Weatherford®

COMPENSATED SONIC WITH INTEGRATED TRANSIT TIME

COMPANY	GRAND MESA OPERATING COMPANY
WELL	RINGER #1-24
FIELD	WILDCAT
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	1792' FNL & 1266' FEL

SEC 24	TWP 30S	RGE 12W	Other Services
Latitude			MAI/MFE MPD/MDN
Longitude			MML
API Number	15-007-24329		

Permanent Datum GL, Elevation 1791 feet
Log Measured From KB, 5.00 feet above Permanent Datum
Drilling Measured From KB

Elevations:	feet
KB	1796.00
DF	1794.00
GL	1791.00

Date	24-JUN-2018			
Run Number	ONE			
Service Order	4558-217017166			
Depth Driller	4920.00	feet		
Depth Logger	4914.00	feet		
First Reading	4901.00	feet		
Last Reading	218.00	feet		
Casing Driller	217.00	feet		
Casing Logger	218.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.40 lb/USg		45.00 CP	
PH / Fluid Loss	9.00		11.00 ml/30Min	
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.42 @ 75.0	ohm-m		
Rmf @ Measured Temp	0.34 @ 75.0	ohm-m		
Rmc @ Measured Temp	0.50 @ 75.0	ohm-m		
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.25 @126.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	126.00	deg F		
Equipment / Base	13096		LIB	
Recorded By	ADAM SILL			
Witnessed By	DAVE BARKER			

BOREHOLE RECORD

Last Edited: 24-JUN-2018 08:52

Bit Size inches	Depth From feet	Depth To feet
7.875	217.00	4920.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	217.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 18.01.6830.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
    0.5 INCH STANDOFF USED ON MFE.
    TWO 0.5 INCH STANDOFFS USED ON MSS.
    0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2550 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 2500 FEET: 625 CU.FT.

- RIG: WW DRILLING #4.

- ENGINEER: A. SILL.

- OPERATOR: J. KLINE.

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 24-JUN-2018 16:35
Filename: C:\Minimus 18.01.6830\Data\Grand Mesa Ringer #1-24\Grand Mesa Ringer #1-24_003.dta — Recorded on 24-JUN-2018 13:00
System Versions: Logged with 18.01.6830 Plotted with 18.01.6830

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

206

Casing Shoe

3-5' Compensated Sonic
microsec/foot
140 115 90 65 40

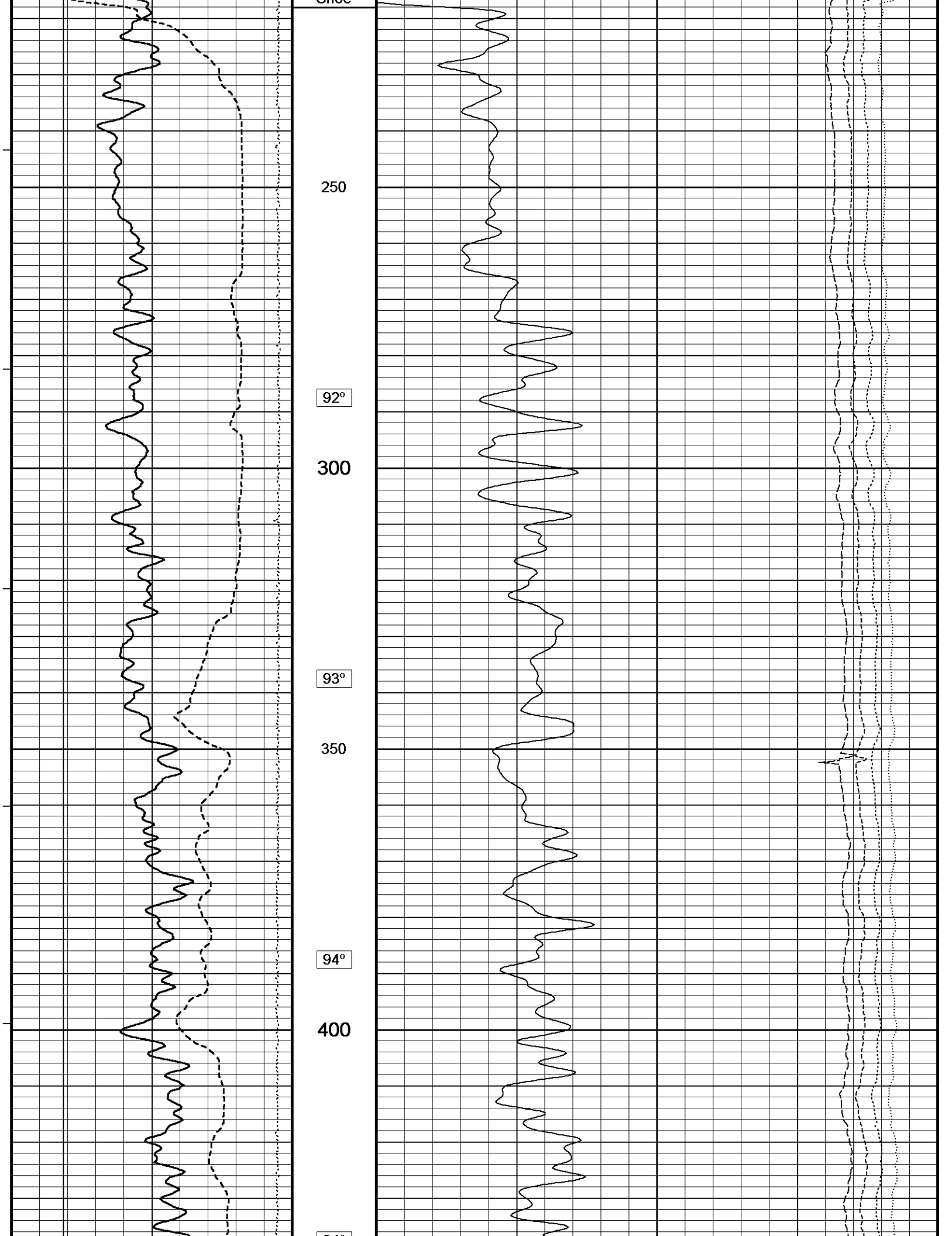
Wyllie Lime. Sonic Por.
percent
30 20 10 0 -10

