

Company: NIGHTHAWK PRODUCTION LLC

Well: TAOS 1-10

Field: WILDCAT

County: LINCOLN State: COLORADO

Platform Express

Compensated Neutron-- Litho Density

County:	LINCOLN				
Field:	WILDCAT				
Location:	NENE SEC 10, T6S, R54W				
Well:	TAOS 1-10				
Company:	NIGHTHAWK PRODUCTION LLC				
		Location:			
		NENE SEC 10, T6S, R54W	Elev.:	K.B.	5228.00 ft
		1091' FNL X 852' FEL		G.L.	5213.00 ft
		LAT/LONG: 39.547420/-103.419820		D.F.	5227.00 ft
		Permanent Datum:	Ground Level	Elev.:	5213.00 f
		Log Measured From:	Kelly Bushing	15.00 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-073-06520-0000	10	6S	54W
Logging Date	31-May-2013				

Logging Date	31-May-2013			
Run Number	Run 1			
Depth Driller	8300.00 ft			
Schlumberger Depth	8315.00 ft			
Bottom Log Interval	8315.00 ft			
Top Log Interval	309.50 ft			
Casing Driller Size @ Depth	8.625 in @ 301.00 ft			
Casing Schlumberger	309.5 ft			
Bit Size	7.875 in			
Type Fluid In Hole	Fresh Water/DAP			
D M D	Density	9 lbm/gal	Viscosity	55 s
	Fluid Loss	12 cm3	PH	7.2
	Source of Sample			
	Flowline			
RM @ Meas Temp	0.75 ohm.m @ 89.68 degF			
RMF @ Meas Temp	0.56 ohm.m @ 75 degF			
RMC @ Meas Temp	0.94 ohm.m @ 75 degF			
Source RMF	RMC	Calculated	Calculated	
RM @ BHT	RMF @ BHT	0.4 @ 175.45	0.25 @ 175.45	
Max Recorded Temperatures				
Circulation Stopped		Time	11:00:00	
Logger on Bottom		Time	16:15:00	
Unit Number	Location:	3022	FORT MORGAN, C	
Recorded By	Keri Lofing			
Witnessed By	Anders Elgerd / 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.

Contents

1. Header

2. Disclaimer

3. Contents

4. Well Sketch

5. Borehole Size/Casing/Tubing Record

6. Operational Run Summary

7. Borehole Fluids

8. Remarks and Equipment Summary

9. Depth Summary

10. Survey Record

11. Run 1 Porosity 5" = 100'

11.1 Integration Summary

11.2 Software Version

11.3 Composite Summary

11.4 Log (5in Porosity)

11.5 Parameter Listing

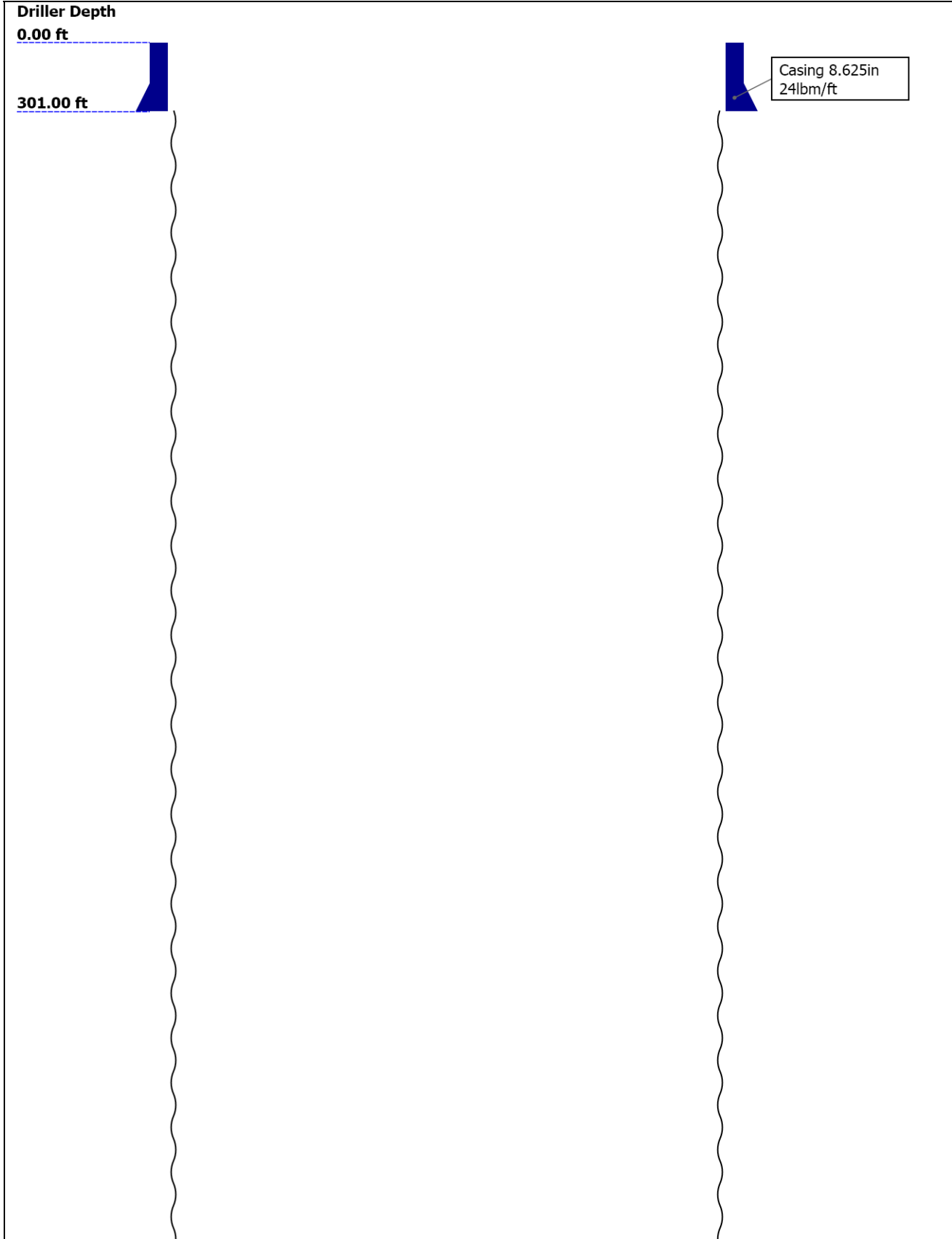
12. Run 1 Porosity 5" = 100'
- 13.5 Parameter Listing

14. Calibration Report

15. Tail

- 12.1 Composite Summary
- 12.2 Log (5in Porosity RA)
- 13. Run 1
 - 13.1 Integration Summary
 - 13.2 Software Version
 - 13.3 Composite Summary
 - 13.4 Log (KM 5in Density Upper)

Well Sketch





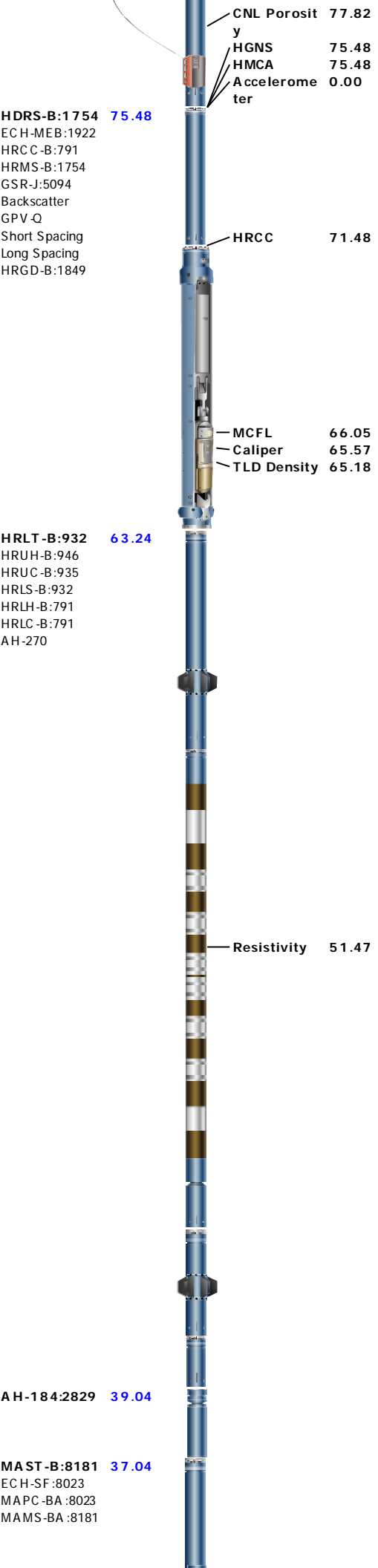
Borehole Size/Casing/Tubing Record						
------------------------------------	--	--	--	--	--	--

Bit						
Bit Size (in)	7.875					
Top Driller (ft)	301					
Top Logger (ft)	309.5					
Bottom Driller (ft)	8300					
Bottom Logger (ft)	8315					
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)	301					
Bottom Logger (ft)	309.5					

Operational Run Summary						
-------------------------	--	--	--	--	--	--

Parameter (unit)	Run 1					
Date Log Started	31-May-2013					
Time Log Started	15:38:56					
Date Log Finished	31-May-2013					
Time Log Finished	18:58:53					
Top Log Interval (ft)	309.50					
Bottom Log Interval (ft)	8315.00					
Total Depth (ft)	8300.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	7.875					
Logging Unit Number	3022					
Logging Unit Location	FORT MORGAN, COLORADO					
Recorded By	Keri Loring					
Witnessed By	Anders Elgerd / Jim Wier					
Service Order Number	BX19-00078					

Borehole Fluids						
Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	Fresh Water/DAP					
Max Recorded Temperatures (degF)	175.45					
Source of Sample	Flowline					
Salinity (ppm)	36327.1					
Density (lbm/gal)	9					
Funnel Viscosity (s)	55					
Fluid Loss (cm3)	12					
PH	7.2					
Date/Time Circulation Stopped	31-May-2013 11:00:00					
Date Logger on Bottom	31-May-2013					
Time Logger on Bottom	16:15:00					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	0.75 @ 89.68					
RMF @ Meas Temp (ohm.m@degF)	0.56 @ 75					
RMC @ Meas Temp (ohm.m@degF)	0.94 @ 75					
RM @ BHT (ohm.m@degF)	0.4 @ 175.45					
RMF @ BHT (ohm.m@degF)	0.25 @ 175.45					
RMC @ BHT (ohm.m@degF)	0.42 @ 175.45					
Total Solid (%)	5					
High Gravity Solids (%)	0					
Remarks and Equipment Summary						
Run 1: Toolstring			Run 1: Remarks			
Equip name	Length	MP name	Offset	Toolstring run as per toolsketch		
LEH-QT:2110	95.73			First run in hole.		
LEH-QT:2110				Thank you for choosing Schlumberger Wireline.		
AH-369:1762	92.82			Crew: J. Musgrave, J. Jump		
EDTC-B:9049	91.39					
EDTH-B:9072						
EDTG-A						
EDTC-B:9049						
		CTEM	87.89			
		ACCZ	0.00			
		HV	0.00			
		Gamma Ray	86.02			
		TelStatus	84.89			
		Temperatur	84.87			
		e				
		GR	84.15			
HGNS-B:863	84.89					
HGNH:2883						
NSR-F:5069						
NPV-N						
HMCA-B						
HGNS-B:863						
HACCZ-B:452						





MAMS 21.6

AIT-H:398 16.00
AHIS:398
AHRM:398

Temperature 7.91
Power Supply 7.91
Induction 7.91

SP 0.08
Mud Resistivity 0.00
Head Tension
TOOL_ZERO

Lengths are in ft

Maximum Outer Diameter = 5.000 in

Line: Sensor Location, V value: Gating Offset

All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	Run 1		
Conveyance Type	Wireline		
Rig Type	LAND		
Depth Remark Parameters	Run 1		
Depth Remark 1	All Schlumberger depth control		

		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		6868A													
Calibration Date		24-OCT-2012													
Calibration Cable Type		7-39P-LXS													
Wheel Correction 1		-6													
Wheel Correction 2		-5													
Tension Device		Run 1													
Type		CMTD-B/A													
Serial Number		1109													
Calibration Date		30-MAR-2013													
Calibrator Serial Number		78135A													
Calibration Points		10													
Calibration RMS		15													
Calibration Peak Error		26													
Logging Cable		Run 1													
Type		7-39P-LXS													
Serial Number		U711136													
Logging Cable Length (ft)		17100.00													
Survey Record															
Survey Calculation															
Method :		Minimum Radius of Curvature				DLS Method :				Lubinski					
North Reference :		True North				Total Correction Formula :				Magnetic Dec					
Rig Location															
Latitude :		39.547420 degrees				Longitude :				-103.41982 degrees					
Tie In Point															
Measured Depth:		0.00 ft		Inclination:		0.00 deg		Azimuth:		0.00 deg					
True Vertical Depth:		0.00 ft		North Displacement:		0.00 ft		East Displacement:		0.00 ft					
Survey Quality Index															
9 : Manual		28 : Tie-In Point													
Survey Correction Index															
0 : No correction															
Survey Description Index															
0 : Not Flagged Survey															
Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
2	256.00	0.57	89.84	256.00	256.00	0.00	0.00	1.27	1.28	89.84	0.22	Other	9	0	0
3	347.00	0.80	131.70	91.00	346.99	-0.42	-0.42	2.20	2.23	100.75	0.59	Other	9	0	0
4	408.00	0.70	146.90	61.00	407.98	-1.01	-1.01	2.72	2.92	110.42	0.36	Other	9	0	0
5	469.00	0.80	133.50	61.00	468.98	-1.62	-1.62	3.23	3.61	116.59	0.33	Other	9	0	0
6	561.00	1.50	134.00	92.00	560.96	-2.90	-2.90	4.57	5.41	122.39	0.76	Other	9	0	0
7	652.00	1.30	136.30	91.00	651.93	-4.47	-4.47	6.14	7.58	126.08	0.23	Other	9	0	0
8	746.00	1.80	120.00	94.00	745.90	-5.98	-5.98	8.15	10.10	126.26	0.70	Other	9	0	0
9	838.00	2.30	107.10	92.00	837.84	-7.25	-7.25	11.17	13.32	122.97	0.74	Other	9	0	0
10	940.00	2.60	101.30	102.00	939.75	-8.30	-8.30	15.39	17.49	118.34	0.38	Other	9	0	0
11	1026.00	2.50	102.00	86.00	1025.66	-9.07	-9.07	19.14	21.19	115.36	0.12	Other	9	0	0
12	1111.00	2.20	109.60	85.00	1110.59	-10.01	-10.01	22.49	24.61	113.98	0.51	Other	9	0	0
13	1197.00	2.30	105.40	86.00	1196.52	-11.02	-11.02	25.71	27.99	113.20	0.22	Other	9	0	0

14	1282.00	2.40	109.20	85.00	1281.45	-12.06	-12.06	29.03	31.43	112.55	0.22	Other	9	0	0
15	1368.00	1.90	113.80	86.00	1367.39	-13.22	-13.22	32.04	34.65	112.43	0.61	Other	9	0	0
16	1453.00	1.80	122.40	85.00	1452.35	-14.51	-14.51	34.46	37.37	112.83	0.35	Other	9	0	0
17	1539.00	1.50	119.10	86.00	1538.31	-15.78	-15.78	36.58	39.83	113.33	0.37	Other	9	0	0
18	1626.00	1.80	114.50	87.00	1625.28	-16.90	-16.90	38.82	42.32	113.52	0.38	Other	9	0	0
19	1712.00	1.50	124.00	86.00	1711.24	-18.09	-18.09	40.98	44.78	113.82	0.47	Other	9	0	0
20	1797.00	1.30	113.80	85.00	1796.22	-19.10	-19.10	42.78	46.85	114.06	0.38	Other	9	0	0
21	1883.00	1.50	109.90	86.00	1882.19	-19.88	-19.88	44.74	48.95	113.96	0.26	Other	9	0	0
22	1968.00	1.20	114.70	85.00	1967.17	-20.63	-20.63	46.59	50.95	113.88	0.38	Other	9	0	0
23	2054.00	1.60	127.00	86.00	2053.14	-21.73	-21.73	48.37	53.02	114.19	0.58	Other	9	0	0
24	2139.00	1.50	135.60	85.00	2138.11	-23.23	-23.23	50.09	55.22	114.88	0.30	Other	9	0	0
25	2225.00	1.70	129.80	86.00	2224.08	-24.86	-24.86	51.86	57.51	115.61	0.30	Other	9	0	0
26	2310.00	1.40	122.80	85.00	2309.04	-26.22	-26.22	53.70	59.78	116.03	0.42	Other	9	0	0
27	2395.00	2.00	102.40	85.00	2394.01	-27.11	-27.11	56.02	62.24	115.82	0.99	Other	9	0	0
28	2483.00	2.00	98.70	88.00	2481.95	-27.67	-27.67	59.04	65.19	115.11	0.15	Other	9	0	0
29	2568.00	2.10	98.90	85.00	2566.90	-28.13	-28.13	62.05	68.11	114.39	0.12	Other	9	0	0
30	2654.00	2.30	98.00	86.00	2652.84	-28.62	-28.62	65.31	71.29	113.66	0.24	Other	9	0	0
31	2740.00	2.00	96.60	86.00	2738.78	-29.03	-29.03	68.51	74.41	112.96	0.35	Other	9	0	0
32	2825.00	2.30	103.60	85.00	2823.72	-29.60	-29.60	71.64	77.53	112.45	0.47	Other	9	0	0
33	2911.00	2.30	114.00	86.00	2909.65	-30.71	-30.71	74.90	80.94	112.29	0.48	Other	9	0	0
34	2996.00	2.40	116.80	85.00	2994.58	-32.21	-32.21	78.04	84.42	112.42	0.18	Other	9	0	0
35	3081.00	2.40	118.40	85.00	3079.50	-33.85	-33.85	81.20	87.96	112.63	0.08	Other	9	0	0
36	3167.00	2.20	118.60	86.00	3165.43	-35.50	-35.50	84.23	91.40	112.85	0.23	Other	9	0	0
37	3252.00	2.50	126.60	85.00	3250.36	-37.39	-37.39	87.15	94.82	113.22	0.52	Other	9	0	0
38	3337.00	1.30	116.60	85.00	3335.31	-38.92	-38.92	89.50	97.60	113.50	1.46	Other	9	0	0
39	3425.00	1.30	117.00	88.00	3423.29	-39.82	-39.82	91.28	99.61	113.57	0.01	Other	9	0	0
40	3512.00	1.40	107.30	87.00	3510.27	-40.59	-40.59	93.18	101.64	113.54	0.29	Other	9	0	0
41	3602.00	1.40	124.00	90.00	3600.24	-41.53	-41.53	95.14	103.81	113.58	0.45	Other	9	0	0
42	3688.00	1.50	133.00	86.00	3686.21	-42.89	-42.89	96.83	105.91	113.89	0.29	Other	9	0	0
43	3773.00	1.50	131.60	85.00	3771.18	-44.38	-44.38	98.48	108.01	114.26	0.04	Other	9	0	0
44	3859.00	1.40	142.50	86.00	3857.15	-45.96	-45.96	99.96	110.01	114.69	0.34	Other	9	0	0
45	3944.00	1.10	122.40	85.00	3942.13	-47.22	-47.22	101.28	111.75	115.00	0.62	Other	9	0	0
46	4030.00	1.30	124.40	86.00	4028.12	-48.22	-48.22	102.78	113.52	115.13	0.24	Other	9	0	0
47	4115.00	1.80	107.10	85.00	4113.09	-49.16	-49.16	104.85	115.81	115.12	0.80	Other	9	0	0
48	4201.00	1.60	101.90	86.00	4199.05	-49.80	-49.80	107.32	118.31	114.89	0.29	Other	9	0	0
49	4288.00	1.70	103.40	87.00	4286.01	-50.35	-50.35	109.76	120.77	114.64	0.13	Other	9	0	0
50	4374.00	1.80	95.50	86.00	4371.97	-50.77	-50.77	112.35	123.29	114.32	0.30	Other	9	0	0
51	4459.00	1.60	93.60	85.00	4456.93	-50.98	-50.98	114.86	125.66	113.93	0.24	Other	9	0	0
52	4545.00	1.50	74.30	86.00	4542.90	-50.75	-50.75	117.14	127.66	113.42	0.61	Other	9	0	0
53	4634.00	1.90	72.70	89.00	4631.86	-49.99	-49.99	119.67	129.69	112.67	0.45	Other	9	0	0
54	4720.00	1.80	77.40	86.00	4717.82	-49.28	-49.28	122.35	131.89	111.94	0.21	Other	9	0	0
55	4807.00	1.80	79.50	87.00	4804.78	-48.73	-48.73	125.03	134.19	111.29	0.08	Other	9	0	0
56	4893.00	2.00	70.20	86.00	4890.73	-47.97	-47.97	127.77	136.48	110.58	0.43	Other	9	0	0
57	4980.00	1.80	103.40	87.00	4977.68	-47.78	-47.78	130.53	139.01	110.10	1.27	Other	9	0	0
58	5067.00	2.00	106.60	87.00	5064.64	-48.53	-48.53	133.31	141.86	110.00	0.26	Other	9	0	0
59	5147.00	2.20	106.20	80.00	5144.58	-49.35	-49.35	136.12	144.78	109.93	0.25	Other	9	0	0
60	5233.00	2.00	109.10	86.00	5230.52	-50.31	-50.31	139.13	147.93	109.88	0.26	Other	9	0	0
61	5318.00	2.00	109.80	85.00	5315.47	-51.29	-51.29	141.92	150.92	109.87	0.03	Other	9	0	0
62	5404.00	2.00	112.80	86.00	5401.42	-52.38	-52.38	144.72	153.90	109.90	0.12	Other	9	0	0
63	5489.00	1.90	115.90	85.00	5486.37	-53.57	-53.57	147.36	156.79	109.98	0.17	Other	9	0	0
64	5575.00	1.80	106.10	86.00	5572.33	-54.57	-54.57	149.94	159.55	110.00	0.39	Other	9	0	0
65	5660.00	1.40	96.60	85.00	5657.29	-55.06	-55.06	152.25	161.91	109.88	0.56	Other	9	0	0
66	5746.00	1.60	105.20	86.00	5743.26	-55.50	-55.50	154.45	164.11	109.76	0.35	Other	9	0	0
67	5831.00	2.70	115.70	85.00	5828.20	-56.67	-56.67	157.40	167.29	109.80	1.37	Other	9	0	0

68	5917.00	2.80	126.50	86.00	5914.10	-58.80	-58.80	160.91	171.33	110.07	0.61	Other	9	0	0
69	6004.00	1.60	140.30	87.00	6001.04	-61.00	-61.00	163.40	174.41	110.47	1.50	Other	9	0	0
70	6090.00	1.40	141.10	86.00	6087.01	-62.74	-62.74	164.83	176.38	110.84	0.23	Other	9	0	0
71	6175.00	1.70	135.10	85.00	6171.98	-64.44	-64.44	166.37	178.41	111.17	0.40	Other	9	0	0
72	6261.00	1.30	131.90	86.00	6257.95	-66.00	-66.00	167.99	180.48	111.45	0.48	Other	9	0	0
73	6346.00	1.30	128.60	85.00	6342.93	-67.24	-67.24	169.47	182.32	111.64	0.09	Other	9	0	0
74	6431.00	1.80	123.30	85.00	6427.90	-68.58	-68.58	171.33	184.55	111.81	0.61	Other	9	0	0
75	6517.00	1.60	127.20	86.00	6513.86	-70.05	-70.05	173.42	187.04	111.99	0.27	Other	9	0	0
76	6603.00	1.40	124.50	86.00	6599.83	-71.37	-71.37	175.24	189.21	112.16	0.25	Other	9	0	0
77	6690.00	2.30	106.10	87.00	6686.78	-72.45	-72.45	177.80	191.99	112.17	1.23	Other	9	0	0
78	6776.00	2.10	101.00	86.00	6772.72	-73.23	-73.23	181.00	195.24	112.03	0.33	Other	9	0	0
79	6864.00	2.00	101.50	88.00	6860.66	-73.85	-73.85	184.09	198.36	111.86	0.12	Other	9	0	0
80	6949.00	2.10	106.60	85.00	6945.61	-74.59	-74.59	187.03	201.35	111.74	0.24	Other	9	0	0
81	7035.00	2.50	122.20	86.00	7031.54	-76.04	-76.04	190.13	204.76	111.80	0.86	Other	9	0	0
82	7123.00	2.50	120.80	88.00	7119.46	-78.04	-78.04	193.40	208.56	111.98	0.07	Other	9	0	0
83	7210.00	2.40	117.50	87.00	7206.38	-79.85	-79.85	196.65	212.24	112.10	0.20	Other	9	0	0
84	7295.00	1.80	106.60	85.00	7291.32	-81.06	-81.06	199.51	215.35	112.11	0.84	Other	9	0	0
85	7381.00	1.70	116.40	86.00	7377.28	-82.01	-82.01	201.94	217.95	112.10	0.37	Other	9	0	0
86	7466.00	1.50	138.80	85.00	7462.25	-83.41	-83.41	203.81	220.21	112.26	0.77	Other	9	0	0
87	7552.00	1.20	114.00	86.00	7548.22	-84.62	-84.62	205.37	222.11	112.39	0.76	Other	9	0	0
88	7641.00	1.10	107.00	89.00	7637.21	-85.25	-85.25	207.04	223.92	112.38	0.19	Other	9	0	0
89	7728.00	1.90	103.60	87.00	7724.18	-85.83	-85.83	209.24	226.15	112.30	0.92	Other	9	0	0
90	7771.00	2.40	110.30	43.00	7767.15	-86.31	-86.31	210.78	227.76	112.27	1.30	Other	9	0	0
91	7813.00	2.90	111.90	42.00	7809.10	-87.02	-87.02	212.59	229.69	112.26	1.20	Other	9	0	0
92	7855.00	3.00	115.20	42.00	7851.04	-87.88	-87.88	214.57	231.86	112.27	0.47	Other	9	0	0
93	7898.00	2.60	111.30	43.00	7893.99	-88.71	-88.71	216.49	233.96	112.28	1.03	Other	9	0	0
94	7941.00	2.20	113.60	43.00	7936.96	-89.40	-89.40	218.16	235.76	112.28	0.96	Other	9	0	0
Run 1															
Porosity 5" = 100'															
Integration Summary															
Output Channel(s)		Output Description				Input Parameter				Output Value		Unit			
IHV		Integrated Hole Volume				GCSE_UP_PASS				3532.9		ft3			
ICV		Integrated Cement Volume				GCSE_UP_PASS, FCD				2208.11		ft3			
Software Version															
Acquisition System								Version							
MaxWell								3.1.9755.0							
Application Patch								SP-20121221-3.1.9755.1574							
								EXP_APL-CMR1574-3.1.9755.1732							
								EXP_APL-MASTCustWF-3.1.9755.1929							
Computation		Description									Version				
Borehole		Borehole Ensemble provides common Borehole Parameters and Channels									3.1.9755.1732				
HENVIR		Computation Ensemble for the HGNS Neutron environmental corrections									3.1.9755.0				
DepthCorrection		DepthCorrection									3.1.9755.1732				
Tool Elements		Description						Software Version				Firmware Version			
HRGD-B		HILT Resistivity Gamma-Ray Density Device, 125 degC						3.1.9755.0				3.0			
HGNS-B		HILT Gamma-Ray and Neutron Sonde, 125 degC						3.1.9755.0				2.0			
HRCC-B		HILT High-Resolution Control Cartridge, 125 degC						3.1.9755.0				2.0			
Pass Summary															
Run Name	Pass Objective		Direction	Top	Bottom	Start				Stop			Depth Shift	Include Parallel	

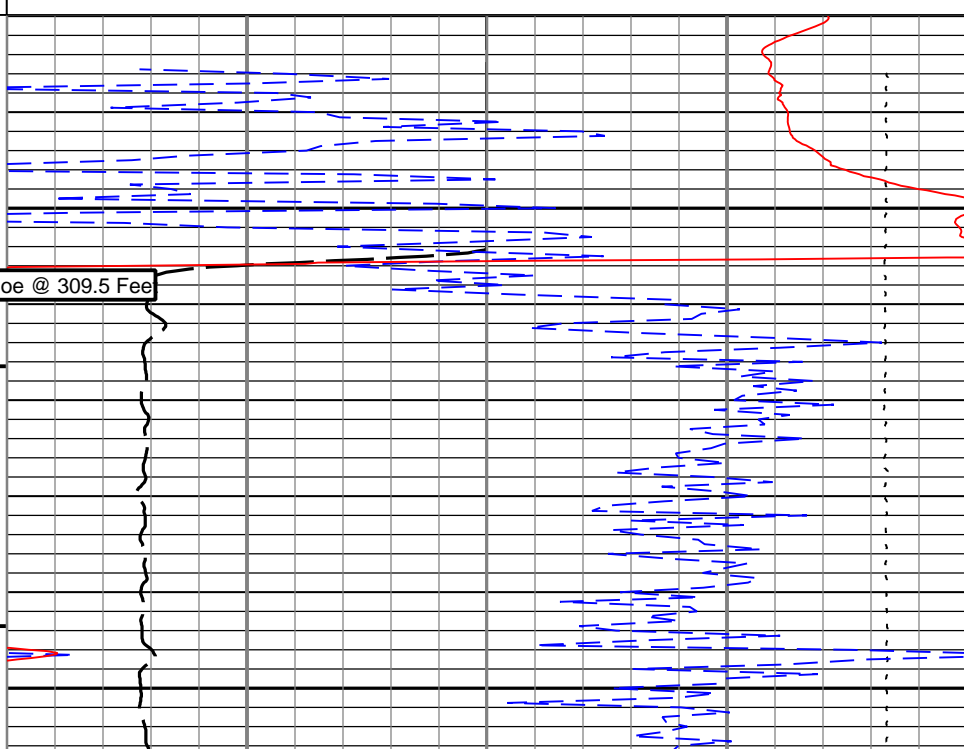
All depths are referenced to toolstring zero

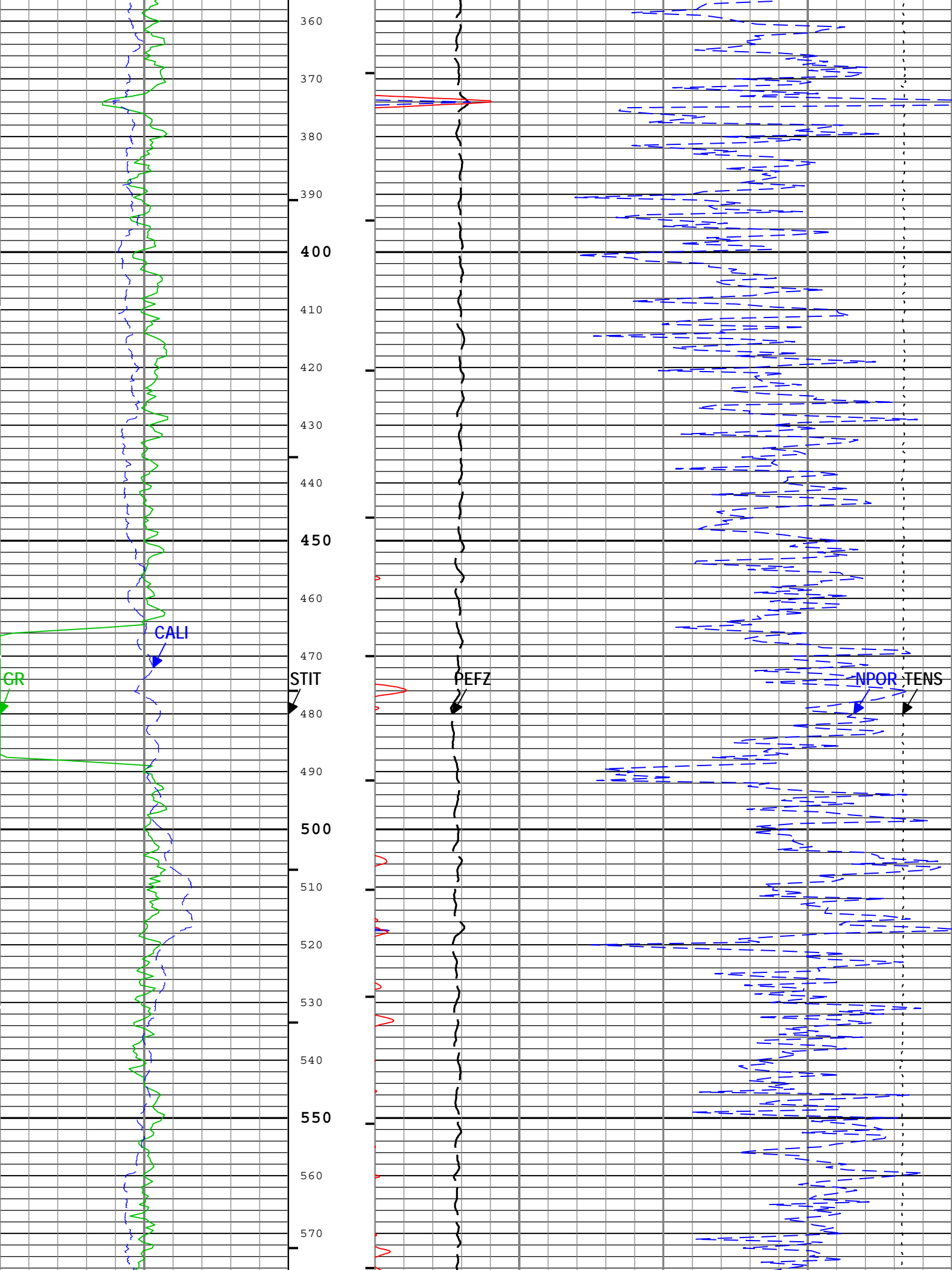
Run 1: Main[3]:Up

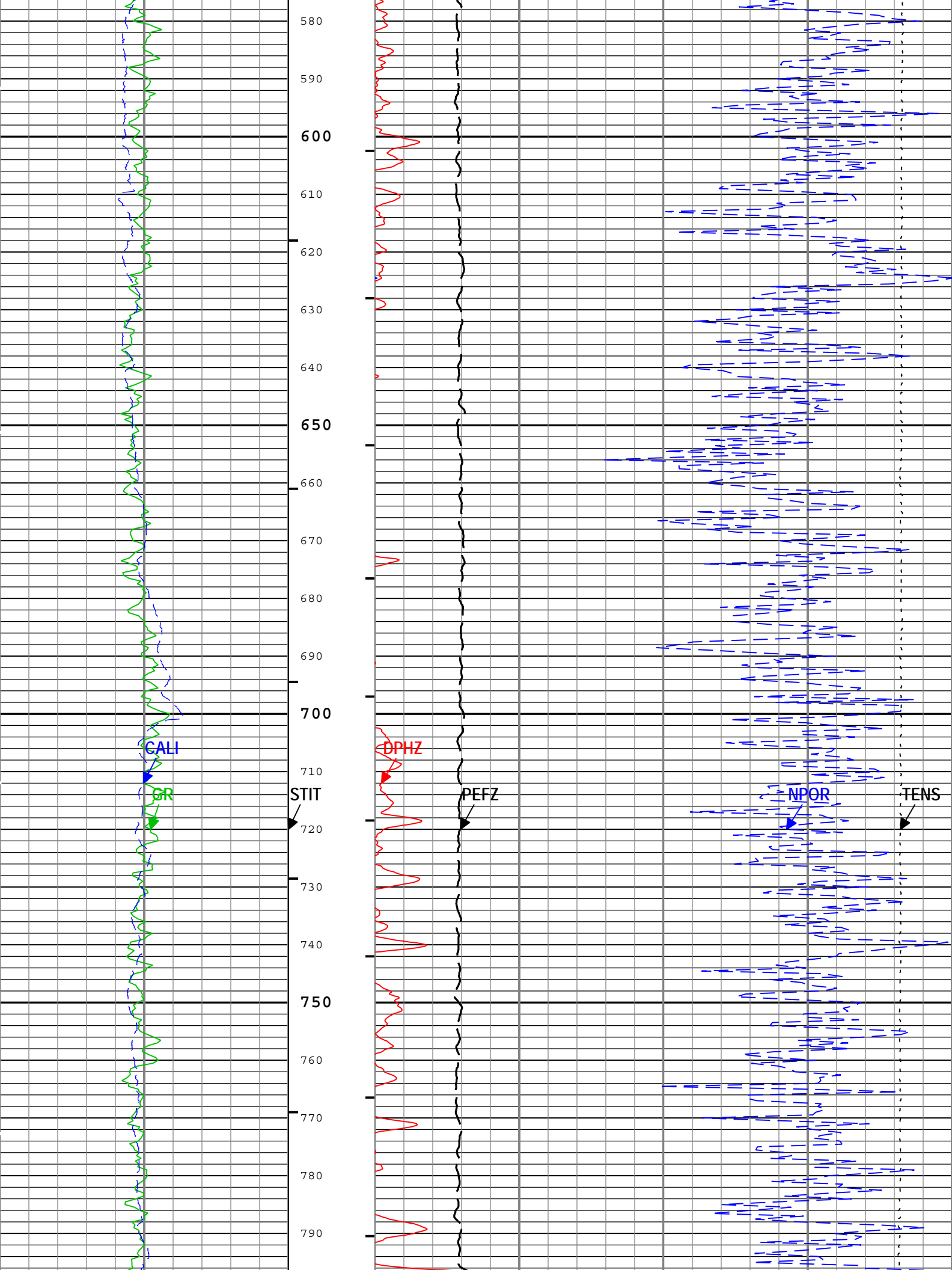
Measured Depth Creation Date: 31-May-2013 22:18:48

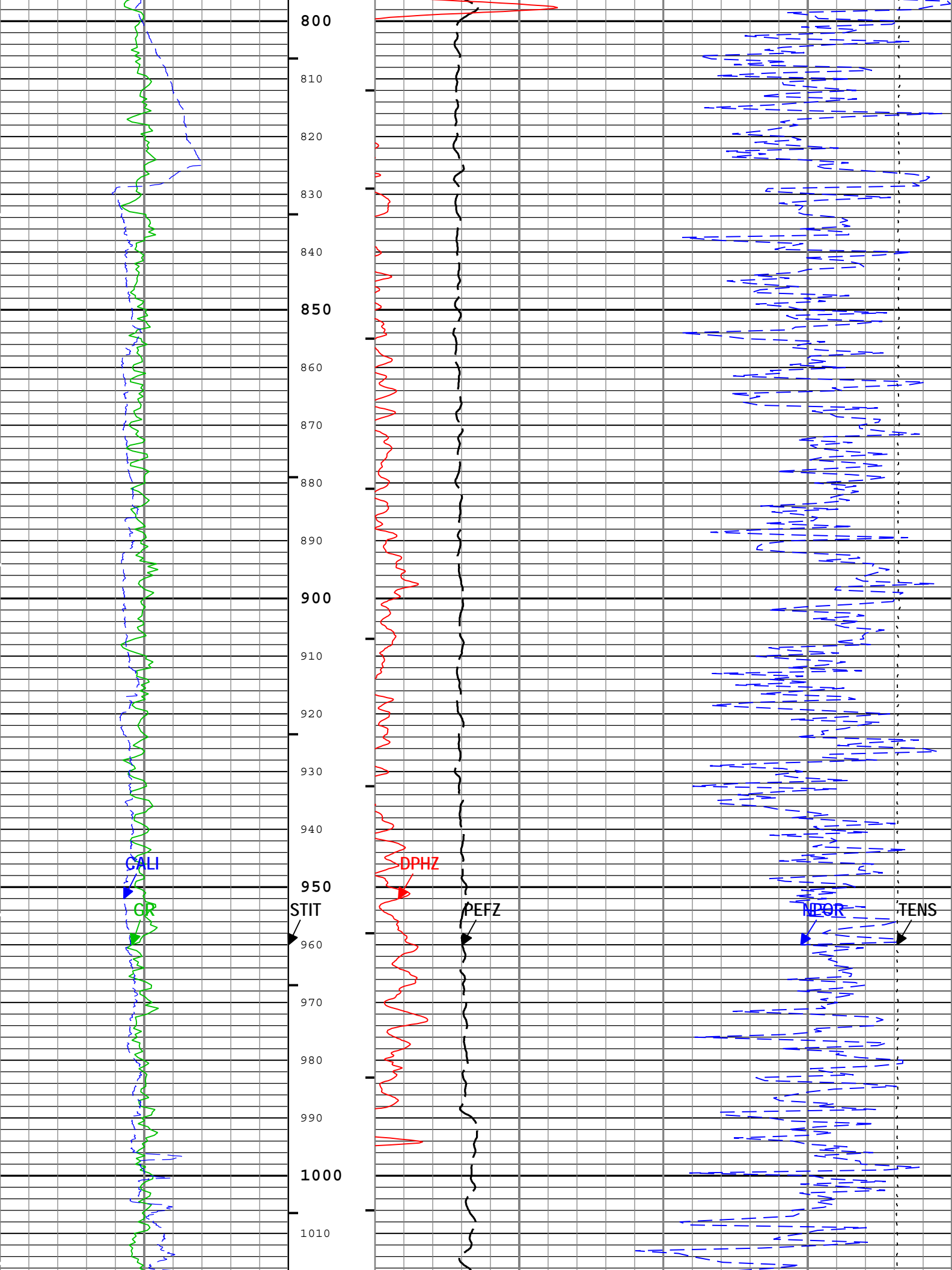
TIME_1900 - Time Marked every 60.00 (s)

