

Company: Nighthawk Production LLC

Well: Pikes Peak Williams 4-30

Field: Wildcat

County: Lincoln Country: United States

Platform Express

Triple Combo

County: Lincoln

Field: Wildcat

Location: NWNW Sec 30, T13S, R55W

Well: Pikes Peak Williams 4-30

Company: Nighthawk Production LLC

Location:

NWNW Sec 30, T13S, R55W

SHL: 660' FNL x 660' FWL

Lat/Long: 38.892850/-103.605630

Elev.: 5155.00 ft

G.L. 5143.00 ft

D.F. 5154.00 ft

Permanent Datum: _____

Ground Level _____

Elev.: 5143.00 f

Log Measured From: _____

Kelly Bushing _____

12.00 ft

above Perm.Datum

Drilling Measured From: _____

Kelly Bushing _____

API Serial No. _____

Max.Hole Deviation 0 deg

Longitude: -103.60563 degrees

Latitude: 38.892850 degrees

05-073-06478-0000

Logging Date	26-Sep-2012		
Run Number	Run 1		
Depth Driller	7896.00 ft		
Schlumberger Depth	7884.00 ft		
Bottom Log Interval	7884.00 ft		
Top Log Interval	342.00 ft		
Casing Driller Size @ Depth	8.625 in @ 328.00 ft		
Casing Schlumberger	342 ft		
Bit Size	7.875 in		
Type Fluid In Hole	Fresh Water		
Density	Viscosity	44 s	
Fluid Loss	PH	8.4 cm3	7.6
MUD			
Source of Sample			
RM @ Meas Temp	1.74 ohm.m @ 64.02 degF		
RMF @ Meas Temp	1.3 ohm.m @ 75 degF		
RMC @ Meas Temp	2.17 ohm.m @ 75 degF		
Source RMF	RMC	Calculated	Calculated
RM @ BHT	RMF @ BHT	0.72 @ 163.67	0.63 @ 163.67
Max Recorded Temperatures			
Circulation Stopped		Time	01:30:00
Logger on Bottom		Time	09:25:00
Unit Number	Location:	2135	Fort Morgan, Colora
Recorded By	Keri Lonng		
Witnessed By	Jim Weir / Andy Elگرد		

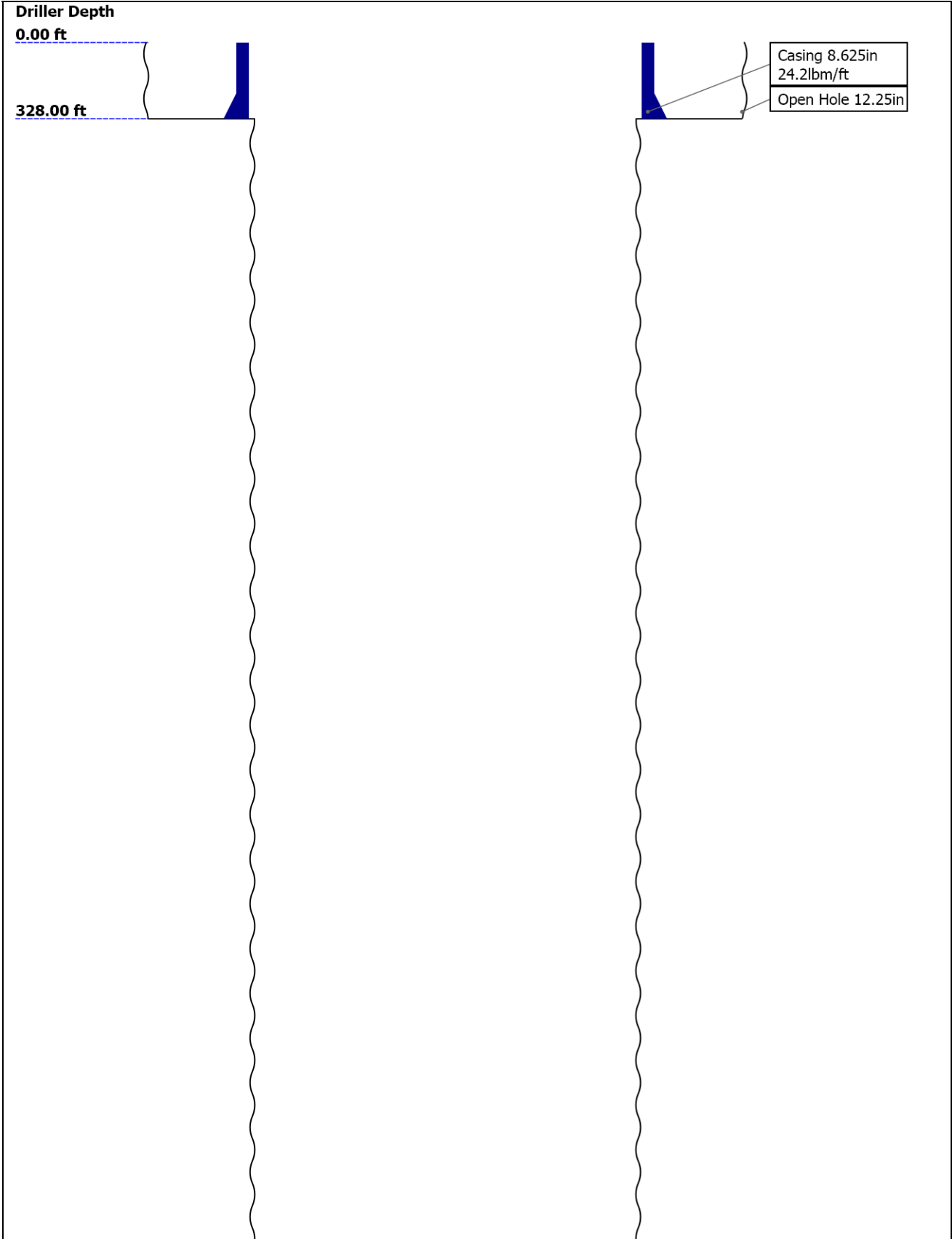
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Well Sketch



7896.00 ft

Open Hole 7.875in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	7.875				
Top Driller (ft)	0	328				
Top Logger (ft)	0	342				
Bottom Driller (ft)	328	7896				
Bottom Logger (ft)	342	7884				
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24.2					
Inner Diameter (in)	8.095					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	328					
Bottom Logger (ft)	342					

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	26-Sep-2012					
Time Log Started	08:13:59					
Date Log Finished	26-Sep-2012					
Time Log Finished	11:49:15					
Top Log Interval (ft)	342.00					
Bottom Log Interval (ft)	7884.00					
Total Depth (ft)	7884.00					
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, Colorado					
Recorded By	Keri Loring					
Witnessed By	Jim Weir / Andy Elgerd					
Service Order Number	BX19-00056					

HRC C-H:5705
HRMS-H:4706
GPV-Q
GSR-J:5240
Short Spacing:27
634
Backscatter
HRGD-H:3816
Long Spacing:28
732

HRCC 46.88

MCFL 41.45
Caliper 40.96
TLD Density 40.57

AH-184:909 38.64

DSLT-H:8339 36.64
ECH-KH:8401
DSLC-H:8339
SLS-E:165

CBL 3ft 24.17
Upper-Near 24.17

VDL 5ft 23.17
Upper-Far 23.17

Delta-T 21.79

Lower-Far 20.42

Lower-Near 19.42

SLS-E 16.00

AIT-M:1270 16.00
AMIS:1270
AMRM:1270

Temperature 7.91
Power Supply 7.91
Induction 7.91



Depth Summary

Depth Control Parameters	Run 1		
Conveyance Type	Wireline		
Rig Type	Land		
Depth Remark Parameters	Run 1		
Depth Remark 1	All Schlumberger depth procedures followed.		
Depth Remark 2	IDW used as primary depth control device.		
Depth Remark 3	Z-chart used as secondary depth control device.		
Depth Measuring Device	Run 1		
Type	IDW-B		
Serial Number	4938		
Calibration Date	11-Apr-2012		
Calibration Cable Type	7-46P XS		
Wheel Correction 1	-6		
Wheel Correction 2	-6		
Tension Device	Run 1		
Type	CMTD-B/A		
Serial Number	1919		
Calibration Date	10-Sep-2012		
Calibrator Serial Number	78135a		
Calibration Points	10		
Calibration RMS	12		
Calibration Peak Error	24		
Logging Cable	Run 1		
Type	7-46P-XS		
Serial Number	U711057		
Logging Cable Length (ft)	24600.00		

Run 1

5" Triple Combo

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
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Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120614-3.1.9755.1038

Computation	Description	Version	
HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections	3.1.9755.0	
DepthCorrection	DepthCorrection	3.1.9755.0	
Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.1.9755.0	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0
AMIS	Array Induction Sonde - M	3.1.9755.1038	1

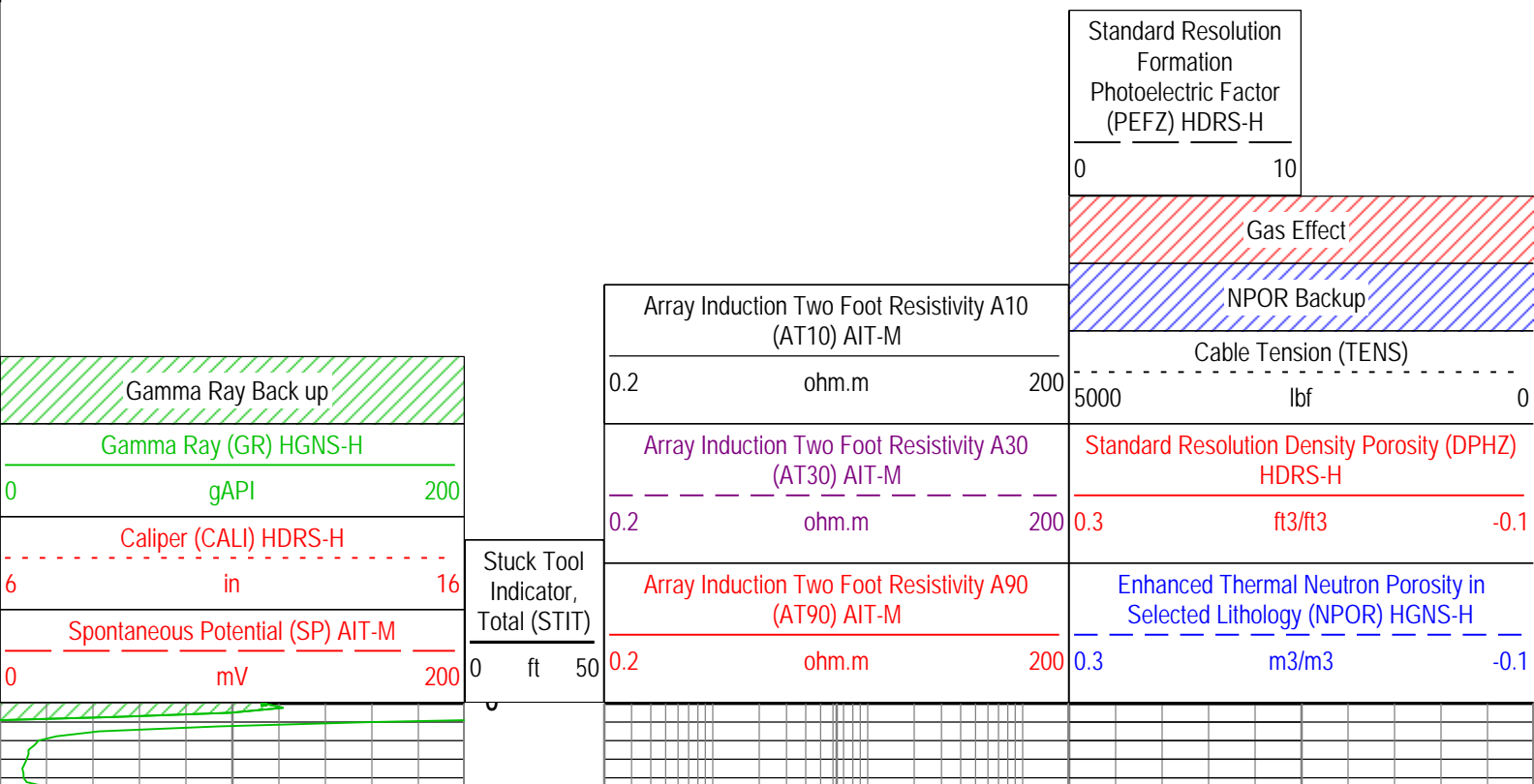
Pass Summary								
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
Run 1	Main[4]:Up	Up	31.88 ft	7892.18 ft	26-Sep-2012 9:23:43 AM	26-Sep-2012 11:48:38 AM	6.25 ft	true
All depths are referenced to toolstring zero								

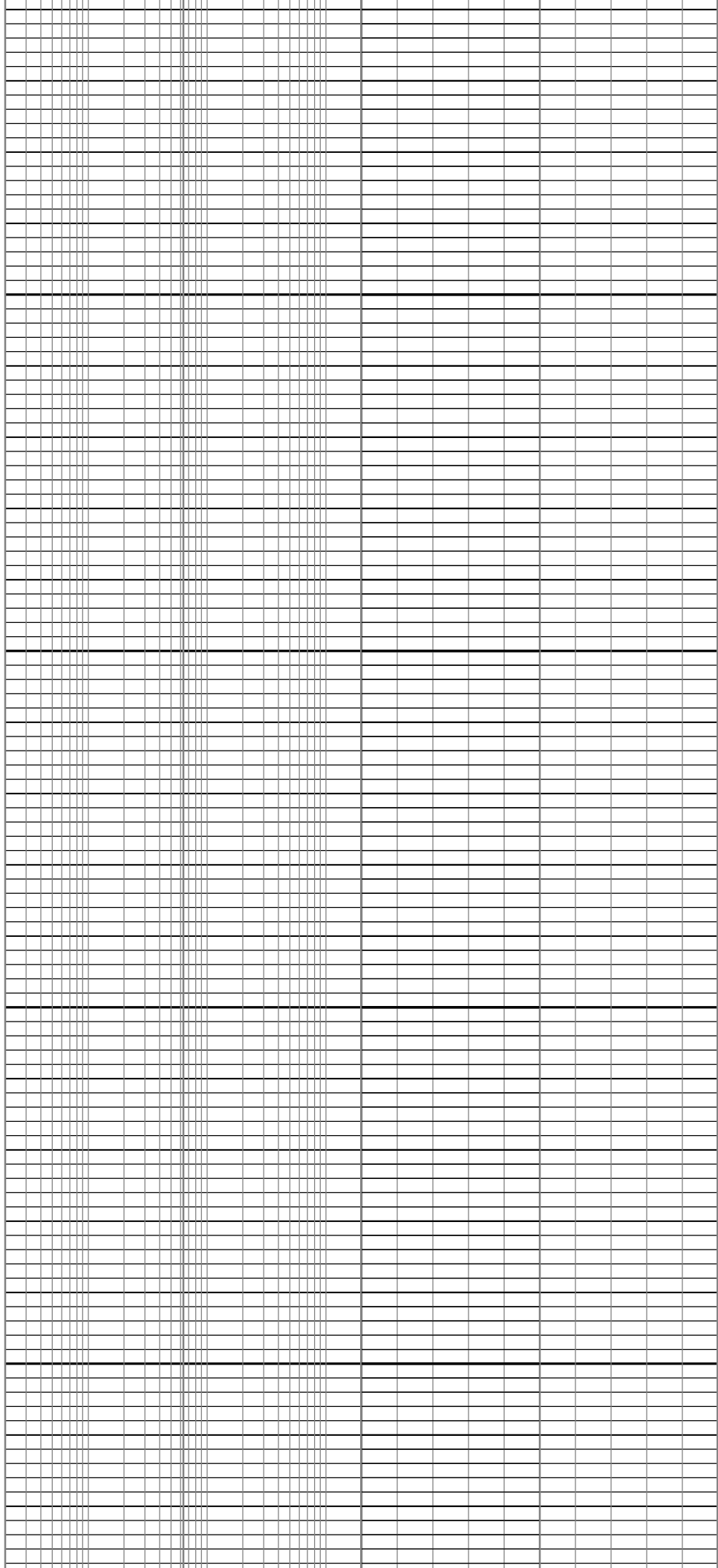
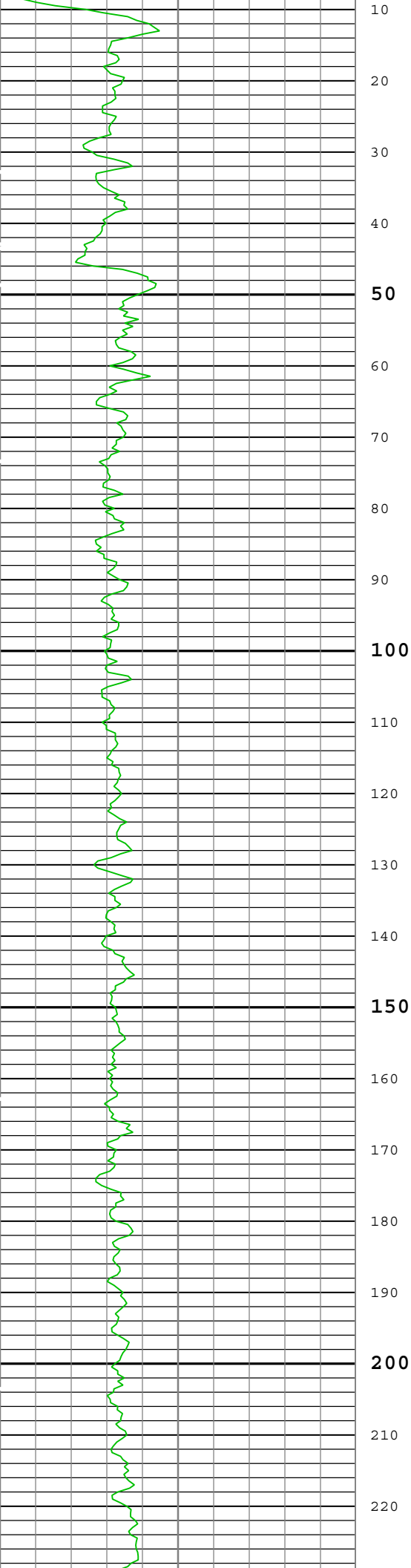
Log	Run 1: Main[4]:Up
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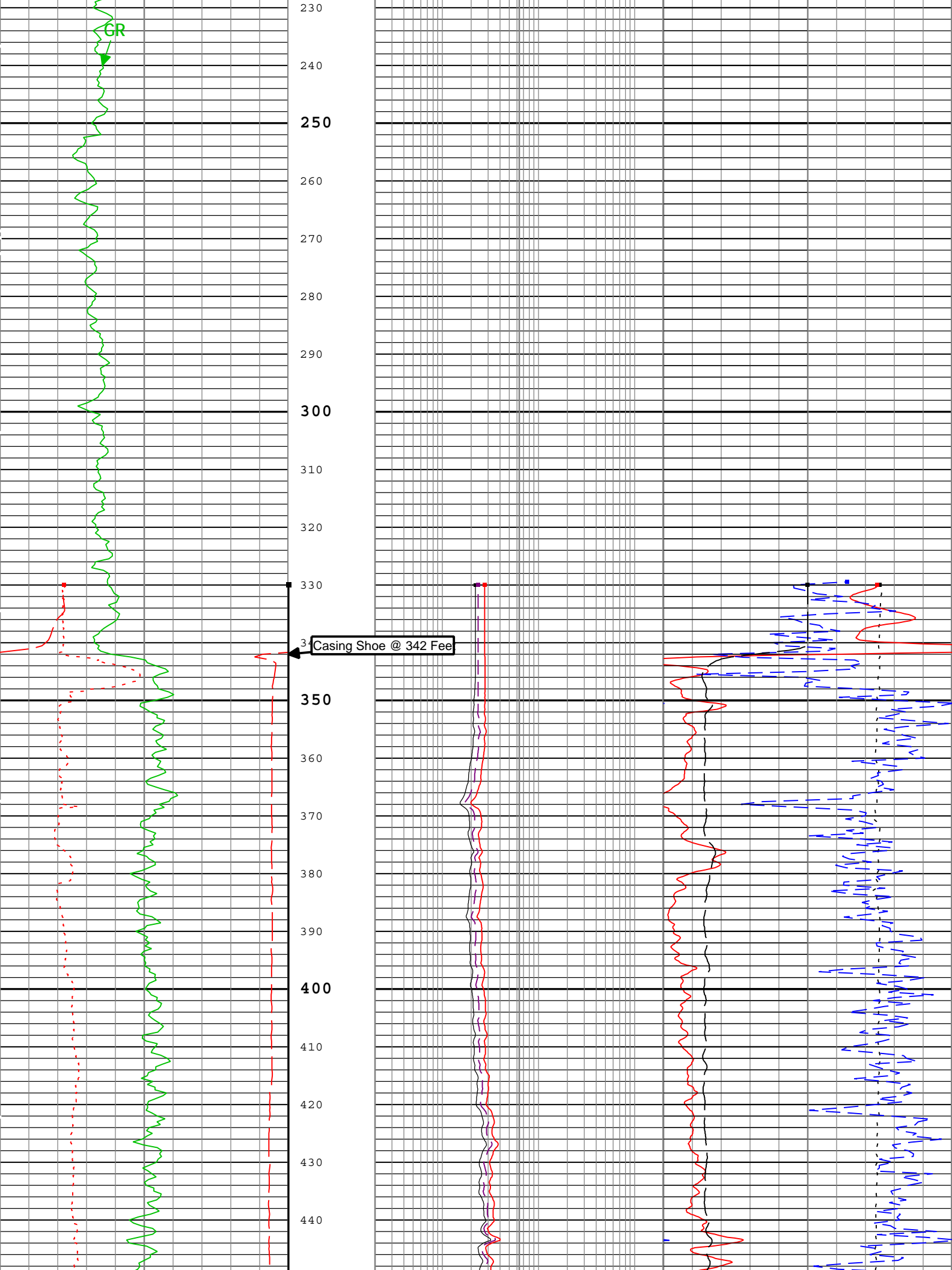
Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Triple Combo) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 26-Sep-2012 12:30:17

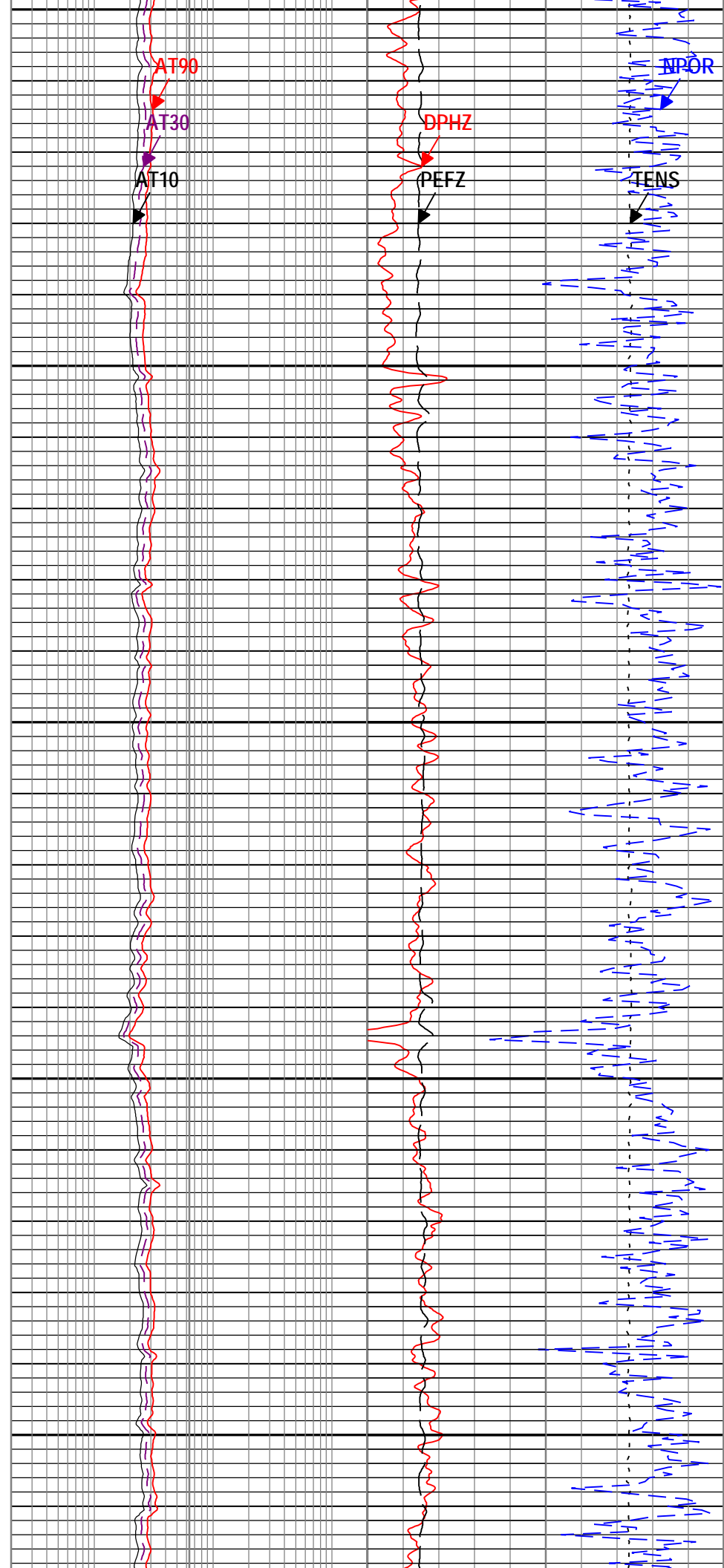
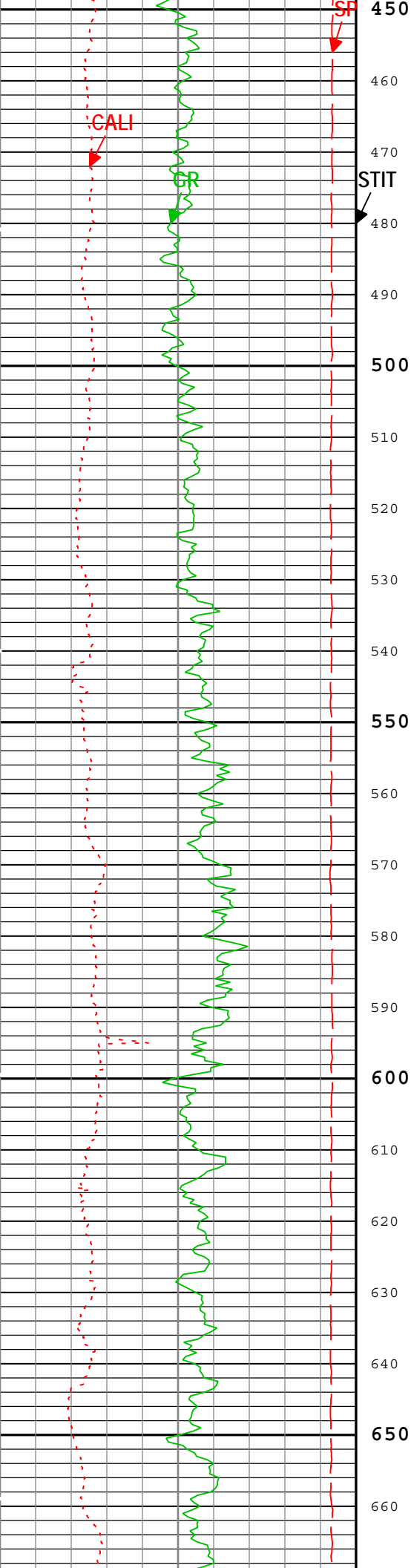
Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
AT30	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in
GR	HGNS-H:HGNS-H:HGNS-H	6in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
SP	AIT-M:AMIS:AMIS	6in
STIT	DepthCorrection	6in
TENS	WLWorkflow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

