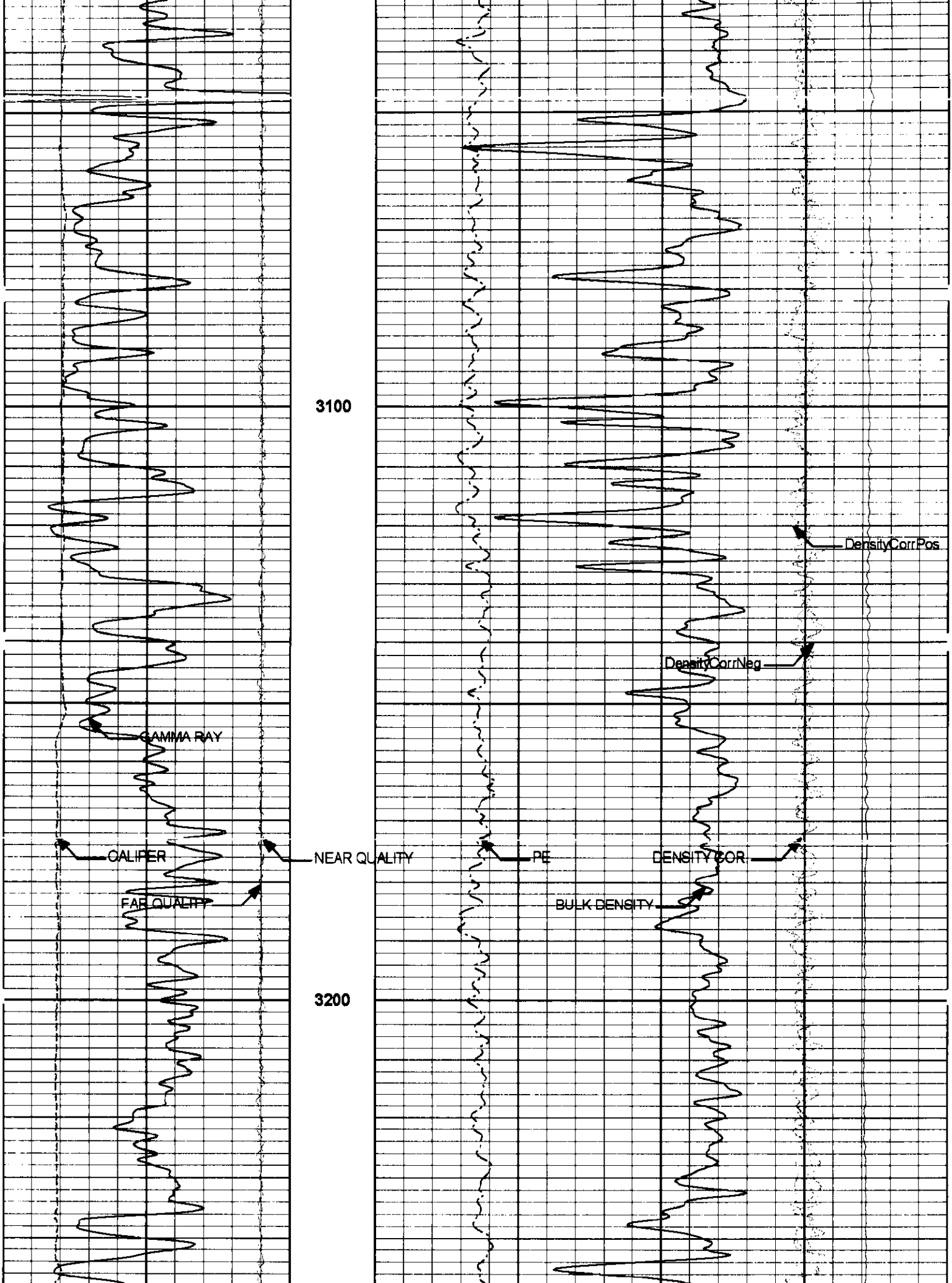

2000
2100
TENSION
GAMMA RAY
DensityCorrPos

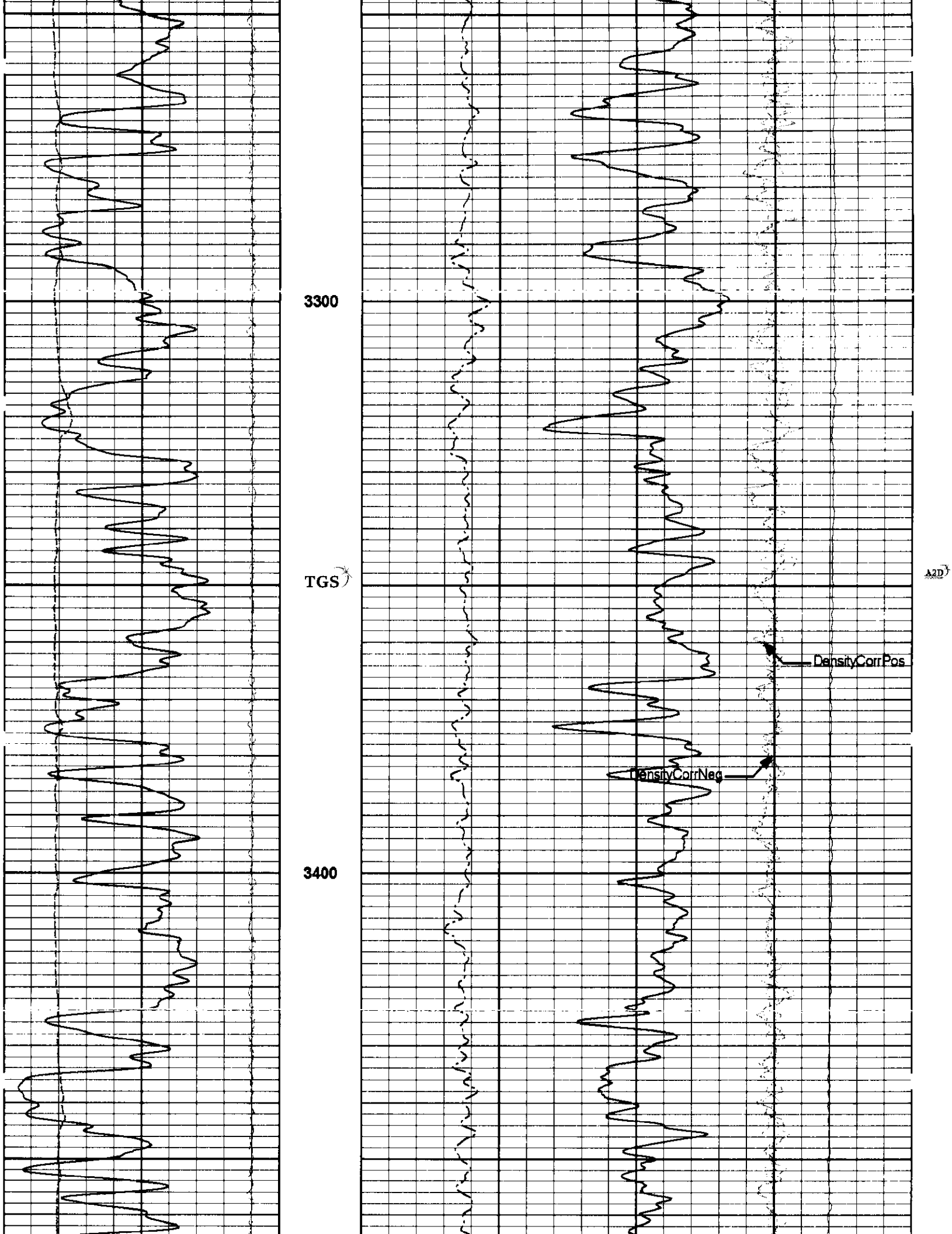

CALIPER
NEAR QUALITY
FAR QUALITY
PE
DENSITY COR.
BULK DENSITY
DensityCorrNeg
2200
2300
TGS
A2D

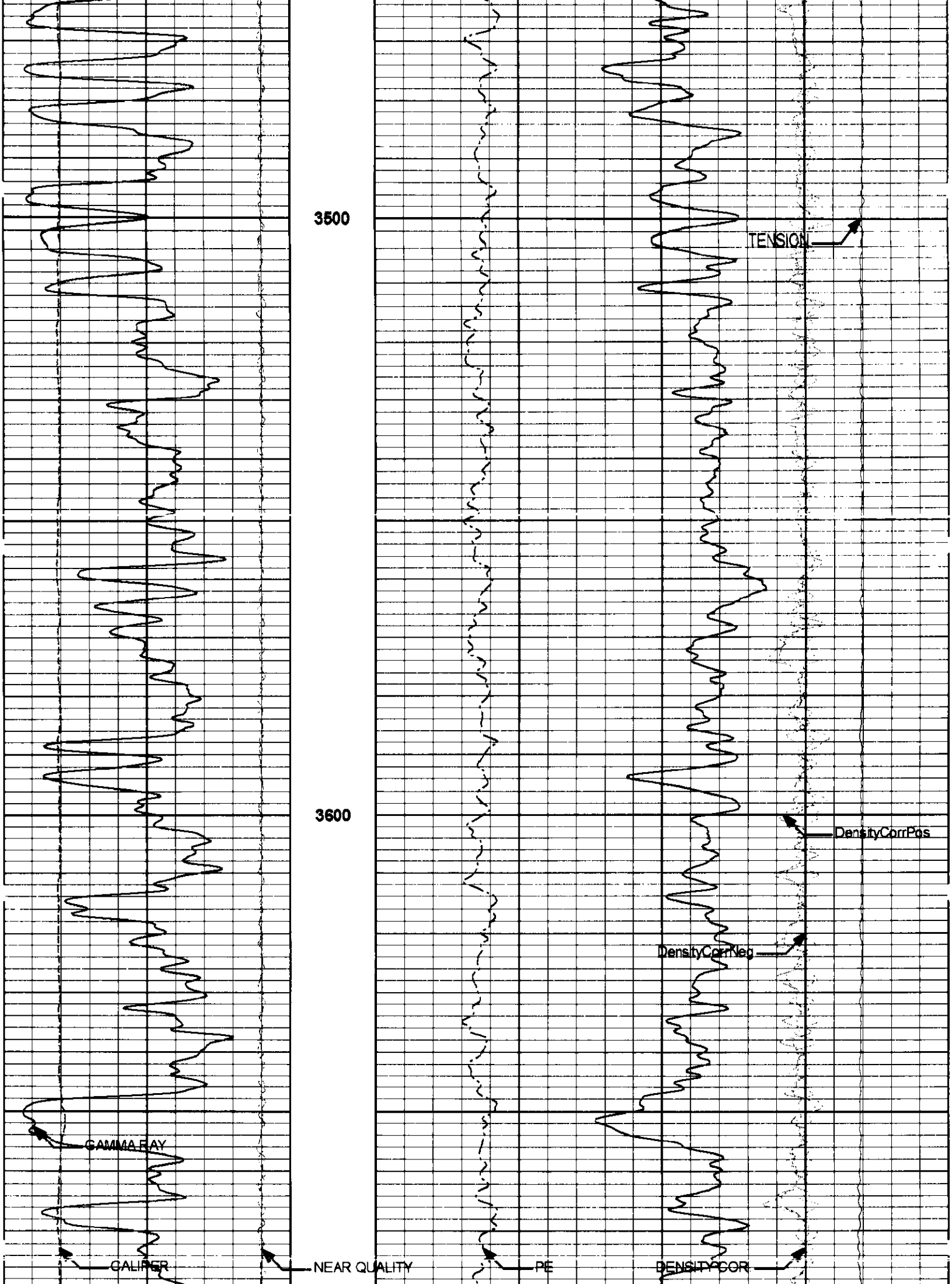

2400
DensityCorrPos
DensityCorrNeg
2500
TENSION
2600

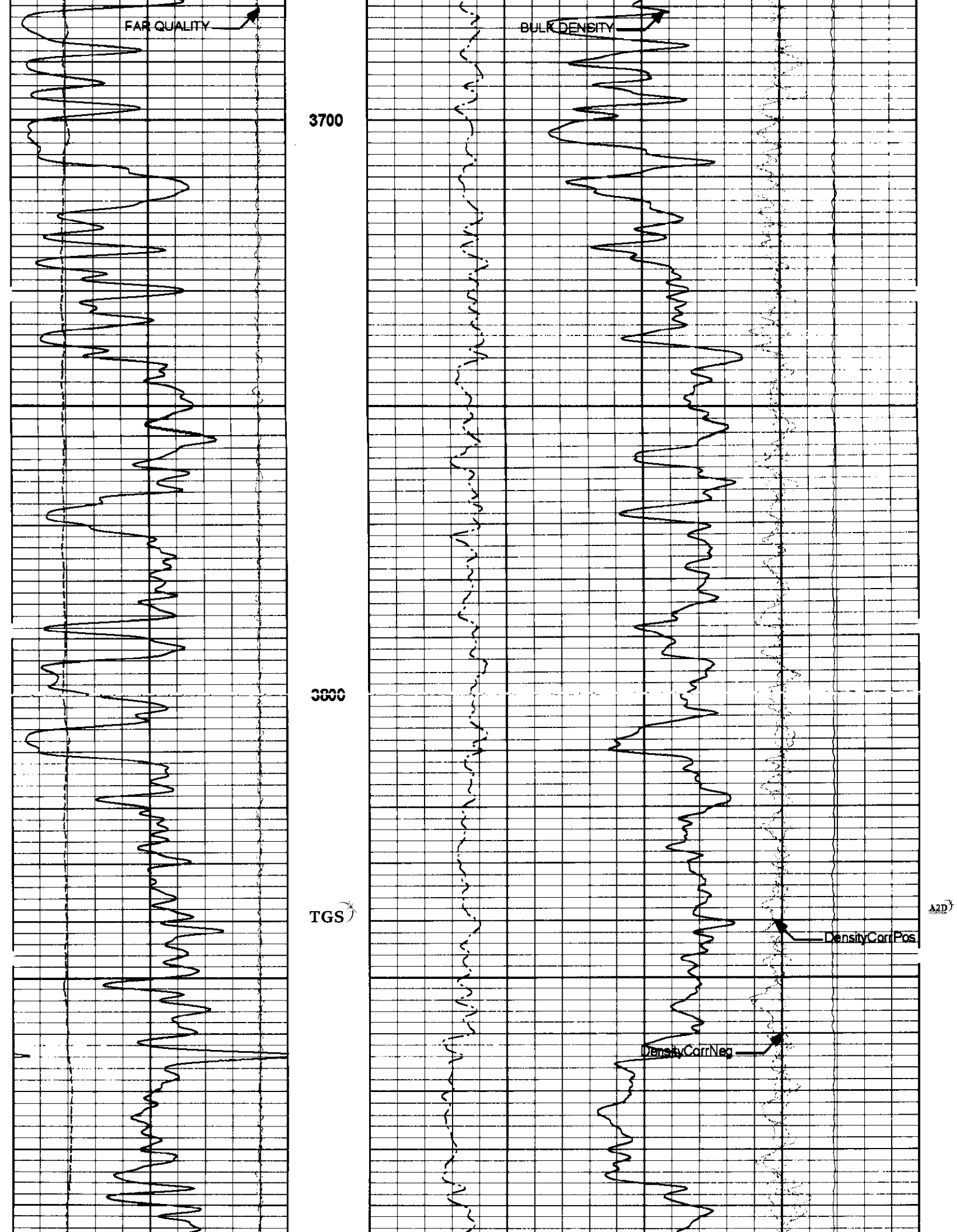

2600
GAMMA RAY
CALIPER
NEAR QUALITY
FAR QUALITY
PE
DensityCorrPos
DensityCorrNeg
DENSITY CGR
BULK DENSITY
2700
2800

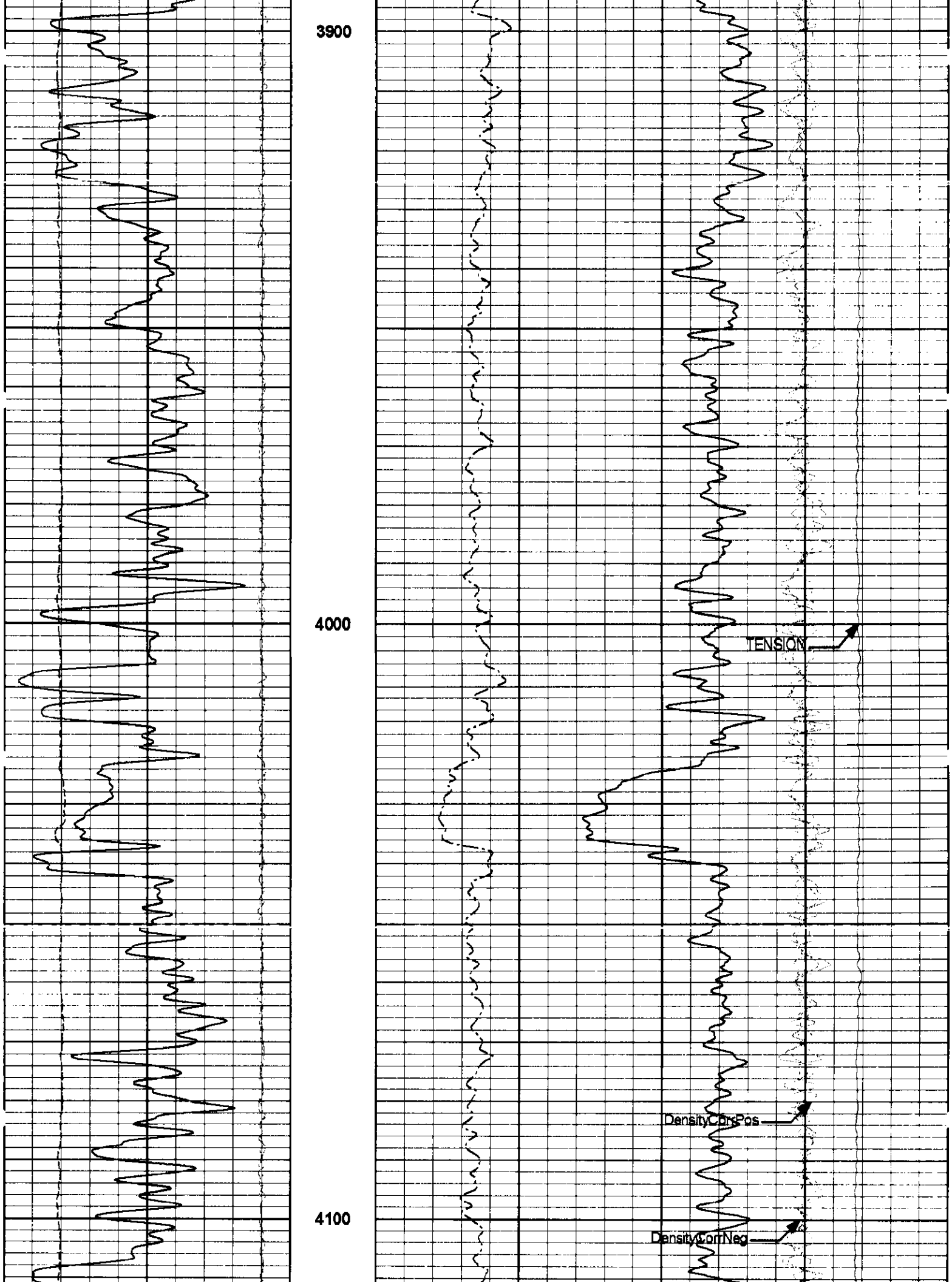

TGS
A2D
DensityCorrPos
DensityCorrNeg
TENSION
2900
3000

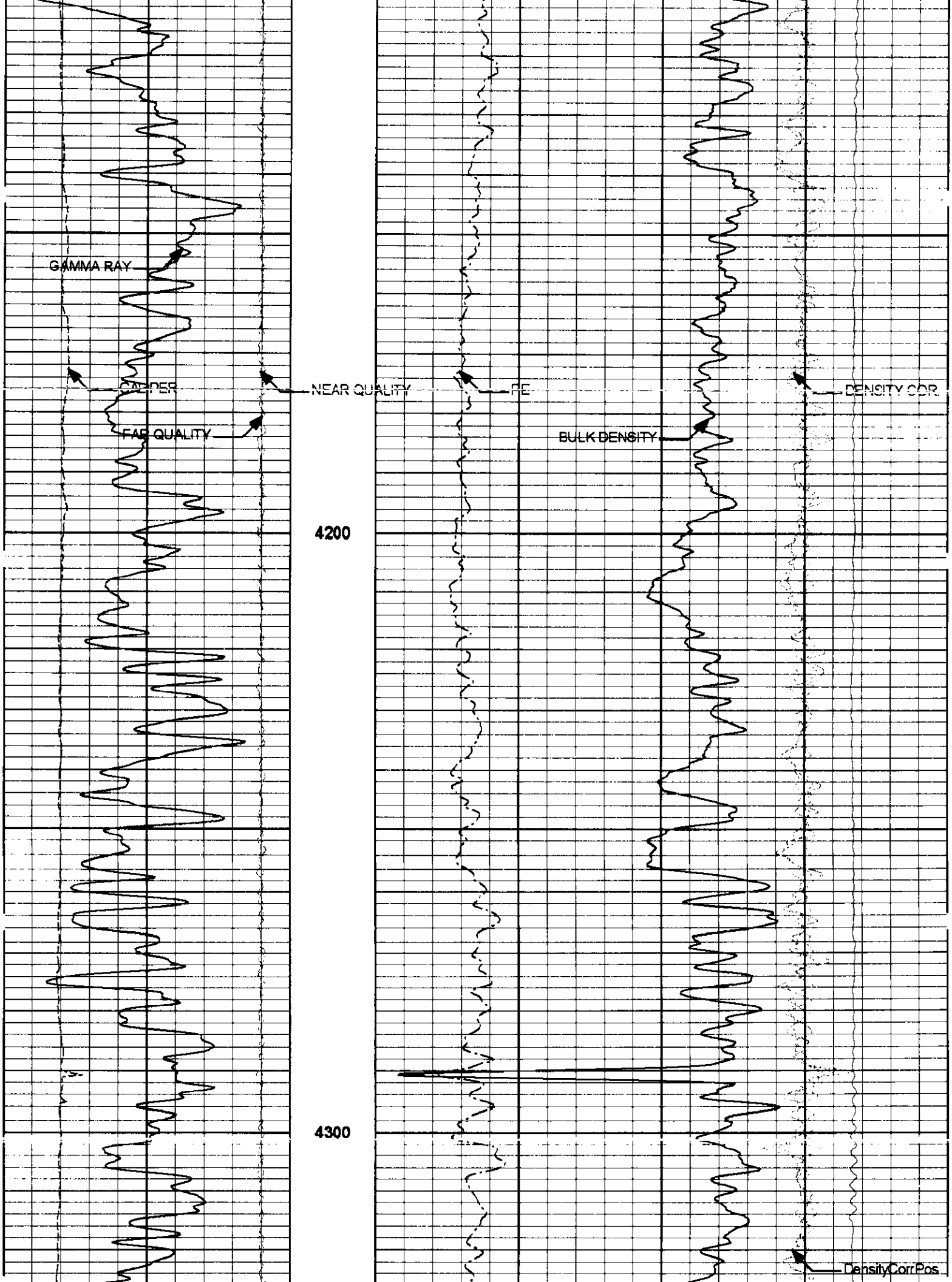

3100
3200
GAMMA RAY
CALIPER
NEAR QUALITY
FAR QUALITY
PE
DENSITY COR
BULK DENSITY
DensityCorrPos
DensityCorrNeg

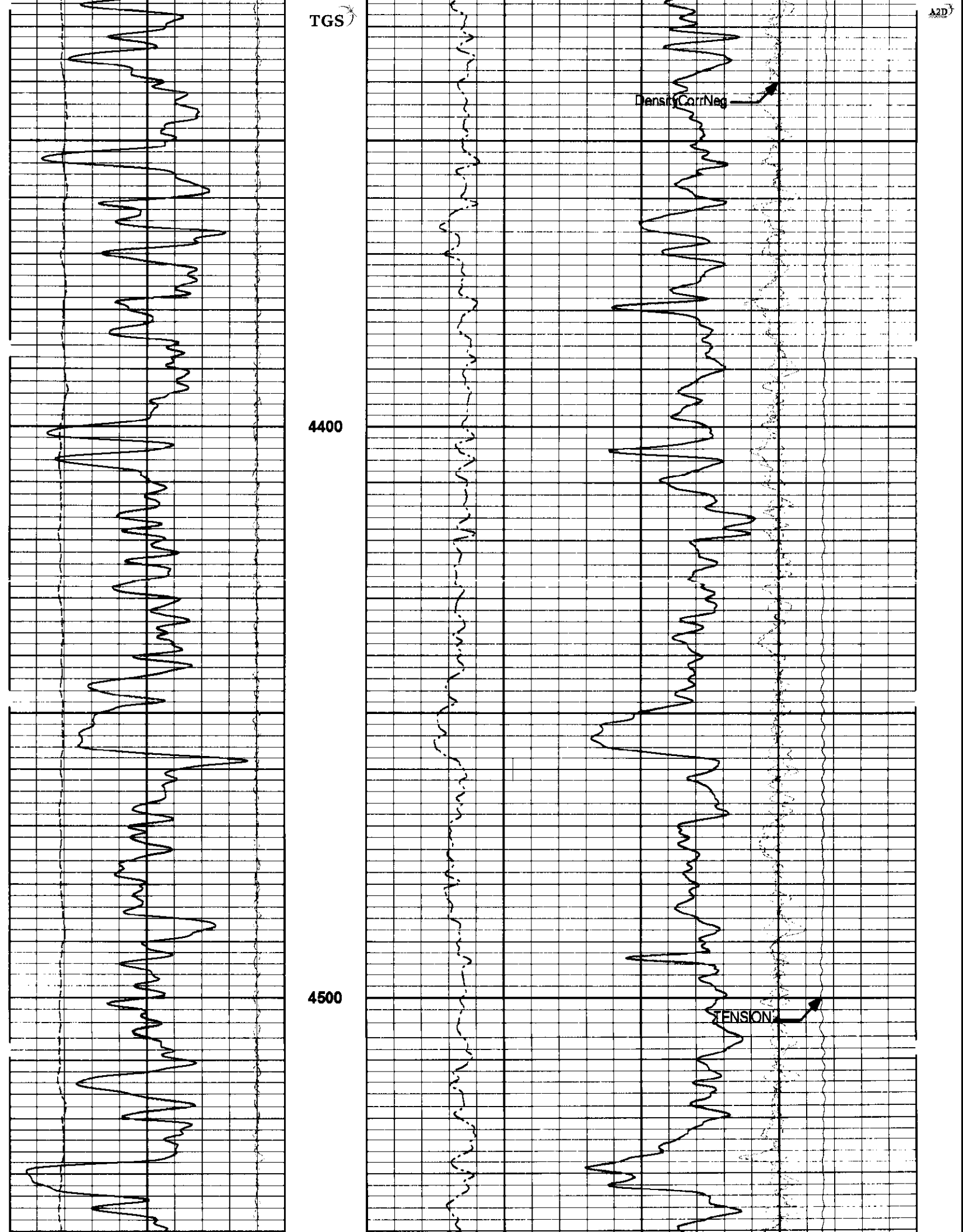

3300
TGS
A2D
DensityCorrPos
DensityCorrNeg
3400

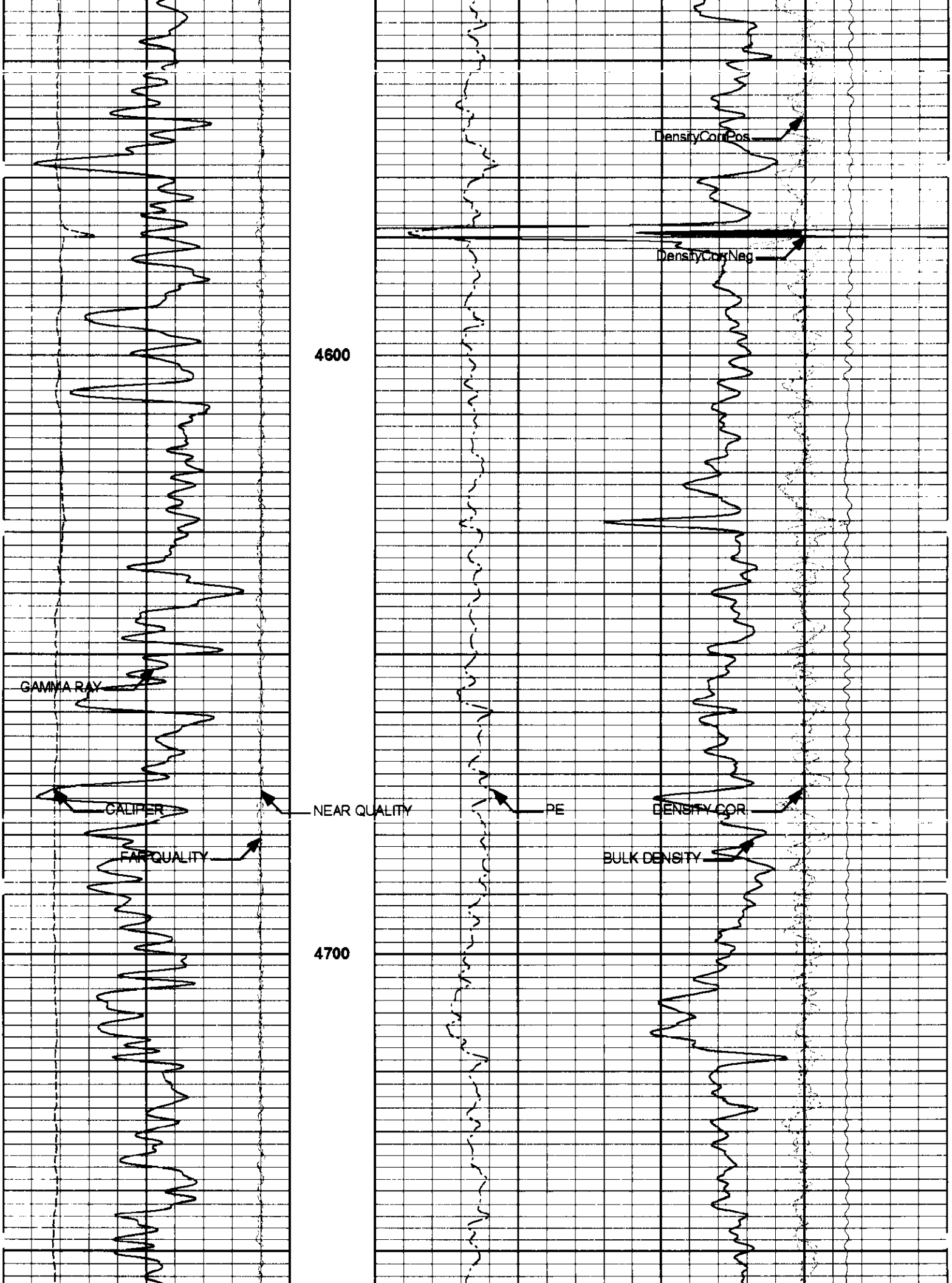

3500
3600
TENSION
DensityCorrPos
DensityCorrNeg
GAMMA RAY
CALIPER
NEAR QUALITY
PE
DENSITYCOR

