

LWD MEMORY LOG									
<div>Baker Hughes</div>			Gamma Ray						
Scale:			Company: Noble Energy						
1:1200			Well: Vogler State D33-769						
Measured Depth			Field: Wattenberg						
Depth Reference:			County: Weld						
Driller's Depth			State: Colorado						
Status:			Surface Location:				Other Services:		
Final Print			Latitude: 40° 12' 23.936" N				Directional		
API No: 05-123-48559-00			Longitude: 104° 33' 43.531" W						
Job ID: 110236119			SEC: 21		TWN: 3N		RGE: 64W		
Permanent Datum (P.D.): Mean Sea Level			Elevation: Above P.D.:		4826.00 ft		Elev. KB: 4826.00 ft		N/A
Log Measured From: Rig Floor							Elev. DF: 4796.00 ft		Elev. GL:
Dates			Interval			Magnetic Field Reference			
From: 2020-02-22			Drilled (ft)		Logged (ft)		Azi Reference North:		
To: 2020-02-25			Top: 1927.00		Top: 1927.00		Grid Dip Angle: (deg)		
Spud: 2020-02-14			Bottom: 17558.00		Bottom: 17545.00		Total Magnetic Field Strength: (nT)		
							Mag to Reference North Correction: (deg)		
Borehole Record			Casing Record						
Hole Size (in)			From (ft)		To (ft)		Size (in)		Weight (lb/ft)
			13.500		30.00		1927.00		36.00
			8.500		1927.00		17558.00		30.00
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Run	Number	Number	Number	Onset (ft)	Onset (ft)	O.D. (in)	I.D. (in)
1	AutoTrak Curve Steering Unit	14452345	Near Bit Inclination	5.93	6.78	7.000	4.330
1	AutoTrak Curve Steering Unit	14452345	Near Bit VSS	5.93	6.78	7.000	4.330
1	AutoTrak Curve MWD	14367858	Gamma (single)	2.74	12.95	7.000	3.250
1	AutoTrak Curve MWD	14367858	Directional (mag)	12.27	22.48	7.000	3.250

### Service and Tool Mnemonics

Mnemonic	Name	Description
ATC SU	AutoTrak Curve SU	Auto Trak Curve Steering Unit
ATC MWD	AutoTrak Curve MWD	Auto Trak Curve MWD
ATC LCPM	AutoTrak Curve LCPM	Auto Trak Curve LCPM

### Comments

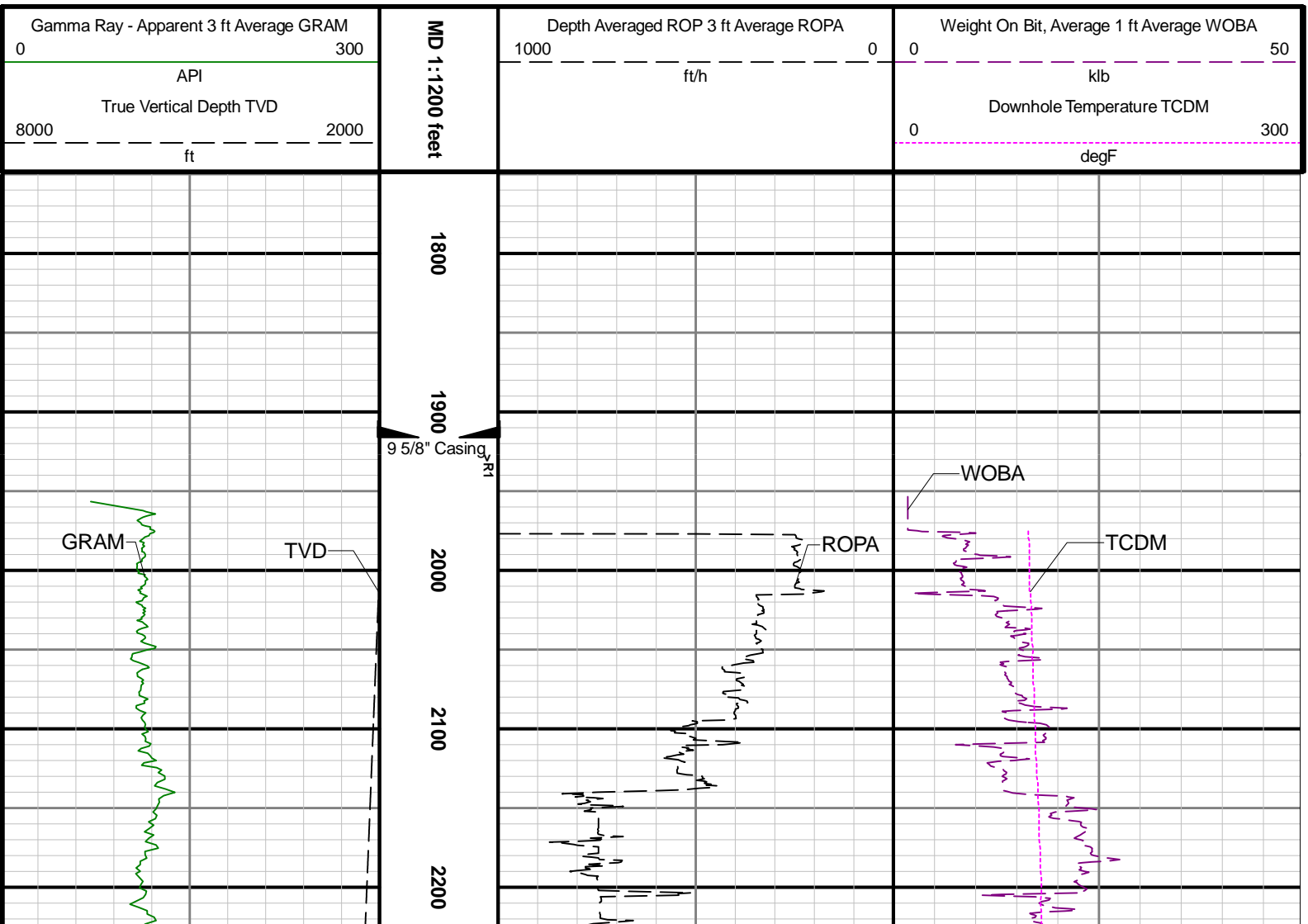
1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD Run 1 utilized 6 ¾ inch NaviGamma service (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1960 to 16493 feet MD (1960 to 5954 feet TVD).
3	The Gamma Ray Apparent (GRAM) data is presented 0 to 300 API, per the customer's request.
4	Several gaps appear in the log due to drilling ahead before the assembly had time to properly power on.

