MWD - Gamma Ray

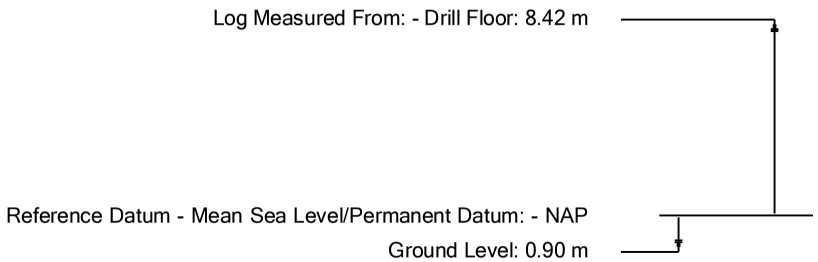
Schlumberger

Recorded Mode

Company:	Trias Westland B.V.
Well:	NLW-GT-02-S1
Field:	Naaldwijk
Rig Name:	KCA Deutag T-207
Country:	Netherlands

Latitude:	51° 59' 26.962" N	UWID:	17HOL0035
Longitude:	4° 14' 22.357" E	Rig Name:	KCA Deutag T-207
		Rig Type:	Land Rig

FL:	NLW-GT-02-S1
FL1:	Section: 24 in.
FL2:	Job no.: 17HOL0035



Acquisition Dates:	22-Mar-2018 -- 27-Mar-2018
Log Interval:	122.98(m)TVD -- 1089.01(m)TVD
Index Types:	True Vertical Depth
Index Scales:	1:200, 1:1000
Depth Source:	Driller's Depth
Depth Sensor:	3rd Party Depth
Print Type:	Final
Spud Date:	08-Mar-2018

Other Services:

Direction & Inclination (Surveys)

Directional Drilling

Country: Netherlands
Rig Name: KCA Deutag T-207
Field: Naaldwijk
Well: NLW-GT-02-S1
Company: Trias Westland B.V.

Disclaimer

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11.3 Log (GR MWD and PD no ticks)
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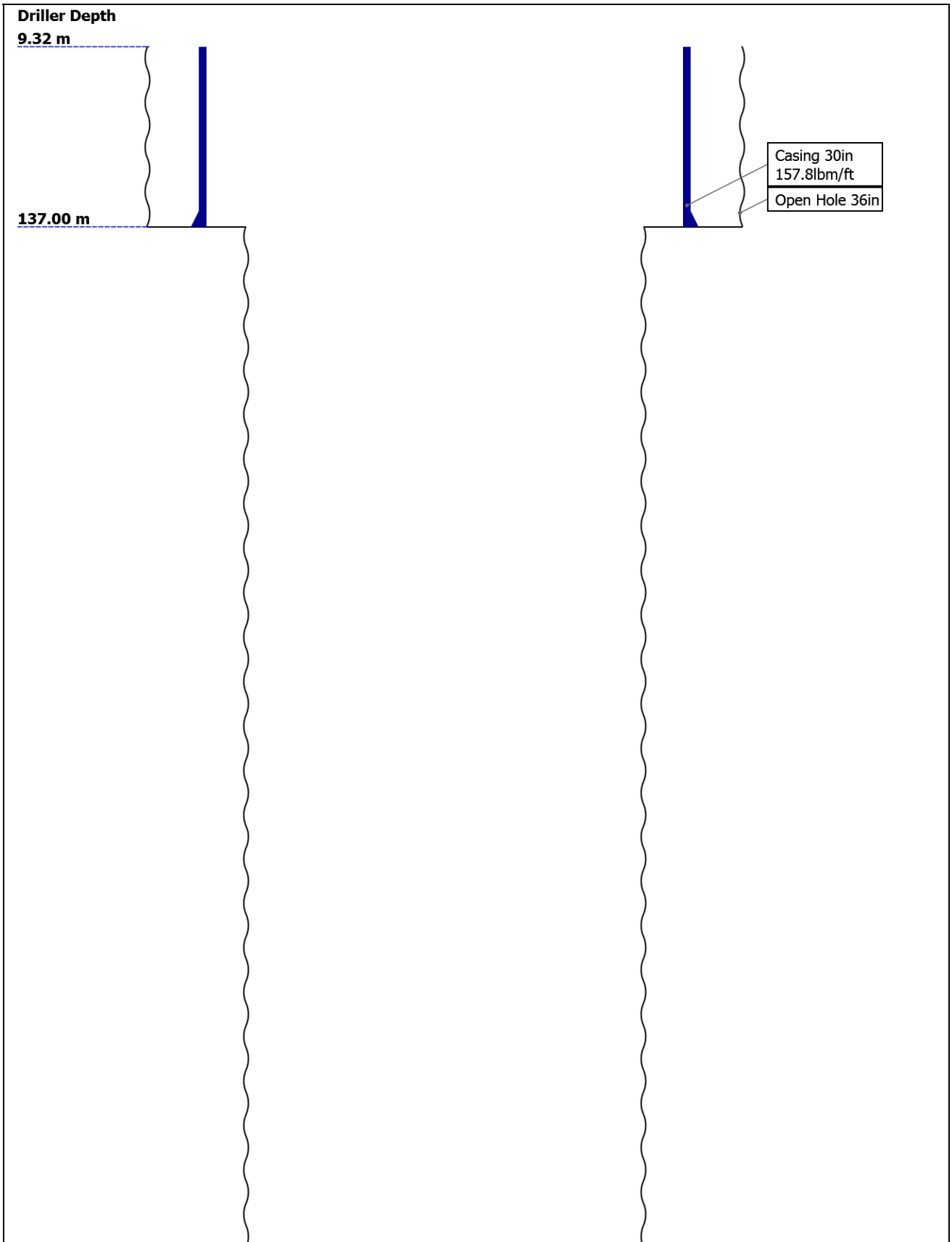
Well Sketch



Borehole Size/Casing Record

Bit						
Bit Size (in)	36	24				
Top Driller (m)	9.32	137				
Bottom Driller (m)	137	1105				
Casing						
Size (in)	30					
Weight (lbm/ft)	157.8					
Inner Diameter (in)	29.021					
Grade	X52					
Top Driller (m)	9.32					
Bottom Driller (m)	137					

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	21-Mar-2018					
Time Log Started	11:10:57					
Date Log Finished	27-Mar-2018					
Time Log Finished	19:08:27					
Bit Size (in)	24.000					
Bit Start Depth (m)	141.00					
Bit Stop Depth (m)	1105.00					
Top Log Interval (m)	124.66					
Bottom Log Interval (m)	1089.05					
Max Hole Deviation (deg)	14.17					
Azimuth of Max Deviation (deg)	112.21					
Logging Unit Number	N/A					
Logging Unit Location						
Recorded By	N.Nsanov					
Witnessed By	P. Gwalter					
Service Order Number	17HOL0035					

Borehole Fluids

Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	KCl/Polymer					
Max Recorded Temperatures (degC)	54.1					
Source of Sample	Active Tank					
Salinity (ppm)	34972.18					
Density (g/cm3)	Zoned					
Funnel Viscosity (s)	49					
Fluid Loss (cm3)	5.5					
PH	9.5					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degC)	0.2 @ 20					
RMF @ Meas Temp (ohm.m@degC)	0.15 @ 20					
RMC @ Meas Temp (ohm.m@degC)						
RM @ BHT (ohm.m@degC)	0.11 @ 54.1					
RMF @ BHT (ohm.m@degC)	0.08 @ 54.1					
RMC @ BHT (ohm.m@degC)	NaN @ 54.1					
Total Solid (%)	14					
High Gravity Solids (%)						

Zoned Borehole Fluids

Run 1

Parameter	Value	Start
Density	1.05	3/21/2018 11:10:57
Density	1.07	3/23/2018 03:30:36
Density	1.12	3/23/2018 21:00:41
Density	1.16	3/24/2018 04:00:00
Density	1.19	3/24/2018 16:00:08
Density	1.2	3/25/2018 04:00:14
Density	1.23	3/25/2018 11:00:00
Density	1.26	3/25/2018 11:00:21
Density	1.24	3/25/2018 21:00:00
Density	1.22	3/26/2018 11:00:00
Density	1.24	3/26/2018 15:50:00

Remarks and Equipment Summary

Run 1: Toolstring

Equip name	Length	MP name	Offset
Stab: 9 1/2":OW S-Stab-9641	**23.65**	22 3/4 in. String Stab	
X/O: 9 1/2"[2]: OWS-XOS-4159	**21.34**	X-Over	
TELE900:E6072	**20.75**	TeleScope	
MSSU900:68362			
Upper Extender			
MDC900:E6072			
MMA:4042			
MDI:2141			
PMGR:223			

Run 1: Remarks

All depths referenced to driller's depth. See EOWR for depth tracking details.

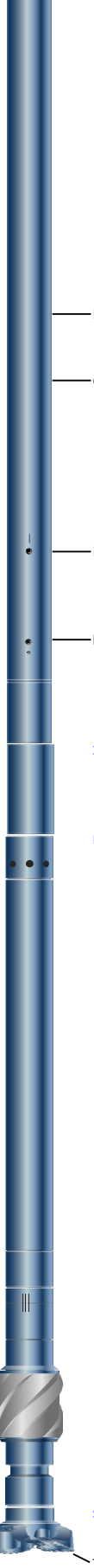
All data from tool memory. All data acquired while drilling.

Gamma Ray measurement is environmentally corrected for mud weight, bit size, collar thickness and Potassium content.

This well is a sidetrack of NLW-GT-02 kicked off from cement plug at 141 m.

Run 1 and 24 in. section TD at 1105 m.

PMEA:3830
MTA:2309
MTK900:2311
APWD:0124
MSSD900:68888A
Lower Extender:B
A23-11-12



D&I 16.43

GR 15.78

ROP 14.08

Pressure 13.07

X/O: 9 1/2"[1]: OWS-XOS-4164 **12.28** X-Over

Motor:6019 **11.05** PowerPak

Bit:RG5091 **0.57** Smith TCI G04B

TOOL_ZERO

Lengths are in m
Maximum Outer Diameter = 24.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Survey Record

Survey Calculation

Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	Grid North	Total Correction Formula :	Magnetic Dec - Grid Convergence
Grid Convergence :	-0.91 deg		

Rig Location

Latitude :	51° 59' 26.962" N	Longitude :	4° 14' 22.357" E

Tie In Point

Measured Depth:	0.00 m	Inclination:	0.00 deg	Azimuth:	0.00 deg
True Vertical Depth:	0.00 m	North Displacement:	0.00 m	East Displacement:	0.00 m
N/-S VSec Origin:	0.00 m	E/-W VSec Origin:	0.00 m	Vertical Section Azimuth:	107.44 deg

D&I Inits Computed and Values Used - Run 1

Geomagnetic Model :	HDGM 2017	Geomagnetic Date :	04-Feb-2018
Computed Location B :	49041.00 nT +/- 300.00nT	Used Location B :	49039.64 nT +/- 300.00nT
Computed Location G :	1000.60 mgn +/- 2.50mgn	Used Location G :	1000.58 mgn +/- 2.50mgn
Computed Magnetic Dip :	67.07 deg +/- 0.45deg	Used Magnetic Dip :	67.07 deg +/- 0.45deg
Computed Magnetic Dec :	1.10 deg	Used Magnetic Dec :	1.10 deg
Computed Total Correction :	2.01 deg	Used Total Correction :	2.01 deg

Survey Quality Index

0 : Long Survey passed all criteria 2 : Long Survey failed mag criteria 9 : Manual

