Schlumberger

Company: Caerus Operating LLC

Well: NPR 13A-8-596

Field: Grand Valley

County: Garfield State: Colorado

Resistivity

Array Induction

County: Garfield
Field: Grand Valley
Location: NESW
Well: NPR 13A-8-596
Company: Caerus Operating LLC

Location:			
NESW	Elev.:	K.B.	7828.00 ft
2514 FSL & 2566 FWL		G.L.	7798.00 ft
Lat/Long: 39.629194/-108.193097		D.F.	7828.00 ft
Permanent Datum:	Ground Level	Elev.:	7798.00 f
Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		

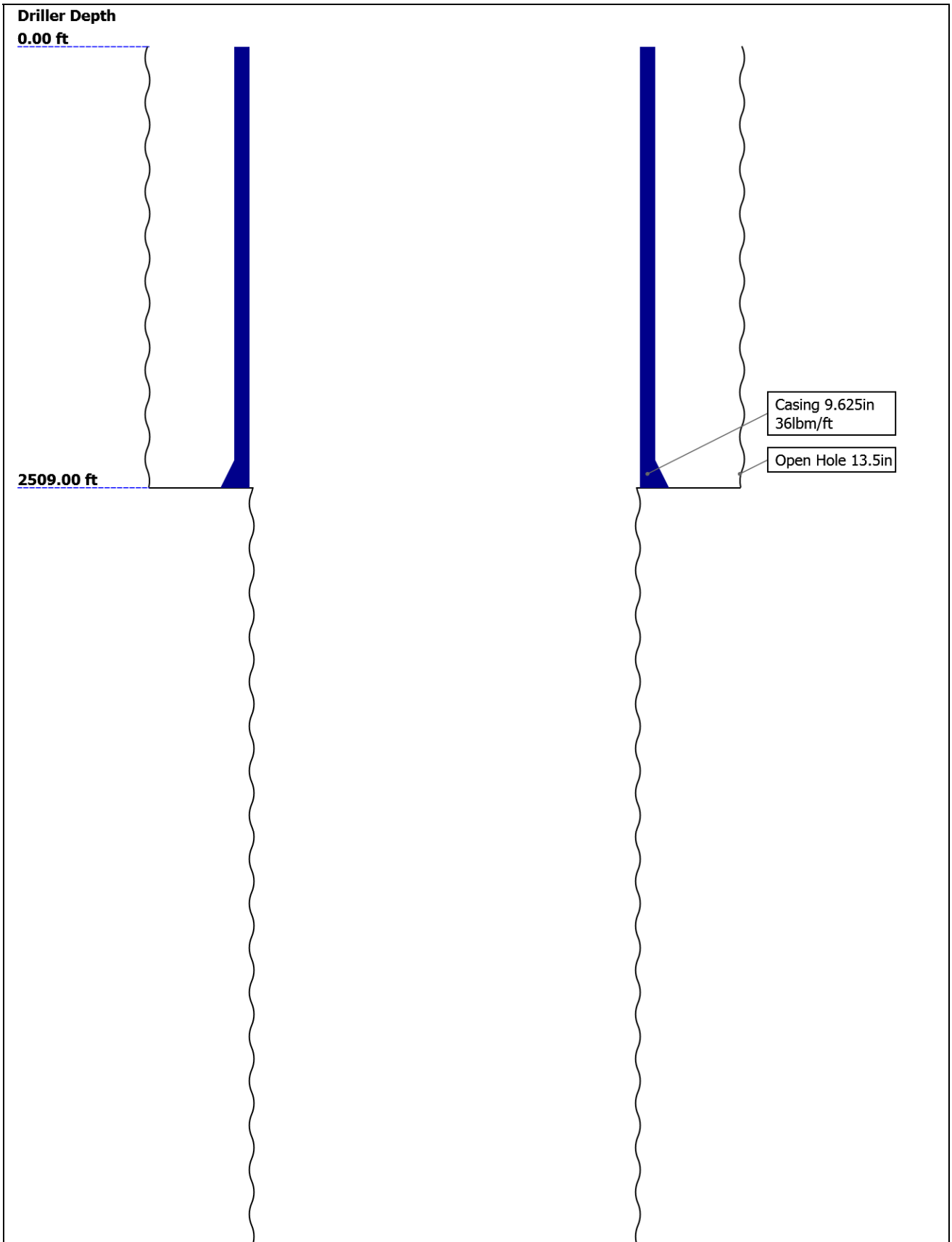
API Serial No.	Section:	Township:	Range:
05-045-23978	8	5S	96W

Logging Date			21-Apr-2019			
Run Number			1A			
Depth Driller			8780.00 ft			
Schlumberger Depth			8679.00 ft			
Bottom Log Interval			8679.00 ft			
Top Log Interval			2500.00 ft			
Casing Driller Size @ Depth			9.625 in @ 2509.00 ft			
Casing Schlumberger			2509 ft			
Bit Size			8.75 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	9.5 lbm/gal	59 s		
	Fluid Loss	PH		9		
	Source of Sample		Active Tank			
RM @ Meas Temp			0.2 ohm.m @ 68 degF			
RMF @ Meas Temp			0.15 ohm.m @ 68 degF			
RMC @ Meas Temp						
Source RMF	RMC			Pressed		
RM @ BHT	RMF @ BHT		0.07 @ 212	0.05 @ 212		
Max Recorded Temperatures			179.6 degF			
Circulation Stopped	Time		21-Apr-2019	08:00:00		
Logger on Bottom	Time		21-Apr-2019	12:30:00		
Unit Number	Location:		9108	Fort Morgan		
Recorded By			Evan Grzecki			
Witnessed By			Jarvis			

Disclaimer

Contents

Well Sketch


Driller Depth
0.00 ft
2509.00 ft
Casing 9.625in
36lbm/ft
Open Hole 13.5in

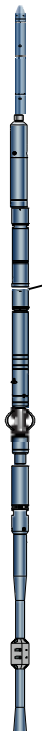
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.75				
Top Driller (ft)	0	2509				
Top Logger (ft)	0	2509				
Bottom Driller (ft)	2509	8780				
Bottom Logger (ft)	2509	8679				
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.921					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	2509					
Bottom Logger (ft)	2509					

Remarks and Equipment Summary

1A: Toolstring

Equip name	Length	MP name	Offset
PEH-EFA	102.26		
AH-317-TB	99.9		
TBCCL-A	98.83		
TBCCL-A			
		CCL	97.12
TBDOT-BA	97.12		
TBHO-BA	93.63		



1A: Remarks

Thank you for choosing Schlumberger!

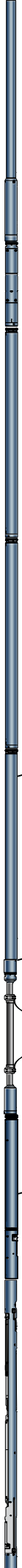
Log run for formation evaluation

Sonic and Resistivity tools run centralized; Neutron and Density tools run eccentered

Matrix: Sandstone

MDEN: 2.68g/cc

Crew: Juceiin Flores, Robert Stelter, Kevin Mattson



SAH-TB **87.69**

TBAT-AA[2] **85.35**

TBAT-AA[1] **79.23**

TMG-A:102 **73.1**
TMG-A:102

Gamma-Ray **72.31**

Status **66.97**

TILE-AB **66.97**

TBN-B:58 **62.47**
TBN-B:58
NNLS-EWA:
5975

Neutron Porosity **60.17**

TBD-B:28 **57.71**
TBD-B:28
GGLS-FZ:339
8

Density L **49.18**


S
Caliper 49.06
Density S 48.79
S
KAH-TB[2] 47.23
KAH-TB[1] 45.81
TBDS-B 44.39
TBDS-B
RX Array 33.28
Mono TX 25.59
Dipole TX 24.94
TBIT-A:45 15.28
TBIT-A:45
Induction Array 9.27

Lengths are in ft
Maximum Outer Diameter = 2.125 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

1A

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	1898.04	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	2580.15	ft3

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.102758.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[1]:Up	Up	583.58 ft	8688.48 ft	21-Apr-2019 6:29:20 AM	21-Apr-2019 1:32:00 PM	ON	0.00 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Caerus Operating LLC Well:NPR 13A-8-596
1A: Log[1]:Up:S014

Description: ThruBit_TBI_2ft_RM Format: Log (ThruBit_TBI_2ft_RM) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 27-Apr-2019 13:13:14

IHV_RM - Integrated Hole Volume every 10.00 (ft3)
IHV_RM - Integrated Hole Volume every 100.00 (ft3)
TIME_1900 - Time Marked every 60.00 (s)
ICV_RM - Integrated Cement Volume every 10.00 (ft3)
ICV_RM - Integrated Cement Volume every 100.00 (ft3)

Cable Tension (TENS)
10000 lbf 0

Thrubit Induction Array Two Foot Resistivity at 20 inch depth of investigation (TBIT20) TBIT-A RM
0.2 ohm.m 2000

Thrubit Induction Array Two Foot Resistivity at 30 inch depth of investigation (TBIT30) TBIT-A RM
0.2 ohm.m 2000

Thrubit Induction Array Two Foot Resistivity at 60 inch depth of investigation (TBIT60) TBIT-A RM
0.2 ohm.m 2000

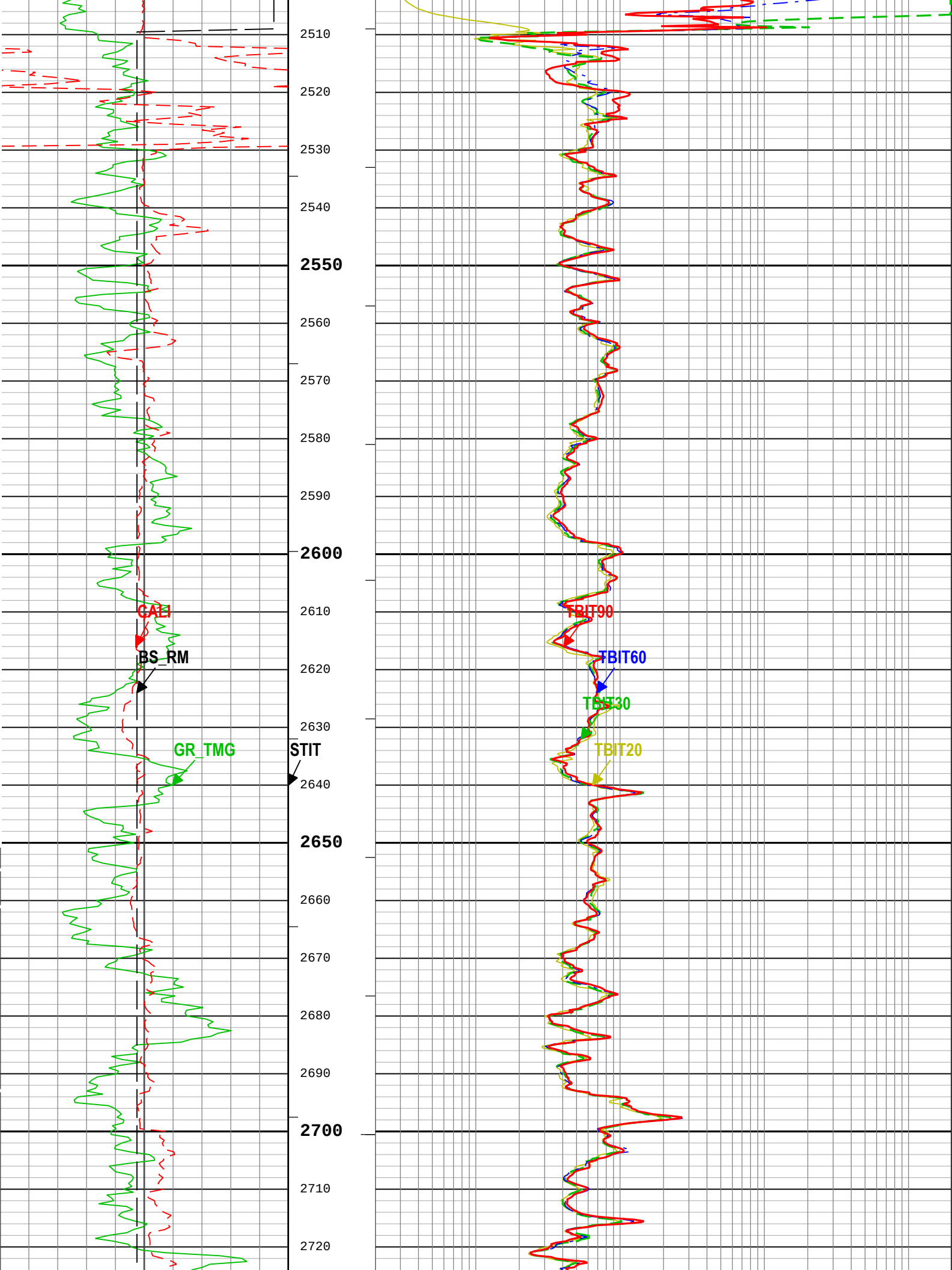
Thrubit Induction Array Two Foot Resistivity at 90 inch depth of investigation (TBIT90) TBIT-A RM
0.2 ohm.m 2000

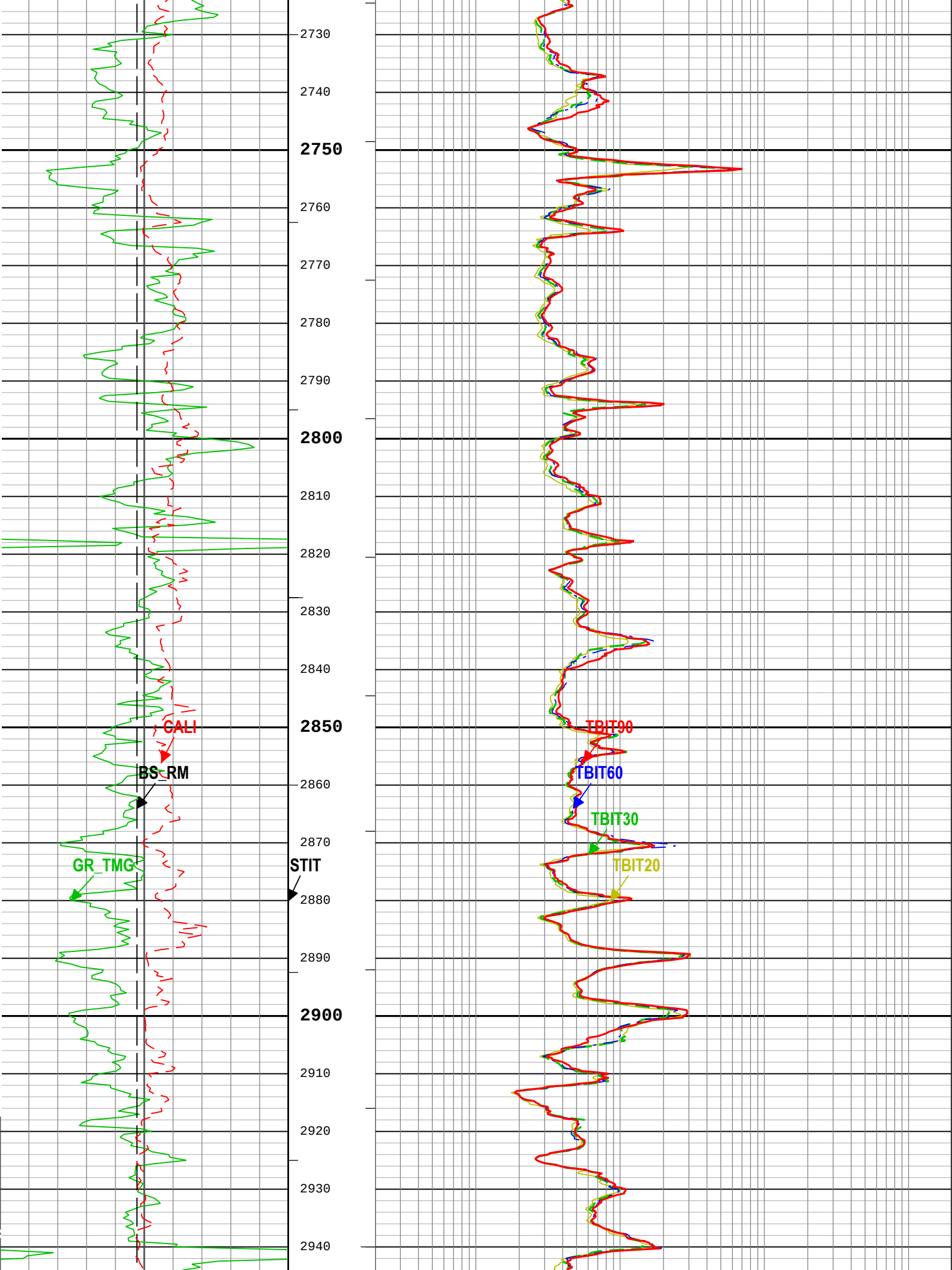
Calibrated Gamma Ray (GR_TMG) TMG-A RM
0 gAPI 200