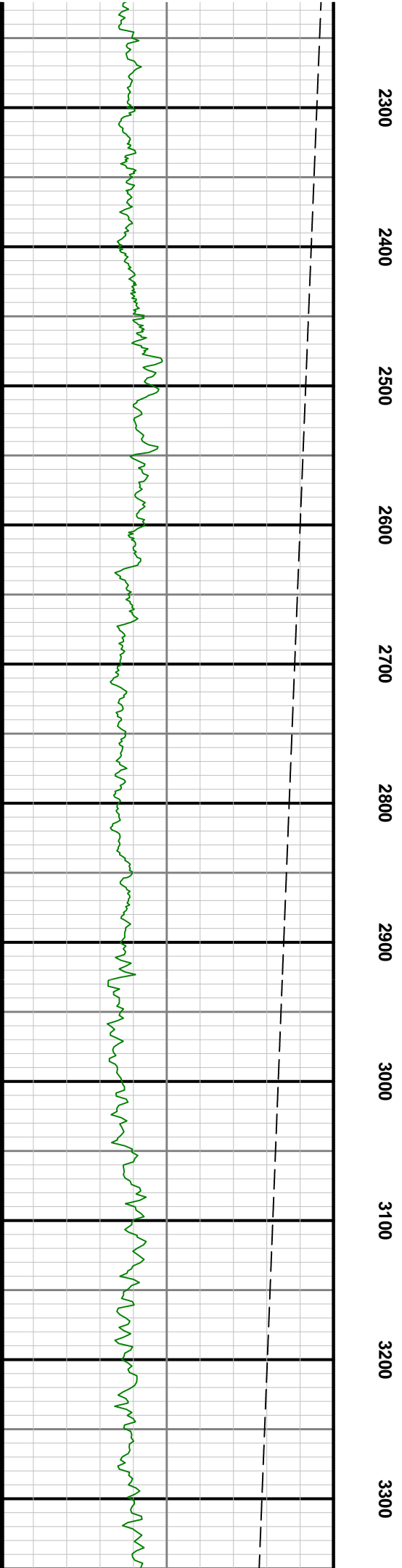
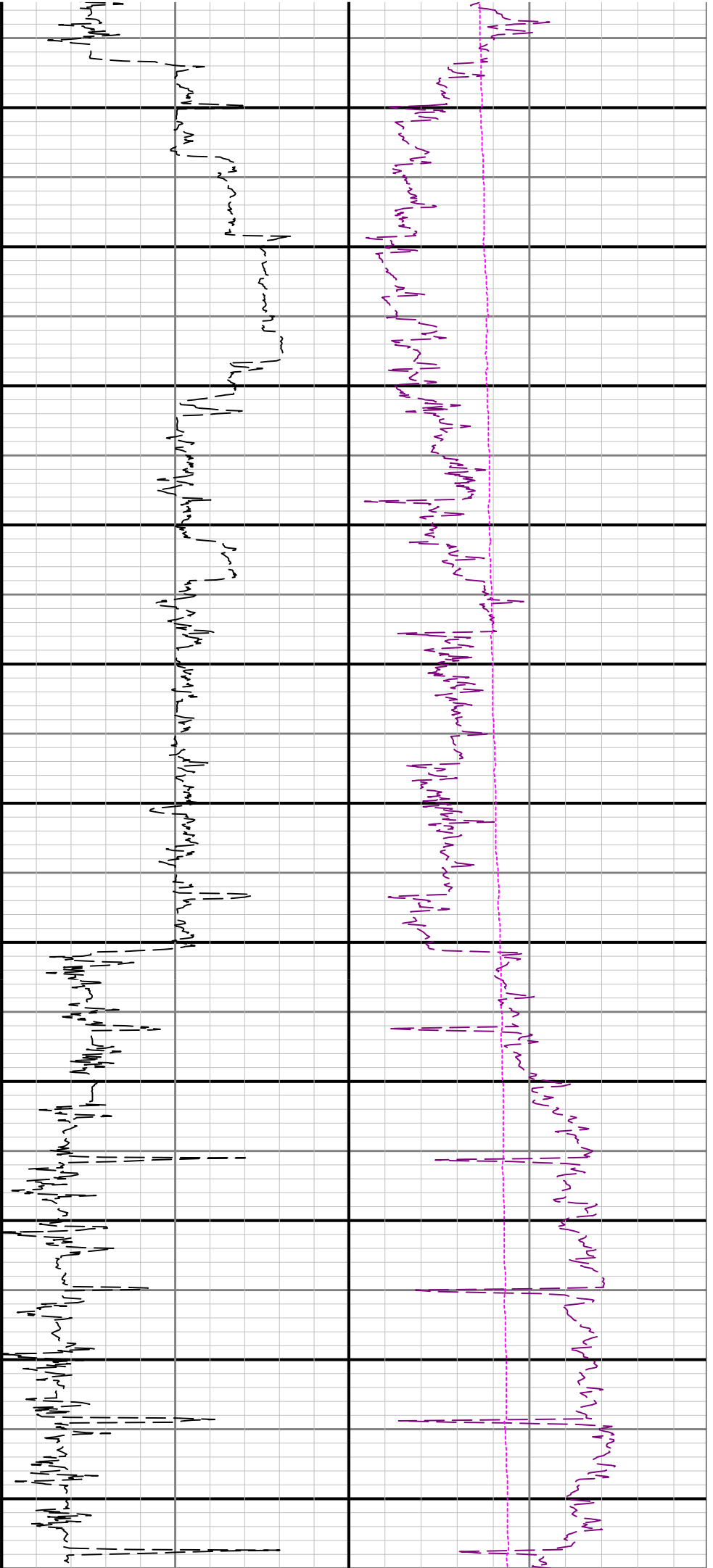
### Remarks

