Weatherford®

COMPENSATED SONIC WITH INTEGRATED TRANSIT TIME

COMPANY	BLACK OAK EXPLORATION
WELL	FRISIBIE FAMILY 1-15
FIELD	WILDCAT
PROVINCE/COUNTY	RAWLINS
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	SE NW NW SE 2180' FSL & 2300' FEL
PERMIT NUMBER	SE NE NW SE

SEC 15	TWP 2S	RGE 36W
Latitude	39.865833	
Longitude	-101.360000	
API Number	15-153-21221	

Other Services
MAI/MFE MPD/MDN
MML

Permanent Datum GL, Elevation 3330 feet
Log Measured From KB, 5.00 feet above Permanent Datum
Drilling Measured From KB

Elevations:	feet
KB	3335.00
DF	3333.00
GL	3330.00

Date	21-MAR-2019			
Run Number	ONE			
Service Order	17937-240384345			
Depth Driller	4860.00	feet		
Depth Logger	4865.00	feet		
First Reading	4849.00	feet		
Last Reading	420.00	feet		
Casing Driller	420.00	feet		
Casing Logger	420.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.00 lb/USg		65.00 sec/qt	
PH / Fluid Loss	10.00		8.80 ml/30Min	
Sample Source	FLOWLINE			
Rm @ Measured Temp	1.04 @103.0	ohm-m		
Rmf @ Measured Temp	0.83 @103.0	ohm-m		
Rmc @ Measured Temp	1.25 @103.0	ohm-m		
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.80 @135.0	ohm-m		
Time Since Circulation	4 HOURS			
Max Recorded Temp	135.00	deg F		
Equipment / Base	13244		LIB	
Recorded By	MATT MCGLOTHLIN			
Witnessed By	CLAYTON CAMOZZI			

BOREHOLE RECORD

Last Edited: 22-MAR-2019 00:06

Bit Size inches	Depth From feet	Depth To feet
7.875	420.00	4860.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	420.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 18.05.4364
- TOOLSTRING: CBH, SHA, MCG, MML, MDN, MPD, SKJ, MFE, MSS, MAI LOGGED IN COMBINATION.
- HARDWARE:
  - MDN: DUAL BOWSPRING FOR DECENTRALIZATION
  - MFE: 1 X 0.5 INCH STANDOFF
  - MSS: 2 X 0.5 INCH STANDOFF
  - MAI: 2 X 0.5 INCH STANDOFF
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST:
  - NEUTRON / DENSITY / MICROLOG / SONIC / INDUCTION: TD - SURFACE CASING.
  - GAMMA RAY: TD - SURFACE.
- CREW: J. JOHNSON, B. COPELAND.

- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.

****CLIENT REQUESTE TO PULL REPEAT PASS UP TO 4000 FEET FROM TD.****

5 INCH MAIN 1:240

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 22-MAR-2019 08:17

Filename: C:\Users\cmcam\AppData\Local\Temp\Weatherford PreView\0\MAIN PASS_001.dta — Recorded on 22-MAR-2019 00:23

System Versions: Logged with 18.05.4364 Processed with 18.05.4364 Plotted with 18.01.5761

Timing Marks
every 60.0 sec

Density Caliper
inches
6 11 16

Borehole Corrected Gamma
API
0 75 150
150 225 300

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

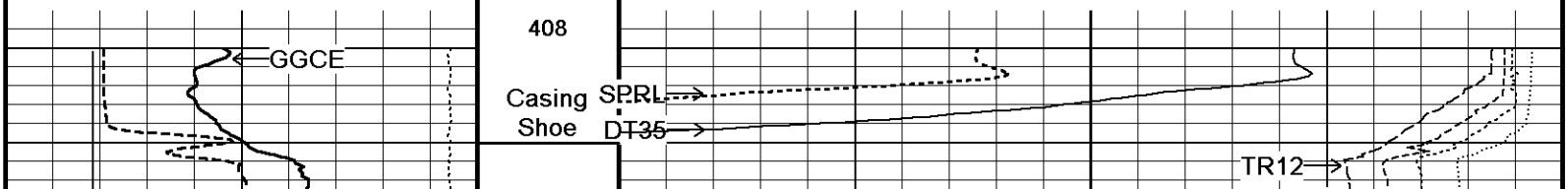
Wyllie Lime. Sonic Por.
percent
30 20 10 0 -10