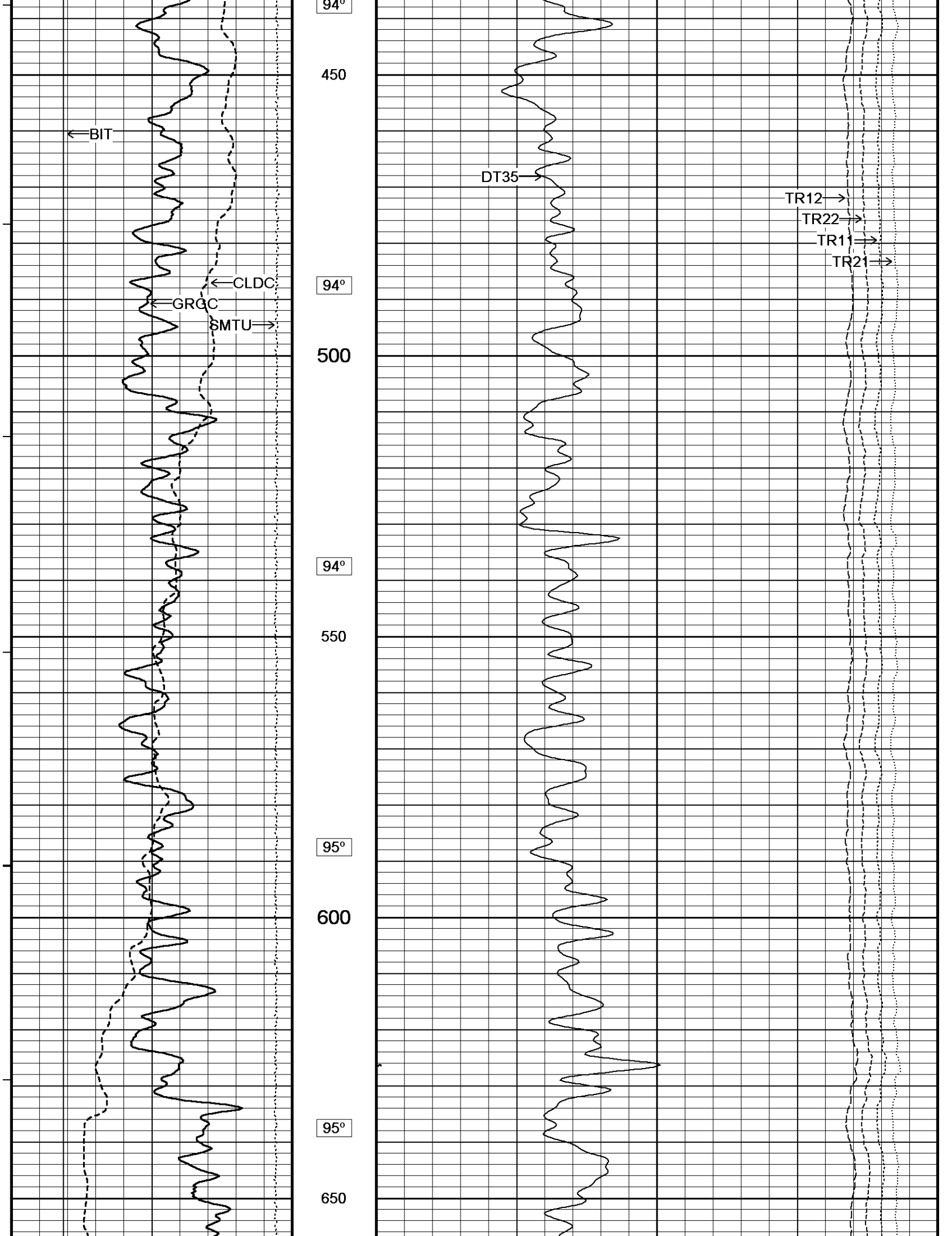
3' Transit Time
microseconds
1100 100

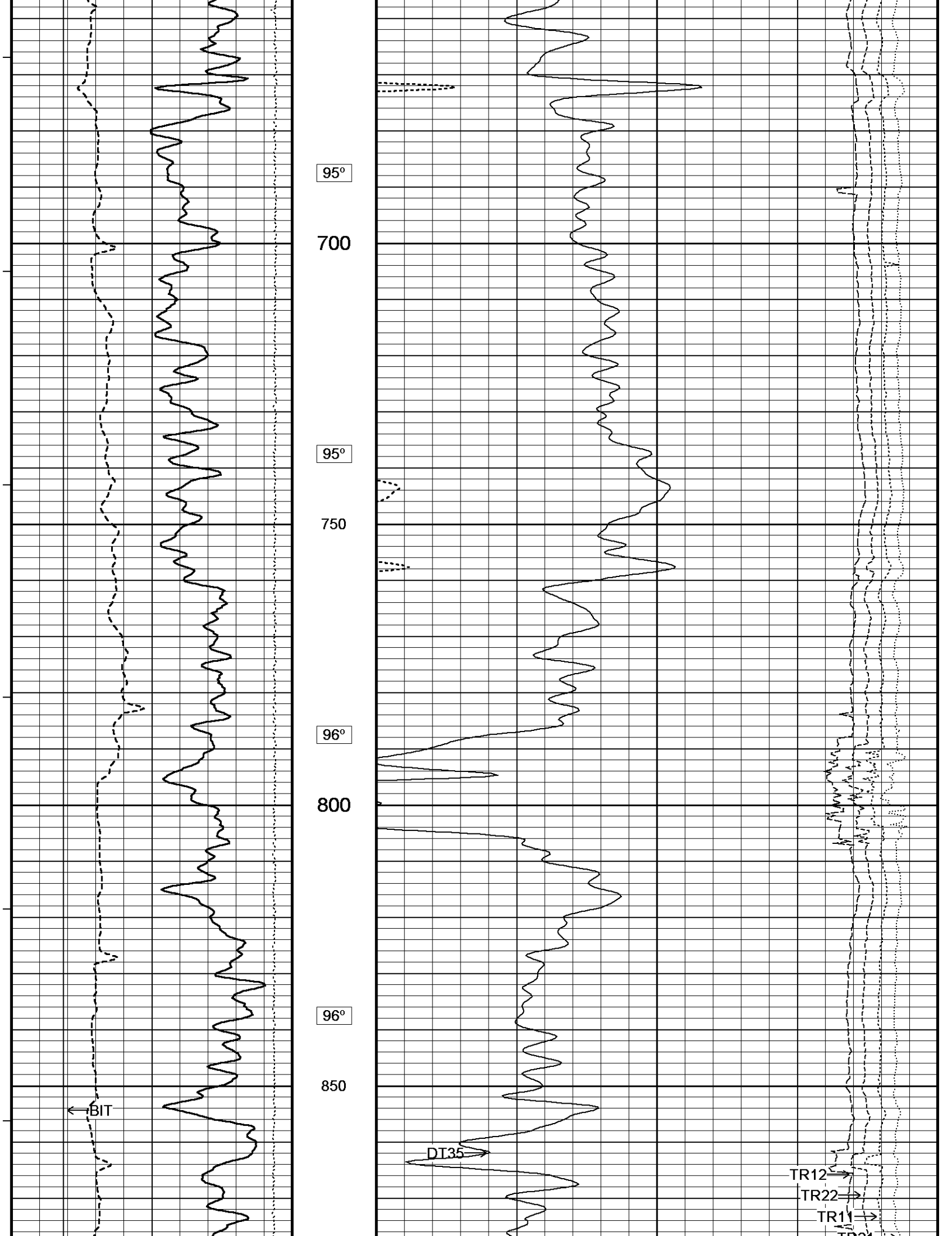
4' Transit Time
microseconds
1100 100

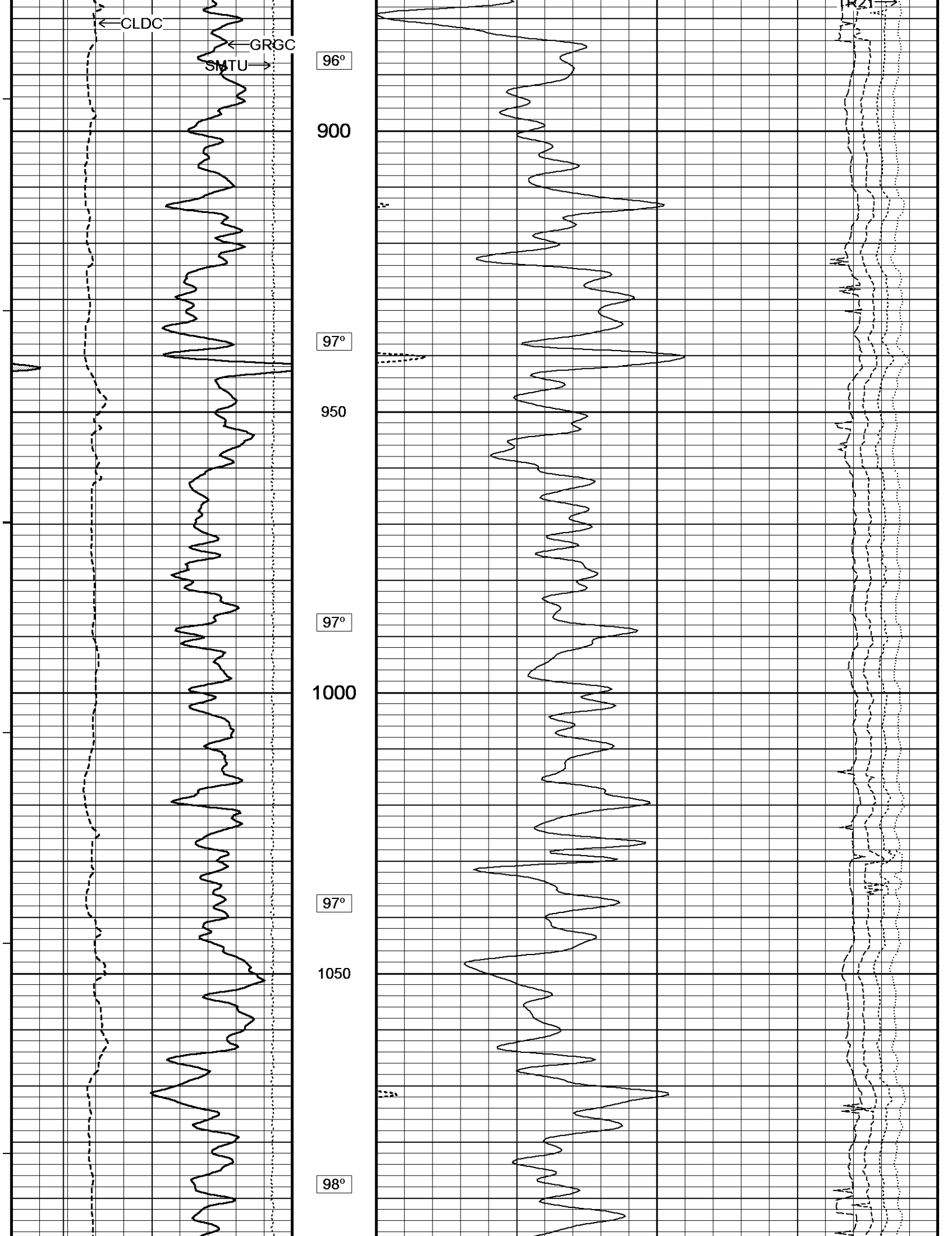
5' Transit Time
microseconds
1100 100

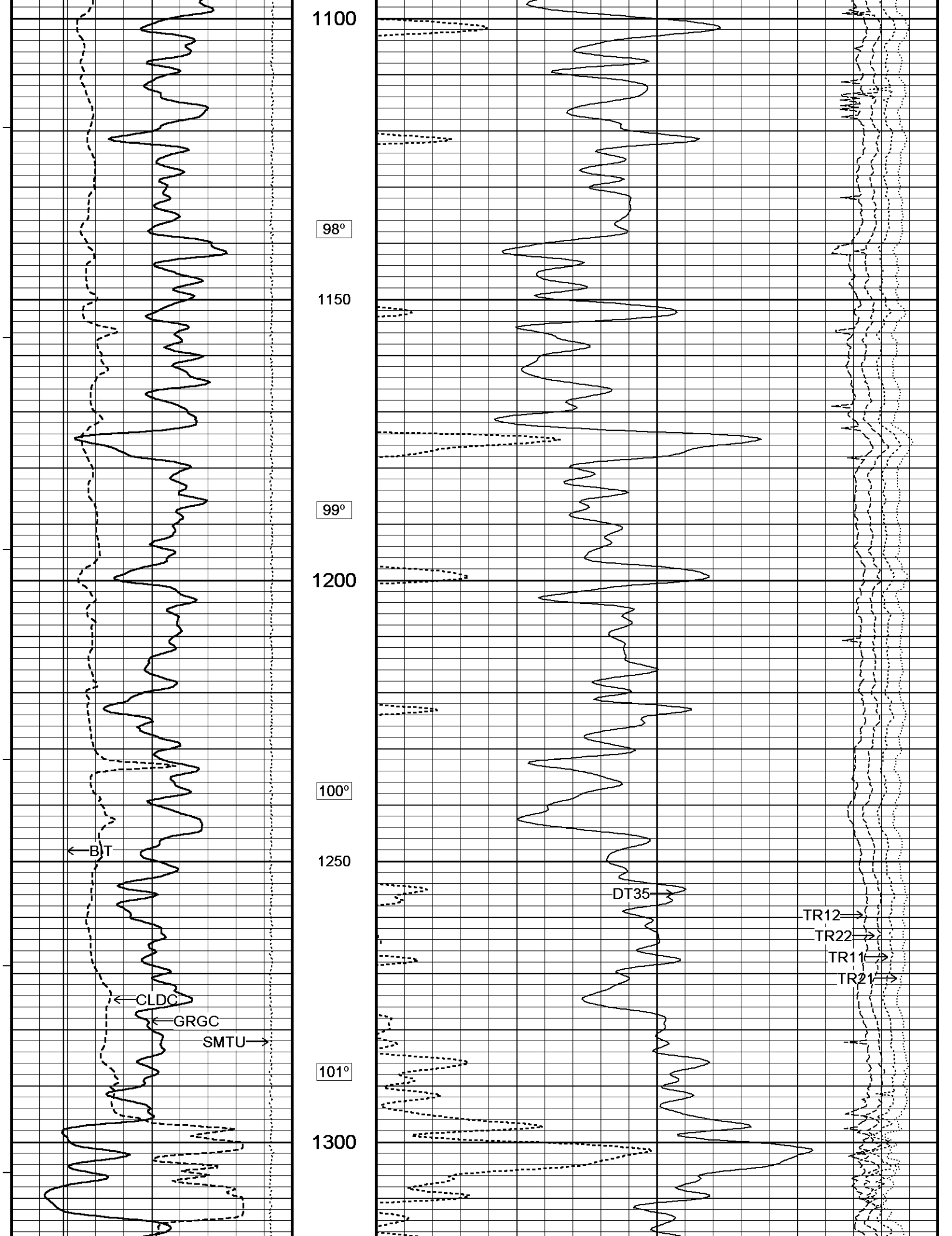
6' Transit Time
microseconds
1100 100

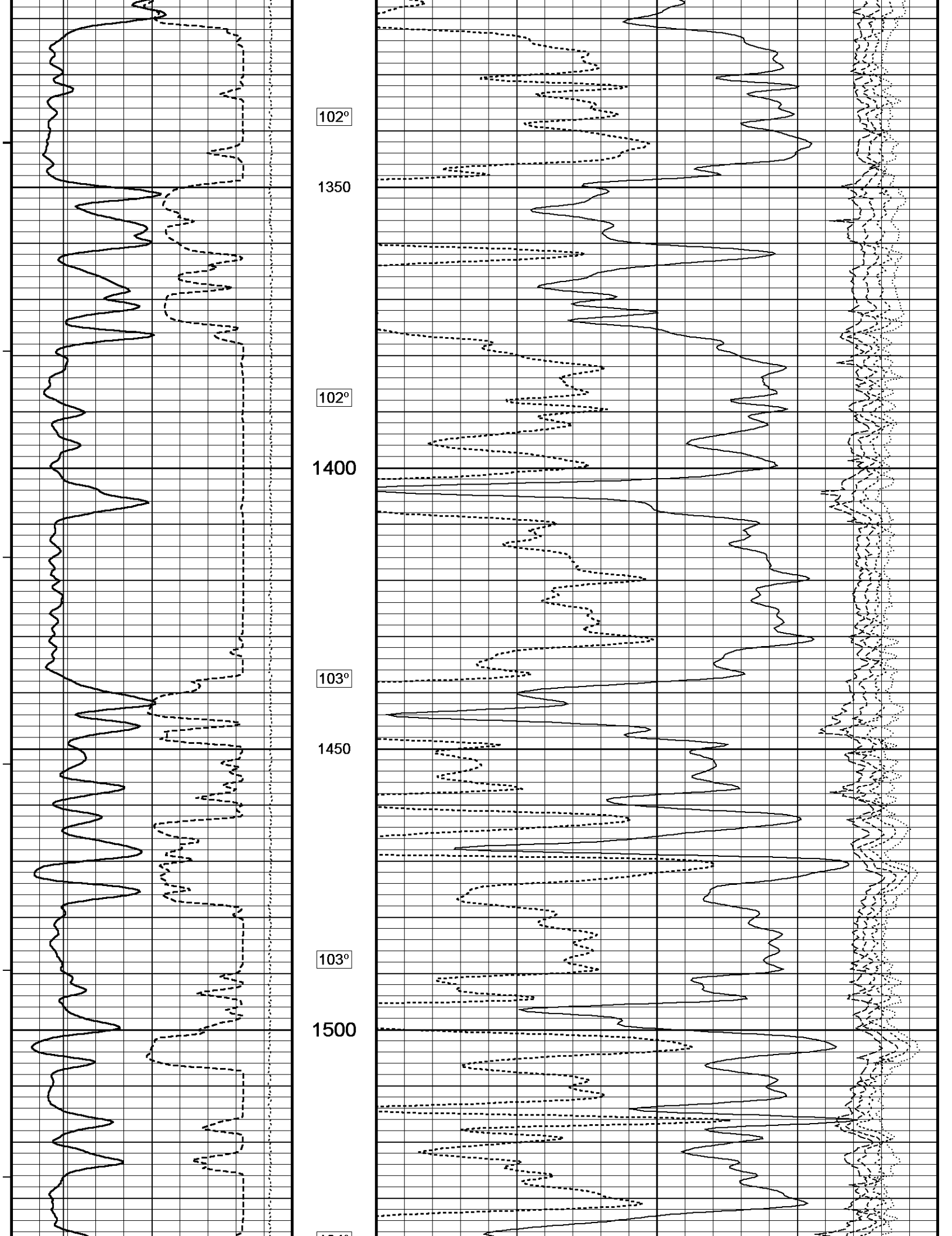

250
92°
300
93°
350
94°
400

