



Natural Formation Evaluation
Azimuthal Gamma Ray
Gamma Ray
Rotary Steerable

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
2	2	8.750	PDC	3.00	AutoTrak Curve	1527.00	5622.00	1539.00	5622.00	2016-08-14 10:56	2016-08-15 13:15	22.78
3	2	8.750	PDC	3.00	AutoTrak Curve	5610.00	12254.00	5622.00	12254.00	2016-08-15 22:07	2016-08-18 08:54	61.41

Crew

Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
Matthew Delmore		2016-08-13	2016-08-19	Ryan Kielian		2016-08-13	2016-08-19	Scott Sims		2016-08-13	2016-08-18
Robbie Opperude		2016-08-14	2016-08-19	Austin Small		2016-08-17	2016-08-19				

Mud Properties Record

Date / Time		Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2016-08-14 03:30		2	1539.00	Water Based Mud	8.5	2	8	N/A	0.0/98.0	Active Pit	600	0.00
2016-08-14 15:30		2	2041.00	Water Based Mud	8.5	1	9	18.4	0.0/99.0	Active Pit	600	0.00
2016-08-15 03:30		2	4502.00	Water Based Mud	8.5	1	9	26.0	0.0/98.5	Active Pit	600	0.00
2016-08-17 15:30		3	9817.00	Water Based Mud	9.9	14	9.8	5.6	1.0/90.0	Active Pit	1800	0.00
2016-08-18 03:30		3	11537.00	Water Based Mud	9.9	14	9.8	5.6	1.0/90.2	Active Pit	1900	0.00
2016-08-18 15:30		3	12254.00	Water Based Mud	10.2	15	9.8	5.4	1.0/88.5	Active Pit	2000	0.00
2016-08-15 19:00		3	5622.00	Water Based Mud	9.0	2	8.5	24.0	0.0/95.0	Active Pit	600	0.00
2016-08-16 03:30		3	6137.00	Water Based Mud	9.9	11	10.5	6.4	1.0/90.5	Active Pit	1100	0.00
2016-08-16 15:30		3	7222.00	Water Based Mud	9.9	11	10.5	6.6	1.5/89.5	Active Pit	1400	0.00
2016-08-17 03:30		3	8112.00	Water Based Mud	9.9	14	10.1	5.4	1.5/89.5	Active Pit	1600	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
2	ATC_SU	12128498	Near Bit VSS	5.93	6.84	7.000	4.330
2	ATC_SU	12128498	Near Bit Inclination	5.93	6.84	7.000	4.330
2	ATC_MWD	12656414	Gamma (single)	2.20	12.46	7.000	3.250
2	ATC_MWD	12656414	Directional (mag)	12.27	22.53	7.000	3.250
3	ATC_SU	12128498	Near Bit VSS	5.93	6.84	7.000	4.330
3	ATC_SU	12128498	Near Bit Inclination	5.93	6.84	7.000	4.330
3	ATC_MWD	12656414	Gamma (single)	2.20	12.46	7.000	3.250
3	ATC_MWD	12656414	Directional (mag)	12.27	22.53	7.000	3.250

Service and Tool Mnemonics


Mnemonic	Name	Description
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Mnemonic	Name	Description
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments
<div>1 Baker Hughes LWD Run 1 utilized a 8 inch NaviTrak (Directional,VSS) assembly behind a 13.5 inch bit from 97 ft MD to 1539 ft MD (97 ft TVD to 1535.12 ft TVD). No logging services were provided for Run 1.</div> <div>2 Baker Hughes LWD Run 2 and 3 utilized a 6.75 inch AutoTrak Curve Rotary Steerable assembly behind a 8.75 inch bit from 1539 ft MD to 12158 MD (1535.12 ft TVD to 7280.78 ft TVD).</div> <div>3 Depth Measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to a lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.</div>

Remarks				
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1533.00	8.750	2	The interval from 1527 ft MD to 1539 ft MD (1523.39 ft TVD to 1535.12 ft TVD) has no surface data due to the Gamma Ray sensor to bit offset.

Curve Mnemonics		
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
GRADM	Azimuthal Gamma Ray - Apparent - Down Quadrant 3 ft Average	API
GRAM	Gamma Ray - Apparent 3 ft Average	API
GRAUM	Azimuthal Gamma Ray - Apparent - Up Quadrant 3 ft Average	API
TCDM	Downhole Temperature	degF
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb

	Company	Cub Creek Energy		
	Well	Markham 5		
	Interval	Date From:	2016-08-14 04:56:33	Top: 1527.00
		Date To:	2016-08-18 02:53:54	Bottom: 12254.00
	Created	2016-08-19 18:59		
Gamma Ray - Apparent 3 ft Average GRAM	MD 1:1200 feet	Rate of Penetration 3 ft Average ROPA		Surface Weight On Bit 1 ft Average WOBA
0 200		1000 0		0 50
API		ft/h		klb
Azimuthal Gamma Ray - Apparent - Up Quadrant 3 ft Average GRAUM				Downhole Temperature TCDM
0 200				0 250
API				degF
Azimuthal Gamma Ray - Apparent - Down Quadrant 3 ft Average GRADM				
0 200				
API				

True Vertical Depth TVD

7500

1500

ft

1400

1500

1600

1700

1800

1900

2000

2100

>R2

See Remark 1

ROPA

WOBA

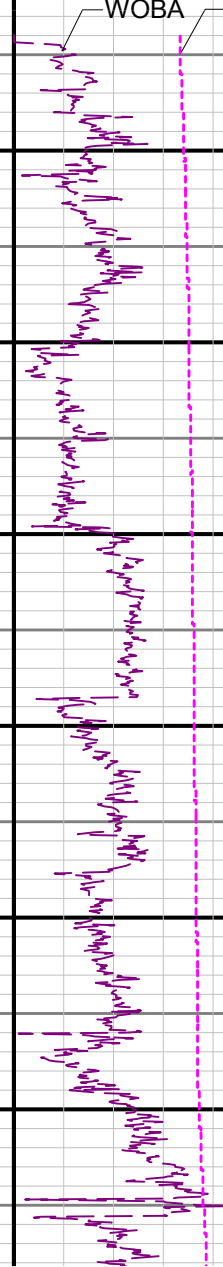
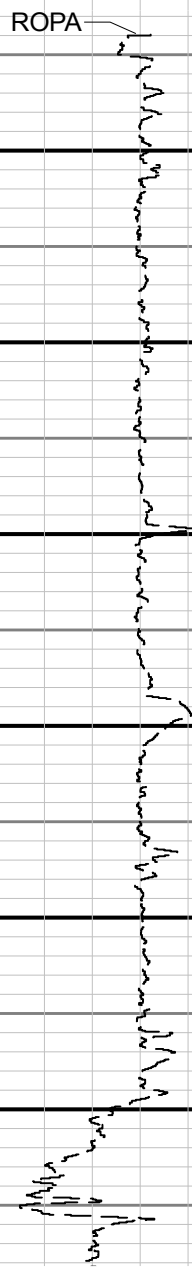
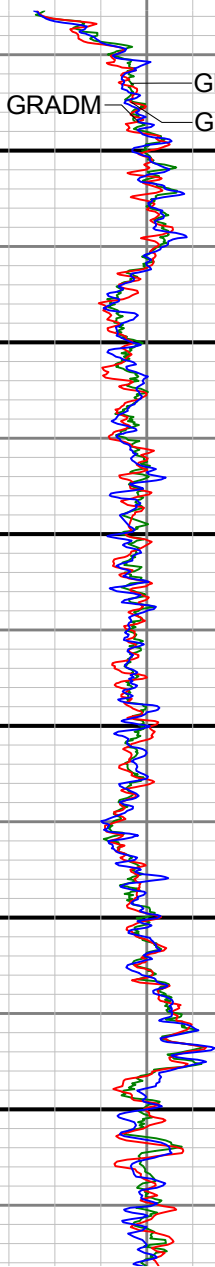
TCDM

