Schlumberger

Company: St Croix Operating Inc

Well: Clover Schenk #1

Field: Wildcat

County: Washington State: Colorado

# Platform Express

## Triple Combo

County: Washington
Field: Wildcat
Location: NWSW Sec. 24, T2S, R53W
Well: Clover-Schenk #1
Company: St Croix Operating Inc

Location:
NWSW Sec. 24, T2S, R53W
2020' FSL & 1200' FWL
Lat: 39.86267 / Long: -103.27005

Elev.: K.B. 4881.00 ft
G.L. 4875.00 ft
D.F. 4880.00 ft

Permanent Datum: Ground Level Elev.: 4875.00 f
Log Measured From: Kelly Bushing 6.00 ft above Perm.Datum
Drilling Measured From: Kelly Bushing

| API Serial No. | Section: | Township: | Range: |
|---|---|---|---|
| 051-121-11070 | 24 | 2S | 51W |

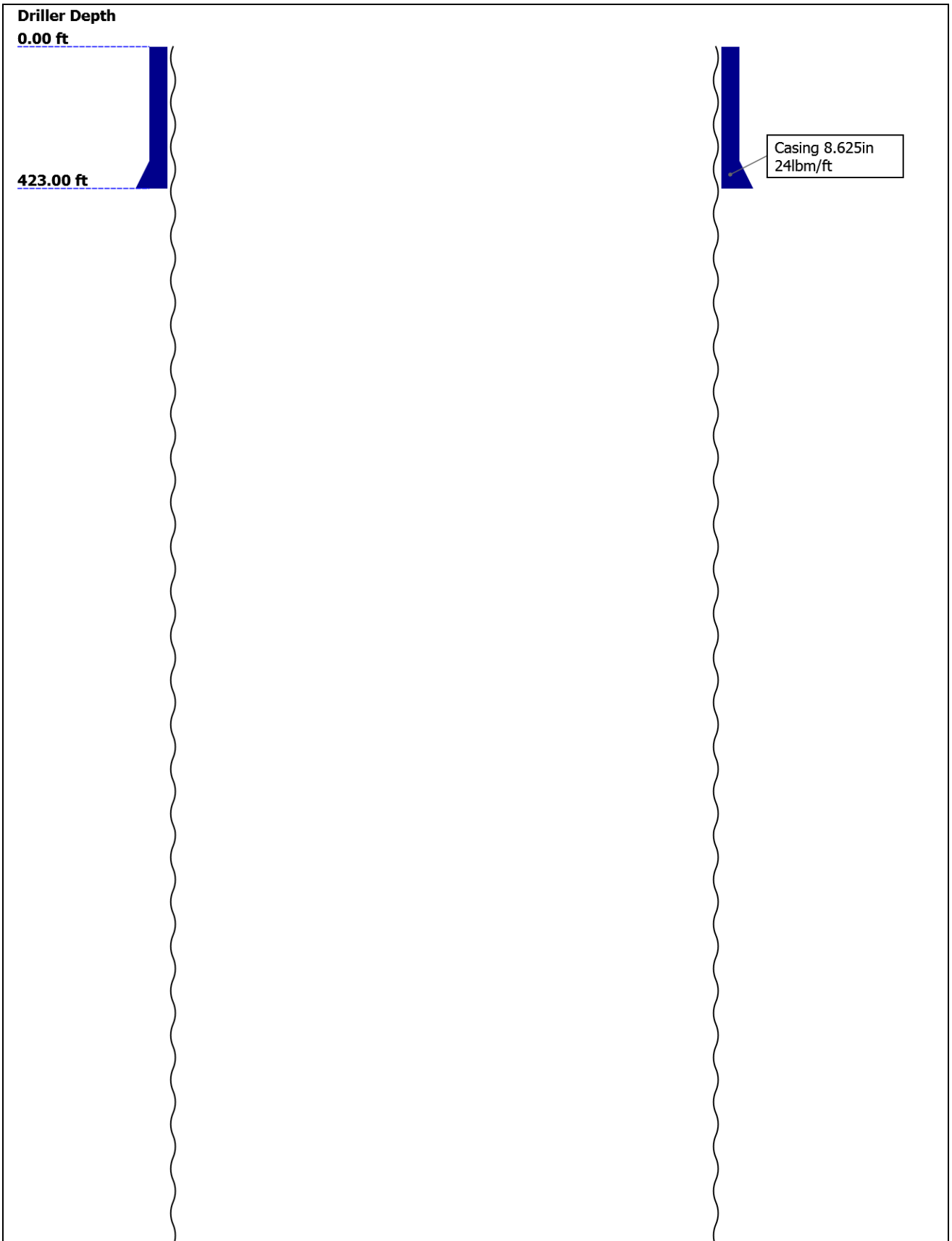
| | | | | | | |
|---|---|---|---|---|---|---|
| Logging Date | | | 26-Oct-2017 | | | |
| Run Number | | | One | | | |
| Depth Driller | | | 4750.00 ft | | | |
| Schlumberger Depth | | | 4750.00 ft | | | |
| Bottom Log Interval | | | 4740.00 ft | | | |
| Top Log Interval | | | 0.00 ft | | | |
| Casing Driller Size @ Depth | | | 8.625 in @ 423.00 ft | | | |
| Casing Schlumberger | | | 423 ft | | | |
| Bit Size | | | 7.875 in | | | |
| Type Fluid In Hole | | | Water | | | |
| MUD | Density | Viscosity | 9.2 lbm/gal | 55 s | | |
| | Fluid Loss | PH | 6.4 cm3 | 9 | | |
| | Source of Sample | | Active Tank | | | |
| RM @ Meas Temp | | | 2.13 ohm.m @ 68 degF | | | |
| RMF @ Meas Temp | | | 1.59 ohm.m @ 68 degF | | | |
| RMC @ Meas Temp | | | 3.19 ohm.m @ 68 degF | | | |
| Source RMF | RMC | | | Pressed | | |
| RM @ BHT | RMF @ BHT | | 1.08 @ 140 | 0.81 @ 140 | | |
| Max Recorded Temperatures | | | 140 degF | | | |
| Circulation Stopped | Time | | 26-Oct-2017 | 04:06:30 | | |
| Logger on Bottom | Time | | 26-Oct-2017 | 06:06:00 | | |
| Unit Number | Location: | | 9108 | Fort Morgan, CO | | |
| Recorded By | | | Stephen Tang | | | |
| Witnessed By | | | Tom Thomas | | | |

## Disclaimer



## Contents

## Well Sketch




## Borehole Size/Casing/Tubing Record

| | | | | | | |
|---|---|---|---|---|---|---|
| **Bit** | | | | | | |
| Bit Size ( in ) | 7.875 | | | | | |
| Top Driller ( ft ) | 0 | | | | | |
| Top Logger ( ft ) | 0 | | | | | |
| Bottom Driller ( ft ) | 4750 | | | | | |
| Bottom Logger ( ft ) | 4750 | | | | | |
| **Casing** | | | | | | |
| Size ( in ) | 8.625 | | | | | |
| Weight ( lbm/ft ) | 24 | | | | | |
| Inner Diameter ( in ) | 8.097 | | | | | |
| Grade | N/A | | | | | |
| Top Driller ( ft ) | 0 | | | | | |
| Top Logger ( ft ) | 0 | | | | | |
| Bottom Driller ( ft ) | 423 | | | | | |
| Bottom Logger ( ft ) | 423 | | | | | |

## Remarks and Equipment Summary

### One: Toolstring

| Equip name | Length | MP name | Offset |
|---|---|---|---|
| **LEH-QT**<br>LEH-QT | **43.57** | | |
| **DTC-H**<br>ECH-KC<br>DTC-H | **40.65** | **CTEM**<br>**HV** | **39.75**<br>**0.00** |
| | | **TelStatus**<br>**ToolStatus** | **37.65**<br>**37.65** |
| **HGNS-H:5118**<br>HGNH<br>NSR-F:5203<br>NPV-N<br>HGNS-H:5118<br>HMCA-H<br>HACCZ-H:5118 | **37.65** | **Temperature**<br>**GR** | **37.62**<br>**36.91** |
| | | **CNL Porosity**<br>**HMCA**<br>**HGNS**<br>**Accelerometer** | **30.57**<br>**28.24**<br>**28.24**<br>**0.00** |
| **HDRS-H** | **28.24** | | |

### One: Remarks

Toolstring ran as per toolsketch.

ECH-MEB
HRCC-H
HRMS-H
Backscatter
GSR-J:5534
GPV-Q
HRGD-H:1721
Long Spacing
Short Spacing


**AIT-M:278** **16.00**
AMIS:278
AMRM:278

Lengths are in ft
Maximum Outer Diameter = 9.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

## Depth Summary

| | One | | |
|---|---|---|---|
| **Depth Measuring Device** | | | |
| Type | IDW-B | | |
| Serial Number | | | |
| Calibration Date | | | |
| Calibrator Serial Number | | | |
| Calibration Cable Type | | | |
| Wheel Correction 1 | 0 | | |
| Wheel Correction 2 | 0 | | |
| **Tension Device** | | | |
| Type | CMTD-B/A | | |

| | | | |
|---|---|---|---|
| Serial Number | | | |
| Calibration Date | | | |
| Calibrator Serial Number | | | |
| Number of Calibration Points | 0 | | |

## Logging Cable

| | | | |
|---|---|---|---|
| Type | 7-46NT-XS | | |
| Serial Number | | | |
| Length | 24000.00 ft | | |
| Conveyance Type | Wireline | | |
| Rig Type | Land | | |

| One:Depth Control Parameters | | Depth Control Remarks |
|---|---|---|
| Log Sequence | First Log In the Well | All Schlumberger depth procedures followed. |
| Rig Up Length At Surface | | IDW used as primary depth device. |
| Rig Up Length At Bottom | | Z-Chart used as secondary depth device. |
| Rig Up Length Correction | | |
| Stretch Correction | | |
| Tool Zero Check At Surface | | |

# One

# 5" Triple Combo

## Pass Summary

| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
|---|---|---|---|---|---|---|---|---|---|
| One | Log[5]:Up | Up | 367.78 ft | 4758.72 ft | 26-Oct-2017 5:57:56 AM | 26-Oct-2017 8:45:09 AM | ON | 2.60 ft | Yes |

All depths are referenced to toolstring zero

## Log

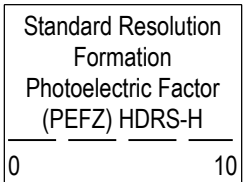
Company:St Croix Operating Inc  Well:Clover Schenk #1

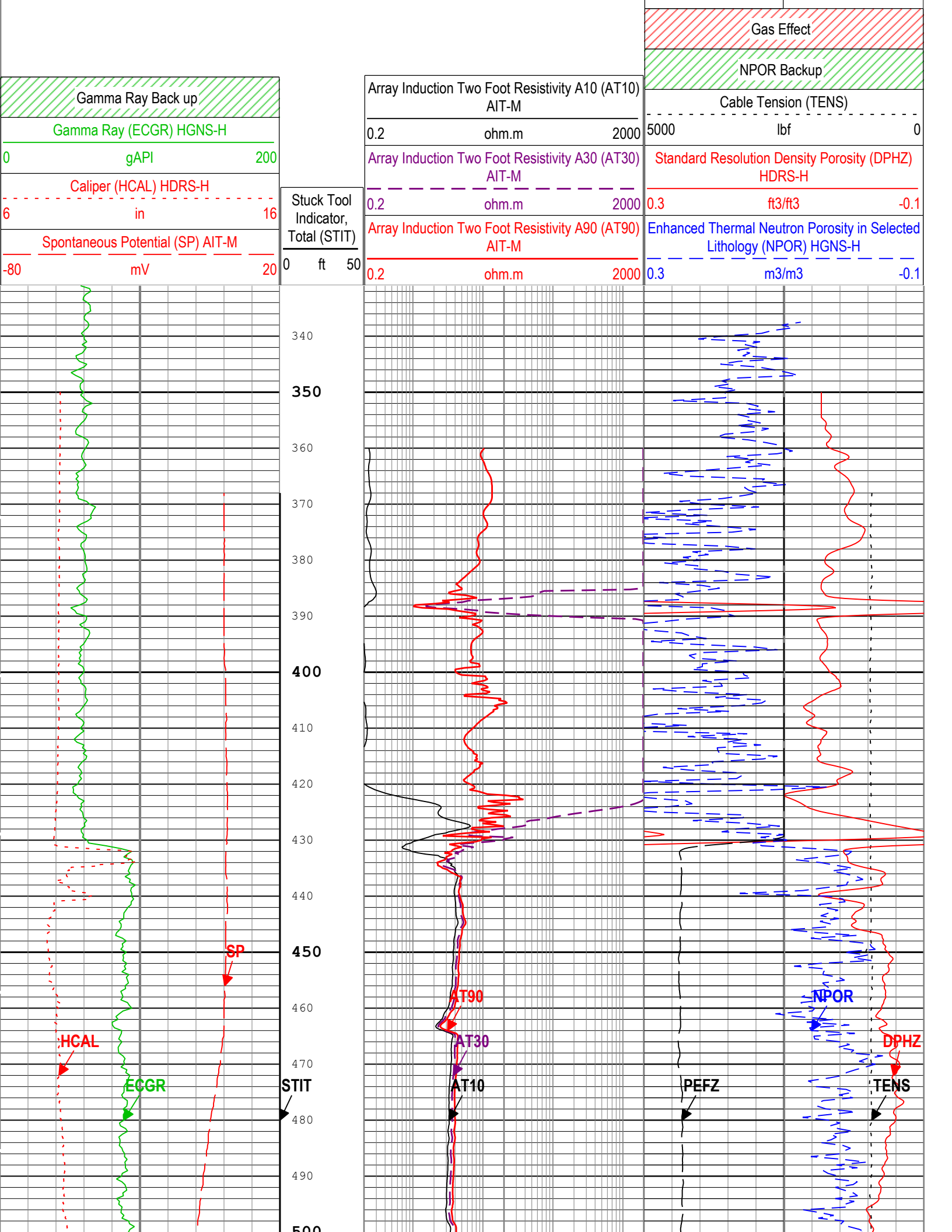
One: Log[5]:Up:S008

Description: HGNS standard resolution porosities for Platform Express  Format: Log ( TripleCombo-5 )  Index Scale: 5 in per 100 ft  Index Unit: ft  Index Type: Measured Depth  Creation Date: 26-Oct-2017 14:40:49

| Channel | Source | Sampling |
|---|---|---|
| AT10 | AIT-M:AMIS:AMIS | 3in |
| AT30 | AIT-M:AMIS:AMIS | 3in |
| AT90 | AIT-M:AMIS:AMIS | 3in |
| CALI | HDRS-H:HRCC-H:HRCC-H | 1in |
| DPHZ | HDRS-H:HRMS-H:HRGD-H | 2in |
| GR | HGNS-H:HGNS-H:HGNS-H | 6in |
| NPOR | HGNS-H:HGNS-H:HGNS-H | 6in |
| PEFZ | HDRS-H:HRMS-H:HRGD-H | 2in |
| SP | AIT-M:AMIS:AMIS | 6in |
| STIT | DepthCorrection | 6in |
| TENS | WLWorkflow | 6in |
| TIME_1900 | WLWorkflow | 0.1in |