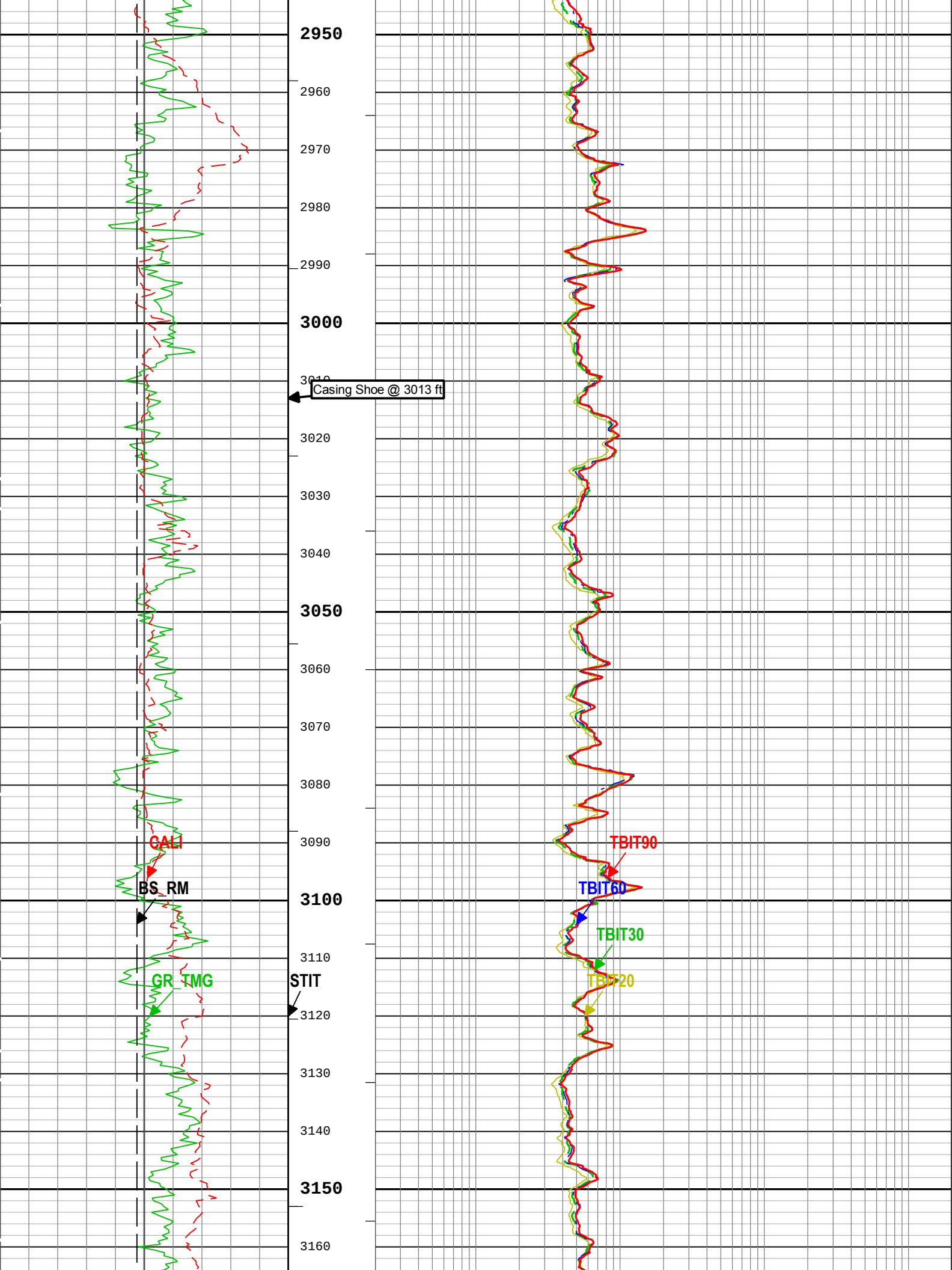
Bit Size (BS_RM) RM
4 in 14

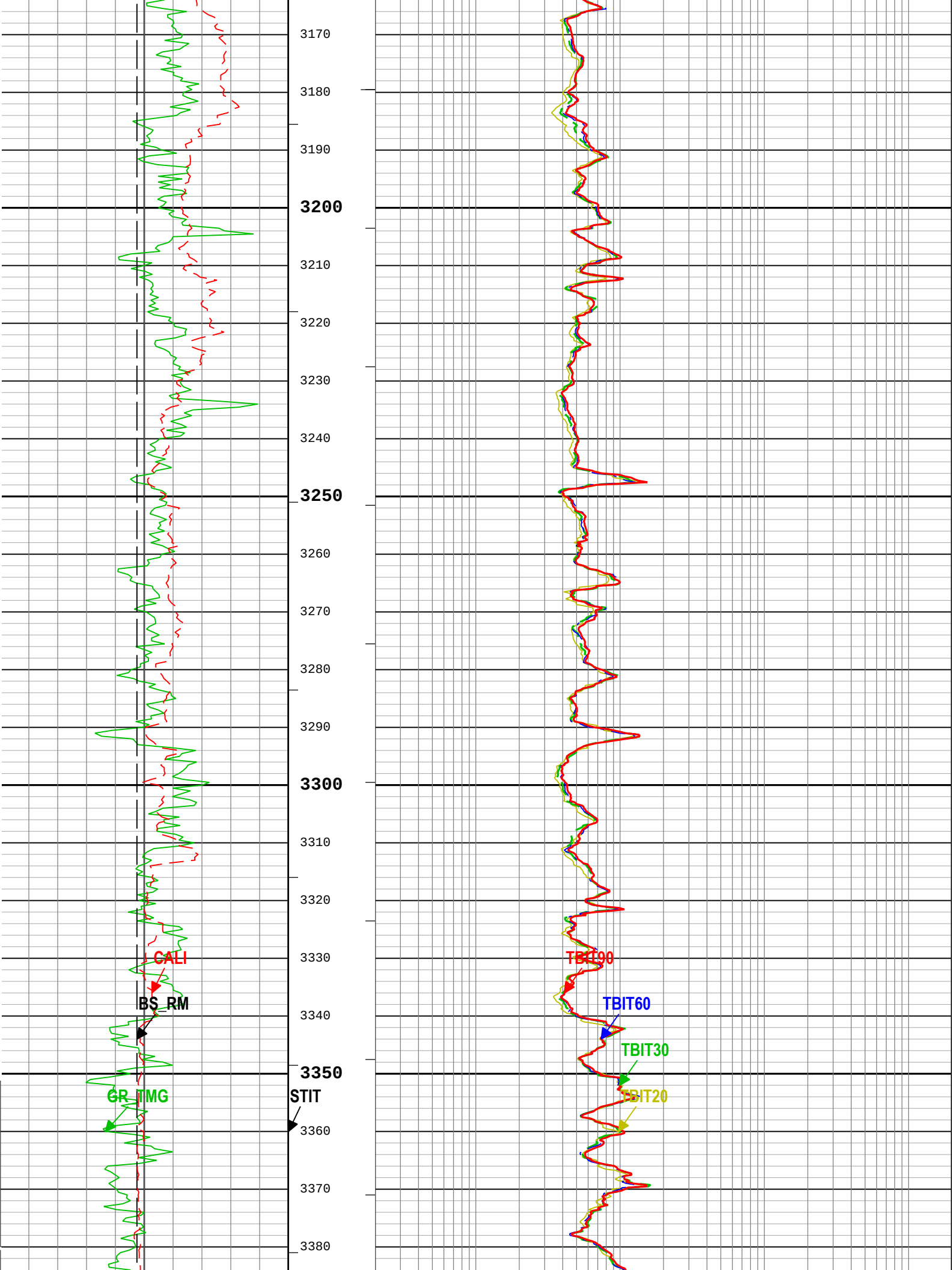
Caliper (CALI) TBD-B RM
4 in 14

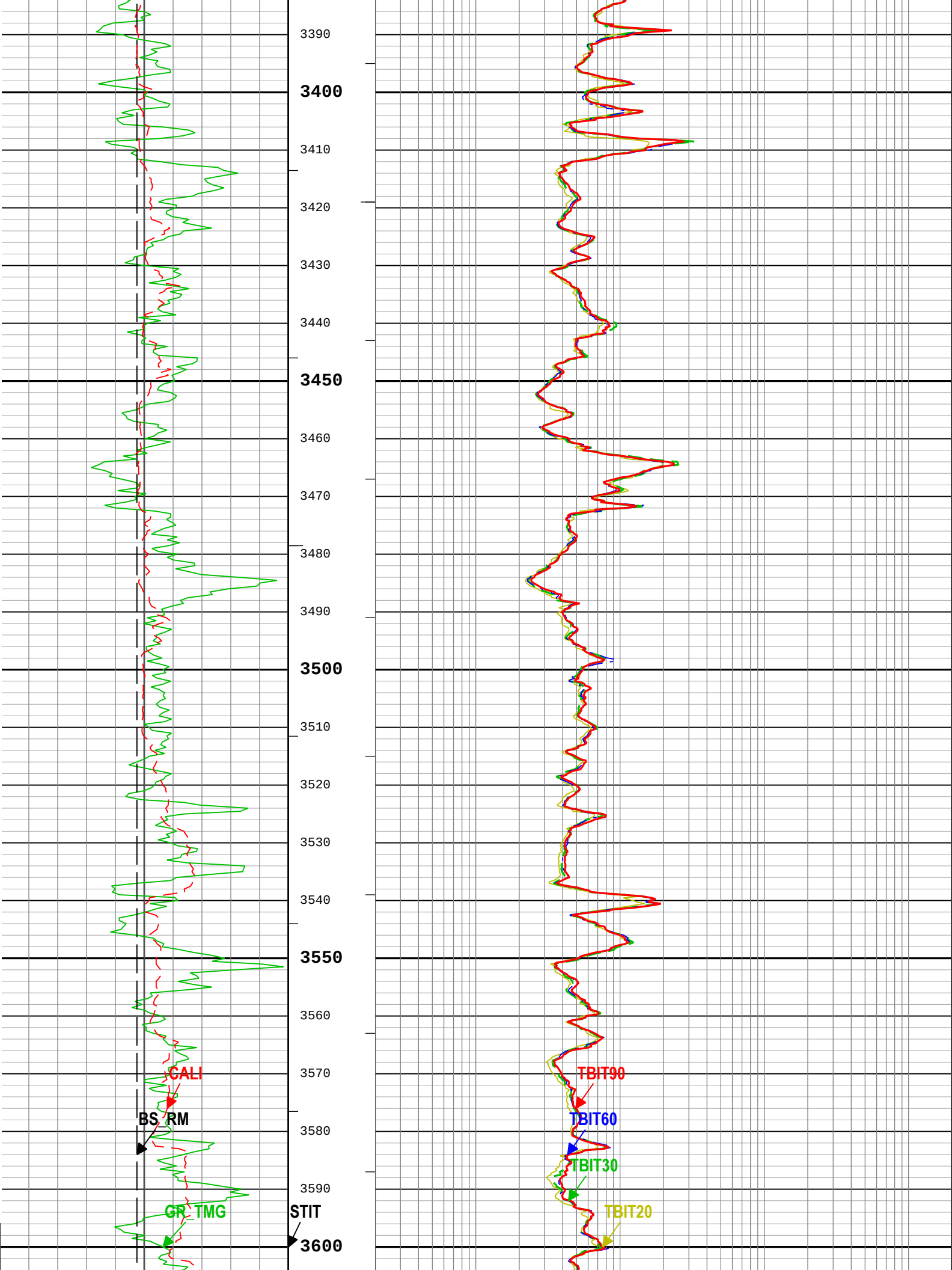
Stuck Tool Indicator, Total (STIT)
0 ft 50

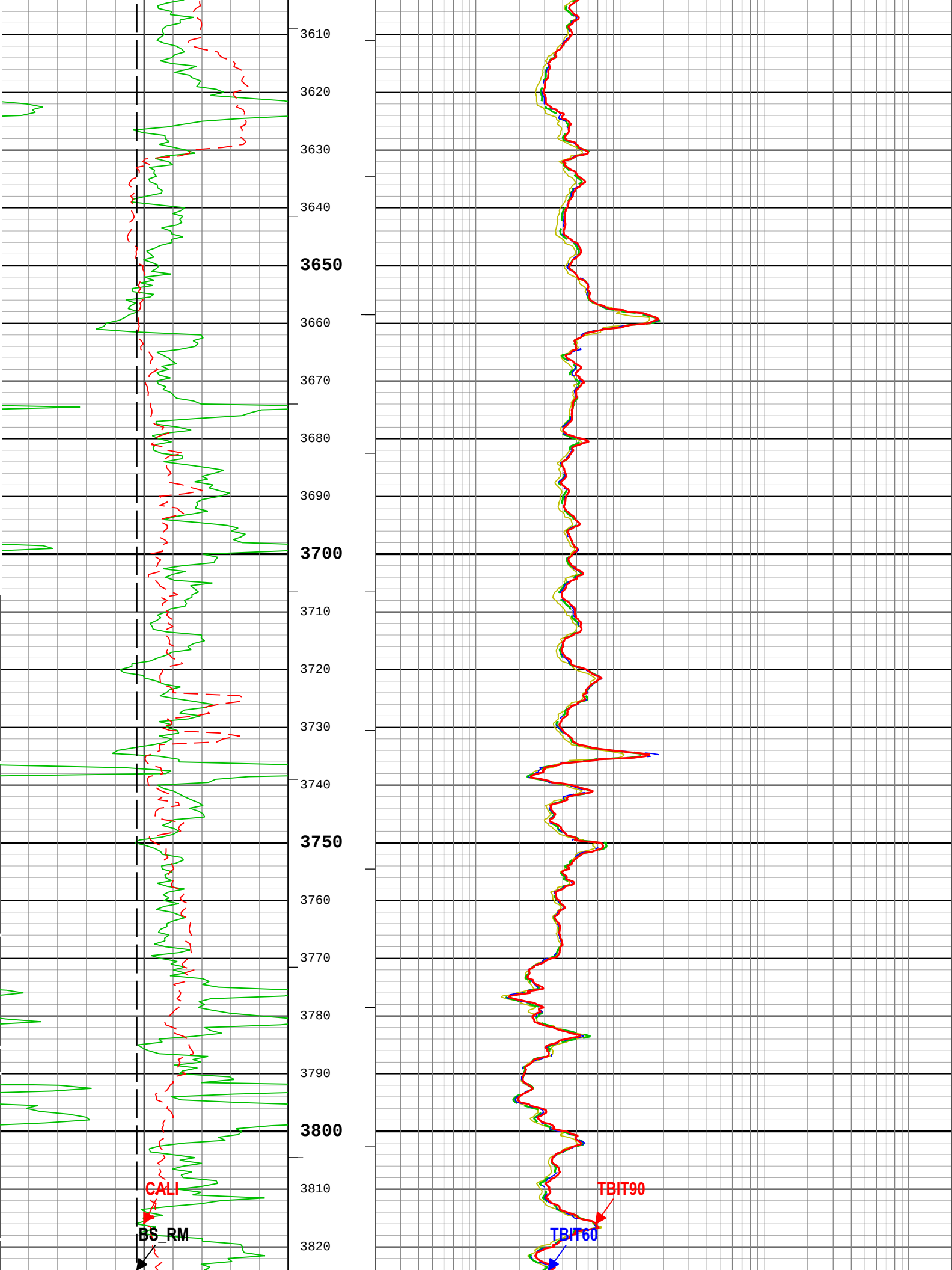

2510
2520
2530
2540
2550
2560
2570
2580
2590
2600
2610
2620
2630
2640
2650
2660
2670
2680
2690
2700
2710
2720
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

