



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	25-Jun-15	30-Jun-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	850.00	7,032.00			
Log End Depth (MD, ft)	7,032.00	16,730.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	24-Jun-15 07:00	26-Jun-15 16:00			
Drill/Wipe End Date and Time	25-Jun-15 13:00	29-Jun-15 15:50			
Min Inc (deg) @ Depth (MD, ft)	0.42 @ 920.00	86.18 @ 7,060.00			
Max Inc (deg) @ Depth (MD, ft)	80.88 @ 6,978.00	93.23 @ 10,187.00			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.75 / PDC			
Flow Rate (gpm)	566.51	296.25			
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)	10.00 / 33.00	9.57 / 34.00			
Filtrate CL (ppm)	15,000.00	1,200.00			
pH / Fluid Loss (mptm)	9.50 / 0	8.50 / 8			
PV (cP) / YP (lhf2)	10 / 6.00	8 / 4.00			
% Solids / % Sand	6 / 0.2	3.50 / 0.00			
% Oil / Oil:Water Ratio	N/A / 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) / Source	180.09 / PCM	255.60 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Adam Sampson	Adam Sampson			
Customer Representative	Charles Collver	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404289	12134698			
Insert Serial Number	11400868	10997272			
Date and Time Initialized	23-Jun-15 13:51	25-Jun-15 14:01			
Date and Time Read	26-Jun-15 06:43	30-Jun-15 07:58			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.00	67.00			
Software Version	6.21	6.33			
Sub Serial Number	11404289	12134698			
Sonde Serial Number	12177556	11833224			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	117.61	43.30			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	42.21	55.21			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404289	12134698			
Insert/Sonde Serial Number	11681025	12071281			

REMARKS

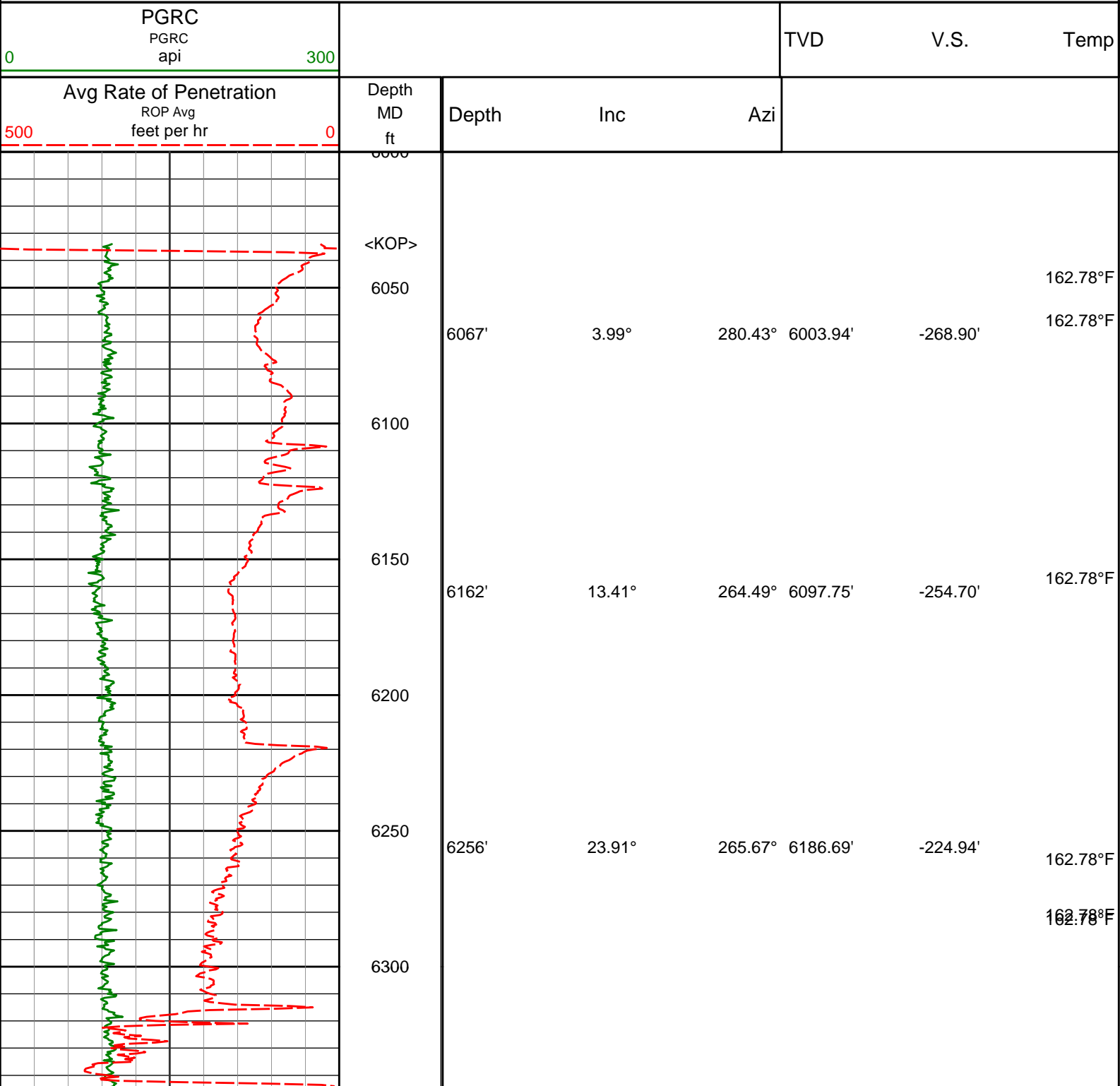
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
 - Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
 - Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.
5. INSITE version 8.1.10.

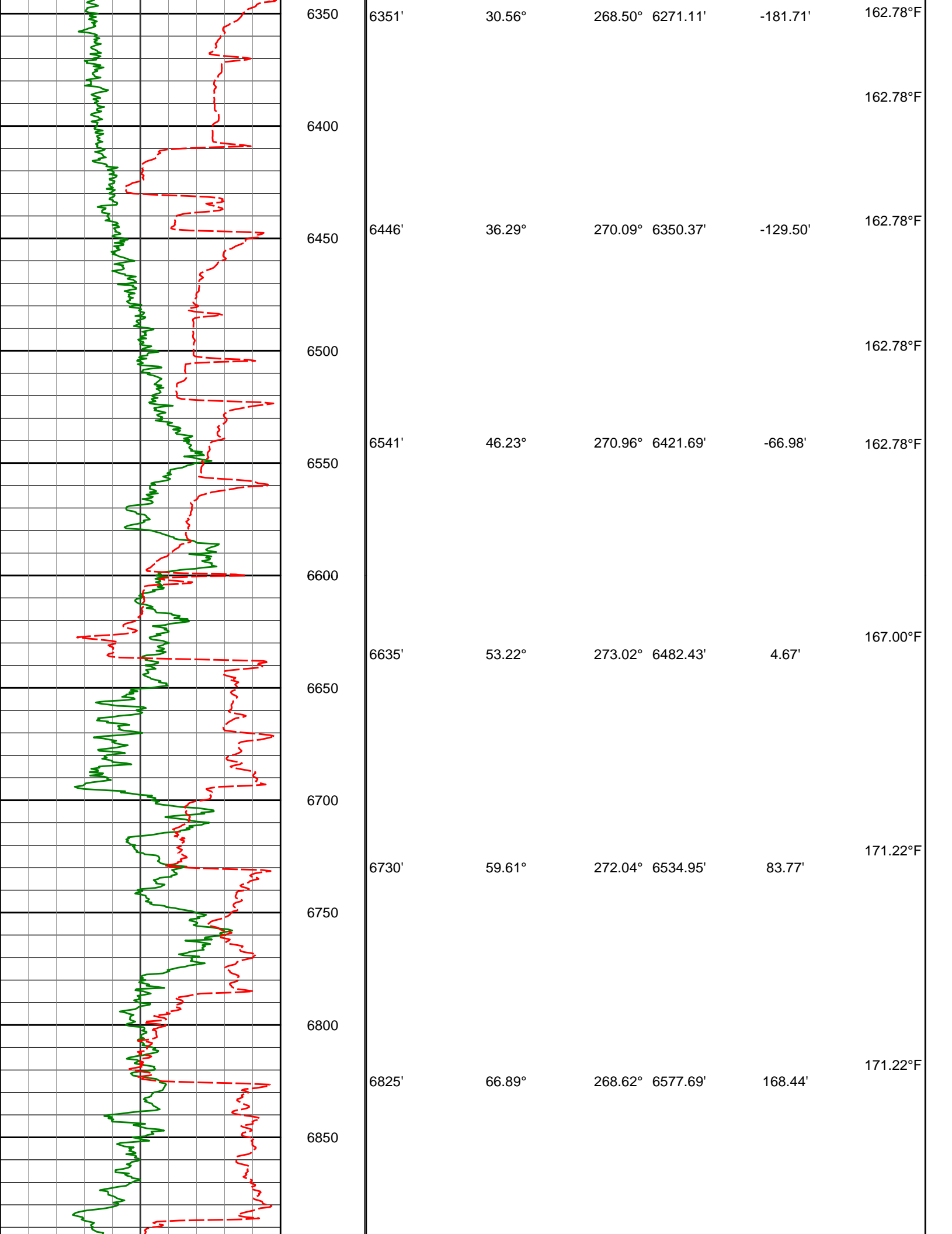
WARRANTY

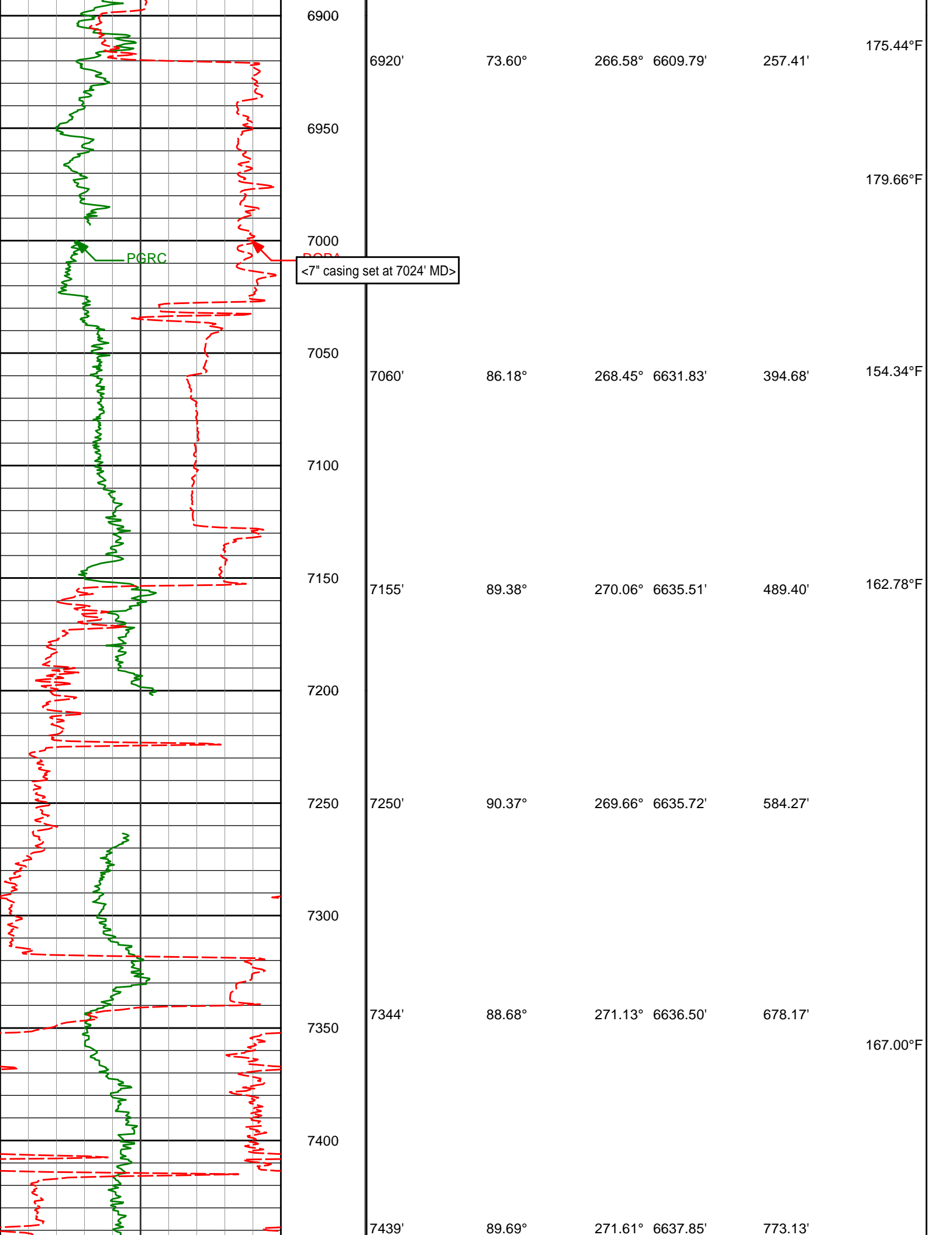
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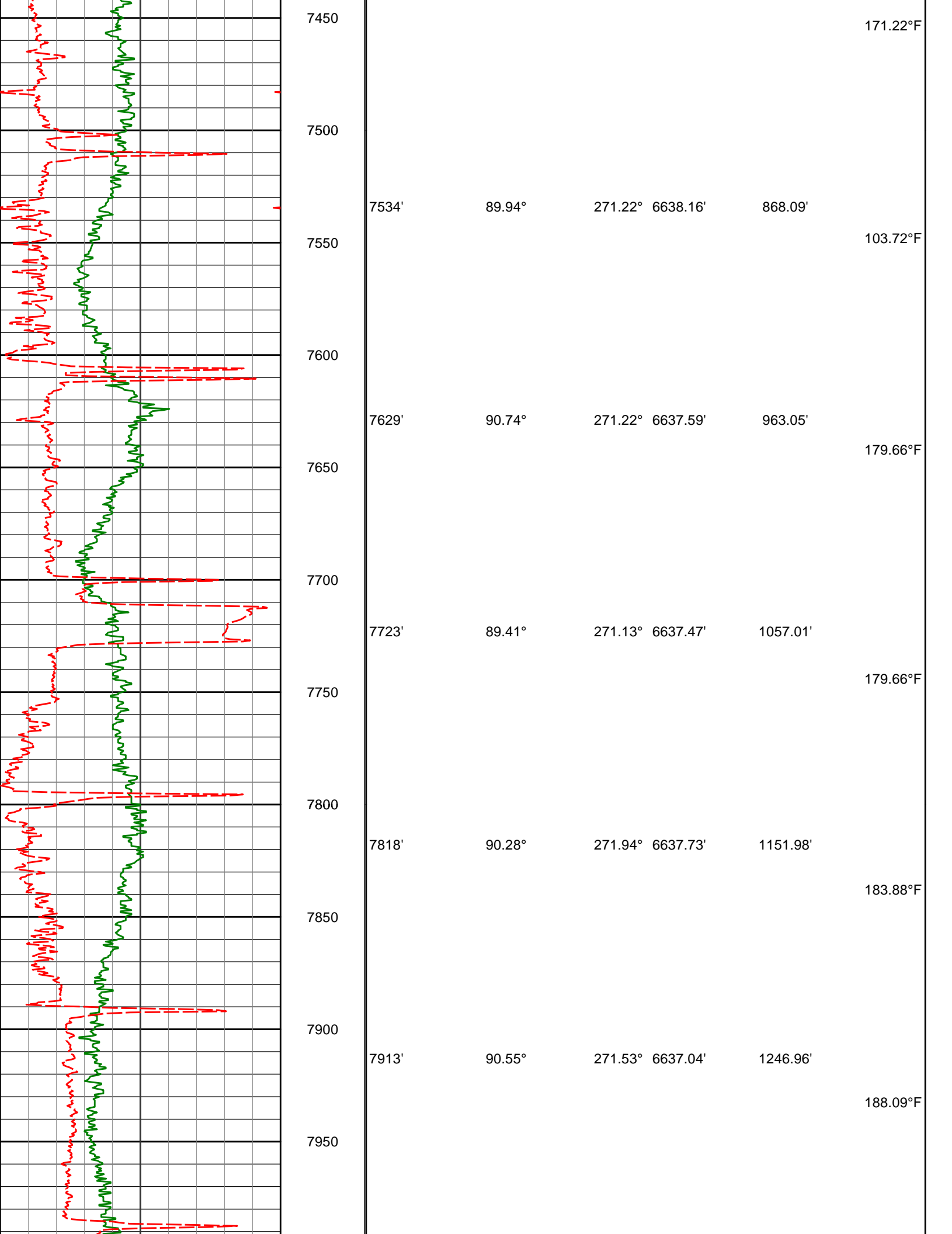
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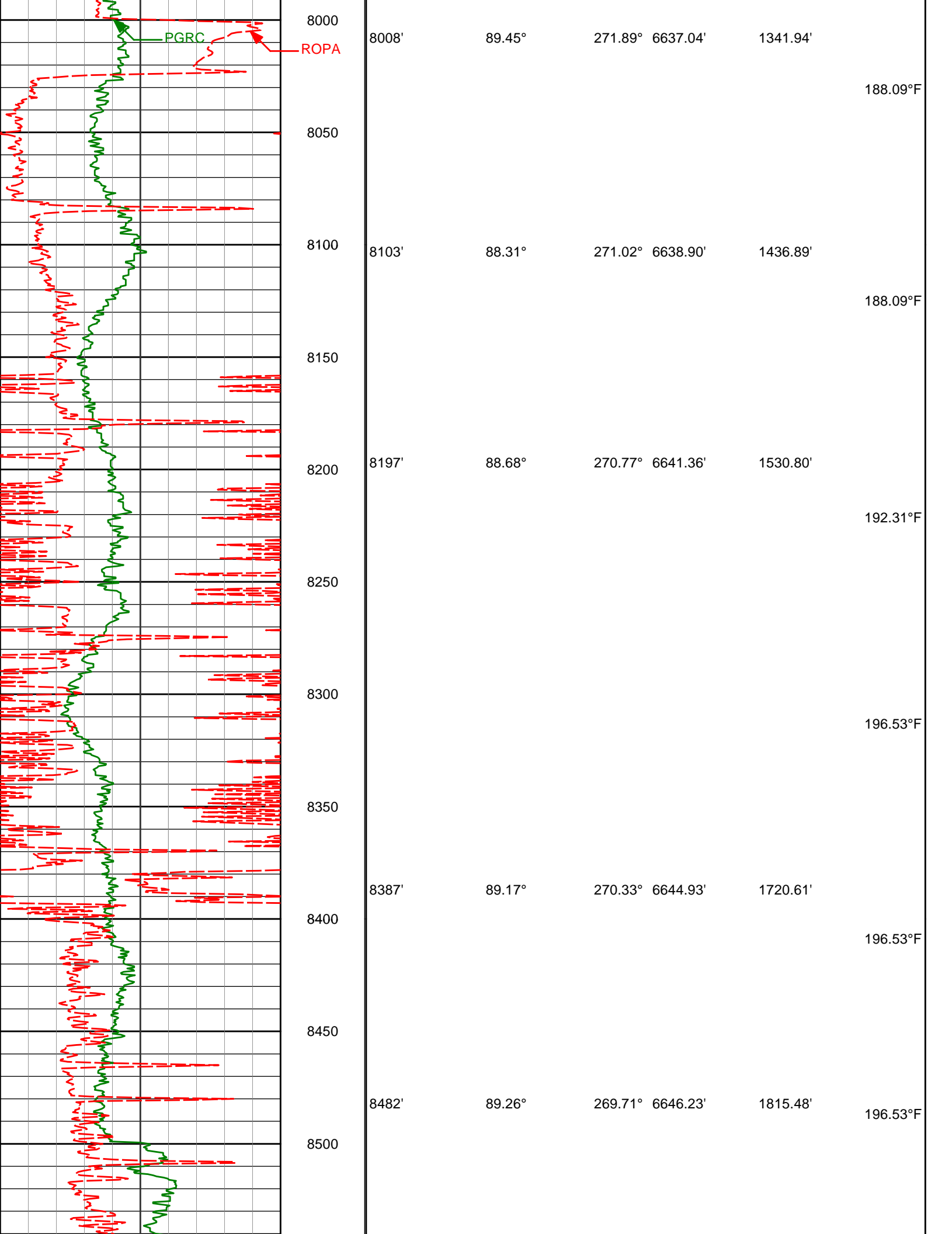
MD Detail 1:600 Scale

