



WELL INFORMATION					
MWD Run Number	100	200	300	400	
Date run completed	16-Jun-15	17-Jun-15	18-Jun-15	21-Jun-15	
Rig Bit Number	0200	3	4	5	
Bit Size (in)	8.750	8.750	8.750	6.125	
Tool Nominal OD (in)	6.750	4.800	6.750	4.800	
Log Start Depth (MD, ft)	638.00	4,816.00	6,615.00	7,159.00	
Log End Depth (MD, ft)	4,816.00	6,615.00	7,159.00	13,878.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	15-Jun-15 21:43	16-Jun-15 21:21	17-Jun-15 15:32	19-Jun-15 01:58	
Drill/Wipe End Date and Time	16-Jun-15 14:55	17-Jun-15 07:30	18-Jun-15 00:35	21-Jun-15 07:55	
Min Inc (deg) @ Depth (MD, ft)	0.07 @ 917.00	0.18 @ 5,329.00	29.27 @ 6,616.00	87.04 @ 8,972.00	
Max Inc (deg) @ Depth (MD, ft)	8.52 @ 2,221.00	26.20 @ 6,561.00	84.82 @ 7,105.00	92.59 @ 12,840.00	
Bit TFA(in2) / Bit Type	0.98 / PDC	1.37 / PDC	1.49 / PDC	0.98 / PDC	
Flow Rate (gpm)	600.00	594.29	550.00	295.00	
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	8.90 / 31.00	9.80 / 31.00	10.75 / 37.00	9.30 / 33.00	
Filtrate CL (ppm)	0.00	1,700.00	2,200.00	2,200.00	
pH / Fluid Loss (mptm)	8.40 / 10	N/A / N/A	9.00 / 7	8.90 / 0	
PV (cP) / YP (lbf2)	4 / 3.00	4 / 3.00	9 / 9.00	7 / 5.00	
% Solids / % Sand	3.50 / 0.75	4 / .2	11.00 / 0.25	5.00 / 0.05	
% Oil / Oil:Water Ratio	0.50 / N/A	N/A / N/A	0.50 / N/A	N/A / N/A	
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Min Temp (degF) / Max Temp (degF)	112.00 / 112.00	172.10 / 172.10	162.00 / 162.00	162.00 / 162.00	

Max Tool Temp (degF) / Source	116.00 / 116.00	156.13 / PCM	162.80 / PCM	130.30 / PCM	
Rm @ Max Tool Temp (degF)	N/A @ 116.00	N/A @ 156.13	N/A @ 162.80	N/A @ 130.30	
Lead MWD Engineer	Robert Barnes	Robert Barnes	Robert Barnes	Robert Barnes	
Customer Representative	Jim Turner	Jim Turner	Jim Turner	Jim Turner	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.93	5.93	5.93	5.93	
Sub Serial Number	11342302	11342302	11342302	12396733	
Insert Serial Number	11680779	11680779	11680727	11680779	
Date and Time Initialized	14-Jun-15 20:03	01-Jan-70 00:00	17-Jun-15 10:04	18-Jun-15 13:51	
Date and Time Read	17-Jun-15 13:32	17-Jun-15 13:38	18-Jun-15 06:39	21-Jun-15 23:09	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	55.00	54.00	54.00	66.00	
Software Version	6.21	6.21	6.33	6.21	
Sub Serial Number	11342302	11342302	11342302	12396733	
Sonde Serial Number	11638567	11638567	11478122	11638567	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	226.30	124.10	9.10	114.50	

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	48.66	47.26	47.28	68.76	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	11342302	11342302	11342302	12396733	
Insert/Sonde Serial Number	11579806	11579806	11680921	11579806	

REMARKS

1. All depths are calibrated to driller's pipe tally and are true vertical depth from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
 - 1:600 Log
PGRC (Gamma CG) and ROPA (Average Rate of Penetration)
Interval Resolution: 1.0 ft
Interval Distance: 3.0 ft
 - 1:240 Log
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
 - ROPA (Average Rate of Penetration):
Interval Resolution: 0.5 ft

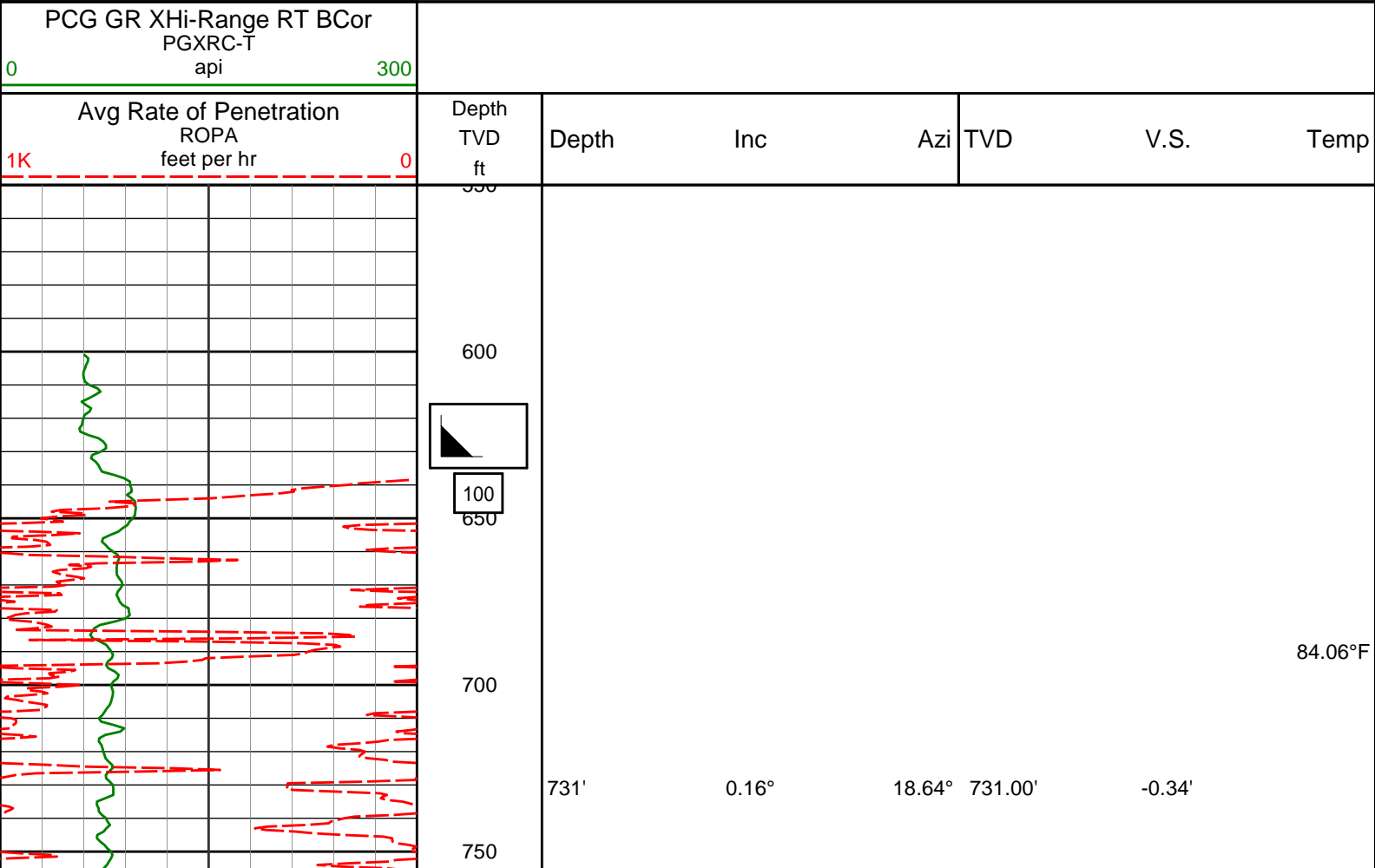
Interval Resolution: 1.2 ft

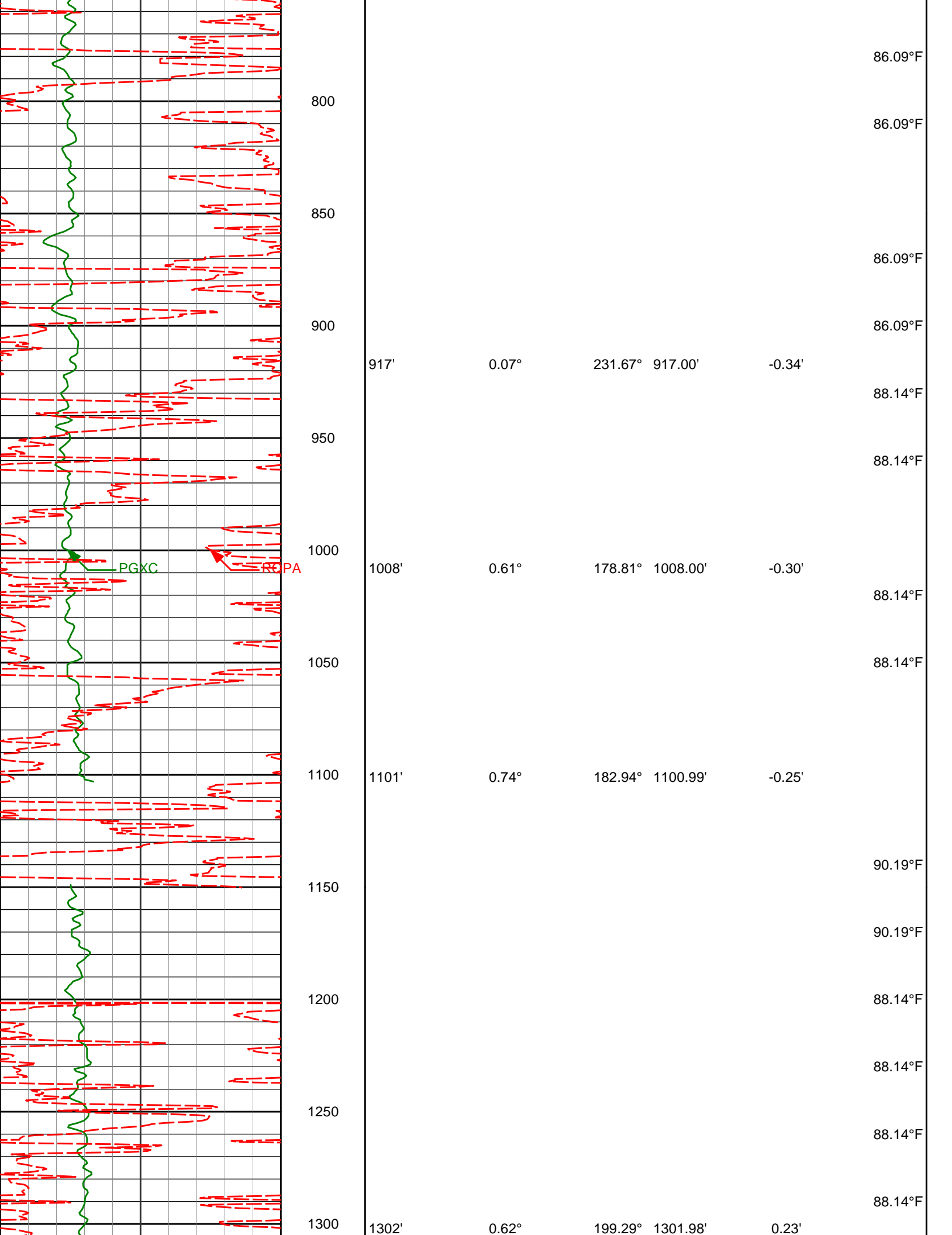
6. Insite Version v8.1.10

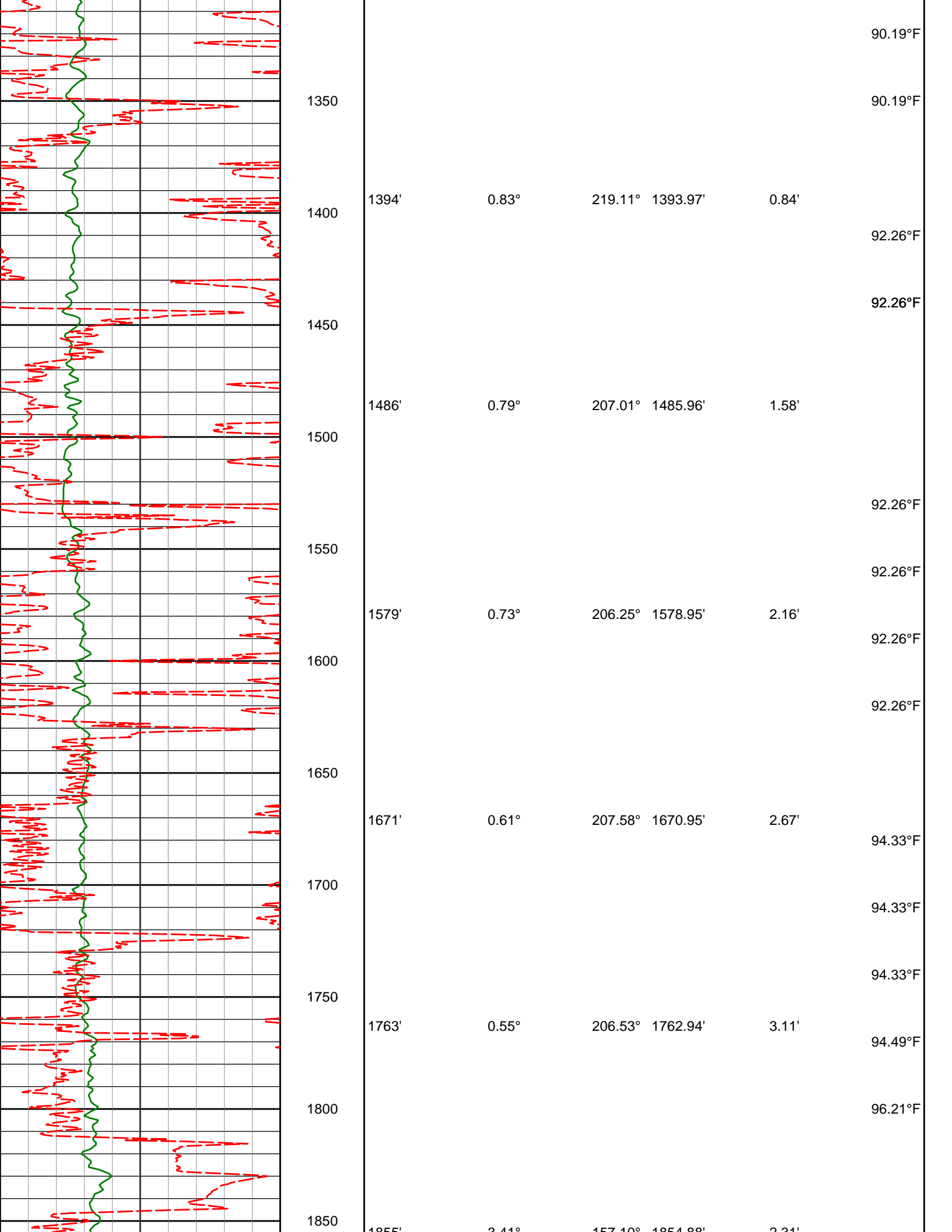
WARRANTY

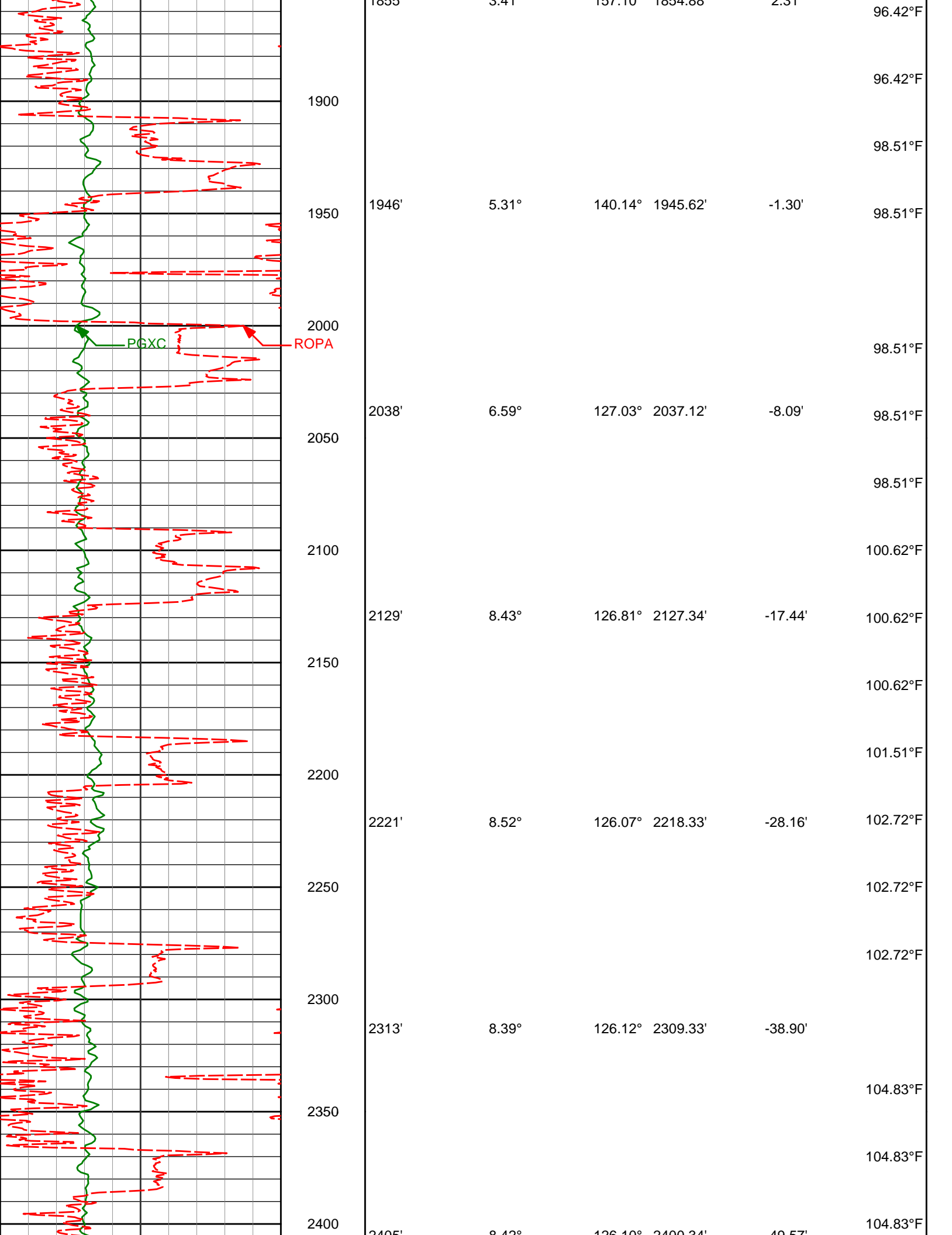
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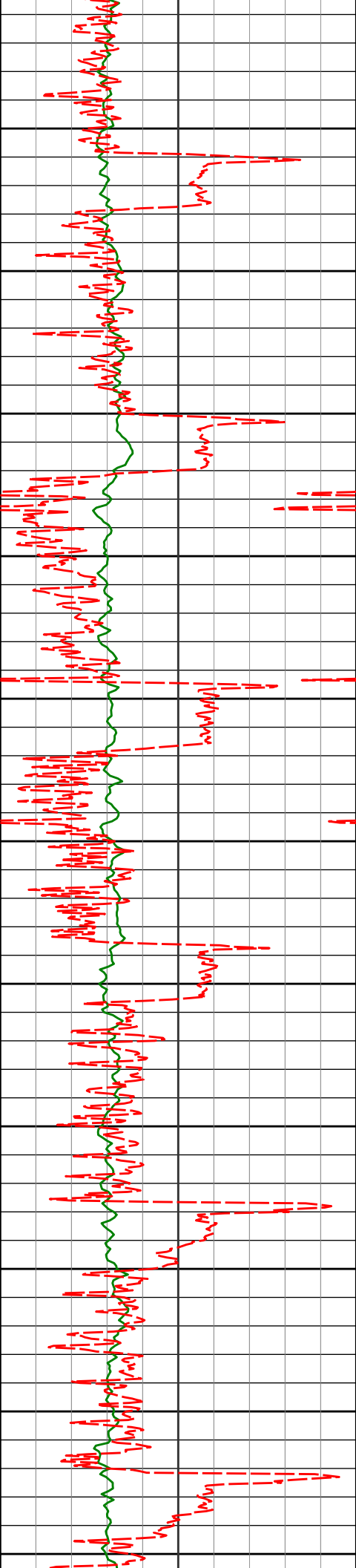
MD Detail 1:600 Scale