28 : Tie-In Point

Survey Correction Index

0 : No correction

Survey Description Index

0 : Not Flagged Survey 1 : DMAG Corrected Survey 7 : Projection to Bit

13 : Inclination Only Survey

Seq	MD (m)	Incl (deg)	Azim (deg)	Course (m)	TVD (m)	V Sec (m)	N/ -S (m)	E/ -W (m)	Closure (m)	at Azim (deg)	DLS deg/30m	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
2	9.32	0.00	0.00	9.32	9.32	0.00	0.00	0.00	0.00	90.00	0.00	Other	9	0	13
3	143.59	2.13	43.05	134.27	143.56	1.08	1.82	1.70	2.49	43.05	0.48	TeleScope	2	0	13
4	171.48	2.43	60.83	27.89	171.43	1.71	2.49	2.57	3.58	45.94	0.82	TeleScope	9	0	1
5	200.72	4.05	79.42	29.24	200.62	3.04	2.98	4.13	5.09	54.17	1.96	TeleScope	9	0	1
6	228.81	5.71	88.57	28.09	228.61	5.24	3.20	6.50	7.24	63.81	1.95	TeleScope	9	0	1
7	256.86	7.22	88.59	28.05	256.48	8.23	3.27	9.66	10.20	71.27	1.61	TeleScope	2	0	13
8	284.90	6.54	86.73	28.04	284.32	11.39	3.41	13.01	13.45	75.32	0.76	TeleScope	2	0	13
9	312.51	7.69	90.35	27.61	311.71	14.63	3.49	16.43	16.79	78.01	1.34	TeleScope	0	0	13
10	340.21	8.35	88.51	27.70	339.14	18.30	3.53	20.29	20.60	80.14	0.77	TeleScope	2	0	13
11	368.61	9.23	88.49	28.40	367.21	22.41	3.64	24.63	24.90	81.59	0.92	TeleScope	9	0	1
12	396.44	10.38	94.74	27.83	394.63	26.96	3.49	29.36	29.57	83.22	1.69	TeleScope	9	0	1
13	424.21	12.96	99.87	27.77	421.83	32.49	2.75	34.92	35.03	85.49	3.00	TeleScope	9	0	1
14	451.76	12.67	105.98	27.55	448.69	38.58	1.39	40.87	40.90	88.05	1.51	TeleScope	9	0	1
15	480.28	11.94	107.66	28.52	476.56	44.65	-0.37	46.69	46.69	90.45	0.86	TeleScope	9	0	1
16	508.01	13.16	109.74	27.73	503.62	50.68	-2.30	52.39	52.45	92.52	1.41	TeleScope	9	0	1
17	536.29	14.17	112.19	28.28	531.10	57.34	-4.70	58.63	58.82	94.58	1.23	TeleScope	9	0	1
18	564.31	13.91	113.38	28.02	558.29	64.11	-7.33	64.90	65.31	96.44	0.42	TeleScope	9	0	1
19	592.18	13.35	112.05	27.87	585.37	70.65	-9.87	70.95	71.64	97.92	0.69	TeleScope	9	0	1
20	620.05	13.22	112.05	27.87	612.50	77.03	-12.27	76.89	77.86	99.07	0.14	TeleScope	9	0	1
21	647.70	13.00	112.85	27.65	639.43	83.28	-14.66	82.69	83.98	100.06	0.31	TeleScope	9	0	1
22	675.87	12.87	114.06	28.17	666.88	89.55	-17.17	88.47	90.12	100.99	0.32	TeleScope	9	0	1
23	703.90	12.21	116.00	28.03	694.24	95.58	-19.75	93.99	96.04	101.86	0.84	TeleScope	9	0	1
24	731.75	12.74	114.18	27.85	721.43	101.55	-22.29	99.43	101.90	102.64	0.71	TeleScope	9	0	1
25	759.59	13.16	114.62	27.84	748.57	107.74	-24.87	105.12	108.02	103.31	0.46	TeleScope	9	0	1
26	787.98	12.93	114.75	28.39	776.22	114.09	-27.55	110.94	114.31	103.95	0.25	TeleScope	9	0	1
27	815.95	11.86	114.15	27.97	803.54	120.05	-30.03	116.40	120.22	104.47	1.16	TeleScope	9	0	1
28	843.88	11.35	114.64	27.93	830.90	125.63	-32.35	121.52	125.75	104.91	0.56	TeleScope	9	0	1
29	871.83	11.35	114.42	27.95	858.30	131.09	-34.64	126.52	131.18	105.31	0.05	TeleScope	9	0	1
30	899.31	11.26	114.67	27.48	885.25	136.43	-36.88	131.42	136.50	105.67	0.11	TeleScope	9	0	1

31	927.06	11.07	115.71	27.75	912.47	141.76	-39.16	136.29	141.80	106.03	0.30	TeleScope	9	0	1
32	955.25	10.73	115.25	28.19	940.16	147.04	-41.46	141.10	147.06	106.37	0.37	TeleScope	9	0	1
33	983.37	10.05	119.06	28.12	967.82	152.03	-43.76	145.61	152.05	106.73	1.03	TeleScope	9	0	1
34	1011.38	9.28	117.91	28.01	995.43	156.65	-46.01	149.74	156.65	107.08	0.85	TeleScope	9	0	1
35	1038.94	8.90	120.58	27.56	1022.64	160.91	-48.13	153.54	160.91	107.41	0.62	TeleScope	9	0	1
36	1067.19	8.20	121.84	28.25	1050.58	164.99	-50.31	157.13	164.99	107.75	0.77	TeleScope	9	0	1
37	1087.46	8.01	119.22	20.27	1070.65	167.77	-51.76	159.60	167.78	107.97	0.61	TeleScope	9	0	1
38	1105.00	7.86	117.59	17.54	1088.02	170.15	-52.91	161.73	170.16	108.12	0.46	TeleScope	9	0	7

Run 1

MWD - Gamma Ray 1:200 TVD

Software Version

Acquisition System	Version
Maxwell 2018 SP1	8.1.99839.3100

Tool Interface	System Version	Loaded Version
HSPM	20.3c.062	8.1.99839.3100

Tool Elements	Description	Software Version	Firmware Version
DRILLING_SURFACE	DRILLING_SURFACE	8.1.99839.3100	
PMGR	TeleScope - M10 Gamma Ray Assembly	8.1.99839.3100	V14.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Run 1	Drilling	Down	140.21 m	1104.98 m	22-Mar-2018 08:11:51	27-Mar-2018 19:08:27	Yes

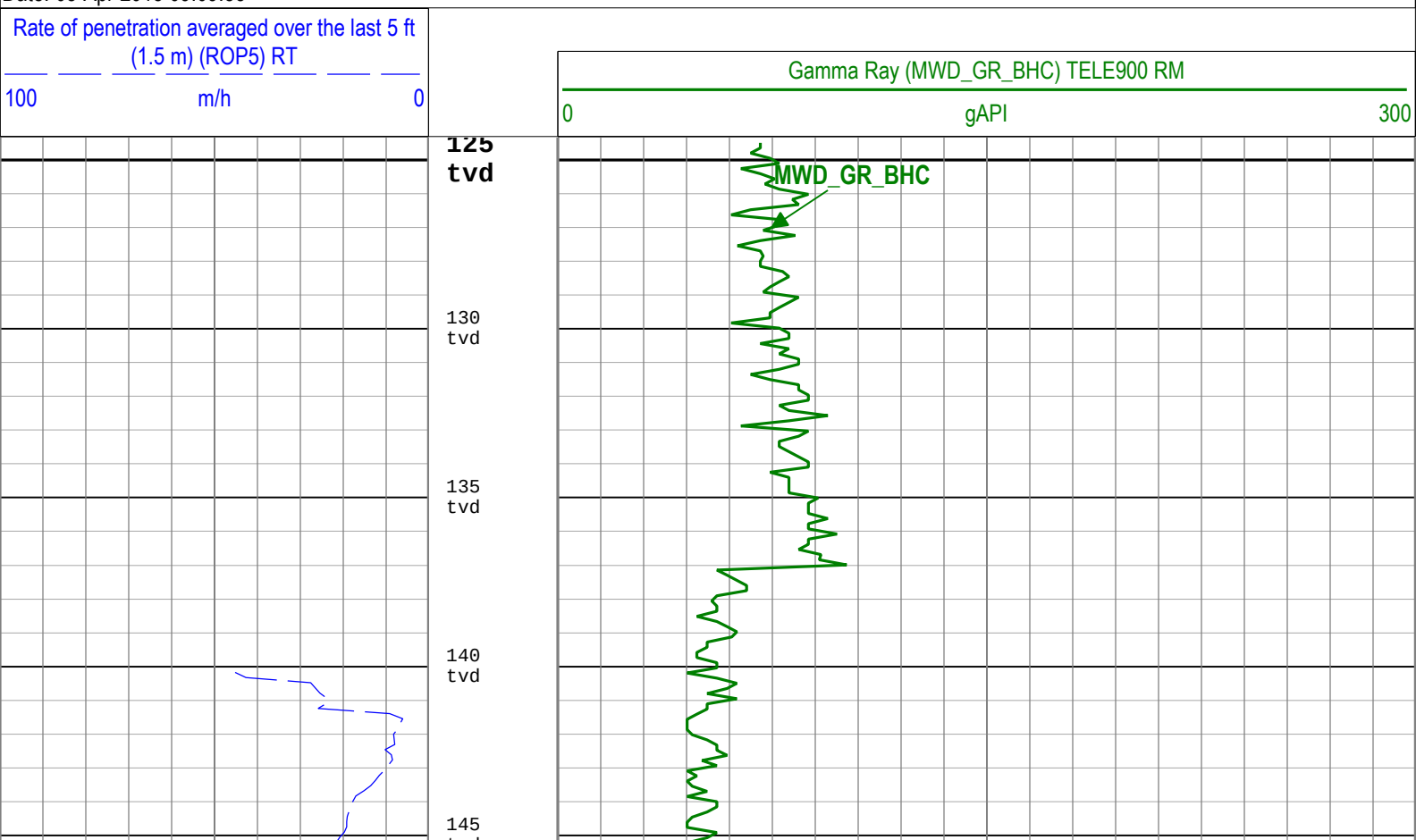
All depths are referenced to toolstring zero

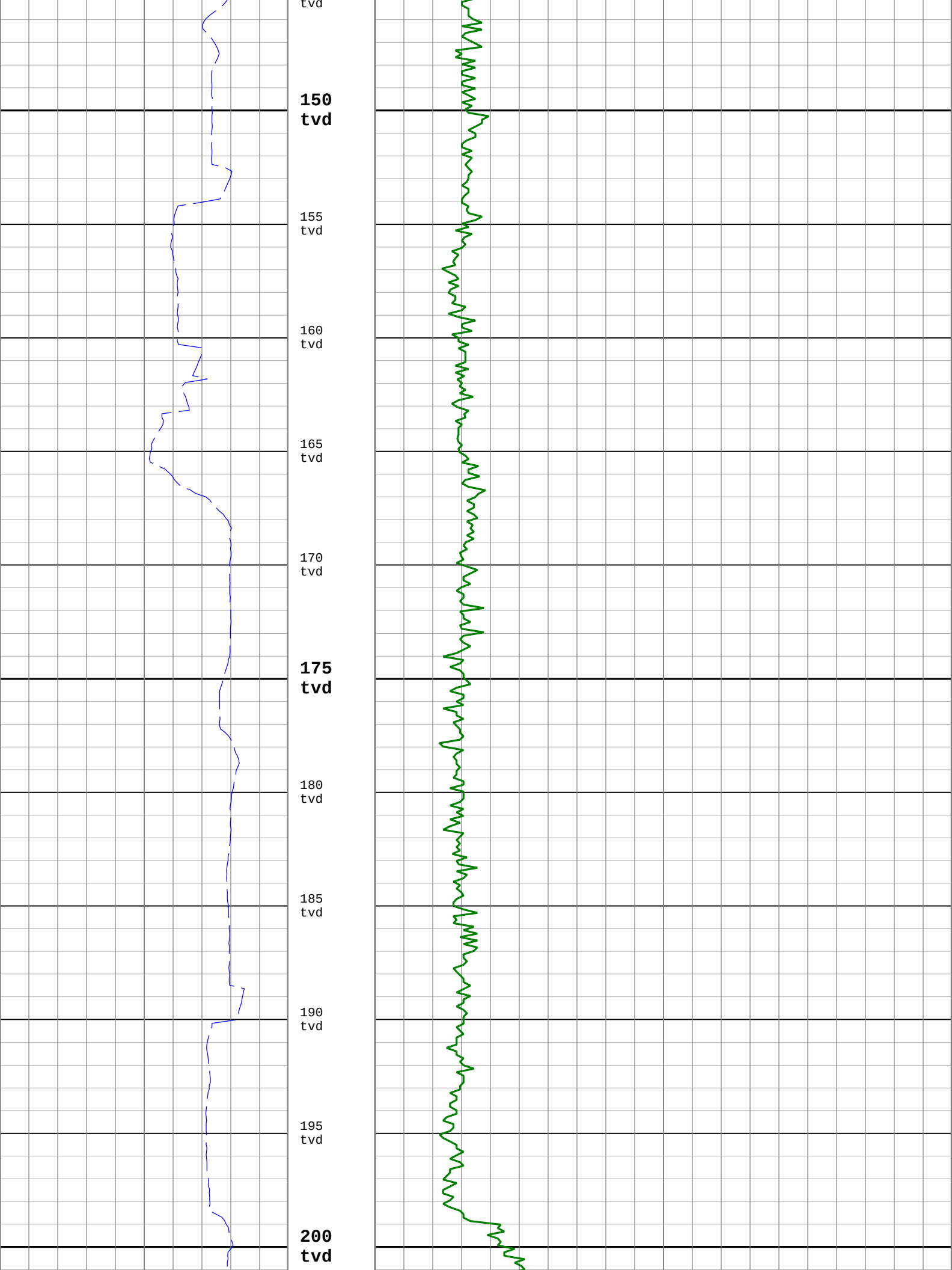
Log

Company:Trias Westland B.V. Well:NLW-GT-02-S1

Run 1: Drilling:S097

Description: TeleScope Gamma Ray Depth RT Format: Log (GR MWD and PD no ticks) Index Scale: 1:200 Index Unit: m Index Type: TVD Creation Date: 05-Apr-2018 09:09:53