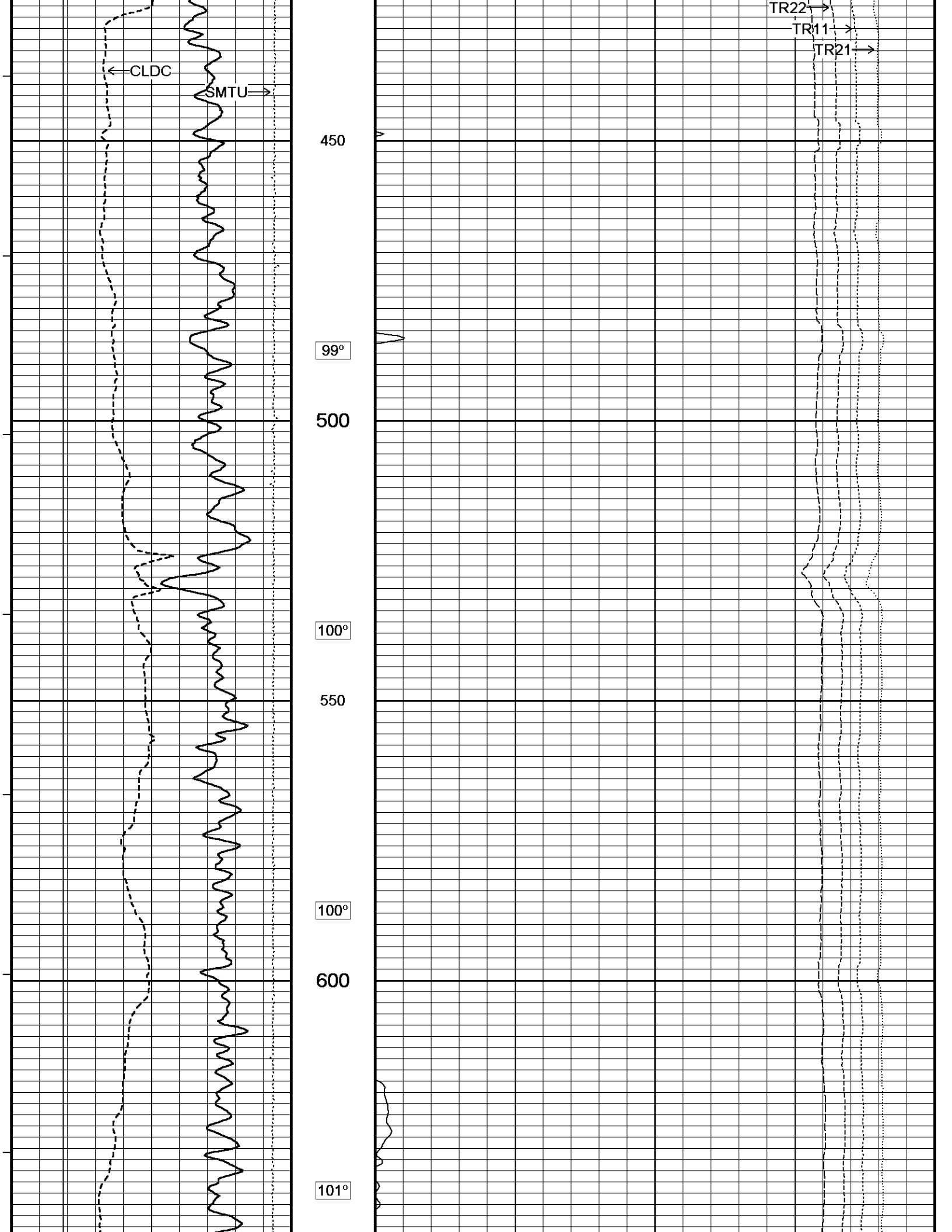
3' Transit Time
microseconds
1100 100

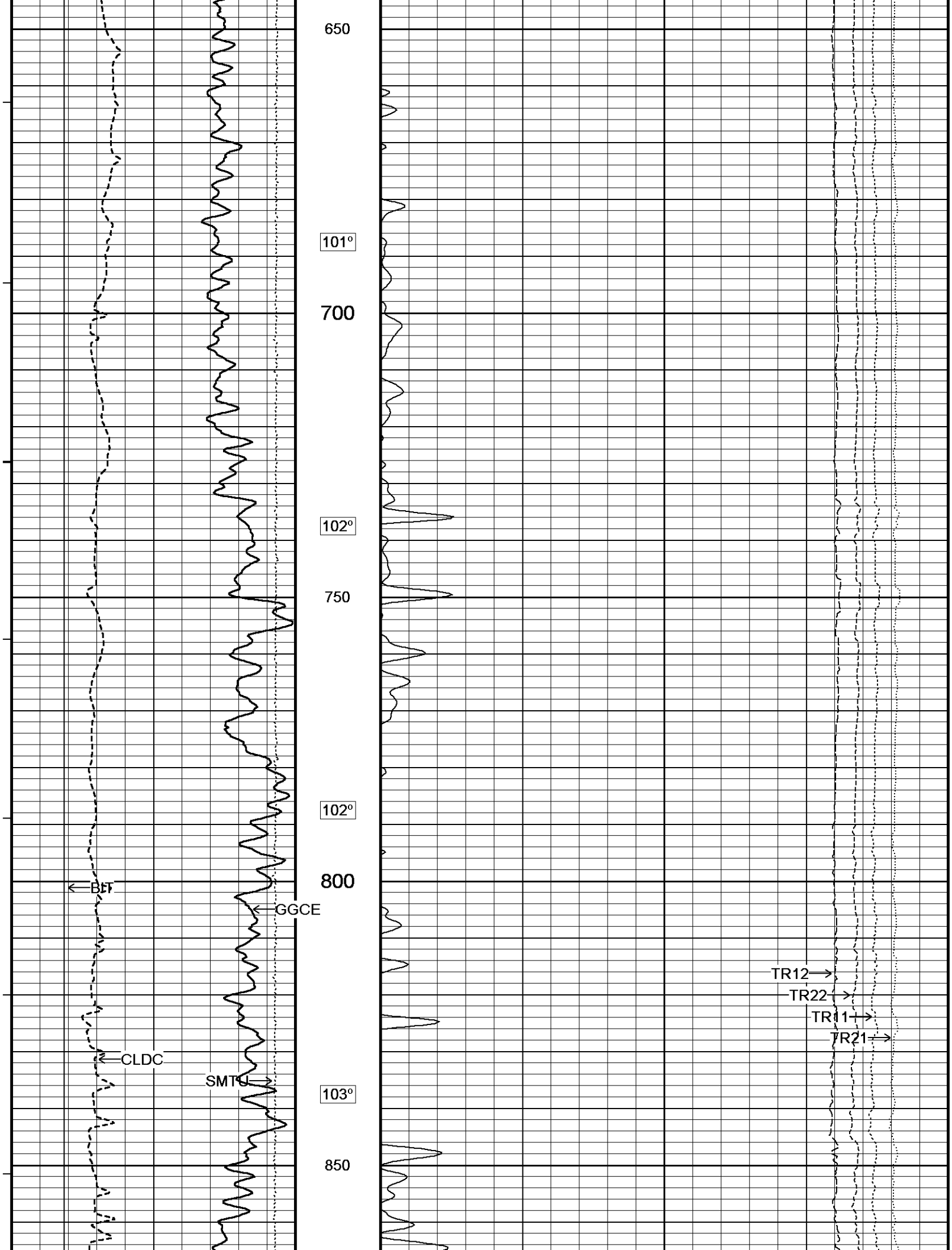
4' Transit Time
microseconds
1100 100

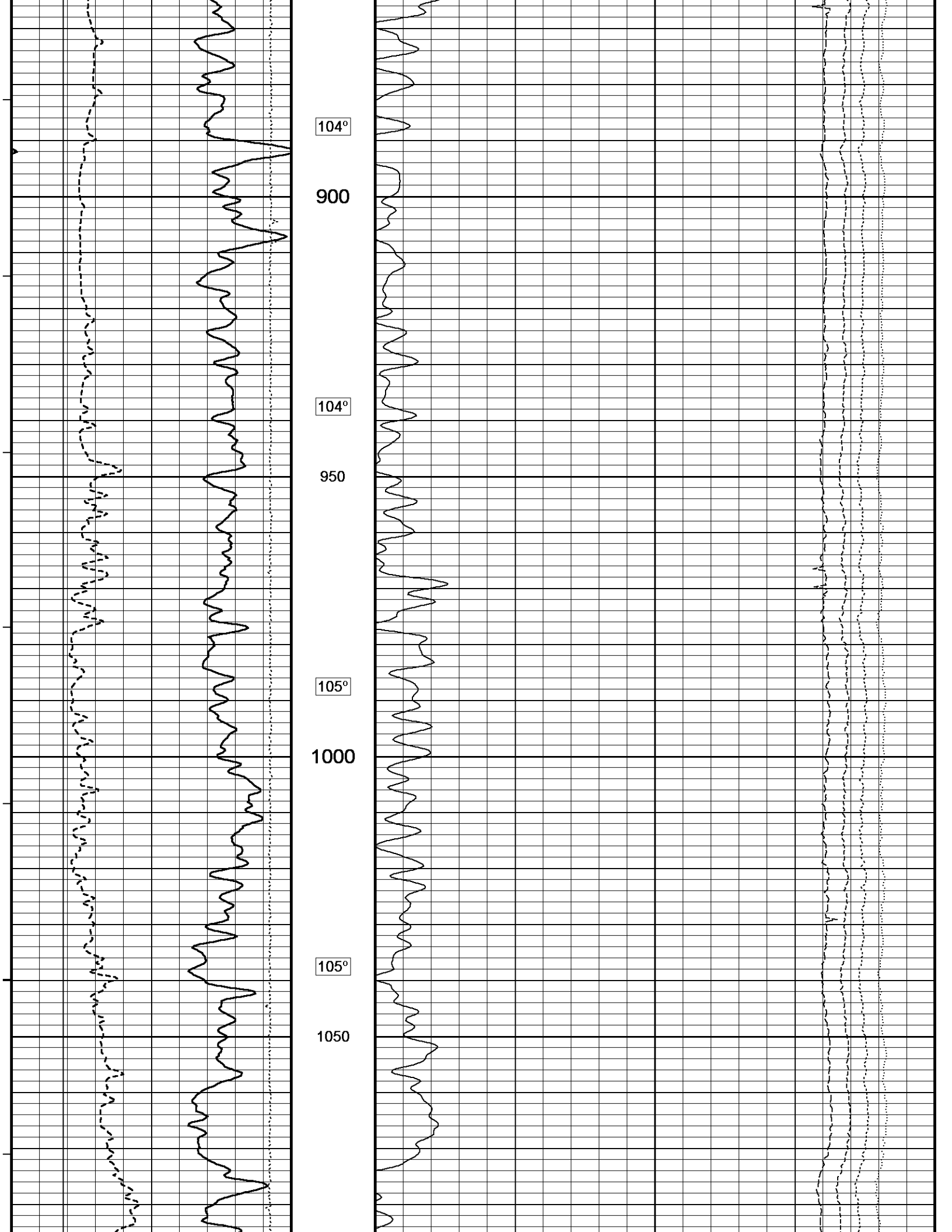
5' Transit Time
microseconds
1100 100

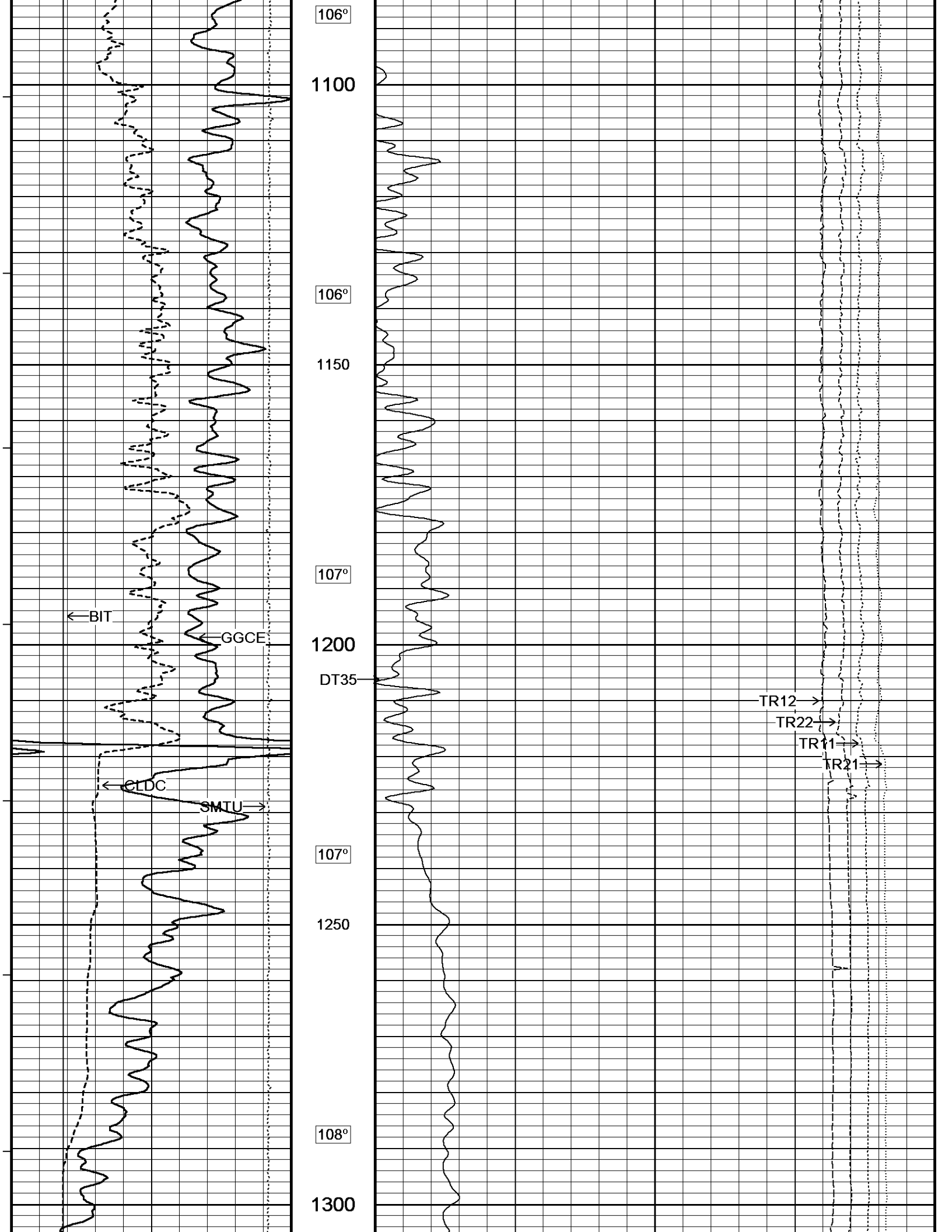
6' Transit Time
microseconds
1100 100

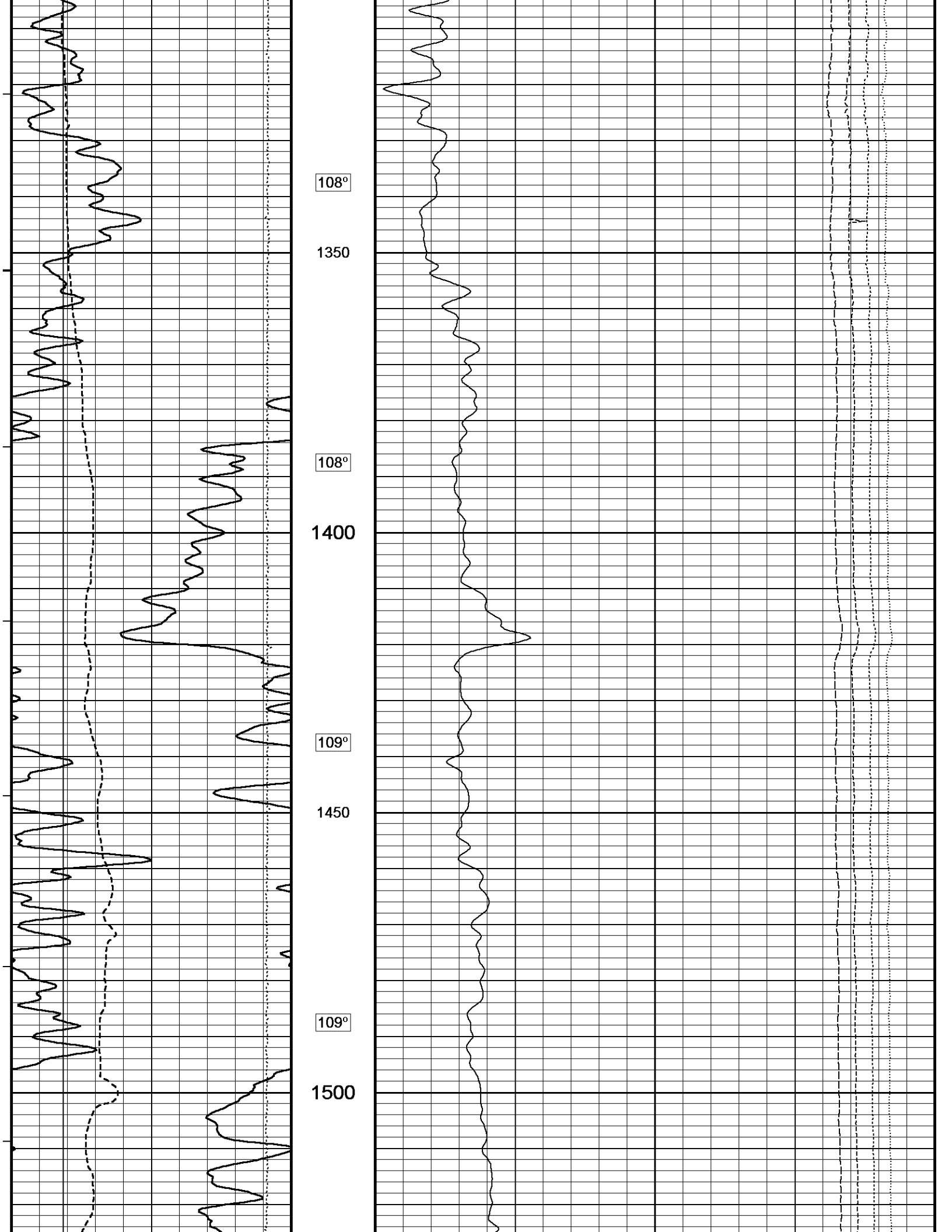


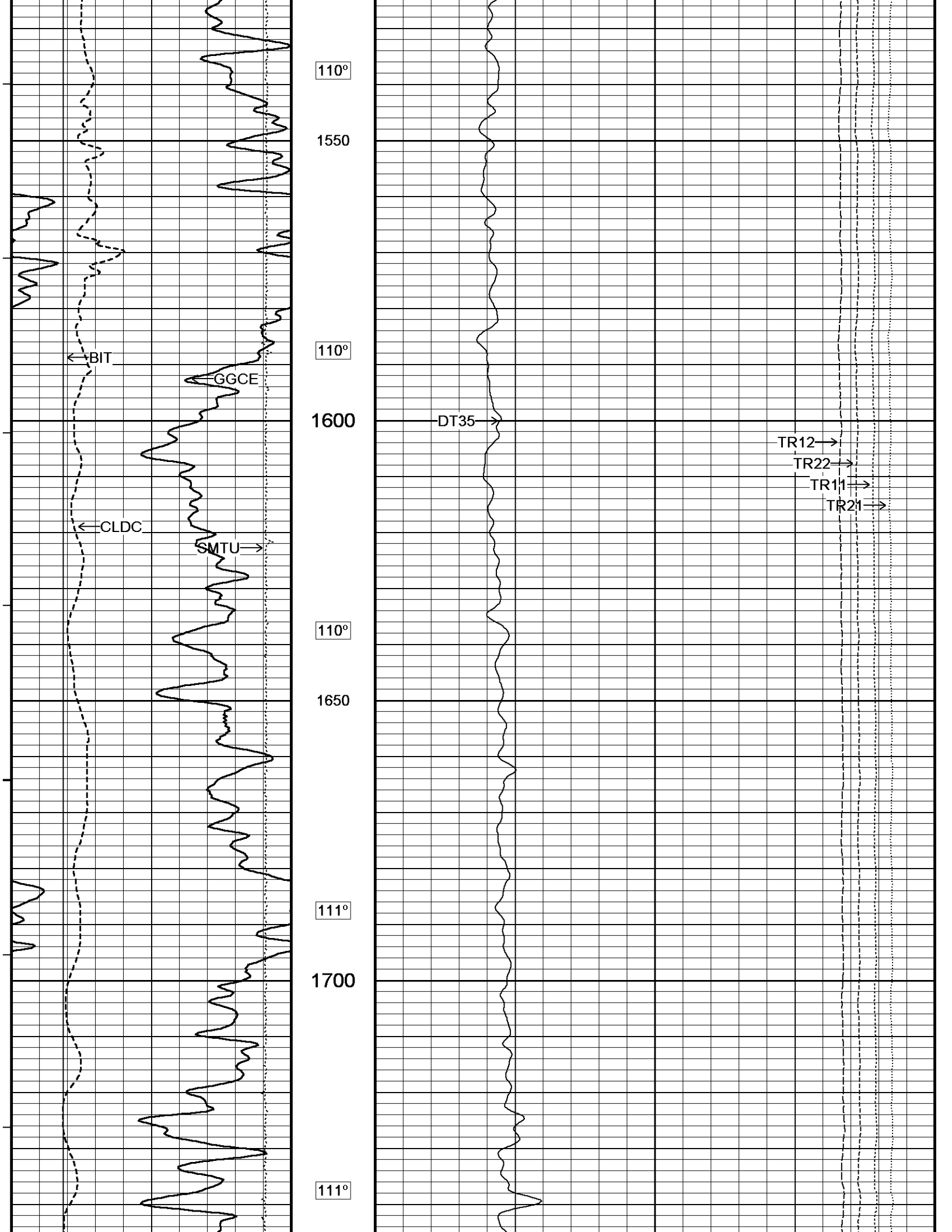

CLDC
SMTU
TR22
TR11
TR21
450