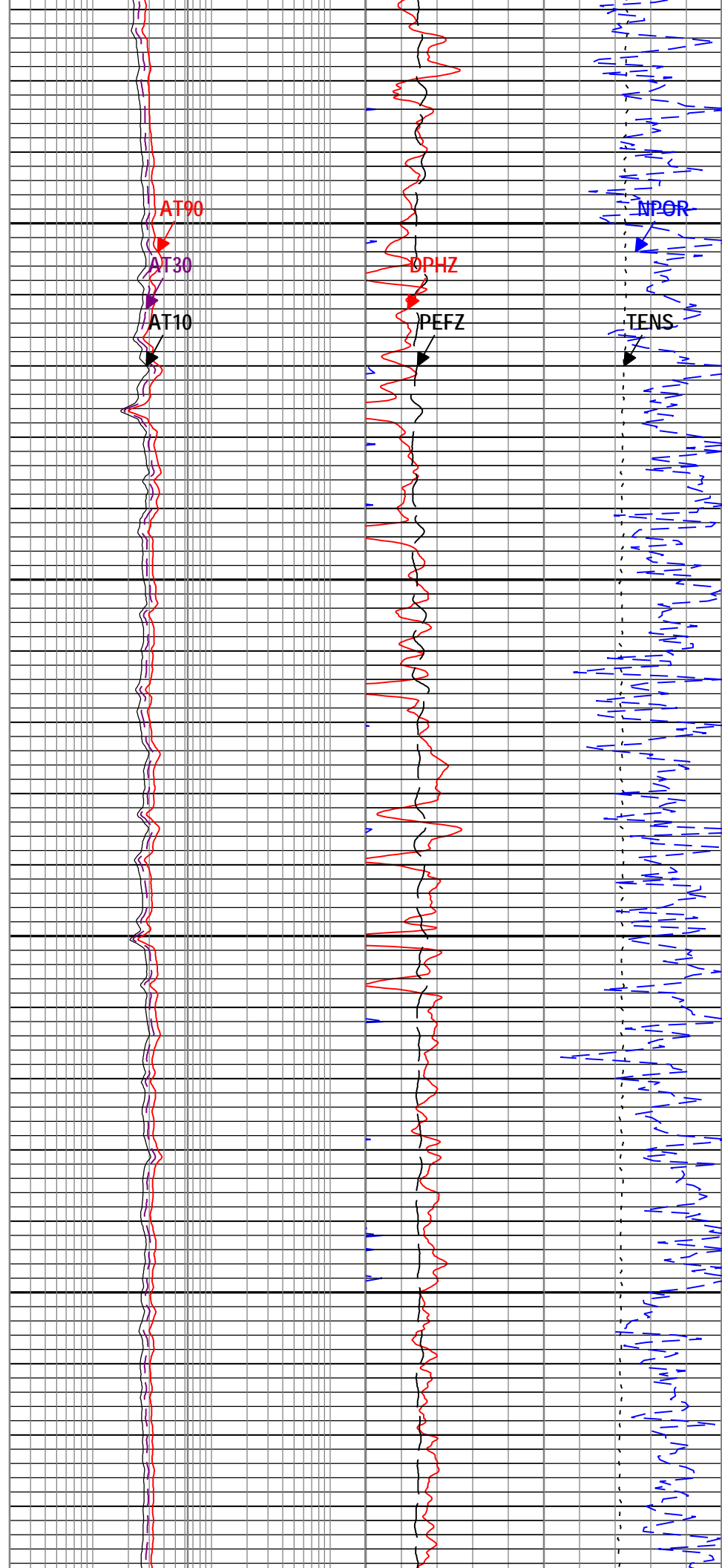
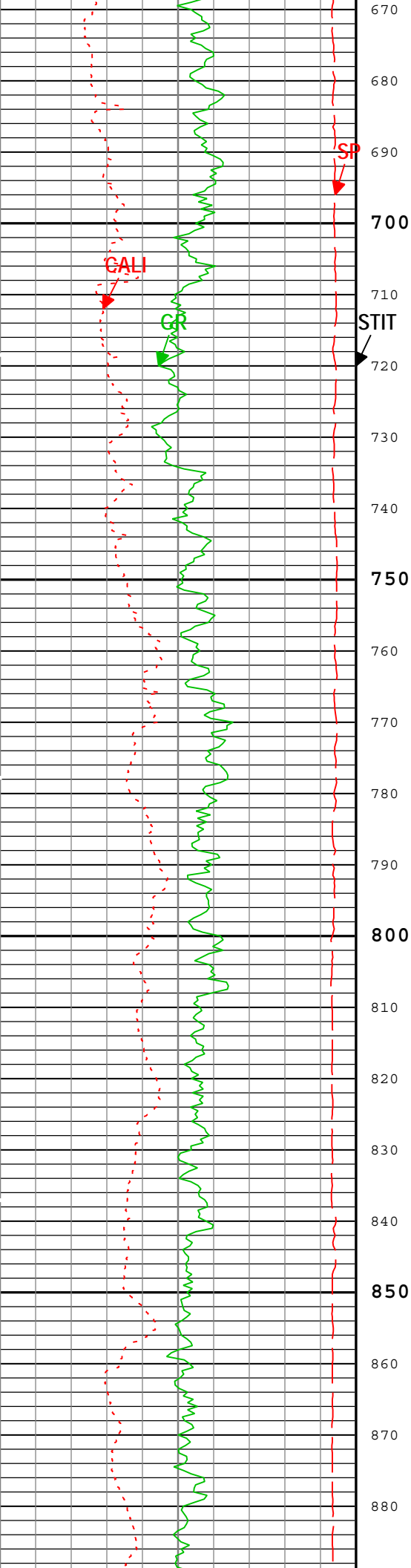
TIME_1900 - Time Marked every 60.00 (s)

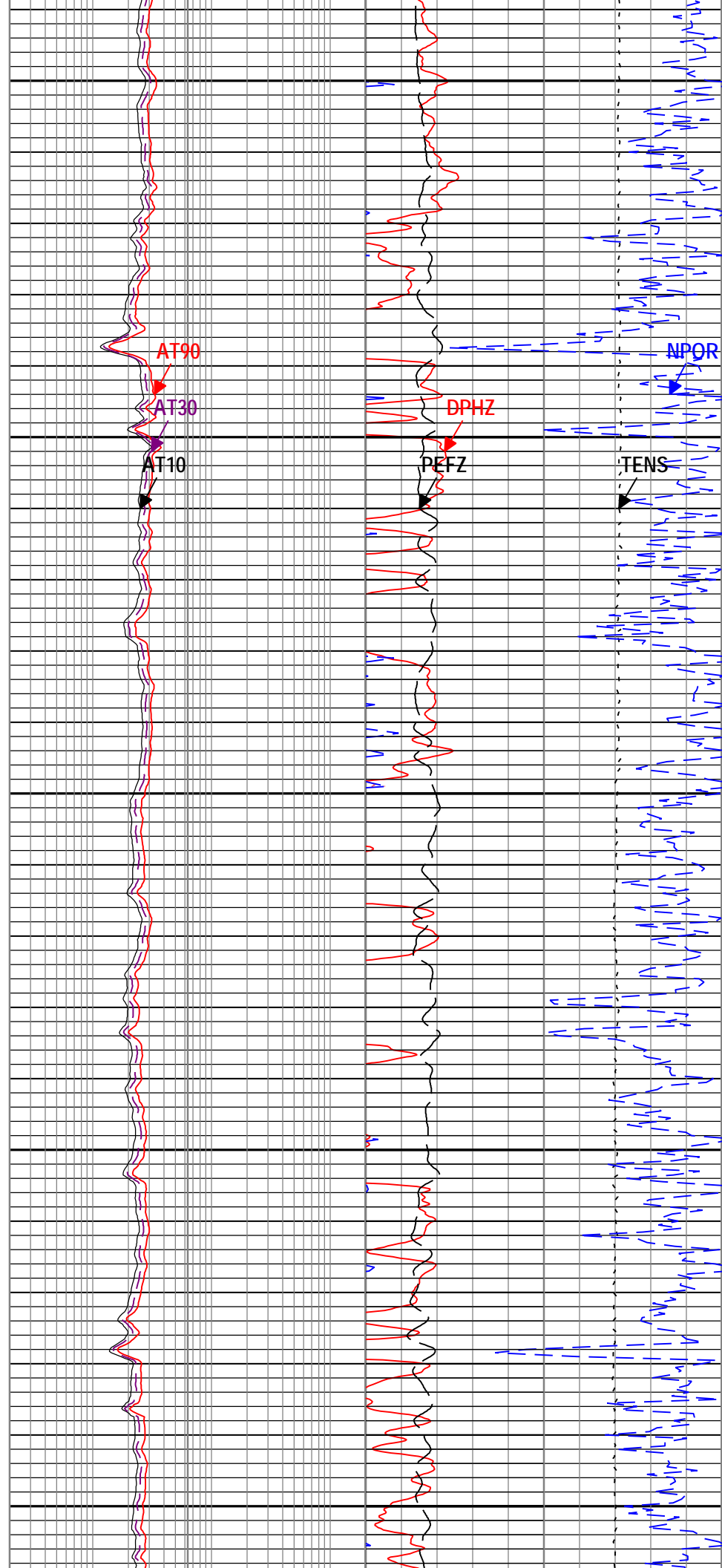
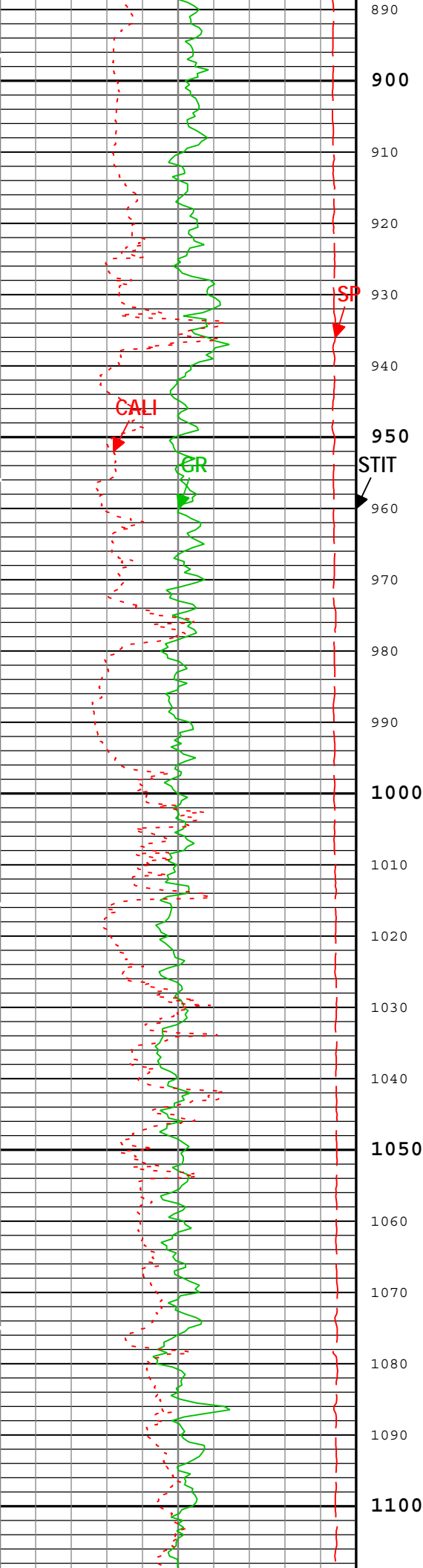


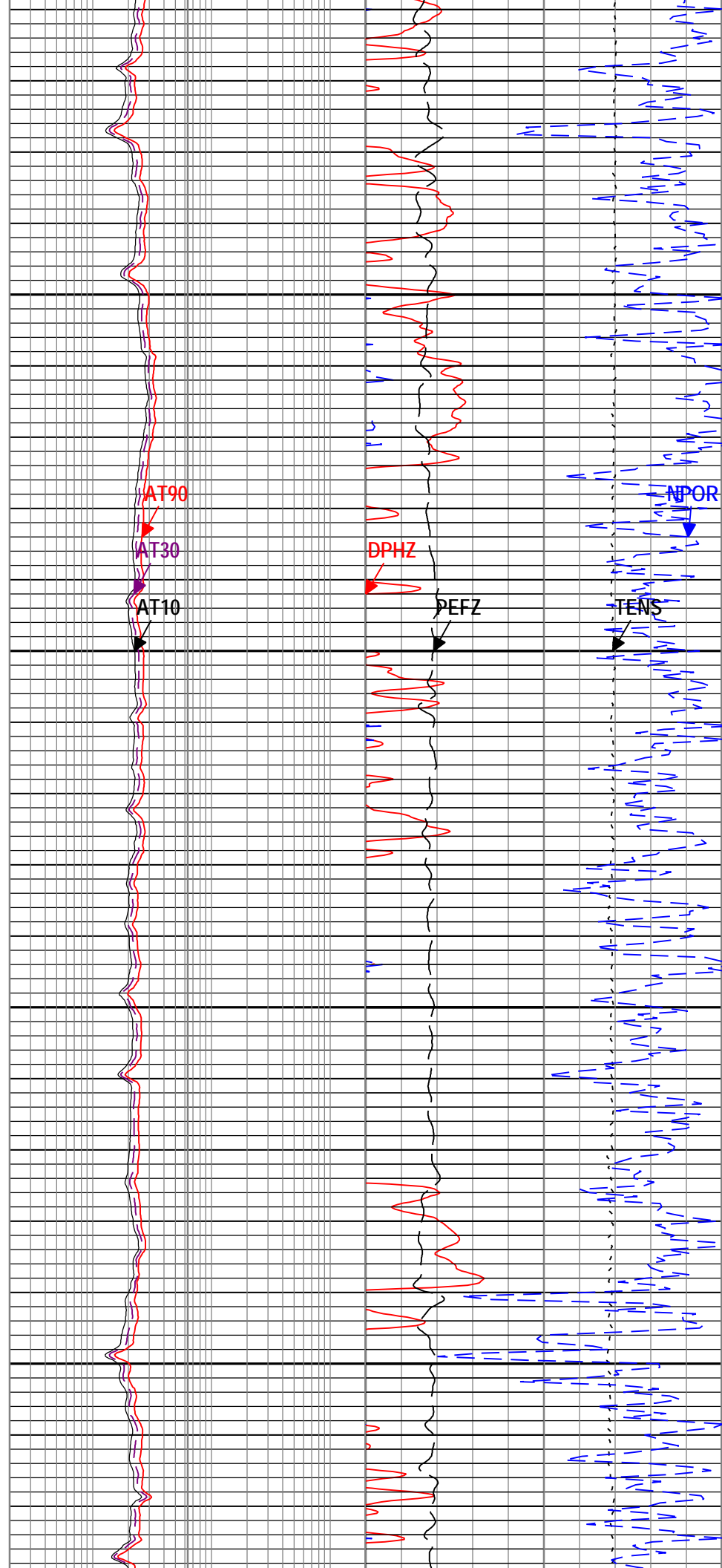
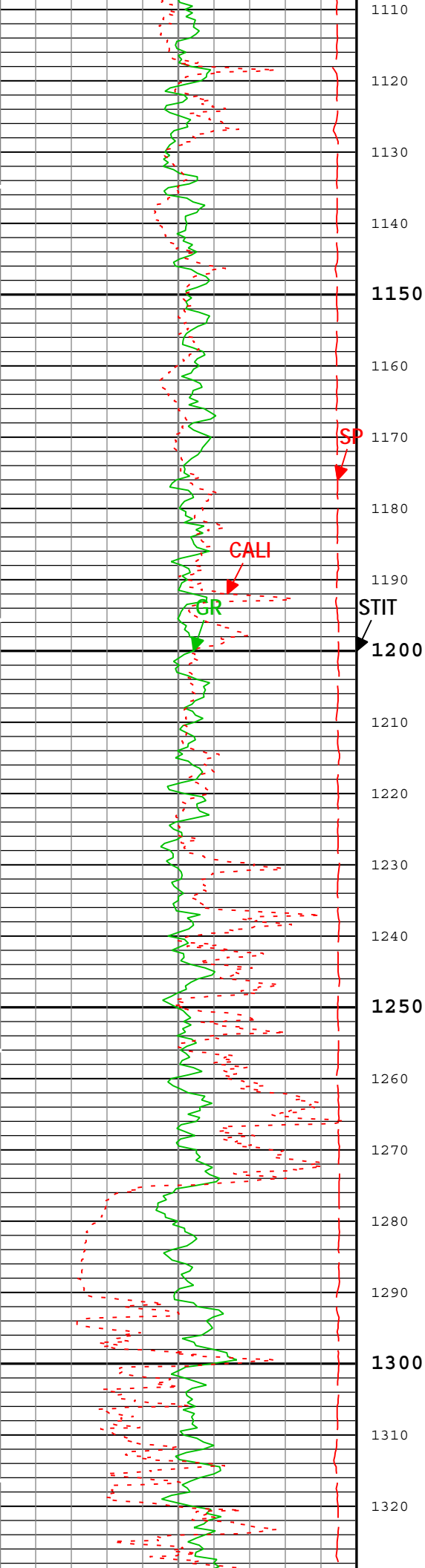


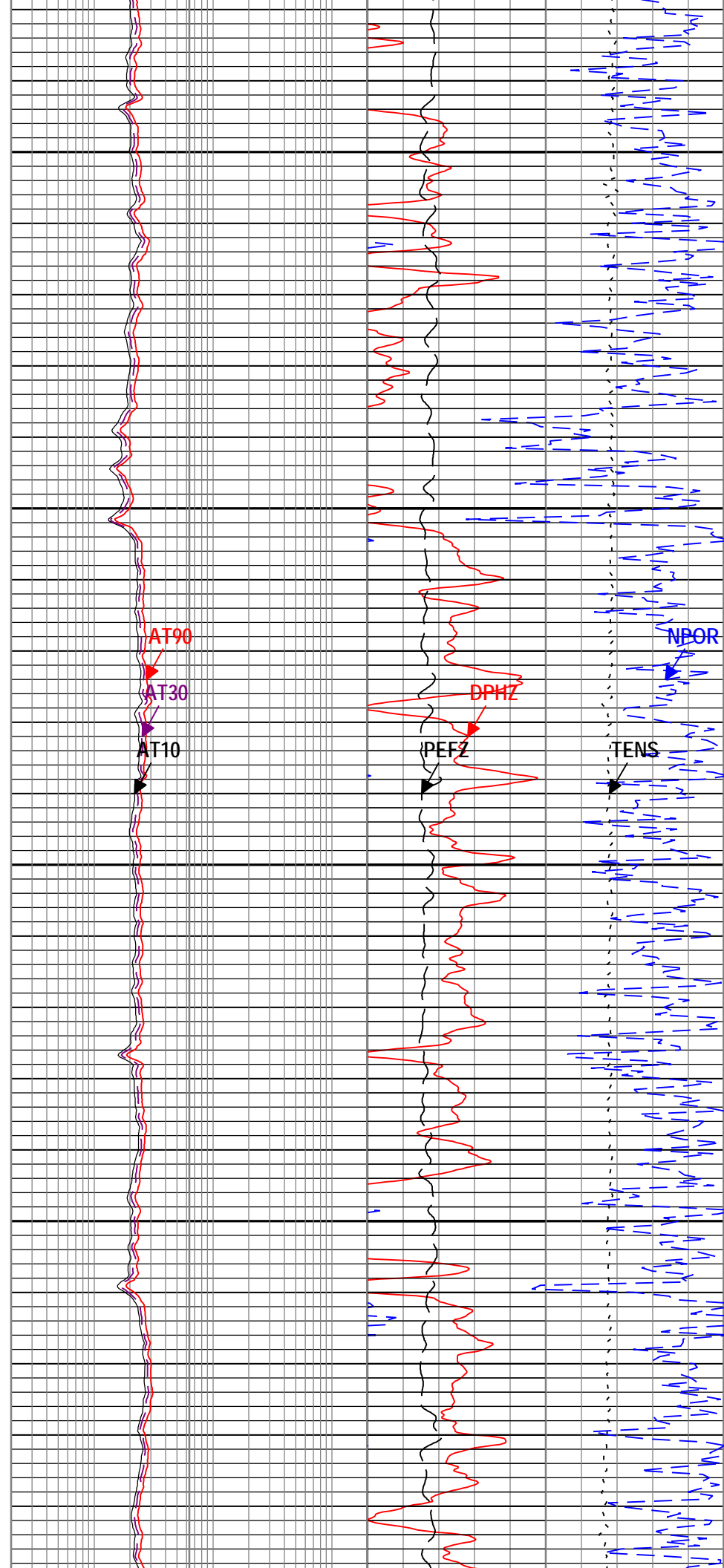
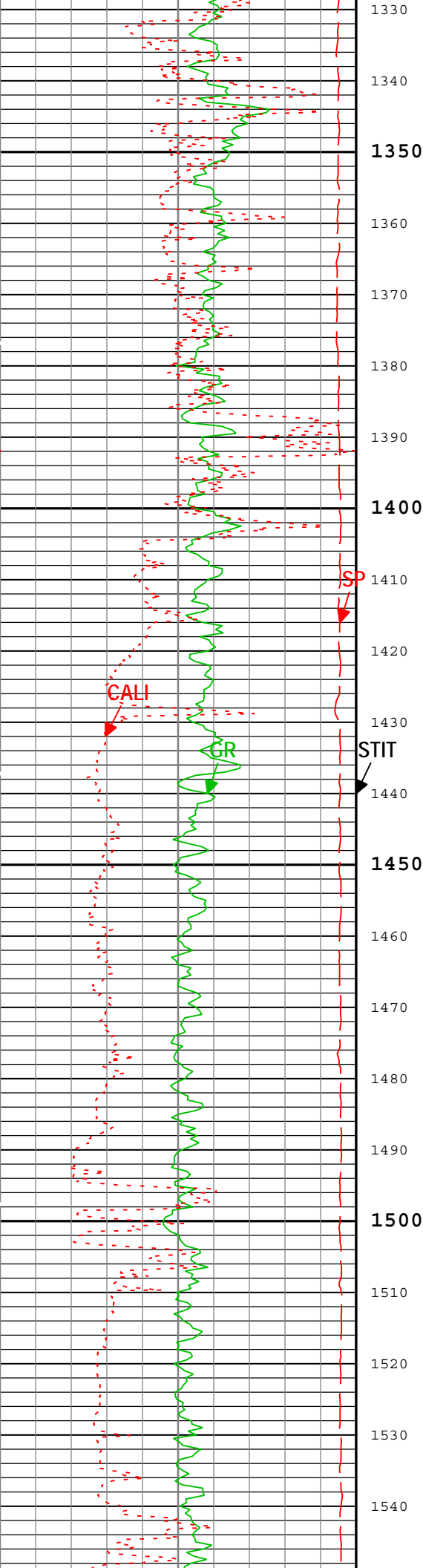


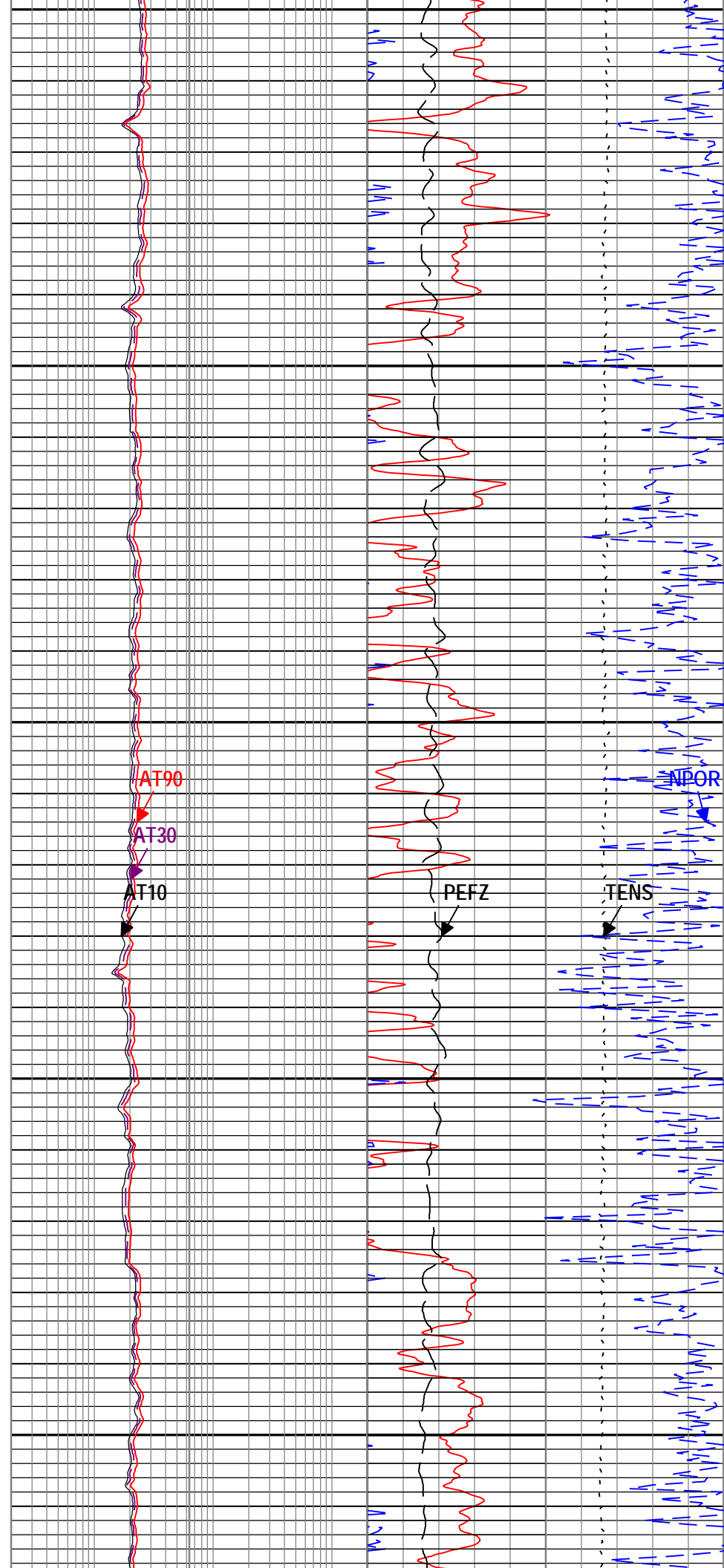
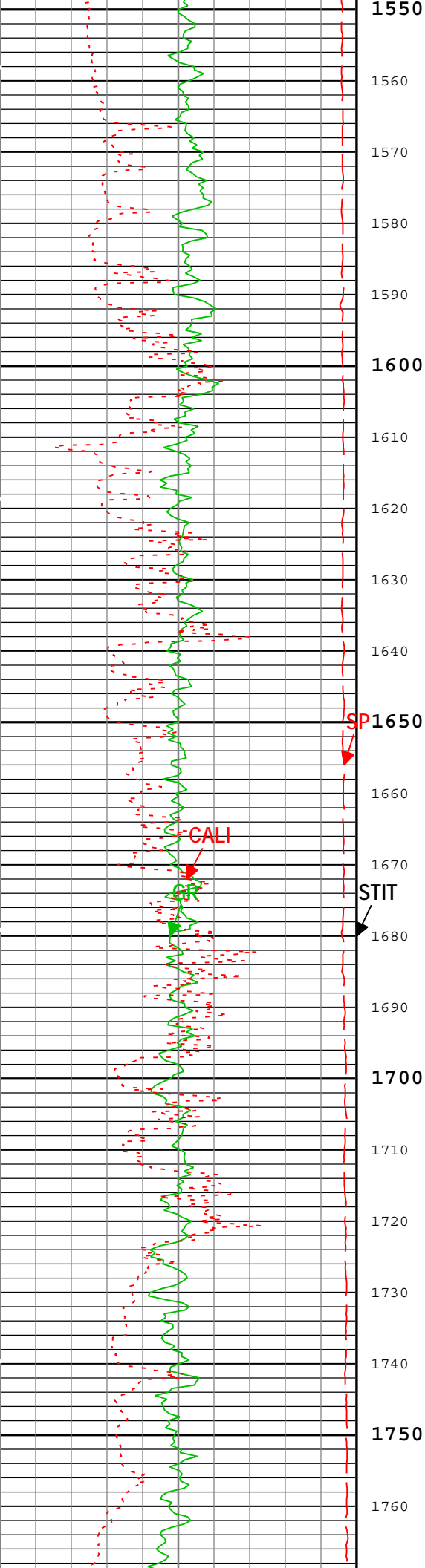


