

LWD Composite Log



Gamma Ray
Natural Formation Evaluation

Scale: Company: Noble Energy

1:1200 MD Well: Shadow A26-663

Depth Reference: Field: Weld County (Noble NAD 83 Grid)

Driller's Depth County: Weld State: United States

Status: Surface Location: Other Services:

Final Print Latitude: 040° 27' 30.816" N

API No: 05-123-42885-00 Longitude: 104° 28' 42.996" W

Job ID: 7928851 SEC: 30 TWN: 6N RGE: 63W

Permanent Datum (P.D.): Ground Level Elevation: 4650.00 ft

Log Measured From: Rig Floor Above P.D. 30.00 ft

Dates Interval Logged Magnetic Field Reference

Date From: 2016-06-12 Top: (ft) 1913.00

Date To: 2016-06-16 Bottom: (ft) 17467.00

Spud Date: 2016-06-10

Borehole Record Casing Record

Hole Size (in) From (ft) To (ft) Size (in) Weight (lb/ft) From (ft) To (ft)

8.500 1928.00 17466.00 9.625 36.00 30.00 1918.00

Mud Record Deviation Record

Type From (ft) To (ft) Hole Size (in) Interval (ft) Inc | Az (Start) Inc | Az (End)

Oil Based Mud 1928.00 17466.00 8.500 15539.43 0.40 | 171.77 89.85 | 269.99

Acquisition System Software Version Other

Baker Hughes Cadence G3.2

Pilot Studio 3.2.7268.7

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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)			
1	2	8.500	PDC	2.00	AutoTrak Curve	1915.27	14497.19	1928.00	14503.75	2016-06-12 07:11	2016-06-15 03:26	59.40
2	2	8.500	PDC	2.00	AutoTrak Curve	14491.57	17460.87	14503.75	17467.43	2016-06-15 21:25	2016-06-16 10:44	14.46

Crew

Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
Akex Osborne		2016-06-11	2016-06-13	Mike Gurnsey		2016-06-11	2016-06-12	Will Drake		2016-06-11	2016-06-16
David Browning		2016-06-12	2016-06-17	Hans Cary		2016-06-13	2016-06-17	Austin Small		2016-06-15	2016-06-16
Brent Cass		2016-06-16	2016-06-17	Chad Hough		2016-06-16	2016-06-17				

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+ (%)
2016-06-11 10:51	1	1900.00	Oil Based Mud	9.7	26	8.4	97.0	0/98	Active Pit	1000	0.00
2016-06-12 13:30	1	3631.00	Oil Based Mud	9.6	48	N/A	0.0	75/25	Active Pit	35500	0.00
2016-06-13 13:30	1	8540.89	Oil Based Mud	9.8	46	N/A	0.0	74/26	Active Pit	38000	0.00
2016-06-14 13:30	1	12580.13	Oil Based Mud	9.8	46	N/A	0.0	73/27	Active Pit	35500	0.00
2016-06-15 13:30	2	14503.75	Oil Based Mud	9.7	52	N/A	0.0	72/28	Active Pit	34000	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)
1	ATC_SU	12099238	Near Bit VSS	5.93	6.56	7.000	4.330
1	ATC_SU	12099238	Near Bit Inclination	5.93	6.56	7.000	4.330
1	ATC_MWD	11993917	Gamma (single)	2.75	12.73	7.000	3.250
1	ATC_MWD	11993917	Directional (mag)	12.27	22.25	7.000	3.250
2	ATC_SU	11813726	Near Bit VSS	5.93	6.56	7.000	4.330
2	ATC_SU	11813726	Near Bit Inclination	5.93	6.56	7.000	4.330
2	ATC_MWD	12450401	Gamma (single)	2.20	12.18	7.000	3.250
2	ATC_MWD	12450401	Directional (mag)	12.27	22.25	7.000	3.250

Comments


- 1 Baker Hughes Run 1 and 2 utilized a 6.75 inch AutoTrak Curve Rotary Steerable assembly tool behind a 8.50 inch bit from 1903 ft MD to 17347 ft MD (1902.99 ft TVD to 6731.45 ft TVD).
- 2 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

Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1920.00	8.500	1	The interval from 1918 ft MD to 1931 ft MD (1917.99 ft TVD to 1931.99 ft TVD) has no surface data due to the Gamma Ray sensor to bit offset
2	14490.00	8.500	2	The interval from 14490 ft MD to 14503 ft MD (6663.40 ft TVD to 6663.60 ft TVD) was logged up to 15 hours after being drilled due to tripping out of the hole for a new drilling assembly
3	17450.00	8.500	2	The interval from 17442 ft MD to 17466 ft MD (6671.00 ft TVD to 6671.10 ft TVD) has no Gamma data due to sensor to bit offset

Curve Mnemonics

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



Company

Well

Interval

Created

Noble Energy

Shadow A26-663

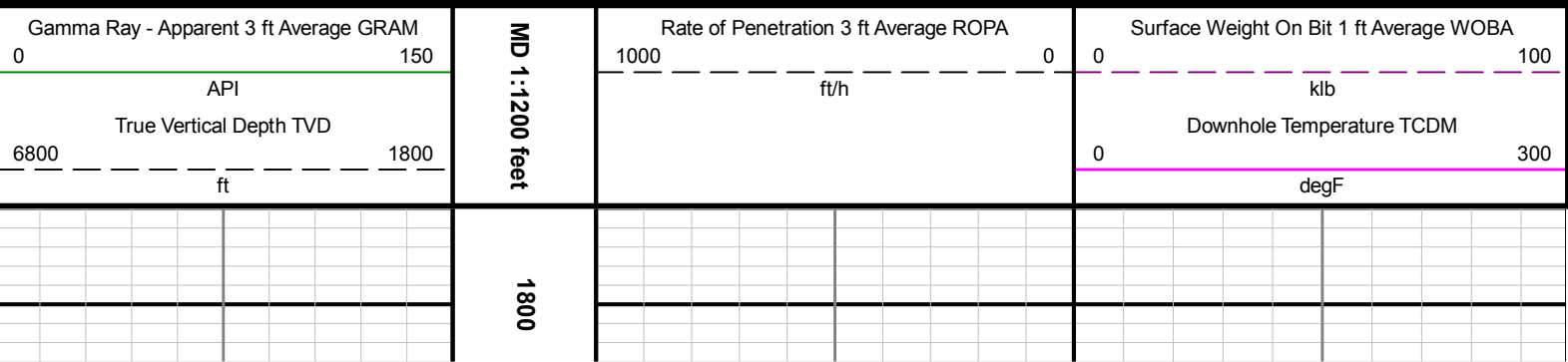
Date From: 2016-06-12 07:11

Date To: 2016-06-16 10:42

Created 2016-06-19 09:04

Top: 1913.00

Bottom: 17467.00



1900 2000 2100 2200 2300 2400 2500 2600

>R1

ROPA

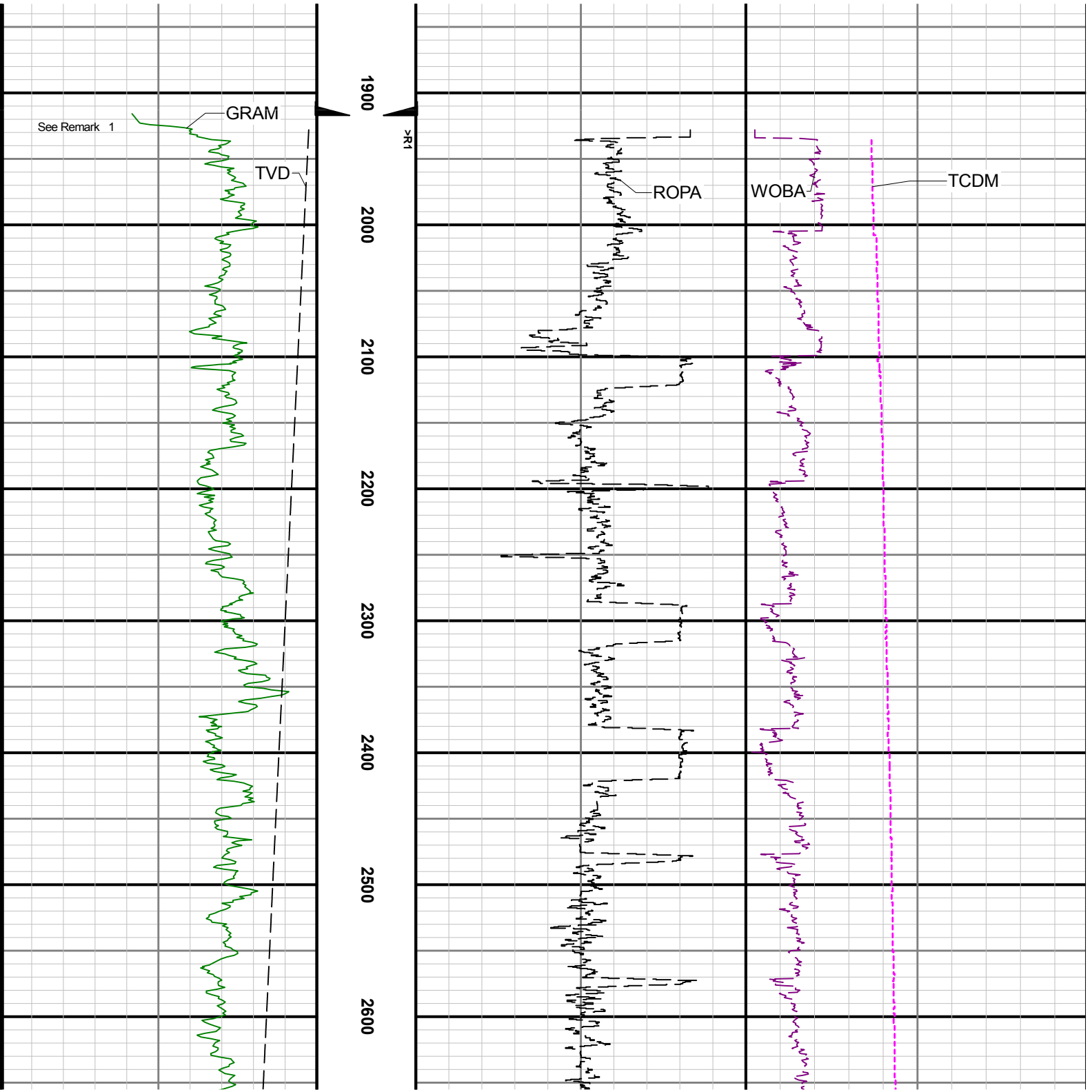
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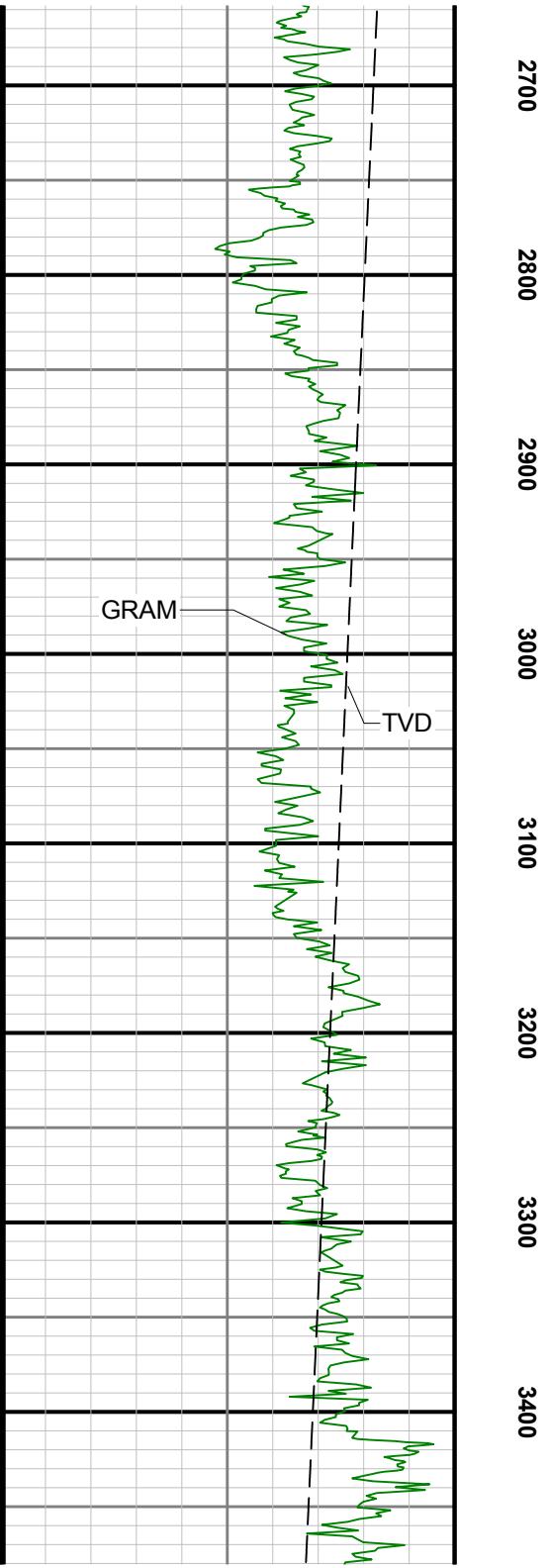
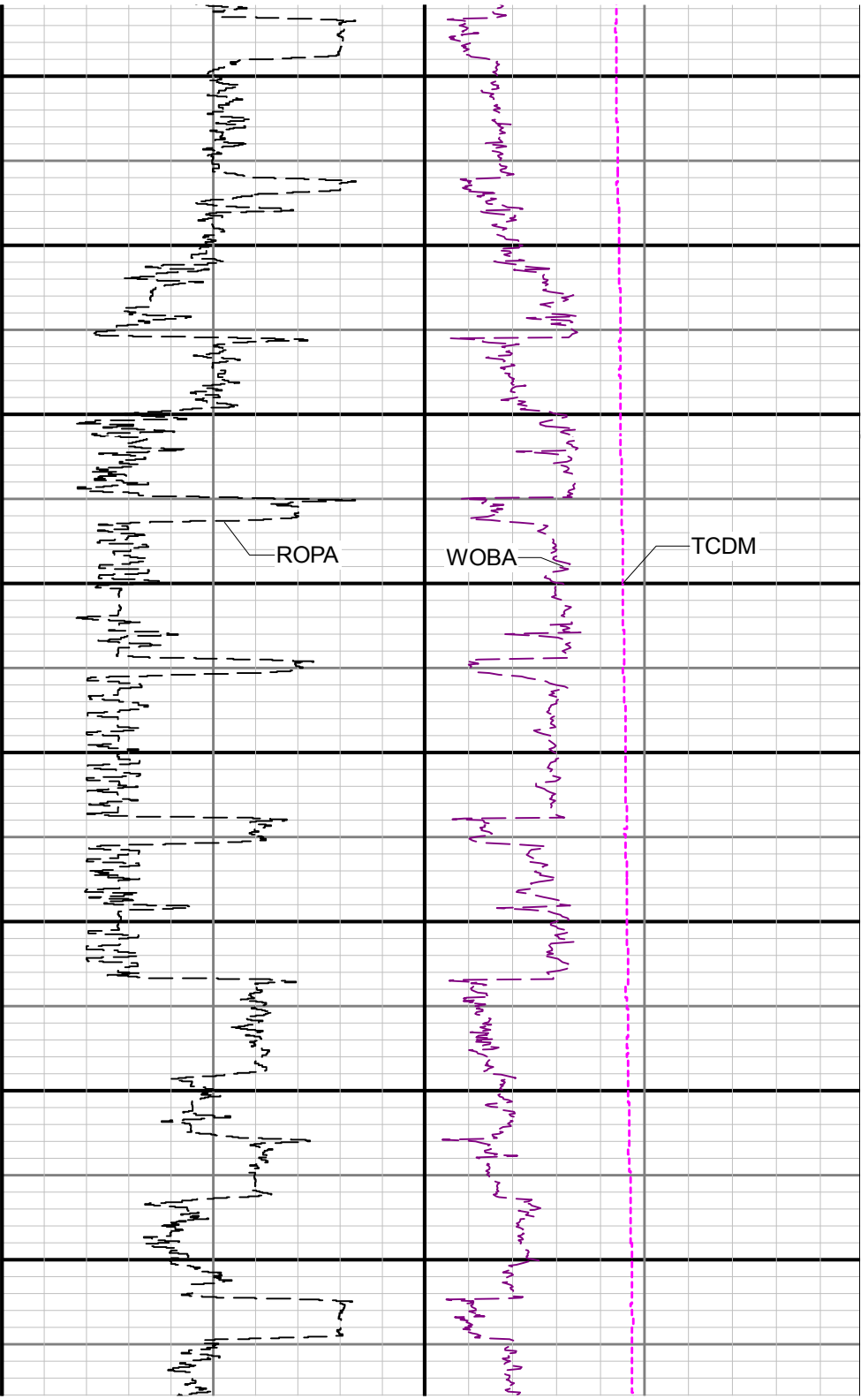
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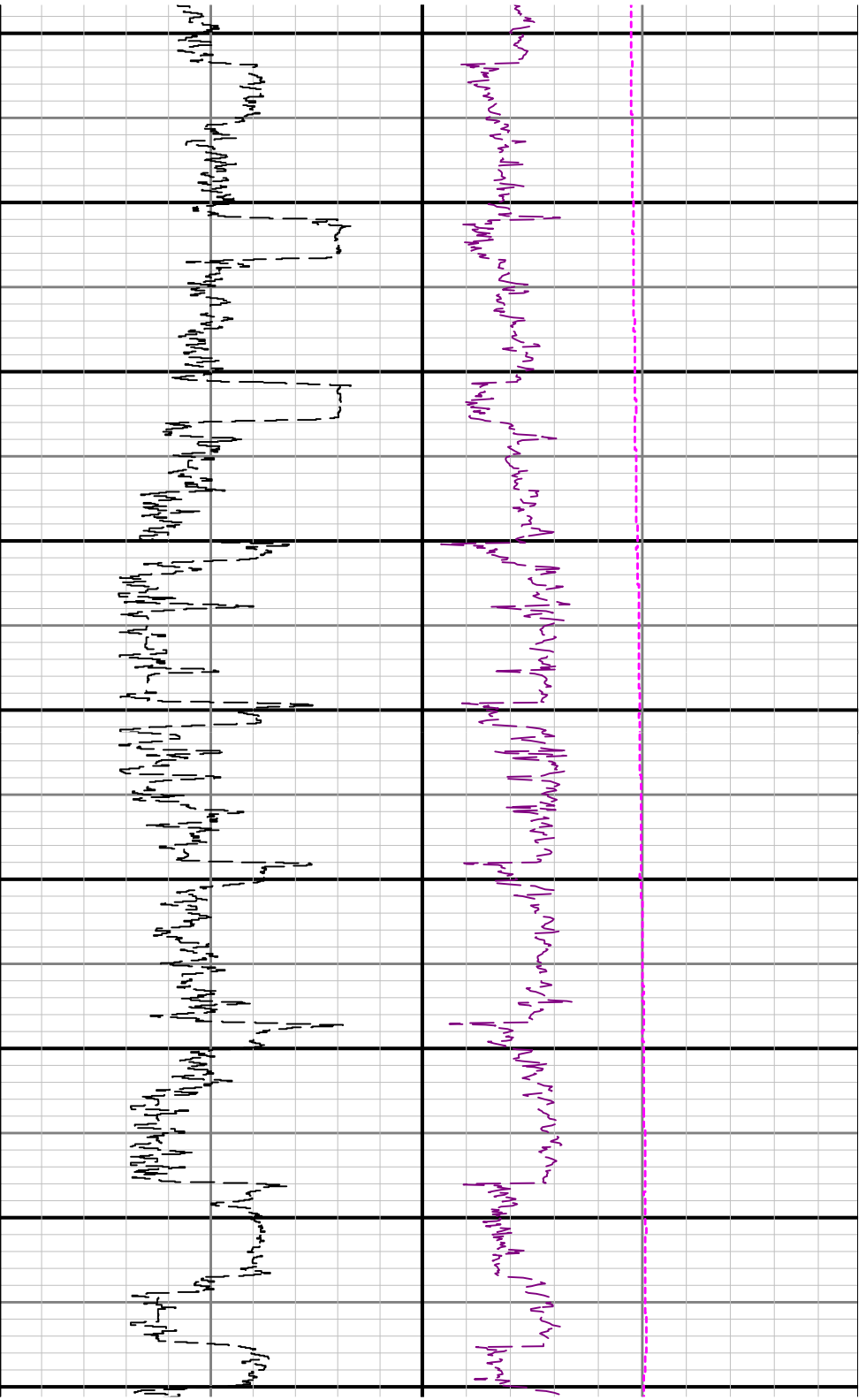
GRAM