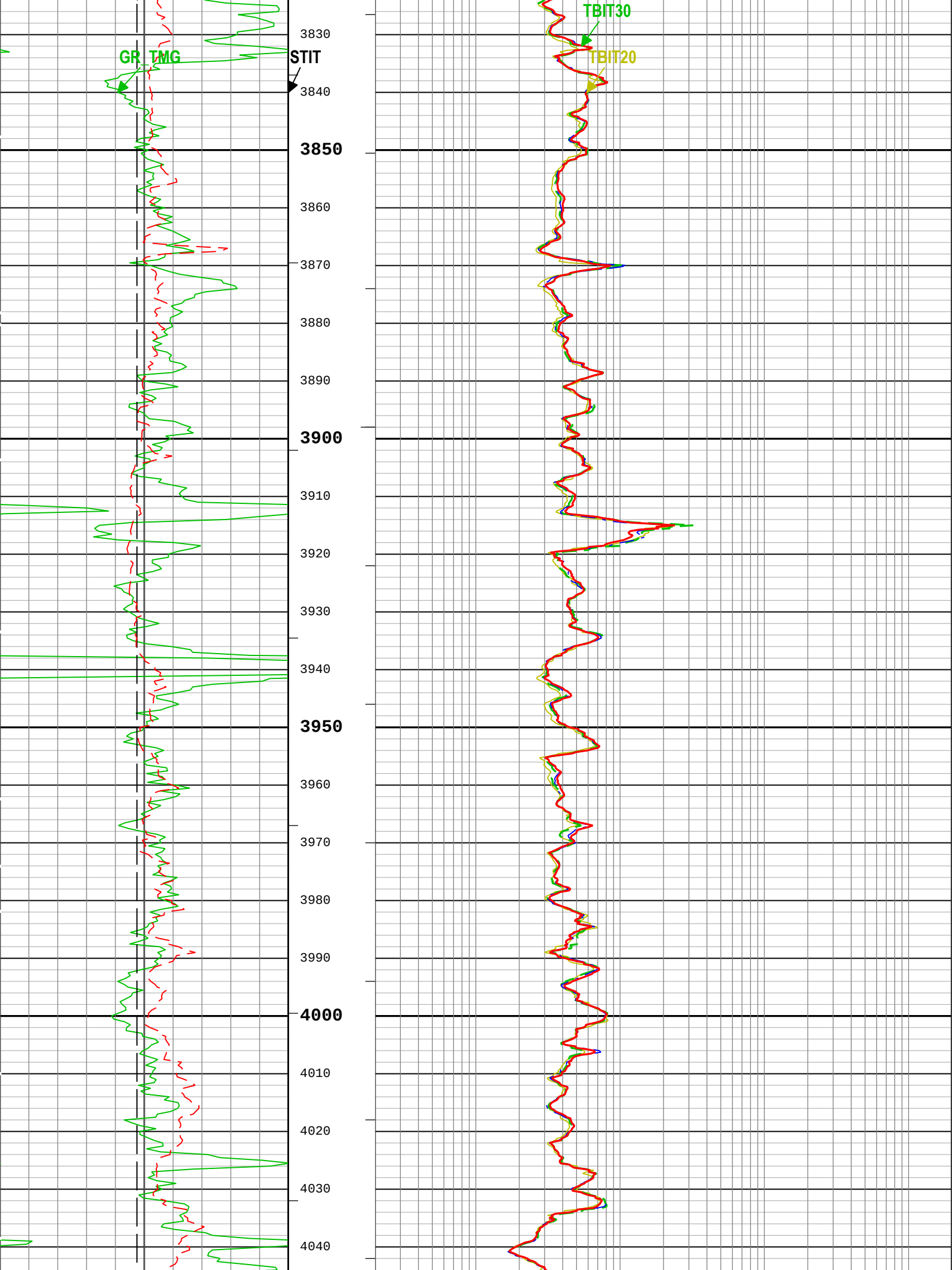

2730
2740
2750
2760
2770
2780
2790
2800
2810
2820
2830
2840
2850
2860
2870
2880
2890
2900
2910
2920
2930
2940
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

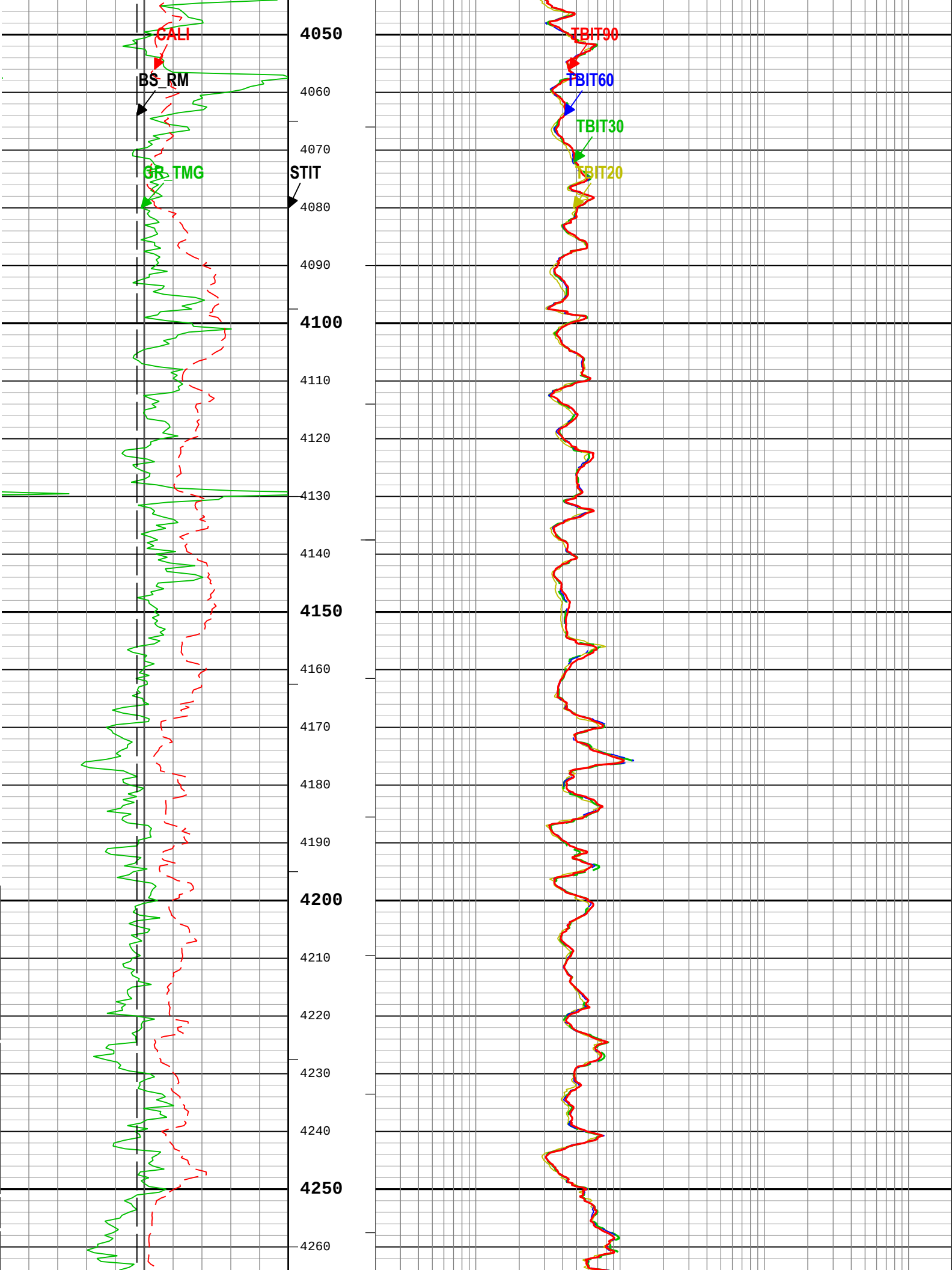

2950
2960
2970
2980
2990
3000
3010
Casing Shoe @ 3013 ft
3020
3030
3040
3050
3060
3070
3080
3090
3100
3110
3120
3130
3140
3150
3160
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

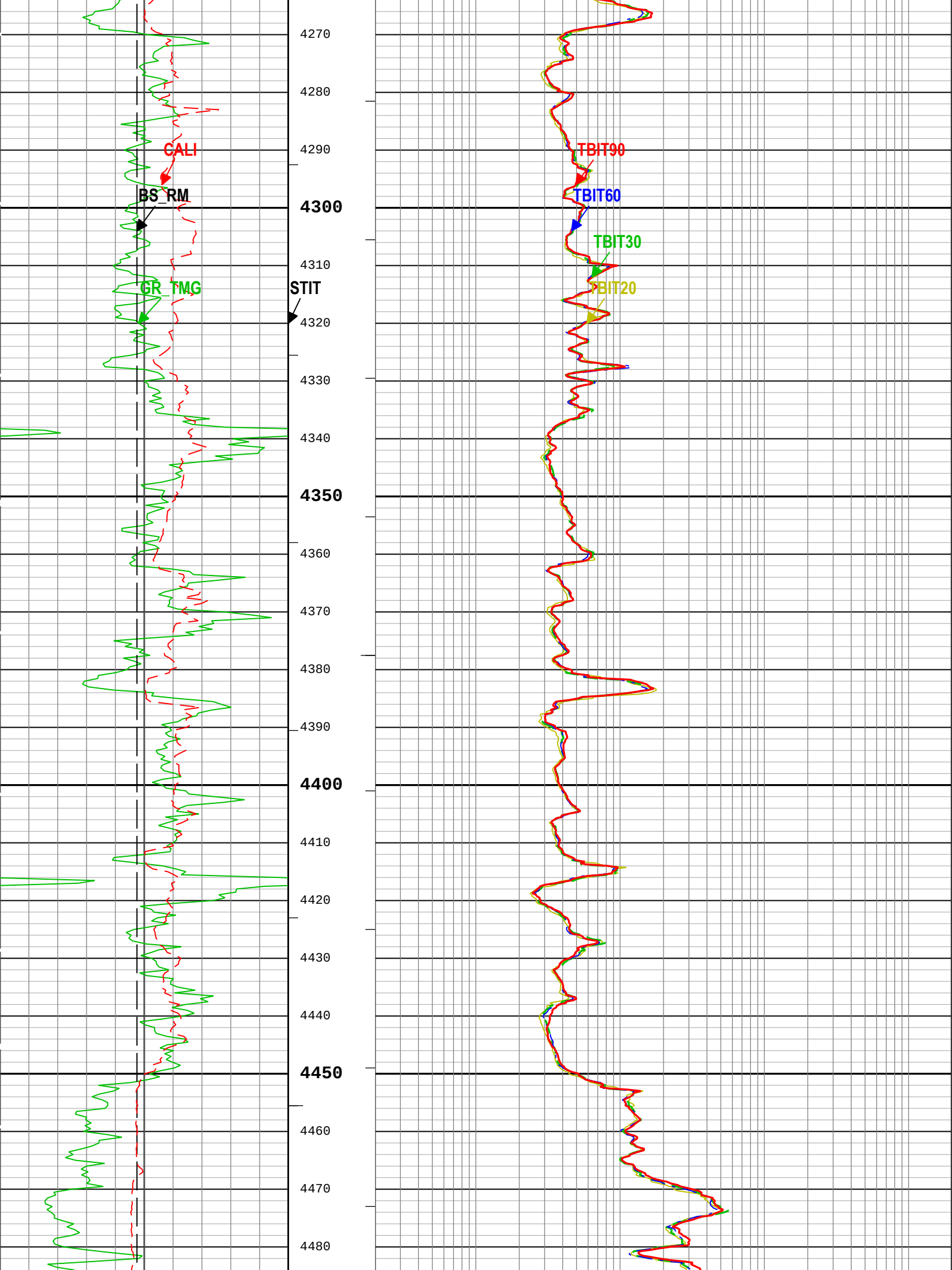

3170
3180
3190
3200
3210
3220
3230
3240
3250
3260
3270
3280
3290
3300
3310
3320
3330
3340
3350
3360
3370
3380
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

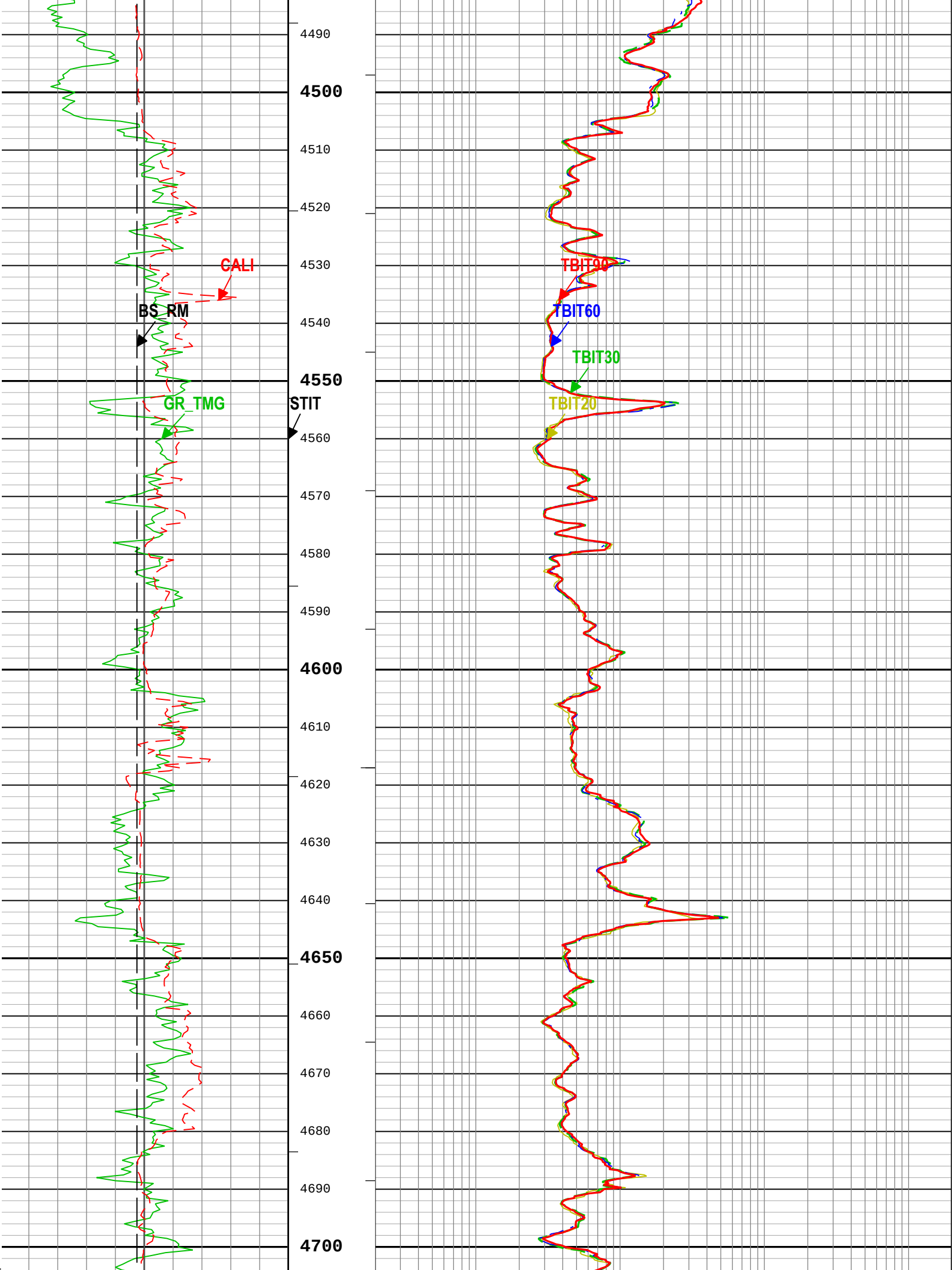

3390
3400
3410
3420
3430
3440
3450
3460
3470
3480
3490
3500
3510
3520
3530
3540
3550
3560
3570
3580
3590
3600
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

