

Company: Nighthawk Production LLC

Well: Silverton 16-10

Field: Jolly Ranch

County: Lincoln State: Colorado

Platform Express
Array Induction
with Linear Correlation

County: Lincoln
Field: Jolly Ranch
Location: Lat/Long : 39.539/-103.42
Well: Silverton 16-10
Company: Nighthawk Production LLC

Location:	Lat/Long : 39.539/-103.42	Elev. K.B. 5242.00 ft G.L. 5227.00 ft D.F. 5241.00 ft	
	SHL : 1183 FSL X 922' FEL SESE		
	Permanent Datum: _____		Ground Level _____
Log Measured From: _____	Kelly Bushing _____	15.00 ft	above Perm.Datum
Drilling Measured From: _____	Kelly Bushing _____		
API Serial No. _____	Section: _____	Township: _____	Range: _____
05-073-06528-00	10	6S	54W

Logging Date	12-Jun-2013	
Run Number	Run 1	
Depth Driller	8450.00 ft	
Schlumberger Depth	8460.00 ft	
Bottom Log Interval	8460.00 ft	
Top Log Interval	345.00 ft	
Casing Driller Size @ Depth	8.625 in @ 334.00 ft	
Casing Schlumberger	345 ft	
Bit Size	7.875 in	
Type Fluid In Hole	Chemical Gel	
Density	9 lbm/gal	68 s
Fluid Loss	PH	7.3
Source of Sample	Flowline	
RM @ Meas Temp	0.58 ohm.m @ 80 degF	
RMF @ Meas Temp	0.44 ohm.m @ 80 degF	
RMC @ Meas Temp	0.72 ohm.m @ 80 degF	
Source RMF	Calculated	Calculated
RM @ BHT	0.25 @ 196 0.19 @ 196	
Max Recorded Temperatures	196 degF 196 196	
Circulation Stopped	12-Jun-2013 13:30:00	
Logger on Bottom	13-Jun-2013 21:40:23	
Unit Number	2135	Fort Morgan
Recorded By	Arvin Shi	
Witnessed By	Anders Elgend / Jim Wier	

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

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Well Sketch

Driller Depth
0.00 ft

334.00 ft

Casing 8.625in
24lbm/ft



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	7.875					
Top Driller (ft)	334					
Top Logger (ft)	345					
Bottom Driller (ft)	8450					
Bottom Logger (ft)	8460					
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24					
Inner Diameter (in)	8.099					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	334					
Bottom Logger (ft)	345					

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	12-Jun-2013					
Time Log Started	22:42:13					
Date Log Finished	14-Jun-2013					
Time Log Finished	00:03:34					
Top Log Interval (ft)	345.00					
Bottom Log Interval (ft)	8460.00					
Total Depth (ft)	8460.00					
Max Hole Deviation (deg)	NaN					
Azimuth of Max Deviation (deg)	NaN					
Bit Size (in)	7.875					
Logging Unit Number	2135					
Logging Unit Location	Fort Morgan					
Recorded By	Arvin Shi					
Witnessed By	Anders Elgerd / Jim Wier					
Service Order Number	C6VJ-00060					

Remarks and Equipment Summary				
Run 1: Toolstring				Run 1: Remarks
Equip name	Length	MP name	Offset	All Schlumberger depth measurement policies followed
LEH-QT	97.73			
LEH-QT				
AH-369	94.82			IDW used as primary depth measurement and Z-Chart as secondary depth measurement
EDTC-B:8593	93.39			
EDTH-B:8625				
EDTG-B:77756				
EDTC-B:8593				
		CTEM	89.89	
		ACCZ	0.00	
		HV	0.00	
		Gamma Ray	88.02	
		TelStatus	86.89	
		Temperature	86.87	
HGNS-H:4865	86.89			
HGNH:4817				
NPV-N		GR	86.15	
NSR-F:2554				
HMCA-H				
HACCZ-H:6991				
HGNS-H:4865				
		CNL Porosity	79.82	
		HGNS	77.48	
		HMCA	77.48	
		Accelerometer	0.00	
HDRS-H:3863	77.48			
ECH-MEB:2898				
HRCC-H:3828				
HRMS-H:3863				
Backscatter				
Short Spacing				
GPV-Q				
GSR-J:5471		HRCC	73.48	
Long Spacing:28620				
HRGD-H:3870				
		MCFL	68.05	
		Caliper	67.57	
		TLD Density	67.18	
HRLT-B	65.24			
HRUH-B				
HRUC-B				
HRLS-B				
HRLH-B				
HRLC-B				
AH-270				

Resistivity 53.47

AH-184[2]:28 41.04
29

MAST-B:8506 39.04
ECH-SF:8081
MAPC-BA:8081
MAMS-CA:8506

MAMS 23.6

AH-184[1]:75 18.00
7

AIT-H:398 16.00
AHIS:398
AHRM



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

Depth Control Parameters			
Conveyance Type	Wireline		
Rig Type	Land		
Depth Measuring Device			
Type	IDW-B		
Wheel Correction 1	-7		
Wheel Correction 2	-5		
Tension Device			
Type	CMTD-B/A		
Calibration Date	17-May-2013		
Calibrator Serial Number	78135		
Calibration Points	10		
Calibration RMS	13		
Calibration Peak Error	24		
Logging Cable			
Type	7-46NT-XS		
Logging Cable Length (ft)	24000.00		

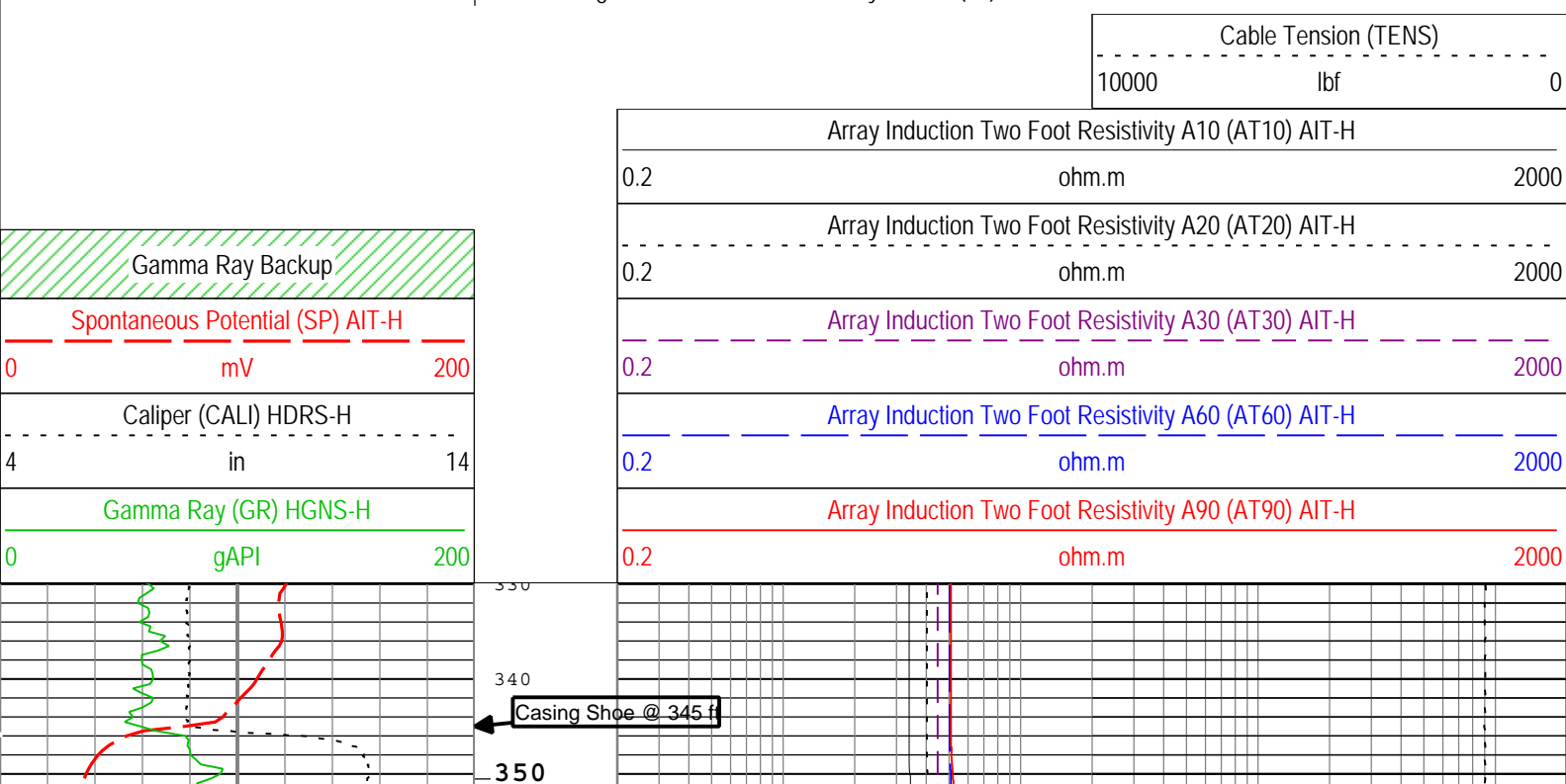
Run 1

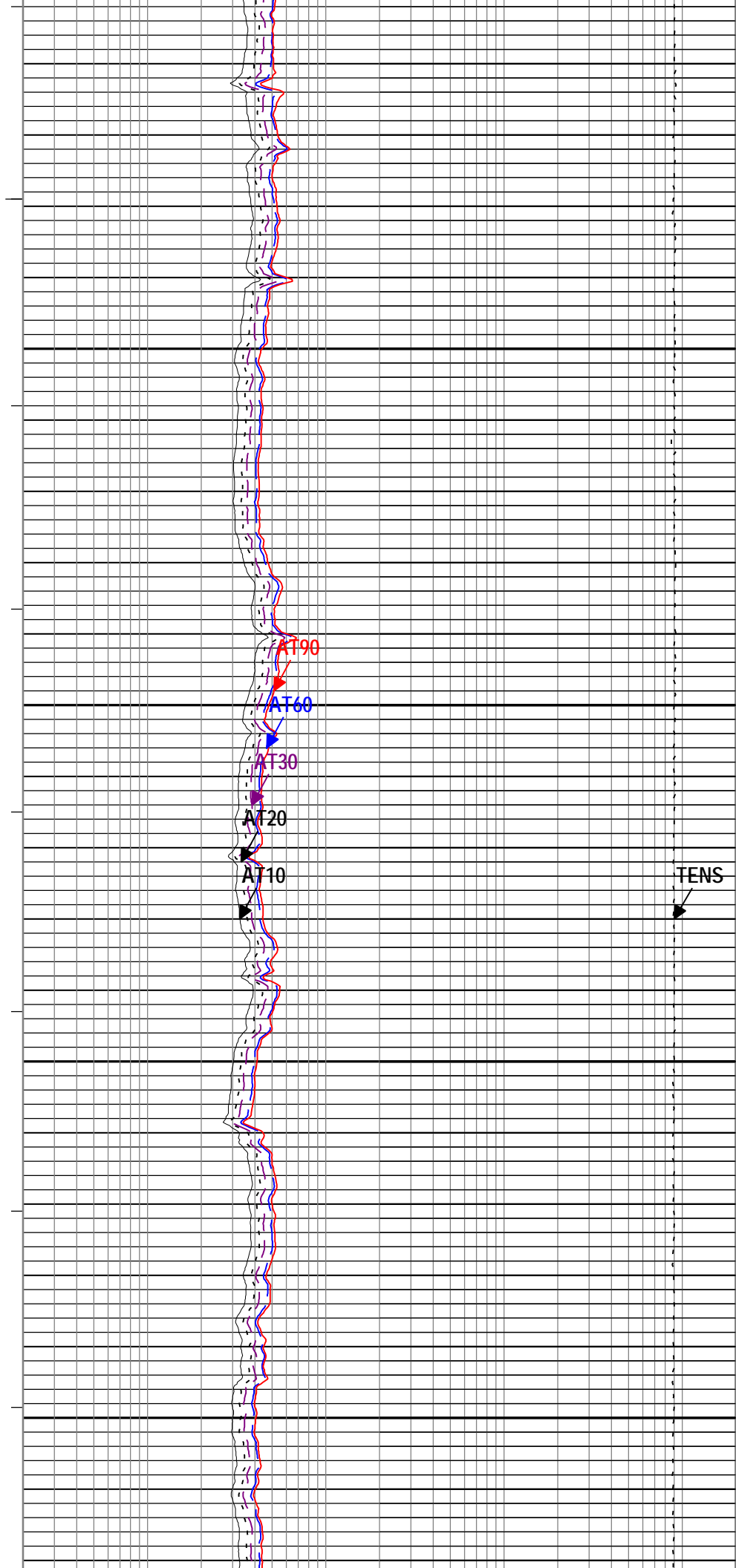
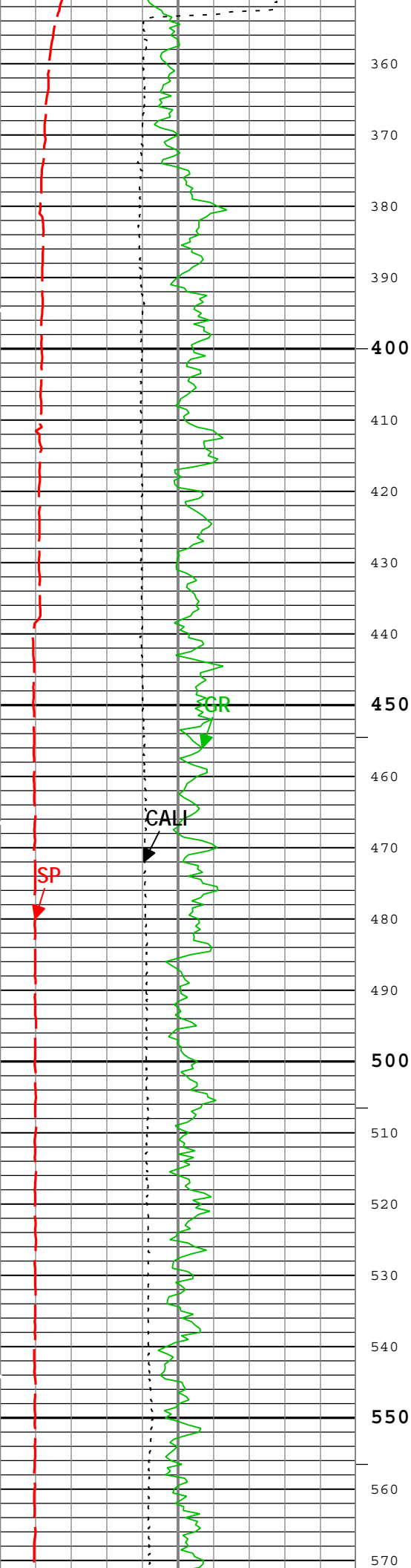
Integration Summary

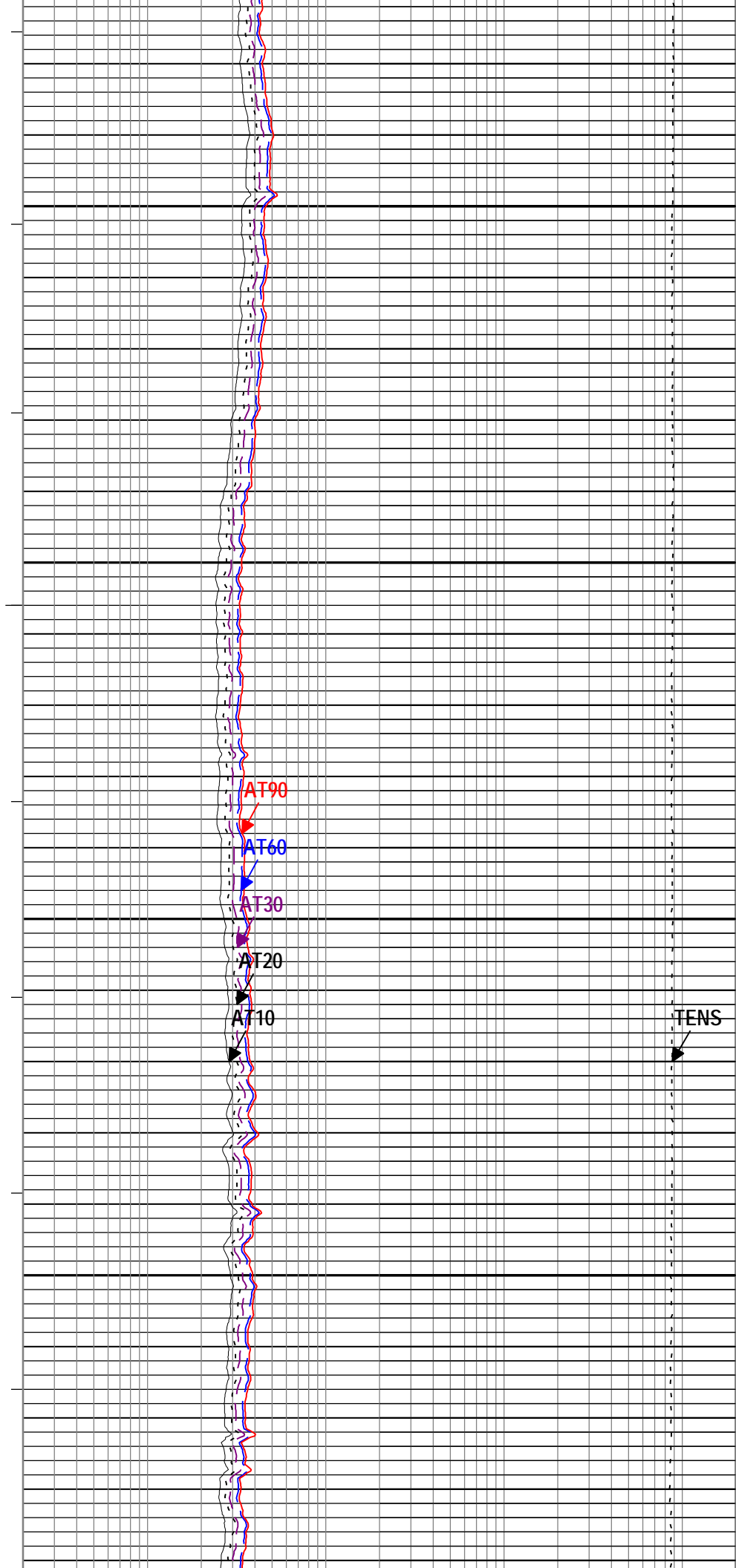
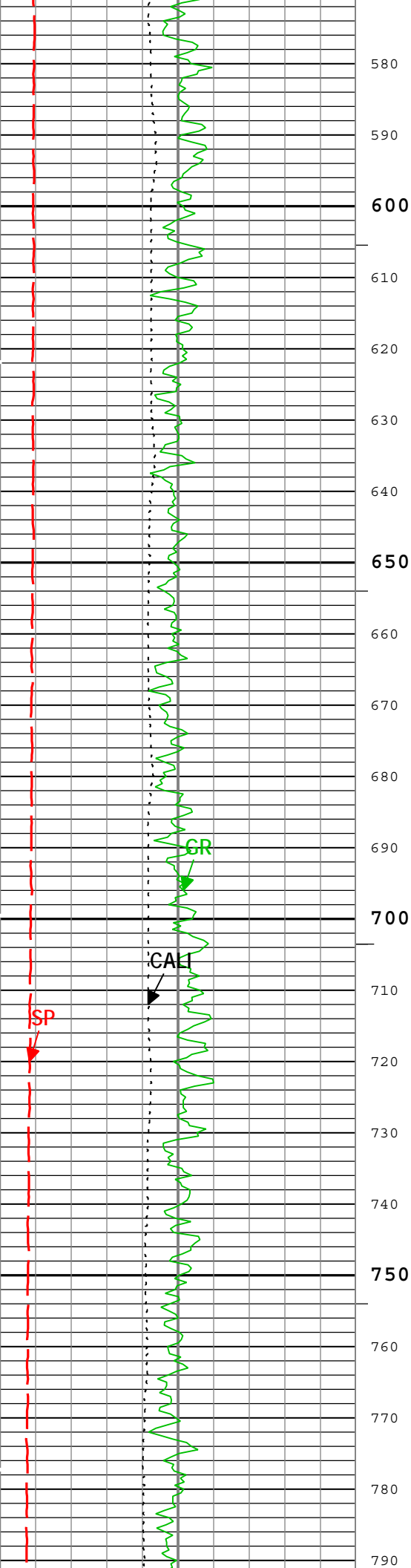
Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	1772.78	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	3114.58	ft3

