



Cathedral Energy Services

1949 Pyrite Road  
Casper, WY 82604**135588**

5":100' - MD

6/18/2014 12:36:08 PM

**CATHEDRAL****Oper. Company:** Encana Oil & Gas (USA) Inc.**Country:** U.S.A.**State / Province:** Colorado**County / Parish:** Weld**Started:** 12/27/2013 04:00 AM**API/UWI:** 05-123-37786-00**Field:** Wattenberg (Codell)**Well:** Lochbuie 2D-31H**Rig:** Helmerich & Payne, Inc. 522**Ended:** 01/03/2014 05:30 AMGamma Ray  
Section Plane: 180.00  
Magnetic North: 8.54  
Gamma Attenuation Factor:  
Gamma Averaging: 7%**Personnel****Day Hand:** C. Van Oerle**Night Hand:** A. Stewart**Comp. Emp:** Sanford Pulleys

Log and Survey Depths Relative to Kelly Bushing (KB) Depth

**Location****Latitude:** 40.014080**Longitude:** -104.712090**Elev. GL:** 5007**Elev. DF:****Elev. KB:** 5037**Hole Data**

Size	From	To
12-1/4	0	1504
8-3/4	1505	7821
6-1/8	7822	12087

**Casing Data**

Size	From	To
9-5/8	0	1504
7	0	7821
4-1/2	0	12087

**Bit Sizes**

Size	From	To
12-1/4	0	1504
8-3/4	1505	7821
6-1/8	7822	12087

**Mud Data**

Type	Weight	Density	Viscosity	Rm	Rmf	Rmc	From	To
Water	8.4		28				0	6000
LSND	9.8		39				6001	7821
LSND	10.2		50				7822	12087

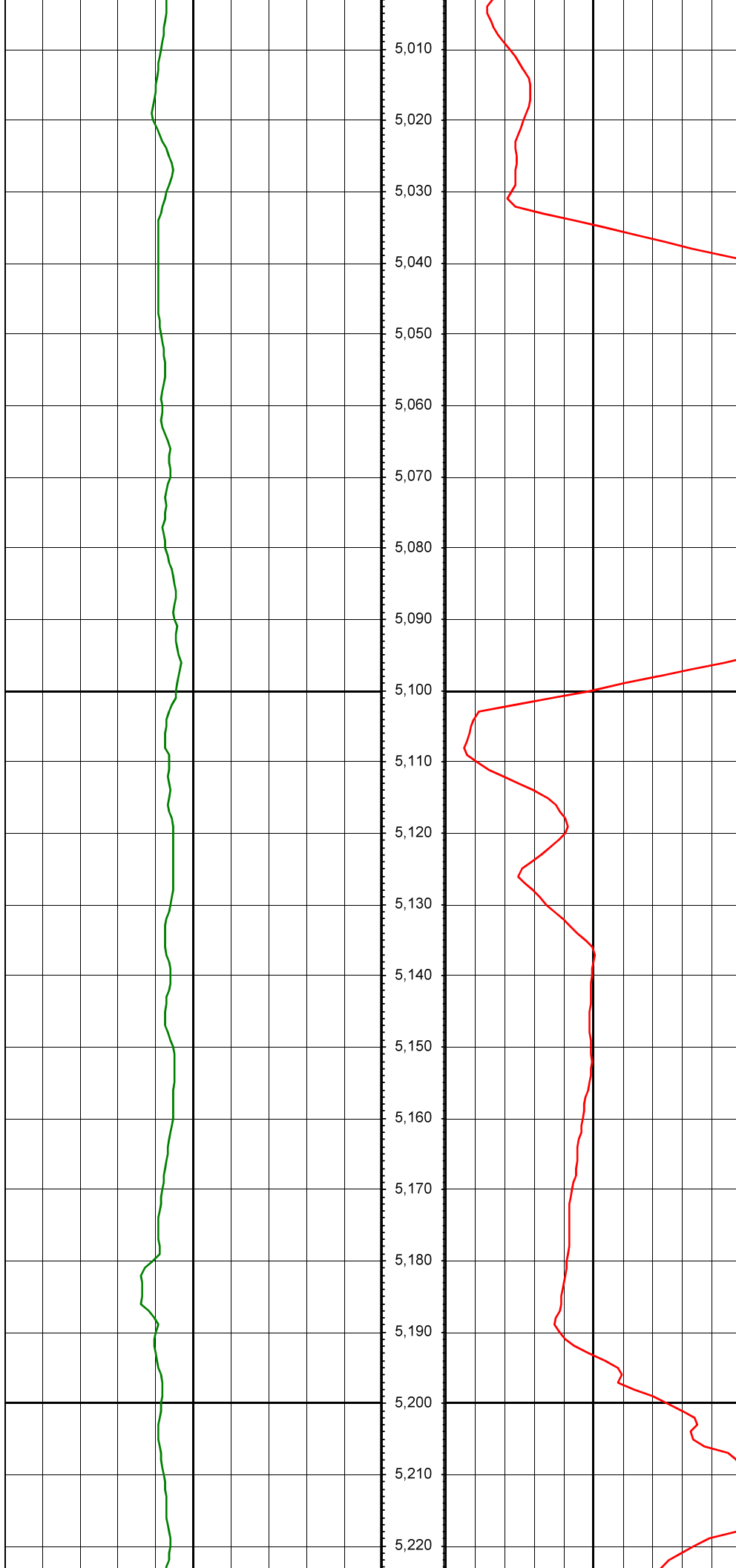
**Tool Run Data**

Serial Number	Gamma Offset	Resist. Offset	Start Time	Start Depth	End Time	End Depth
249	35.71	0	12/27/2013 4:00:38 AM	5000	12/27/2013 9:00:38 PM	6702
249	40.62	0	12/28/2013 8:00:12 AM	6703	12/29/2013 8:00:12 AM	7821
249	37.93	0	12/31/2013 12:00:05 PM	7822	1/1/2014 4:00:05 AM	9465
249	37.93	0	1/1/2014 4:20:44 AM	9466	1/3/2014 5:30:44 AM	12087

*All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost damages or expenses incurred or sustained by anyone resulting from an interpretation made by any of our officers, agents, or employees.*

