



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	18-Jan-15	19-Jan-15	22-Jan-15		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	4.750	4.700		
Log Start Depth (MD, ft)	1,234.00	5,815.00	6,077.00		
Log End Depth (MD, ft)	5,815.00	6,077.00	10,870.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	17-Jan-15 13:40	18-Jan-15 18:00	19-Jan-15 03:10		
Drill/Wipe End Date and Time	18-Jan-15 12:00	18-Jan-15 23:25	22-Jan-15 04:30		
Min Inc (deg) @ Depth (MD, ft)	0.68 @ 4,955.00	72.57 @ 5,903.00	87.75 @ 6,184.00		
Max Inc (deg) @ Depth (MD, ft)	59.32 @ 5,808.00	87.47 @ 6,024.00	92.53 @ 6,554.00		
Bit TFA(in2) / Bit Type	0.91 / PDC	0.91 / PDC	0.75 / PDC		
Flow Rate (gpm)	565.11	515.00	298.42		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	10.55 / 45.00	10.70 / 39.00	10.50 / 37.00		
Filtrate CL (ppm)	375.00	375.00	325.00		
pH / Fluid Loss (mptm)	9.10 / 0	8.90 / 8	9.50 / 0		
PV (cP) / YP (lbf2)	15 / 11.00	12 / 11.00	11 / 9.00		
% Solids / % Sand	12.3 / 0.2	10.60 / 0.15	9.8 / 0.1		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	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		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (in F) / S	150.45 / PDM	150.47 / PDM	210.42 / PDM		

Max Tool Temp (degF) / Source	158.47 / PCM	158.47 / PCM	213.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Jual Pablo Centeno	Jual Pablo Centeno	Jual Pablo Centeno		
Customer Representative	Justin Fields	Justin Fields	Justin Fields		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11303511	11303511	12365886		
Insert Serial Number	11399998	11399998	11145600		
Date and Time Initialized	17-Jan-15 04:05	01-Jan-70 00:00	18-Jan-15 19:13		
Date and Time Read	19-Jan-15 05:48	19-Jan-15 05:54	25-Jan-15 16:05		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	57.00	53.00	62.00		
Software Version	6.21	6.21	6.33		
Sub Serial Number	11303511	11303511	12365886		
Sonde Serial Number	11638501	11638501	11062113		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	104.80	143.80	352.50		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.22	46.72	55.68		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11303511	11303511	12365886		
Insert/Sonde Serial Number	11120599	11120599	11579854		

REMARKS

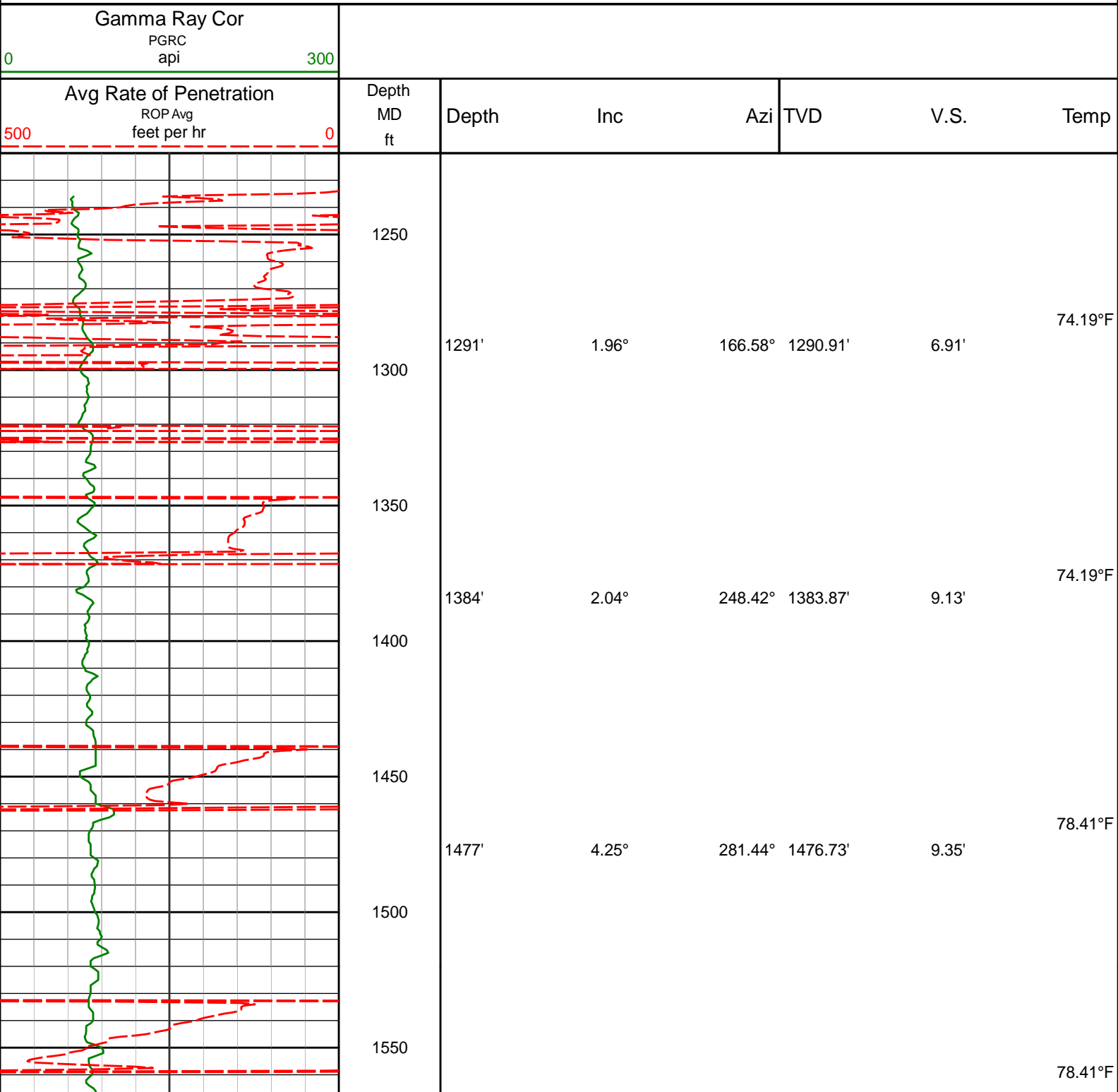
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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
6. Gamma presented inside casing/cement from 6030 ft. MD to 6069 ft. MD.

