



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100				
Date run completed	09-Apr-16				
Rig Bit Number	0100				
Bit Size (in)	8.500				
Tool Nominal OD (in)	6.750				
Log Start Depth (MD, ft)	1,952.00				
Log End Depth (MD, ft)	11,920.00				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	07-Apr-16 09:13				
Drill/Wipe End Date and Time	09-Apr-16 10:00				
Min Inc (deg) @ Depth (MD, ft)	0.13 @ 3,574.00				
Max Inc (deg) @ Depth (MD, ft)	91.96 @ 9,963.00				
Bit TFA(in2) / Bit Type	1.53 / PDC				
Flow Rate (gpm)	595.29				
Max AV (fpm) / CV (fpm) @ MWD	550.0 / N/A				
Fluid Type	Diesel Mud Base				
Density (ppg) / Viscosity (spqt)	9.19 / 43.00				
Filtrate CL (ppm)	42,500.00				
pH / Fluid Loss (mptm)	N/A / N/A				
PV (cP) / YP (lhf2)	12 / 8.00				
% Solids / % Sand	8.00 / 0				
% Oil / Oil:Water Ratio	67.00 / 74:26				
Rm @ Measured Temp (degF)	N/A @ N/A				
Rmf @ Measured Temp (degF)	N/A @ N/A				
Rmc @ Measured Temp (degF)	N/A @ N/A				
Max Tool Temp (degF) / S	222.00 / PDC				

Max Tool Temp (degF) / Source	230.30 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Mason Smith				
Customer Representative	Johnny Sanchez				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	11382329				
Insert Serial Number	12230080				
Date and Time Initialized	07-Apr-16 03:56				
Date and Time Read	09-Apr-16 18:15				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	57.96				
Software Version	6.33				
Sub Serial Number	11382329				
Sonde Serial Number	11478016				
Sensor ID Number	N/A				
Toolface Offset (deg)	149.60				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	47.84				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11382329				
Insert/Sonde Serial Number	11293354				

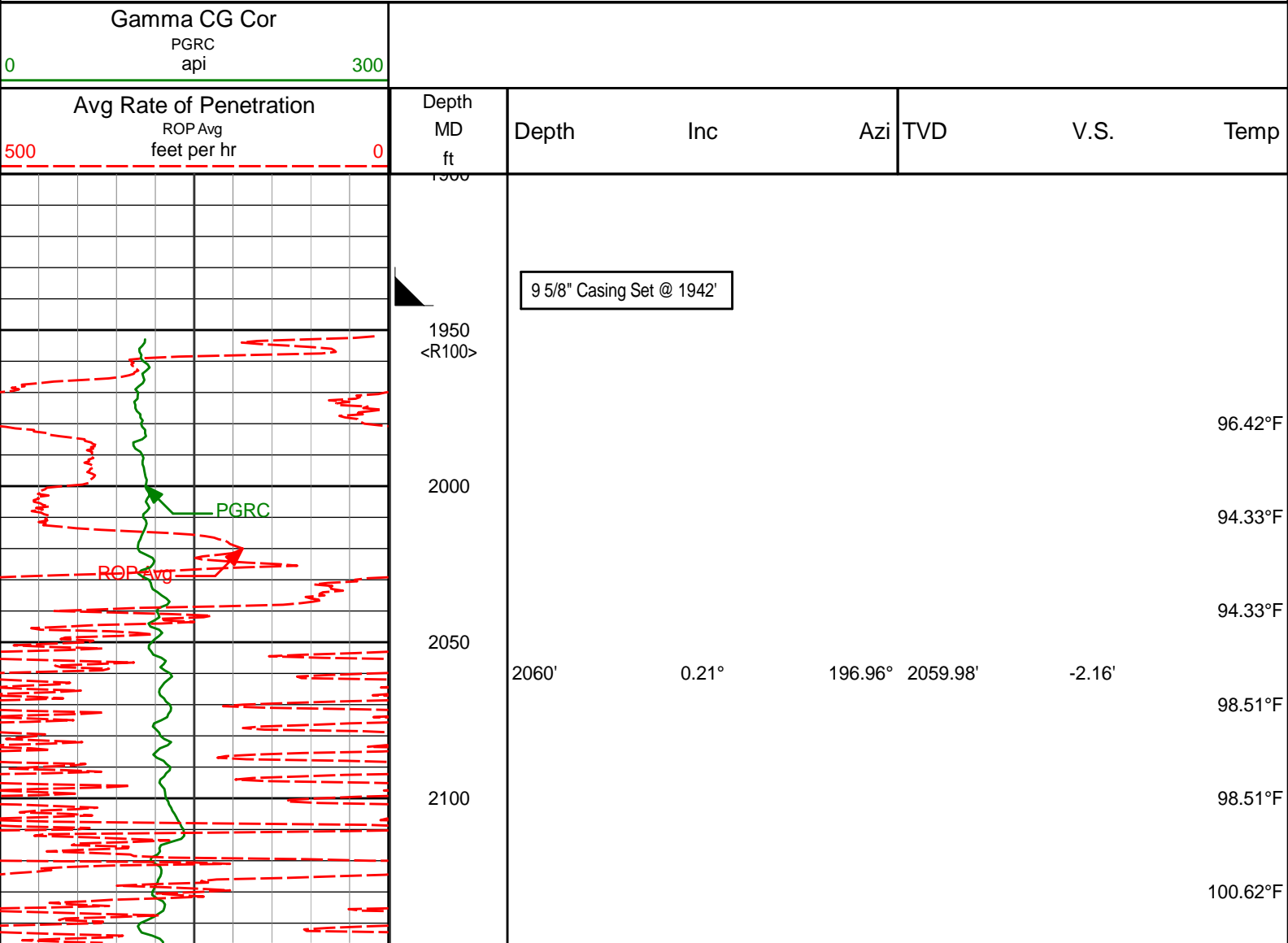
REMARKS

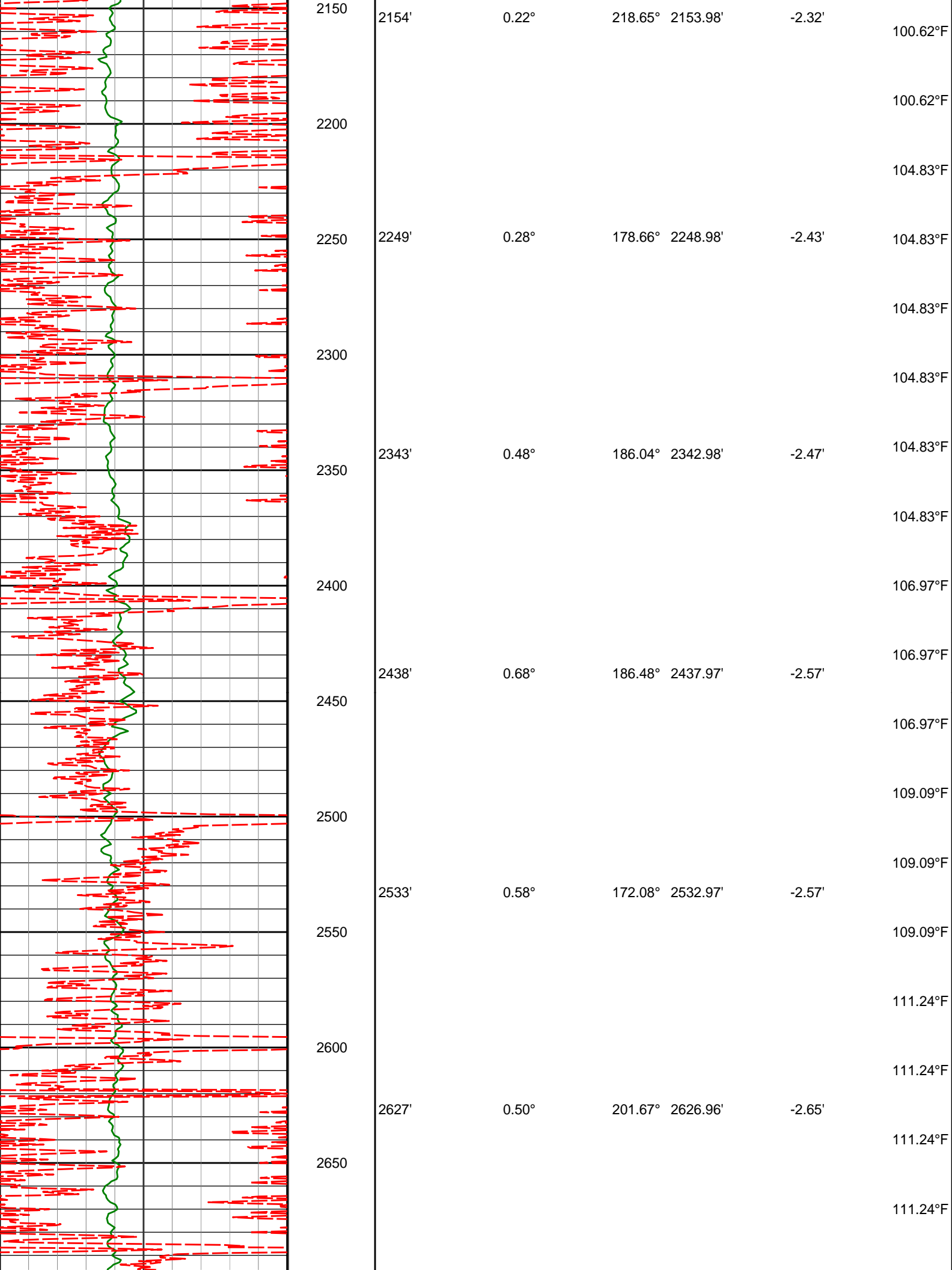
1. All depths are calibrated to driller's pipe tally and are measured depths from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. The following smoothing parameters have been applied to the data:
 - 1: 600 (2"):
 - Interval: 1.0 ft
 - Coercion Distance: 3.0 ft (ROPA)
 - Interval: 1.0 ft
 - Coercion Distance: 3.0 ft (Gamma Ray)
 - 1: 240 (5"):
 - Interval: 0.5 ft
 - Coercion Distance: 1.2 ft (ROPA)
 - Interval: 0.5 ft
 - Coercion Distance: 0.6 ft (Gamma Ray)
5. Final survey is a projection to the bit.

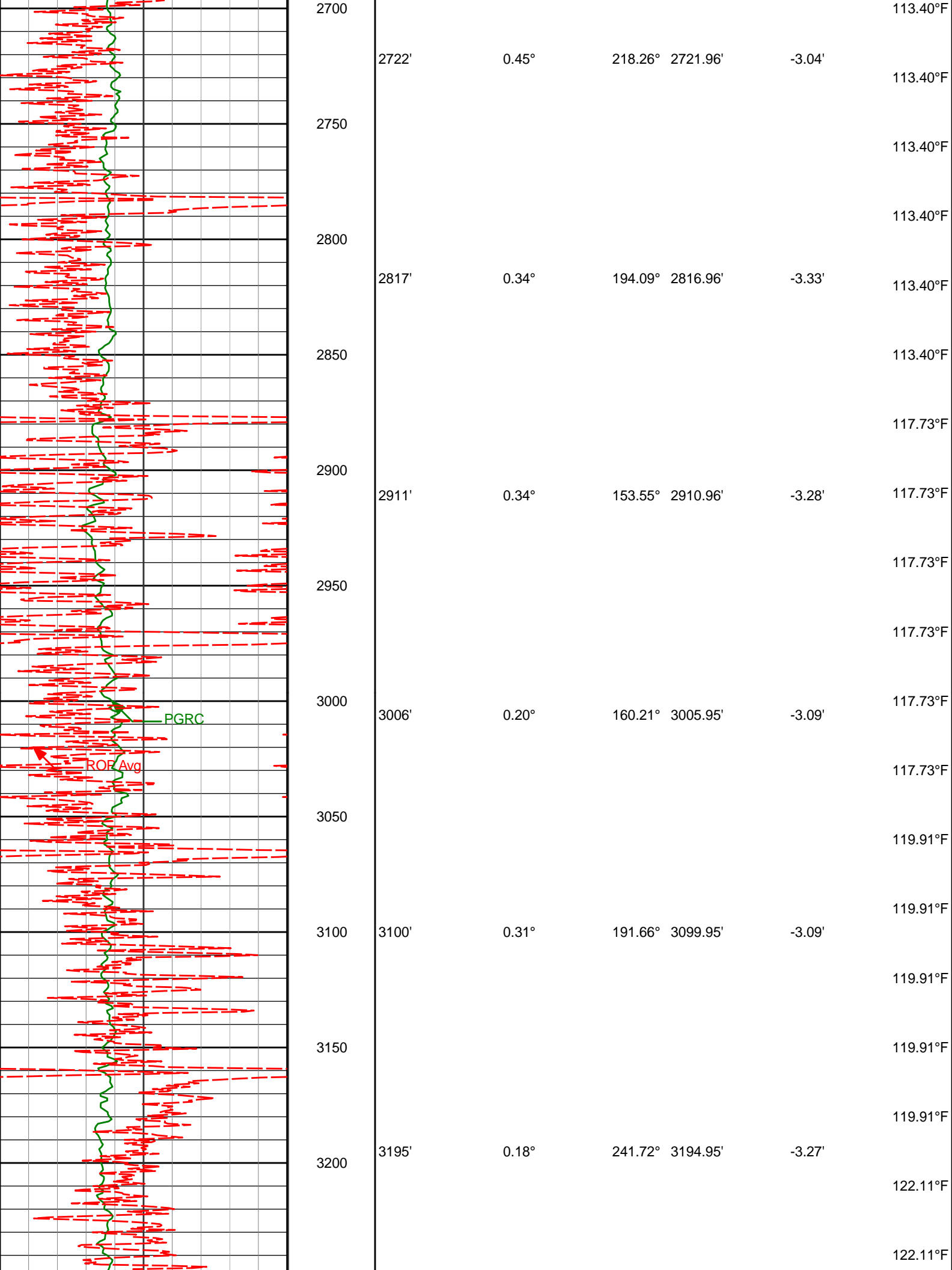
WARRANTY

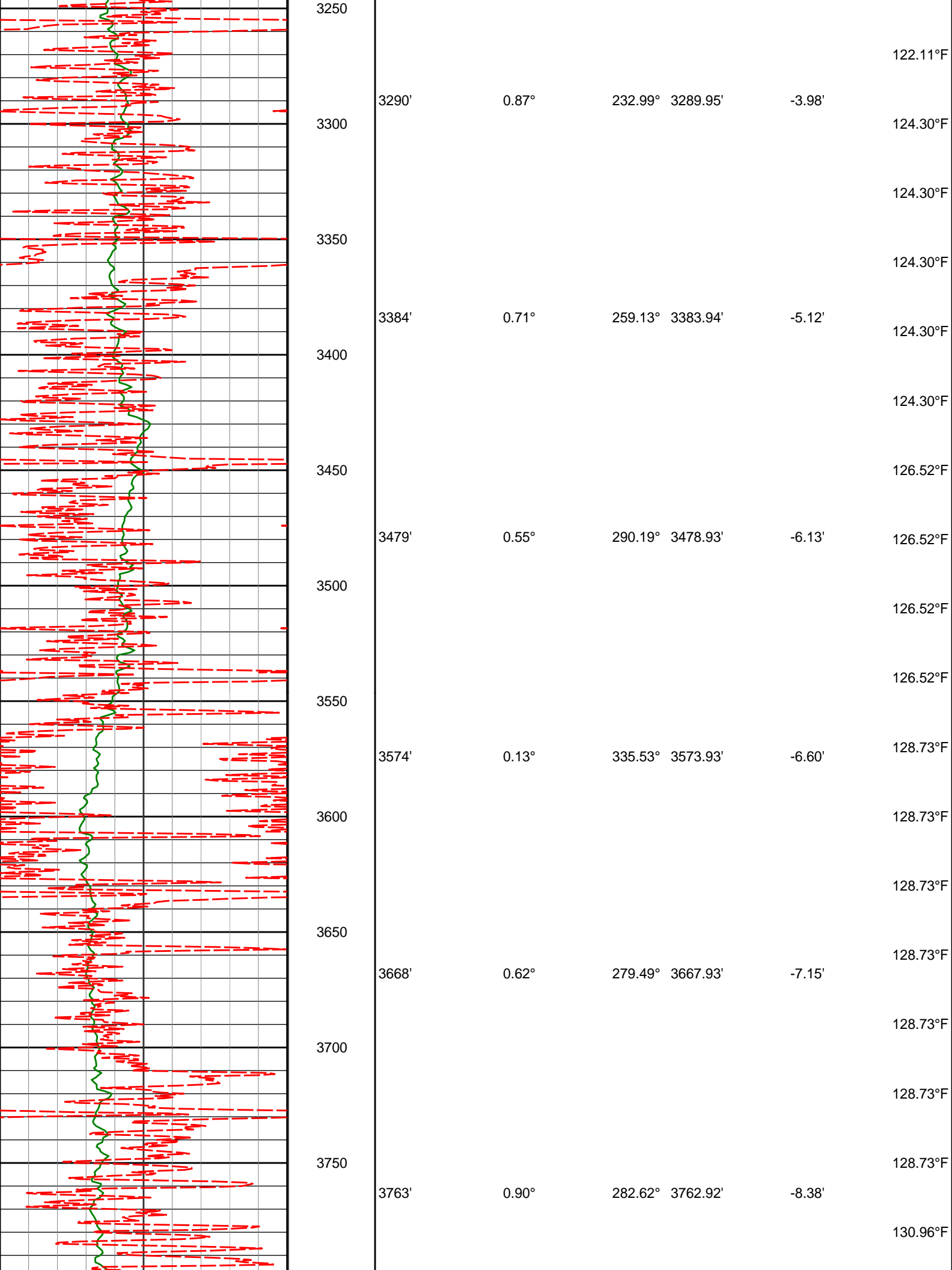
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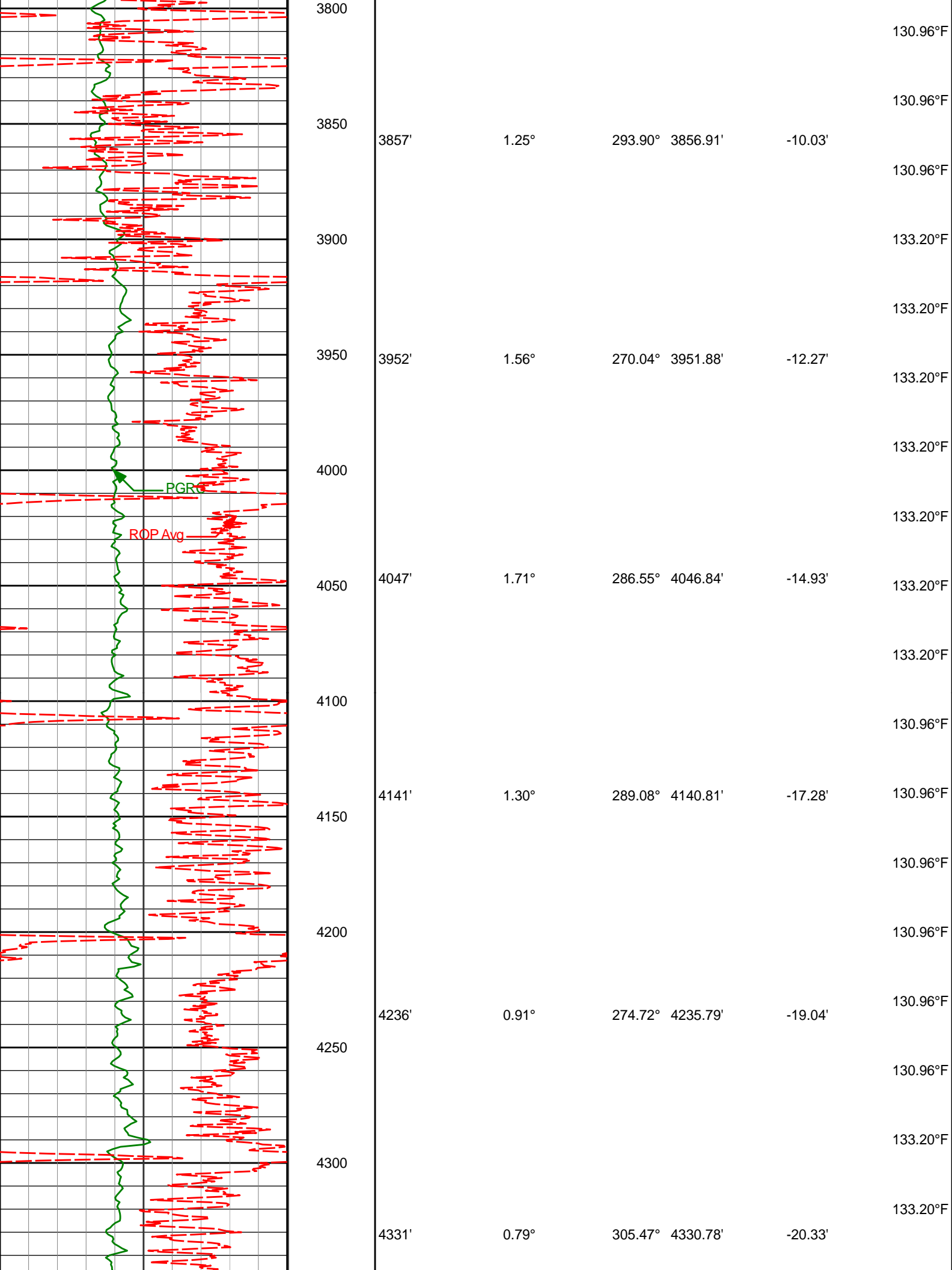
MD Detail 1:600 Scale

