FLORENCE COPPER

FLORENCE COPPER INC.
1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

December 14, 2021

David Albright
Manager, Groundwater Protection Section
USEPA Region 9 (WTR-4-2)
75 Hawthorne Street
San Francisco, CA 94105

Re: Transmittal of Quarterly Temperature Logging Summary, Q4 2021
Production Test Facility Westbay Wells: WB-01, WB-02, WB-03, and WB-04
Florence Copper Project, Florence Arizona

Dear Mr. Albright:

Florence Copper Inc. herewith transmits the enclosed Technical Memorandum, *Quarterly Temperature Logging Summary, Q4 2021, Production Test Facility Westbay Wells: WB-01, WB-02, WB-03, and WB-04, Florence Copper Project, Florence Arizona.*

Please contact me at 520-316-3710 if you require any additional information.

Sincerely,
Florence Copper Inc.

Brent Berg
General Manager

cc: Nancy Rumrill, U.S. Environmental Protection Agency

Enclosure

FLORENCE COPPER

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1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

TECHNICAL MEMORANDUM

TO: David Albright
USEPA Region 9

FROM: Brent Berg
Florence Copper

DATE: December 14, 2021

SUBJECT: Quarterly Temperature Logging Summary, Q4 2021
Production Test Facility Westbay Wells: WB-01, WB-02, WB-03, and WB-04
Florence Copper Inc., Florence, Arizona

Introduction

This Technical Memorandum presents the results of temperature logging for Production Test Facility (PTF) Westbay wells WB-01, WB-02, WB-03, and WB-04 during November 2021 for Florence Copper Inc. (Florence Copper) in Florence, Arizona. Westbay wells WB-01, WB-02, WB-03, and WB-04 are located within the Underground Injection Control (UIC) Permitted Area of Review for UIC Permit R9UIC-AZ3-FY11-1 and were completed as Class III multi-level monitoring wells for the PTF (Figure 1).

Florence Copper contracted Southwest Exploration Services, LLC to perform temperature logging to verify the absence of fluid movement through vertical channels adjacent to the well, in accordance with the 25 July 2019 UIC Permit Minor Modification.

Wells Logged

Florence Copper completed temperature logging of Westbay wells WB-01, WB-02, WB-03, and WB-04. Temperature runs were completed at least 4 hours apart after the wells had been shut in for 24 hours. The temperature logs were performed as listed in the following table.

Well ID	Temperature Log Date	Temperature Log Run 1 Time	Temperature Log Run 2 Time
WB-01	11/09/2021	8:15 AM	1:50 PM
WB-02	11/09/2021	9:15 PM	2:30 PM
WB-03	11/09/2021	10:00 PM	3:20 PM
WB-04	11/09/2021	10:40 PM	4:05 PM

As-built diagrams of the Westbay wells are provided in Appendix A and the temperature logs are provided in Appendix B. Daily average flow rates for the injection and recovery wells, and daily average water level elevations for the recovery and observation wells, are provided in Appendix C for the day temperature logs were conducted.

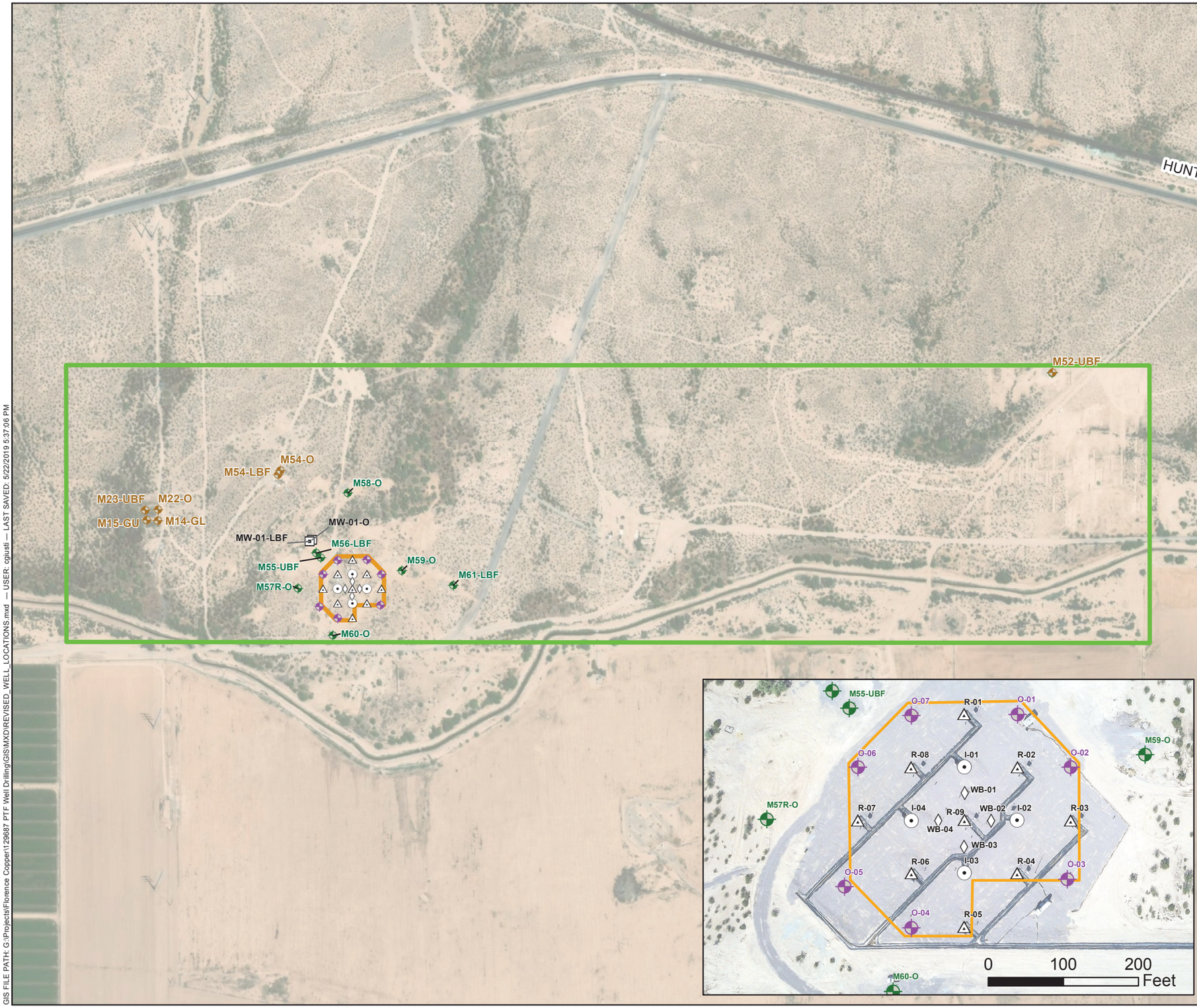
Findings

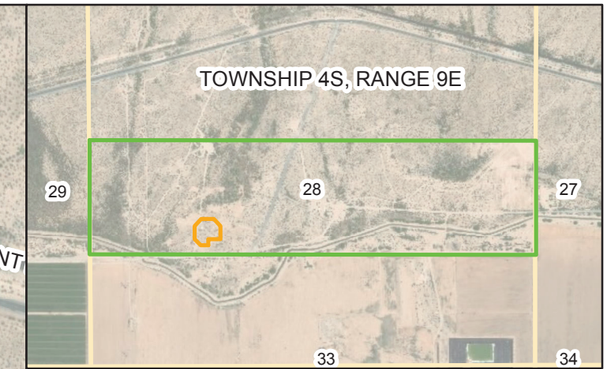
The temperature logging results for Westbay wells WB-01, WB-02, WB-03, and WB-04 show no anomalies that would indicate that there is flow behind the well casings. The temperature logs for each logging event reflect similar instrument readings for both the initial and secondary runs, resulting in parallel temperature traces on each of the log records for the entirety of the well.

Enclosures:

Figure 1 – Well Locations
Appendix A – Westbay Well As-Built Diagrams
Appendix B – Q4 2021 Temperature Logs
Appendix C – Daily Average Flow Rates and Water Level Elevations

FIGURE





0 1,000 2,000 Feet

LEGEND

- INJECTION WELL
- RECOVERY WELL
- WESTBAY WELL
- OPERATIONAL WELL
- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINY-OF-COMPLIANCE WELL
- STATE LAND LEASE
- PTF WELLFIELD

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE
2. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

WELL LOCATIONS

FLORENCE COPPER

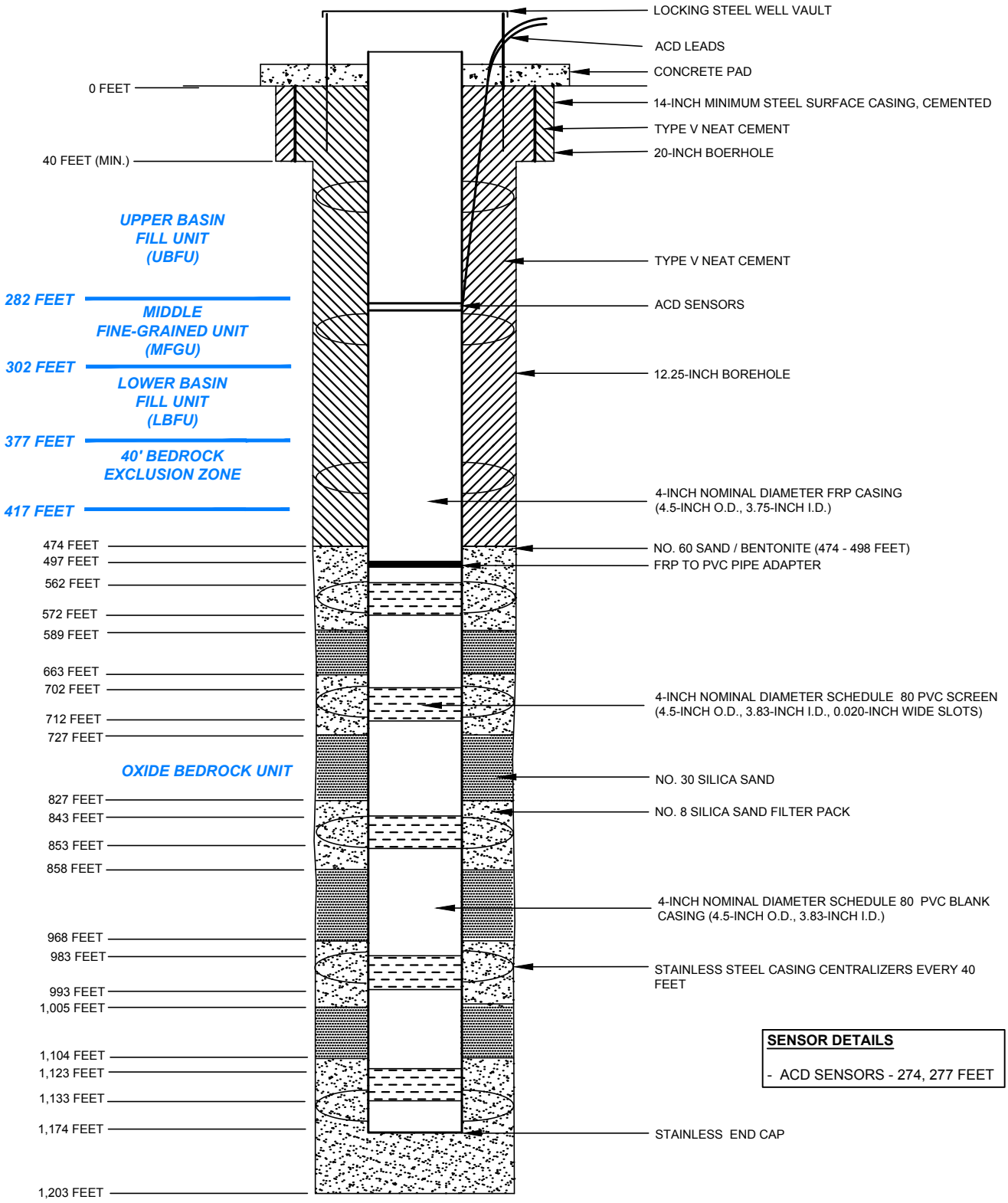
JUNE 2020

FIGURE 1

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\MXD\REVISED_WELL_LOCATIONS.mxd — USER: cgiusti — LAST SAVED: 5/22/2019 5:37:06 PM

APPENDIX A

Westbay Well As-Built Diagrams



SENSOR DETAILS

- ACD SENSORS - 274, 277 FEET

NOTES

1. WELL REGISTRATION NO.: 55-227226
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1479.34 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. ACD = ANNULAR CONDUCTIVITY DEVICE
9. DOWNHOLE EQUIPMENT INSTALLED BY WESTBAY INSTRUMENTS

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

WB-01 WESTBAY WELL
AS-BUILT DIAGRAM

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2

MOBINI, GITA Printed: 8/31/2018 2:54 PM Layout: WB-01
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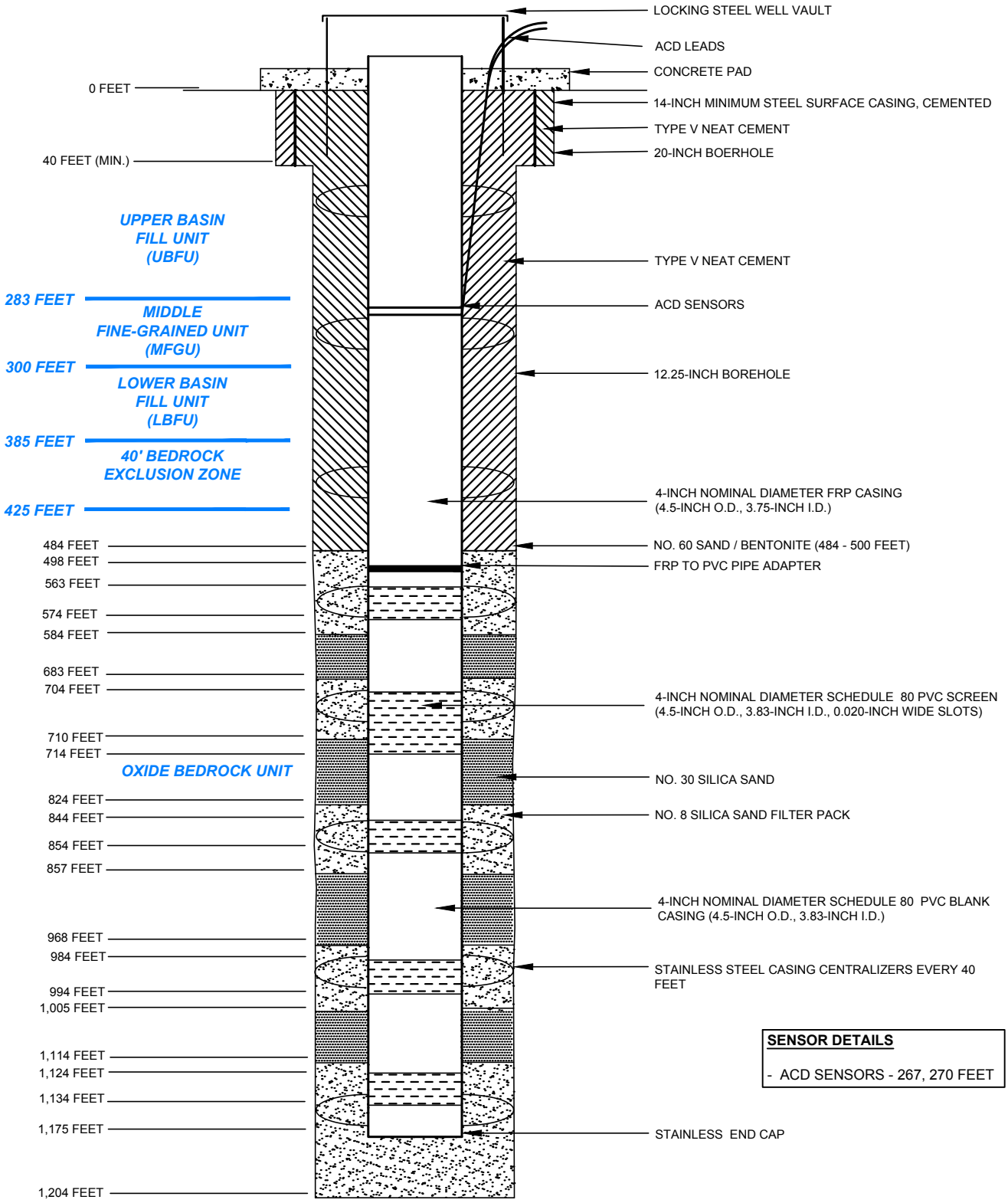