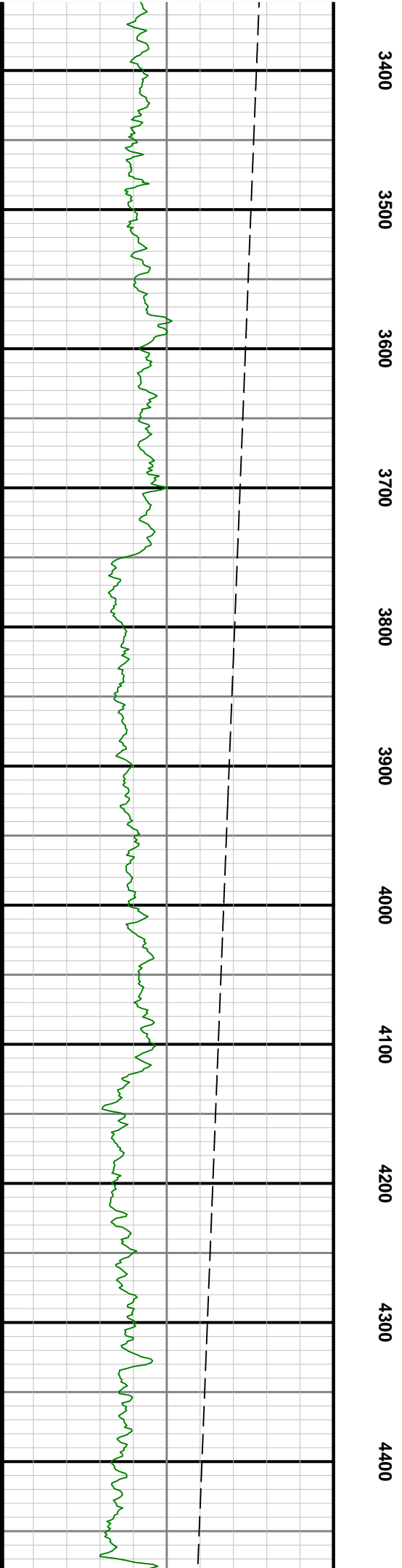
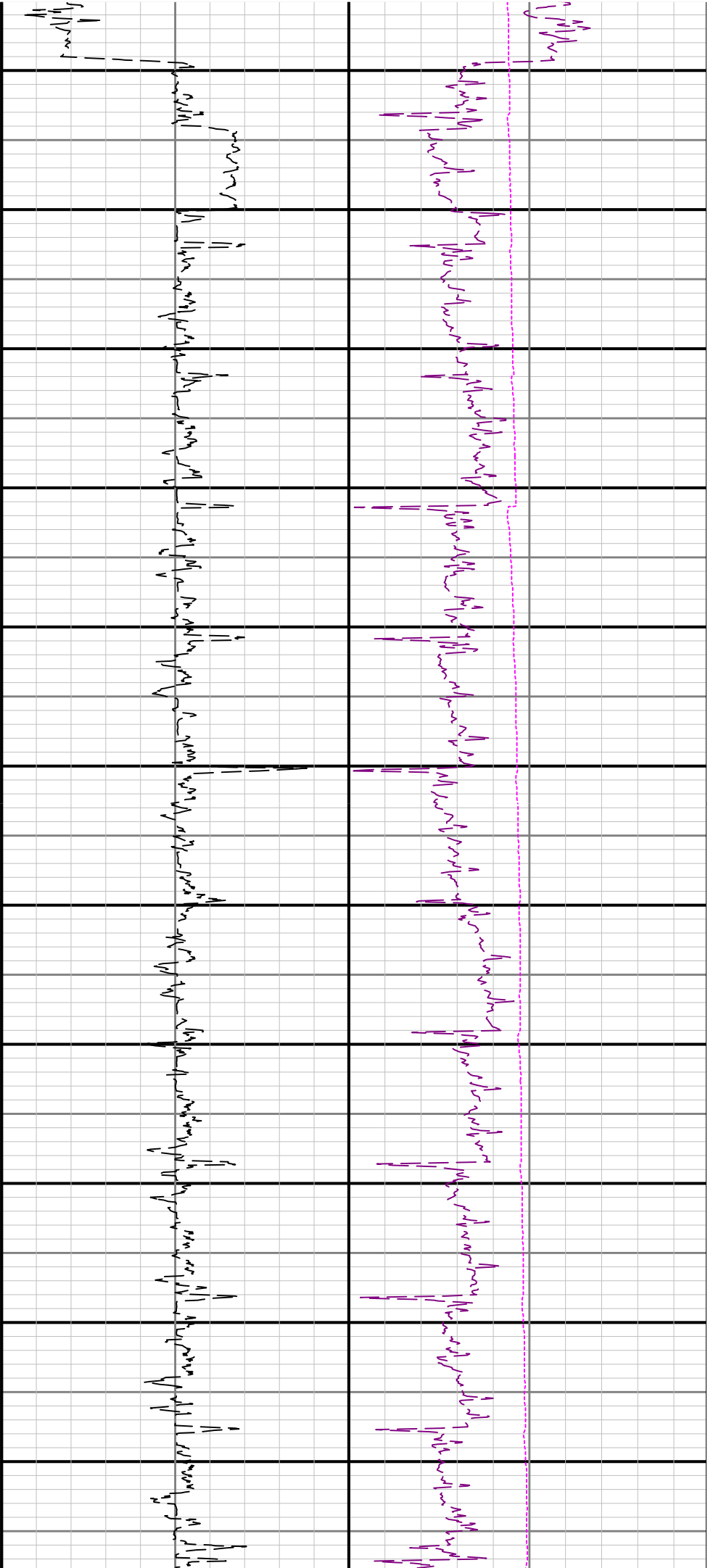
Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	12680.00	8.500	1	The interval from 12680 to 12714 feet MD (6872 feet TVD) and several other interval were not logged due to tool not power up.
2	17545.00	8.500	1	The interval from 17545 to 17558 feet MD (6847 feet TVD) was not logged due to sensor to bit offset at well TD.

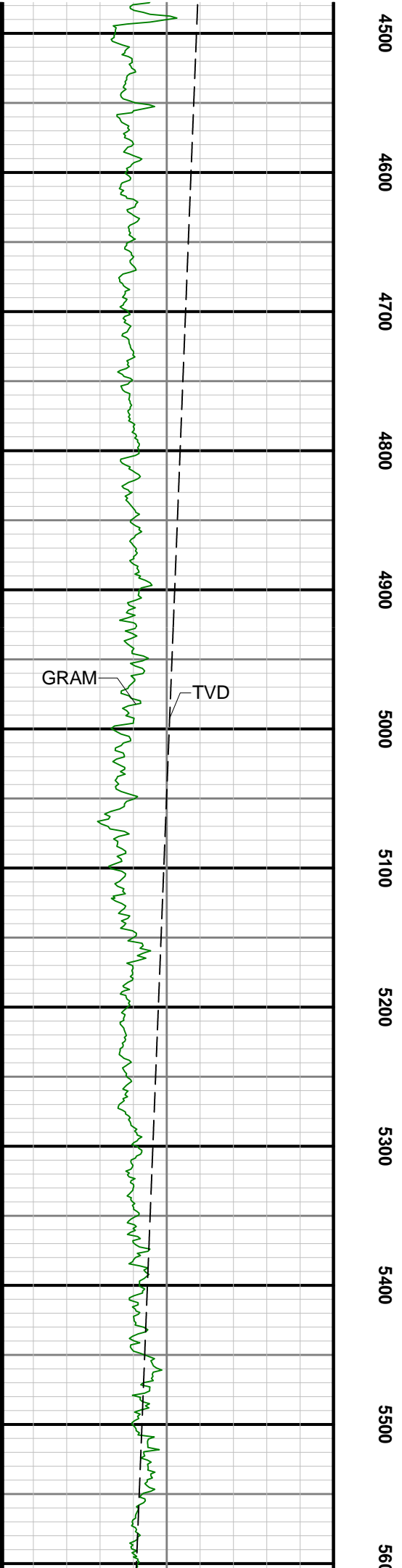
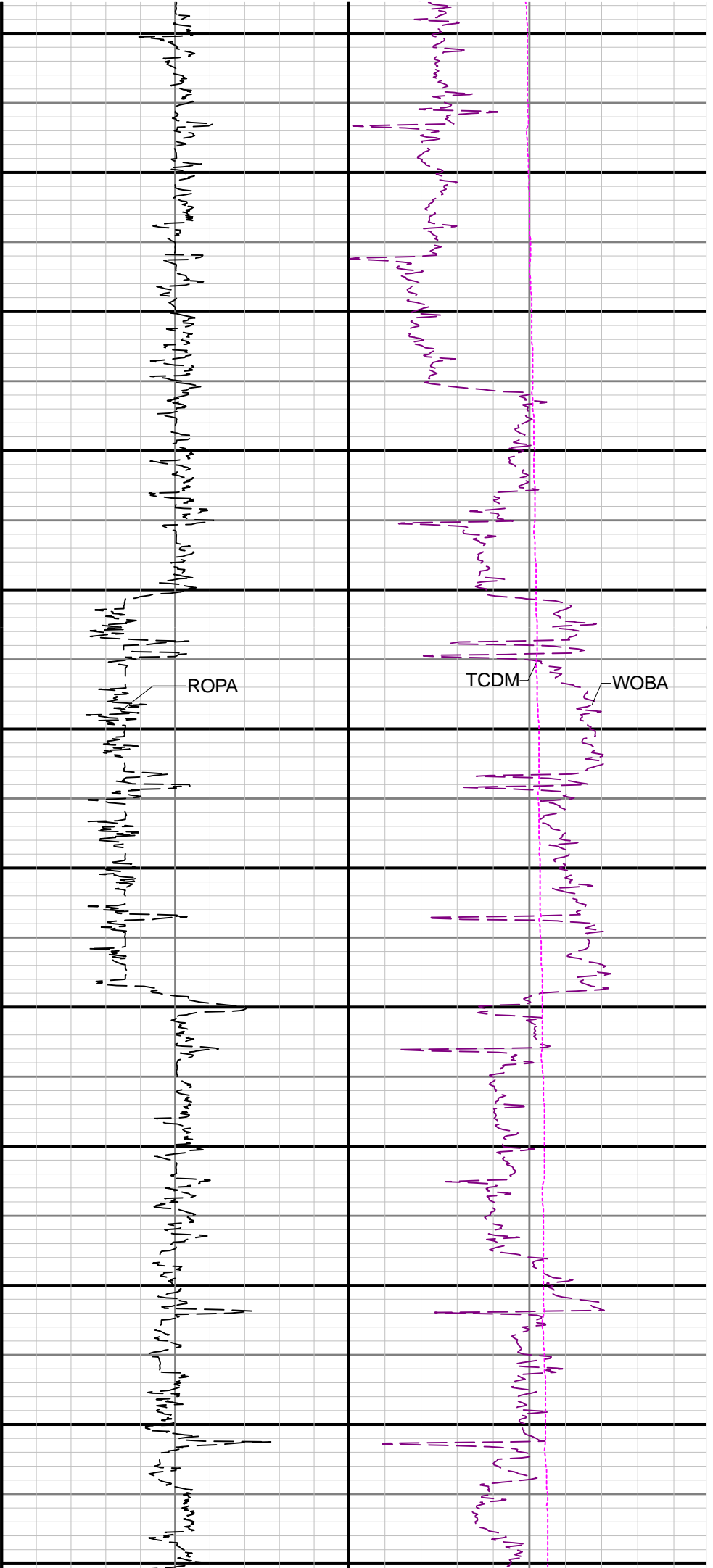
### Curve Mnemonics