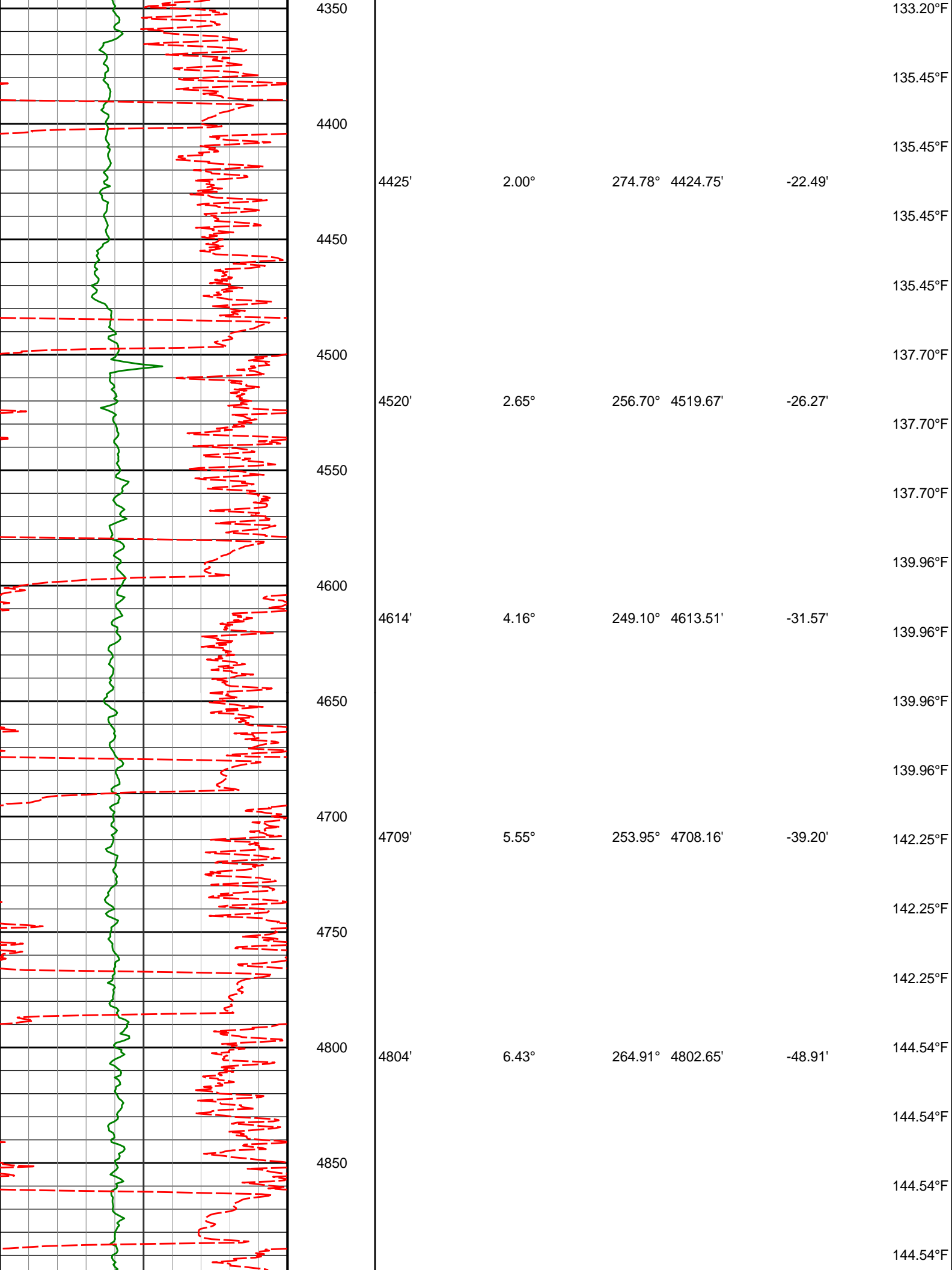


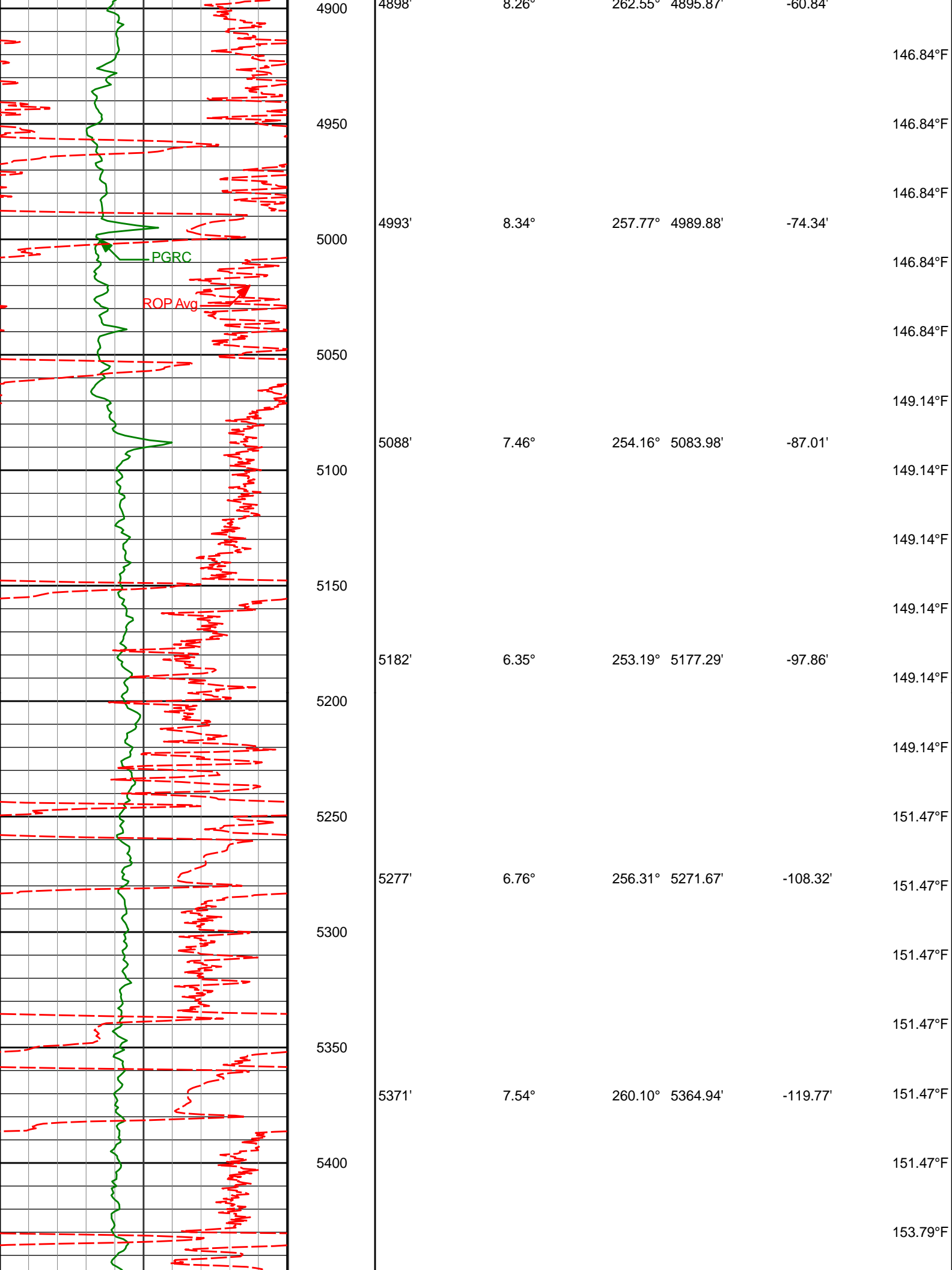


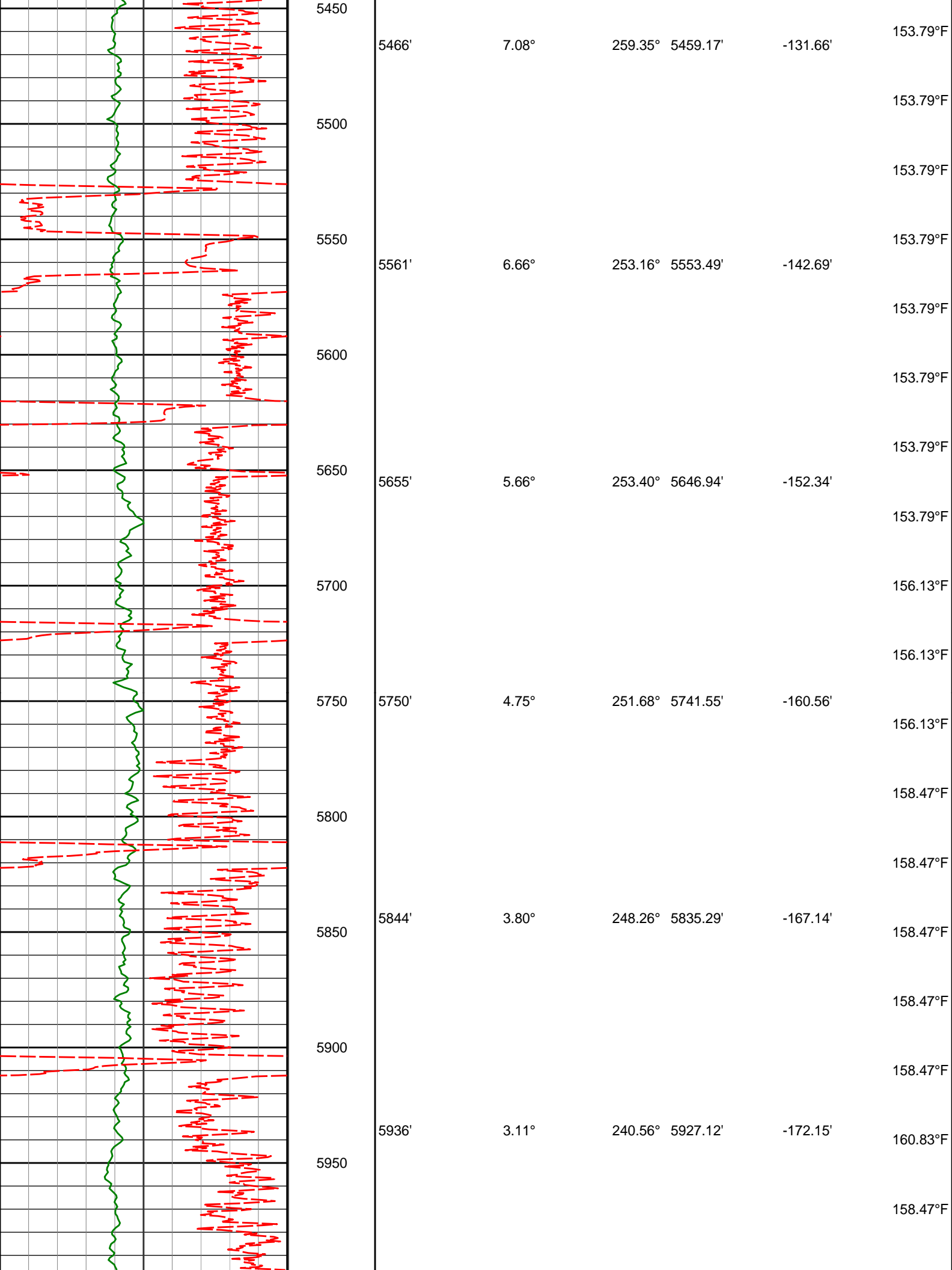


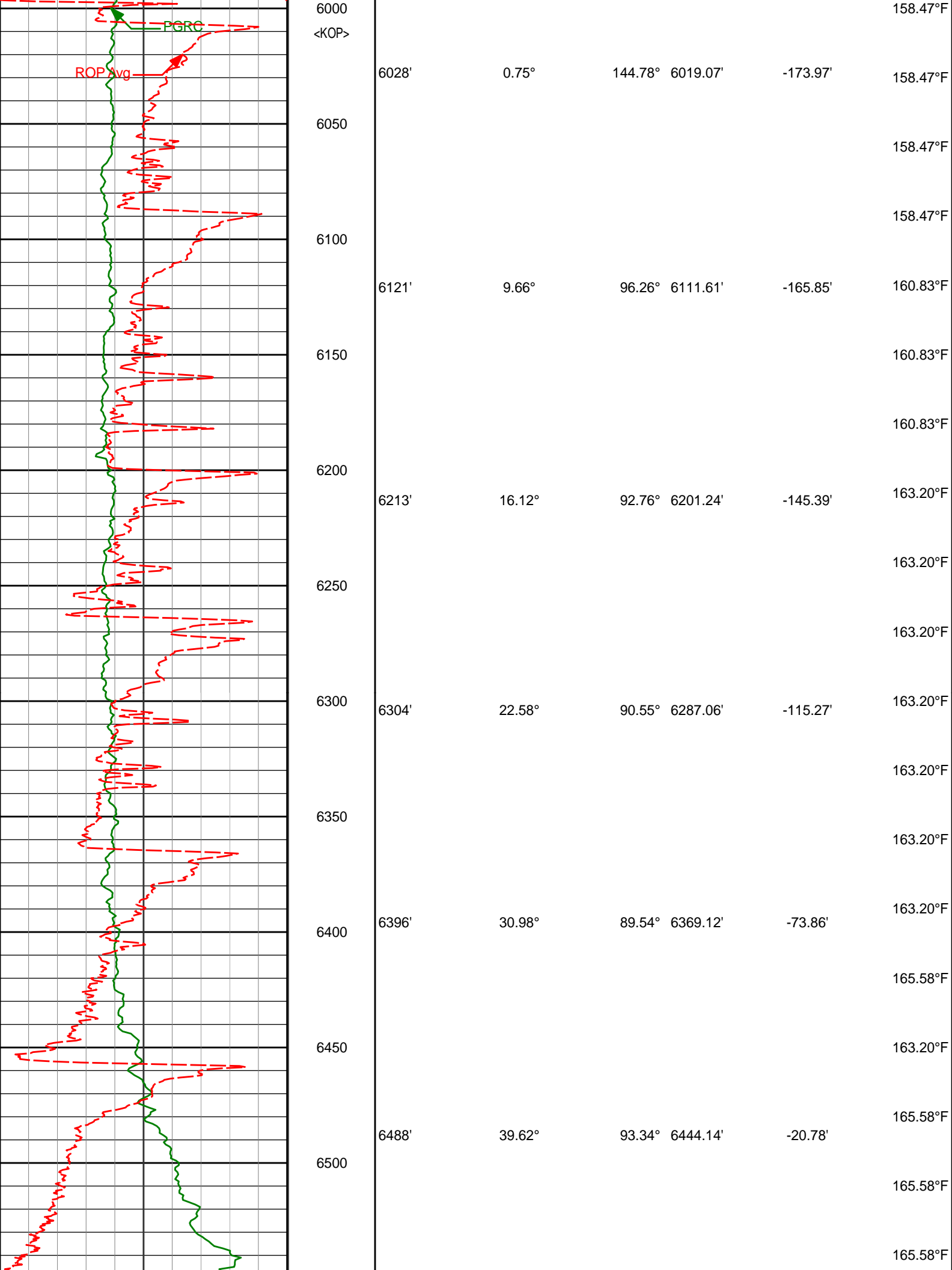


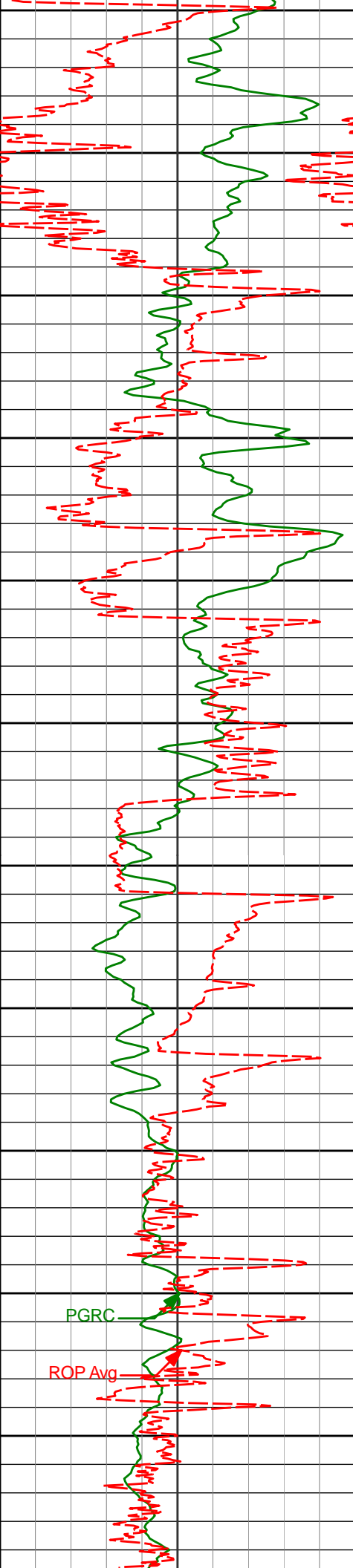




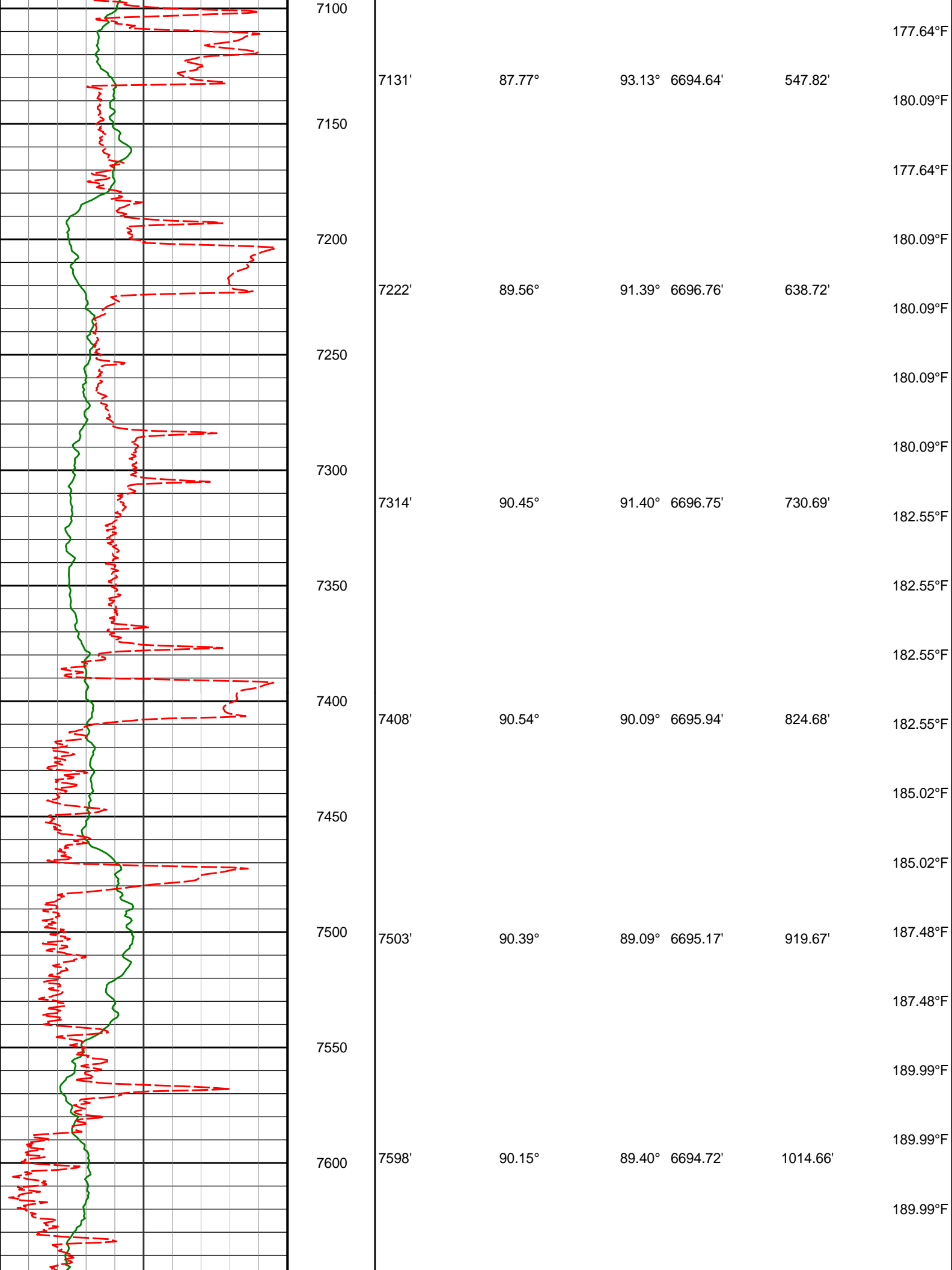


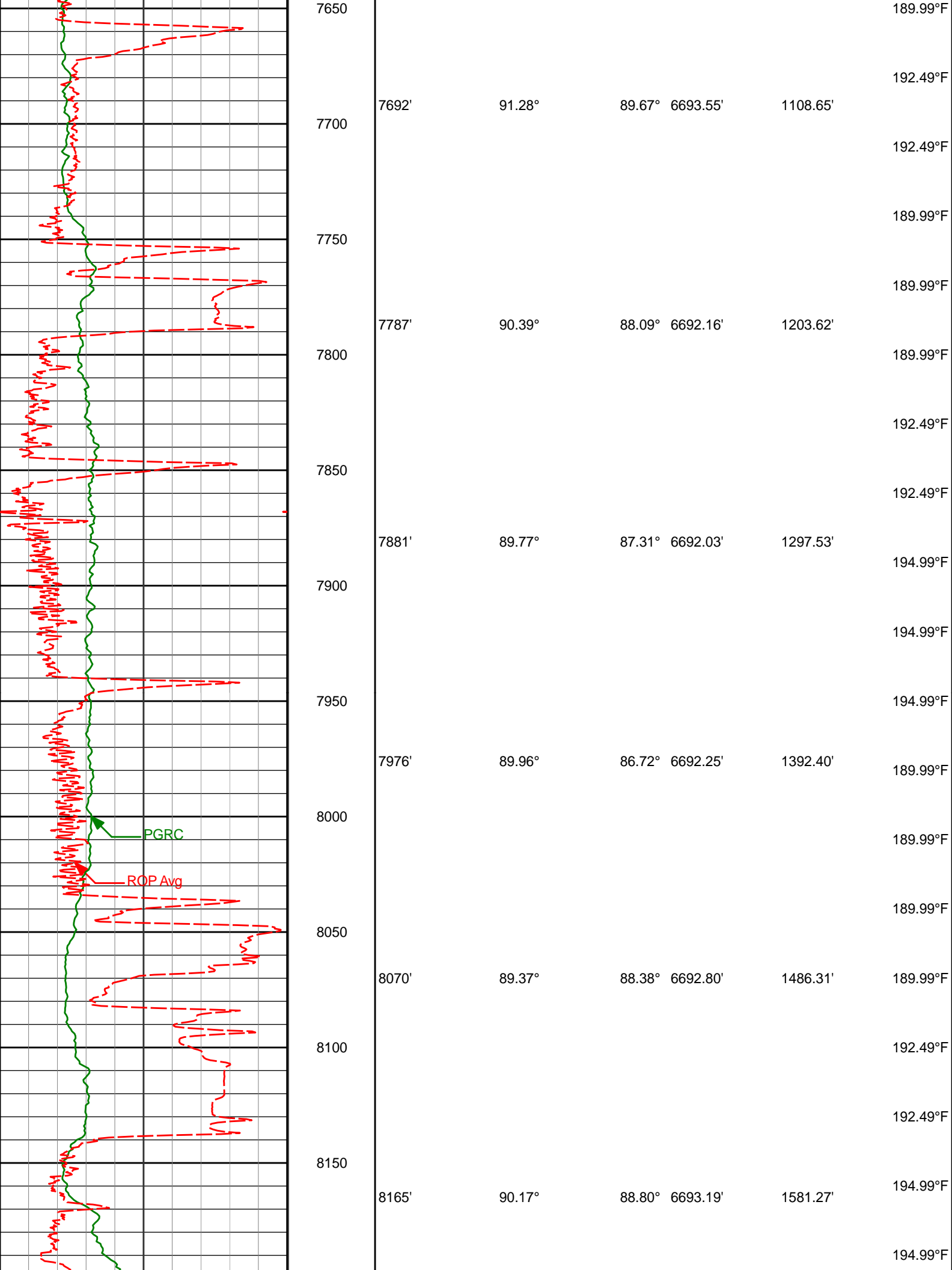


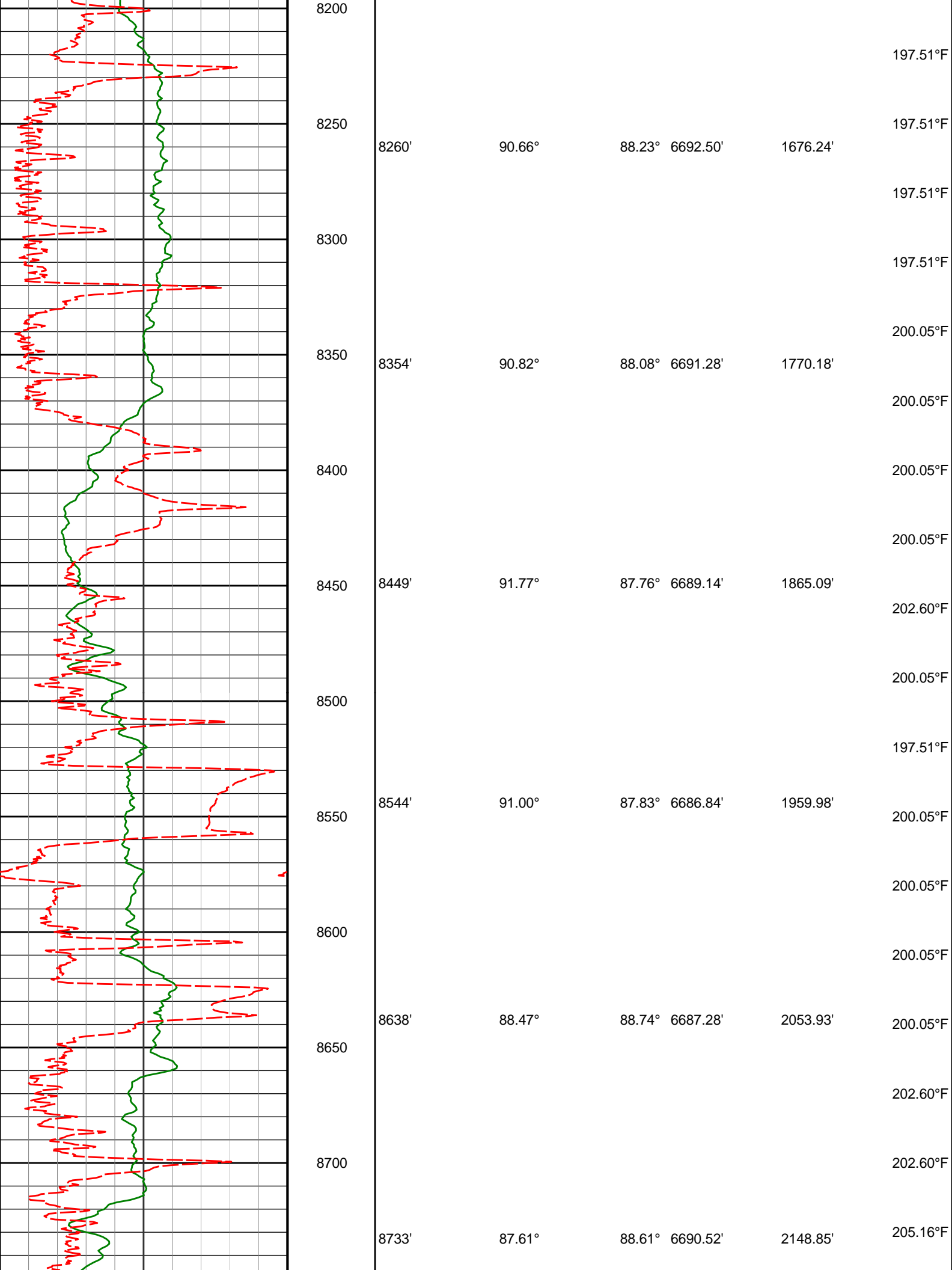


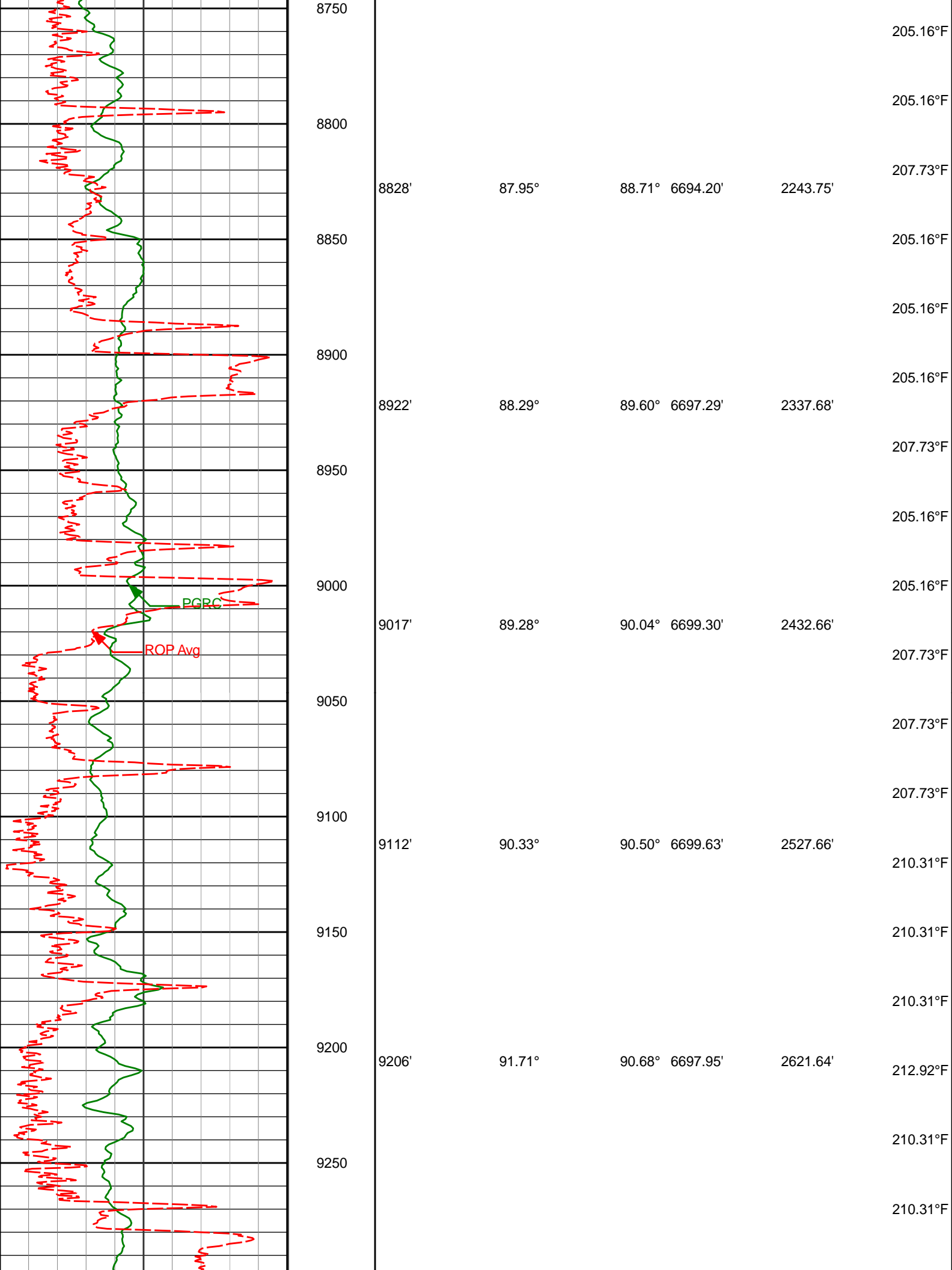


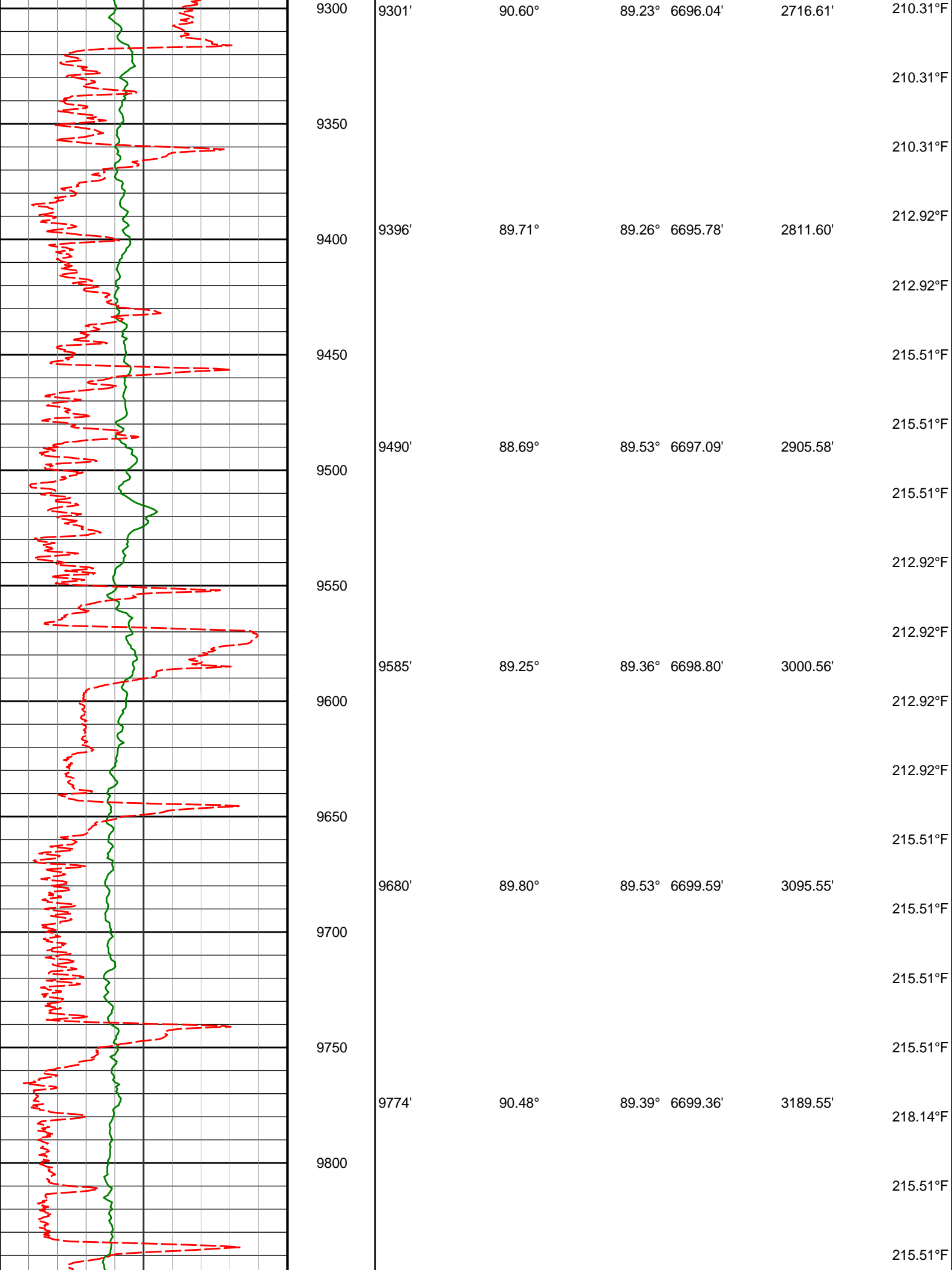
6550					167.97°F
6579'	49.18°	95.70°	6509.09'	42.60'	167.97°F
6600					167.97°F
6650					167.97°F
6671'	56.09°	90.55°	6564.91'	115.54'	167.97°F
6700					170.37°F
6750					170.37°F
6763'	61.85°	85.89°	6612.33'	194.26'	170.37°F
6800					170.37°F
6850					172.78°F
6855'	67.90°	86.05°	6651.37'	277.31'	172.78°F
6900					172.78°F
6950					175.21°F
6947'	78.04°	91.13°	6678.29'	365.10'	175.21°F
7000					175.21°F
7039'	86.88°	94.26°	6690.35'	456.11'	175.21°F
7050					177.64°F
					177.64°F

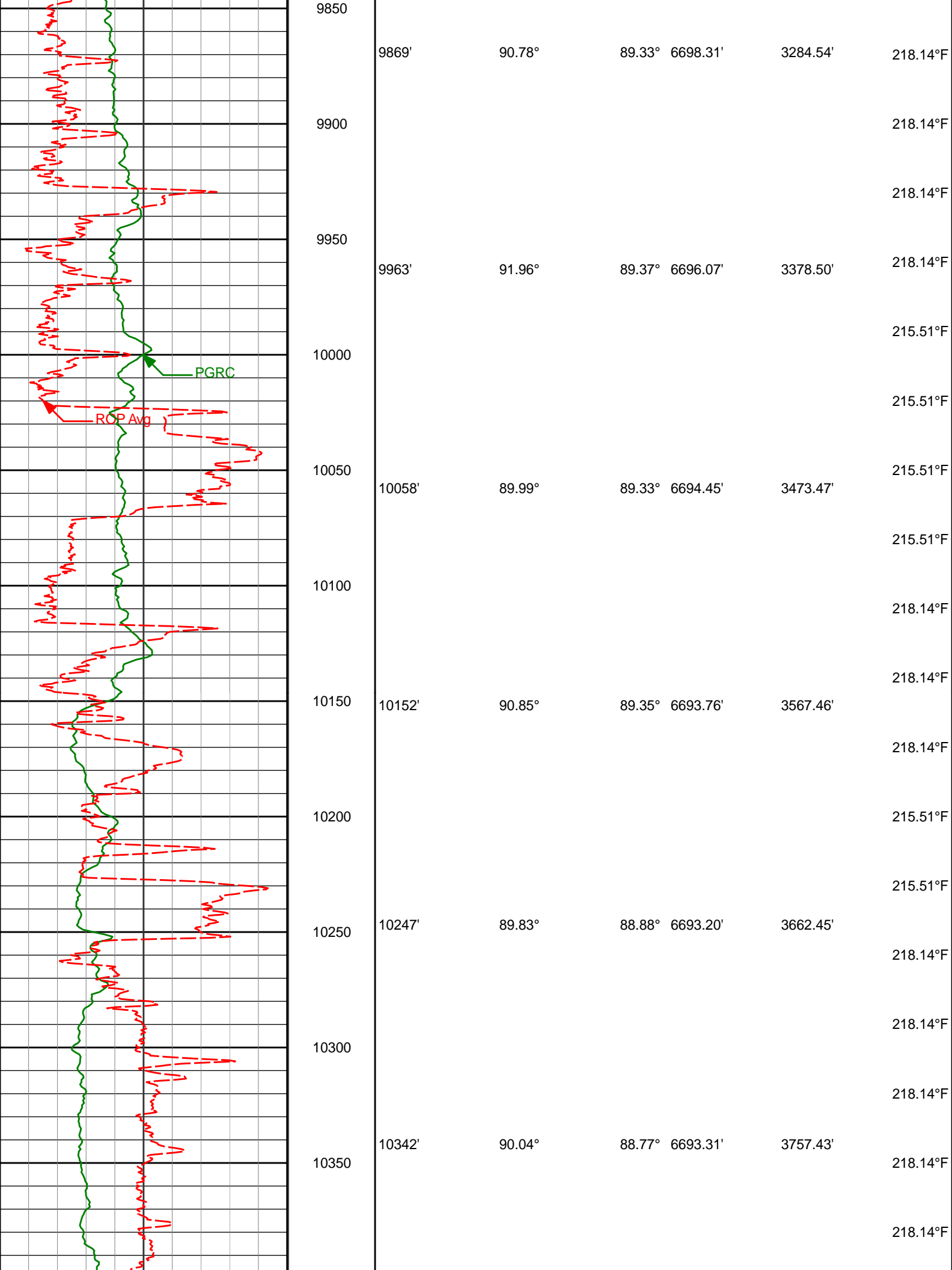


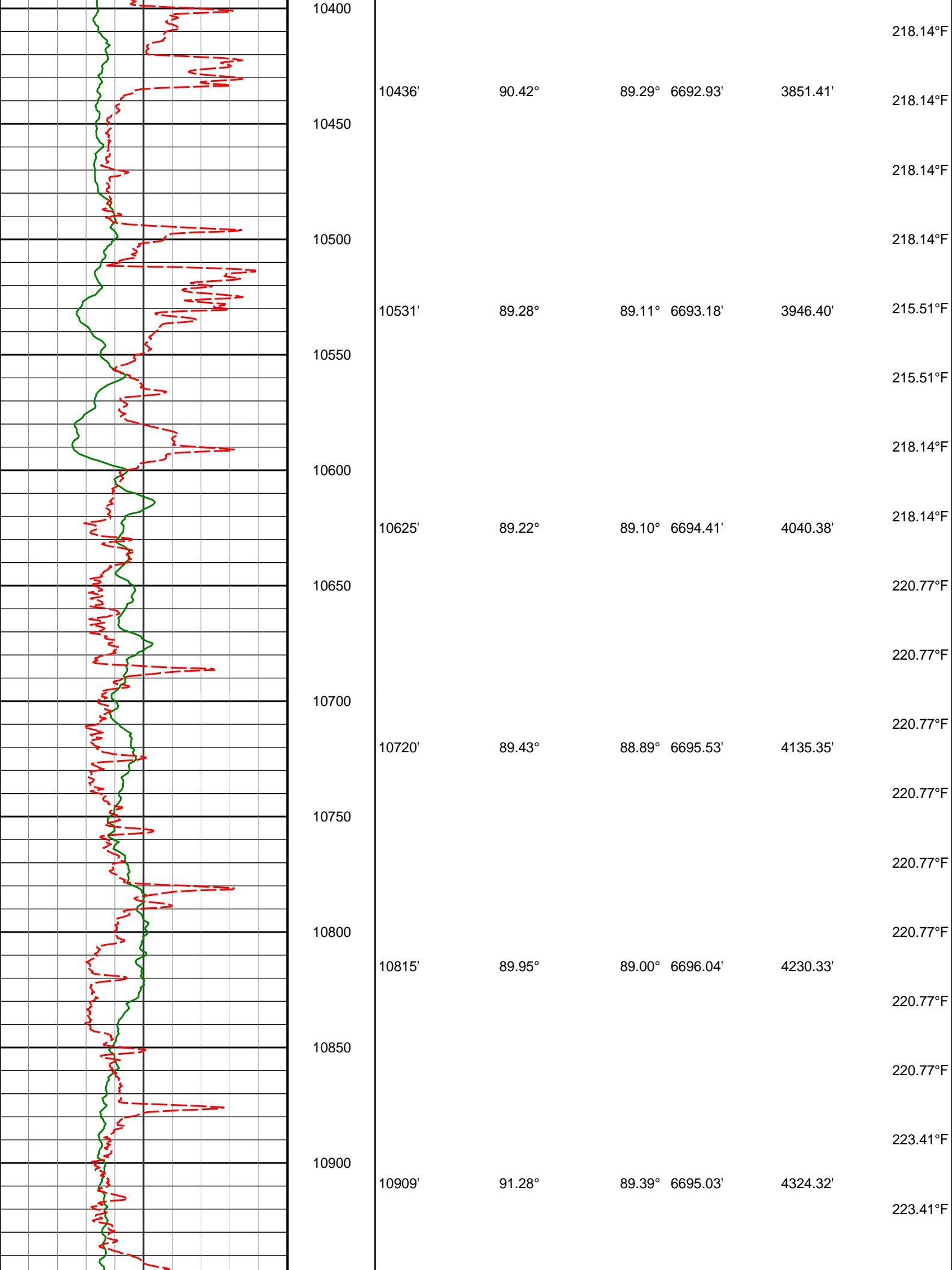


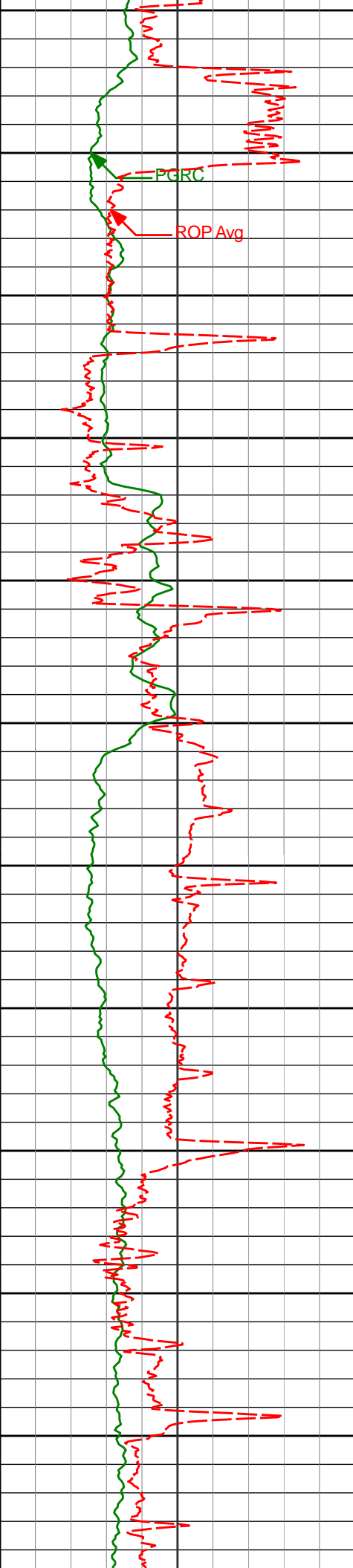




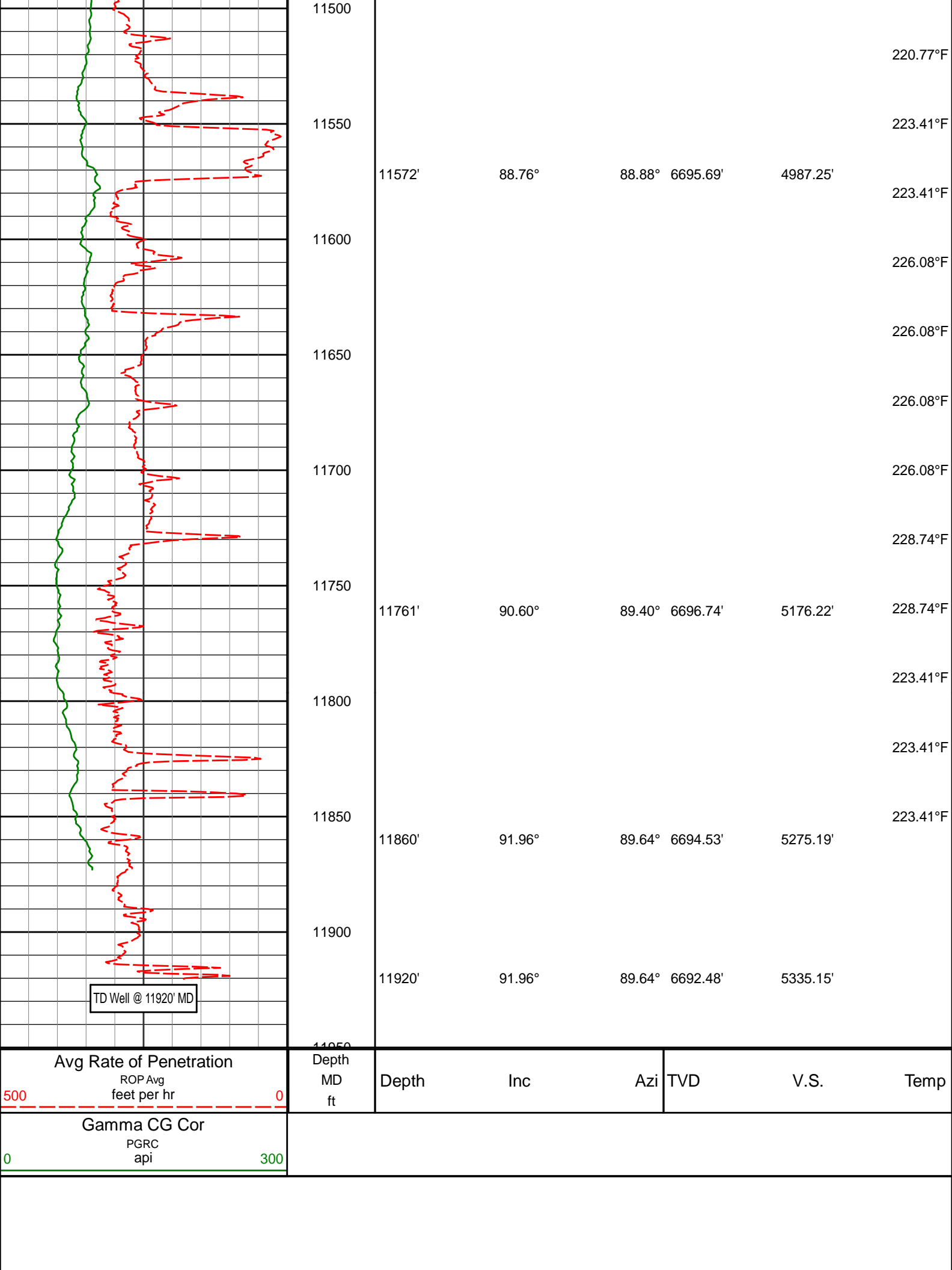




