PATHFINDER

A Schlumberger Company

GAMMA-RAY

2" = 100'
FEET MD

COMPANY : EXTRACTON OIL AND GAS LLC
WELL : NELSON FARM #1 ST1
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : U.S.A.
API No.: 05-123-39961

COMPANY : EXTRACTON OIL AND GAS LLC
WELL : NELSON FARM #1 ST1
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : U.S.A.
API No.: 05-123-39961

WELL LOCATION

LAT:40°33'02"N LON:104°54'23"W
X:3,164,958' Y:1,443,980'NAD83

SEC: 28 TWP: 7N RANGE: 67W

OTHER SERVICES

DIRECTIONAL
ROP
DENSITY/PE
CALIPER

DEPTH REF. : ROTARY TABLE
ELEVATION : 16.00 ft (ROTARY TABLE - GROUND LEVEL)
ALTITUDE : 4975.00 ft (GROUND LEVEL - MEAN SEA LEVEL)

BOREHOLE RECORD

HOLE SIZE in	FROM ft	TO ft
13 1/2	0	825
8 3/4	825	7557
6 1/8	7557	14630

CASING RECORD

CASING SIZE in	FROM ft	TO ft
9 5/8	0	815
7	0	7540

DEVIATION RECORD

INCLINATION deg	FROM ft	TO ft
00 - 10	0	1771
10 - 04	1771	6548
04 - 90	6548	10395
90 +/-4	10395	14630

DRILLING Co.: XTREME DRILLING
RIG : 7
LWD UNIT No.: TRAILER DISTRICT : CASPER
SPUD DATE : 27-AUG-14
LWD START DATE : 05-SEP-14 DEPTH : 4000 ft
LWD END DATE : 13-SEP-14 DEPTH : 14630 ft
TOTAL DEPTH : 14630 ft

RUN DATA

RUN NUMBER	2	5	6																
START DATE	28-AUG-14	05-SEP-14	08-SEP-14																
START TIME	23:50	02:00	08:30																
END DATE	30-AUG-14	07-SEP-14	13-SEP-14																
END TIME	21:30	10:00	18:30																
DEPTH IN ft	825	6129	7557																
DEPTH OUT ft	6129	7557	14630																
LOG TOP ft	4000	6129	7540																
LOG BOTTOM ft	7031	7524	14562																
HOLE SIZE in	8 3/4	8 3/4	6 1/8																
MUD DATA @ ft	7065	7149	14271																
MUD TYPE	WATER BASED	WATER BASED	WATER BASED																
DENSITY lb/gal	10.20	10.50	9.20																
VISCOSITY s/qt	39	37	45																
pH	7.0	10.5	8.5																
FLUID LOSS cm3/30	10.0	7.5	7.5																
SALINITY mg/L	200	200	200																
Rm ohmm @ deg F	@	@	@																
Rmf ohmm @ deg F	@	@	@																

MAX REC TEMP deg F	159	170	217			
Rm @ MAX TEMP ohmm						
LWD ENGINEER #1	M. IBRAHIM	M. IBRAHIM	M. IBRAHIM			
LWD ENGINEER #2	R. BAGBY	B. SCHMIDT	B. SCHMIDT			
LWD ENGINEER #3	B. ELEBE	B. ELEBE	B. ELEBE			

REMARKS

EXTRACTION OIL & GAS LLC AFE #: 14-201.

PATHFINDER JOB #: 14CAS0368.

ALL LOGGING DATA IS TRANSMITTED ONLY UNLESS STATED OTHERWISE.

ALL REFERENCES TO LOG TOP, LOG BOTTOM, OR LOGGING TOOL DEPTH REFER TO THE GAMMA-RAY SENSOR UNLESS STATED OTHERWISE.

ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH.

THIRD PARTY DEPTH TRACKING SERVICES PROVIDED BY PASON.

ST1 DEPARTS ORIGINAL WELLBORE AT 6129'MD (6091'TVD) OFF CEMENT PLUG IN OPEN HOLE.

RUN #1: 8" HDS-1 DIRECTIONAL ONLY RUN. NO LOGGING DATA ACQUIRED.

RUN #2: 6 3/4" HDS-1/GAMMA LOGGING RUN. DATA ACQUIRED IN ORIGINAL HOLE.

RUN #3: 6 3/4" HDS-1/GAMMA LOGGING RUN. DATA ACQUIRED IN ORIGINAL HOLE.

RUN #4: 6 3/4" HDS-1/GAMMA LOGGING RUN. DATA ACQUIRED IN ORIGINAL HOLE.

RUN #5: 6 3/4" HDS-1/GAMMA LOGGING RUN.

RUN #6: 4 3/4" HDS-1L/GAMMA/IDNSC LOGGING RUN.

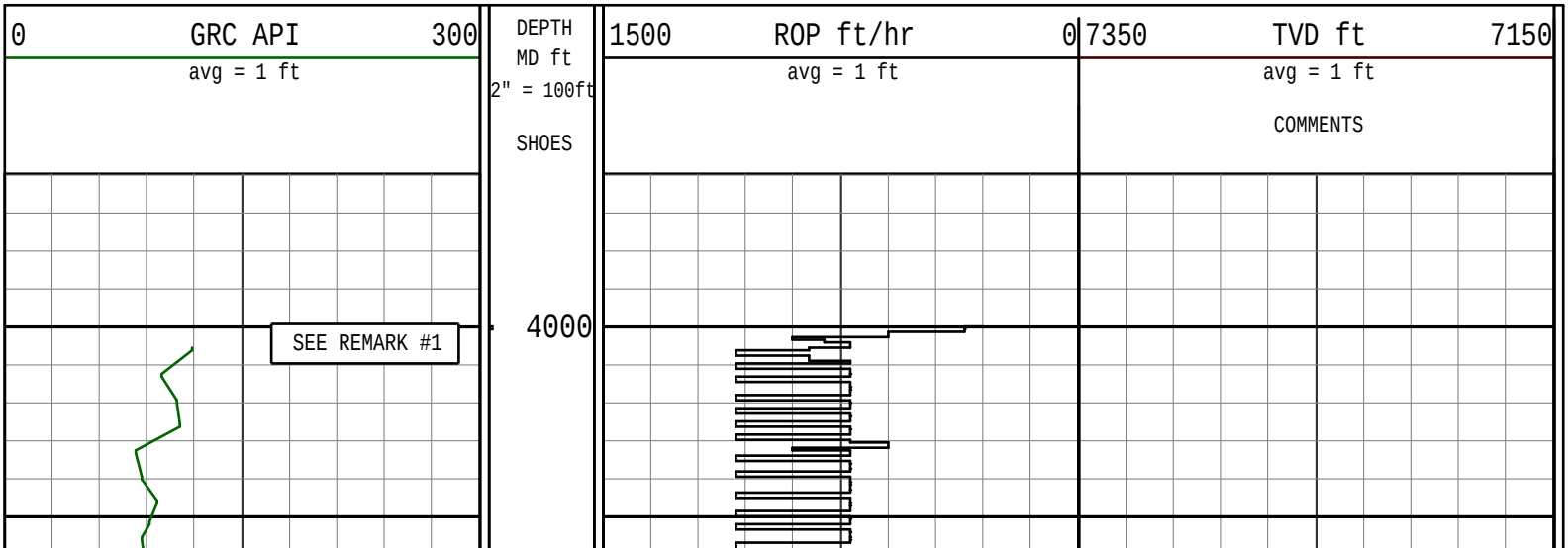
REMARK #1: GAMMA-RAY SERVICE BEGINS AT A DEPTH OF 4000'MD (3976'TVD) PER CUSTOMER'S REQUEST.

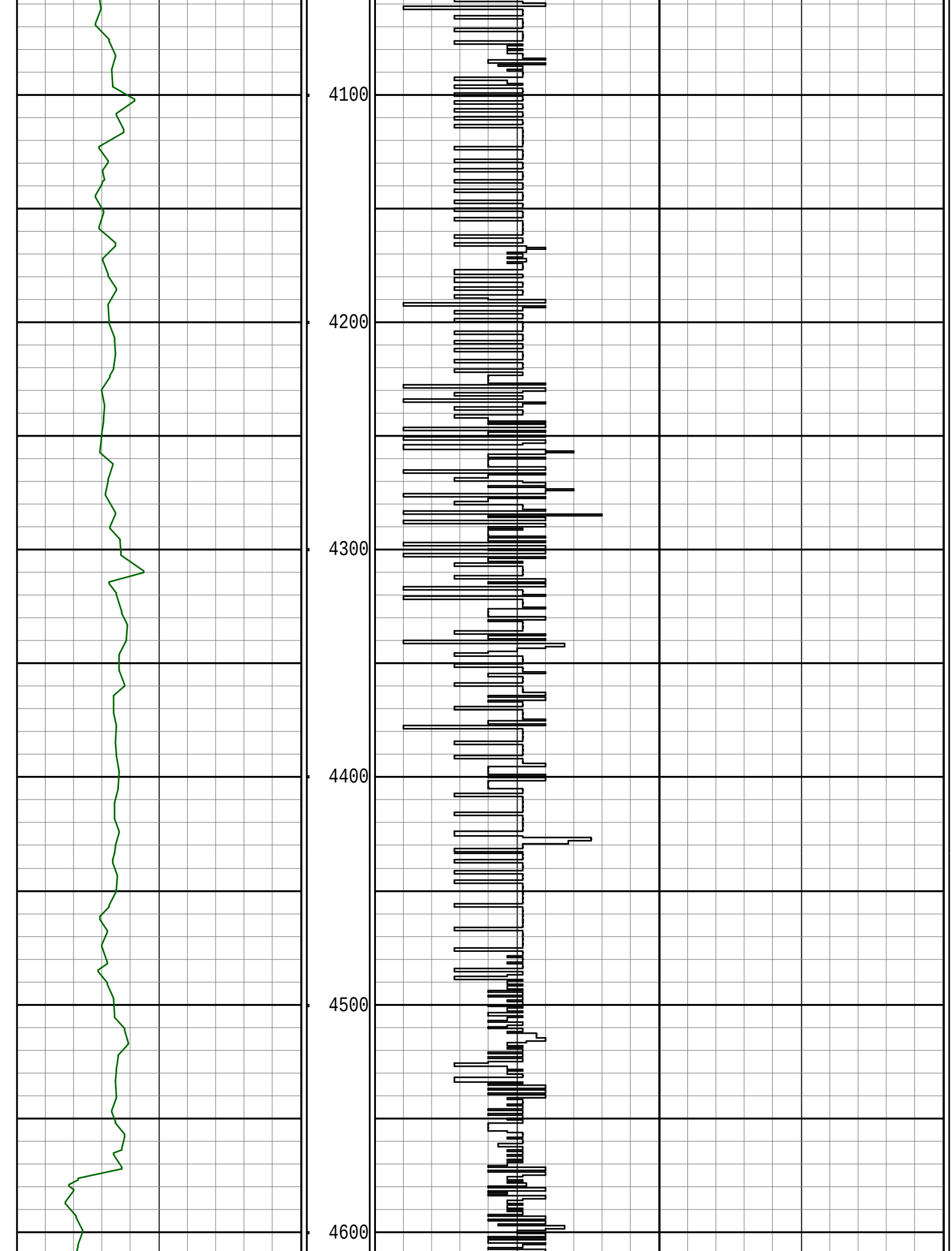
REMARK #2: GAMMA-RAY LOGGED THROUGH CASING FROM 7530'-7540'MD (7185'-7185'TVD).