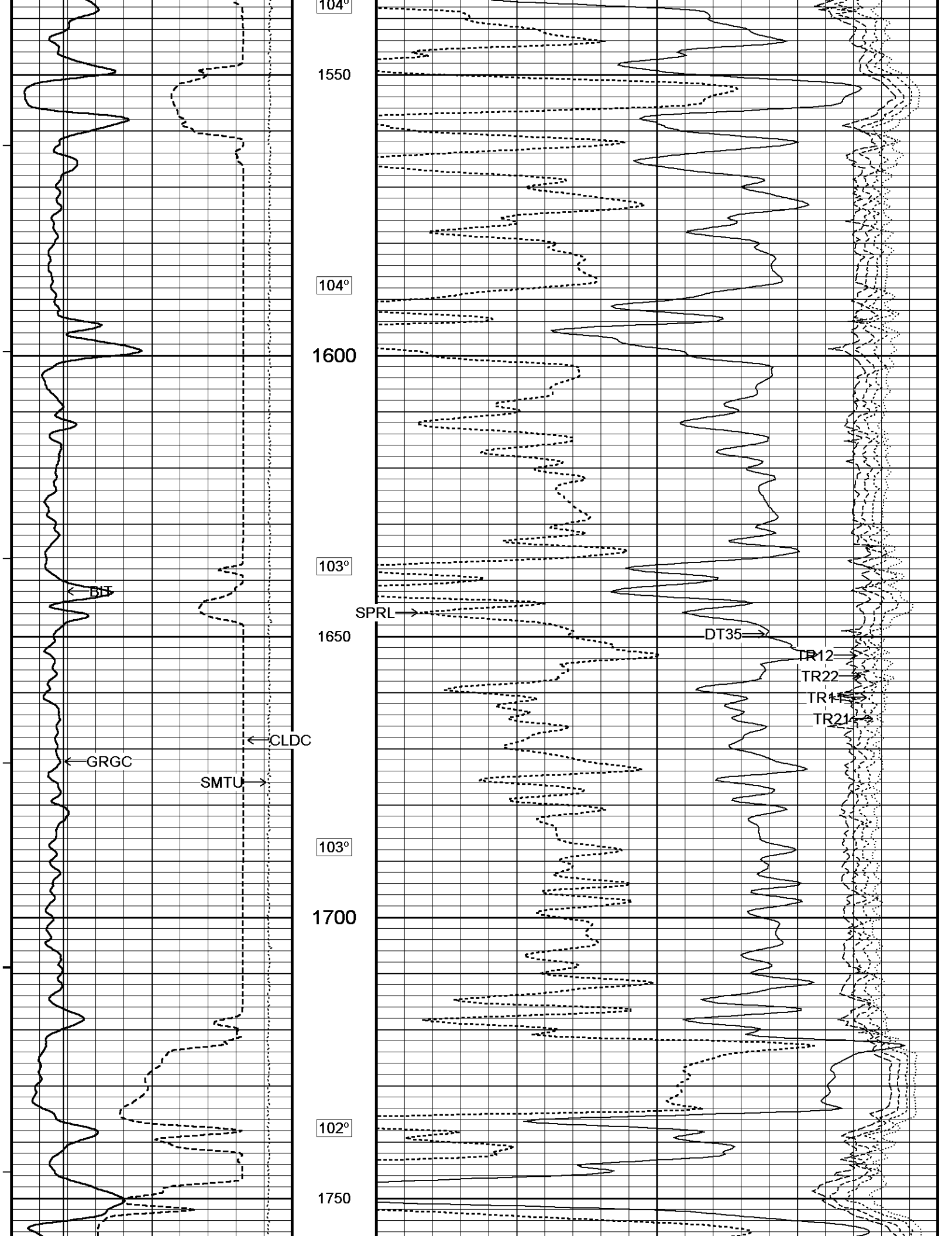

94°
450
BIT
DT35
TR12
TR22
TR11
TR21
CLDC
94°
GRCC
SMTU
500
94°
550
95°
600
95°
650

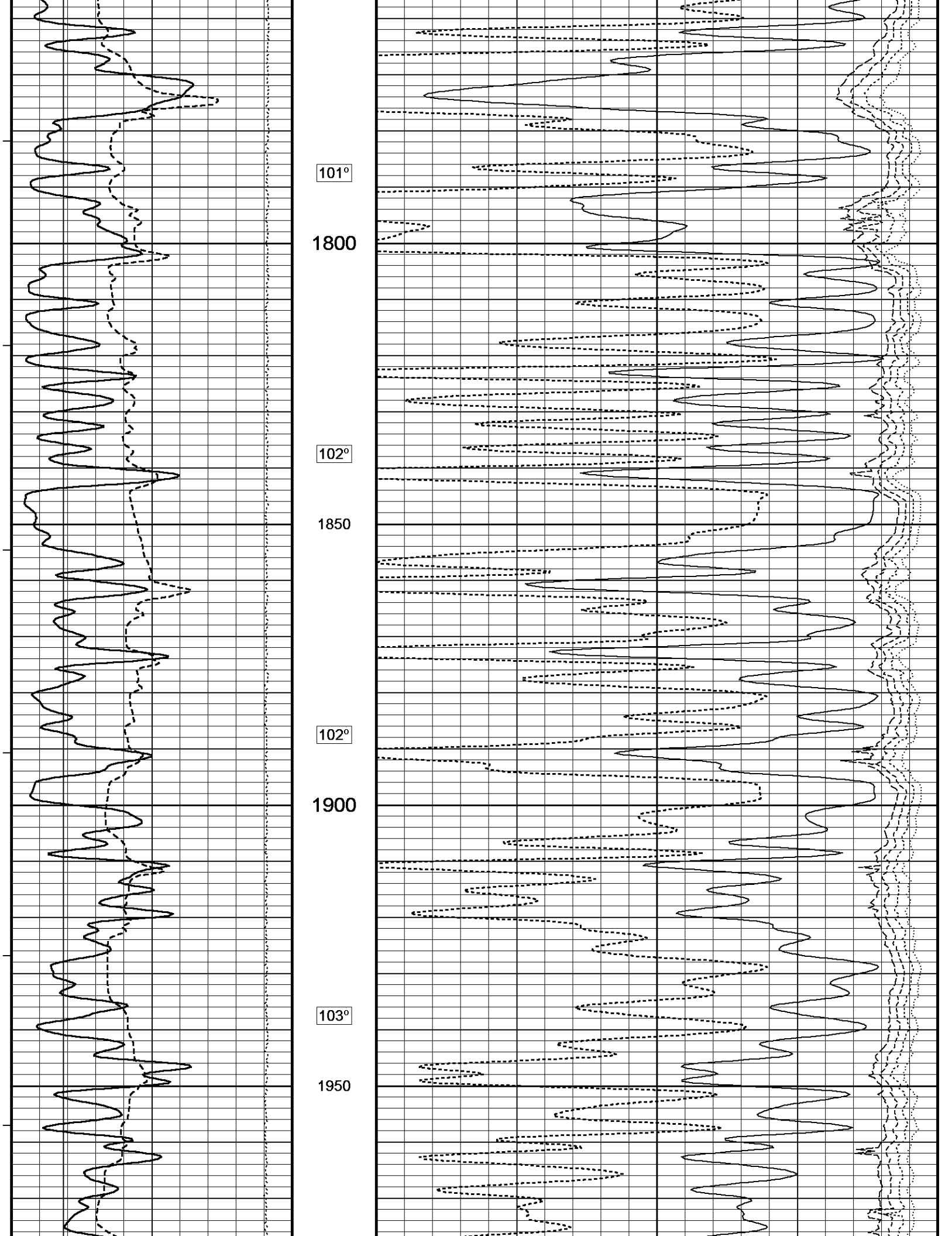

95°
700
95°
750
96°
800
96°
850
BIT
DT35
TR12
TR22
TR11


CLDC
GRGC
SMTU
RZI
96°
900
97°
950
97°
1000
97°
1050
98°


1100
98°
1150
99°
1200
100°
1250
101°
1300
BIT
CLDC
GRGC
SMTU
DT35
TR12
TR22
TR11
TR21


102°
1350
102°
1400
103°
1450
103°