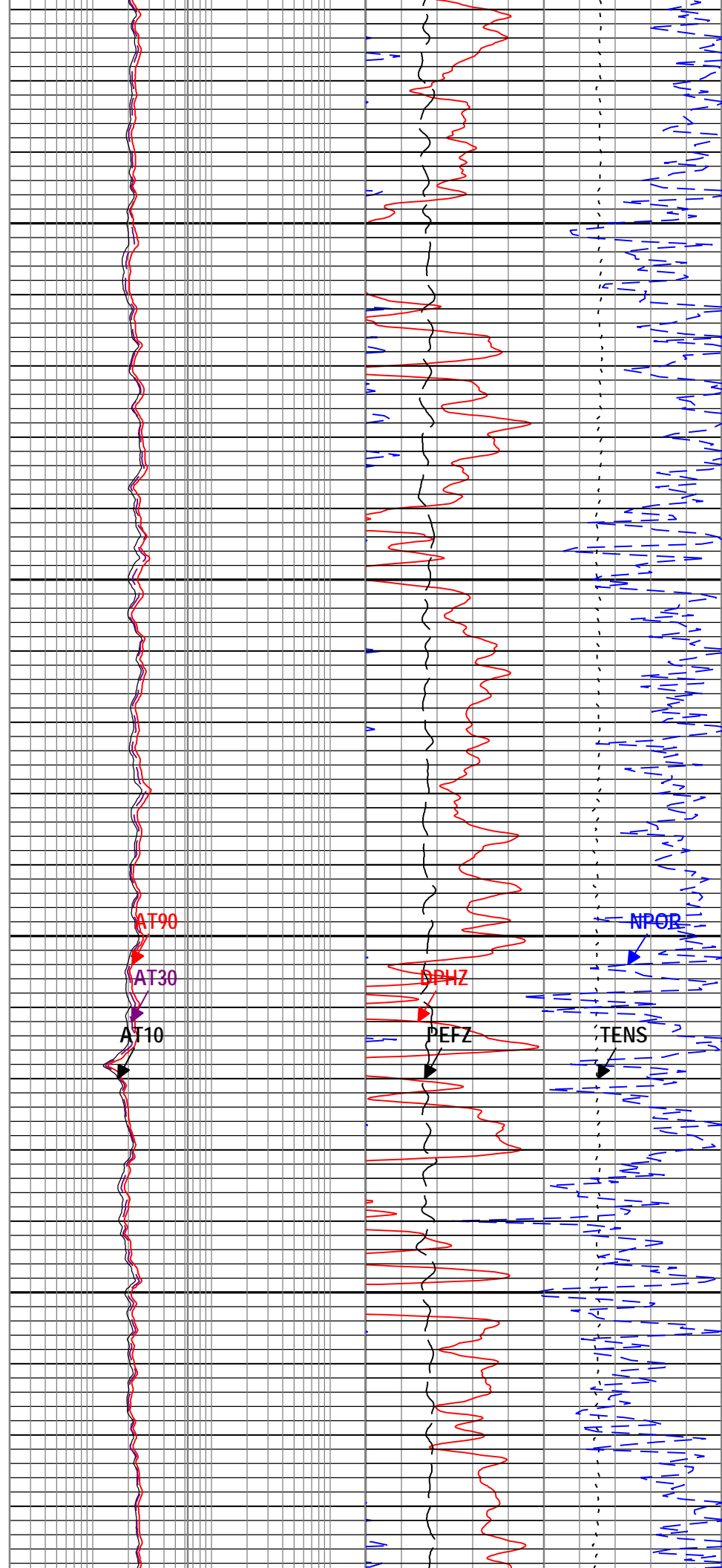
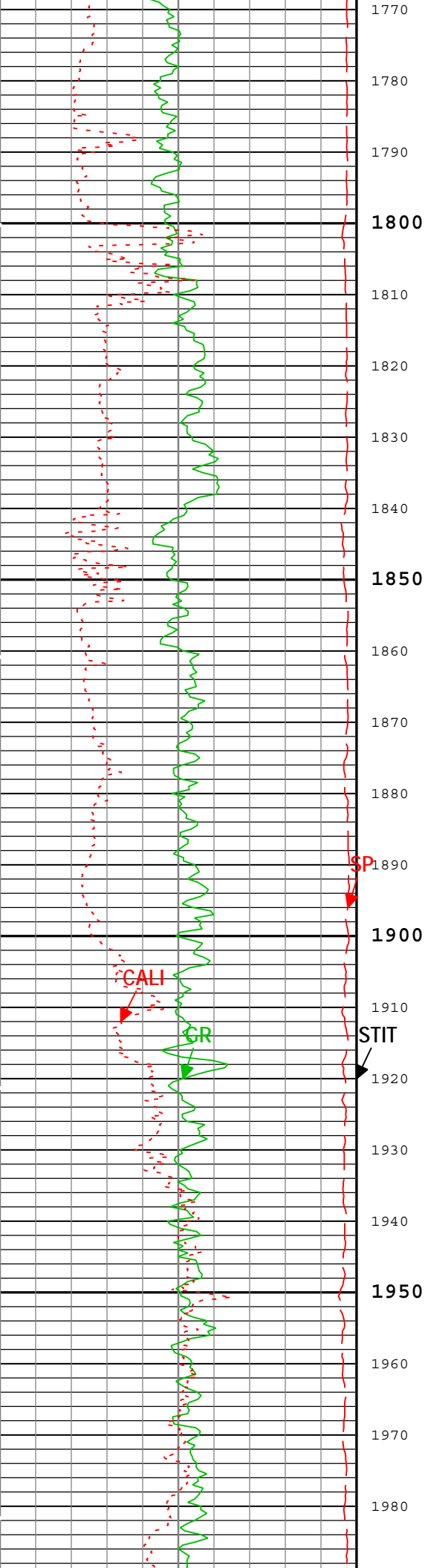


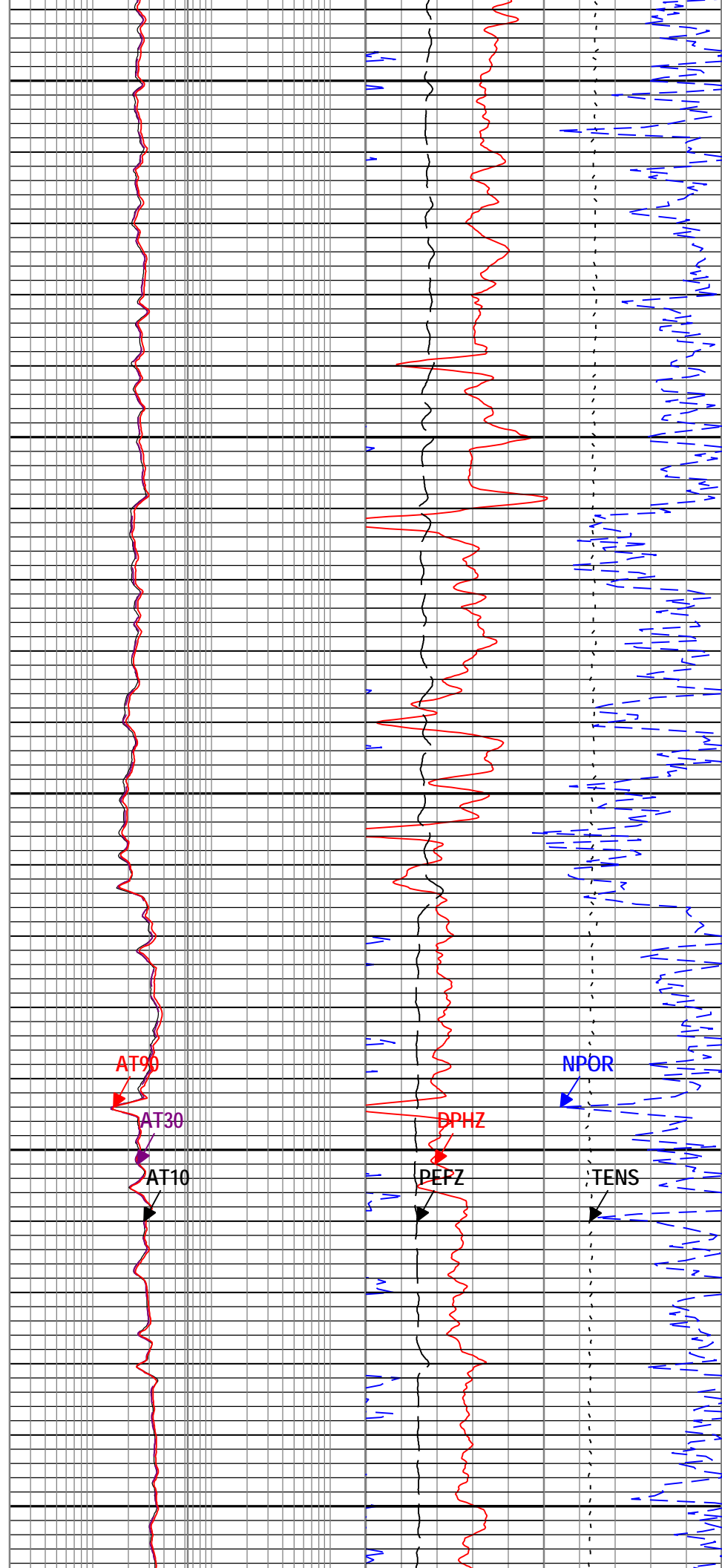
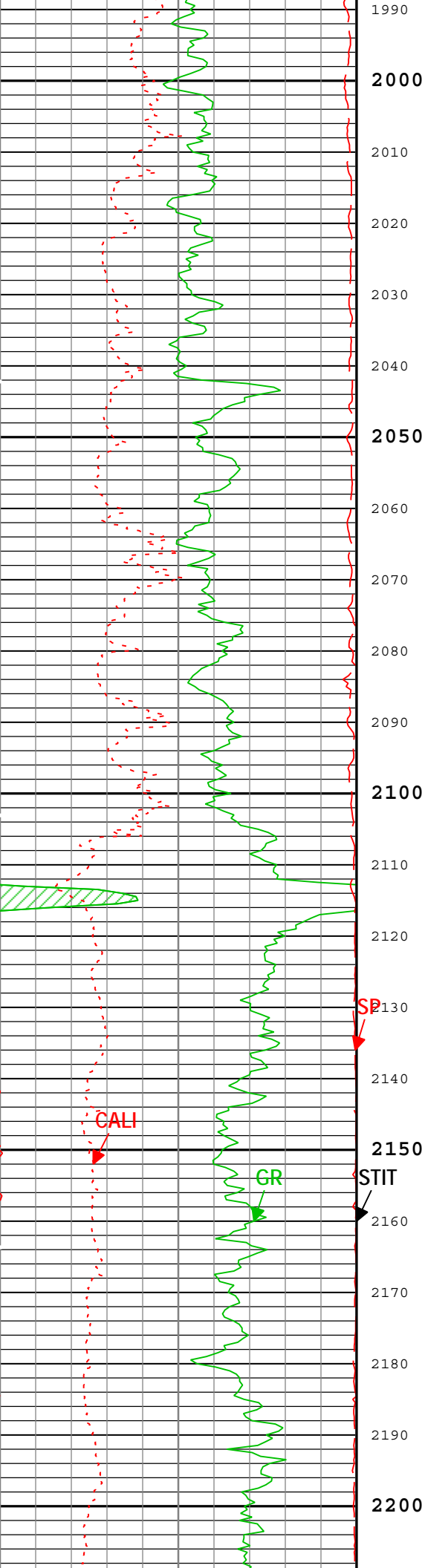


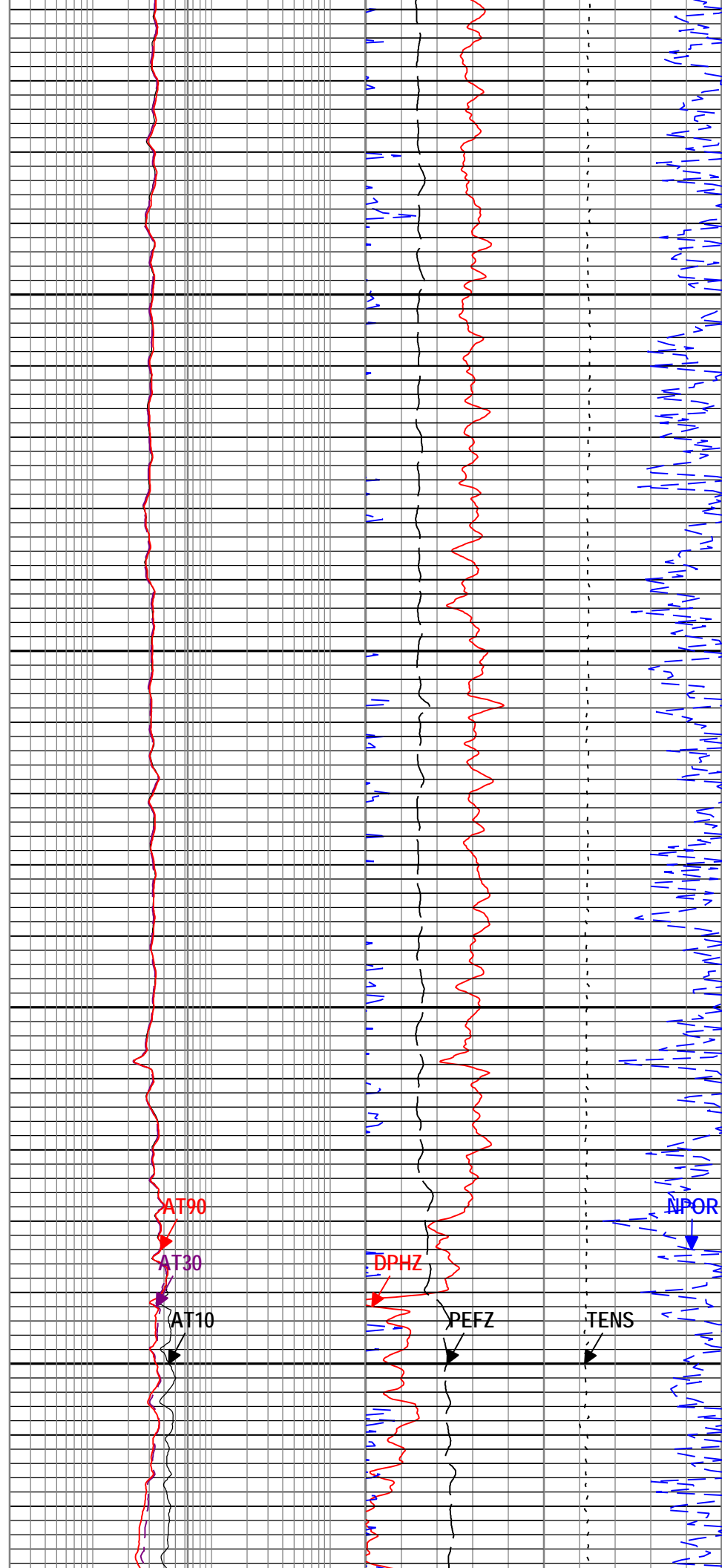
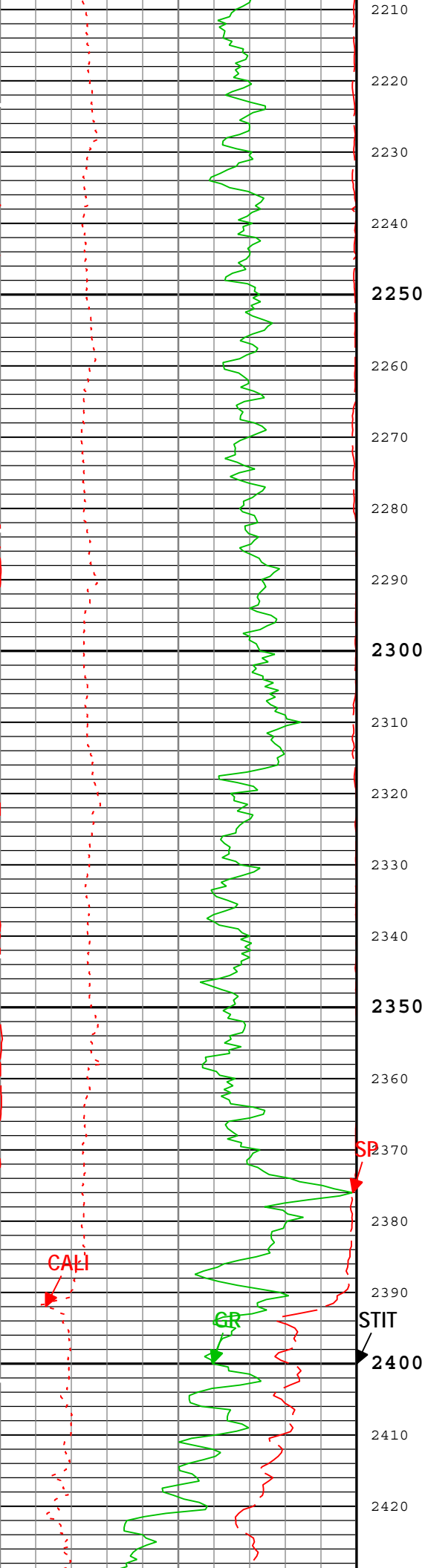


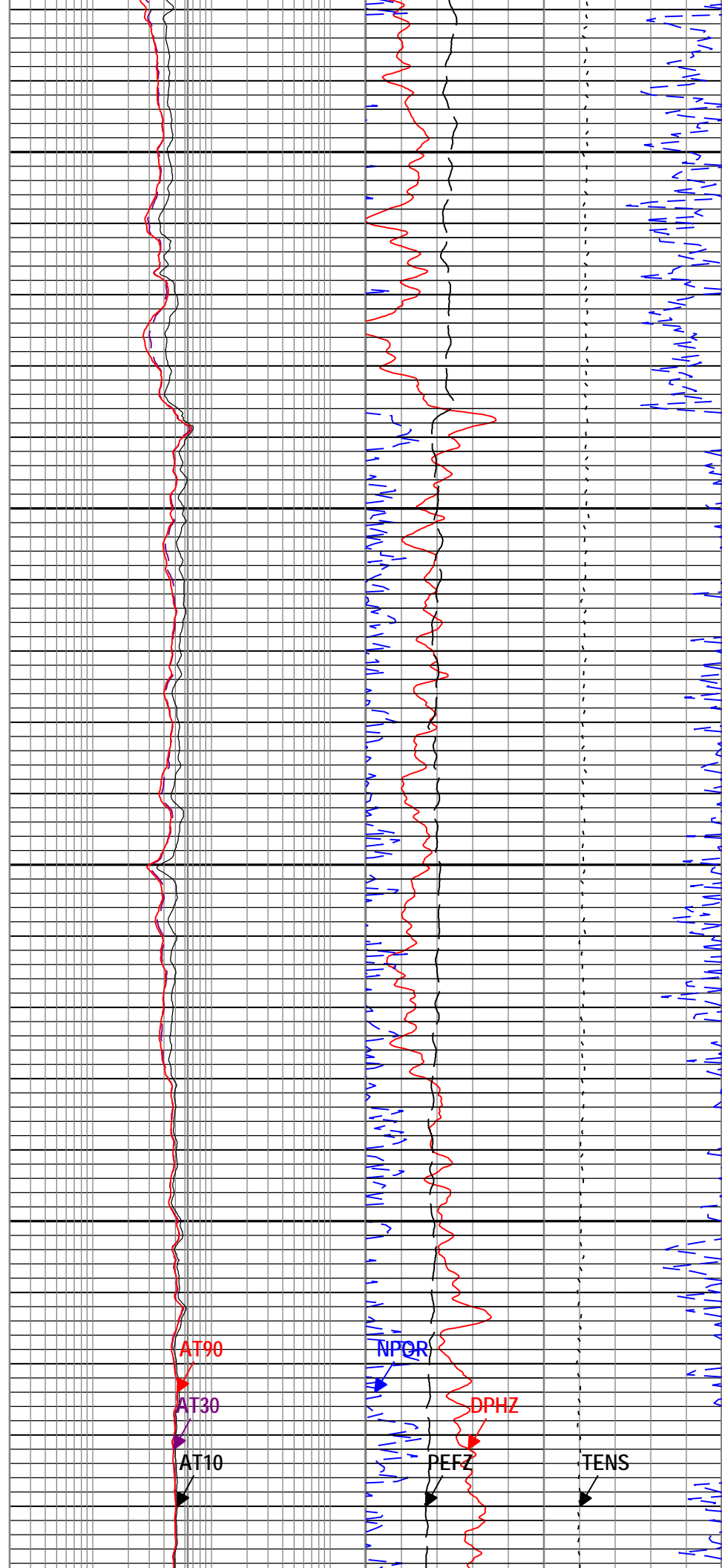
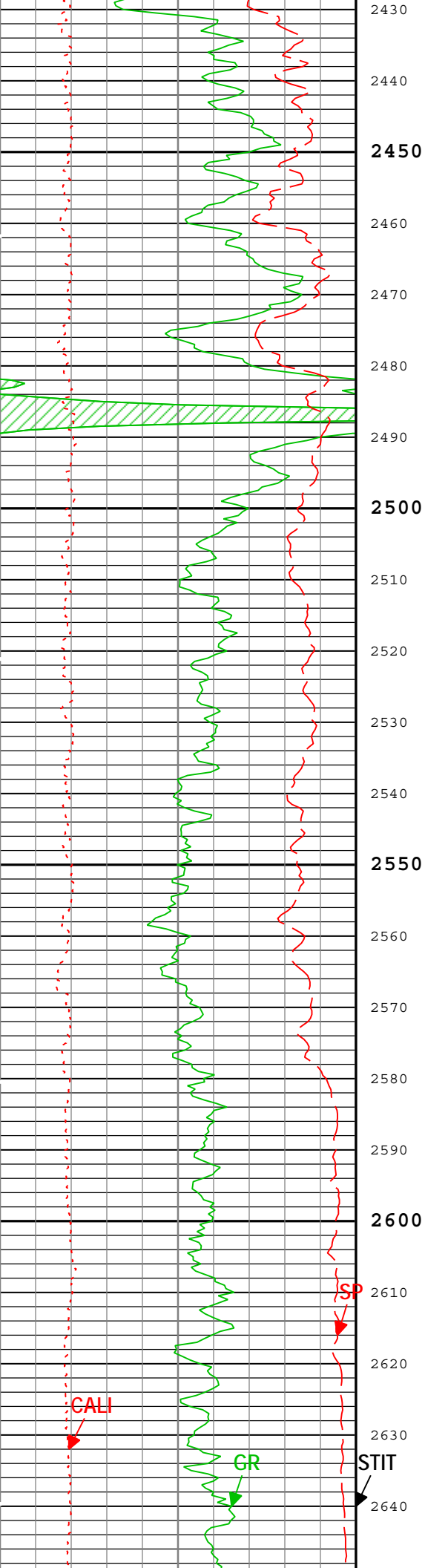