99°
500
100°
550
100°
600
101°

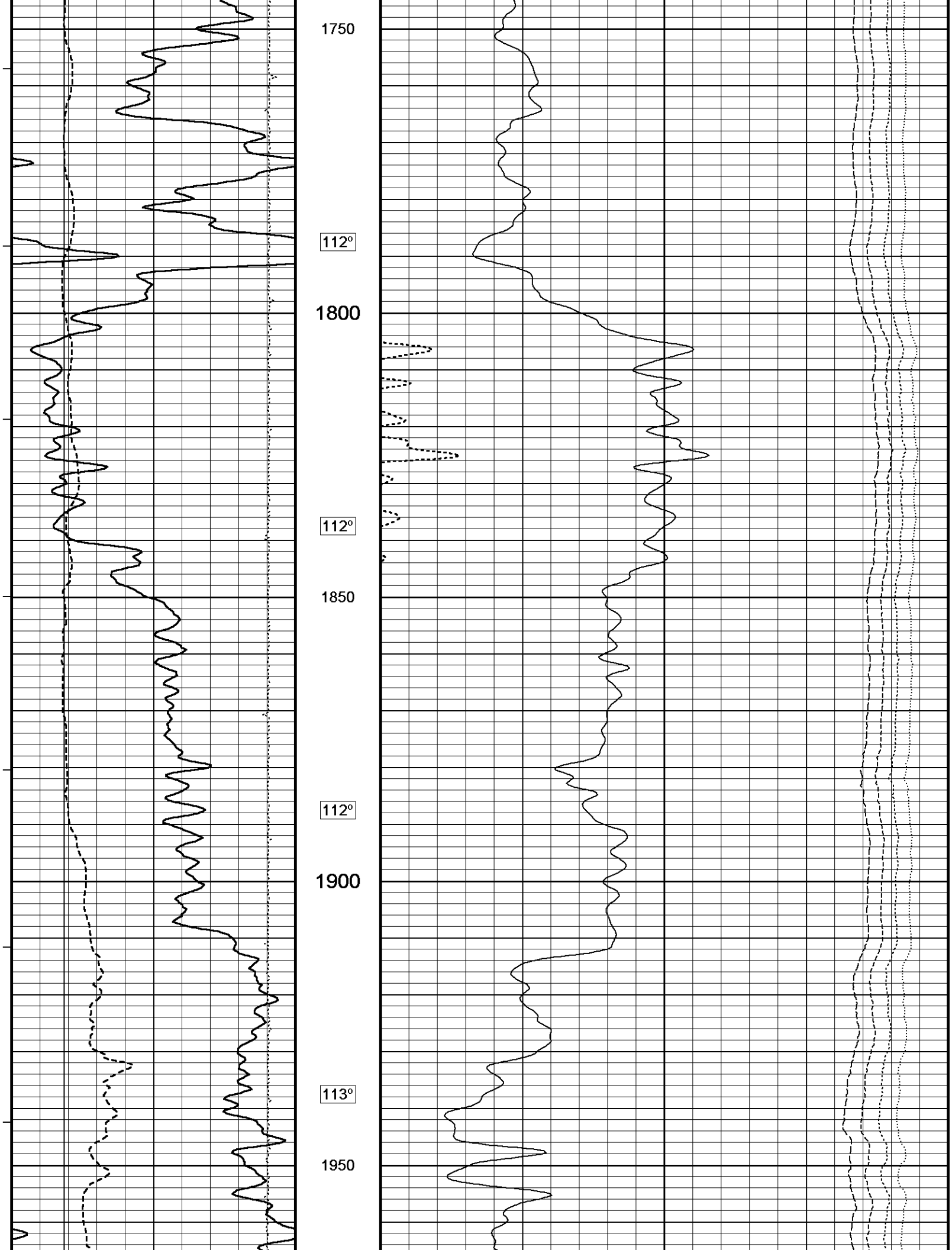

650
101°
700
102°
750
102°
800
BIT
GGCE
CLDC
SMTU
103°
850
TR12
TR22
TR11
TR21

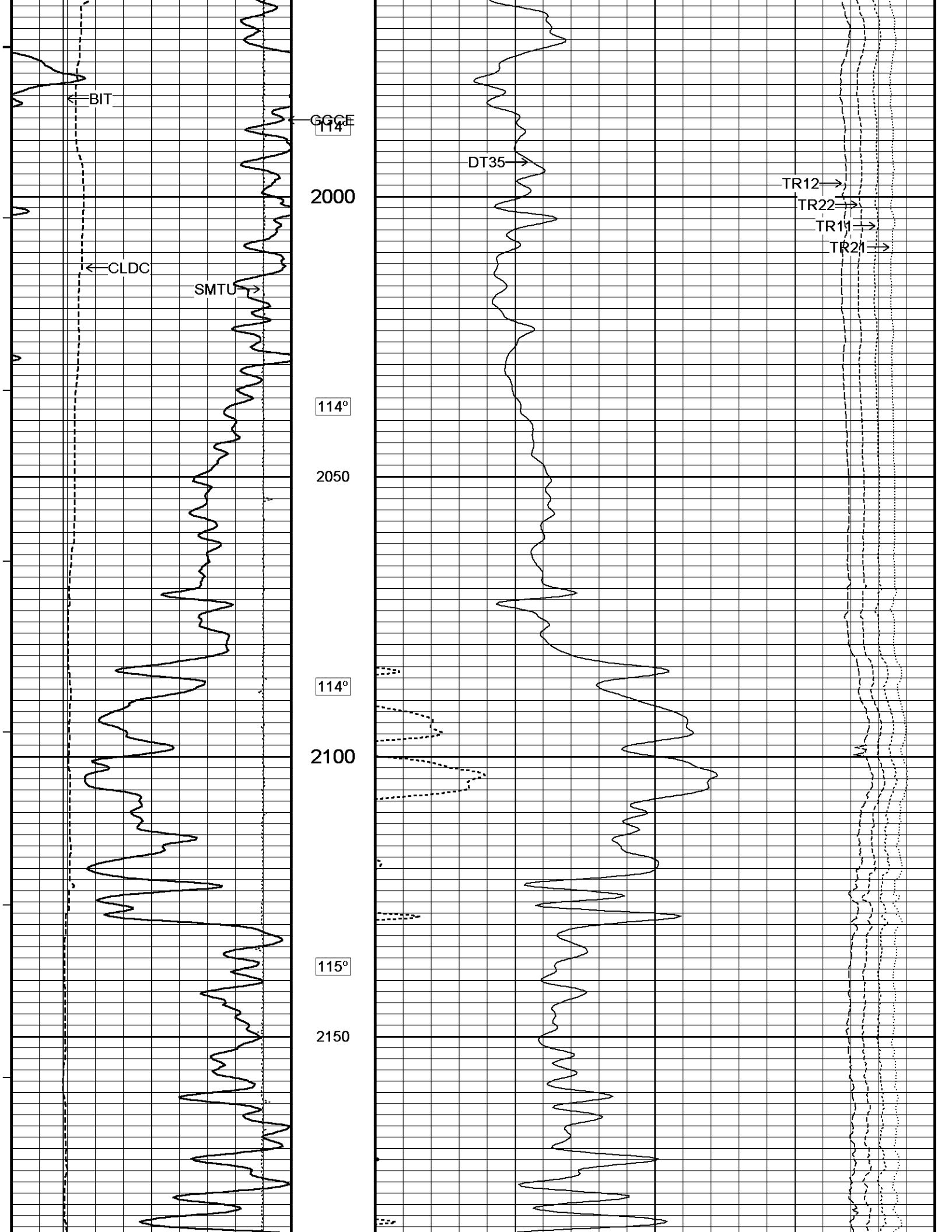

104°
900
104°
950
105°
1000
105°
1050

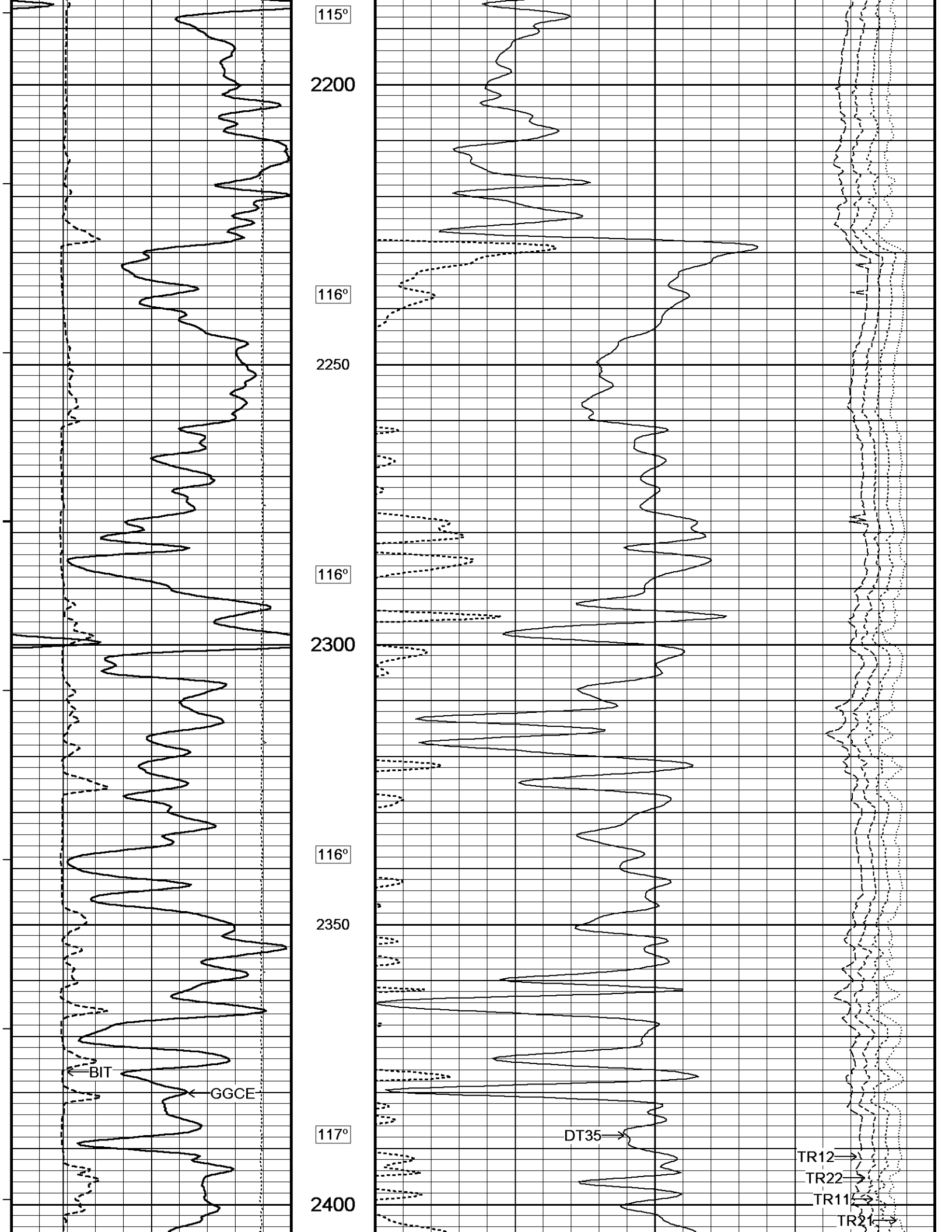

106°
1100
106°
1150
107°
BIT
GGCE
1200
DT35
TR12
TR22
TR11
TR21
CLDC
SMTU
107°
1250
108°
1300

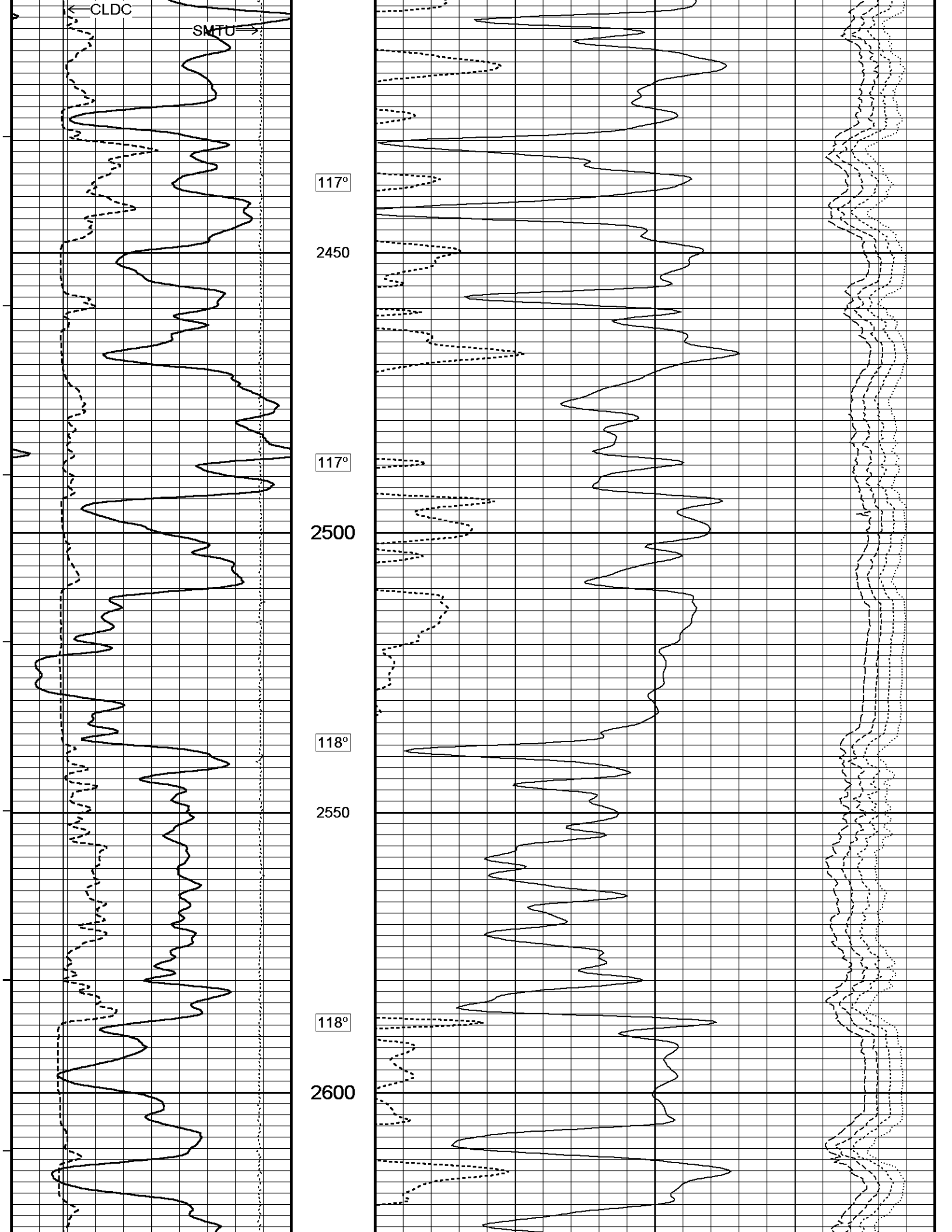

108°
1350
108°