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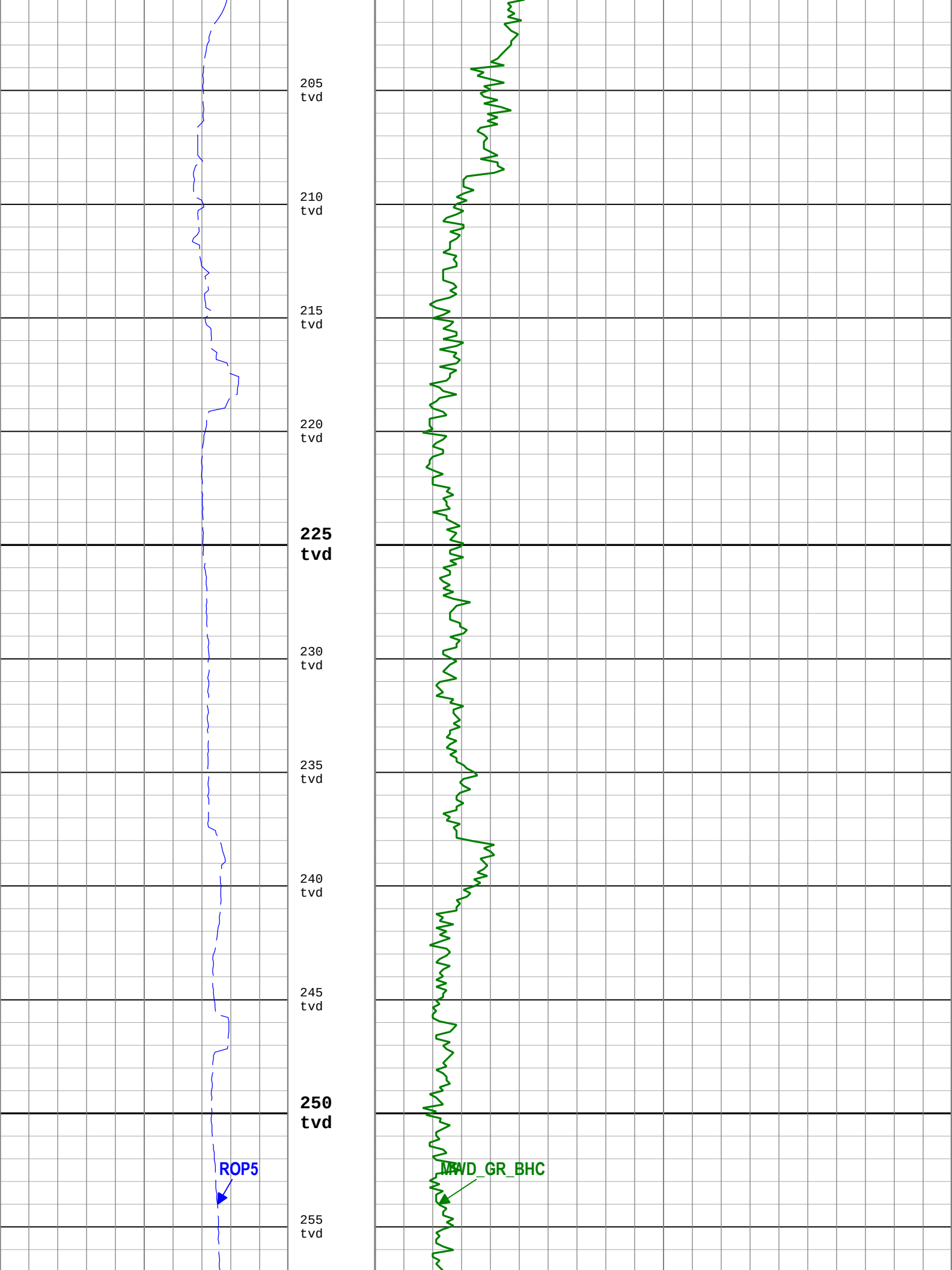
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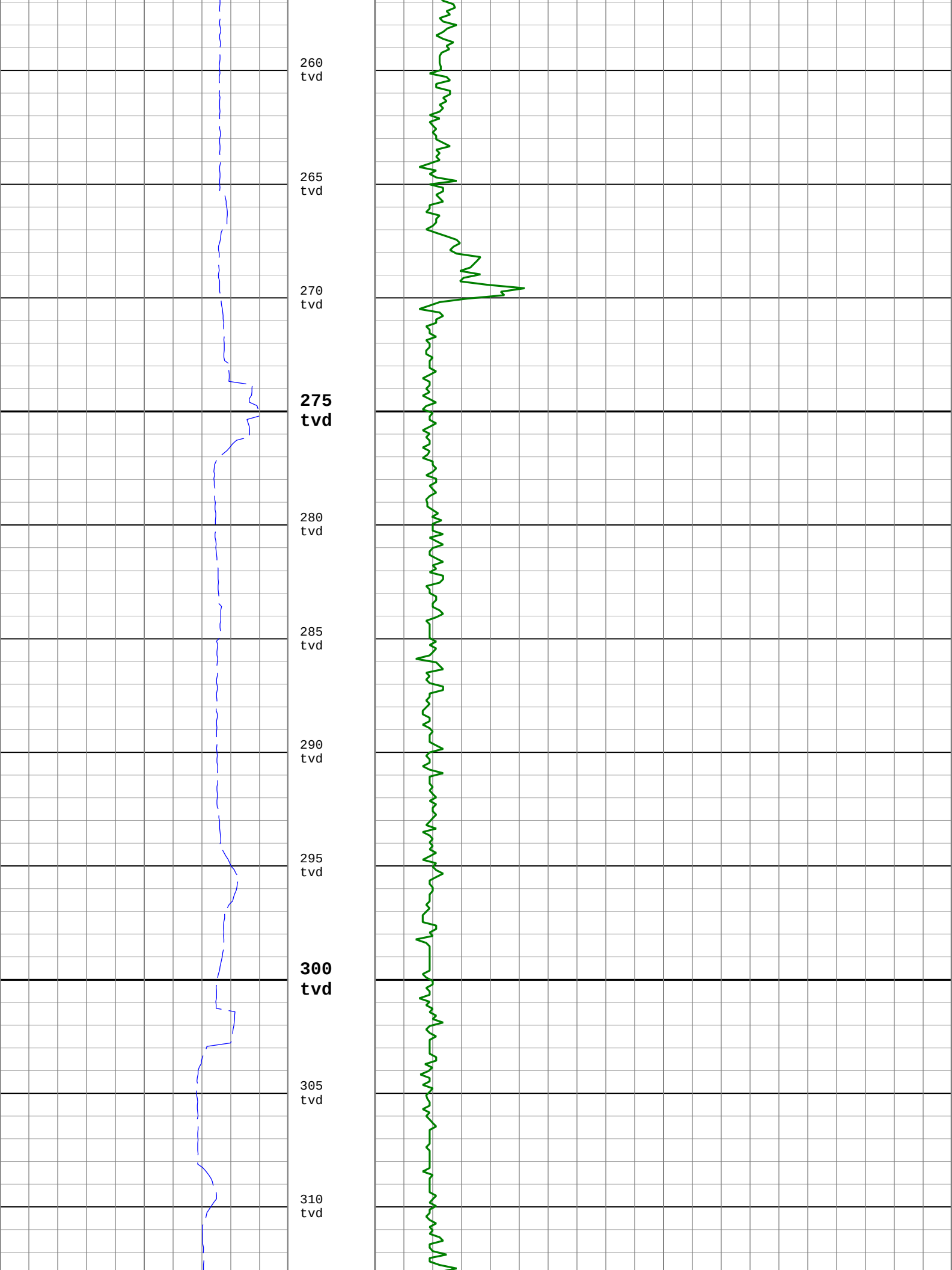
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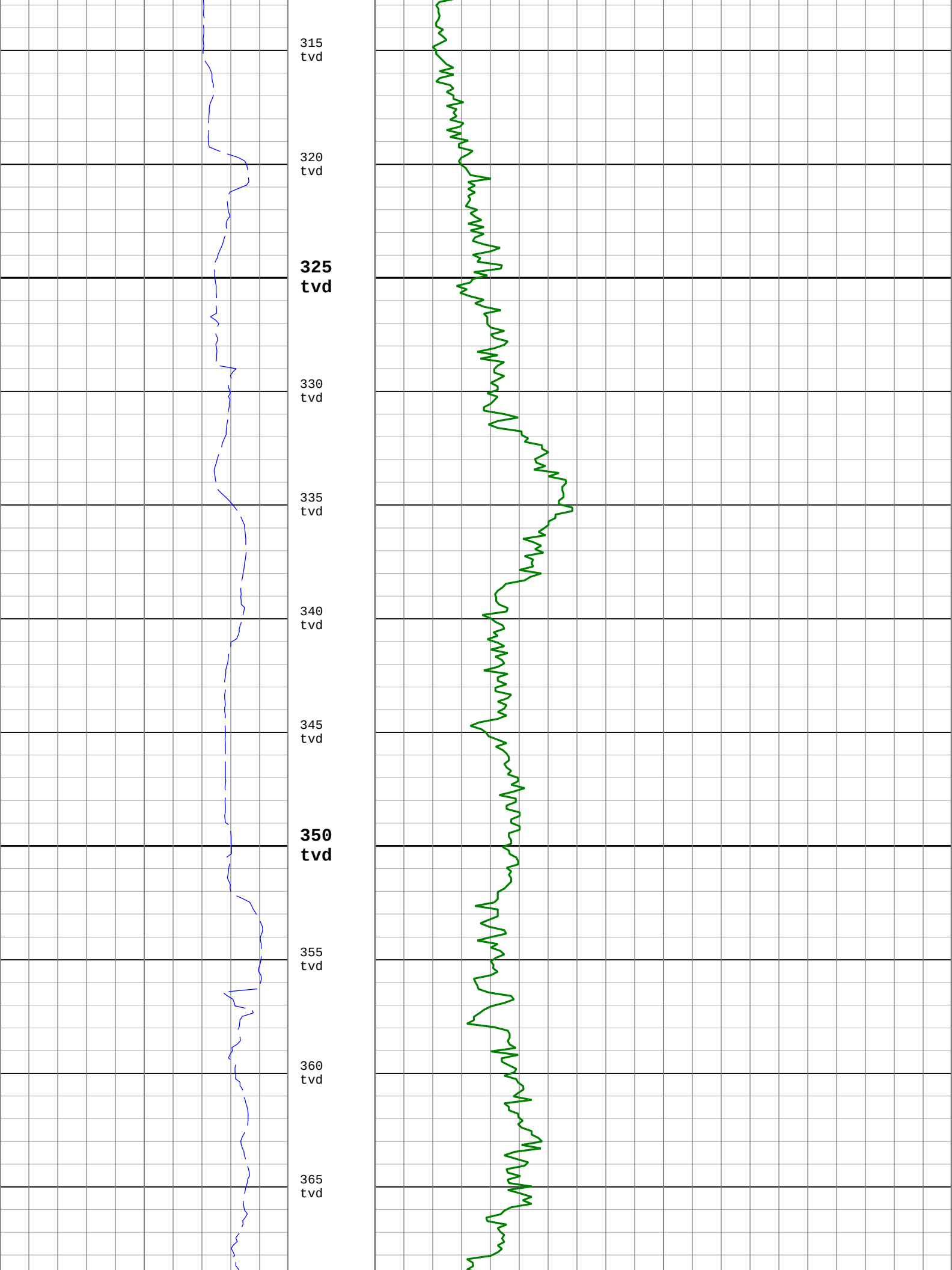
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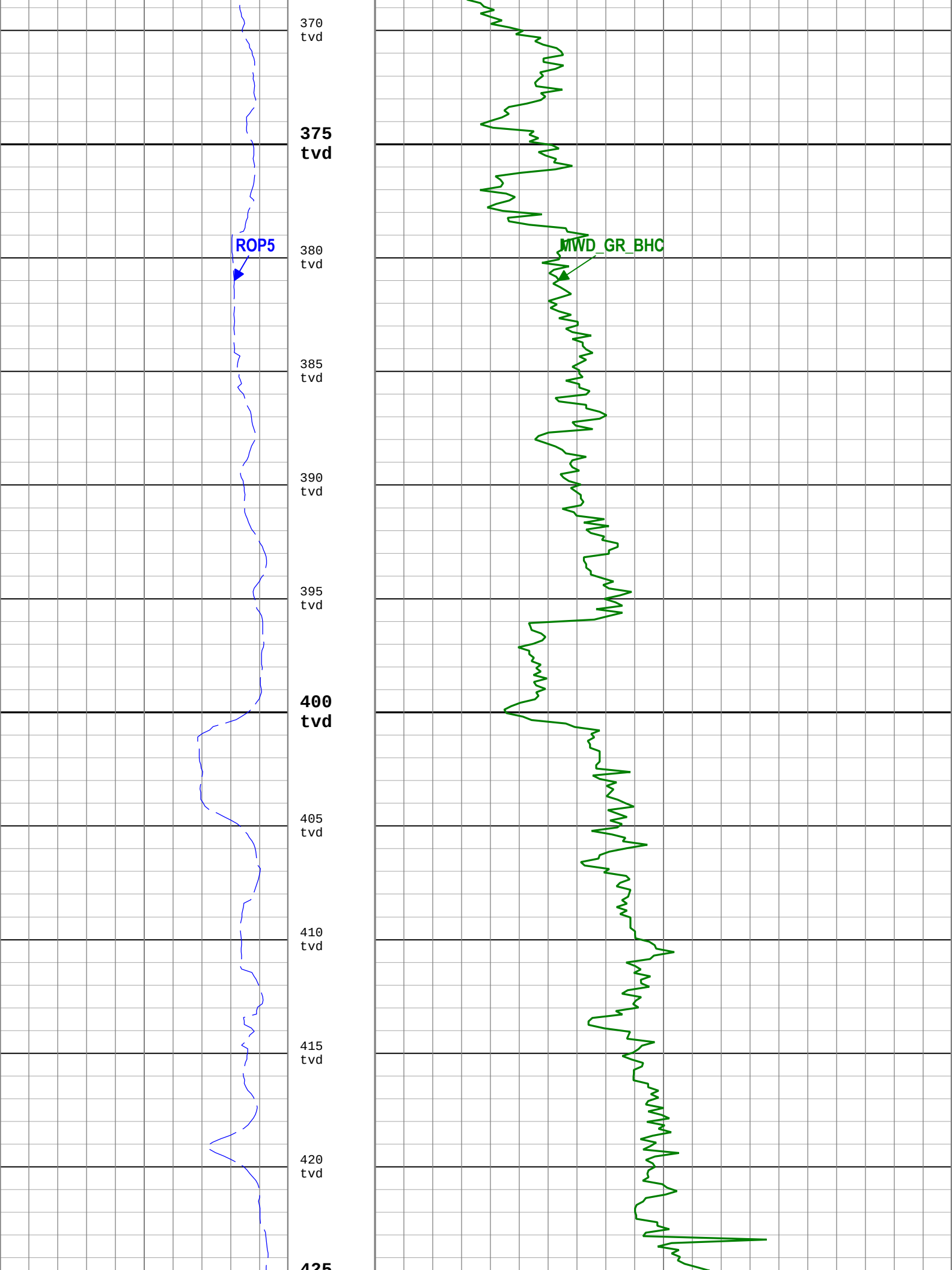