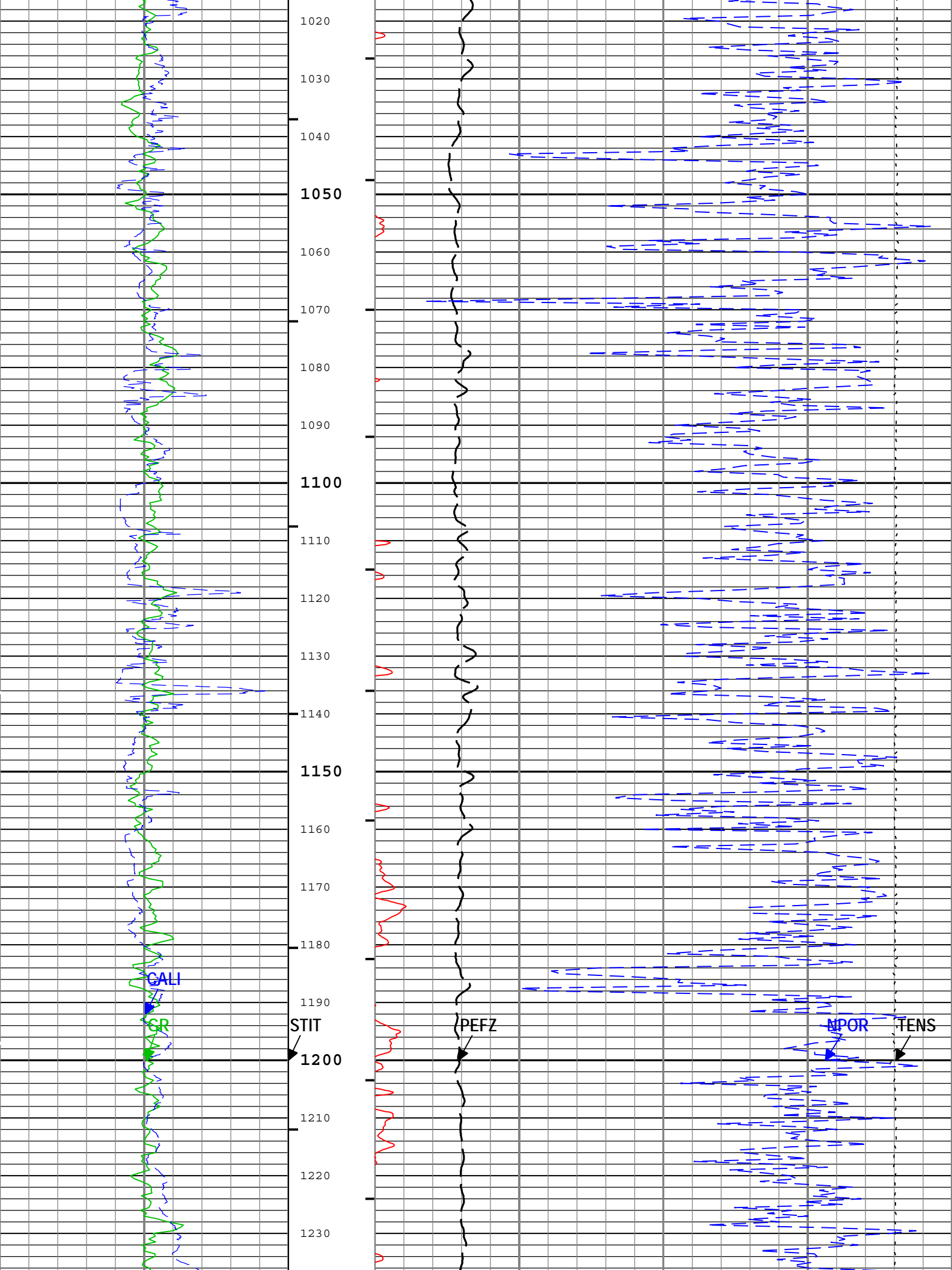
—IHV - Integrated Hole Volume every 10.00 (ft3)