0.00      Gamma Ray(API)      150.00      MD      0.00      ROP (FT/HR)      600.00      Surveys (MD/INC/AZ)

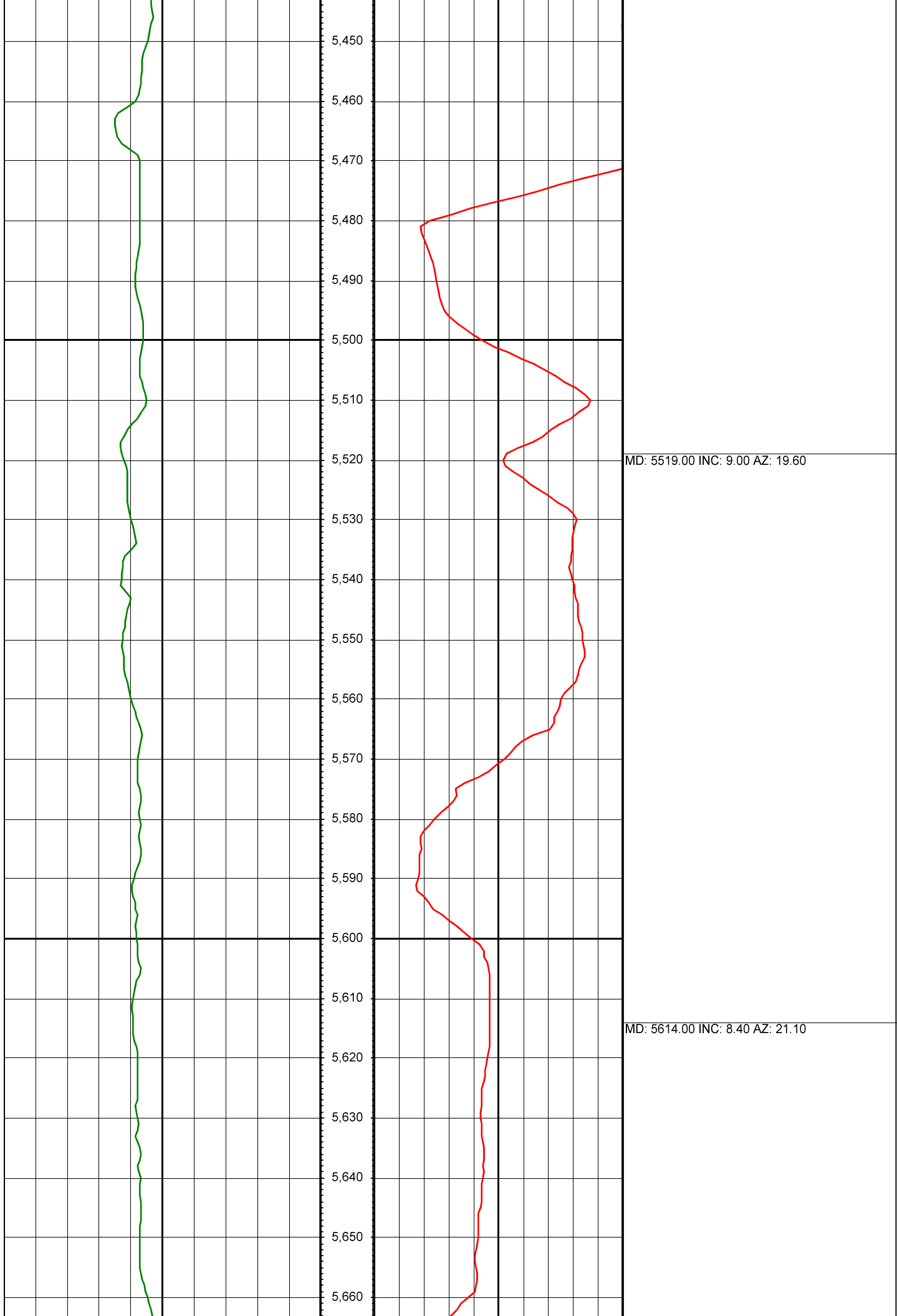
150.00      2      300.00      FT



MD: 5046.00 INC: 7.90 AZ: 15.90

MD: 5141.00 INC: 8.80 AZ: 16.10

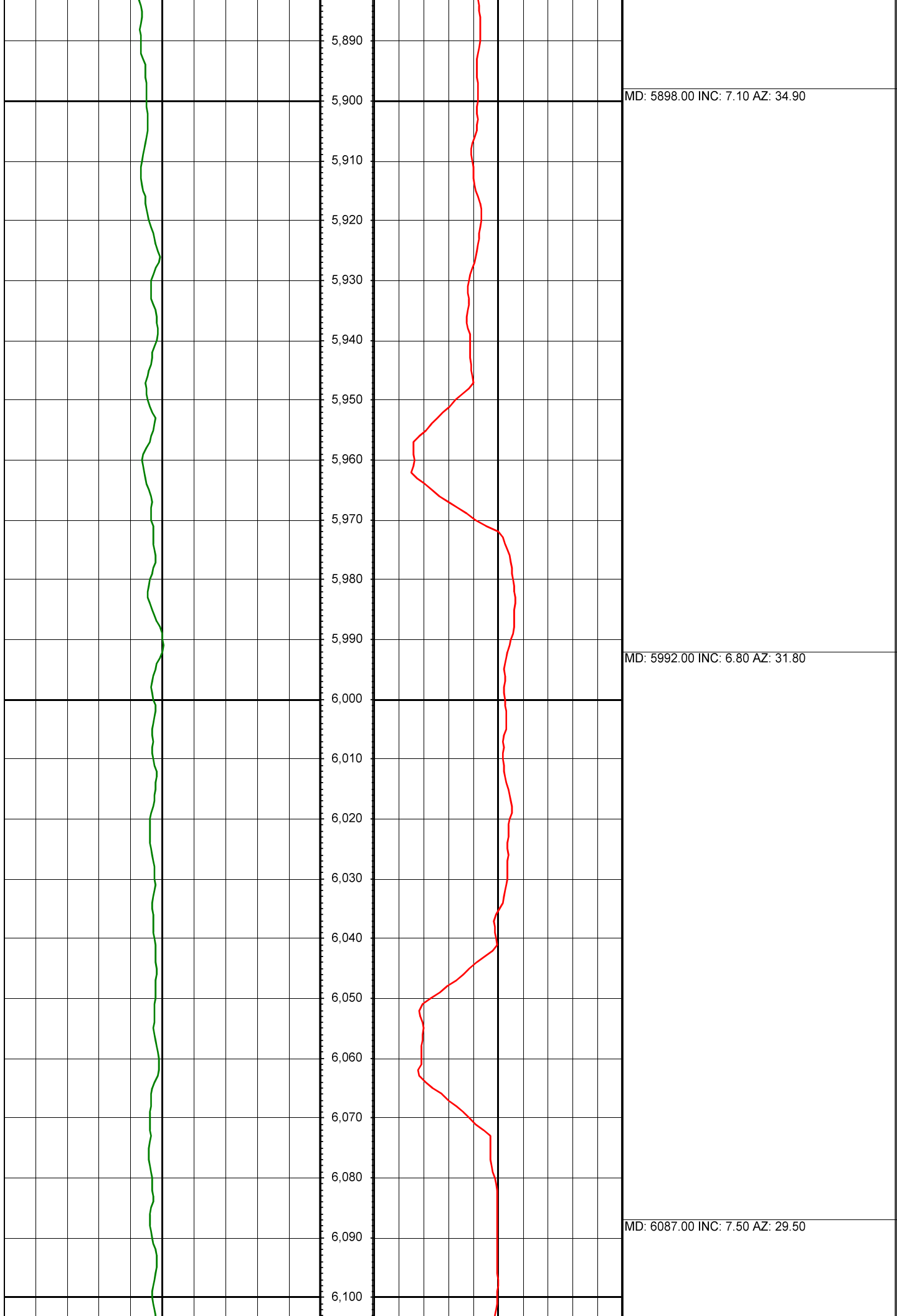


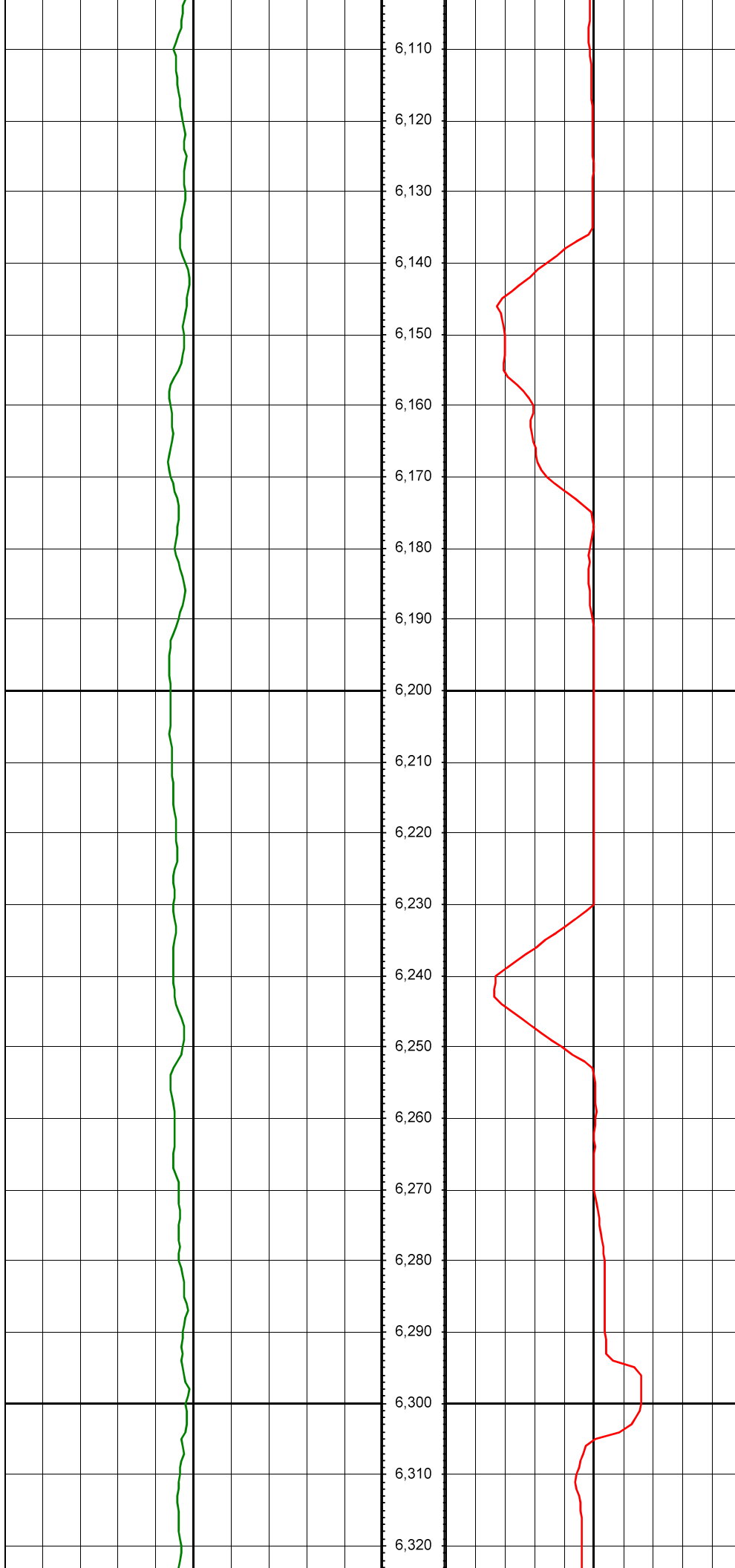