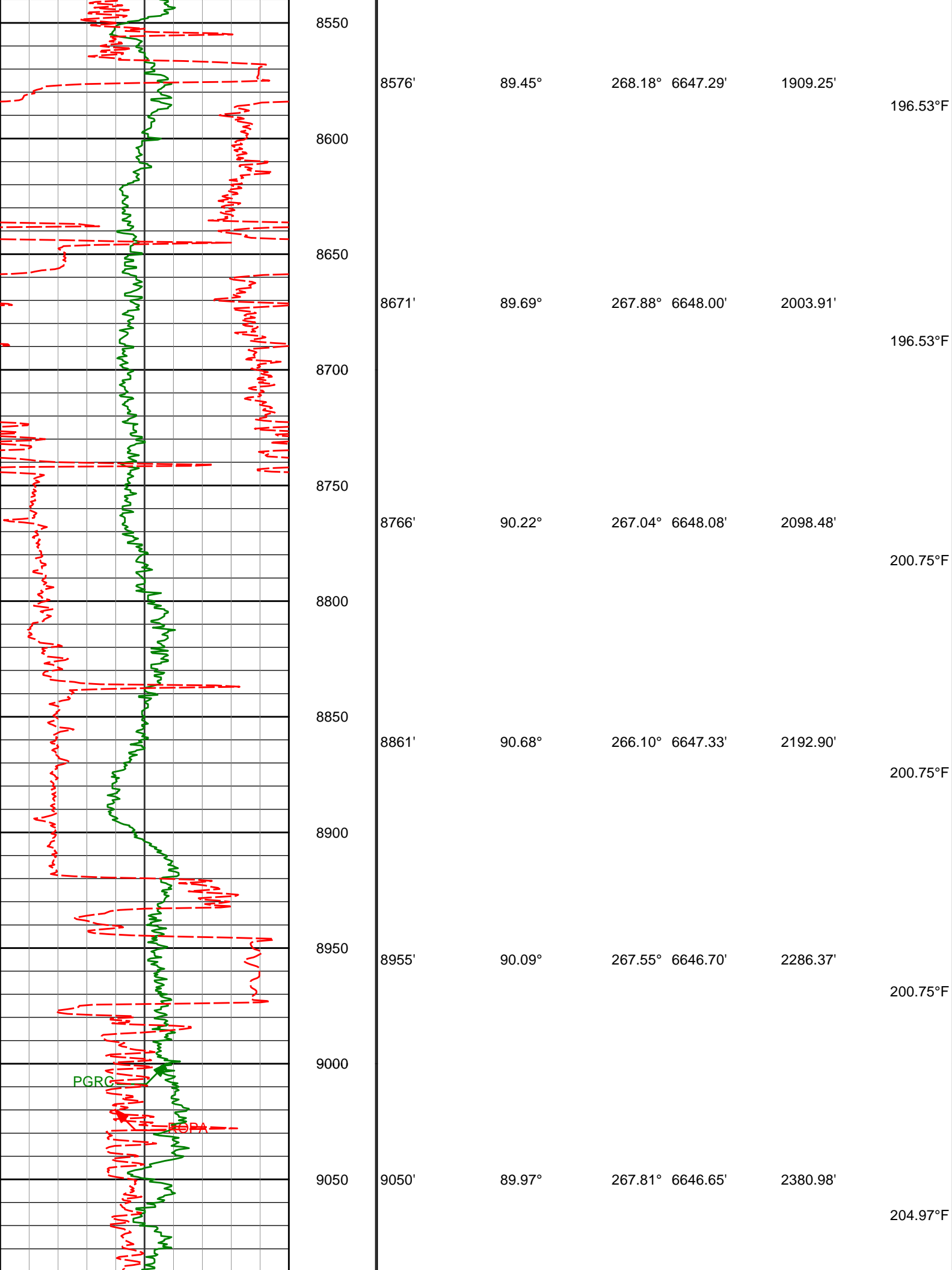


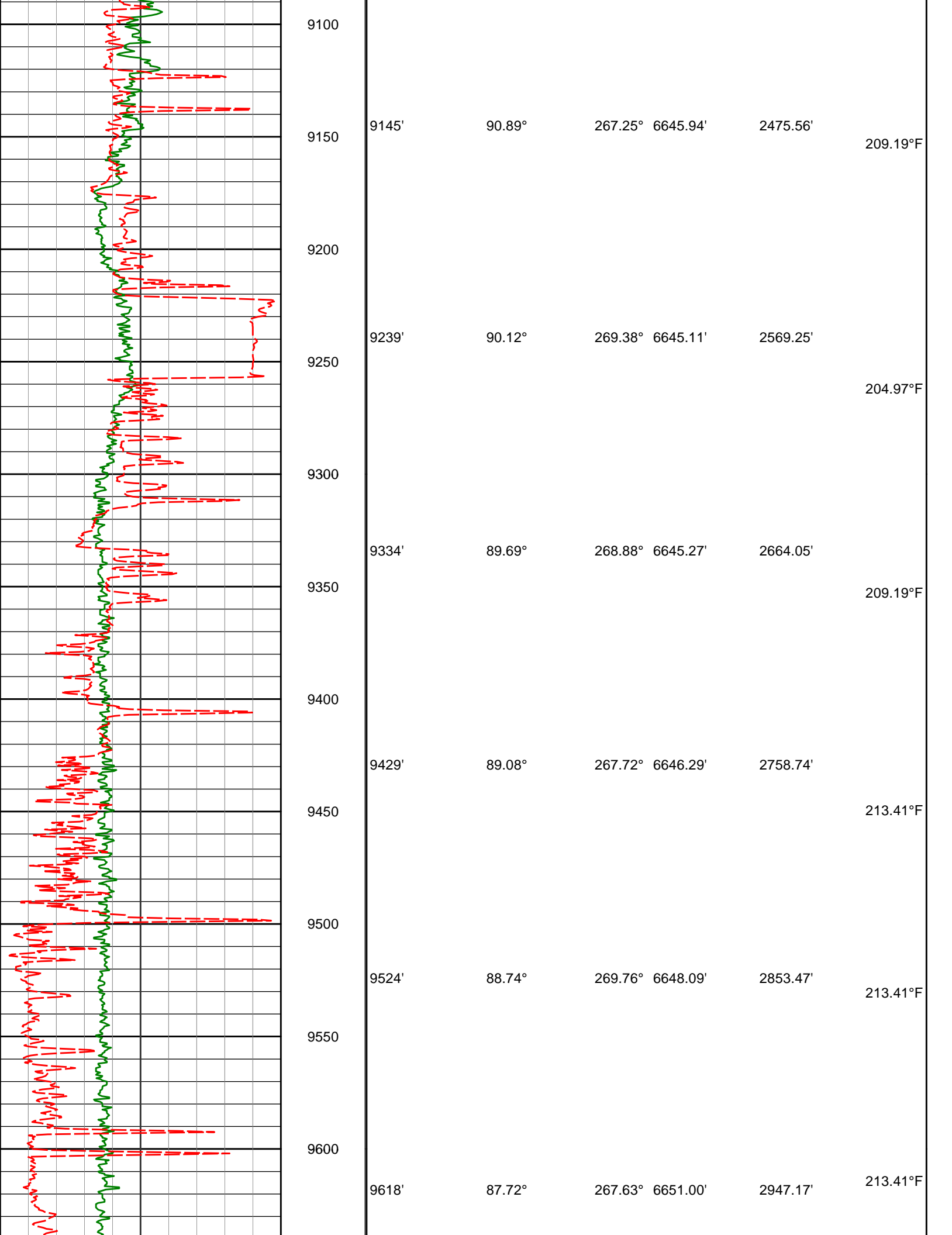


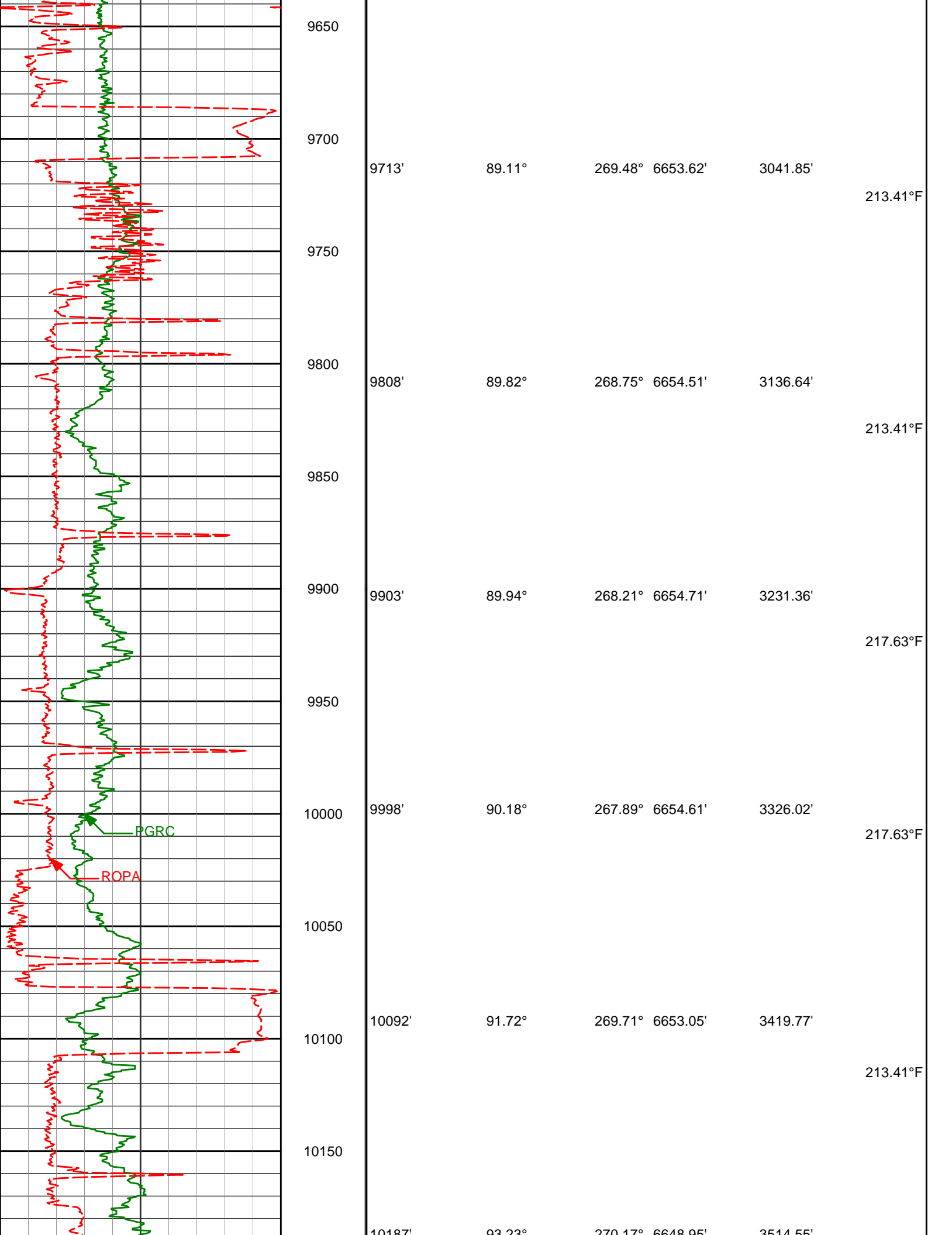


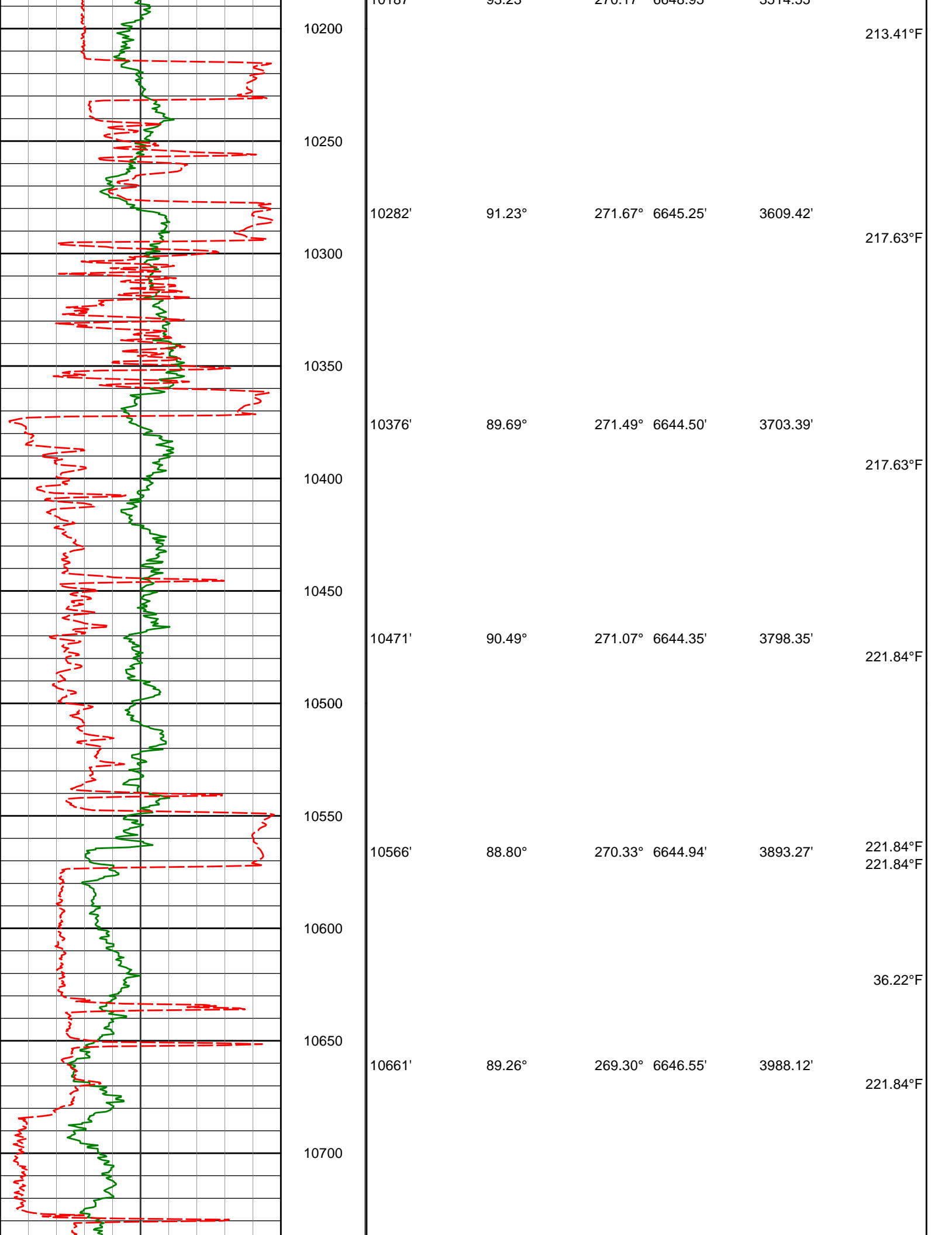


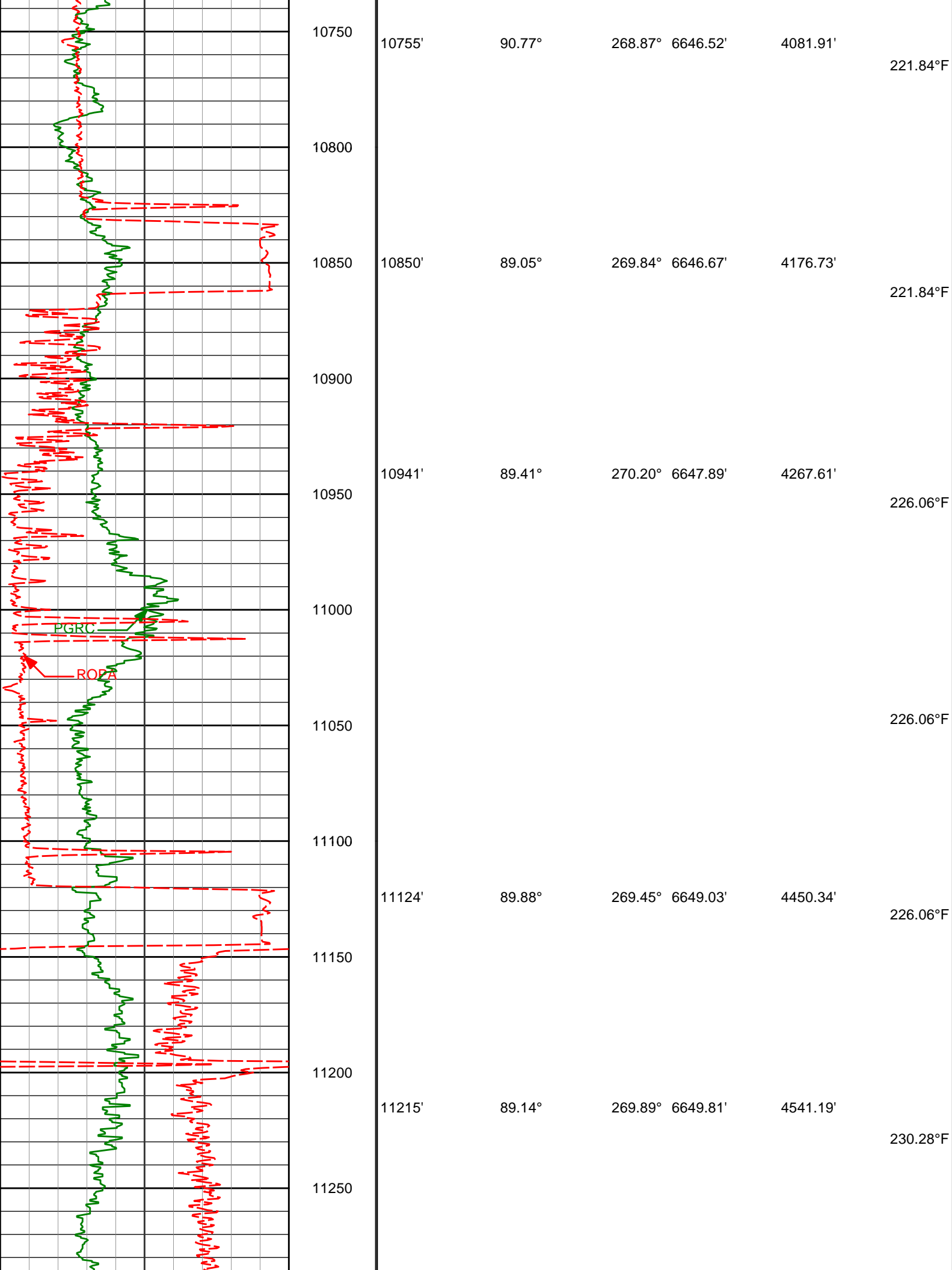


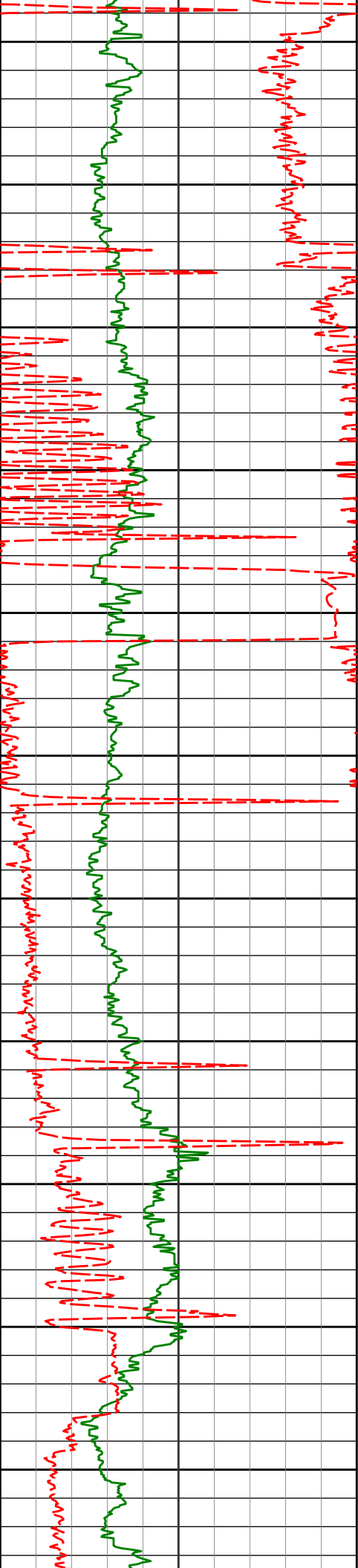




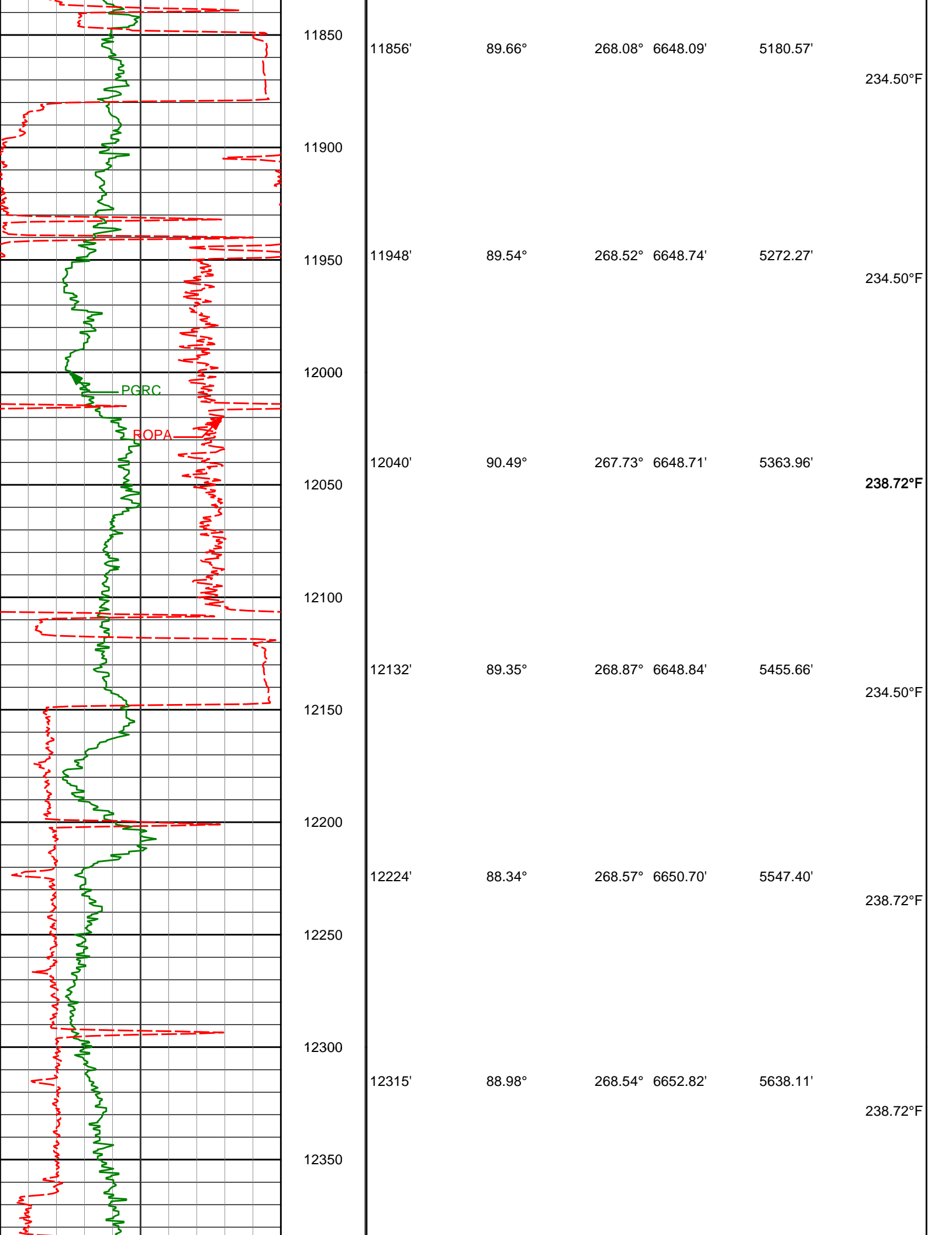


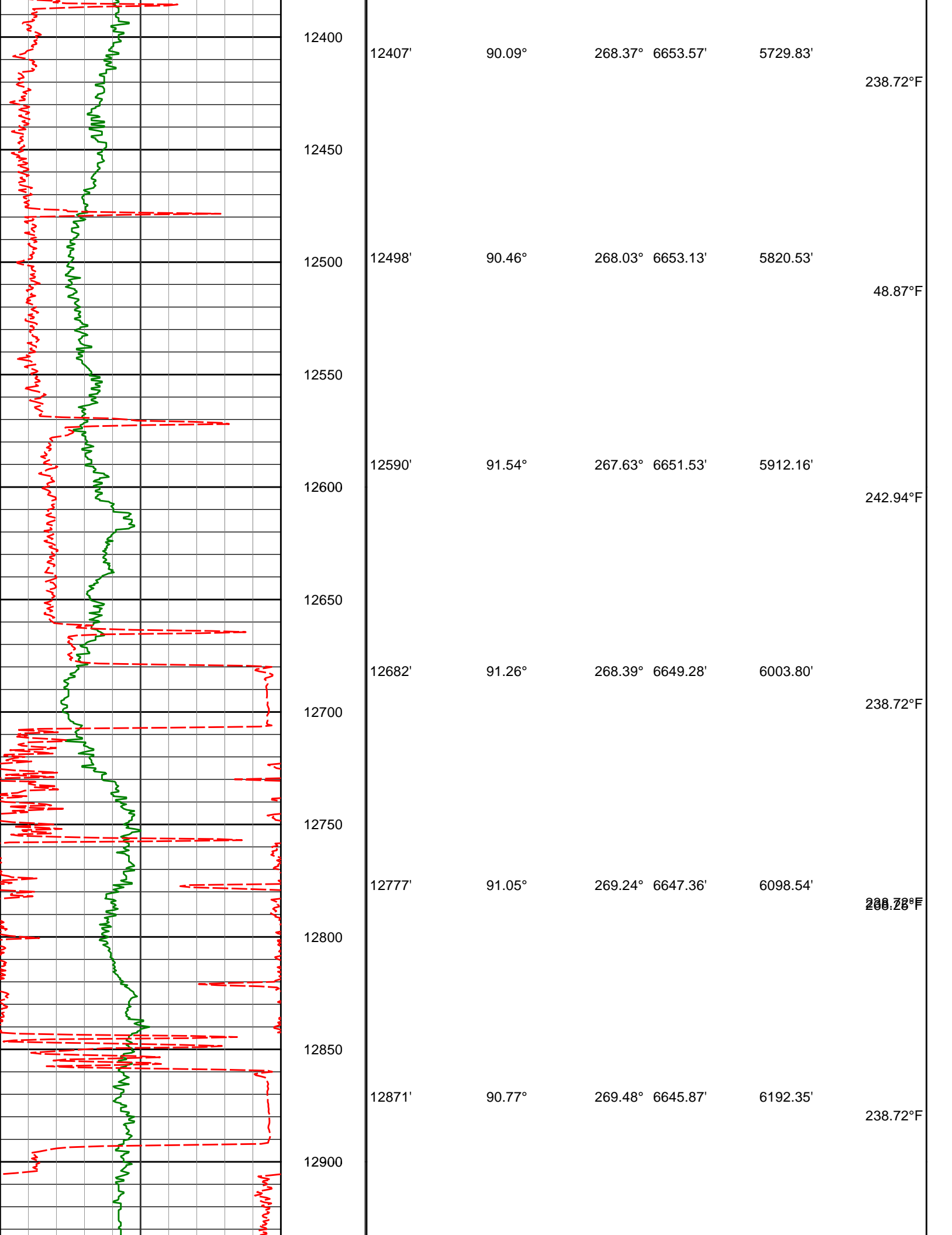


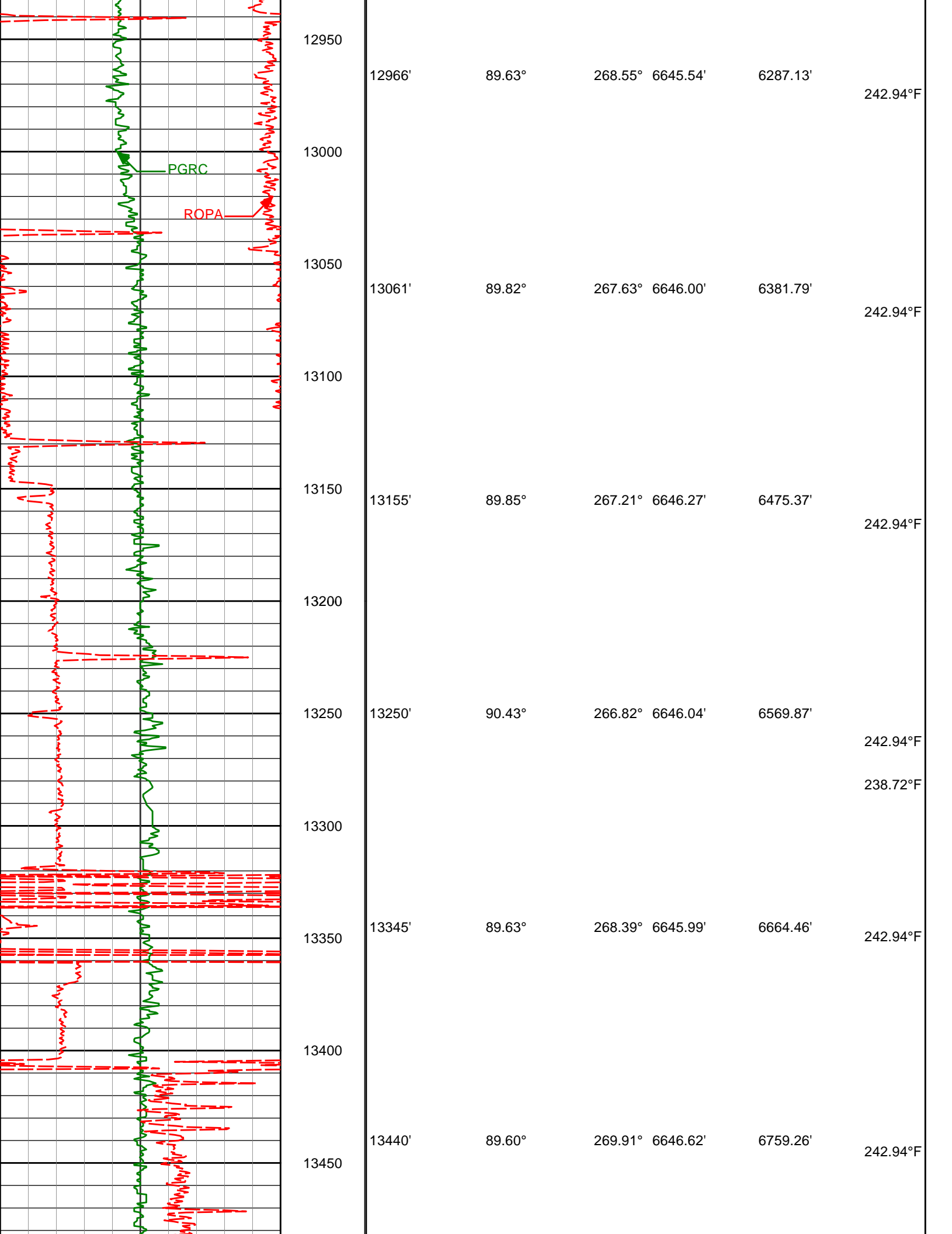


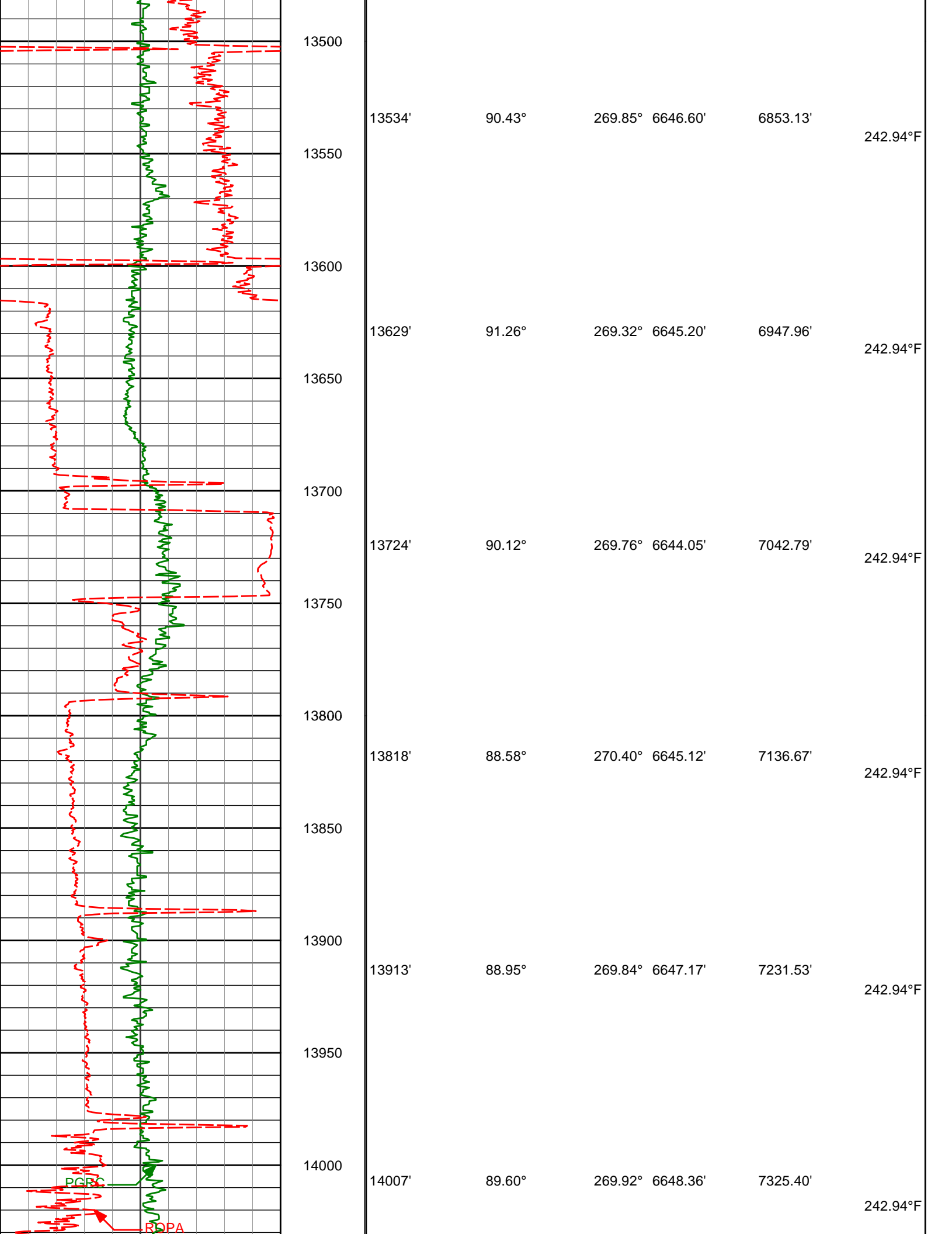


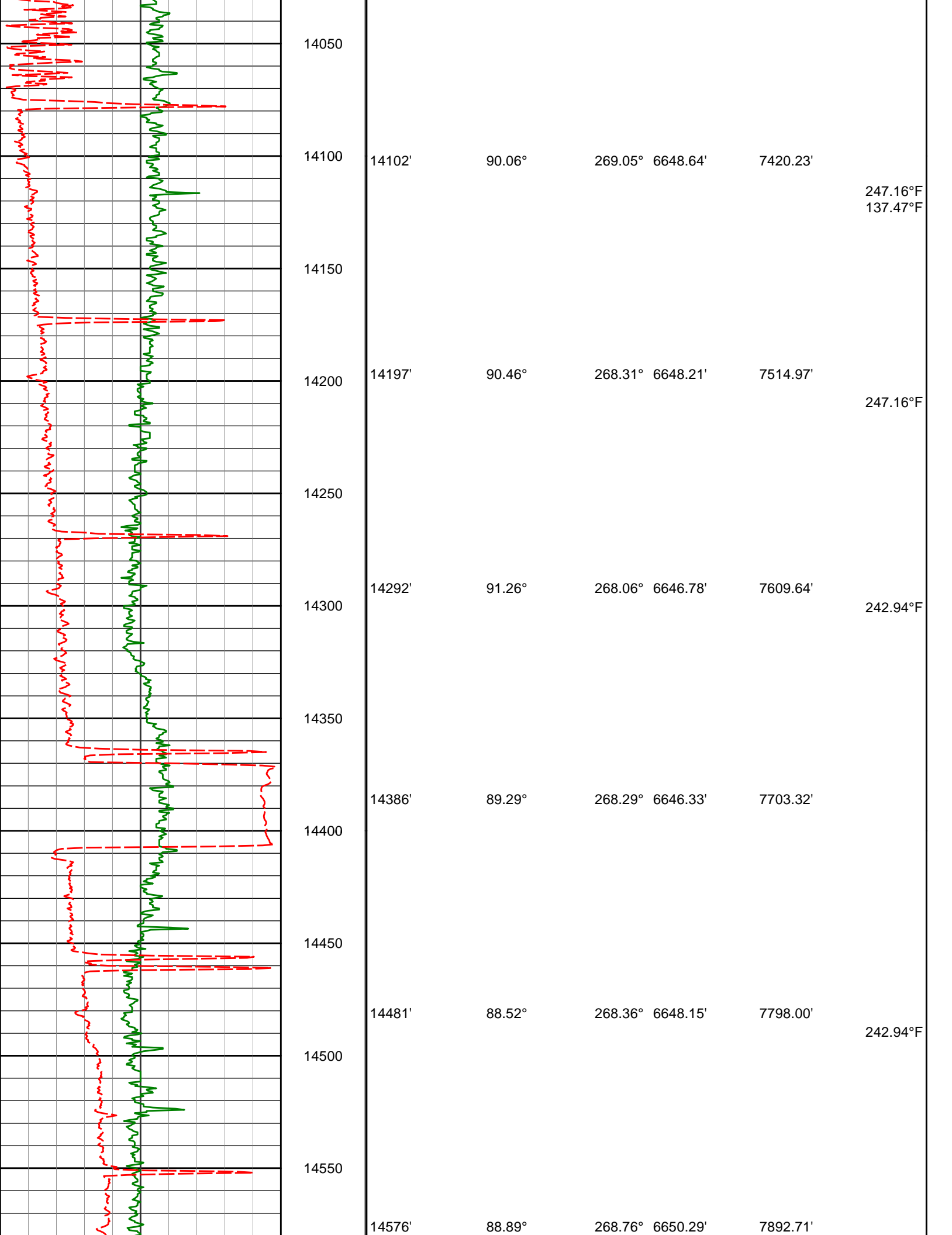
11300	11306'	89.88°	270.15°	6650.58'	4632.08'	230.28°F
11350						
11400	11398'	90.55°	270.43°	6650.24'	4723.98'	234.50°F
11450						