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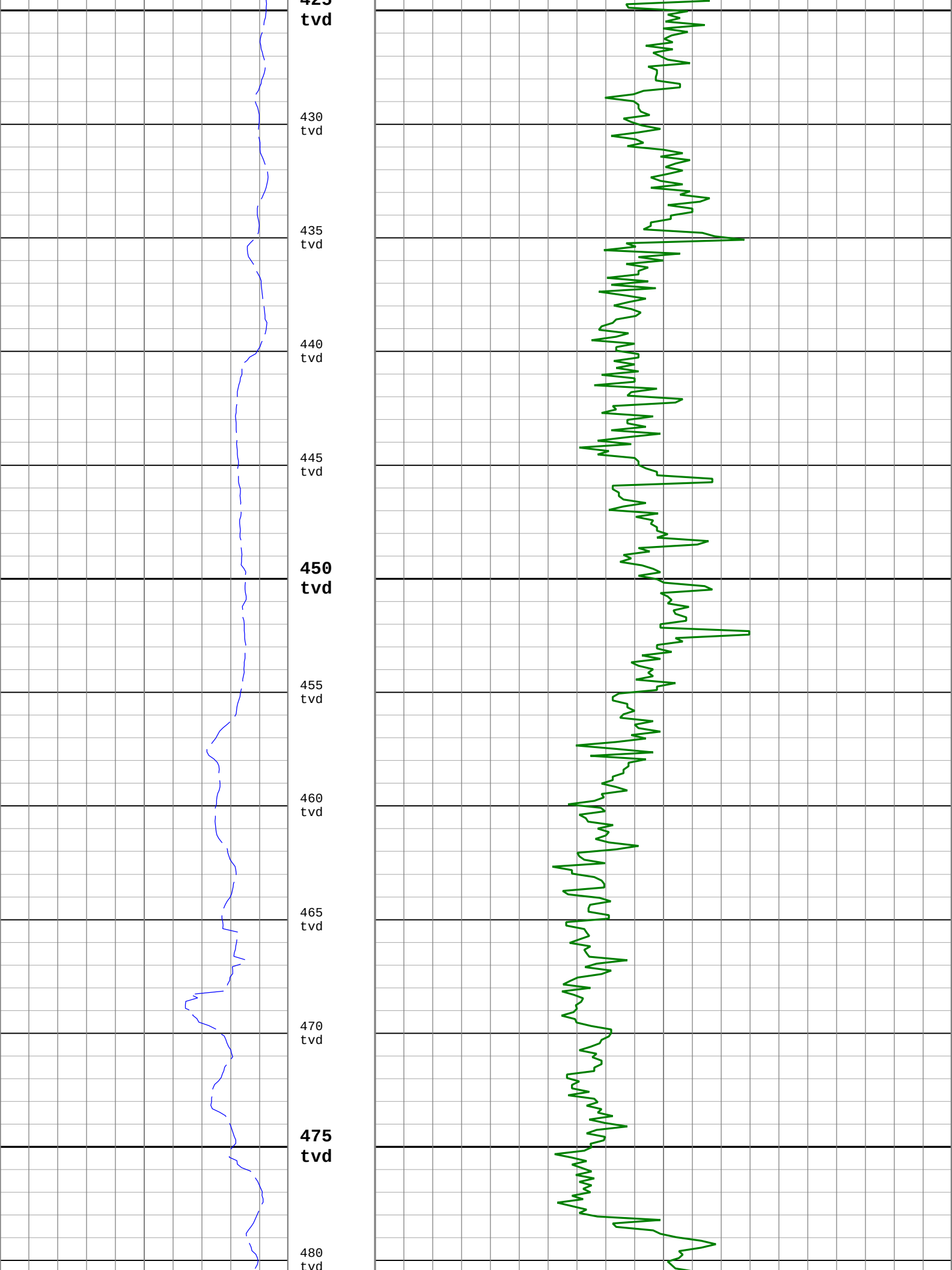
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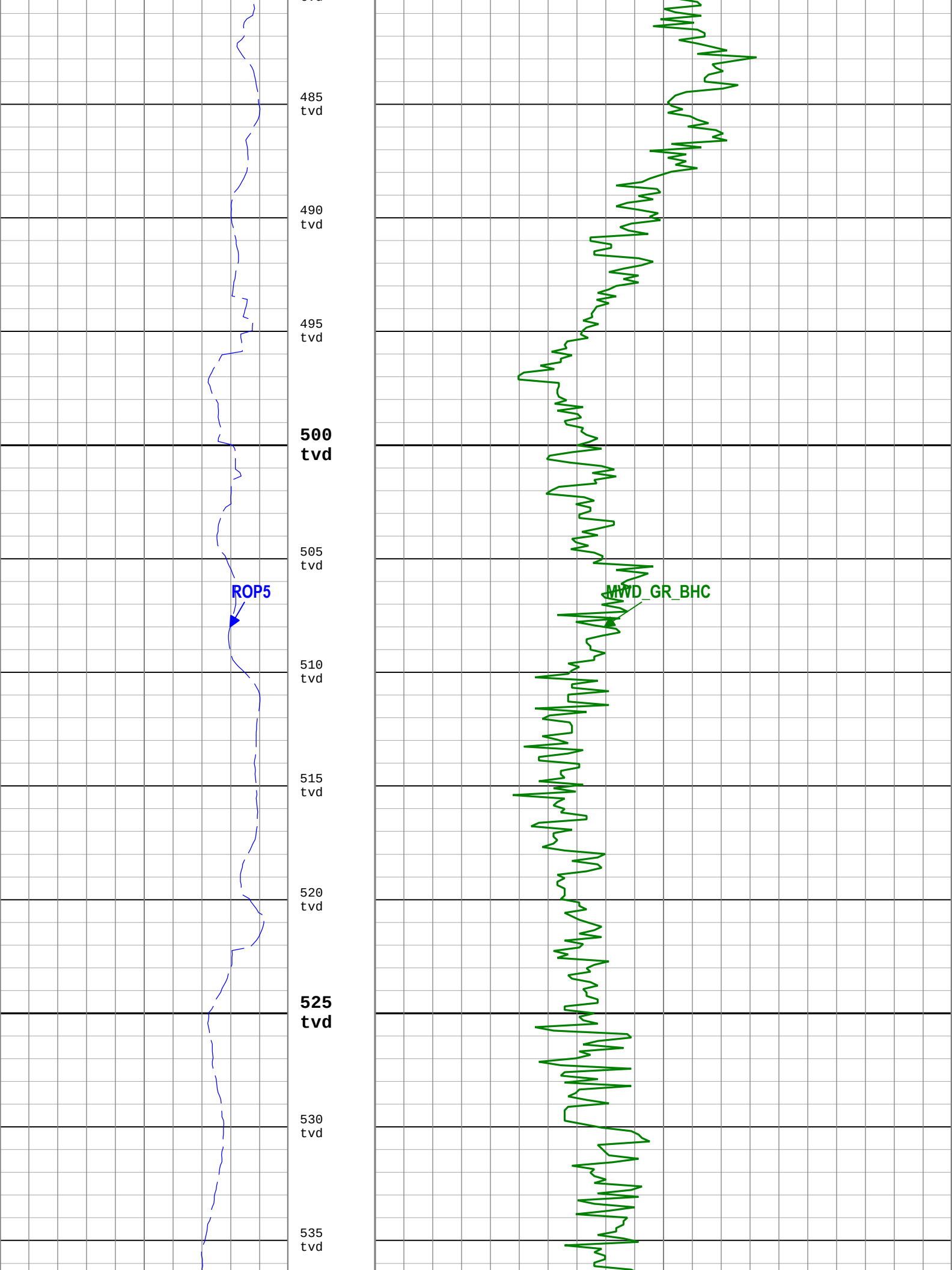
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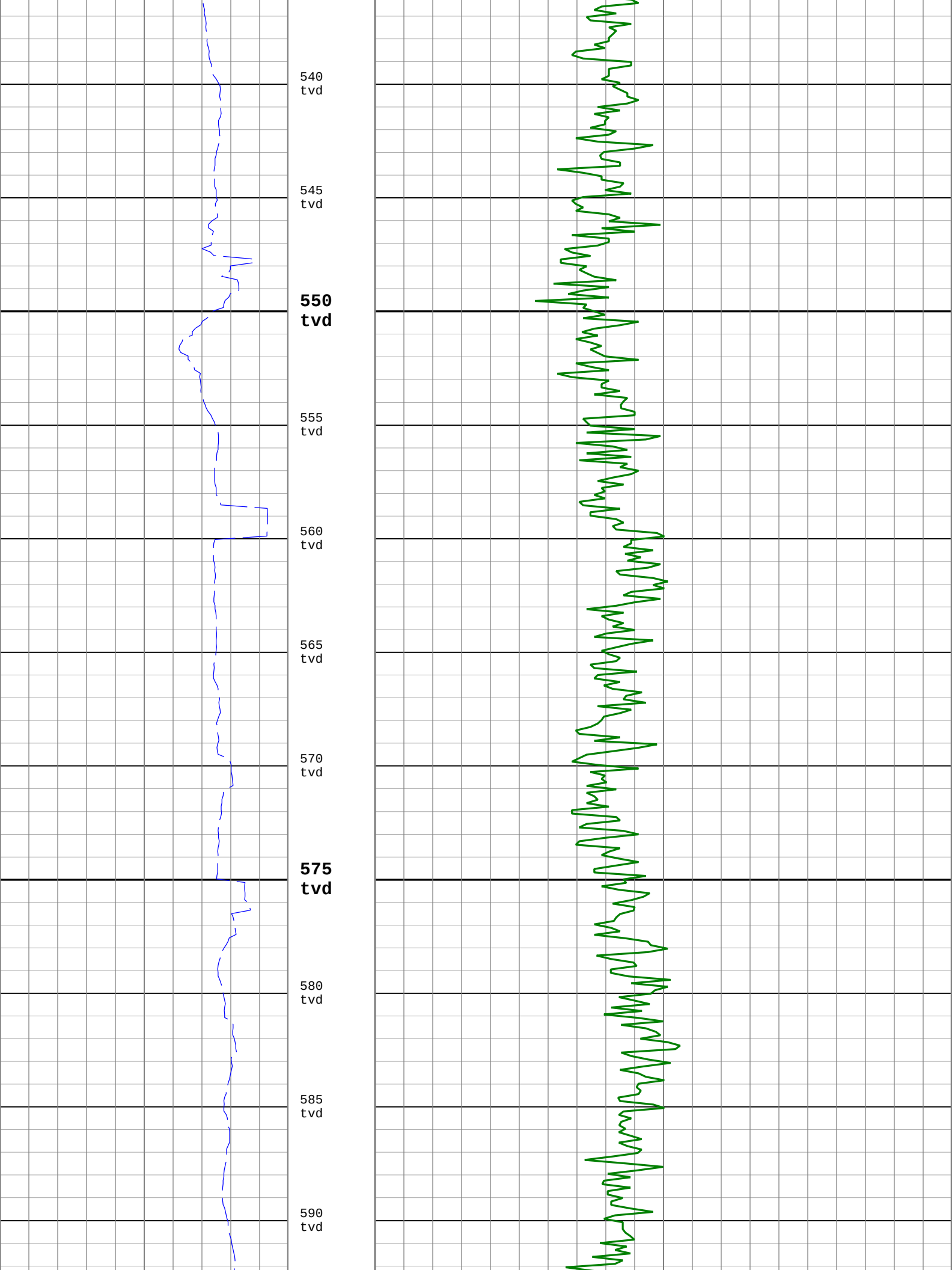
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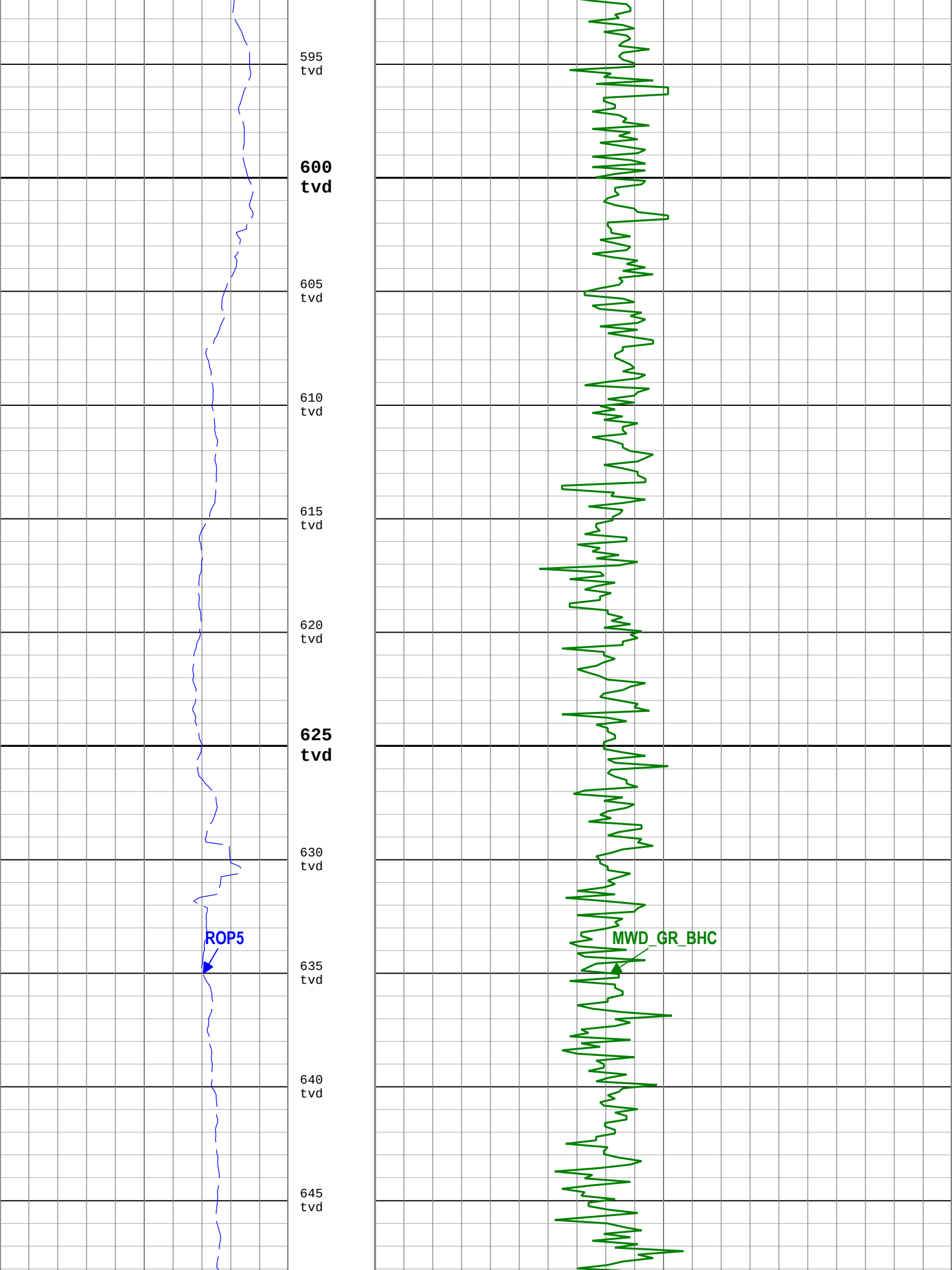
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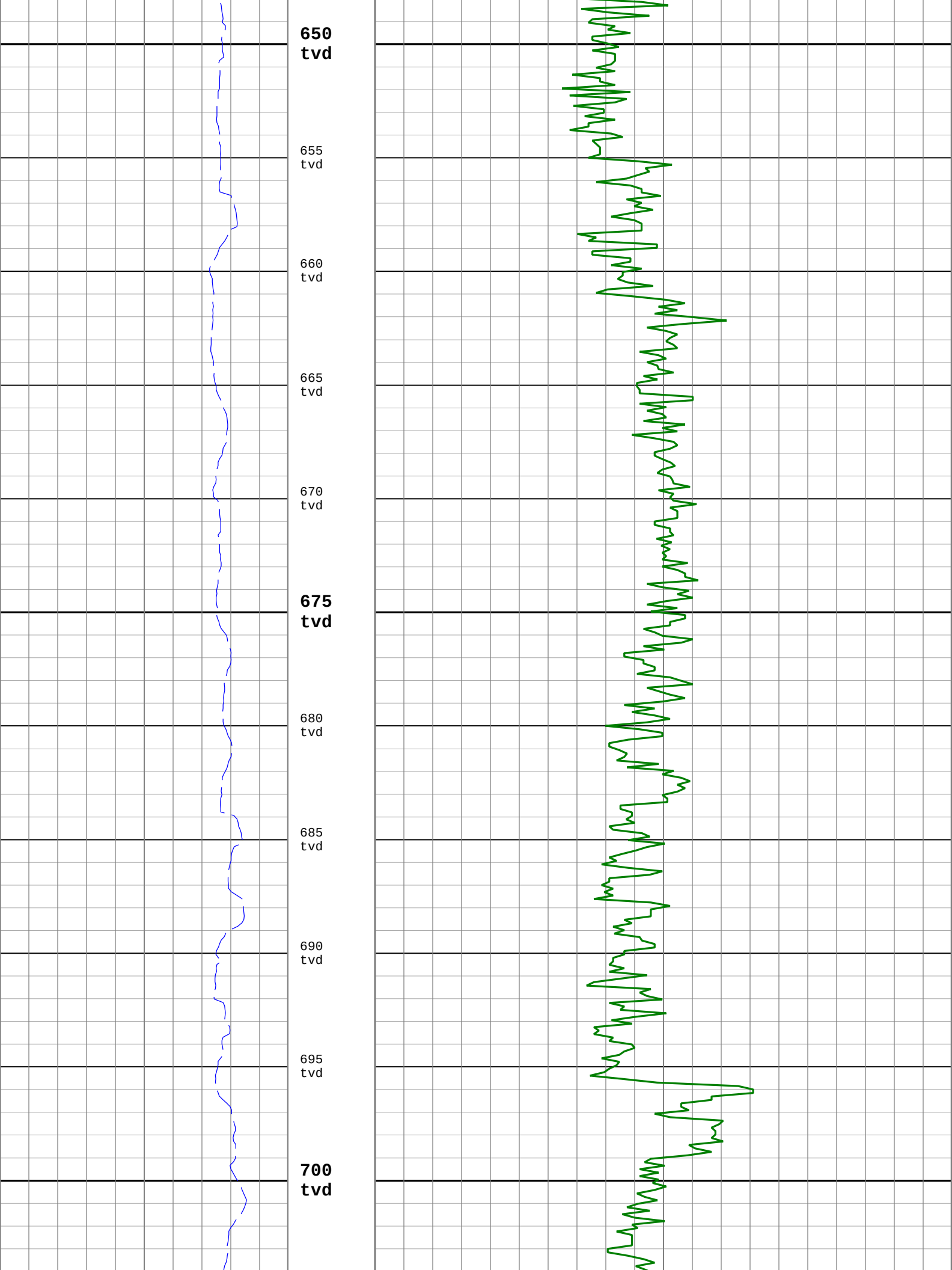