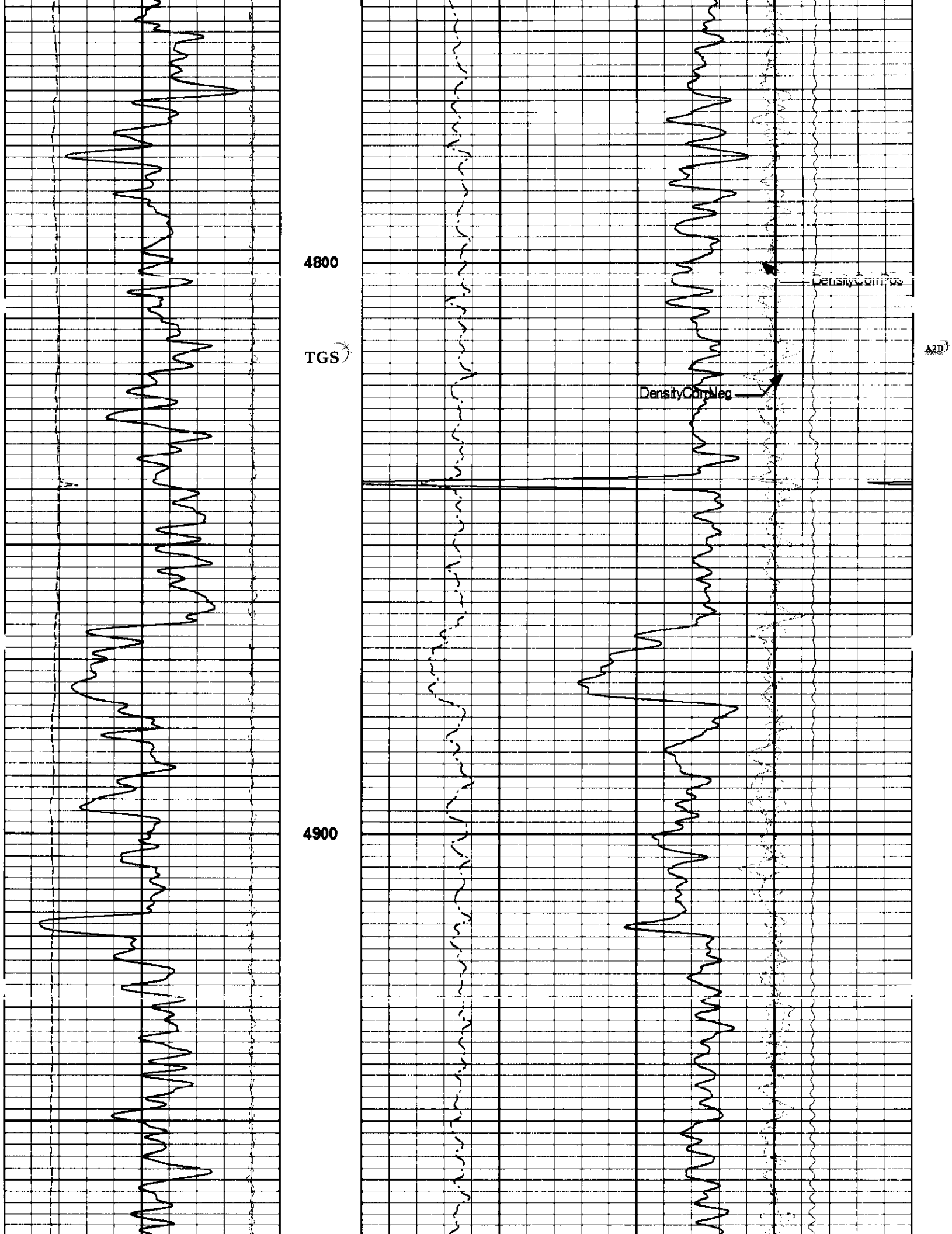

FAR QUALITY
BULK DENSITY
3700
3800
TGS
A2D
DensityCorrPos
DensityCorrNeg

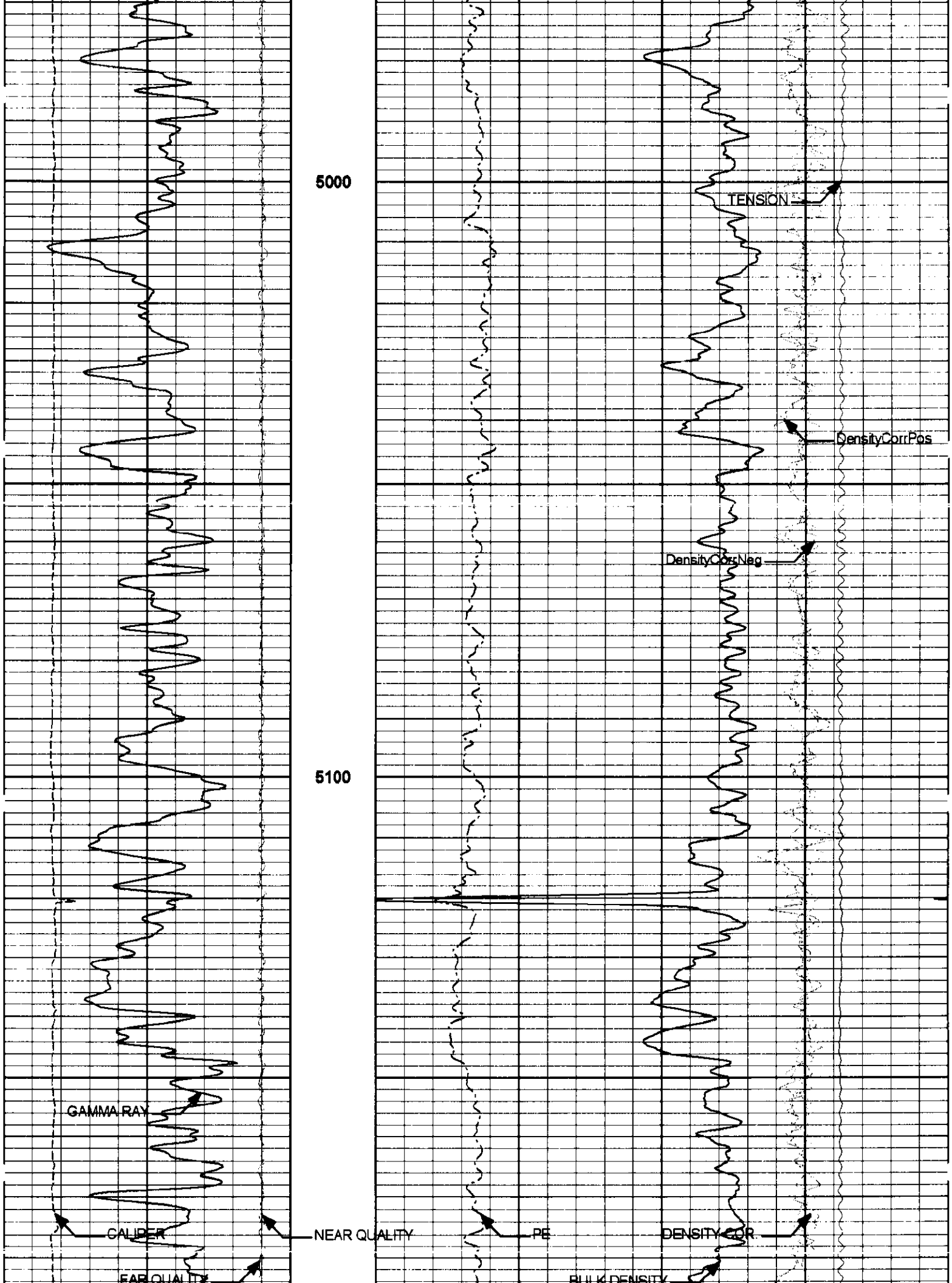

3900
4000
4100
TENSION
DensityCorrPos
DensityCorrNeg

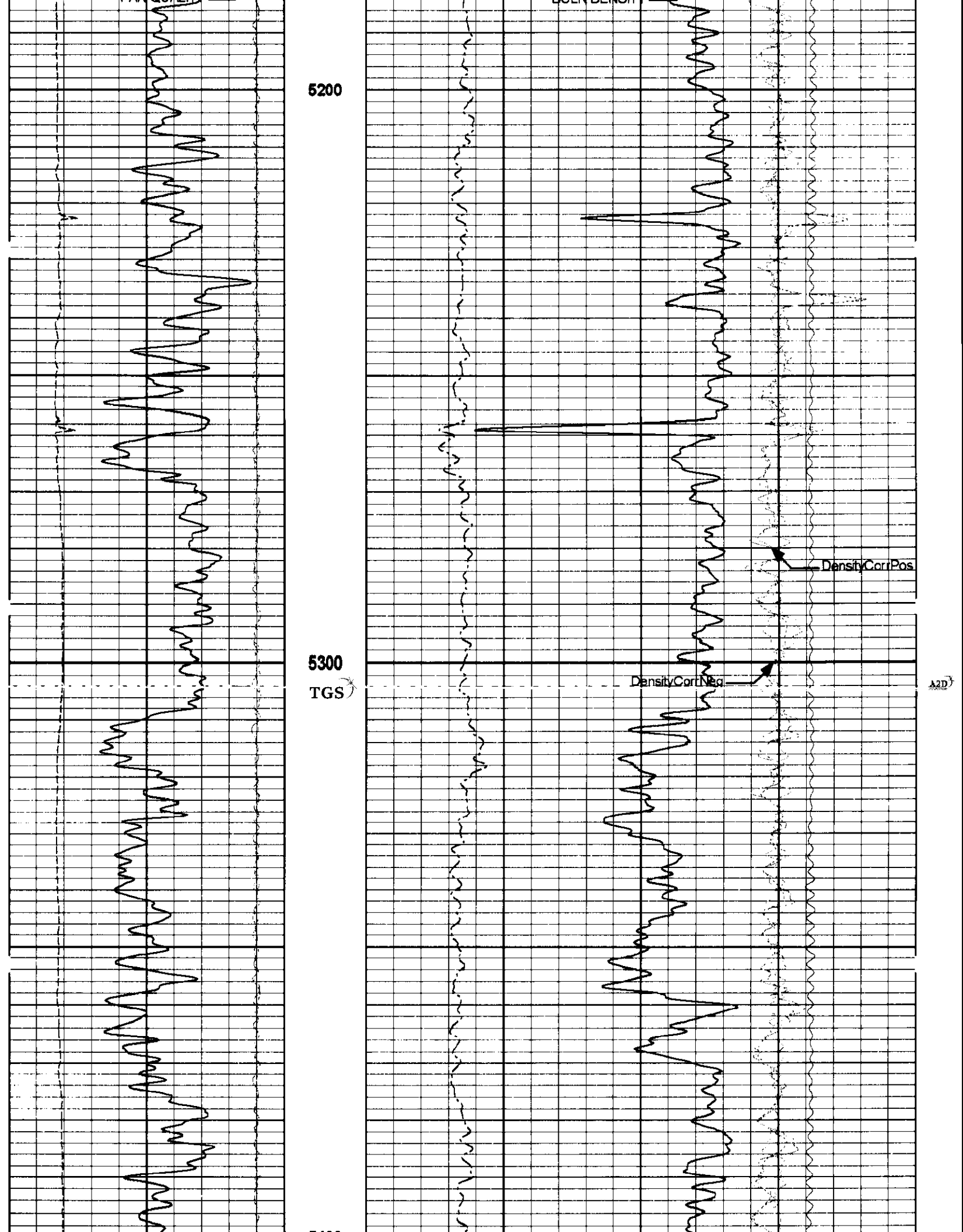

GAMMA RAY
CALIPER
NEAR QUALITY
FAR QUALITY
PE
BULK DENSITY
DENSITY COR.
4200
4300
DensityCorrPos

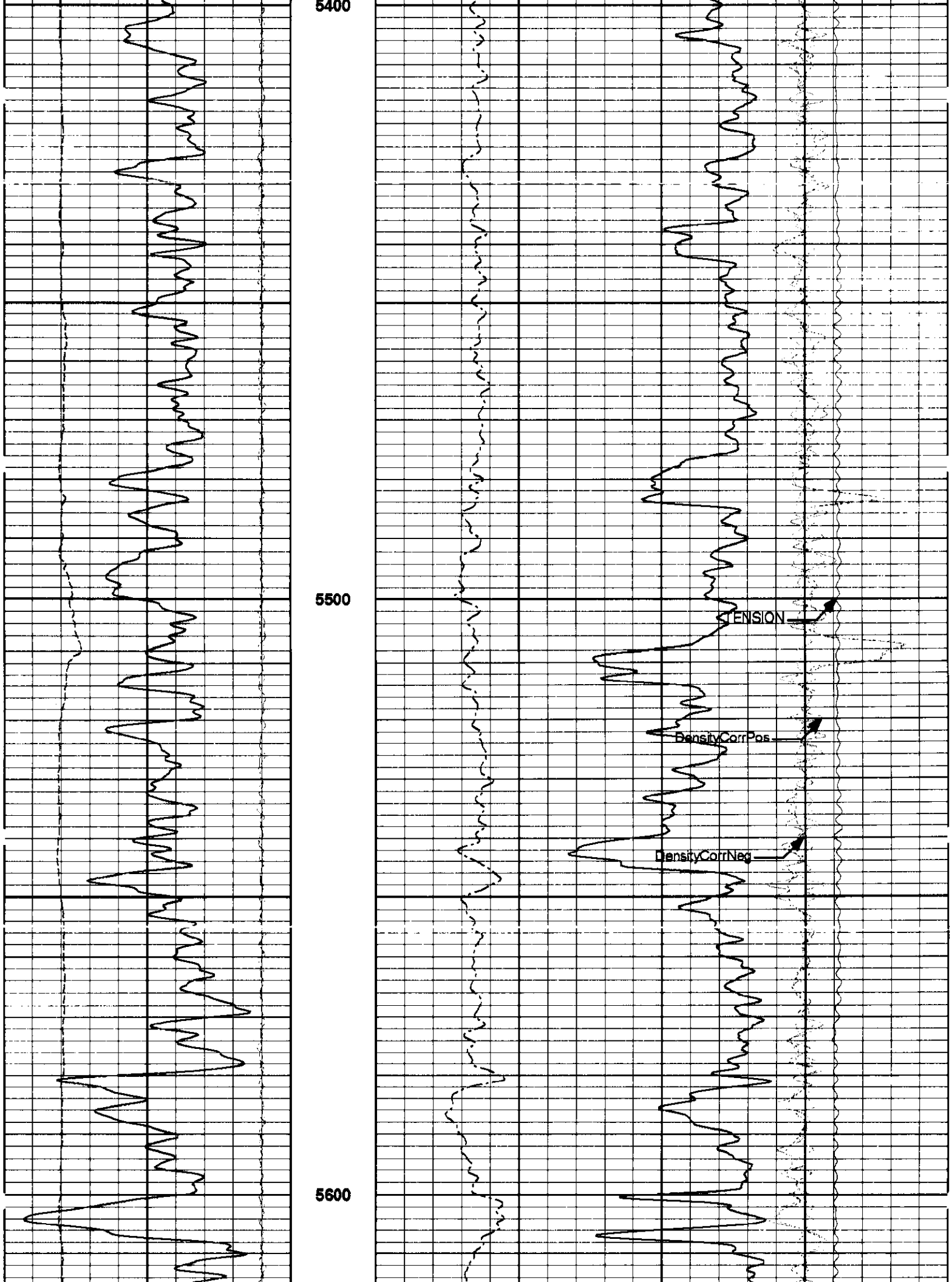

TGS
A2D
DensityCorrNeg
4400
4500
TENSION

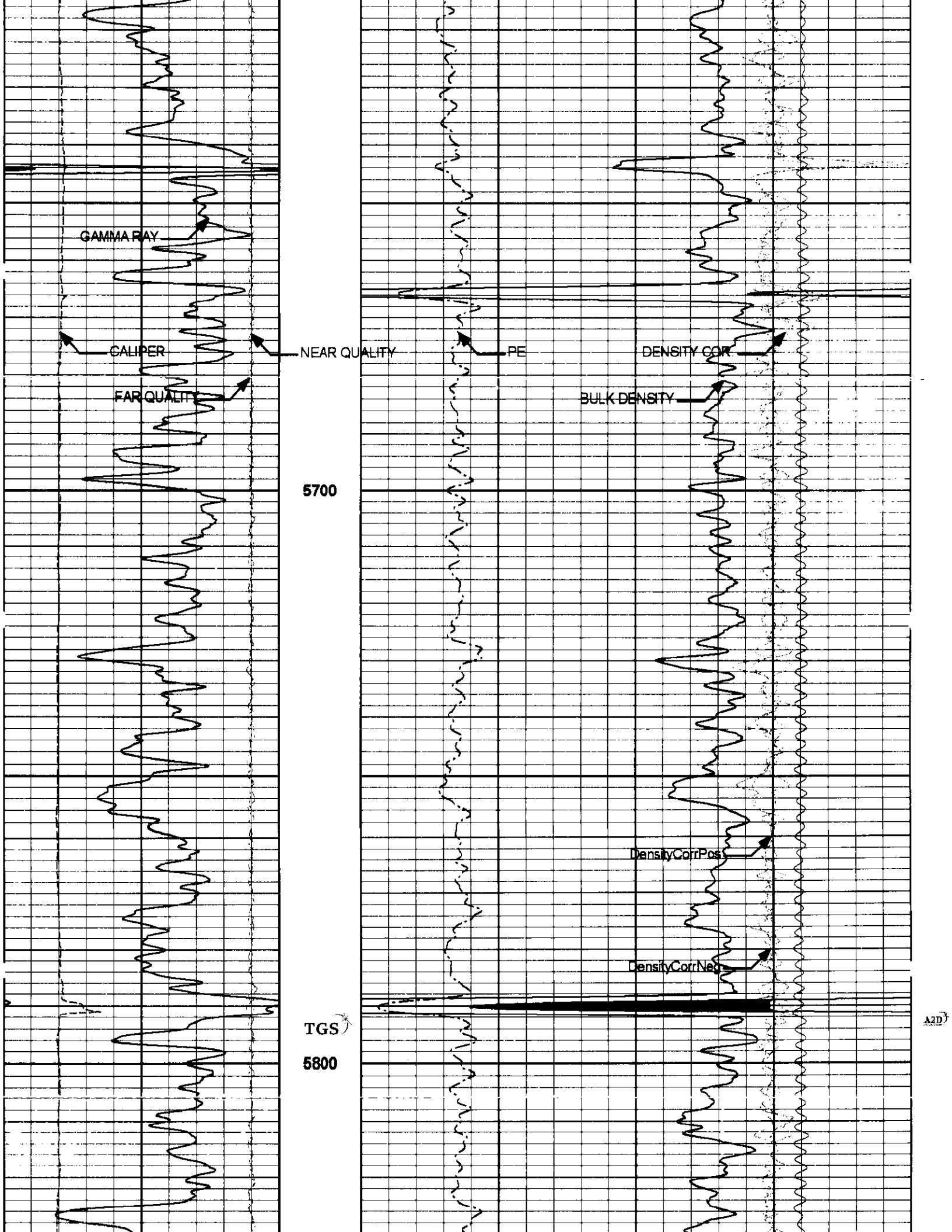

DensityCorrPos
DensityCorrNeg
4600
GAMMA RAY
CALIPER
NEAR QUALITY
PE
DENSITY COR
FARQUALITY
BULK DENSITY
4700

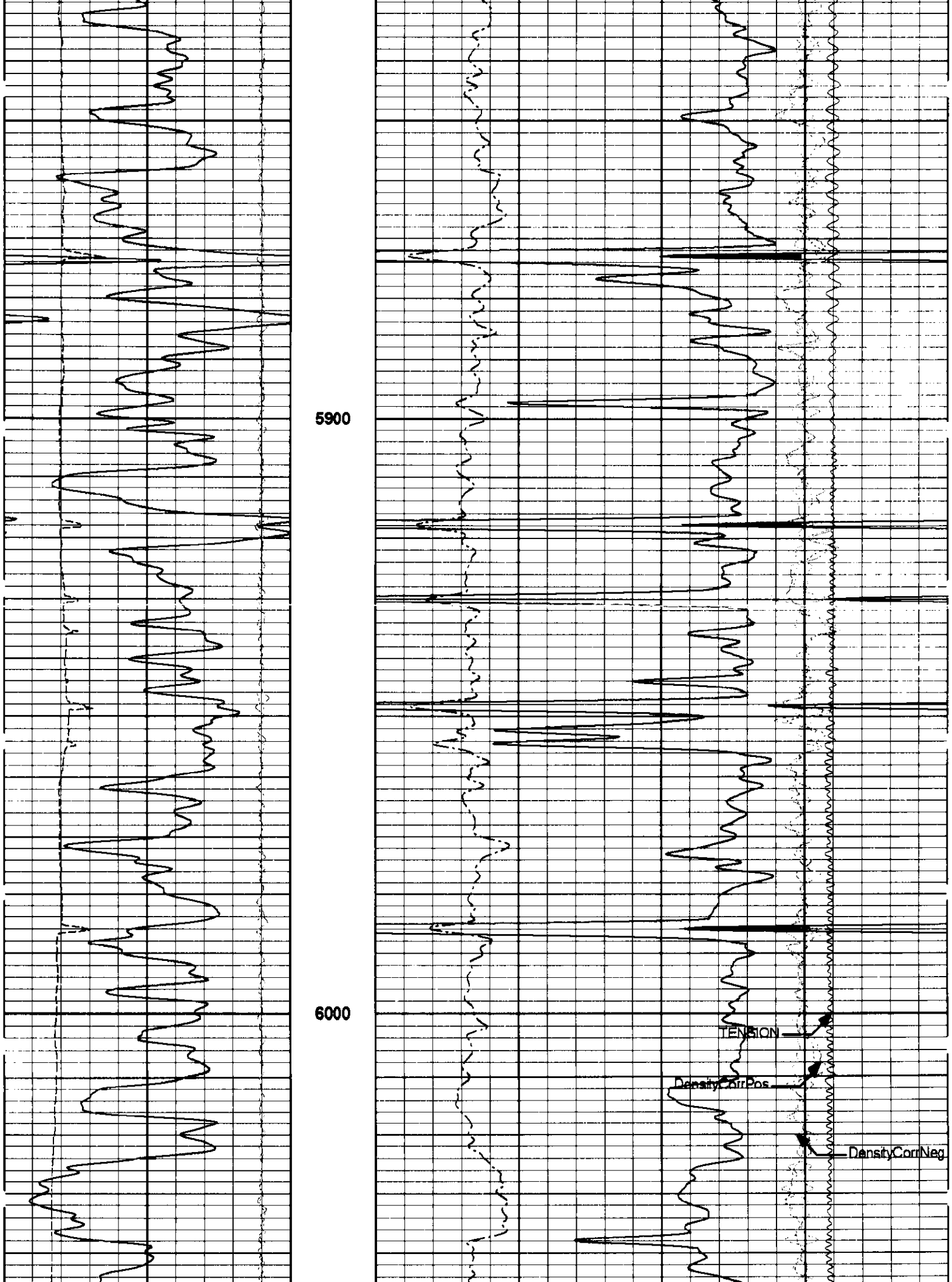

4800
TGS
4900
DensityCorrPos
DensityCorrNeg
A2D

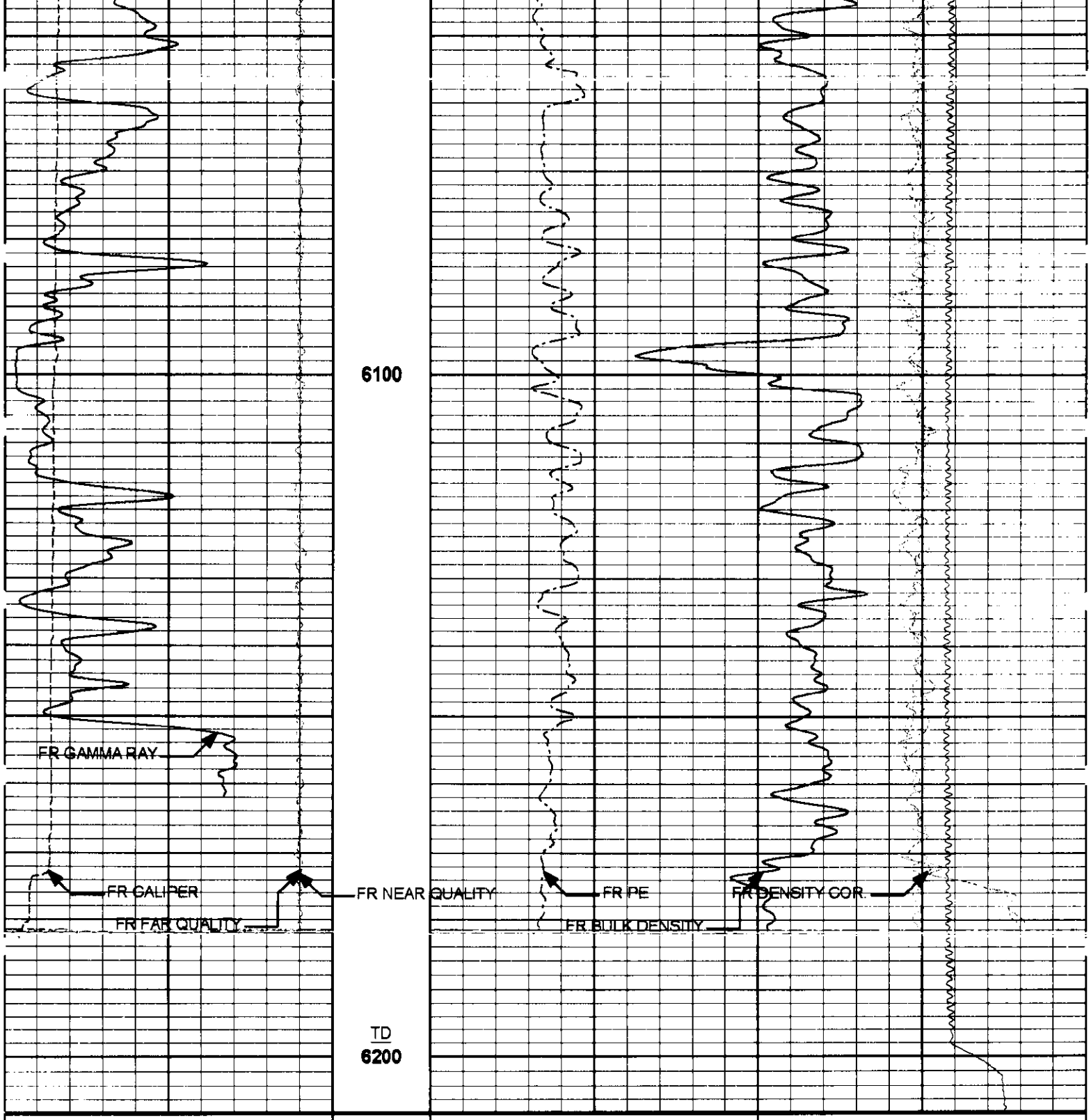

5000
5100
TENSION
DensityCorrPos
DensityCorrNeg
GAMMA RAY
CALIPER
NEAR QUALITY
PE
DENSITY COR
FAR QUALITY
BULK DENSITY


5200
5300
TGS
DensityCorrPos
DensityCorrNeg
A2D


5400
5500
5600
TENSION
DensityCorrPos
DensityCorrNeg


GAMMA RAY
CALIPER
NEAR QUALITY
FAR QUALITY
PE
DENSITY COR
BULK DENSITY
DensityCorrPos
DensityCorrNeg
5700
TGS
5800
A2D


5900
6000
TENSION
DensityCorrPos
DensityCorrNeg




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 45 | FAR QUALITY | -5 | 1 : 240 FT. | 0 | PE | 10 | -0.25 DENSITY COR. 0.25 g/cc |
| -45 | NEAR QUALITY | 5 | | | | | 10000 TENSION 0 pounds |
| 6 | CALIPER inches | 16 | | | | | -0.25 DensityCorrPos 0.25 gram per cc |
| | | | | | | | -0.25 DensityCorrNeg 0.25 gram per cc |
| 0 | GAMMA RAY api | 200 | | 2 | BULK DENSITY g/cc | 3 | |

HALLIBURTON

**HALLIBURTON**

Plot Time: 08-Apr-10 05:34:21
Plot Range: 470 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\DAQ-0001-004\
Plot File: \\SDL\I_RHOB_M

## MAIN PASS 5" = 100'

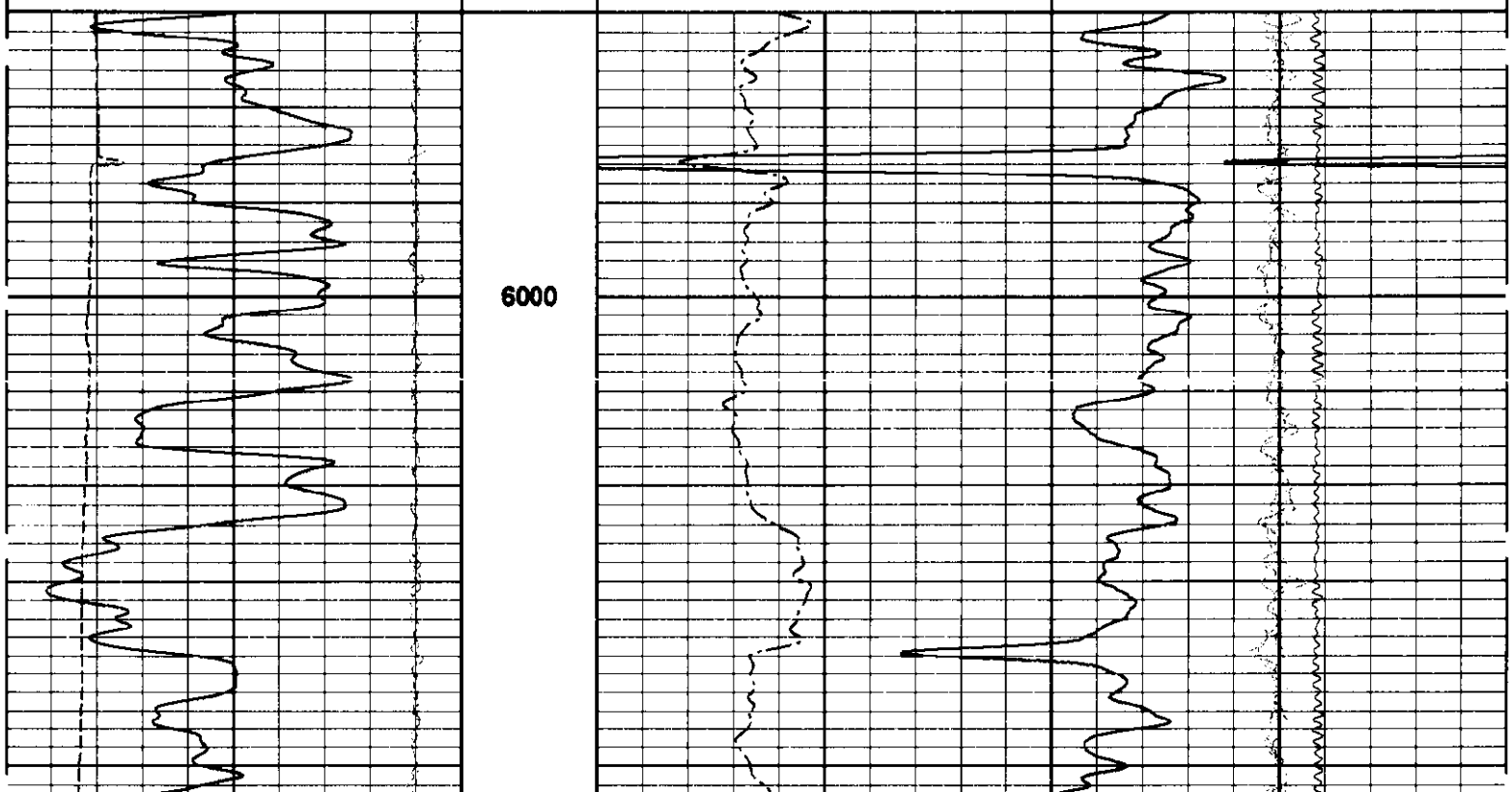
TGS A2D

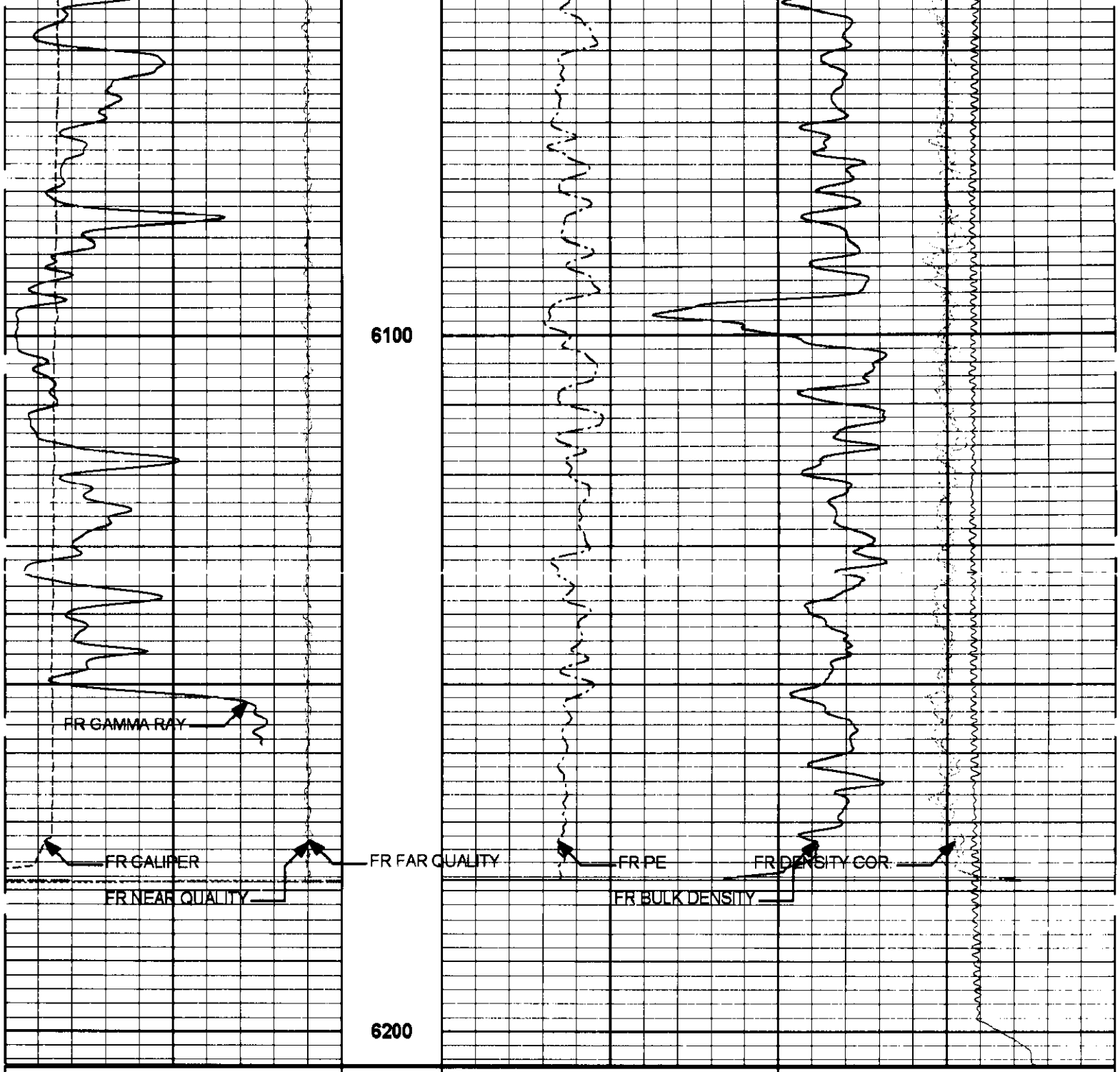
**HALLIBURTON**

Plot Time: 08-Apr-10 05:34:21
Plot Range: 5970 ft to 6204.92 ft
Data: UTE_TRIBAL_2015\Well Based\REPEAT\
Plot File: \\SDL\I_RHOB_R

## REPEAT PASS 5" = 100'

| | | | | |
|---|---|---|---|---|
| 0 | GAMMA RAY (api) | 200 | | |
| 6 | CALIPER (inches) | 16 | | |
| -45 | NEAR QUALITY | 5 | | |
| 45 | FAR QUALITY | -5 | | |
| | | | 1 : 240 FT. | |
| 2 | BULK DENSITY (g/cc) | 3 | | |
| -0.25 | DensityCorrNeg (gram per cc) | 0.25 | | |
| -0.25 | DensityCorrPos (gram per cc) | 0.25 | | |
| 10000 | TENSION (pounds) | 0 | | |
| 0 | PE | 10 | | |
| -0.25 | DENSITY COR. (g/cc) | 0.25 | | |






| | | |
|---|---|---|
| 45 | FAR QUALITY | -5 |
| -45 | NEAR QUALITY | 5 |
| 6 | CALIPER (inches) | 16 |
| 0 | GAMMA RAY (api) | 200 |

1 : 240
FT.

| | | |
|---|---|---|
| 0 | PE | 10 |
| -0.25 | DENSITY COR. (g/cc) | 0.25 |
| 10000 | TENSION (pounds) | 0 |
| -0.25 | DensityCorrPos (gram per cc) | 0.25 |
| -0.25 | DensityCorrNeg (gram per cc) | 0.25 |
| 2 | BULK DENSITY (g/cc) | 3 |

**HALLIBURTON**

Plot Time: 08-Apr-10 05:34:22
Plot Range: 5970 ft to 6204.92 ft
Data: UTE_TRIBAL_2015\Well Based\REPEAT\
Plot File: \\SDL\ RHOB_R

## REPEAT PASS 5" = 100'

**HALLIBURTON**

# CALIBRATION REPORT

## NATURAL GAMMA RAY TOOL SHOP CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | GTET - 10842354 | **Reference Calibration Date:** | 15-Feb-10 17:03:52 |
| **Engineer:** | J. MELANCON | **Calibration Date:** | 22-Mar-10 14:12:42 |
| **Software Version:** | WL INSITE R2.6.1 (Build 9) | **Calibration Version:** | 1 |

Calibrator Source S/N: TB-549

Calibrator API Reference:240.00 api

| | Measurement | Measured | Calibrated | Units | |
|---|---|---|---|---|---|
| TGS | Background | 32.6 | 32.9 | api | A2D |
| | Background + Calibrator | 270.7 | 272.9 | api | |
| | Calibrator | 240.3 | 240.0 | api | |

## NATURAL GAMMA RAY TOOL FIELD CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | GTET - 10842354 | **Reference Calibration Date:** | 22-Mar-10 14:12:42 |
| **Engineer:** | J. MELANCON | **Calibration Date:** | 07-Apr-10 11:09:50 |
| **Software Version:** | WL INSITE R2.6.1 (Build 9) | **Calibration Version:** | 1 |

Calibrator Source S/N: TB-549

Calibrator API Reference:240.00 api

| Field Verification | Shop | Field | Units |
|---|---|---|---|
| Background | 32.9 | 28.9 | api |
| Background + Calibrator | 272.9 | 269.6 | api |
| Calibrator | 240.0 | 240.7 | api |

| Shop | Field | Difference | Tolerance |
|---|---|---|---|
| 240.0 | 240.7 | -0.7 | +/- 9.00 |

## DUAL SPACED NEUTRON SHOP CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | DSNT - 11277437 | **Reference Calibration Date:** | 18-Feb-10 10:08:43 |
| **Engineer:** | M. LECUREUX | **Calibration Date:** | 23-Mar-10 13:49:05 |
| **Software Version:** | WL INSITE R2.6.1 (Build 9) | **Calibration Version:** | 1 |

Logging Source S/N: 08-040

Tank Serial Number: 105045

Reference value assigned to Tank: 52.630

Snow Block S/N: 37526

Calibration Tank Water Temperature: 61 degF

Min. Tool Housing Outside Diameter: 3.625 in

### CALIBRATION CONSTANTS

| Measurement | Prev. Value | New Value | Control Limit On New Value |
|---|---|---|---|
| Gain: | 1.006 | 1.004 | 0.900 - 1.100 |

## WATER TANK SUMMARY (Horizontal Water Tank)

| Measurement | Current Reading (Previous Coef.) | Calibrated (New Coef.) | Change | Control Limit On Change |
|---|---|---|---|---|
| Porosity (decp): | 0.2166 | 0.2162 | 0.0003 | +/- 0.0020 |
| Calibrated Ratio: | 9.92 | 9.91 | 0.011 | +/- 0.050 |

## VERIFIER

| Measurement | Value | Control Limit |
|---|---|---|
| Snow-Block Porosity (decp): | 0.0787 | 0.02000 - 0.09000 |

## PASS/FAIL SUMMARY

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

## DUAL SPACED NEUTRON FIELD CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | **DSNT - 11277437** | **Reference Calibration Date:** | **23-Mar-10 13:49:06** |
| **Engineer:** | **J. MELANCON** | **Calibration Date:** | **07-Apr-10 11:20:07** |
| **Software Version:** | **WL INSITE R2.6.1 (Build 9)** | **Calibration Version:** | **1** |

Logging Source S/N: 08-040

Snow Block S/N: 37526

## NEUTRON FIELD-CHECK SUMMARY

| | Shop | Field | Difference | Control Limit On Change |
|---|---|---|---|---|
| Snow-Block Porosity (decp): | 0.0787 | 0.0691 | -0.0095 | +/- 0.0150 |