PATHFINDER - A Schlumberger Company

Version No : RX5 V6.05B Release 20Jun2014

Plot Time : 13-Sep-2014 20:14

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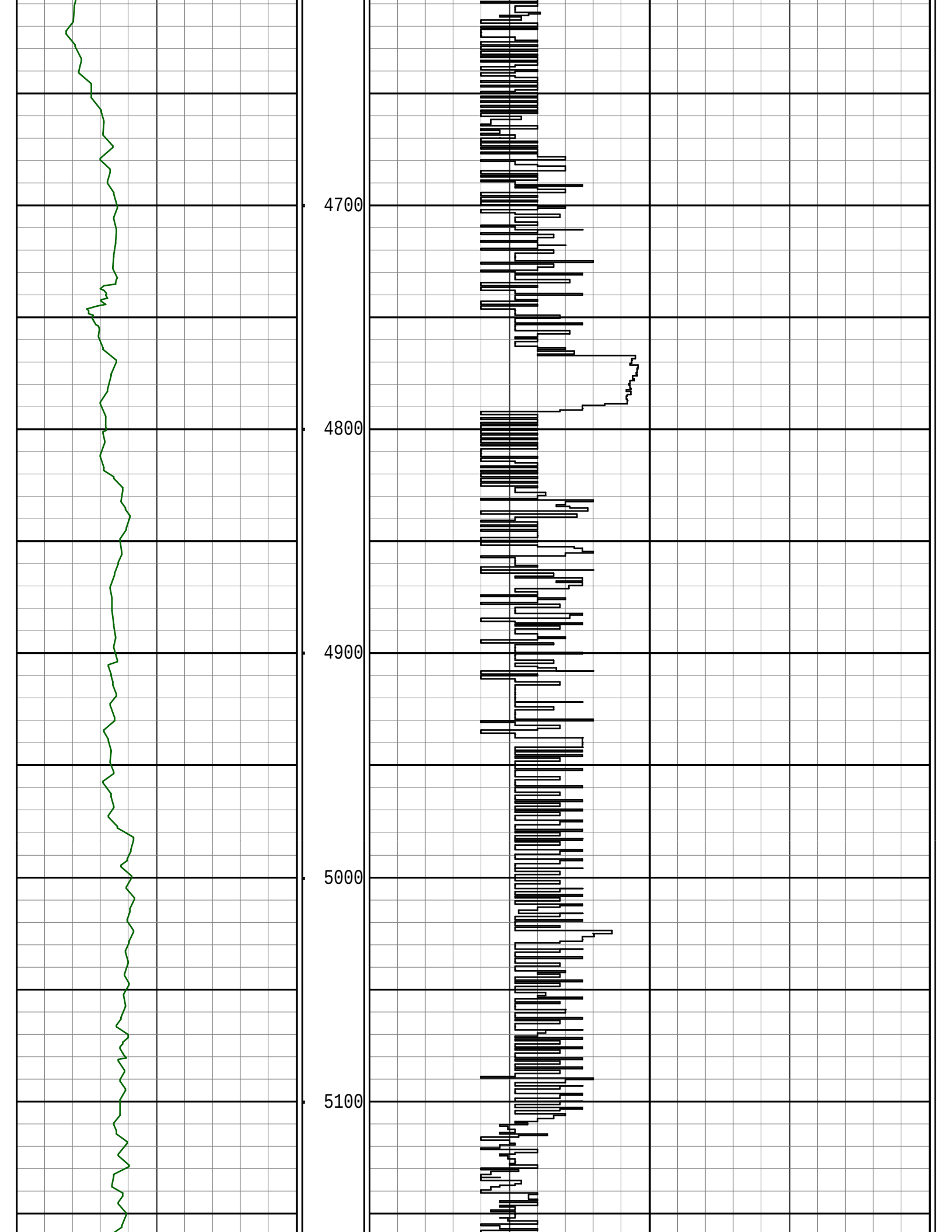
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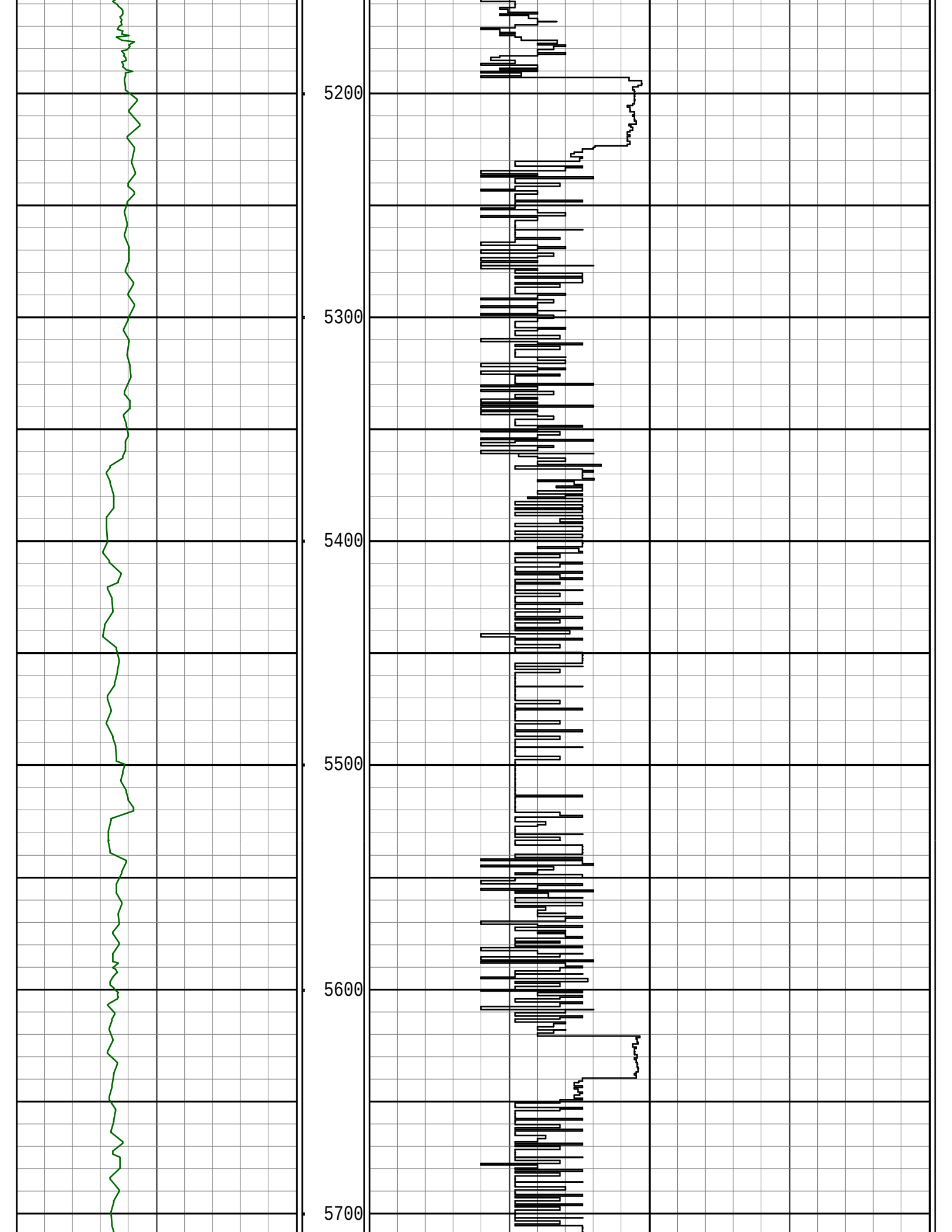
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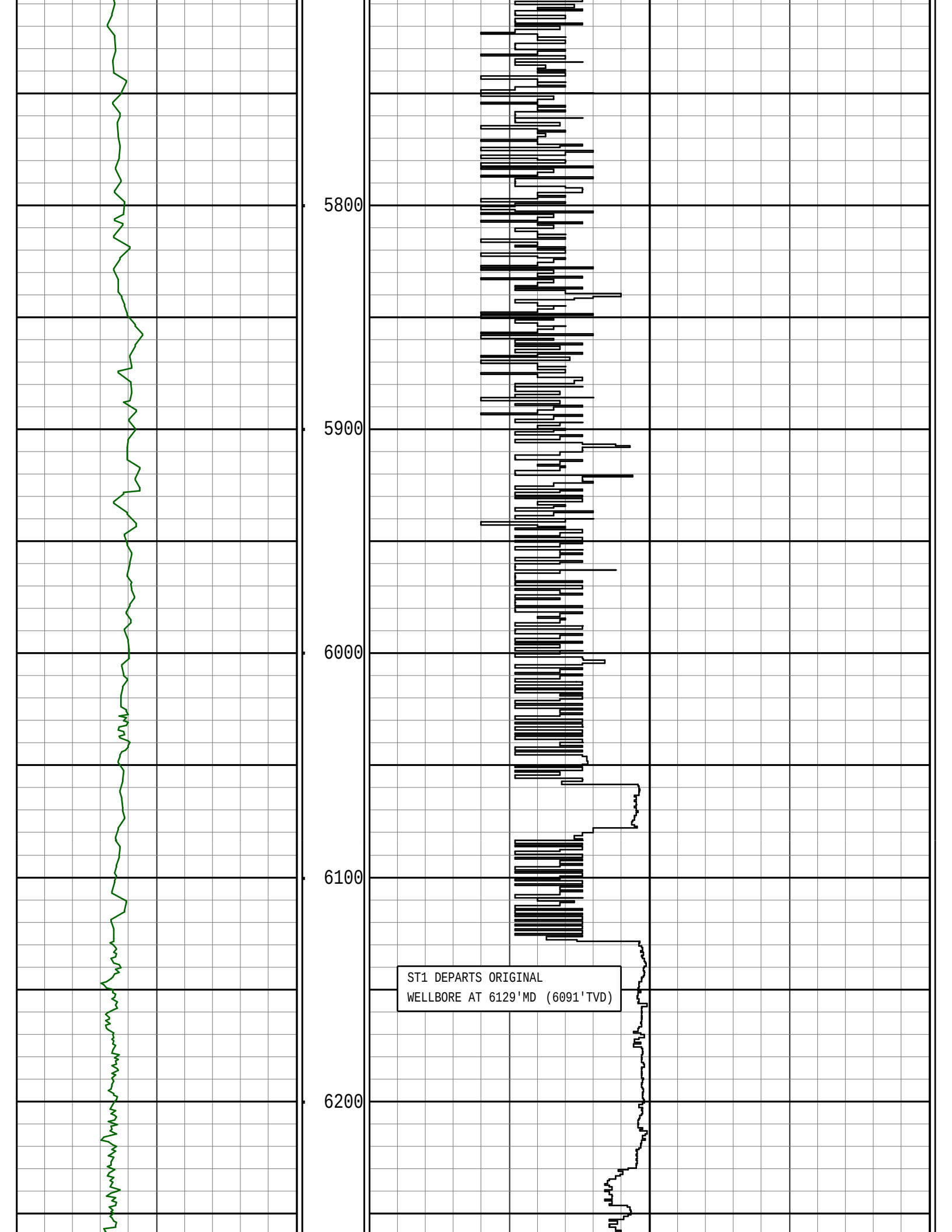
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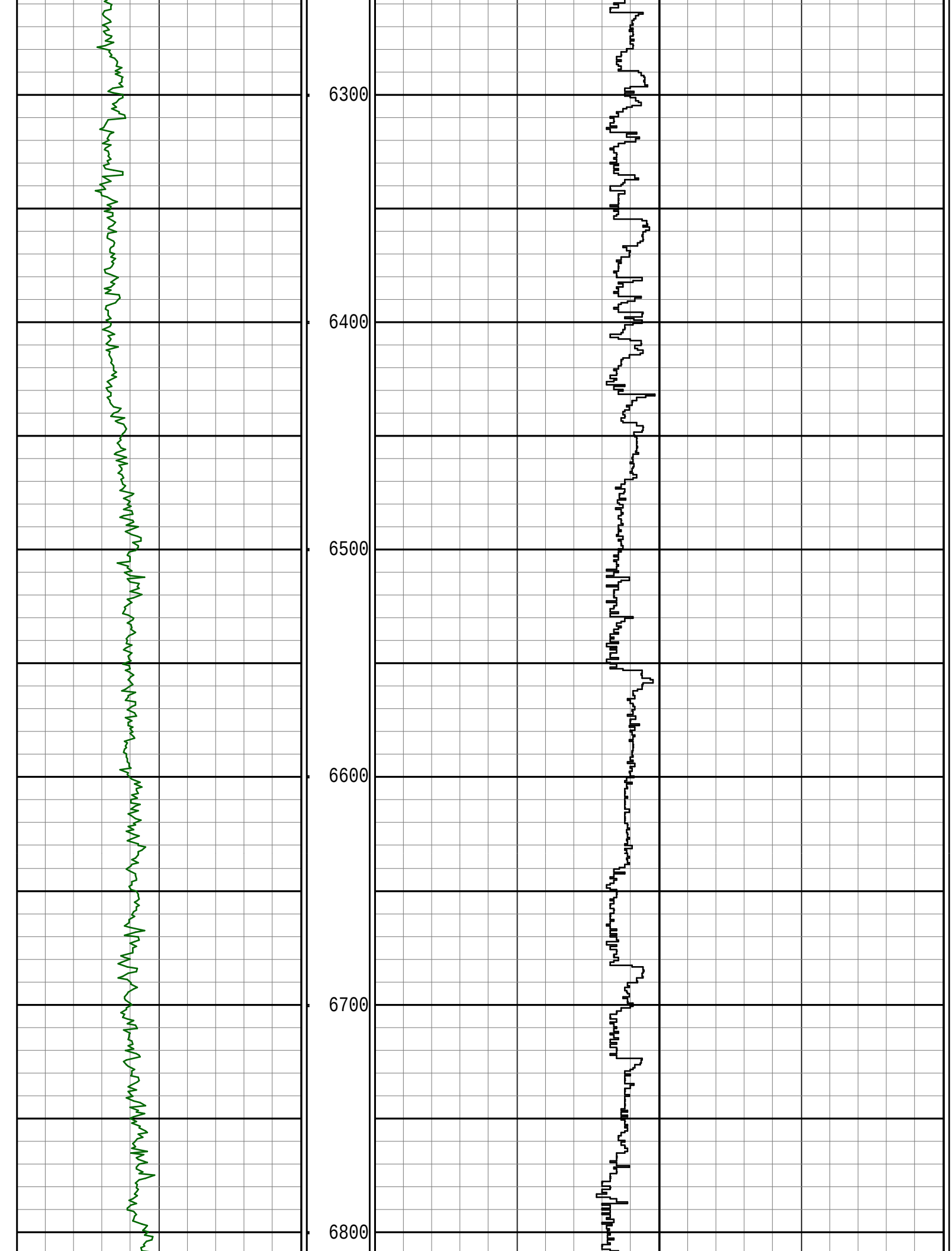