1500


104°
1550
104°
1600
103°
BIT
SPRL
1650
DT35
TR12
TR22
TR11
TR21
CLDC
GRGC
SMTU
103°
1700
102°
1750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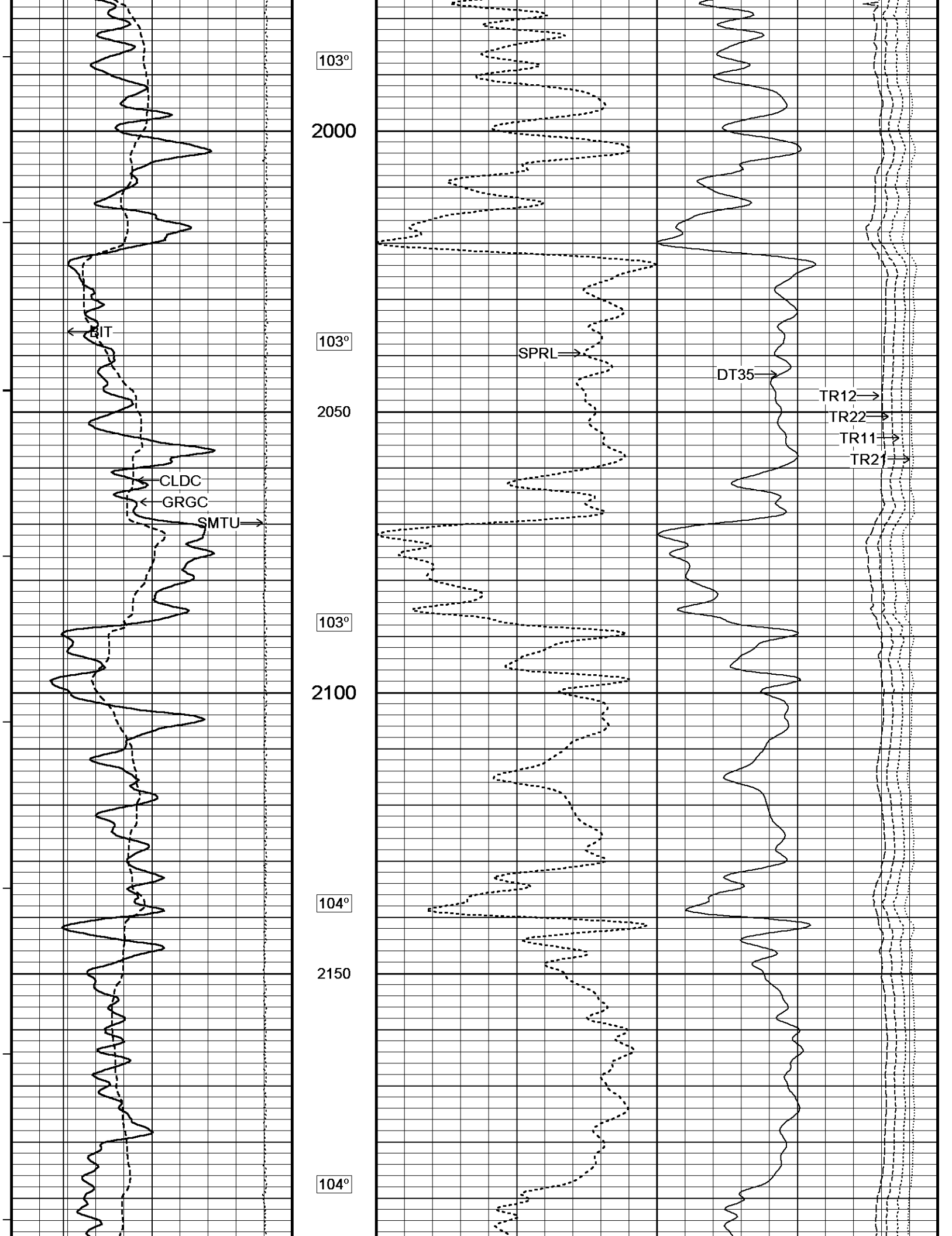
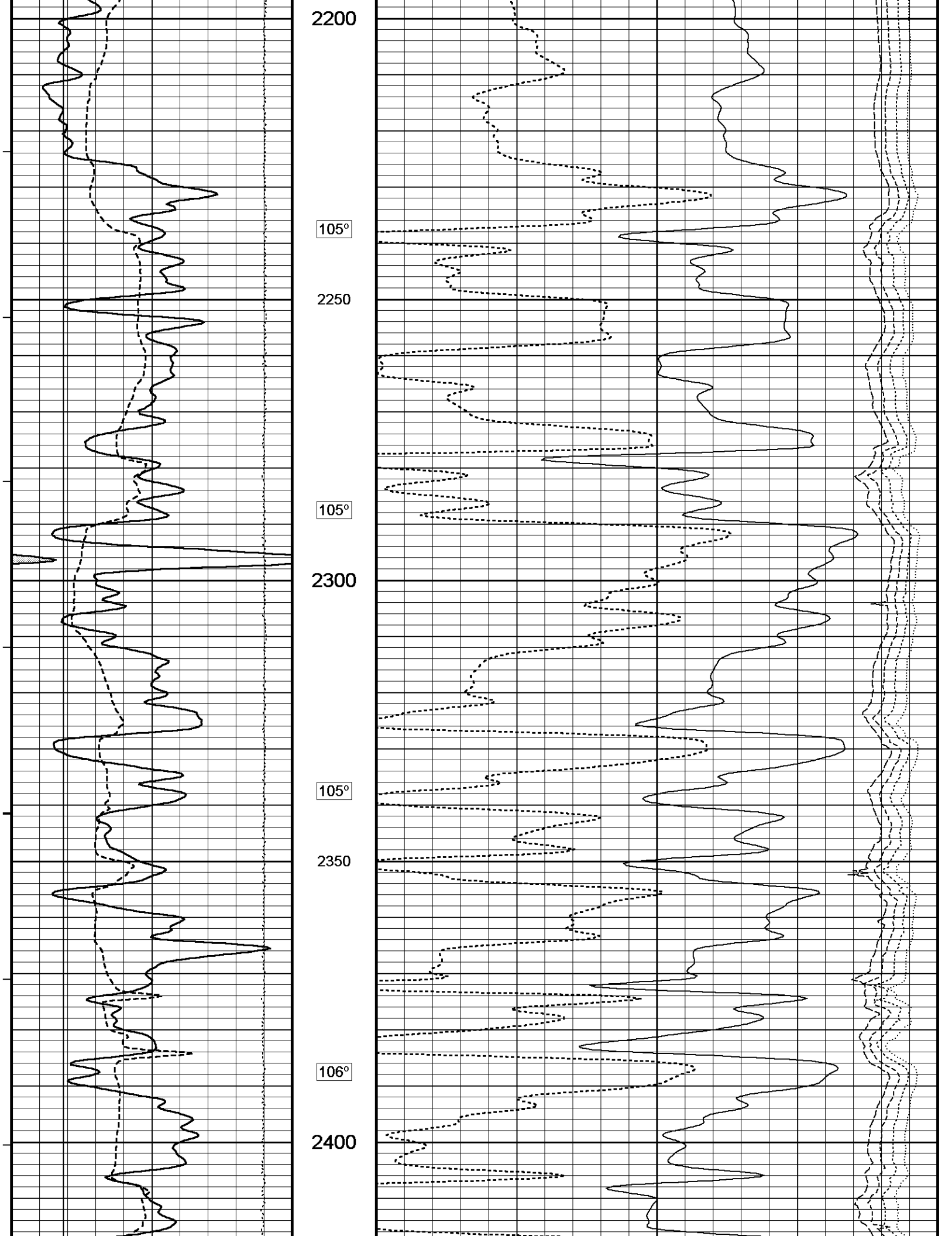
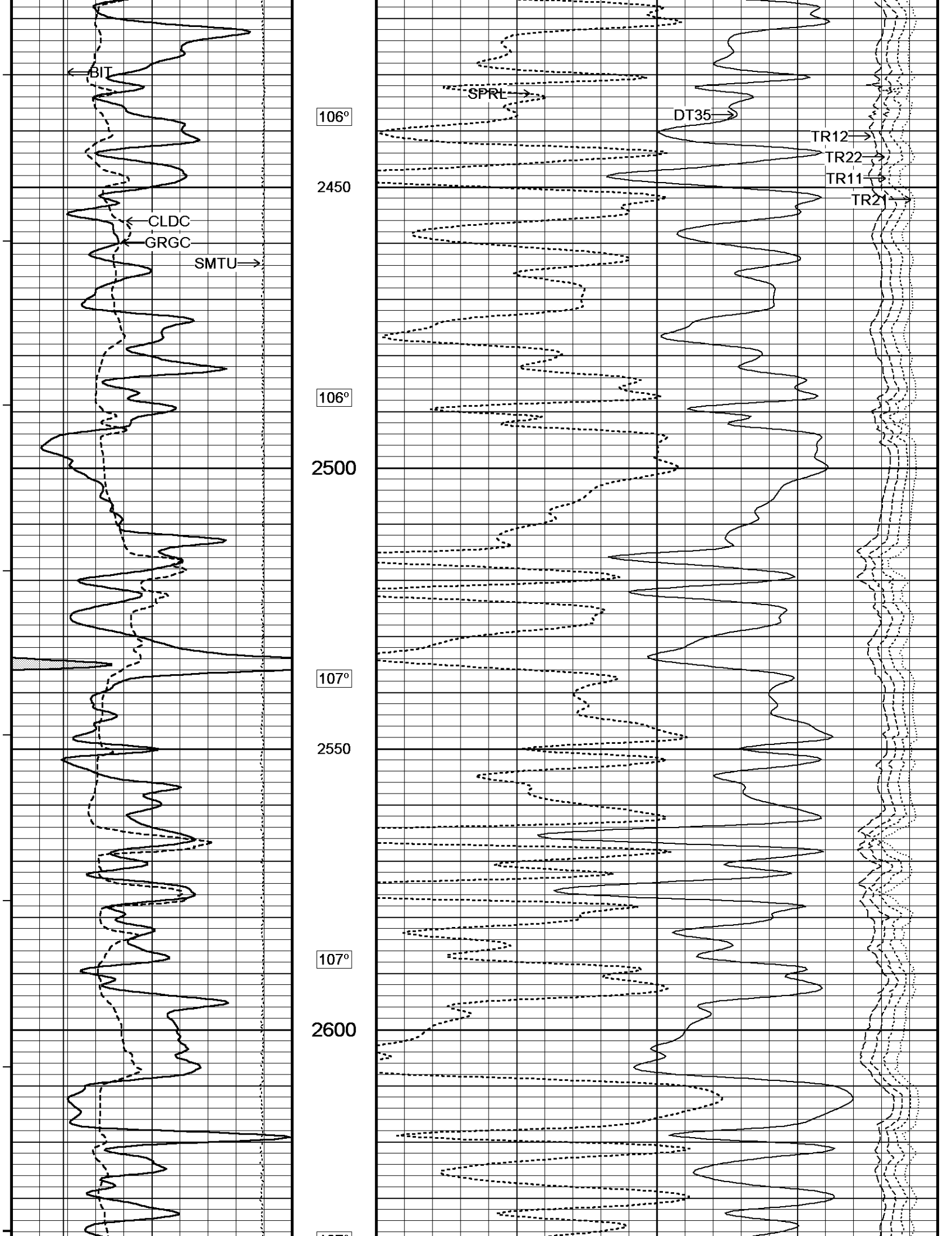
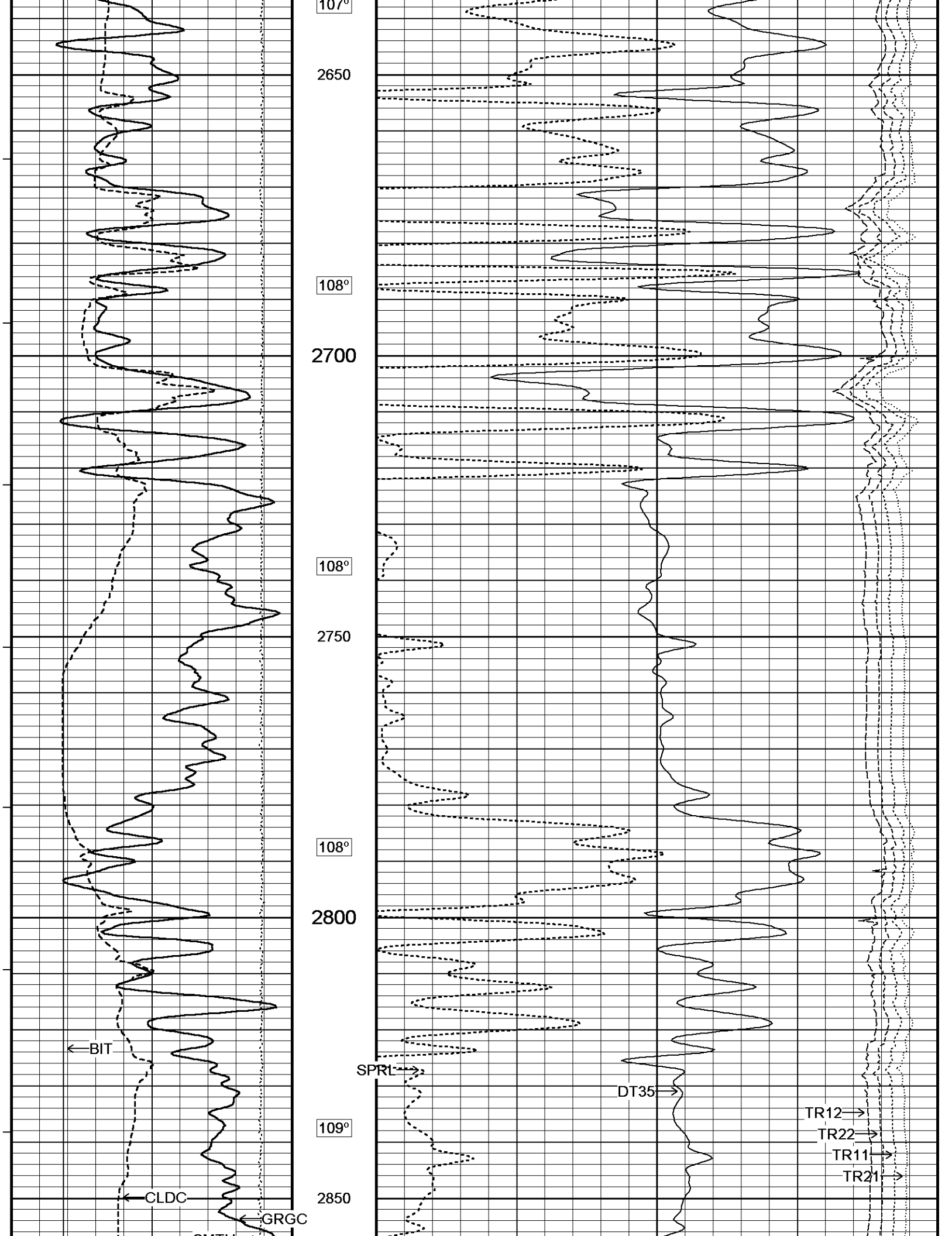
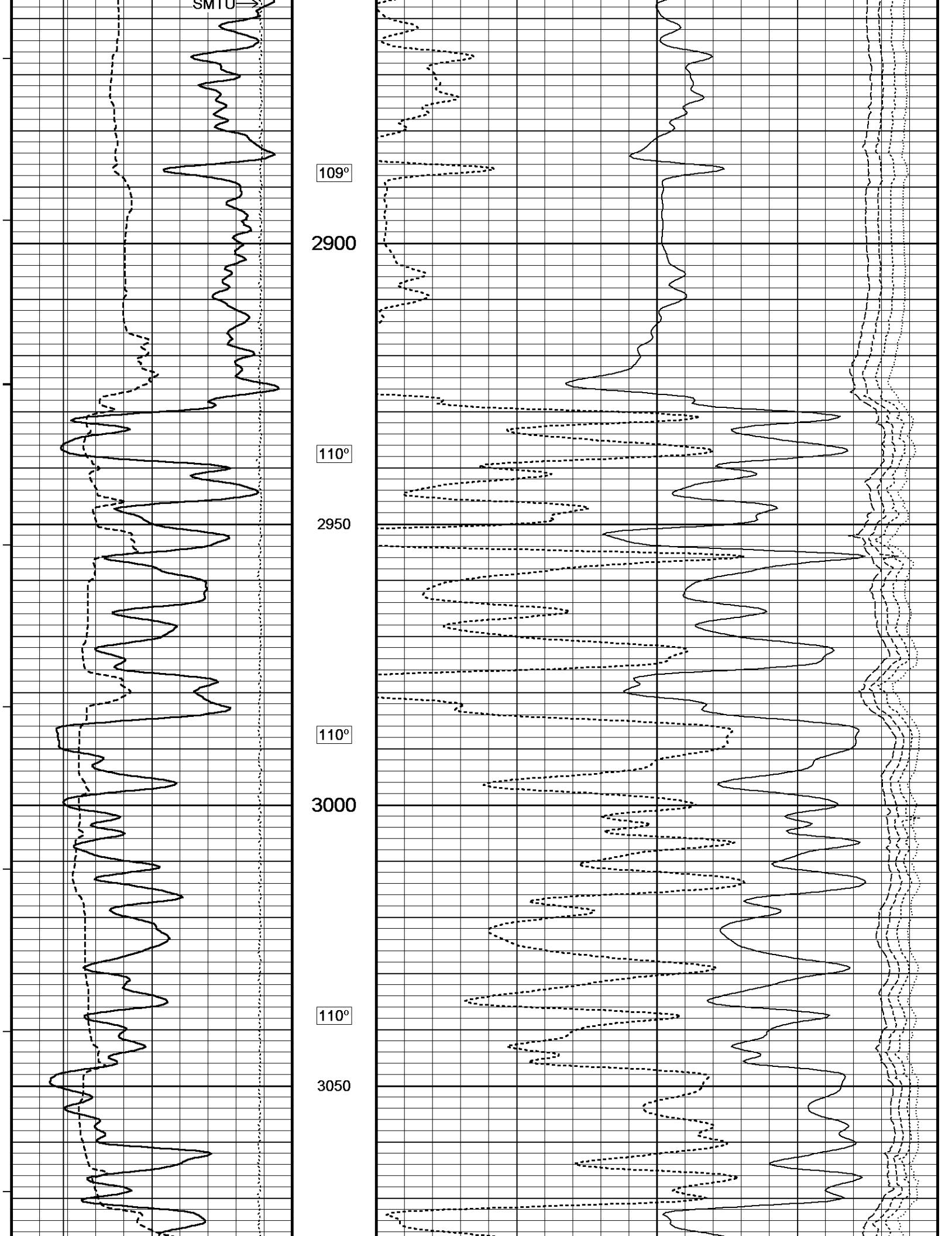
1800
102°
1850
102°
1900
103°
1950