MD: 5709.00 INC: 7.50 AZ: 31.90

MD: 5803.00 INC: 8.20 AZ: 34.80





MD: 6182.00 INC: 7.90 AZ: 19.50

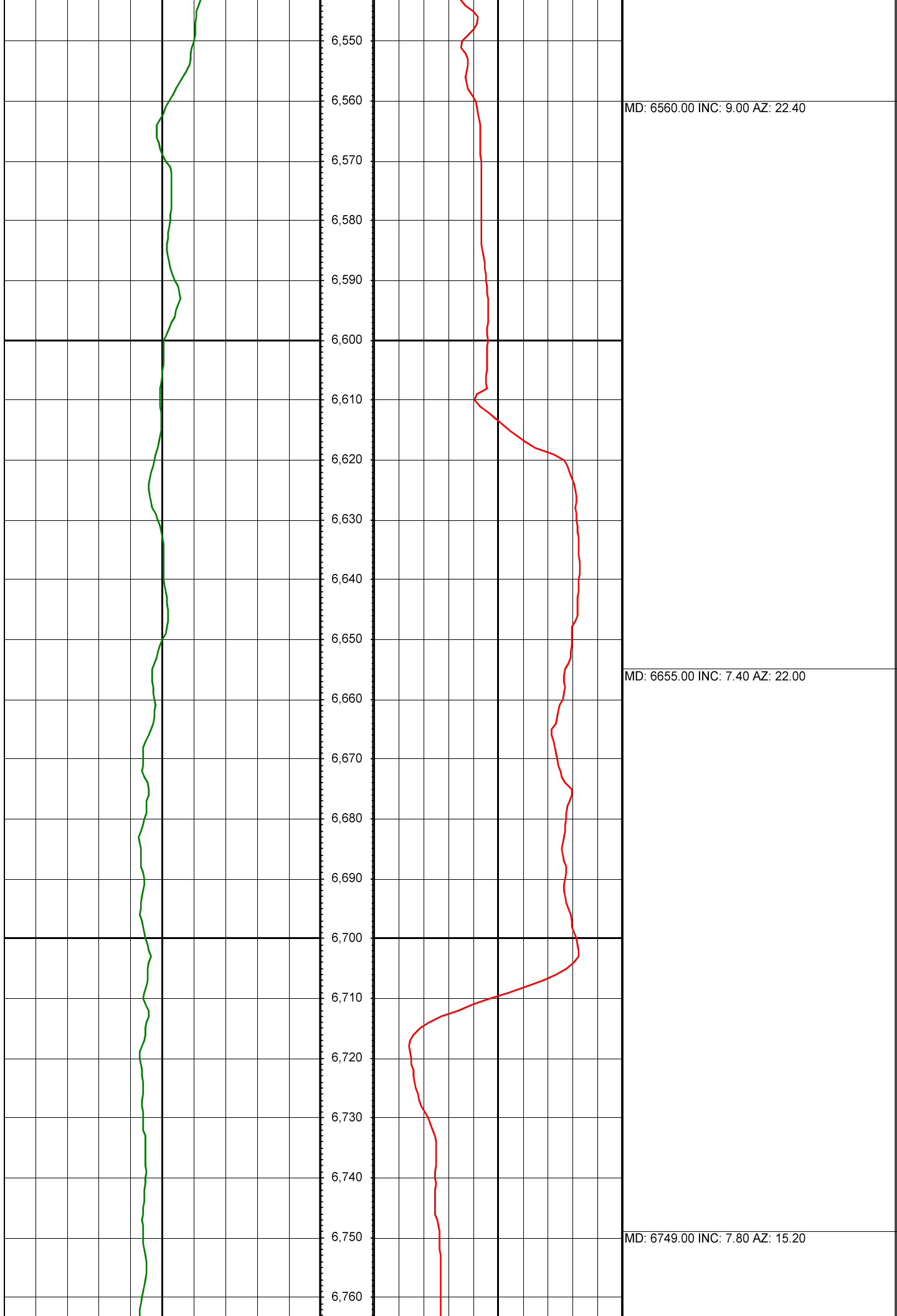
MD: 6276.00 INC: 7.90 AZ: 13.50



MD: 6371.00 INC: 7.30 AZ: 14.10

MD: 6466.00 INC: 7.70 AZ: 23.80

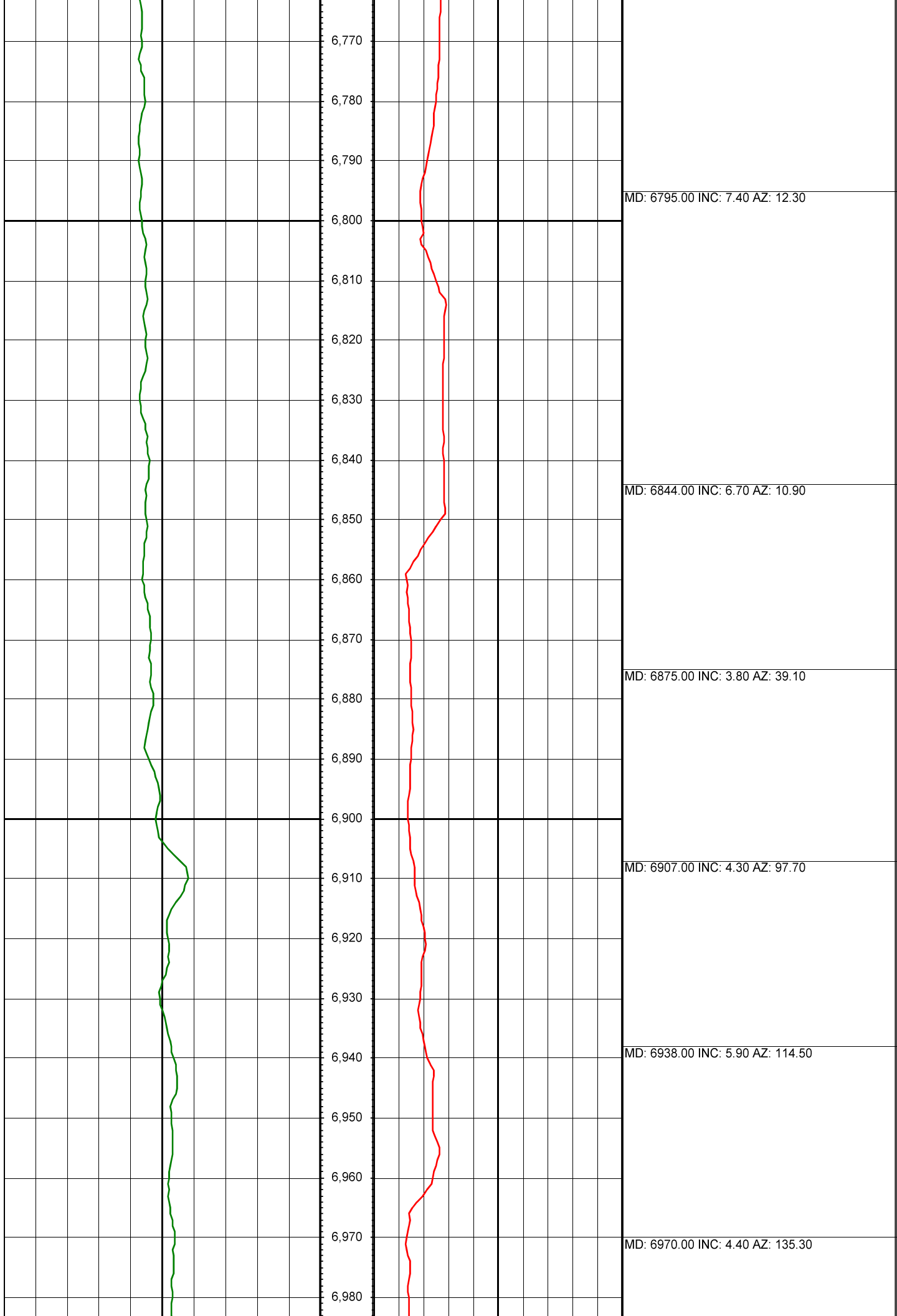


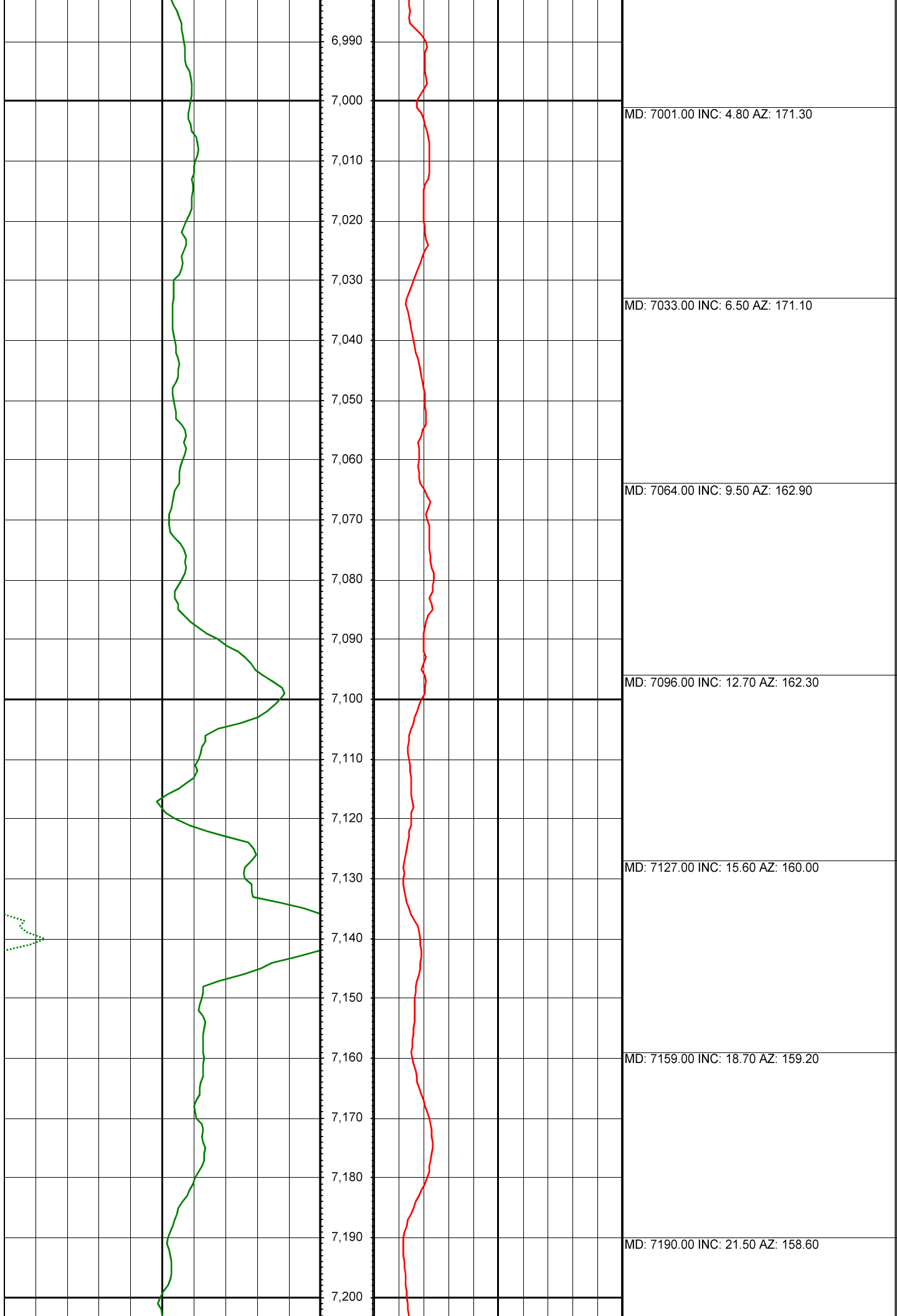