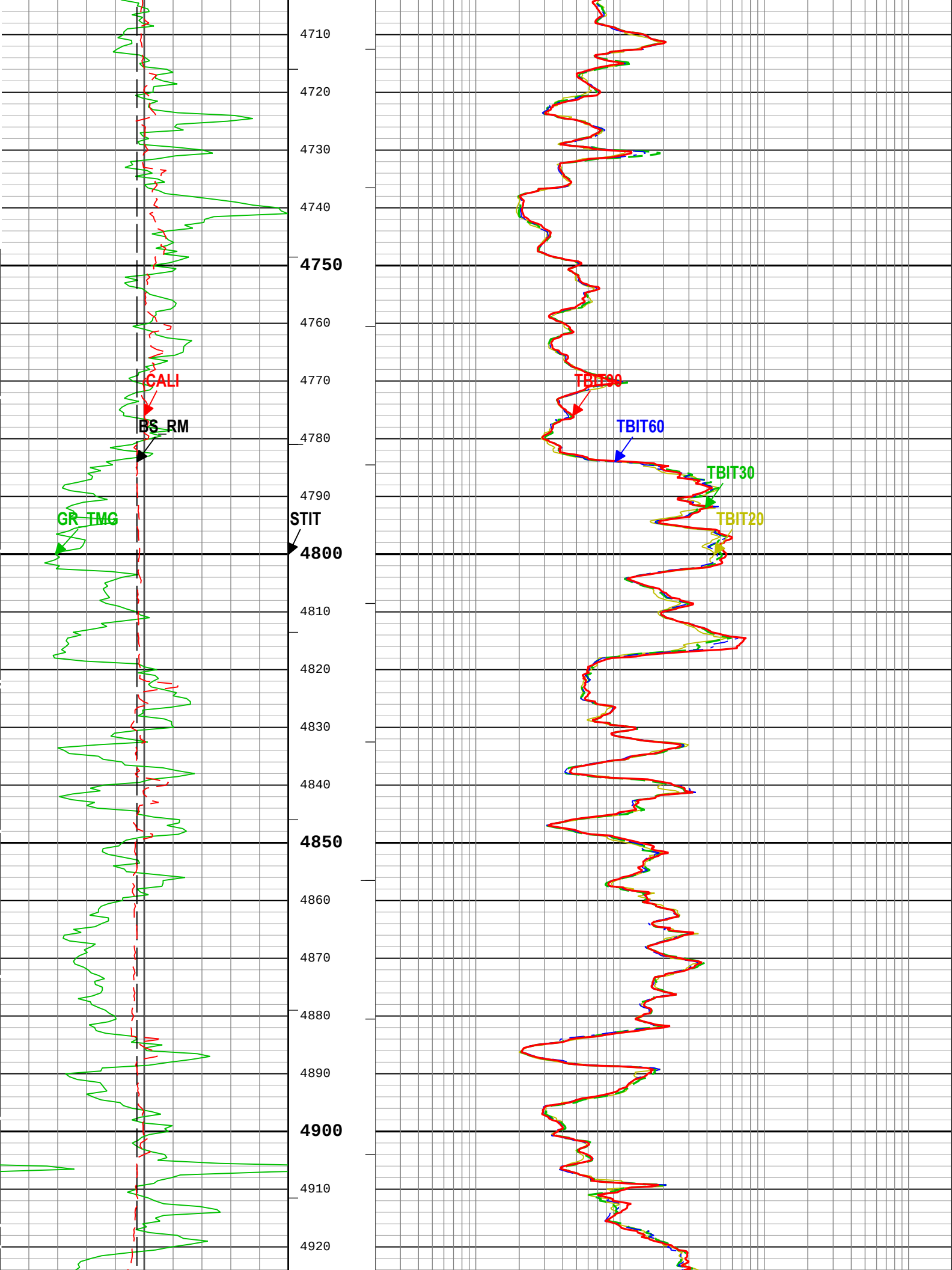

3610
3620
3630
3640
3650
3660
3670
3680
3690
3700
3710
3720
3730
3740
3750
3760
3770
3780
3790
3800
3810
3820
CALI
BS_RM
TBIT90
TBIT60

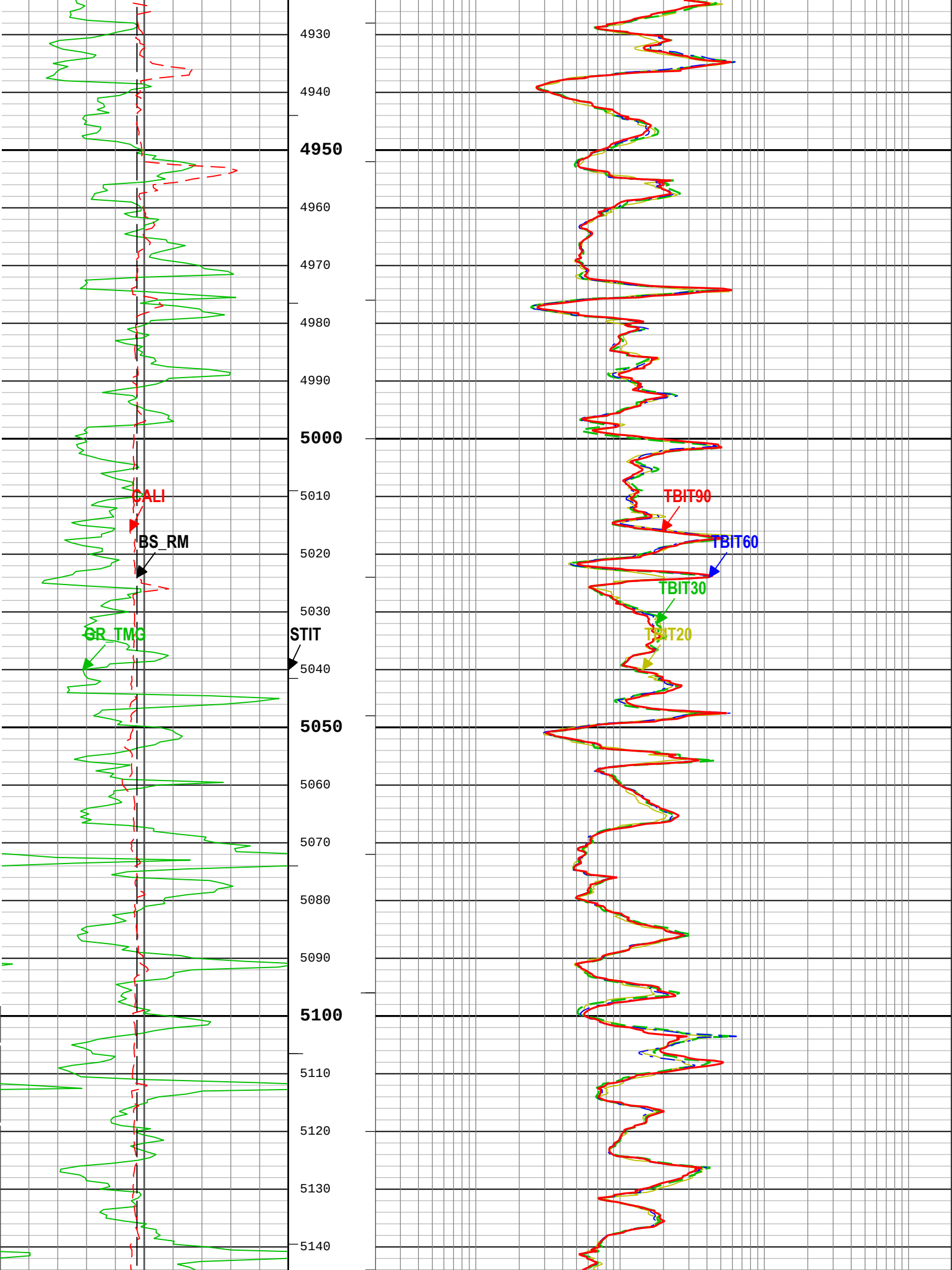

GR_TMG
STIT
TBIT30
TBIT20
3830
3840
3850
3860
3870
3880
3890
3900
3910
3920
3930
3940
3950
3960
3970
3980
3990
4000
4010
4020
4030
4040

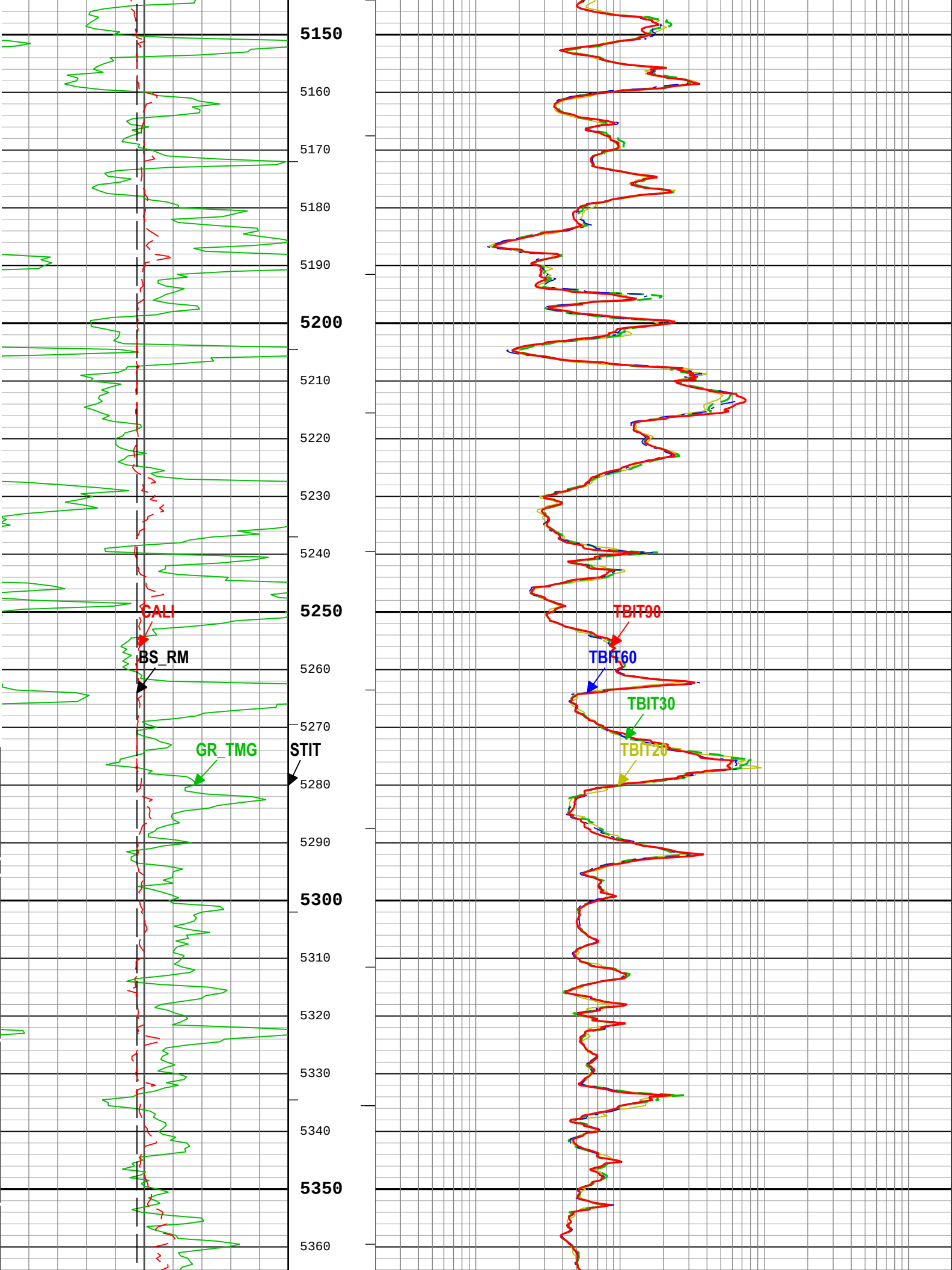

CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20
4050
4060
4070
4080
4090
4100
4110
4120
4130
4140
4150
4160
4170
4180
4190
4200
4210
4220
4230
4240
4250
4260

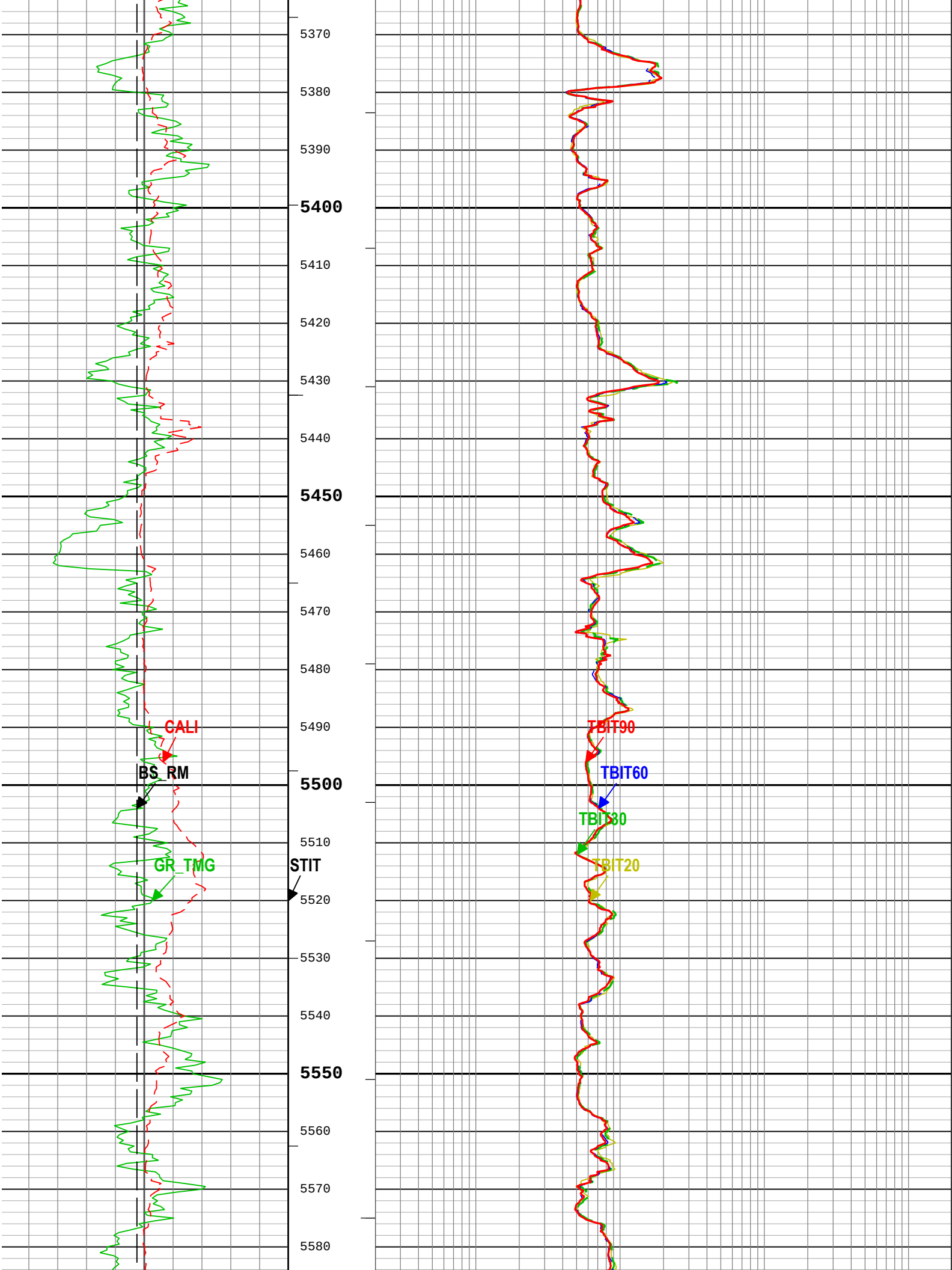

CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20
4270
4280
4290
4300
4310
4320
4330
4340
4350
4360
4370
4380
4390
4400
4410
4420
4430
4440
4450
4460
4470
4480