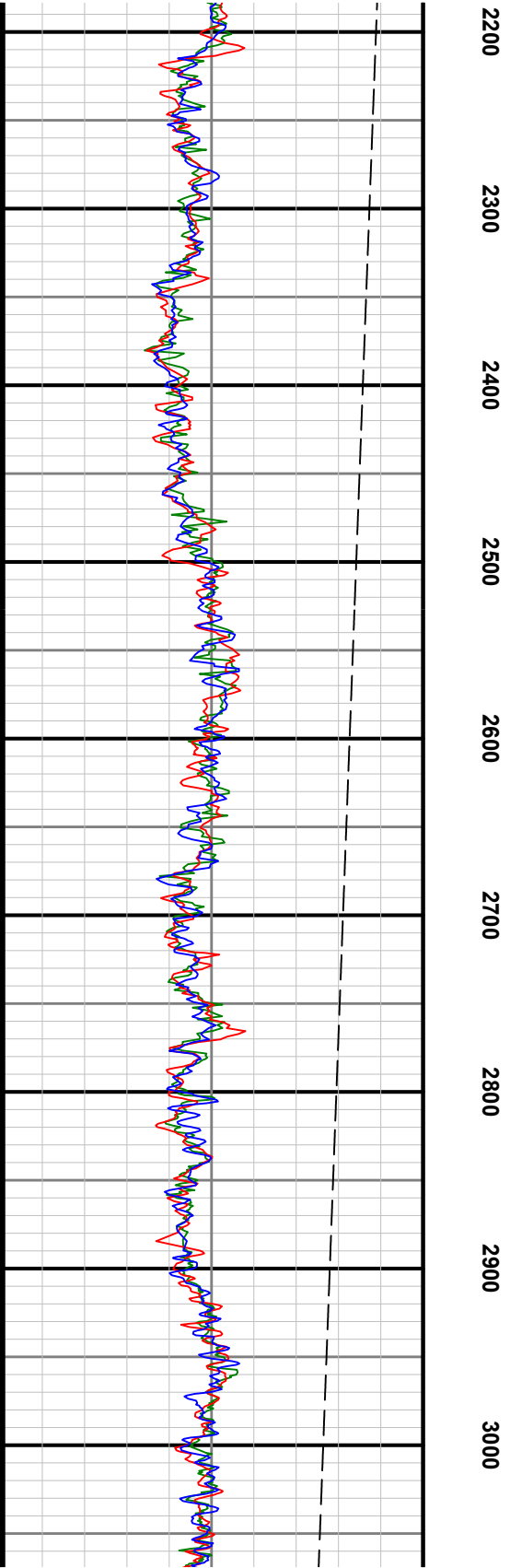
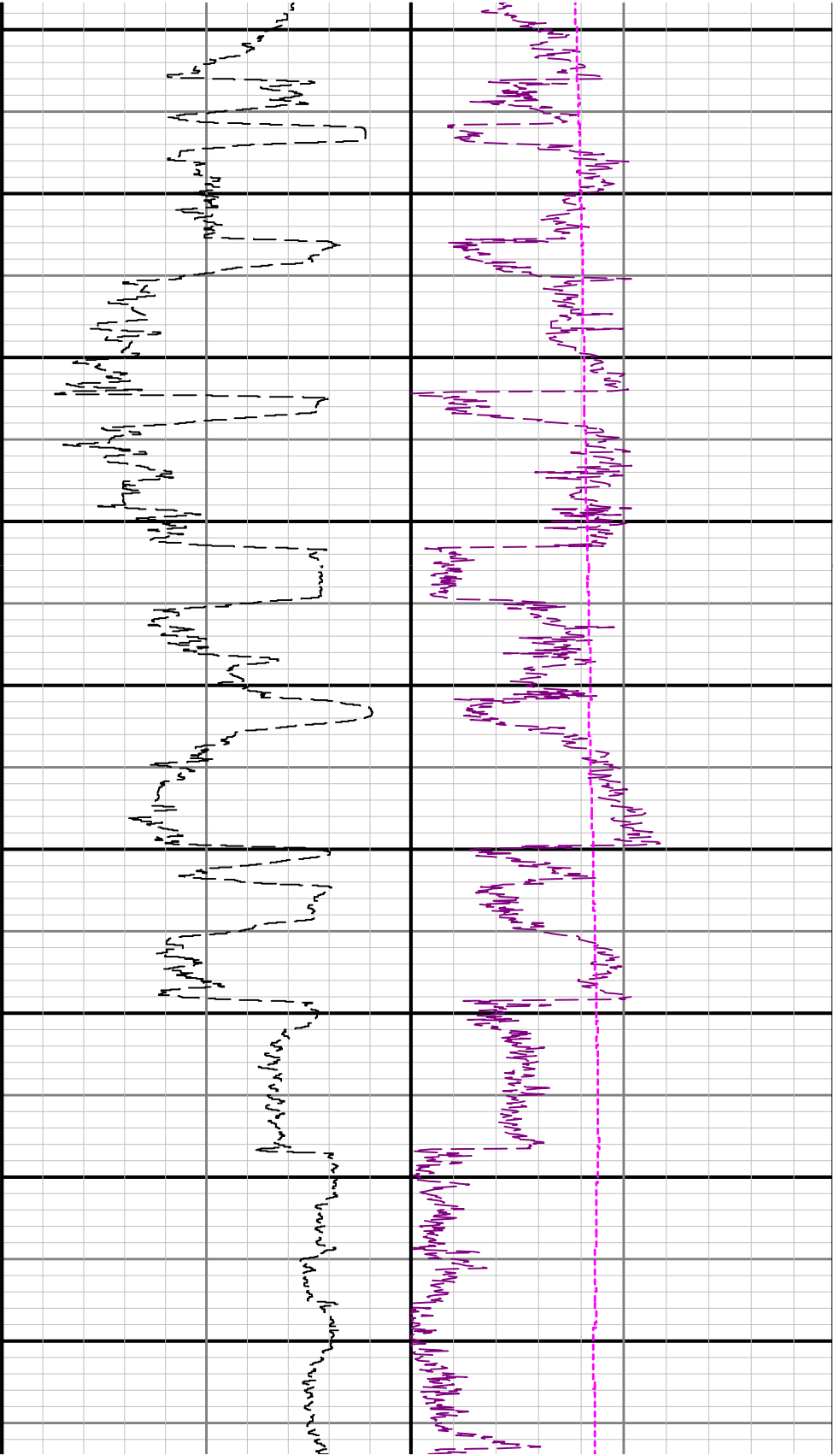
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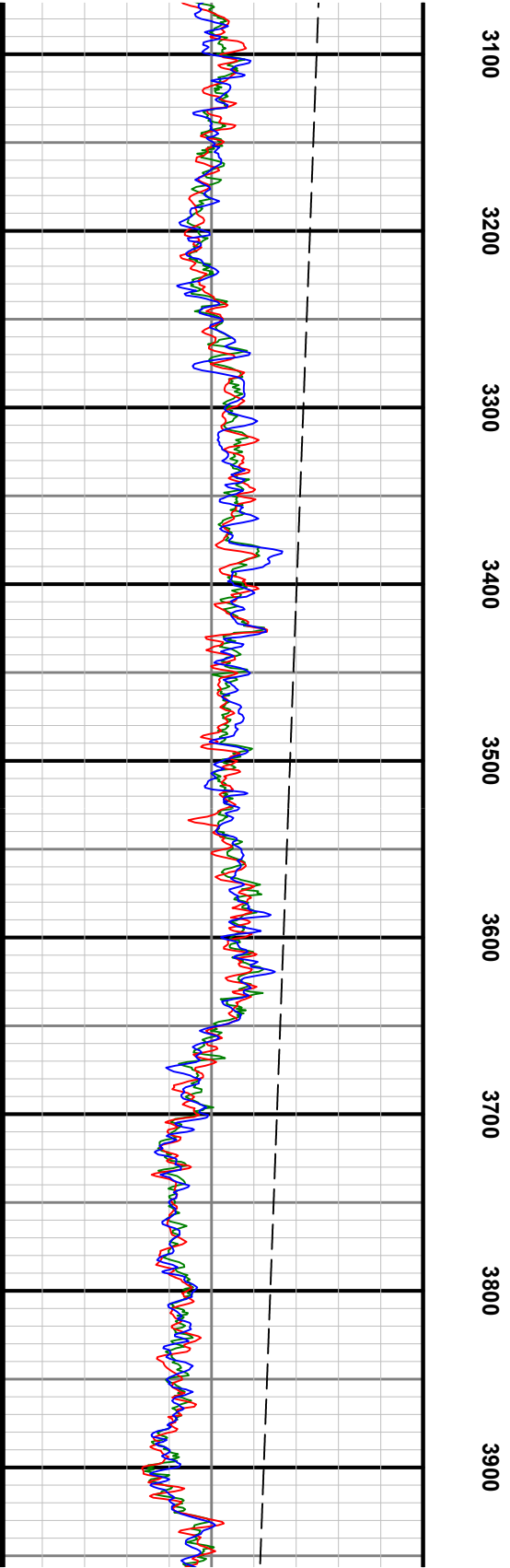