11500	11490'	89.88°	269.13°	6649.89'	4815.84'	230.28°F
11550						
11600	11582'	89.82°	268.25°	6650.13'	4907.60'	234.50°F
11650						
11700	11673'	90.28°	267.94°	6650.06'	4998.28'	234.50°F
11750						
11800	11764'	91.26°	267.78°	6648.83'	5088.92'	238.72°F

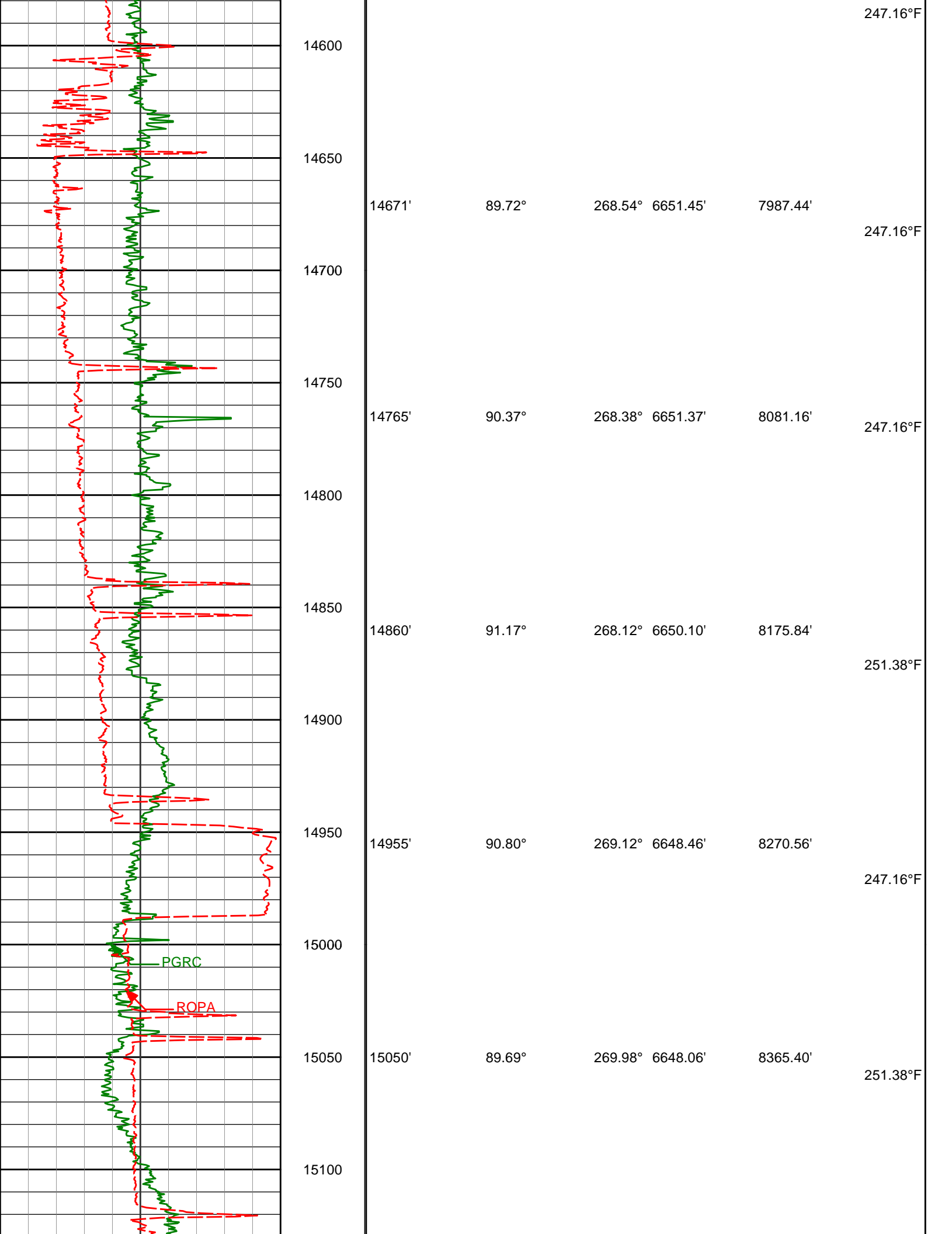


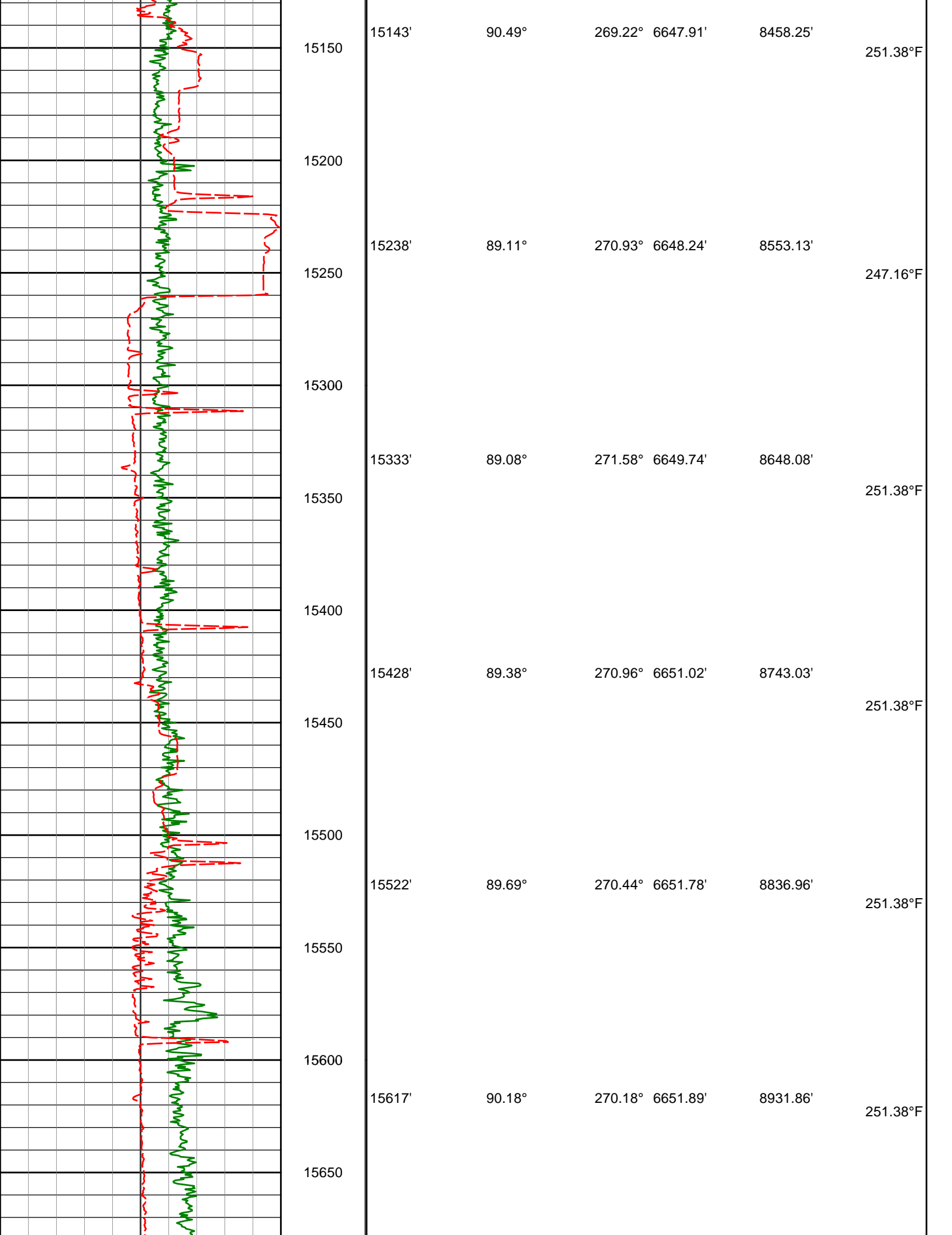


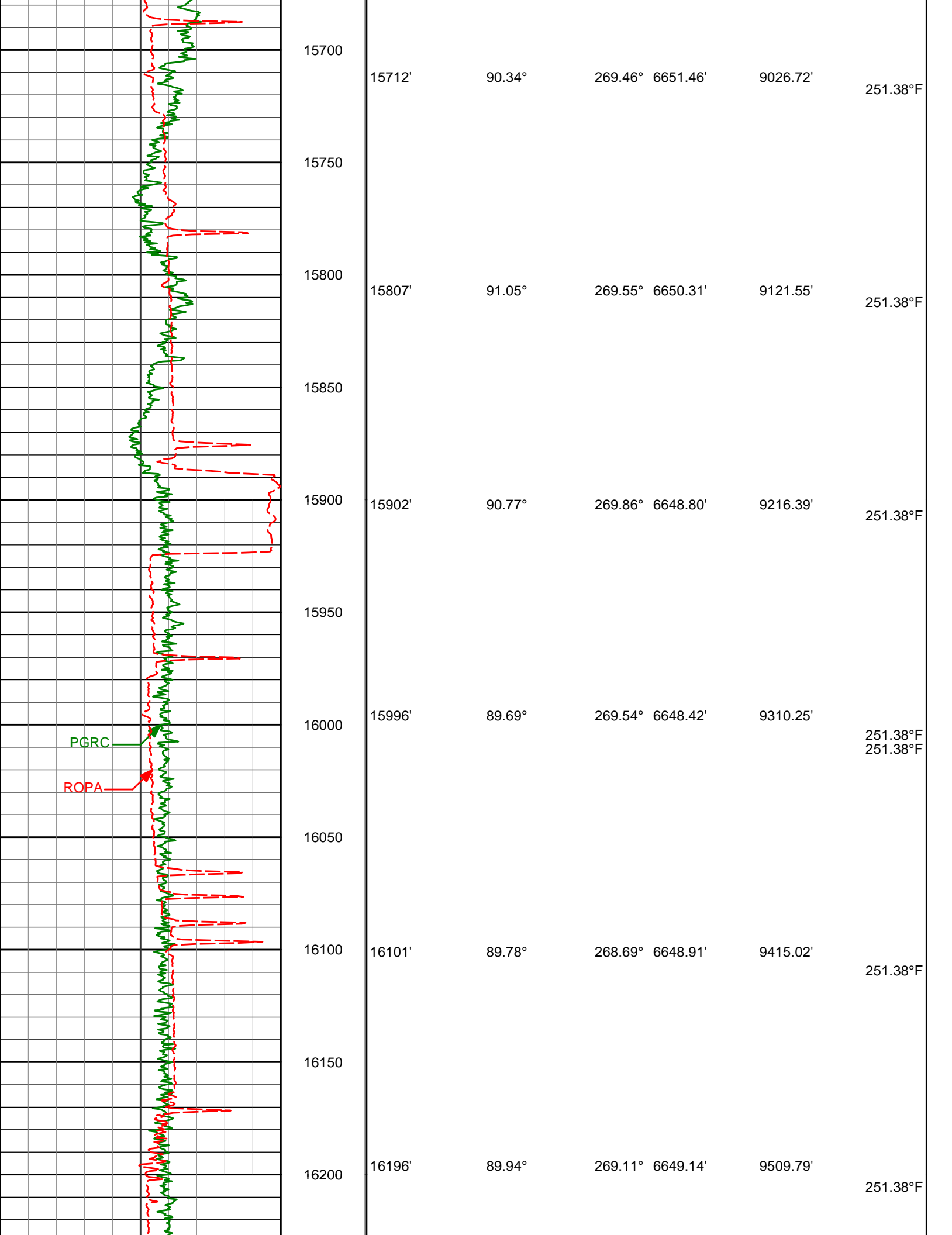


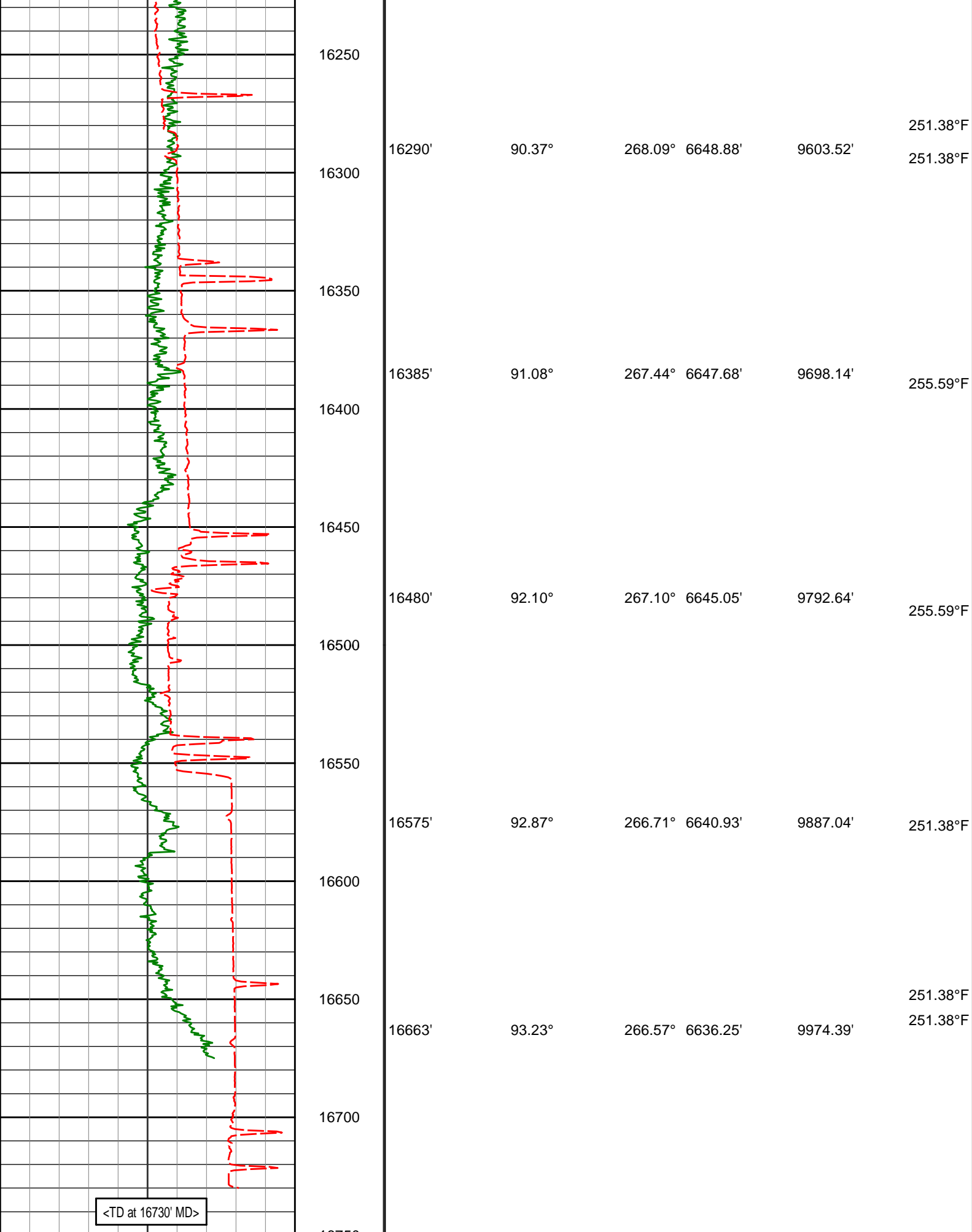








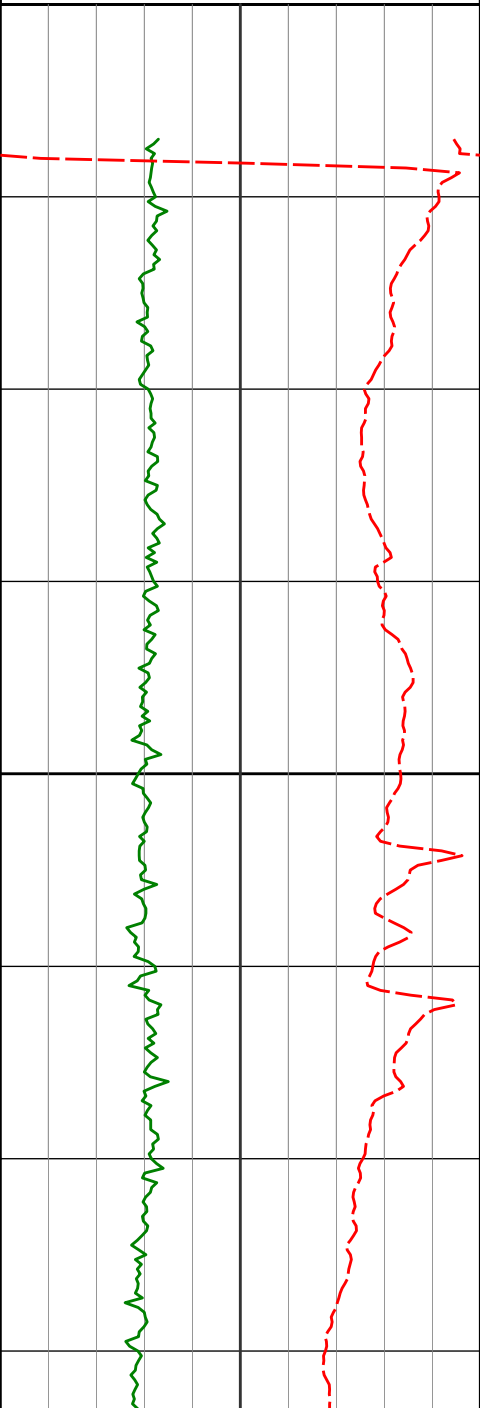


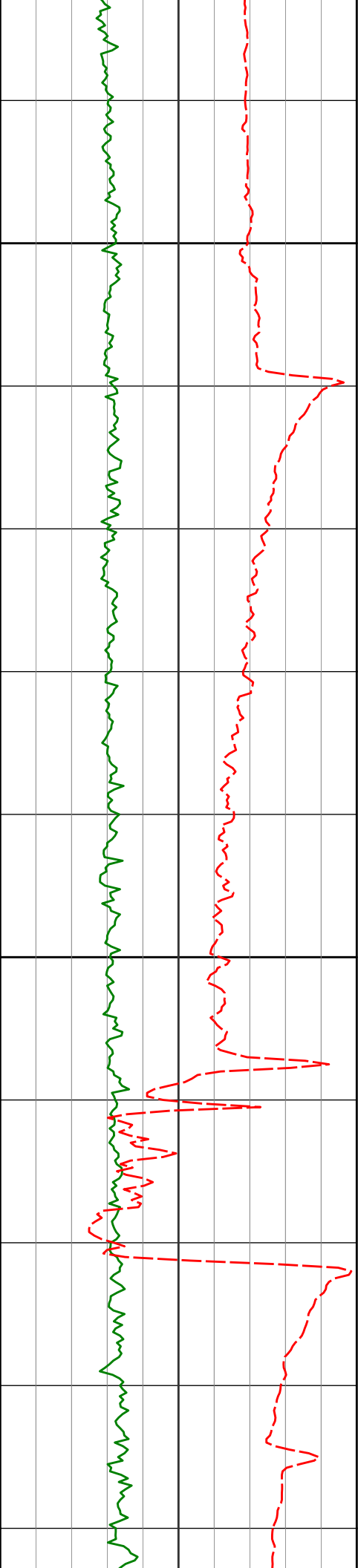


Avg Rate of Penetration		Depth	Inc		Azi		
ROP Avg		MD					
feet per hr		ft					
500	0						