TIME_1900 - Time Marked every 60.00 (s)




Gas Effect
NPOR Backup
Gamma Ray Back up
Gamma Ray (ECGR) HGNS-H
0 gAPI 200
Caliper (HCAL) HDRS-H
6 in 16
Spontaneous Potential (SP) AIT-M
-80 mV 20
Stuck Tool Indicator, Total (STIT)
0 ft 50
Array Induction Two Foot Resistivity A10 (AT10) AIT-M
0.2 ohm.m 2000
Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2 ohm.m 2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2 ohm.m 2000
Cable Tension (TENS)
5000 lbf 0
Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3 ft3/ft3 -0.1
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3 m3/m3 -0.1
340
350
360
370
380
390
400
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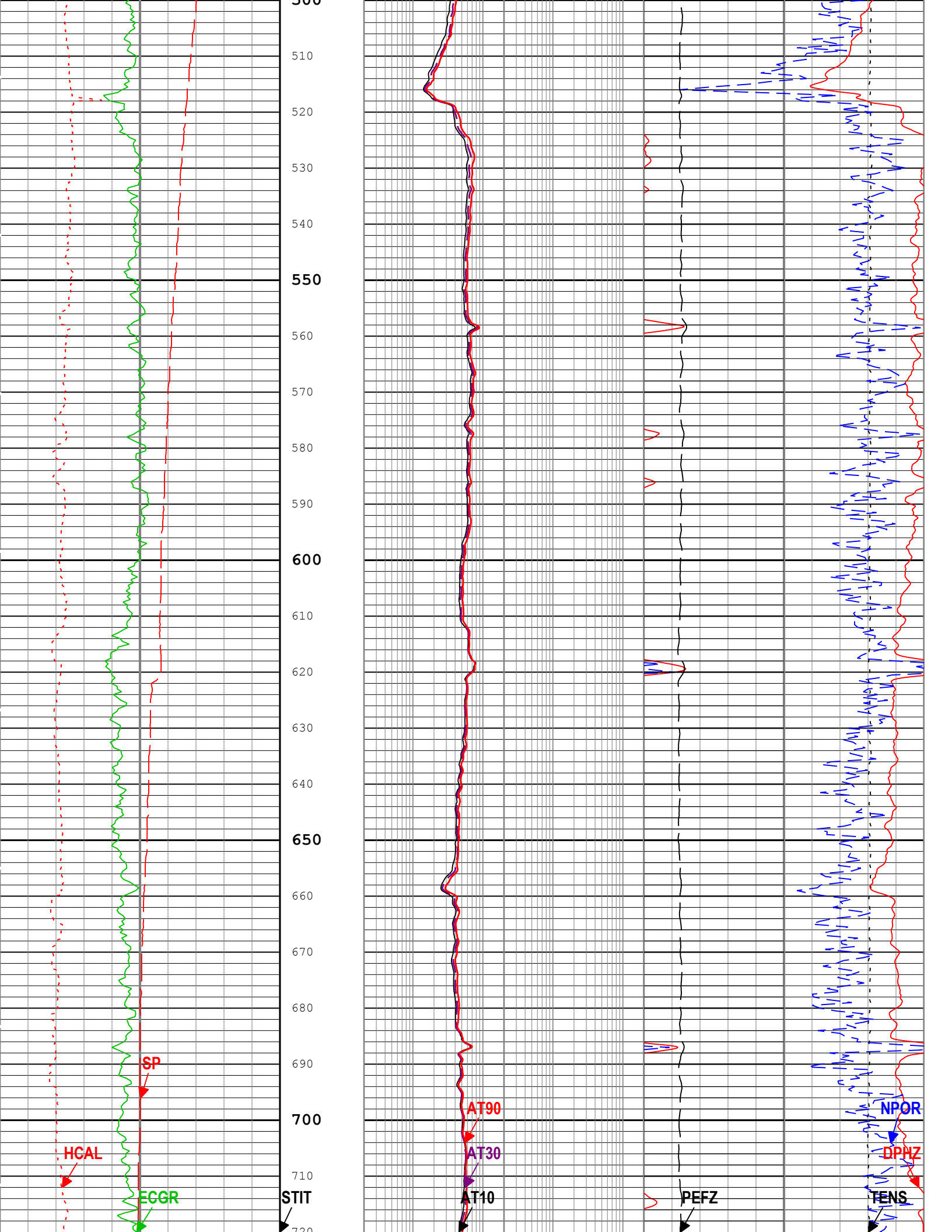
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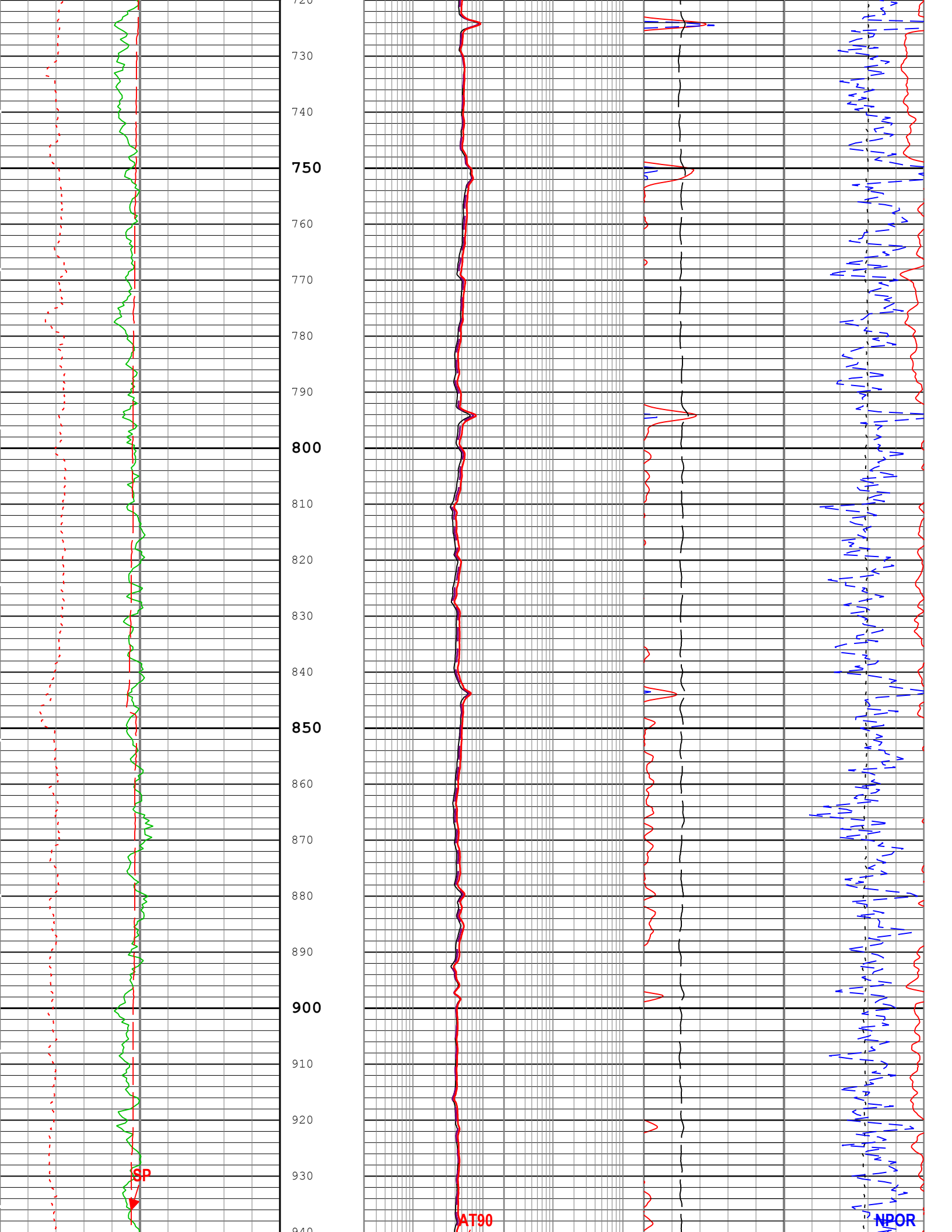
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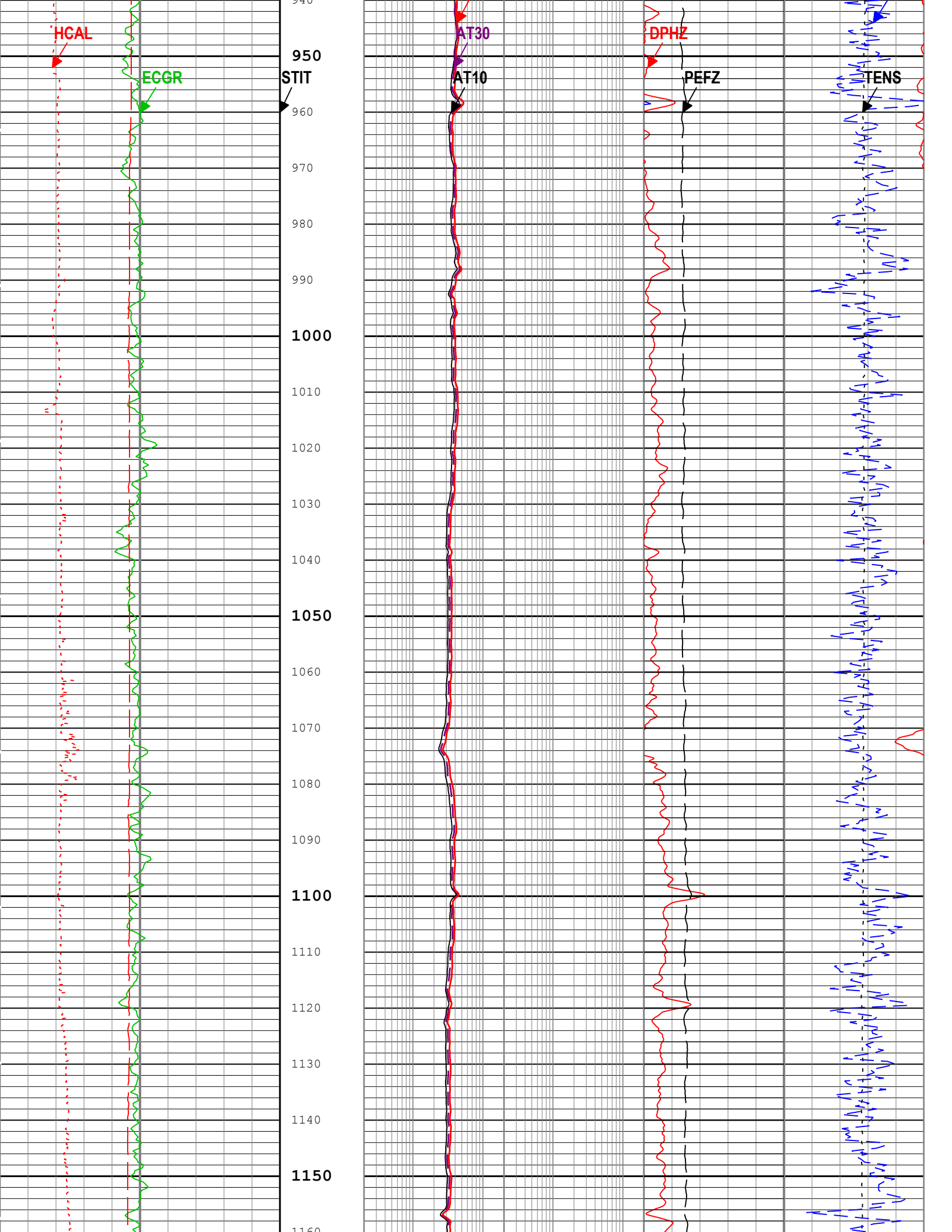
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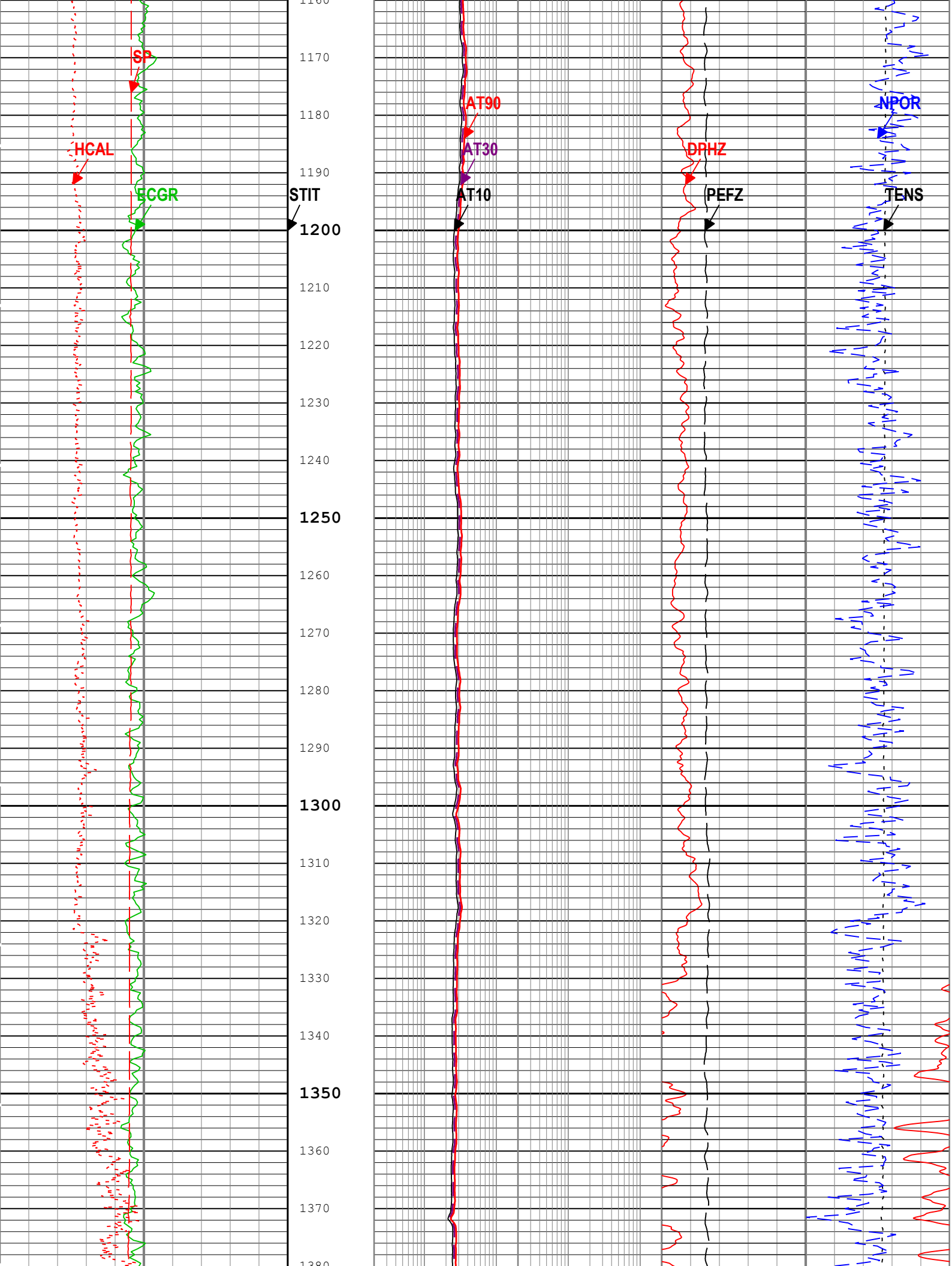