ST1 DEPARTS ORIGINAL
WELLBORE AT 6129'MD (6091'TVD)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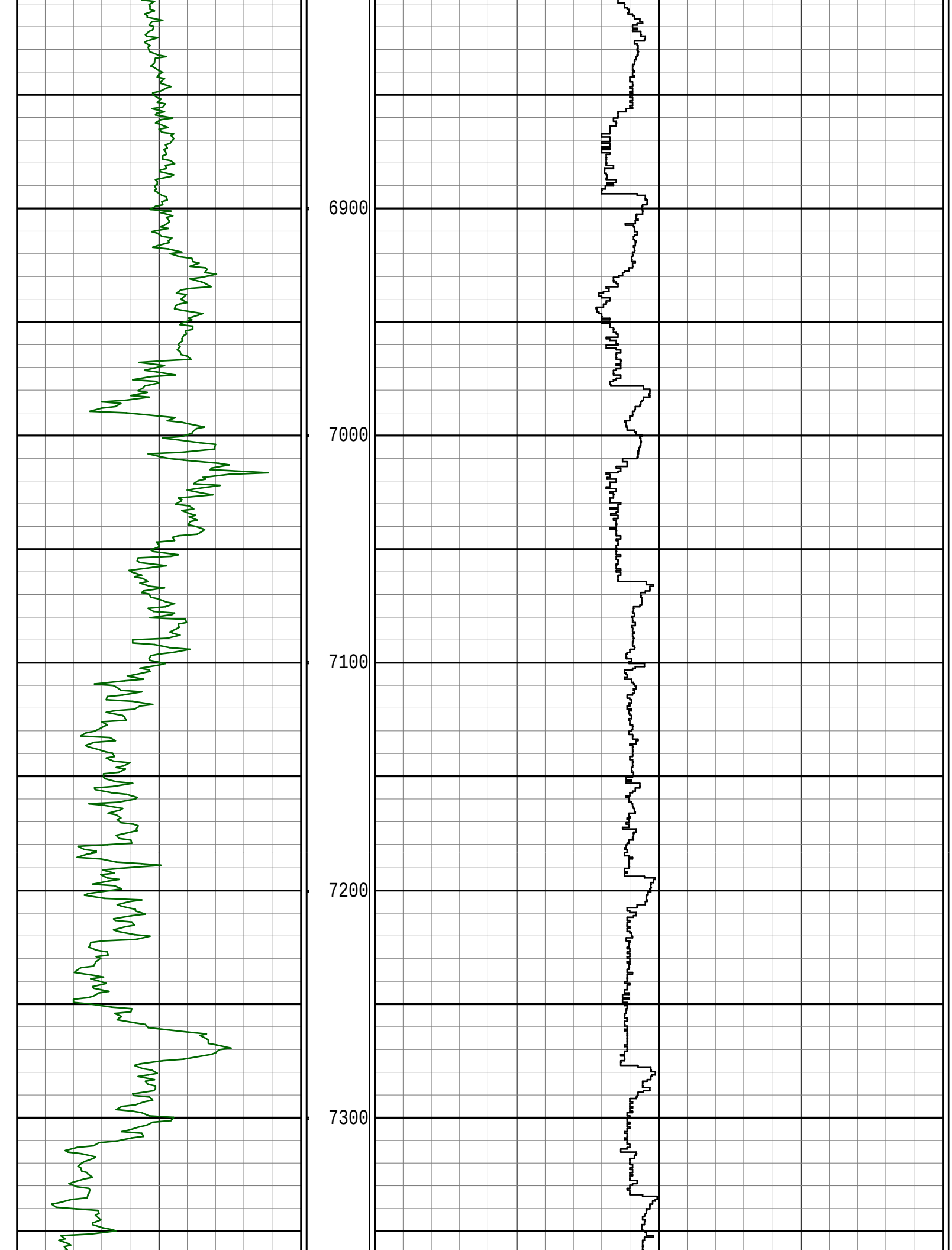
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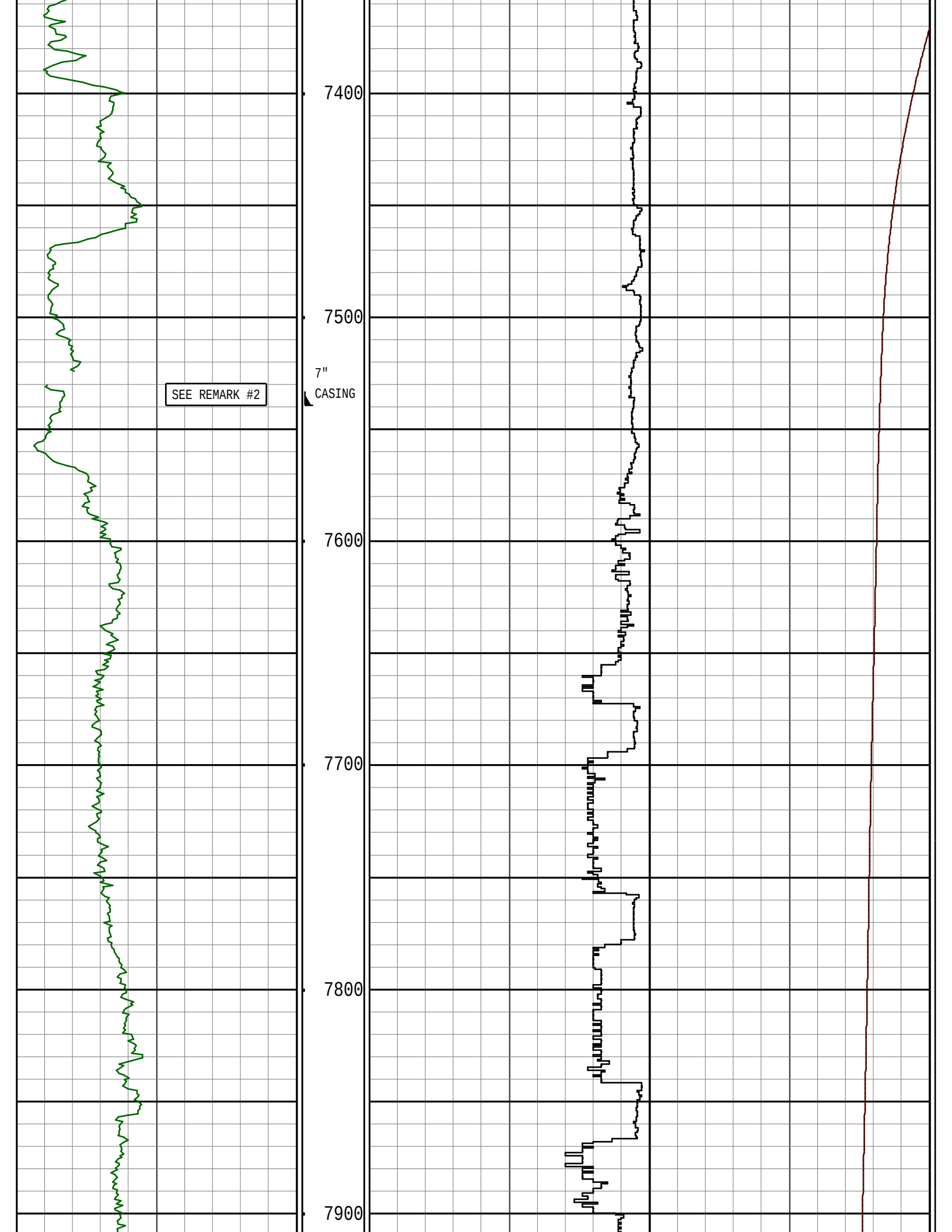
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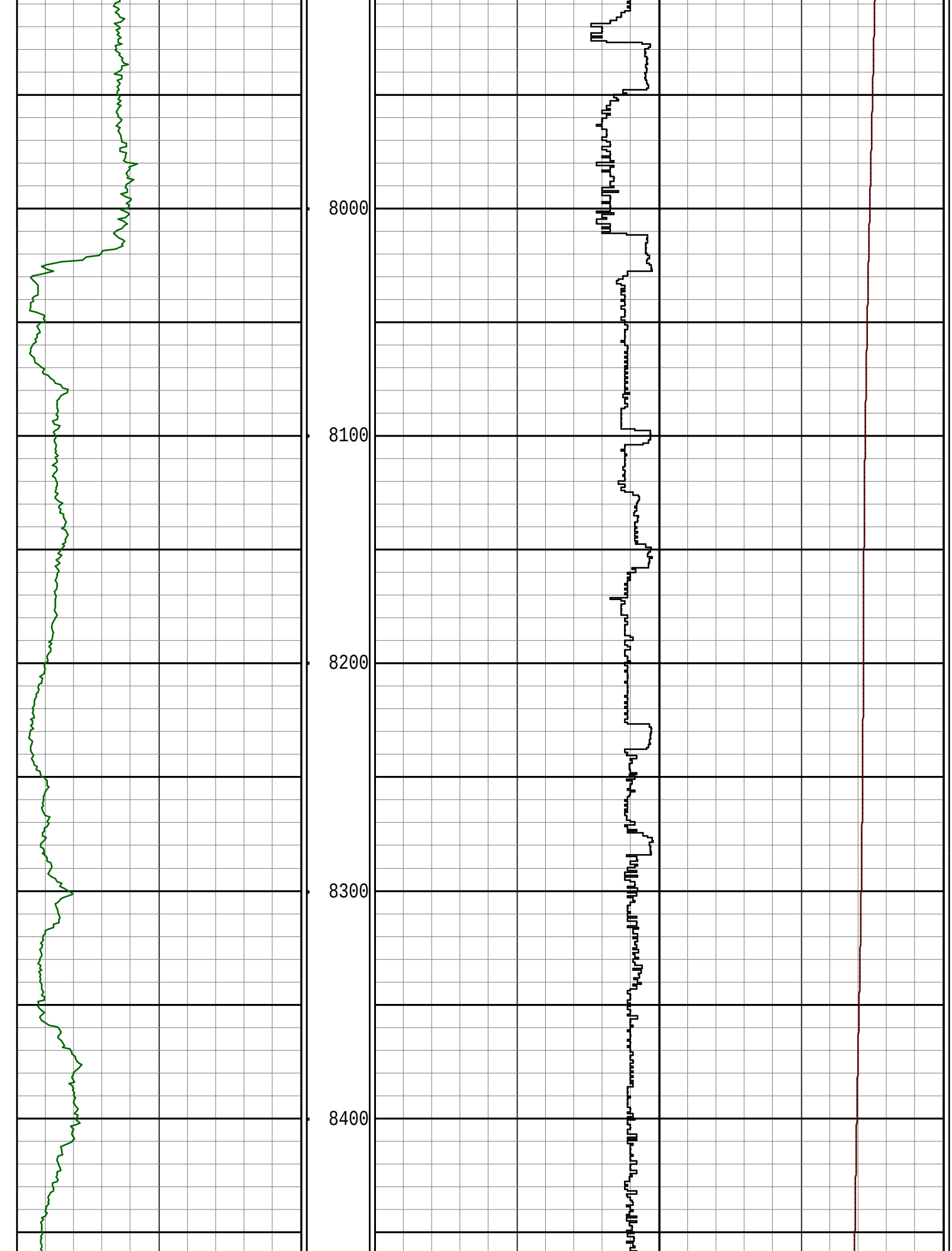
SEE REMARK #2
7"
CASING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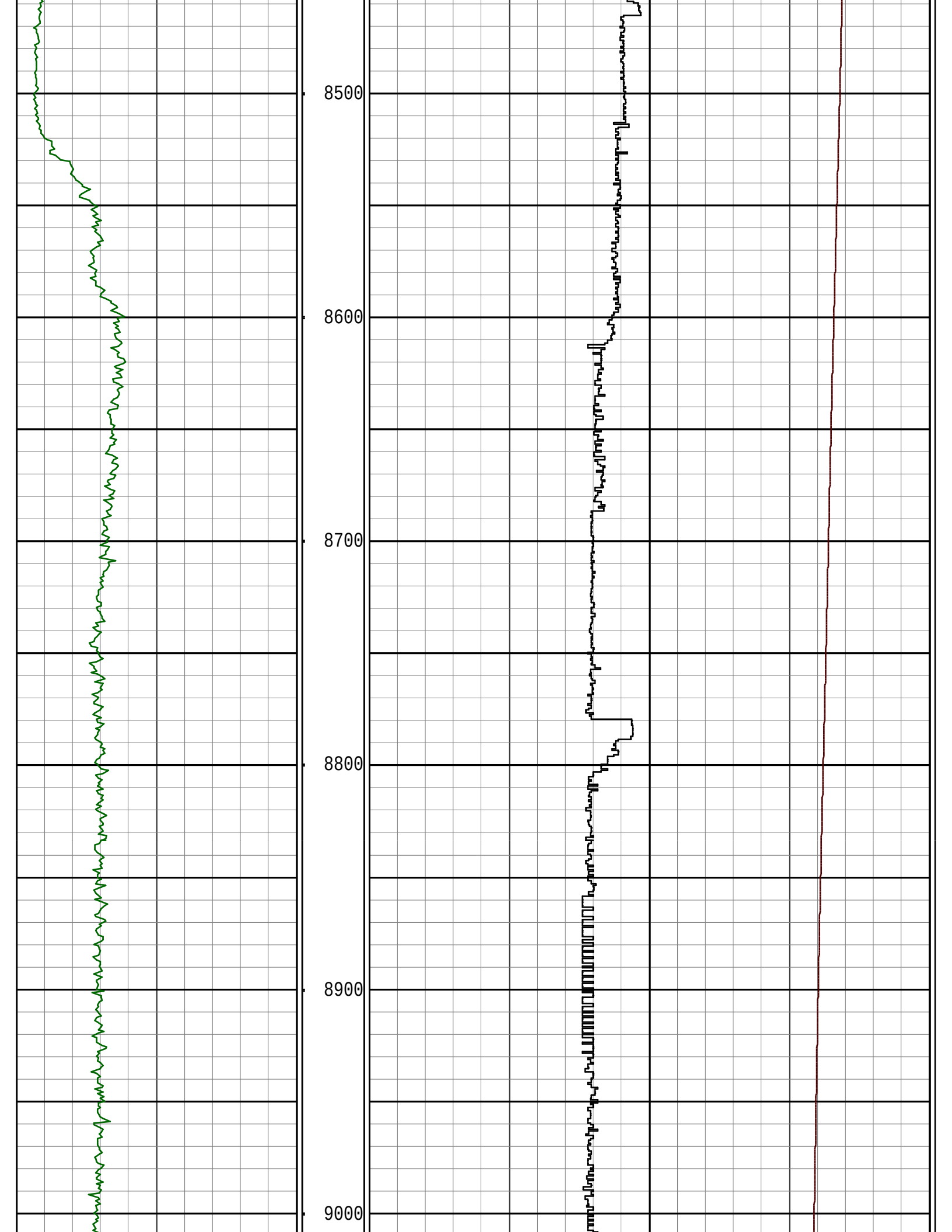
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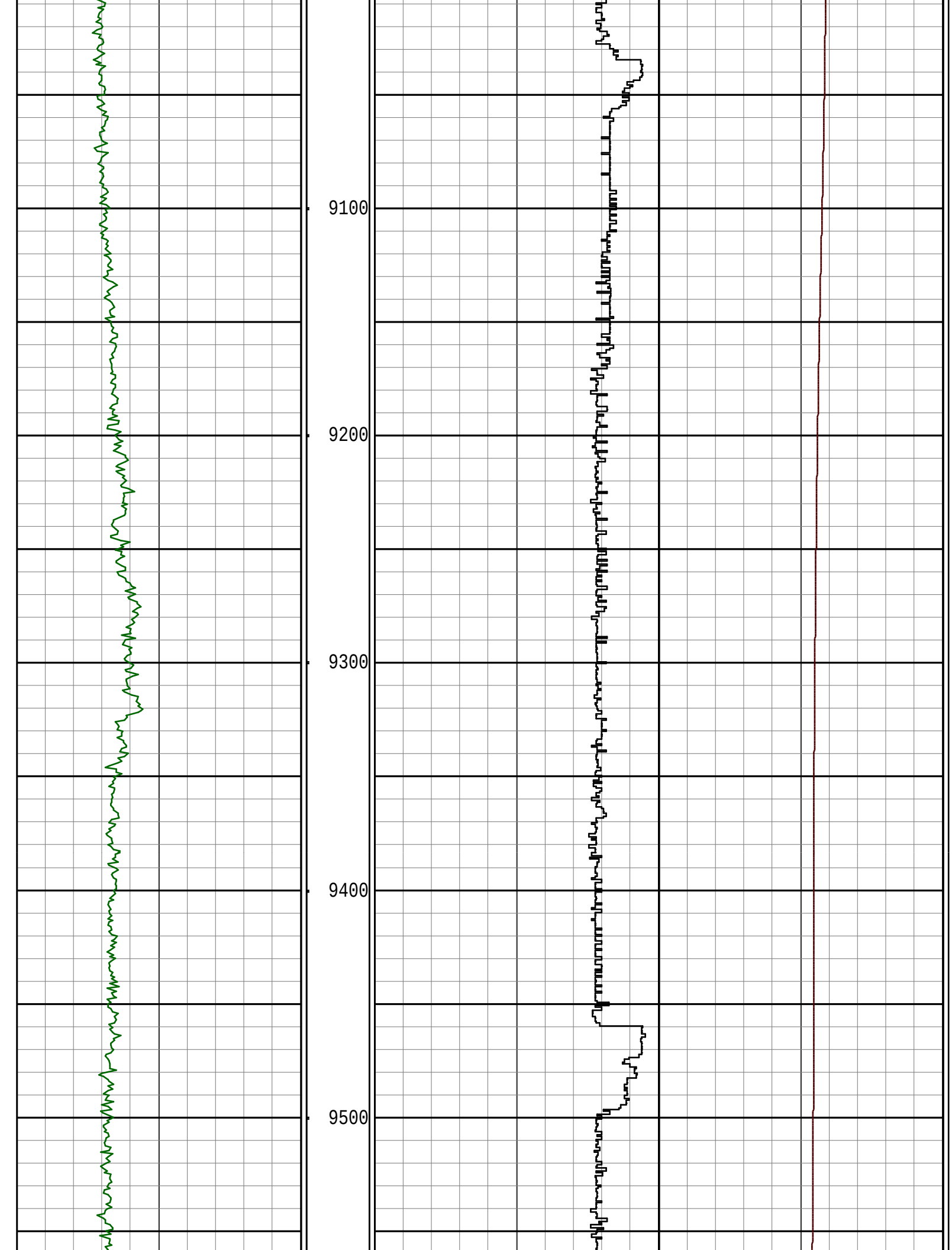