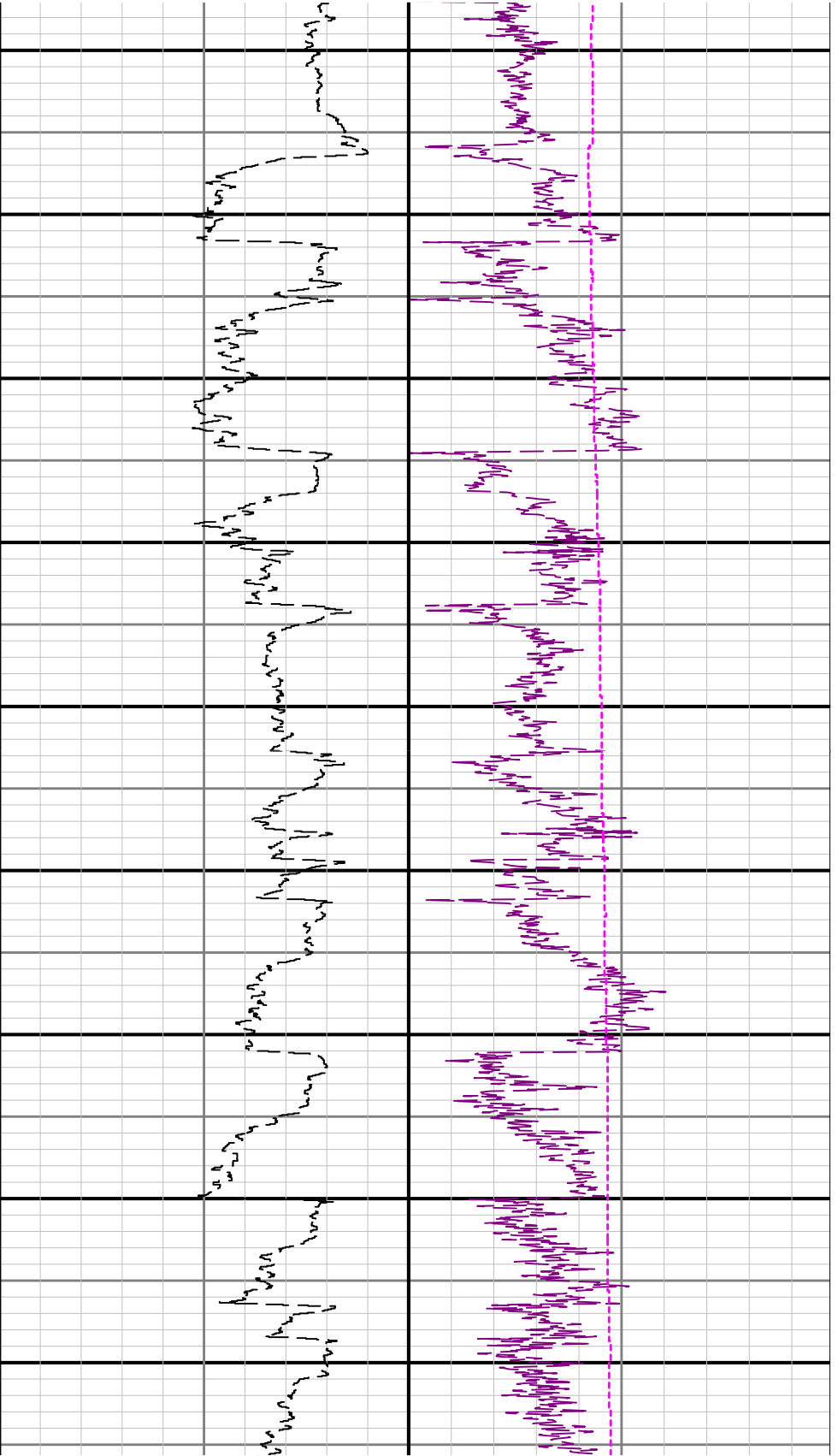
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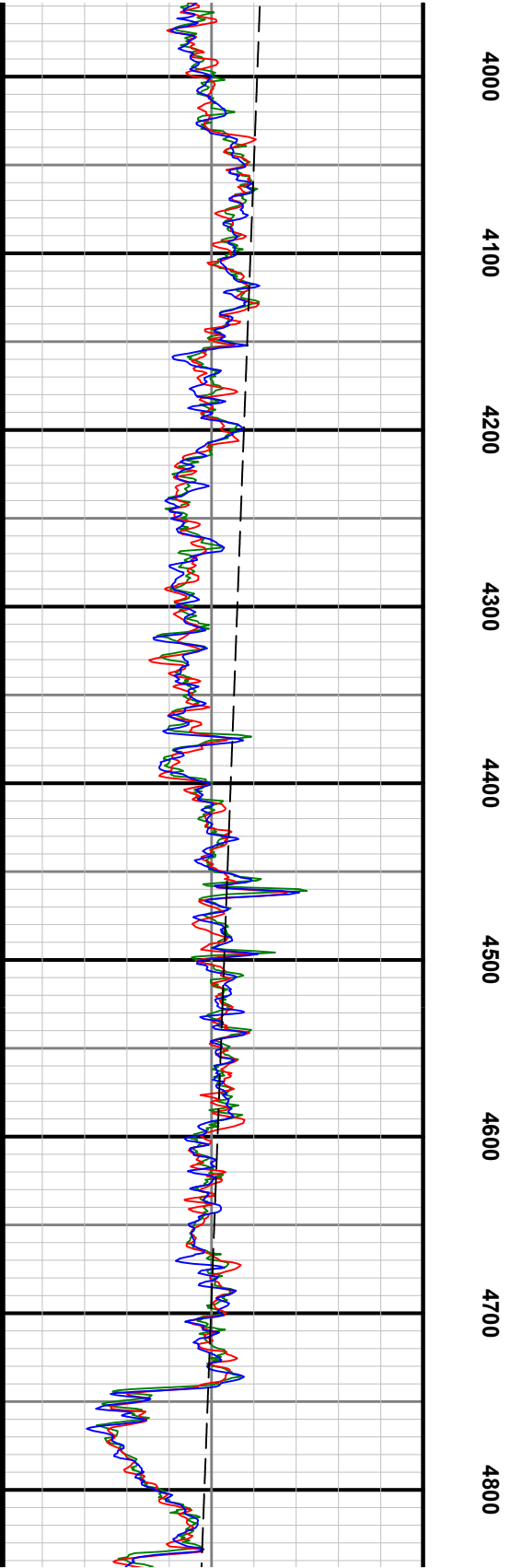
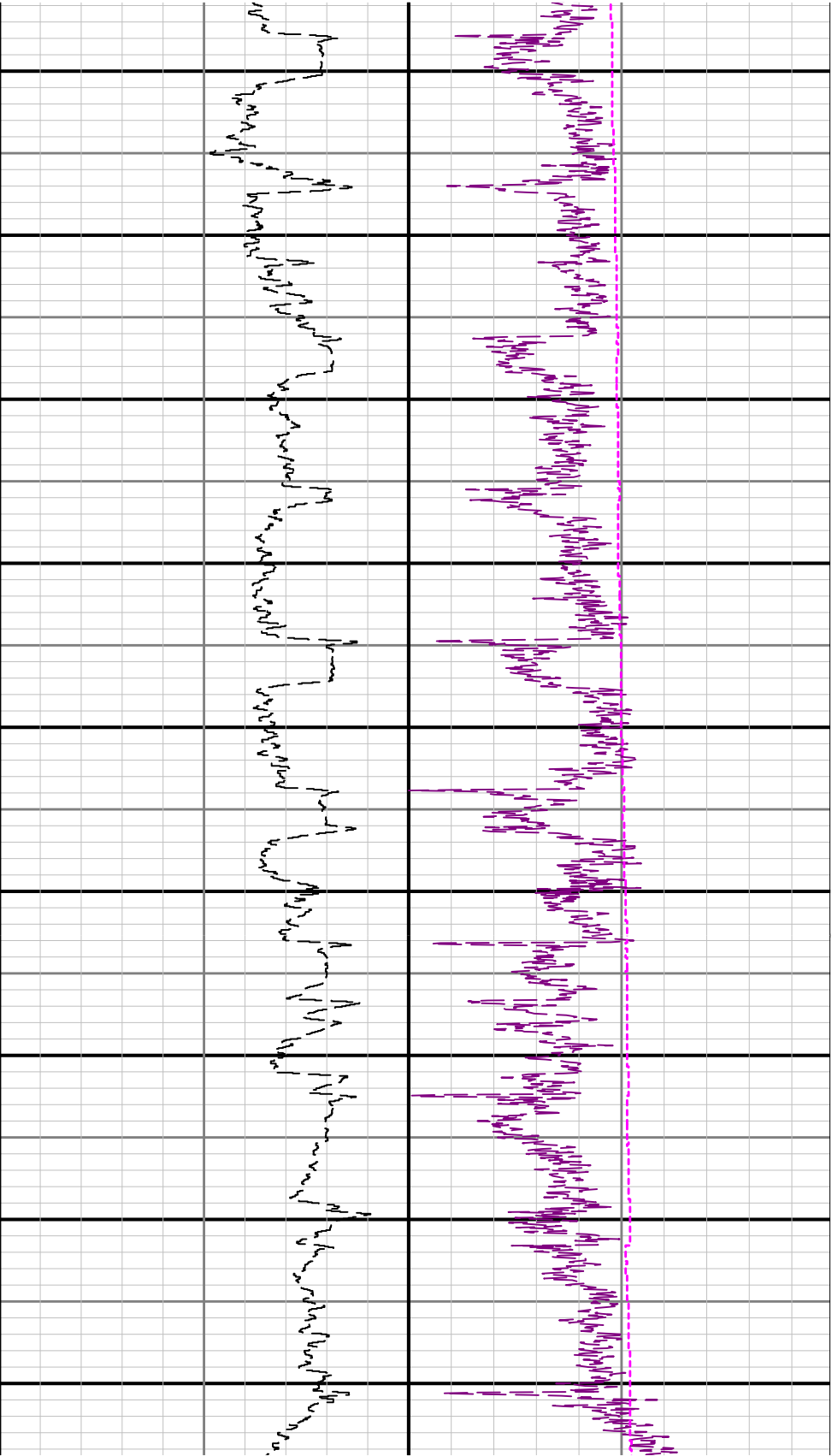
GRAUM