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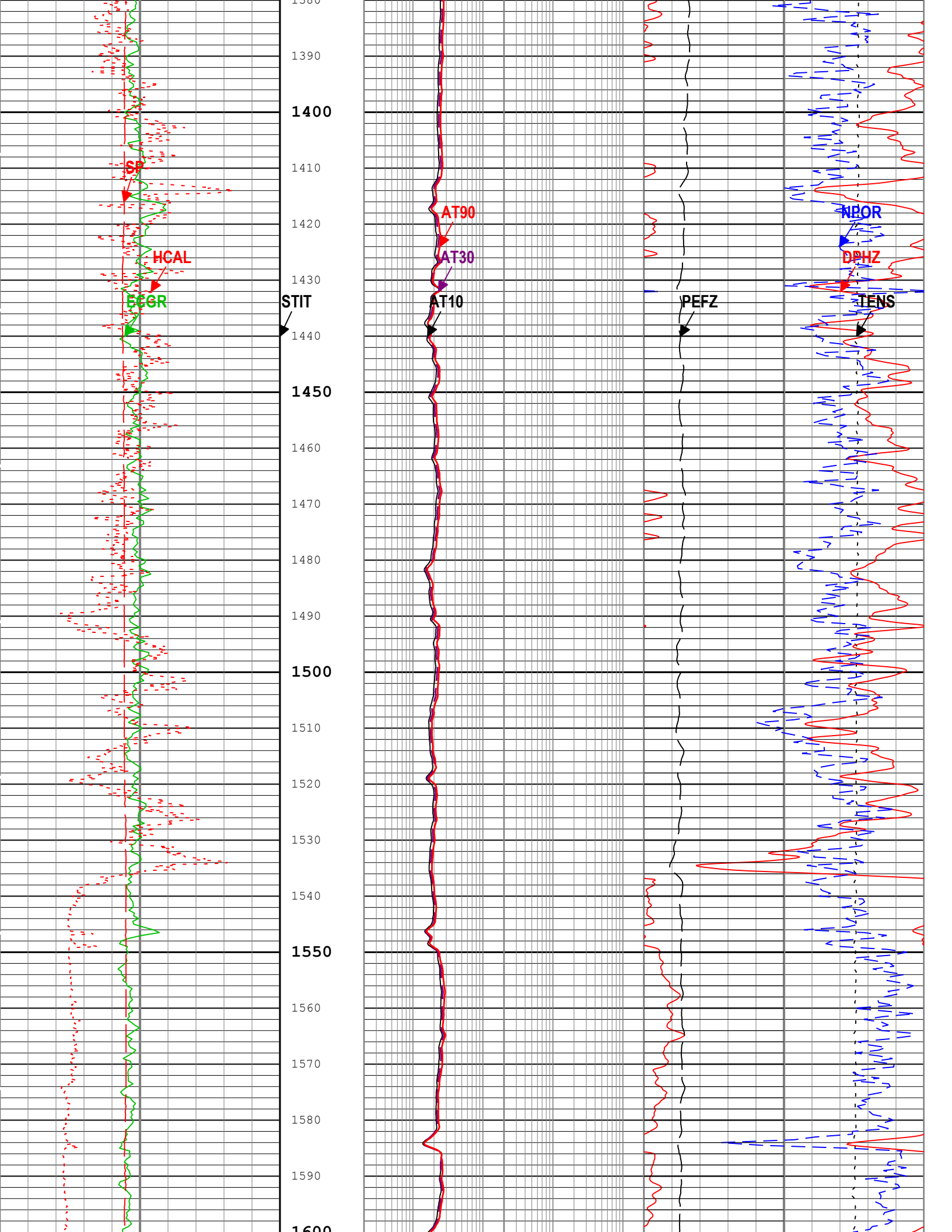
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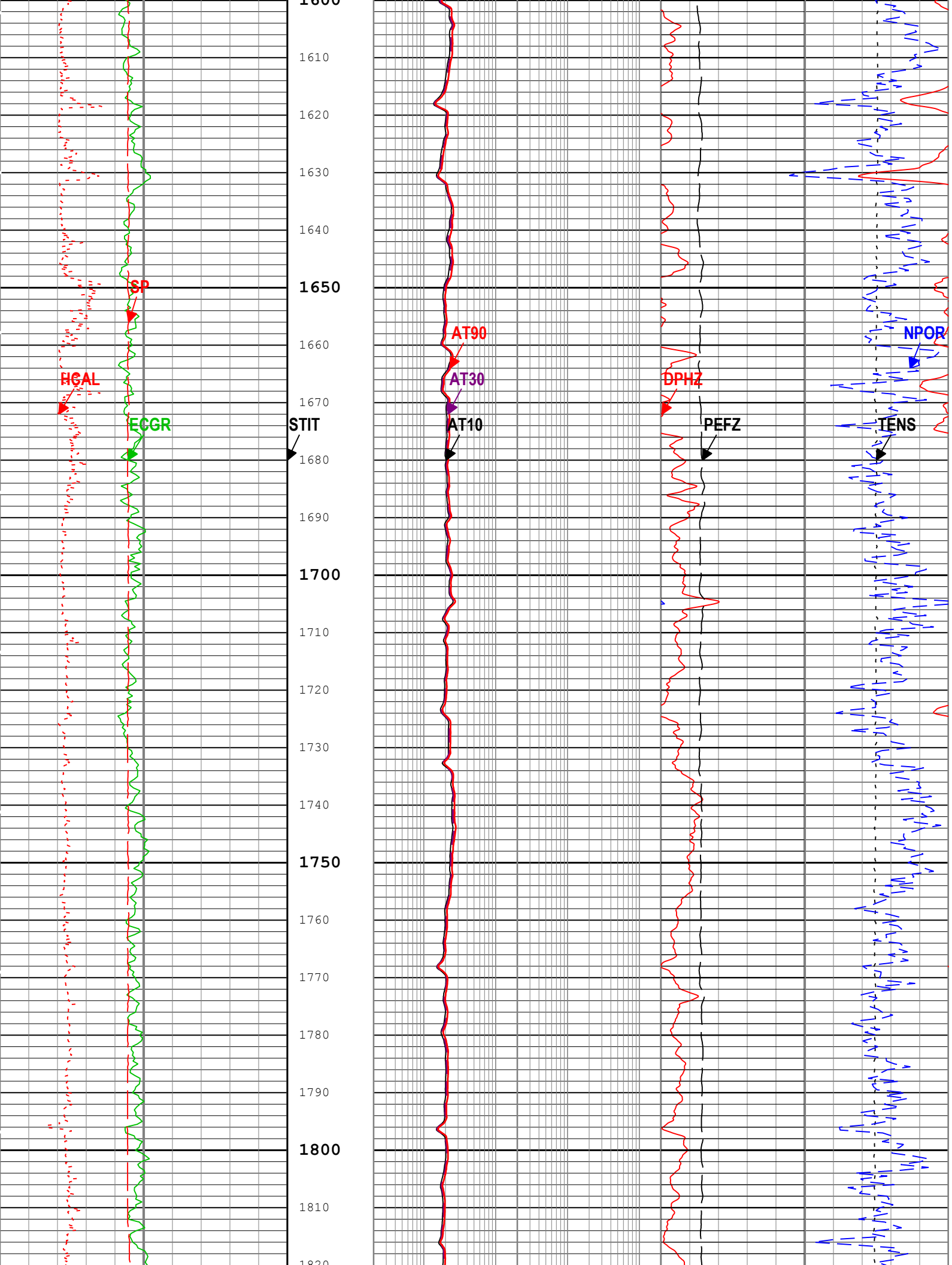
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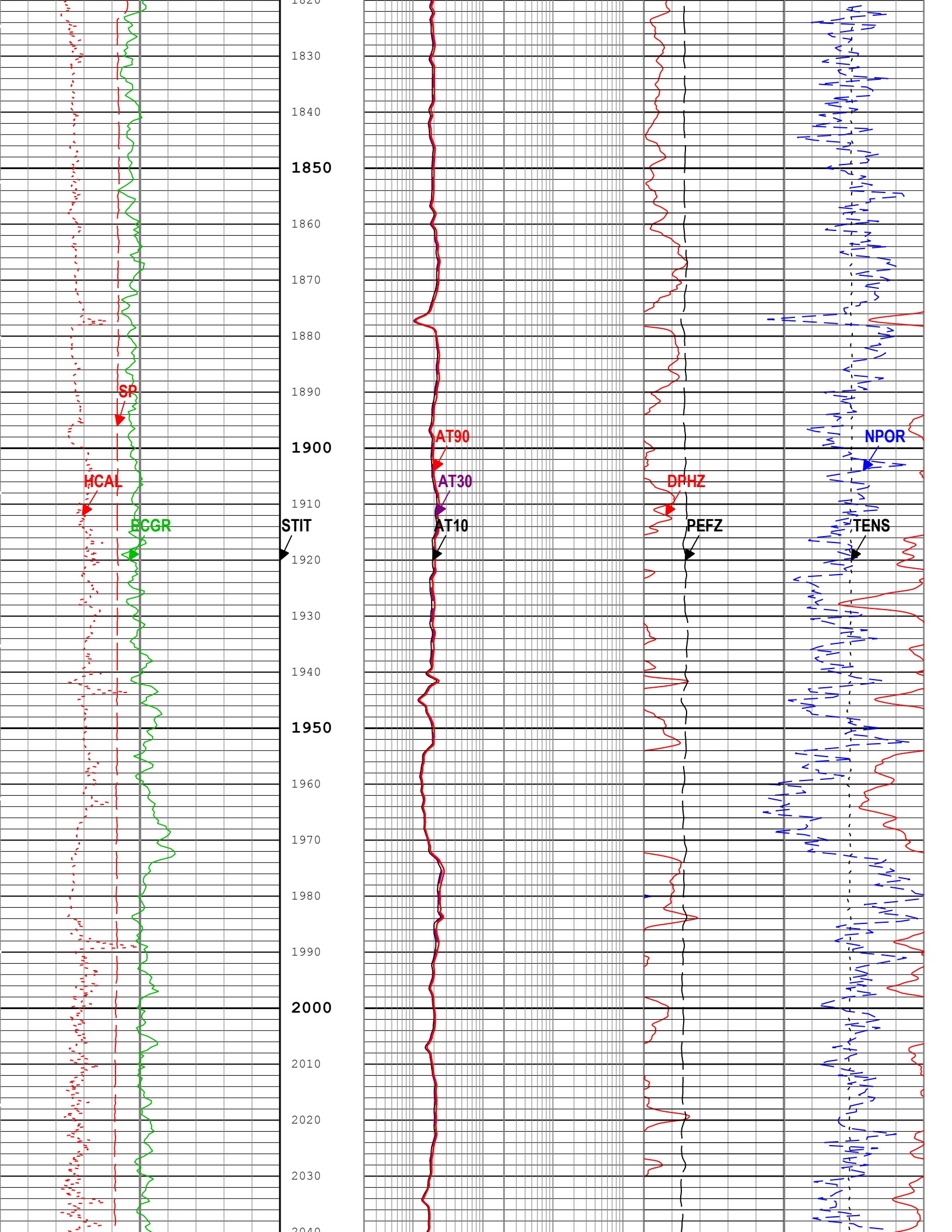
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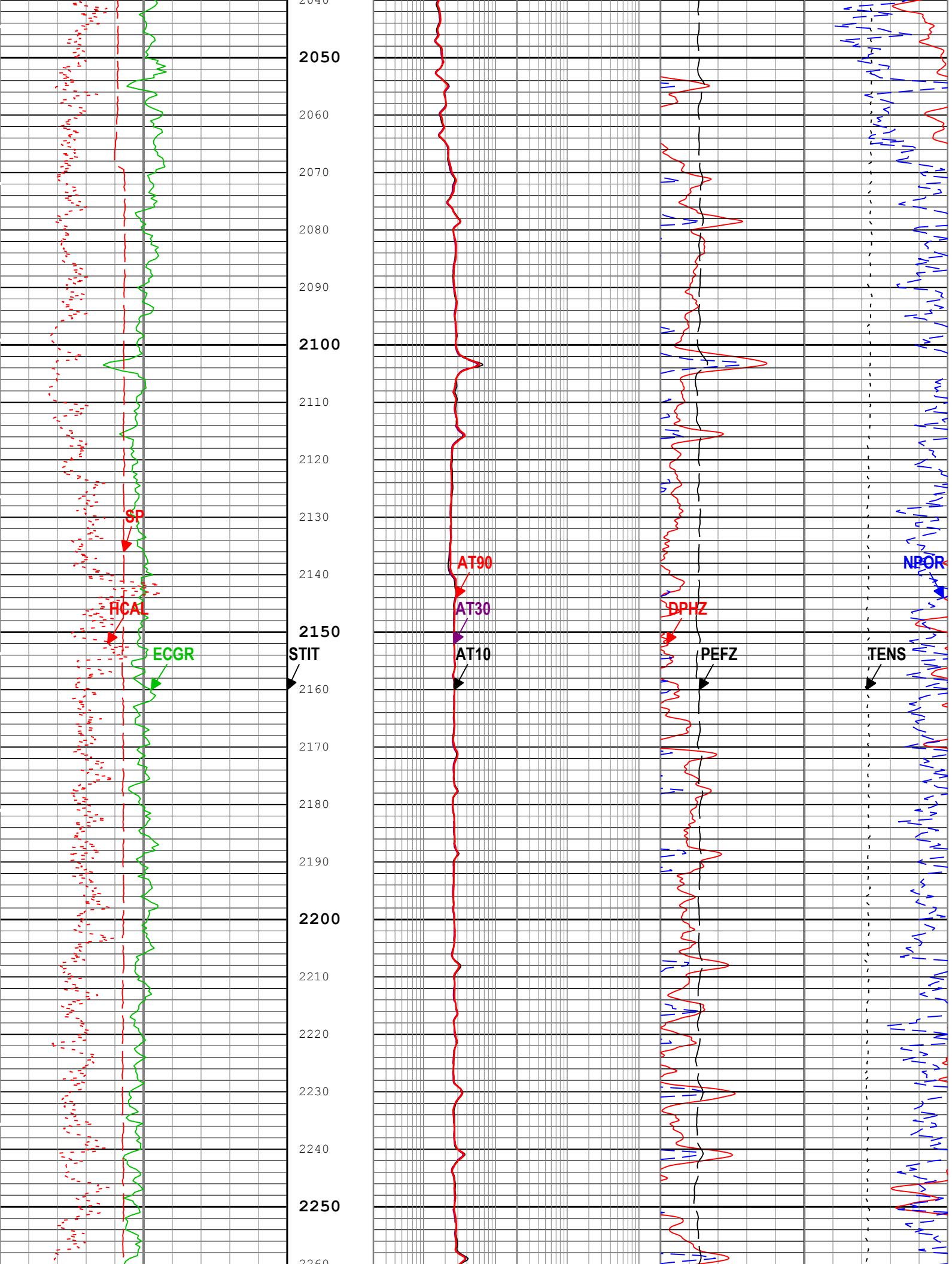
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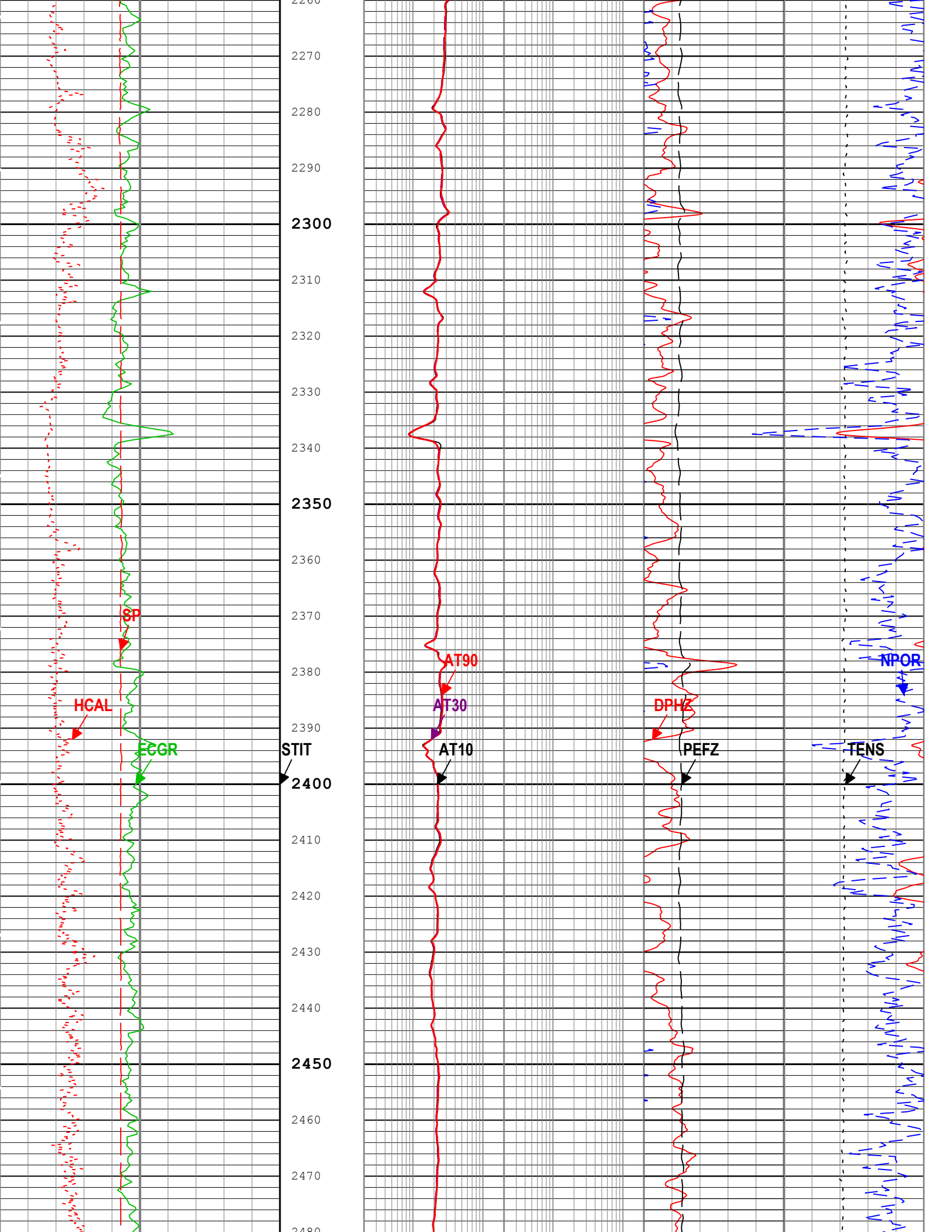