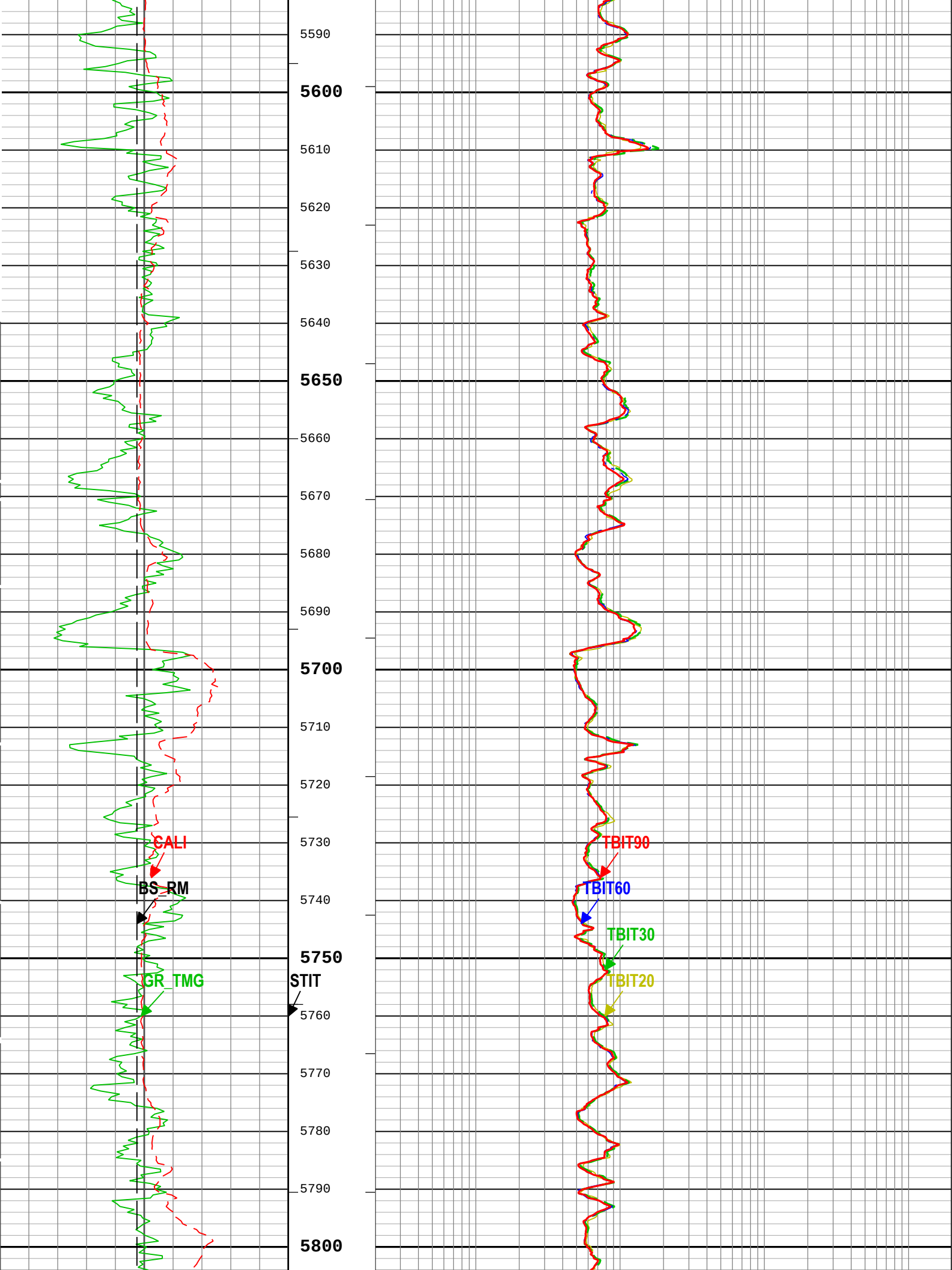

CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20
4490
4500
4510
4520
4530
4540
4550
4560
4570
4580
4590
4600
4610
4620
4630
4640
4650
4660
4670
4680
4690
4700

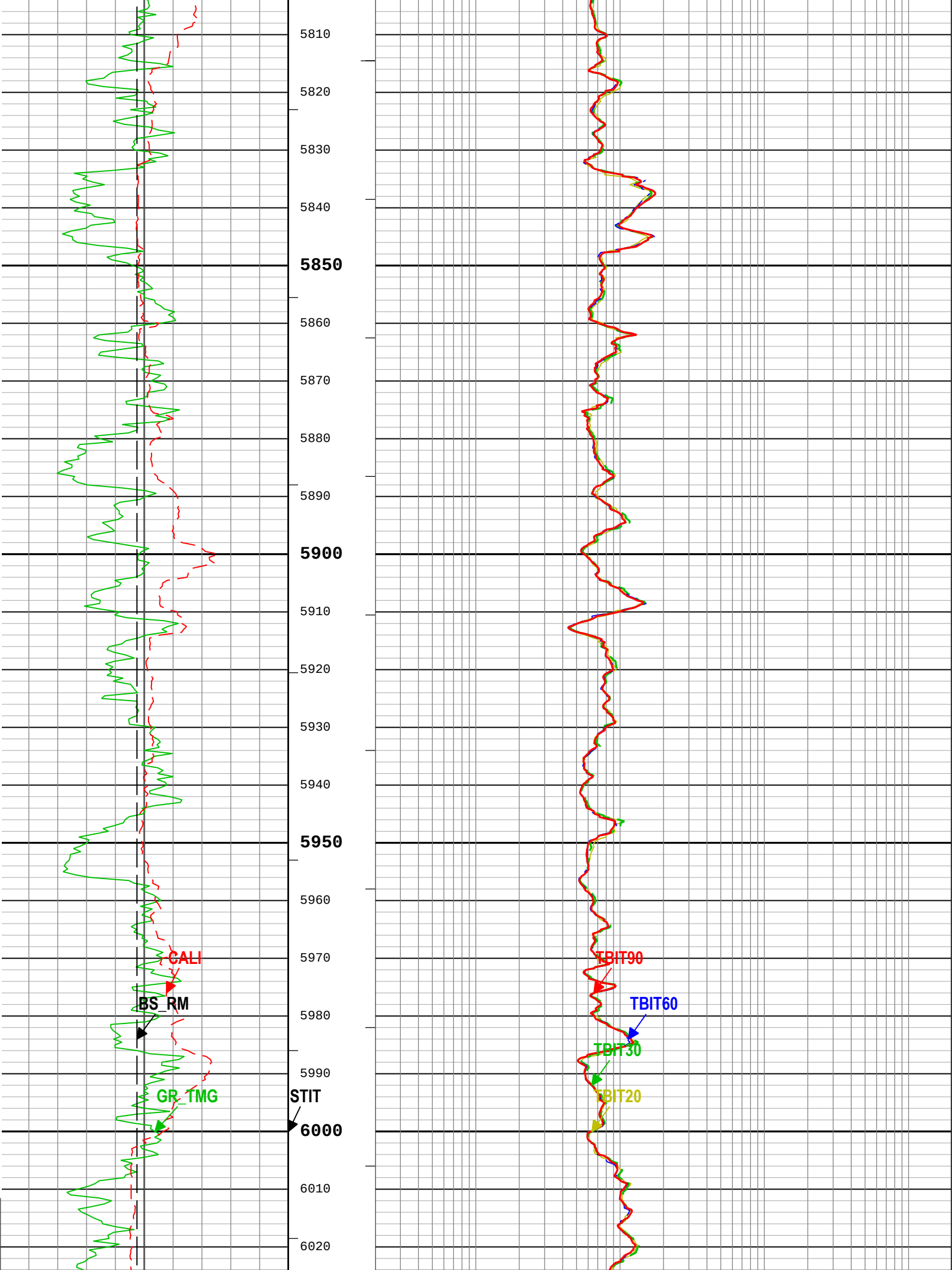

4710
4720
4730
4740
4750
4760
4770
4780
4790
4800
4810
4820
4830
4840
4850
4860
4870
4880
4890
4900
4910
4920
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

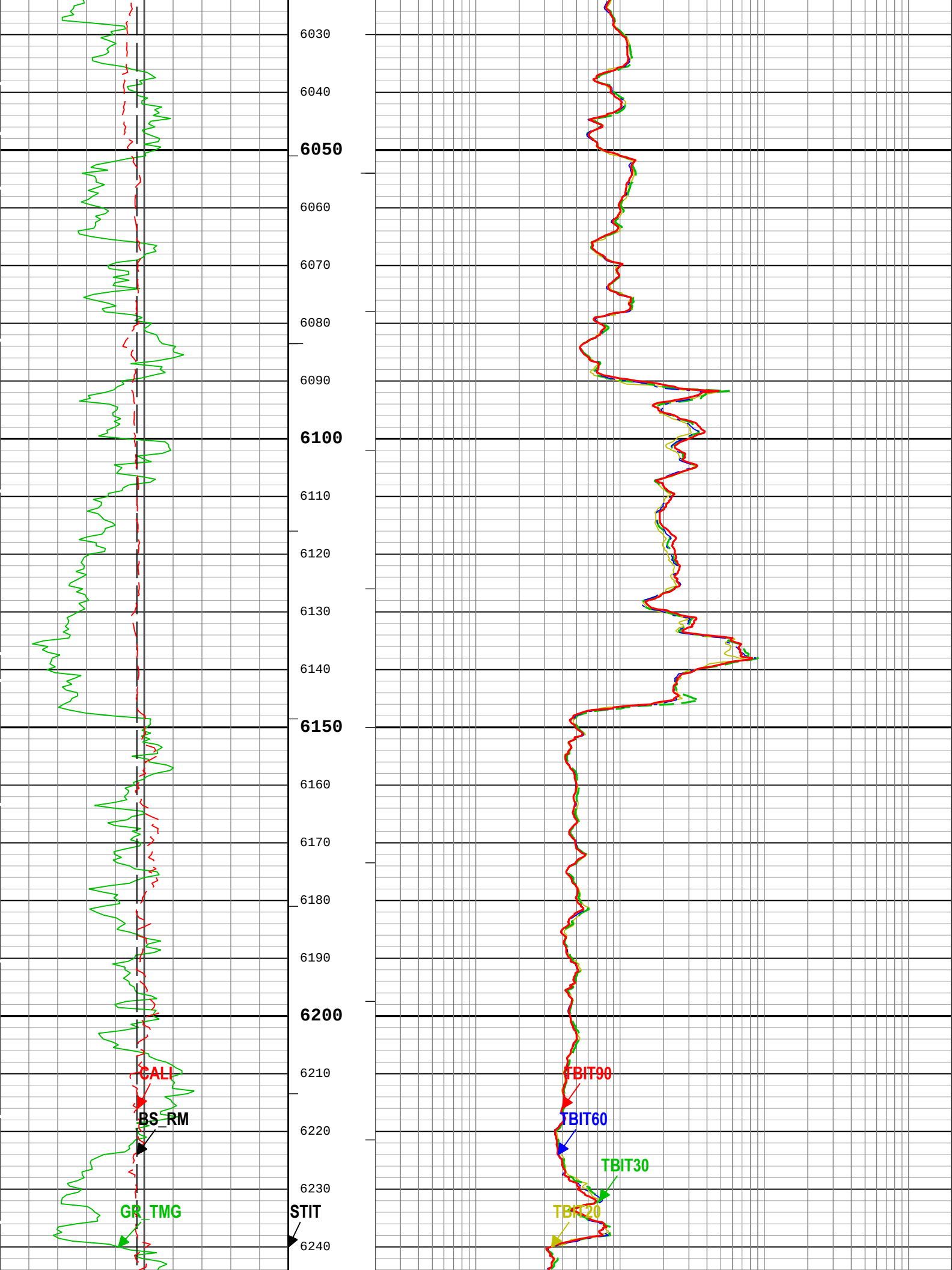

4930
4940
4950
4960
4970
4980
4990
5000
5010
5020
5030
5040
5050
5060
5070
5080
5090
5100
5110
5120
5130
5140
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

