

Company: Nighthawk Production LLC

Well: John Craig 4-2

Field: Old Homestead

County: Lincoln State: Colorado

Platform Express

Triple Combo

County: Lincoln

Field: Old Homestead

Location: SWNW Sec: 2 T: 10S Rng: 56W

Well: John Craig 4-2

Company: Nighthawk Production LLC

Location:

SWNW Sec: 2 T: 10S Rng: 56W

Elev.: K.B. 5310.00 ft

SHL: 1303 FNL & 1124 FEL

G.L. 5295.00 ft

D.F. 5309.00 ft

Permanent Datum:

Ground Level

Elev.: 5295.00 f

Log Measured From:

Kelly Bushing

15.00 ft

above Perm.Datum

Drilling Measured From:

Kelly Bushing

API Serial No.

Section: 2

Township: 10S

Range: 56W

05-073-06568

Logging Date	04-Jun-2014		
Run Number	ONE		
Depth Driller	8432.00 ft		
Schlumberger Depth	8447.00 ft		
Bottom Log Interval	8447.00 ft		
Top Log Interval	366.20 ft		
Casing Driller Size @ Depth	8.625 in @ 367.00 ft		
Casing Schlumberger	366.2 ft		
Bit Size	7.875 in		
Type Fluid In Hole	WBM		
Density	Viscosity	91 s	
Fluid Loss	PH	7.7	
Source of Sample	Flowline		
RM @ Meas Temp	1.5 ohm.m	@ 68 degF	
RMF @ Meas Temp	1.12 ohm.m	@ 68 degF	
RMC @ Meas Temp	2.25 ohm.m	@ 68 degF	
Source RMF	Calculated	Calculated	
RM @ BHT	0.53 @ 204.95	0.4 @ 204.95	
Max Recorded Temperatures	204.95 degF	204.95	204.95
Circulation Stopped	03-Jun-2014	22:00:00	
Logger on Bottom	04-Jun-2014	09:15:02	
Unit Number	Location:	2135	
Recorded By	Tim Bjerkelund		
Witnessed By	Jim Weir		

**Disclaimer**

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Well Sketch

Driller Depth

0.00 ft

367.00 ft

Casing 8.625in  
24lbm/ft




Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	7.875					
Top Driller ( ft )	0					
Top Logger ( ft )	0					
Bottom Driller ( ft )	8432					
Bottom Logger ( ft )	8447					
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 )	367					
Bottom Logger ( ft )	366.2					

Operational Run Summary

Parameter ( unit )	ONE					
Date Log Started	04-Jun-2014					
Time Log Started	07:45:28					
Date Log Finished	04-Jun-2014					
Time Log Finished	18:04:33					
Top Log Interval ( ft )	366.20					
Bottom Log Interval ( ft )	8447.00					
Total Depth ( ft )	8447.00					
Max Hole Deviation ( deg )	0.00					
Azimuth of Max Deviation ( deg )	0.00					
Bit Size ( in )	7.875					
Logging Unit Number	2135					
Logging Unit Location	Fort Morgan					
Recorded By	Tim Bjerkelund					
Witnessed By	Jim Weir					
Service Order Number	CVG6-00026					

Service Order Number		CVC00-00020					
Borehole Fluids							
Parameter( unit )	ONE						
Fluid Type	Water						
Fluid Name	WBM						
Max Recorded Temperatures ( degF )	204.95						
Source of Sample	Flowline						
Salinity ( ppm )	0						
Density ( lbm/gal )	8.9						
Funnel Viscosity ( s )	91						
Fluid Loss ( cm3 )	4.4						
PH	7.7						
Date/Time Circulation Stopped	03-Jun-2014 22:00:00						
Date Logger on Bottom	04-Jun-2014						
Time Logger on Bottom	09:15:02						
Source RMF	Calculated						
RMC	Calculated						
RM @ Meas Temp ( ohm.m@degF )	1.5 @ 68						
RMF @ Meas Temp ( ohm.m@degF )	1.12 @ 68						
RMC @ Meas Temp ( ohm.m@degF )	2.25 @ 68						
RM @ BHT ( ohm.m@degF )	0.53 @ 204.95						
RMF @ BHT ( ohm.m@degF )	0.4 @ 204.95						
RMC @ BHT ( ohm.m@degF )	0.79 @ 204.95						
Total Solid ( % )	4.6						
High Gravity Solids ( % )	0						
Remarks and Equipment Summary							
ONE: Toolstring			ONE: Remarks				
Equip name LEH-QT:2109 LEH-QT:2109	Length 69.67	MP name Offset					
DTC-H:9469 ECH-KC:9469 DTC-H:9469	66.75	CTEM HV					
		65.85 0.00					
PPC-B:8437 PPC-B:8437	63.75	TelStatus ToolStatus					
		63.75 63.75					
		PPC-B Caliper s	62.61				

CMRT-B:202 57.24  
CMRC:78  
CMRH:78  
CMRS:202

CMRT 43.59

AH-107 41.65

AH-184 39.65

HGNS-H:4867 37.65  
HGNH:4817  
NPV-N:2554  
NSR-F:2554  
HACCCZ-H:6991  
HGNS-H:4867  
HMCA-H

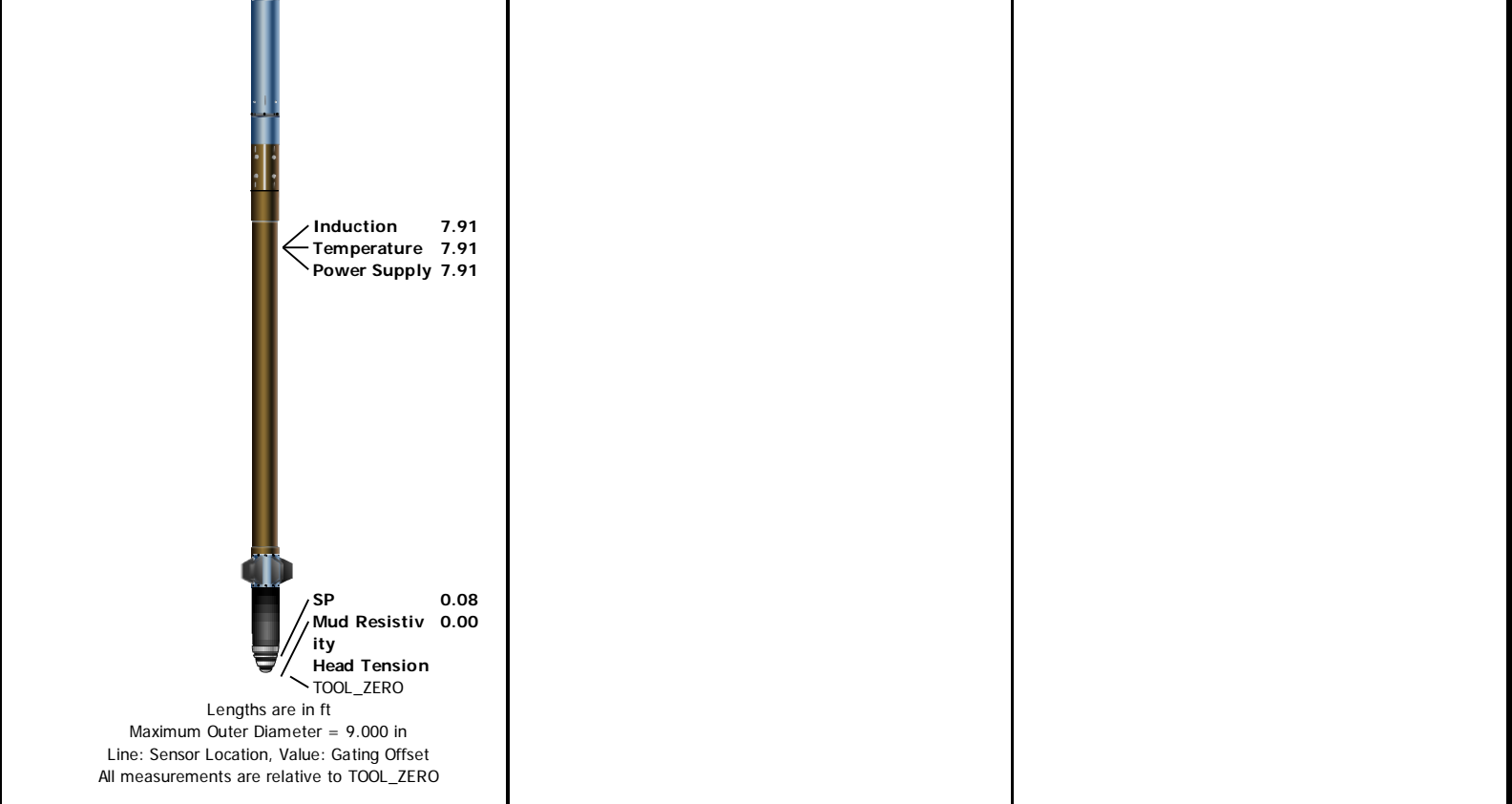
CNL Porosity 30.57  
HGNS 28.24  
HMCA 28.24  
Acceleromete 0.00  
r

HDRS-H:3868 28.24  
ECH-MEB  
HRCC-H:3828  
HRMS-H:3868  
Backscatter  
Short Spacing  
HRGD-H:3760  
GPV-Q  
Long Spacing  
GSR-J:5471

HRCC 24.24

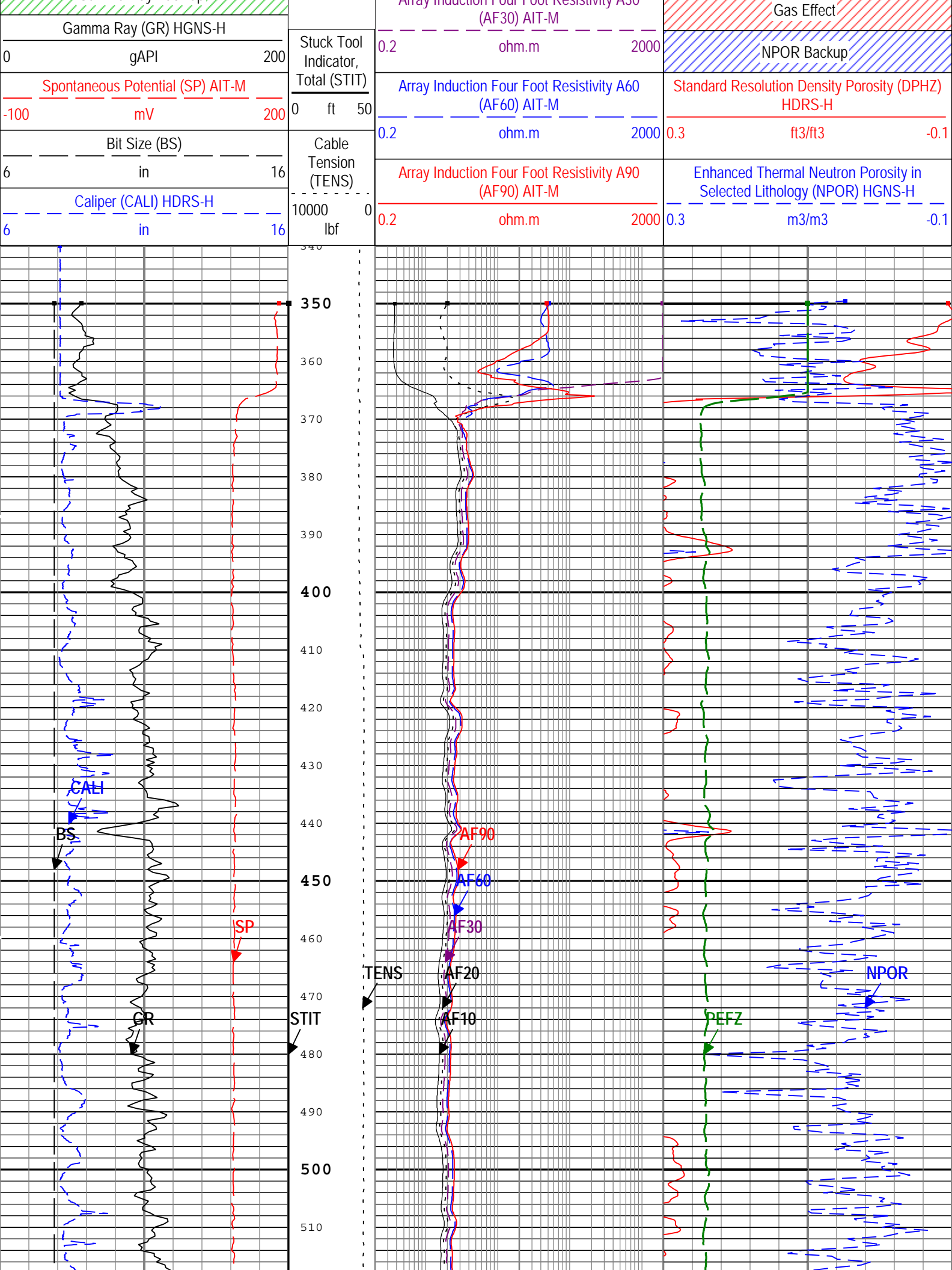
MCFL 18.81  
Caliper 18.33  
TLD Density 17.94

AIT-M:181 16.00  
AMIS:181  
AMRM:181

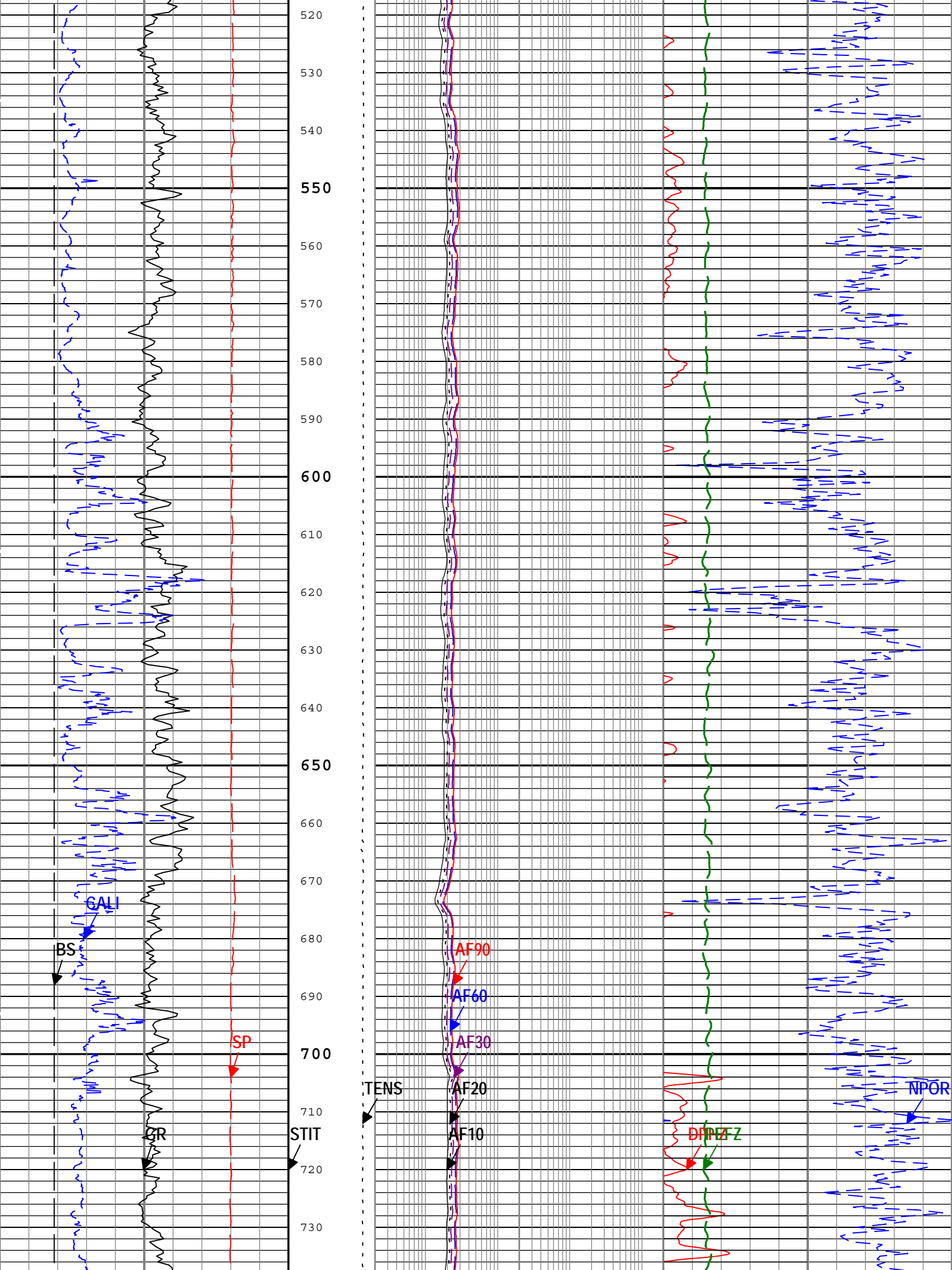


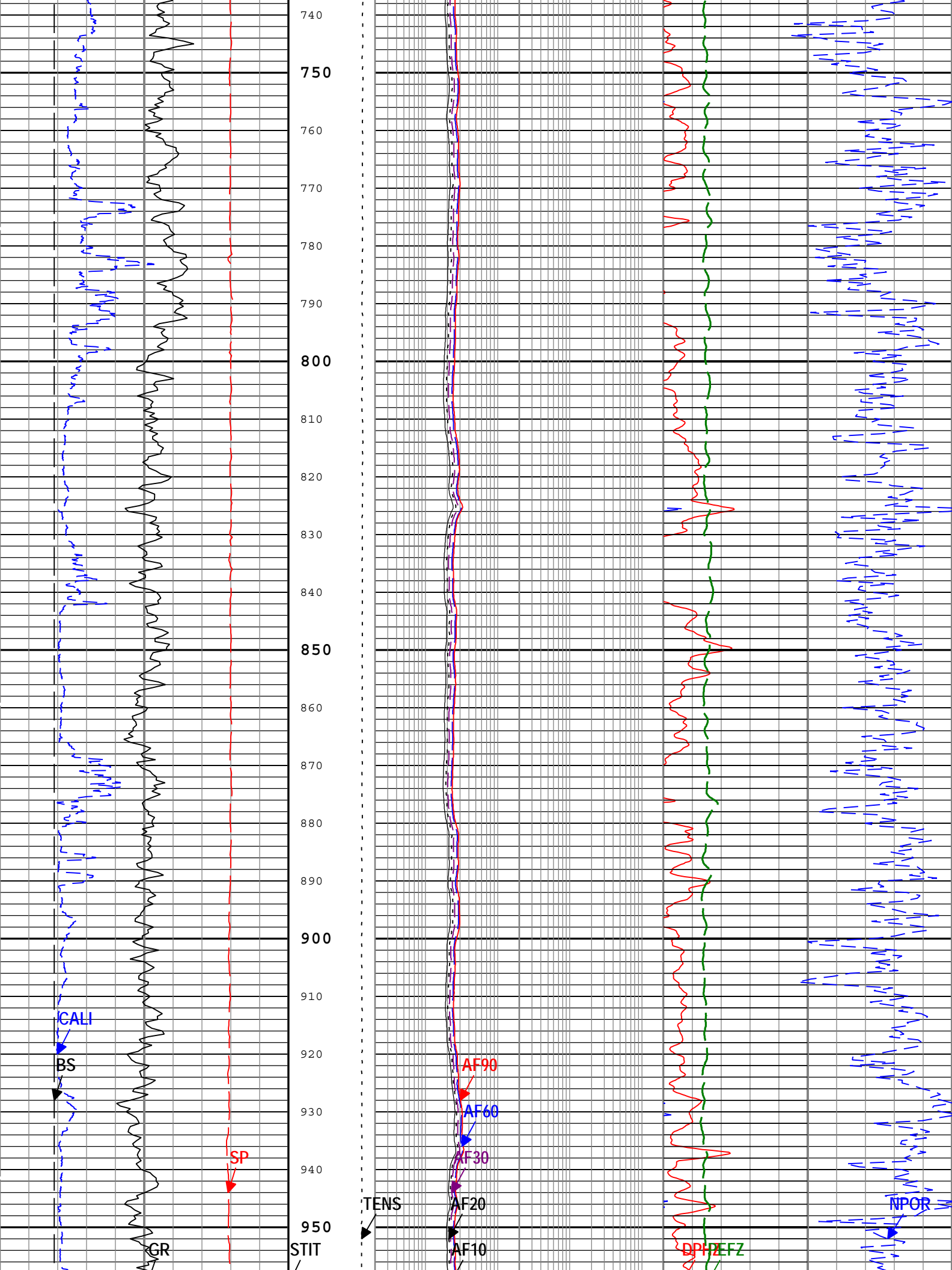
Depth Summary			
ONE			
Depth Measuring Device			
Type	IDW-JA		
Serial Number	6961		
Calibration Date	23-May-2014		
Calibrator Serial Number			
Calibration Cable Type	7-46 PXS		
Wheel Correction 1	-6		
Wheel Correction 2	-3		
Tension Device			
Type	CMTD-B/A		
Serial Number	2300		
Calibration Date	18-May-2014		
Calibrator Serial Number	88310		
Number of Calibration Points	10		
Calibration Root Mean Square Error	39		
Calibration Peak Error	62		
Logging Cable			
Type	7-46P-XS		
Serial Number			
Length	17500.00 ft		
Conveyance Type	Wireline		
Rig Type	Single		
ONE:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	1. ALL SCHLUMBERGER DEPTH PROCEDURES FOLLOWED. 2. IDW USED AS PRIMARY DEPTH DEVICE. 3. Z-CHART USED AS SECONDARY DEPTH CONTROL MEASURE. 4 TD: 8447', CSG: 366.2'. 5. STRECH CORRECTION 14.91'	
Rig Up Length At Surface			
Rig Up Length At Bottom			
Rig Up Length Correction			
Stretch Correction	14.91 ft		
Tool Zero Check At Surface			

