

Company: NIGHTHAWK PRODUCTION LLC

Well: TAOS 1-10

Field: WILDCAT

County: LINCOLN Country: UNITED STATES

Triple Combo
Laterolog Array

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.	Max.Hole Deviation	Longitude:
05-073-06520-0000			0 deg	-103.41982 degrees
				Latitude: 39.547420 degrees
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			
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	Calculated	RMC	Calculated	
RM @ BHT	0.4 @ 175.45	RMF @ BHT	0.25 @ 175.45	
Max Recorded Temperatures	175.45 degF			
Circulation Stopped	31-May-2013 11:00:00			
Logger on Bottom	31-May-2013 16:15:00			
Unit Number	3022	Location:	FORT MORGAN, C	
Recorded By	Keri Lonng			
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.

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Well Sketch

Driller Depth
0.00 ft

301.00 ft

Casing 8.625in
24lbm/ft

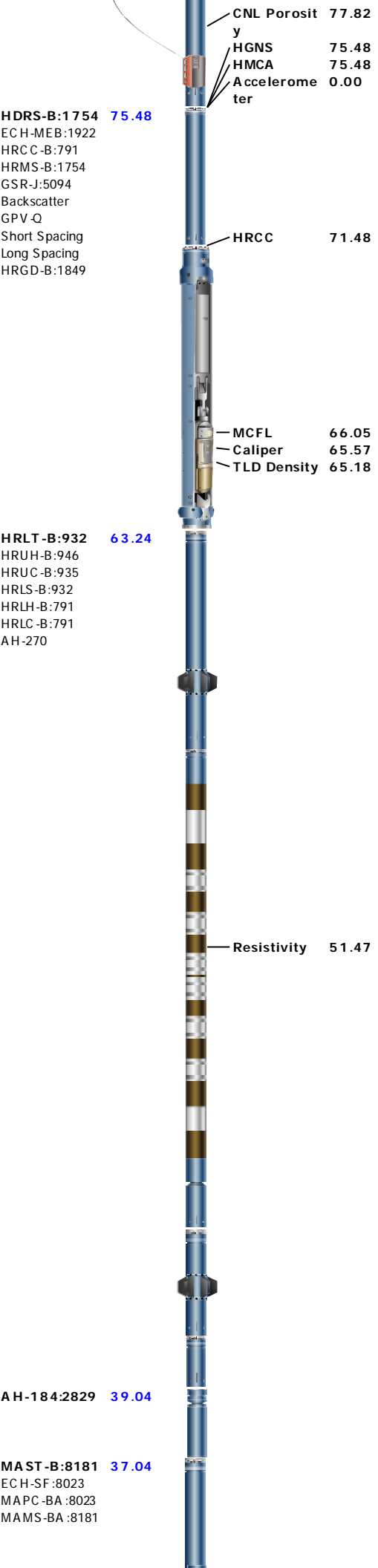


Borehole Size/Casing/Tubing Record

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					





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

MAMS 21.6

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															

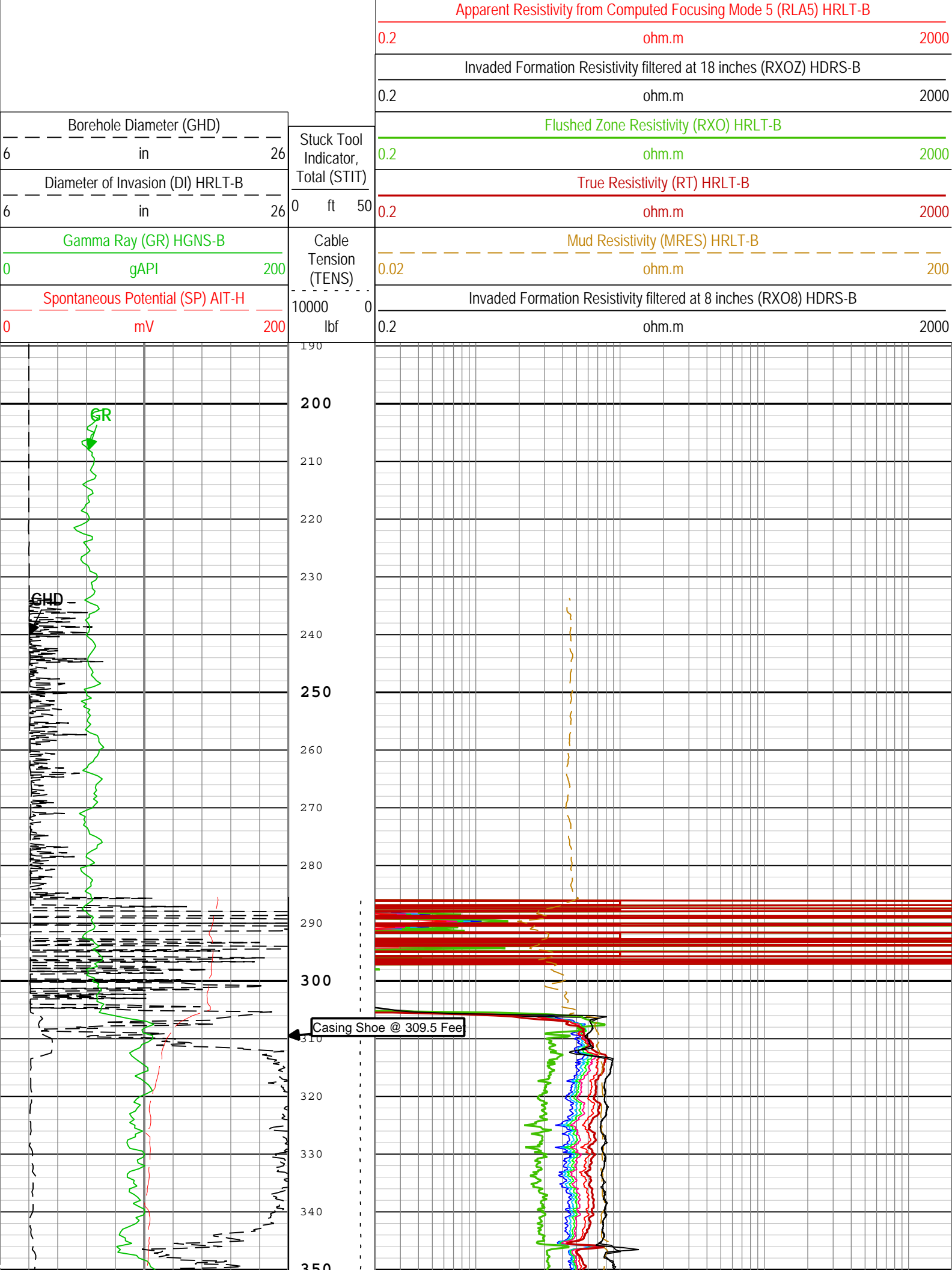
Integration Summary											
Output Channel(s)		Output Description			Input Parameter		Output Value		Unit		
Pass Summary											
Run Name	Pass Objective	Direction	Top	Bottom	Start		Stop		Depth Shift	Include Parallel Data	
Run 1	Main[3]:Up	Up	285.10 ft	8340.47 ft	31-May-2013 4:39:28 PM		31-May-2013 6:55:10 PM		10.52 ft	true	
All depths are referenced to toolstring zero											

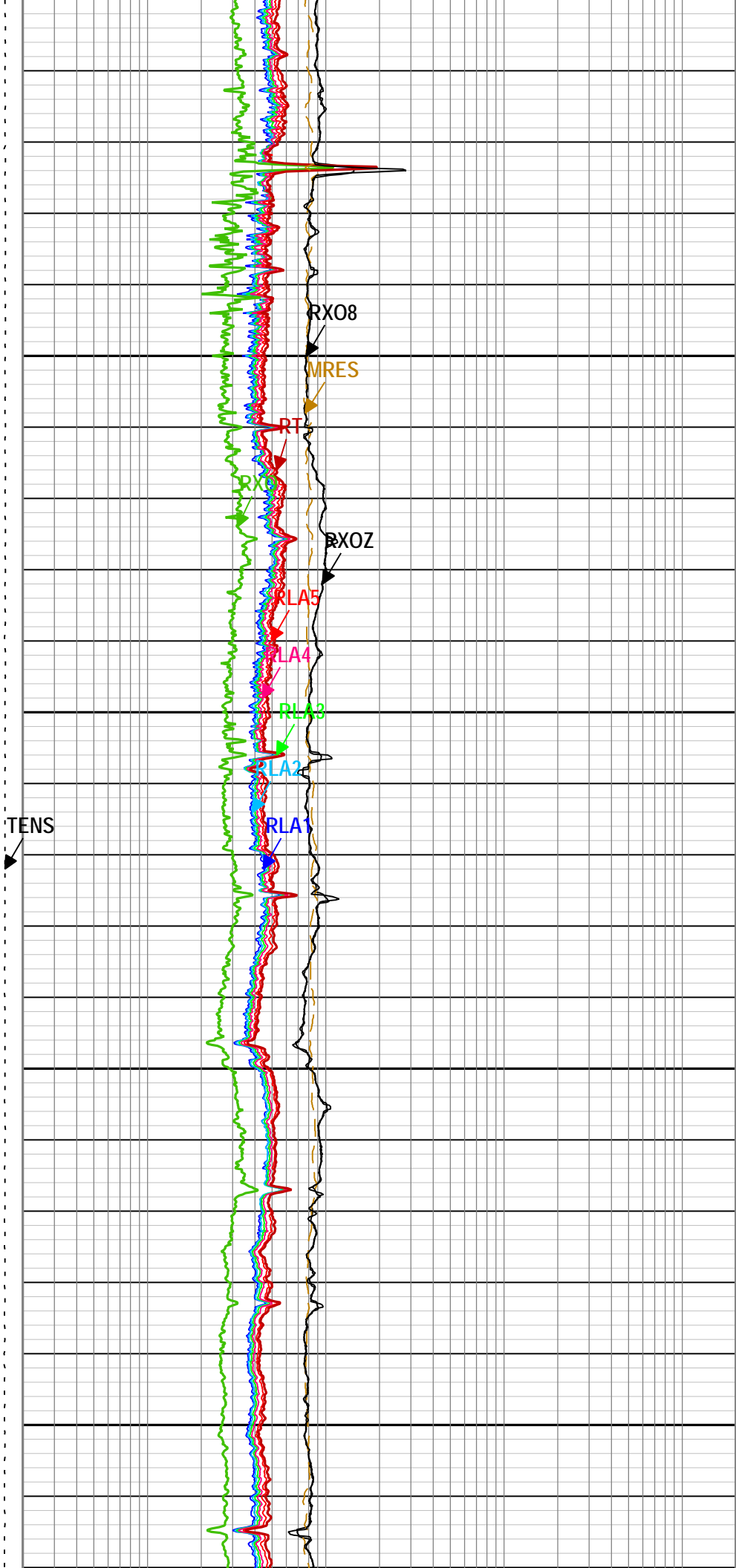
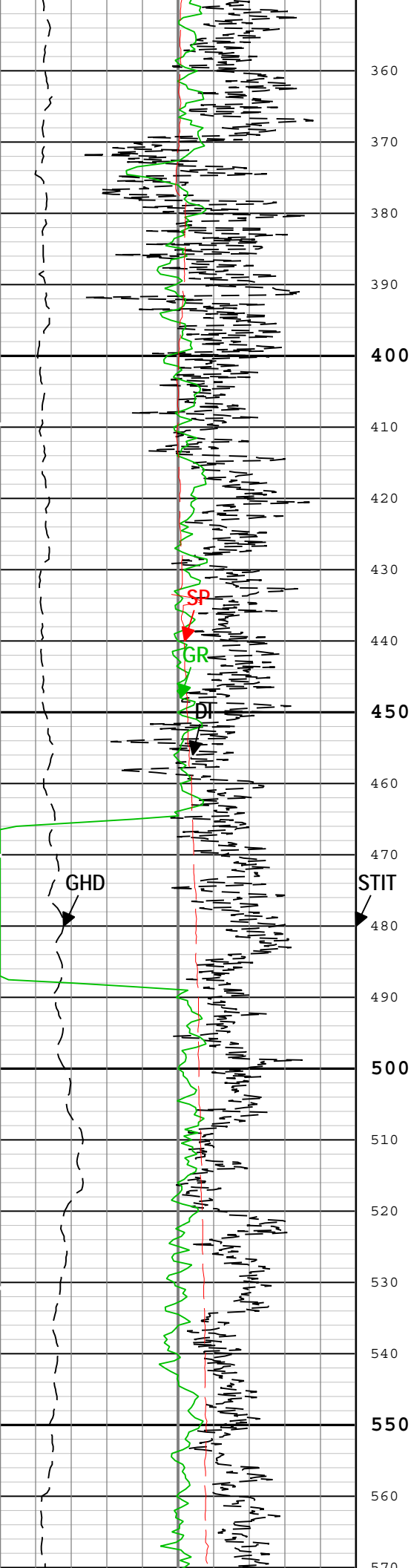
Log	Run 1: Main[3]:Up														
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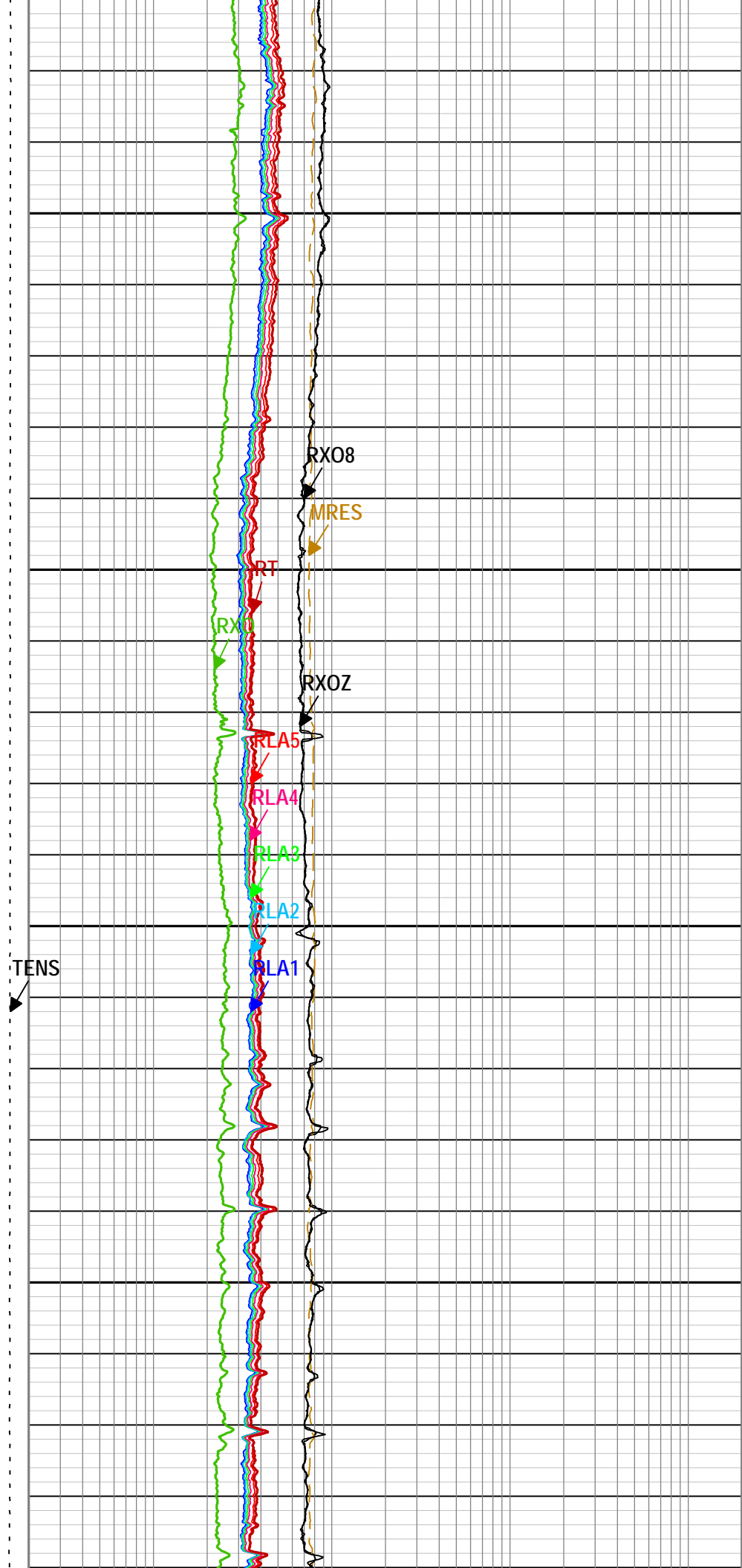
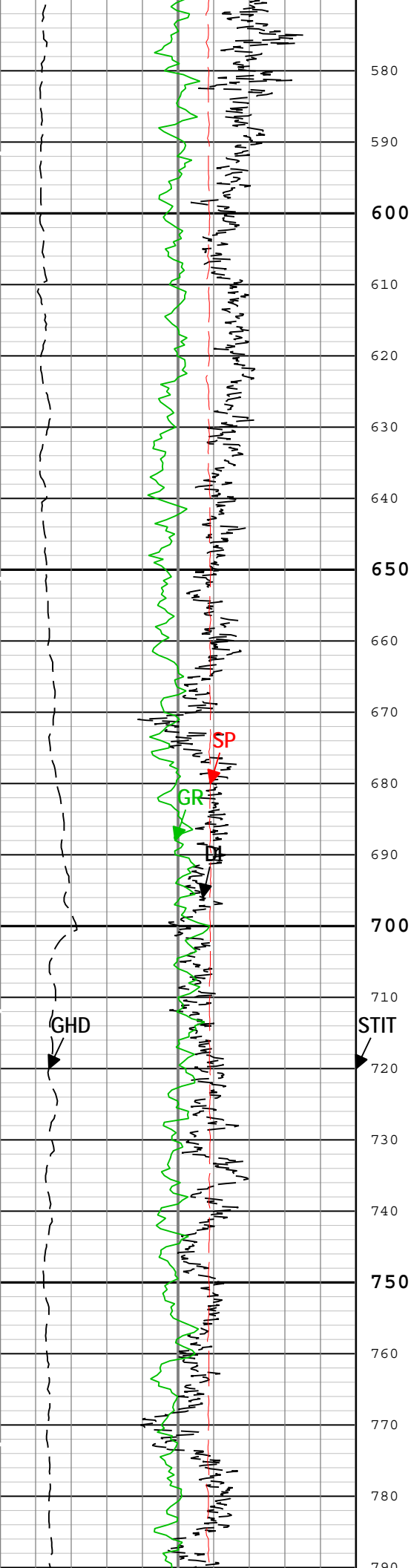
Description: HRLT BASIC LOG Format: Log (HRLT Basic Log) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:20:52

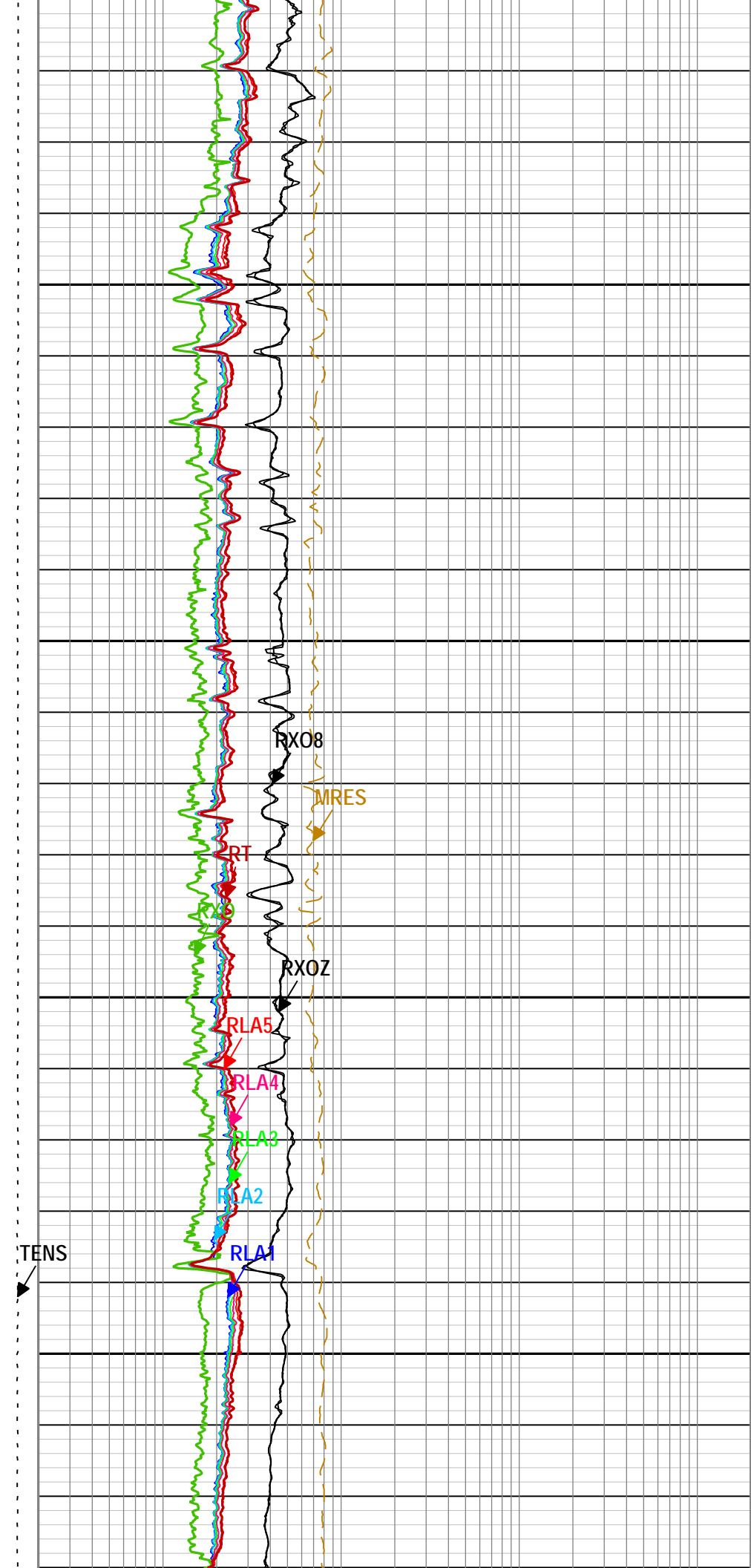
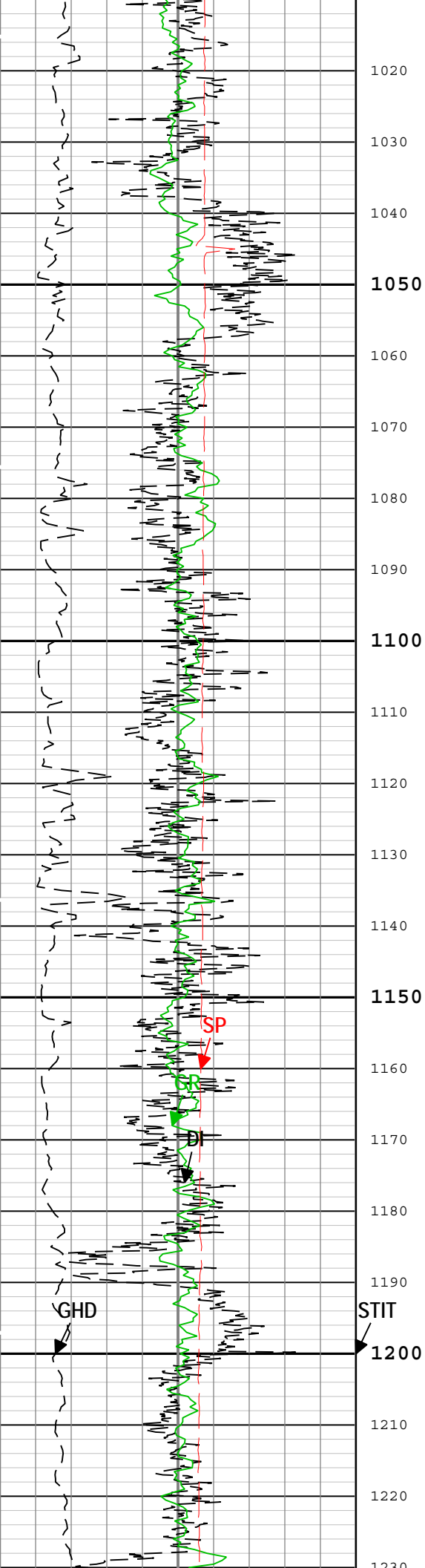
TIME_1900 - Time Marked every 60.00 (s)