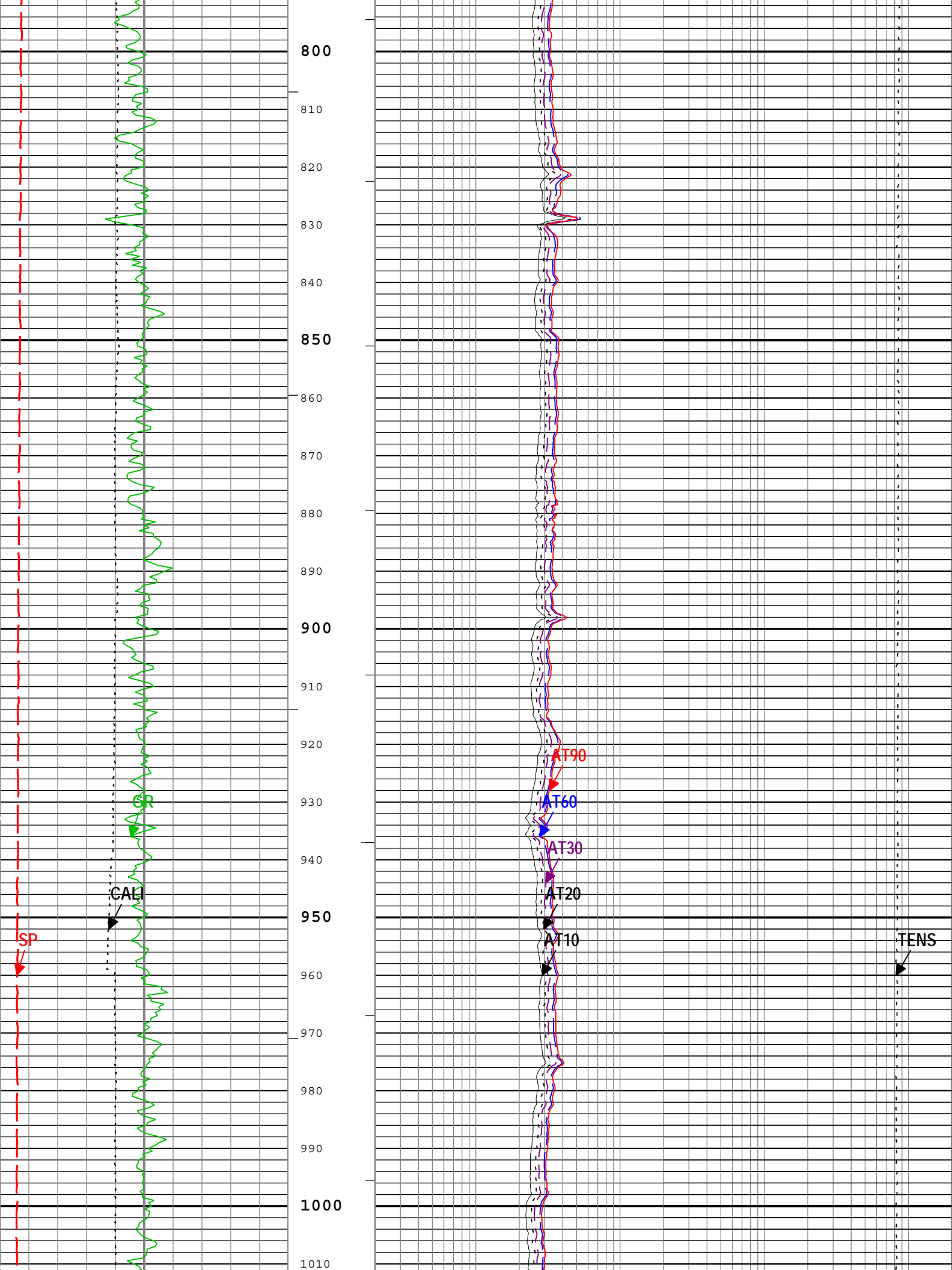
Software Version

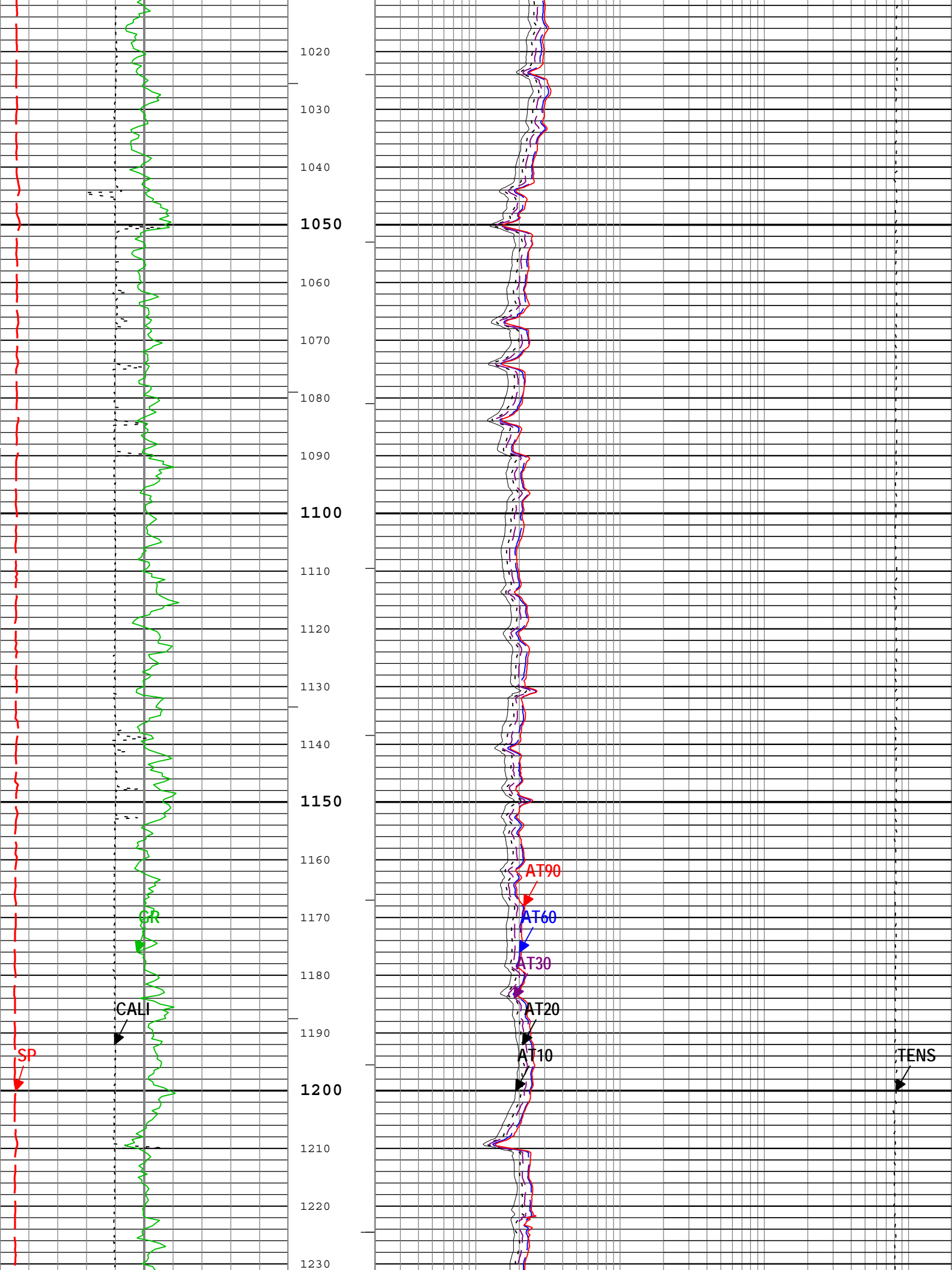
Acquisition System		Version
MaxWell		3.1.9755.0
Application Patch		SP-20130325-3.1.9755.1799
Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.1799