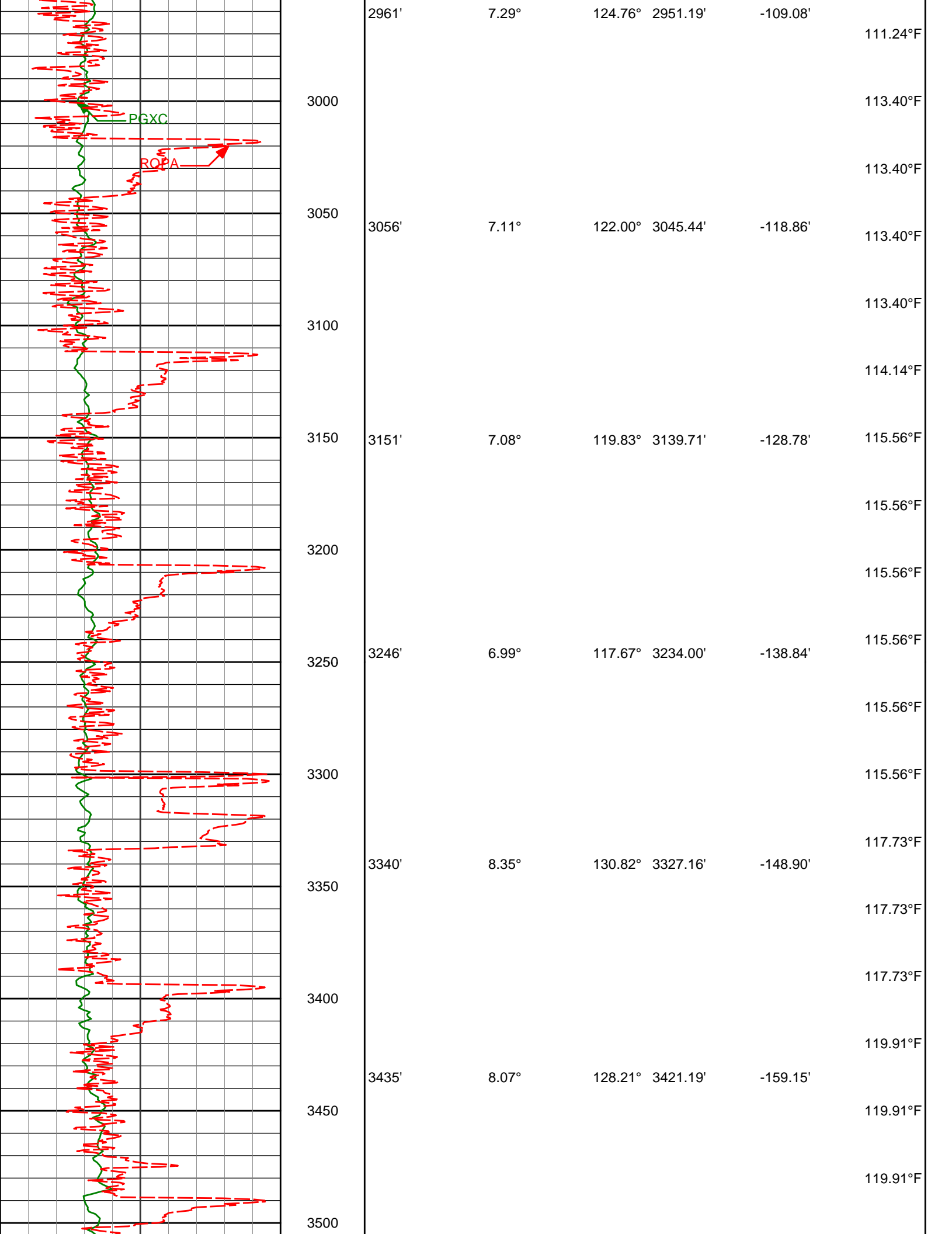


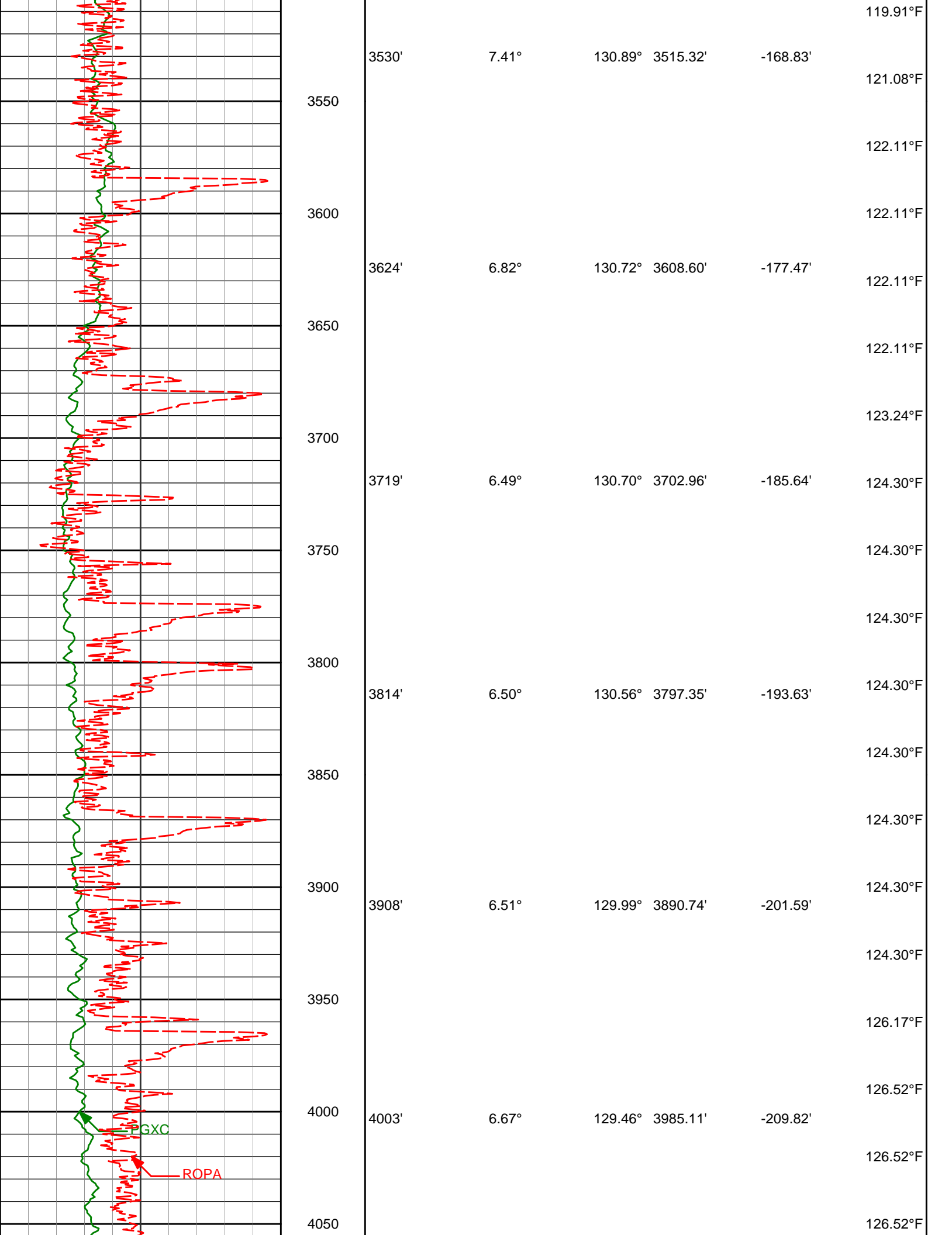


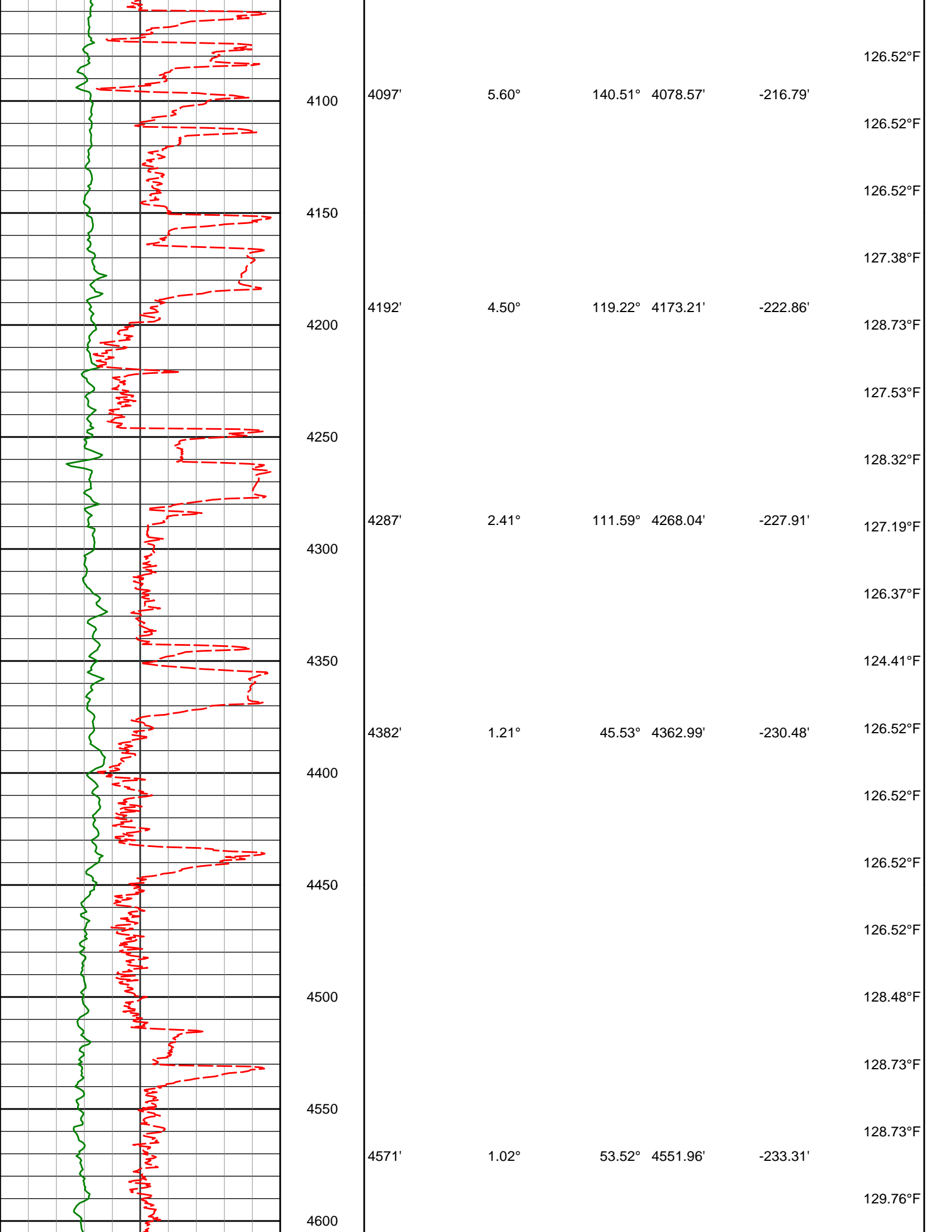


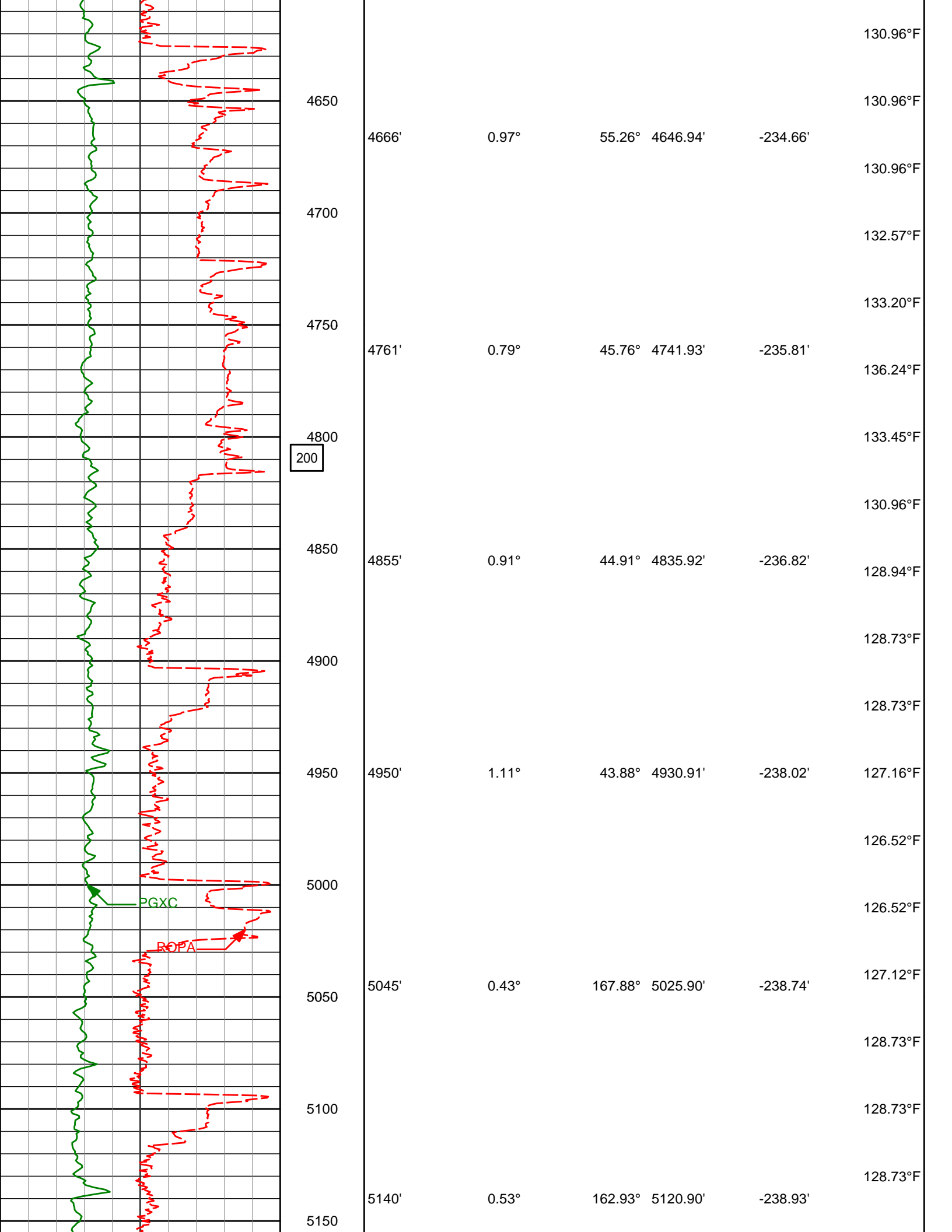


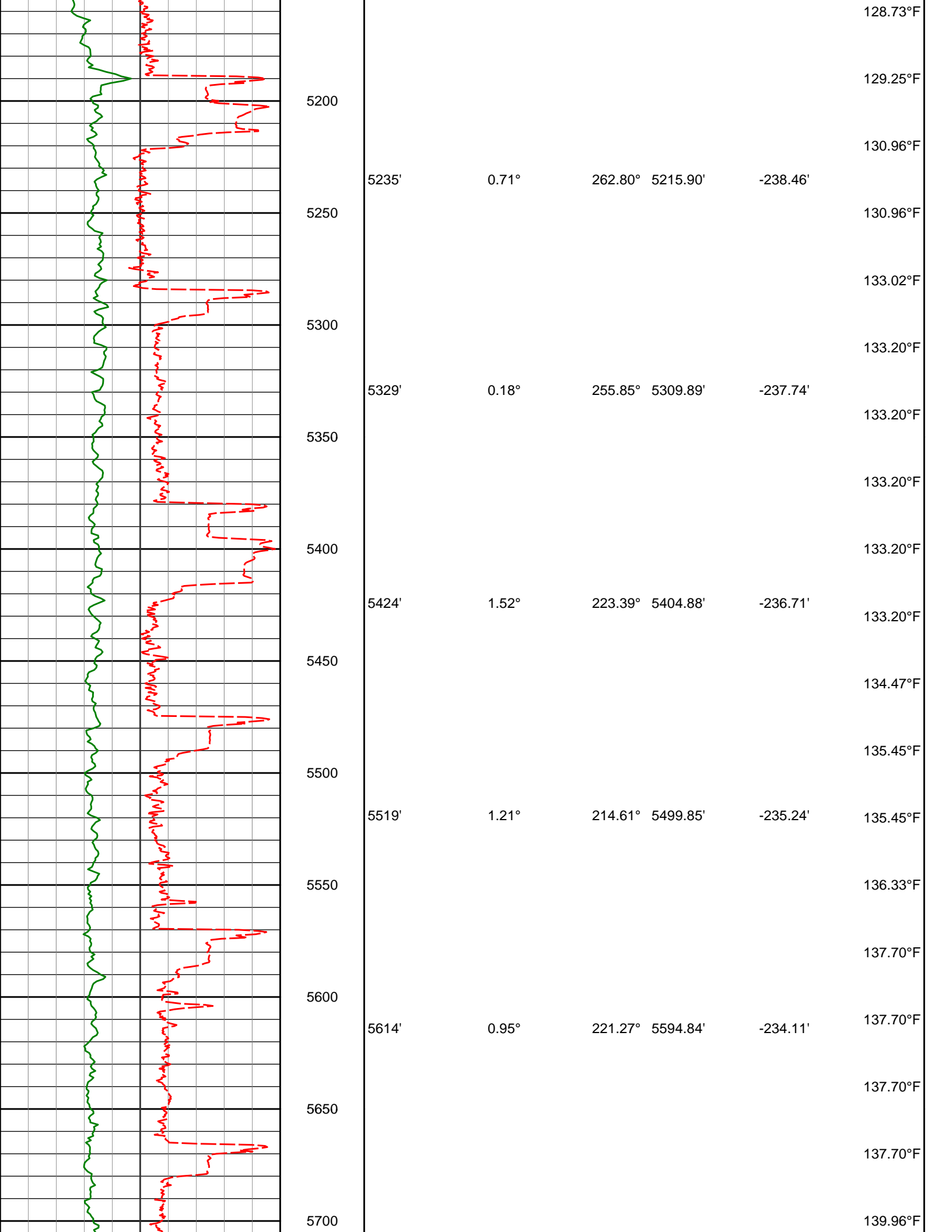
	2400	8.42°	126.10°	2400.34'	-49.37'	
						104.83°F
2450						104.83°F
						104.83°F
2500	2497'	8.17°	126.56°	2491.38'	-60.07'	106.30°F
						106.97°F
2550						106.97°F
						106.97°F
2600	2589'	7.91°	126.57°	2582.48'	-70.22'	109.09°F
						109.09°F
2650						109.09°F
						109.09°F
2700	2680'	7.89°	127.34°	2672.61'	-80.04'	110.08°F
						111.24°F
2750						111.24°F
						111.24°F
2800	2772'	7.75°	127.22°	2763.76'	-89.82'	111.24°F
						111.24°F
2850						111.24°F
						111.24°F
2900	2867'	7.25°	126.42°	2857.94'	-99.57'	111.24°F
						111.24°F
2950						111.24°F