## PASS/FAIL SUMMARY

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

## SPECTRAL DENSITY SHOP CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | **SDLT - 11107339** | **Reference Calibration Date:** | **15-Feb-10 16:29:03** |
| **Engineer:** | **M. LECUREUX** | **Calibration Date:** | **23-Mar-10 11:25:04** |
| **Software Version:** | **WL INSITE R2.6.1 (Build 9)** | **Calibration Version:** | **1** |

Logging Source S/N: 24520B

| | | |
|---|---|---|
| Aluminum Block S/N: 8261 | Density: 2.602g/cc | Pe: 3.100 |
| Magnesium Block S/N: 8260 | Density: 1.688g/cc | Pe: 2.594 |

## DENSITY CALIBRATION SUMMARY

| Measurement | Previous Value | New Value | Control Limit |
|---|---|---|---|
| Near Bar Gain | 1.0673 | 1.0998 | 0.90 - 1.10 |
| Near Dens Gain | 1.0039 | 1.0251 | 0.90 - 1.10 |
| Near Peak Gain | 0.9949 | 1.0278 | 0.90 - 1.10 |
| Near Lith Gain | 0.9893 | 0.9892 | 0.90 - 1.10 |
| Far Bar Gain | 1.0109 | 1.0119 | 0.90 - 1.10 |
| Far Dens Gain | 0.9995 | 0.9997 | 0.90 - 1.10 |
| Far Peak Gain | 0.9904 | 0.9903 | 0.90 - 1.10 |
| Far Lith Gain | 0.9704 | 0.9726 | 0.90 - 1.10 |

| | | | |
|---|---|---|---|
| Near Bar Offset | -0.5125 | -0.8019 | NONE |
| Near Dens Offset | 0.0930 | -0.0911 | NONE |
| Near Peak Offset | 0.1702 | -0.1039 | NONE |
| Near Lith Offset | 0.3420 | 0.1816 | NONE |
| Far Bar Offset | -0.0747 | -0.0690 | NONE |
| Far Dens Offset | 0.0307 | 0.0399 | NONE |
| Far Peak Offset | 0.0986 | 0.1122 | NONE |
| Far Lith Offset | 0.2161 | 0.2128 | NONE |
| Near Bar Background | 1134.11 | 1135.31 | 700 - 1450 |
| Near Dens Background | 375.98 | 372.20 | 230 - 480 |
| Near Peak Background | 160.75 | 161.27 | 100 - 210 |
| Near Lith Background | 198.79 | 198.46 | 125 - 260 |
| Far Bar Background | 547.50 | 547.56 | 450 - 900 |
| Far Dens Background | 220.30 | 216.91 | 175 - 345 |
| Far Peak Background | 86.53 | 86.85 | 70 - 140 |
| Far Lith Background | 88.84 | 89.87 | 75 - 145 |

## CALIBRATION BLOCK SUMMARY

| Measurement | Current Reading (Previous Coef) | Calibrated (New Coef) | Change | Control Limit On Change |
|---|---|---|---|---|
| MAGNESIUM | | | | |
| Density (g/cc) | 1.689 | 1.688 | -0.001 | +/- 0.015 |
| Pe | 2.583 | 2.594 | 0.011 | +/- 0.150 |
| ALUMINUM | | | | |
| Density (g/cc) | 2.609 | 2.602 | -0.007 | +/- 0.01500 |
| Pe | 3.084 | 3.100 | 0.016 | +/- 0.150 |

## TOOL SUMMARY

| Measurement | Near Detector | | Far Detector | |
|---|---|---|---|---|
| | Value | Control Limits | Value | Control Limits |
| QUALITY | | | | |
| Background | -0.0009 | +/- 0.0110 | -0.0019 | +/- 0.0140 |
| Magnesium Block | -0.0006 | +/- 0.0110 | -0.0004 | +/- 0.0140 |
| Aluminum Block | -0.0011 | +/- 0.0110 | 0.0006 | +/- 0.0140 |
| Resolution | 9.29 | 6.00 - 11.50 | 9.00 | 6.00 - 11.50 |
| Internal Verifier(B+D+P+L) | 1867 | 1200 - 2700 | 941 | 800 - 1700 |

TGS

A2D

## PASS/FAIL SUMMARY

| | |
|---|---|
| Background Quality Check: | Passed |
| Background Range Check: | Passed |
| Background Resolution Check: | Passed |
| Background Verification Check: | Passed |
| Magnesium Quality Check: | Passed |
| Aluminum Quality Check: | Passed |
| Gains Check: | Passed |
| Changes in Calibration Blocks: | Passed |

## SPECTRAL DENSITY FIELD CHECK

**Tool Name:** SDLT - 11107339 **Reference Calibration Date:** 23-Mar-10 11:25:04

**Engineer:** J. MELANCON **Calibration Date:** 07-Apr-10 11:10:21

Software Version: WL INSITE R2.6.1 (Build 9) Calibration Version: 1

Pad Temperature: 61.1 degF

## DENSITY FIELD CALIBRATION SUMMARY

| Measurement | Shop | Field | Change | Control Limit +/- |
|---|---|---|---|---|
| Near (B+D+P+L) cps | 1867.239 | 1864.974 | -2.265 | 17.296 |
| Far (B+D+P+L) cps | 941.198 | 941.626 | 0.428 | 16.570 |
| Near Resolution | 9.29 | 9.27 | -0.020 | 0.50 |
| Far Resolution | 9.00 | 8.94 | -0.060 | 1.00 |

### PASS/FAIL SUMMARY

| | |
|---|---|
| Bkg Quality Check: | Passed |
| Bkg Resolution Check: | Passed |
| Bkg Verification Check: | Passed |

## DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 11107339 Reference Calibration Date: 23-Mar-10 13:22:02

Engineer: M. LECUREUX Calibration Date: 23-Mar-10 13:27:40

Software Version: WL INSITE R2.6.1 (Build 9) Calibration Version: 1

### CALIBRATION COEFFICIENTS

| Measurement | Previous Value | New Value | Control Limit On New Value |
|---|---|---|---|
| Pad Offset | -1187.39 | -1183.92 | -7000.00 - -1000.00 |
| Pad Gain | 0.0003875 | 0.0003872 | 0.000200 - 0.000600 |
| Arm Offset | -4070.46 | -4133.68 | -5000.00 - 3000.00 |
| Arm Gain | 0.0005166 | 0.0005077 | 0.000300 - 0.000700 |
| Arm Power | -0.000002759 | -0.000001981 | -0.000010 - 0.000010 |

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

### CALIBRATION RINGS

| Measurement | Current Reading (Previous Coeff.) | Calibrated (New Coeff.) | Change | Control Limit On New Value |
|---|---|---|---|---|
| PAD EXTENSION: | | | | |
| Small Ring (in) | 2.00 | 2.00 | 0.00 | +/- 0.20 |
| Medium Ring (in) | 3.75 | 3.75 | 0.00 | +/- 0.20 |
| RING DIAMETER: | | | | |
| Small Ring (in) | 6.55 | 6.50 | -0.05 | +/- 0.20 |
| Medium Ring (in) | 8.32 | 8.25 | -0.07 | +/- 0.20 |
| Large Ring (in) | 15.03 | 15.00 | -0.03 | +/- 0.20 |

### PASS/FAIL SUMMARY

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

### PASS/FAIL SUMMARY

| | |
|---|---|
| Calibration-Coefficients Range Check: | Passed |

## SDLT CALIPER FIELD CALIBRATION

Tool Name: SDLT - 11107339 Reference Calibration Date: 23-Mar-10 13:27:40

Engineer: J. MELANCON Calibration Date: 07-Apr-10 11:14:17

Software Version: WL INSITE R2.6.1 (Build 9) Calibration Version: 1

### MEASURED CALIPER VALUES

Control Limit On

| Measurement | Shop | Field | Change | Control Limit On New Value |
|---|---|---|---|---|
| Pad Extension | 3.75 | 3.79 | 0.04 | +/- 0.10 |
| Ring Diameter | 8.25 | 8.29 | 0.04 | +/- 0.15 |

**PASS/FAIL SUMMARY**

| | |
|---|---|
| Pad Extension Check: | Passed |
| Diameter Check: | Passed |

## ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

| | | | |
|---|---|---|---|
| Tool Name: | ACRt - I907S909 | Reference Calibration Date: | 03-Dec-09 10:32:48 |
| Engineer: | M. LECUREUX | Calibration Date: | 03-Dec-09 10:43:58 |
| Software Version: | WL INSITE R2.5.1 (Build 3) | Calibration Version: | 1 |

### TYPICAL GAIN RANGE

| Subarray | R12KHz | | | R36KHz | | | R72KHz | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper |
| A1 (80") | 0.95 | 0.9986 | 1.05 | 0.95 | 1.0051 | 1.05 | 0.95 | 1.0102 | 1.05 |
| A2 (50") | 0.95 | 0.9997 | 1.05 | 0.95 | 1.0060 | 1.05 | 0.95 | 1.0134 | 1.05 |
| A3 (29") | 0.95 | 0.9970 | 1.05 | 0.95 | 1.0022 | 1.05 | 0.95 | 1.0059 | 1.05 |
| A4 (17") | 0.95 | 1.0007 | 1.05 | 0.95 | 1.0037 | 1.05 | 0.95 | 1.0097 | 1.05 |
| A5 (10") | N/A | N/A | N/A | 0.95 | 0.9863 | 1.05 | 0.95 | 0.9918 | 1.05 |
| A6 (6") | N/A | N/A | N/A | 0.95 | 0.9730 | 1.05 | 0.95 | 0.9775 | 1.05 |

### TYPICAL SONDE OFFSET RANGE

| Subarray | R12KHz | | | R36KHz | | | R72KHz | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper |
| A1 (80") | -5 | -1.237 | 2 | -6 | -4.451 | -2 | -8 | -5.001 | -2 |
| A2 (50") | -7 | -2.254 | -2 | -6 | -4.437 | -2 | -7 | -4.136 | -2 |
| A3 (29") | -27 | -12.098 | -9 | -9 | -3.045 | -3 | -7 | -3.124 | -1 |
| A4 (17") | -180 | -89.281 | -60 | -45 | -29.477 | -15 | -39 | -24.261 | -13 |
| A5 (10") | N/A | N/A | N/A | -150 | -75.639 | -50 | -80 | -38.309 | -10 |
| A6 (6") | N/A | N/A | N/A | 175 | 313.523 | 525 | 90 | 159.457 | 270 |

### TRANSMITTER CURRENT GAIN

| Signal | Lower | R | Upper |
|---|---|---|---|
| 12K | 0.6 | 0.9205 | 1.3 |
| 36K | 1.0 | 1.4037 | 2.0 |
| 72K | 1.0 | 1.6527 | 2.0 |

### R-MUD VERIFICATION

| Signal | Lower (ohm-m) | Measured (ohm-m) | Upper (ohm-m) |
|---|---|---|---|
| Mud Cell | 0.95 | 1.000 | 1.05 |

### CALIBRATION SUMMARY

| Sensor | Shop | Field | Post | Difference | Tolerance | Units |
|---|---|---|---|---|---|---|
| GTET-10842354 | | | | | | |
| Gamma Ray Calibrator | 240.0 | 240.7 | ---------- | -0.7 | +/- 9.00 | api |
| DSNT-11277437 | | | | | | |
| Snow-Block Porosity | 0.0787 | 0.0691 | ---------- | 0.0096 | +/- 0.0150 | decp |
| SDLT-11107339 | | | | | | |
| Near(B+D+P+L) | 1867.239 | 1864.974 | ---------- | 2.265 | +/-17.296 | cps |
| Far(B+D+P+L) | 941.198 | 941.626 | ---------- | -0.428 | +/-16.570 | cps |
| Pad Extension | 3.75 | 3.79 | ---------- | -0.04 | +/-0.10 | in |
| Ring Diameter | 8.25 | 8.29 | ---------- | -0.040 | +/-0.15 | in |

TGS

ACRt-1807S909

| | | | | | | |
|---|---|---|---|---|---|---|
| Mud Cell | 1.000 | ---------- | ---------- | 0.000 | ---------- | ohm-m |

Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\004 08-Apr-10 03:27 Up @6208.3f — Date: 08-Apr-10 04:38:03

**HALLIBURTON**

## CUSTOMER EVENT LOG

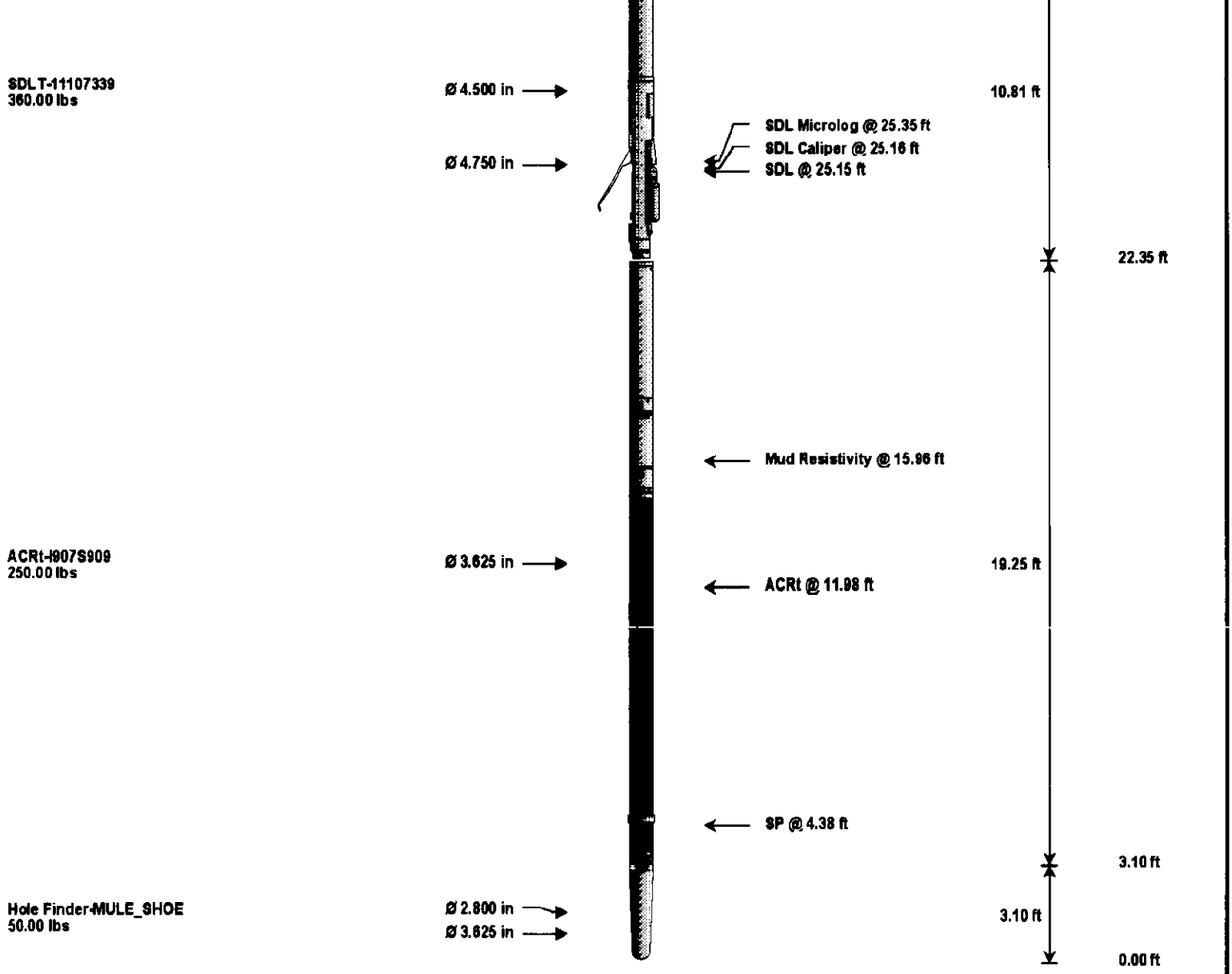
| Event Type | Time & Date | Depth (ft) | Event Description |
|---|---|---|---|
| | 08-Apr-10 02:26:22 | 803.50 | Logging 001 08-Apr-10 02:26 Up @803.5f |
| | 08-Apr-10 02:33:49 | 473.05 | Halting 001 08-Apr-10 02:26 Up @803.5f |
| | 08-Apr-10 02:35:09 | 413.25 | Logging 002 08-Apr-10 02:35 Dn @413.3f |
| | 08-Apr-10 03:12:22 | 6184.82 | Halting 002 08-Apr-10 02:35 Dn @413.3f |
| | 08-Apr-10 03:13:16 | 6205.00 | Logging 003 08-Apr-10 03:13 Up @6205.0f |
| | 08-Apr-10 03:22:28 | 5969.82 | Halting 003 08-Apr-10 03:13 Up @6205.0f |
| | 08-Apr-10 03:27:02 | 6208.25 | Logging 004 08-Apr-10 03:27 Up @6208.3f |
| | 08-Apr-10 05:21:23 | 87.69 | Halting 004 08-Apr-10 03:27 Up @6208.3f |

Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\HW11174 — Date: 08-Apr-10 05:25:17

**HALLIBURTON**

## TOOL STRING DIAGRAM REPORT

| Description | O.D. | Sensors @ Delays | Length | Accumulated Length |
|---|---|---|---|---|
| | | | | 57.62 ft |
| RWCH-C089<br>135.00 lbs | Ø 3.625 in | Load Cell @ 53.94 ft<br>BH Temperature @ 53.37 ft | 6.25 ft | |
| | | | | 51.37 ft |
| GTET-10842354<br>165.00 lbs | Ø 3.625 in | GammaRay @ 45.31 ft | 8.52 ft | |
| | | | | 42.85 ft |
| DSNT-11277437<br>174.00 lbs | Ø 3.625 in | DSN Far @ 35.91 ft<br>DSN Near @ 35.16 ft | 9.69 ft | |
| | | | | 33.16 ft |




| Mnemonic | Tool Name | Serial Number | Weight (lbs) | Length (ft) | Accumulated Length (ft) | Max.Log. Speed (fpm) |
|---|---|---|---|---|---|---|
| RWCH | Releasable Wireline Cable Head | C089 | 135.00 | 6.25 | 51.37 | 300.00 |
| GTET | Gamma Telemetry Tool | 10842354 | 165.00 | 8.52 | 42.85 | 60.00 |
| DSNT | Dual Spaced Neutron | 11277437 | 174.00 | 9.69 | 33.16 | 60.00 |
| SDLT | Spectral Density Tool | 11107339 | 360.00 | 10.81 | 22.35 | 60.00 |
| ACRt | Array Compensated True Resistivity | I907S909 | 250.00 | 19.25 | 3.10 | 300.00 |
| SP | SP Ring | 1 | 0.00 | 0.25 * | 4.38 | 300.00 |
| HFND | Hole Finder | MULE_SHOE | 50.00 | 3.10 | 0.00 | 300.00 |
| Total | | | 1,134.00 | 57.62 | | |

* Not included in Total Length and Length Accumulation.

Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\004 08-Apr-10 03:27 Up @6208.3f

Date: 08-Apr-10 04:32:14

| | | | |
|---|---|---|---|
| COMPANY | PETROGLYPH OPERATING COMPANY | | |
| WELL | UTE TRIBAL 20-15 | | |
| FIELD | ANTELOPE CREEK | | |
| COUNTY | DUCHESNE | STATE | UTAH |

SPECTRAL DENSITY

| | |
|---|---|
| **HALLIBURTON** | SPECTRAL DENSITY<br>DUAL SPACED NEUTRON<br><br>TIGHT HOLE |

Riley®

# HALLIBURTON

CONFIDENTIAL

## COMPENSATED TRUE RESISTIVITY

TIGHT HOLE

| | |
|---|---|
| COMPANY | PETROGLYPH OPERATING COMPANY |
| WELL | UTE TRIBAL 20-15 |
| FIELD | ANTELOPE CREEK |
| COUNTY | DUCHESNE |
| STATE | UTAH |

COMPANY PETROGLYPH OPERATING COMPANY
WELL UTE TRIBAL 20-15
FIELD ANTELOPE CREEK
COUNTY DUCHESNE STATE UTAH

API No. 43013340510000
Location SURFACE HOLE LOCATION: 574' FSL & 1806' FEL (SWSE)

Other Services: RWCH, GR, DSN/SDL

Sect. 20 Twp. 5S Rge. 3W

| | | | |
|---|---|---|---|
| Permanent Datum | GL | Elev. 6475.0 ft | Elev.: K.B. 6489.0 ft |
| Log measured from | KB | 14.0 ft above perm. Datum | D.F. 6488.0 ft |
| Drilling measured from | KB | | G.L. 6475.0 ft |

| | | | | |
|---|---|---|---|---|
| Date | | 08-Apr-10 | | |
| Run No. | | ONE | | |
| Depth - Driller | | 6182.00 ft | | |
| Depth - Logger | | 6198.0 ft | | |
| Bottom - Logged Interval | | 6186.0 ft | | |
| Top - Logged Interval | | 100.0 ft | | |
| Casing - Driller | | 8.625 in @ 500.0 ft | @ | |
| Casing - Logger | | 509.0 ft | | |
| Bit Size | | 7.875 in | @ | |
| Type Fluid in Hole | | FRESH WATER / BRINE | | |
| Density | Viscosity | 8.4 ppg / 27.00 s/qt | | |
| PH | Fluid Loss | 7.00 pH / 0.0 cptm | | |
| Source of Sample | | MUD TANK | | |
| Rm @ Meas. Temperature | | 1.22 ohmm @ 53.00 degF | @ | |
| Rmf @ Meas. Temperature | | @ | @ | |
| Rmc @ Meas. Temperature | | @ | @ | |
| Source Rmf | Rmc | | | |
| Rm @ BHT | | 0.44 ohmm @ 160.0 degF | @ | |
| Time Since Circulation | | | | |
| Time on Bottom | | 08-Apr-10 02:10 | | |
| Max. Rec. Temperature | | 160.0 degF @ 6198.0 ft | @ | @ |
| Equipment | Location | 11392047 / VERNAL, UT | | |
| Recorded By | | J. MELANCON | | |
| Witnessed By | | D. DAVIS | | |

RECEIVED
JUN 0 3 2010
DIV. OF OIL, GAS & MINING

Fold here

Service Ticket No.: 7277849 API Serial No.: 43013340510000 PGM Version: WL INSITE R2.6.1 (Build 9)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

| Date | Sample No. | | | | |
|---|---|---|---|---|---|
| Depth-Driller | | | | | |
| Type Fluid in Hole | | | | | |
| Density | Viscosity | | | | |
| Ph | Fluid Loss | | | | |
| Source of Sample | | | | | |
| Rm @ Meas. Temp | | @ | | @ | |
| Rmf @ Meas. Temp. | | @ | | @ | |
| Rmc @ Meas. Temp. | | @ | | @ | |
| Source Rmf | Rmc | | | | |
| Rm @ BHT | | @ | | @ | |
| Rmf @ BHT | | @ | | @ | |
| Rmc @ BHT | | @ | | @ | |

RESISTIVITY SCALE CHANGES

| Type Log | Depth | Scale Up Hole | Scale Down Hole |
|---|---|---|---|
| | | | |

RESISTIVITY EQUIPMENT DATA

| Run No. | Tool Type & No. | Pad Type | Tool Pos. | Other |
|---|---|---|---|---|
| ONE | ACRt I907S909 | N/A | 1.5" STANDOFF | N/A |

EQUIPMENT DATA

| GAMMA | | ACOUSTIC | | DENSITY | | NEUTRON | |
|---|---|---|---|---|---|---|---|
| Run No. | ONE | Run No. | | Run No. | ONE | Run No. | ONE |
| Serial No. | 10842354 | Serial No. | | Serial No. | 11107339 | Serial No. | 11277437 |
| Model No. | GTET | Model No. | | Model No. | SDLT-I | Model No. | DSNT-I |
| Diameter | 3.625" | No. of Cent. | | Diameter | 4.5" | Diameter | 3.625" |
| Detector Model No. | GTET | Spacing | | Log Type | GAMMA-GAMMA | Log Type | THERMAL |
| Type | SCINTILLATION | | | Source Type | Cs-137 | Source Type | Am241Be |
| Length | 8" | LSA [Y/N] | | Serial No. | 24520B | Serial No. | 08-040 |
| Distance to Source | 10' | FWDA [Y/N ] | | Strength | 1.5 Ci | Strength | 15 Ci |

LOGGING DATA

GENERAL | GAMMA | ACOUSTIC

| GENERAL | | | | GAMMA | | ACOUSTIC | | | DENSITY | | | NEUTRON | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Run | Depth | | Speed | Scale | | Scale | | Matrix | Scale | | Matrix | Scale | | Matrix |
| No. | From | To | ft/min | L | R | L | R | | L | R | | L | R | |
| ONE | 6198 | 100 | REC | 0 | 200 | | | | 30% | -10% | 2.68 g/cc | 30% | -10% | SAND |

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

Remarks:

HOLE RUGOSITY AND TENSION PULLS MAY AFFECT LOG QUALITY

ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING

NEUTRON DECENTRALIZER NOT RUN PER COMPANY MAN REQUEST

LATITUDE: 40.02643° N

LONGITUDE: 110.24320° W

CREW: J. HERBERT, M. LEISTER, A. HAKEEM

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, VERNAL, UTAH (435)789-2550 RIG: AZTEC DRILLING #184

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

HALLIBURTON

**HALLIBURTON**

## PARAMETERS REPORT

| Depth (ft) | Tool Name | Description | Value | Units |
|---|---|---|---|---|
| TOP | | | | |
| | SHARED | Bit Size | 7.875 | in |
| | SHARED | Use Bit Size instead of Caliper for all applications. | No | |
| | SHARED | Borehole Fluid Weight | 8.400 | ppg |
| | SHARED | Oil Based Mud System? | No | |
| | SHARED | Mud Resistivity | 1.220 | ohmm |
| | SHARED | Temperature of Mud | 53.0 | degF |
| | SHARED | Logging Interval is Cased? | No | |
| | SHARED | AHV Casing OD | 5.500 | in |
| | SHARED | Surface Temperature | 30.0 | degF |
| | SHARED | Total Well Depth | 6198.00 | ft |
| | SHARED | Bottom Hole Temperature | 160.0 | degF |
| | Rwa / CrossPlot | Process Crossplot? | Yes | |
| | Rwa / CrossPlot | Select Source of F | Automatic | |
| | Rwa / CrossPlot | Archie A factor | 0.6200 | |
| | Rwa / CrossPlot | Archie M factor | 2.1500 | |
| | Rwa / CrossPlot | Rmf Reference | 0.10 | ohmm |
| | Rwa / CrossPlot | Rmf Ref Temp | 75.00 | degF |
| | Rwa / CrossPlot | Resistivity of Formation Water | 0.05 | ohmm |
| | GTET | Process Gamma Ray? | Yes | |
| | GTET | Gamma Tool Standoff | 0.000 | in |
| | GTET | Process Gamma Ray EVR? | Yes | |
| | DSNT | Process DSN? | Yes | |
| | DSNT | Process DSN EVR? | Yes | |
| | DSNT | Neutron Mode | | |

| | | | |
|---|---|---|---|
| DSNT | Neutron Lithology | Sandstone | |
| DSNT | DSN Standoff - 0.25 in (6.35 mm) Recommended | 0.000 | in |
| DSNT | Temperature Correction Type | None | |
| DSNT | DSN Pressure Correction Type | None | |
| DSNT | View More Correction Options | No | |
| DSNT | Use TVD for Gradient Corrections? | No | |
| DSNT | Logging Horizontal Water Tank? | No | |
| SDLT | Process Density? | Yes | |
| SDLT | Process Density EVR? | Yes | |
| SDLT | Is Hole Air Drilled? | No | |
| SDLT | Logging Calibration Blocks? | No | |
| SDLT | SDLT Pad Temperature Valid? | Yes | |
| SDLT | Disable temperature warning | No | |
| SDLT | Weighted Mud Correction Type? | None | |
| SDLT | Formation Density Matrix | 2.680 | g/cc |
| SDLT | Formation Density Fluid | 1.000 | g/cc |
| SDLT | Process Caliper Outputs? | Yes | |
| SDLT | Process MicroLog Outputs? | Yes | |
| ACRt | Process ACRt? | Yes | |
| ACRt | Minimum Tool Standoff | 1.50 | in |
| ACRt | Temperature Correction Source | FP Lwr & FP Upr | |
| ACRt | Tool Position | Free Hanging | |
| ACRt | Rmud Source | Mud Cell | |
| ACRt | Minimum Resistivity for MAP | 0.20 | ohmm |
| ACRt | Maximum Resistivity for MAP | 200.00 | ohmm |

BOTTOM

Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\DLE

Date: 08-Apr-10 04:31:55

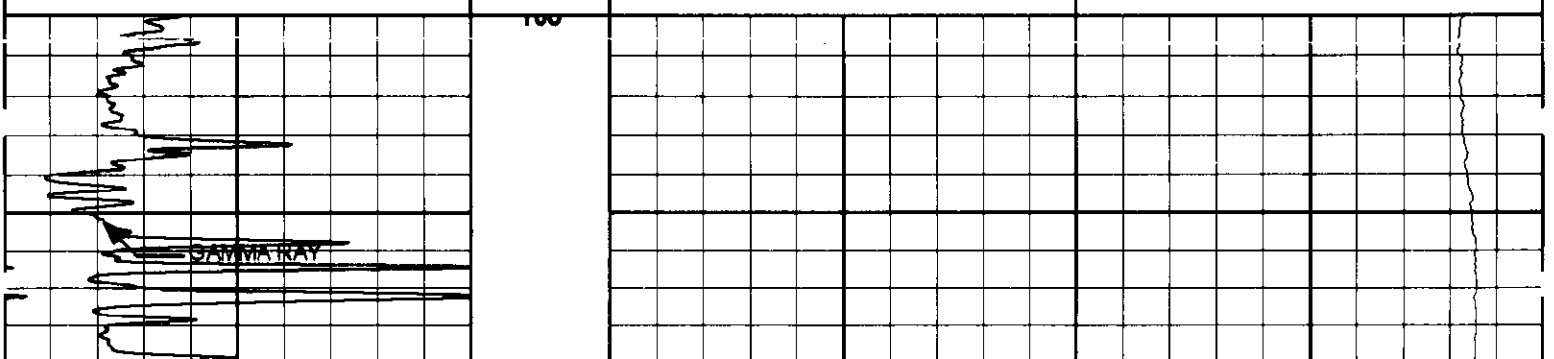
TGS A2D

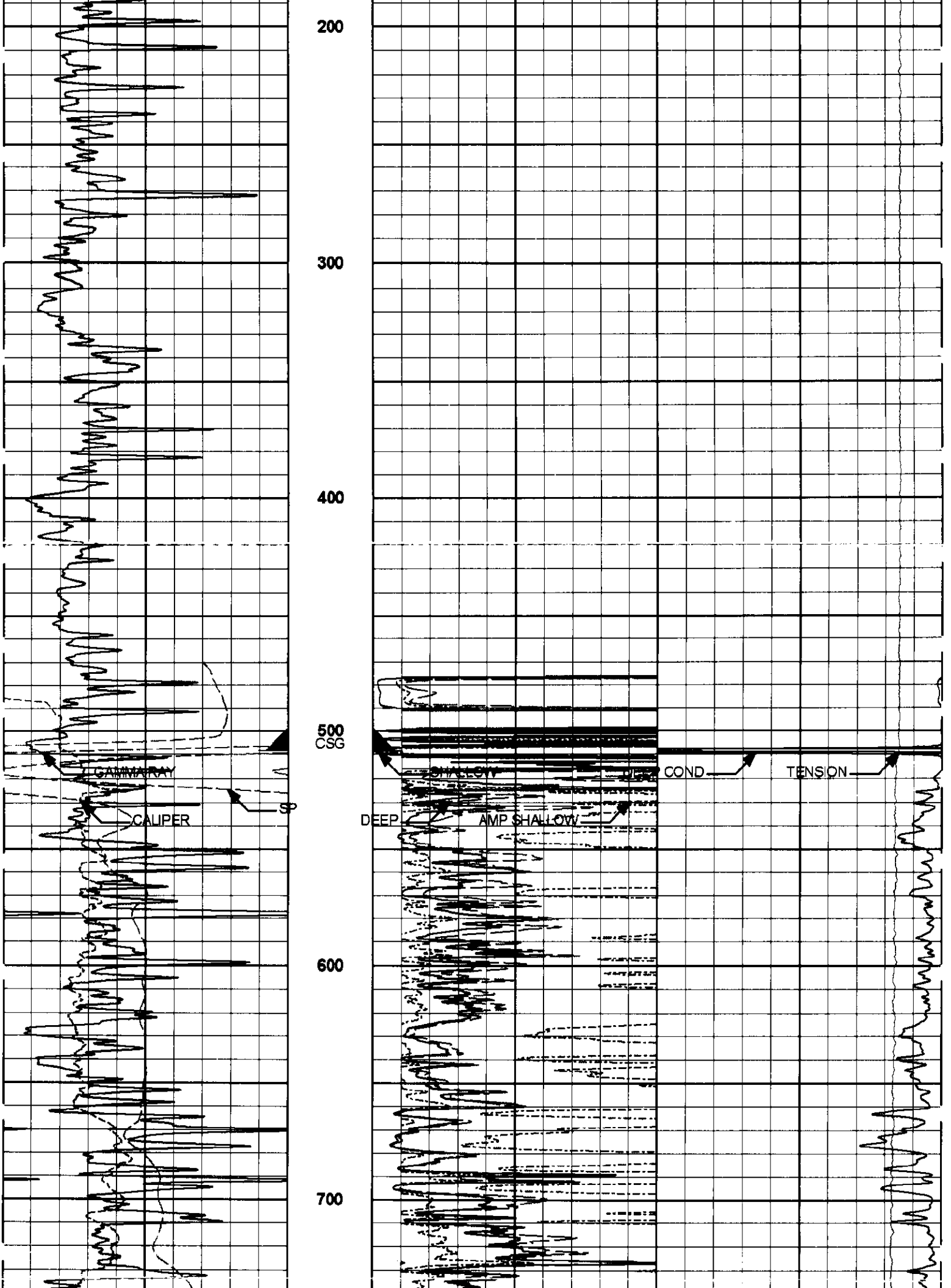
**HALLIBURTON**

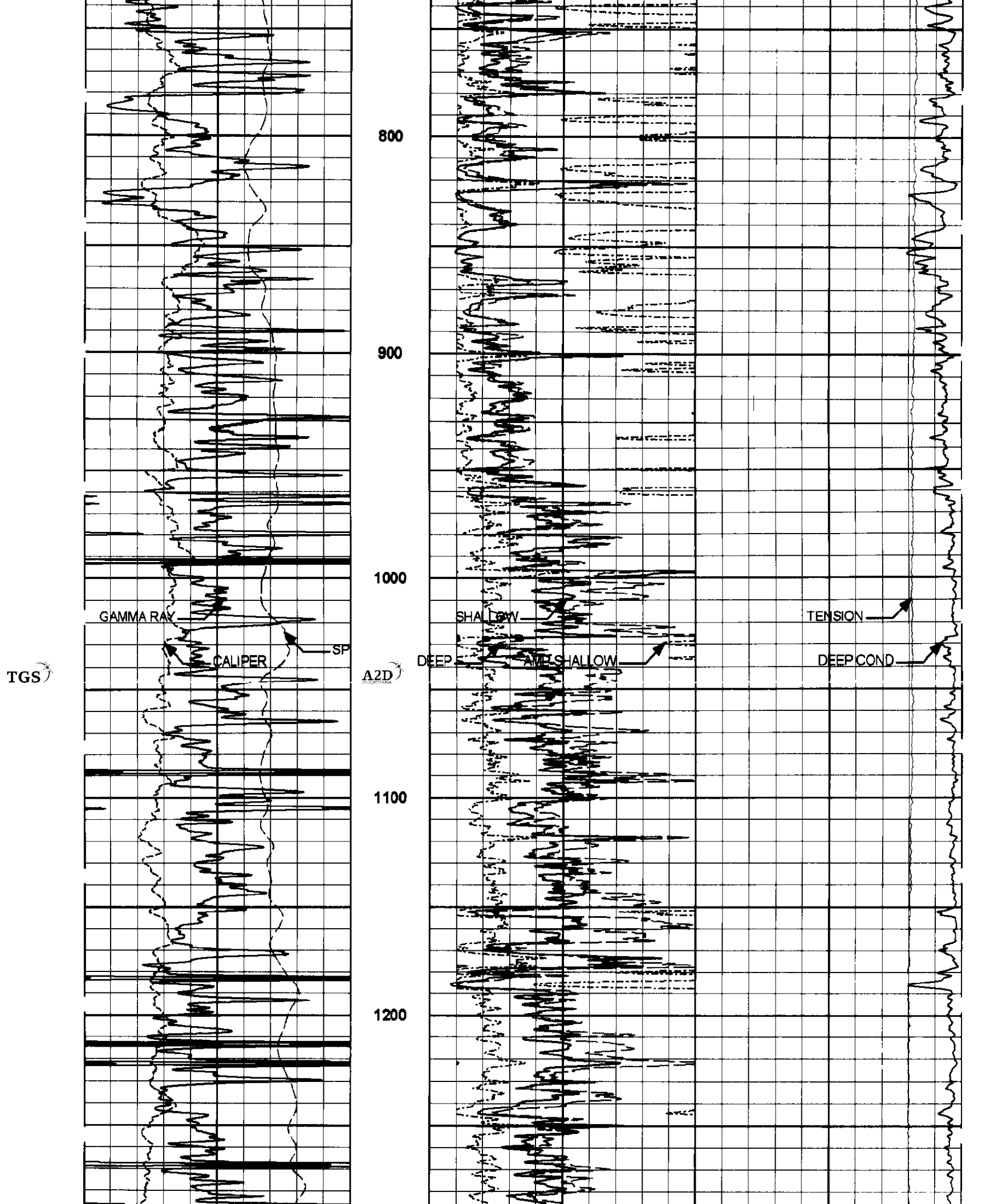
Plot Time: 08-Apr-10 05:26:00
Plot Range: 100 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\MAIN\
Plot File: \\ACRT\I_ACRT_2IN_M