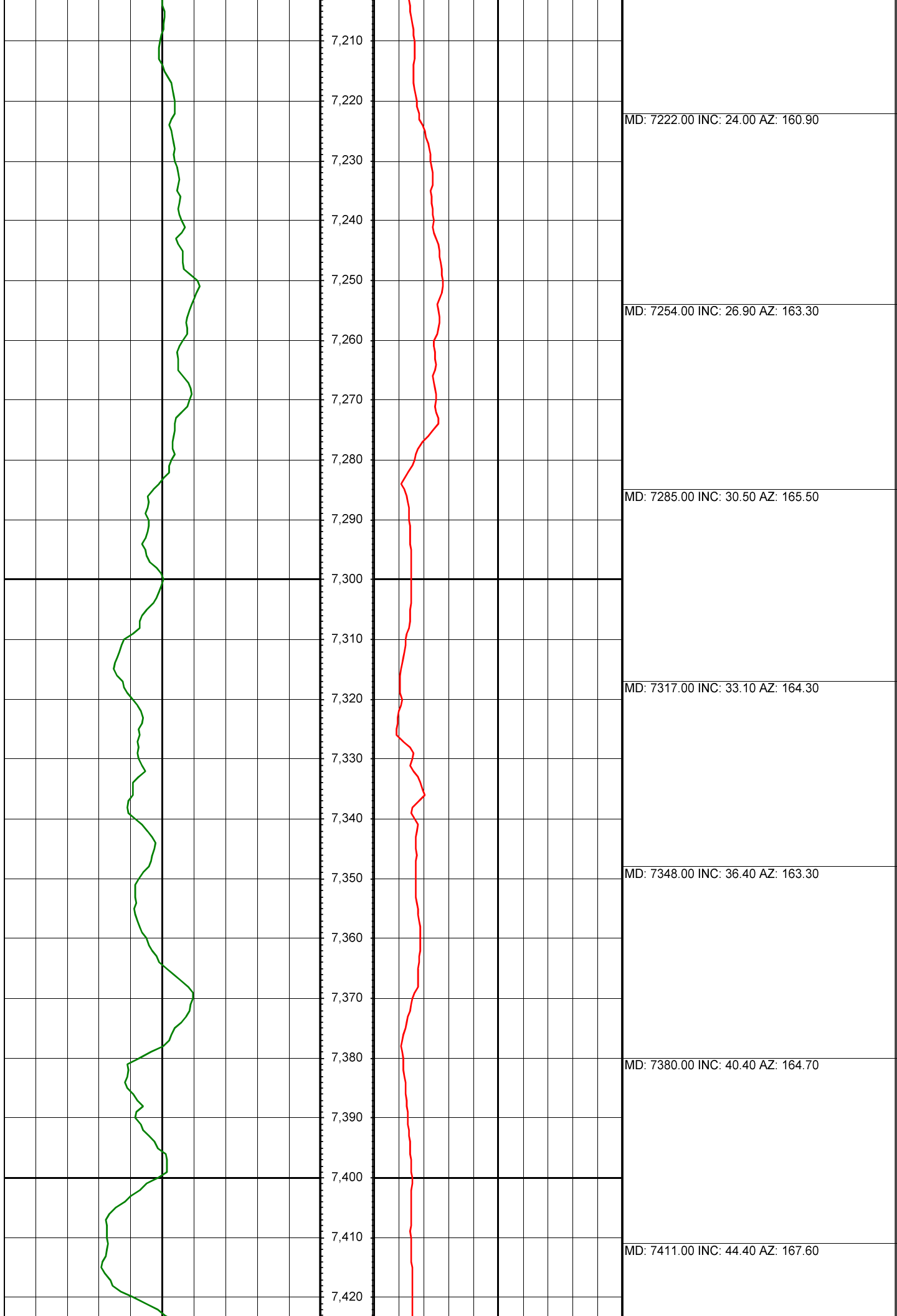
MD: 6560.00 INC: 9.00 AZ: 22.40

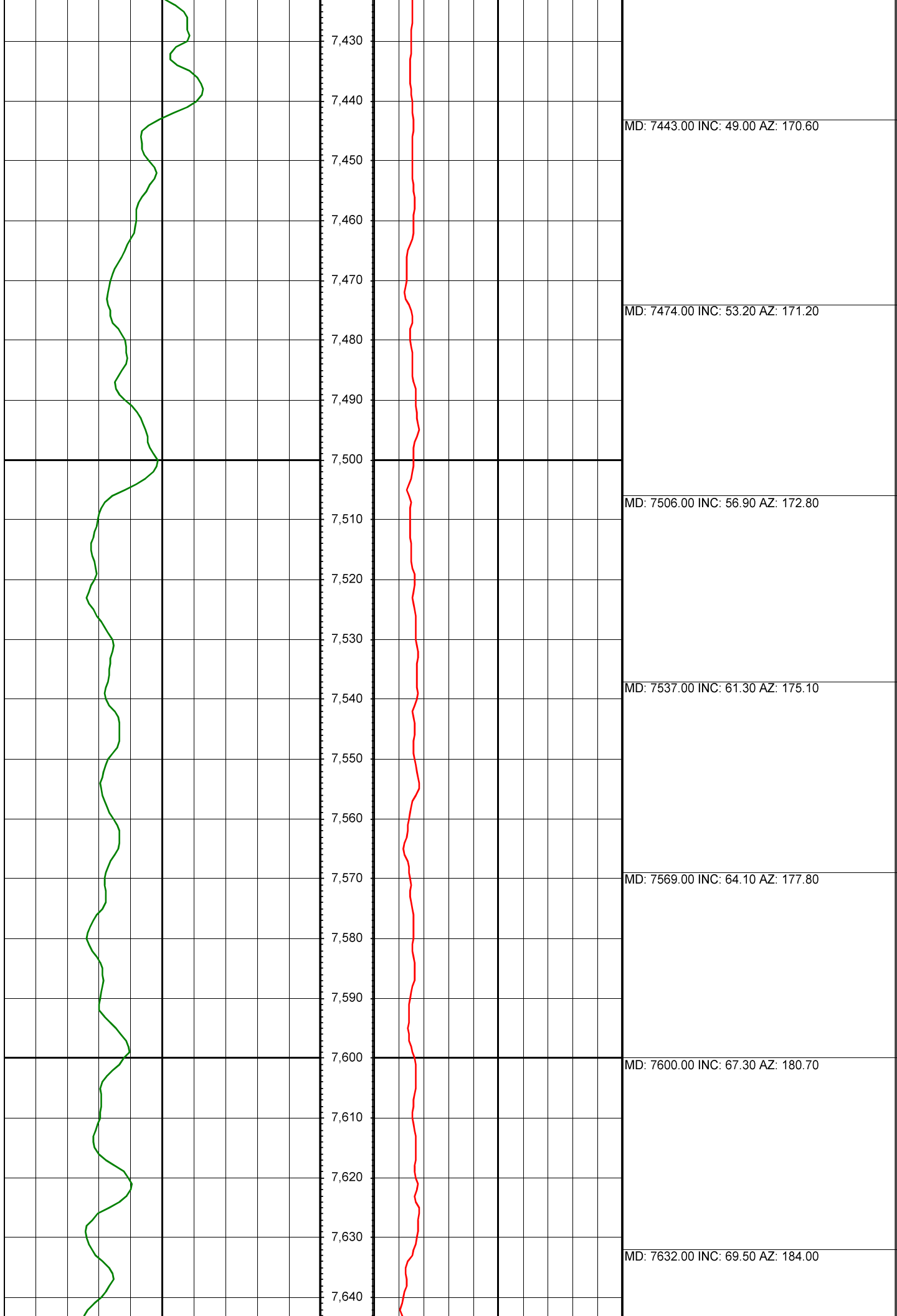
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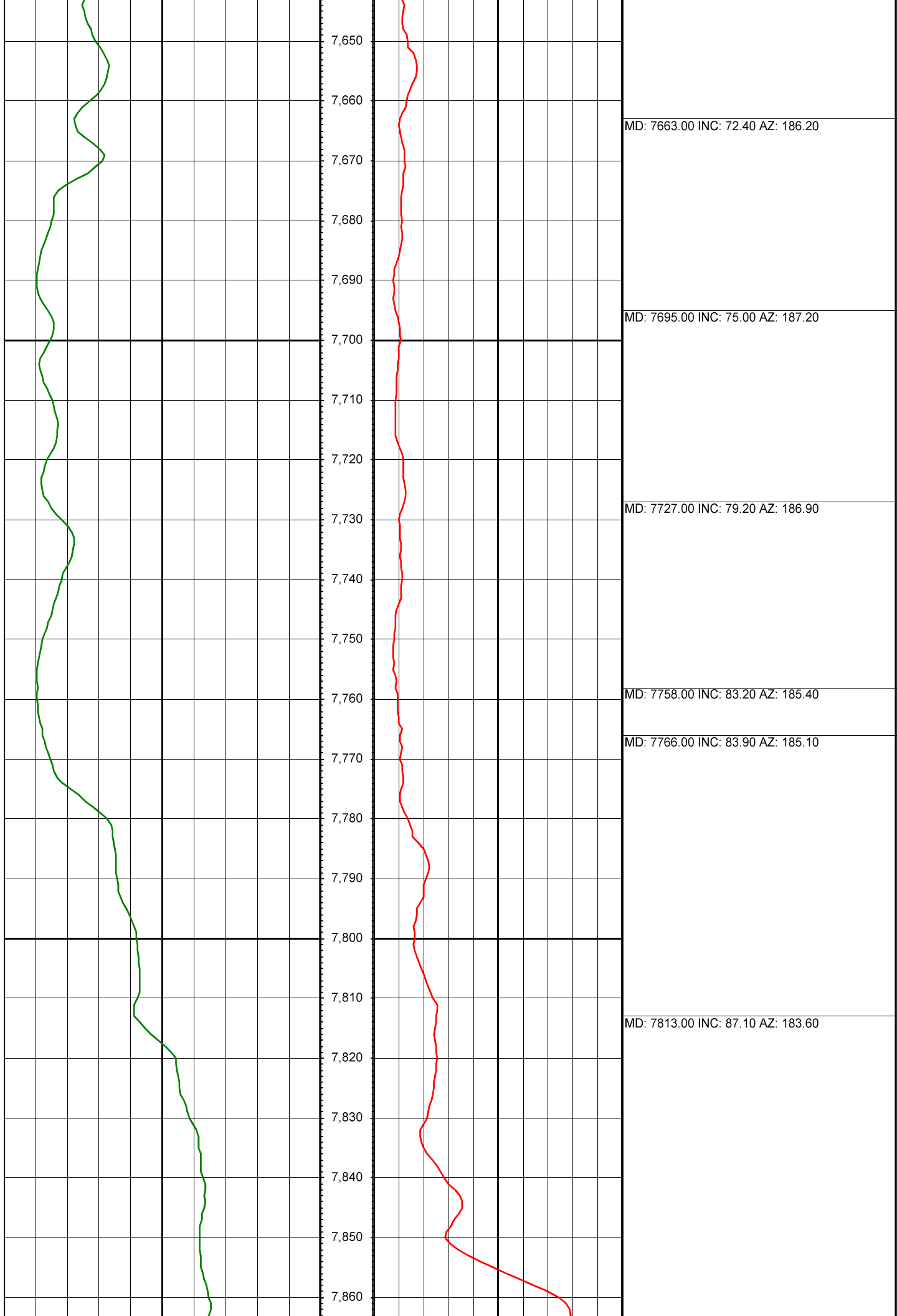
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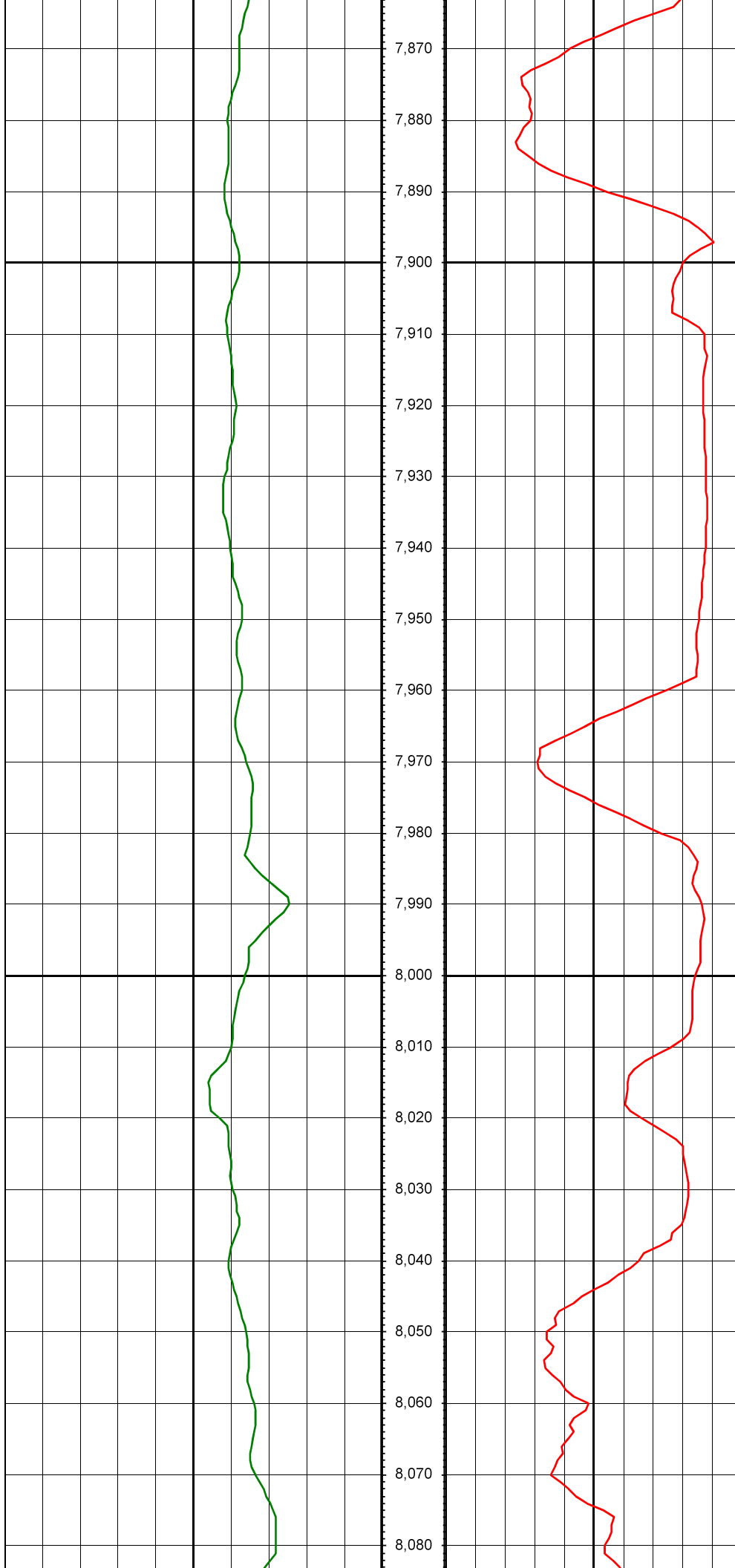