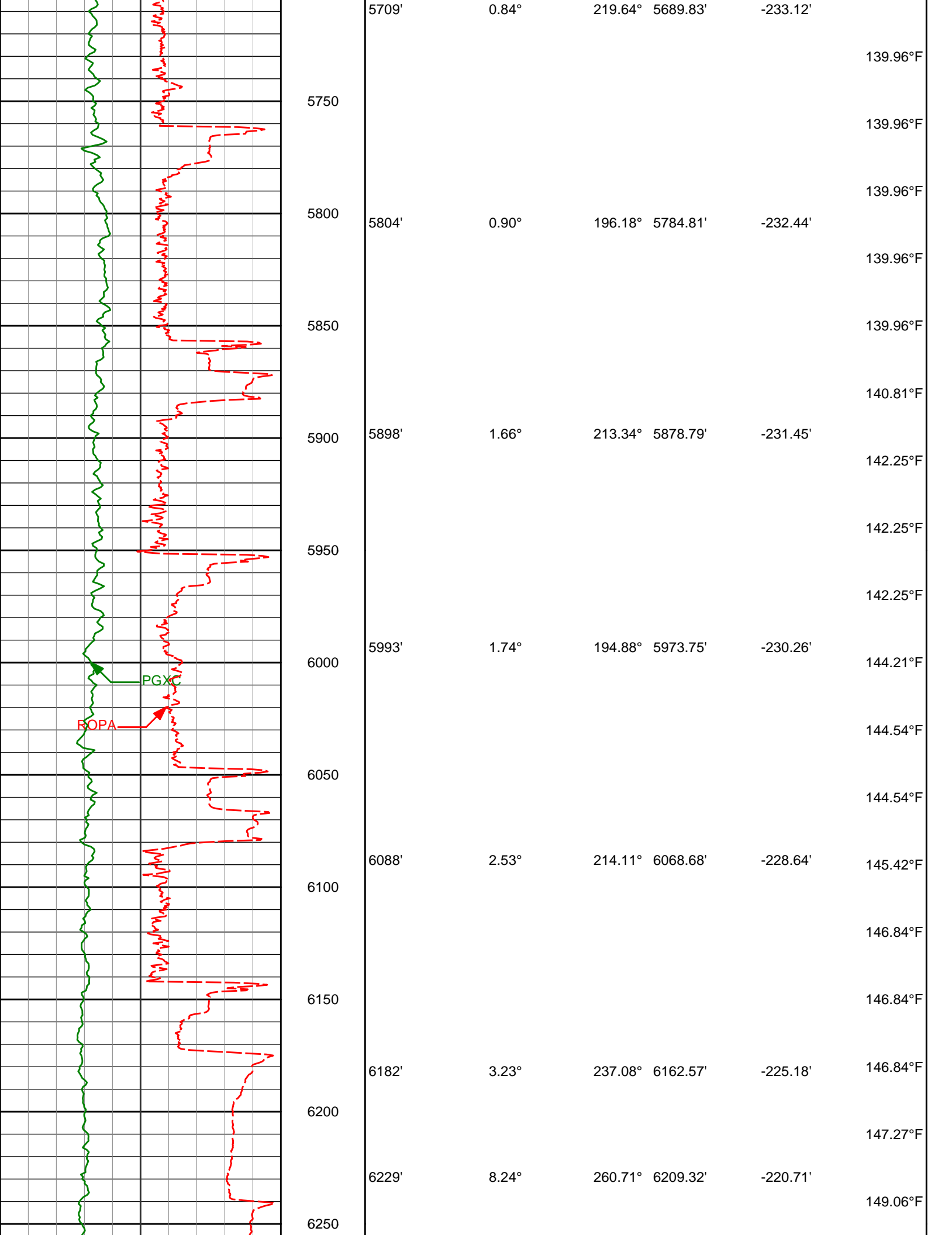


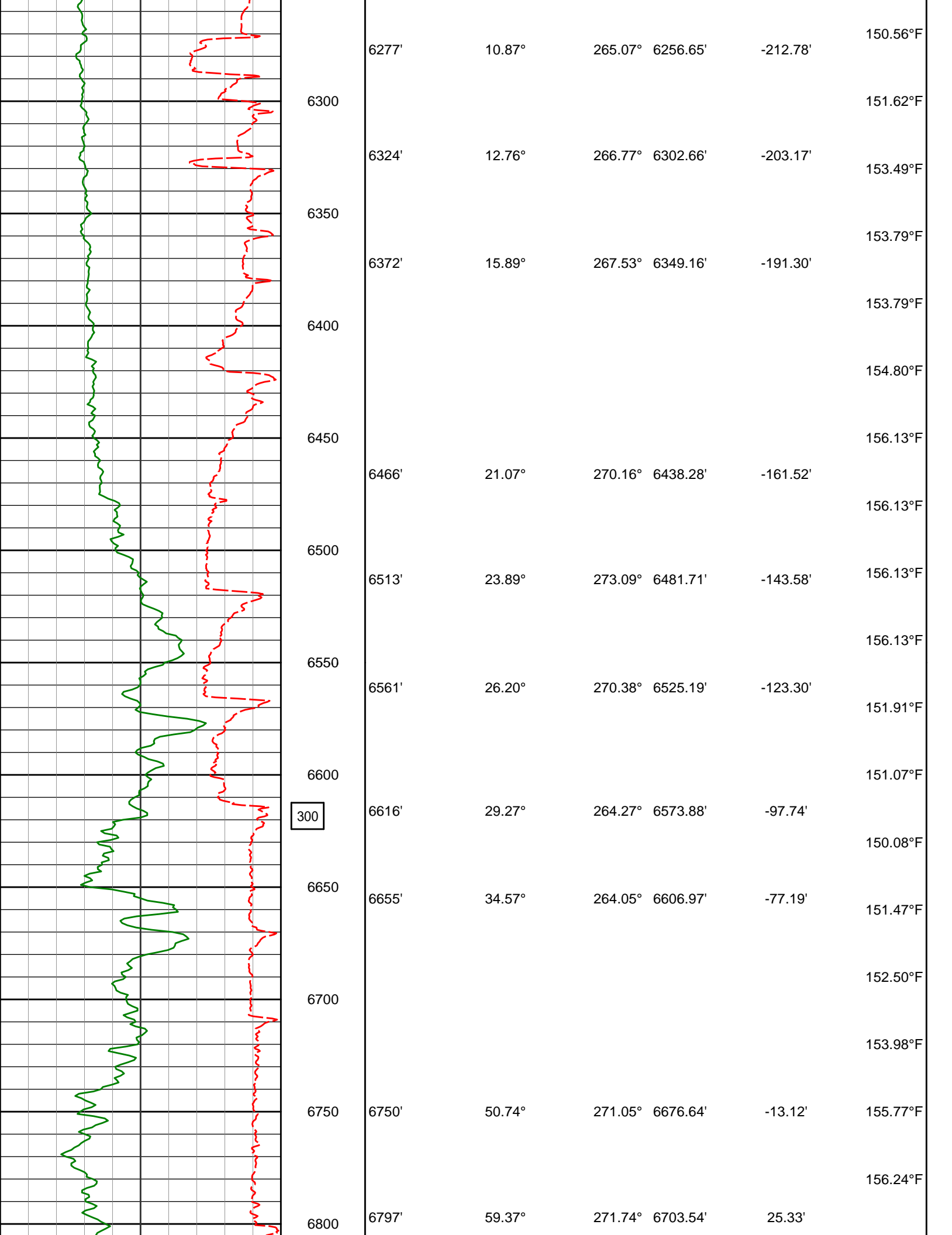


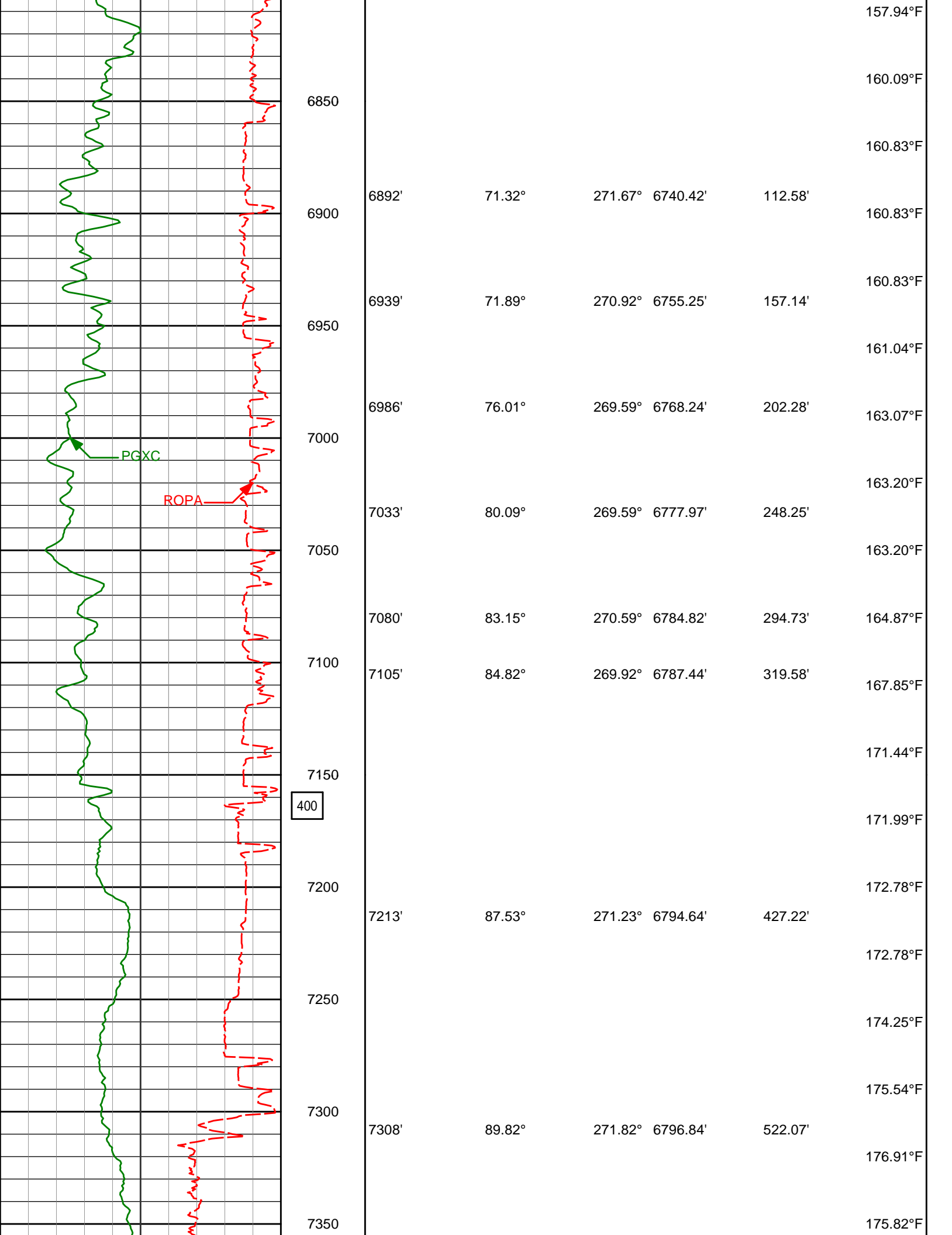


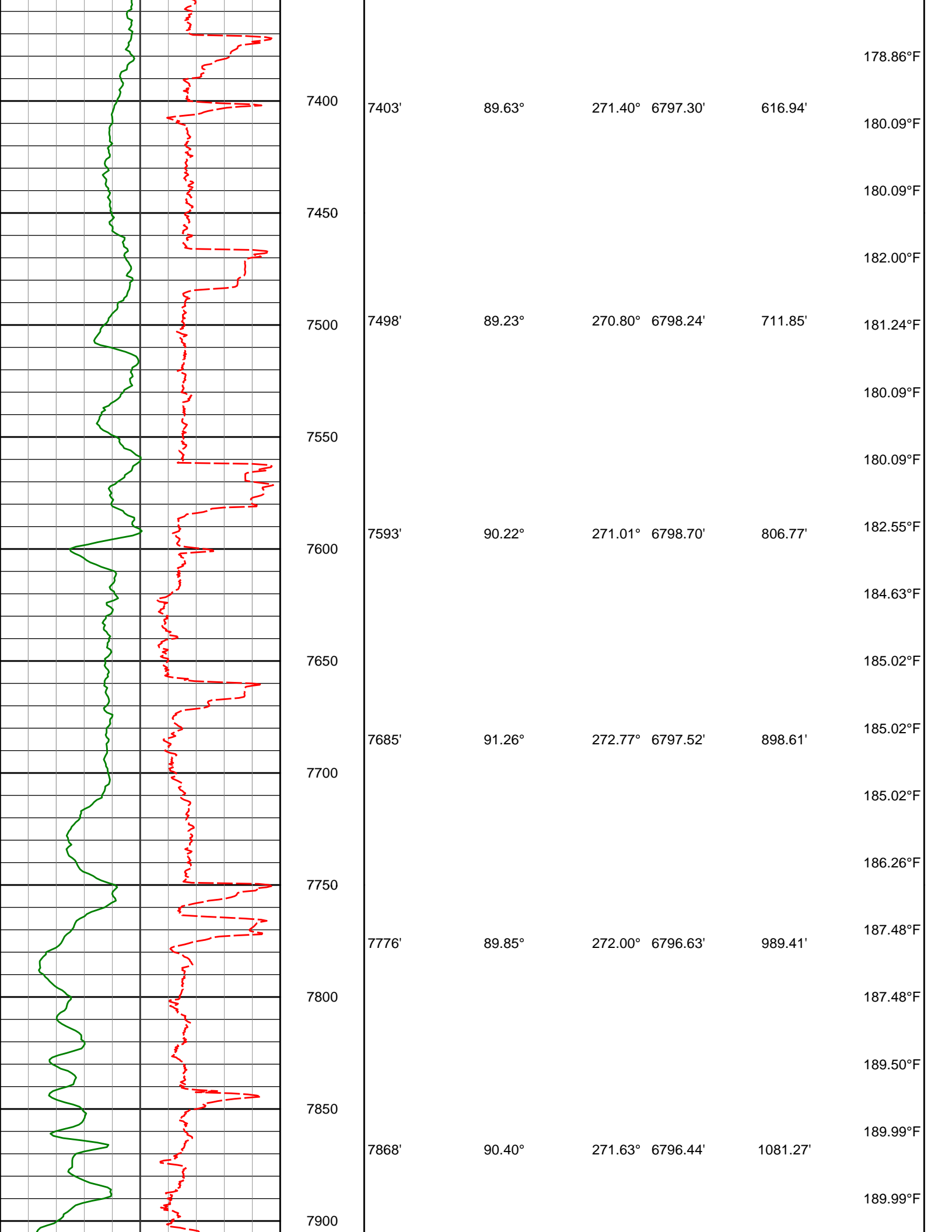


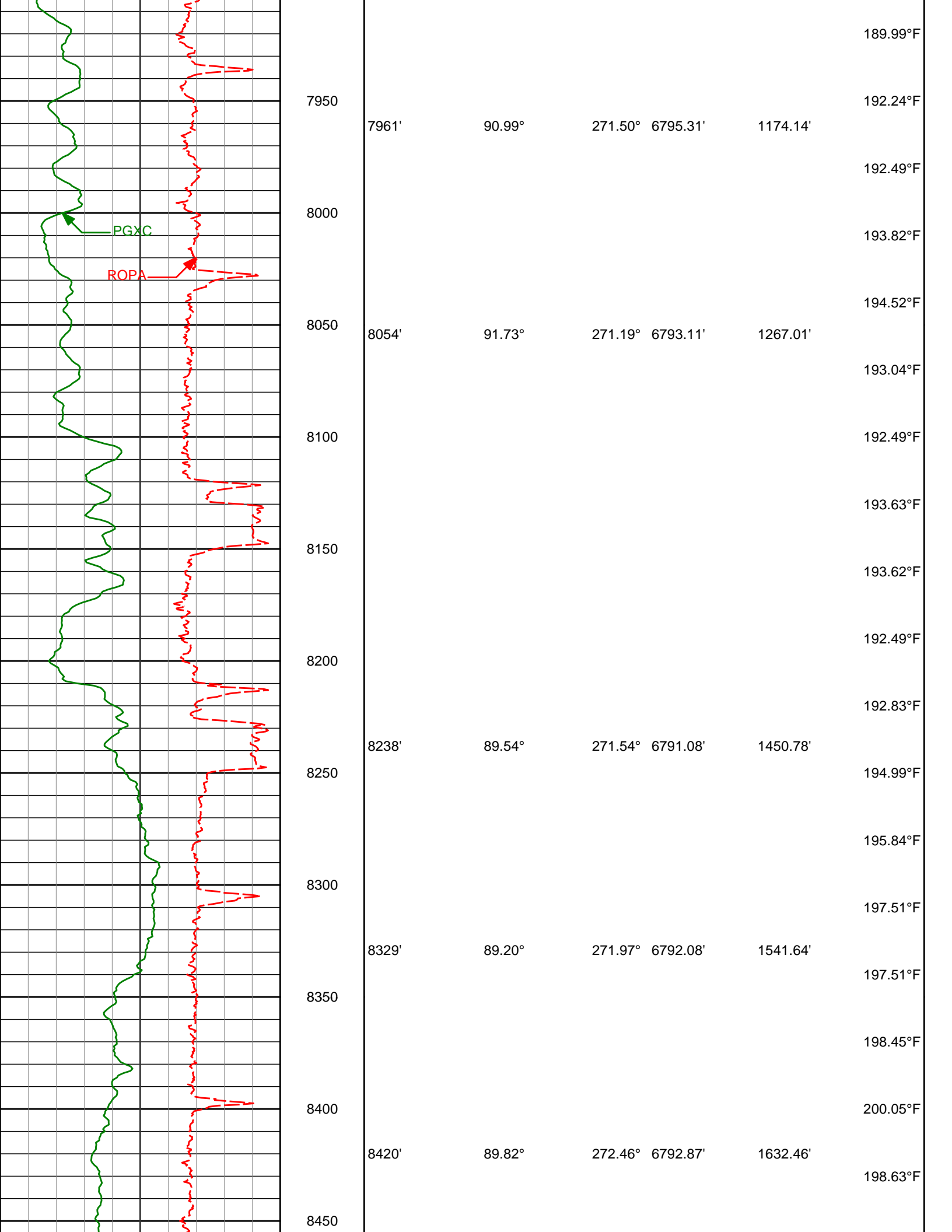


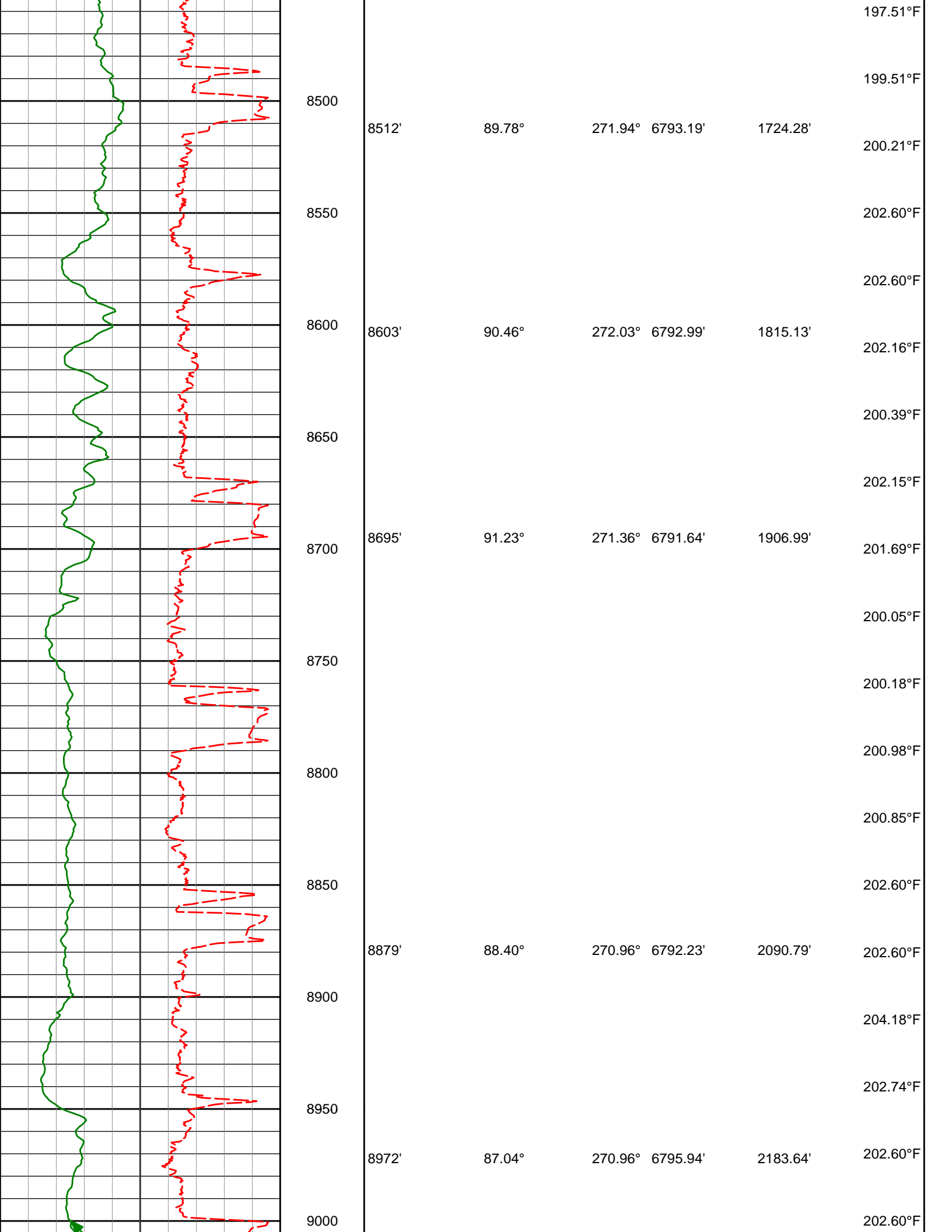


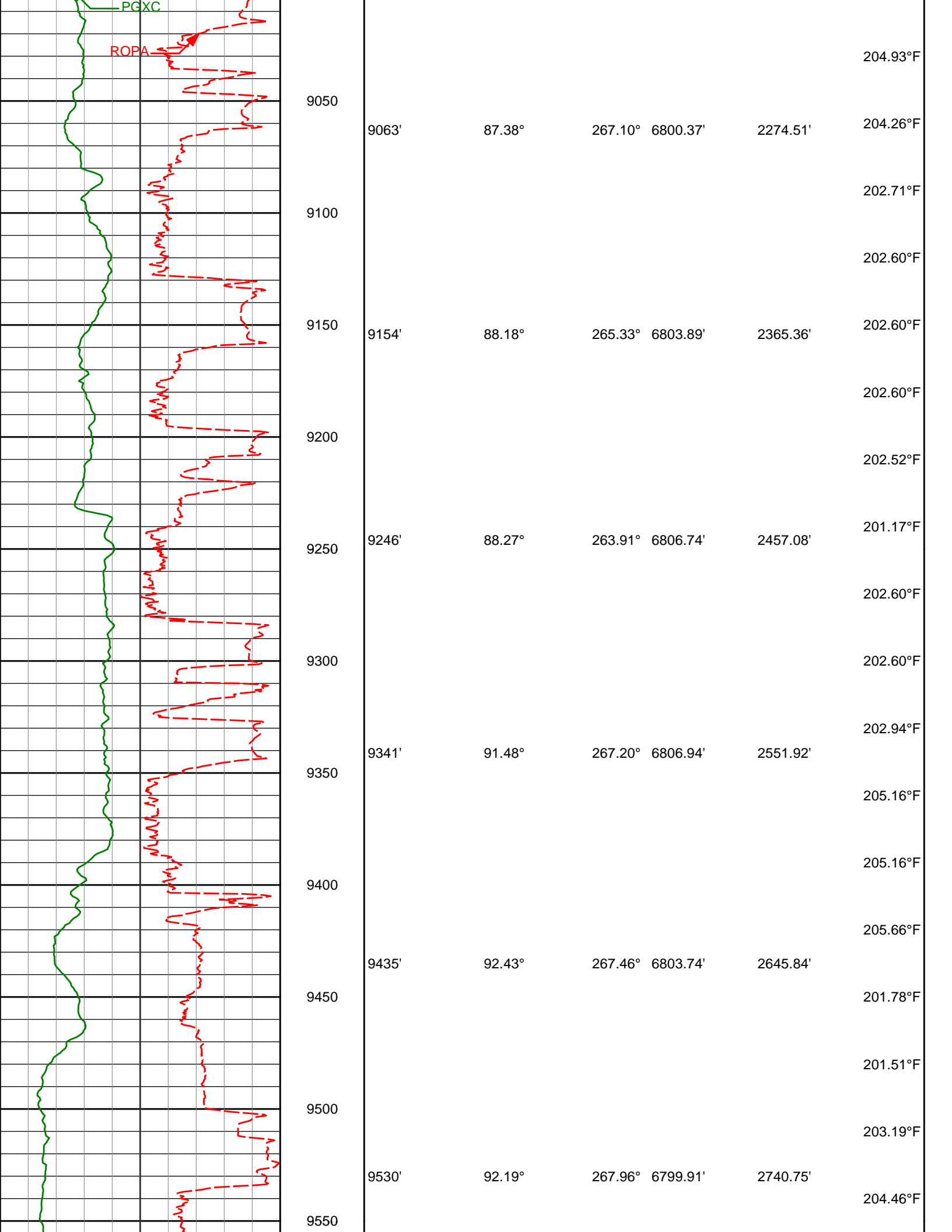


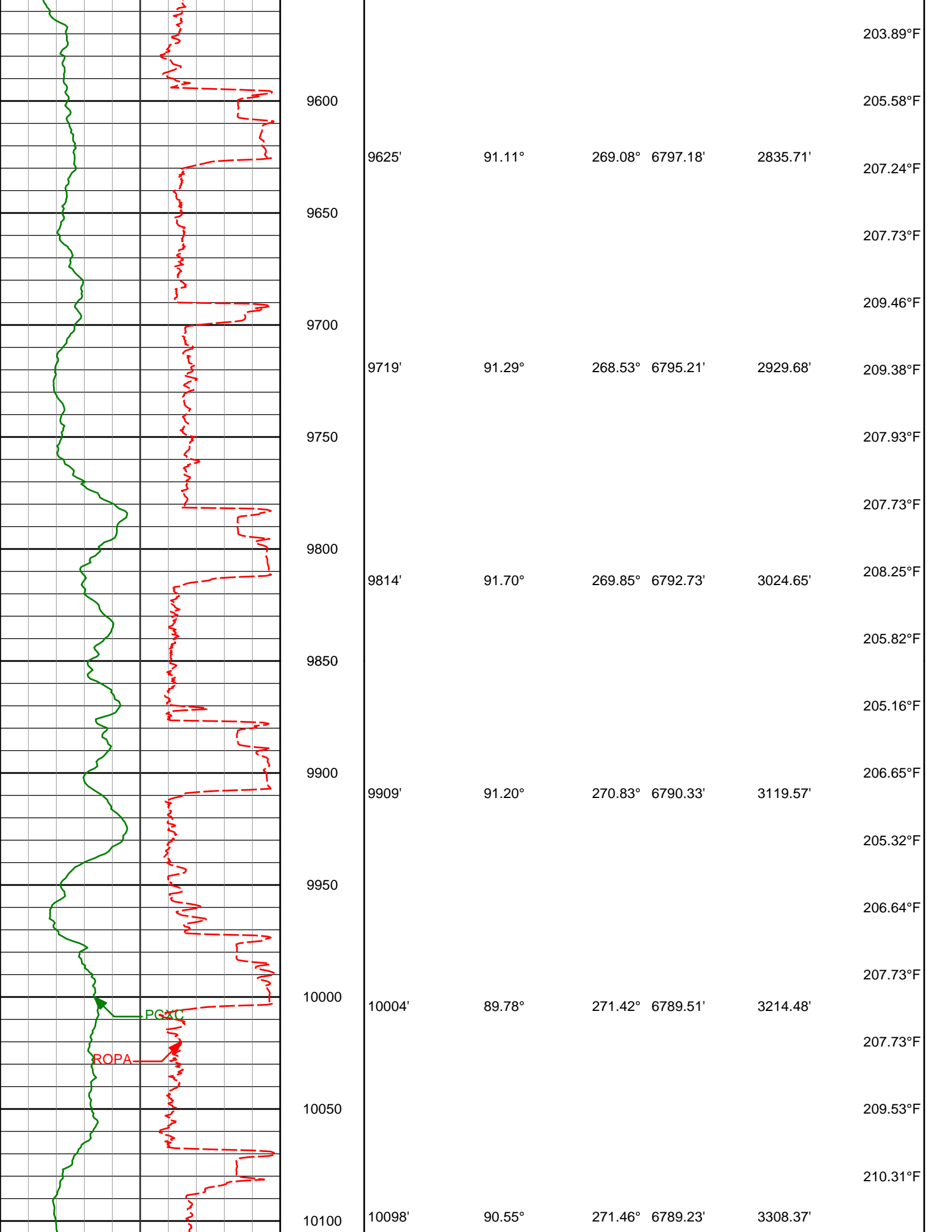


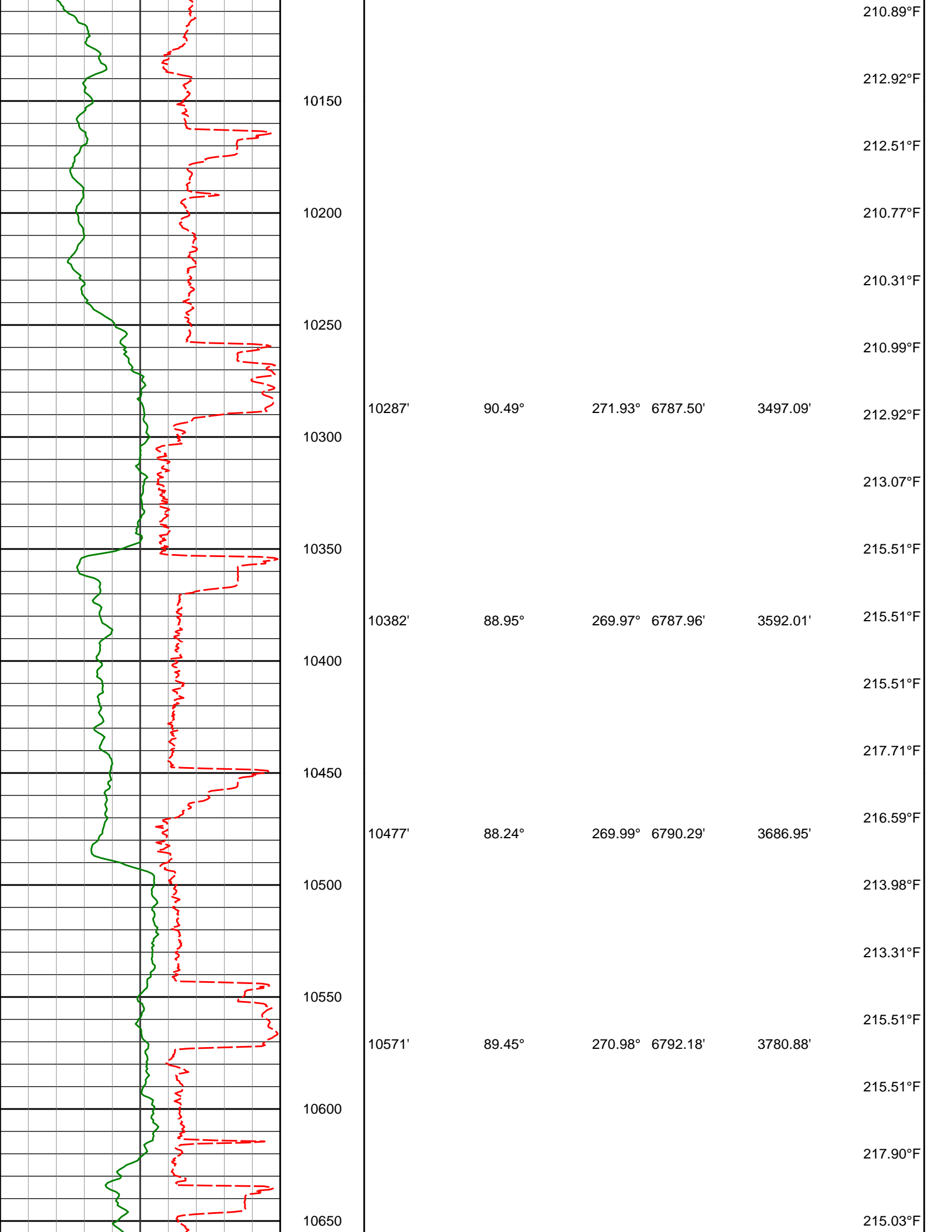


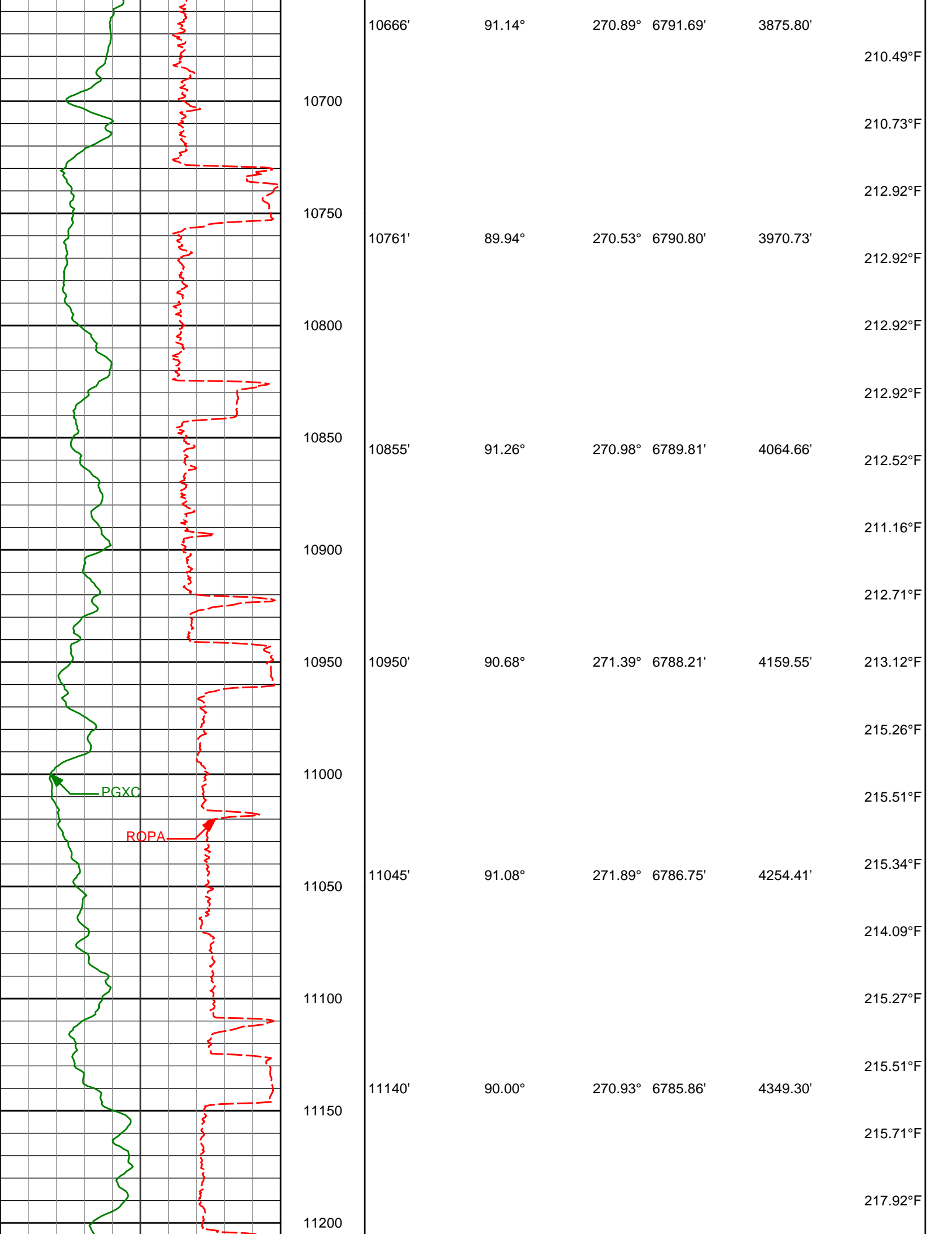


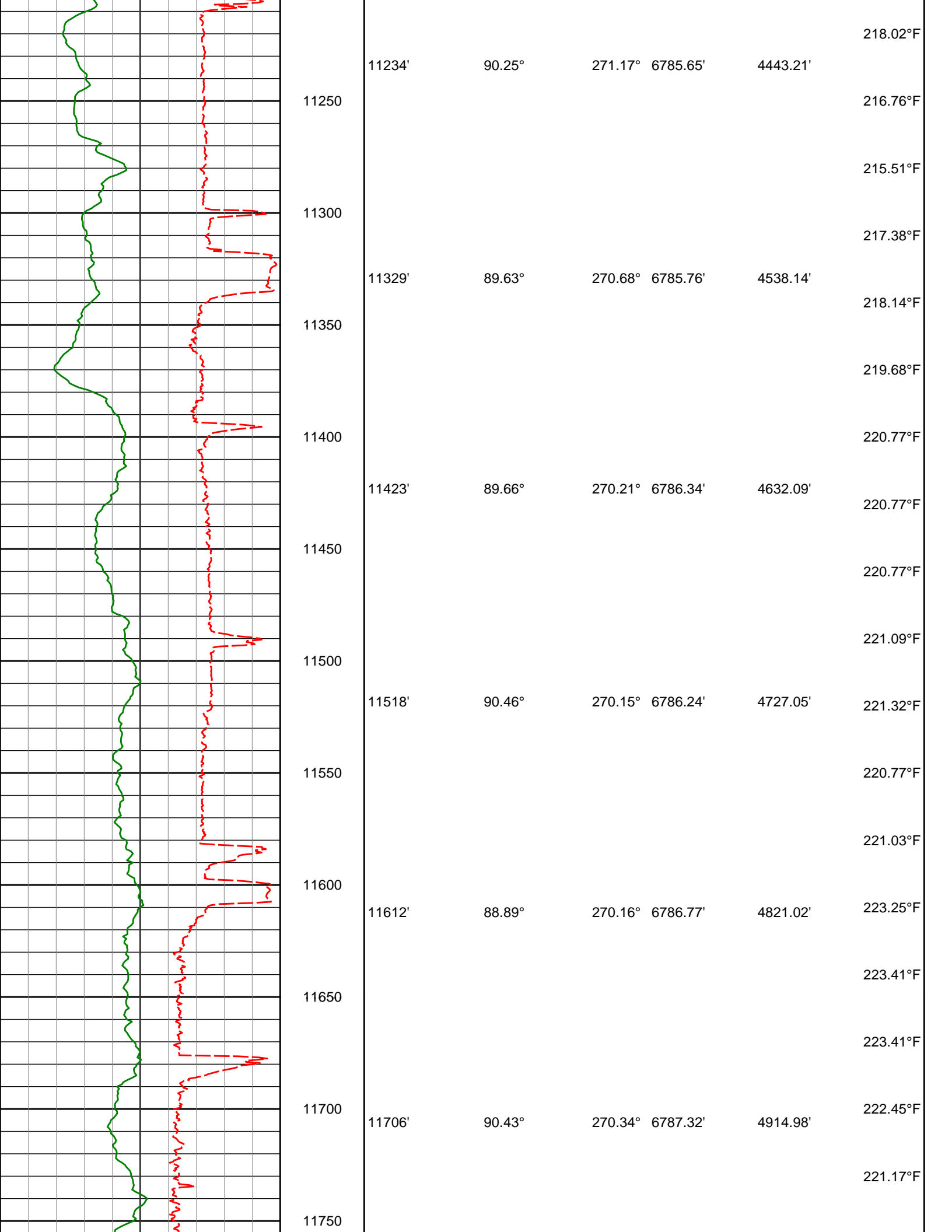


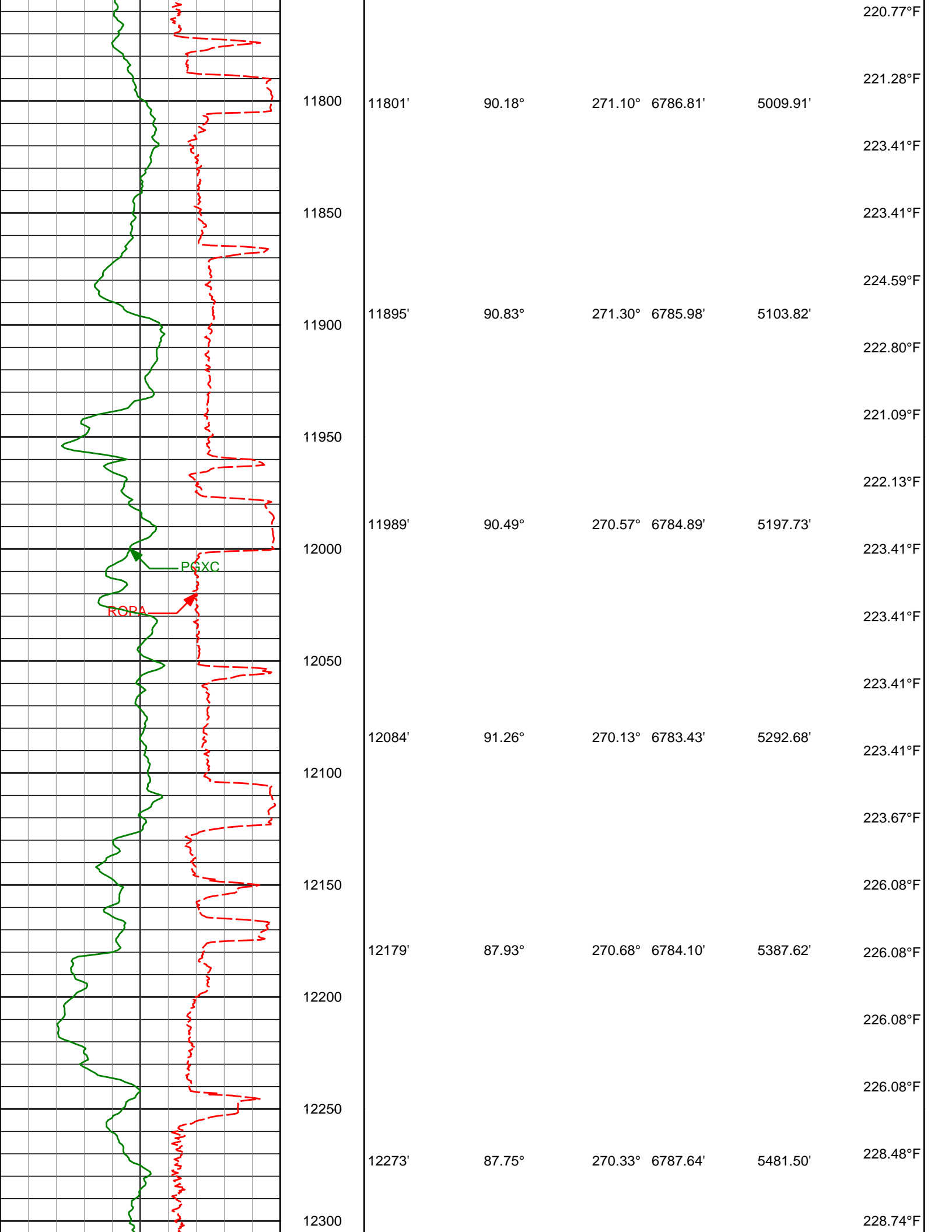


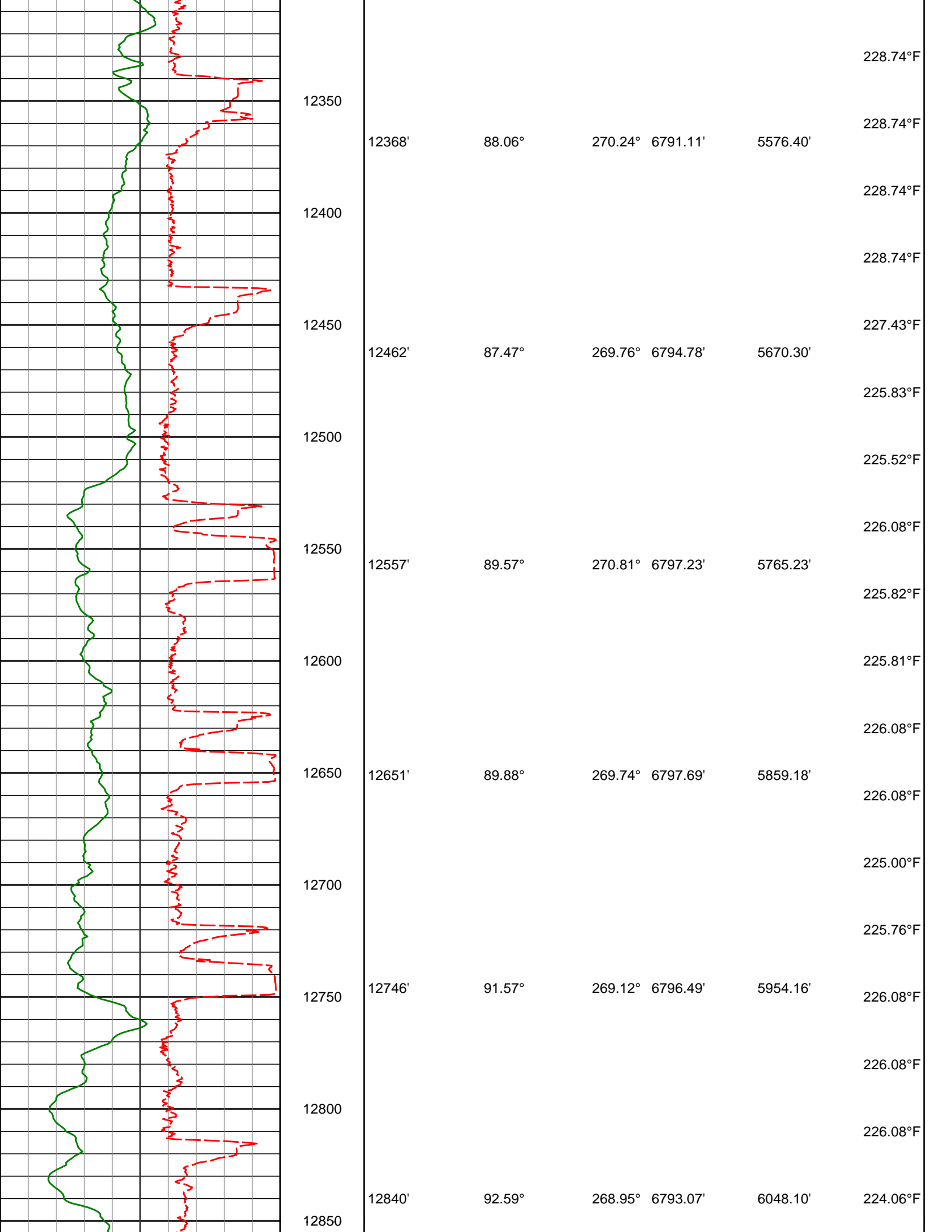


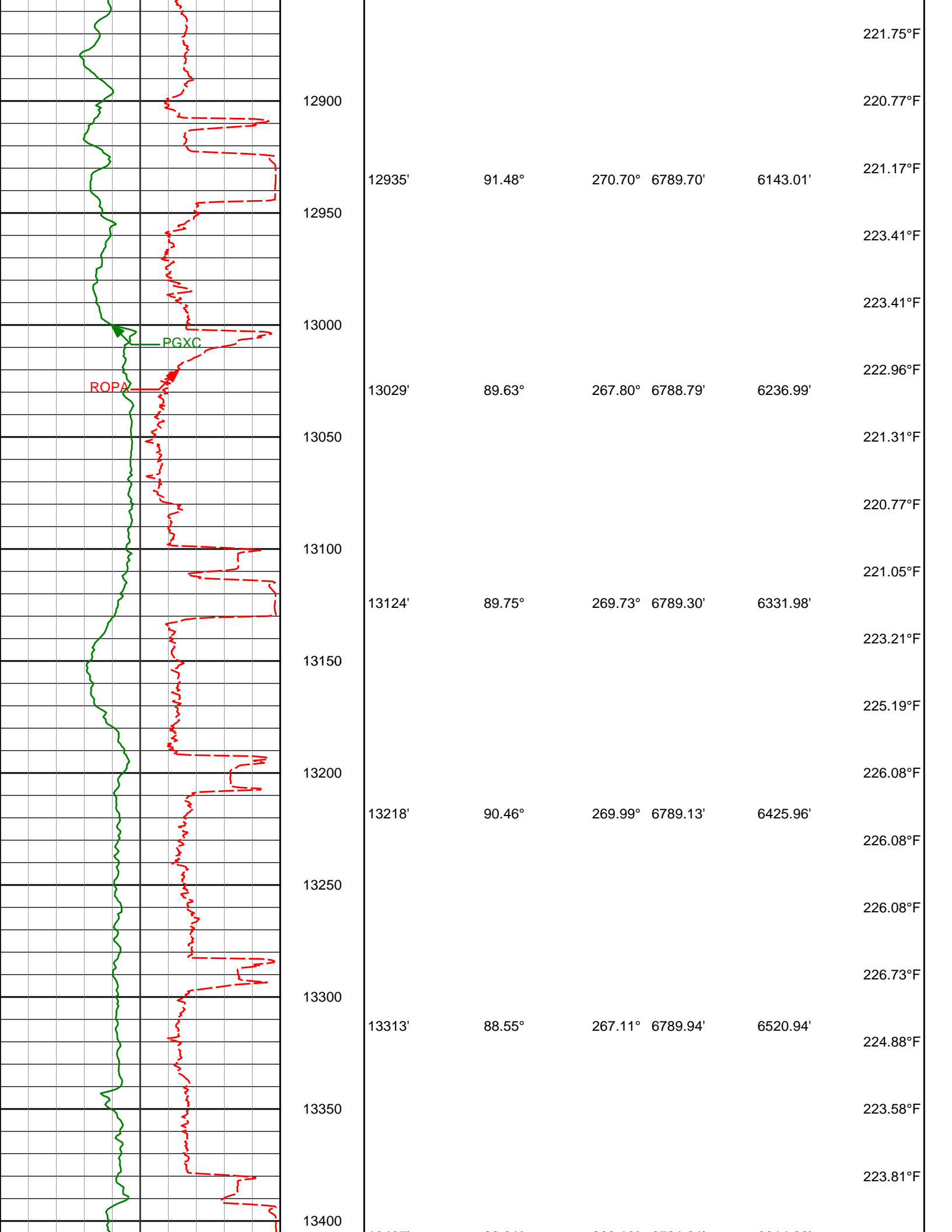


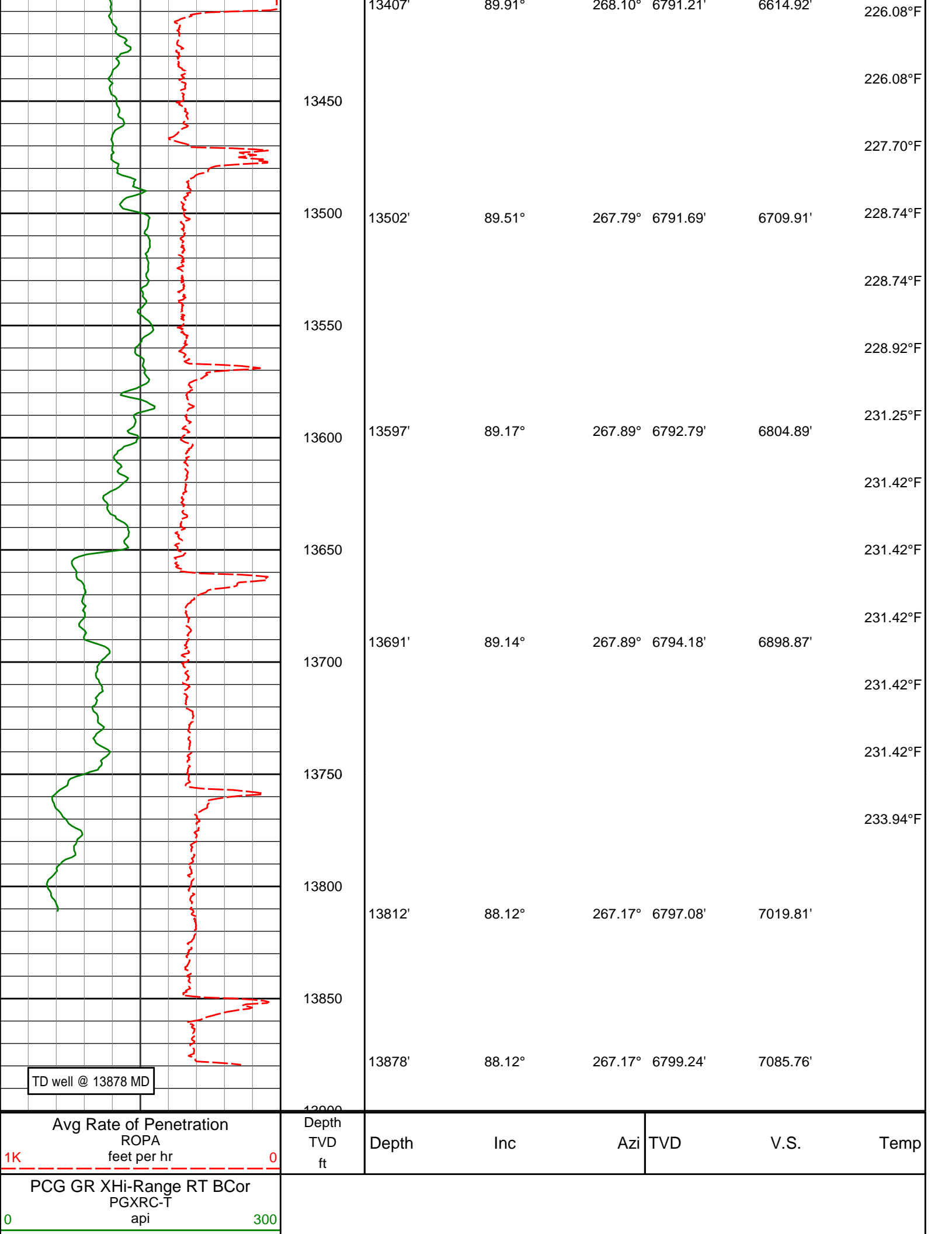




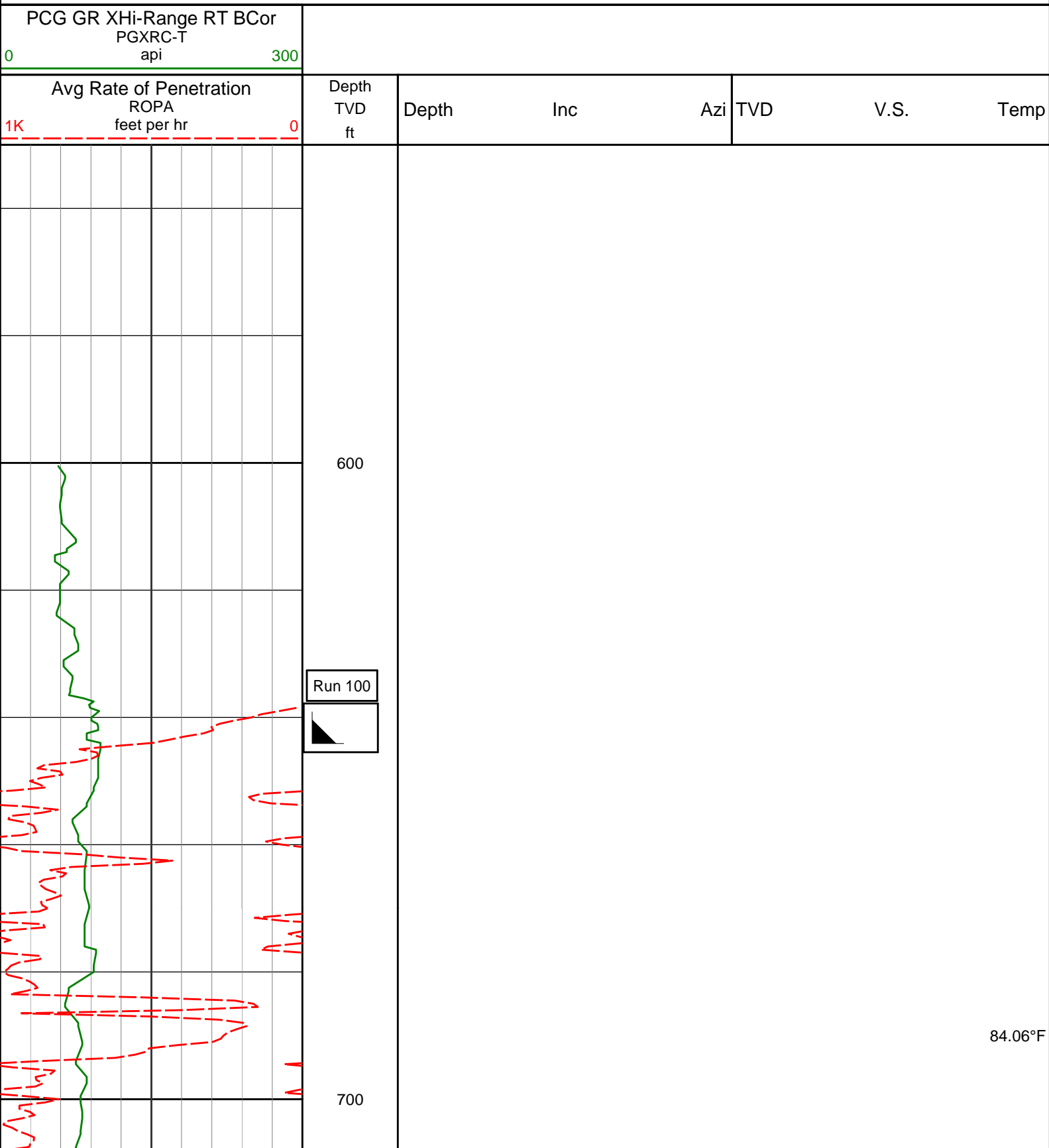


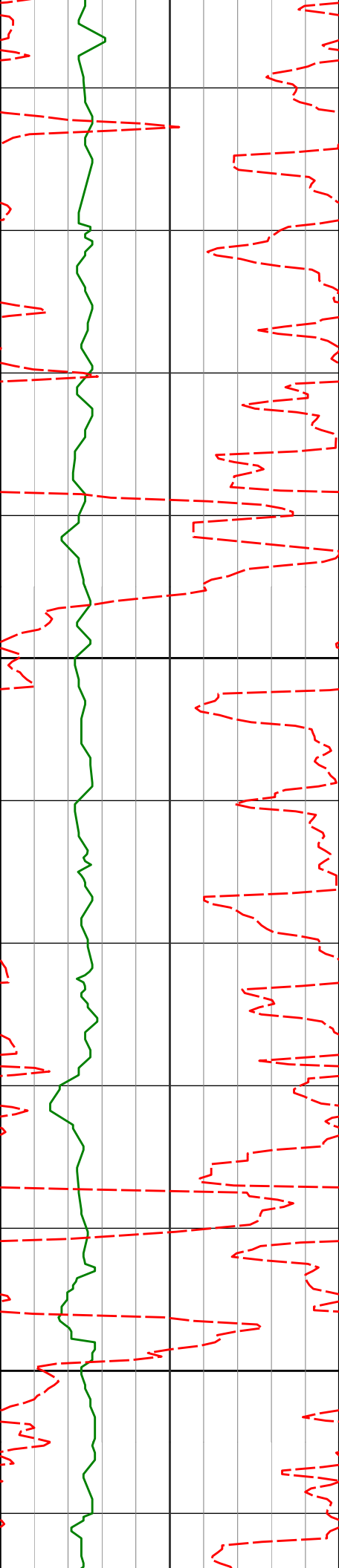






MD Detail 1:240 Scale





731'

0.16°

18.64° 731.00'

-0.34'

800

86.09°F

86.09°F

900

86.09°F

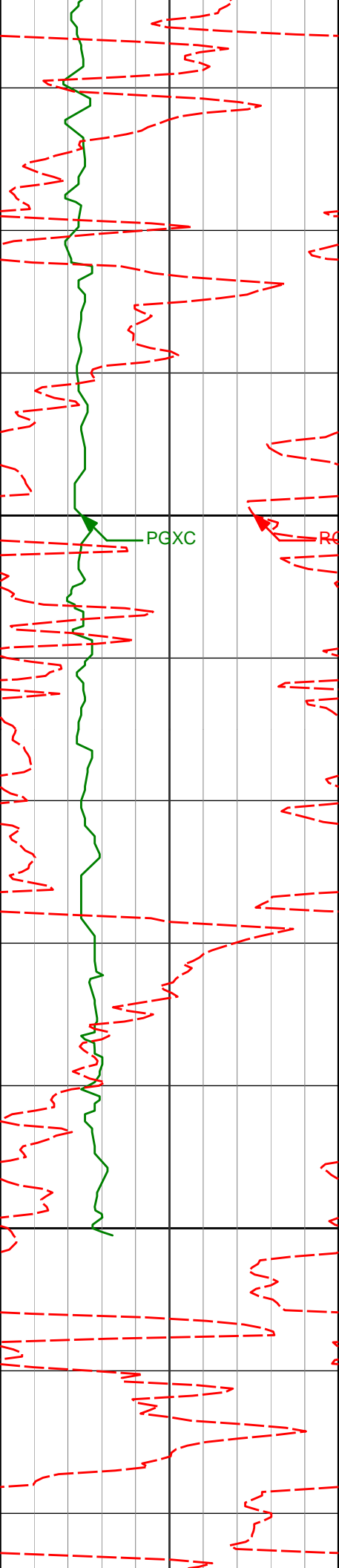
86.09°F

917'

0.07°

231.67° 917.00'

-0.34'



1000

PGXC

ROPA

1008'

0.61°

178.81°

1008.00'

-0.30'

88.14°F

88.14°F

88.14°F

88.14°F

1100

1101'

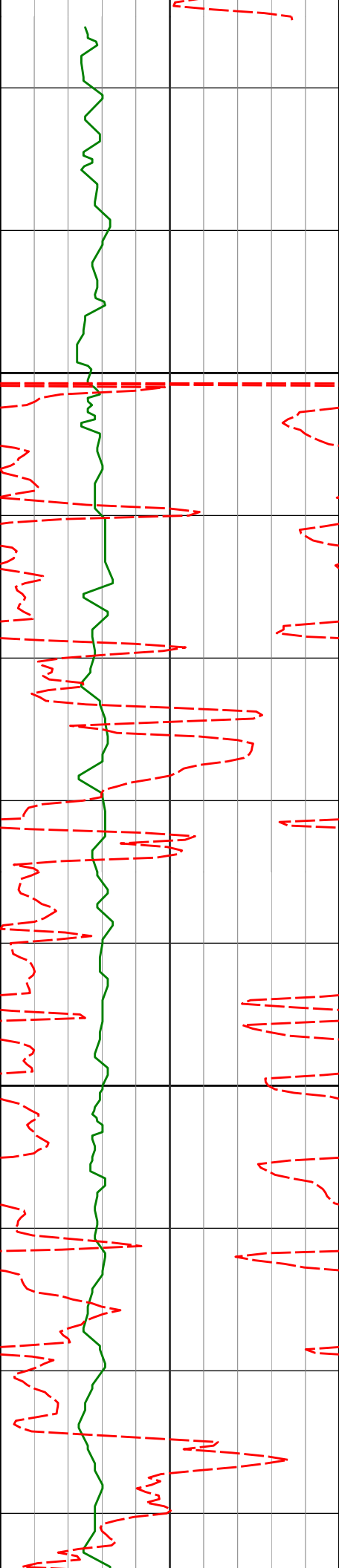
0.74°

182.94°

1100.99'

-0.25'

90.19°F



1200

1300

1302'

0.62°

199.29°

1301.98'

0.23'

90.19°F

88.14°F

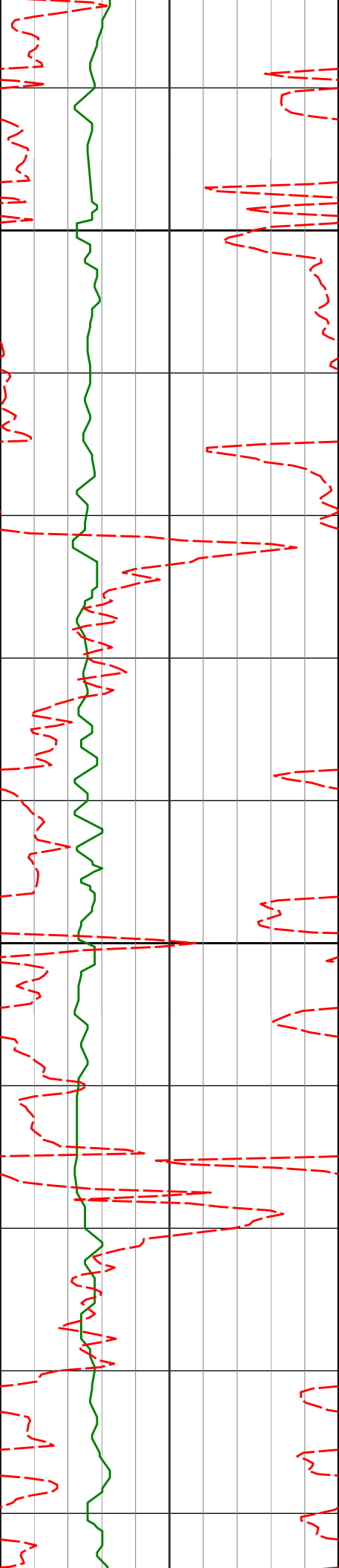
88.14°F

88.14°F

88.14°F

90.19°F

90.19°F



1400

1500

1394'

1486'

1579'

0.83°

0.79°

0.73°

219.11°

207.01°