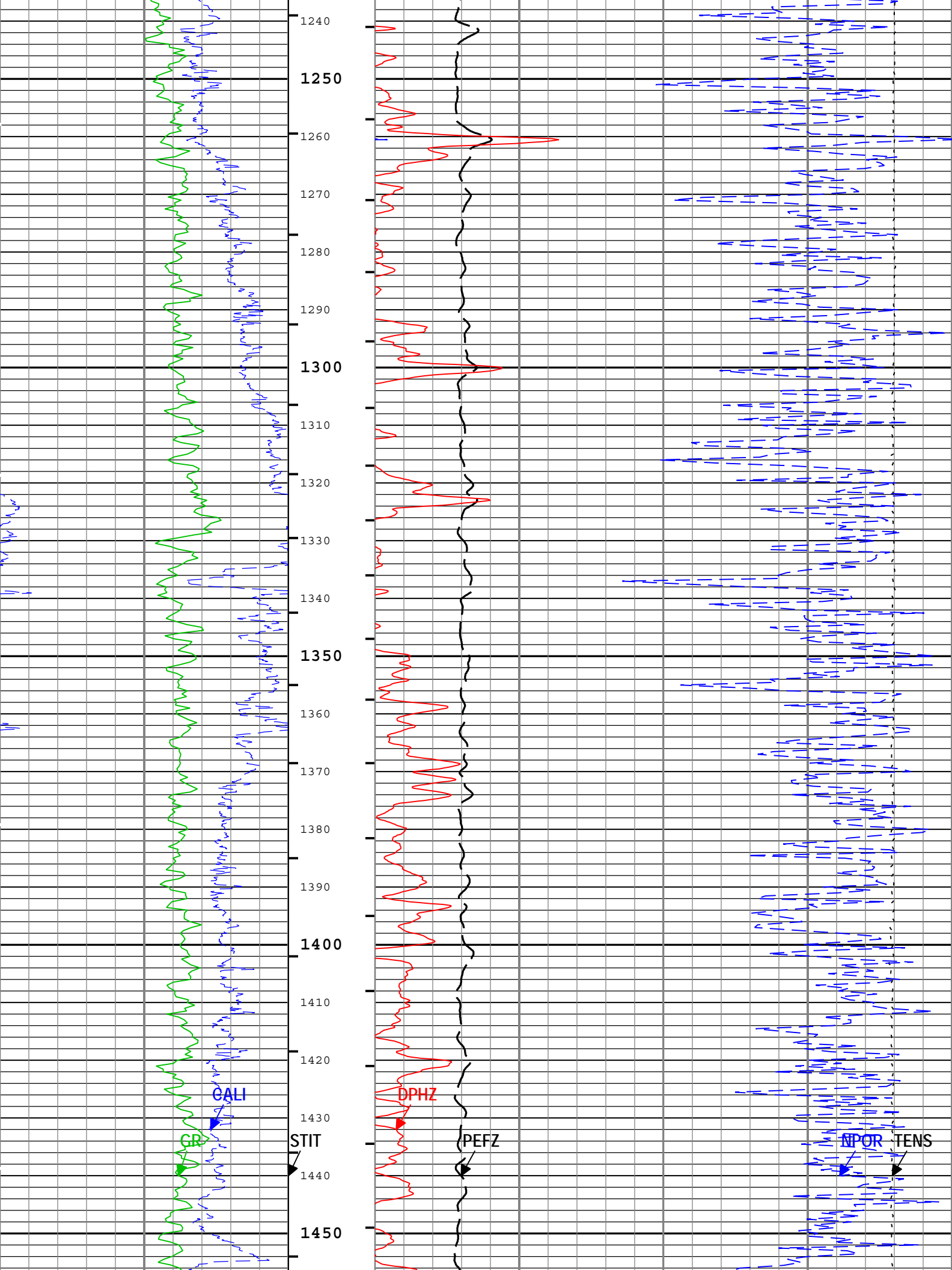


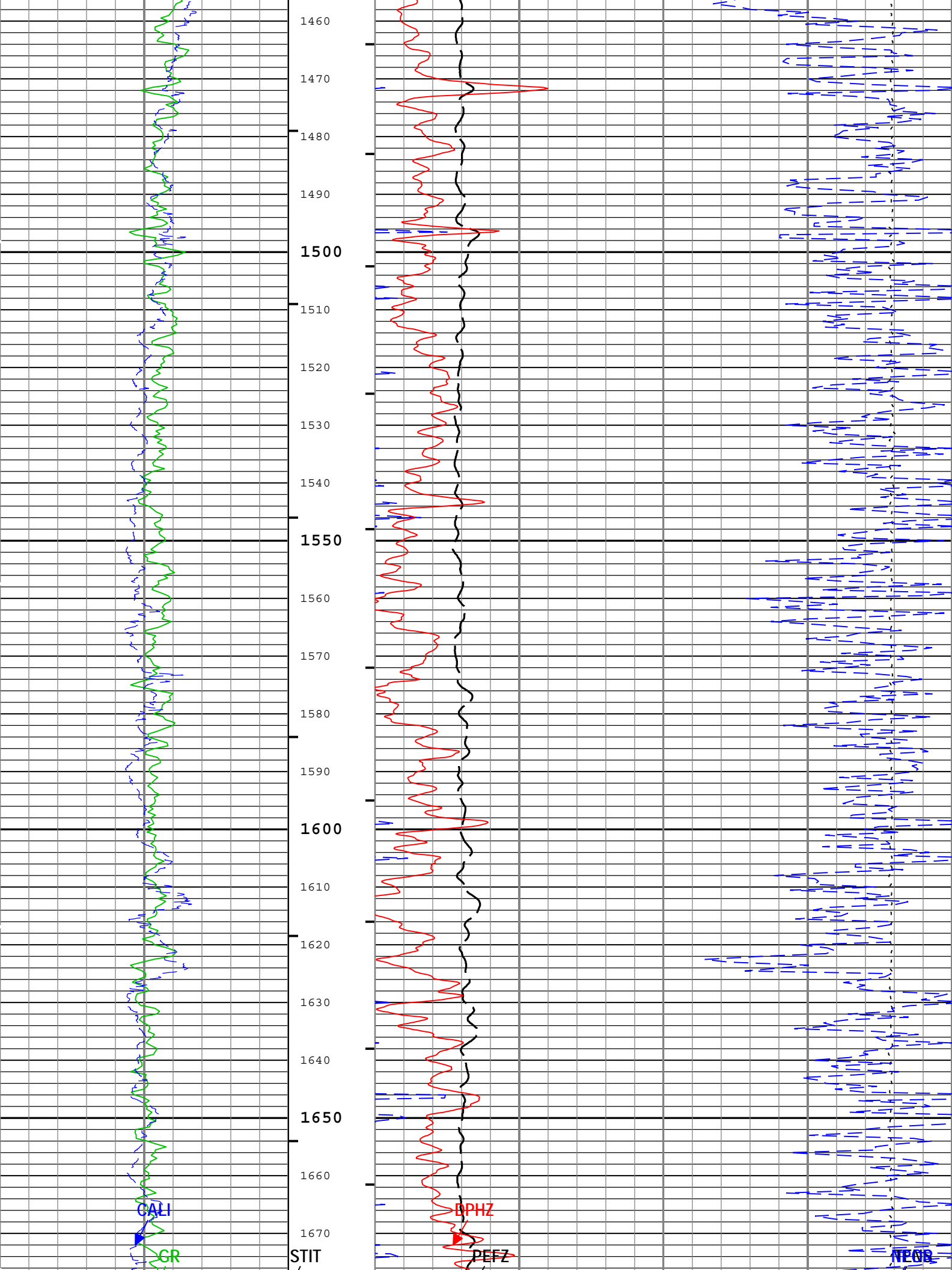


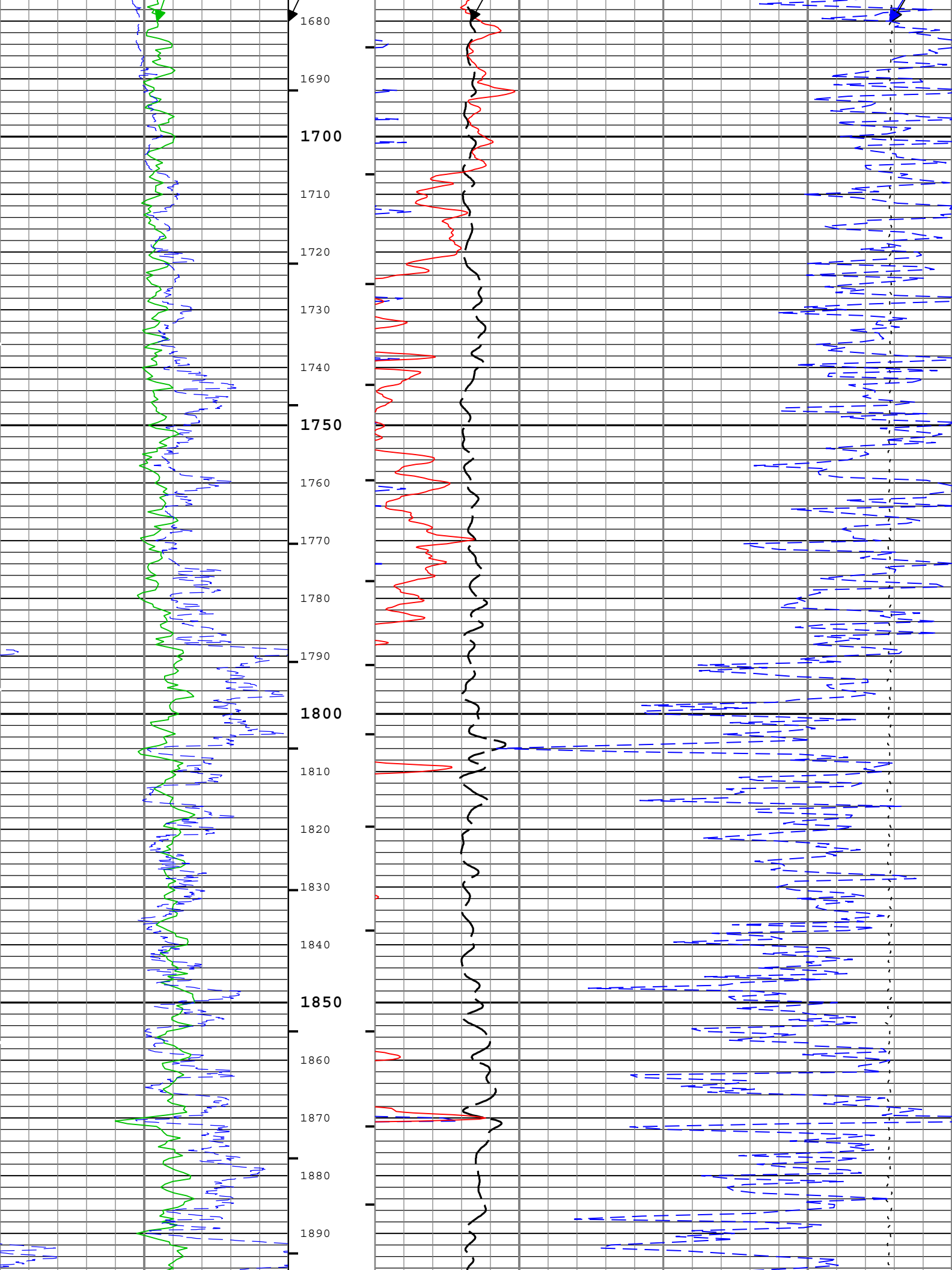


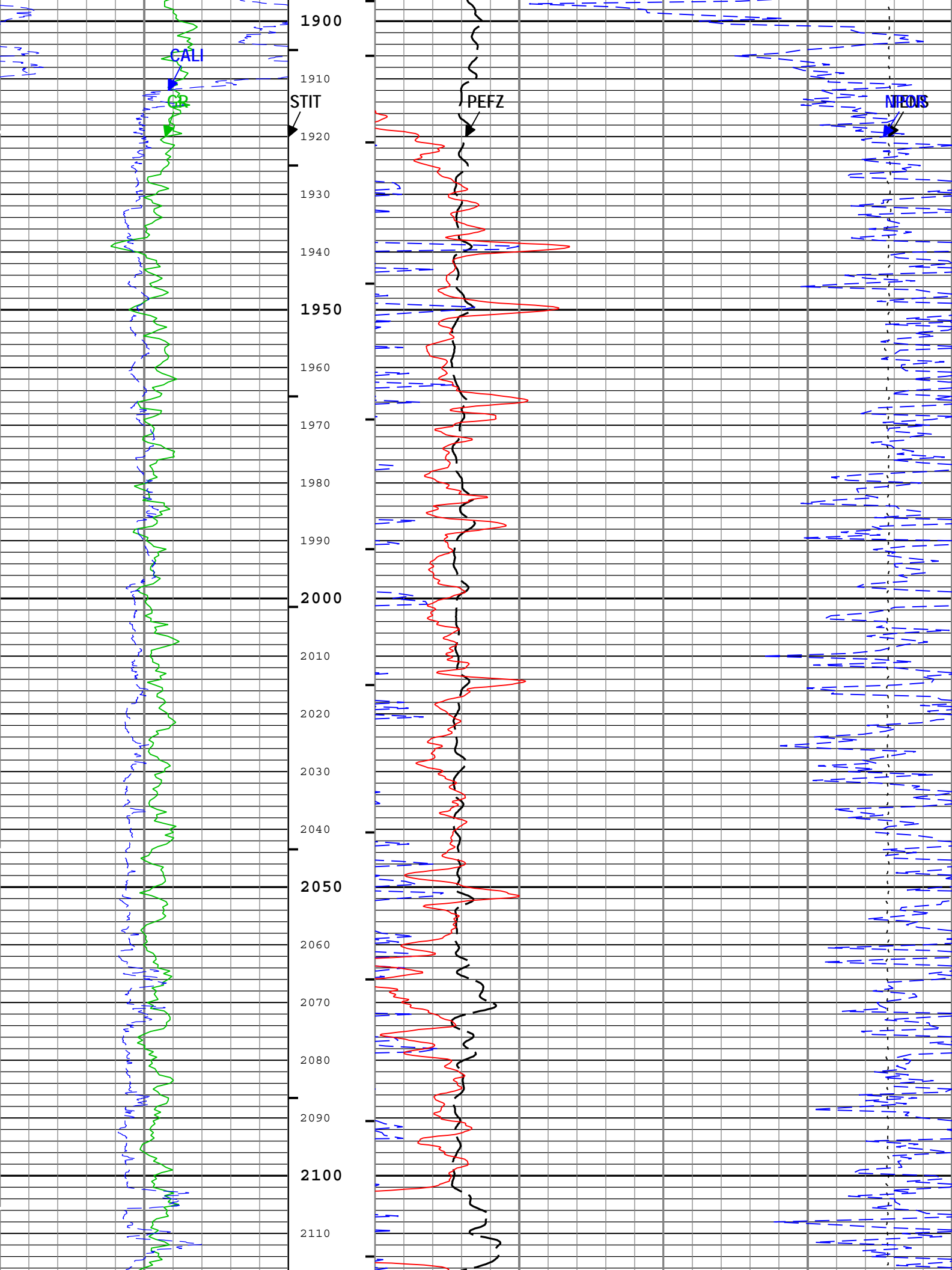


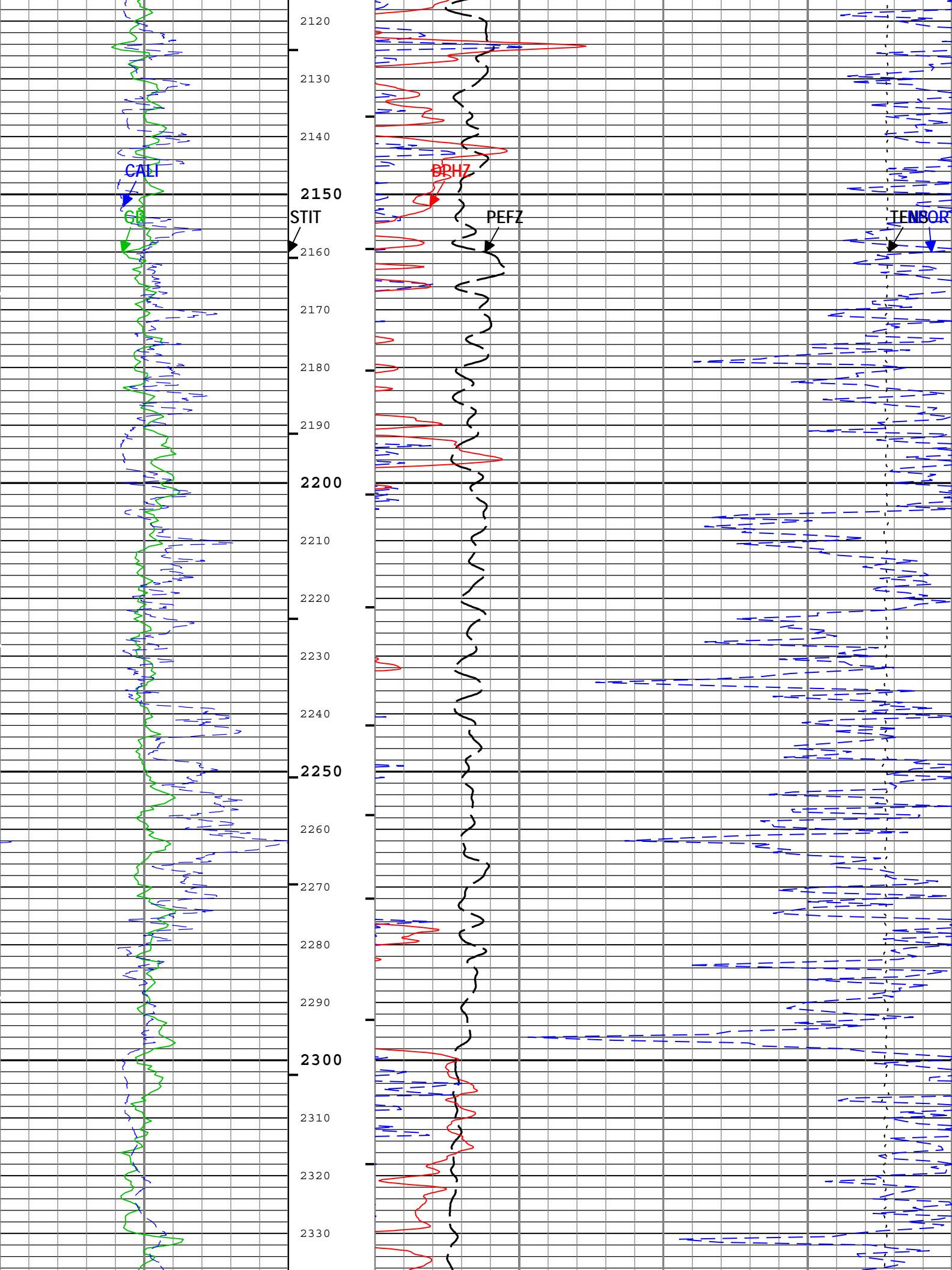


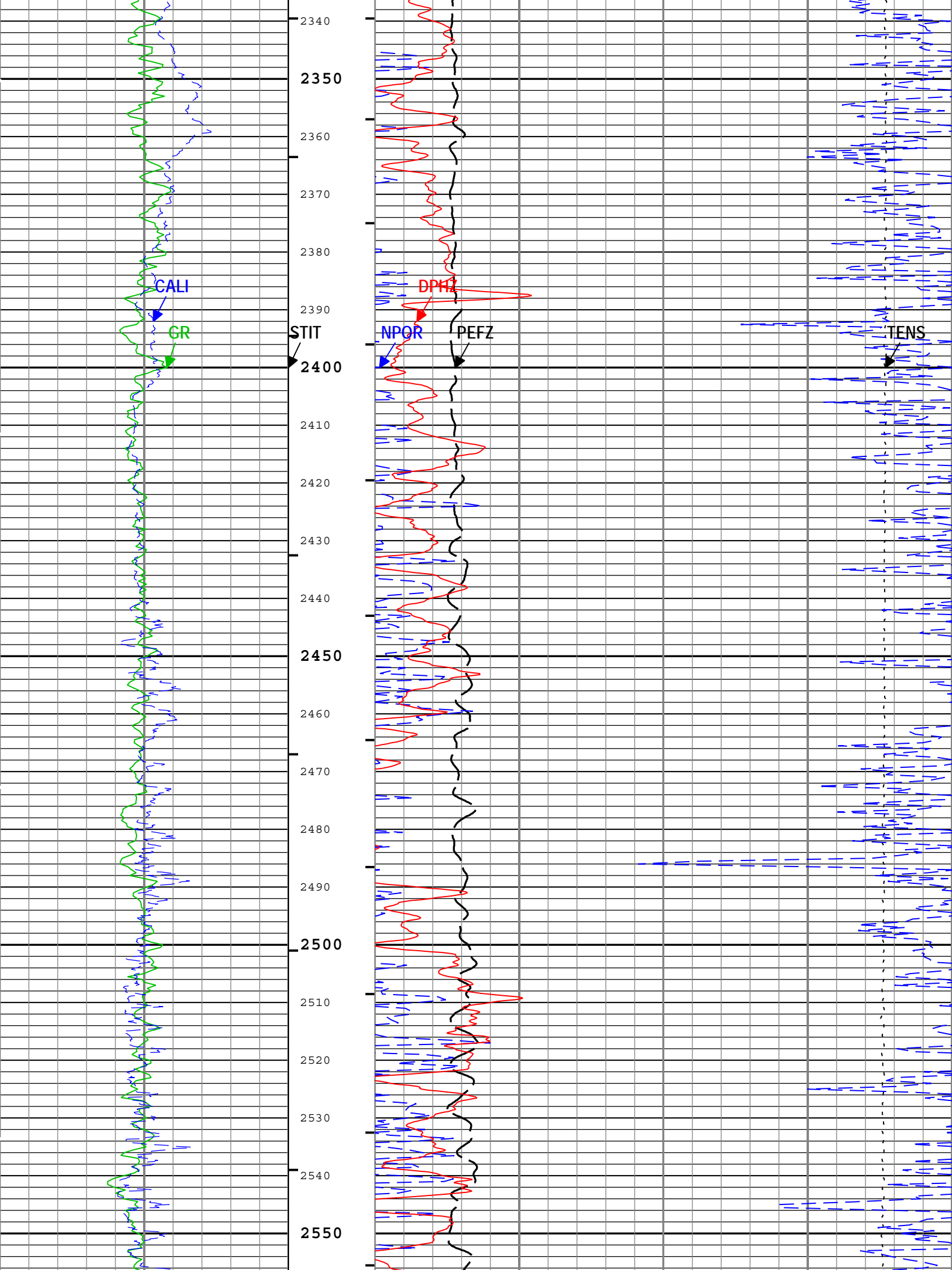


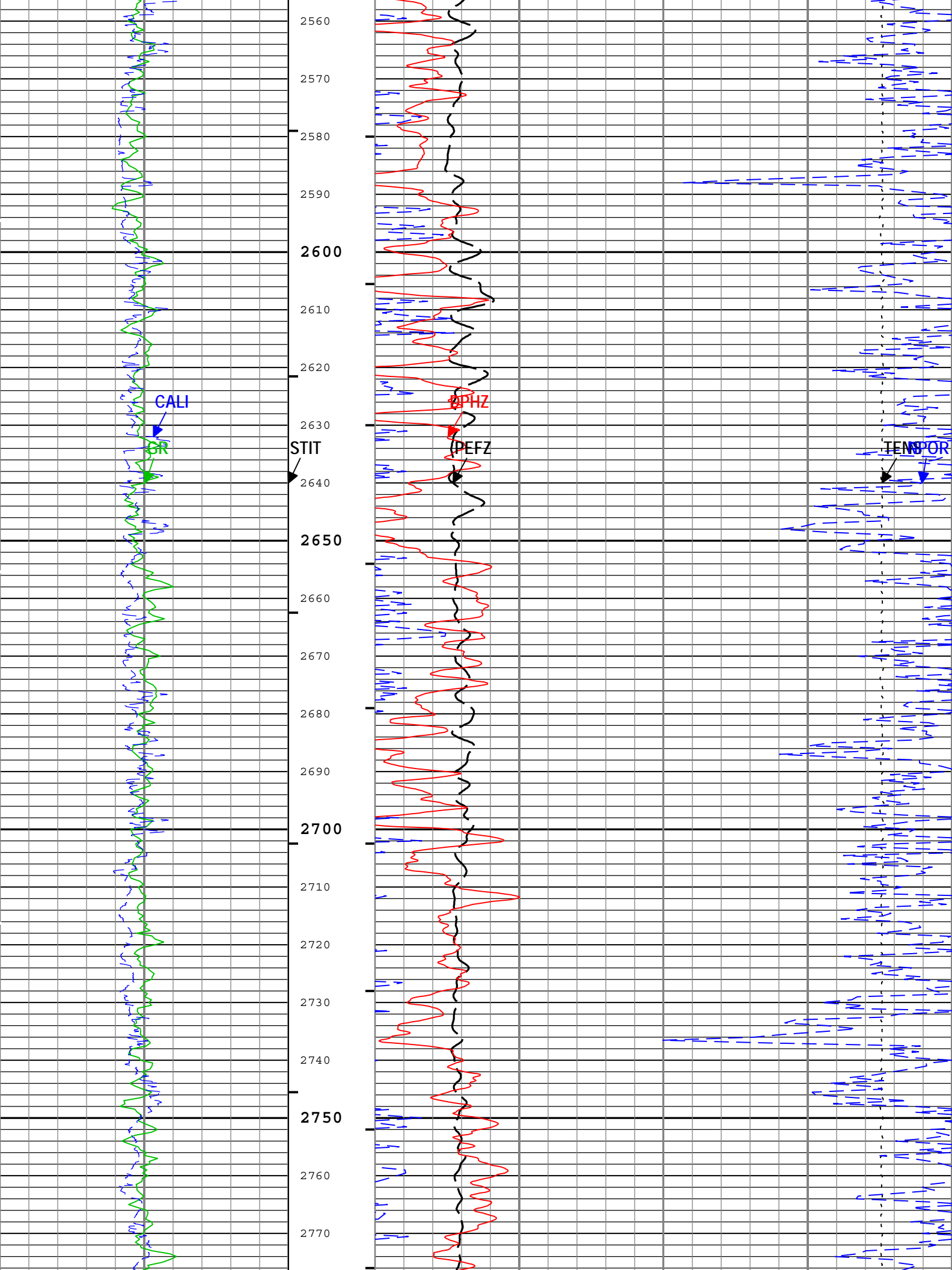


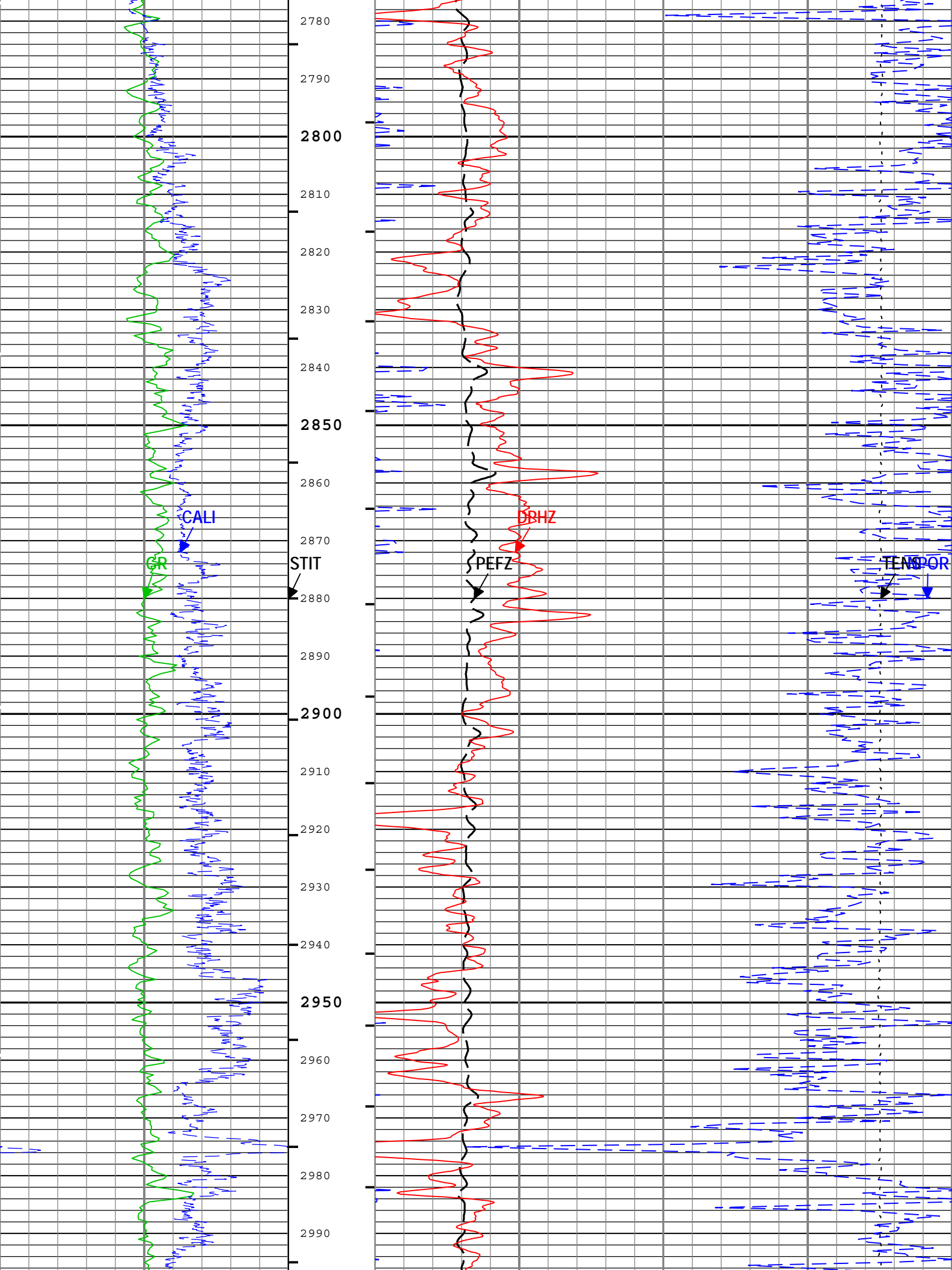


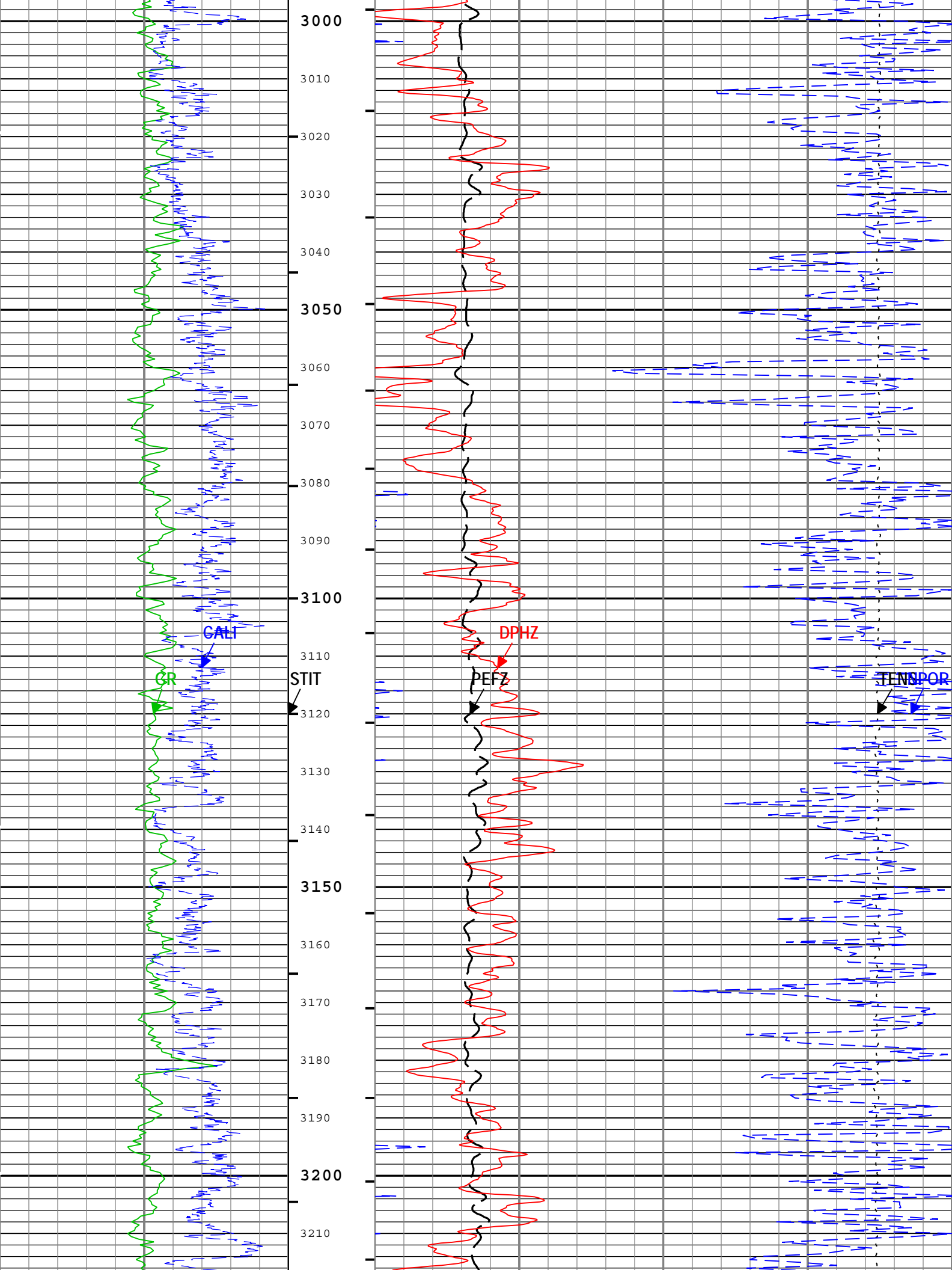


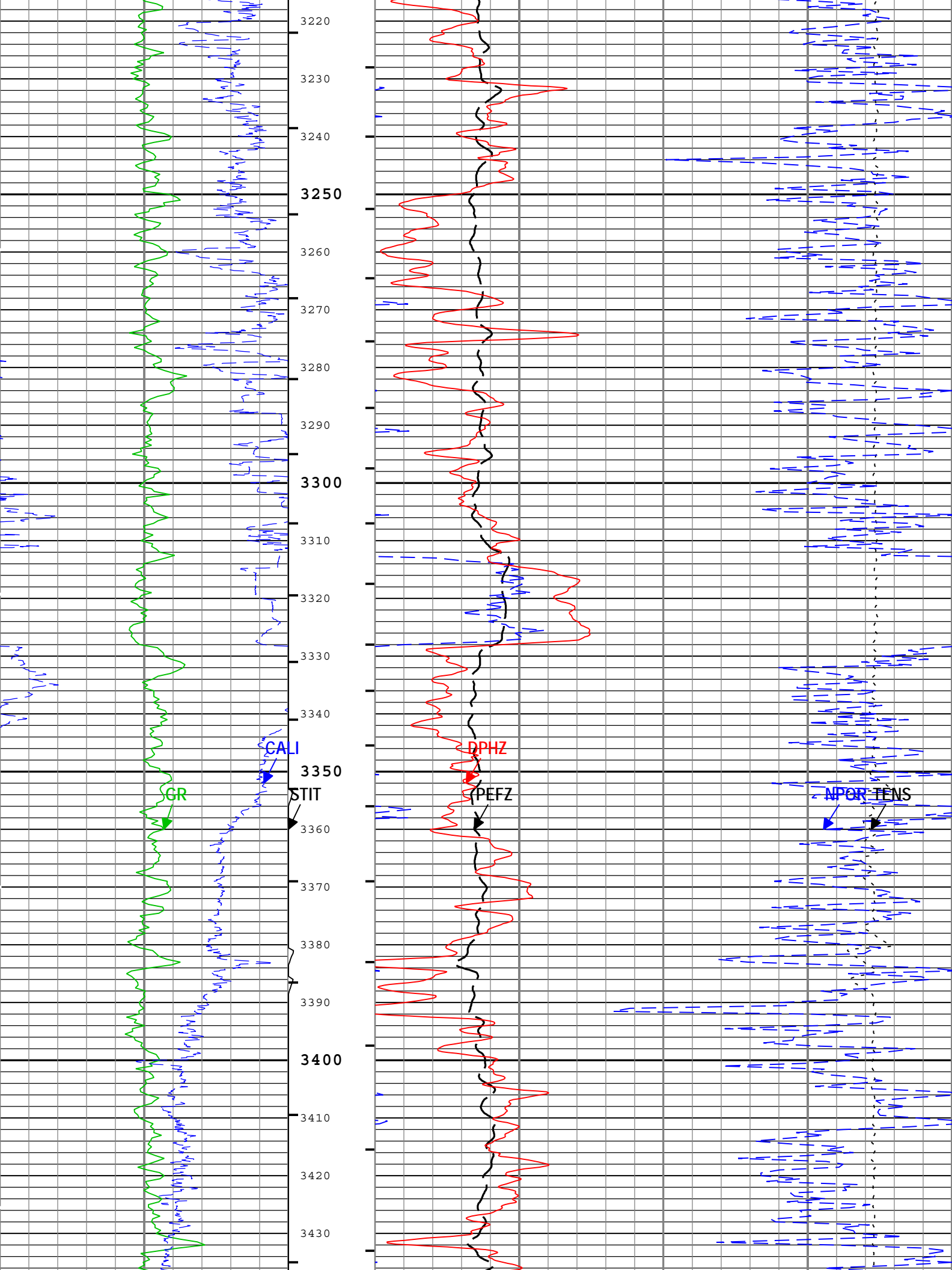


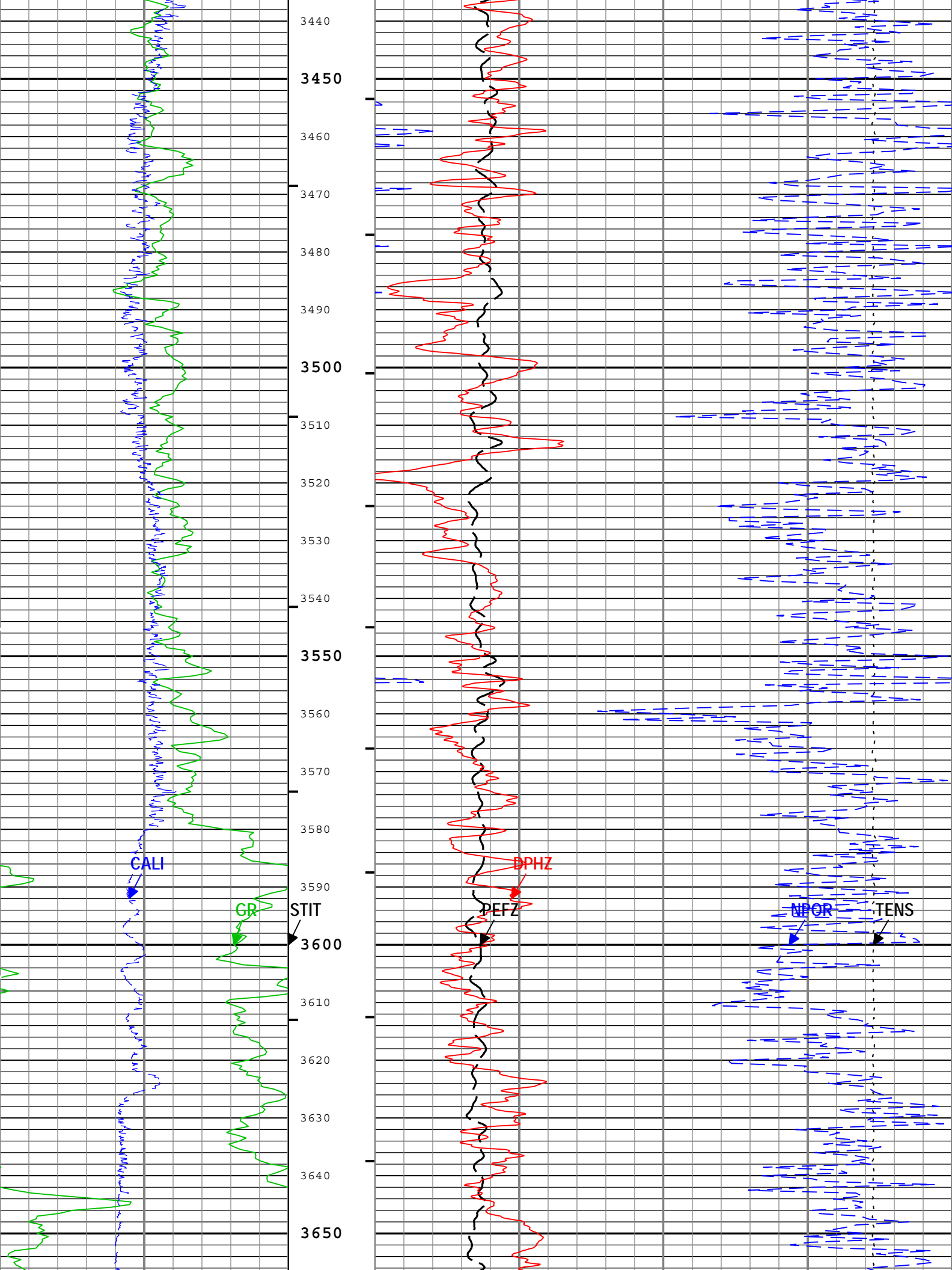


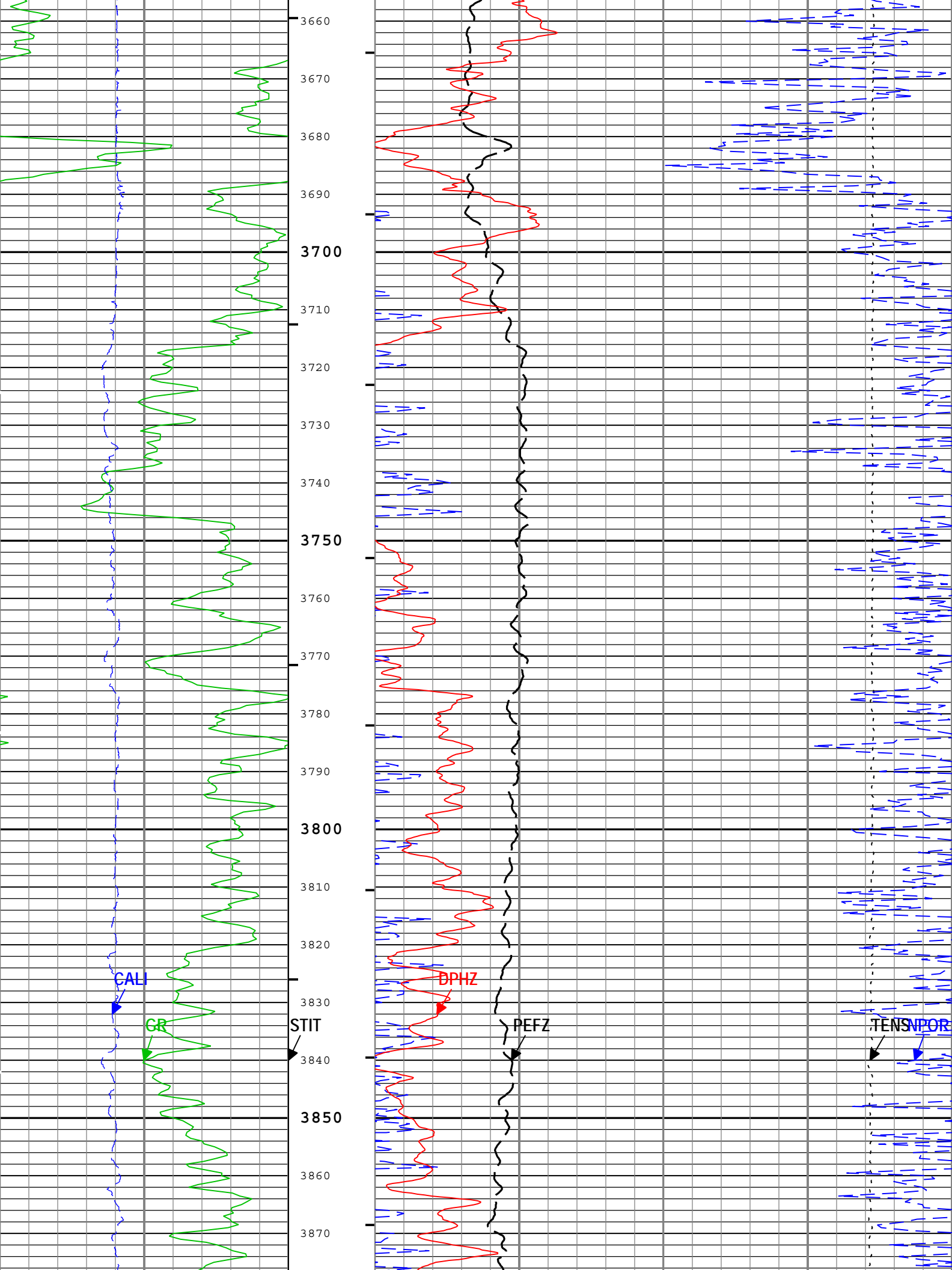


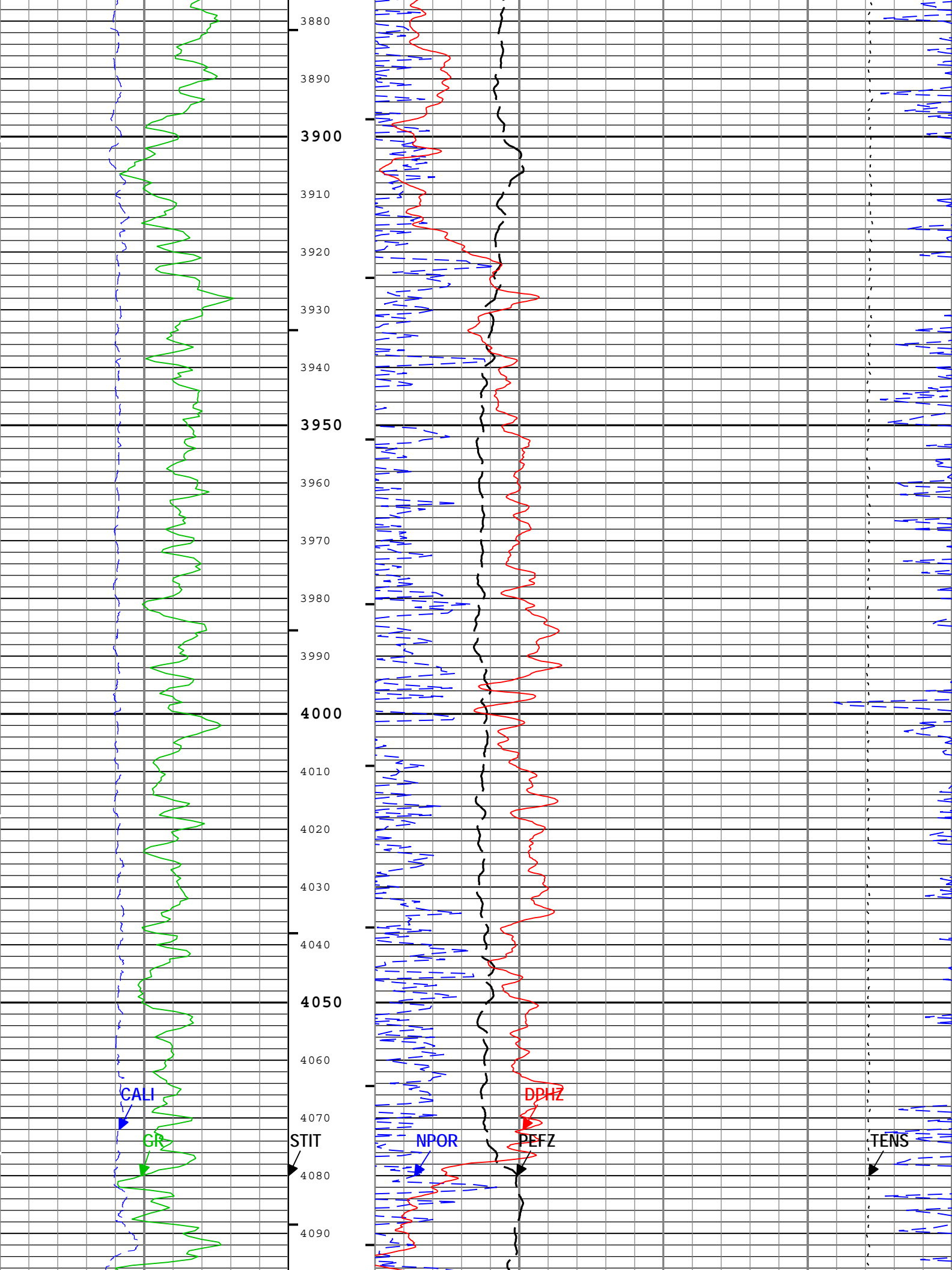


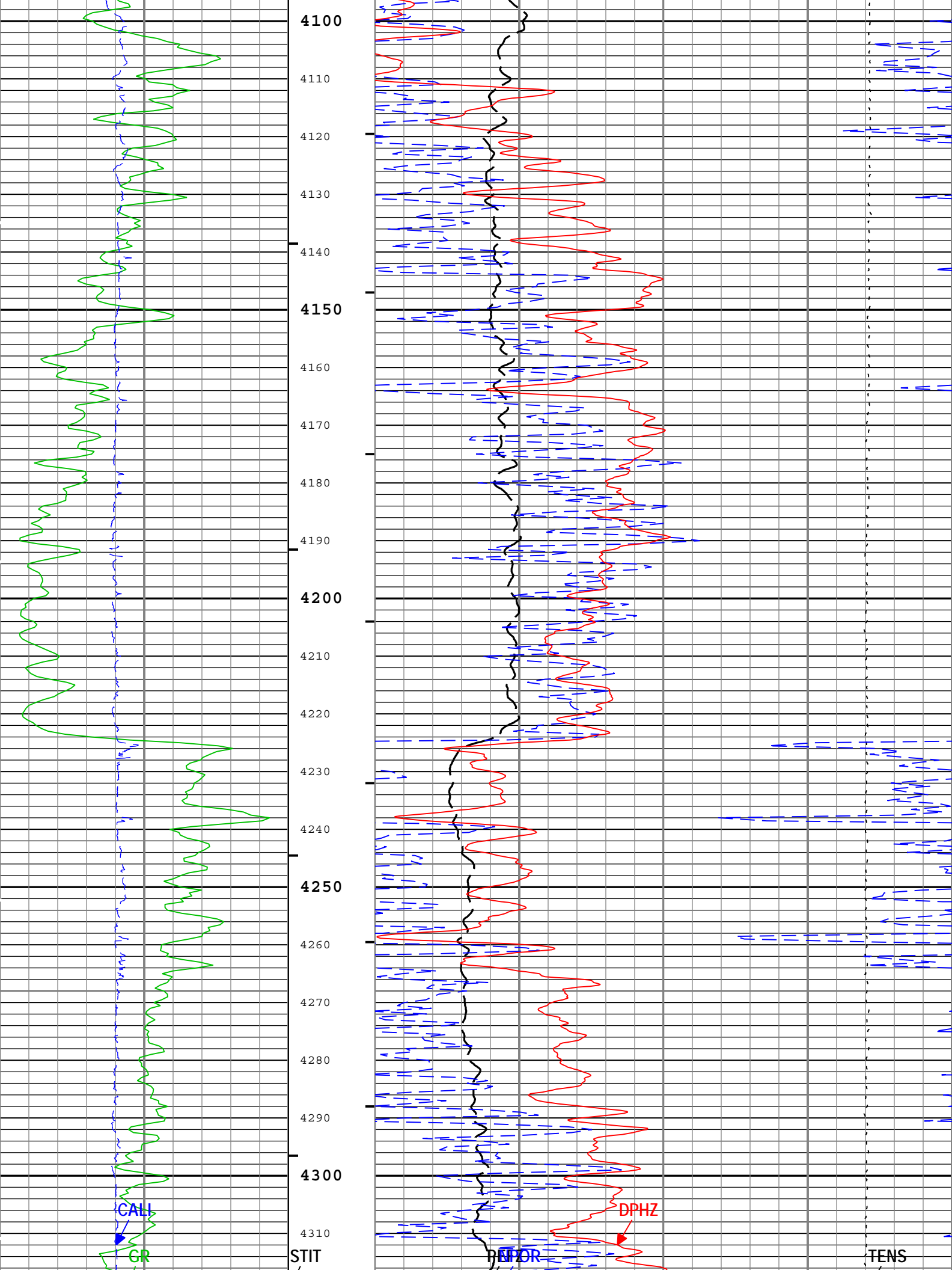


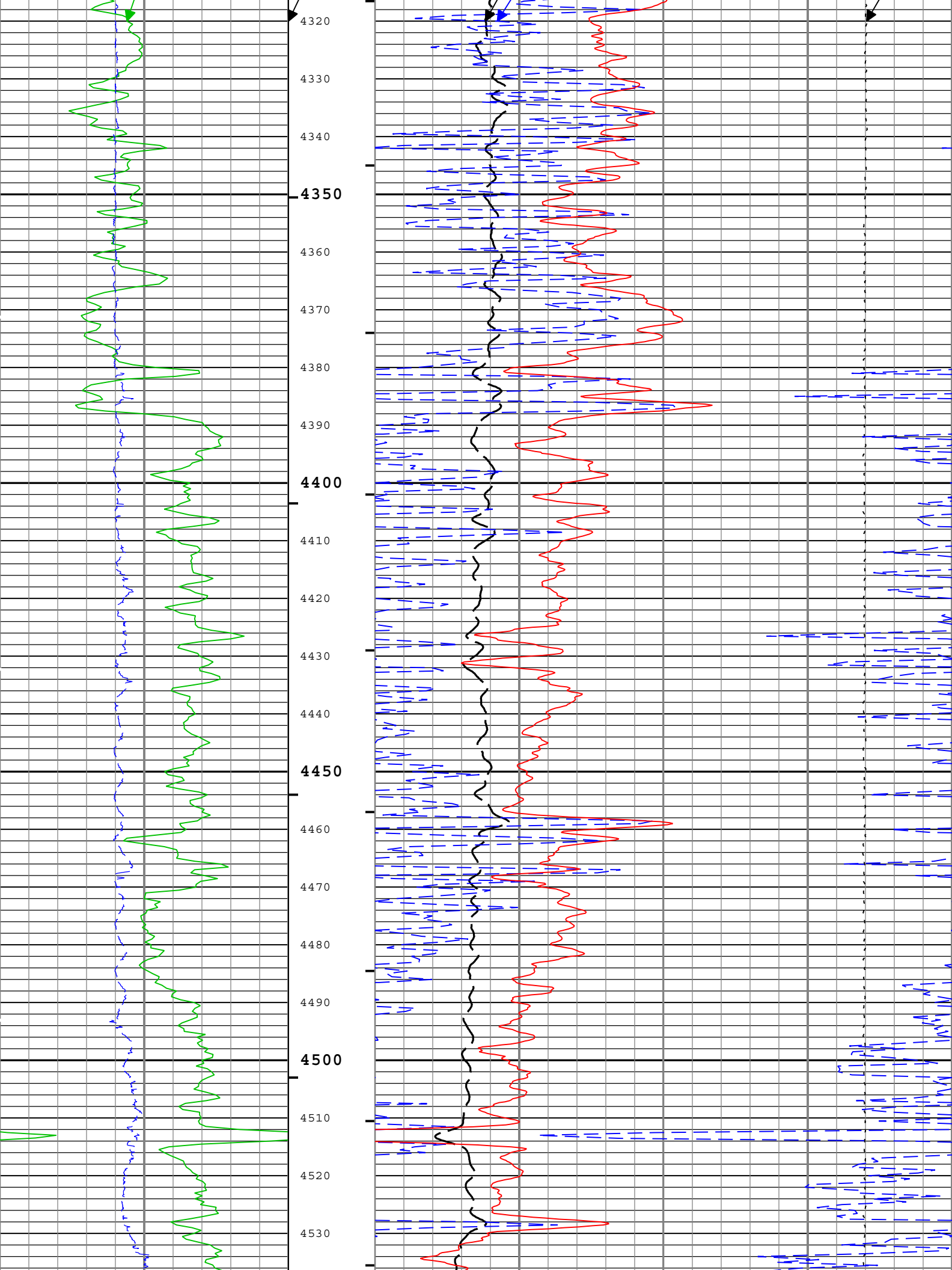


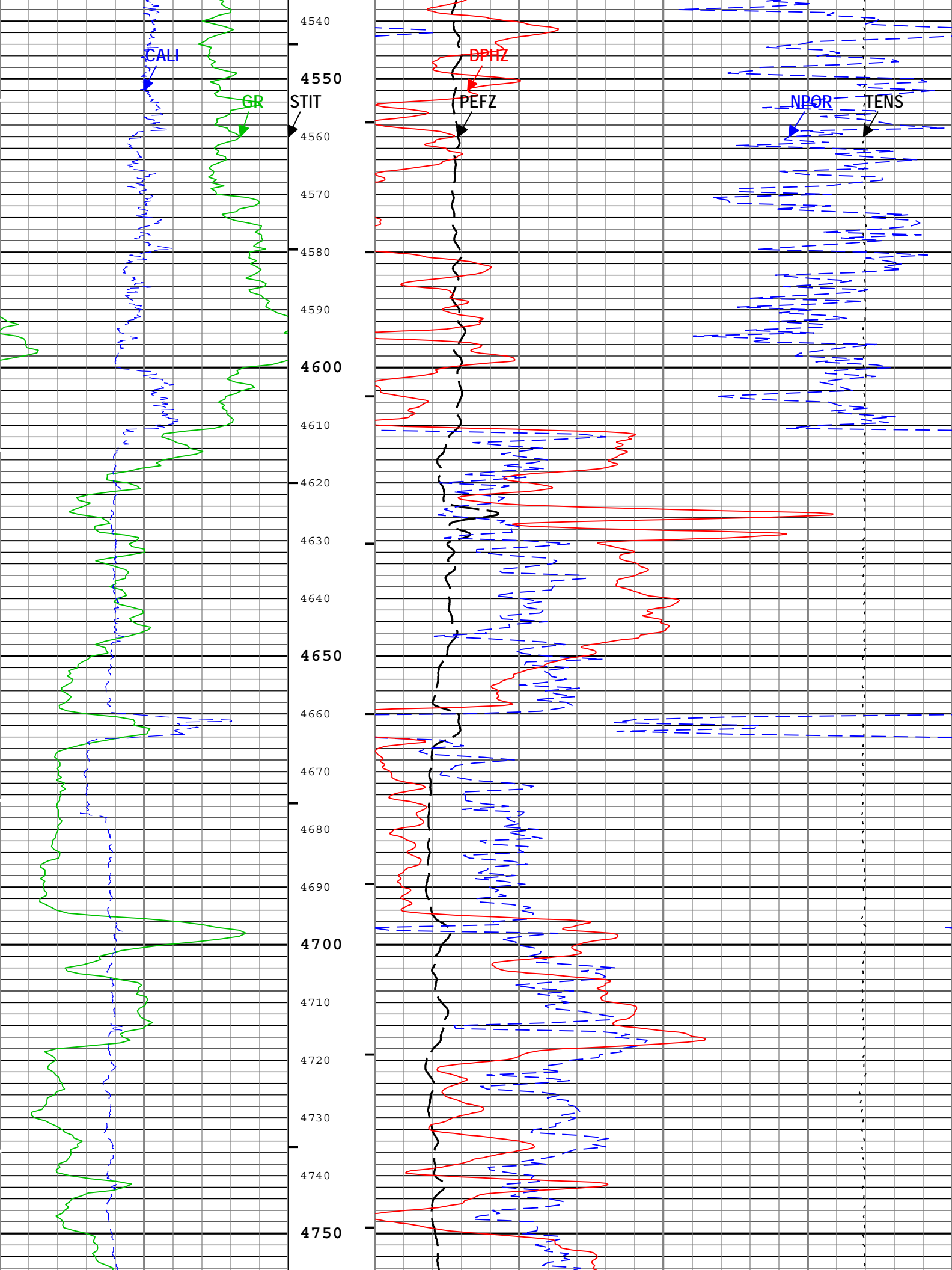


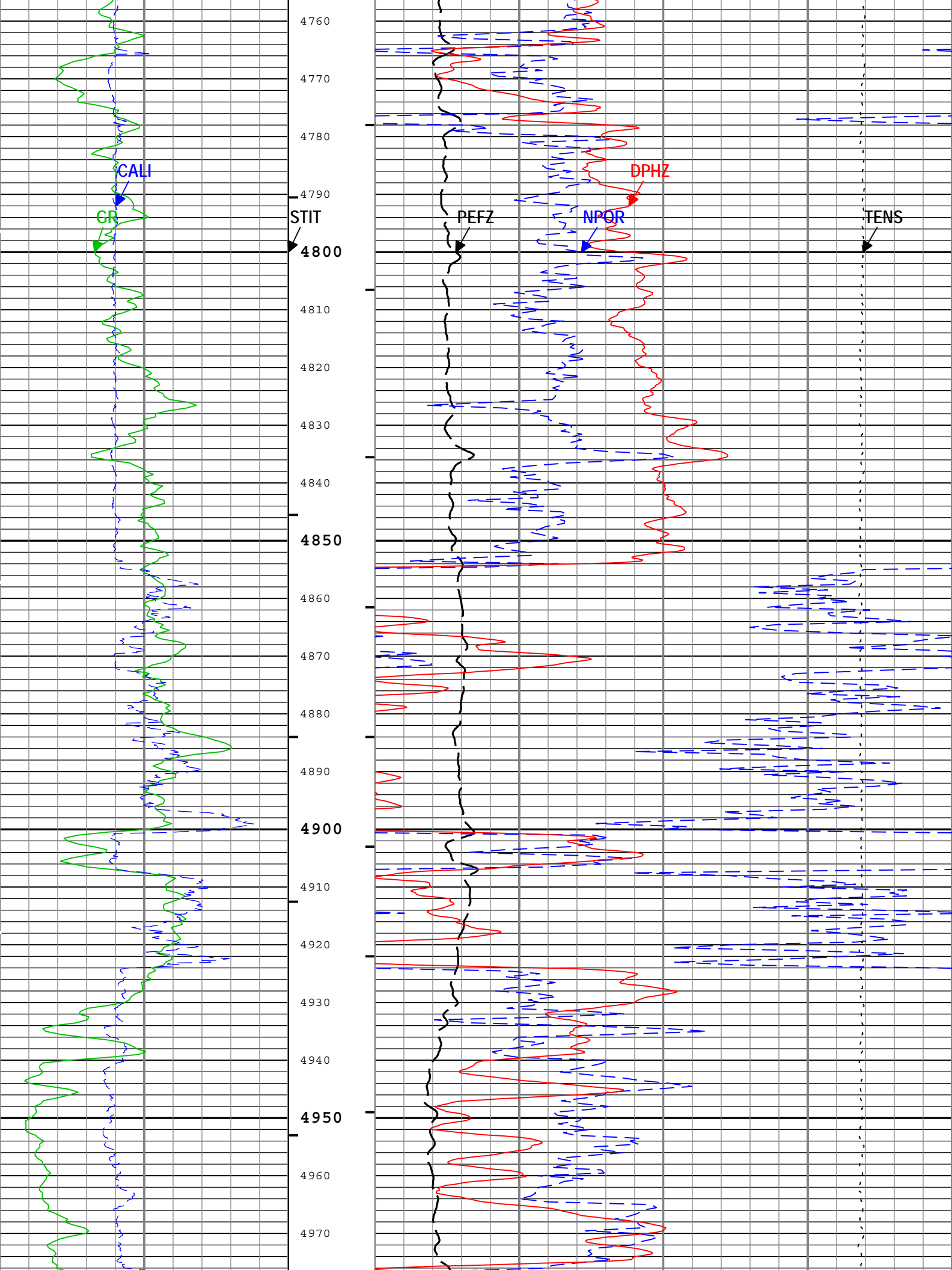


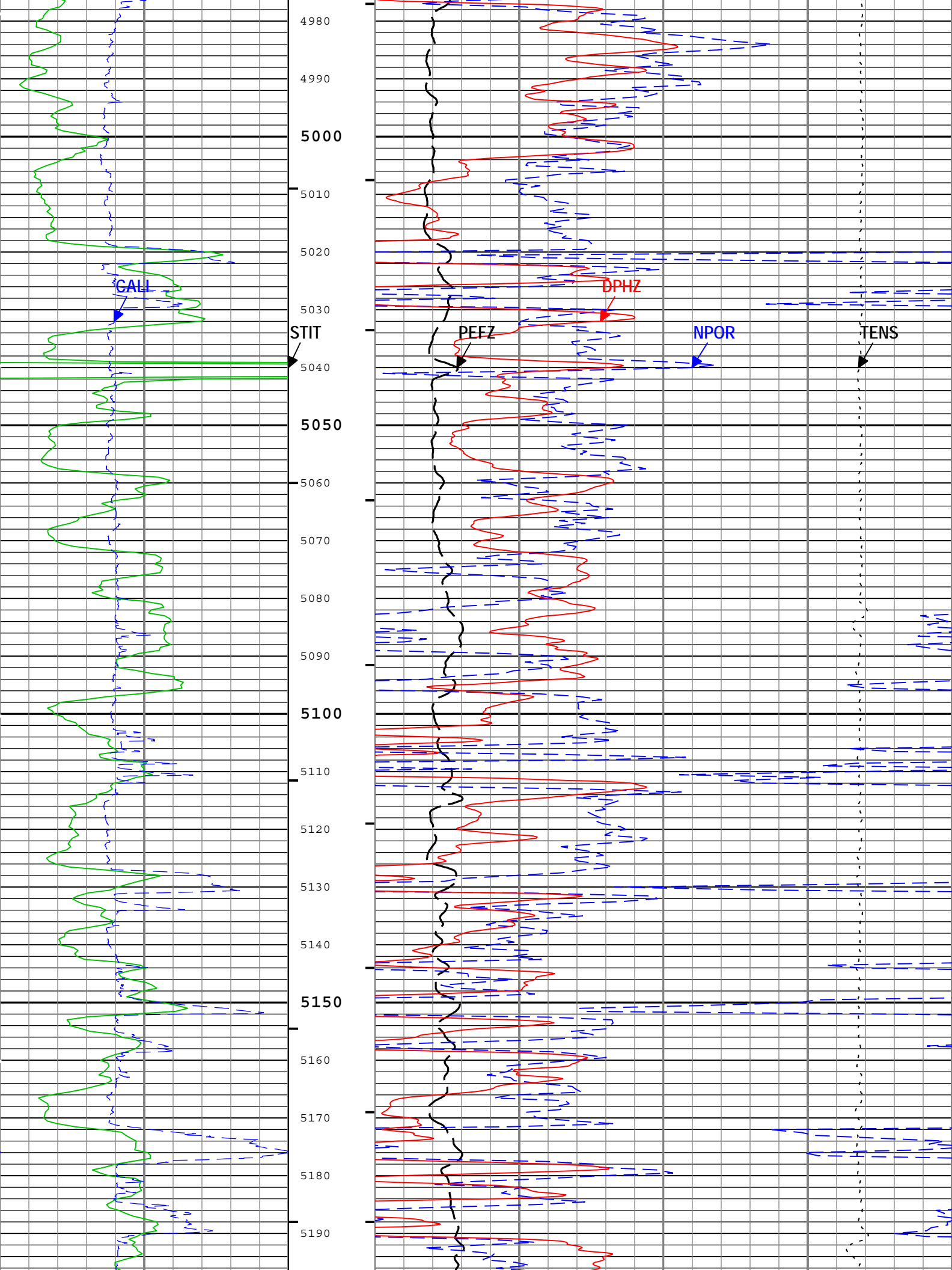


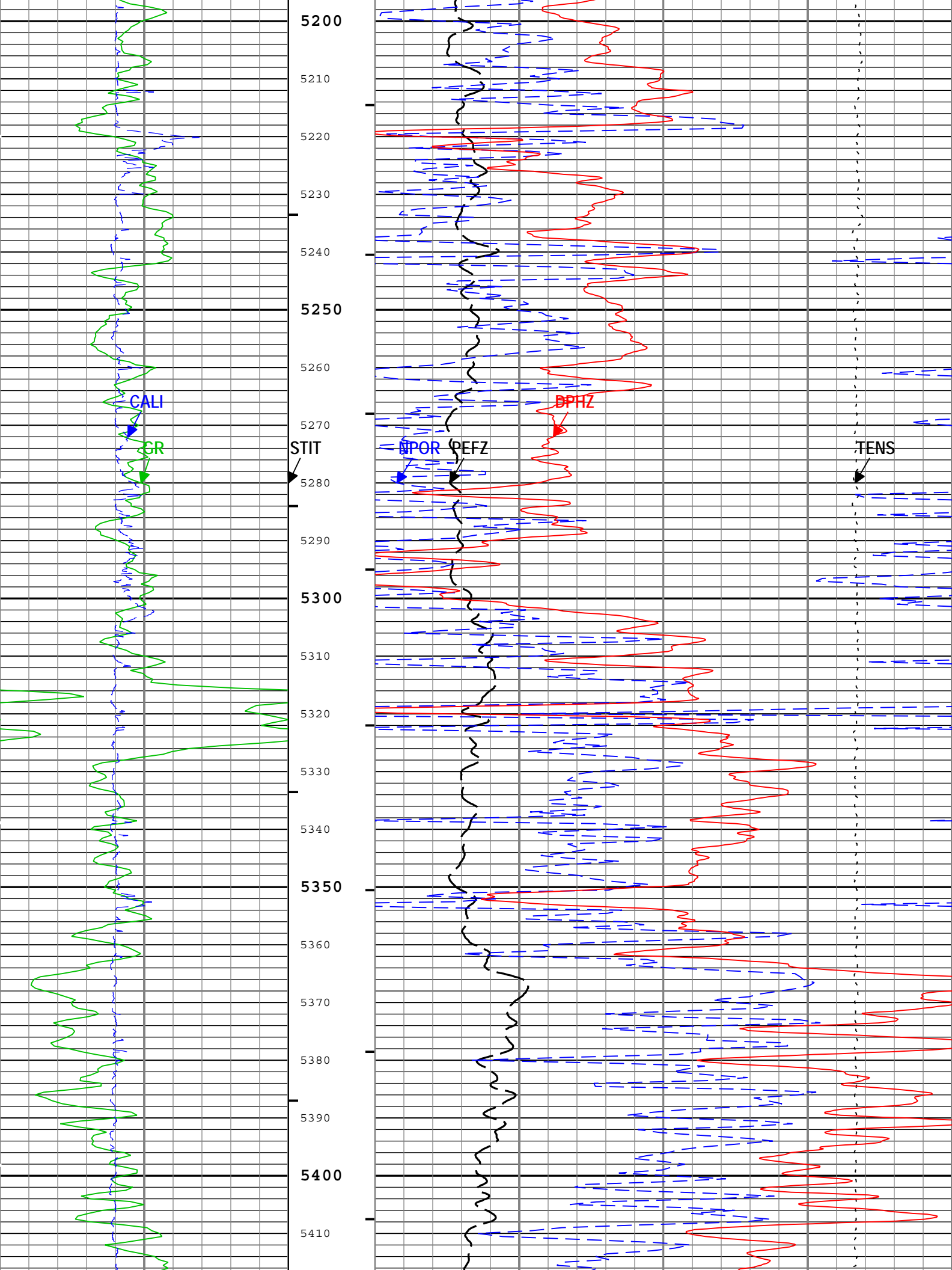


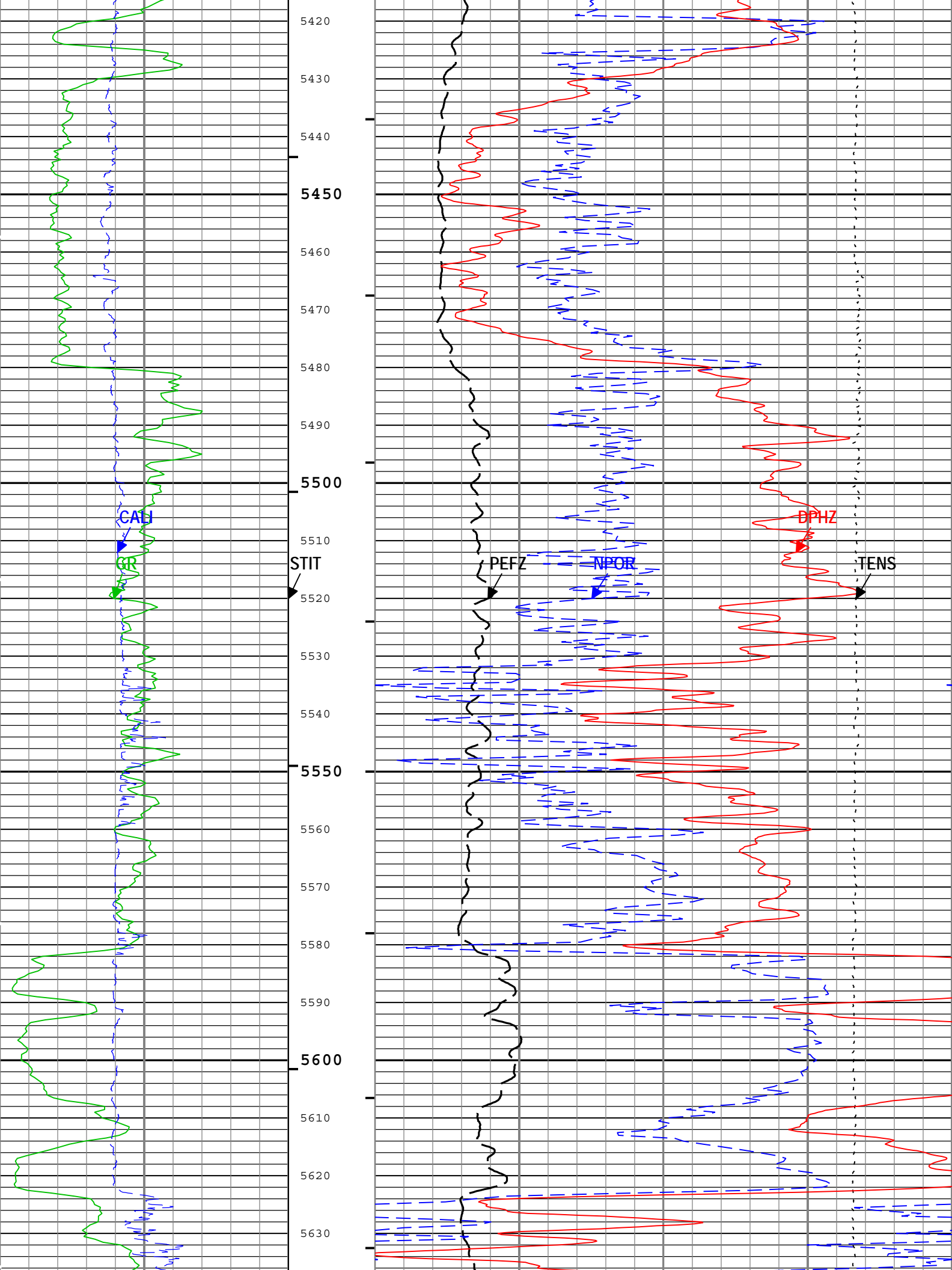


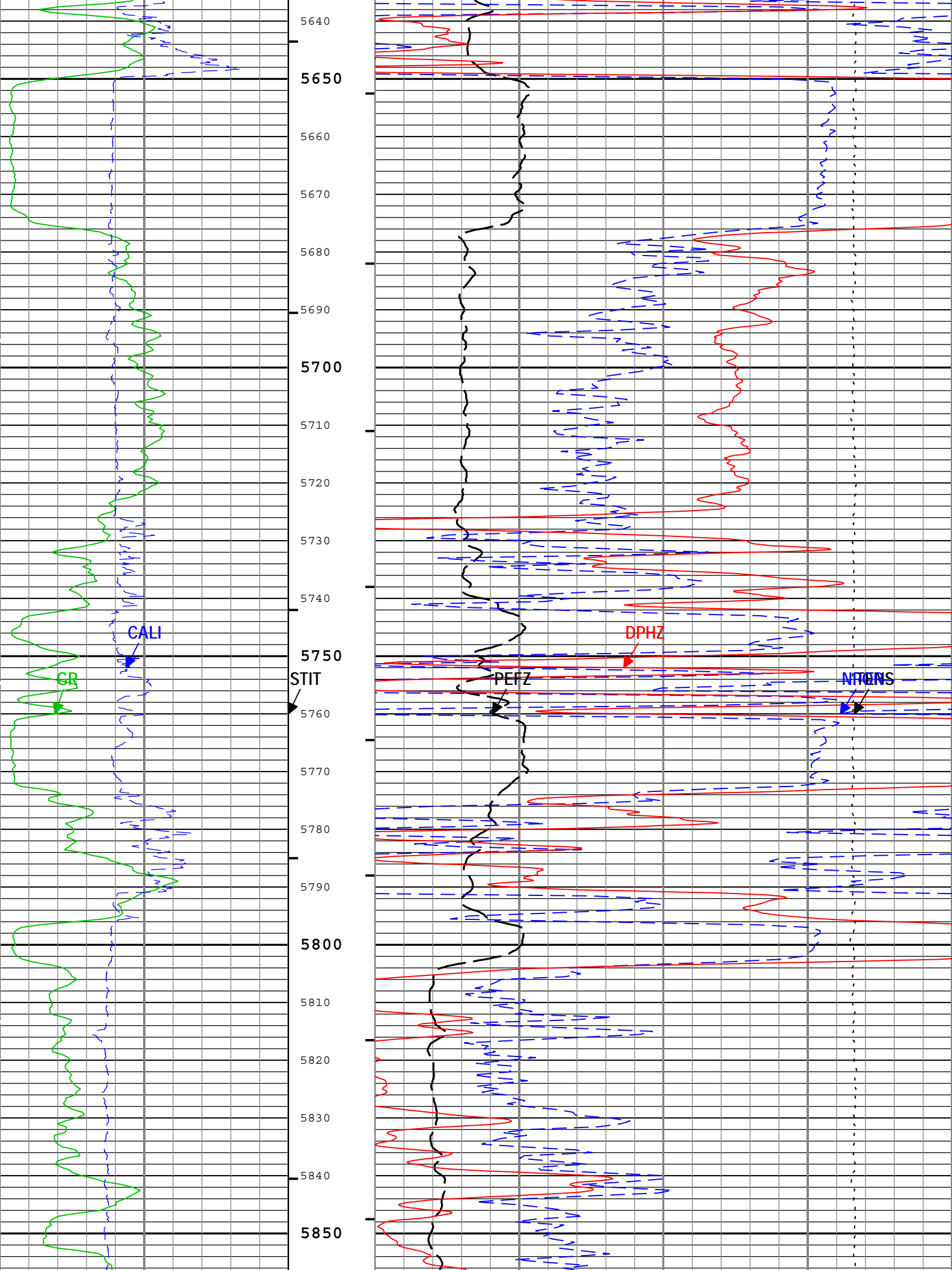