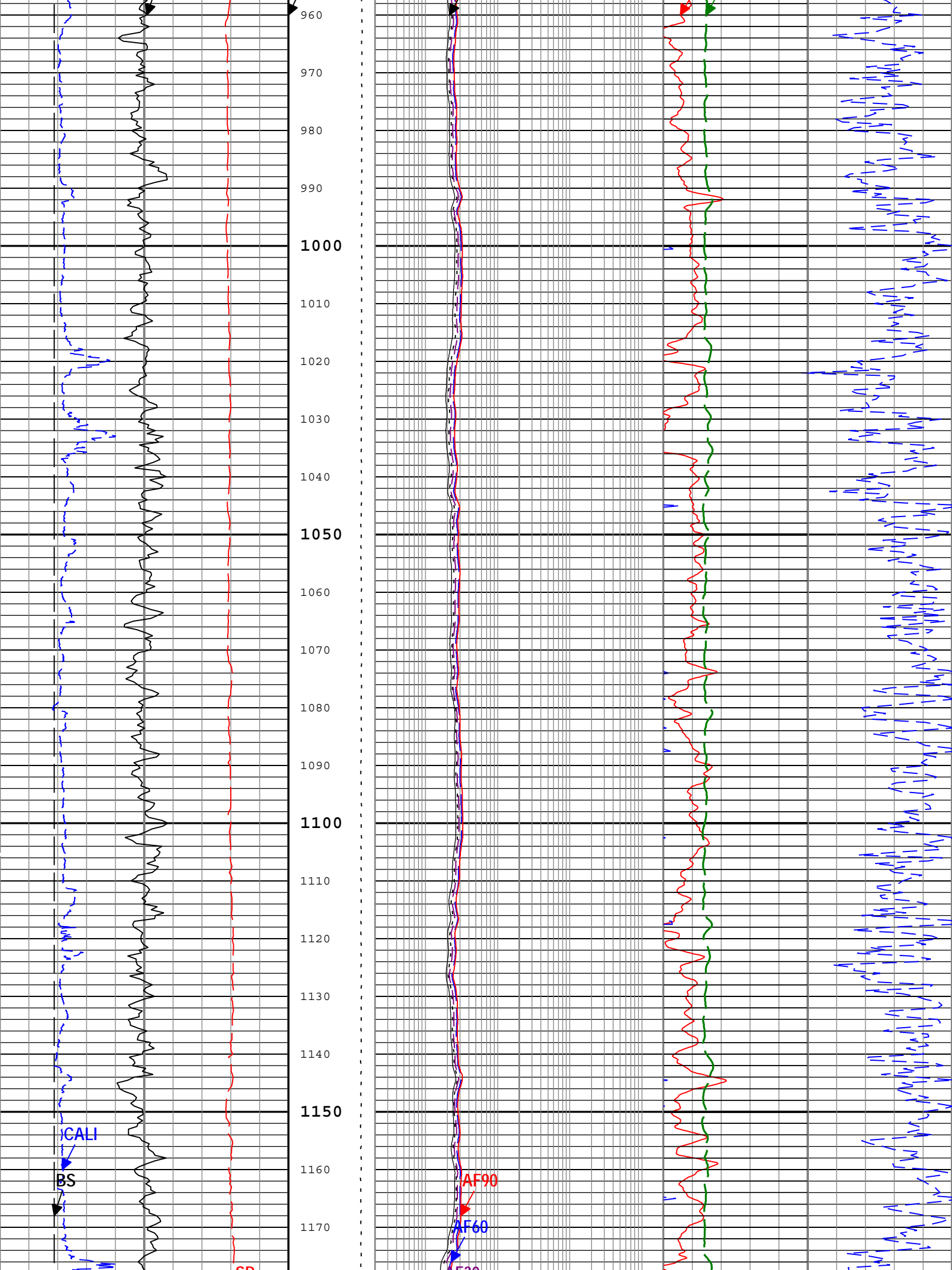
Software Version										
Acquisition System						Version				
MaxWell						4.0.9163.3000				
Application Patch						Patch-SP-10767_18214-4.0.9163.3001				
						Patch-Hotfix_Task_Tree_GDI_SP2-20806-4.0.9434.3002				
Computation	Description					Version				
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels					4.0.9433.3000				
HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections					4.0.9360.3000				
DepthCorrection	DepthCorrection					4.0.9433.3000				
Tool Elements	Description				Software Version		Firmware Version			
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC				4.0.9385.3000		2.0			
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC				4.0.9385.3000		2.0			
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC				4.0.9385.3000		3.0			
AMIS	Array Induction Sonde - M				4.0.9427.3000		1			
Pass Summary										
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data	
ONE	Main[11]:Up	Up	299.53 ft	8473.28 ft	04-Jun-2014 2:13:39 PM	04-Jun-2014 5:58:38 PM	ON	2.10 ft	No	
All depths are referenced to toolstring zero										
Log	Company:Nighthawk Production LLC      Well:John Craig 4-2 ONE: Main[11]:Up:S009									
Description: HGNS standard resolution porosities for Platform Express    Format: Log ( EMD 5in Triple Combo Linear )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 04-Jun-2014 20:30:58										
Channel	Source	Sampling								
AF10	AIT-M:AMIS:AMIS	3in								
AF20	AIT-M:AMIS:AMIS	3in								
AF30	AIT-M:AMIS:AMIS	3in								
AF60	AIT-M:AMIS:AMIS	3in								
AF90	AIT-M:AMIS:AMIS	3in								
BS	Borehole	6in								
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)										
						Array Induction Four Foot Resistivity A10 (AF10) AIT-M				
						0.2	ohm.m	2000	Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H 010	
						Array Induction Four Foot Resistivity A20 (AF20) AIT-M				
						0.2	ohm.m	2000		
Gamma Ray Back up						Array Induction Four Foot Resistivity A30				