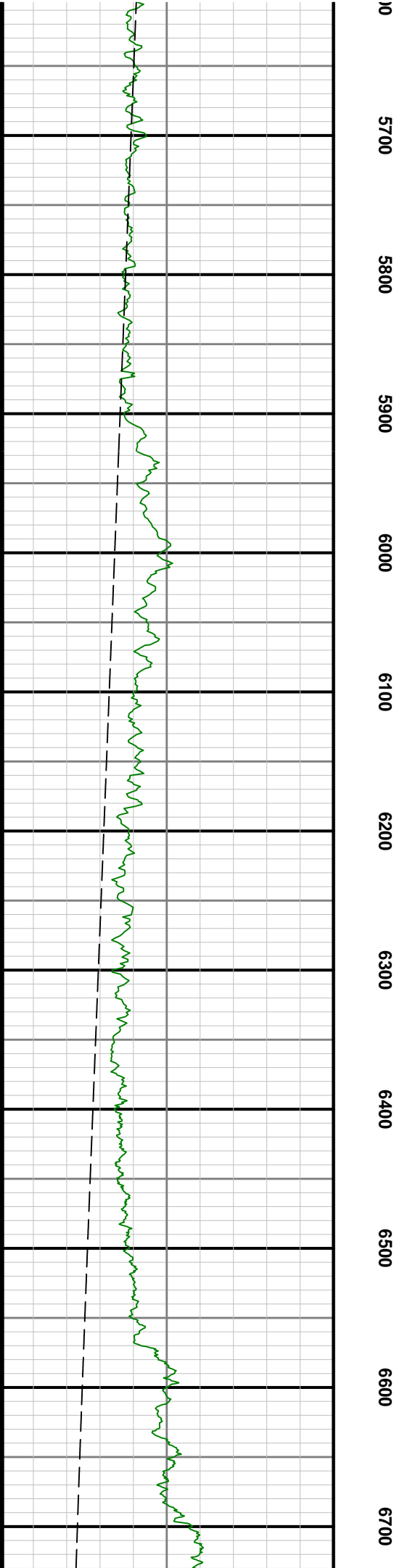
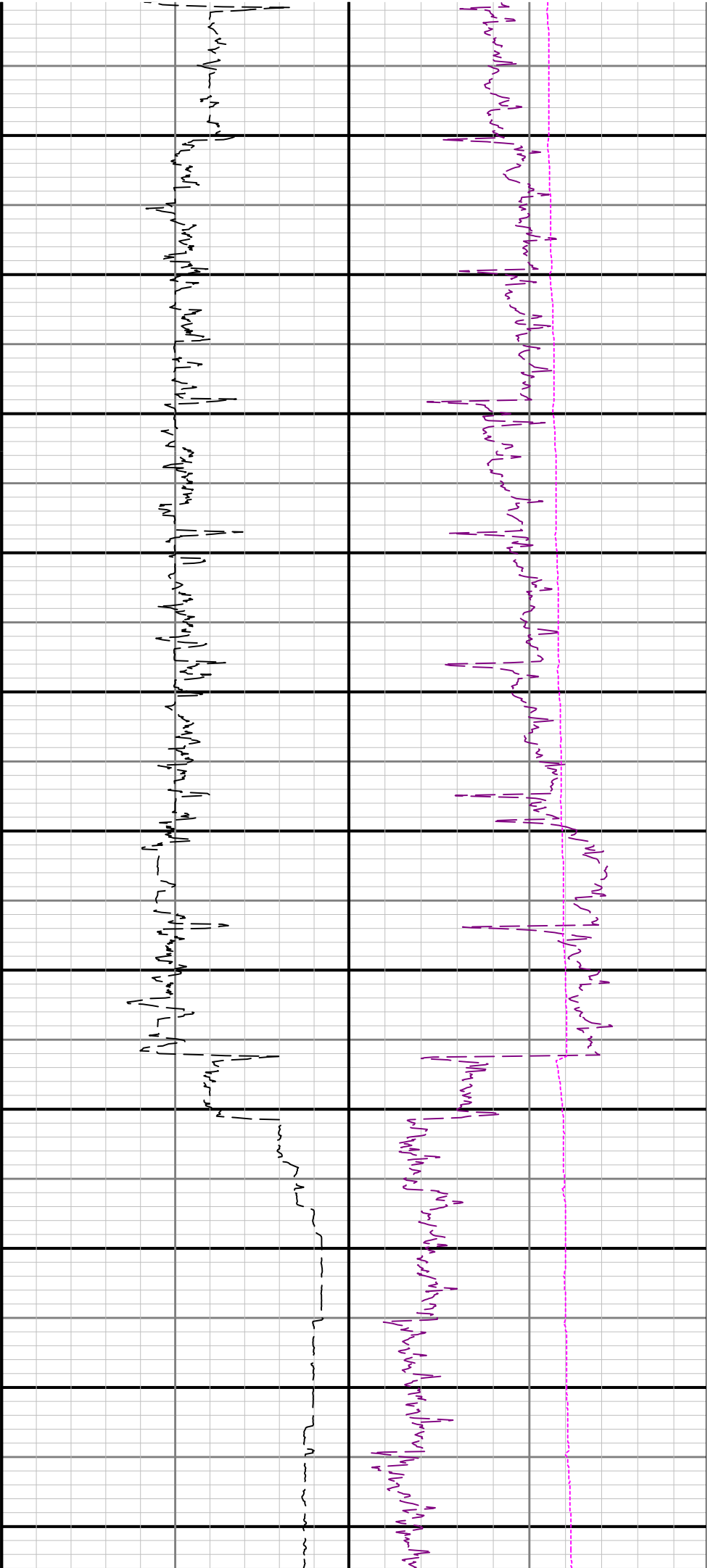
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 3 ft Average	API
TCDM	Directional Real-Time Survey Temperature	degF