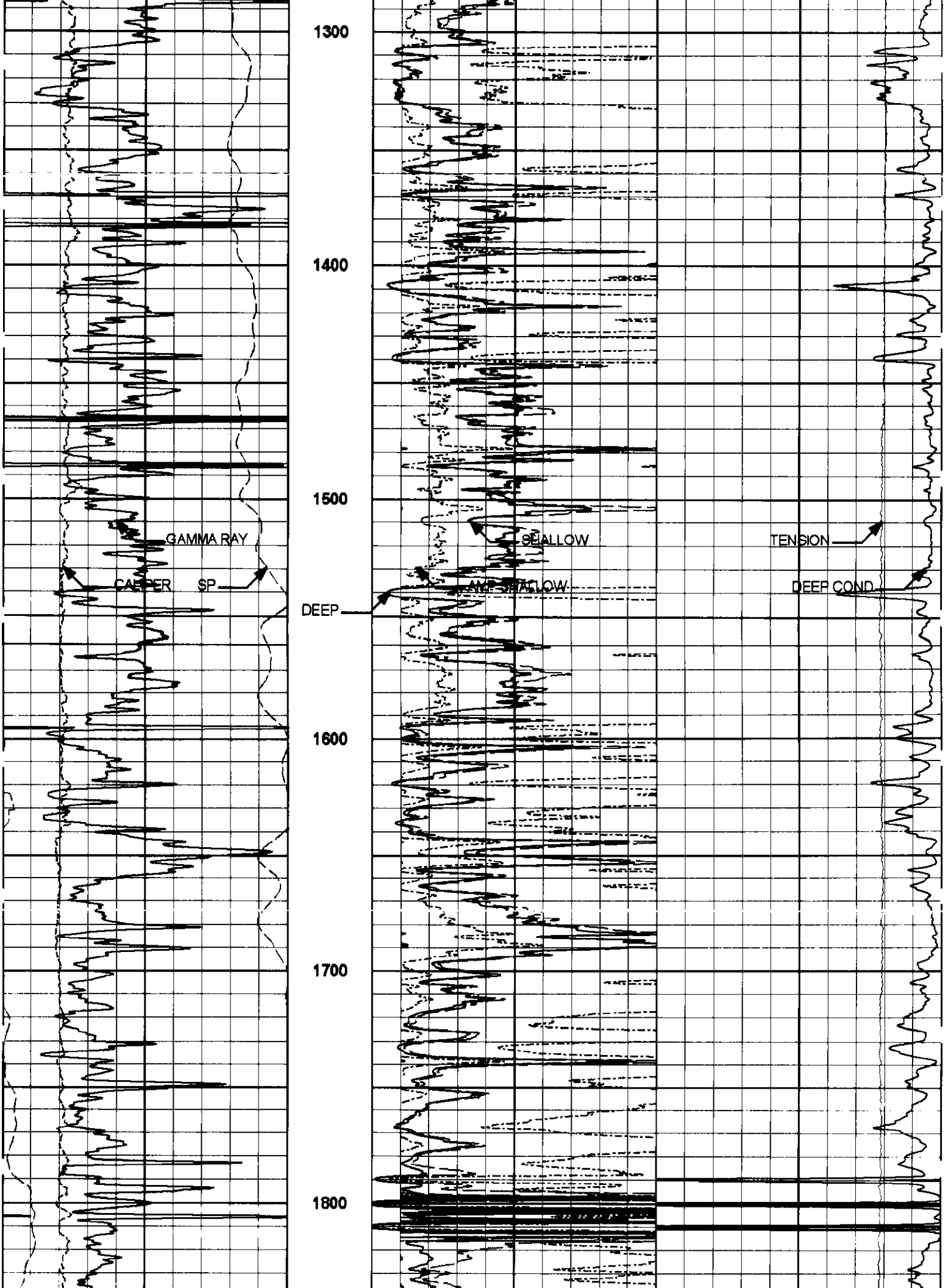
## MAIN PASS 2" = 100'

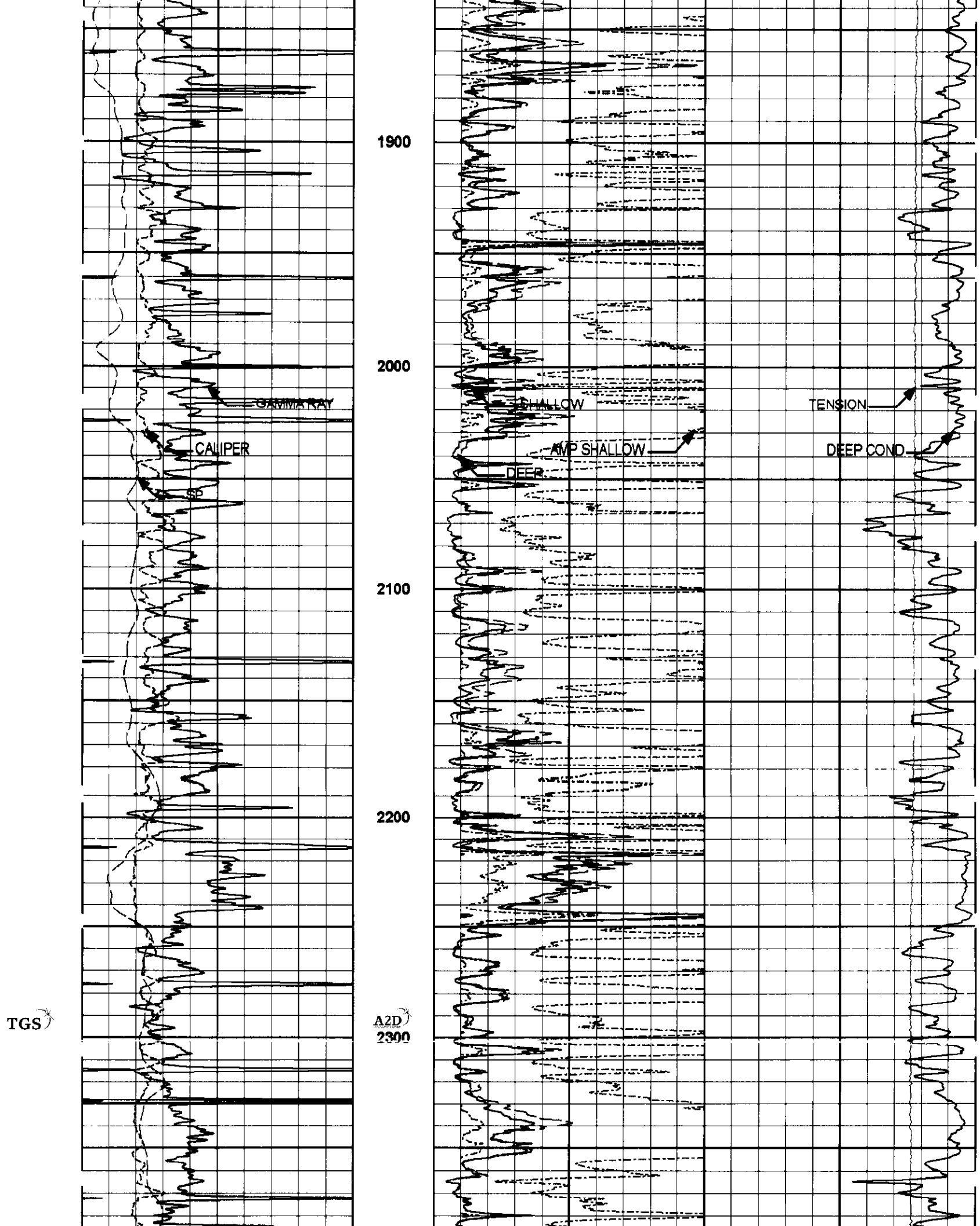
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | GAMMA RAY | 200 | | 0 | DEEP | 100 | | |
| | api | | | | ohm-m | | | |
| 6 | CALIPER | 16 | | 0 | AMP SHALLOW | 20 | 500 | DEEP COND 0 |
| | inches | | | | ohm-m | | | mmho |
| 0 | SP | 100 | 1 : 600 | 0 | SHALLOW | 100 | 10000 | TENSION 0 |
| | millivolts | | FT. | | ohm-m | | | pounds |

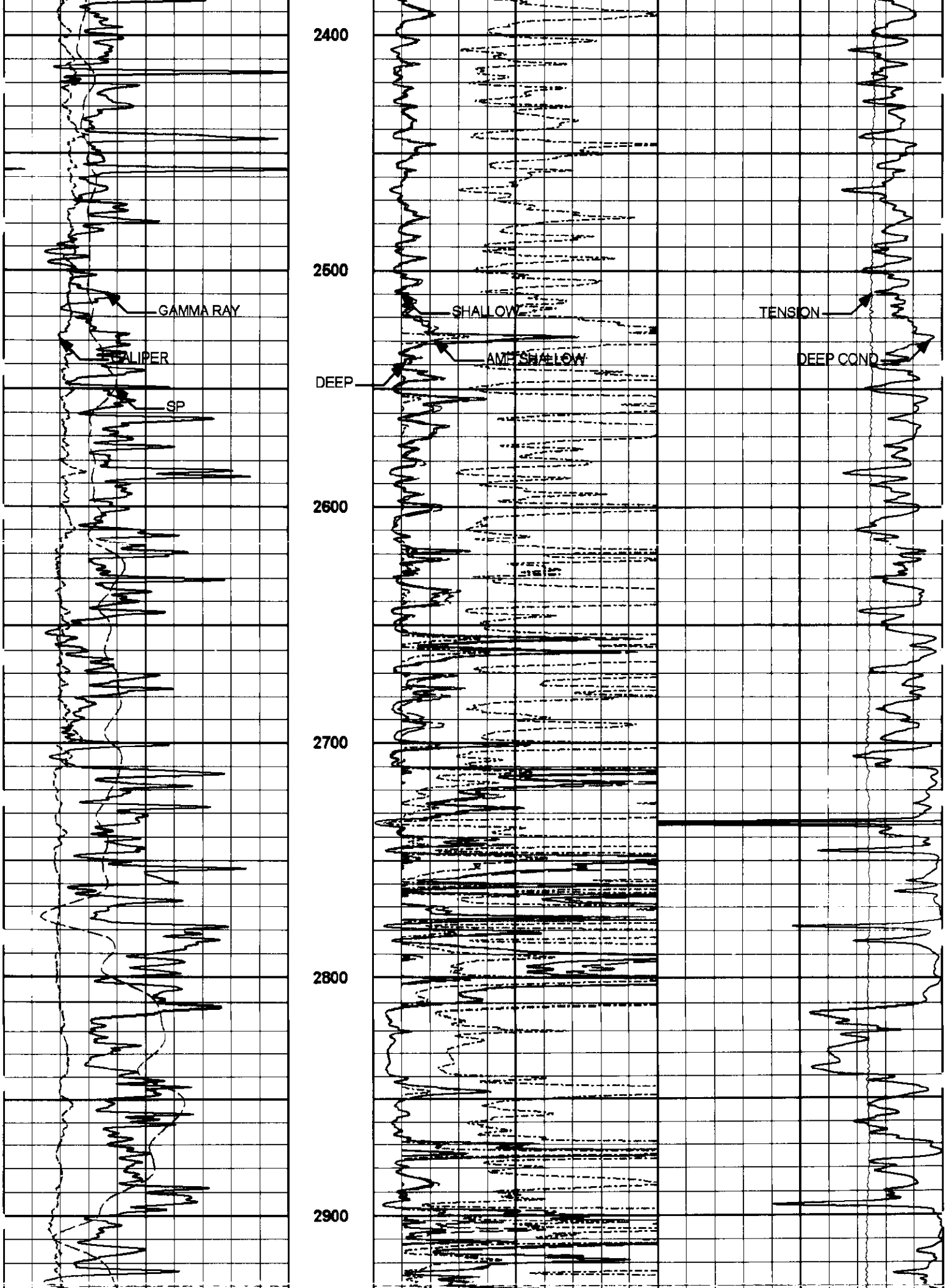


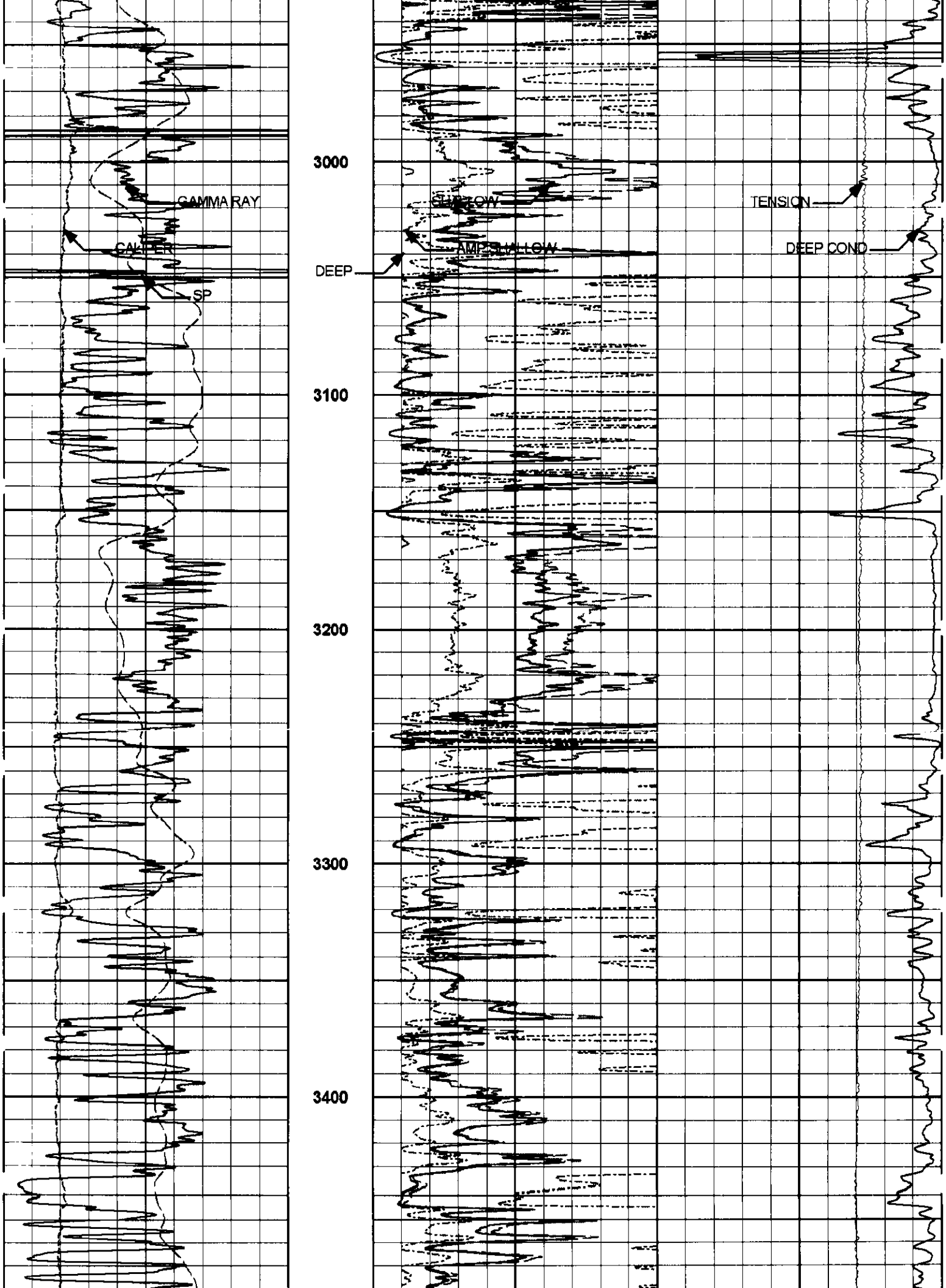

200
300
400
500
CSG
600
700
GAMMA RAY
CALIPER
SP
SHALLOW
DEEP
AMP SHALLOW
COND
TENSION

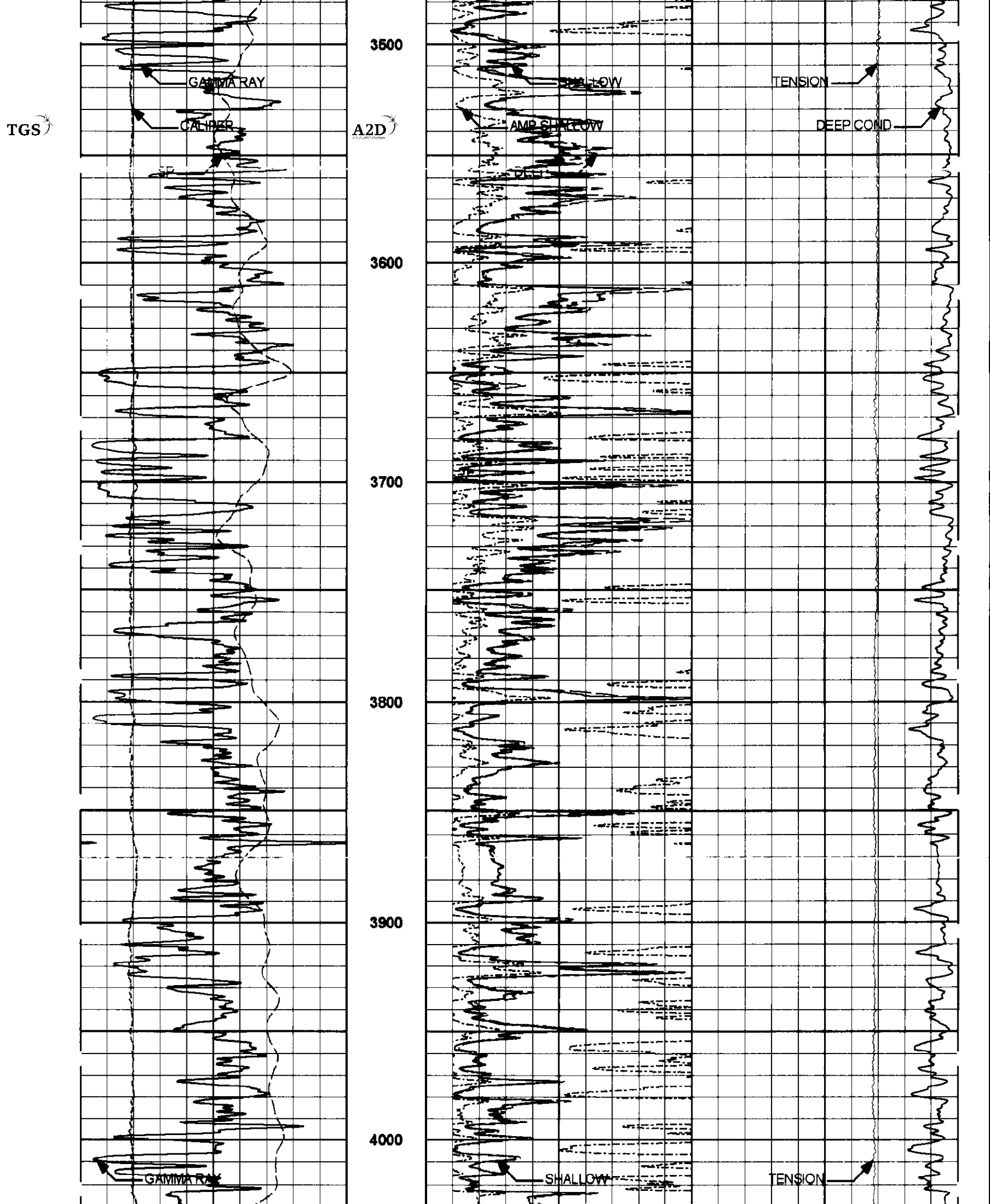

800
900
1000
1100
1200
GAMMA RAY
CALIPER
SP
TGS
A2D
SHALLOW
DEEP
AMP SHALLOW
TENSION
DEEP COND

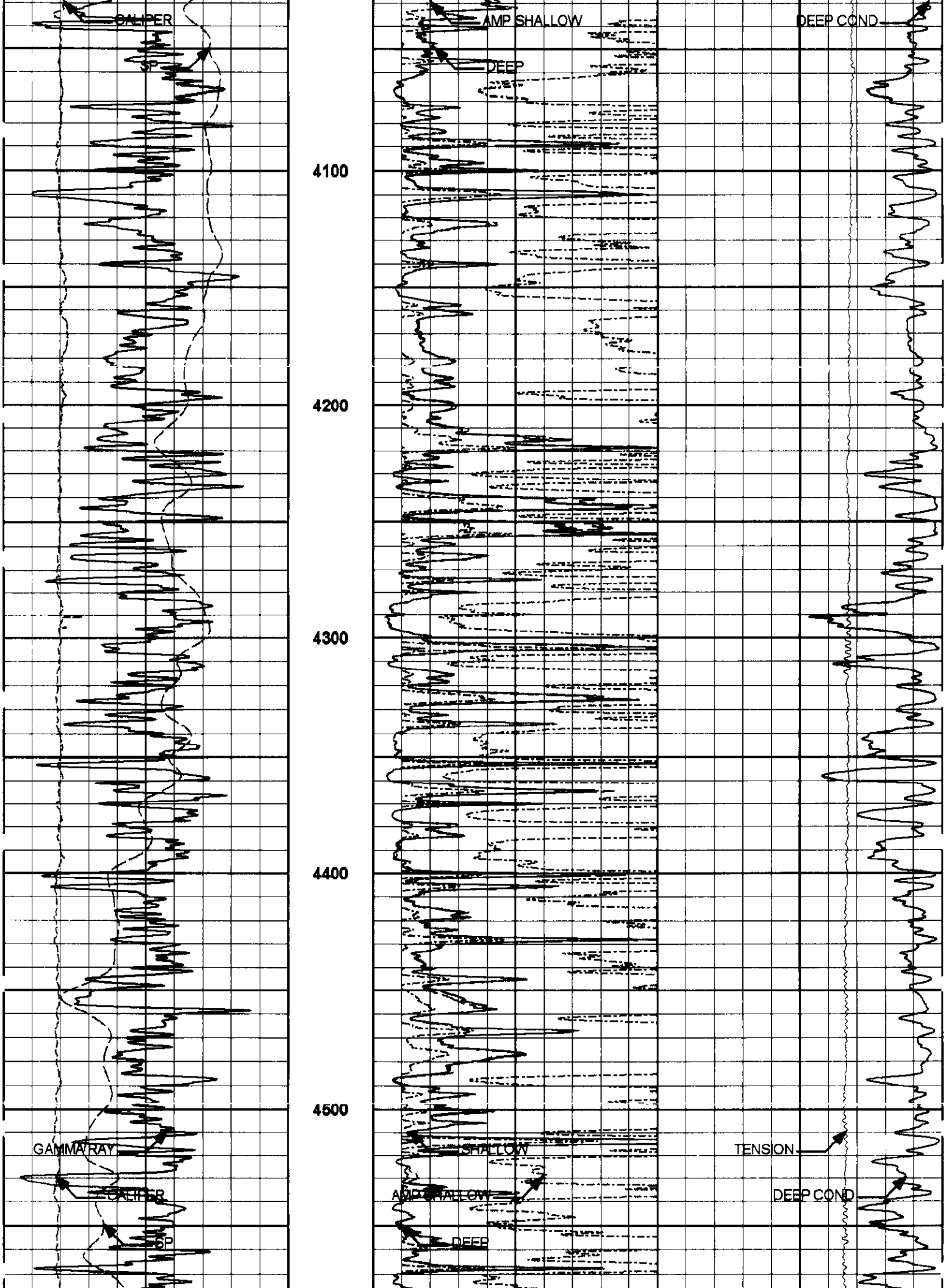

1300
1400
1500
1600
1700
1800
GAMMA RAY
CALIPER
SP
DEEP
SHALLOW
AMP SHALLOW
TENSION
DEEP COND

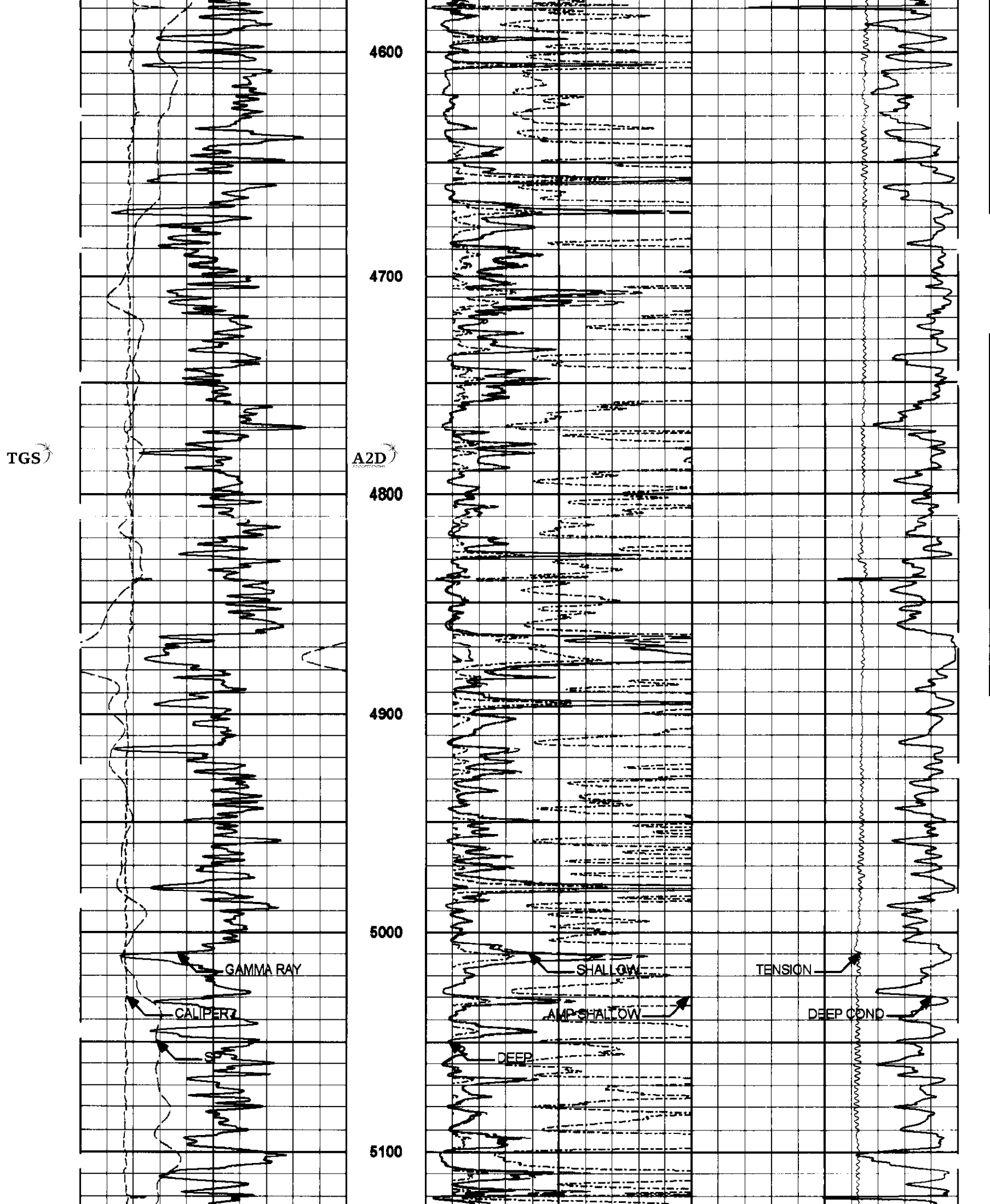

1900
2000
2100
2200
2300
GAMMA RAY
CALIPER
SP
SHALLOW
AMP SHALLOW
DEEP
TENSION
DEEP COND
TGS
A2D

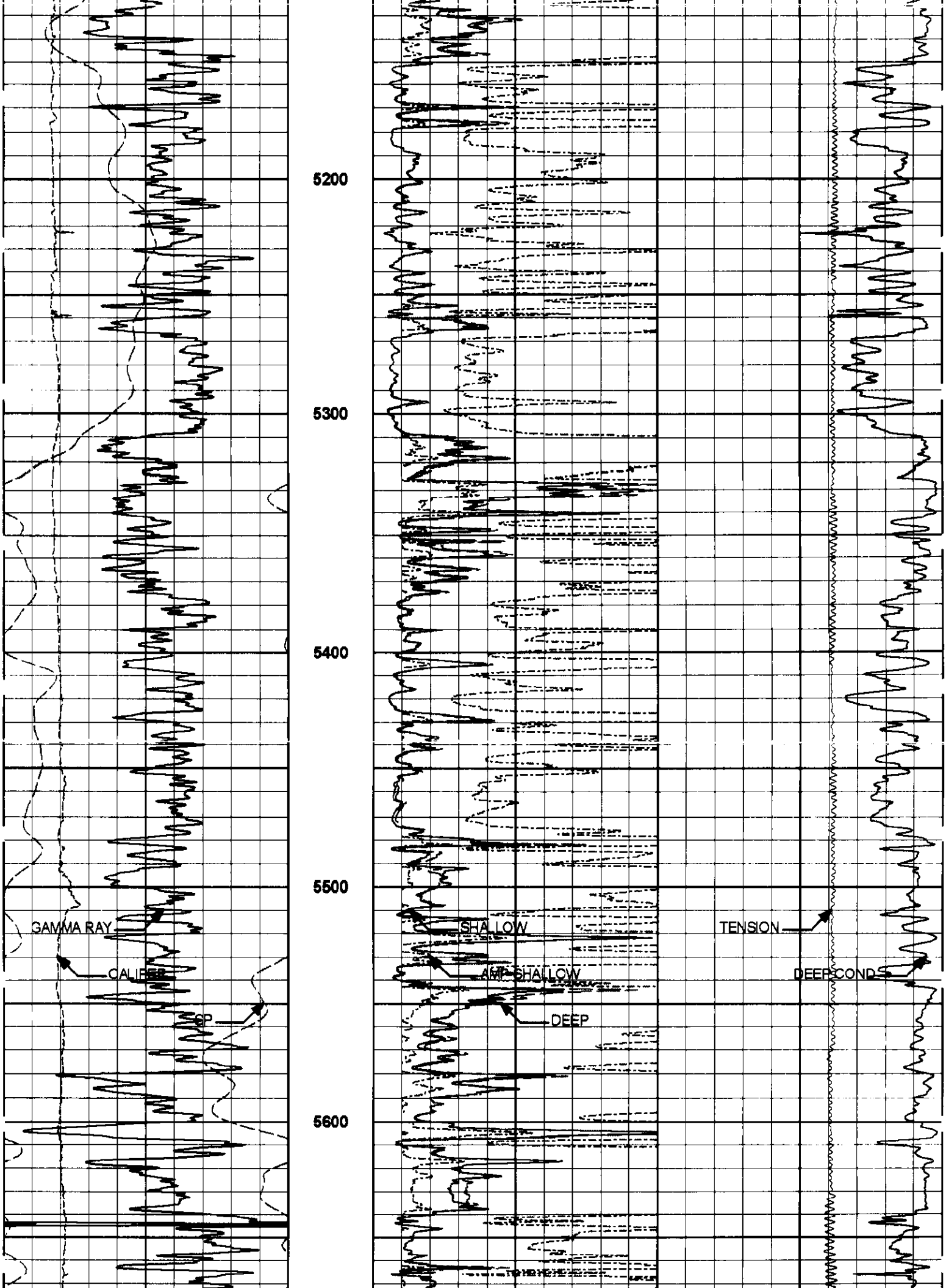

2400
2500
2600
2700
2800
2900
GAMMA RAY
CALIPER
SP
DEEP
SHALLOW
AMT SHALLOW
TENSION
DEEP COND

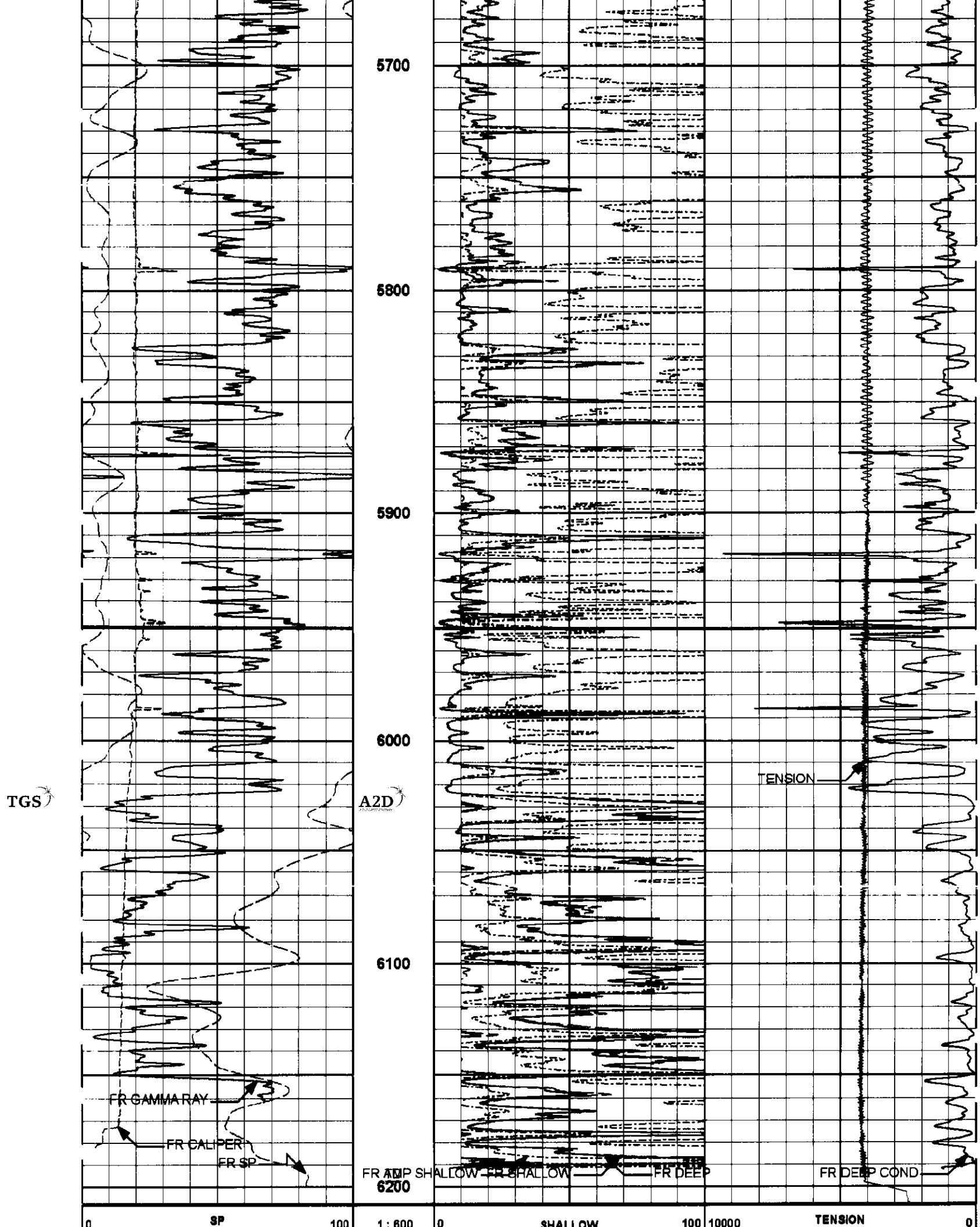

GAMMA RAY
CALIPER
SP
DEEP
SHALLOW
AMP SHALLOW
TENSION
DEEP COND
3000
3100
3200
3300
3400


TGS
A2D
3500
3600
3700
3800
3900
4000
GAMMA RAY
CALIPER
SP
GAMMA RAY
SHALLOW
AMP SHALLOW
DEEP
SHALLOW
TENSION
DEEP COND
TENSION