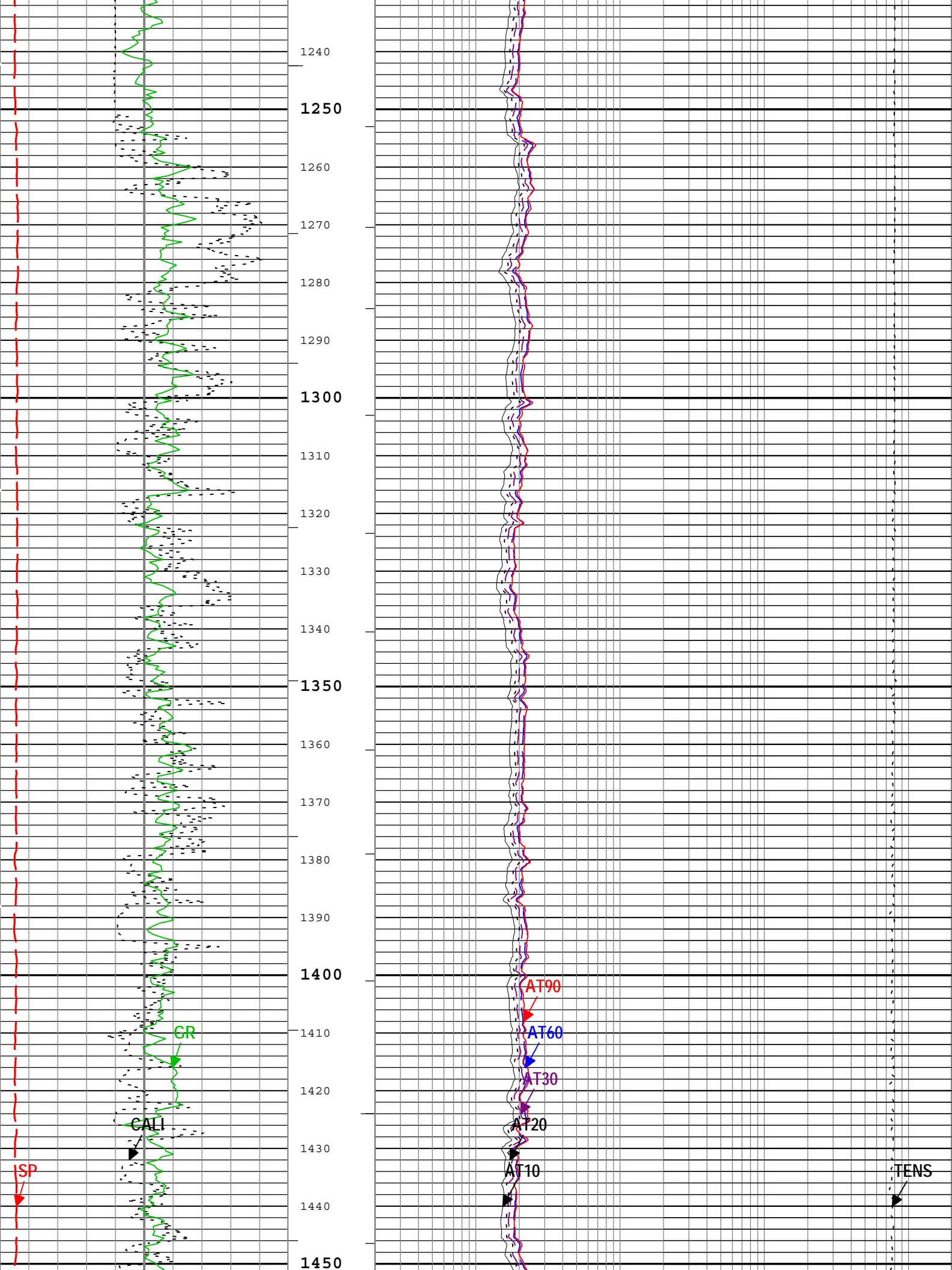


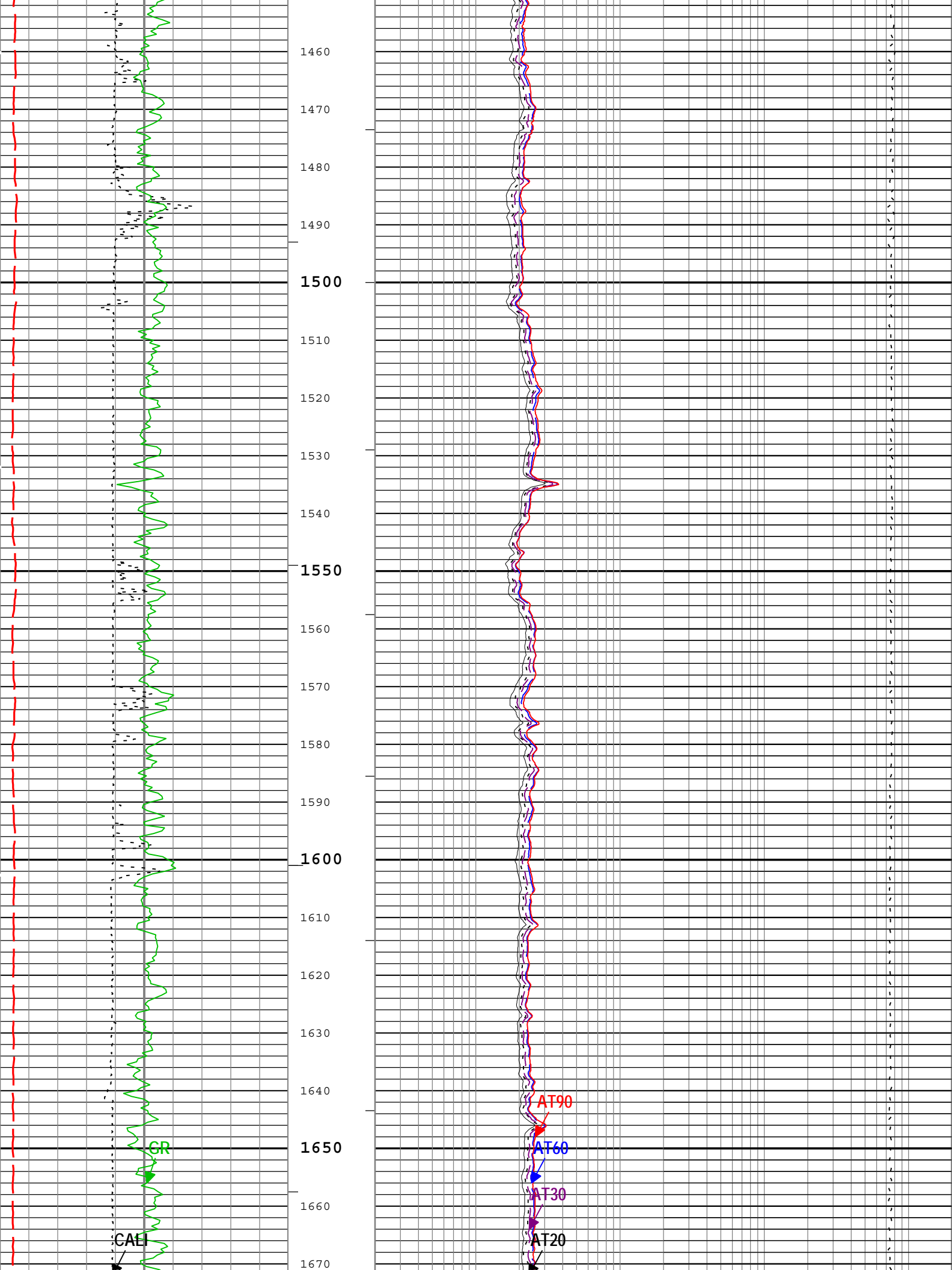


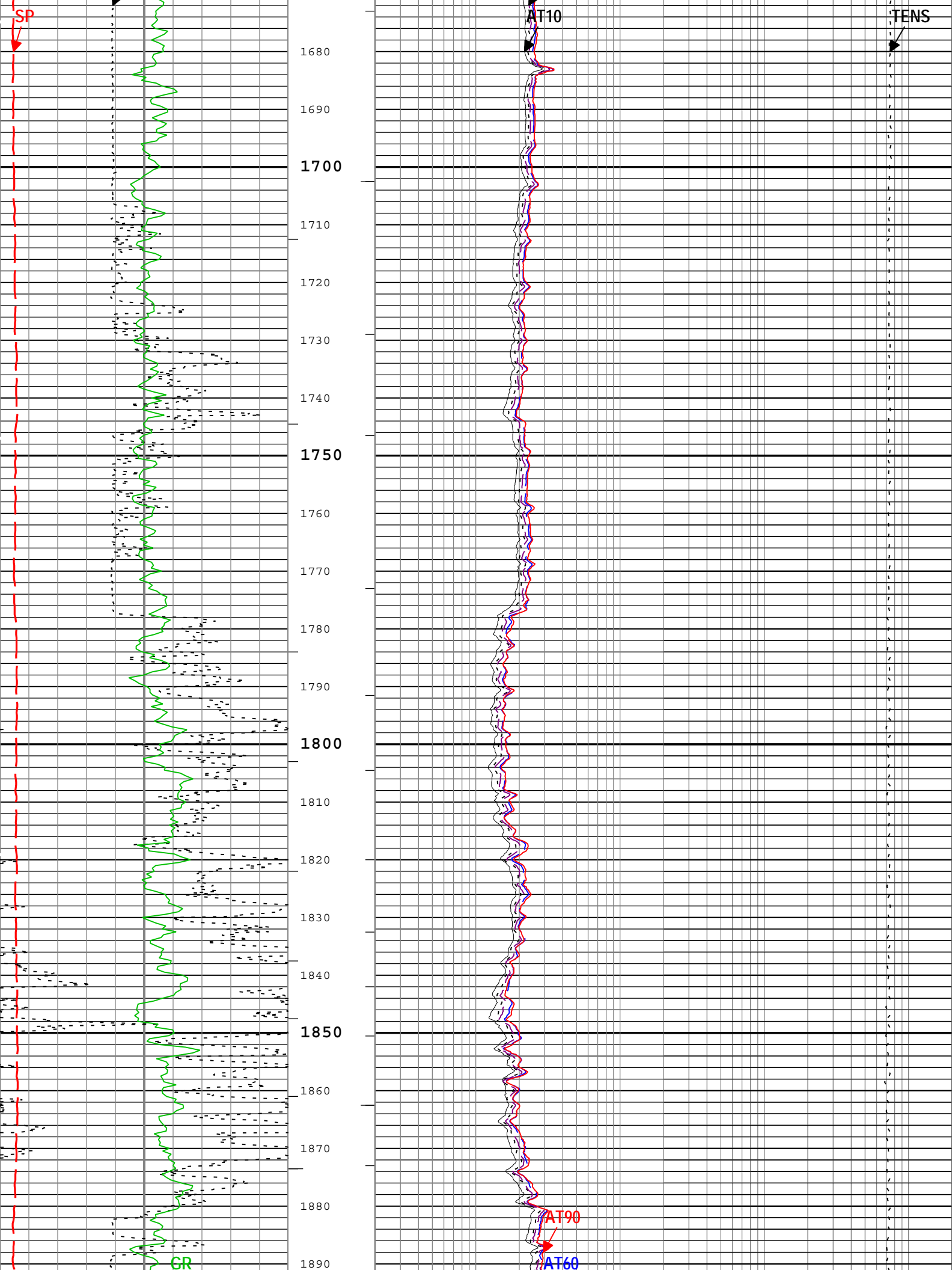


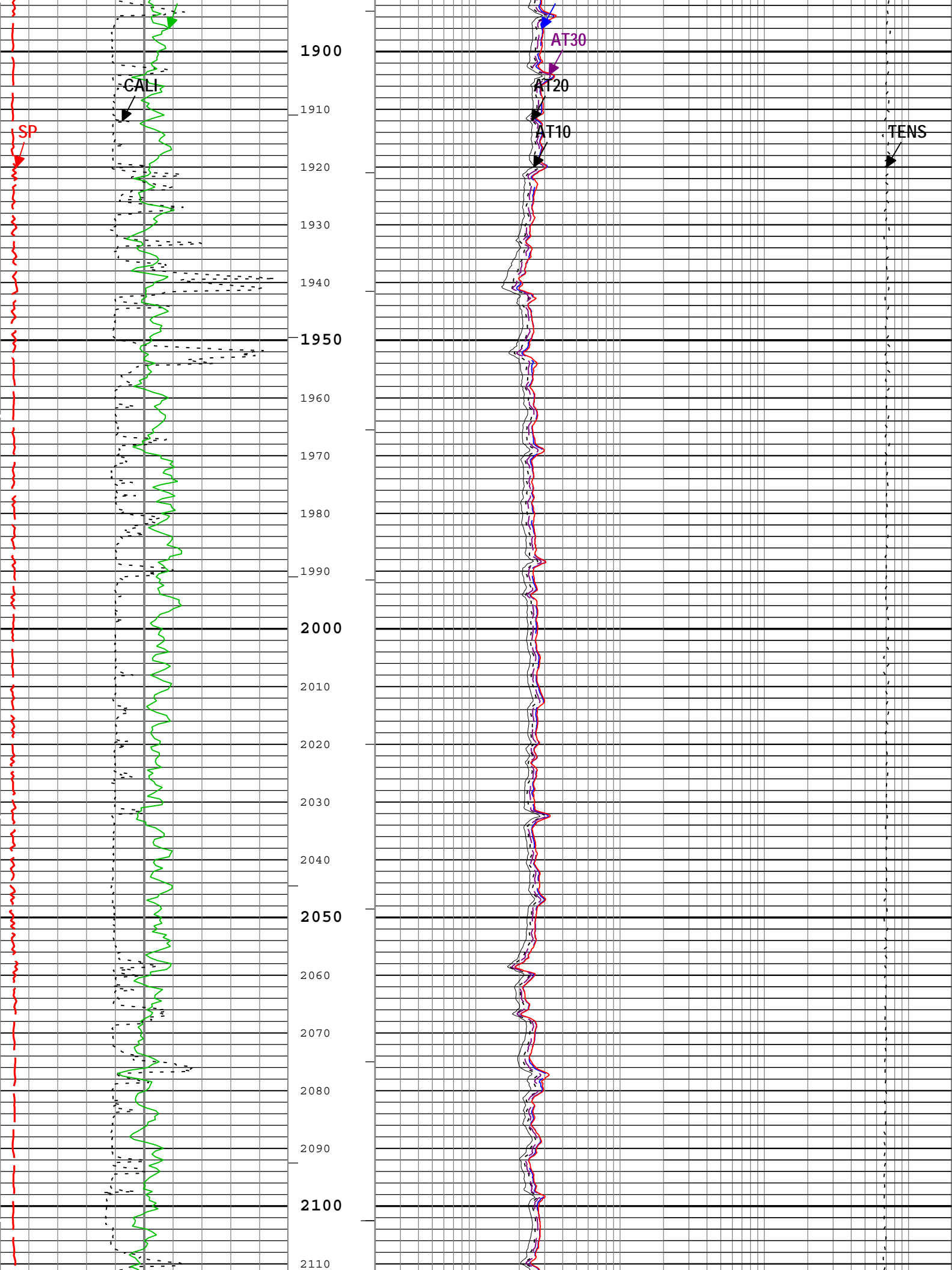


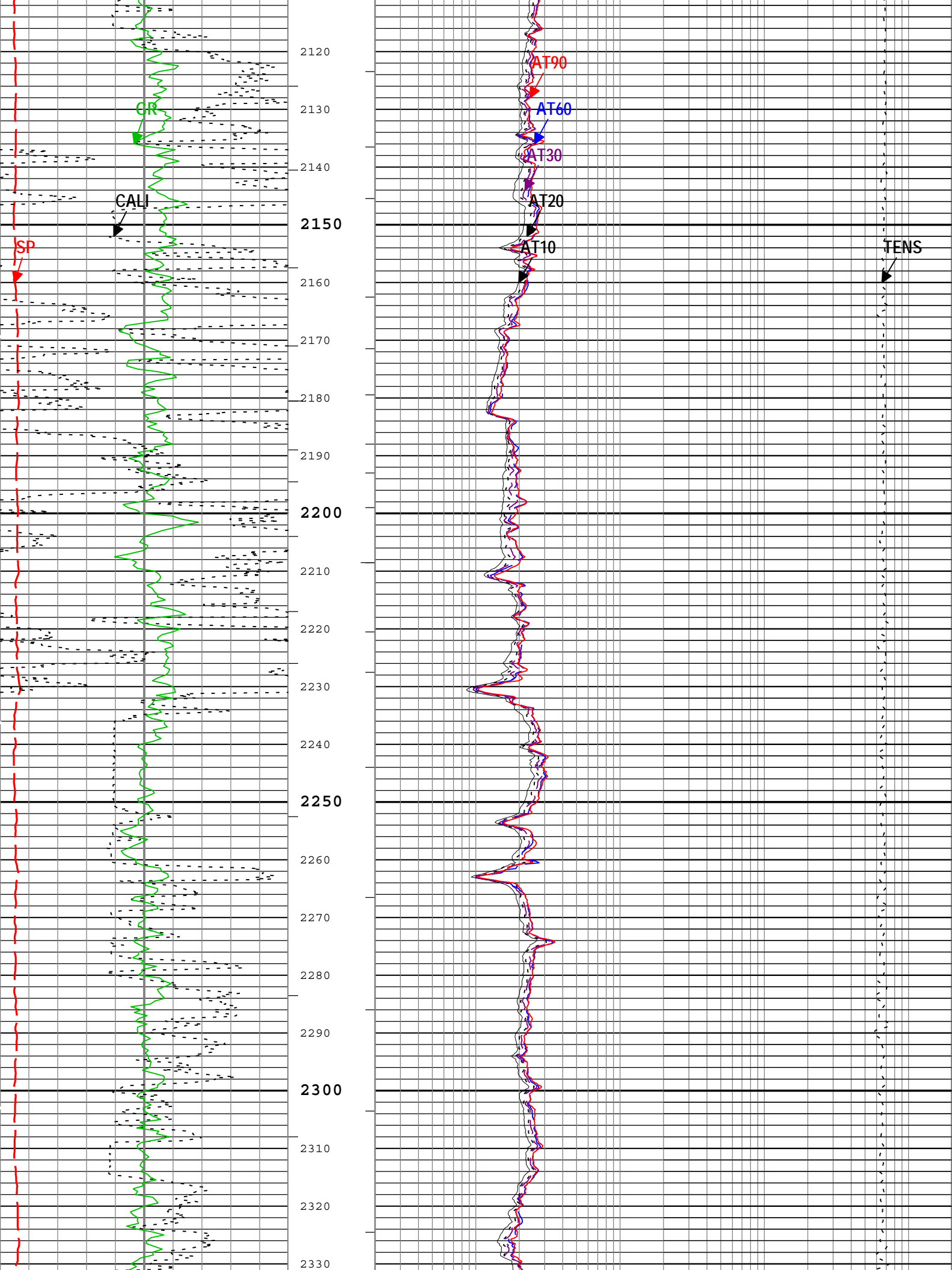


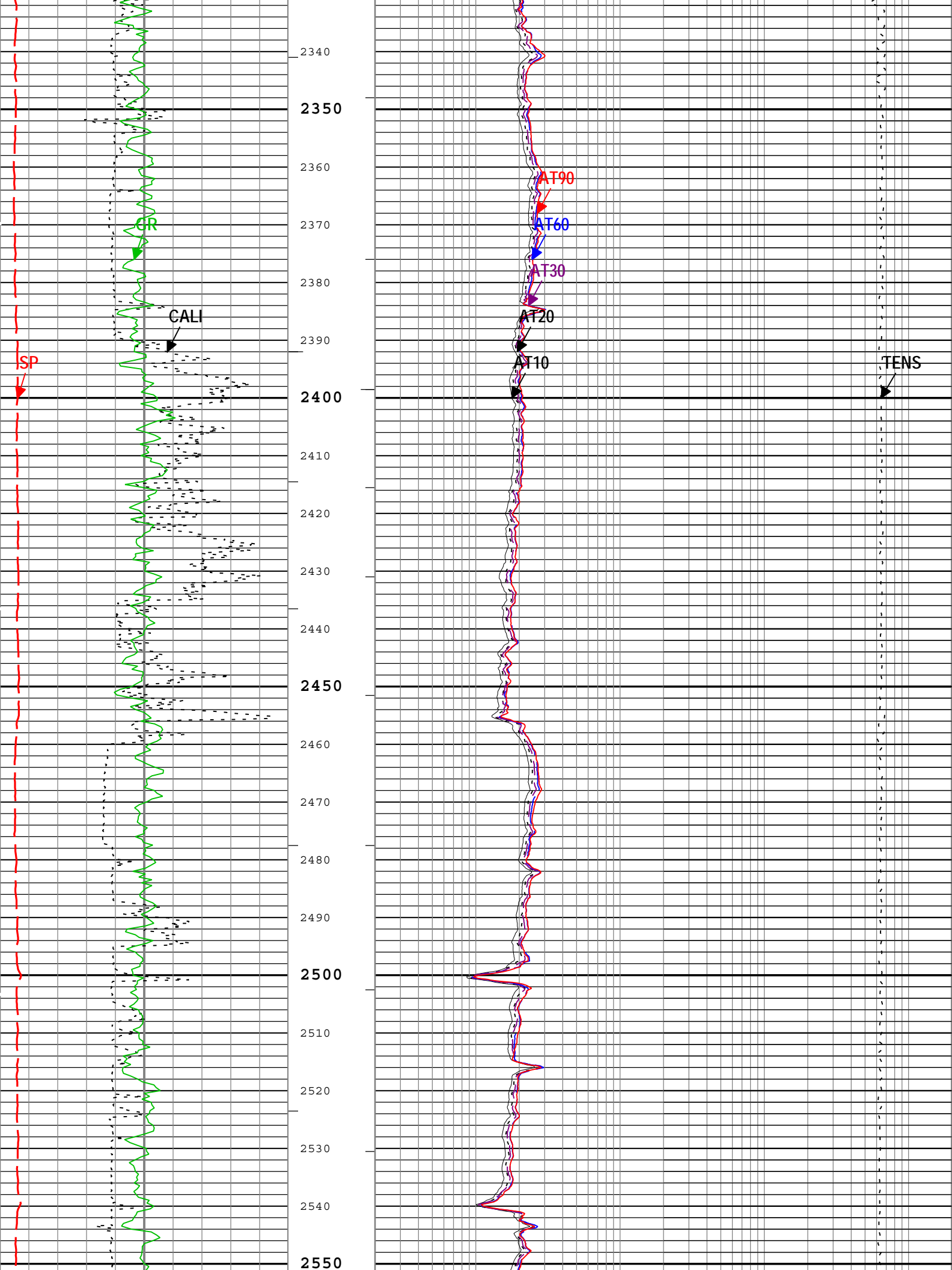


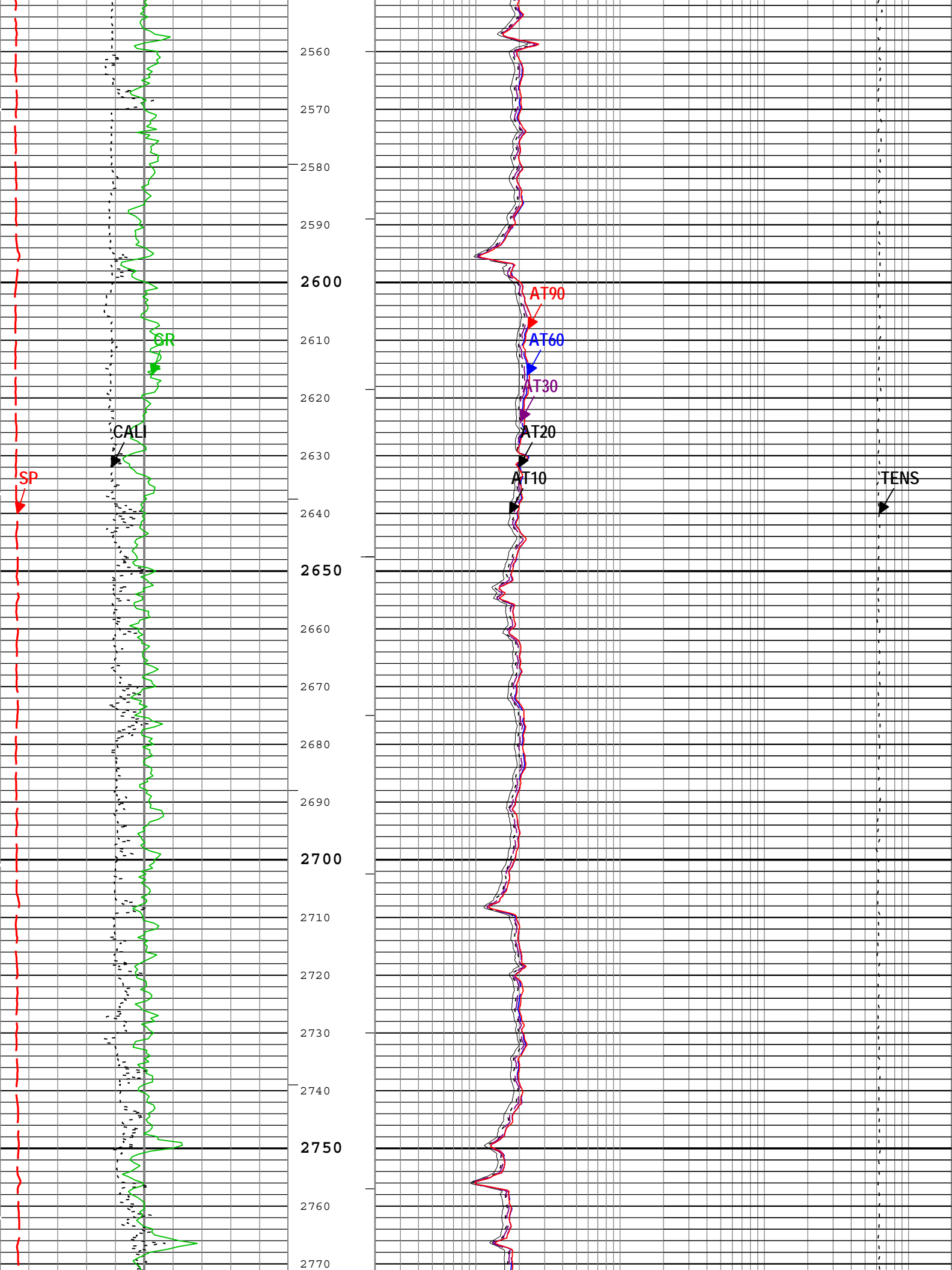


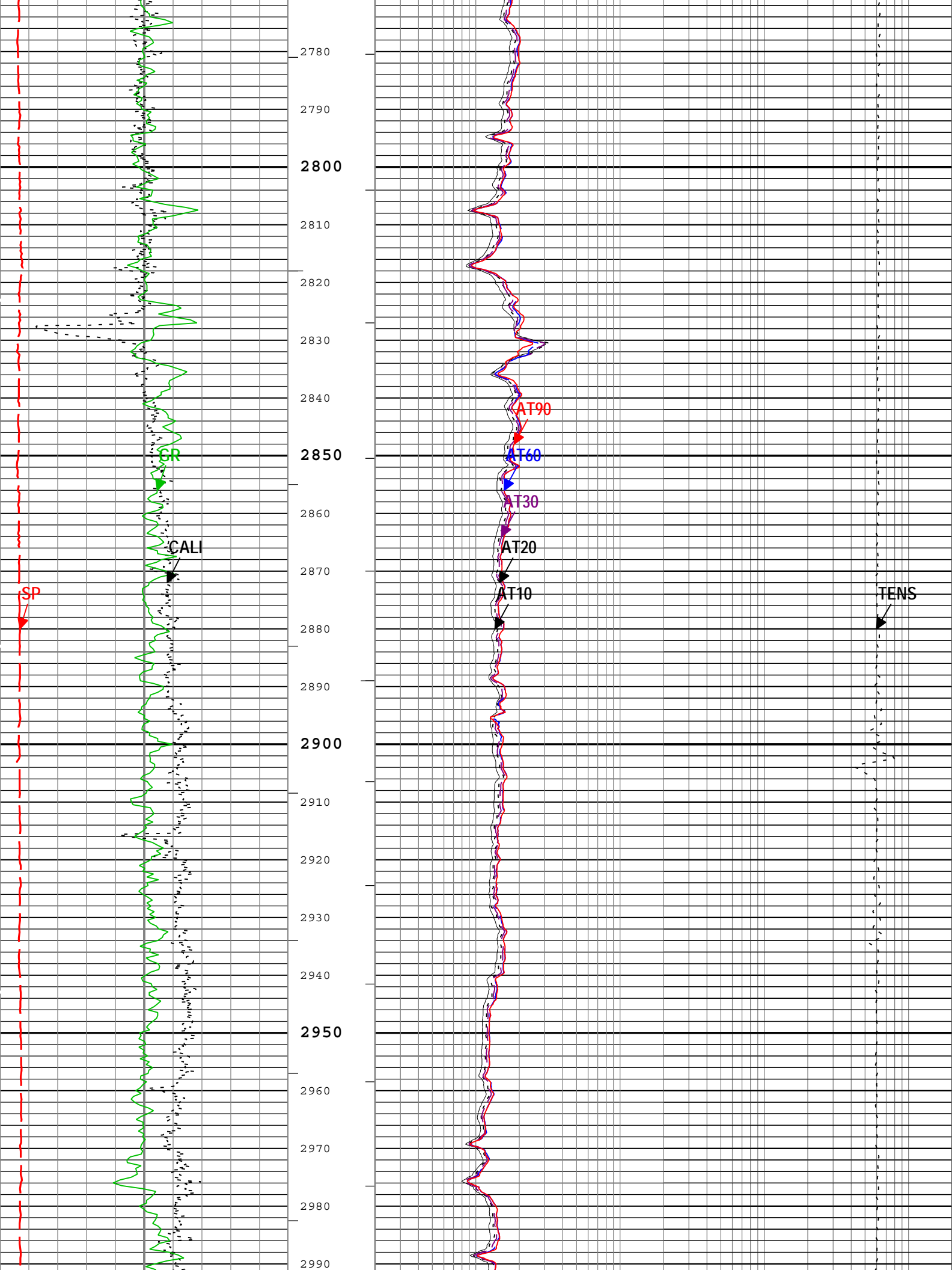


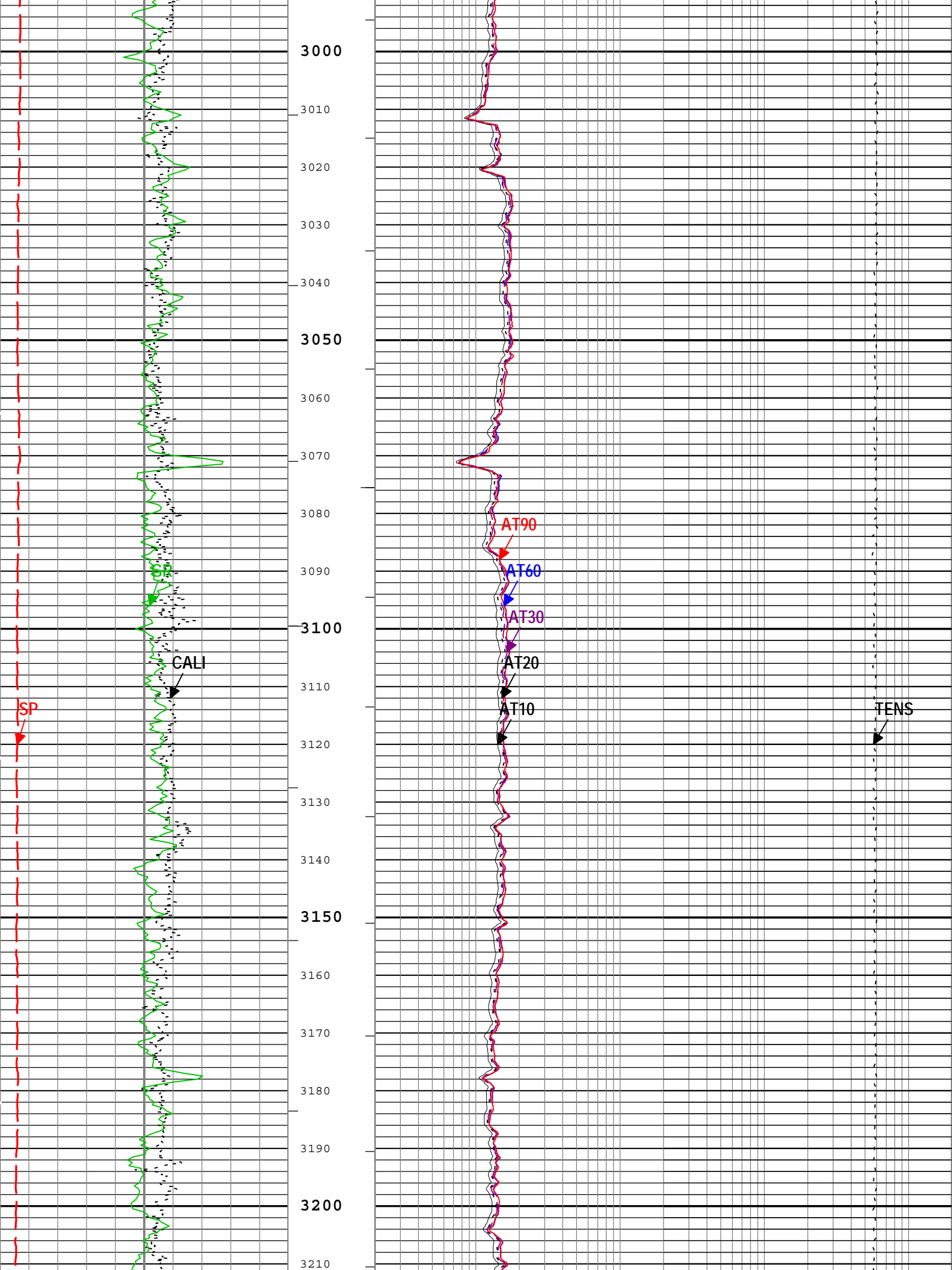


