



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	07-Jun-15	09-Jun-15			
Rig Bit Number	2	3			
Bit Size (in)	8.75	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	616.00	7,089.00			
Log End Depth (MD, ft)	7,089.00	13,872.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	05-Jun-15 22:30	07-Jun-15 22:00			
Drill/Wipe End Date and Time	07-Jun-15 20:30	09-Jun-15 08:00			
Min Inc (deg) @ Depth (MD, ft)	0.37 @ 1,668.00	87.04 @ 10,720.00			
Max Inc (deg) @ Depth (MD, ft)	86.48 @ 7,023.00	93.02 @ 11,761.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.98 / PDC			
Flow Rate (gpm)	586.49	325.66			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	8.90 / 27.00	9.10 / 31.00			
Filtrate CL (ppm)	1,600.00	2,700.00			
pH / Fluid Loss (mptm)	9.80 / 32	8.00 / 8			
PV (cP) / YP (lhf2)	2 / 2.00	7 / 9.00			
% Solids / % Sand	10.7 / 0.70	4 / 0.10			
% Oil / Oil:Water Ratio	0.00 / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (degF) @ Depth (MD, ft)	107.07 @ 7,023.00	224.50 @ 11,761.00			

Max Tool Temp (degF) / Source	167.97 / PCM	234.50 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Brian Neu	Brian Neu			
Customer Representative	JW Ewrin	JW Ewrin			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404299	11675316			
Insert Serial Number	11680801	11680742			
Date and Time Initialized	05-Jun-15 13:39	06-Jun-15 22:39			
Date and Time Read	07-Jun-15 02:37	09-Jun-15 17:57			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	63.00	68.00			
Software Version	6.21	6.33			
Sub Serial Number	11404299	11675316			
Sonde Serial Number	11833212	11062074			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	320.20	339.90			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	56.11	61.45			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404299	11675316			
Insert/Sonde Serial Number	11579761	11579811			

REMARKS

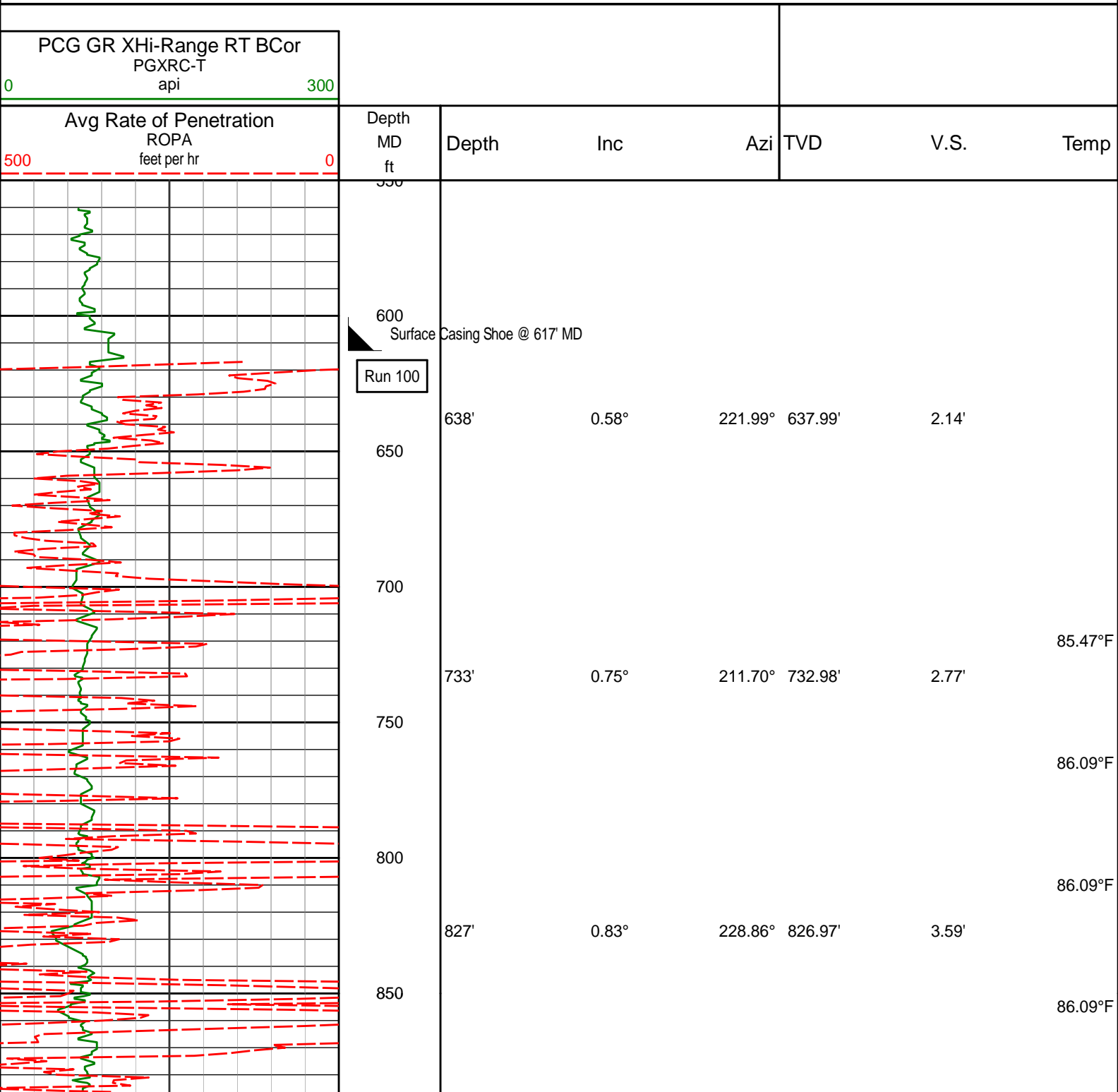
1. All depths are calibrated to driller's pipe tally and are total vertical depth from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Environmental parameters used in gamma and resistance processing:
Hole Size: 6.125"
Mud Density: 9.9-10.3
5. The following smoothing parameters have been applied to the data:
Interval: 0.5 ft
Coercion Distance: 1.2 ft (ROPA)
Interval: 0.5 ft
Coercion Distance: 0.6 ft (Gamma Ray)

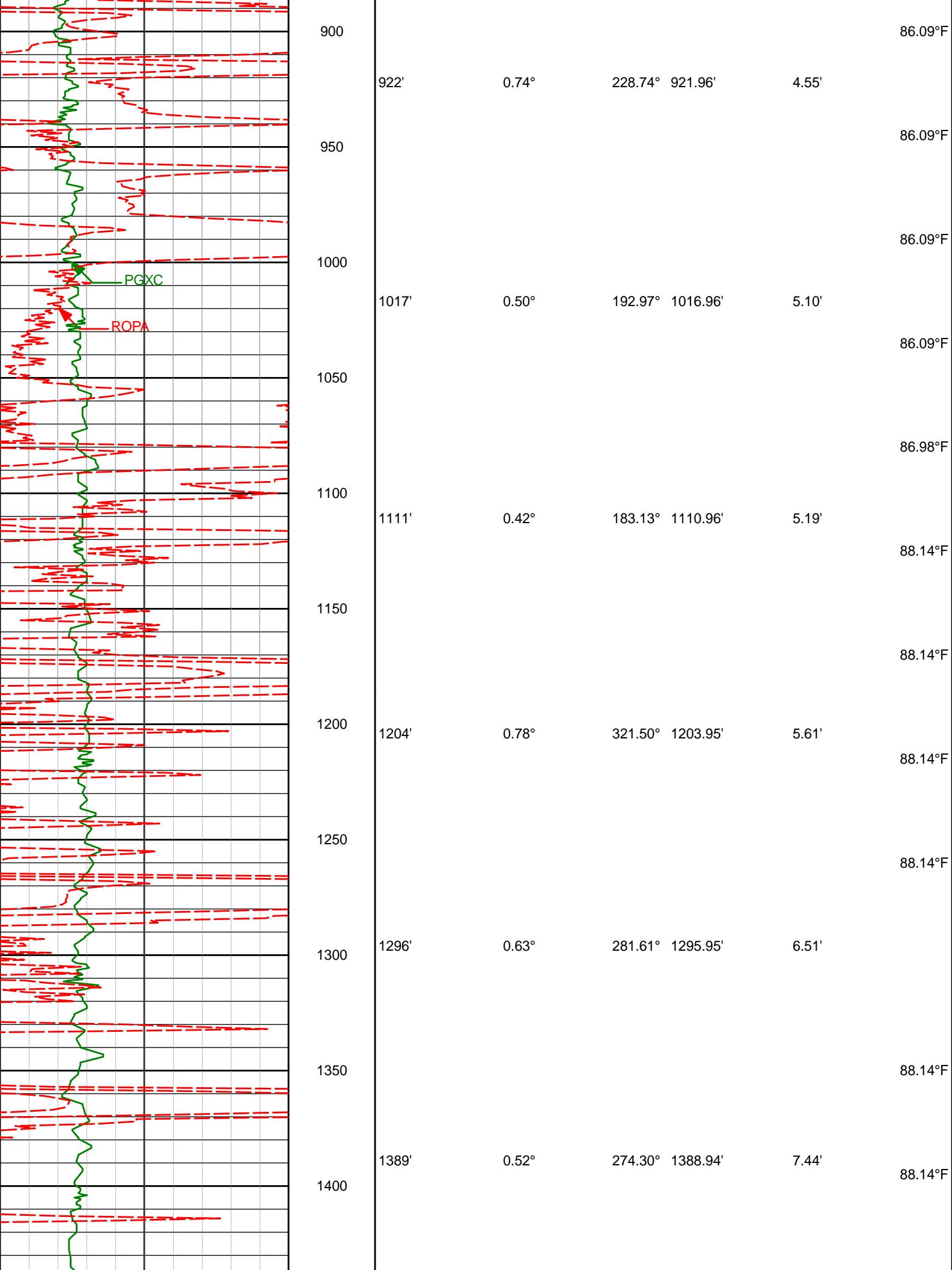
WARRANTY

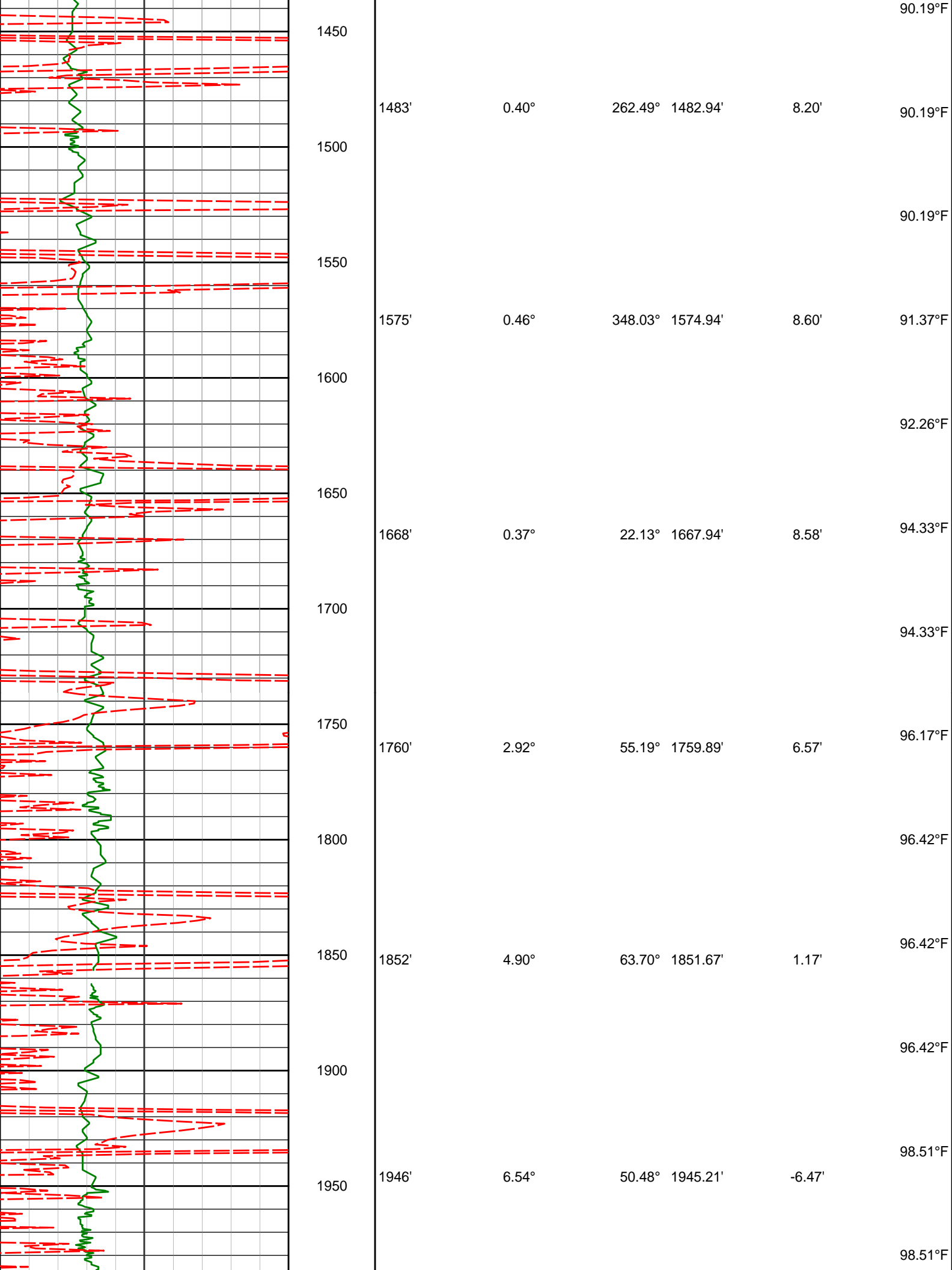
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MD Detail 1:600 Scale