1400
109°
1450
109°
1500

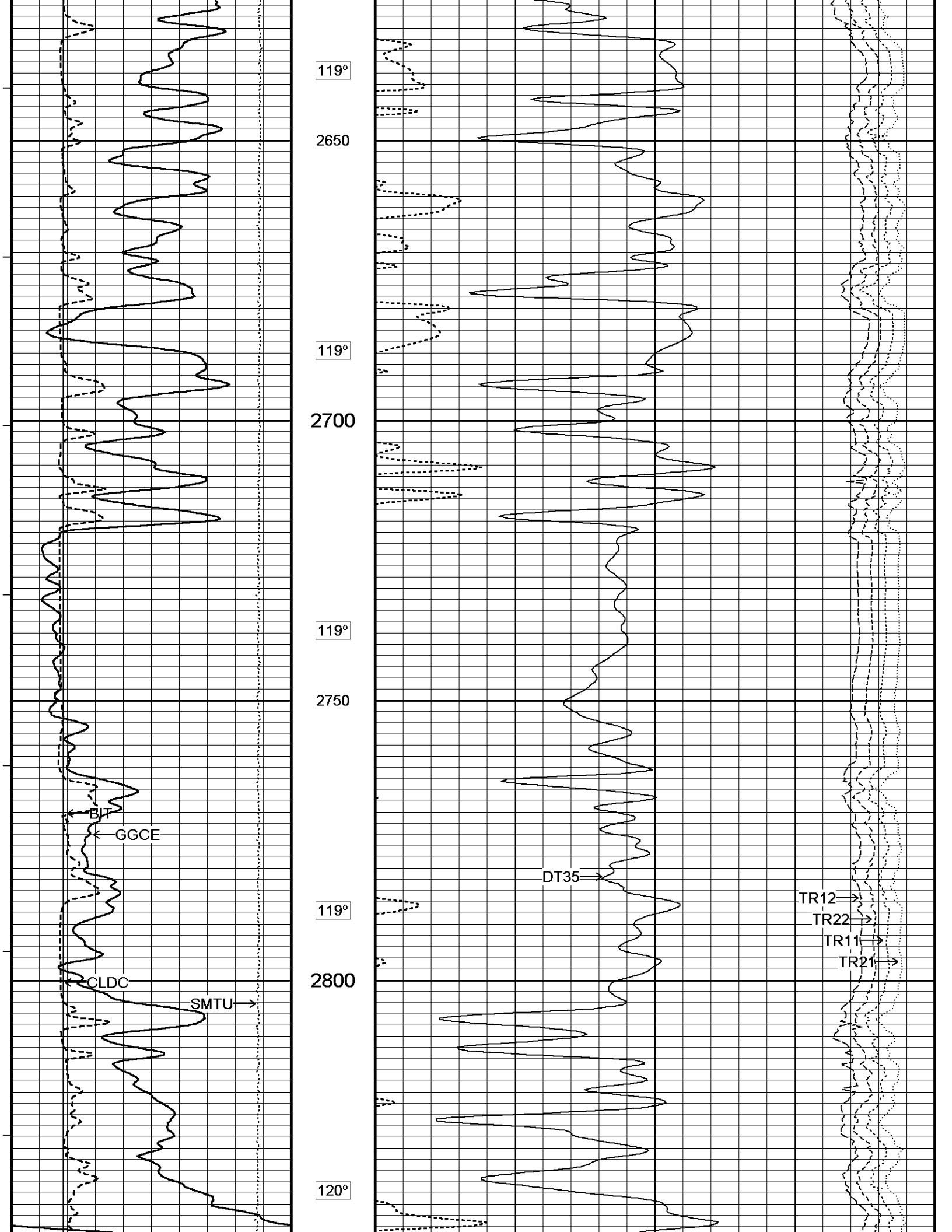

110°
1550
110°
BIT
GGCE
1600
DT35
TR12
TR22
TR11
TR21
CLDC
SMTU
110°
1650
111°
1700
111°

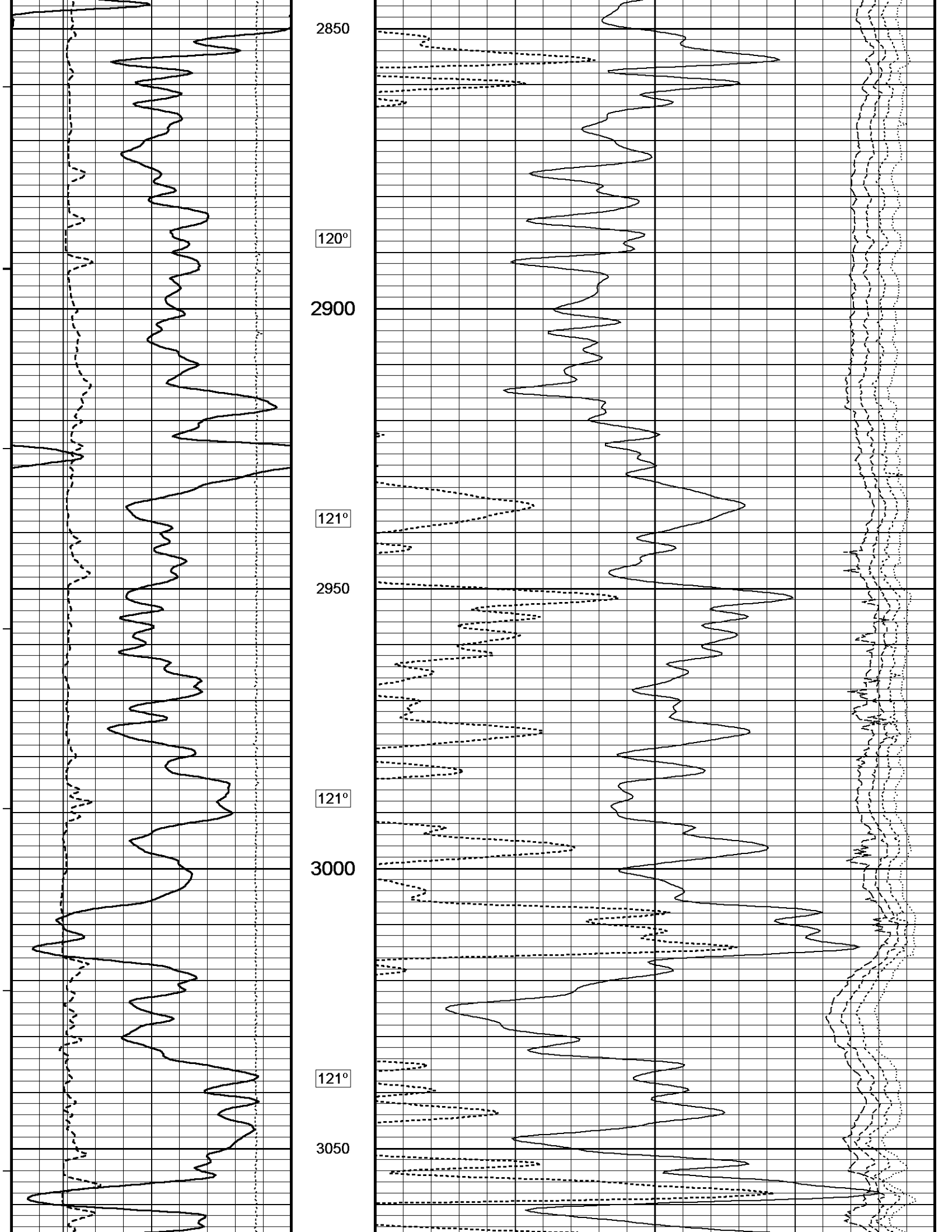

1750
112°
1800
112°
1850
112°
1900
113°
1950

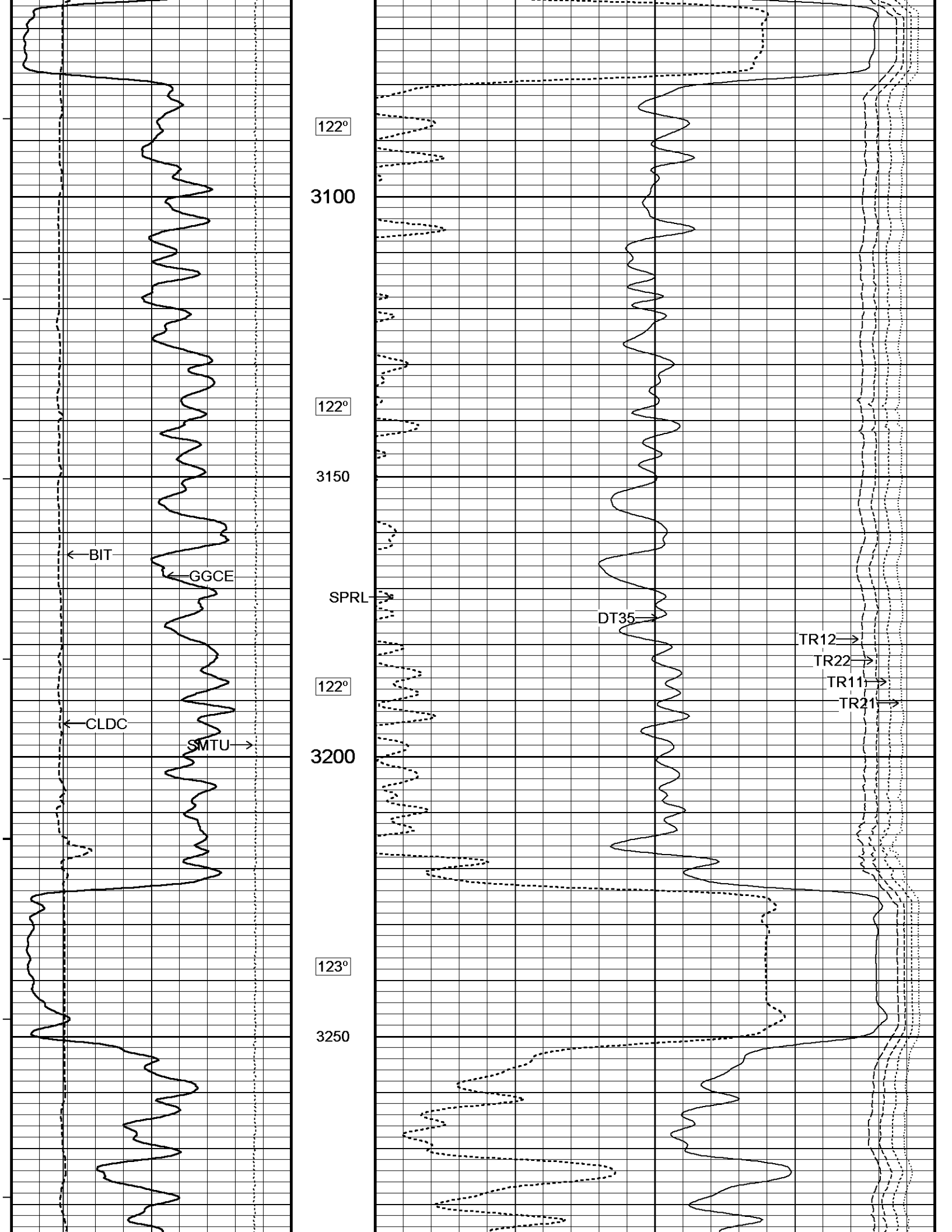

BIT
GGCE
114°
DT35
TR12
TR22
TR11
TR21
2000
CLDC
SMTU
114°
2050
114°
2100
115°
2150

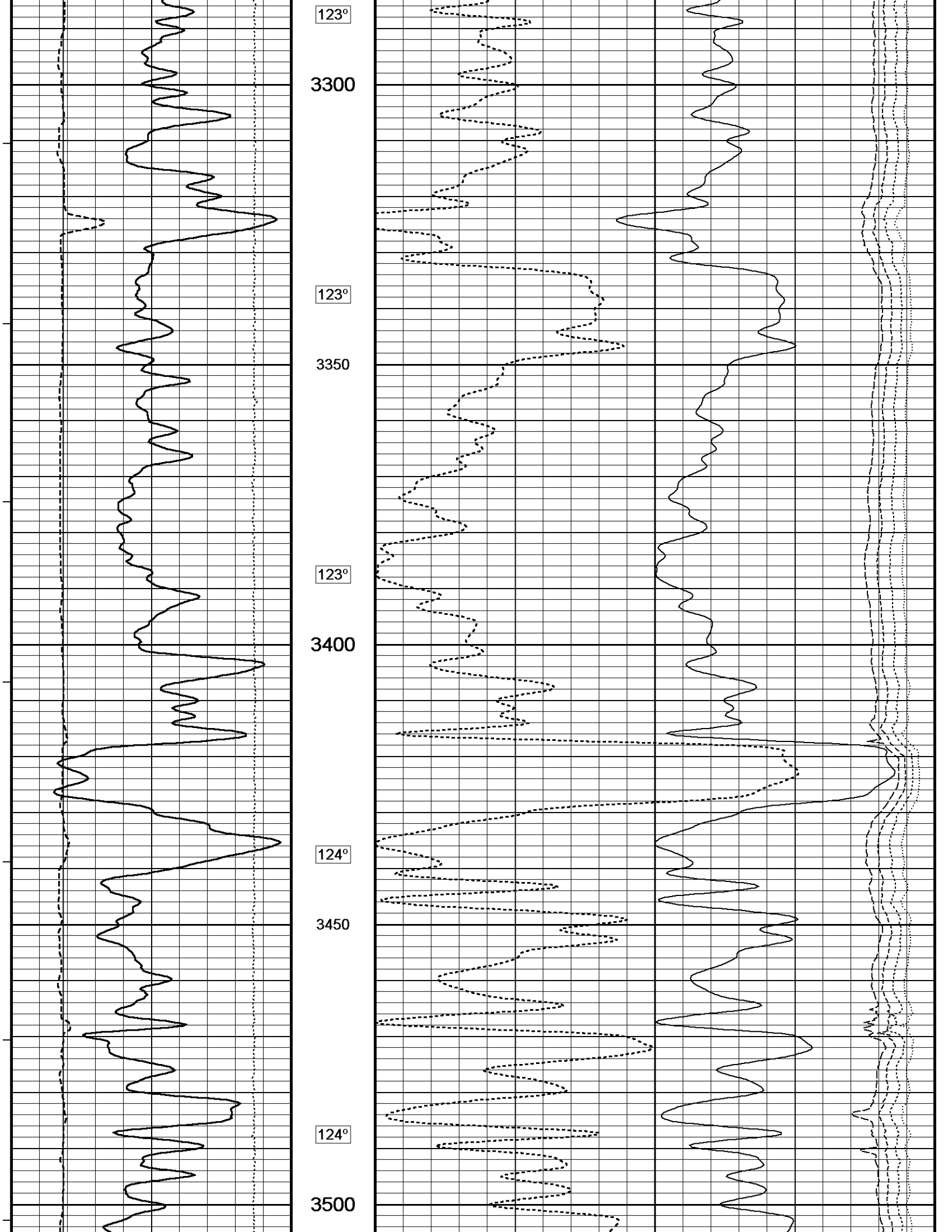

115°
2200
116°
2250