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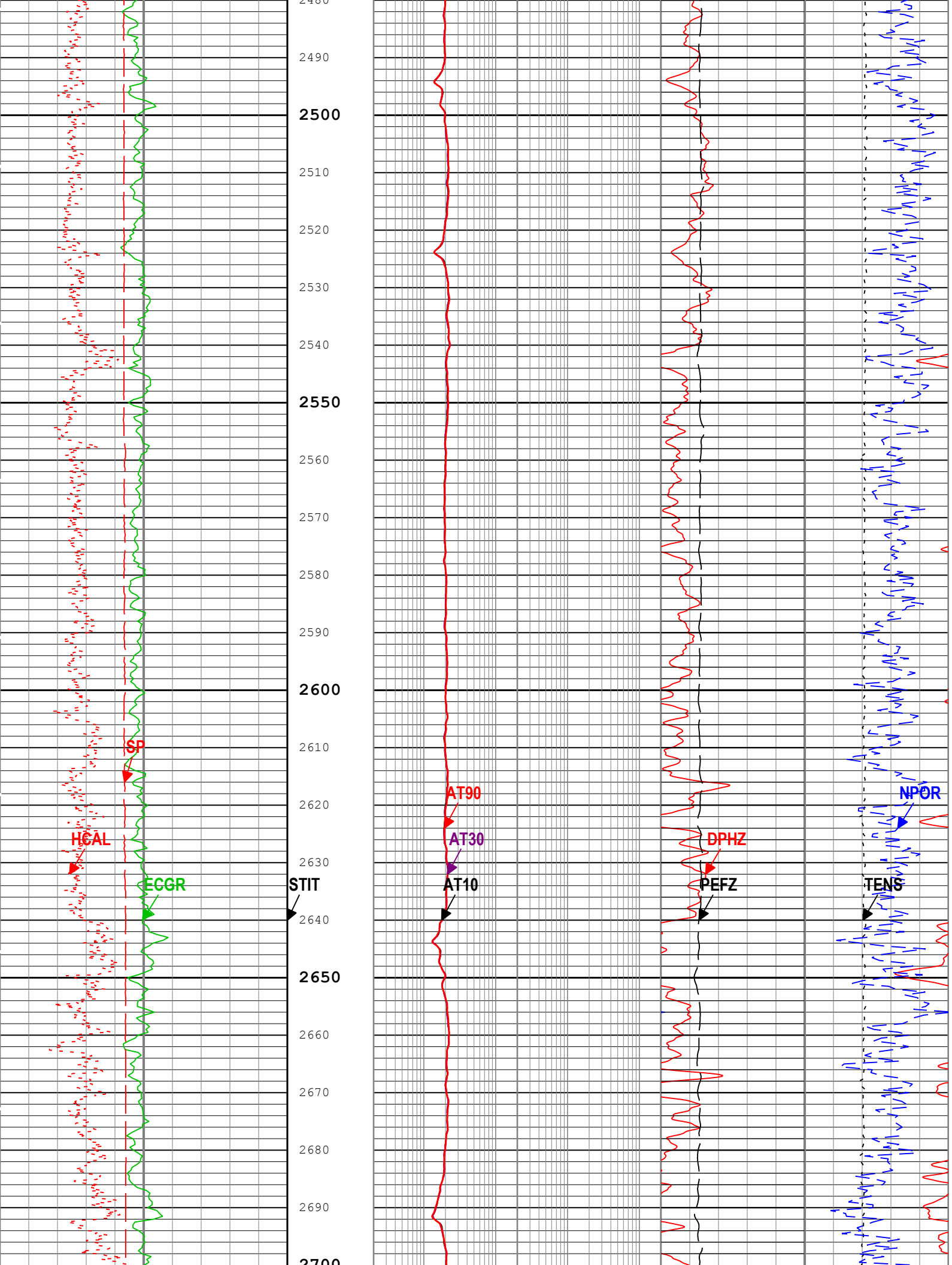
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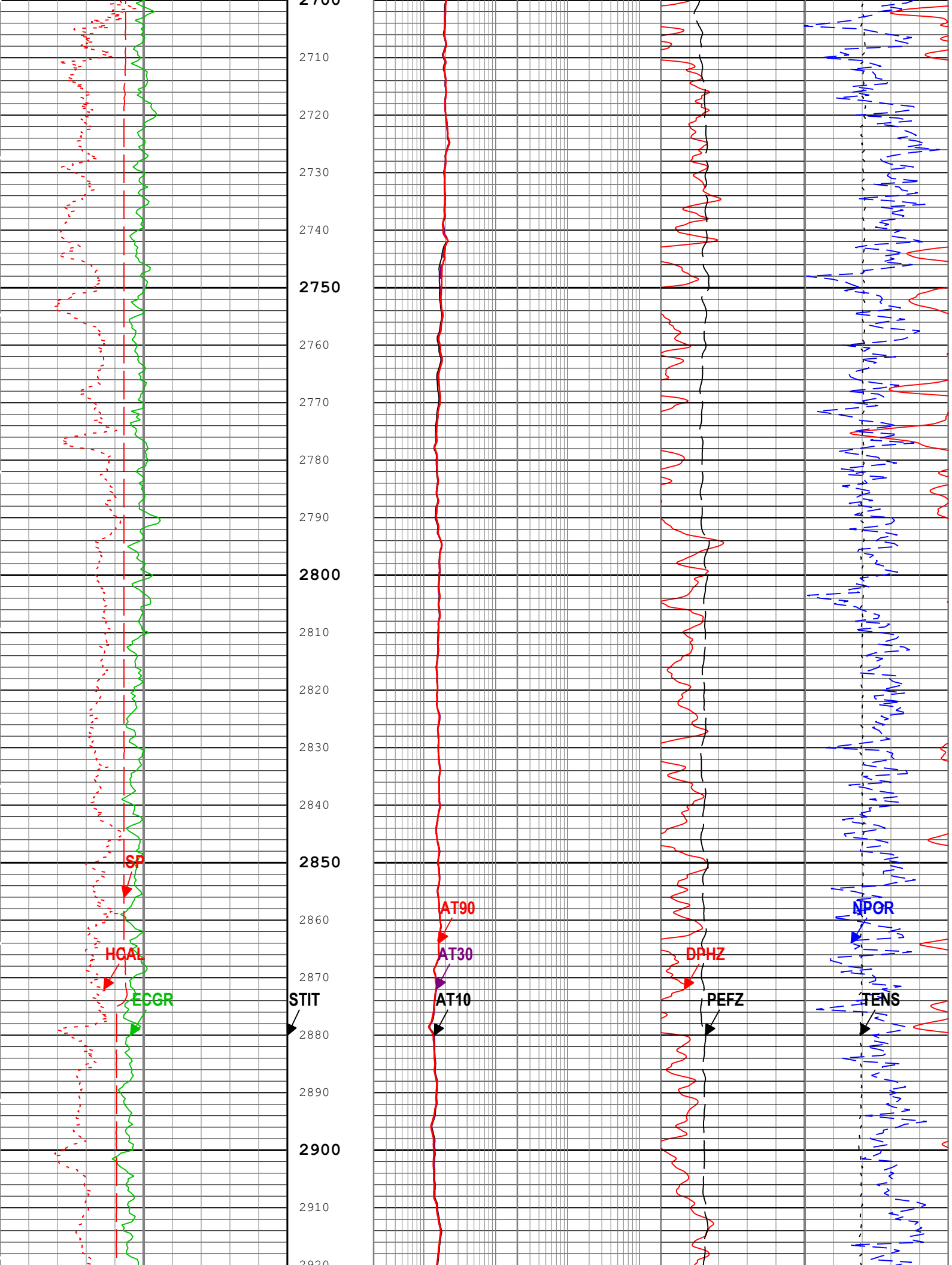
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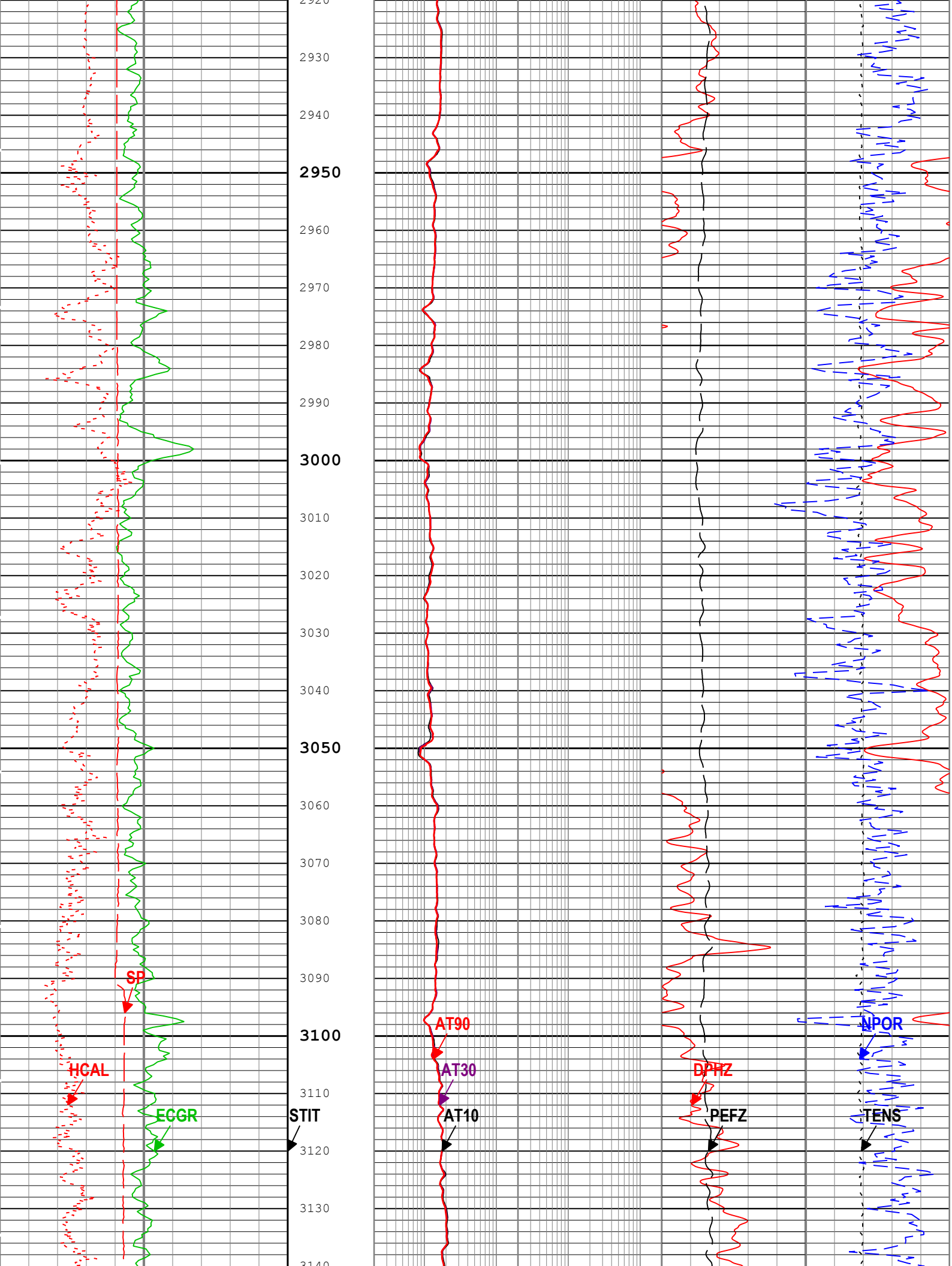
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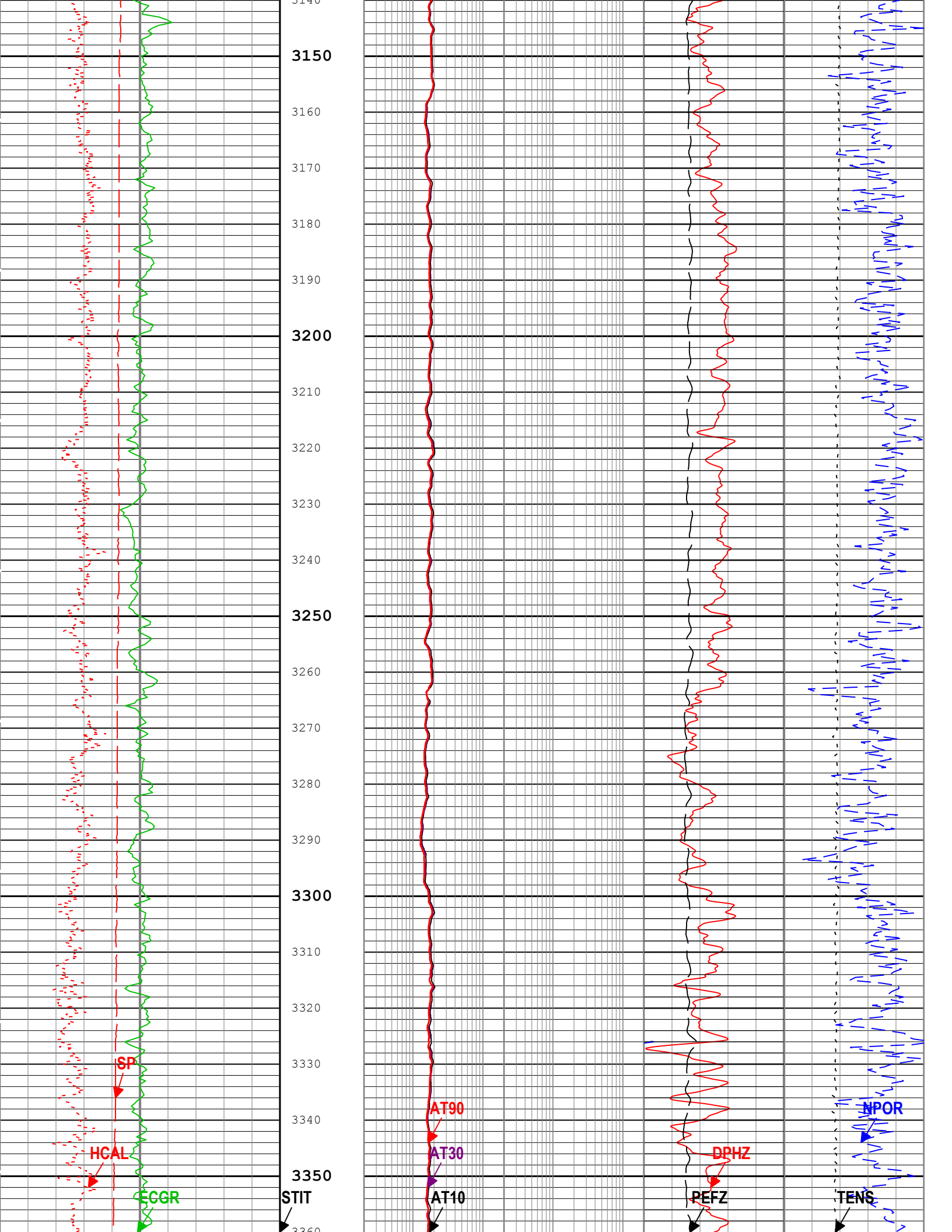
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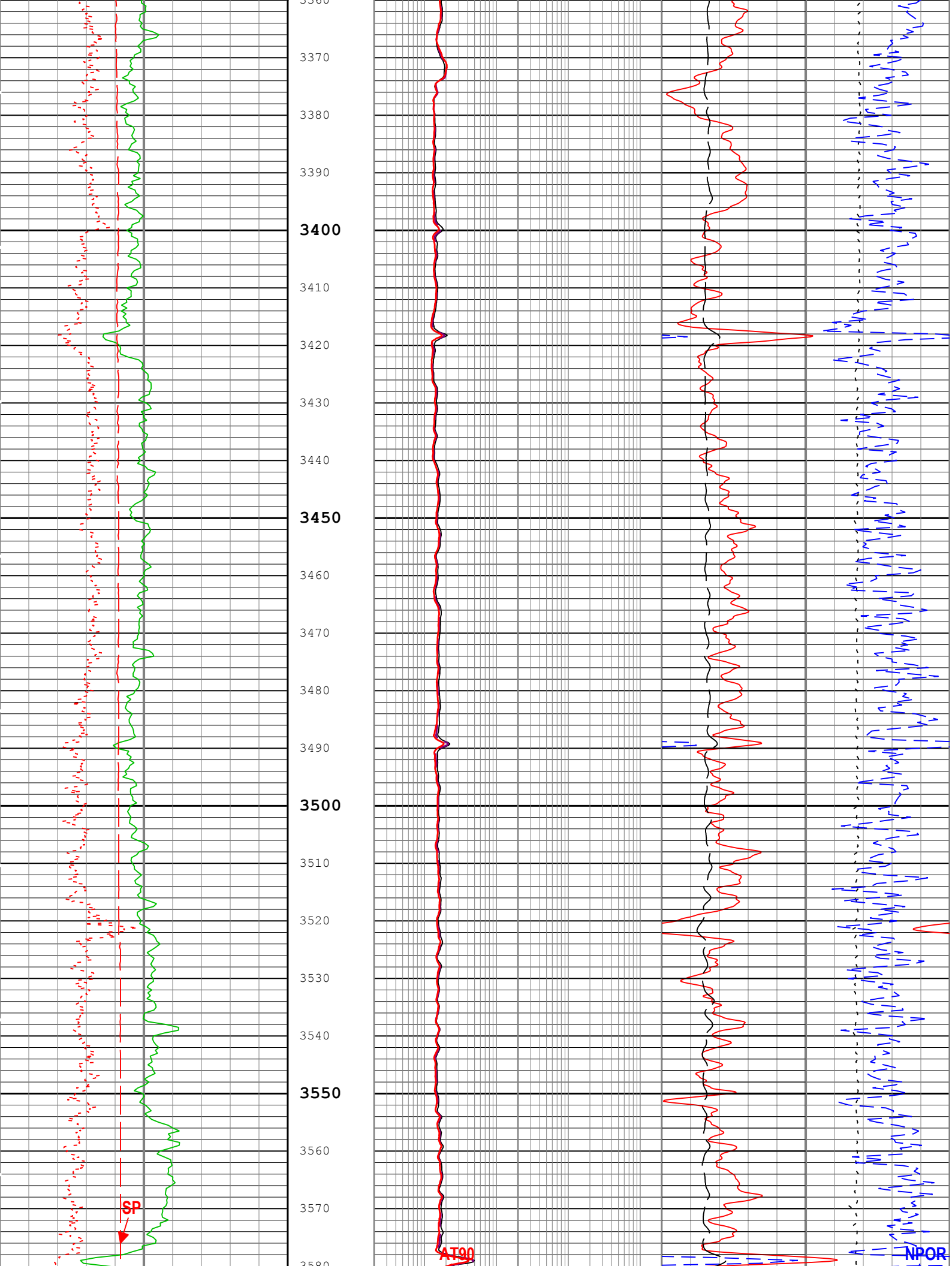
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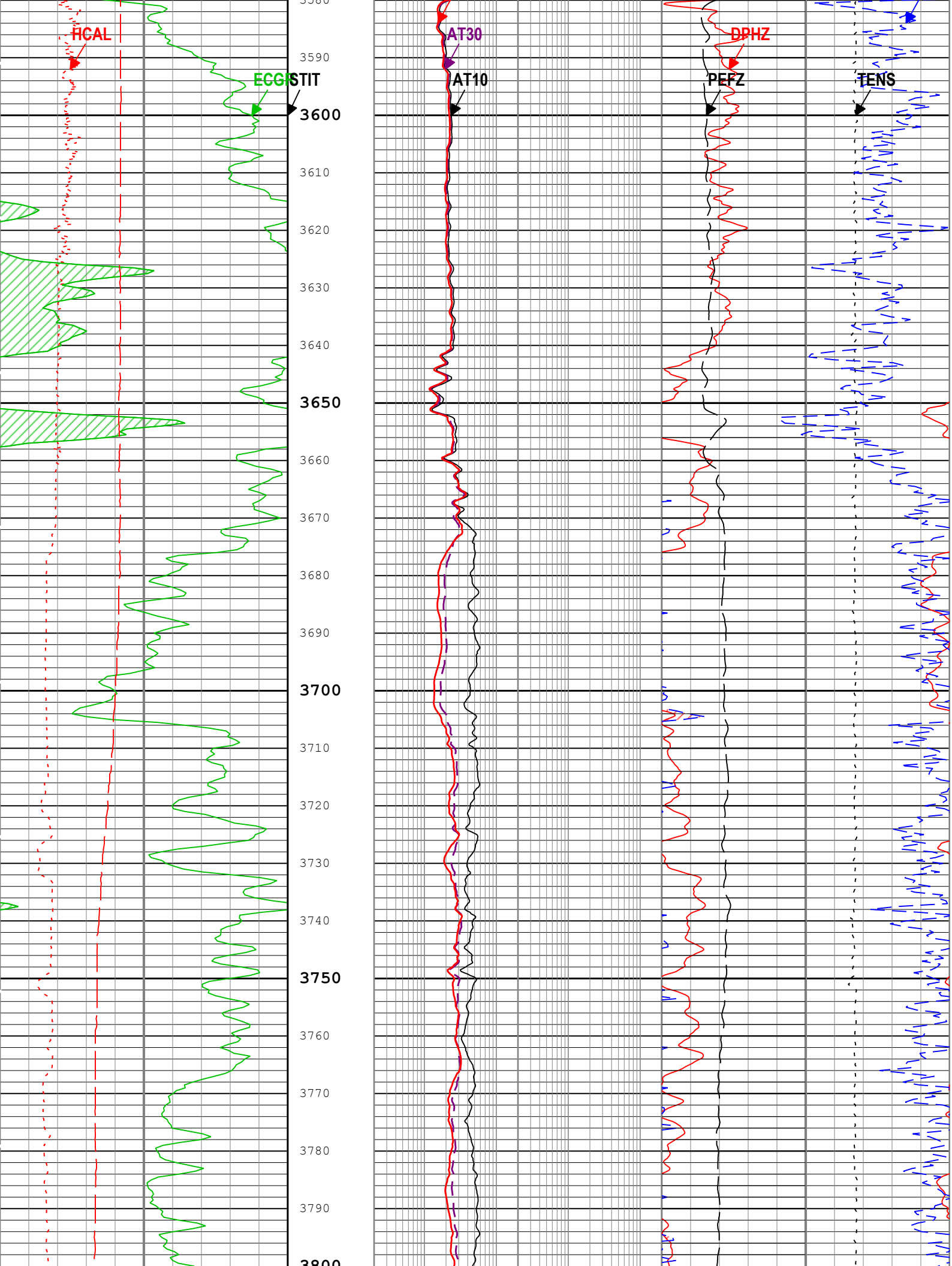