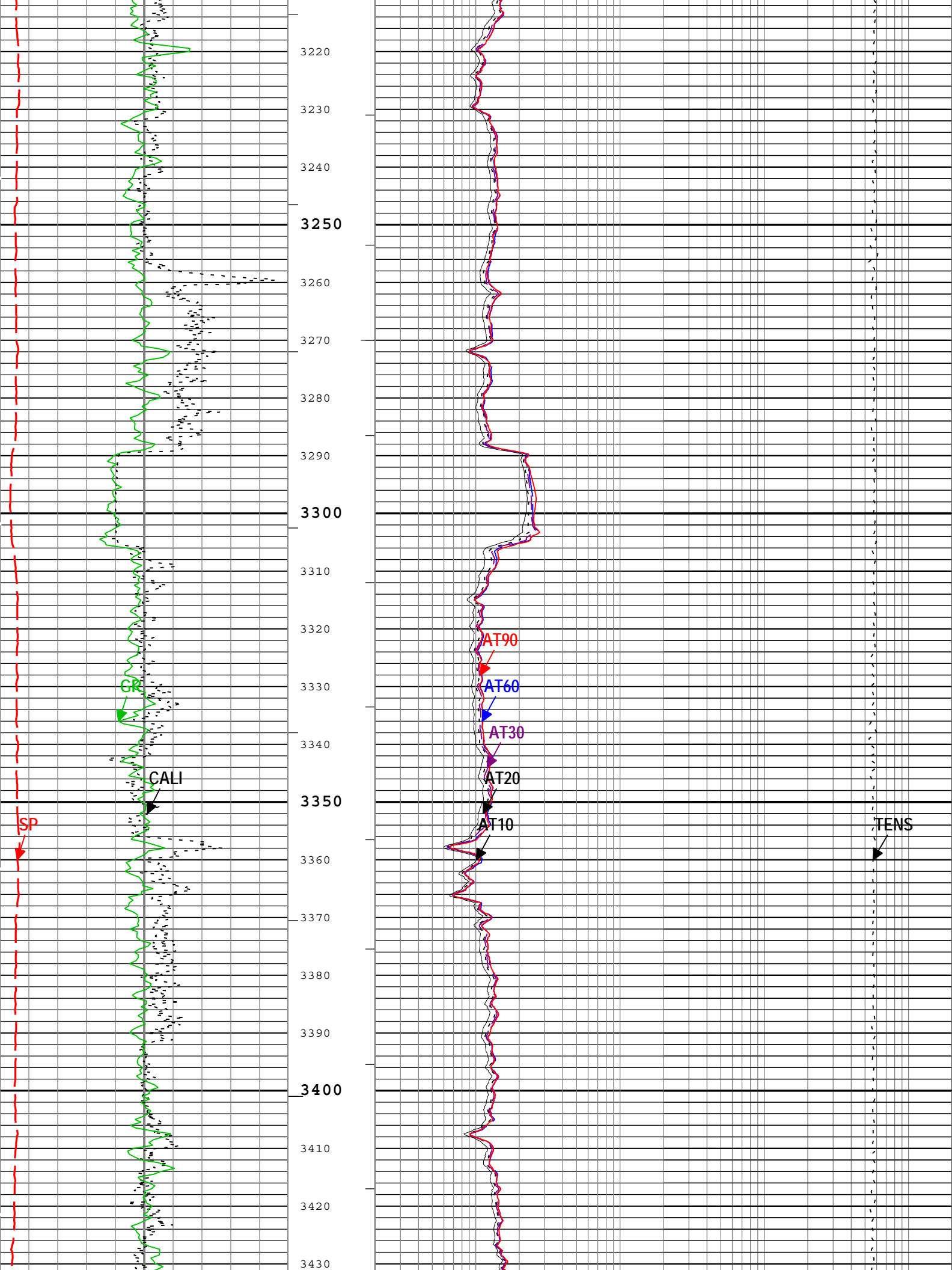


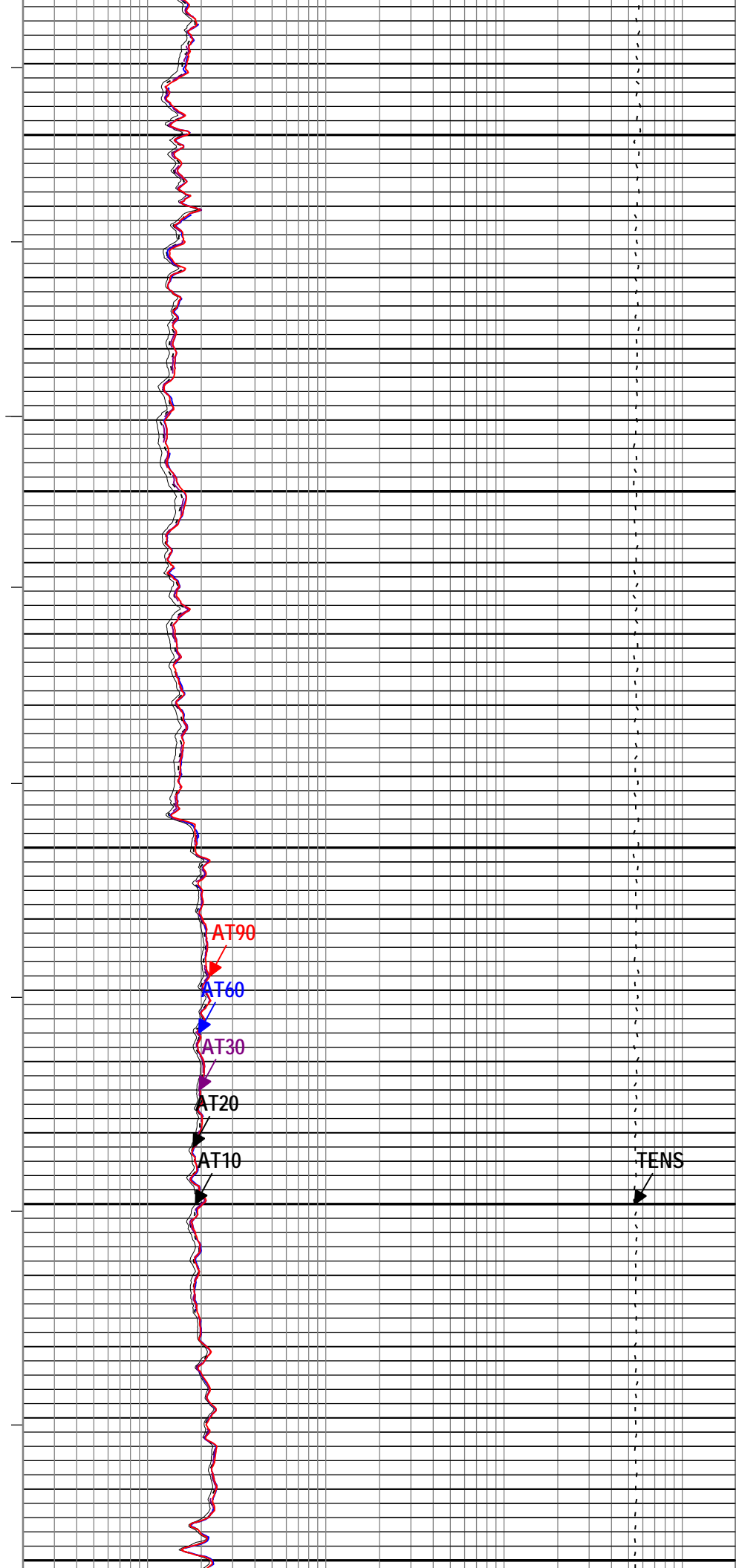
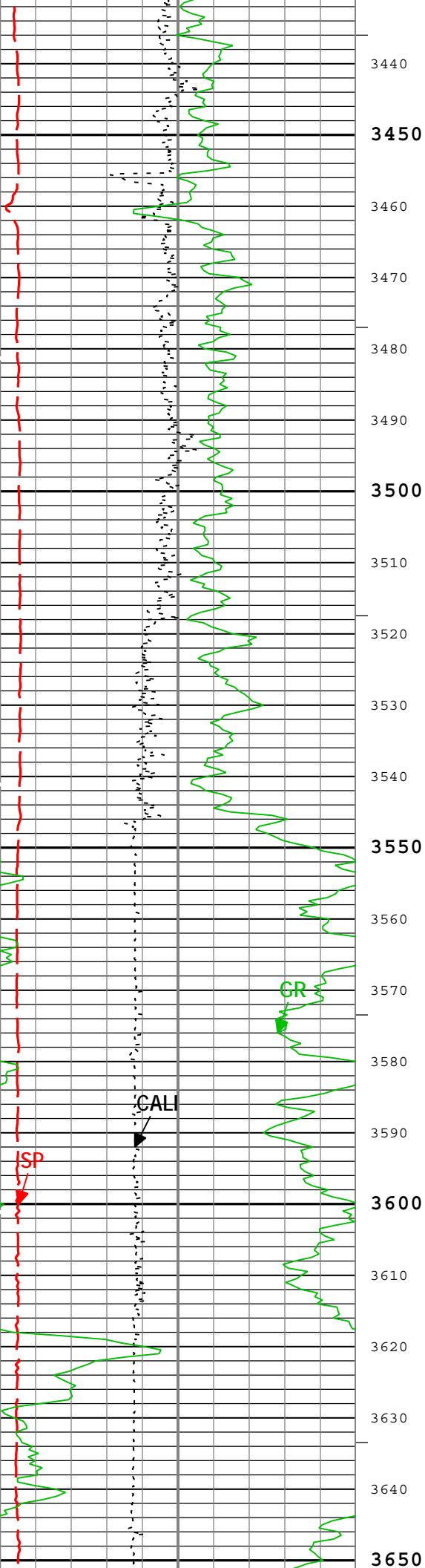


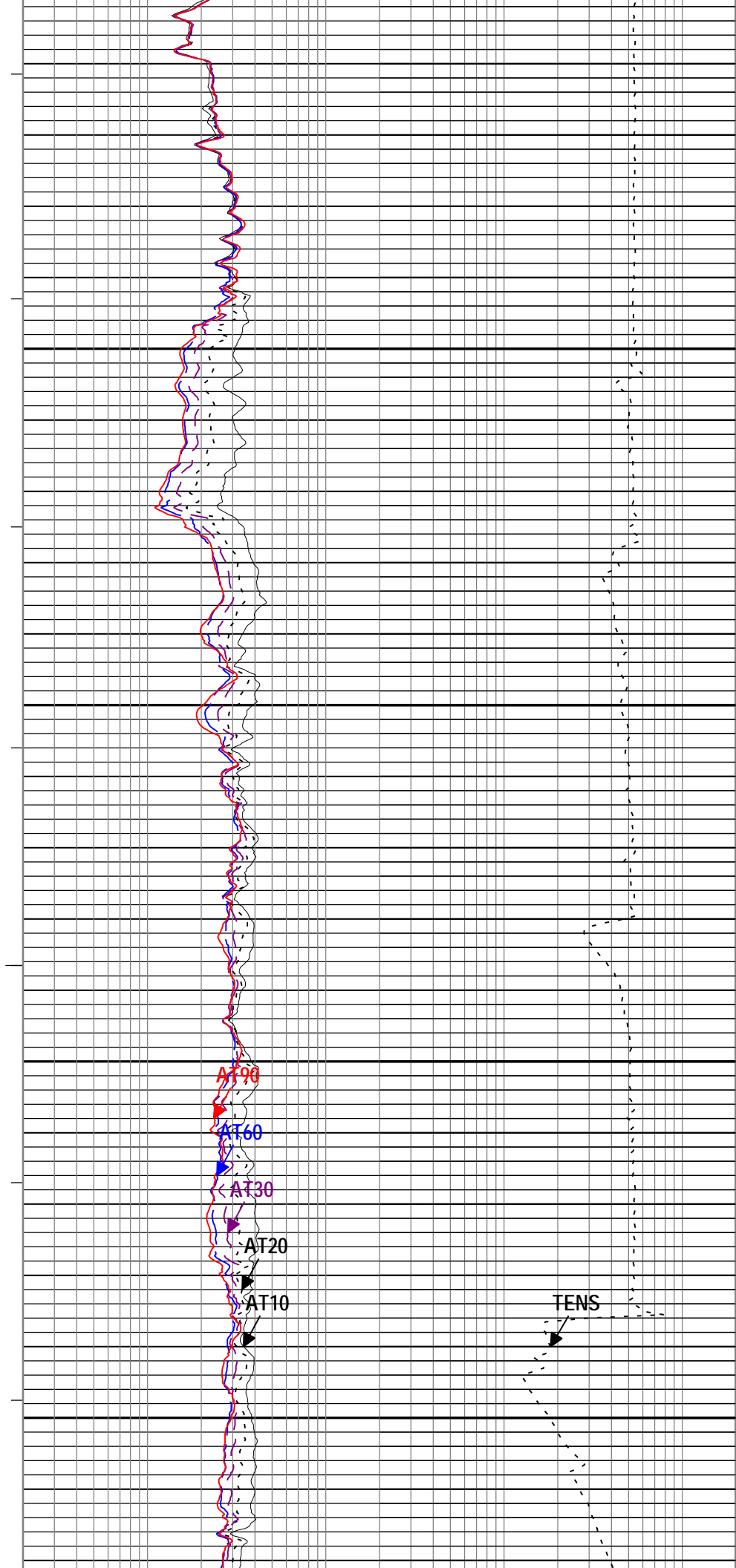
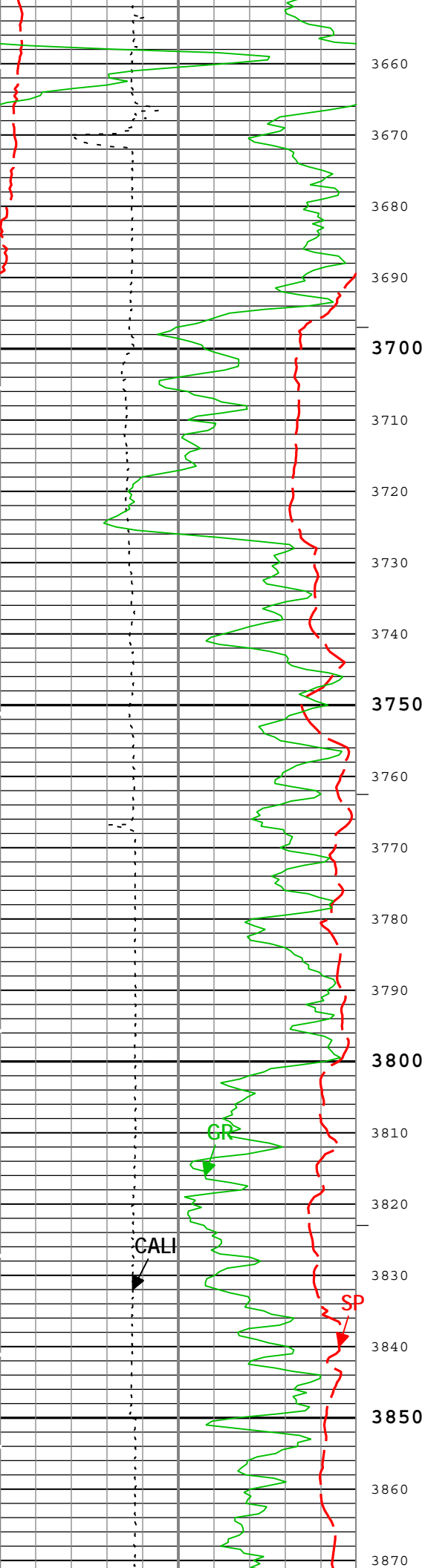


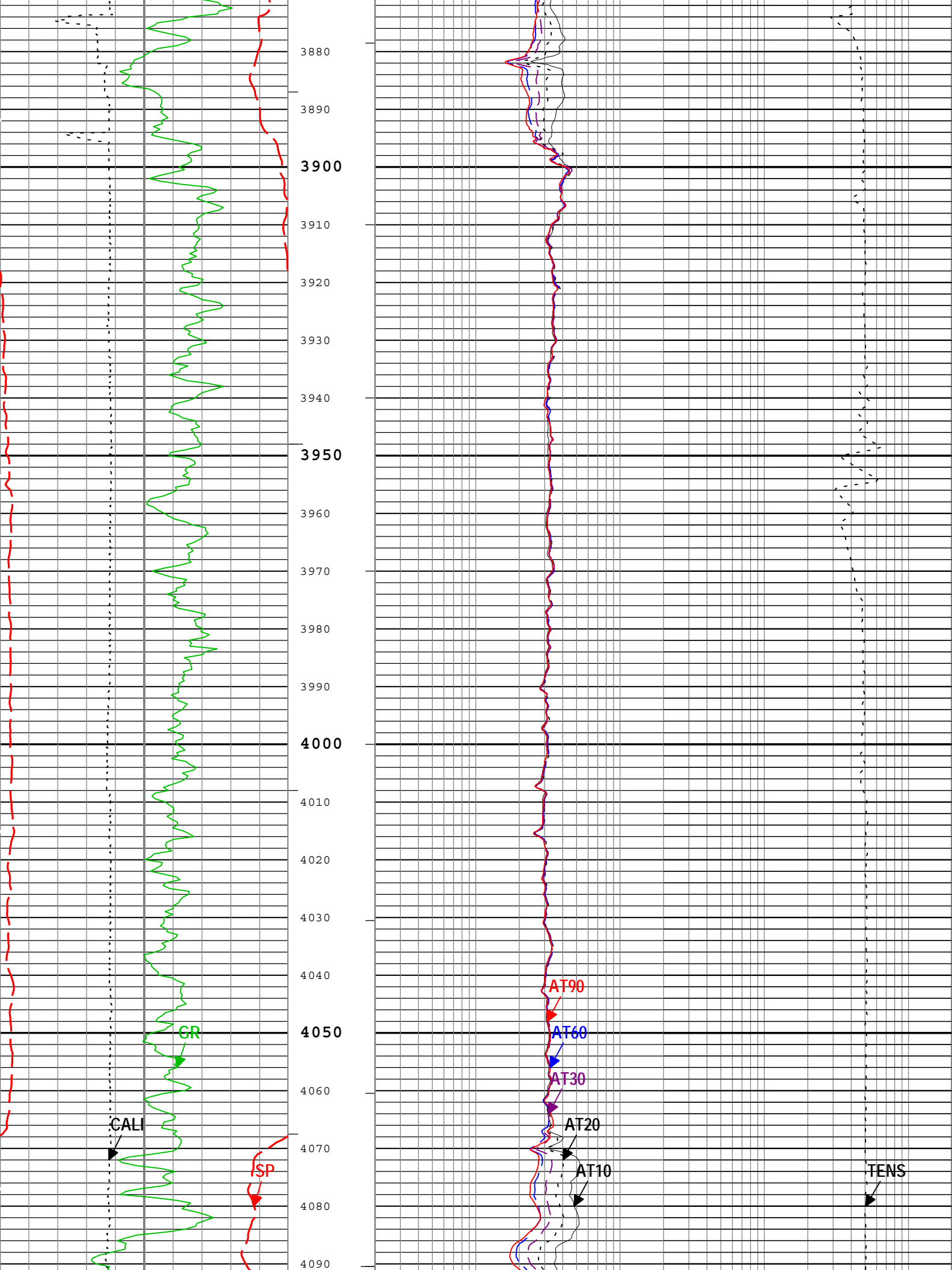


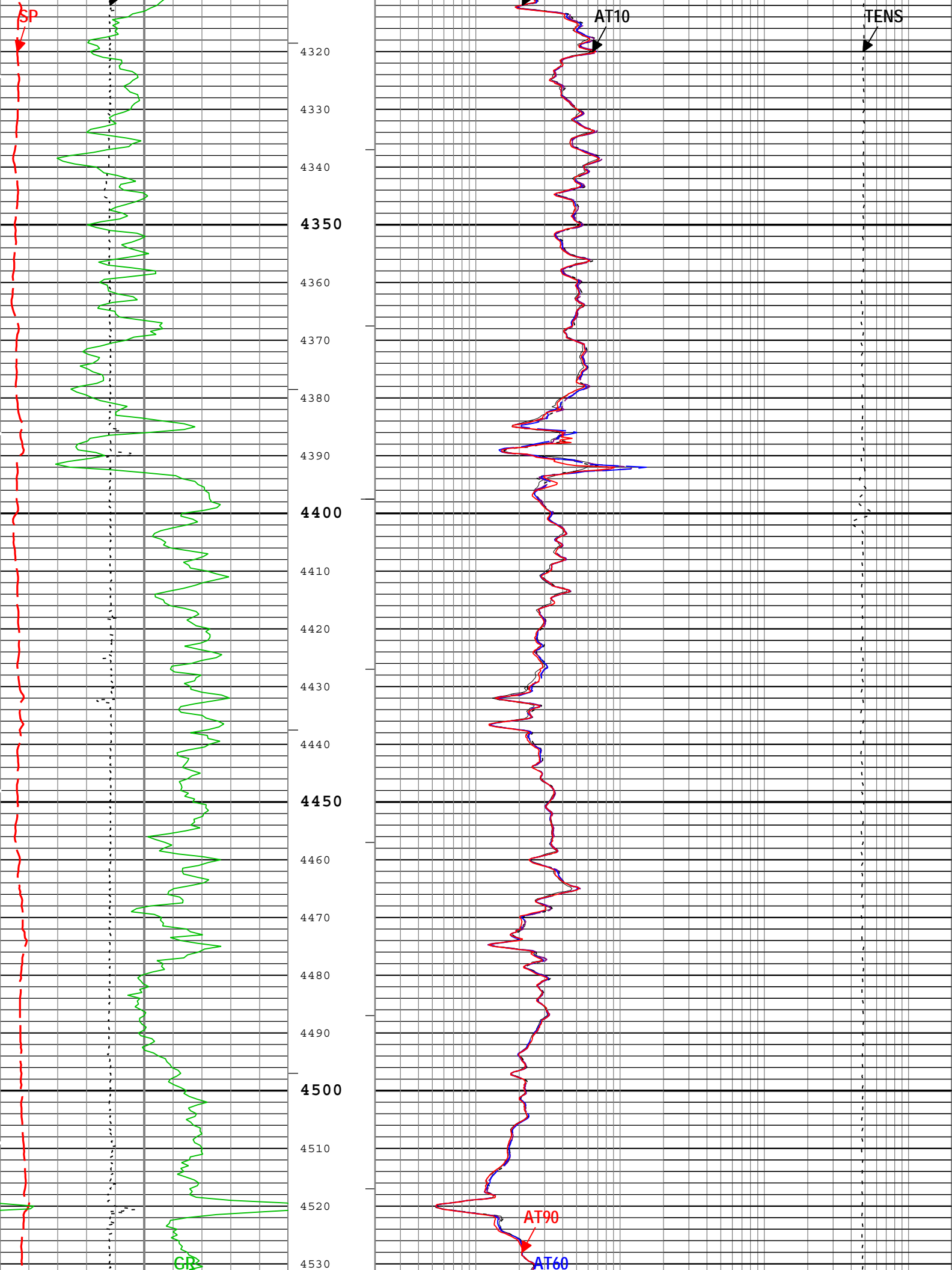


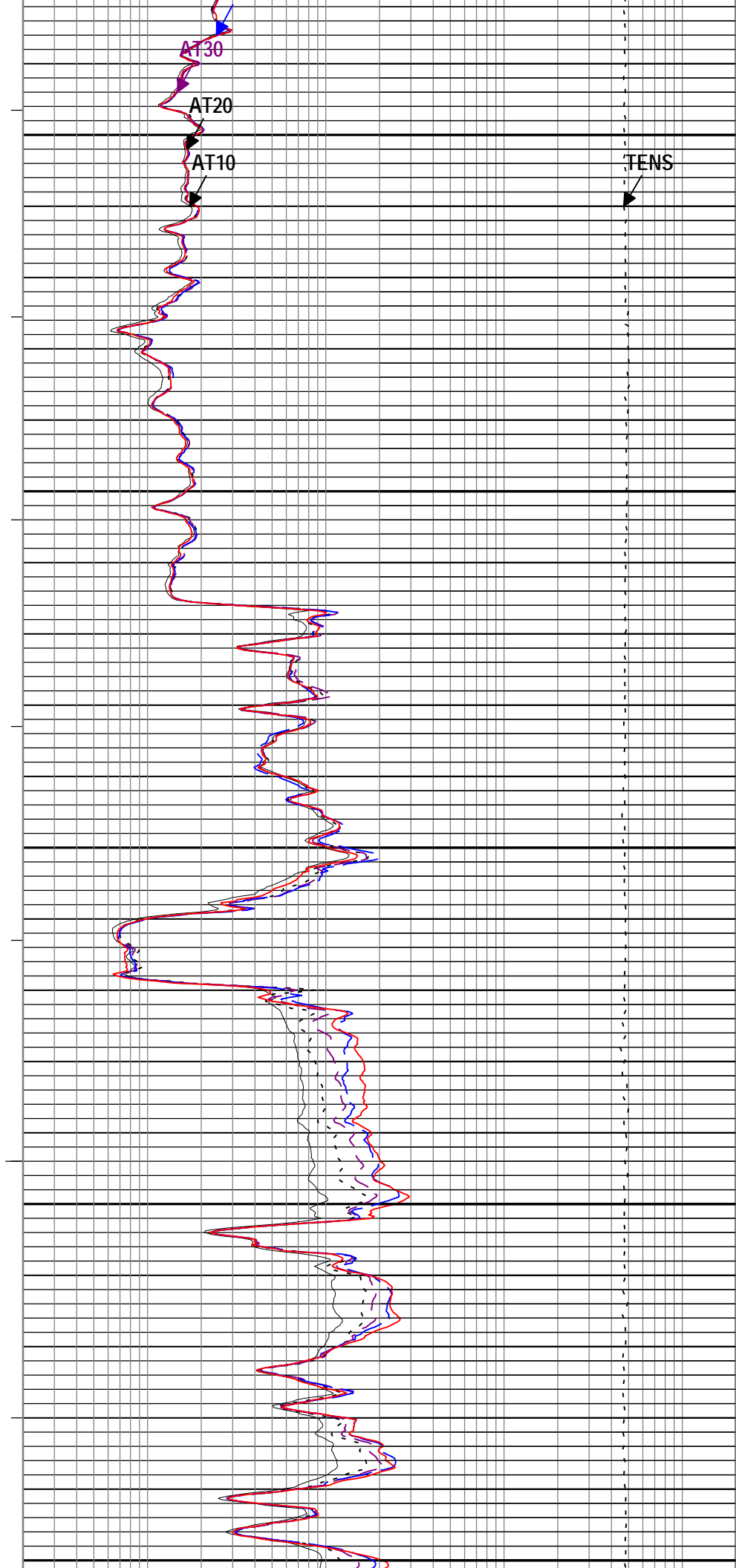
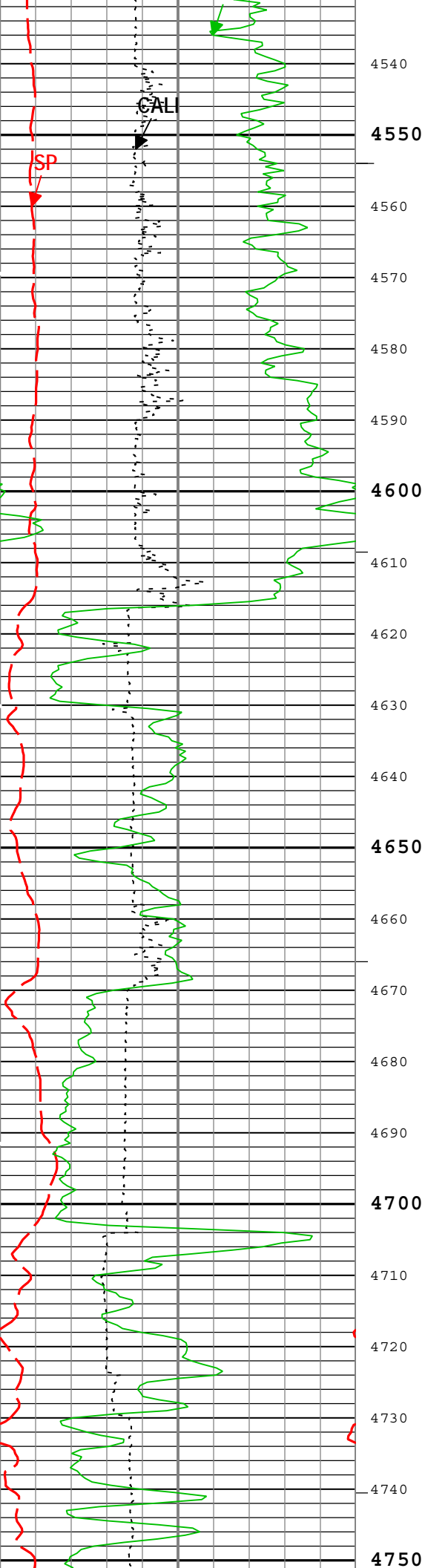