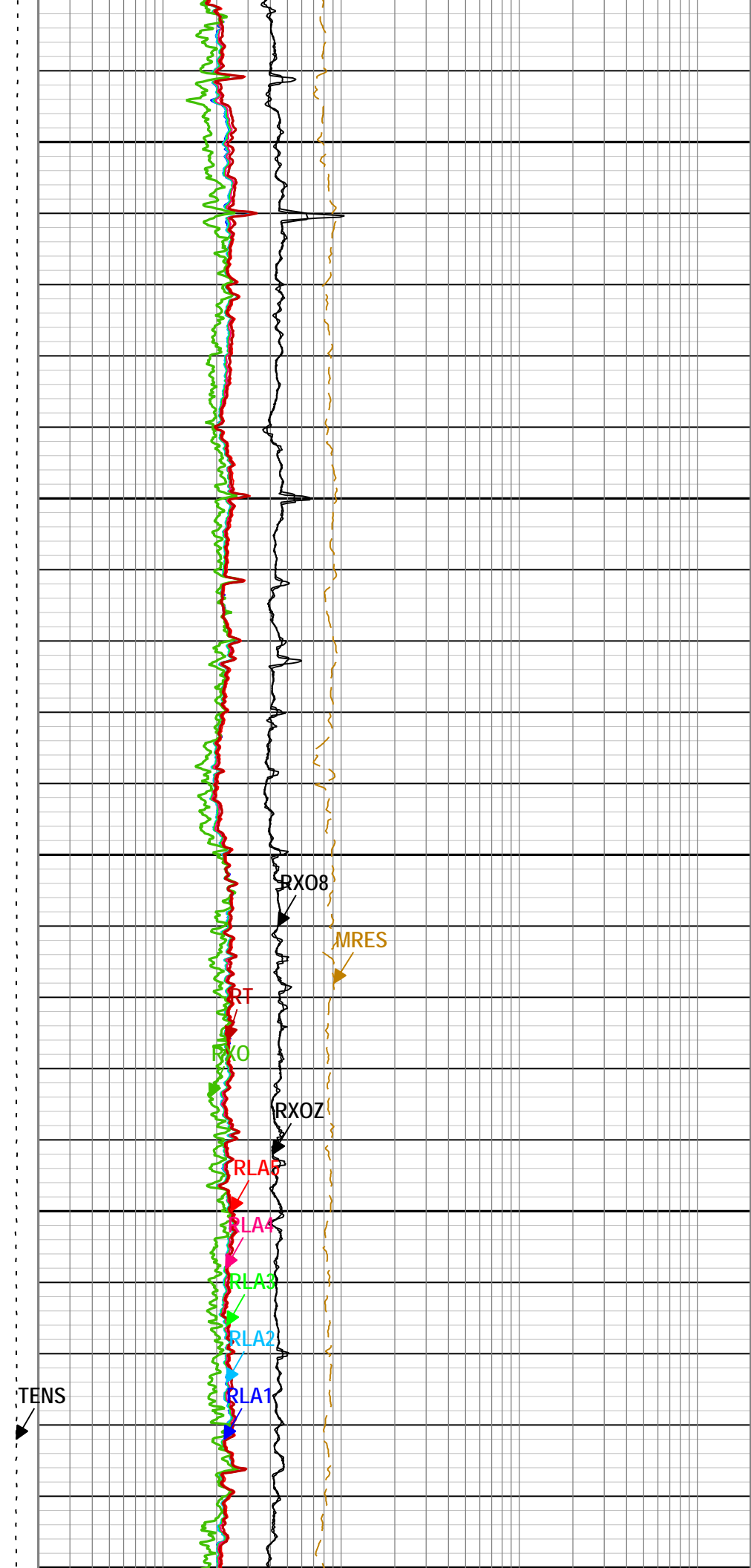
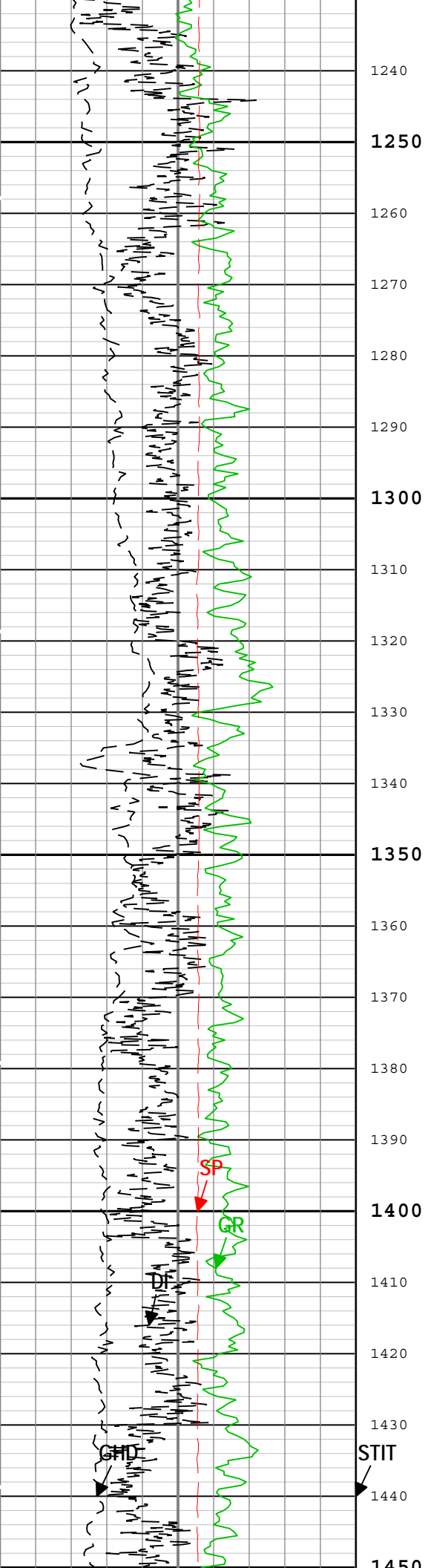
Apparent Resistivity from Computed Focusing Mode 1 (RLA1) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 2 (RLA2) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 3 (RLA3) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 4 (RLA4) HRLT-B		
0.2	ohm.m	2000

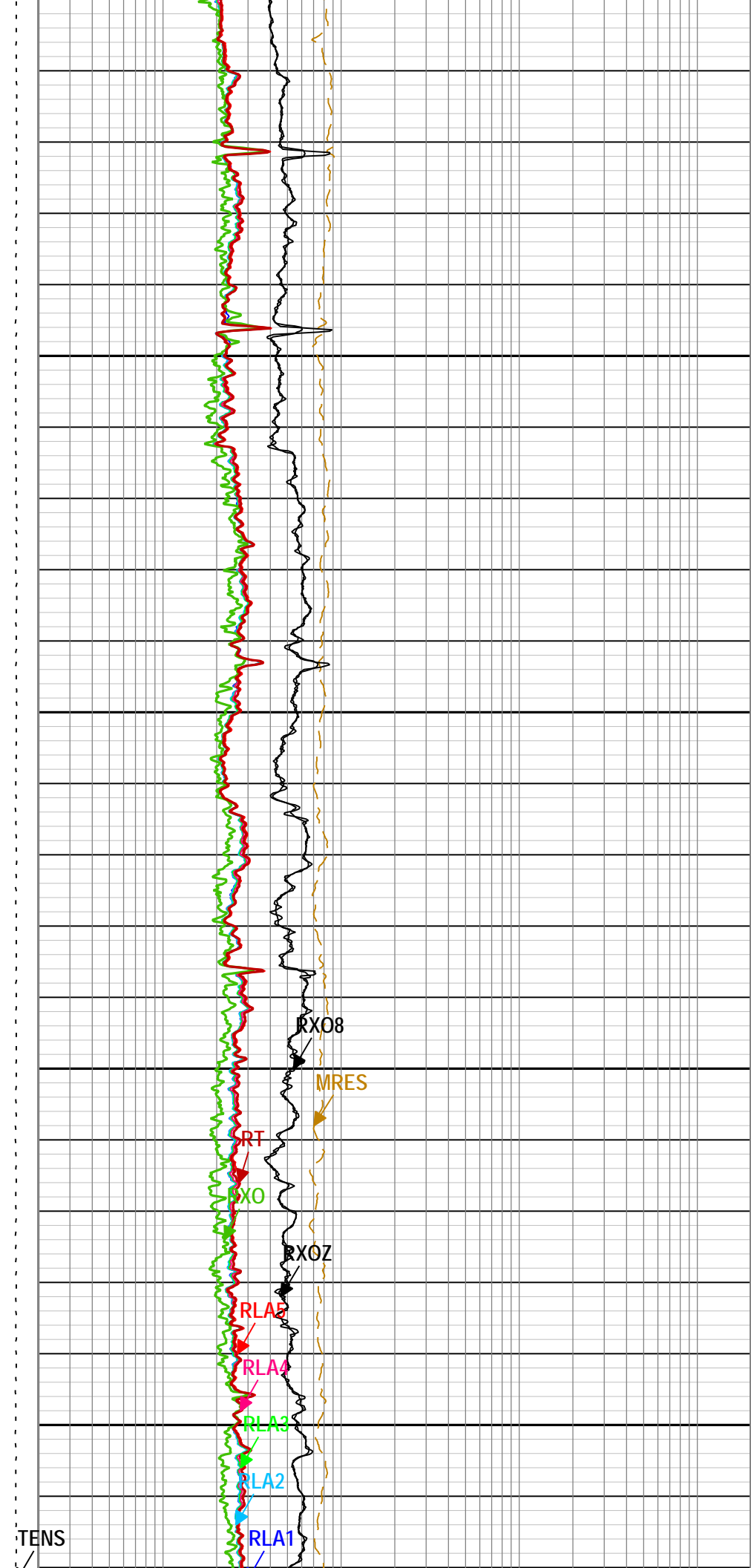
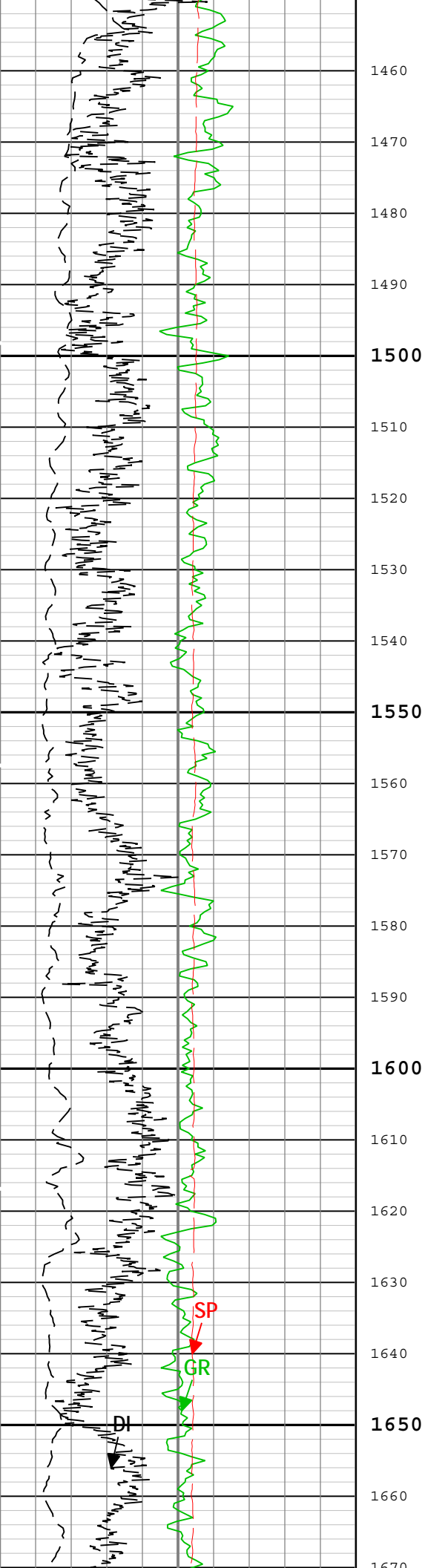


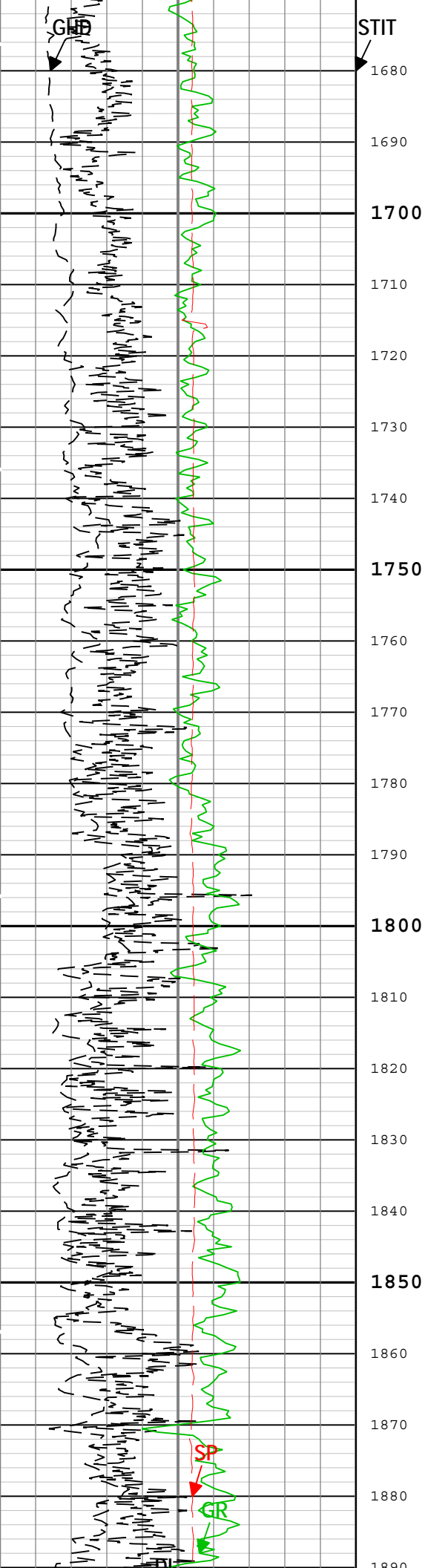












STIT

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1800

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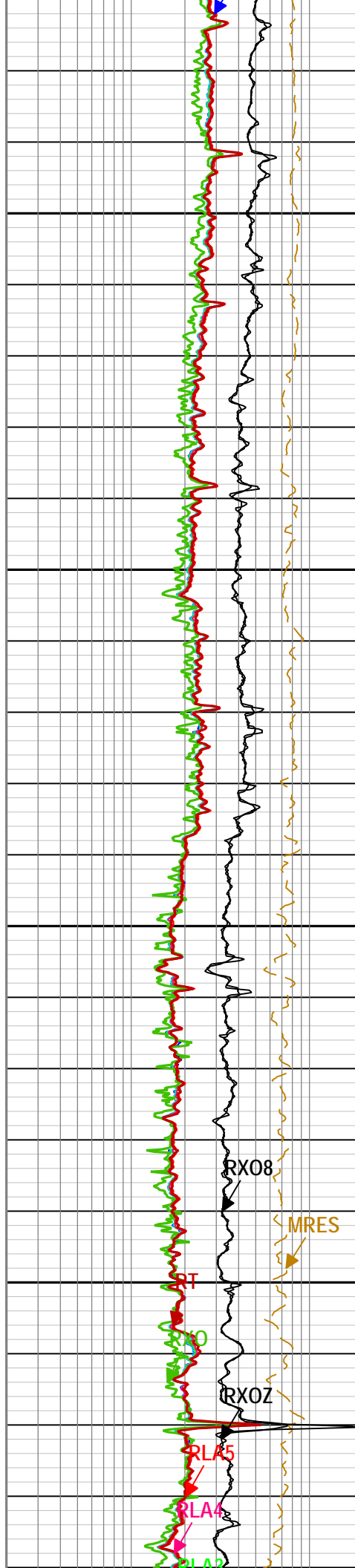
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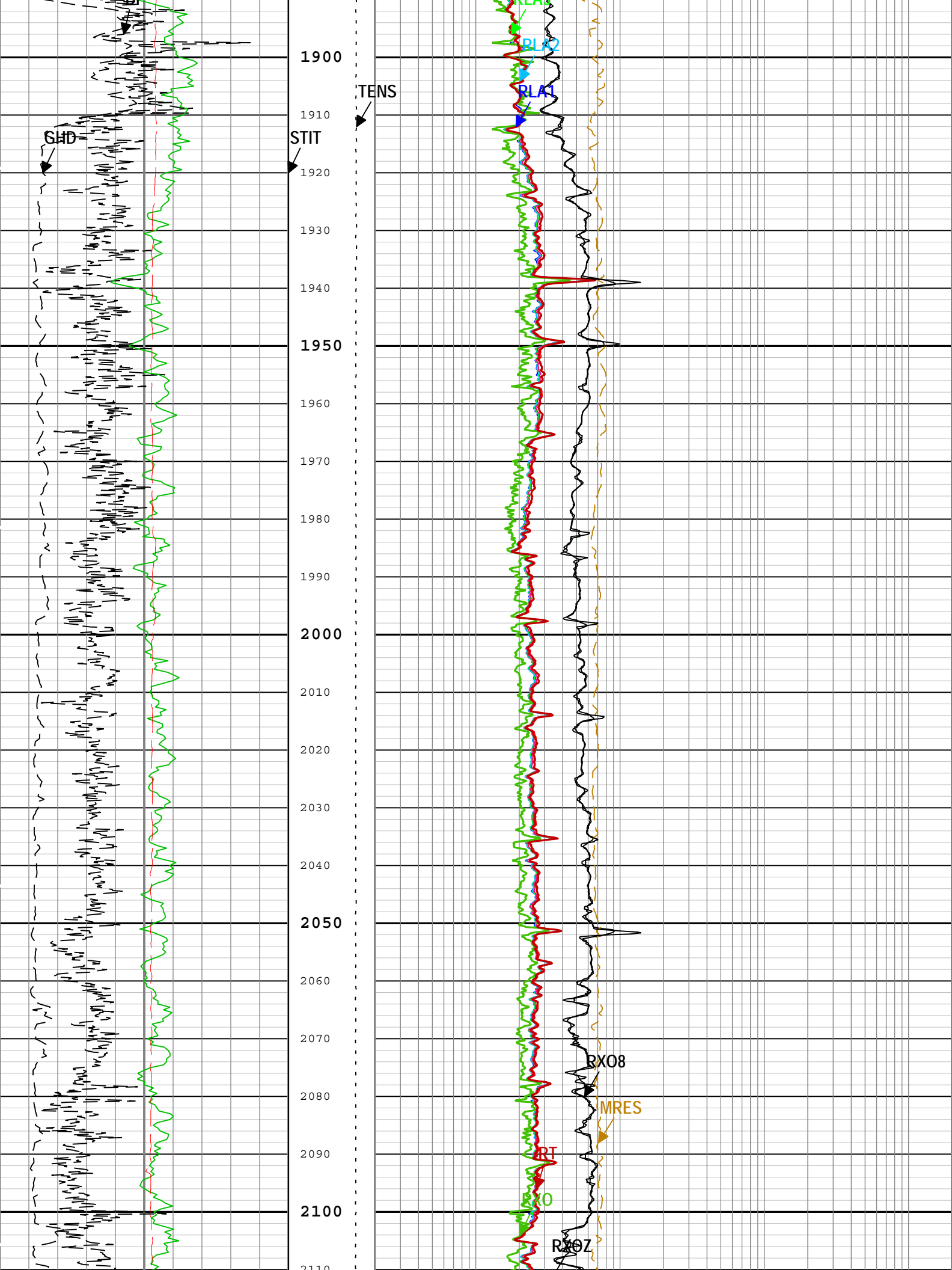
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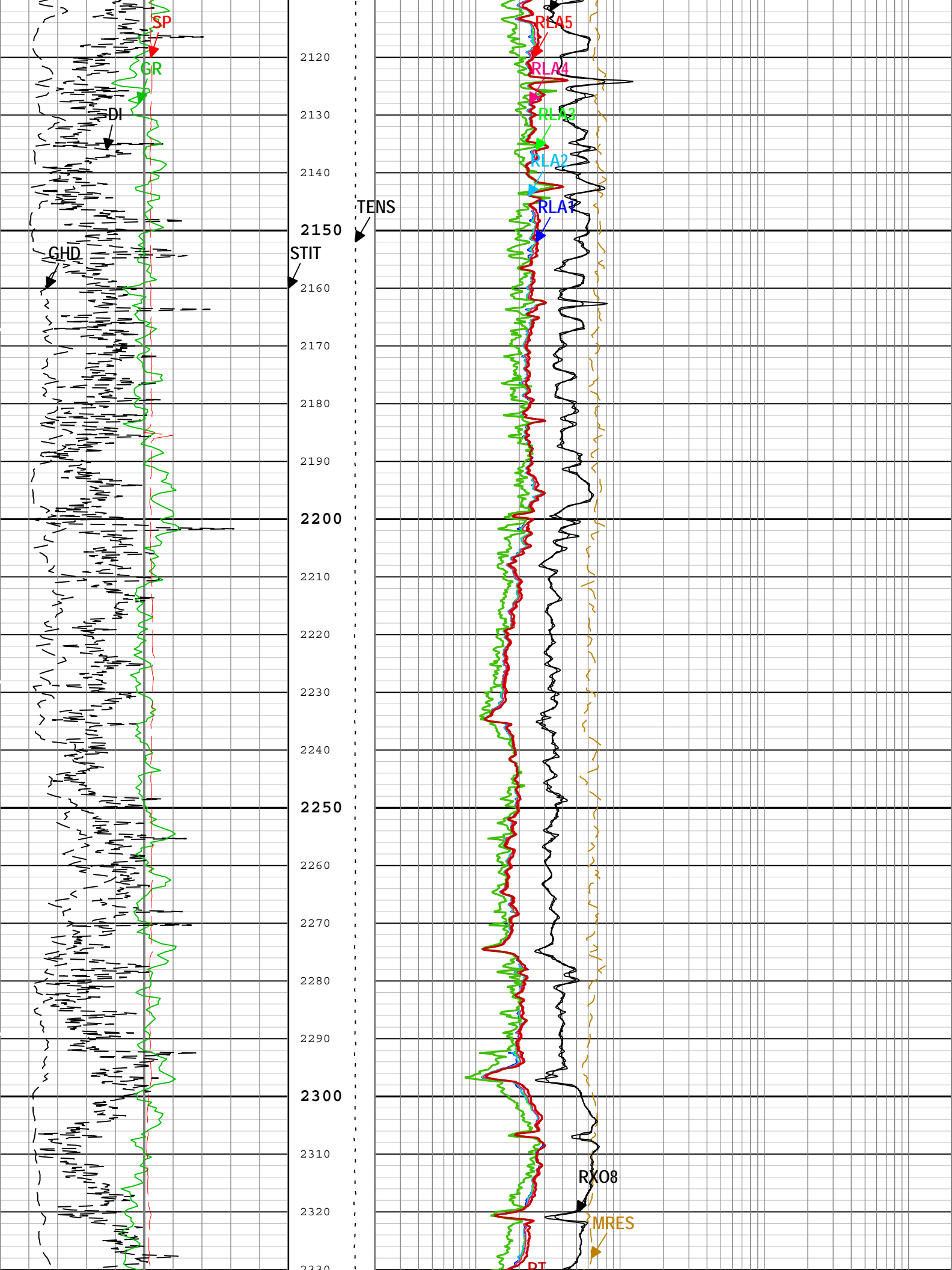
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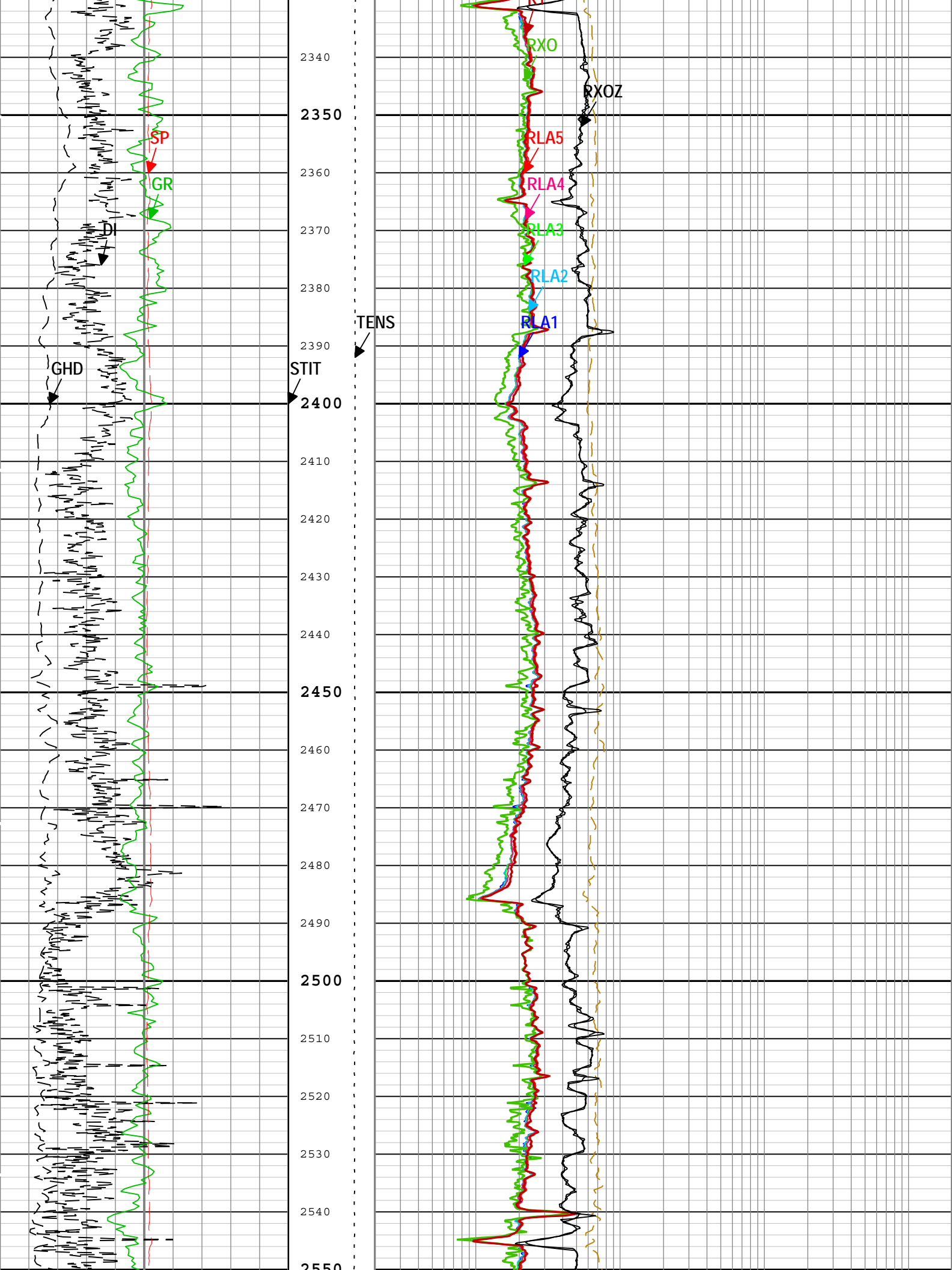
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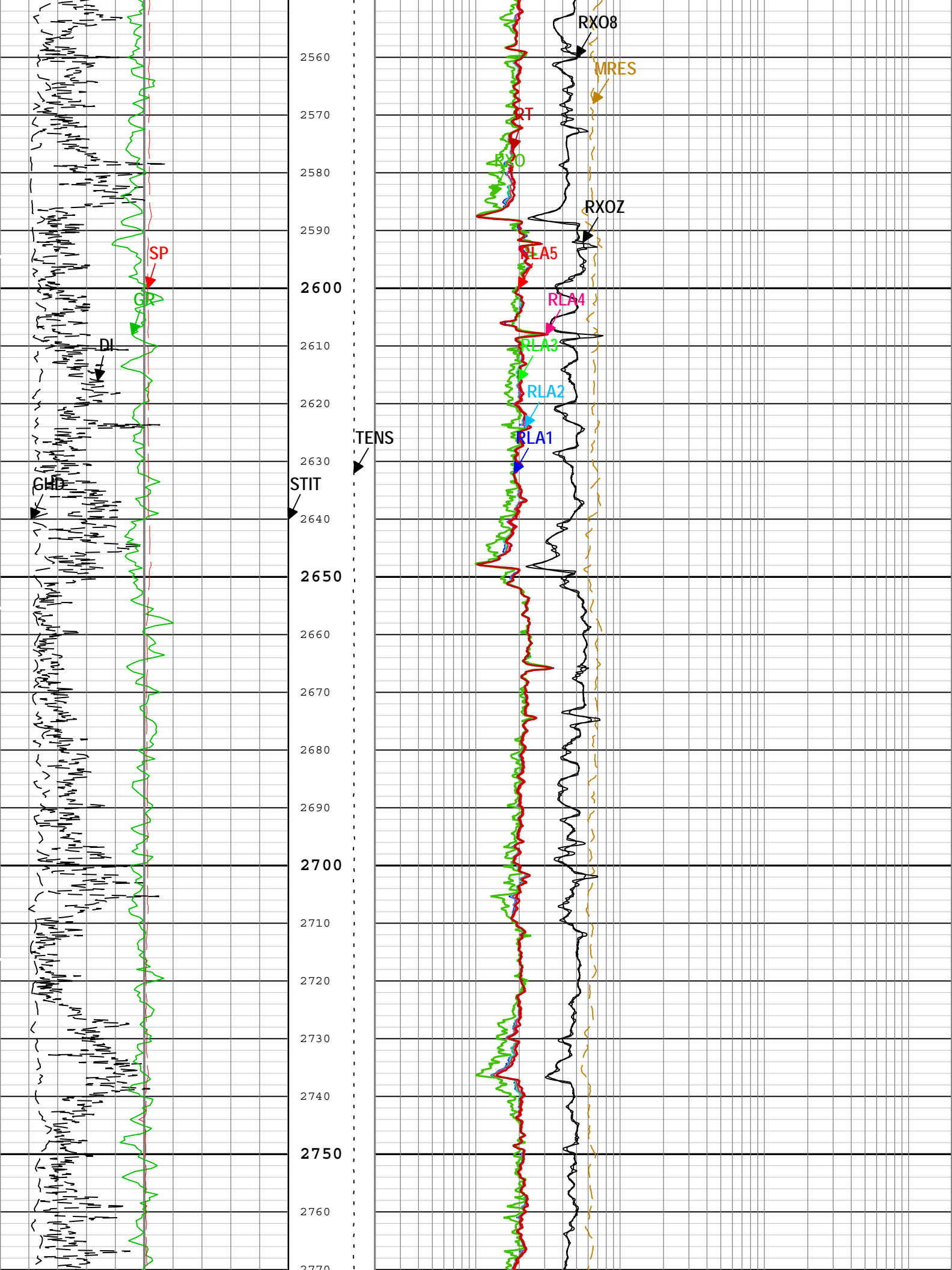
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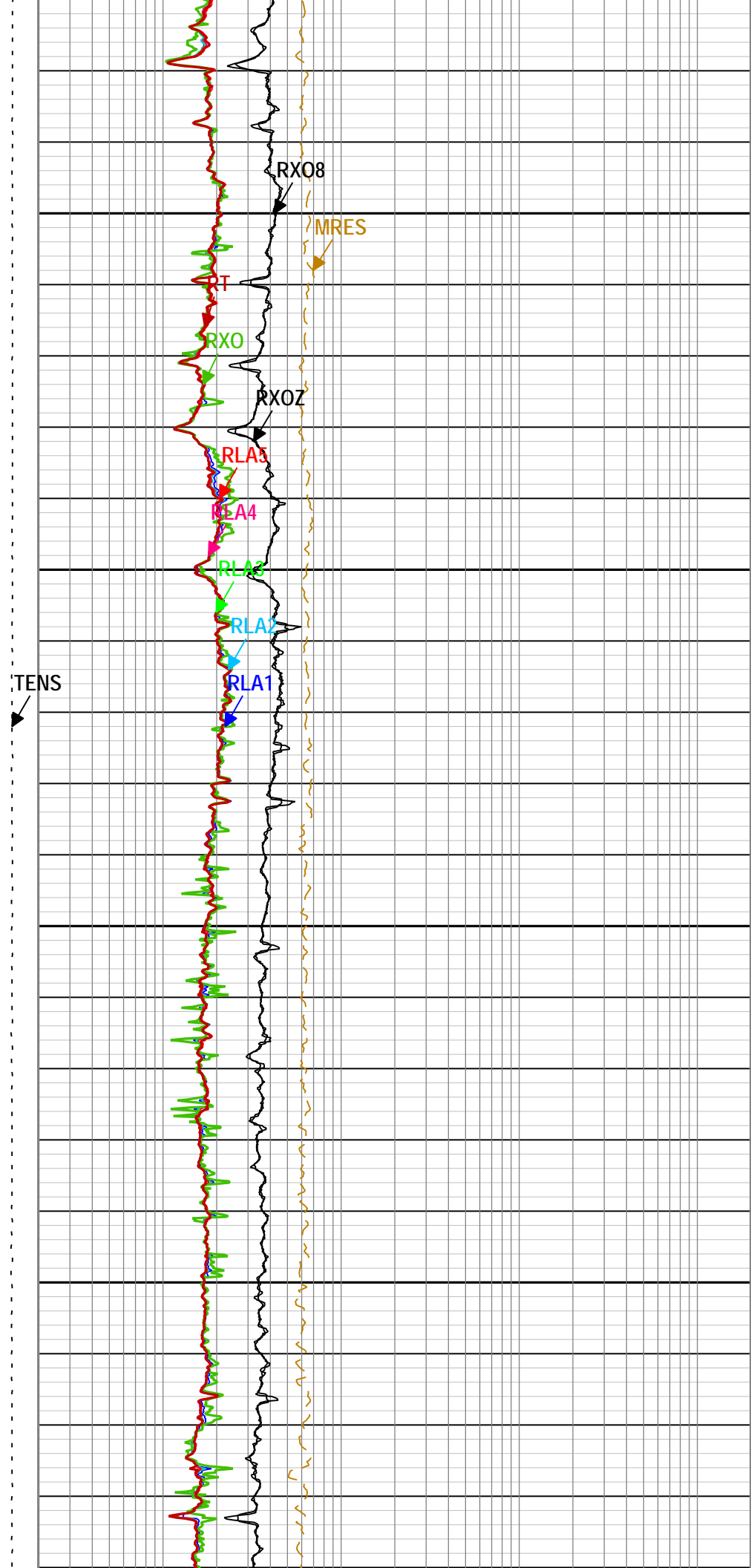
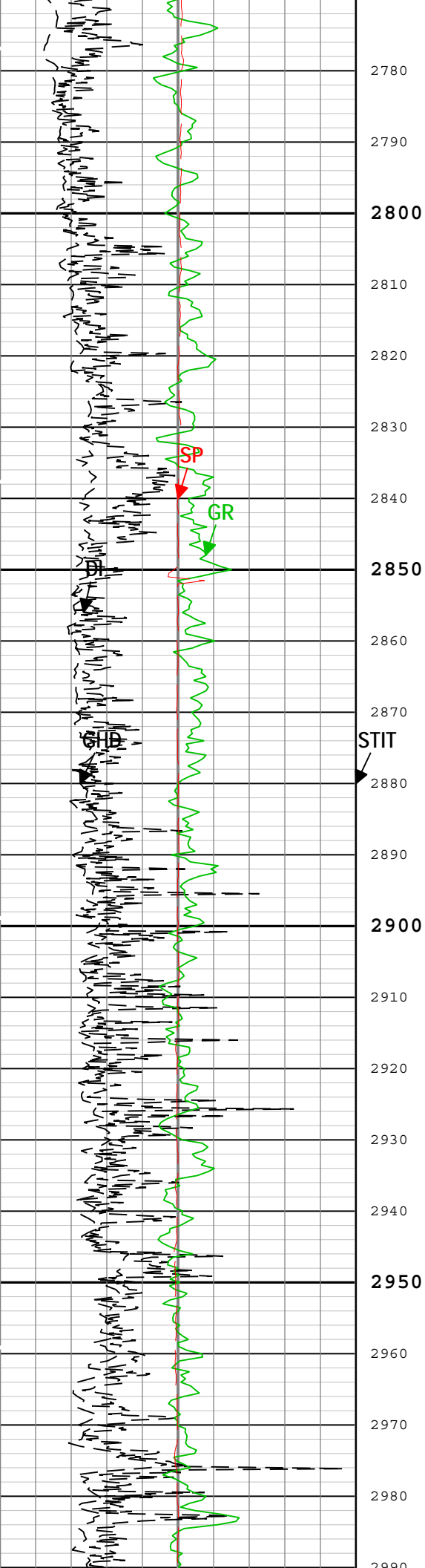