206.25°

1393.97'

1485.96'

1578.95'

0.84'

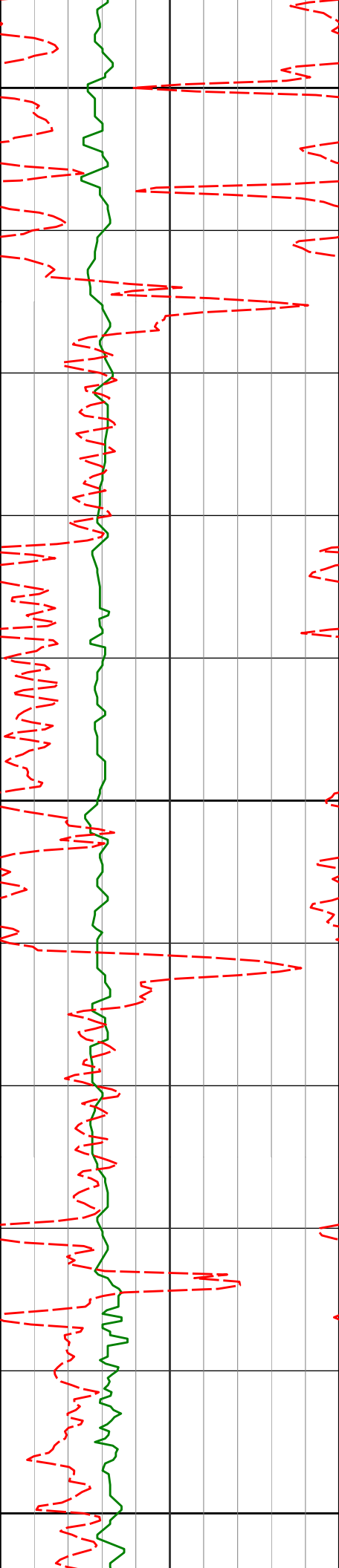
1.58'

2.16'

92.26°F

92.26°F

92.26°F



1600

1700

1800

1671'

0.61°

207.58°

1670.95'

2.67'

1763'

0.55°

206.53°

1762.94'

3.11'

92.26°F

92.26°F

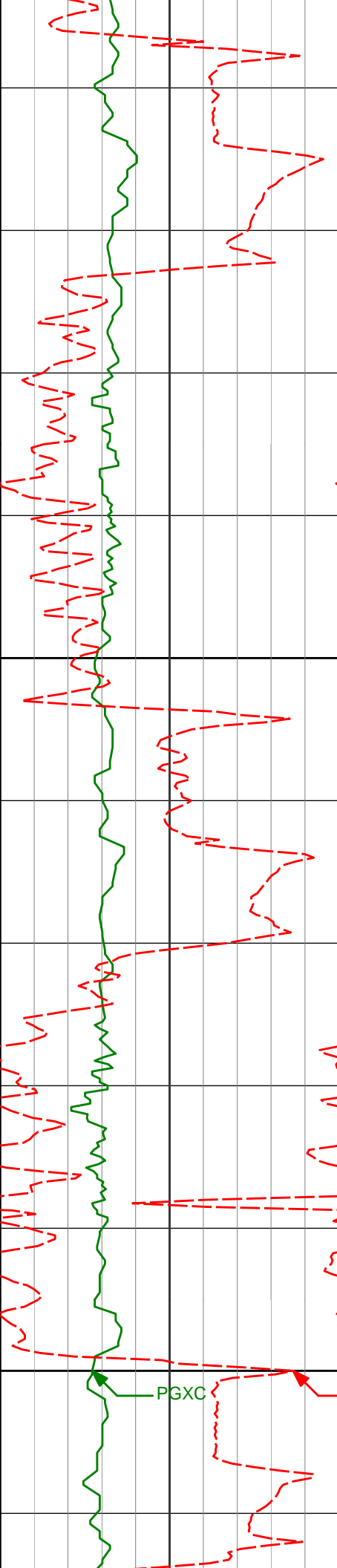
94.33°F

94.33°F

94.33°F

94.49°F

96.21°F



1855'

3.41°

157.10°

1854.88'

2.31'

96.42°F

96.42°F

1900

98.51°F

1946'

5.31°

140.14°

1945.62'

-1.30'

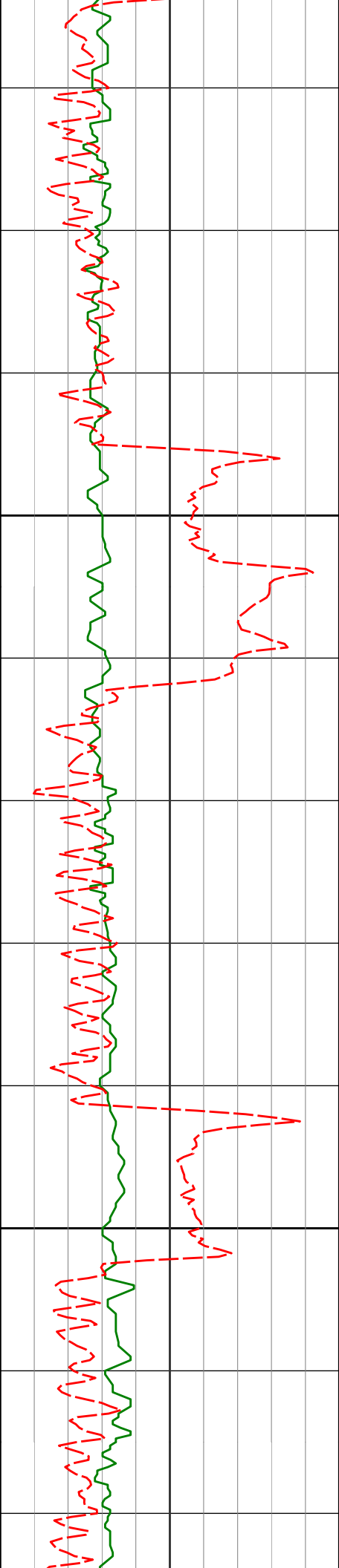
98.51°F

2000

PGXC

ROPA

98.51°F



2100

2200

2038'

6.59°

127.03°

2037.12'

-8.09'

98.51°F

98.51°F

100.62°F

2129'

8.43°

126.81°

2127.34'

-17.44'

100.62°F

100.62°F

101.51°F

2221'

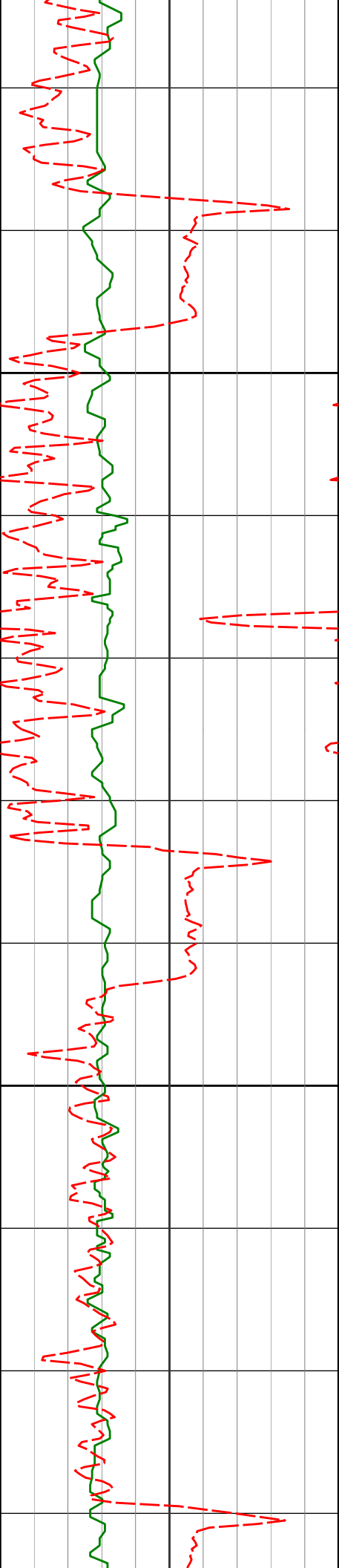
8.52°

126.07°

2218.33'

-28.16'

102.72°F



2300

2313'

8.39°

126.12°

2309.33'

-38.90'

2400

2405'

8.42°

126.10°

2400.34'

-49.57'

102.72°F

102.72°F

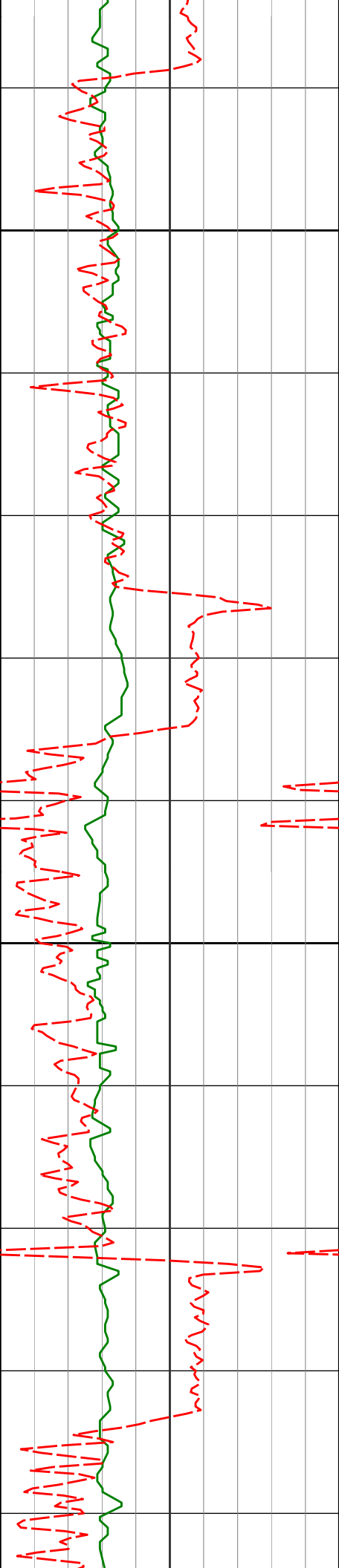
104.83°F

104.83°F

104.83°F

104.83°F

104.83°F



2500

2600

2497'

2589'

2680'

8.17°

7.91°

7.89°

126.56°

126.57°

127.34°

2491.38'

2582.48'

2672.61'

-60.07'

-70.22'

-80.04'

104.83°F

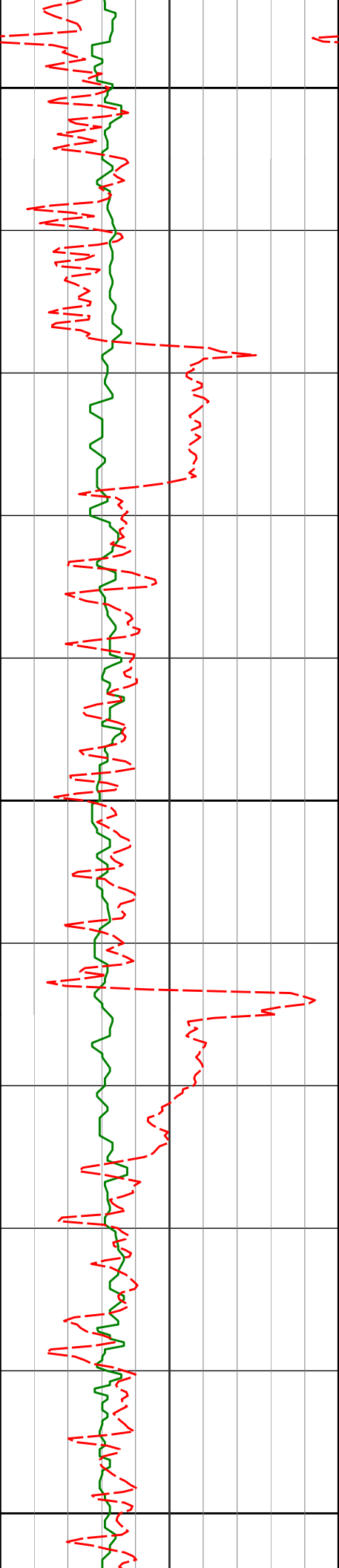
106.30°F

106.97°F

106.97°F

106.97°F

109.09°F



2700

109.09°F

109.09°F

109.09°F

2772'

7.75°

127.22°

2763.76'

-89.82'

110.08°F

2800

111.24°F

111.24°F

2867'