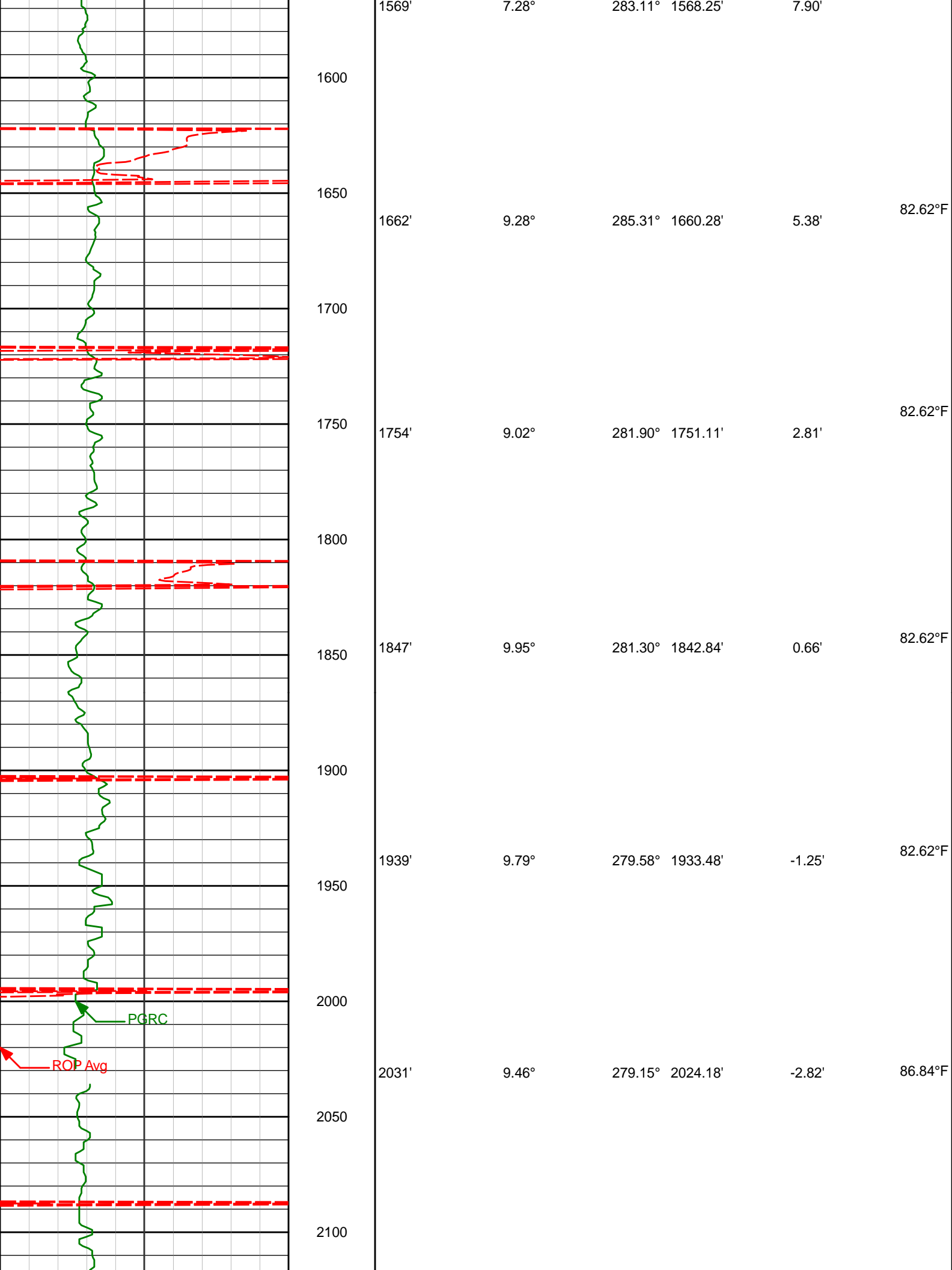
WARRANTY

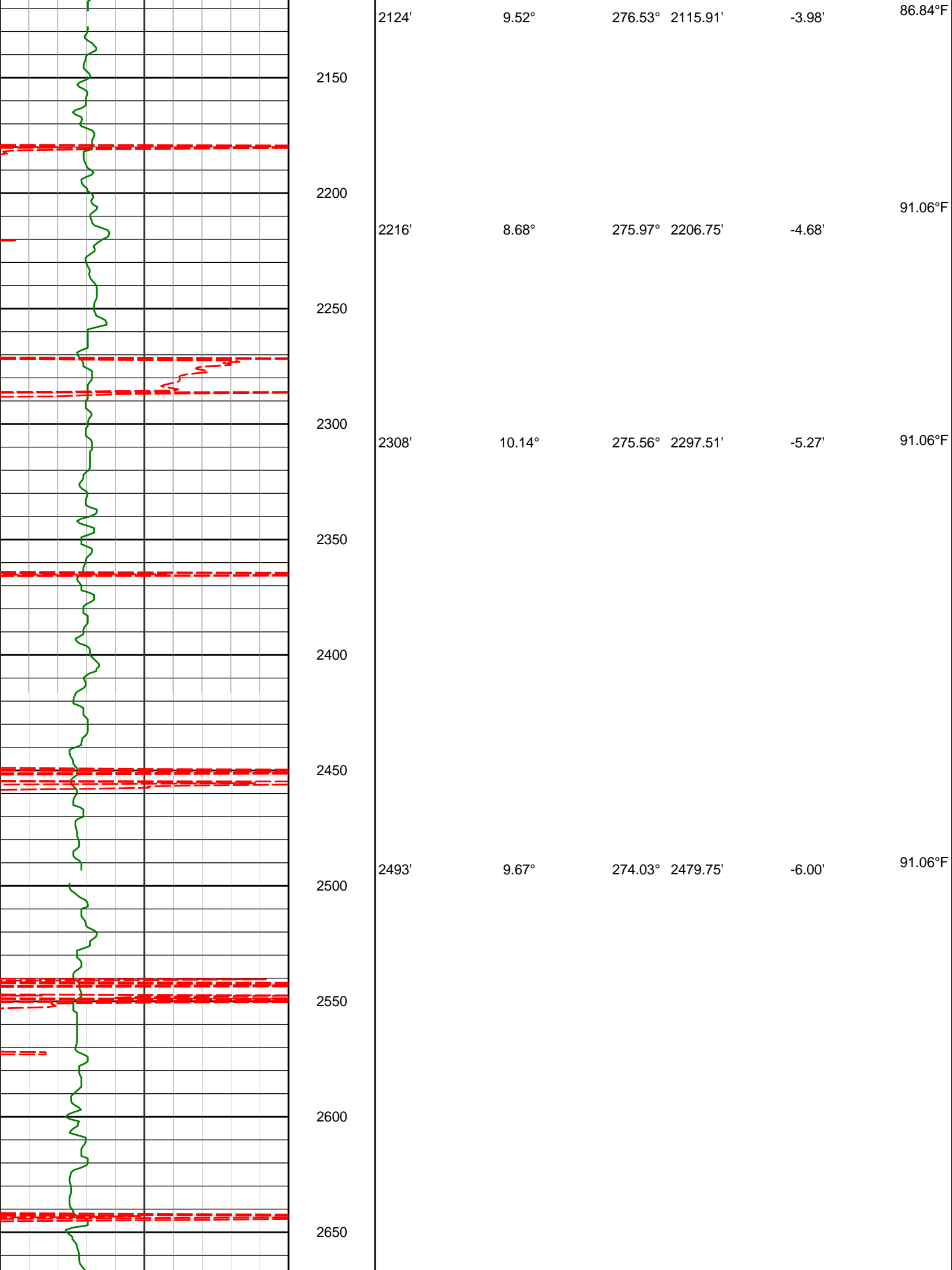
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