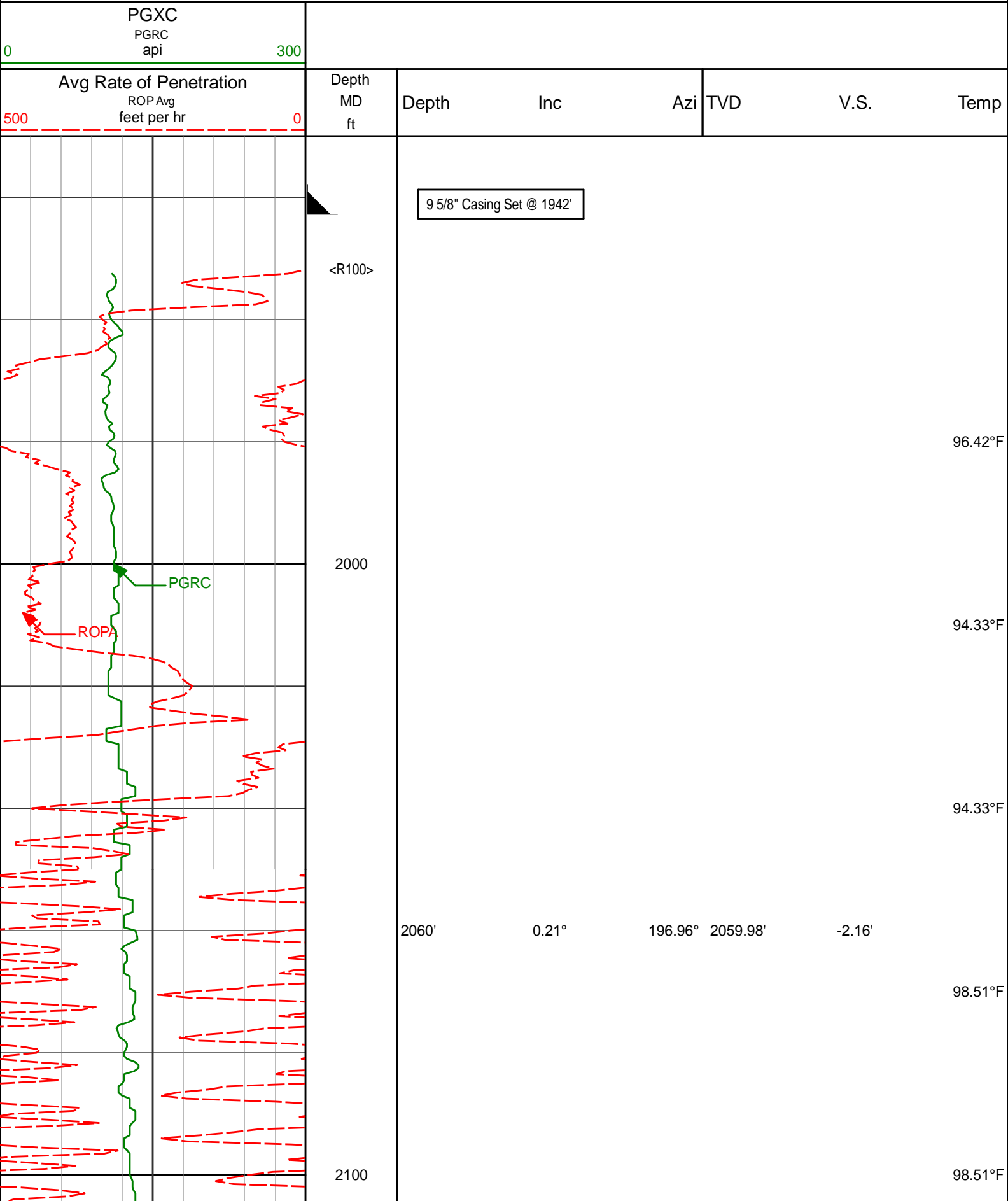


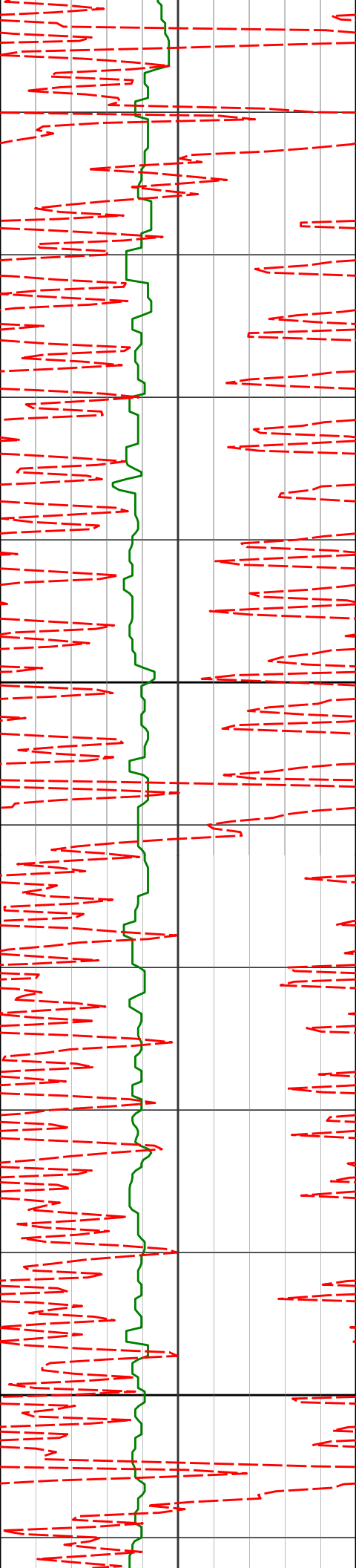


10950					220.77°F
					220.77°F
11000	11004'	89.15°	89.99°	6694.68'	4419.31'
					220.77°F
					220.77°F
11050					223.41°F
					223.41°F
11100	11098'	89.34°	89.89°	6695.91'	4513.30'
					220.77°F
					223.41°F
11150					223.41°F
					223.41°F
11200	11193'	89.22°	89.89°	6697.11'	4608.29'
					223.41°F
					226.08°F
11250					226.08°F
					226.08°F
11300	11288'	90.20°	89.85°	6697.59'	4703.29'
					226.08°F
					226.08°F
11350					226.08°F
					226.08°F
11400	11382'	90.26°	89.63°	6697.21'	4797.29'
					226.08°F
					226.08°F
11450					228.74°F
	11477'	91.41°	89.55°	6695.83'	4892.27'
					226.08°F



MD Detail 1:240 Scale





2200

2300

2154'

0.22°

218.65°

2153.98'

-2.32'

2249'

0.28°

178.66°

2248.98'

-2.43'

100.62°F

100.62°F

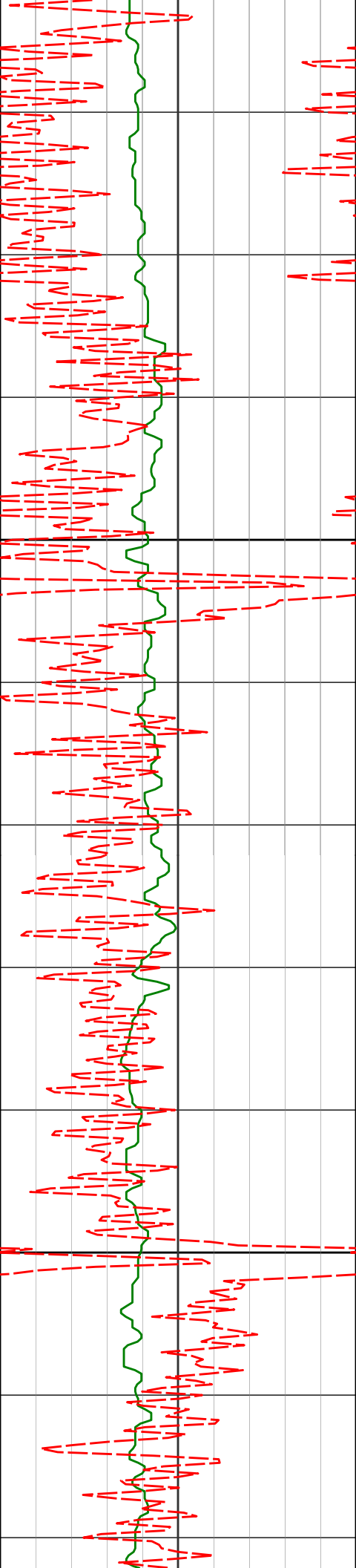
100.62°F

104.83°F

104.83°F

104.83°F

104.83°F



2400

2500

2343'

0.48°

186.04° 2342.98'

-2.47'

104.83°F

104.83°F

106.97°F

106.97°F

2438'

0.68°

186.48° 2437.97'

-2.57'