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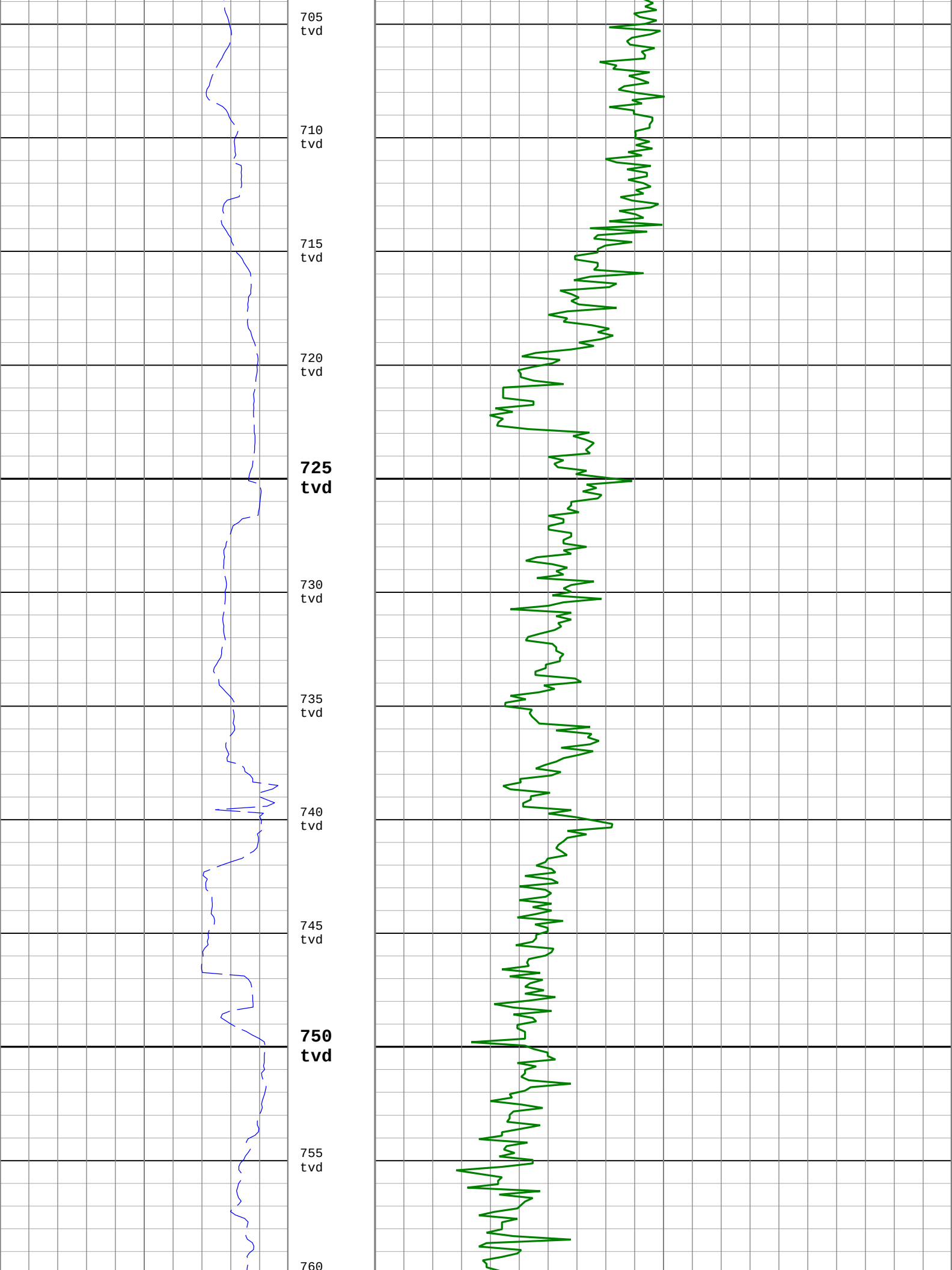
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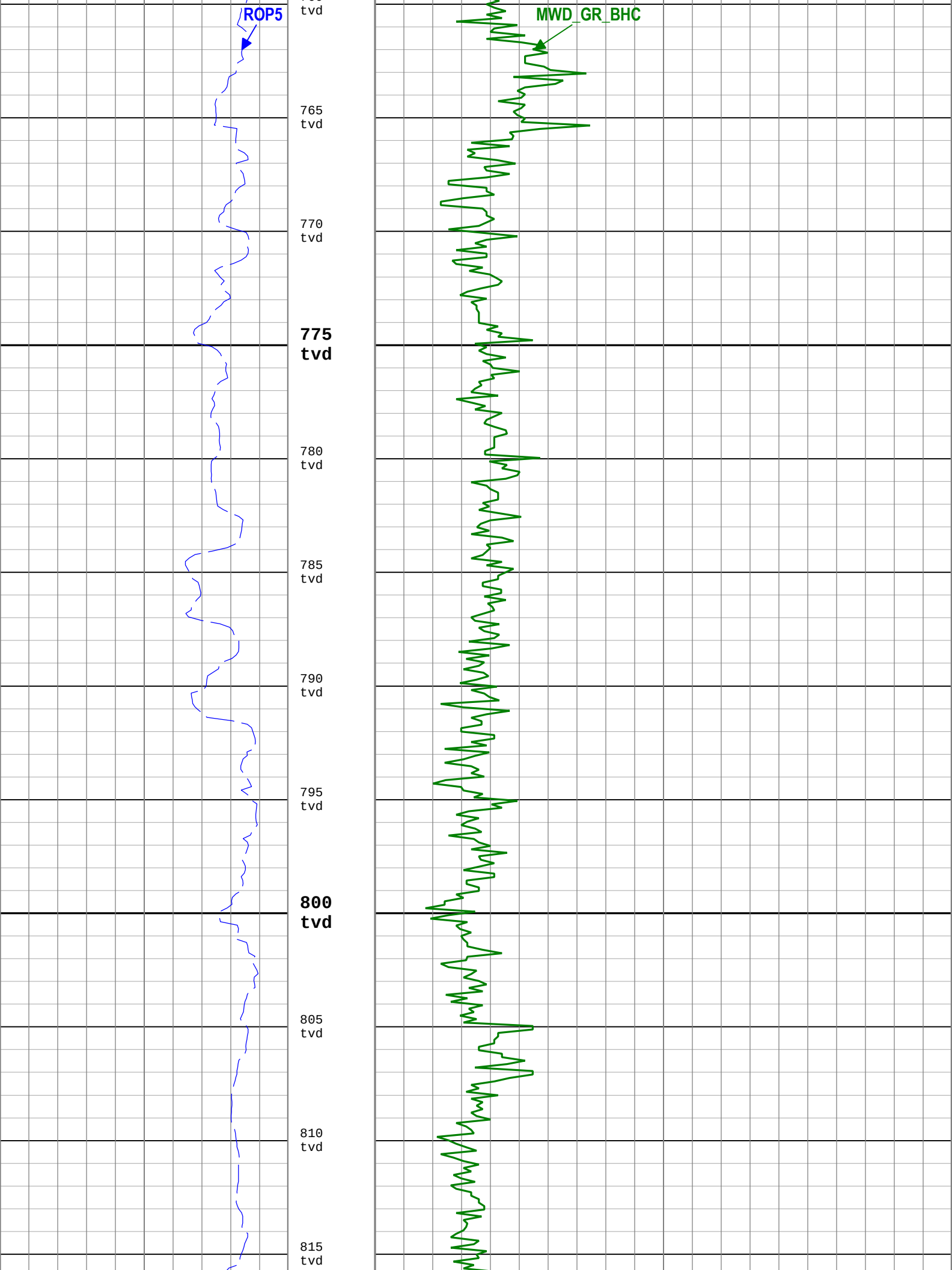
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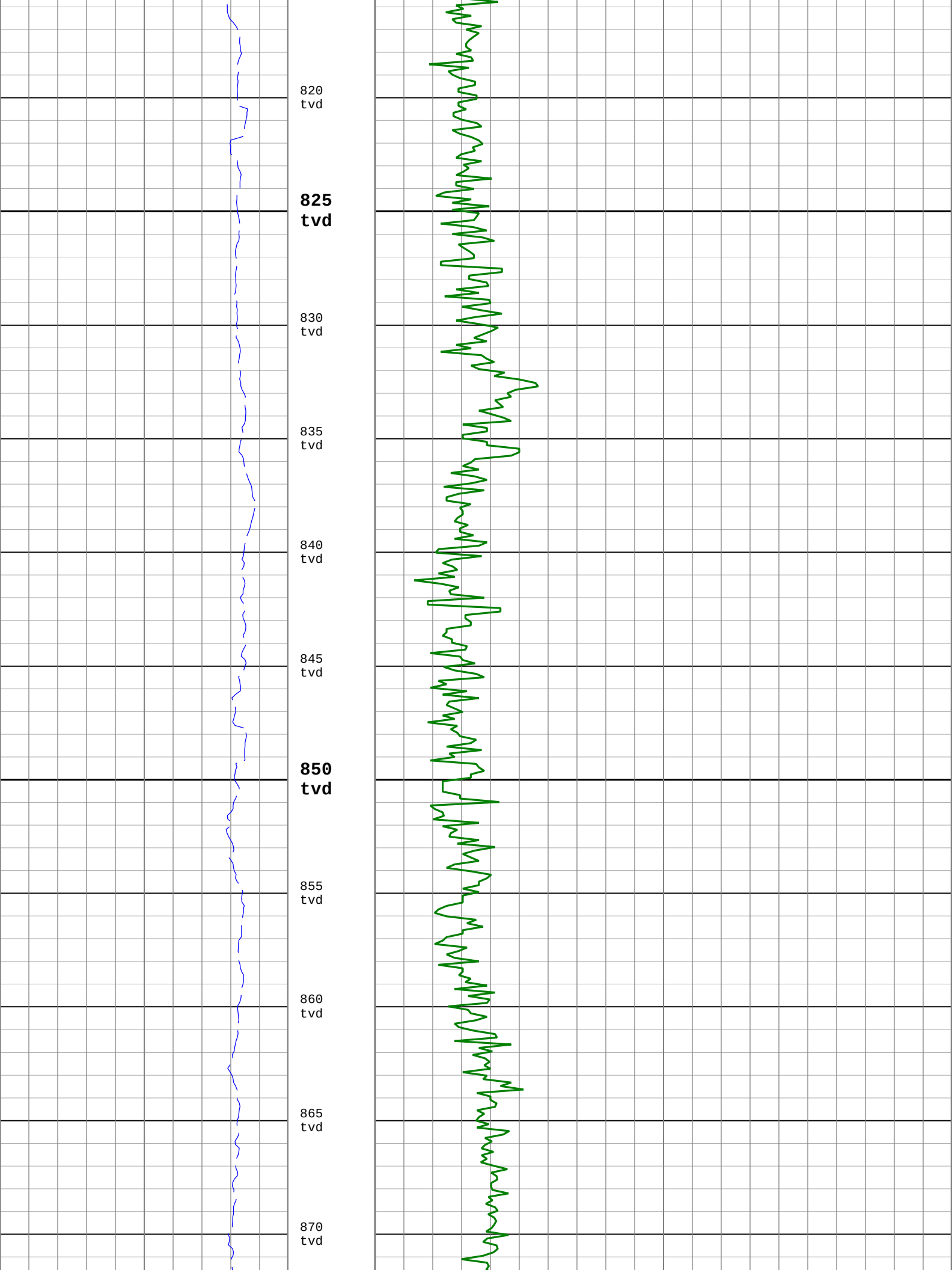
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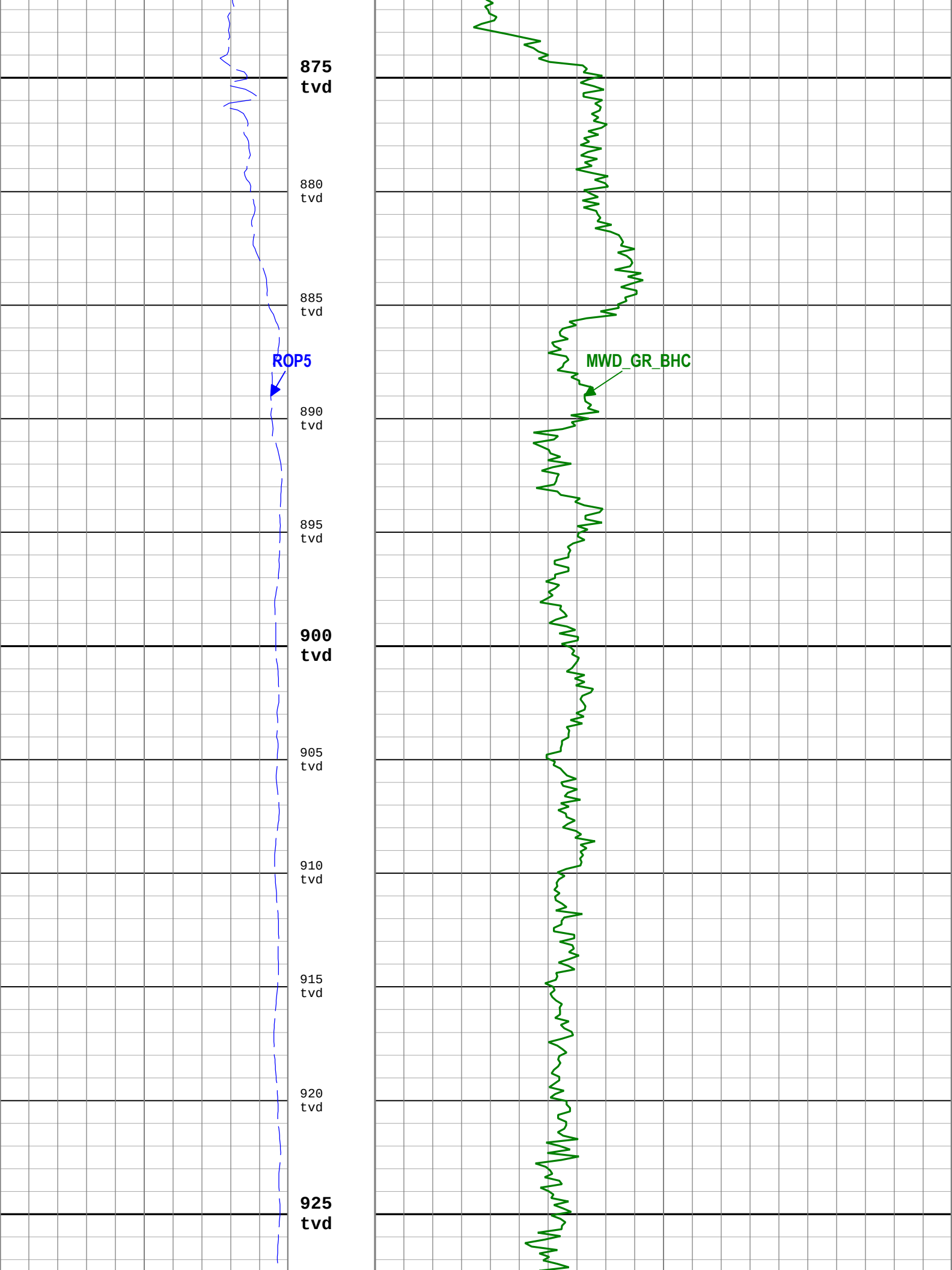