NOTES

1. WELL REGISTRATION NO.: 55-227227
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1478.75 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. ACD = ANNULAR CONDUCTIVITY DEVICE
9. DOWNHOLE EQUIPMENT INSTALLED BY WESTBAY INSTRUMENTS

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FLORENCE COPPER, INC.
FLORENCE, ARIZONA

WB-02 WESTBAY WELL
AS-BUILT DIAGRAM

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2

MOBINI, GITA Printed: 8/31/2018 2:54 PM Layout: WB-02
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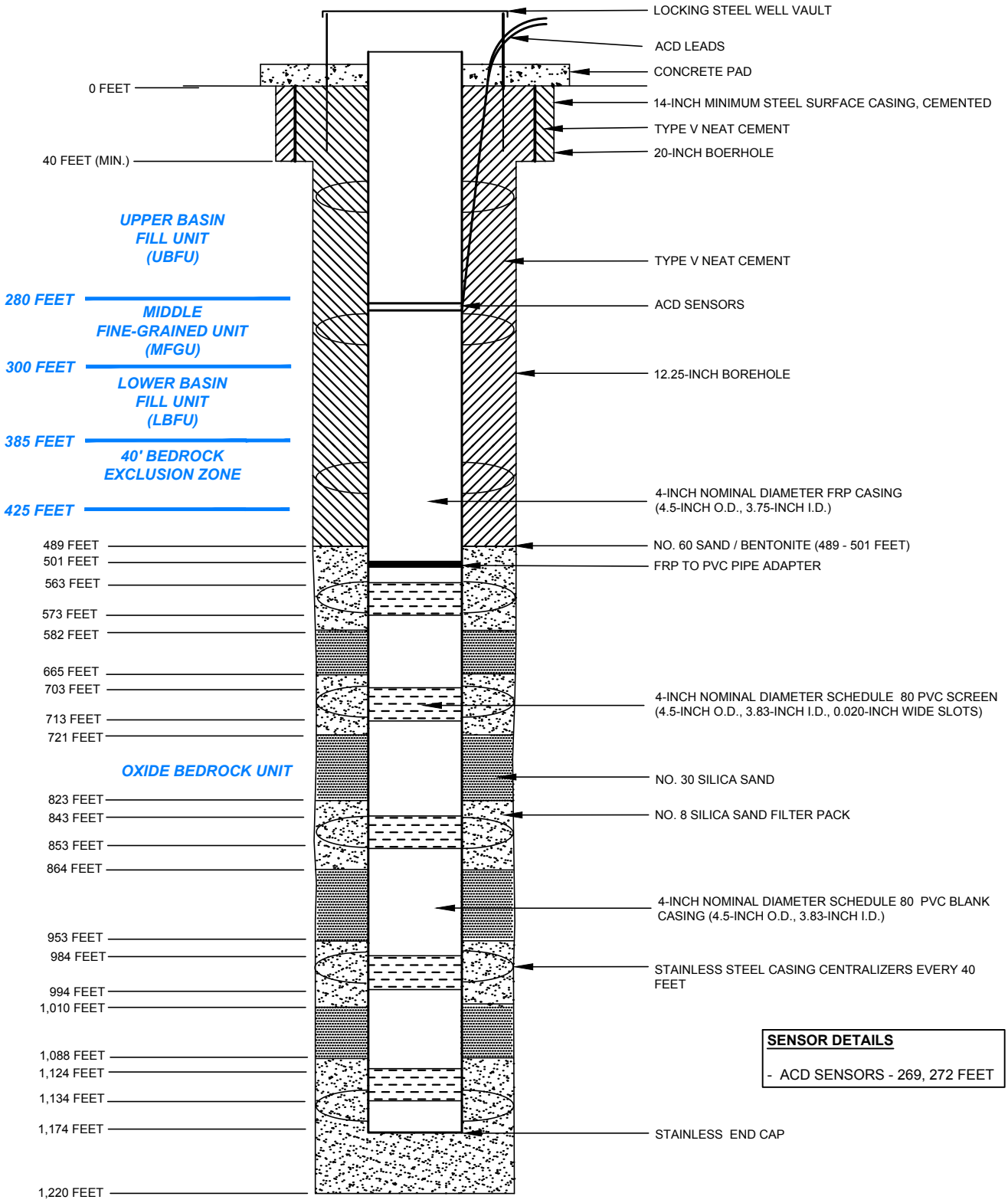

NOTES

1. WELL REGISTRATION NO.: 55-227228
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1478.99 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. ACD = ANNULAR CONDUCTIVITY DEVICE
9. DOWNHOLE EQUIPMENT INSTALLED BY WESTBAY INSTRUMENTS

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

WB-03 WESTBAY WELL
AS-BUILT DIAGRAM

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2

MOBINI, GITA Printed: 8/31/2018 2:54 PM Layout: WB-03
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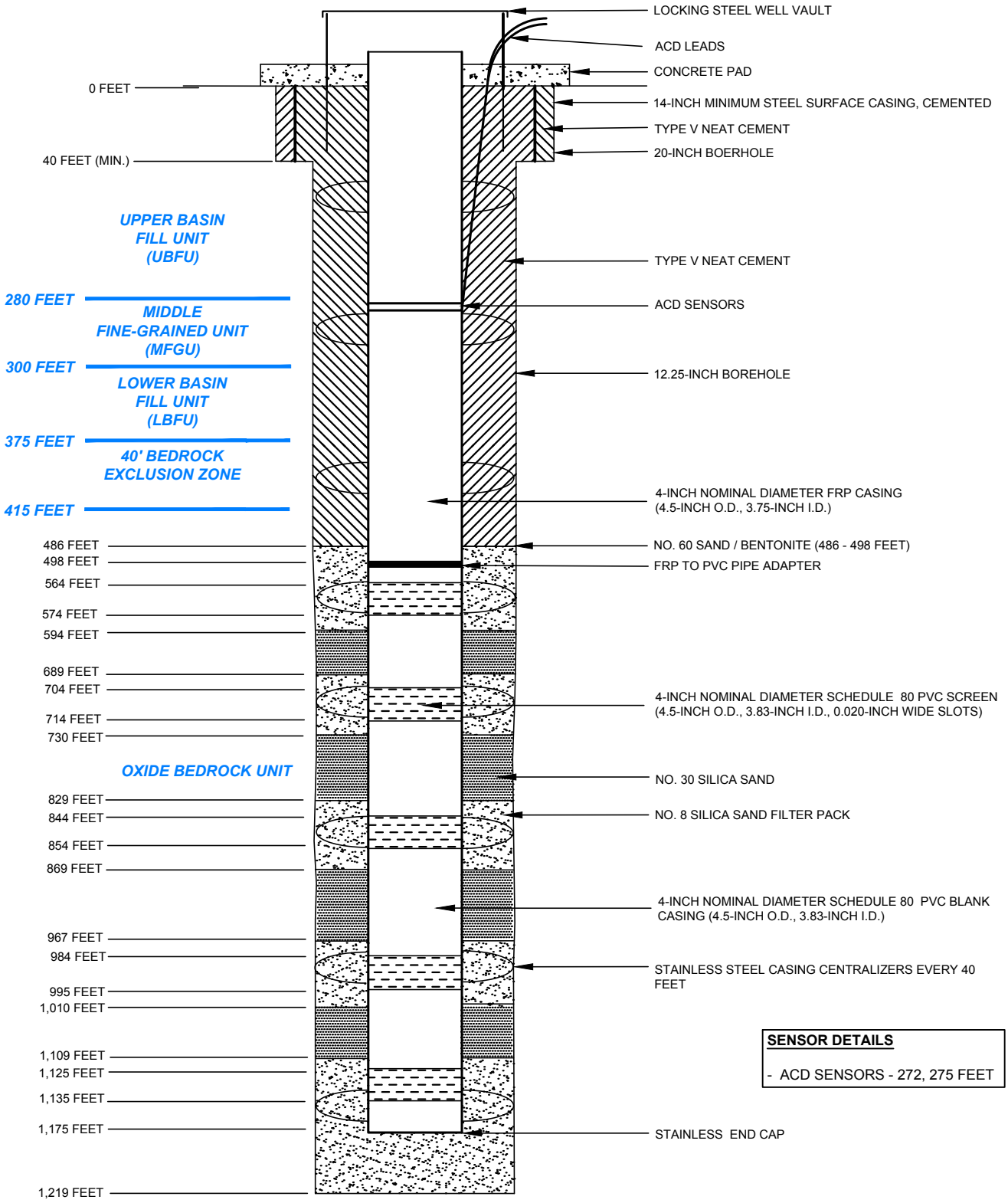

NOTES

1. WELL REGISTRATION NO.: 55-227229
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1479.79 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. ACD = ANNULAR CONDUCTIVITY DEVICE
9. DOWNHOLE EQUIPMENT INSTALLED BY WESTBAY INSTRUMENTS

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

WB-04 WESTBAY WELL
AS-BUILT DIAGRAM

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2

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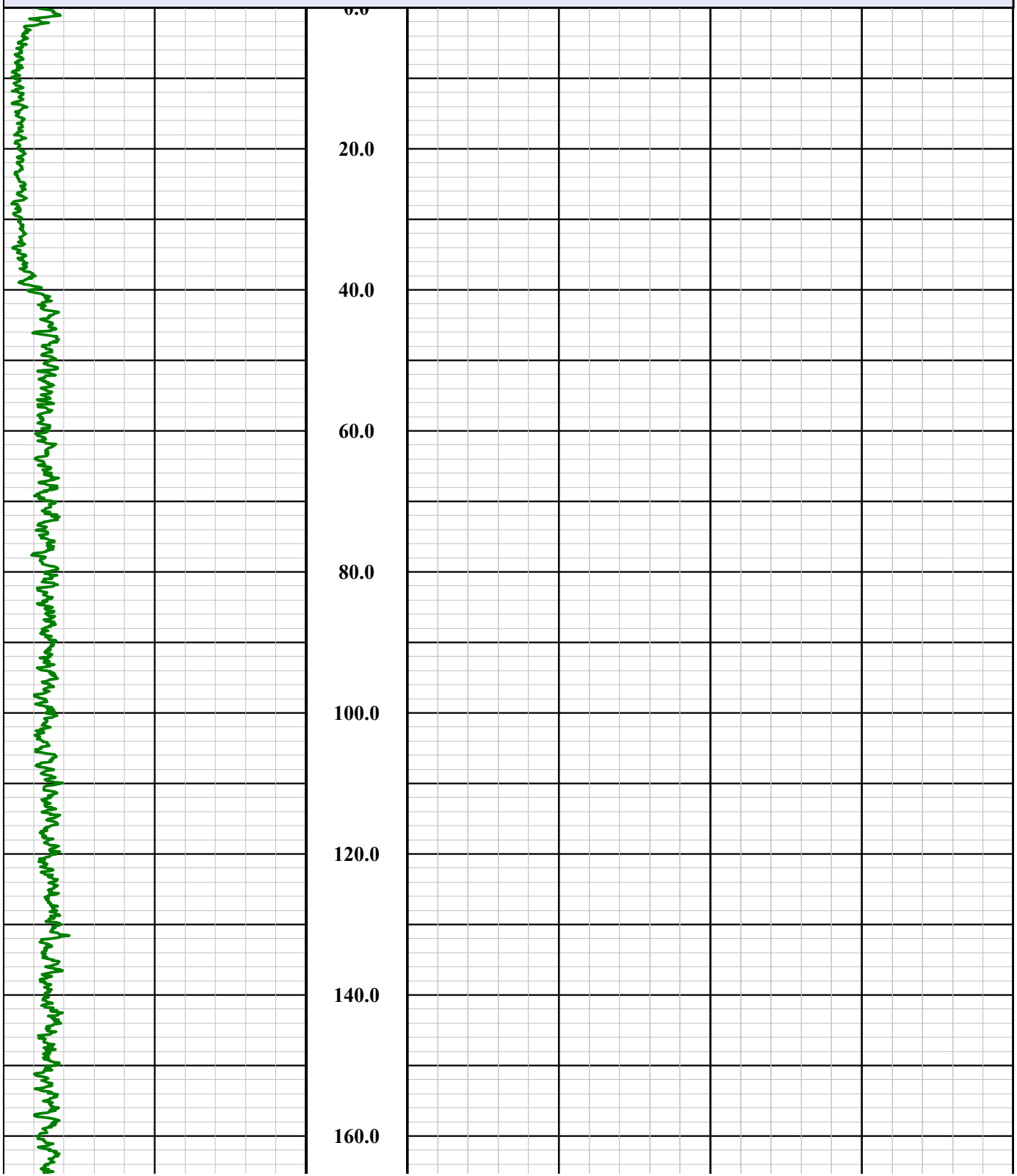
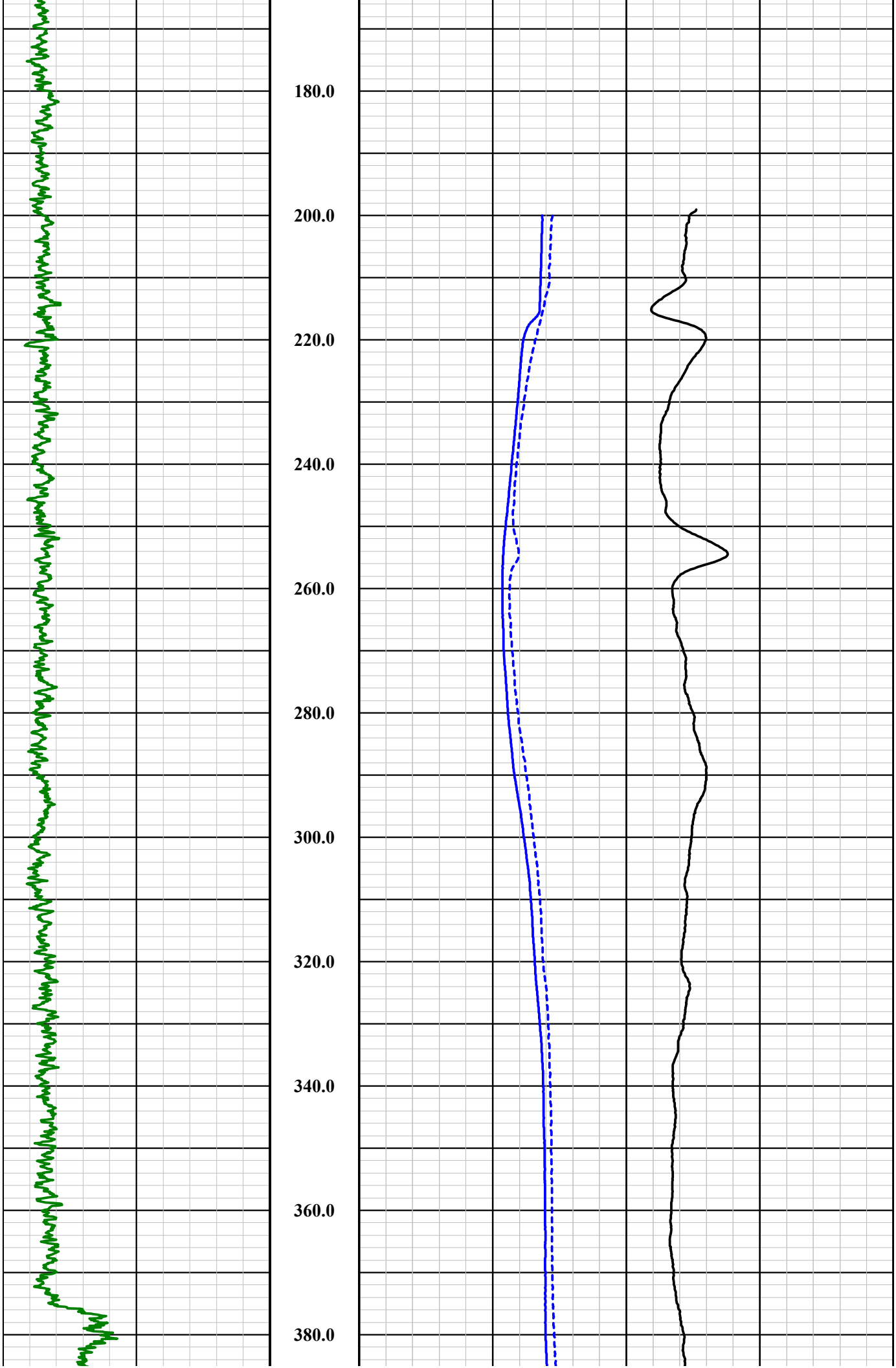
APPENDIX B