106.97°F

109.09°F

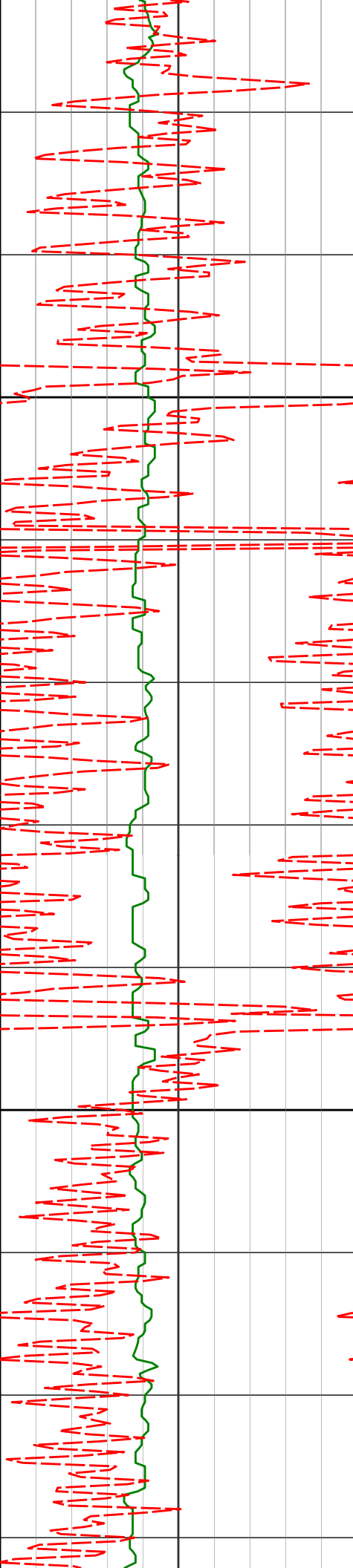
109.09°F

2533'

0.58°

172.08° 2532.97'

-2.57'



2600

2700

2627'

2722'

0.50°

0.45°

201.67°

218.26°

2626.96'

2721.96'

-2.65'

-3.04'

109.09°F

111.24°F

111.24°F

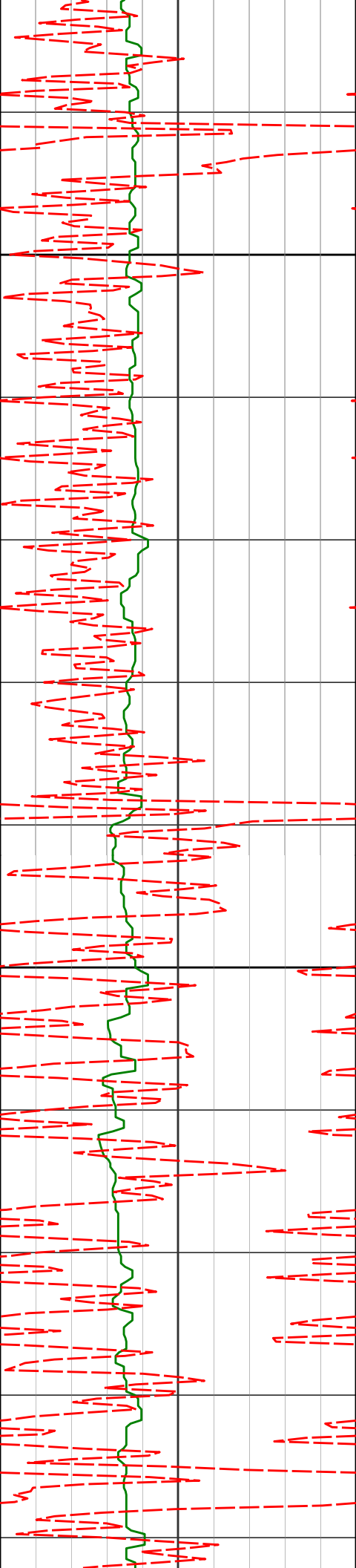
111.24°F

111.24°F

113.40°F

113.40°F

113.40°F



2800

2817'

0.34°

194.09° 2816.96'

-3.33'

113.40°F

113.40°F

113.40°F

117.73°F

2900

2911'

0.34°

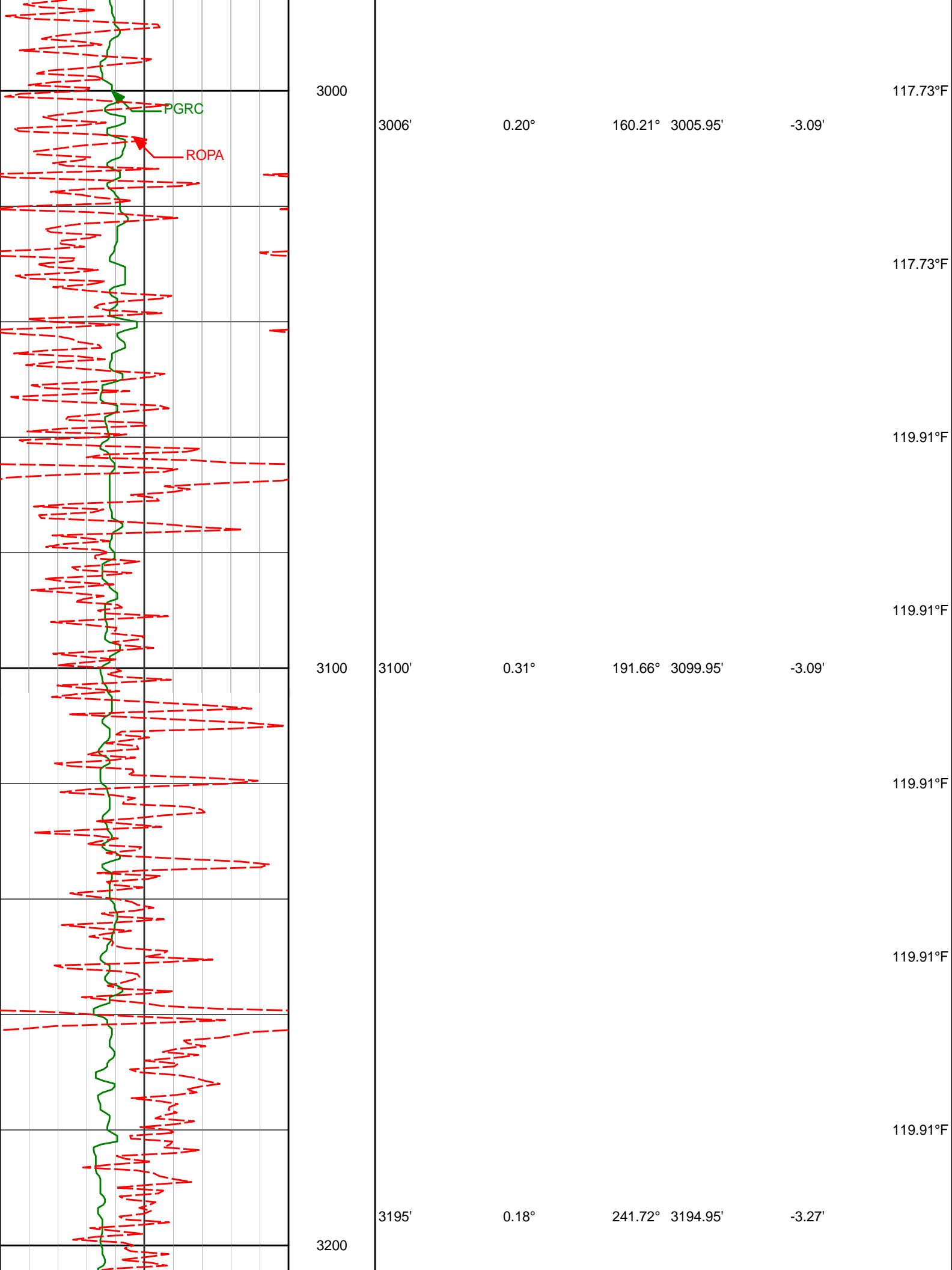
153.55° 2910.96'

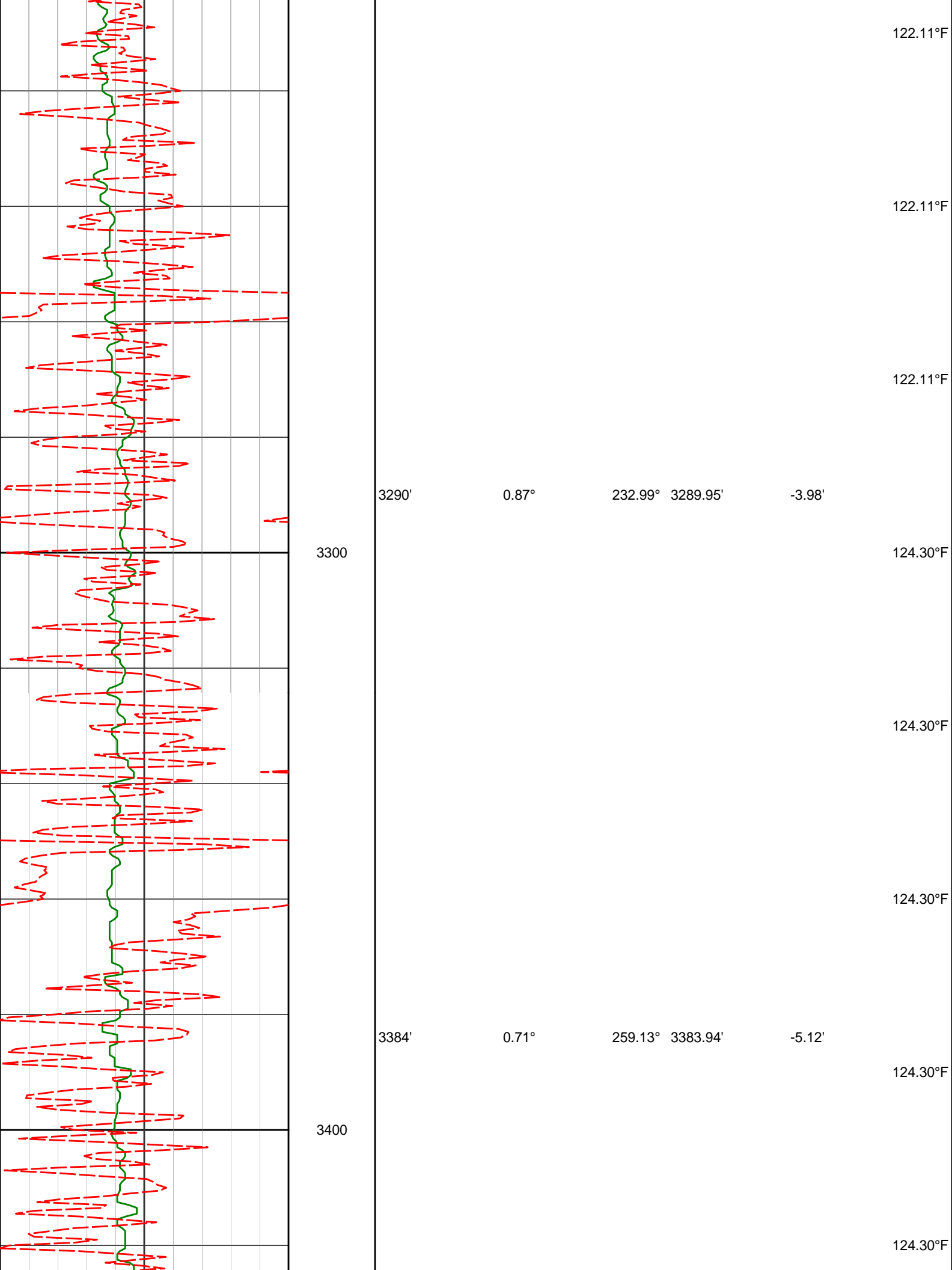
-3.28'

117.73°F

117.73°F

117.73°F







3500

3600

3479'

3574'

0.55°

0.13°

290.19°

335.53°

3478.93'

3573.93'

-6.13'

-6.60'

126.52°F

126.52°F

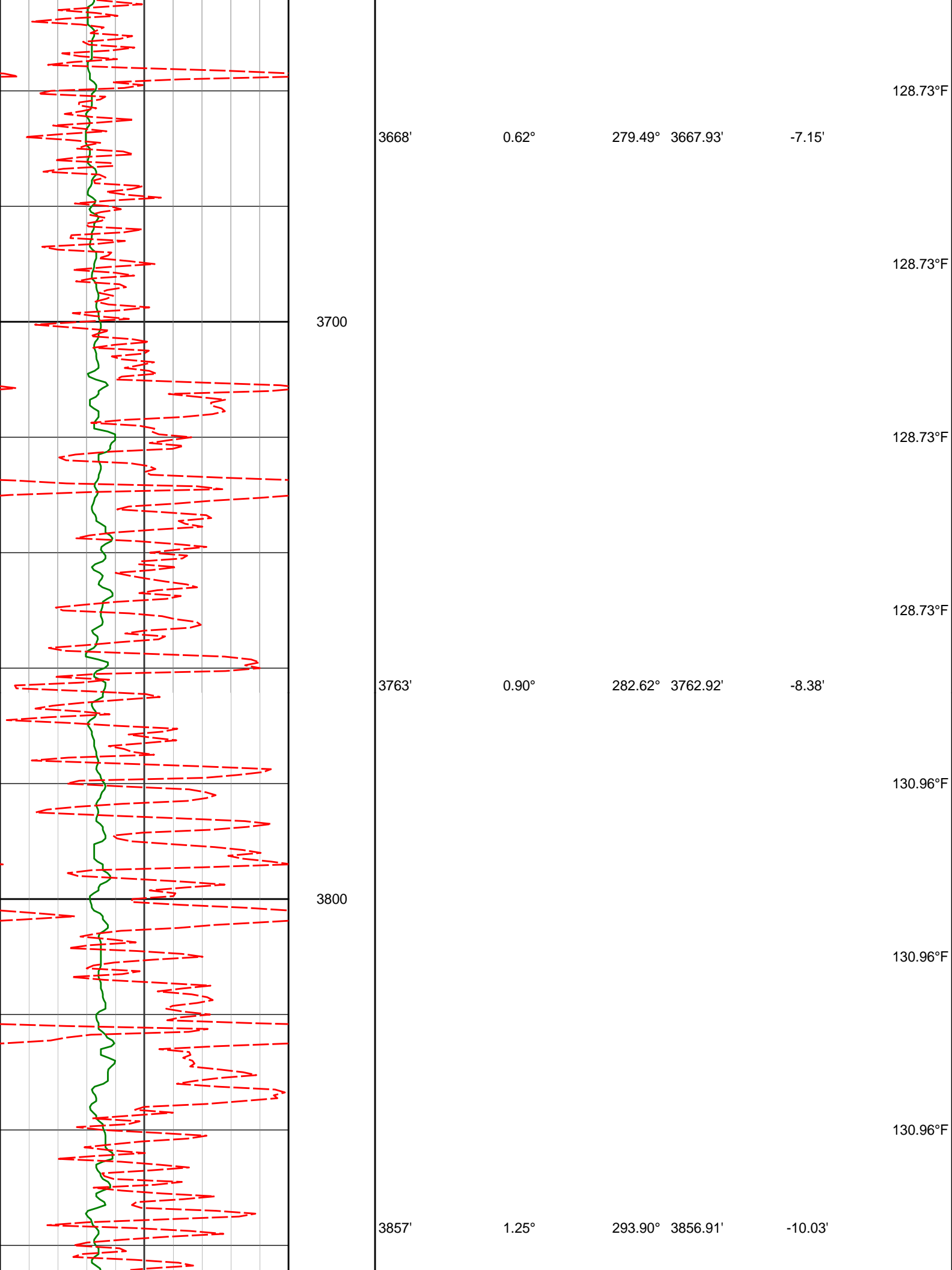
126.52°F

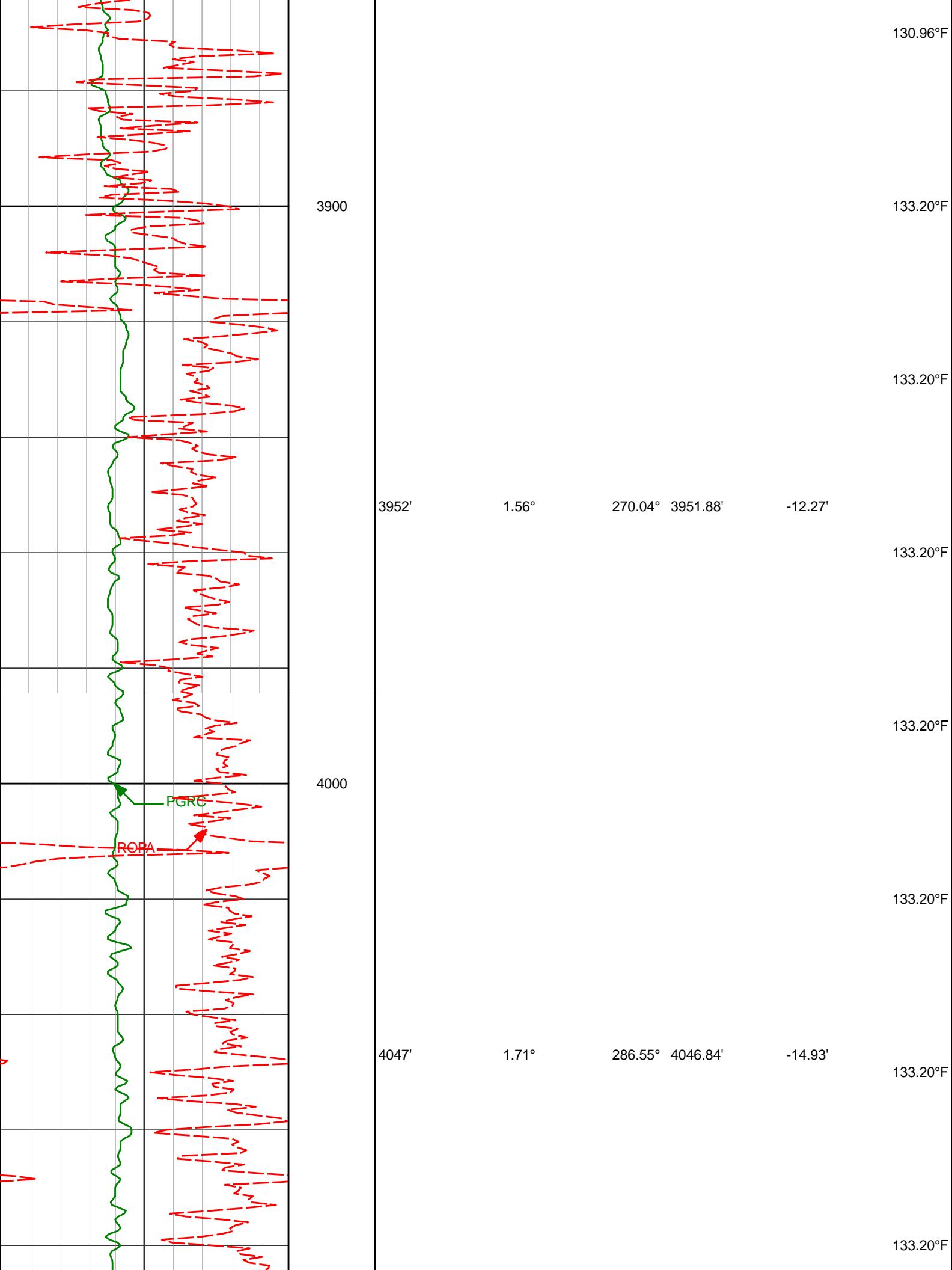
126.52°F

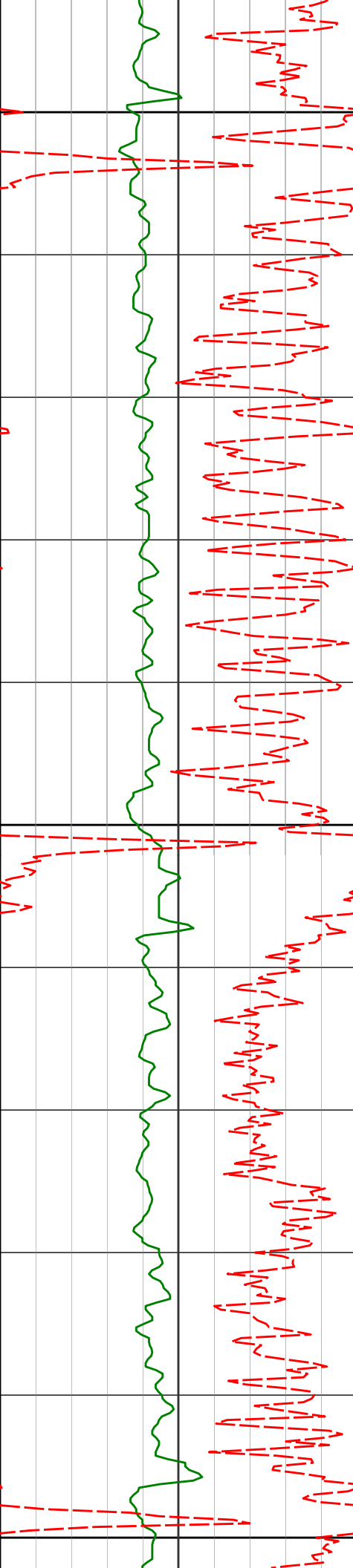
128.73°F

128.73°F

128.73°F







4100

130.96°F

4141'

1.30°

289.08°

4140.81'

-17.28'

130.96°F

130.96°F

4200

130.96°F

4236'

0.91°

274.72°

4235.79'

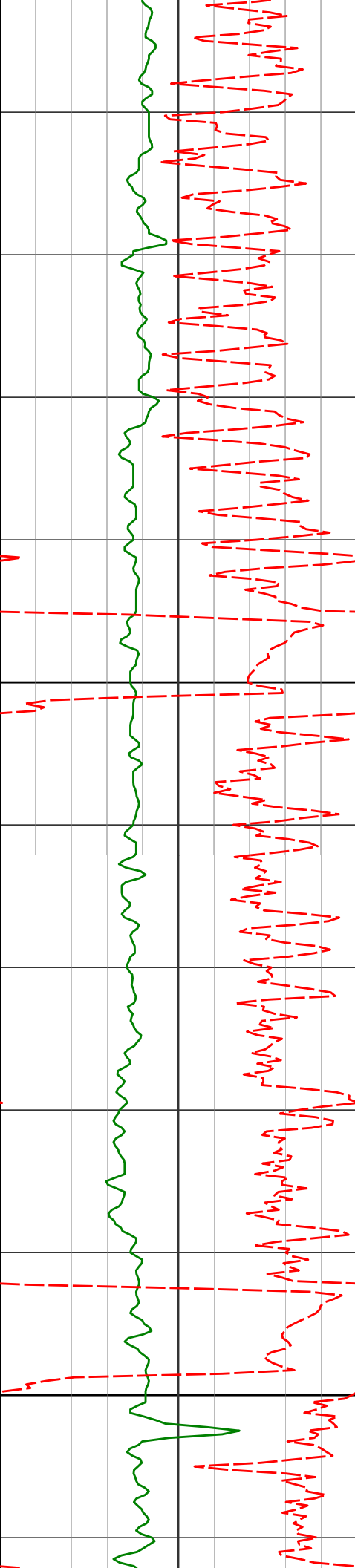
-19.04'

130.96°F

130.96°F

4300

133.20°F



4400

4500

4331'

4425'

4520'

0.79°

2.00°

2.65°

305.47°

274.78°

256.70°

4330.78'

4424.75'

4519.67'

-20.33'

-22.49'

-26.27'

133.20°F

133.20°F

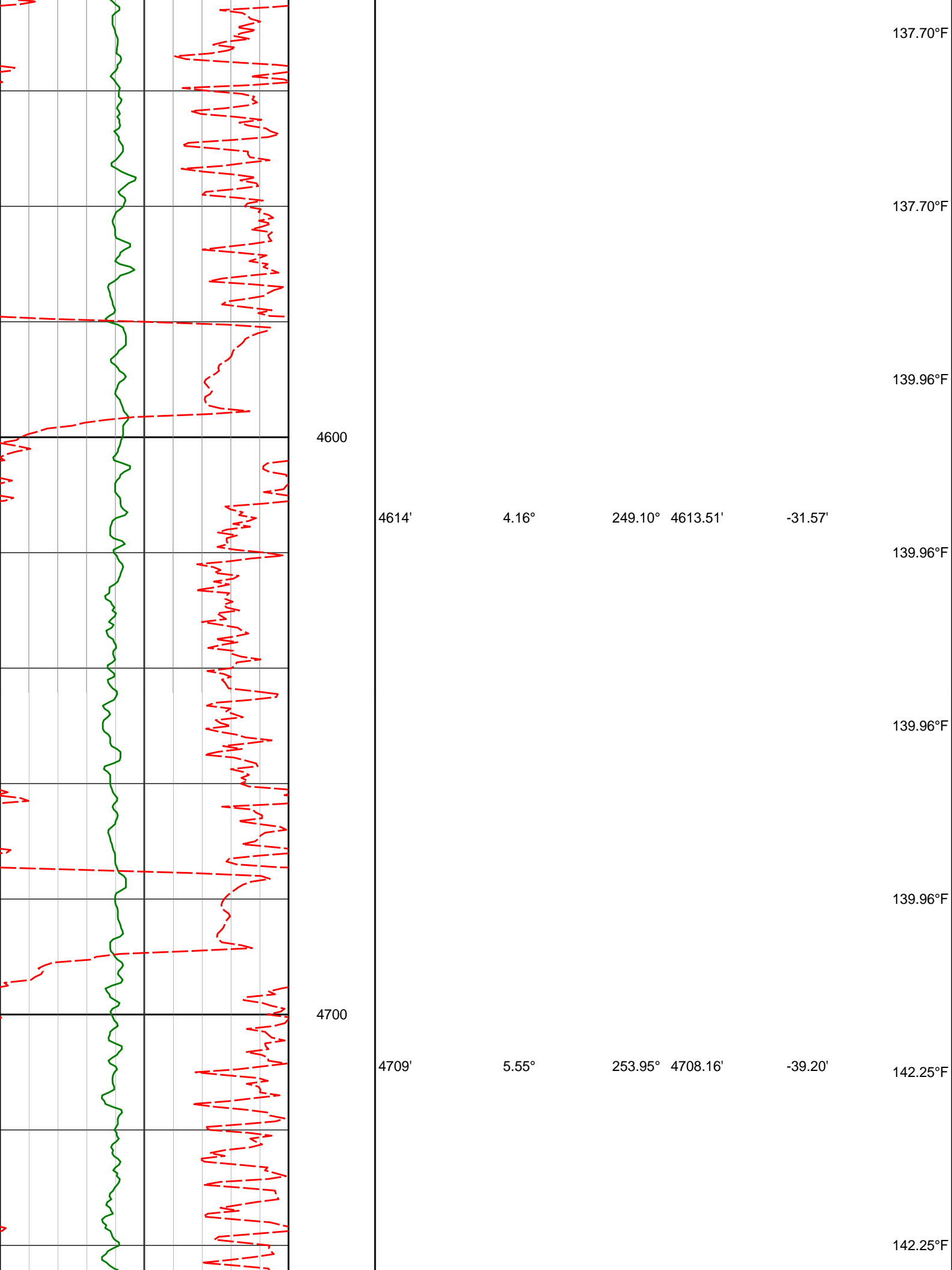
135.45°F

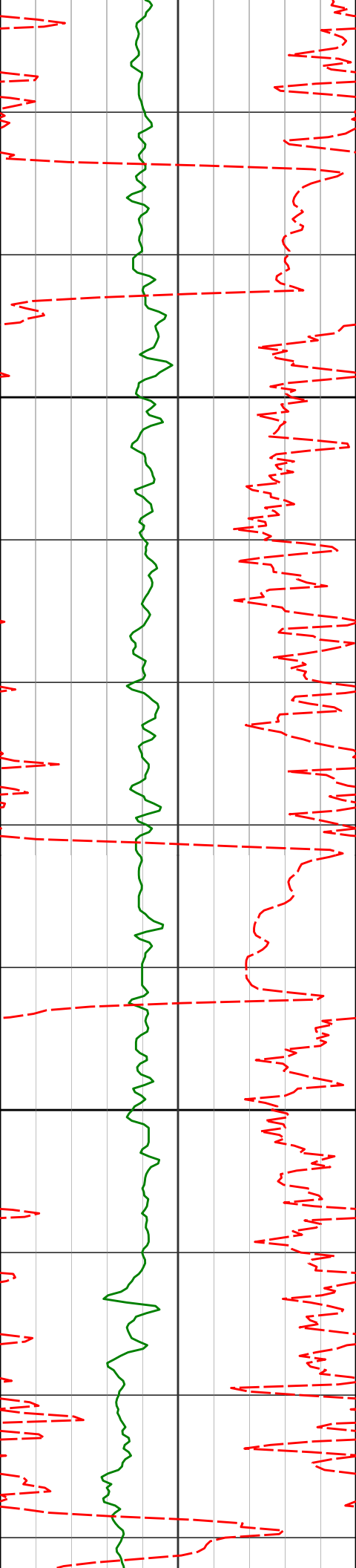
135.45°F

135.45°F

135.45°F

137.70°F





4800

4900

4804'