7.25°

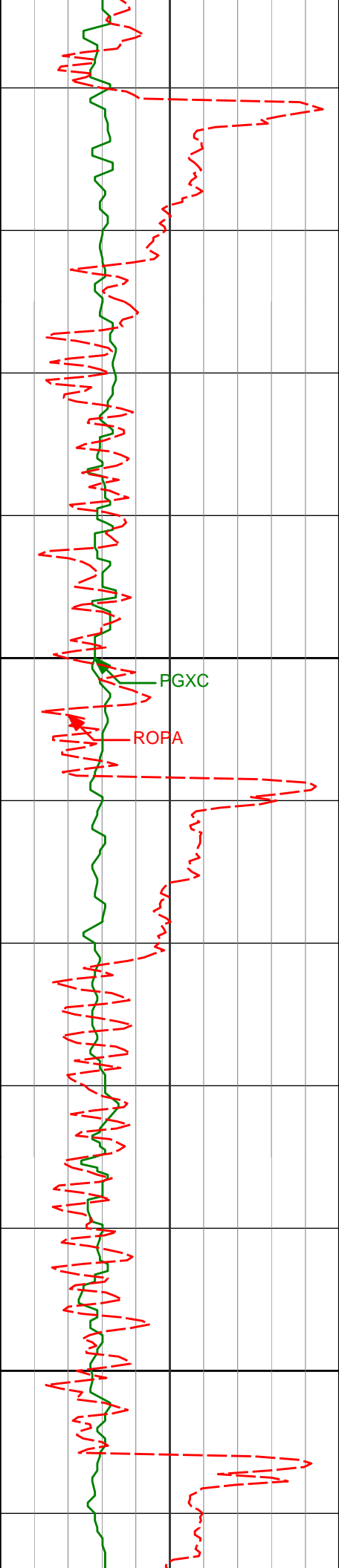
126.42°

2857.94'

-99.57'

111.24°F

2900



2961'

7.29°

124.76°

2951.19'

-109.08'

3056'

7.11°

122.00°

3045.44'

-118.86'

3000

3100

111.24°F

111.24°F

111.24°F

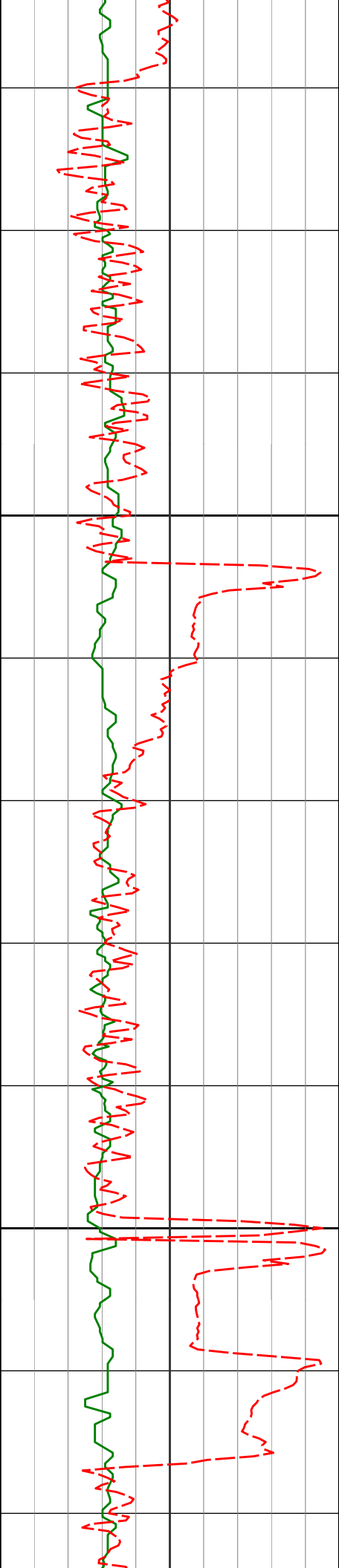
113.40°F

113.40°F

113.40°F

113.40°F

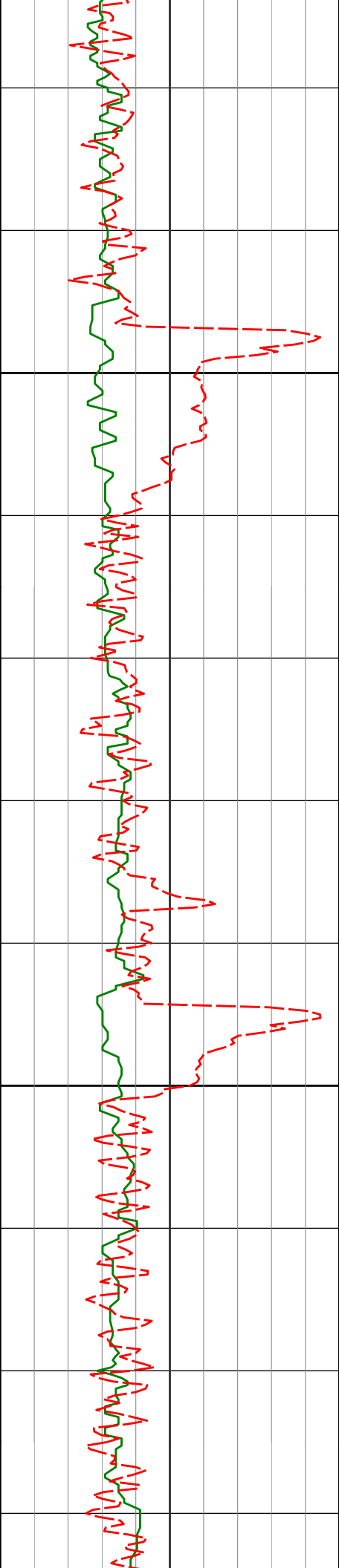
114.14°F



3200

3300

3151'	7.08°	119.83°	3139.71'	-128.78'	115.56°F
					115.56°F
					115.56°F
					115.56°F
3246'	6.99°	117.67°	3234.00'	-138.84'	115.56°F
					115.56°F
					115.56°F
					115.56°F
3340'	8.35°	130.82°	3327.16'	-148.90'	117.73°F



3400

3500

3435'

3530'

8.07°

7.41°

128.21°

130.89°

3421.19'

3515.32'

-159.15'

-168.83'

117.73°F

117.73°F

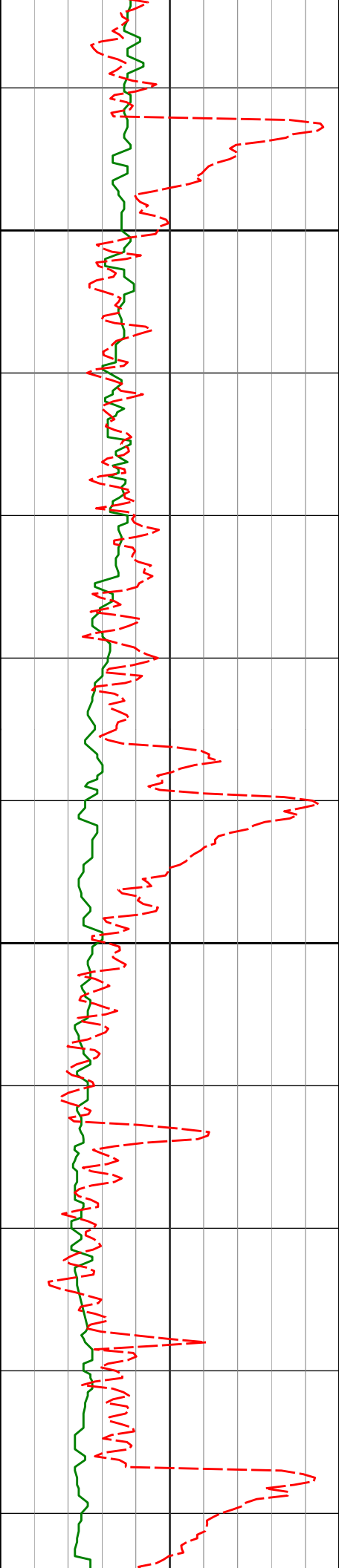
119.91°F

119.91°F

119.91°F

119.91°F

121.08°F



3600

3624'

6.82°

130.72°

3608.60'

-177.47'

3700

3719'

6.49°

130.70°

3702.96'

-185.64'

122.11°F

122.11°F

122.11°F

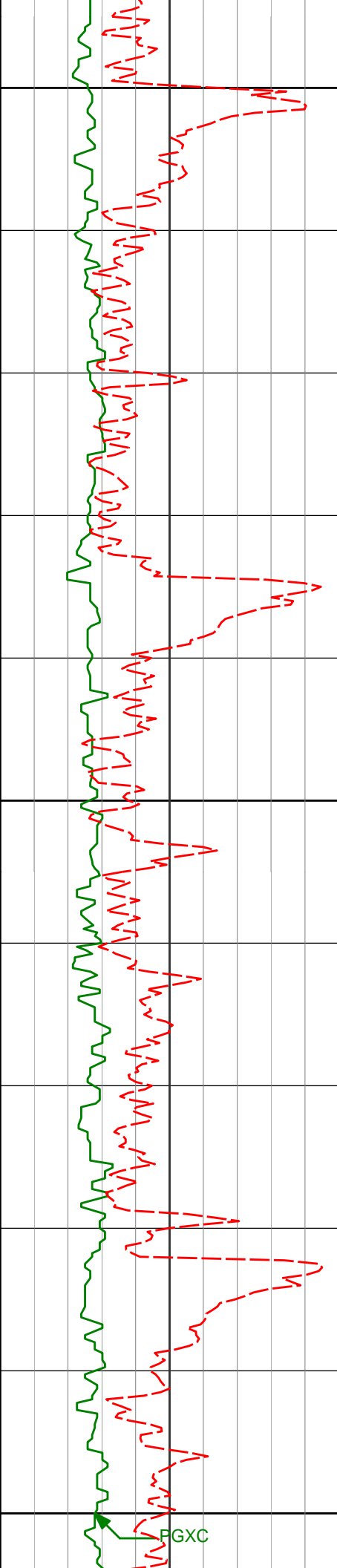
122.11°F

123.24°F

124.30°F

124.30°F

124.30°F



3800

3814'

6.50°

130.56°

3797.35'

-193.63'

124.30°F

124.30°F

124.30°F

3900

3908'

6.51°

129.99°

3890.74'

-201.59'

124.30°F

124.30°F

126.17°F

4000

4003'

6.67°

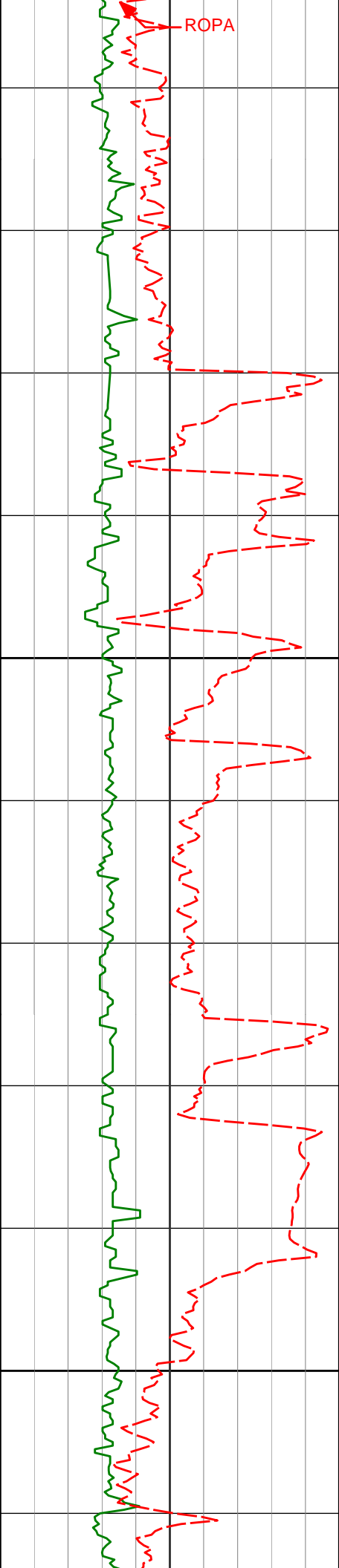
129.46°

3985.11'

-209.82'

126.52°F

FGXC



4100

4097'

5.60°

140.51°

4078.57'

-216.79'

126.52°F

126.52°F

127.38°F

4192'

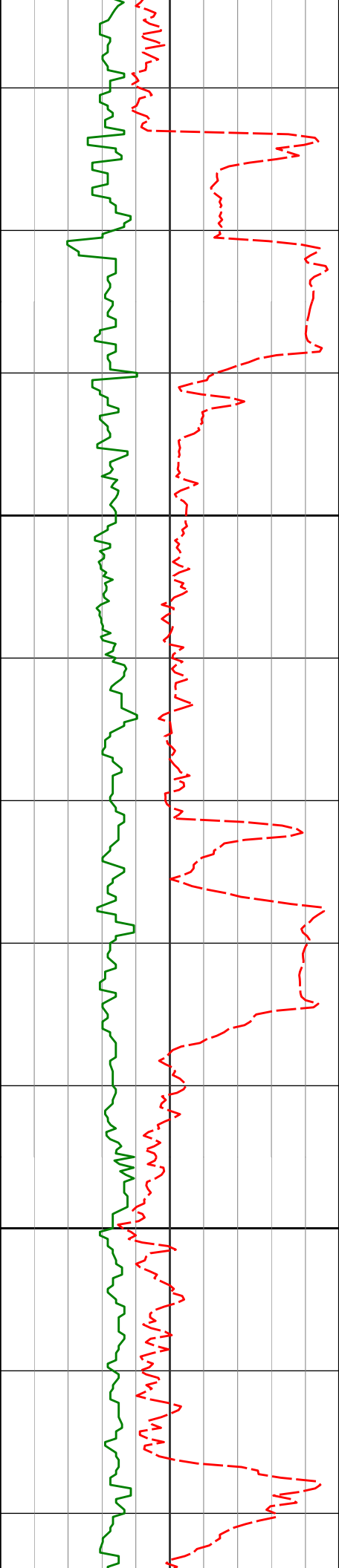
4.50°

119.22°

4173.21'

-222.86'

128.73°F



4300

4400

4287'

2.41°

111.59°

4268.04'

-227.91'

4382'

1.21°

45.53°

4362.99'

-230.48'

127.53°F

128.32°F

127.19°F

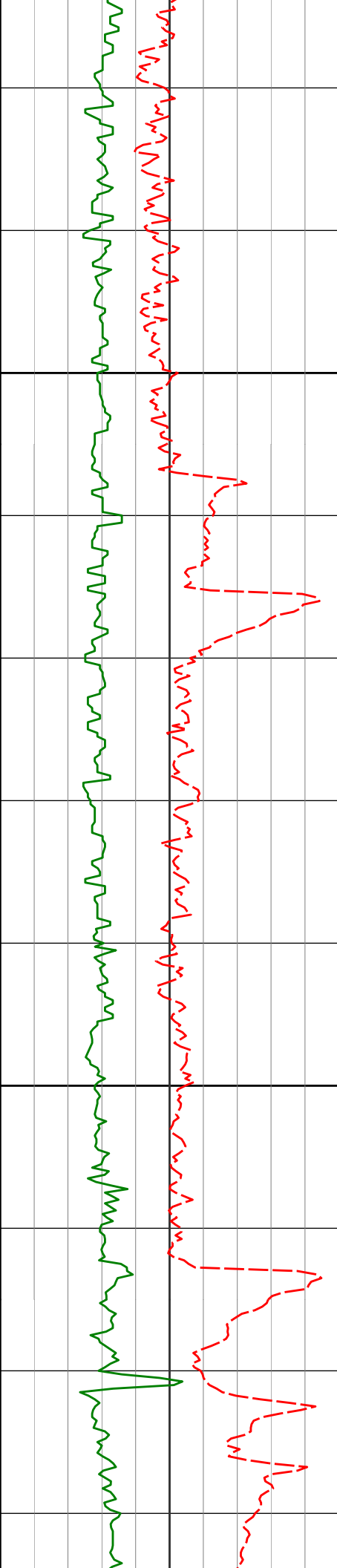
126.37°F

124.41°F

126.52°F

126.52°F

126.52°F



4500

4600

4571'

4666'

1.02°

0.97°

53.52°

55.26°

4551.96'

4646.94'

-233.31'

-234.66'

126.52°F

128.48°F

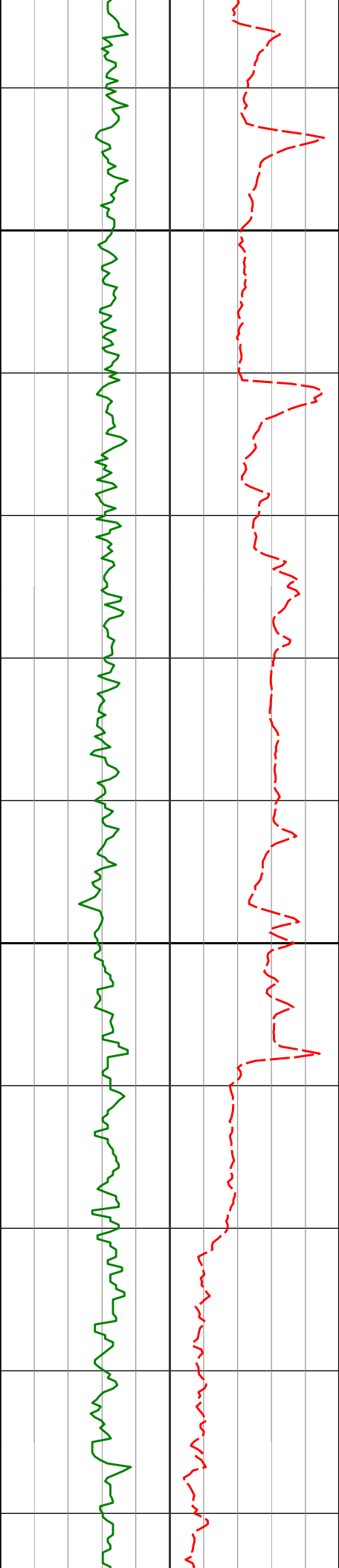
128.73°F

128.73°F

129.76°F

130.96°F

130.96°F



4700

4800

200

4761'

0.79°

45.76°

4741.93'

-235.81'

4855'

0.91°

44.91°

4835.92'

-236.82'

130.96°F

132.57°F

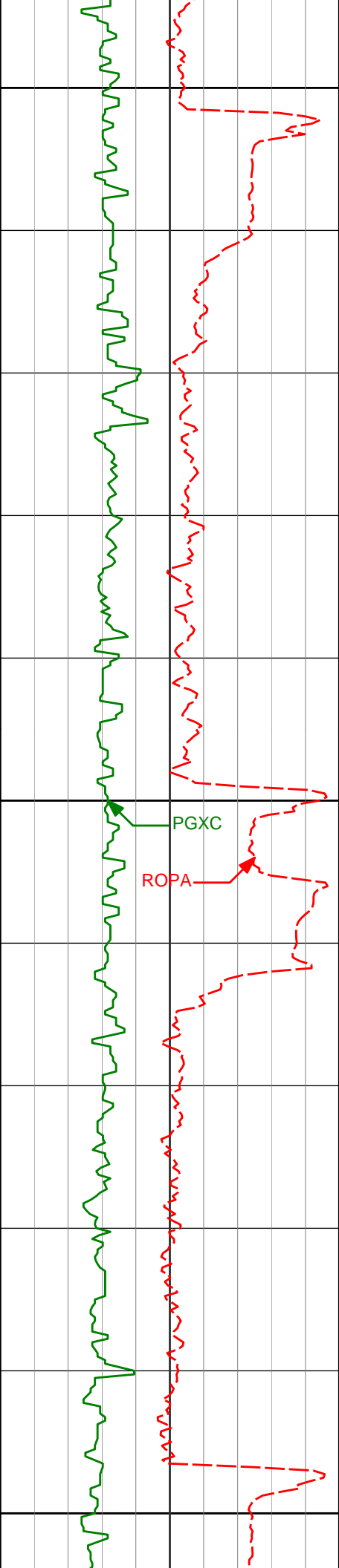
133.20°F

136.24°F

133.45°F

130.96°F

128.94°F



4900

4950'

1.11°

43.88°

4930.91'

-238.02'

127.16°F

5000

PGXC

ROPA

126.52°F

5045'

0.43°

167.88°

5025.90'

-238.74'

127.12°F

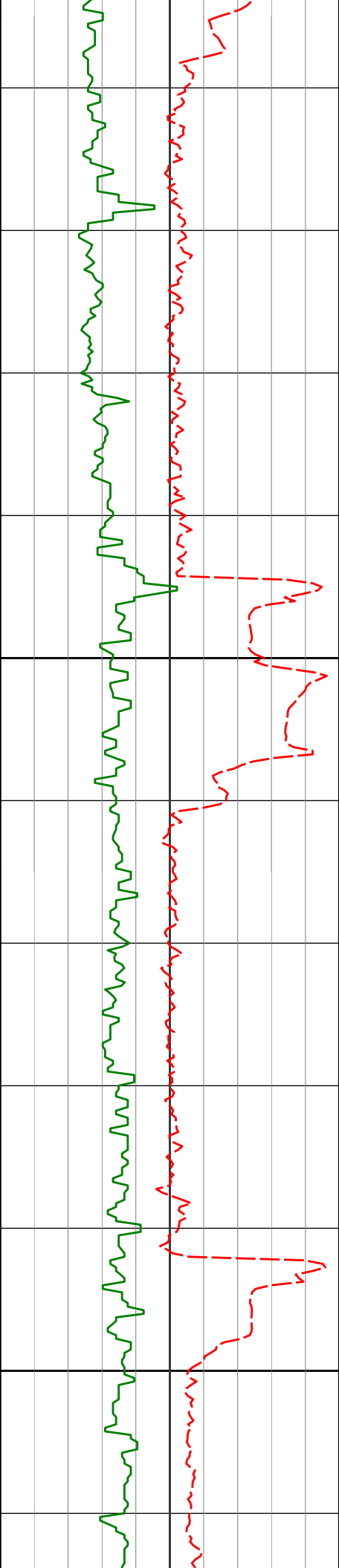
128.73°F

5100

128.73°F

128.73°F

128.73°F



5200

5300

5140'

0.53°

162.93°

5120.90'

-238.93'

5235'

0.71°

262.80°

5215.90'

-238.46'

128.73°F

128.73°F

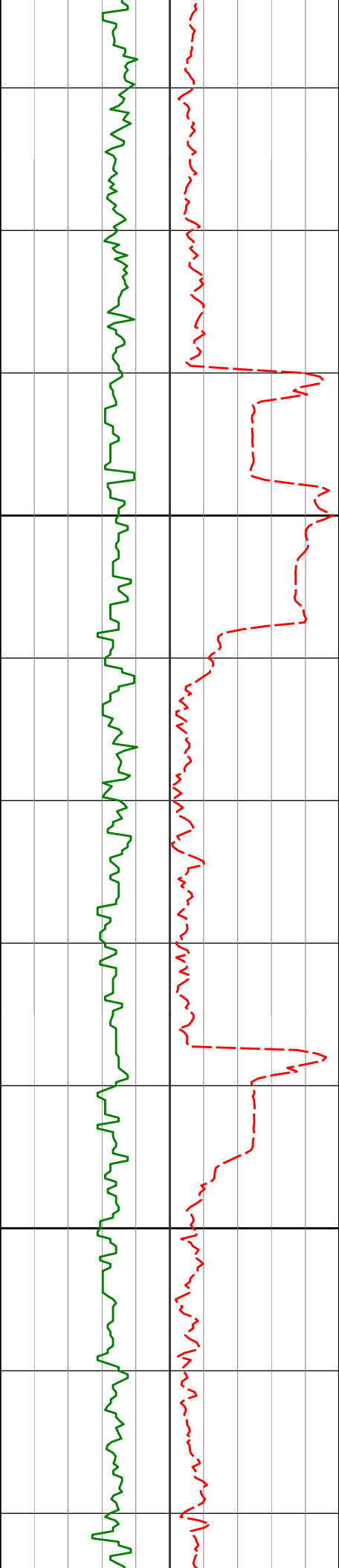
129.25°F

130.96°F

130.96°F

133.02°F

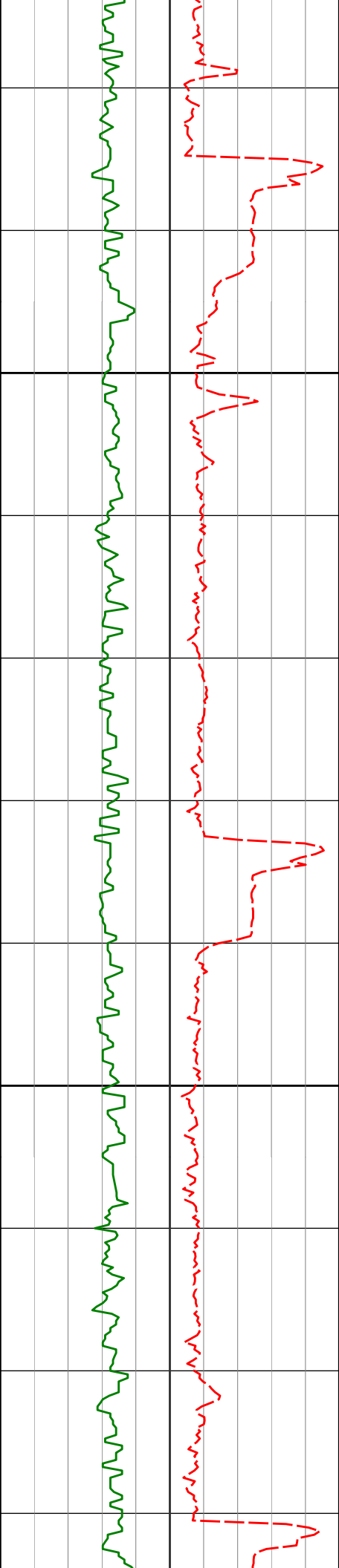
133.20°F



5400

5500

5329'	0.18°	255.85°	5309.89'	-237.74'	
					133.20°F
					133.20°F
					133.20°F
5424'	1.52°	223.39°	5404.88'	-236.71'	133.20°F
					134.47°F
					135.45°F
5519'	1.21°	214.61°	5499.85'	-235.24'	135.45°F



5600

5614'

0.95°

221.27°

5594.84'

-234.11'

5700

5709'

0.84°

219.64°

5689.83'

-233.12'

136.33°F

137.70°F

137.70°F

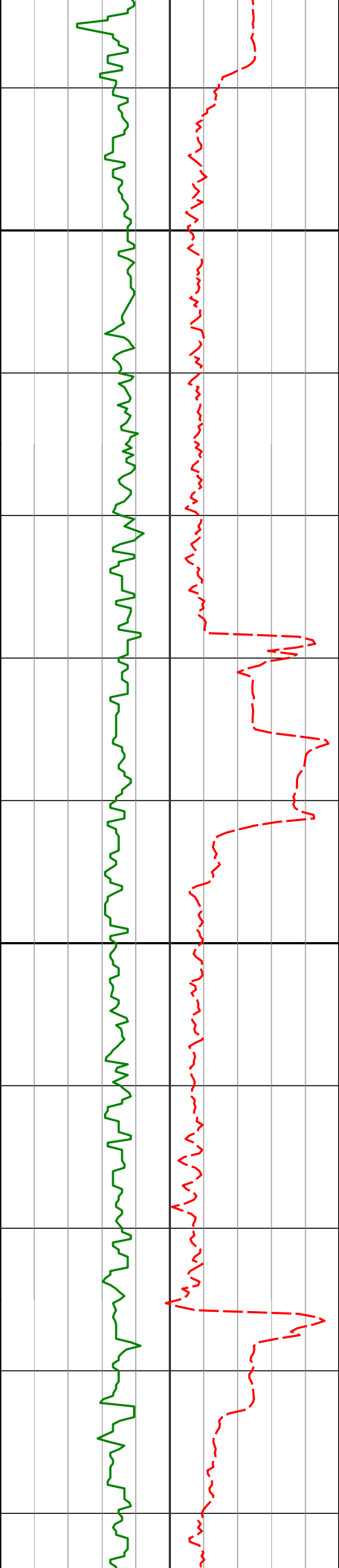
137.70°F

137.70°F

139.96°F

139.96°F

139.96°F



5800

5804'

0.90°

196.18° 5784.81'

-232.44'

139.96°F

139.96°F

139.96°F

140.81°F

5900

5898'

1.66°

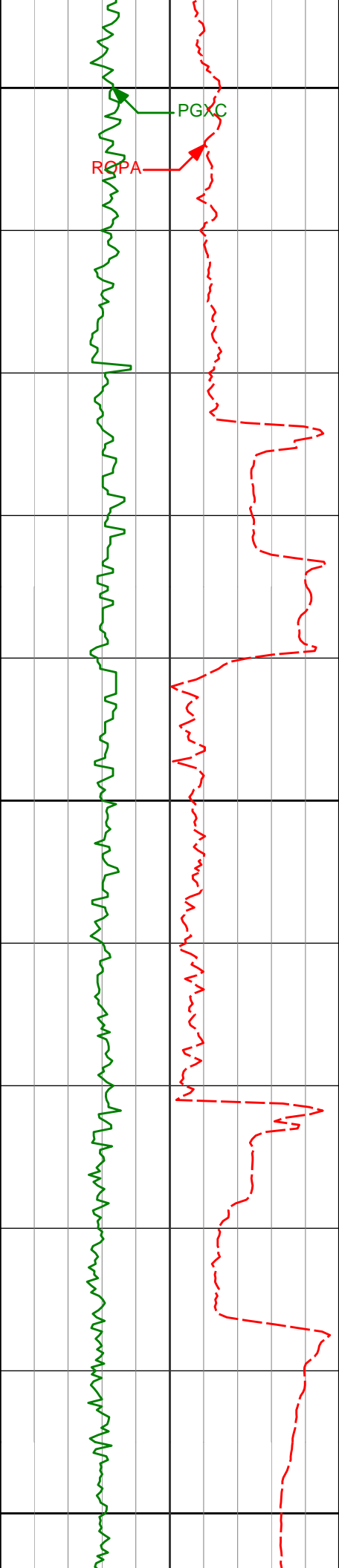
213.34° 5878.79'

-231.45'

142.25°F

142.25°F

142.25°F



6000

5993'

1.74°

194.88° 5973.75'

-230.26'