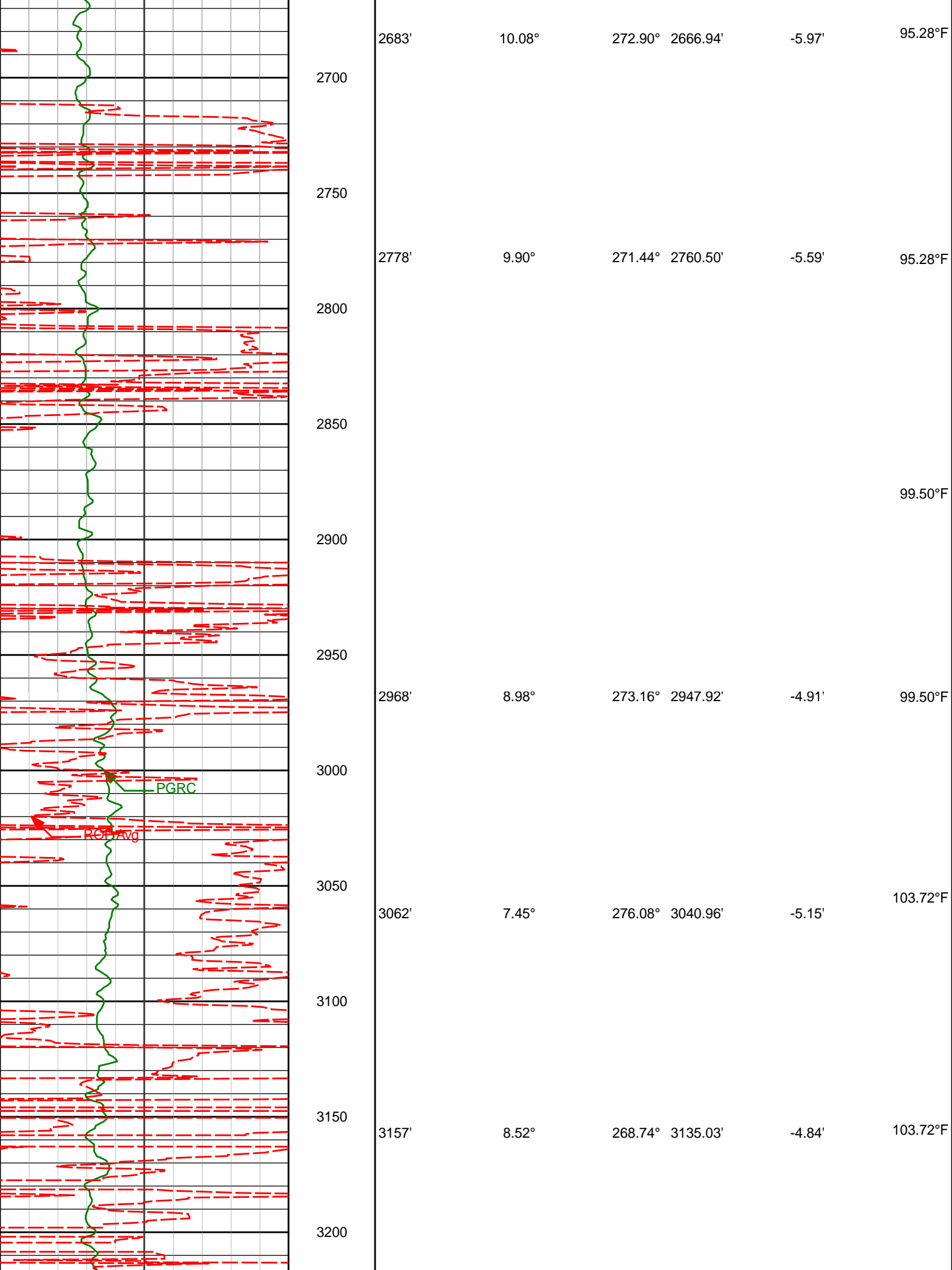
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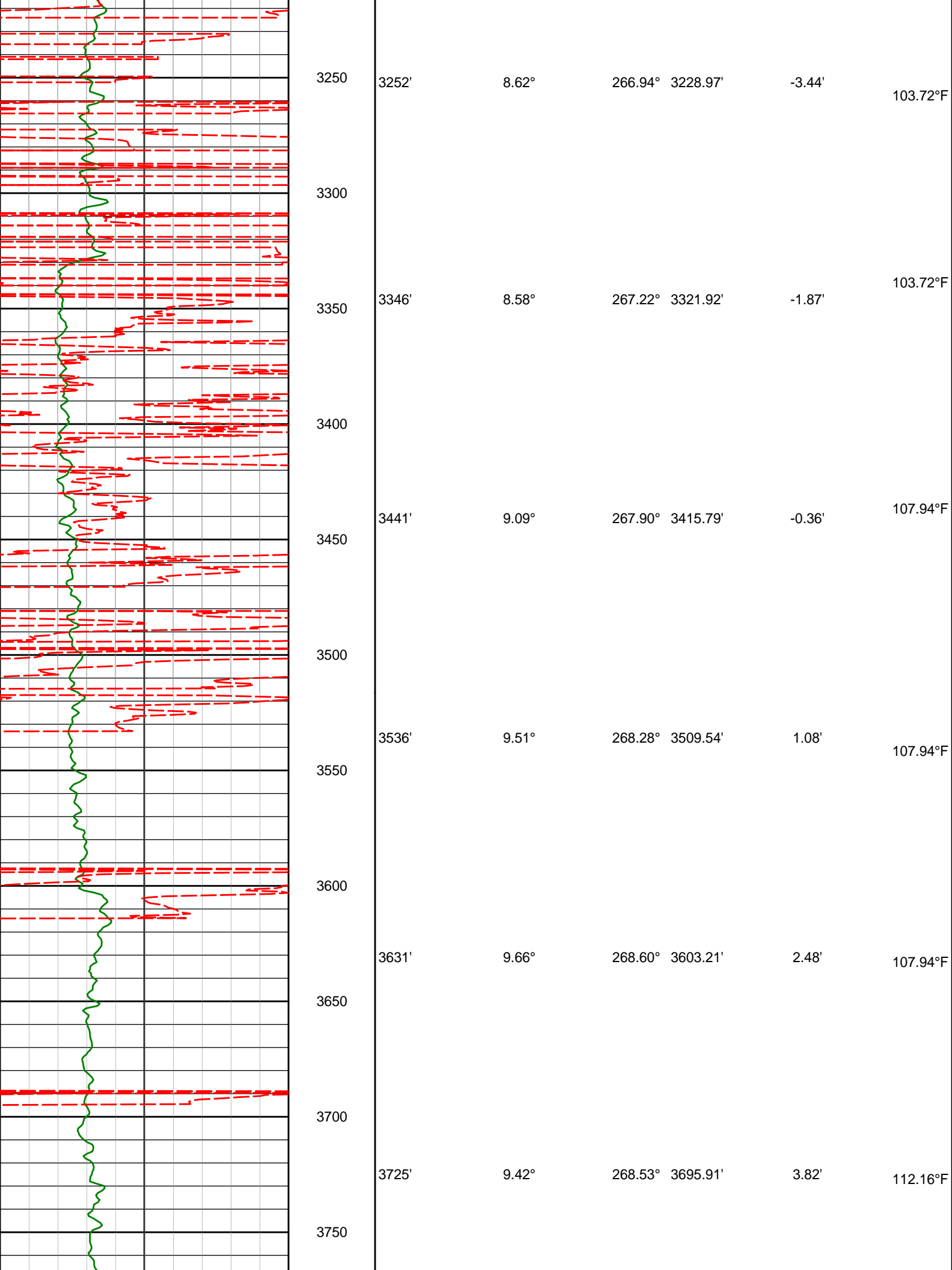
MD Detail 1:600 Scale