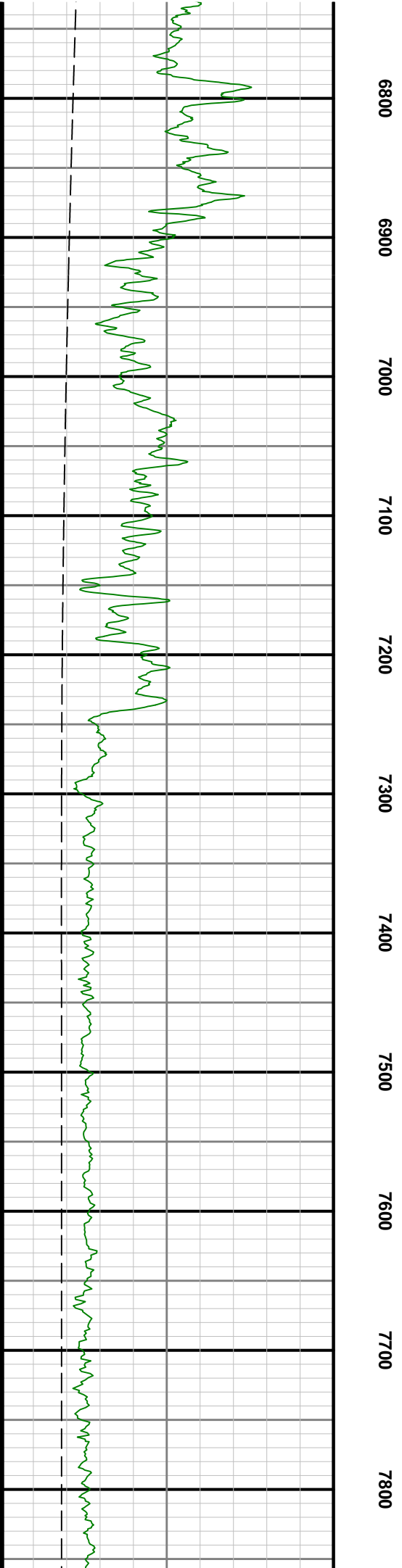
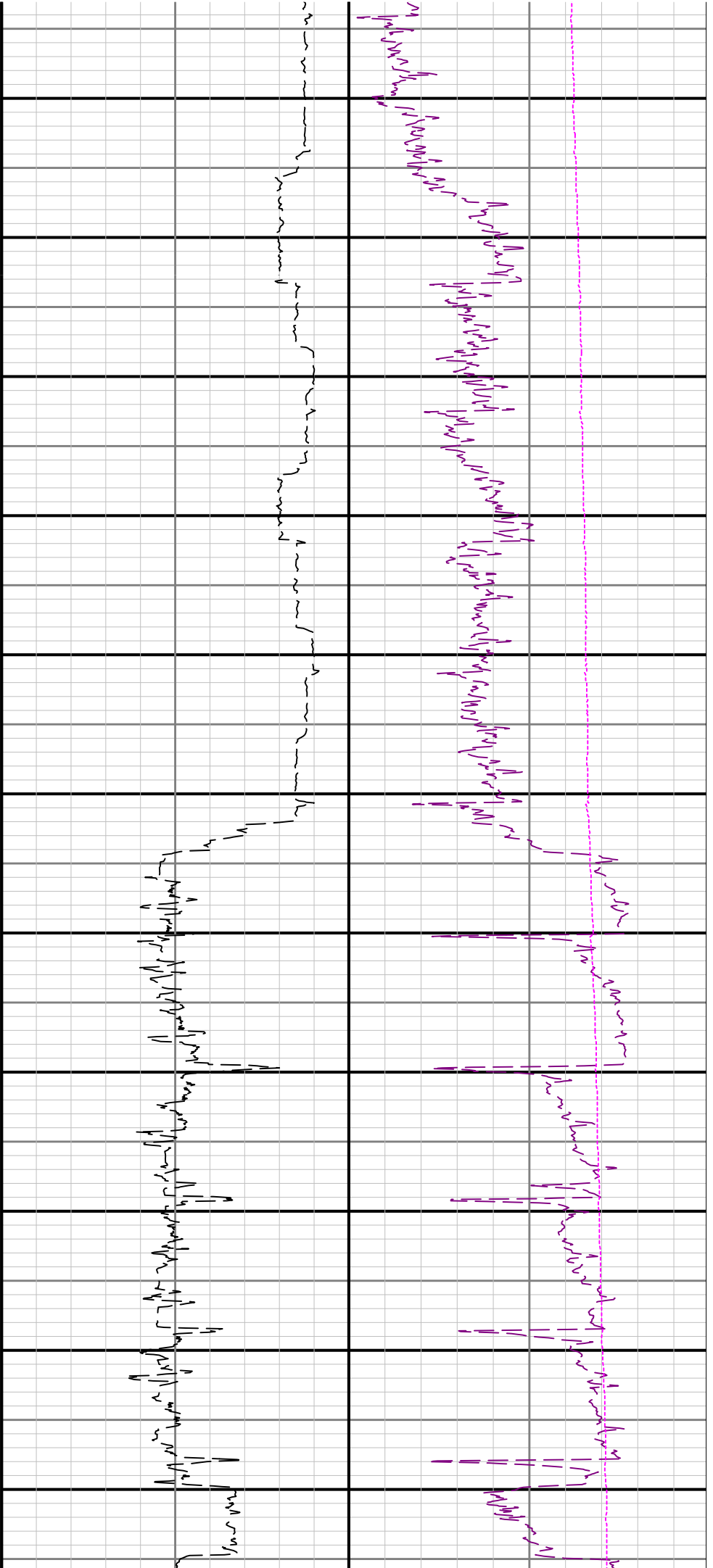