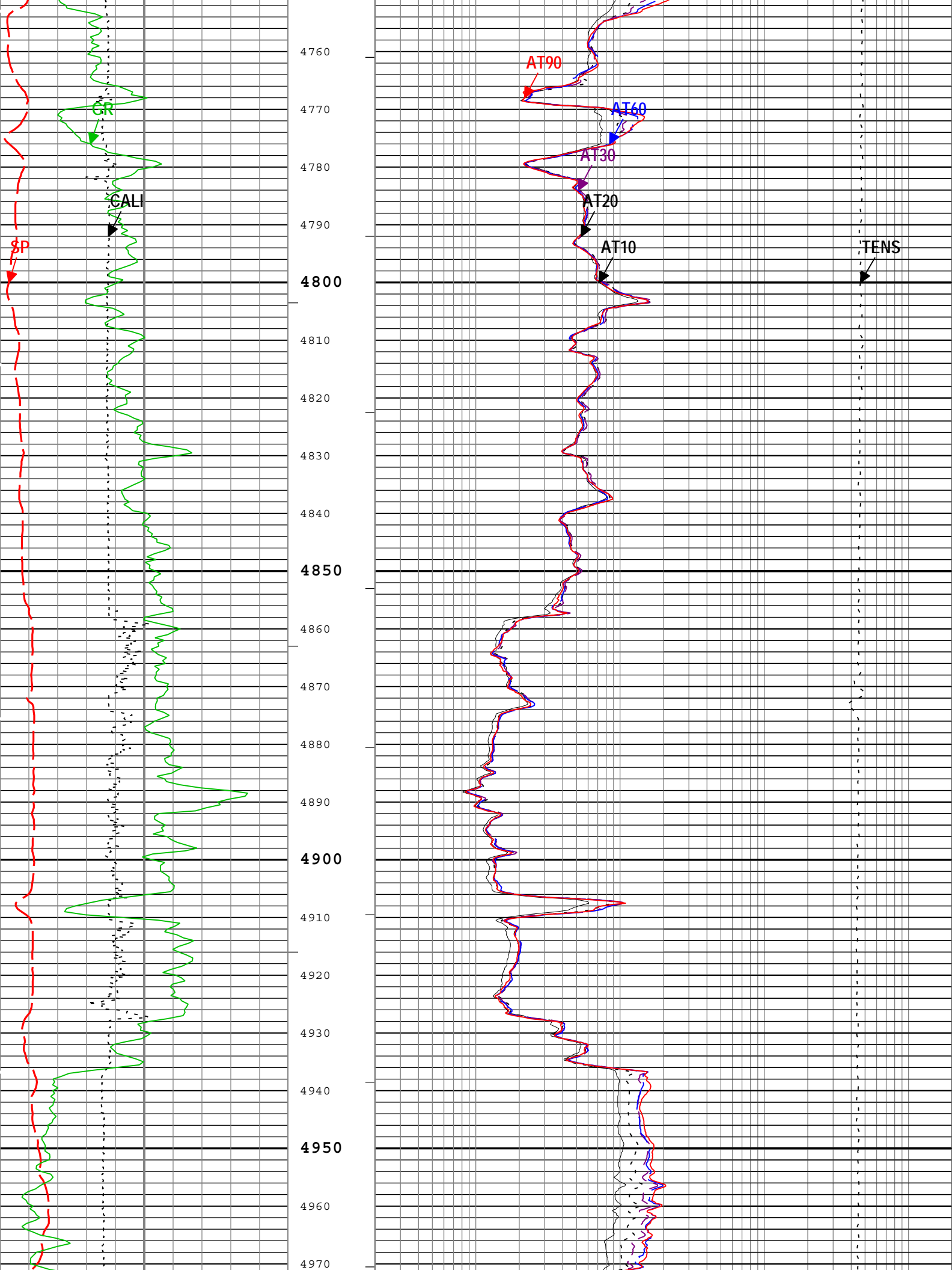


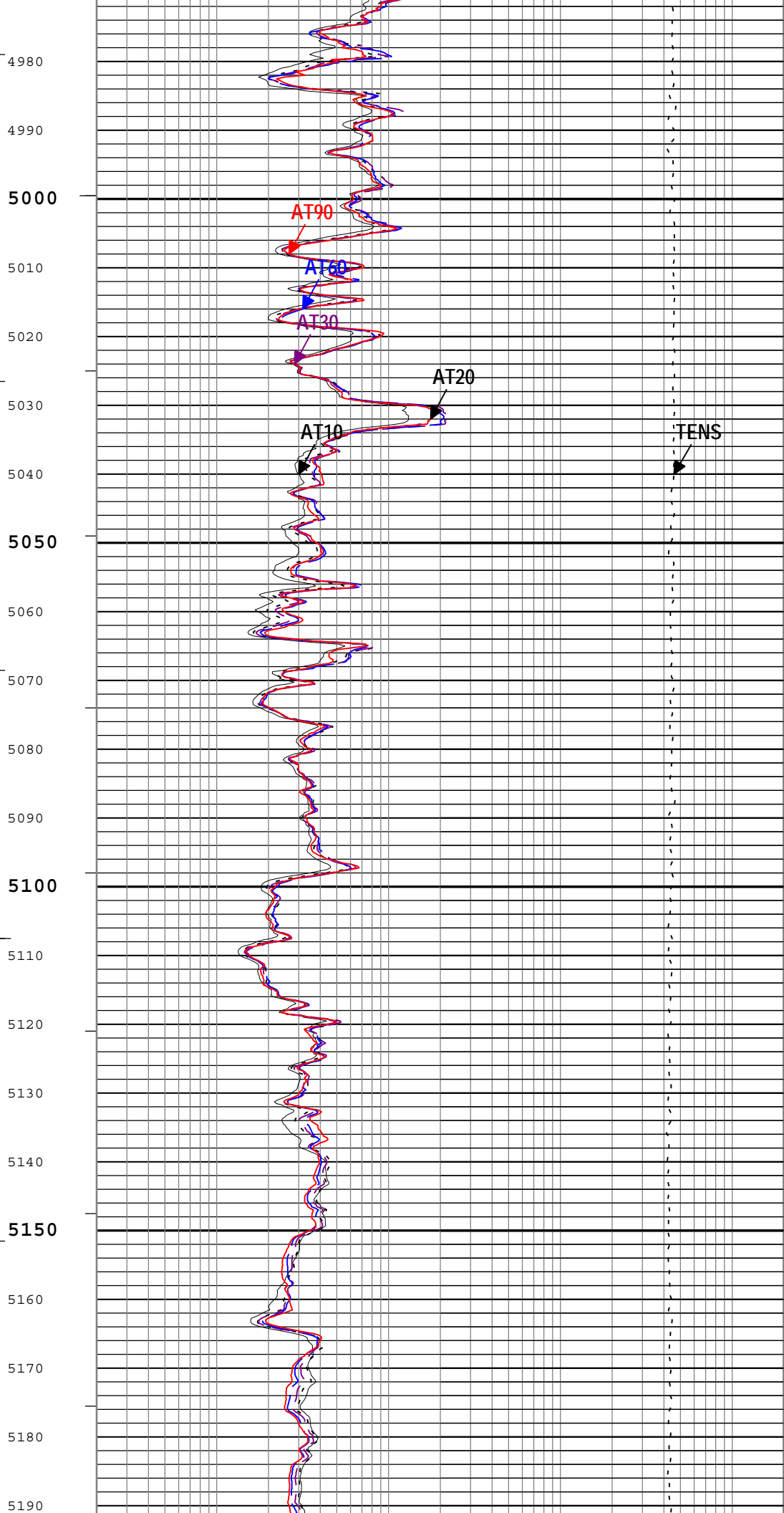
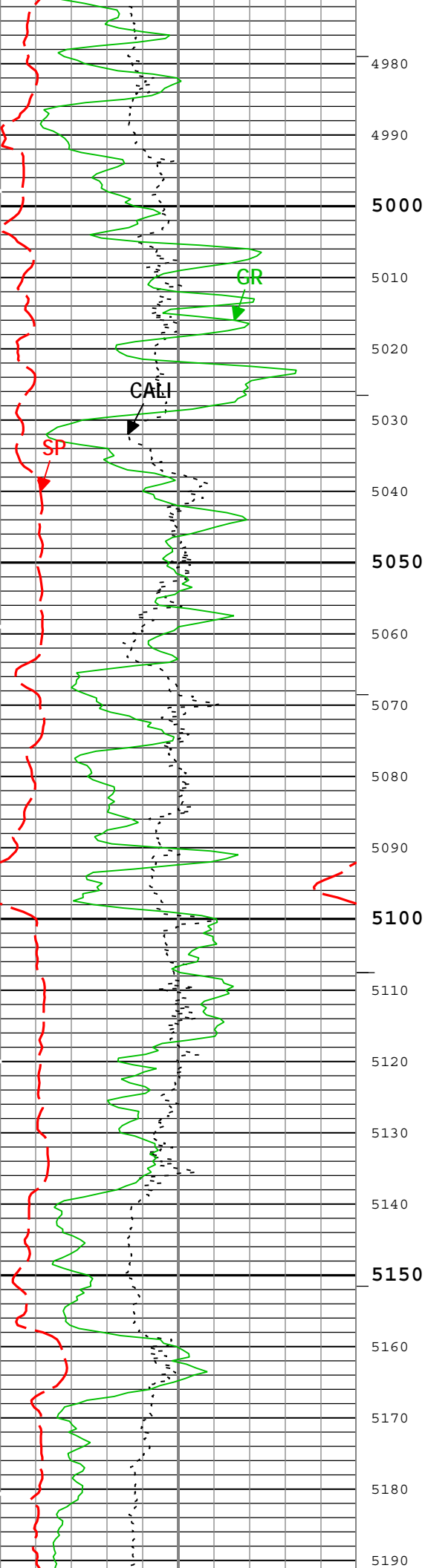


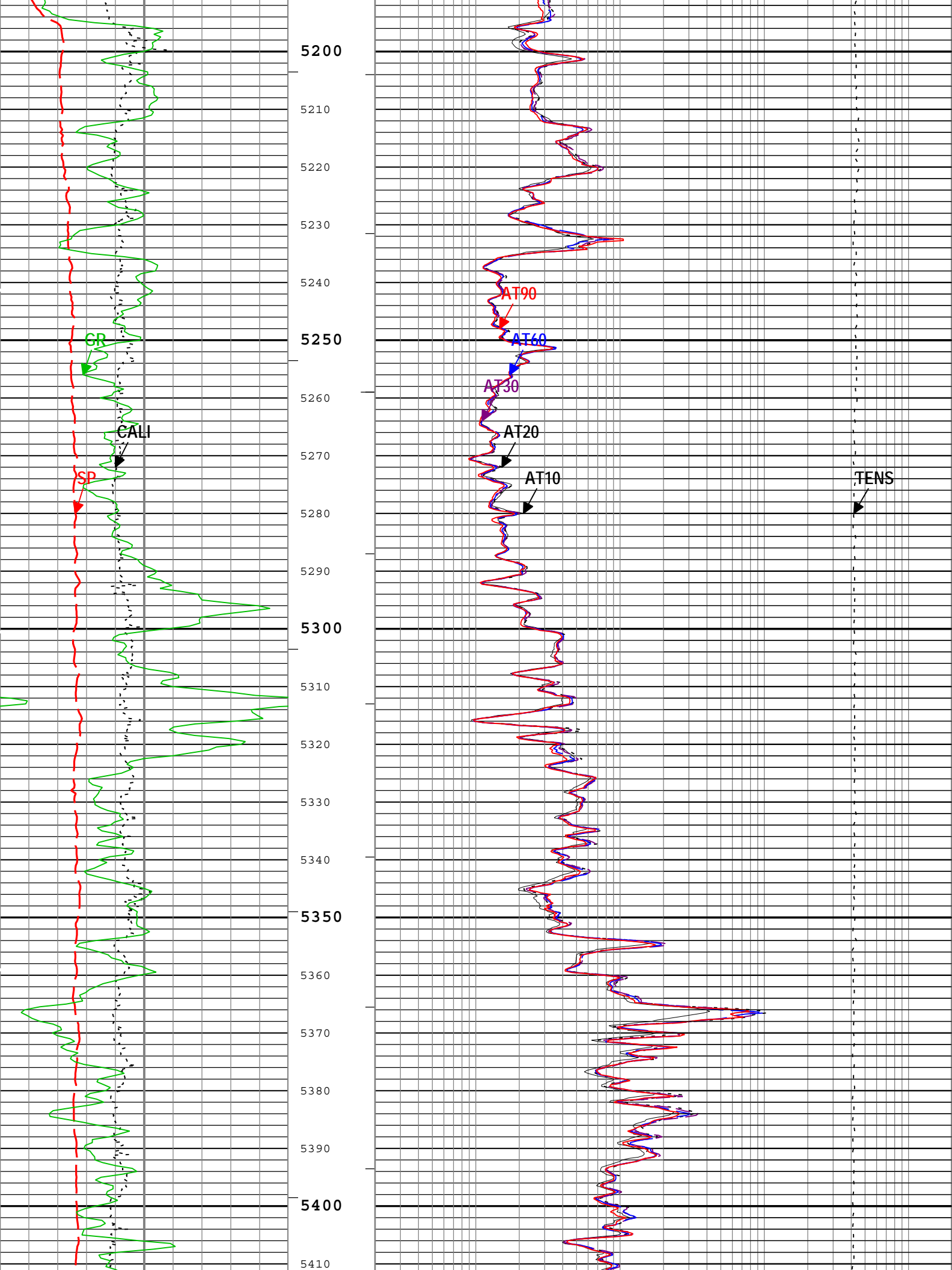


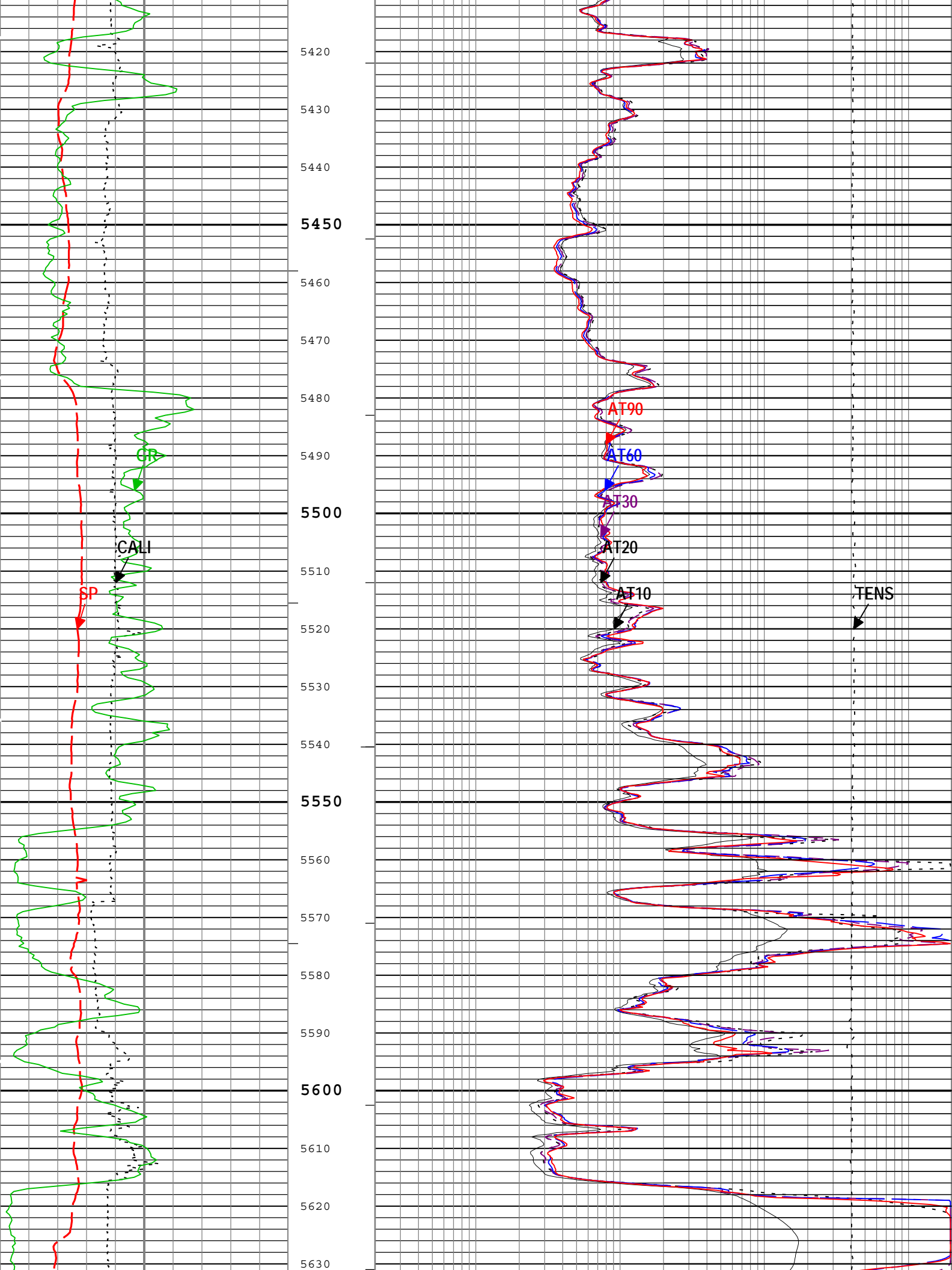


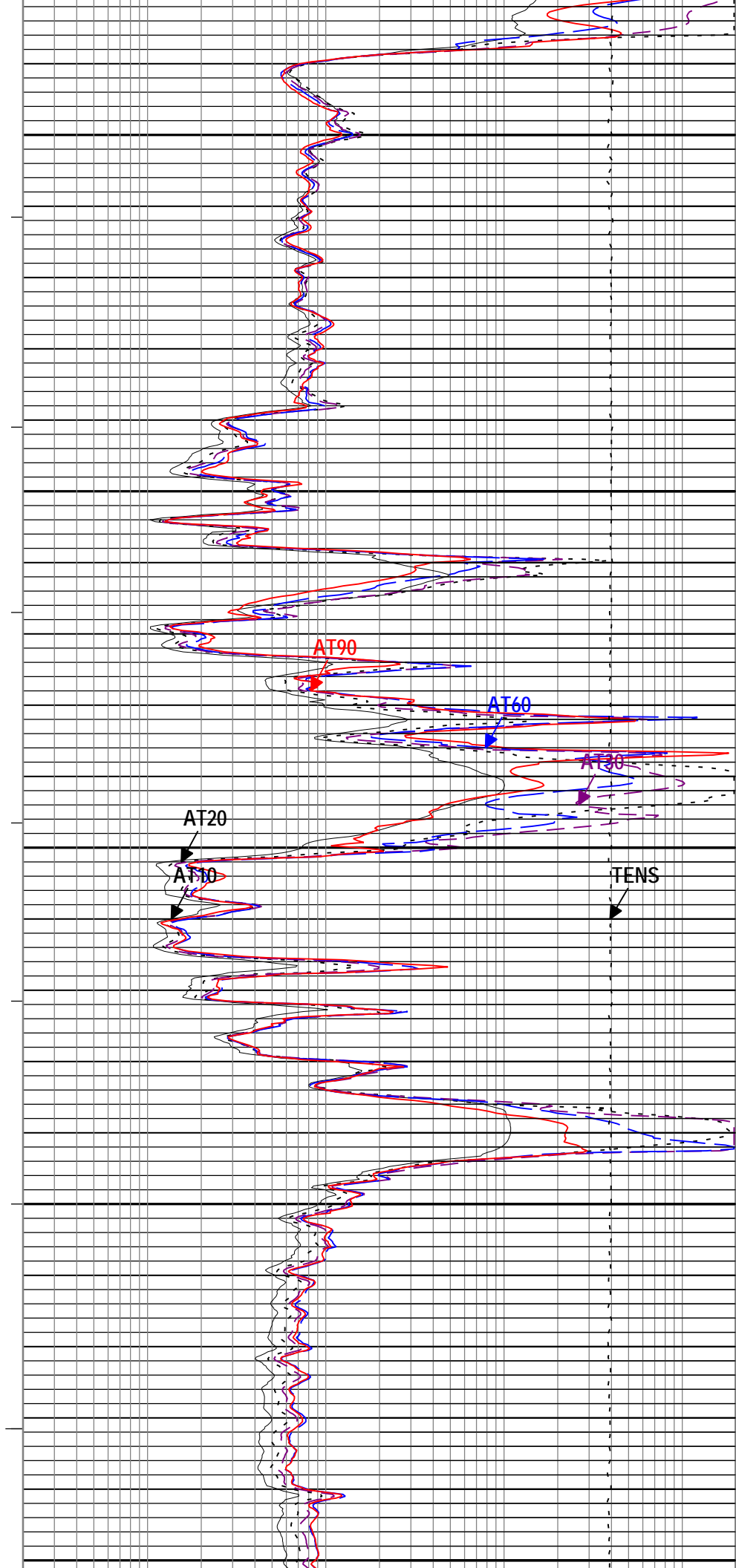
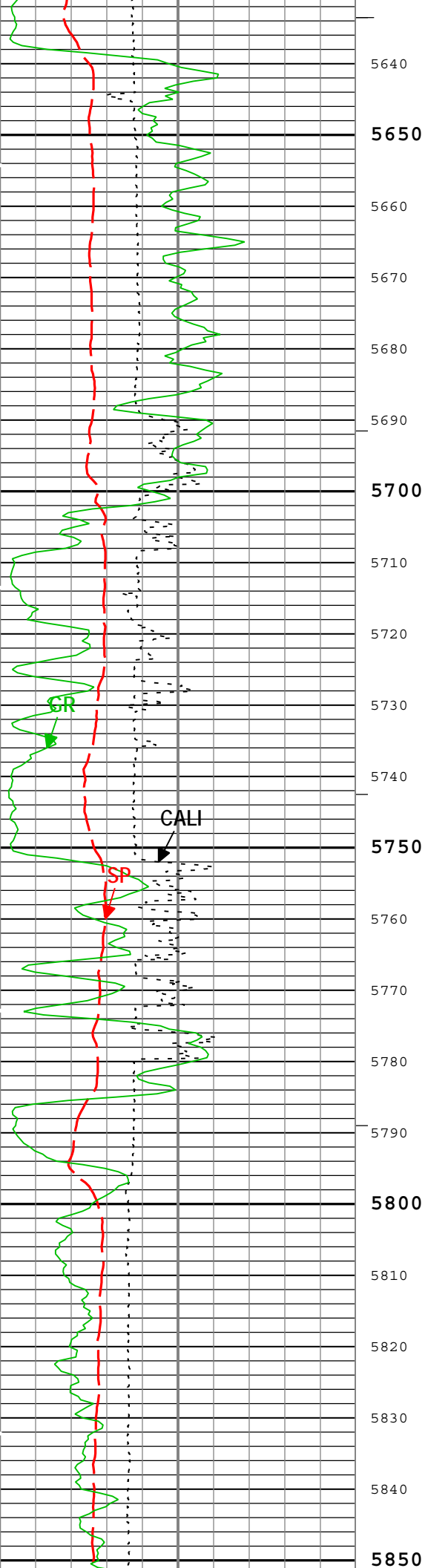