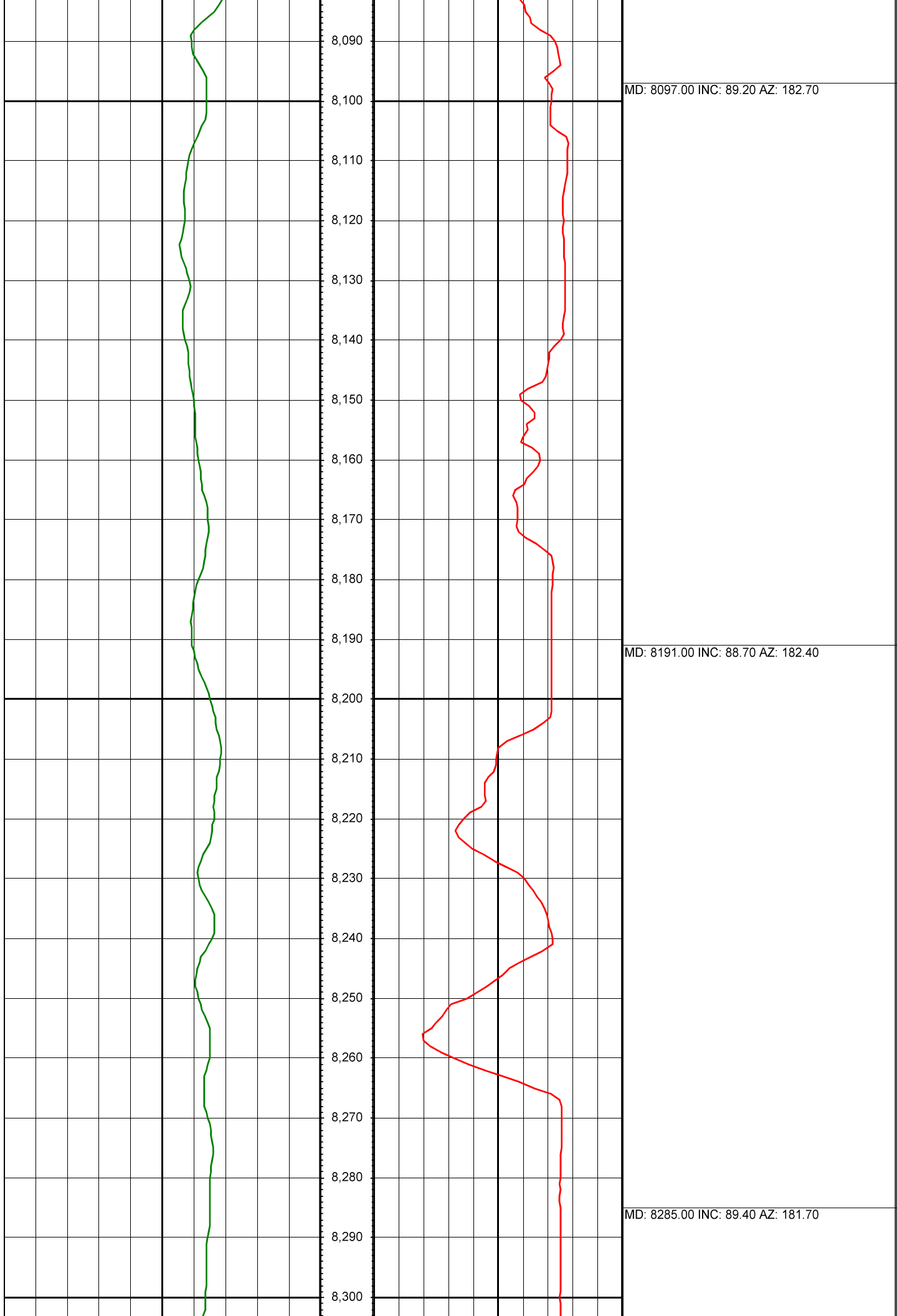




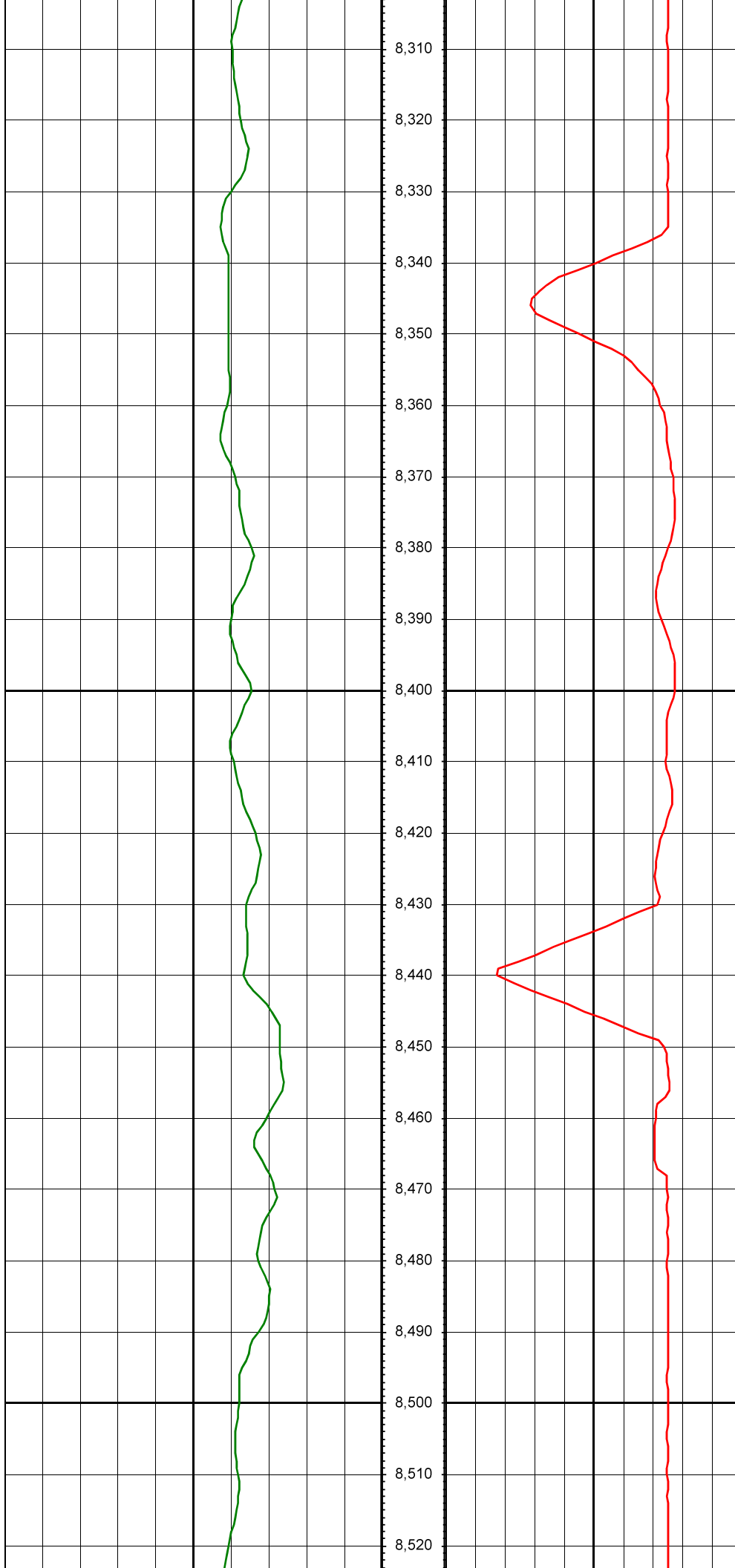


MD: 7907.00 INC: 90.80 AZ: 181.30

MD: 8002.00 INC: 89.30 AZ: 181.90

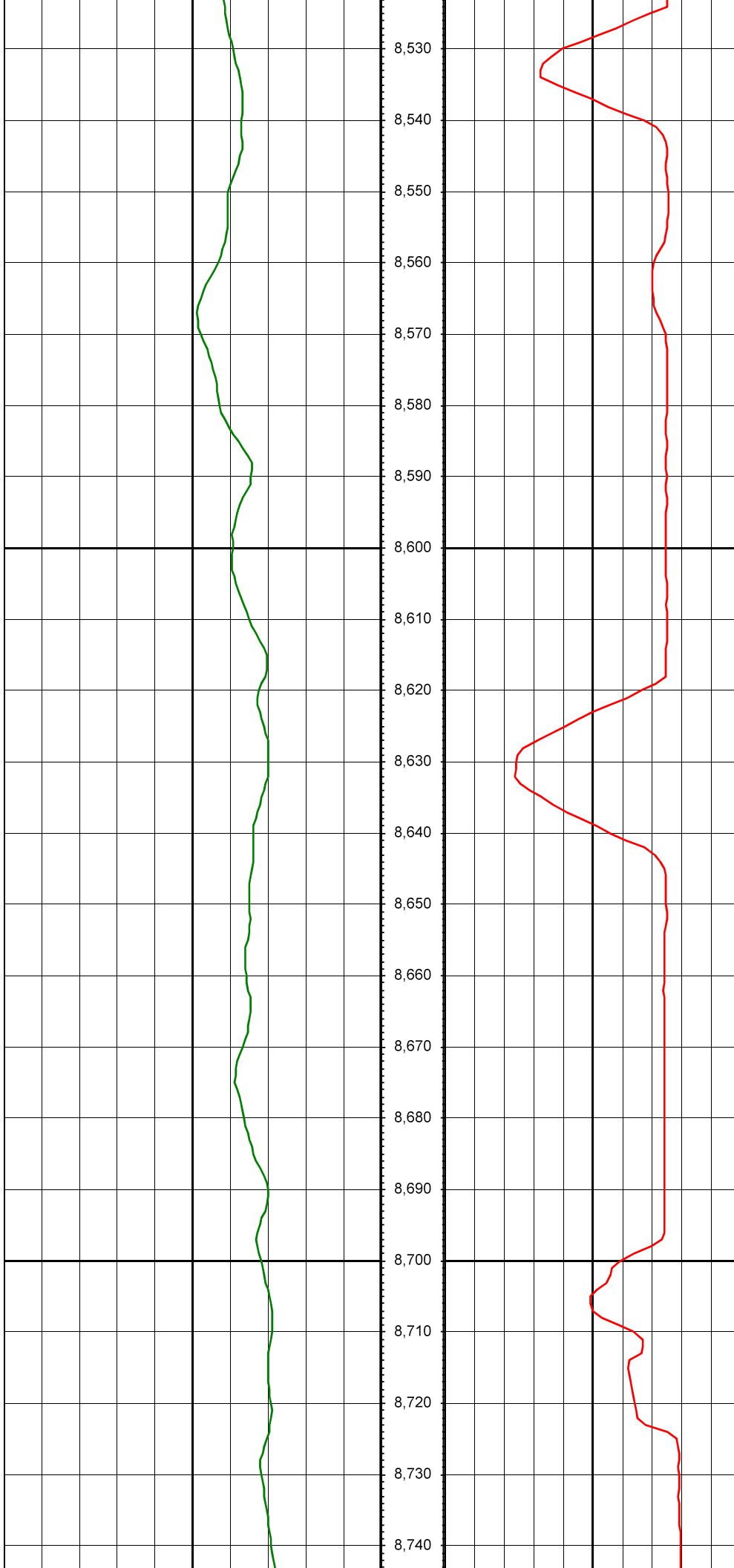






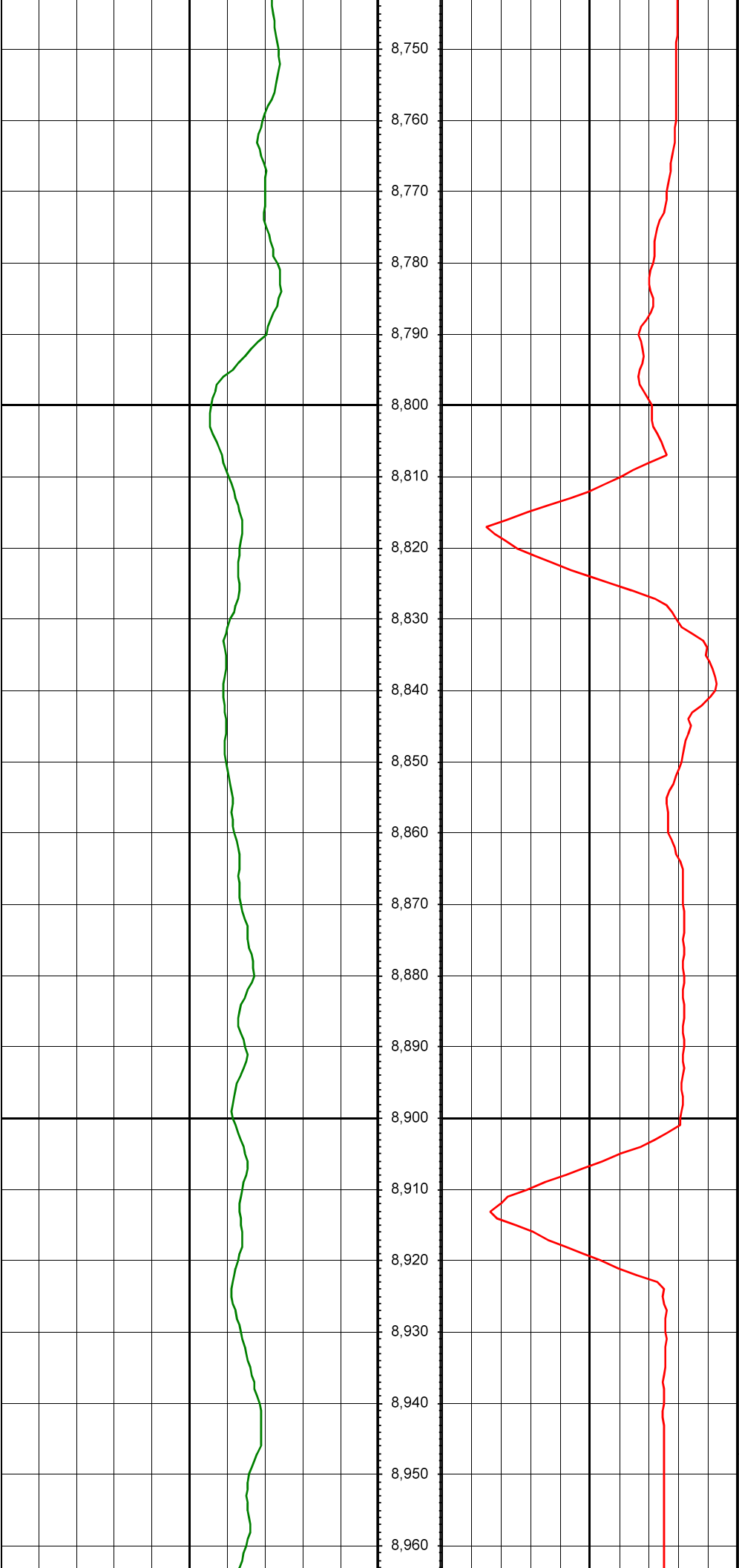
MD: 8380.00 INC: 90.60 AZ: 181.40

MD: 8474.00 INC: 88.80 AZ: 179.60



MD: 8569.00 INC: 88.40 AZ: 179.40

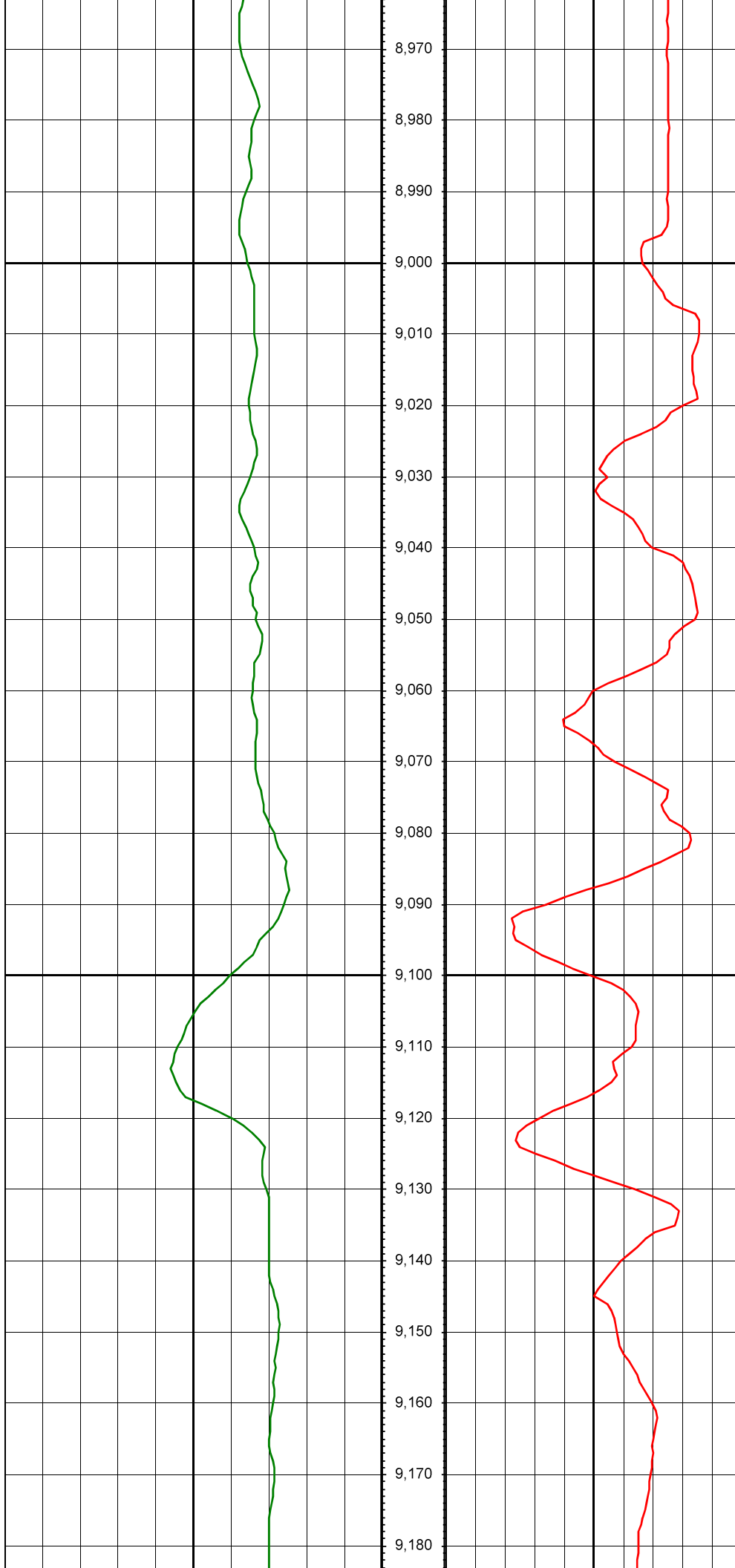