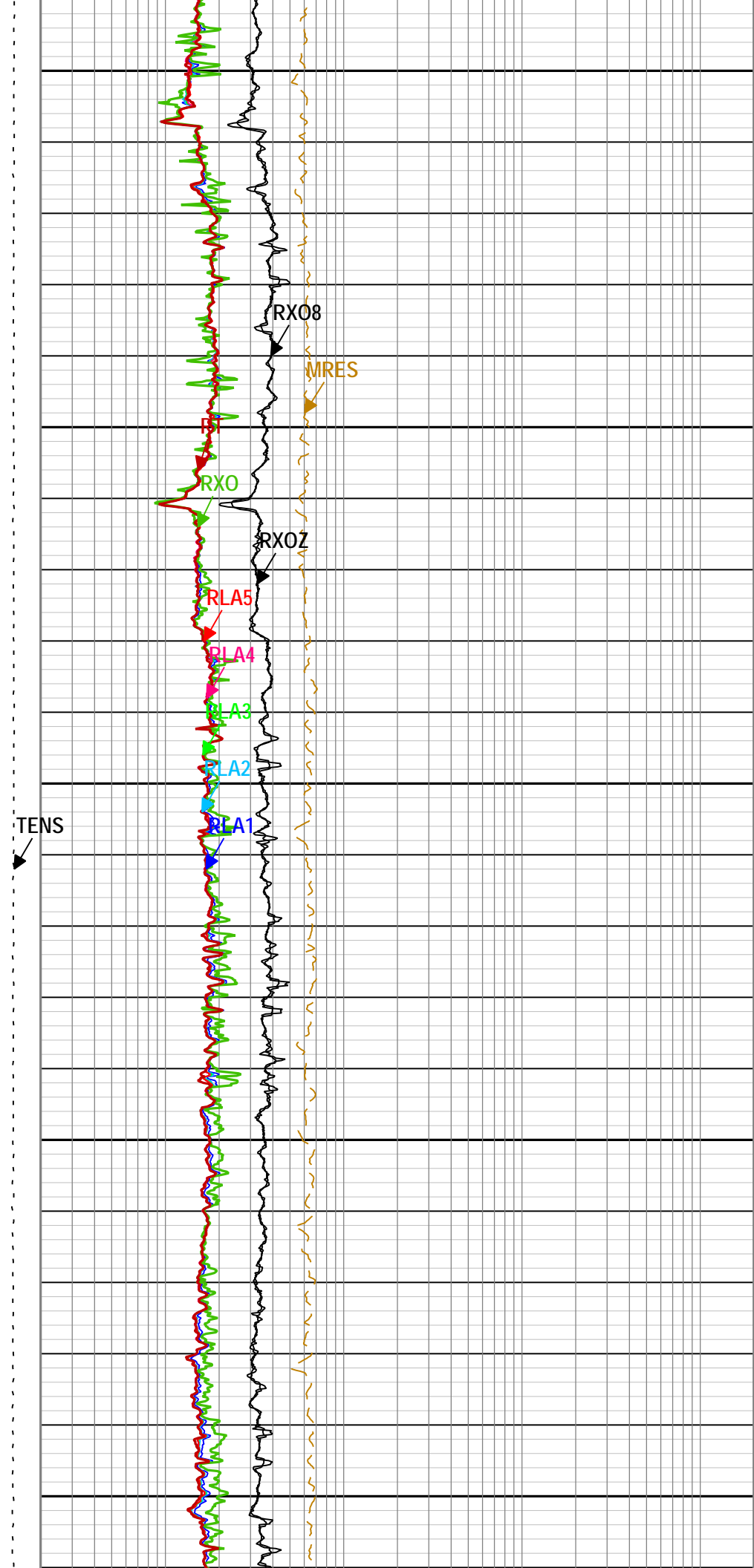
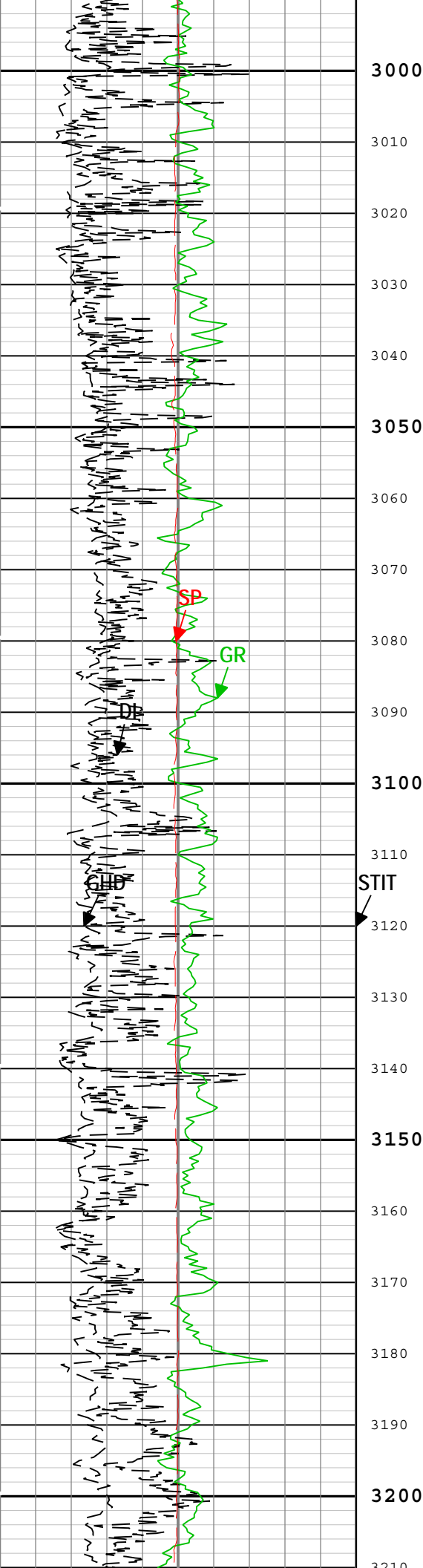


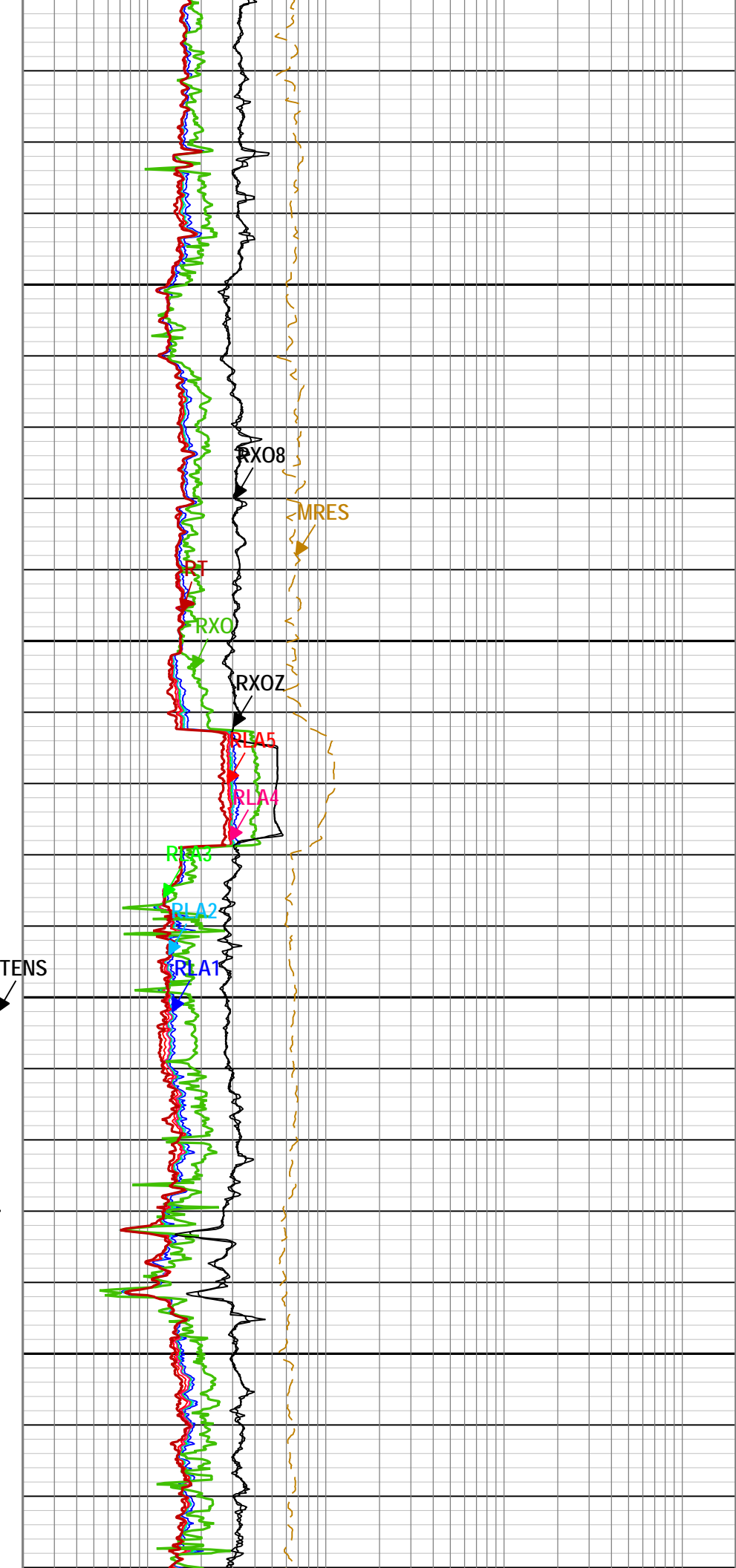
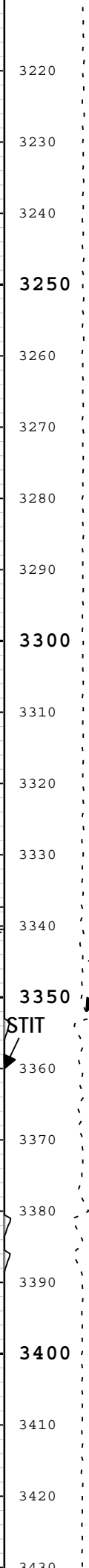
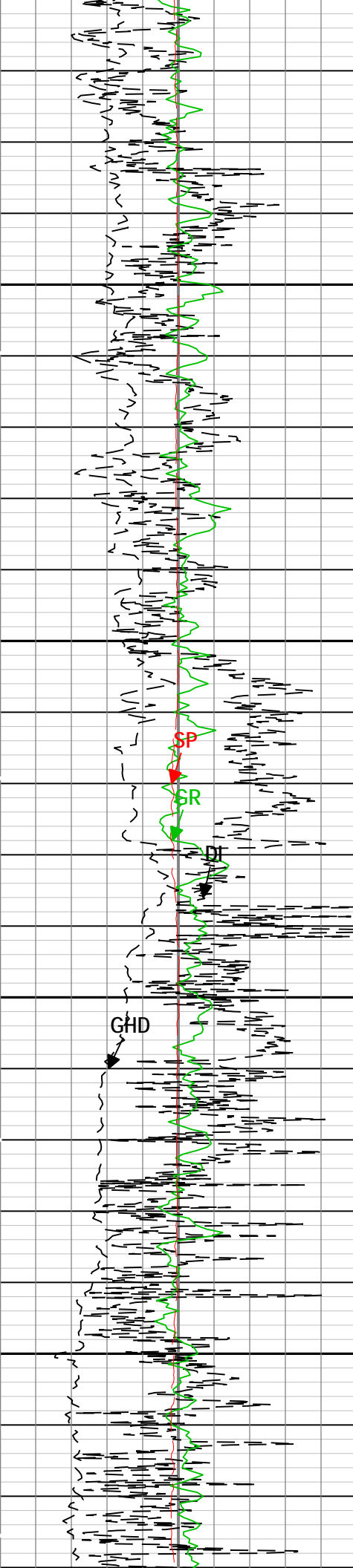


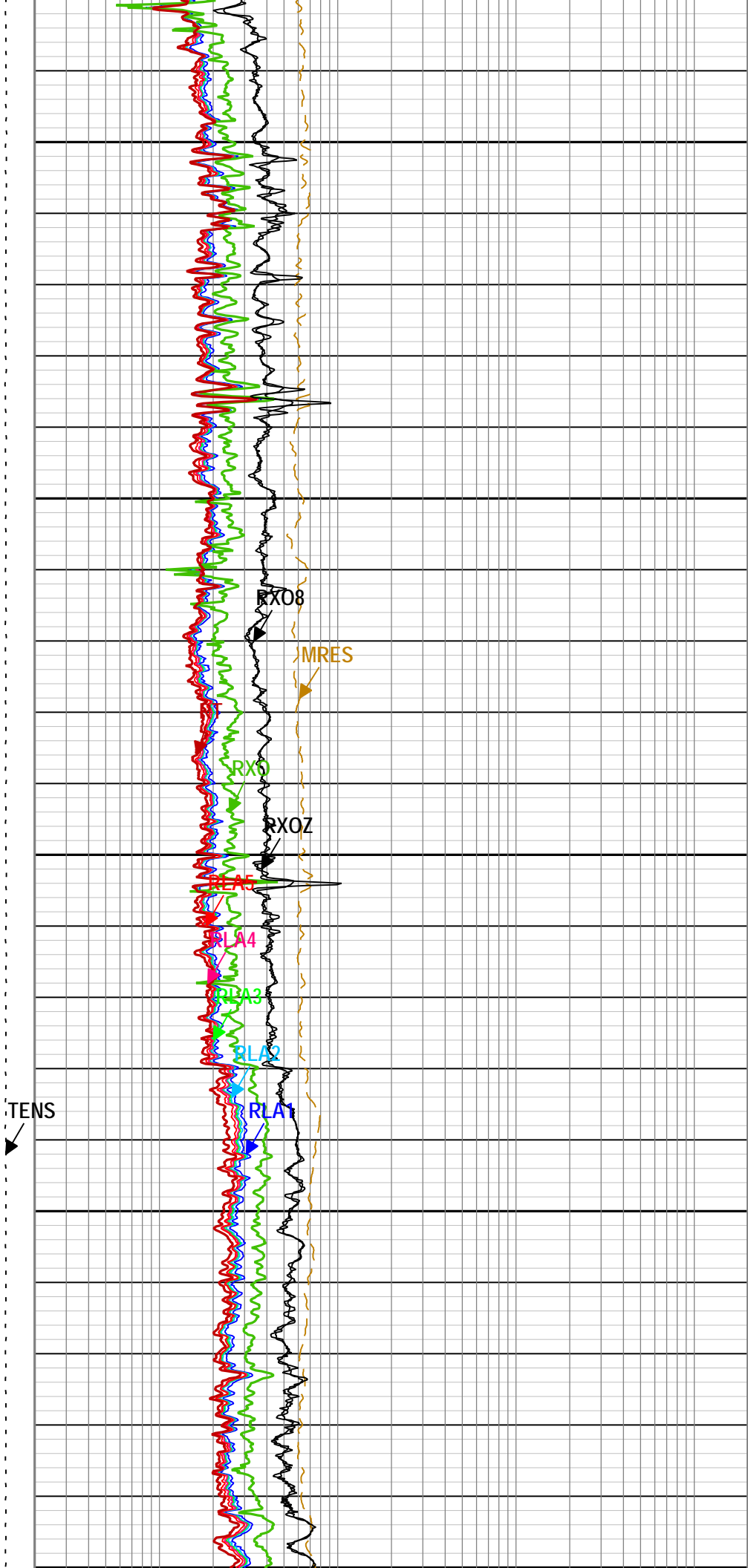
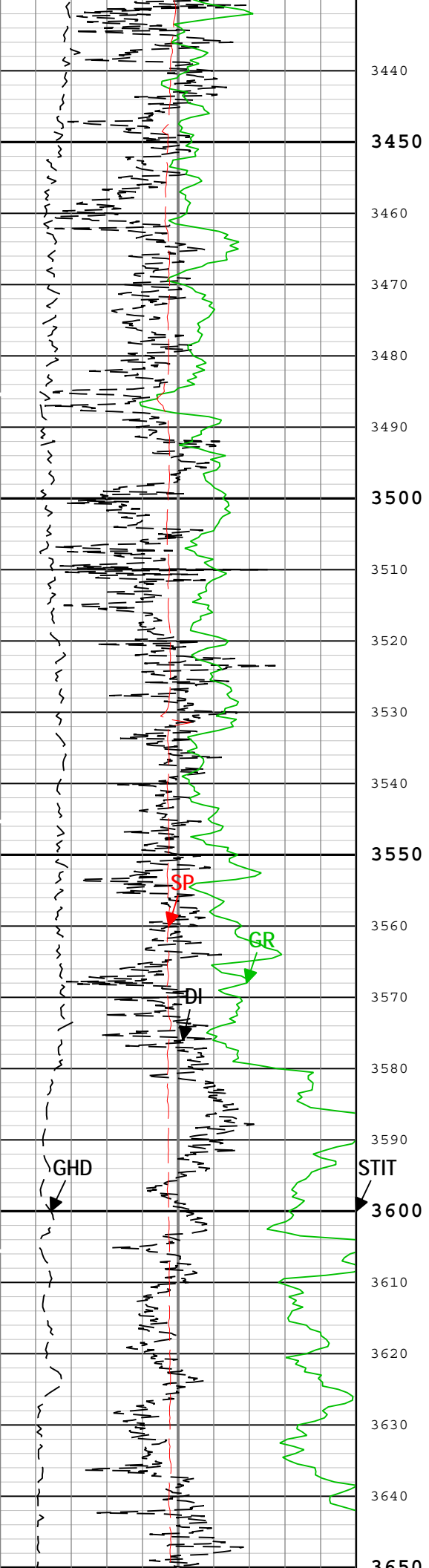