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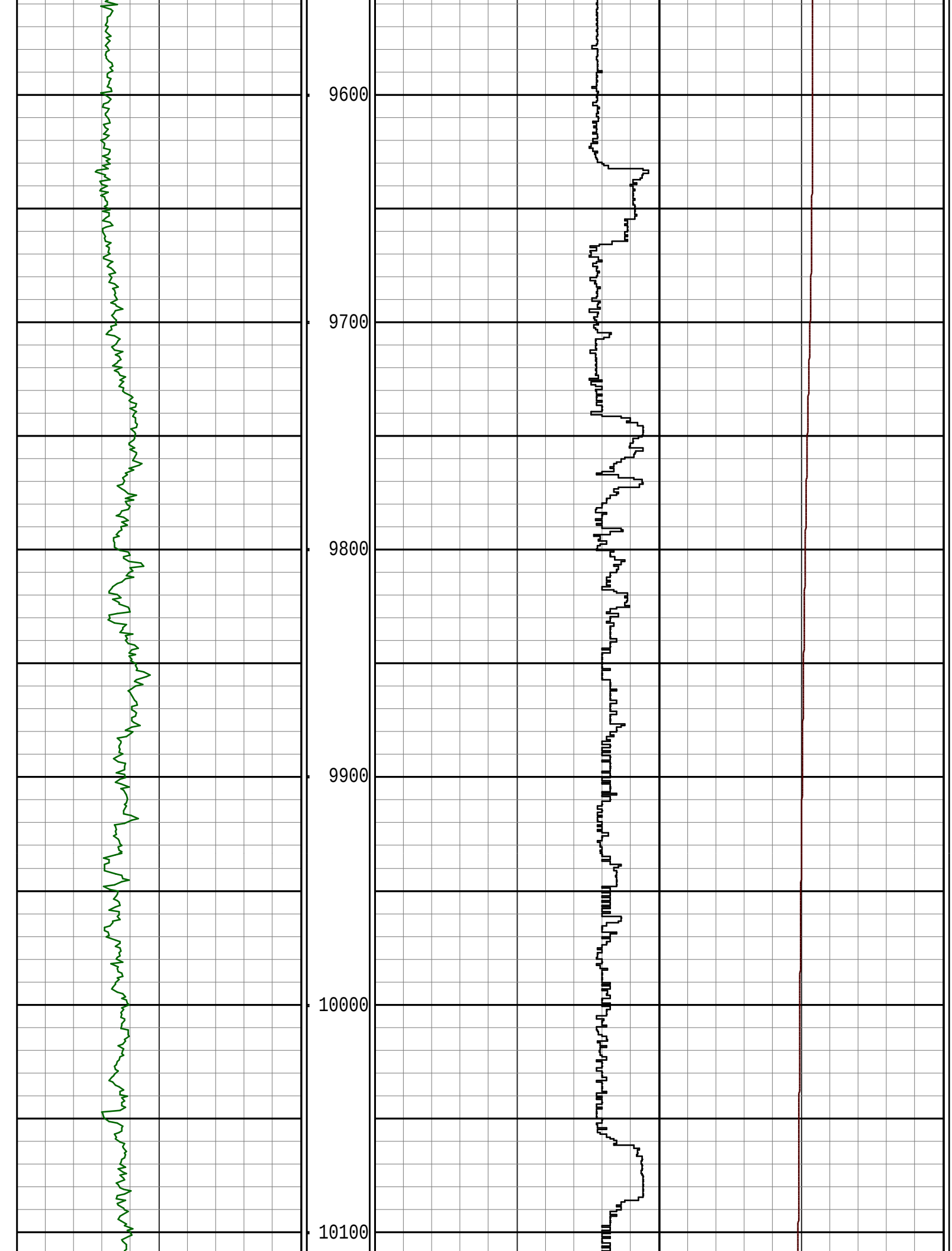
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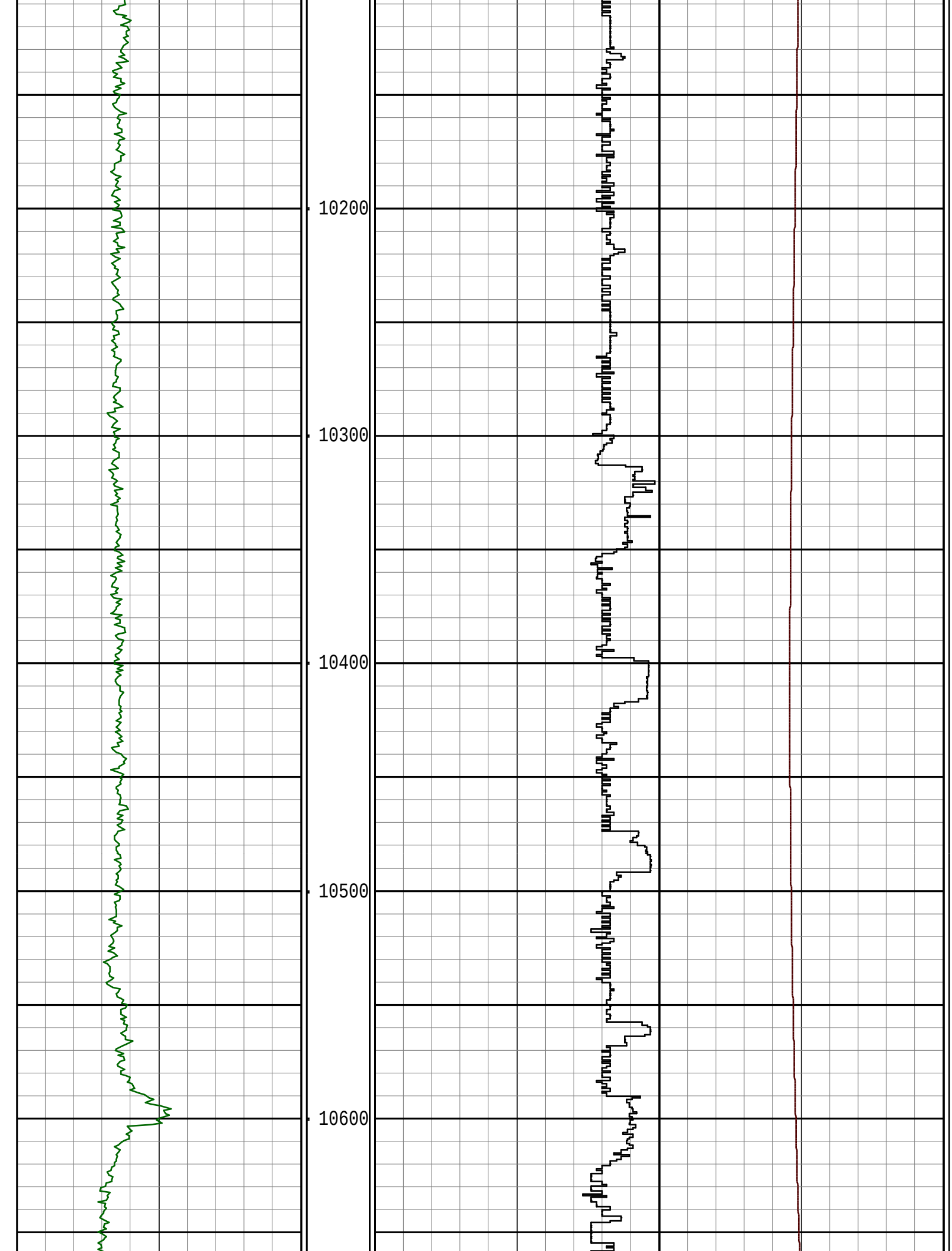
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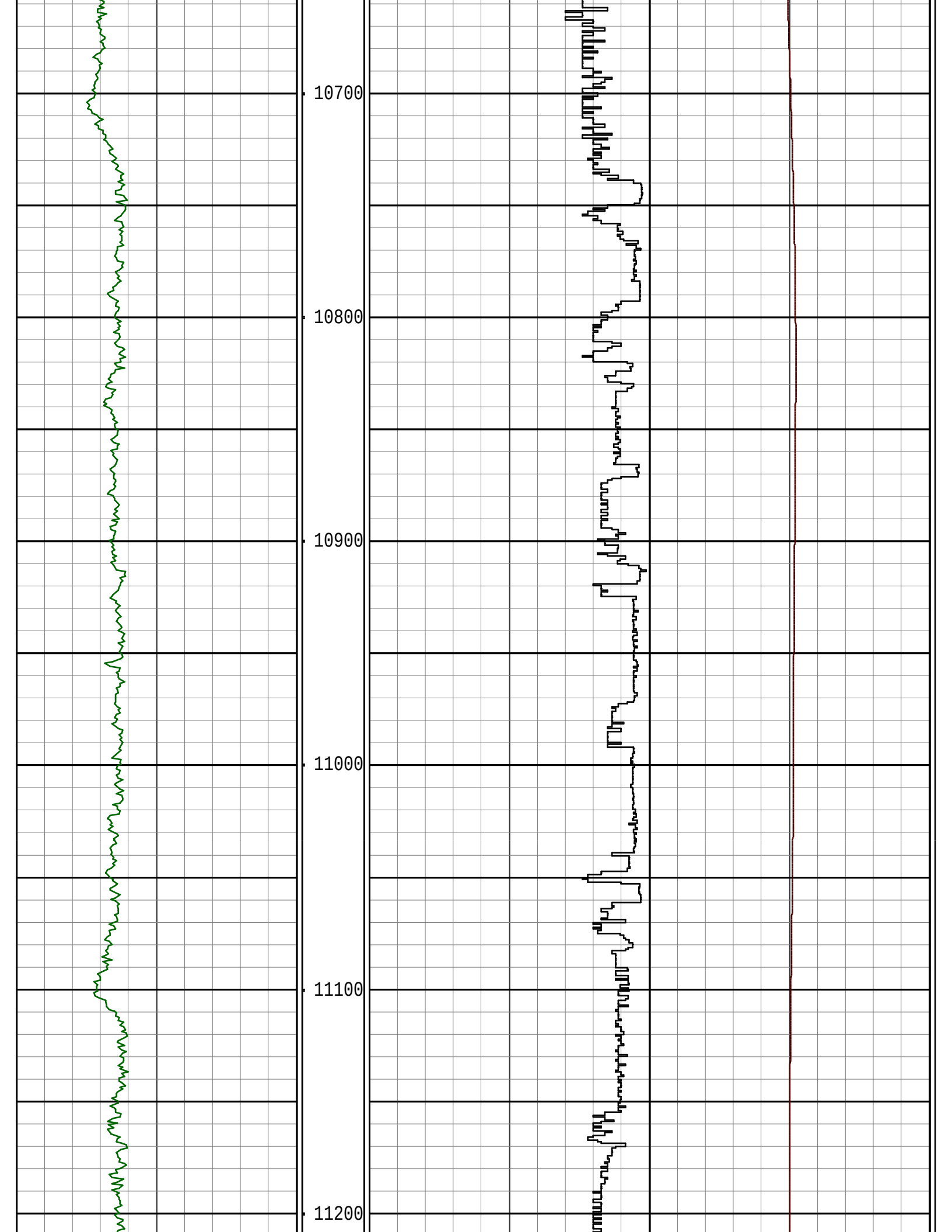
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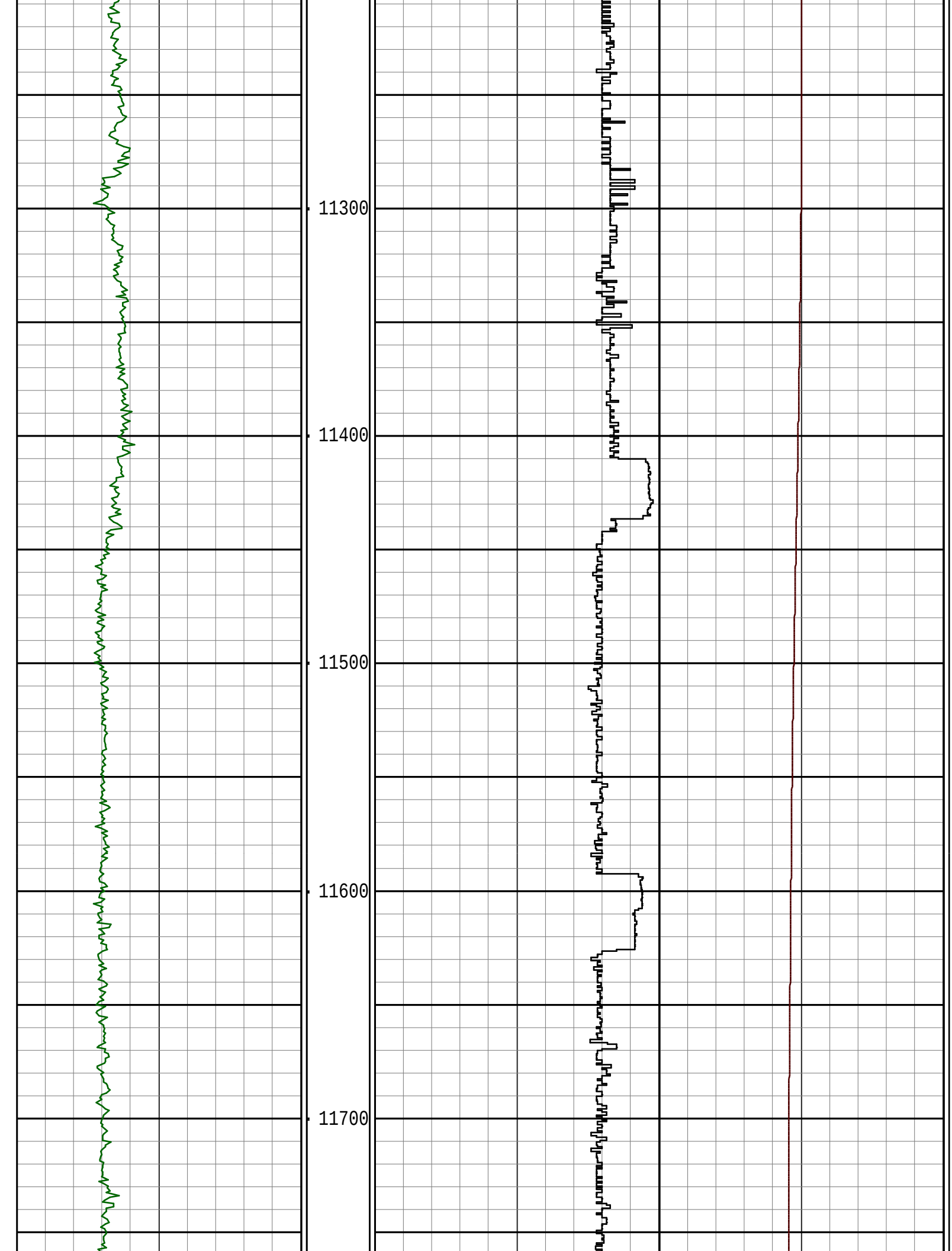
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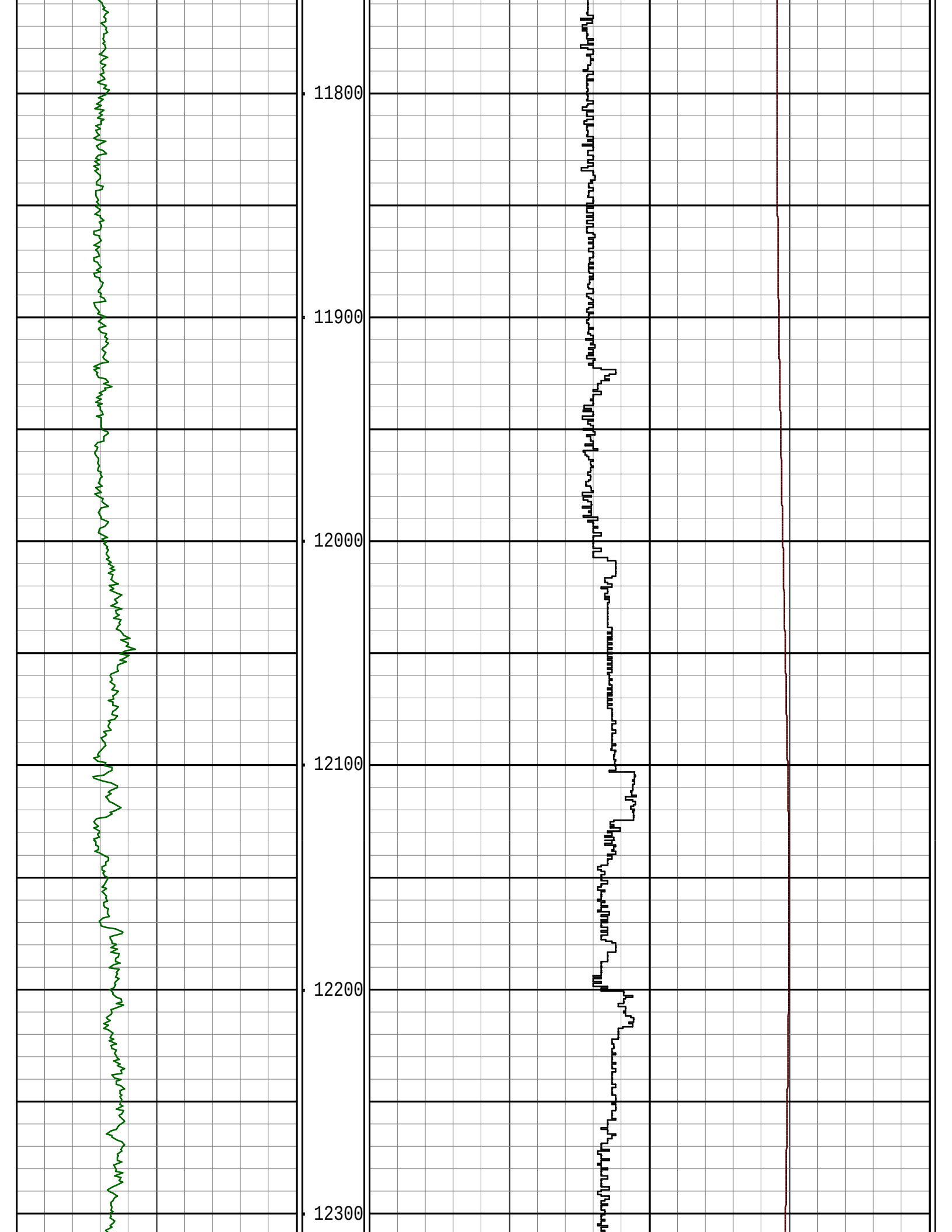