144.21°F

144.54°F

144.54°F

6088'

2.53°

214.11° 6068.68'

-228.64'

145.42°F

6100

146.84°F

146.84°F

6182'

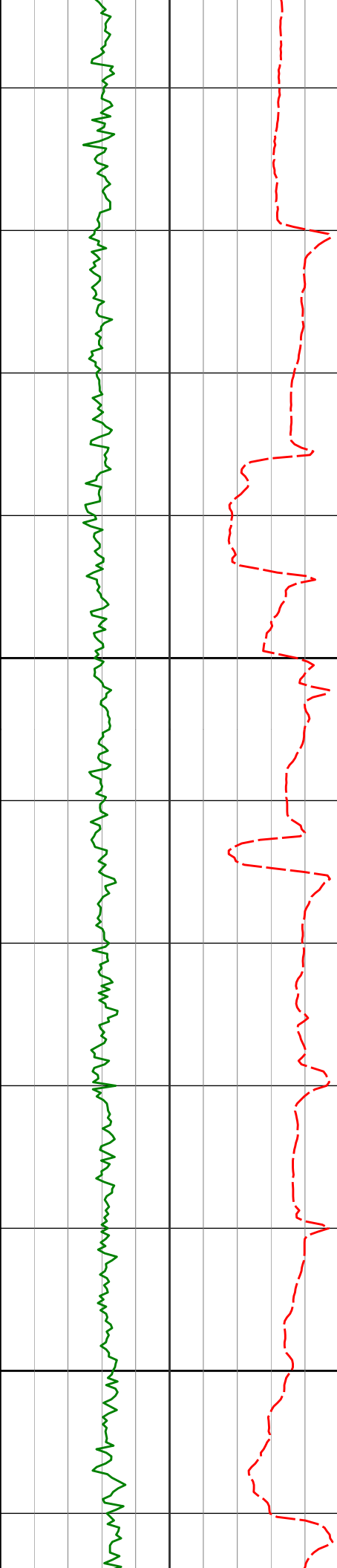
3.23°

237.08° 6162.57'

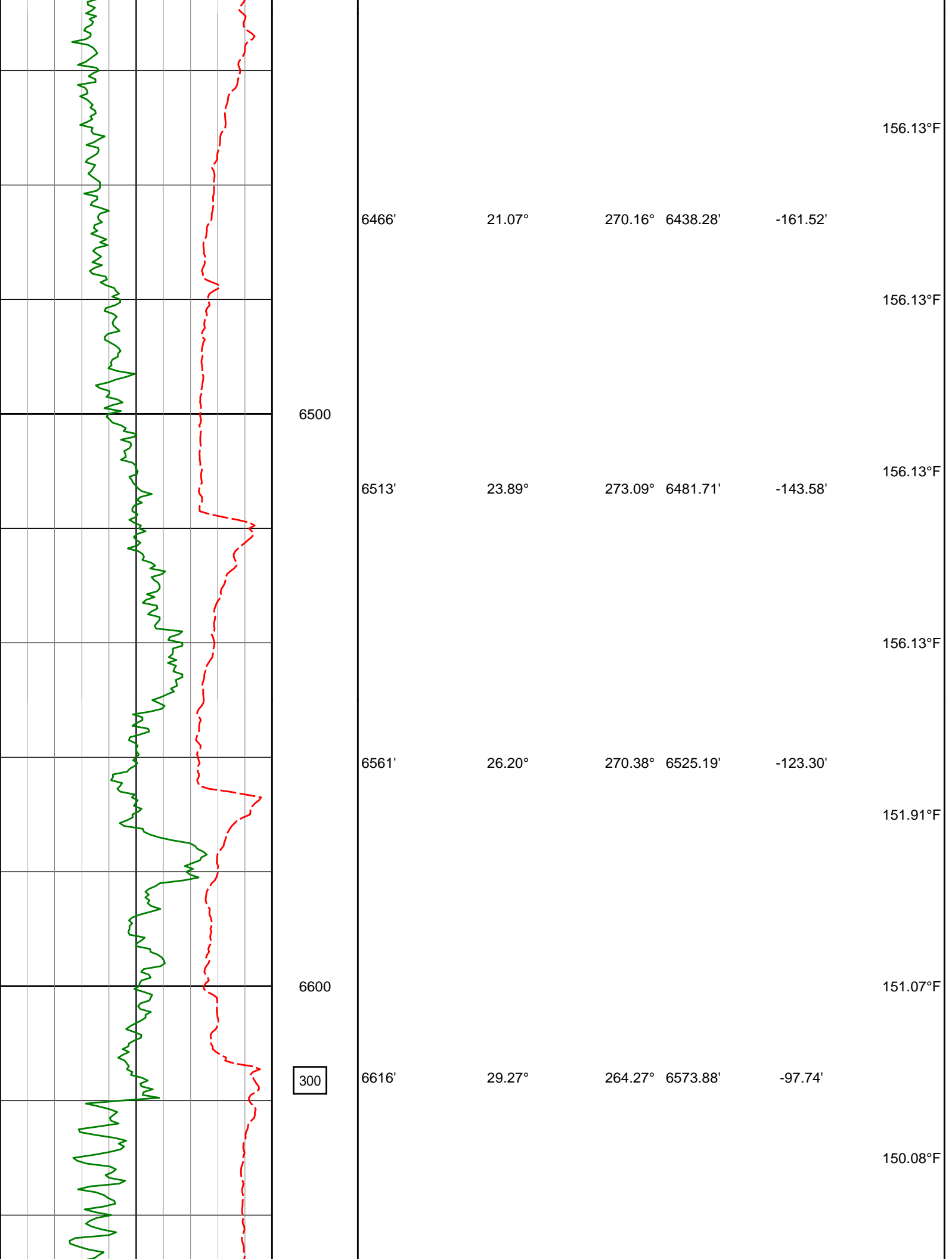
-225.18'

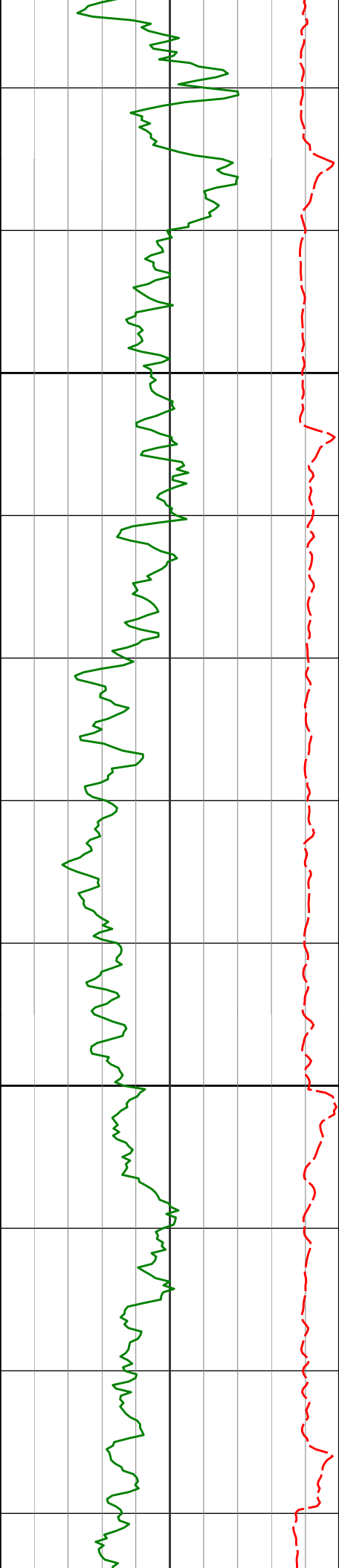
146.84°F

6200



6300	6229'	8.24°	260.71°	6209.32'	-220.71'	147.27°F
						149.06°F
	6277'	10.87°	265.07°	6256.65'	-212.78'	150.56°F
						151.62°F
	6324'	12.76°	266.77°	6302.66'	-203.17'	153.49°F
6400						153.79°F
	6372'	15.89°	267.53°	6349.16'	-191.30'	153.79°F
						153.79°F
						154.80°F





6700

6655'

34.57°

264.05°

6606.97'

-77.19'

151.47°F

152.50°F

153.98°F

6750'

50.74°

271.05°

6676.64'

-13.12'

155.77°F

156.24°F

6800

6797'

59.37°

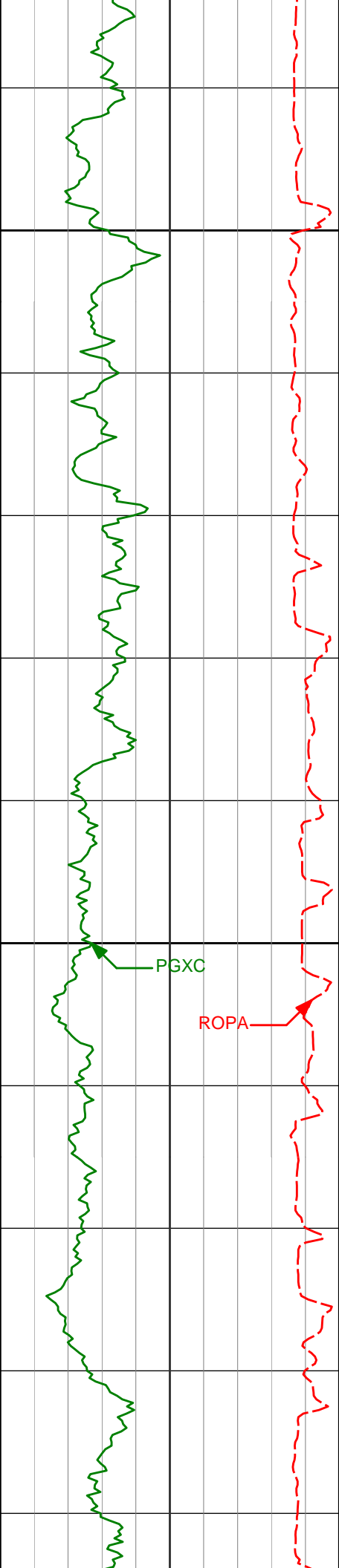
271.74°

6703.54'

25.33'

157.94°F

160.09°F



6900

7000

6892'

71.32°

271.67°

6740.42'

112.58'

6939'

71.89°

270.92°

6755.25'

157.14'

6986'

76.01°

269.59°

6768.24'

202.28'

7033'

80.09°

269.59°

6777.97'

248.25'

7080'

83.15°

270.59°

6784.82'

294.73'

160.83°F

160.83°F

160.83°F

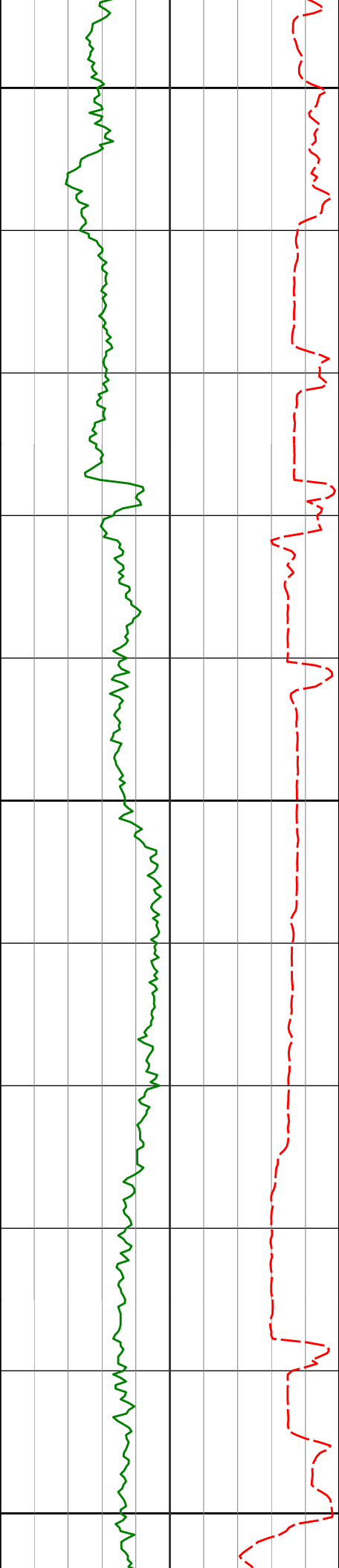
161.04°F

163.07°F

163.20°F

163.20°F

164.87°F



7100

7105'

84.82°

269.92° 6787.44'

319.58'

167.85°F

171.44°F

400

171.99°F

7200

172.78°F

7213'

87.53°

271.23° 6794.64'

427.22'

172.78°F

174.25°F

175.54°F

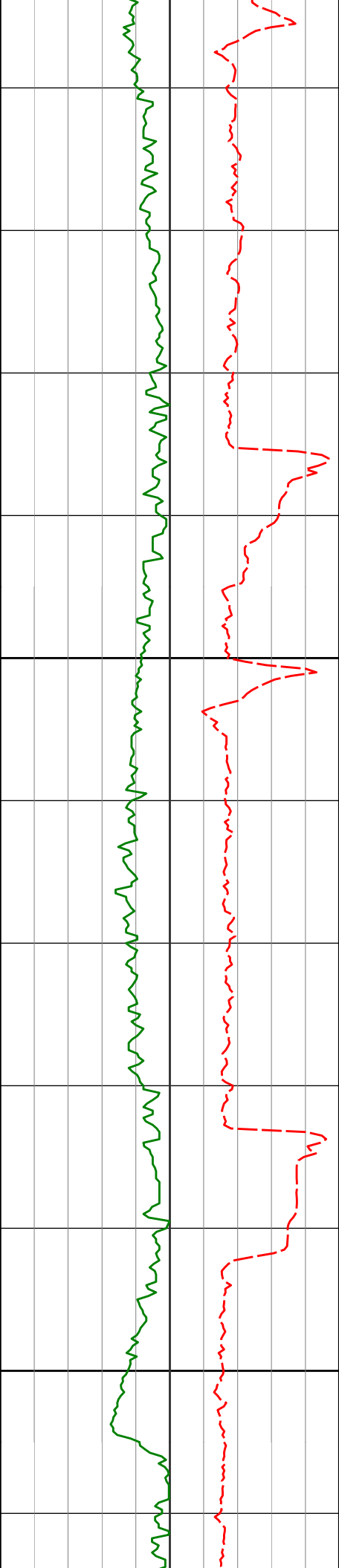
7300

7300'

89.92°

271.23° 6799.94'

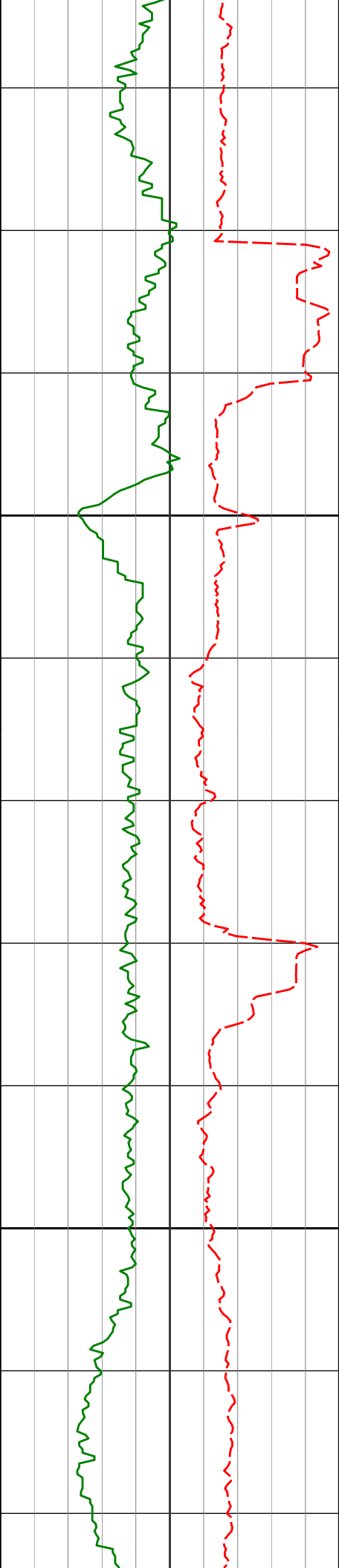
500.97'



7400

7500

7308'	89.82°	271.82°	6796.84'	522.07'	
					176.91°F
					175.82°F
					178.86°F
7403'	89.63°	271.40°	6797.30'	616.94'	180.09°F
					180.09°F
					182.00°F
7498'	89.23°	270.80°	6798.24'	711.85'	181.24°F



7600

7700

7593'

90.22°

271.01°

6798.70'

806.77'

7685'

91.26°

272.77°

6797.52'

898.61'

180.09°F

180.09°F

182.55°F

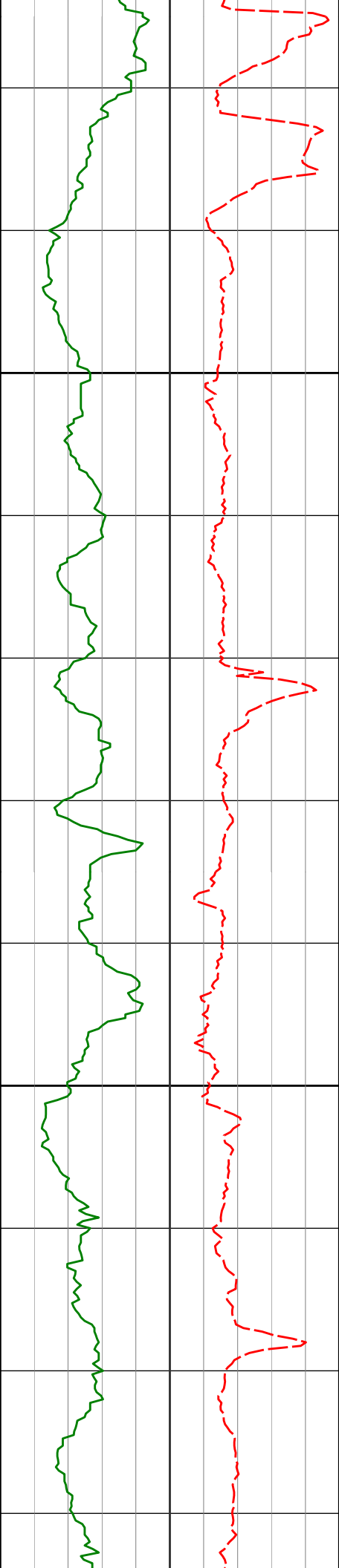
184.63°F

185.02°F

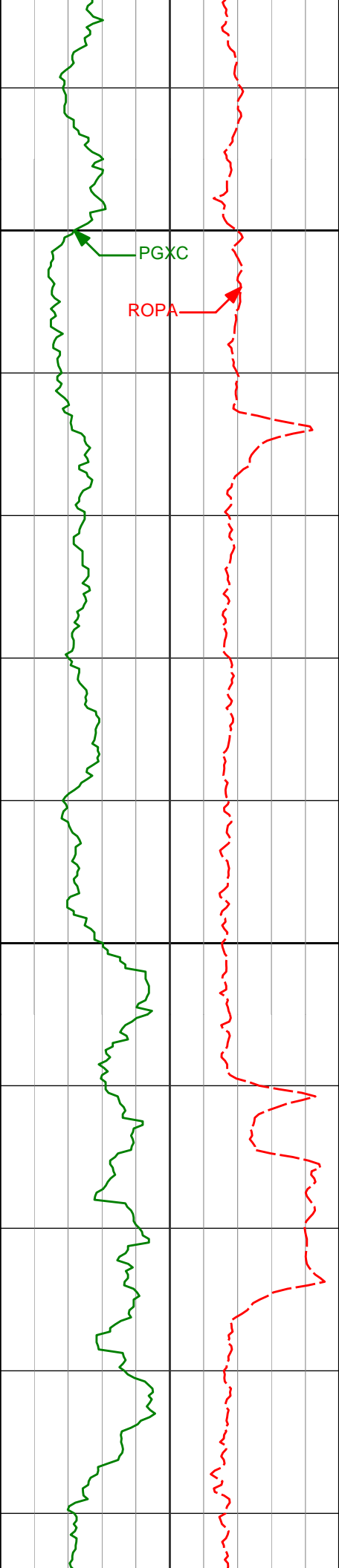
185.02°F

185.02°F

186.26°F



7776'	89.85°	272.00°	6796.63'	989.41'	187.48°F
					187.48°F
7800					189.50°F
					189.99°F
7868'	90.40°	271.63°	6796.44'	1081.27'	189.99°F
					189.99°F
7900					189.99°F
					192.24°F
7961'	90.99°	271.50°	6795.31'	1174.14'	



8000

PGXC

ROPA

8054'

91.73°

271.19° 6793.11'

1267.01'

8100

192.49°F

193.82°F

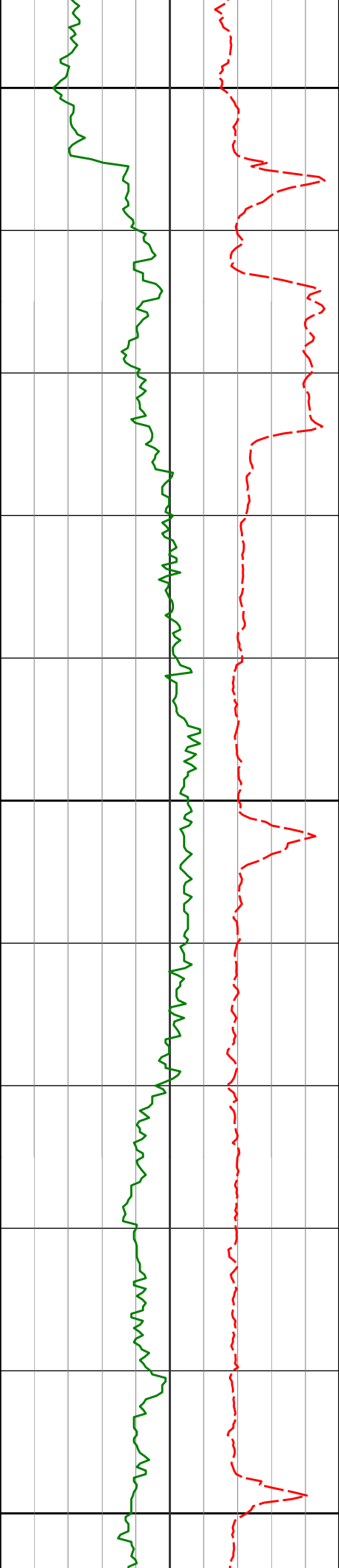
194.52°F

193.04°F

192.49°F

193.63°F

193.62°F



8200

8300

8400

8238'

89.54°

271.54° 6791.08'

1450.78'

8329'

89.20°

271.97° 6792.08'

1541.64'

192.49°F

192.83°F

194.99°F

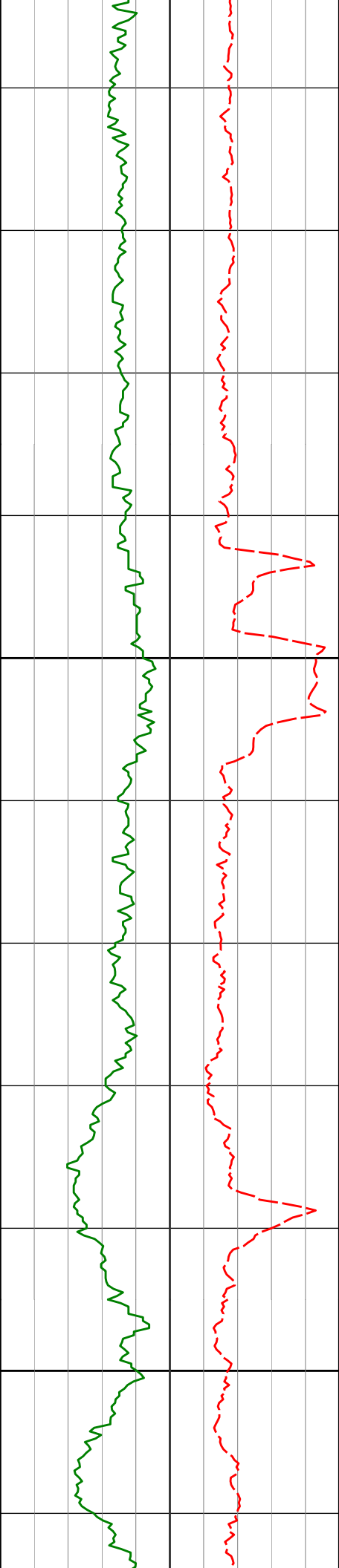
195.84°F

197.51°F

197.51°F

198.45°F

200.05°F



8420'

89.82°

272.46° 6792.87'

1632.46'

198.63°F

197.51°F

199.51°F

8500

8512'

89.78°

271.94° 6793.19'

1724.28'

200.21°F

202.60°F

202.60°F

8600

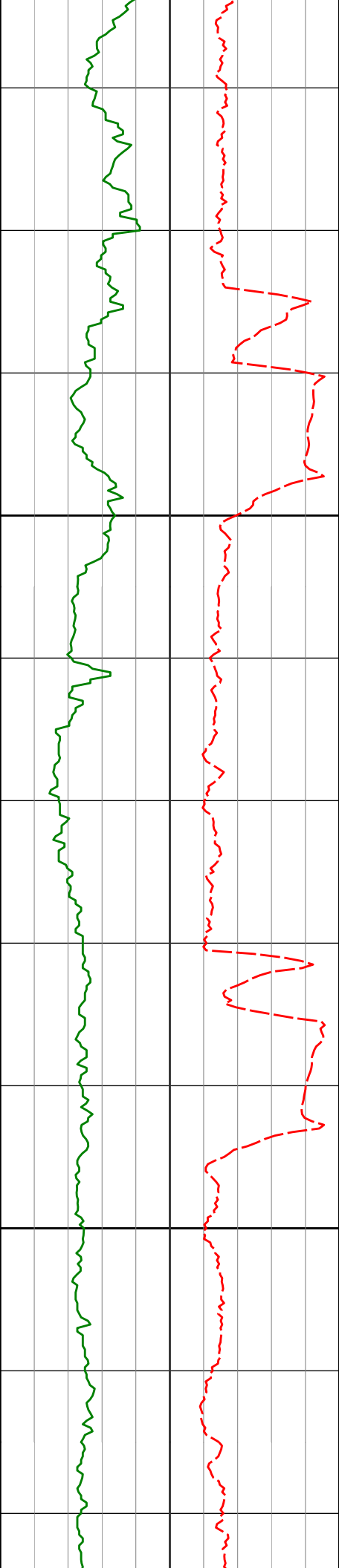
8603'

90.46°

272.03° 6792.99'

1815.13'

202.16°F



8700

8800

8695'

91.23°

271.36°

6791.64'

1906.99'

200.39°F

202.15°F

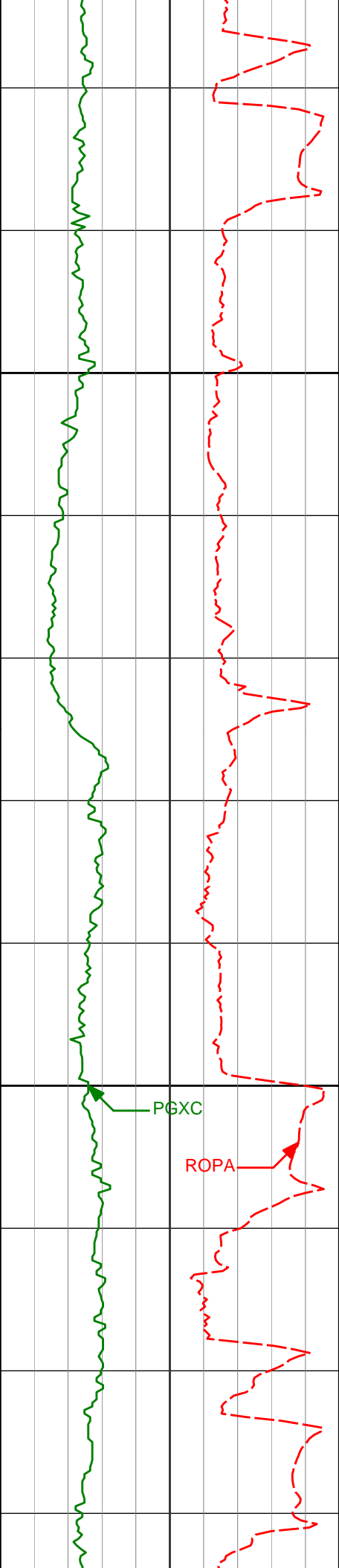
201.69°F

200.05°F

200.18°F

200.98°F

200.85°F



8900

9000

8879'

88.40°

270.96°

6792.23'

2090.79'

202.60°F

8972'

87.04°

270.96°

6795.94'

2183.64'

202.60°F

9063'

87.38°

267.10°

6800.37'

2274.51'

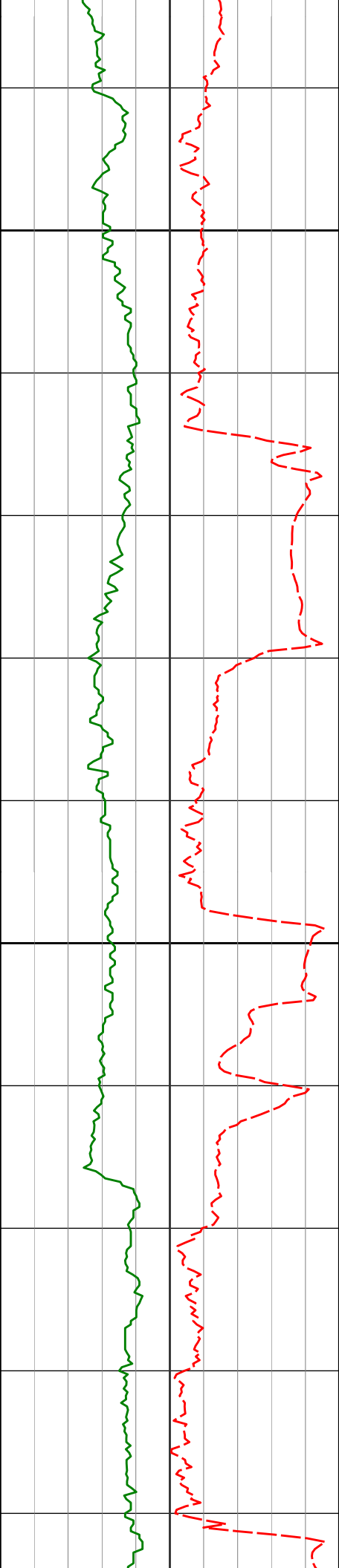
204.26°F

202.60°F

204.18°F

202.74°F

204.93°F



9100

9154'