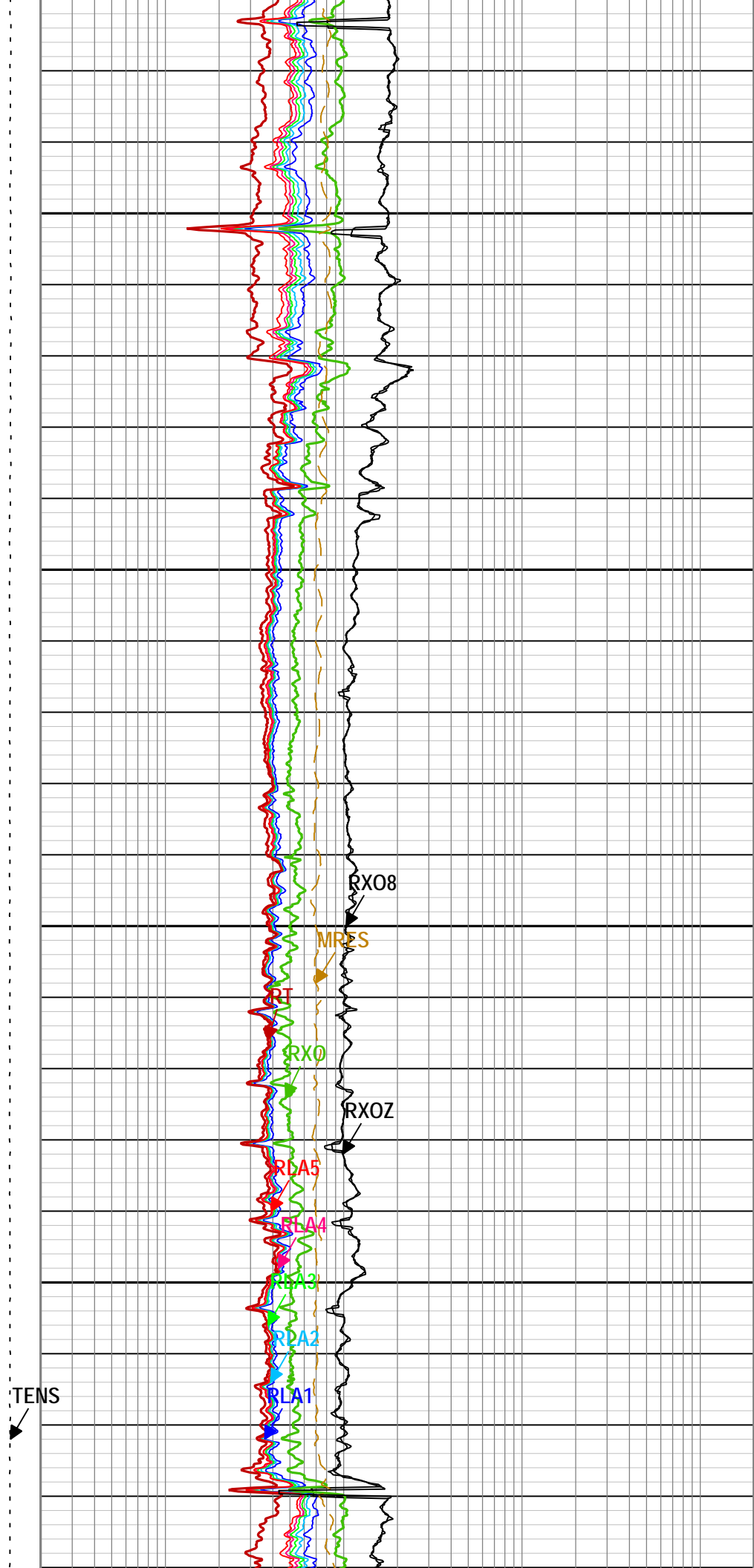
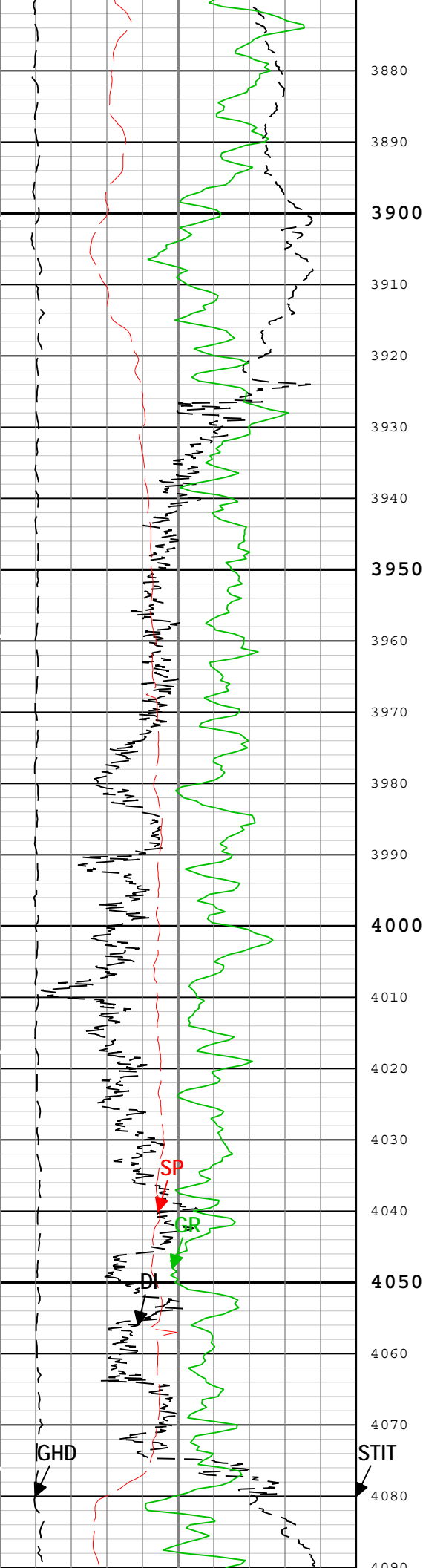


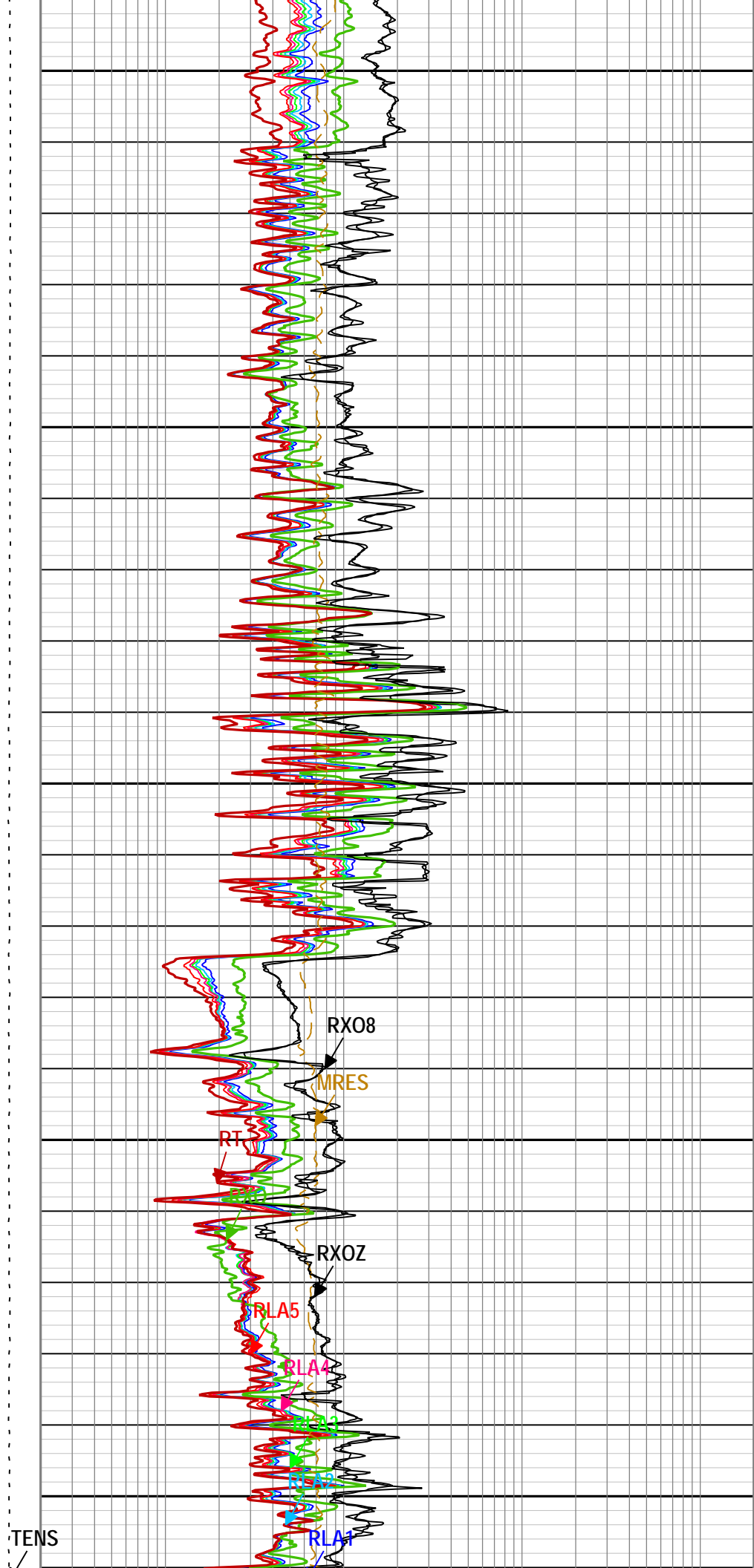
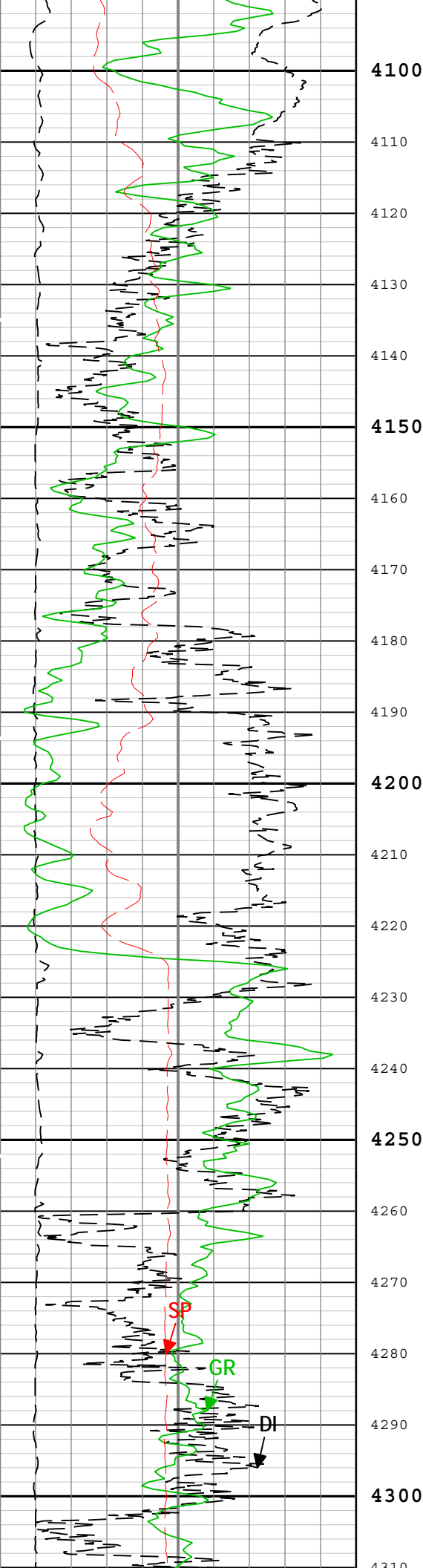




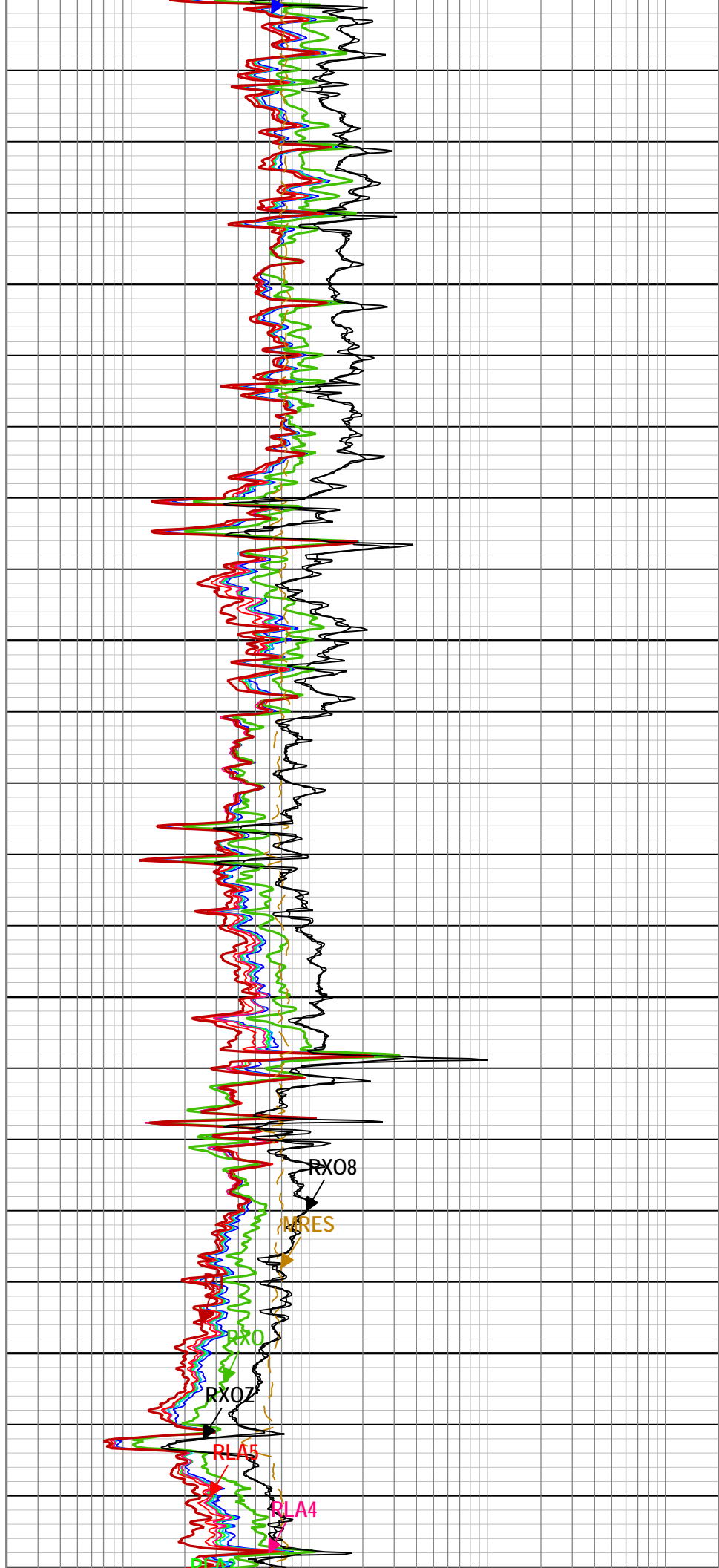
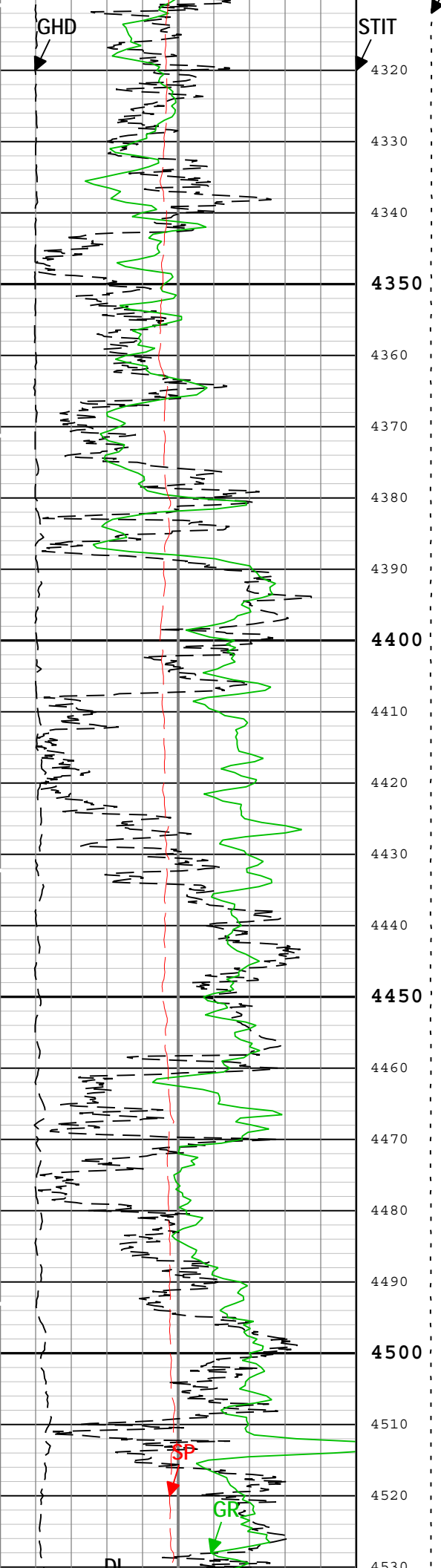


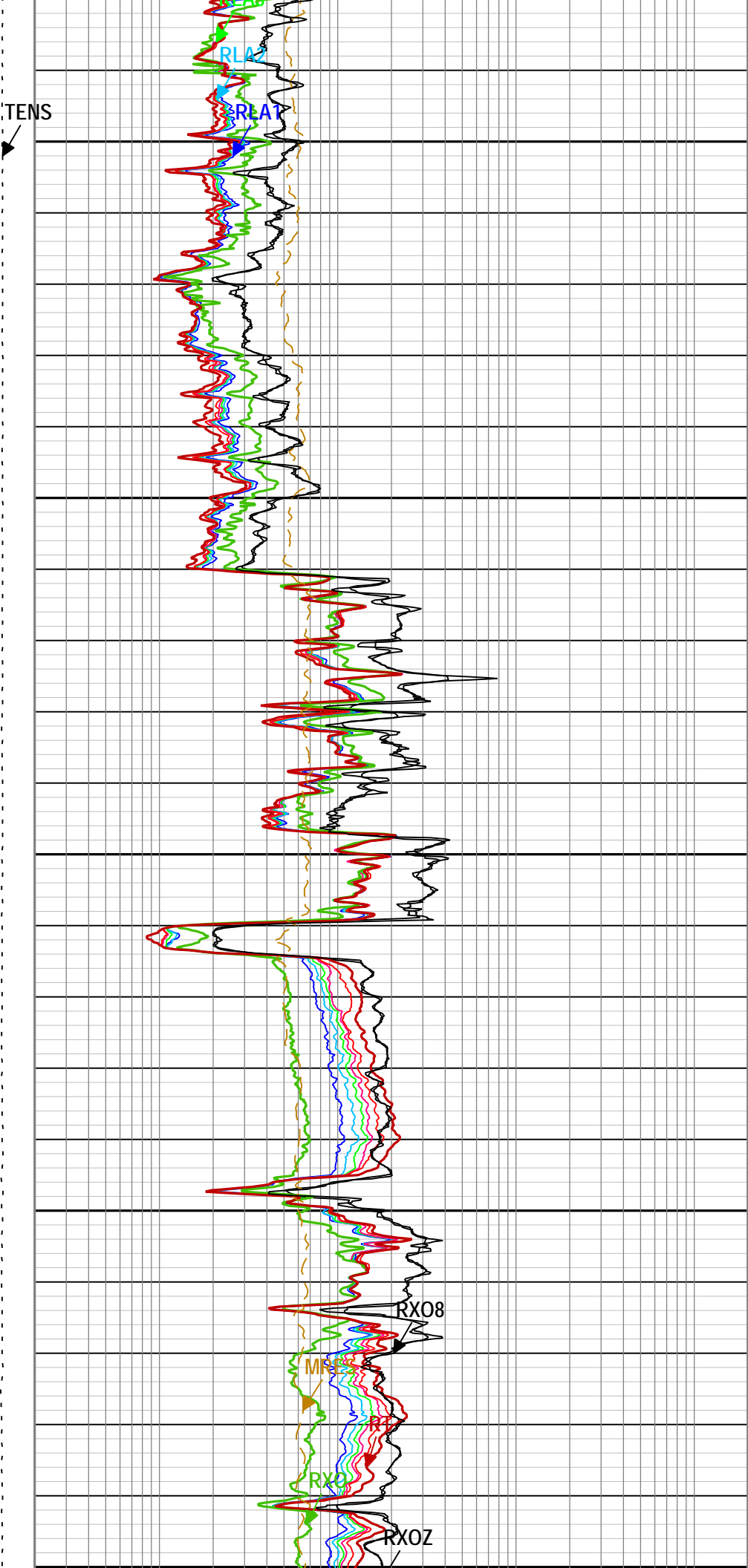
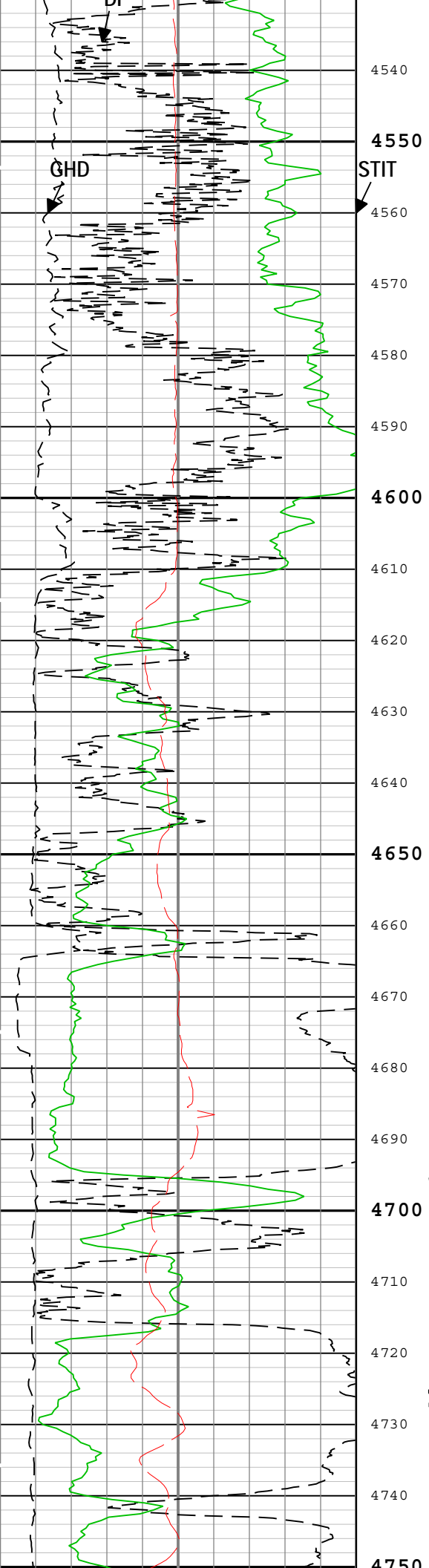