CALIPER
SP
AMP SHALLOW
DEEP
DEEP COND
4100
4200
4300
4400
4500
GAMMA RAY
CALIPER
SP
SHALLOW
AMP SHALLOW
DEEP
TENSION
DEEP COND


TGS
A2D
4600
4700
4800
4900
5000
5100
GAMMA RAY
CALIPER2
SP
SHALLOW
AMP SHALLOW
DEEP
TENSION
DEEP COND


5200
5300
5400
5500
5600
GAMMA RAY
CALIPER
SP
SHALLOW
AMP-SHALLOW
DEEP
TENSION
DEEP COND


5700
5800
5900
6000
6100
6200
TGS
A2D
TENSION
FR GAMMA RAY
FR CALIPER
FR SP
FR AMP SHALLOW
FR SHALLOW
FR DEEP
FR DEEP COND
0
SP
100
1 : 600
0
SHALLOW
100
10000
TENSION
0

| | | | | |
|---|---|---|---|---|
| millivolts | | ohm-m | | pounds |
| 6 CALIPER 16 | FT. | 0 AMP SHALLOW 20 | | 500 DEEP COND 0 |
| inches | | ohm-m | | mmho |
| 0 GAMMA RAY 200 | | 0 DEEP 100 | | |
| api | | ohm-m | | |

**HALLIBURTON**

Plot Time: 08-Apr-10 05:26:02
Plot Range: 100 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\MAIN\
Plot File: \\ACRT\I_ACRT_2IN_M

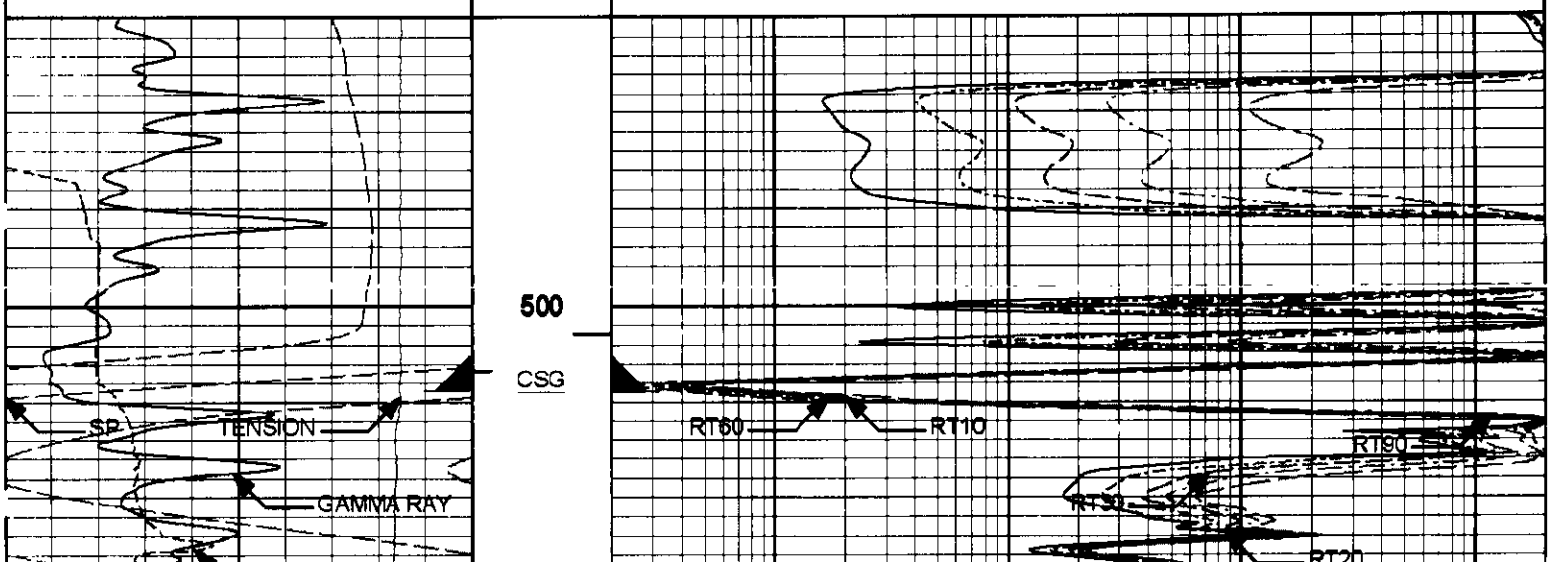
## MAIN PASS 2" = 100'

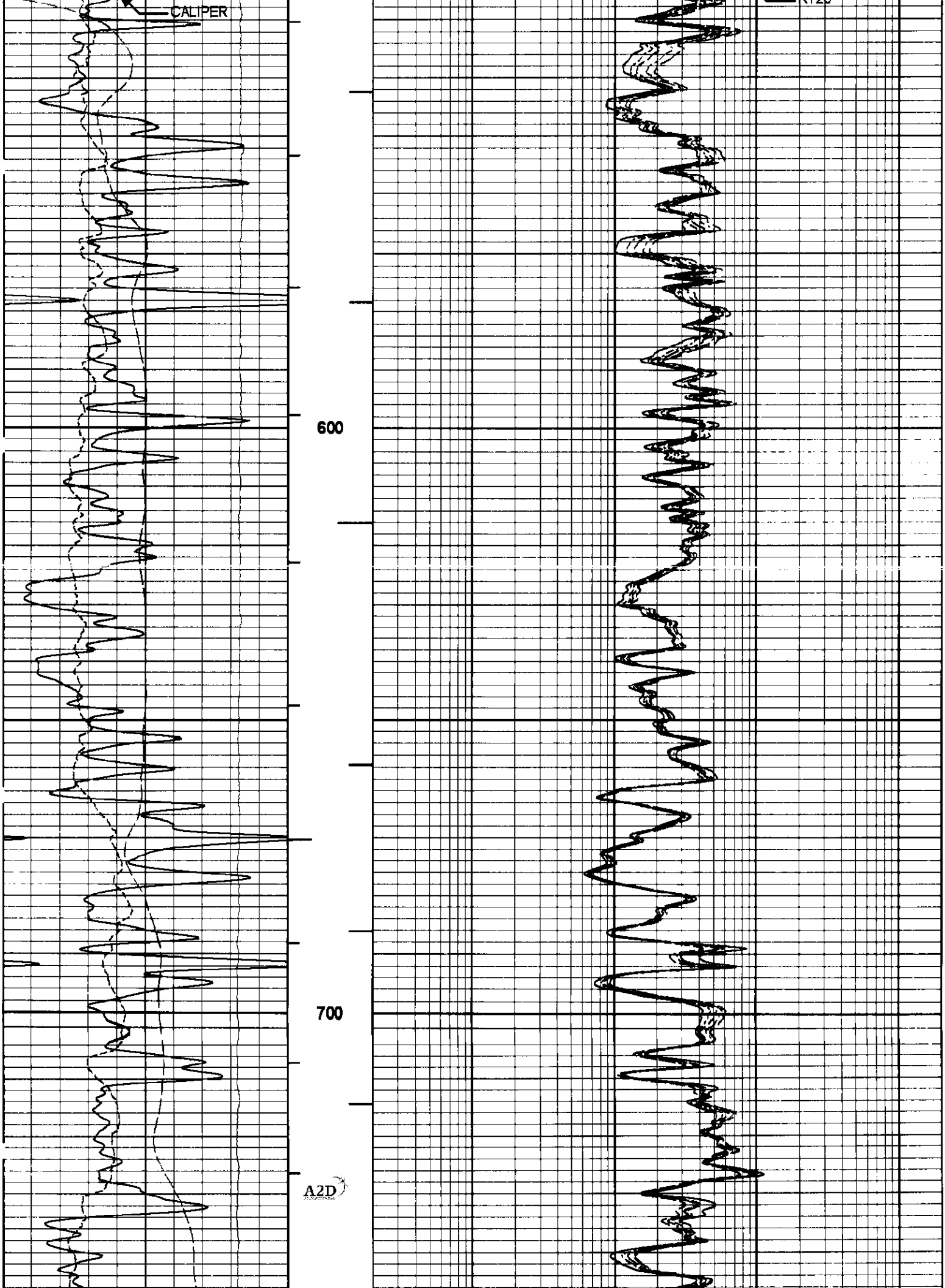
**HALLIBURTON**

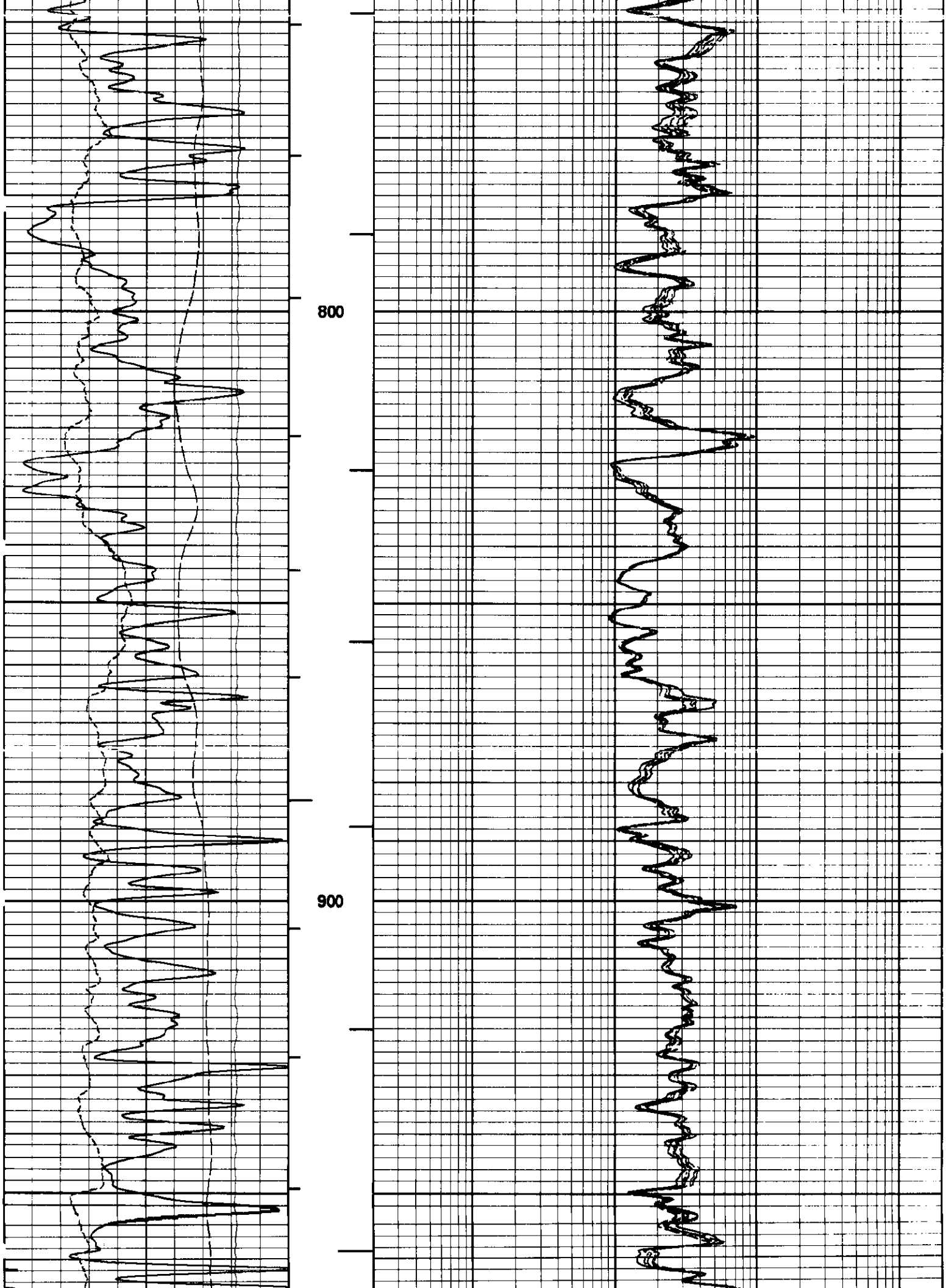
Plot Time: 08-Apr-10 05:26:03
Plot Range: 470 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\DAQ-0001-004\
Plot File: \\ACRT\I_ACRT_5IN_M

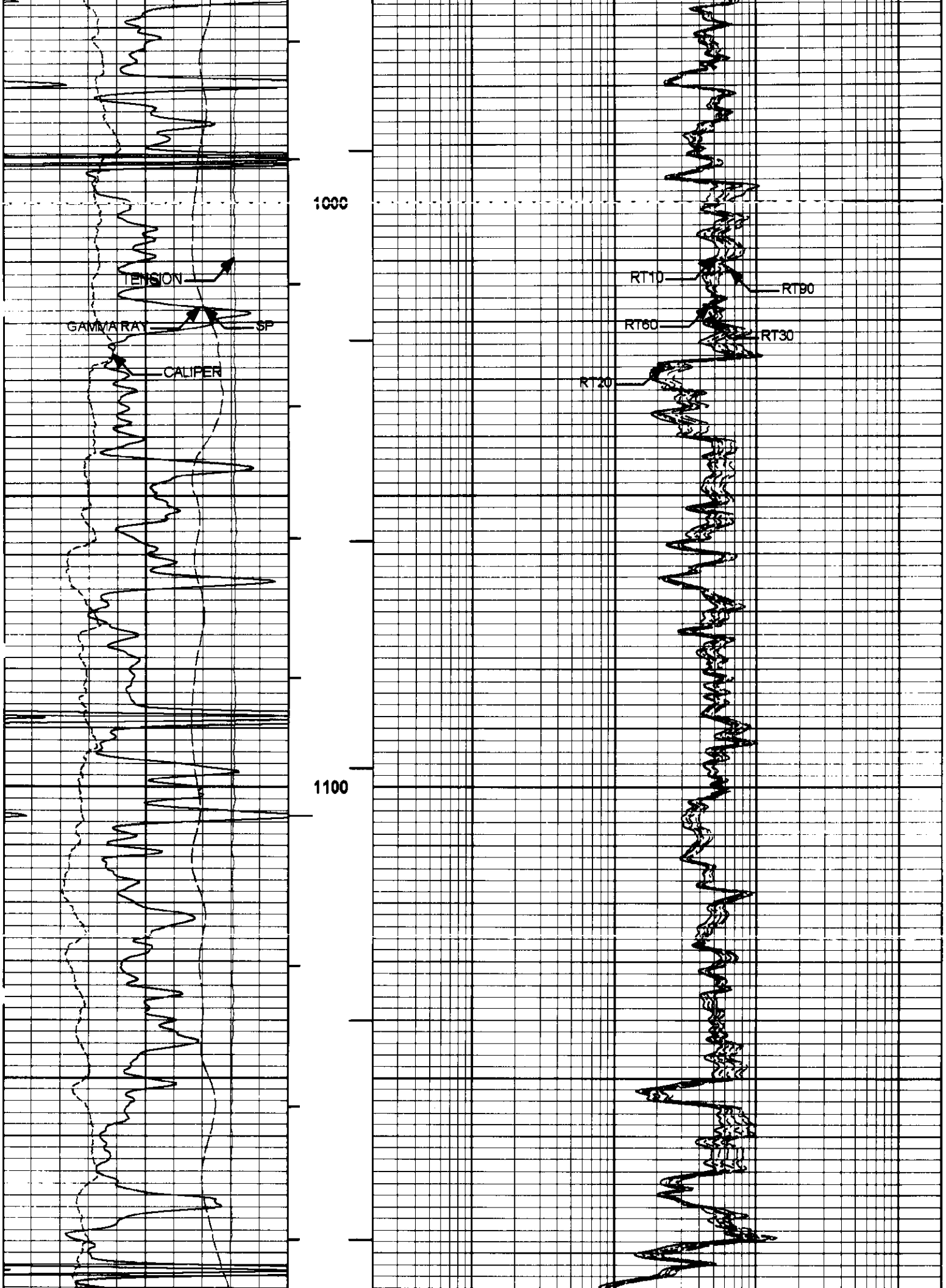
## MAIN PASS 5" = 100'

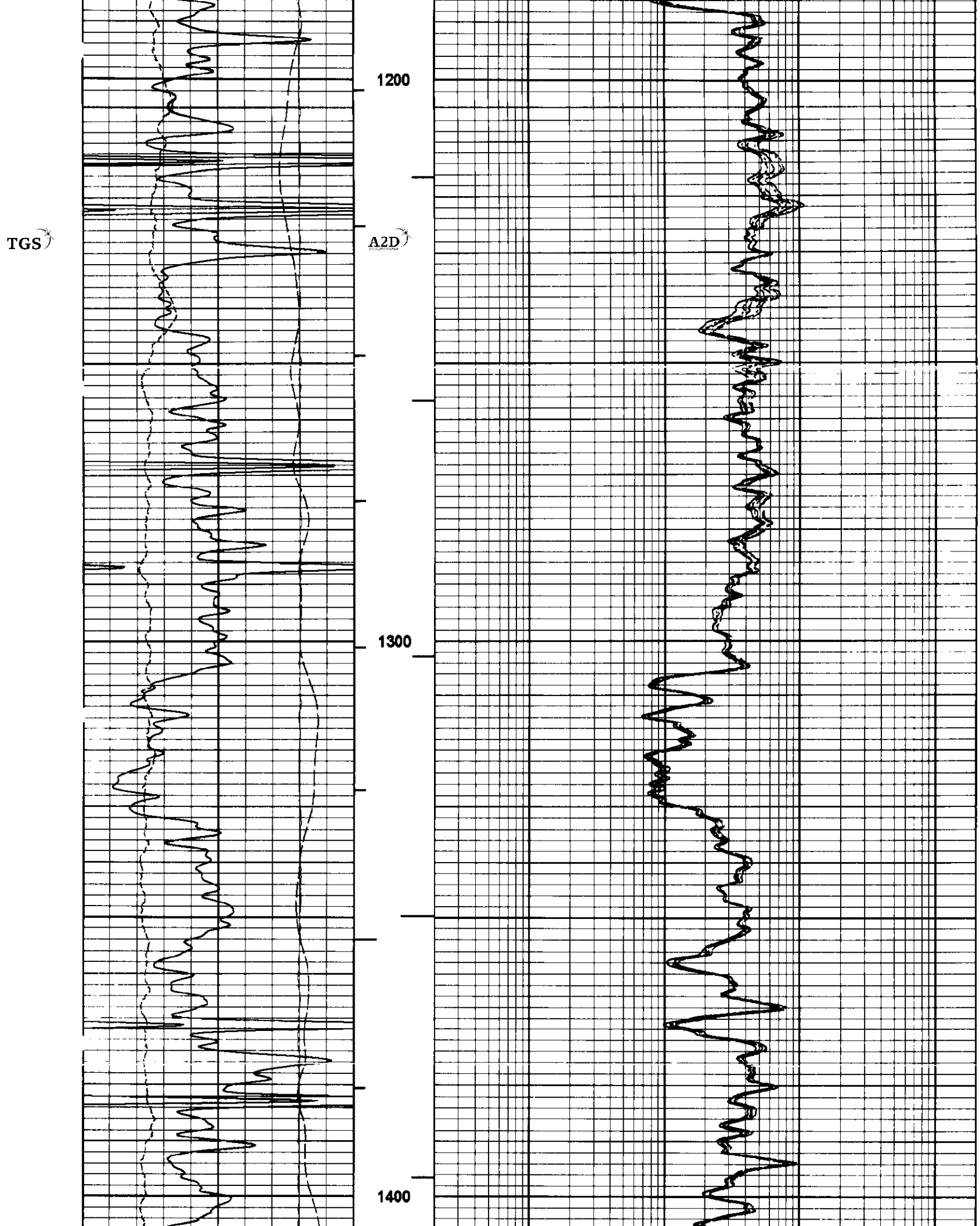
| | | | |
|---|---|---|---|
| 0 GAMMA RAY 200 | | 0.2 RT90 2000 | |
| api | | ohm-m | |
| 6 CALIPER 16 | AHV | 0.2 RT60 2000 | |
| inches | | ohm-m | |
| 0 SP 100 | BHV | 0.2 RT30 2000 | |
| millivolts | | ohm-m | |
| 10000 TENSION 0 | 1 : 240 | 0.2 RT20 2000 | |
| pounds | FT. | ohm-m | |
| | | 0.2 RT10 2000 | |
| | | ohm-m | |



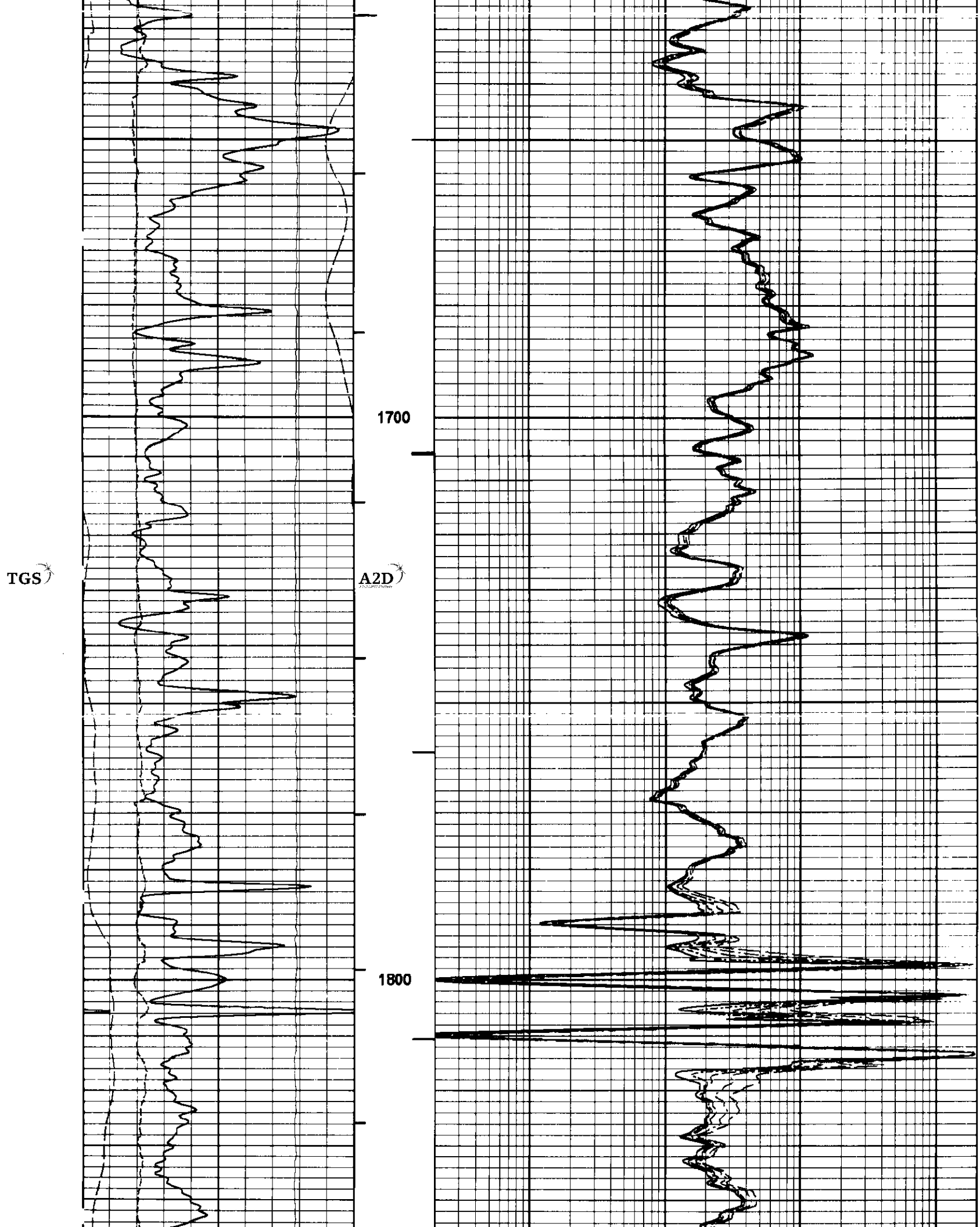

CALIPER
600
700
TGS
A2D

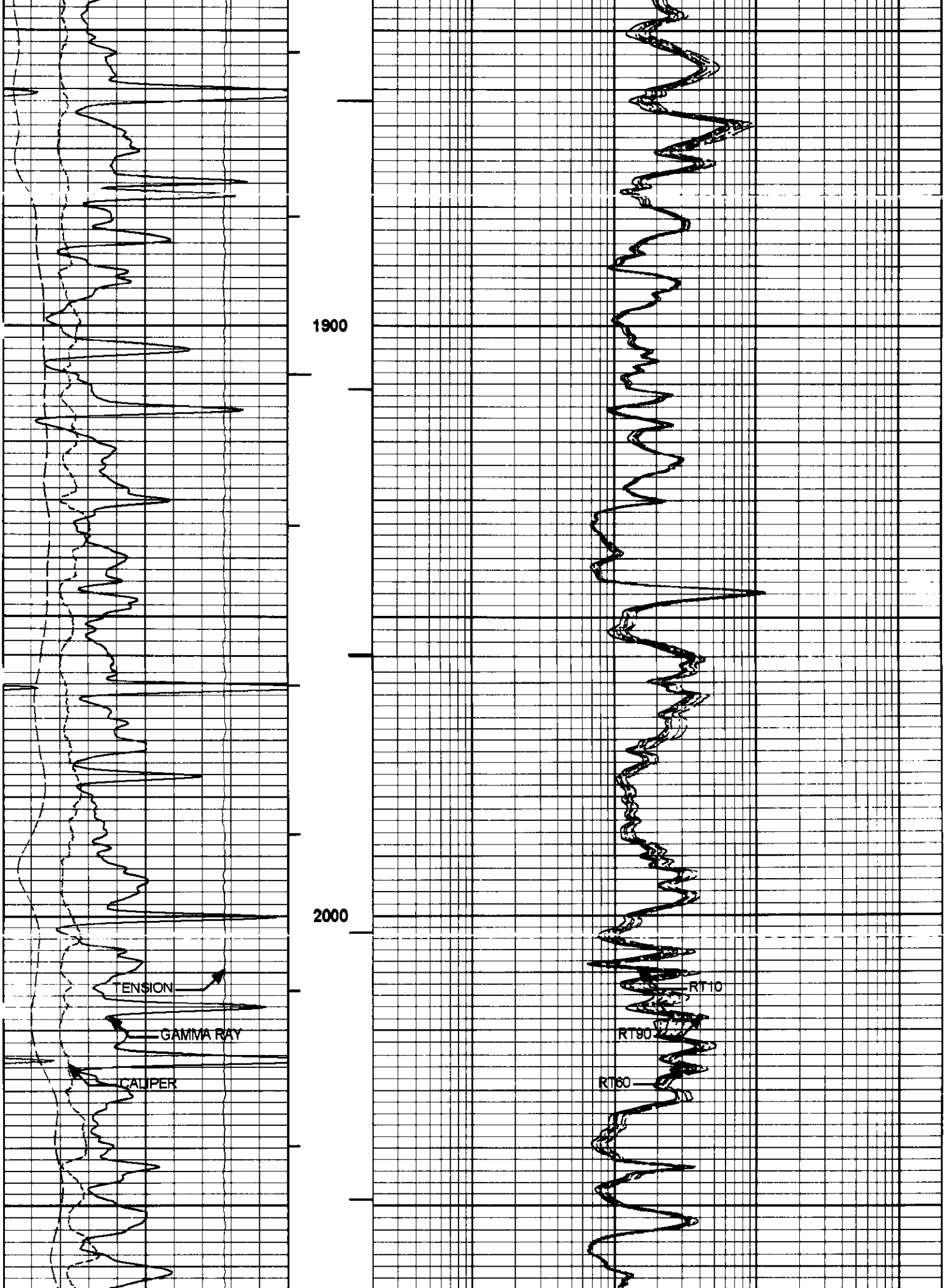

800
900

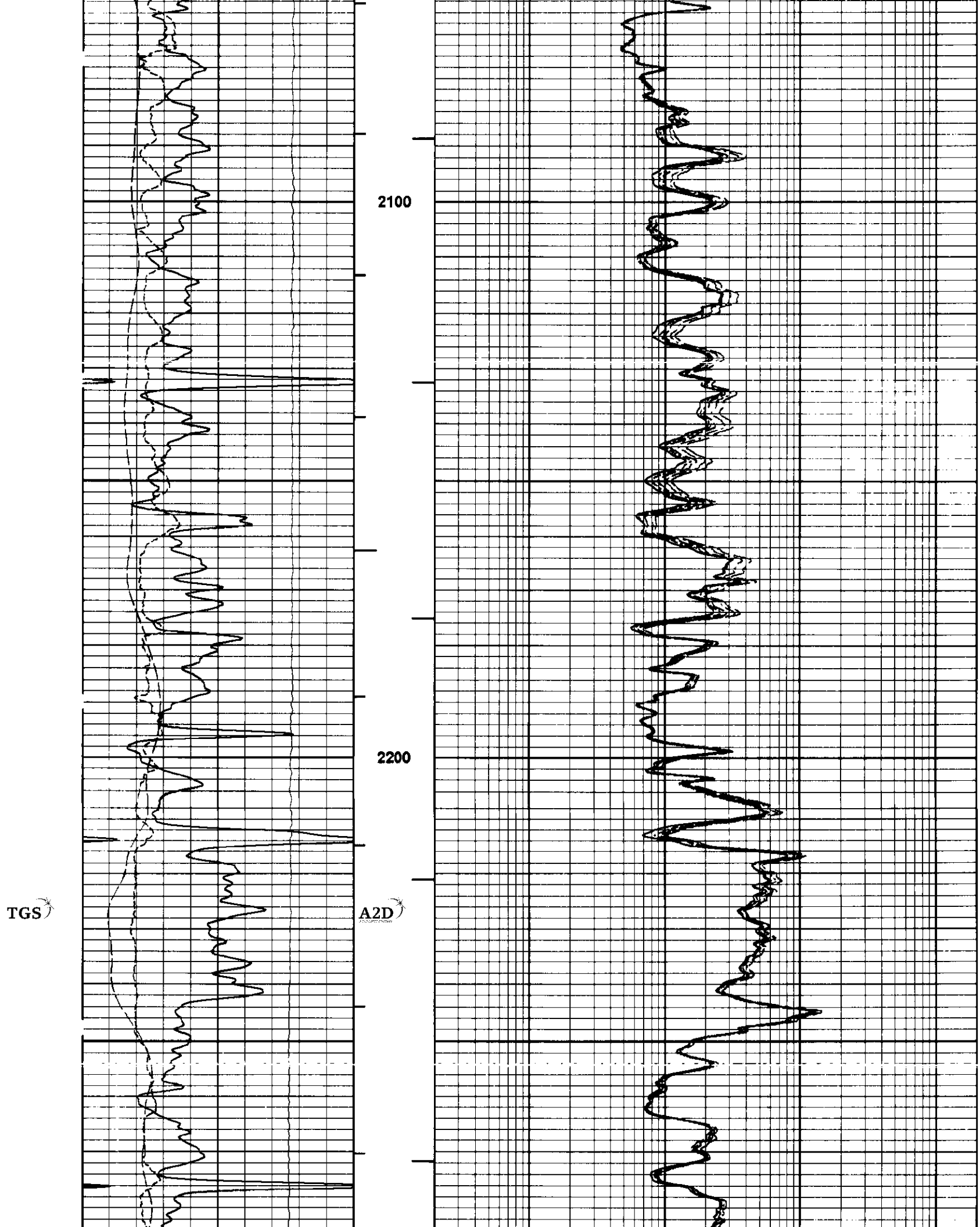

1000
1100
TENSION
GAMMA RAY
SP
CALIPER
RT10
RT90
RT60
RT30
RT20

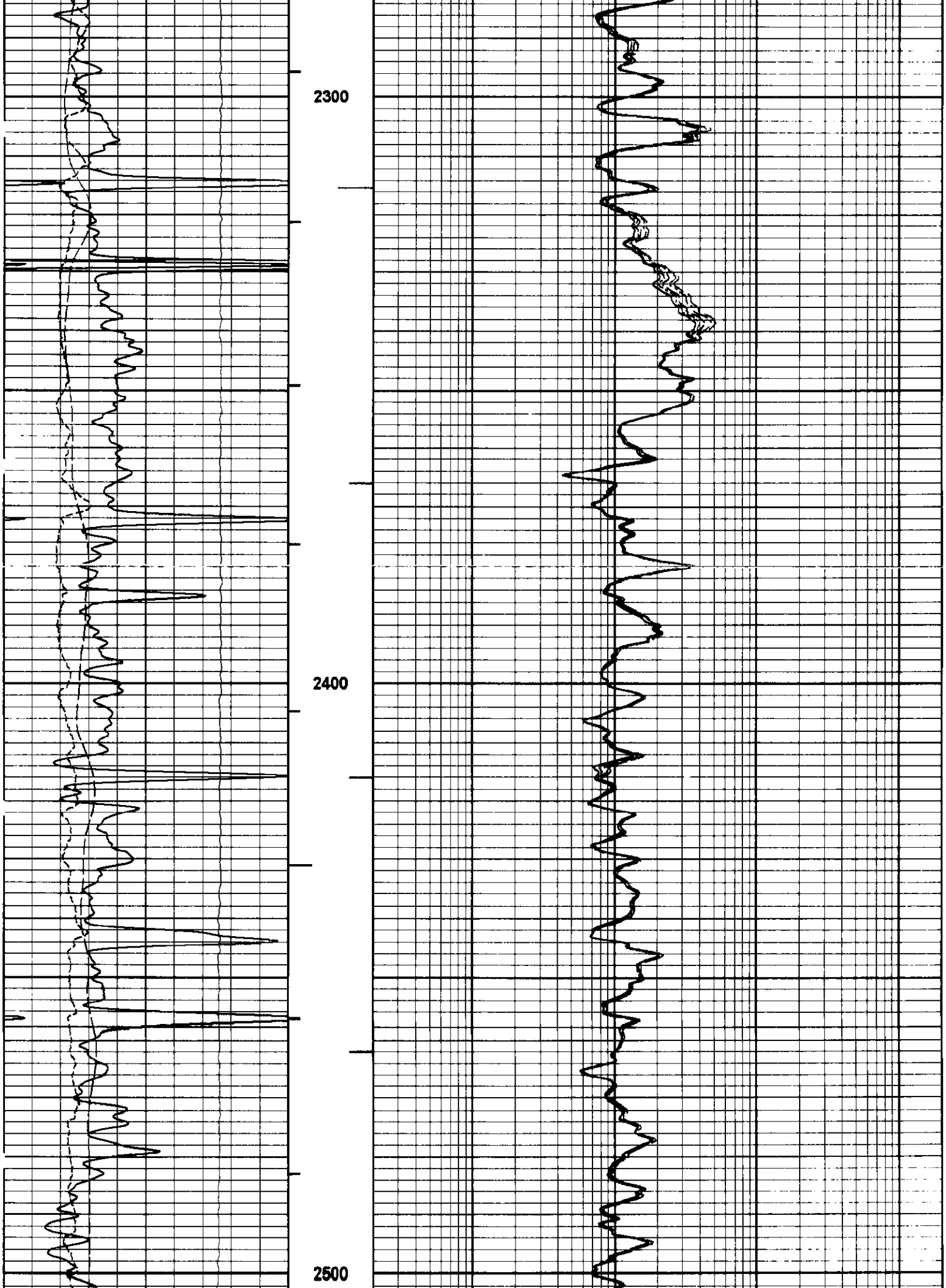

TGS
A2D
1200
1300
1400

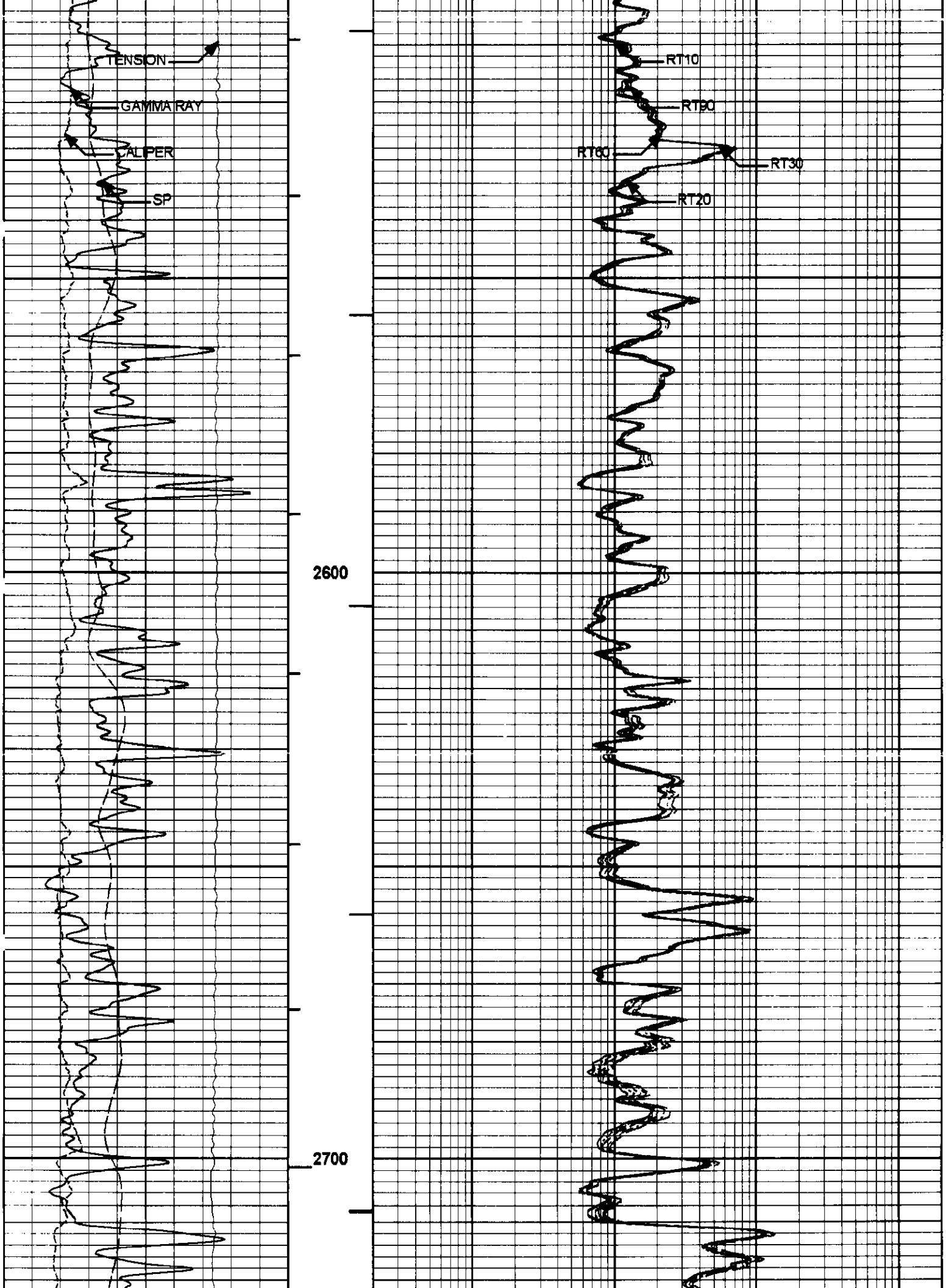
1500
1600
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20