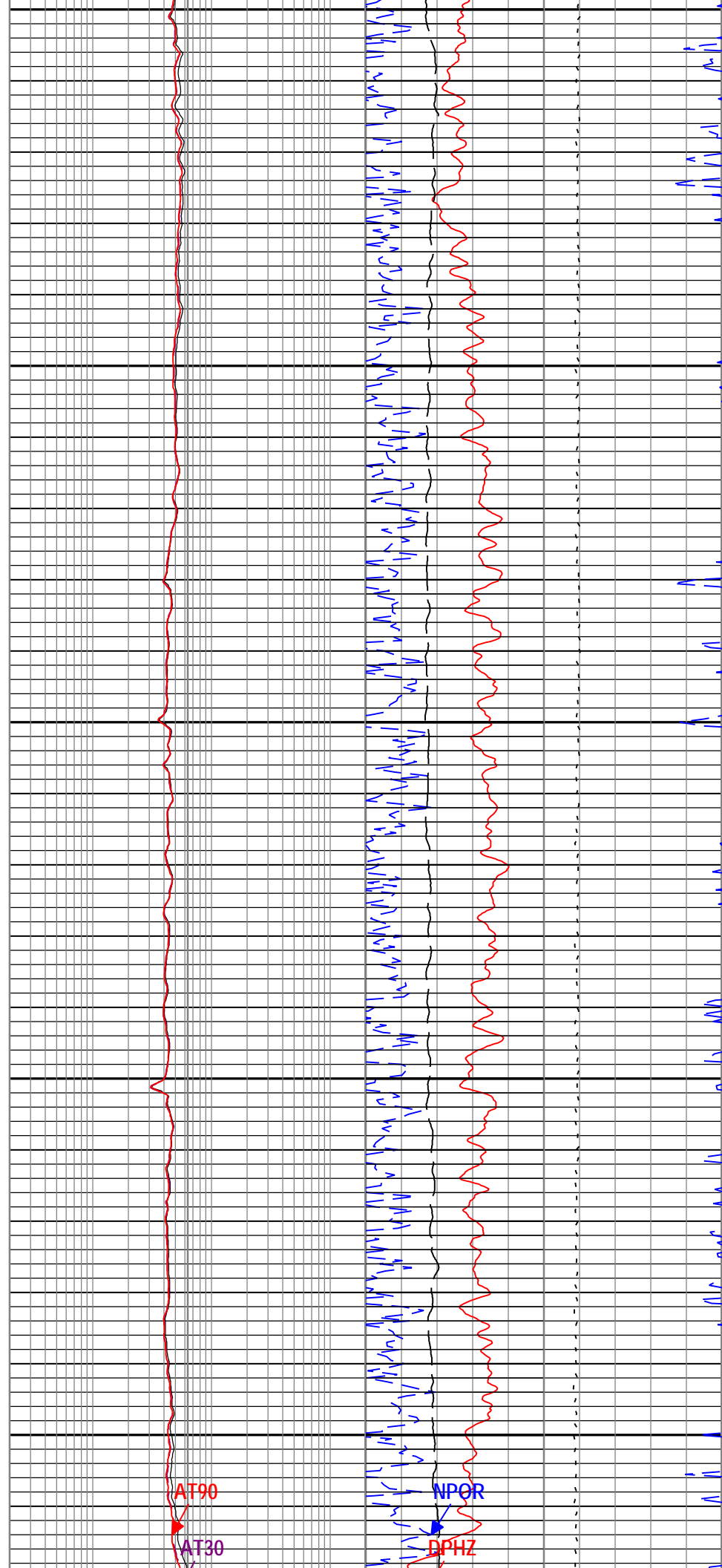
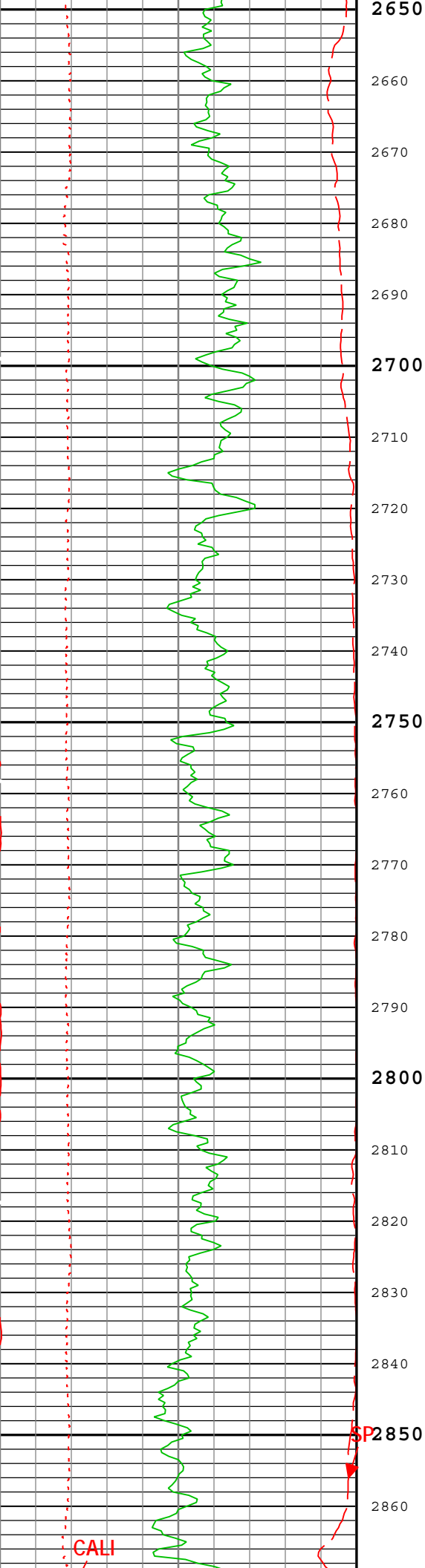


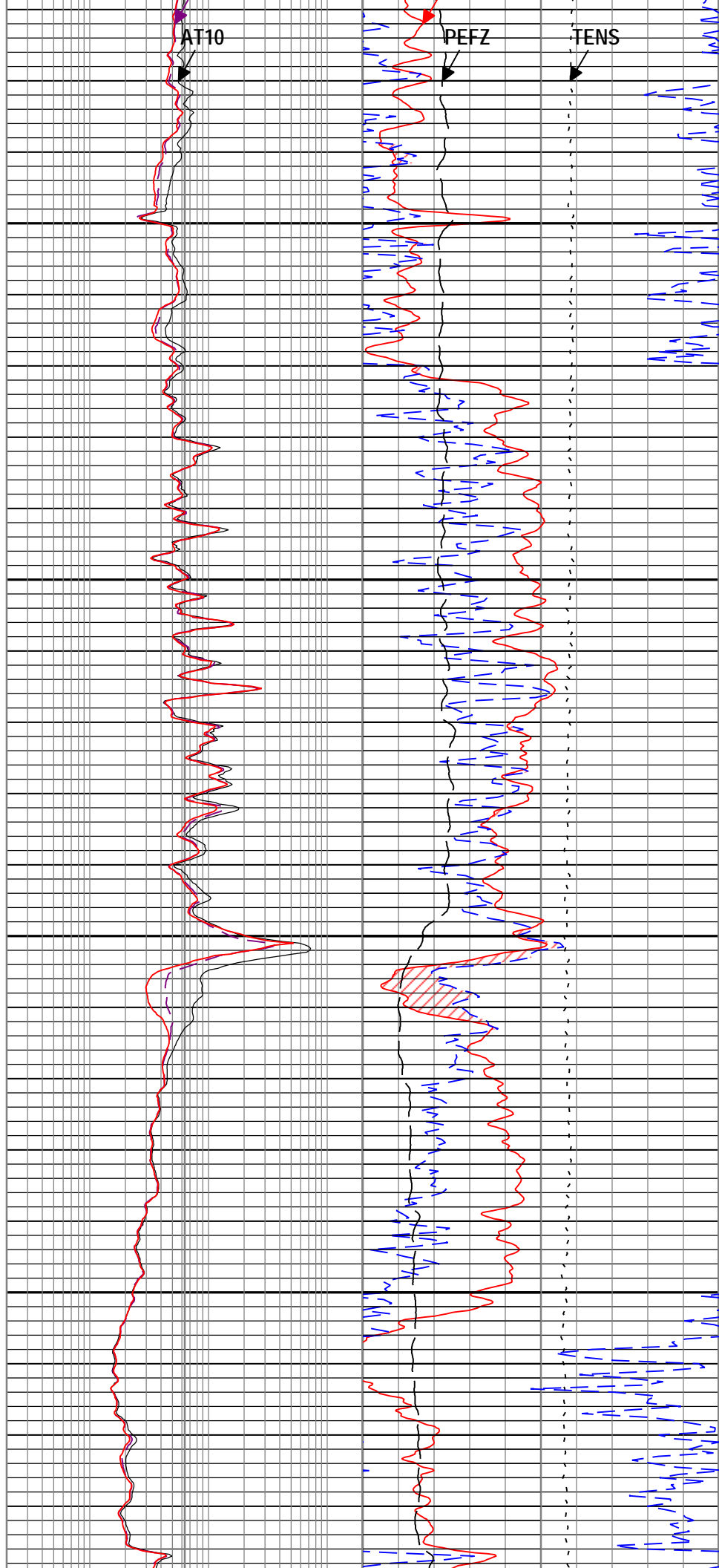
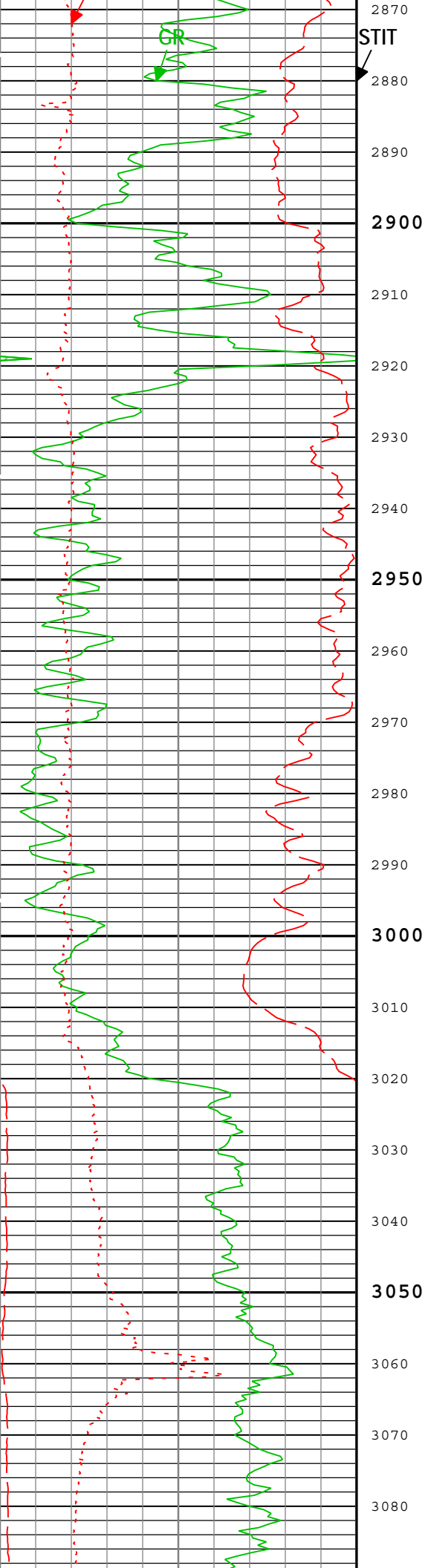


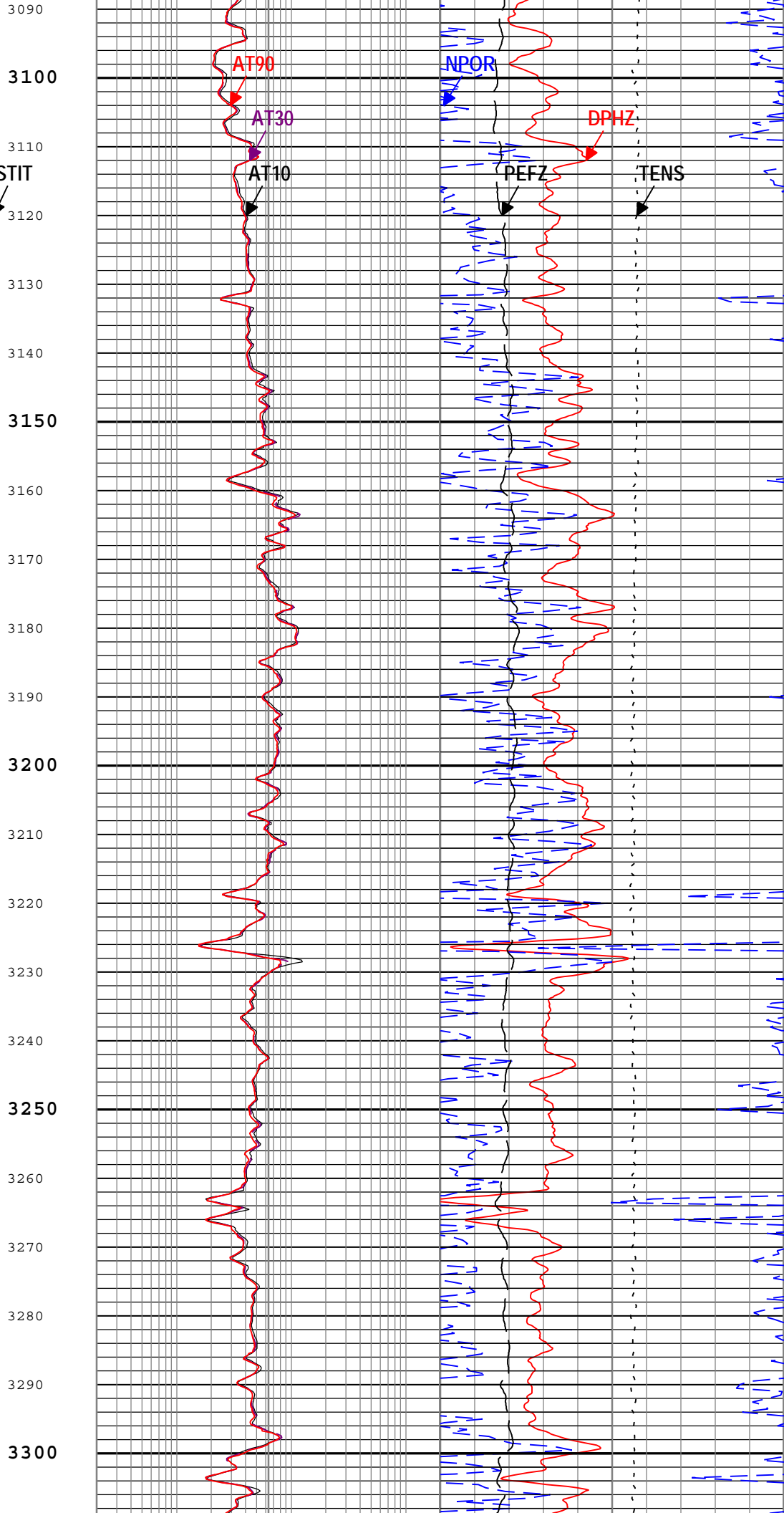
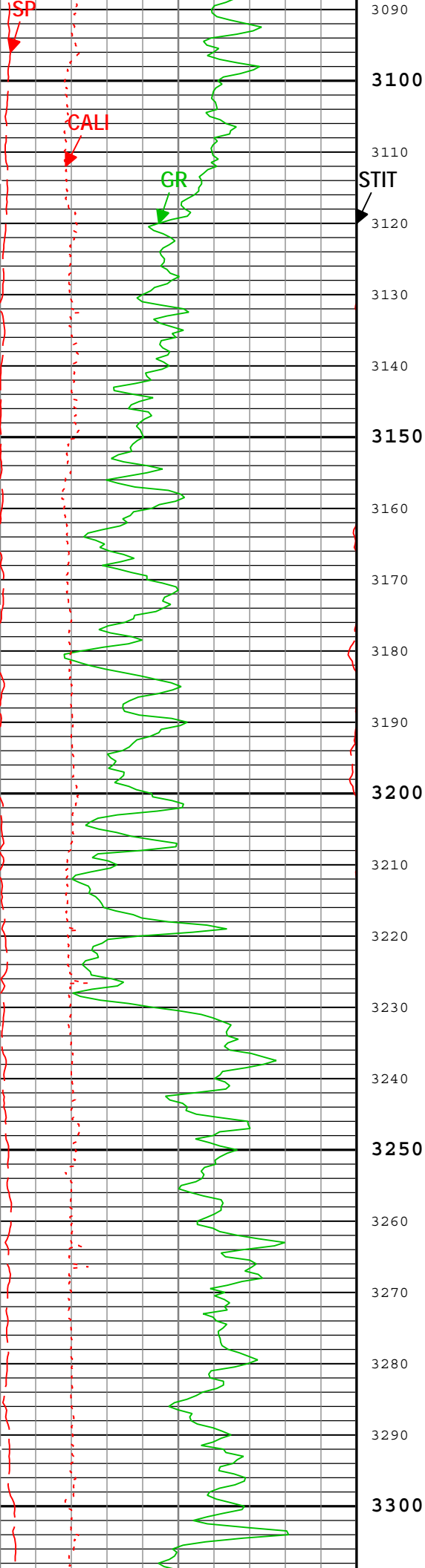


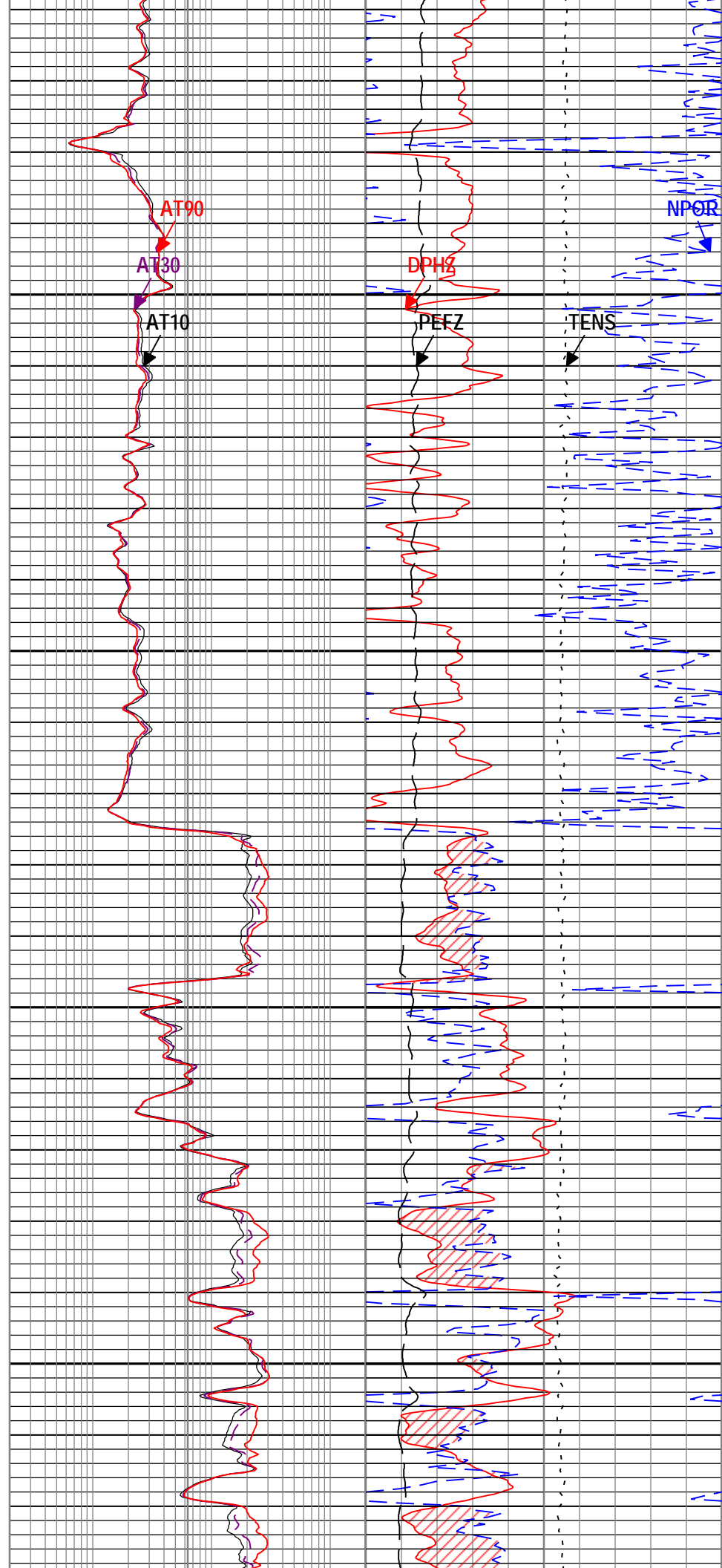
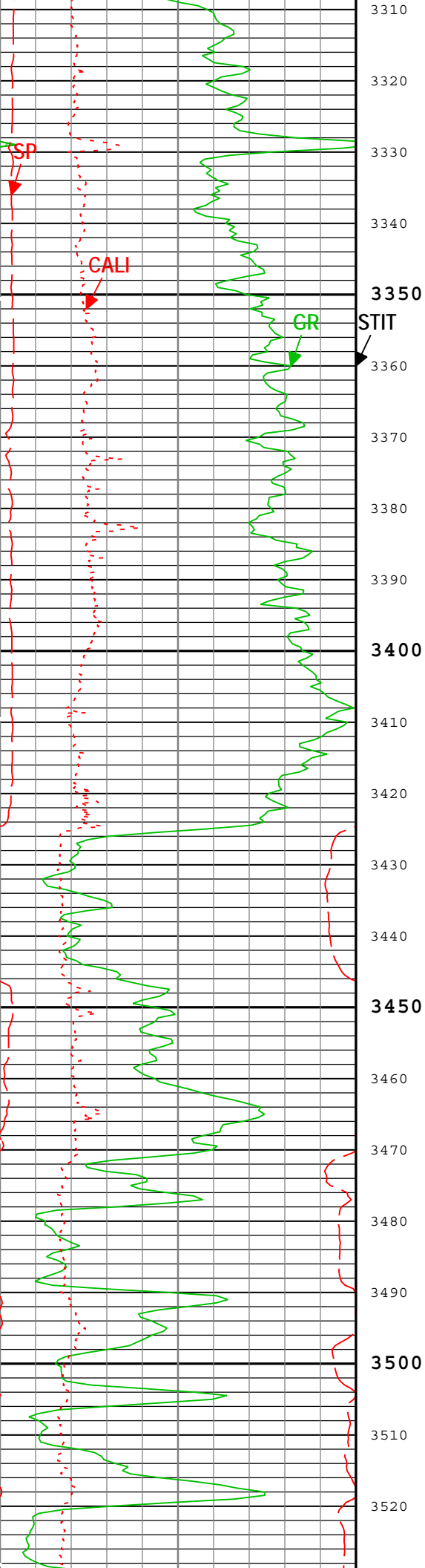


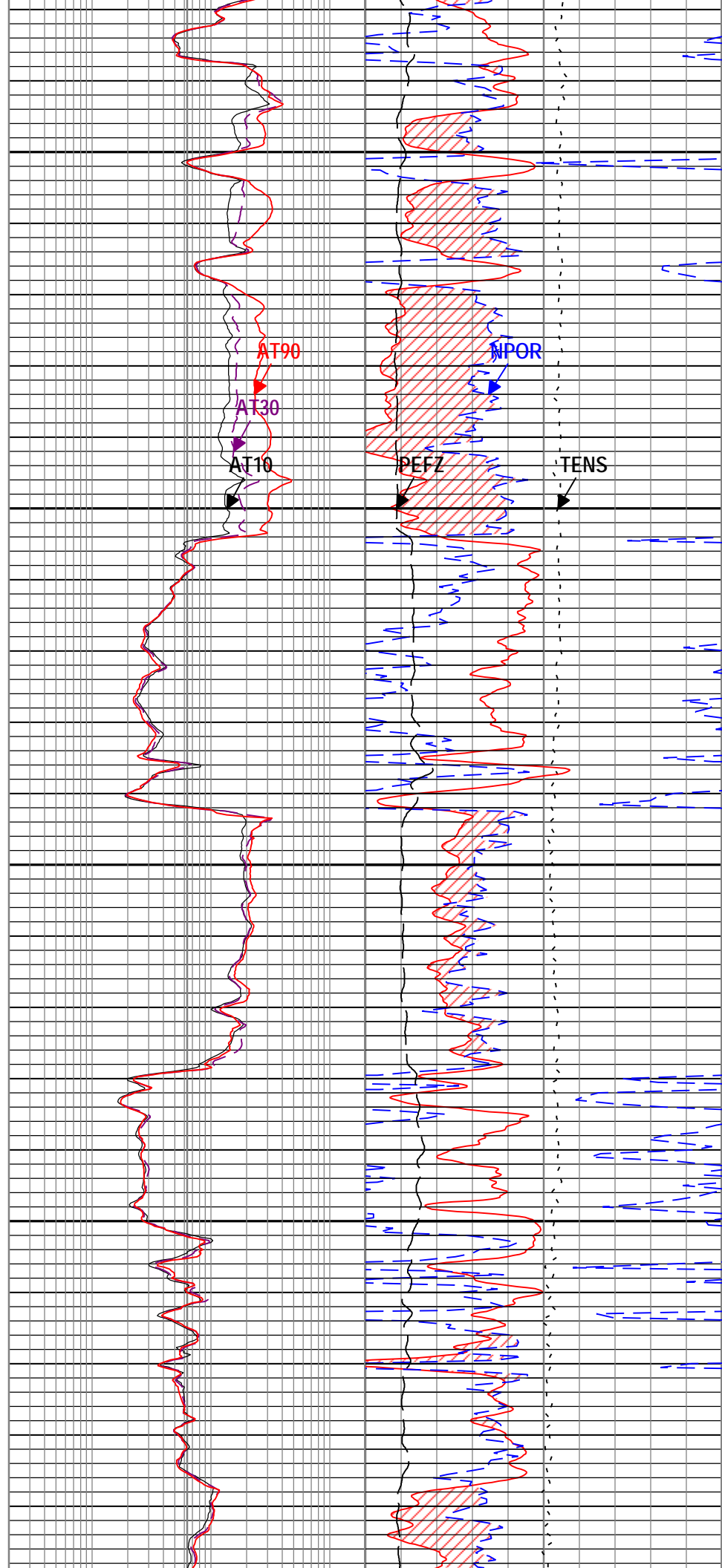
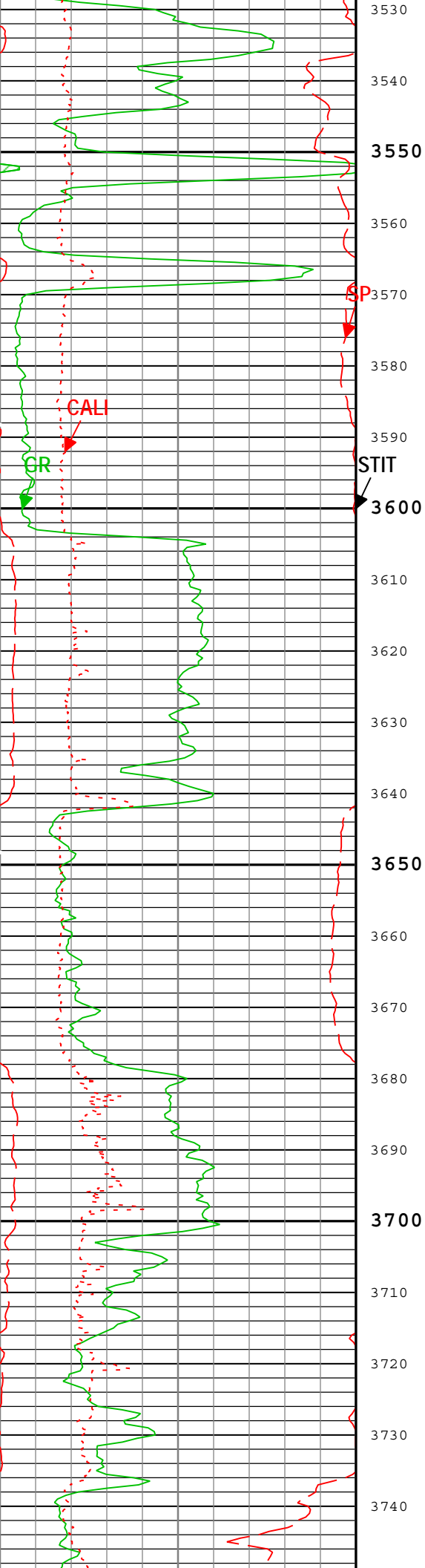