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880
tvd
885
tvd
ROP5
890
tvd
MWD_GR_BHC
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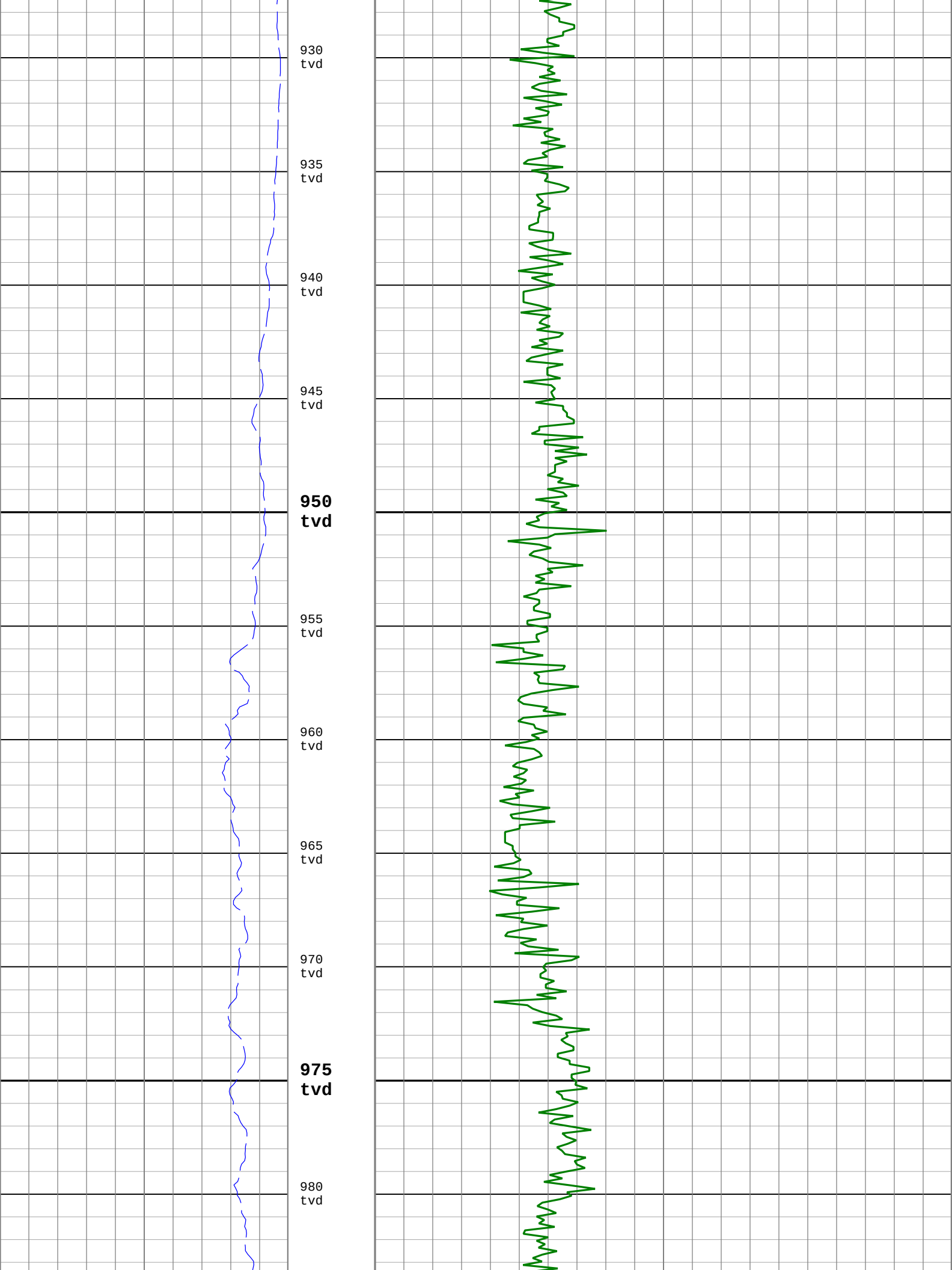
920
tvd
925
tvd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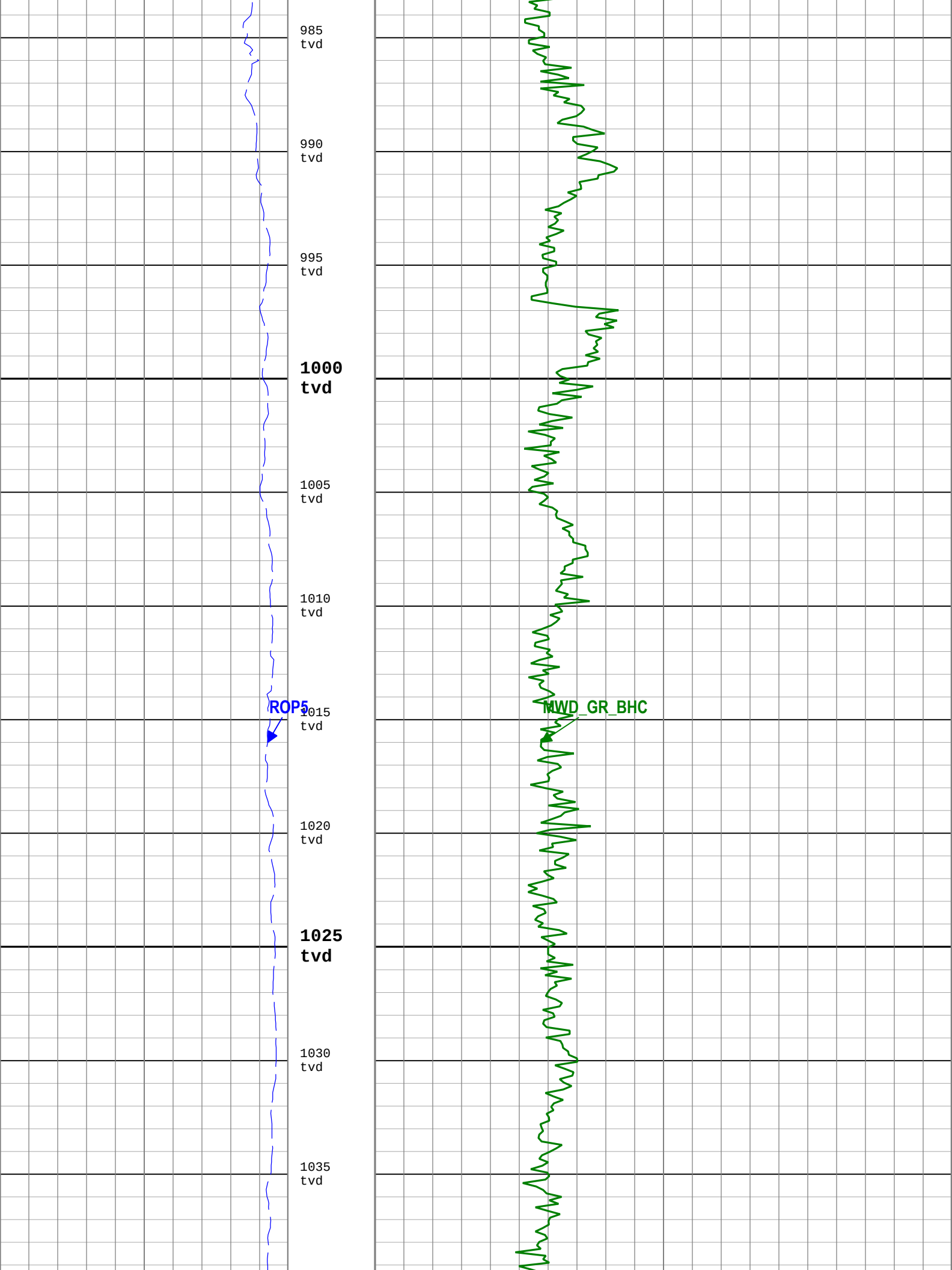
tvd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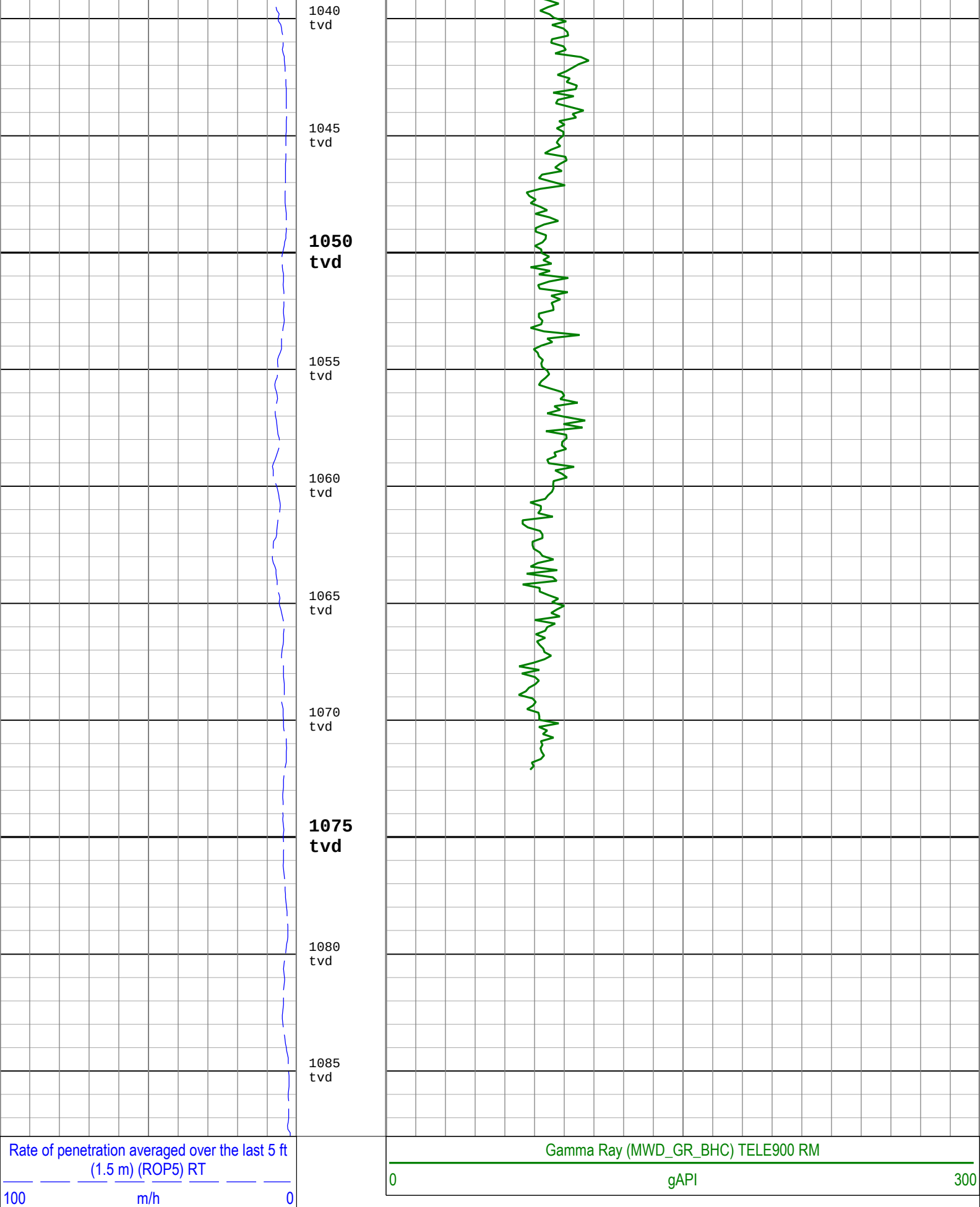