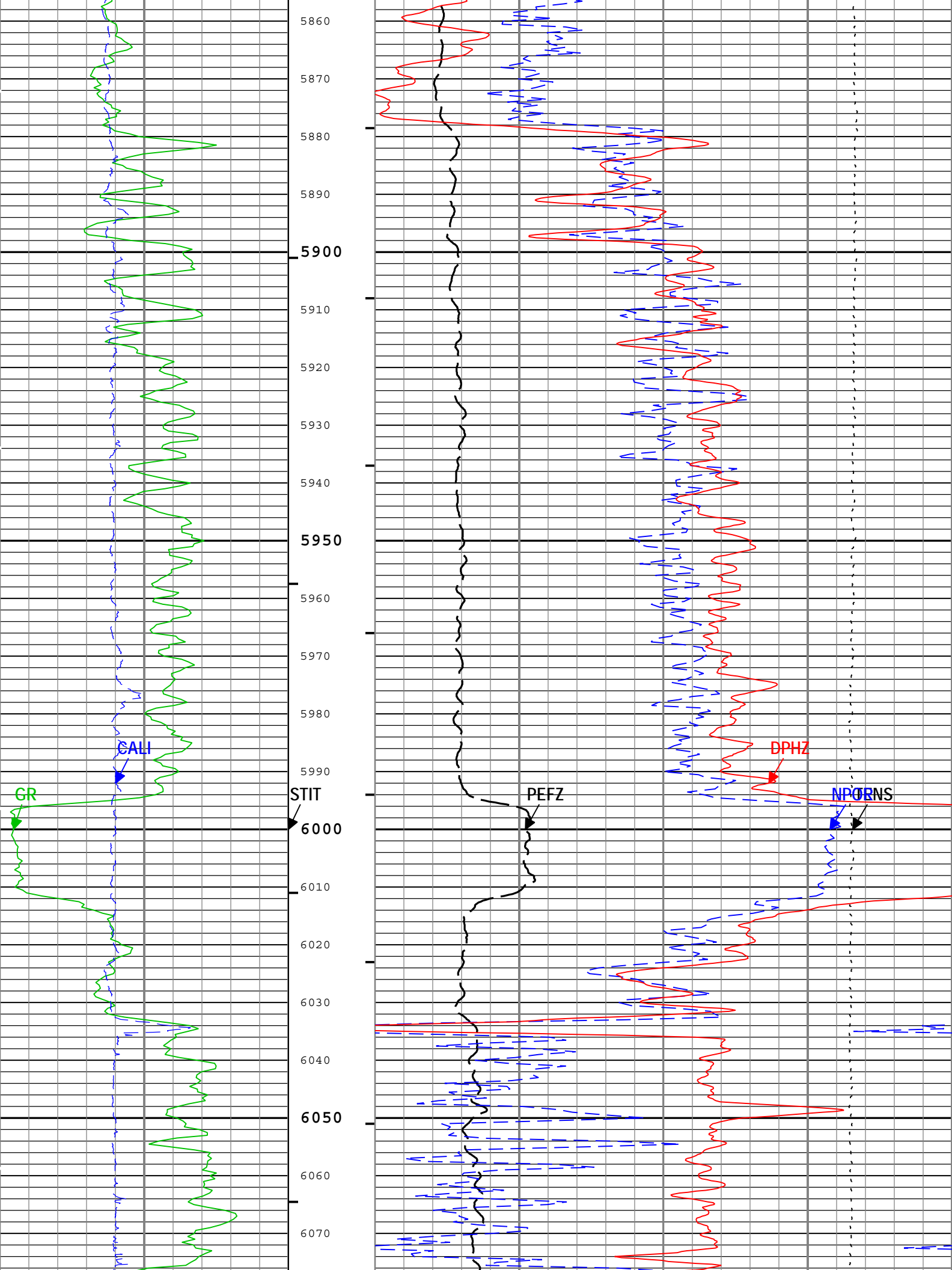


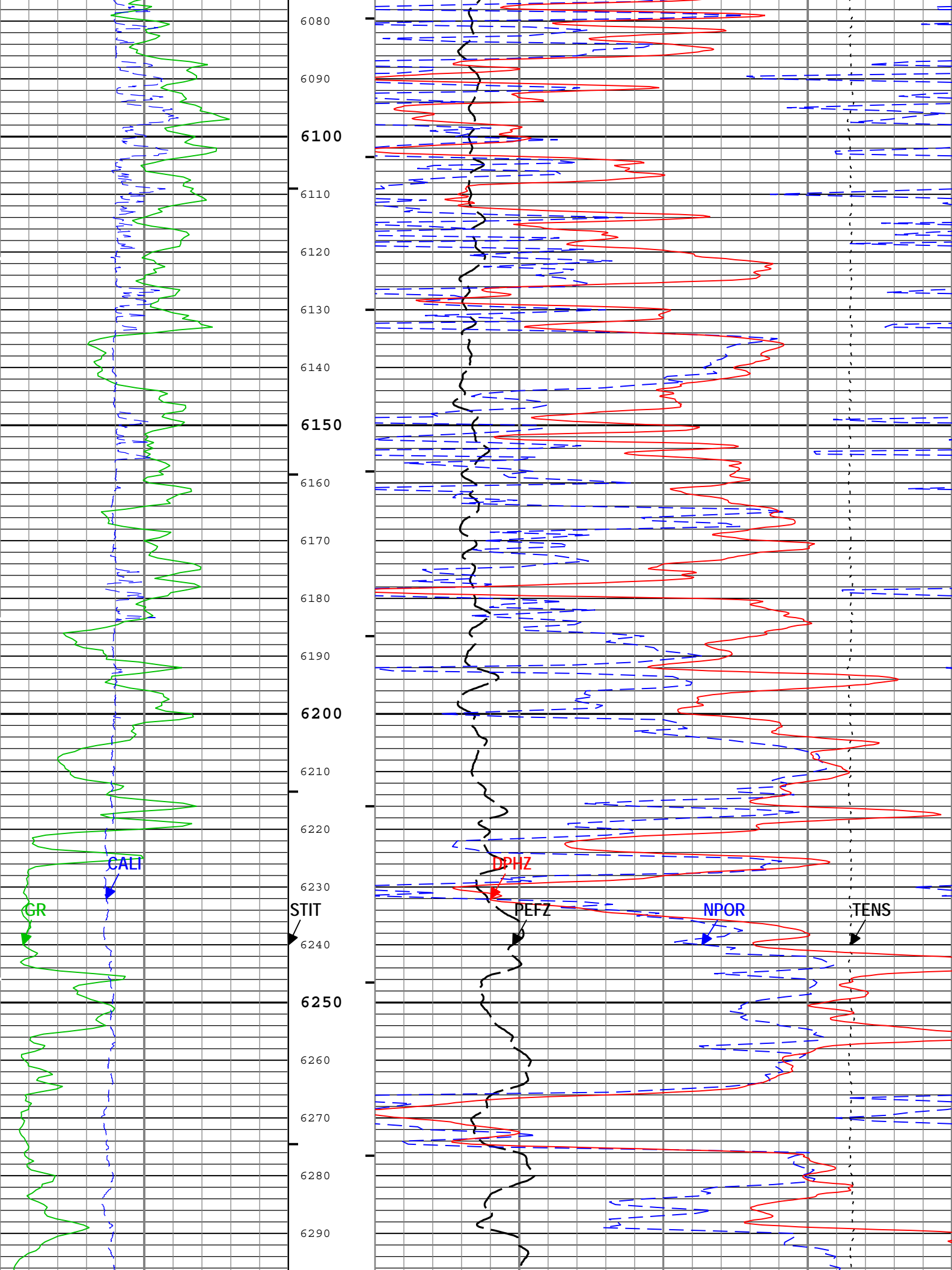


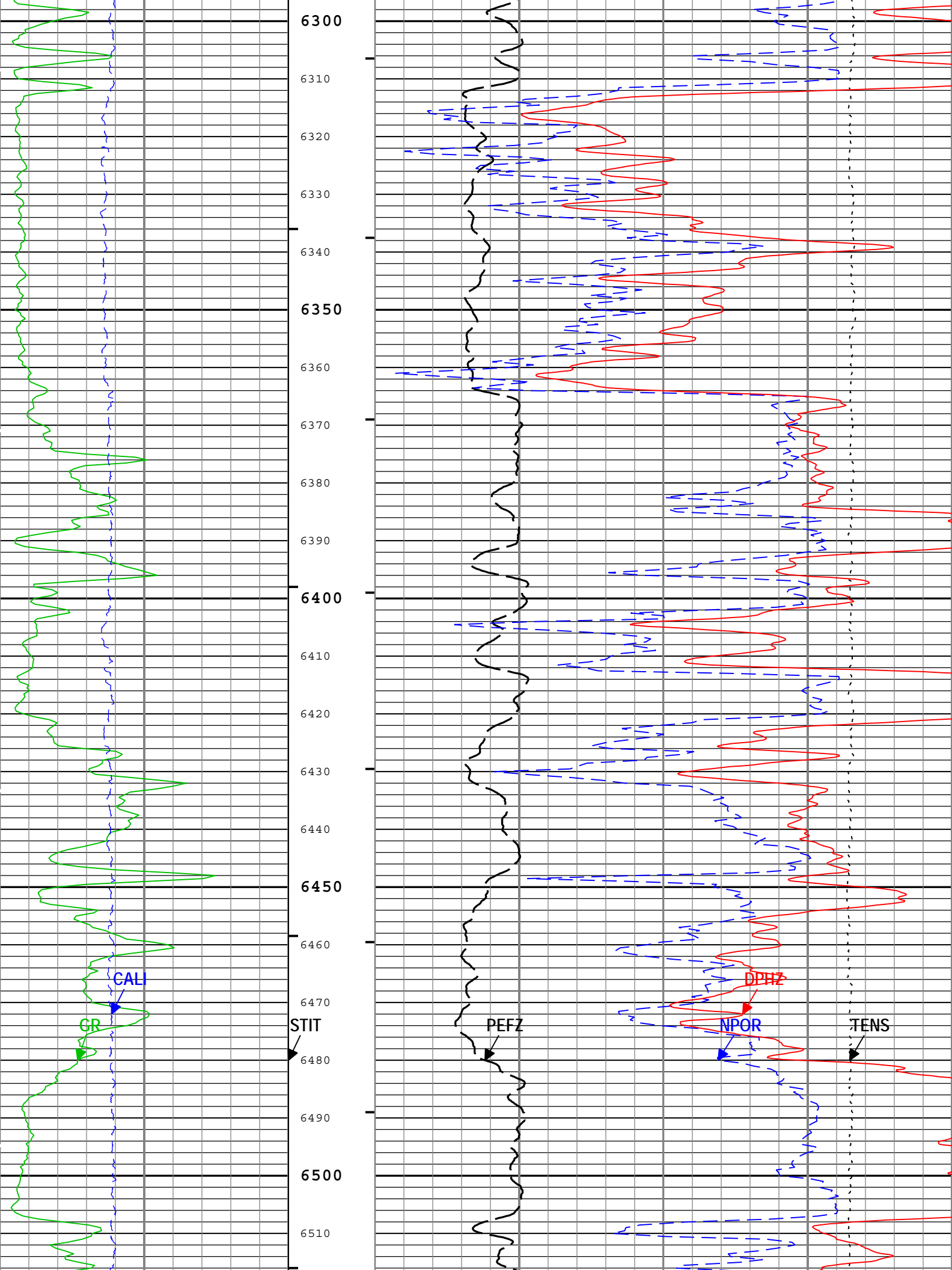


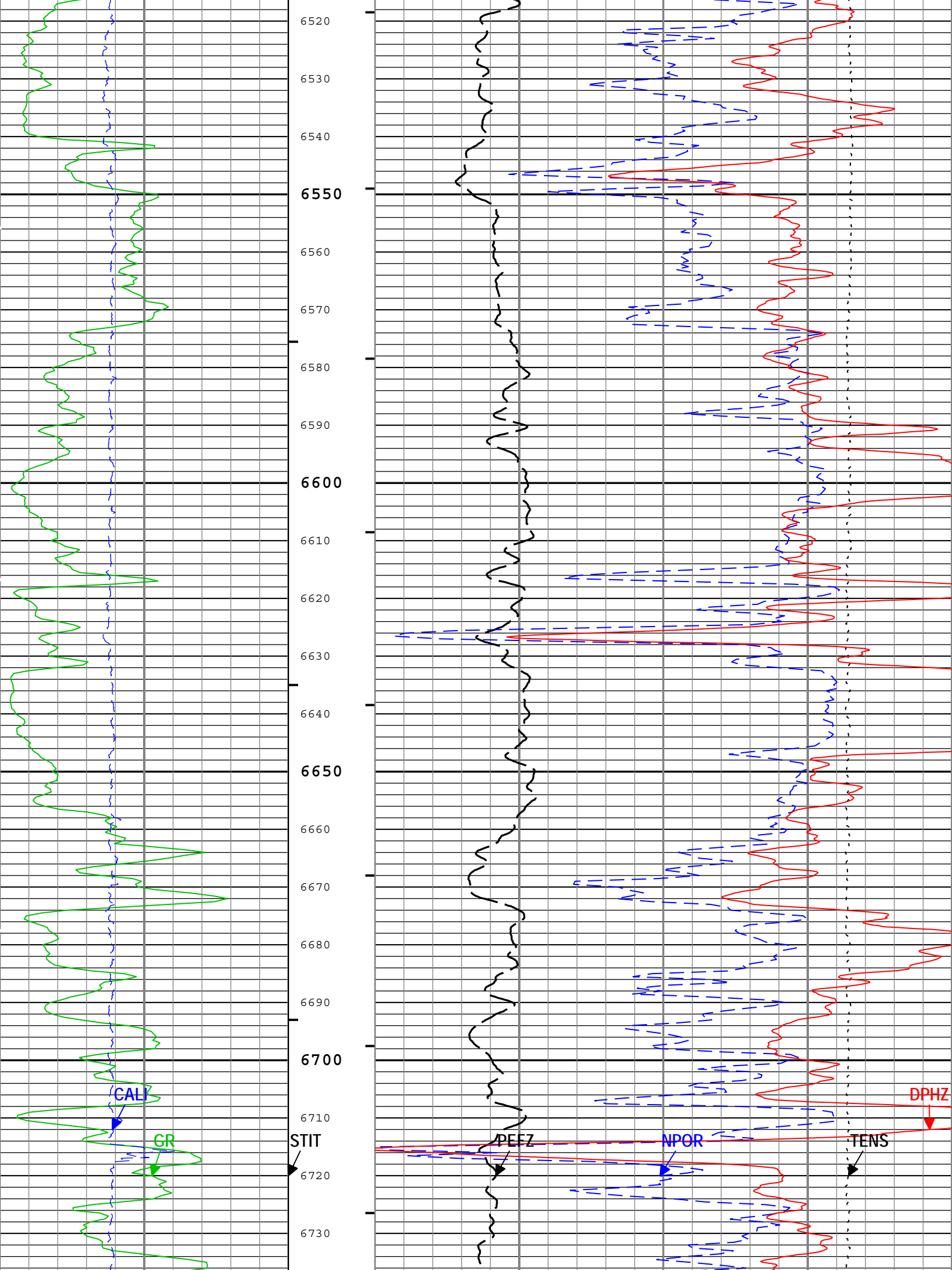


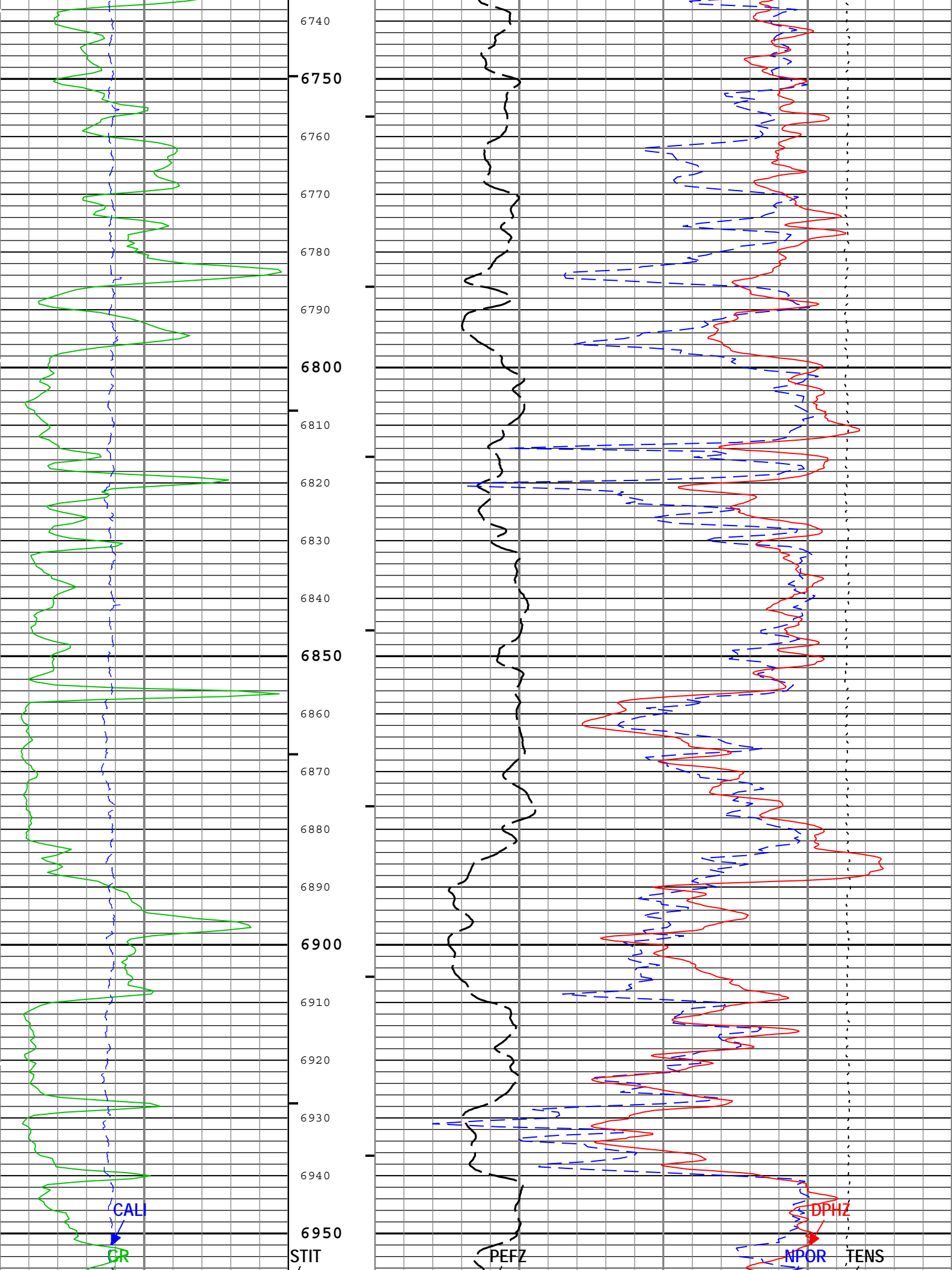


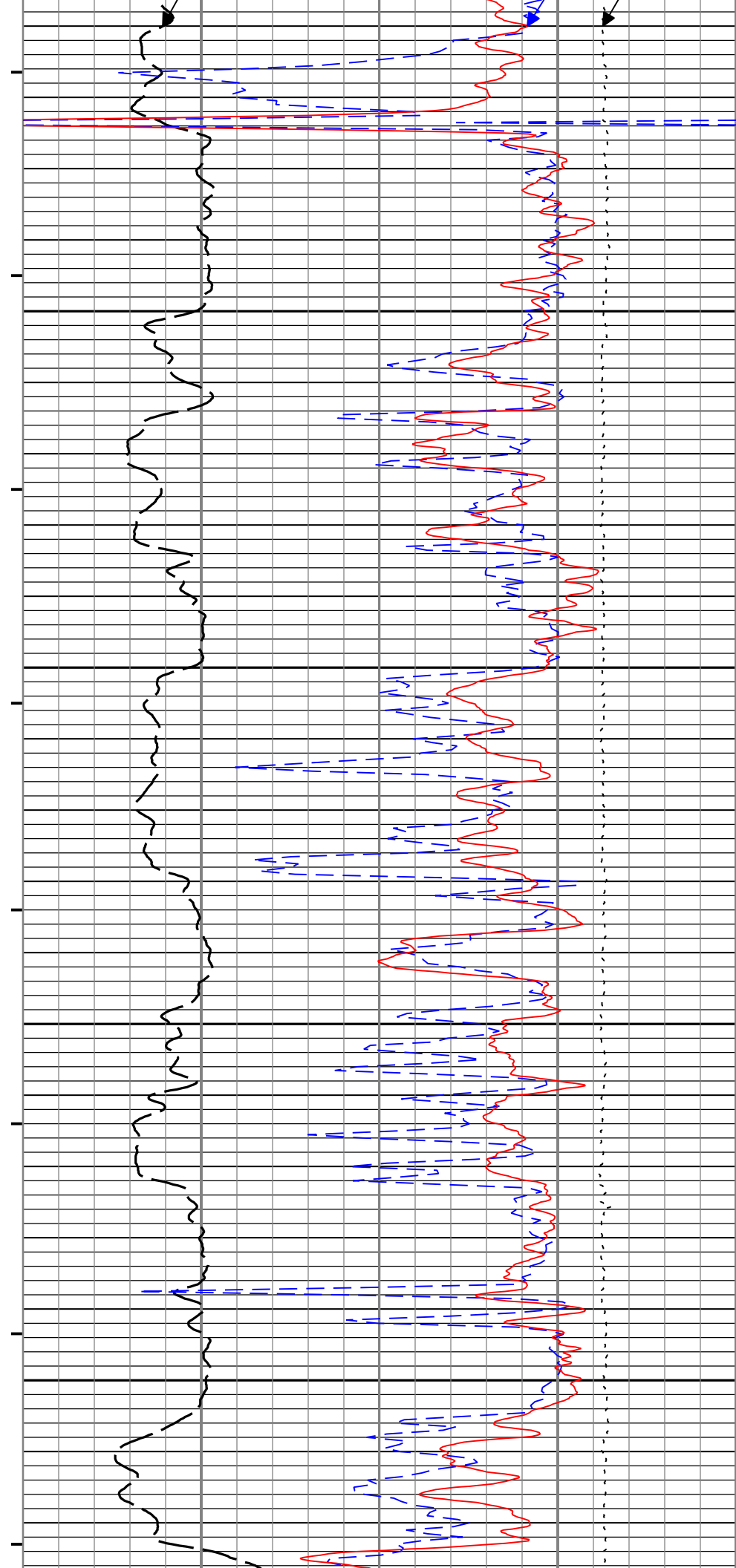
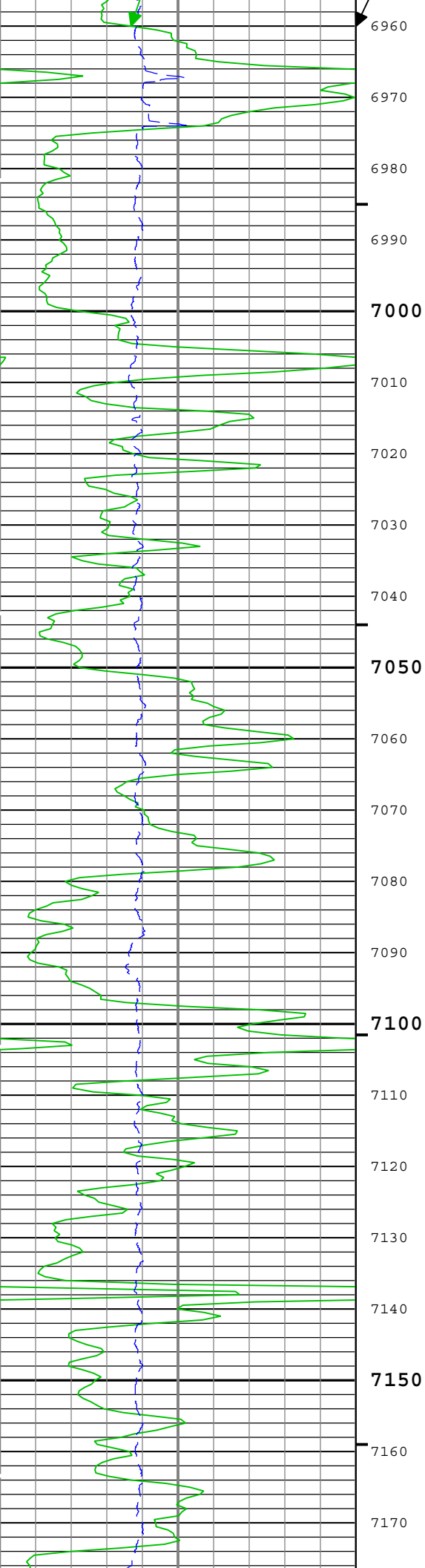


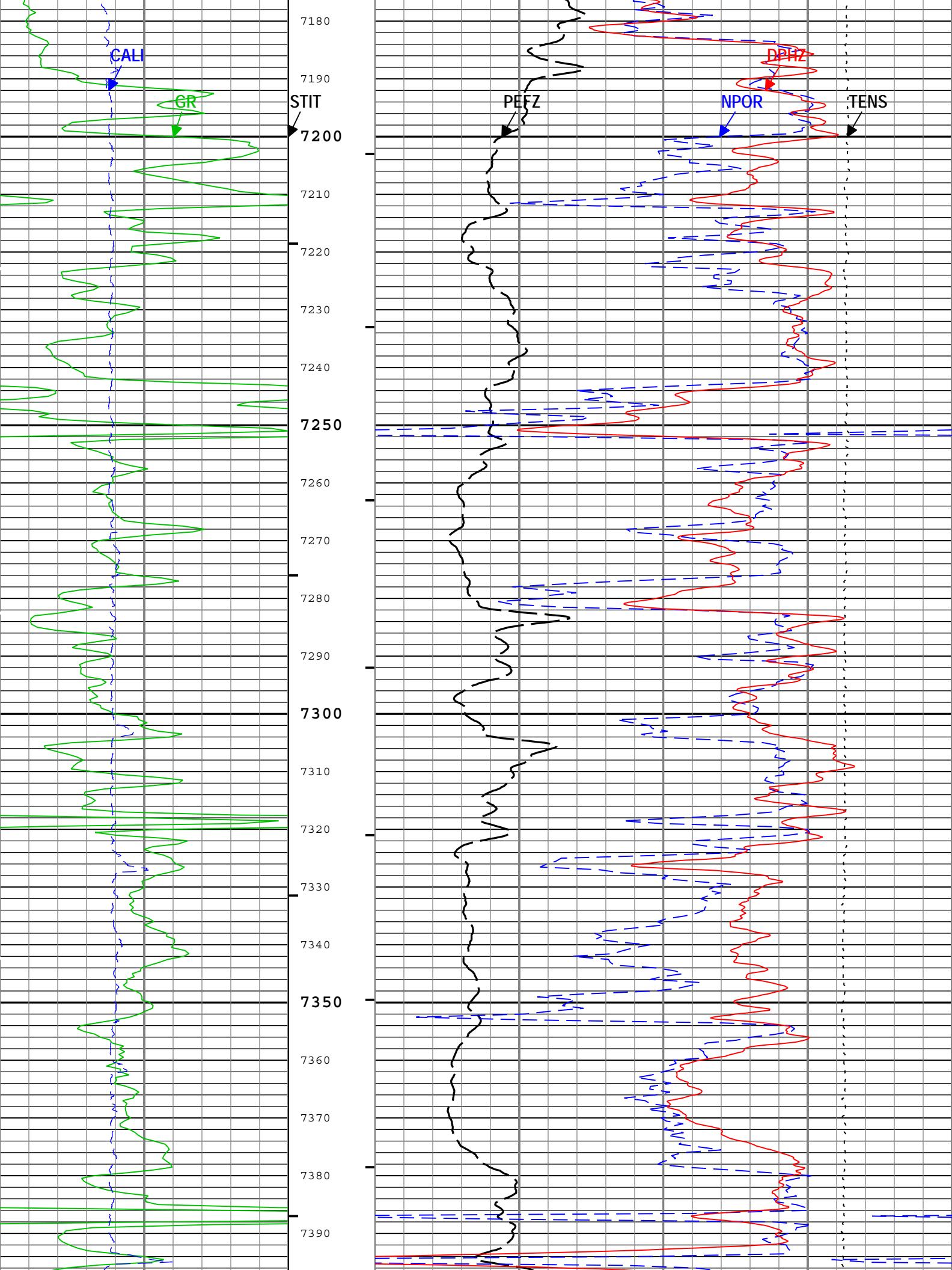


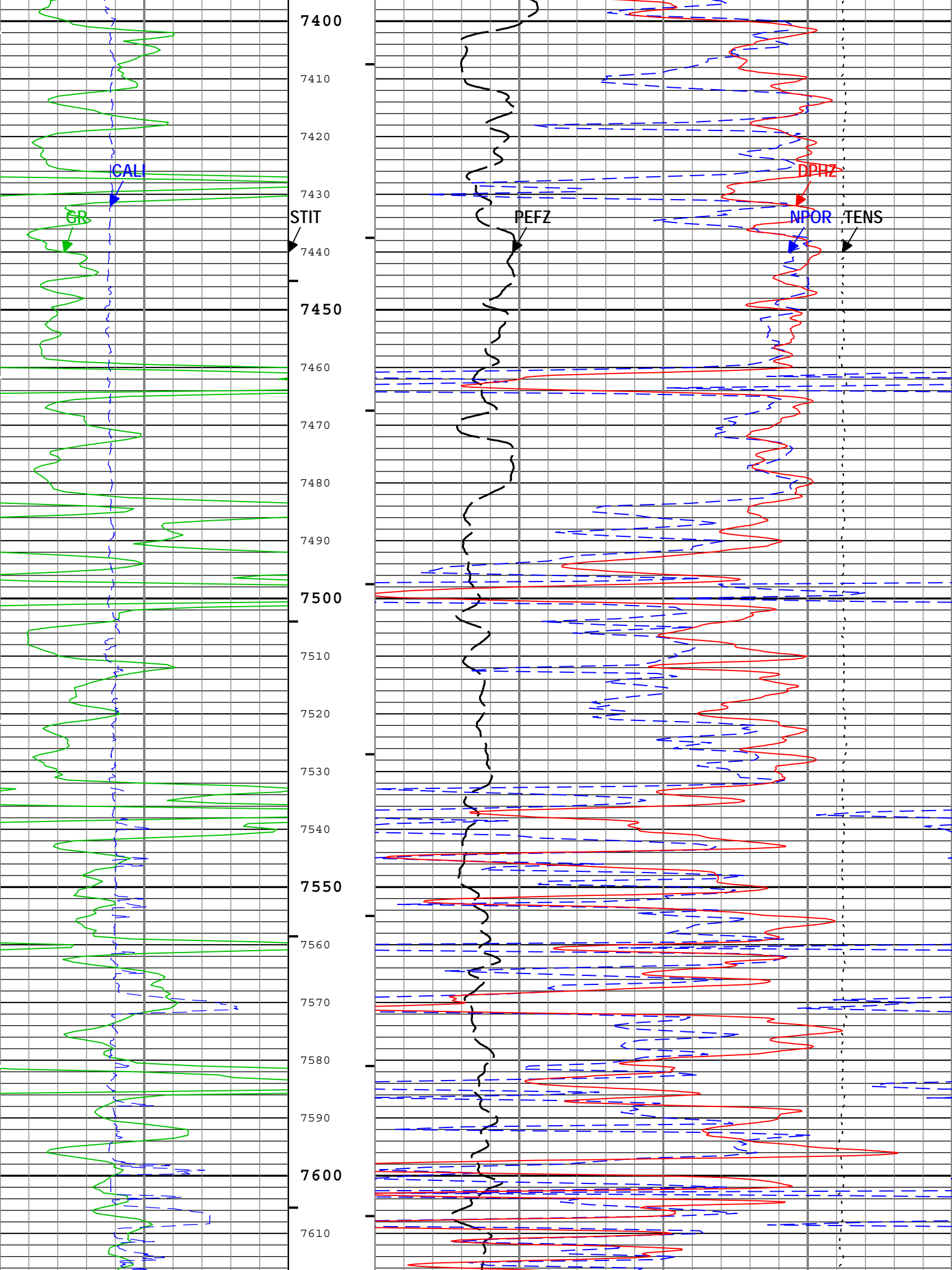


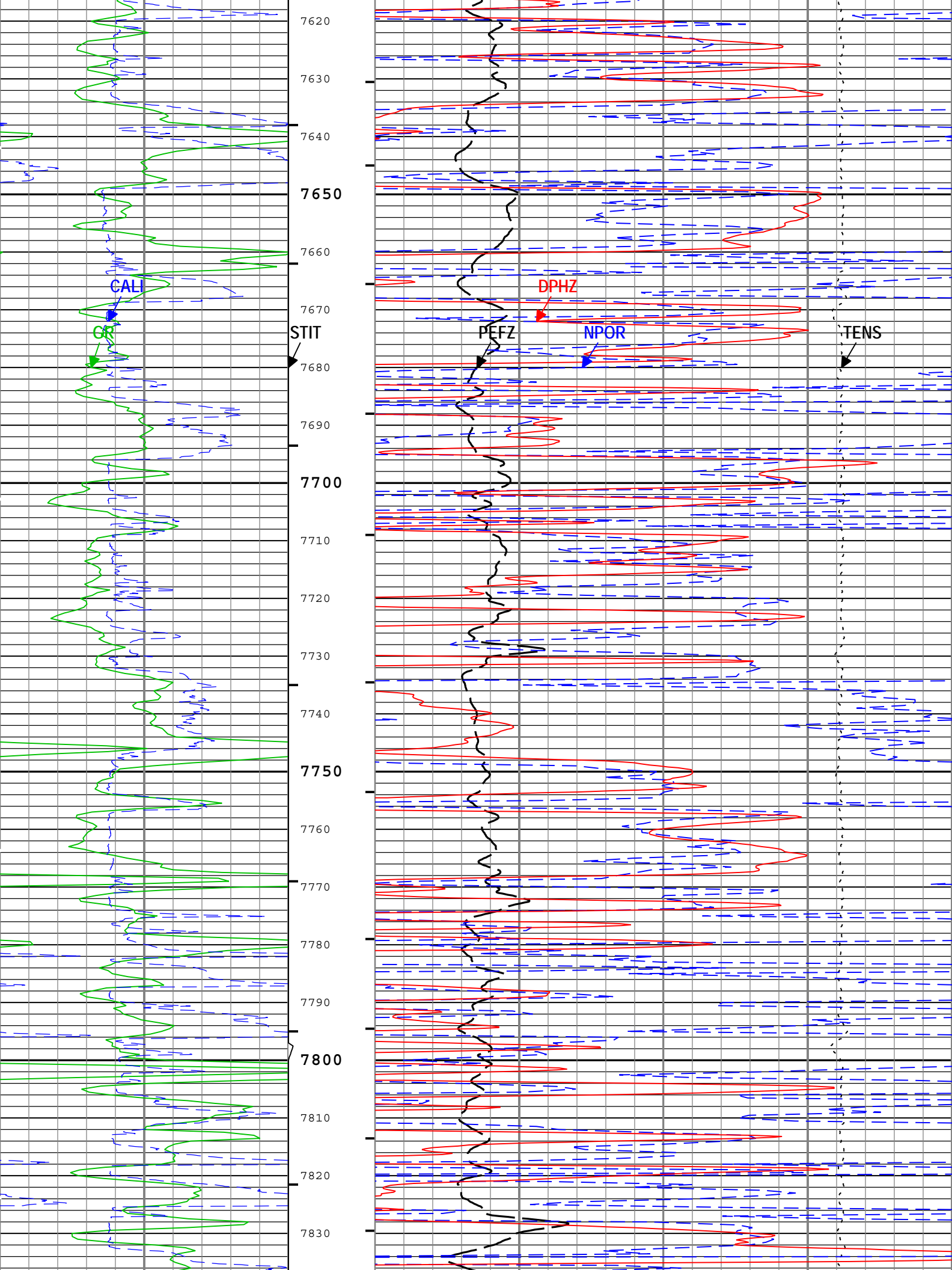


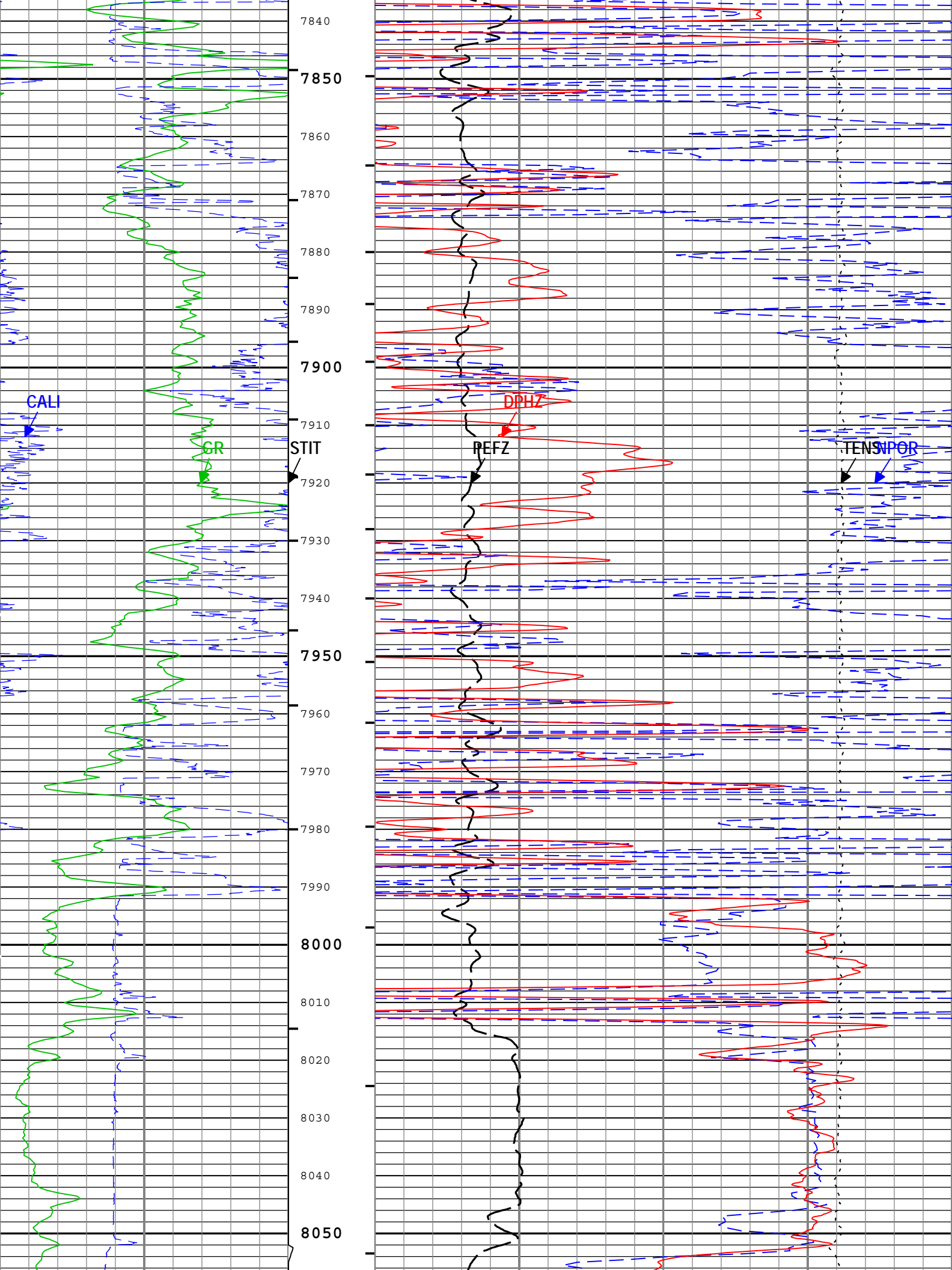


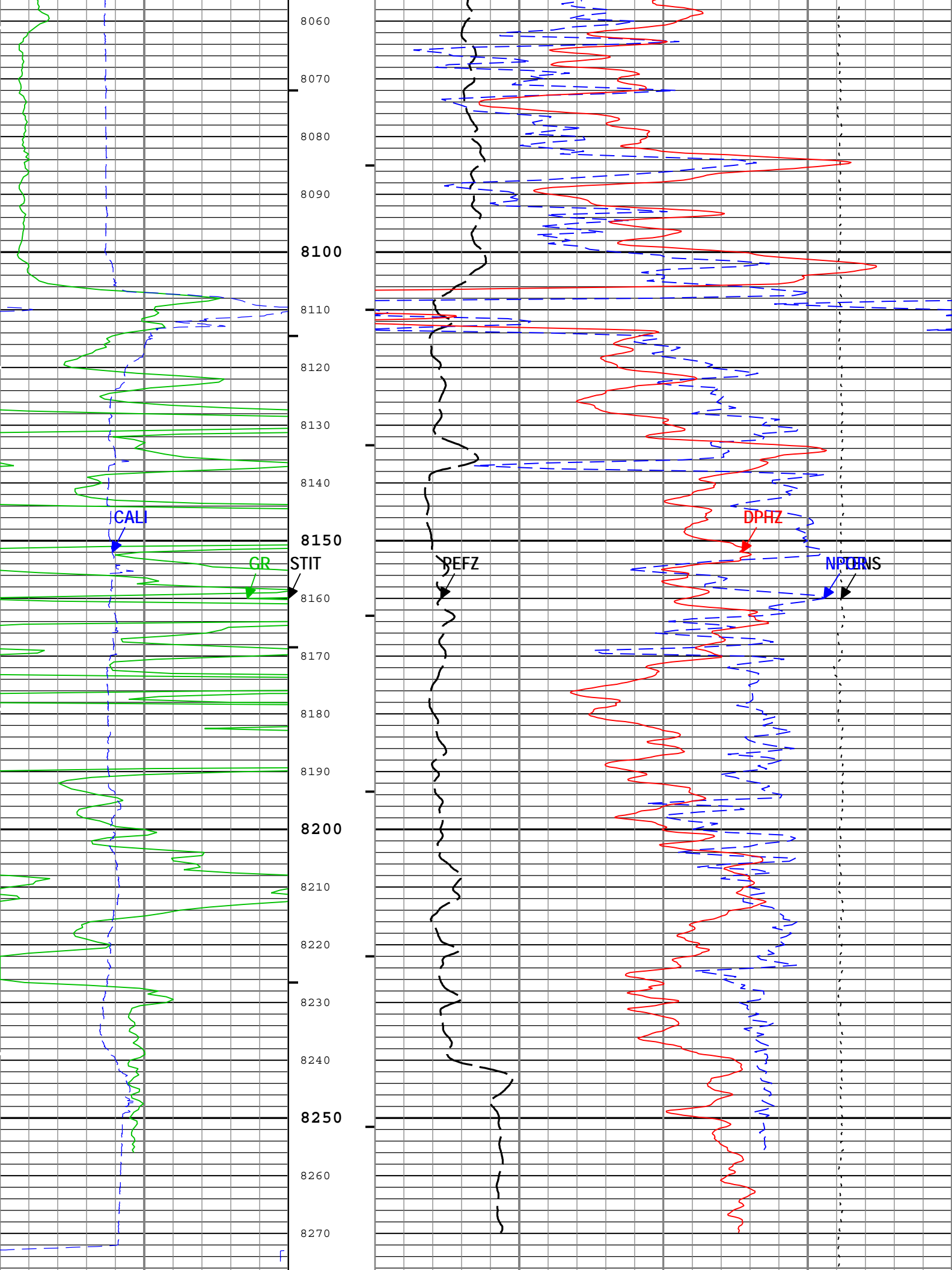


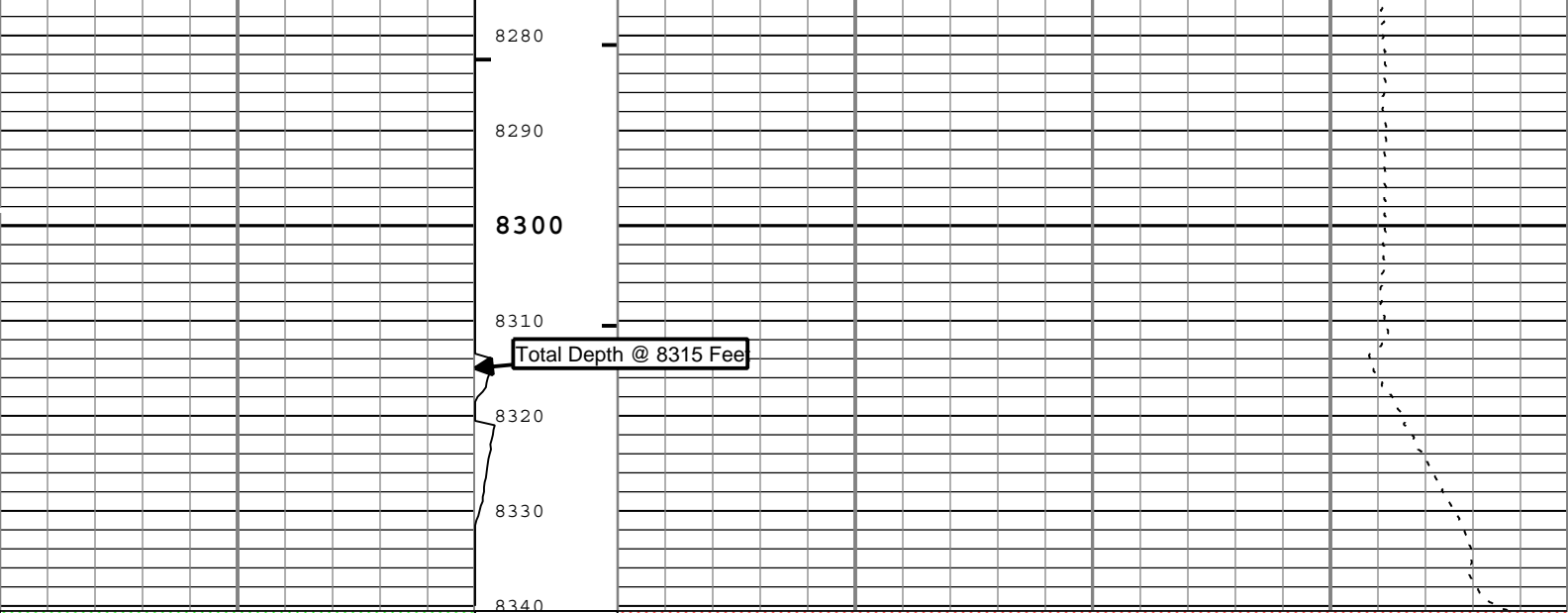












GR Backup		Stuck Tool Indicator, Total (STIT)		Gas Effect	
Gamma Ray (GR) HGNS-B		Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-B			
0	gAPI	200	0	ft	50
Caliper (CALI) HDRS-B		Standard Resolution Density Porosity (DPHZ) HDRS-B		Cable Tension (TENS)	
4	in	14	0.3	m3/m3	-0.1
		Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-B		10000	lbf
				0	0