0	PGRC PGRC api	300			TVD	V.S.	Temp
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MD Detail 1:240 Scale

PGRC PGRC api									
0	300								
Avg Rate of Penetration ROP Avg feet per hr			Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500	0								
			<KOP>						162.78°F
				6067'	3.99°	280.43°	6003.94'	-268.90'	162.78°F
			6100						
									162.78°F
				6162'	13.41°	264.49°	6097.75'	-254.70'	



6200

6300

6256'

23.91°

265.67°

6186.69'

-224.94'

162.78°F

162.78°F

6351'

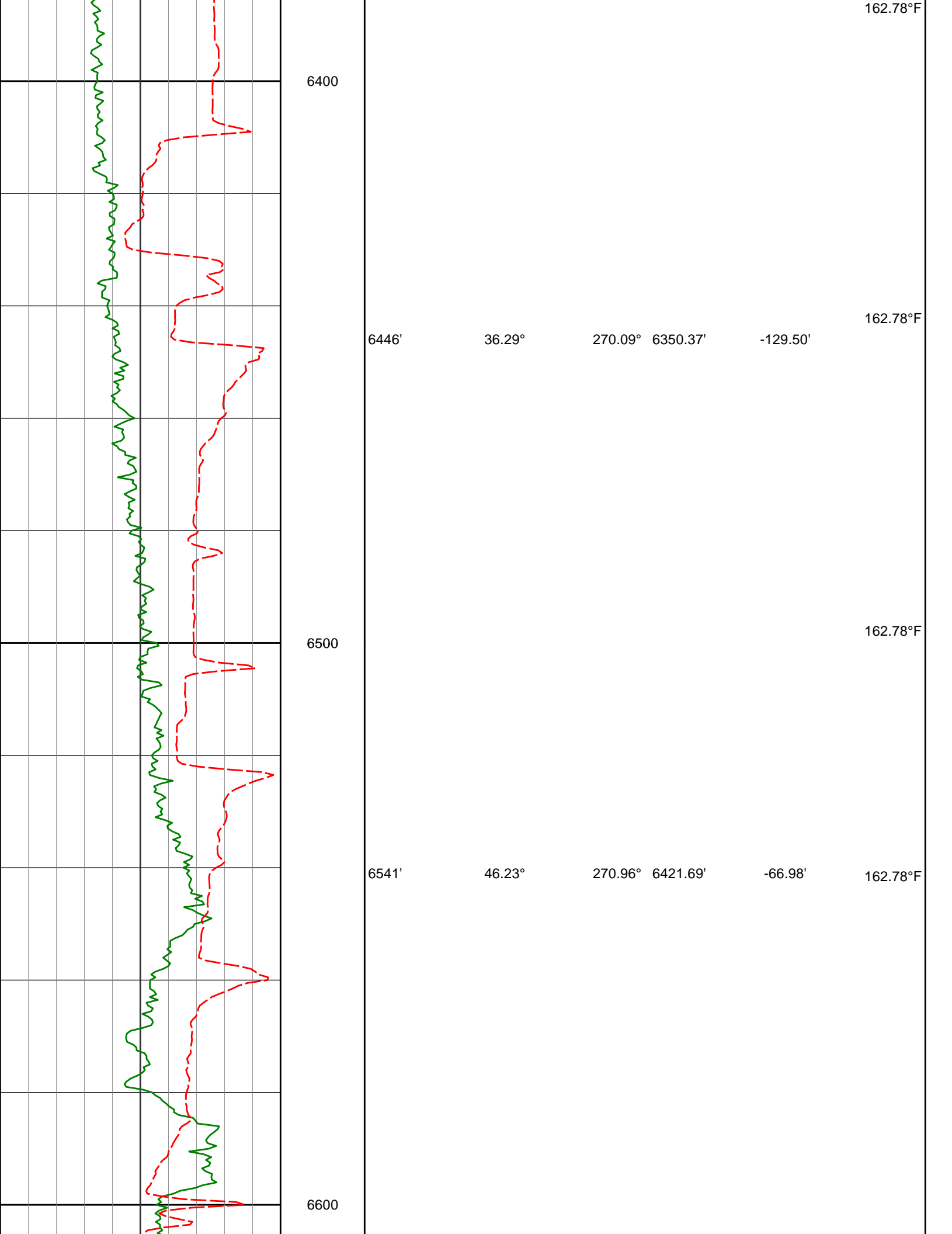
30.56°

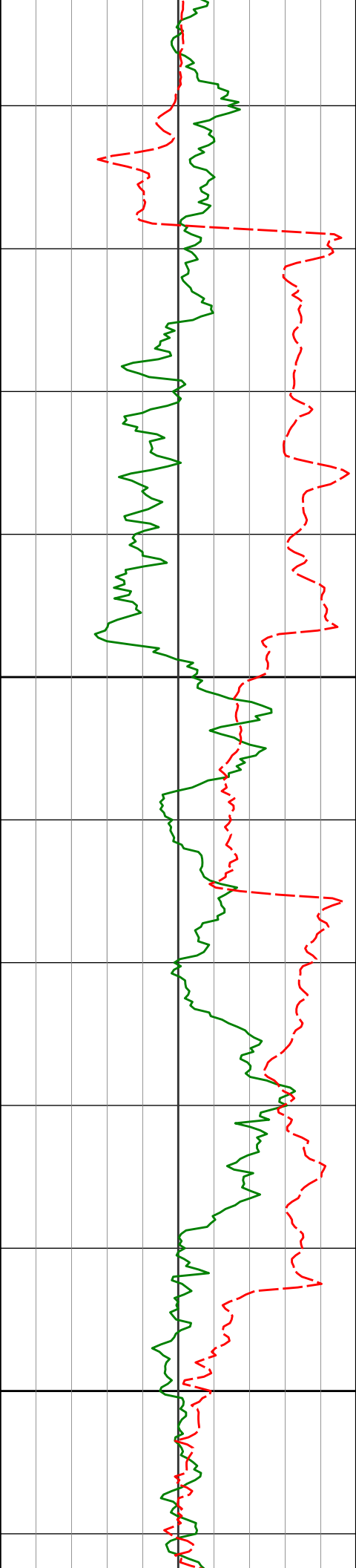
268.50°

6271.11'

-181.71'

162.78°F





6700

6800

6635'

6730'

6825'

53.22°

59.61°

66.80°

273.02°

272.04°

268.62°

6482.43'

6534.95'

6577.60'

4.67'

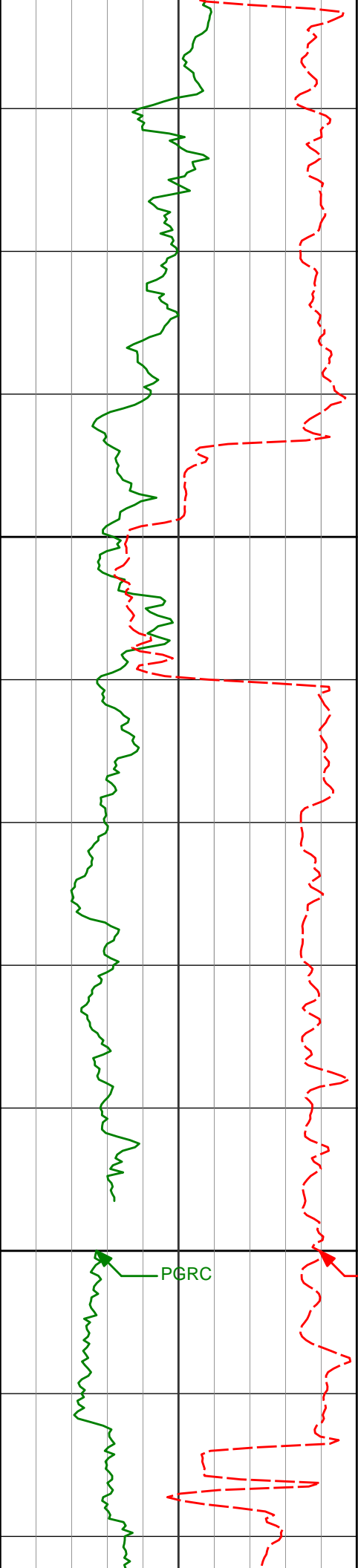
83.77'

168.44'

167.00°F

171.22°F

171.22°F



6900

6920'

73.60°

266.58°

6609.79'

257.41'

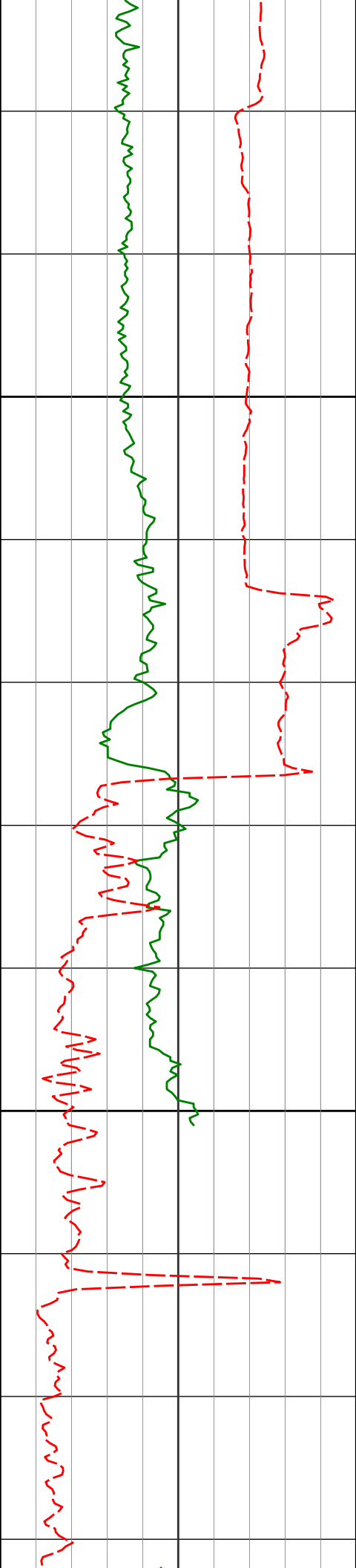
175.44°F

179.66°F

7000

ROPA

<7" casing set at 7024' MD>



7100

7200

7060'

7155'

7250'

86.18°

89.38°

90.37°

268.45°

270.06°

269.66°

6631.83'

6635.51'

6635.72'

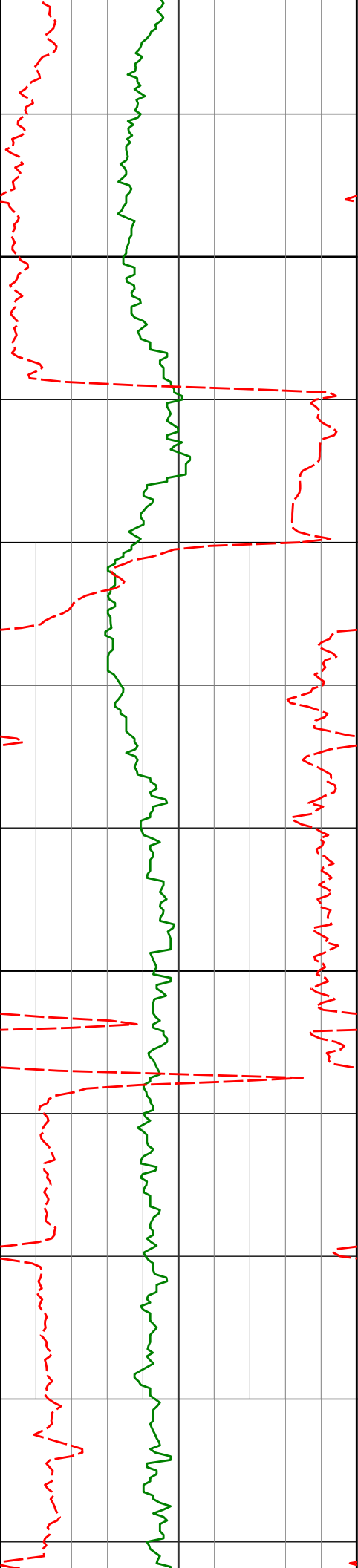
394.68'

489.40'

584.27'

154.34°F

162.78°F



7300

7344'

88.68°

271.13°

6636.50'

678.17'

167.00°F

7400

7439'

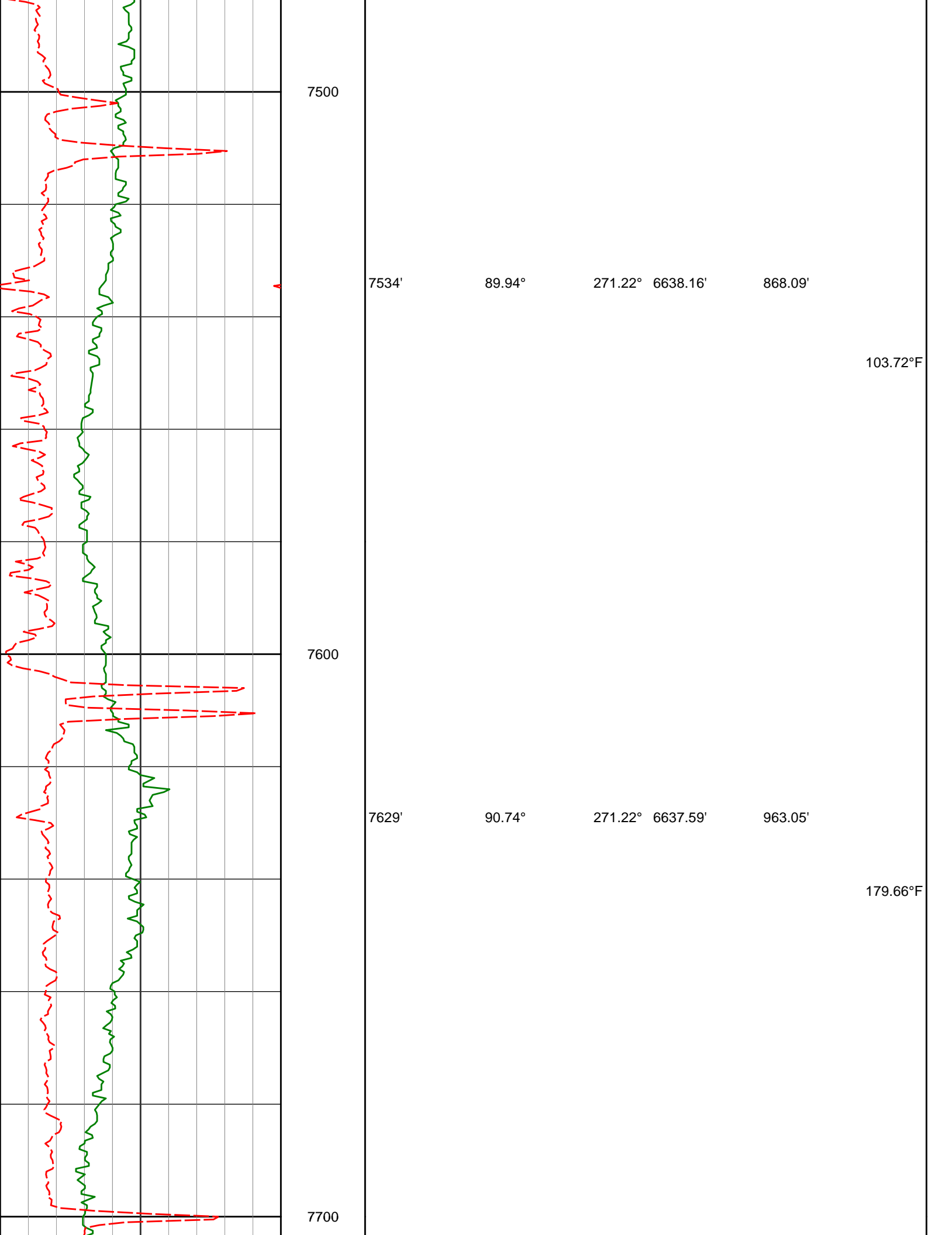
89.69°

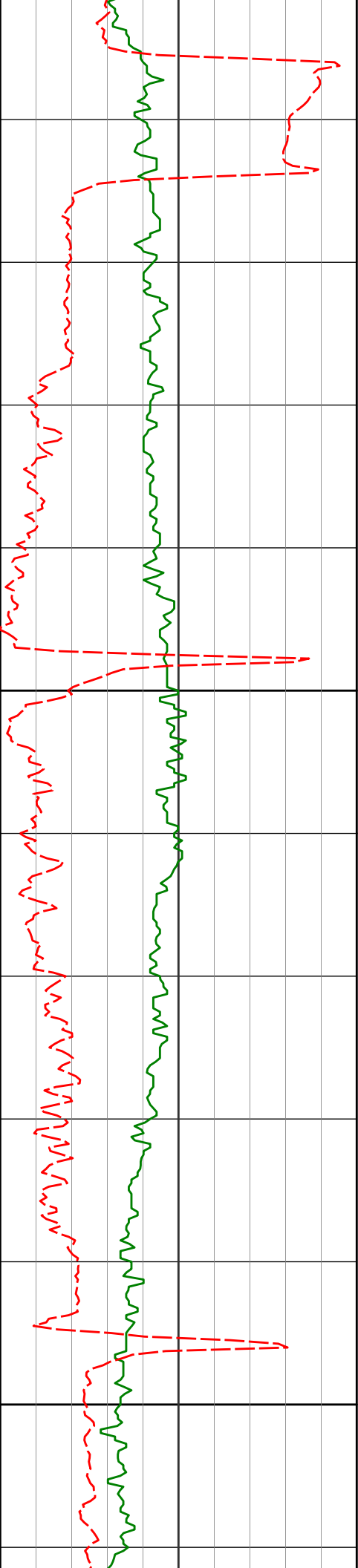
271.61°

6637.85'

773.13'

171.22°F





7800

7900

7723'

89.41°

271.13° 6637.47'

1057.01'

179.66°F

7818'

90.28°

271.94° 6637.73'

1151.98'

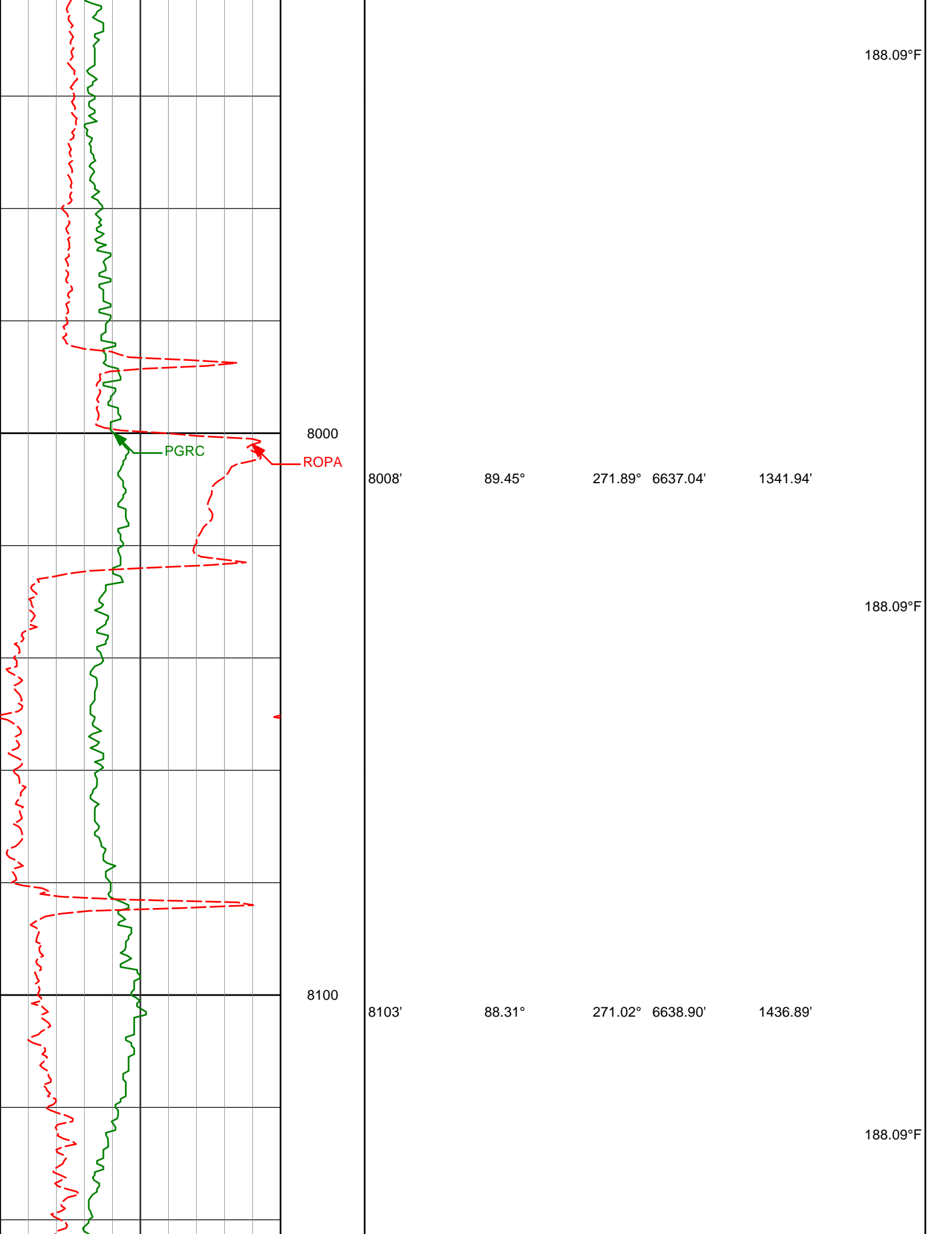
183.88°F

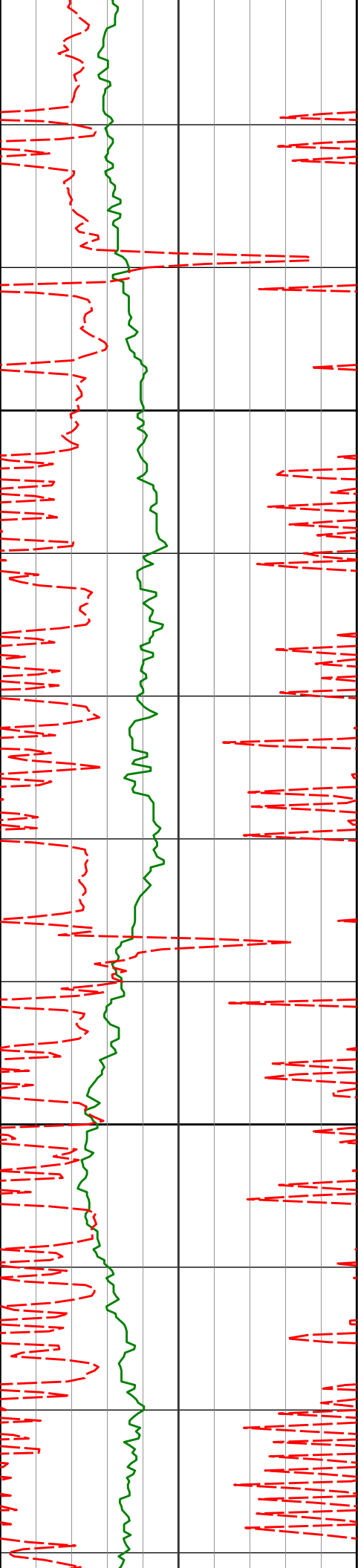
7913'