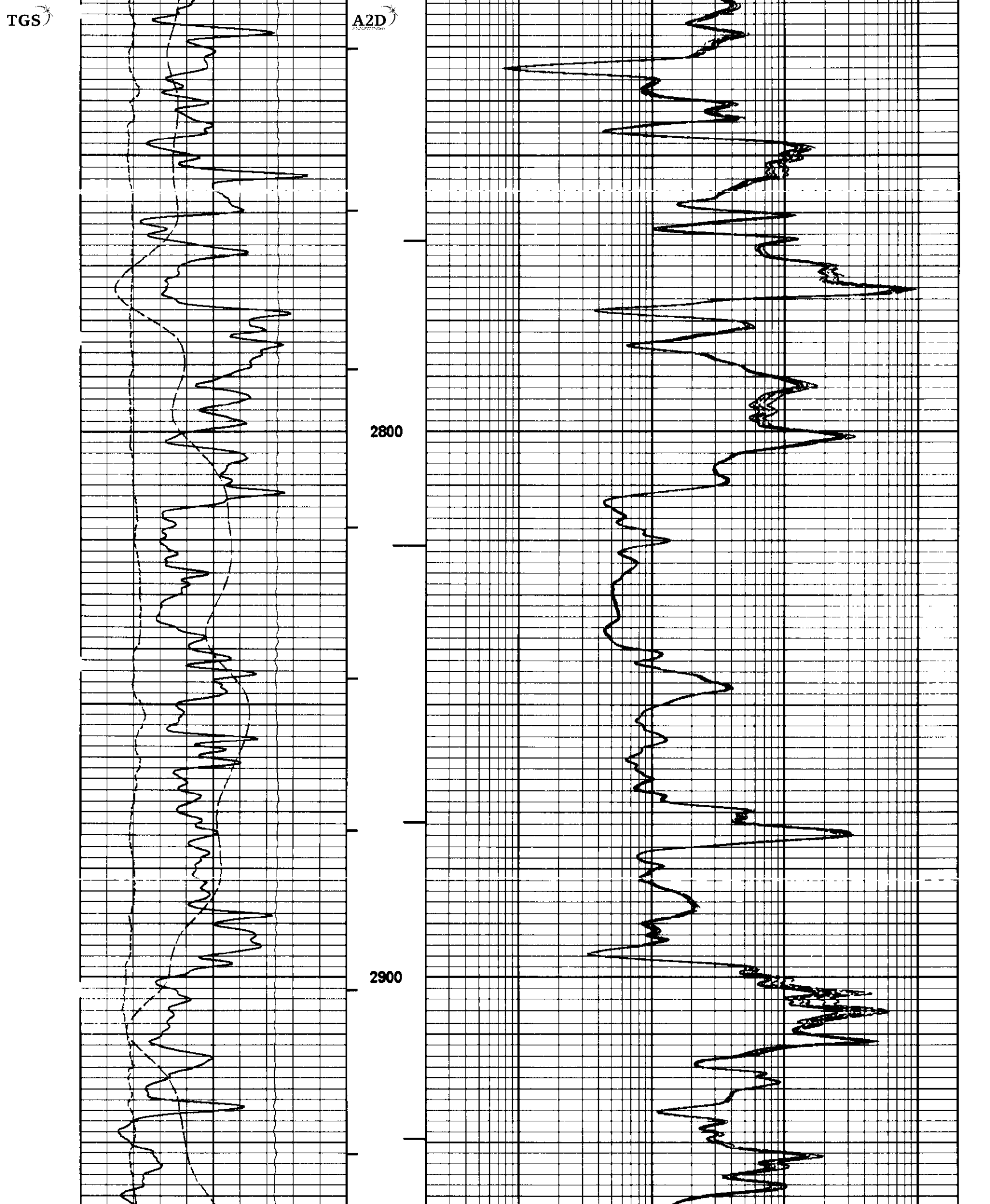

TGS
A2D
1700
1800

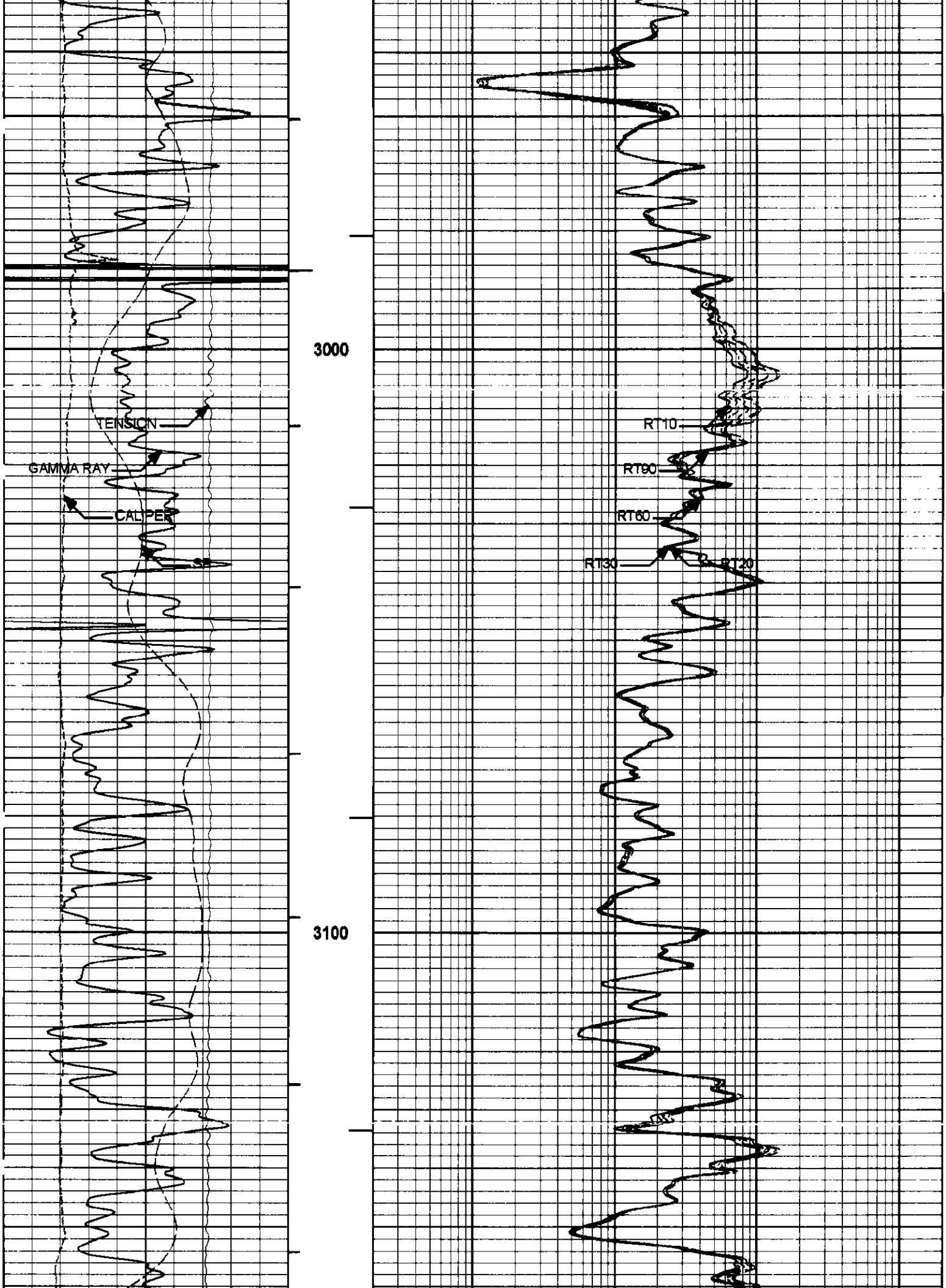

1900
2000
TENSION
GAMMA RAY
CALIPER
RT10
RT90
RT60

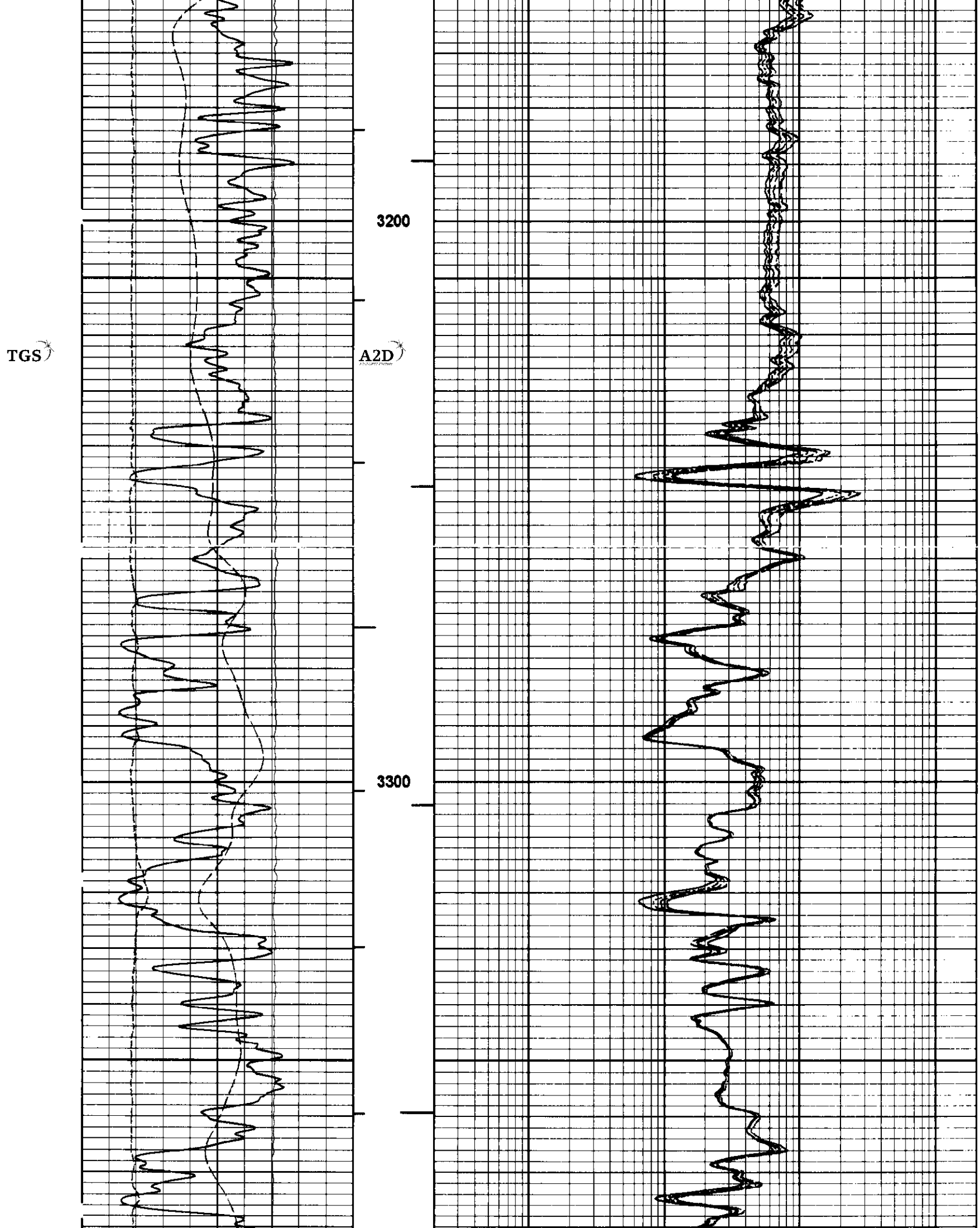

2100
2200
TGS
A2D

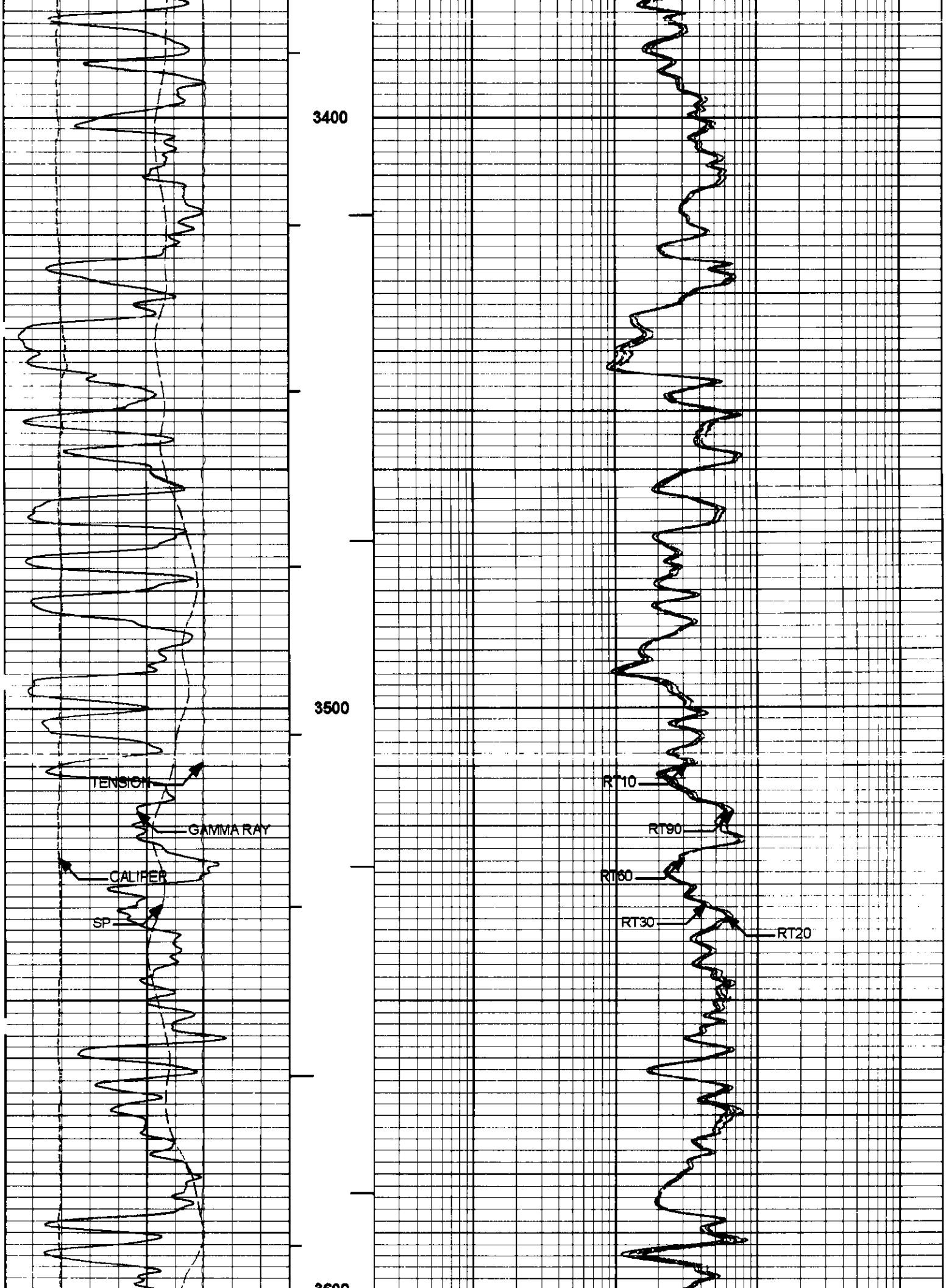

2300
2400
2500

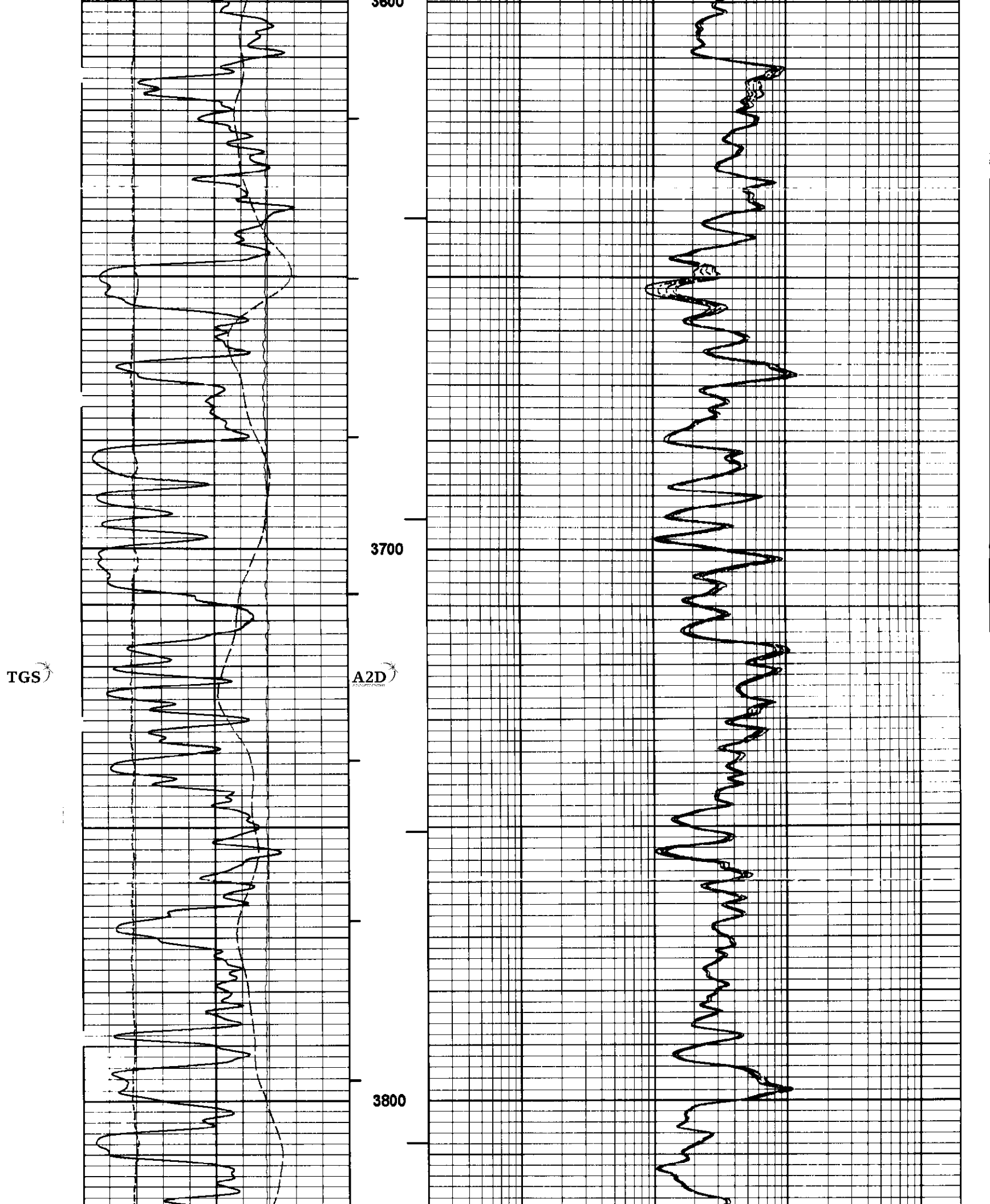

TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20
2600
2700

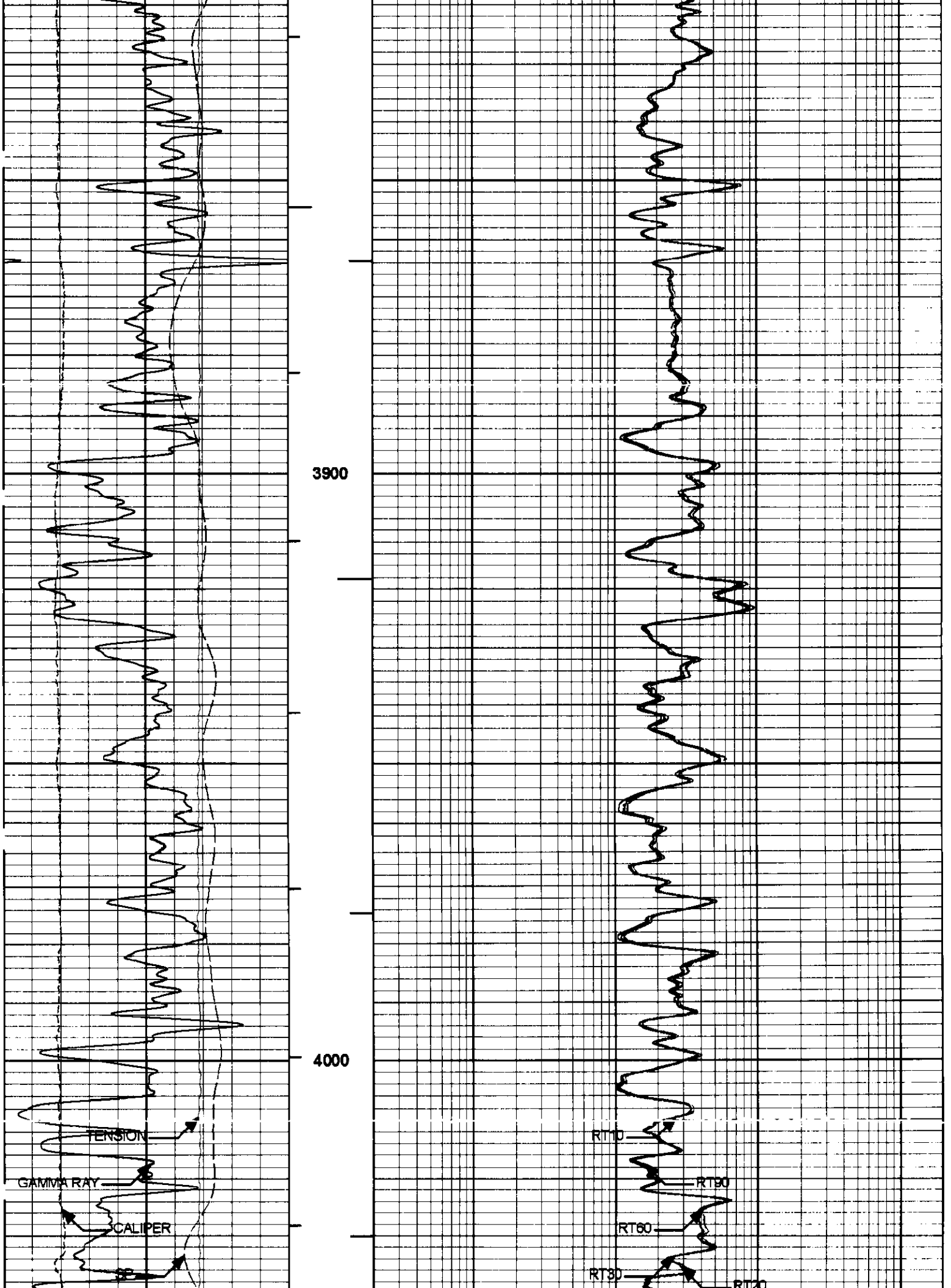

TGS
A2D
2800
2900

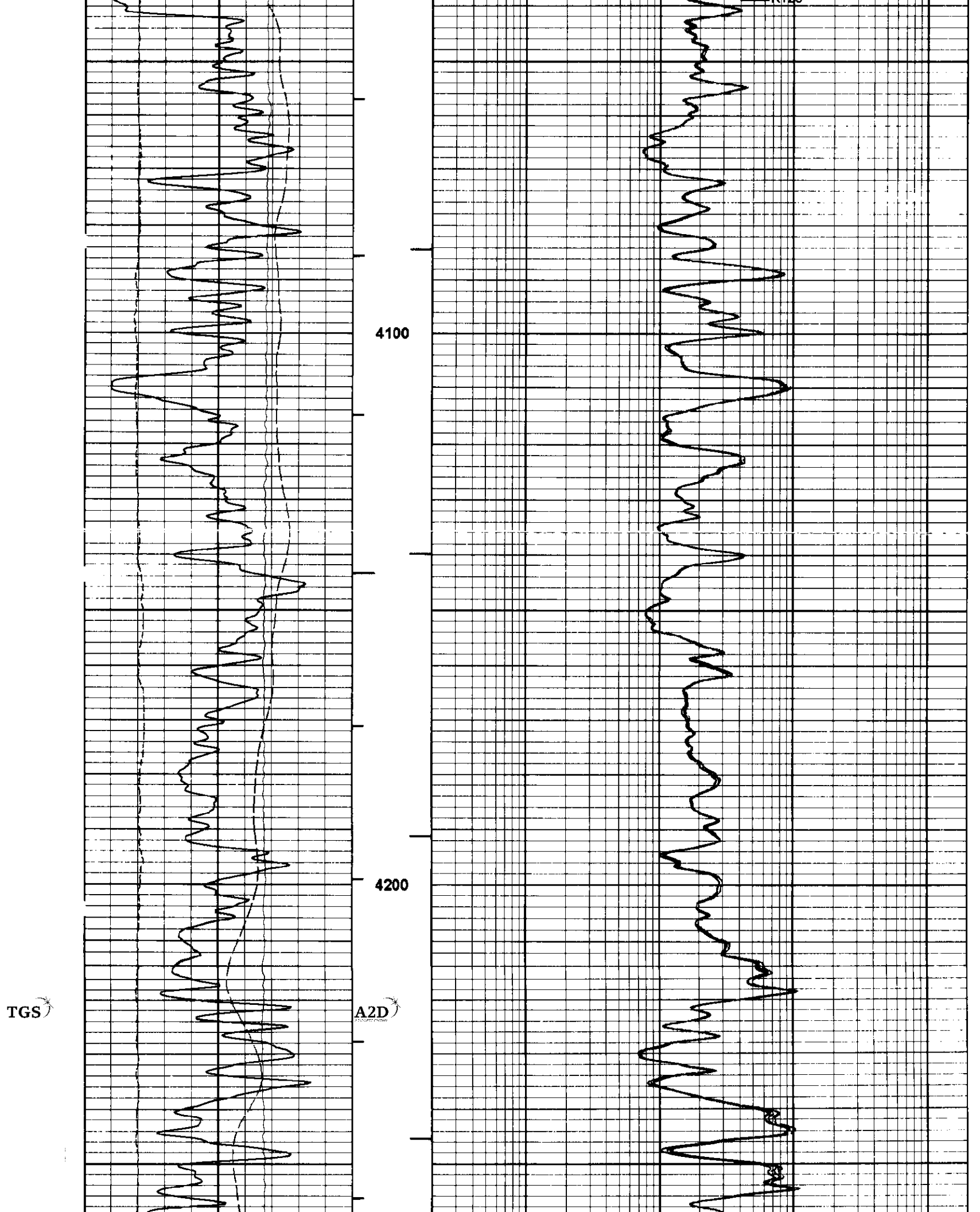

3000
3100
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20

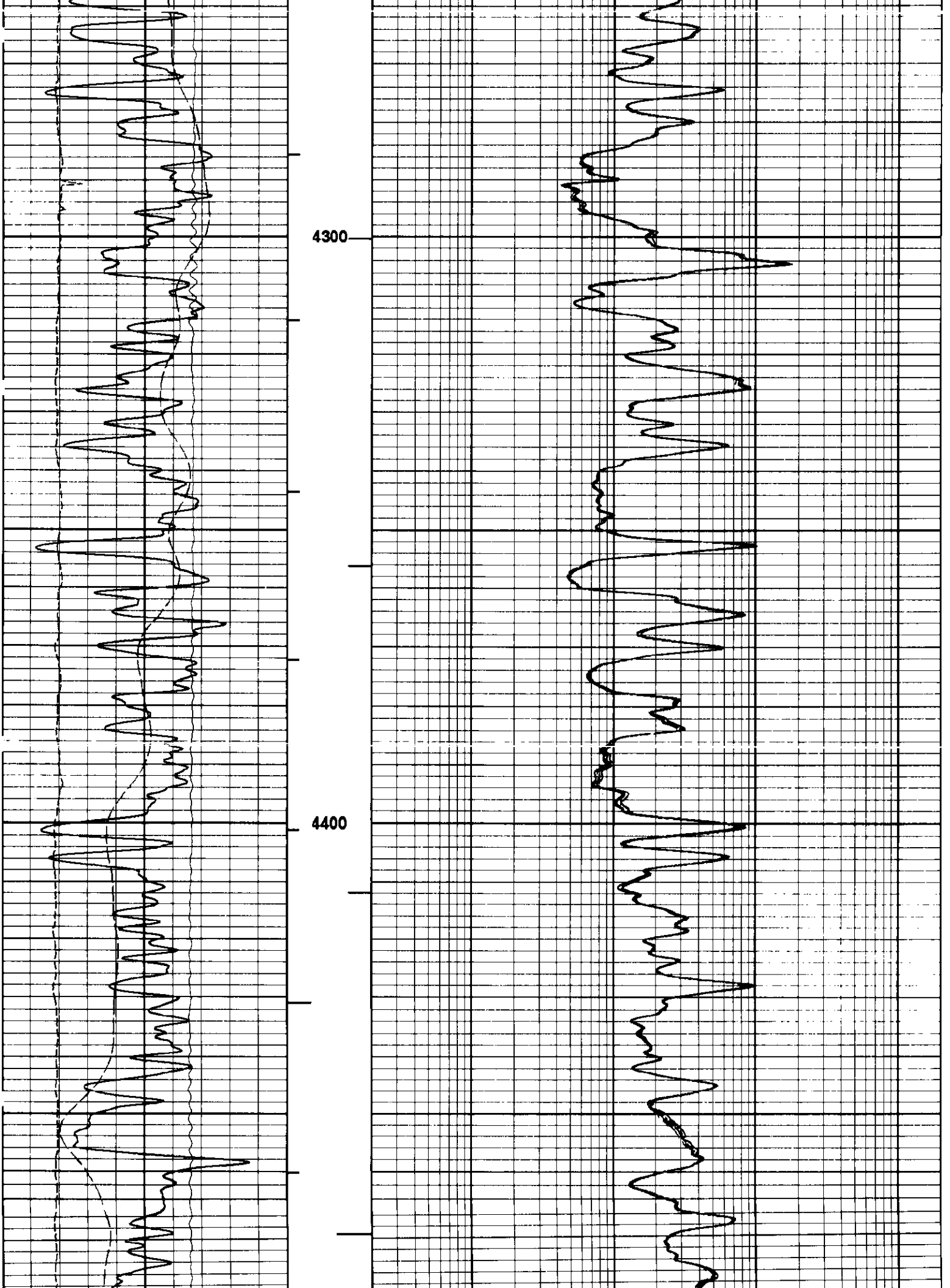

3200
TGS
A2D
3300

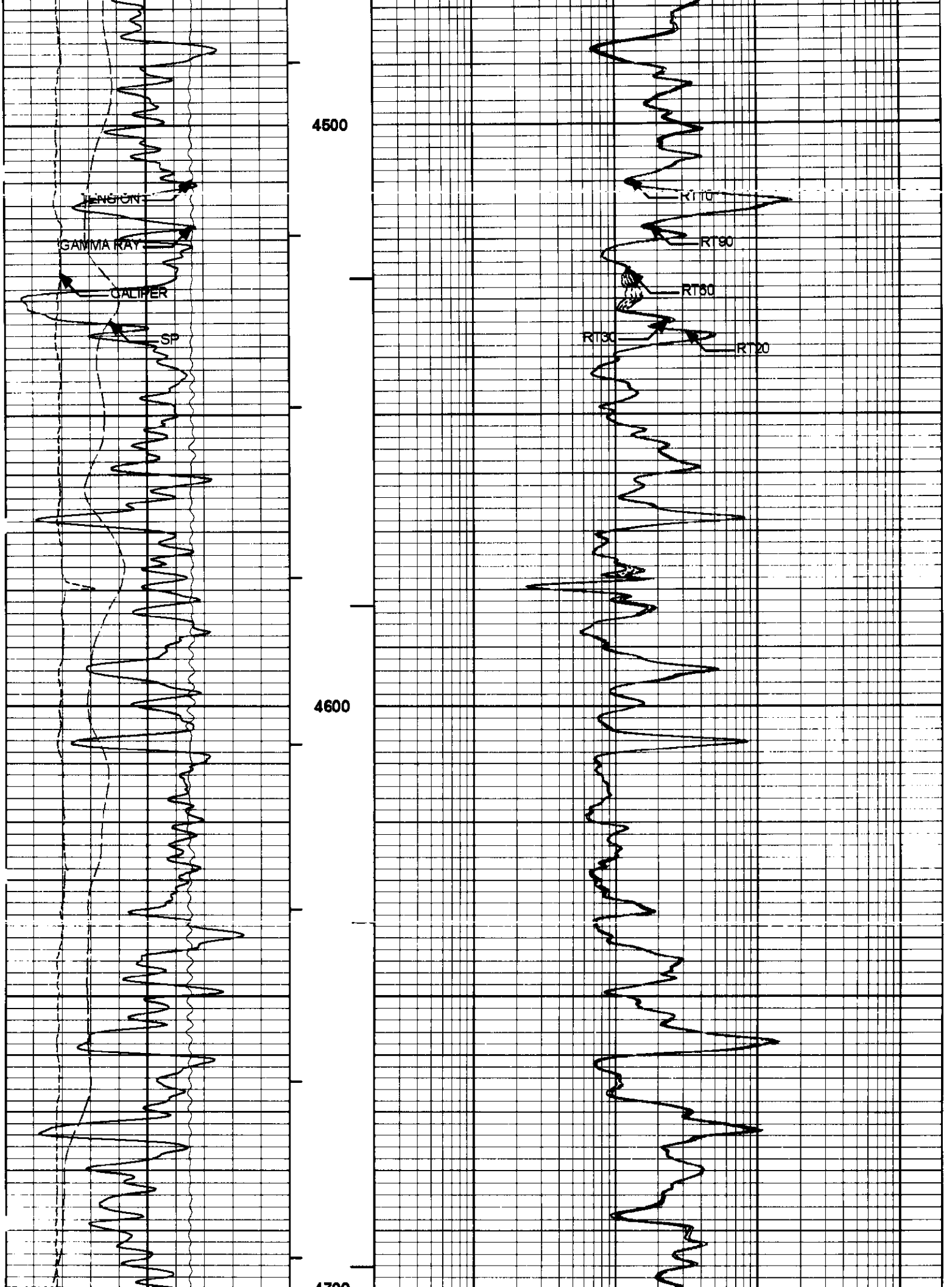

3400
3500
3600
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20

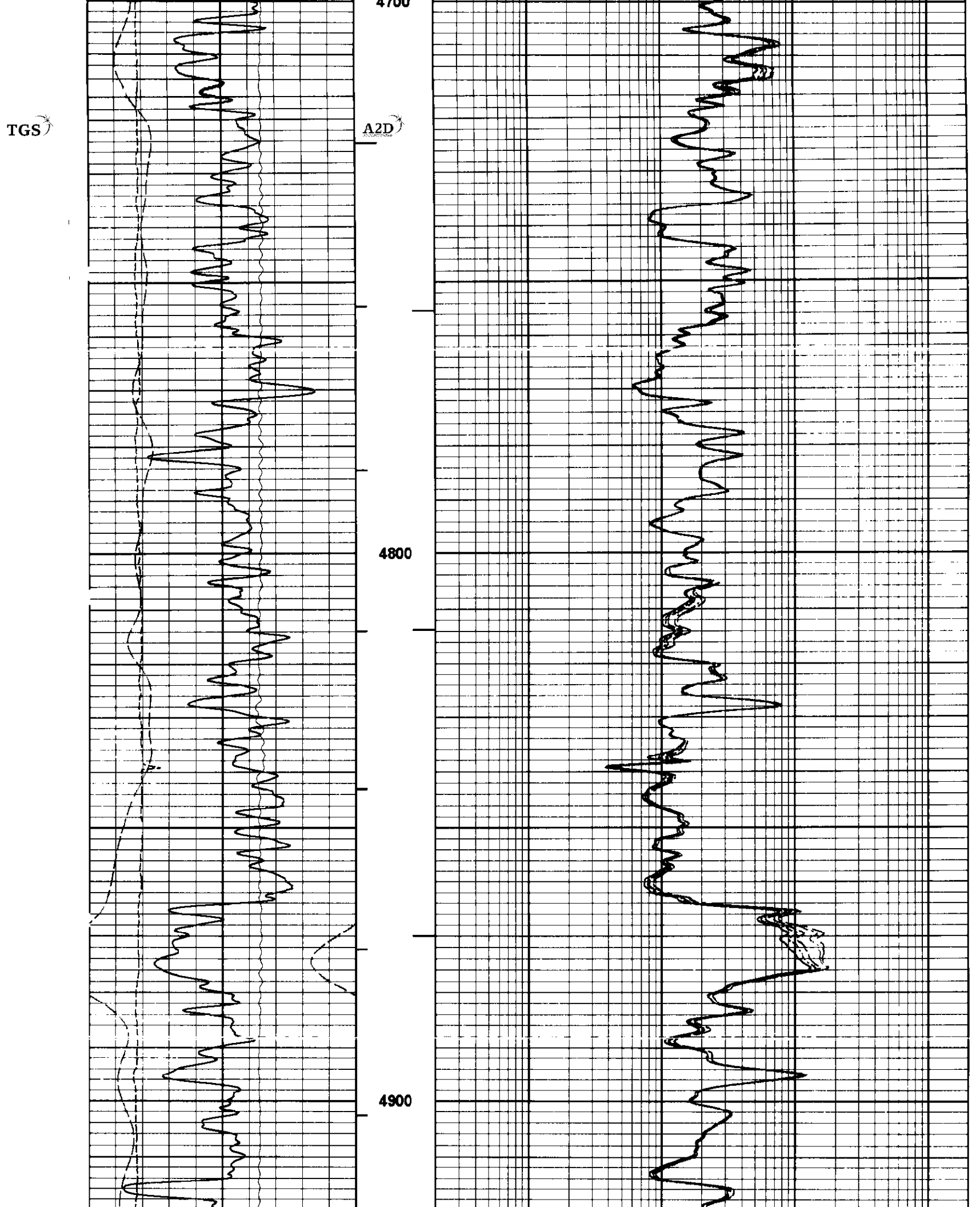

3600
3700
3800
TGS
A2D

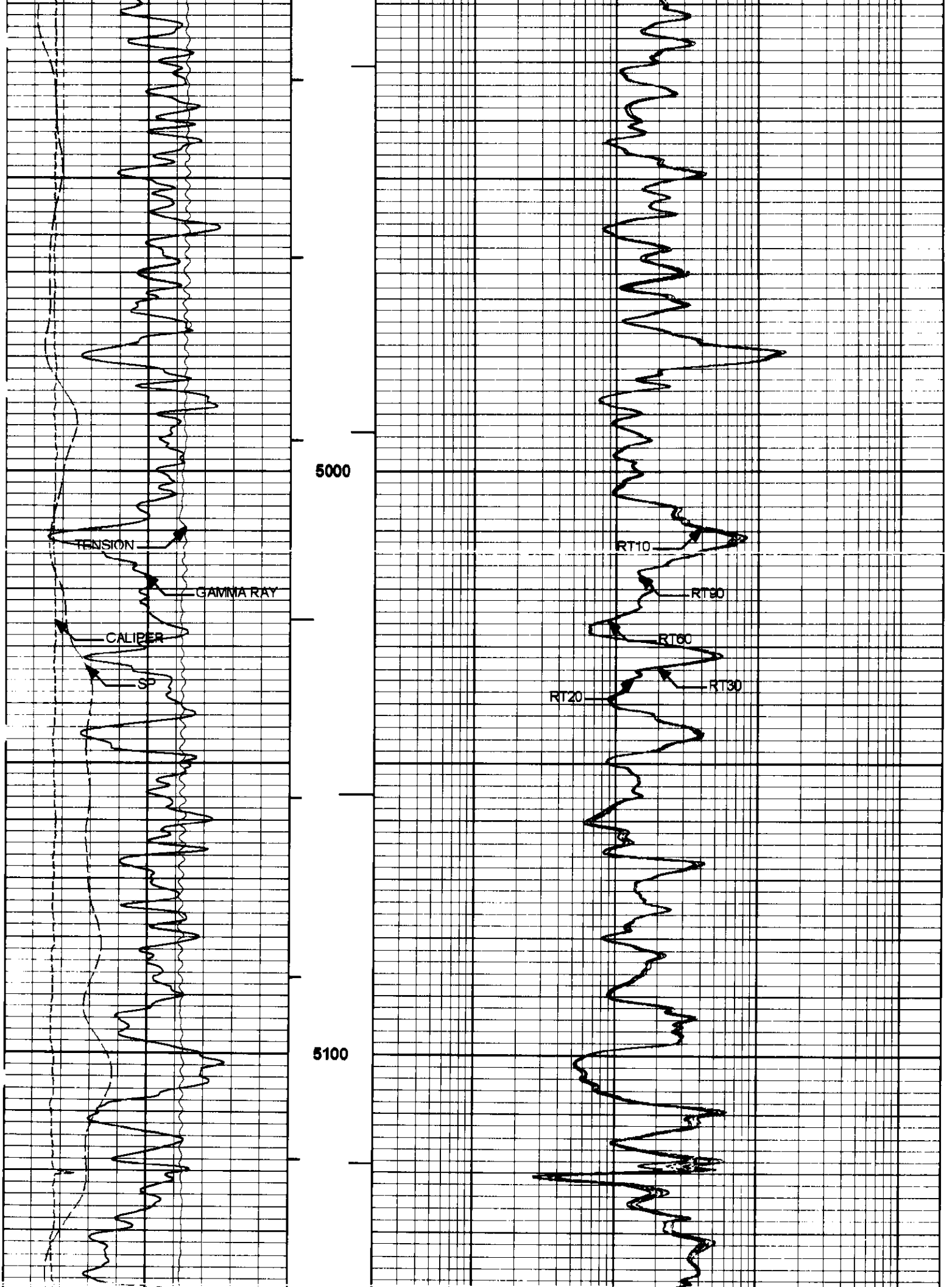

3900
4000
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT10

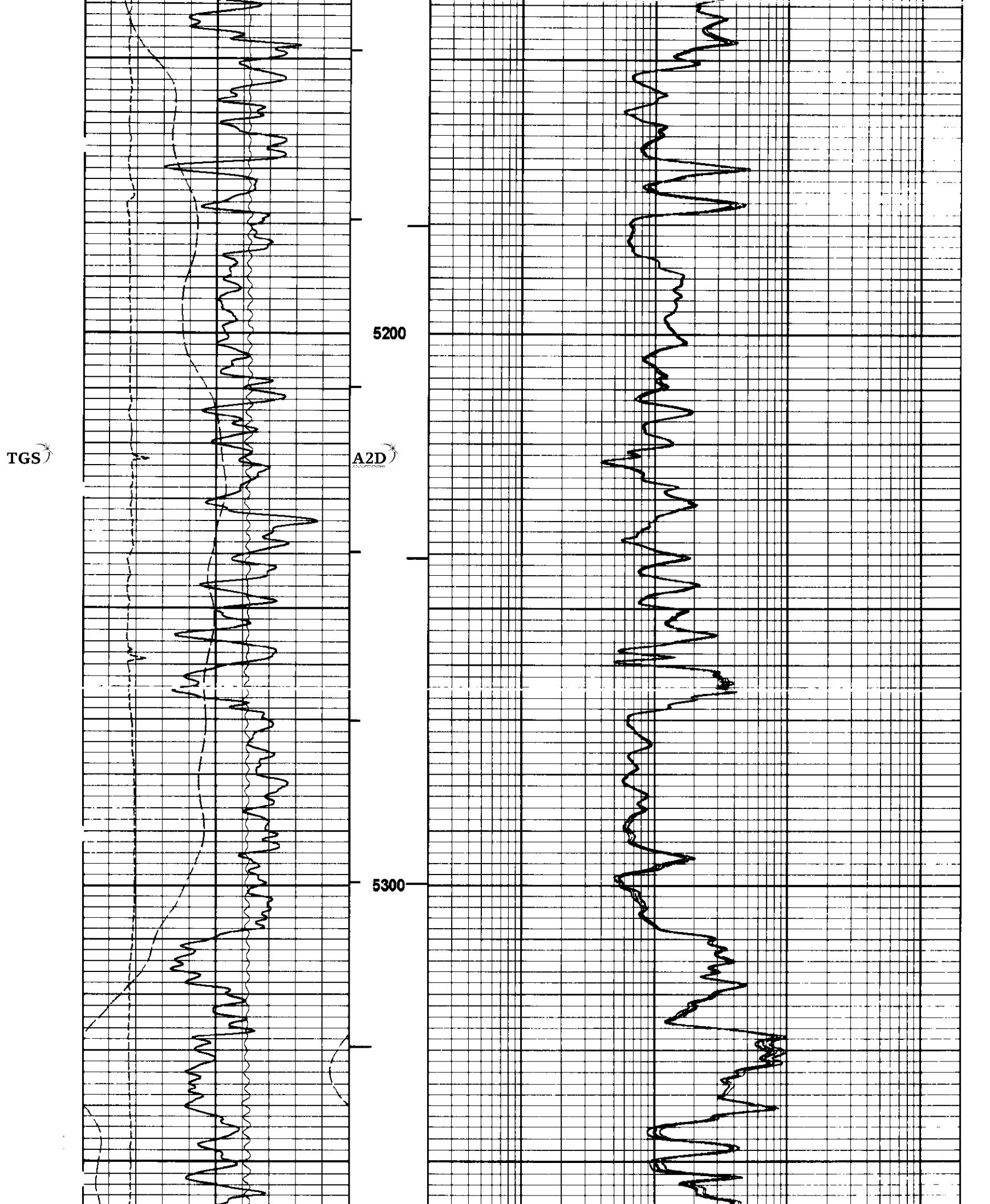

4100
4200
TGS
A2D

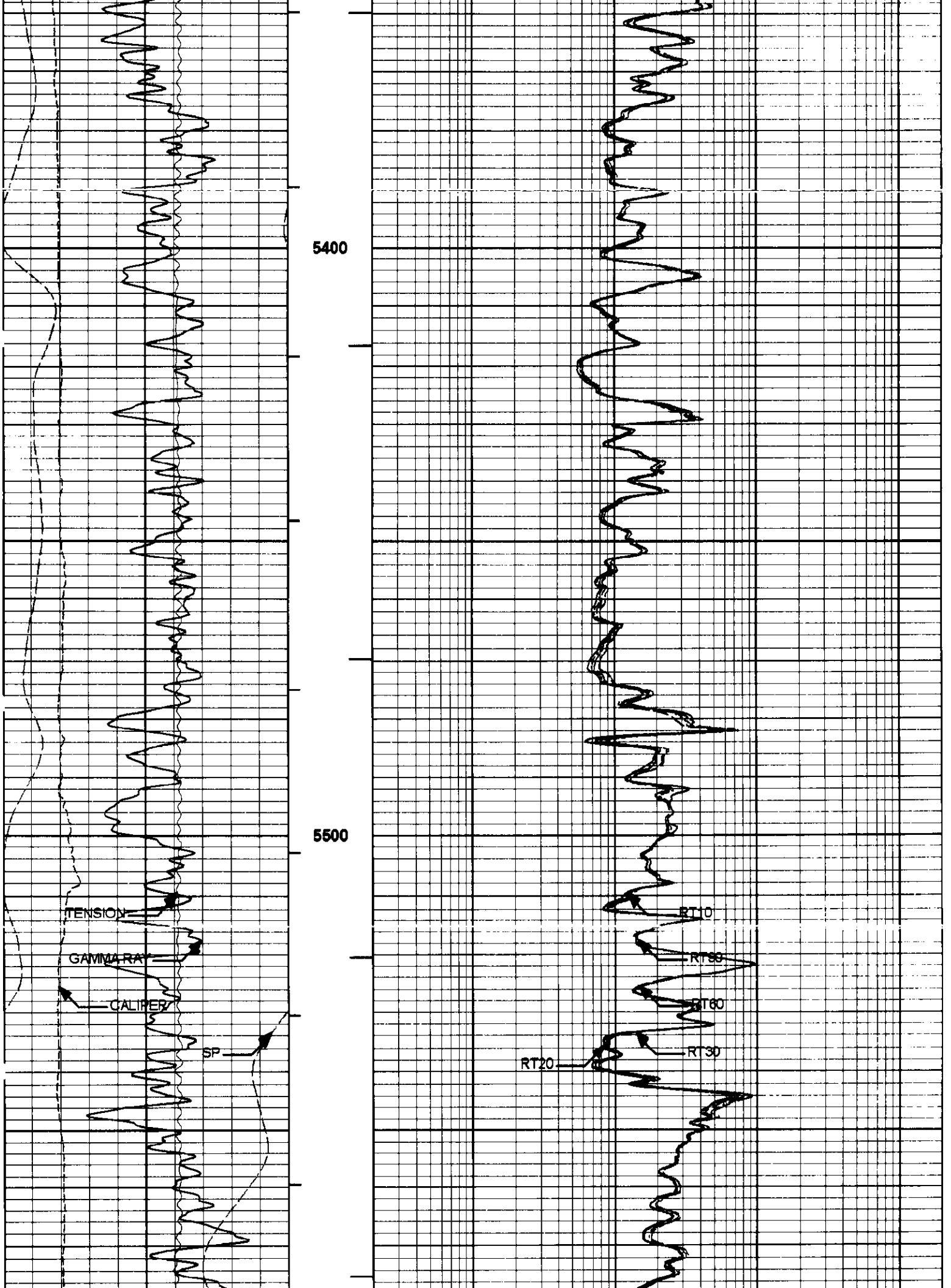

4300
4400

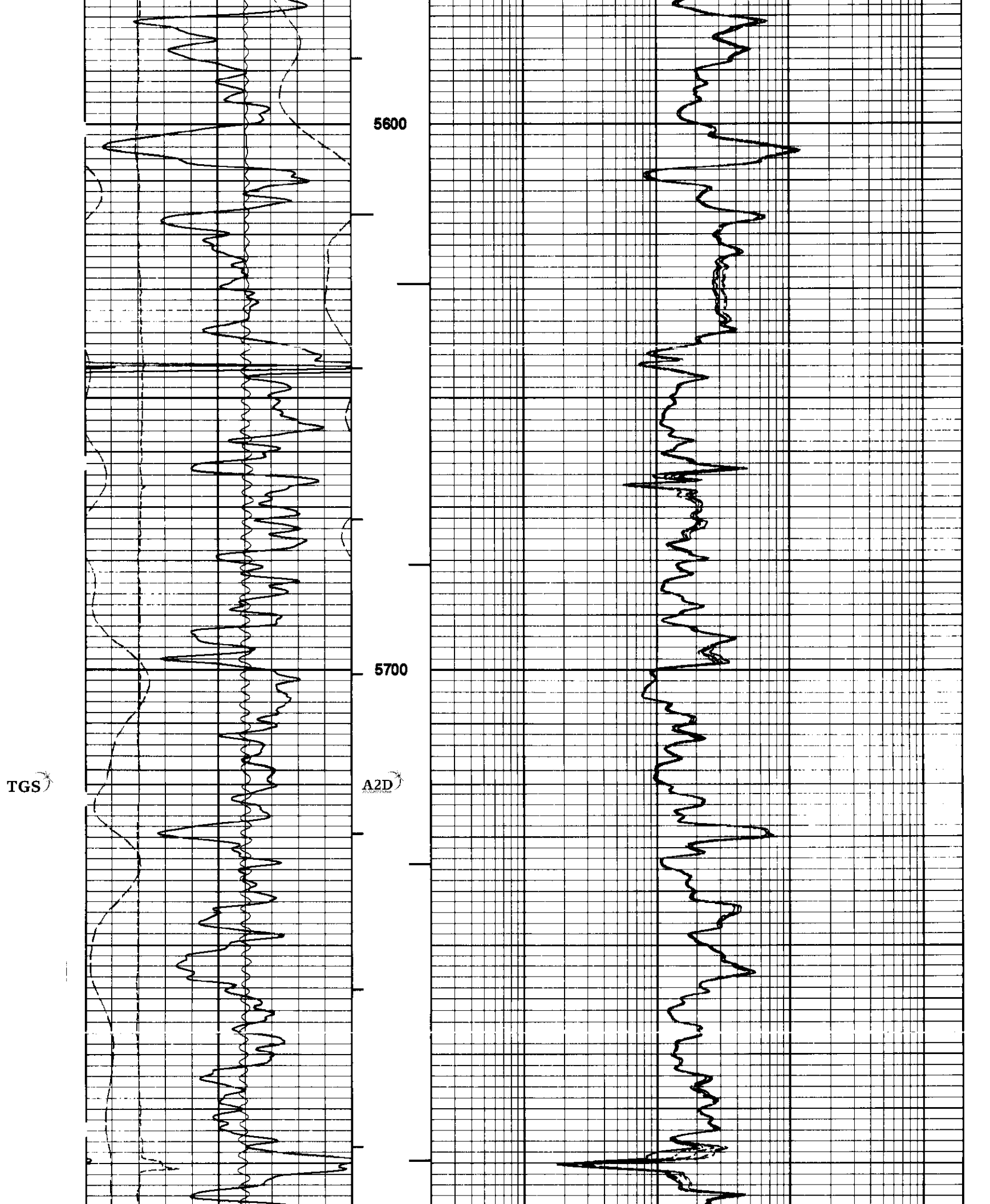

4500
4600
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20