—IHV - Integrated Hole Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 10.00 (ft3)

—IHV - Integrated Hole Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:18:48

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
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	36327.1	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-B	0.121	in
CBLO	Casing Bottom (Logger)	WLSESSION	309.5	ft
CDEN	Cement Density	HGNS-B	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	8.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Fresh Water/DAP	
DHC	Density Hole Correction	HDRS-B	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
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-B	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	0.56	ohm.m
SOCO	Standoff Correction Option	HGNS-B	Yes	
TD	Total Measured Depth	Borehole	8300	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	280	309.5
BS	7.875	309.5	8340.5

All depth are actual.

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-B	0	
HRGD_BRD_TYPE	HRGD Board Type	HDRS-B	WITHOUT_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
STSO_HRDD	Temperature Source for the Density Algorithm	HDRS-B	Decaytime algorithm	

Run 1

Porosity 5" = 100'

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
Run 1	Repeat[2]:Up	Up	7892.70 ft	8335.41 ft	31-May-2013 4:27:36 PM	31-May-2013 4:35:26 PM	10.10 ft	true
Run 1	Main[3]:Up	Up	285.10 ft	8340.47 ft	31-May-2013 4:39:28 PM	31-May-2013 6:55:10 PM	10.52 ft	true

All depths are referenced to toolstring zero

Log

Run 1: Main[3]:Up

Description: HGNS standard resolution porosities for Platform Express Format: Log (5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:18:54

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

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

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

TIME_1900 - Time Marked every 60.00 (s)

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

Main To Repeat

Repeat To Main

Standard Resolution Formation Photoelectric
Factor (PEFZ) HDRS-B

010

Main To Repeat

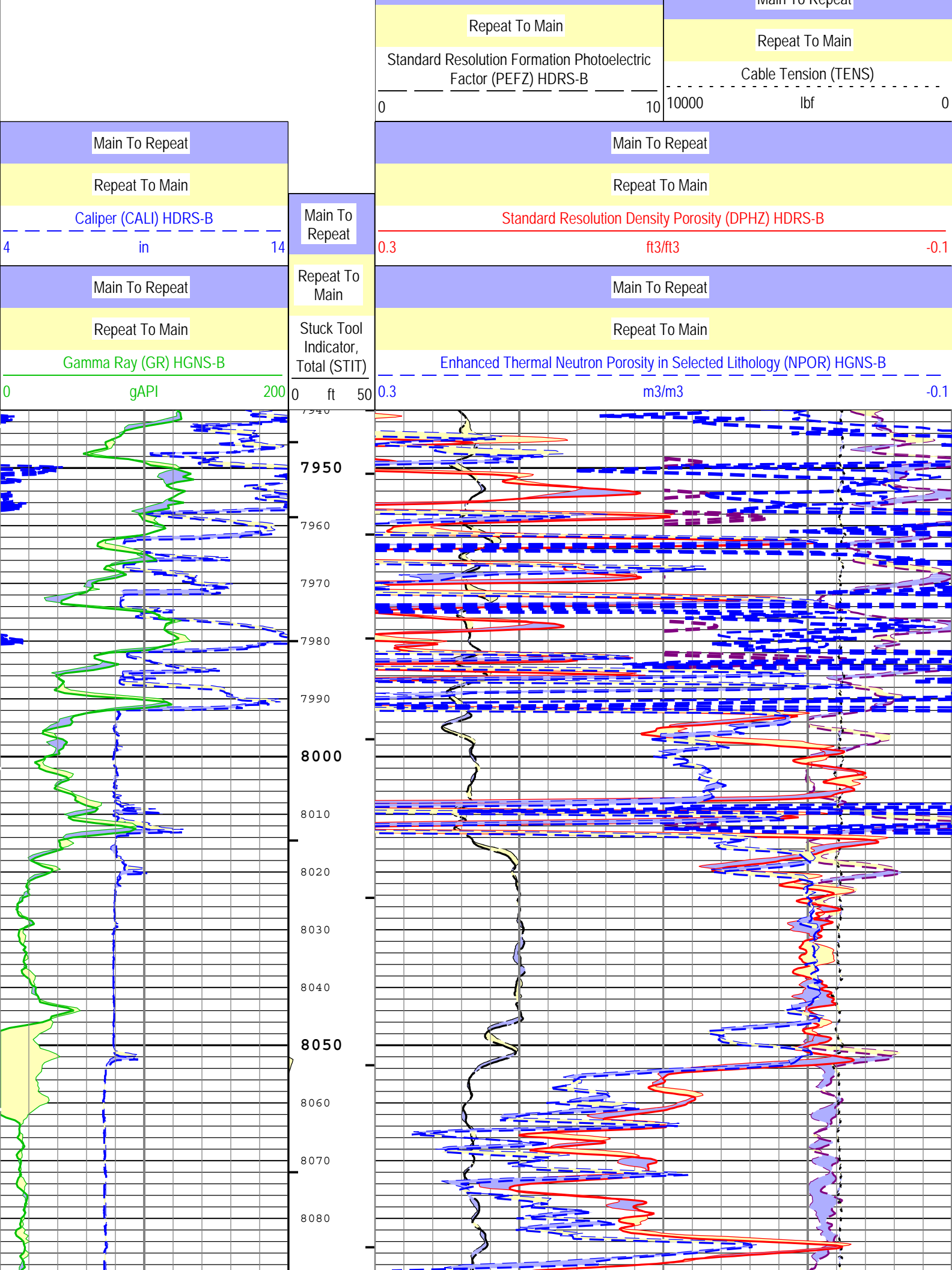
Main To Repeat

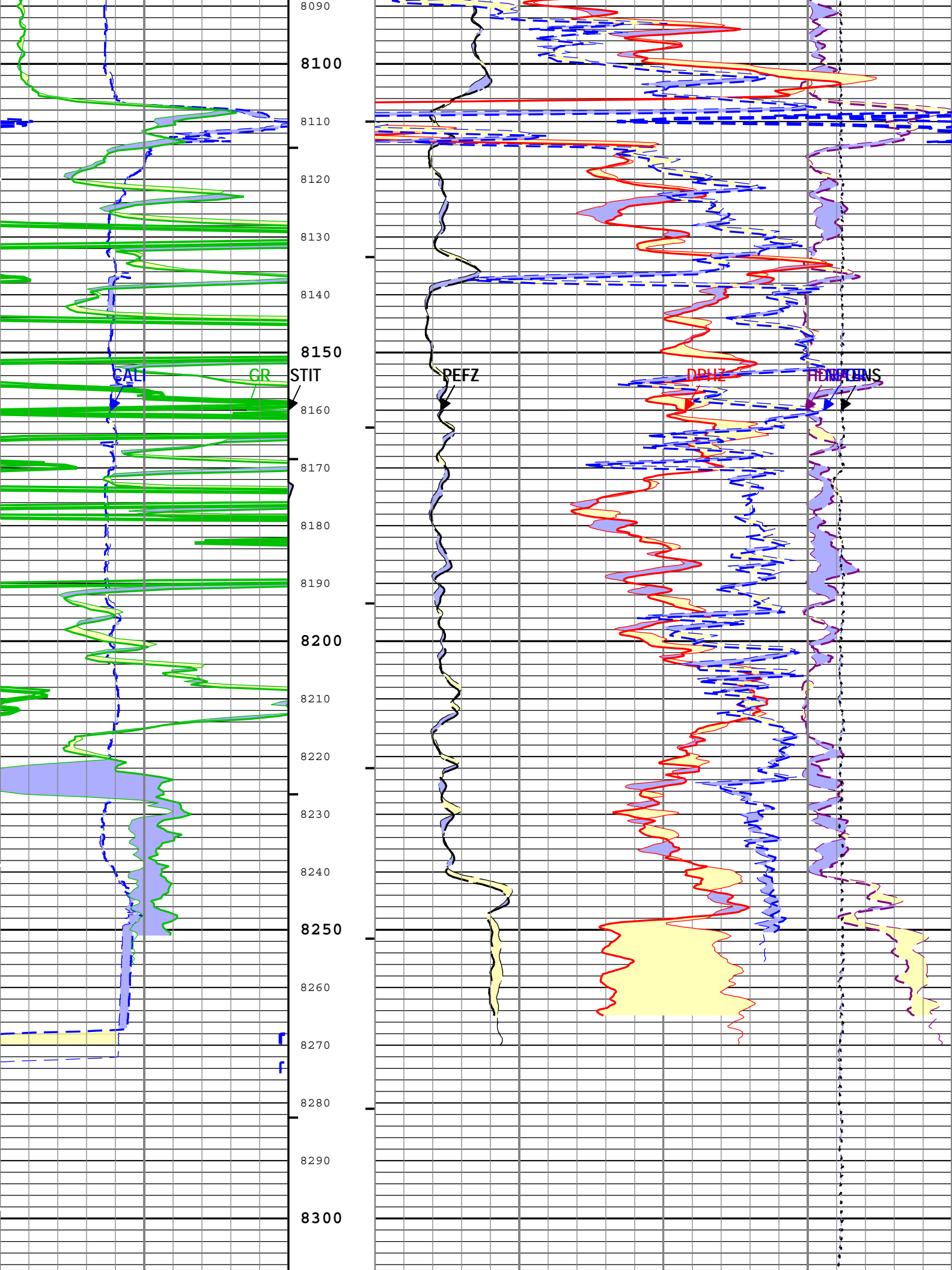
Repeat To Main

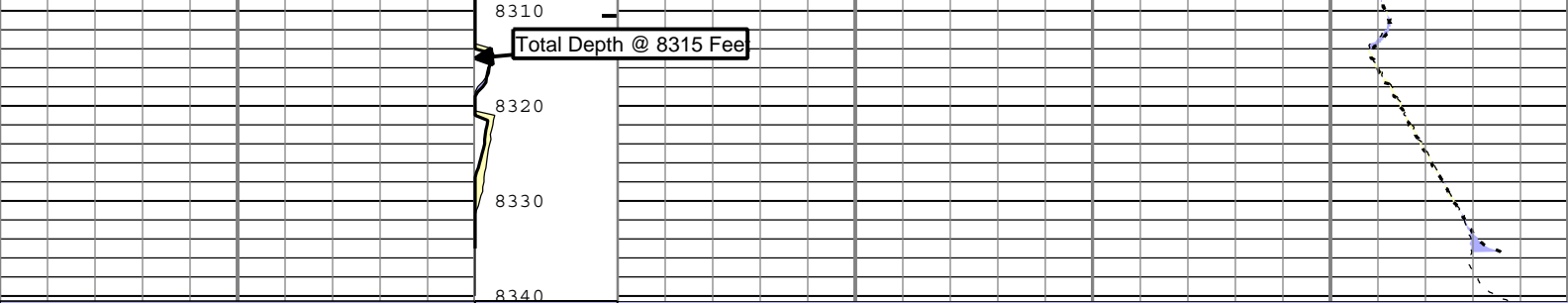
Density Standoff Correction (HDRA) HDRS-B

-0.250.25
g/cm3

Main To Repeat







Main To Repeat
Repeat To Main
Caliper (CALI) HDRS-B
4 in 14
Main To Repeat
Repeat To Main
Gamma Ray (GR) HGNS-B
0 gAPI 200

Main To Repeat
Repeat To Main
Stuck Tool Indicator, Total (STIT)
0 ft 50

Main To Repeat
Repeat To Main
Standard Resolution Density Porosity (DPHZ) HDRS-B
0.3 ft3/ft3 -0.1
Main To Repeat
Repeat To Main
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-B
0.3 m3/m3 -0.1

Main To Repeat
Repeat To Main
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-B
0 10
Main To Repeat
Repeat To Main
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-B
0 10

Main To Repeat
Repeat To Main
Density Standoff Correction (HDRA) HDRS-B
-0.25 g/cm3 0.25
Main To Repeat
Repeat To Main
Cable Tension (TENS)
10000 lbf 0

TIME_1900 - Time Marked every 60.00 (s)

—| IHV - Integrated Hole Volume every 10.00 (ft3)

—| ICV - Integrated Cement Volume every 10.00 (ft3)

—| ICV - Integrated Cement Volume every 10.00 (ft3)

—| IHV - Integrated Hole Volume every 10.00 (ft3)

Description: HGNS standard resolution porosities for Platform Express Format: Log (5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:18:54

Run 1

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
-------------------	--------------------	-----------------	--------------	------

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20121221-3.1.9755.1574
	EXP_APL-CMR1574-3.1.9755.1732
	EXP_APL-MAX-3.1.9755.1222

Computation	Description		Version
DepthCorrection	DepthCorrection		3.1.9755.1732
Tool Elements	Description	Software Version	Firmware Version
HRGD-B	HILT Resistivity Gamma-Ray Density Device, 125 degC	3.1.9755.0	3.0
HGNS-B	HILT Gamma-Ray and Neutron Sonde, 125 degC	3.1.9755.0	2.0
HRCC-B	HILT High-Resolution Control Cartridge, 125 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
Run 1	Main[3]:Up	Up	285.10 ft	8340.47 ft	31-May-2013 4:39:28 PM	31-May-2013 6:55:10 PM	10.52 ft	true
All depths are referenced to toolstring zero								

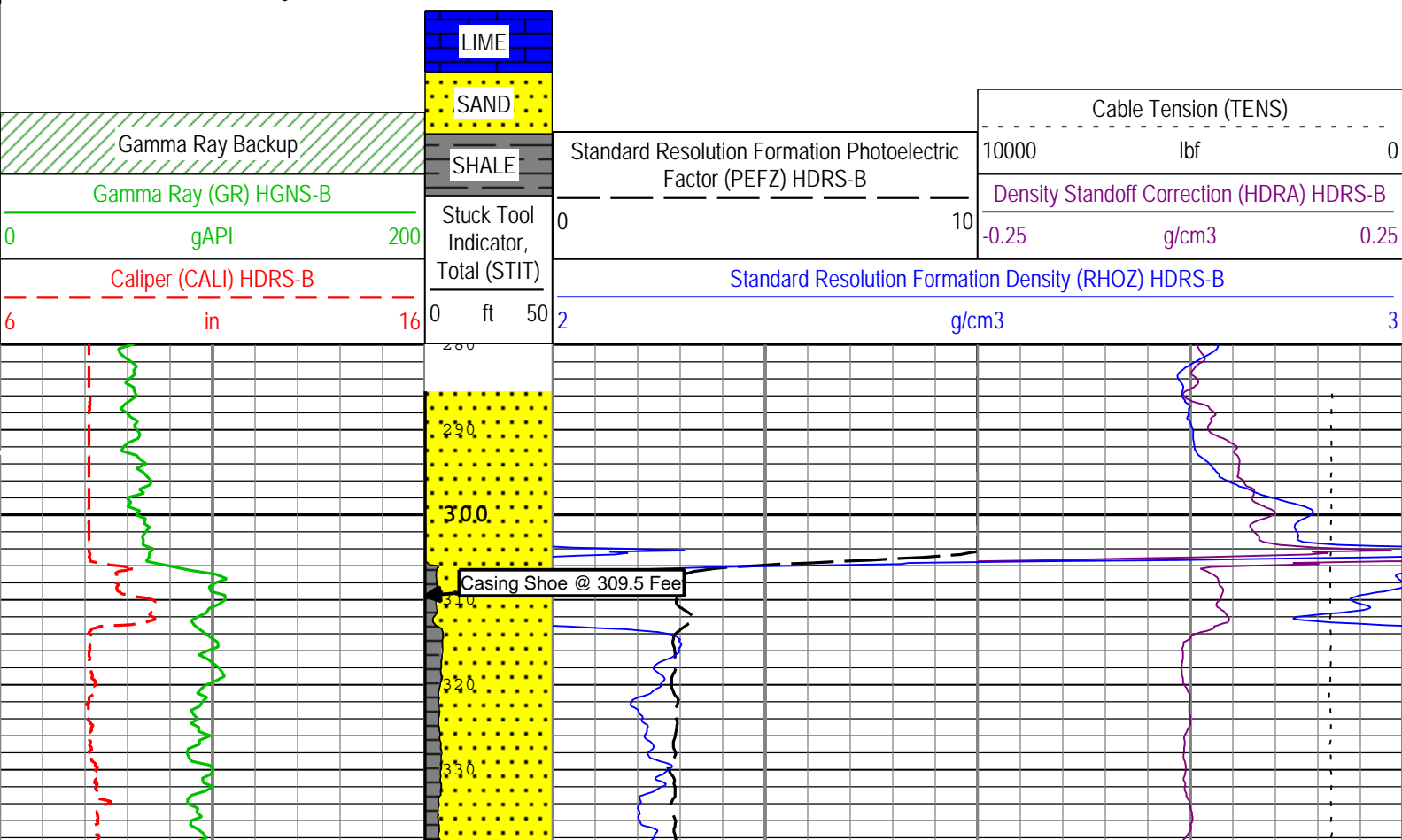
Log

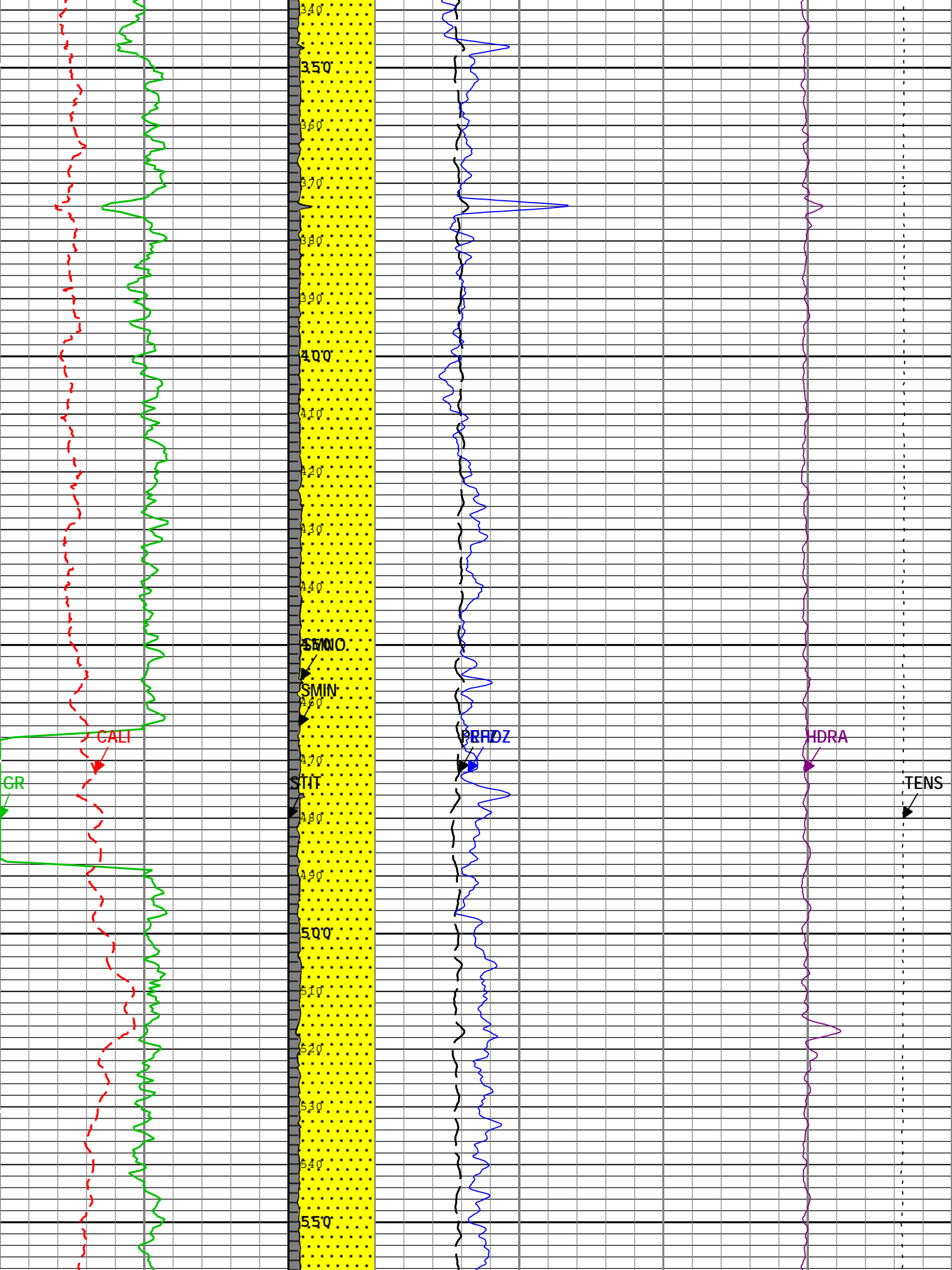
Run 1: Main[3]:Up

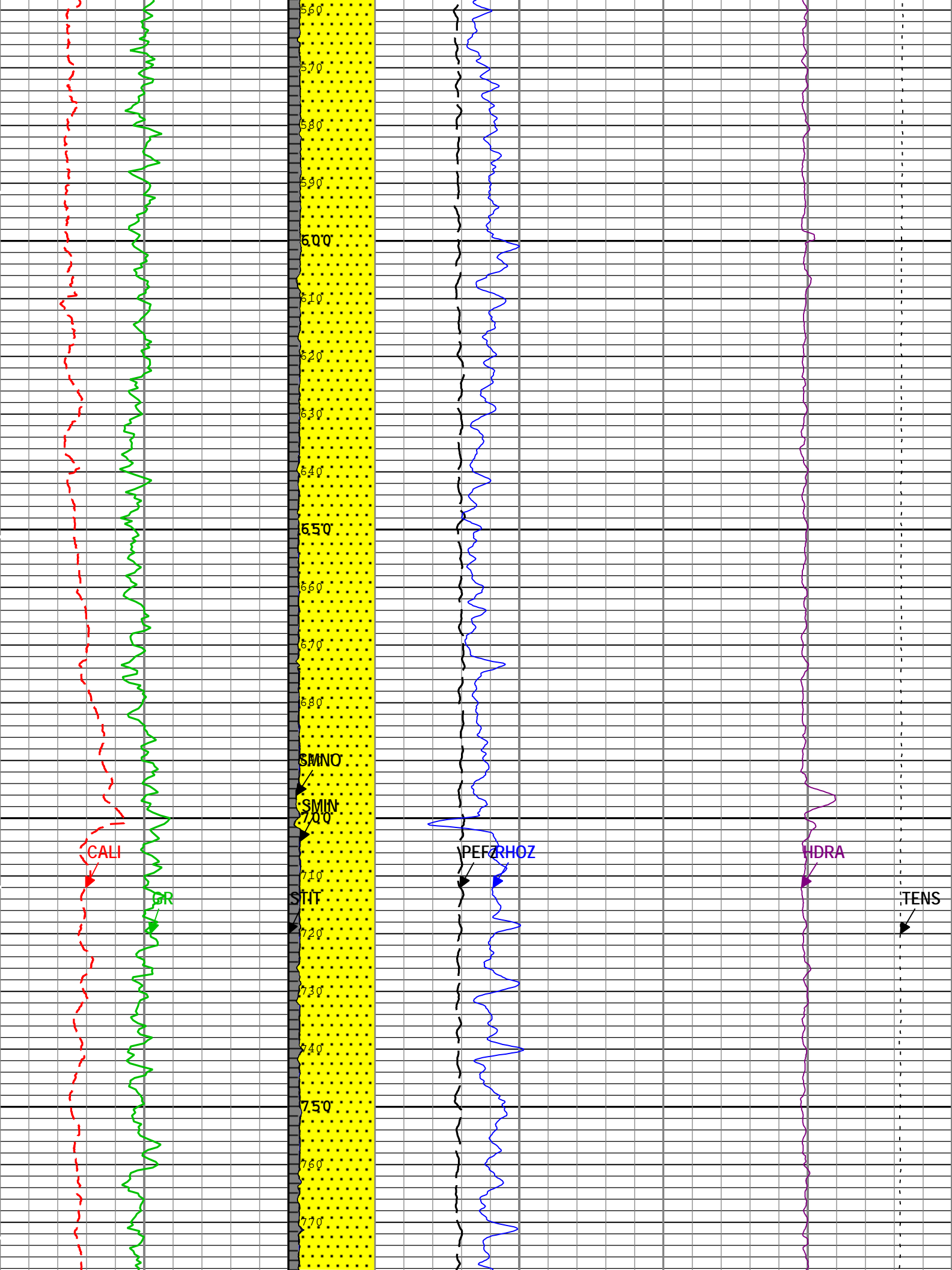
Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Density Upper) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 31-May-2013 22:18:56

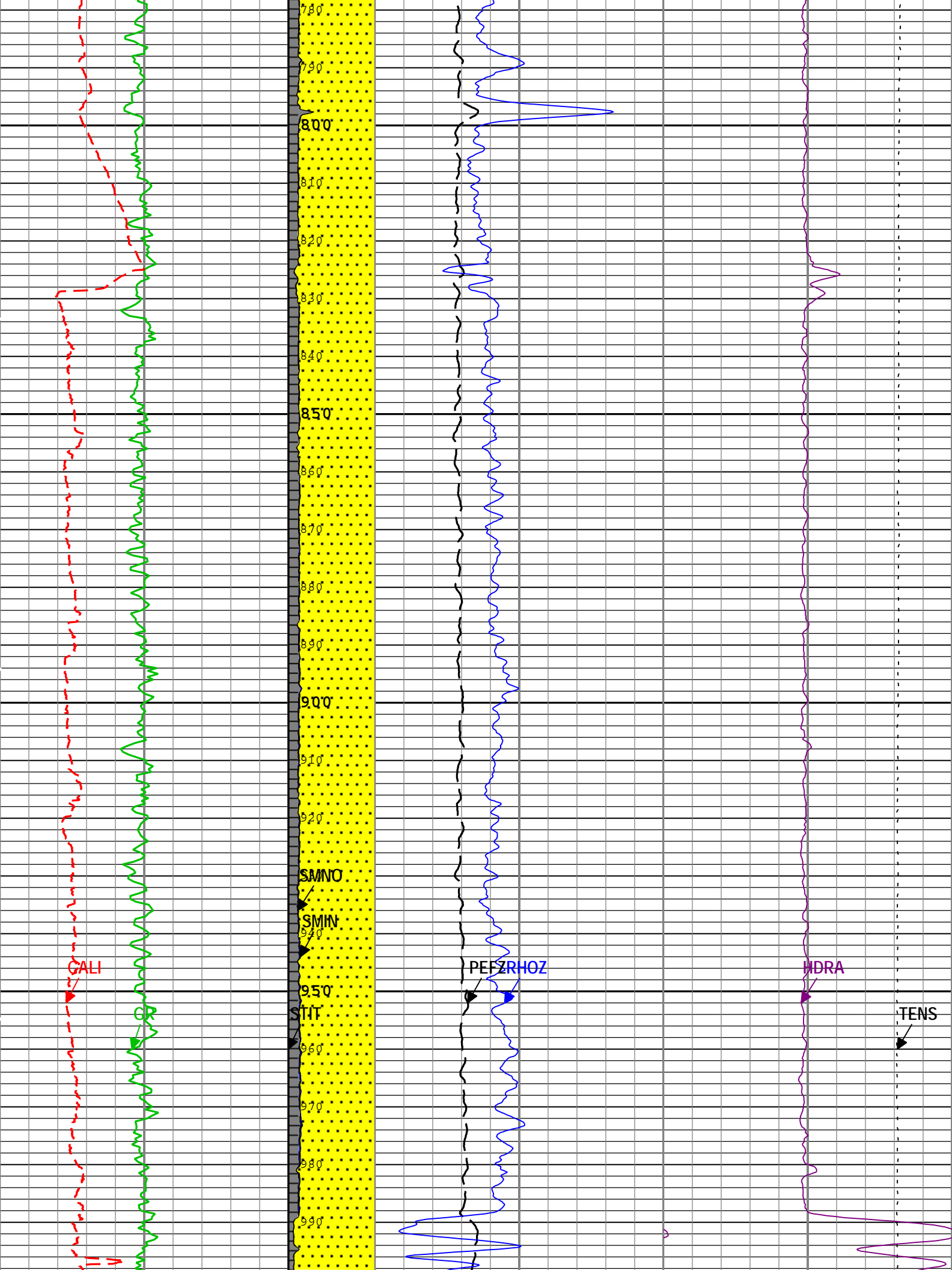
Channel	Source	Sampling
CALI	HDRS-B:HRCC-B:HRCC-B	1in
GR	HGNS-B:HGNS-B:HGNS-B	6in
HDRA	HDRS-B:HRMS-B:HRGD-B	2in
PEFZ	HDRS-B:HRMS-B:HRGD-B	2in
RHOZ	HDRS-B:HRMS-B:HRGD-B	2in
SMIN	HDRS-B:HRMS-B:HRGD-B	2in
SMNO	HDRS-B:HRMS-B:HRGD-B	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

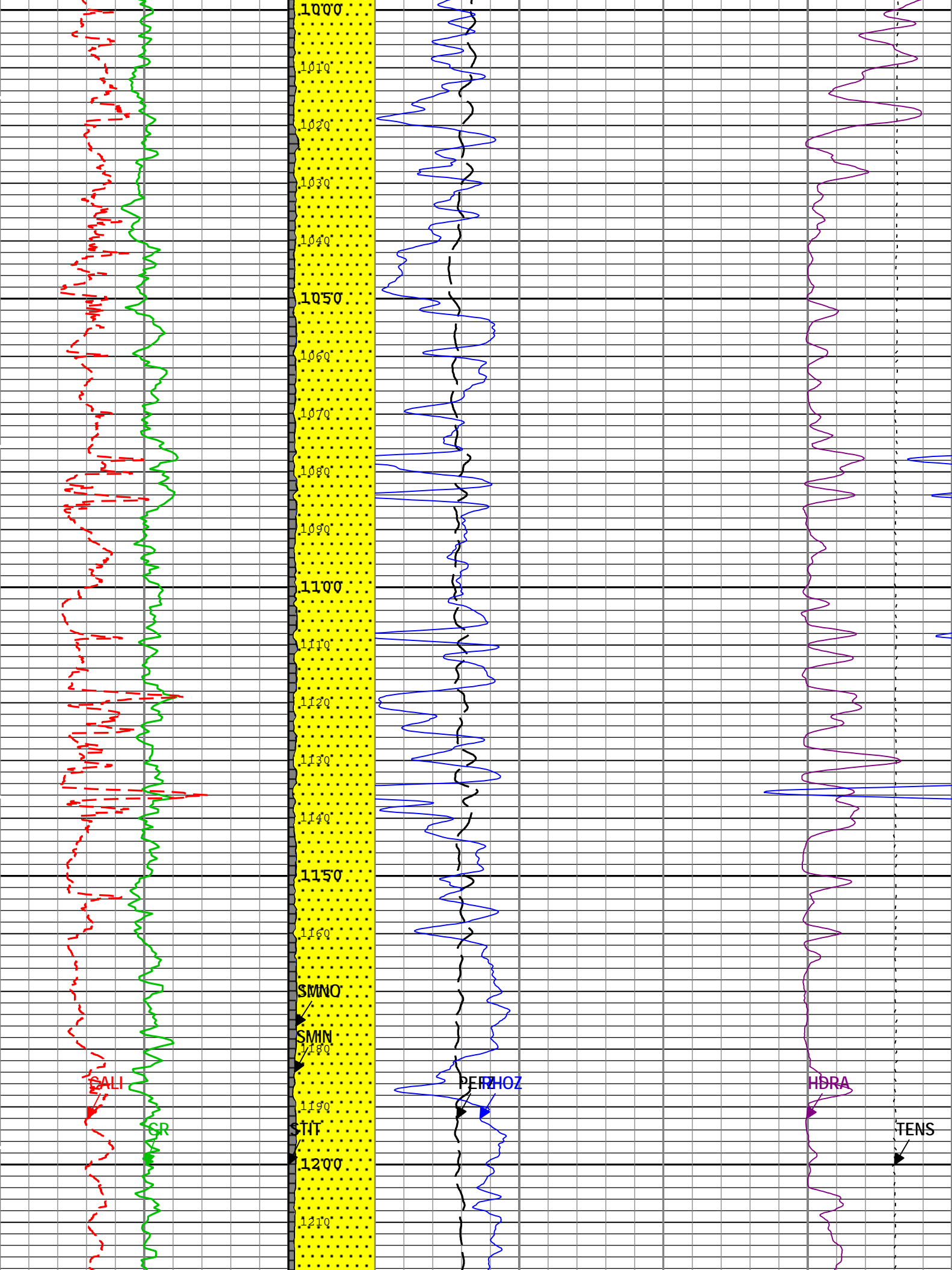
TIME_1900 - Time Marked every 60.00 (s)