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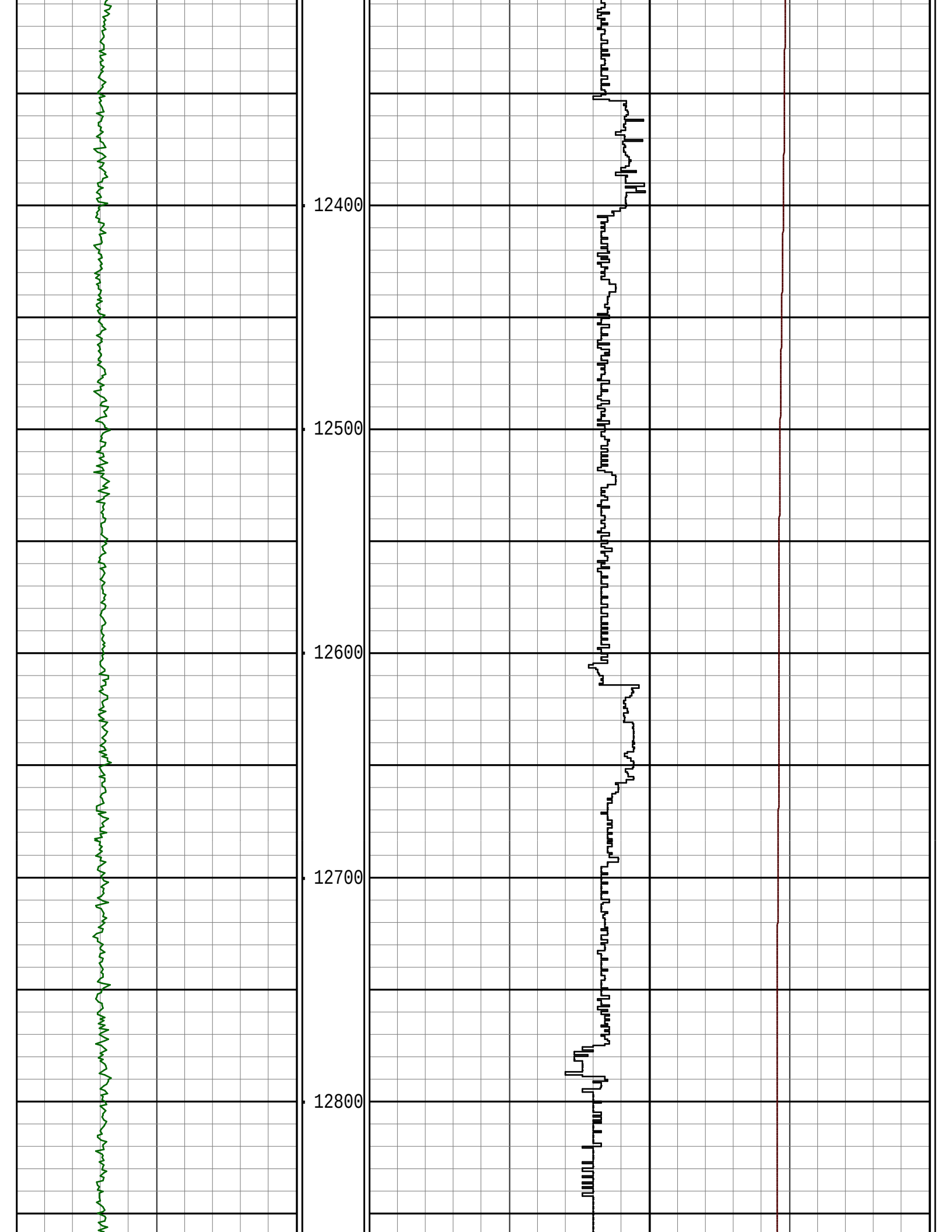
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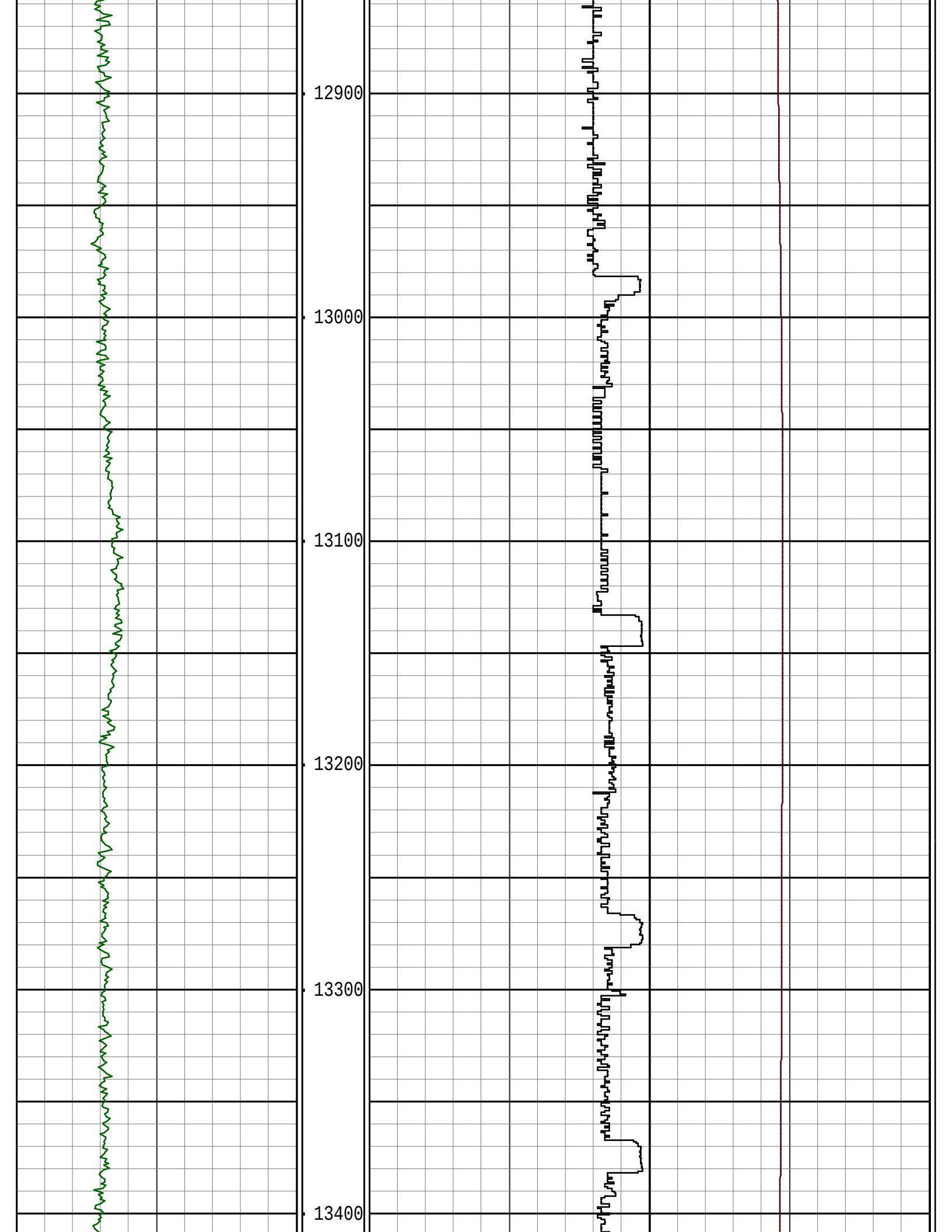
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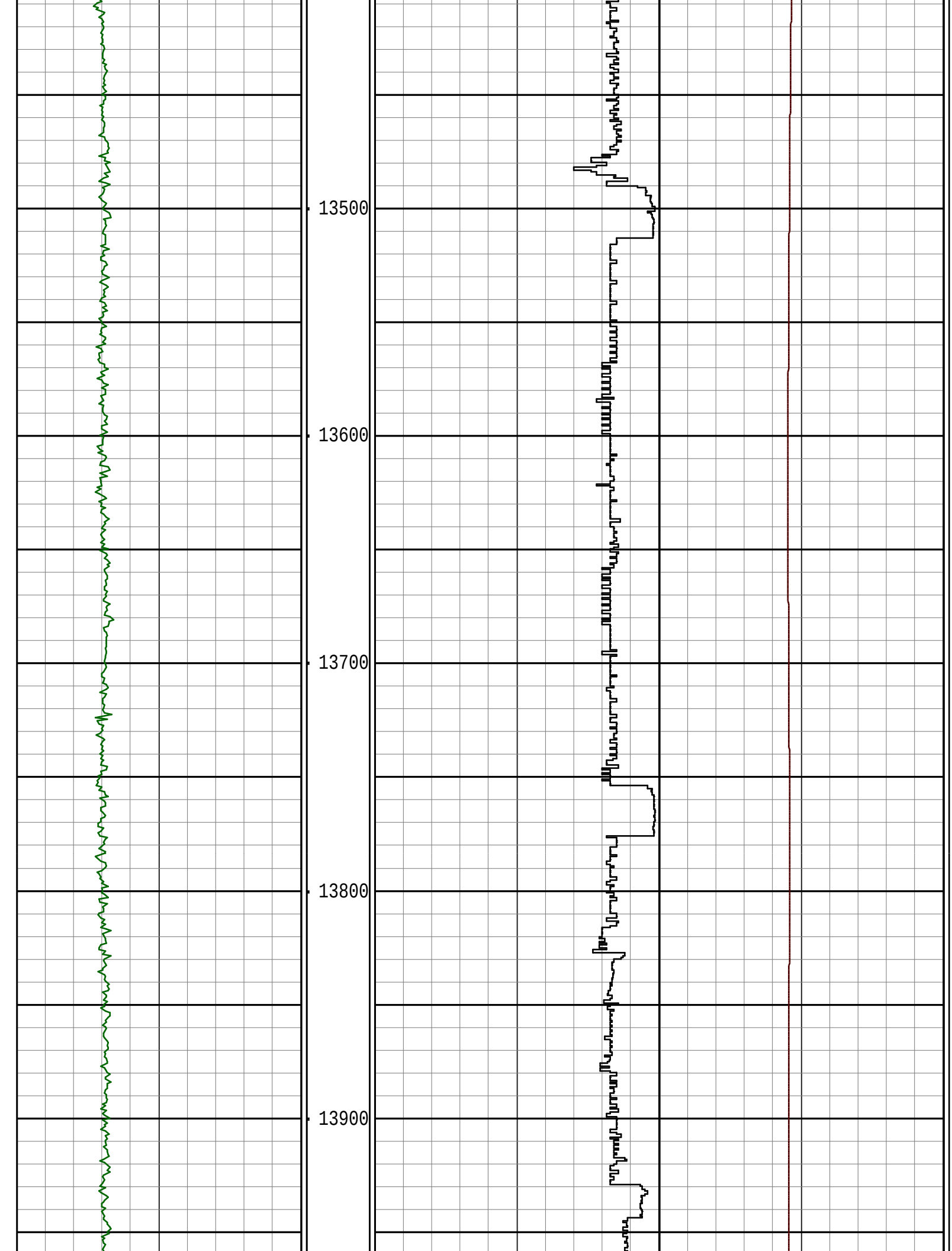
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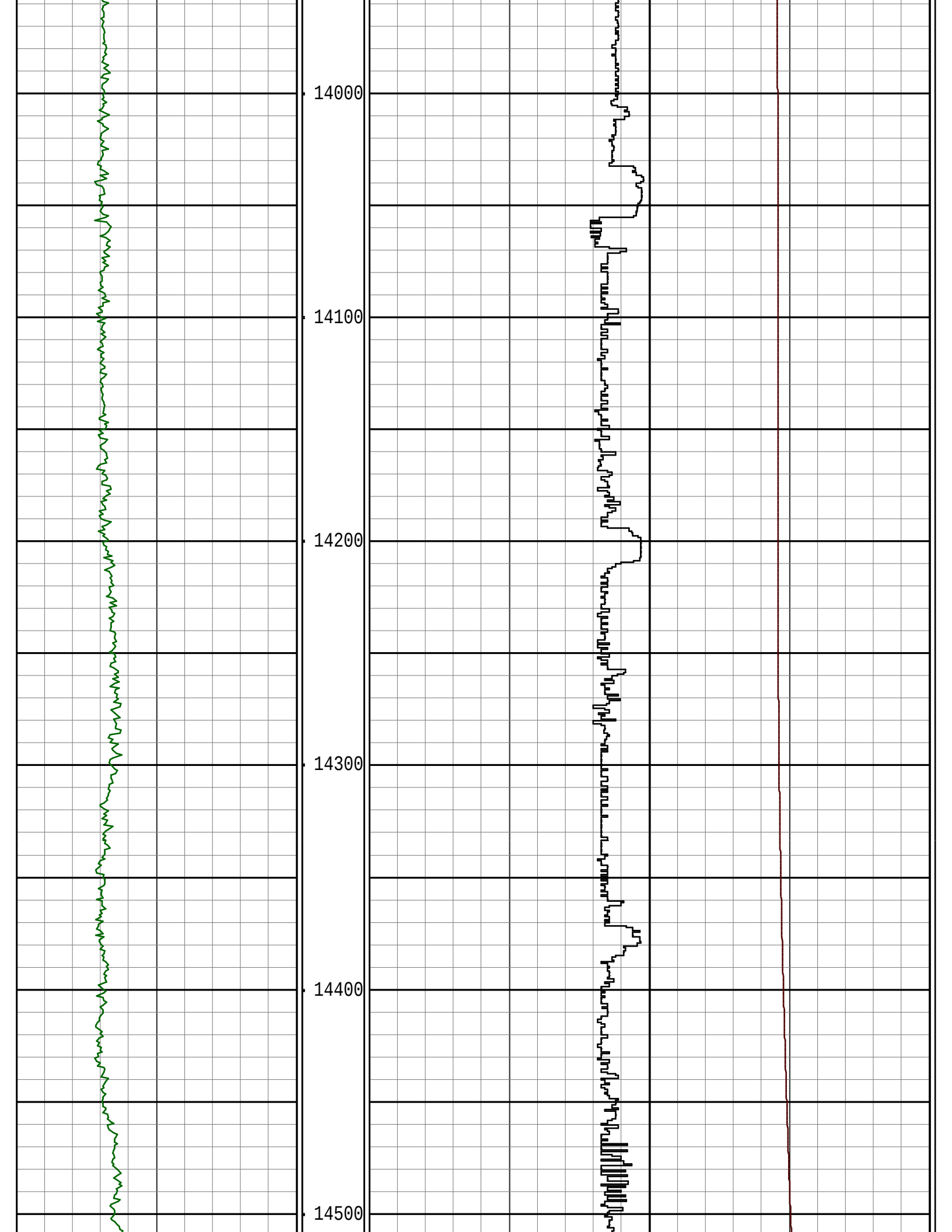
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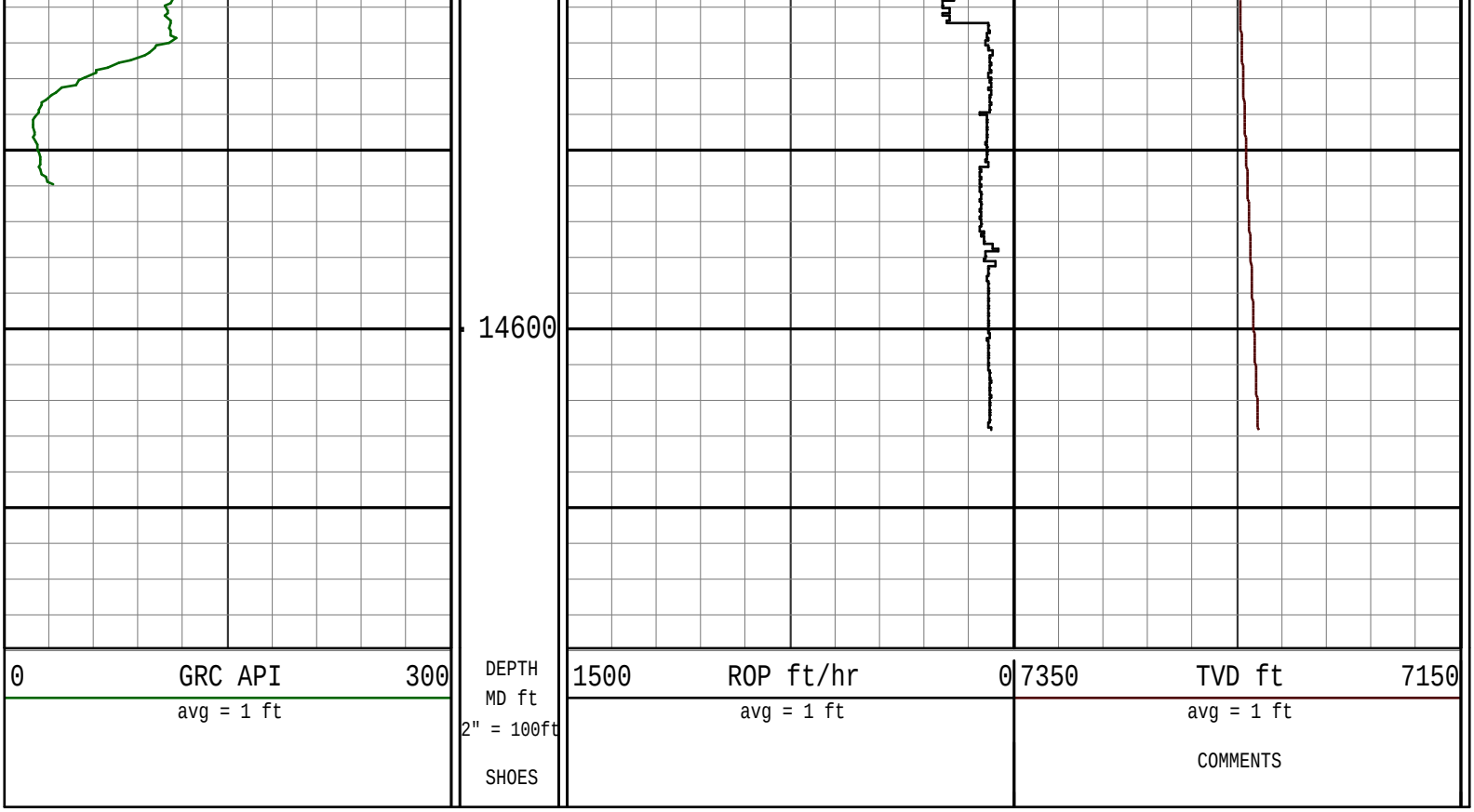