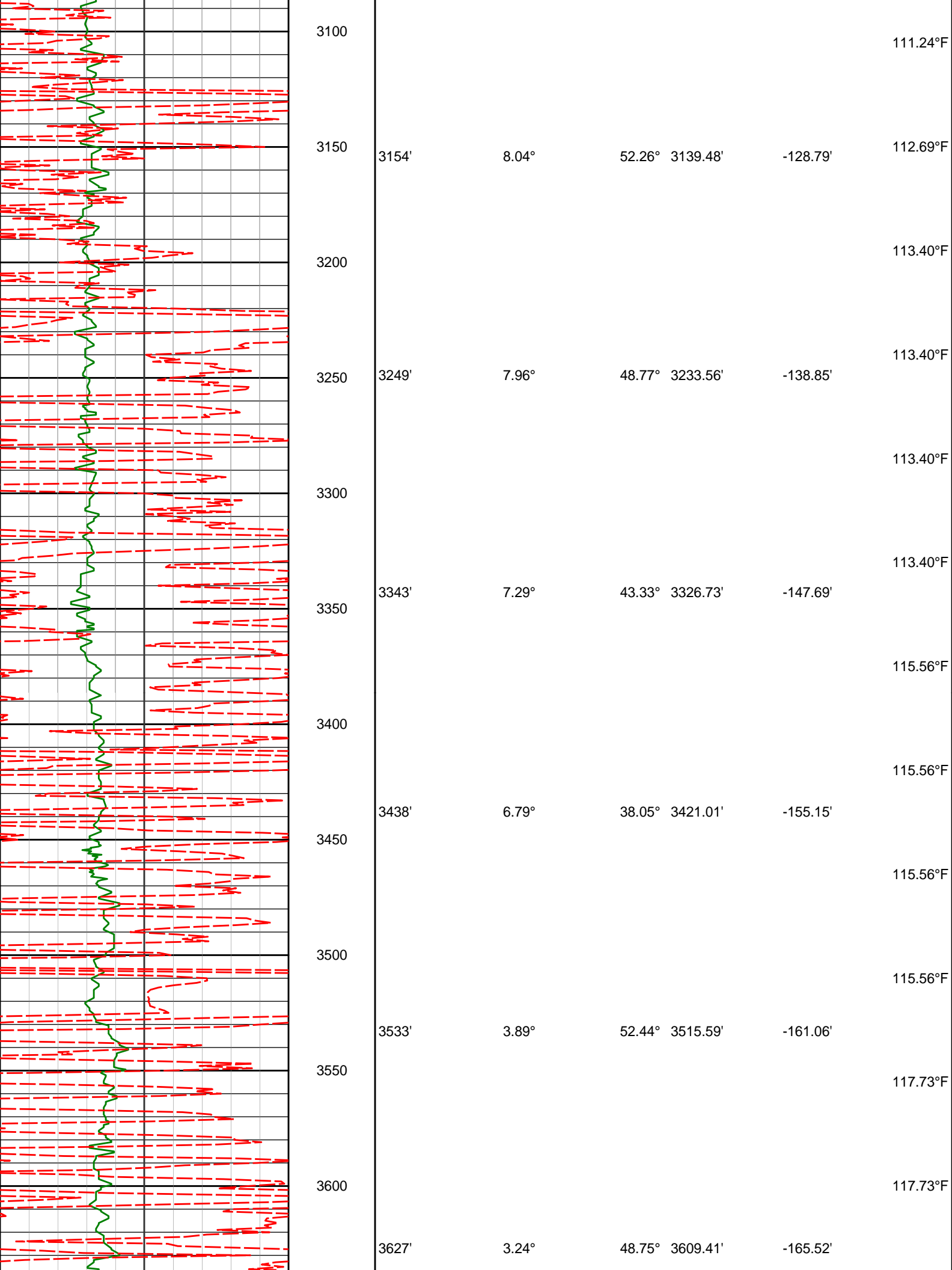




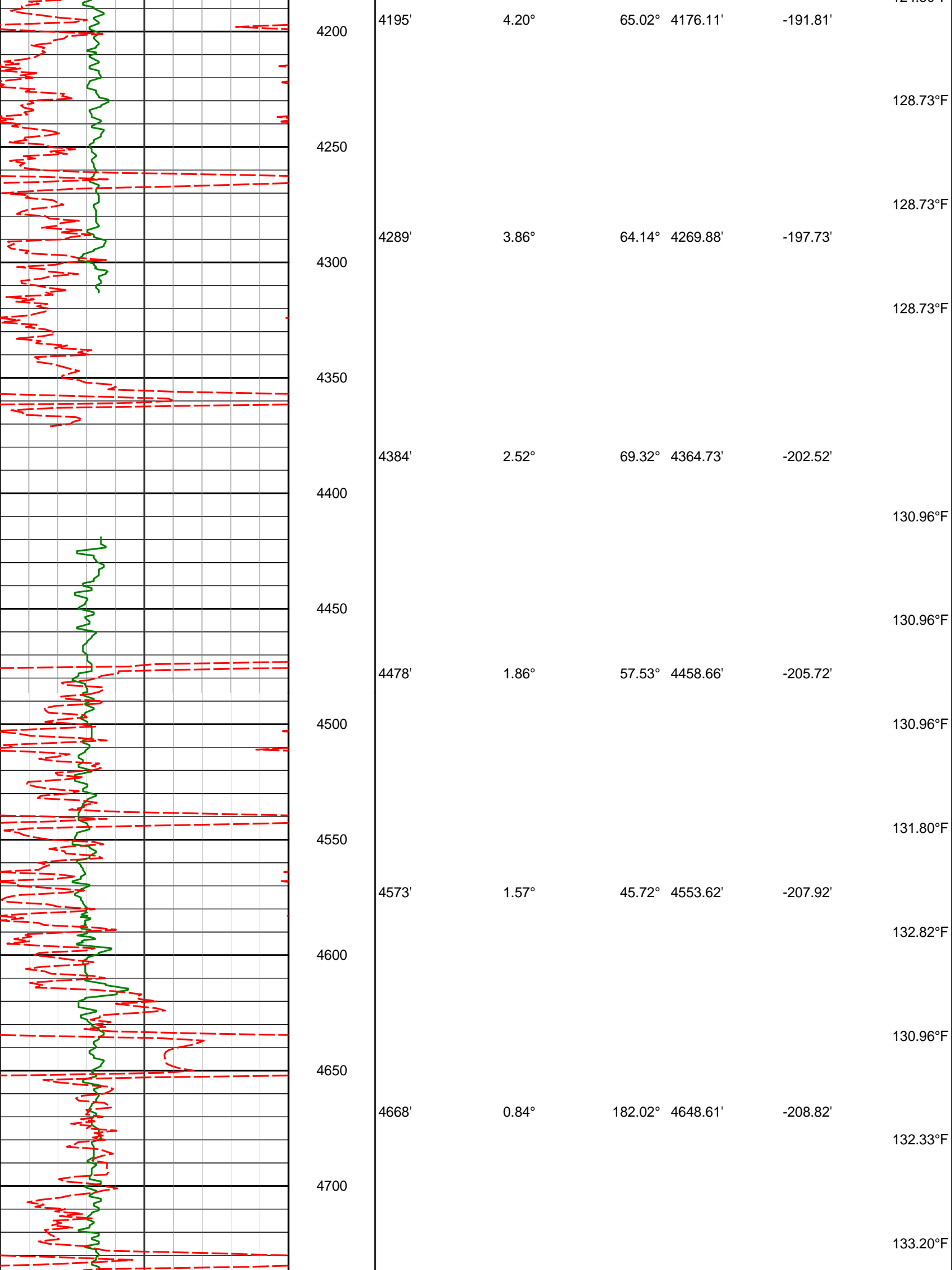


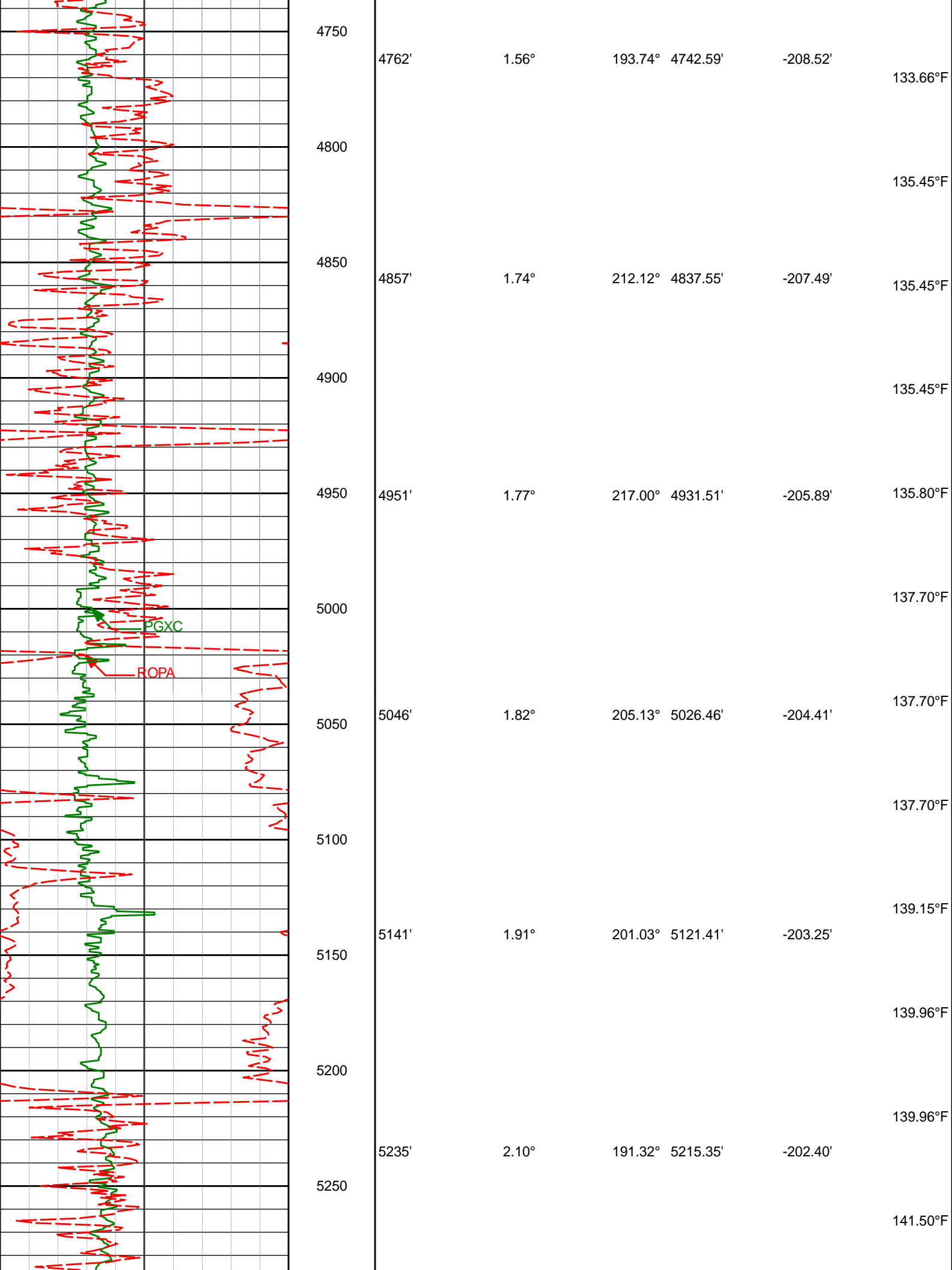


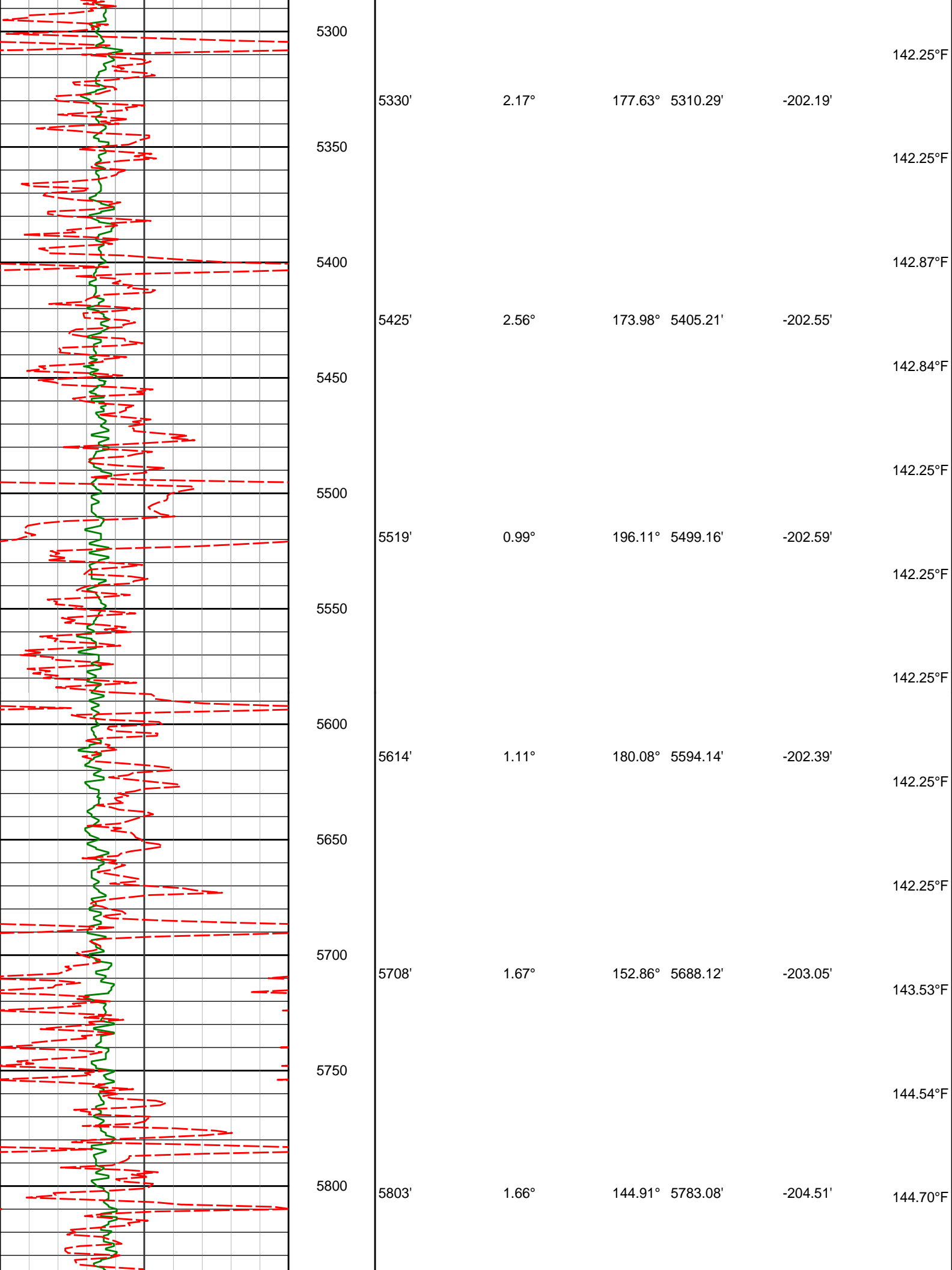


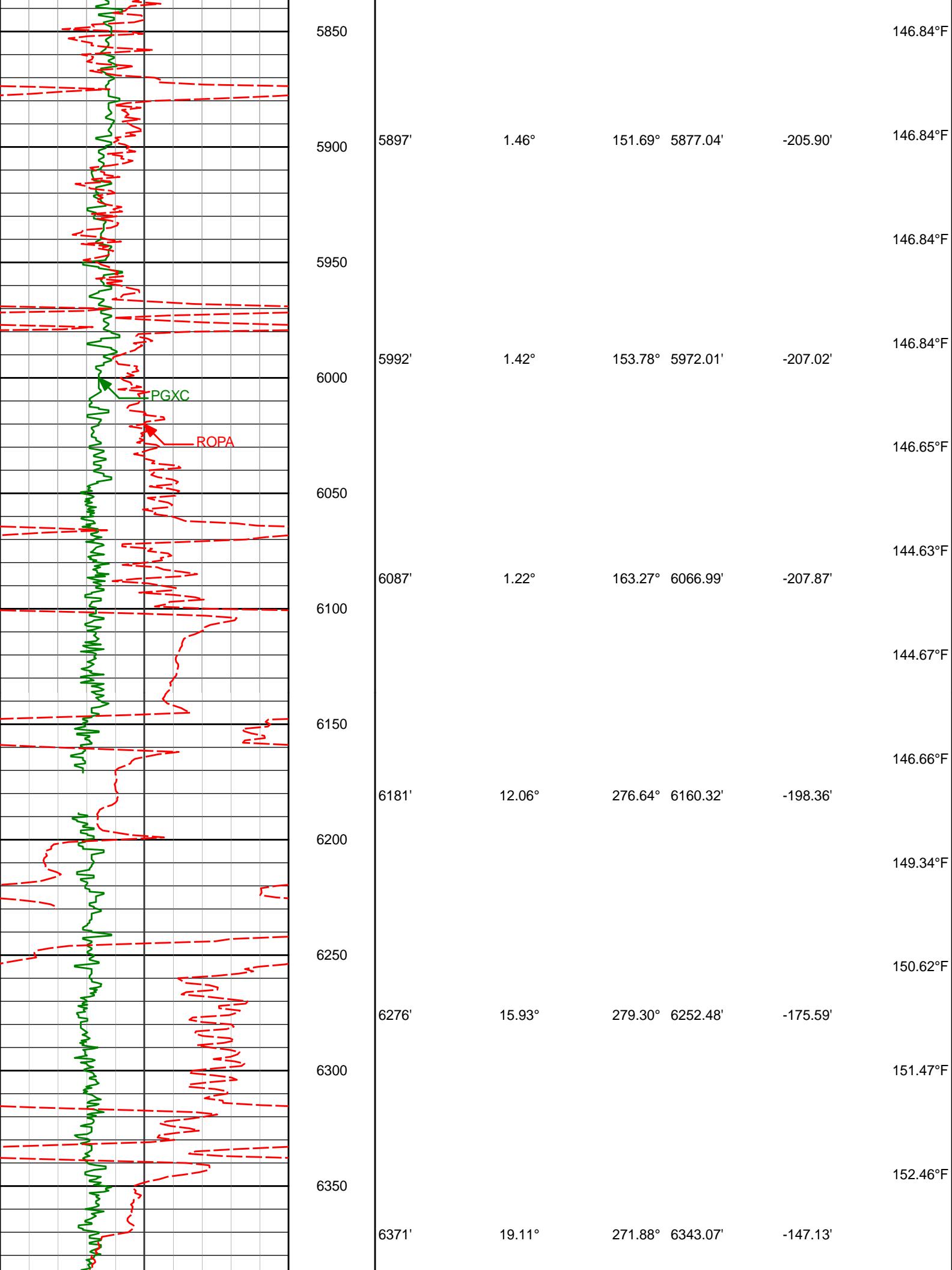


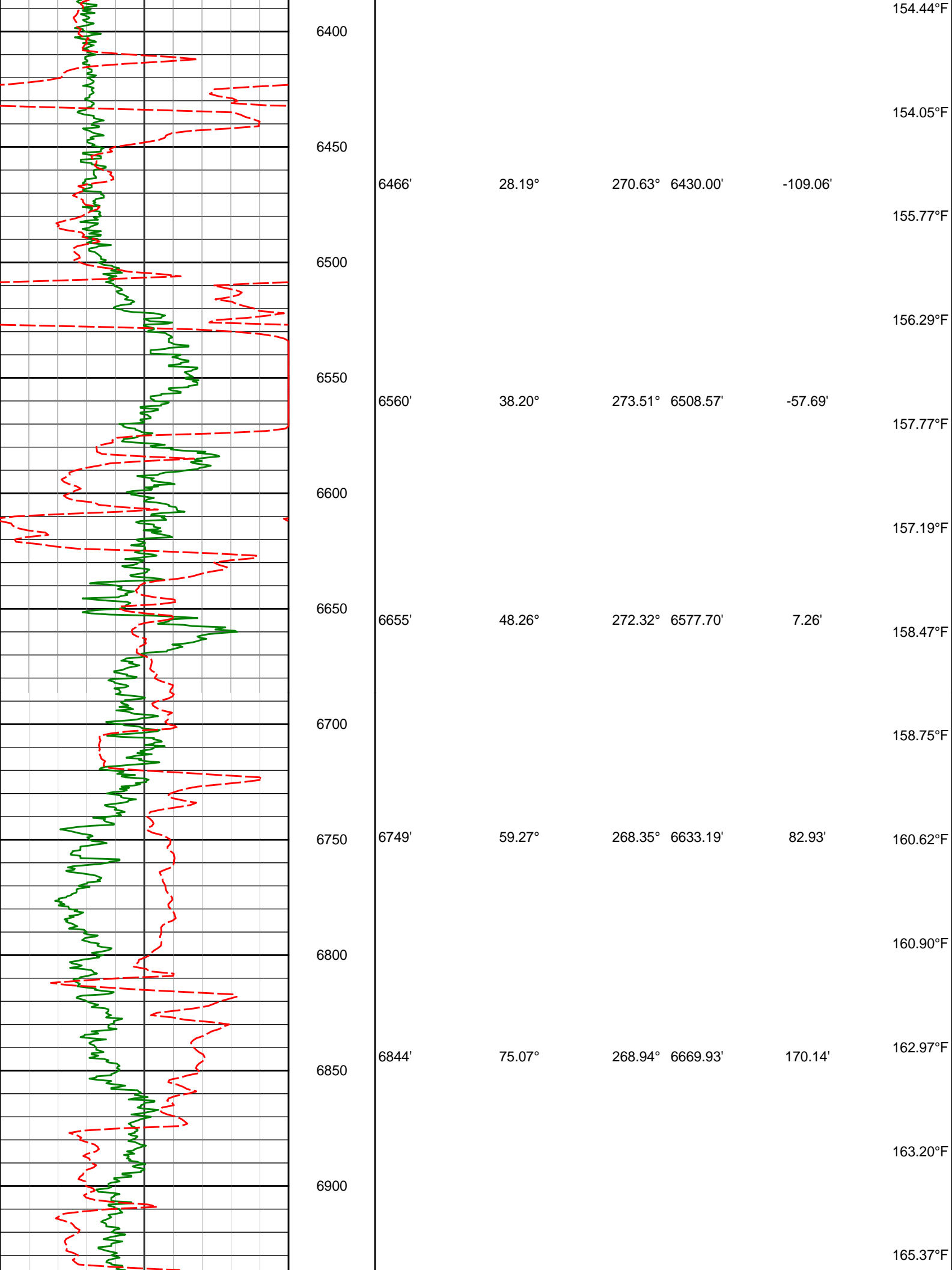


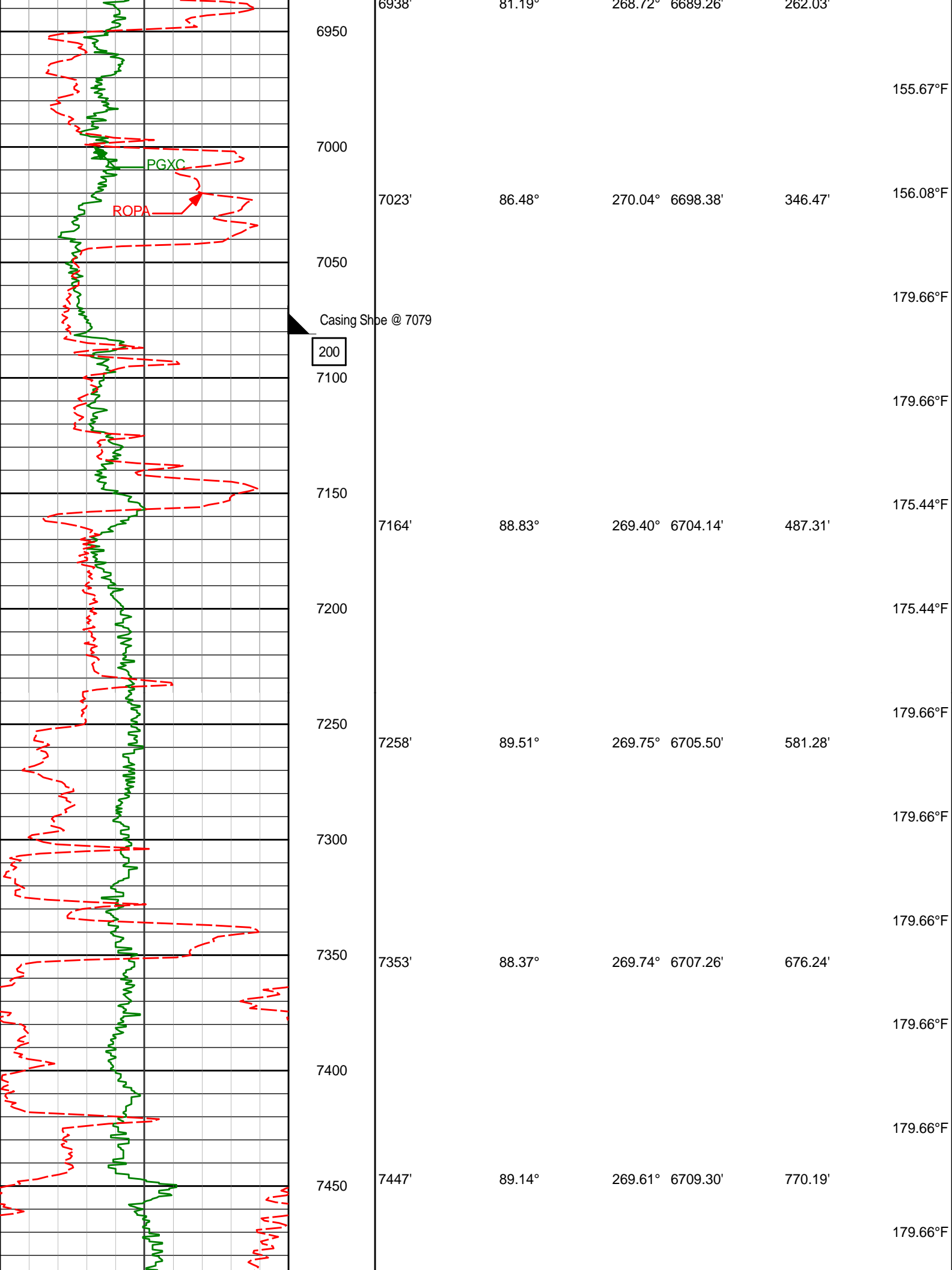


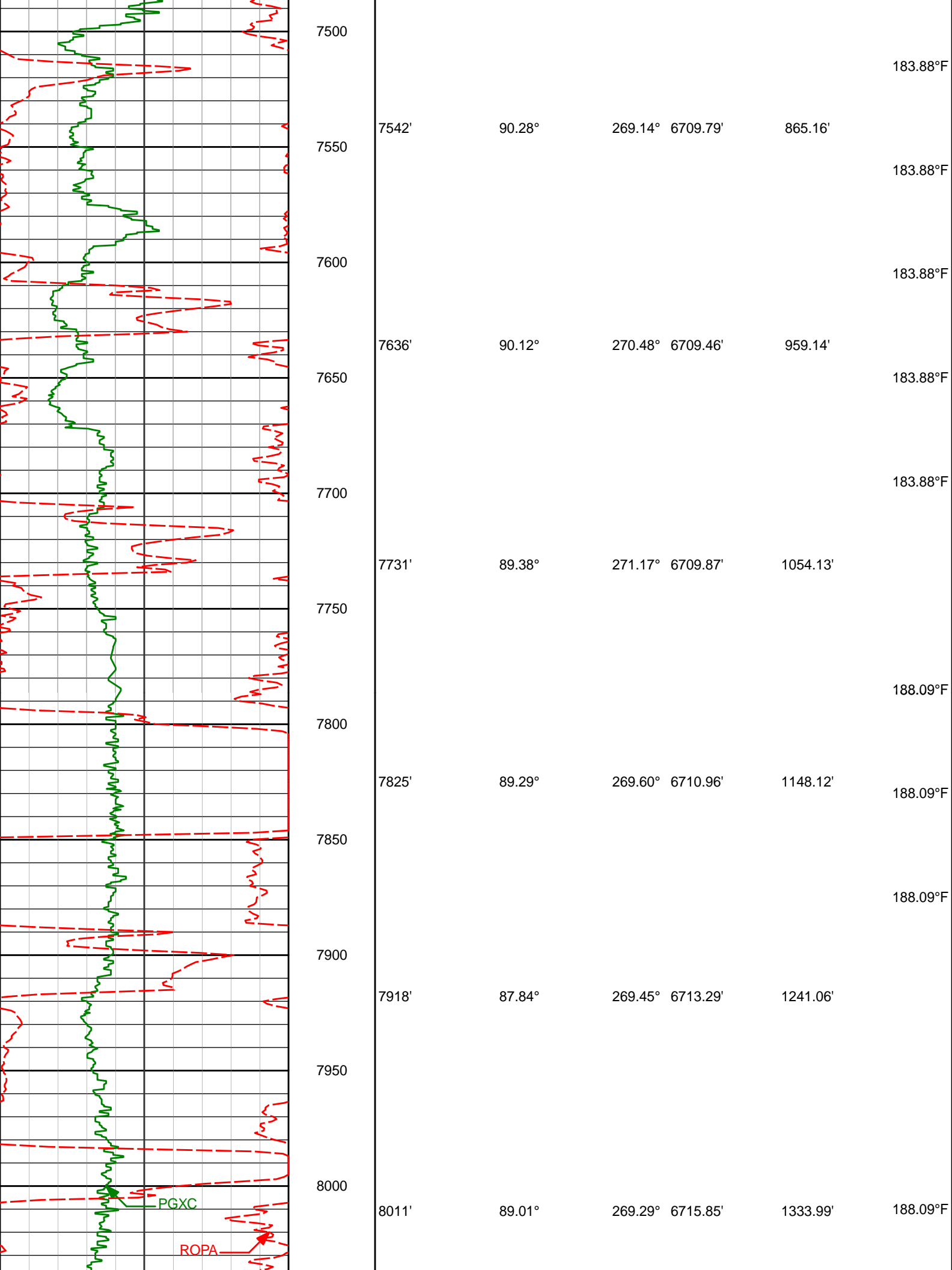


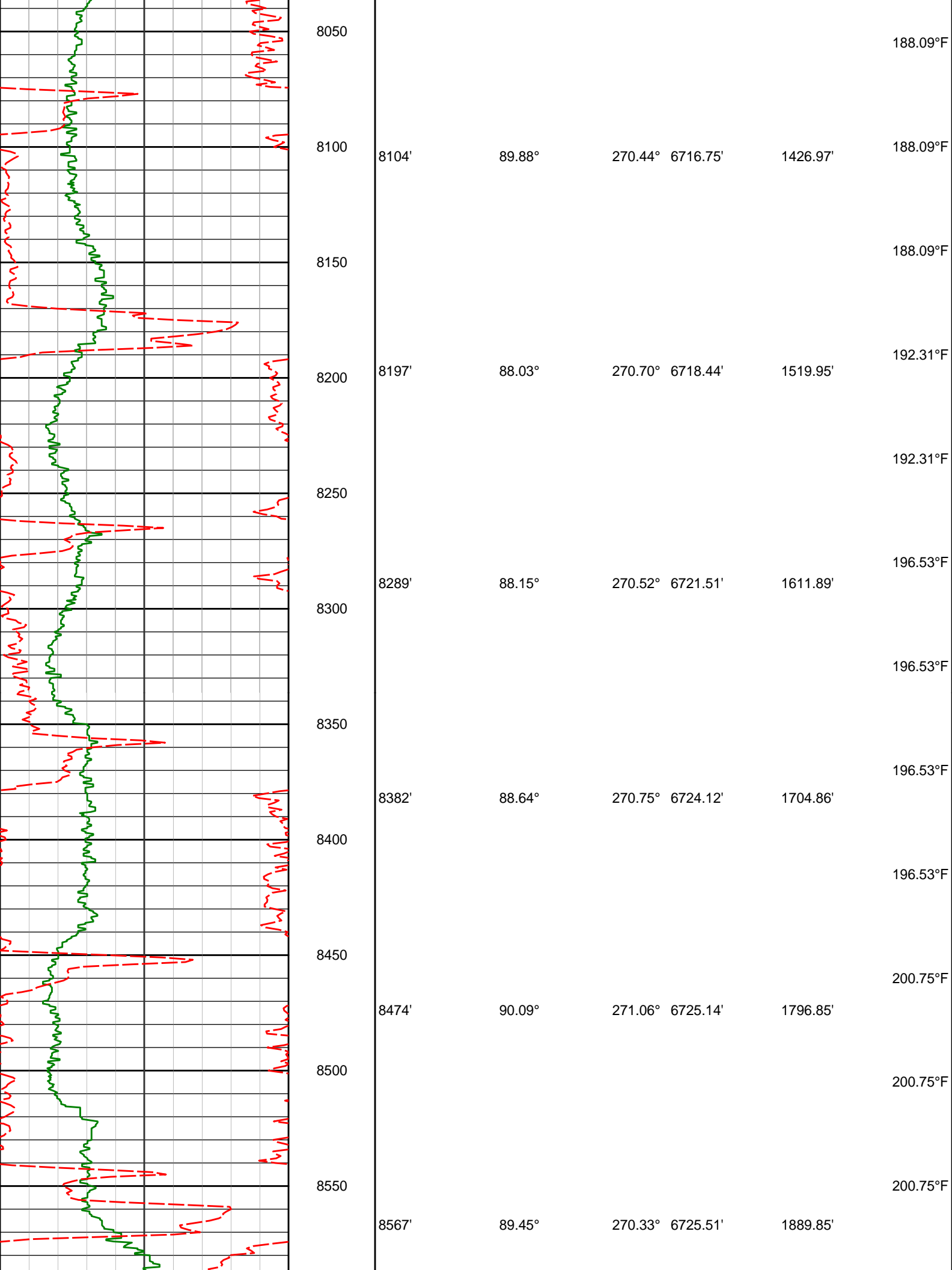


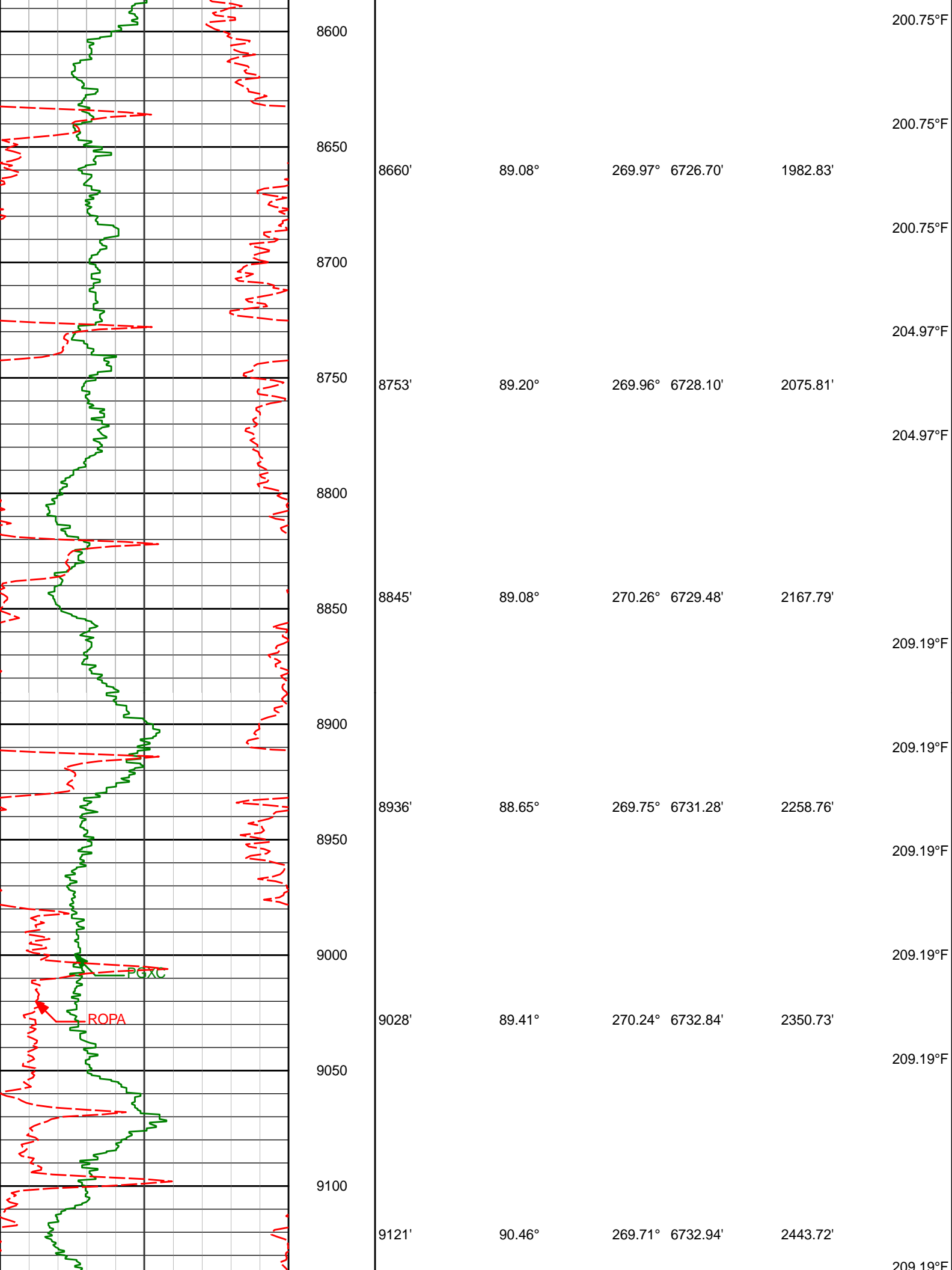


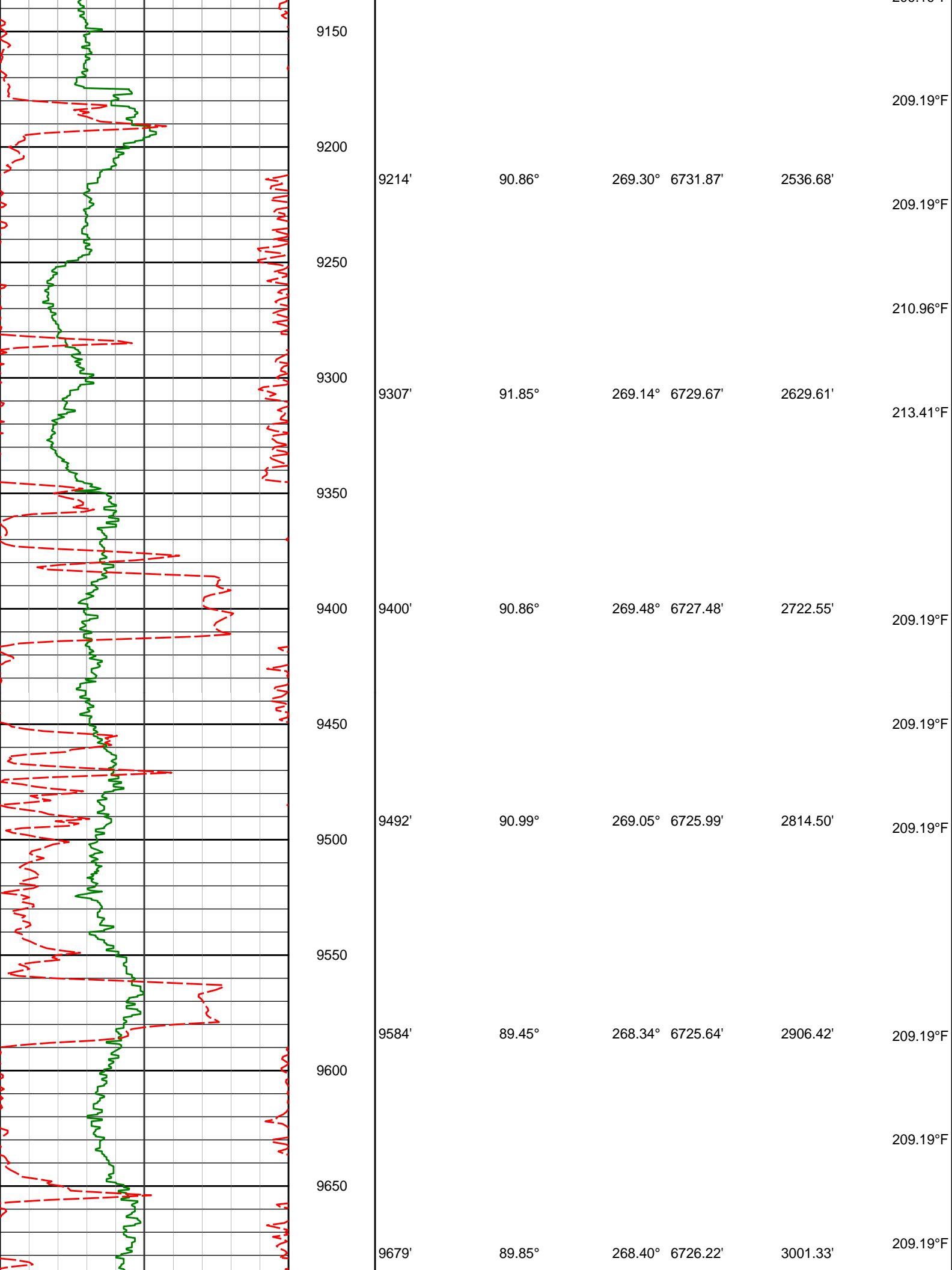


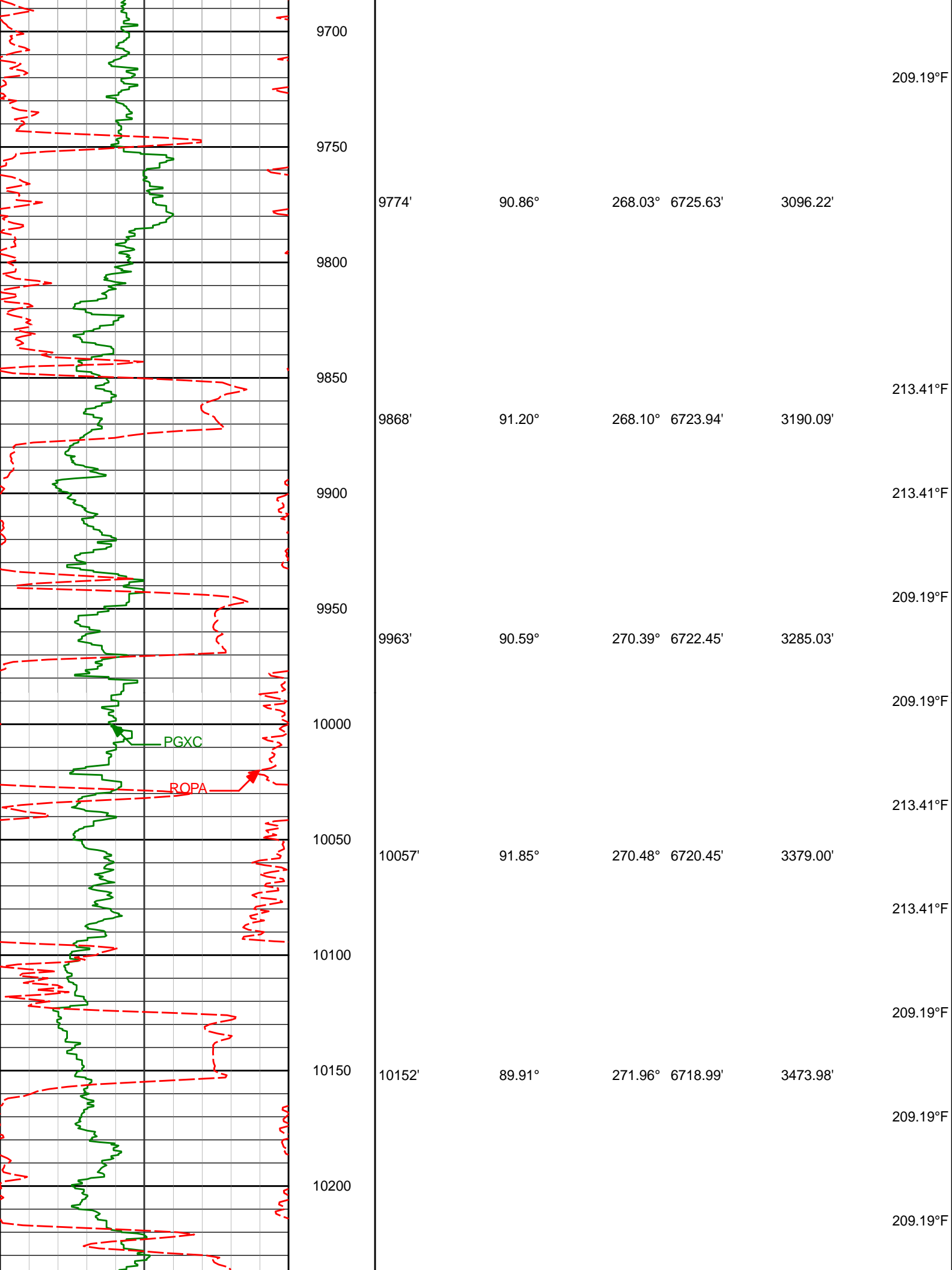


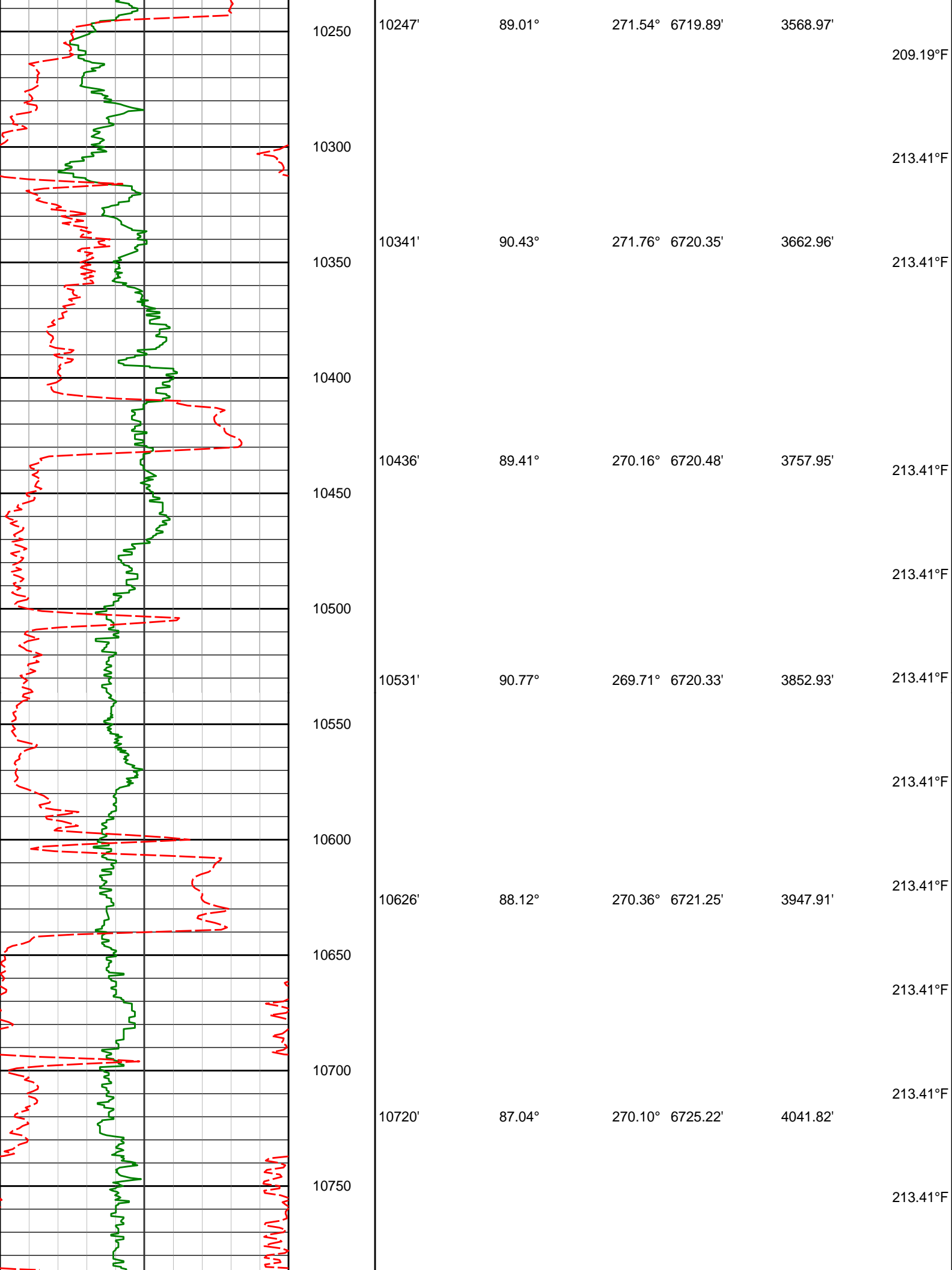


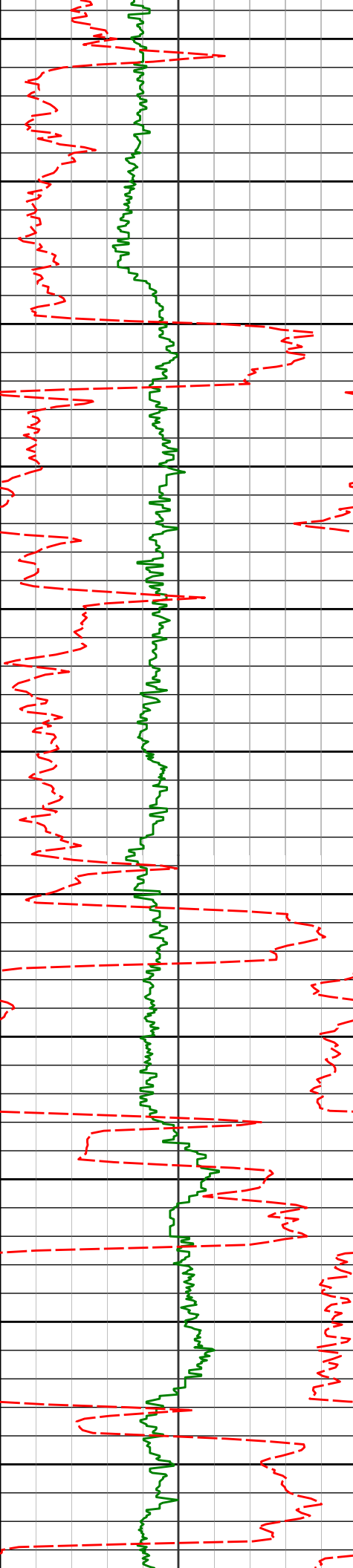




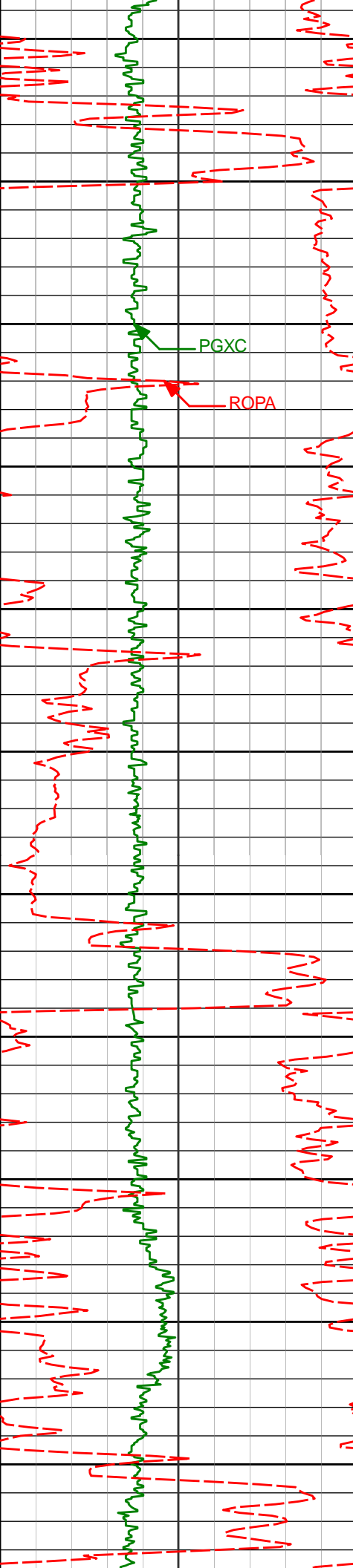








11350						217.63°F
	11383'	88.55°	265.79°	6738.55'	4703.69'	217.63°F
11400						
11450						
	11477'	89.85°	266.97°	6739.87'	4797.38'	213.41°F
11500						213.41°F
11550						
	11572'	90.34°	266.30°	6739.71'	4892.11'	217.63°F
11600						217.63°F
11650						217.63°F
	11667'	90.77°	266.58°	6738.79'	4986.82'	
11700						217.63°F
11750						217.63°F
	11761'	93.02°	268.09°	6735.68'	5080.58'	
11800						217.63°F
11850	11856'	92.06°	267.89°	6731.47'	5175.36'	
						217.63°F



11900
11950
12000
12050
12100
12150
12200
12250
12300
12350
12400

11951'
12045'
12140'
12234'
12329'
12424'

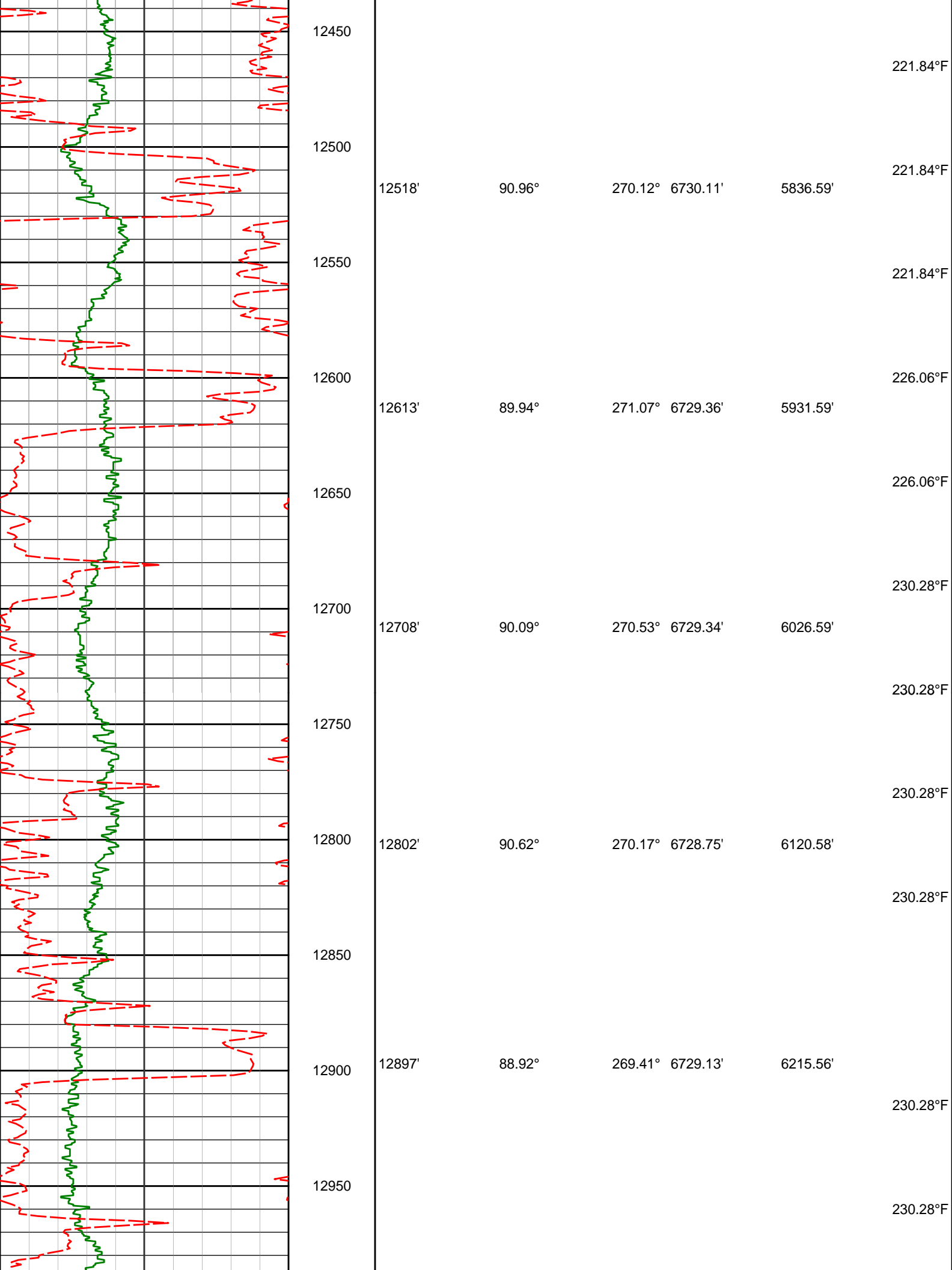
89.32°
89.63°
89.75°
90.15°
90.83°
89.63°

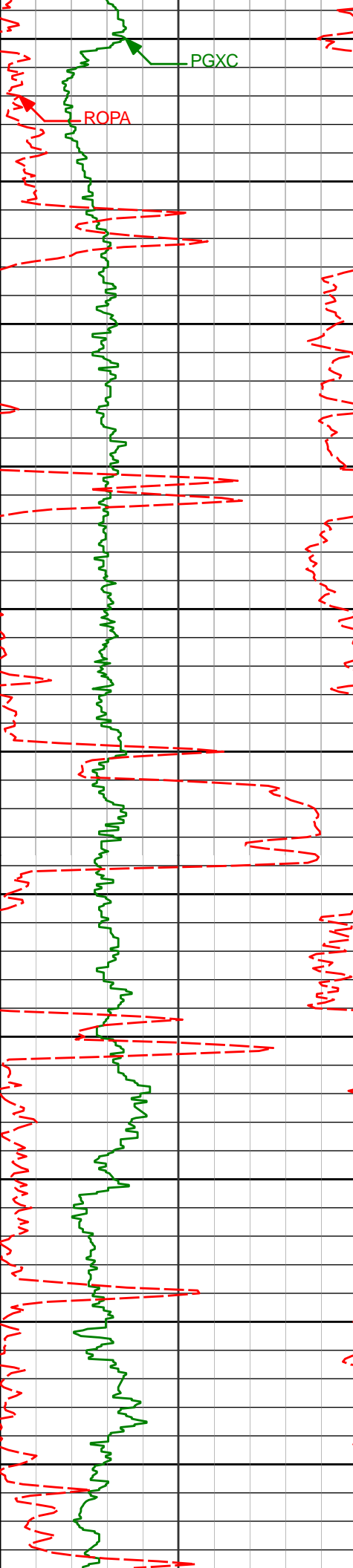
268.62°
267.86°
268.02°
267.89°
267.92°
268.64°

6730.33'
6731.19'
6731.70'
6731.78'
6730.97'
6730.59'

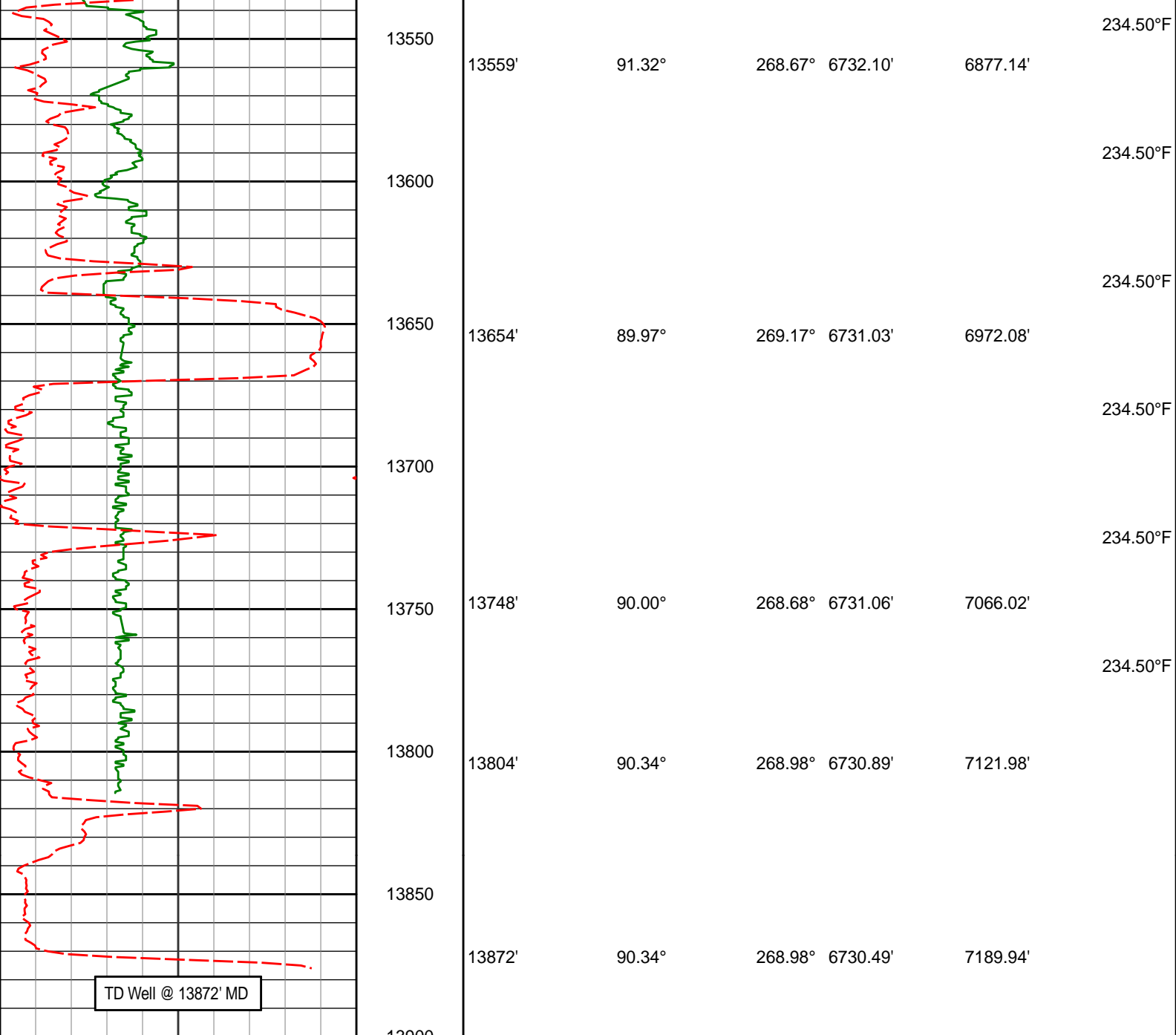