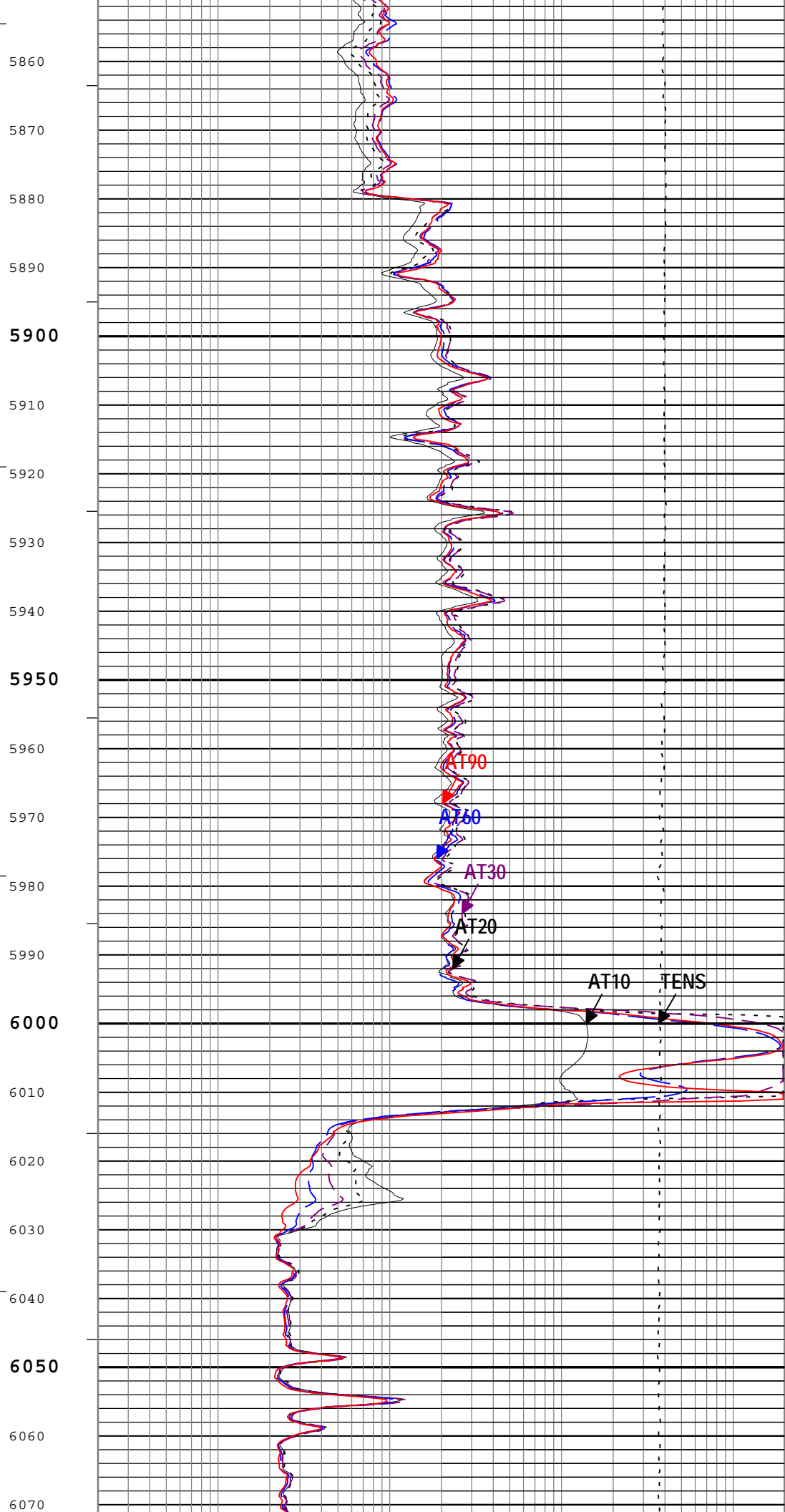
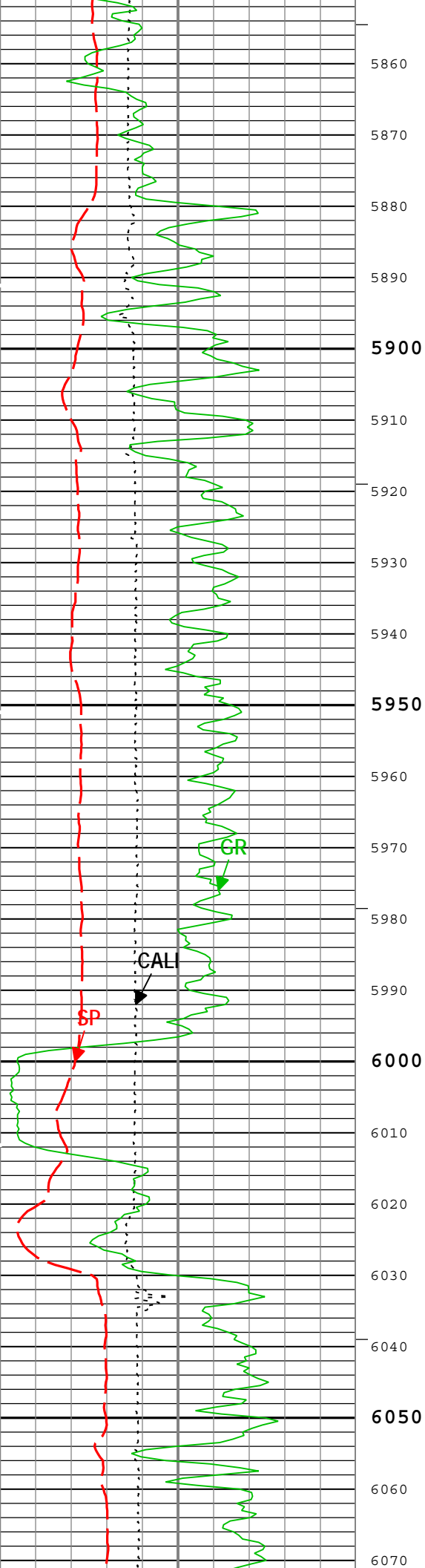


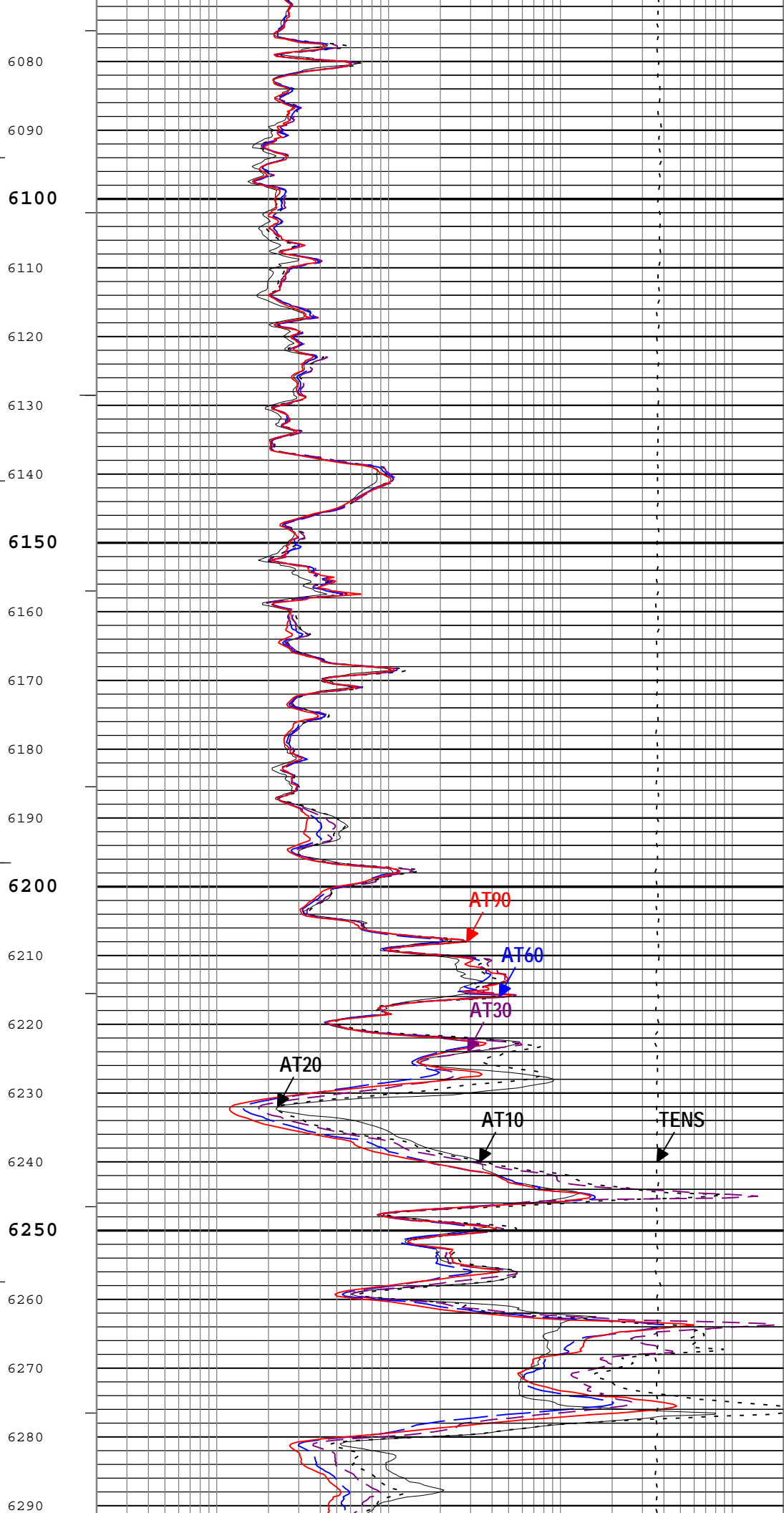
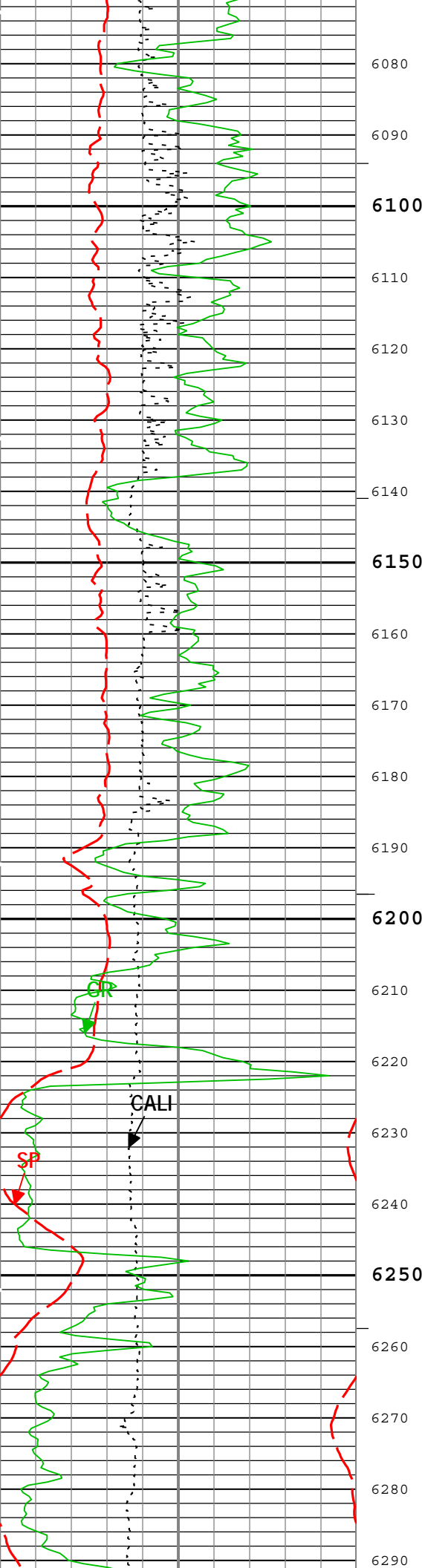


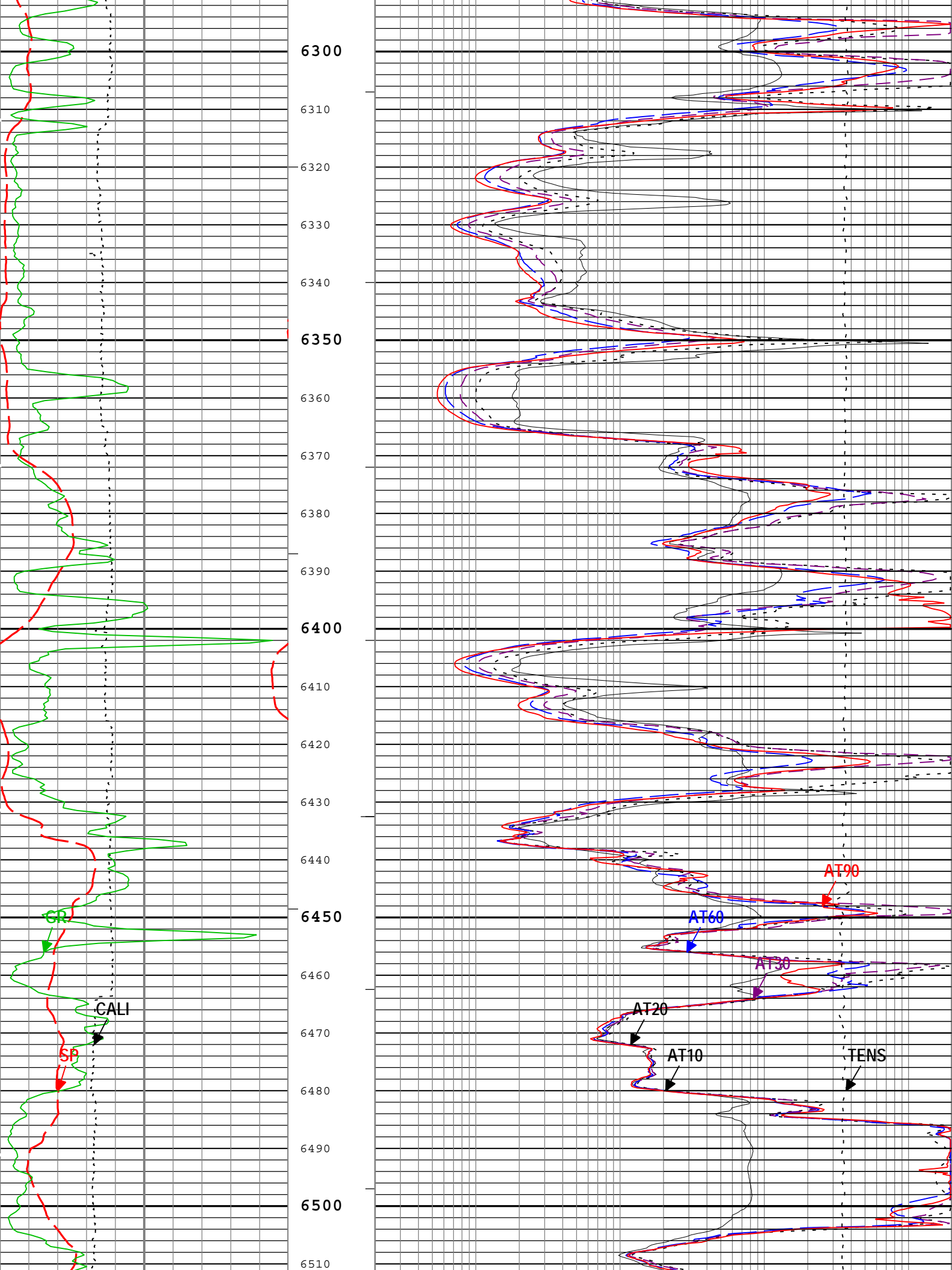


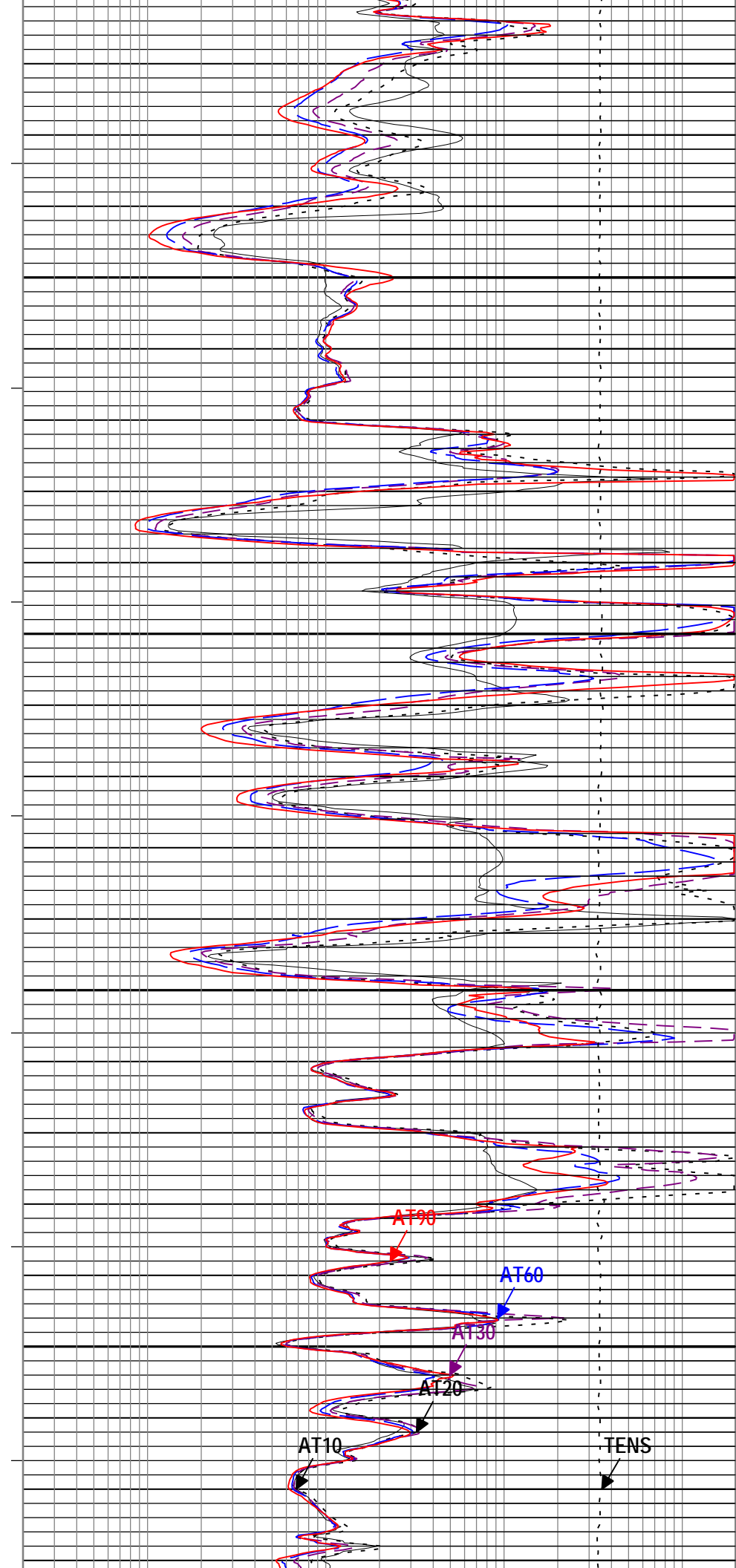
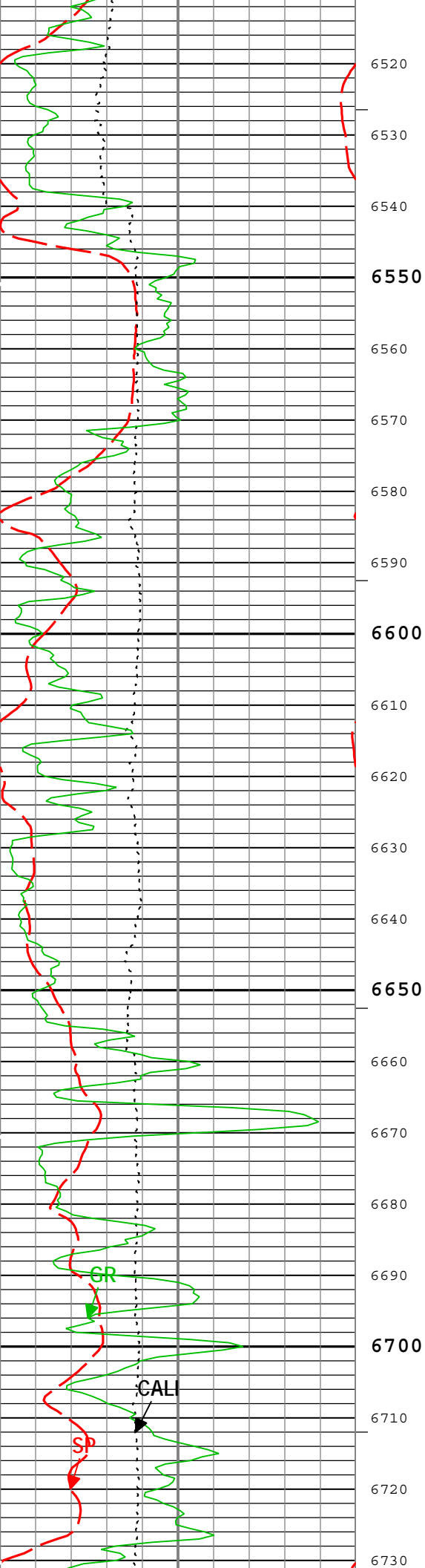