Q4 2021 Temperature Logs

Hole Information	Depth 1in:20ft	Temperature (8:15 AM) 60 Deg F 100
Well Name: WB-01 Survey Date: 11-09-21 Elevation: 1478.56 Ft Northing (NAD83): 746167.49 Easting (NAD83): 847695.07 Shut In Time: 24 Hours 0 Min Base of Lowermost USDW: 302 Ft		Temperature (1:50 PM) 60 Deg F 100
		Differential Temperature -3 Deg F 3
Nat. Gamma 0 API 400		

WB-01 Temperature Evaluation

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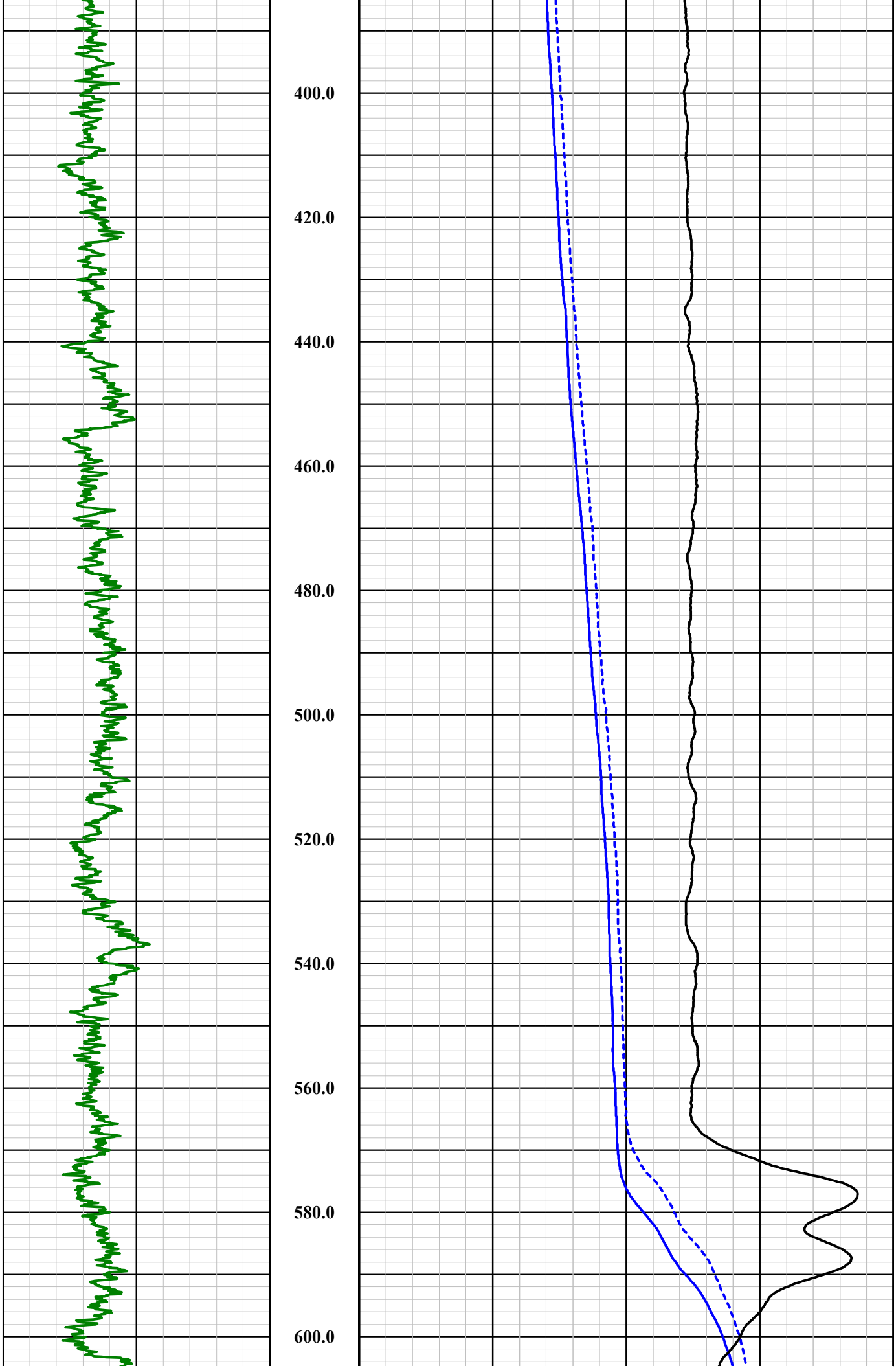
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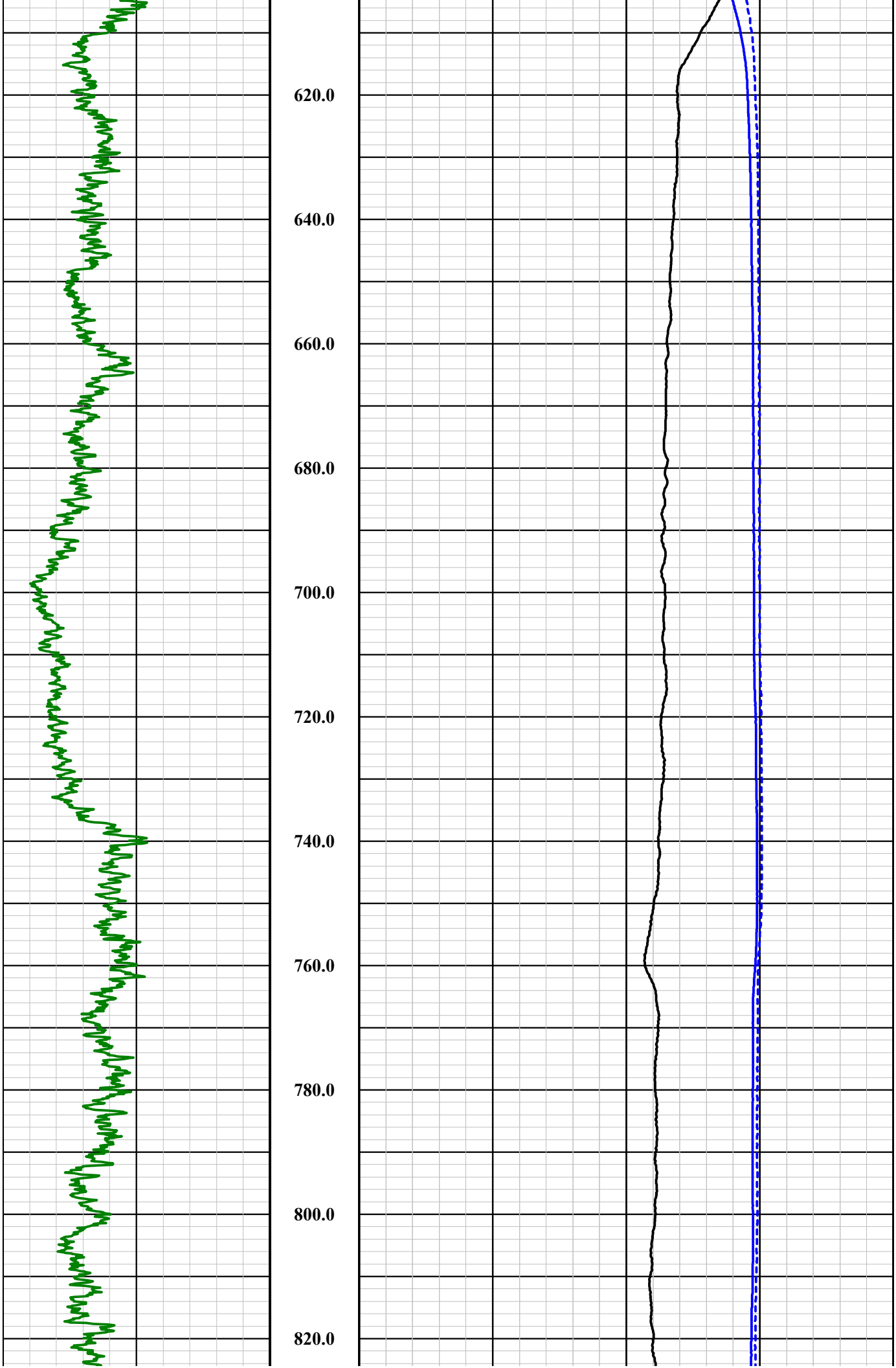
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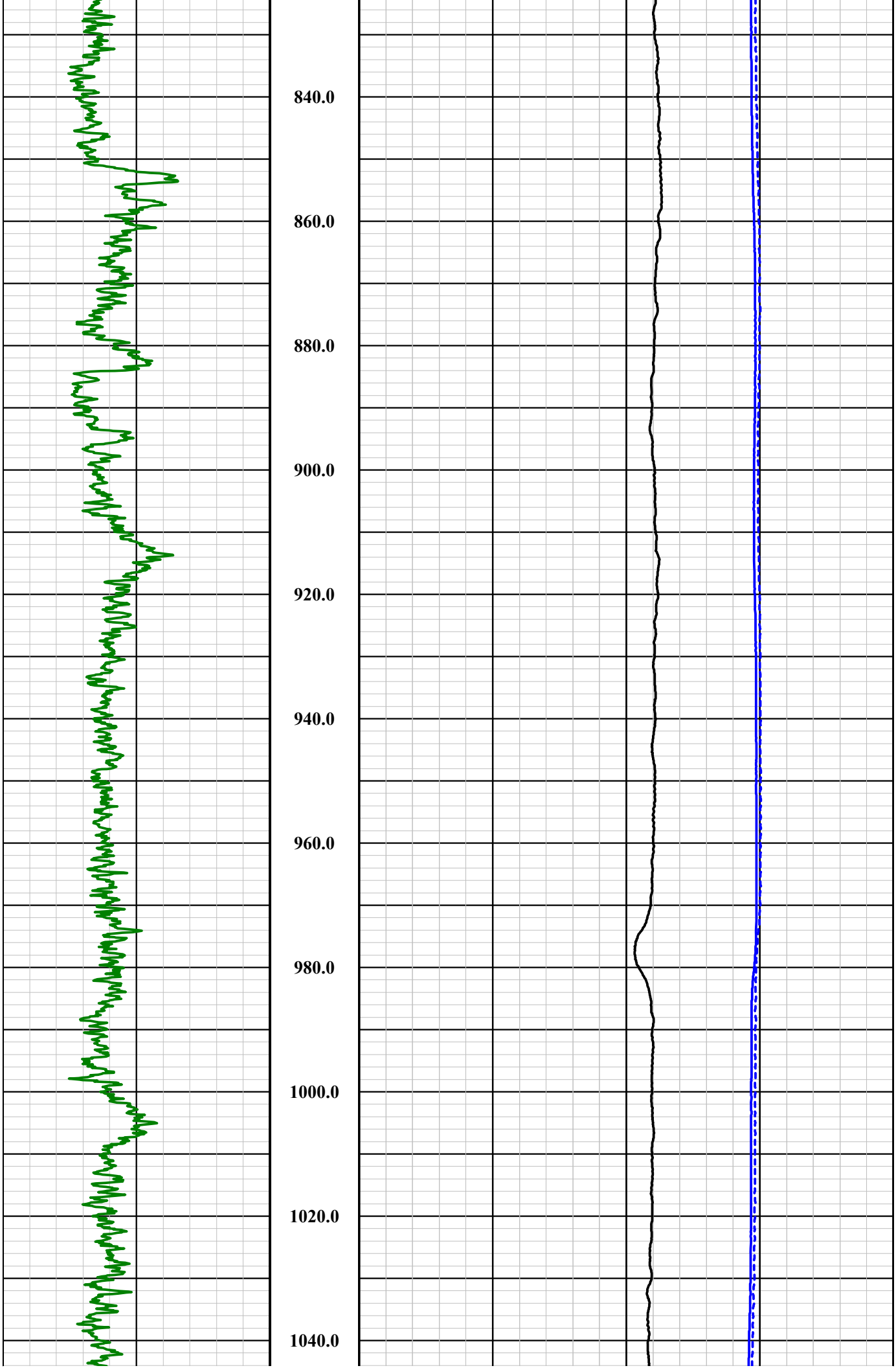
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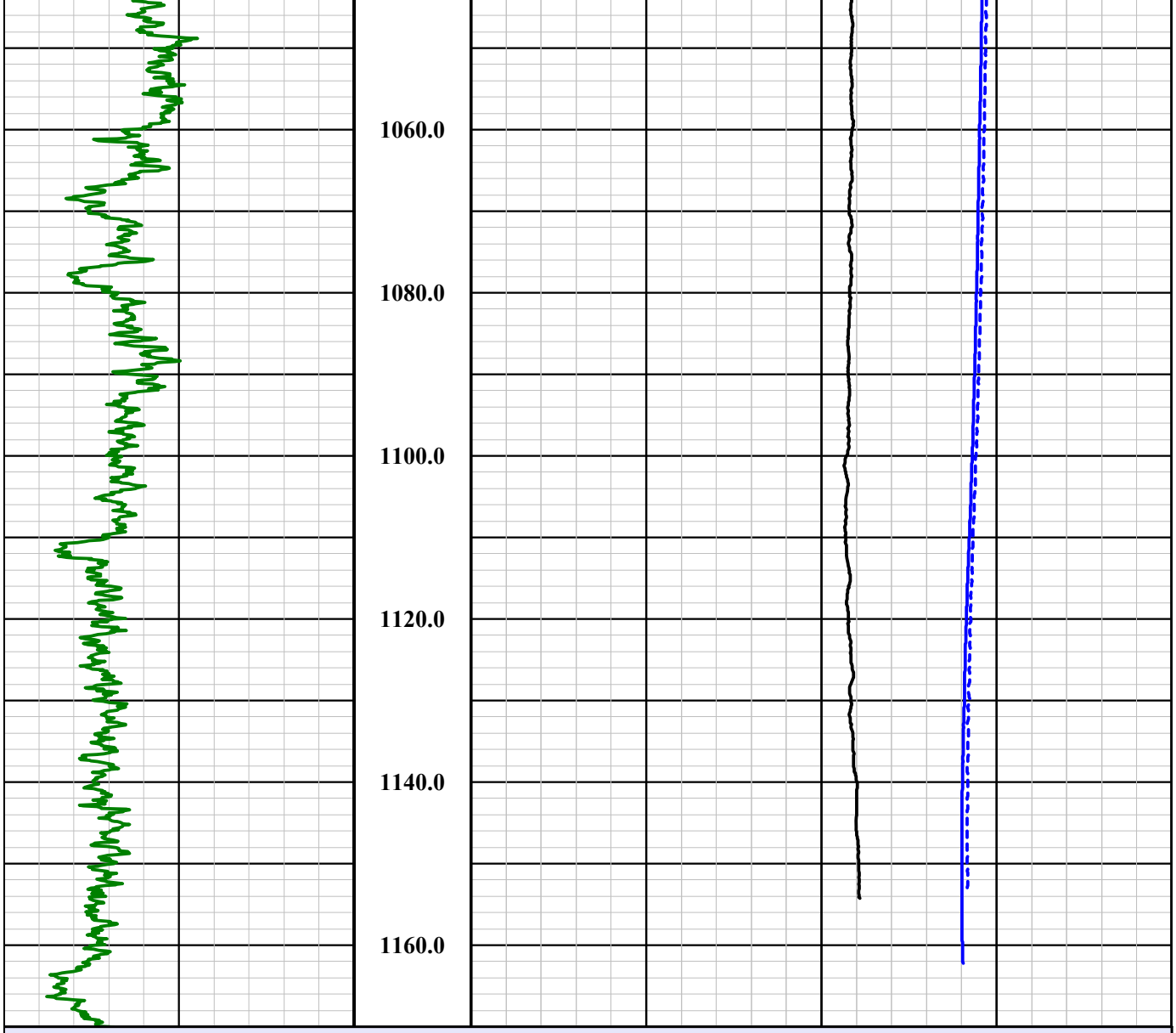
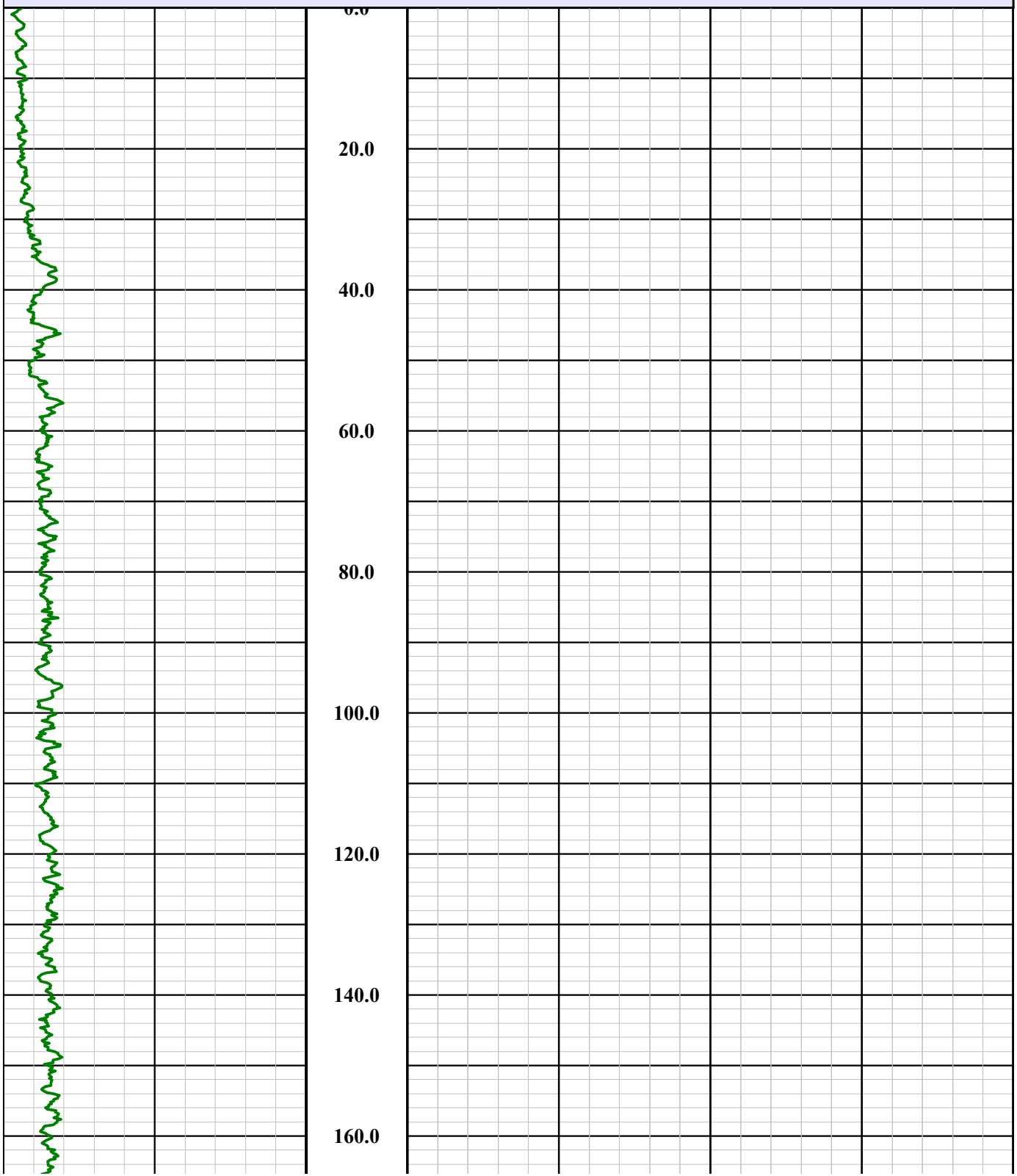