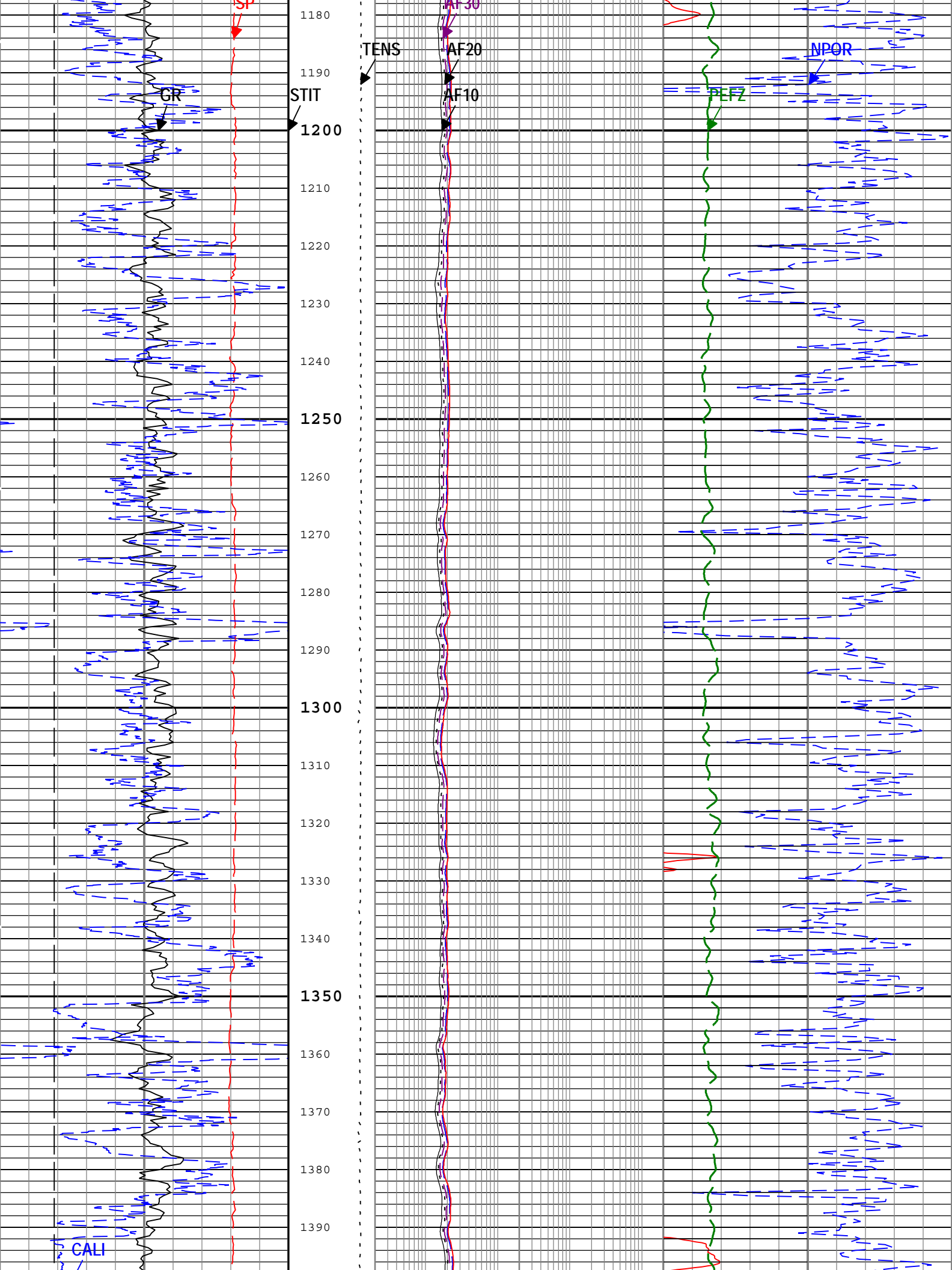


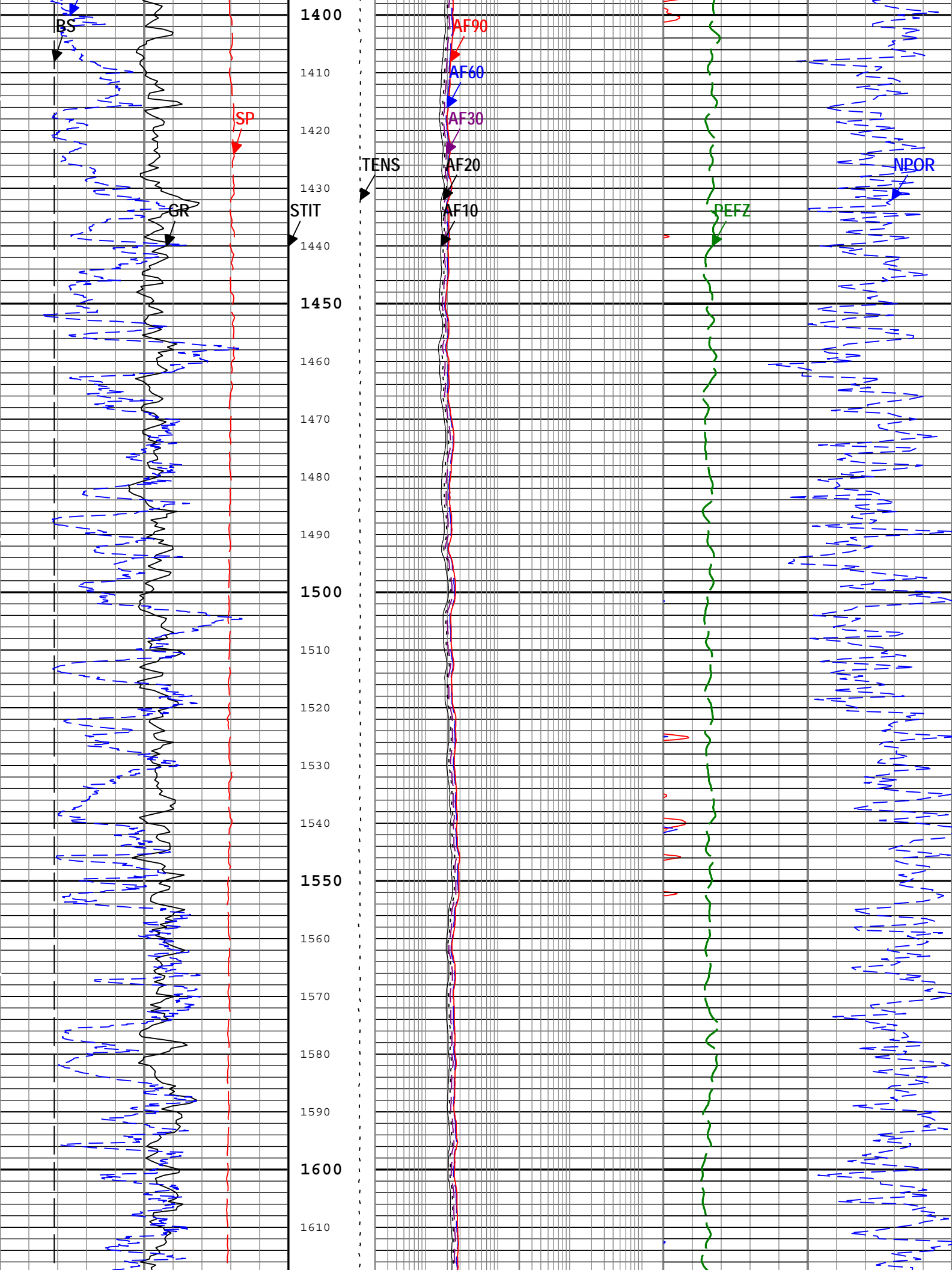


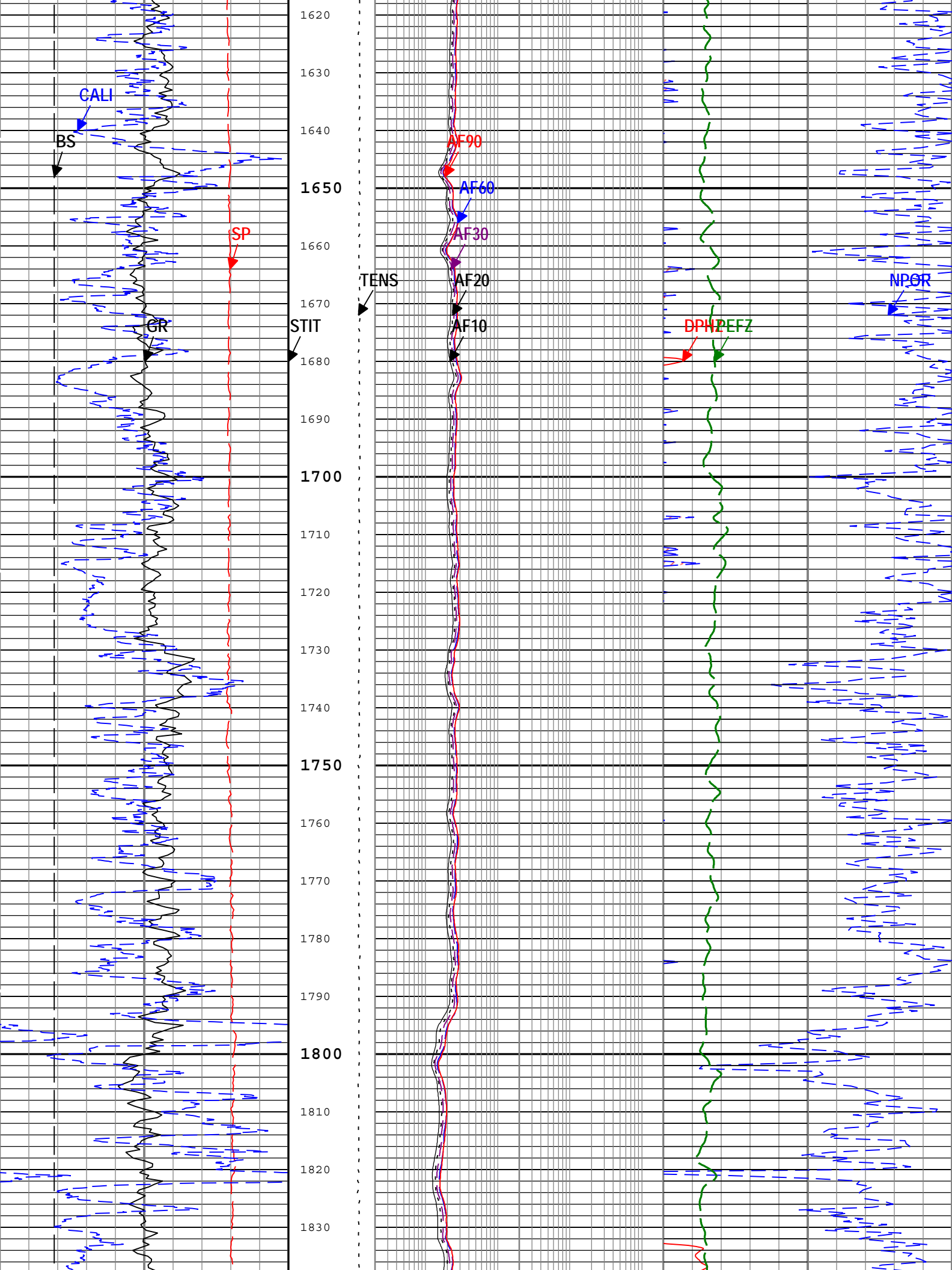


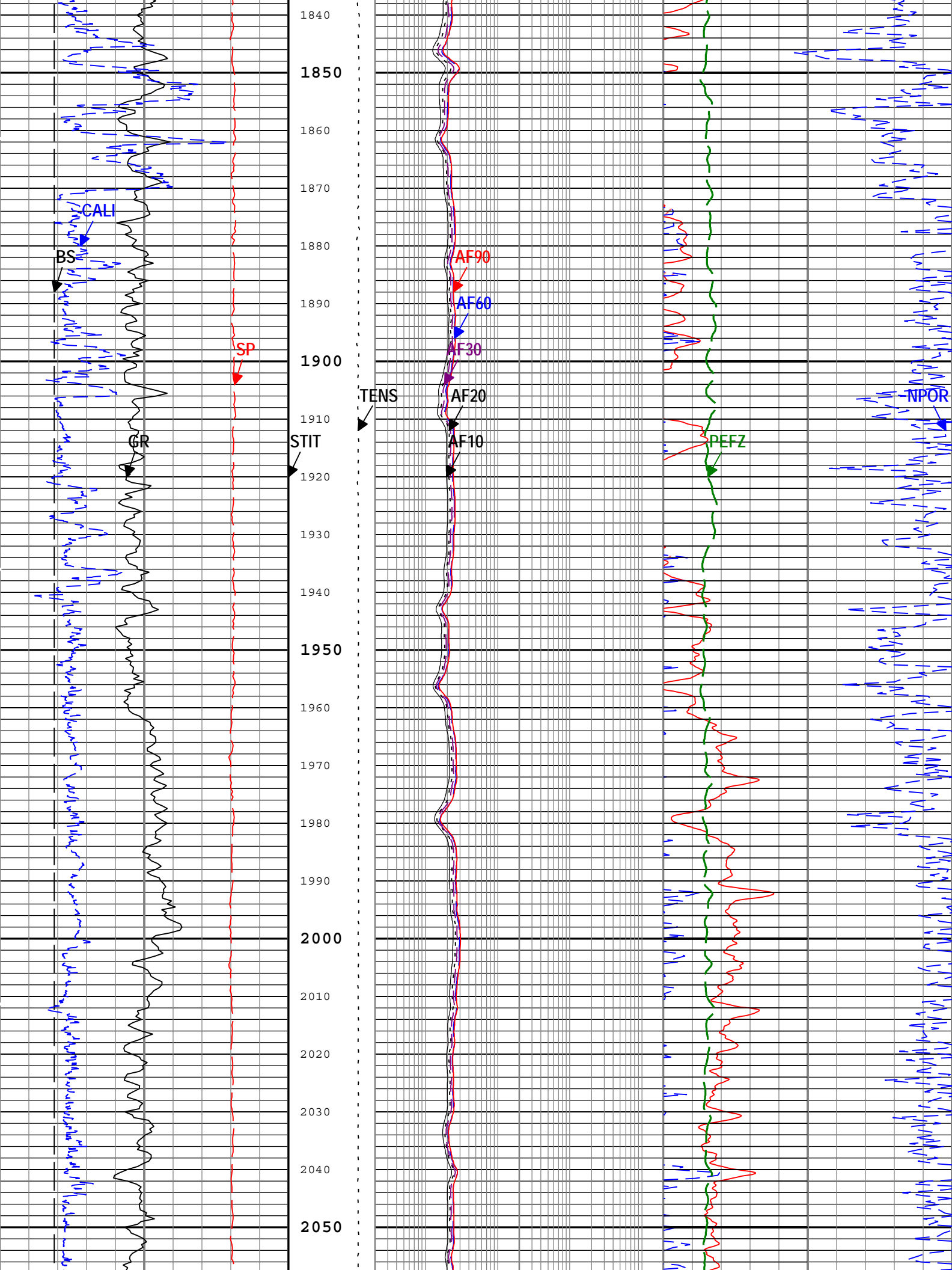


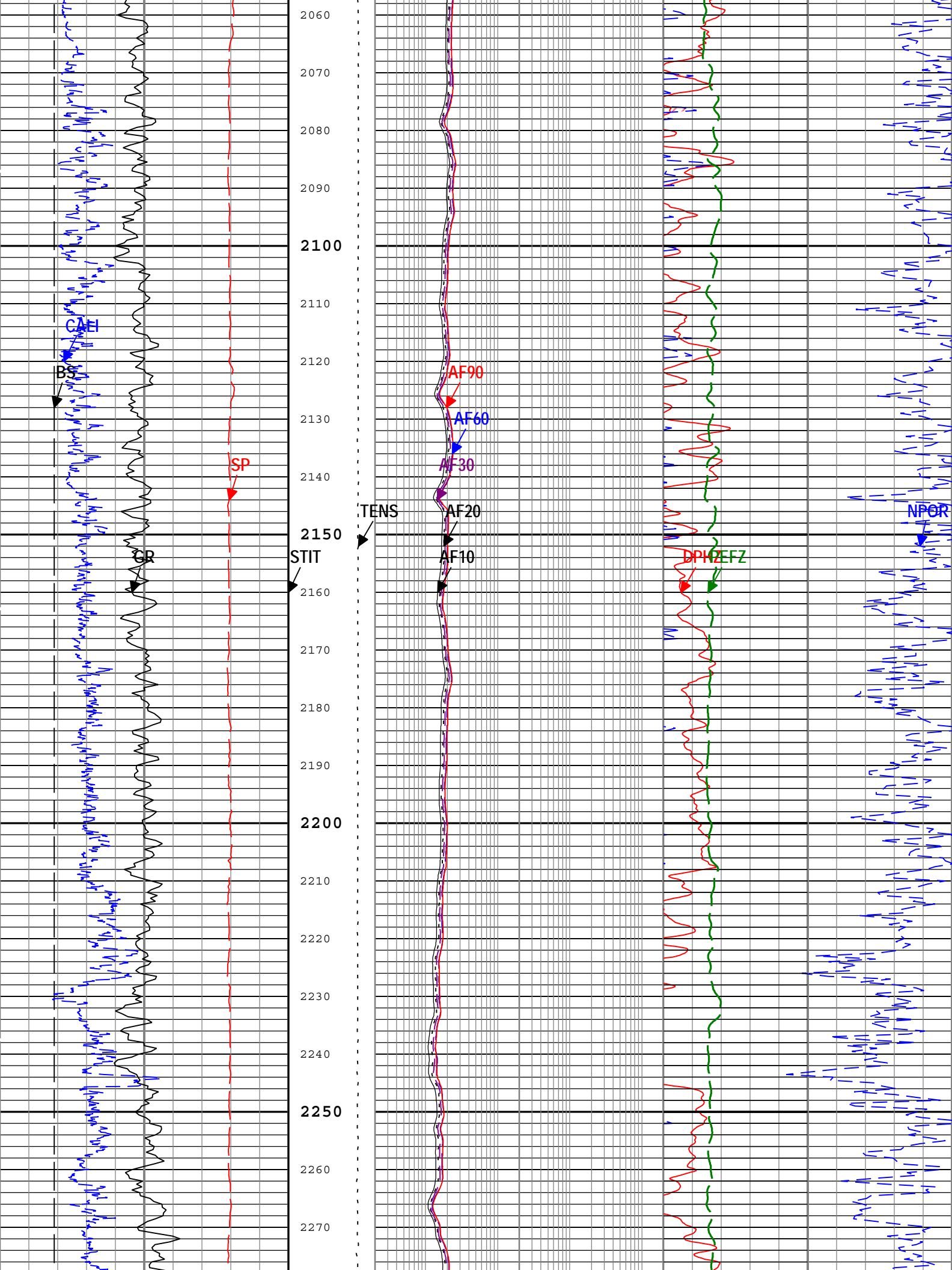




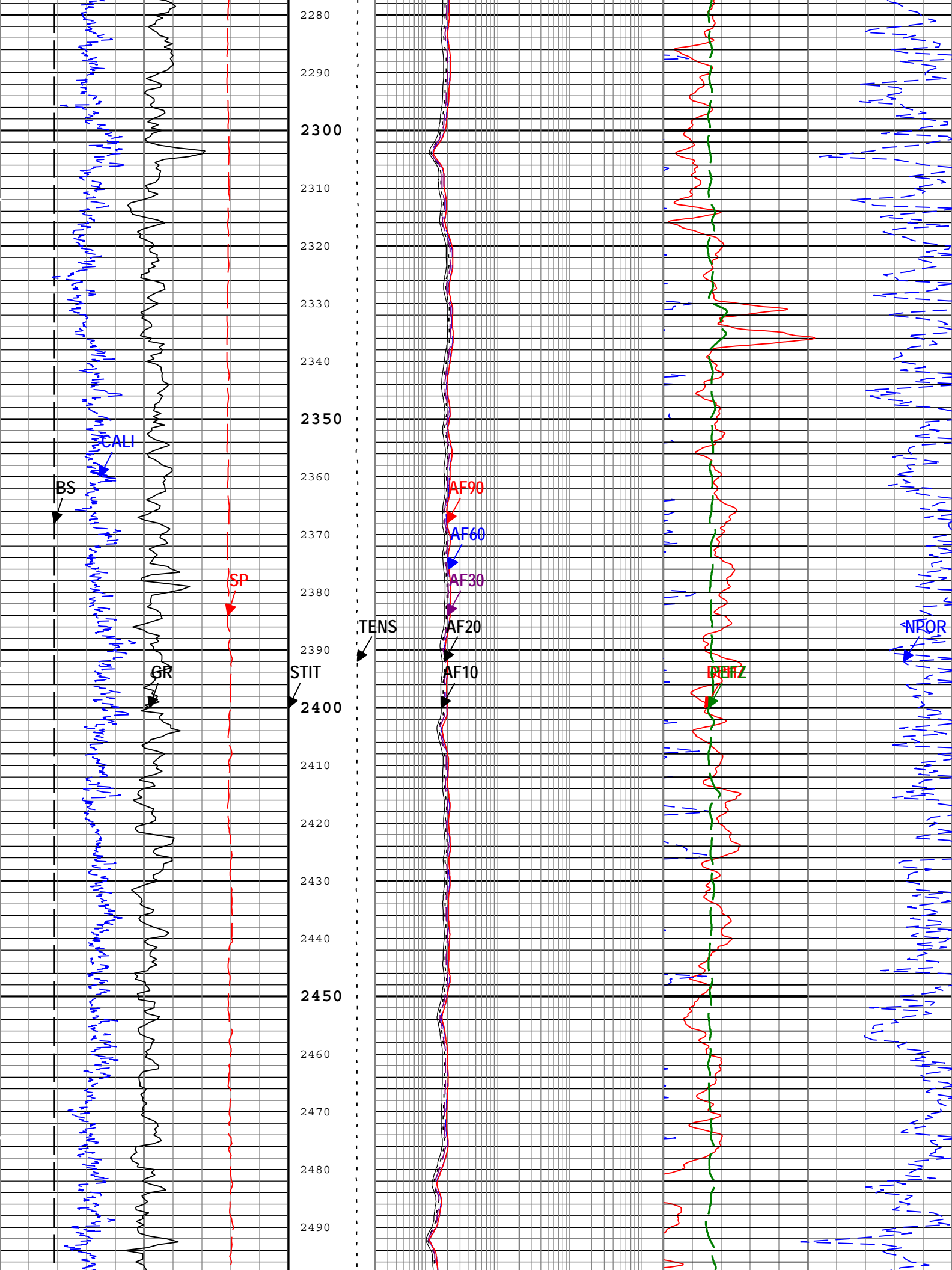


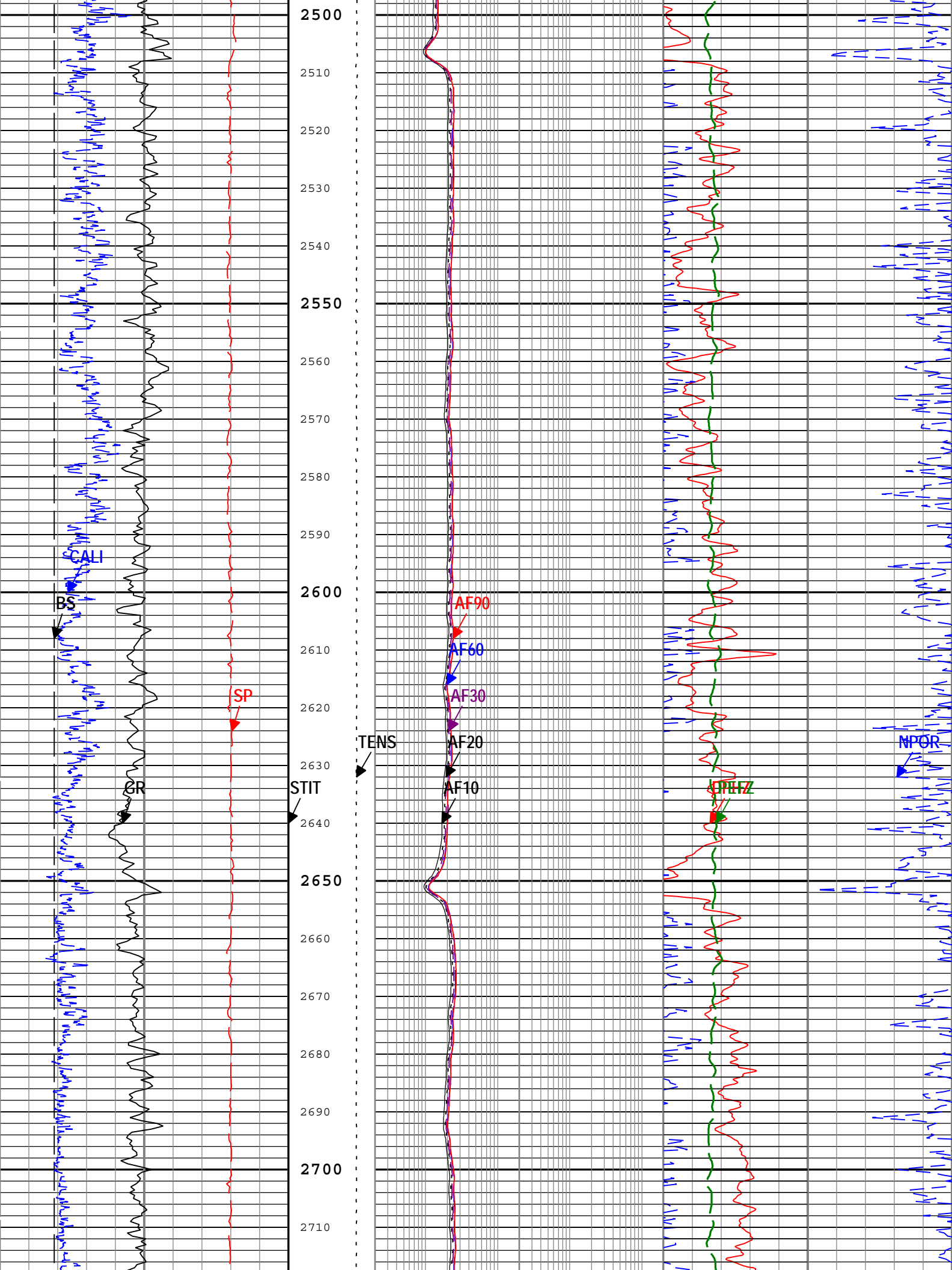


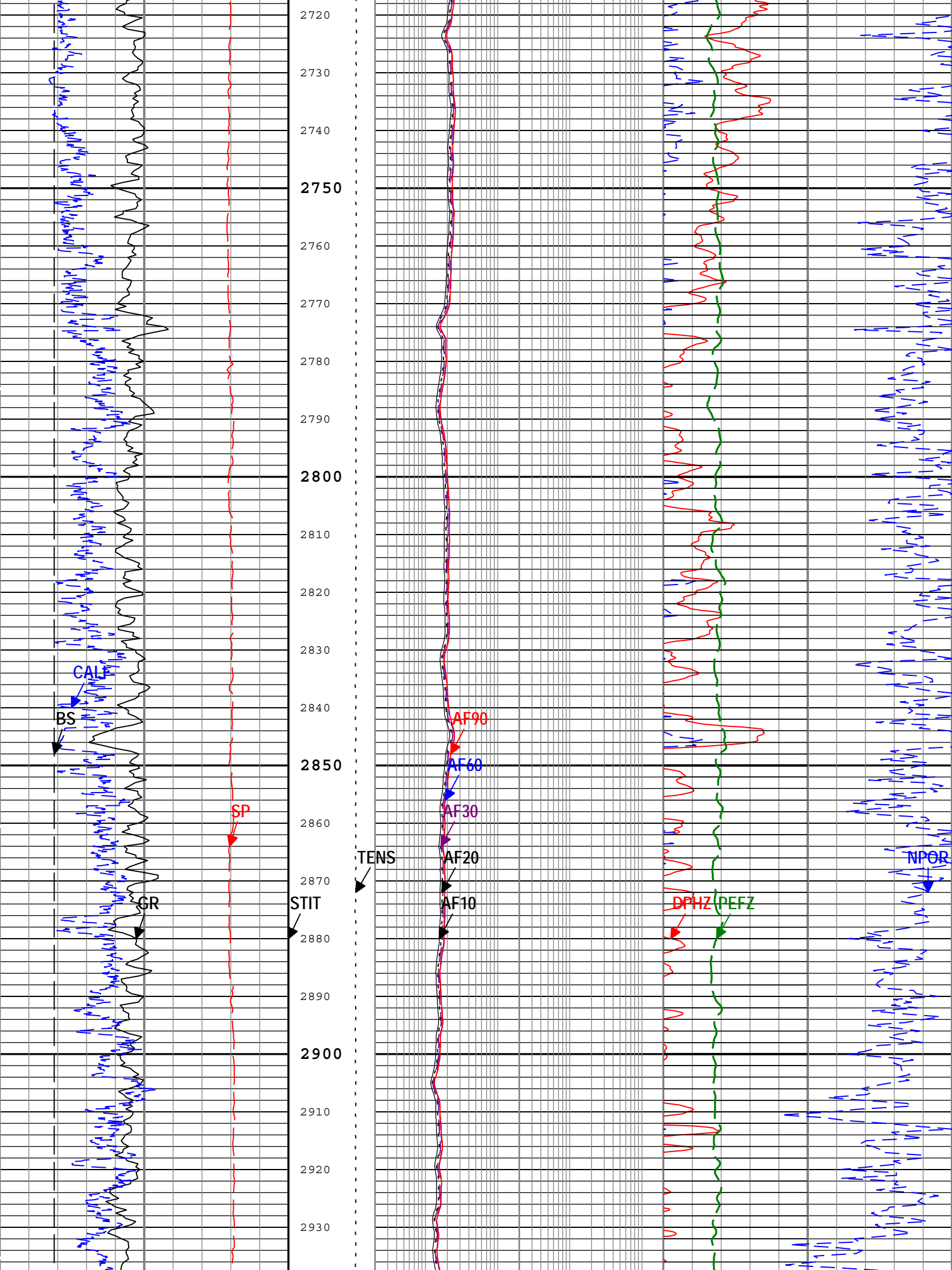


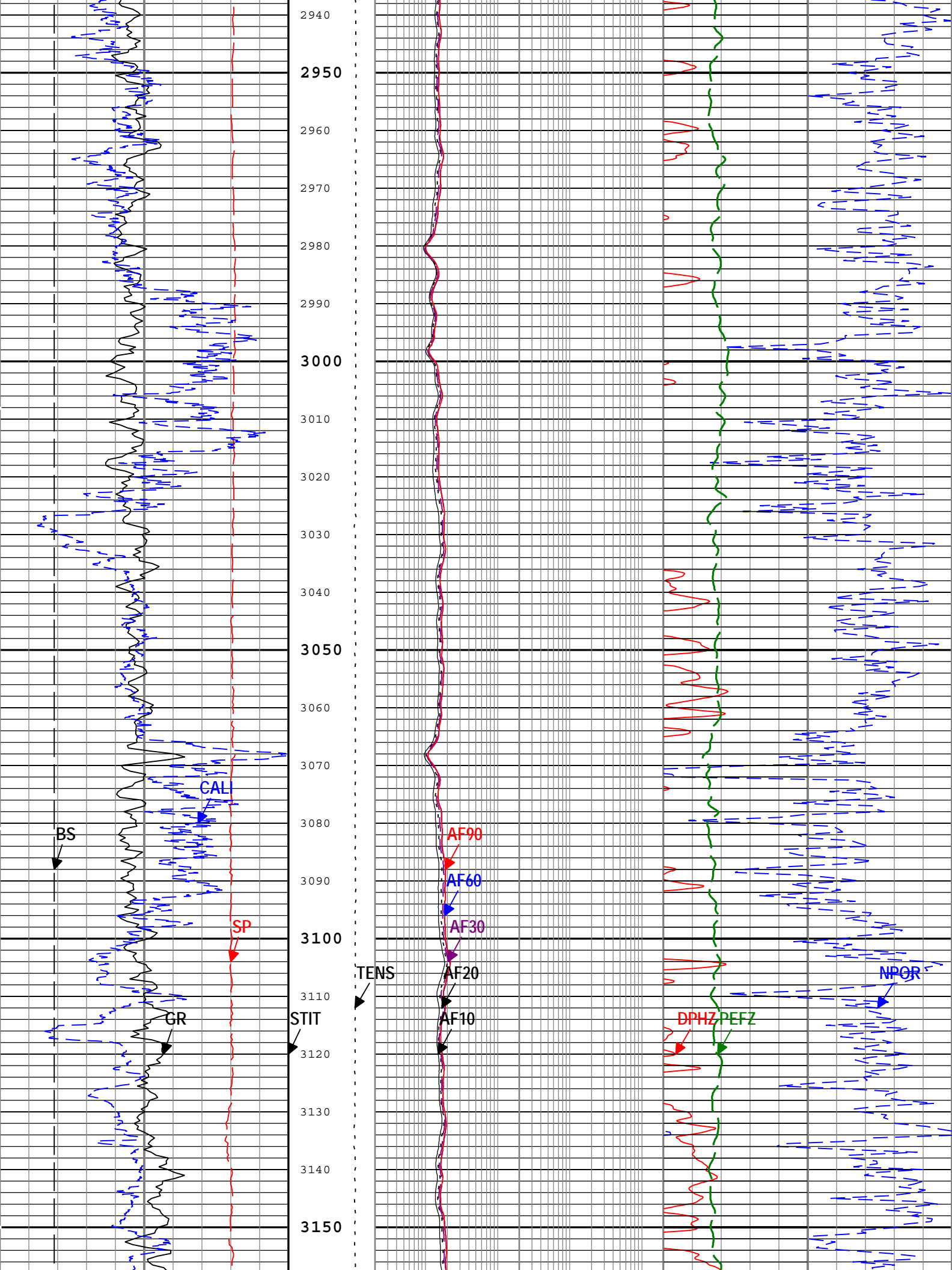