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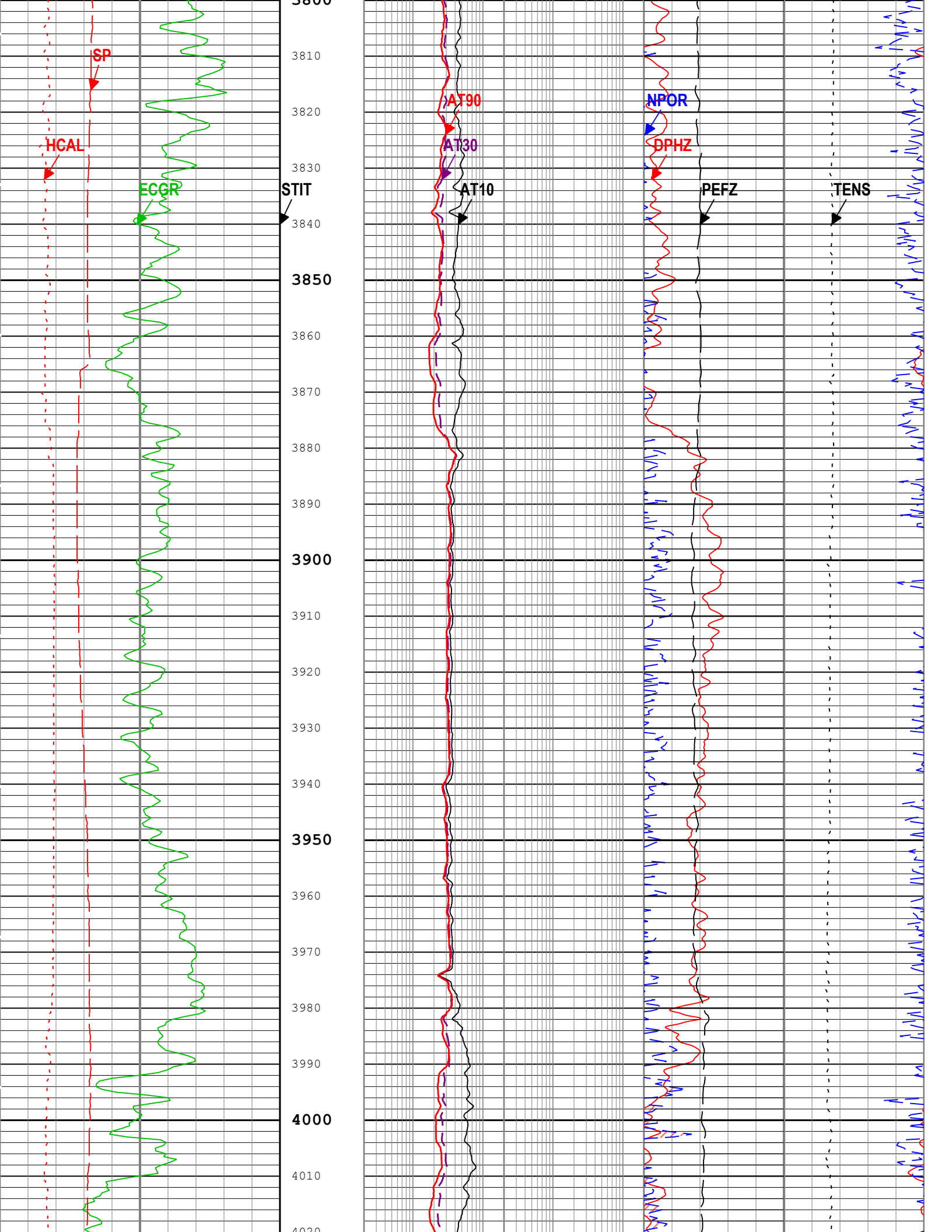
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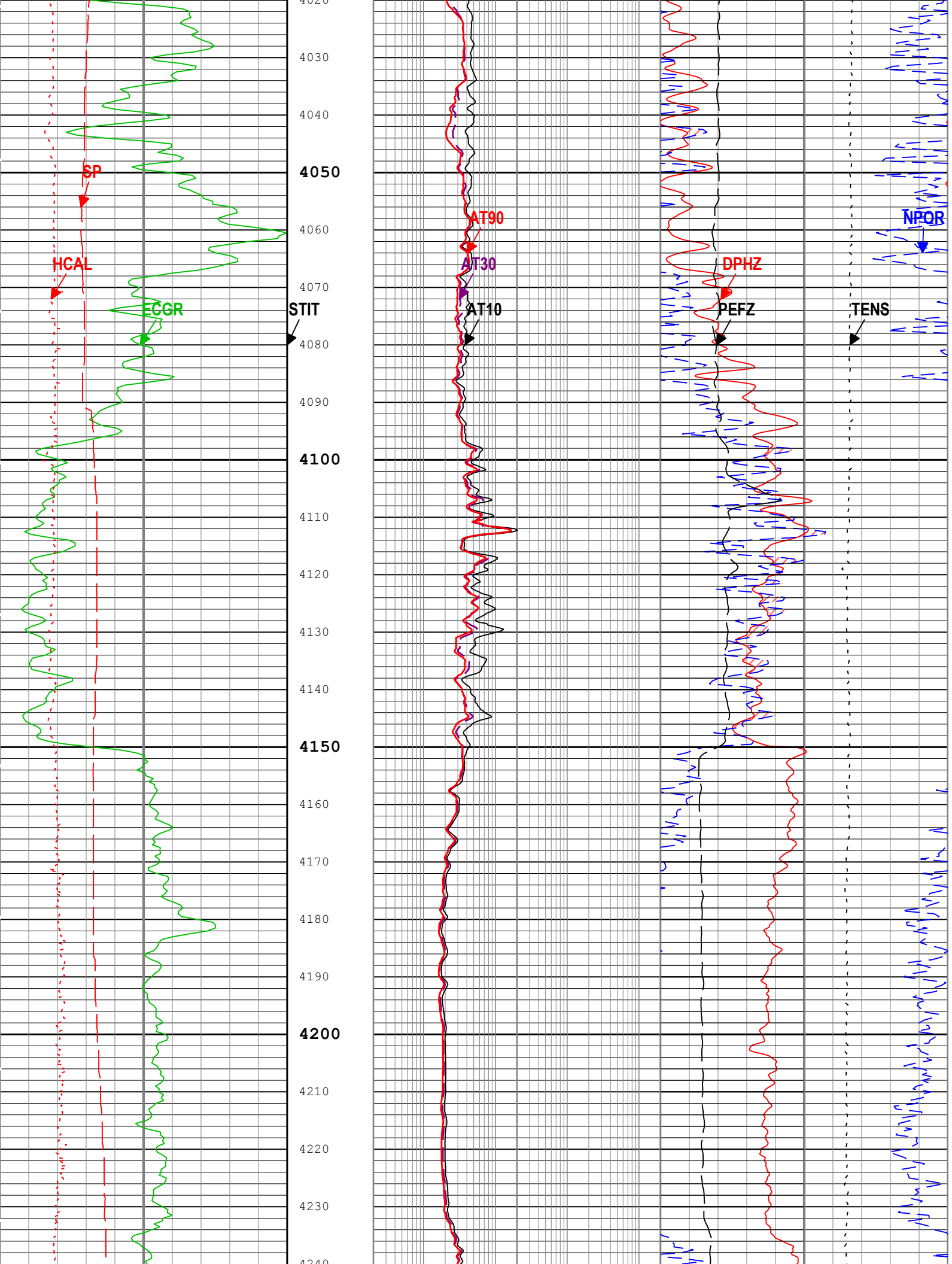
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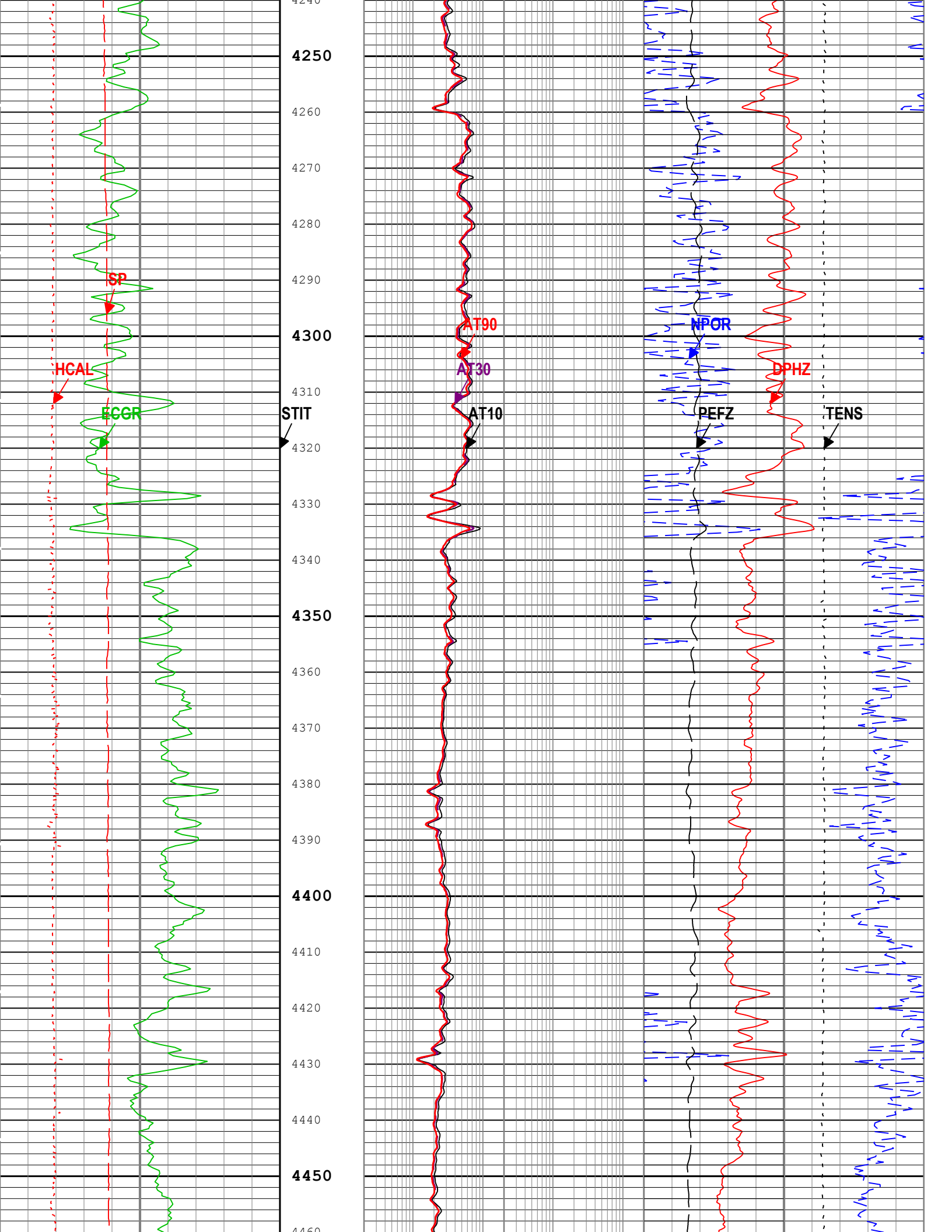
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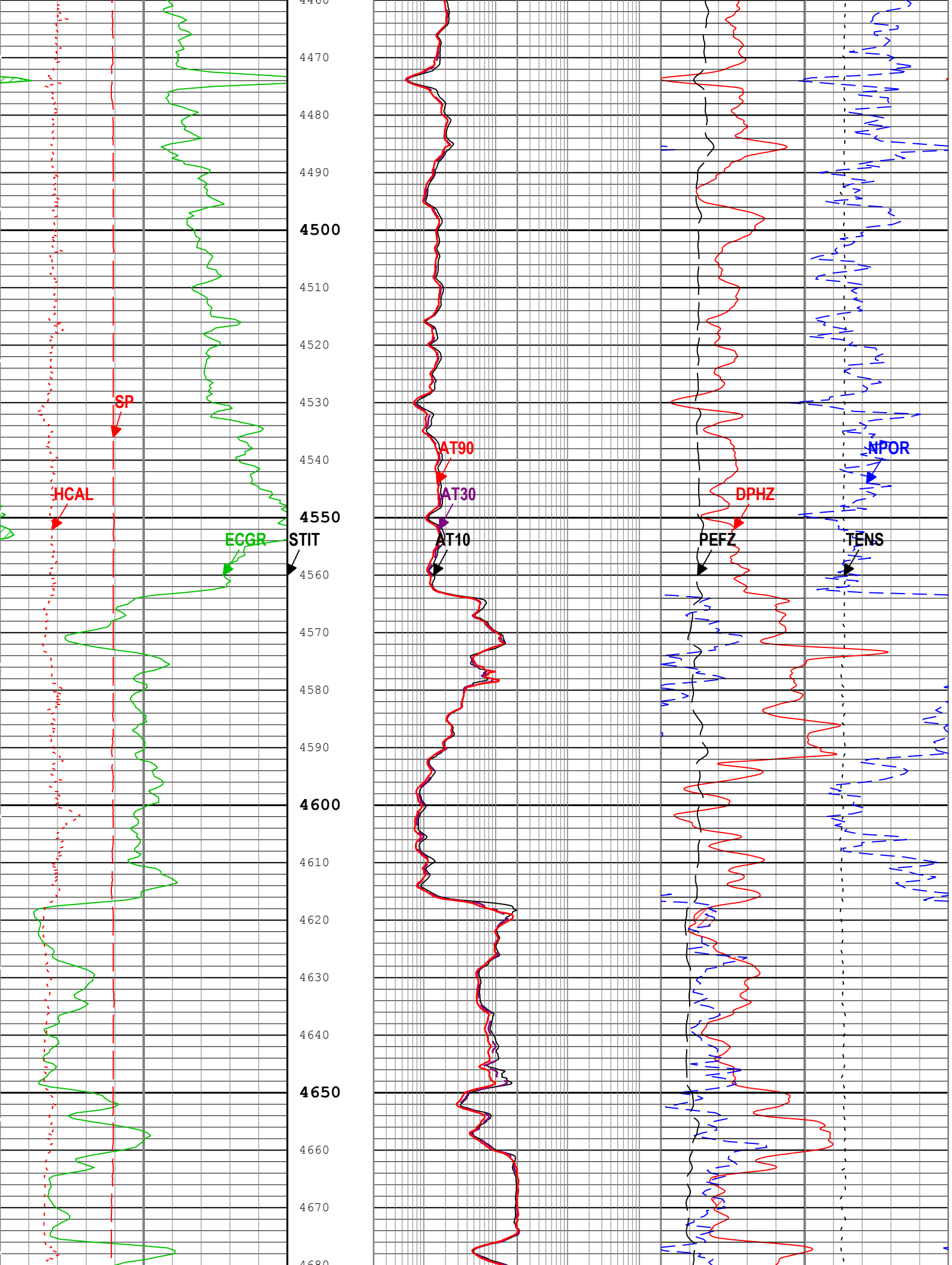
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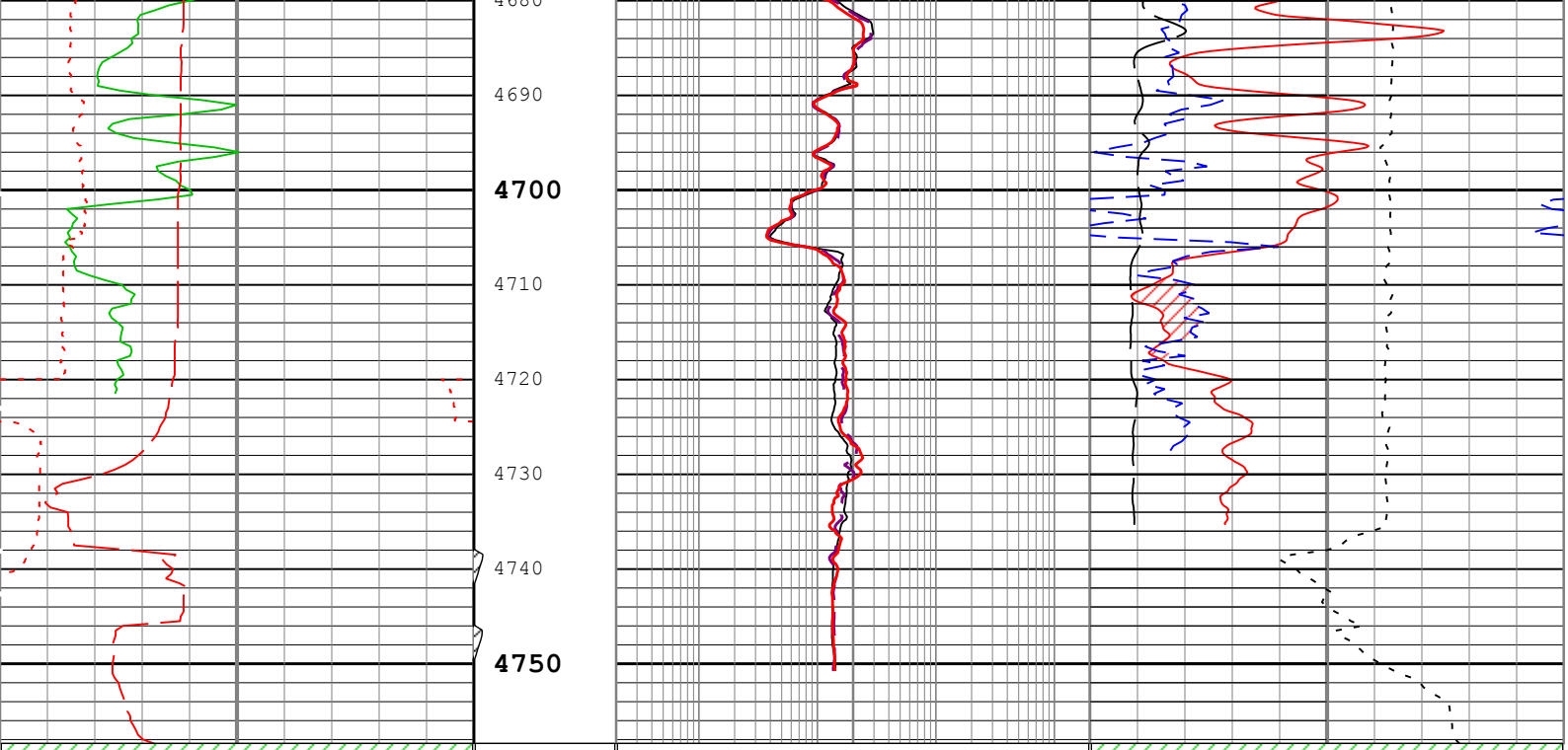