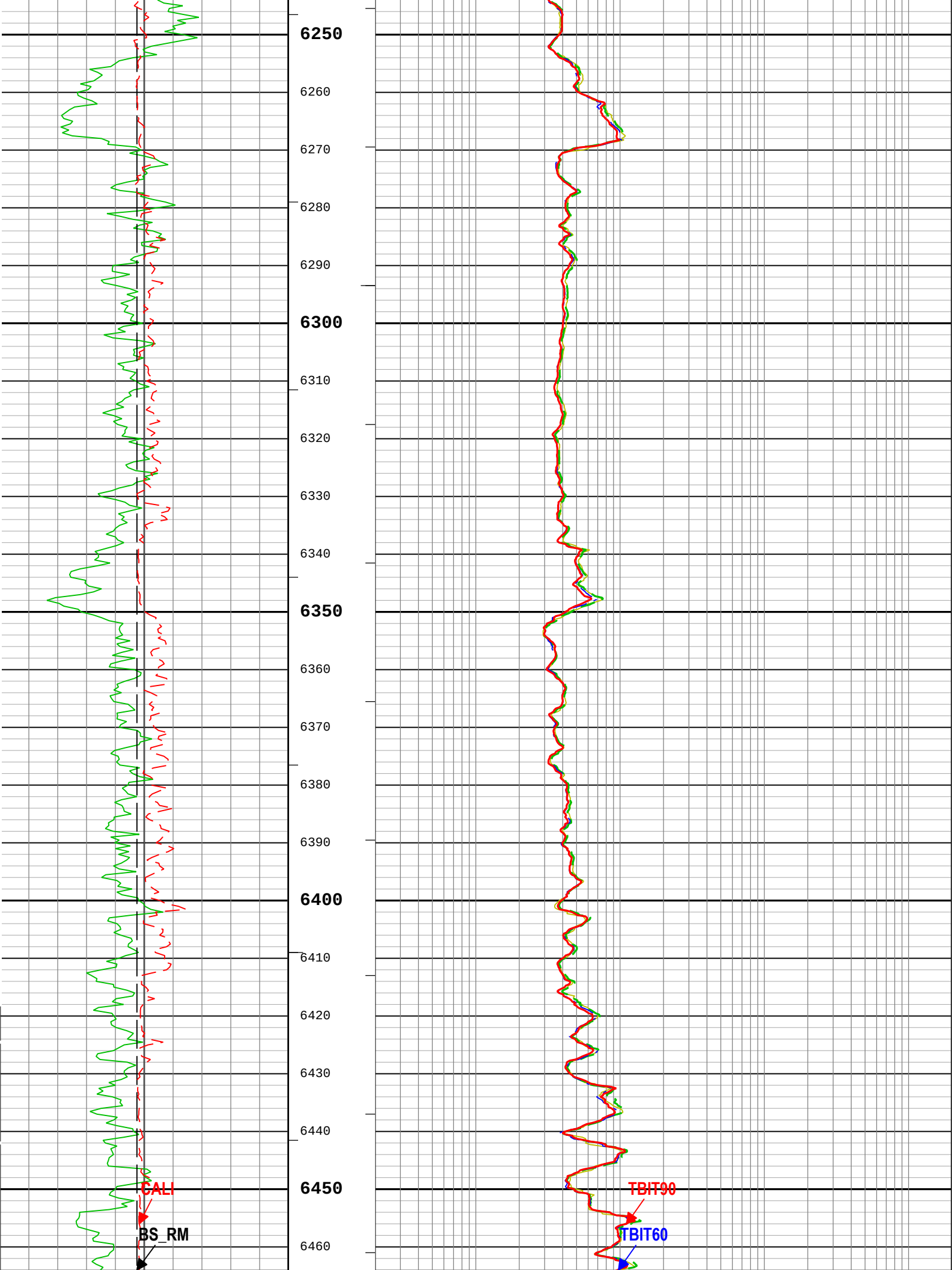

5150
5160
5170
5180
5190
5200
5210
5220
5230
5240
5250
5260
5270
5280
5290
5300
5310
5320
5330
5340
5350
5360
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

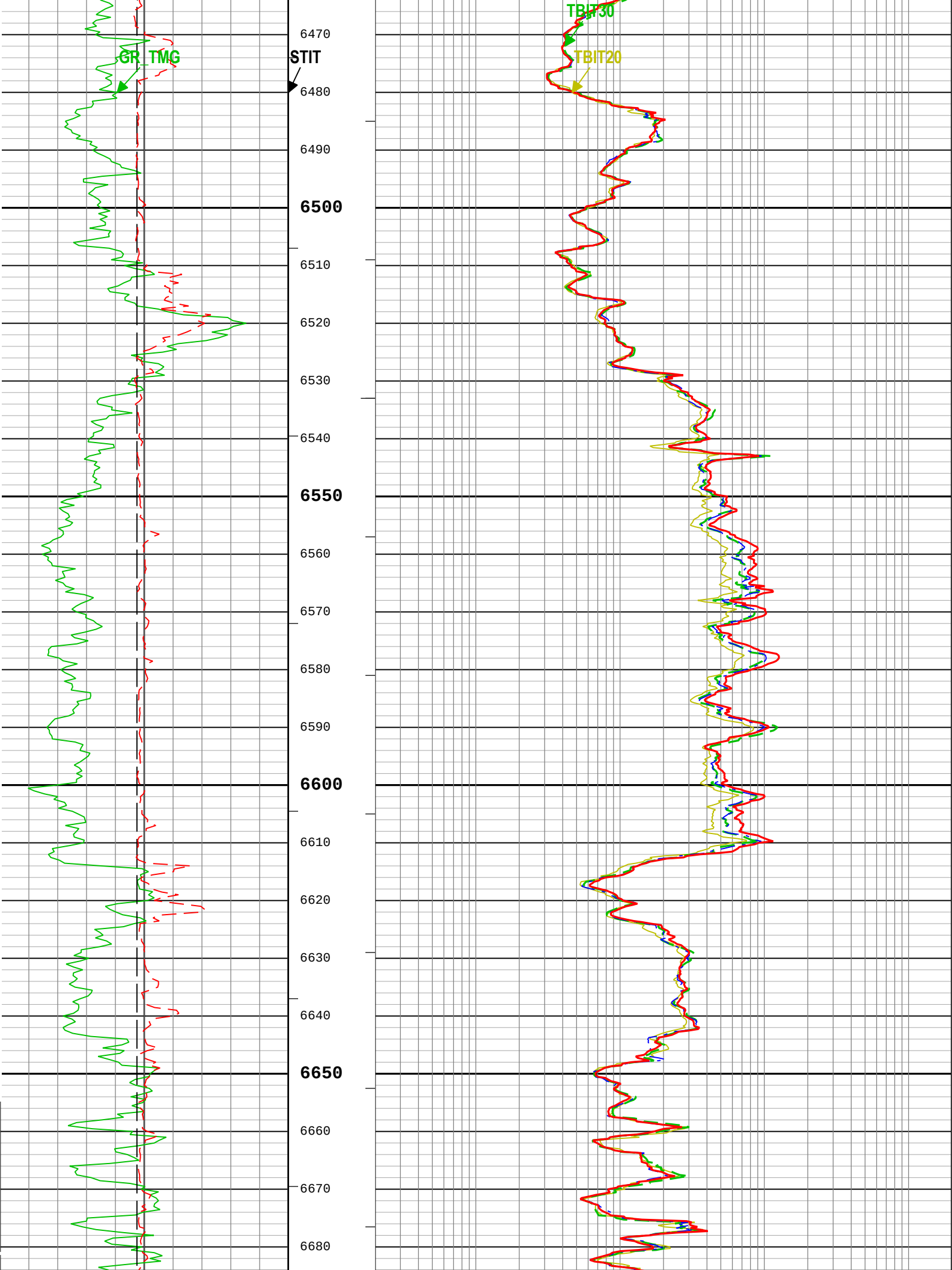

5370
5380
5390
5400
5410
5420
5430
5440
5450
5460
5470
5480
5490
5500
5510
5520
5530
5540
5550
5560
5570
5580
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

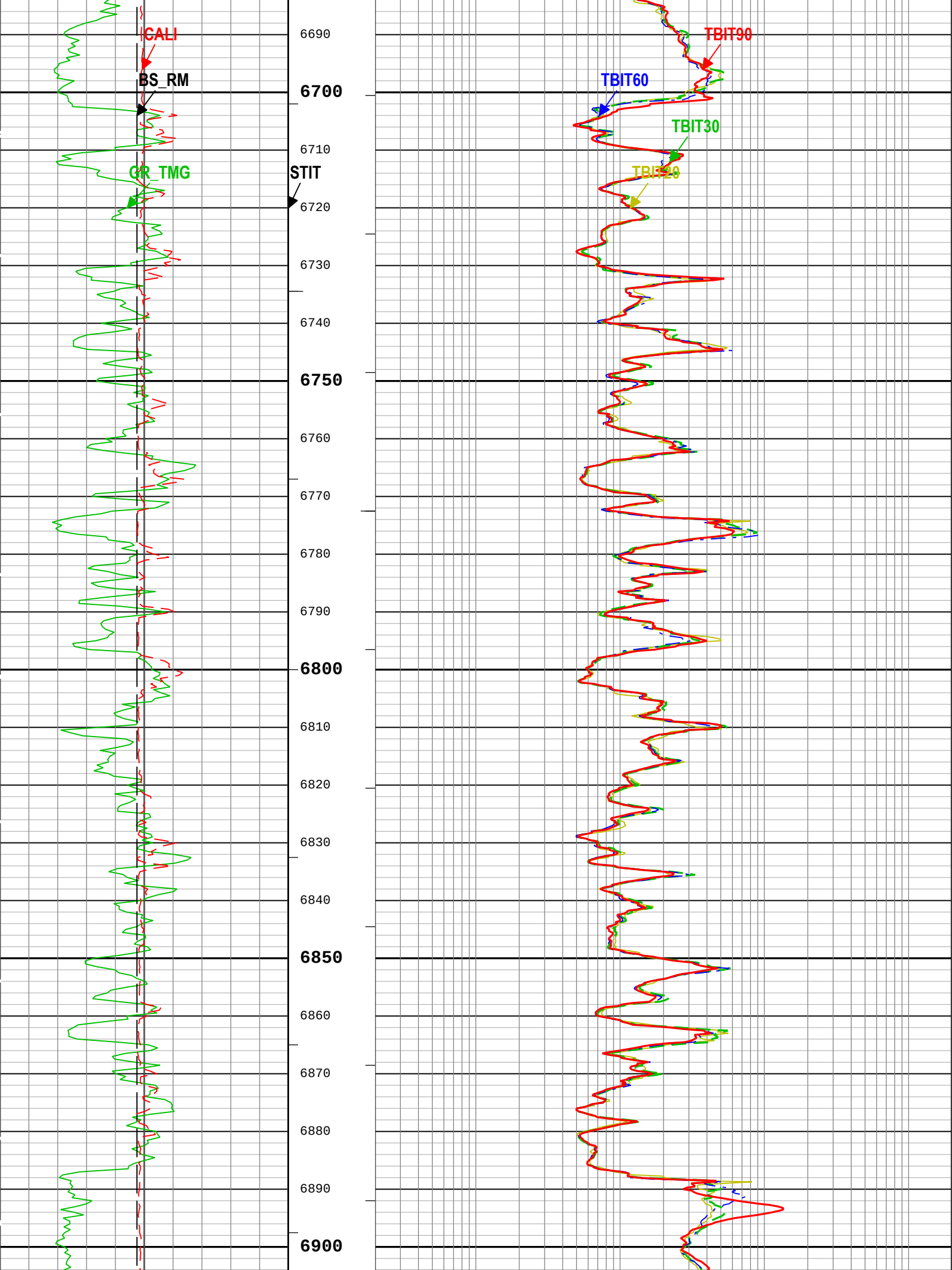

5590
5600
5610
5620
5630
5640
5650
5660
5670
5680
5690
5700
5710
5720
5730
5740
5750
5760
5770
5780
5790
5800
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

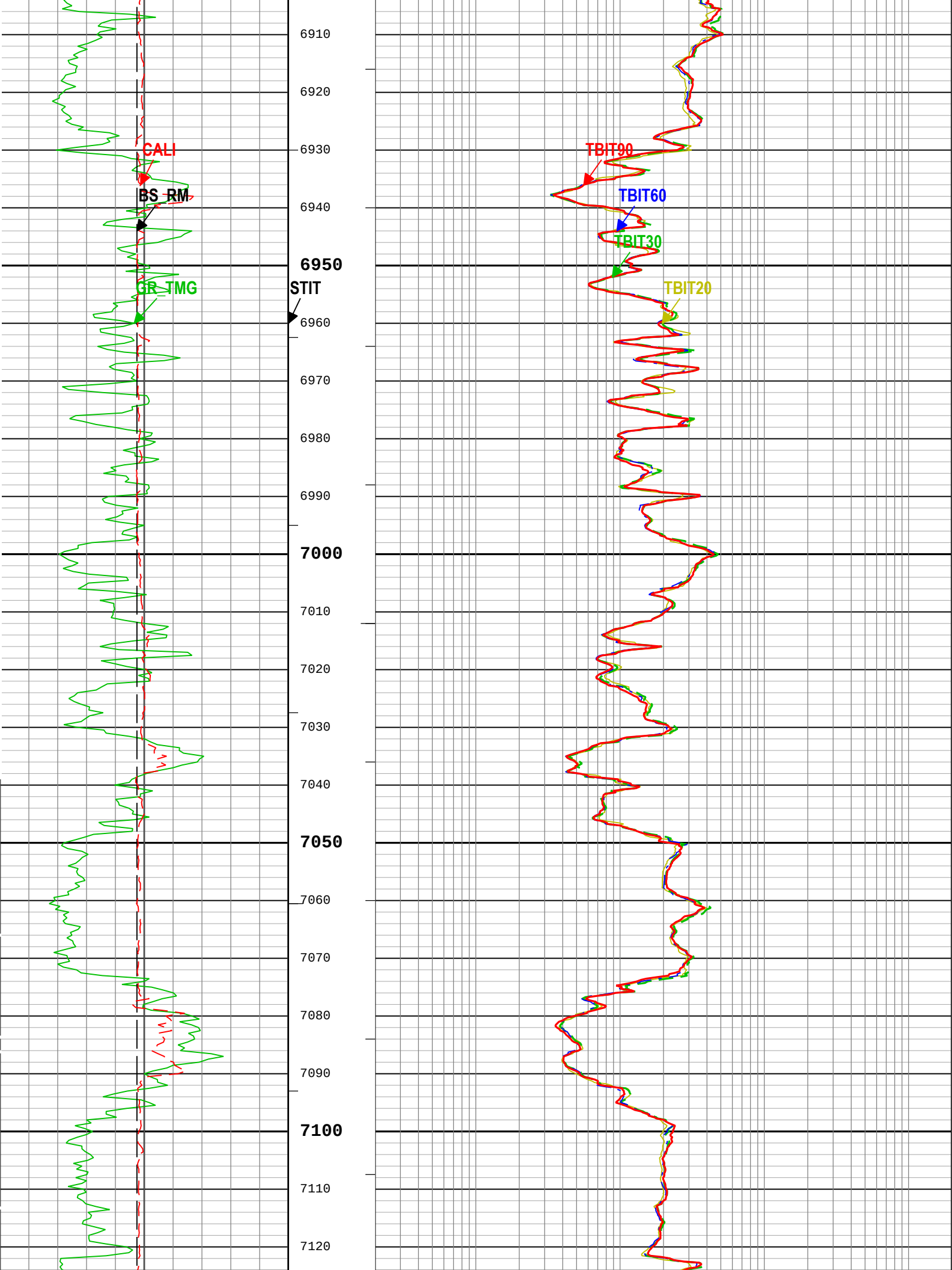

5810
5820
5830
5840
5850
5860
5870
5880
5890
5900
5910
5920
5930
5940
5950
5960
5970
5980
5990
6000
6010
6020
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