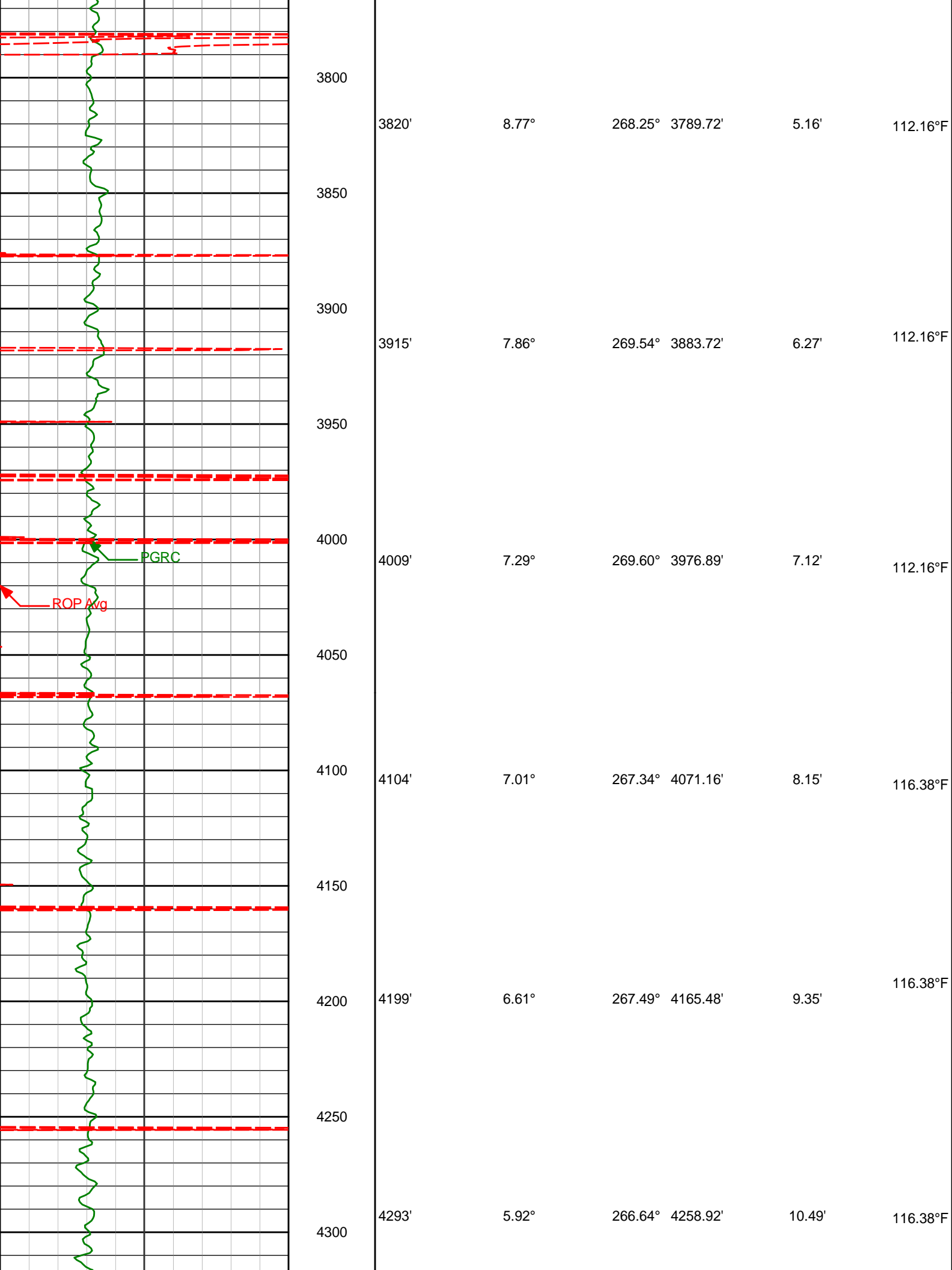


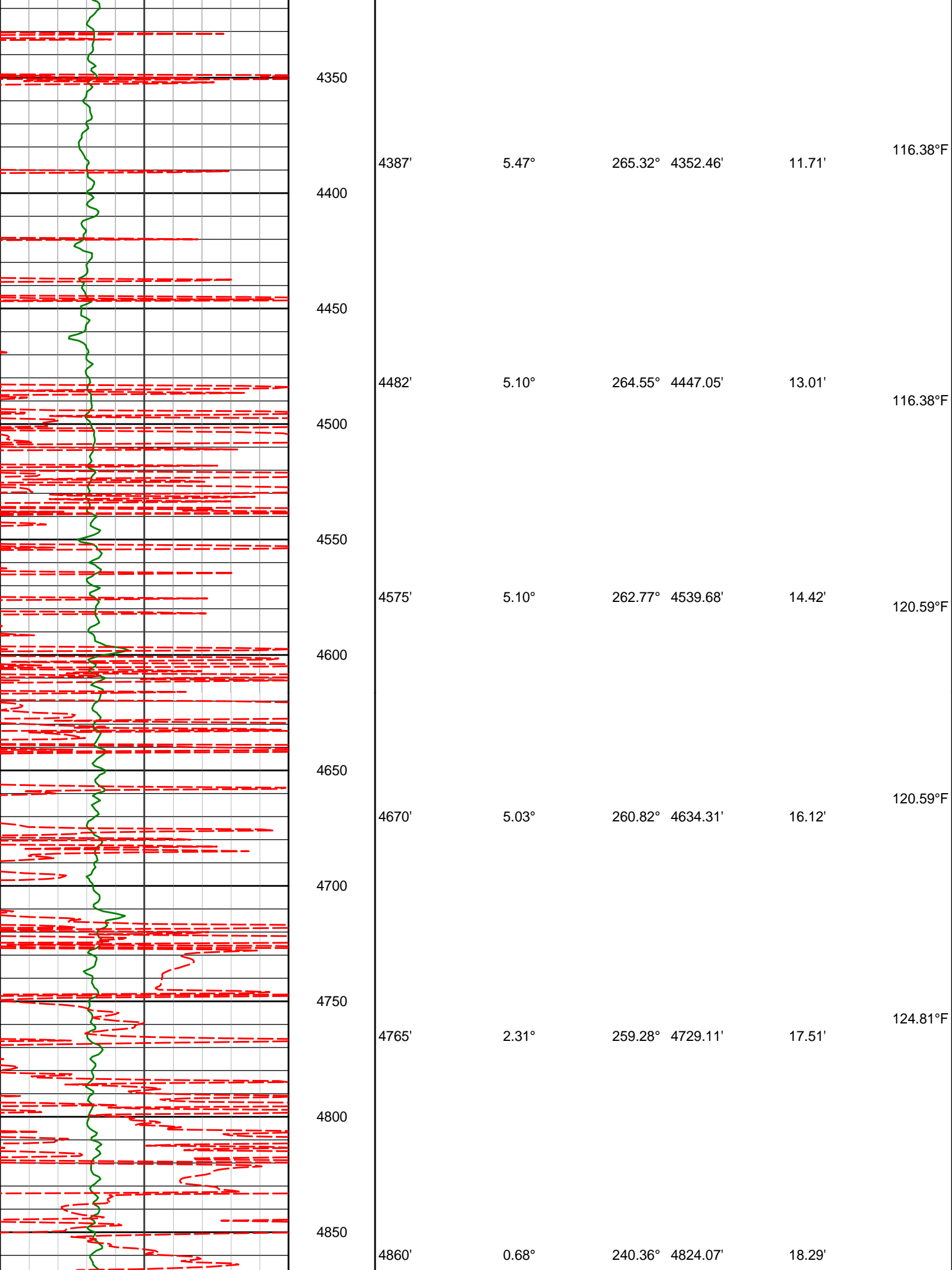