5270.24'
5364.13'
5459.00'
5552.87'
5647.74'
5742.63'

221.84°F
221.84°F
221.84°F
223.57°F
226.06°F
221.84°F
221.84°F
151.99°F
118.73°F
221.84°F





12991'	89.57°	269.73°	6730.37'	6309.52'	230.28°F
13086'	90.12°	269.24°	6730.63'	6404.49'	230.28°F
13180'	89.26°	267.16°	6731.14'	6498.38'	230.28°F
13275'	89.04°	269.63°	6732.55'	6593.27'	230.28°F
13370'	89.48°	269.71°	6733.77'	6688.24'	230.28°F
13465'	90.62°	269.44°	6733.69'	6783.21'	234.50°F

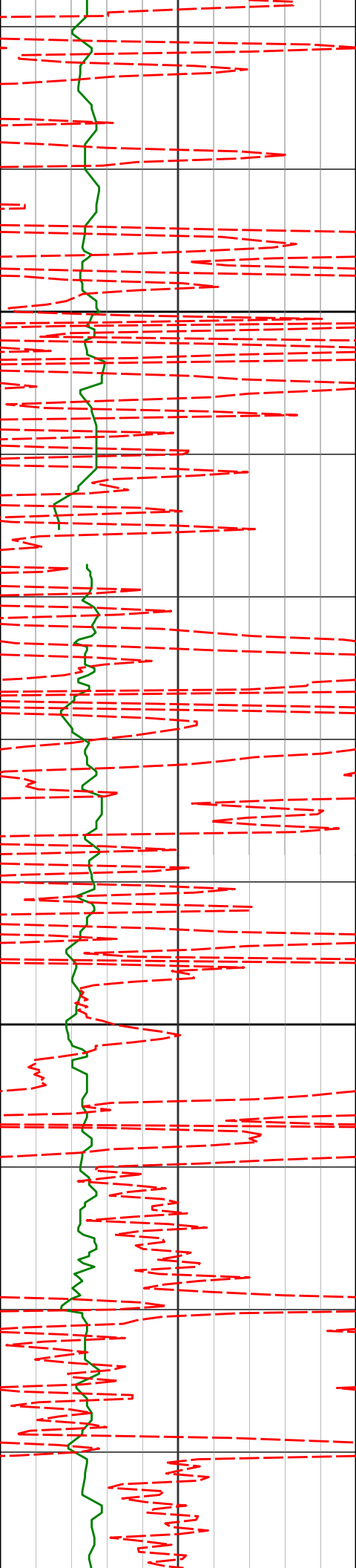


Avg Rate of Penetration ROPA feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500 0								
PCG GR XHi-Range RT BCor PGXRC-T api								
0 300								

MD Detail 1:240 Scale

PCG GR XHi-Range RT BCor PGXRC-T api								
0 300								

Avg Rate of Penetration ROPA feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500	0							
		600						
Surface Casing Shoe @ 617' MD Run 100								
		638'	0.58°	221.99°	637.99'	2.14'		
		700						
		733'	0.75°	211.70°	732.98'	2.77'		85.47°F



800

900

827'

922'

0.83°

0.74°

228.86° 826.97'

228.74° 921.96'

3.59'

4.55'

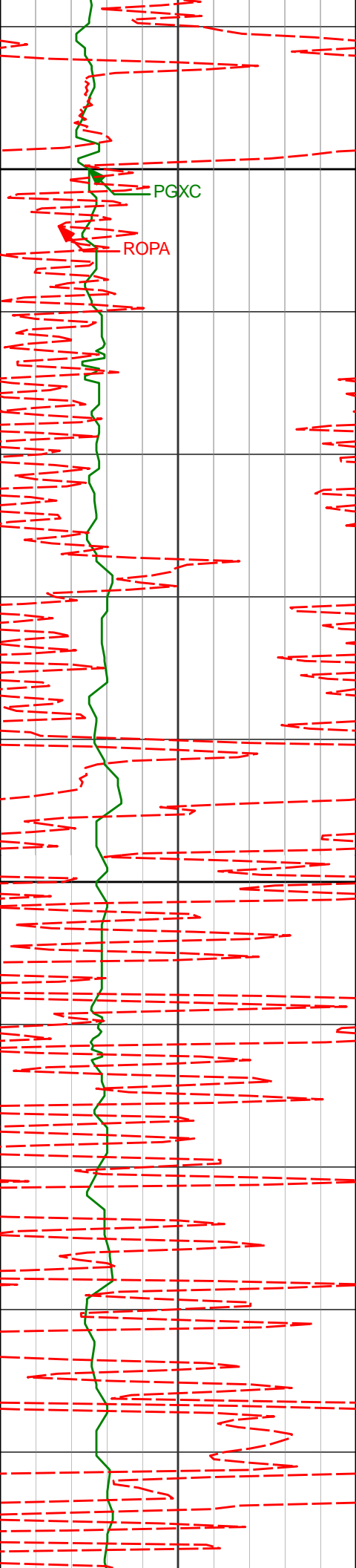
86.09°F

86.09°F

86.09°F

86.09°F

86.09°F



1000

1100

1017'

0.50°

192.97°

1016.96'

5.10'

1111'

0.42°

183.13°

1110.96'

5.19'

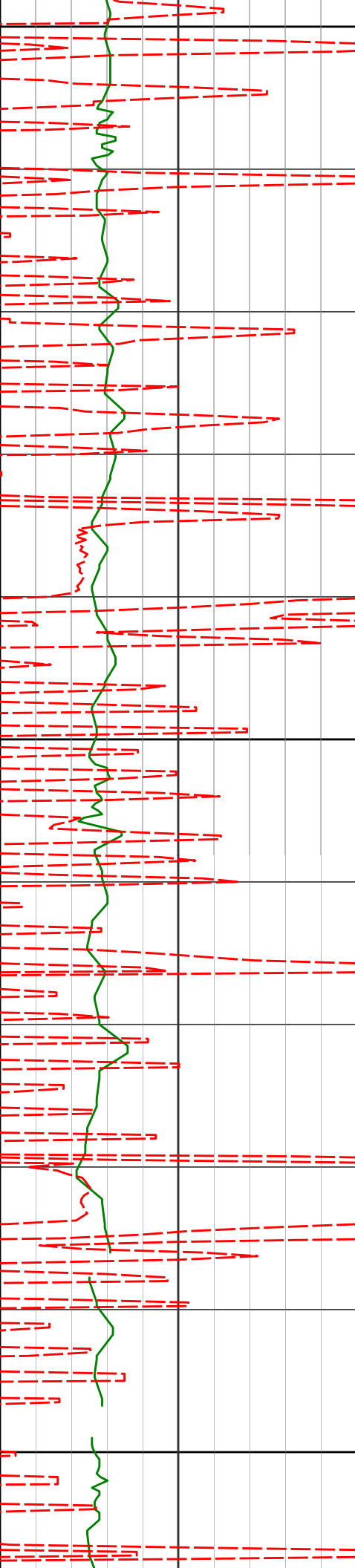
86.09°F

86.09°F

86.98°F

88.14°F

88.14°F



1200

1204'

0.78°

321.50° 1203.95'

5.61'

88.14°F

1300

1296'

0.63°

281.61° 1295.95'

6.51'

88.14°F

1400

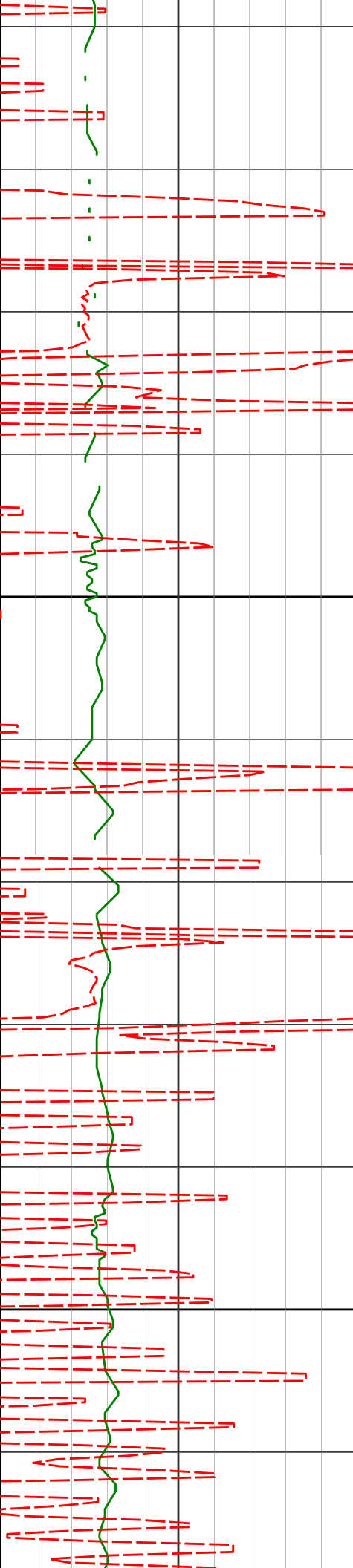
1389'