TVD

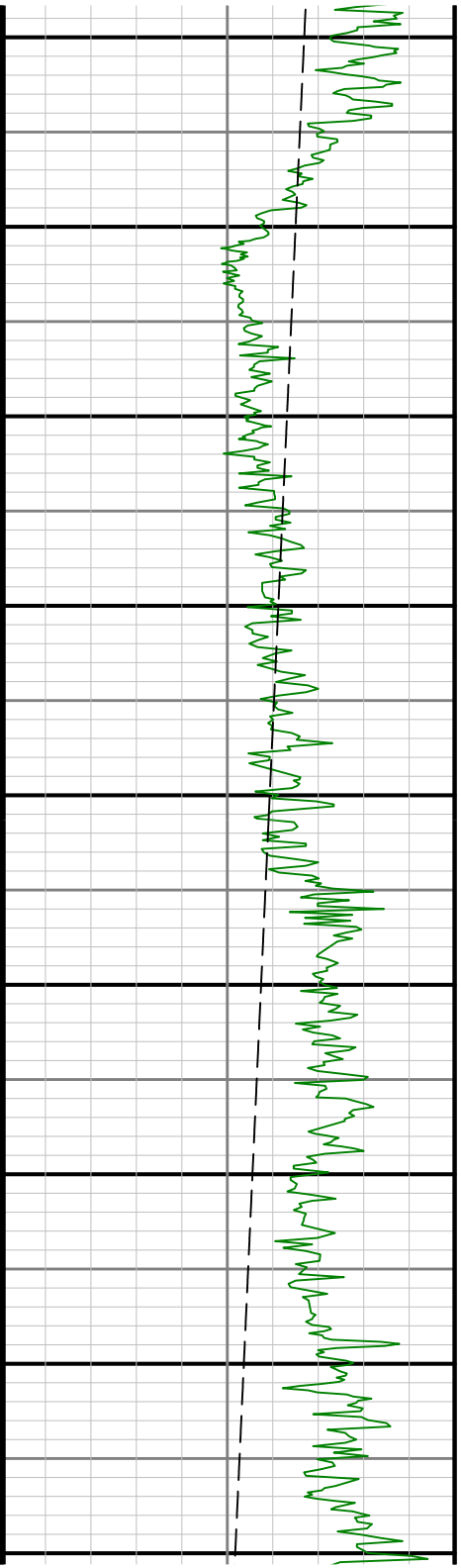
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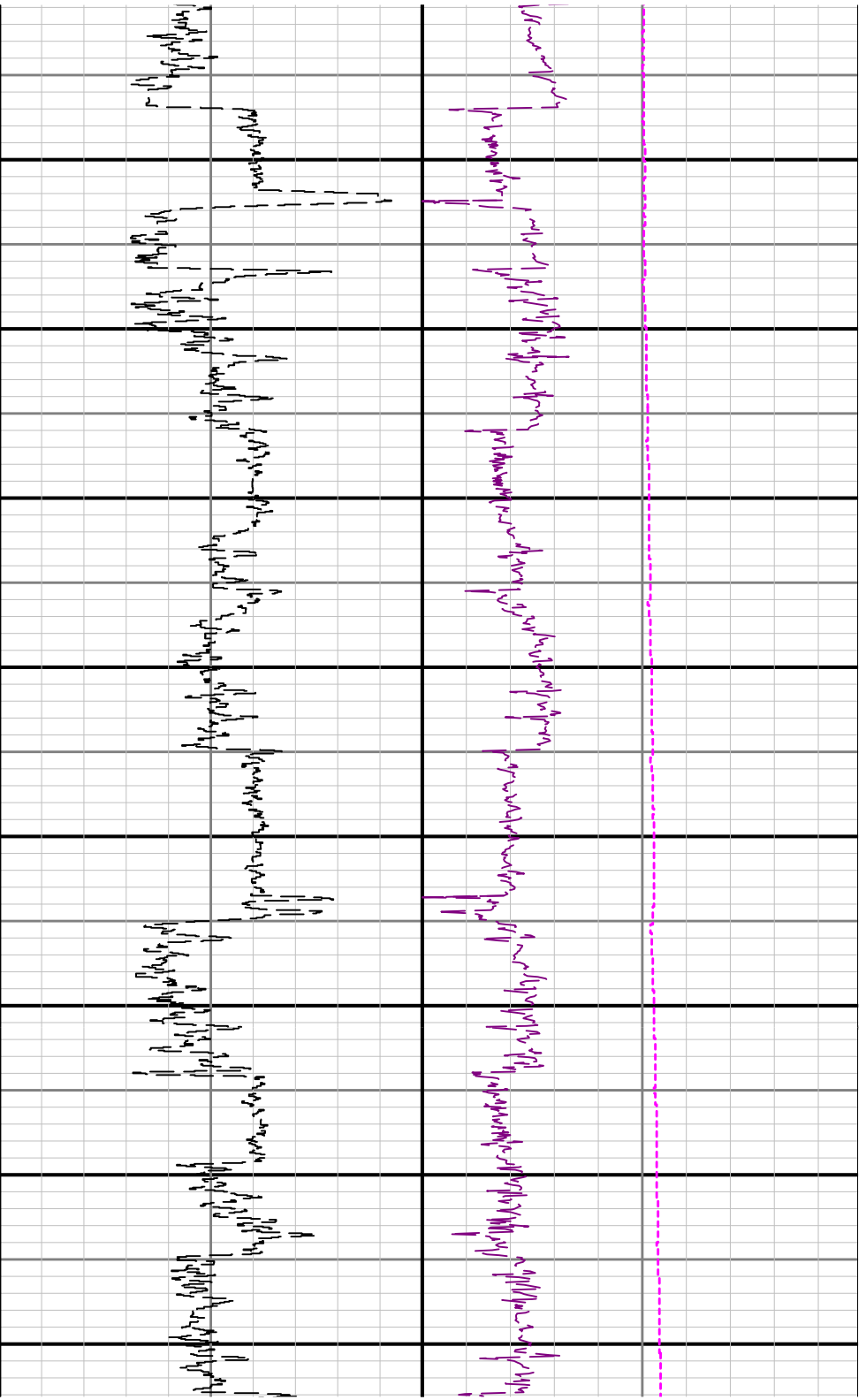