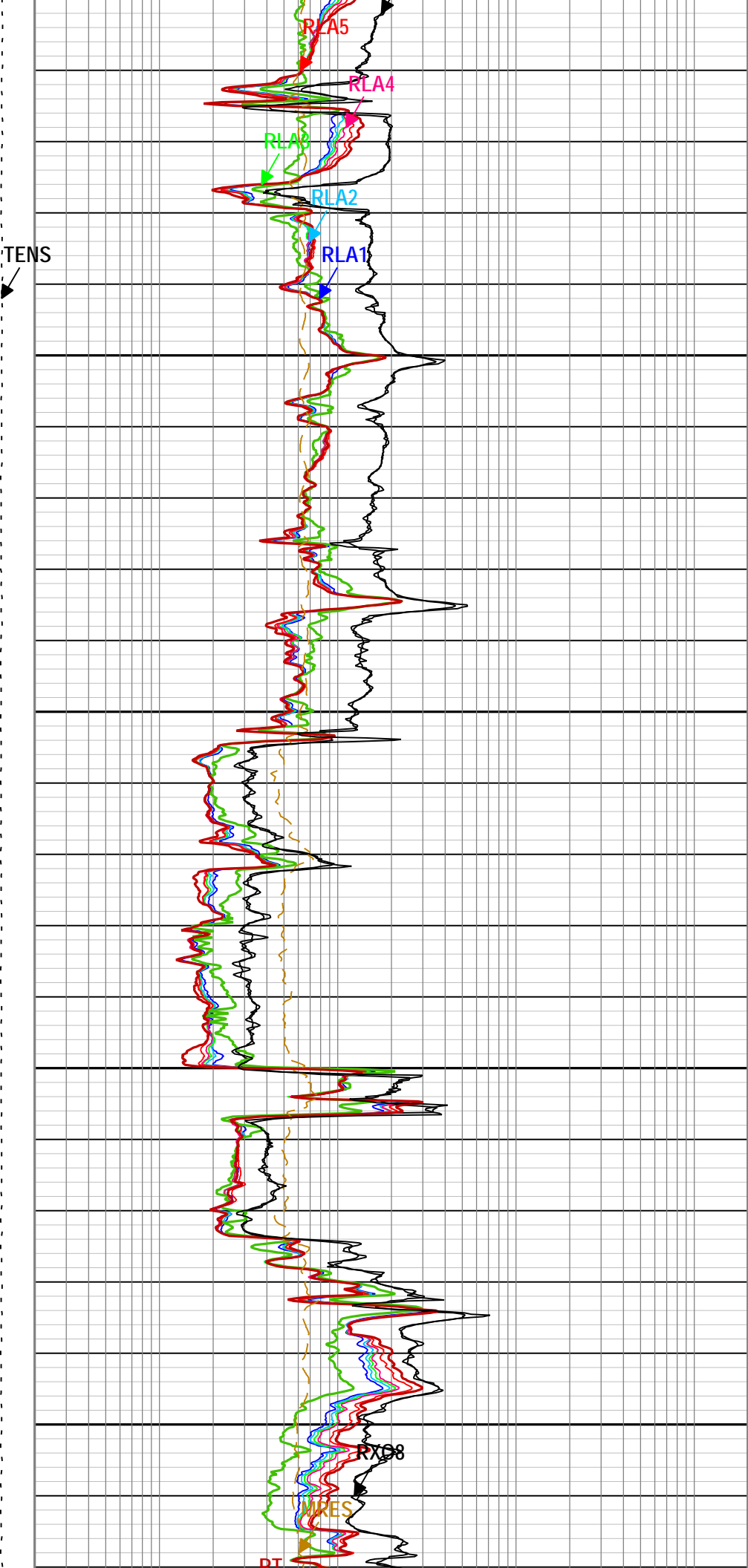
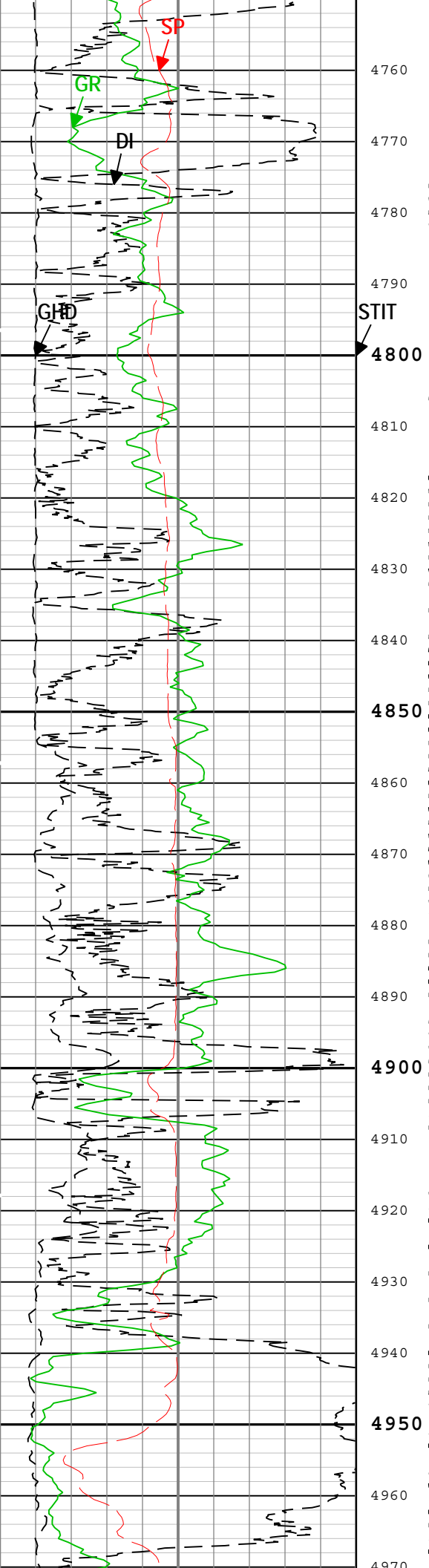


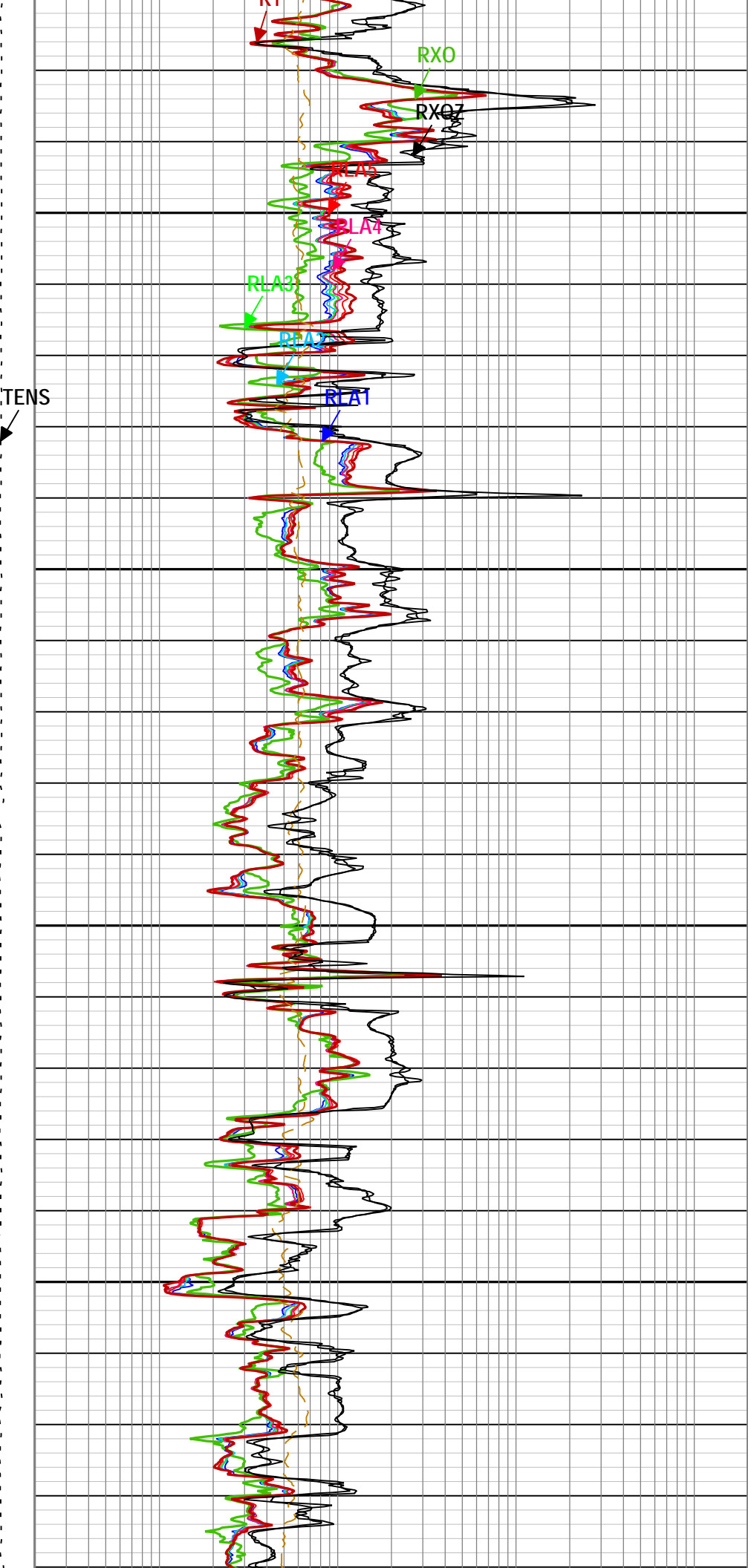
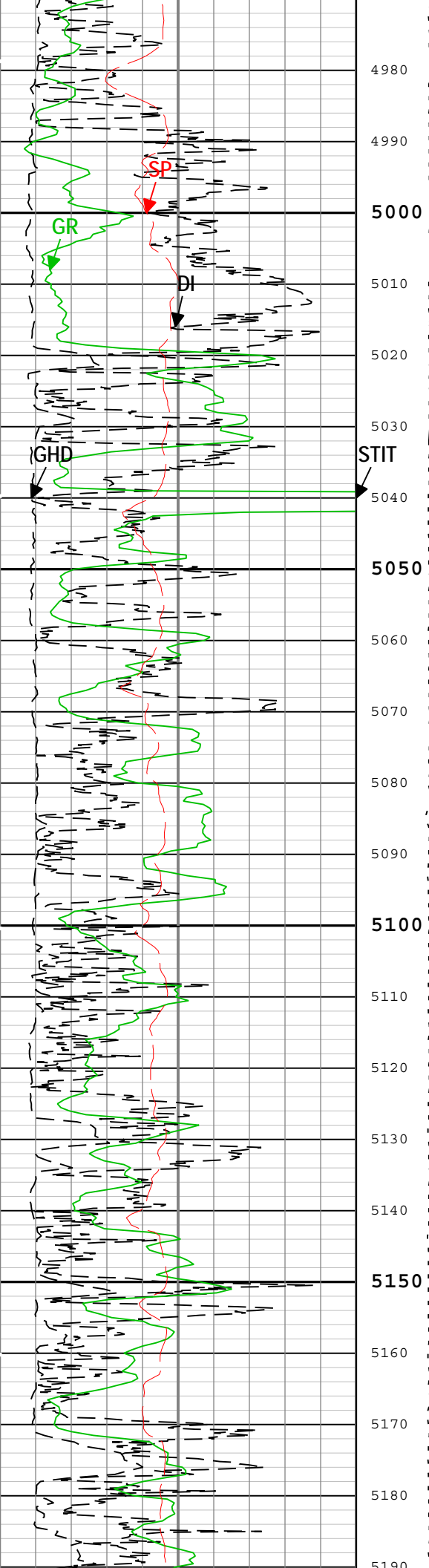


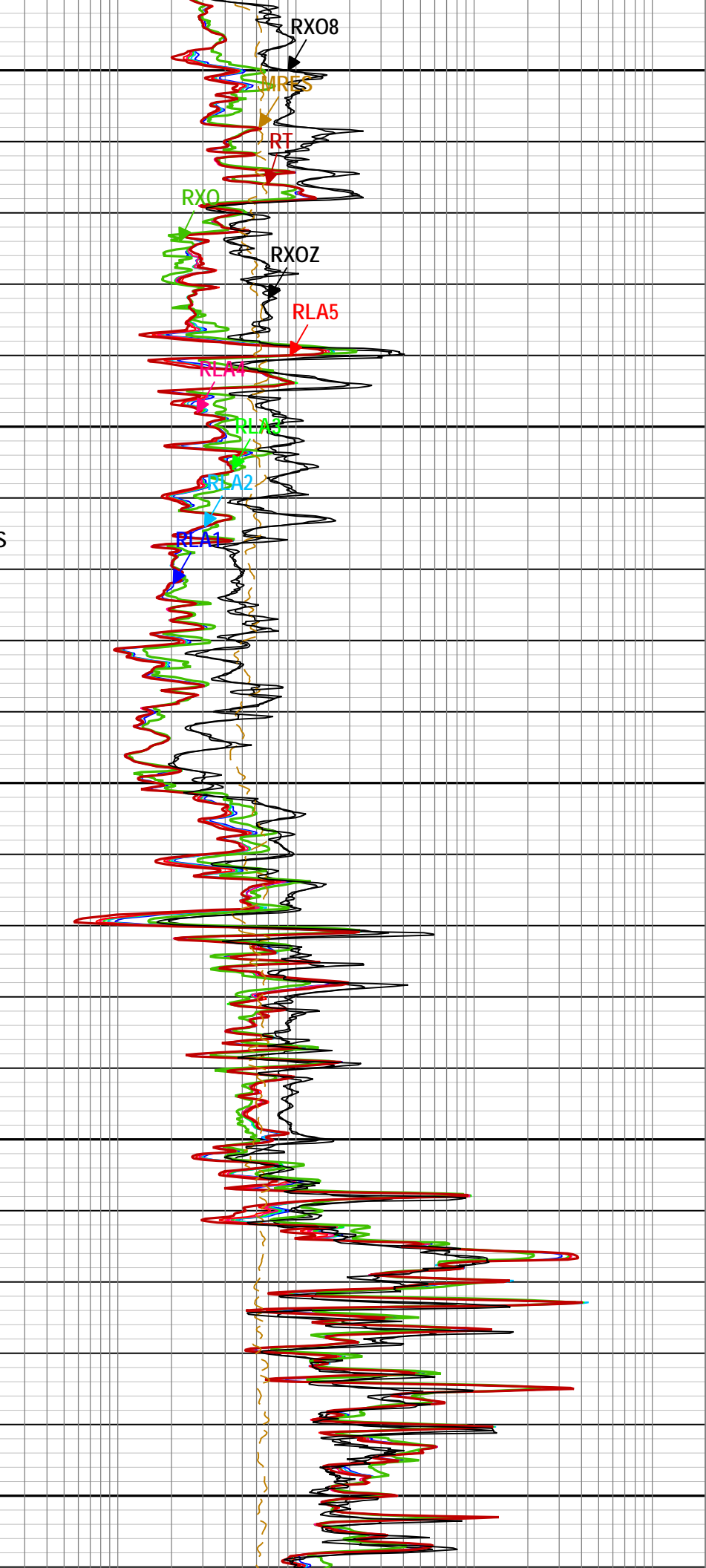
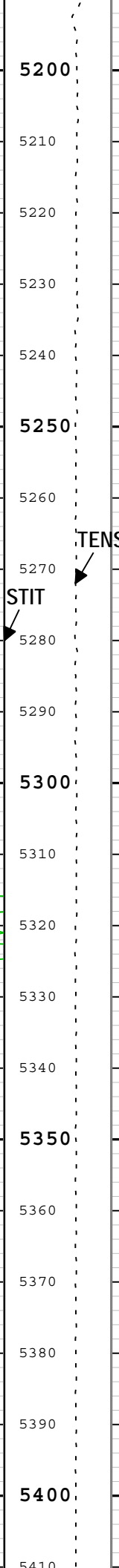
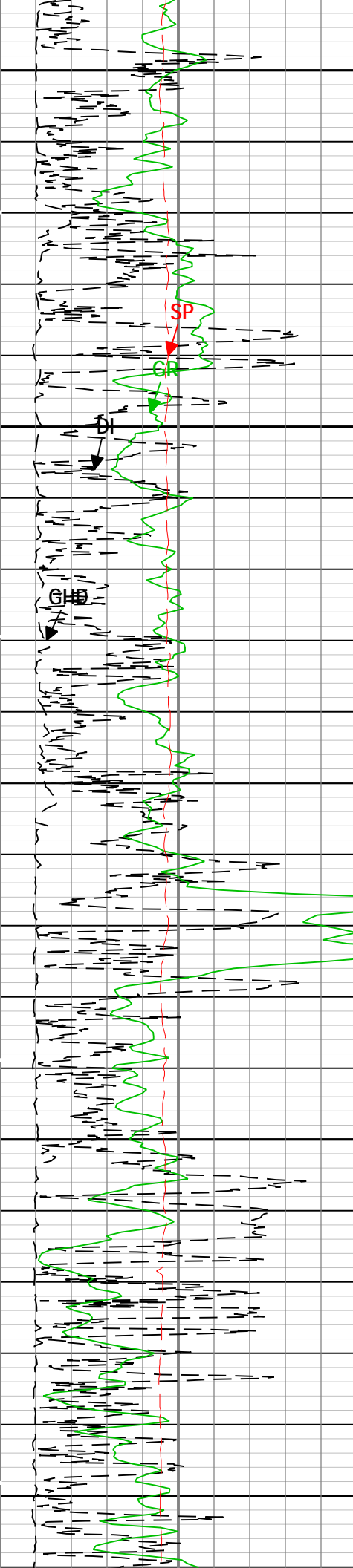
TENS

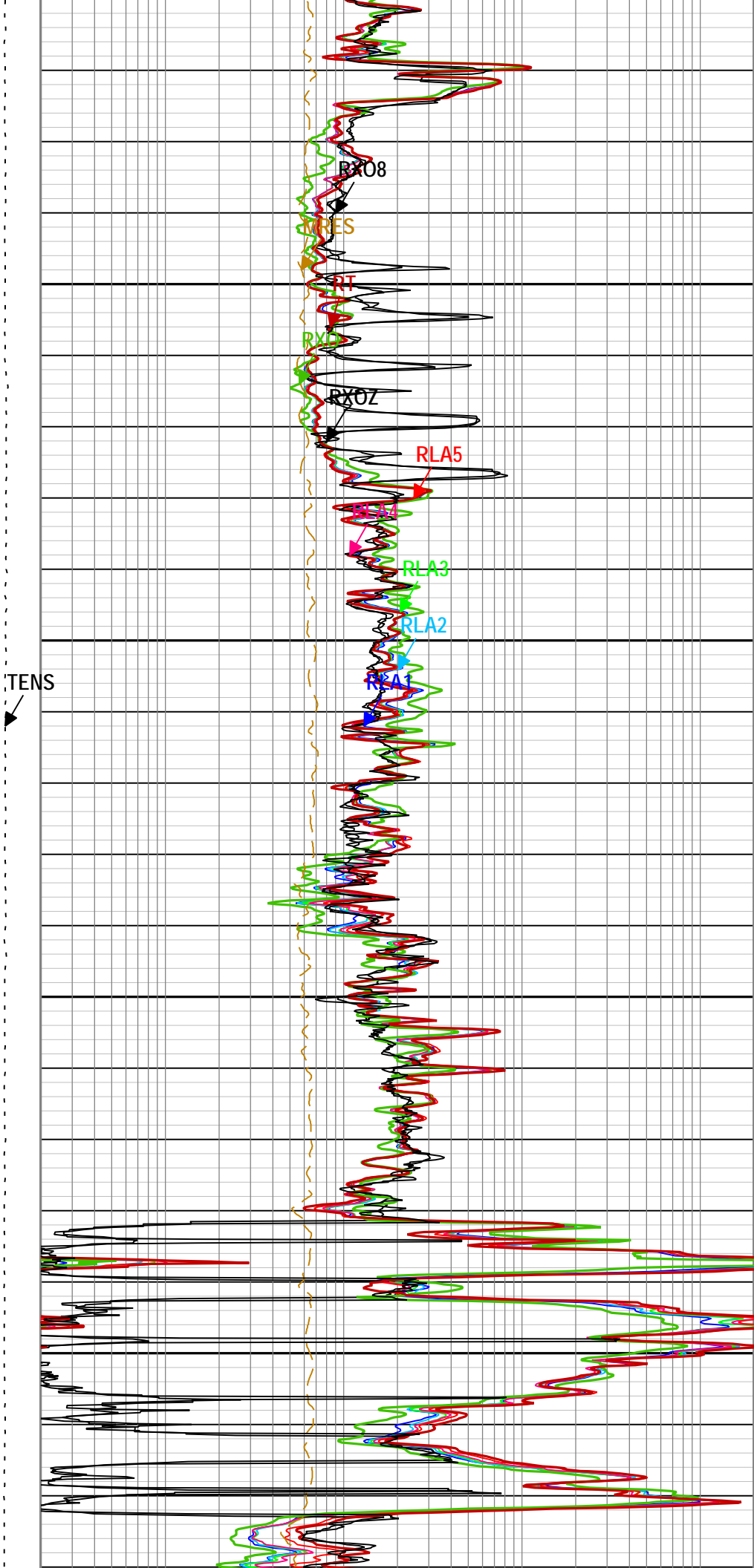
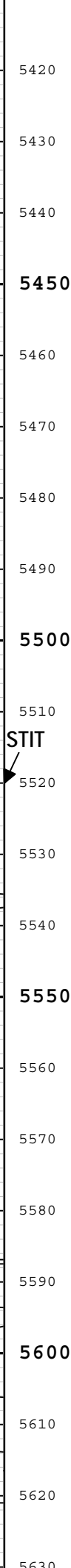
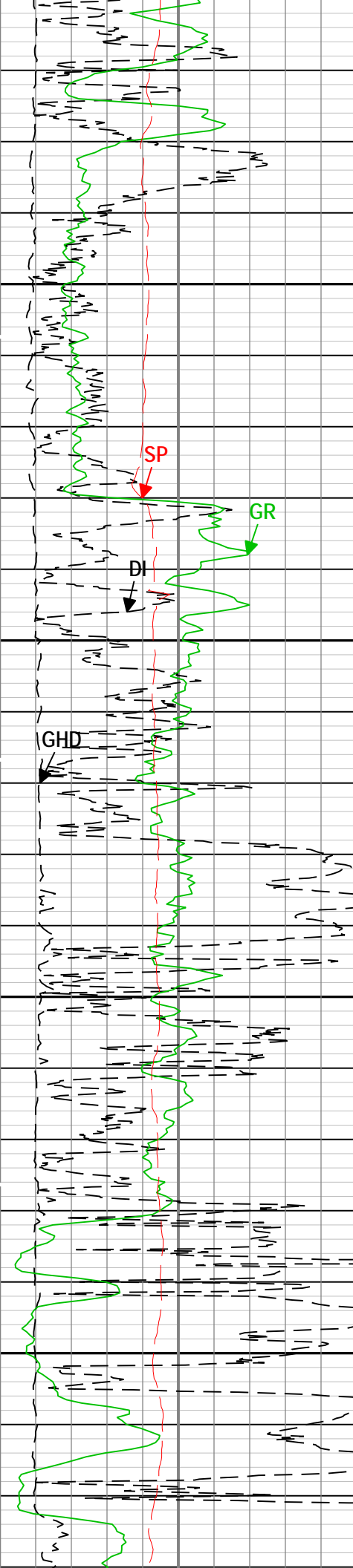


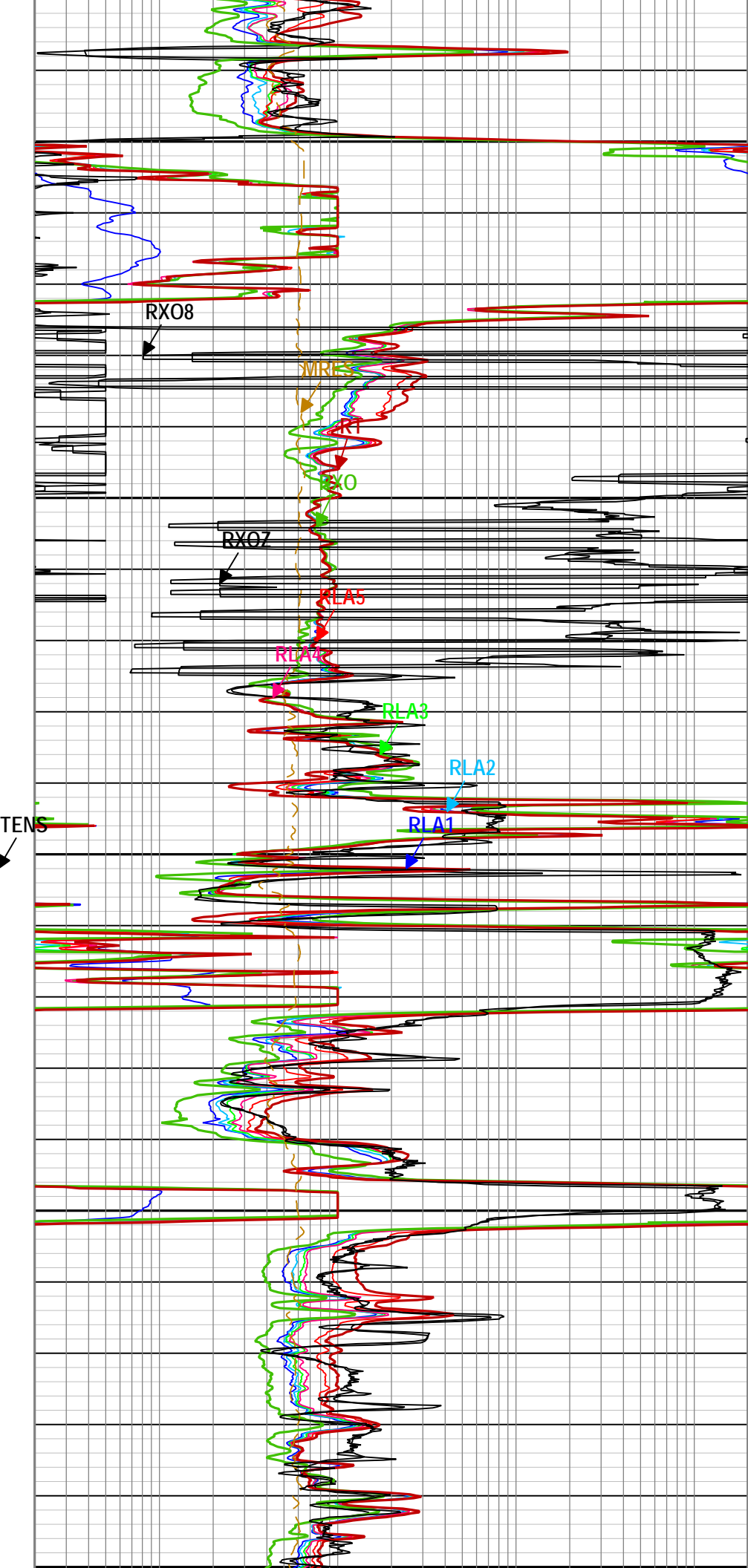
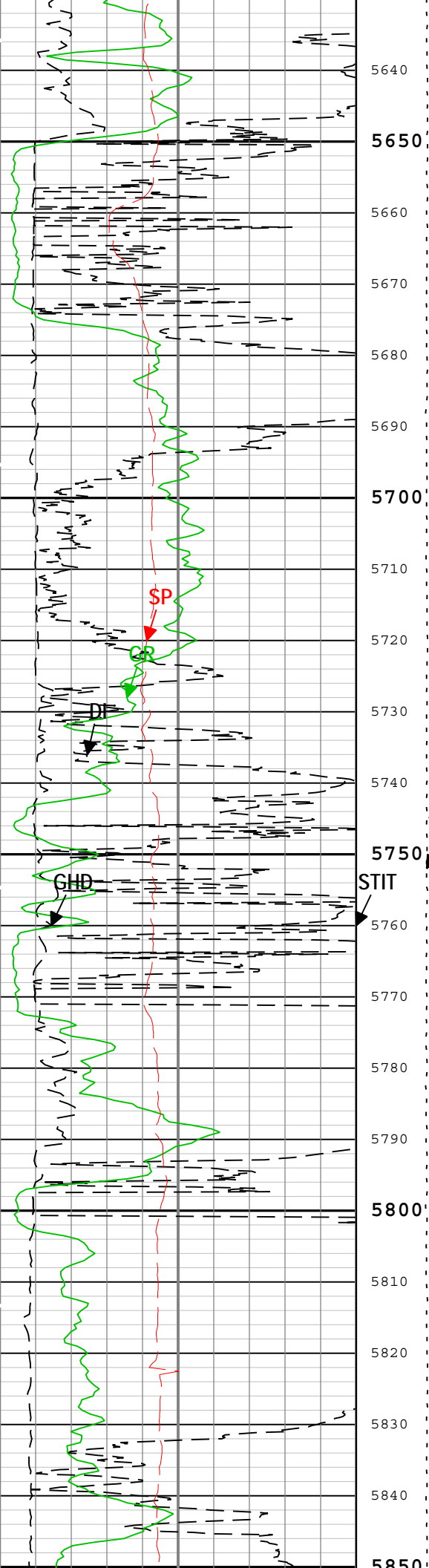