116°
2300
116°
2350
117°
2400
BIT
GGCE
DT35
TR12
TR22
TR11
TR21

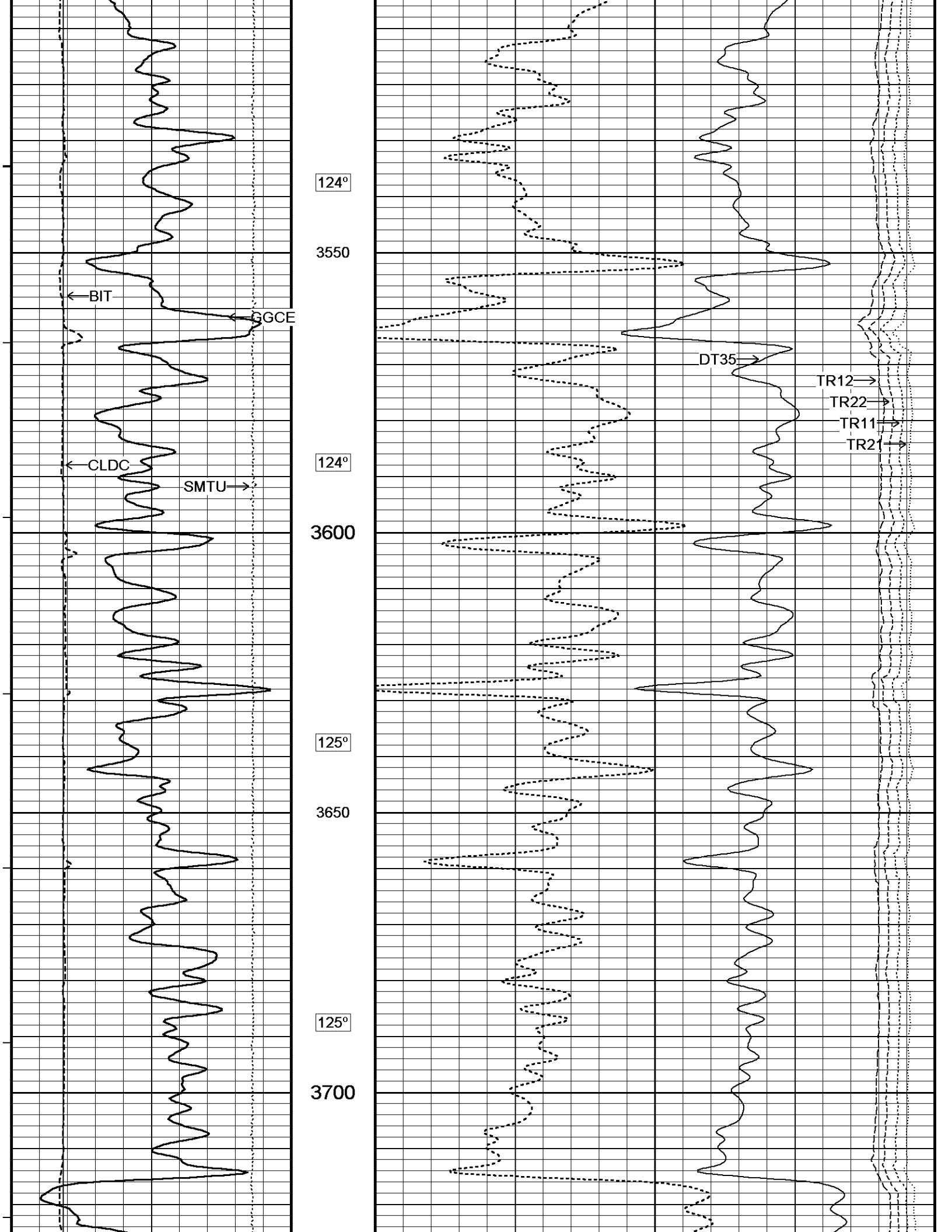

CLDC
SMTU
117°
2450
117°
2500
118°
2550
118°
2600

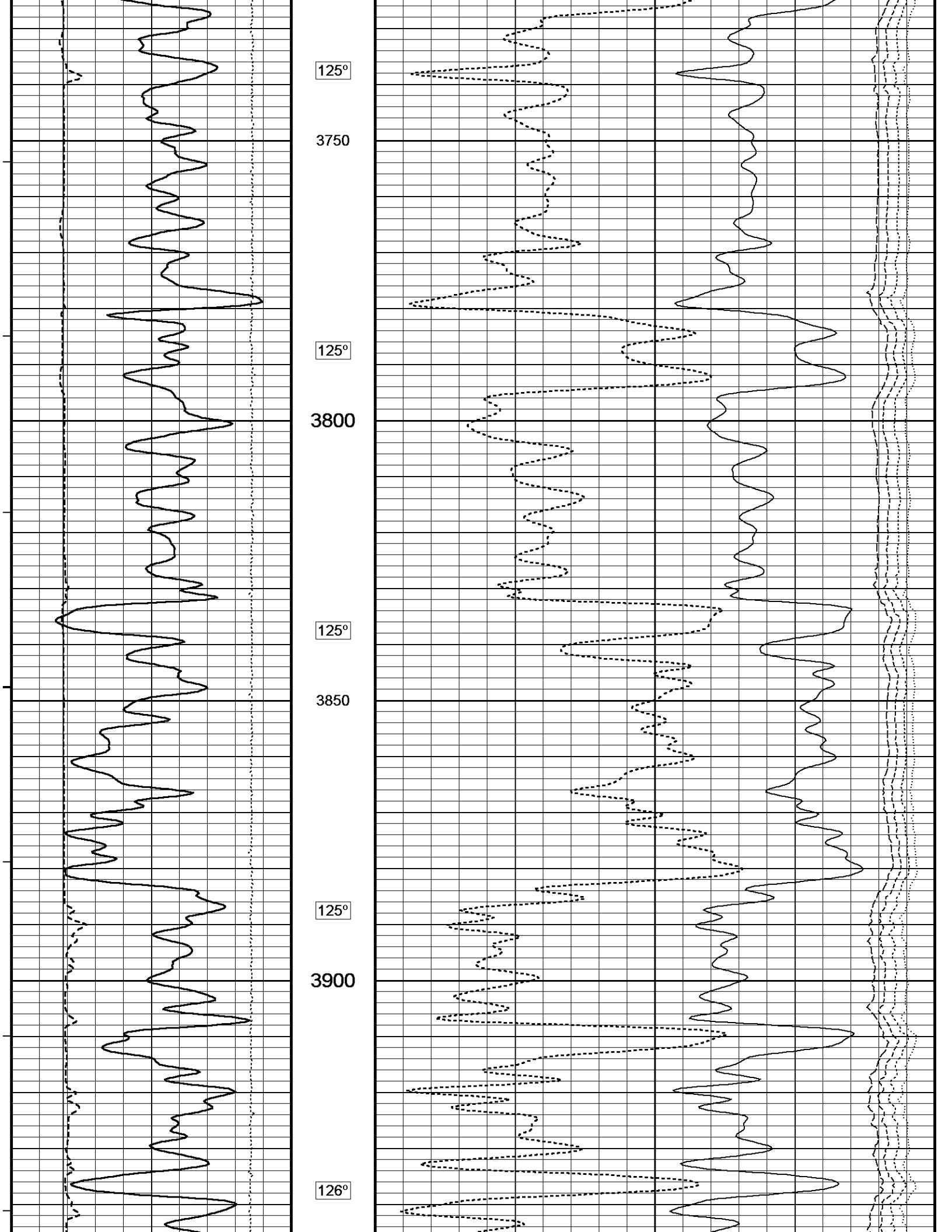

119°
2650
119°
2700
119°
2750
119°
2800
120°
BIT
GGCE
CLDC
SMTU
DT35
TR12
TR22
TR11
TR21


2850
120°
2900
121°
2950
121°
3000
121°
3050


122°
3100
122°
3150
BIT
GGCE
SPRL
DT35
TR12
TR22
TR11
TR21
122°
CLDC
SMTU
3200
123°
3250


123°