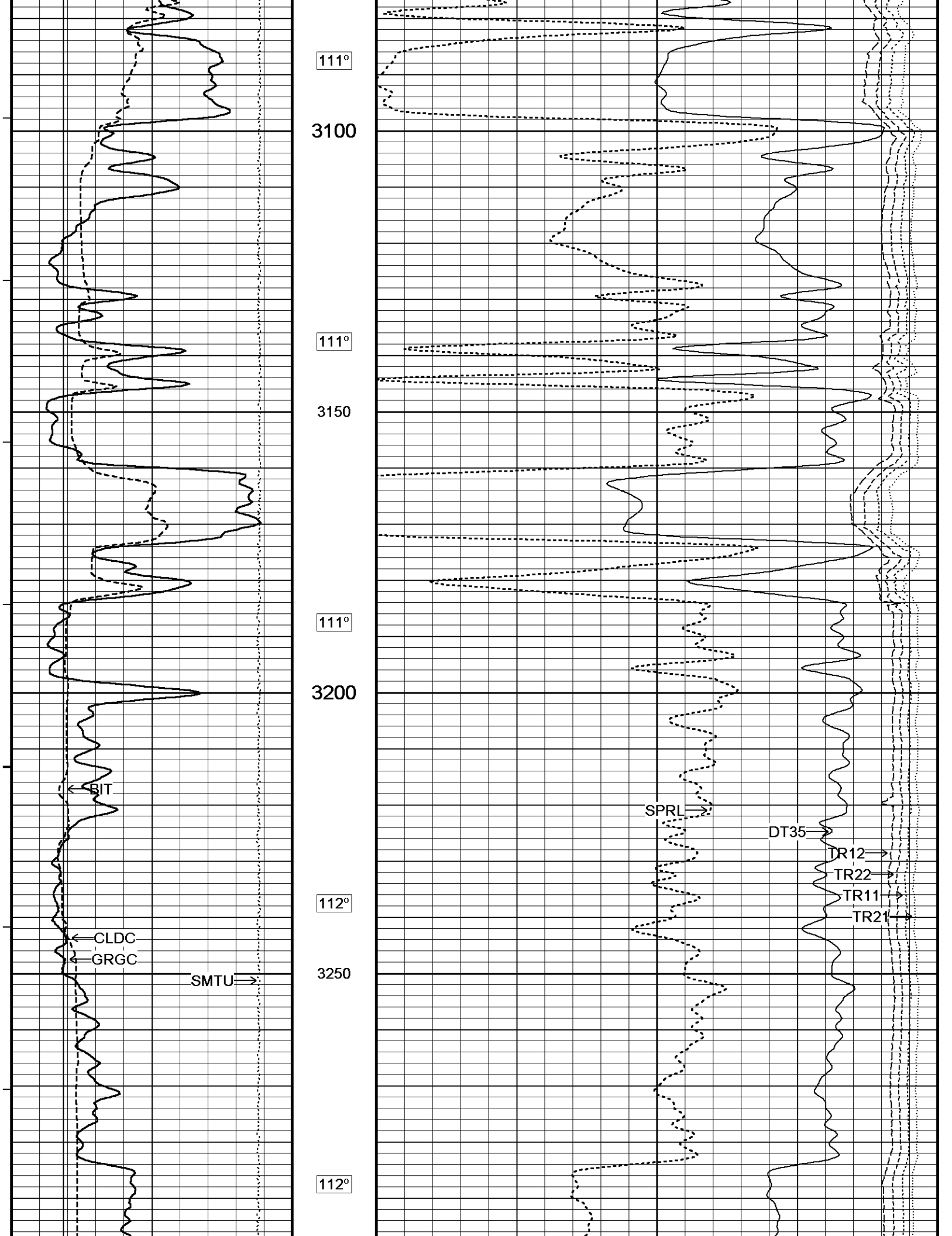

103°
2000
BIT
103°
SPRL
DT35
TR12
TR22
TR11
TR21
2050
CLDC
GRGC
SMTU
103°
2100
104°
2150
104°

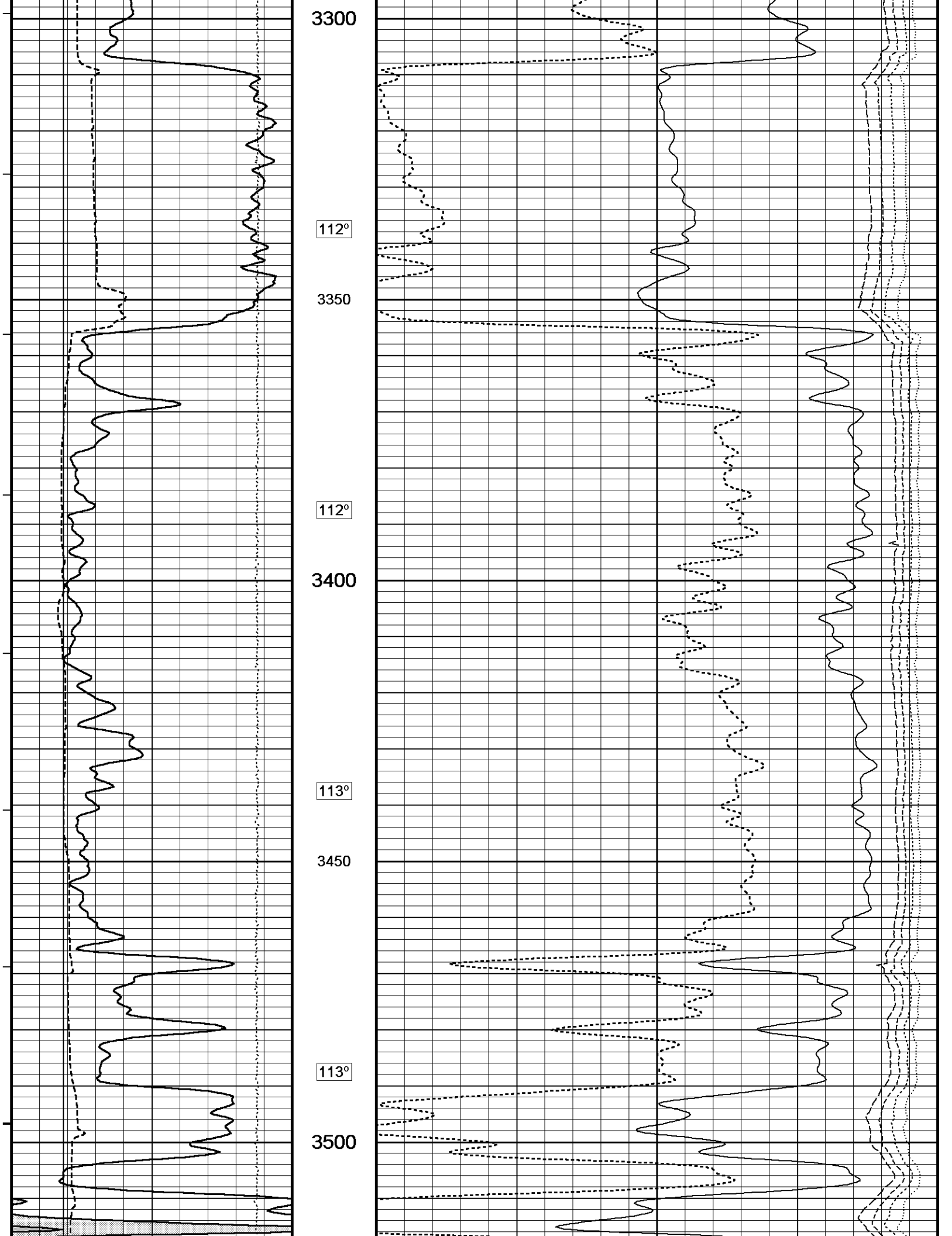

2200
105°
2250
105°
2300
105°
2350
106°
2400

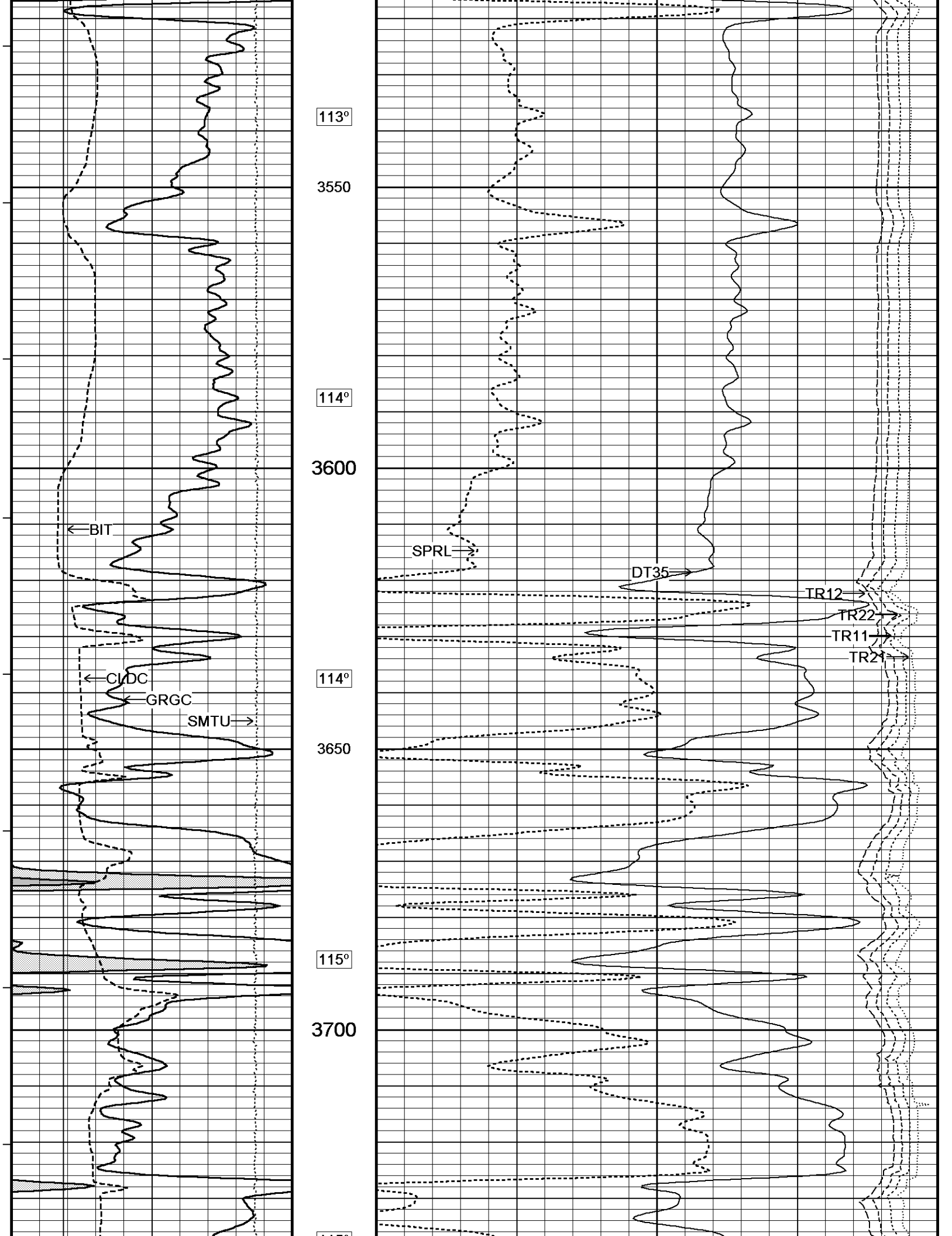

BIT
SPRL
106°
DT35
TR12
TR22
TR11
TR21
2450
CLDC
GRGC
SMTU
106°
2500
107°
2550
107°
2600

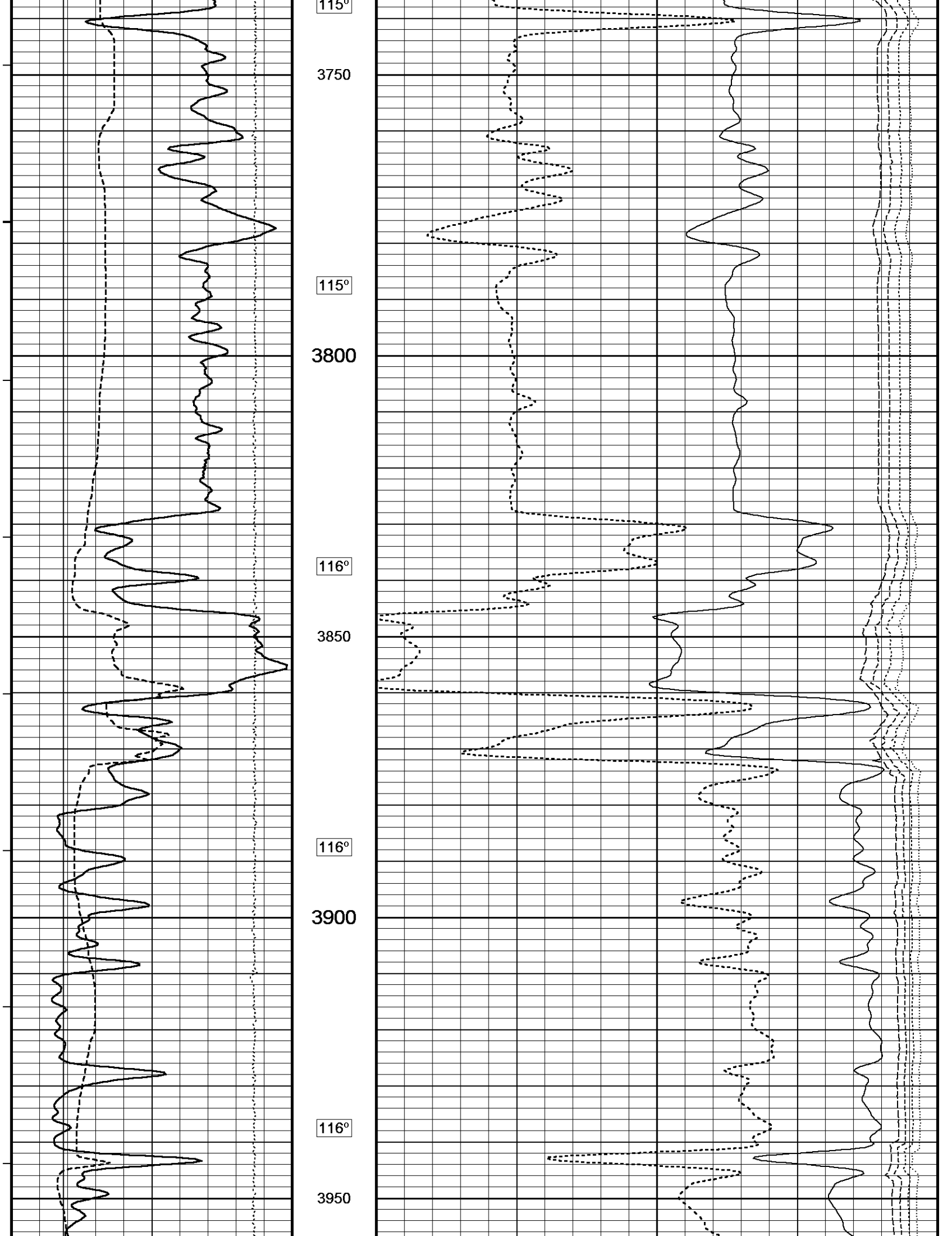

107°
2650
108°
2700
108°
2750
108°
2800
109°
2850
BIT
CLDC
GRGC
SPRL
DT35
TR12
TR22
TR11
TR21


SMTU
109°
2900
110°
2950
110°
3000
110°
3050