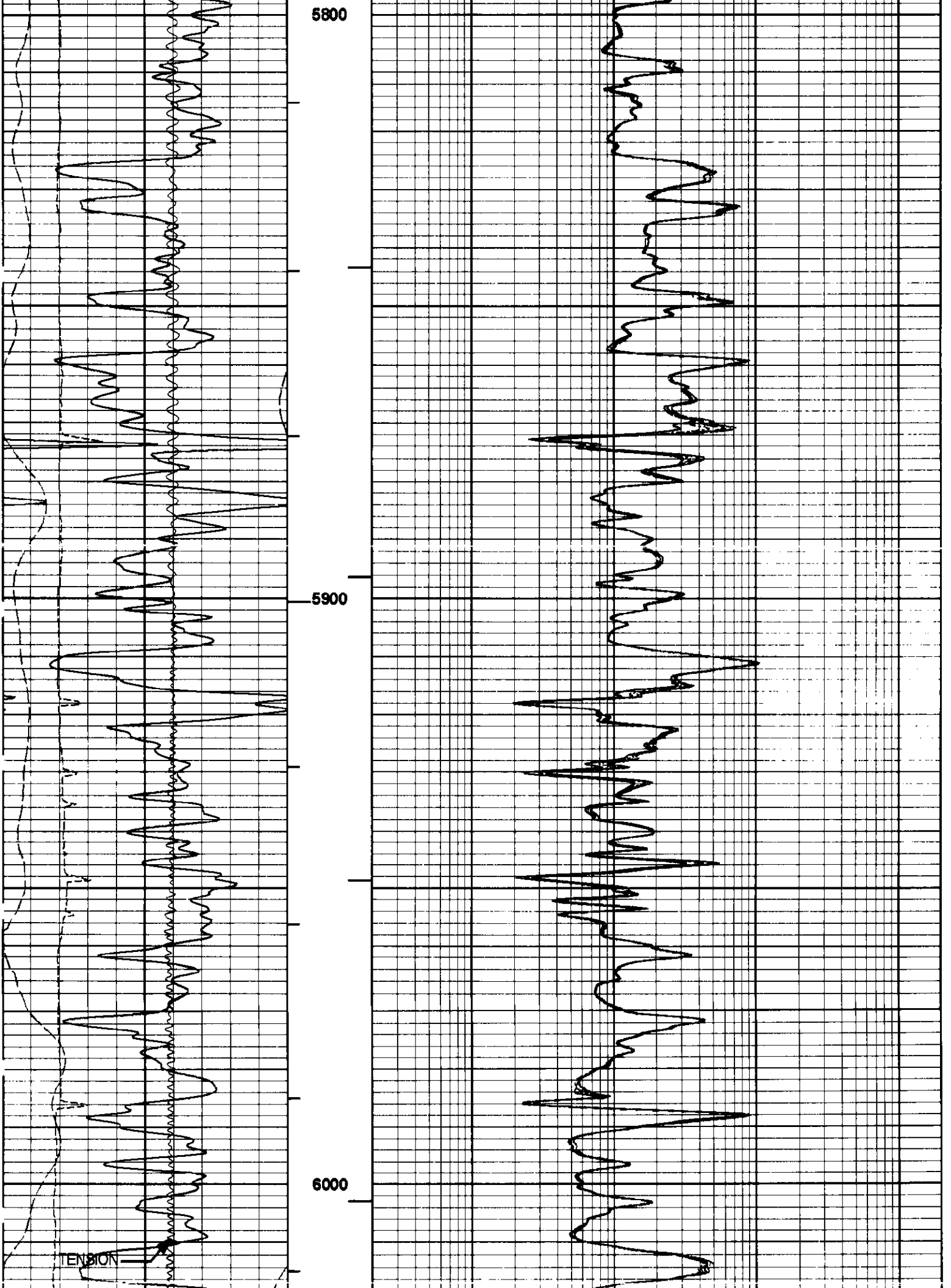

4700
TGS
A2D
4800
4900

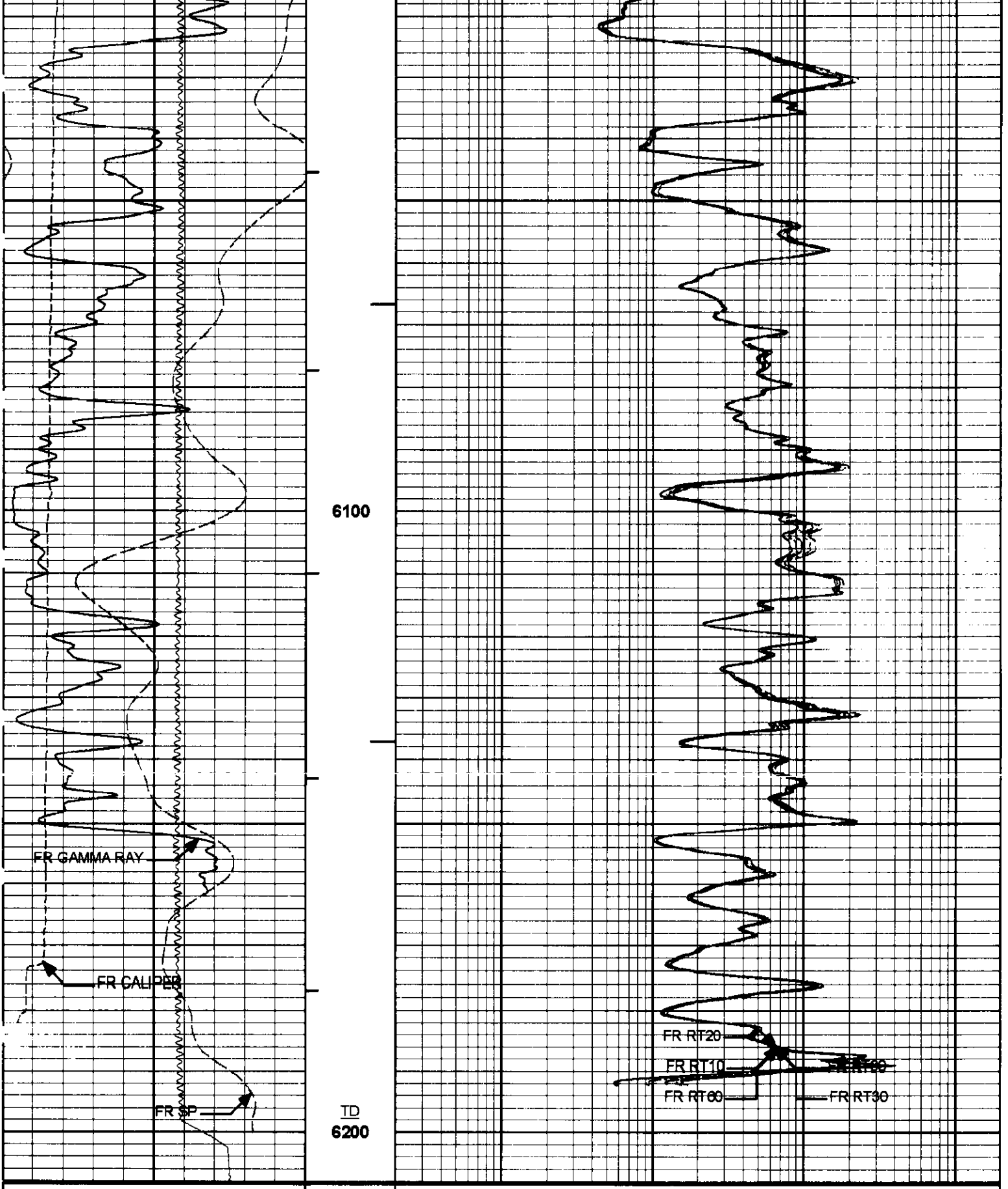

5000
5100
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20


5200
TGS
A2D
5300


5400
5500
TENSION
GAMMA RAY
CALIPER
SP
RT10
RT90
RT60
RT30
RT20


5600
5700
TGS
A2D


5800
5900
6000
TENSION




| | | | | | | |
|---|---|---|---|---|---|---|
| 10000 | TENSION pounds | 0 | 1 : 240 FT. | 0.2 | RT10 ohm-m | 2000 |
| 0 | SP millivolts | 100 | BHV | 0.2 | RT20 ohm-m | 2000 |
| 6 | CALIPER inches | 16 | AHV | 0.2 | RT30 ohm-m | 2000 |

TGS A2D

| | | |
|---|---|---|
| 0 | GAMMA RAY (api) | 200 |
| 0.2 | RT60 (ohm-m) | 2000 |
| 0.2 | RT90 (ohm-m) | 2000 |

**HALLIBURTON**

Plot Time: 08-Apr-10 05:26:06
Plot Range: 470 ft to 6207.92 ft
Data: UTE_TRIBAL_2015\Well Based\DAQ-0001-004\
Plot File: \\ACRT\I_ACRT_5IN_M

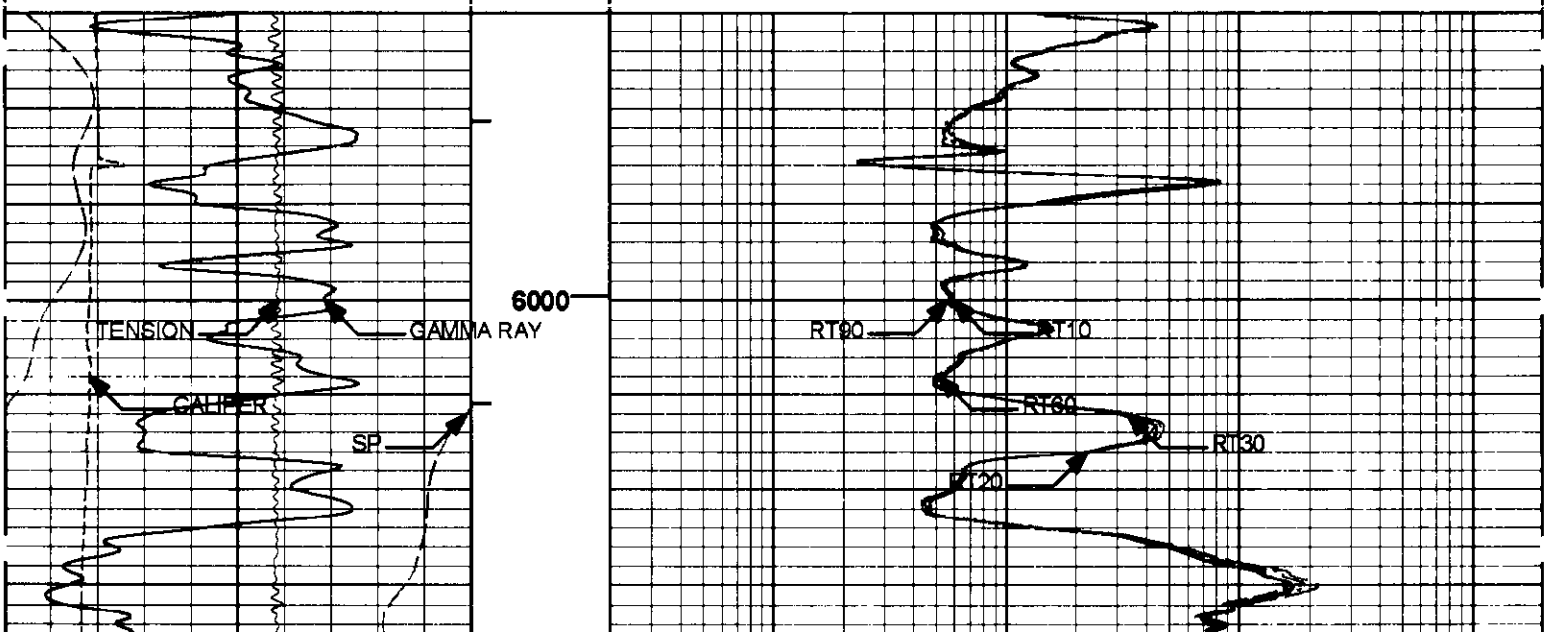
## MAIN PASS 5" = 100'

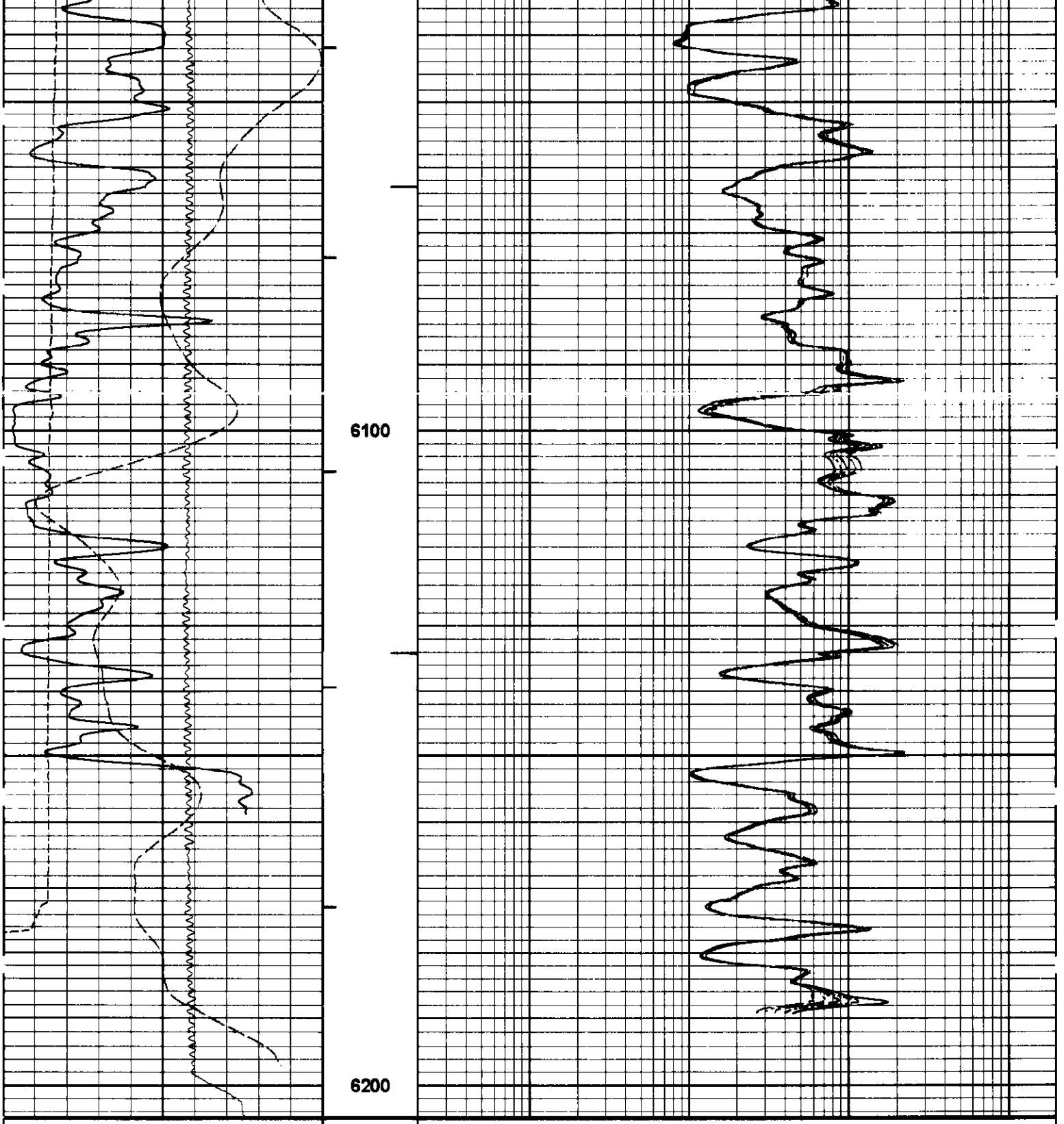
**HALLIBURTON**

Plot Time: 08-Apr-10 05:26:07
Plot Range: 5970 ft to 6204.92 ft
Data: UTE_TRIBAL_2015\Well Based\REPEAT\
Plot File: \\ACRT\I_ACRT_5IN_R