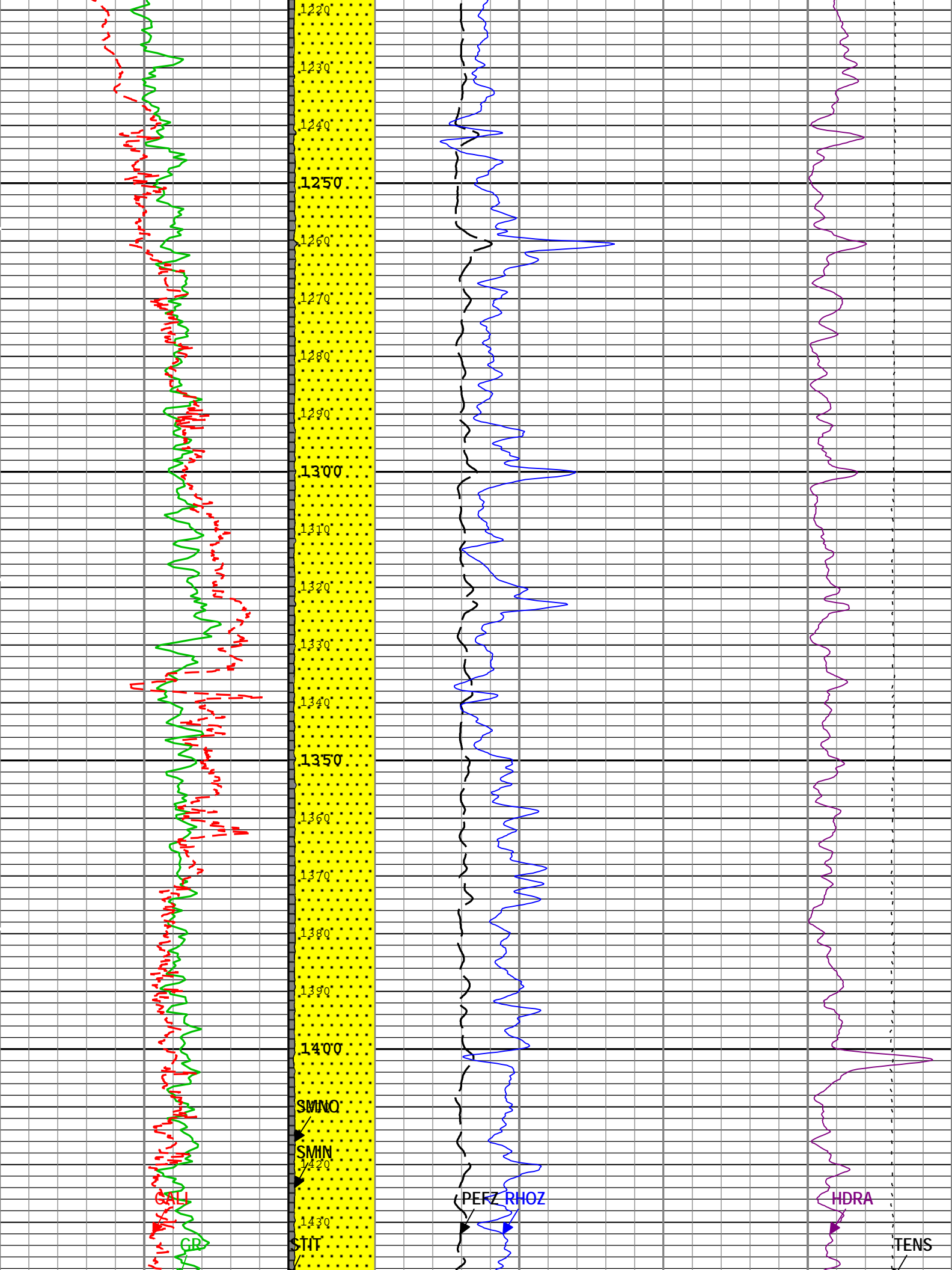


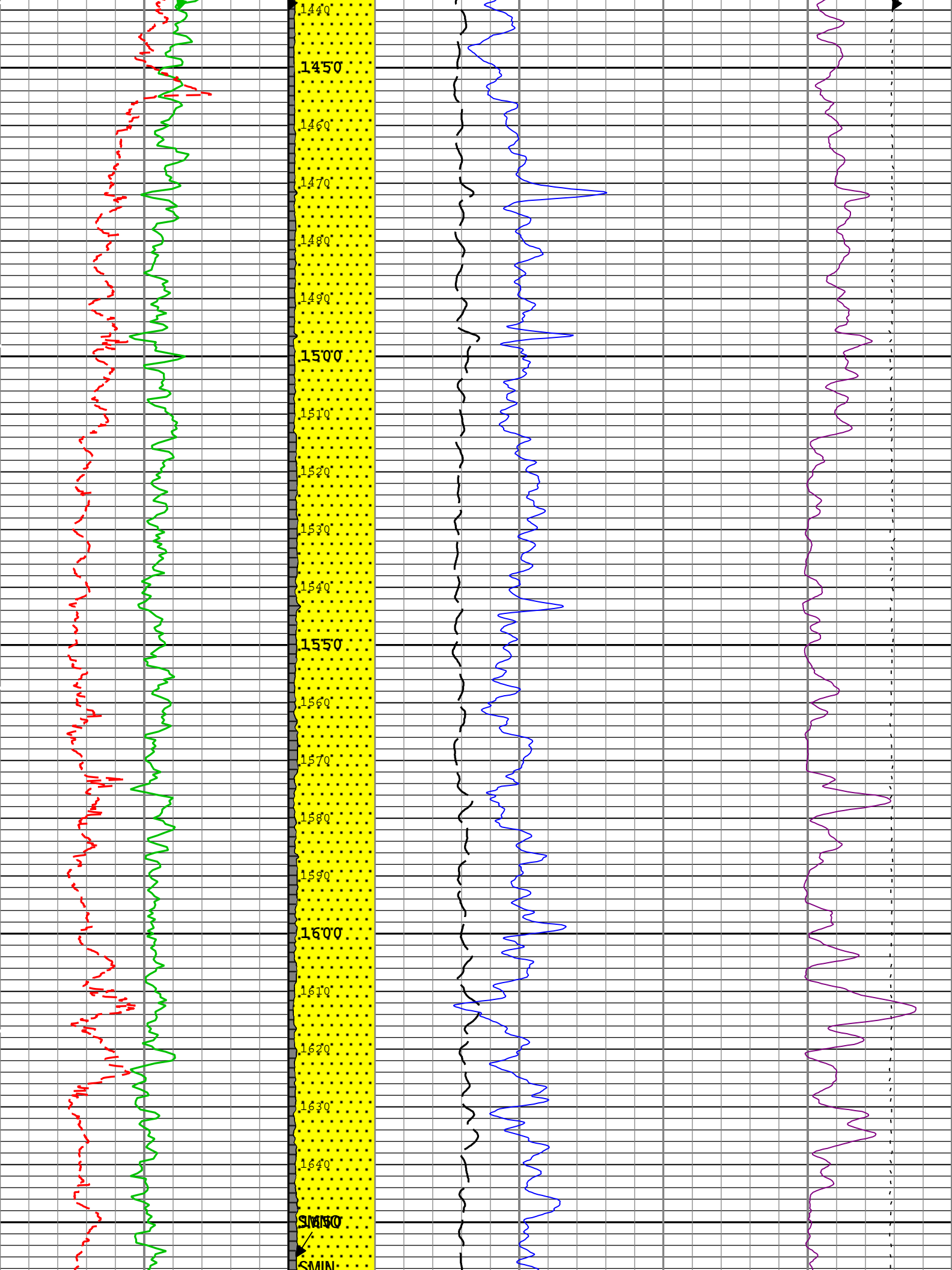


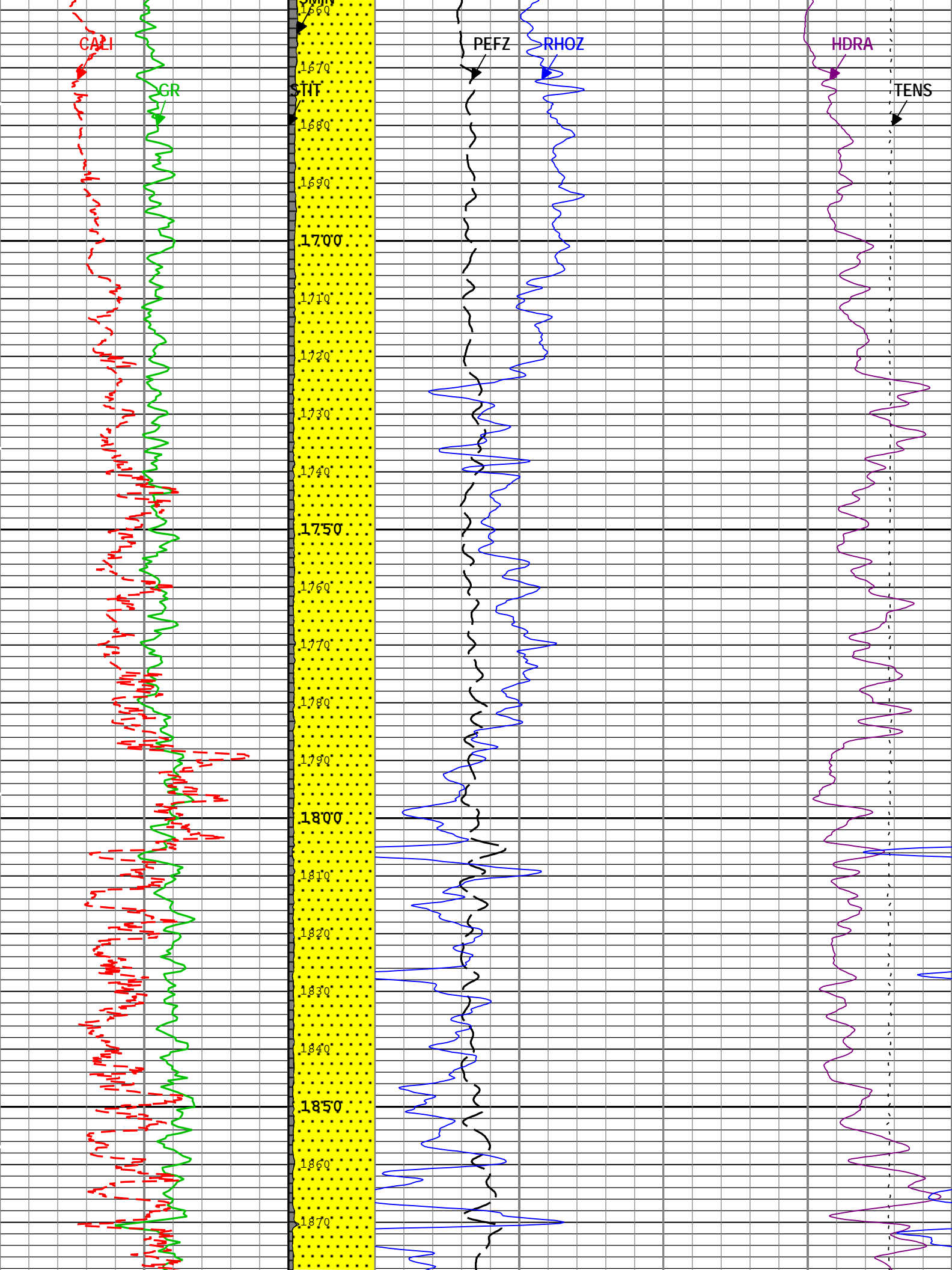


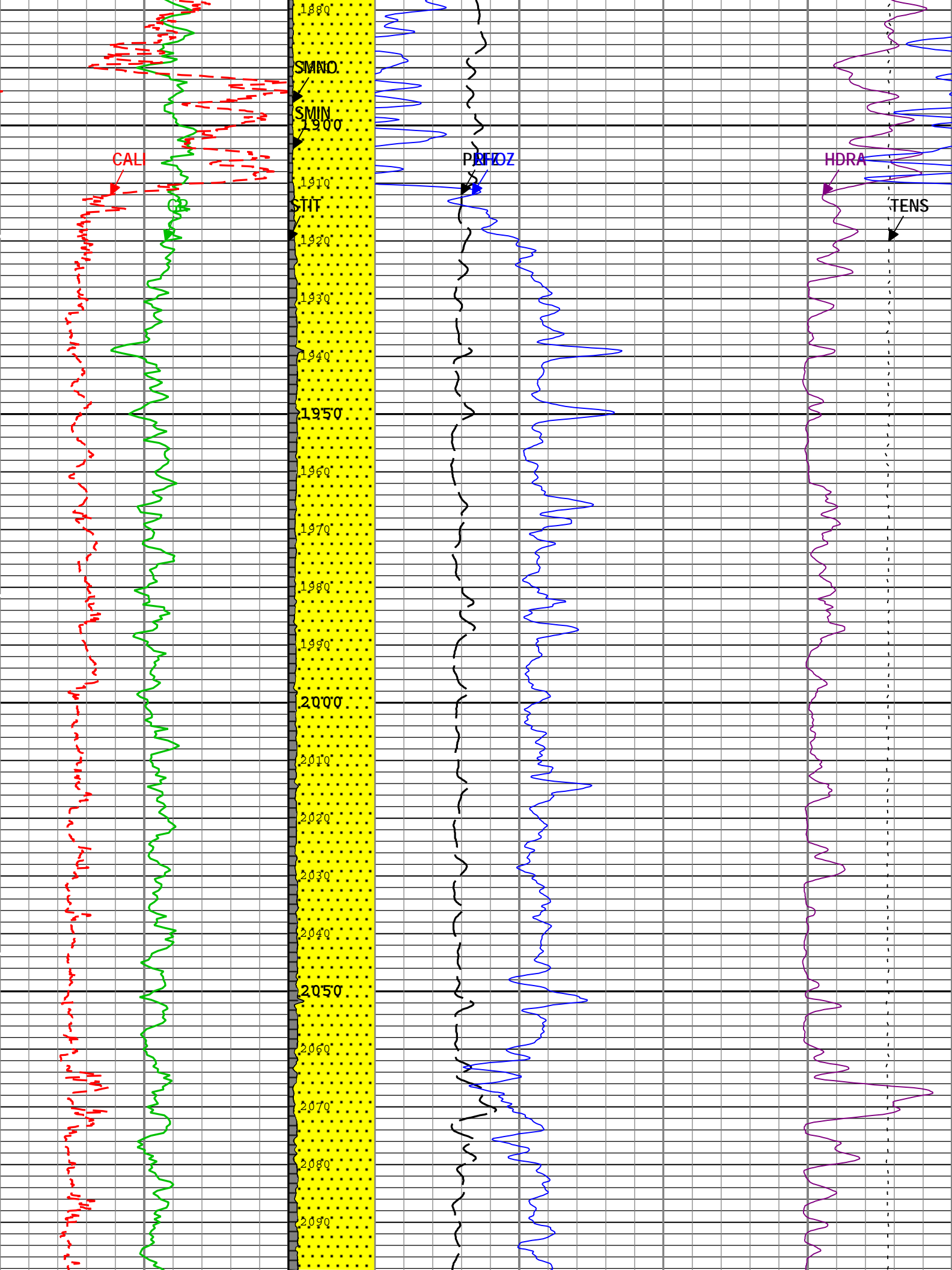


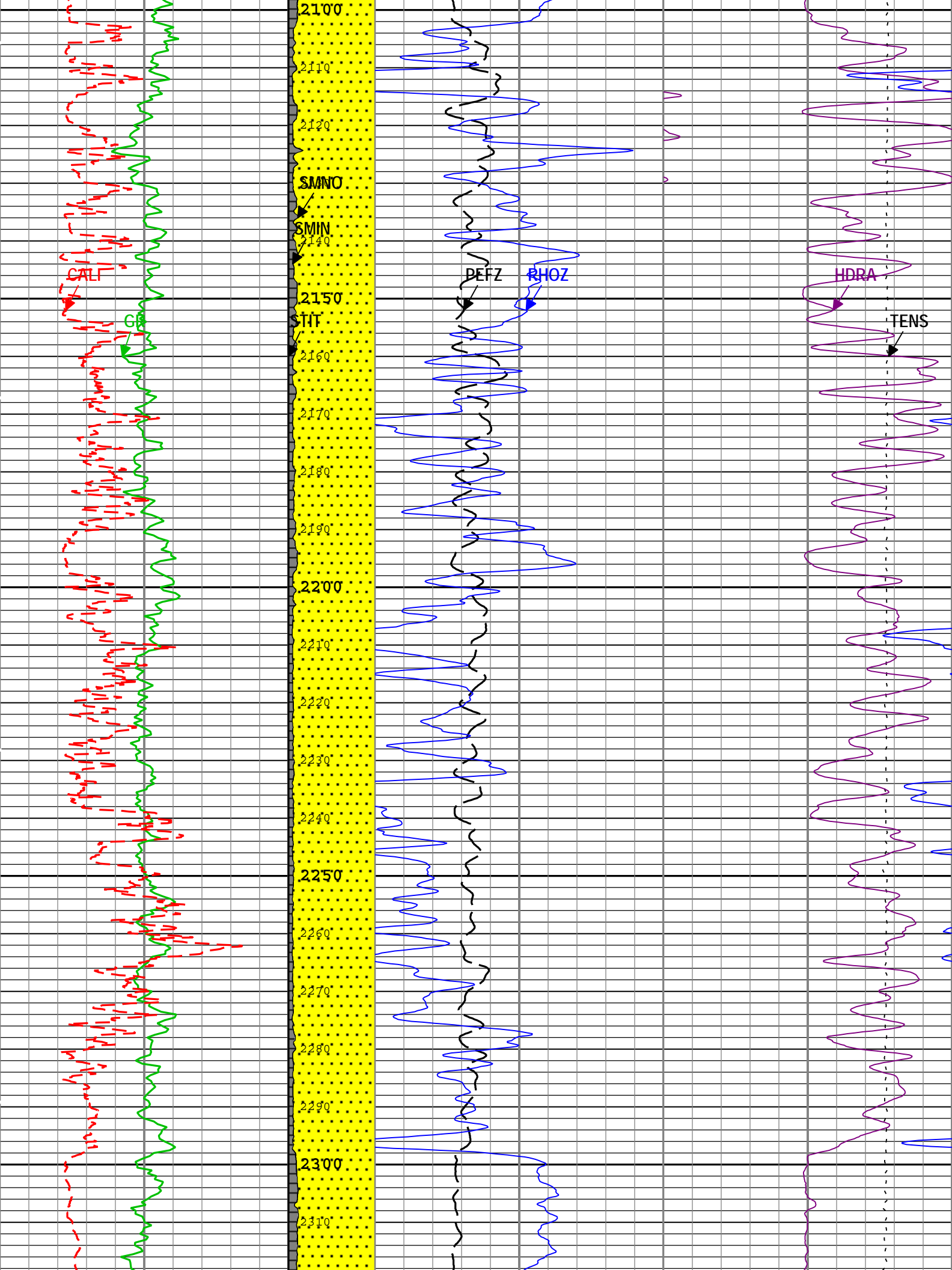


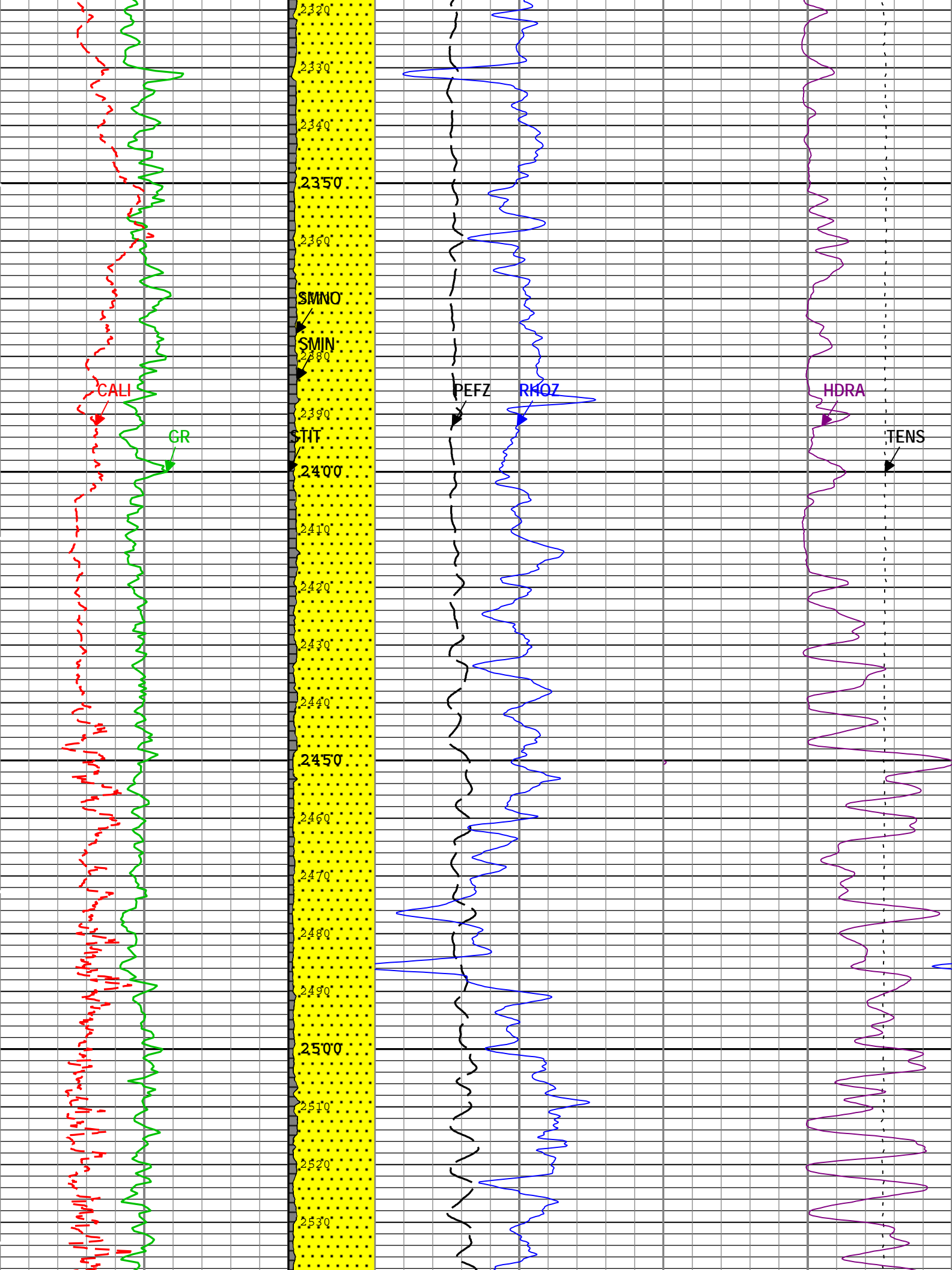


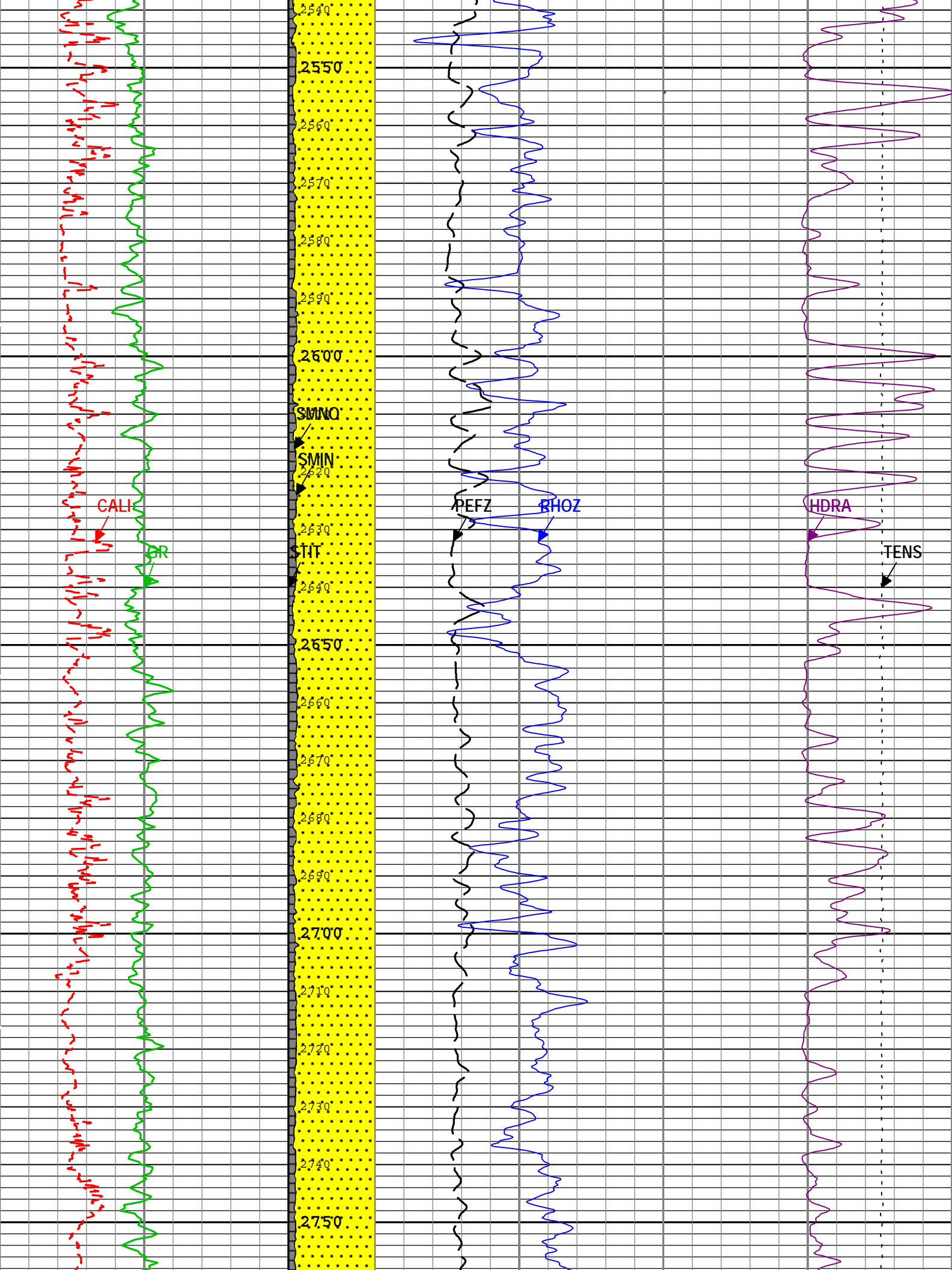


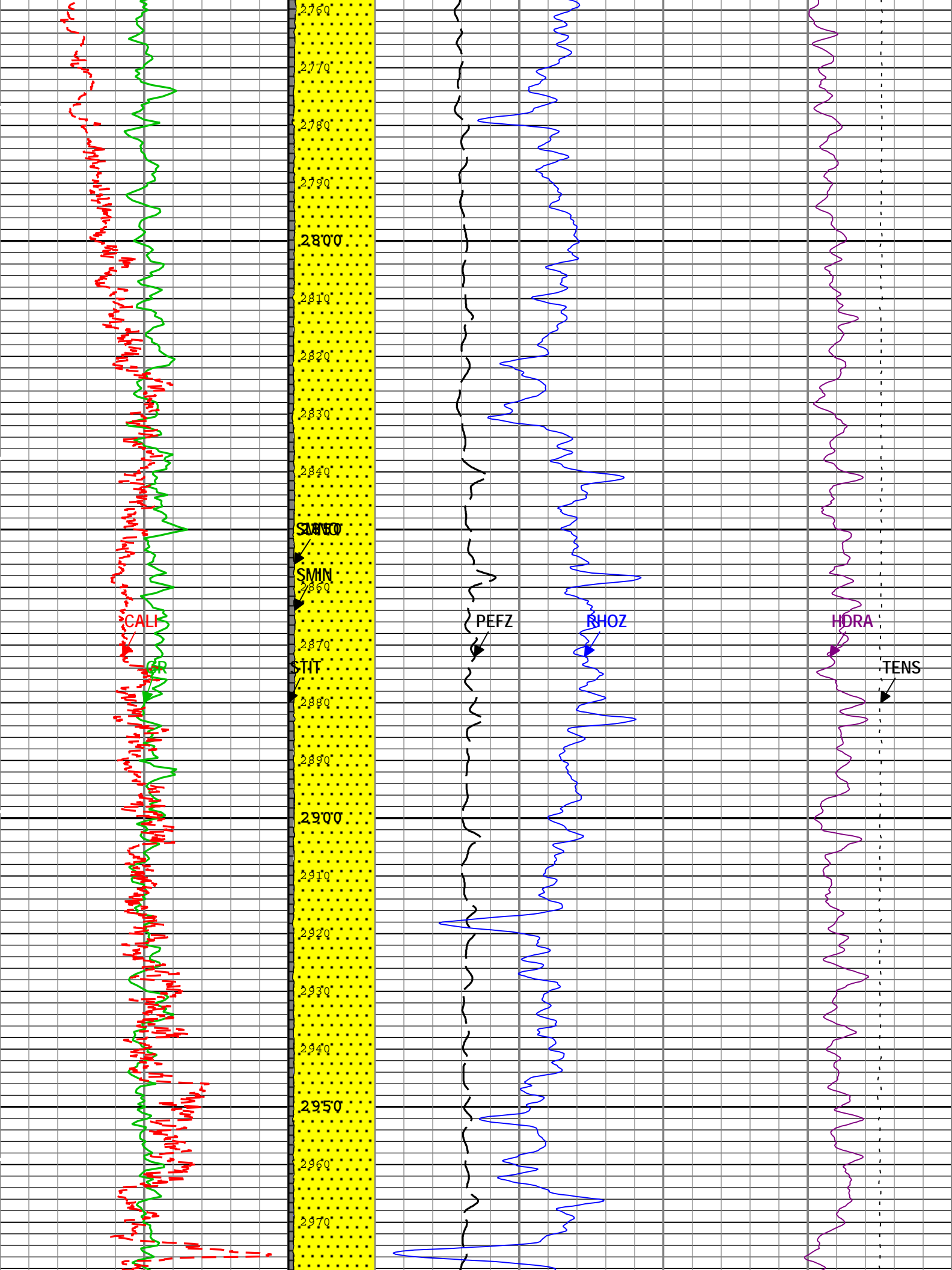






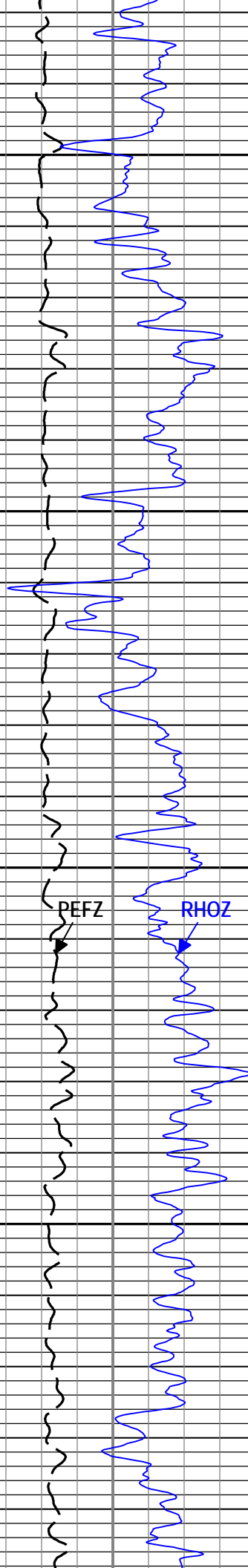






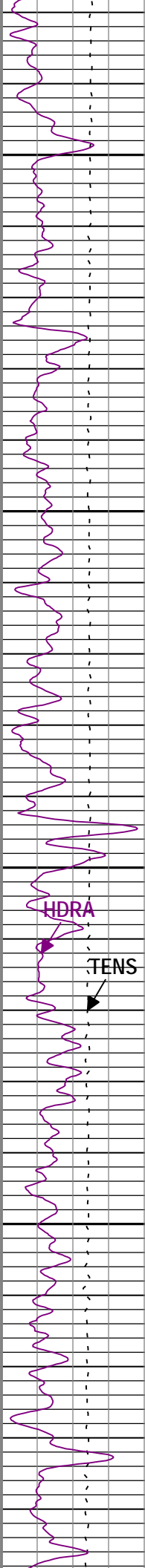


2980
2990
3000
3010
3020
3030
3040
3050
3060
3070
3080
SMNO
3100
SMIN
3110
STIT
3120
3130
3140
3150
3160
3170
3180
3190



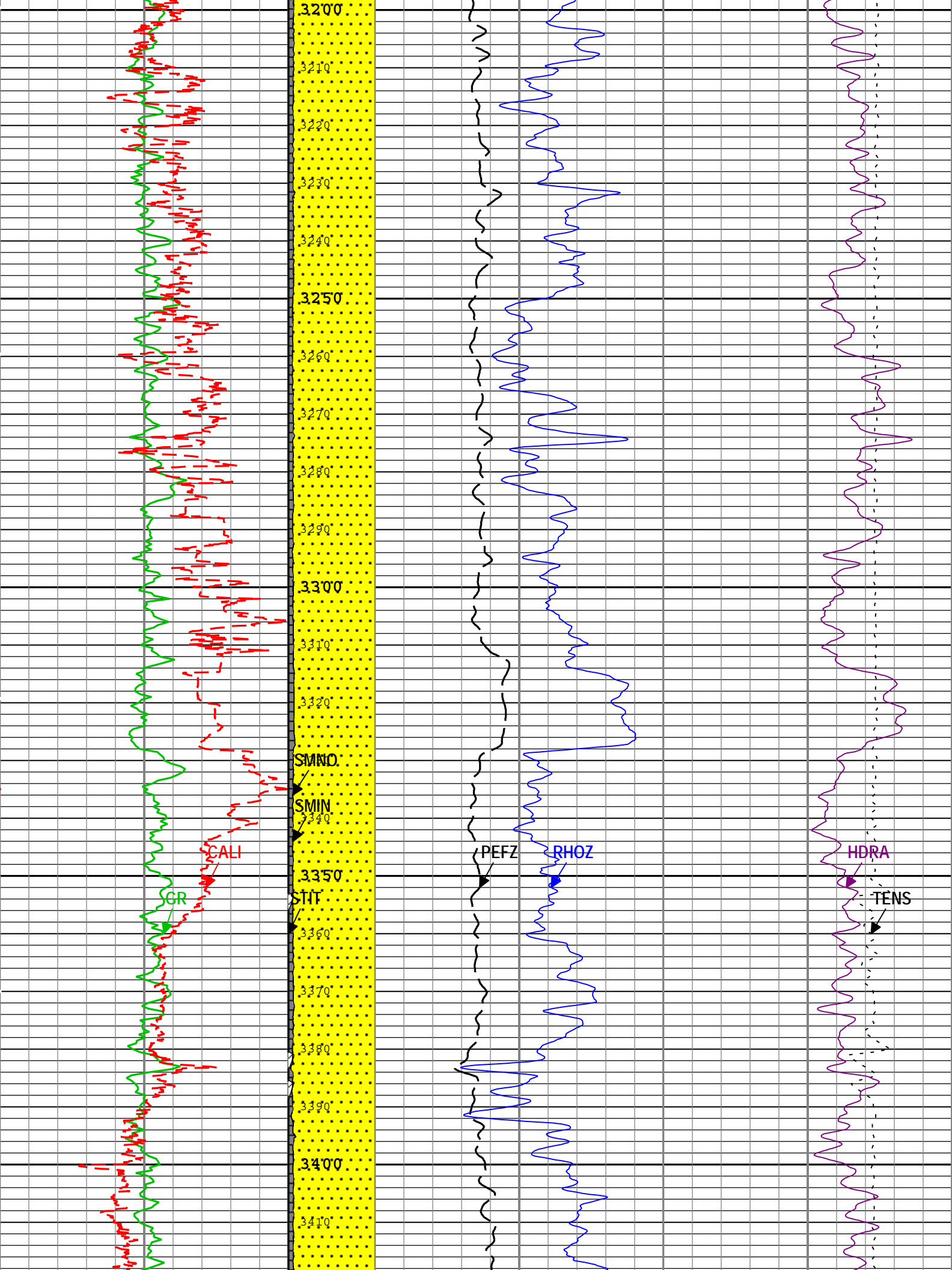
PEFZ

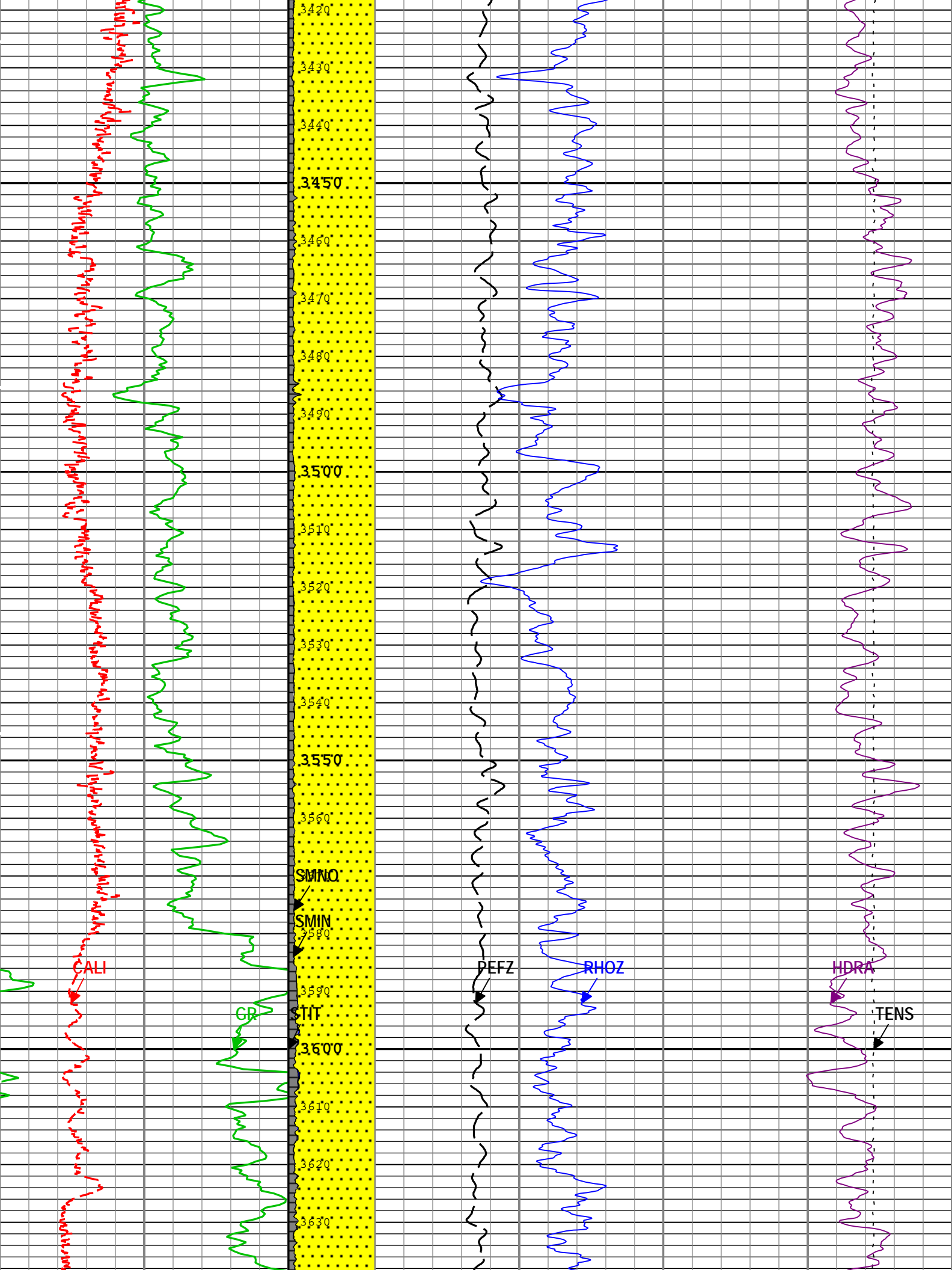
RHOZ

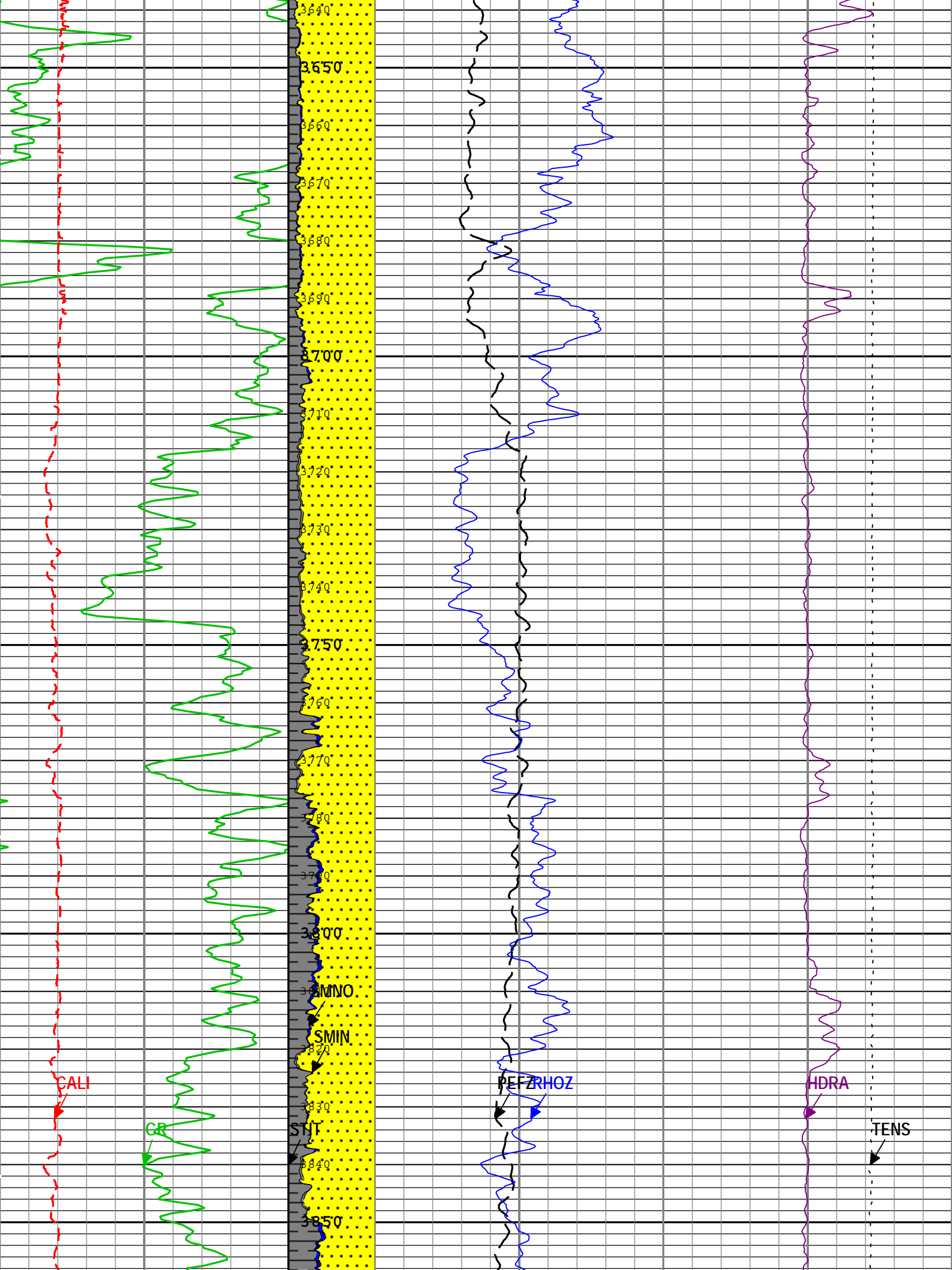


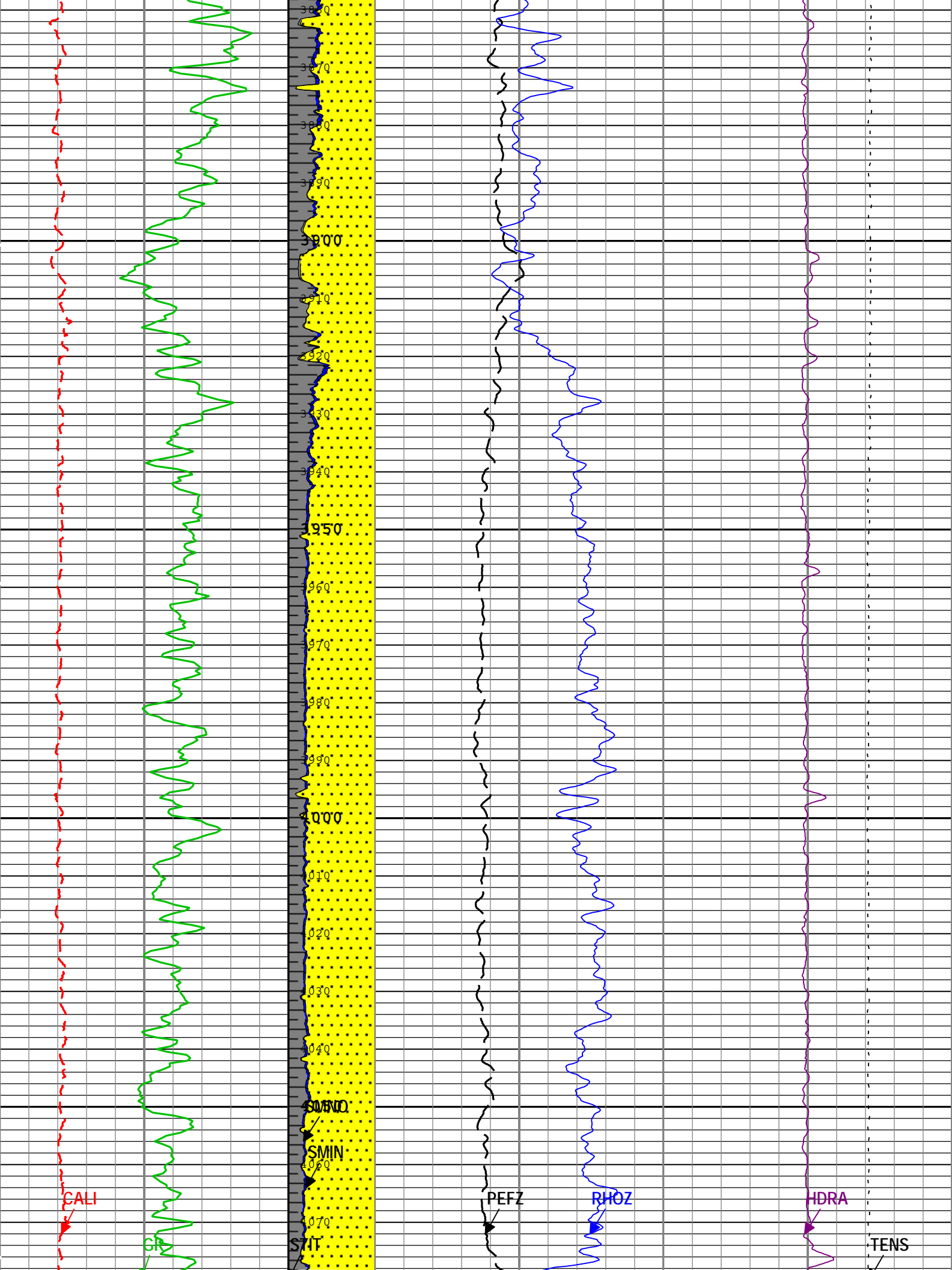
HDRA

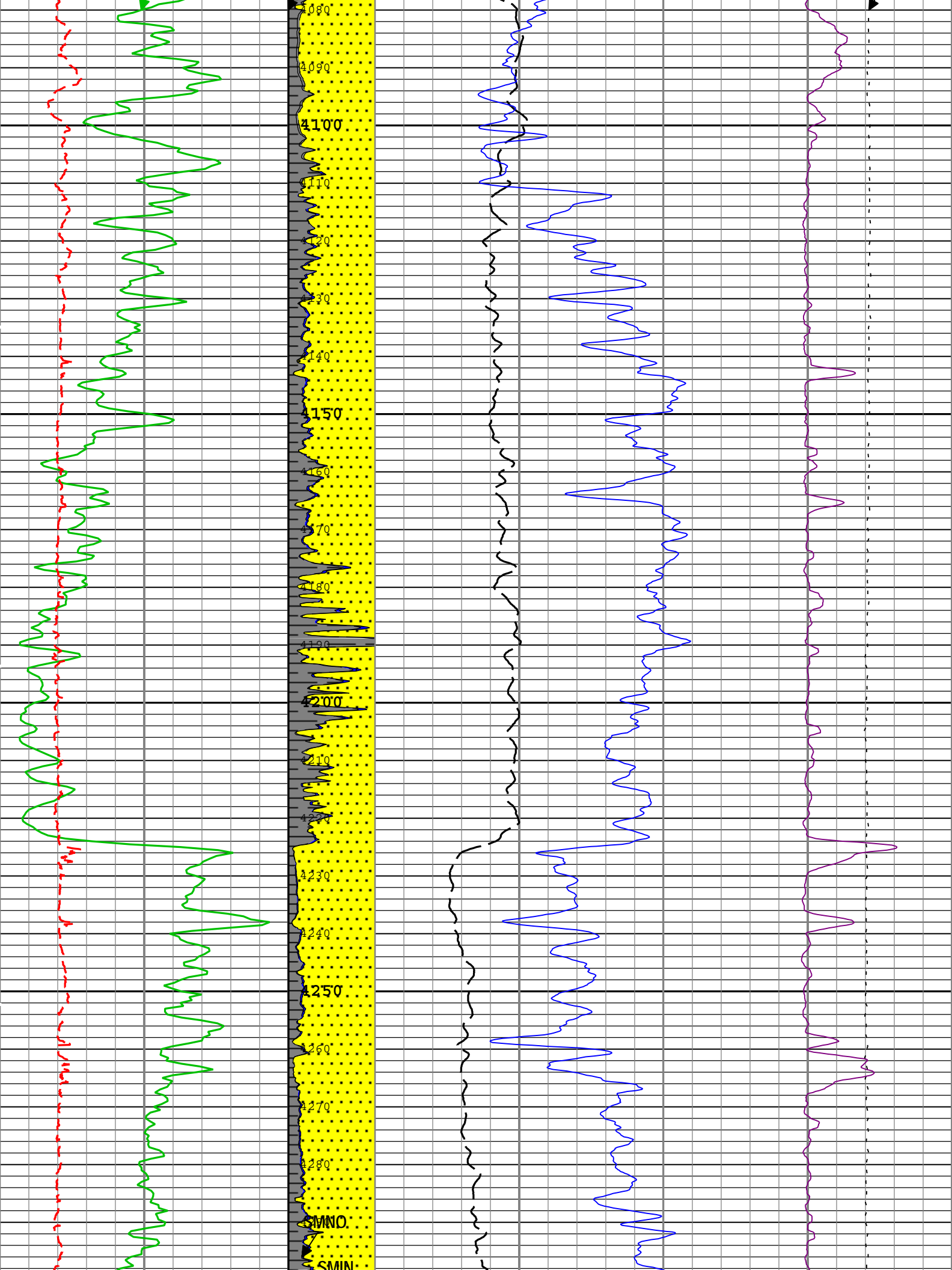
TENS

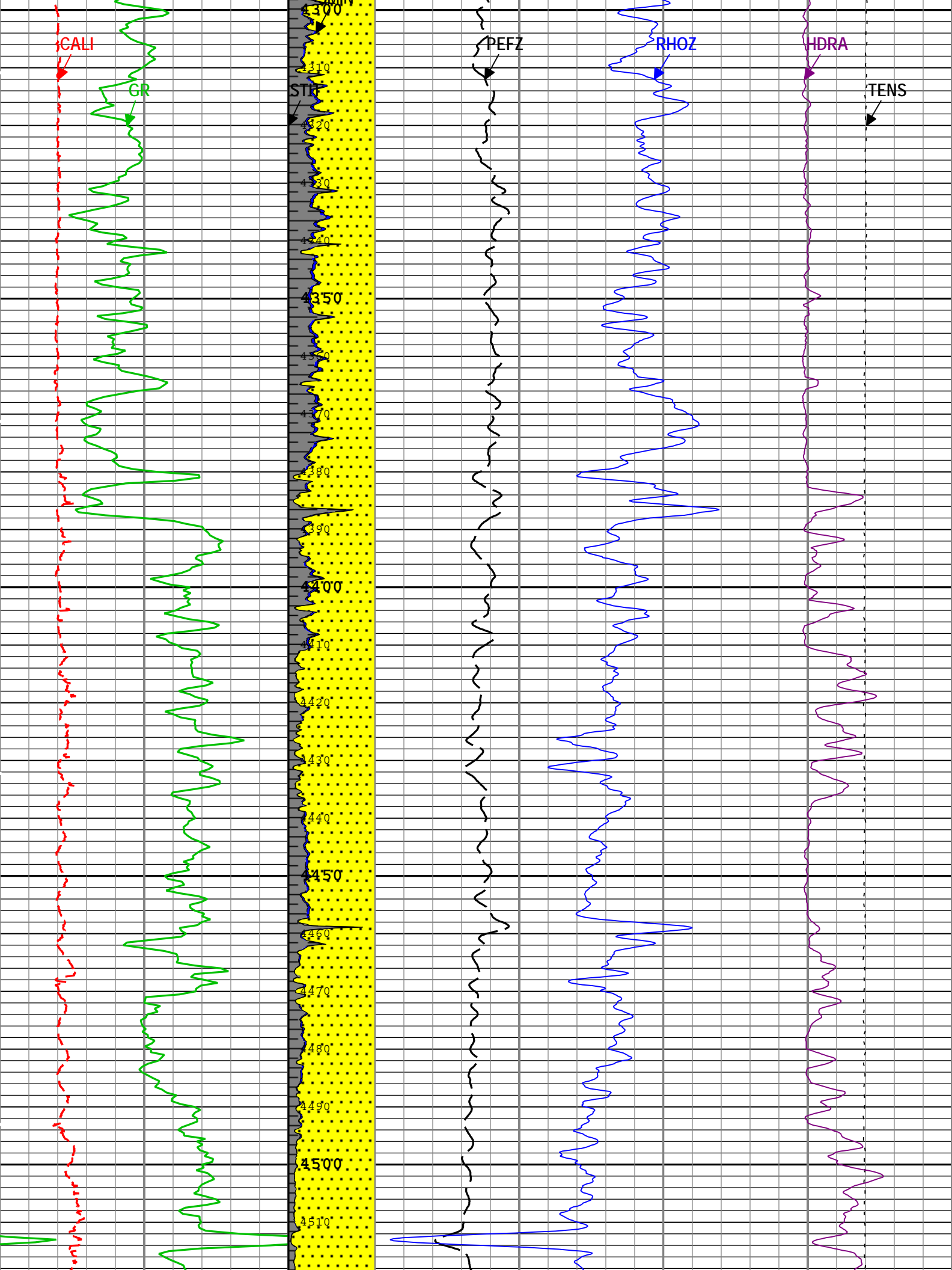


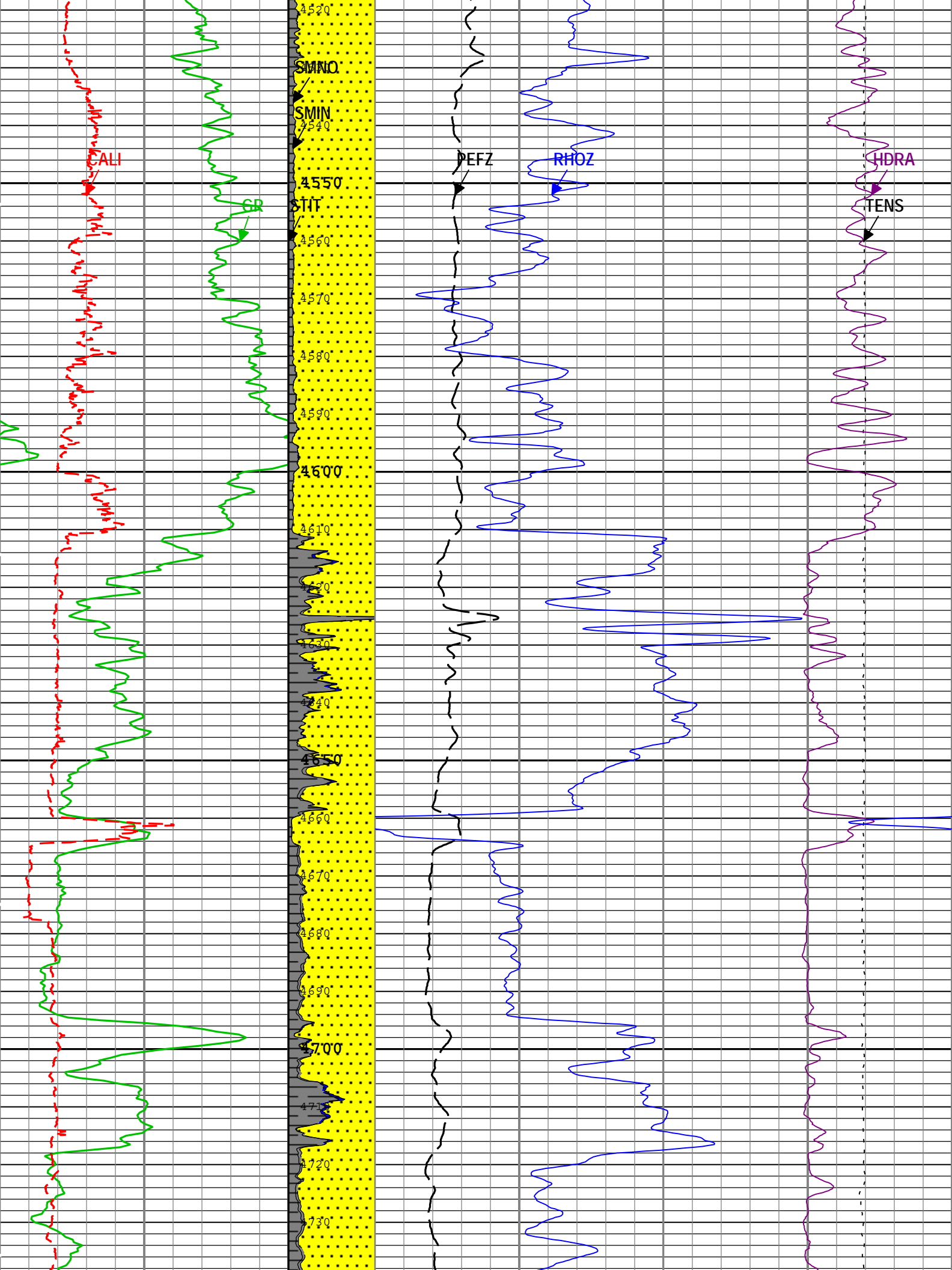


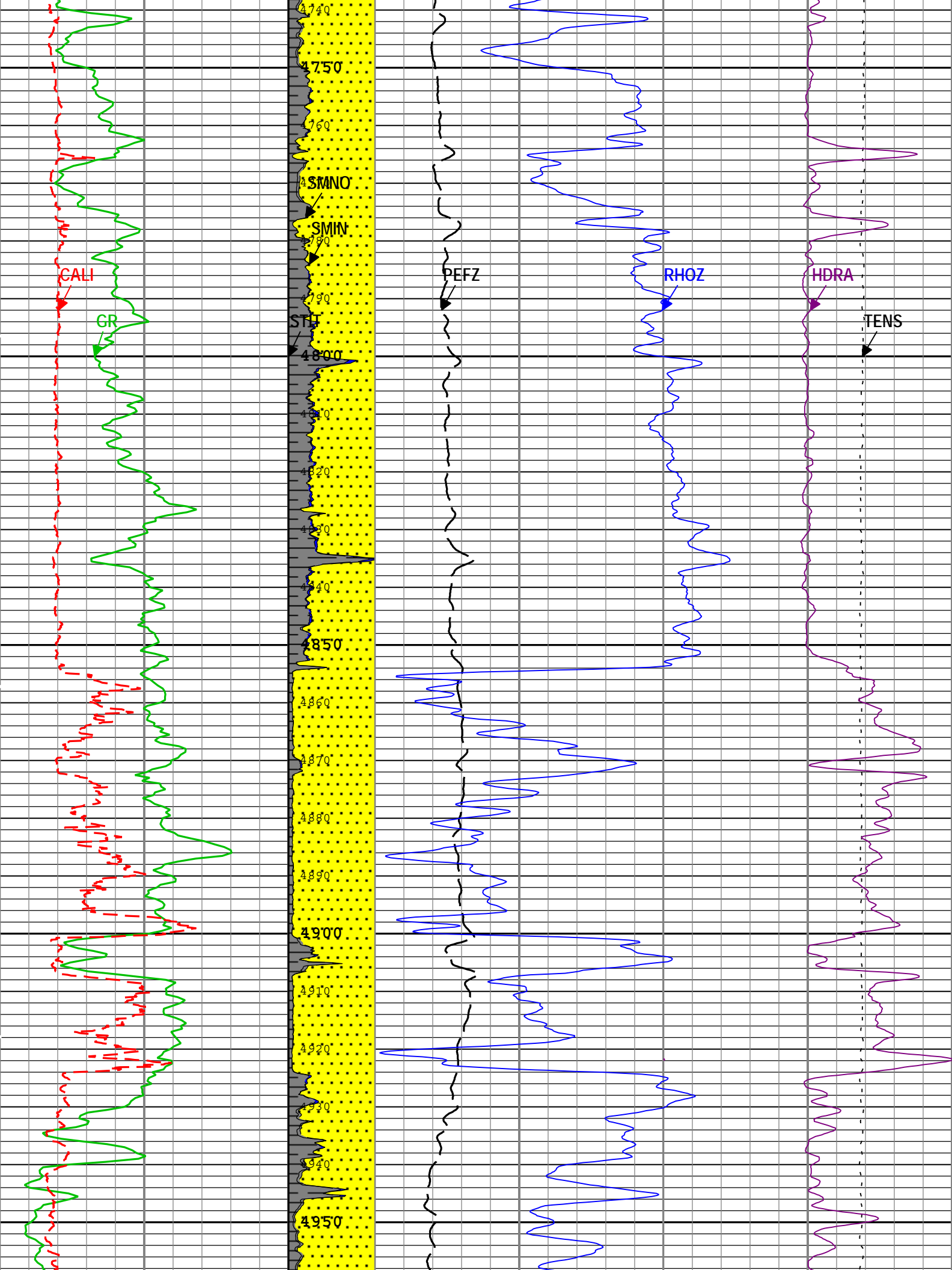


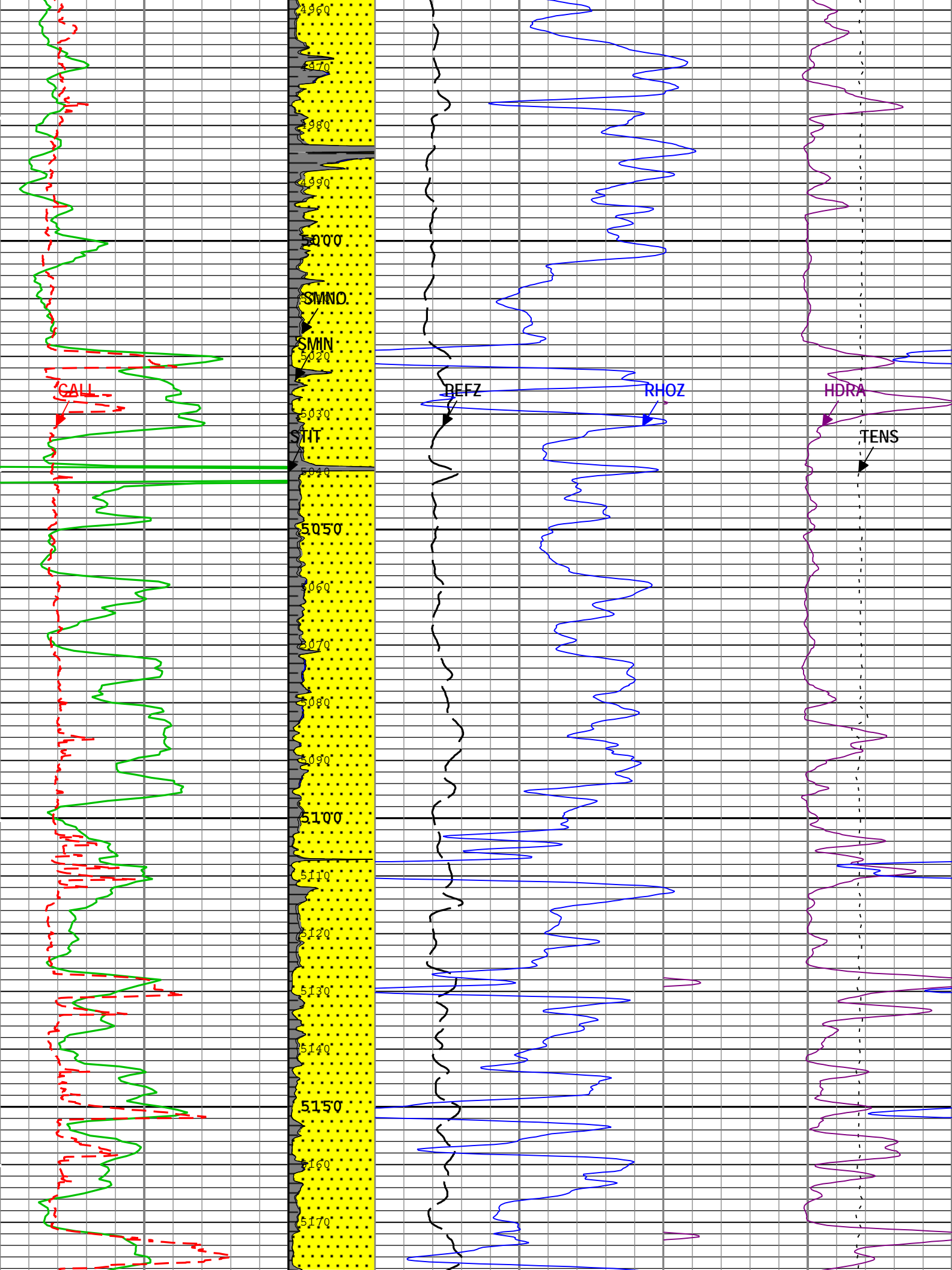


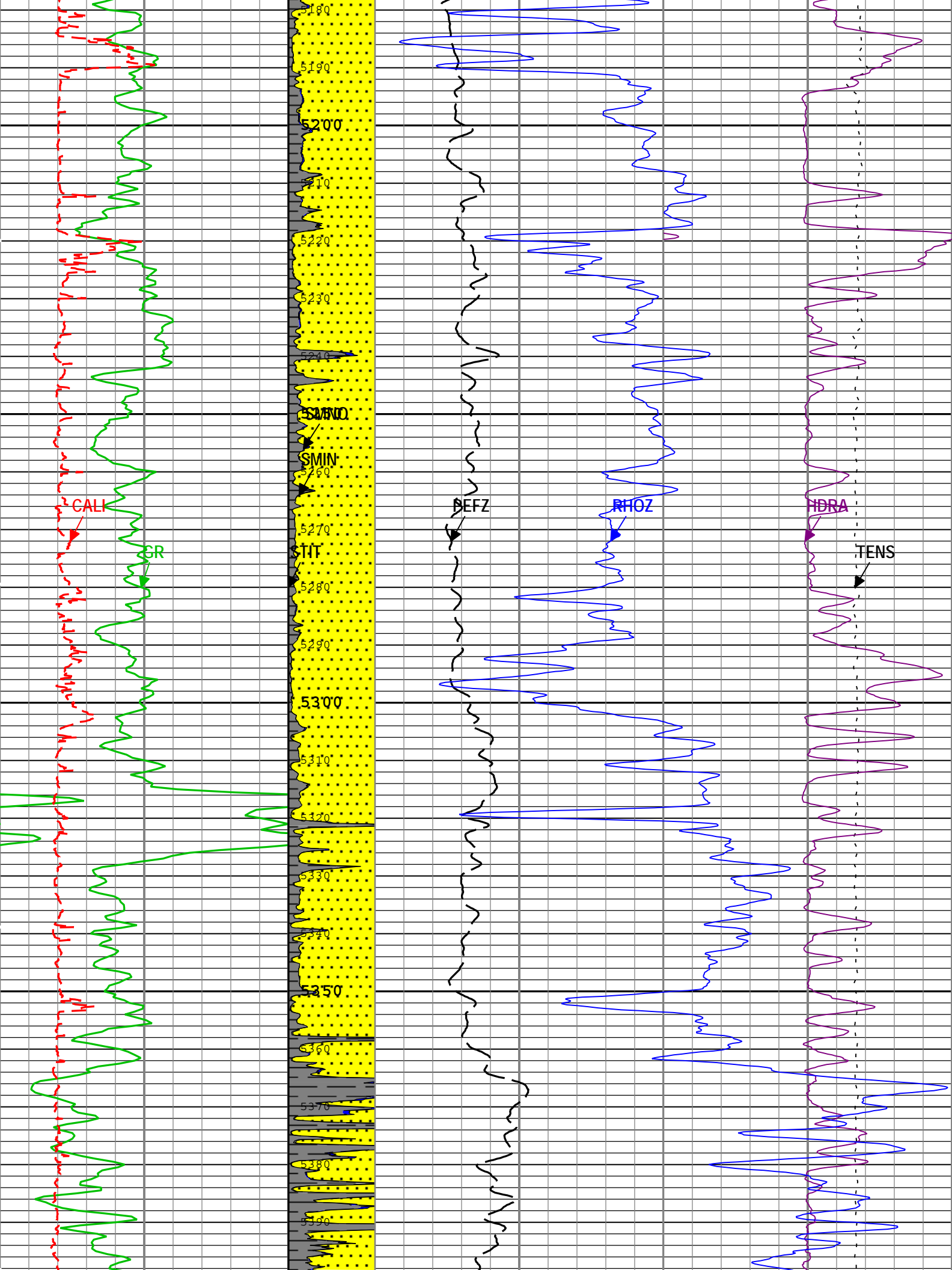


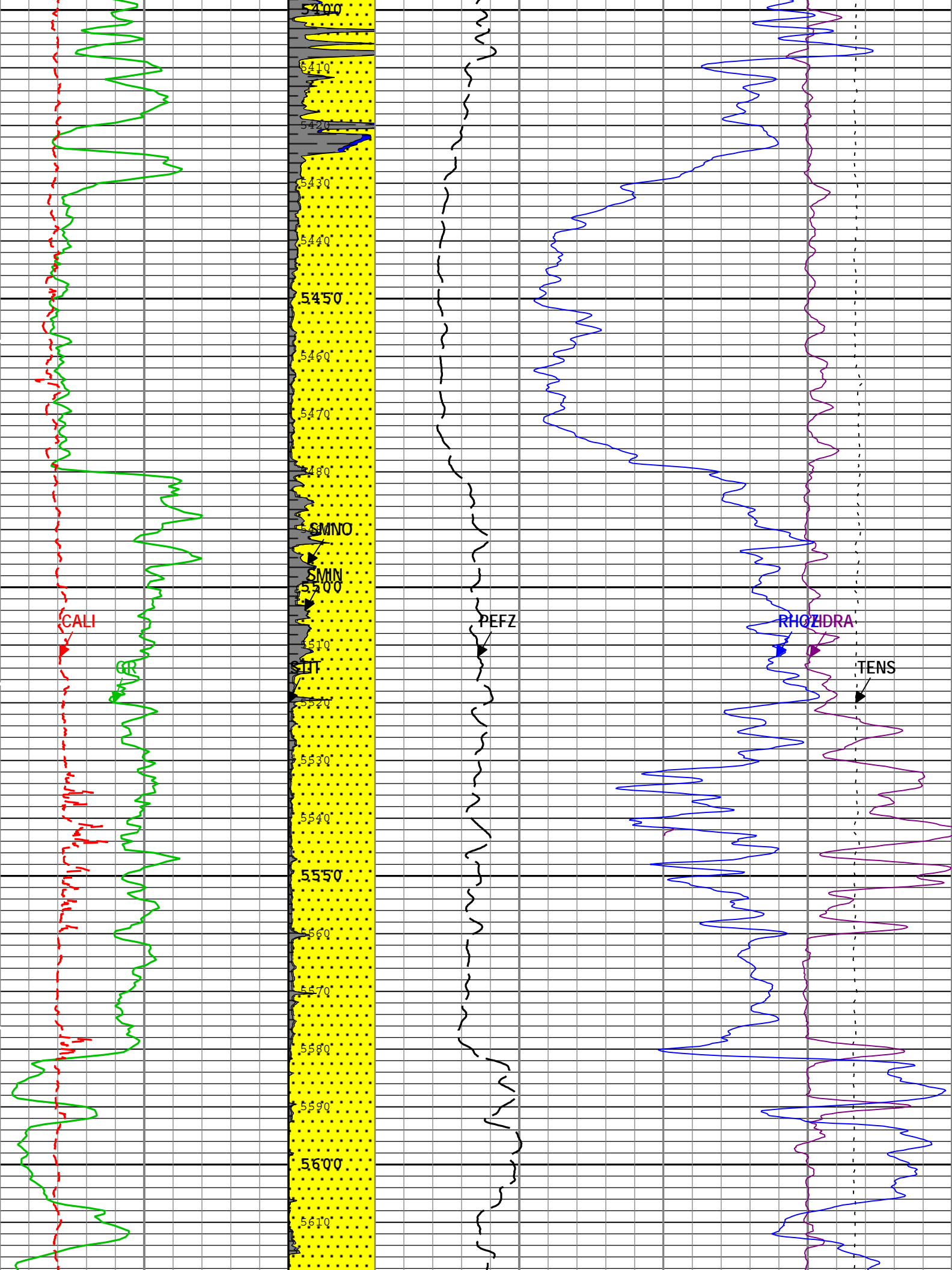


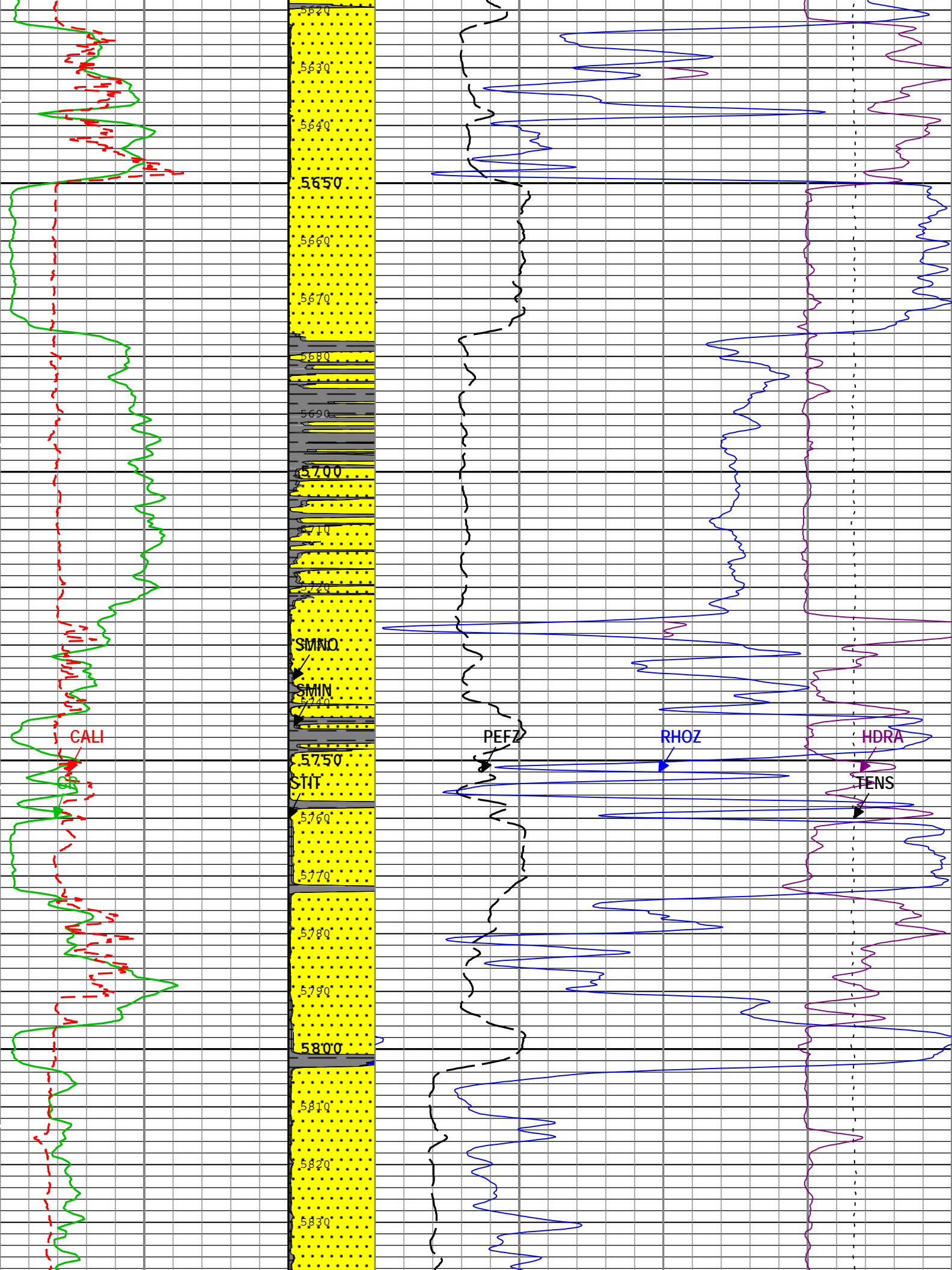


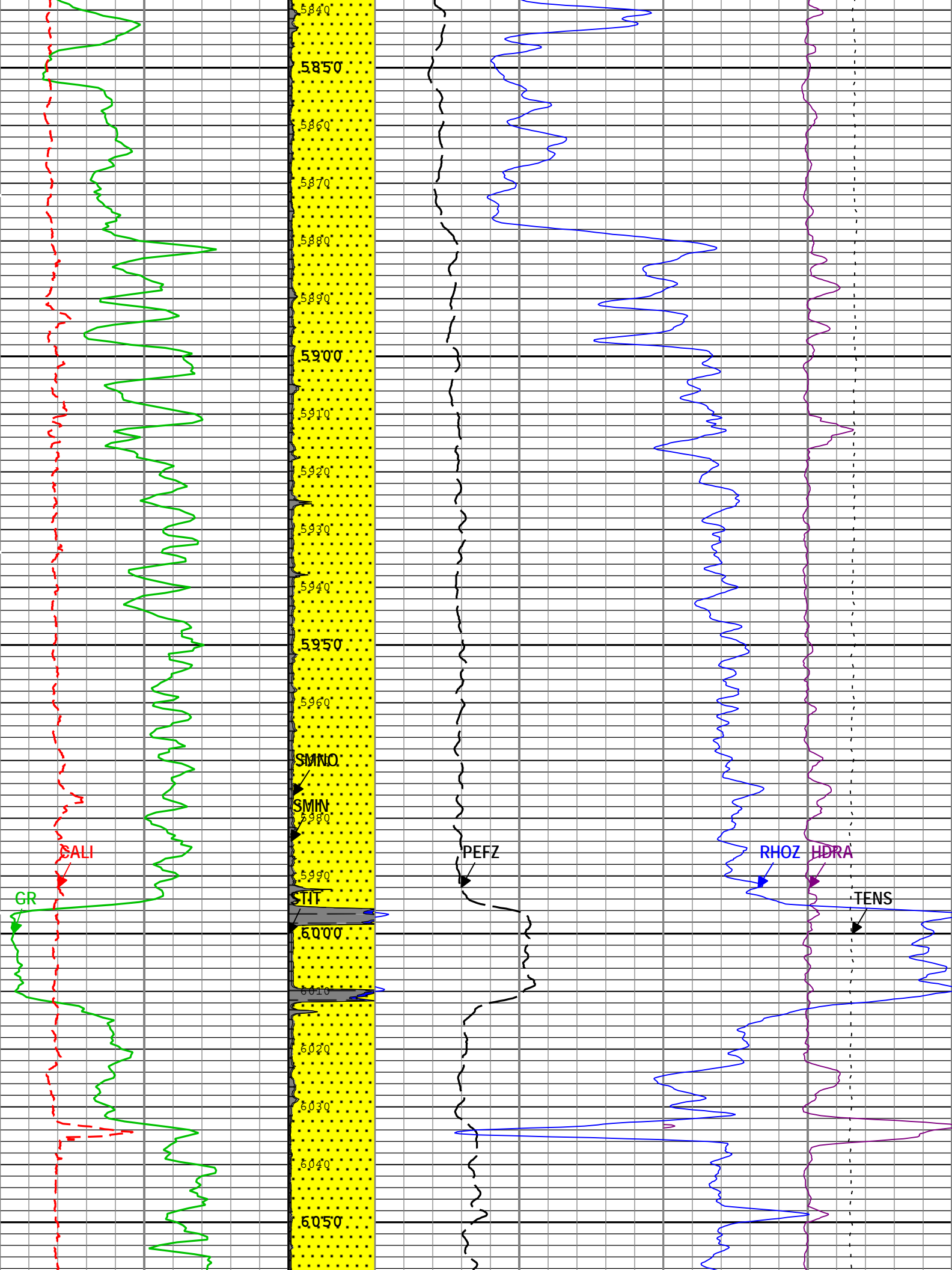


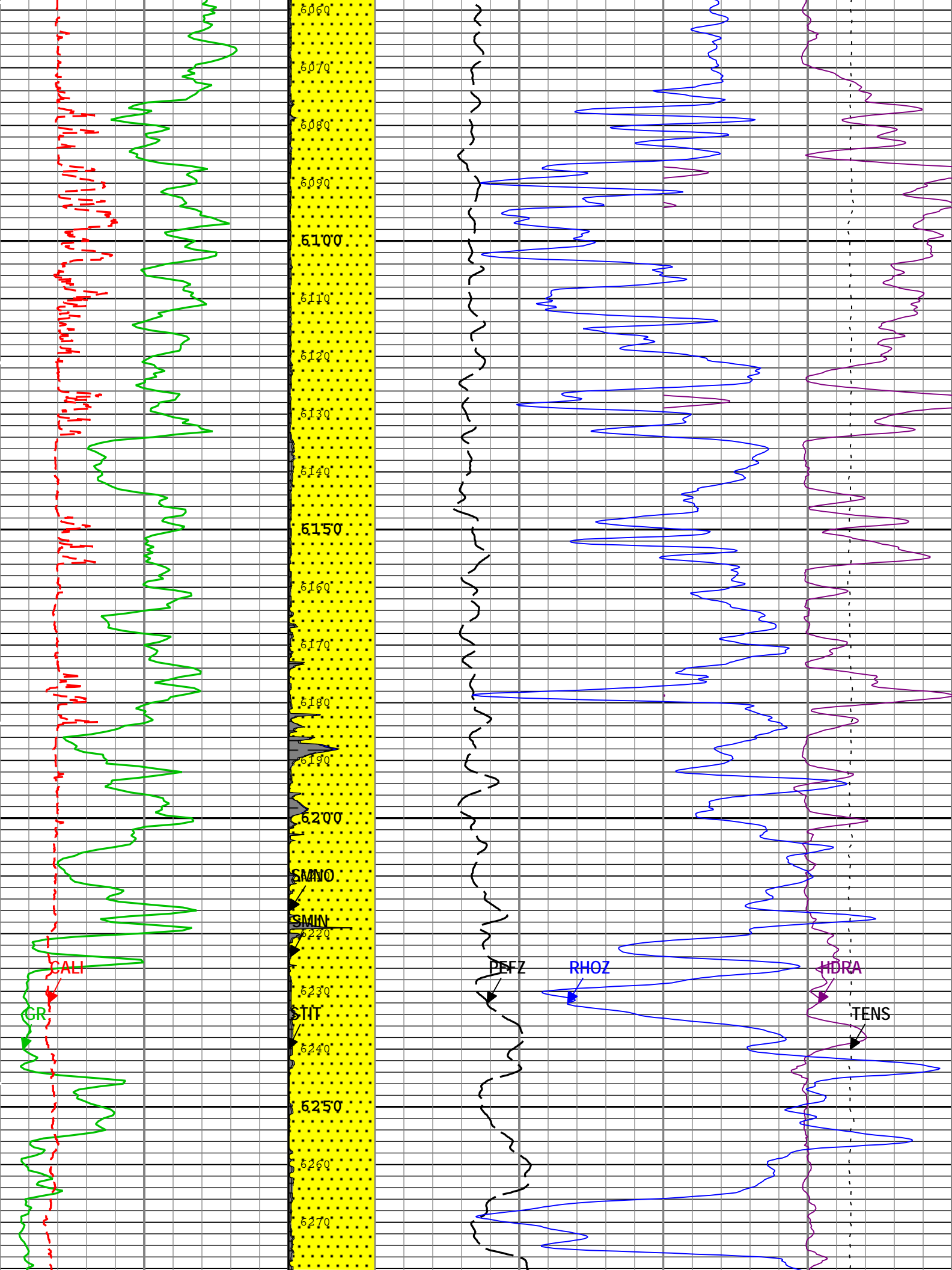


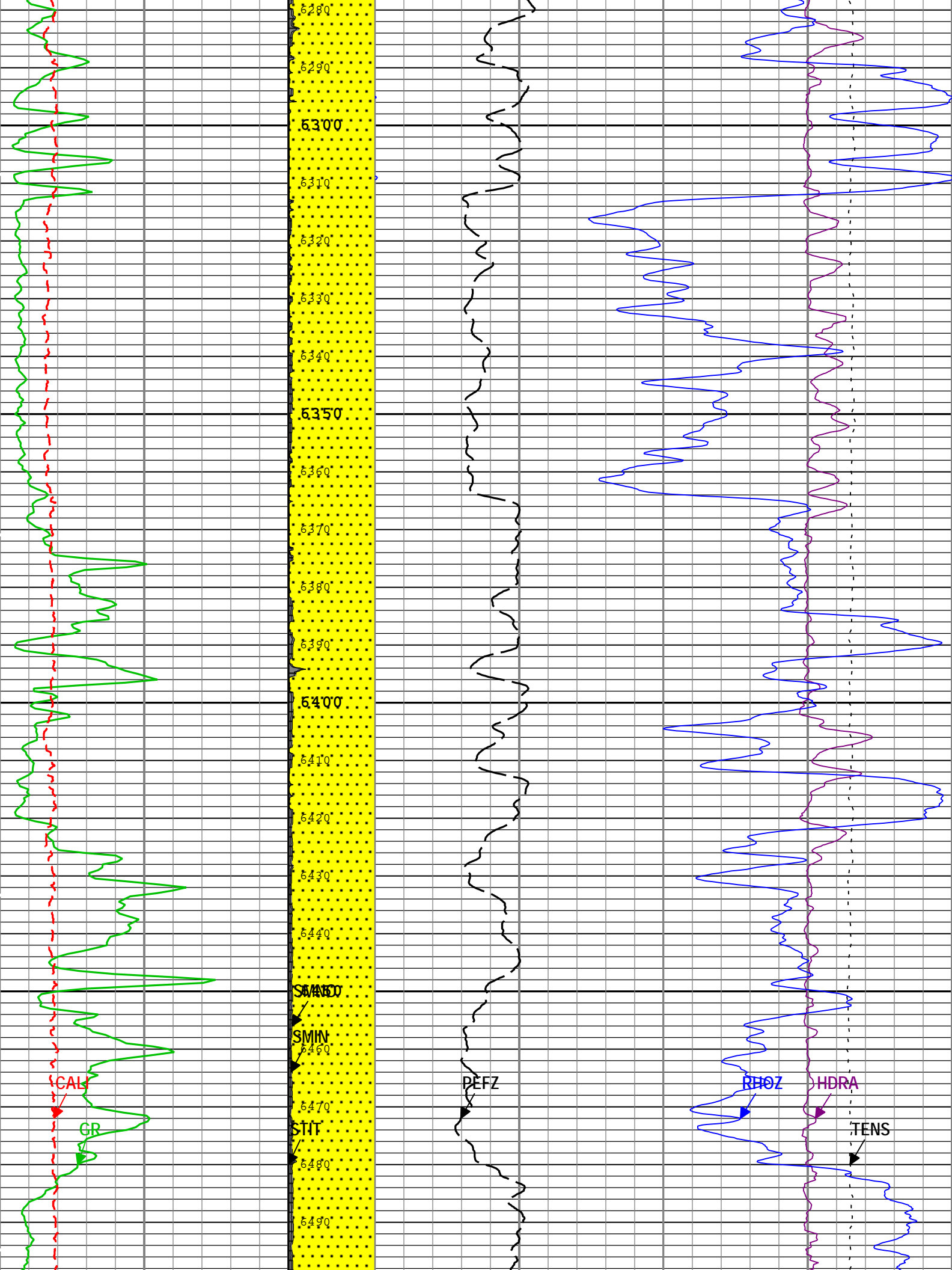


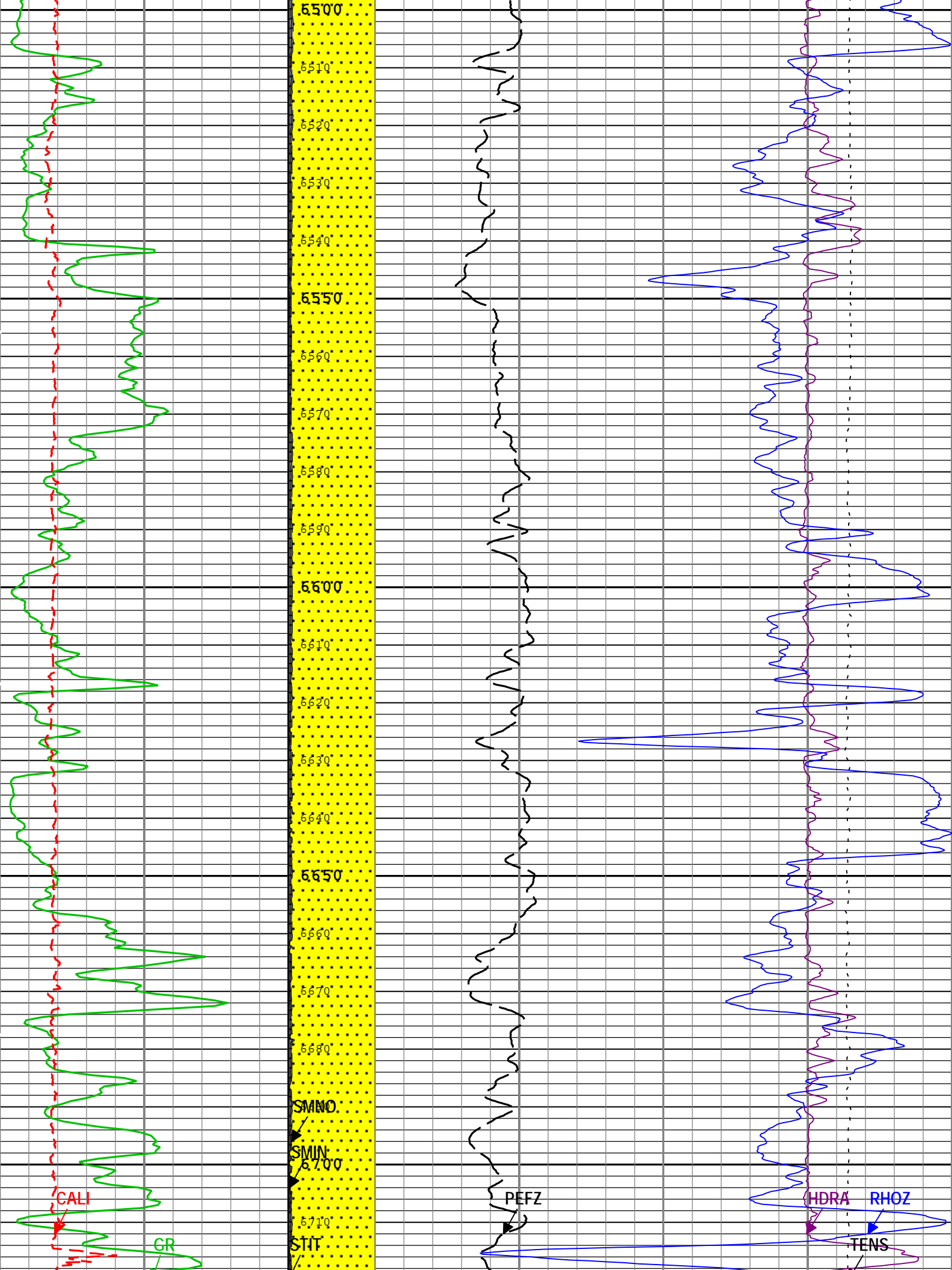


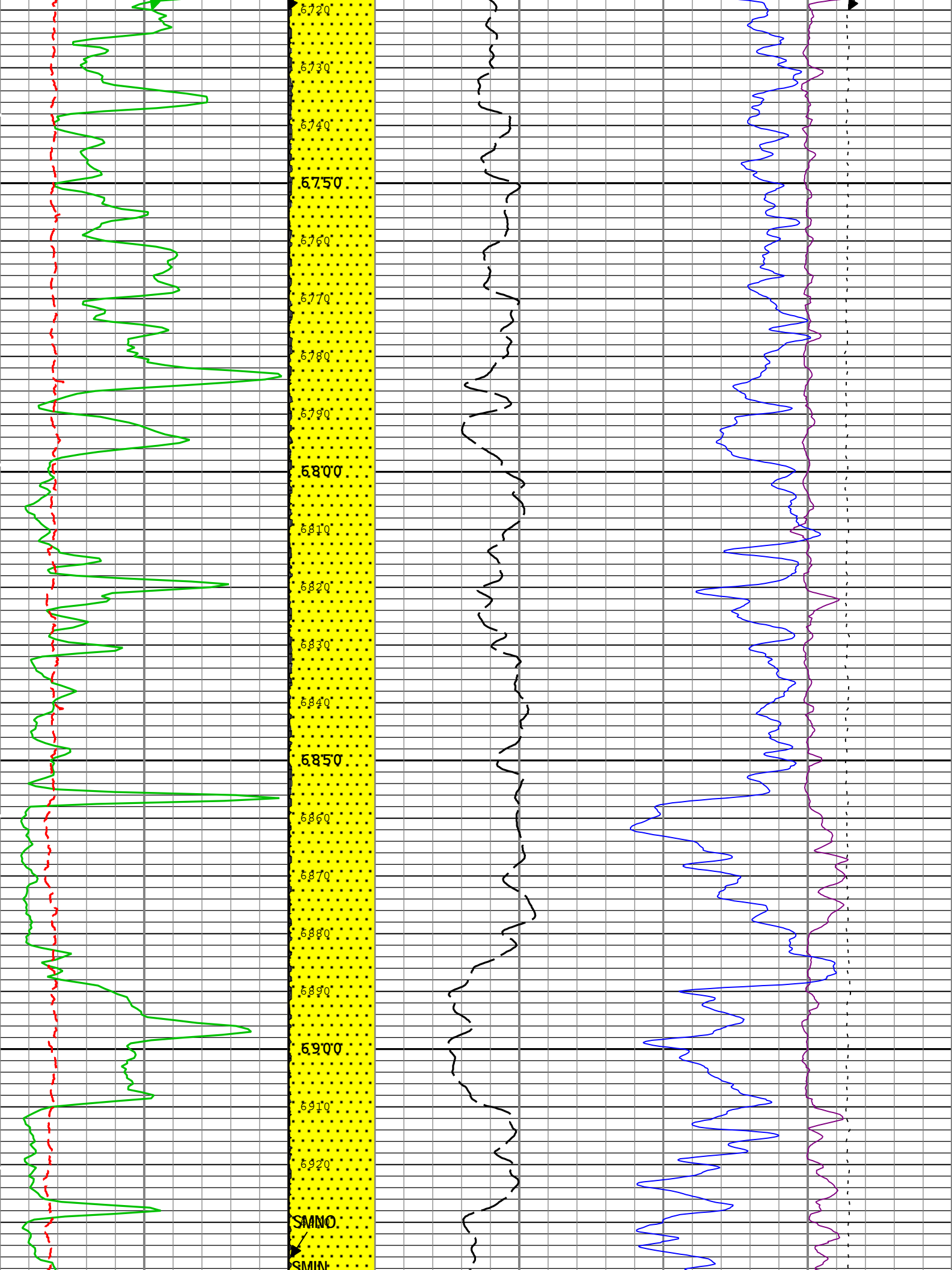


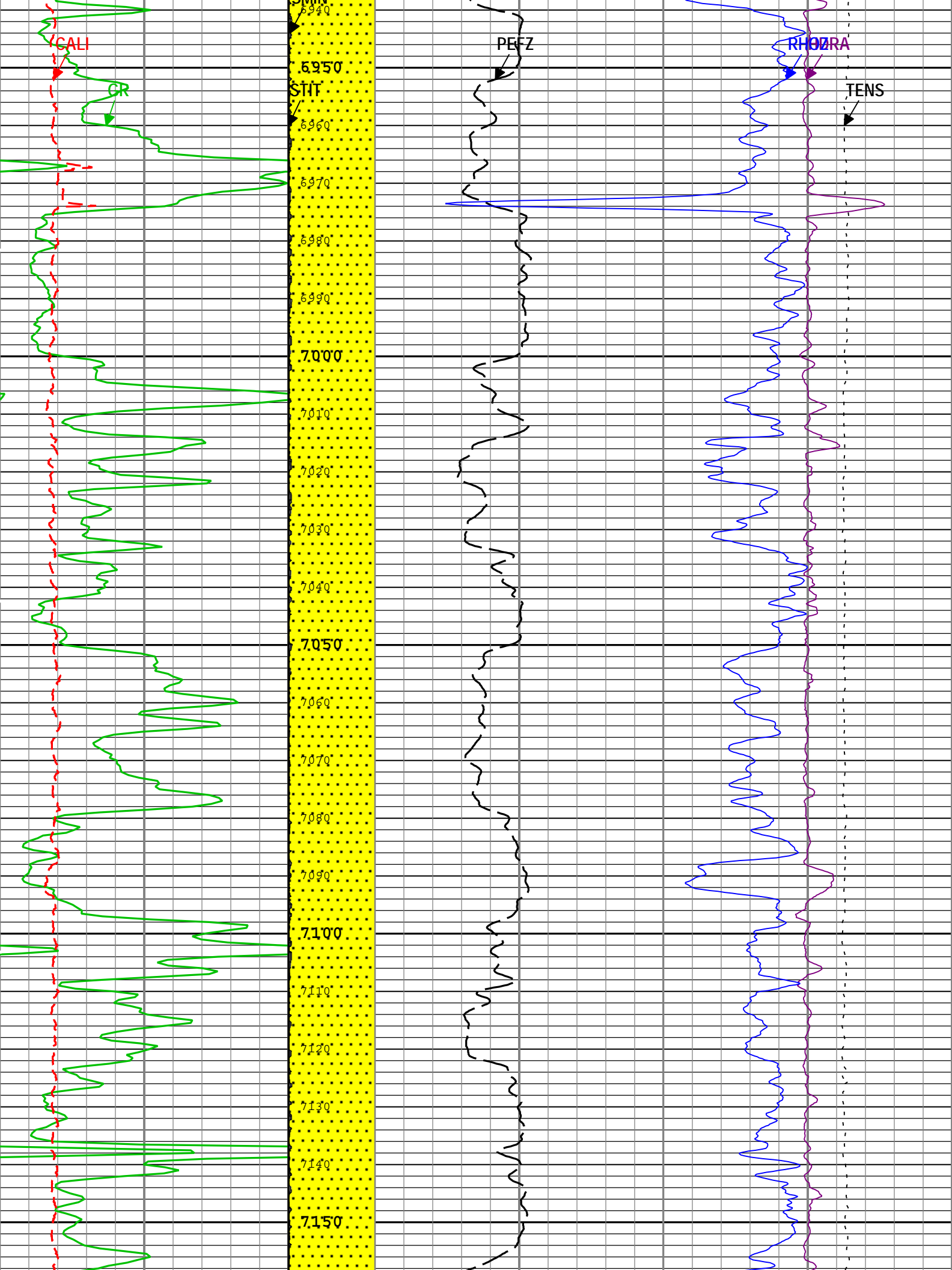


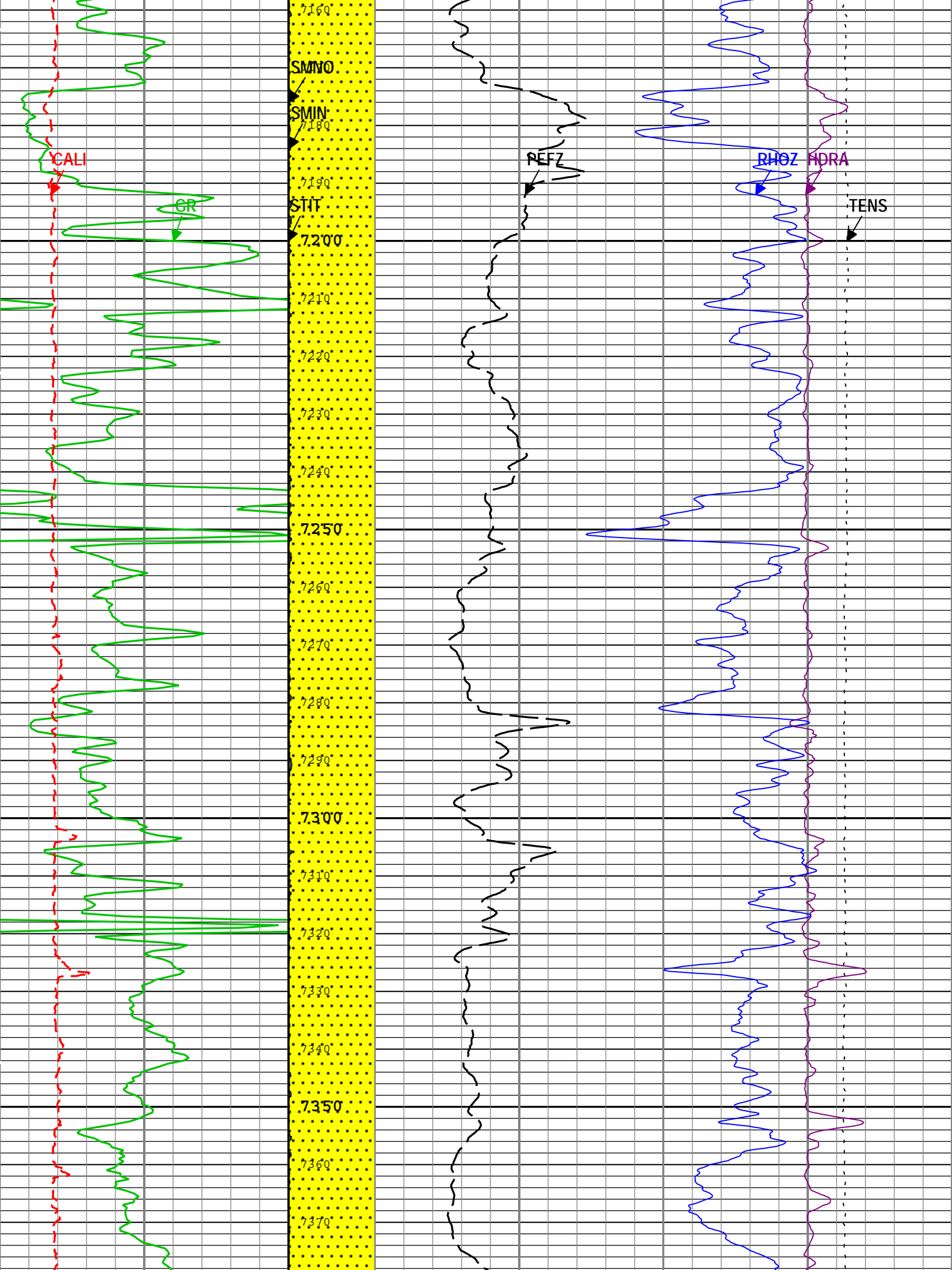


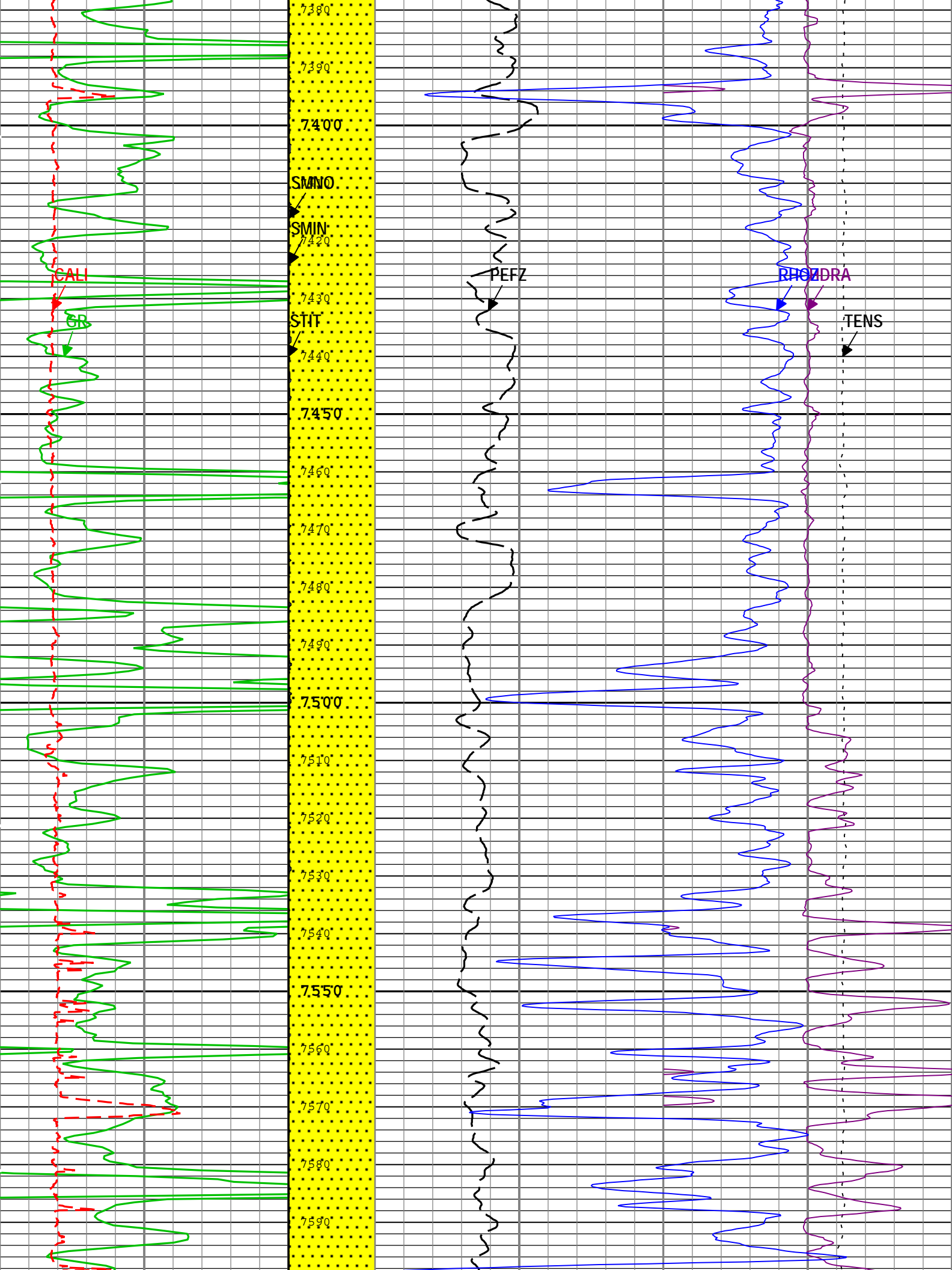


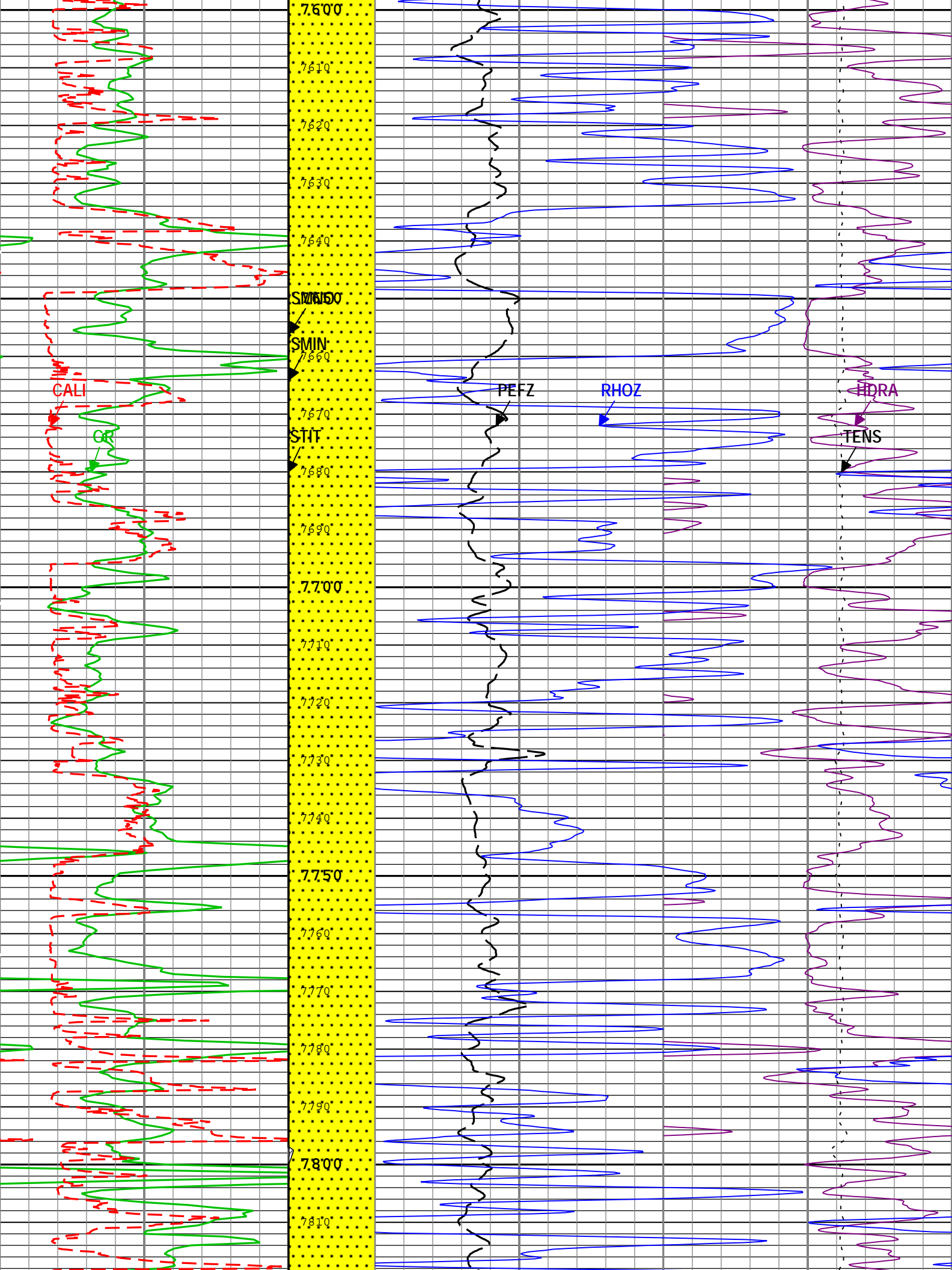


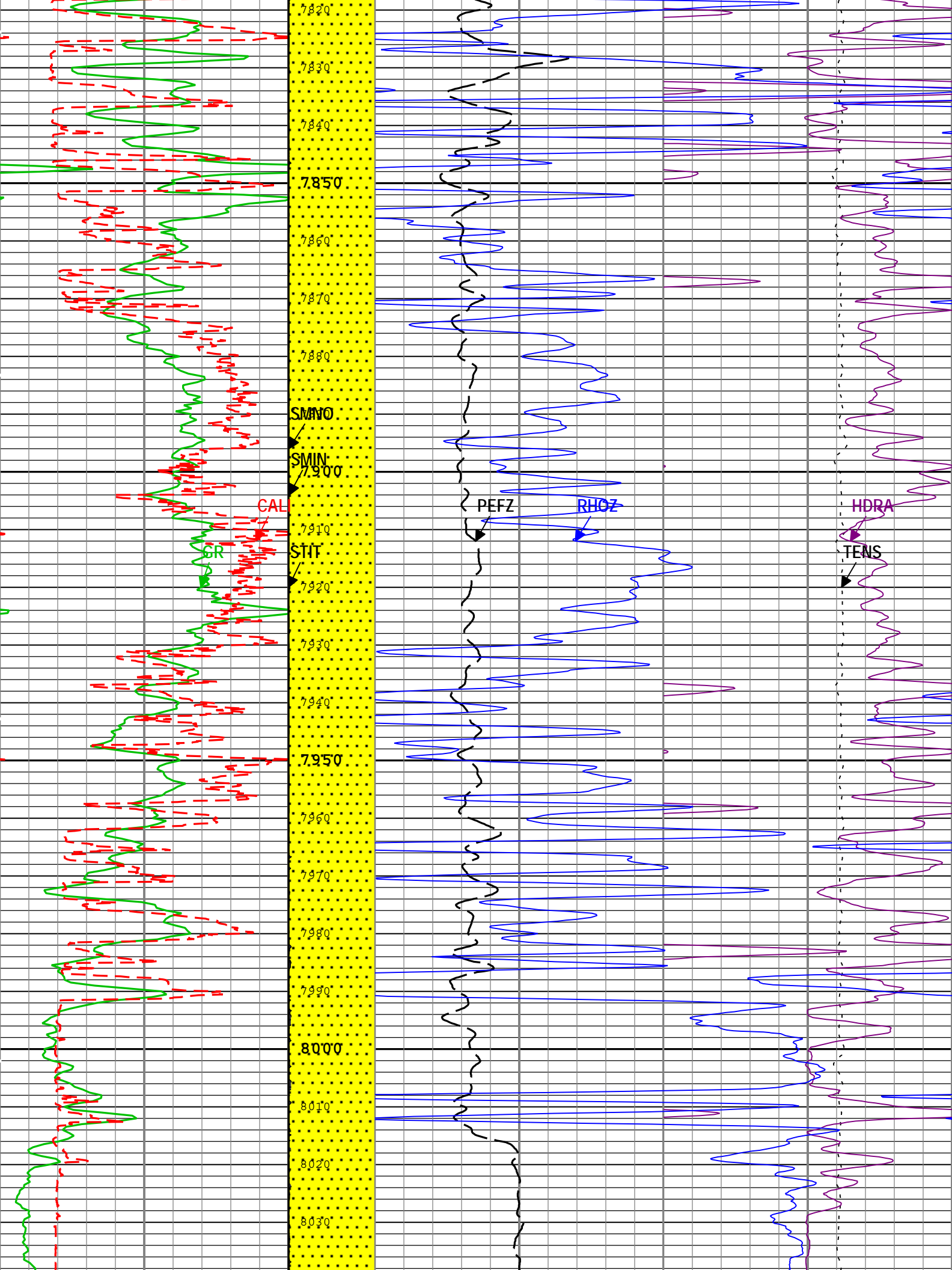


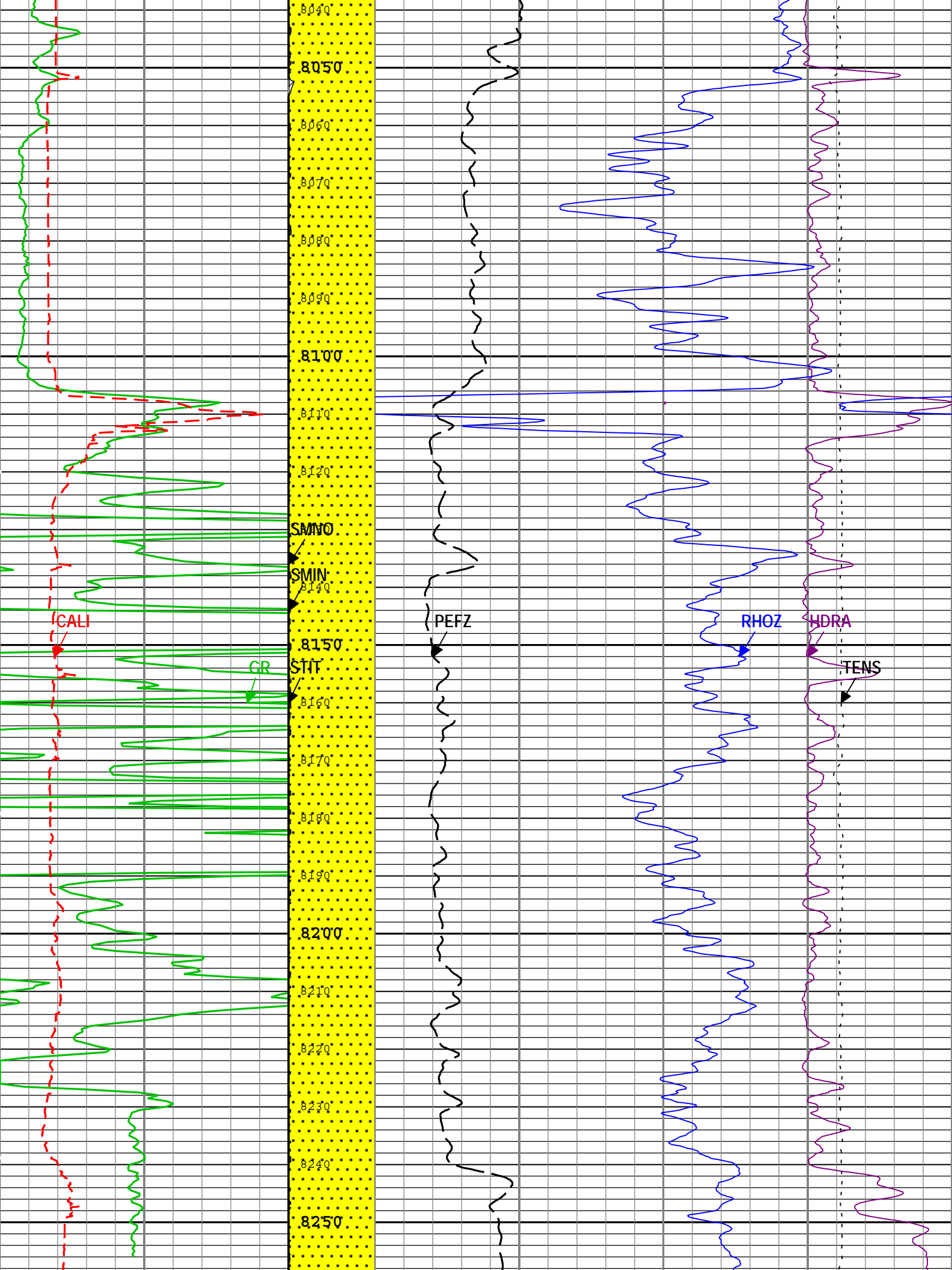


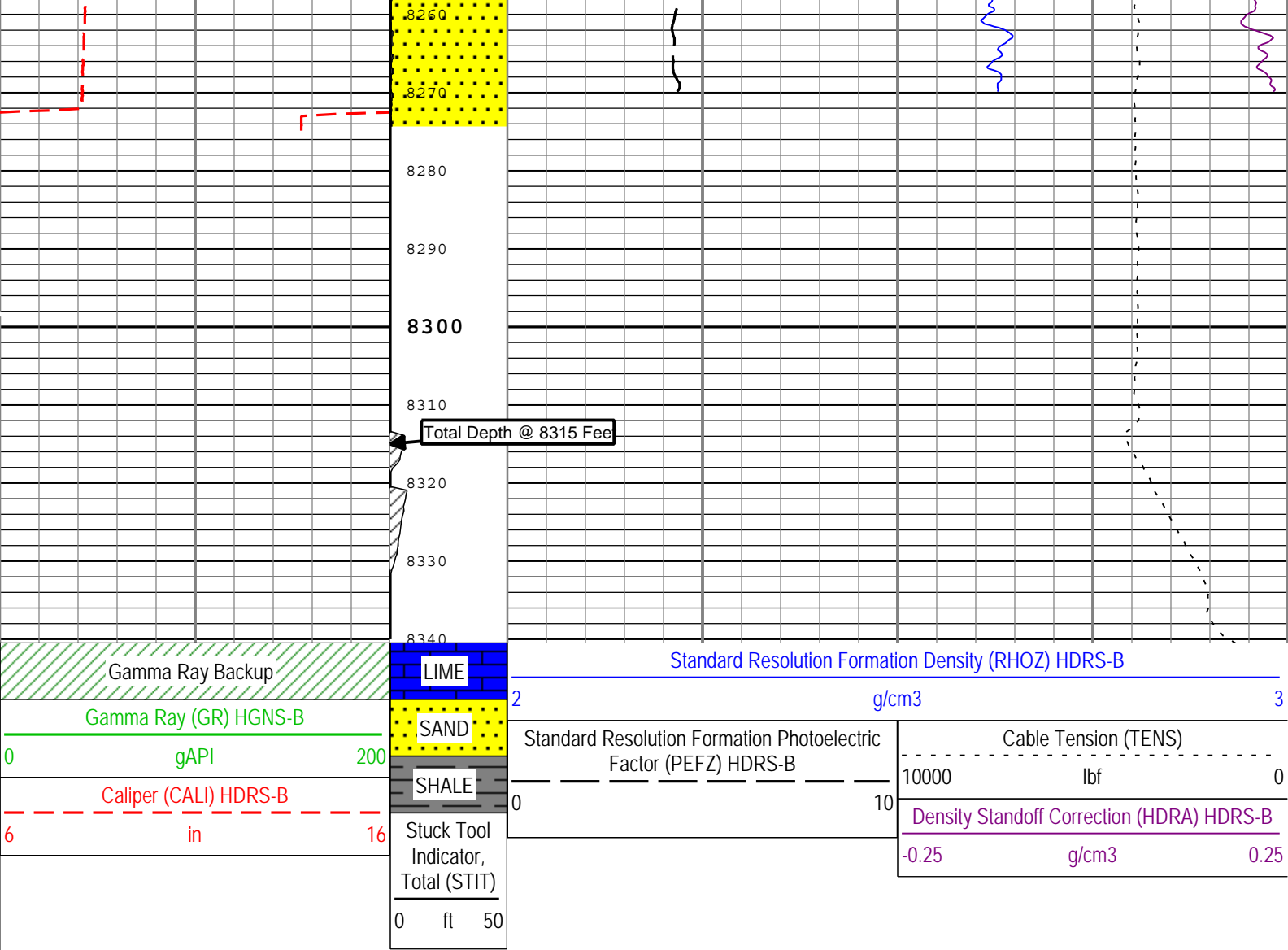












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Density Upper) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 31-May-2013 22:18:56

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
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-B	0.121	in
CBLO	Casing Bottom (Logger)	WLSESSION	309.5	ft
CDEN	Cement Density	HGNS-B	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-B	Bit Size	
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	