3300
123°
3350
123°
3400
124°
3450
124°
3500


124°
3550
BIT
GGCE
DT35
TR12
TR22
TR11
TR21
CLDC
124°
SMTU
3600
125°
3650
125°
3700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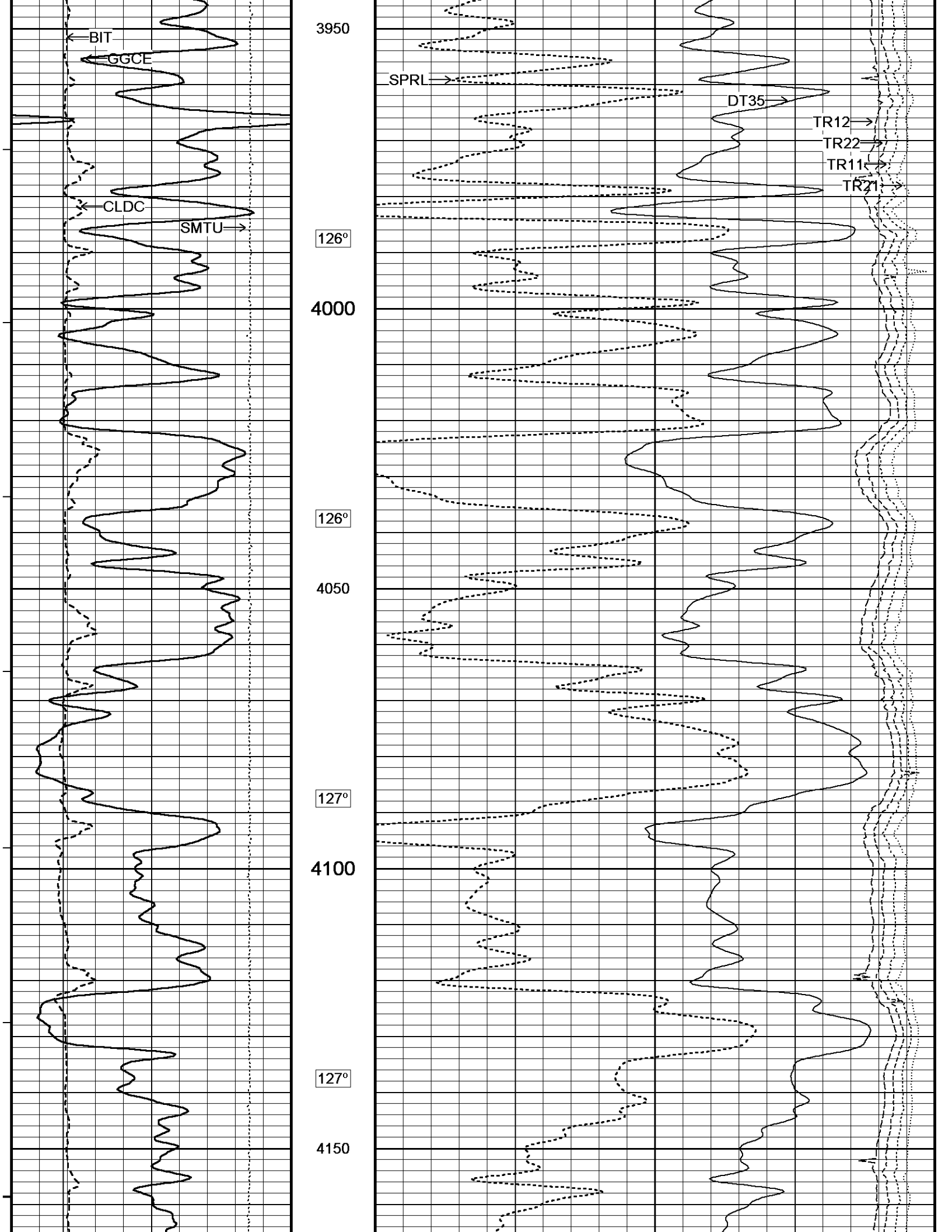
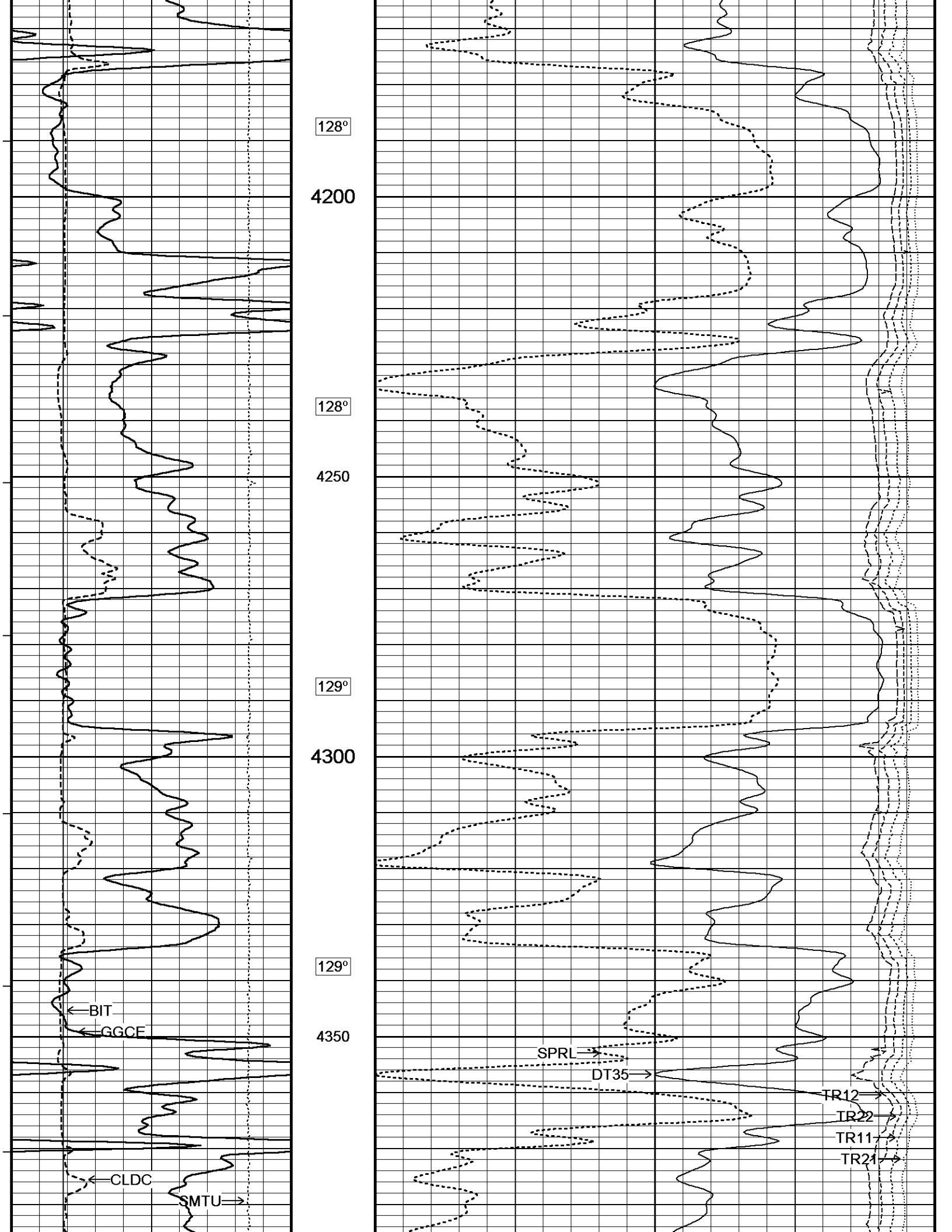
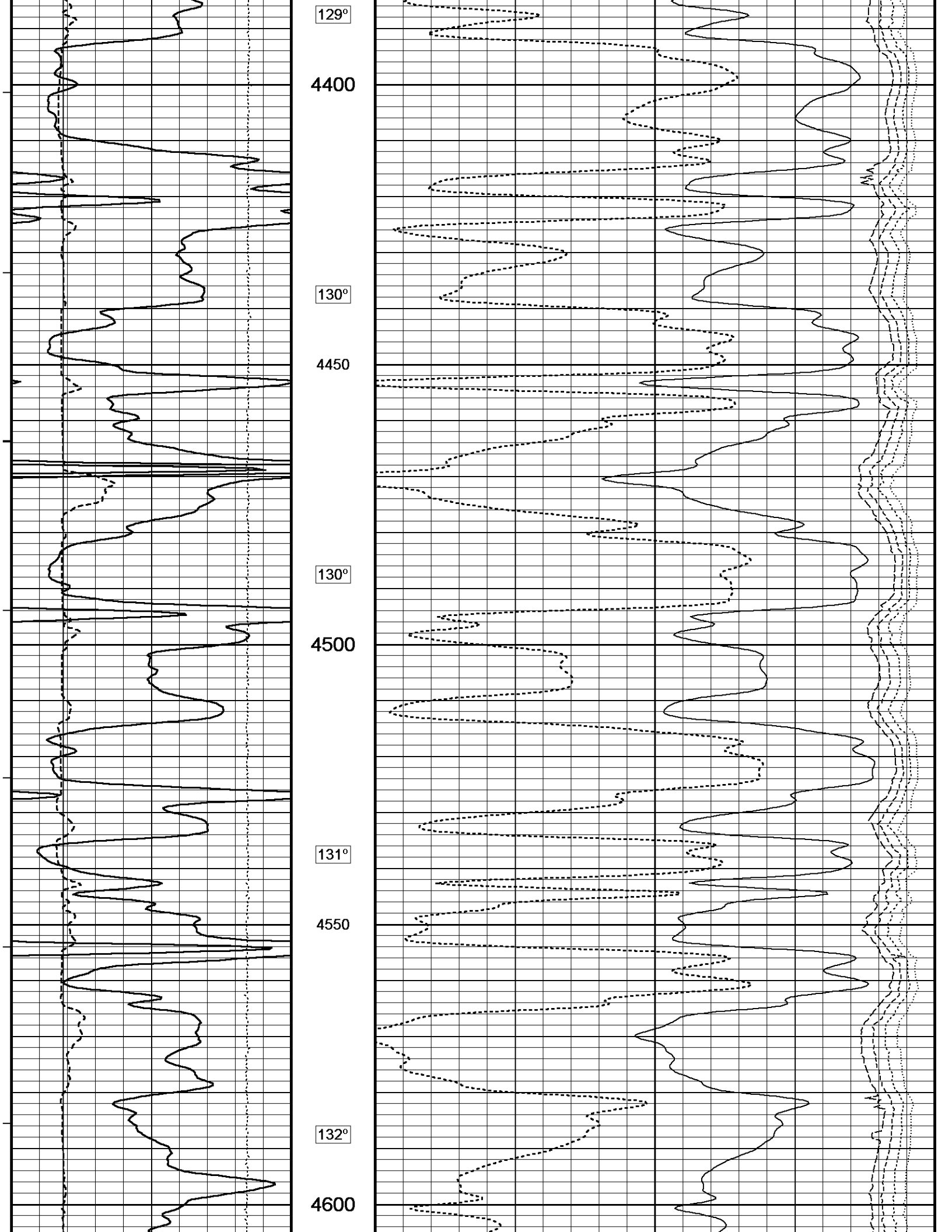
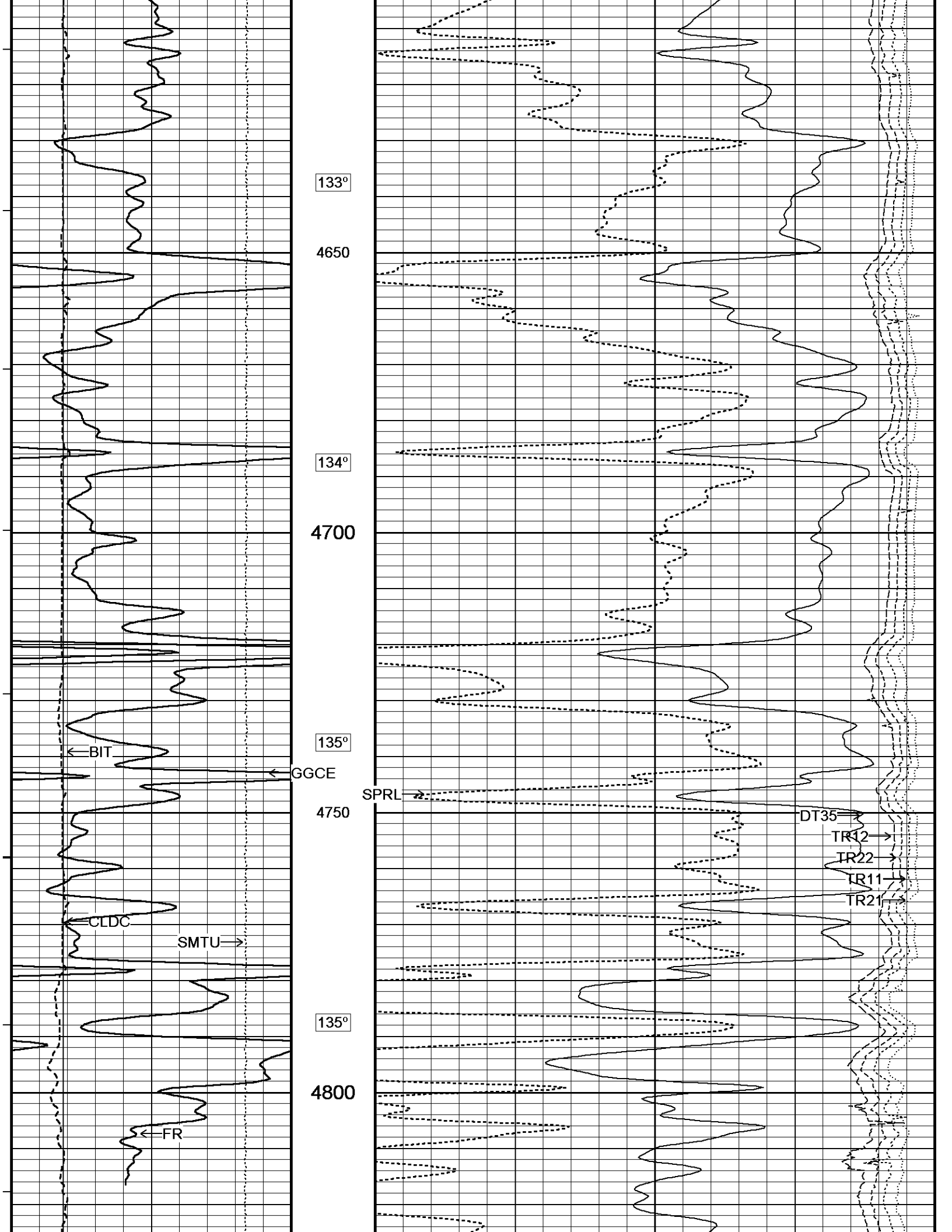
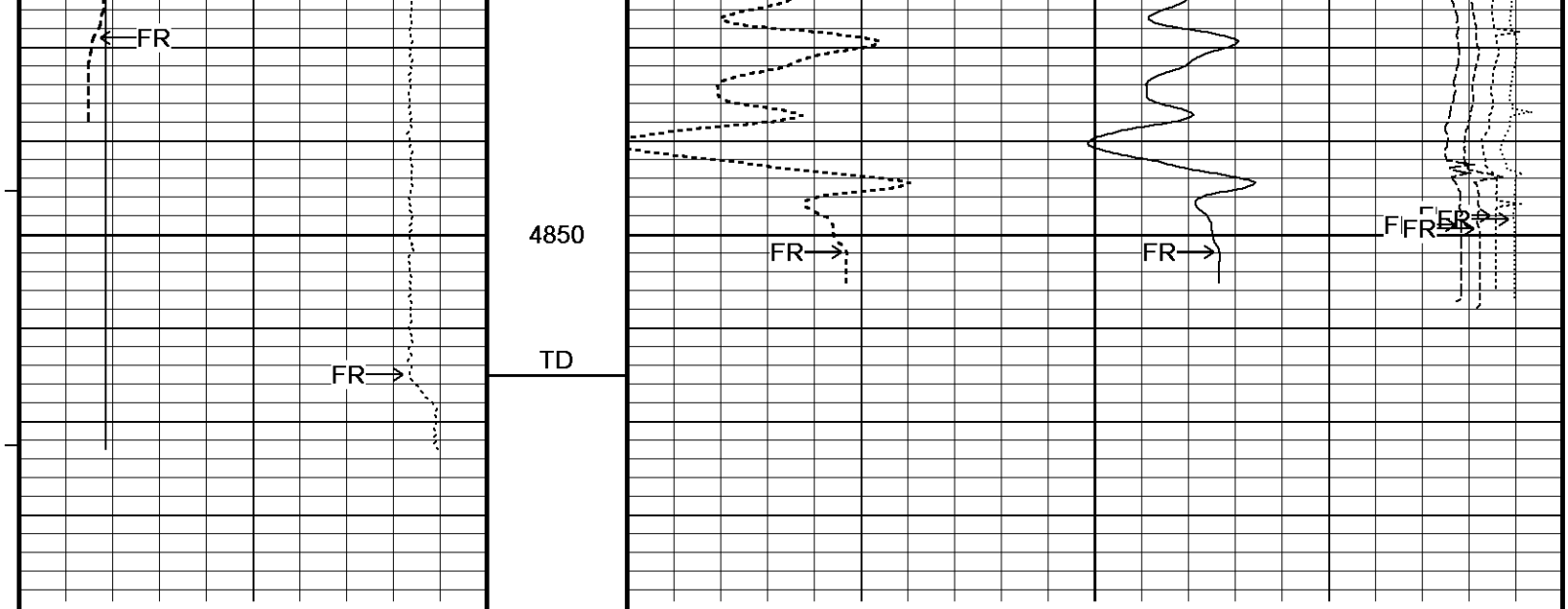
3750
125°
3800
125°
3850
125°
3900
126°