4898'

6.43°

8.26°

264.91° 4802.65'

262.55° 4895.87'

-48.91'

-60.84'

142.25°F

144.54°F

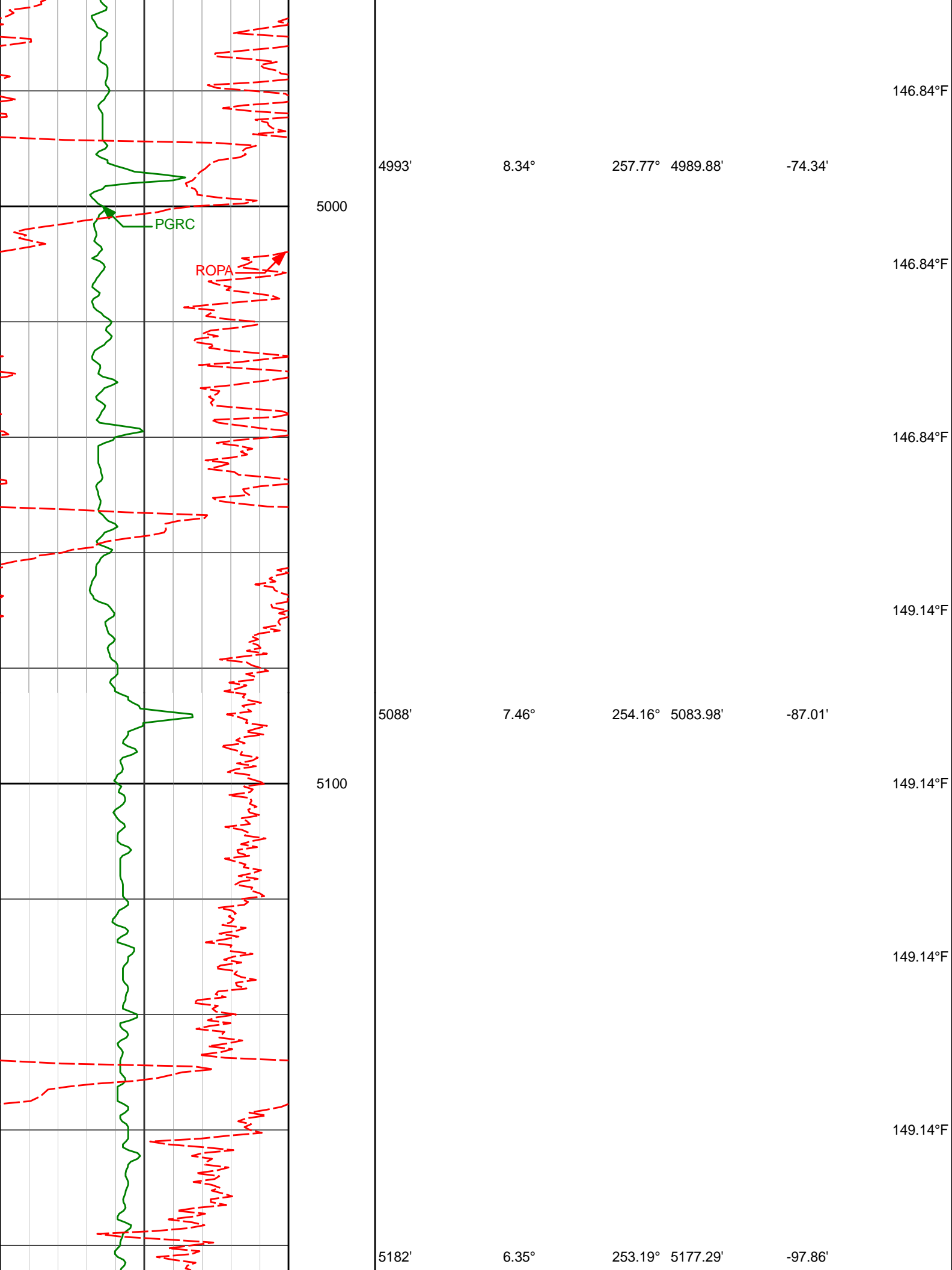
144.54°F

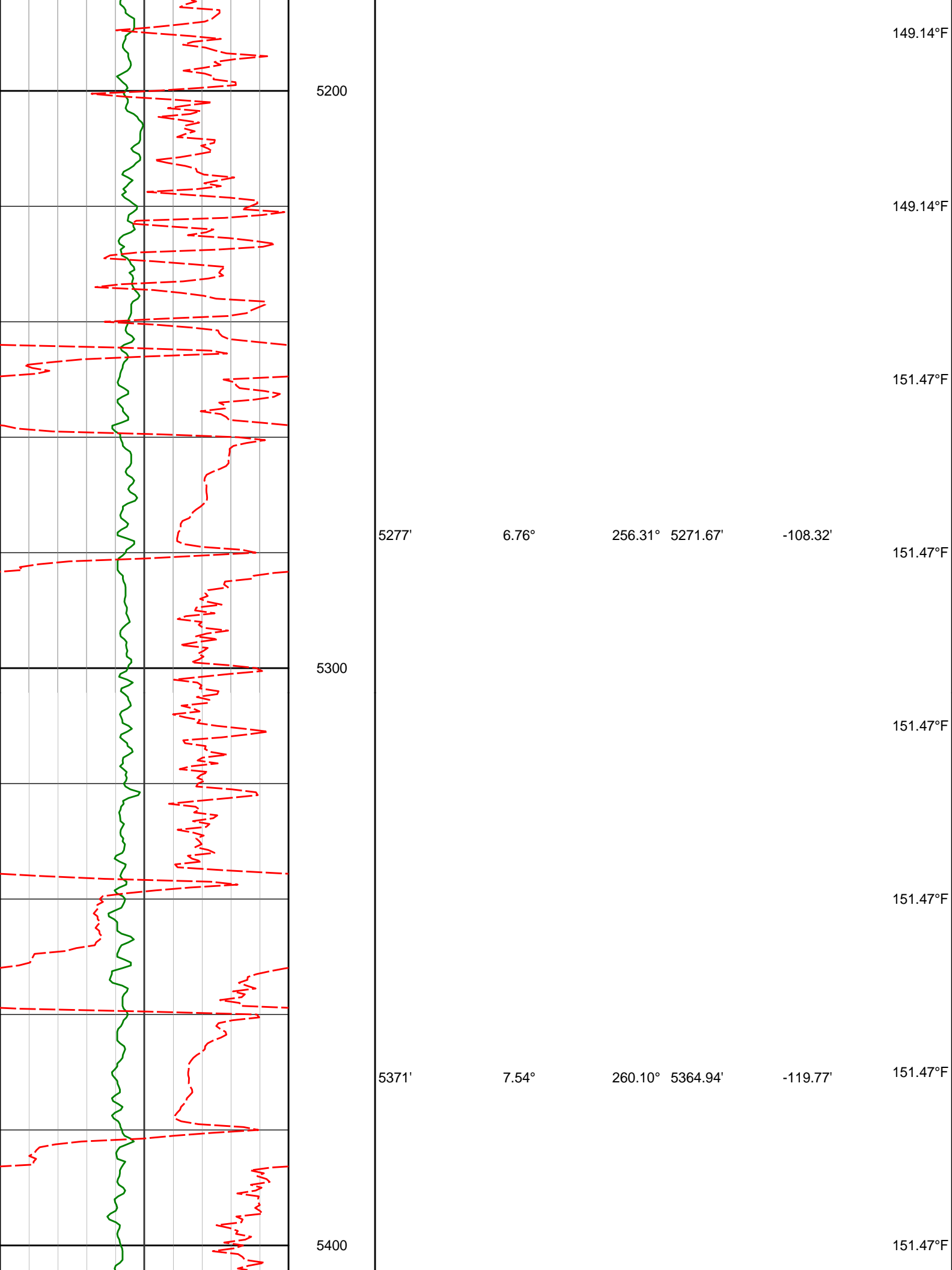
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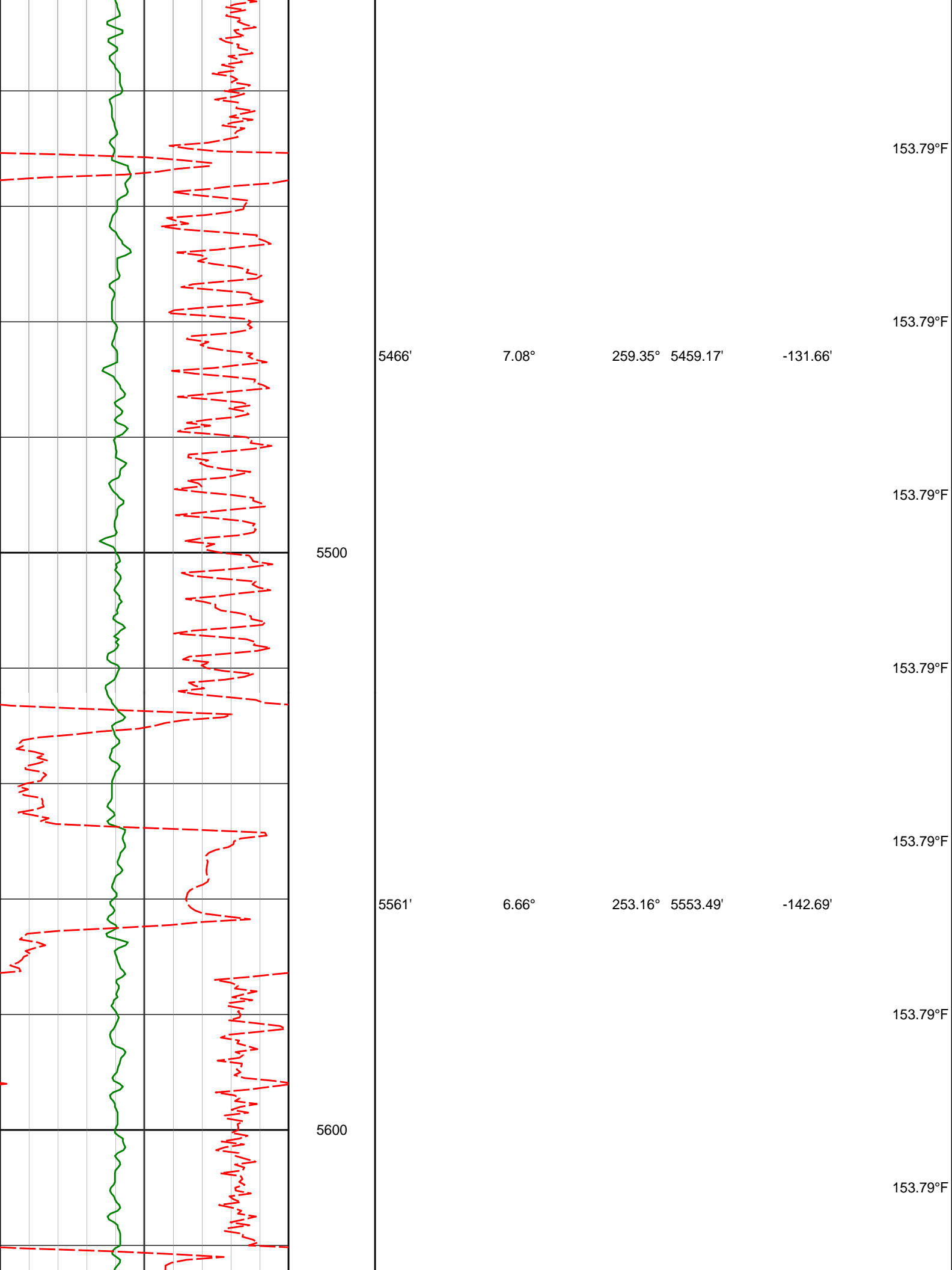
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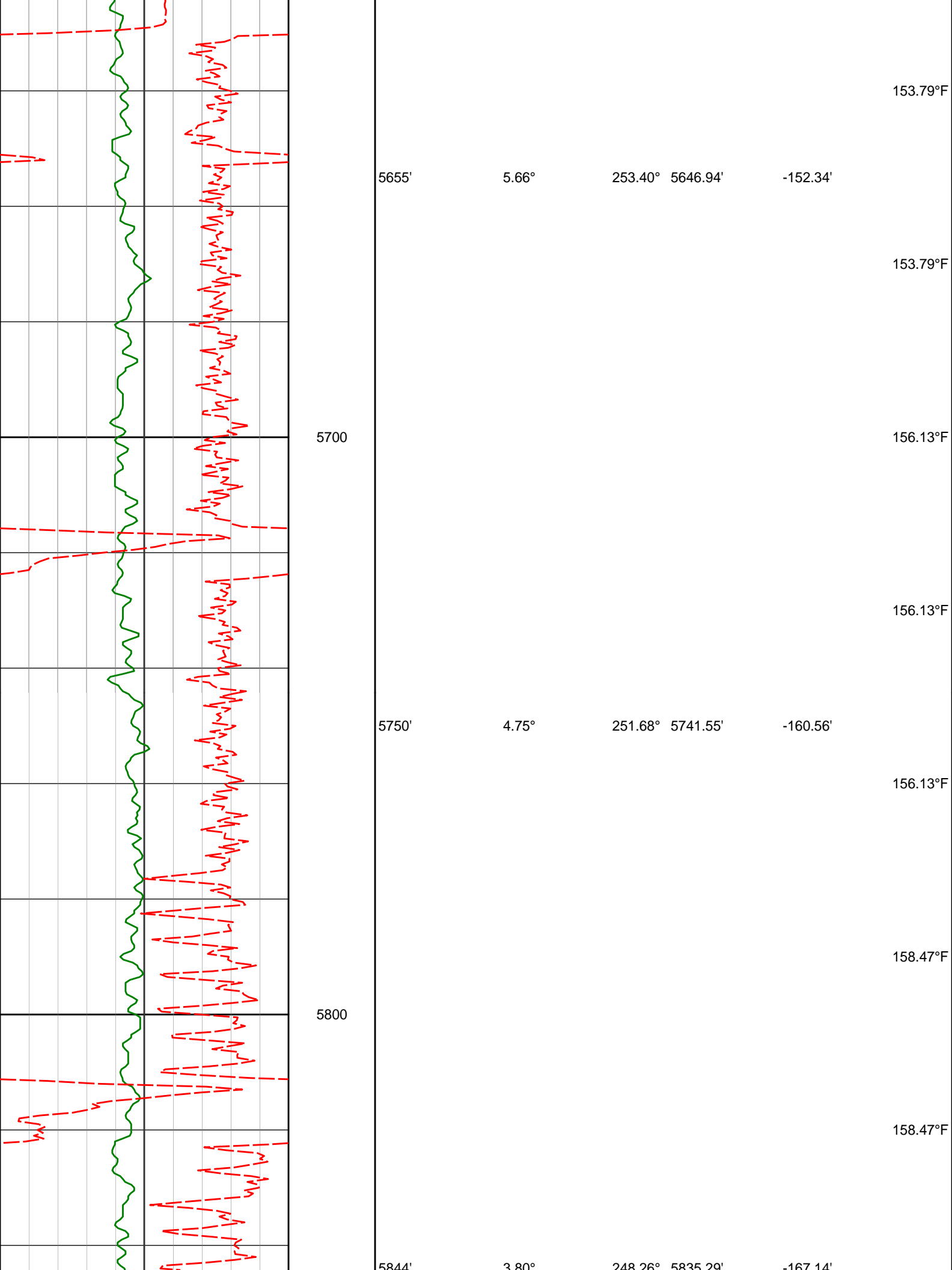
146.84°F

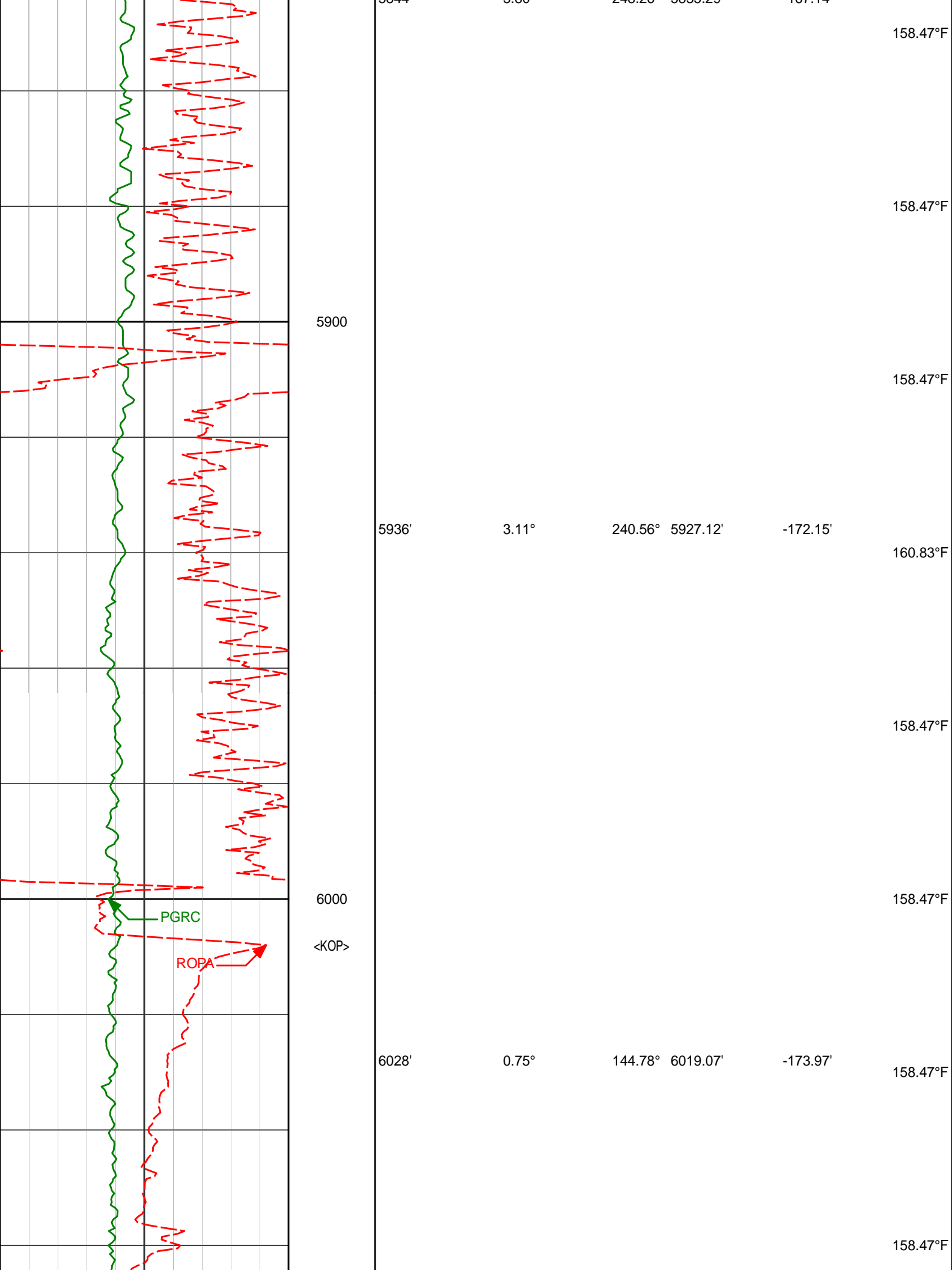
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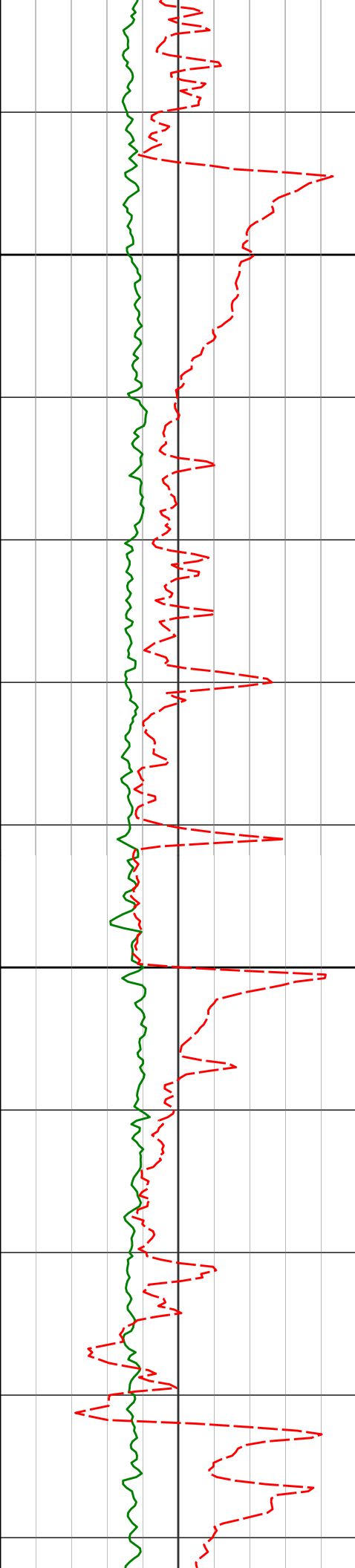












6100

6200

6121'

6213'

9.66°

16.12°

96.26°

92.76°

6111.61'

6201.24'

-165.85'

-145.39'

158.47°F

160.83°F

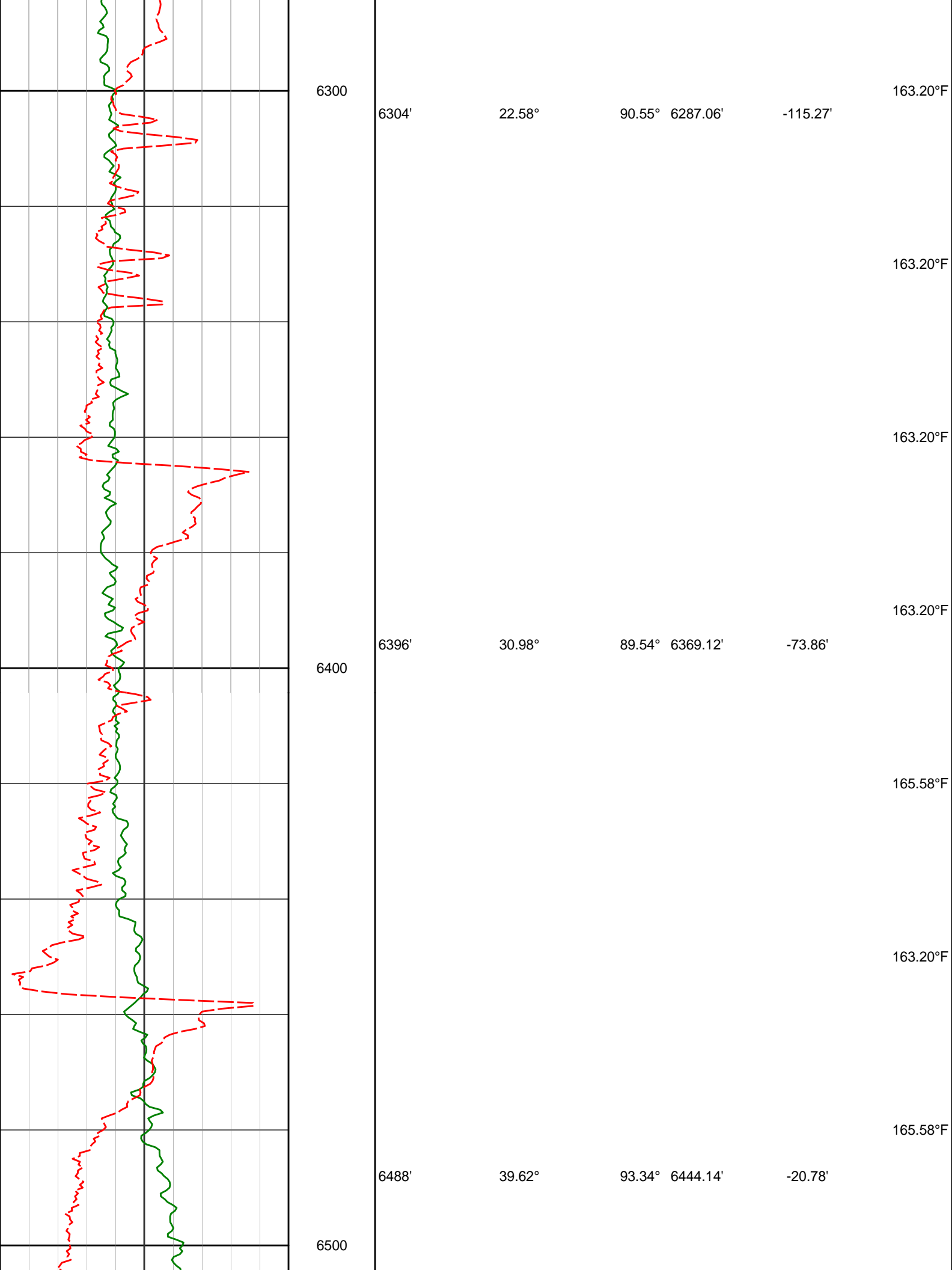
160.83°F

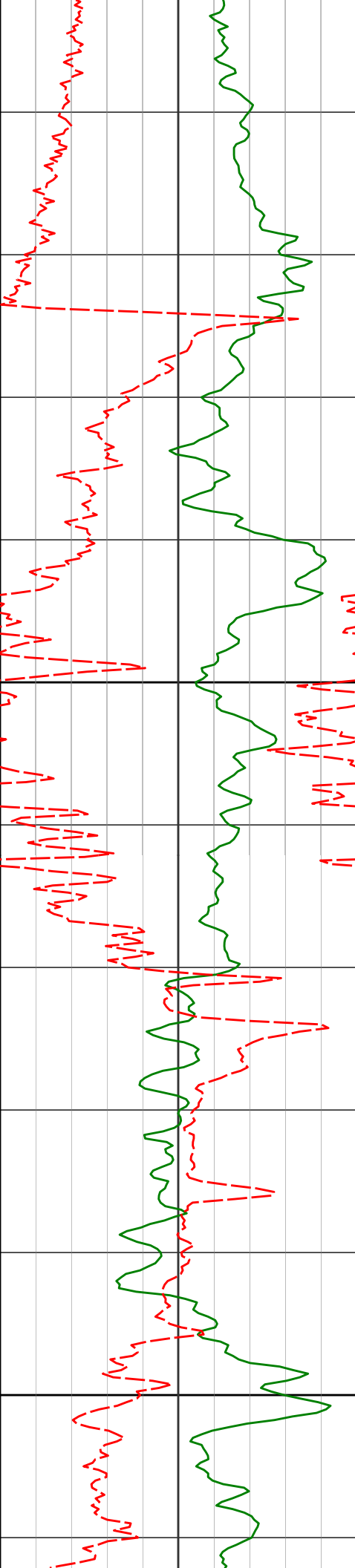
160.83°F

163.20°F

163.20°F

163.20°F





6600

6700

6579'