Survey Report

Vertical Section Plane: 84.58°	Total Correction: 8.14° East to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: NELSON FARM #1 ST1
RT: 16 FT ROTARY TABLE TO GROUND LEVEL	FIELD: WATTENBERG

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
ORIGIN OF WELL AT SURFACE.											
0.00	0.00	0.00	0.00		0.00	0.00 N	0.00 E	0.00	0.00		
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.											
503.00	0.62	238.59	502.99	503.00	-2.45	1.42 S	2.32 W	2.72	238.59	0.12	79.34
595.00	0.35	310.75	594.99	92.00	-3.09	1.49 S	2.96 W	3.32	243.22	0.67	82.95
687.00	0.70	294.93	686.98	92.00	-3.77	1.07 S	3.68 W	3.84	253.74	0.41	86.57
775.00	1.41	322.88	774.97	88.00	-4.80	0.02 N	4.82 W	4.82	270.19	0.97	90.18
1066.00	6.42	313.21	1065.20	291.00	-17.44	14.02 N	18.85 W	23.49	306.64	1.73	79.34
1343.00	7.30	322.52	1340.22	277.00	-37.02	38.59 N	40.85 W	56.19	313.37	0.51	82.95
1601.00	6.86	318.83	1596.26	258.00	-54.72	63.20 N	60.97 W	87.81	316.03	0.24	86.57
1771.00	9.85	319.89	1764.43	170.00	-68.93	81.96 N	77.02 W	112.47	316.78	1.76	90.18
2026.00	8.79	340.37	2016.13	255.00	-86.14	117.01 N	97.62 W	152.38	320.16	1.36	93.80
2281.00	8.35	338.43	2268.28	255.00	-96.07	152.58 N	110.98 W	188.67	323.97	0.21	97.41
2537.00	8.18	335.36	2521.63	256.00	-107.23	186.42 N	125.40 W	224.67	326.07	0.19	101.02
2971.00	6.42	330.26	2952.10	434.00	-127.39	235.55 N	150.31 W	279.43	327.46	0.43	104.64
3415.00	5.36	325.69	3393.75	444.00	-147.64	274.24 N	174.32 W	324.95	327.56	0.26	111.87
3860.00	5.63	329.29	3836.70	445.00	-167.00	310.17 N	197.18 W	367.54	327.56	0.10	115.48
4290.00	7.21	324.11	4264.00	430.00	-189.70	350.17 N	223.77 W	415.57	327.42	0.39	115.48
4715.00	5.89	322.44	4686.21	425.00	-214.82	389.07 N	252.70 W	463.93	327.00	0.31	126.32
5141.00	6.07	319.01	5109.90	426.00	-239.55	423.39 N	280.80 W	508.05	326.45	0.09	129.94
5568.00	7.21	330.61	5534.05	427.00	-263.57	463.79 N	308.76 W	557.16	326.35	0.41	133.55
5993.00	5.98	330.43	5956.23	425.00	-283.47	506.28 N	332.78 W	605.85	326.68	0.29	140.78
ST1 DEPARTS ORIGINAL WELLBORE AT 6129'MD.											
6162.00	9.58	1.37	6123.71	169.00	-285.41	528.01 N	336.79 W	626.28	327.47	3.20	126.32
6247.00	13.72	33.10	6207.02	85.00	-278.28	543.55 N	331.11 W	636.46	328.65	8.80	137.17
6332.00	11.87	28.79	6289.91	85.00	-267.09	559.66 N	321.39 W	645.37	330.13	2.45	137.17
6417.00	8.79	32.84	6373.53	85.00	-258.15	572.78 N	313.66 W	653.04	331.29	3.72	140.78
6502.00	5.45	62.28	6457.88	85.00	-250.39	580.12 N	306.56 W	656.13	332.15	5.70	144.39
6588.00	12.22	60.26	6542.81	86.00	-238.30	586.54 N	295.02 W	656.56	333.30	7.88	144.39
6673.00	19.43	68.78	6624.55	85.00	-216.47	596.13 N	274.00 W	656.09	335.31	8.89	148.01
6758.00	24.97	72.74	6703.22	85.00	-185.28	606.58 N	243.67 W	653.69	338.11	6.75	151.62
6843.00	27.87	76.52	6779.34	85.00	-148.04	616.54 N	207.20 W	650.43	341.42	3.94	155.24
6928.00	33.50	83.64	6852.44	85.00	-104.87	623.78 N	164.52 W	645.11	345.22	7.87	155.24
7013.00	35.70	81.27	6922.40	85.00	-56.65	630.14 N	116.69 W	640.85	349.51	3.03	158.85
7099.00	42.47	82.67	6989.12	86.00	-2.51	637.66 N	63.03 W	640.77	354.36	7.94	148.01
7184.00	53.02	84.17	7046.20	85.00	60.30	644.79 N	0.61 W	644.79	359.95	12.48	158.85
7269.00	54.69	83.55	7096.33	85.00	128.93	652.14 N	67.63 E	655.64	5.92	2.05	162.46
7354.00	60.50	79.51	7141.88	85.00	200.53	662.78 N	138.55 E	677.11	11.81	7.92	162.46
7439.00	76.33	76.78	7173.05	85.00	278.80	679.07 N	215.63 E	712.48	17.62	18.86	166.08