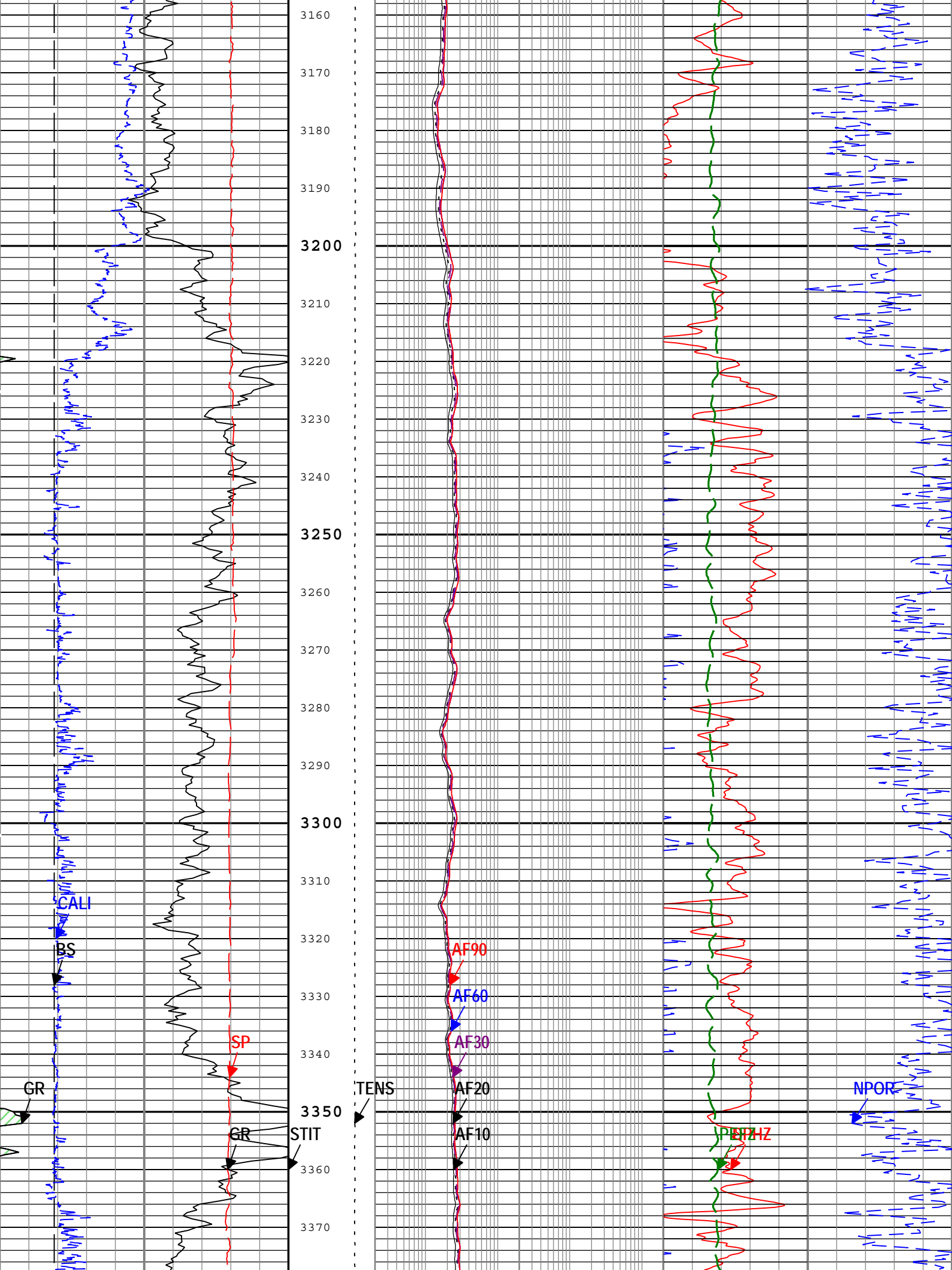


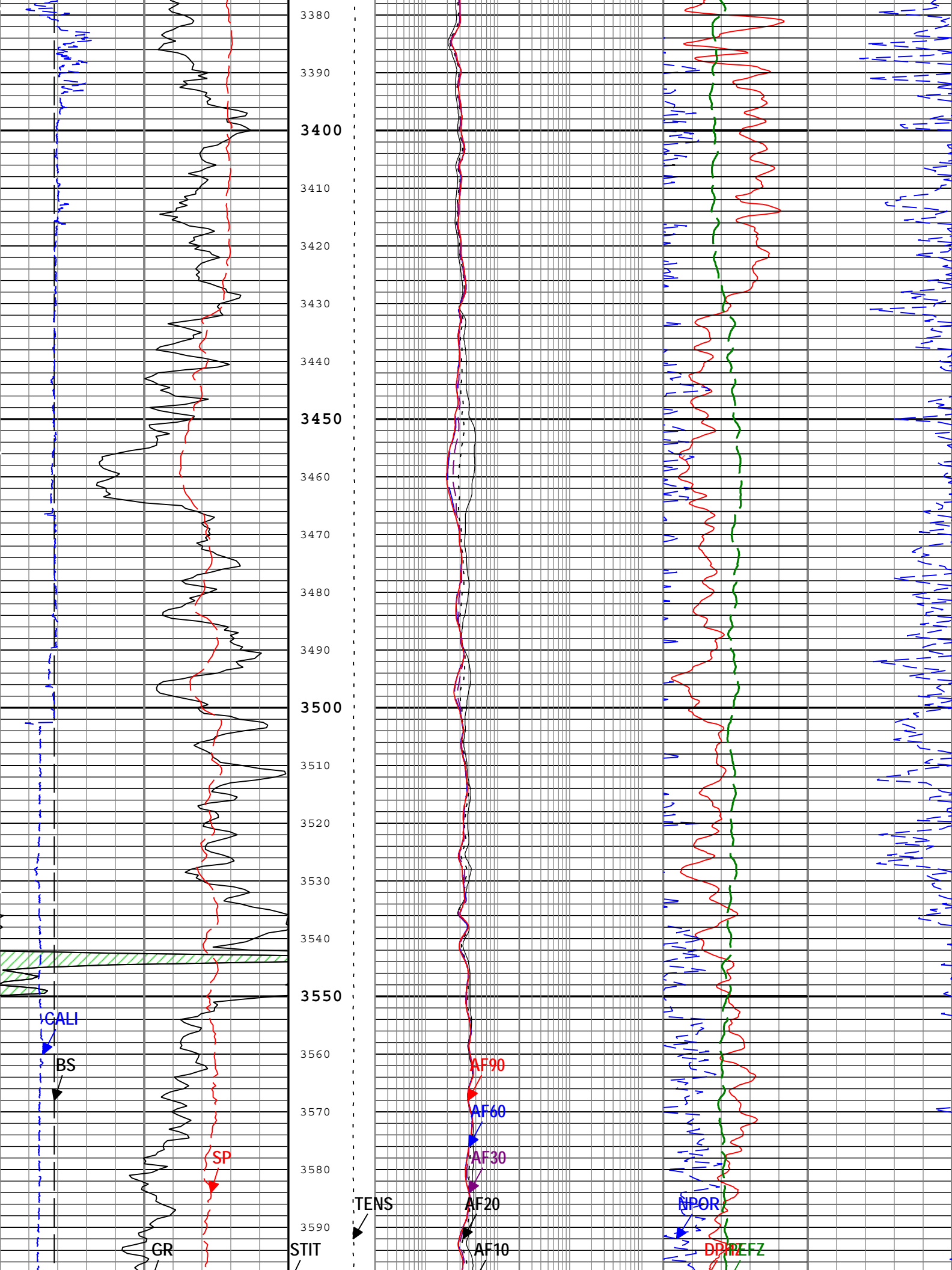


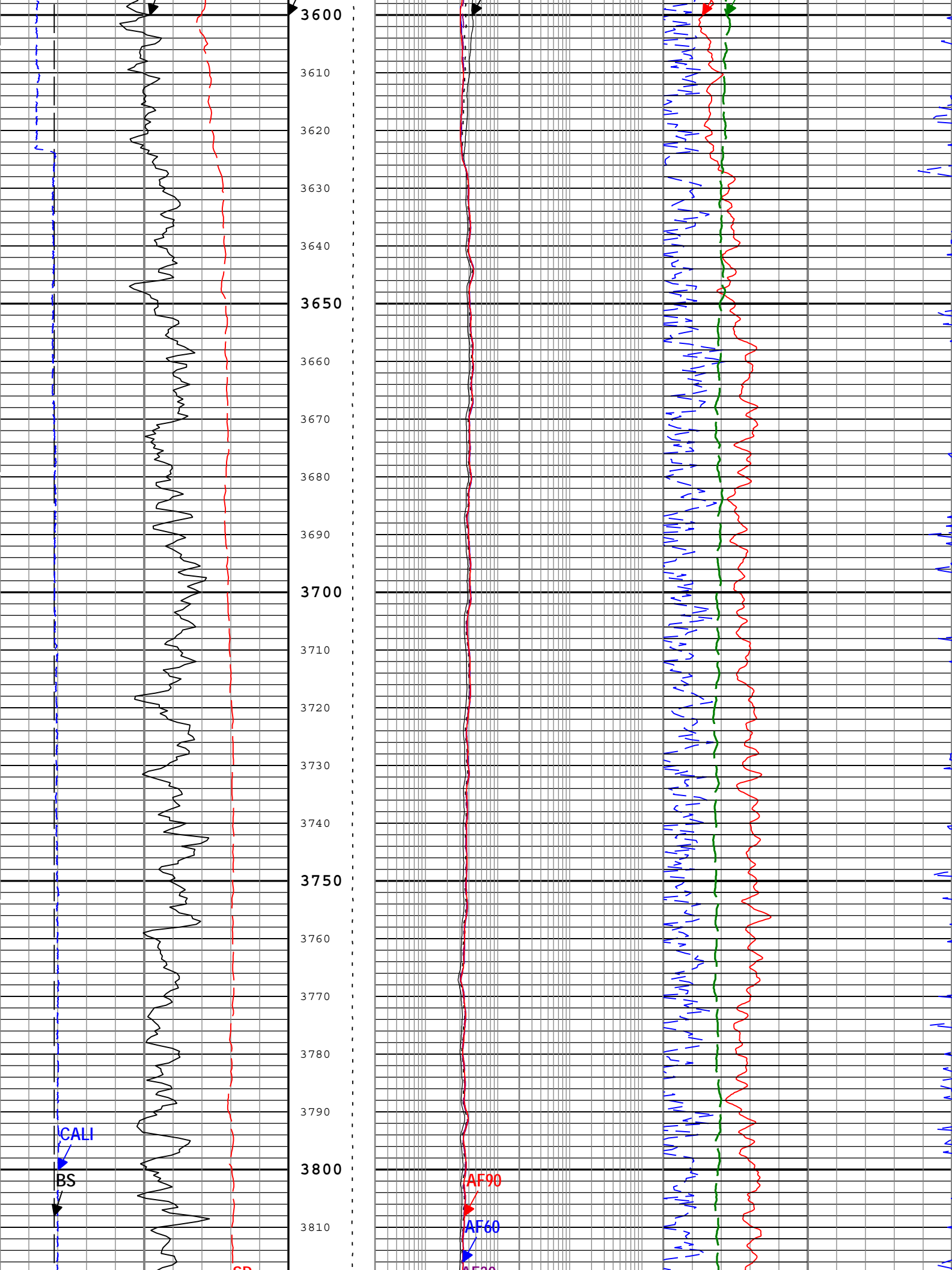


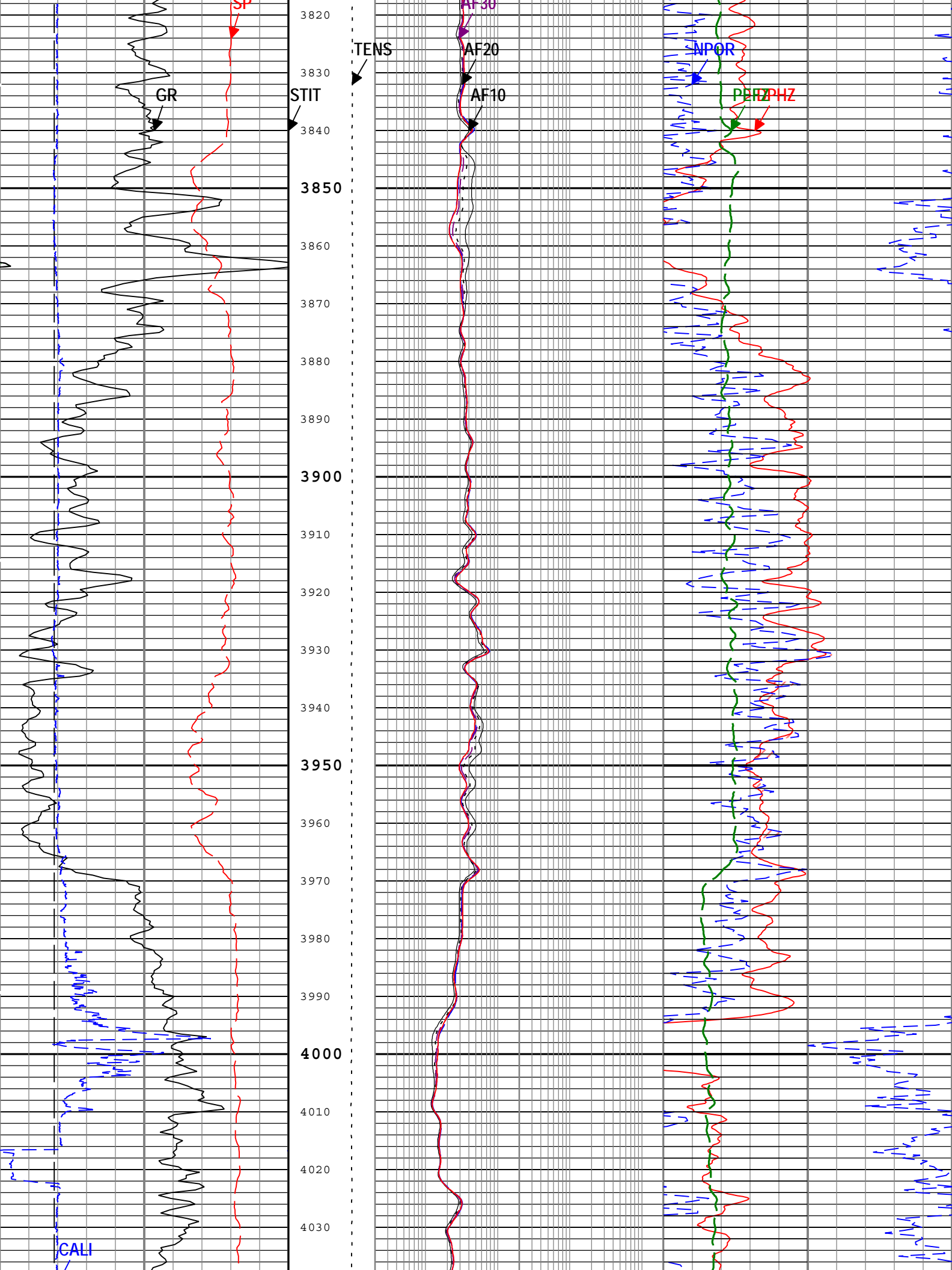




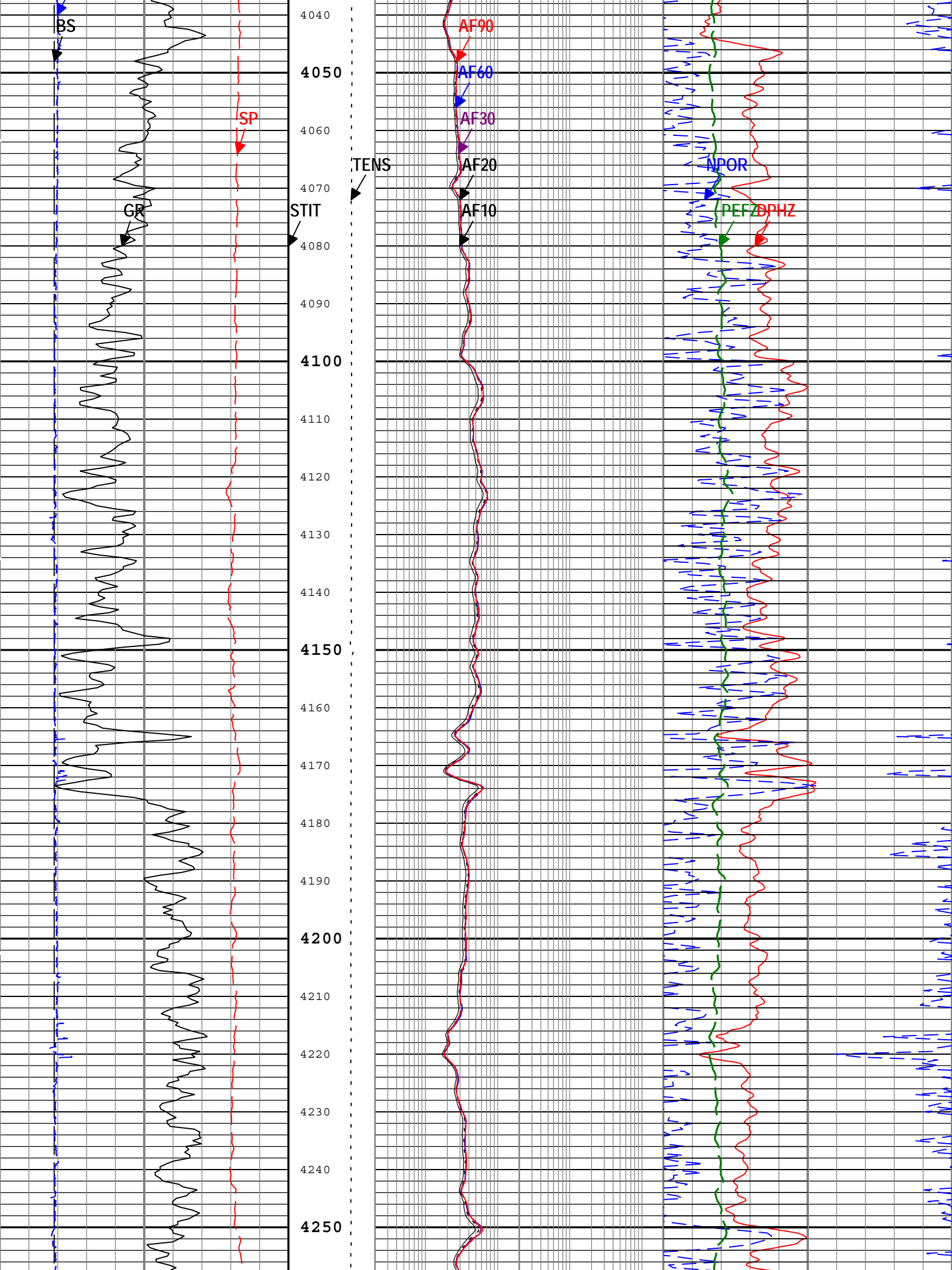


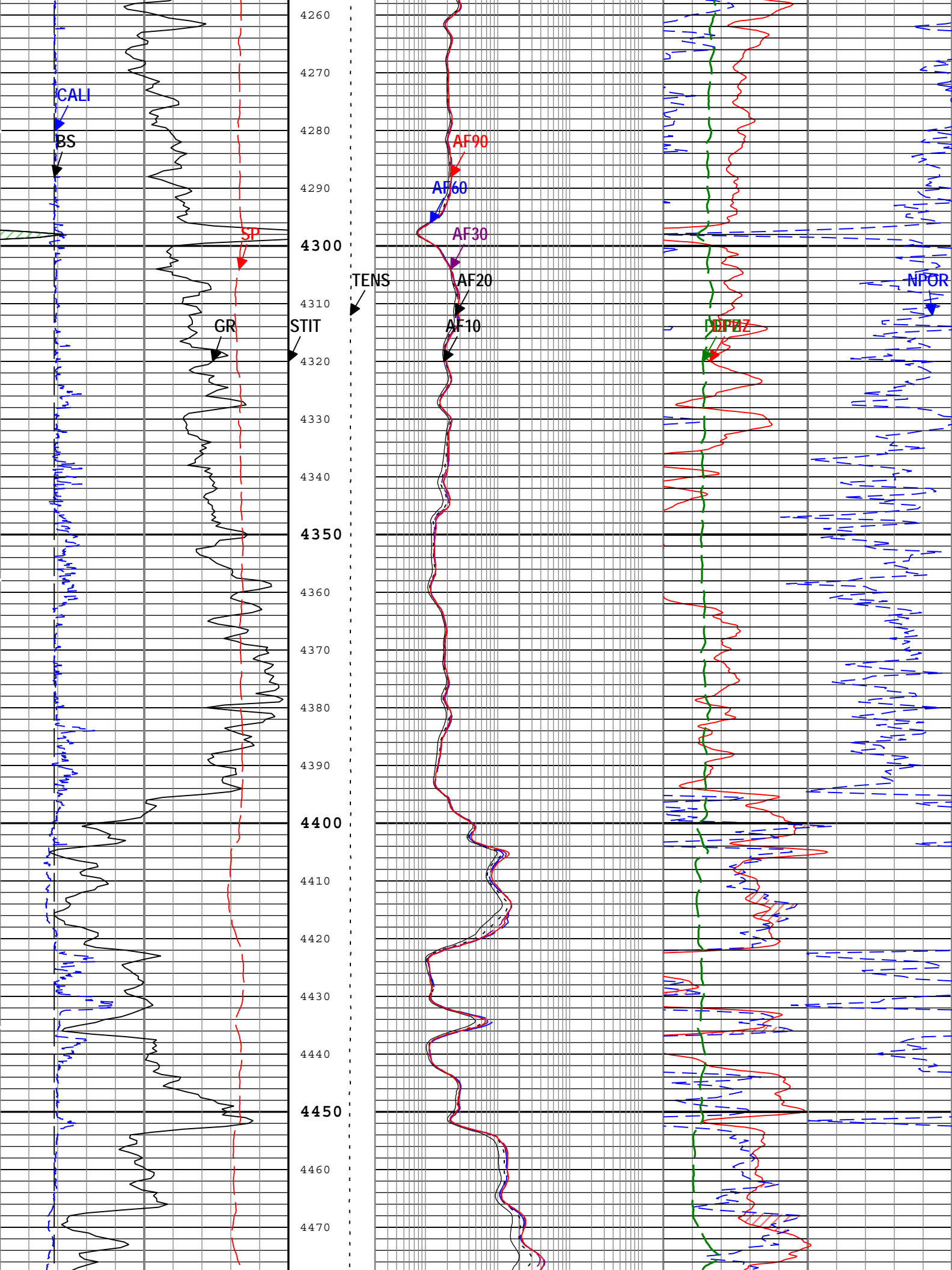


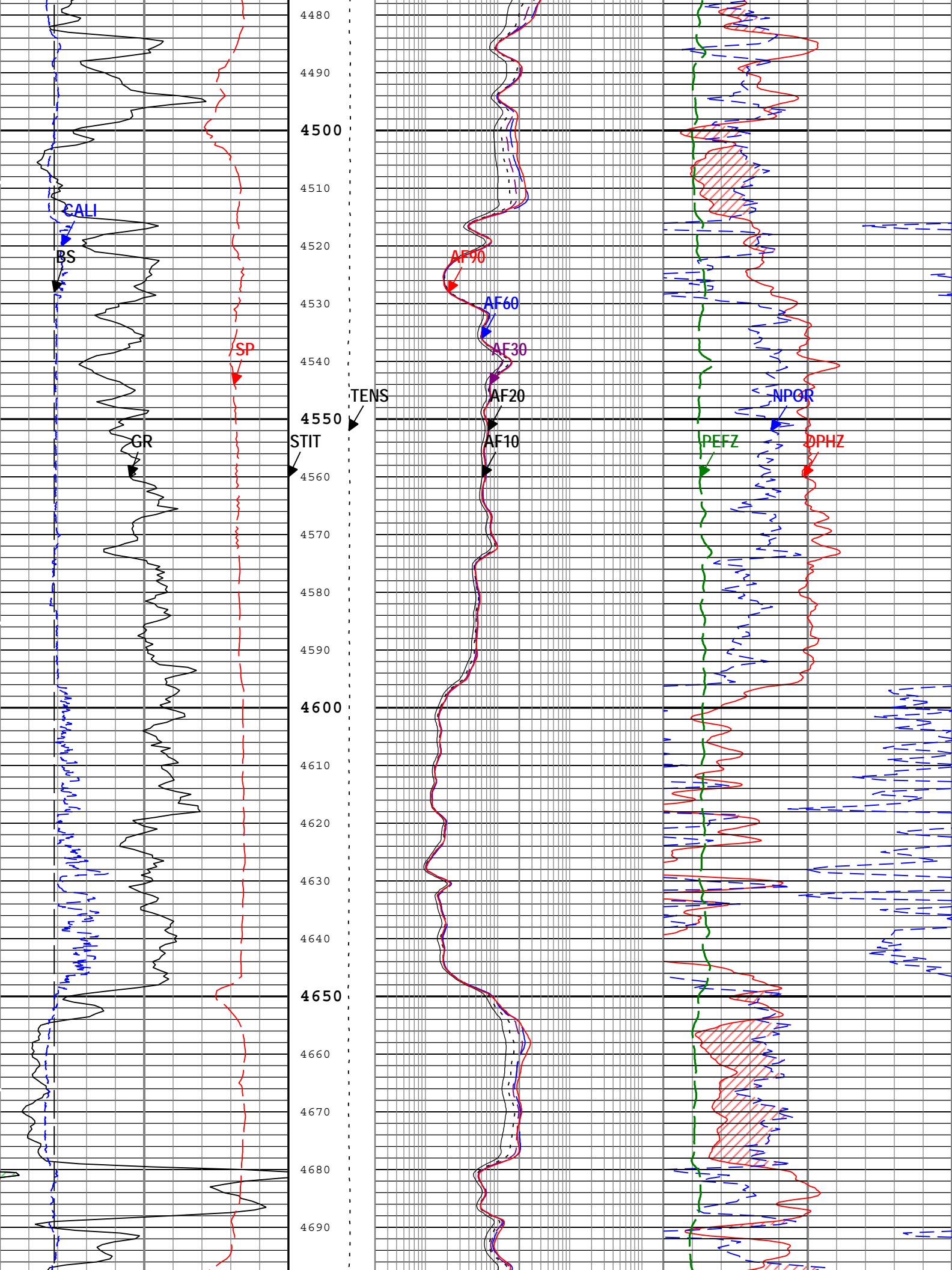


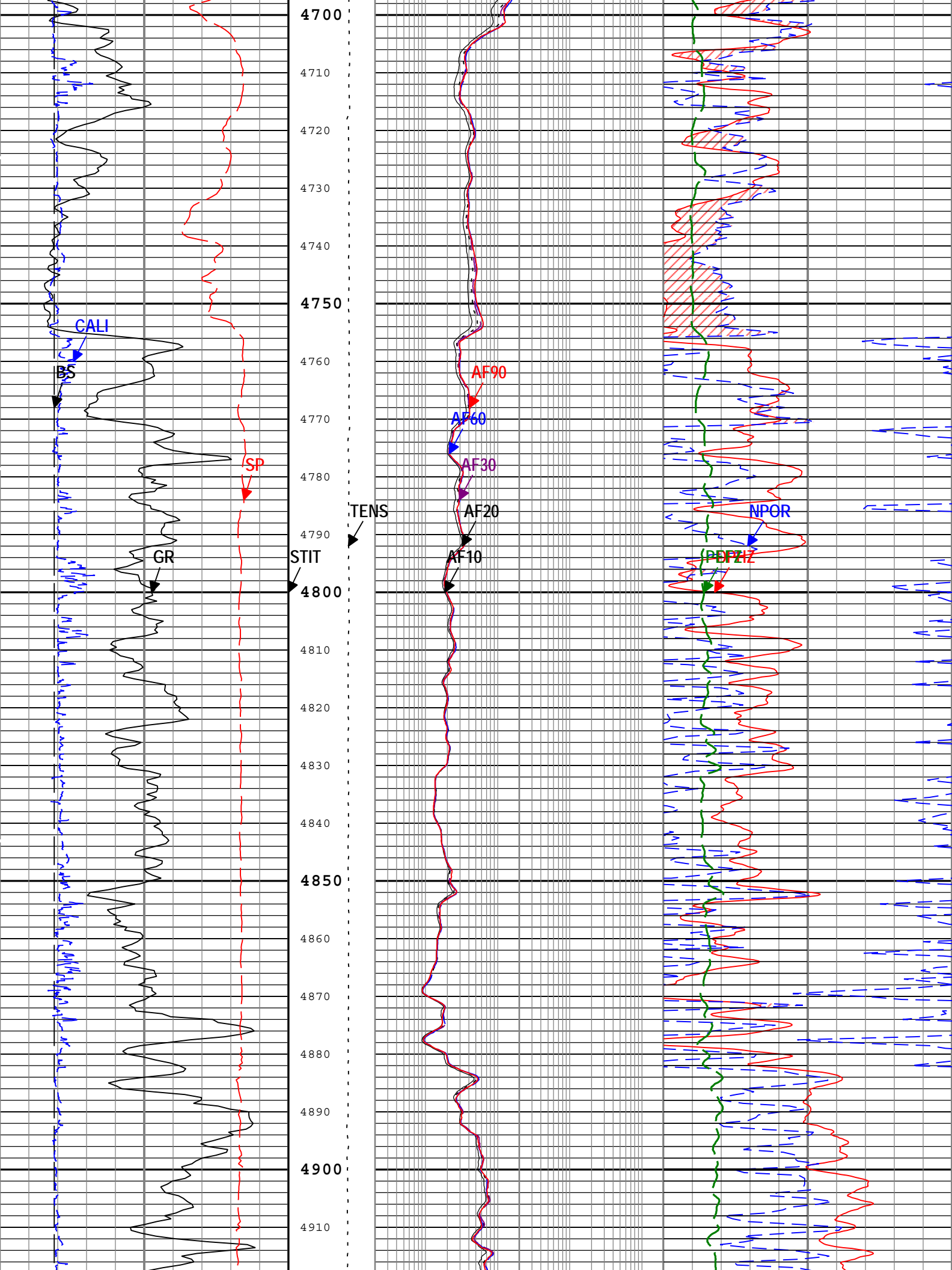


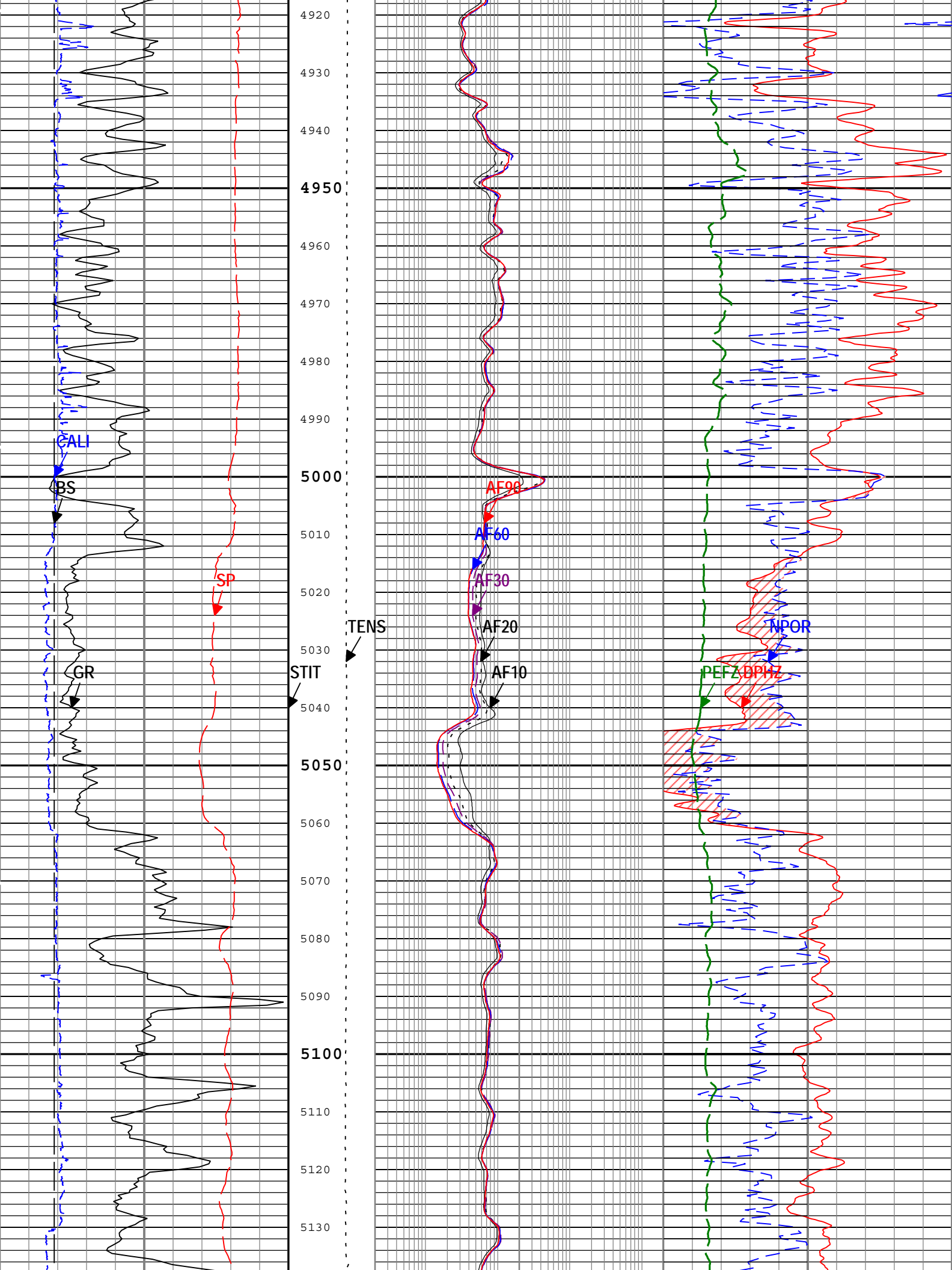