BIT
GGCE
CLDC
SMTU
3950
126°
4000
126°
4050
127°
4100
127°
4150
SPRL
DT35
TR12
TR22
TR11
TR21


128°
4200
128°
4250
129°
4300
129°
4350
BIT
GGCE
CLDC
SMTU
SPRL
DT35
TR12
TR22
TR11
TR21


129°
4400
130°
4450
130°
4500
131°
4550
132°
4600


133°
4650
134°
4700
135°
BIT
GGCE
SPRL
4750
DT35
TR12
TR22
TR11
TR21
CLDC
SMTU
135°
4800
FR



4850

TD

Depth in Feet

Timing Marks
every 60.0 sec

Density Caliper
inches
6 11 16

Borehole Corrected Gamma
API
0 75 150
150 225 300

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

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

Borehole Temp in deg F

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 22-MAR-2019 08:17
Filename: C:\Users\cmcam\AppData\Local\Temp\Weatherford PreView\0\MAIN PASS_001.dta
Recorded on 22-MAR-2019 00:23
System Versions: Logged with 18.05.4364 Processed with 18.05.4364 Plotted with 18.01.5761

5 INCH MAIN 1:240

REPEAT SECTION 1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 22-MAR-2019 08:17
Filename: C:\Users\cmcam\AppData\Local\Temp\Weatherford PreView\0\REPEAT PASS_ 001.dta
Recorded on 21-MAR-2019 23:34

System Versions: Logged with 18.05.4364 Processed with 18.05.4364 Plotted with 18.01.5761

Timing Marks
every 60.0 sec

Density Caliper
inches
6 11 16

Borehole Corrected Gamma
API
0 75 150
150 225 300

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

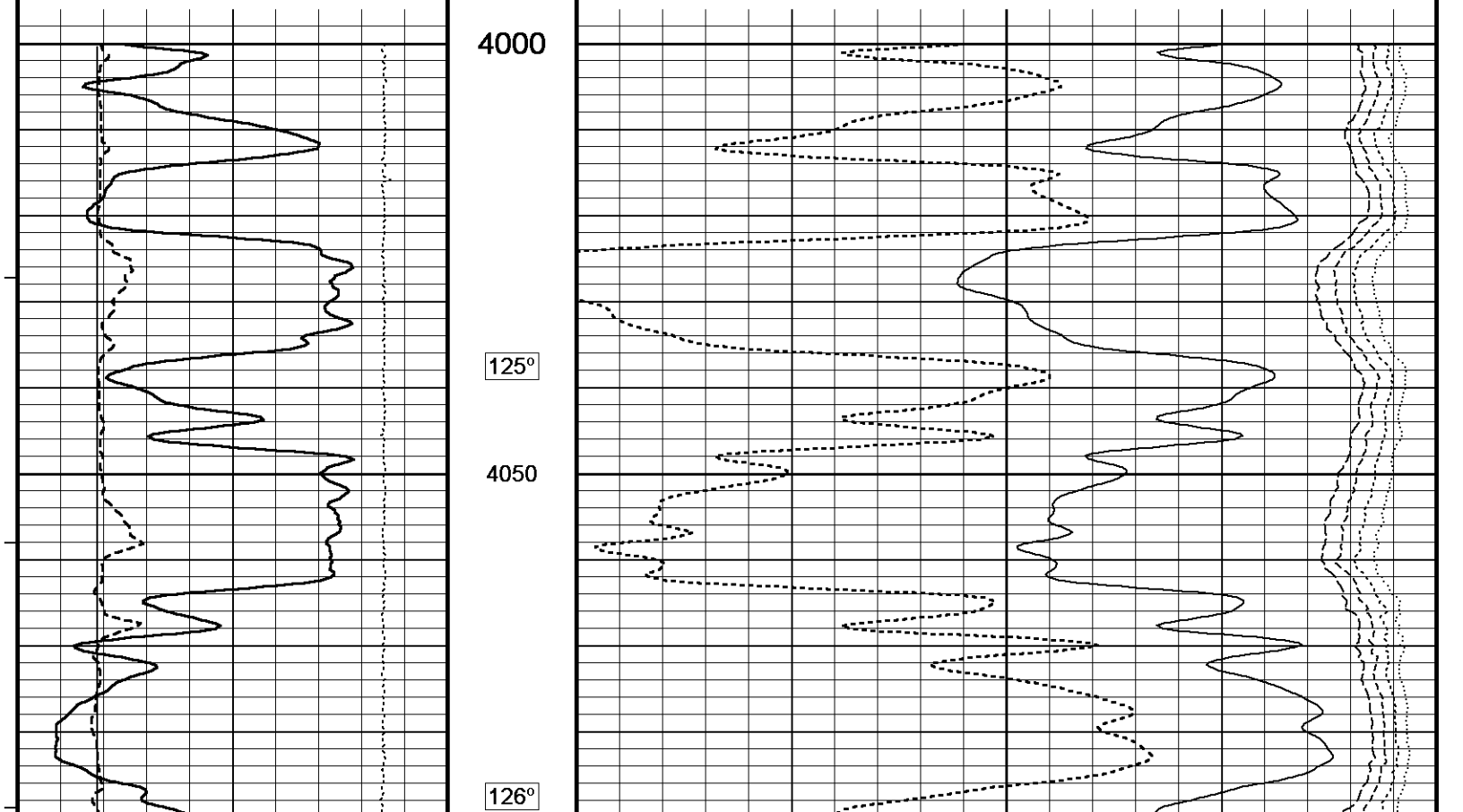
Wyllie Lime. Sonic Por.
percent
30 20 10 0 -10