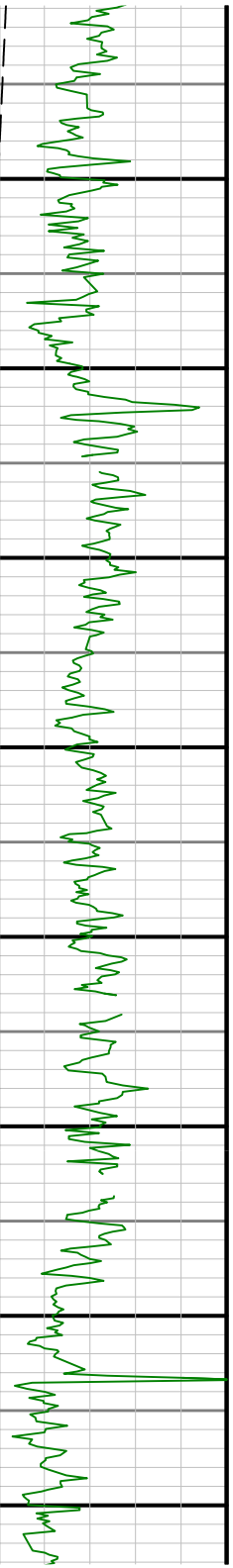


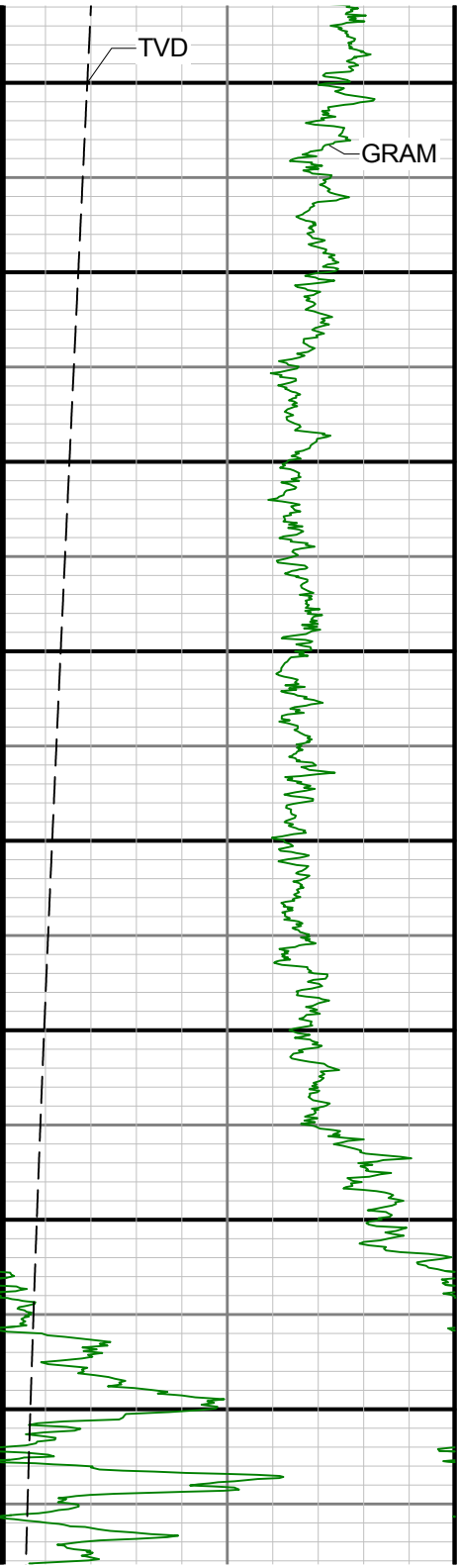
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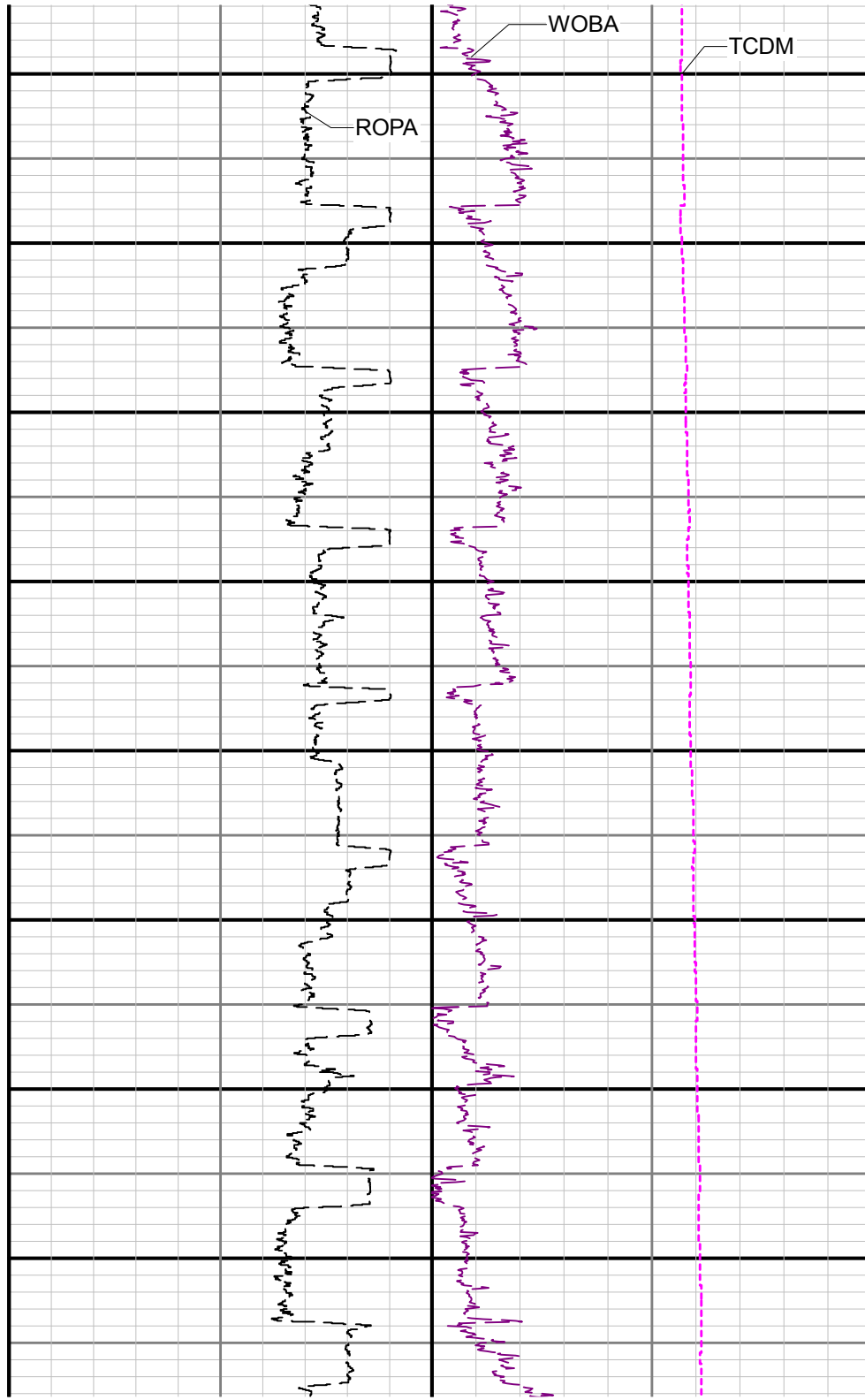


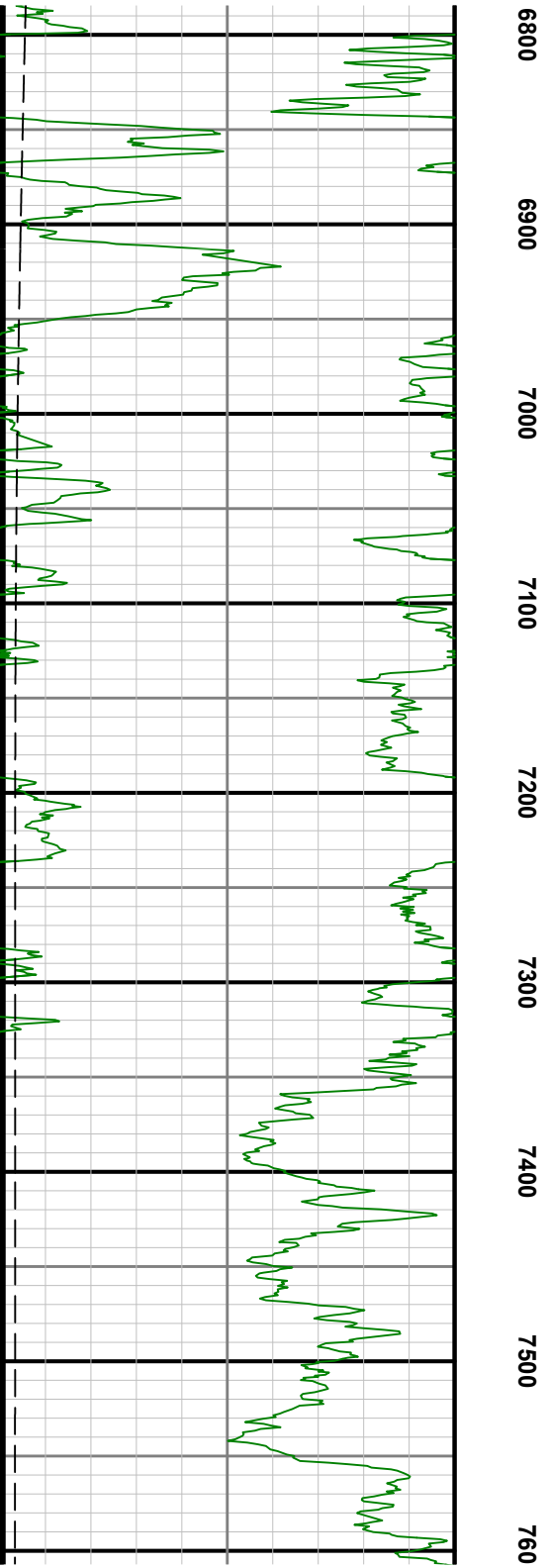
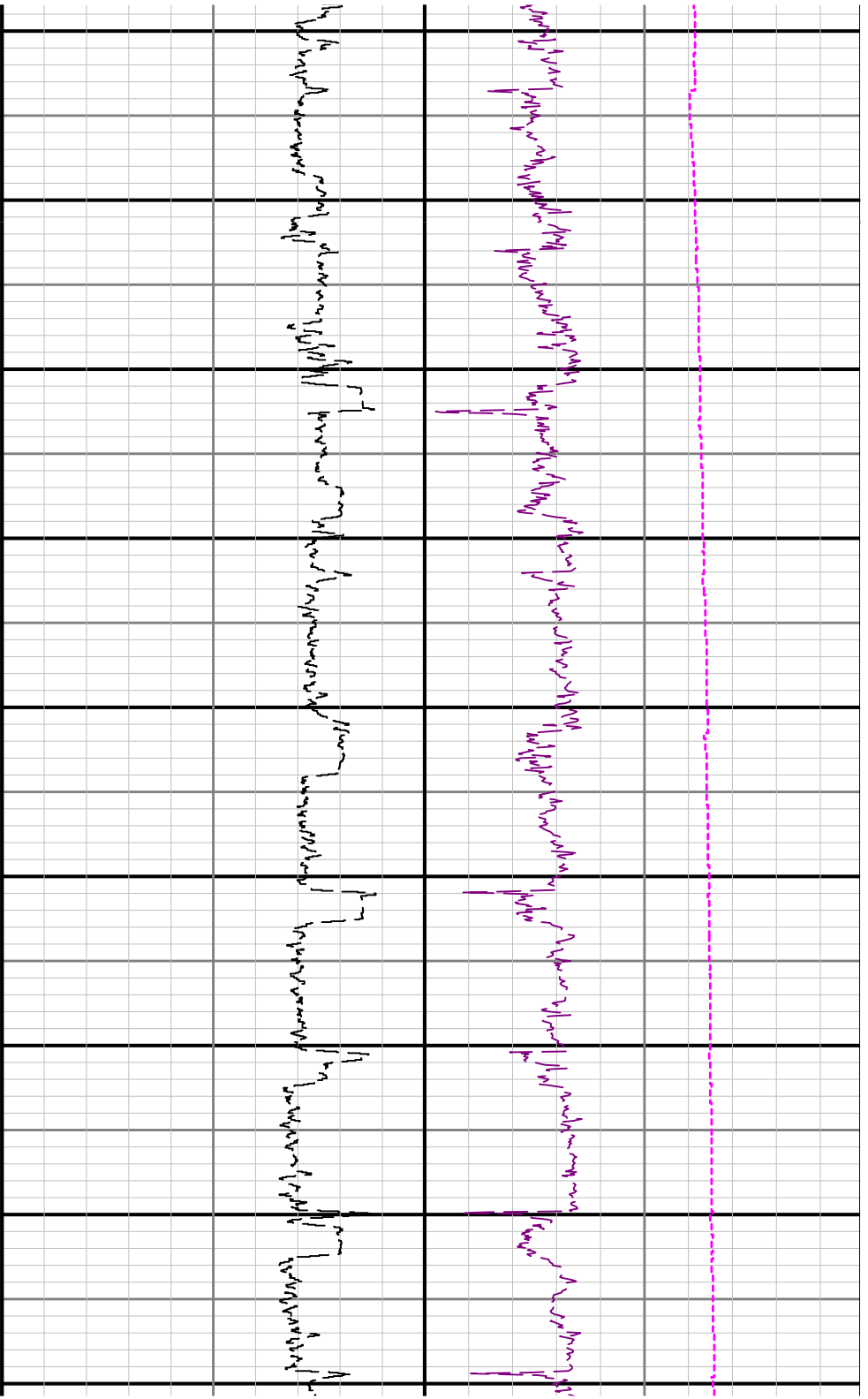
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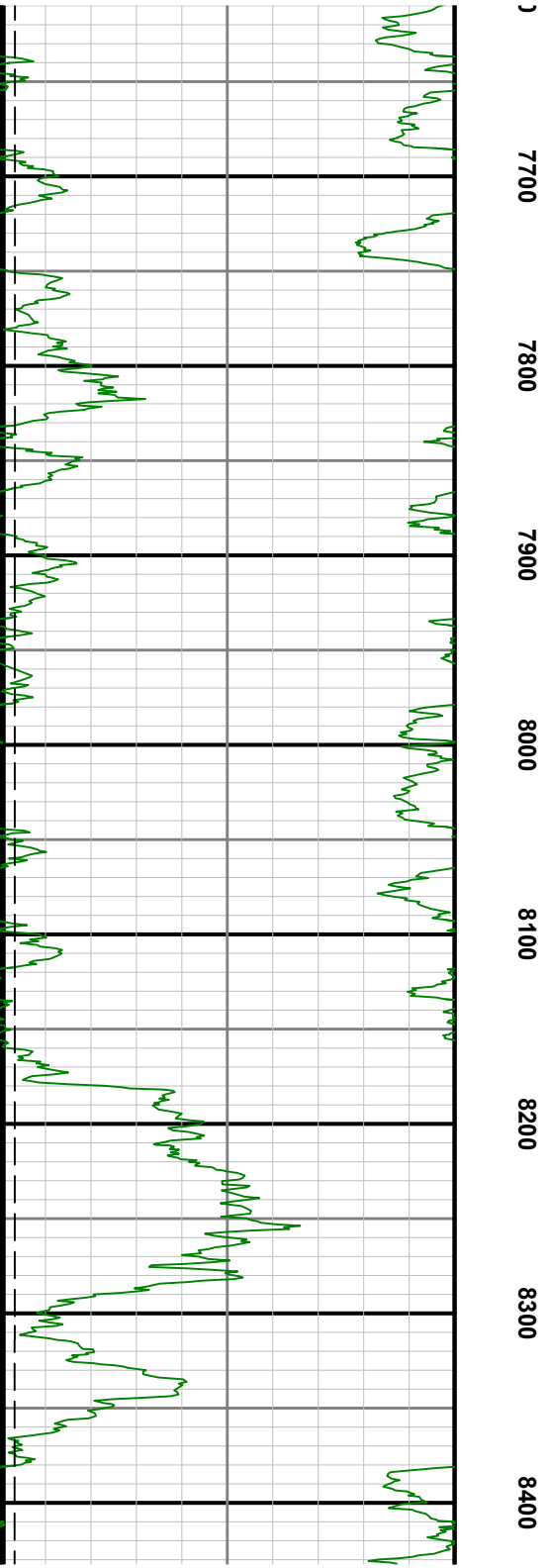
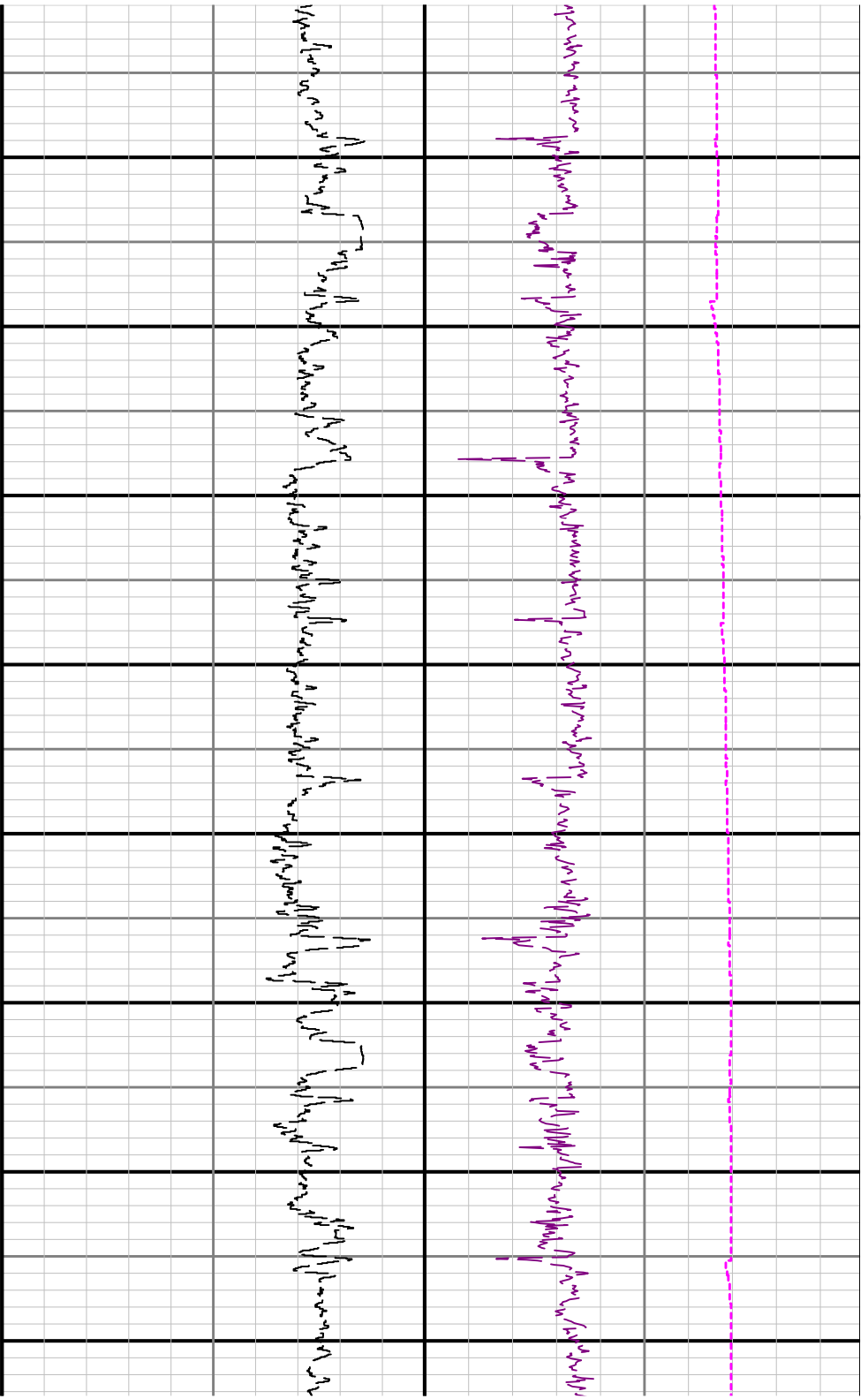