49.18°

95.70°

6509.09'

42.60'

6671'

56.09°

90.55°

6564.91'

115.54'

165.58°F

165.58°F

167.97°F

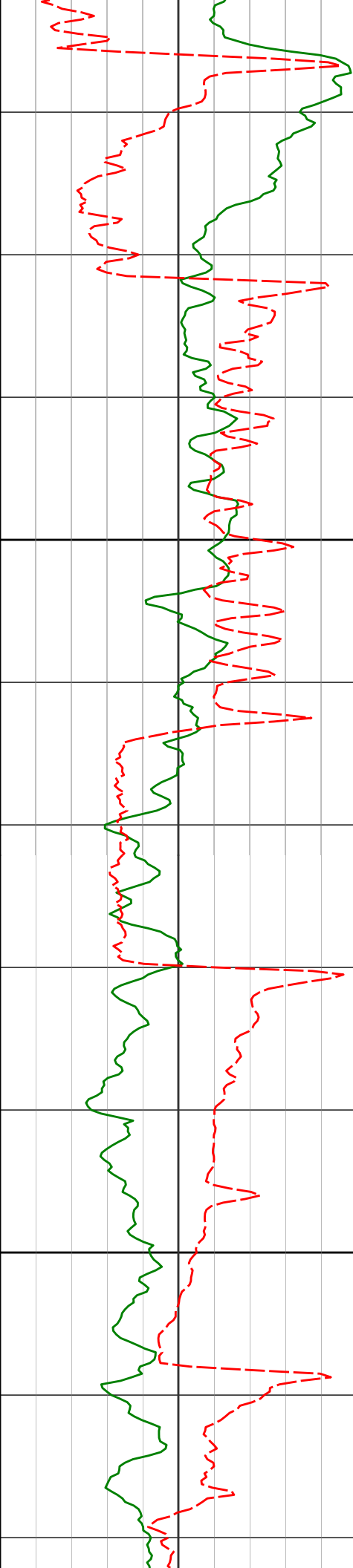
167.97°F

167.97°F

167.97°F

170.37°F

170.37°F



6800

6900

6763'

61.85°

85.89°

6612.33'

194.26'

6855'

67.90°

86.05°

6651.37'

277.31'

170.37°F

170.37°F

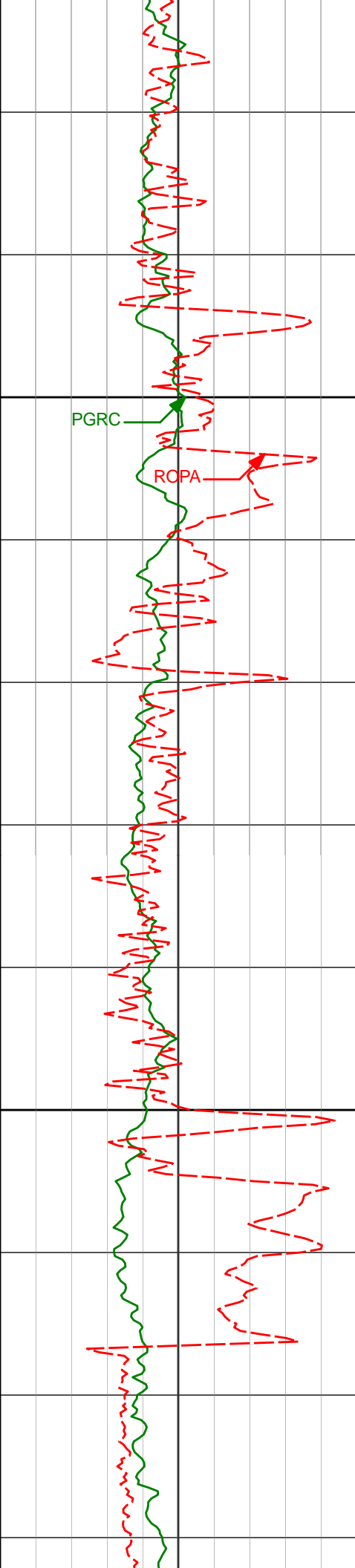
172.78°F

172.78°F

172.78°F

172.78°F

175.21°F



7000

7100

6947'

78.04°

91.13° 6678.29'

365.10'

175.21°F

175.21°F

175.21°F

7039'

86.88°

94.26° 6690.35'

456.11'

177.64°F

177.64°F

177.64°F

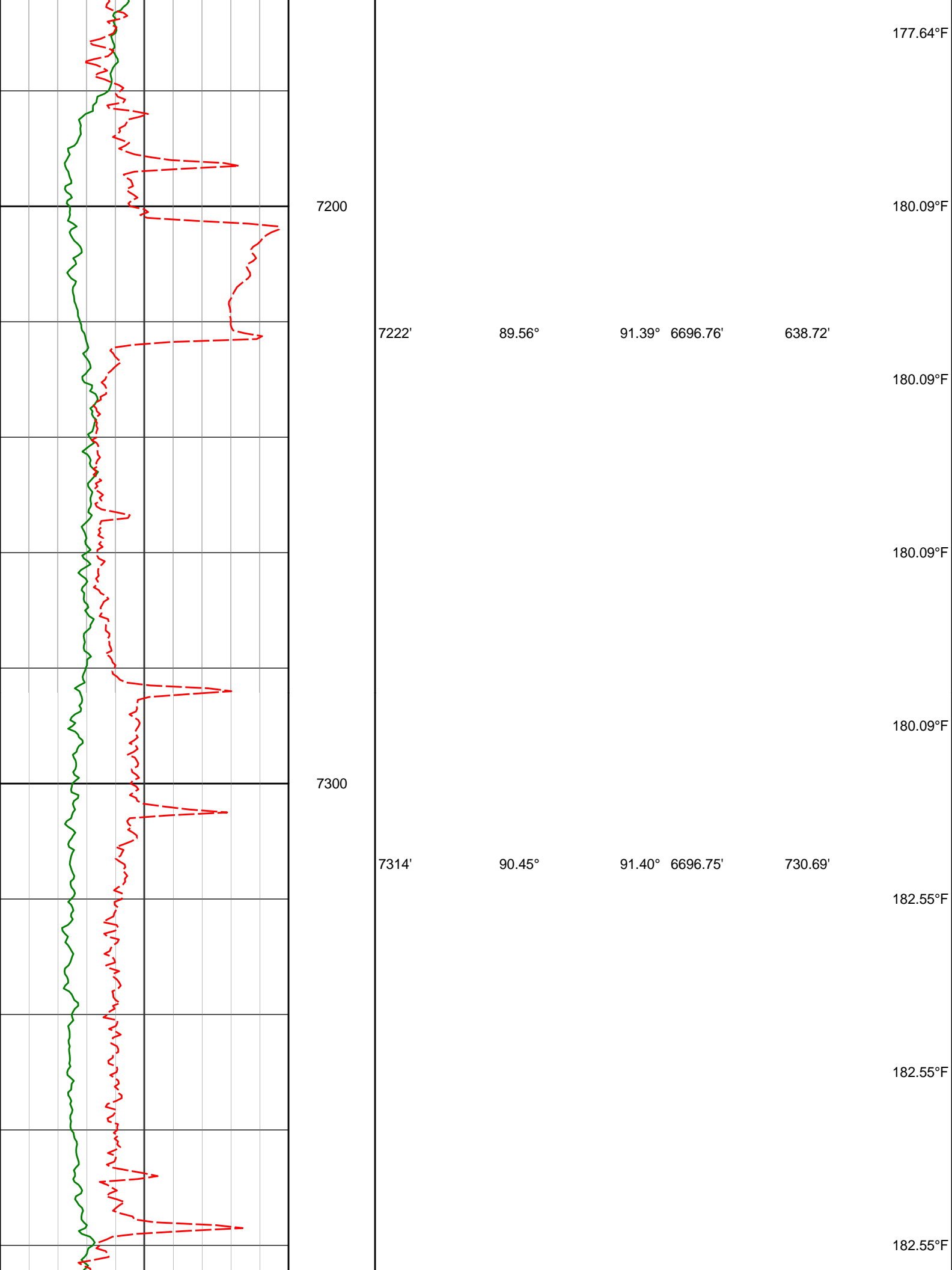
7131'

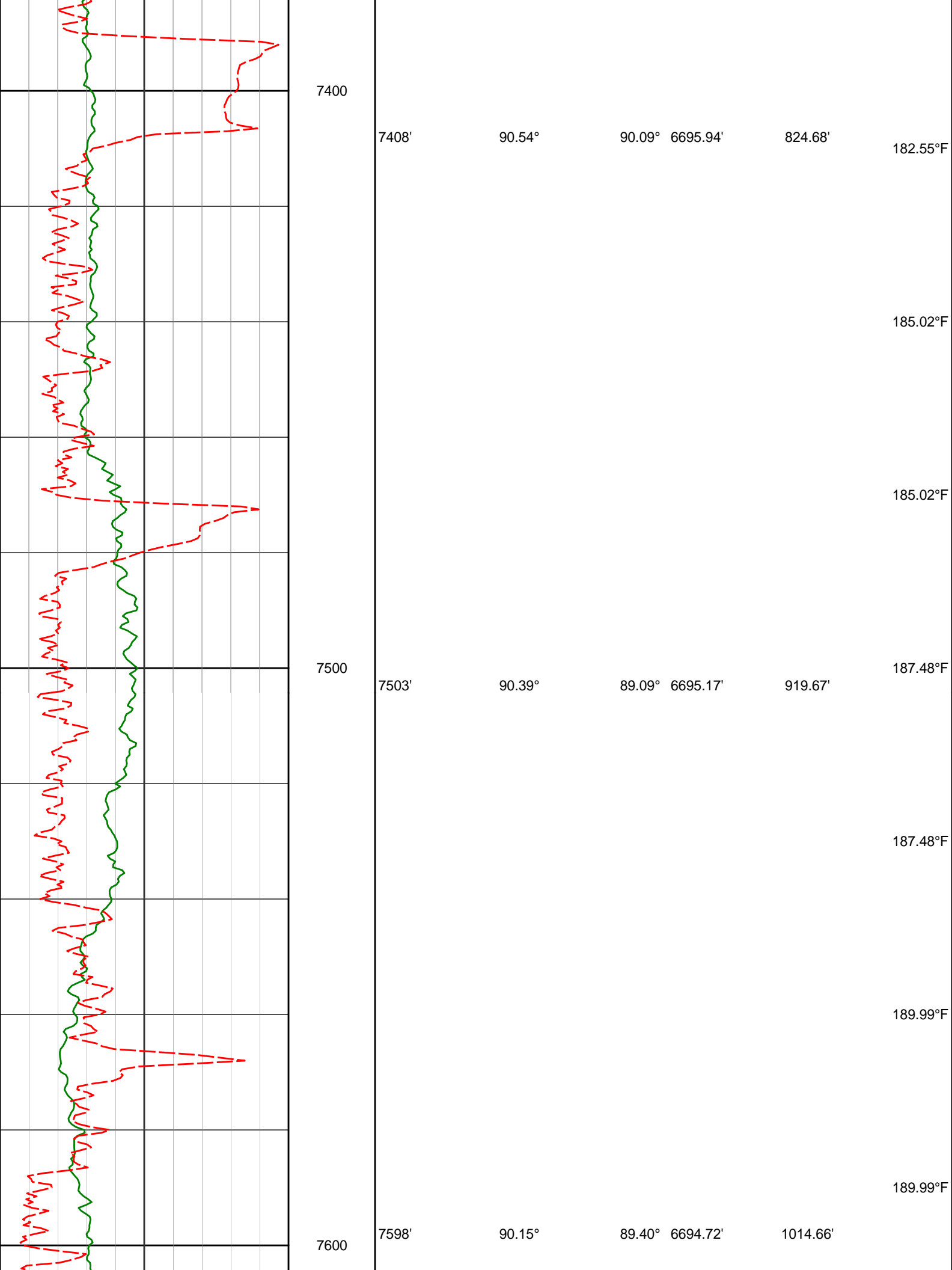
87.77°

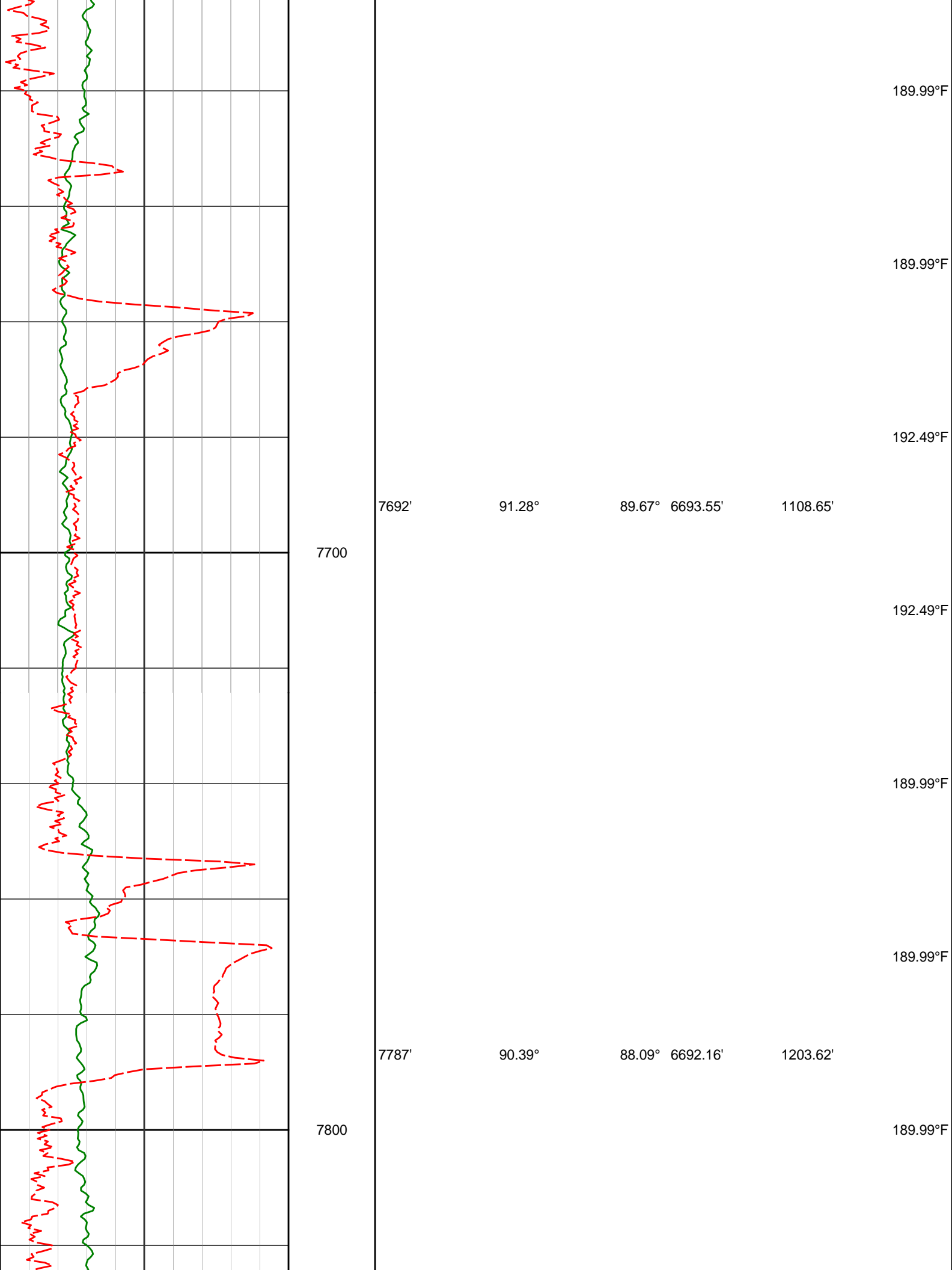
93.13° 6694.64'

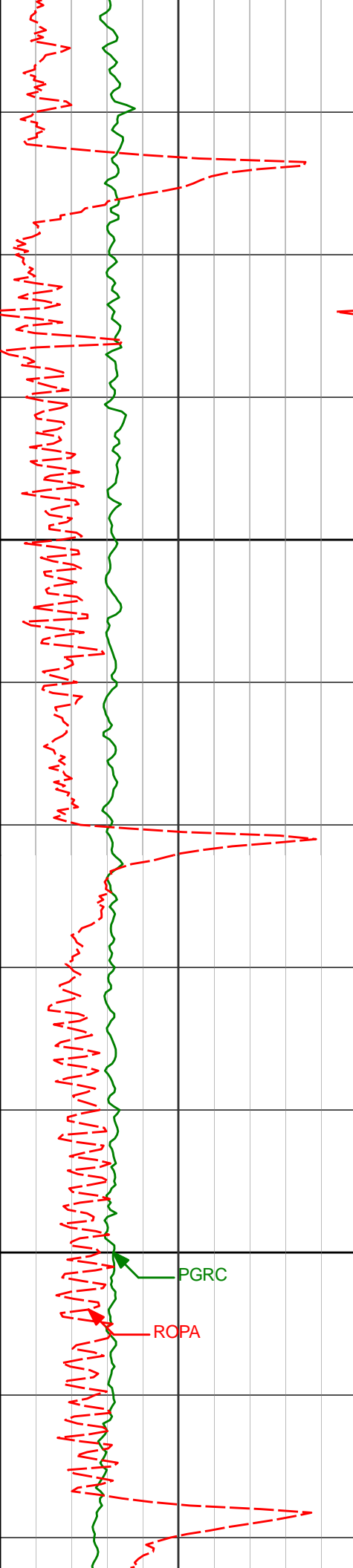
547.82'

180.09°F









7900

8000

7881'

89.77°

87.31° 6692.03'

1297.53'

7976'

89.96°

86.72° 6692.25'

1392.40'

PGRC

ROPA

192.49°F

192.49°F

194.99°F

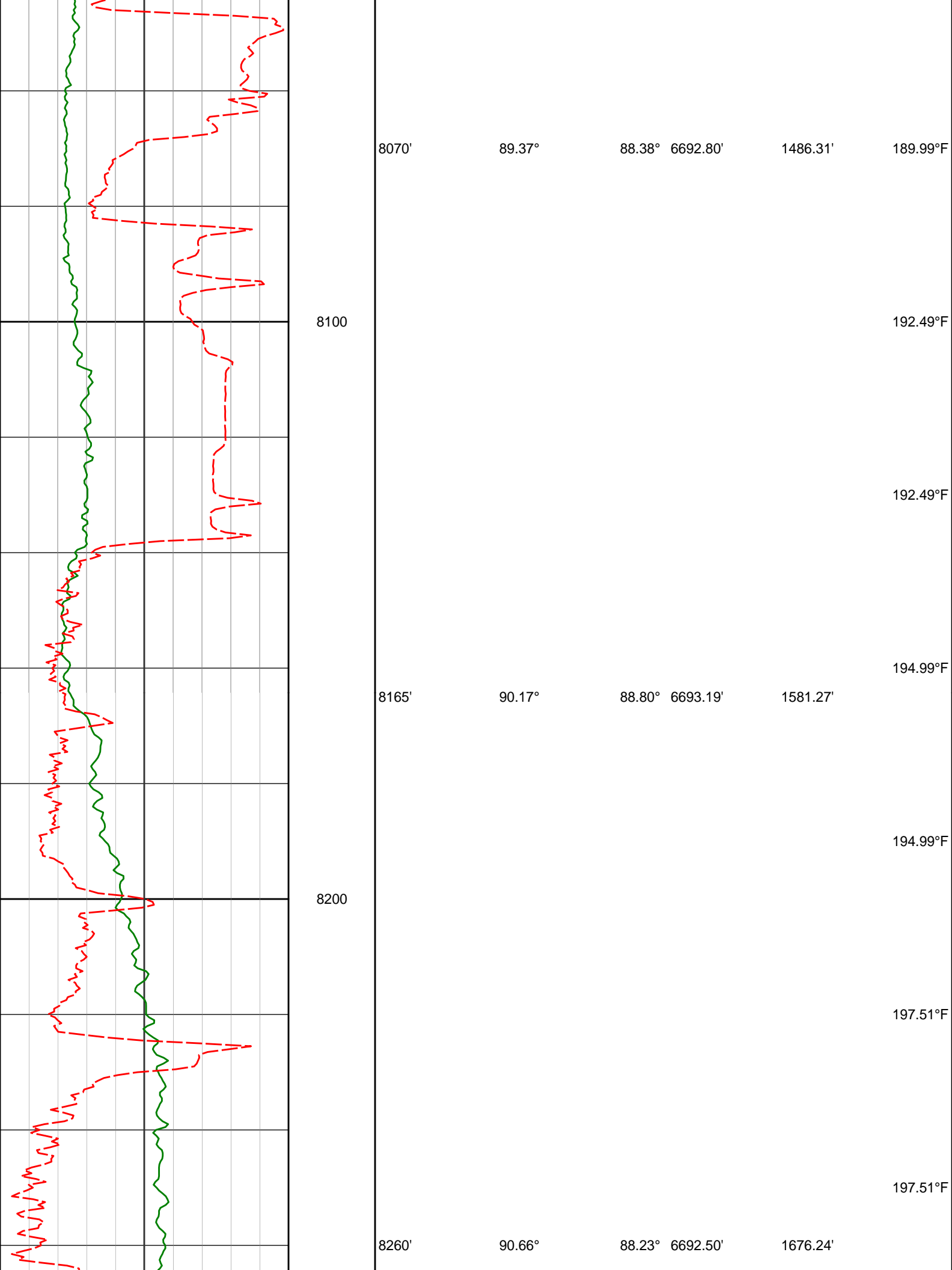
194.99°F

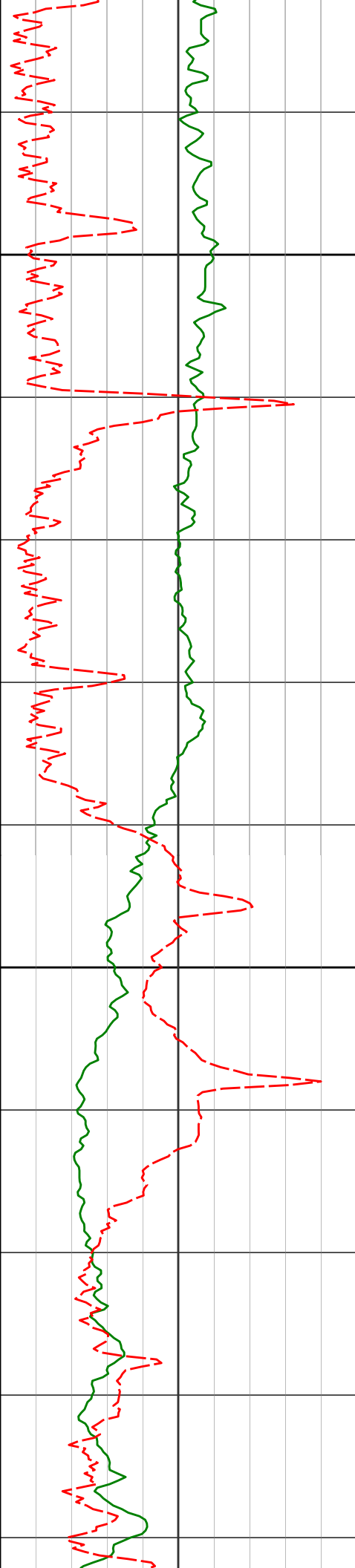
194.99°F

189.99°F

189.99°F

189.99°F





8300

8400

8354'

8449'

90.82°

91.77°

88.08°

87.76°

6691.28'

6689.14'

1770.18'

1865.09'