0.52°

274.30° 1388.94'

7.44'

88.14°F



1500

1600

1483'

0.40°

262.49° 1482.94'

8.20'

90.19°F

90.19°F

90.19°F

1575'

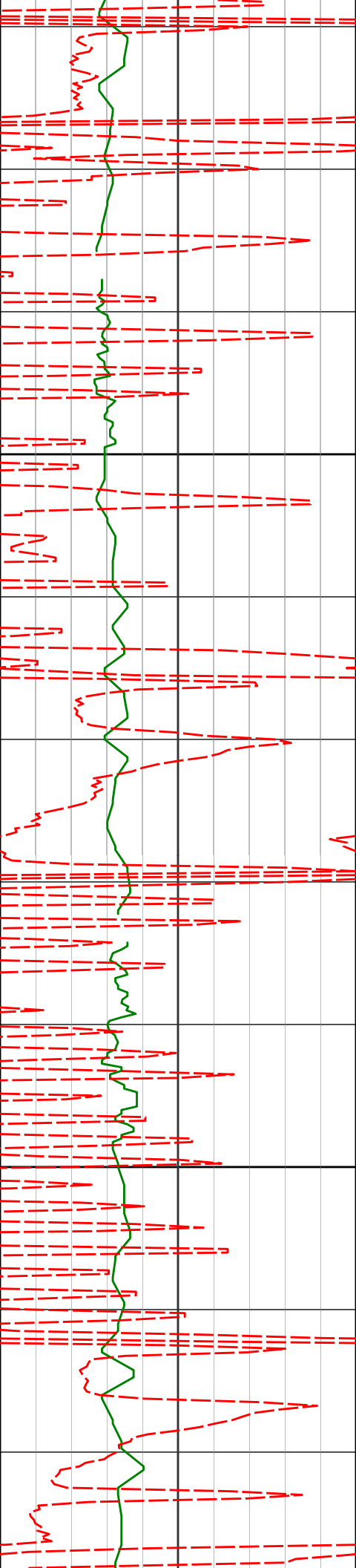
0.46°

348.03° 1574.94'

8.60'

91.37°F

92.26°F



1700

1800

1668'

0.37°

22.13°

1667.94'

8.58'

94.33°F

94.33°F

96.17°F

1760'

2.92°

55.19°

1759.89'

6.57'

96.42°F

96.42°F

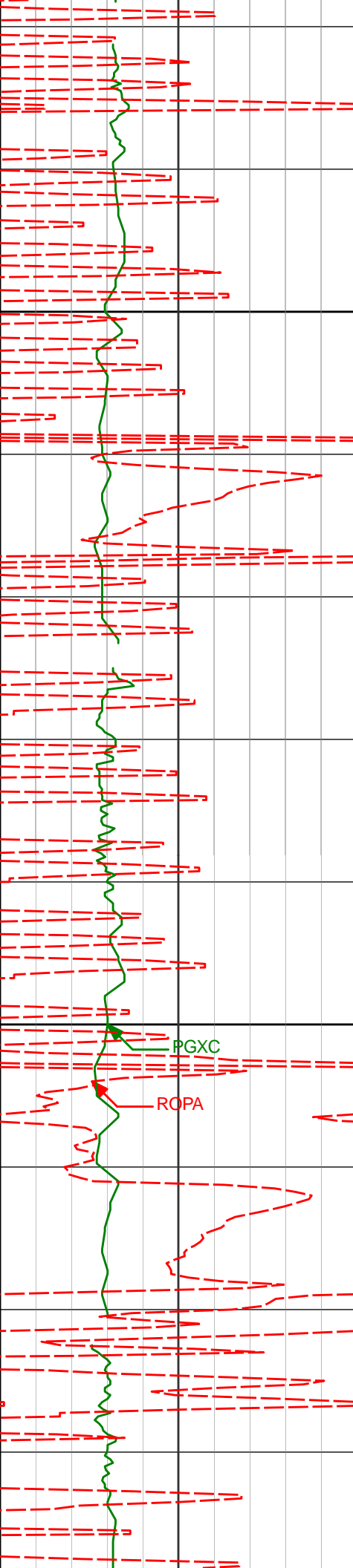
1852'

4.90°

63.70°

1851.67'

1.17'



1900

2000

2039'

1946'

6.54°

50.48°

1945.21'

-6.47'

PGXC

ROPA

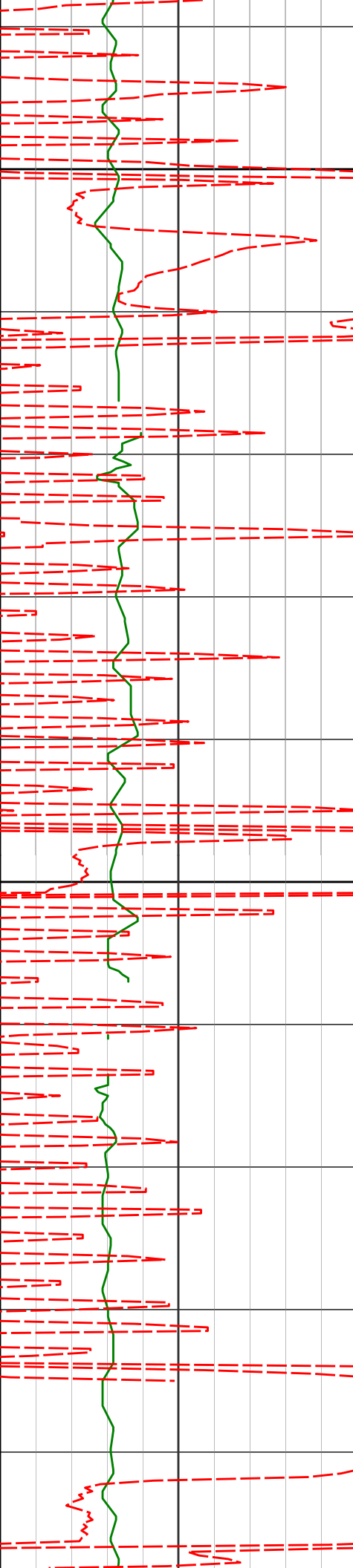
96.42°F

98.51°F

98.51°F

98.51°F

99.76°F



2100

100.62°F

2131'

9.20°

45.06°

2128.57'

-25.05'

100.62°F

2200

100.62°F

2222'

9.02°

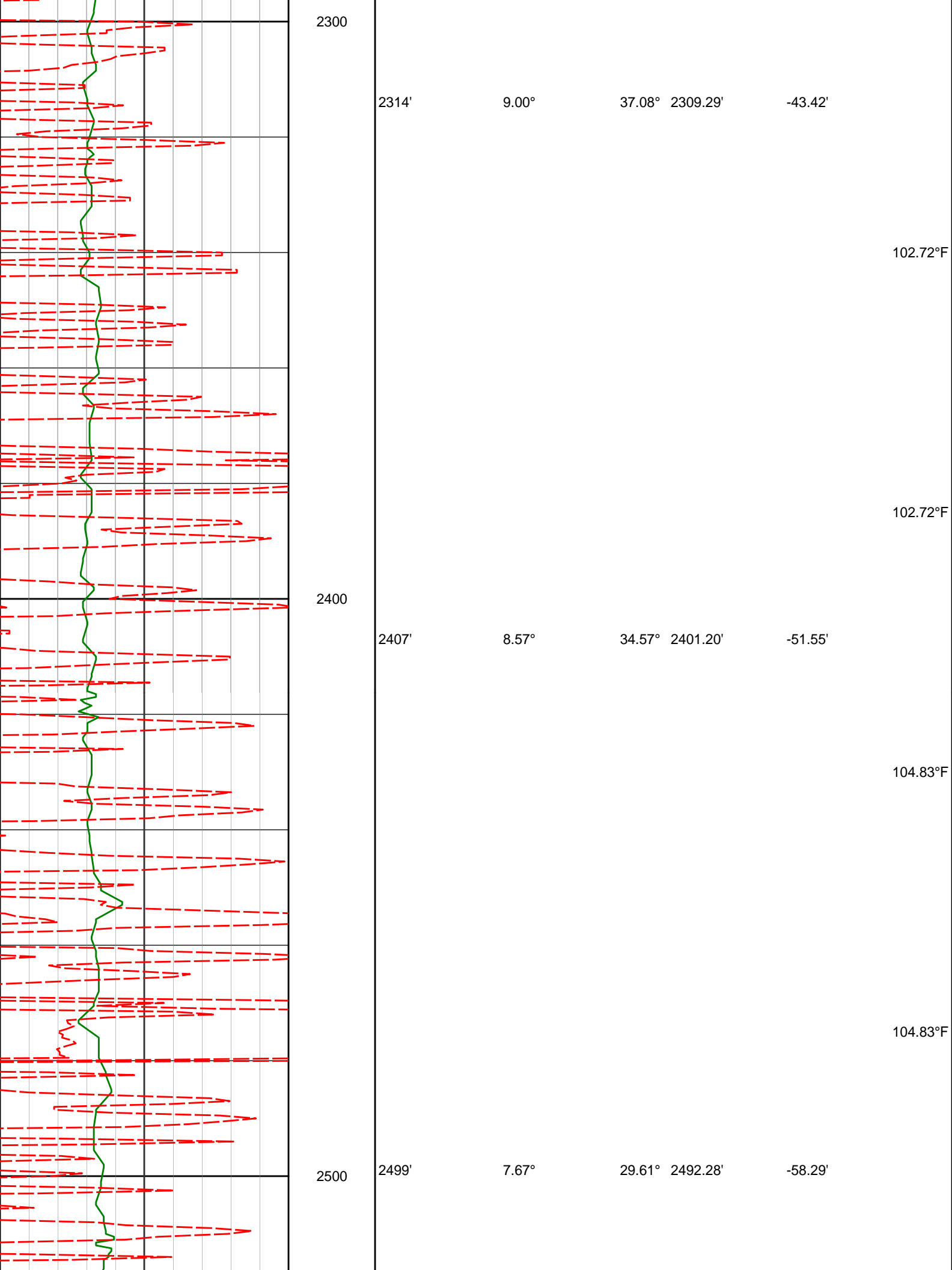
40.06°

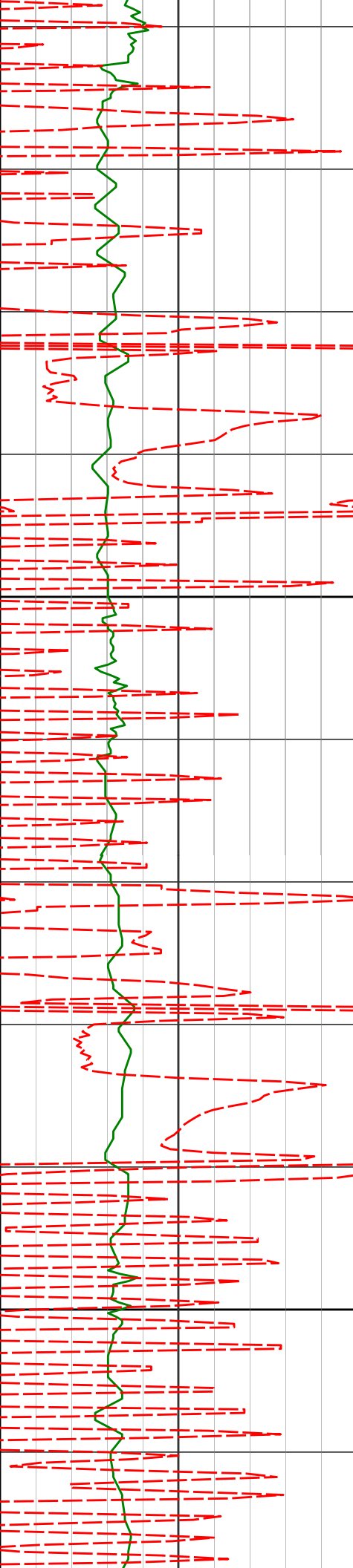
2218.42'

-34.62'

102.72°F

102.72°F





2600

2700

2593'

2685'

8.31°

9.60°

38.17°

44.72°

2585.37'

2676.25'

-65.42'

-74.75'

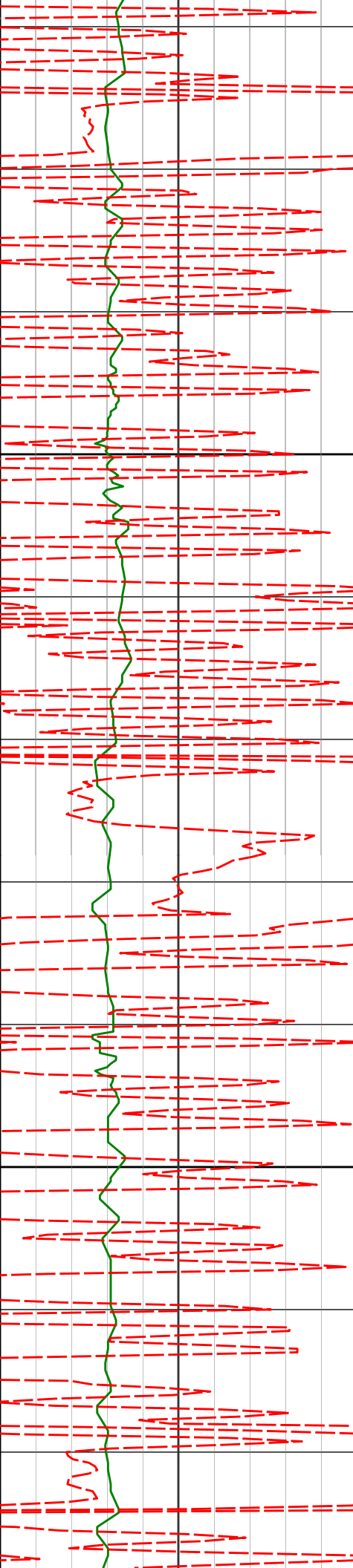
104.83°F

104.83°F

104.83°F

104.83°F

106.97°F



2800

2900

2778'

10.31°

43.98° 2767.85'

-85.80'

2870'

9.03°

49.52° 2858.54'

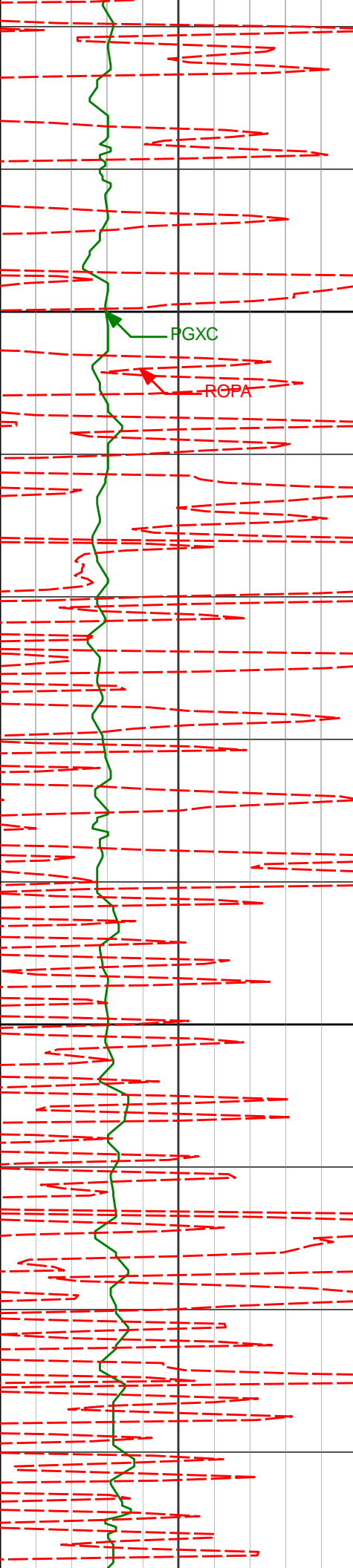
-96.83'

107.20°F

109.09°F

109.09°F

111.24°F



3000

3100

2965'

8.46°

51.08° 2952.44'

-107.79'

111.24°F

111.24°F

111.24°F

111.24°F

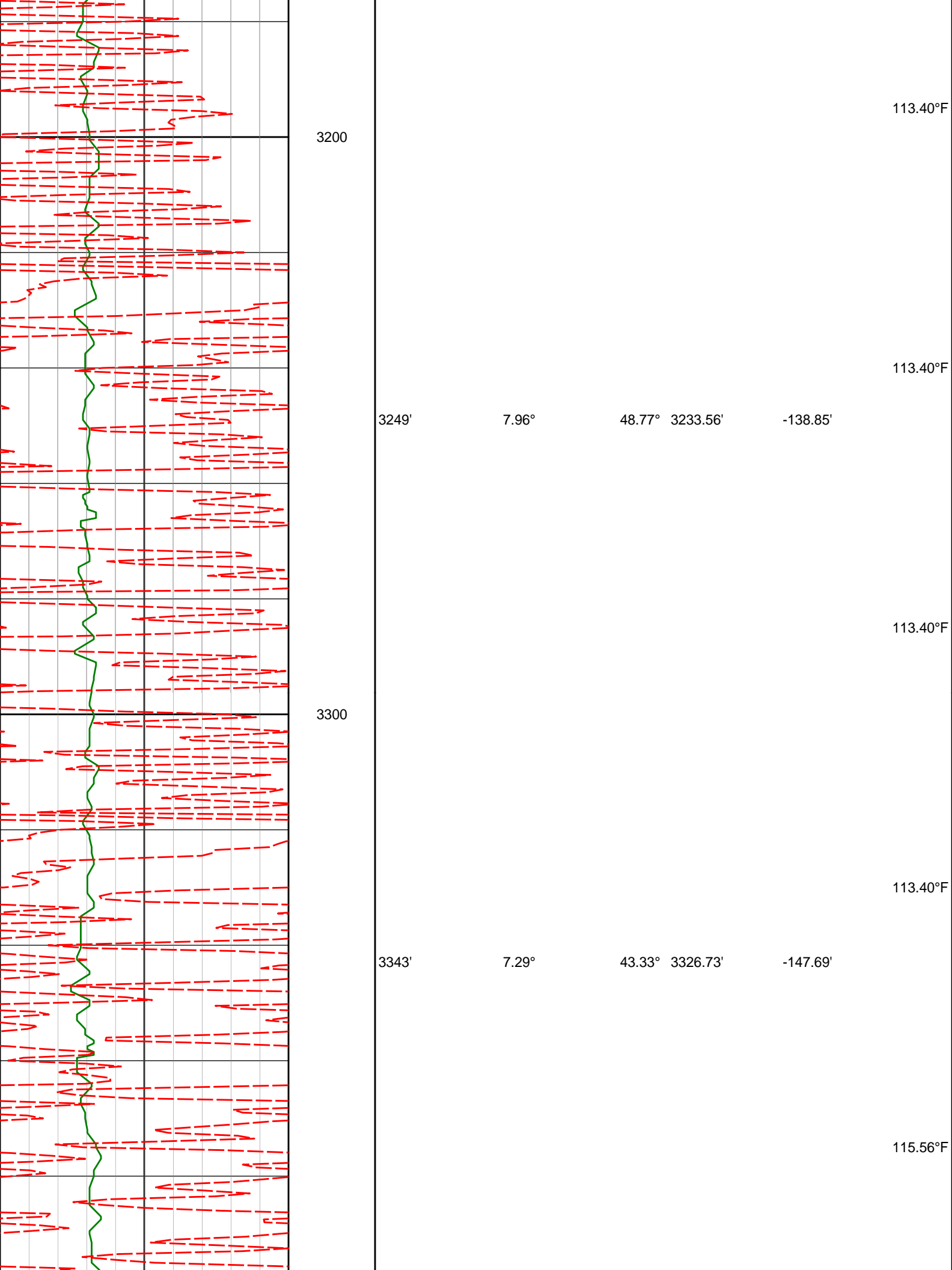
112.69°F

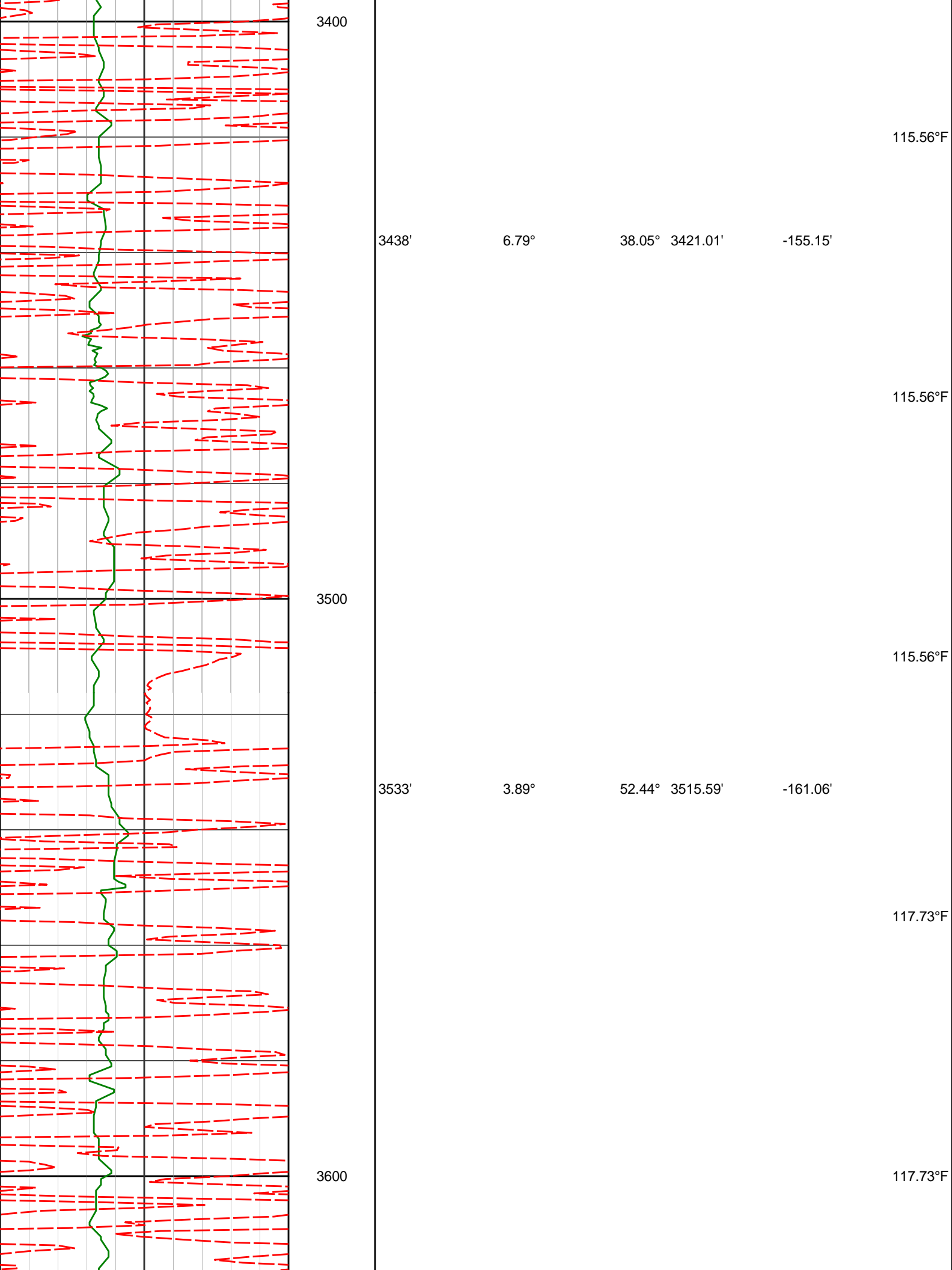
3154'

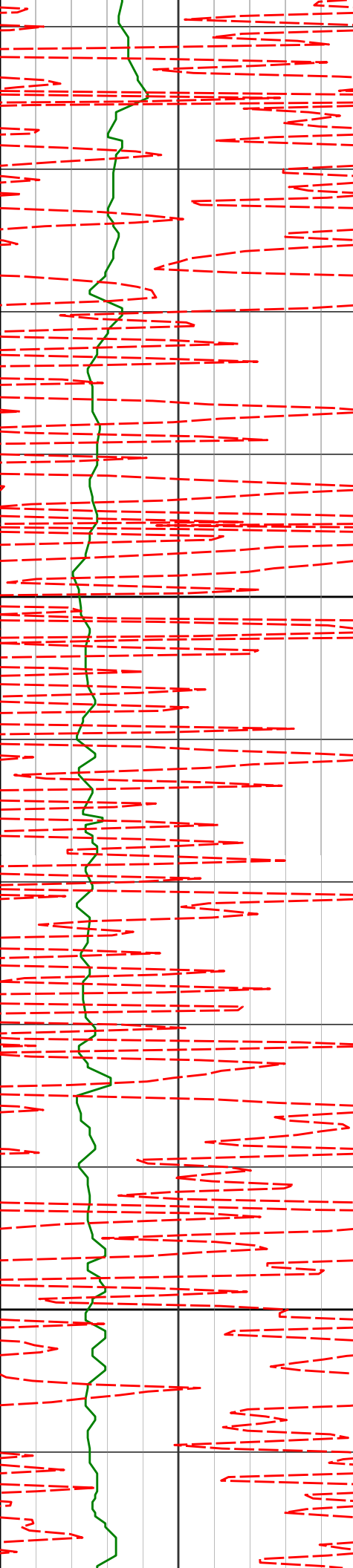
8.04°

52.26° 3139.48'

-128.79'







3627'

3.24°

48.75° 3609.41'

-165.52'

119.91°F

119.91°F

3700

3722'

3.53°

42.67° 3704.24'

-169.46'

119.91°F

119.91°F

3800

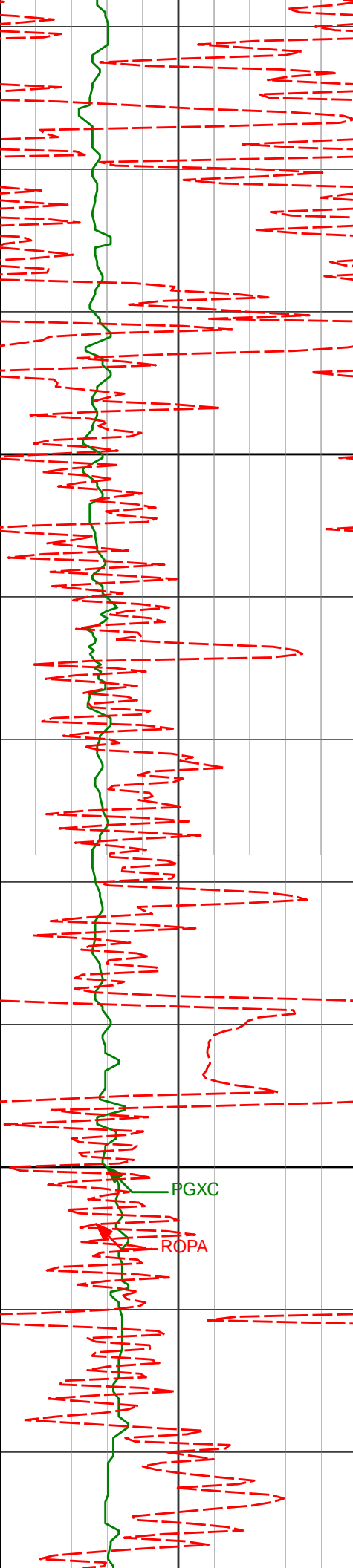
3817'

3.39°

35.51° 3799.07'

-173.00'

122.11°F



3900

3911'

3.80°

29.40°

3892.89'