## REPEAT SECTION 5" = 100'

| | | | |
|---|---|---|---|
| 0.2 | RT90 (ohm-m) | | 2000 |
| 0 | GAMMA RAY (api) | | 200 |
| 0.2 | RT60 (ohm-m) | | 2000 |
| 6 | CALIPER (inches) | | 16 |
| 0.2 | RT30 (ohm-m) | AHV | 2000 |
| 0 | SP (millivolts) | | 100 |
| 0.2 | RT20 (ohm-m) | BHV | 2000 |
| 10000 | TENSION (pounds) | | 0 |
| 0.2 | RT10 (ohm-m) | 1 : 240 FT. | 2000 |






| | | | | | | |
|---|---|---|---|---|---|---|
| 10000 | TENSION | 0 | 1 : 240 FT. | 0.2 | RT10 | 2000 |
| | pounds | | | | ohm-m | |
| 0 | SP | 100 | BHV | 0.2 | RT20 | 2000 |
| | millivolts | | | | ohm-m | |
| 6 | CALIPER | 16 | AHV | 0.2 | RT30 | 2000 |
| | inches | | | | ohm-m | |
| 0 | GAMMA RAY | 200 | | 0.2 | RT60 | 2000 |
| | api | | | | ohm-m | |
| | | | | 0.2 | RT90 | 2000 |
| | | | | | ohm-m | |

**HALLIBURTON**

Plot Time: 08-Apr-10 05:26:07
Plot Range: 5970 ft to 6204.92 ft
Data: UTE_TRIBAL_2015\Well Based\REPEAT\
Plot File: \\ACRT\I_ACRT_5IN_R

## REPEAT SECTION 5" = 100'

TGS

**HALLIBURTON**

# CALIBRATION REPORT

## NATURAL GAMMA RAY TOOL SHOP CALIBRATION

| | | | |
|---|---|---|---|
| Tool Name: | GTET - 10842354 | Reference Calibration Date: | 15-Feb-10 17:03:52 |
| Engineer: | J. MELANCON | Calibration Date: | 22-Mar-10 14:12:42 |
| Software Version: | WL INSITE R2.6.1 (Build 9) | Calibration Version: | 1 |

Calibrator Source S/N: TB-549
Calibrator API Reference:240.00 api

| Measurement | Measured | Calibrated | Units |
|---|---|---|---|
| Background | 32.6 | 32.9 | api |
| Background + Calibrator | 270.7 | 272.9 | api |
| Calibrator | 240.3 | 240.0 | api |

## NATURAL GAMMA RAY TOOL FIELD CALIBRATION

| | | | |
|---|---|---|---|
| Tool Name: | GTET - 10842354 | Reference Calibration Date: | 22-Mar-10 14:12:42 |
| Engineer: | J. MELANCON | Calibration Date: | 07-Apr-10 11:09:50 |
| Software Version: | WL INSITE R2.6.1 (Build 9) | Calibration Version: | 1 |

Calibrator Source S/N: TB-549
Calibrator API Reference:240.00 api

| Field Verification | Shop | Field | Units |
|---|---|---|---|
| Background | 32.9 | 28.9 | api |
| Background + Calibrator | 272.9 | 269.6 | api |
| Calibrator | 240.0 | 240.7 | api |

| Shop | Field | Difference | Tolerance |
|---|---|---|---|
| 240.0 | 240.7 | -0.7 | +/- 9.00 |

## DUAL SPACED NEUTRON SHOP CALIBRATION

| | | | |
|---|---|---|---|
| Tool Name: | DSNT - 11277437 | Reference Calibration Date: | 18-Feb-10 10:08:43 |
| Engineer: | M. LECUREUX | Calibration Date: | 23-Mar-10 13:49:05 |
| Software Version: | WL INSITE R2.6.1 (Build 9) | Calibration Version: | 1 |

Logging Source S/N: 08-040
Tank Serial Number: 105045
Reference value assigned to Tank: 52.630
Snow Block S/N: 37526
Calibration Tank Water Temperature: 61 degF
Min. Tool Housing Outside Diameter: 3.625 in

### CALIBRATION CONSTANTS

Control Limit On New

| Measurement | Prev. Value | New Value | Control Limit On New Value |
|---|---|---|---|
| Gain: | 1.006 | 1.004 | 0.900 - 1.100 |

**WATER TANK SUMMARY (Horizontal Water Tank)**

| Measurement | Current Reading (Previous Coef.) | Calibrated (New Coef.) | Change | Control Limit On Change |
|---|---|---|---|---|
| Porosity (decp): | 0.2166 | 0.2162 | 0.0003 | +/- 0.0020 |
| Calibrated Ratio: | 9.92 | 9.91 | 0.011 | +/- 0.050 |

**VERIFIER**

| Measurement | Value | Control Limit |
|---|---|---|
| Snow-Block Porosity (decp): | 0.0787 | 0.02000 - 0.09000 |

**PASS/FAIL SUMMARY**

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

## DUAL SPACED NEUTRON FIELD CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | **DSNT - 11277437** | **Reference Calibration Date:** | **23-Mar-10 13:49:05** |
| **Engineer:** | **J. MELANCON** | **Calibration Date:** | **07-Apr-10 11:20:07** |
| **Software Version:** | **WL INSITE R2.6.1 (Build 9)** | **Calibration Version:** | **1** |

Logging Source S/N: 08-040
Snow Block S/N: 37526

**NEUTRON FIELD-CHECK SUMMARY**

| | Shop | Field | Difference | Control Limit On Change |
|---|---|---|---|---|
| Snow-Block Porosity (decp): | 0.0787 | 0.0691 | -0.0095 | +/- 0.0150 |

**PASS/FAIL SUMMARY**

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

## SPECTRAL DENSITY SHOP CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | **SDLT - 11107339** | **Reference Calibration Date:** | **15-Feb-10 16:29:03** |
| **Engineer:** | **M. LECUREUX** | **Calibration Date:** | **23-Mar-10 11:25:04** |
| **Software Version:** | **WL INSITE R2.6.1 (Build 9)** | **Calibration Version:** | **1** |

Logging Source S/N: 24520B

| | | |
|---|---|---|
| Aluminum Block S/N: 8261 | Density: 2.602g/cc | Pe: 3.100 |
| Magnesium Block S/N: 8260 | Density: 1.688g/cc | Pe: 2.594 |

**DENSITY CALIBRATION SUMMARY**

| Measurement | Previous Value | New Value | Control Limit |
|---|---|---|---|
| Near Bar Gain | 1.0673 | 1.0998 | 0.90 - 1.10 |
| Near Dens Gain | 1.0039 | 1.0251 | 0.90 - 1.10 |
| Near Peak Gain | 0.9949 | 1.0278 | 0.90 - 1.10 |
| Near Lith Gain | 0.9893 | 0.9892 | 0.90 - 1.10 |
| Far Bar Gain | 1.0109 | 1.0119 | 0.90 - 1.10 |
| Far Dens Gain | 0.9995 | 0.9997 | 0.90 - 1.10 |
| Far Peak Gain | 0.9904 | 0.9903 | 0.90 - 1.10 |
| Far Lith Gain | 0.9704 | 0.9726 | 0.90 - 1.10 |

| | | | |
|---|---|---|---|
| Near Bar Offset | -0.5125 | -0.8019 | NONE |
| Near Dens Offset | 0.0930 | -0.0911 | NONE |
| Near Peak Offset | 0.1702 | -0.1039 | NONE |
| Near Lith Offset | 0.3420 | 0.1816 | NONE |
| Far Bar Offset | -0.0747 | -0.0690 | NONE |
| Far Dens Offset | 0.0307 | 0.0399 | NONE |
| Far Peak Offset | 0.0986 | 0.1122 | NONE |
| Far Lith Offset | 0.2161 | 0.2128 | NONE |
| Near Bar Background | 1134.11 | 1135.31 | 700 - 1450 |
| Near Dens Background | 375.96 | 372.20 | 230 - 480 |
| Near Peak Background | 160.75 | 161.27 | 100 - 210 |
| Near Lith Background | 198.79 | 198.46 | 125 - 260 |
| Far Bar Background | 547.50 | 547.56 | 450 - 900 |
| Far Dens Background | 220.30 | 218.91 | 175 - 345 |
| Far Peak Background | 86.53 | 86.85 | 70 - 140 |
| Far Lith Background | 88.84 | 89.87 | 75 - 145 |

**CALIBRATION BLOCK SUMMARY**

| Measurement | Current Reading (Previous Coef) | Calibrated (New Coef) | Change | Control Limit On Change |
|---|---|---|---|---|
| MAGNESIUM | | | | |
| Density (g/cc) | 1.689 | 1.688 | -0.001 | +/- 0.015 |
| Pe | 2.583 | 2.594 | 0.011 | +/- 0.150 |
| ALUMINUM | | | | |
| Density (g/cc) | 2.609 | 2.602 | -0.007 | +/- 0.01500 |
| Pe | 3.084 | 3.100 | 0.016 | +/- 0.150 |

TGS A2D

**TOOL SUMMARY**

| Measurement | Near Detector | | Far Detector | |
|---|---|---|---|---|
| | Value | Control Limits | Value | Control Limits |
| QUALITY | | | | |
| Background | -0.0009 | +/- 0.0110 | -0.0019 | +/- 0.0140 |
| Magnesium Block | -0.0006 | +/- 0.0110 | -0.0004 | +/- 0.0140 |
| Aluminum Block | -0.0011 | +/- 0.0110 | 0.0006 | +/- 0.0140 |
| Resolution | 9.29 | 6.00 - 11.50 | 9.00 | 6.00 - 11.50 |
| Internal Verifier(B+D+P+L) | 1867 | 1200 - 2700 | 941 | 800 - 1700 |

**PASS/FAIL SUMMARY**

| | |
|---|---|
| Background Quality Check: | Passed |
| Background Range Check: | Passed |
| Background Resolution Check: | Passed |
| Background Verification Check: | Passed |
| Magnesium Quality Check: | Passed |
| Aluminum Quality Check: | Passed |
| Gains Check: | Passed |
| Changes in Calibration Blocks: | Passed |

## SPECTRAL DENSITY FIELD CHECK

| | | | |
|---|---|---|---|
| **Tool Name:** | **SDLT - 11107339** | **Reference Calibration Date:** | **23-Mar-10 11:25:04** |
| **Engineer:** | **J. MELANCON** | **Calibration Date:** | **07-Apr-10 11:10:21** |
| **Software Version:** | **WL INSITE R2.6.1 (Build 9)** | **Calibration Version:** | **1** |

Pad Temperature: 61.1 degF

## DENSITY FIELD CALIBRATION SUMMARY

| Measurement | Shop | Field | Change | Control Limit +/- |
|---|---|---|---|---|
| Near (B+D+P+L) cps | 1867.239 | 1864.974 | -2.265 | 17.296 |
| Far (B+D+P+L) cps | 941.198 | 941.626 | 0.428 | 16.570 |
| Near Resolution | 9.29 | 9.27 | -0.020 | 0.50 |
| Far Resolution | 9.00 | 8.94 | -0.060 | 1.00 |

### PASS/FAIL SUMMARY

| | |
|---|---|
| Bkg Quality Check: | Passed |
| Bkg Resolution Check: | Passed |
| Bkg Verification Check: | Passed |

## DENSITY CALIPER SHOP CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | SDLT - 11107339 | **Reference Calibration Date:** | 23-Mar-10 13:22:02 |
| **Engineer:** | M. LECUREUX | **Calibration Date:** | 23-Mar-10 13:27:40 |
| **Software Version:** | WL INSITE R2.6.1 (Build 9) | **Calibration Version:** | 1 |

### CALIBRATION COEFFICIENTS

| Measurement | Previous Value | New Value | Control Limit On New Value |
|---|---|---|---|
| Pad Offset | -1187.39 | -1183.92 | -7000.00 - -1000.00 |
| Pad Gain | 0.0003875 | 0.0003872 | 0.000200 - 0.000600 |
| Arm Offset | -4070.46 | -4133.68 | -5000.00 - 3000.00 |
| Arm Gain | 0.0005166 | 0.0005077 | 0.000300 - 0.000700 |
| Arm Power | -0.000002759 | -0.000001981 | -0.000010 - 0.000010 |

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

### CALIBRATION RINGS

| Measurement | Current Reading (Previous Coeff.) | Calibrated (New Coeff.) | Change | Control Limit On New Value |
|---|---|---|---|---|
| PAD EXTENSION: | | | | |
| Small Ring (in) | 2.00 | 2.00 | 0.00 | +/- 0.20 |
| Medium Ring (in) | 3.75 | 3.75 | 0.00 | +/- 0.20 |
| RING DIAMETER: | | | | |
| Small Ring (in) | 6.55 | 6.50 | -0.05 | +/- 0.20 |
| Medium Ring (in) | 8.32 | 8.25 | -0.07 | +/- 0.20 |
| Large Ring (in) | 15.03 | 15.00 | -0.03 | +/- 0.20 |

### PASS/FAIL SUMMARY

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

### PASS/FAIL SUMMARY

| | |
|---|---|
| Calibration-Coefficients Range Check: | Passed |

## SDLT CALIPER FIELD CALIBRATION

| | | | |
|---|---|---|---|
| **Tool Name:** | SDLT - 11107339 | **Reference Calibration Date:** | 23-Mar-10 13:27:40 |
| **Engineer:** | J. MELANCON | **Calibration Date:** | 07-Apr-10 11:14:17 |
| **Software Version:** | WL INSITE R2.6.1 (Build 9) | **Calibration Version:** | 1 |

### MEASURED CALIPER VALUES

| Measurement | Shop | Field | Change | Control Limit On New Value |
|---|---|---|---|---|
| Pad Extension | 3.75 | 3.79 | 0.04 | +/- 0.10 |

| | | | | |
|---|---|---|---|---|
| Ring Diameter | 8.25 | 8.29 | 0.04 | +/- 0.15 |

**PASS/FAIL SUMMARY**

| | |
|---|---|
| Pad Extension Check: | Passed |
| Diameter Check: | Passed |

## ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

| | | | |
|---|---|---|---|
| Tool Name: | ACRt - I907S909 | Reference Calibration Date: | 03-Dec-09 10:32:48 |
| Engineer: | M. LECUREUX | Calibration Date: | 03-Dec-09 10:43:58 |
| Software Version: | WL INSITE R2.5.1 (Build 3) | Calibration Version: | 1 |

### TYPICAL GAIN RANGE

| Subarray | R12KHz | | | R36KHz | | | R72KHz | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper |
| A1 (80") | 0.95 | 0.9986 | 1.05 | 0.95 | 1.0051 | 1.05 | 0.95 | 1.0102 | 1.05 |
| A2 (50") | 0.95 | 0.9997 | 1.05 | 0.95 | 1.0060 | 1.05 | 0.95 | 1.0134 | 1.05 |
| A3 (29") | 0.95 | 0.9970 | 1.05 | 0.95 | 1.0022 | 1.05 | 0.95 | 1.0059 | 1.05 |
| A4 (17") | 0.95 | 1.0007 | 1.05 | 0.95 | 1.0037 | 1.05 | 0.95 | 1.0097 | 1.05 |
| A5 (10") | N/A | N/A | N/A | 0.95 | 0.9863 | 1.05 | 0.95 | 0.9918 | 1.05 |
| A6 (6") | N/A | N/A | N/A | 0.95 | 0.9730 | 1.05 | 0.95 | 0.9775 | 1.05 |

### TYPICAL SONDE OFFSET RANGE

| Subarray | R12KHz | | | R36KHz | | | R72KHz | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper | Lower | (mmho/m) | Upper |
| A1 (80") | -5 | -1.237 | 2 | -6 | -4.451 | -2 | -8 | -5.001 | -2 |
| A2 (50") | -7 | -2.254 | -2 | -6 | -4.437 | -2 | -7 | -4.136 | -2 |
| A3 (29") | -27 | -12.098 | -9 | -9 | -3.045 | -3 | -7 | -3.124 | -1 |
| A4 (17") | -180 | -89.281 | -60 | -45 | -29.477 | -15 | -39 | -24.261 | -13 |
| A5 (10") | N/A | N/A | N/A | -150 | -75.639 | -50 | -80 | -38.309 | -10 |
| A6 (6") | N/A | N/A | N/A | 175 | 313.523 | 525 | 90 | 159.457 | 270 |

### TRANSMITTER CURRENT GAIN

| Signal | Lower | R | Upper |
|---|---|---|---|
| 12K | 0.6 | 0.9205 | 1.3 |
| 36K | 1.0 | 1.4037 | 2.0 |
| 72K | 1.0 | 1.6527 | 2.0 |

### R-MUD VERIFICATION

| Signal | Lower (ohm-m) | Measured (ohm-m) | Upper (ohm-m) |
|---|---|---|---|
| Mud Cell | 0.95 | 1.000 | 1.05 |

TGS A2D

### CALIBRATION SUMMARY

| Sensor | Shop | Field | Post | Difference | Tolerance | Units |
|---|---|---|---|---|---|---|
| **GTET-10842354** | | | | | | |
| Gamma Ray Calibrator | 240.0 | 240.7 | ---------- | -0.7 | +/- 9.00 | api |
| **DSNT-11277437** | | | | | | |
| Snow-Block Porosity | 0.0787 | 0.0691 | ---------- | 0.0096 | +/- 0.0150 | decp |
| **SDLT-11107339** | | | | | | |
| Near(B+D+P+L) | 1867.239 | 1864.974 | ---------- | 2.265 | +/-17.296 | cps |
| Far(B+D+P+L) | 941.198 | 941.626 | ---------- | -0.428 | +/-16.570 | cps |
| Pad Extension | 3.75 | 3.79 | ---------- | -0.04 | +/-0.10 | in |
| Ring Diameter | 8.25 | 8.29 | ---------- | -0.040 | +/-0.15 | in |
| **ACRt-I907S909** | | | | | | |
| Mud Cell | 1.000 | ---------- | ---------- | 0.000 | ---------- | ohm-m |

**HALLIBURTON**

## CUSTOMER EVENT LOG

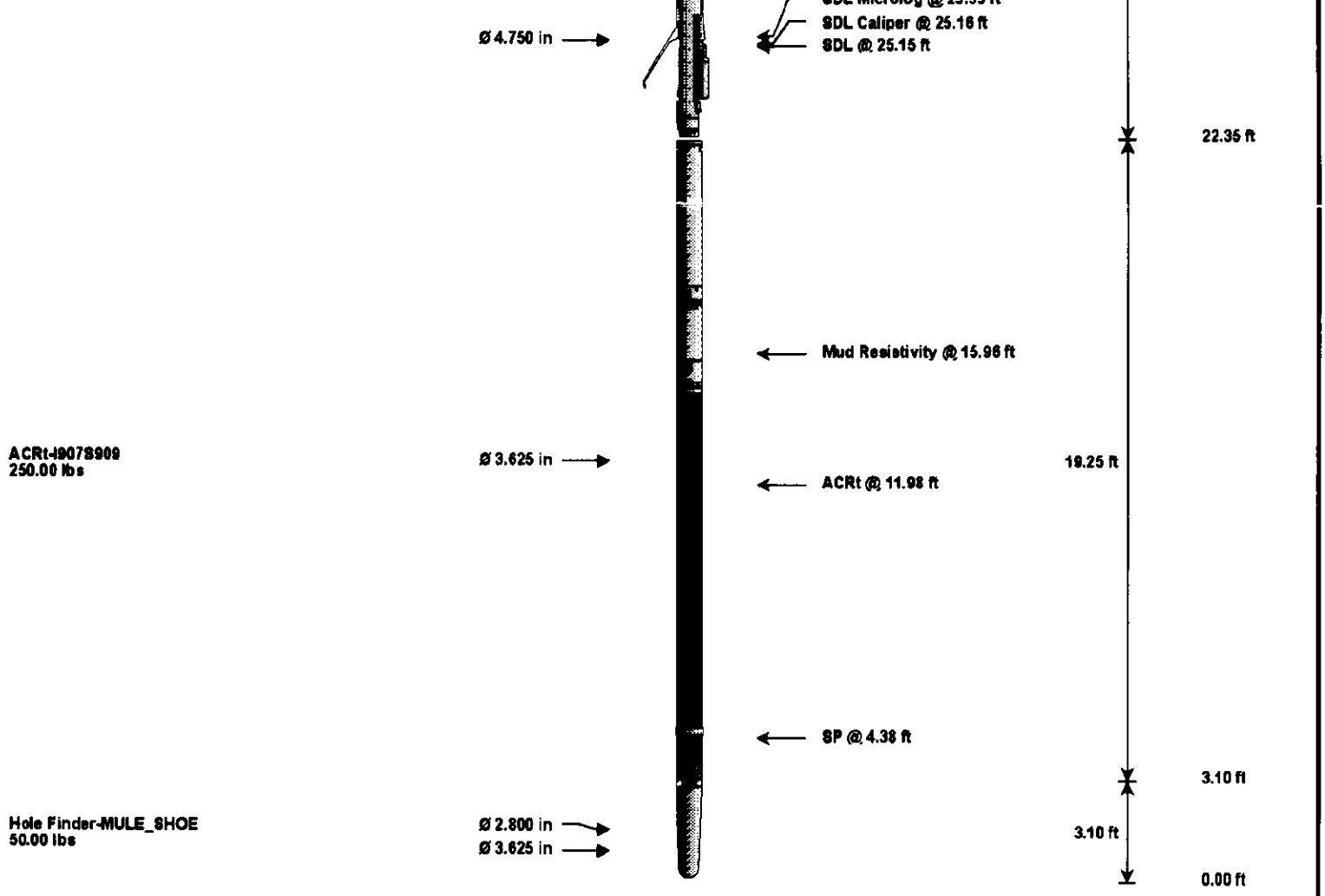
| Event Type | Time & Date | Depth (ft) | Event Description |
|---|---|---|---|
| | 08-Apr-10 02:26:22 | 803.50 | Logging 001 08-Apr-10 02:26 Up @803.5f |
| | 08-Apr-10 02:33:49 | 473.05 | Halting 001 08-Apr-10 02:26 Up @803.5f |
| | 08-Apr-10 02:35:09 | 413.25 | Logging 002 08-Apr-10 02:35 Dn @413.3f |
| | 08-Apr-10 03:12:22 | 6184.82 | Halting 002 08-Apr-10 02:35 Dn @413.3f |
| | 08-Apr-10 03:13:16 | 6205.00 | Logging 003 08-Apr-10 03:13 Up @6205.0f |
| | 08-Apr-10 03:22:28 | 5969.82 | Halting 003 08-Apr-10 03:13 Up @6205.0f |
| | 08-Apr-10 03:27:02 | 6208.25 | Logging 004 08-Apr-10 03:27 Up @6208.3f |
| | 08-Apr-10 05:21:23 | 87.69 | Halting 004 08-Apr-10 03:27 Up @6208.3f |

Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\HW11174 Date: 08-Apr-10 05:25:17

**HALLIBURTON**

## TOOL STRING DIAGRAM REPORT

| Description | O.D. | Sensors @ Delays | Length | Accumulated Length |
|---|---|---|---|---|
| | | | | 57.62 ft |
| RWCH-C089<br>135.00 lbs | Ø 3.625 in | Load Cell @ 53.94 ft<br>BH Temperature @ 53.37 ft | 6.25 ft | |
| | | | | 51.37 ft |
| GTET-10842354<br>165.00 lbs | Ø 3.625 in | GammaRay @ 45.31 ft | 8.52 ft | |
| | | | | 42.85 ft |
| DSNT-11277437<br>174.00 lbs | Ø 3.625 in | DSN Far @ 35.91 ft<br>DSN Near @ 35.16 ft | 9.69 ft | |
| | | | | 33.16 ft |
| SDLT-11107339<br>360.00 lbs | Ø 4.500 in | SDL Microlog @ 25.35 ft | 10.81 ft | |




| Mnemonic | Tool Name | Serial Number | Weight (lbs) | Length (ft) | Accumulated Length (ft) | Max Log. Speed (fpm) |
|---|---|---|---|---|---|---|
| RWCH | Releasable Wireline Cable Head | C089 | 135.00 | 6.25 | 51.37 | 300.00 |
| GTET | Gamma Telemetry Tool | 10842354 | 165.00 | 8.52 | 42.85 | 60.00 |
| DSNT | Dual Spaced Neutron | 11277437 | 174.00 | 9.69 | 33.16 | 60.00 |
| SDLT | Spectral Density Tool | 11107339 | 360.00 | 10.81 | 22.35 | 60.00 |
| ACRt | Array Compensated True Resistivity | I907S909 | 250.00 | 19.25 | 3.10 | 300.00 |
| SP | SP Ring | 1 | 0.00 | 0.25 * | 4.38 | 300.00 |
| HFND | Hole Finder | MULE_SHOE | 50.00 | 3.10 | 0.00 | 300.00 |
| Total | | | 1,134.00 | 57.62 | | |

* Not included in Total Length and Length Accumulation.

Data: UTE_TRIBAL_2015\0001 LOGIQ TRIPLE\004 08-Apr-10 03:27 Up @6208.3f

Date: 08-Apr-10 04:32:14

| | | | |
|---|---|---|---|
| COMPANY | PETROGLYPH OPERATING COMPANY | | |
| WELL | UTE TRIBAL 20-15 | | |
| FIELD | ANTELOPE CREEK | | |
| COUNTY | DUCHESNE | STATE | UTAH |

**HALLIBURTON**

ARRAY COMPENSATED
TRUE RESISTIVITY

ATTACHMENT NO. 9

LIST OF OWNERS AND AFFIDAVIT NOTIFICATION

## AFFIDAVIT OF MAILING

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

Dated on this 24th day of July, 2015

Kevin Dickey

Vice President, Operations

Petroglyph Energy

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

This 24 day of July, 2015.

EDNA SYES NOTARY PUBLIC STATE OF IDAHO

Edna Syes

Notary Public

**PETROGLYPH** EXECUTIVE OFFICES

July 24th, 2015

**Mineral, Surface, and Working Interest Owners**

To Whom It May Concern,

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

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

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

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

Sincerely,

Kevin Dickey

Vice President, Operations, Petroglyph Energy

Enclosure

**PETROGLYPH OPERATING COMPANY, INC.**

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

**ANTELOPE CREEK FIELD**

**WELLS TO BE CONVERTED TO INJECTION**

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

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

United States Environmental Protection Agency

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**XIV. Certification**

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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | T/A | C |
|---|---|---|
| U | | |

*Read Attached instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

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<br>Ute Tribal 08-11 |

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

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

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

EPA

United States Environmental Protection Agency

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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

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<br>Ute Tribal 09-01 |

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

*(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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | T/A | C |
|---|---|---|
| U | | |

*Read Attached instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**XIV. Certification**

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

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

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

C. Signature:

D. Date Signed: 07/27/2015

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<br>Ute Tribal 17-04 |

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**XIV. Certification**

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

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

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

C. Signature:

D. Date Signed: 07/27/2015

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

EPA

United States Environmental Protection Agency

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**XIV. Certification**

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

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

EPA

United States Environmental Protection Agency

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | T/A | C |
|---|---|---|
| U | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | T/A | C |
|---|---|---|
| U | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

United States Environmental Protection Agency

# 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<br>Ute Tribal 31-05 |

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

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

United States Environmental Protection Agency

# 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<br>Ute Tribal 31-07 |

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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)* | B. Phone No. *(Area Code and No.)* |
|---|---|
| Kevin Dickey, Vice President, Operations | (208) 685-7600 |
| C. Signature | D. Date Signed: 07/27/2015 |

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

EPA

United States Environmental Protection Agency

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

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

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**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

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

United States Environmental Protection Agency

EPA

# Underground Injection Control Permit Application

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

**I. EPA ID Number**

| | | T/A | C |
|---|---|---|---|
| U | | | |

*Read Attached Instructions Before Starting*

**For Official Use Only**

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

**II. Owner Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**III. Operator Name and Address**

Owner Name: Petroglyph Energy, Inc.

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

Phone Number: (208) 685-7600

City: Boise State: ID ZIP CODE: 83707

**IV. Commercial Facility**

- [ ] Yes
- [x] No

**V. Ownership**

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

**VI. Legal Contact**

- [ ] Owner
- [x] Operator

**VII. SIC Codes**

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

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

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

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

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

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

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

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

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

**XII. Indian Lands (Mark 'x')**

- [x] Yes
- [ ] No

**XIII. Attachments**

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

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

**XIV. Certification**

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

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

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

C. Signature: Kevin Dickey

D. Date Signed: 07/27/2015

ATTACHMENT NO. 10

WELL BORE DIAGRAMS FOR THE UIC WELL

# Ute Tribal 20-15 Well History

**Well History:**

Spud Well: 3/28/2010

Completed: 5/5/2010

First Production: 5/5/2010

**Tops (KB):**

**BMSW* Found at 1489'**

Green River 1504'

**A Marker 4042'**

X Marker 4531'

Douglas Creek 4672'

B Limestone 5048'

Castle Peak 5545'

**Basal Carbonate 6024'**

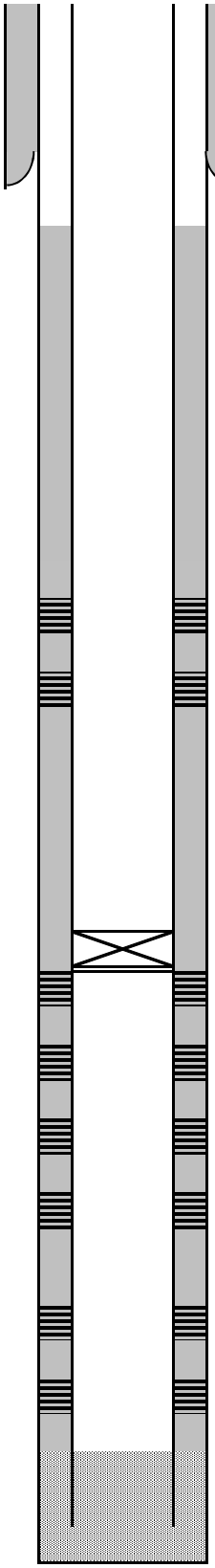
**Perf History**

4/20/2010

| | |
|---|---|
| B06 | 4240' to 4244' |
| B06 | 4250' to 4256' |
| B08.1 | 4363' to 4365' |
| C04 | 4710' to 4714' |
| C06 | 4868' to 4877' |
| C09.1 | 4978' to 4981' |
| D3 | 5132' to 5139' |
| D3 | 5142' to 5146' |

4/23/2010

| | |
|---|---|
| BP | at 5120' |



GL: 6475'

KB: 6489'

8 5/8" 24# Surface CSG @ 514' KB

cmt'd w/395sx

Surface Hole size 12 1/4"

Cement top @ 770'

5 1/2" 15.5# J-55 CSG @ 6196'

cmt'd w/865 sx

Hole Size 7 7/8" bit

Perf's:

B06 4240' to 4244'

B06 4250' to 4256'

B08.1 4363' to 4365'

C04 4710' to 4714'

C06 4868' to 4877'

C09.1 4978' to 4981'

BP @ 5120'

D3 5132' to 5139'

D3 5142' to 5146'

PBTD @ 6136' KB

TD @ 6197' KB

(Not to Scale)

Petroglyph Operating Co., Inc.

Ute Tribal #20-15

(1806' FEL 574' FSL)

SW SE Section 20, 5S- 3W

Antelope Creek Field

Duchesne Co. Utah

API#: 43013340510000

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

# Ute Tribal 20-15 Injection

**Well History:**

Spud Well: 3/28/2010

Completed: 5/5/2010

First Production: 5/5/2010

**Tops (KB):**

**BMSW* Found at 1489'**

Green River 1504'

**A Marker 4042'**

X Marker 4531'

Douglas Creek 4672'

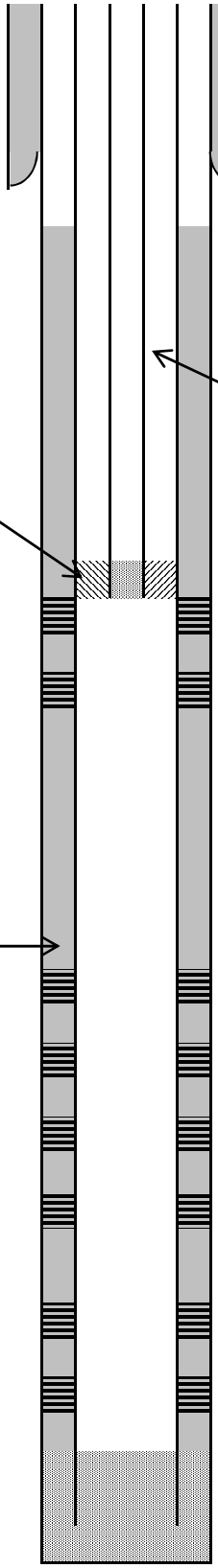
B Limestone 5048'

Castle Peak 5545'

**Basal Carbonate 6024'**

Injection packer @ 4118'

Remove BP @ 5120'



GL: 6475'

KB: 6489'

8 5/8" 24# Surface CSG @ 514' KB

cmt'd w/395sx

Surface Hole size 12 1/4"

Cement top @ 770'

5 1/2" 15.5# J-55 CSG @ 6196'

cmt'd w/865 sx

Tubing 2 7/8" 6.5# J55

Hole Size 7 7/8" bit

Perf's:

Add B05 4208' to 4219'

B06 4240' to 4244'

B06 4250' to 4256'

B08.1 4363' to 4365'

Add B08.1 4369' to 4371'

Add B10 4449' to 4458'

Add C04 4708' to 4710'

C04 4710' to 4714'

C06 4868' to 4877'

C09.1 4978' to 4981'

D3 5132' to 5139'

D3 5142' to 5146'

PBTD @ 6136' KB

TD @ 6197' KB

Petroglyph Operating Co., Inc.

Ute Tribal #20-15

(1806' FEL 574' FSL)

SW SE Section 20, 5S- 3W

Antelope Creek Field

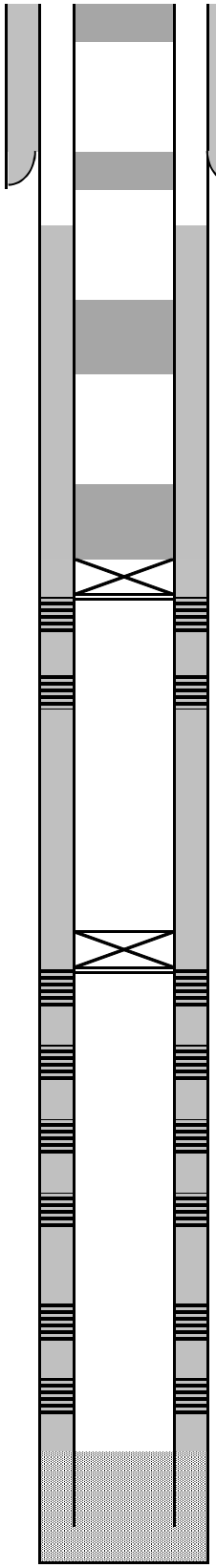
Duchesne Co. Utah

API#: 43013340510000

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

(Not to Scale)

# Ute Tribal 20-15 Plug and Abandonment



GL: 6475'
KB: 6489'

8sx Class G Cement-50' plug

8 5/8" 24# Surface CSG @ 514' KB
cmt'd w/395sx

15sx Class G Cement-100' plug

Surface Hole size 12 1/4"

Cement top @ 770'
5 1/2" 15.5# J-55 CSG @ 6196'
cmt'd w/865 sx

30sx Class G Cement-200' plug

Hole Size 7 7/8" bit

30sx Class G Cement-200' plug
CIBP @ 4150'

Perf's:
B06 4240' to 4244'
B06 4250' to 4256'
B08.1 4363' to 4365'
C04 4710' to 4714'
C06 4868' to 4877'
C09.1 4978' to 4981'
BP @ 5120'
D3 5132' to 5139'
D3 5142' to 5146'

PBTD @ 6136' KB
TD @ 6197' KB

Petroglyph Operating Co., Inc.
Ute Tribal #20-15
(1806' FEL 574' FSL)
SW SE Section 20, 5S- 3W
Antelope Creek Field
Duchesne Co. Utah
API#: 43013340510000

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

(Not to Scale)

ATTACHMENT NO. 11

P&A PROCEDURE

# Plug and Abandonment Procedure

**Ute Tribal 20-15**

**43-013-34051**

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 @ 4150‘.

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

6. Raise the tubing to 514’ and set balanced 100’ cement plug using 15sxs of Class G cement.

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

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

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

ATTACHMENT NO. 12

MIT PROCEDURE

# Mechanical Integrity Test Procedure

**Ute Tribal 20-15**

**43-013-34051**

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: B05 4208' to 4219', B08.1 4369' to 4371', B10 4449' to 4458', and C04 4708' to 4710' .
7. RD Wireline.
8. PU plug and packer and new tubing. RIH and breakdown perfs.
9. POOH. RIH with injection packer to 4118'.
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.