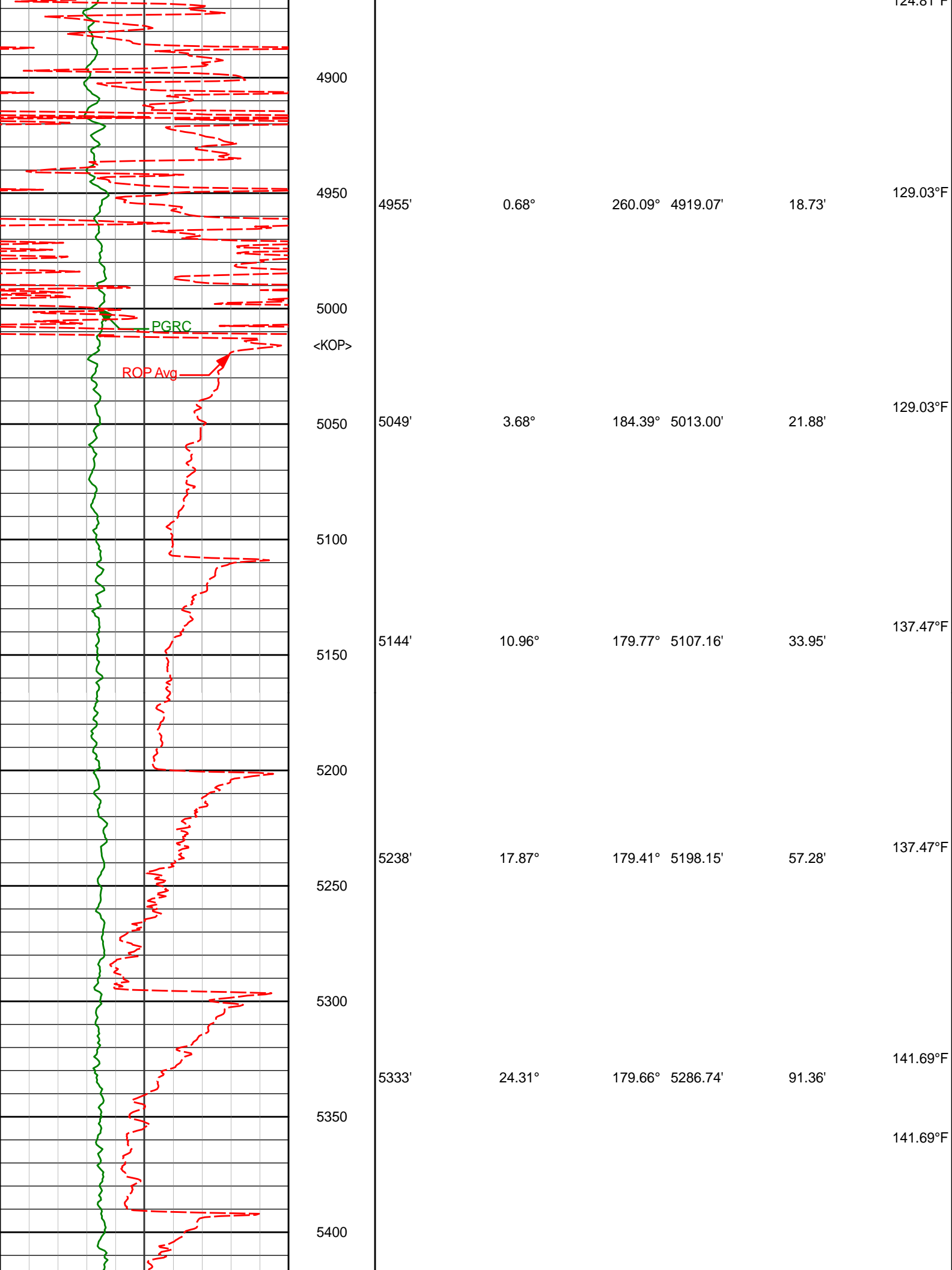


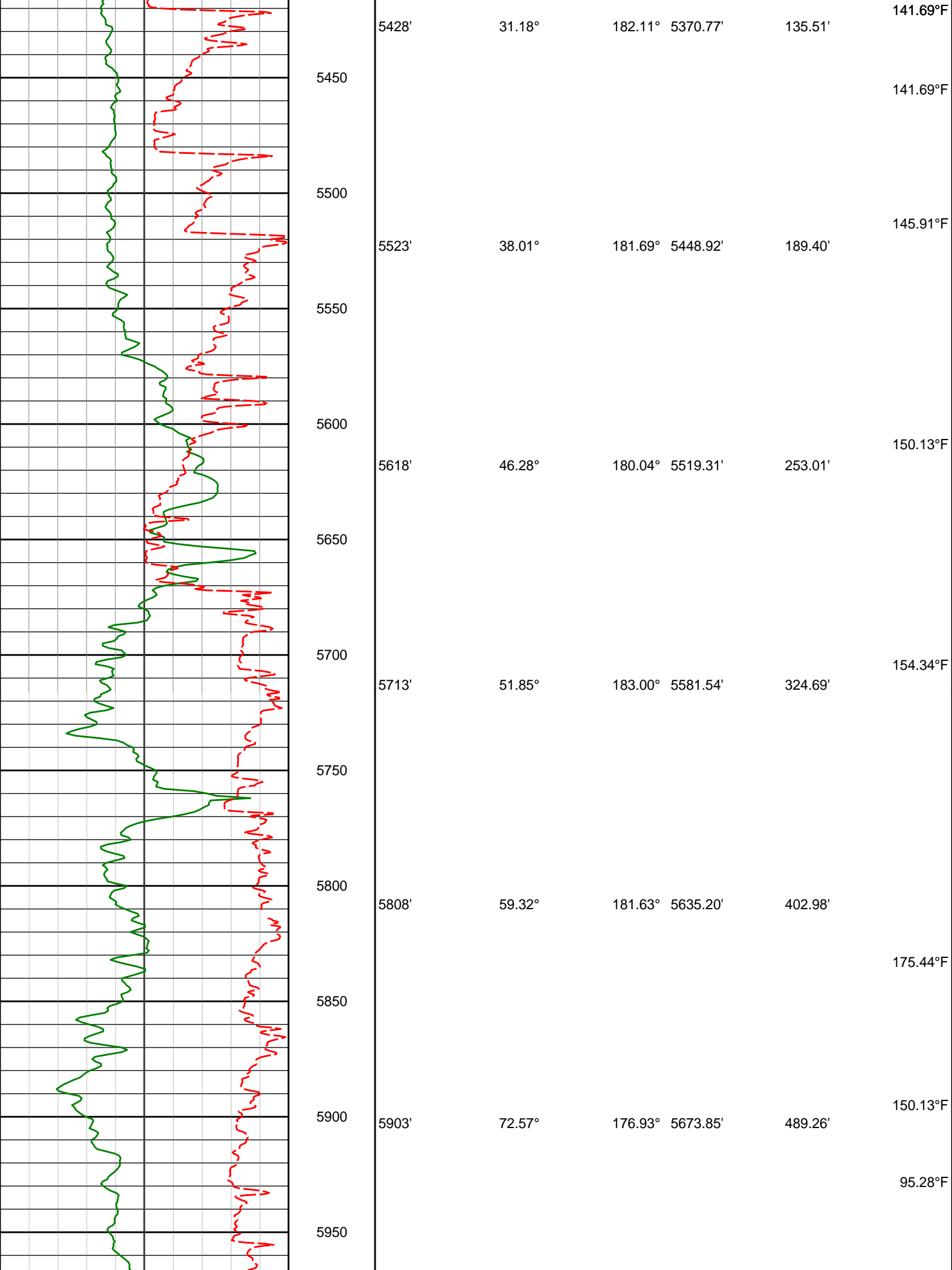