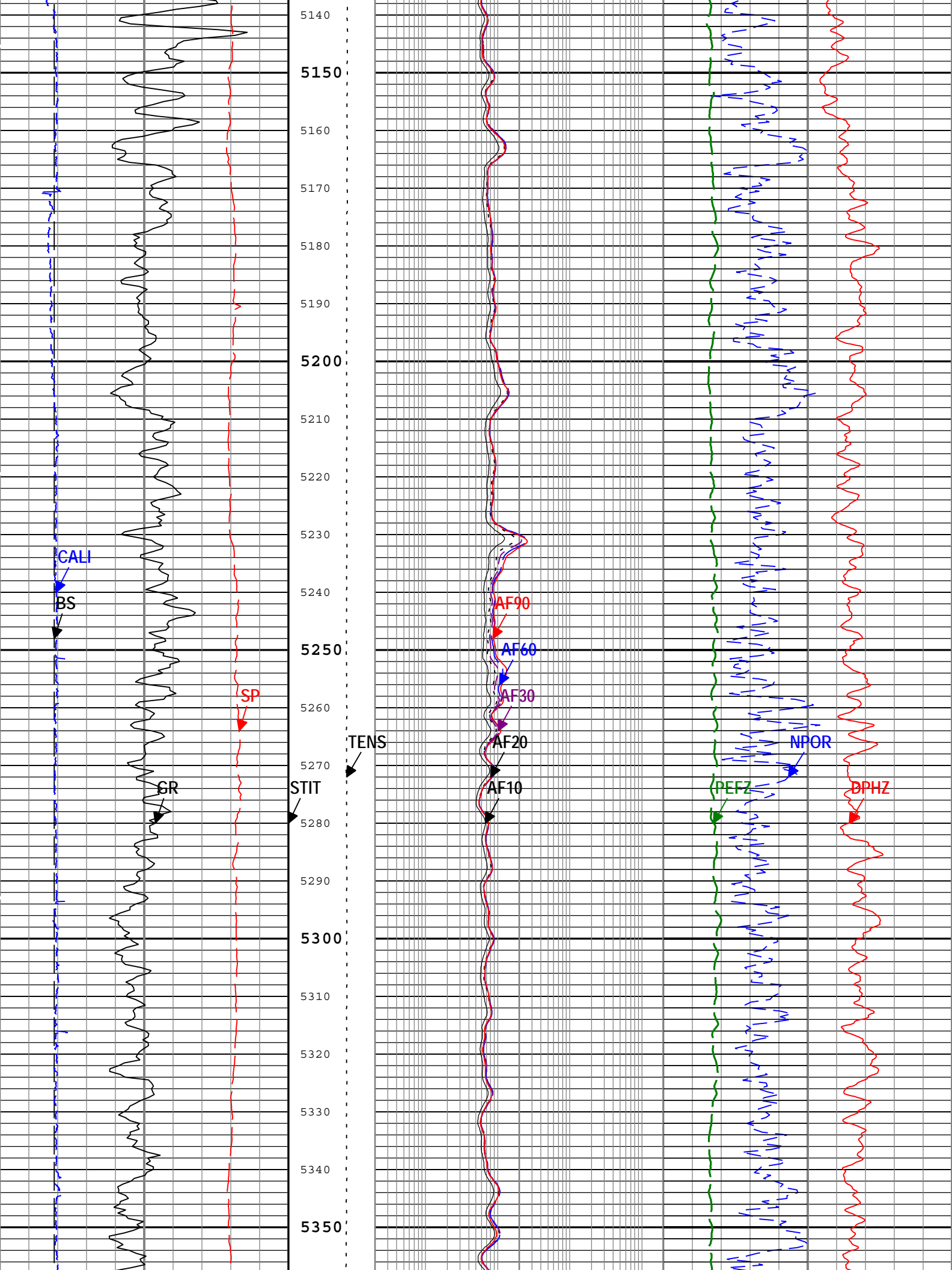


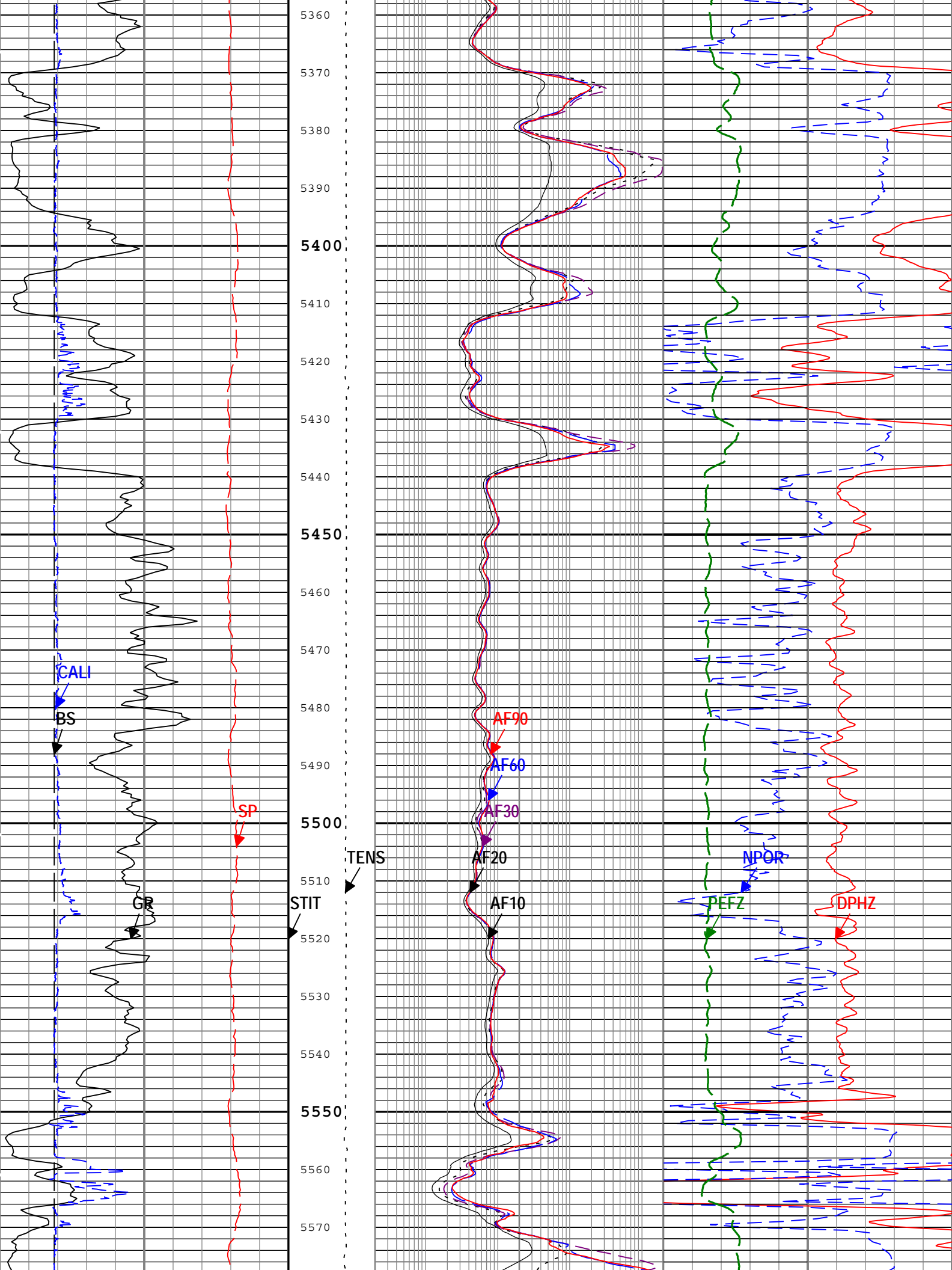


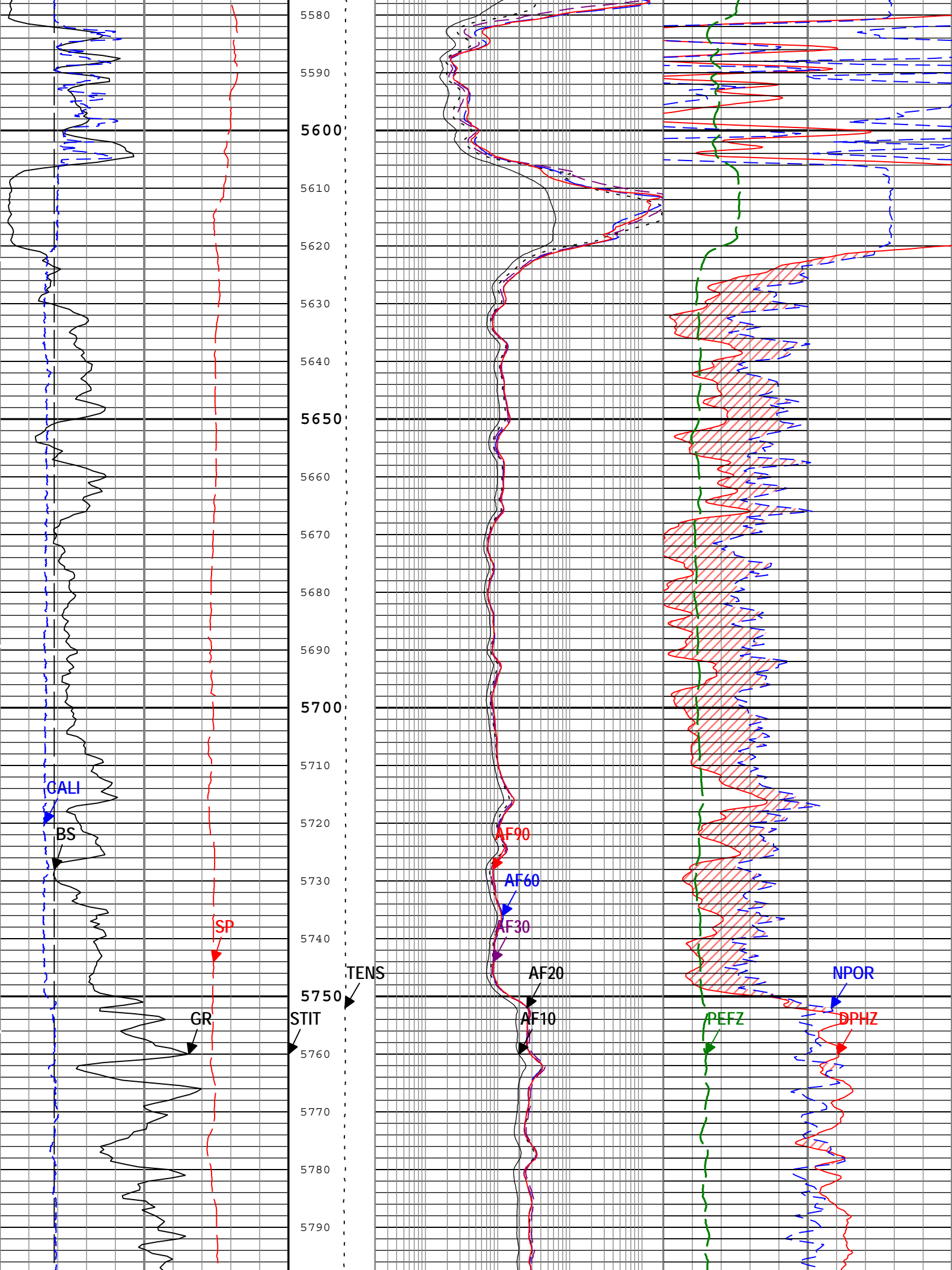




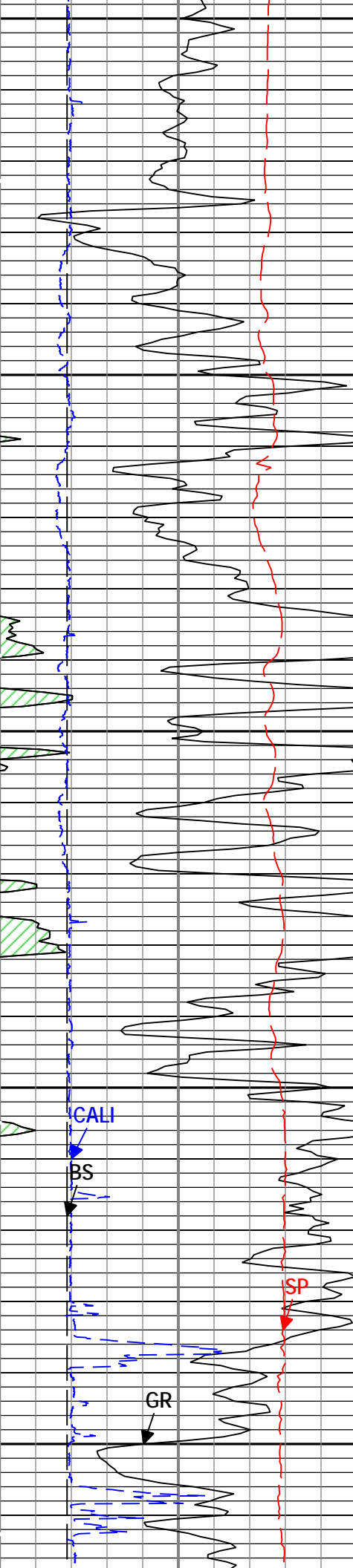




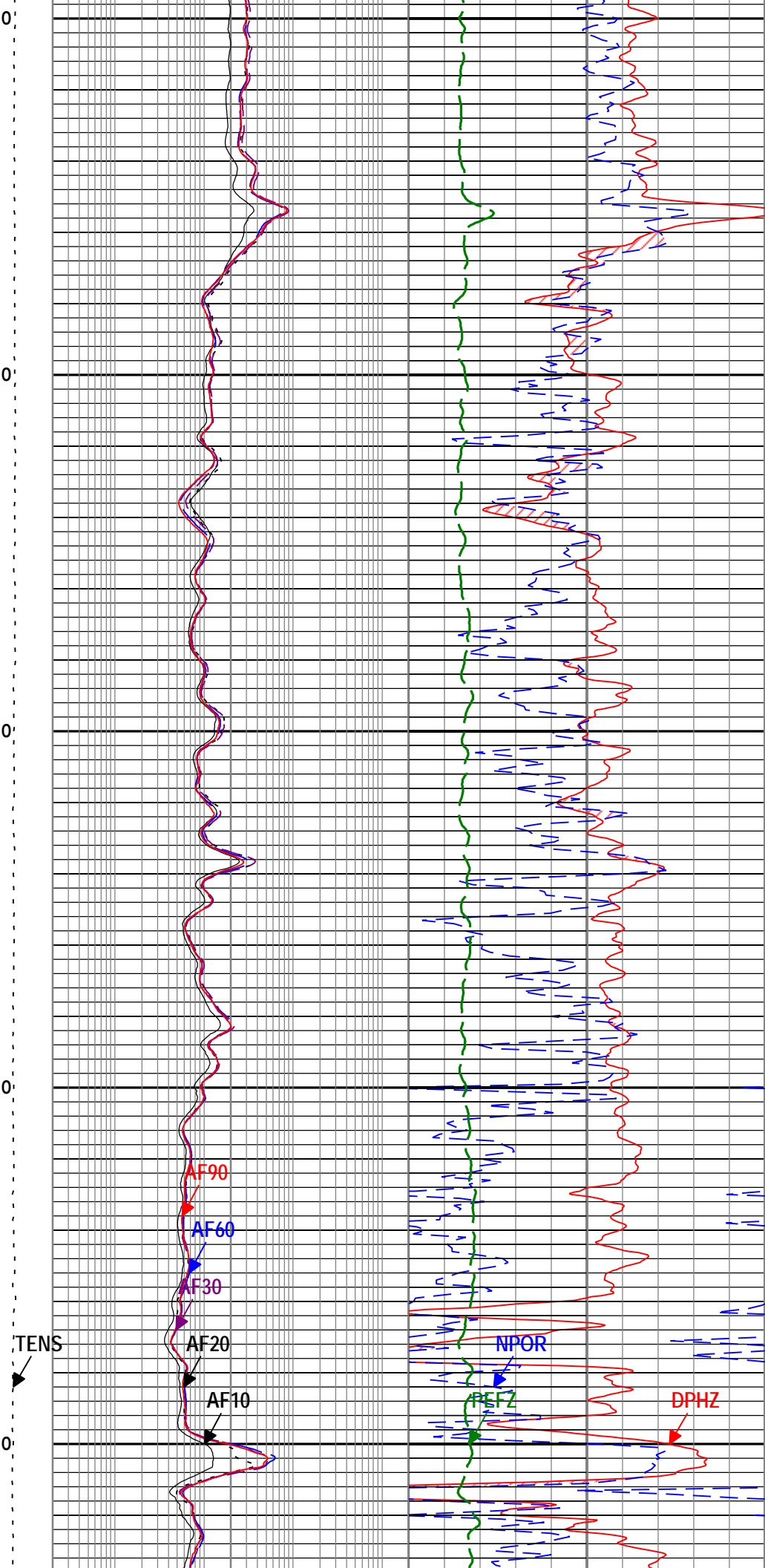


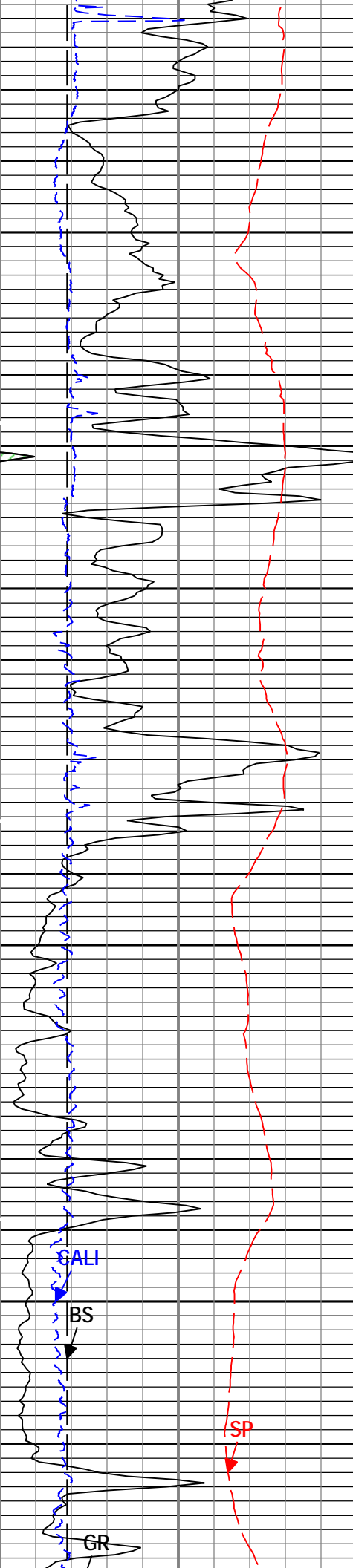






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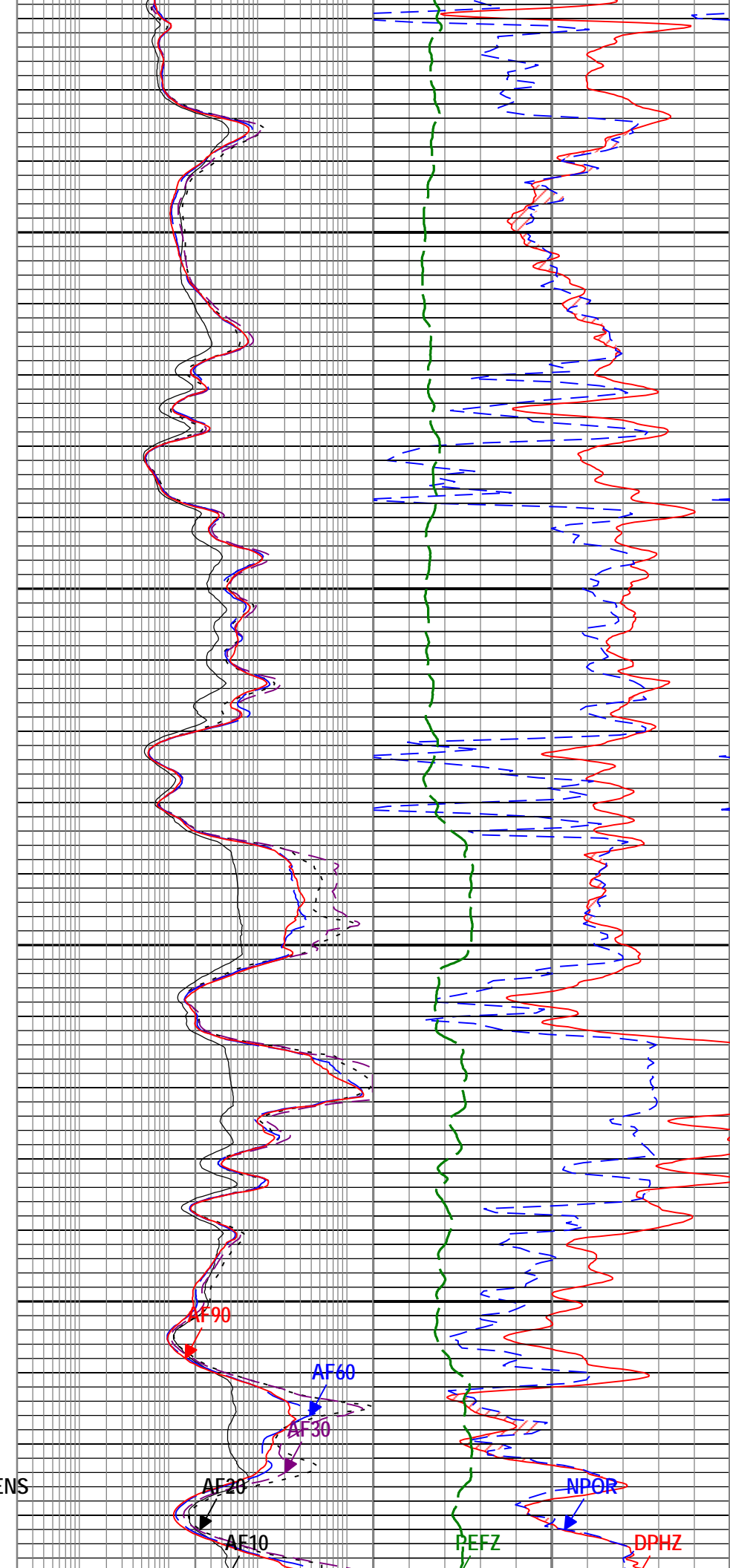