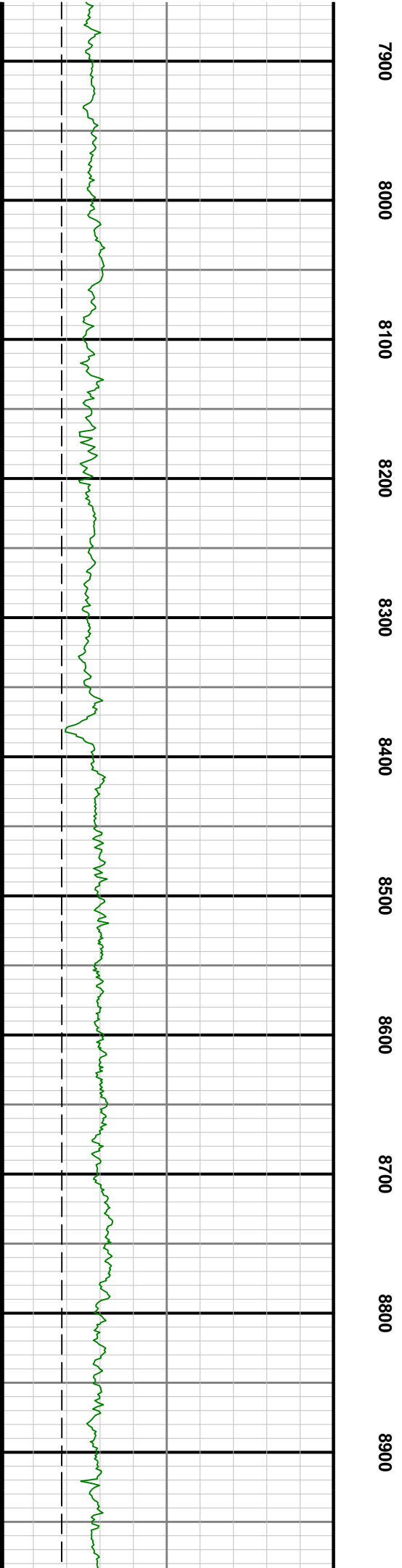
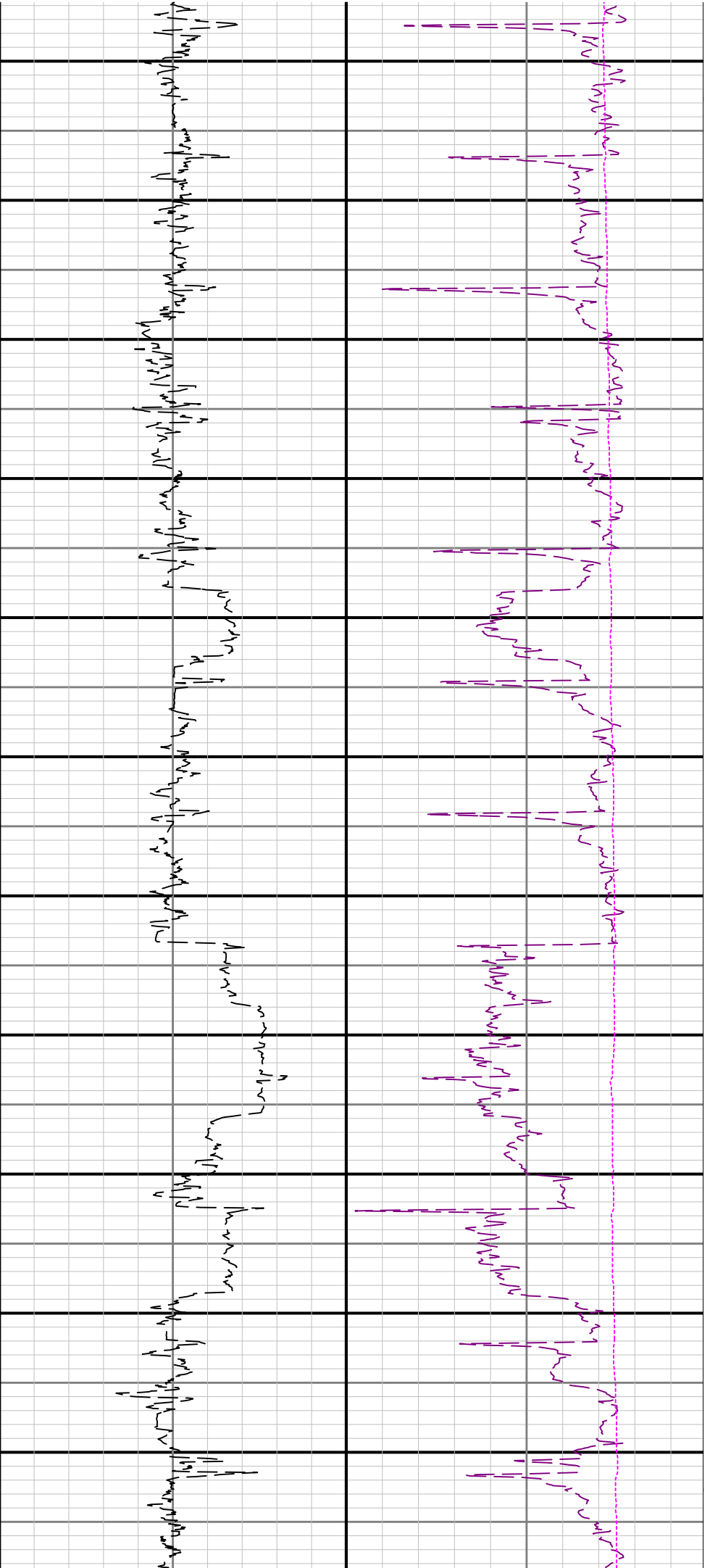




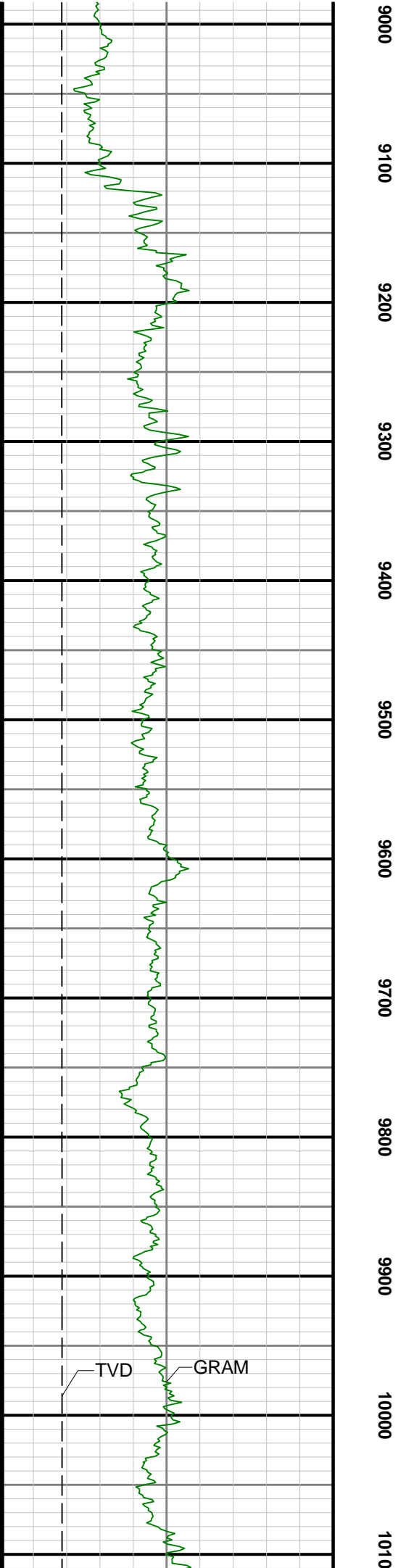
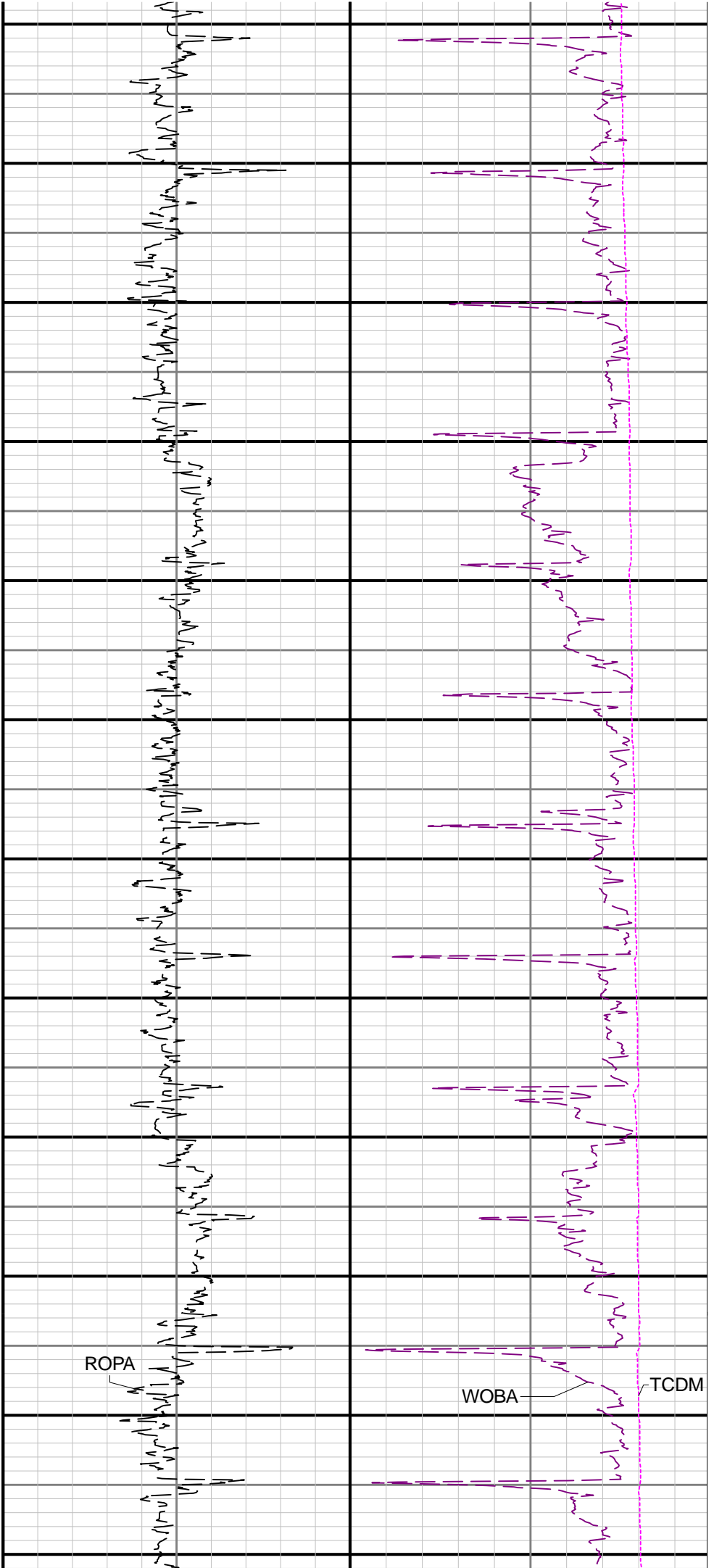