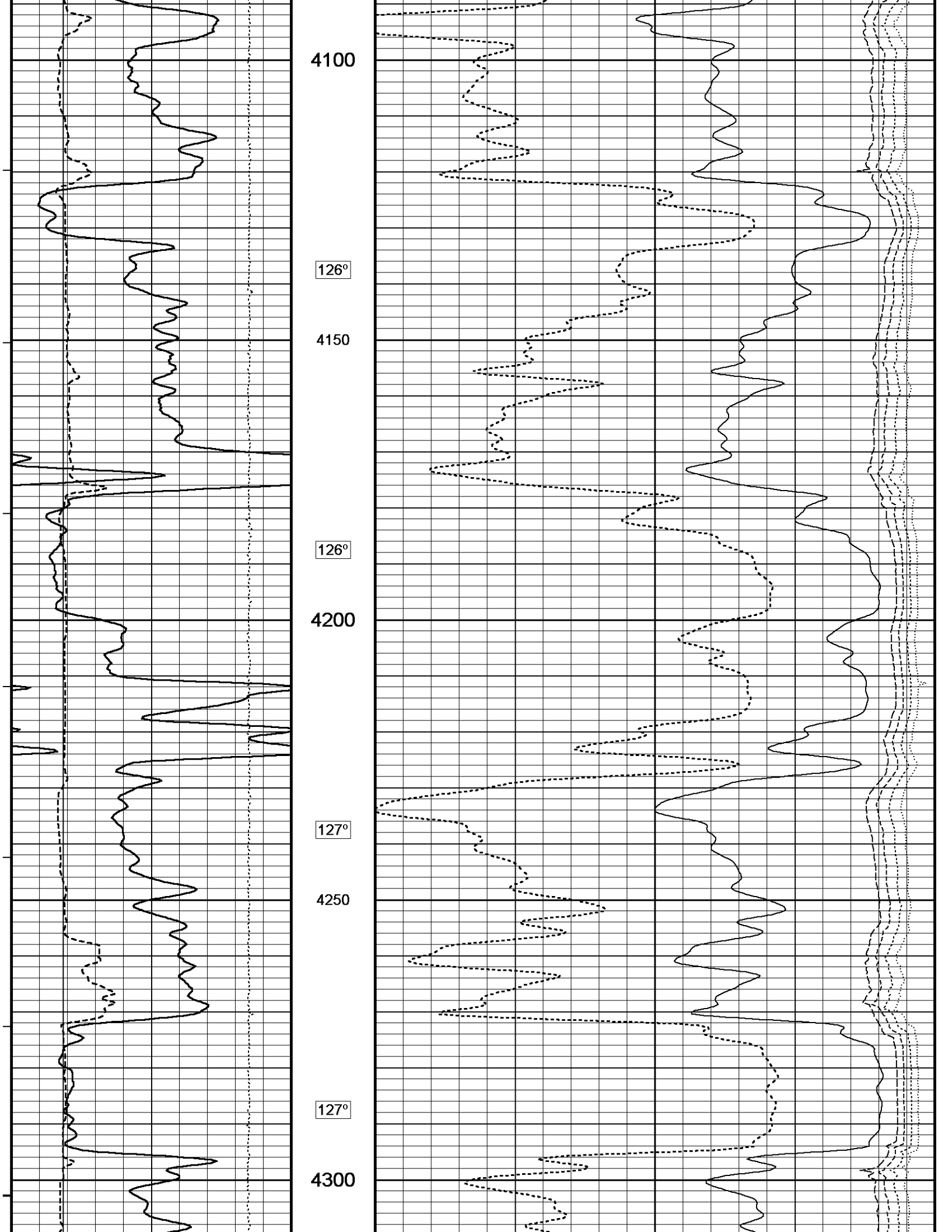
3' Transit Time
microseconds
1100 100

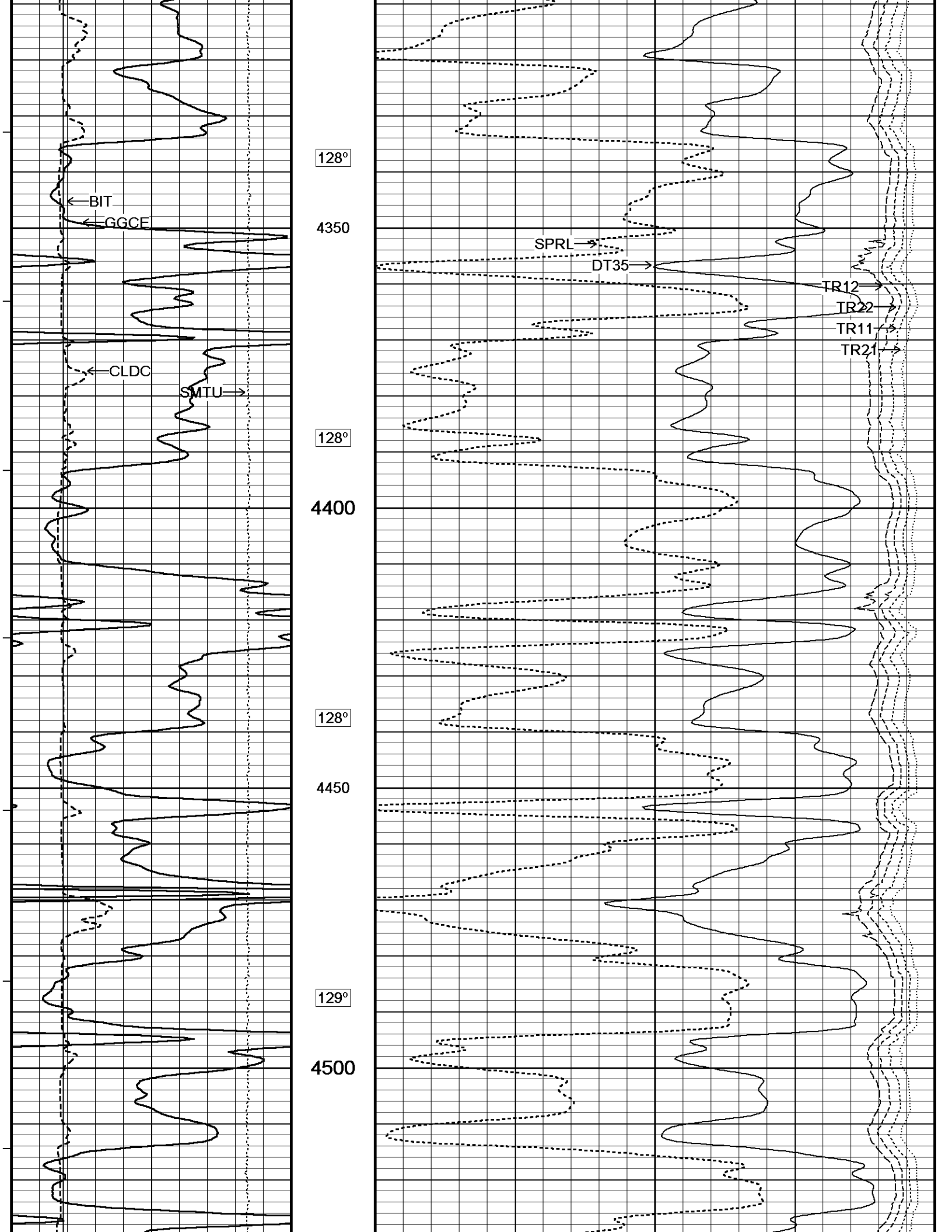
4' Transit Time
microseconds
1100 100

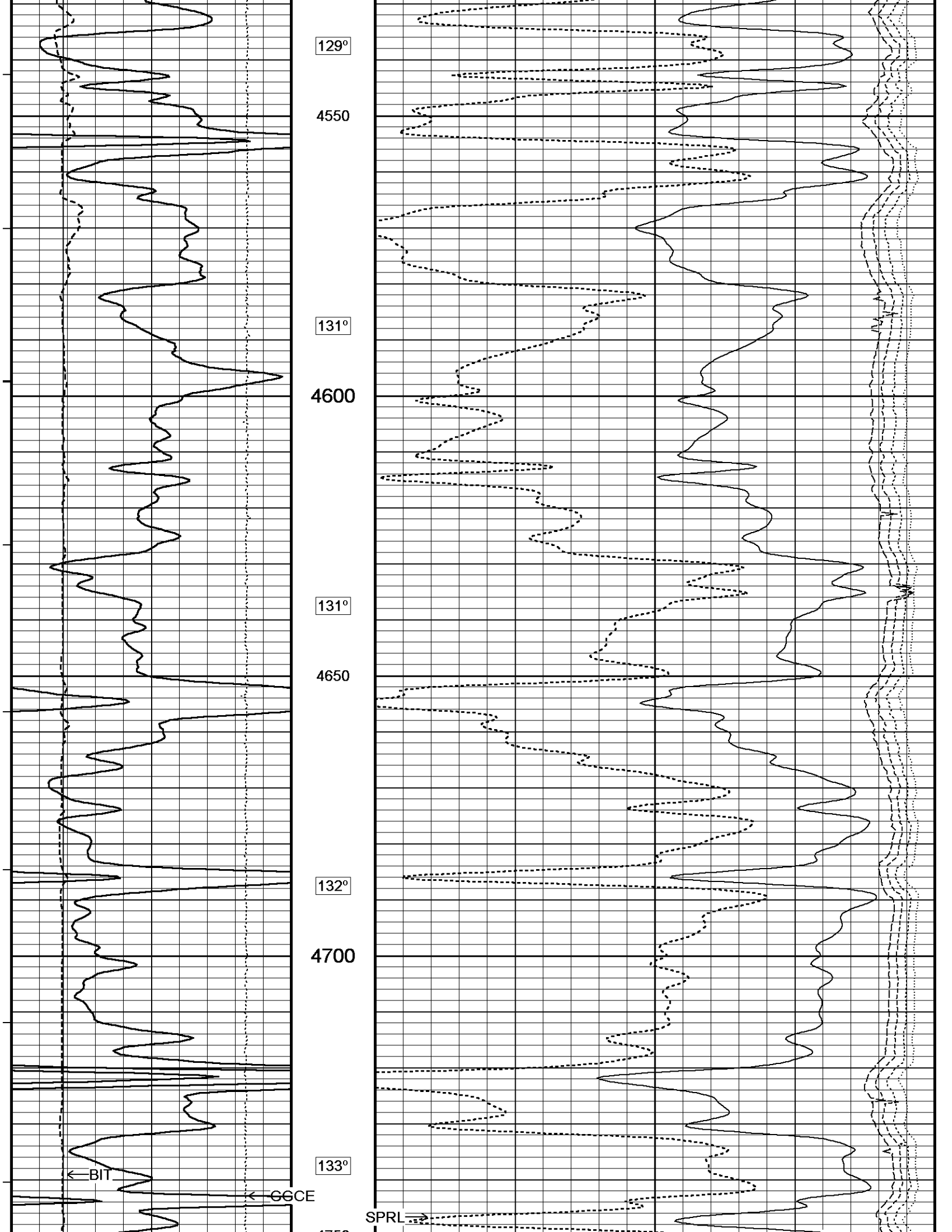
5' Transit Time
microseconds
1100 100

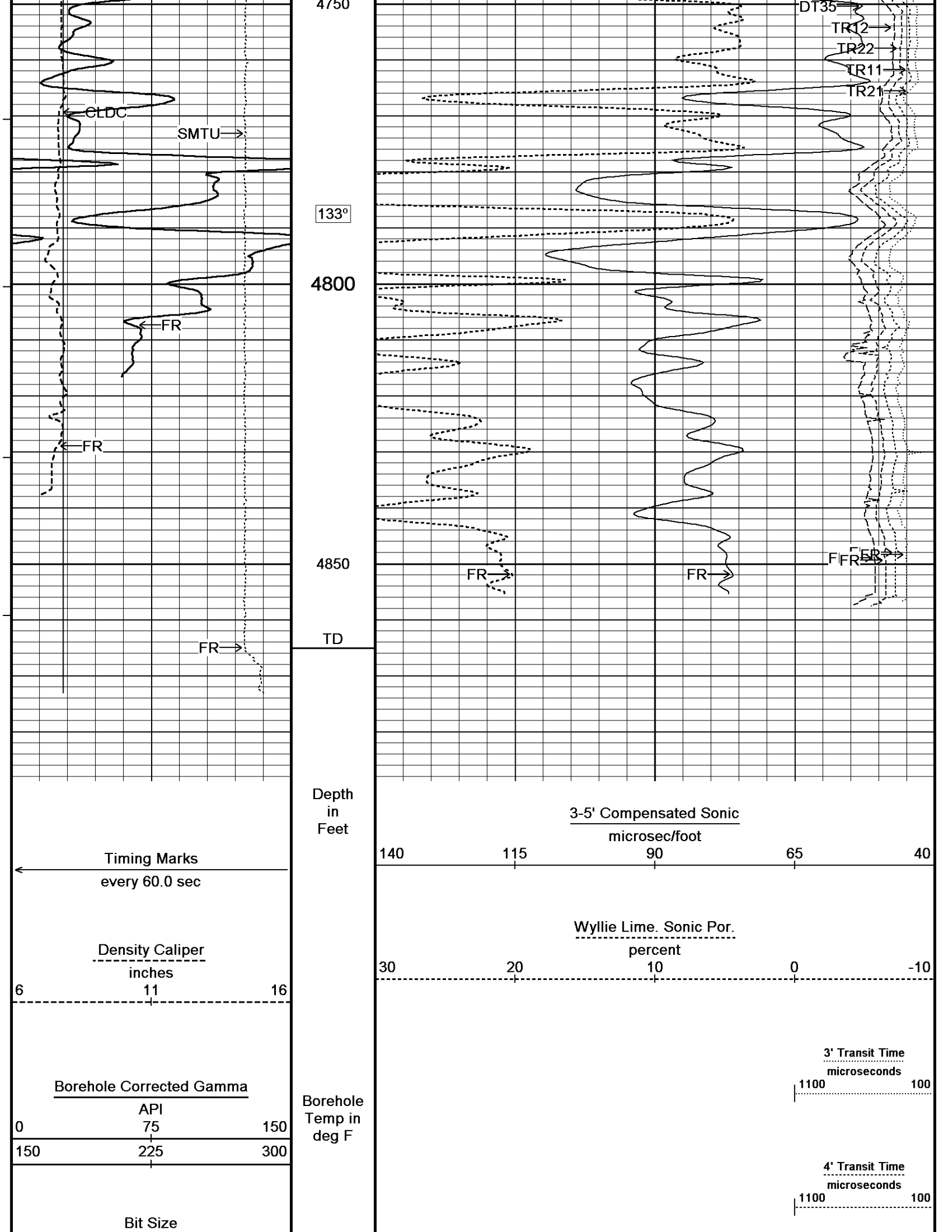
6' Transit Time
microseconds
1100 100




4100
126°
4150
126°
4200
127°
4250
127°
4300


128°
BIT
GGCE
4350
SPRL
DT35
TR12
TR22
TR11
TR21
CLDC
SMTU
128°
4400
128°
4450
129°
4500


129°
4550
131°
4600
131°
4650
132°
4700
133°
BIT
GCCE
SPRL


4750
CLDC
SMTU
133°
4800
FR
FR
4850
FR
TD
DT35
TR12
TR22
TR11
TR21
FR
FR
FR
FR
Depth
in
Feet
Timing Marks
every 60.0 sec
Density Caliper
inches
6
11
16
Borehole Corrected Gamma
API
0
75
150
150
225
300
Bit Size
3-5' Compensated Sonic
microsec/foot
140
115
90
65
40
Wyllie Lime. Sonic Por.
percent
30
20
10
0
-10
Borehole
Temp in
deg F
3' Transit Time
microseconds
1100
100
4' Transit Time
microseconds
1100
100

inches
6 11 16

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

5' Transit Time
microseconds
1100 100

6' Transit Time
microseconds
1100 100

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 22-MAR-2019 08:17
Filename: C:\Users\cmcam\AppData\Local\Temp\Weatherford PreView\0\REPEAT PASS_ 001.dta
Recorded on 21-MAR-2019 23:34
System Versions: Logged with 18.05.4364 Processed with 18.05.4364 Plotted with 18.01.5761

REPEAT SECTION 1:240

BEFORE SURVEY CALIBRATION

C:\Users\cmcam\AppData\Local\Temp\Weatherford PreView\0\MAIN PASS_001.dta

General Constants All 000

Last Edited on 21-MAR-2019,23:06

General Parameters		
Mud Resistivity	1.040	ohm-metres
Mud Resistivity Temperature	103.000	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	Array Ind. One Res Rt	
RWA Constant A	0.620	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-D.K 443

Field Calibration on 21-MAR-2019 09:55

	Measured	Calibrated (API)
Background	64	45
Calibrator (Gross)	707	501
Calibrator (Net)	644	456

Gamma Calibration Tolerances MCG-D.K 443

Ratio 1.412 (1.40 | 1.475 | 1.55) Counts/API

Gamma Constants MCG-D.K 443

Last Edited on 21-MAR-2019,22:14

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.08	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.K 443

Field Calibration on 21-MAR-2019,09:56

	Measured	Calibrated(Deg F)
Lower	50.00	50.00

Upper	212.00	212.00

High Resolution Temperature Constants MCG-D.K 443

Last Edited on 12-OCT-2018,05:20

Pre-filter Length	11

Sonic Constants MSS-C.K 308

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'					
4'					
5'					
6'					

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
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 21-MAR-2019 10:44
Field Calibration on 21-MAR-2019 10:45

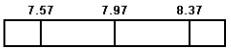
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16416	3.99
2	24992	5.98
3	33618	7.97
4	41920	9.86
5	51021	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.96	7.97

Caliper Calibration Tolerances MPD-C.A 216

Long Arm Field Cal. 7.96 

in

DOWNHOLE EQUIPMENT

C:\Users\cmcam\AppData\Local\Temp\Weatherford PreView\0\MAIN PASS_001.dta

Cablehead, 11 pin
CBH-CB 267 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-J.B 722 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-log
MML-A 7 LG: 7.97 ft WT: 81.6 lb OD: 2.240 in

Compact Neutron
MDN-B.A 295 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: 2.449 in

Compact Knuckle Joint
SKJ-E.B 733 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

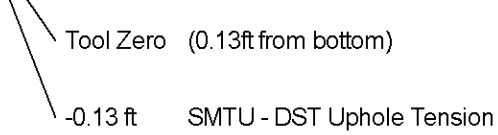
Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-C.K 308 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: 2.240 in

Total Length: 67.54 ft Weight: 526.9 lb

57.56 ft	GGCE - MCG BH Corrected Gamma
55.38 ft	CCLG - Casing Collar Locator
54.65 ft	CGXT - MCG External Temperature
47.93 ft	MINV - Micro-inverse
47.93 ft	MNRL - Micro-normal
48.92 ft	MLTC - MML Caliper
43.13 ft	NPRL - Limestone Neutron Por.
35.89 ft	AVOL - Annular Volume
35.89 ft	HVOL - Hole Volume
35.89 ft	CLDC - Density Caliper
33.96 ft	DPRL - Limestone Density Por.
33.96 ft	DCOR - Density Correction
33.90 ft	PDPE - PE
26.24 ft	FEFE - Shallow FE
16.96 ft	TR11 - 4' Transit Time
16.46 ft	TR21 - 3' Transit Time
15.95 ft	TR12 - 6' Transit Time
15.46 ft	TR22 - 5' Transit Time
12.96 ft	SPRL - Wyllie Lime. Sonic Por.
3.34 ft	R40T - Array Ind. Two Res 40
3.34 ft	R30T - Array Ind. Two Res 30
3.34 ft	R20T - Array Ind. Two Res 20
3.34 ft	R60T - Array Ind. Two Res 60
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
3.34 ft	R40O - Array Ind. One Res 40
0.23 ft	SPCG - Spontaneous Potential



All measurements relative to tool zero.

COMPANY	BLACK OAK EXPLORATION
WELL	FRISIBIE FAMILY 1-15
FIELD	WILDCAT
PROVINCE/COUNTY	RAWLINS
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3335	feet	First Reading	4849.00	feet
Elevation Drill Floor	3333	feet	Depth Driller	4860.00	feet
Elevation Ground Level	3330	feet	Depth Logger	4865.00	feet

Weatherford®

COMPENSATED SONIC

WITH INTEGRATED TRANSIT TIME