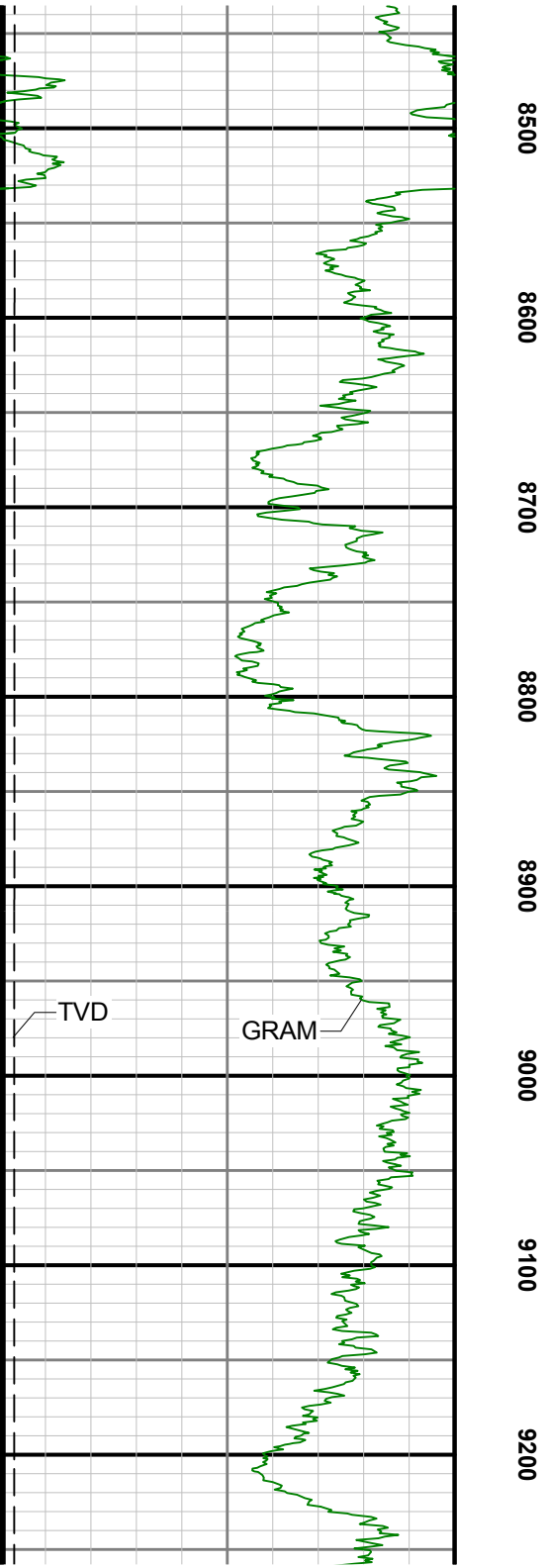
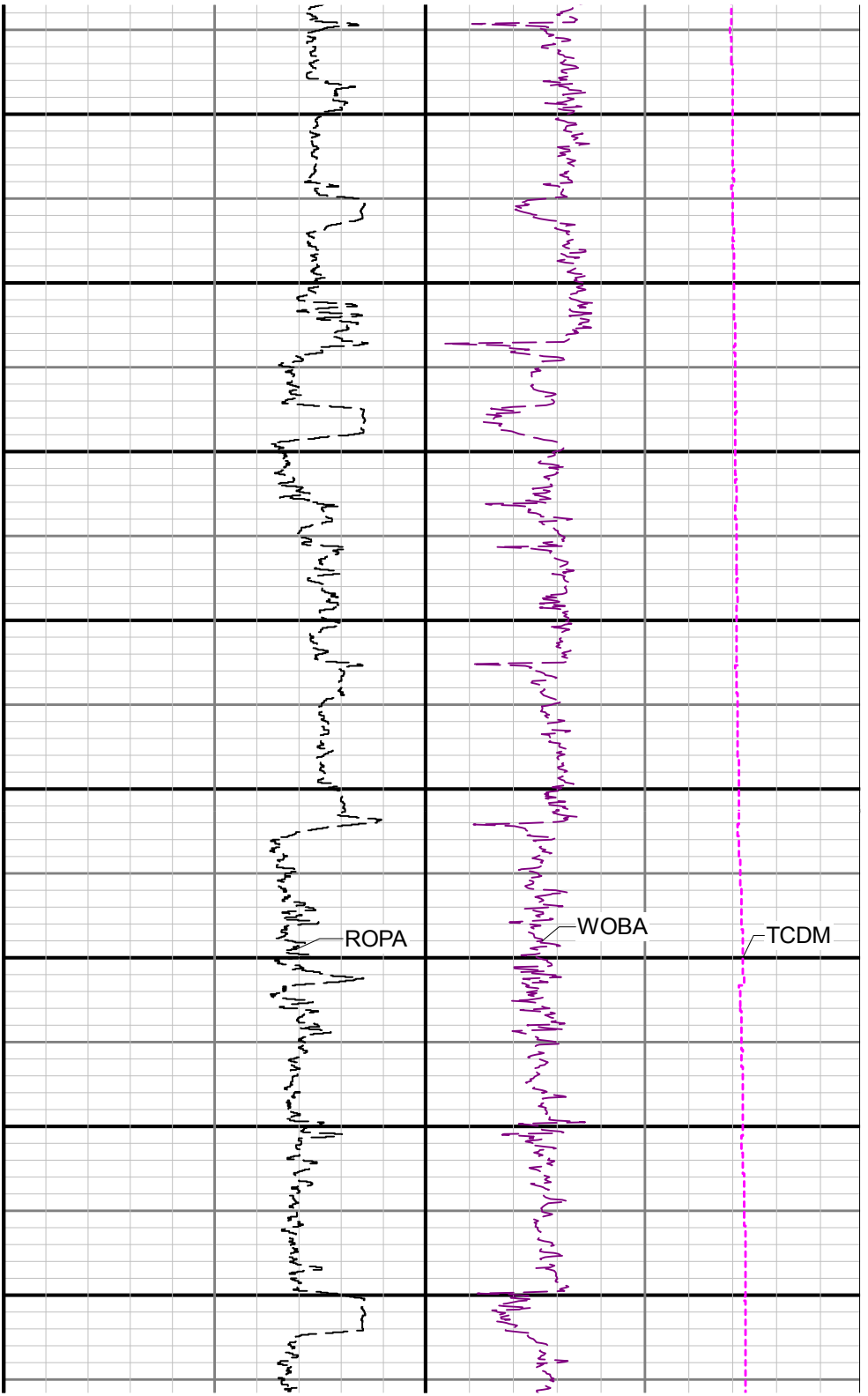