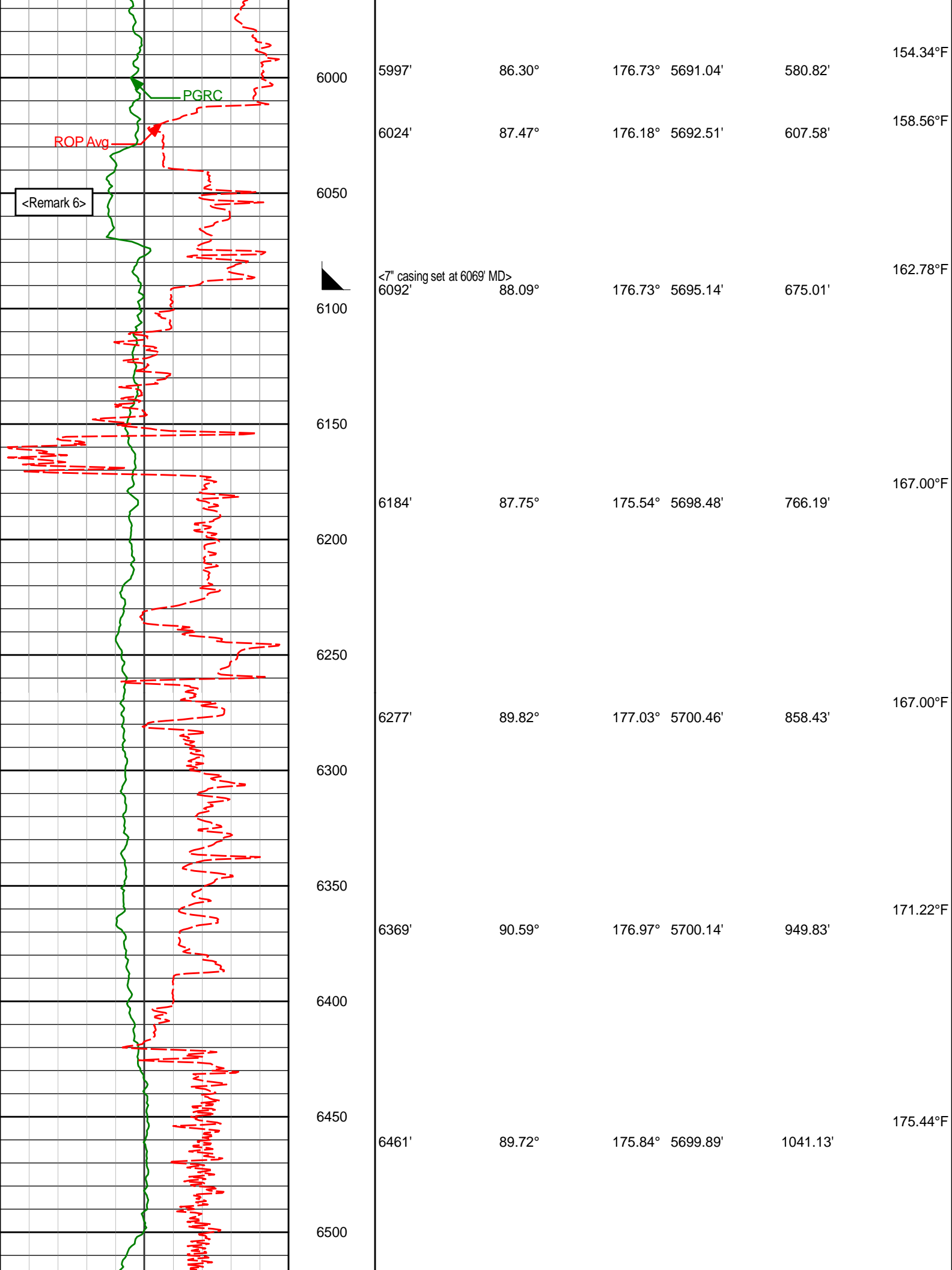