197.51°F

197.51°F

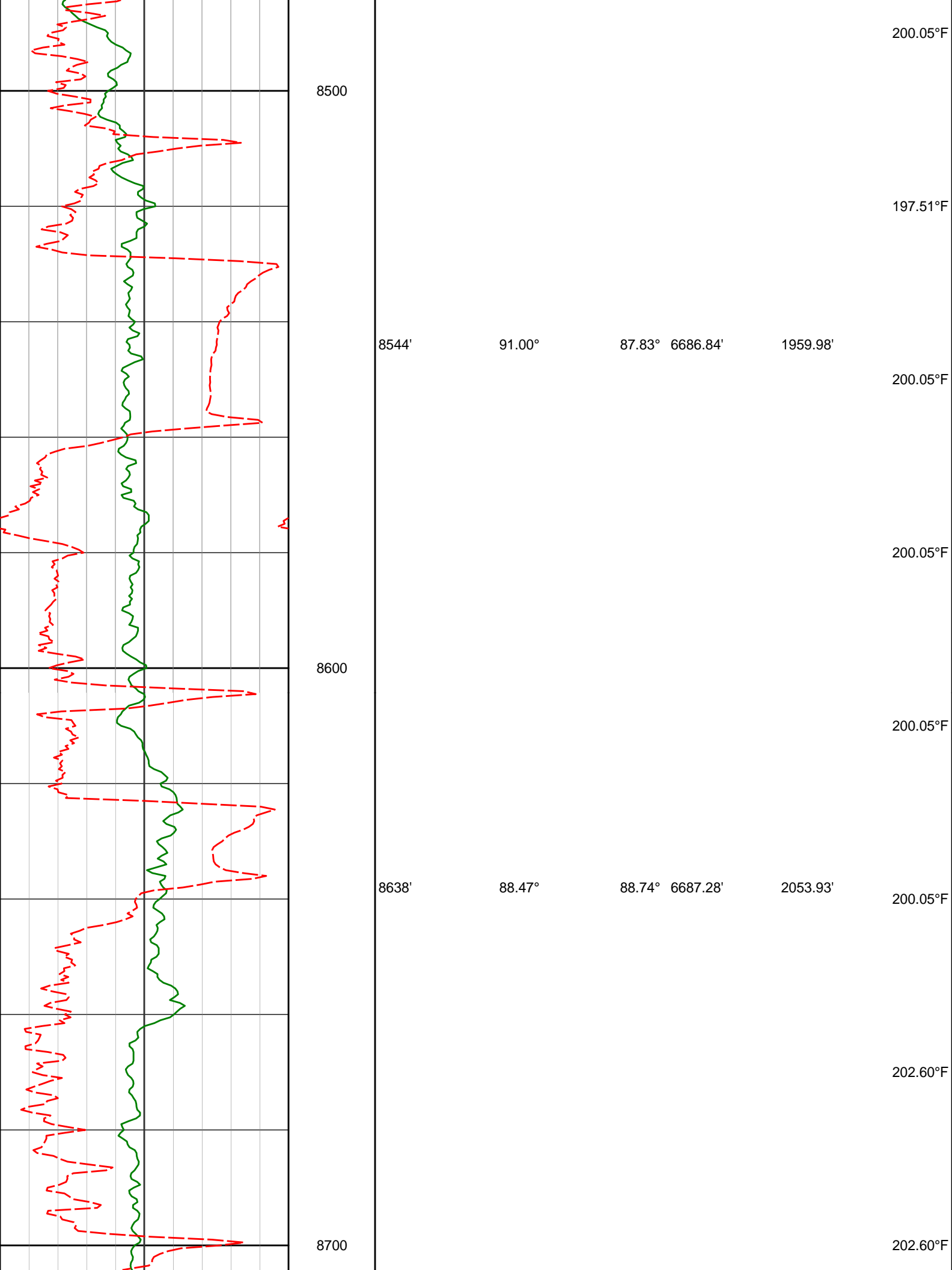
200.05°F

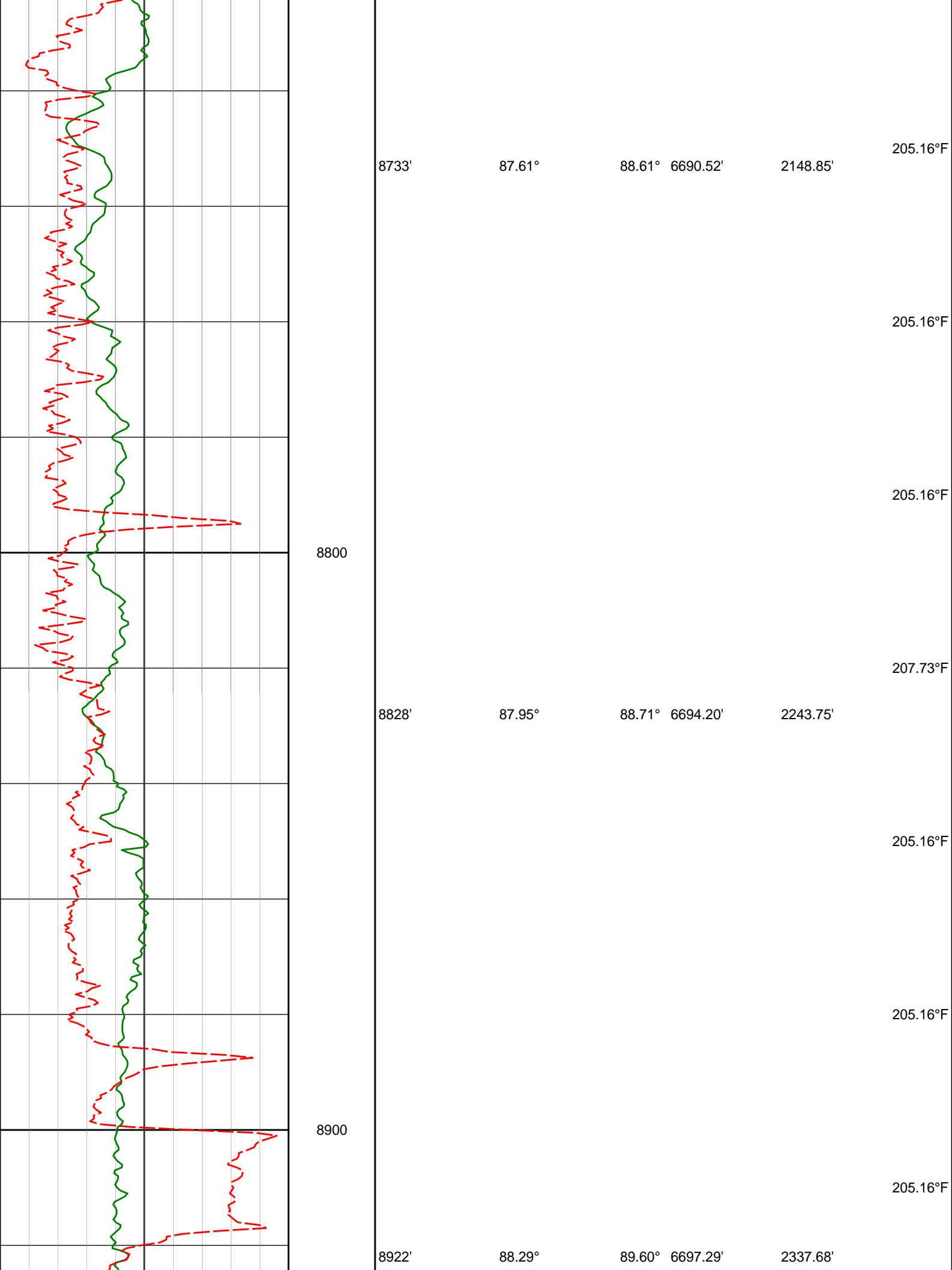
200.05°F

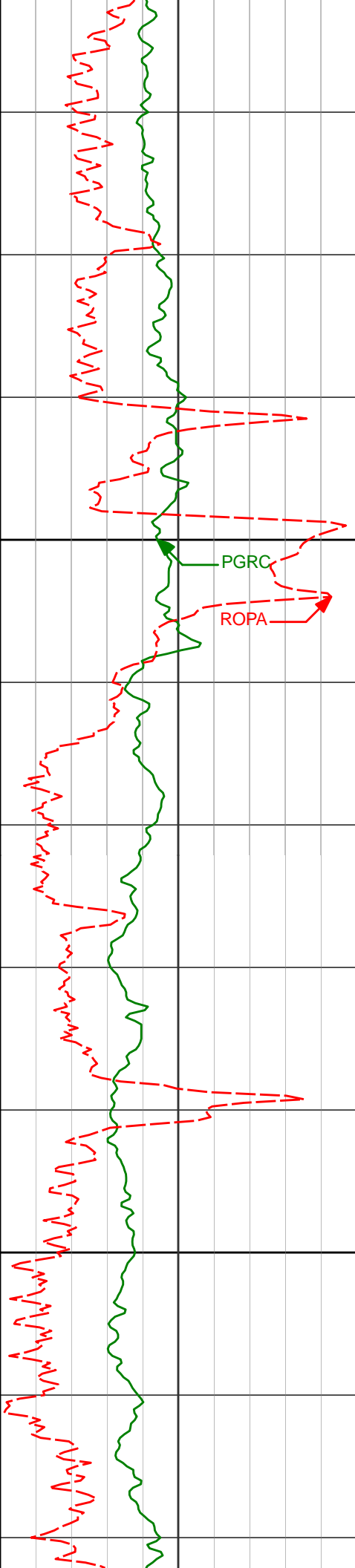
200.05°F

200.05°F

202.60°F







9000

9100

9017'

9112'

89.28°

90.33°

90.04° 6699.30'

90.50° 6699.63'

2432.66'

2527.66'

207.73°F

205.16°F

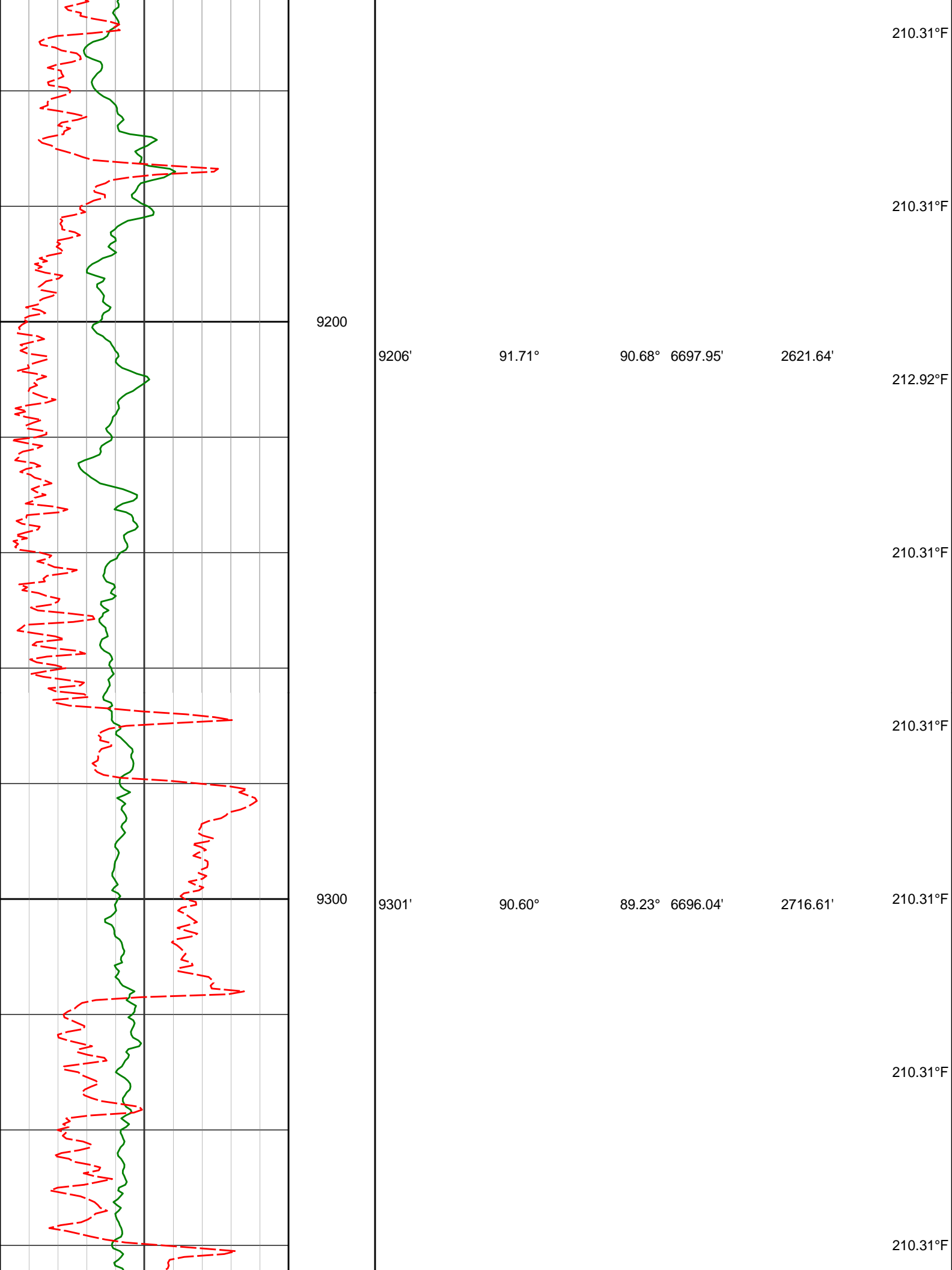
205.16°F

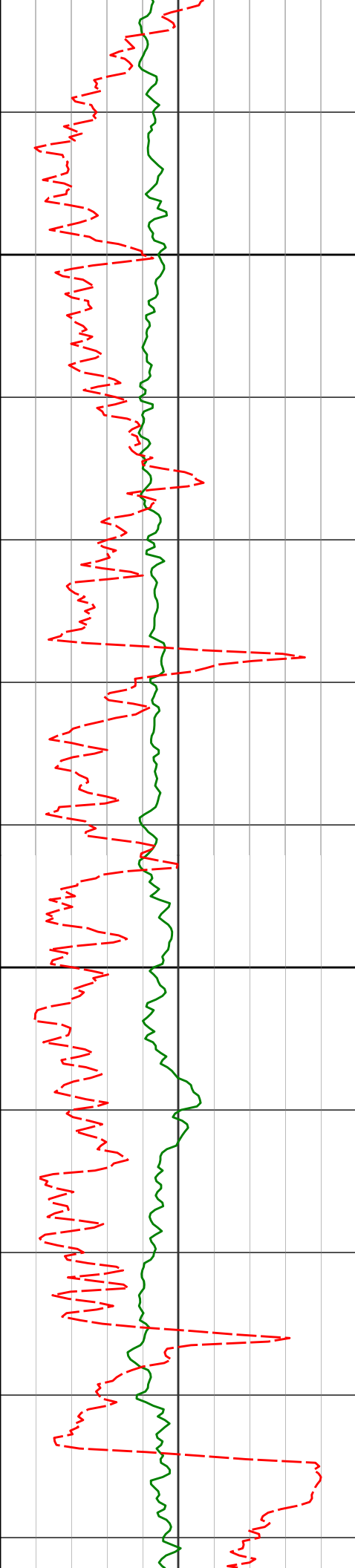
207.73°F

207.73°F

207.73°F

210.31°F





9400

9500

9396'

89.71°

89.26° 6695.78'

2811.60'

212.92°F

212.92°F

215.51°F

215.51°F

9490'

88.69°

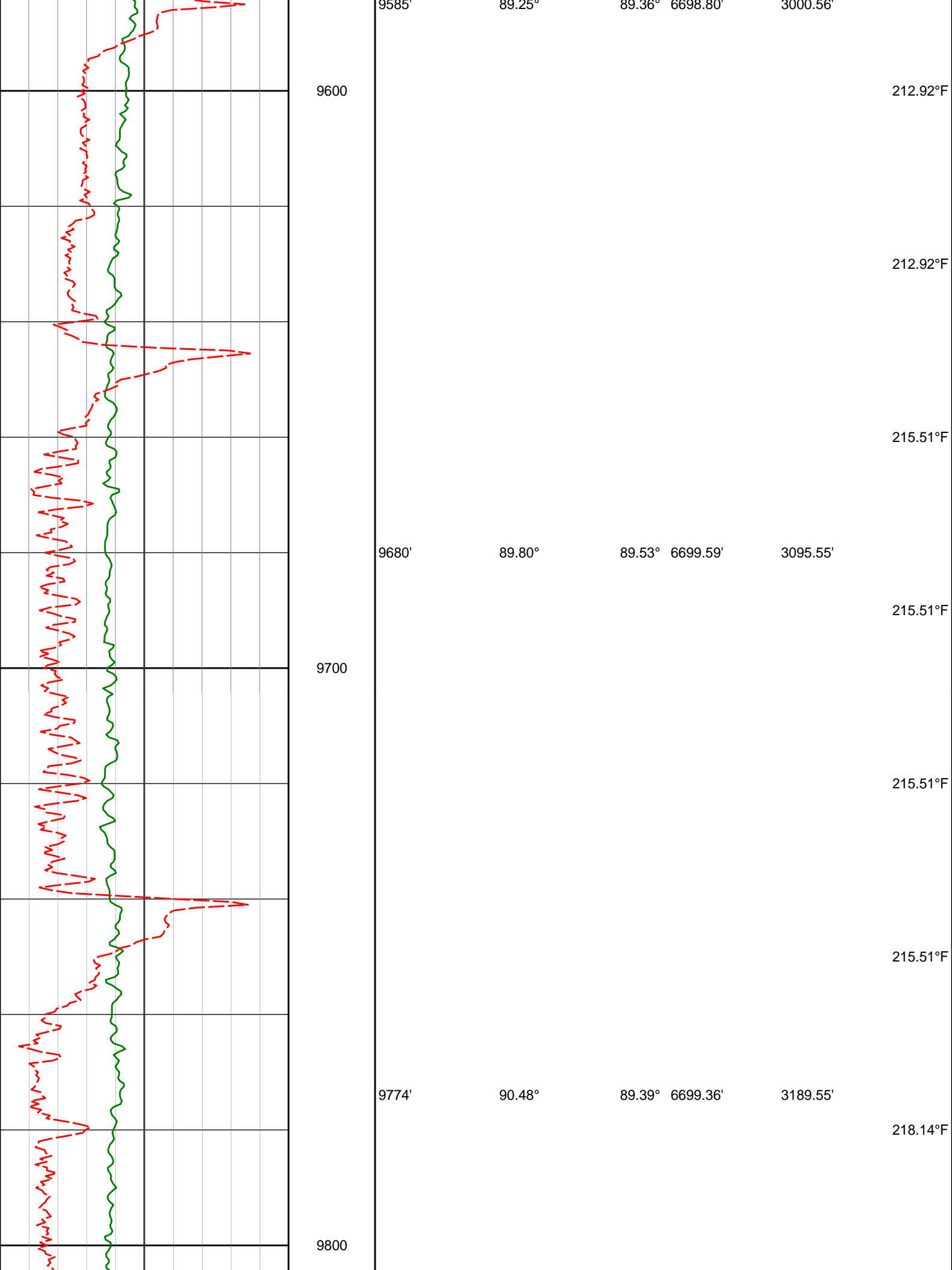
89.53° 6697.09'

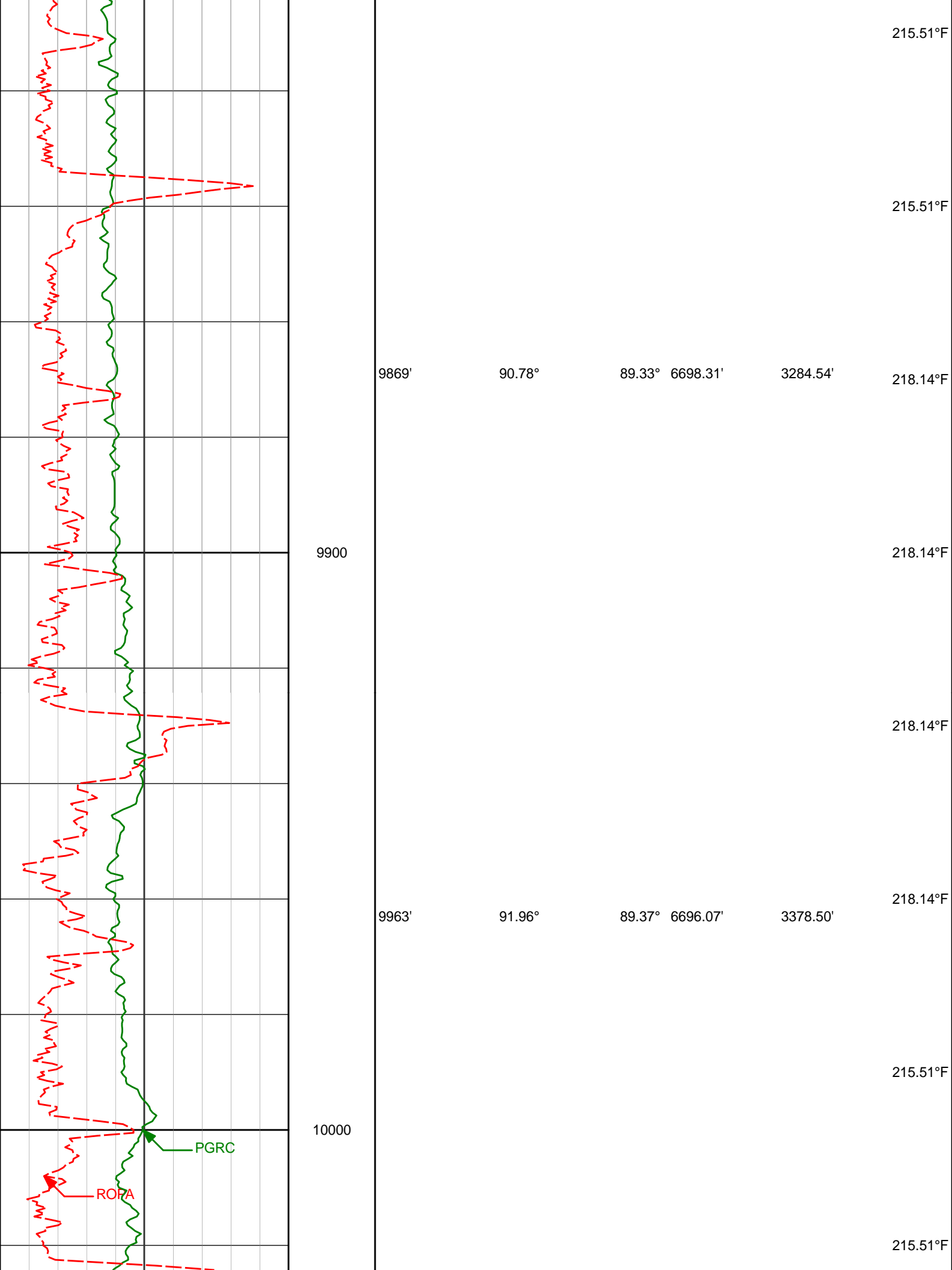
2905.58'

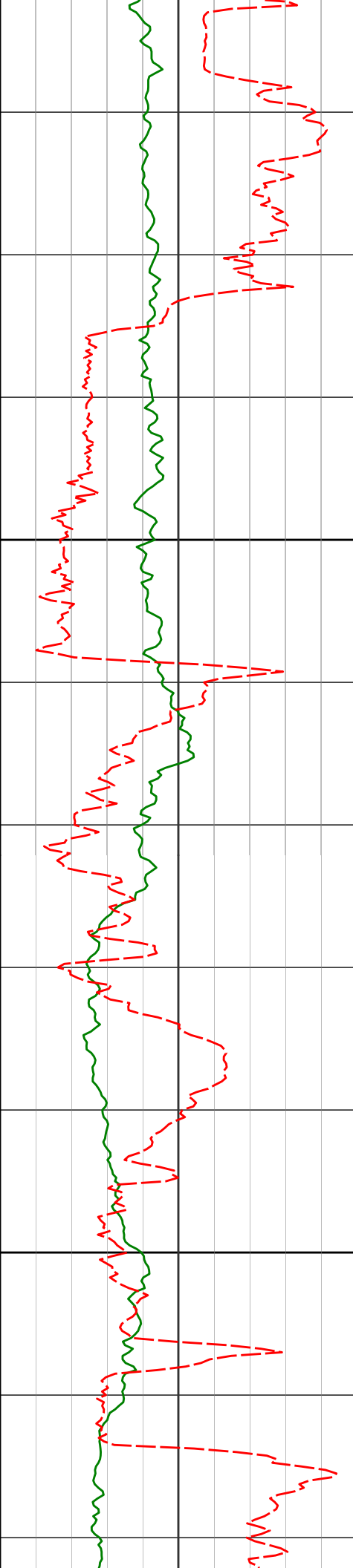
215.51°F

212.92°F

212.92°F







10100

10200

10058'

10152'

89.99°

90.85°

89.33°

89.35°

6694.45'

6693.76'

3473.47'

3567.46'

215.51°F

215.51°F

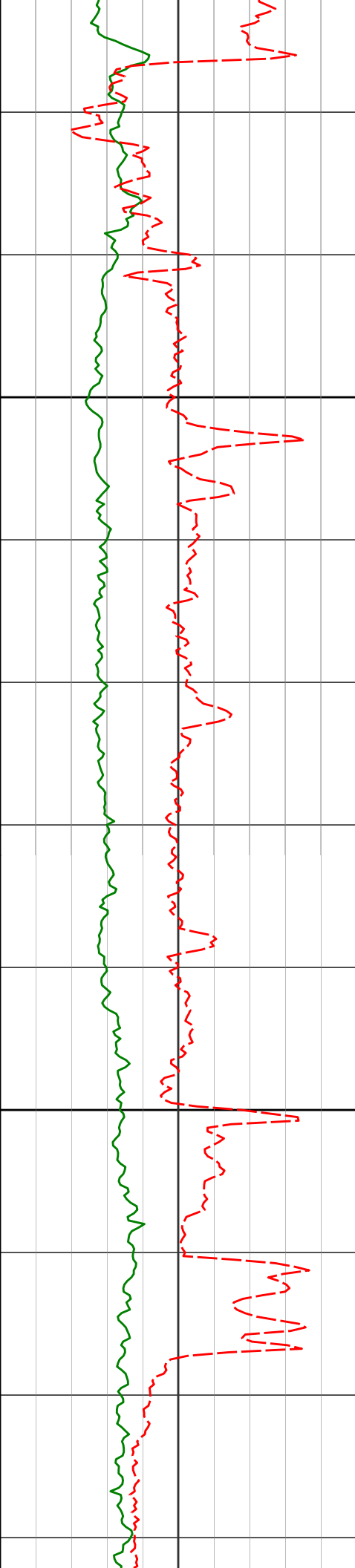
218.14°F

218.14°F

218.14°F

215.51°F

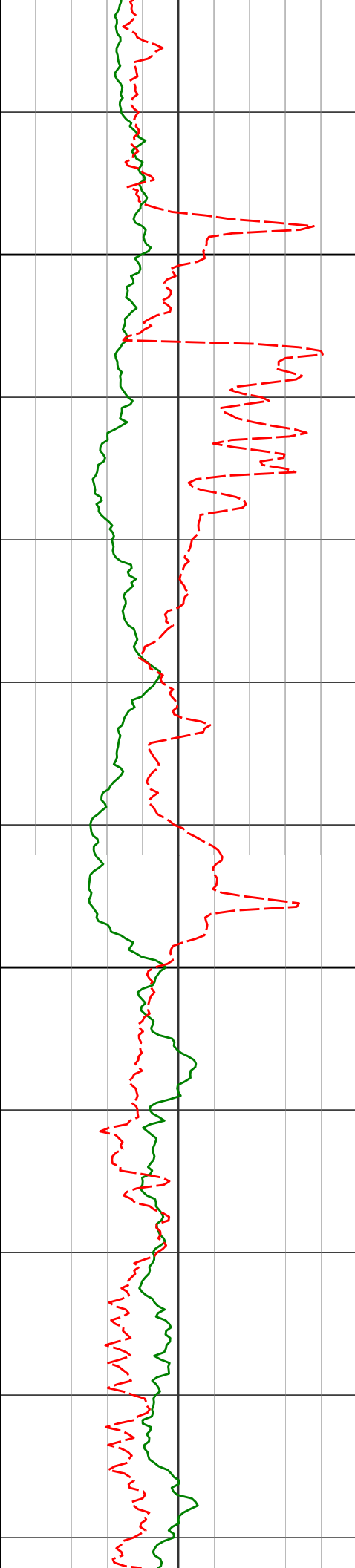
215.51°F



10300

10400

10247'	89.83°	88.88°	6693.20'	3662.45'	
					218.14°F
					218.14°F
10342'	90.04°	88.77°	6693.31'	3757.43'	
					218.14°F
					218.14°F
10436'	90.42°	89.29°	6692.93'	3851.41'	
					218.14°F