-176.06'

122.11°F

122.11°F

122.11°F

4000

4005'

4.14°

51.68°

3986.67'

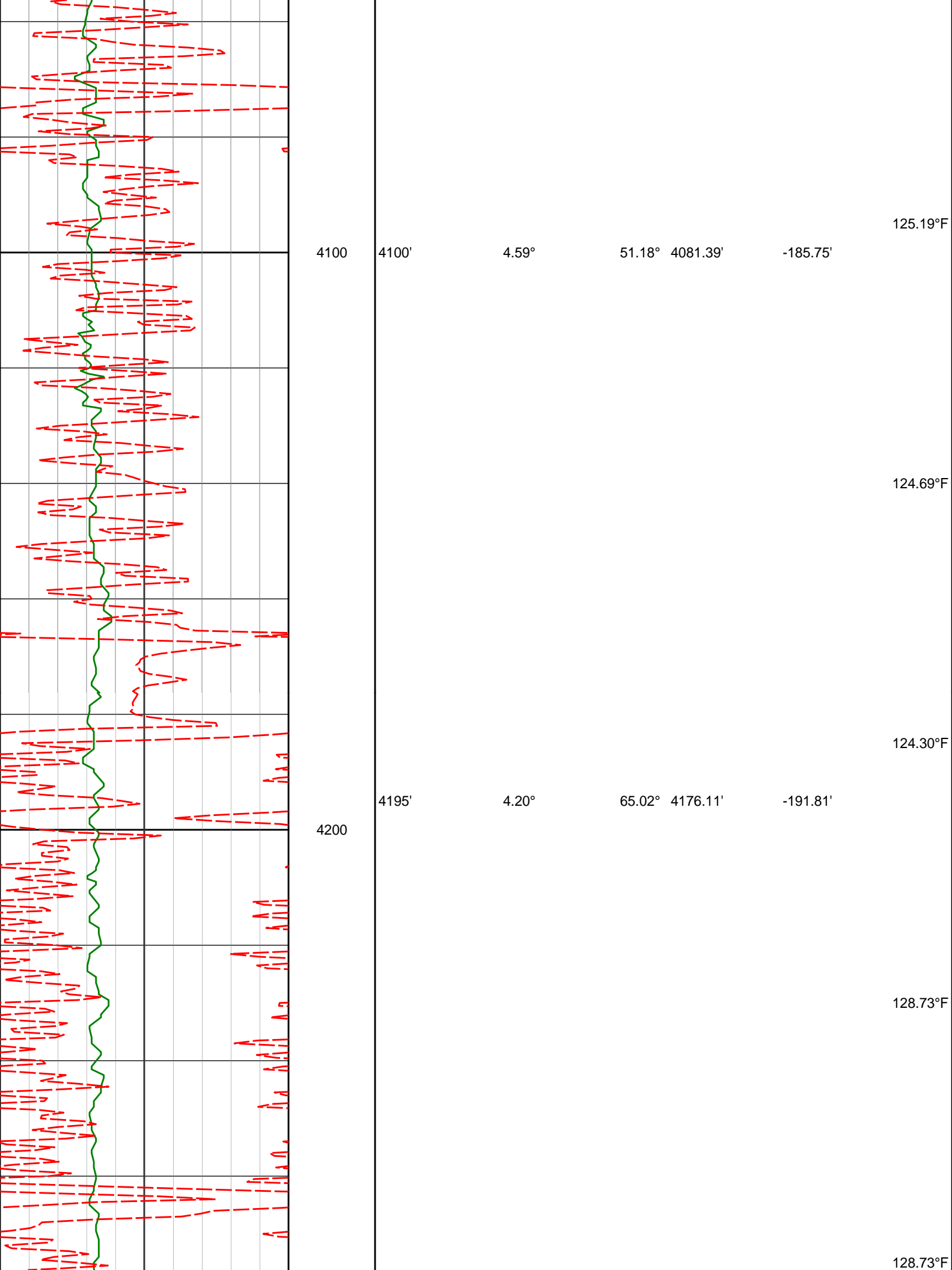
-180.18'

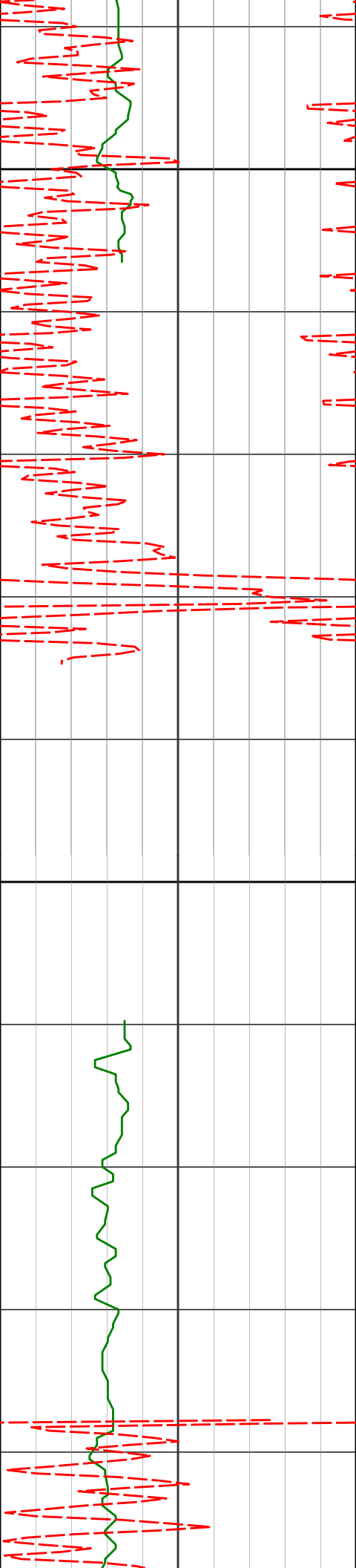
122.37°F

124.30°F

PGXC

ROPA





4289'

3.86°

64.14° 4269.88'

-197.73'

4300

128.73°F

4384'

2.52°

69.32° 4364.73'

-202.52'

4400

130.96°F

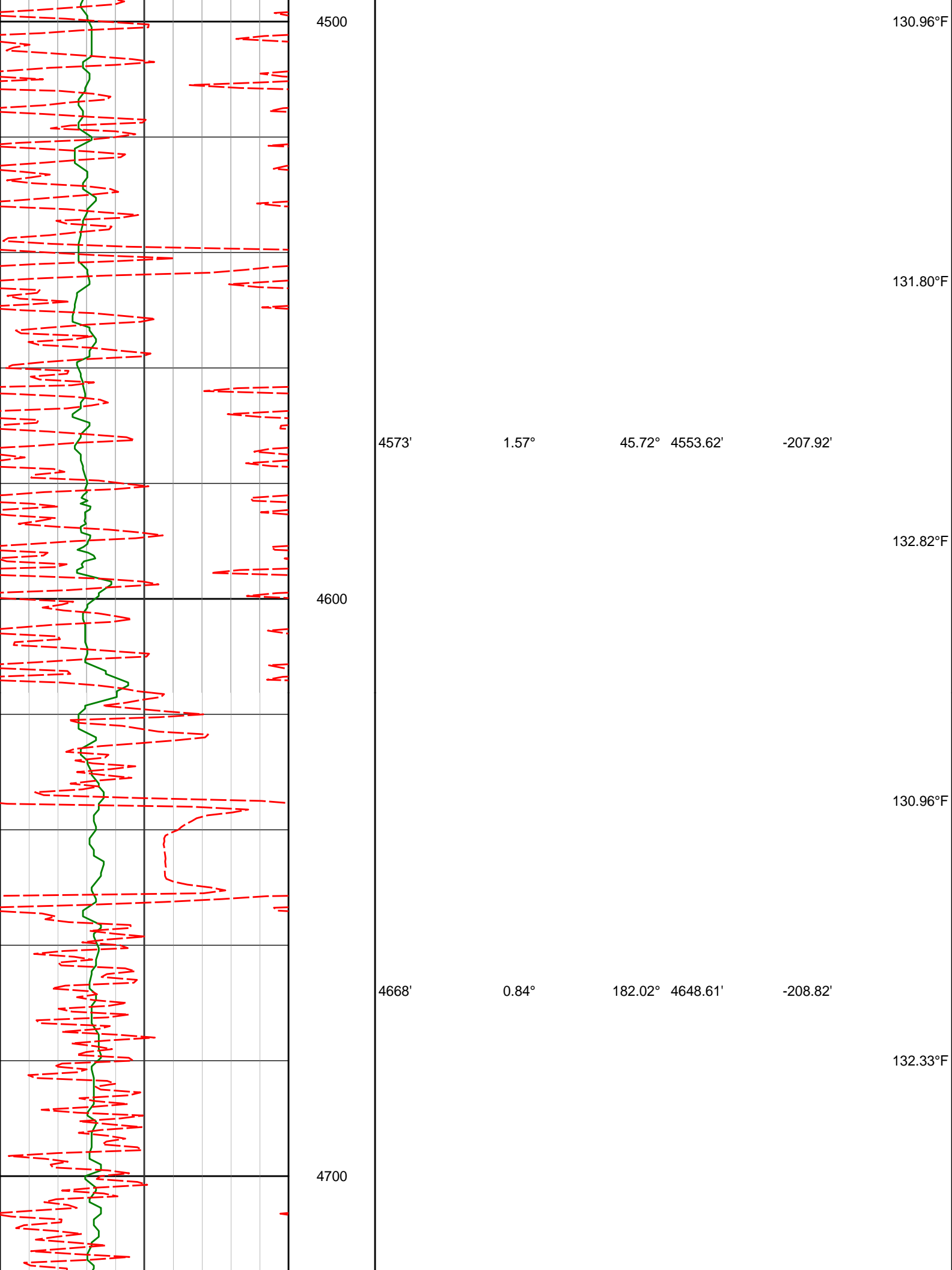
130.96°F

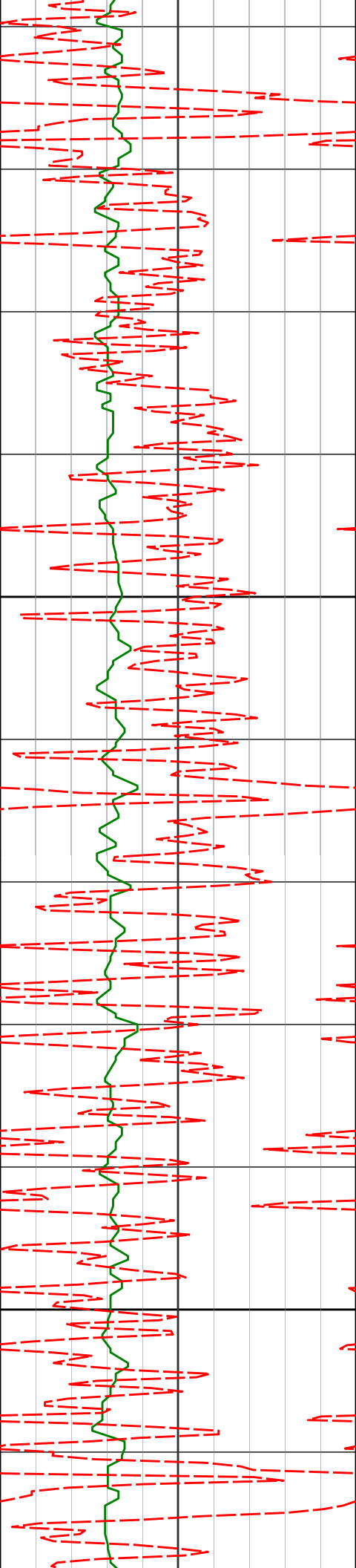
4478'

1.86°

57.53° 4458.66'

-205.72'





4800

4900

4762'

1.56°

193.74° 4742.59'

-208.52'

4857'

1.74°

212.12° 4837.55'

-207.49'

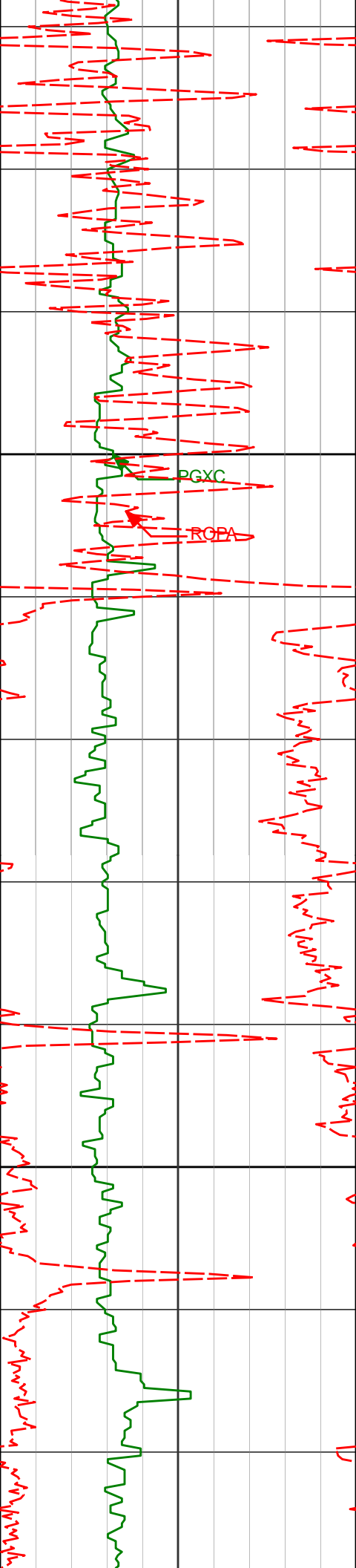
133.20°F

133.66°F

135.45°F

135.45°F

135.45°F



5000

5100

4951'

1.77°

217.00° 4931.51'

-205.89'

135.80°F

137.70°F

137.70°F

5046'

1.82°

205.13° 5026.46'

-204.41'

137.70°F

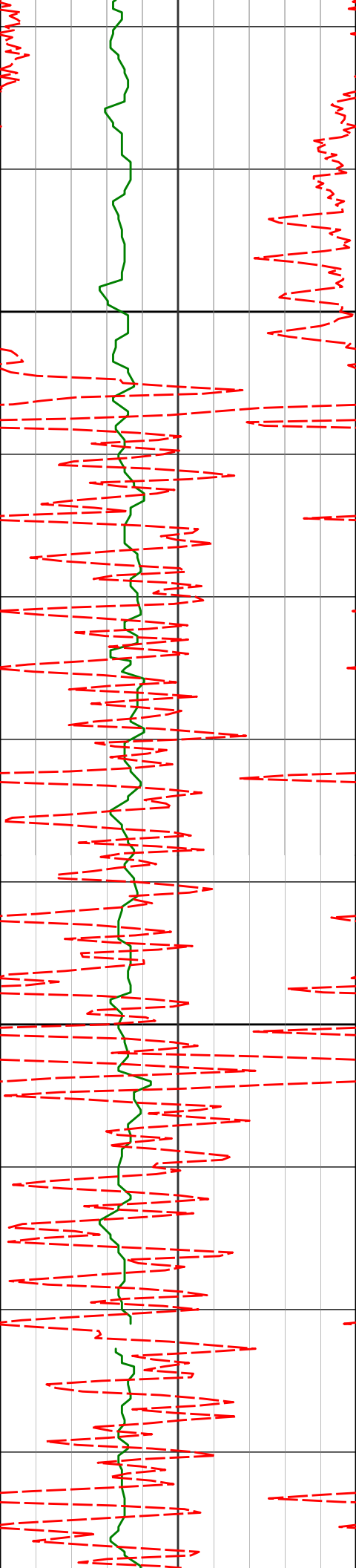
139.15°F

5141'

1.91°

201.03° 5121.41'

-203.25'



5200

5300

5235'

5330'

2.10°

2.17°

191.32°

177.63°

5215.35'

5310.29'

-202.40'

-202.19'

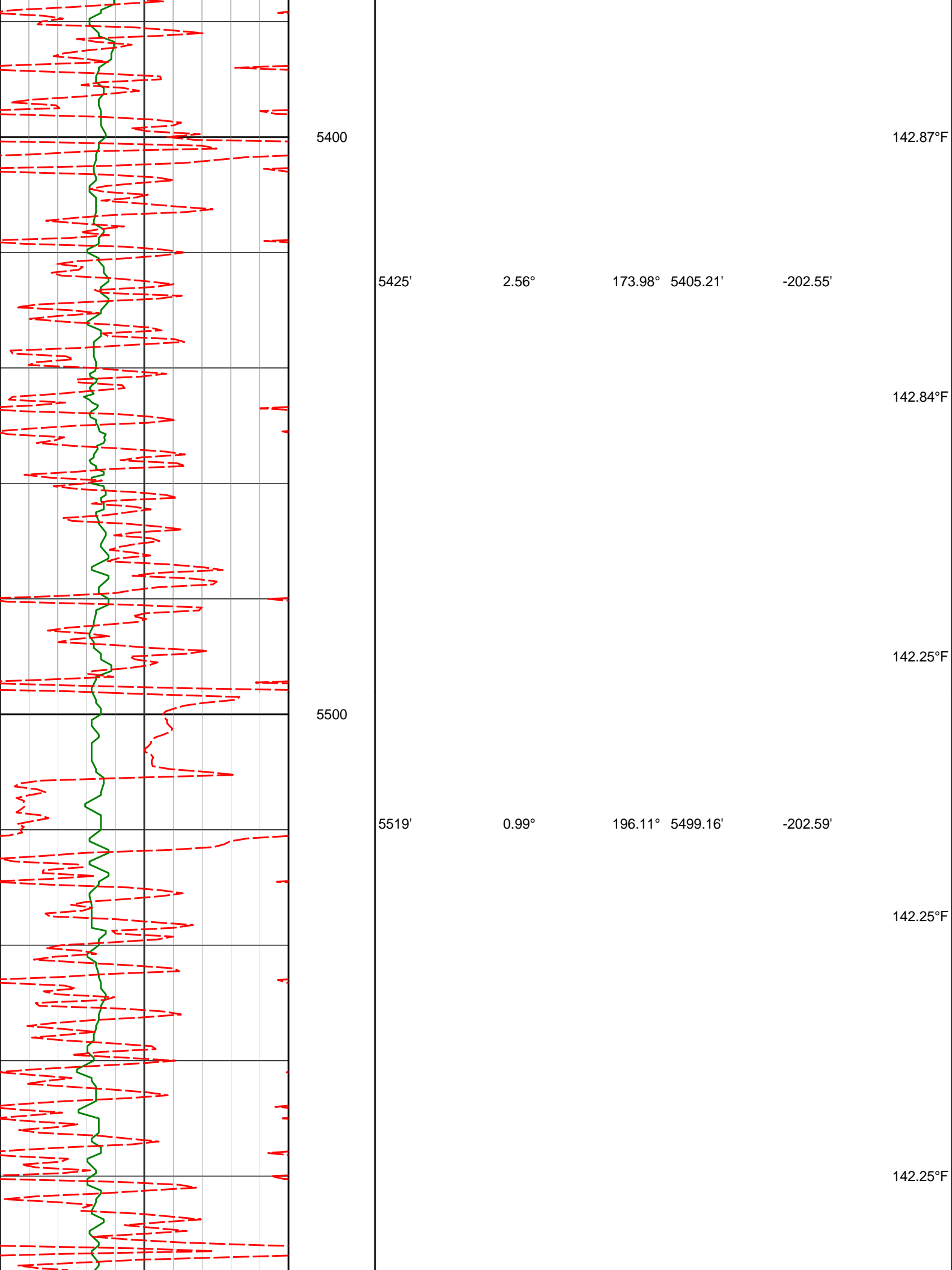
139.96°F

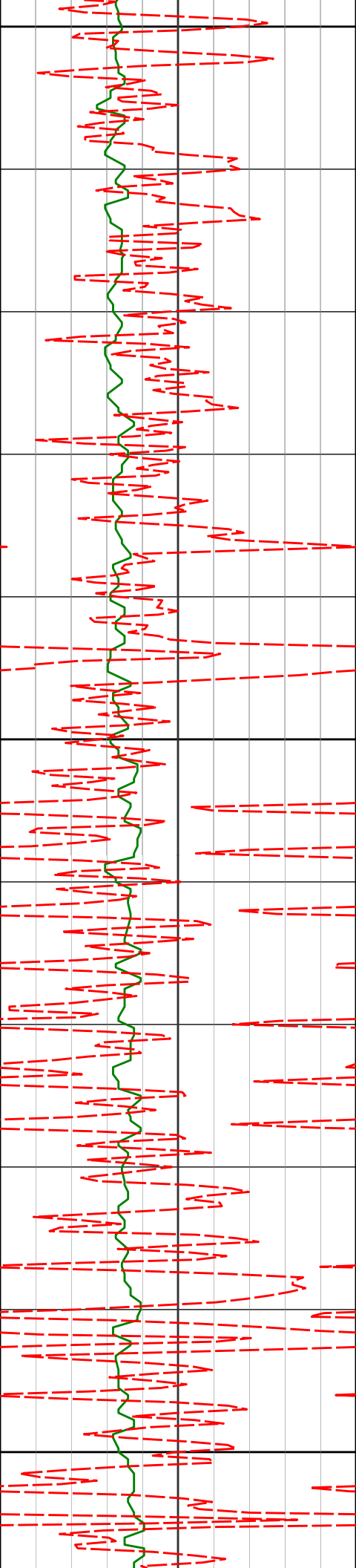
139.96°F

141.50°F

142.25°F

142.25°F





5600

5614'

1.11°

180.08° 5594.14'

-202.39'

142.25°F

142.25°F

5700

5708'

1.67°

152.86° 5688.12'

-203.05'

143.53°F

144.54°F

5800

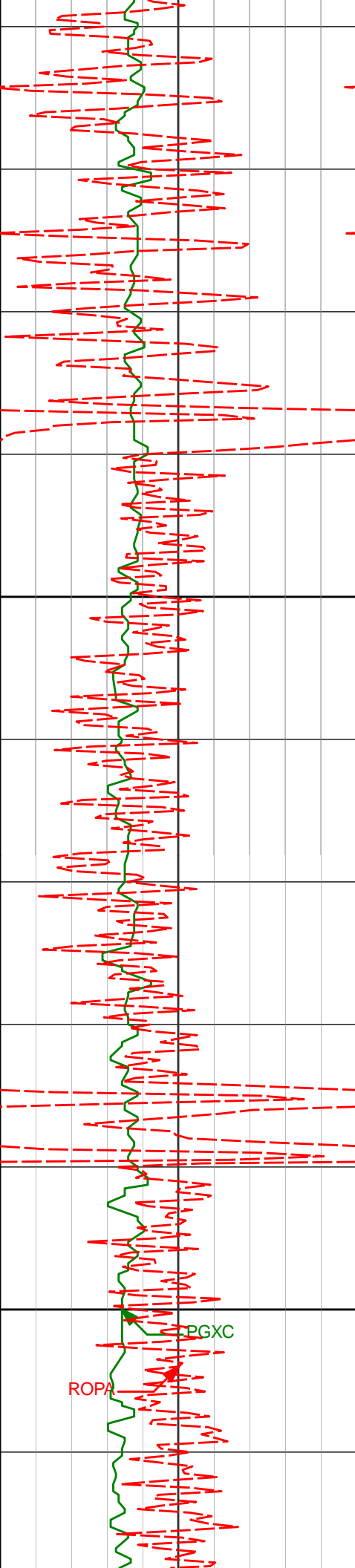
5803'

1.66°

144.91° 5783.08'

-204.51'

144.70°F



5900

6000

5897'

5992'

1.46°

1.42°

151.69°

153.78°

5877.04'

5972.01'

-205.90'

-207.02'

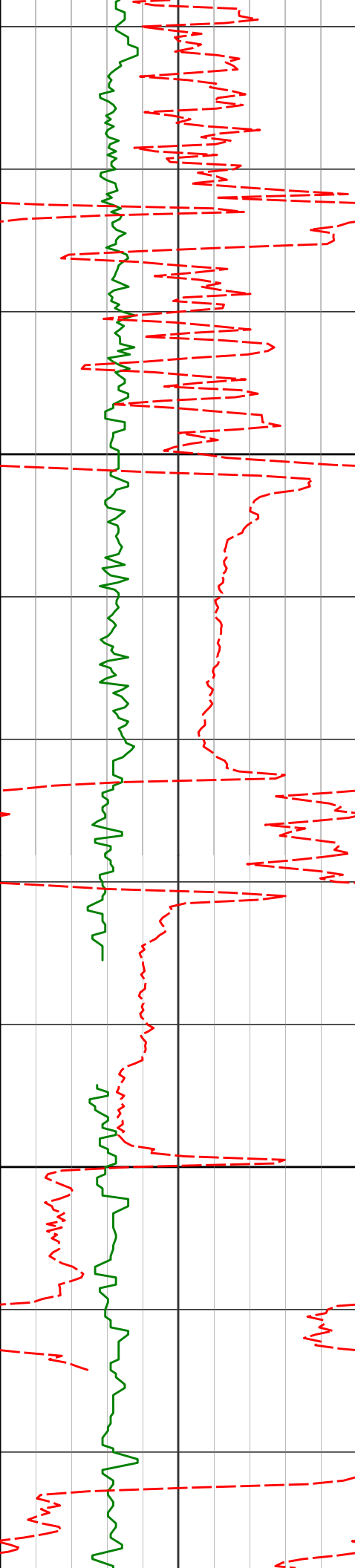
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146.84°F

146.84°F

146.84°F

146.65°F



6100

6200

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163.27° 6066.99'

-207.87'

6181'

12.06°

276.64° 6160.32'

-198.36'

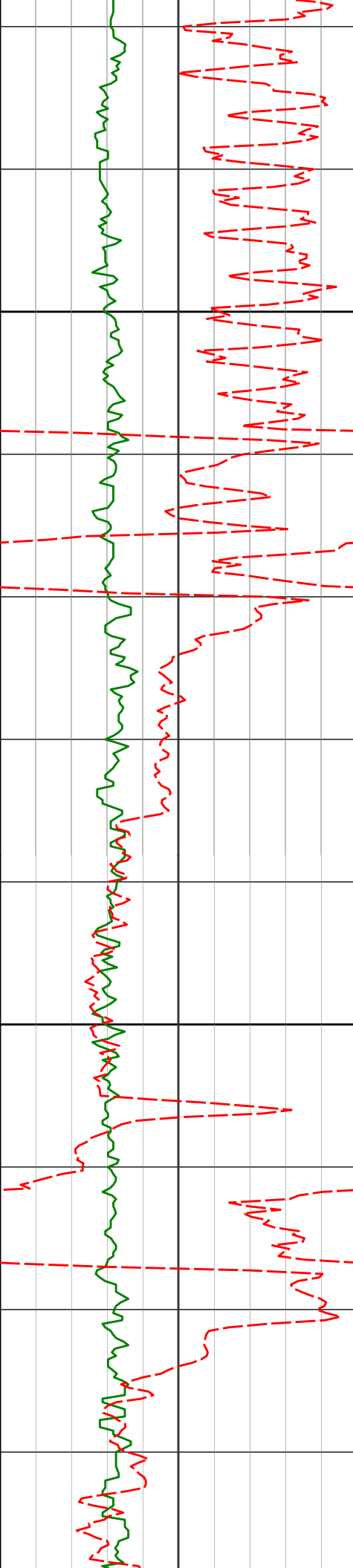
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144.67°F

146.66°F

149.34°F

150.62°F



6300

6400

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15.93°

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6371'

19.11°

271.88° 6343.07'

-147.13'

6466'

28.19°

270.63° 6430.00'