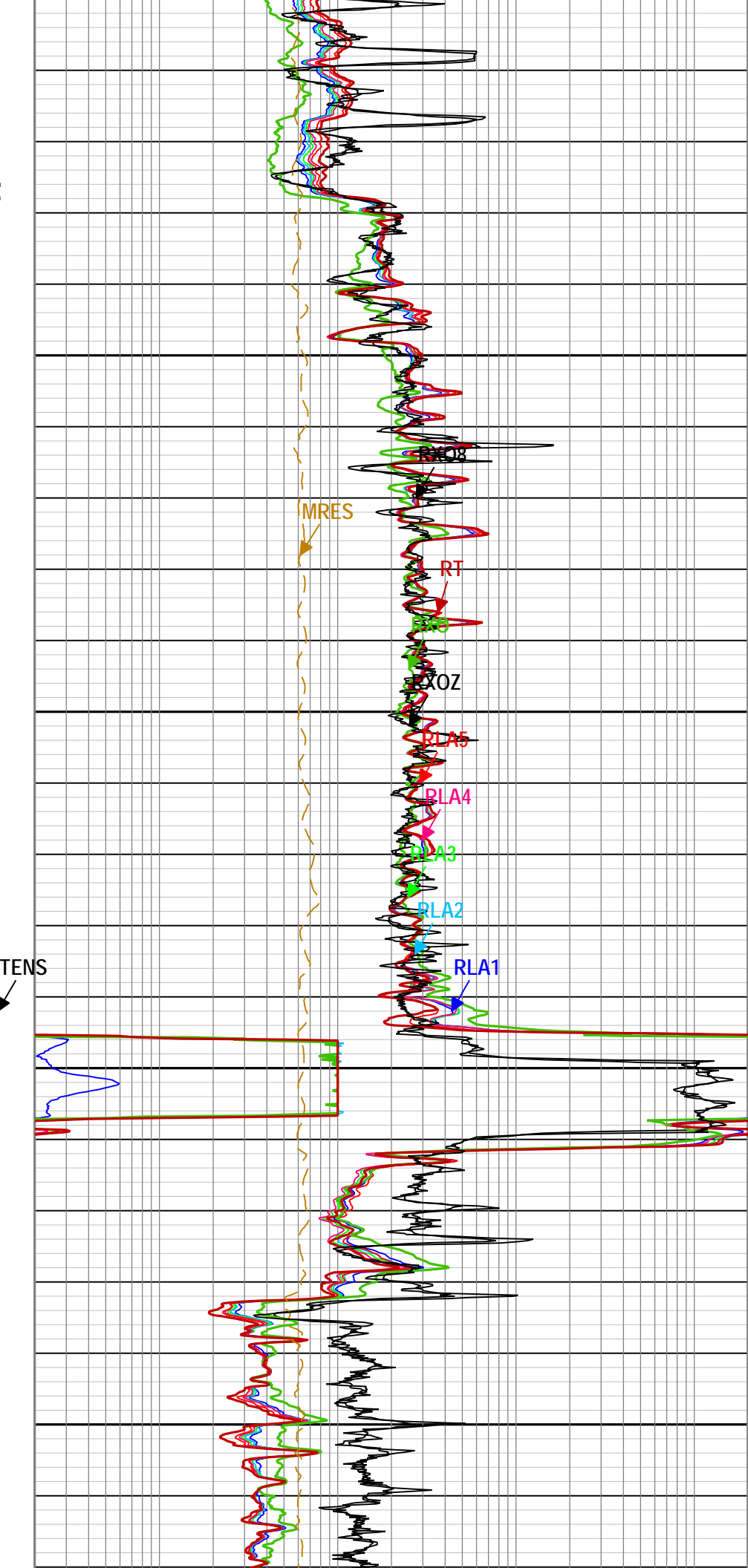
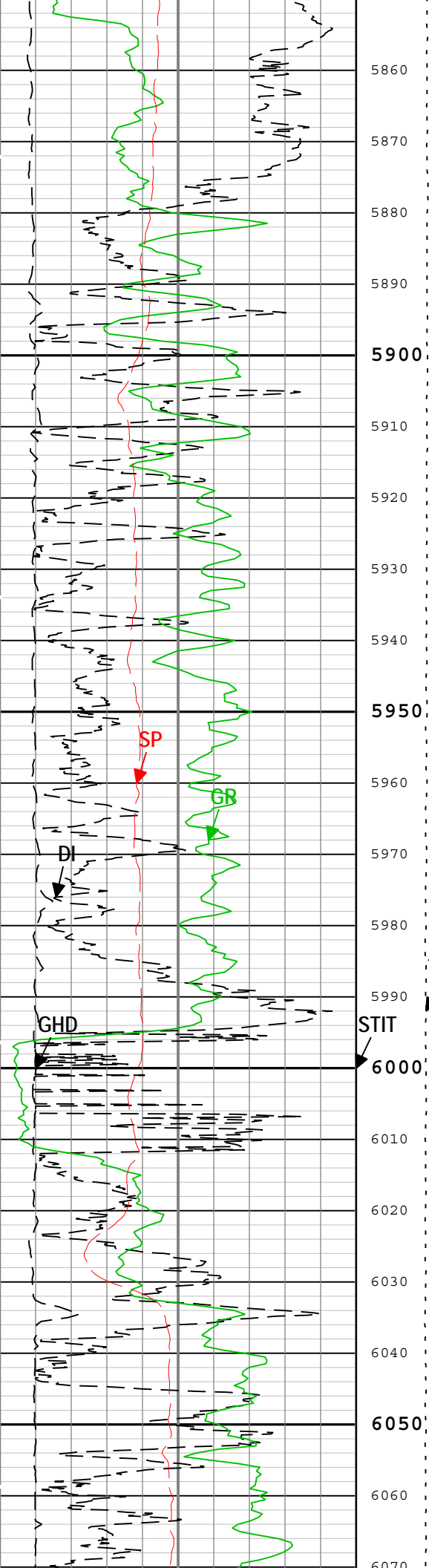


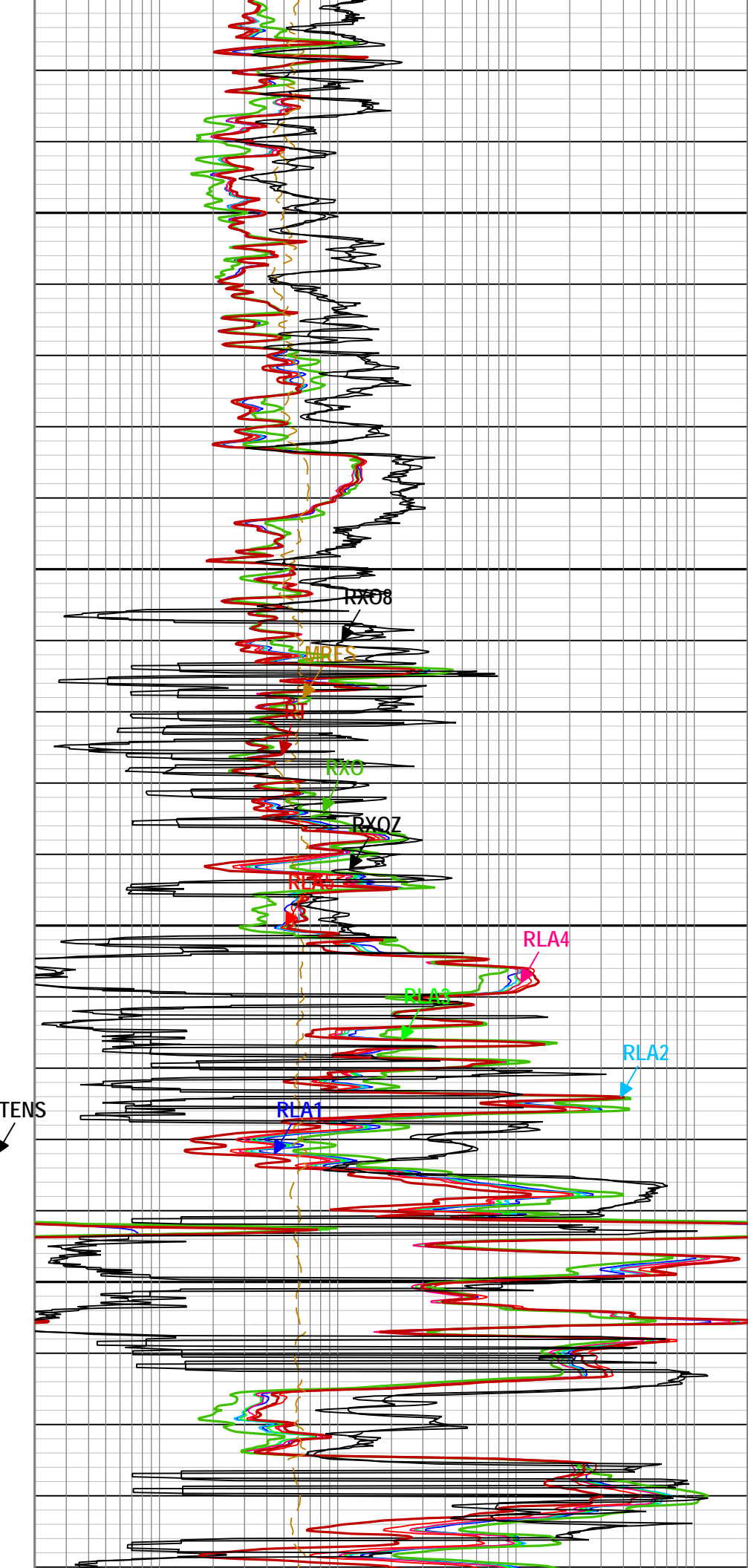
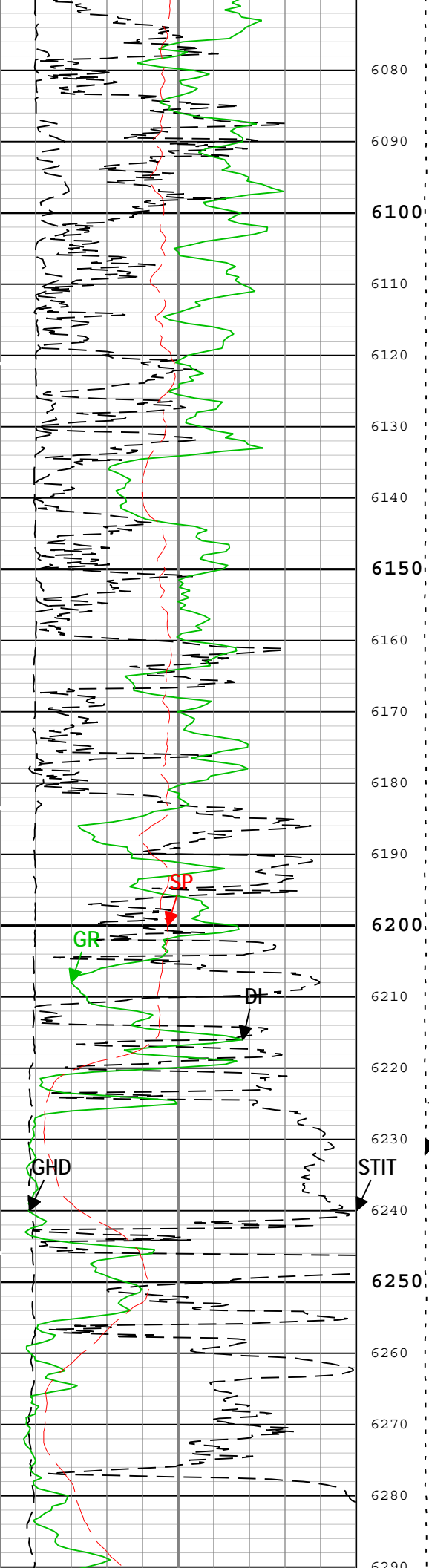


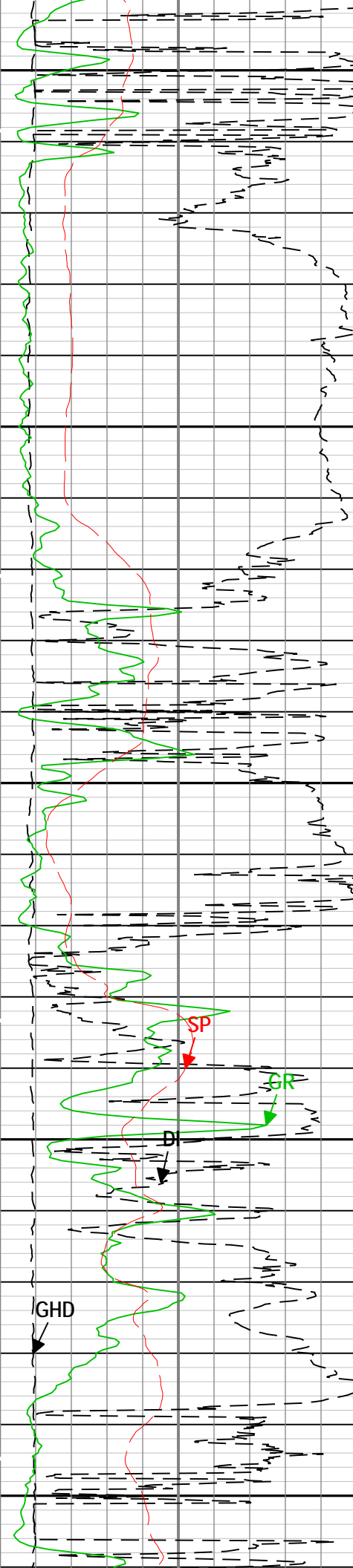




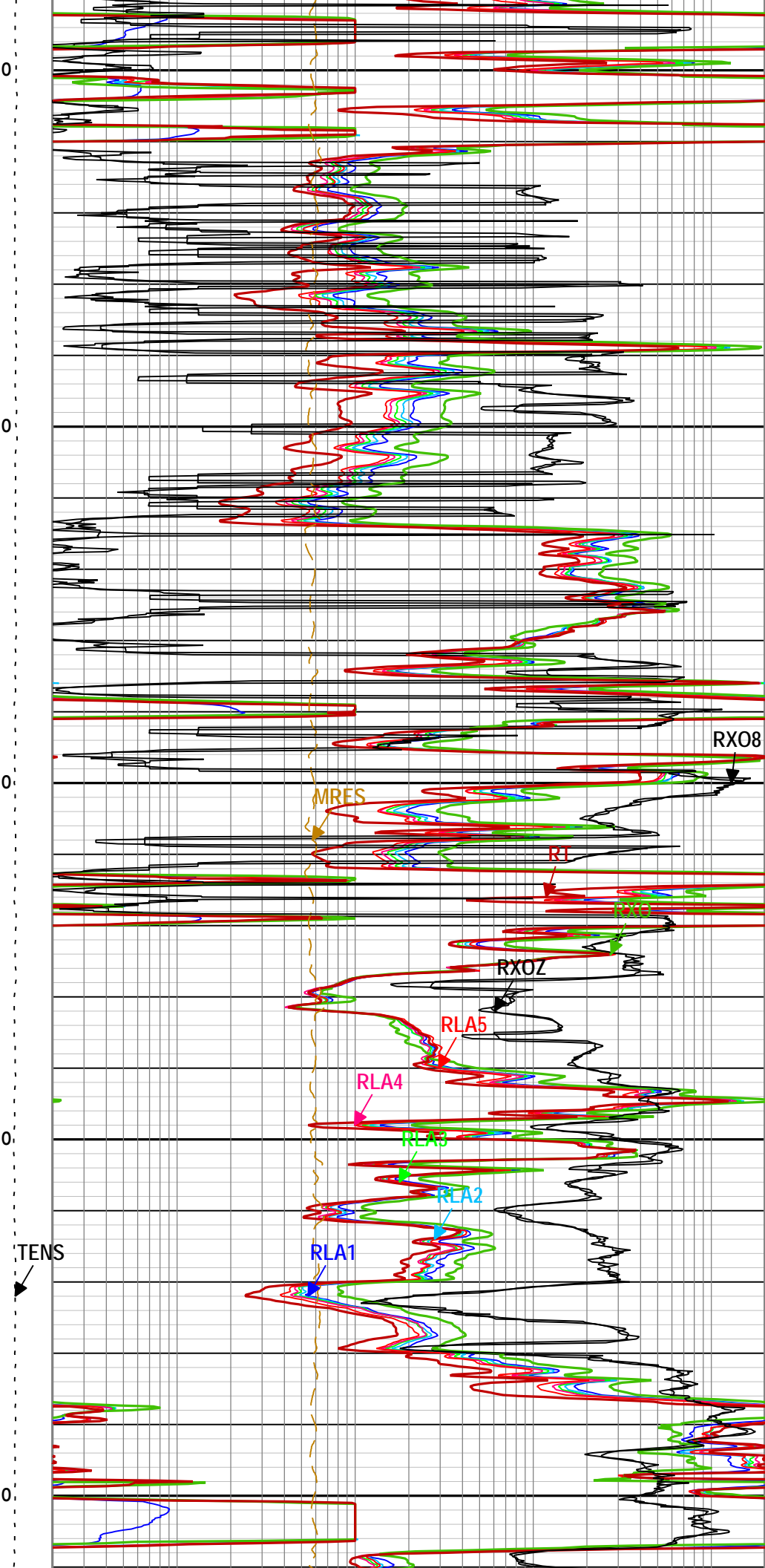


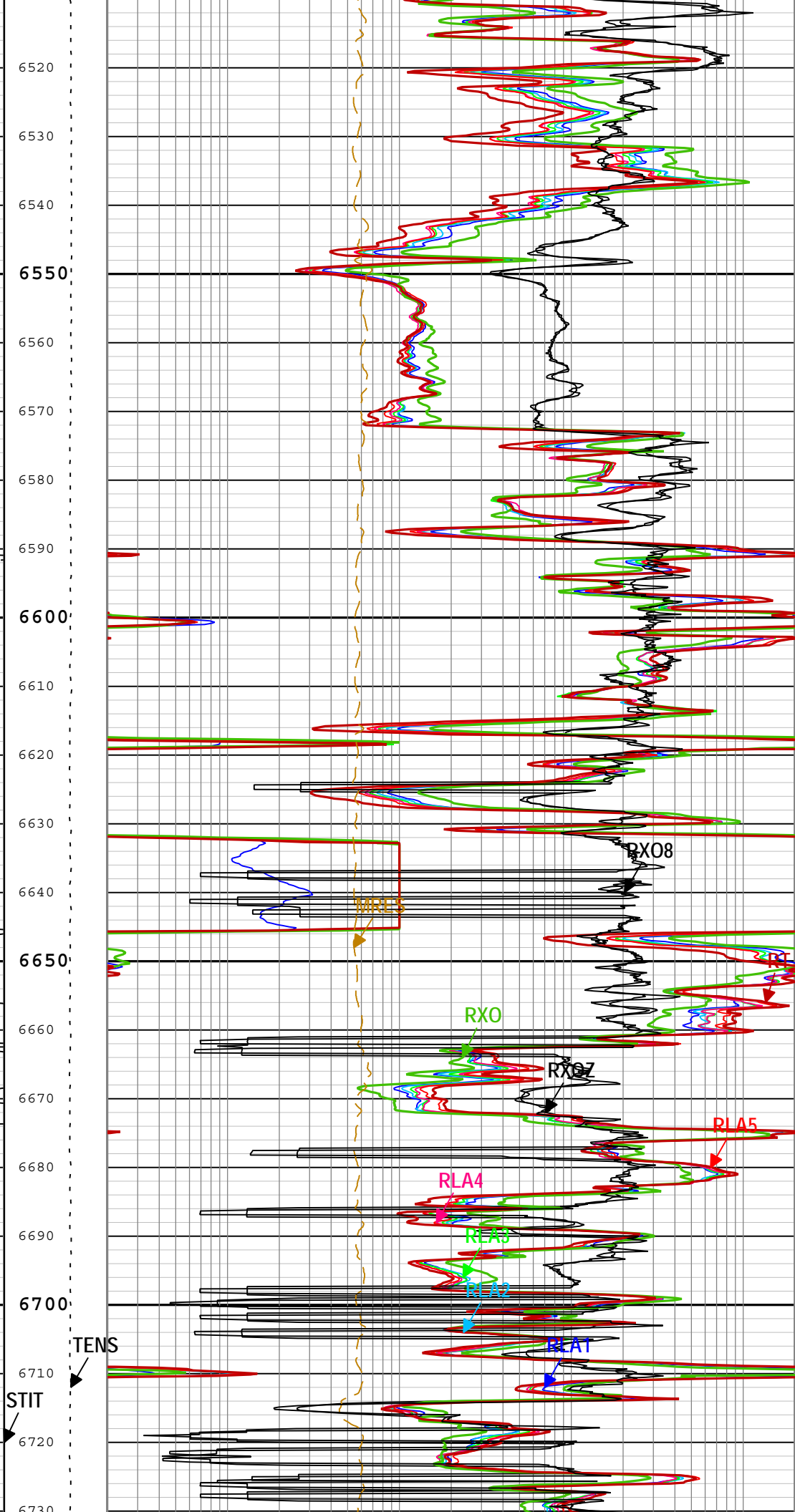
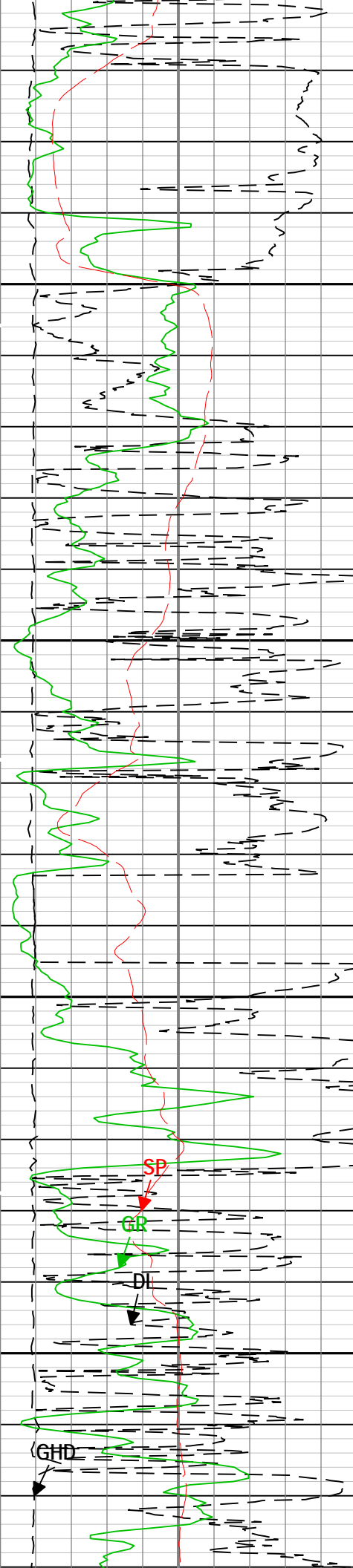