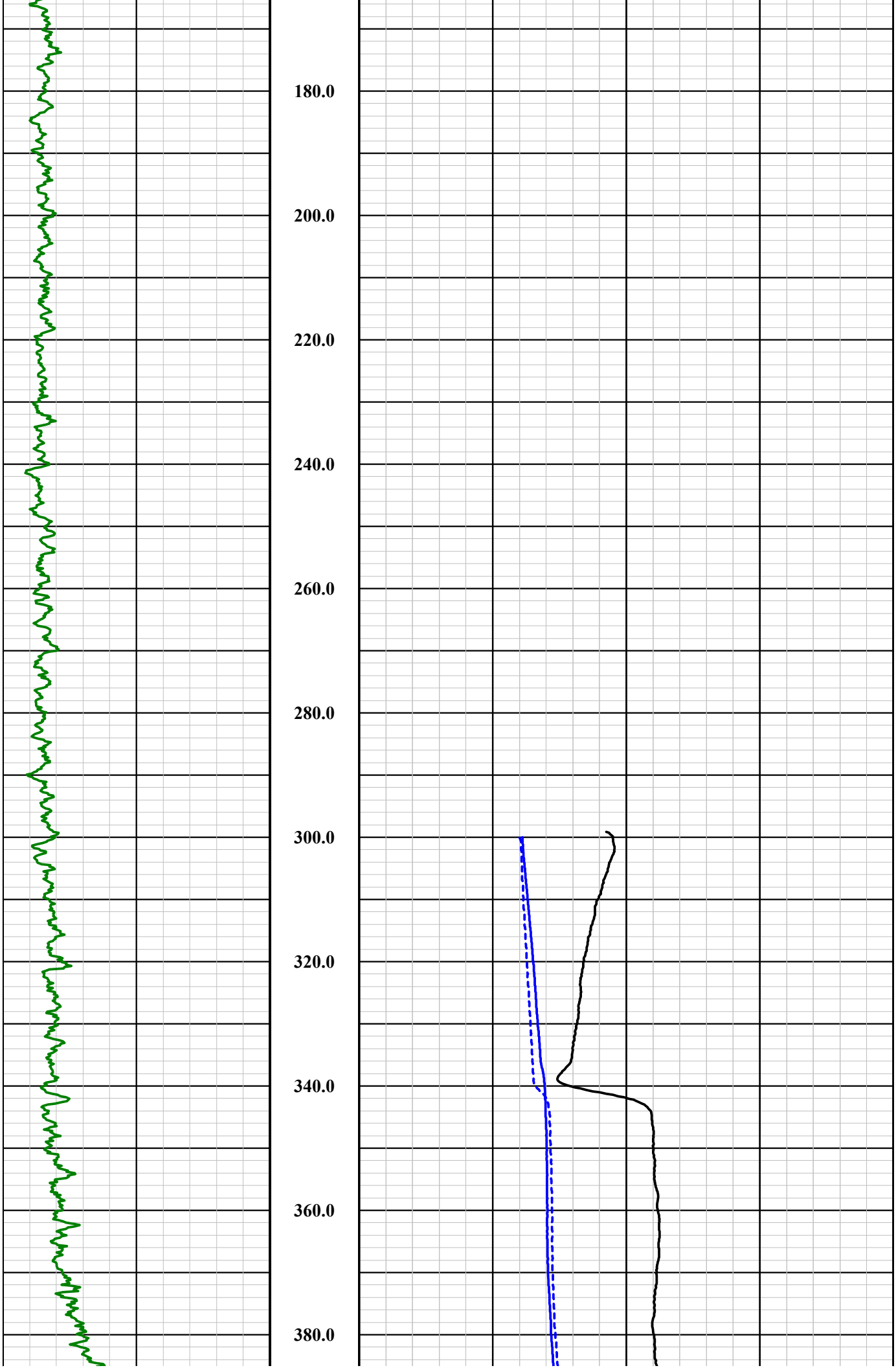
WB-01 Temperature Evaluation

0 API 400 **Nat. Gamma**		
Base of Lowermost USDW: 302 Ft **Shut In Time: 24 Hours 0 Min** **Easting (NAD83): 847695.07** **Northing (NAD83): 746167.49** **Elevation: 1478.56 Ft** **Survey Date: 11-09-21** **Well Name: WB-01**		-3 Deg F 3 **Differential Temperature** 60 Deg F 100 **Temperature (1:50 PM)**
Hole Information	1in:20ft **Depth**	60 Deg F 100 **Temperature (8:15 AM)**

Hole Information	Depth	Temperature (9:15 AM)		
	1in:20ft	60	Deg F	100
Well Name: WB-02		Temperature (2:30 PM)		
Survey Date: 11-09-21		60	Deg F	100
Elevation: 1478.27 Ft		Differential Temperature		
Northing (NAD83): 746131.32		-3	Deg F	3
Easting (NAD83): 847730.23				
Shut In Time: 24 Hours 0 Min				
Base of Lowermost USDW: 300 Ft				
Nat. Gamma				
0 API 400				