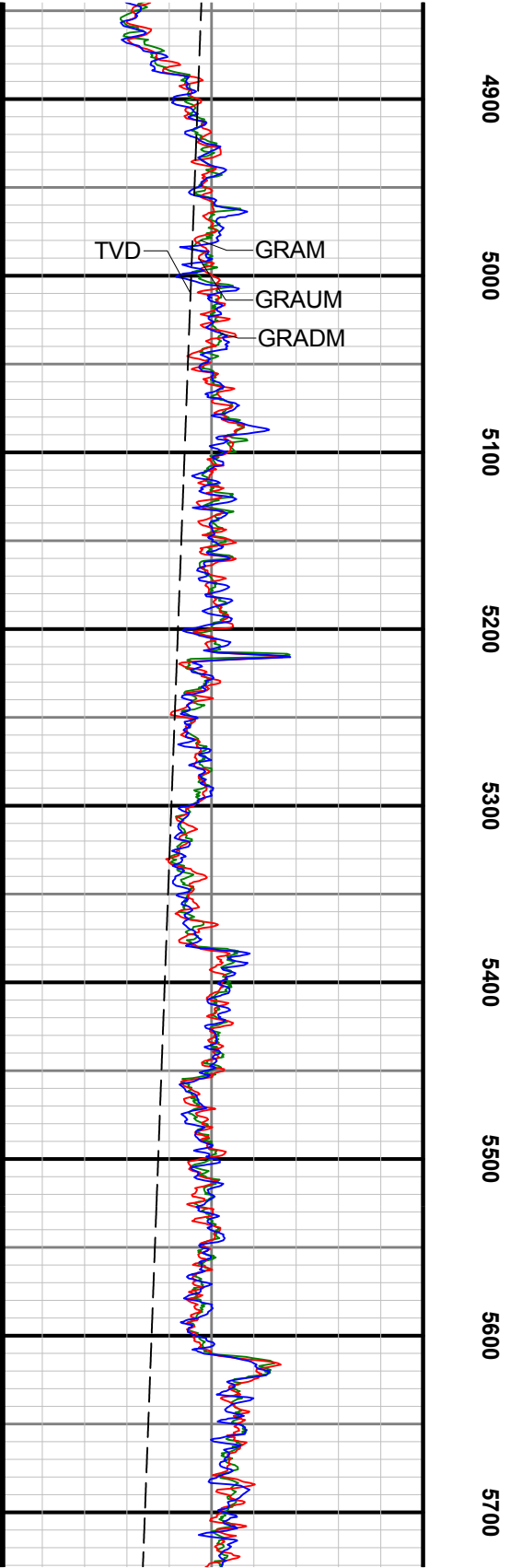
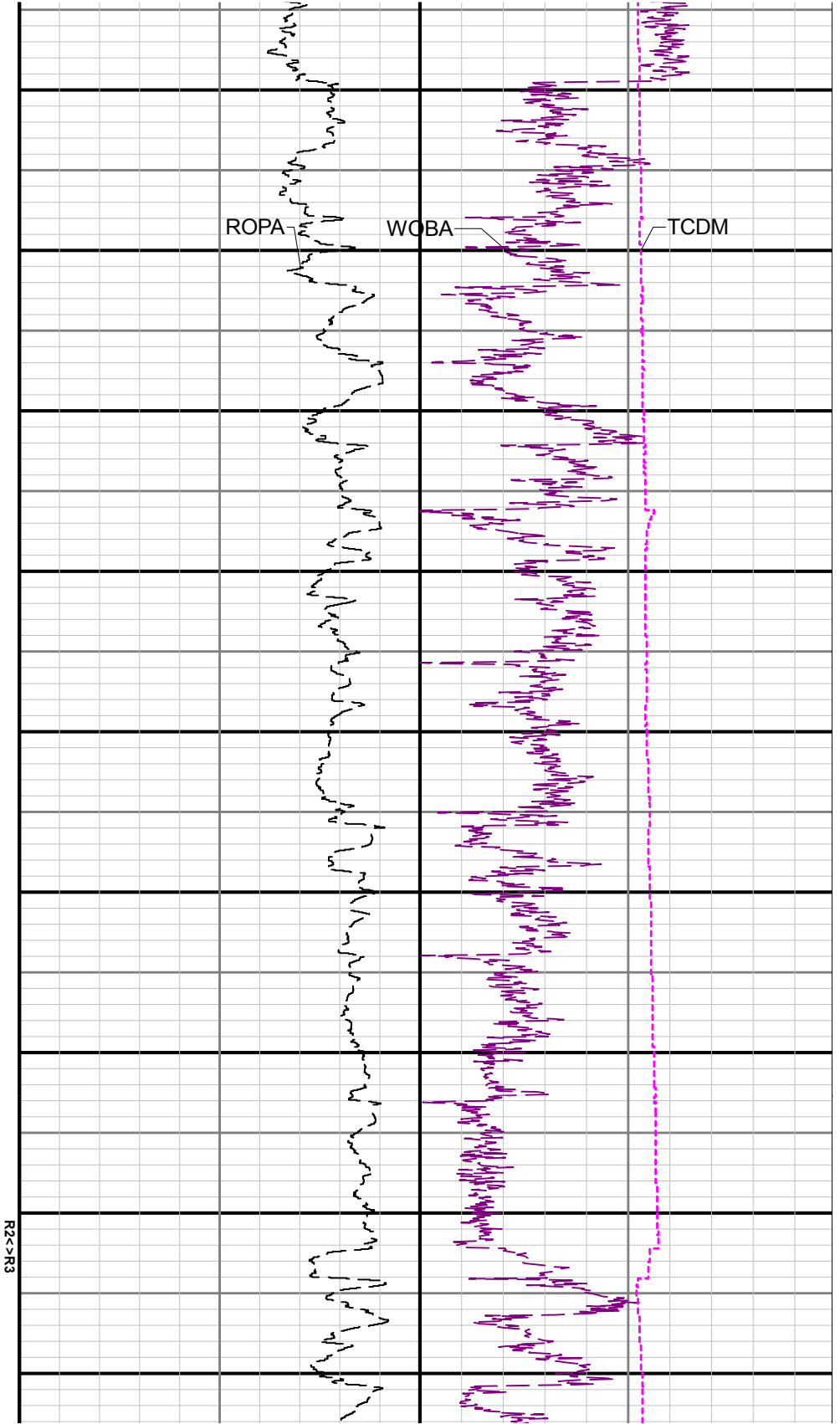
TVD