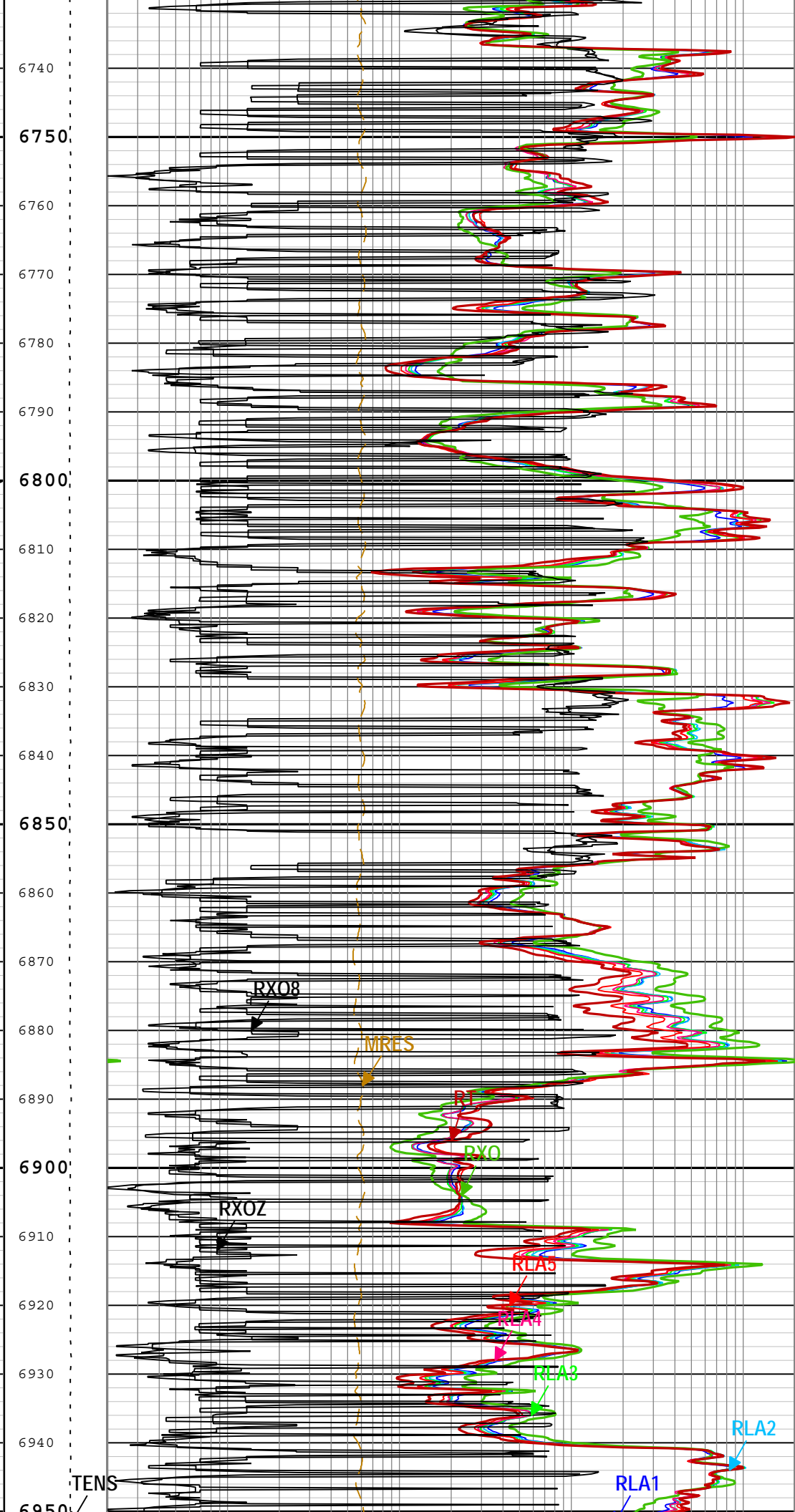
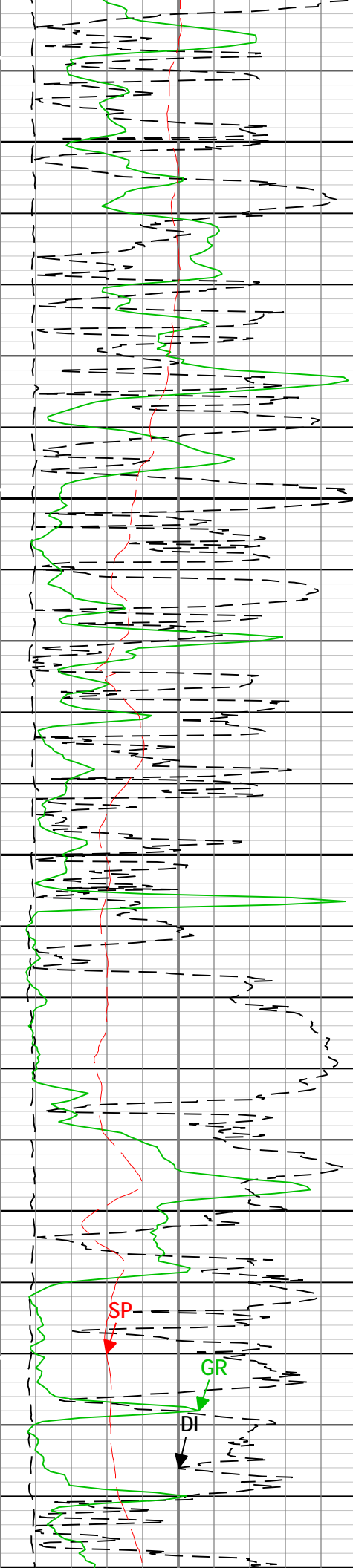


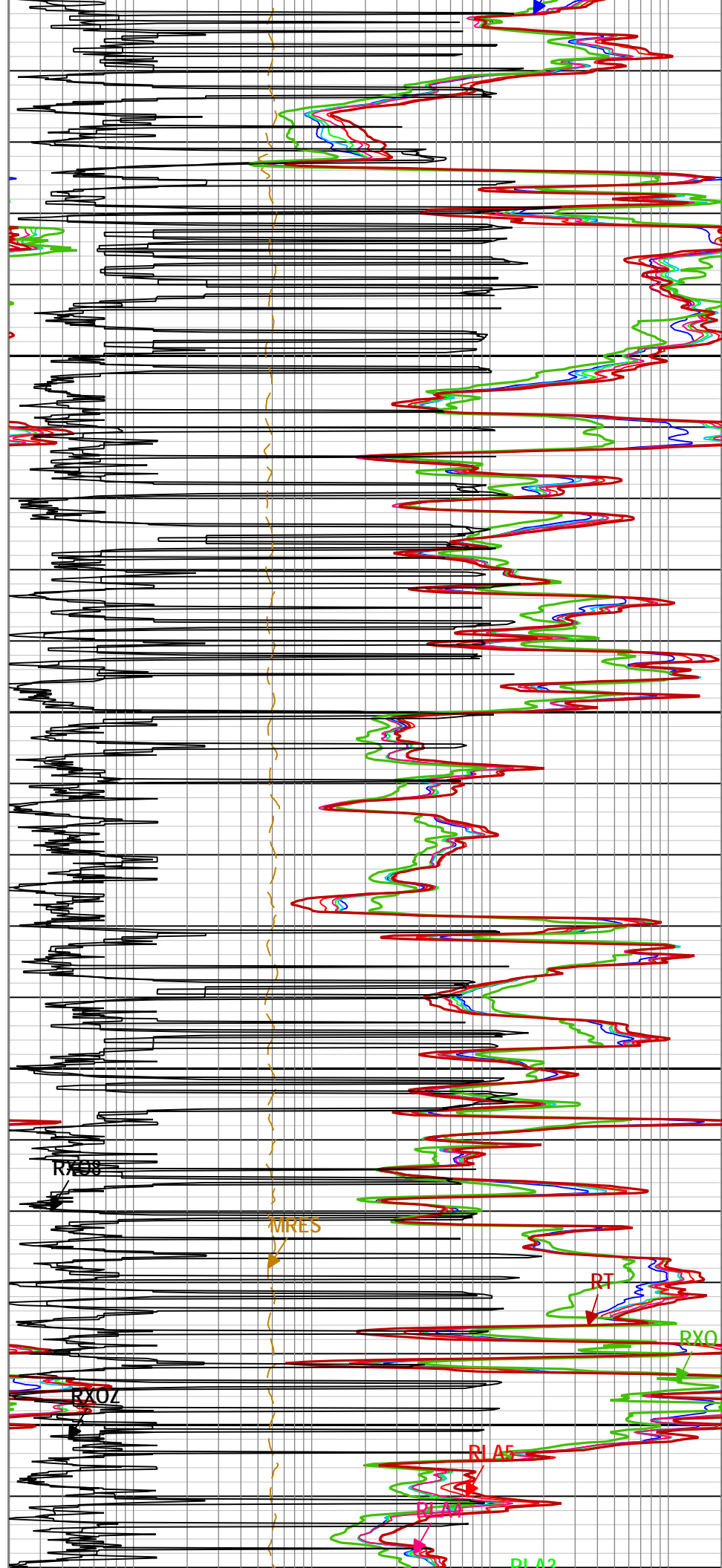
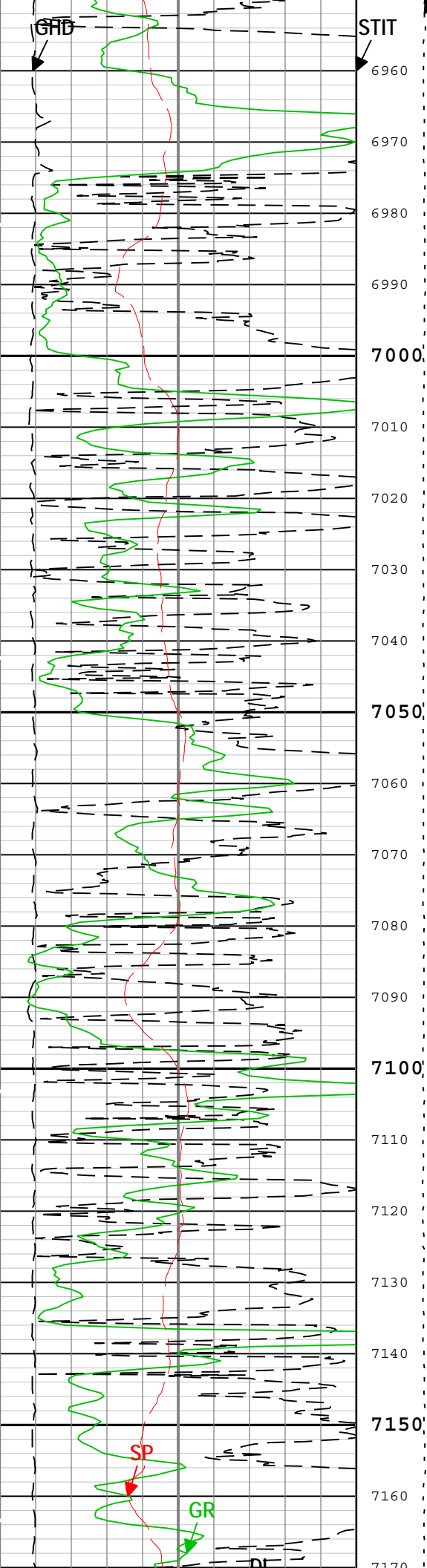


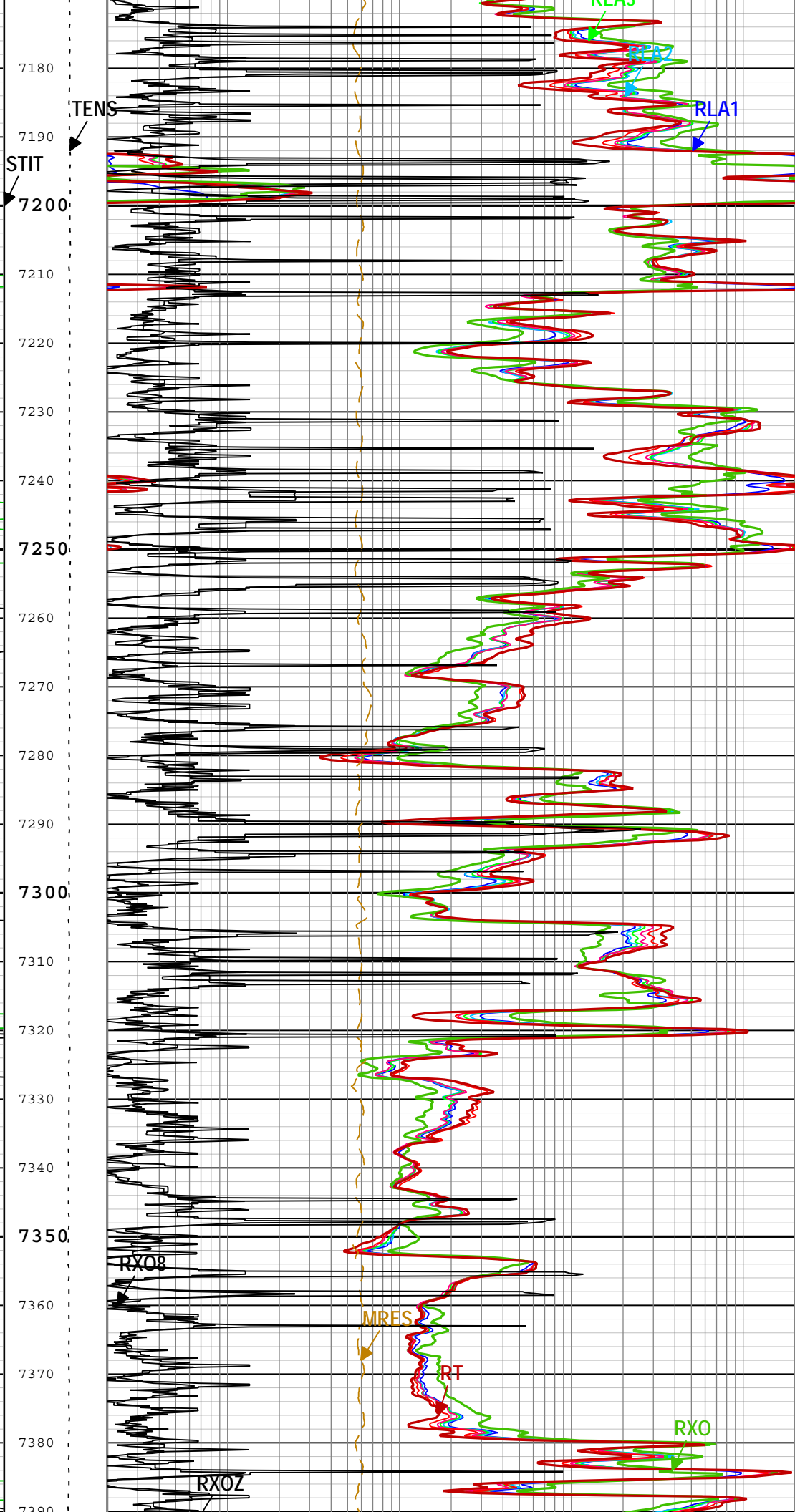
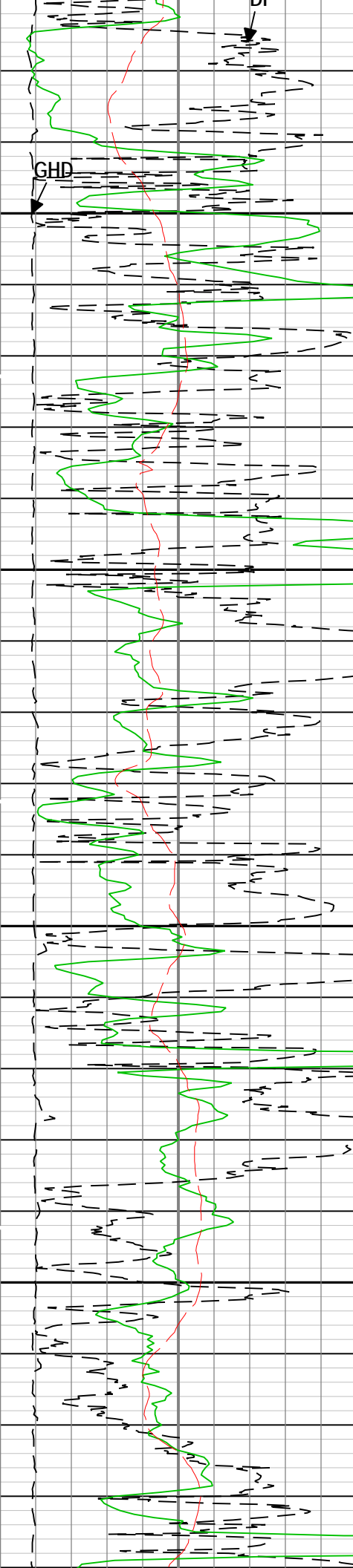
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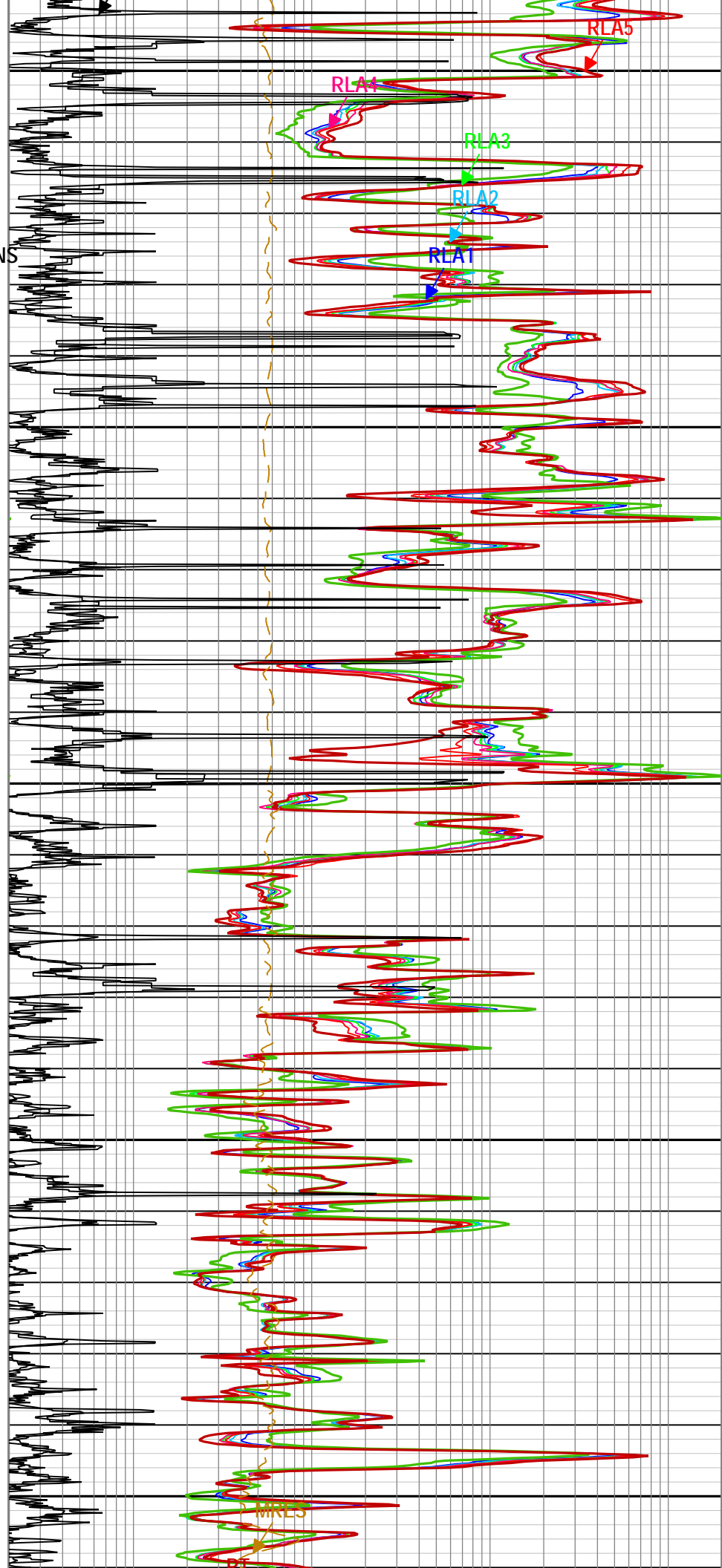
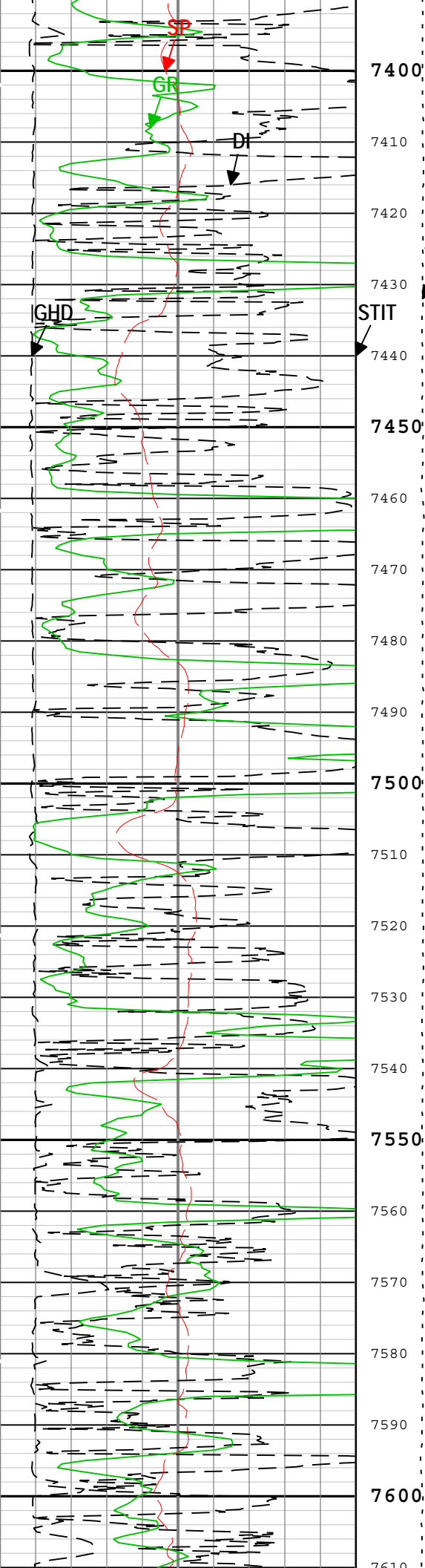


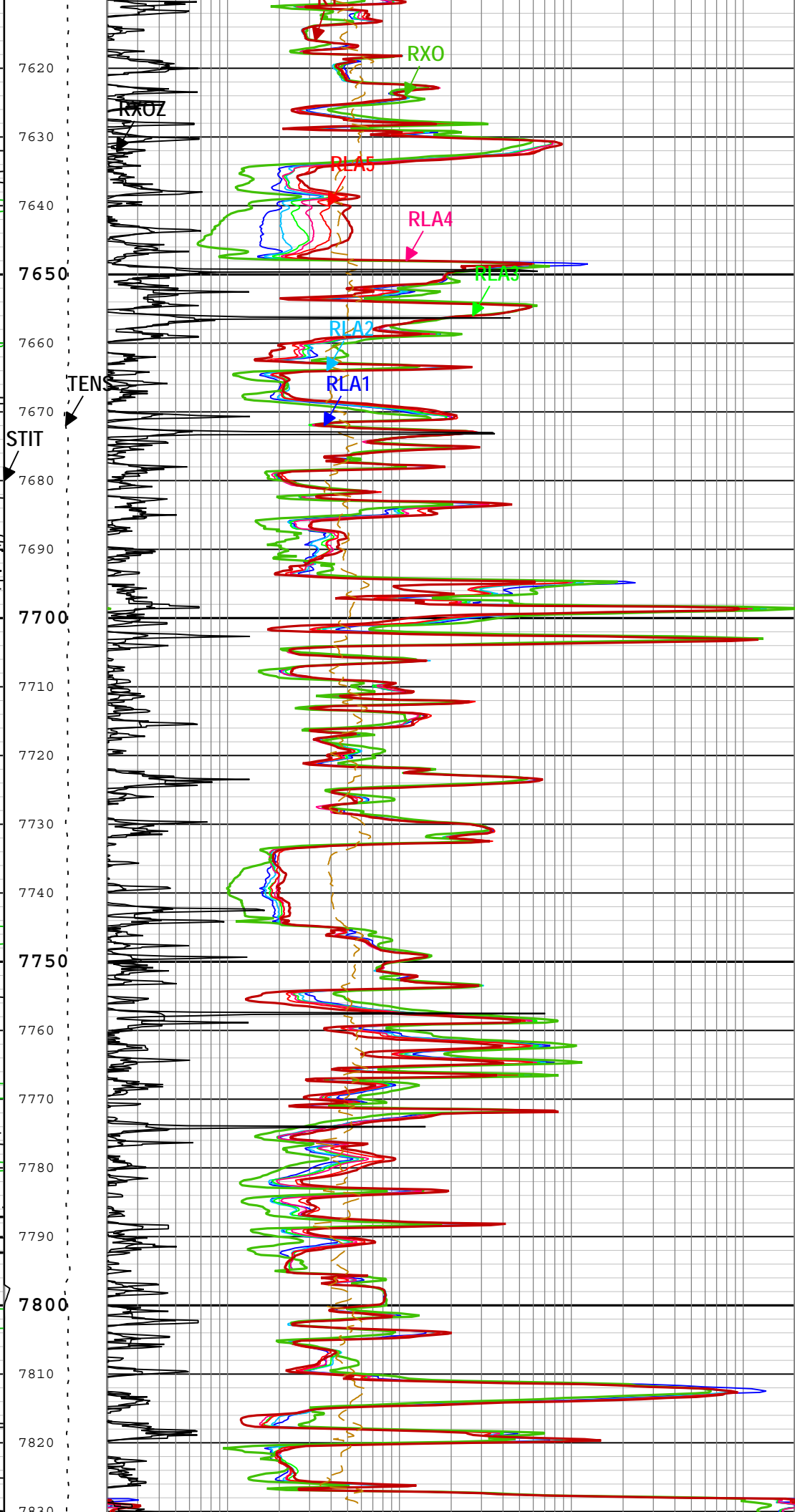
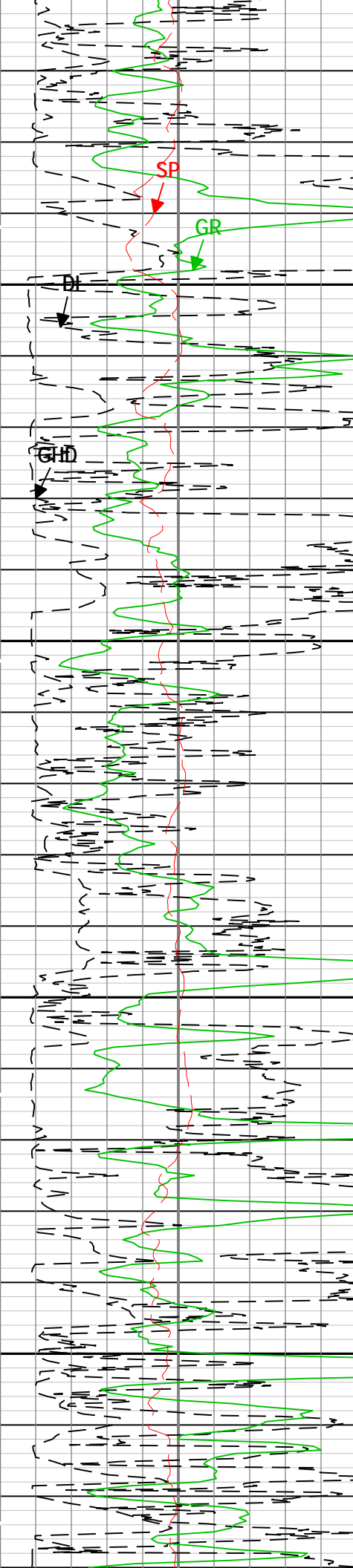