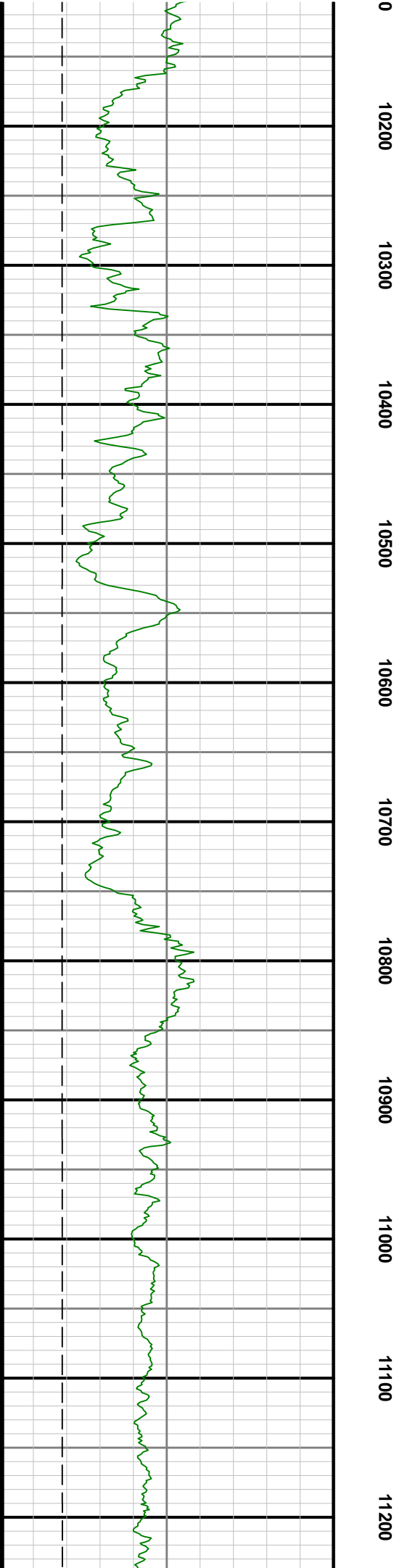
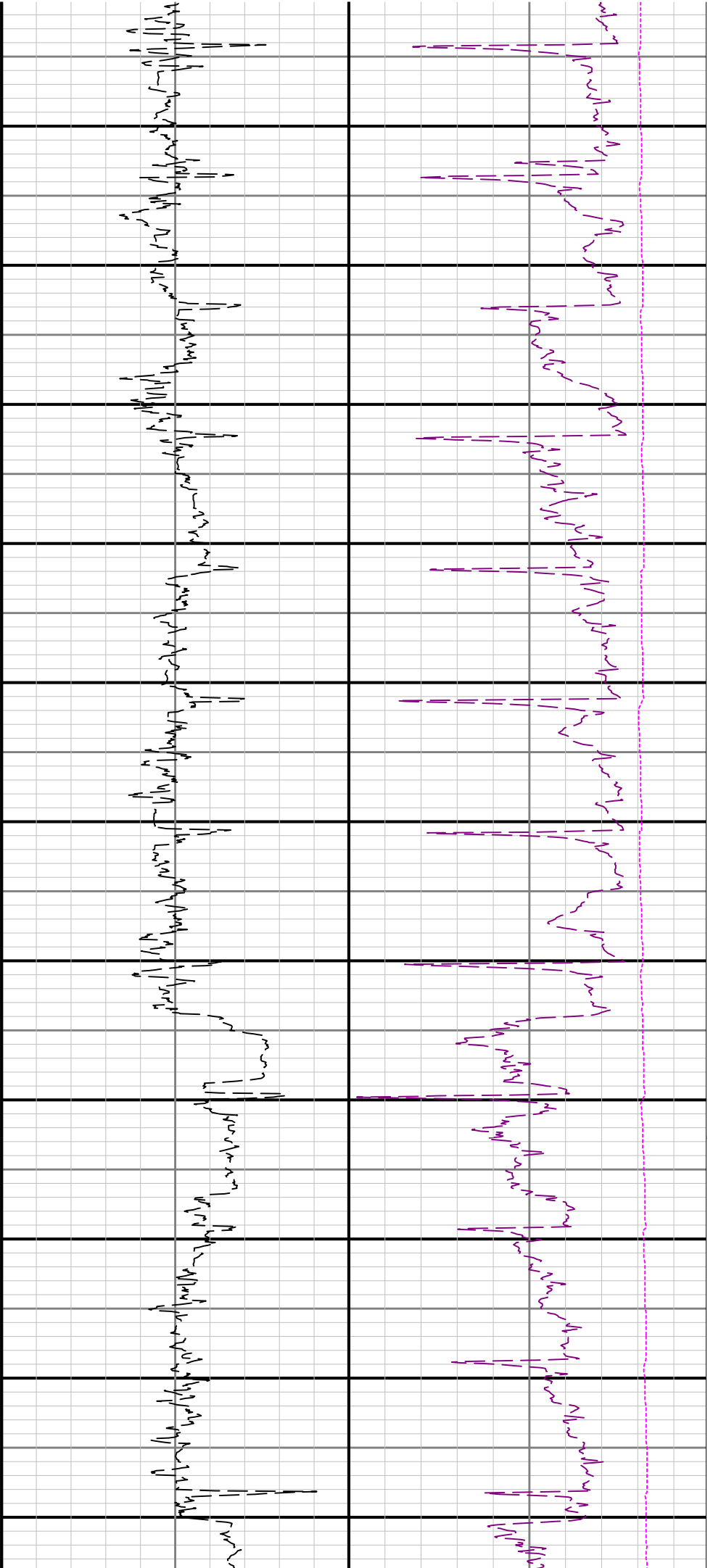