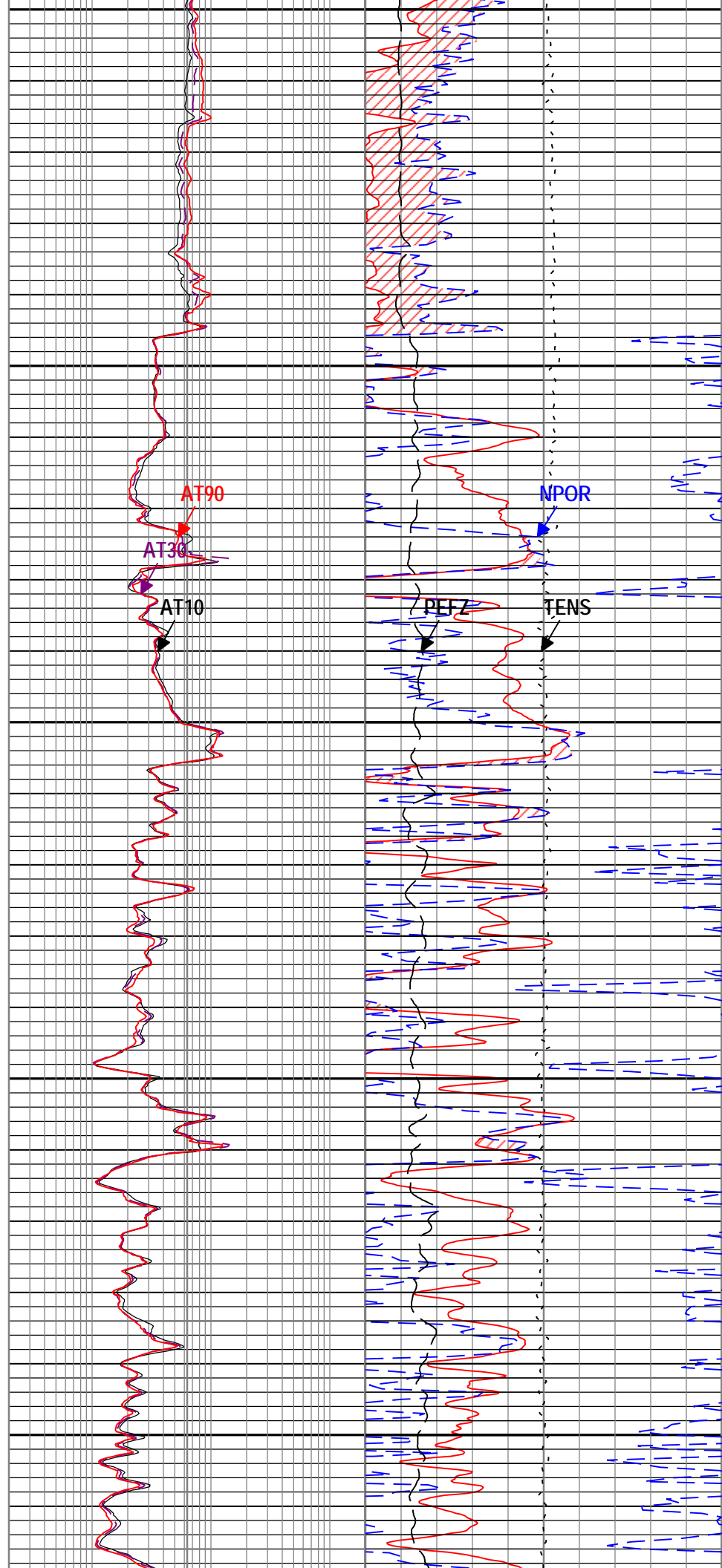
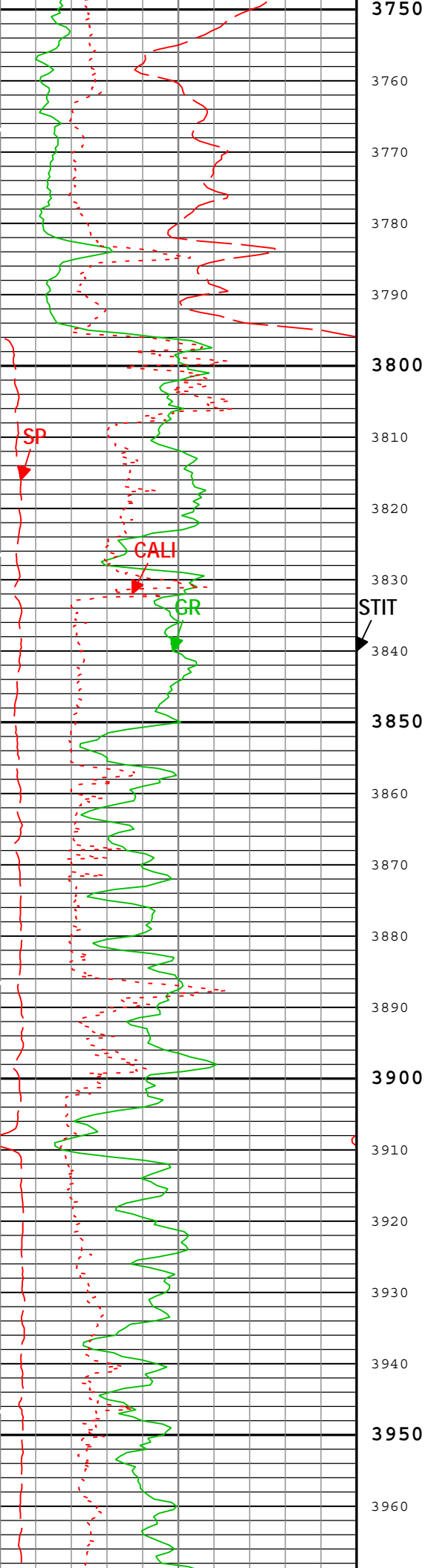


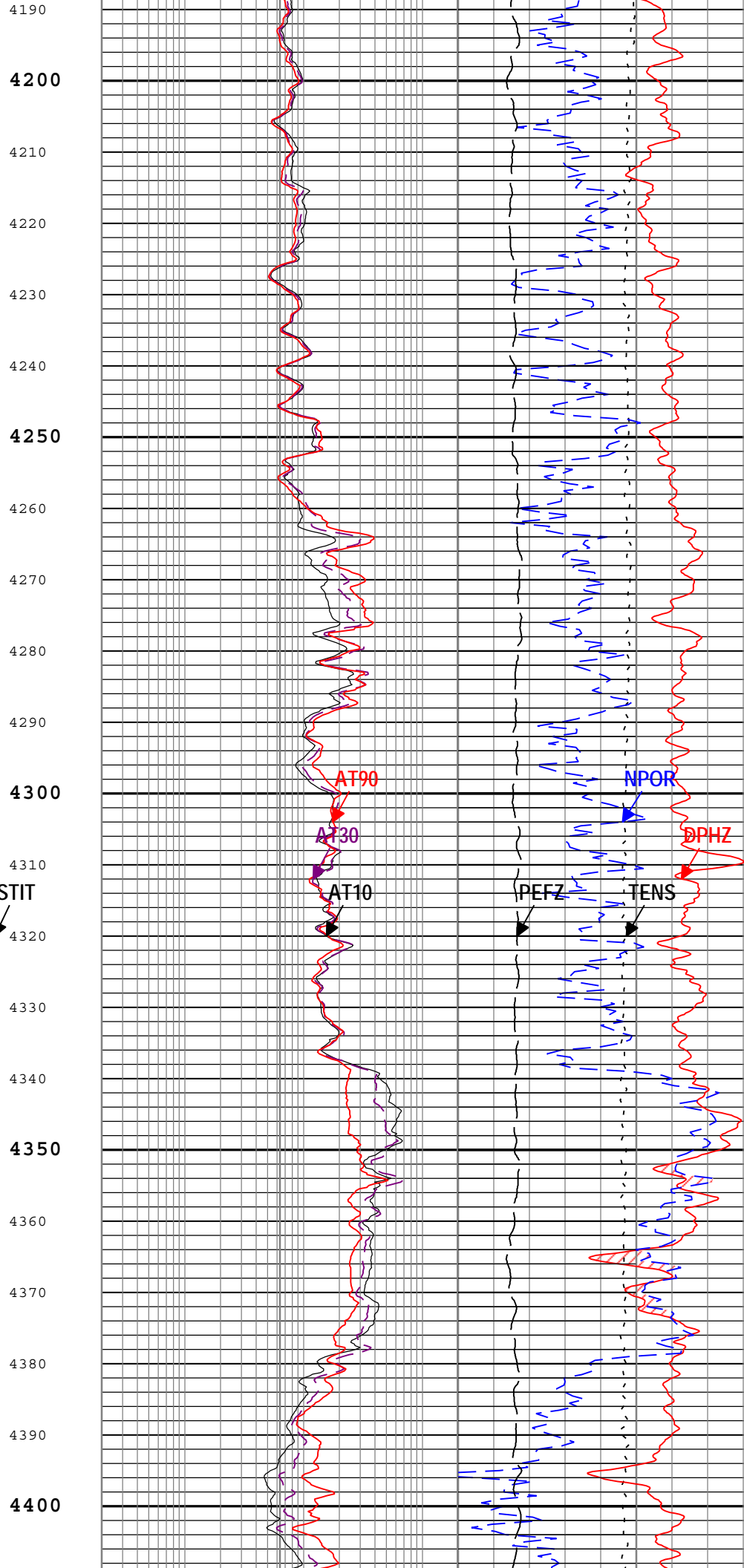
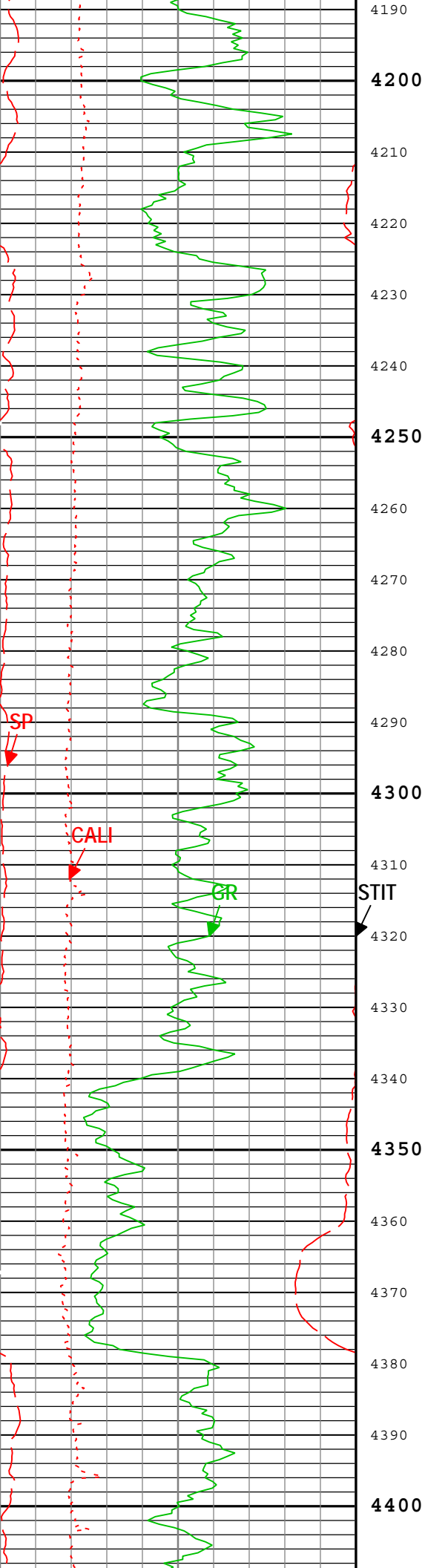


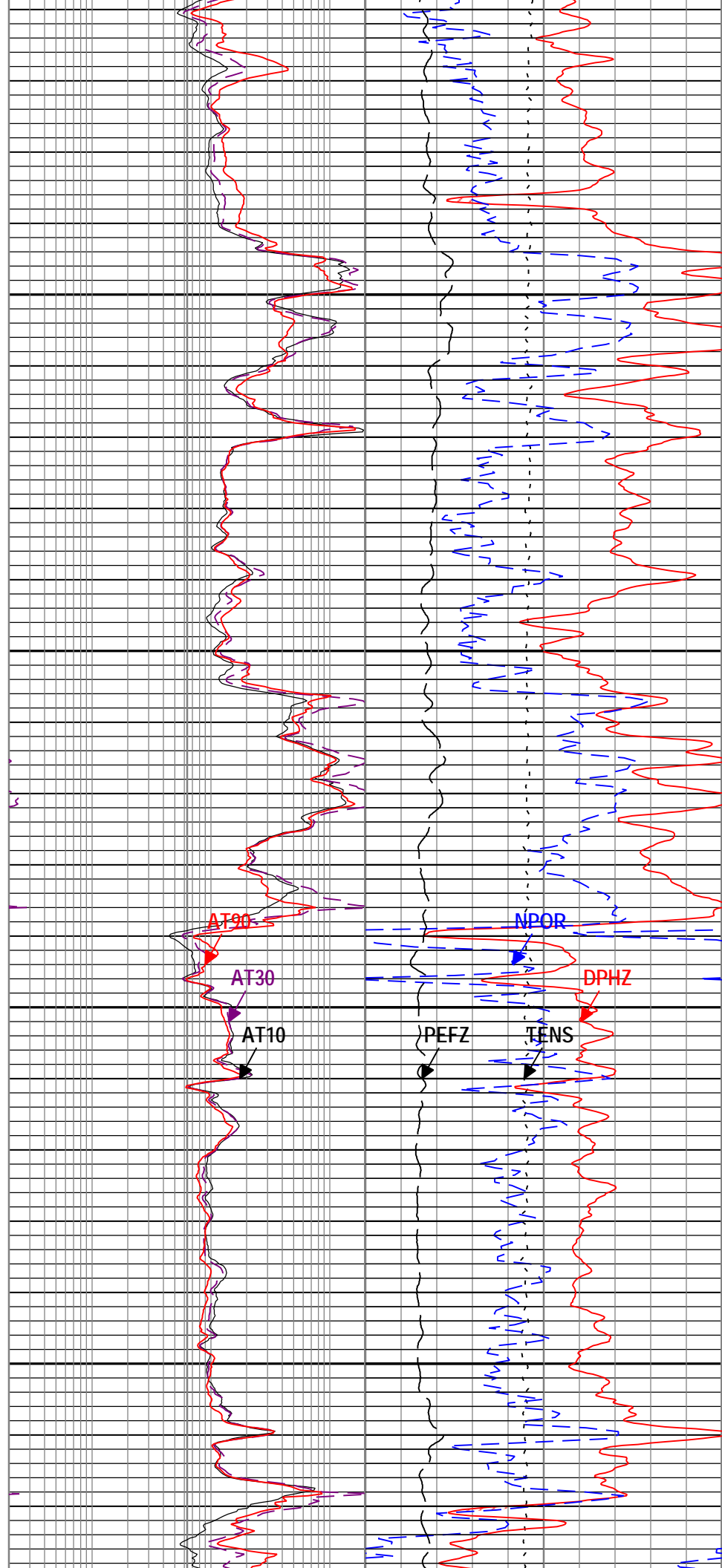
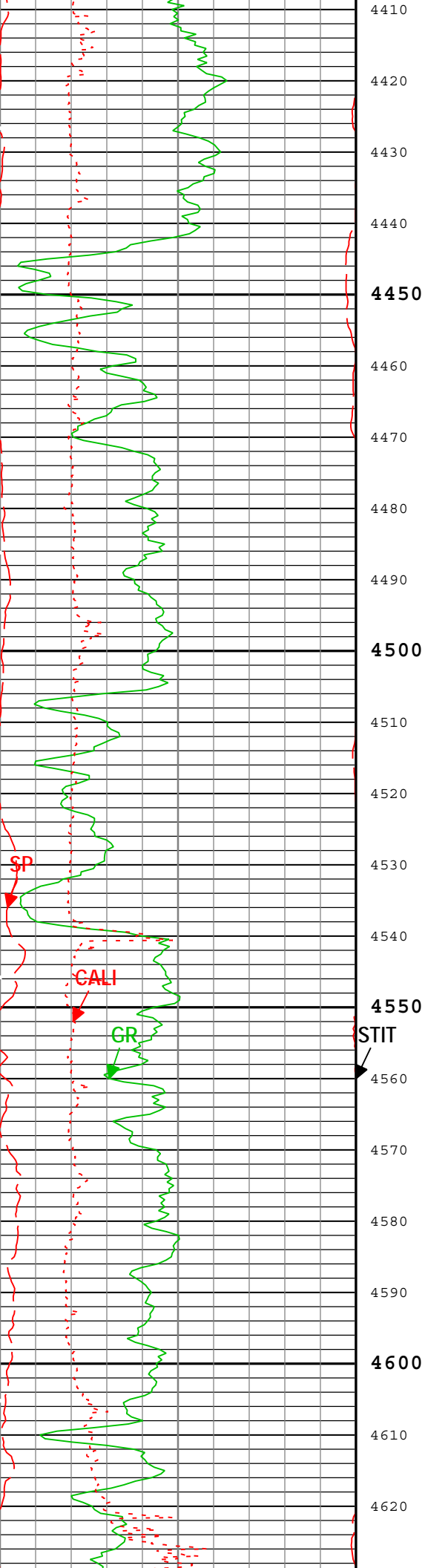


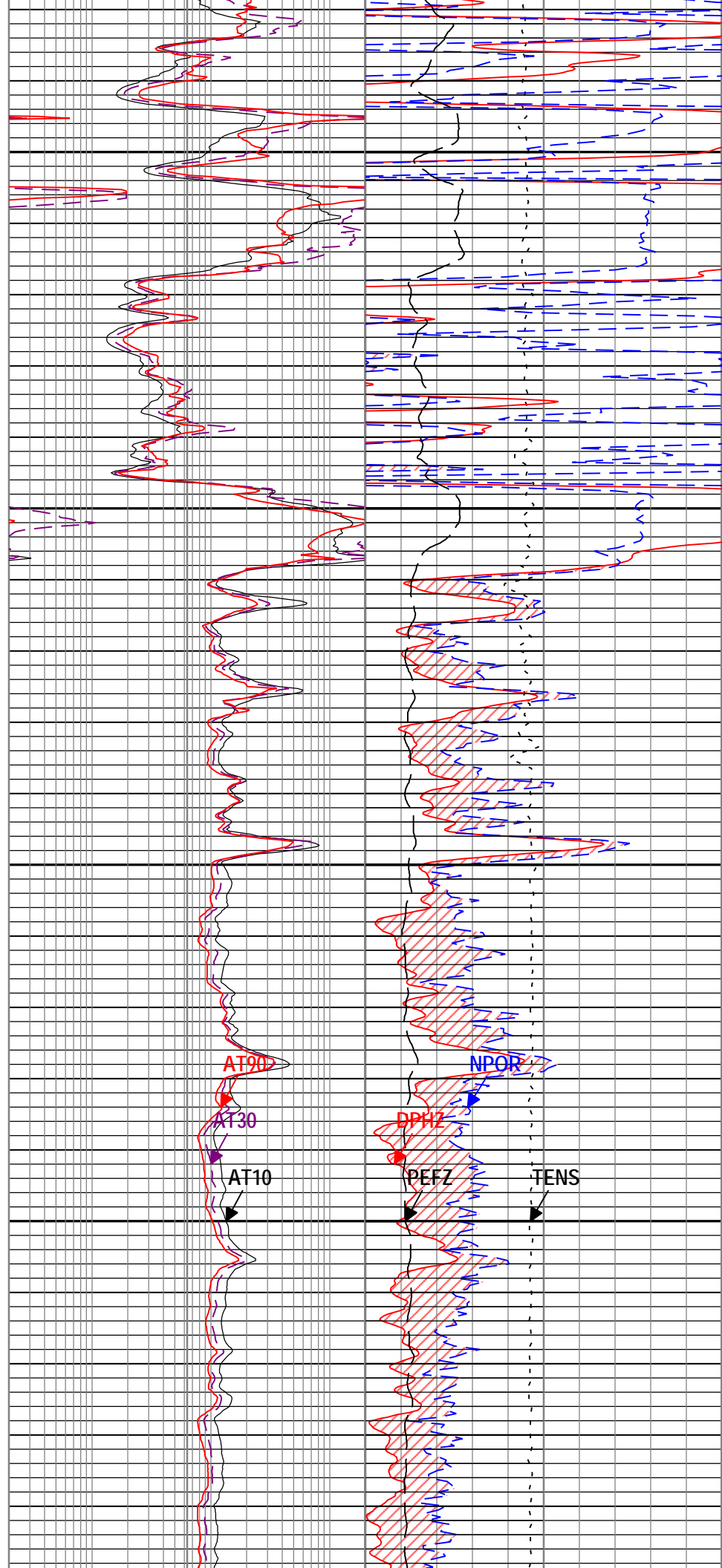
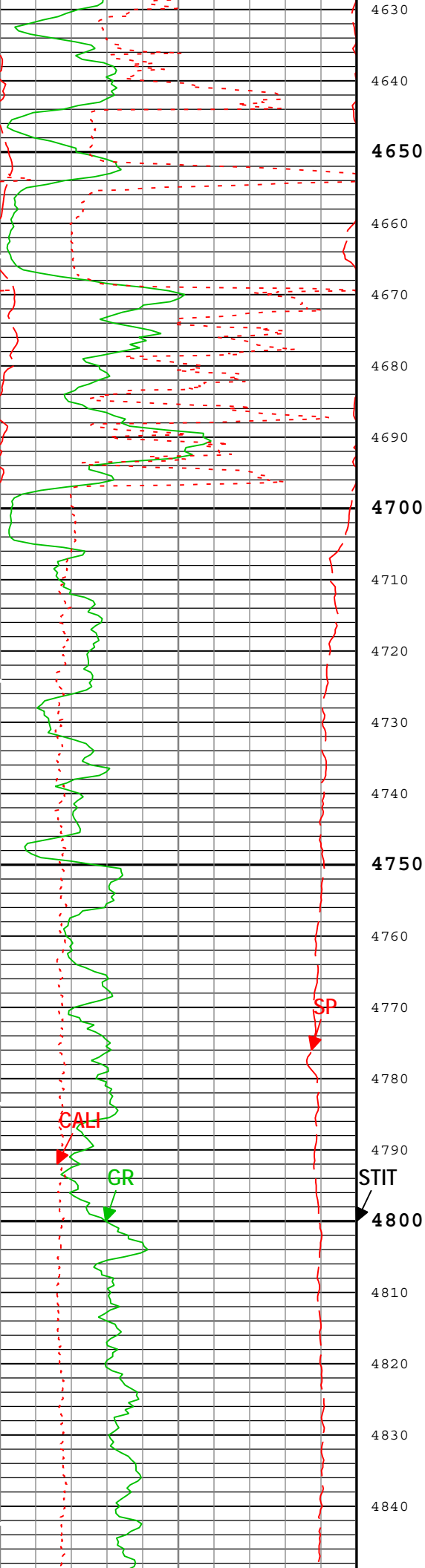


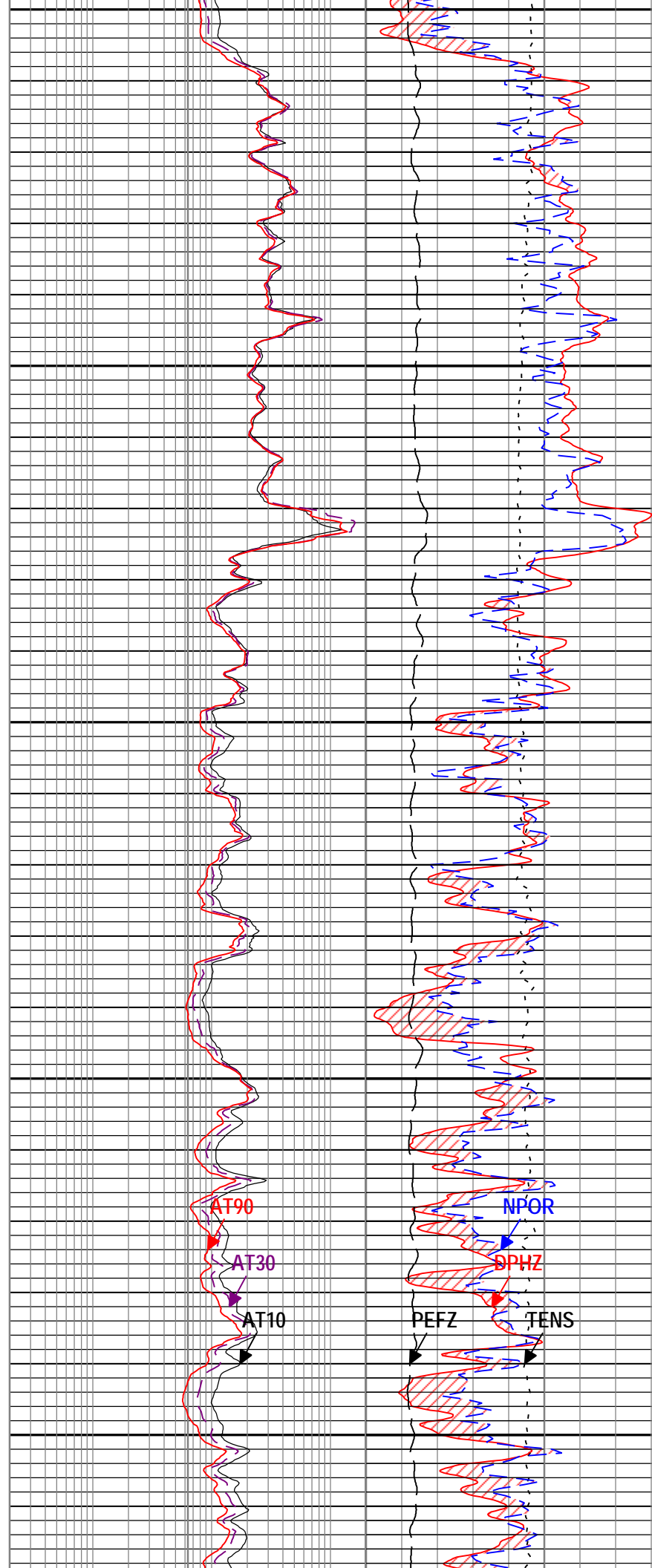
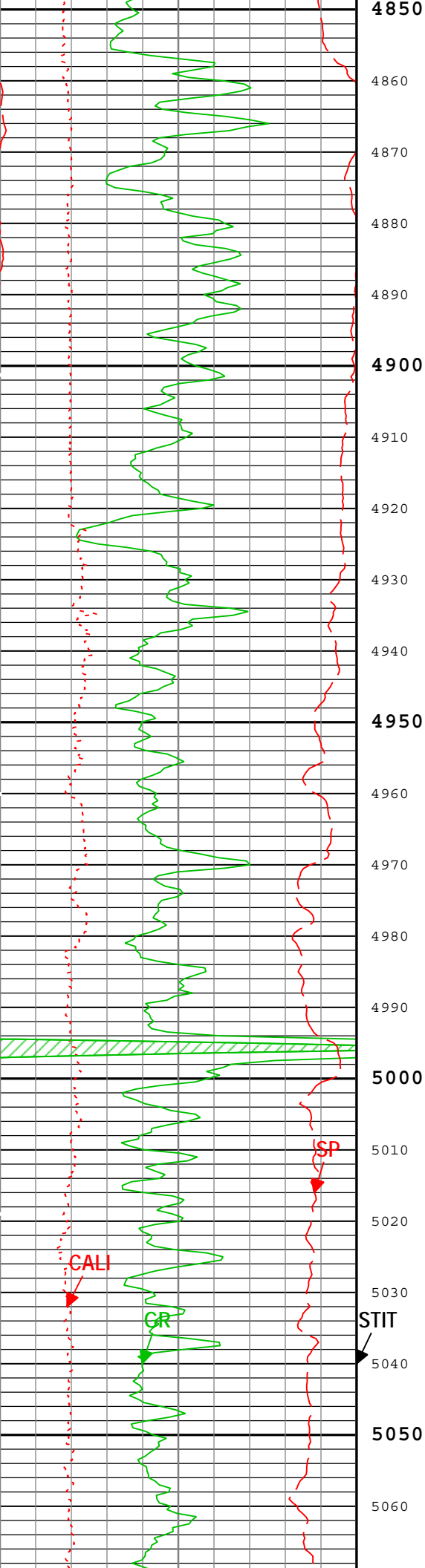