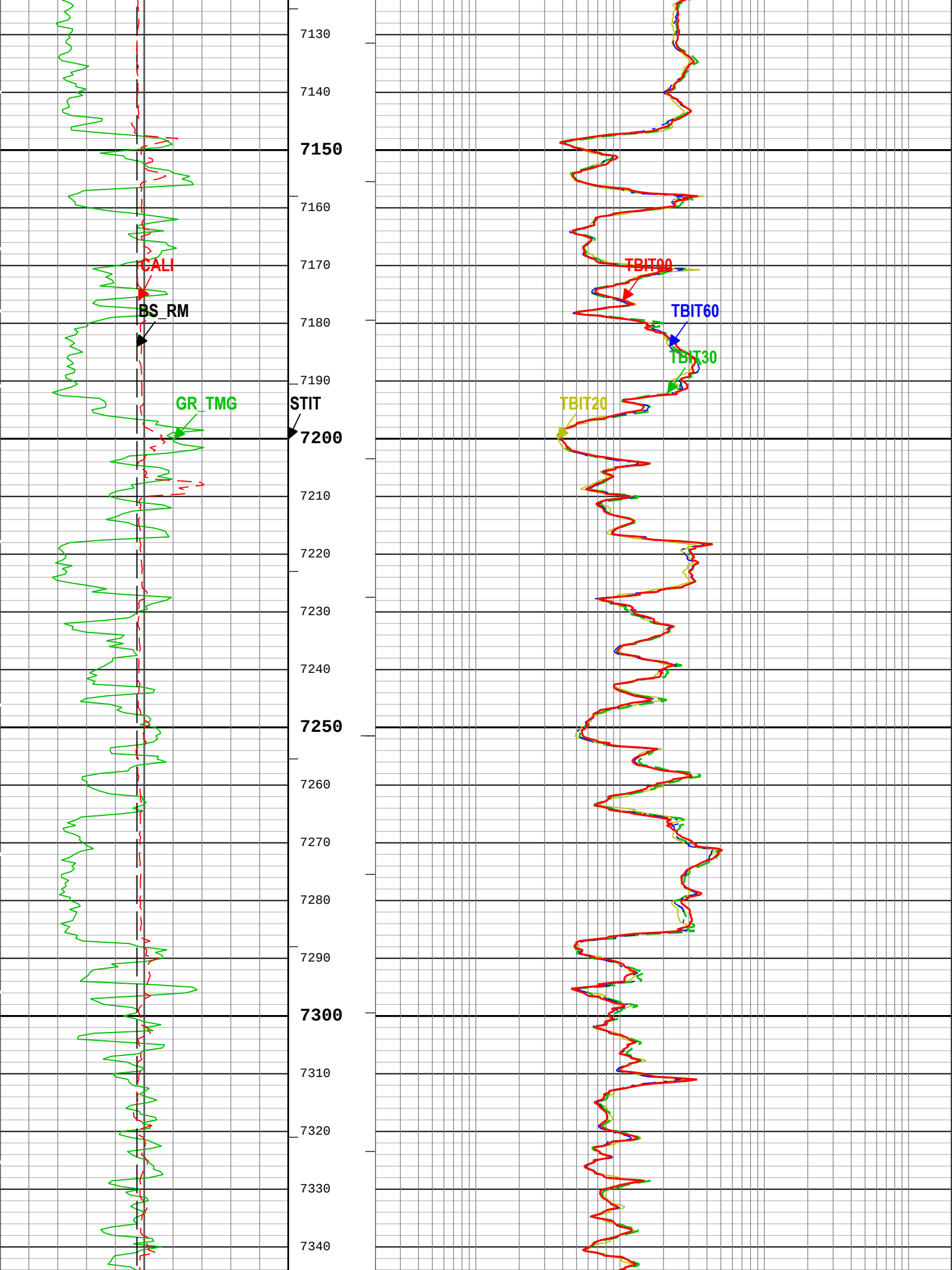

6030
6040
6050
6060
6070
6080
6090
6100
6110
6120
6130
6140
6150
6160
6170
6180
6190
6200
6210
6220
6230
6240
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

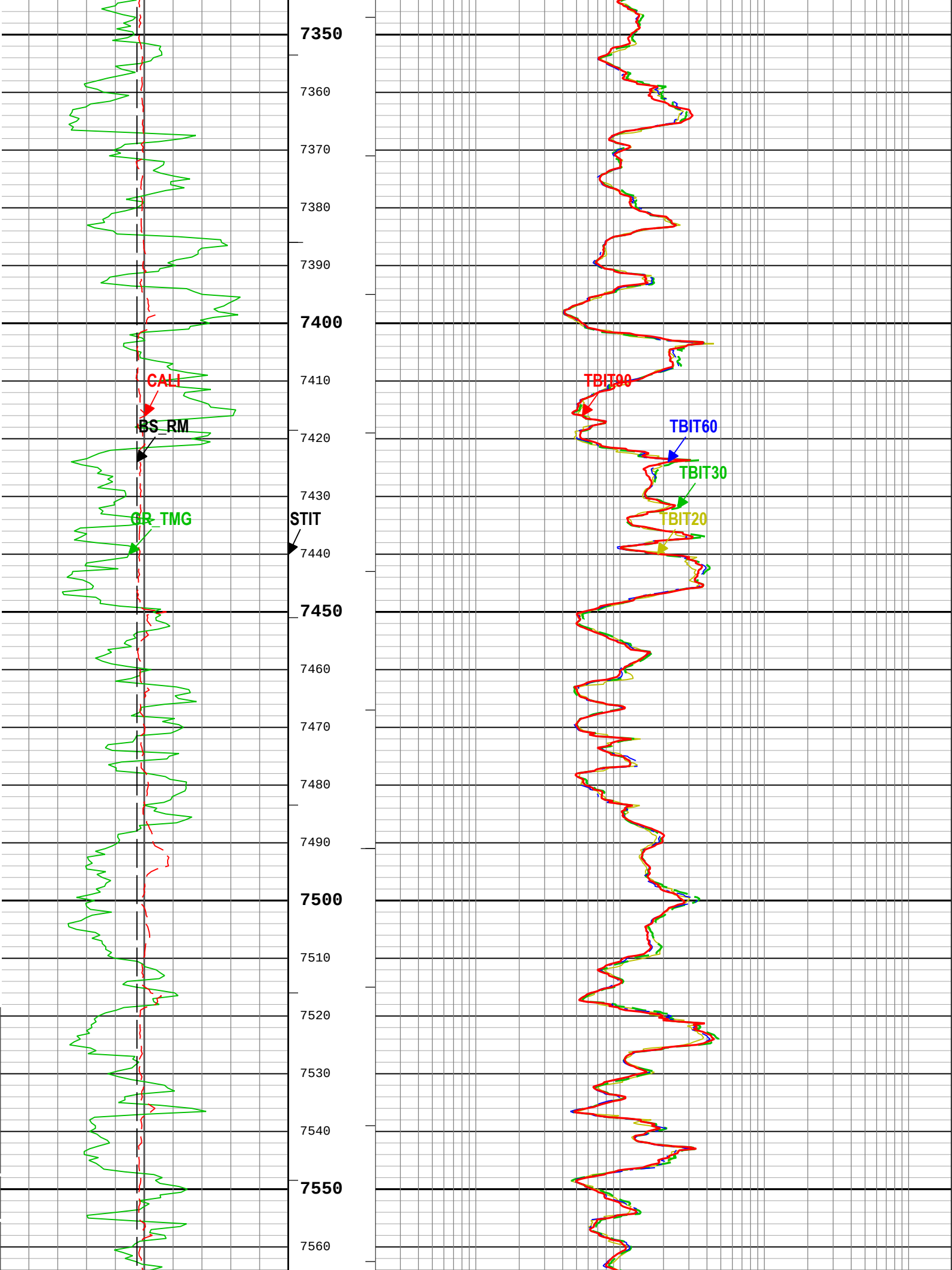

6250
6260
6270
6280
6290
6300
6310
6320
6330
6340
6350
6360
6370
6380
6390
6400
6410
6420
6430
6440
6450
6460
CALI
BS_RM
TBIT90
TBIT60

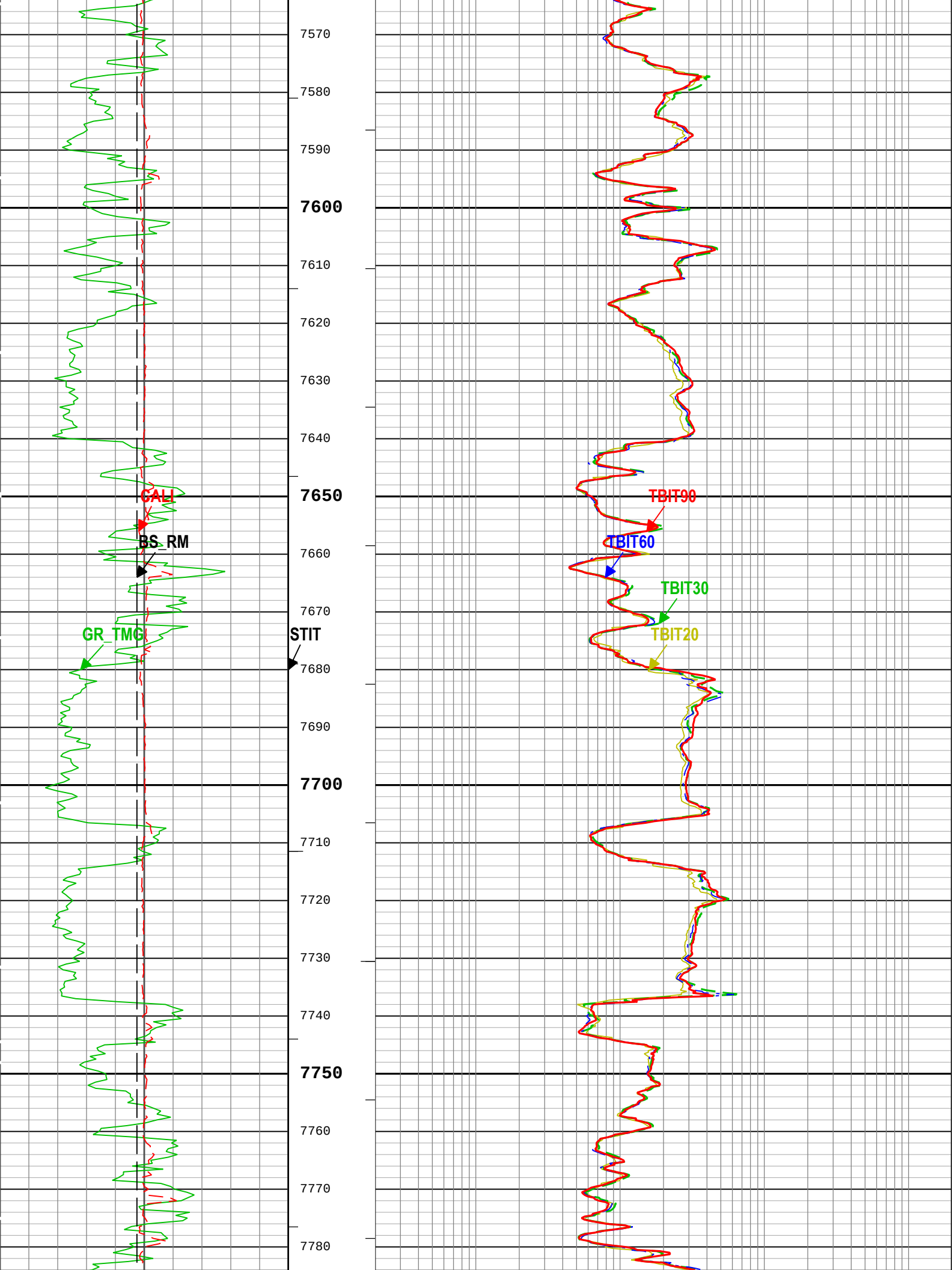

GR_TMG
STIT
TBIT30
TBIT20
6470
6480
6490
6500
6510
6520
6530
6540
6550
6560
6570
6580
6590
6600
6610
6620
6630
6640
6650
6660
6670
6680

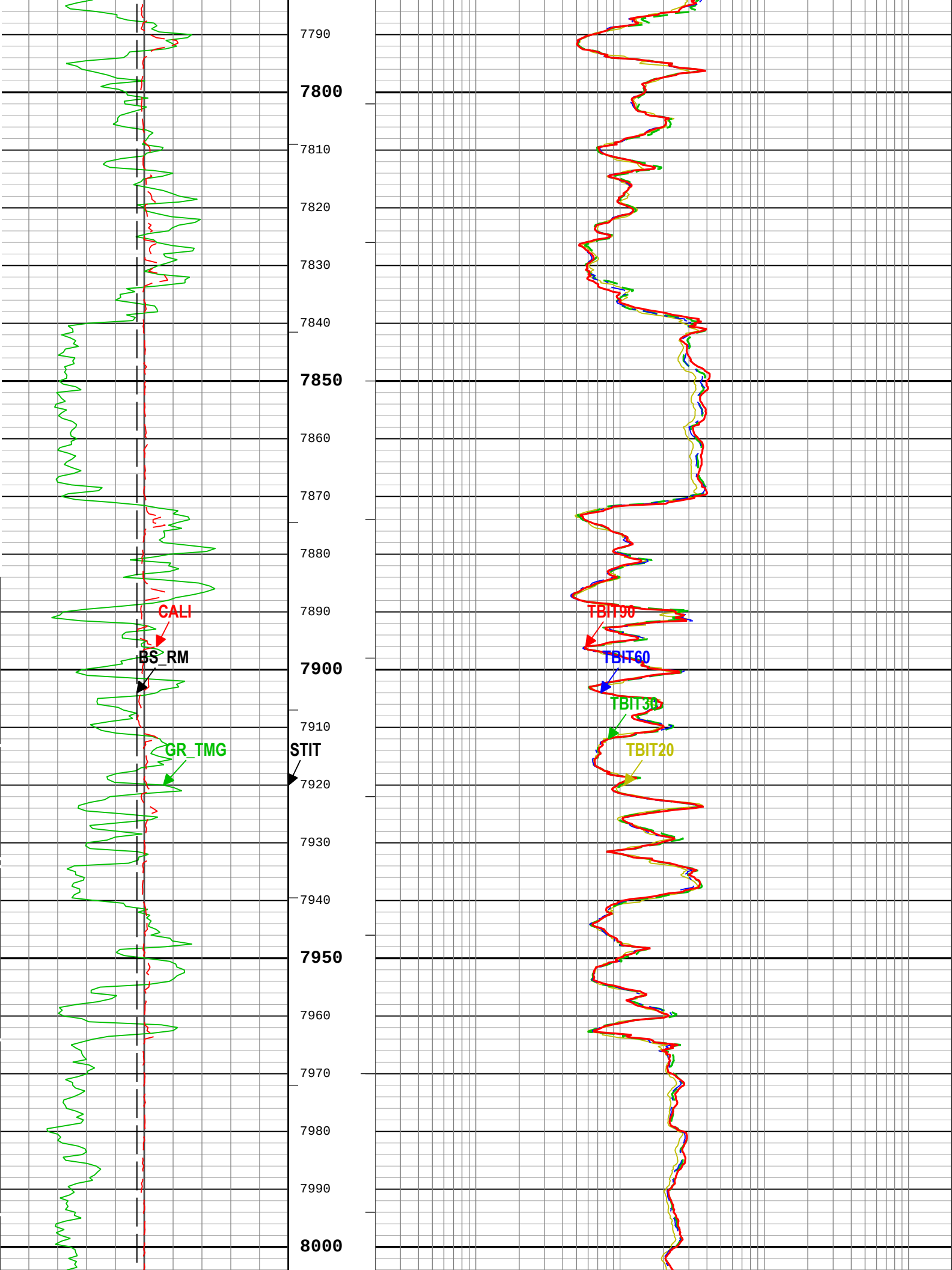

CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20
6690
6700
6710
6720
6730
6740
6750
6760
6770
6780
6790
6800
6810
6820
6830
6840
6850
6860
6870
6880
6890
6900