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MD: 8758.00 INC: 89.70 AZ: 180.50

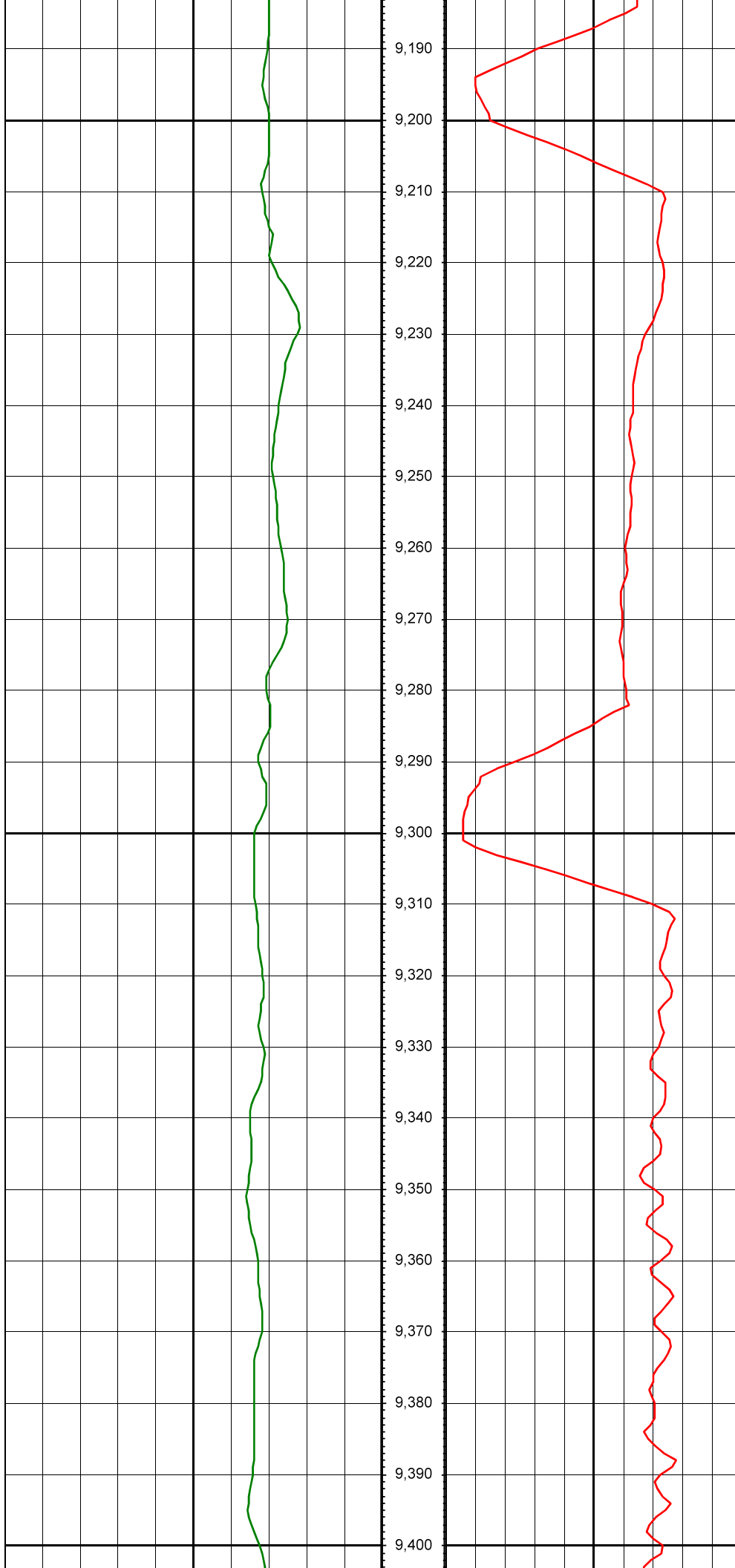
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MD: 8947.00 INC: 90.50 AZ: 181.70



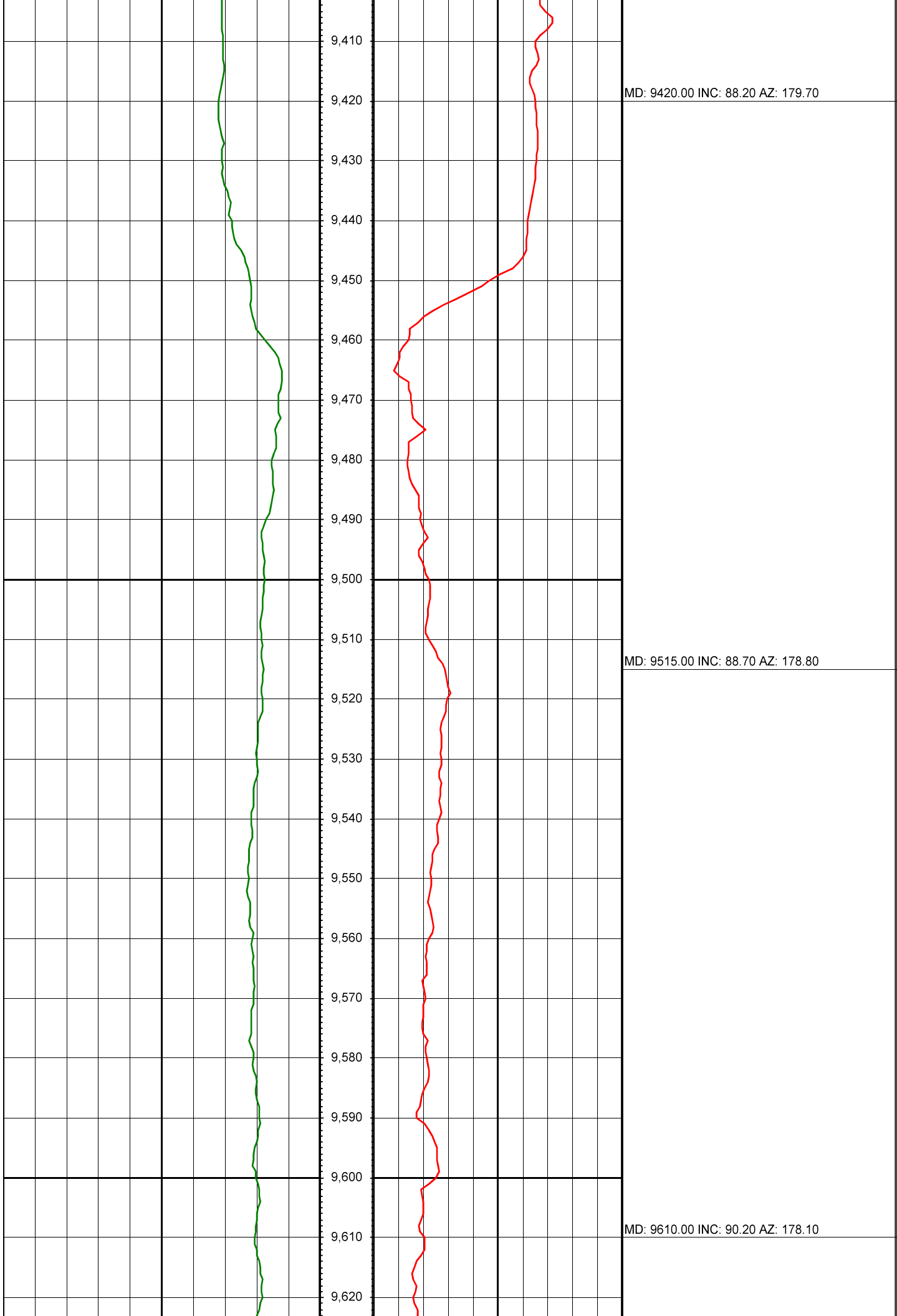
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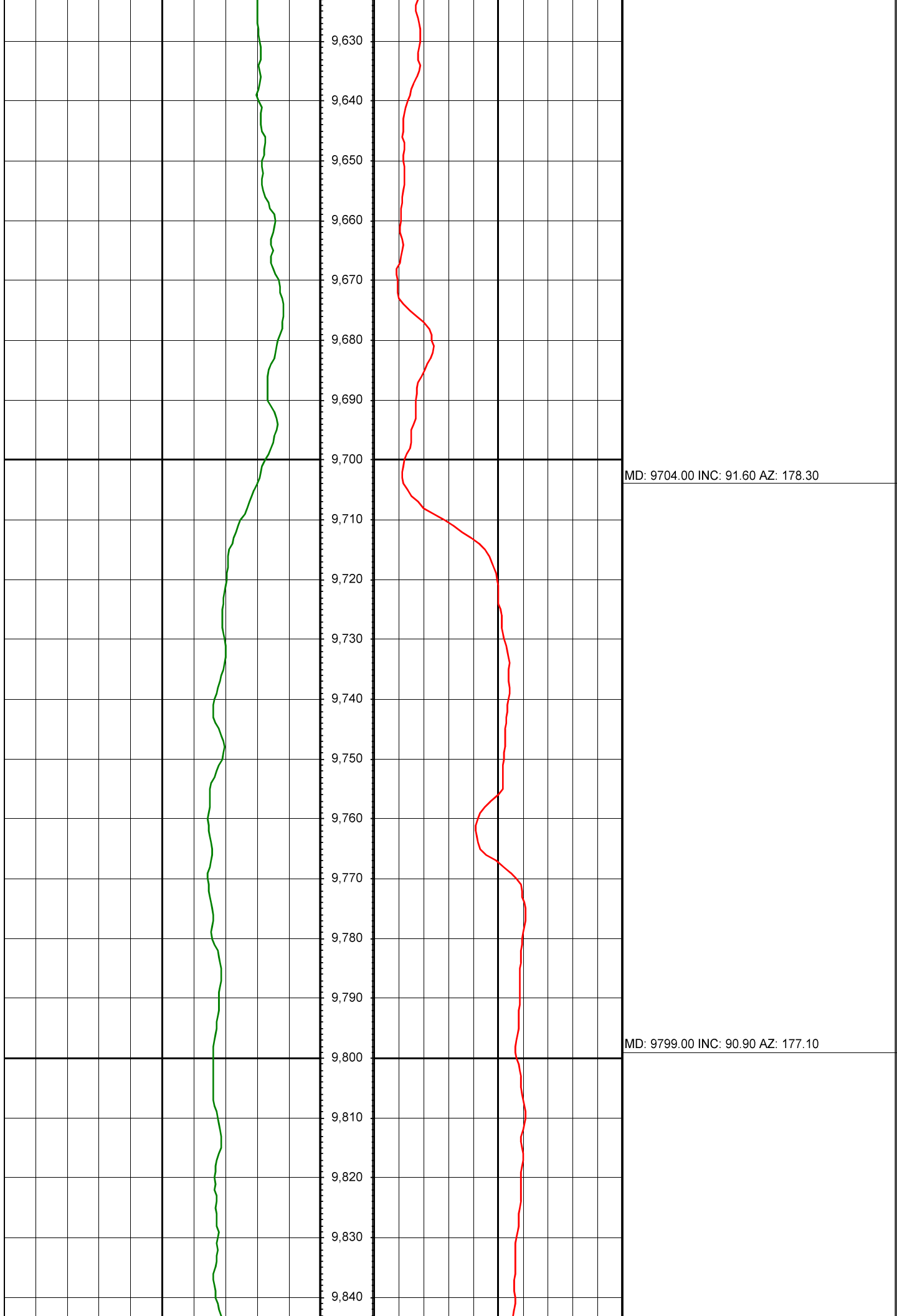
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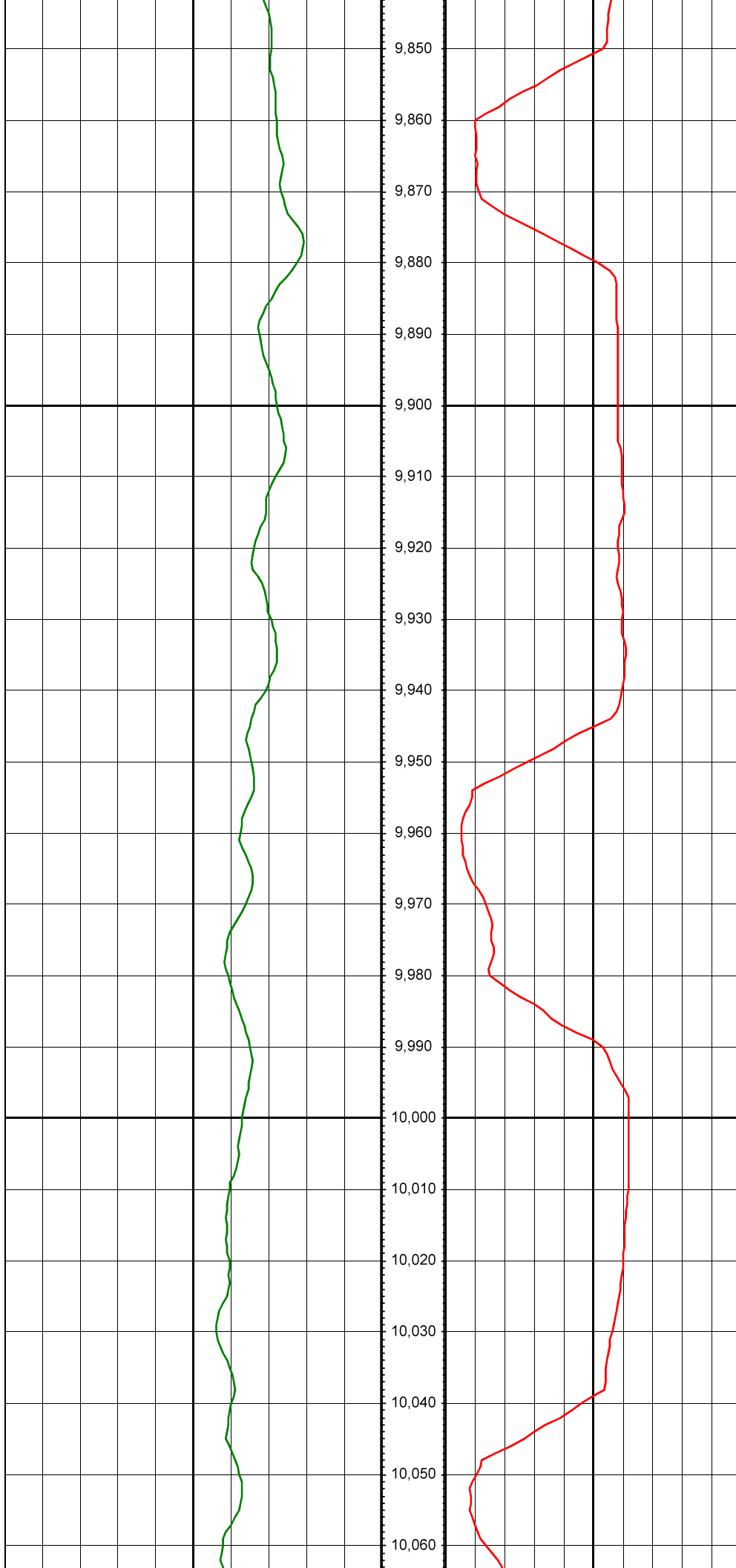