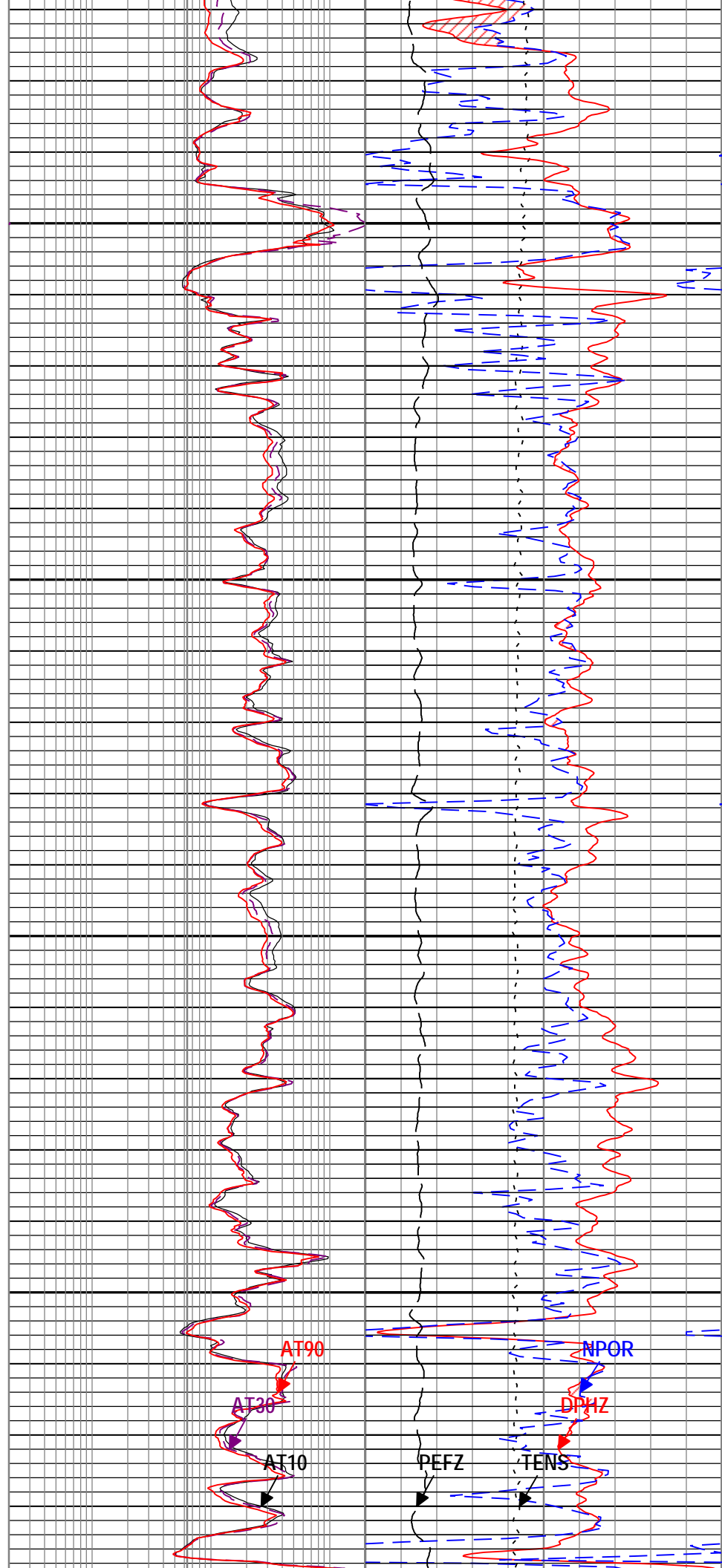
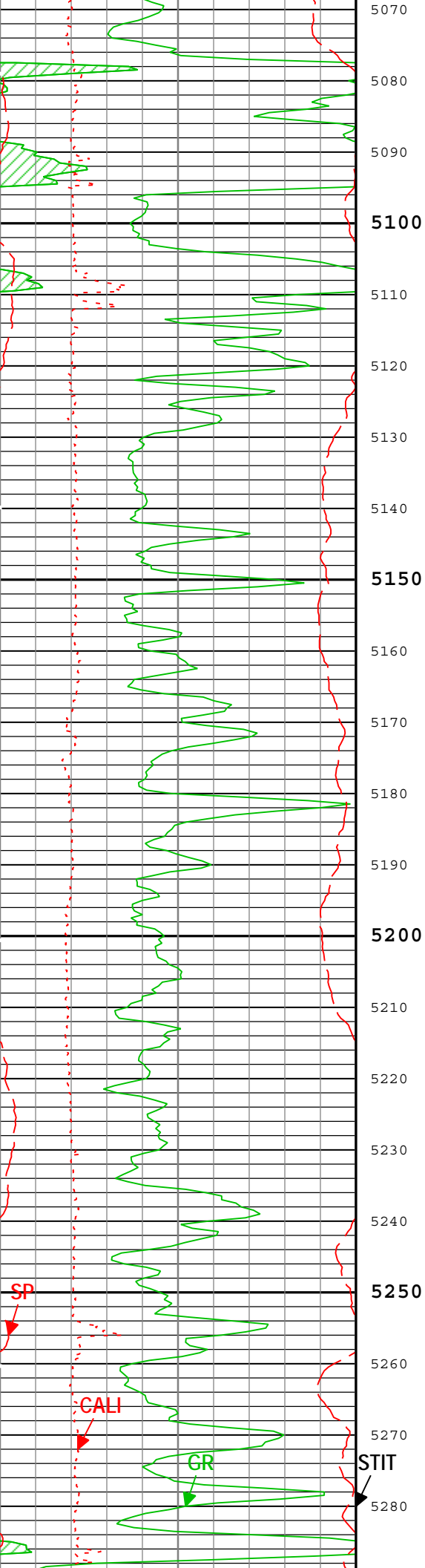


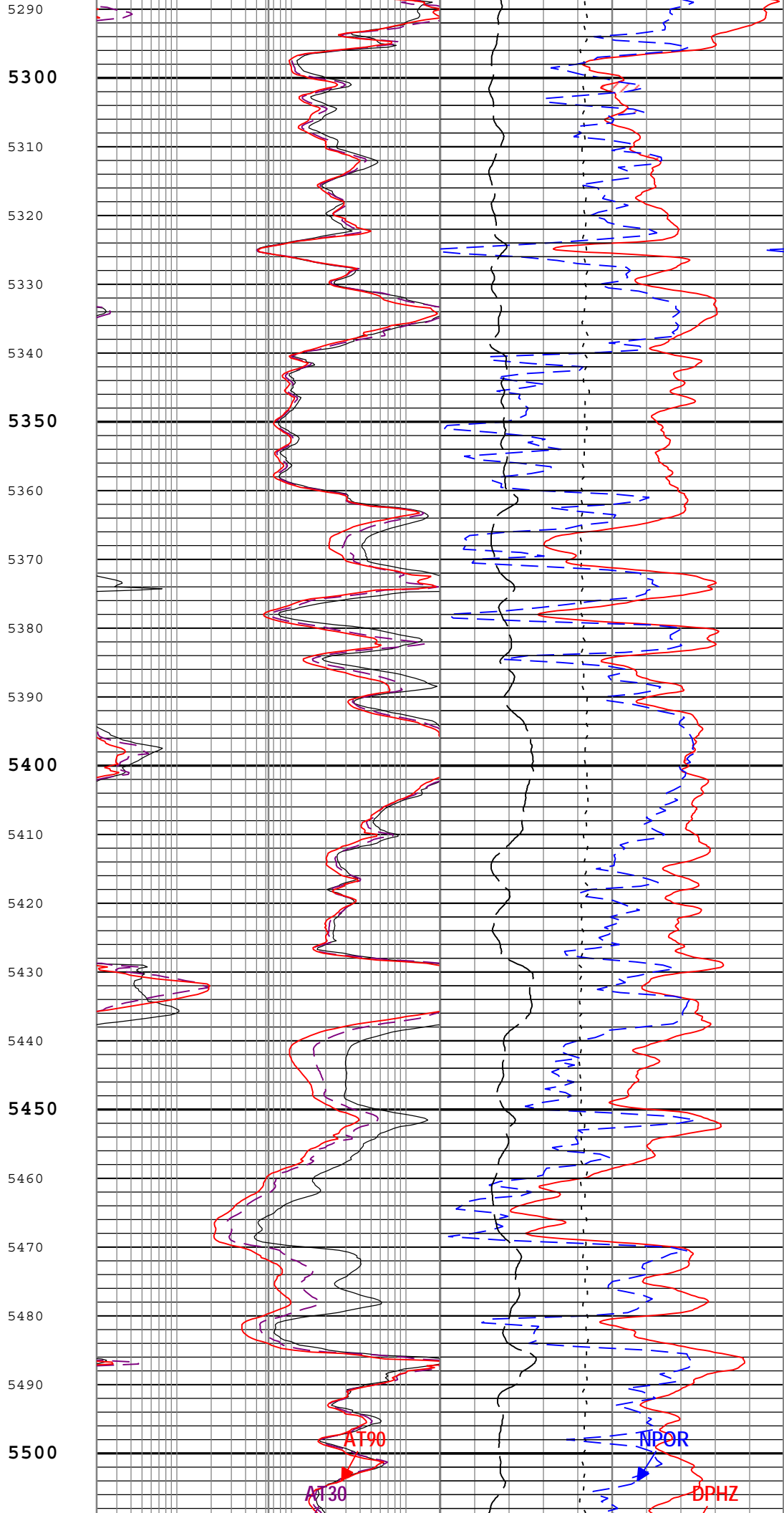
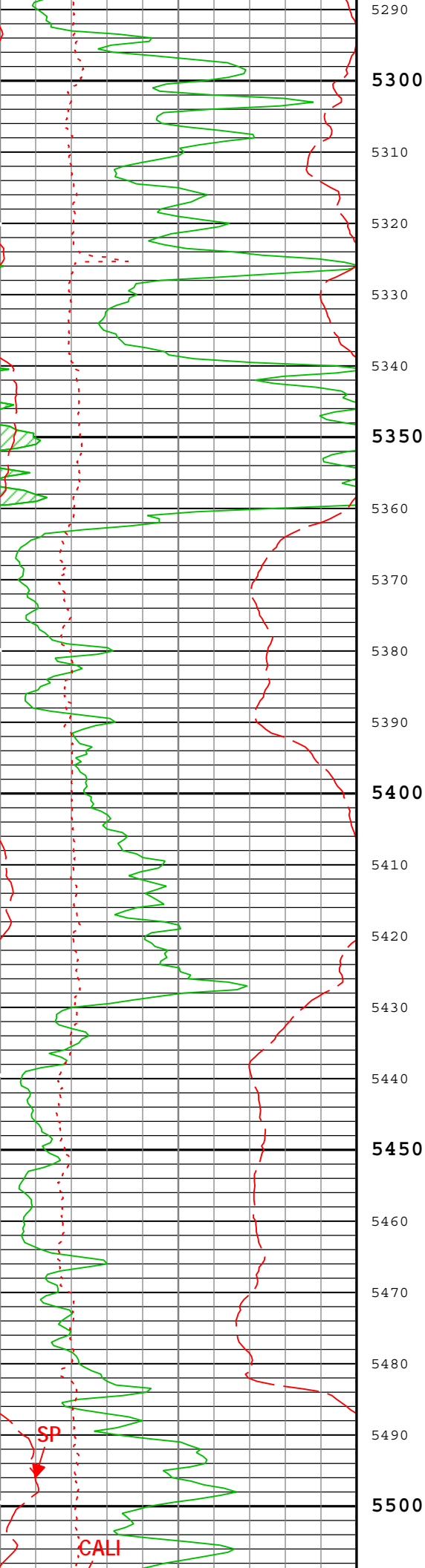


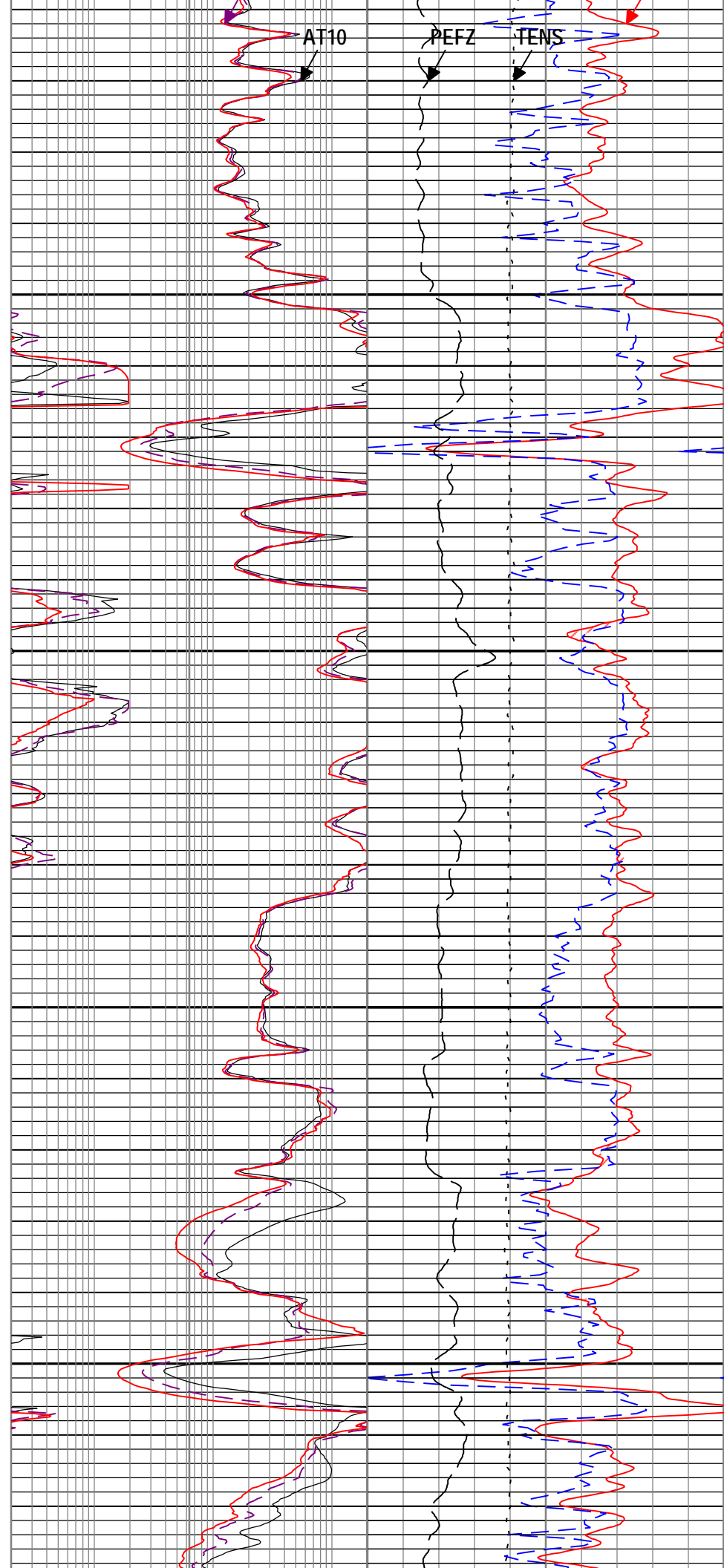
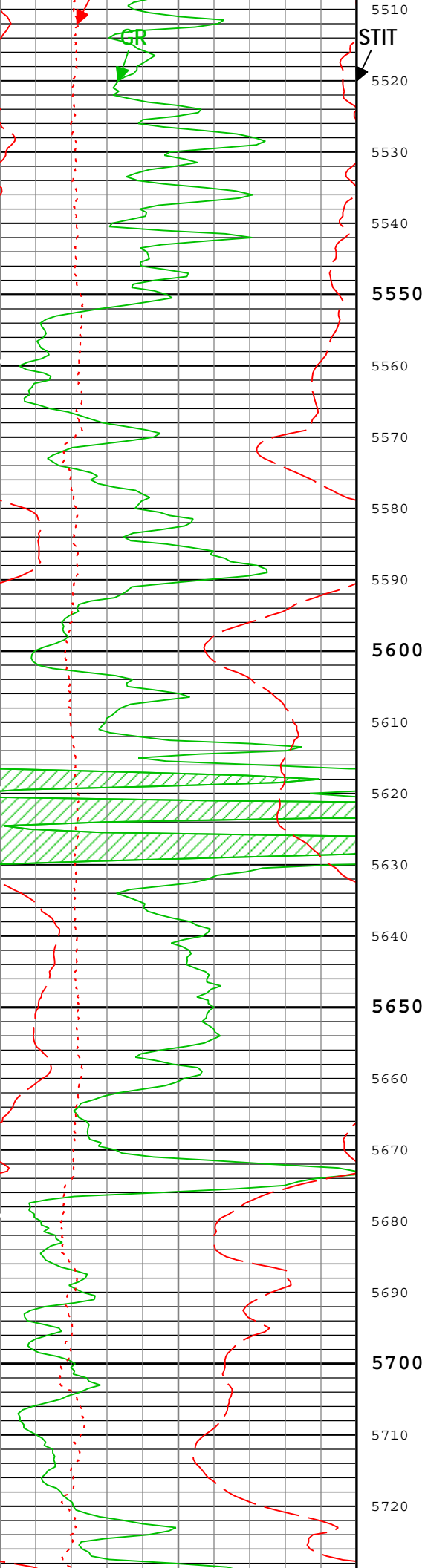


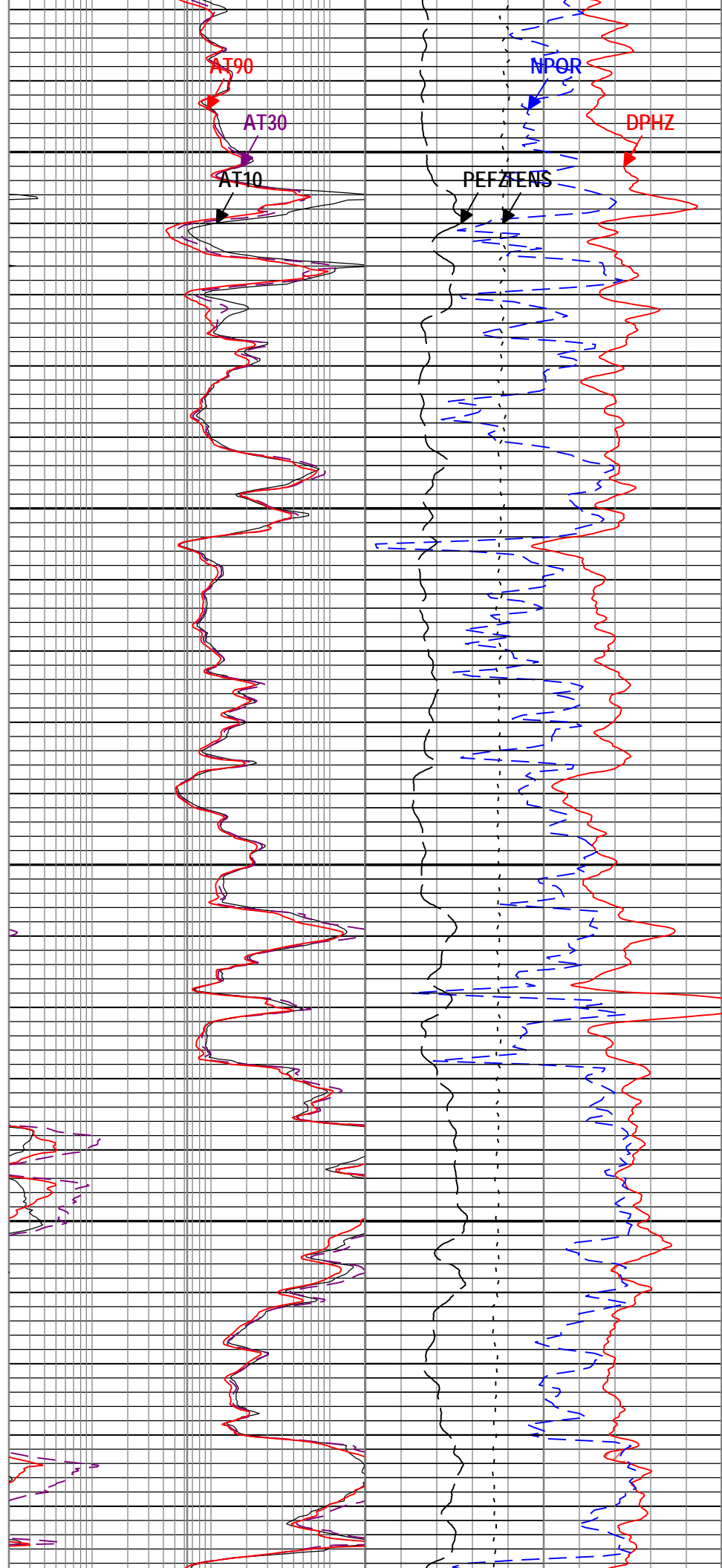
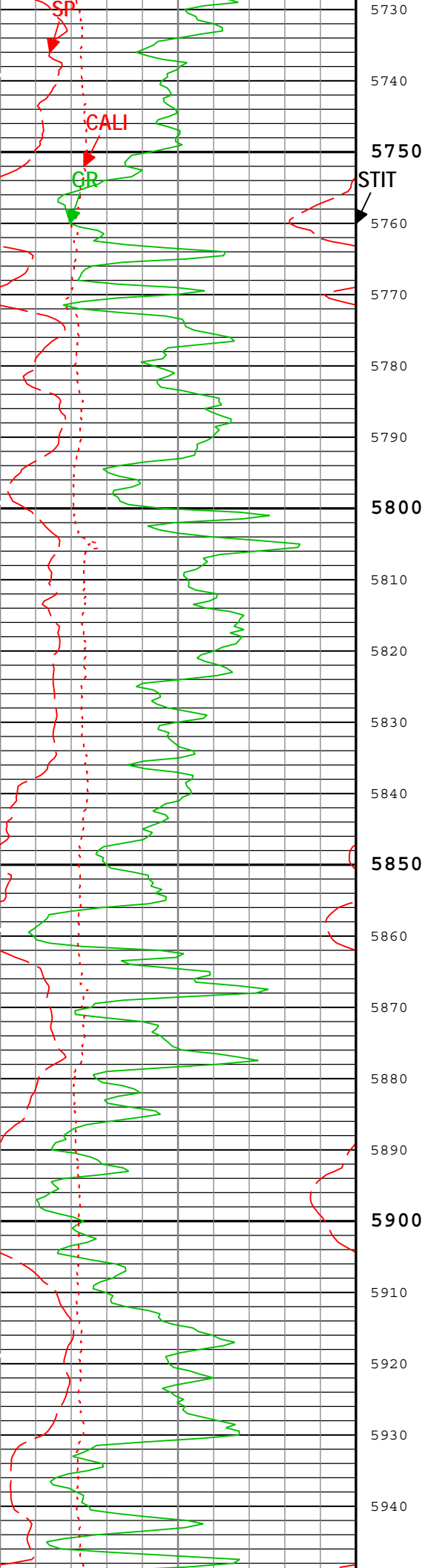


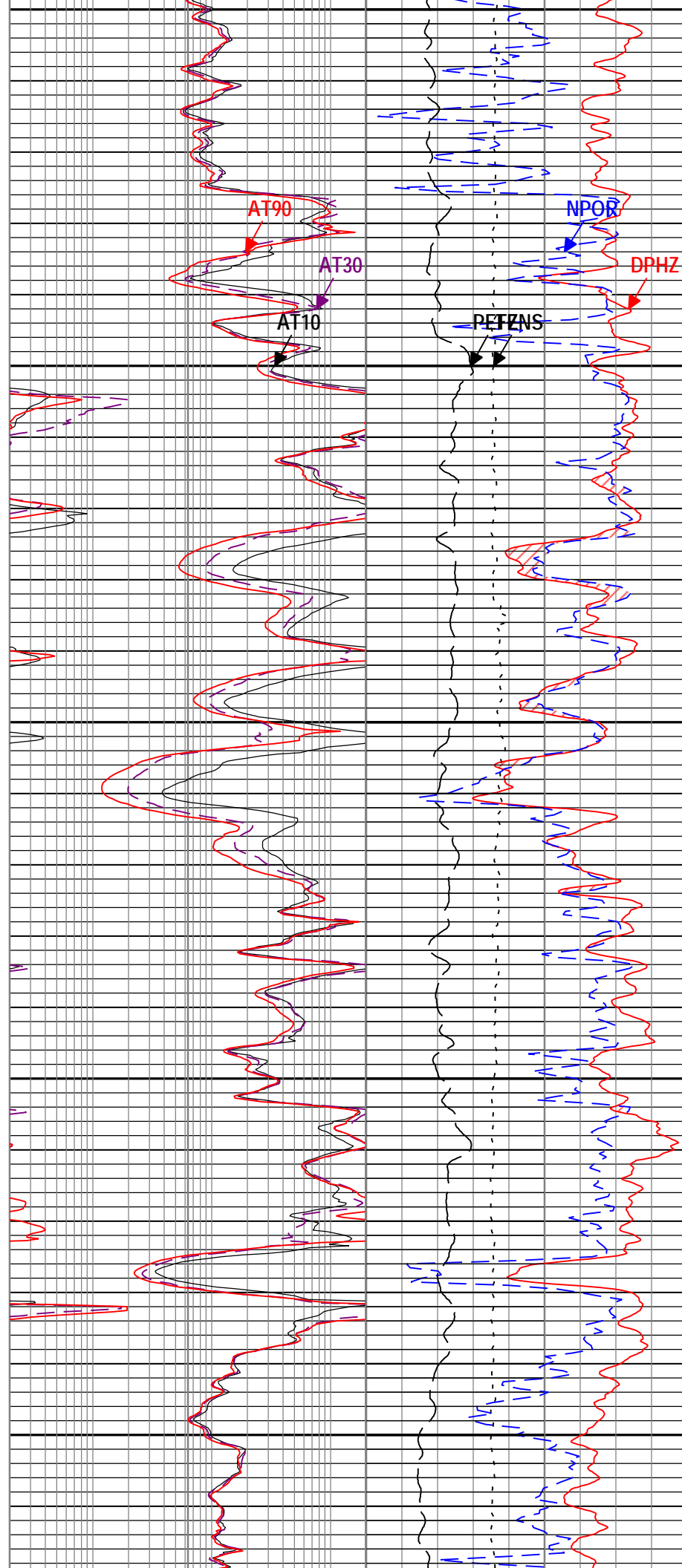
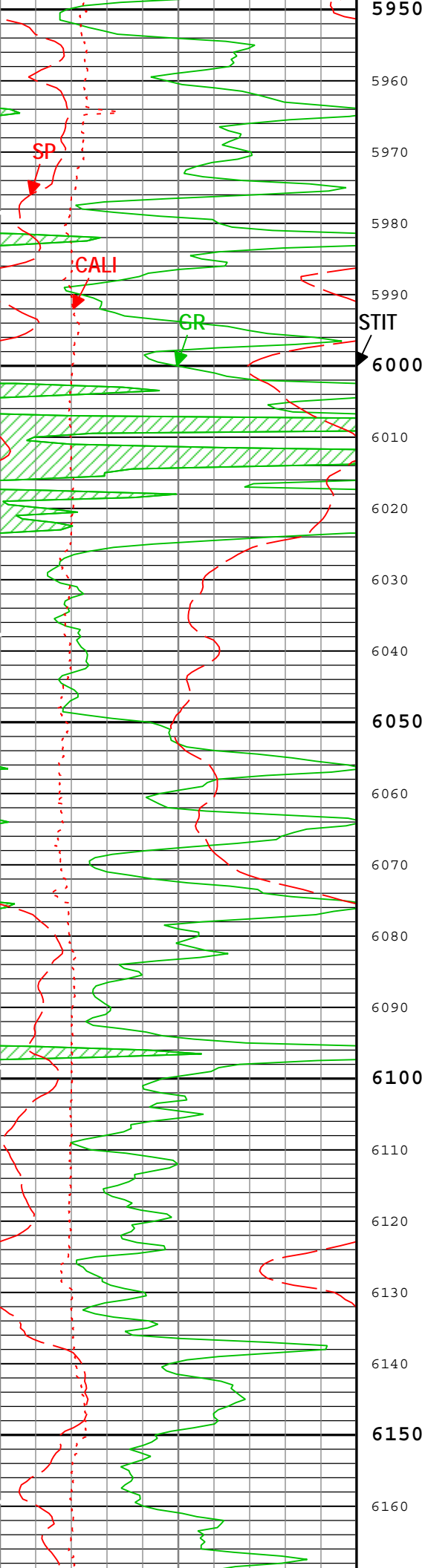