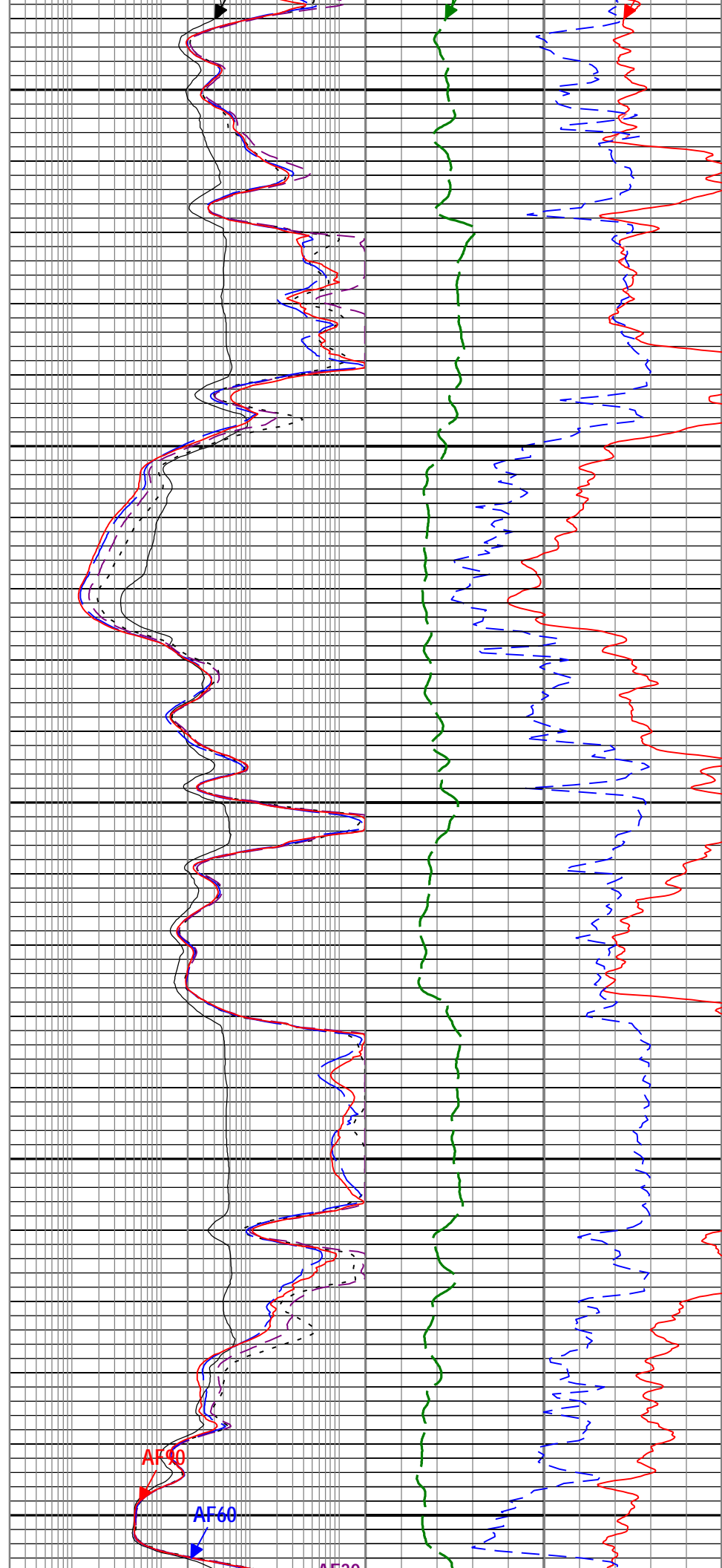
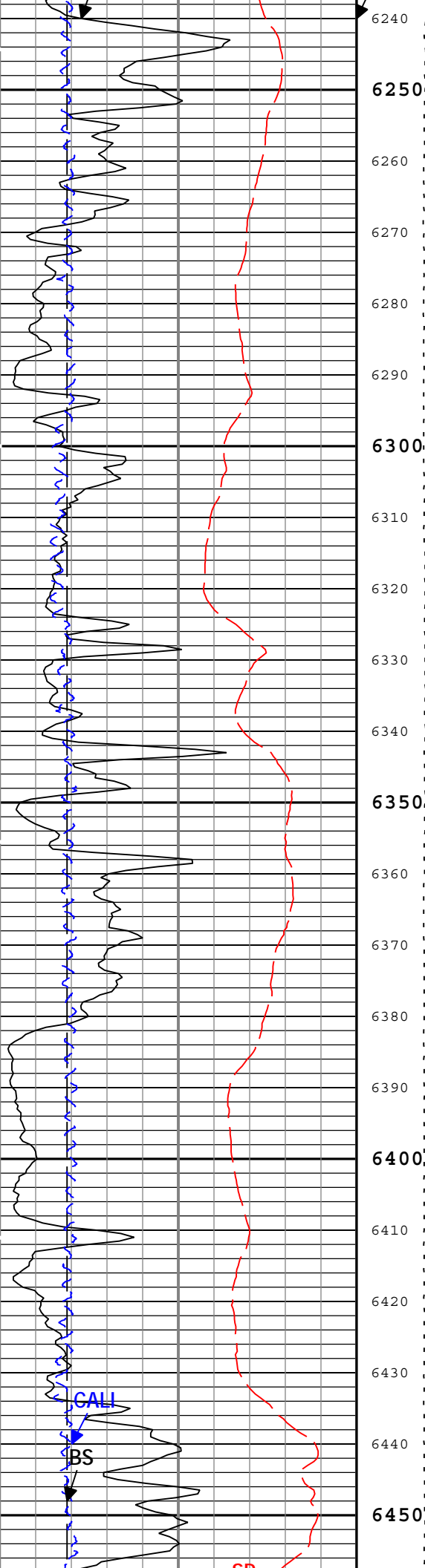


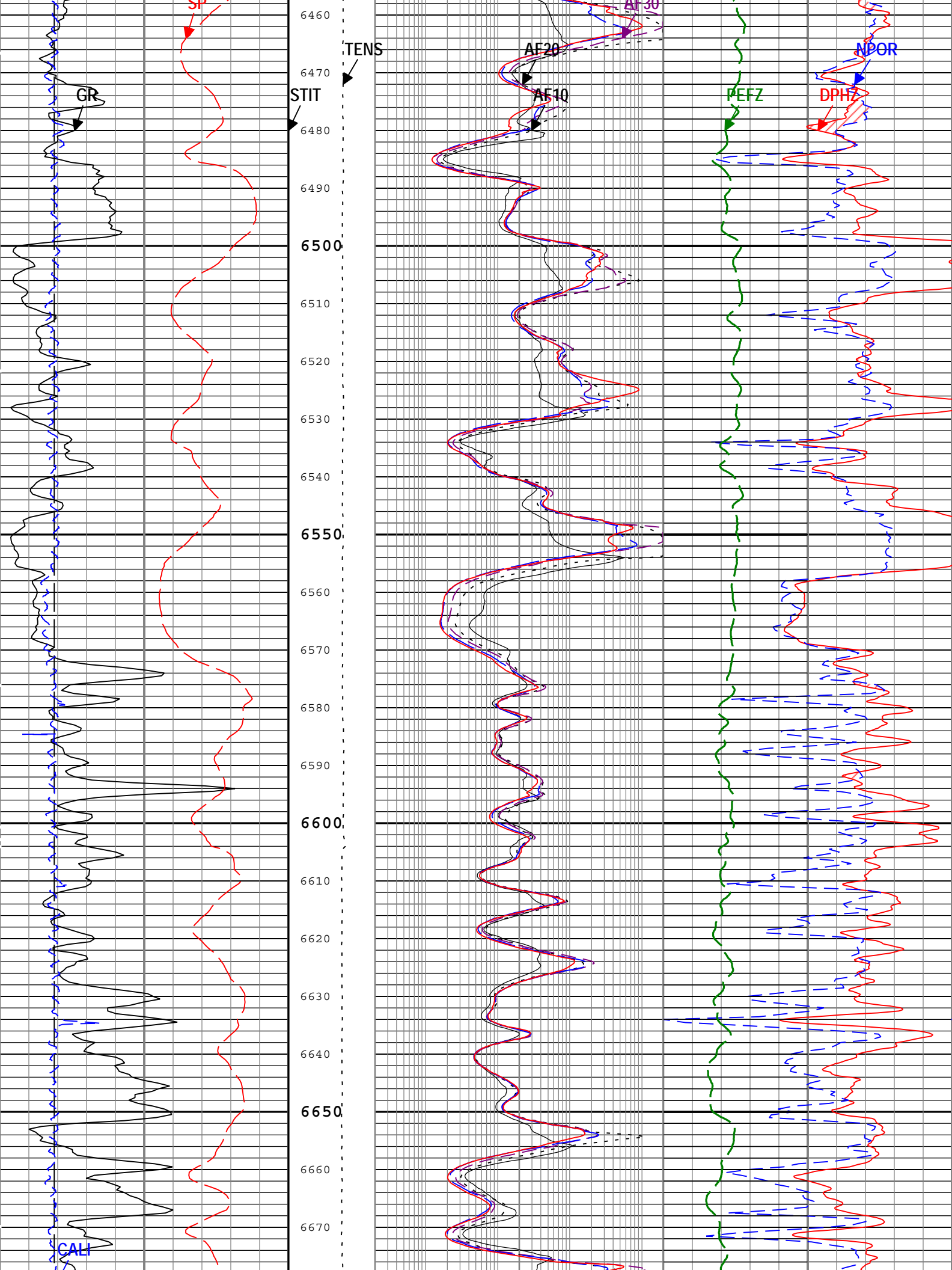
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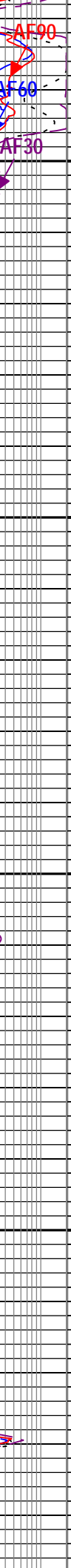
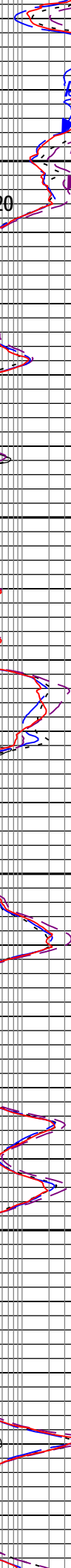
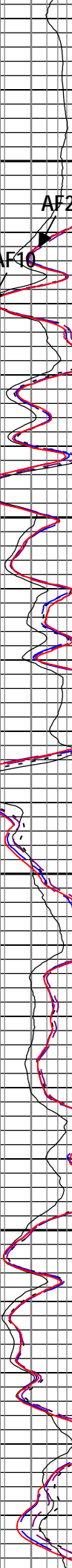
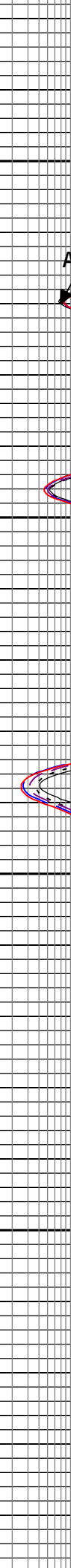
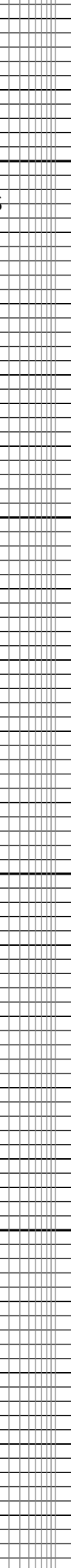
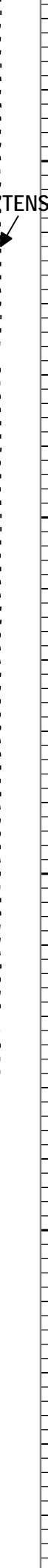
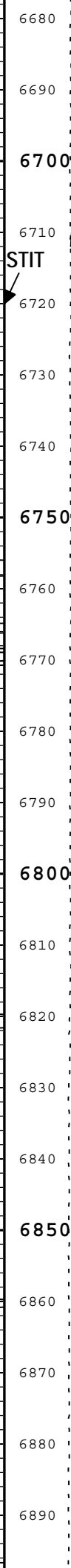
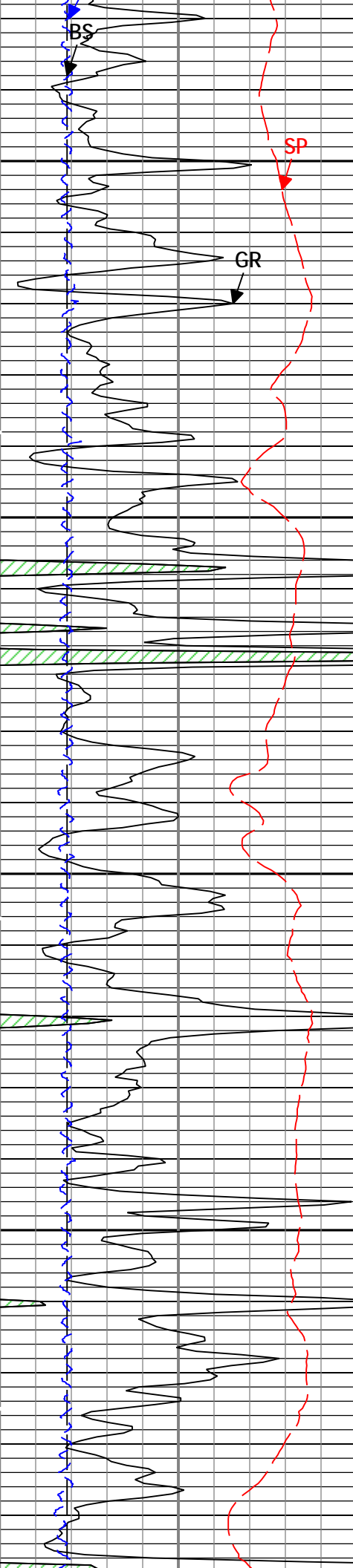
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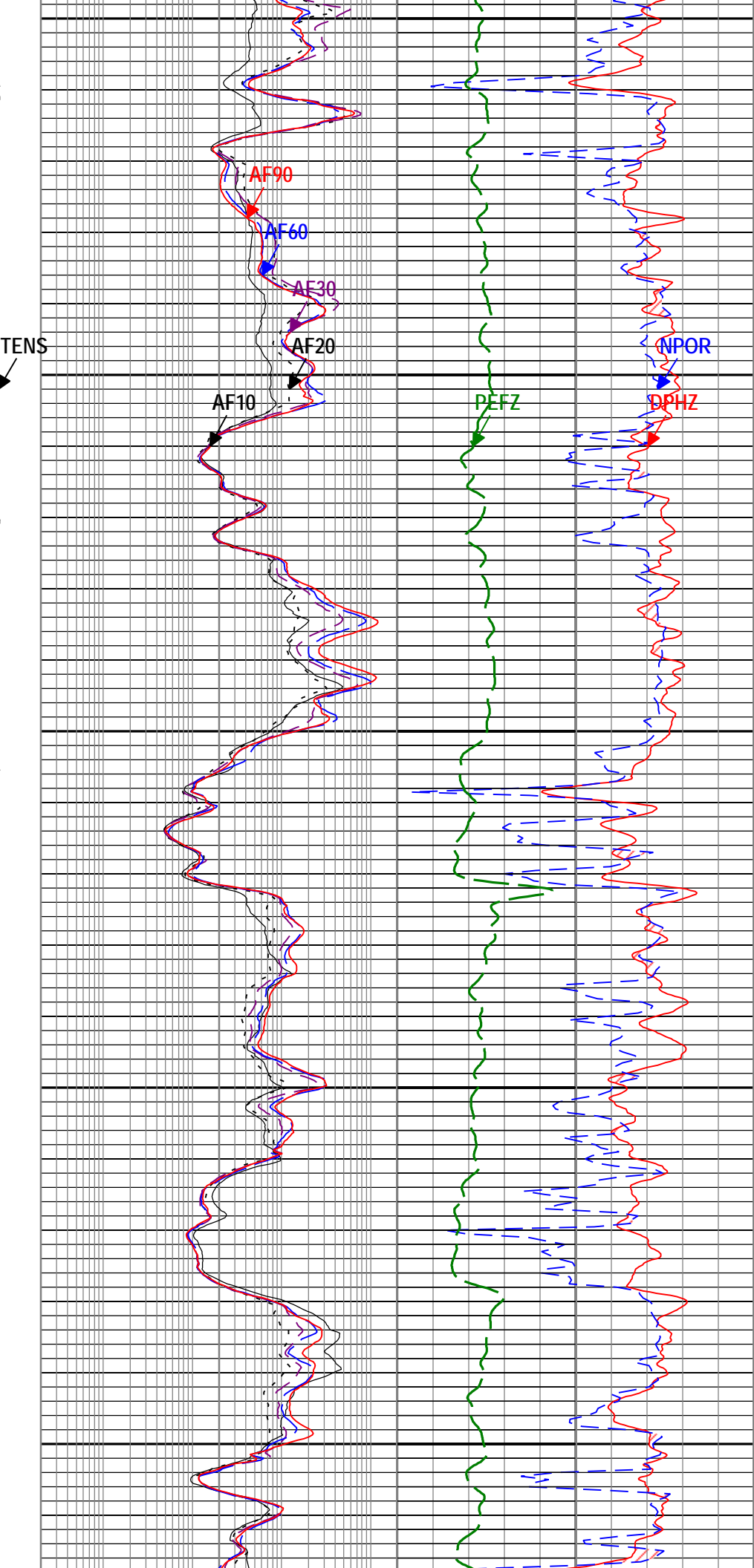
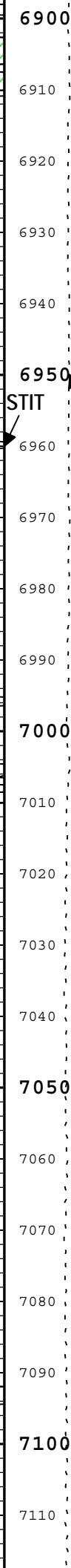
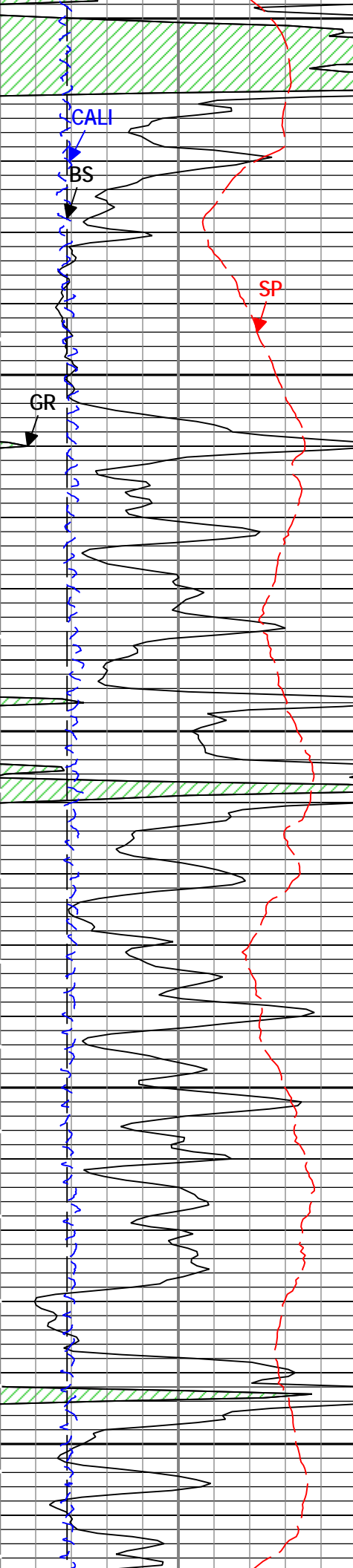
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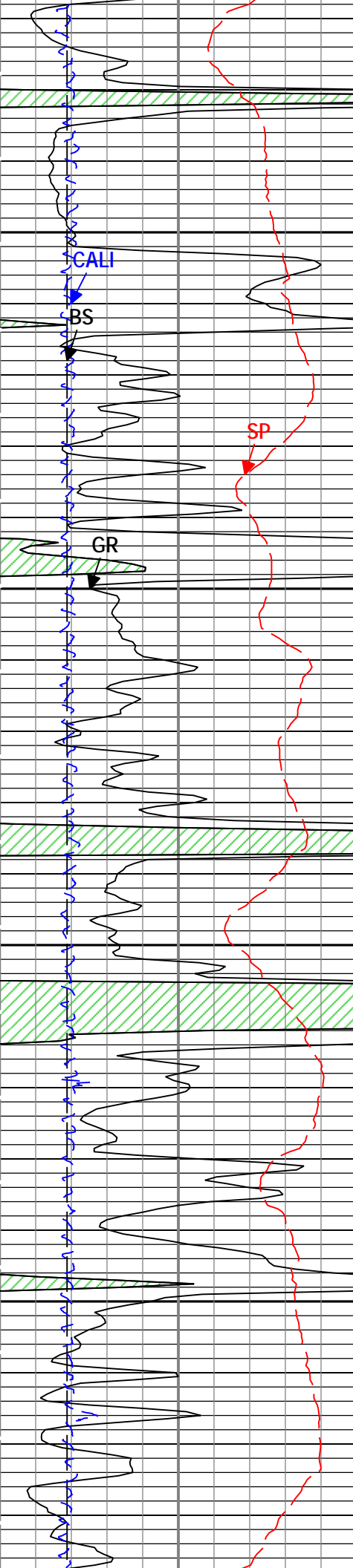








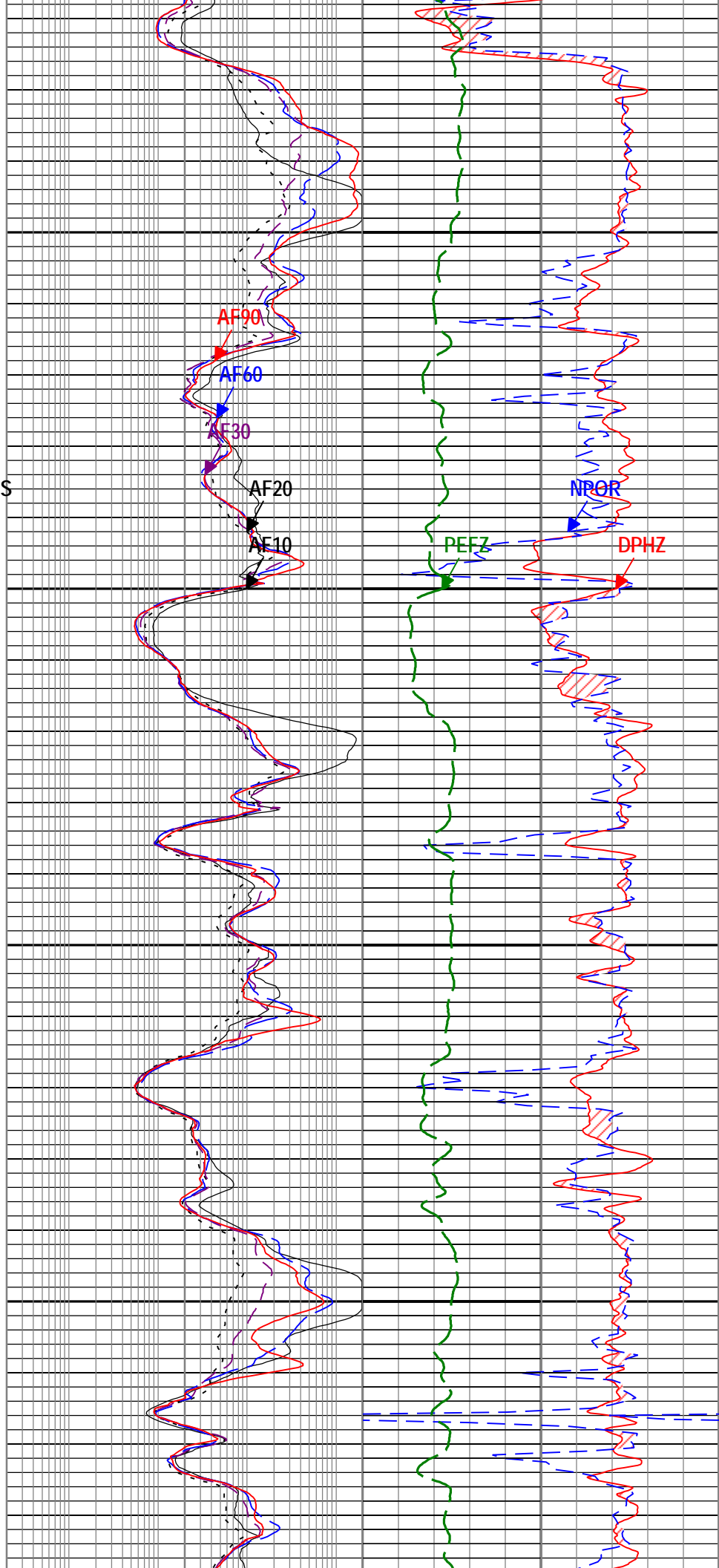




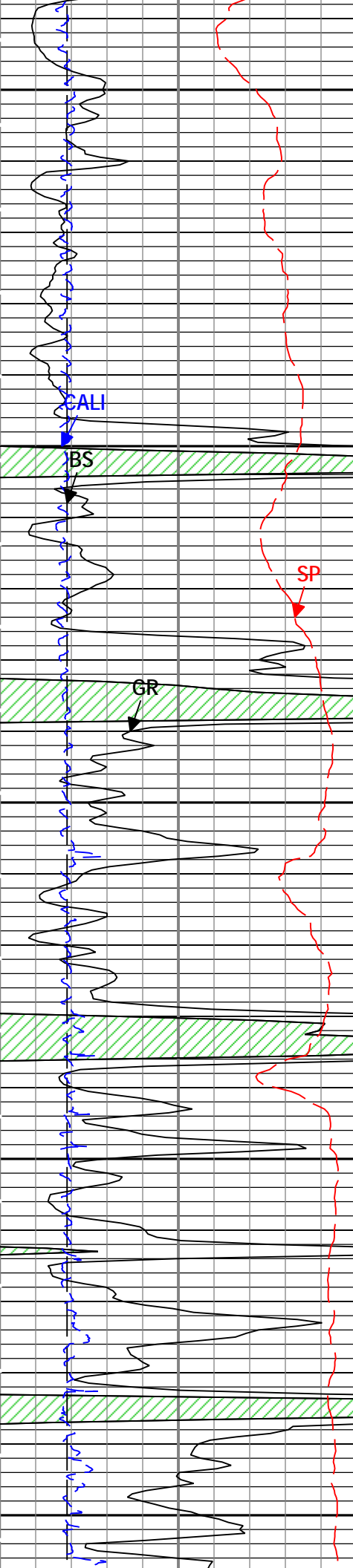
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TENS