WB-02 Temperature Evaluation

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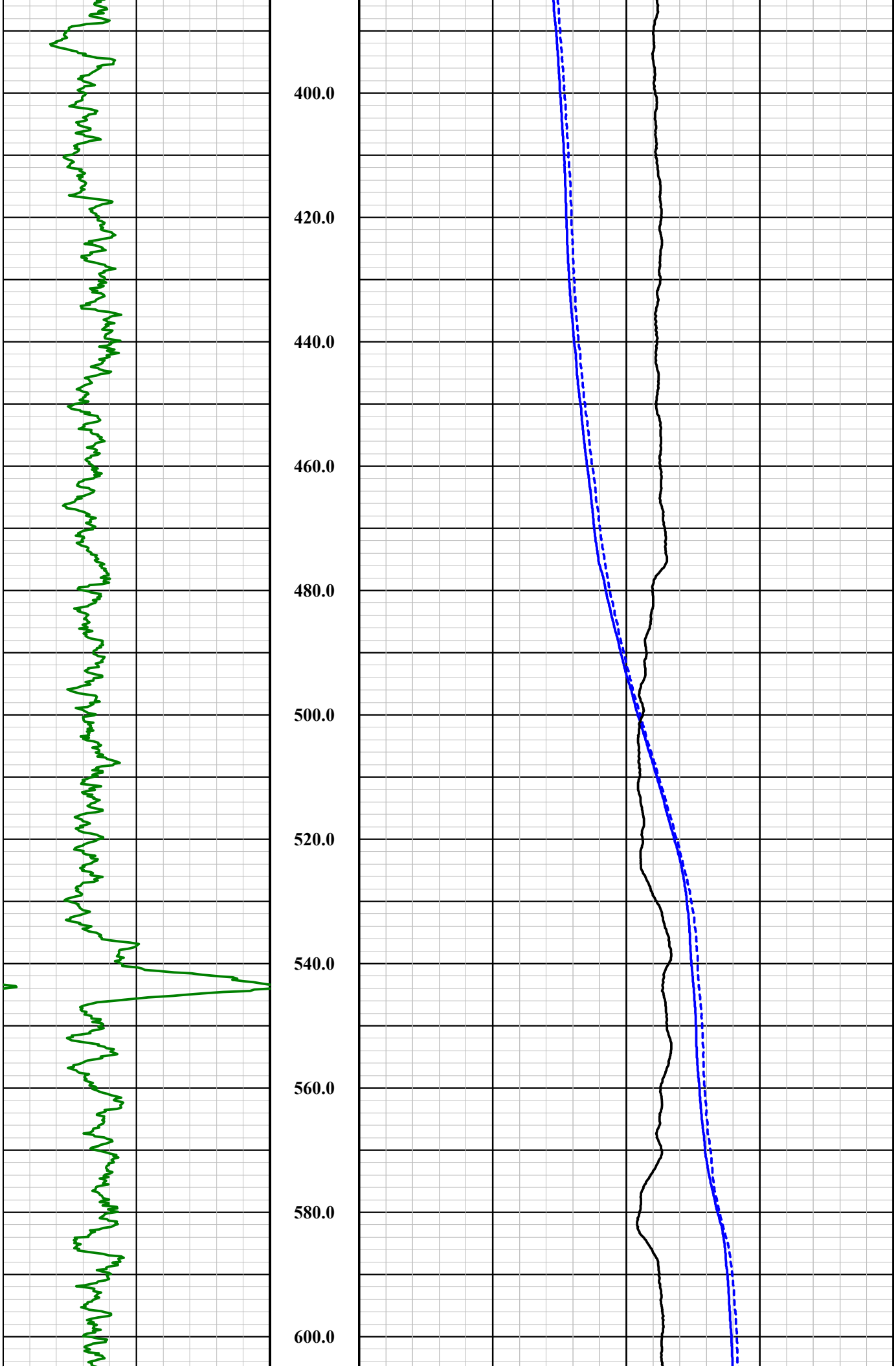
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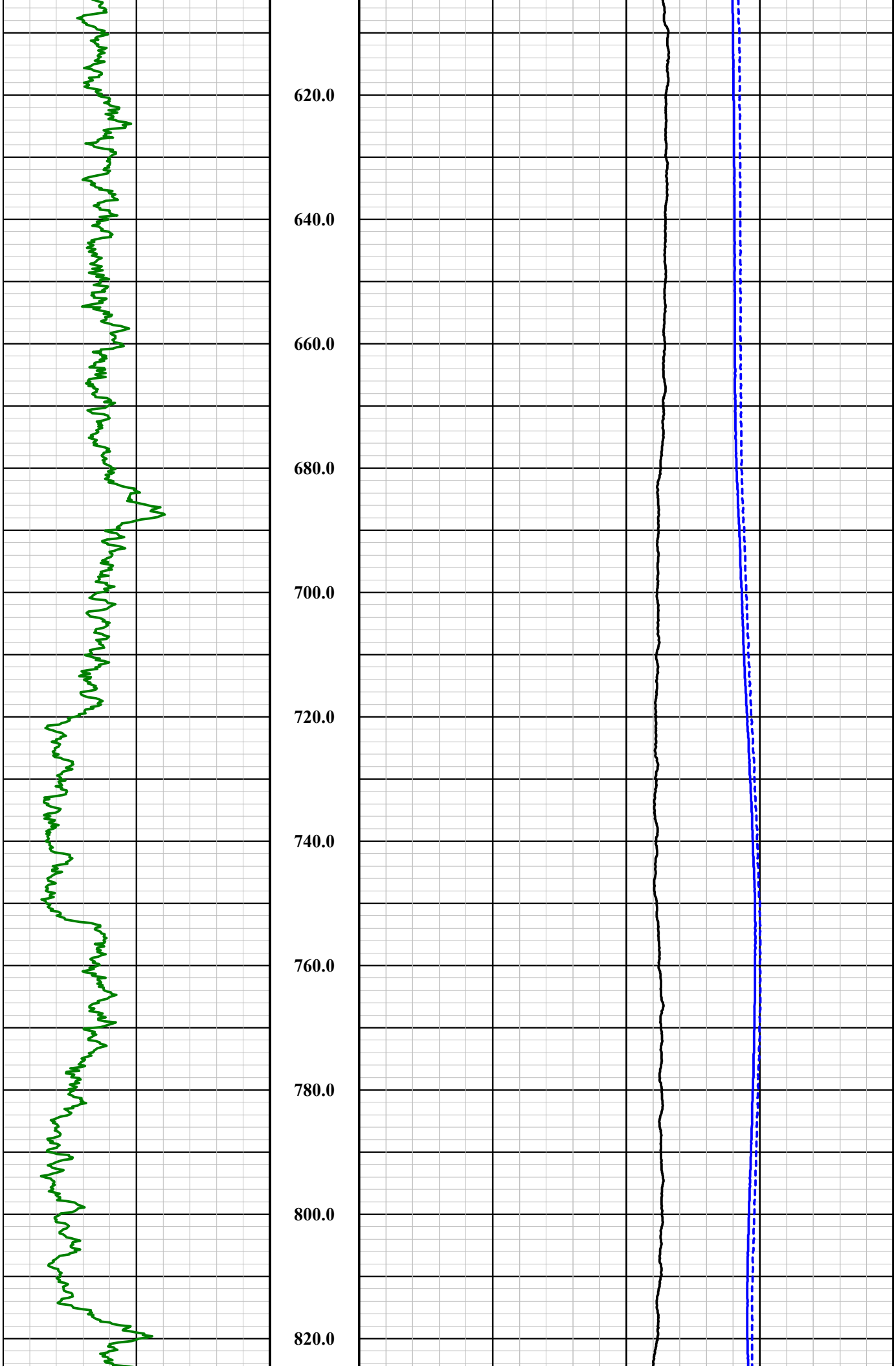
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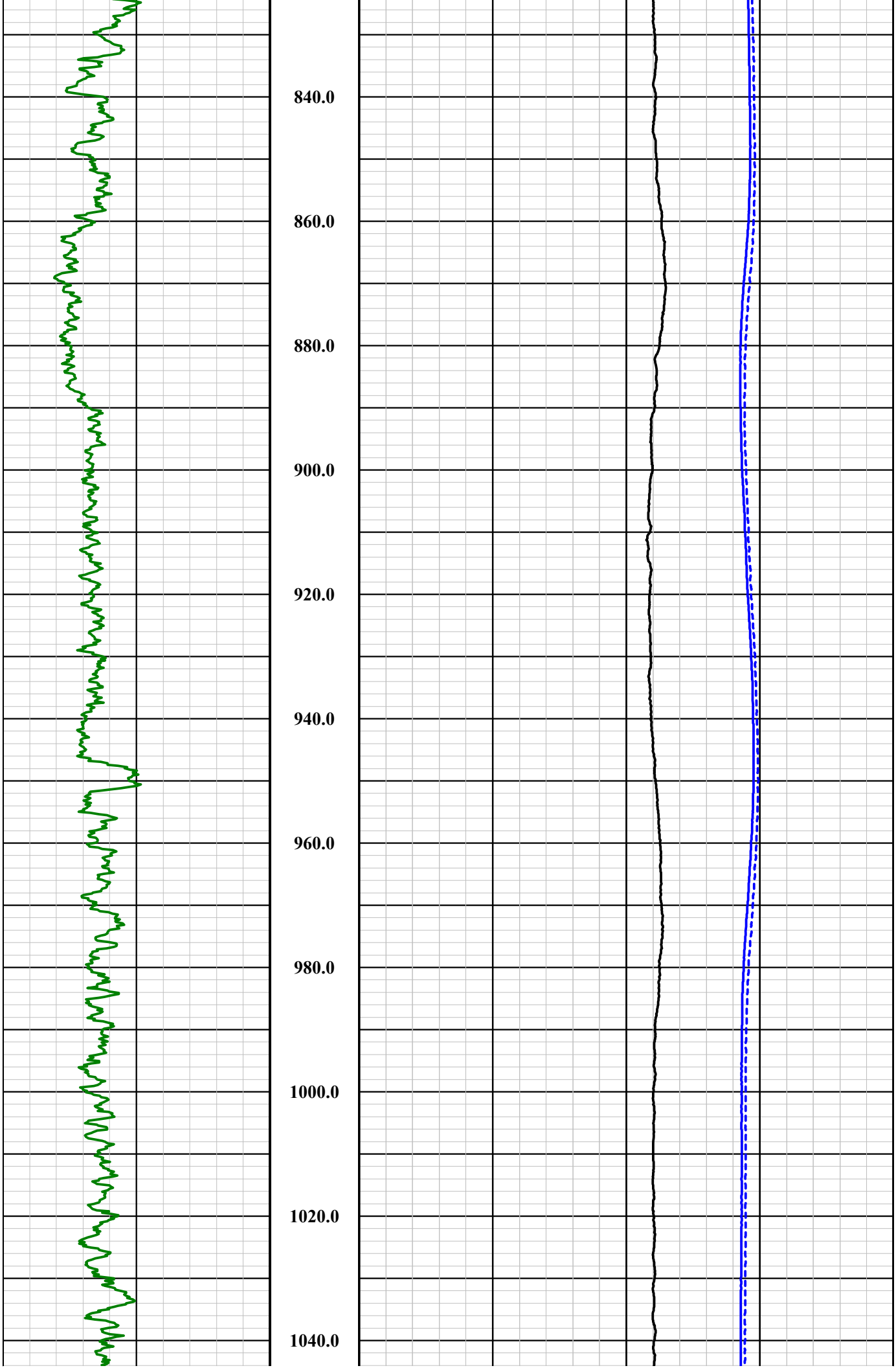
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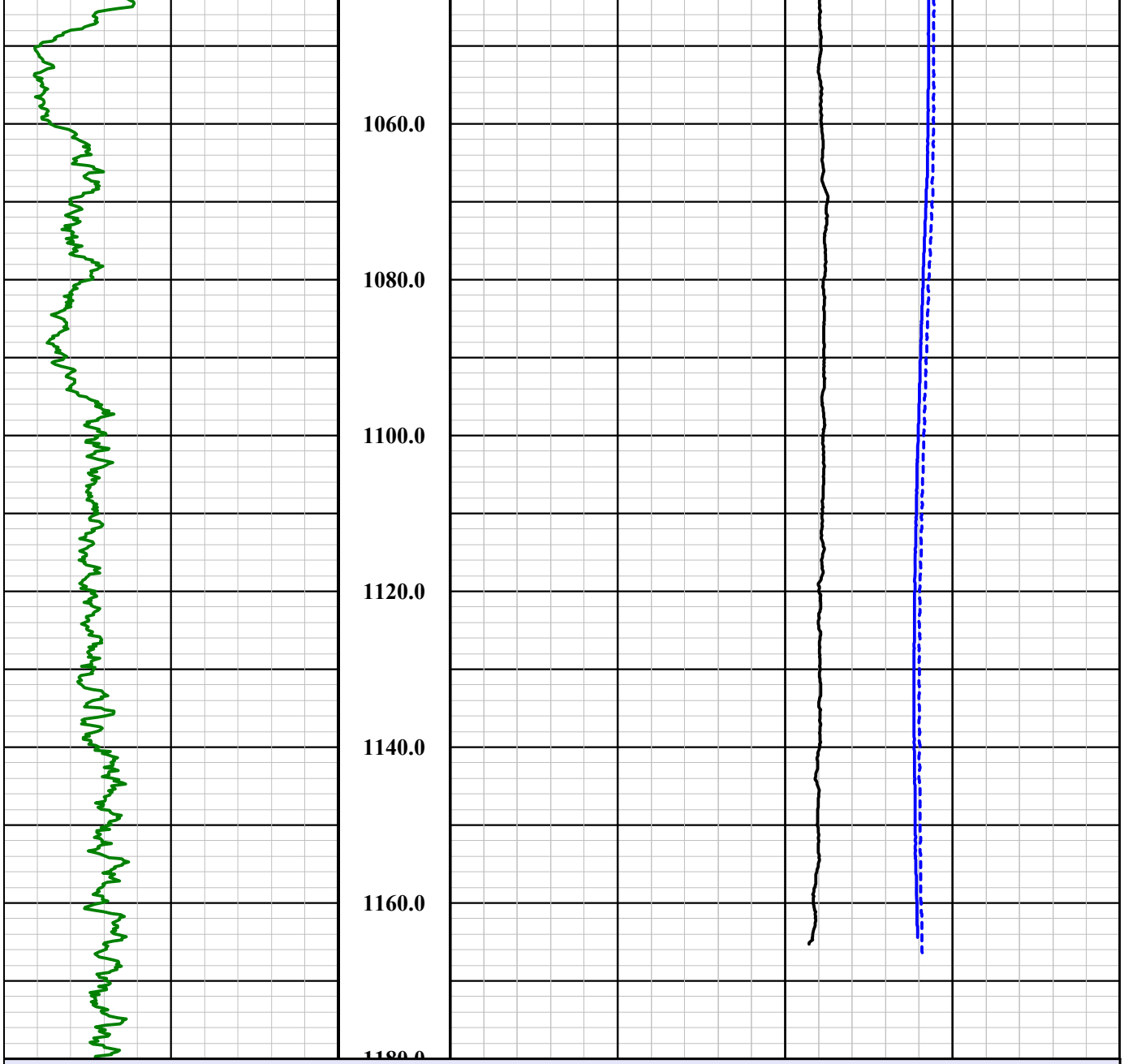
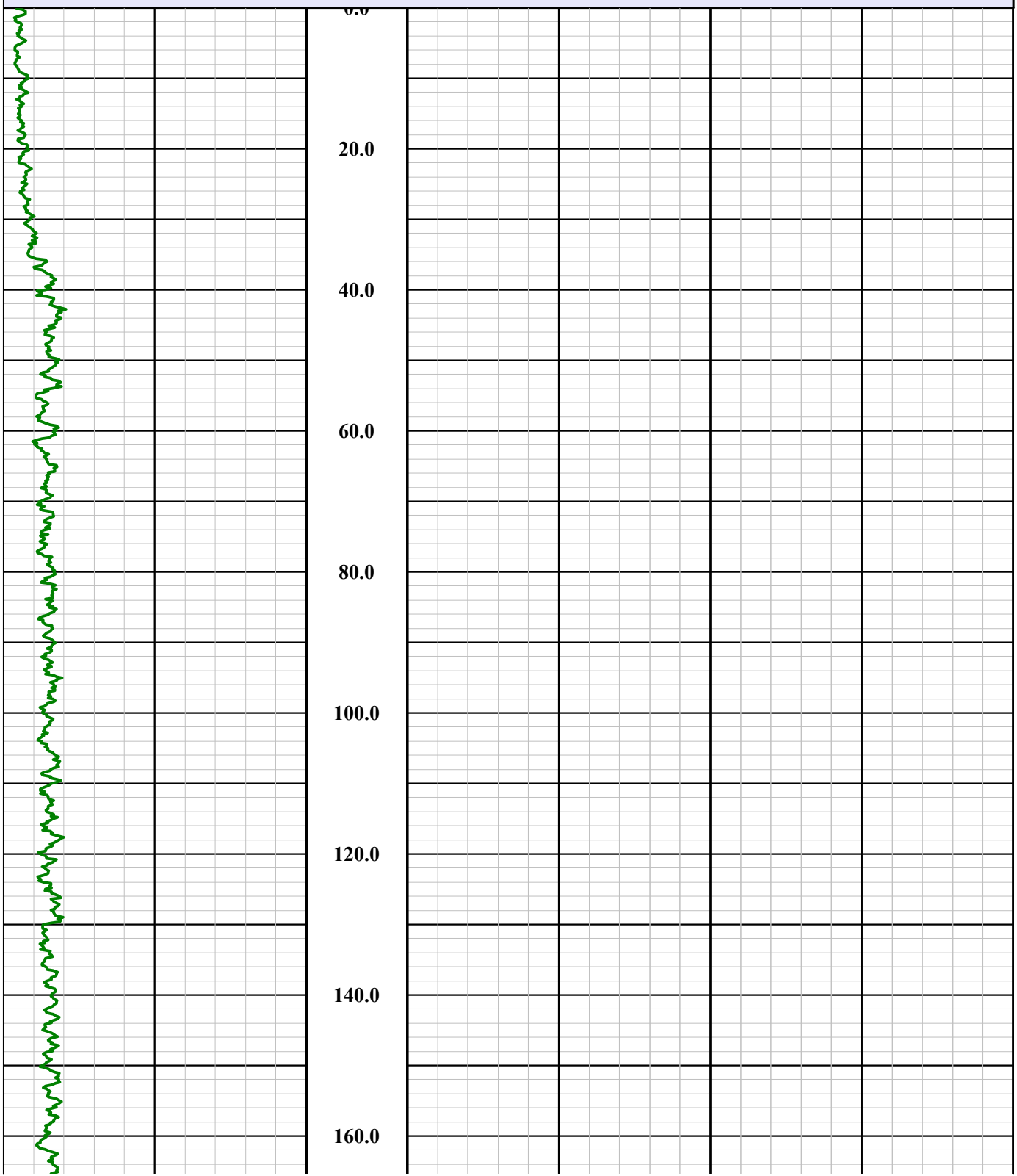