Gamma Ray Back up

Gamma Ray (ECGR) HGNS-H
0 gAPI 200

Caliper (HCAL) HDRS-H
6 in 16

Spontaneous Potential (SP) AIT-M
-80 mV 20

Stuck Tool Indicator, Total (STIT)
0 ft 50

Array Induction Two Foot Resistivity A10 (AT10) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2 ohm.m 2000

Gas Effect

NPOR Backup

Cable Tension (TENS)
5000 lbf 0

Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3 ft3/ft3 -0.1

Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3 m3/m3 -0.1

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H
0 10

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log ( TripleCombo-5 ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 26-Oct-2017 14:40:49

# Channel Processing Parameters

## One: Parameters

| Parameter | Description | Tool | Value | Unit |
|---|---|---|---|---|
| ABHM | Array Induction Borehole Correction Mode | AIT-M | Compute Standoff | |
| ASTA | Array Induction Tool Standoff | AIT-M | 0.6 | in |
| ISSBAR | Barite Mud Presence Flag | Borehole | No | |
| BHS | Borehole Status (Open or Cased Hole) | Borehole | Open | |
| BHT | Bottom Hole Temperature | Borehole | 140 | degF |
| BS | Bit Size | WLSESSION | 7.875 | in |
| BSAL | Borehole Salinity | Borehole | 0 | ppm |
| CALI_SHIFT | CALI Supplementary Offset | HDRS-H | -0.796 | in |
| CBLO | Casing Bottom (Logger) | WLSESSION | 423 | ft |
| CDEN | Cement Density | HGNS-H | 2 | g/cm3 |

| | | | | |
|---|---|---|---|---|
| DFD | Drilling Fluid Density | Borehole | 9.2 | lbm/gal |
| DFT_CATEGORY | Drilling Fluid Type | Borehole | Water | |
| DHC | Density Hole Correction | HDRS-H | Caliper | |
| FD | Fluid Density | Borehole | 1 | g/cm3 |
| FSAL | Formation Salinity | Borehole | 0 | ppm |
| GCSE_DOWN_PASS | Generalized Caliper Selection for WL Log Down Passes | Borehole | BS(RT) | |
| GCSE_UP_PASS | Generalized Caliper Selection for WL Log Up Passes | Borehole | CALI | |
| GRSE | Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity | Borehole | AMF | |
| GTSE | Generalized Temperature Selection, from Measured or Computed Temperature | Borehole | CTEM | |
| HSCO | Hole Size Correction Option | HGNS-H | Yes | |
| MATR | Rock Matrix for Neutron Porosity Corrections | Borehole | Depth Zoned | |
| MDEN | Matrix Density for Density Porosity | Borehole | Depth Zoned | g/cm3 |
| MFST | Mud Filtrate Sample Temperature | Borehole | 68 | degF |
| RMFS | Resistivity of Mud Filtrate Sample | Borehole | 1.59 | ohm.m |
| SOCO | Standoff Correction Option | HGNS-H | Yes | |
| SPDR | SP Drift Per Foot | AIT-M | 0 | mV/ft |

## Depth Zone Parameters

| Parameter | Value | Start ( ft ) | Stop ( ft ) |
|---|---|---|---|
| MATR | LIMESTONE | 331 | 4150 |
| MATR | SANDSTONE | 4150 | 4758.5 |
| MDEN | 2.71 | 331 | 4150 |
| MDEN | 2.65 | 4150 | 4758.5 |

All depth are actual.

## Tool Control Parameters

### One: Parameters

| Parameter | Description | Tool | Value | Unit |
|---|---|---|---|---|
| HMCA_BOARD_TYPE | HMCA Board Type | HGNS-H | 1 | |
| HRGD_BOARD_TYPE | HRGD Board Type | HDRS-H | WITHOUT_HET | |
| MAX_LOG_SPEED | Toolstring Maximum Logging Speed | WLSESSION | 3600 | ft/h |
| STSO_HRDD | Temperature Source for the Density Algorithm | HDRS-H | Decaytime algorithm | |

## One

## 5" Triple Combo

## Pass Summary

| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
|---|---|---|---|---|---|---|---|---|---|
| One | Log[3]:Up | Up | 2991.52 ft | 3277.64 ft | 26-Oct-2017 5:35:11 AM | 26-Oct-2017 5:41:06 AM | ON | 2.08 ft | Yes |
| One | Log[5]:Up | Up | 367.78 ft | 4758.72 ft | 26-Oct-2017 5:57:56 AM | 26-Oct-2017 8:45:09 AM | ON | 2.60 ft | Yes |

All depths are referenced to toolstring zero

## Log

Company:St Croix Operating Inc Well:Clover Schenk #1

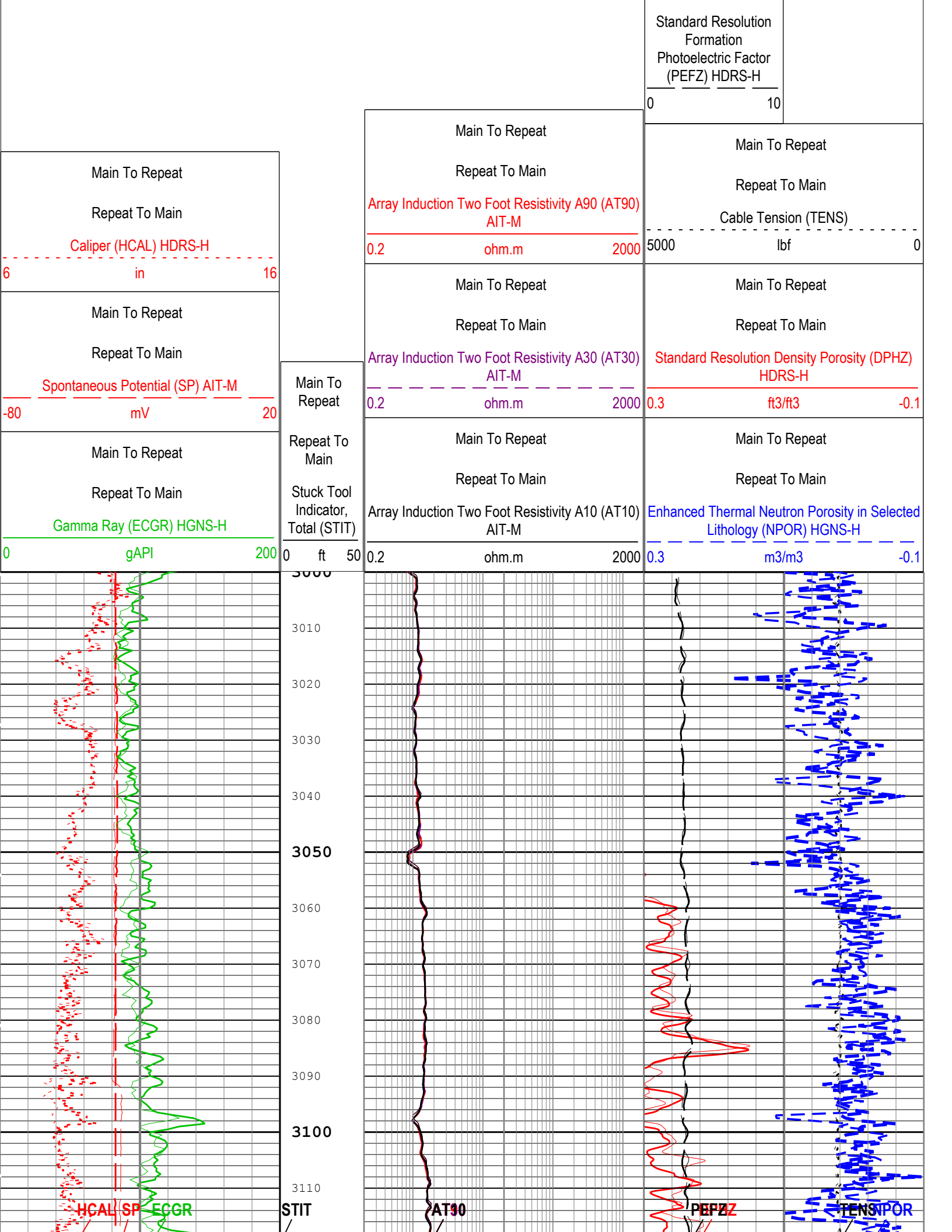
One: Log[5]:Up:S008

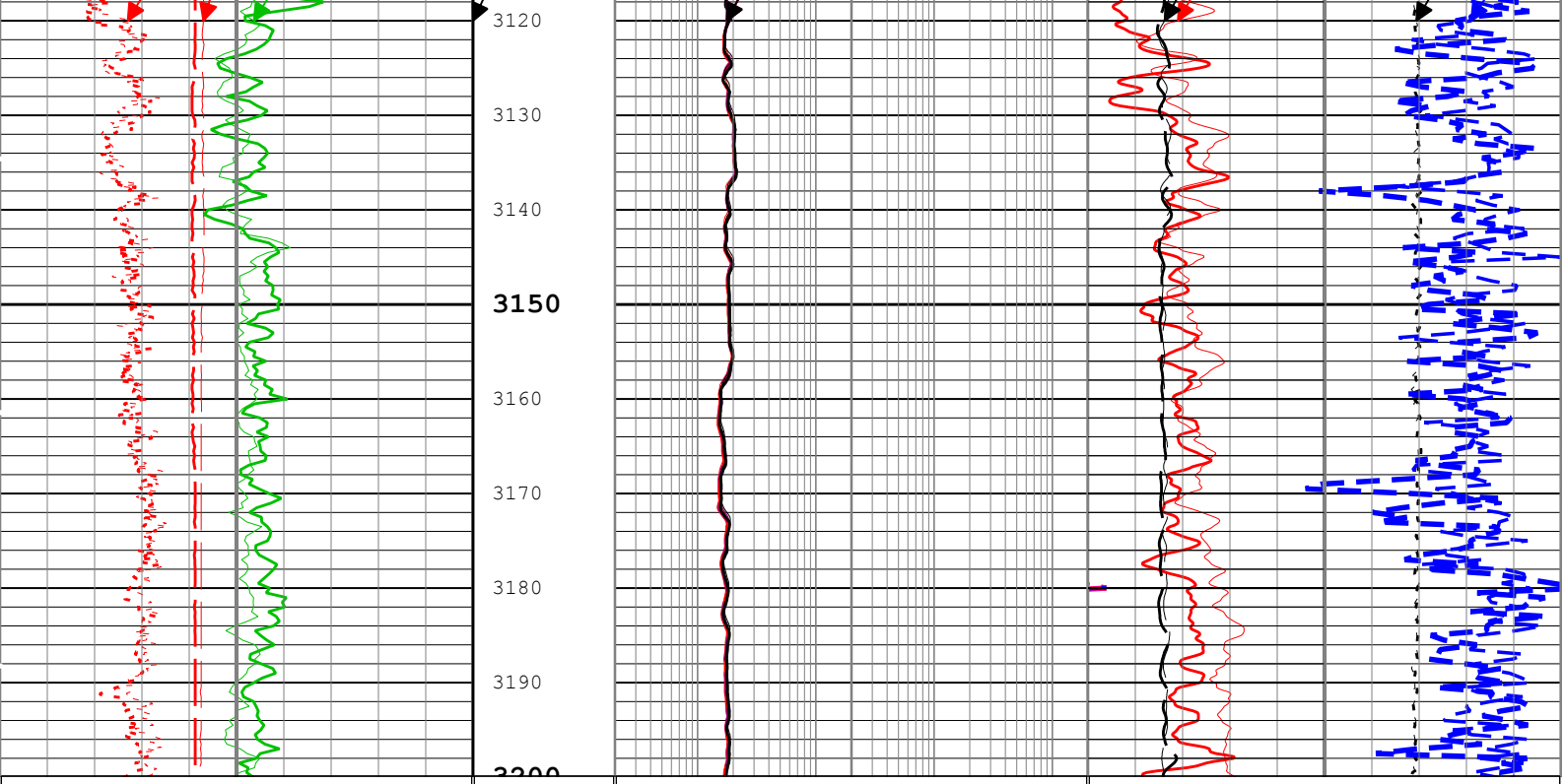
Description: HGNS standard resolution porosities for Platform Express Format: Log ( TripleCombo-5 RA ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 26-Oct-2017 14:40:54

TIME_1900 - Time Marked every 60.00 (s)

Main To Repeat

Repeat To Main


Main To Repeat
Repeat To Main
Caliper (HCAL) HDRS-H
6
in
16
Main To Repeat
Repeat To Main
Spontaneous Potential (SP) AIT-M
-80
mV
20
Main To Repeat
Repeat To Main
Gamma Ray (ECGR) HGNS-H
0
gAPI
200
Main To Repeat
Repeat To Main
Stuck Tool Indicator, Total (STIT)
0
ft
50
Main To Repeat
Repeat To Main
Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2
ohm.m
2000
Main To Repeat
Repeat To Main
Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2
ohm.m
2000
Main To Repeat
Repeat To Main
Array Induction Two Foot Resistivity A10 (AT10) AIT-M
0.2
ohm.m
2000
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H
0
10
Main To Repeat
Repeat To Main
Cable Tension (TENS)
5000
lbf
0
Main To Repeat
Repeat To Main
Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3
ft3/ft3
-0.1
Main To Repeat
Repeat To Main
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3
m3/m3
-0.1
3000
3010
3020
3030
3040
3050
3060
3070
3080
3090
3100
3110
HCAL
SP
ECGR
STIT
AT90
AT30
AT10
PEFZ
TENS
DPHZ
NPOR




Main To Repeat

Repeat To Main

Caliper (HCAL) HDRS-H

6 in 16

Main To Repeat

Repeat To Main

Spontaneous Potential (SP) AIT-M

-80 mV 20

Main To Repeat

Repeat To Main

Gamma Ray (ECGR) HGNS-H

0 gAPI 200

Main To Repeat

Repeat To Main

Stuck Tool Indicator, Total (STIT)

0 ft 50

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Cable Tension (TENS)

5000 lbf 0

Main To Repeat

Repeat To Main

Standard Resolution Density Porosity (DPHZ) HDRS-H

0.3 ft3/ft3 -0.1

Main To Repeat

Repeat To Main

Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H

0.3 m3/m3 -0.1

Main To Repeat

Repeat To Main

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H

0 10

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log ( TripleCombo-5 RA ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 26-Oct-2017 14:40:54