90.55°

271.53° 6637.04'

1246.96'





8200

8300

8197'

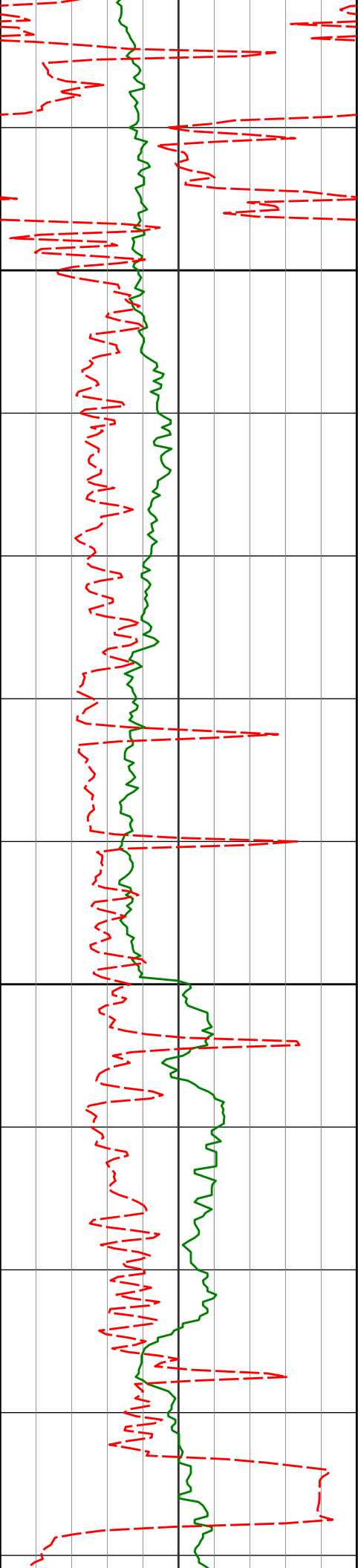
88.68°

270.77° 6641.36'

1530.80'

192.31°F

196.53°F



8387'

89.17°

270.33° 6644.93'

1720.61'

8400

196.53°F

8482'

89.26°

269.71° 6646.23'

1815.48'

8500

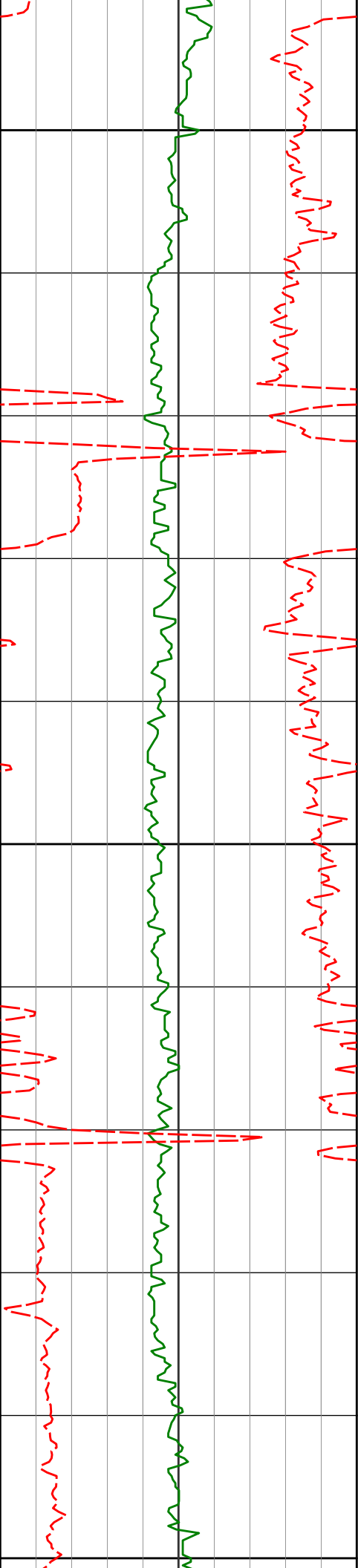
196.53°F

8576'

89.45°

268.18° 6647.29'

1909.25'



8600

8700

8800

8671'

8766'

89.69°

90.22°

267.88°

267.04°

6648.00'

6648.08'

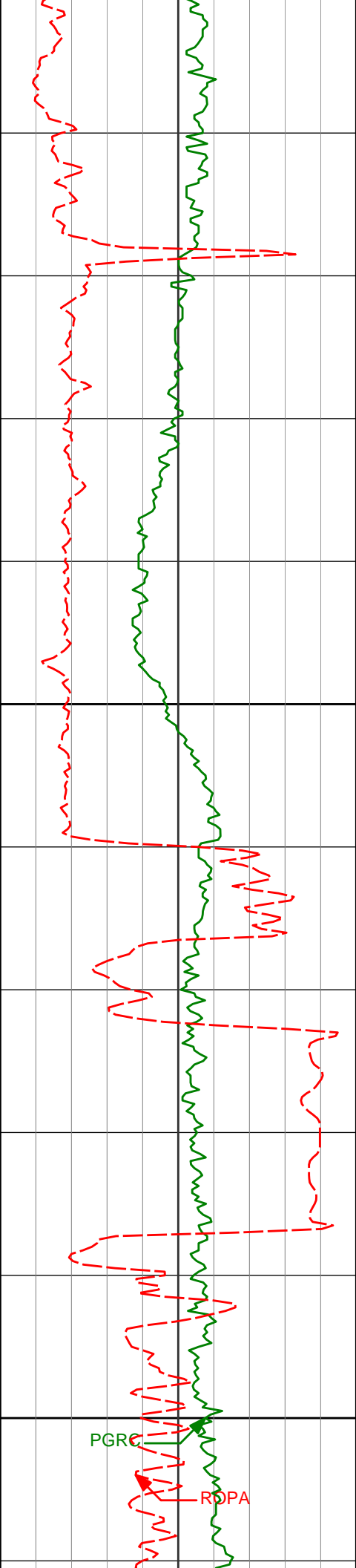
2003.91'

2098.48'

196.53°F

196.53°F

200.75°F



8900

9000

8861'

90.68°

266.10° 6647.33'

2192.90'

200.75°F

8955'

90.09°

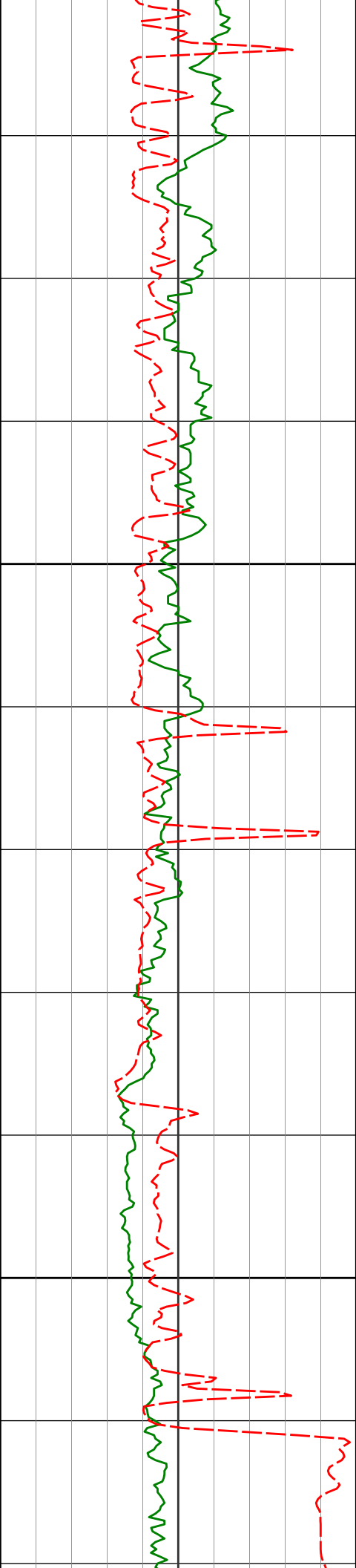
267.55° 6646.70'

2286.37'

200.75°F

PGRC

ROPA



9100

9200

9050'

89.97°

267.81° 6646.65'

2380.98'

204.97°F

9145'

90.89°

267.25° 6645.94'

2475.56'

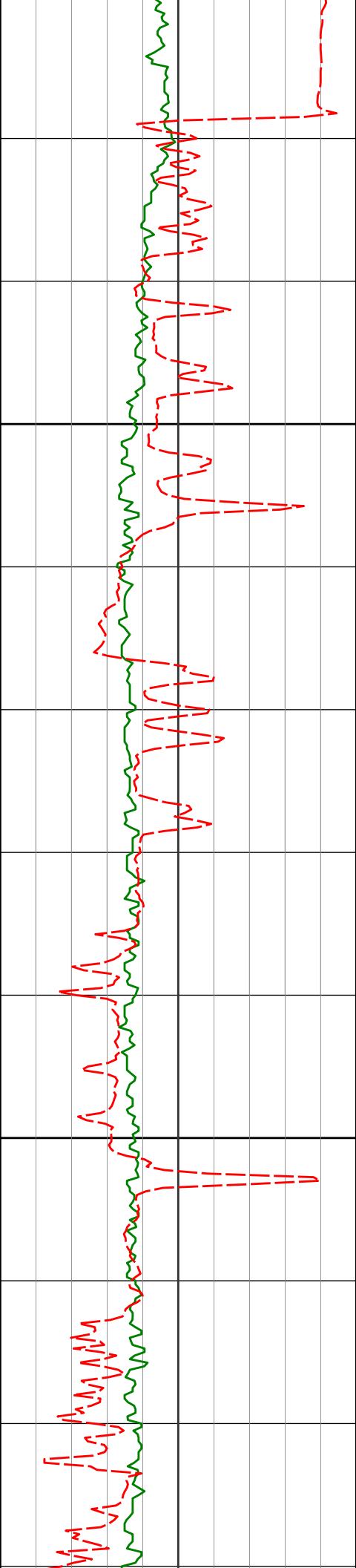
209.19°F

9239'

90.12°

269.38° 6645.11'

2569.25'



9300

9400

9334'

9429'

89.69°

89.08°

268.88° 6645.27'

267.72° 6646.29'

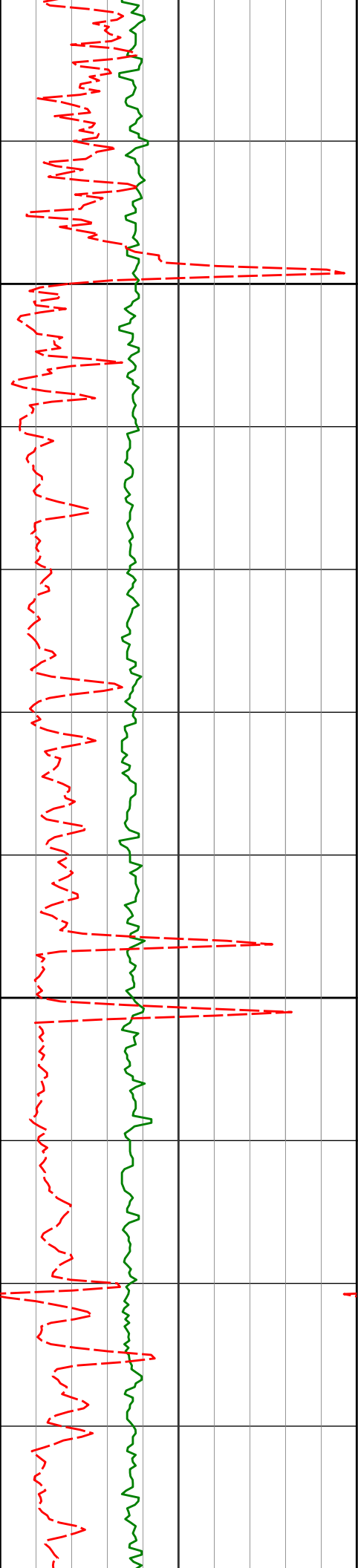
2664.05'

2758.74'

204.97°F

209.19°F

213.41°F



9500

9524'

88.74°

269.76° 6648.09'

2853.47'

213.41°F

9600

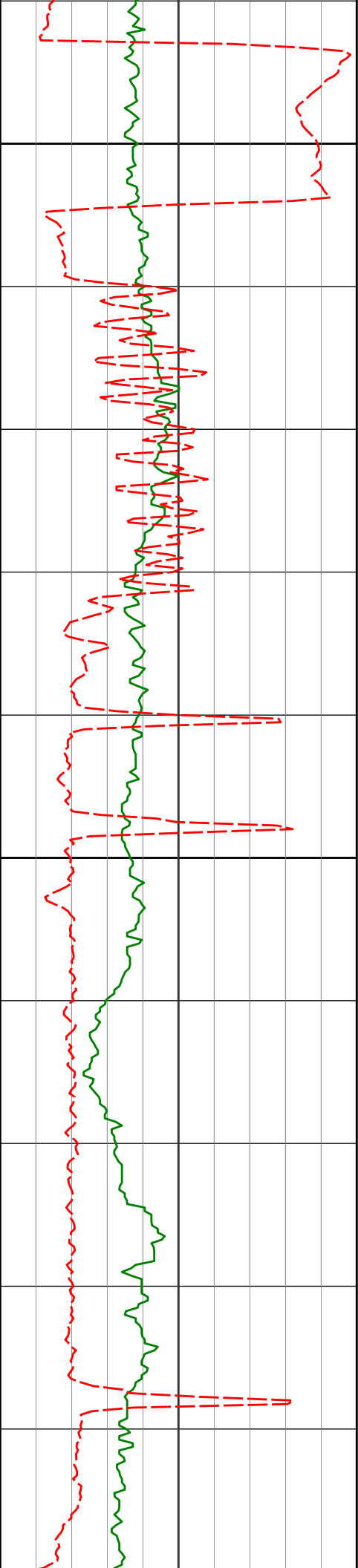
9618'

87.72°

267.63° 6651.00'

2947.17'

213.41°F



9700

9713'

89.11°

269.48°

6653.62'

3041.85'

213.41°F

9800

9808'

89.82°

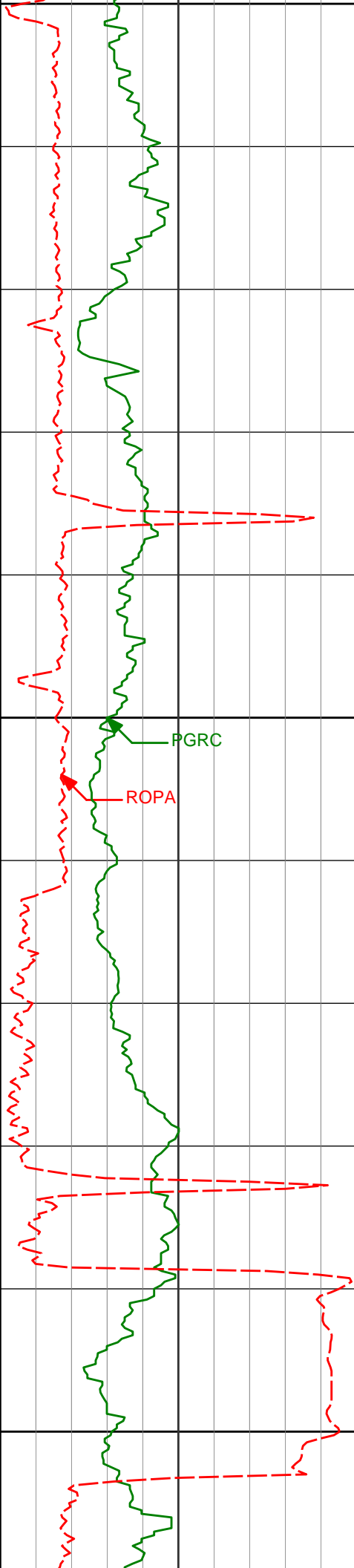
268.75°

6654.51'

3136.64'

213.41°F

9900



9900

9903'

89.94°

268.21° 6654.71'

3231.36'

217.63°F

10000

9998'

90.18°

267.89° 6654.61'

3326.02'

217.63°F

10100

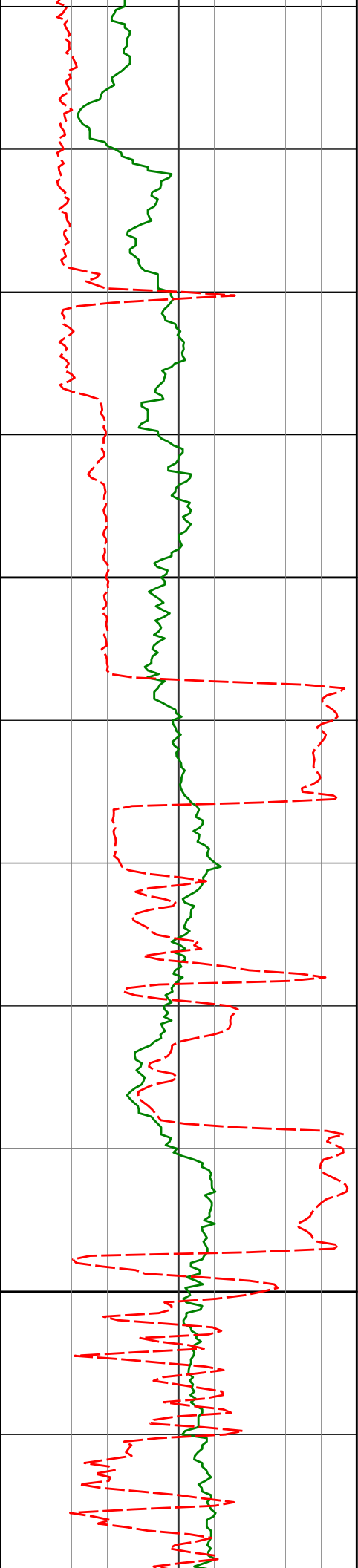
10092'

91.72°

269.71° 6653.05'

3419.77'

213.41°F



10200

10300

10187'

93.23°

270.17°

6648.95'

3514.55'

213.41°F

10282'

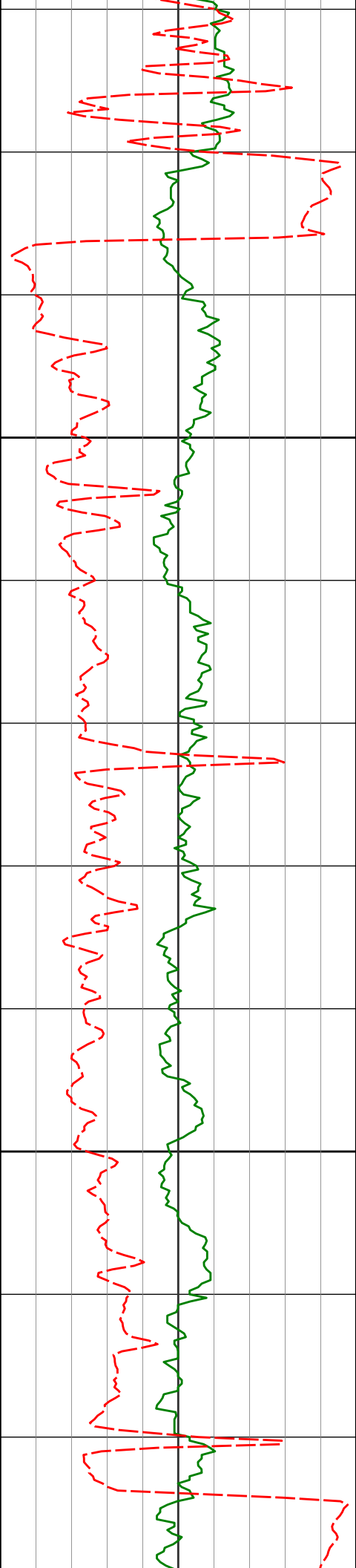
91.23°

271.67°

6645.25'

3609.42'

217.63°F



10400

10376'

89.69°

271.49° 6644.50'

3703.39'

217.63°F

10471'

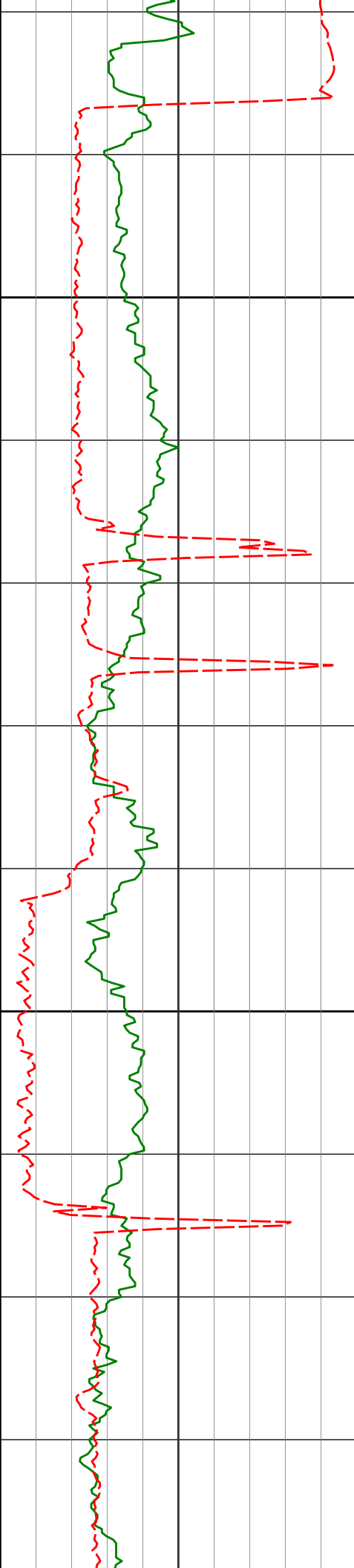
90.49°

271.07° 6644.35'

3798.35'

221.84°F

10500



10600

10700

10566'

10661'

10755'

88.80°

89.26°

90.77°

270.33°

269.30°

268.87°

6644.94'

6646.55'

6646.52'

3893.27'

3988.12'

4081.91'

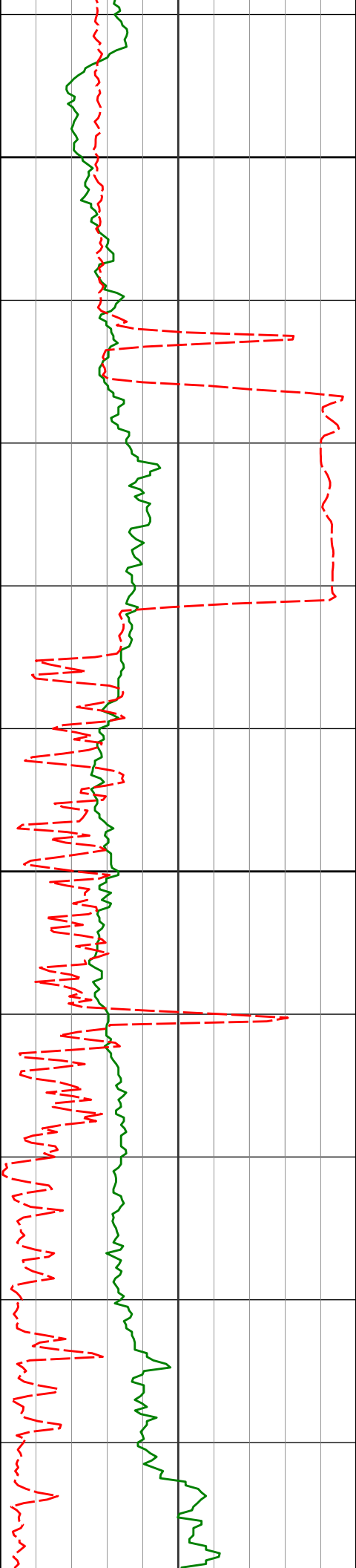
221.84°F

221.84°F

36.22°F

221.84°F

221.84°F



10800

10850'

89.05°

269.84° 6646.67'

4176.73'