88.18°

265.33° 6803.89'

2365.36'

9200

9246'

88.27°

263.91° 6806.74'

2457.08'

202.71°F

202.60°F

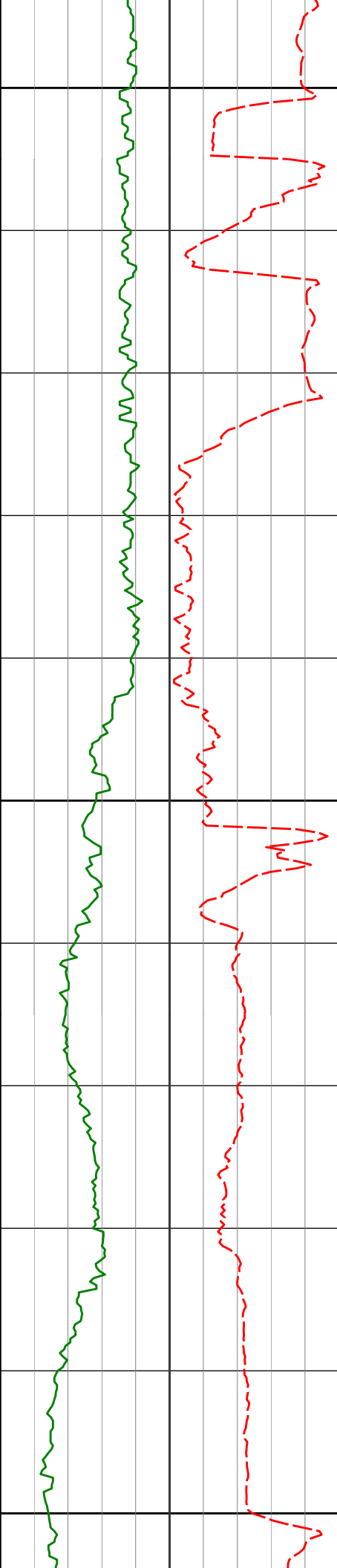
202.60°F

202.60°F

202.52°F

201.17°F

202.60°F



9300

9341'

9400

9435'

9500

91.48°

92.43°

267.20°

267.46°

6806.94'

6803.74'

2551.92'

2645.84'

202.60°F

202.94°F

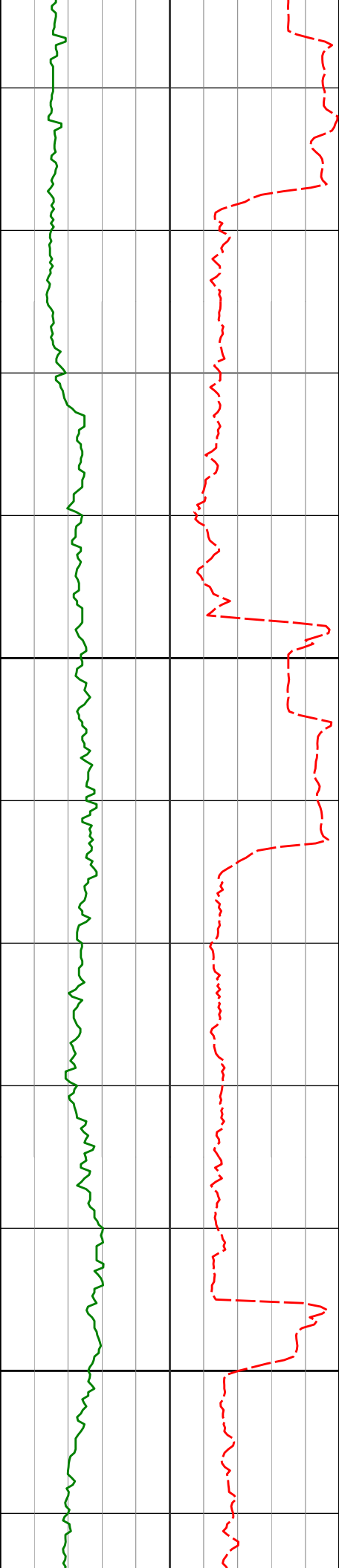
205.16°F

205.16°F

205.66°F

201.78°F

201.51°F



9600

9700

9530'

92.19°

267.96° 6799.91'

2740.75'

9625'

91.11°

269.08° 6797.18'

2835.71'

9719'

91.29°

268.53° 6795.21'

2929.68'

203.19°F

204.46°F

203.89°F

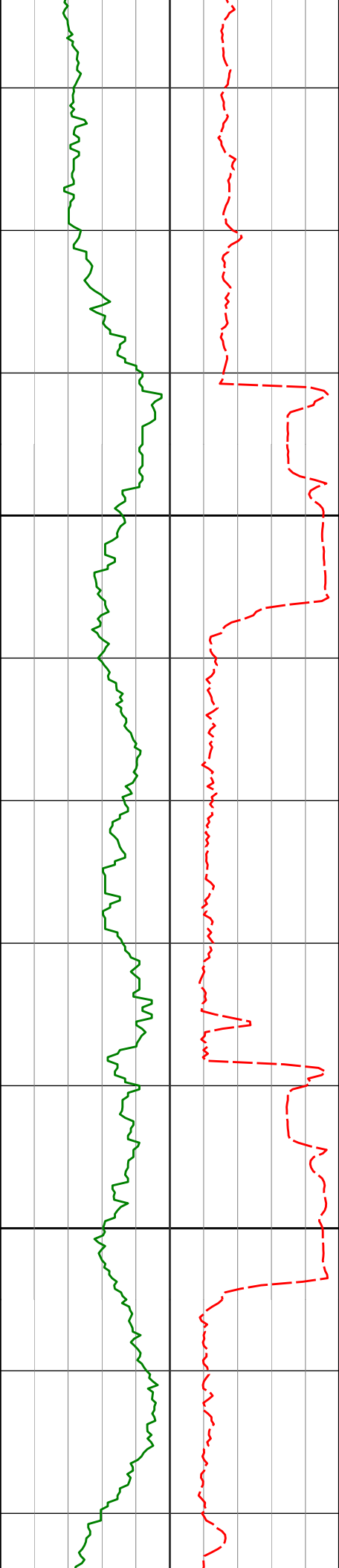
205.58°F

207.24°F

207.73°F

209.46°F

209.38°F



9800

9814'

91.70°

269.85° 6792.73'

3024.65'

9900

9909'

91.20°

270.83° 6790.33'

3119.57'

207.93°F

207.73°F

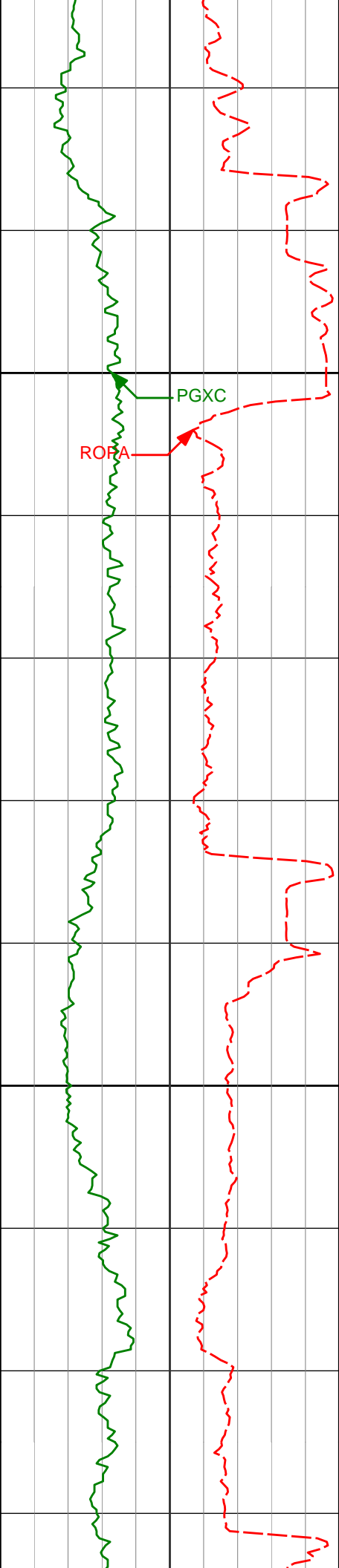
208.25°F

205.82°F

205.16°F

206.65°F

205.32°F



10000

10100

10004'

10098'

89.78°

90.55°

271.42° 6789.51'

271.46° 6789.23'

3214.48'

3308.37'

206.64°F

207.73°F

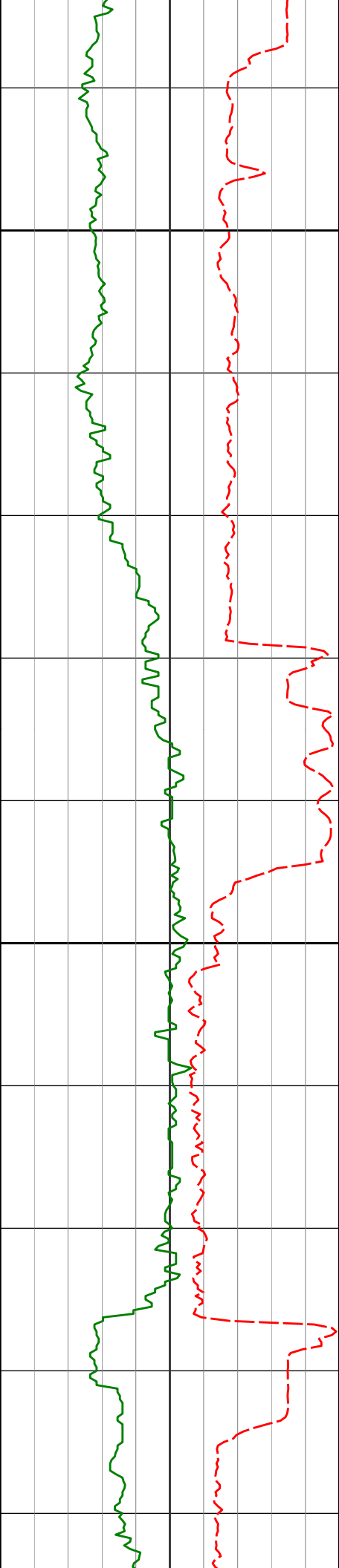
207.73°F

209.53°F

210.31°F

210.89°F

212.92°F



10200

10300

10287'

90.49°

271.93° 6787.50'

3497.09'

10382'

88.95°

269.97° 6787.96'

3592.01'

212.51°F

210.77°F

210.31°F

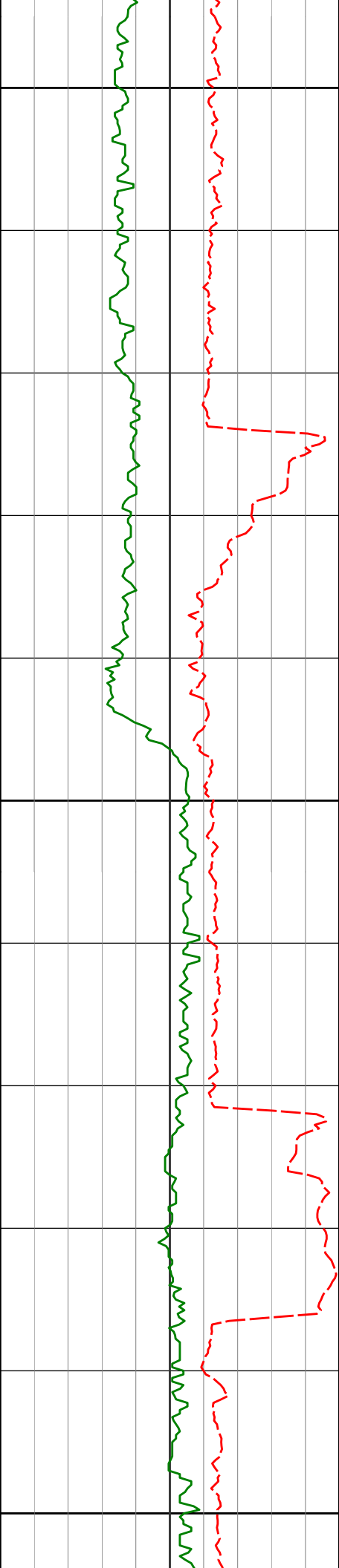
210.99°F

212.92°F

213.07°F

215.51°F

215.51°F



10400

215.51°F

217.71°F

216.59°F

10477'

88.24°

269.99° 6790.29'

3686.95'

10500

213.98°F

213.31°F

215.51°F

10571'

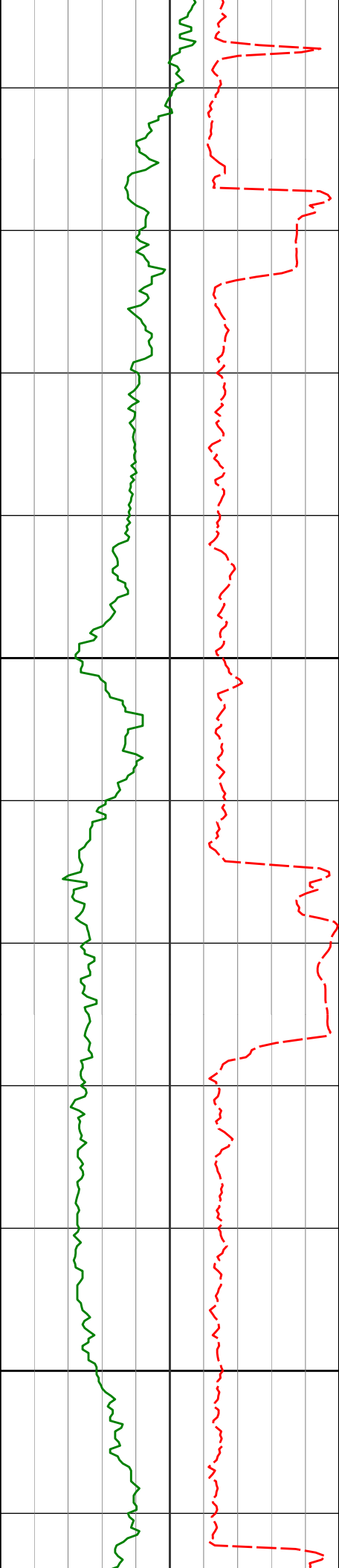
89.45°

270.98° 6792.18'

3780.88'

10600

215.51°F



10666'

91.14°

270.89°

6791.69'

3875.80'

10700

10761'

89.94°

270.53°

6790.80'

3970.73'

10800

217.90°F

215.03°F

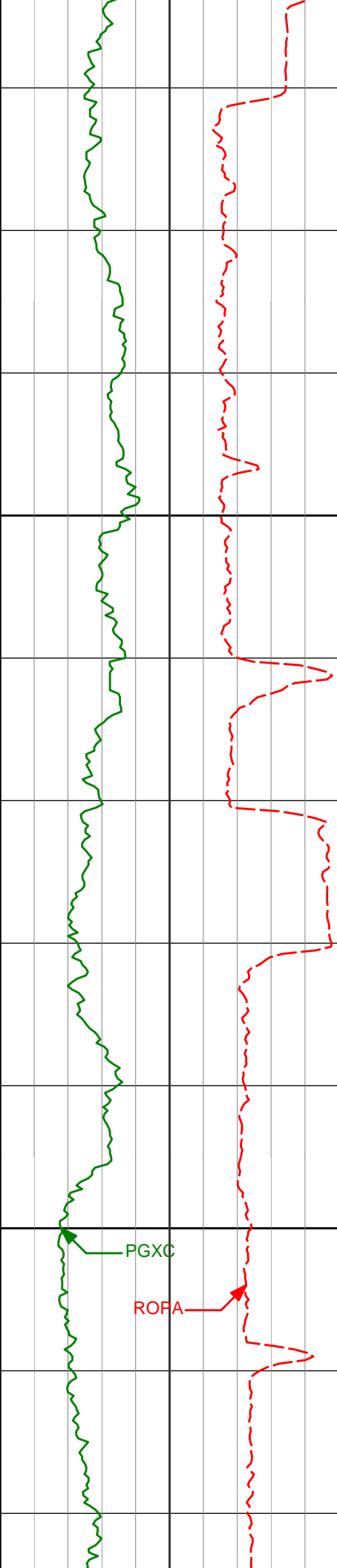
210.49°F

210.73°F

212.92°F

212.92°F

212.92°F



10900

11000

10855'

91.26°

270.98° 6789.81'

4064.66'

10950'

90.68°

271.39° 6788.21'

4159.55'

11045'

91.08°

271.89° 6786.75'

4254.41'

212.92°F

212.52°F

211.16°F

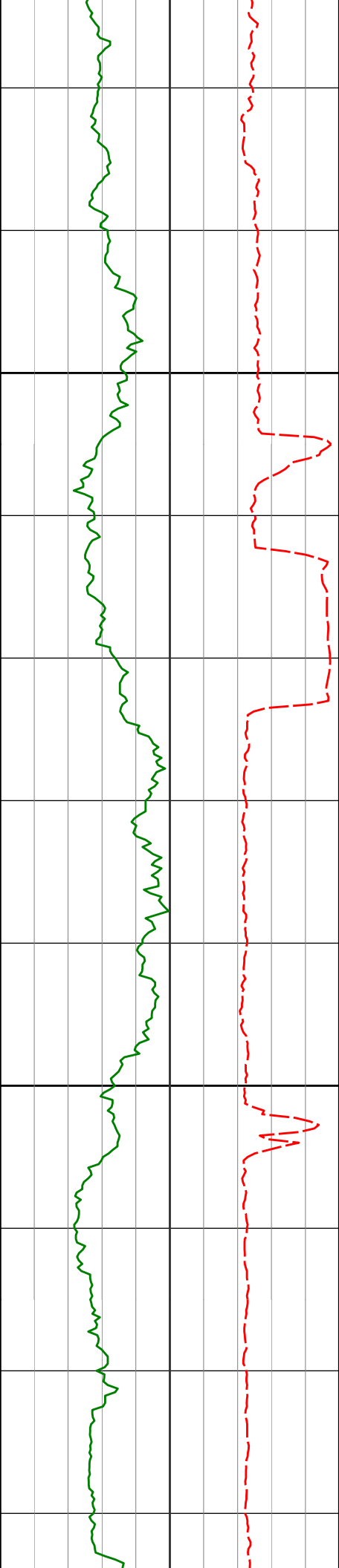
212.71°F

213.12°F

215.26°F

215.51°F

215.34°F



11100

11140'

11200

11234'

90.00°

90.25°

270.93° 6785.86'

271.17° 6785.65'

4349.30'

4443.21'

214.09°F

215.27°F

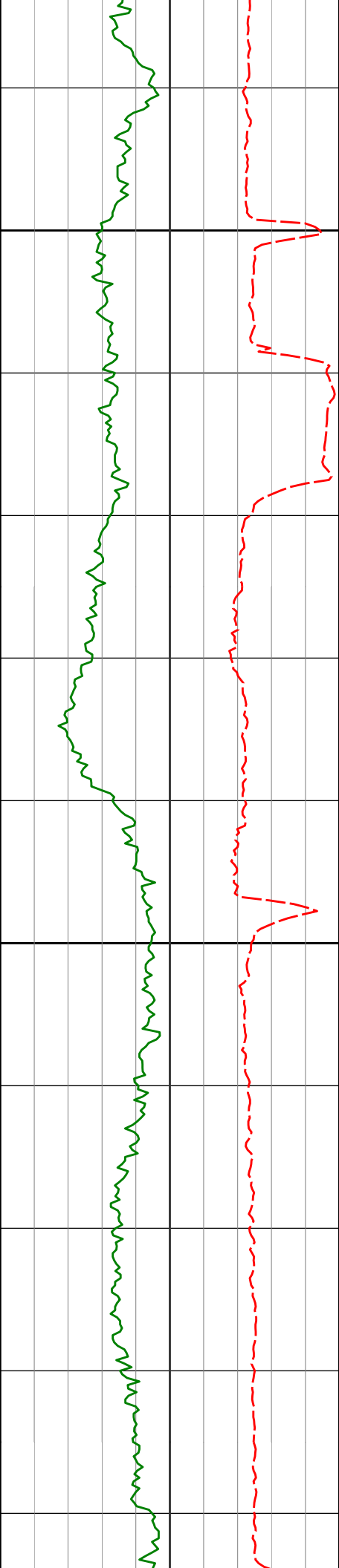
215.51°F

215.71°F

217.92°F

218.02°F

216.76°F



11300

11400

11329'

11423'

89.63°

89.66°

270.68°

270.21°

6785.76'

6786.34'

4538.14'

4632.09'

215.51°F

217.38°F

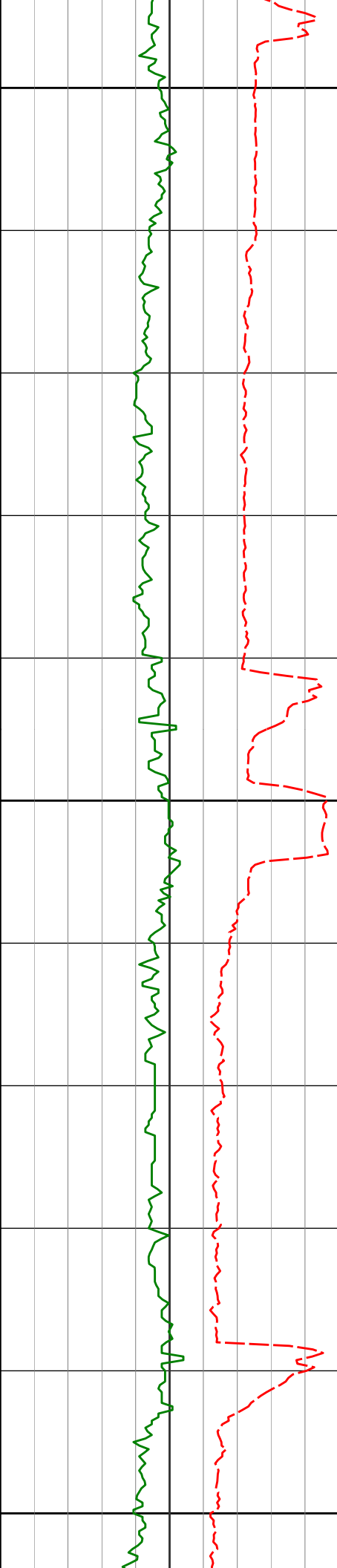
218.14°F

219.68°F

220.77°F

220.77°F

220.77°F



11500

11518'

90.46°

270.15°

6786.24'

4727.05'

221.32°F

220.77°F

221.03°F

11600

11612'

88.89°

270.16°

6786.77'

4821.02'

223.25°F

223.41°F

223.41°F

11700

11706'

90.43°

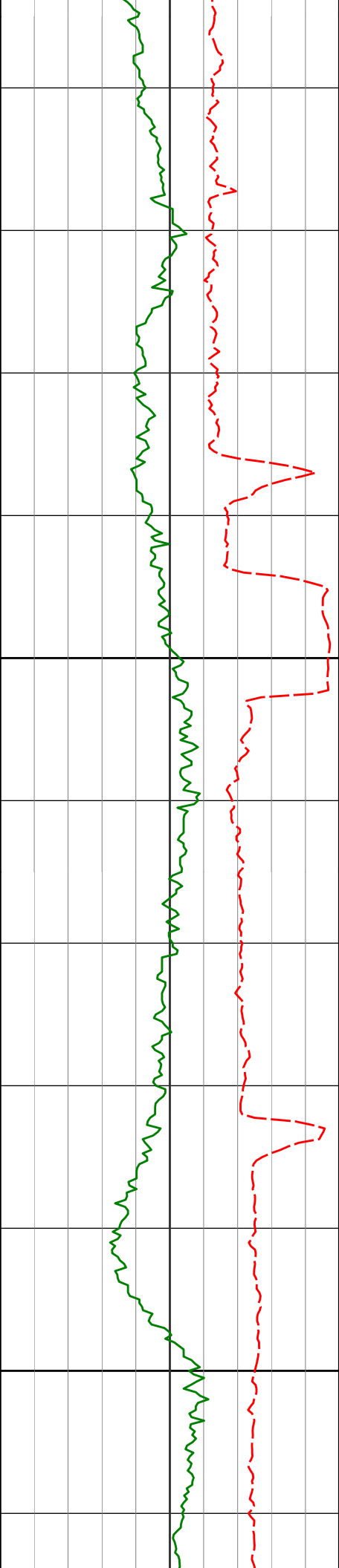
270.34°

6787.32'

4914.98'

222.45°F

221.09°F



11800

11801'

90.18°

271.10°

6786.81'

5009.91'

11900

11895'

90.83°

271.30°

6785.98'

5103.82'

221.17°F

220.77°F

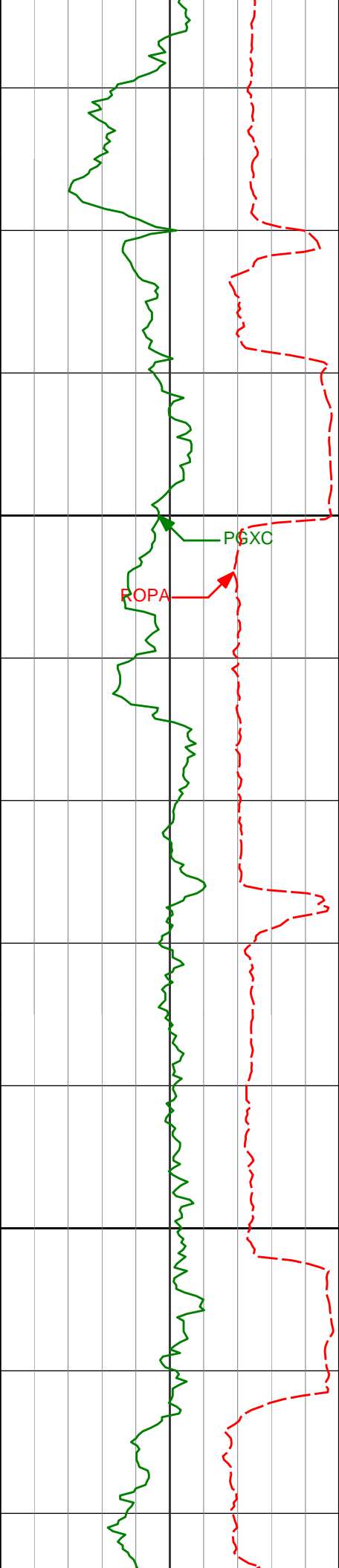
221.28°F

223.41°F

223.41°F

224.59°F

222.80°F



12000

12100

11989'

12084'

90.49°

91.26°

270.57°

270.13°

6784.89'

6783.43'

5197.73'

5292.68'

221.09°F

222.13°F

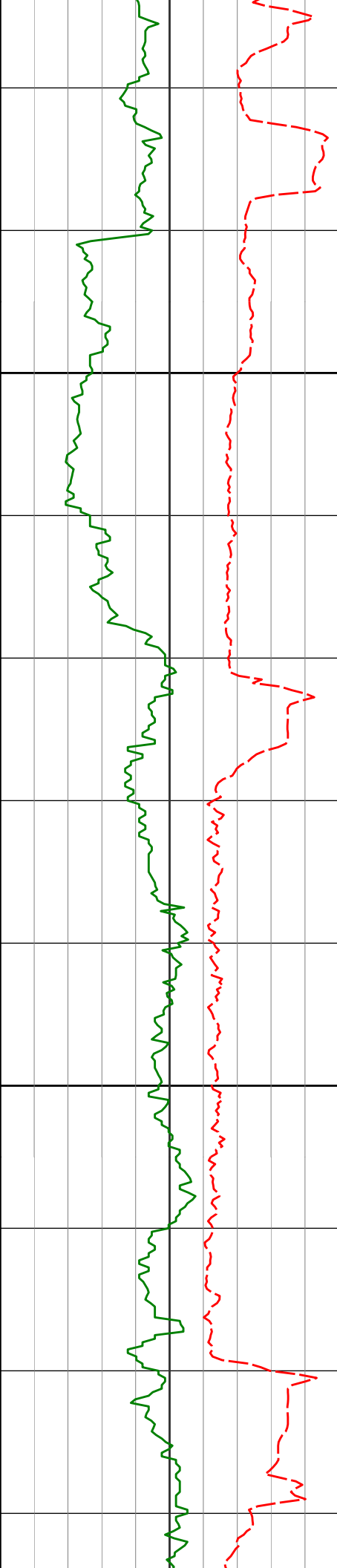
223.41°F

223.41°F

223.41°F

223.41°F

223.67°F



12200

12300

12179'

87.93°

270.68° 6784.10'

5387.62'

226.08°F

12273'

87.75°

270.33° 6787.64'

5481.50'

228.48°F

12269'

88.06°

270.24° 6791.11'

5576.40'