## Channel Processing Parameters

### One: Parameters

| Parameter | Description | Tool | Value | Unit |
|---|---|---|---|---|
| ABHM | Array Induction Borehole Correction Mode | AIT-M | Compute Standoff | |
| ASTA | Array Induction Tool Standoff | AIT-M | 0.6 | in |
| ISSBAR | Barite Mud Presence Flag | Borehole | No | |
| BHS | Borehole Status (Open or Cased Hole) | Borehole | Open | |
| BHT | Bottom Hole Temperature | Borehole | 140 | degF |
| BS | Bit Size | WLSESSION | 7.875 | in |
| BSAL | Borehole Salinity | Borehole | 0 | ppm |
| CALI_SHIFT | CALI Supplementary Offset | HDRS-H | -0.796 | in |
| CBLO | Casing Bottom (Logger) | WLSESSION | 423 | ft |
| CDEN | Cement Density | HGNS-H | 2 | g/cm3 |
| DFD | Drilling Fluid Density | Borehole | 9.2 | lbm/gal |
| DFT_CATEGORY | Drilling Fluid Type | Borehole | Water | |
| DHC | Density Hole Correction | HDRS-H | Caliper | |
| FD | Fluid Density | Borehole | 1 | g/cm3 |
| FSAL | Formation Salinity | Borehole | 0 | ppm |
| GCSE_DOWN_PASS | Generalized Caliper Selection for WL Log Down Passes | Borehole | BS(RT) | |
| GCSE_UP_PASS | Generalized Caliper Selection for WL Log Up Passes | Borehole | CALI | |
| GRSE | Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity | Borehole | AMF | |
| GTSE | Generalized Temperature Selection, from Measured or Computed Temperature | Borehole | CTEM | |
| HSCO | Hole Size Correction Option | HGNS-H | Yes | |
| MATR | Rock Matrix for Neutron Porosity Corrections | Borehole | LIMESTONE | |
| MDEN | Matrix Density for Density Porosity | Borehole | 2.71 | g/cm3 |
| MFST | Mud Filtrate Sample Temperature | Borehole | 68 | degF |
| RMFS | Resistivity of Mud Filtrate Sample | Borehole | 1.59 | ohm.m |
| SOCO | Standoff Correction Option | HGNS-H | Yes | |
| SPDR | SP Drift Per Foot | AIT-M | 0 | mV/ft |

# Tool Control Parameters

## One: Parameters

| Parameter | Description | Tool | Value | Unit |
|---|---|---|---|---|
| HMCA_BOARD_TYPE | HMCA Board Type | HGNS-H | 1 | |
| HRGD_BOARD_TYPE | HRGD Board Type | HDRS-H | WITHOUT_HET | |
| MAX_LOG_SPEED | Toolstring Maximum Logging Speed | WLSESSION | 3600 | ft/h |
| STSO_HRDD | Temperature Source for the Density Algorithm | HDRS-H | Decaytime algorithm | |

# Calibration Report

## AIT-M (Array Induction Tool - M) Calibration - Run One

**Primary Equipment :**

| | | |
|---|---|---|
| File code for AIT-MA Sonde Tool Element | AMIS | 278 |

**Auxiliary Equipment :**

| | | |
|---|---|---|
| File code for AIT Bottom Nose Tool Element | AMRM | 278 |

## AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 06:12:01 21-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| Test Loop Gain - 0 | | Master | 1.000 | 0.950 | 1.011 | 1.050 |
| Test Loop Phase - 0 | deg | Master | 0 | -3.000 | 1.203 | 3.000 |
| Test Loop Gain - 1 | | Master | 1.000 | 0.950 | 1.013 | 1.050 |
| Test Loop Phase - 1 | deg | Master | 0 | -3.000 | 1.391 | 3.000 |
| Test Loop Gain - 2 | | Master | 1.000 | 0.950 | 1.015 | 1.050 |
| Test Loop Phase - 2 | deg | Master | 0 | -3.000 | 0.494 | 3.000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Test Loop Gain - 3 | | Master | 1.000 | 0.950 | 1.010 | 1.050 | |
| Test Loop Phase - 3 | deg | Master | 0 | -3.000 | 0.189 | 3.000 | |
| Test Loop Gain - 4 | | Master | 1.000 | 0.950 | 0.993 | 1.050 | |
| Test Loop Phase - 4 | deg | Master | 0 | -3.000 | 0.155 | 3.000 | |
| Test Loop Gain - 5 | | Master | 1.000 | 0.950 | 0.999 | 1.050 | |
| Test Loop Phase - 5 | deg | Master | 0 | -3.000 | 0.079 | 3.000 | |
| Test Loop Gain - 6 | | Master | 1.000 | 0.950 | 1.005 | 1.050 | |
| Test Loop Phase - 6 | deg | Master | 0 | -3.000 | 0.374 | 3.000 | |
| Test Loop Gain - 7 | | Master | 1.000 | 0.950 | 1.017 | 1.050 | |
| Test Loop Phase - 7 | deg | Master | 0 | -3.000 | -0.102 | 3.000 | |

## AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 06:12:01 21-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|---|---|---|---|---|---|---|---|
| Sonde Error Correction Real - 0 | mS/m | Master | ----- | -231.000 | -41.134 | 119.000 | |
| Sonde Error Correction Quad - 0 | | Master | ----- | -2250.000 | -1893.069 | 2250.000 | |
| Sonde Error Correction Real - 1 | mS/m | Master | ----- | 114.000 | 168.959 | 204.000 | |
| Sonde Error Correction Quad - 1 | | Master | ----- | -625.000 | -343.994 | 625.000 | |
| Sonde Error Correction Real - 2 | mS/m | Master | ----- | 66.000 | 104.770 | 156.000 | |
| Sonde Error Correction Quad - 2 | | Master | ----- | -350.000 | 12.153 | 350.000 | |
| Sonde Error Correction Real - 3 | mS/m | Master | ----- | 39.000 | 59.197 | 89.000 | |
| Sonde Error Correction Quad - 3 | | Master | ----- | -250.000 | 17.679 | 250.000 | |
| Sonde Error Correction Real - 4 | mS/m | Master | ----- | 15.000 | 27.329 | 35.000 | |
| Sonde Error Correction Quad - 4 | | Master | ----- | -63.000 | -62.993 | 63.000 | |
| Sonde Error Correction Real - 5 | mS/m | Master | ----- | 4.000 | 11.132 | 24.000 | |
| Sonde Error Correction Quad - 5 | | Master | ----- | -50.000 | -0.530 | 50.000 | |
| Sonde Error Correction Real - 6 | mS/m | Master | ----- | 5.000 | 9.386 | 15.000 | |
| Sonde Error Correction Quad - 6 | | Master | ----- | -30.000 | -5.736 | 30.000 | |
| Sonde Error Correction Real - 7 | mS/m | Master | ----- | -5.000 | -1.972 | 5.000 | |
| Sonde Error Correction Quad - 7 | | Master | ----- | -30.000 | 0.981 | 30.000 | |

## AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 06:12:01 21-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|---|---|---|---|---|---|---|---|
| Coarse Gain | | Master | 1.000 | 0.800 | 0.824 | 1.200 | |
| Fine Gain | | Master | 1.000 | 0.800 | 0.825 | 1.200 | |

## AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 06:12:01 21-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|---|---|---|---|---|---|---|---|
| Thru Cal Mag - 0 | V | Master | ----- | 0.366 | 0.628 | 0.854 | |
| Thru Cal Phase - 0 | deg | Master | ----- | 137.000 | -172.124 | -103.000 | |
| Thru Cal Mag - 1 | V | Master | ----- | 0.762 | 1.286 | 1.778 | |
| Thru Cal Phase - 1 | deg | Master | ----- | 136.000 | -173.206 | -104.000 | |
| Thru Cal Mag - 2 | V | Master | ----- | 0.372 | 0.638 | 0.868 | |
| Thru Cal Phase - 2 | deg | Master | ----- | 132.000 | -176.837 | -108.000 | |
| Thru Cal Mag - 3 | V | Master | ----- | 0.420 | 0.719 | 0.980 | |
| Thru Cal Phase - 3 | deg | Master | ----- | 131.000 | -177.608 | -109.000 | |
| Thru Cal Mag - 4 | V | Master | ----- | 0.804 | 1.346 | 1.876 | |
| Thru Cal Phase - 4 | deg | Master | ----- | 125.000 | 176.132 | -115.000 | |
| Thru Cal Mag - 5 | V | Master | ----- | 1.176 | 1.964 | 2.744 | |
| Thru Cal Phase - 5 | deg | Master | ----- | 122.000 | 174.472 | -118.000 | |
| Thru Cal Mag - 6 | V | Master | ----- | 1.176 | 1.964 | 2.744 | |
| Thru Cal Phase - 6 | deg | Master | ----- | 121.000 | 174.460 | -119.000 | |
| Thru Cal Mag - 7 | V | Master | ----- | 0.846 | 1.415 | 1.974 | |
| Thru Cal Phase - 7 | deg | Master | ----- | 115.000 | 173.650 | -125.000 | |
| SPA Zero | mV | Master | | -50.000 | -0.086 | 50.000 | |
| SPA Plus | mV | Master | | 941.000 | 992.712 | 1040.000 | |
| Temperature Zero | V | Master | | -0.050 | 0.000 | 0.050 | |
| Temperature Plus | V | Master | | 0.870 | 0.919 | 0.960 | |

## HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run One

**Primary Equipment :**

| | | |
|---|---|---|
| HILT High-Resolution Control Cartridge, 150 degC | HRCC-H | |
| HILT Resistivity Gamma-Ray Density Device, 150 degC | HRGD-H | 1721 |

**Auxiliary Equipment :**

| | | |
|---|---|---|
| HRDD Backscatter Detector | Backscatter | |
| HRDD Long Spacing Detector | Long Spacing | |
| HRDD Short Spacing Detector | Short Spacing | |
| Cesium 137 Gamma-Ray Logging Source | GSR-J | 5534 |
| HILT High-Resolution Control Cartridge, 150 degC | HRCC-H | |
| HILT High-Resolution Mechanical Sonde, 150 degC | HRMS-H | |

**Calibration Parameter :**

Small Ring Size

Large Ring Size

## HDRS Density Calibration - Inversion Results

Master (EEPROM): 07:19:00 07-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| Rho Aluminum | g/cm3 | Master | 2.596 | 2.586 | 2.598 | 2.606 |
| Rho Magnesium | g/cm3 | Master | 1.686 | 1.676 | 1.688 | 1.696 |
| Pe Aluminum | | Master | 2.570 | 2.470 | 2.546 | 2.670 |
| Pe Magnesium | | Master | 2.650 | 2.550 | 2.636 | 2.750 |

## HDRS Density Calibration - Deviation Summary

Master (EEPROM): 07:19:00 07-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| BS Average Deviation | % | Master | 0 | -0.6000 | 0.4917 | 0.6000 |
| BS Max Deviation | % | Master | 0 | -1.6000 | 1.0330 | 1.6000 |
| SS Average Deviation | % | Master | 0 | -1.0000 | 0.3867 | 1.0000 |
| SS Max Deviation | % | Master | 0 | -2.5000 | 0.8933 | 2.5000 |
| LS Average Deviation | % | Master | 0 | -1.5000 | 0.4691 | 1.5000 |
| LS Max Deviation | % | Master | 0 | -3.5000 | 0.9644 | 3.5000 |

## HDRS Density Calibration - Background Summary

Master (EEPROM): 07:19:00 07-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| BS Window Ratio | | Master | 1.0000 | | 0.7645 | |
| BS Window Sum | 1/s | Master | 1 | | 8005 | |
| SS Window Ratio | | Master | 1.0000 | | 0.4954 | |
| SS Window Sum | 1/s | Master | 1 | | 7923 | |
| LS Window Ratio | | Master | 1.0000 | | 0.2937 | |
| LS Window Sum | 1/s | Master | 1 | | 939 | |

## HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 07:19:00 07-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| BS PM High Voltage | V | Master | | 1000 | 1620 | 2400 |
| SS PM High Voltage | V | Master | | 1000 | 1354 | 2400 |
| LS PM High Voltage | V | Master | | 1000 | 1444 | 2400 |

## HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 07:19:00 07-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| BS Crystal Resolution | % | Master | | 5.00 | 10.98 | 25.00 |
| SS Crystal Resolution | % | Master | | 5.00 | 9.00 | 20.00 |
| LS Crystal Resolution | % | Master | | 5.00 | 9.01 | 20.00 |

# HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run One

**Primary Equipment :**

| | | |
|---|---|---|
| HILT Gamma-Ray and Neutron Sonde, 150 degC | HGNS-H | 5118 |

**Auxiliary Equipment :**

| | | |
|---|---|---|
| HGNS Accelerometer, 150 degC | HACCZ-H | 5118 |
| AmBe Neutron Logging Source | NSR-F | 5203 |

**Calibration Parameter :**

| | |
|---|---|
| Water Temperature (Calibration Tank Water Temperature) | 60.0 |
| Housing Size (Thermal Housing Size) | 3.37 |
| JIG-BKG | |

## HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 18:00:00 14-May-2006

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| Accelerometer Manufacturer | | Master | | | QAT_160 | |
| Accelerometer Reference Temperature | degF | Master | | 30.2 | 77.0 | 122.0 |
| Accelerometer Coefficients - 0 | | Master | ----- | ----- | 2900.000 | ----- |
| Accelerometer Coefficients - 1 | | Master | ----- | ----- | 19.000 | ----- |
| Accelerometer Coefficients - 2 | | Master | ----- | ----- | 0.002 | ----- |
| Accelerometer Coefficients - 3 | | Master | ----- | ----- | 0.000 | ----- |
| Accelerometer Coefficients - 4 | | Master | ----- | ----- | 2.747 | ----- |
| Accelerometer Coefficients - 5 | | Master | ----- | ----- | 0.000 | ----- |
| Accelerometer Coefficients - 6 | | Master | ----- | ----- | 0.000 | ----- |
| Accelerometer Coefficients - 7 | | Master | ----- | ----- | 0.000 | ----- |
| Accelerometer Coefficients - 8 | | Master | ----- | ----- | 299.100 | ----- |
| Accelerometer Coefficients - 9 | | Master | ----- | ----- | 0.993 | ----- |

## HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 08:27:56 14-Oct-2017

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit |
|---|---|---|---|---|---|---|
| Near Zero Measurement | 1/s | Master | 0 | 5.0 | 27.0 | 40.0 |
| Far Zero Measurement | 1/s | Master | 0 | 5.0 | 29.5 | 40.0 |
| Near Plus Measurement | 1/s | Master | 6031.0 | 4700.0 | 5318.0 | 6900.0 |
| Far Plus Measurement | 1/s | Master | 2793.0 | 1900.0 | 2156.0 | 2900.0 |
| Near Corrected Plus Measurement | 1/s | Master | | 4700.0 | 5363.0 | 6900.0 |
| Far Corrected Plus Measurement | 1/s | Master | | 1900.0 | 2170.0 | 2900.0 |

Company: St Croix Operating Inc

Schlumberger

Well: Clover Schenk #1

Field: Wildcat

County: Washington

State: Colorado

# Platform Express

# Triple Combo