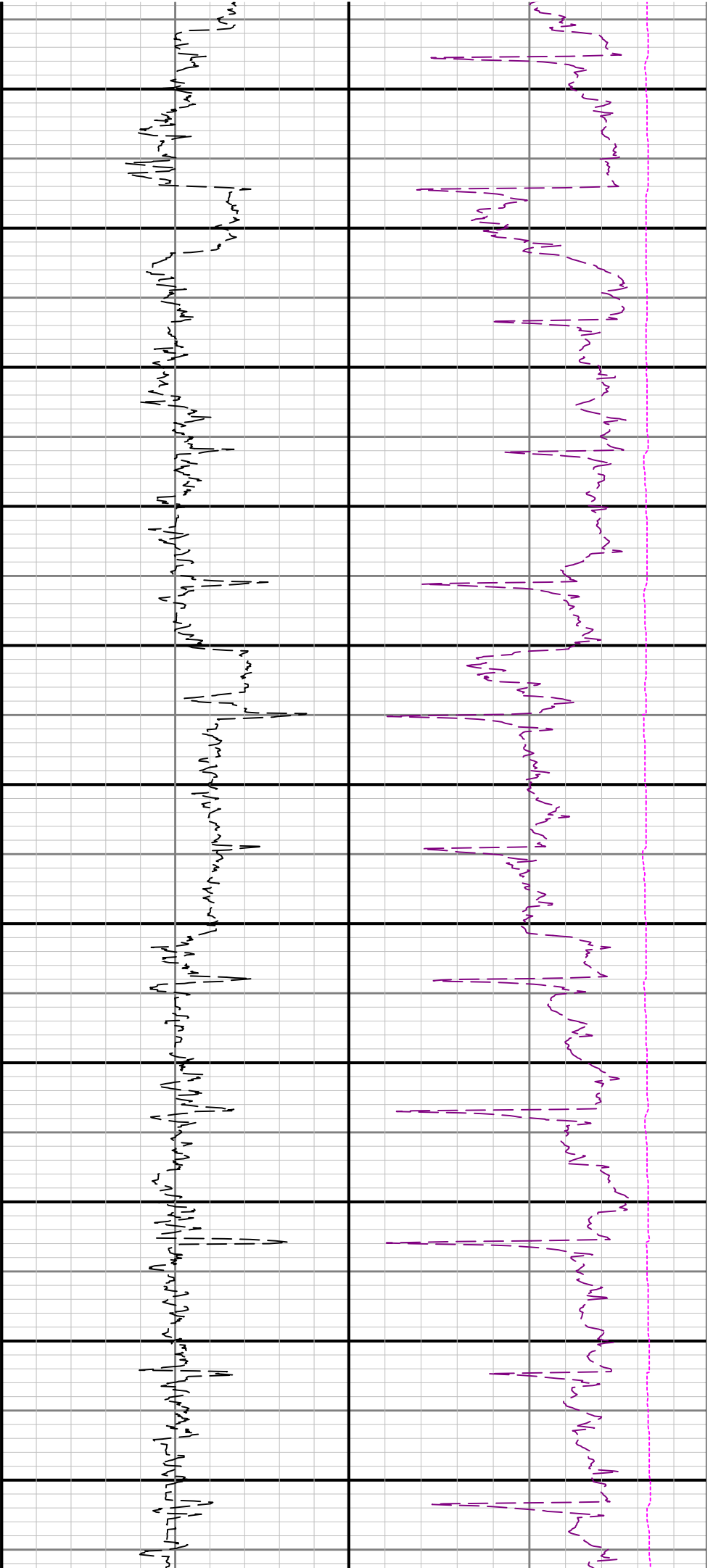




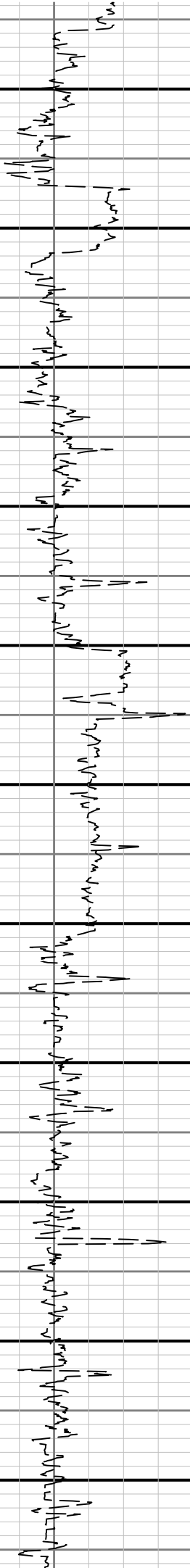


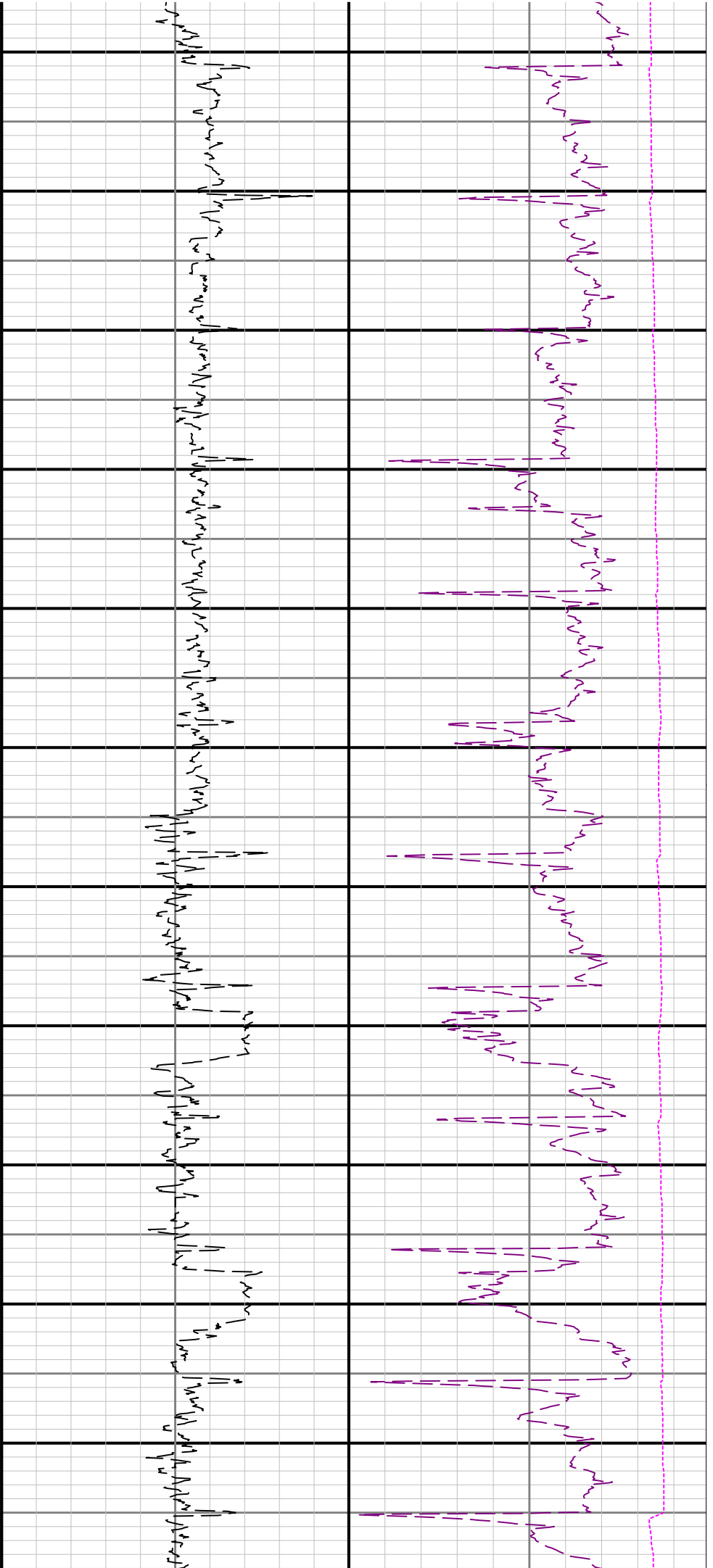






11300      11400      11500      11600      11700      11800      11900      12000      12100      12200      12300





12400

12500

12600

12700

12800

12900

13000

13100

13200

13300

13400

1

See Remark 1