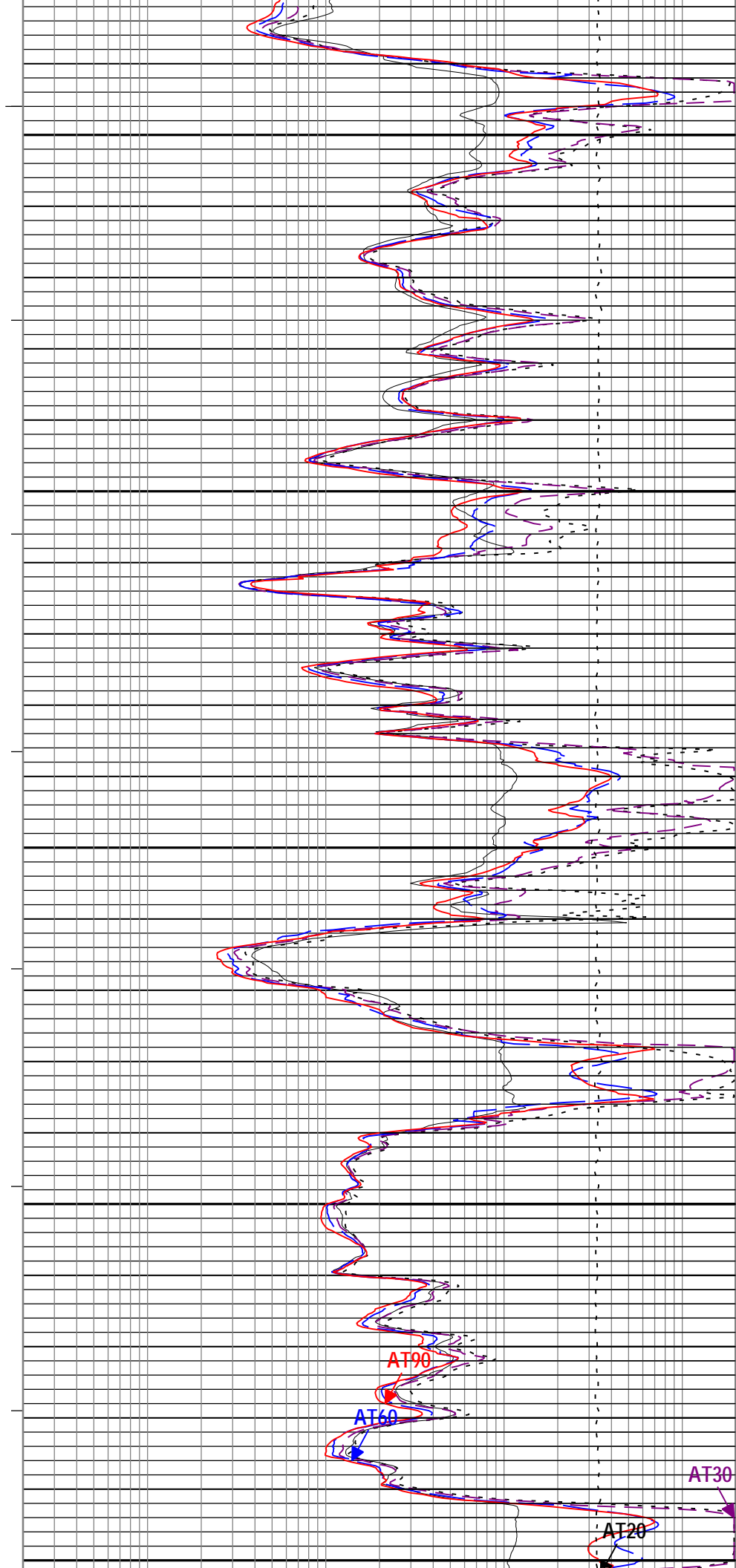
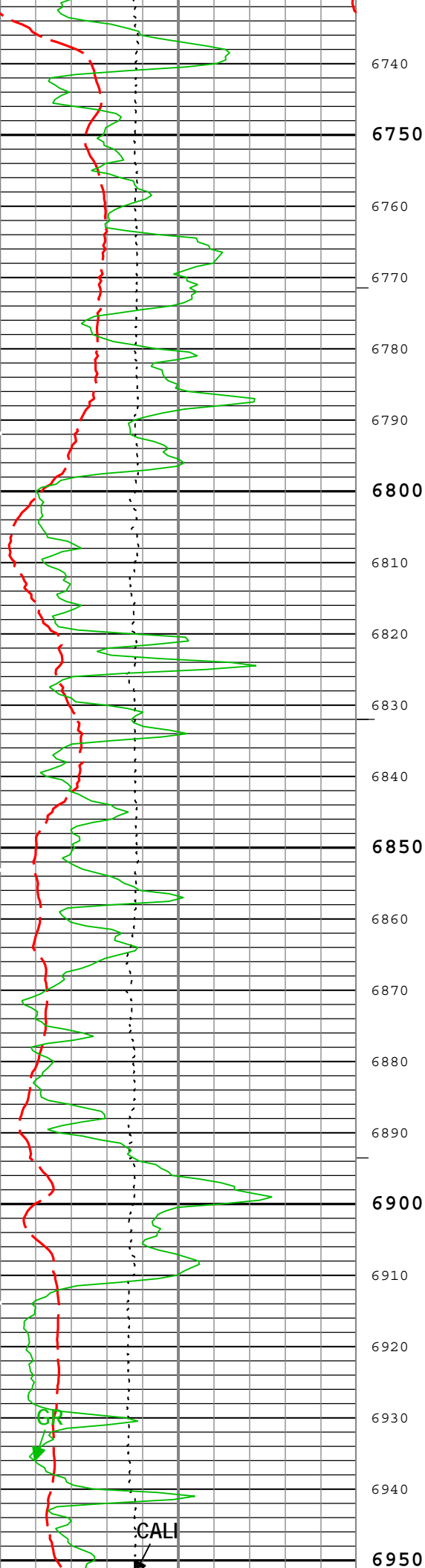


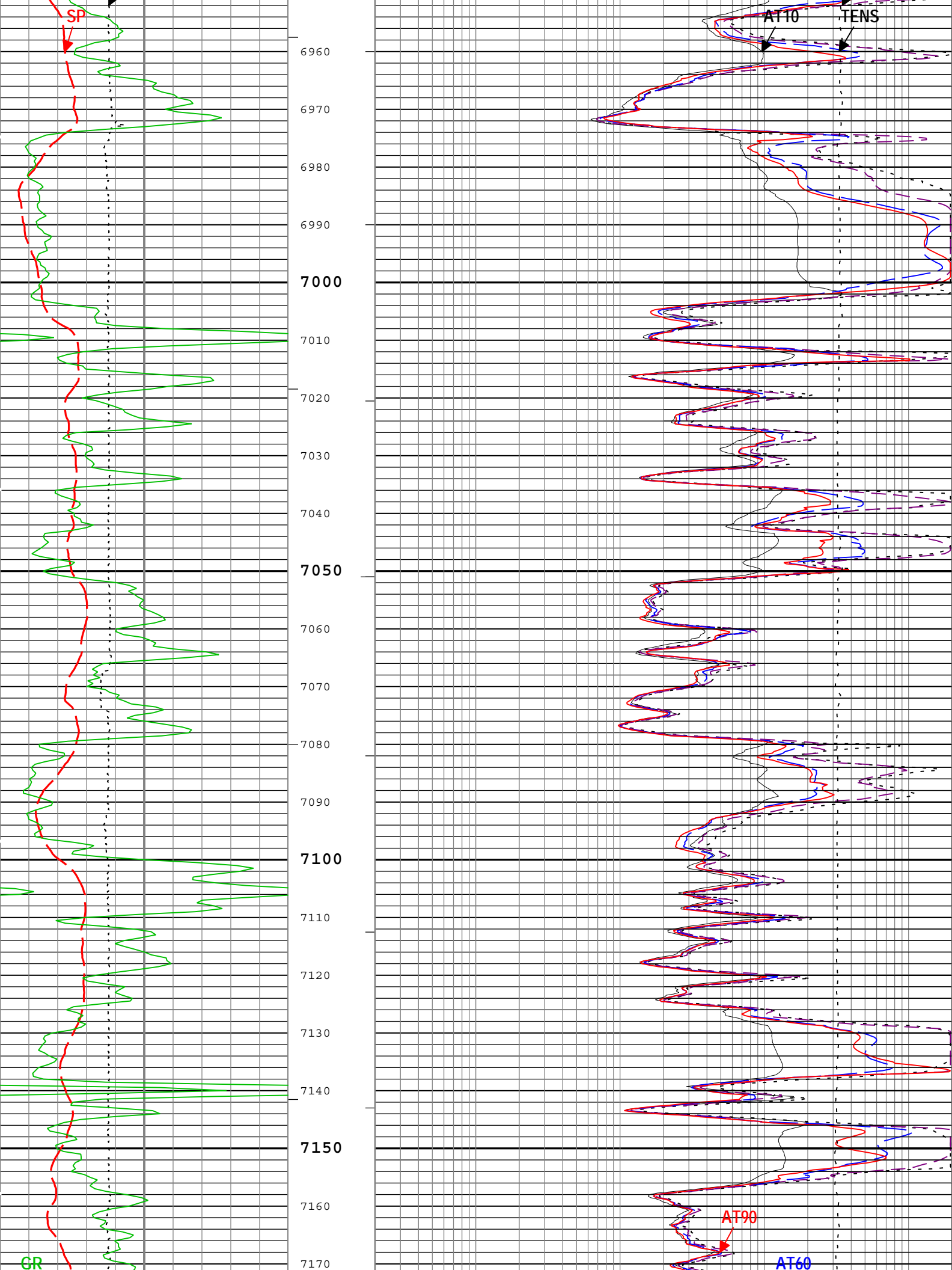


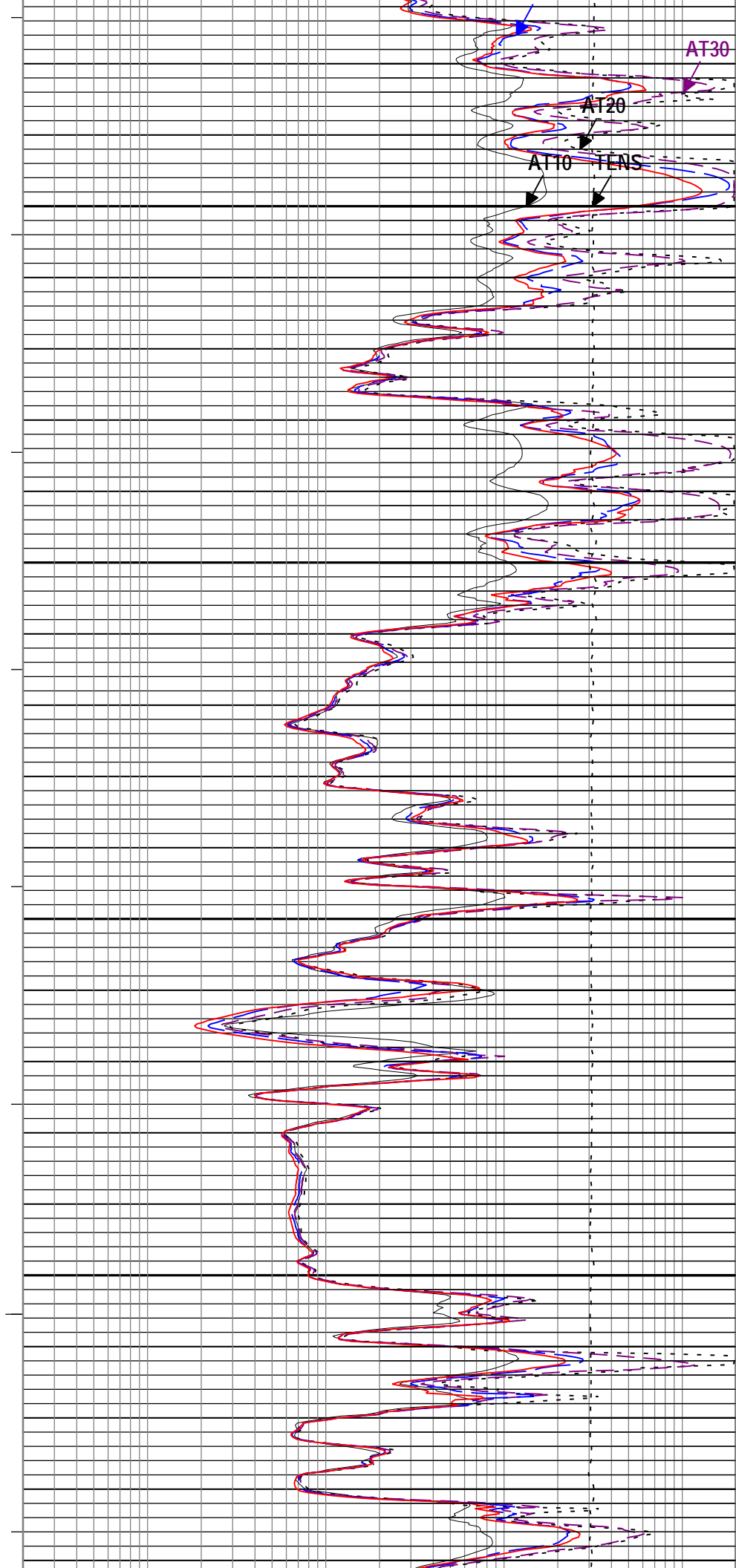
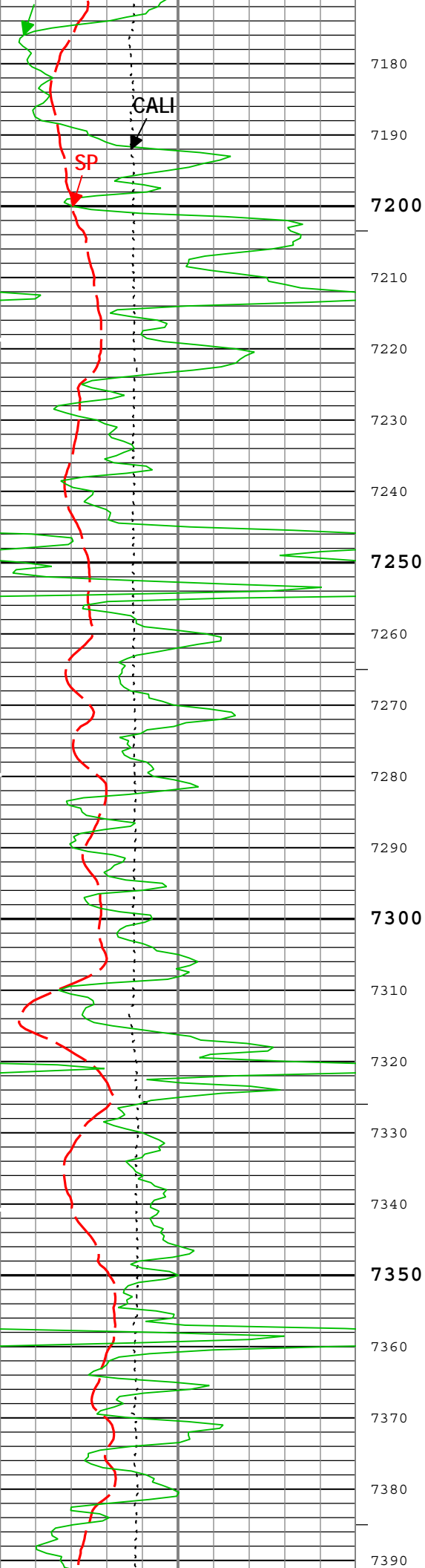


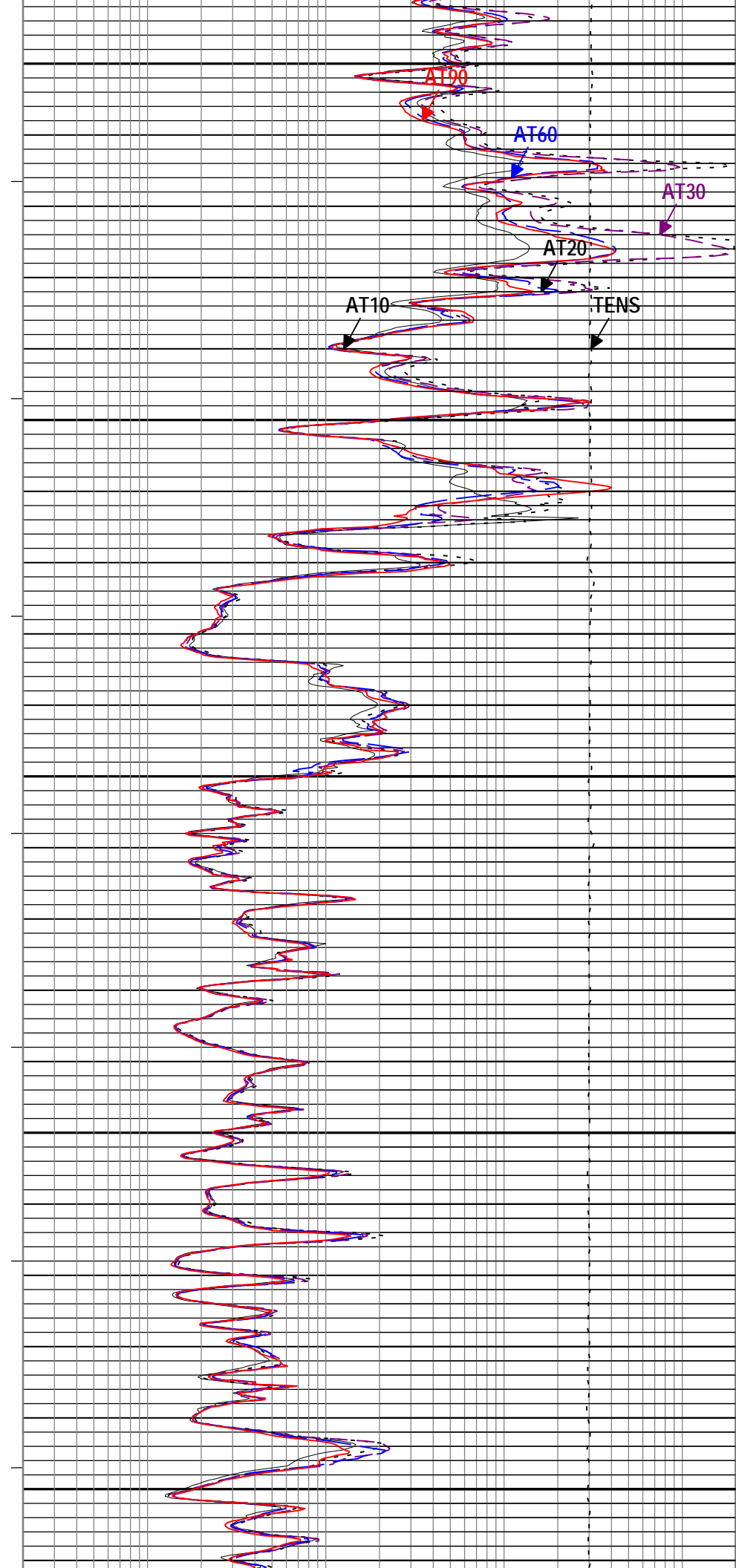
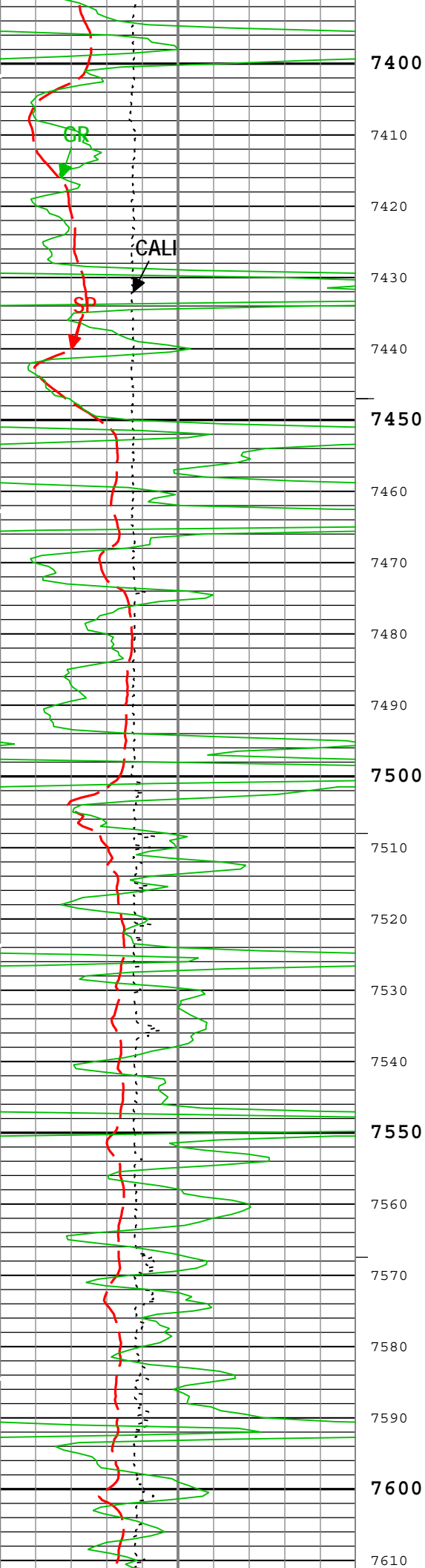