221.84°F

10900

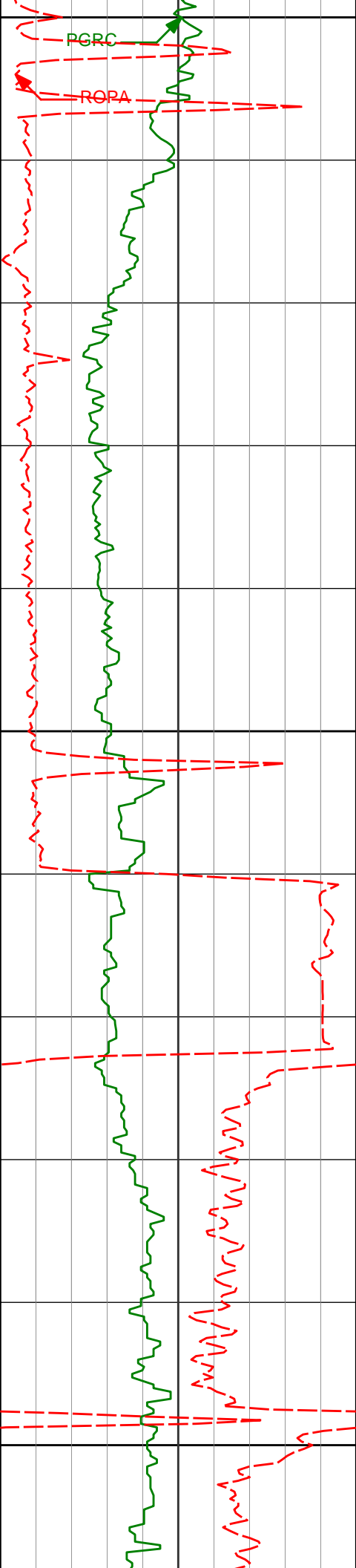
10941'

89.41°

270.20° 6647.89'

4267.61'

226.06°F



11000

PGRC

ROPA

11100

11124'

89.88°

269.45° 6649.03'

4450.34'

11200

11215'

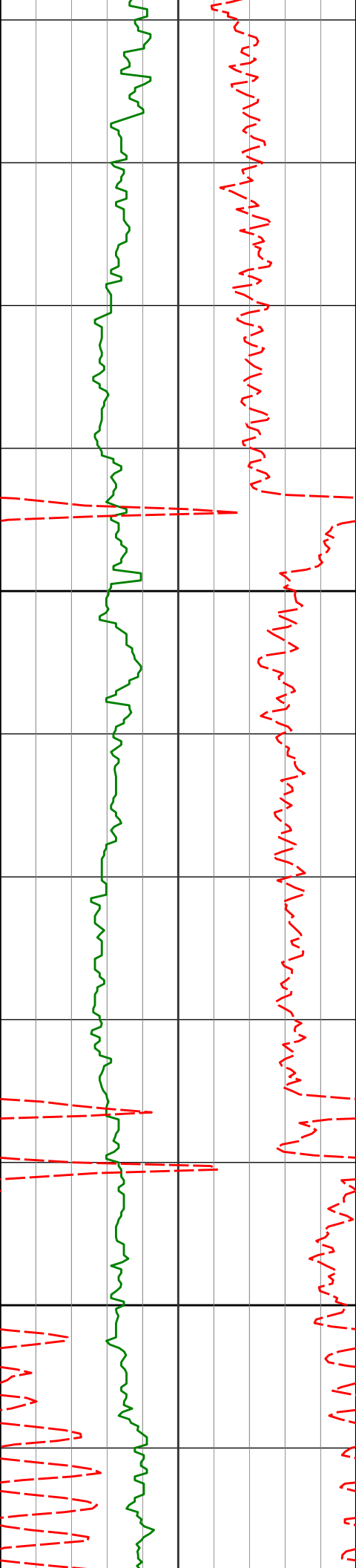
89.14°

269.89° 6649.81'

4541.19'

226.06°F

226.06°F



11300

11306'

89.88°

270.15°

6650.58'

4632.08'

11400

11398'

90.55°

270.43°

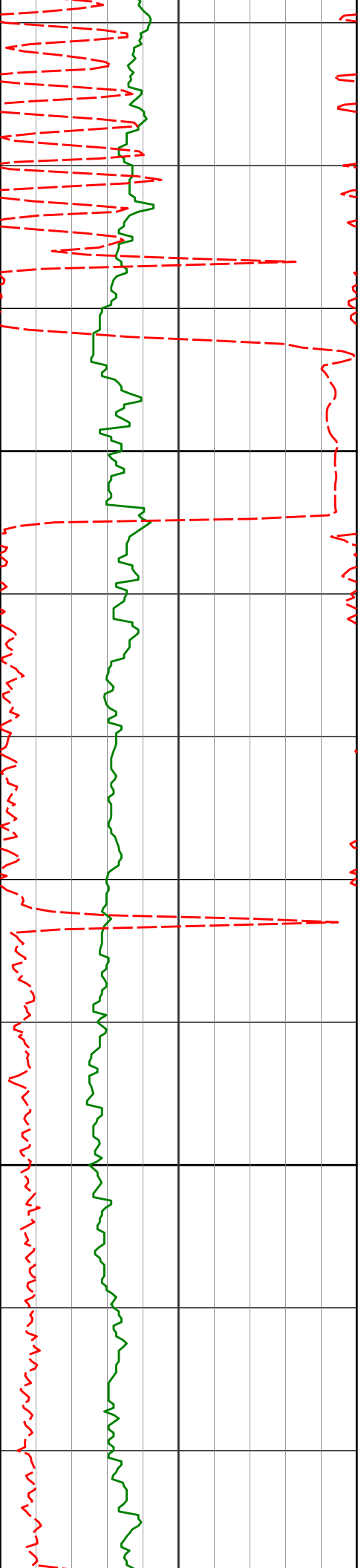
6650.24'

4723.98'

230.28°F

230.28°F

234.50°F



11500

11600

11490'

89.88°

269.13° 6649.89'

4815.84'

11582'

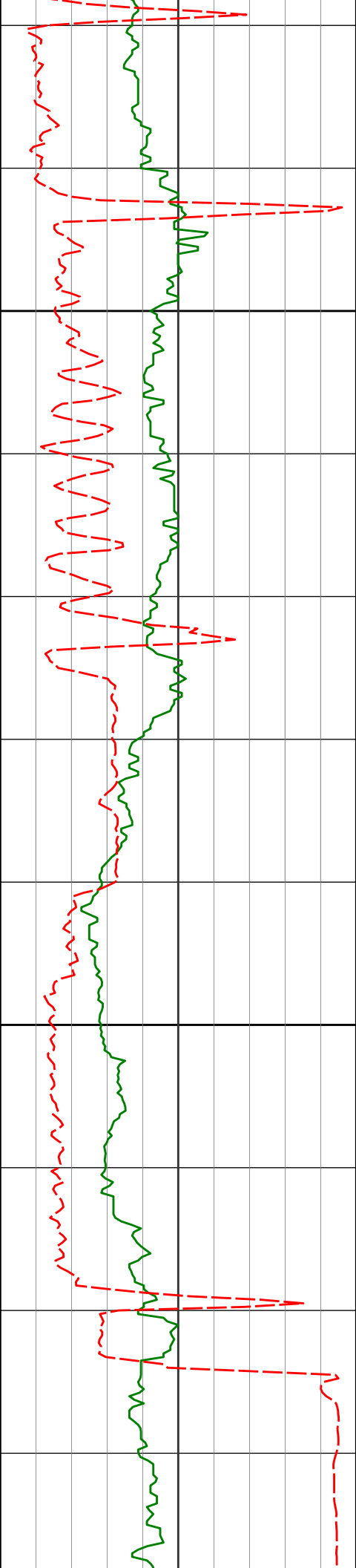
89.82°

268.25° 6650.13'

4907.60'

230.28°F

234.50°F



11673'

90.28°

267.94° 6650.06'

4998.28'

11700

234.50°F

11764'

91.26°

267.78° 6648.83'

5088.92'

11800

238.72°F

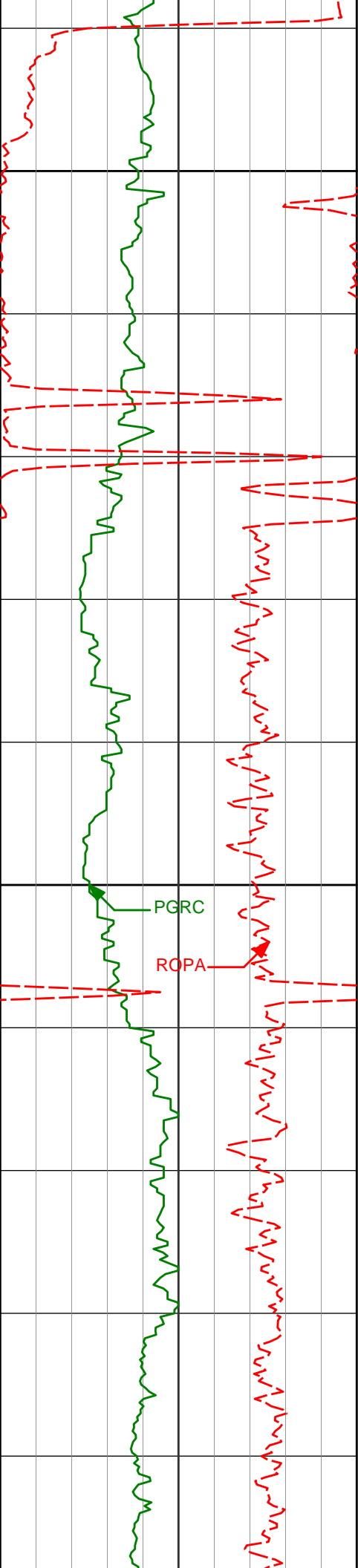
11856'

89.66°

268.08° 6648.09'

5180.57'

234.50°F



11900

11948'

89.54°

268.52° 6648.74'

5272.27'

234.50°F

12000

PGRC

ROPA

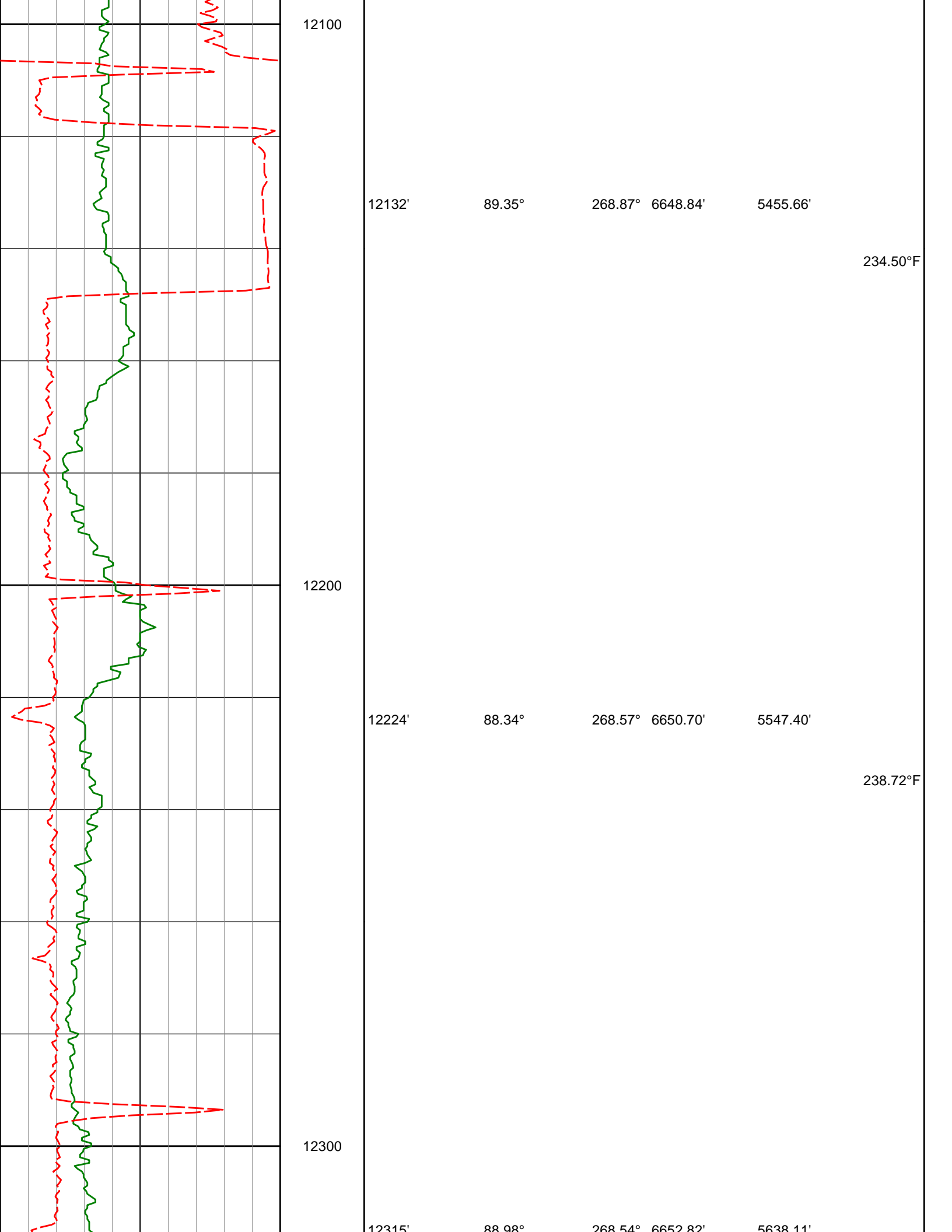
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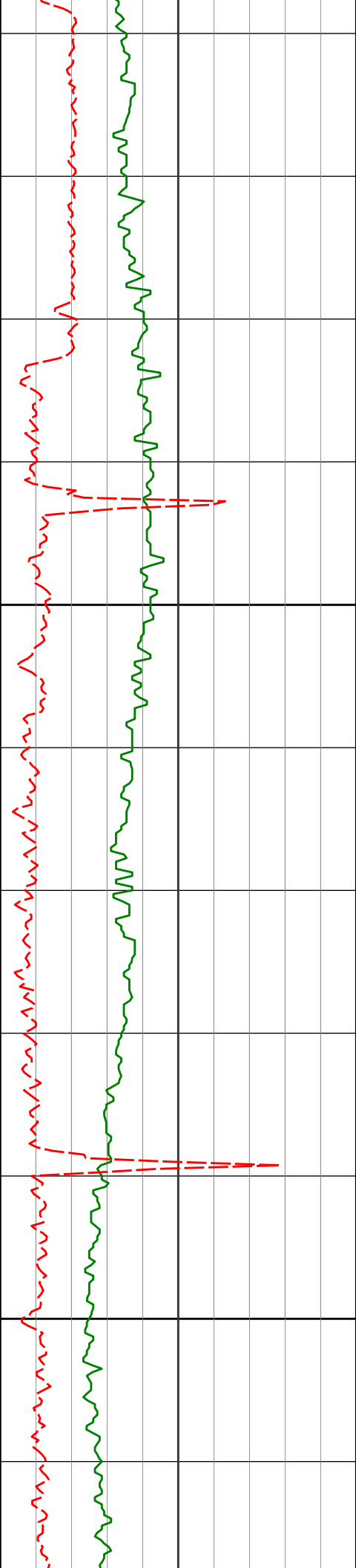
90.49°

267.73° 6648.71'

5363.96'

238.72°F





12400

12407'

90.09°

268.37°

6653.57'

5729.83'

238.72°F

238.72°F

12500

12498'

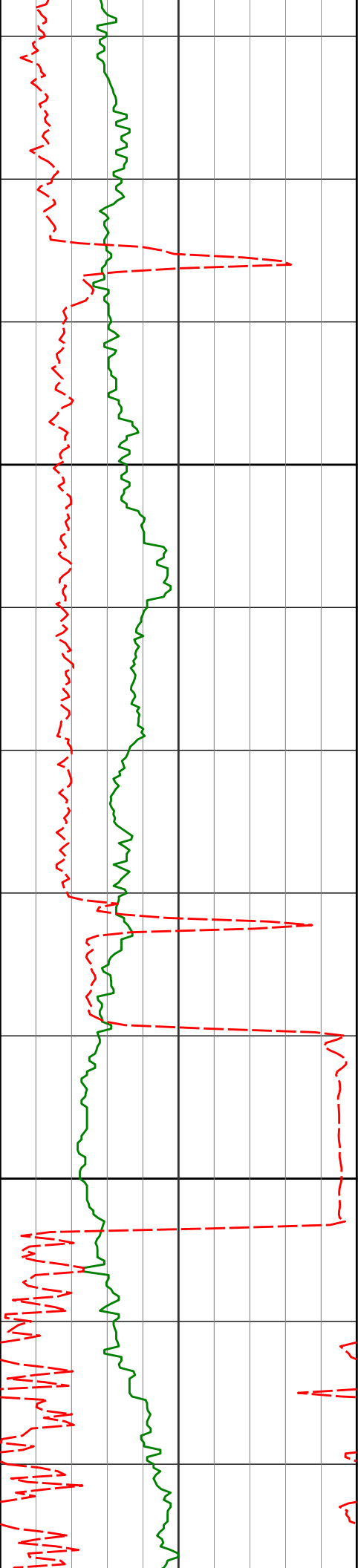
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268.03°

6653.13'

5820.53'

48.87°F



12600

12700

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12682'

91.54°

91.26°

267.63°

268.39°

6651.53'

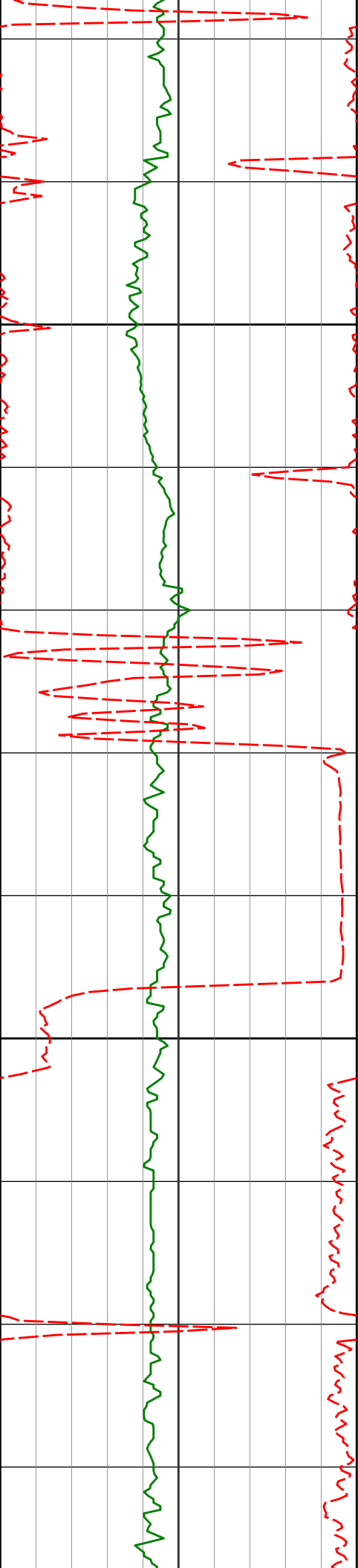
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5912.16'

6003.80'

242.94°F

238.72°F



12777'

91.05°

269.24° 6647.36'

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238.25°F

12800

12871'

90.77°

269.48° 6645.87'

6192.35'

238.72°F

12900

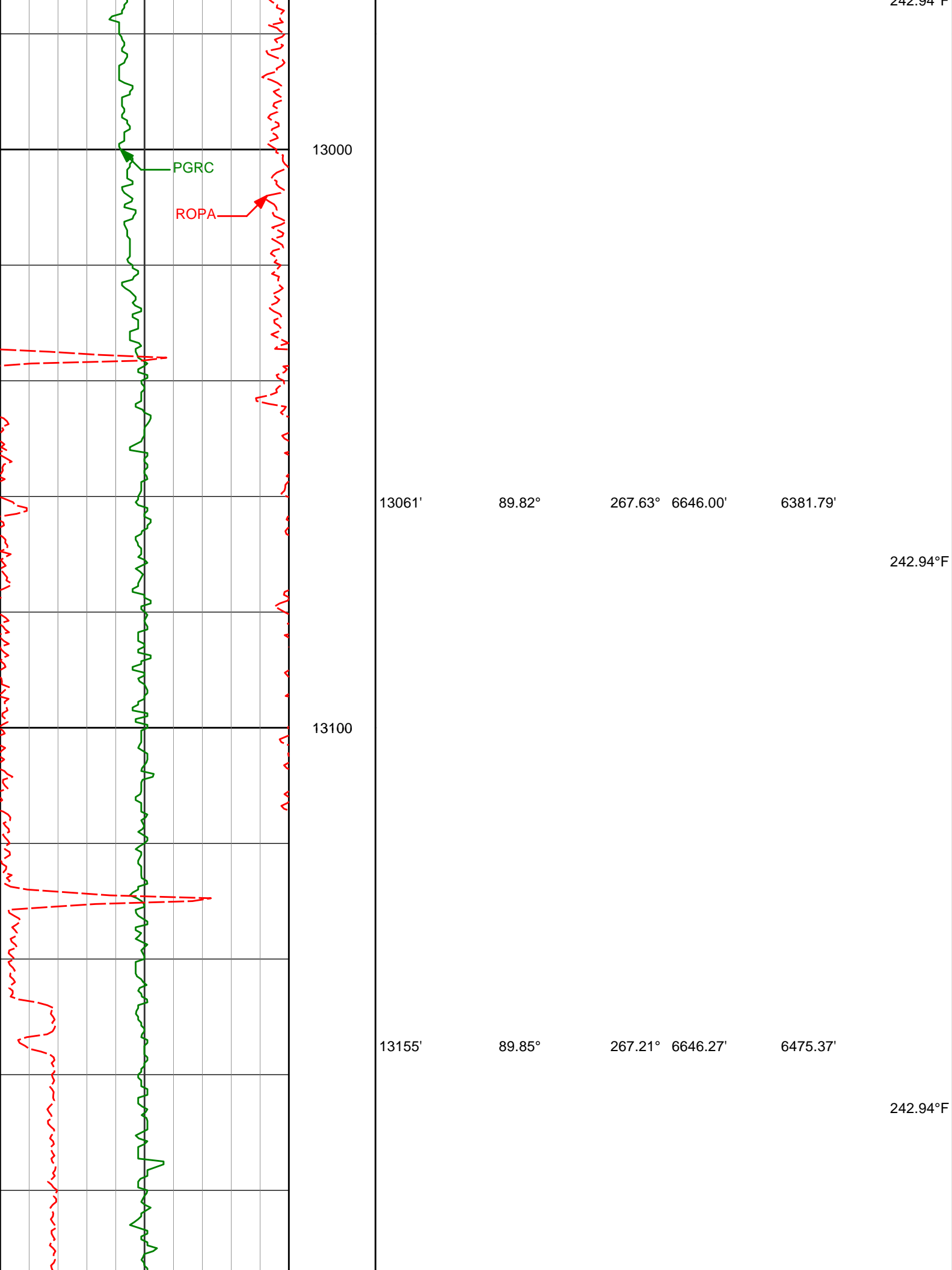
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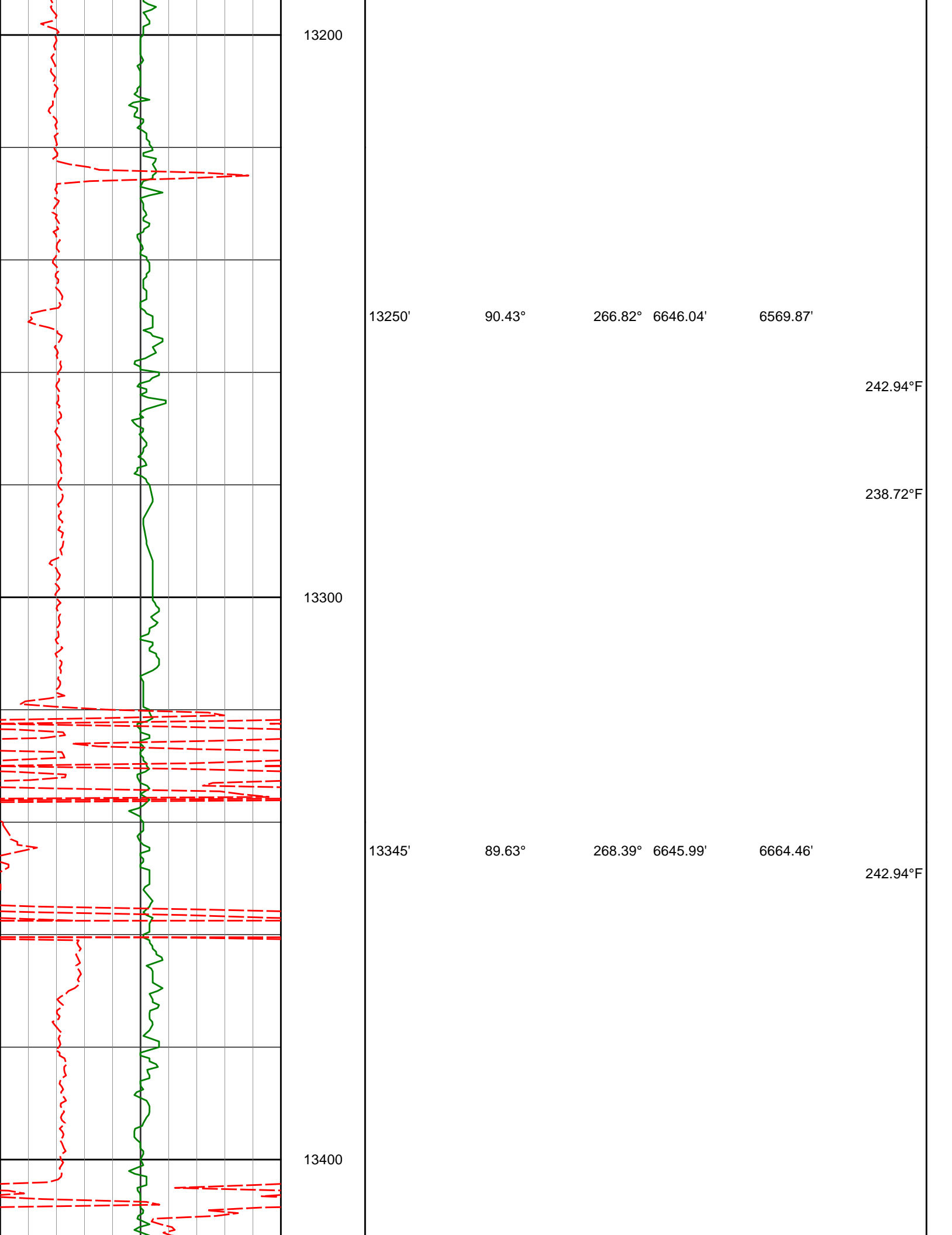
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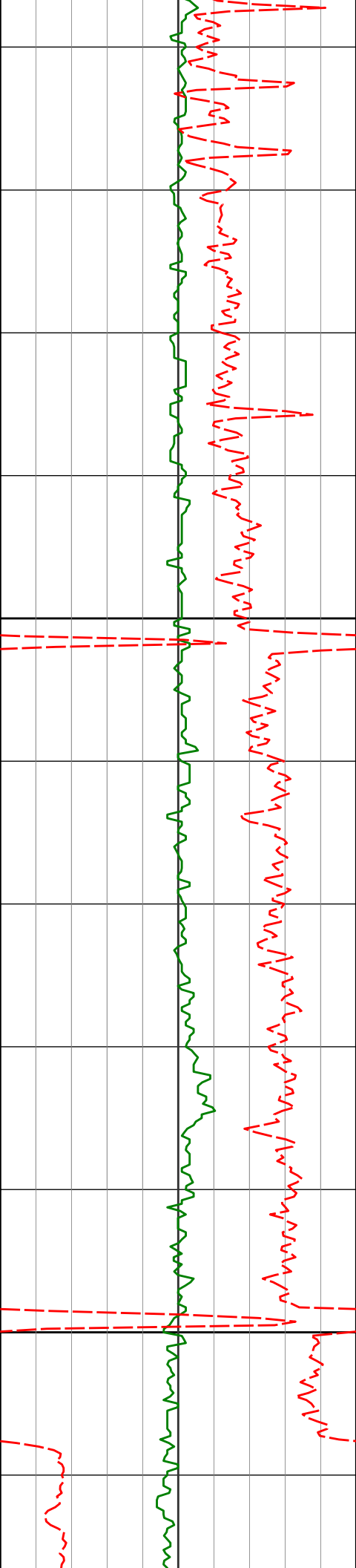
268.55° 6645.54'