10500

10600

10531'

89.28°

89.11° 6693.18'

3946.40'

10625'

89.22°

89.10° 6694.41'

4040.38'

218.14°F

218.14°F

215.51°F

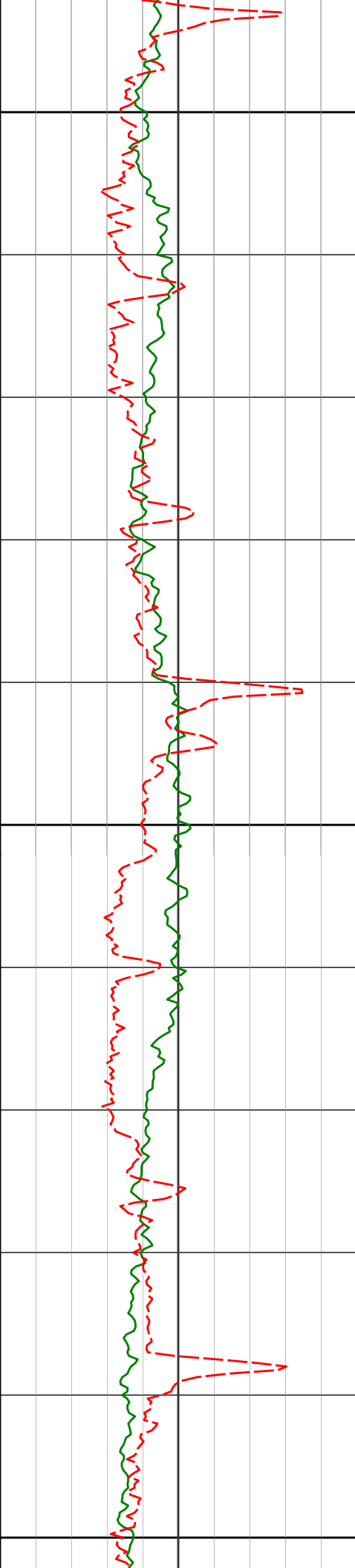
215.51°F

218.14°F

218.14°F

220.77°F

220.77°F



10700

10720'

89.43°

88.89° 6695.53'

4135.35'

220.77°F

220.77°F

220.77°F

10800

10815'

89.95°

89.00° 6696.04'

4230.33'

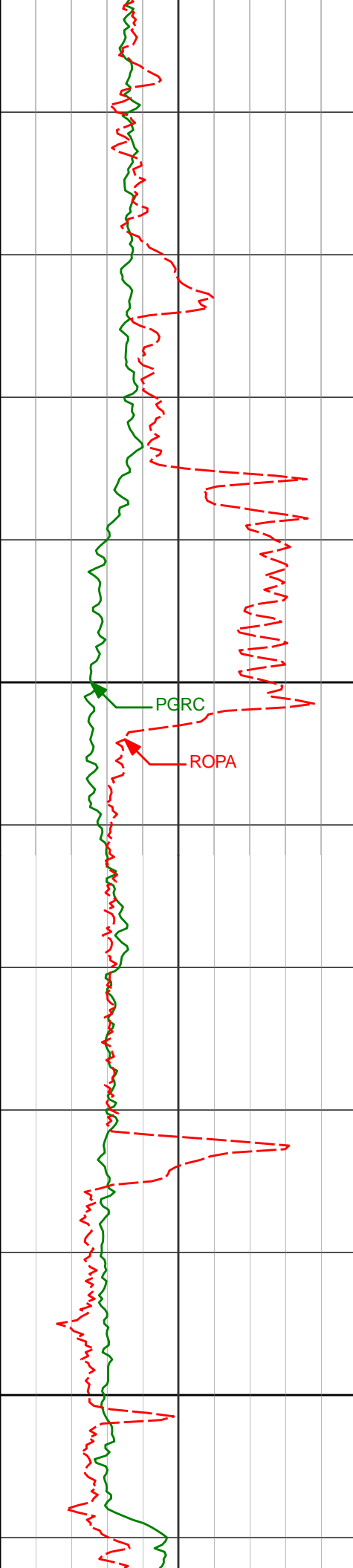
220.77°F

220.77°F

220.77°F

10900

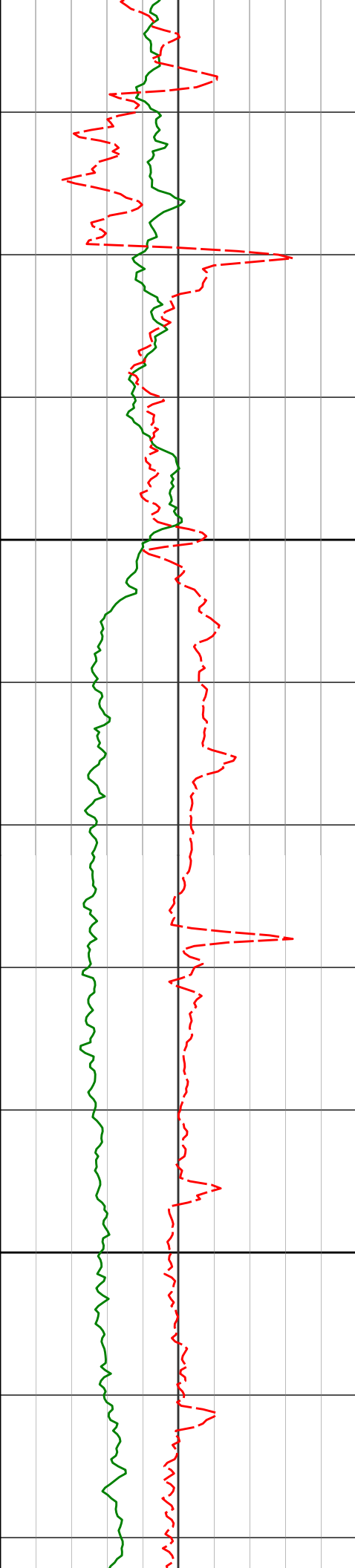
223.41°F



11000

11100

10909'	91.28°	89.39°	6695.03'	4324.32'	
					223.41°F
					220.77°F
					220.77°F
11004'	89.15°	89.99°	6694.68'	4419.31'	220.77°F
					220.77°F
					223.41°F
11098'	89.34°	89.89°	6695.91'	4513.30'	223.41°F



11200

11300

11193'

89.22°

89.89°

6697.11'

4608.29'

11288'

90.20°

89.85°

6697.59'

4703.29'

220.77°F

223.41°F

223.41°F

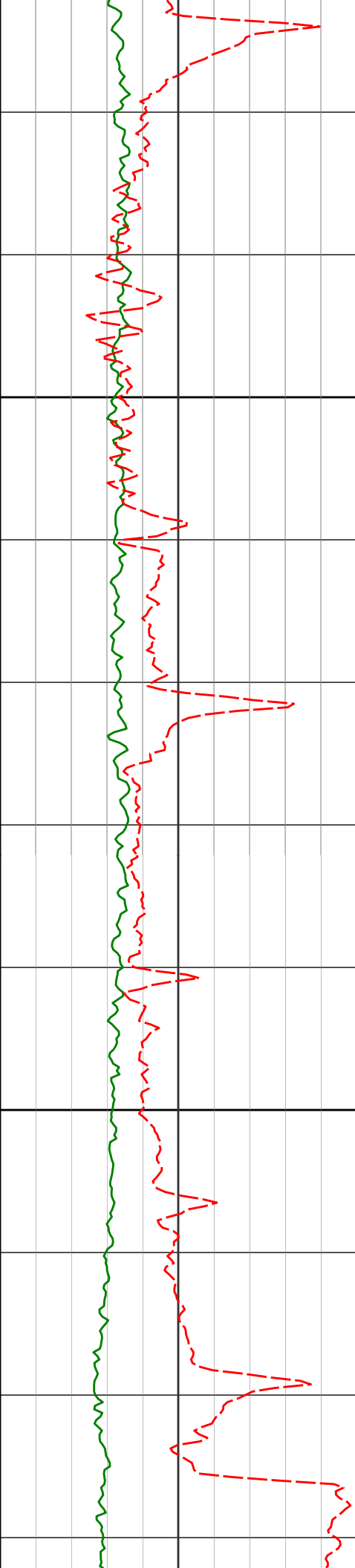
223.41°F

226.08°F

226.08°F

226.08°F

226.08°F



11400

11500

11382'

90.26°

89.63° 6697.21'

4797.29'

11477'

91.41°

89.55° 6695.83'

4892.27'

226.08°F

226.08°F

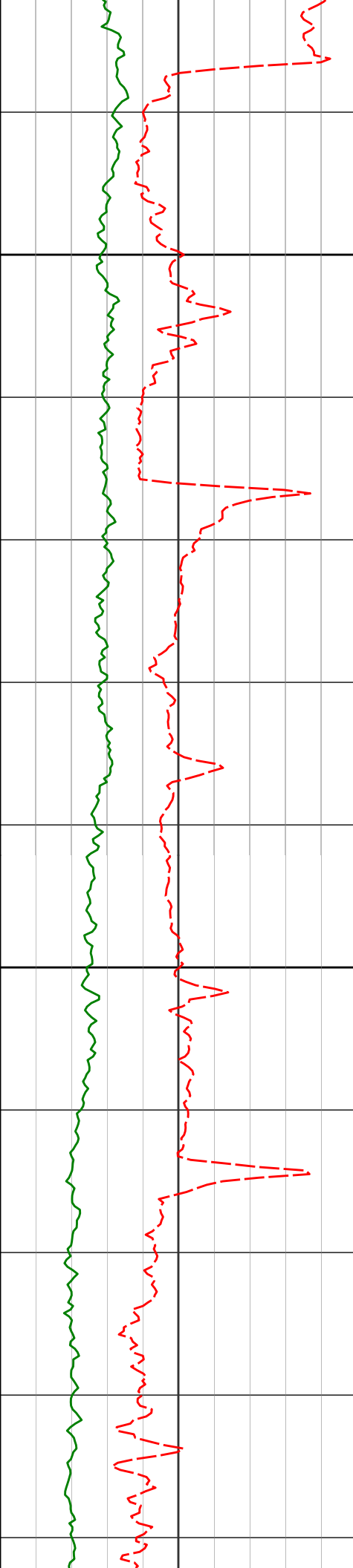
226.08°F

228.74°F

226.08°F

220.77°F

223.41°F



11600

11700

11572'

88.76°

88.88° 6695.69'

4987.25'

11761'

90.60°

89.40° 6696.74'

5176.22'

223.41°F

226.08°F

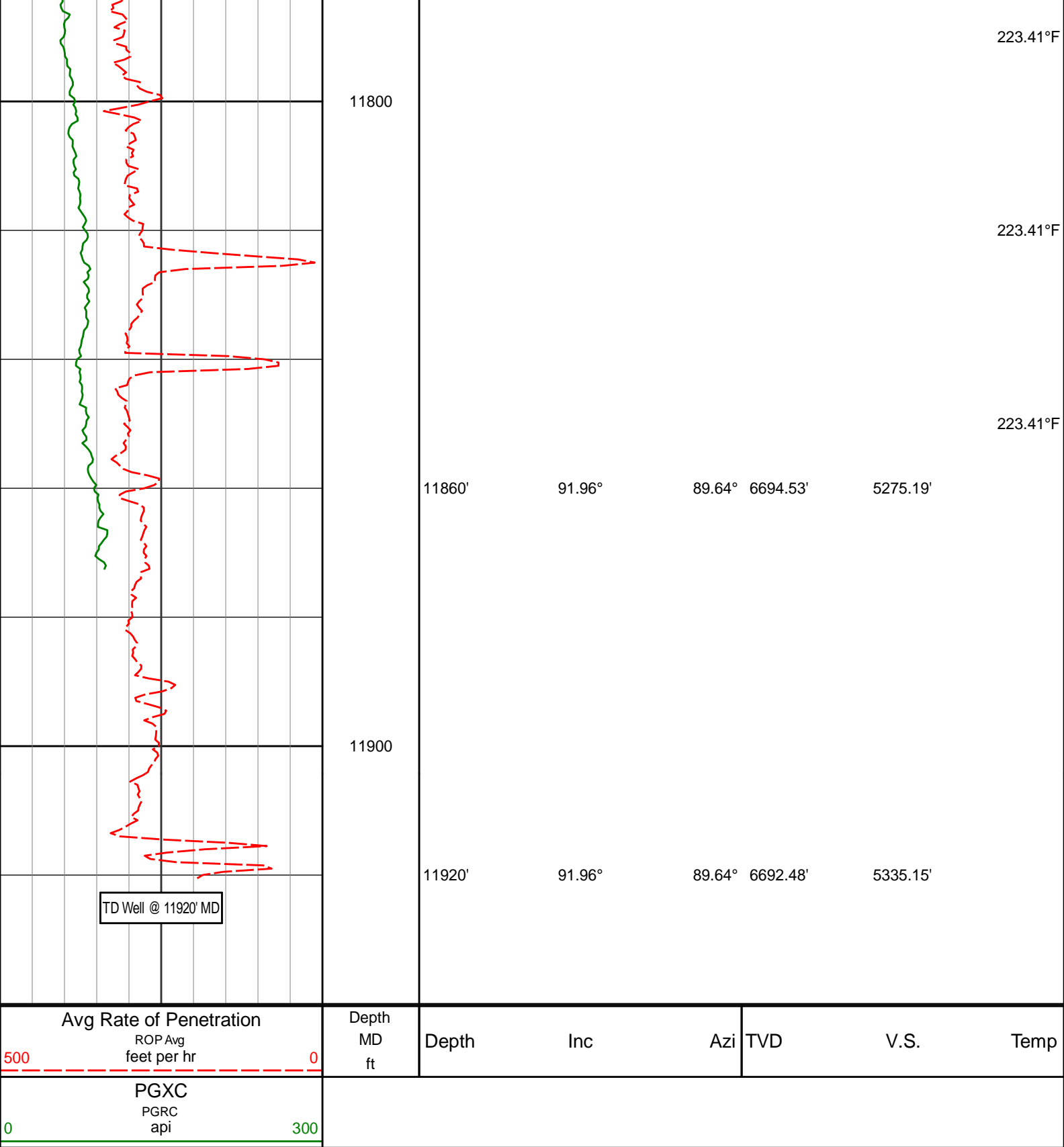
226.08°F

226.08°F

226.08°F

228.74°F

228.74°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AA22-645
Wattenberg
Weld Colorado
USA
CA-XX-0903206505

0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
84.00	0.26	178.91	84.00	0.19 S	0.00 E	0.00	0.31
178.00	0.29	169.38	178.00	0.64 S	0.05 E	0.05	0.06
270.00	0.45	136.99	270.00	1.13 S	0.34 E	0.34	0.28
362.00	0.19	188.52	362.00	1.55 S	0.56 E	0.57	0.40
455.00	0.19	210.80	454.99	1.83 S	0.46 E	0.46	0.08
549.00	0.15	200.16	548.99	2.08 S	0.34 E	0.34	0.05
644.00	0.26	256.65	643.99	2.25 S	0.09 E	0.09	0.23
738.00	0.44	239.86	737.99	2.48 S	0.43 W	-0.43	0.22
833.00	0.19	232.70	832.99	2.76 S	0.87 W	-0.87	0.27
928.00	0.19	260.37	927.99	2.88 S	1.15 W	-1.15	0.10
1022.00	0.20	267.27	1021.99	2.91 S	1.47 W	-1.47	0.03
1117.00	0.11	268.40	1116.99	2.92 S	1.73 W	-1.72	0.09
1211.00	0.24	307.98	1210.99	2.80 S	1.97 W	-1.97	0.18
1306.00	0.24	327.99	1305.99	2.51 S	2.23 W	-2.23	0.09
1400.00	0.09	42.76	1399.99	2.29 S	2.29 W	-2.29	0.25
1495.00	0.08	56.76	1494.99	2.20 S	2.18 W	-2.18	0.02
1589.00	0.36	42.21	1588.99	1.94 S	1.93 W	-1.93	0.30
1684.00	0.15	193.91	1683.99	1.84 S	1.76 W	-1.76	0.52
1779.00	0.15	165.33	1778.99	2.09 S	1.76 W	-1.76	0.08
1873.00	0.38	197.80	1872.98	2.50 S	1.82 W	-1.82	0.28
1933.00	0.47	196.52	1932.98	2.93 S	1.95 W	-1.95	0.15
2060.00	0.21	196.96	2059.98	3.64 S	2.17 W	-2.16	0.21
2154.00	0.22	218.65	2153.98	3.94 S	2.33 W	-2.32	0.09
2249.00	0.28	178.66	2248.98	4.32 S	2.44 W	-2.43	0.19
2343.00	0.48	186.04	2342.98	4.95 S	2.47 W	-2.47	0.22
2438.00	0.68	186.48	2437.97	5.90 S	2.58 W	-2.57	0.20
2533.00	0.58	172.08	2532.97	6.94 S	2.57 W	-2.57	0.19
2627.00	0.50	201.67	2626.96	7.80 S	2.66 W	-2.65	0.31
2722.00	0.45	218.26	2721.96	8.48 S	3.04 W	-3.04	0.16
2817.00	0.34	194.09	2816.96	9.04 S	3.34 W	-3.33	0.21
2911.00	0.34	153.55	2910.96	9.56 S	3.28 W	-3.28	0.25
3006.00	0.20	160.21	3005.95	9.98 S	3.10 W	-3.09	0.16
3100.00	0.31	191.66	3099.95	10.38 S	3.10 W	-3.09	0.18
3195.00	0.18	241.72	3194.95	10.70 S	3.28 W	-3.27	0.25
3290.00	0.87	232.99	3289.95	11.20 S	3.99 W	-3.98	0.72
3384.00	0.71	259.13	3383.94	11.74 S	5.13 W	-5.12	0.41
3479.00	0.55	290.19	3478.93	11.70 S	6.14 W	-6.13	0.39
3574.00	0.13	335.53	3573.93	11.44 S	6.61 W	-6.60	0.49
3668.00	0.62	279.49	3667.93	11.26 S	7.16 W	-7.15	0.60
3763.00	0.90	282.62	3762.92	11.01 S	8.39 W	-8.38	0.29
3857.00	1.25	293.90	3856.91	10.44 S	10.04 W	-10.03	0.43
3952.00	1.56	270.04	3951.88	10.02 S	12.28 W	-12.27	0.69
4047.00	1.71	286.55	4046.84	9.61 S	14.94 W	-14.93	0.52
4141.00	1.30	289.08	4140.81	8.87 S	17.29 W	-17.28	0.44
4236.00	0.91	274.72	4235.79	8.45 S	19.05 W	-19.04	0.50
4331.00	0.79	305.47	4330.78	8.01 S	20.33 W	-20.33	0.49
4425.00	2.00	274.78	4424.75	7.50 S	22.50 W	-22.49	1.46
4520.00	2.65	256.70	4519.67	7.87 S	26.28 W	-26.27	1.03
4614.00	4.16	249.10	4613.51	9.58 S	31.58 W	-31.57	1.67
4709.00	5.55	253.95	4708.16	12.08 S	39.21 W	-39.20	1.52
4804.00	6.43	264.91	4802.65	13.82 S	48.92 W	-48.91	1.51
4898.00	8.26	262.55	4895.87	15.16 S	60.86 W	-60.84	1.97
4993.00	8.34	257.77	4989.88	17.51 S	74.36 W	-74.34	0.73
5088.00	7.46	254.16	5083.98	20.65 S	87.03 W	-87.01	1.07
5182.00	6.35	253.19	5177.29	23.82 S	97.88 W	-97.86	1.19
5277.00	6.76	256.31	5271.67	26.66 S	108.34 W	-108.32	0.57
5371.00	7.54	260.10	5364.94	29.03 S	119.80 W	-119.77	0.97
5466.00	7.08	259.35	5459.17	31.19 S	131.69 W	-131.66	0.50
5561.00	6.66	253.16	5553.49	33.86 S	142.72 W	-142.69	0.90
5655.00	5.66	253.40	5646.94	36.77 S	152.37 W	-152.34	1.07
5750.00	4.75	251.68	5741.55	39.34 S	160.59 W	-160.56	0.97
5844.00	3.80	248.26	5835.29	41.72 S	167.18 W	-167.14	1.04
5936.00	3.11	240.56	5927.12	44.07 S	172.19 W	-172.15	0.91
6028.00	0.75	144.78	6019.07	45.79 S	174.01 W	-173.97	3.55
6121.00	9.66	96.26	6111.61	47.14 S	165.89 W	-165.85	9.88
6213.00	16.12	92.76	6201.24	48.60 S	145.44 W	-145.39	7.07
6304.00	22.58	90.55	6287.06	49.37 S	115.32 W	-115.27	7.15
6396.00	30.98	89.54	6369.12	49.35 S	73.90 W	-73.86	9.15
6488.00	39.62	93.34	6444.14	50.87 S	20.83 W	-20.78	9.68

6579.00	49.18	95.70	6509.09	55.99 S	42.55 E	42.60	10.66
6671.00	56.09	90.55	6564.91	59.82 S	115.48 E	115.54	8.73
6763.00	61.85	85.89	6612.33	57.27 S	194.21 E	194.26	7.61
6855.00	67.90	86.05	6651.37	51.42 S	277.26 E	277.31	6.58
6947.00	78.04	91.13	6678.29	49.36 S	365.06 E	365.10	12.22
7039.00	86.88	94.26	6690.35	53.67 S	456.06 E	456.11	10.18
7131.00	87.77	93.13	6694.64	59.59 S	547.77 E	547.82	1.57
7222.00	89.56	91.39	6696.76	63.18 S	638.66 E	638.72	2.73
7314.00	90.45	91.40	6696.75	65.42 S	730.64 E	730.69	0.97
7408.00	90.54	90.09	6695.94	66.64 S	824.62 E	824.68	1.40
7503.00	90.39	89.09	6695.17	65.96 S	919.62 E	919.67	1.06
7598.00	90.15	89.40	6694.72	64.71 S	1014.61 E	1014.66	0.41
7692.00	91.28	89.67	6693.55	63.94 S	1108.59 E	1108.65	1.24
7787.00	90.39	88.09	6692.16	62.09 S	1203.56 E	1203.62	1.91
7881.00	89.77	87.31	6692.03	58.31 S	1297.48 E	1297.53	1.06
7976.00	89.96	86.72	6692.25	53.37 S	1392.35 E	1392.40	0.65
8070.00	89.37	88.38	6692.80	49.35 S	1486.26 E	1486.31	1.87
8165.00	90.17	88.80	6693.19	47.01 S	1581.23 E	1581.27	0.95
8260.00	90.66	88.23	6692.50	44.55 S	1676.20 E	1676.24	0.79
8354.00	90.82	88.08	6691.28	41.52 S	1770.14 E	1770.18	0.23
8449.00	91.77	87.76	6689.14	38.08 S	1865.05 E	1865.09	1.06
8544.00	91.00	87.83	6686.84	34.42 S	1959.95 E	1959.98	0.81
8638.00	88.47	88.74	6687.28	31.61 S	2053.90 E	2053.93	2.86
8733.00	87.61	88.61	6690.52	29.41 S	2148.82 E	2148.85	0.92
8828.00	87.95	88.71	6694.20	27.19 S	2243.72 E	2243.75	0.37
8922.00	88.29	89.60	6697.29	25.81 S	2337.66 E	2337.68	1.01
9017.00	89.28	90.04	6699.30	25.51 S	2432.64 E	2432.66	1.14
9112.00	90.33	90.50	6699.63	25.96 S	2527.64 E	2527.66	1.21
9206.00	91.71	90.68	6697.95	26.92 S	2621.61 E	2621.64	1.48
9301.00	90.60	89.23	6696.04	26.85 S	2716.59 E	2716.61	1.92
9396.00	89.71	89.26	6695.78	25.60 S	2811.58 E	2811.60	0.94
9490.00	88.69	89.53	6697.09	24.61 S	2905.56 E	2905.58	1.12
9585.00	89.25	89.36	6698.80	23.69 S	3000.54 E	3000.56	0.62
9680.00	89.80	89.53	6699.59	22.76 S	3095.54 E	3095.55	0.61
9774.00	90.48	89.39	6699.36	21.88 S	3189.53 E	3189.55	0.74
9869.00	90.78	89.33	6698.31	20.82 S	3284.52 E	3284.54	0.32
9963.00	91.96	89.37	6696.07	19.75 S	3378.48 E	3378.50	1.26
10058.00	89.99	89.33	6694.45	18.67 S	3473.46 E	3473.47	2.07
10152.00	90.85	89.35	6693.76	17.59 S	3567.45 E	3567.46	0.92
10247.00	89.83	88.88	6693.20	16.12 S	3662.44 E	3662.45	1.18
10342.00	90.04	88.77	6693.31	14.18 S	3757.42 E	3757.43	0.25
10436.00	90.42	89.29	6692.93	12.58 S	3851.40 E	3851.41	0.69
10531.00	89.28	89.11	6693.18	11.26 S	3946.39 E	3946.40	1.21
10625.00	89.22	89.10	6694.41	9.79 S	4040.37 E	4040.38	0.06
10720.00	89.43	88.89	6695.53	8.12 S	4135.35 E	4135.35	0.31
10815.00	89.95	89.00	6696.04	6.37 S	4230.33 E	4230.33	0.56
10909.00	91.28	89.39	6695.03	5.05 S	4324.31 E	4324.32	1.47
11004.00	89.15	89.99	6694.68	4.54 S	4419.31 E	4419.31	2.33
11098.00	89.34	89.89	6695.91	4.44 S	4513.30 E	4513.30	0.23
11193.00	89.22	89.89	6697.11	4.26 S	4608.29 E	4608.29	0.13
11288.00	90.20	89.85	6697.59	4.04 S	4703.29 E	4703.29	1.03
11382.00	90.26	89.63	6697.21	3.62 S	4797.29 E	4797.29	0.24
11477.00	91.41	89.55	6695.83	2.94 S	4892.27 E	4892.27	1.21
11572.00	88.76	88.88	6695.69	1.64 S	4987.25 E	4987.25	2.88
11761.00	90.60	89.40	6696.74	1.20 N	5176.22 E	5176.22	1.01
11860.00	91.96	89.64	6694.53	2.03 N	5275.19 E	5275.19	1.39
11920.00	91.96	89.64	6692.48	2.41 N	5335.15 E	5335.15	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 90.05 DEGREES (GRID)
A TOTAL CORRECTION OF 7.60 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11920.00 FEET
IS 5335.15 FEET ALONG 89.97 DEGREES (GRID)**

Tie onto gyro surveys at 1933' MD.

Last survey is a projection to the bit at TD