Description: TeleScope Gamma Ray Depth RT Format: Log (GR MWD and PD no ticks) Index Scale: 1:200 Index Unit: m Index Type: TVD Creation Date: 05-Apr-2018 09:09:53

Run 1

MWD - Gamma Ray 1:1000 TVD

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Run 1	Drilling	Down	140.21 m	1104.98 m	22-Mar-2018 08:11:51	27-Mar-2018 19:08:27	Yes

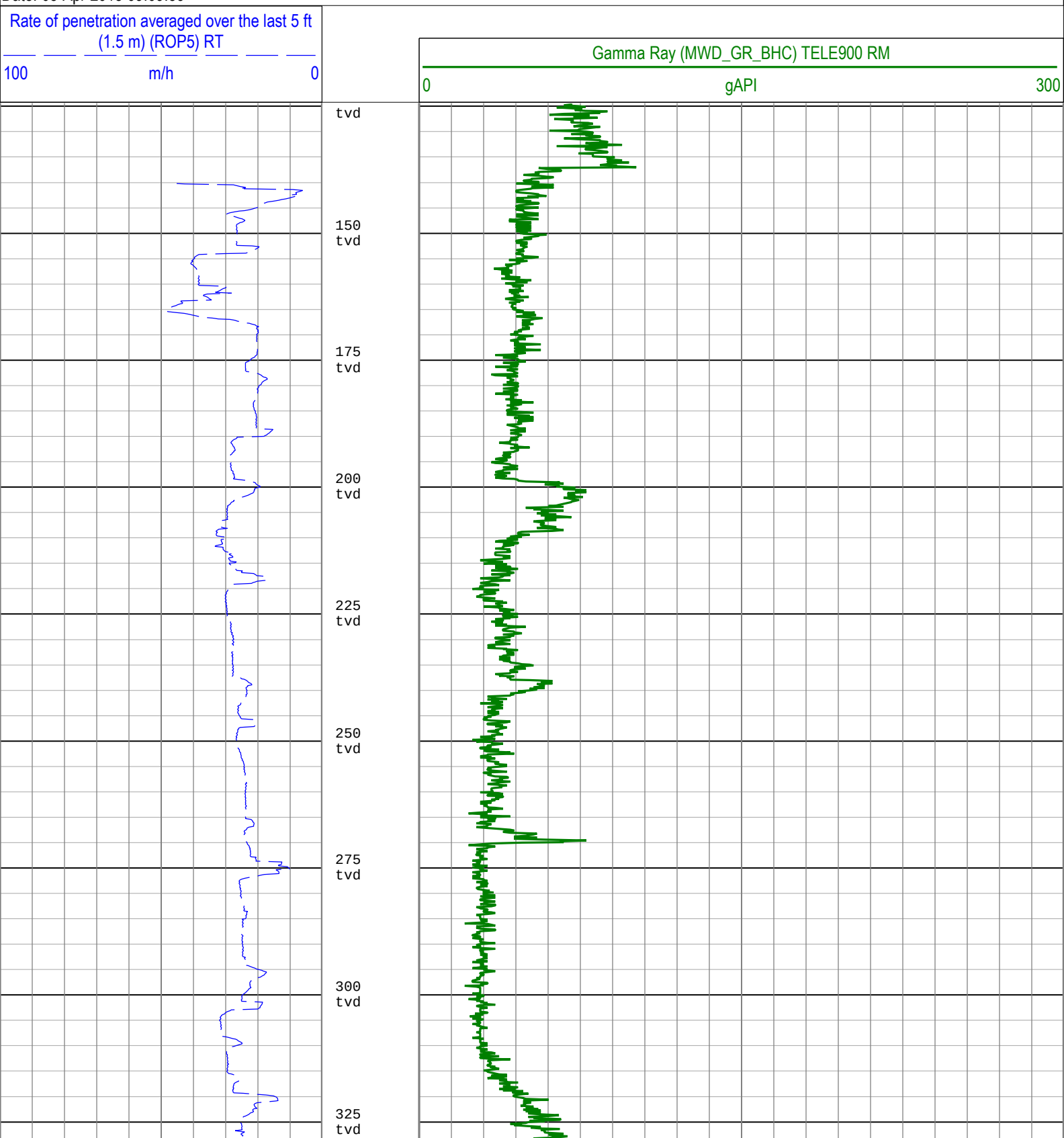
All depths are referenced to toolstring zero