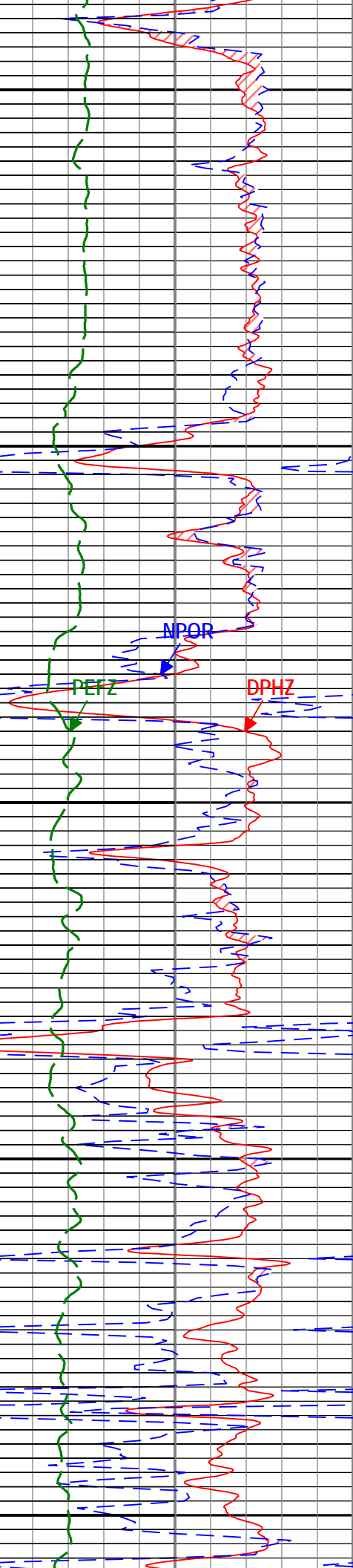
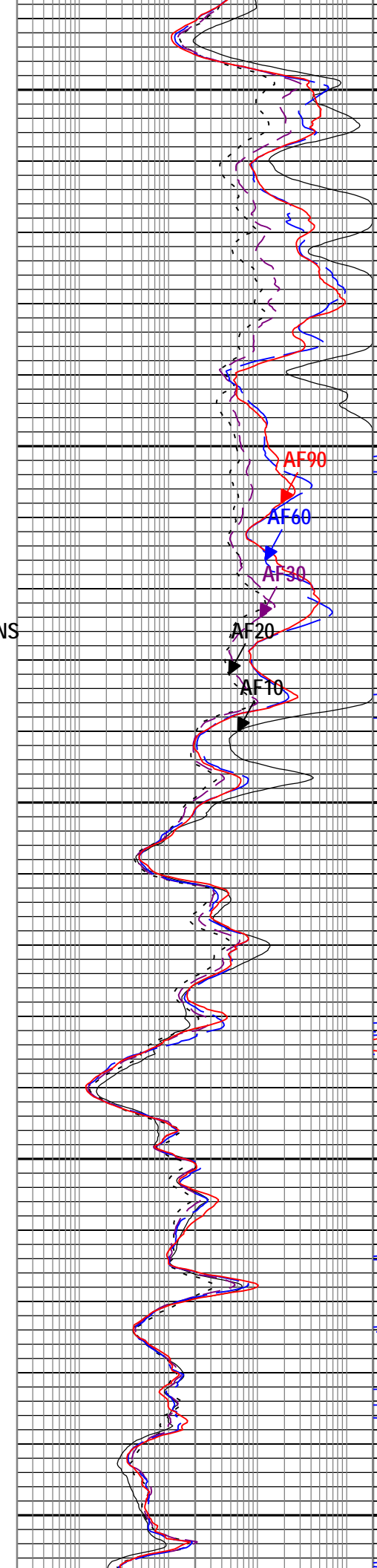
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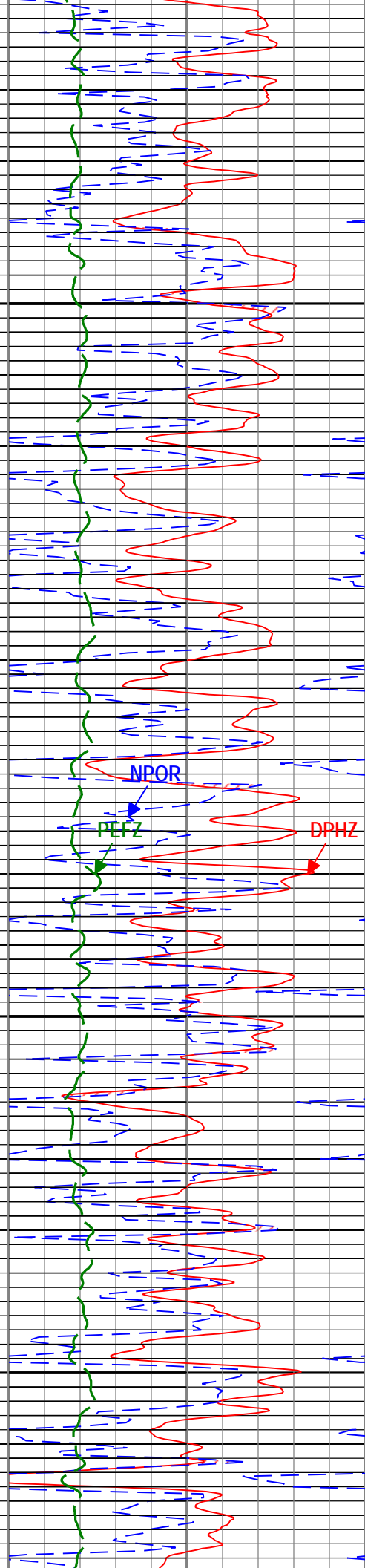
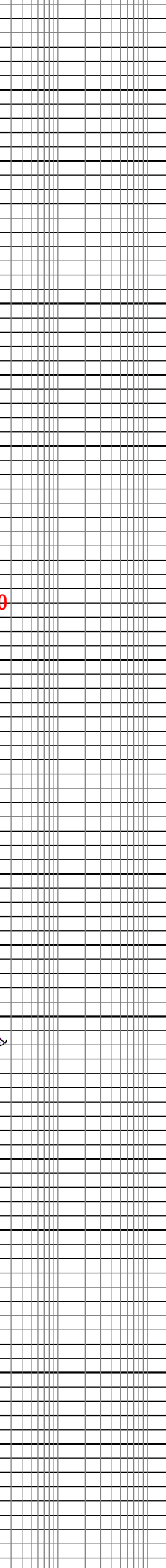
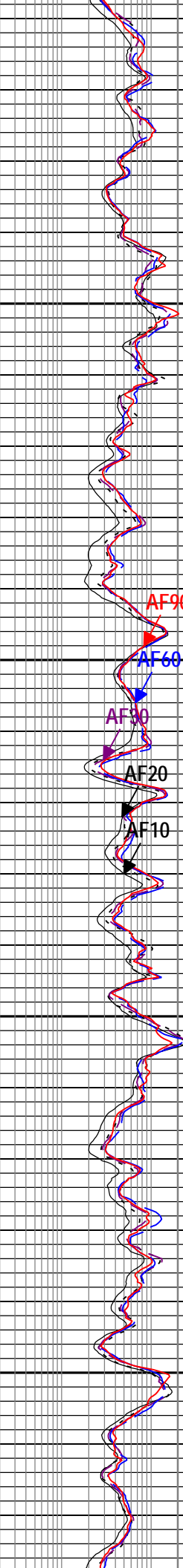
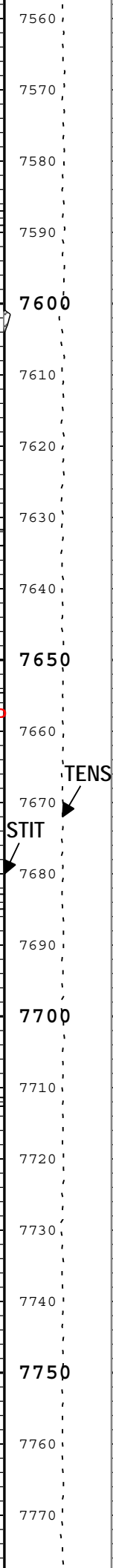
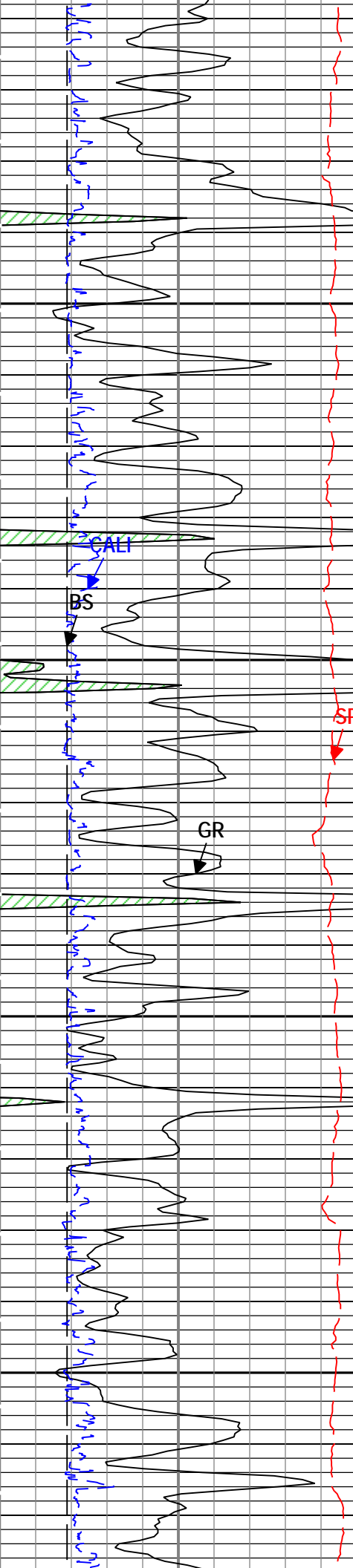
BS

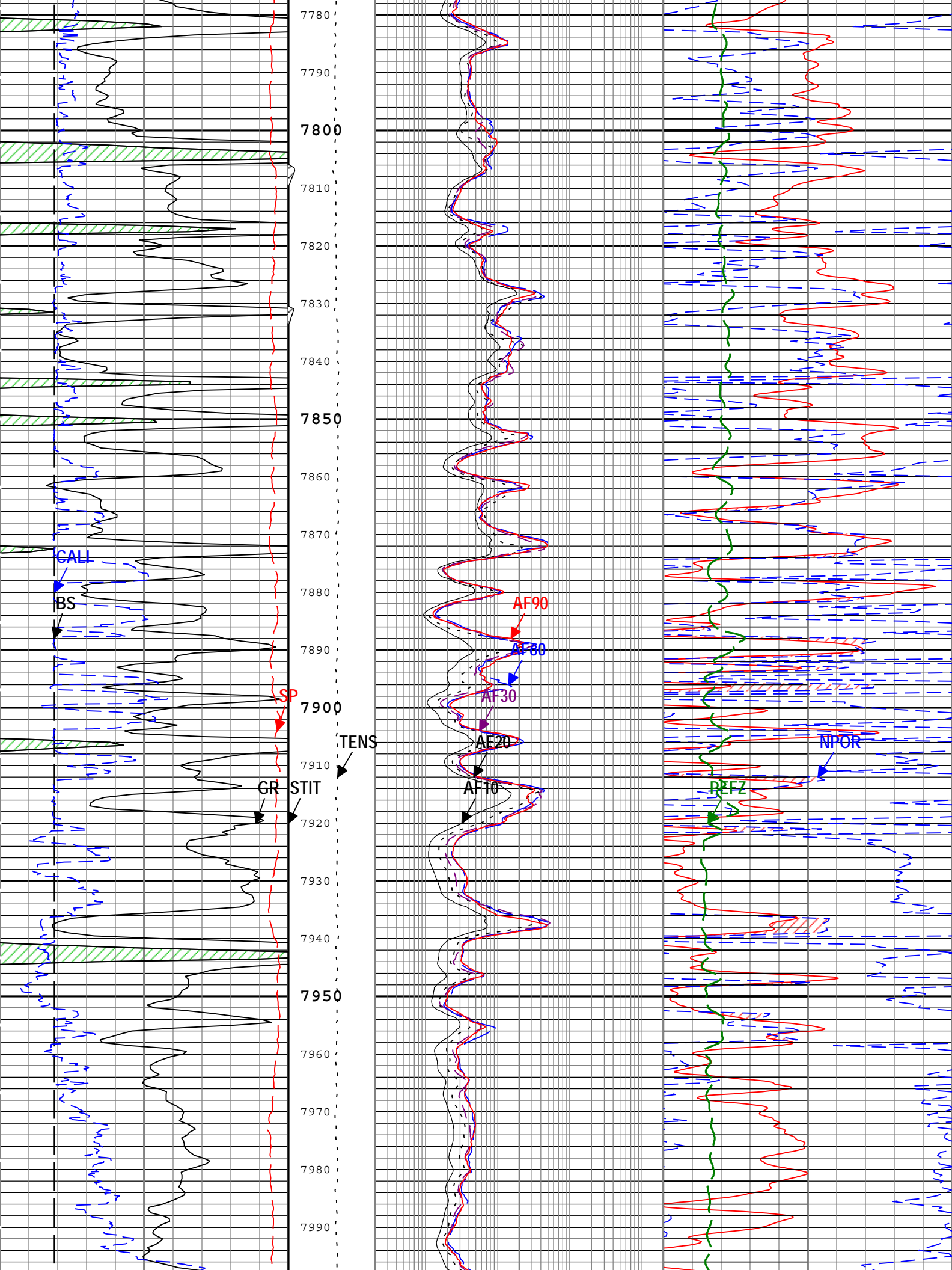
SP

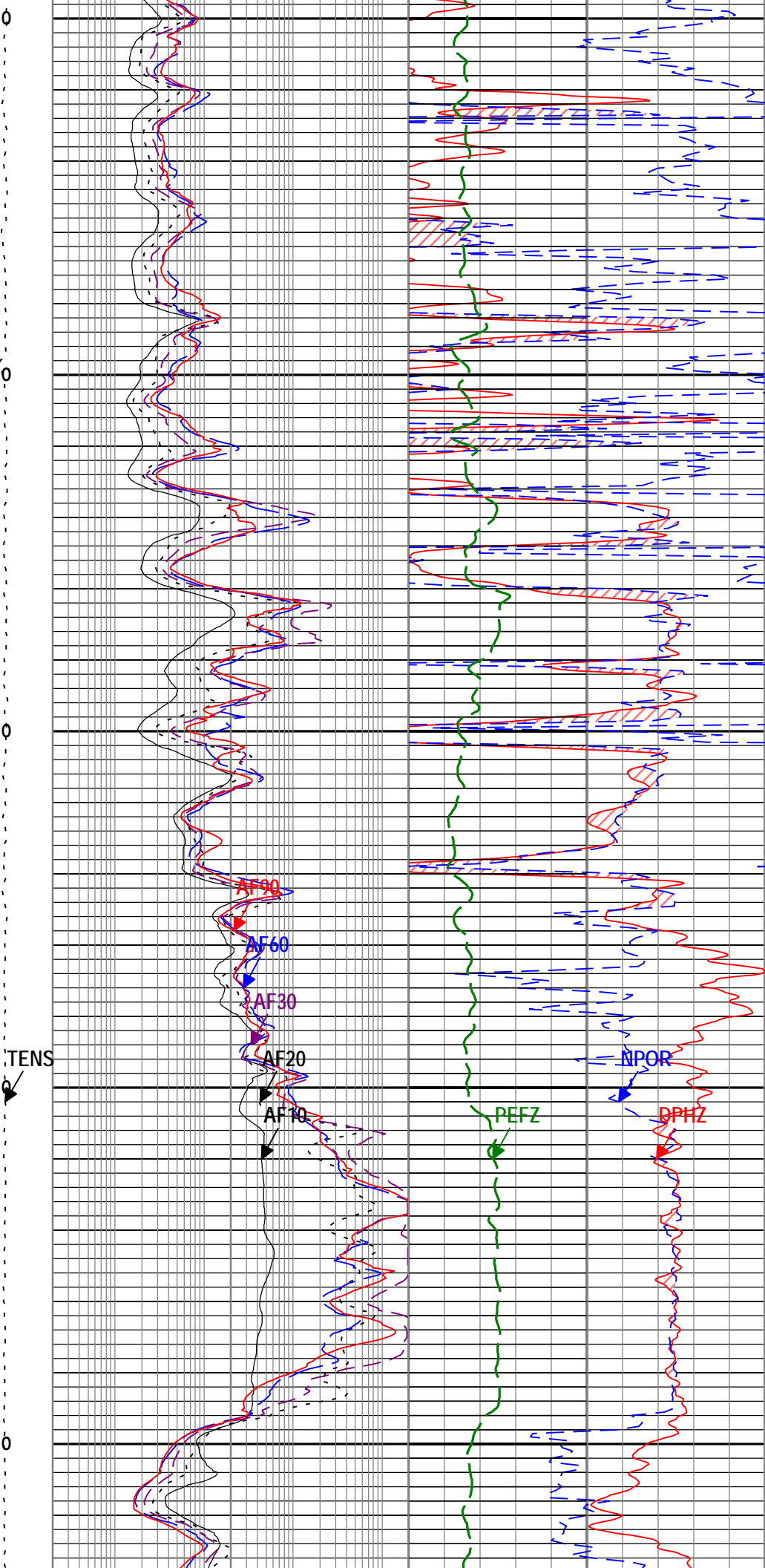
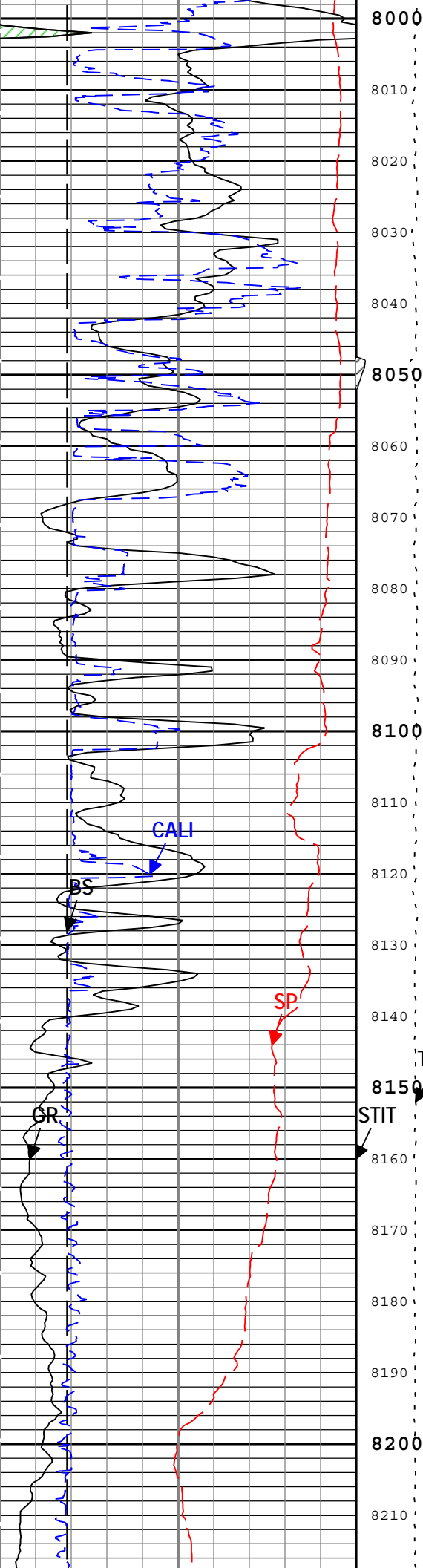
CALI

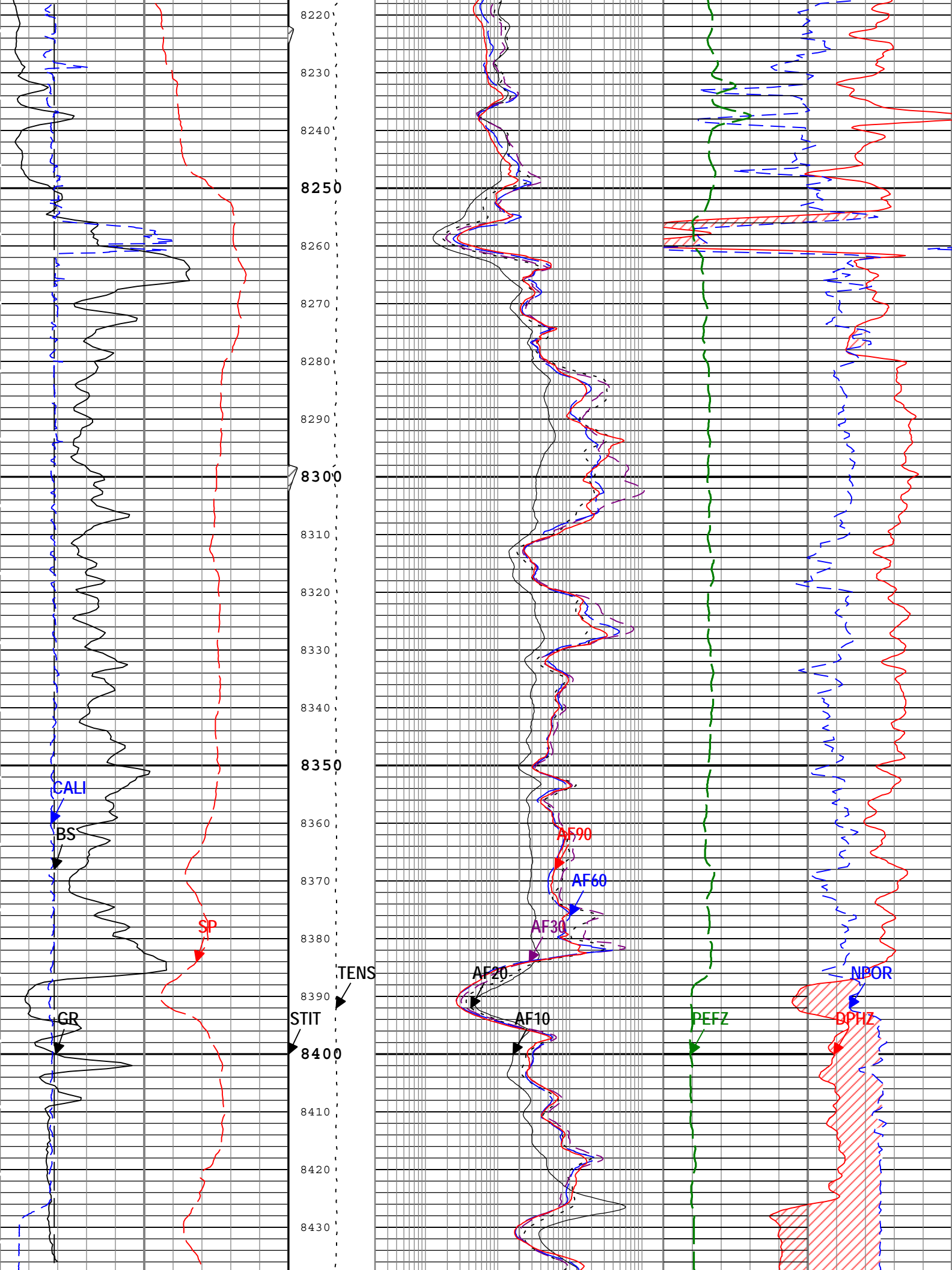


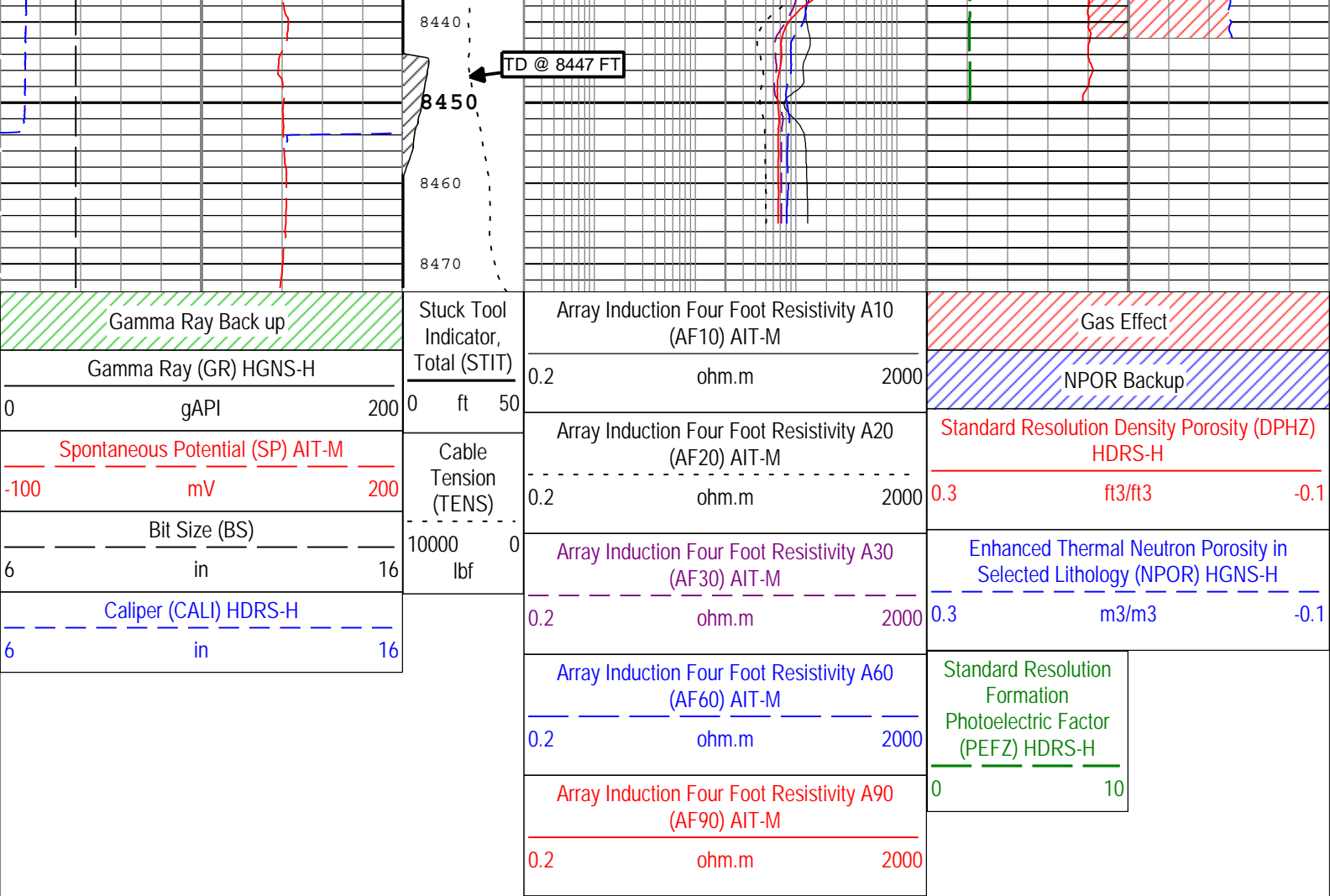












TIME\_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express    Format: Log ( EMD 5in Triple Combo Linear )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 04-Jun-2014 20:30:58