111°
3100
111°
3150
111°
3200
BIT
CLDC
GRGC
SMTU
112°
3250
112°
SPRL
DT35
TR12
TR22
TR11
TR21


3300
112°
3350
112°
3400
113°
3450
113°
3500


113°
3550
114°
3600
BIT
SPRL
DT35
TR12
TR22
TR11
TR21
CILDC
GRGC
SMTU
114°
3650
115°
3700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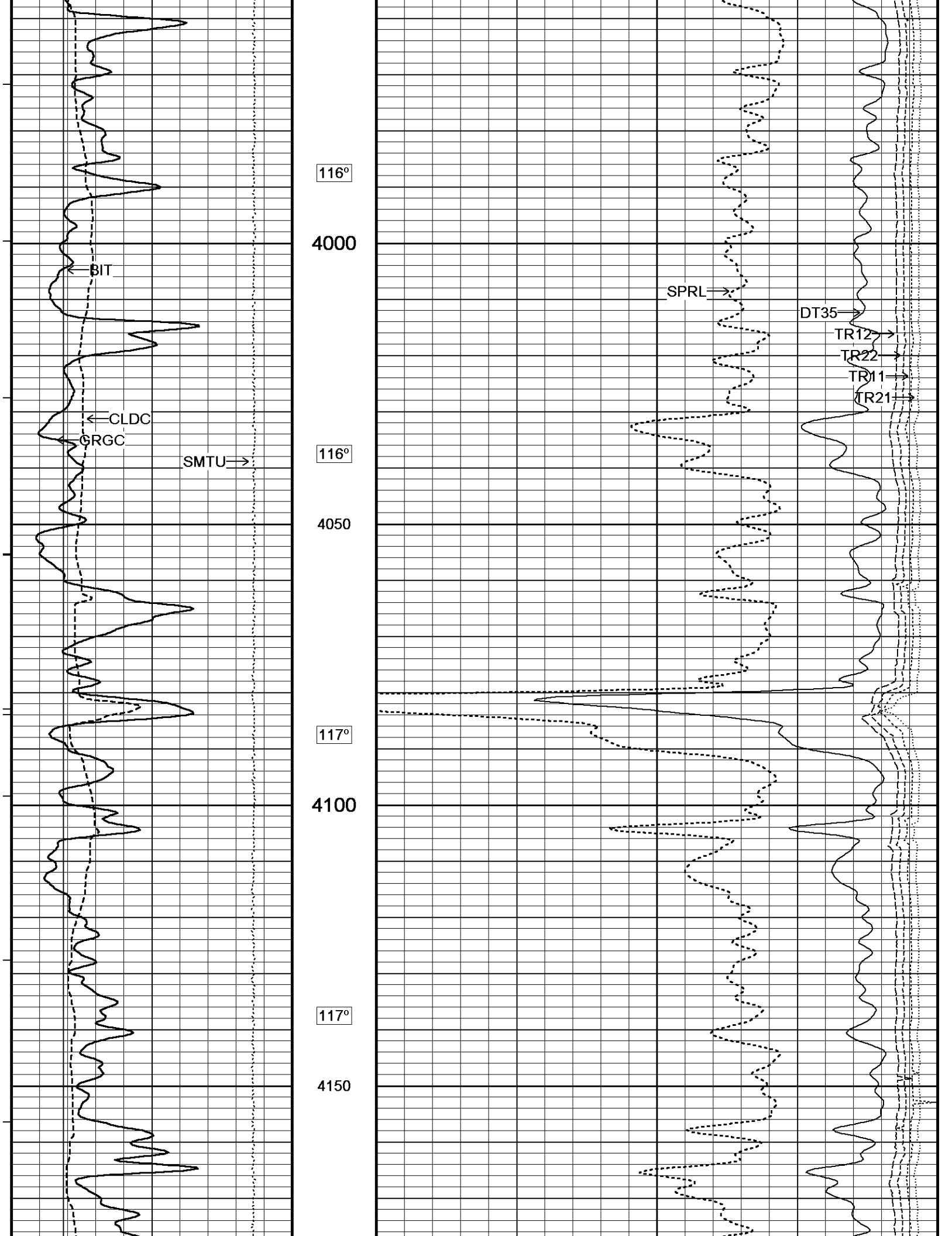
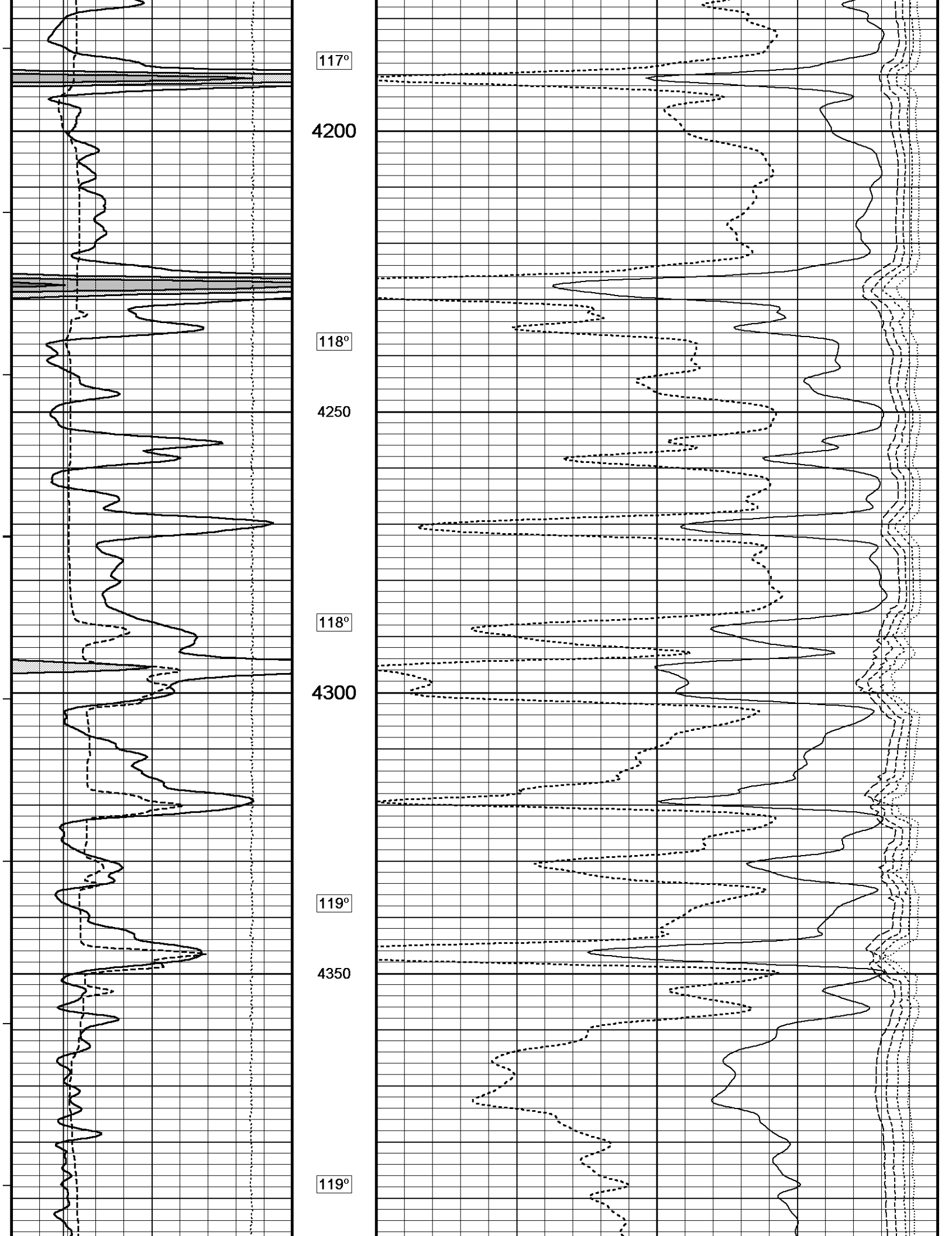
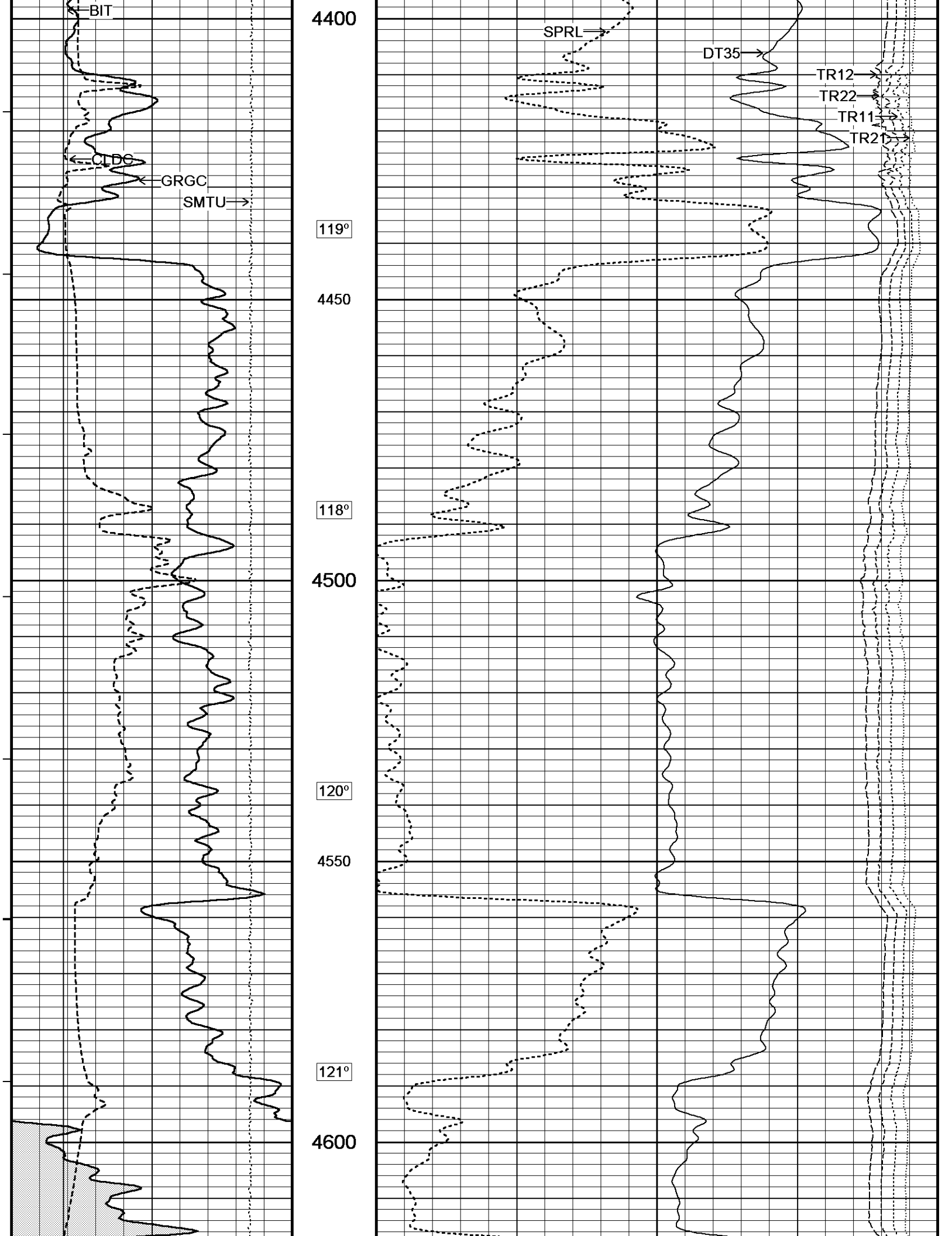
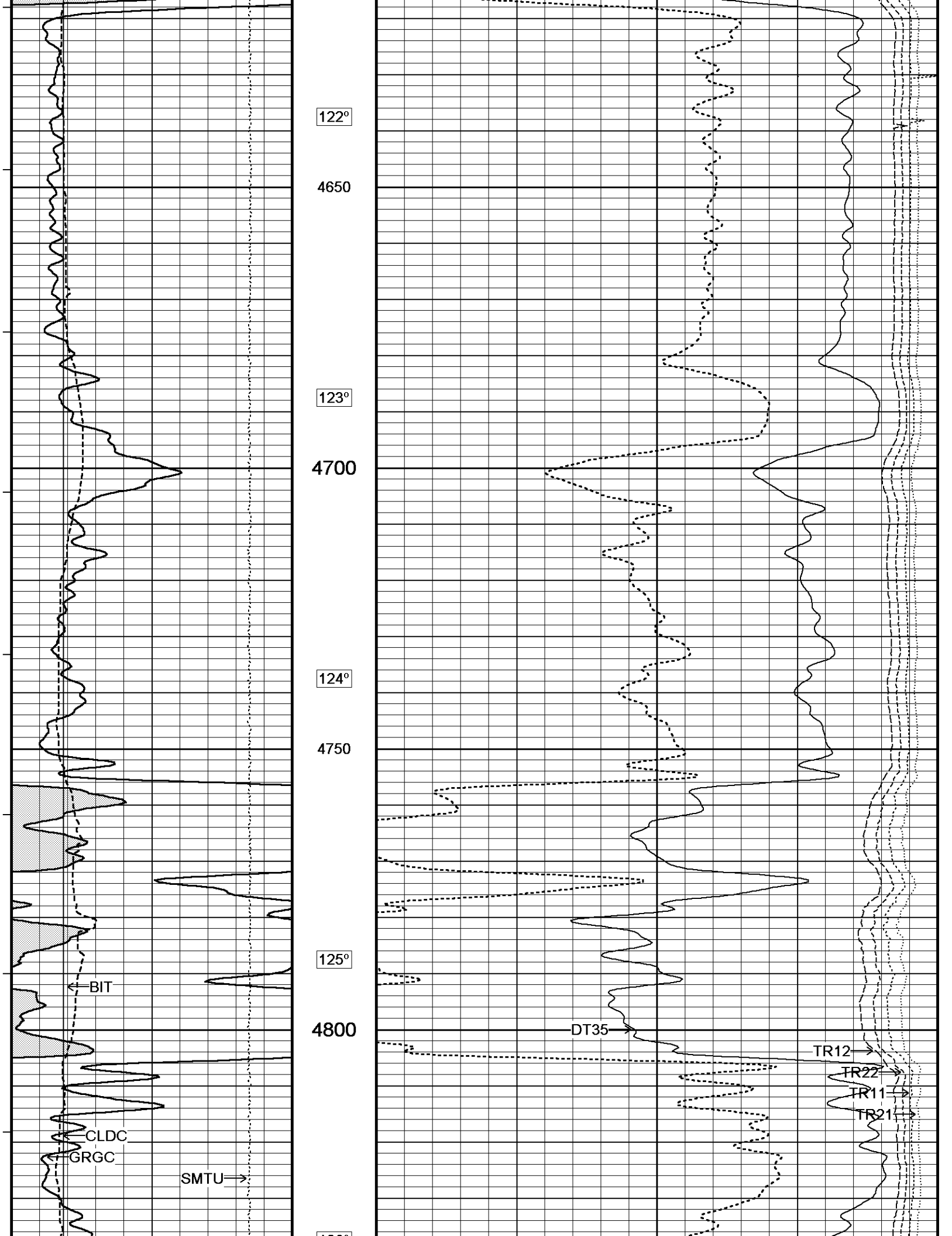
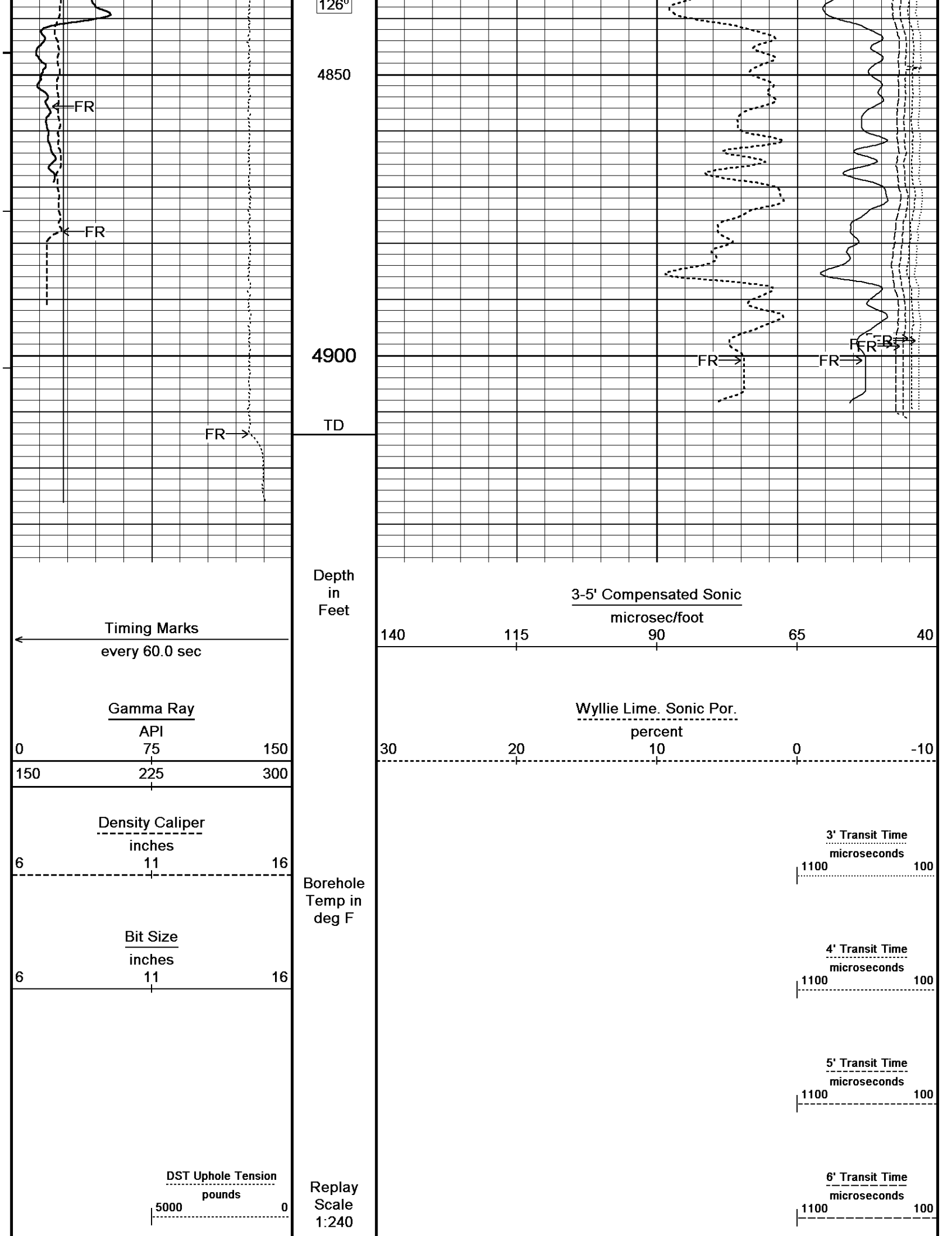
3750
115°
3800
116°
3850
116°
3900
116°
3950