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MD: 9326.00 INC: 89.30 AZ: 180.10



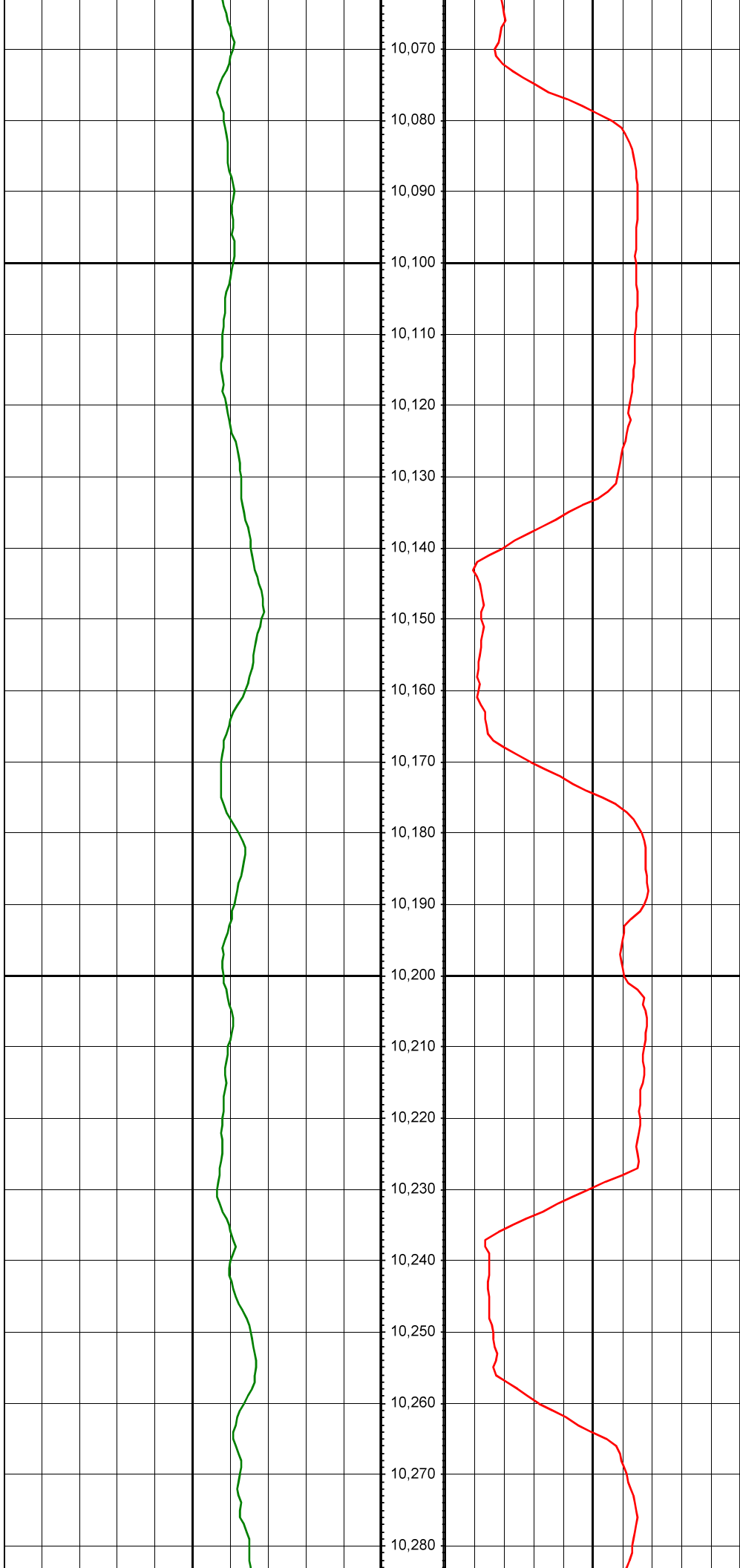




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MD: 9988.00 INC: 91.60 AZ: 179.60