SOCO	Standoff Correction Option	HGNS-B	Yes	
TD	Total Measured Depth	Borehole	8300	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
-----------	-------	--------------	-------------

BS	0	280	309.5
BS	7.875	309.5	8340.5

All depth are actual.

Tool Control Parameters				
Parameter	Description	Tool	Value	Unit
HRGD_BRD_TYPE	HRGD Board Type	HDRS-B	WITHOUT_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
STSO_HRDD	Temperature Source for the Density Algorithm	HDRS-B	Decaytime algorithm	

Calibration Report				
HDRS-B (HILT Density and Rxo Sonde, 125 degC) Calibration - Run 1				
Primary Equipment :				
	HILT High-Resolution Control Cartridge, 125 degC	HRCC-B	791	
	HILT Resistivity Gamma-Ray Density Device, 125 degC	HRGD-B	1849	
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	5094	
	HILT High-Resolution Control Cartridge, 125 degC	HRCC-B	791	
	HILT High-Resolution Mechanical Sonde, 125 degC	HRMS-B	1754	
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):		13:51:36 30-May-2013 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	8.06	10.00	
Large Ring	in	Before	12.00	9.00	12.26	15.00	

HDRS Density Calibration - Inversion Results							
Master (EEPROM):		12:10:08 24-May-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.600	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.688	1.696	
Pe Aluminum		Master	2.570	2.470	2.564	2.670	
Pe Magnesium		Master	2.650	2.550	2.620	2.750	

HDRS Density Calibration - Deviation Summary							
Master (EEPROM):		12:10:08 24-May-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.4759	0.6000	
BS Max Deviation	%	Master	0	-1.6000	1.0180	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.3444	1.0000	
SS Max Deviation	%	Master	0	-2.5000	1.6146	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.3616	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.2182	3.5000	

HDRS Density Calibration - Background Summary							
Master (EEPROM):		12:10:08 24-May-2013		Before (Measured):		13:48:25 30-May-2013 Expired by 1 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7358		
		Before	0.7358	0.6990	0.7372	0.7725	