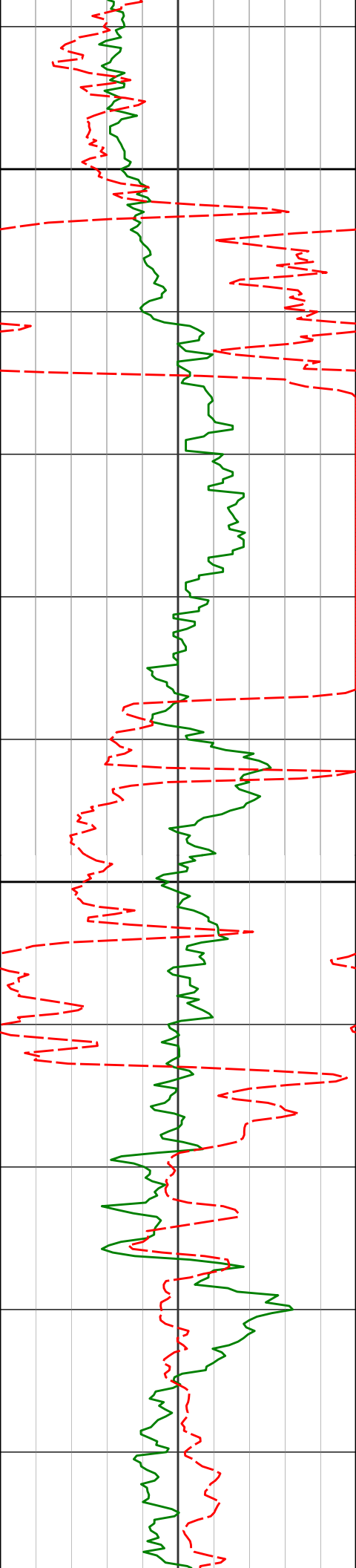
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154.44°F

154.05°F



6500

6600

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48.26°

273.51°

272.32°

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6577.70'

-57.69'

7.26'

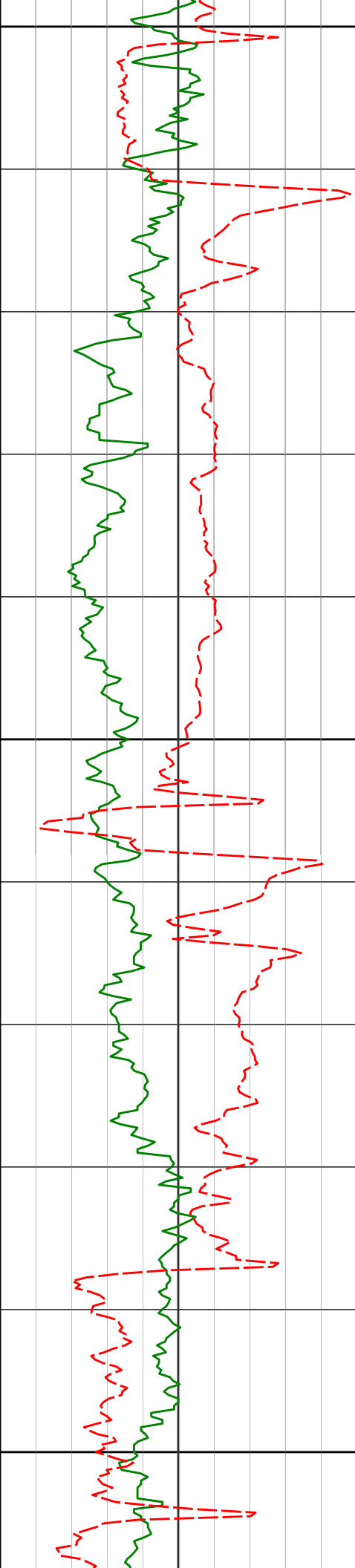
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156.29°F

157.77°F

157.19°F

158.47°F



6700

158.75°F

6749'

59.27°

268.35° 6633.19'

82.93'

160.62°F

6800

160.90°F

6844'

75.07°

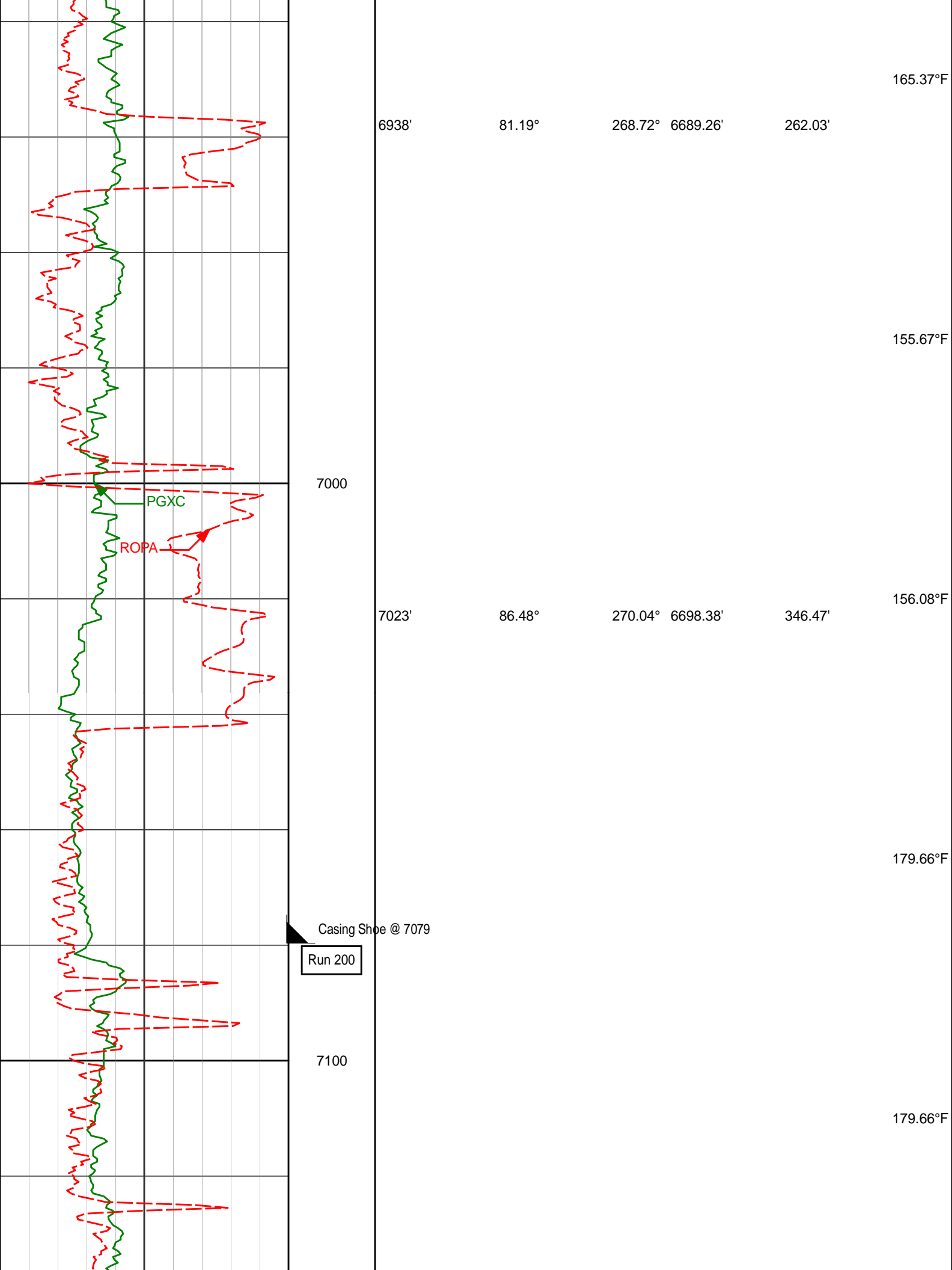
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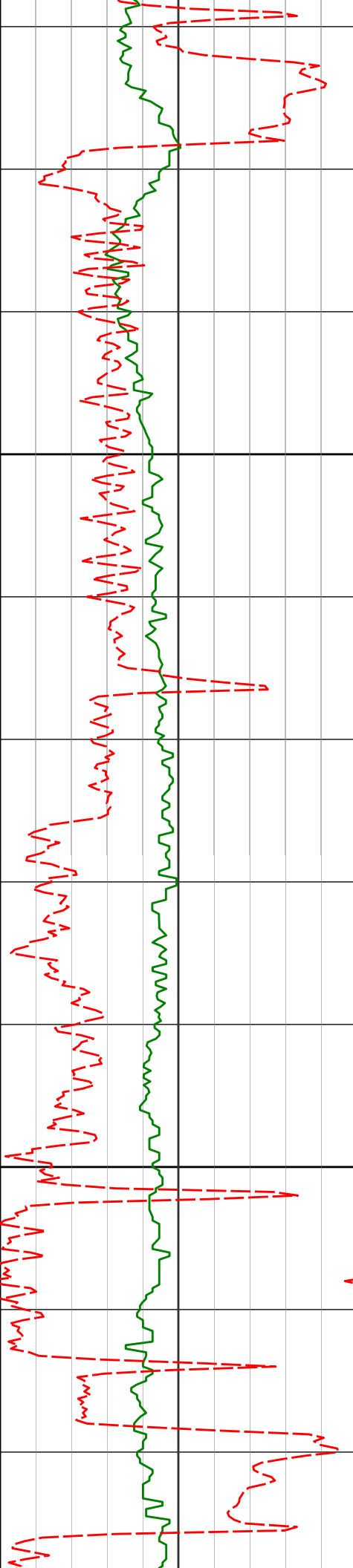
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162.97°F

6900

163.20°F





7200

7300

7164'

88.83°

269.40° 6704.14'

487.31'

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269.75° 6705.50'

581.28'

7353'

88.37°

269.74° 6707.26'

676.24'

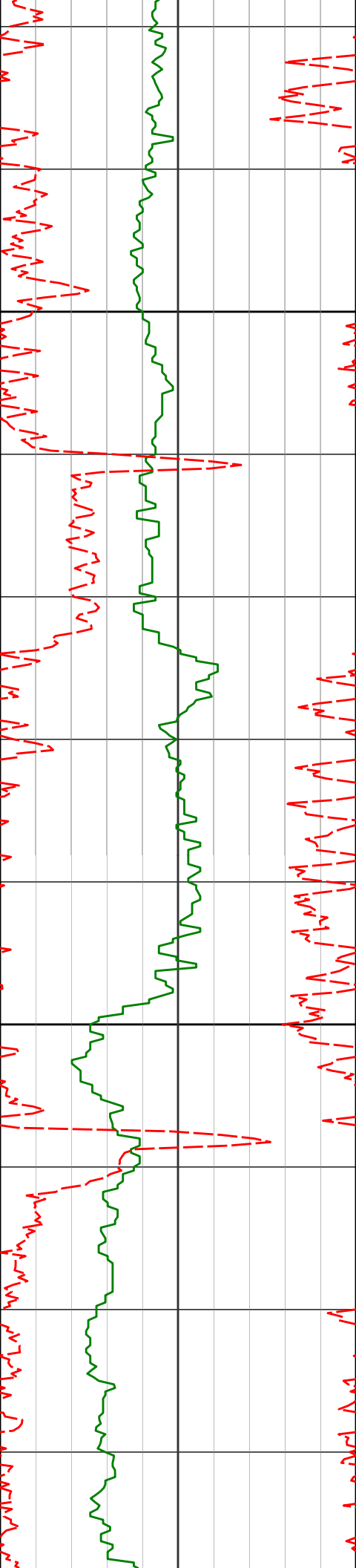
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175.44°F

179.66°F

179.66°F

179.66°F



7400

7500

7447'

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90.28°

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269.14° 6709.79'

770.19'

865.16'

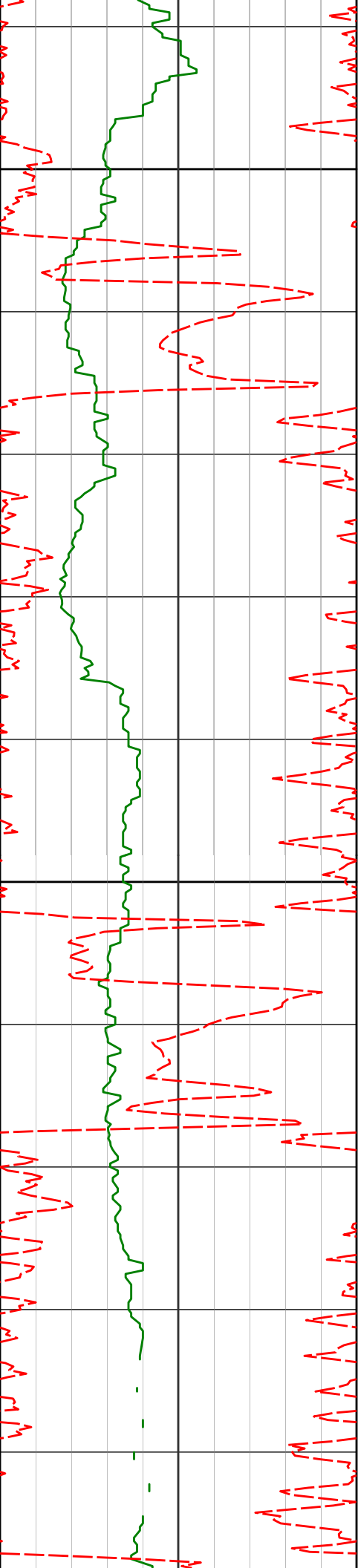
179.66°F

179.66°F

179.66°F

183.88°F

183.88°F



7600

183.88°F

7636'

90.12°

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959.14'

183.88°F

7700

183.88°F

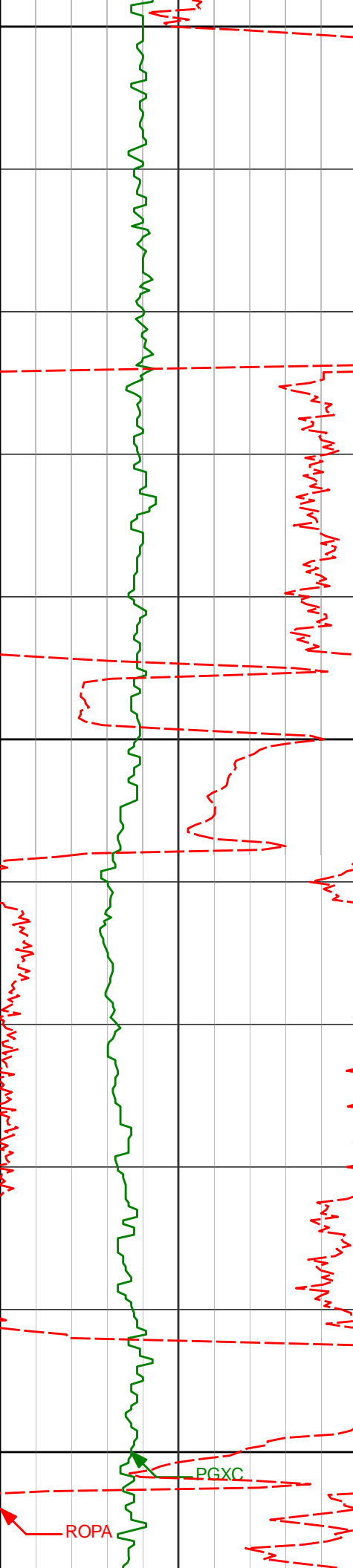
7731'

89.38°

271.17° 6709.87'

1054.13'

188.09°F



7800

7825'

89.29°

269.60° 6710.96'

1148.12'

188.09°F

188.09°F

7900

7918'

87.84°

269.45° 6713.29'

1241.06'

8000

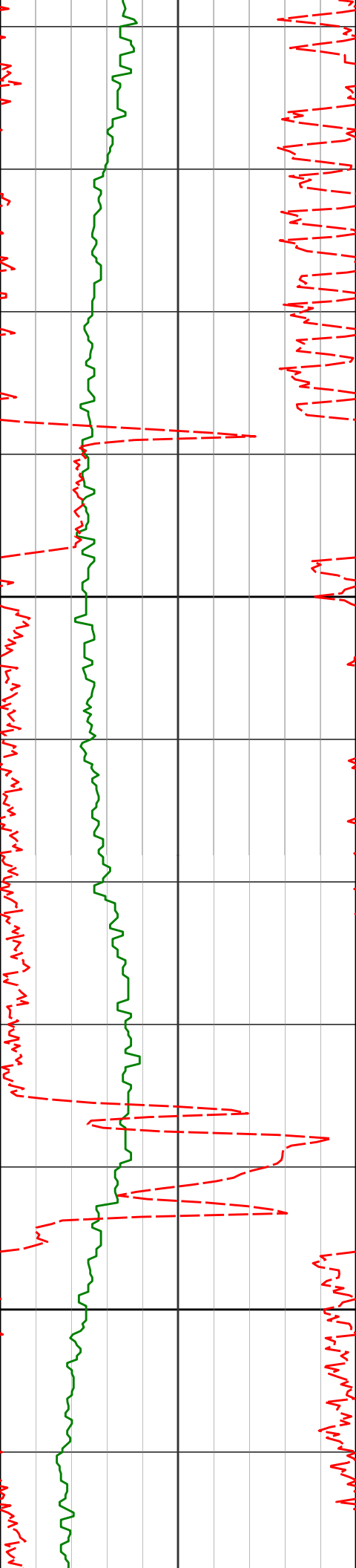
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1333.99'

188.09°F



8100

8200

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89.88°

88.03°

270.44° 6716.75'

270.70° 6718.44'

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1519.95'

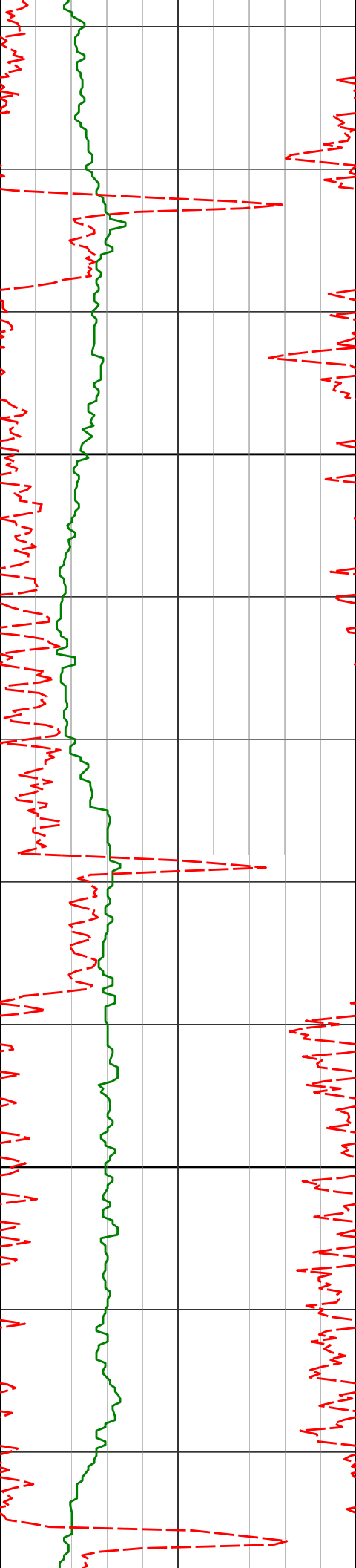
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188.09°F

188.09°F

192.31°F

192.31°F



8300

8400

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8382'

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88.64°

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270.75° 6724.12'

1611.89'

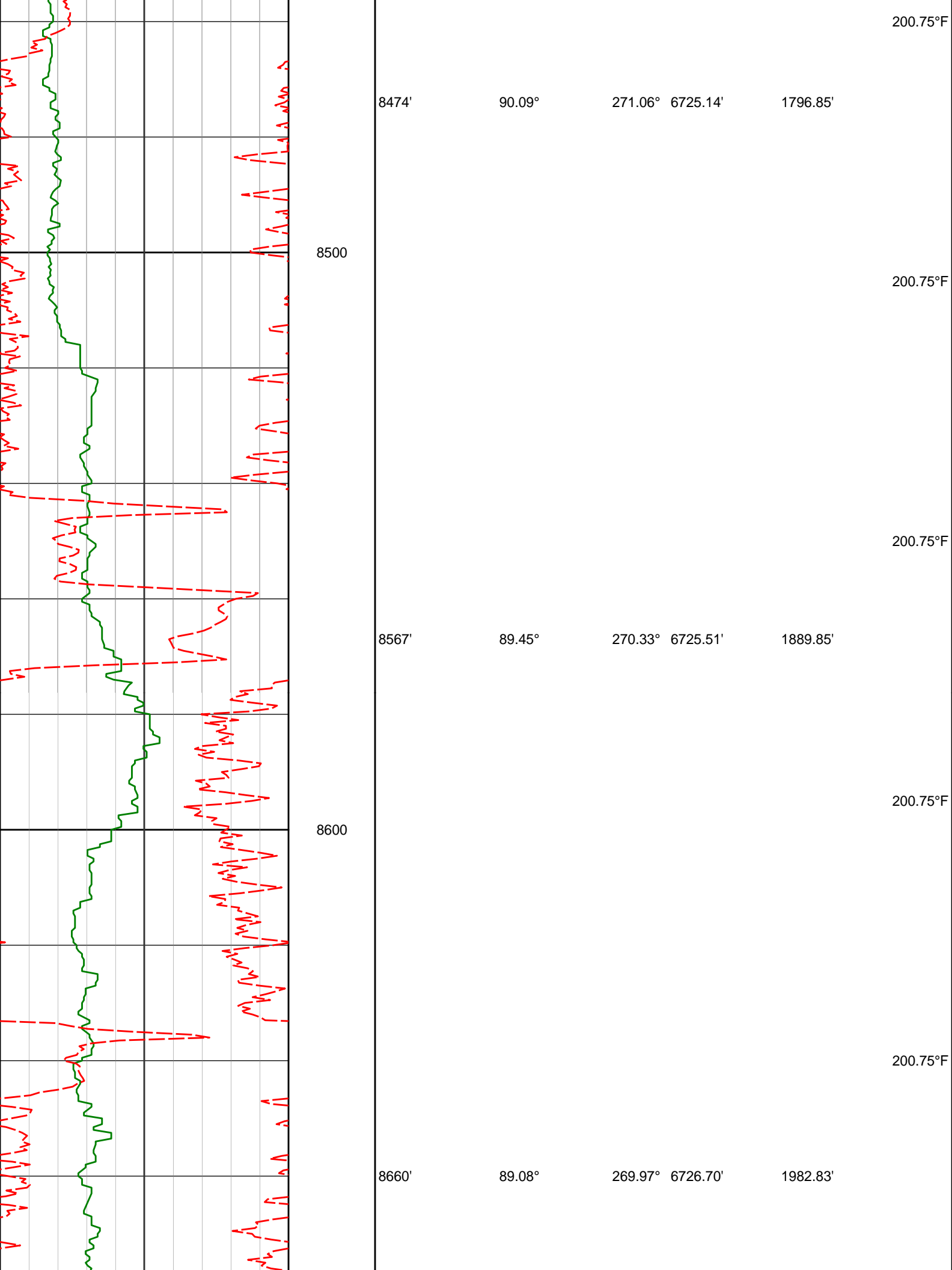
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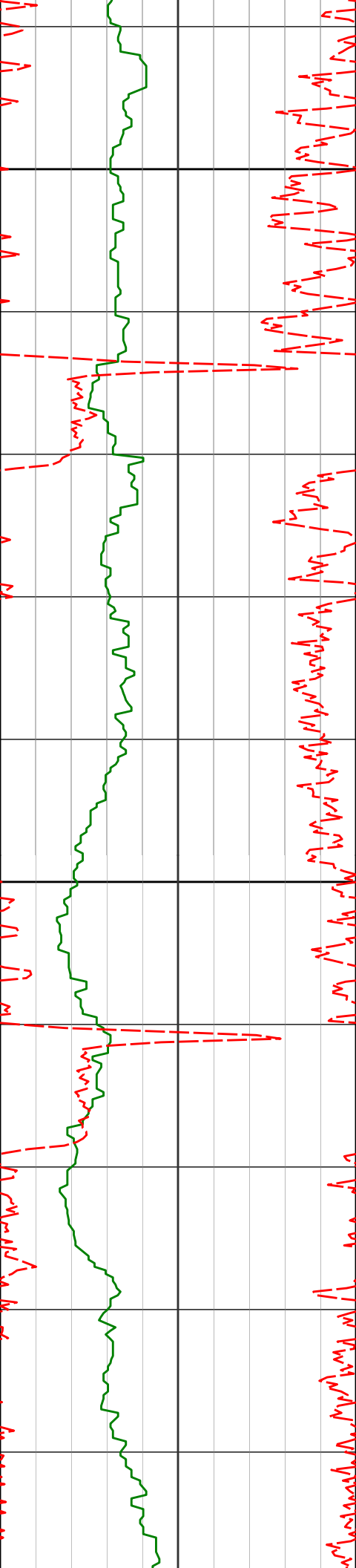
196.53°F

196.53°F

196.53°F

196.53°F





8700

8800

8753'

8845'

89.20°

89.08°

269.96° 6728.10'

270.26° 6729.48'

2075.81'

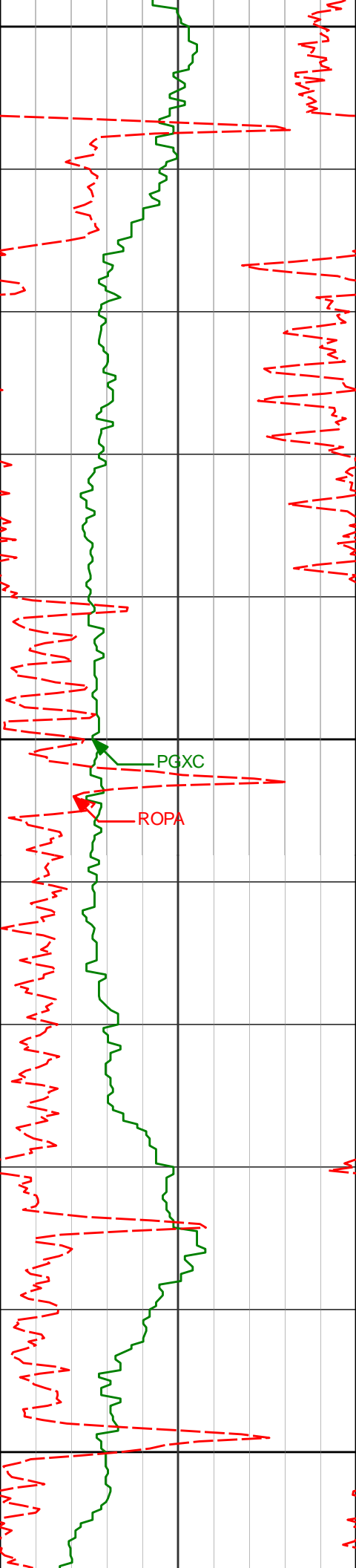
2167.79'

200.75°F

204.97°F

204.97°F

209.19°F



8900

209.19°F

8936'

88.65°

269.75° 6731.28'

2258.76'

209.19°F

9000

209.19°F

PGXC

ROPA

9028'

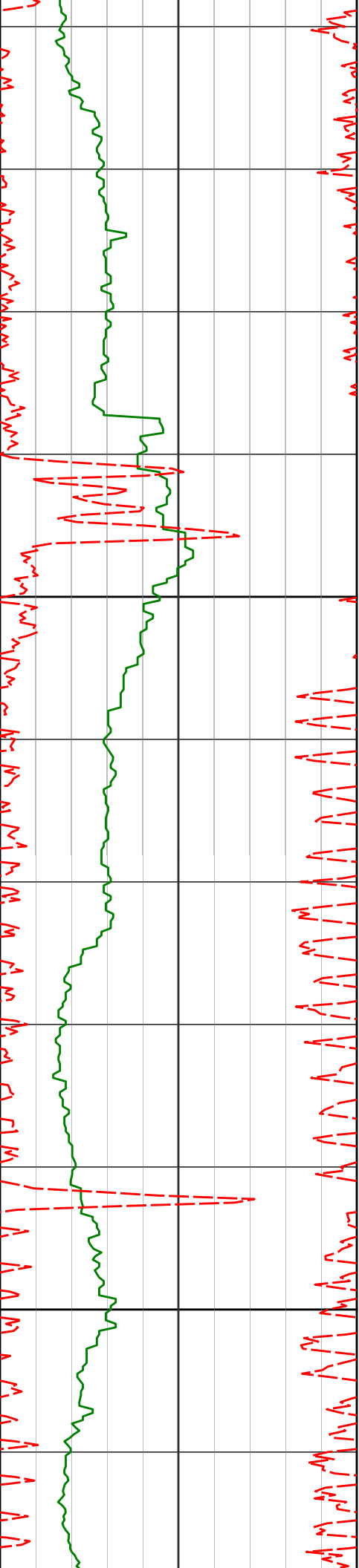
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2350.73'

209.19°F

9100



9121'

90.46°

269.71° 6732.94'

2443.72'

209.19°F

209.19°F

9200

9214'

90.86°

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2536.68'