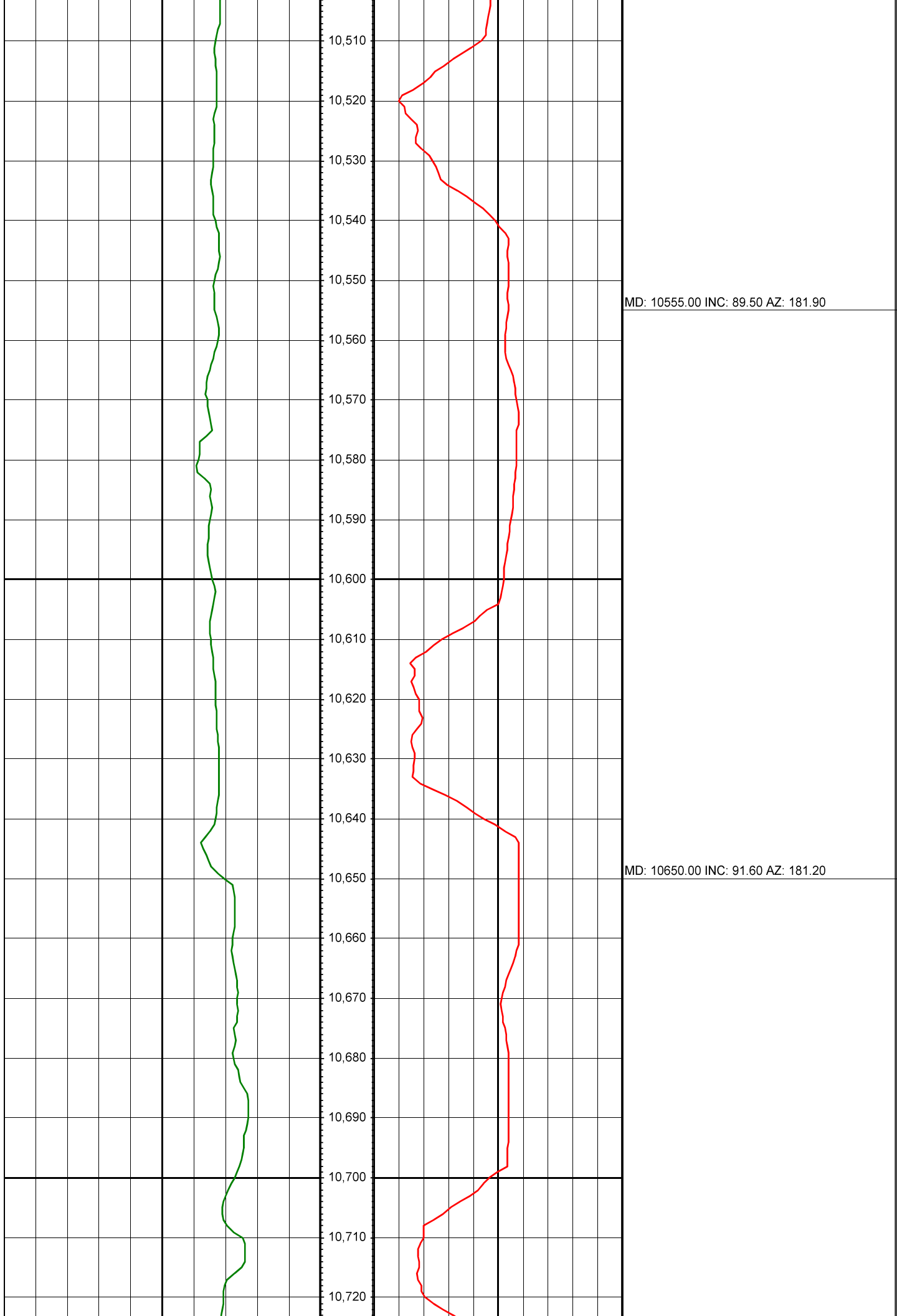


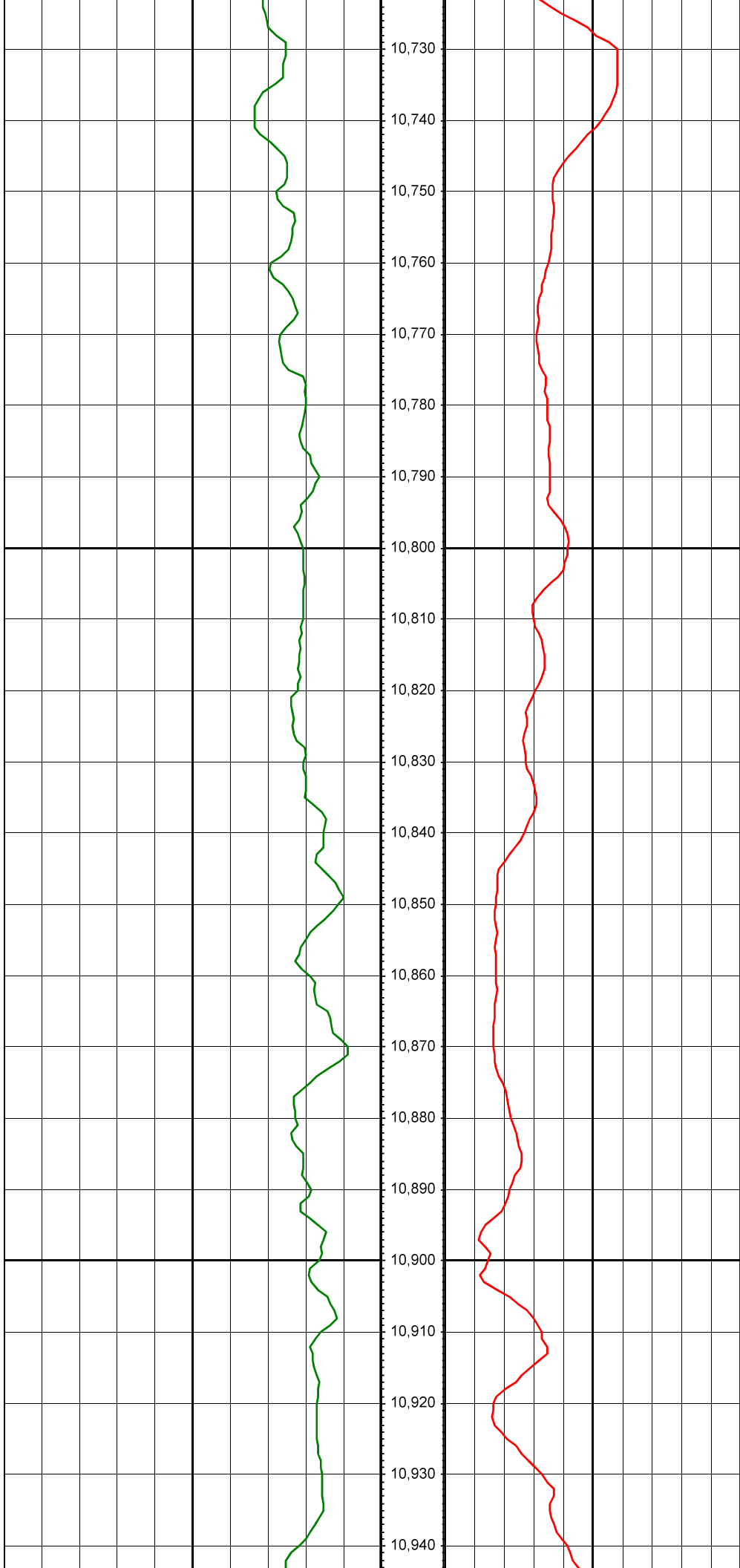
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MD: 10177.00 INC: 88.40 AZ: 179.40

MD: 10272.00 INC: 91.90 AZ: 178.70



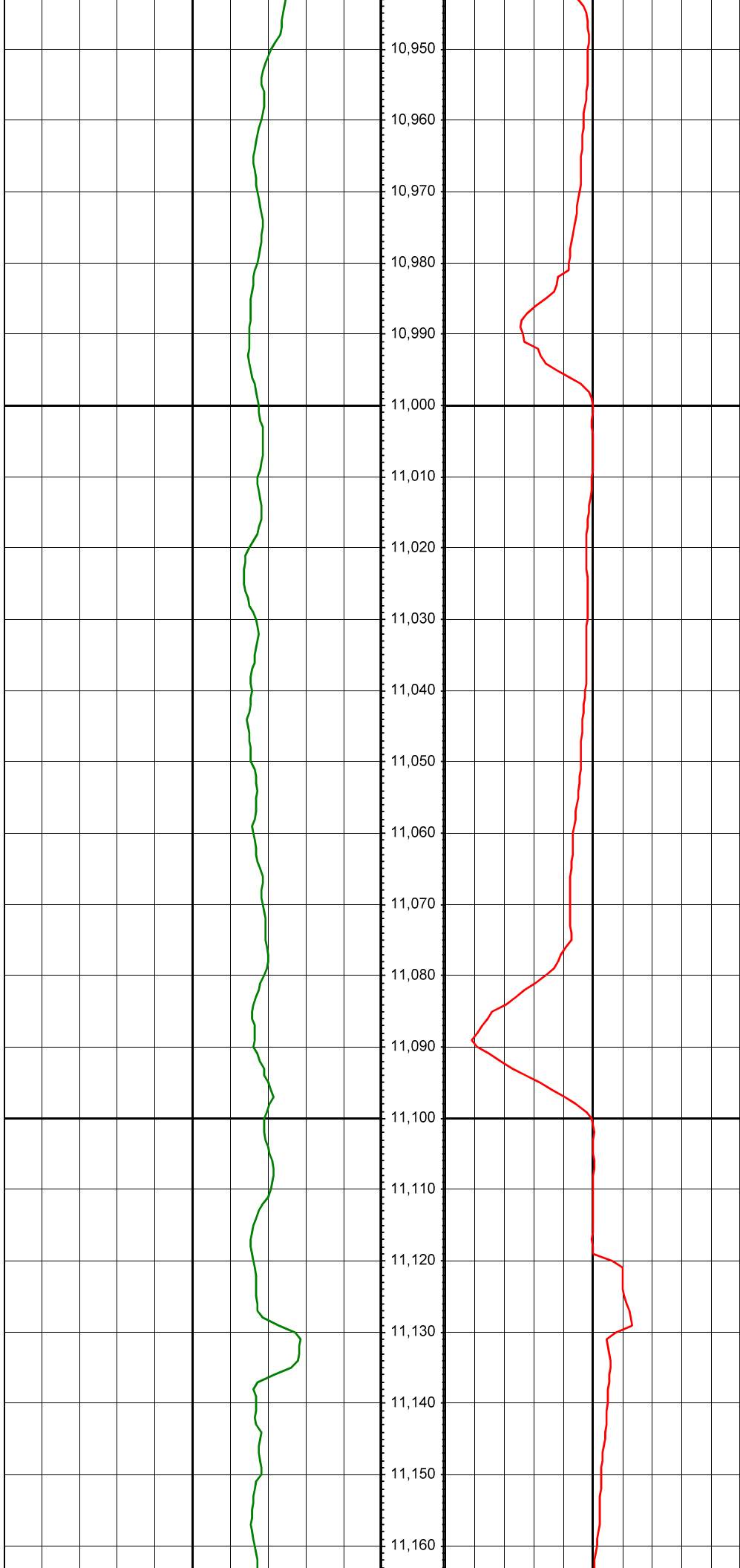




MD: 10744.00 INC: 89.80 AZ: 180.60

MD: 10839.00 INC: 89.10 AZ: 180.50

MD: 10934.00 INC: 91.10 AZ: 180.00



MD: 11029.00 INC: 90.90 AZ: 180.10

MD: 11123.00 INC: 90.90 AZ: 179.30



MD: 11218.00 INC: 91.10 AZ: 178.20

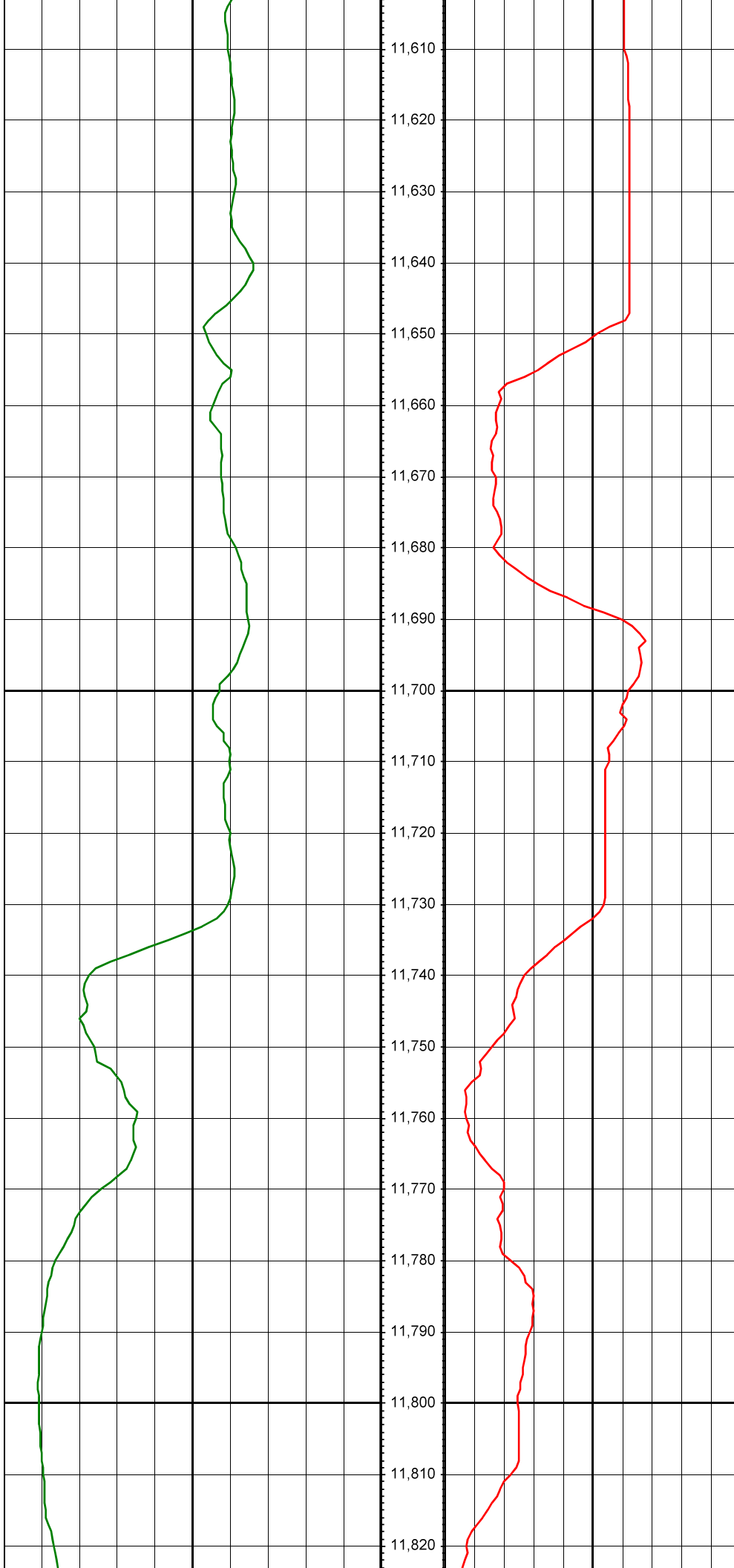
MD: 11312.00 INC: 91.20 AZ: 176.90



MD: 11407.00 INC: 92.10 AZ: 178.10

MD: 11502.00 INC: 91.90 AZ: 176.60

MD: 11596.00 INC: 90.40 AZ: 176.00



MD: 11691.00 INC: 92.30 AZ: 176.60

MD: 11785.00 INC: 92.60 AZ: 176.60