116°
4000
BIT
SPRL
DT35
TR12
TR22
TR11
TR21
CLDC
GRGC
SMTU
116°
4050
117°
4100
117°
4150


117°
4200
118°
4250
118°
4300
119°
4350
119°


BIT
CLDC
GRGC
SMTU
4400
119°
4450
118°
4500
120°
4550
121°
4600
SPRL
DT35
TR12
TR22
TR11
TR21


122°
4650
123°
4700
124°
4750
125°
4800
BIT
CLDC
GRGC
SMTU
DT35
TR12
TR22
TR11
TR21


126°
4850
4900
TD
FR
FR
FR
FR
FR
FR
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
DST Uphole Tension
pounds
5000
0
Borehole Temp in deg F
Replay Scale 1:240
3-5' Compensated Sonic
microsec/foot
140
115
90
65
40
Wyllie Lime. Sonic Por.
percent
30
20
10
0
-10
3' Transit Time
microseconds
1100
100
4' Transit Time
microseconds
1100
100
5' Transit Time
microseconds
1100
100
6' Transit Time
microseconds
1100
100

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 24-JUN-2018 16:35
Filename: C:\Minimus 18.01.6830\Data\Grand Mesa Ringer #1-24\Grand Mesa Ringer #1-24_003.dta
Recorded on 24-JUN-2018 13:00
System Versions: Logged with 18.01.6830 Plotted with 18.01.6830

5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 24-JUN-2018 16:35
Filename: C:\Minimus 18.01.6830\Data\Grand Mesa Ringer #1-24\Grand Mesa Ringer #1-24_002.dta
Recorded on 24-JUN-2018 12:12
System Versions: Logged with 18.01.6830 Plotted with 18.01.6830

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240

3-5' Compensated Sonic
microsec/foot
140 115 90 65 40

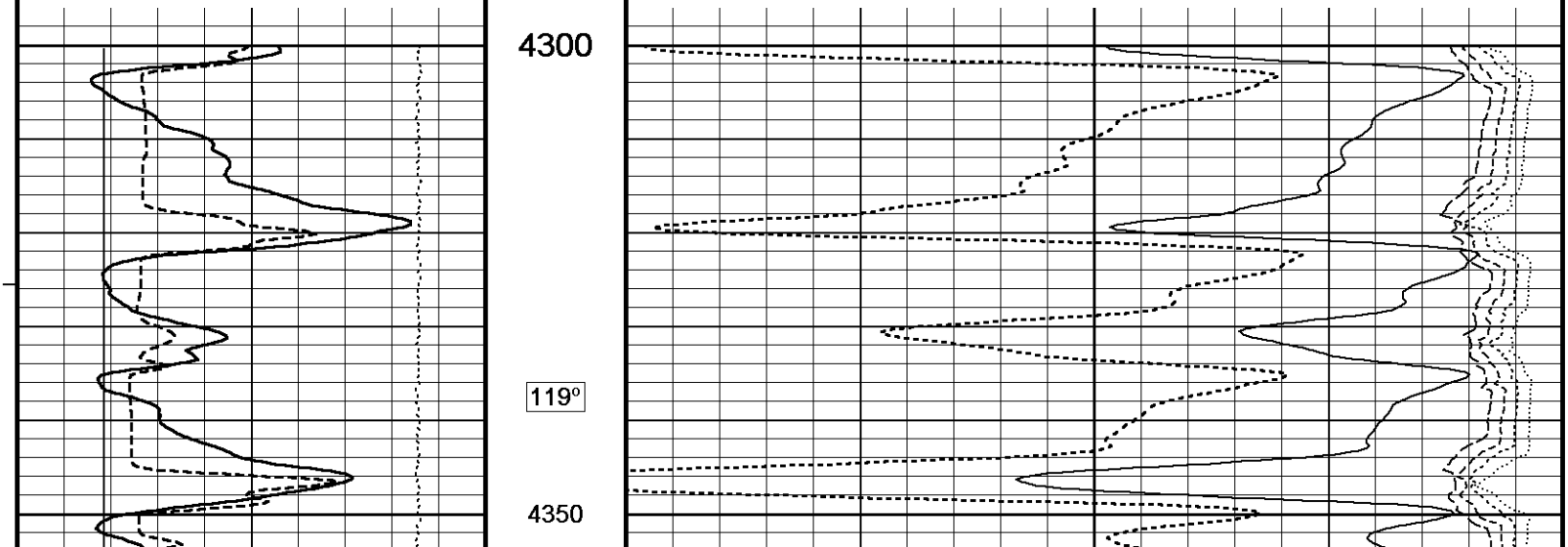
Wyllie Lime. Sonic Por.
percent
30 20 10 0 -10