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ACDE	Array Induction Casing Detection Enable	AIT-M	No	
ASTA	Array Induction Tool Standoff	AIT-M	0.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	204.95	degF
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.088	in
CBLO	Casing Bottom (Logger)	WLSESSION	366.2	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.9	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	WBM	
DHC	Density Hole Correction	HDRS-H	Bit Size	
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	
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	1.12	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft
TD	Total Measured Depth	Borehole	8447	ft

Tool Control Parameters				
Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	840	ft/h

ONE									

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Repeat[4]:Up	Up	6919.22 ft	8469.63 ft	04-Jun-2014 9:20:39 AM	04-Jun-2014 9:49:43 AM	ON	14.91 ft	No
ONE	Main[11]:Up	Up	299.53 ft	8473.28 ft	04-Jun-2014 2:13:39 PM	04-Jun-2014 5:58:38 PM	ON	2.10 ft	No

All depths are referenced to toolstring zero

Log	Company:Nighthawk Production LLC      Well:John Craig 4-2 ONE: Main[11]:Up:S009								
-----	--	--	--	--	--	--	--	--	--

Description: HGNS standard resolution porosities for Platform Express    Format: Log ( EMD 5in Triple Combo Linear RA\_1 )    Index Scale: 5 in per 100 ft  
Index Unit: ft    Index Type: Measured Depth    Creation Date: 04-Jun-2014 20:31:02

TIME_1900 - Time Marked every 60.00 (s)															
			Main To Repeat												
			Repeat To Main												
			Array Induction Two Foot Resistivity A60 (AT60) 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												
			Array Induction Two Foot Resistivity A20 (AT20) AIT-M												
			0.2	ohm.m			2000								
			Main To Repeat												
			Repeat To Main												
			Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H												
			-0.1	ft3/ft3			-0.5								

Main To Repeat

Repeat To Main

Spontaneous Potential (SP) AIT-M

-100mV200

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

200gAPI400

Main To Repeat

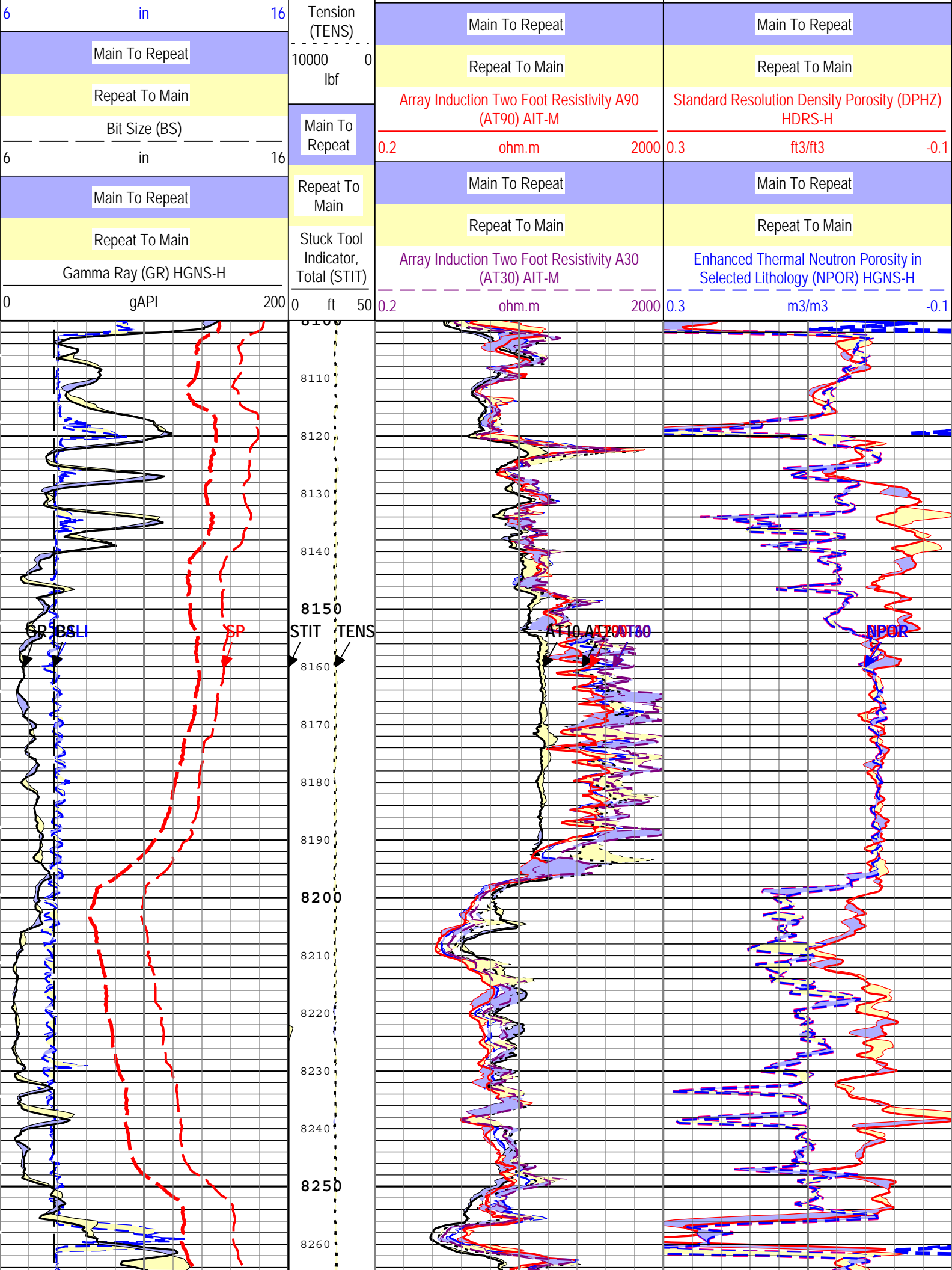
Repeat To Main

Caliper (CALI) HDRS-H

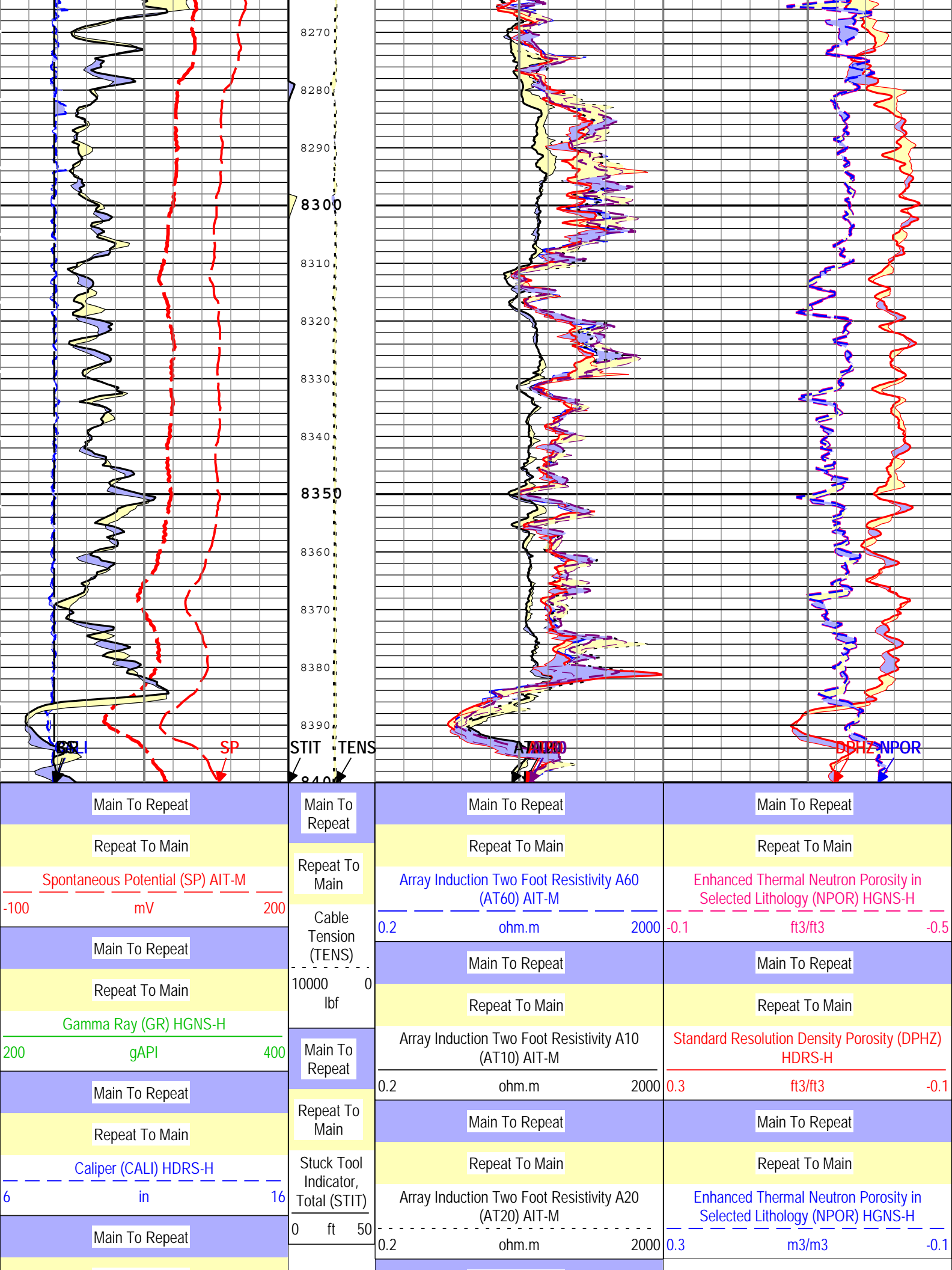
Main To Repeat

Repeat To Main

Cable









Repeat To Main		
Bit Size (BS)		
6	in	16
Main To Repeat		
Repeat To Main		
Gamma Ray (GR) HGNS-H		
0	gAPI	200

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

TIME\_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express    Format: Log ( EMD 5in Triple Combo Linear RA\_1 )    Index Scale: 5 in per 100 ft  
Index Unit: ft    Index Type: Measured Depth    Creation Date: 04-Jun-2014 20:31:02

## Calibration Report

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



Primary Equipment :		
File code for AIT-MA Sonde Tool Element	AMIS	181
Auxiliary Equipment :		
AITM Rm/SP Bottom Nose	AMRM	181

### AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):		14:33:17 20-Mar-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.016	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.495	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.017	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.643	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.018	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	0.087	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.017	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.145	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.997	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.094	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.992	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.159	3.000	
Test Loop Gain - 6		Master	1.000	0.950	0.999	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.205	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.011	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	-0.094	3.000	




### AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM):		14:33:17 20-Mar-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-102.955	119.000	
Sonde Error Correction Quad - 0		Master	-----	-2250.000	102.357	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	159.656	204.000	
Sonde Error Correction Quad - 1		Master	-----	-625.000	-157.628	625.000	
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	115.718	156.000	
Sonde Error Correction Quad - 2		Master	-----	-350.000	-102.814	350.000	
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	51.233	89.000	
Sonde Error Correction Quad - 3		Master	-----	-250.000	5.344	250.000	
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	26.452	35.000	
Sonde Error Correction Quad - 4		Master	-----	-63.000	-4.814	63.000	
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	11.507	24.000	
Sonde Error Correction Quad - 5		Master	-----	-50.000	20.881	50.000	
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	10.309	15.000	
Sonde Error Correction Quad - 6		Master	-----	-30.000	1.576	30.000	

Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.361	5.000	
Sonde Error Correction Quad - 7		Master	-----	-30.000	1.574	30.000	


























































# AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM):	14:33:17 20-Mar-2014
------------------	----------------------

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	0.813	1.200	
Fine Gain		Master	1.000	0.800	0.814	1.200	

# AIT Electronics Check - Thru Calibration Check

Master (EEPROM):	14:33:17 20-Mar-2014	Before (Measured):	07:50:47 04-Jun-2014
------------------	----------------------	--------------------	----------------------

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Thru Cal Mag - 0	V	Master	-----	0.366	0.575	0.854	
		Before	-----	0.366	0.575	0.854	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 0	deg	Master	-----	137.000	-168.771	-103.000	
		Before	-----	137.000	-168.266	-103.000	
		Before-Master	-----	-----	0.505	-----	
Thru Cal Mag - 1	V	Master	-----	0.762	1.178	1.778	
		Before	-----	0.762	1.178	1.778	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 1	deg	Master	-----	136.000	-169.870	-104.000	
		Before	-----	136.000	-169.367	-104.000	
		Before-Master	-----	-----	0.503	-----	
Thru Cal Mag - 2	V	Master	-----	0.372	0.585	0.868	
		Before	-----	0.372	0.585	0.868	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 2	deg	Master	-----	132.000	-173.511	-108.000	
		Before	-----	132.000	-173.010	-108.000	
		Before-Master	-----	-----	0.501	-----	
Thru Cal Mag - 3	V	Master	-----	0.420	0.660	0.980	
		Before	-----	0.420	0.660	0.980	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 3	deg	Master	-----	131.000	-174.289	-109.000	
		Before	-----	131.000	-173.788	-109.000	
		Before-Master	-----	-----	0.501	-----	
Thru Cal Mag - 4	V	Master	-----	0.804	1.233	1.876	
		Before	-----	0.804	1.234	1.876	
		Before-Master	-----	-----	0.001	-----	
Thru Cal Phase - 4	deg	Master	-----	125.000	179.445	-115.000	
		Before	-----	125.000	179.936	-115.000	
		Before-Master	-----	-----	0.491	-----	
Thru Cal Mag - 5	V	Master	-----	1.176	1.795	2.744	
		Before	-----	1.176	1.796	2.744	
		Before-Master	-----	-----	0.001	-----	
Thru Cal Phase - 5	deg	Master	-----	122.000	177.791	-118.000	
		Before	-----	122.000	178.279	-118.000	
		Before-Master	-----	-----	0.488	-----	
Thru Cal Mag - 6	V	Master	-----	1.176	1.795	2.744	
		Before	-----	1.176	1.795	2.744	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 6	deg	Master	-----	121.000	177.797	-119.000	
		Before	-----	121.000	178.289	-119.000	
		Before-Master	-----	-----	0.492	-----	
Thru Cal Mag - 7	V	Master	-----	0.846	1.295	1.974	
		Before	-----	0.846	1.295	1.974	
		Before-Master	-----	-----	0.000	-----	
Thru Cal Phase - 7	deg	Master	-----	115.000	177.075	-125.000	
		Before	-----	115.000	177.525	-125.000	
		Before-Master	-----	-----	0.450	-----	
SPA Zero	mV	Master		-50.000	0.130	50.000	
		Before		-50.000	0.145	50.000	
		Before-Master	-----	----	0.015	----	
SPA Plus	mV	Master		941.000	992.434	1040.000	
		Before		941.000	992.478	1040.000	
		Before-Master	-----	----	0.044	----	
Temperature Zero	V	Master		-0.050	0.000	0.050	
		Before		-0.050	0.000	0.050	

		Before-Master	-----	-----	0.000	-----	
Temperature Plus	V	Master		0.870	0.919	0.960	
		Before		0.870	0.919	0.960	
		Before-Master	-----	-----	0.000	-----	

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

### Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3828
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3760

### 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	5471
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3828
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3868

### Calibration Parameter :

Small Ring Size (Caliper Calibration Small Ring)	8.00
Large Ring Size (Caliper Calibration Large Ring)	12.00

## HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 15:22:57 02-Jun-2014 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	7.93	10.00	
Large Ring	in	Before	12.00	9.00	12.26	15.00	

## HDRS Density Calibration - Inversion Results

Master (EEPROM): 12:54:08 17-May-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.599	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.686	1.696	
Pe Aluminum		Master	2.570	2.470	2.554	2.670	
Pe Magnesium		Master	2.650	2.550	2.618	2.750	

## HDRS Density Calibration - Deviation Summary

Master (EEPROM): 12:54:08 17-May-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2948	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.8395	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.2110	1.0000	
SS Max Deviation	%	Master	0	-2.5000	0.5013	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.6924	1.5000	
LS Max Deviation	%	Master	0	-3.5000	2.1932	3.5000	

## HDRS Density Calibration - Background Summary

Master (EEPROM): 12:54:08 17-May-2014 Before (Measured): 15:24:56 02-Jun-2014 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7358		
		Before	0.7358	0.6991	0.7337	0.7726	
		Before-Master	-----	-----	-0.0021	-----	
BS Window Sum	1/s	Master	1		24077		
		Before	24077	22873	24007	25280	
		Before-Master	-----	-----	-70	-----	
SS Window Ratio		Master	1.0000		0.4839		
		Before	0.4839	0.4597	0.4873	0.5081	
		Before-Master	-----	-----	0.0034	-----	
SS Window Sum	1/s	Master	1		9819		
		Before	9819	9328	9816	10310	
		Before-Master	-----	-----	-3	-----	
LS Window Ratio		Master	1.0000		0.3038		
		Before	0.3038	0.2887	0.3039	0.3190	
		Before-Master	-----	-----	0.0001	-----	
LS Window Sum	1/s	Master	1		1184		

Window Cam	1/3	Master Before Before-Master	1184 -----	1125 -----	1184 1181 -3	1243 -----	
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## HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM):		12:54:08 17-May-2014		Before (Measured):		15:24:56 02-Jun-2014		Expired by 1 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div></div>		
BS PM High Voltage	V	Master		1000	1307	2400	<div><div></div></div>		
		Before		1000	1362	2400	<div><div></div></div>		
		Before-Master	-----	-100	55	100	<div><div></div></div>		
SS PM High Voltage	V	Master		1000	1615	2400	<div><div></div></div>		
		Before		1000	1627	2400	<div><div></div></div>		
		Before-Master	-----	-100	12	100	<div><div></div></div>		
LS PM High Voltage	V	Master		1000	1194	2400	<div><div></div></div>		
		Before		1000	1194	2400	<div><div></div></div>		
		Before-Master	-----	-100	0	100	<div><div></div></div>		

## HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		12:54:08 17-May-2014		Before (Measured):		15:24:56 02-Jun-2014		Expired by 1 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>		
BS Crystal Resolution	%	Master		5.00	10.53	25.00	<div></div>		
		Before		5.00	10.67	25.00	<div></div>		
		Before-Master	----	-1.00	0.14	1.00	<div></div>		
SS Crystal Resolution	%	Master		5.00	9.58	20.00	<div></div>		
		Before		5.00	9.44	20.00	<div></div>		
		Before-Master	----	-1.00	-0.14	1.00	<div></div>		
LS Crystal Resolution	%	Master		5.00	8.33	20.00	<div></div>		
		Before		5.00	8.53	20.00	<div></div>		
		Before-Master	----	-1.00	0.20	1.00	<div></div>		

## HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 07:49:47 04-Jun-2014							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div></div>
Main Resistivity	ohm.m	Before	3875	3565	3860	4185	<div><div></div></div>
Deep Resistivity	ohm.m	Before	3830	3524	3793	4136	<div><div></div></div>
Shallow Resistivity	ohm.m	Before	3830	3524	3814	4136	<div><div></div></div>

## 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	4867
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC		HACCZ-H	6991
AmBe Neutron Logging Source		NSR-F	2554
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)		165	

## HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 07:48:33 04-Jun-2014							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.1	32.8	<div><div></div><div></div><div></div><div></div></div>

## HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-May-2007							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div></div>
Accelerometer Manufacturer		Master			QAT_160		<div><div></div></div>
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0	<div><div></div></div>
Accelerometer Coefficients - 0		Master	----	----	-4298.000	----	<div><div></div></div>
Accelerometer Coefficients - 1		Master	----	----	50.180	----	<div><div></div></div>
Accelerometer Coefficients - 2		Master	----	----	-0.002	----	<div><div></div></div>
Accelerometer Coefficients - 3		Master	----	----	0.000	----	<div><div></div></div>
Accelerometer Coefficients - 4		Master	----	----	2.754	----	<div><div></div></div>
Accelerometer Coefficients - 5		Master	----	----	0.000	----	<div><div></div></div>

Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	300.500	-----	
Accelerometer Coefficients - 9		Master	-----	-----	0.994	-----	

## HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM):		16:12:40 06-May-2014		Before (Measured):		15:26:06 02-Jun-2014 Expired by 1 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.1	40.0	
		Before	0	5.0	28.2	40.0	
		Before-Master	-----	-4.1	1.1	4.1	
Far Zero Measurement	1/s	Master	0	5.0	28.3	40.0	
		Before	0	5.0	27.5	40.0	
		Before-Master	-----	-4.2	-0.8	4.2	
Near Plus Measurement	1/s	Master	6031.0	4700.0	5701.0	6900.0	
		Before	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2321.0	2900.0	
		Before	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
Near Corrected Plus Measurement	1/s	Master		4700.0	5693.0	6900.0	
		Before	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
Far Corrected Plus Measurement	1/s	Master		1900.0	2303.0	2900.0	
		Before	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	

## HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		15:30:29 02-Jun-2014 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	68.2	120.0	
RGR Plus Measurement	gAPI	Before	185.4	157.1	173.7	206.3	
GR Calibration Gain		Before	0.89	0.80	0.95	1.05	

Company:	Nighthawk Production LLC	Schlumberger
Well:	John Craig 4-2	
Field:	Old Homestead	
County:	Lincoln	
State:	Colorado	
Platform Express		
Triple Combo		