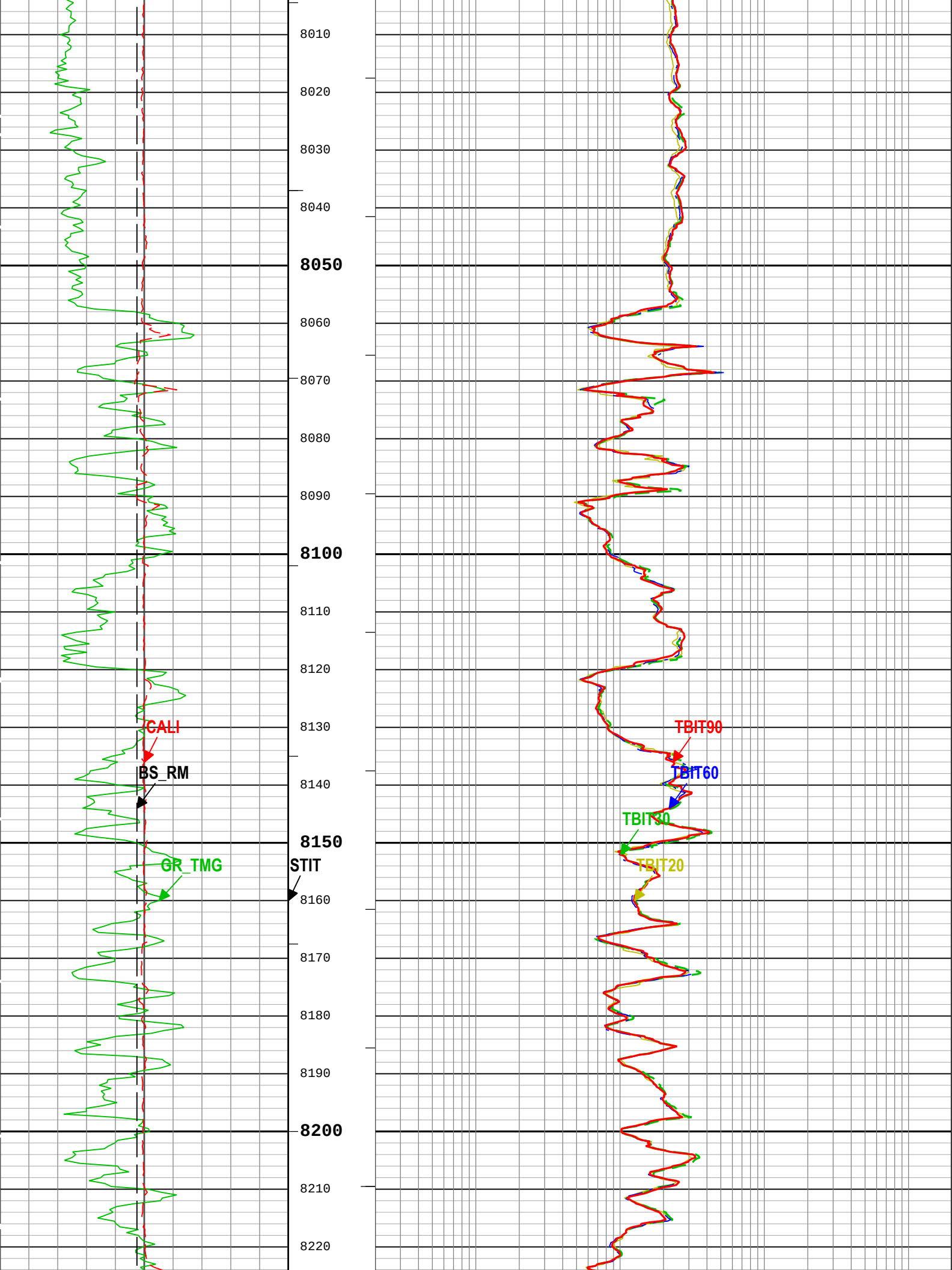

CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20
6910
6920
6930
6940
6950
6960
6970
6980
6990
7000
7010
7020
7030
7040
7050
7060
7070
7080
7090
7100
7110
7120

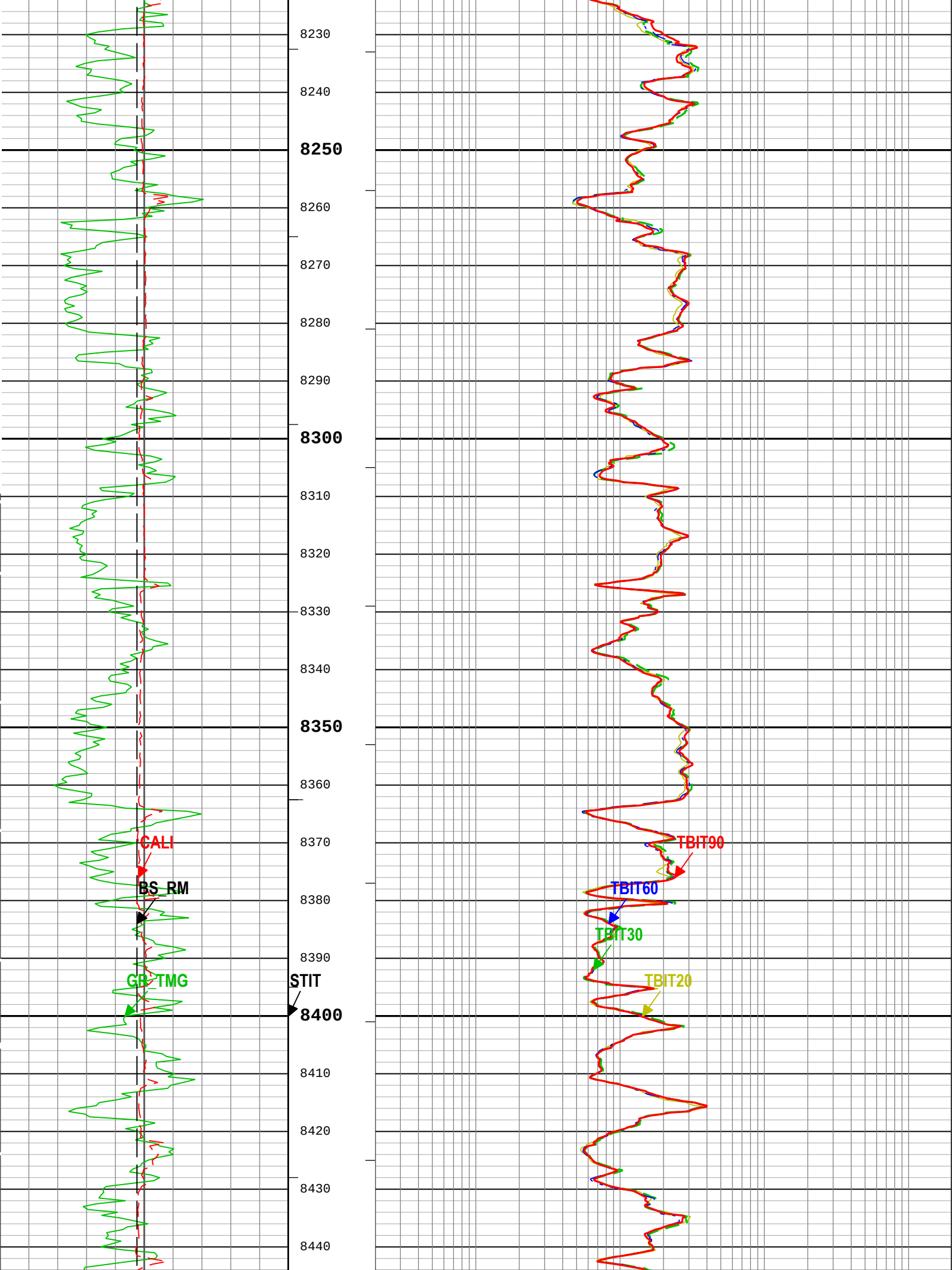

CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20
7130
7140
7150
7160
7170
7180
7190
7200
7210
7220
7230
7240
7250
7260
7270
7280
7290
7300
7310
7320
7330
7340

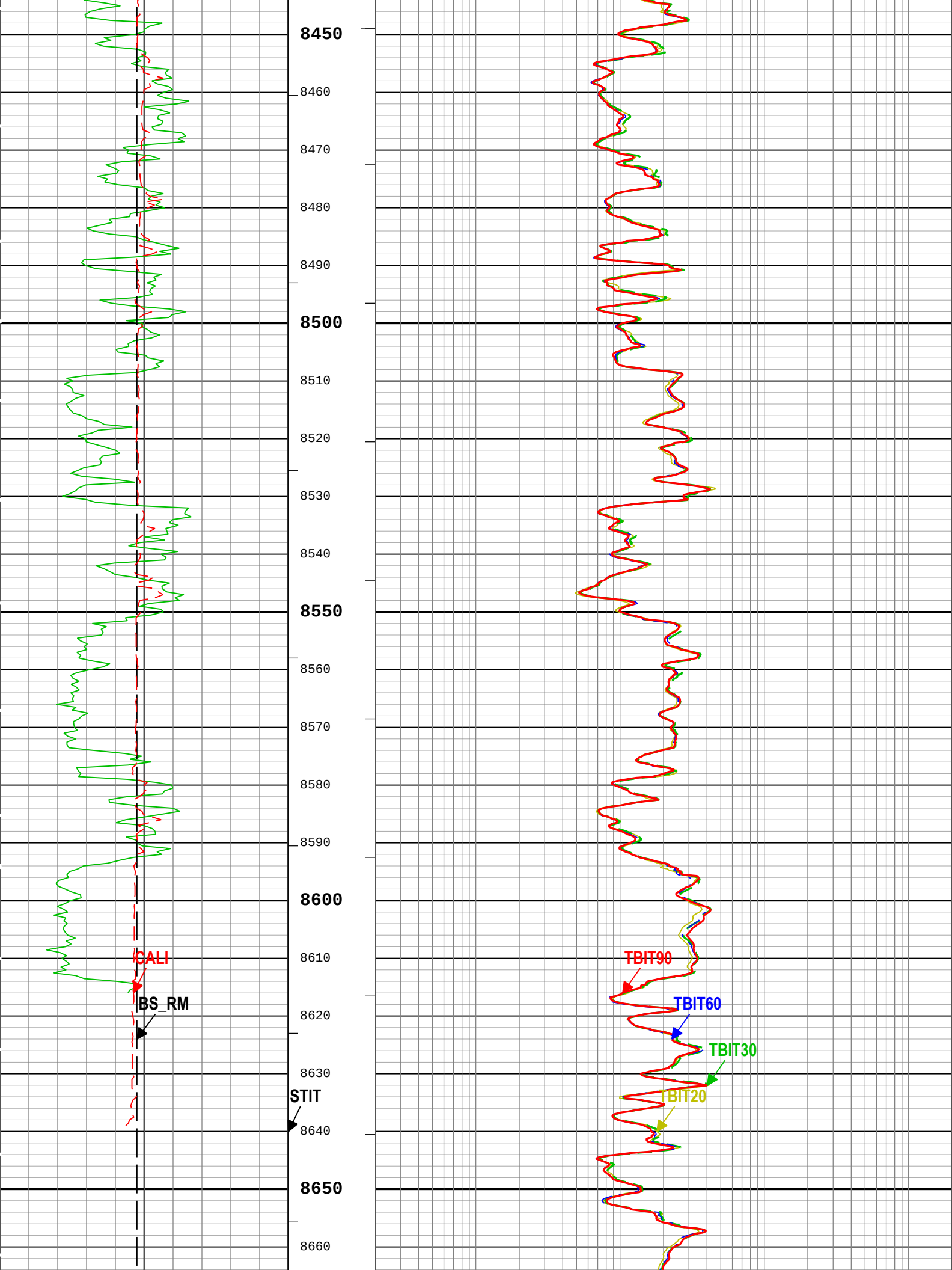

7350
7360
7370
7380
7390
7400
7410
7420
7430
7440
7450
7460
7470
7480
7490
7500
7510
7520
7530
7540
7550
7560
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20

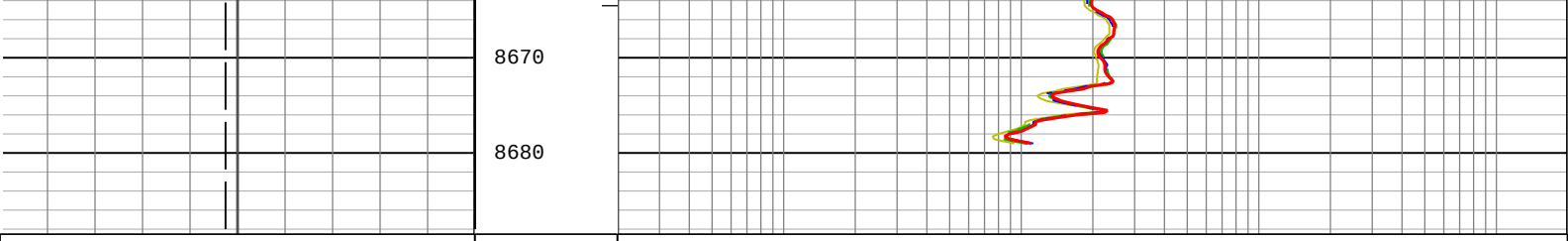

7570
7580
7590
7600
7610
7620
7630
7640
7650
7660
7670
7680
7690
7700
7710
7720
7730
7740
7750
7760
7770
7780
CALI
BS_RM
GR_TMGI
STIT
TBIT90
TBIT60
TBIT30
TBIT20


7790
7800
7810
7820
7830
7840
7850
7860
7870
7880
7890
7900
7910
7920
7930
7940
7950
7960
7970
7980
7990
8000
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20


8010
8020
8030
8040
8050
8060
8070
8080
8090
8100
8110
8120
8130
8140
8150
8160
8170
8180
8190
8200
8210
8220
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20


8230
8240
8250
8260
8270
8280
8290
8300
8310
8320
8330
8340
8350
8360
8370
8380
8390
8400
8410
8420
8430
8440
CALI
BS_RM
GR_TMG
STIT
TBIT90
TBIT60
TBIT30
TBIT20


8450
8460
8470
8480
8490
8500
8510
8520
8530
8540
8550
8560
8570
8580
8590
8600
8610
8620
8630
8640
8650
8660
CALI
BS_RM
STIT
TBIT90
TBIT60
TBIT30
TBIT20



Calibrated Gamma Ray (GR_TMG) TMG-A RM
0 gAPI 200

Bit Size (BS_RM) RM
4 in 14

Caliper (CALI) TBD-B RM
4 in 14

Stuck Tool Indicator, Total (STIT)
0 ft 50

Thrubit Induction Array Two Foot Resistivity at 20 inch depth of investigation (TBIT20) TBIT-A RM
0.2 ohm.m 2000

Thrubit Induction Array Two Foot Resistivity at 30 inch depth of investigation (TBIT30) TBIT-A RM
0.2 ohm.m 2000

Thrubit Induction Array Two Foot Resistivity at 60 inch depth of investigation (TBIT60) TBIT-A RM
0.2 ohm.m 2000

Thrubit Induction Array Two Foot Resistivity at 90 inch depth of investigation (TBIT90) TBIT-A RM
0.2 ohm.m 2000

Cable Tension (TENS)
10000 lbf 0

ICV_RM - Integrated Cement Volume every 100.00 (ft3)

ICV_RM - Integrated Cement Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

IHV_RM - Integrated Hole Volume every 100.00 (ft3)

IHV_RM - Integrated Hole Volume every 10.00 (ft3)

Description: ThruBit_TBI_2ft_RM Format: Log (ThruBit_TBI_2ft_RM) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 27-Apr-2019 13:13:14

Channel Processing Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	TBD-B	-0.7	in
CBLO	Casing Bottom (Logger)	WLSESSION	2509	ft
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
FCD	Future Casing (Outer) Diameter	WLSESSION	4.5	in
HSCOT	Hole Size Correction Option (None, Bit Size, Density Caliper, GCSE)	TBIT-A	GCSE	
TBI_TC_OP	Induction Temperature Correction Option	TBIT-A	Lower	
TBI_REPL_ARRAY_DEST	Thrubit Induction Array to Replace	TBIT-A	None	
TBI_REPL_ARRAY_SOURCE	Thrubit Induction Array to Replace with	TBIT-A	None	
TBI_RMUD_SRC	TBI Mud Resistivity Source for Borehole Correction	TBIT-A	Data_Channel_RMUD	
TD	Total Measured Depth	Borehole	8679	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	2500	2509

BS	8.75	2509	8679

All depth are actual.

Tool Control Parameters

Company:	Caerus Operating LLC
Well:	NPR 13A-8-596
Field:	Grand Valley
County:	Garfield
State:	Colorado

Schlumberger

Resistivity
Array Induction