209.19°F

210.96°F

9300

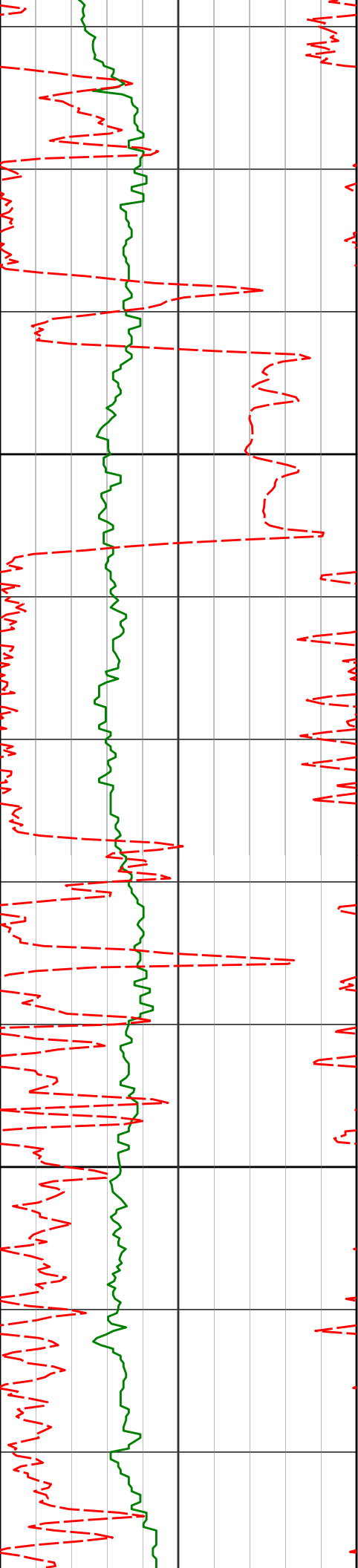
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91.85°

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2629.61'

213.41°F



9400

9400'

90.86°

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2722.55'

209.19°F

209.19°F

9492'

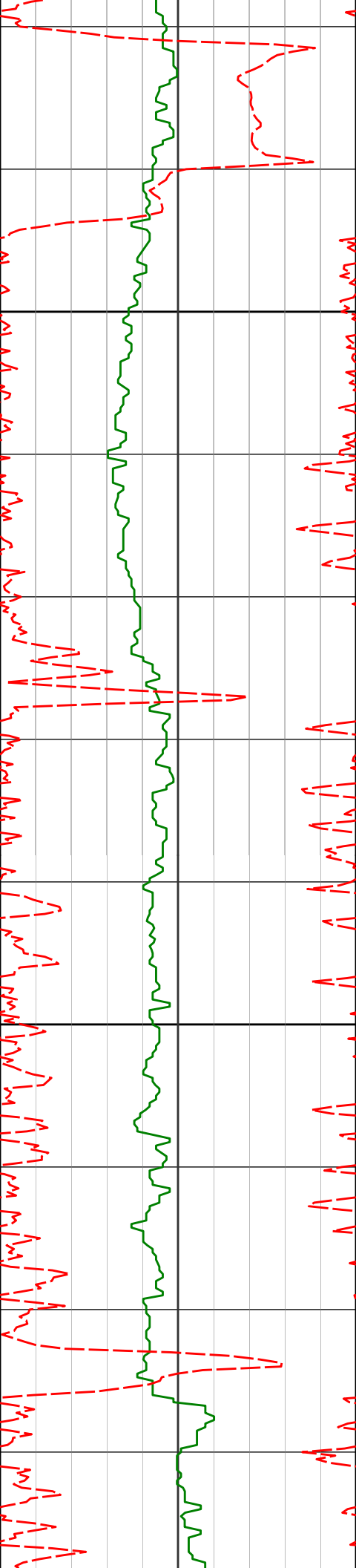
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269.05° 6725.99'

2814.50'

209.19°F

9500



9584'

89.45°

268.34° 6725.64'

2906.42'

209.19°F

9600

209.19°F

9679'

89.85°

268.40° 6726.22'

3001.33'

209.19°F

9700

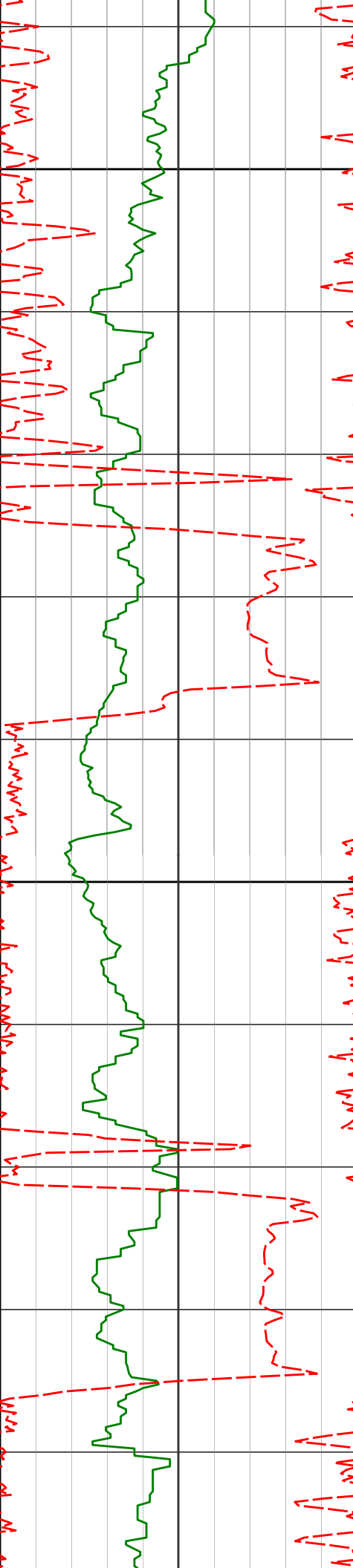
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90.86°

268.03° 6725.63'

3096.22'



9800

9900

9868'

9963'

91.20°

90.59°

268.10° 6723.94'

270.39° 6722.45'

3190.09'

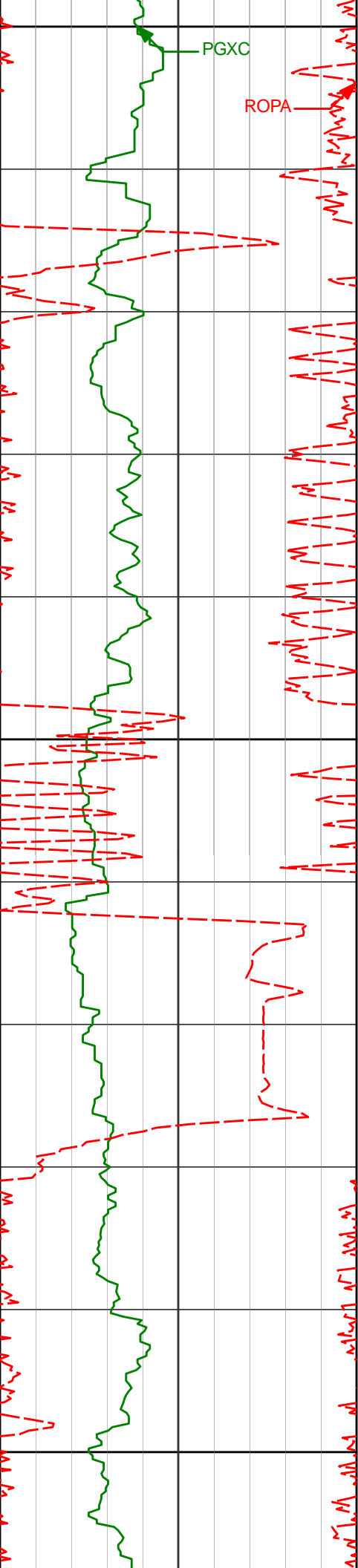
3285.03'

213.41°F

213.41°F

209.19°F

209.19°F



10000

10057'

91.85°

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3379.00'

213.41°F

213.41°F

10100

10152'

89.91°

271.96° 6718.99'

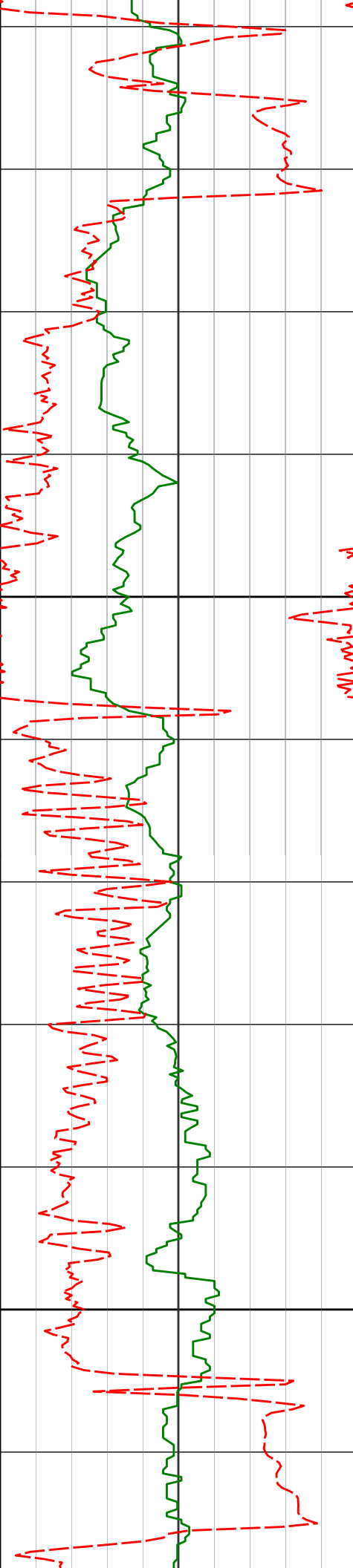
3473.98'

209.19°F

209.19°F

10200

209.19°F



10300

10400

10247'

89.01°

271.54° 6719.89'

3568.97'

209.19°F

213.41°F

10341'

90.43°

271.76° 6720.35'

3662.96'

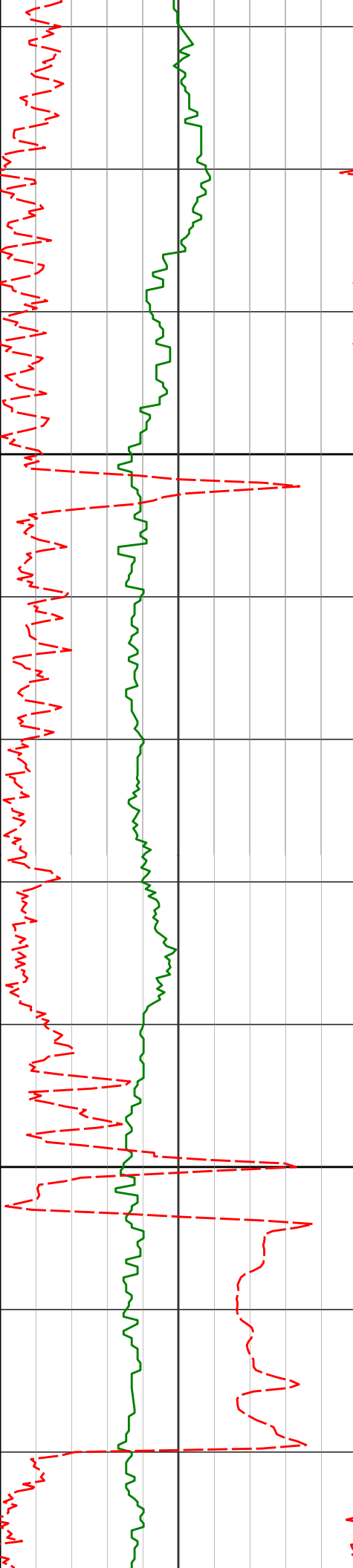
213.41°F

10436'

89.41°

270.16° 6720.48'

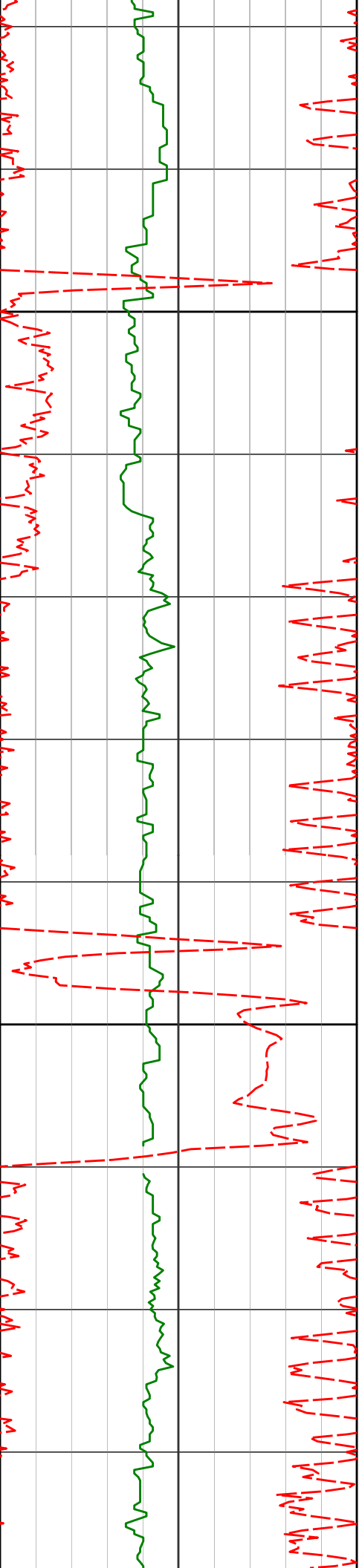
3757.95'



10500

10600

10488	89.41°	270.10°	6720.48'	3797.93'	213.41°F
10531'	90.77°	269.71°	6720.33'	3852.93'	213.41°F
10626'	88.12°	270.36°	6721.25'	3947.91'	213.41°F



10700

10800

10720'

10815'

87.04°

87.47°

270.10° 6725.22'

268.13° 6729.77'

4041.82'

4136.66'

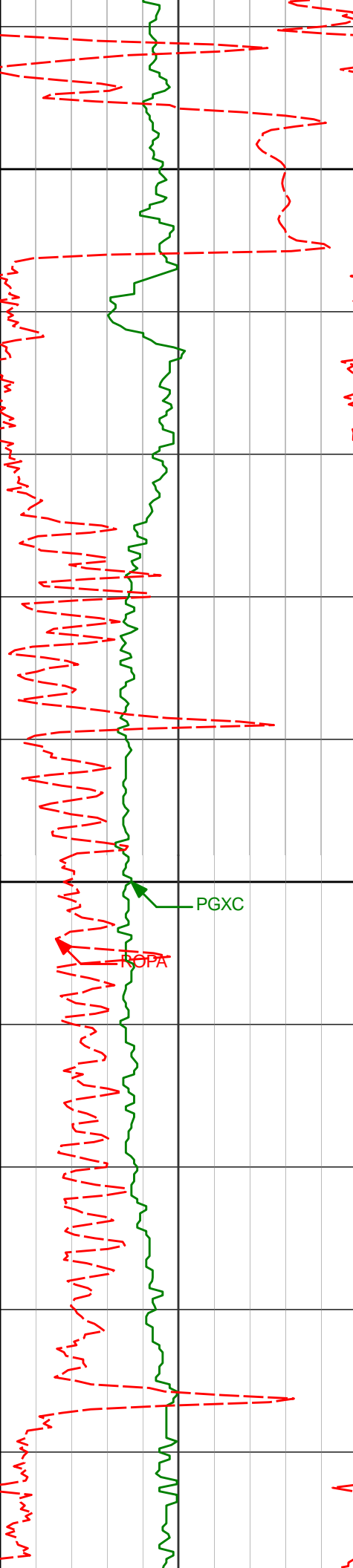
213.41°F

213.41°F

213.41°F

213.41°F

213.41°F



10900

10909'

89.14°

268.00° 6732.55'

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11004'

89.48°

268.43° 6733.70'

4325.38'

PGXC

ROPA

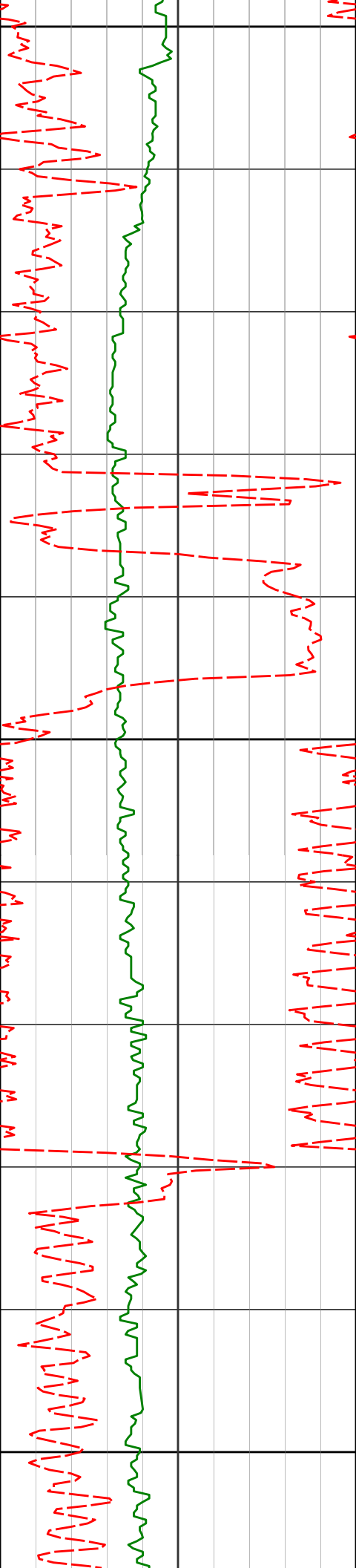
213.41°F

213.41°F

213.41°F

213.41°F

213.41°F



11100

11099'

90.43°

269.20° 6733.77'

4420.32'

213.41°F

213.41°F

11200

11193'

88.61°

267.45° 6734.56'

4514.21'

213.41°F

217.63°F

11300

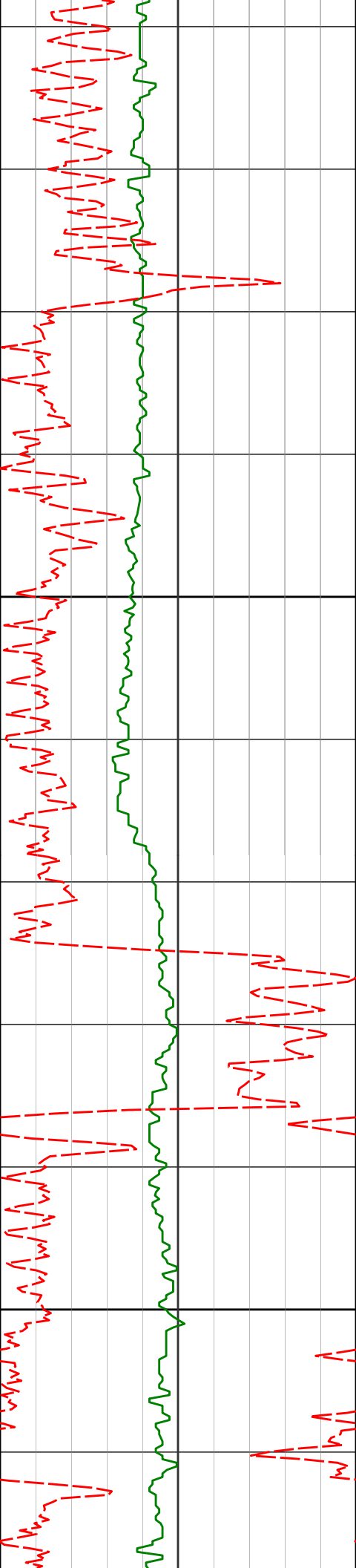
11288'

89.01°

267.15° 6736.53'

4609.00'

217.63°F



11400

11500

11383'

88.55°

265.79° 6738.55'

4703.69'

217.63°F

217.63°F

11477'

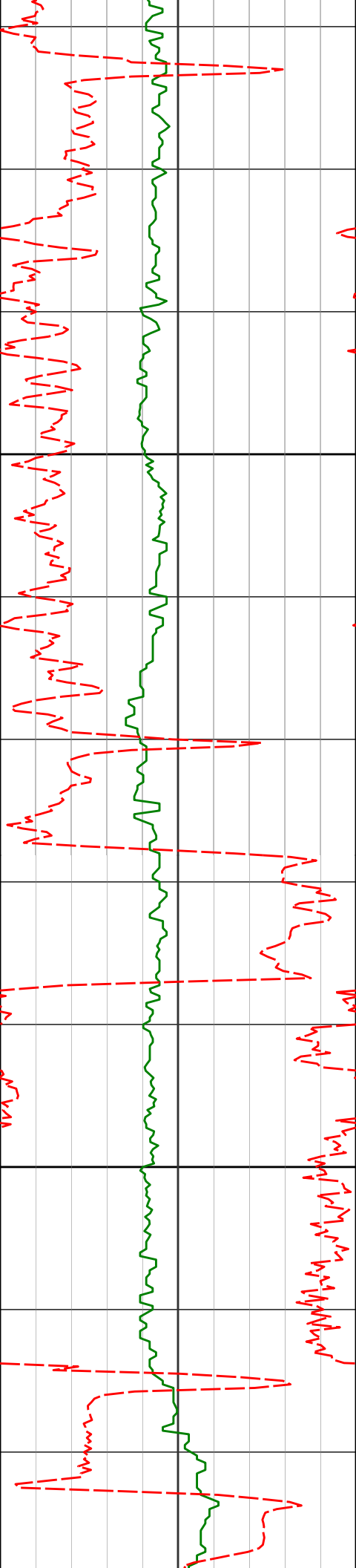
89.85°

266.97° 6739.87'

4797.38'

213.41°F

213.41°F



11600

11700

11572'

90.34°

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4892.11'

11667'

90.77°

266.58° 6738.79'

4986.82'

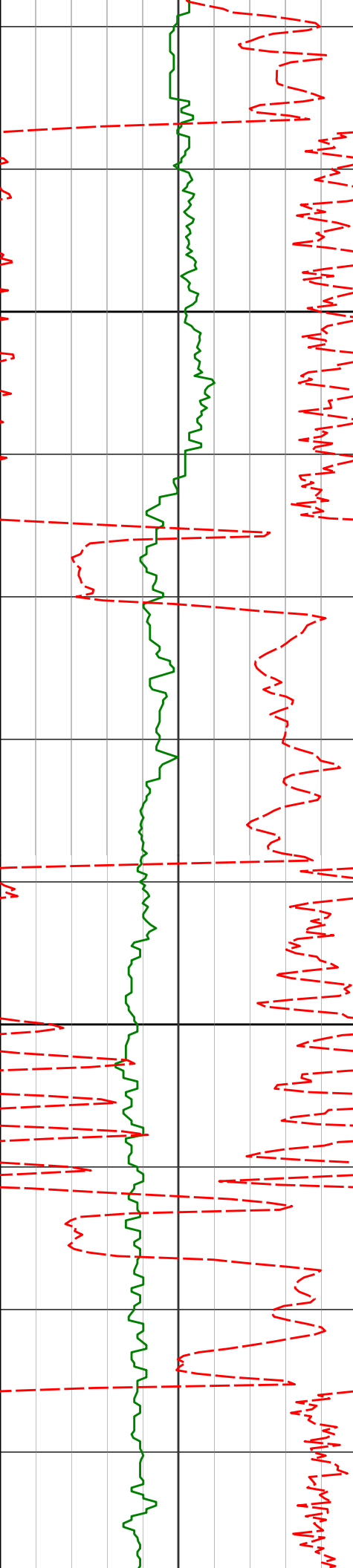
217.63°F

217.63°F

217.63°F

217.63°F

217.63°F



11800

11900

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11856' 92.06° 267.89° 6731.47' 5175.36'

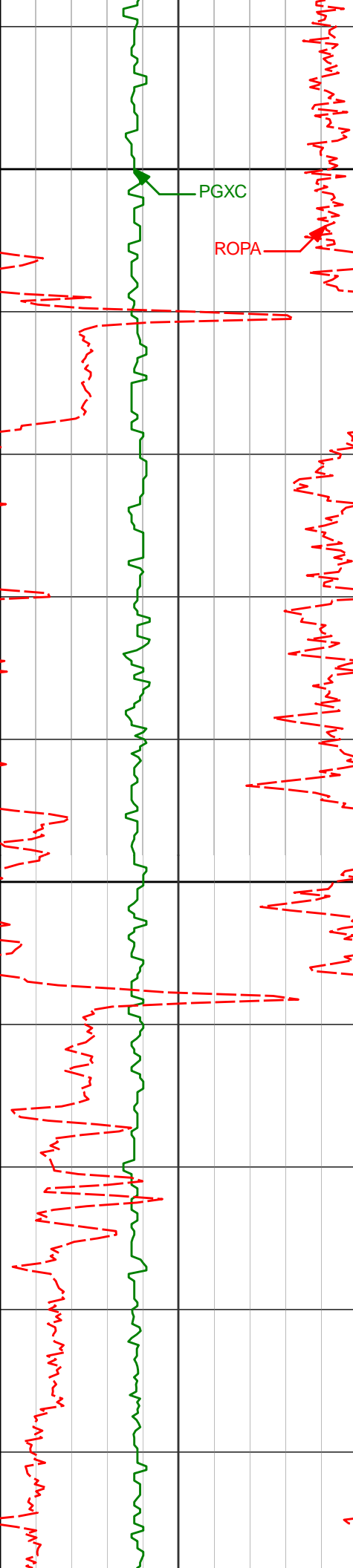
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217.63°F

217.63°F

217.63°F

221.84°F



12000

PGXC

ROPA

221.84°F

12045'

89.63°

267.86° 6731.19'

5364.13'

221.84°F

12100

223.57°F

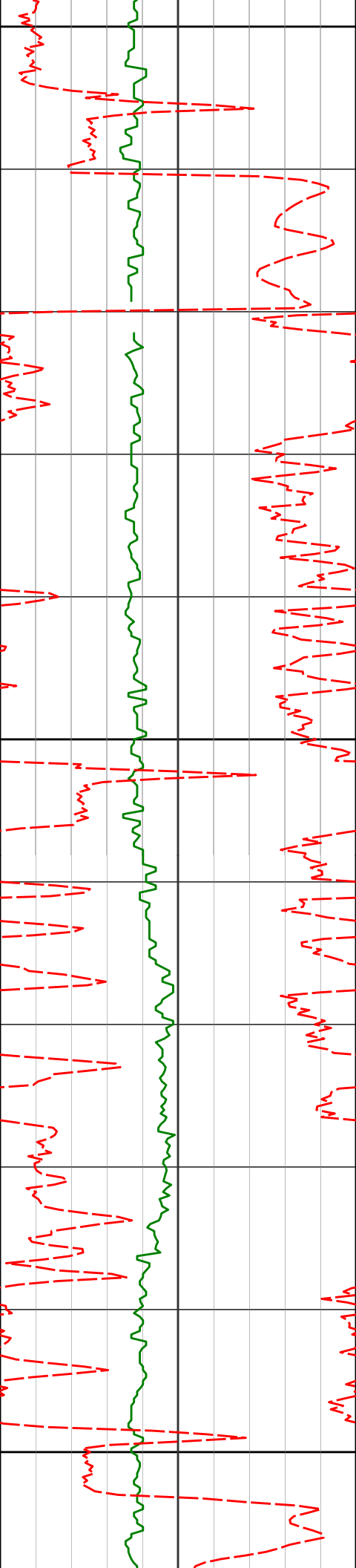
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89.75°

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226.06°F



12200

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90.15°

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221.84°F

12300

12329'