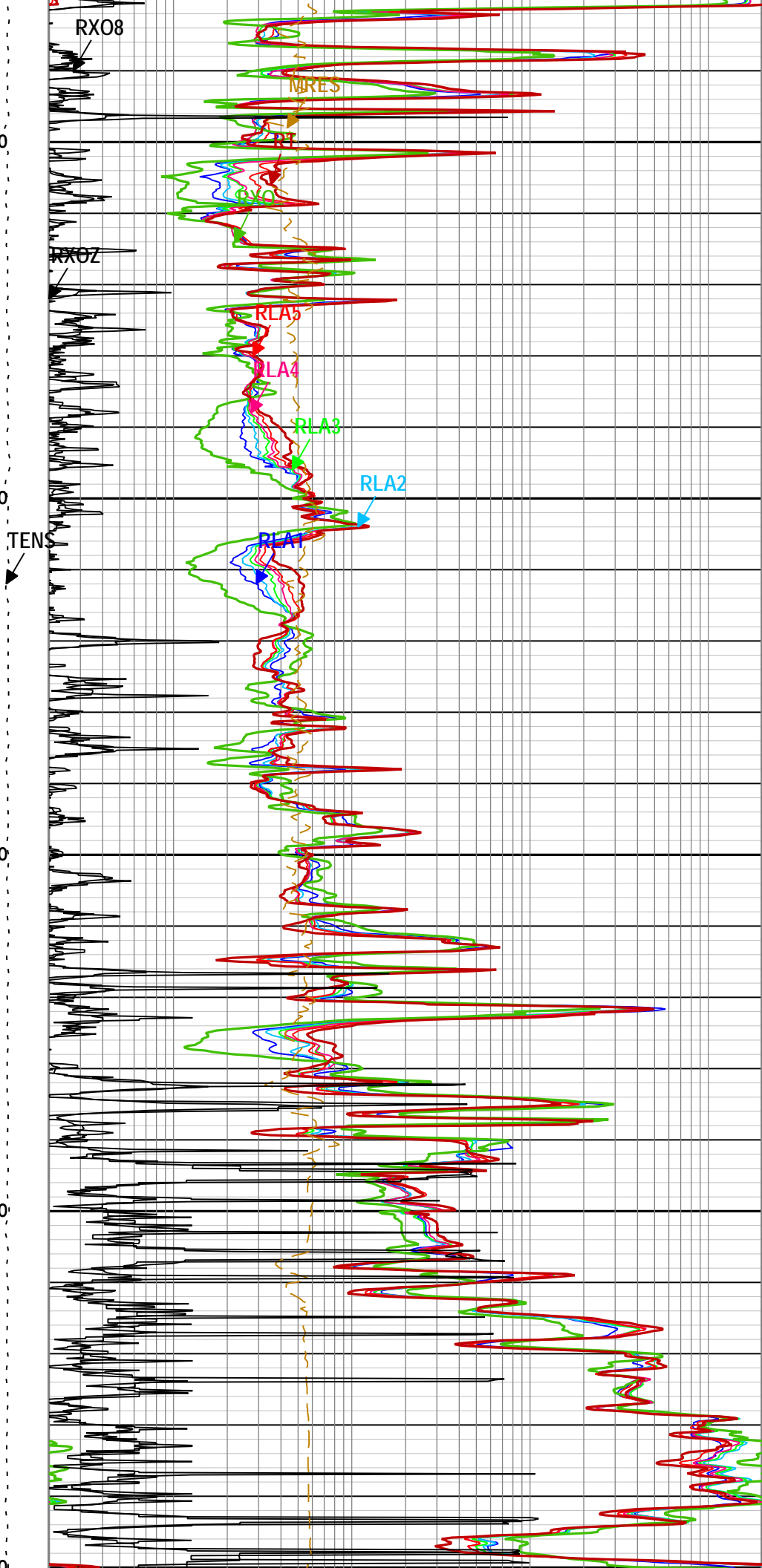
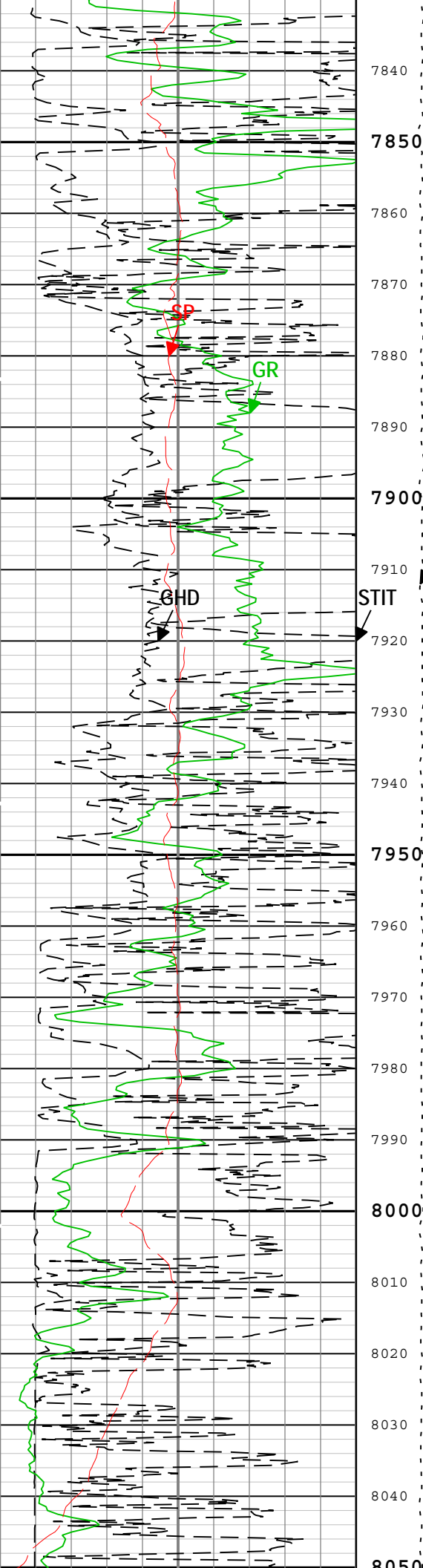


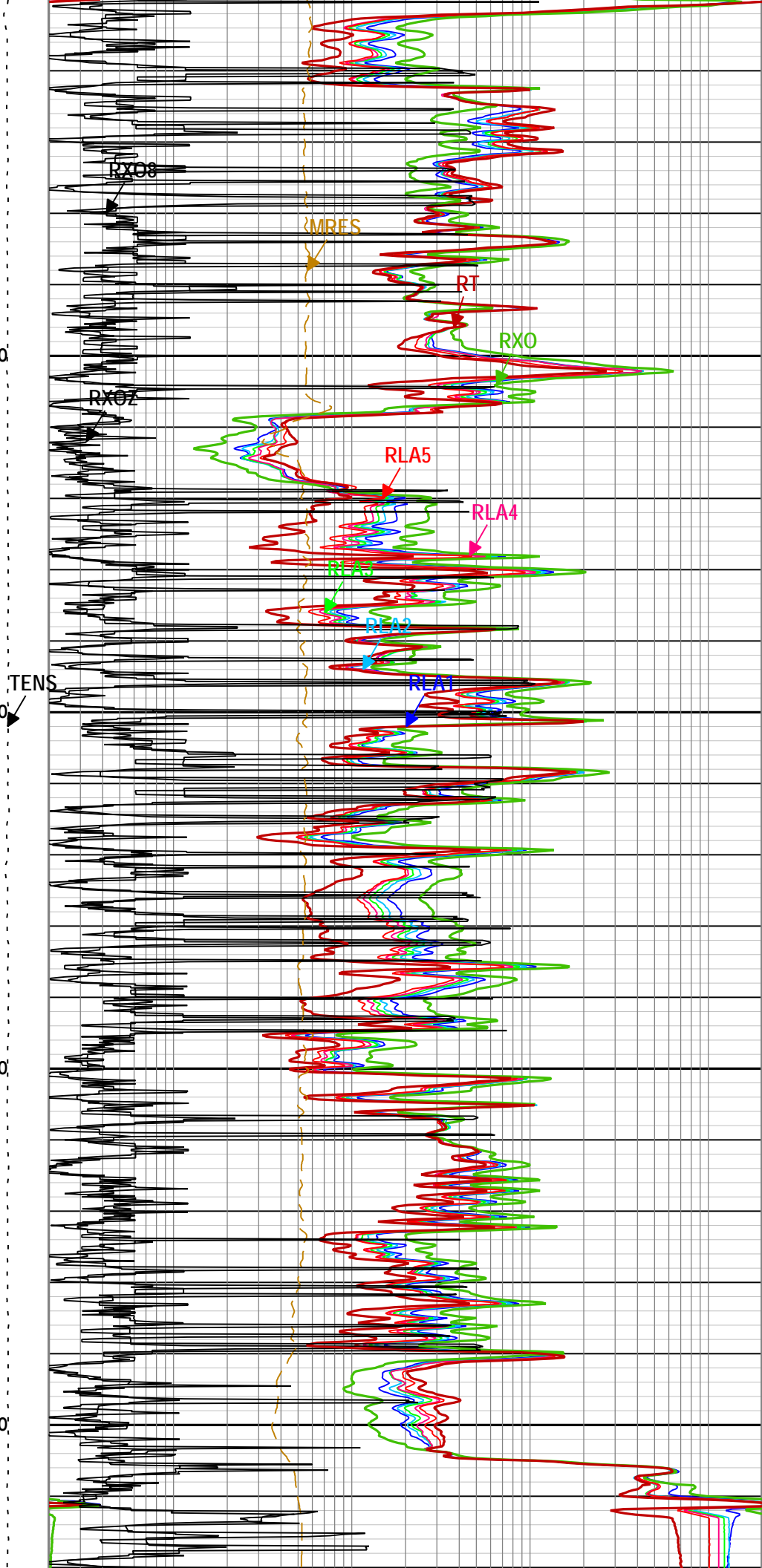
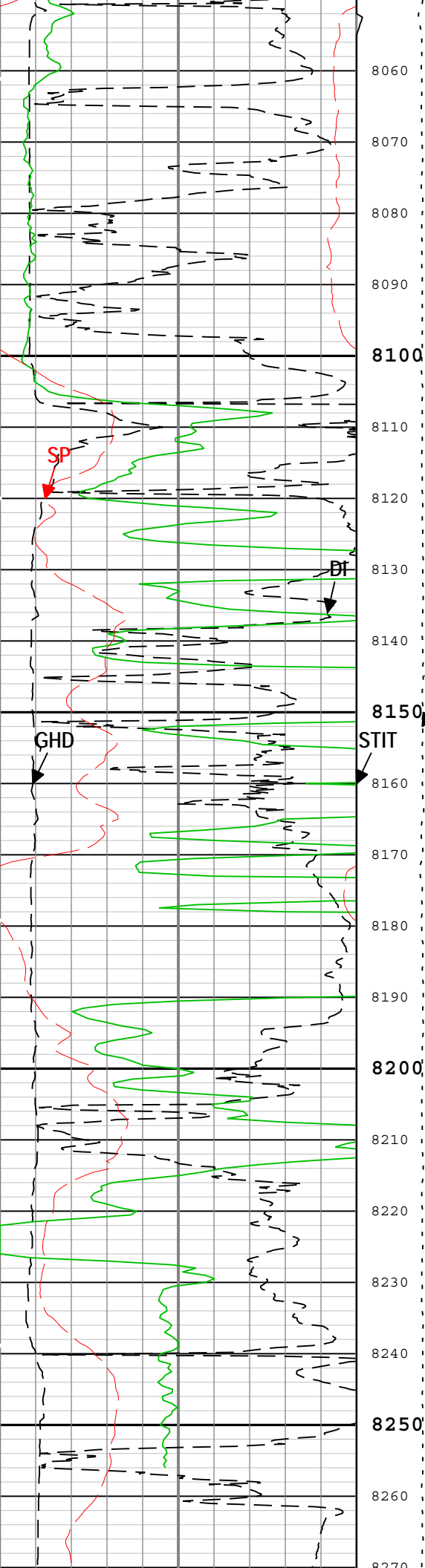


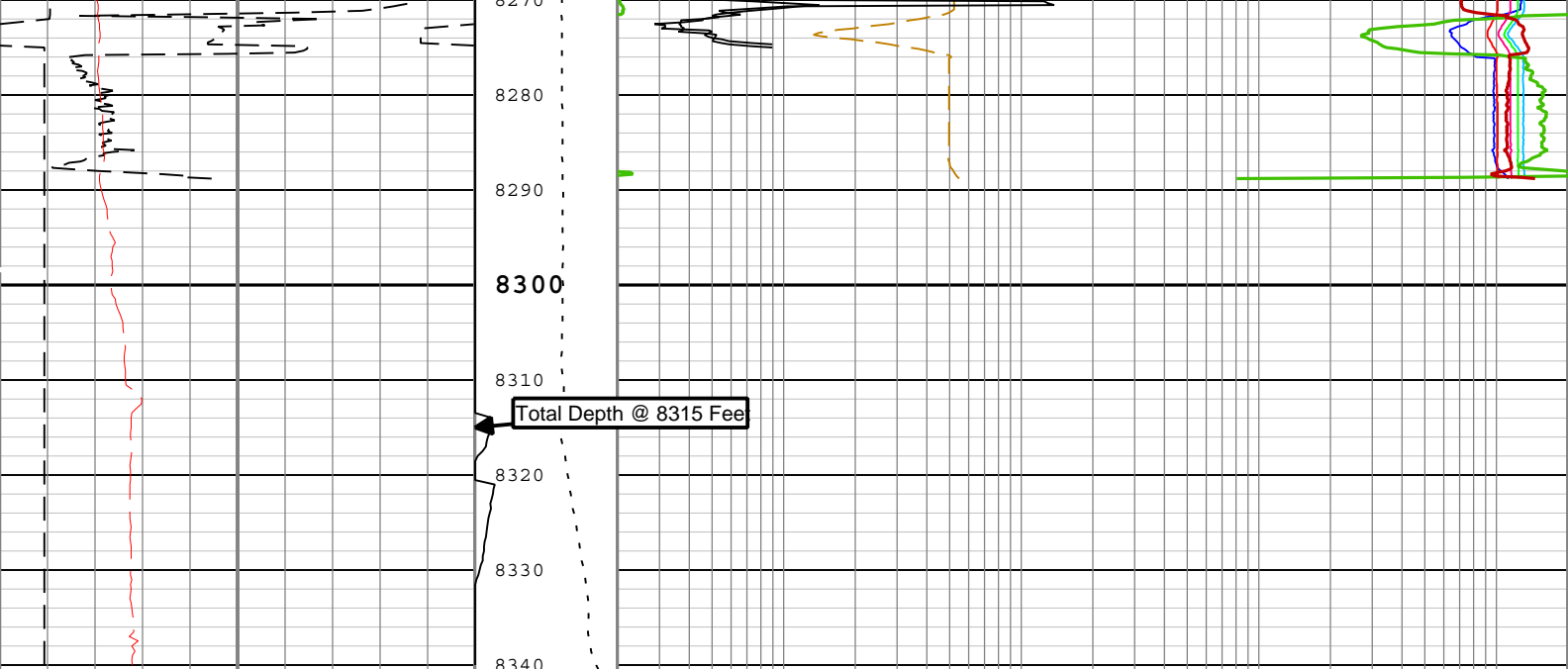












Borehole Diameter (GHD)		
6	in	26
Diameter of Invasion (DI) HRLT-B		
6	in	26
Gamma Ray (GR) HGNS-B		
0	gAPI	200
Spontaneous Potential (SP) AIT-H		
0	mV	200

Stuck Tool Indicator, Total (STIT)	0	ft	50
	Cable Tension (TENS)		
	10000	lbf	0

Apparent Resistivity from Computed Focusing Mode 1 (RLA1) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 2 (RLA2) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 3 (RLA3) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 4 (RLA4) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 5 (RLA5) HRLT-B		
0.2	ohm.m	2000
Invaded Formation Resistivity filtered at 18 inches (RXOZ) HDRS-B		
0.2	ohm.m	2000
Flushed Zone Resistivity (RXO) HRLT-B		
0.2	ohm.m	2000
True Resistivity (RT) HRLT-B		
0.2	ohm.m	2000
Mud Resistivity (MRES) HRLT-B		
0.02	ohm.m	200
Invaded Formation Resistivity filtered at 8 inches (RXO8) HDRS-B		
0.2	ohm.m	2000

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (HRLT Basic Log) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:20:52

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
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	
HRLT_PROCRM	Mud Resistivity Select	HRLT-B	HRLT Compute	
HRLT_RXOSE	Inversion Micro-Resistivity Selection	HRLT-B	HRLT Compute	
KFAC_HRLT	HRLT Geometrical Factor Option	HRLT-B	Sonde	
PROCINV	Resistivity Inversion Selection	HRLT-B	On	
PROCMSO	Mechanical Standoff Size	HRLT-B	1.5	in
PROCSP0	Sonde Position	HRLT-B	Eccentered	
SOCO	Standoff Correction Option	HGNS-B	Yes	
SPDR	SP Drift Per Foot	AIT-H	0	mV/ft
TD	Total Measured Depth	Borehole	8300	ft

Depth Zone Parameters				
Parameter	Value	Start (ft)	Stop (ft)	
BS	0	189.5	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				
HRLT-B (High Resolution Laterolog Array) Calibration - Run 1				
Primary Equipment :				
HRLT-B Sonde		HRLS-B		932

HRLT-B Calibration - HRLT M0-M1 Voltage Plus							
Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M01 - 0	uV	Before	-322.7	-379.6	-316.0	-280.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M01 - 1	uV	Before	-322.7	-379.6	-331.4	-280.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M01 - 2	uV	Before	-322.7	-379.6	-352.8	-280.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M01 - 3	uV	Before	-322.7	-379.6	-338.6	-280.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M01 - 4	uV	Before	-322.7	-379.6	-312.9	-280.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M01 - 5	uV	Before	-322.7	-379.6	-329.5	-280.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M01 - 6	uV	Before	322.7	280.6	338.6	379.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HRLT-B Calibration - HRLT M1-M2 Voltage Plus							
Before (Measured):		16:27:03 31-May-2013		After:			

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M12 - 0	uV	Before	1781.0	1548.7	1754.7	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M12 - 1	uV	Before	1781.0	1548.7	1842.5	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M12 - 2	uV	Before	1781.0	1548.7	1956.0	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M12 - 3	uV	Before	1781.0	1548.7	1877.0	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M12 - 4	uV	Before	1781.0	1548.7	1734.6	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M12 - 5	uV	Before	1781.0	1548.7	1828.4	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M12 - 6	uV	Before	-1781.0	-2095.3	-1890.9	-1548.7	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HRLT-B Calibration - HRLT M2-M3 Voltage Plus

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M23 - 0	uV	Before	1781.0	1548.7	1733.4	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M23 - 1	uV	Before	1781.0	1548.7	1830.3	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M23 - 2	uV	Before	1781.0	1548.7	1944.3	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M23 - 3	uV	Before	1781.0	1548.7	1869.8	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M23 - 4	uV	Before	1781.0	1548.7	1722.5	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M23 - 5	uV	Before	1781.0	1548.7	1817.2	2095.3	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT M23 - 6	uV	Before	-1781.0	-2095.3	-1866.0	-1548.7	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HRLT-B Calibration - HRLT A3-A4 Voltage Plus

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V34 - 0	uV	Before	70000.0	60869.6	68465.3	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V34 - 1	uV	Before	70000.0	60869.6	72365.1	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V34 - 2	uV	Before	70000.0	60869.6	77144.3	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V34 - 3	uV	Before	70000.0	60869.6	74374.1	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V34 - 4	uV	Before	70000.0	60869.6	68392.2	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V34 - 5	uV	Before	70000.0	60869.6	72124.6	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	

		After-Before	----	----	----		
HRLT V34 - 6	uV	Before	-70000.0	-82352.9	-72745.3	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HRLT-B Calibration - HRLT A4-A5 Voltage Plus

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V45 - 0	uV	Before	70000.0	60869.6	68409.0	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V45 - 1	uV	Before	70000.0	60869.6	72458.0	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V45 - 2	uV	Before	70000.0	60869.6	77201.1	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V45 - 3	uV	Before	70000.0	60869.6	74380.9	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V45 - 4	uV	Before	70000.0	60869.6	68344.7	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V45 - 5	uV	Before	70000.0	60869.6	72039.7	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V45 - 6	uV	Before	-70000.0	-82352.9	-72838.6	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HRLT-B Calibration - HRLT A5-A6 Voltage Plus

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V56 - 0	uV	Before	70000.0	60869.6	68377.4	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V56 - 1	uV	Before	70000.0	60869.6	72416.5	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V56 - 2	uV	Before	70000.0	60869.6	77147.5	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V56 - 3	uV	Before	70000.0	60869.6	74348.7	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V56 - 4	uV	Before	70000.0	60869.6	68320.9	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V56 - 5	uV	Before	70000.0	60869.6	72025.0	82352.9	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT V56 - 6	uV	Before	-70000.0	-82352.9	-72811.2	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	

HRLT-B Calibration - HRLT Torpedo-M0 Voltage

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT VTP - 0	uV	Before	-70000.0	-82352.9	-67973.8	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT VTP - 1	uV	Before	-70000.0	-82352.9	-72218.6	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT VTP - 2	uV	Before	-70000.0	-82352.9	-76956.2	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	
HRLT VTP - 3	uV	Before	-70000.0	-82352.9	-74227.0	-60869.6	
		After	----	----	----	----	
		After-Before	----	----	----	----	

		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VTP - 4	uV	Before	-70000.0	-82352.9	-68307.1	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VTP - 5	uV	Before	-70000.0	-82352.9	-72039.0	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VTP - 6	uV	Before	70000.0	60869.6	72549.7	82352.9	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HRLT-B Calibration - HRLT Bridle#9-M0 Voltage

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT VBD - 0	uV	Before	-70000.0	-82352.9	-68040.0	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VBD - 1	uV	Before	-70000.0	-82352.9	-72476.8	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VBD - 2	uV	Before	-70000.0	-82352.9	-77210.1	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VBD - 3	uV	Before	-70000.0	-82352.9	-74437.6	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VBD - 4	uV	Before	-70000.0	-82352.9	-68414.8	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VBD - 5	uV	Before	-70000.0	-82352.9	-72125.0	-60869.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT VBD - 6	uV	Before	70000.0	60869.6	72805.2	82352.9	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HRLT-B Calibration - HRLT Source Current Plus

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT ISO - 0	uA	Before	284.0	247.0	283.4	334.1	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT ISO - 1	uA	Before	281.1	244.4	281.1	330.7	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT ISO - 2	uA	Before	281.1	244.4	281.1	330.7	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT ISO - 3	uA	Before	281.1	244.4	281.1	330.7	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT ISO - 4	uA	Before	281.1	244.4	281.1	330.7	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT ISO - 5	uA	Before	281.1	244.4	281.1	330.7	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT ISO - 6	uA	Before	281.1	244.4	281.1	330.7	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HRLT-B Calibration - HRLT Vertical Voltage PI

Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT MV - 0	uV	Before	-322.7	-379.6	-319.1	-280.6	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
HRLT MV - 1	uV	Before	-322.7	-379.6	-328.0	-280.6	

		After After-Before	----	----	----	----	
HRLT MV - 2	uV	Before After After-Before	-322.7 ----- -----	-379.6 ----- -----	-347.9 ----- -----	-280.6 ----- -----	
HRLT MV - 3	uV	Before After After-Before	-322.7 ----- -----	-379.6 ----- -----	-331.9 ----- -----	-280.6 ----- -----	
HRLT MV - 4	uV	Before After After-Before	-322.7 ----- -----	-379.6 ----- -----	-303.7 ----- -----	-280.6 ----- -----	
HRLT MV - 5	uV	Before After After-Before	-322.7 ----- -----	-379.6 ----- -----	-335.1 ----- -----	-280.6 ----- -----	
HRLT MV - 6	uV	Before After After-Before	322.7 ----- -----	280.6 ----- -----	348.8 ----- -----	379.6 ----- -----	

HRLT-B Calibration - HRLT Calibration Temperature							
Before (Measured):		16:27:03 31-May-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CTEM_HRLT	degF	Before			147.0		
		After	----	----	----	----	
		After-Before	----	----	----	----	

HGNS-B (HILT Gamma-Ray and Neutron Sonde, 125 degC) Calibration - Run 1			
Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 125 degC	HGNS-B	863	
Auxiliary Equipment :			
HGNS Accelerometer, 125 degC	HACCZ-B	452	
AmBe Neutron Logging Source	NSR-F	5069	
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)	165		

HGNS Accelerometer Calibration - Accelerometer Accumulations							
Before (Measured):		15:41:18 31-May-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	31.8	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read							
Master (EEPROM):		00:00:00 15-Dec-1996					
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):		10:38:08 25-Feb-2013 Expired by 5 days		Before (Measured):		13:45:42 30-May-2013 Expired by 1 days		After:	
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	----	----	1.2	4.2	
		Before-Master	----	-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	
Country:	UNITED STATES	

Triple Combo
Laterolog Array