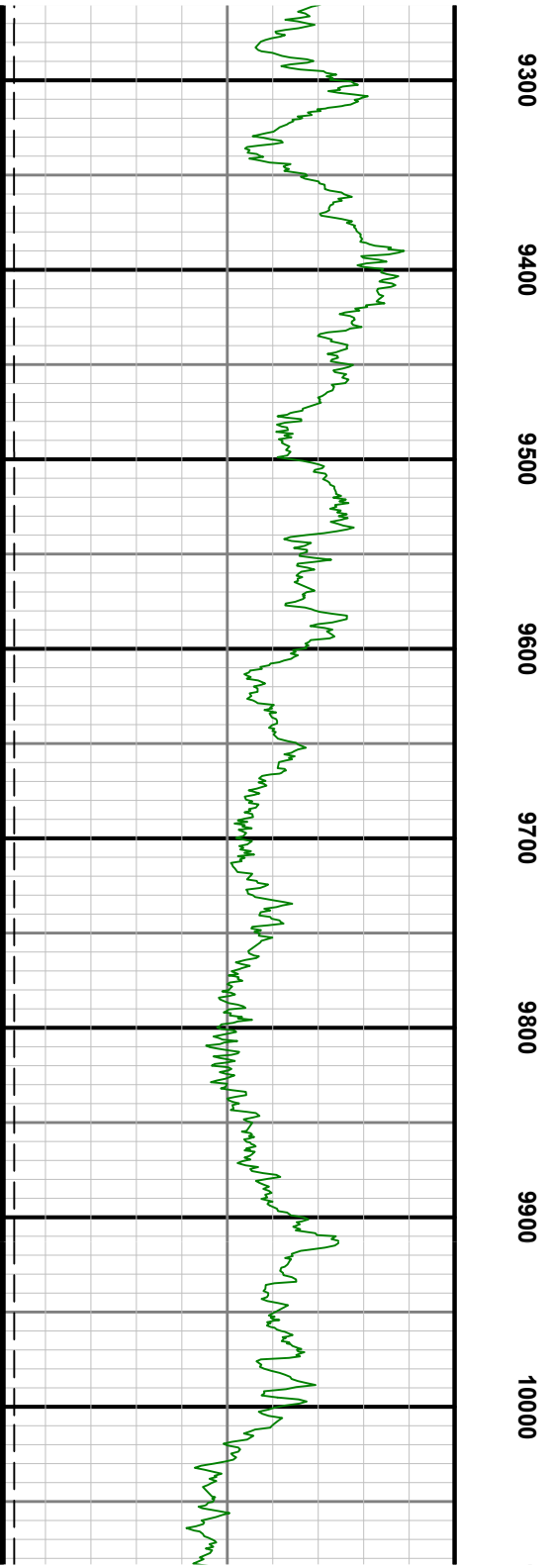
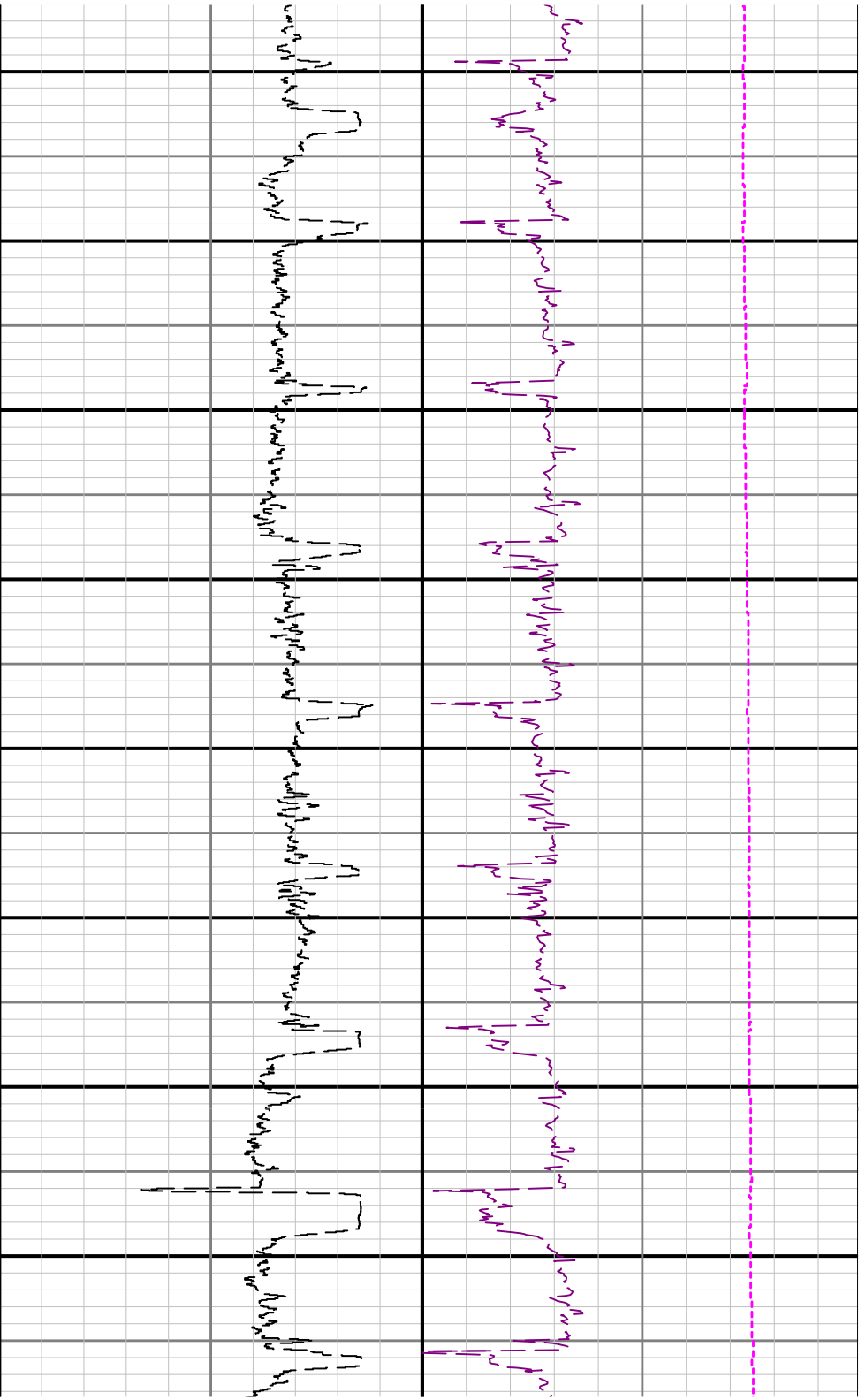
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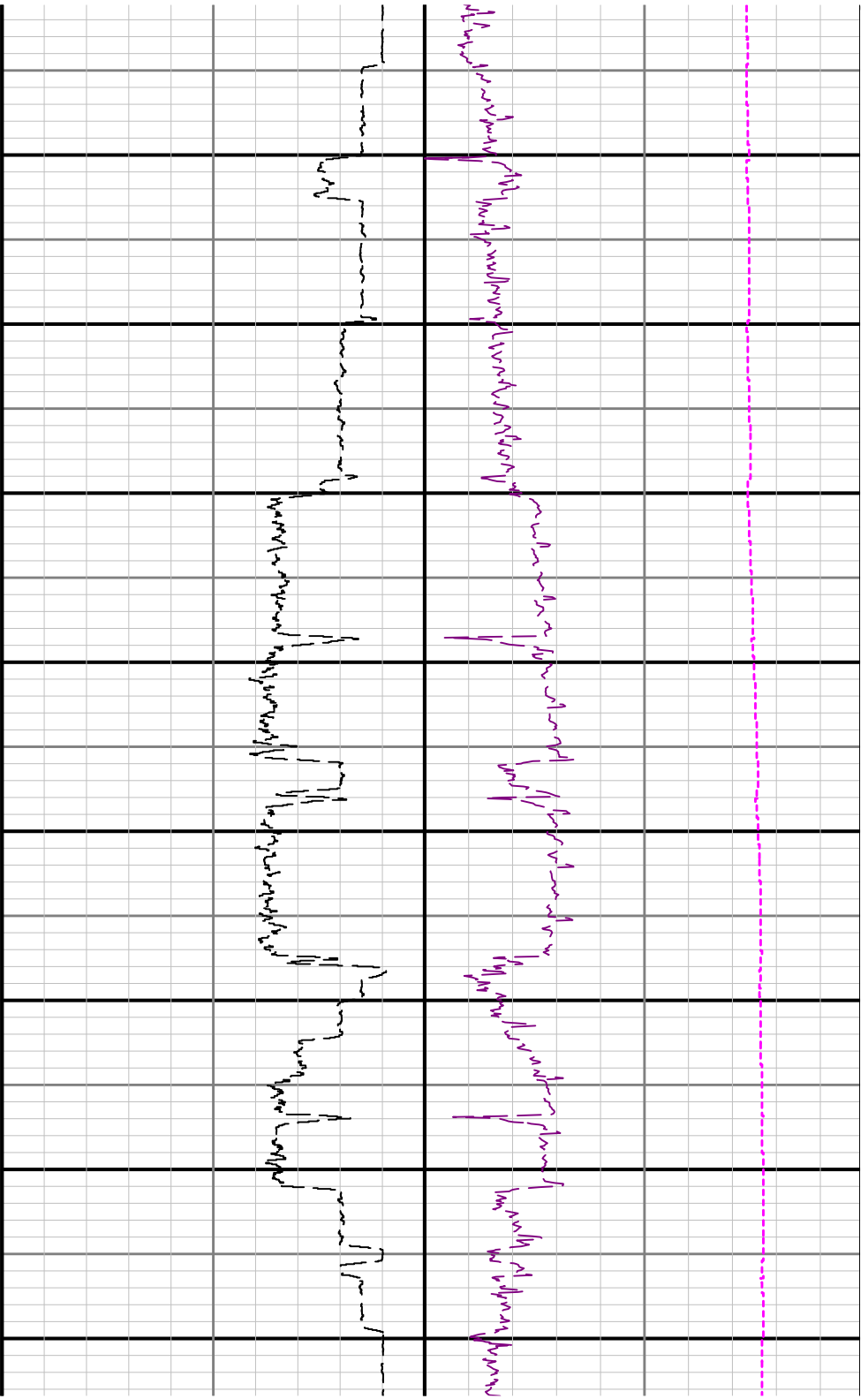




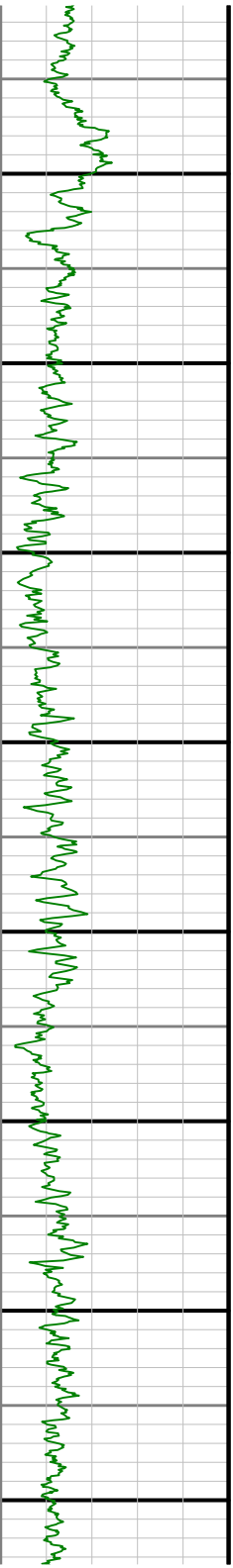


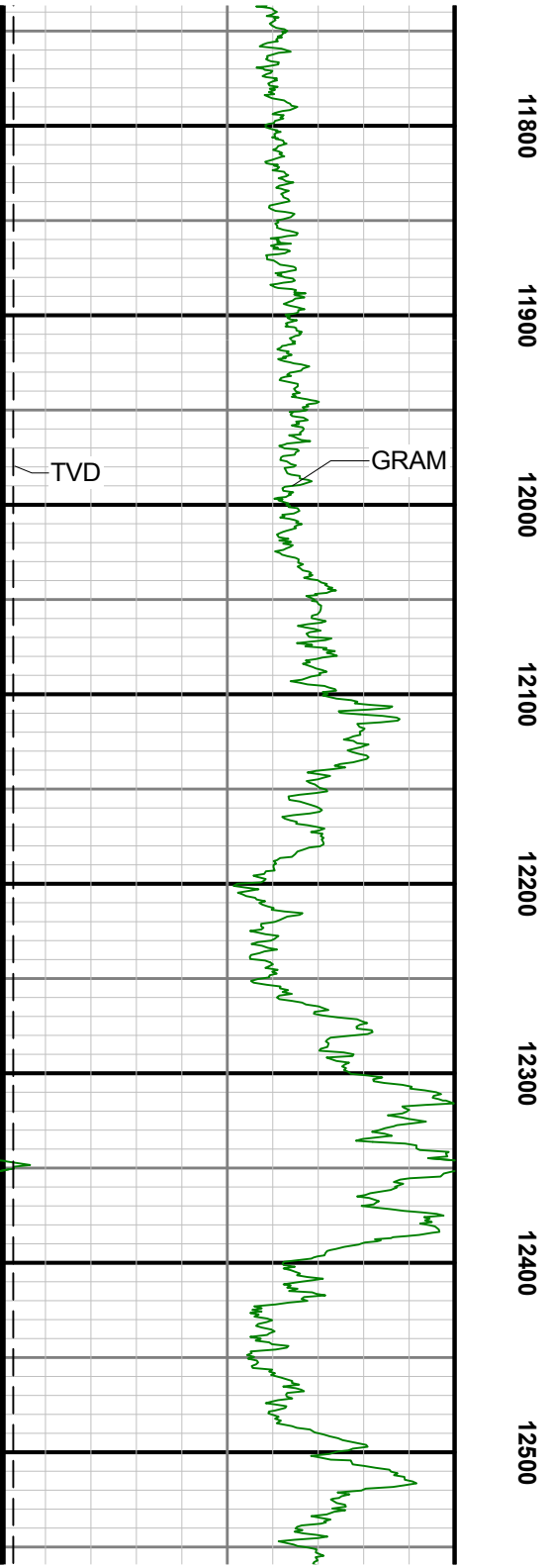
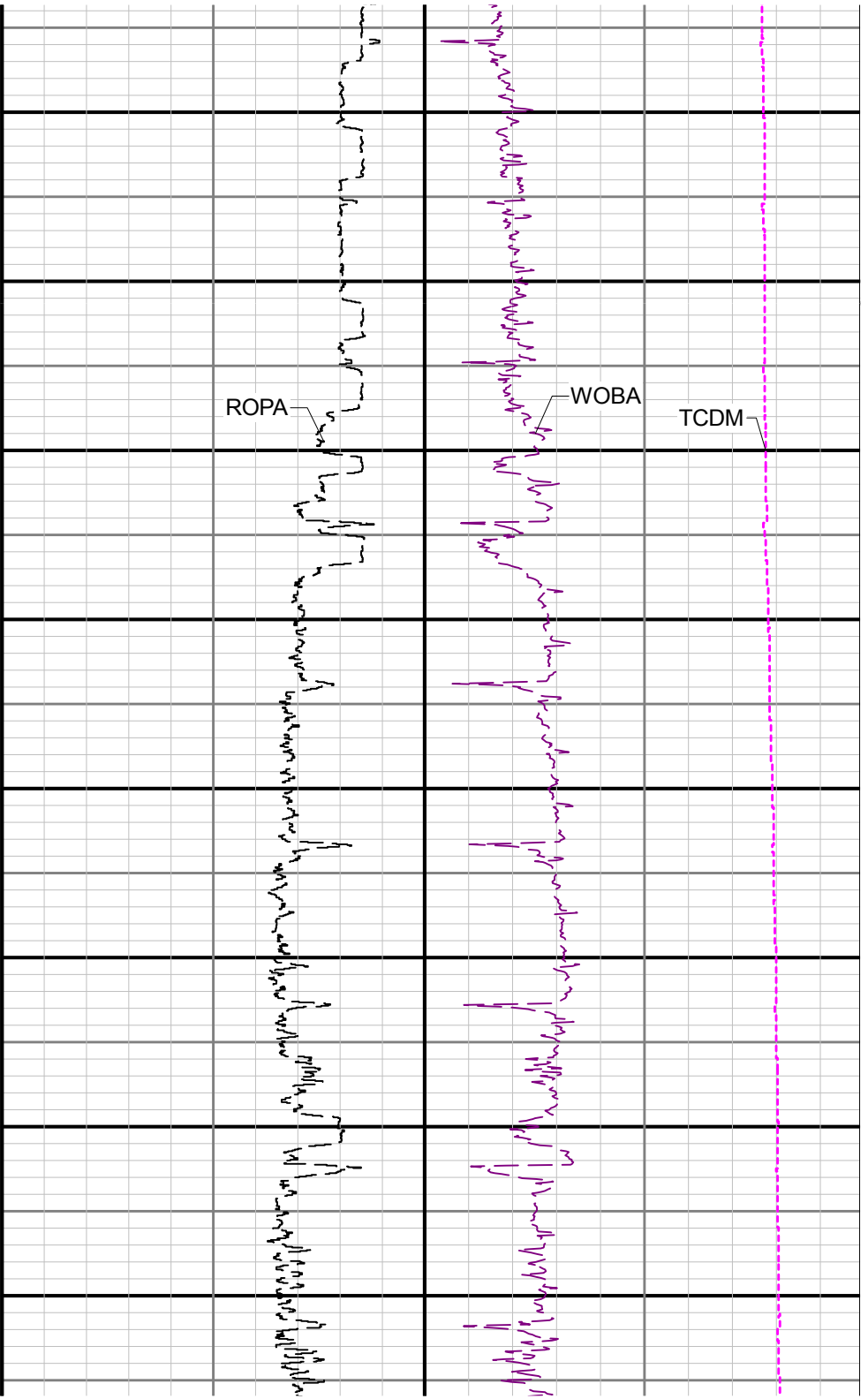