7506.00	86.09	77.75	7183.28	67.00	344.40	693.64 N	280.13 E	748.07	21.99	14.64	169.69
7582.00	88.11	77.40	7187.12	76.00	419.73	709.97 N	354.25 E	793.44	26.52	2.70	166.08
7668.00	87.76	80.39	7190.22	86.00	505.24	726.52 N	438.58 E	848.63	31.12	3.50	166.08
7753.00	88.46	82.14	7193.03	85.00	590.05	739.42 N	522.54 E	905.42	35.25	2.22	166.08
7838.00	88.11	85.13	7195.57	85.00	674.99	748.84 N	606.97 E	963.94	39.03	3.54	166.08
7924.00	87.76	88.03	7198.67	86.00	760.87	753.96 N	692.75 E	1023.90	42.58	3.39	169.69
8009.00	87.76	90.58	7201.99	85.00	845.51	754.99 N	777.67 E	1083.88	45.85	3.00	173.31
8094.00	88.55	91.90	7204.73	85.00	929.89	753.16 N	862.61 E	1145.14	48.88	1.81	173.31
8179.00	89.69	92.51	7206.03	85.00	1014.13	749.89 N	947.53 E	1208.37	51.64	1.52	173.31
8265.00	89.08	93.22	7206.96	86.00	1099.22	745.59 N	1033.42 E	1274.31	54.19	1.09	176.92
8350.00	87.93	94.18	7209.17	85.00	1183.12	740.10 N	1118.21 E	1340.95	56.50	1.76	180.54
8435.00	88.55	92.87	7211.79	85.00	1267.04	734.88 N	1203.01 E	1409.71	58.58	1.70	180.54
8520.00	87.49	93.57	7214.72	85.00	1351.03	730.11 N	1287.82 E	1480.39	60.45	1.49	184.15
8605.00	87.58	91.37	7218.38	85.00	1435.14	726.45 N	1372.66 E	1553.04	62.11	2.59	184.15
8690.00	88.02	90.41	7221.64	85.00	1519.56	725.13 N	1457.58 E	1628.00	63.55	1.24	184.15
8776.00	87.76	90.67	7224.81	86.00	1605.04	724.32 N	1543.52 E	1705.02	64.86	0.43	184.15
8861.00	87.93	90.76	7228.00	85.00	1689.49	723.26 N	1628.46 E	1781.85	66.05	0.23	187.76
8946.00	88.37	90.76	7230.75	85.00	1773.95	722.13 N	1713.40 E	1859.36	67.15	0.52	187.76
9031.00	88.81	90.32	7232.84	85.00	1858.47	721.33 N	1798.37 E	1937.65	68.14	0.73	187.76
9116.00	87.76	90.49	7235.38	85.00	1942.99	720.73 N	1883.33 E	2016.53	69.06	1.25	191.38
9202.00	88.64	90.93	7238.09	86.00	2028.45	719.67 N	1969.28 E	2096.66	69.93	1.14	191.38
9287.00	89.16	91.64	7239.72	85.00	2112.86	717.76 N	2054.24 E	2176.03	70.74	1.04	194.99
9372.00	89.52	92.34	7240.70	85.00	2197.14	714.81 N	2139.19 E	2255.46	71.52	0.93	194.99
9457.00	90.13	92.51	7240.96	85.00	2281.34	711.21 N	2224.11 E	2335.06	72.27	0.75	194.99
9542.00	89.16	91.02	7241.48	85.00	2365.67	708.60 N	2309.07 E	2415.34	72.94	2.09	194.99
9628.00	89.87	91.11	7242.21	86.00	2451.12	707.00 N	2395.05 E	2497.22	73.55	0.83	194.99
9713.00	87.58	90.23	7244.10	85.00	2535.61	706.00 N	2480.01 E	2578.55	74.11	2.89	198.61
9798.00	88.55	89.44	7246.97	85.00	2620.20	706.25 N	2564.96 E	2660.42	74.61	1.47	198.61
9884.00	88.90	88.38	7248.89	86.00	2705.94	707.88 N	2650.92 E	2743.81	75.05	1.30	198.61
9969.00	89.08	87.51	7250.38	85.00	2790.78	710.93 N	2735.86 E	2826.72	75.43	1.04	202.22
10054.00	89.52	87.33	7251.42	85.00	2875.66	714.76 N	2820.76 E	2909.91	75.78	0.56	198.61
10140.00	88.64	88.38	7252.80	86.00	2961.51	717.98 N	2906.69 E	2994.05	76.13	1.59	202.22

Survey Report

Vertical Section Plane: 84.58°	Total Correction: 8.14° East to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: NELSON FARM #1 ST1
RT: 16 FT ROTARY TABLE TO GROUND LEVEL	FIELD: WATTENBERG

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
10225.00	88.55	87.51	7254.89	85.00	3046.34	721.02 N	2991.61 E	3077.27	76.45	1.03	202.22
10310.00	88.90	86.80	7256.78	85.00	3131.23	725.24 N	3076.48 E	3160.81	76.74	0.93	202.22
10395.00	89.69	89.00	7257.82	85.00	3216.08	728.36 N	3161.41 E	3244.23	77.03	2.75	202.22
10480.00	90.92	90.76	7257.37	85.00	3300.71	728.53 N	3246.41 E	3327.15	77.35	2.53	202.22
10566.00	92.07	91.20	7255.13	86.00	3386.14	727.06 N	3332.36 E	3410.76	77.69	1.43	205.83
10651.00	92.86	91.72	7251.47	85.00	3470.45	724.90 N	3417.26 E	3493.30	78.02	1.11	205.83
10736.00	92.68	91.02	7247.36	85.00	3554.75	722.87 N	3502.13 E	3575.96	78.34	0.85	205.83
10822.00	89.87	89.97	7245.45	86.00	3640.26	722.13 N	3588.10 E	3660.04	78.62	3.49	205.83
10907.00	89.08	90.14	7246.23	85.00	3724.87	722.05 N	3673.09 E	3743.39	78.88	0.95	209.45
10992.00	89.78	90.67	7247.08	85.00	3809.43	721.45 N	3758.09 E	3826.71	79.13	1.03	209.45
11077.00	88.55	91.46	7248.31	85.00	3893.87	719.87 N	3843.06 E	3909.90	79.39	1.72	209.45
11162.00	89.69	90.93	7249.62	85.00	3978.30	718.09 N	3928.03 E	3993.13	79.64	1.48	209.45
11248.00	90.13	89.88	7249.75	86.00	4063.85	717.49 N	4014.03 E	4077.64	79.87	1.32	213.06
11333.00	88.90	87.33	7250.47	85.00	4148.63	719.55 N	4098.99 E	4161.67	80.04	3.33	213.06
11418.00	88.20	88.74	7252.63	85.00	4233.44	722.47 N	4183.91 E	4245.83	80.20	1.85	209.45
11504.00	88.37	89.70	7255.20	86.00	4319.12	723.64 N	4269.86 E	4330.75	80.38	1.13	209.45
11589.00	89.25	89.88	7256.96	85.00	4403.75	723.95 N	4354.84 E	4414.61	80.56	1.06	209.45
11674.00	89.08	92.08	7258.20	85.00	4488.21	722.50 N	4439.81 E	4498.22	80.76	2.60	209.45
11760.00	89.96	92.34	7258.92	86.00	4573.44	719.18 N	4525.75 E	4582.53	80.97	1.07	213.06
11845.00	90.66	92.60	7258.46	85.00	4657.64	715.52 N	4610.67 E	4665.86	81.18	0.88	213.06
11930.00	91.63	92.25	7256.77	85.00	4741.82	711.92 N	4695.57 E	4749.23	81.38	1.21	213.06
12015.00	91.98	92.16	7254.09	85.00	4826.03	708.65 N	4780.47 E	4832.71	81.57	0.42	213.06
12100.00	91.89	91.64	7251.22	85.00	4910.29	705.84 N	4865.37 E	4916.30	81.75	0.62	213.06
12186.00	89.34	88.91	7250.29	86.00	4995.84	705.42 N	4951.35 E	5001.35	81.89	4.34	213.06
12271.00	88.46	87.77	7251.93	85.00	5080.64	707.89 N	5036.30 E	5085.80	82.00	1.69	213.06
12357.00	89.34	87.15	7253.58	86.00	5166.52	711.70 N	5122.19 E	5171.40	82.09	1.25	209.45
12442.00	88.46	88.47	7255.21	85.00	5251.36	714.94 N	5207.11 E	5255.97	82.18	1.87	213.06
12527.00	89.25	87.94	7256.91	85.00	5336.18	717.61 N	5292.05 E	5340.49	82.28	1.12	213.06
12612.00	90.04	88.12	7257.44	85.00	5421.02	720.53 N	5377.00 E	5425.06	82.37	0.95	209.45
12697.00	89.16	91.02	7258.03	85.00	5505.69	721.17 N	5461.99 E	5509.39	82.48	3.57	209.45
12783.00	89.96	91.02	7258.69	86.00	5591.14	719.63 N	5547.97 E	5594.45	82.61	0.93	213.06
12868.00	90.66	91.20	7258.23	85.00	5675.59	717.99 N	5632.95 E	5678.53	82.74	0.85	213.06
12957.00	91.36	90.67	7256.66	89.00	5764.02	716.54 N	5721.93 E	5766.62	82.86	0.99	213.06
13046.00	90.66	91.81	7255.09	89.00	5852.41	714.61 N	5810.89 E	5854.67	82.99	1.50	213.06
13135.00	89.78	91.28	7254.75	89.00	5940.75	712.21 N	5899.86 E	5942.69	83.12	1.15	213.06
13224.00	89.69	91.11	7255.16	89.00	6029.16	710.35 N	5988.84 E	6030.82	83.24	0.22	209.45
13313.00	89.69	93.83	7255.64	89.00	6117.31	706.52 N	6077.74 E	6118.67	83.37	3.06	209.45
13402.00	88.90	95.15	7256.74	89.00	6204.97	699.55 N	6166.46 E	6206.01	83.53	1.73	213.06
13491.00	89.34	94.10	7258.10	89.00	6292.59	692.38 N	6255.16 E	6293.36	83.68	1.28	213.06
13580.00	89.43	92.43	7259.06	89.00	6380.56	687.31 N	6344.01 E	6381.13	83.82	1.88	213.06
13665.00	90.57	91.90	7259.06	85.00	6464.82	684.10 N	6428.94 E	6465.24	83.93	1.48	213.06
13750.00	90.57	91.37	7258.21	85.00	6549.17	681.67 N	6513.90 E	6549.48	84.03	0.62	213.06

13839.00	89.16	90.41	7258.42	89.00	6637.63	680.29 N	6602.89 E	6637.84	84.12	1.92	213.06
13928.00	90.22	90.67	7258.91	89.00	6726.14	679.45 N	6691.88 E	6726.29	84.20	1.23	213.06
14017.00	90.84	90.85	7258.08	89.00	6814.62	678.27 N	6780.87 E	6814.71	84.29	0.72	213.06
14106.00	89.34	89.97	7257.94	89.00	6903.16	677.63 N	6869.87 E	6903.21	84.37	1.95	216.68
14195.00	90.22	90.23	7258.28	89.00	6991.74	677.48 N	6958.86 E	6991.76	84.44	1.03	213.06
14284.00	90.75	90.49	7257.53	89.00	7080.29	676.92 N	7047.86 E	7080.29	84.51	0.66	216.68
14373.00	92.15	90.23	7255.28	89.00	7168.80	676.36 N	7136.83 E	7168.80	84.59	1.60	216.68
14462.00	93.03	89.70	7251.26	89.00	7257.32	676.41 N	7225.73 E	7257.33	84.65	1.15	216.68
14551.00	94.00	89.00	7245.80	89.00	7345.84	677.42 N	7314.56 E	7345.86	84.71	1.34	216.68
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 14630'MD.											
14630.00	94.00	89.00	7240.29	79.00	7424.42	678.80 N	7393.35 E	7424.45	84.75	0.00	

PATHFINDER ENERGY SERVICES - TOOL CODES & DESCRIPTIONS

HDS1M	HIGH SPEED DIRECTIONAL SURVEY MULTILINK TOOL	CLSSM	COMPENSATED LONG SPACE SONIC TOOL
HDS1L	HIGH SPEED DIRECTIONAL SURVEY GAMMA TOOL	SCLSS	SLIM COMPENSATED LONG SPACE SONIC MULTILINK TOOL
HDS1R	HIGH SPEED DIRECTIONAL SURVEY GAMMA RETRIEVABLE TOOL	DPM	DYNAMIC PRESSURE MODULE
AWR	ARRAY WAVE RESISTIVITY GAMMA MULTILINK TOOL	PZIG	AT-BIT INCLINATION AND GAMMA RAY
CWRGM	COMPENSATED WAVE RESISTIVITY GAMMA MULTILINK TOOL	2DRS	2D ROTARY STEERING TOOL
SCWR	SLIM COMPENSATED WAVE RESISTIVITY TOOL	3DRS	3D ROTARY STEERING TOOL
DNSCM	DENSITY NEUTRON STANDOFF CALIPER MULTILINK TOOL	DFT	DRILLING FORMATION TESTER

PATHFINDER ENERGY SERVICES - MNEMONICS LIST

GENERAL

AHV	ANNULAR HOLE VOLUME TICKS	ROP	RATE OF PENETRATION
AHVT	ANNULAR HOLE VOLUME-ACCUMULATIVE TOTAL	GRW	RAW GAMMA RAY
BHV	BOREHOLE VOLUME TICKS	GRC	CALIBRATED GAMMA RAY
BHVT	BOREHOLE VOLUME-ACCUMULATIVE TOTAL	GREC	ENVIRONMENTALLY CORRECTED GAMMA RAY
DEPT	MEASURED DEPTH	RM	RESISTIVITY OF MUD
MTVD	MEASURED TRUE VERTICAL DEPTH	RMF	RESISTIVITY OF MUD FILTRATE
INC	INCLINATION	SHOES	CASING SHOE SYMBOLS
AZI	AZIMUTH	SURVS	SURVEY TEXT SYMBOLS