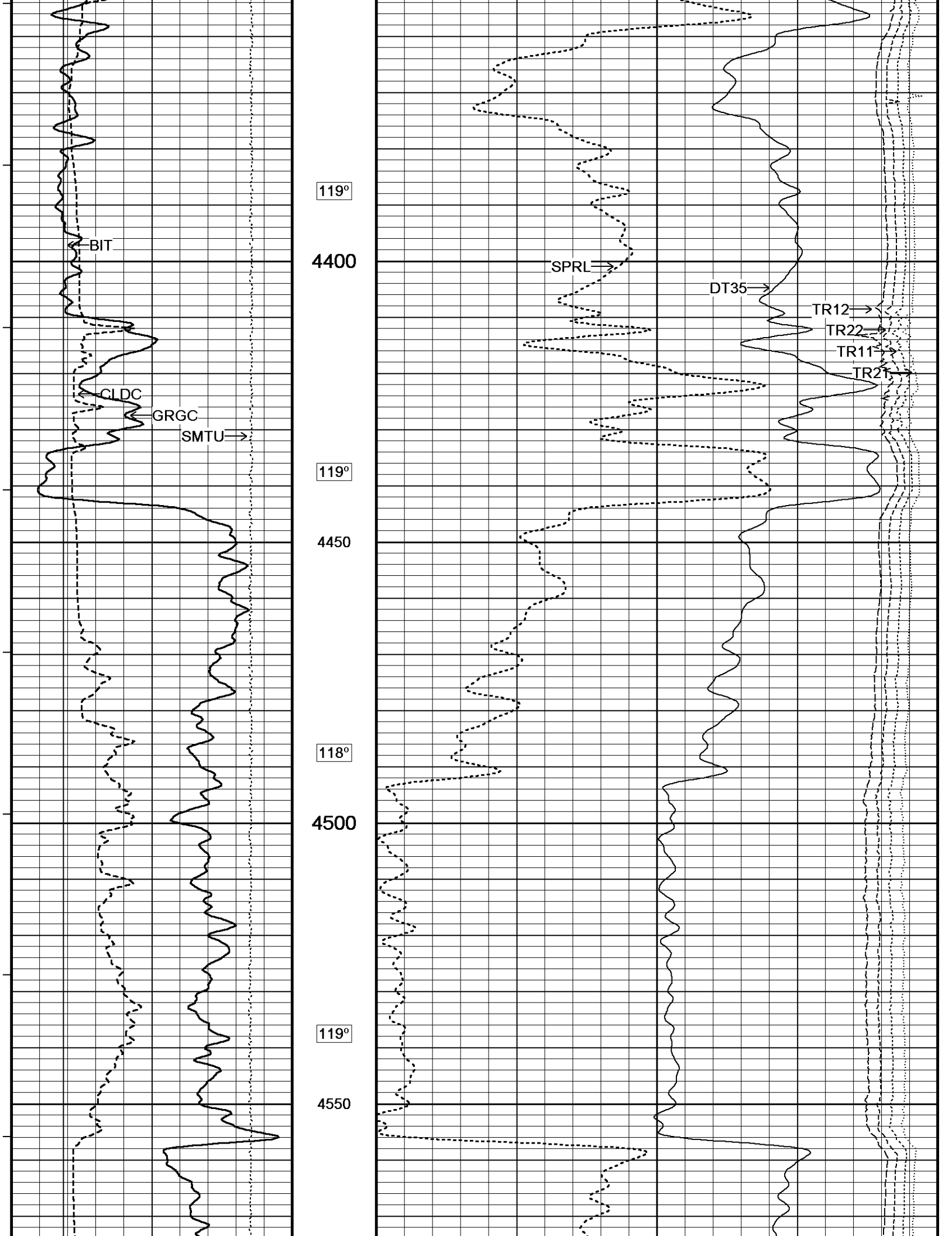
3' Transit Time
microseconds
1100 100

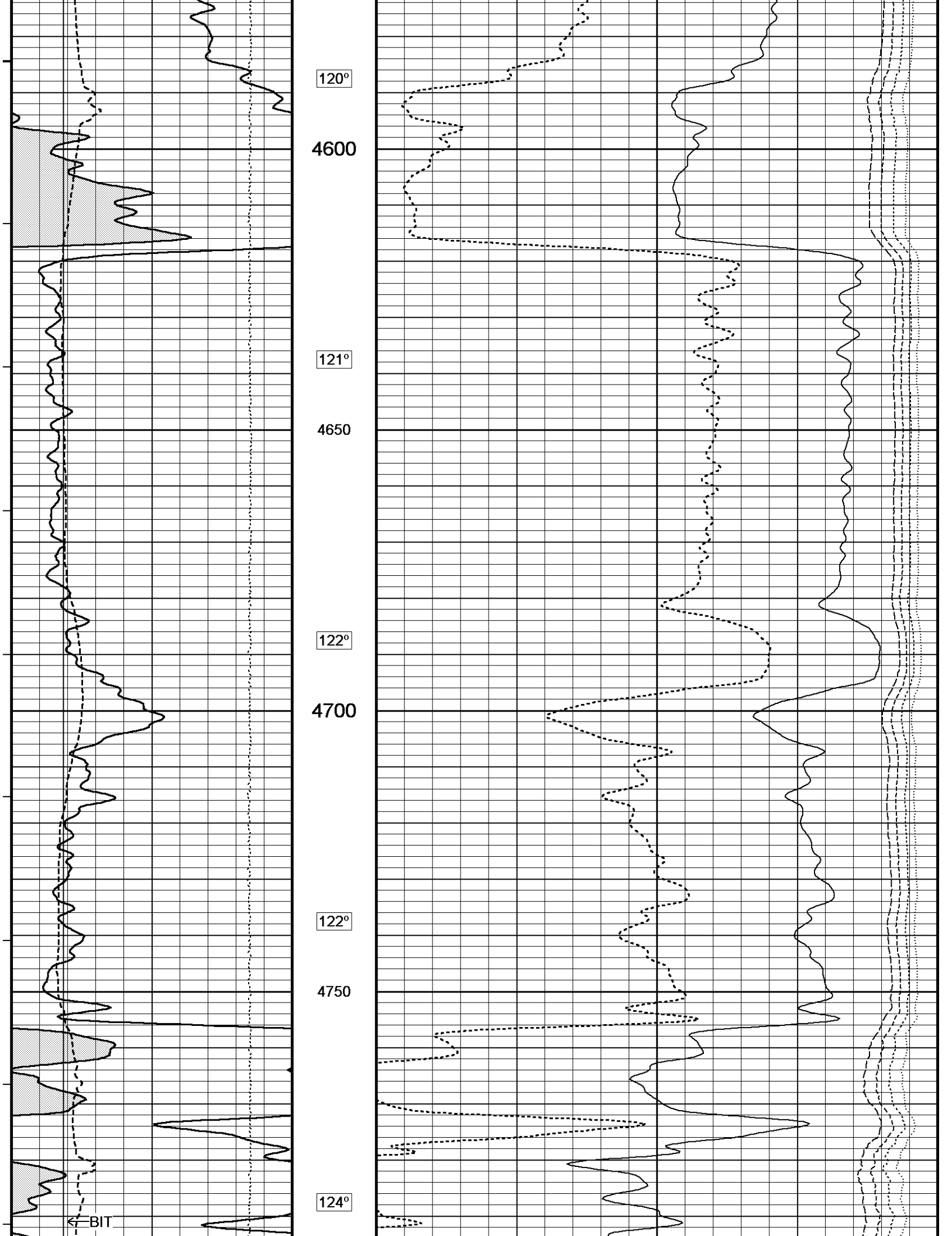
4' Transit Time
microseconds
1100 100

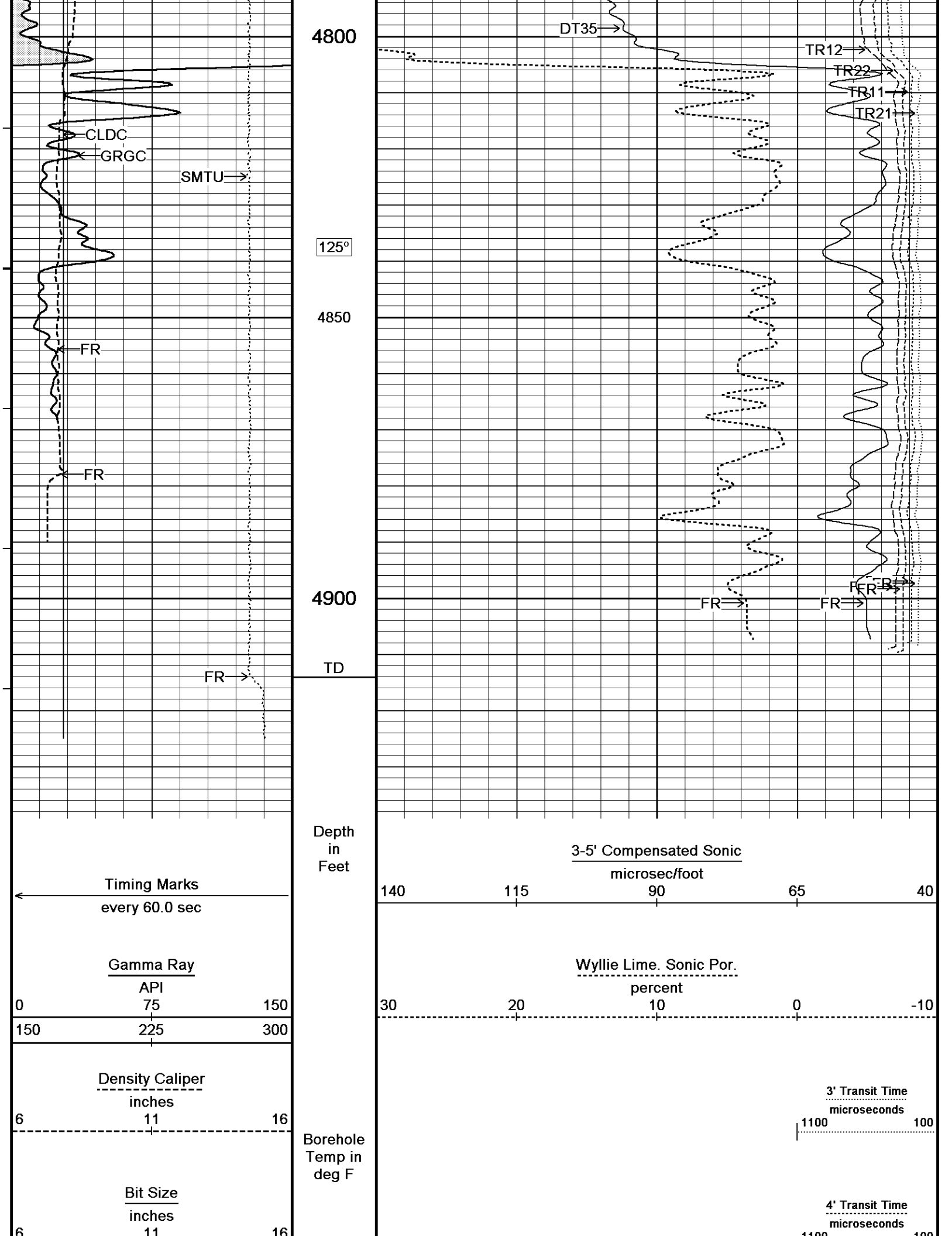
5' Transit Time
microseconds
1100 100

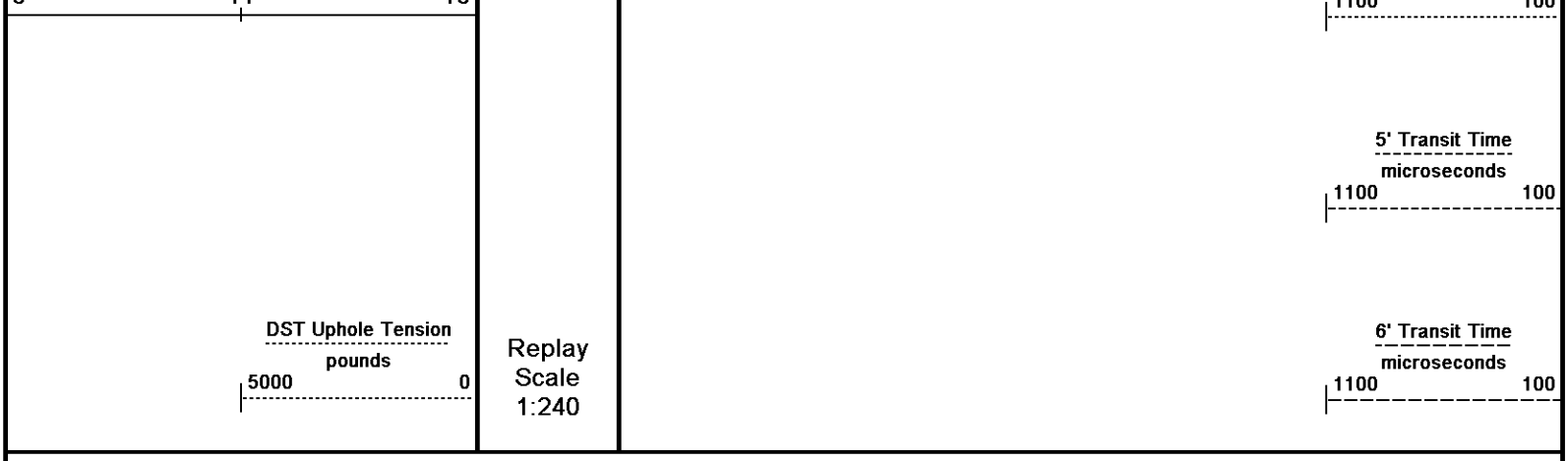
6' Transit Time
microseconds
1100 100




BIT
CLDC
GRGC
SMTU
119°
4400
119°
4450
118°
4500
119°
4550
SPRL
DT35
TR12
TR22
TR11
TR21


120°
4600
121°
4650
122°
4700
122°
4750
124°
BIT


4800
4850
4900
TD
125°
CLDC
GRGC
SMTU
FR
FR
FR
DT35
TR12
TR22
TR11
TR21
FR
FR
FR
FR
Depth in Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Density Caliper
inches
6
11
16
Bit Size
inches
6
11
16
Borehole Temp in deg F
3-5' Compensated Sonic
microsec/foot
140
115
90
65
40
Wyllie Lime. Sonic Por.
percent
30
20
10
0
-10
3' Transit Time
microseconds
1100
100
4' Transit Time
microseconds



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 24-JUN-2018 16:35
Filename: C:\Minimus 18.01.6830\Data\Grand Mesa Ringer #1-24\Grand Mesa Ringer #1-24_002.dta — Recorded on 24-JUN-2018 12:12
System Versions: Logged with 18.01.6830 Plotted with 18.01.6830

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 18.01.6830\Data\Grand Mesa Ringer #1-24\Grand Mesa Ringer #1-24_002.dta

General Constants All 000

Last Edited on 24-JUN-2018,11:52

General Parameters		
Mud Resistivity	0.420	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Crossplot Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.620	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-D.A 246

Field Calibration on 24-JUN-2018,09:00

	Measured	Calibrated (API)
Background	57	39
Calibrator (Gross)	734	495
Calibrator (Net)	676	456

Gamma Calibration Tolerances MCG-D.A 246

Ratio 1.483 (1.40 — 1.475 — 1.55) Counts/API

Gamma Constants MCG-D.A 246

Last Edited on 24-JUN-2018,09:01

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-D.A 246

Field Calibration on 22-JUN-2018,16:25

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	212.00	212.00

High Resolution Temperature Constants MCG-D.A 246

Last Edited on 07-JUN-2018,10:42

Pre-filter Length	11

Sonic Constants MSS-C.K 319

Maximum Boundary Contrast	70.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MX3FT	1500.00	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft
Sonde Mode	Compensated	
Hole Type	Open Hole	

Sonde Parameters

	Measured	Calibrated
Offset		0.0000
Free Pipe	0.0000	

Peak Amplitude Source

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing N/A

Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (m)
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	

Full Waveform Parameters

Use 3' Waveform to derive TR	No	
Use 4' Waveform to derive TR	No	
Use 5' Waveform to derive TR	No	
Use 6' Waveform to derive TR	No	
3' Waveform Discriminator Level	0.30	mV
4' Waveform Discriminator Level	0.30	mV
5' Waveform Discriminator Level	0.15	mV
6' Waveform Discriminator Level	0.15	mV
Waveform Discriminator Filter	Not Applied	
Semblance Window Width	150.00	micro-sec
Semblance Processing Enabled	Yes	
Tracking Boxes Enabled In Processing	Yes	

Caliper Calibration MPD-C.A 216

Base Calibration on 07-JUN-2018 14:09
Field Calibration on 24-JUN-2018,08:58

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	14245	3.99
2	22960	5.98
3	31650	7.97
4	39952	9.86
5	49231	11.92

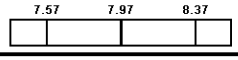
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.98	7.97

Caliper Calibration Tolerances MPD-C.A 216

Long Arm Field Cal. 7.98 in



DOWNHOLE EQUIPMENT

C:\Minimus 18.01.6830\Data\Grand Mesa Ringer #1-24\Grand Mesa Ringer #1-24_002.dta

Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-J.B 724 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Comms Gamma
MCG-D.A 246 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-B.A 91 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-B.A 292 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.913 in

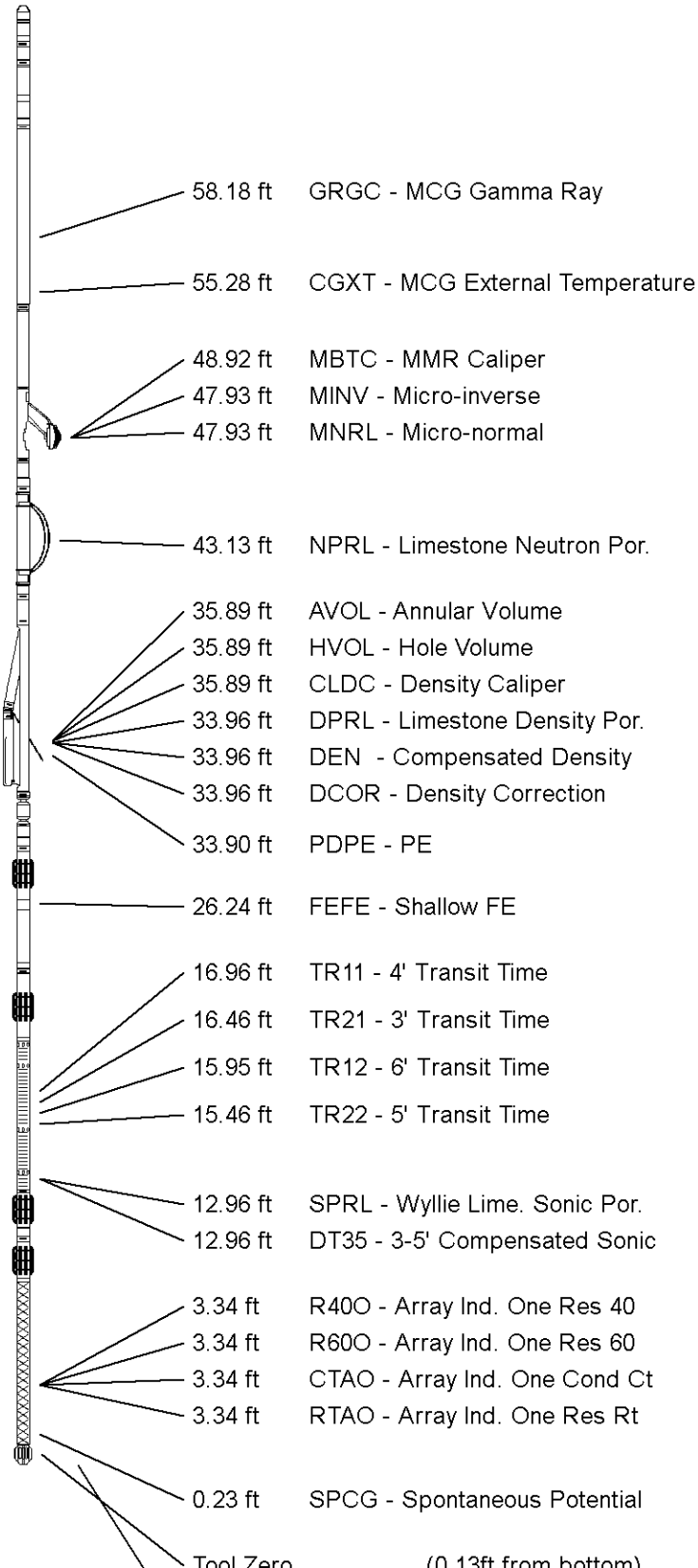
Compact Knuckle Joint
SKJ-D.A 167 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

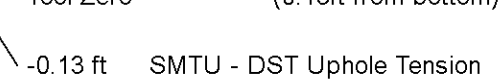
Compact Focussed Electric
MFE-A.A 135 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-C.K 319 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 68.16 ft Weight: 526.9 lb





-0.13 ft SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	RINGER #1-24
FIELD	WILDCAT
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1796	feet	First Reading	4901.00	feet
Elevation Drill Floor	1794	feet	Depth Driller	4920.00	feet
Elevation Ground Level	1791	feet	Depth Logger	4914.00	feet

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WITH INTEGRATED TRANSIT TIME