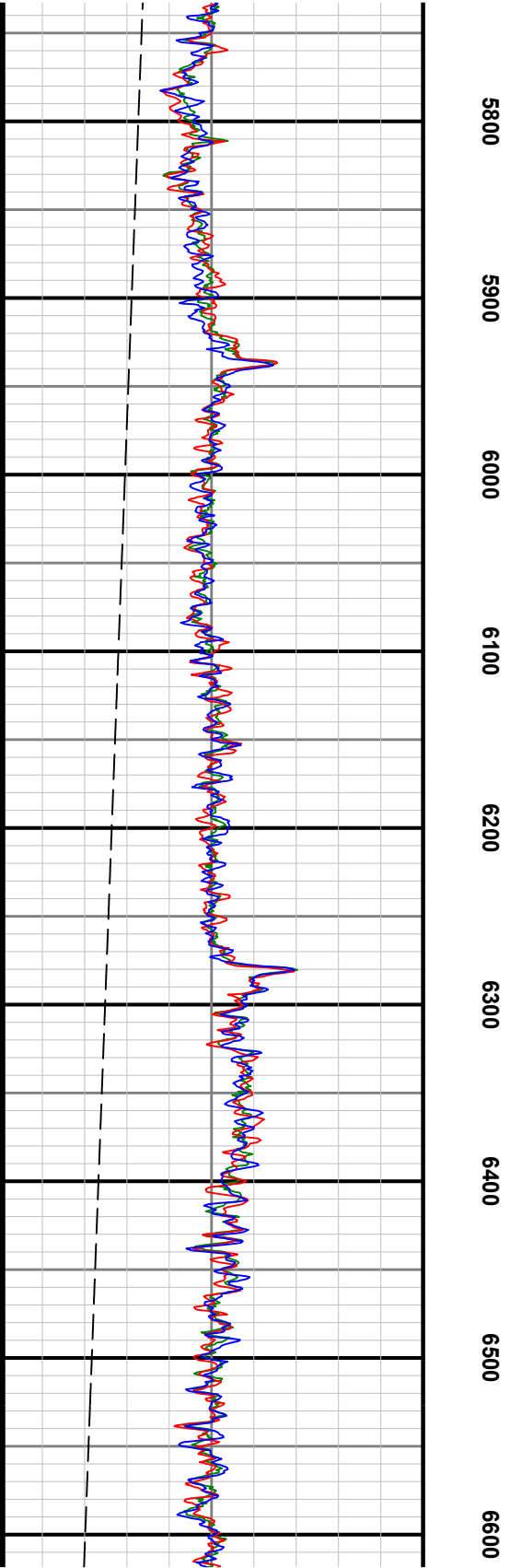
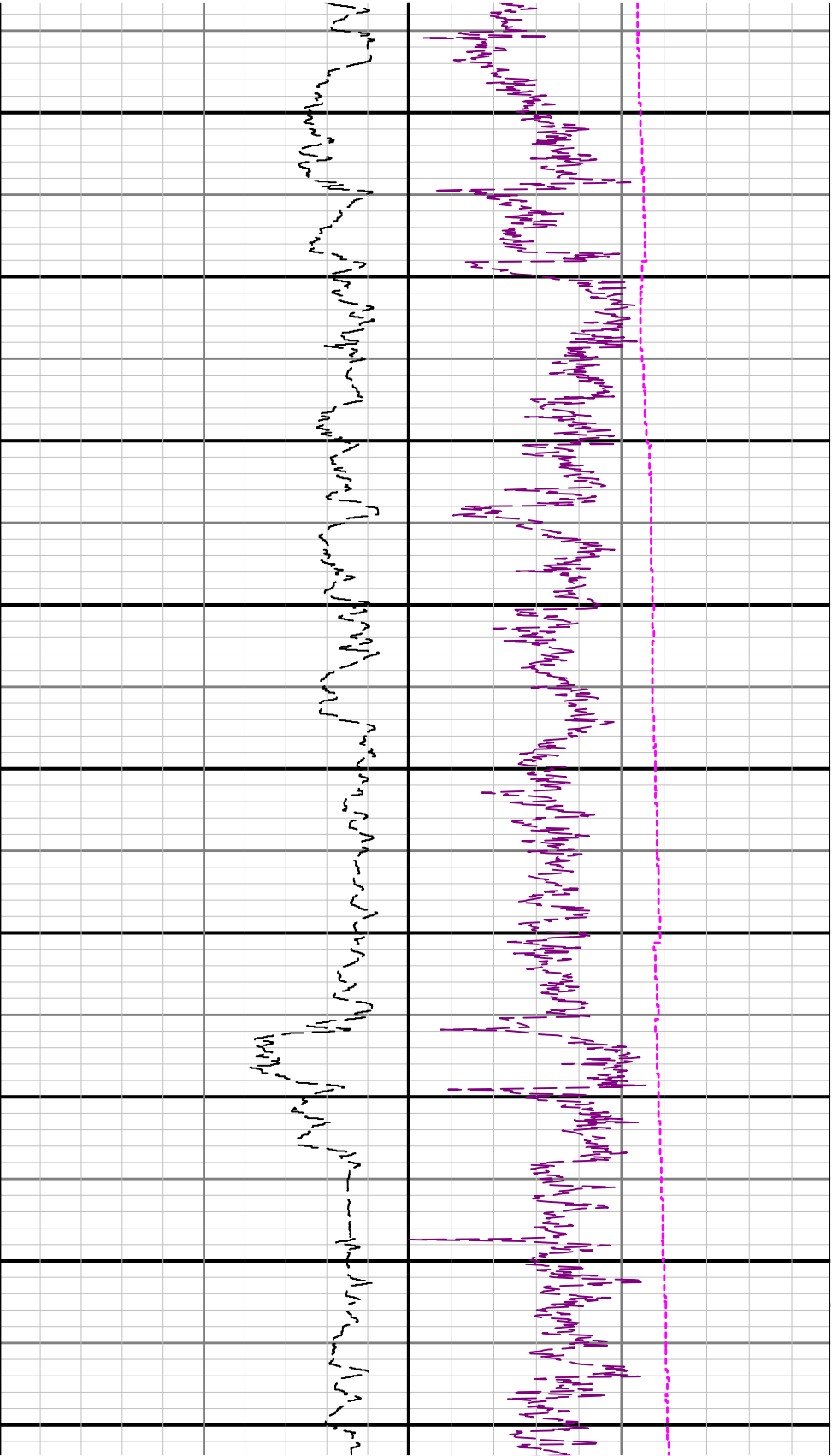