6287.13'

242.04°F







13440'

89.60°

269.91° 6646.62'

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242.94°F

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13534'

90.43°

269.85° 6646.60'

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242.94°F

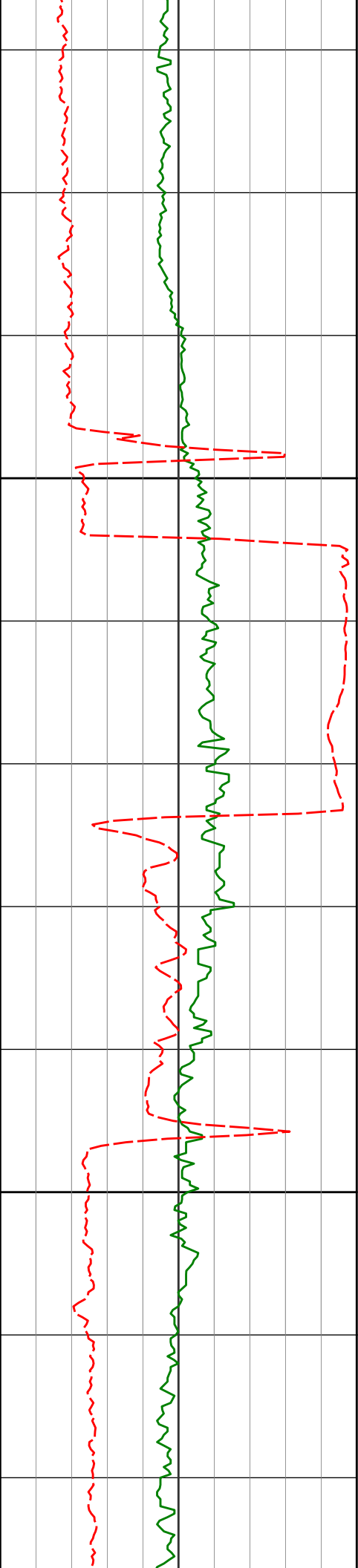
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269.32° 6645.20'

6947.96'



13700

13724'

90.12°

269.76°

6644.05'

7042.79'

13800

13818'

88.58°

270.40°

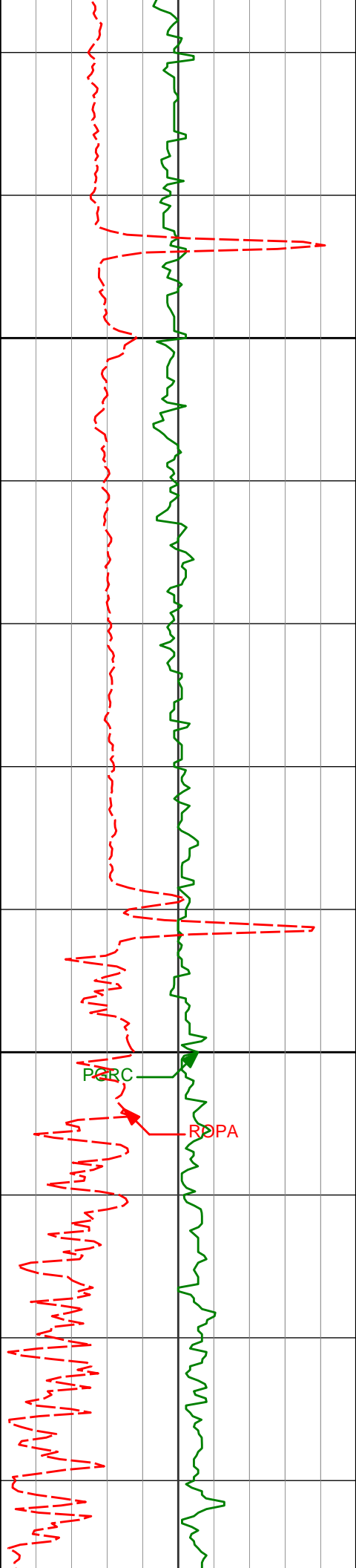
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7136.67'

242.94°F

242.94°F

242.94°F



13900

13913'

88.95°

269.84° 6647.17'

7231.53'

242.94°F

14000

14007'

89.60°

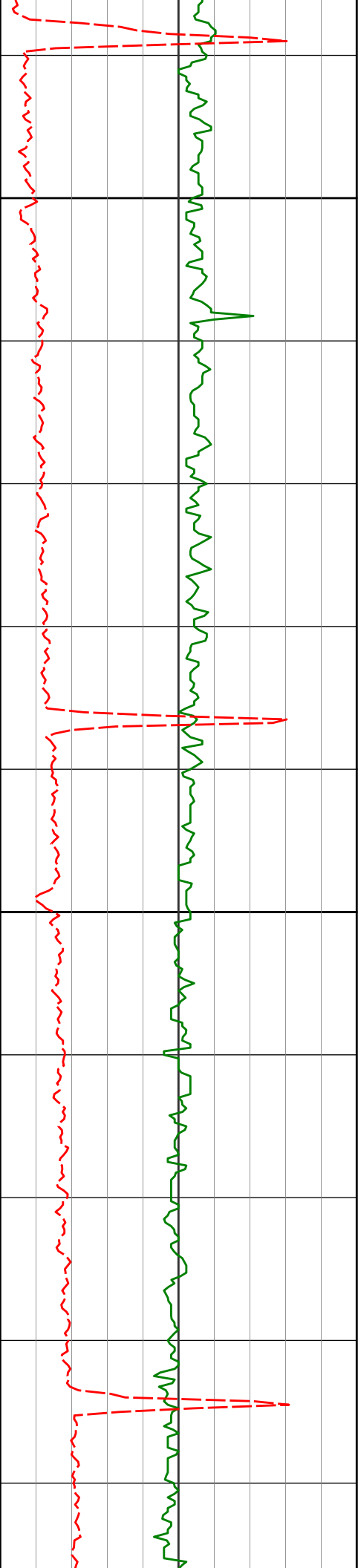
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7325.40'

242.94°F

PRC

ROPA



14100

14102'

90.06°

269.05°

6648.64'

7420.23'

247.16°F

137.47°F

14200

14197'

90.46°

268.31°

6648.21'

7514.97'

247.16°F

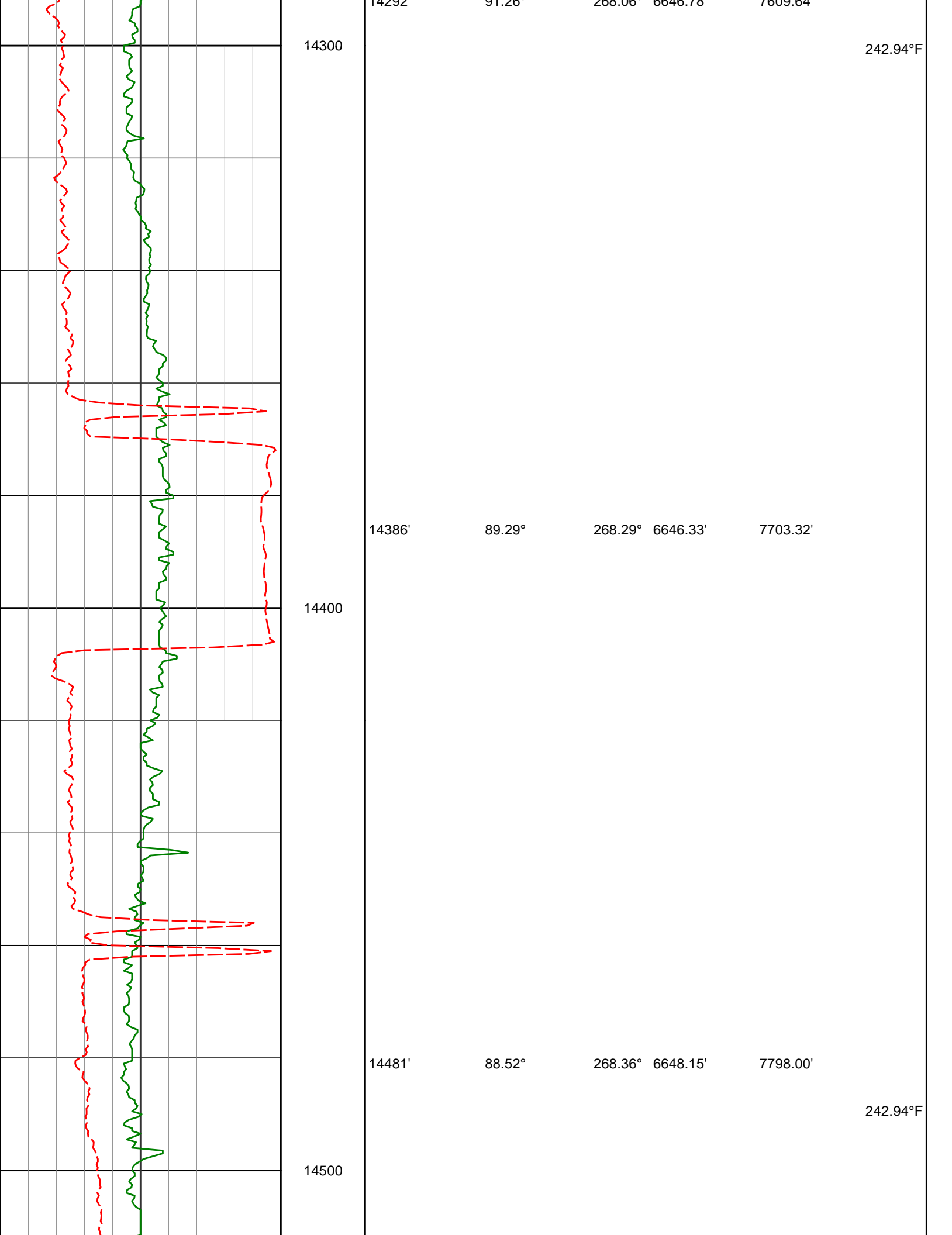
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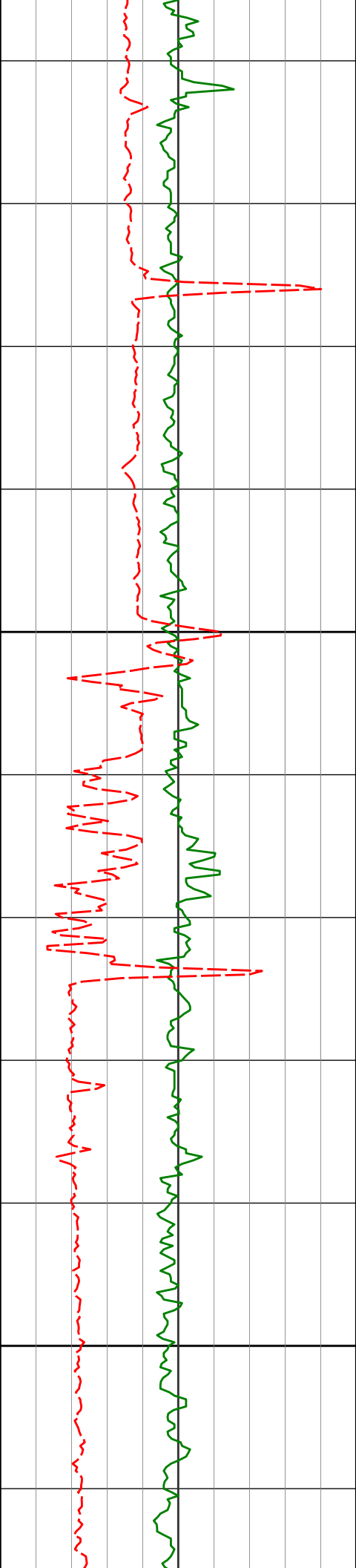
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268.06°

6646.79'

7600.64'





14600

14700

14576'

88.89°

268.76°

6650.29'

7892.71'

247.16°F

14671'

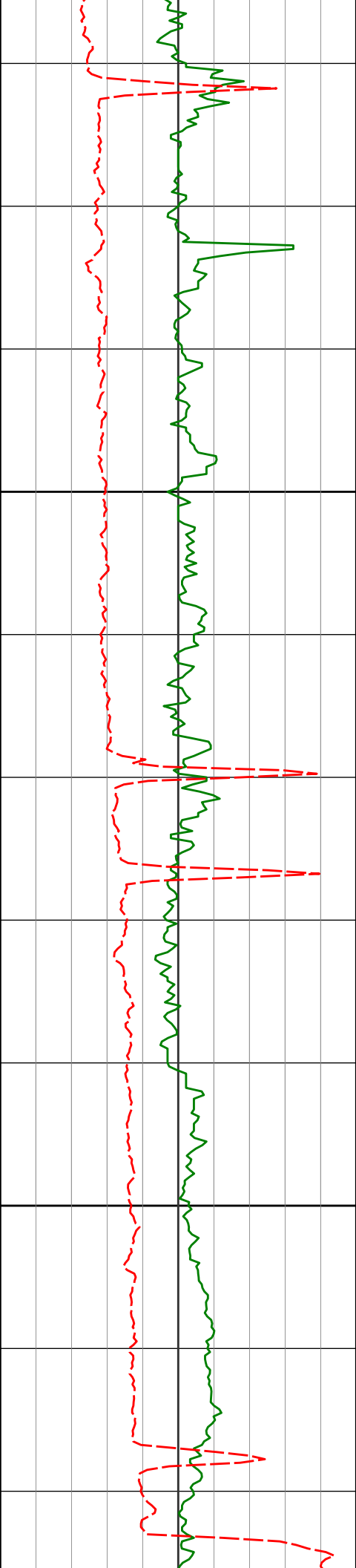
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7987.44'

247.16°F



14800

14900

14765'

90.37°

268.38° 6651.37'

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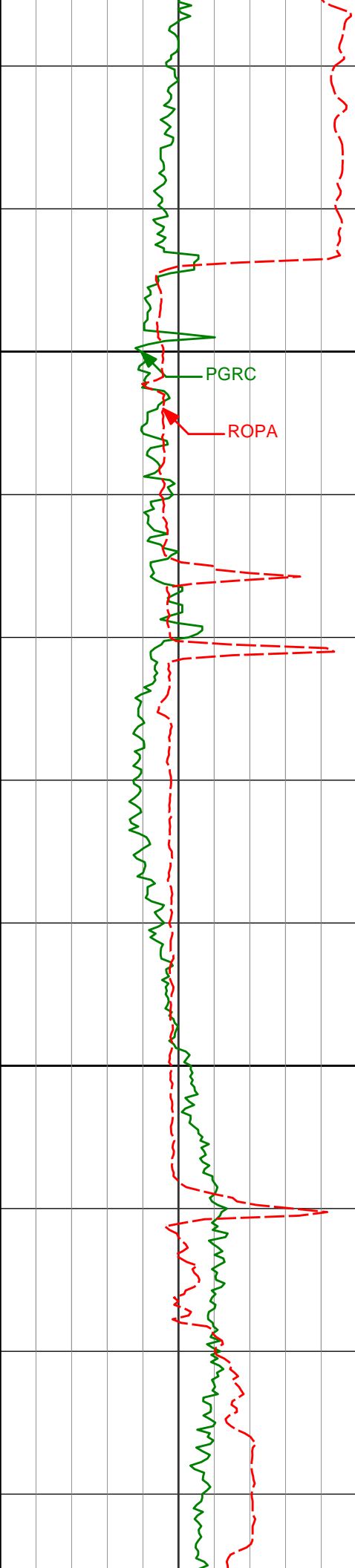
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8175.84'

251.38°F



15000

15100

PGRC

ROPA

14955'

90.80°

269.12°

6648.46'

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247.16°F

15050'

89.69°

269.98°

6648.06'

8365.40'

251.38°F

15143'

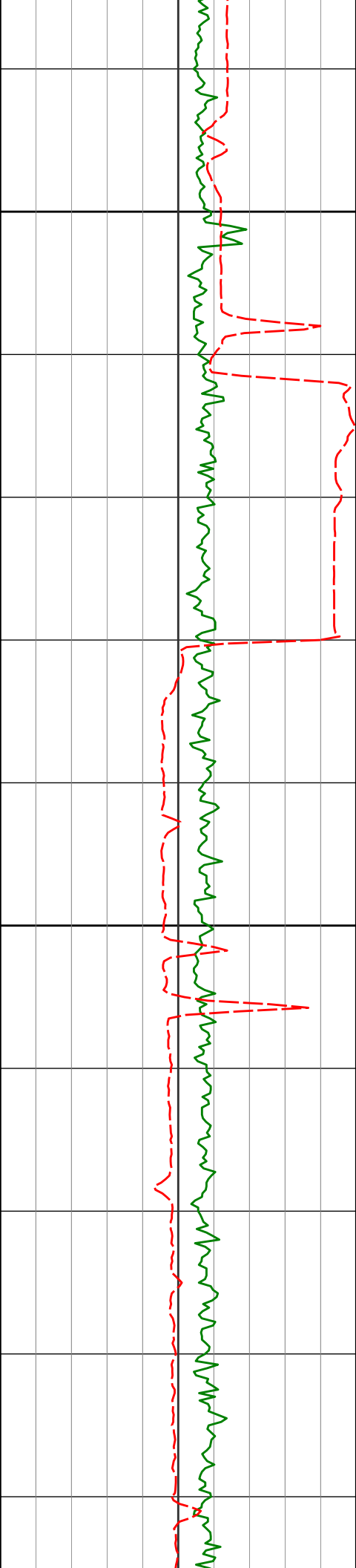
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269.22°

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8458.25'

251.38°F



15200

15300

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89.11°

270.93°

6648.24'

8553.13'

247.16°F

15333'

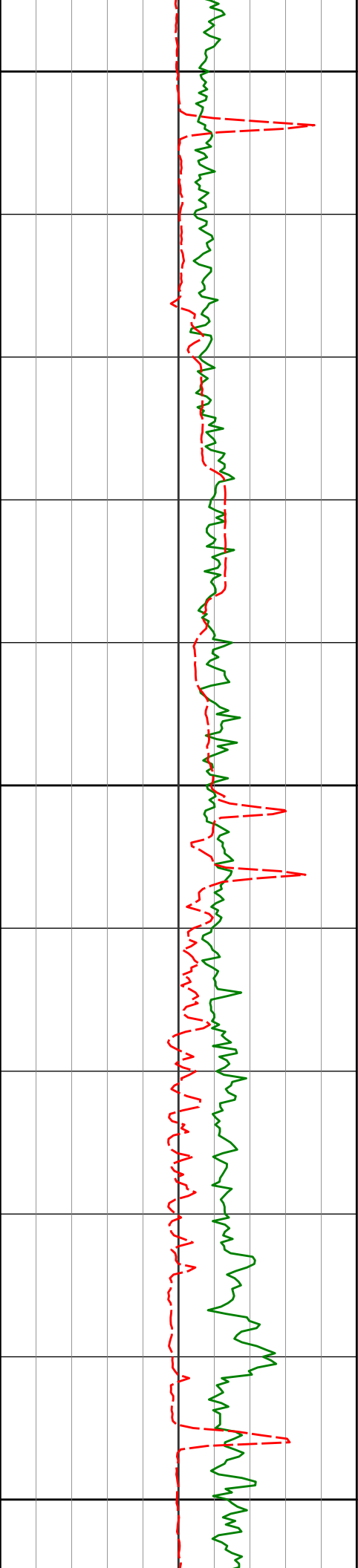
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271.58°

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251.38°F



15400

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89.38°

270.96°

6651.02'

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251.38°F

15500

15522'

89.69°

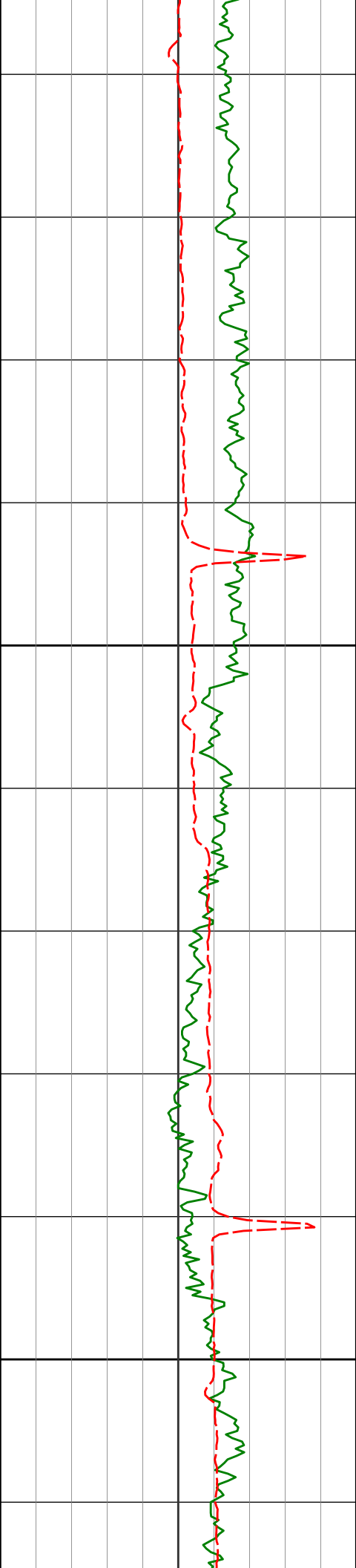
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15700

15800

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90.18°

270.18°

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251.38°F

15712'

90.34°

269.46°

6651.46'

9026.72'

251.38°F

15807'

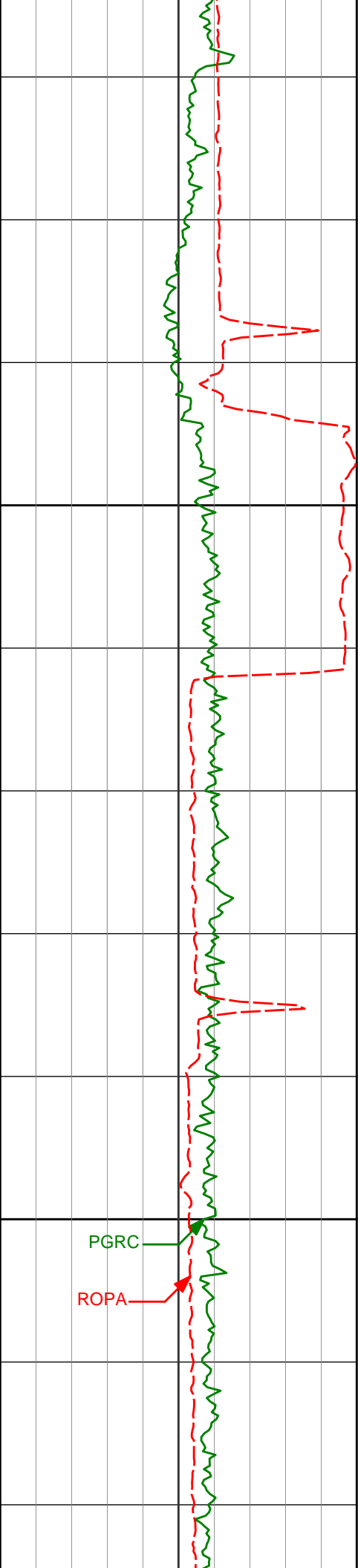
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251.38°F