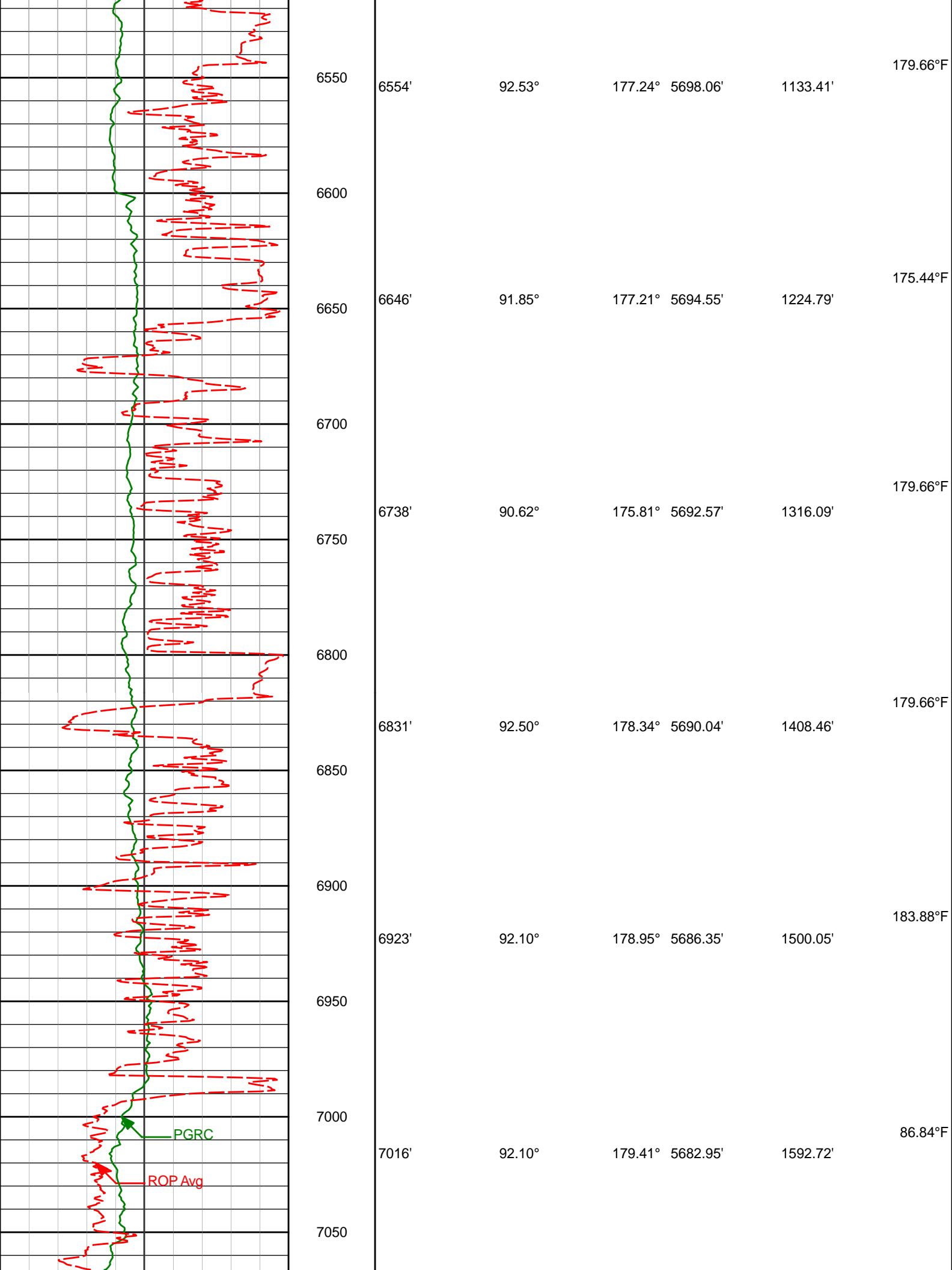


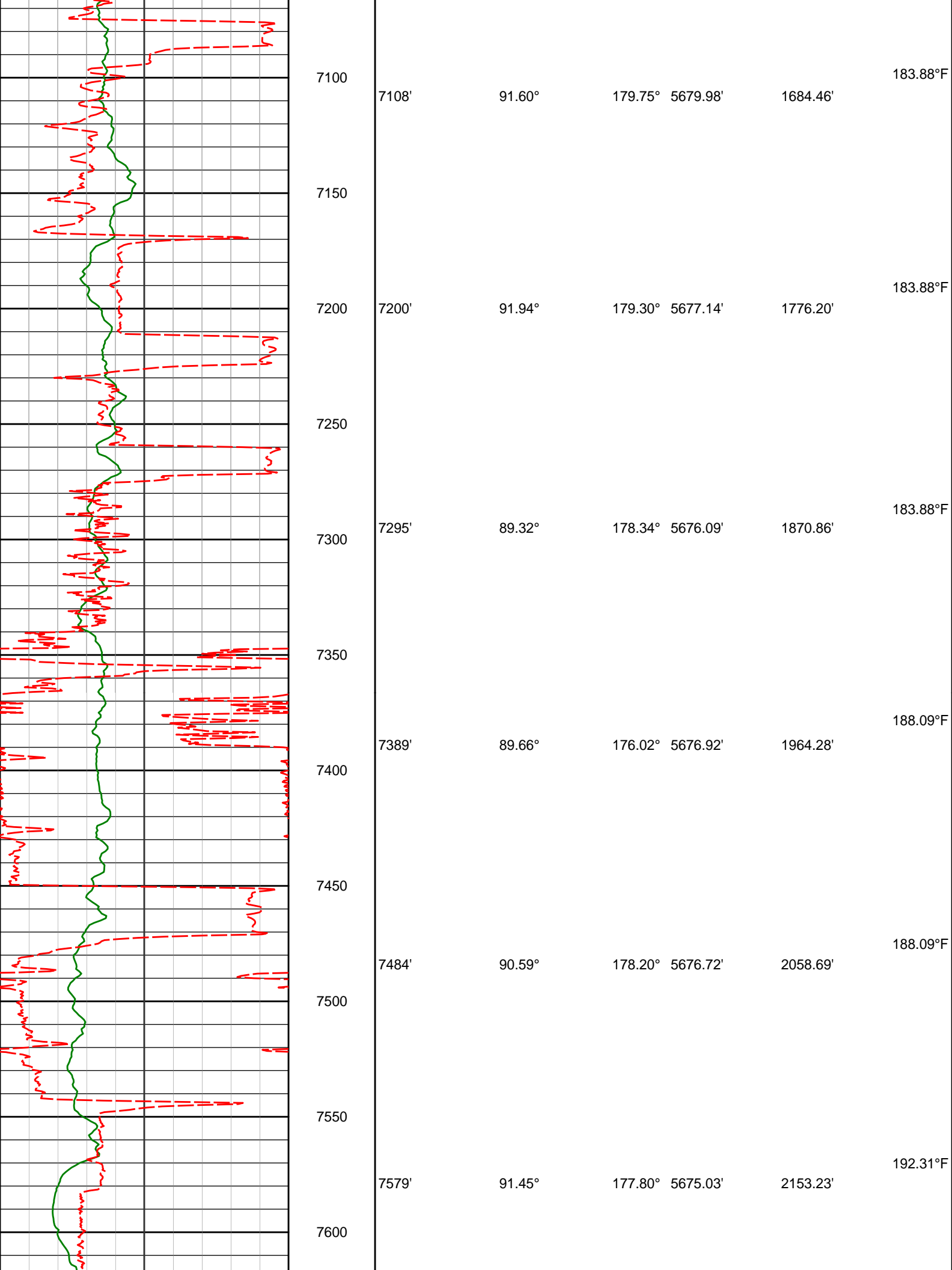