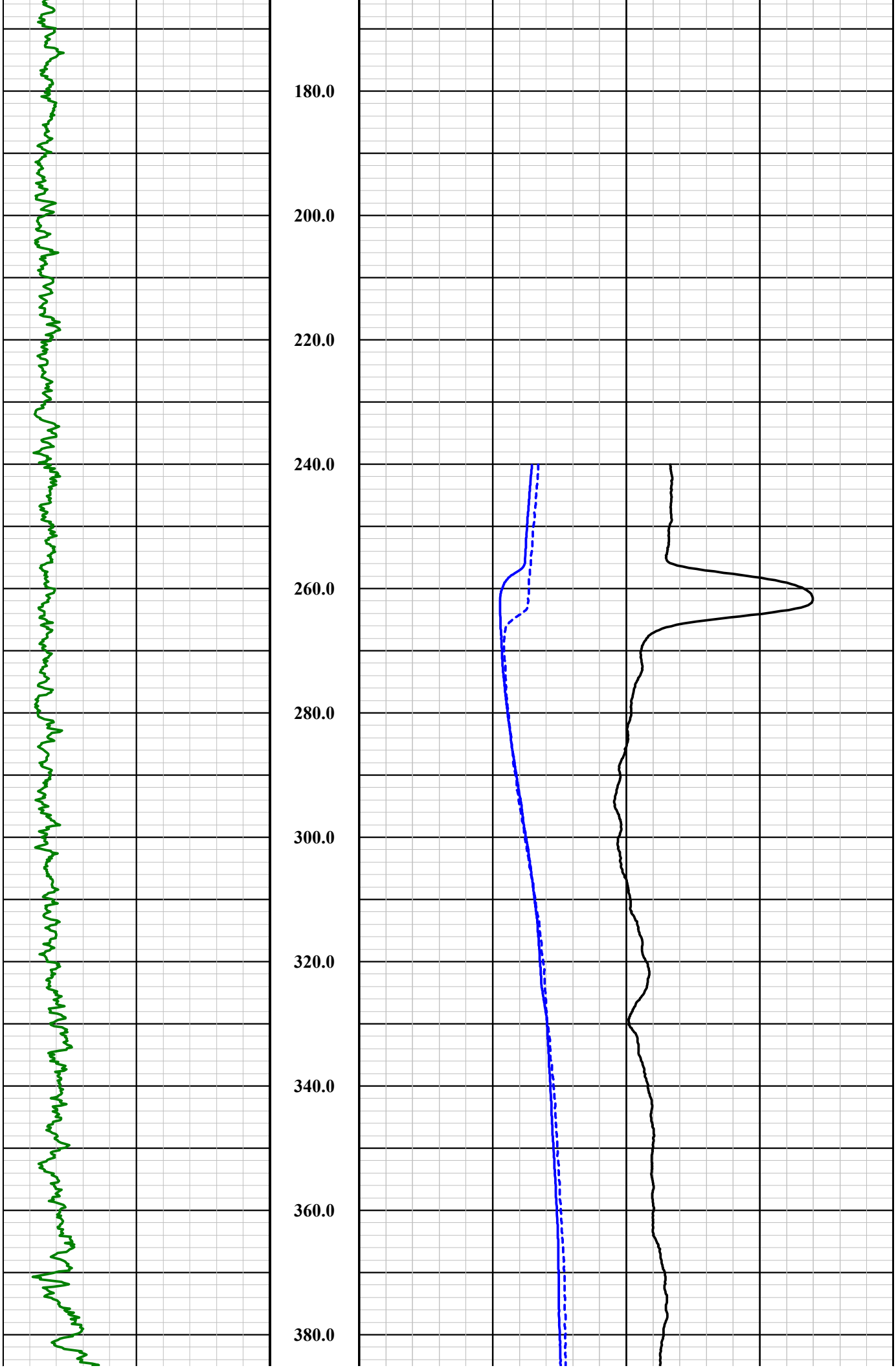
WB-02 Temperature Evaluation

0 API 400 **Nat. Gamma**		
Base of Lowermost USDW: 300 Ft **Shut In Time: 24 Hours 0 Min** **Easting (NAD83): 847730.23** **Northing (NAD83): 746131.32** **Elevation: 1478.27 Ft** **Survey Date: 11-09-21** **Well Name: WB-02**		-3 Deg F 3 **Differential Temperature** 60 Deg F 100 **Temperature (2:30 PM)**
Hole Information	1in:20ft **Depth**	60 Deg F 100 **Temperature (9:15 AM)**

Hole Information	Depth	Temperature (10:00 AM)		
	1in:20ft	60	Deg F	100
Well Name: WB-03		Temperature (3:20 PM)		
Survey Date: 11-09-21		60	Deg F	100
Elevation: 1478.18 Ft		Differential Temperature		
Northing (NAD83): 746096.49		-3	Deg F	3
Easting (NAD83): 847694.07				
Shut In Time: 24 Hours 0 Min				
Base of Lowermost USDW: 300 Ft				
Nat. Gamma				
0 API 400				

WB-03 Temperature Evaluation

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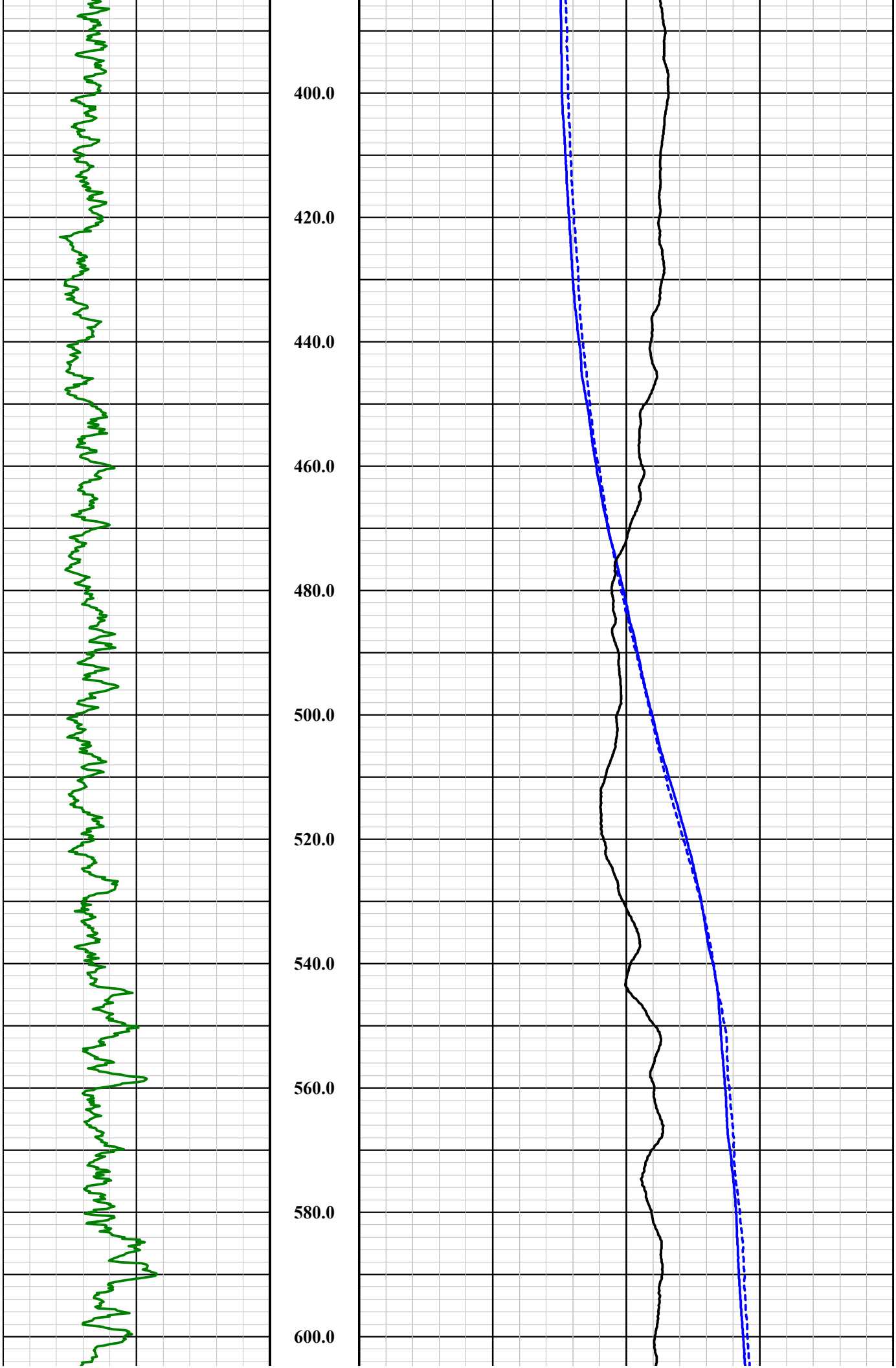
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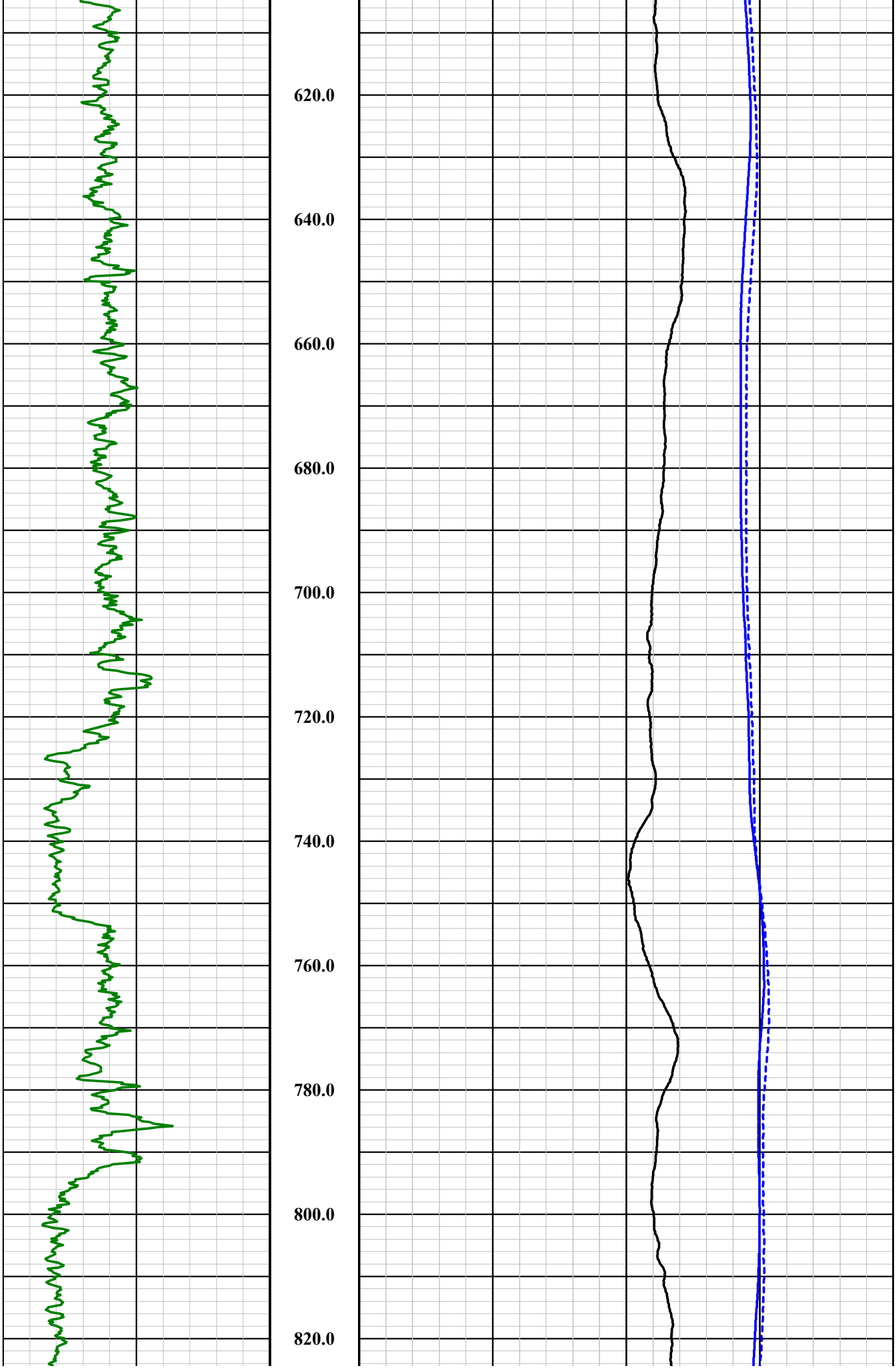
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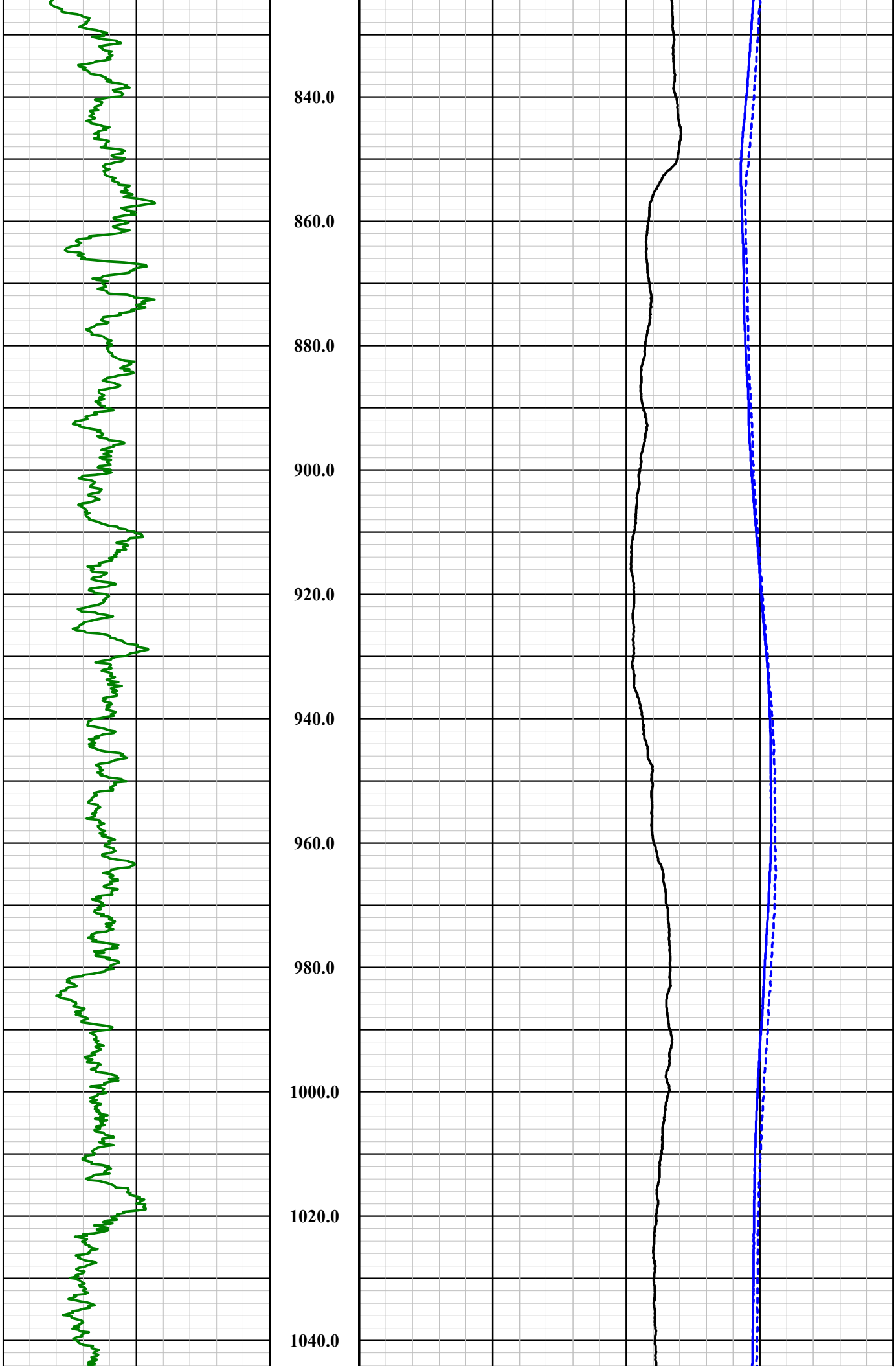
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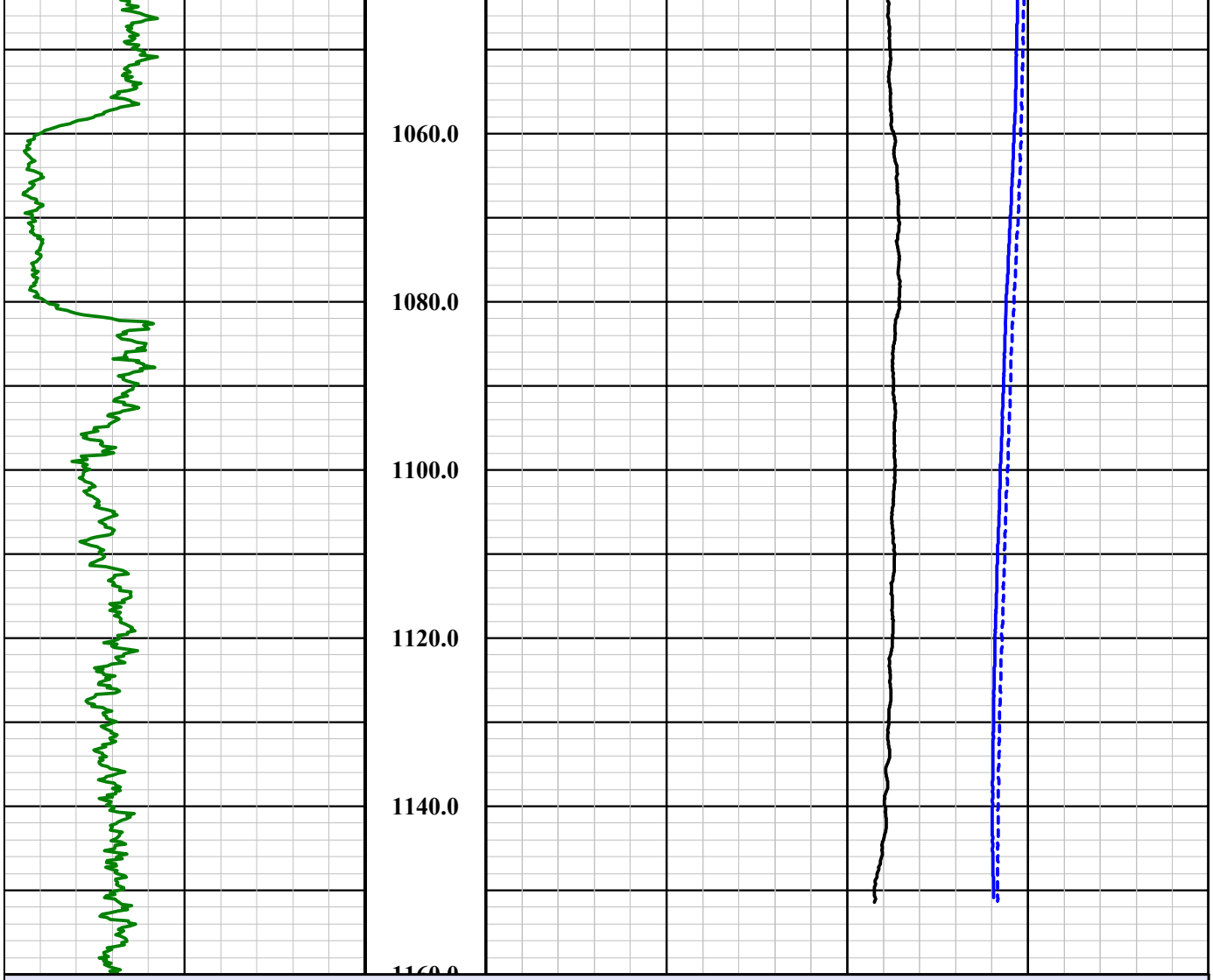
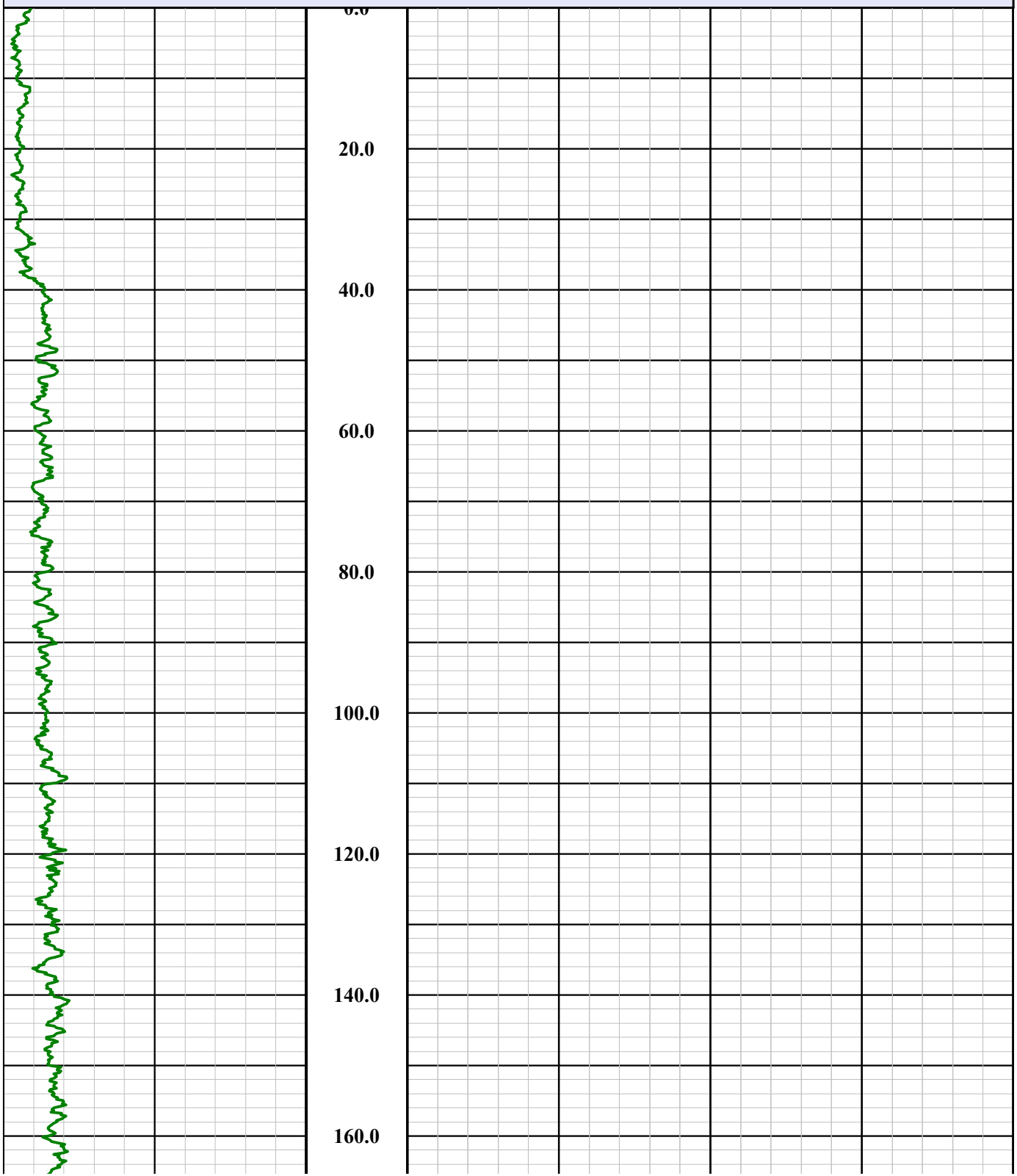