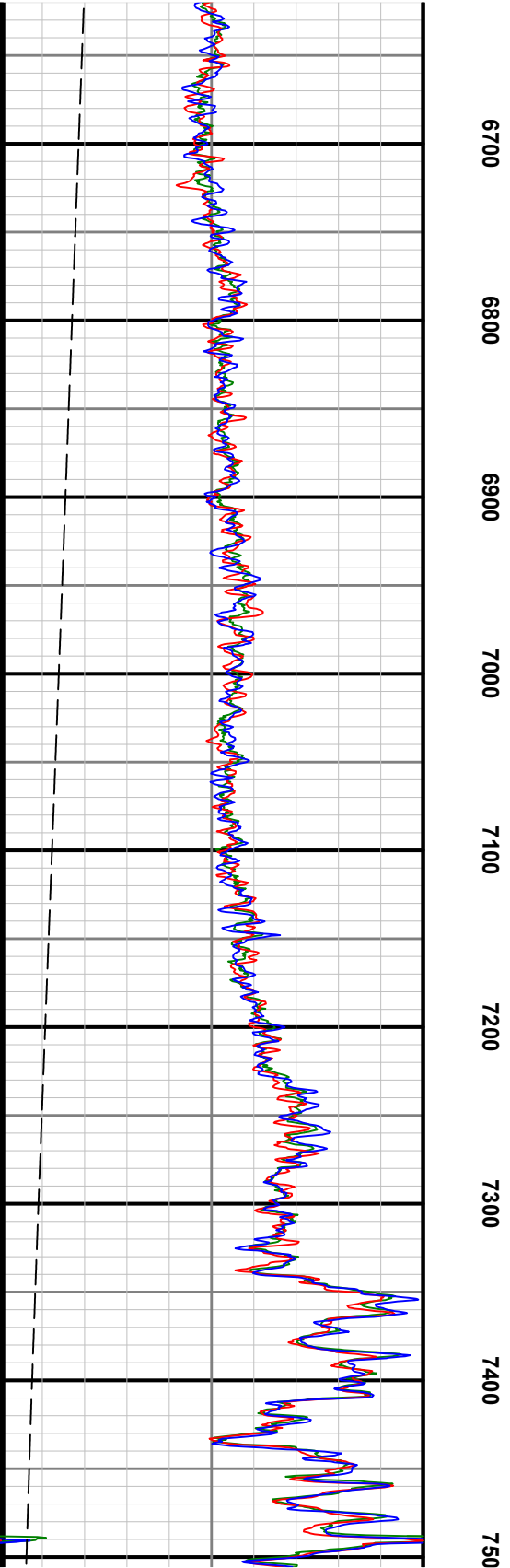
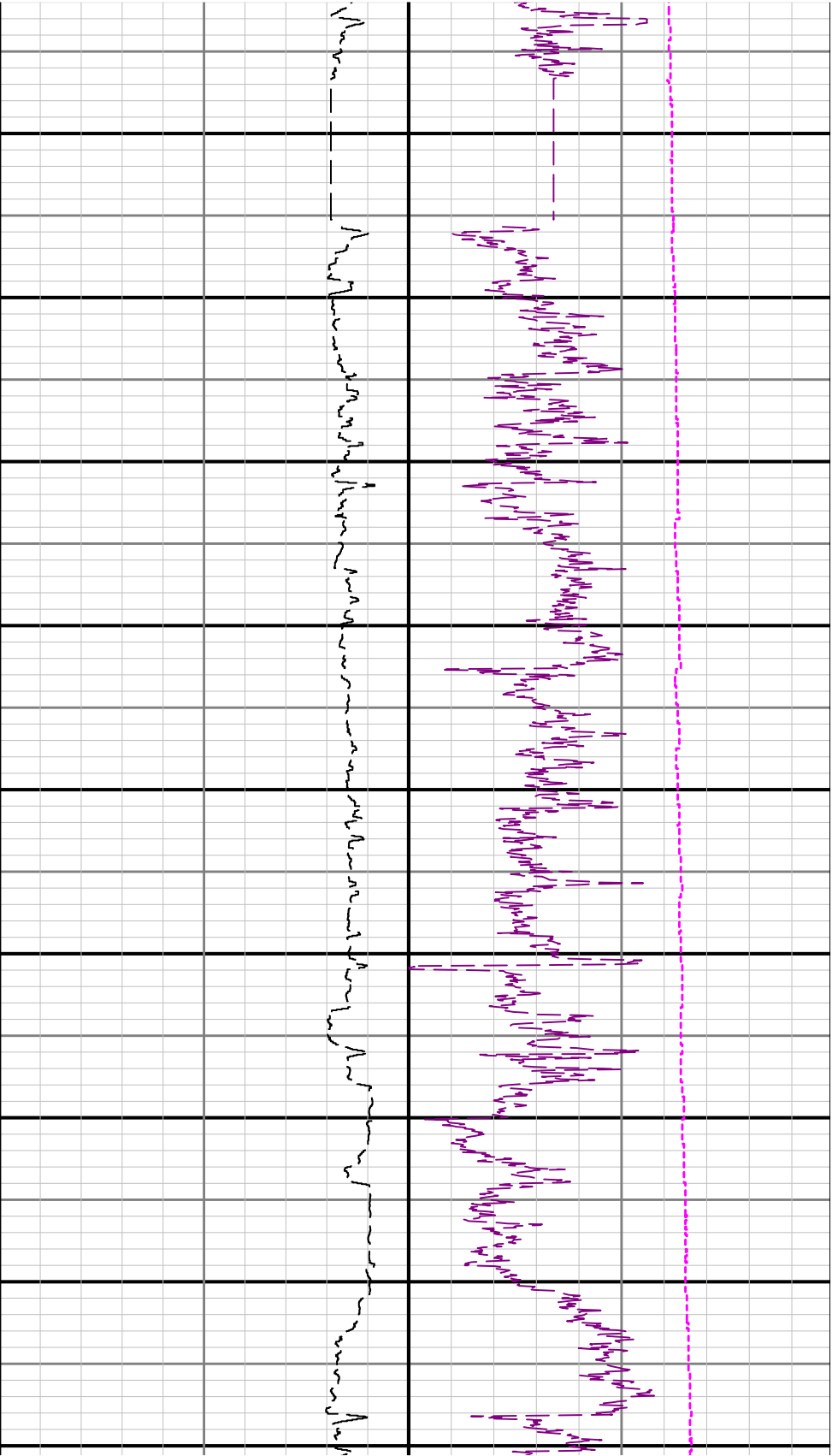