228.74°F

226.08°F

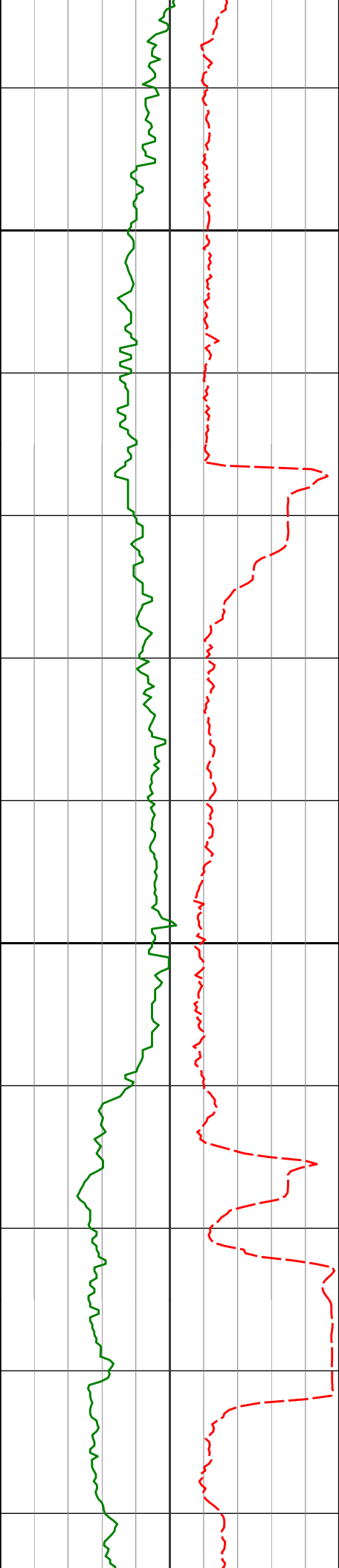
226.08°F

226.08°F

228.74°F

228.74°F

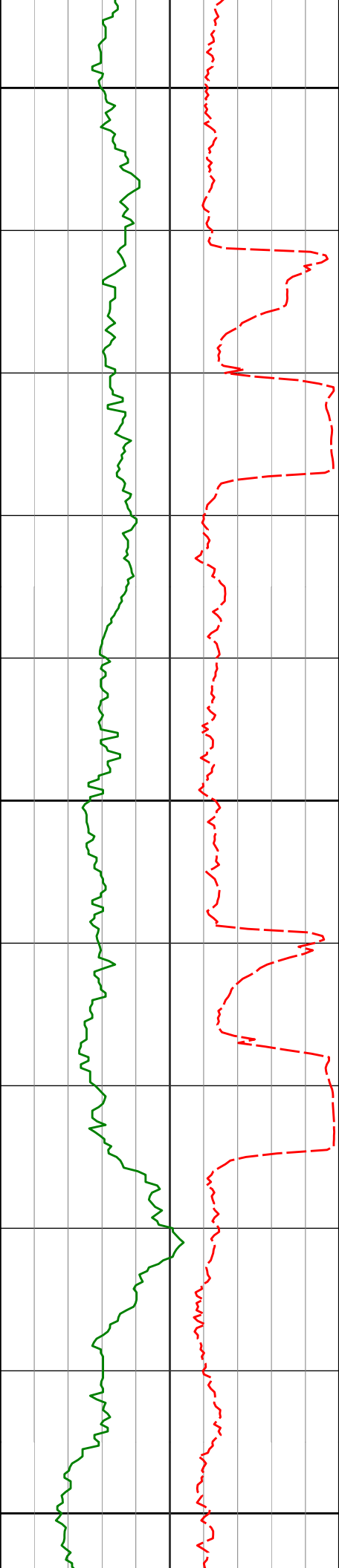
228.74°F



12400

12500

12368	88.06°	270.24°	6791.11'	5576.40'	
					228.74°F
					228.74°F
					227.43°F
12462'	87.47°	269.76°	6794.78'	5670.30'	
					225.83°F
					225.52°F
					226.08°F
12557'	89.57°	270.81°	6797.23'	5765.23'	
					225.82°F



12600

225.81°F

226.08°F

12651'

89.88°

269.74° 6797.69'

5859.18'

226.08°F

225.00°F

12700

225.76°F

12746'

91.57°

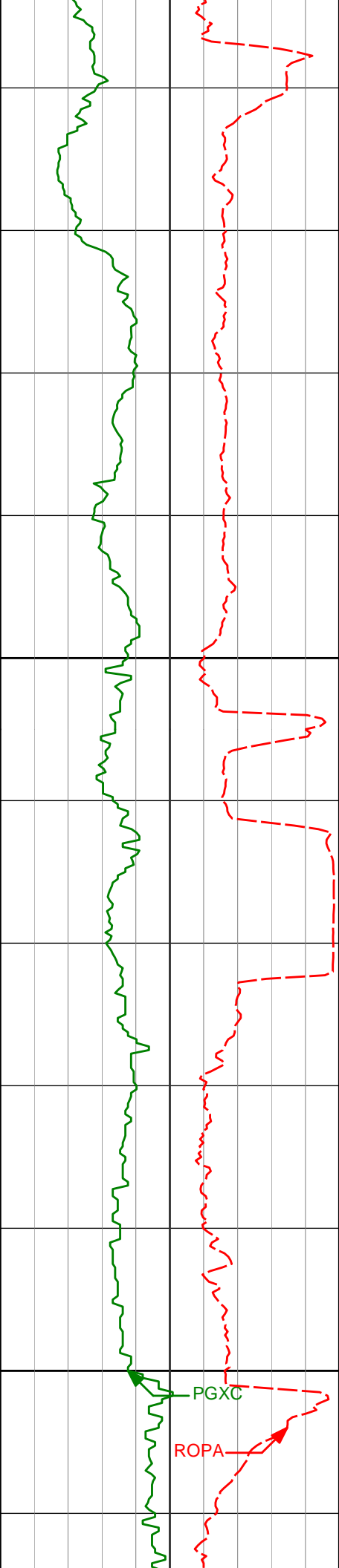
269.12° 6796.49'

5954.16'

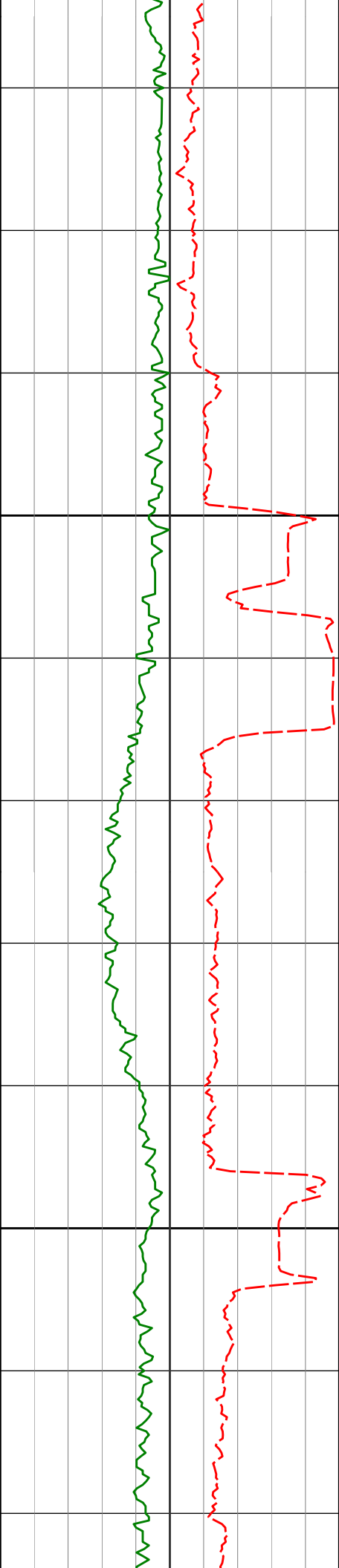
226.08°F

226.08°F

12800



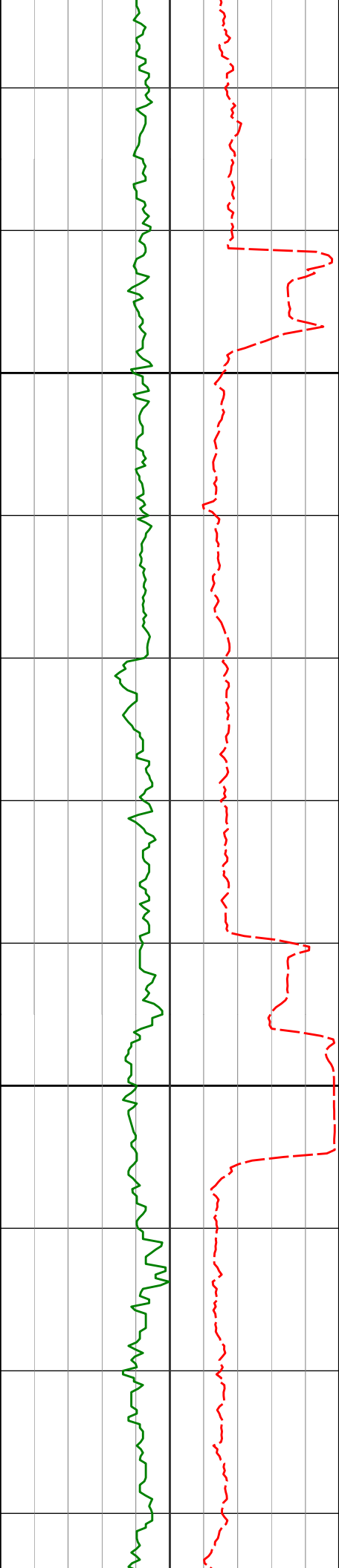
					226.08°F
12840'	92.59°	268.95°	6793.07'	6048.10'	224.06°F
					221.75°F
12900					220.77°F
					221.17°F
12935'	91.48°	270.70°	6789.70'	6143.01'	
					223.41°F
					223.41°F
13000					
					222.96°F



13100

13200

13029'	89.63°	267.80°	6788.79'	6236.99'	
					221.31°F
					220.77°F
					221.05°F
13124'	89.75°	269.73°	6789.30'	6331.98'	
					223.21°F
					225.19°F
					226.08°F
13218'	90.46°	269.99°	6789.13'	6425.96'	
					226.08°F



13300

13313'

88.55°

267.11°

6789.94'

6520.94'

226.08°F

226.73°F

224.88°F

223.58°F

223.81°F

13400

13407'

89.91°

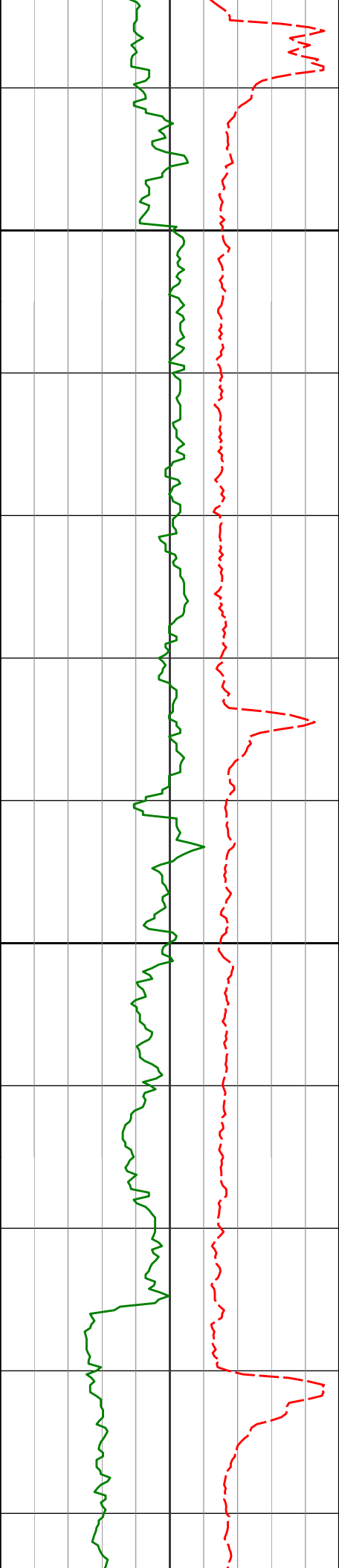
268.10°

6791.21'

6614.92'

226.08°F

226.08°F



13500

13502'

89.51°

267.79°

6791.69'

6709.91'

228.74°F

228.74°F

228.92°F

231.25°F

13600

13597'

89.17°

267.89°

6792.79'

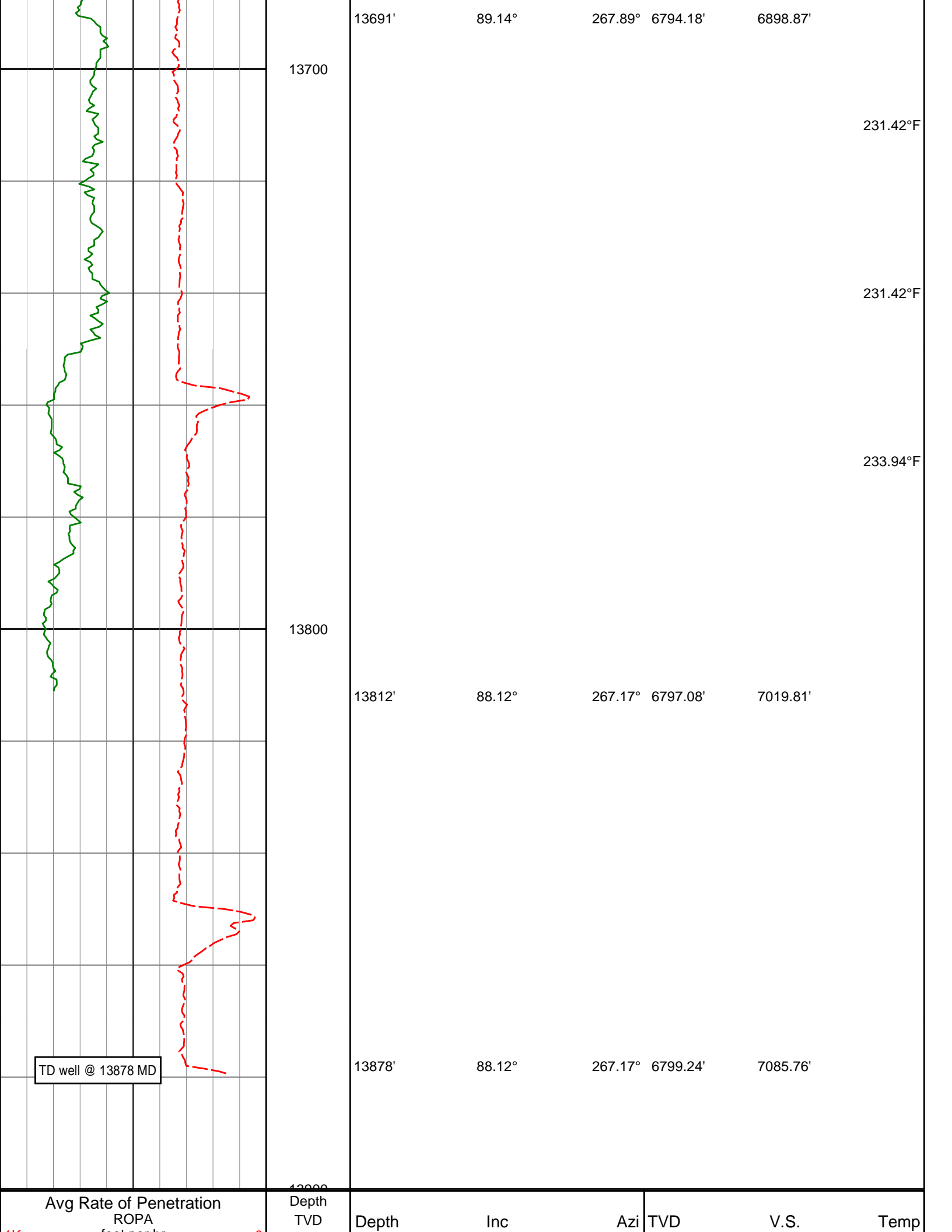
6804.89'

231.42°F

231.42°F

231.42°F

227.70°F



feet per hr	0	ft	
PCG GR XHi-Range RT BCor PGXRC-T api	300		

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AA11-676
Wattenberg
Weld Colorado
USA
CA-XX-0902421171
Tied in @ Surface

Final survey projected to bit.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
731.00	0.16	18.64	731.00	0.95 N	0.32 E	-0.34	0.02
917.00	0.07	231.67	917.00	1.12 N	0.31 E	-0.34	0.12
1008.00	0.61	178.81	1008.00	0.61 N	0.28 E	-0.30	0.62
1101.00	0.74	182.94	1100.99	0.48 S	0.26 E	-0.25	0.15
1302.00	0.62	199.29	1301.98	2.81 S	0.17 W	0.23	0.11
1394.00	0.83	219.11	1393.97	3.80 S	0.75 W	0.84	0.35
1486.00	0.79	207.01	1485.96	4.89 S	1.46 W	1.58	0.19
1579.00	0.73	206.25	1578.95	5.99 S	2.02 W	2.16	0.06
1671.00	0.61	207.58	1670.95	6.96 S	2.51 W	2.67	0.14
1763.00	0.55	206.53	1762.94	7.78 S	2.93 W	3.11	0.07
1855.00	3.41	157.10	1854.88	10.70 S	2.06 W	2.31	3.35
1946.00	5.31	140.14	1945.62	16.42 S	1.69 E	-1.30	2.50
2038.00	6.59	127.03	2037.12	22.87 S	8.63 E	-8.09	2.03
2129.00	8.43	126.81	2127.34	30.02 S	18.15 E	-17.44	2.02
2221.00	8.52	126.07	2218.33	38.07 S	29.06 E	-28.16	0.15
2313.00	8.39	126.12	2309.33	46.04 S	39.99 E	-38.90	0.15
2405.00	8.42	126.10	2400.34	53.97 S	50.86 E	-49.57	0.03
2497.00	8.17	126.56	2491.38	61.83 S	61.54 E	-60.07	0.28
2589.00	7.91	126.57	2582.48	69.50 S	71.88 E	-70.22	0.28
2680.00	7.89	127.34	2672.61	77.02 S	81.88 E	-80.04	0.12
2772.00	7.75	127.22	2763.76	84.60 S	91.84 E	-89.82	0.15
2867.00	7.25	126.42	2857.94	92.03 S	101.76 E	-99.57	0.54
2961.00	7.29	124.76	2951.19	98.96 S	111.44 E	-109.08	0.23
3056.00	7.11	122.00	3045.44	105.51 S	121.38 E	-118.86	0.41
3151.00	7.08	119.83	3139.71	111.54 S	131.44 E	-128.78	0.28
3246.00	6.99	117.67	3234.00	117.13 S	141.64 E	-138.84	0.29
3340.00	8.35	130.82	3327.16	124.25 S	151.87 E	-148.90	2.35
3435.00	8.07	128.21	3421.19	132.89 S	162.33 E	-159.15	0.49
3530.00	7.41	130.89	3515.32	141.03 S	172.20 E	-168.83	0.79
3624.00	6.82	130.72	3608.60	148.64 S	181.02 E	-177.47	0.63
3719.00	6.49	130.70	3702.96	155.82 S	189.37 E	-185.64	0.34
3814.00	6.50	130.56	3797.35	162.82 S	197.52 E	-193.63	0.02
3908.00	6.51	129.99	3890.74	169.70 S	205.65 E	-201.59	0.07
4003.00	6.67	129.46	3985.11	176.68 S	214.04 E	-209.82	0.18
4097.00	5.60	140.51	4078.57	183.69 S	221.18 E	-216.79	1.69
4192.00	4.50	119.22	4173.21	189.09 S	227.38 E	-222.86	2.27
4287.00	2.41	111.59	4268.04	191.64 S	232.49 E	-227.91	2.25
4382.00	1.21	45.53	4362.99	191.68 S	235.06 E	-230.48	2.33
4571.00	1.02	53.52	4551.96	189.28 S	237.83 E	-233.31	0.13
4666.00	0.97	55.26	4646.94	188.33 S	239.17 E	-234.66	0.06
4761.00	0.79	45.76	4741.93	187.41 S	240.29 E	-235.81	0.24
4855.00	0.91	44.91	4835.92	186.44 S	241.28 E	-236.82	0.13
4950.00	1.11	43.88	4930.91	185.24 S	242.45 E	-238.02	0.21
5045.00	0.43	167.88	5025.90	184.92 S	243.17 E	-238.74	1.47

5140.00	0.53	162.93	5120.90	185.69 S	243.37 E	-238.93	0.11
5235.00	0.71	262.80	5215.90	186.18 S	242.92 E	-238.46	1.00
5329.00	0.18	255.85	5309.89	186.29 S	242.20 E	-237.74	0.56
5424.00	1.52	223.39	5404.88	187.24 S	241.19 E	-236.71	1.44
5519.00	1.21	214.61	5499.85	188.98 S	239.76 E	-235.24	0.39
5614.00	0.95	221.27	5594.84	190.40 S	238.67 E	-234.11	0.31
5709.00	0.84	219.64	5689.83	191.53 S	237.70 E	-233.12	0.12
5804.00	0.90	196.18	5784.81	192.78 S	237.05 E	-232.44	0.38
5898.00	1.66	213.34	5878.79	194.62 S	236.10 E	-231.45	0.90
5993.00	1.74	194.88	5973.75	197.17 S	234.97 E	-230.26	0.58
6088.00	2.53	214.11	6068.68	200.31 S	233.42 E	-228.64	1.11
6182.00	3.23	237.08	6162.57	203.46 S	230.03 E	-225.18	1.42
6229.00	8.24	260.71	6209.32	204.73 S	225.59 E	-220.71	11.57
6277.00	10.87	265.07	6256.65	205.67 S	217.69 E	-212.78	5.67
6324.00	12.76	266.77	6302.66	206.34 S	208.09 E	-203.17	4.10
6372.00	15.89	267.53	6349.16	206.93 S	196.23 E	-191.30	6.54
6466.00	21.07	270.16	6438.28	207.43 S	166.46 E	-161.52	5.58
6513.00	23.89	273.09	6481.71	206.90 S	148.50 E	-143.58	6.46
6561.00	26.20	270.38	6525.19	206.30 S	128.19 E	-123.30	5.37
6616.00	29.27	264.27	6573.88	207.57 S	102.66 E	-97.74	7.60
6655.00	34.57	264.05	6606.97	209.67 S	82.16 E	-77.19	13.59
6750.00	50.74	271.05	6676.64	211.80 S	18.12 E	-13.12	17.72
6797.00	59.37	271.74	6703.54	210.85 S	20.36 W	25.33	18.40
6845.00	68.93	271.07	6724.44	209.81 S	63.50 W	68.42	19.95
6892.00	71.32	271.08	6740.42	208.98 S	107.69 W	112.58	5.09
6939.00	71.89	270.81	6755.25	208.24 S	152.28 W	157.14	1.33
6986.00	76.01	269.44	6768.24	208.15 S	197.44 W	202.28	9.20
7033.00	80.09	269.70	6777.97	208.49 S	243.41 W	248.25	8.70
7080.00	83.15	270.21	6784.82	208.53 S	289.90 W	294.73	6.60
7105.00	84.82	271.22	6787.44	208.22 S	314.76 W	319.58	7.80
7213.00	87.53	271.23	6794.64	205.92 S	422.48 W	427.22	2.51
7308.00	89.82	271.82	6796.84	203.39 S	517.42 W	522.07	2.48
7403.00	89.63	271.40	6797.30	200.72 S	612.38 W	616.94	0.49
7498.00	89.23	270.80	6798.24	198.90 S	707.36 W	711.85	0.76
7593.00	90.22	271.01	6798.70	197.41 S	802.34 W	806.77	1.06
7685.00	91.26	272.77	6797.52	194.37 S	894.28 W	898.61	2.23
7776.00	89.85	272.00	6796.63	190.58 S	985.19 W	989.41	1.77
7868.00	90.40	271.63	6796.44	187.66 S	1077.15 W	1081.27	0.73
7961.00	90.99	271.50	6795.31	185.12 S	1170.10 W	1174.14	0.65
8054.00	91.73	271.19	6793.11	182.93 S	1263.05 W	1267.01	0.86
8238.00	89.54	271.54	6791.08	178.56 S	1446.98 W	1450.78	1.20
8329.00	89.20	271.97	6792.08	175.77 S	1537.93 W	1541.64	0.61
8420.00	89.82	272.46	6792.87	172.25 S	1628.86 W	1632.46	0.86
8512.00	89.78	271.94	6793.19	168.71 S	1720.79 W	1724.28	0.56
8603.00	90.46	272.03	6792.99	165.56 S	1811.73 W	1815.13	0.75
8695.00	91.23	271.36	6791.64	162.84 S	1903.68 W	1906.99	1.11
8879.00	88.40	270.96	6792.23	159.11 S	2087.62 W	2090.79	1.55
8972.00	87.04	270.96	6795.94	157.56 S	2180.53 W	2183.64	1.46
9063.00	87.38	267.10	6800.37	159.10 S	2271.39 W	2274.51	4.25
9154.00	88.18	265.33	6803.89	165.11 S	2362.12 W	2365.36	2.14
9246.00	88.27	263.91	6806.74	173.73 S	2453.67 W	2457.08	1.54
9341.00	91.48	267.20	6806.94	181.09 S	2548.36 W	2551.92	4.84
9435.00	92.43	267.46	6803.74	185.47 S	2642.20 W	2645.84	1.05
9530.00	92.19	267.96	6799.91	189.26 S	2737.05 W	2740.75	0.59
9625.00	91.11	269.08	6797.18	191.71 S	2831.97 W	2835.71	1.64
9719.00	91.29	268.53	6795.21	193.67 S	2925.93 W	2929.68	0.62
9814.00	91.70	269.85	6792.73	195.02 S	3020.89 W	3024.65	1.45
9909.00	91.20	270.83	6790.33	194.46 S	3115.86 W	3119.57	1.15
10004.00	89.78	271.42	6789.51	192.59 S	3210.83 W	3214.48	1.62
10098.00	90.55	271.46	6789.23	190.24 S	3304.80 W	3308.37	0.82
10287.00	90.49	271.93	6787.50	184.65 S	3493.71 W	3497.09	0.25
10382.00	88.95	269.97	6787.96	183.08 S	3588.69 W	3592.01	2.62
10477.00	88.24	269.99	6790.29	183.11 S	3683.66 W	3686.95	0.75
10571.00	89.45	270.98	6792.18	182.32 S	3777.63 W	3780.88	1.66
10666.00	91.14	270.89	6791.69	180.77 S	3872.62 W	3875.80	1.79
10761.00	89.94	270.53	6790.80	179.59 S	3967.60 W	3970.73	1.32
10855.00	91.26	270.98	6789.81	178.35 S	4061.59 W	4064.66	1.49
10950.00	90.68	271.39	6788.21	176.39 S	4156.55 W	4159.55	0.75
11045.00	91.08	271.89	6786.75	173.67 S	4251.50 W	4254.41	0.67
11140.00	90.00	270.93	6785.86	171.33 S	4346.47 W	4349.30	1.52

11234.00	90.25	271.17	6785.65	169.60 S	4440.45 W	4443.21	0.36
11329.00	89.63	270.68	6785.76	168.07 S	4535.44 W	4538.14	0.83
11423.00	89.66	270.21	6786.34	167.34 S	4629.43 W	4632.09	0.50
11518.00	90.46	270.15	6786.24	167.04 S	4724.43 W	4727.05	0.85
11612.00	88.89	270.16	6786.77	166.79 S	4818.43 W	4821.02	1.67
11706.00	90.43	270.34	6787.32	166.37 S	4912.42 W	4914.98	1.65
11801.00	90.18	271.10	6786.81	165.18 S	5007.41 W	5009.91	0.83
11895.00	90.83	271.30	6785.98	163.21 S	5101.39 W	5103.82	0.72
11989.00	90.49	270.57	6784.89	161.67 S	5195.37 W	5197.73	0.85
12084.00	91.26	270.13	6783.43	161.09 S	5290.35 W	5292.68	0.94
12179.00	87.93	270.68	6784.10	160.42 S	5385.33 W	5387.62	3.55
12273.00	87.75	270.33	6787.64	159.60 S	5479.26 W	5481.50	0.42
12368.00	88.06	270.24	6791.11	159.12 S	5574.20 W	5576.40	0.34
12462.00	87.47	269.76	6794.78	159.11 S	5668.13 W	5670.30	0.81
12557.00	89.57	270.81	6797.23	158.65 S	5763.09 W	5765.23	2.47
12651.00	89.88	269.74	6797.69	158.20 S	5857.08 W	5859.18	1.18
12746.00	91.57	269.12	6796.49	159.14 S	5952.07 W	5954.16	1.90
12840.00	92.59	268.95	6793.07	160.72 S	6045.99 W	6048.10	1.10
12935.00	91.48	270.70	6789.70	161.01 S	6140.93 W	6143.01	2.18
13029.00	89.63	267.80	6788.79	162.23 S	6234.90 W	6236.99	3.66
13124.00	89.75	269.73	6789.30	164.28 S	6329.87 W	6331.98	2.03
13218.00	90.46	269.99	6789.13	164.51 S	6423.87 W	6425.96	0.80
13313.00	88.55	267.11	6789.94	166.92 S	6518.82 W	6520.94	3.64
13407.00	89.91	268.10	6791.21	170.85 S	6612.73 W	6614.92	1.79
13502.00	89.51	267.79	6791.69	174.26 S	6707.66 W	6709.91	0.53
13597.00	89.17	267.89	6792.79	177.84 S	6802.59 W	6804.89	0.37
13691.00	89.14	267.89	6794.18	181.31 S	6896.52 W	6898.87	0.03
13812.00	88.12	267.17	6797.08	186.52 S	7017.37 W	7019.81	1.03
13878.00	88.12	267.17	6799.24	189.78 S	7083.25 W	7085.76	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 268.65 DEGREES (GRID)
A TOTAL CORRECTION OF 7.65 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 13878.00 FEET
IS 7085.79 FEET ALONG 268.47 DEGREES (GRID)**