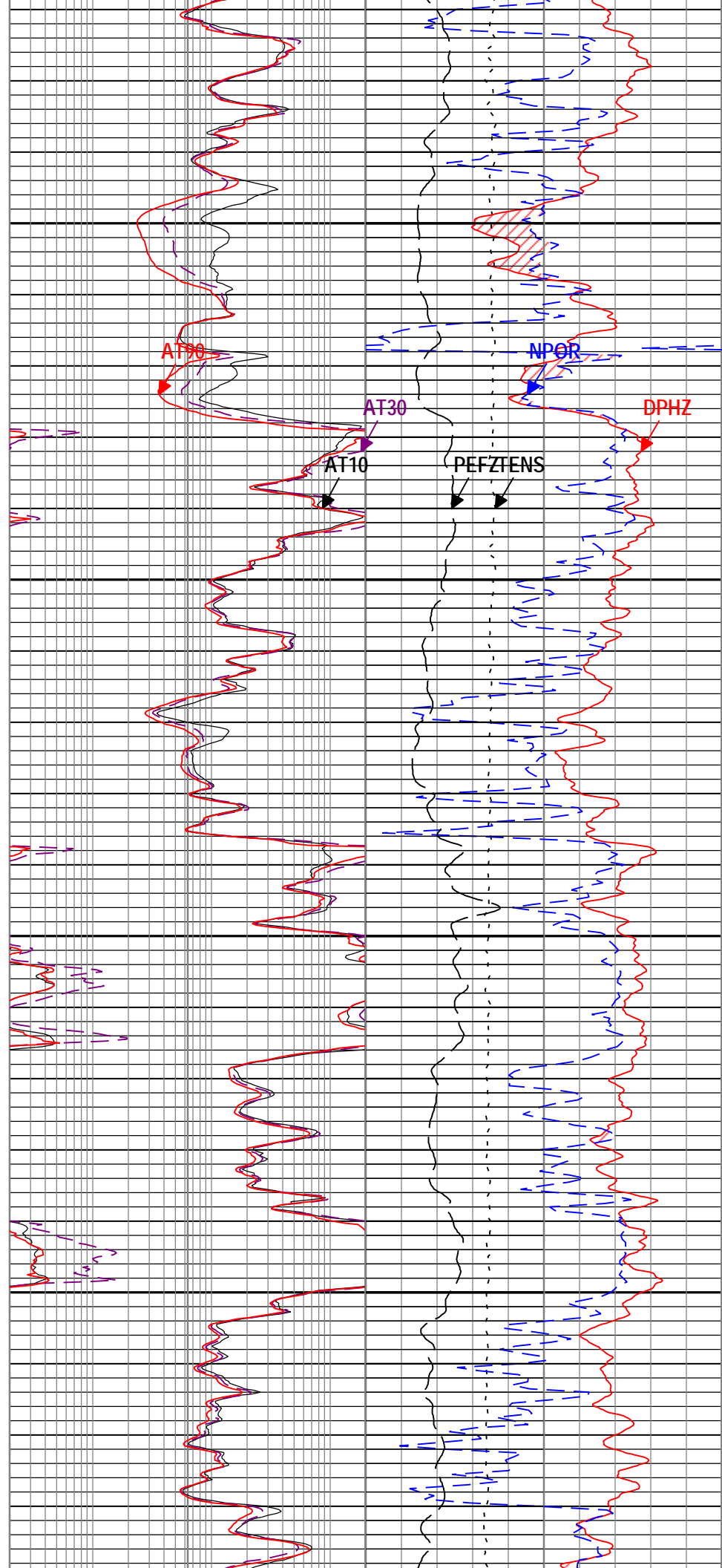
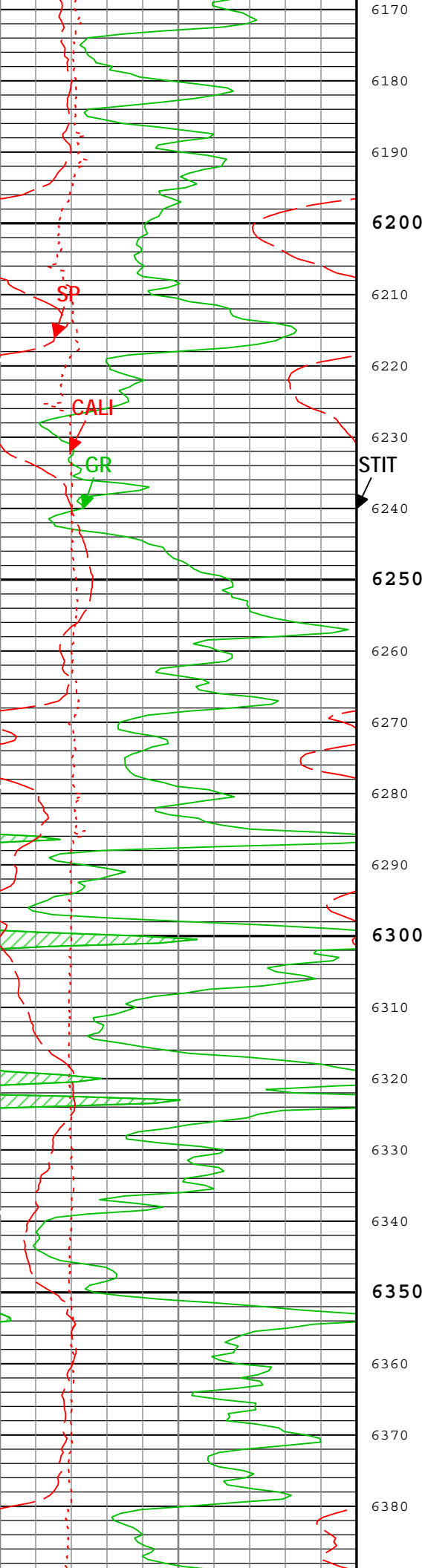


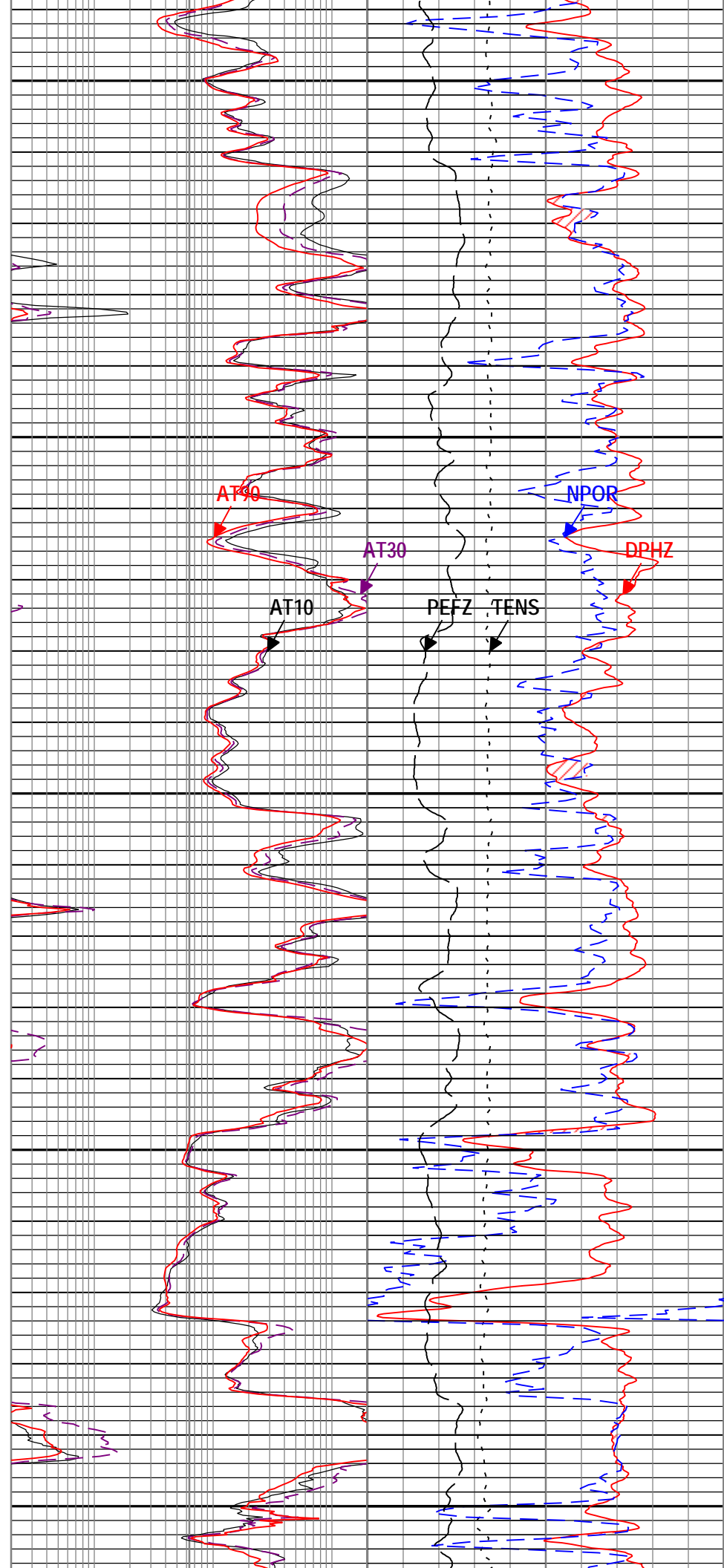
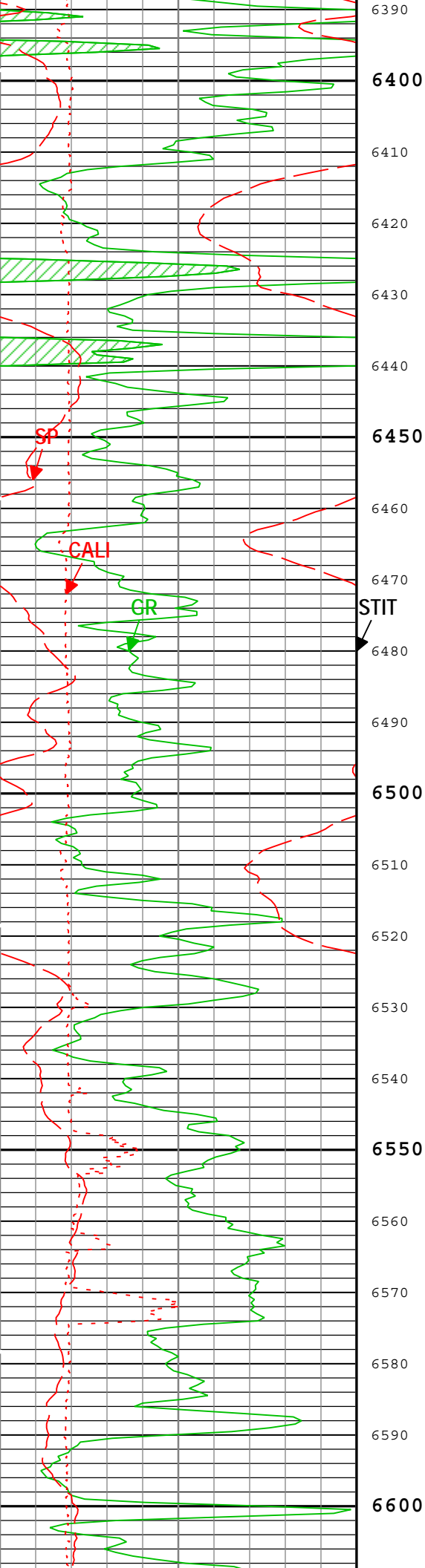


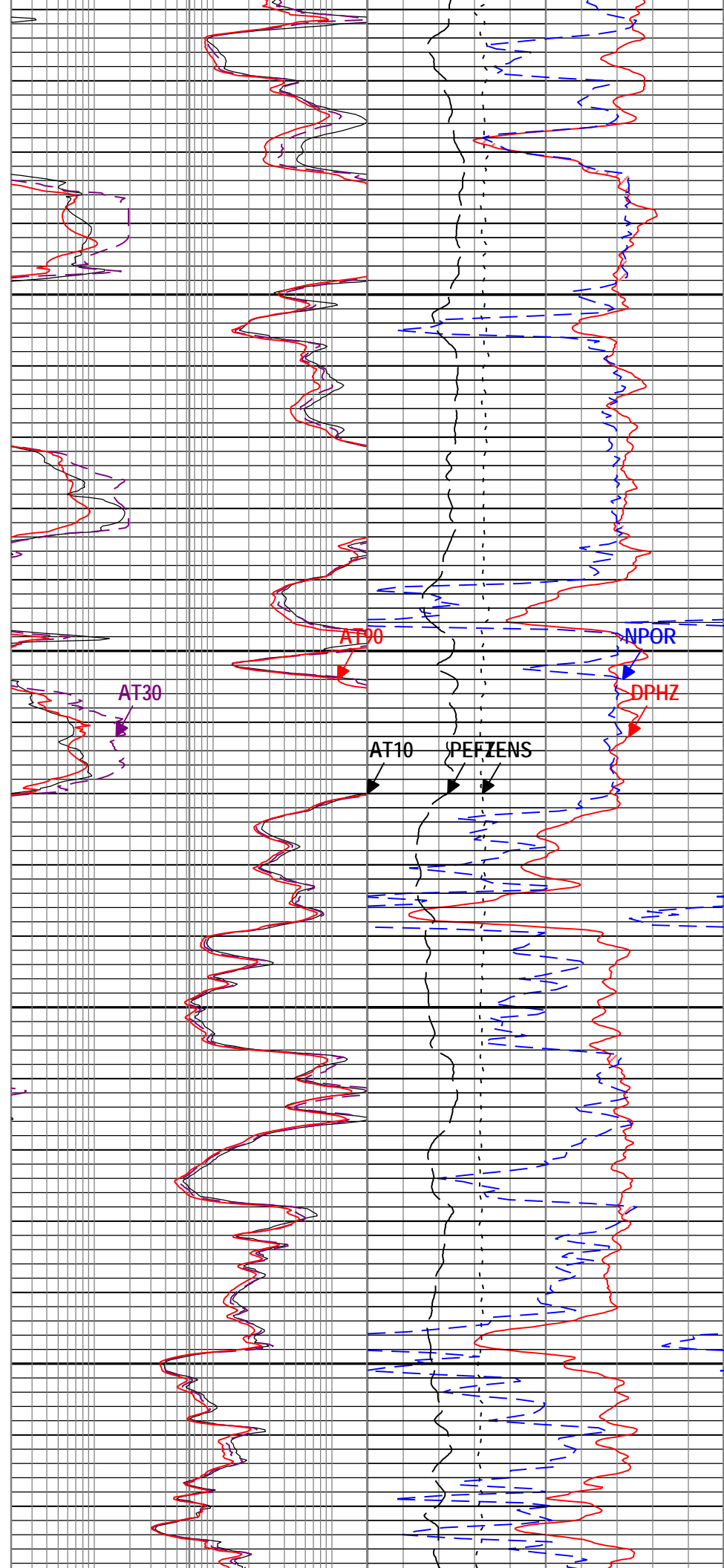
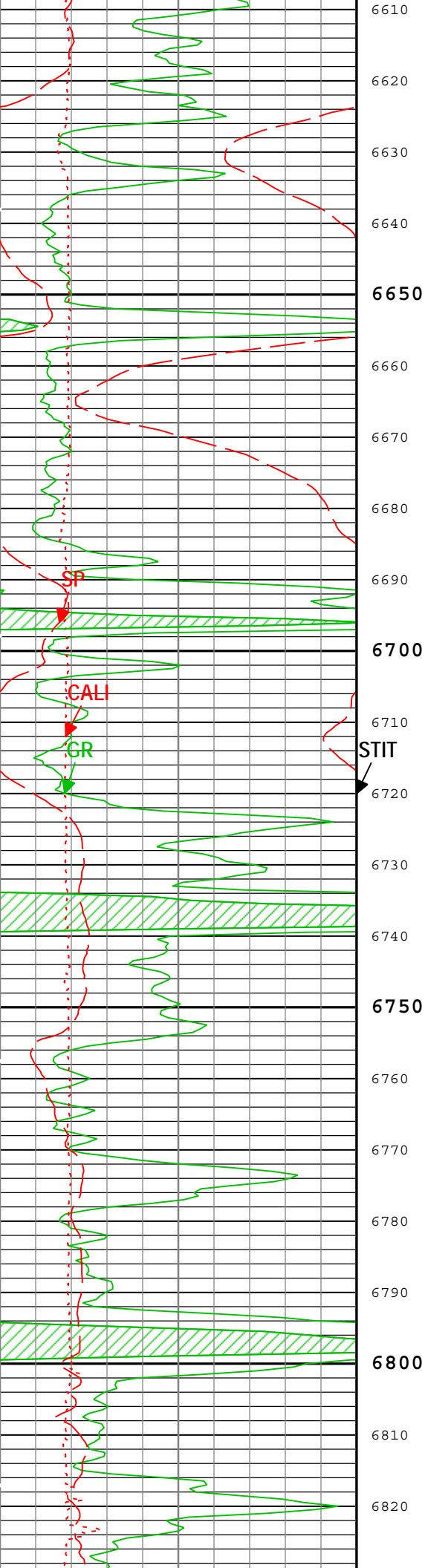


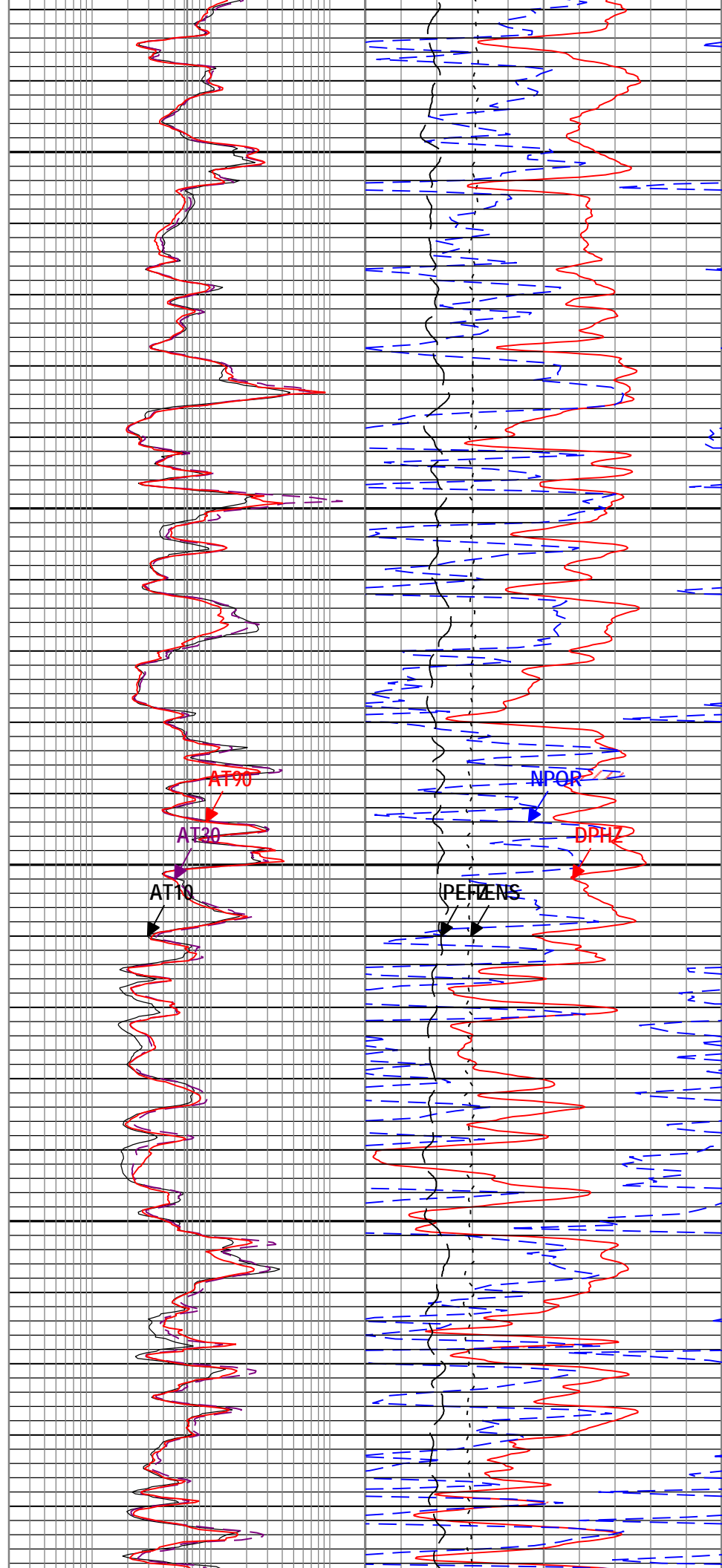
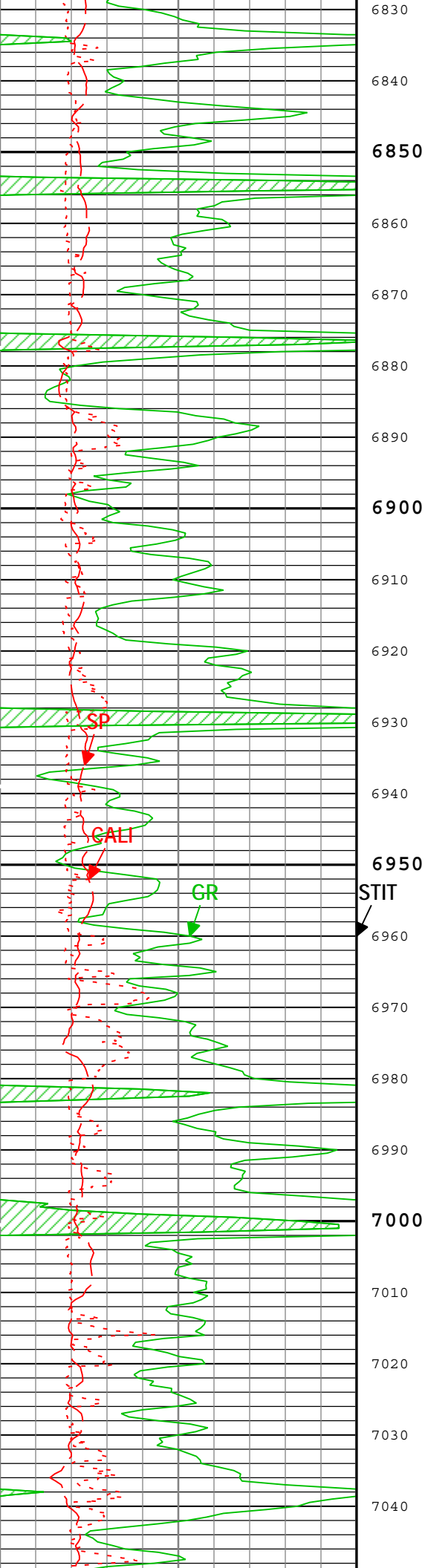


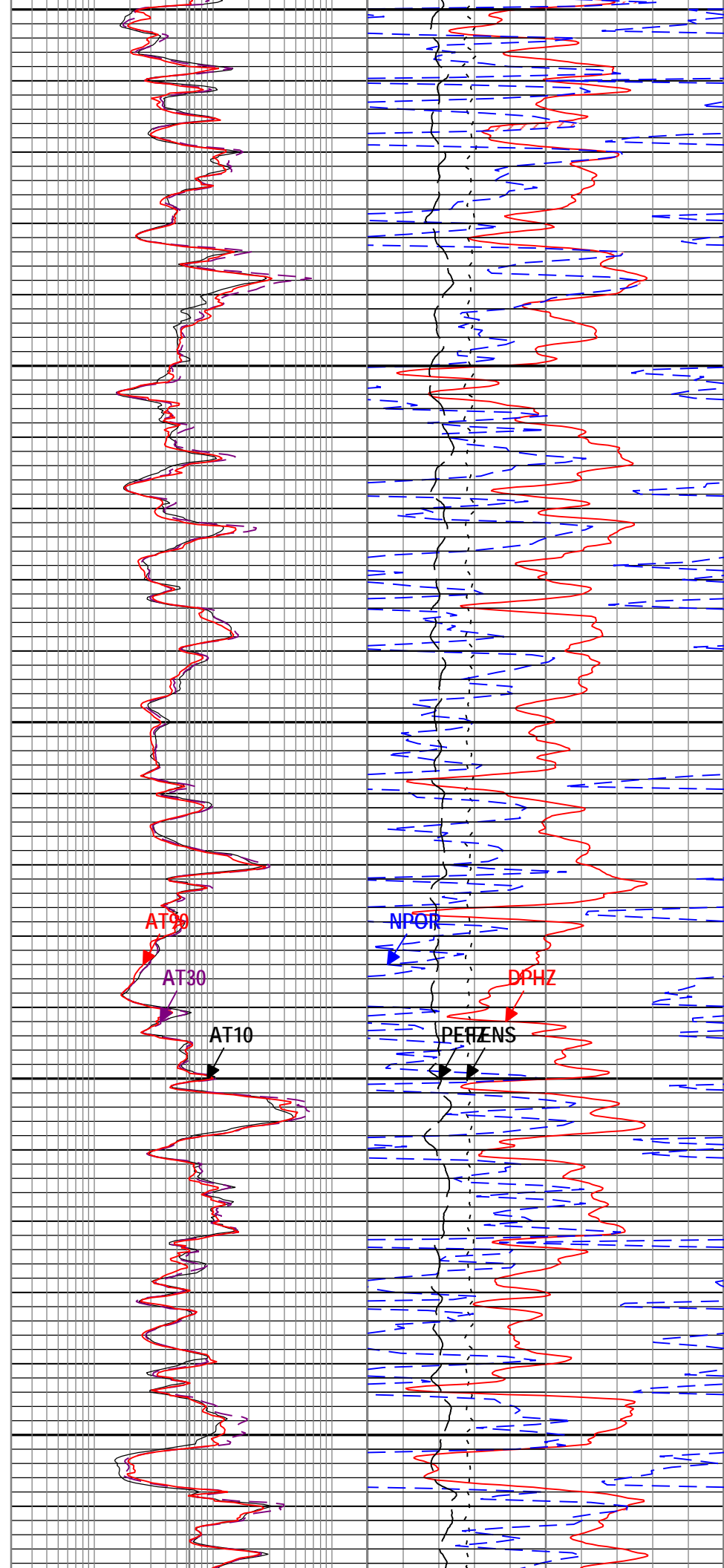
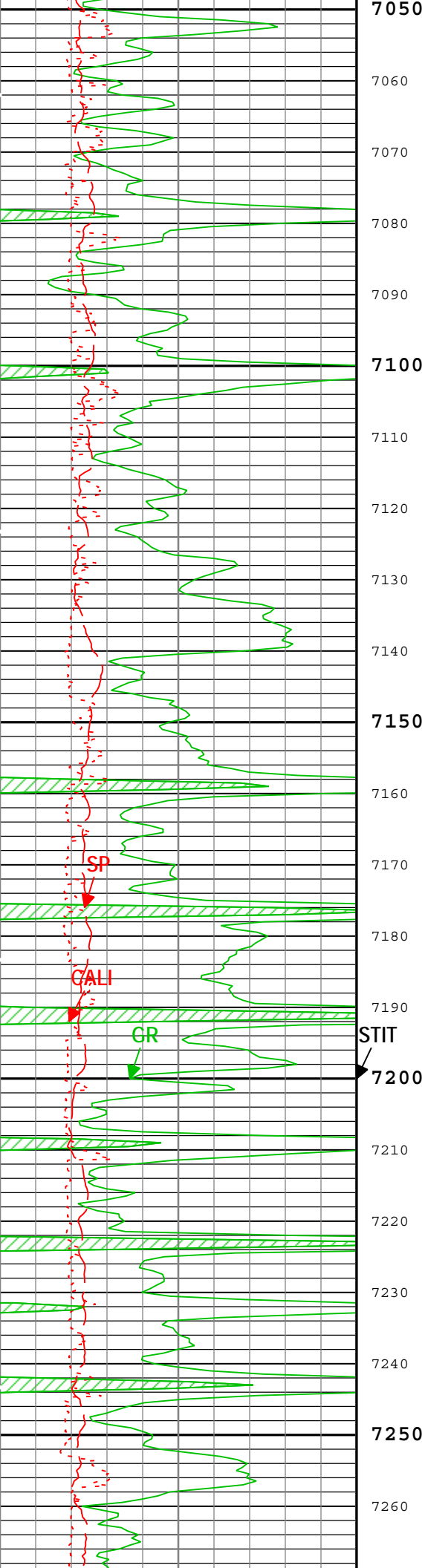