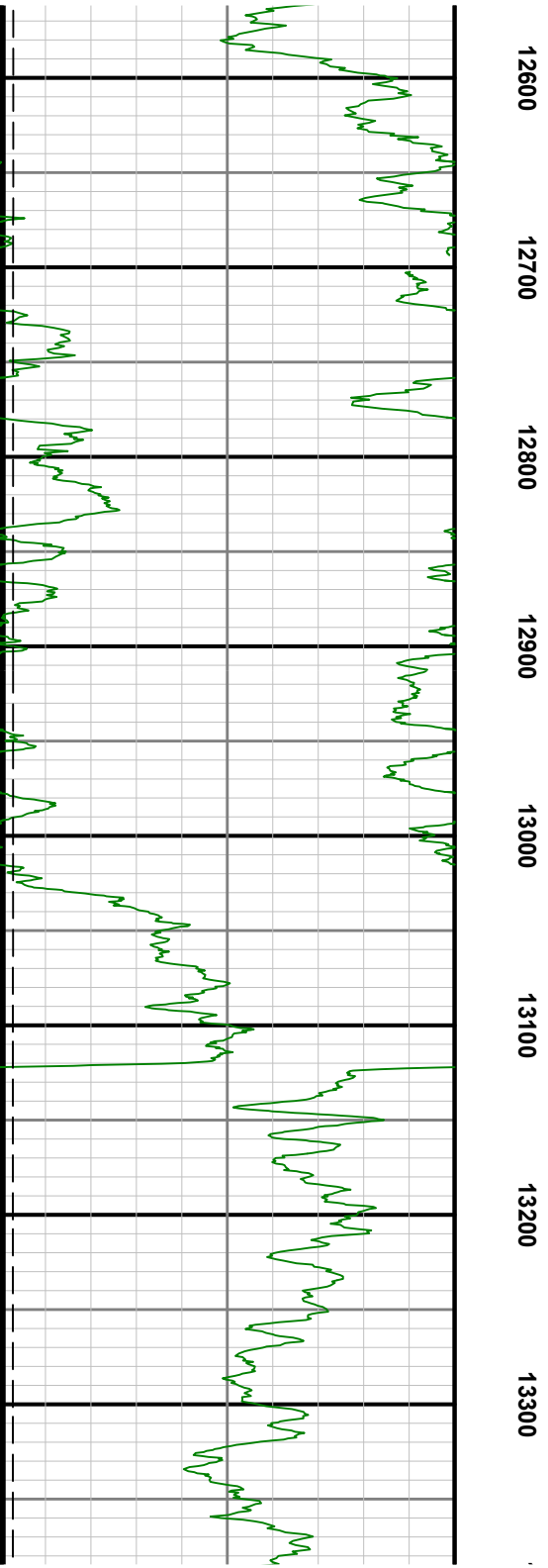
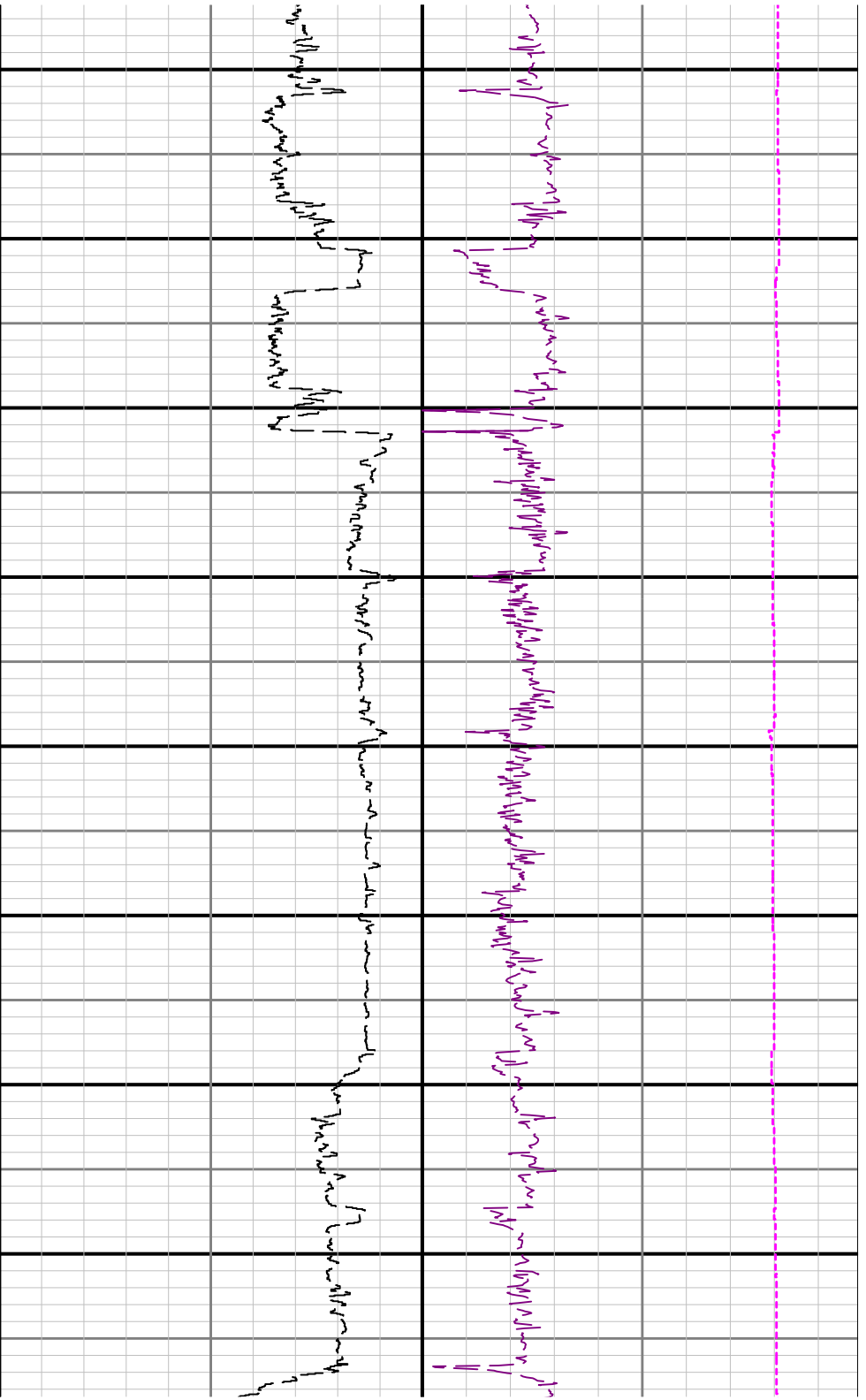


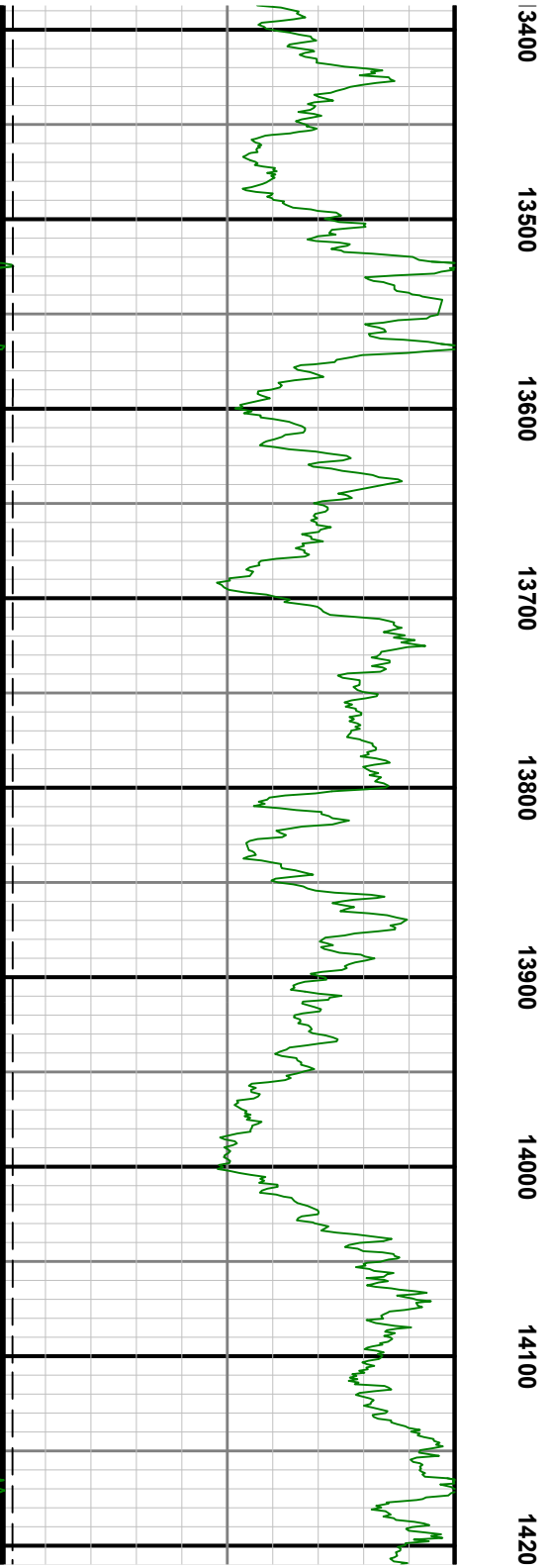
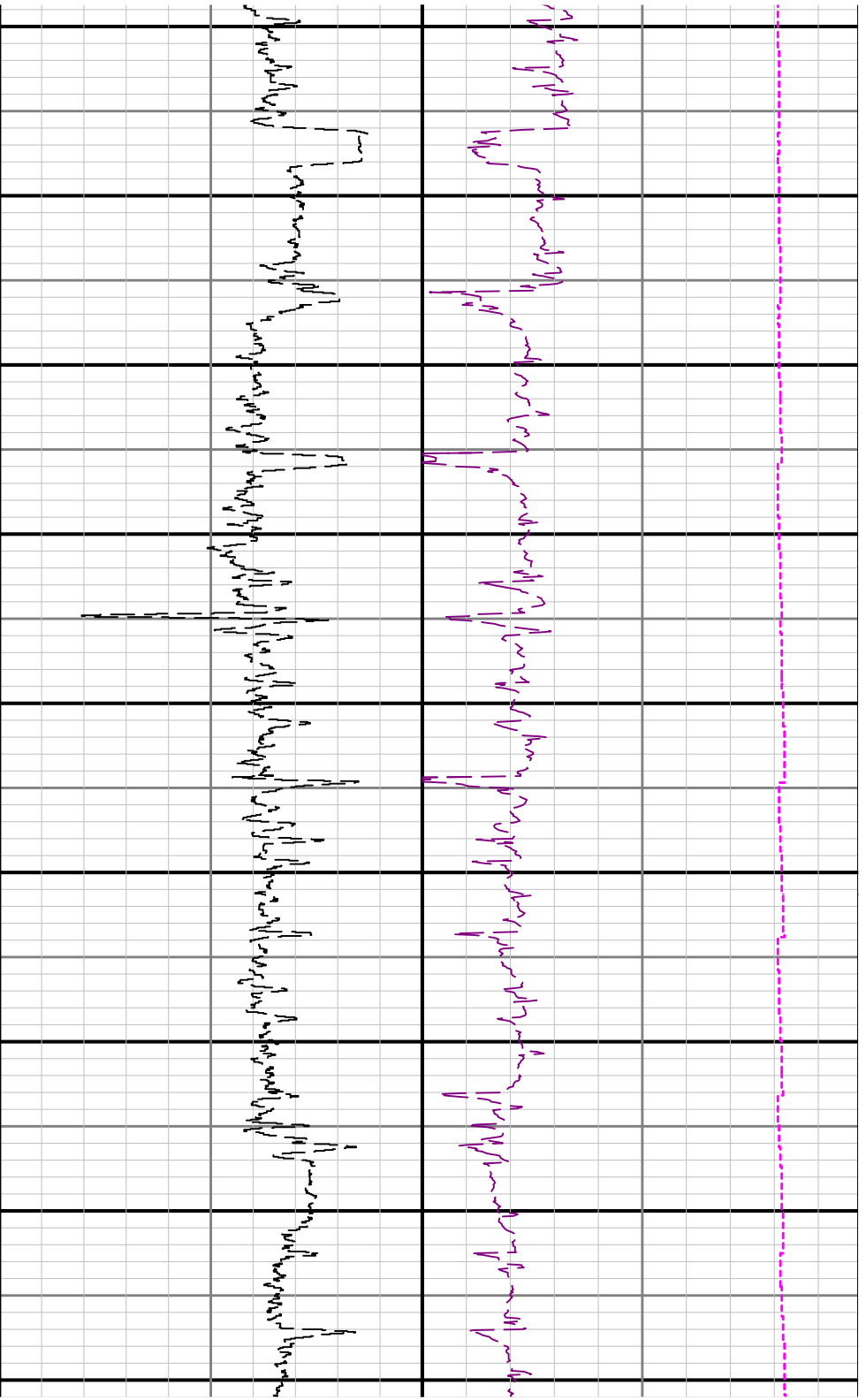