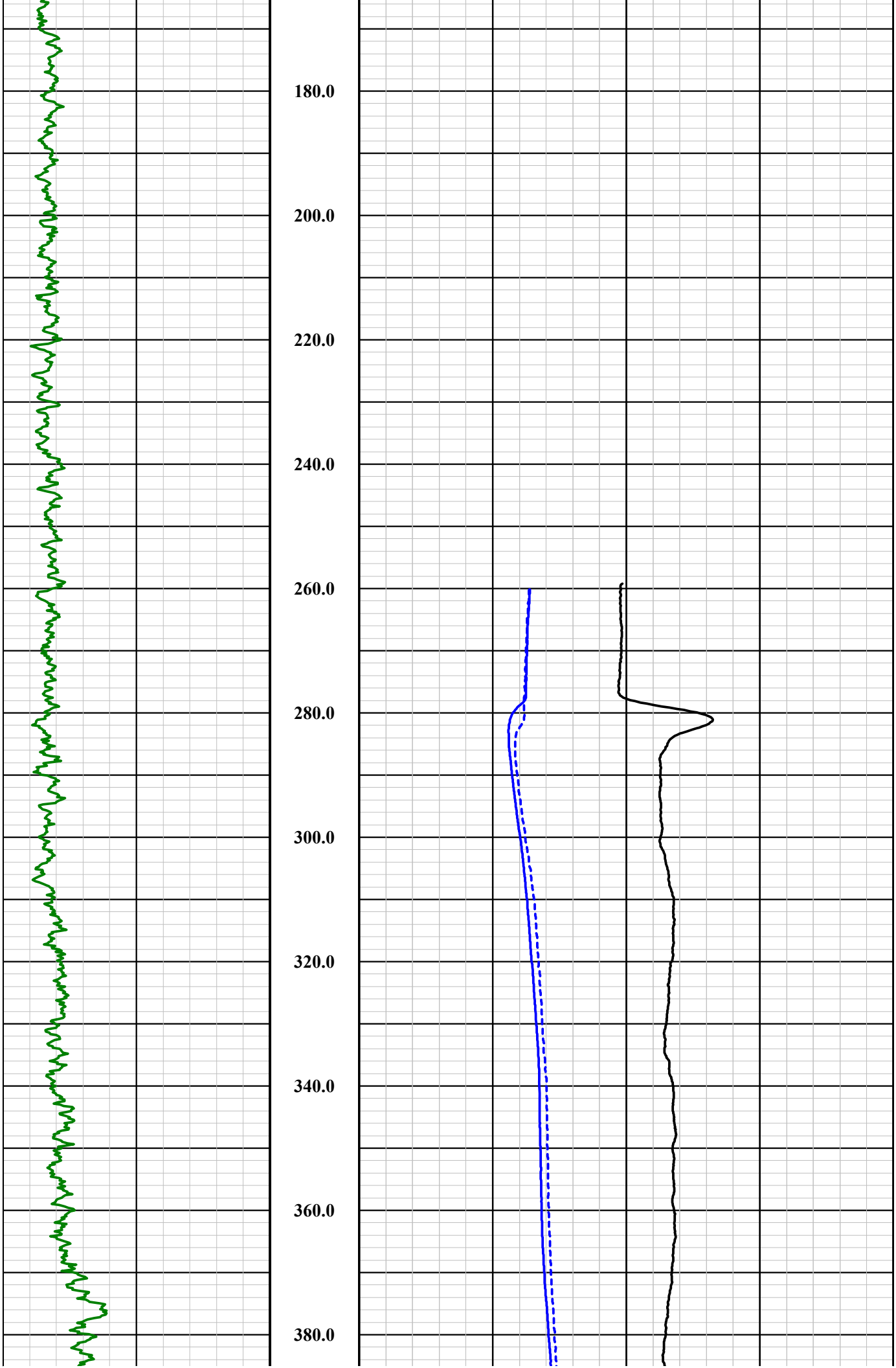
WB-03 Temperature Evaluation

0 API 400 **Nat. Gamma**		
Base of Lowermost USDW: 300 Ft **Shut In Time: 24 Hours 0 Min** **Easting (NAD83): 847694.07** **Northing (NAD83): 746096.49** **Elevation: 1478.18 Ft** **Survey Date: 11-09-21** **Well Name: WB-03**		-3 Deg F 3 **Differential Temperature**
		60 Deg F 100 **Temperature (3:20 PM)**
Hole Information	1in:20ft **Depth**	60 Deg F 100 **Temperature (10:00 AM)**

Hole Information	Depth	Temperature (10:40 AM)		
	1in:20ft	60	Deg F	100
Well Name: WB-04		Temperature (4:05 PM)		
Survey Date: 11-09-21		60	Deg F	100
Elevation: 1478.17 Ft		Differential Temperature		
Northing (NAD83): 746131.41		-3	Deg F	3
Easting (NAD83): 847659.81				
Shut In Time: 24 Hours 0 Min				
Base of Lowermost USDW: 300 Ft				
Nat. Gamma				
0 API 400				