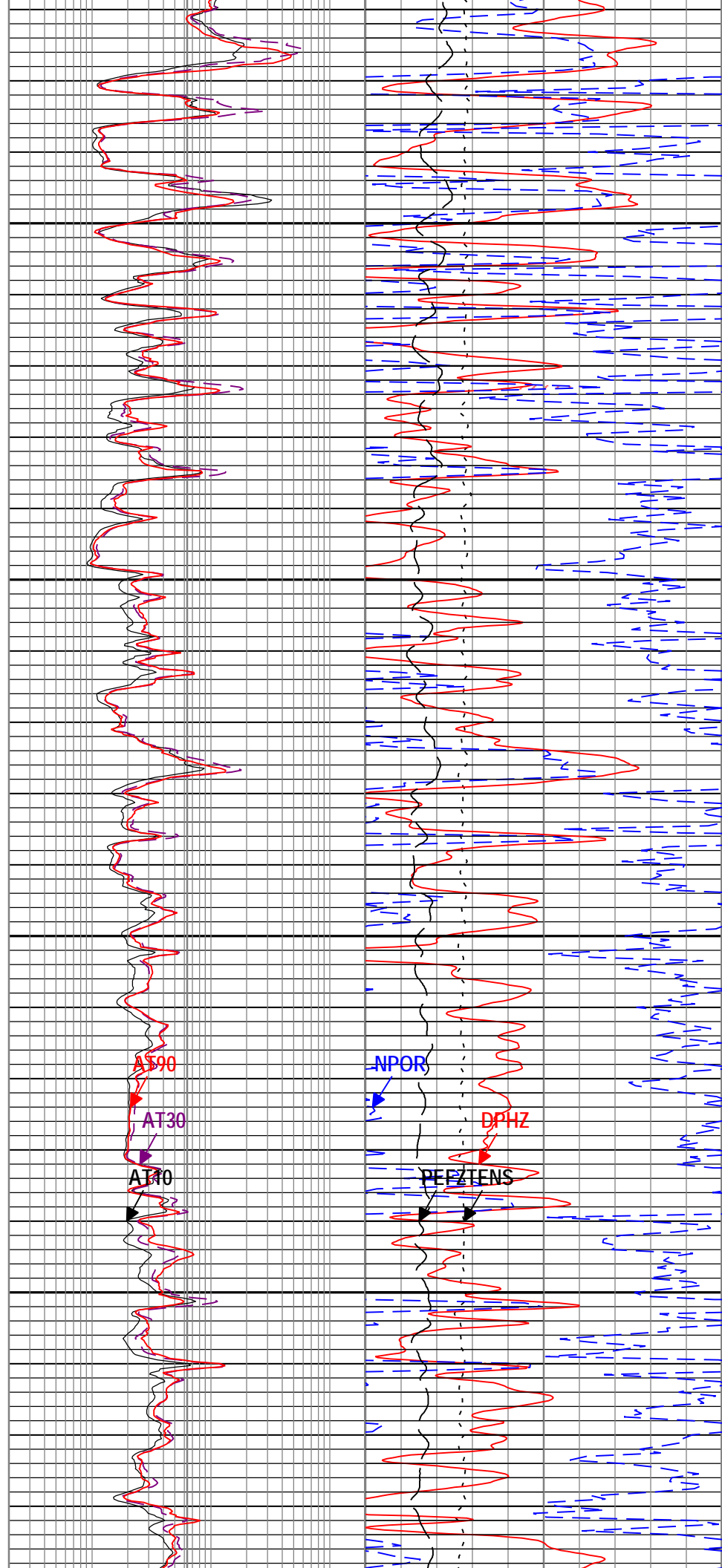
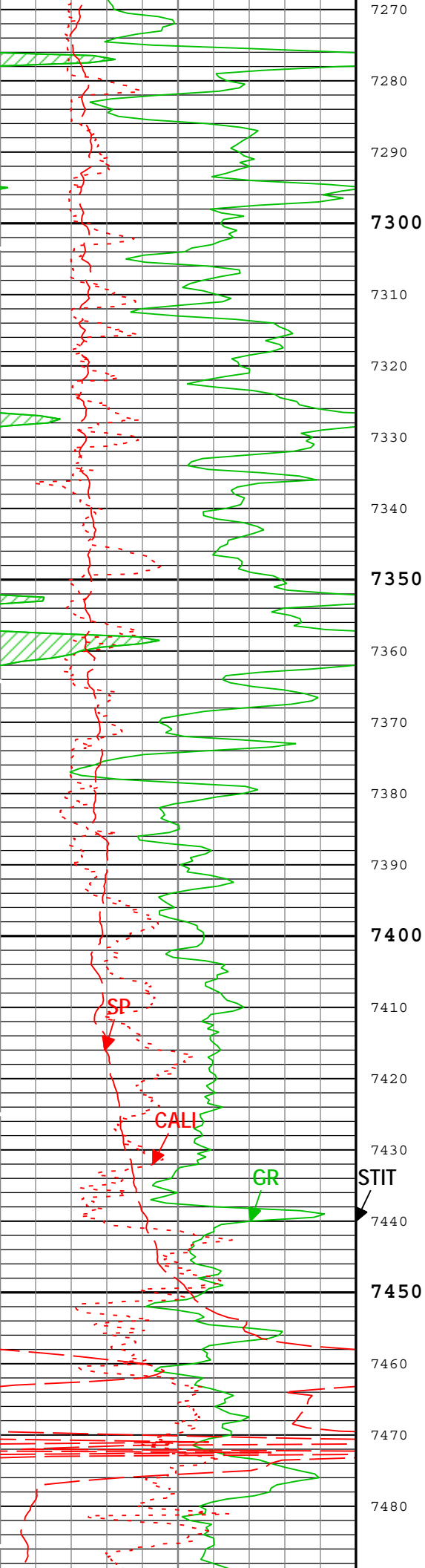


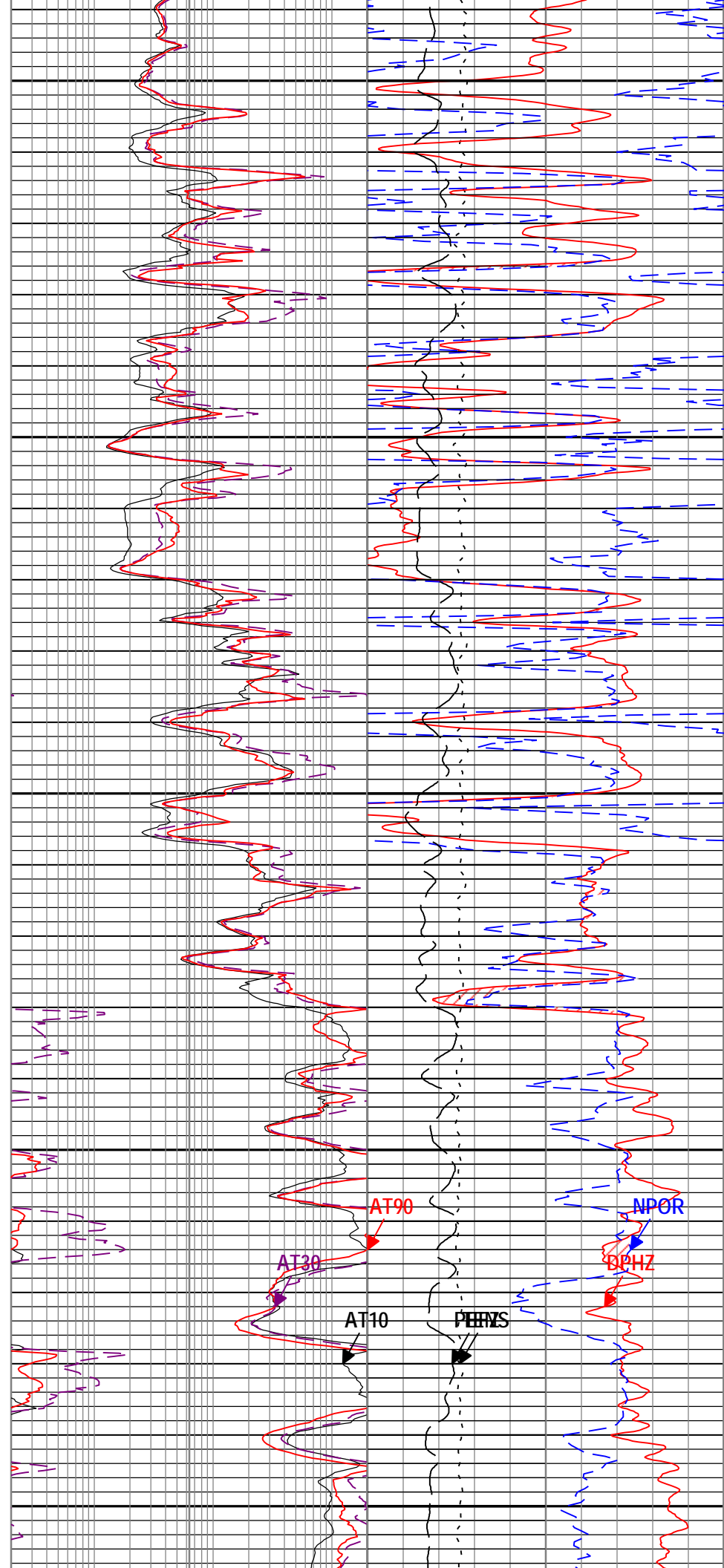
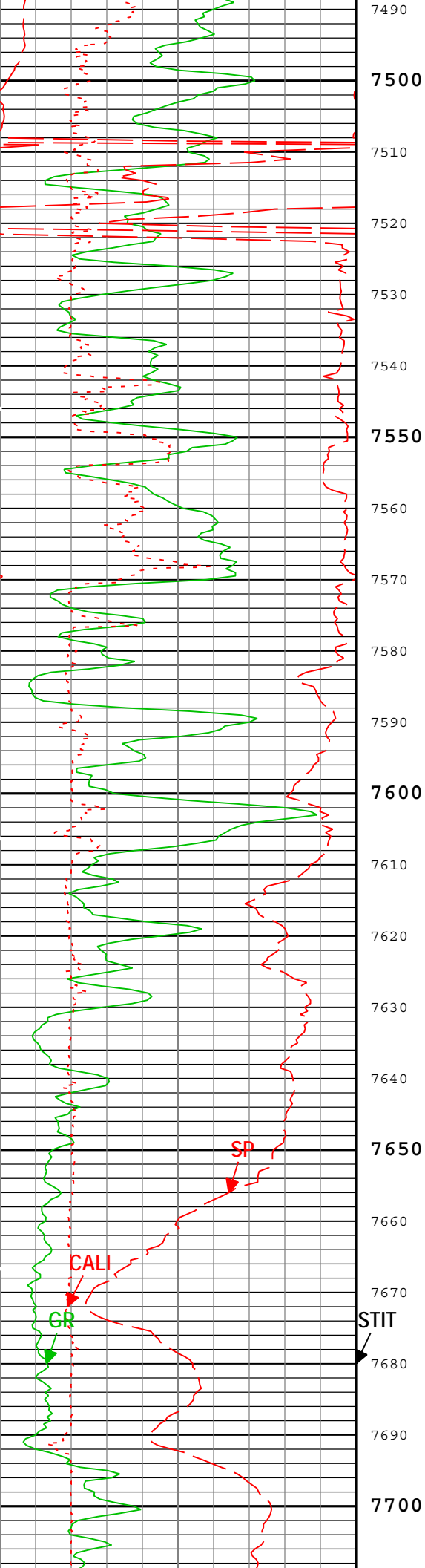


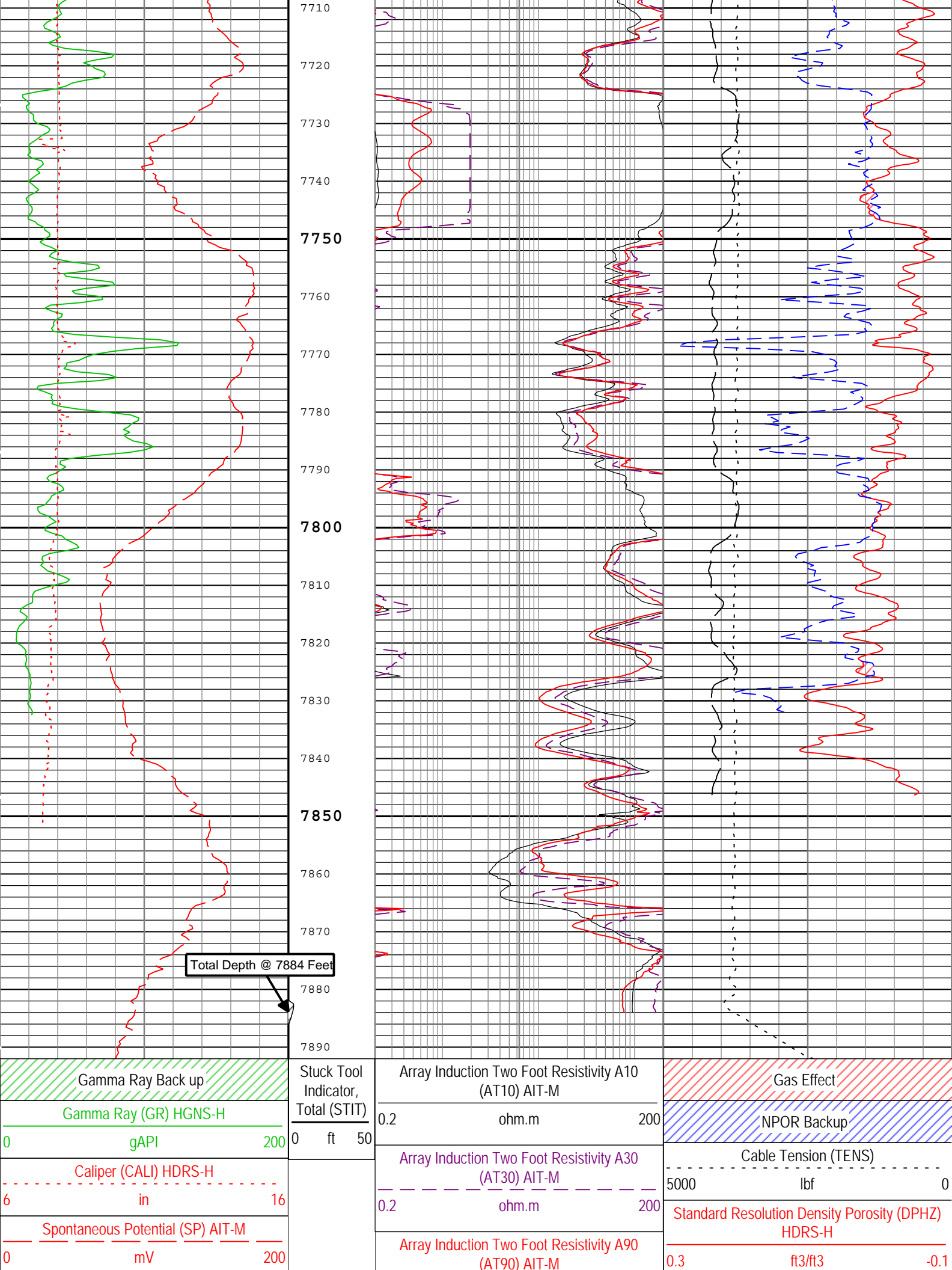












	0.2	ohm.m	200	Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
	0.3	m3/m3	-0.1	
	Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		0	10

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express

Format: Log (KM 5in Triple Combo)

Index Scale: 5 in per 100 ft

Index Unit: ft

Index Type: Measured Depth

Creation Date: 26-Sep-2012 12:30:17

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ASTA	Array Induction Tool Standoff	AIT-M	1	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	3601.04	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.273	in
CBLO	Casing Bottom (Logger)	WLSESSION	342	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Fresh Water	
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	75	degF
RMFS	Resistivity of Mud Filtrate Sample	Borehole	1.3	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft
TD	Total Measured Depth	Borehole	7884	ft

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	0	342
BS	7.875	342	7892
All depth are actual.			

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	3600	ft/h

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run 1

Primary Equipment :			
Array Induction Sonde - M	AMIS	1270	
Auxiliary Equipment :			
AITM Rm/SP Bottom Nose	AMRM	1270	

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):		19:16:23 15-Jul-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.012	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.560	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.013	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.607	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.016	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	-0.014	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.009	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.166	3.000	
Test Loop Gain - 4		Master	1.000	0.950	1.002	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.075	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.988	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.171	3.000	
Test Loop Gain - 6		Master	1.000	0.950	0.997	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.212	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	-0.127	3.000	

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM):		19:16:23 15-Jul-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-111.871	119.000	
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-133.029	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	158.885	204.000	
Sonde Error Correction Quad - 1		Master	-----	-625.000	-138.465	625.000	
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	115.585	156.000	
Sonde Error Correction Quad - 2		Master	-----	-350.000	-69.804	350.000	
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	64.217	89.000	
Sonde Error Correction Quad - 3		Master	-----	-250.000	-61.654	250.000	
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	26.915	35.000	
Sonde Error Correction Quad - 4		Master	-----	-63.000	2.367	63.000	
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	13.317	24.000	
Sonde Error Correction Quad - 5		Master	-----	-50.000	-2.232	50.000	
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.680	15.000	
Sonde Error Correction Quad - 6		Master	-----	-30.000	3.238	30.000	
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-2.031	5.000	
Sonde Error Correction Quad - 7		Master	-----	-30.000	-0.854	30.000	

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM):		19:16:23 15-Jul-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	0.864	1.200	
Fine Gain		Master	1.000	0.800	0.872	1.200	

AIT Electronics Check - Thru Calibration Check

Master (EEPROM):		19:16:23 15-Jul-2012		Before (Measured):		11:55:37 25-Sep-2012		After:	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit			
Thru Cal Mag - 0	V	Master	-----	0.366	0.603	0.854			
		Before	-----	0.366	0.606	0.854			

		After Before-Master After-Before	----- ----- -----	----- ----- -----	----- 0.003 -----	----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 0	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	137.000 137.000 ----- ----- -----	-165.749 -165.262 ----- 0.487 -----	-103.000 -103.000 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Mag - 1	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.762 0.762 ----- ----- -----	1.234 1.241 ----- 0.007 -----	1.778 1.778 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 1	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	136.000 136.000 ----- ----- -----	-166.820 -166.332 ----- 0.488 -----	-104.000 -104.000 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Mag - 2	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.372 0.372 ----- ----- -----	0.615 0.618 ----- 0.003 -----	0.868 0.868 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 2	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	132.000 132.000 ----- ----- -----	-170.365 -169.876 ----- 0.489 -----	-108.000 -108.000 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Mag - 3	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.420 0.420 ----- ----- -----	0.693 0.697 ----- 0.004 -----	0.980 0.980 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 3	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	131.000 131.000 ----- ----- -----	-171.117 -170.628 ----- 0.489 -----	-109.000 -109.000 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Mag - 4	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.804 0.804 ----- ----- -----	1.300 1.308 ----- 0.008 -----	1.876 1.876 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 4	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	125.000 125.000 ----- ----- -----	-177.241 -176.748 ----- 0.493 -----	-115.000 -115.000 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Mag - 5	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	1.176 1.176 ----- ----- -----	1.896 1.907 ----- 0.011 -----	2.744 2.744 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 5	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	122.000 122.000 ----- ----- -----	-178.924 -178.427 ----- 0.497 -----	-118.000 -118.000 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Mag - 6	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	1.176 1.176 ----- ----- -----	1.897 1.907 ----- 0.010 -----	2.744 2.744 ----- ----- -----	<div><div></div><div></div><div></div></div>
Thru Cal Phase - 6	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	121.000 121.000 ----- ----- -----	-178.907 -178.409 ----- 0.498 -----	-119.000 -119.000 ----- ----- -----	<div><div></div><div></div><div></div></div>

Thru Cal Mag - 7	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	0.846 0.846 ----- ----- -----	1.378 1.387 ----- 0.009 -----	1.974 1.974 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 7	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	115.000 115.000 ----- ----- -----	-179.889 -179.351 ----- 0.538 -----	-125.000 -125.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Zero	mV	Master Before After Before-Master After-Before	 ----- ----- -----	-50.000 -50.000 ----- ----- -----	0.639 0.651 ----- 0.012 -----	50.000 50.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Plus	mV	Master Before After Before-Master After-Before	 ----- ----- -----	941.000 941.000 ----- ----- -----	992.590 992.685 ----- 0.095 -----	1040.000 1040.000 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Zero	V	Master Before After Before-Master After-Before	 ----- ----- -----	-0.050 -0.050 ----- ----- -----	0.001 0.001 ----- 0.000 -----	0.050 0.050 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Plus	V	Master Before After Before-Master After-Before	 ----- ----- -----	0.870 0.870 ----- ----- -----	0.919 0.920 ----- 0.001 -----	0.960 0.960 ----- ----- -----	<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1

Primary Equipment :							
	HILT High-Resolution Control Cartridge, 150 degC	HRCC-H			5705		
	HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H			3816		
Auxiliary Equipment :							
	HRDD Backscatter Detector	Backscatter					
	HRDD Long Spacing Detector	Long Spacing			28732		
	HRDD Short Spacing Detector	Short Spacing			27634		
	Cesium 137 Gamma-Ray Logging Source	GSR-J			5240		
	HILT High-Resolution Control Cartridge, 150 degC	HRCC-H			5705		
	HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H			4706		
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):		12:01:23 25-Sep-2012					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Small Ring	in	Before	8.00	6.00	8.83	10.00	<div><div></div><div></div><div></div><div></div><div></div></div>
Large Ring	in	Before	12.00	9.00	13.08	15.00	<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Inversion Results

Master (EEPROM):		05:11:40 26-Aug-2012 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Aluminum	g/cm3	Master	2.596	2.586	2.597	2.606	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Magnesium	g/cm3	Master	1.686	1.676	1.687	1.696	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Aluminum		Master	2.570	2.470	2.552	2.670	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Magnesium		Master	2.650	2.550	2.628	2.750	<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Deviation Summary

Master (EEPROM):		05:11:40 26-Aug-2012 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>

Calibration Parameter :

Water Temperature

Housing Size

JIG-BKG (Jig minus background reference)

165

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 08:17:00 26-Sep-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.0	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Mar-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	----	----	8084.000	----	
Accelerometer Coefficients - 1		Master	----	----	-8.467	----	
Accelerometer Coefficients - 2		Master	----	----	0.009	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.722	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	298.700	----	
Accelerometer Coefficients - 9		Master	----	----	0.995	----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 11:55:48 10-Jul-2012 Before (Measured): 11:55:23 25-Sep-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	25.2	40.0	
		Before	0	5.0	25.2	40.0	
		After	----	----	----	----	
		Before-Master	----	-3.8	0.0	3.8	
		After-Before	----	----	----	----	
Far Zero Measurement	1/s	Master	0	5.0	28.4	40.0	
		Before	0	5.0	27.7	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.3	-0.7	4.3	
		After-Before	----	----	----	----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5277.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2204.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5227.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2158.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 12:01:46 25-Sep-2012

After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
-------------	------	-------	---------	-----------	--------	------------	--

RGR Zero Measurement	gAPI	Before After After-Before	30.0 ----- -----	0 ----- -----	82.6 ----- -----	120.0 ----- -----	<div></div>
RGR Plus Measurement	gAPI	Before After After-Before	185.4 ----- -----	157.1 ----- -----	168.1 NOT DONE -----	206.3 ----- -----	<div></div>
GR Calibration Gain		Before After After-Before	0.89 ----- -----	0.80 ----- -----	0.98 ----- -----	1.05 ----- -----	<div></div>

LEH-QT (Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor) Calibration - Run 1


Primary Equipment :							
Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor				LEH-QT			

HTEN Master Calibration - HTEN Master Calibration

Master:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
HTEN Shop Gain		Master	1.000	0.800	NOT DONE	4.500	<div></div>
HTEN Shop Offset	lbf	Master	0	-1000.000	NOT DONE	1000.000	<div></div>

HTEN Before Calibration - HTEN Before Calibration

Before:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
RHTE Zero Measurement - 0	lbf	Before	-----	-----	-----	-----	<div></div>
RHTE Plus Measurement - 0	lbf	Before	-----	-----	-----	-----	<div></div>
HTEN Gain - 0		Before	-----	-----	-----	-----	<div></div>
HTEN Offset - 0	lbf	Before	-----	-----	-----	-----	<div></div>

Company:	Nighthawk Production LLC	
Well:	Pikes Peak Williams 4-30	
Field:	Wildcat	
County:	Lincoln	
Country:	United States	
Platform Express		
Triple Combo		