4 3/4" SCWR

C15A	CWR ATTENUATION CONDUCTIVITY (15")	R35A	CWR ATTENUATION RESISTIVITY (35")
C15P	CWR PHASE CONDUCTIVITY (15")	R35P	CWR PHASE RESISTIVITY (35")
C35A	CWR ATTENUATION CONDUCTIVITY (35")	UL1A	UNCOMPENSATED 15" ATTENUATION RESISTIVITY LOWER
C35P	CWR PHASE CONDUCTIVITY (35")	UL1P	UNCOMPENSATED 15" PHASE RESISTIVITY LOWER
CWRFET	CWR FORMATION EXPOSURE TIME	UL3A	UNCOMPENSATED 35" ATTENUATION RESISTIVITY LOWER
GRC	CALIBRATED GAMMA RAY	UL3P	UNCOMPENSATED 35" PHASE RESISTIVITY LOWER
GREC	ENVIRONMENTALLY CORRECTED GAMMA RAY	UU1A	UNCOMPENSATED 15" ATTENUATION RESISTIVITY UPPER
GRFET	GAMMA RAY FORMATION EXPOSURE TIME	UU1P	UNCOMPENSATED 15" PHASE RESISTIVITY UPPER
R15A	CWR ATTENUATION RESISTIVITY (15")	UU3A	UNCOMPENSATED 35" ATTENUATION RESISTIVITY UPPER
R15P	CWR PHASE RESISTIVITY (15")	UU3P	UNCOMPENSATED 35" PHASE RESISTIVITY UPPER

6 3/4", 8", & 9 1/2" CWR

C25A	CWR ATTENUATION CONDUCTIVITY (25")	R55A	CWR ATTENUATION RESISTIVITY (55")
C25P	CWR PHASE CONDUCTIVITY (25")	R55P	CWR PHASE RESISTIVITY (55")
C55A	CWR ATTENUATION CONDUCTIVITY (55")	UL2A	UNCOMPENSATED 25" ATTENUATION RESISTIVITY LOWER
C55P	CWR PHASE CONDUCTIVITY (55")	UL2P	UNCOMPENSATED 25" PHASE RESISTIVITY LOWER
CWRFET	CWR FORMATION EXPOSURE TIME	UL5A	UNCOMPENSATED 55" ATTENUATION RESISTIVITY LOWER
GRC	CALIBRATED GAMMA RAY	UL5P	UNCOMPENSATED 55" PHASE RESISTIVITY LOWER
GREC	ENVIRONMENTALLY CORRECTED GAMMA RAY	UU2A	UNCOMPENSATED 25" ATTENUATION RESISTIVITY UPPER
GRFET	GAMMA RAY FORMATION EXPOSURE TIME	UU2P	UNCOMPENSATED 25" PHASE RESISTIVITY UPPER
R25A	CWR ATTENUATION RESISTIVITY (25")	UU5A	UNCOMPENSATED 55" ATTENUATION RESISTIVITY UPPER
R25P	CWR PHASE RESISTIVITY (25")	UU5P	UNCOMPENSATED 55" PHASE RESISTIVITY UPPER

4 3/4", 6 3/4", 8", & 9 1/2" AWR

GRCA	AWR CALIBRATED GAMMA RAY	RDPH	DEEP PHASE RESISTIVITY FROM 2 MHZ FREQUENCY
GRWA	AWR RAW GAMMA RAY	RSAH	SHALLOW ATTENUATION RESISTIVITY FROM 2 MHZ FREQUENCY
TEMP_A	TEMPERATURE FROM AWR TOOL	RMAH	MEDIUM ATTENUATION RESISTIVITY FROM 2 MHZ FREQUENCY

INC_A	AWR STATIC INCLINATION	RDAH	DEEP ATTENUATION RESISTIVITY FROM 2 MHZ FREQUENCY
INCD_A	AWR DYNAMIC INCLINATION	CSPL	SHALLOW PHASE CONDUCTIVITY FROM 500 kHZ FREQUENCY
RSPL	SHALLOW PHASE RESISTIVITY FROM 500 kHZ FREQUENCY	CMPL	MEDIUM PHASE CONDUCTIVITY FROM 500 kHZ FREQUENCY
RMPL	MEDIUM PHASE RESISTIVITY FROM 500 kHZ FREQUENCY	CDPL	DEEP PHASE CONDUCTIVITY FROM 500 kHZ FREQUENCY
RDPL	DEEP PHASE RESISTIVITY FROM 500 kHZ FREQUENCY	CSPH	SHALLOW PHASE CONDUCTIVITY FROM 2 MHZ FREQUENCY
RSAL	SHALLOW ATTENUATION RESISTIVITY FROM 500 kHZ FREQUENCY	CMPH	MEDIUM PHASE CONDUCTIVITY FROM 2 MHZ FREQUENCY
RMAL	MEDIUM ATTENUATION RESISTIVITY FROM 500 kHZ FREQUENCY	CDPH	DEEP PHASE CONDUCTIVITY FROM 2 MHZ FREQUENCY
RDAL	DEEP ATTENUATION RESISTIVITY FROM 500 kHZ FREQUENCY	ARFET	AWR FORMATION EXPOSURE TIME
RSPH	SHALLOW PHASE RESISTIVITY FROM 2 MHZ FREQUENCY	GAFET	AWR GAMMA RAY FORMATION EXPOSURE TIME
RMPH	MEDIUM PHASE RESISTIVITY FROM 2 MHZ FREQUENCY		

4 3/4", 6 3/4", 8" DNSC

BS	BIT SIZE	NLIM	NEUTRON POROSITY (LIMESTONE MATRIX)
CALI	CALIPER	NNEAR	NEAR NEUTRON COUNT RATE
DDDN	DNSC DATA DENSITY (0 - 4 SAMPLES/FT)	NRAT	NEUTRON RATIO
DGAM	DENSITY GAMMA (NATURAL)	NSAC	ENVIRONMENTALLY CORRECTED NEUTRON
DNPH	NEUTRON POROSITY CORRECTION		
DNSFET	DNSC FORMATION EXPOSURE TIME	NSAN	NEUTRON POROSITY (SANDSTONE MATRIX)
DPE	PE CORRECTION	PE	PHOTOELECTRIC INDEX
DPHI	DENSITY POROSITY (GIVEN MATRIX)	PEMI	PHOTOELECTRIC INDEX (MINIMUM FILTER)
DHRM	DENSITY CORRECTION MINUS	RHOB	BULK DENSITY
DRHO	DENSITY CORRECTION	SDNP	STANDARD DEVIATION NEUTRON POROSITY
DRHP	DENSTIY CORRECTION PLUS	SDPE	STANDARD DEVIATION PE COMPUTATION
EDPH	DENSITY POROSITY-EVR PROCESSED	SDRH	STANDARD DEVIATION DENSITY
ENPH	NEUTRON POROSTIY-EVR PROCESSED	SOA	UNWEIGHTED DENSITY STANDOFF
ERHO	BULK DENSITY-EVR PROCESSED	TBDN	TIME BEHIND DNSC
NDOL	NEUTRON POROSTIY (DOLOMITE MATRIX)	WSOD	WEIGHTED STANDOFF DENSITY
NFAR	FAR NEUTRON COUNT RATE	WSON	WEIGHTED STANDOFF NEUTRON

4 3/4" SCLSS, 6 3/4" & 8" CLSS

ACFET	ACOUSTIC FORMATION EXPOSIRE TIME	SHS1	MAX SHEAR SEMBLANCE , UPPER XMITR
SO	ACOUSTIC TOOL STANDOFF	SHS2	MAX SHEAR SEMBLANCE , LOWER XMITR
SOFF	STANDOFF	SLS1	SHEAR SEMBLANCE MIN CUTOFF , UPPER XMITR
DTCU	DELTA T COMP , UPPER XMITR-FIELD PROCESSED	SLS2	SHEAR SEMBLANCE MIN CUTOFF , LOWER XMITR
DTCL	DELTA T COMP , LOWER XMITR-FIELD PROCESSED	WFT1	WAVEFORM XMITR1 , ALL 4 RCVRS (NON-PARSED)
DTP1	DELTA T COMP , UPPER XMITR-POST PROCESSED	WFT2	WAVEFORM XMITR2 , ALL 4 RCVRS (NON-PARSED)
DTP2	DELTA T COMP , LOWER XMITR-POST PROCESSED	W11C	PARSED WAVEFORM , XMITR 1 , RCVR 1
DTS1	DELTA T SHEAR , UPPER XMITR-POST PROCESSED	W12C	PARSED WAVEFORM , XMITR 1 , RCVR 2
DTS2	DELTA T SHEAR , LOWER XMITR-POST PROCESSED	W13C	PARSED WAVEFORM , XMITR 1 , RCVR 3
SEM1	SEMBLANCE , UPPER XMITR-POST PROCESSED	W14C	PARSED WAVEFORM , XMITR 1 , RCVR 4
SEM2	SEMBLANCE , LOWER XMITR-POST PROCESSED	W21C	PARSED WAVEFORM , XMITR 2 , RCVR 1
SMX1	MAX COMP SEMBLANCE , UPPER XMITR	W22C	PARSED WAVEFORM , XMITR 2 , RCVR 2
SMX2	MAX COMP SEMBLANCE , LOWER XMITR	W23C	PARSED WAVEFORM , XMITR 2 , RCVR 3
SMN1	COMP SEMBLANCE MIN CUTOFF , UPPER XMITR	W24C	PARSED WAVEFORM , XMITR 2 , RCVR 4
SMN2	COMP SEMBLANCE MIN CUTOFF , LOWER XMITR		

4 3/4" , 6 3/4" , 8" & 9 1/2" DPM & QPM

ANPR	ANNULAR PRESSURE	KPOSI	KELLY POSITION
BDEPS	BIT DEPTH STAMP	MWC	MUD WEIGHT CALCULATED
DAPR	PRESSURE TOOL DIFFERENTIAL PRESSURE	MWI_P	MUD WEIGHT IN
DPPR	PRESSURE TOOL DRILL PIPE PRESSURE	SPP_I	STANDPIPE PRESSURE
ECDM	EQUIVALENT CIRCULATING DENSITY	SWOB	SURFACE WEIGHT ON BIT
HDEPS	HOLE DEPTH STAMP	TDPM	PRESSURE TOOL ANNULAR TEMPERATURE

6 3/4" DFT

DFGR	DFT GAMMA RAW	HYDA	HYDROSTATIC PRESSURE -- AFTER
DFGRC	DFT GAMMA CALIBRATED	HYDB	HYDROSTATIC PRESSURE -- BEFORE
DFANPR	DFT ANNULAR PRESSURE	FPRES	FORMATION PRESSURE
DFECD	DFT EQUIVALENT CIRCULATING DENSITY OF THE MUD		

4 3/4", 6 3/4" PZIG

NBDINC	NEAR BIT DYNAMIC INCLINATION	NBGRC	NEAR BIT GAMMA CALIBRATED
NBSINC	NEAR BIT STATIC INCLINATION	NBTMP	NEAR BIT TEMERATURE
NBGR	NEAR BIT GAMMA RAW	NBIFET	NEAR BIT FORMATION EXPOSURE TIME

EQUIPMENT DATA

RUN NUMBER	6					
RES DTA						
RES MANDREL						
RES SIZE in						
RES VERIFIER						
API BLANKET						
HDS-1M DTA						
HDS-1M MANDREL						
HDS-1M SIZE in						
DNSC DTA	4077					
DNSC MANDREL	N47N077D					
DNSC SIZE in	4 3/4					
DENSITY SOURCE NO.	5207-GW					
NEUTRON SOURCE NO.						
CLSS DTA						
CLSS MANDREL						
CLSS SIZE in						
DPM DTA						
DPM SIZE in						
DFT DTA						
DFT MANDREL						
DFT SIZE in						
PZIG UXM DTA						
PZIG LXM DTA						
PZIG SIZE in						

BOTTOM HOLE ASSEMBLY RECORD

RUN 2	ft	RUN 5	ft	RUN 6	ft		
8 3/4" PDC BIT	1.00	8 3/4" ROCK BIT	1.00	6 1/8" PDC BIT	0.50		
2.12° MUD MOTOR	26.55	1.95° MUD MOTOR	24.96	1.5° MUD MOTOR	25.55		
FLOAT SUB	3.55	FLOAT SUB	3.55	5 3/4" STAB.	4.84		
HDS-1 (DIR/GR)	28.44	HDS-1 (DIR/GR)	28.44	ISDNSC (DEN/CAL)	18.86		
CROSSOVER SUB	3.30	CROSSOVER SUB	3.30	ABS (BATTERY)	14.09		
NMDC	30.47	NMDC	30.47	CROSSOVER SUB	1.15		
CROSSOVER SUB	3.87	CROSSOVER SUB	3.87	HDS-1L (DIR/GR)	28.09		
FILTER SUB	2.96	FILTER SUB	2.96	5 3/4" STAB.	4.81		
CROSSOVER SUB	3.57	CROSSOVER SUB	3.57	NMDC	30.96		

4 1/2" HWDP	1284.11	4 1/2" HWDP	1291.60	NMDC	29.98		
CROSSOVER SUB	3.49	CROSSOVER SUB	3.49	FILTER SUB	3.06		
==========		==========		CROSSOVER SUB	3.22		
TOTAL BHA LENGTH	1391.31	TOTAL BHA LENGTH	1396.29	1 x 4" DP	42.59		
				6" REAMER	4.00		
				==========			
				TOTAL BHA LENGTH	211.70		
				SENSOR OFFSETS:			
				DIRECTIONAL	76.27		
				GAMMA-RAY	68.16		
SENSOR OFFSETS:		SENSOR OFFSETS:		CALIPER	41.01		
DIRECTIONAL	50.36	DIRECTIONAL	49.02	DENSITY	39.55		
GAMMA-RAY	33.78	GAMMA-RAY	32.44	IMG DIRECTIONAL	36.22		

PATHFINDER

A Schlumberger Company

GAMMA-RAY

2" = 100'

FEET MD