90.83°

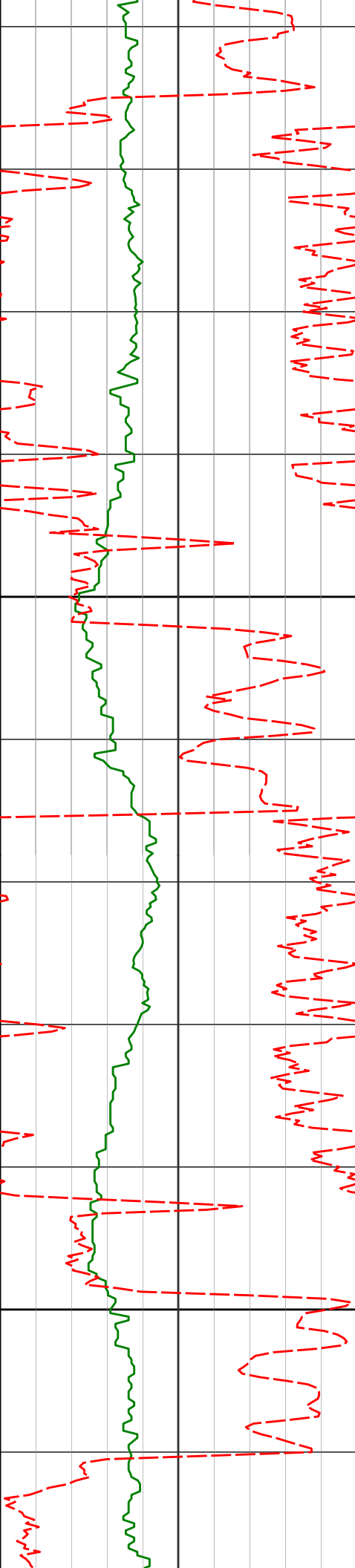
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12400

118.73°F



12500

12600

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89.63°

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5742.63'

221.84°F

12518'

90.96°

270.12° 6730.11'

5836.59'

221.84°F

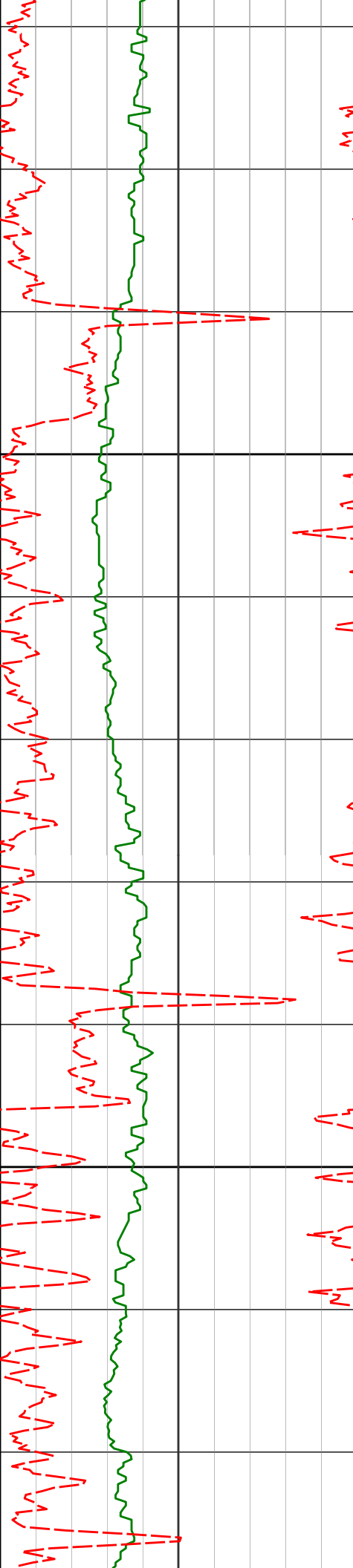
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226.06°F



12700

12800

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12802'

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90.62°

270.53°

270.17°

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6728.75'

6026.59'

6120.58'

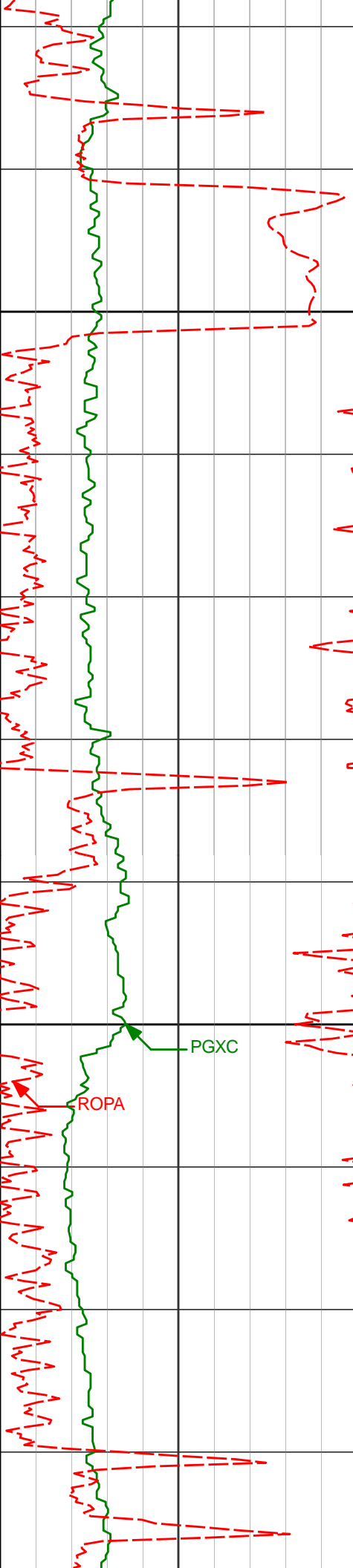
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230.28°F

230.28°F

230.28°F

230.28°F



12900

13000

12897'

12991'

88.92°

89.57°

269.41° 6729.13'

269.73° 6730.37'

6215.56'

6309.52'

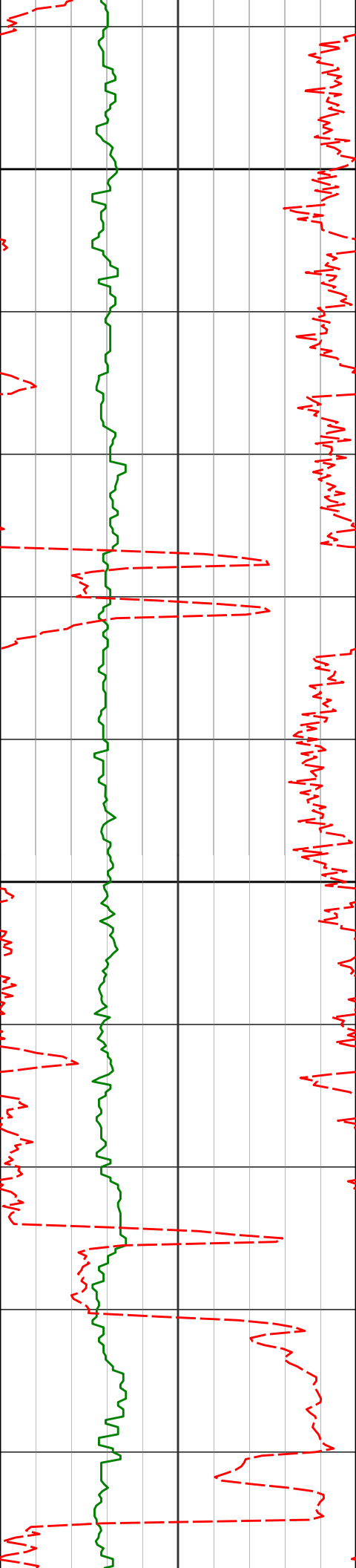
230.28°F

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230.28°F

PGXC

ROPA



13100

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230.28°F

13180'

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230.28°F

13200

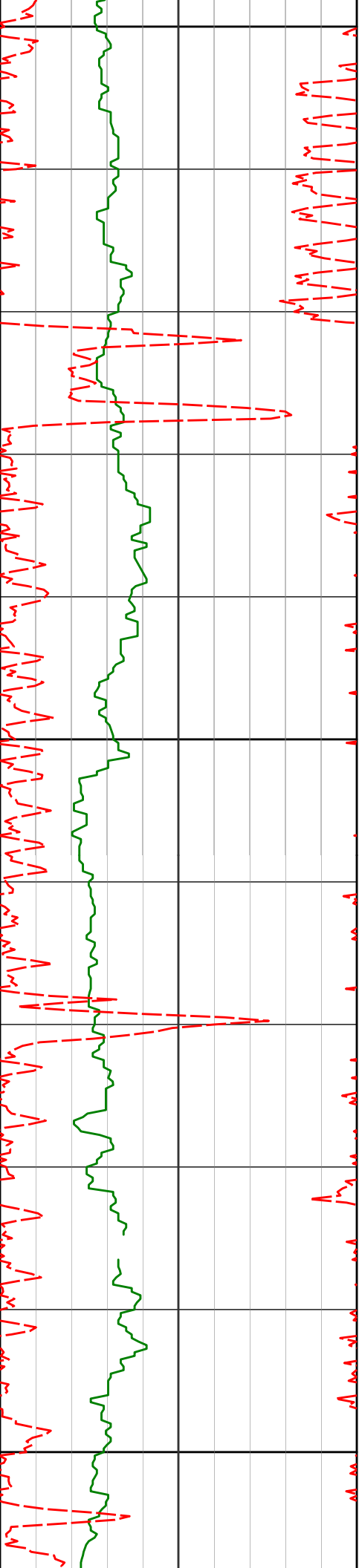
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13300

230.28°F

230.28°F

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13400

230.28°F

234.50°F

13465'

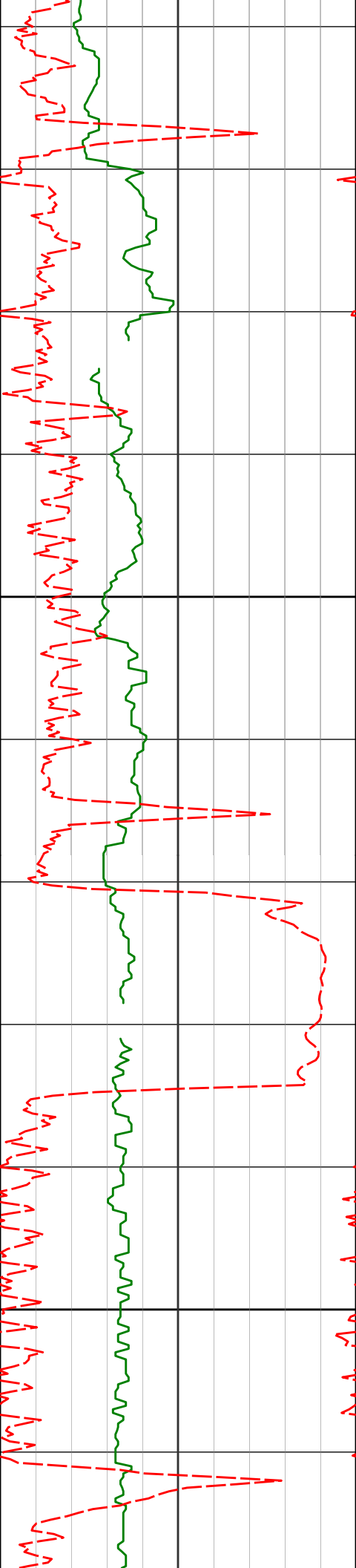
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13500

234.50°F



13600

13700

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91.32°

89.97°

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269.17° 6731.03'

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6972.08'

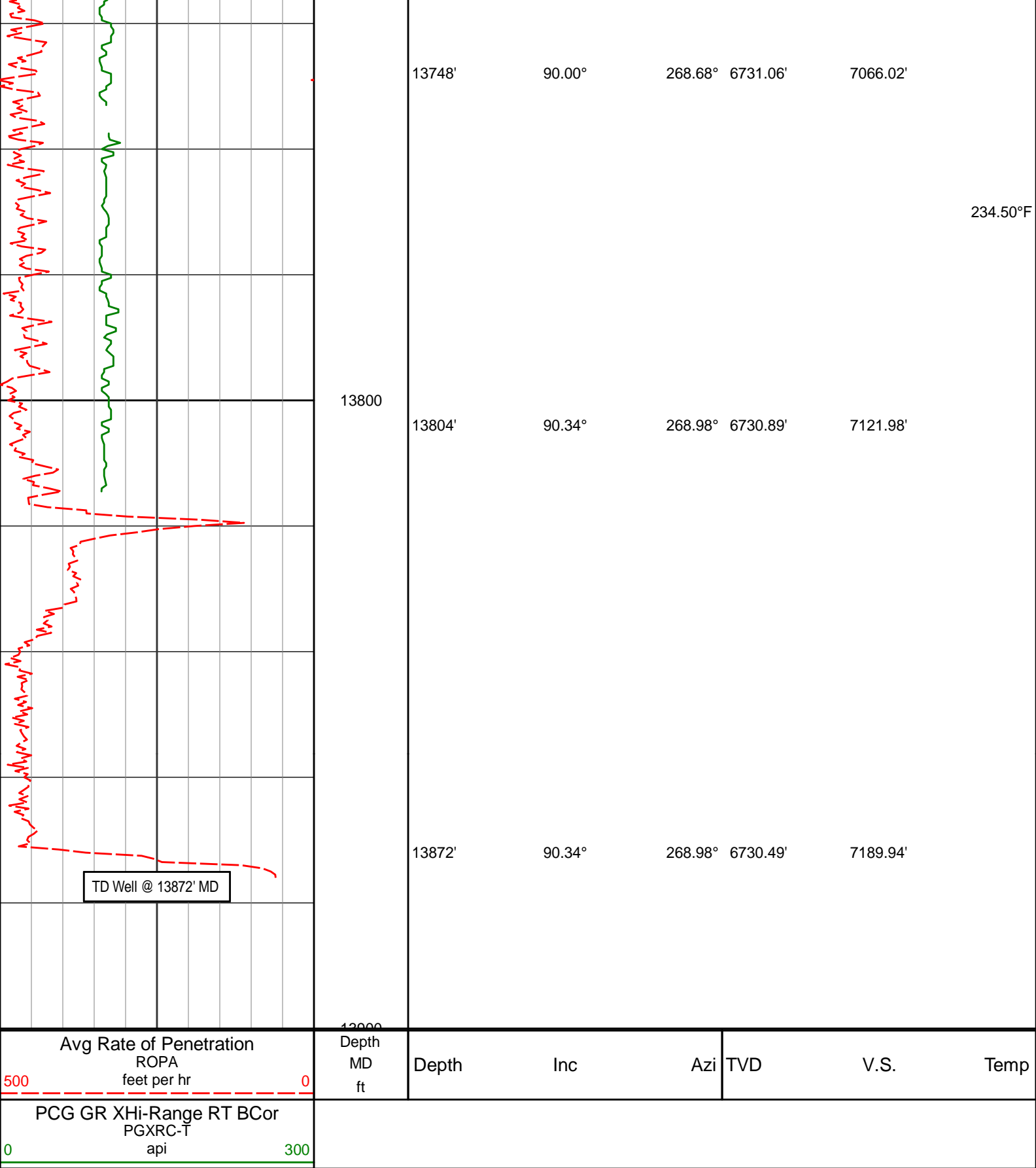
234.50°F

234.50°F

234.50°F

234.50°F

234.50°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AA11-623

Wells Ranch

0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
638.00	0.58	221.99	637.99	2.42 S	2.18 W	2.14	0.09
733.00	0.75	211.70	732.98	3.31 S	2.83 W	2.77	0.21
827.00	0.83	228.86	826.97	4.27 S	3.66 W	3.59	0.26
922.00	0.74	228.74	921.96	5.13 S	4.64 W	4.55	0.09
1017.00	0.50	192.97	1016.96	5.94 S	5.19 W	5.10	0.47
1111.00	0.42	183.13	1110.96	6.68 S	5.30 W	5.19	0.12
1204.00	0.78	321.50	1203.95	6.52 S	5.72 W	5.61	1.22
1296.00	0.63	281.61	1295.95	5.92 S	6.61 W	6.51	0.55
1389.00	0.52	274.30	1388.94	5.79 S	7.54 W	7.44	0.14
1483.00	0.40	262.49	1482.94	5.80 S	8.29 W	8.20	0.16
1575.00	0.46	348.03	1574.94	5.48 S	8.69 W	8.60	0.64
1668.00	0.37	22.13	1667.94	4.84 S	8.66 W	8.58	0.28
1760.00	2.92	55.19	1759.89	3.22 S	6.62 W	6.57	2.84
1852.00	4.90	63.70	1851.67	0.15 S	1.17 W	1.17	2.24
1946.00	6.54	50.48	1945.21	5.04 N	6.56 E	-6.47	2.22
2039.00	7.32	53.97	2037.53	11.90 N	15.44 E	-15.24	0.96
2131.00	9.20	45.06	2128.57	20.54 N	25.39 E	-25.05	2.46
2222.00	9.02	40.06	2218.42	31.14 N	35.12 E	-34.62	0.89
2314.00	9.00	37.08	2309.29	42.40 N	44.10 E	-43.42	0.51
2407.00	8.57	34.57	2401.20	53.91 N	52.42 E	-51.55	0.63
2499.00	7.67	29.61	2492.28	64.89 N	59.34 E	-58.29	1.24
2593.00	8.31	38.17	2585.37	75.69 N	66.64 E	-65.42	1.43
2685.00	9.60	44.72	2676.25	86.36 N	76.14 E	-74.75	1.78
2778.00	10.31	43.98	2767.85	97.86 N	87.38 E	-85.80	0.78
2870.00	9.03	49.52	2858.54	108.47 N	98.59 E	-96.83	1.72
2965.00	8.46	51.08	2952.44	117.70 N	109.70 E	-107.79	0.65
3154.00	8.04	52.26	3139.48	134.52 N	130.96 E	-128.79	0.24
3249.00	7.96	48.77	3233.56	142.92 N	141.16 E	-138.85	0.52
3343.00	7.29	43.33	3326.73	151.55 N	150.15 E	-147.69	1.05
3438.00	6.79	38.05	3421.01	160.35 N	157.74 E	-155.15	0.86
3533.00	3.89	52.44	3515.59	166.74 N	163.76 E	-161.06	3.34
3627.00	3.24	48.75	3609.41	170.43 N	168.28 E	-165.52	0.74
3722.00	3.53	42.67	3704.24	174.35 N	172.28 E	-169.46	0.49
3817.00	3.39	35.51	3799.07	178.79 N	175.89 E	-173.00	0.48
3911.00	3.80	29.40	3892.89	183.76 N	179.04 E	-176.06	0.60
4005.00	4.14	51.68	3986.67	188.58 N	183.23 E	-180.18	1.67
4100.00	4.59	51.18	4081.39	193.09 N	188.88 E	-185.75	0.47
4195.00	4.20	65.02	4176.11	196.94 N	194.99 E	-191.81	1.19
4289.00	3.86	64.14	4269.88	199.78 N	200.96 E	-197.73	0.37
4384.00	2.52	69.32	4364.73	201.91 N	205.79 E	-202.52	1.44
4478.00	1.86	57.53	4458.66	203.46 N	209.01 E	-205.72	0.85
4573.00	1.57	45.72	4553.62	205.19 N	211.24 E	-207.92	0.48
4668.00	0.84	182.02	4648.61	205.40 N	212.15 E	-208.82	2.37
4762.00	1.56	193.74	4742.59	203.47 N	211.82 E	-208.52	0.80
4857.00	1.74	212.12	4837.55	200.99 N	210.74 E	-207.49	0.59
4951.00	1.77	217.00	4931.51	198.63 N	209.11 E	-205.89	0.16
5046.00	1.82	205.13	5026.46	196.09 N	207.59 E	-204.41	0.39
5141.00	1.91	201.03	5121.41	193.25 N	206.38 E	-203.25	0.17
5235.00	2.10	191.32	5215.35	190.10 N	205.48 E	-202.40	0.41
5330.00	2.17	177.63	5310.29	186.59 N	205.21 E	-202.19	0.54
5425.00	2.56	173.98	5405.21	182.69 N	205.51 E	-202.55	0.44
5519.00	0.99	196.11	5499.16	179.83 N	205.50 E	-202.59	1.79
5614.00	1.11	180.08	5594.14	178.12 N	205.28 E	-202.39	0.34
5708.00	1.67	152.86	5688.12	175.99 N	205.90 E	-203.05	0.90
5803.00	1.66	144.91	5783.08	173.63 N	207.32 E	-204.51	0.24
5897.00	1.46	151.69	5877.04	171.46 N	208.68 E	-205.90	0.29
5992.00	1.42	153.78	5972.01	169.34 N	209.77 E	-207.02	0.07
6087.00	1.22	163.27	6066.99	167.32 N	210.58 E	-207.87	0.31
6181.00	12.06	276.64	6160.32	167.49 N	201.08 E	-198.36	13.40
6276.00	15.93	279.30	6252.48	170.75 N	178.35 E	-175.59	4.13
6371.00	19.11	271.88	6343.07	173.36 N	149.93 E	-147.13	4.09
6466.00	28.19	270.63	6430.00	174.12 N	111.87 E	-109.06	9.56
6560.00	38.20	273.51	6508.57	176.15 N	60.53 E	-57.69	10.78
6655.00	48.26	272.32	6577.70	179.39 N	4.38 W	7.26	10.63
6749.00	59.27	268.35	6633.19	179.65 N	80.05 W	82.93	12.19
6844.00	75.07	268.94	6669.93	177.62 N	167.31 W	170.14	16.65
6938.00	81.19	268.72	6689.26	175.74 N	259.24 W	262.03	6.51

6888.00	81.15	268.12	6698.28	170.24 N	238.24 W	232.24	0.81
7023.00	86.48	270.04	6698.38	174.83 N	343.71 W	346.47	6.42
7164.00	88.83	269.40	6704.14	174.14 N	484.58 W	487.31	1.72
7258.00	89.51	269.75	6705.50	173.44 N	578.57 W	581.28	0.81
7353.00	88.37	269.74	6707.26	173.02 N	673.55 W	676.24	1.20
7447.00	89.14	269.61	6709.30	172.49 N	767.52 W	770.19	0.83
7542.00	90.28	269.14	6709.79	171.45 N	862.52 W	865.16	1.30
7636.00	90.12	270.48	6709.46	171.14 N	956.51 W	959.14	1.44
7731.00	89.38	271.17	6709.87	172.51 N	1051.50 W	1054.13	1.07
7825.00	89.29	269.60	6710.96	173.14 N	1145.49 W	1148.12	1.67
7918.00	87.84	269.45	6713.29	172.37 N	1238.45 W	1241.06	1.57
8011.00	89.01	269.29	6715.85	171.35 N	1331.41 W	1333.99	1.27
8104.00	89.88	270.44	6716.75	171.13 N	1424.40 W	1426.97	1.55
8197.00	88.03	270.70	6718.44	172.05 N	1517.38 W	1519.95	2.01
8289.00	88.15	270.52	6721.51	173.03 N	1609.32 W	1611.89	0.24
8382.00	88.64	270.75	6724.12	174.06 N	1702.28 W	1704.86	0.58
8474.00	90.09	271.06	6725.14	175.51 N	1794.26 W	1796.85	1.61
8567.00	89.45	270.33	6725.51	176.64 N	1887.25 W	1889.85	1.04
8660.00	89.08	269.97	6726.70	176.88 N	1980.24 W	1982.83	0.56
8753.00	89.20	269.96	6728.10	176.83 N	2073.23 W	2075.81	0.13
8845.00	89.08	270.26	6729.48	177.00 N	2165.22 W	2167.79	0.35
8936.00	88.65	269.75	6731.28	177.01 N	2256.20 W	2258.76	0.73
9028.00	89.41	270.24	6732.84	177.00 N	2348.19 W	2350.73	0.98
9121.00	90.46	269.71	6732.94	176.96 N	2441.19 W	2443.72	1.26
9214.00	90.86	269.30	6731.87	176.16 N	2534.18 W	2536.68	0.62
9307.00	91.85	269.14	6729.67	174.89 N	2627.14 W	2629.61	1.08
9400.00	90.86	269.48	6727.48	173.77 N	2720.11 W	2722.55	1.13
9492.00	90.99	269.05	6725.99	172.59 N	2812.09 W	2814.50	0.49
9584.00	89.45	268.34	6725.64	170.50 N	2904.06 W	2906.42	1.84
9679.00	89.85	268.40	6726.22	167.80 N	2999.02 W	3001.33	0.43
9774.00	90.86	268.03	6725.63	164.84 N	3093.97 W	3096.22	1.13
9868.00	91.20	268.10	6723.94	161.66 N	3187.90 W	3190.09	0.37
9963.00	90.59	270.39	6722.45	160.41 N	3282.88 W	3285.03	2.49
10057.00	91.85	270.48	6720.45	161.13 N	3376.85 W	3379.00	1.34
10152.00	89.91	271.96	6718.99	163.15 N	3471.81 W	3473.98	2.57
10247.00	89.01	271.54	6719.89	166.05 N	3566.76 W	3568.97	1.05
10341.00	90.43	271.76	6720.35	168.76 N	3660.72 W	3662.96	1.53
10436.00	89.41	270.16	6720.48	170.35 N	3755.70 W	3757.95	2.00
10531.00	90.77	269.71	6720.33	170.24 N	3850.70 W	3852.93	1.51
10626.00	88.12	270.36	6721.25	170.30 N	3945.68 W	3947.91	2.87
10720.00	87.04	270.10	6725.22	170.67 N	4039.60 W	4041.82	1.18
10815.00	87.47	268.13	6729.77	169.21 N	4134.47 W	4136.66	2.12
10909.00	89.14	268.00	6732.55	166.04 N	4228.37 W	4230.50	1.78
11004.00	89.48	268.43	6733.70	163.08 N	4323.32 W	4325.38	0.58
11099.00	90.43	269.20	6733.77	161.11 N	4418.30 W	4420.32	1.29
11193.00	88.61	267.45	6734.56	158.37 N	4512.25 W	4514.21	2.69
11288.00	89.01	267.15	6736.53	153.89 N	4607.12 W	4609.00	0.53
11383.00	88.55	265.79	6738.55	148.04 N	4701.92 W	4703.69	1.51
11477.00	89.85	266.97	6739.87	142.11 N	4795.72 W	4797.38	1.87
11572.00	90.34	266.30	6739.71	136.53 N	4890.55 W	4892.11	0.87
11667.00	90.77	266.58	6738.79	130.63 N	4985.36 W	4986.82	0.54
11761.00	93.02	268.09	6735.68	126.27 N	5079.20 W	5080.58	2.88
11856.00	92.06	267.89	6731.47	122.94 N	5174.05 W	5175.36	1.03
11951.00	89.32	268.62	6730.33	120.04 N	5268.99 W	5270.24	2.98
12045.00	89.63	267.86	6731.19	117.16 N	5362.94 W	5364.13	0.87
12140.00	89.75	268.02	6731.70	113.74 N	5457.88 W	5459.00	0.21
12234.00	90.15	267.89	6731.78	110.39 N	5551.82 W	5552.87	0.45
12329.00	90.83	267.92	6730.97	106.92 N	5646.75 W	5647.74	0.72
12424.00	89.63	268.64	6730.59	104.06 N	5741.70 W	5742.63	1.47
12518.00	90.96	270.12	6730.11	103.05 N	5835.69 W	5836.59	2.12
12613.00	89.94	271.07	6729.36	104.03 N	5930.68 W	5931.59	1.47
12708.00	90.09	270.53	6729.34	105.36 N	6025.67 W	6026.59	0.59
12802.00	90.62	270.17	6728.75	105.93 N	6119.67 W	6120.58	0.68
12897.00	88.92	269.41	6729.13	105.59 N	6214.66 W	6215.56	1.96
12991.00	89.57	269.73	6730.37	104.88 N	6308.65 W	6309.52	0.77
13086.00	90.12	269.24	6730.63	104.03 N	6403.65 W	6404.49	0.78
13180.00	89.26	267.16	6731.14	101.07 N	6497.59 W	6498.38	2.39
13275.00	89.04	269.63	6732.55	98.41 N	6592.54 W	6593.27	2.61
13370.00	89.48	269.71	6733.77	97.87 N	6687.53 W	6688.24	0.47
13465.00	90.62	269.44	6733.69	97.16 N	6782.52 W	6783.21	1.23
13559.00	91.32	268.67	6732.10	95.61 N	6876.50 W	6877.14	1.11
13654.00	89.97	269.17	6731.03	93.82 N	6971.47 W	6972.08	1.52
13748.00	90.00	268.68	6731.06	92.06 N	7065.45 W	7066.02	0.52
13804.00	90.34	268.98	6730.89	90.91 N	7121.44 W	7121.98	0.81
13872.00	90.34	268.98	6730.49	89.70 N	7189.43 W	7189.94	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 270.92 DEGREES (GRID)
A TOTAL CORRECTION OF 7.38 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 13872.00 FEET
IS 7189.99 FEET ALONG 270.71 DEGREES (GRID)**

Final survey is a straight line projection to TD.

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