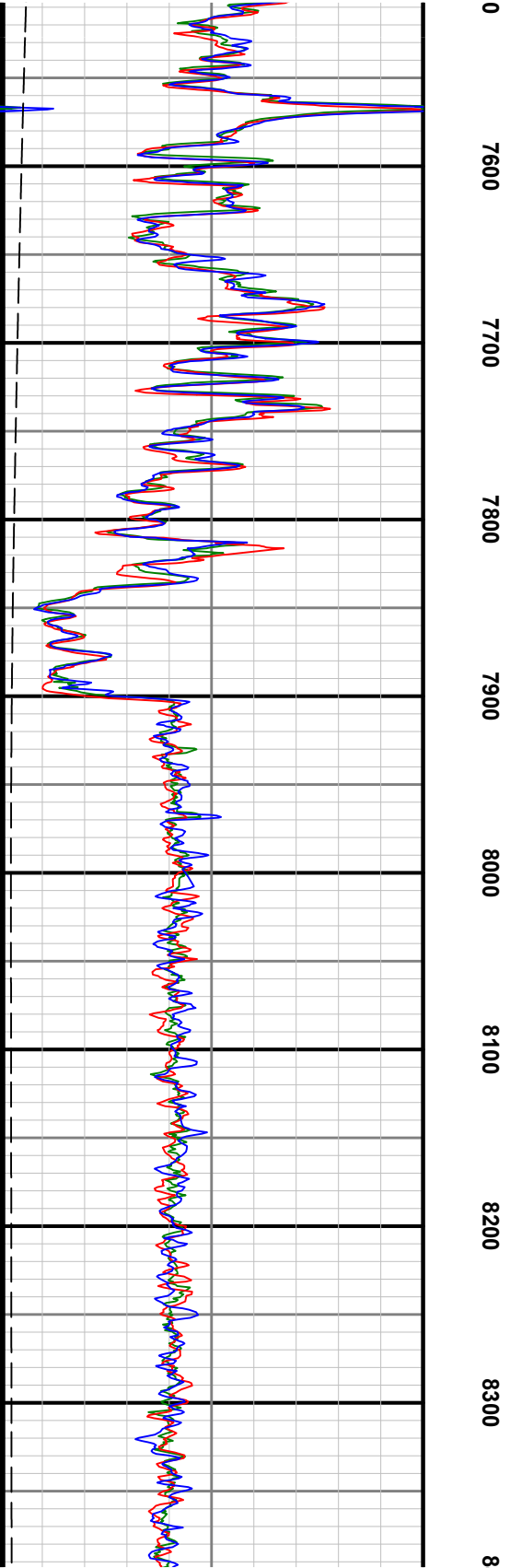
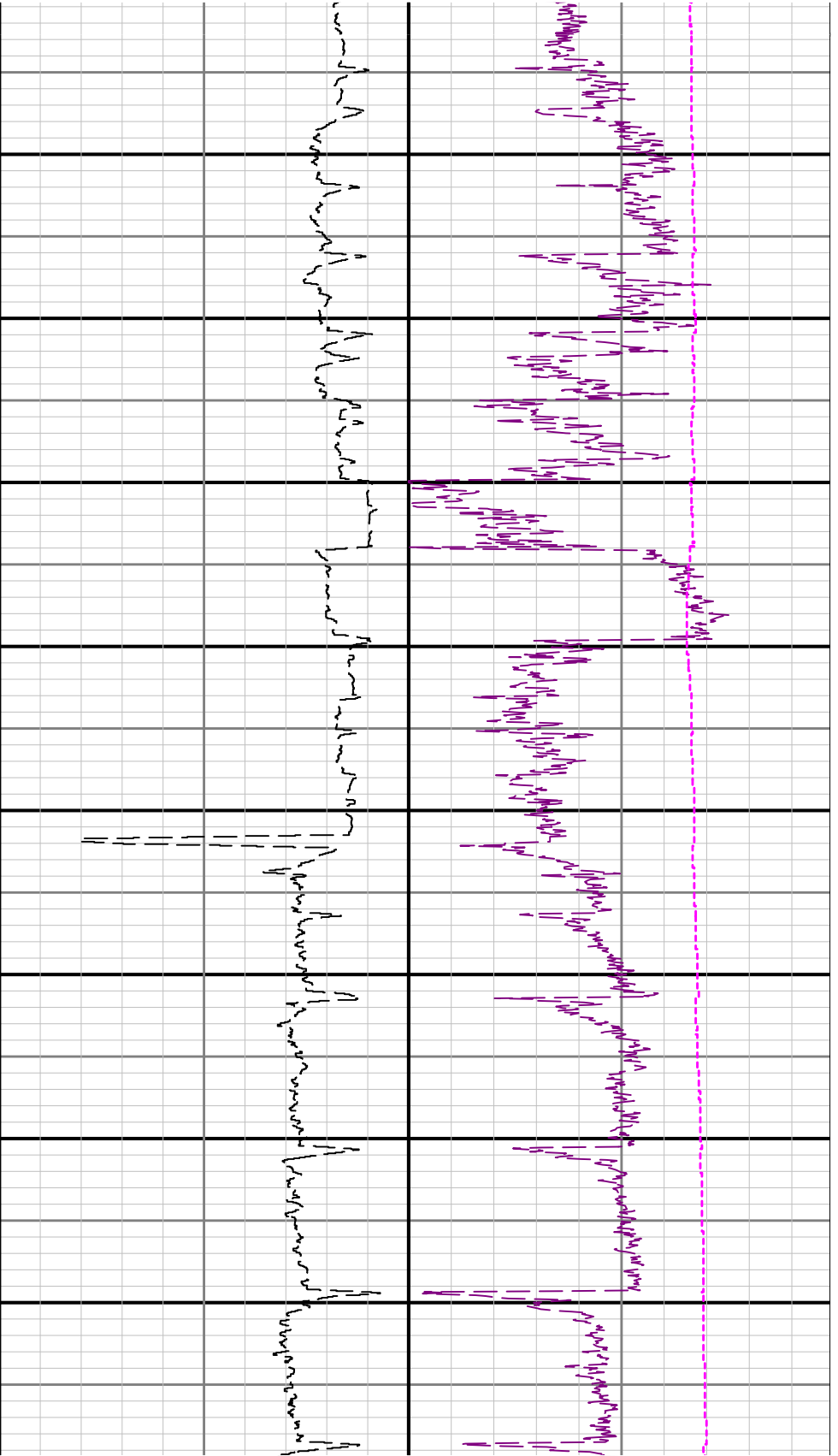