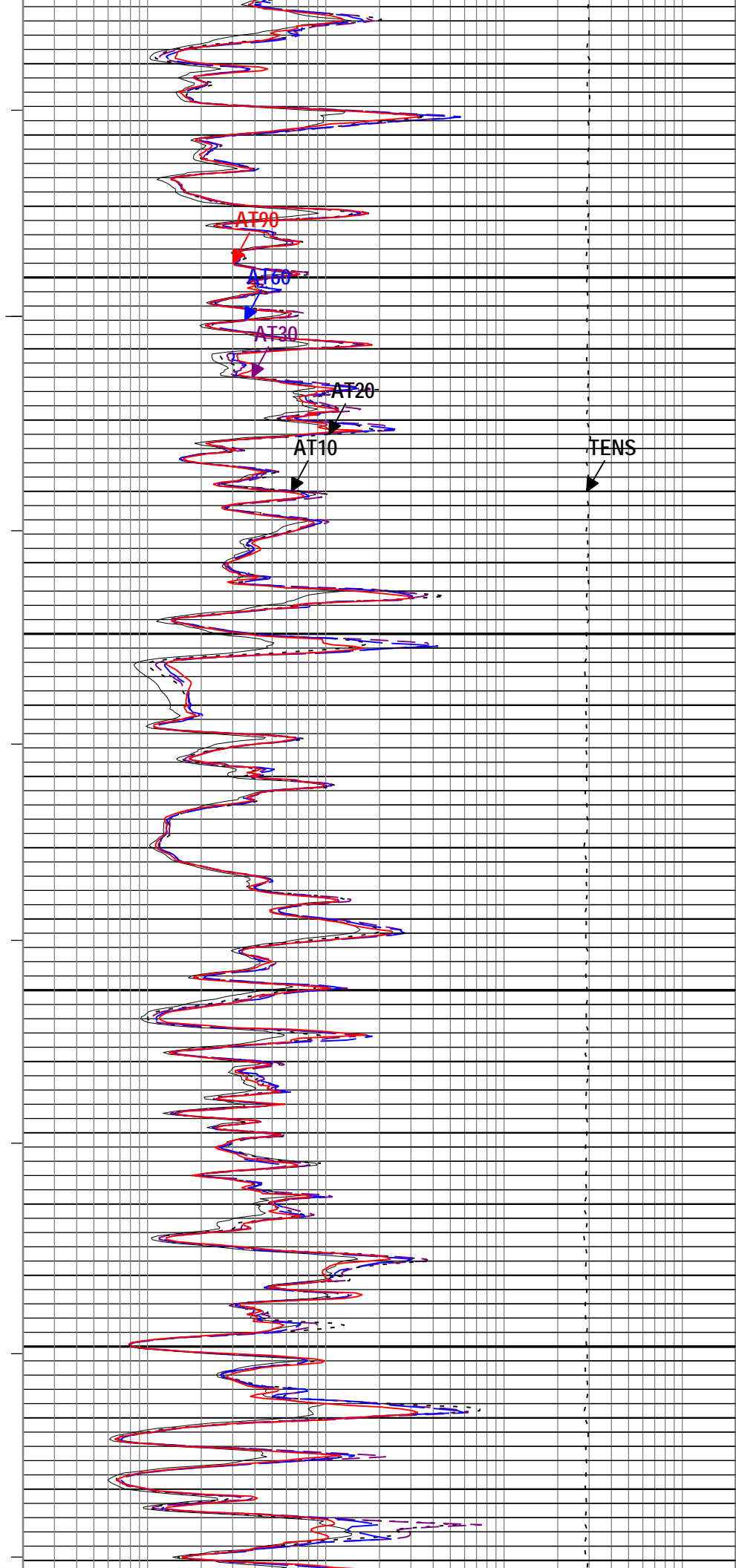
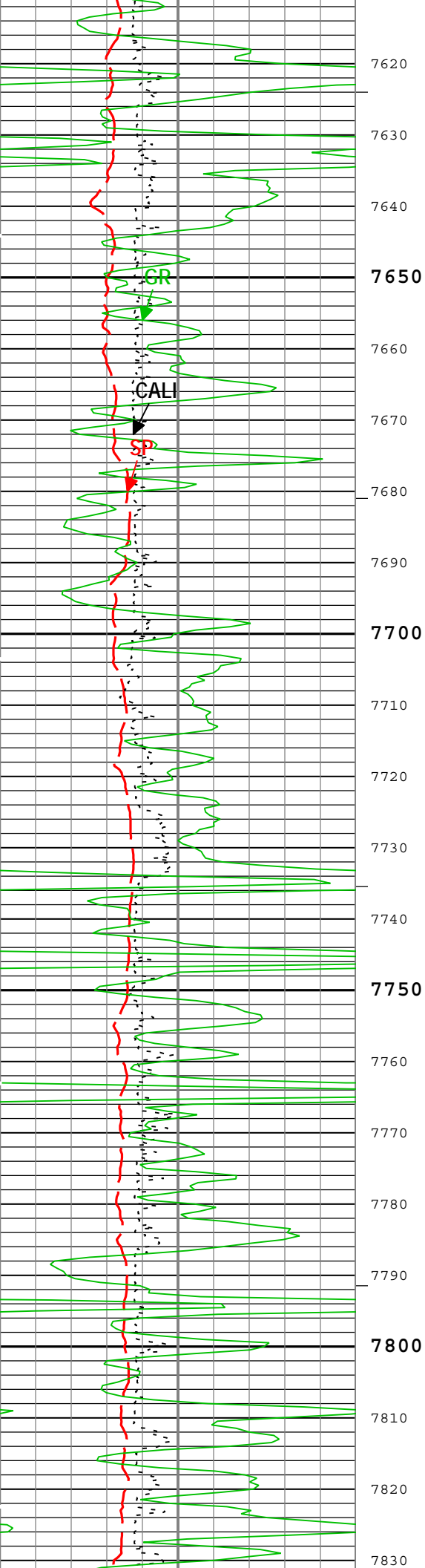


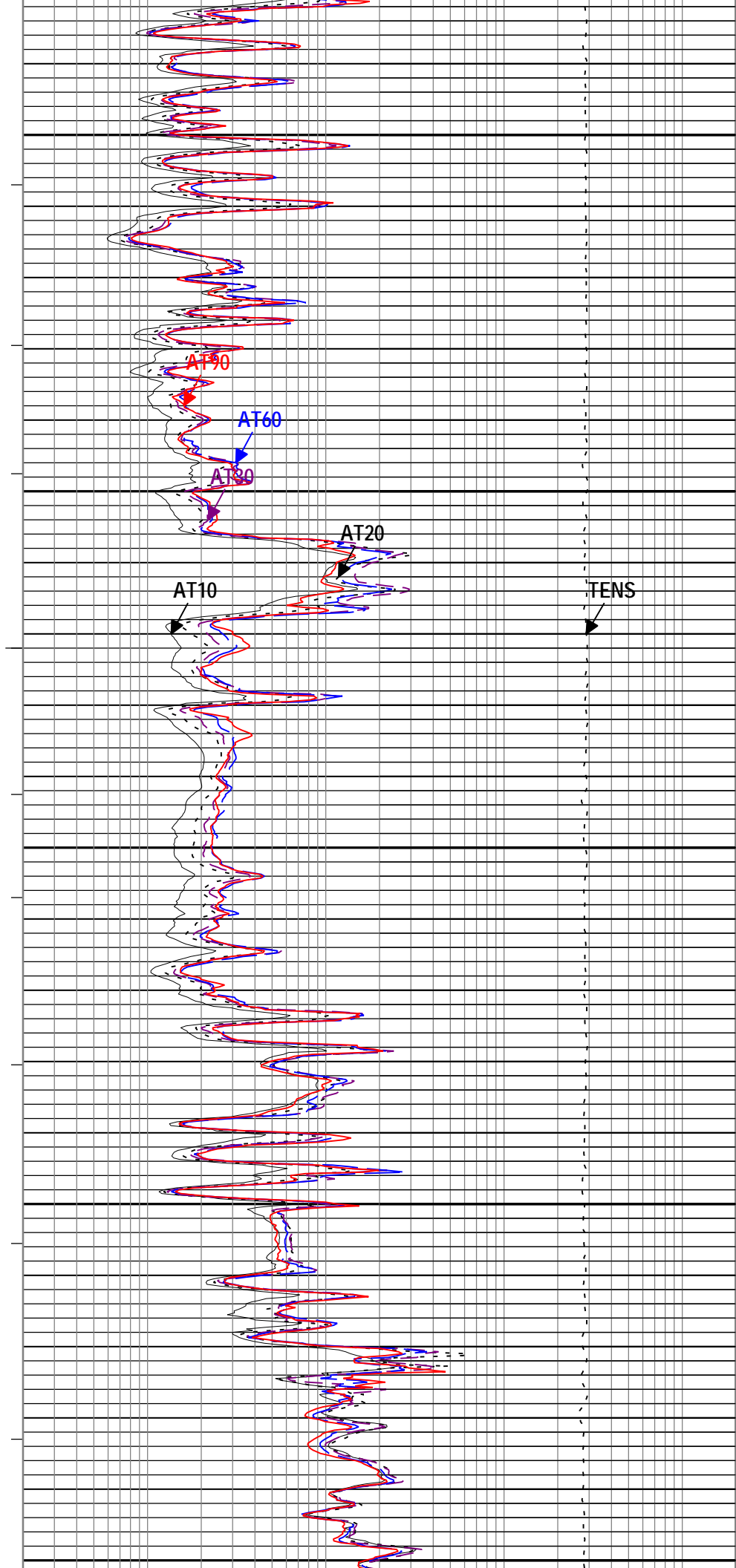
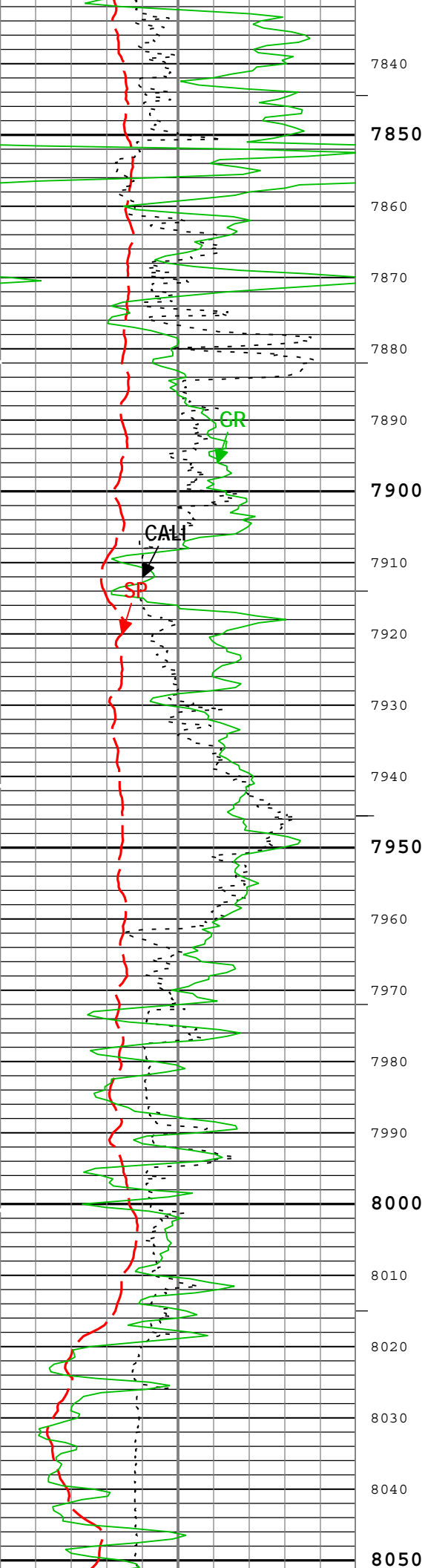


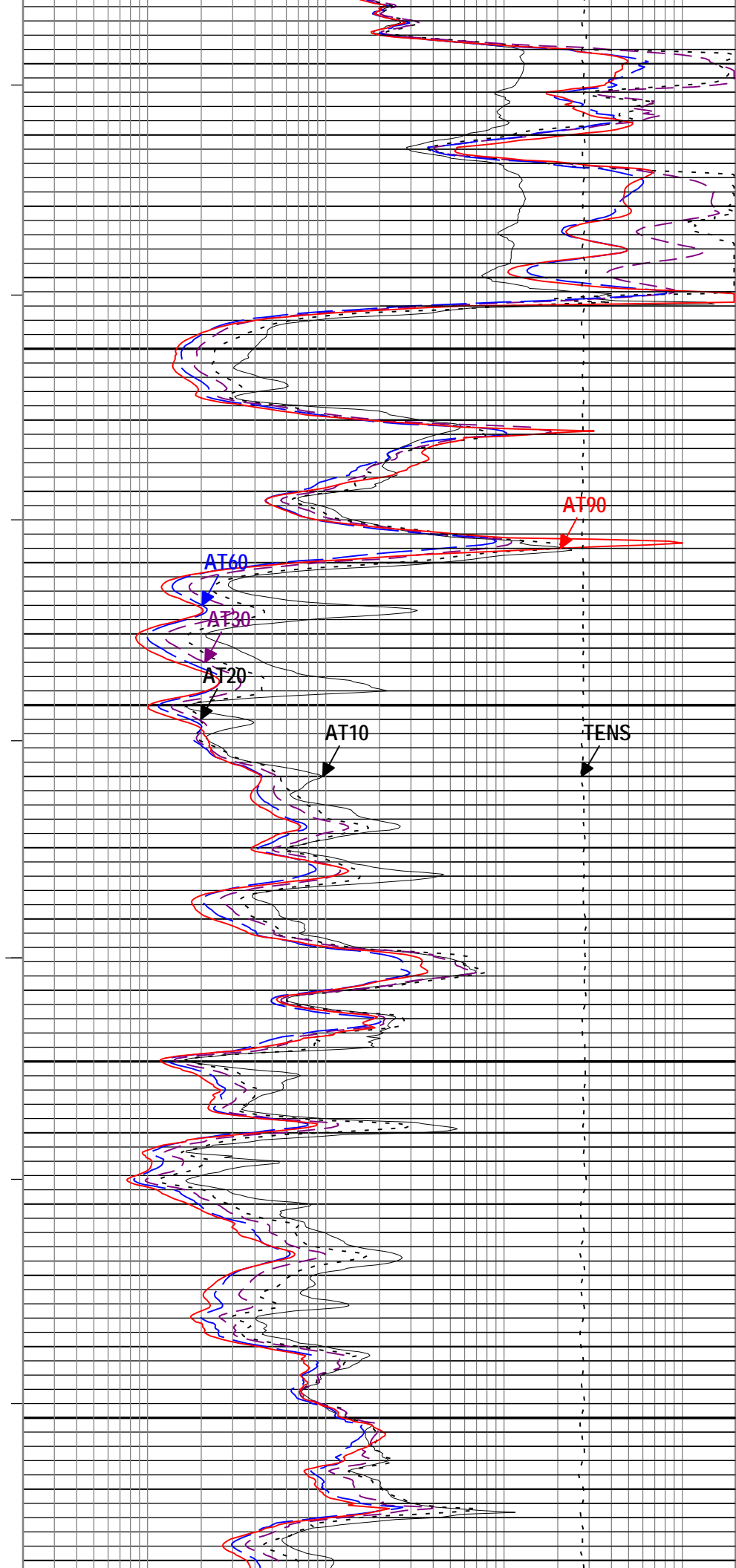
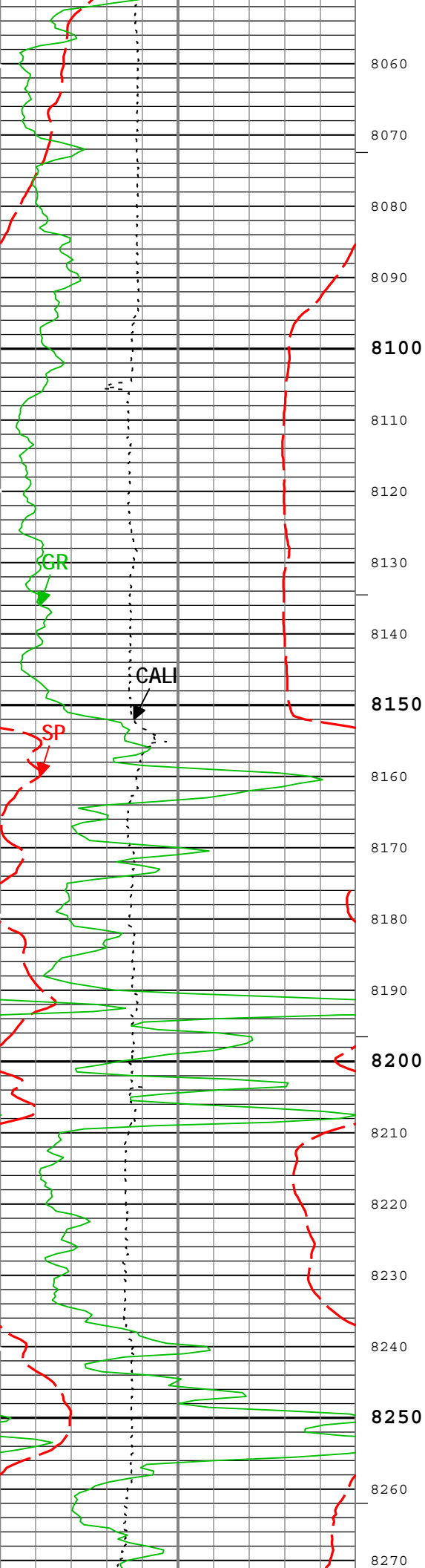


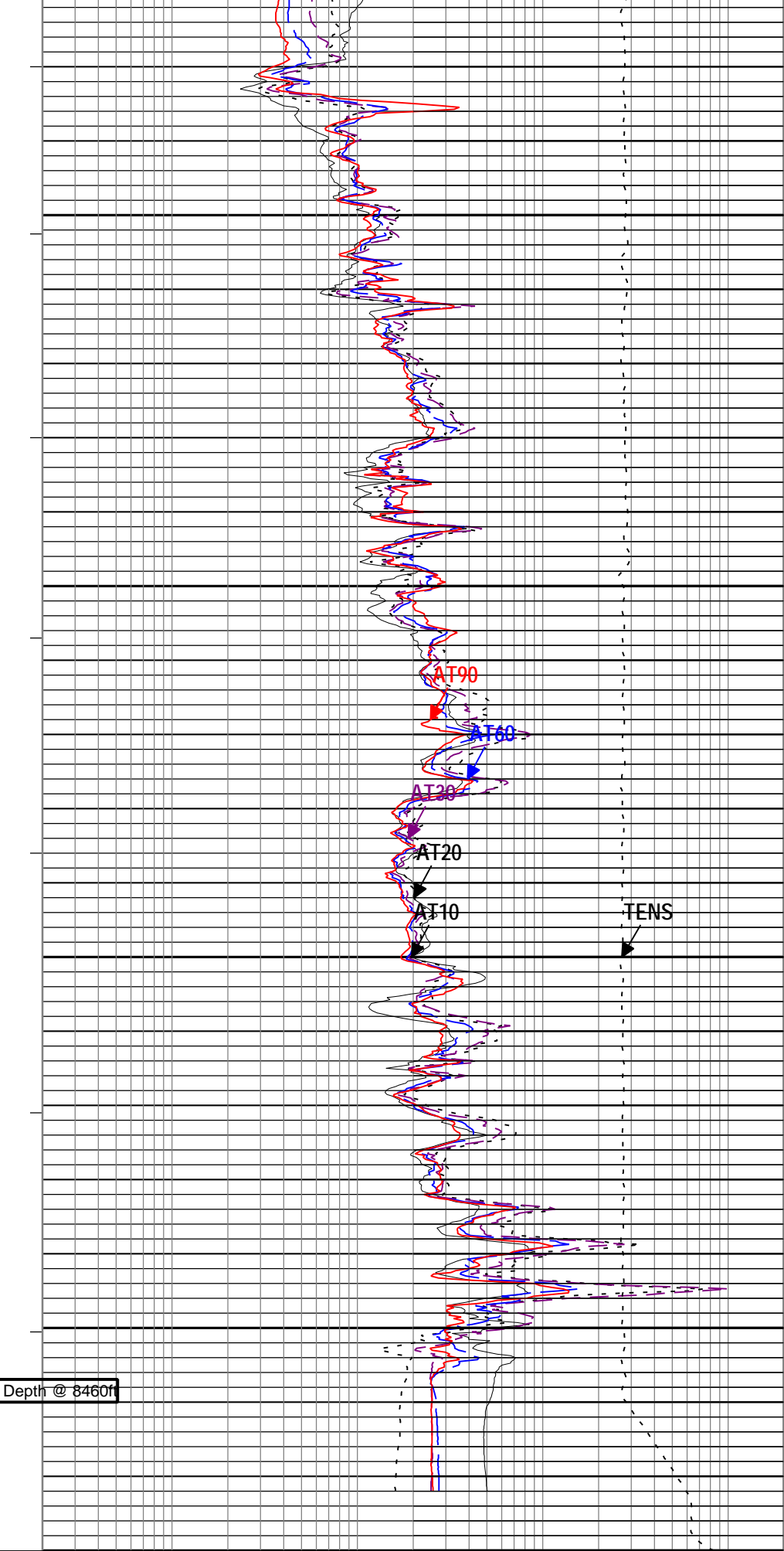
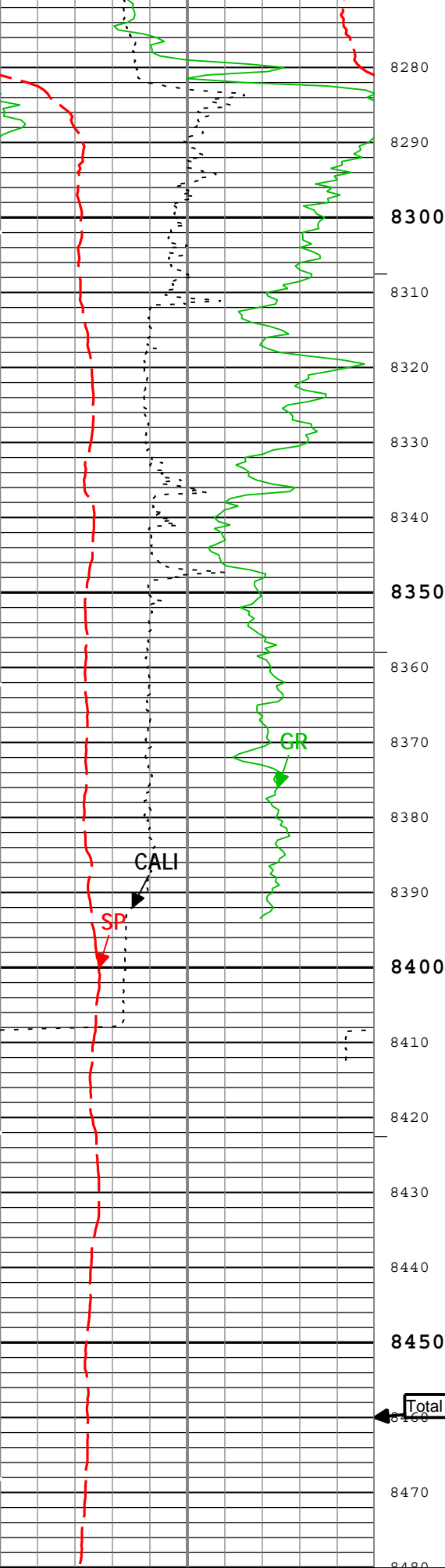












Gamma Ray Backup
Spontaneous Potential (SP) AIT-H

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

0	mV	200
Caliper (CALI) HDRS-H		
4	in	14
Gamma Ray (GR) HGNS-H		
0	gAPI	200

Array Induction Two Foot Resistivity A20 (AT20) AIT-H		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A30 (AT30) AIT-H		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-H		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-H		
0.2	ohm.m	2000
Cable Tension (TENS)		
10000	lbf	0

└─ ICV - Integrated Cement Volume every 100.00 (ft3)

└─ ICV - Integrated Cement Volume every 10.00 (ft3)

└─ IHV - Integrated Hole Volume every 100.00 (ft3)

└─ IHV - Integrated Hole Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Two Format: Log (KM 5in Induction Upper) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 14-Jun-2013 00:55:28

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-H	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-H	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-H	Yes	
ASTA	Array Induction Tool Standoff	AIT-H	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.07	in
CBLO	Casing Bottom (Logger)	WLSESSION	345	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	8.625	in
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
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	
SOCO	Standoff Correction Option	HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-H	0	mV/ft

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	0	330	345
BS	7.875	345	8480

All depth are actual.

Tool Control Parameters				
Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

Well:	Silverton 16-10
Field:	Jolly Ranch
County:	Lincoln
State:	Colorado

Platform Express
Array Induction
with Linear Correlation