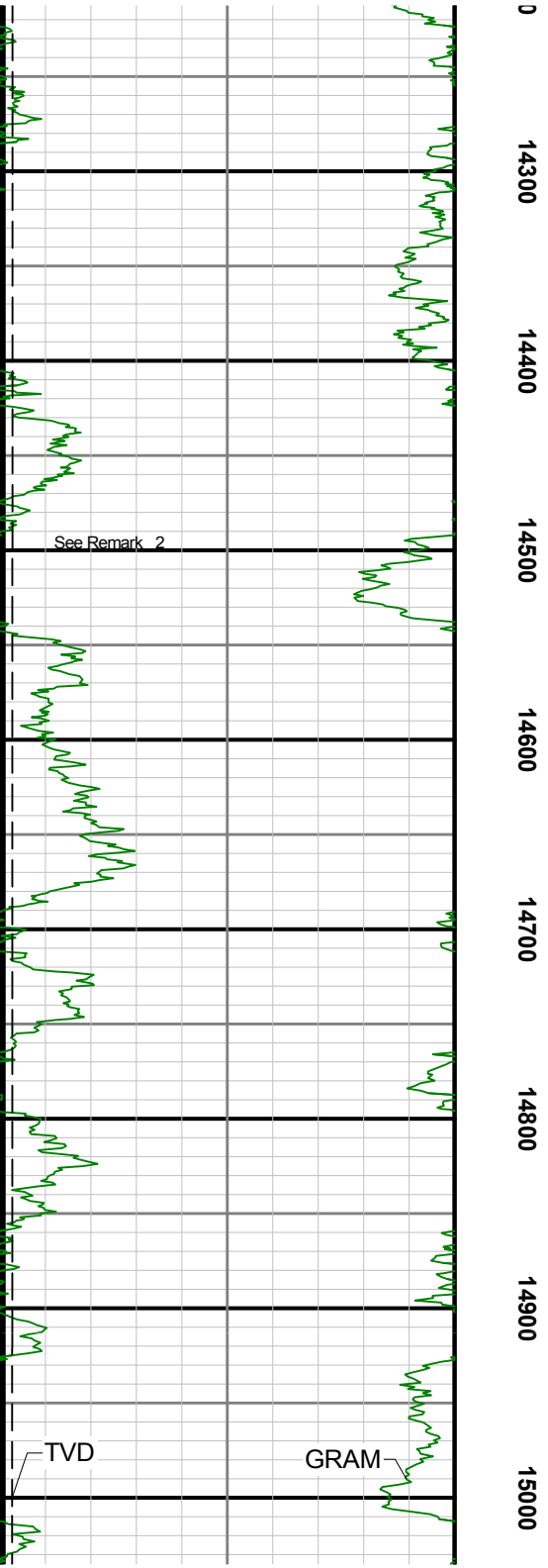
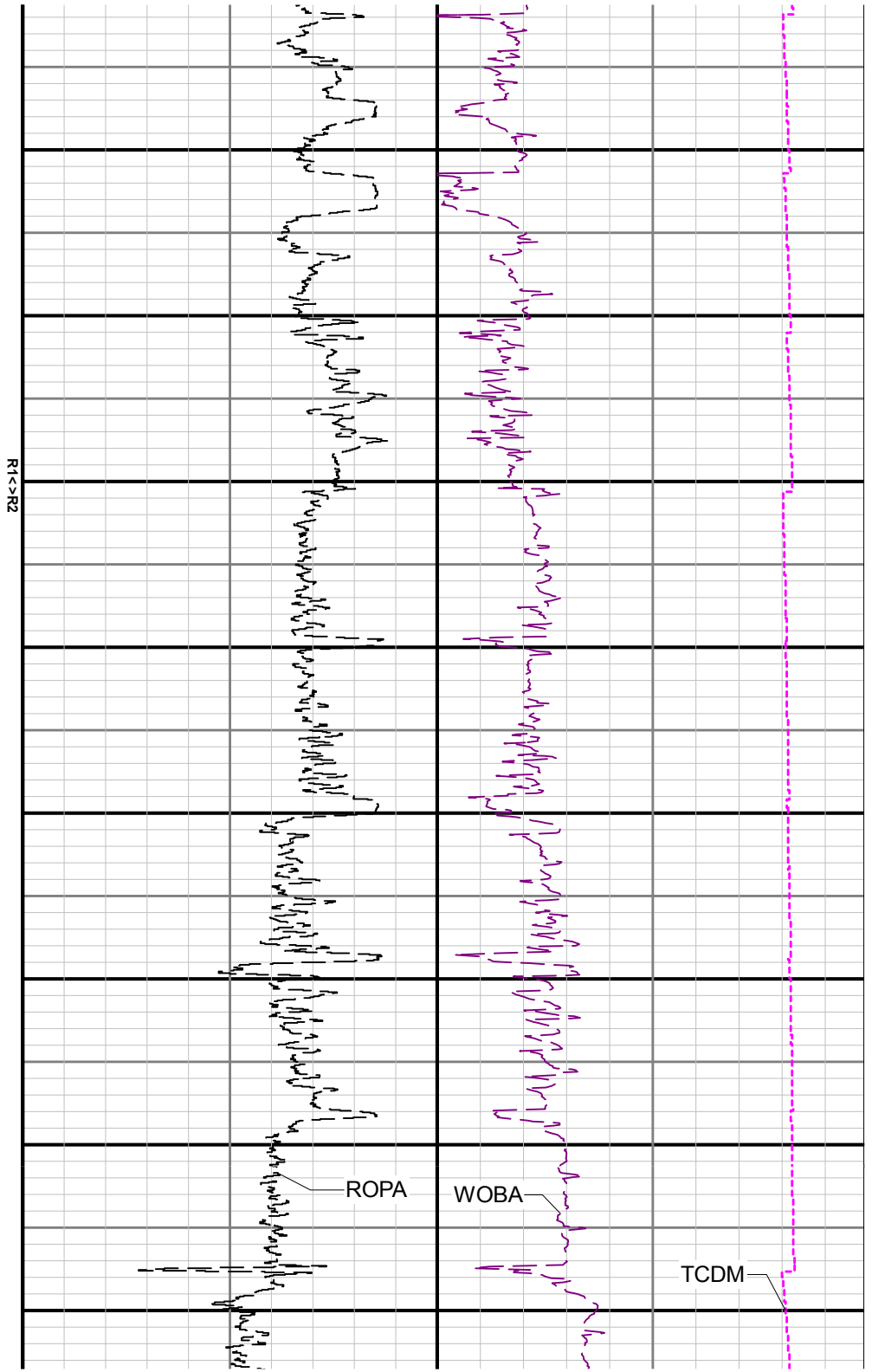
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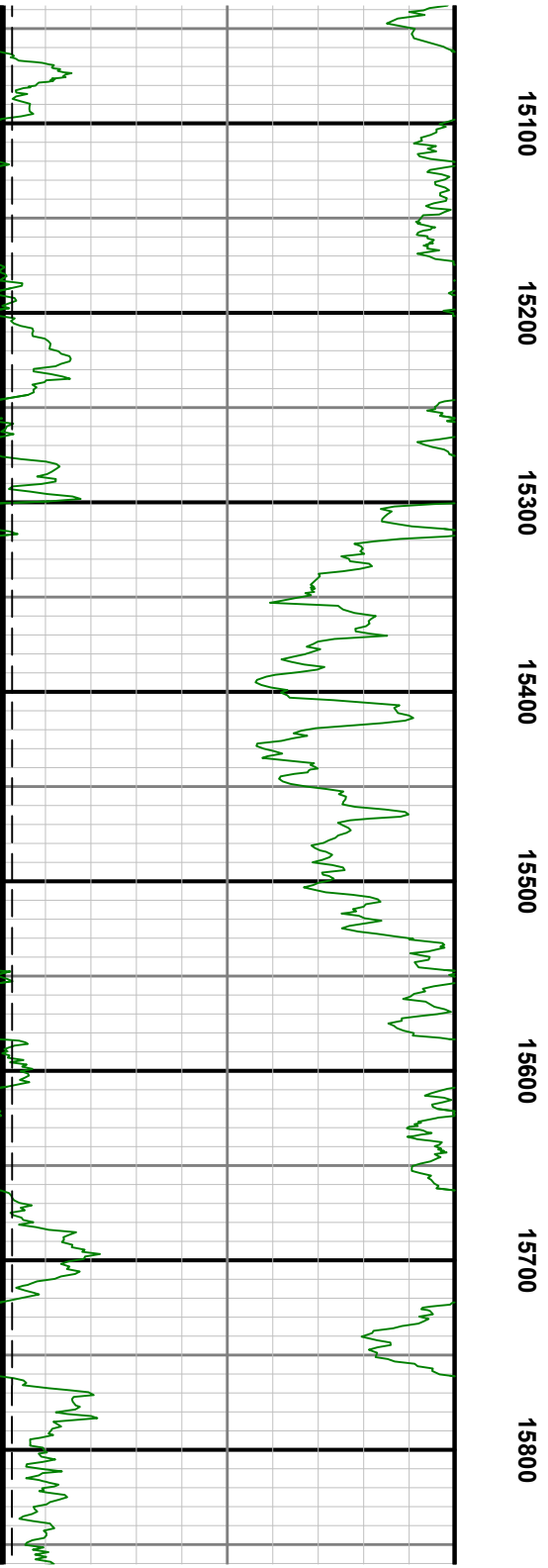
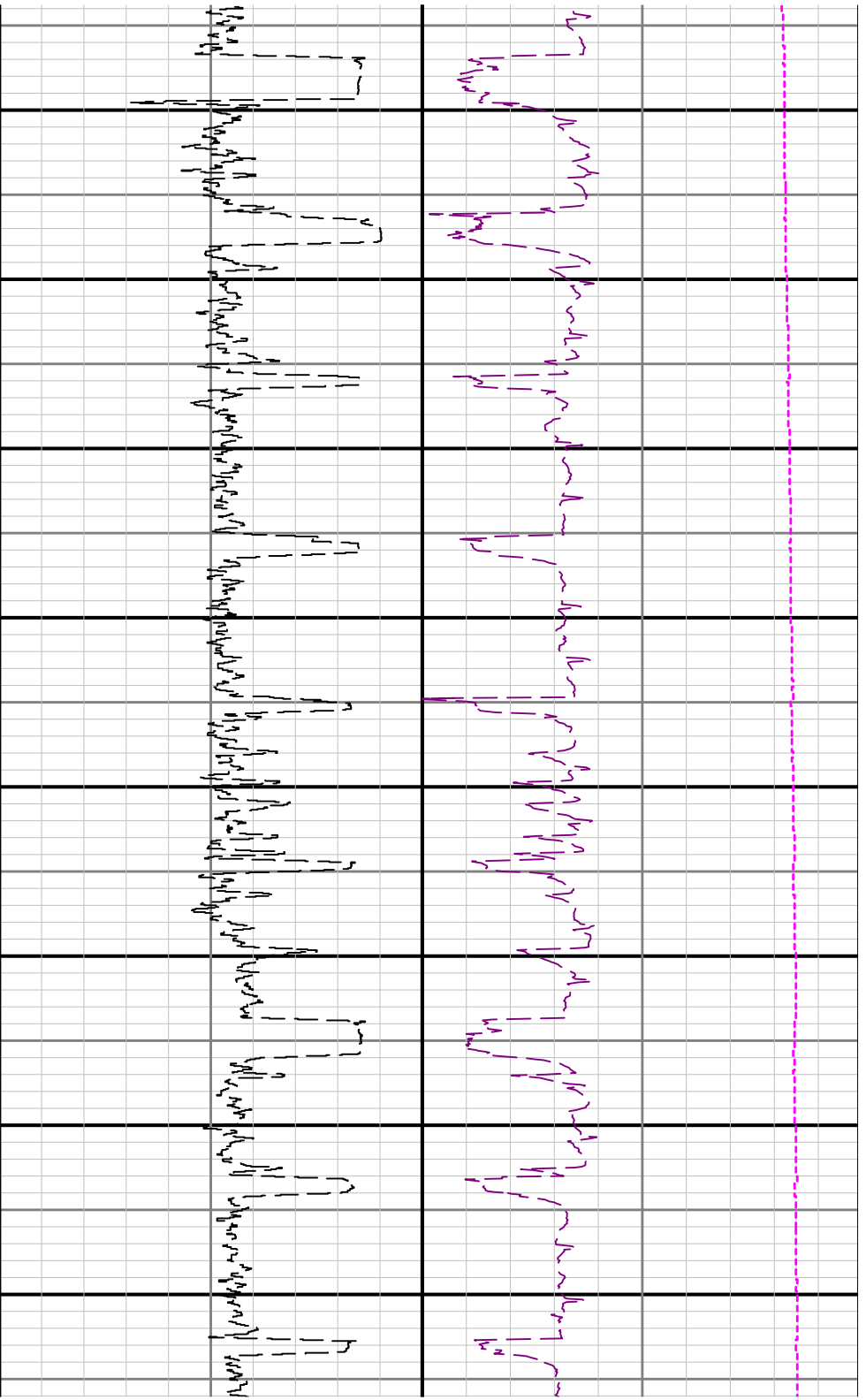