		Before-Master	-----	-----	0.0014	-----	
BS Window Sum	1/s	Master	1		9446		
		Before	9446	8974	9445	9918	
		Before-Master	-----	-----	-1	-----	
SS Window Ratio		Master	1.0000		0.4930		

[illegible]

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Accelerometer Manufacturer		Master			Sunstrand		
Accelerometer Reference Temperature	degF	Master		30.2	68.0	122.0	
Accelerometer Coefficients - 0		Master	----	----	51.000	----	
Accelerometer Coefficients - 1		Master	----	----	11.800	----	
Accelerometer Coefficients - 2		Master	----	----	0.011	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.182	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	293.400	----	
Accelerometer Coefficients - 9		Master	----	----	0.997	----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM):		Before (Measured):		After:			
10:38:08 25-Feb-2013 Expired by 5 days		13:45:42 30-May-2013 Expired by 1 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.8	40.0	
		Before	0	5.0	29.0	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.2	1.2	4.2	
		After-Before	----	----	----	----	
Far Zero Measurement	1/s	Master	0	5.0	31.8	40.0	
		Before	0	5.0	31.0	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.8	-0.8	4.8	
		After-Before	----	----	----	----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4914.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2076.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	4881.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2041.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		13:48:38 30-May-2013 Expired by 1 days		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	81.9	120.0	
		After	----	----	----	----	
		After-Before	----	----	----	----	
RGR Plus Measurement	gAPI	Before	185.4	157.1	168.3	206.3	
		After	----	----	NOT DONE	----	
		After-Before	----	----	----	----	
GR Calibration Gain		Before	0.89	0.80	0.98	1.05	
		After	----	----	----	----	
		After-Before	----	----	----	----	

Company: NIGHTHAWK PRODUCTION LLC

Schlumberger

Well:	TAOS 1-10
Field:	WILDCAT
County:	LINCOLN
State:	COLORADO

Platform Express

Compensated Neutron-- Litho Density