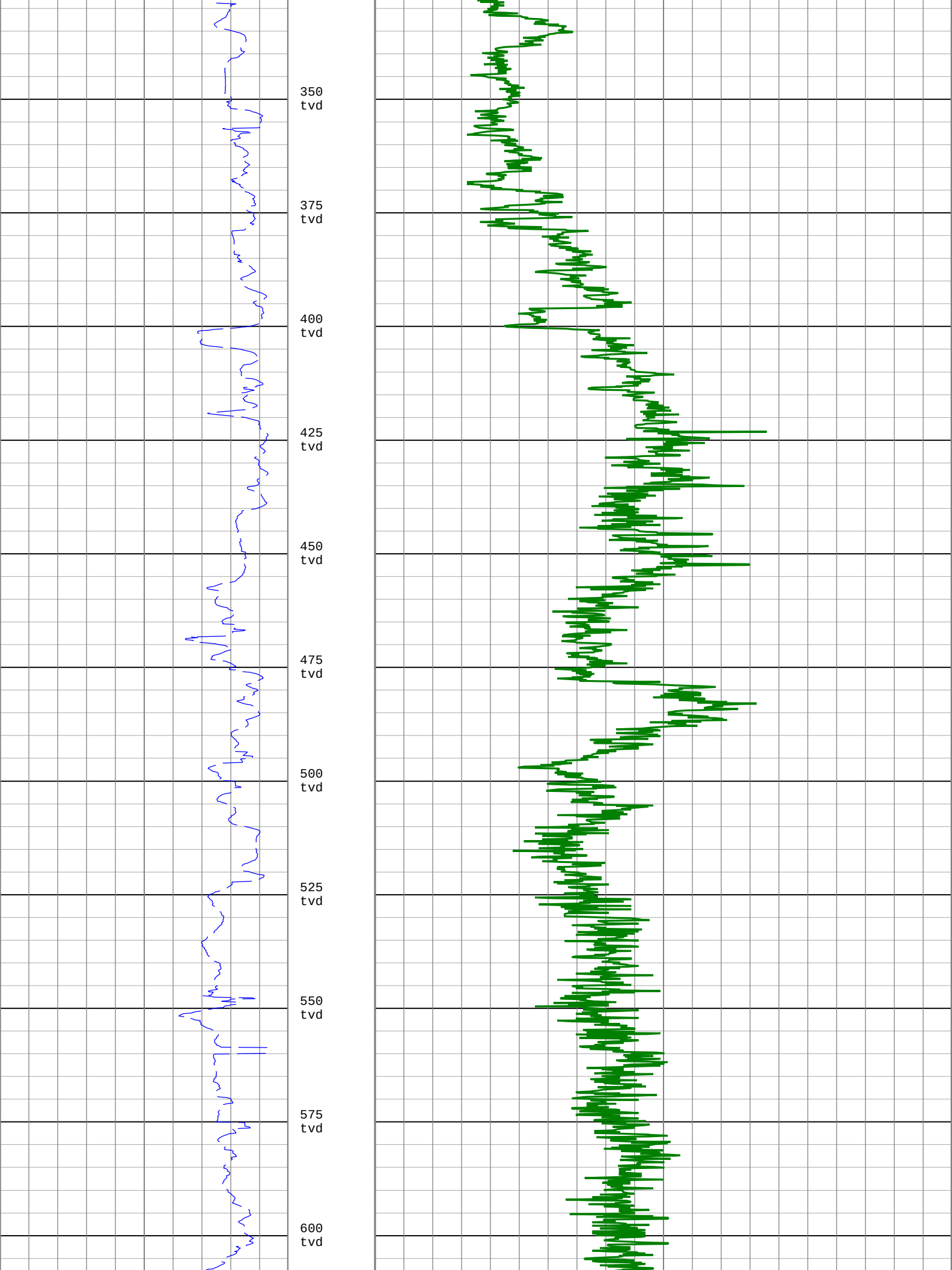
Log

Company:Trias Westland B.V. Well:NLW-GT-02-S1

Run 1: Drilling:S097

Description: TeleScope Gamma Ray Depth RT Format: Log (GR MWD and PD no ticks) Index Scale: 1:1000 Index Unit: m Index Type: TVD Creation Date: 05-Apr-2018 09:09:59

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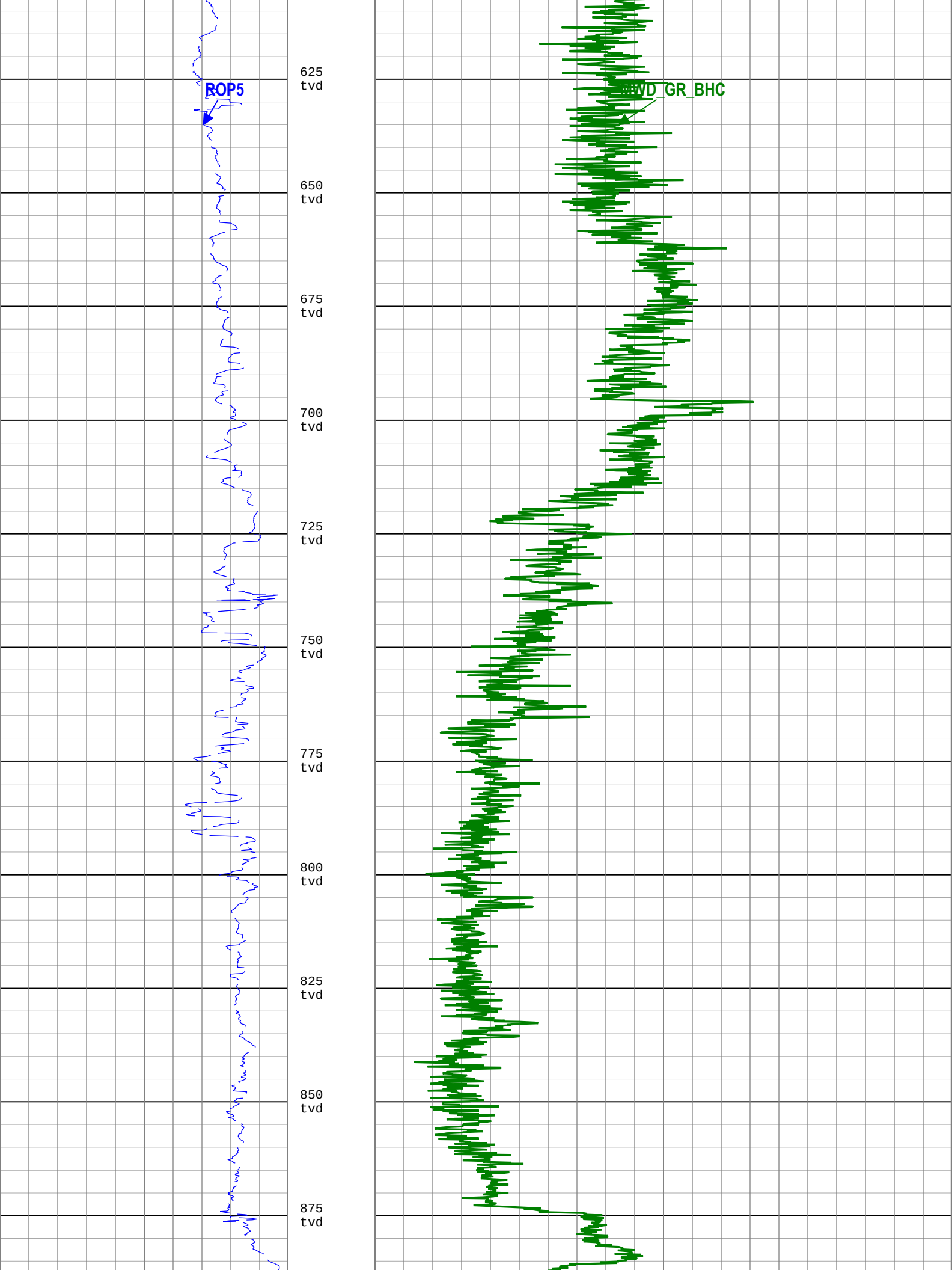
600
tvd


ROP5
WD_GR_BHC
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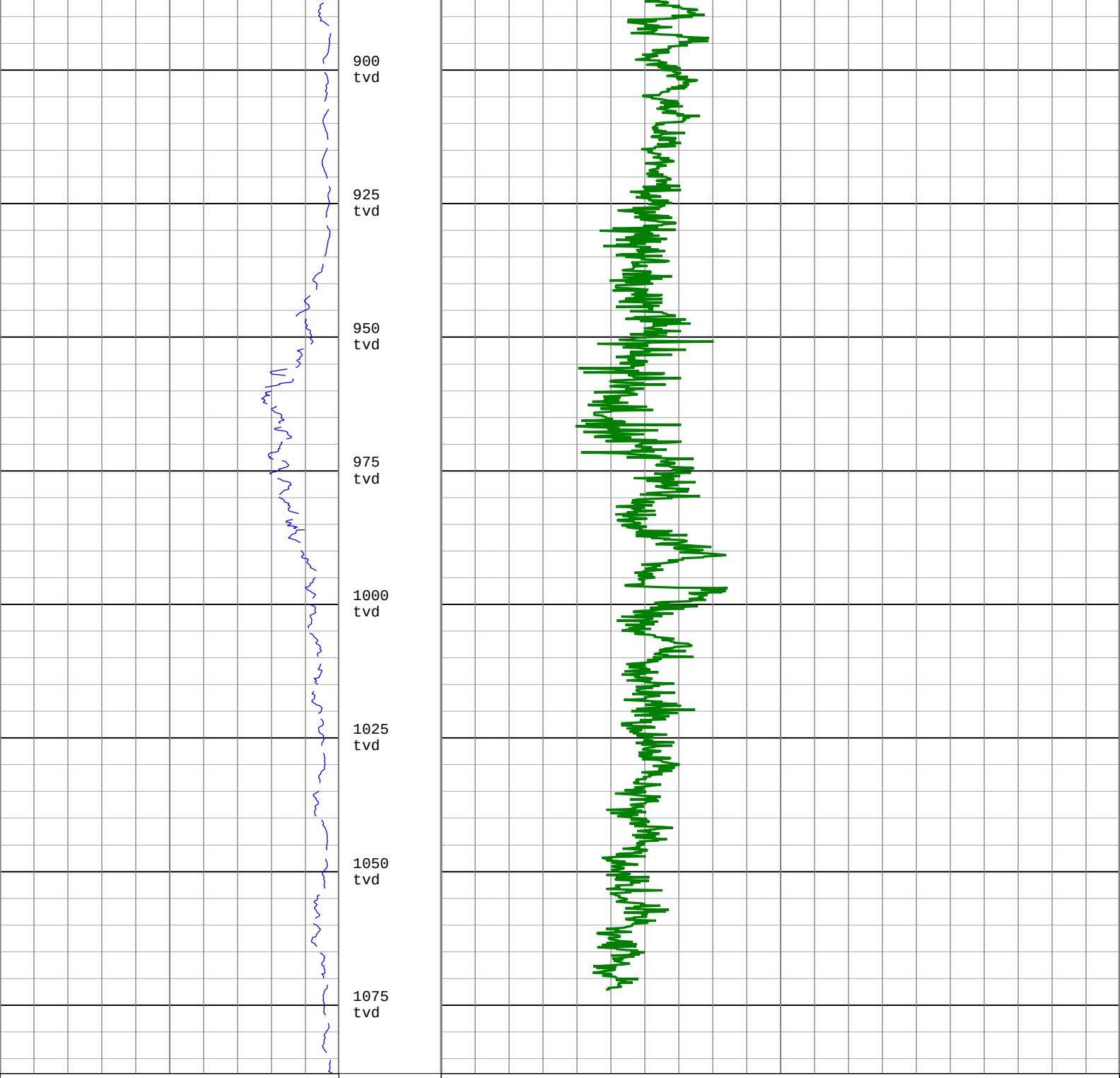
875
tvd



Description: TeleScope Gamma Ray Depth RT Format: Log (GR MWD and PD no ticks) Index Scale: 1:1000 Index Unit: m Index Type: TVD Creation Date: 05-Apr-2018 09:09:59

Channel Processing Parameters

Run 1: Parameters

Parameter	Description	Tool	Value	Unit
BHK	Drilling Fluid Potassium Concentration	Borehole	Time Zoned	%
BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	g/cm3
GR_SRC	GR Input Channel Name	TELE900	GAMMA_CPS	

Depth Zone Parameters

Parameter	Value	Start (m)	Stop (m)
BS	36	124.34	136.94
BS	24	136.94	1087.99

All depth are actual.

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (m)	Stop Depth (m)
BHK	0	22-Mar-2018 08:11:51	24-Mar-2018 04:20:10	140.21	441.4
BHK	5.5	24-Mar-2018 04:20:10	24-Mar-2018 21:00:00	441.4	685.83
BHK	4.77	24-Mar-2018 21:00:00	25-Mar-2018 15:00:00	685.83	902.59
BHK	4.17	25-Mar-2018 15:00:00	25-Mar-2018 21:00:00	902.59	920.39
BHK	4.35	25-Mar-2018 21:00:00	27-Mar-2018 19:08:27	920.39	1104.98
DFD	1.05	22-Mar-2018 08:11:51	23-Mar-2018 03:30:36	140.21	182.7
DFD	1.07	23-Mar-2018 03:30:36	23-Mar-2018 21:00:41	182.7	427.94
DFD	1.12	23-Mar-2018 21:00:41	24-Mar-2018 04:00:00	427.94	441.38
DFD	1.16	24-Mar-2018 04:00:00	24-Mar-2018 16:00:08	441.38	608.56
DFD	1.19	24-Mar-2018 16:00:08	25-Mar-2018 04:00:14	608.56	768.12
DFD	1.2	25-Mar-2018 04:00:14	25-Mar-2018 11:00:00	768.12	861.03
DFD	1.23	25-Mar-2018 11:00:00	25-Mar-2018 11:00:21	861.03	861.03
DFD	1.26	25-Mar-2018 11:00:21	25-Mar-2018 21:00:00	861.03	920.39
DFD	1.24	25-Mar-2018 21:00:00	26-Mar-2018 11:00:00	920.39	1000.46
DFD	1.22	26-Mar-2018 11:00:00	26-Mar-2018 15:50:00	1000.46	1032.26
DFD	1.24	26-Mar-2018 15:50:00	27-Mar-2018 19:08:27	1032.26	1104.98

All depth are at tool zero.

Tool Control Parameters

Calibration Report

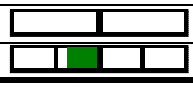
TELE900 (TeleScope 900) Calibration - Run 1

Primary Equipment :

Gamma Ray Cartridge PMGR 223

GAMMA_SF - Gamma Ray: Blanket

Master (Time Frame File): 22:50:15 02-Mar-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Gamma Ray Calibration Gain		Master	1.0000	0.7500	0.8431	1.2500	

Company:	Trias Westland B.V.
Well:	NLW-GT-02-S1
Field:	Naaldwijk
Rig Name:	KCA Deutag T-207
Country:	Netherlands

Schlumberger

MWD - Gamma Ray

Recorded Mode