WB-04 Temperature Evaluation

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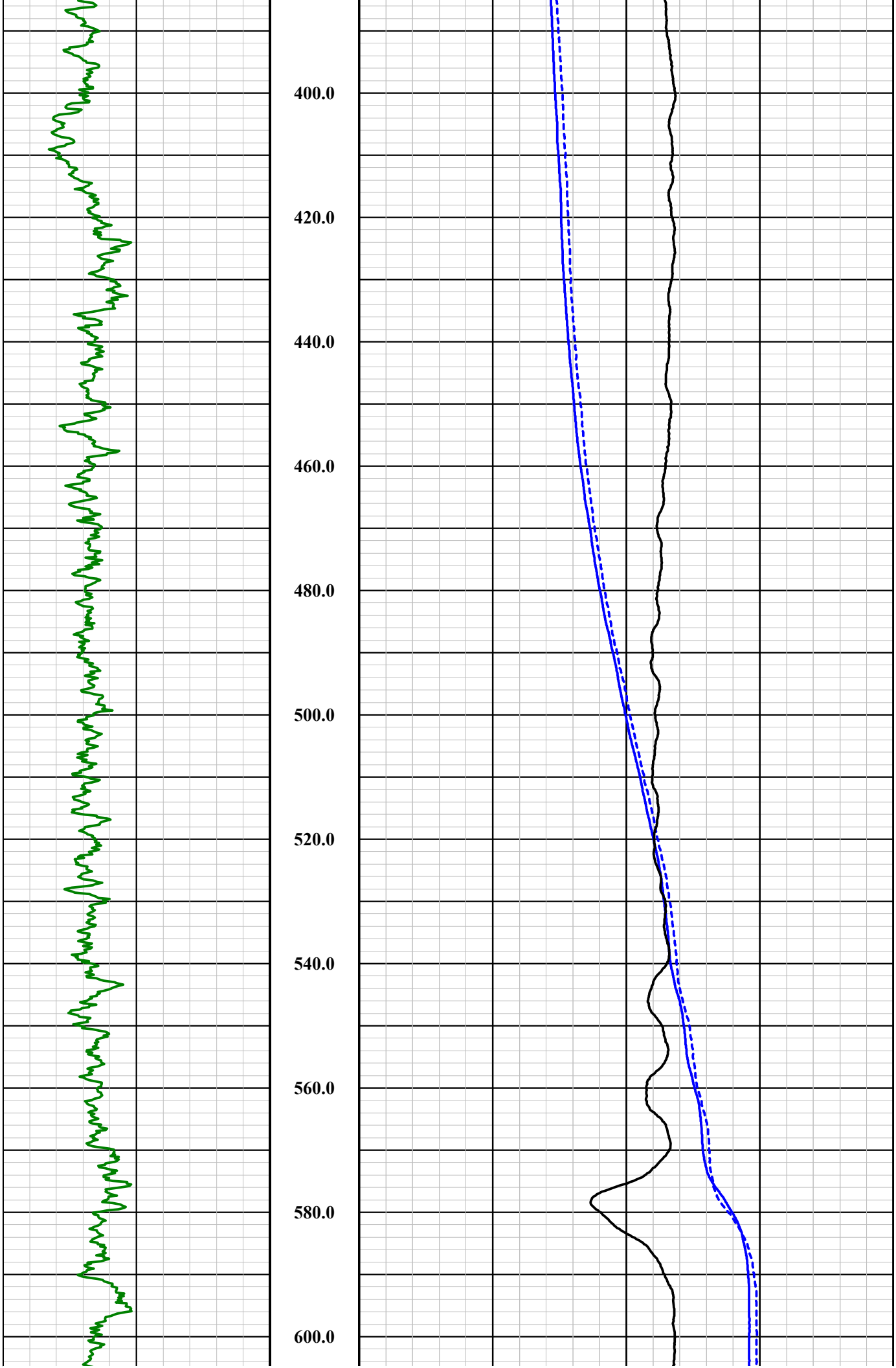
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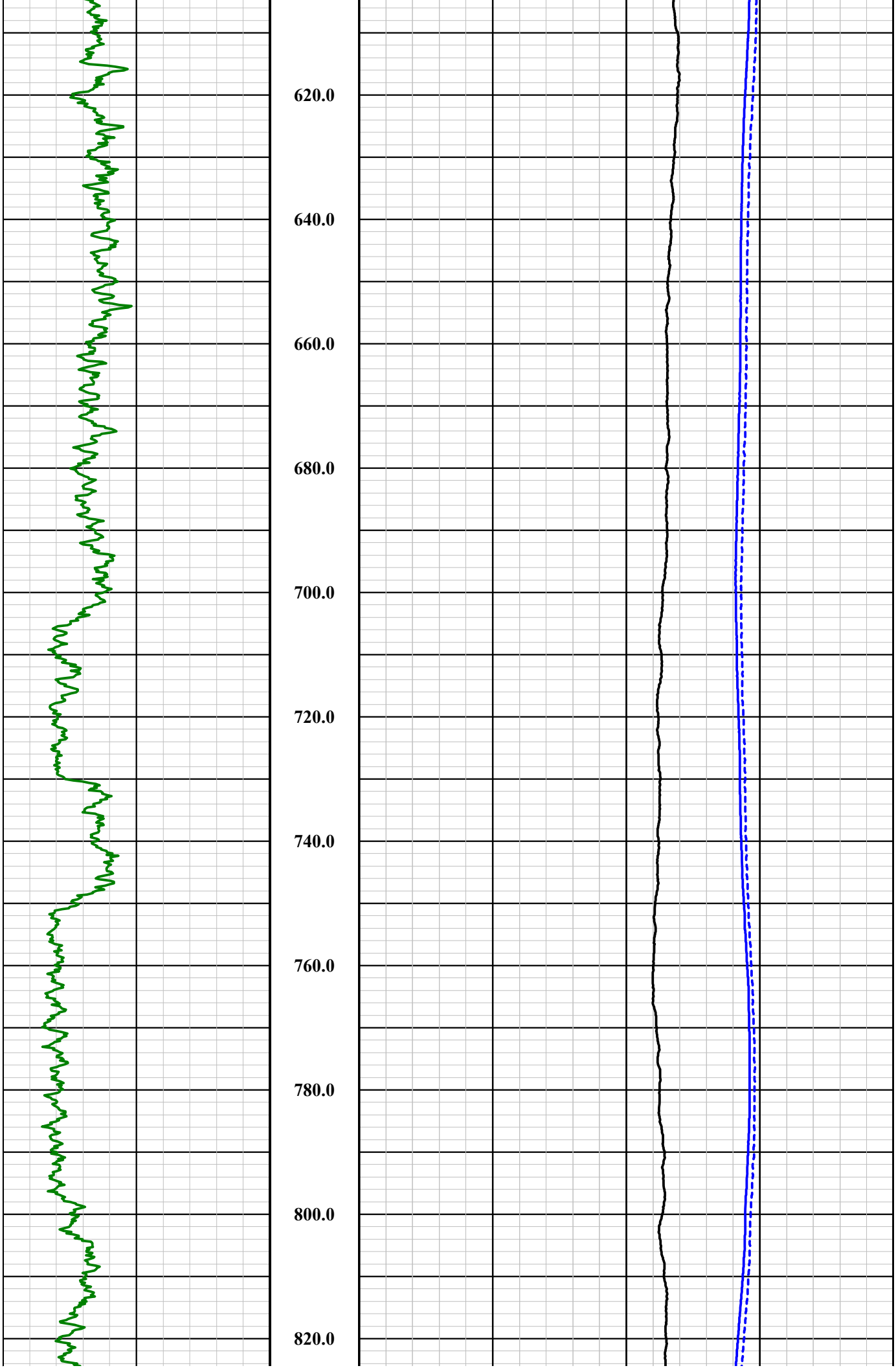
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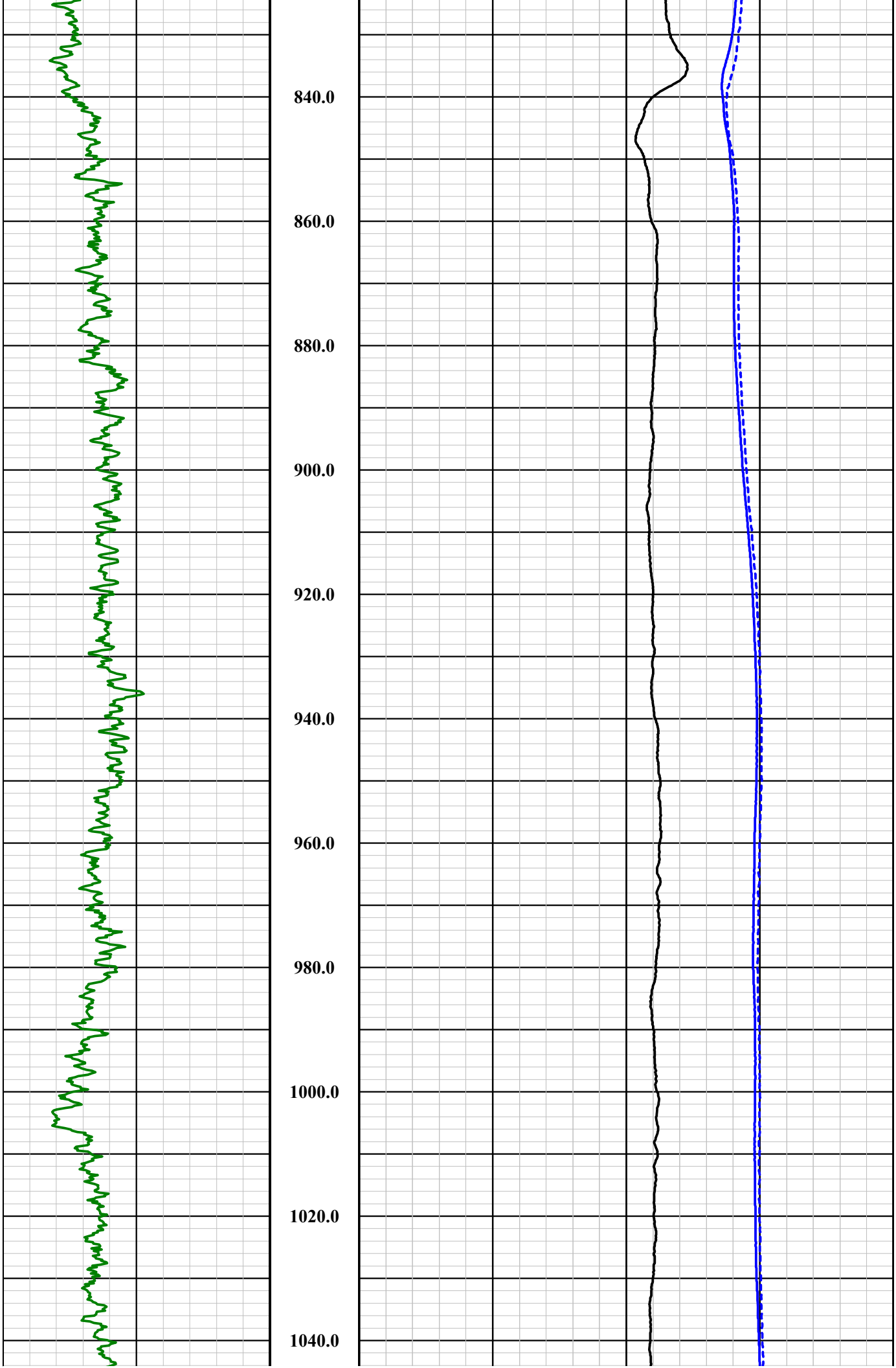
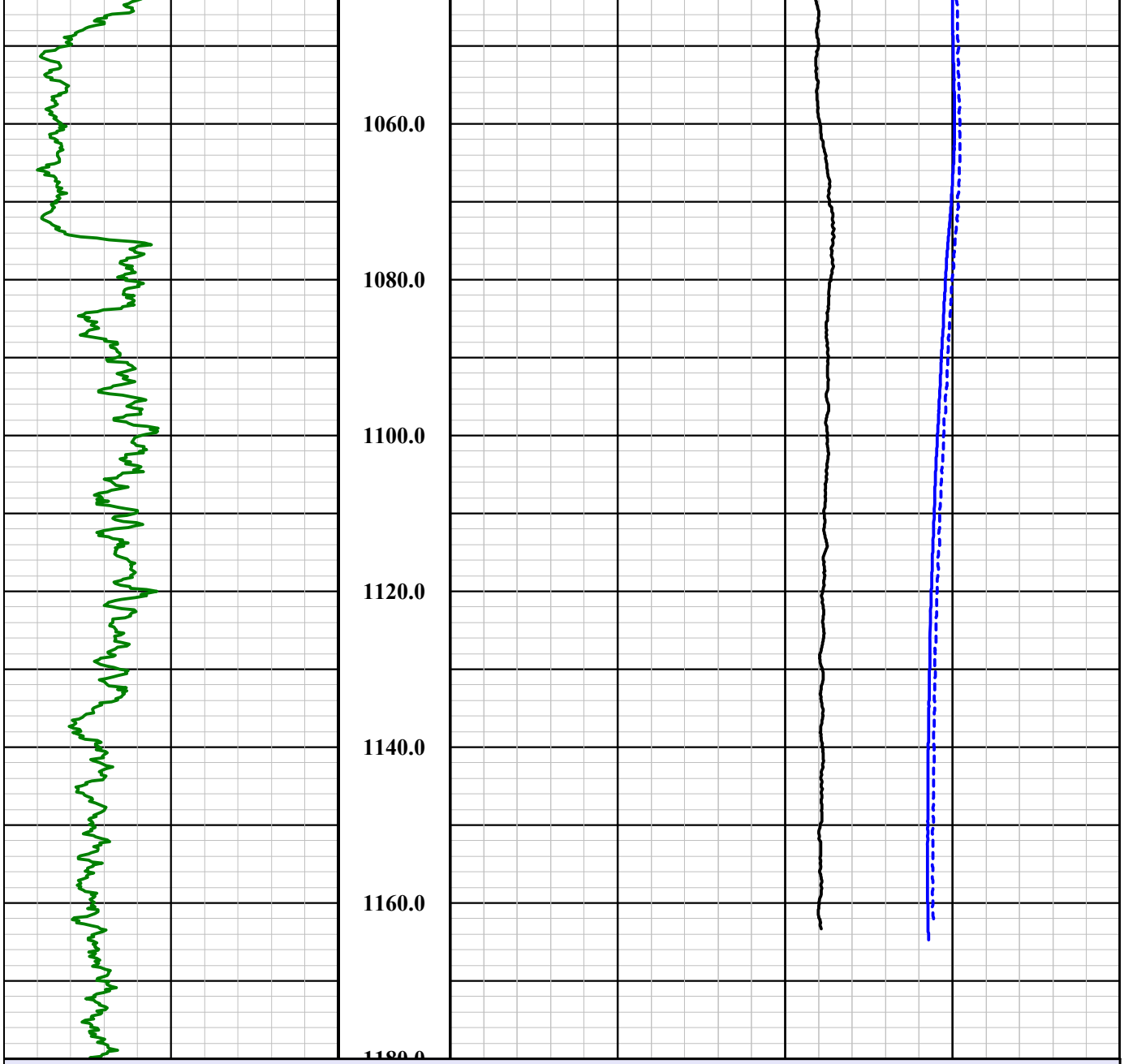

840.0
860.0
880.0
900.0
920.0
940.0
960.0
980.0
1000.0
1020.0
1040.0



WB-04 Temperature Evaluation

0 API 400 **Nat. Gamma**		
Base of Lowermost USDW: 300 Ft **Shut In Time: 24 Hours 0 Min** **Easting (NAD83): 847659.81** **Northing (NAD83): 746131.41** **Elevation: 1478.17 Ft** **Survey Date: 11-09-21** **Well Name: WB-04**		-3 Deg F 3 **Differential Temperature** 60 Deg F 100 **Temperature (4:05 PM)**
Hole Information	1in:20ft **Depth**	60 Deg F 100 **Temperature (10:40 AM)**

APPENDIX C

Daily Average Flow Rates and Water Level Elevations

APPENDIX C-1
DAILY AVERAGE FLOW RATES FOR INJECTION
AND RECOVERY WELLS DURING TEMPERATURE LOGGING
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

Date	Daily Average Flow Rate in Gallons per Minute														
	I-01	I-02	I-03	I-04	R-01	R-02	R-03	R-04	R-05	R-06	R-07	R-08	R-09	O-02*	O-03**
11/9/2021	0.00	0.00	27.01	26.18	22.85	39.72	15.00	14.86	15.00	39.72	12.01	0.00	57.08	0.42	0.49

* ran from 7:32 - 8:42
** ran from 7:32 - 8:37

APPENDIX C-2
DAILY AVERAGE WATER LEVEL ELEVATIONS
DURING TEMPERATURE LOGGING
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

Date	Daily Average Water Level Elevation in Feet Above Mean Sea Level															
	R-01	R-02	R-03	R-04	R-05	R-06	R-07	R-08*	R-09	O-01	O-02	O-03	O-04	O-05	O-06	O-07
11/9/2021	1145.36	1121.21	1139.91	1142.33	1146.42	1112.66	1210.43		1183.24	1200.78	1205.04	1203.41	1216.85	1213.94	1212.14	1211.16

*Well R-08 was under redevelopment.