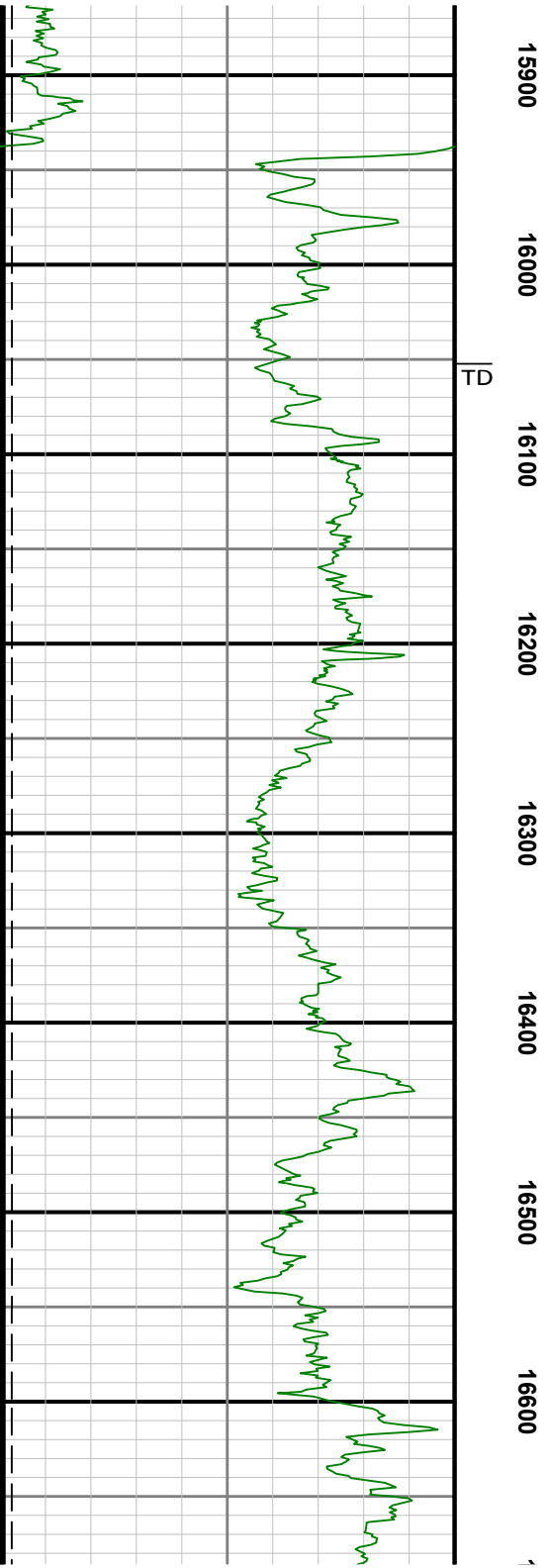
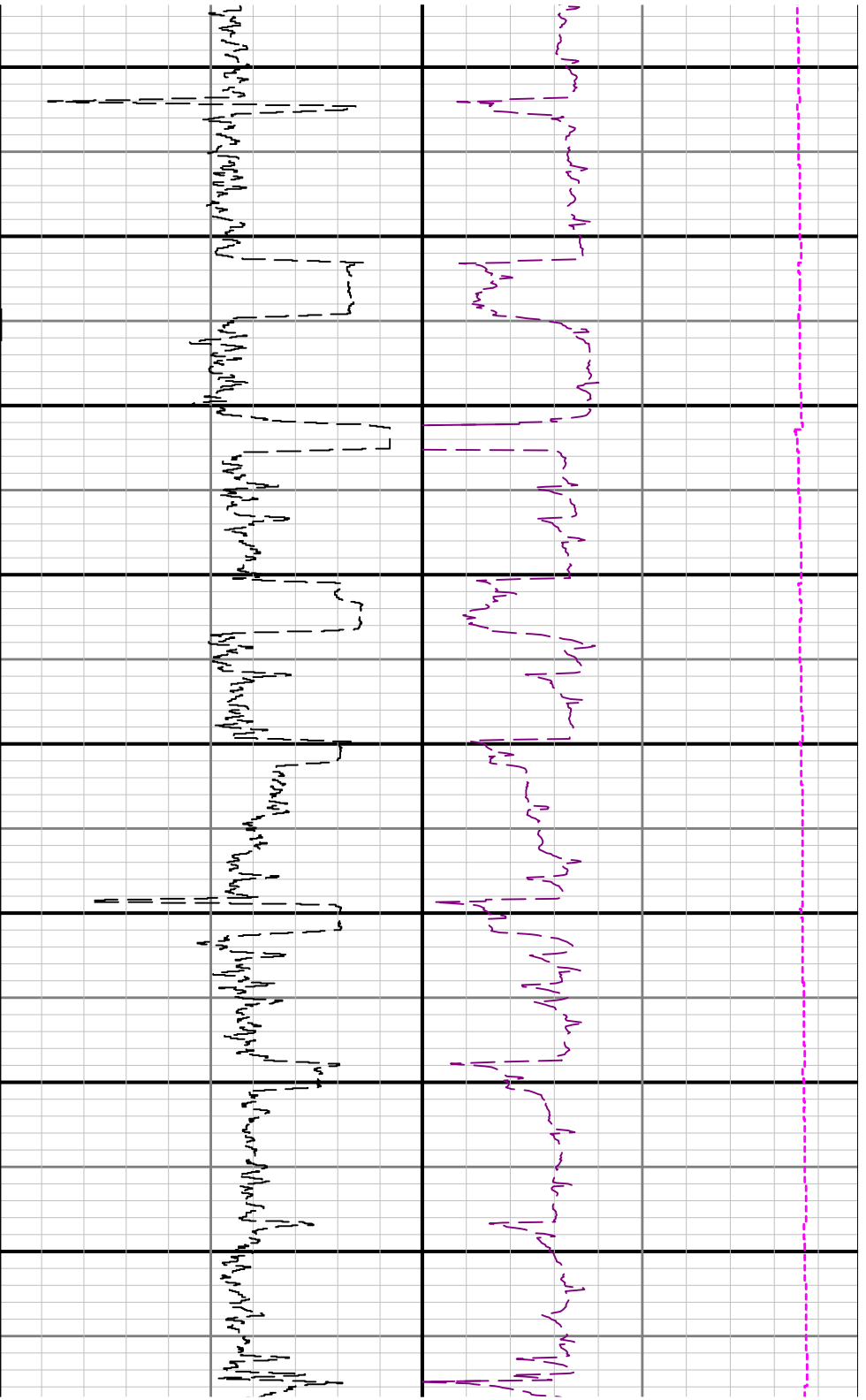


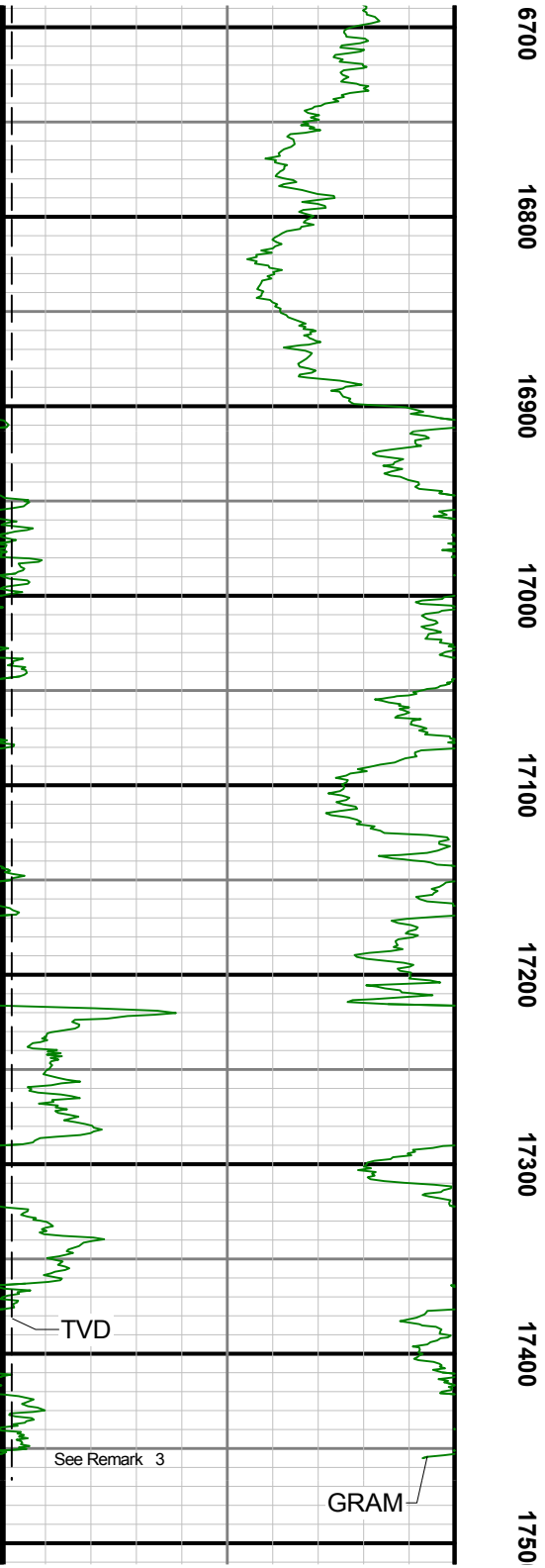
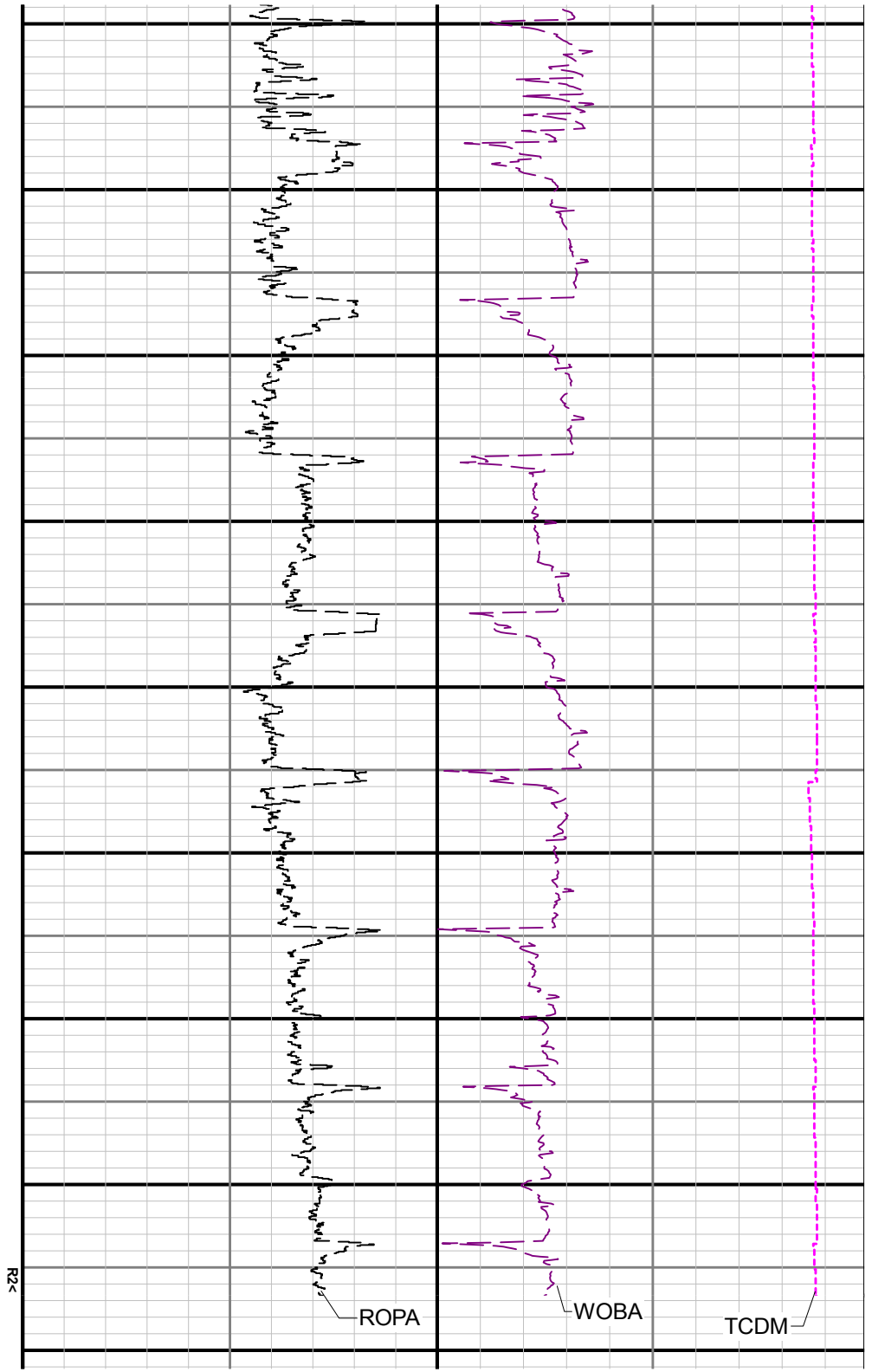












	17600		
Gamma Ray - Apparent 3 ft Average GRAM	MD 1:1200 feet	Rate of Penetration 3 ft Average ROPA	Surface Weight On Bit 1 ft Average WOBA
0150		10000ft/h	0100klb
API			Downhole Temperature TCDM
True Vertical Depth TVD			0300degF
68001800			
ft			