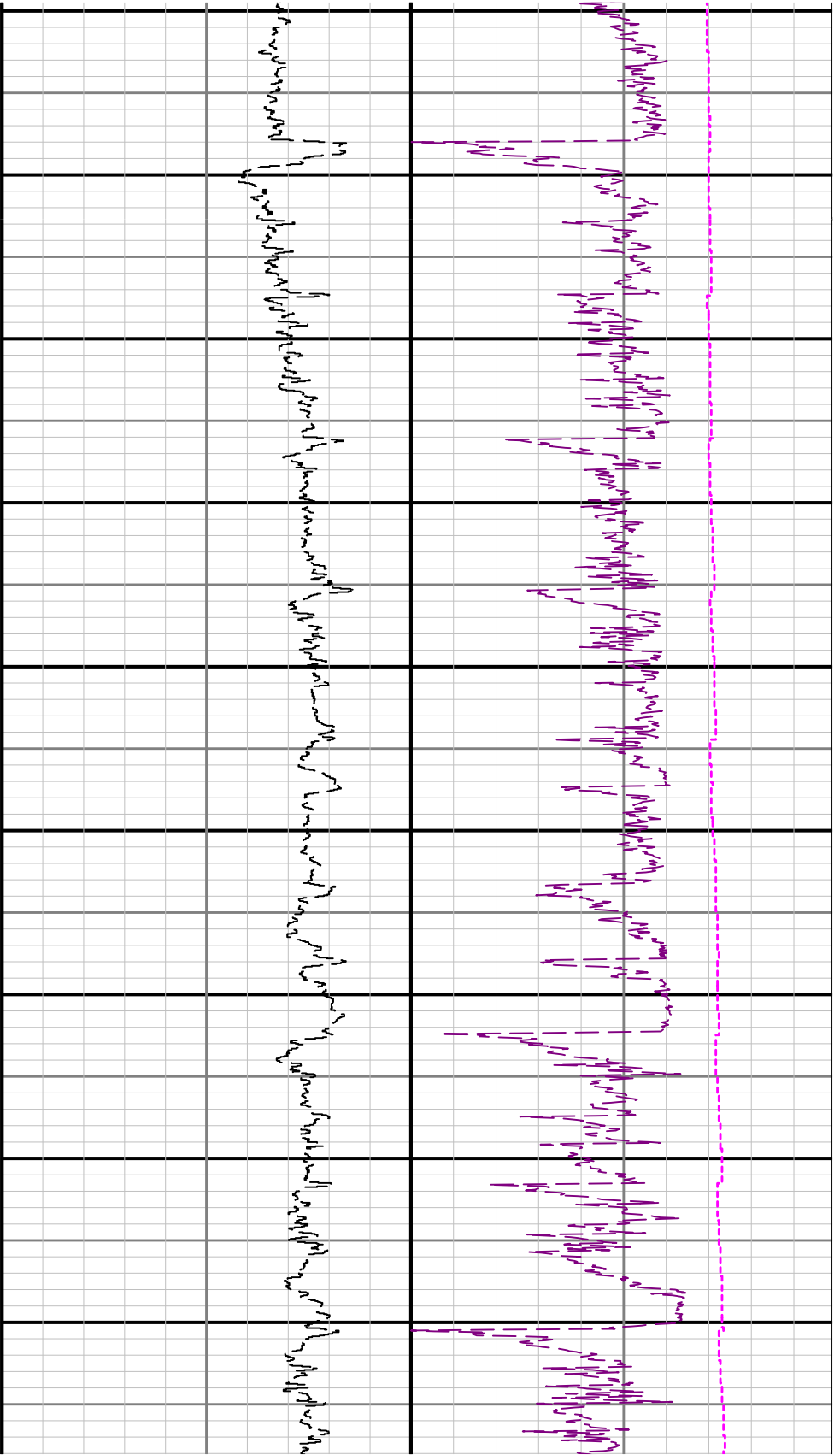












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