15900

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90.77°

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9216.39'

251.38°F

16000

15996'

89.69°

269.54° 6648.42'

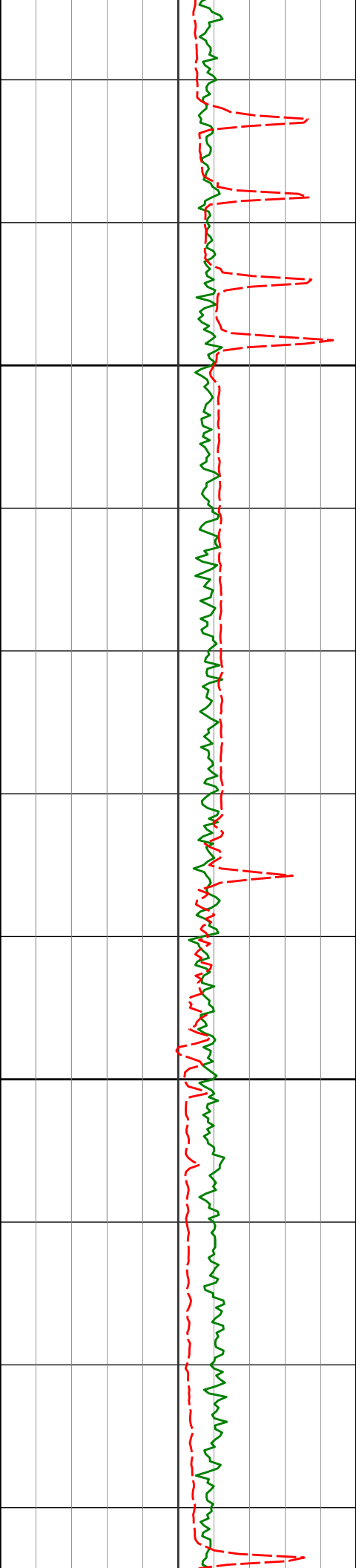
9310.25'

PGRC

ROPA

251.38°F

251.38°F



16100

16101'

89.78°

268.69° 6648.91'

9415.02'

251.38°F

16200

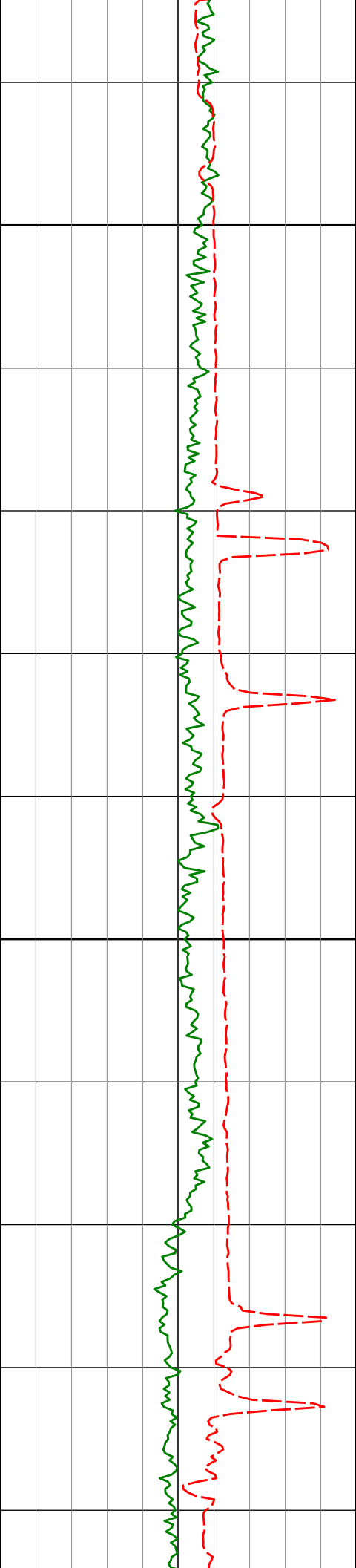
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9509.79'

251.38°F



16300

16400

16290'

90.37°

268.09°

6648.88'

9603.52'

16385'

91.08°

267.44°

6647.68'

9698.14'

16480'

92.10°

267.10°

6645.05'

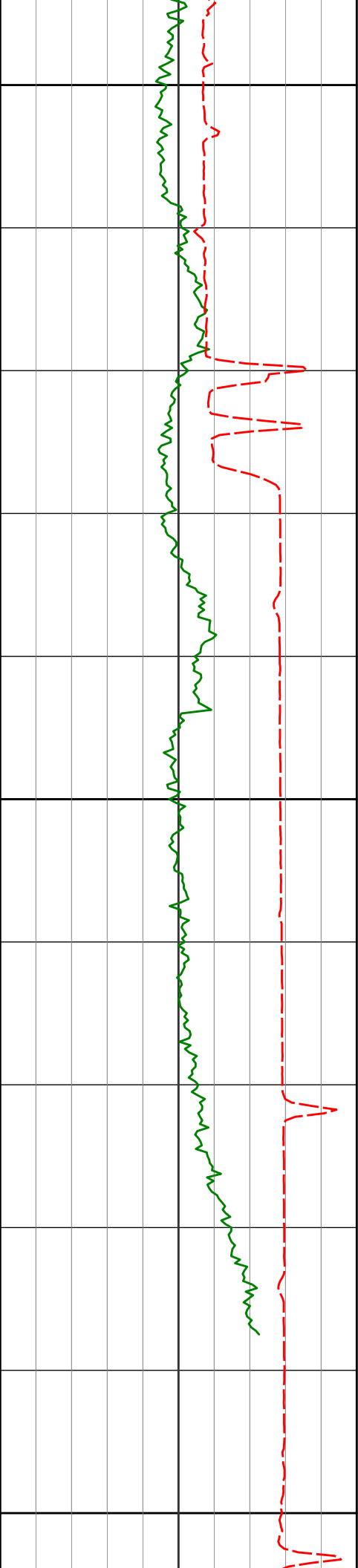
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251.38°F

255.59°F

255.59°F



16500

16575'

92.87°

266.71° 6640.93'

9887.04'

251.38°F

16600

16700

16663'

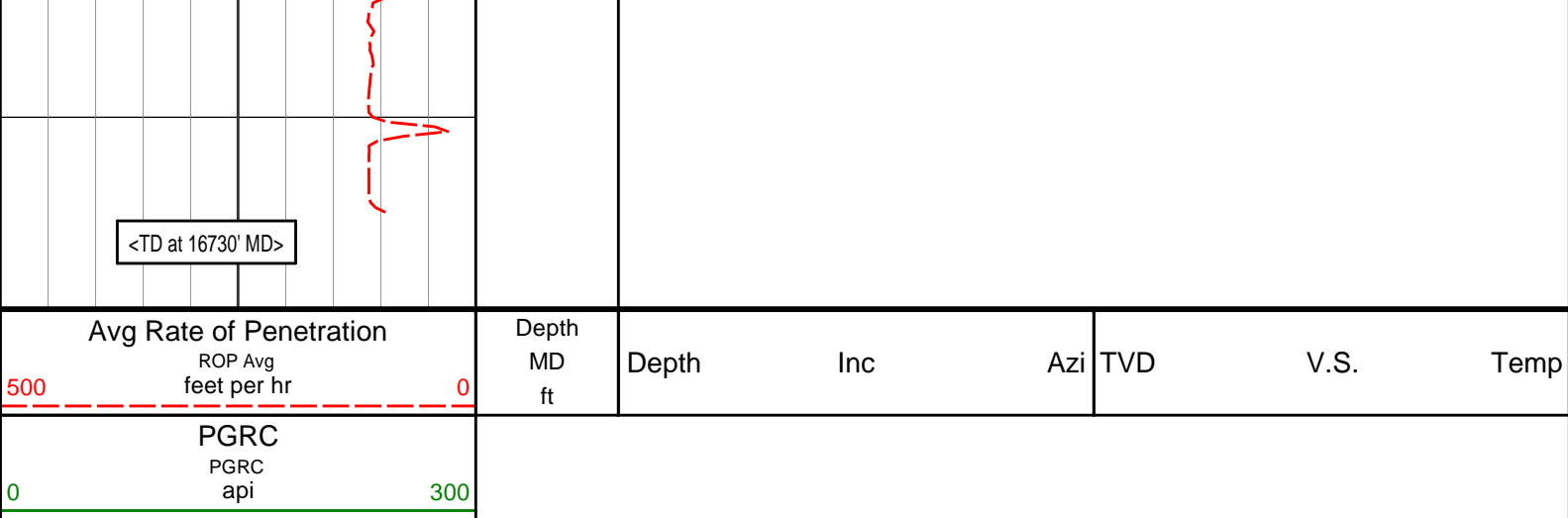
93.23°

266.57° 6636.25'

9974.39'

251.38°F

251.38°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch State A36-655
Wattenberg
Weld Colorado
USA
CA-XX-0902510729

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
300.00	0.14	198.52	300.00	0.35 S	0.12 W	0.10	0.05
600.00	0.25	198.52	600.00	1.32 S	0.44 W	0.37	0.04
850.00	0.39	198.52	849.99	2.64 S	0.88 W	0.75	0.06
920.00	0.42	198.52	919.99	3.11 S	1.04 W	0.88	0.04
1109.00	0.95	166.76	1108.98	5.29 S	0.90 W	0.64	0.33
1200.00	0.62	89.50	1199.97	6.02 S	0.23 W	-0.07	1.11
1292.00	2.68	44.03	1291.93	4.47 S	1.76 E	-1.98	2.48
1382.00	4.00	49.19	1381.78	0.90 S	5.60 E	-5.64	1.51
1474.00	6.27	37.90	1473.40	5.16 N	11.11 E	-10.84	2.69
1565.00	7.73	36.31	1563.72	14.01 N	17.79 E	-17.06	1.62
1657.00	9.87	29.07	1654.64	25.89 N	25.28 E	-23.95	2.62
1749.00	10.82	31.67	1745.14	40.13 N	33.65 E	-31.59	1.15
1841.00	9.92	27.03	1835.64	54.54 N	41.78 E	-38.99	1.33
1932.00	10.77	23.45	1925.16	69.32 N	48.73 E	-45.18	1.17
2023.00	10.24	18.26	2014.64	84.80 N	54.65 E	-50.32	1.19
2115.00	10.35	29.58	2105.17	99.76 N	61.29 E	-56.20	2.20
2207.00	10.96	23.14	2195.58	115.00 N	68.81 E	-62.94	1.45
2299.00	9.81	15.65	2286.07	130.60 N	74.36 E	-67.71	1.93
2391.00	11.09	28.33	2376.56	145.94 N	80.68 E	-73.24	2.85
2482.00	10.38	20.42	2465.97	161.33 N	87.69 E	-79.48	1.80
2574.00	11.10	29.93	2556.37	176.77 N	95.00 E	-86.00	2.08
2666.00	10.43	24.13	2646.75	192.04 N	102.83 E	-93.05	1.39
2757.00	10.38	22.62	2736.25	207.12 N	109.34 E	-98.80	0.30
2849.00	11.65	32.46	2826.56	222.61 N	117.52 E	-106.18	2.46
2941.00	10.81	27.40	2916.81	238.11 N	126.47 E	-114.35	1.40
3036.00	10.54	26.01	3010.16	253.82 N	134.38 E	-121.46	0.40
3131.00	9.67	21.70	3103.69	269.04 N	141.14 E	-127.44	1.21
3225.00	10.47	27.26	3196.24	283.97 N	147.97 E	-133.52	1.34
3320.00	8.58	17.75	3289.93	298.39 N	154.08 E	-138.90	2.58
3415.00	10.68	25.22	3383.59	313.11 N	160.00 E	-144.06	2.57
3510.00	11.95	22.55	3476.75	330.16 N	167.52 E	-150.72	1.44
3604.00	11.55	18.64	3568.78	348.06 N	174.26 E	-156.55	0.95
3699.00	11.77	18.21	3661.82	366.27 N	180.33 E	-161.70	0.25
3794.00	12.51	27.19	3754.70	384.63 N	188.06 E	-168.50	2.13
3889.00	12.72	24.97	3847.41	403.26 N	197.17 E	-176.66	0.56

3983.00	12.64	23.91	3939.12	422.05 N	205.71 E	-184.25	0.26
4078.00	10.70	29.76	4032.15	439.22 N	214.31 E	-191.97	2.39
4173.00	10.02	27.73	4125.60	454.19 N	222.53 E	-199.43	0.82
4268.00	9.18	28.82	4219.27	468.14 N	230.03 E	-206.22	0.90
4362.00	10.81	26.77	4311.84	482.58 N	237.61 E	-213.07	1.77
4457.00	10.35	26.78	4405.23	498.15 N	245.47 E	-220.13	0.48
4552.00	9.43	27.83	4498.81	512.66 N	252.95 E	-226.87	0.99
4647.00	8.30	26.53	4592.68	525.67 N	259.64 E	-232.91	1.21
4741.00	10.18	25.56	4685.45	539.23 N	266.26 E	-238.83	2.01
4836.00	8.61	24.97	4779.18	553.25 N	272.88 E	-244.74	1.65
4931.00	10.29	23.08	4872.88	567.51 N	279.21 E	-250.34	1.79
5025.00	9.48	22.24	4965.49	582.39 N	285.43 E	-255.81	0.88
5120.00	8.57	19.30	5059.31	596.31 N	290.73 E	-260.40	1.07
5215.00	7.02	17.42	5153.43	608.52 N	294.81 E	-263.86	1.65
5309.00	5.62	17.10	5246.86	618.41 N	297.88 E	-266.43	1.49
5404.00	4.27	19.23	5341.50	626.20 N	300.42 E	-268.57	1.43
5499.00	3.27	15.24	5436.30	632.15 N	302.29 E	-270.15	1.10
5594.00	2.53	13.89	5531.17	636.80 N	303.51 E	-271.13	0.78
5688.00	1.79	16.76	5625.11	640.22 N	304.43 E	-271.88	0.79
5783.00	1.46	7.85	5720.07	642.84 N	305.02 E	-272.34	0.44
5877.00	1.13	351.01	5814.04	644.94 N	305.04 E	-272.25	0.53
5972.00	1.18	6.38	5909.03	646.84 N	305.01 E	-272.12	0.33
6067.00	3.99	280.43	6003.94	648.41 N	301.86 E	-268.90	4.30
6162.00	13.41	264.49	6097.75	647.95 N	287.62 E	-254.70	10.14
6256.00	23.91	265.67	6186.69	645.46 N	257.69 E	-224.94	11.18
6351.00	30.56	268.50	6271.11	643.37 N	214.31 E	-181.71	7.13
6446.00	36.29	270.09	6350.37	642.78 N	162.01 E	-129.50	6.10
6541.00	46.23	270.96	6421.69	643.40 N	99.44 E	-66.98	10.48
6635.00	53.22	273.02	6482.43	645.95 N	27.82 E	4.67	7.62
6730.00	59.61	272.04	6534.95	649.41 N	51.21 W	83.77	6.78
6825.00	66.89	268.62	6577.69	649.82 N	135.96 W	168.44	8.30
6920.00	73.60	266.58	6609.79	646.05 N	225.24 W	257.41	7.35
6978.00	80.88	266.50	6622.59	642.64 N	281.66 W	313.60	12.55
7060.00	86.18	268.45	6631.83	639.06 N	363.03 W	394.68	6.89
7155.00	89.38	270.06	6635.51	637.83 N	457.93 W	489.40	3.77
7250.00	90.37	269.66	6635.72	637.60 N	552.93 W	584.27	1.12
7344.00	88.68	271.13	6636.50	638.24 N	646.92 W	678.17	2.38
7439.00	89.69	271.61	6637.85	640.51 N	741.88 W	773.13	1.18
7534.00	89.94	271.22	6638.16	642.86 N	836.85 W	868.09	0.49
7629.00	90.74	271.22	6637.59	644.88 N	931.83 W	963.05	0.84
7723.00	89.41	271.13	6637.47	646.81 N	1025.81 W	1057.01	1.42
7818.00	90.28	271.94	6637.73	649.35 N	1120.77 W	1151.98	1.25
7913.00	90.55	271.53	6637.04	652.23 N	1215.72 W	1246.96	0.52
8008.00	89.45	271.89	6637.04	655.07 N	1310.68 W	1341.94	1.22
8103.00	88.31	271.02	6638.90	657.48 N	1405.63 W	1436.89	1.51
8197.00	88.68	270.77	6641.36	658.94 N	1499.58 W	1530.80	0.47
8387.00	89.17	270.33	6644.93	660.77 N	1689.54 W	1720.61	0.35
8482.00	89.26	269.71	6646.23	660.80 N	1784.53 W	1815.48	0.66
8576.00	89.45	268.18	6647.29	659.07 N	1878.51 W	1909.25	1.64
8671.00	89.69	267.88	6648.00	655.80 N	1973.45 W	2003.91	0.40
8766.00	90.22	267.04	6648.08	651.59 N	2068.35 W	2098.48	1.05
8861.00	90.68	266.10	6647.33	645.91 N	2163.18 W	2192.90	1.10
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9050.00	89.97	267.81	6646.65	636.86 N	2351.95 W	2380.98	0.30
9145.00	90.89	267.25	6645.94	632.77 N	2446.86 W	2475.56	1.13
9239.00	90.12	269.38	6645.11	630.00 N	2540.81 W	2569.25	2.41
9334.00	89.69	268.88	6645.27	628.56 N	2635.80 W	2664.05	0.69
9429.00	89.08	267.72	6646.29	625.74 N	2730.75 W	2758.74	1.38
9524.00	88.74	269.76	6648.09	623.65 N	2825.70 W	2853.47	2.18
9618.00	87.72	267.63	6651.00	621.51 N	2919.63 W	2947.17	2.51
9713.00	89.11	269.48	6653.62	619.12 N	3014.55 W	3041.85	2.44
9808.00	89.82	268.75	6654.51	617.65 N	3109.54 W	3136.64	1.07
9903.00	89.94	268.21	6654.71	615.13 N	3204.50 W	3231.36	0.58
9998.00	90.18	267.89	6654.61	611.90 N	3299.45 W	3326.02	0.42
10092.00	91.72	269.71	6653.05	609.93 N	3393.41 W	3419.77	2.54
10187.00	93.23	270.17	6648.95	609.83 N	3488.32 W	3514.55	1.66
10282.00	91.23	271.67	6645.25	611.36 N	3583.22 W	3609.42	2.63
10376.00	89.69	271.49	6644.50	613.95 N	3677.18 W	3703.39	1.65
10471.00	90.49	271.07	6644.35	616.07 N	3772.16 W	3798.35	0.95
10566.00	88.80	270.33	6644.94	617.23 N	3867.14 W	3893.27	1.94
10661.00	89.26	269.30	6646.55	616.92 N	3962.13 W	3988.12	1.19

10755.00	90.77	268.87	6646.52	615.42 N	4056.11 W	4081.91	1.67
10850.00	89.05	269.84	6646.67	614.35 N	4151.10 W	4176.73	2.08
10941.00	89.41	270.20	6647.89	614.38 N	4242.09 W	4267.61	0.56
11124.00	89.88	269.45	6649.03	613.83 N	4425.09 W	4450.34	0.48
11215.00	89.14	269.89	6649.81	613.30 N	4516.08 W	4541.19	0.95
11306.00	89.88	270.15	6650.58	613.33 N	4607.08 W	4632.08	0.86
11398.00	90.55	270.43	6650.24	613.80 N	4699.08 W	4723.98	0.79
11490.00	89.88	269.13	6649.89	613.44 N	4791.07 W	4815.84	1.59
11582.00	89.82	268.25	6650.13	611.34 N	4883.05 W	4907.60	0.96
11673.00	90.28	267.94	6650.06	608.32 N	4974.00 W	4998.28	0.61
11764.00	91.26	267.78	6648.83	604.92 N	5064.92 W	5088.92	1.09
11856.00	89.66	268.08	6648.09	601.60 N	5156.86 W	5180.57	1.77
11948.00	89.54	268.52	6648.74	598.87 N	5248.81 W	5272.27	0.50
12040.00	90.49	267.73	6648.71	595.86 N	5340.76 W	5363.96	1.34
12132.00	89.35	268.87	6648.84	593.13 N	5432.72 W	5455.66	1.75
12224.00	88.34	268.57	6650.70	591.07 N	5524.68 W	5547.40	1.15
12315.00	88.98	268.54	6652.82	588.78 N	5615.62 W	5638.11	0.70
12407.00	90.09	268.37	6653.57	586.30 N	5707.58 W	5729.83	1.22
12498.00	90.46	268.03	6653.13	583.44 N	5798.54 W	5820.53	0.55
12590.00	91.54	267.63	6651.53	579.96 N	5890.46 W	5912.16	1.25
12682.00	91.26	268.39	6649.28	576.76 N	5982.37 W	6003.80	0.88
12777.00	91.05	269.24	6647.36	574.80 N	6077.33 W	6098.54	0.92
12871.00	90.77	269.48	6645.87	573.75 N	6171.32 W	6192.35	0.39
12966.00	89.63	268.55	6645.54	572.12 N	6266.30 W	6287.13	1.55
13061.00	89.82	267.63	6646.00	568.95 N	6361.24 W	6381.79	0.99
13155.00	89.85	267.21	6646.27	564.72 N	6455.15 W	6475.37	0.45
13250.00	90.43	266.82	6646.04	559.77 N	6550.02 W	6569.87	0.74
13345.00	89.63	268.39	6645.99	555.80 N	6644.93 W	6664.46	1.85
13440.00	89.60	269.91	6646.62	554.39 N	6739.92 W	6759.26	1.60
13534.00	90.43	269.85	6646.60	554.19 N	6833.91 W	6853.13	0.89
13629.00	91.26	269.32	6645.20	553.51 N	6928.90 W	6947.96	1.04
13724.00	90.12	269.76	6644.05	552.74 N	7023.89 W	7042.79	1.29
13818.00	88.58	270.40	6645.12	552.88 N	7117.88 W	7136.67	1.77
13913.00	88.95	269.84	6647.17	553.07 N	7212.86 W	7231.53	0.71
14007.00	89.60	269.92	6648.36	552.88 N	7306.85 W	7325.40	0.70
14102.00	90.06	269.05	6648.64	552.02 N	7401.84 W	7420.23	1.04
14197.00	90.46	268.31	6648.21	549.83 N	7496.82 W	7514.97	0.89
14292.00	91.26	268.06	6646.78	546.83 N	7591.76 W	7609.64	0.88
14386.00	89.29	268.29	6646.33	543.83 N	7685.70 W	7703.32	2.11
14481.00	88.52	268.36	6648.15	541.06 N	7780.64 W	7798.00	0.81
14576.00	88.89	268.76	6650.29	538.67 N	7875.59 W	7892.71	0.57
14671.00	89.72	268.54	6651.45	536.43 N	7970.56 W	7987.44	0.90
14765.00	90.37	268.38	6651.37	533.90 N	8064.52 W	8081.16	0.71
14860.00	91.17	268.12	6650.10	531.00 N	8159.47 W	8175.84	0.89
14955.00	90.80	269.12	6648.46	528.72 N	8254.42 W	8270.56	1.12
15050.00	89.69	269.98	6648.06	527.97 N	8349.42 W	8365.40	1.48
15143.00	90.49	269.22	6647.91	527.32 N	8442.41 W	8458.25	1.19
15238.00	89.11	270.93	6648.24	527.45 N	8537.41 W	8553.13	2.31
15333.00	89.08	271.58	6649.74	529.53 N	8632.37 W	8648.08	0.68
15428.00	89.38	270.96	6651.02	531.63 N	8727.34 W	8743.03	0.72
15522.00	89.69	270.44	6651.78	532.78 N	8821.33 W	8836.96	0.64
15617.00	90.18	270.18	6651.89	533.29 N	8916.33 W	8931.86	0.58
15712.00	90.34	269.46	6651.46	532.99 N	9011.33 W	9026.72	0.78
15807.00	91.05	269.55	6650.31	532.17 N	9106.31 W	9121.55	0.75
15902.00	90.77	269.86	6648.80	531.68 N	9201.30 W	9216.39	0.44
15996.00	89.69	269.54	6648.42	531.19 N	9295.30 W	9310.25	1.20
16101.00	89.78	268.69	6648.91	529.57 N	9400.28 W	9415.02	0.81
16196.00	89.94	269.11	6649.14	527.75 N	9495.26 W	9509.79	0.47
16290.00	90.37	268.09	6648.88	525.45 N	9589.23 W	9603.52	1.18
16385.00	91.08	267.44	6647.68	521.75 N	9684.15 W	9698.14	1.01
16480.00	92.10	267.10	6645.05	517.22 N	9779.01 W	9792.64	1.13
16575.00	92.87	266.71	6640.93	512.10 N	9873.78 W	9887.04	0.91
16663.00	93.23	266.57	6636.25	506.95 N	9961.50 W	9974.39	0.44
16730.00	93.23	266.57	6632.47	502.95 N	10028.28 W	10040.88	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 RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 272.88 DEGREES (GRID)
A TOTAL CORRECTION OF 7.49 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16730.00 FEET
IS 10040.88 FEET ALONG 272.87 DEGREES (GRID)

Last survey is a projection to bit at TD

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