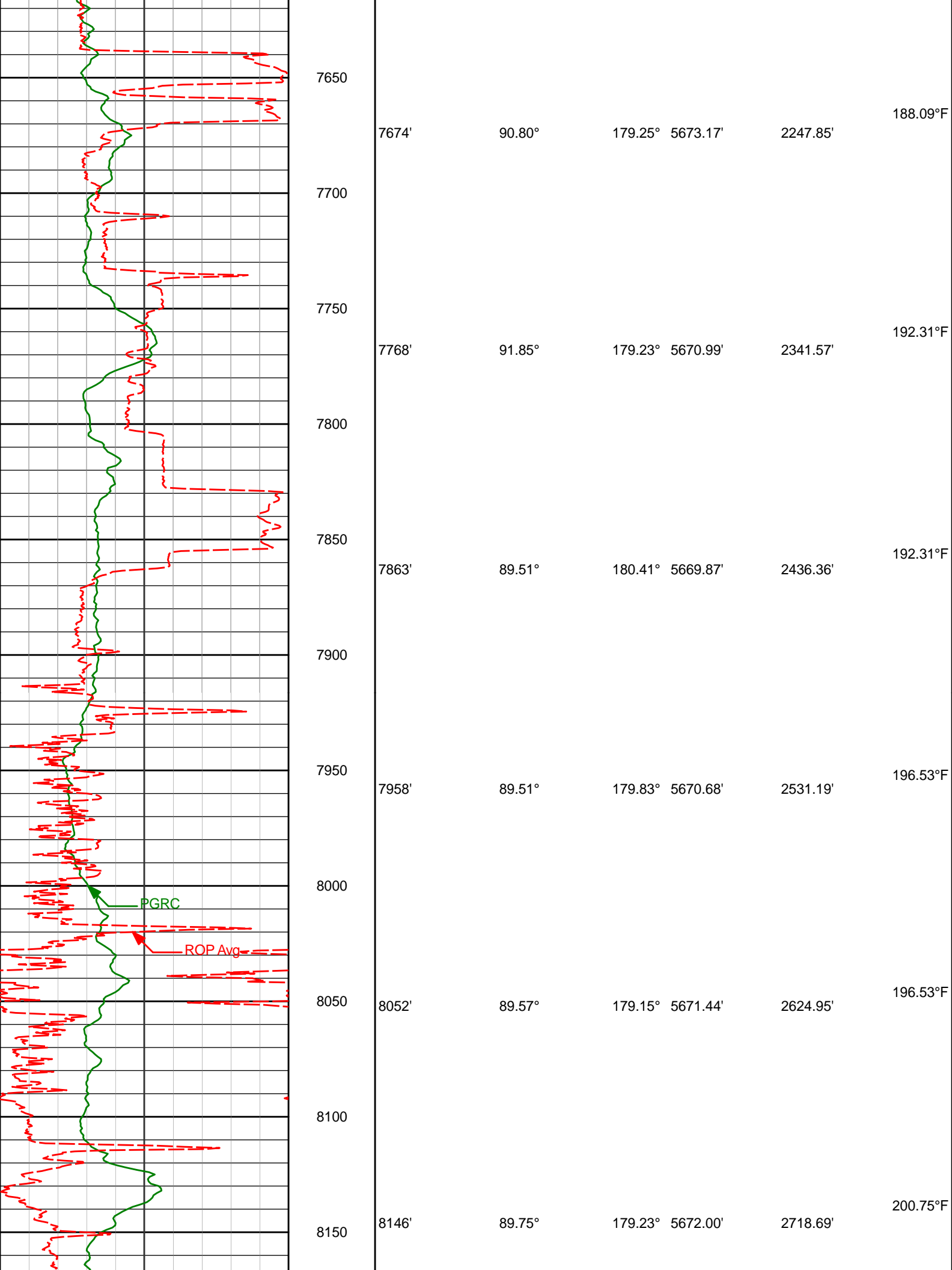


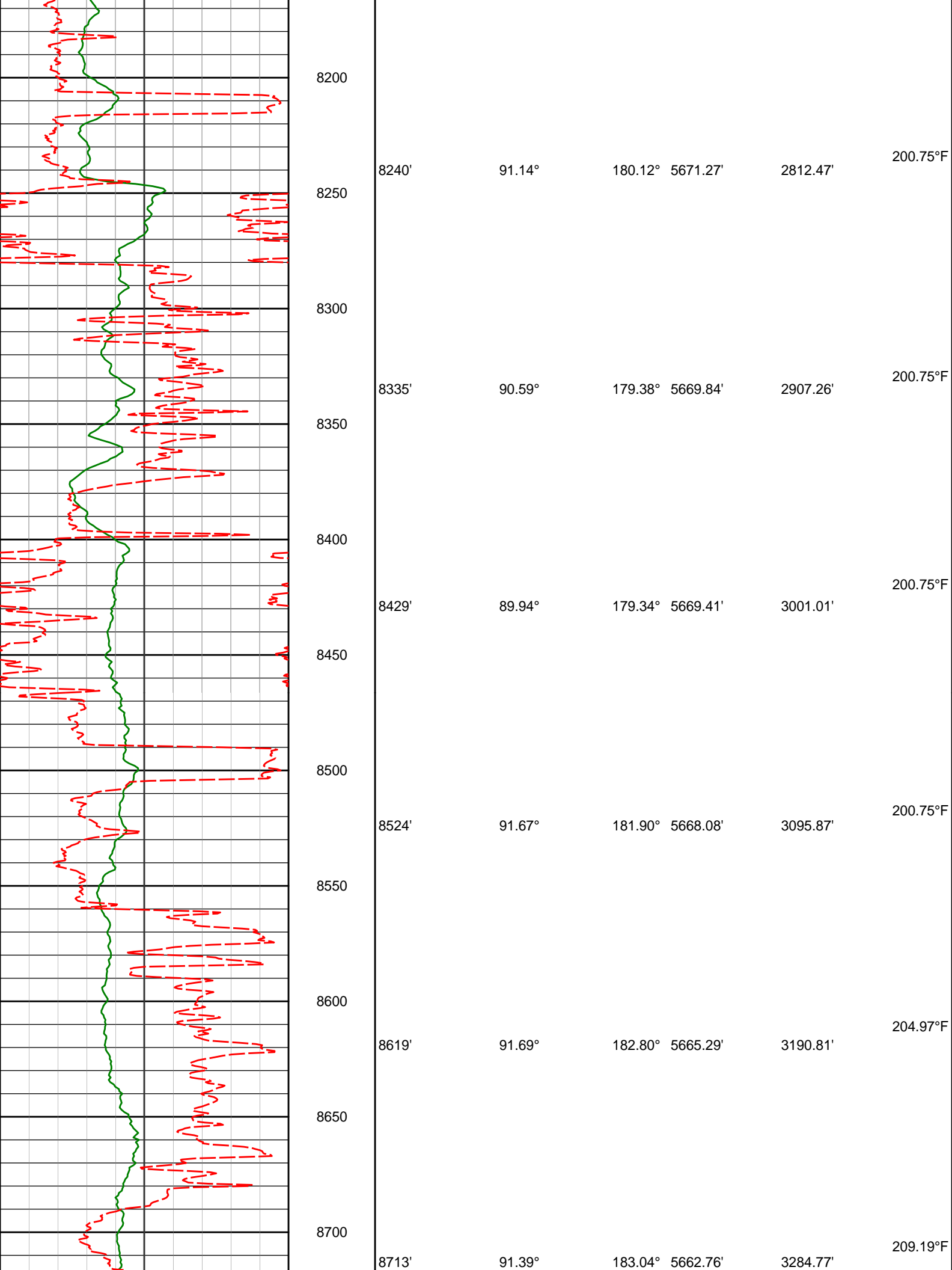


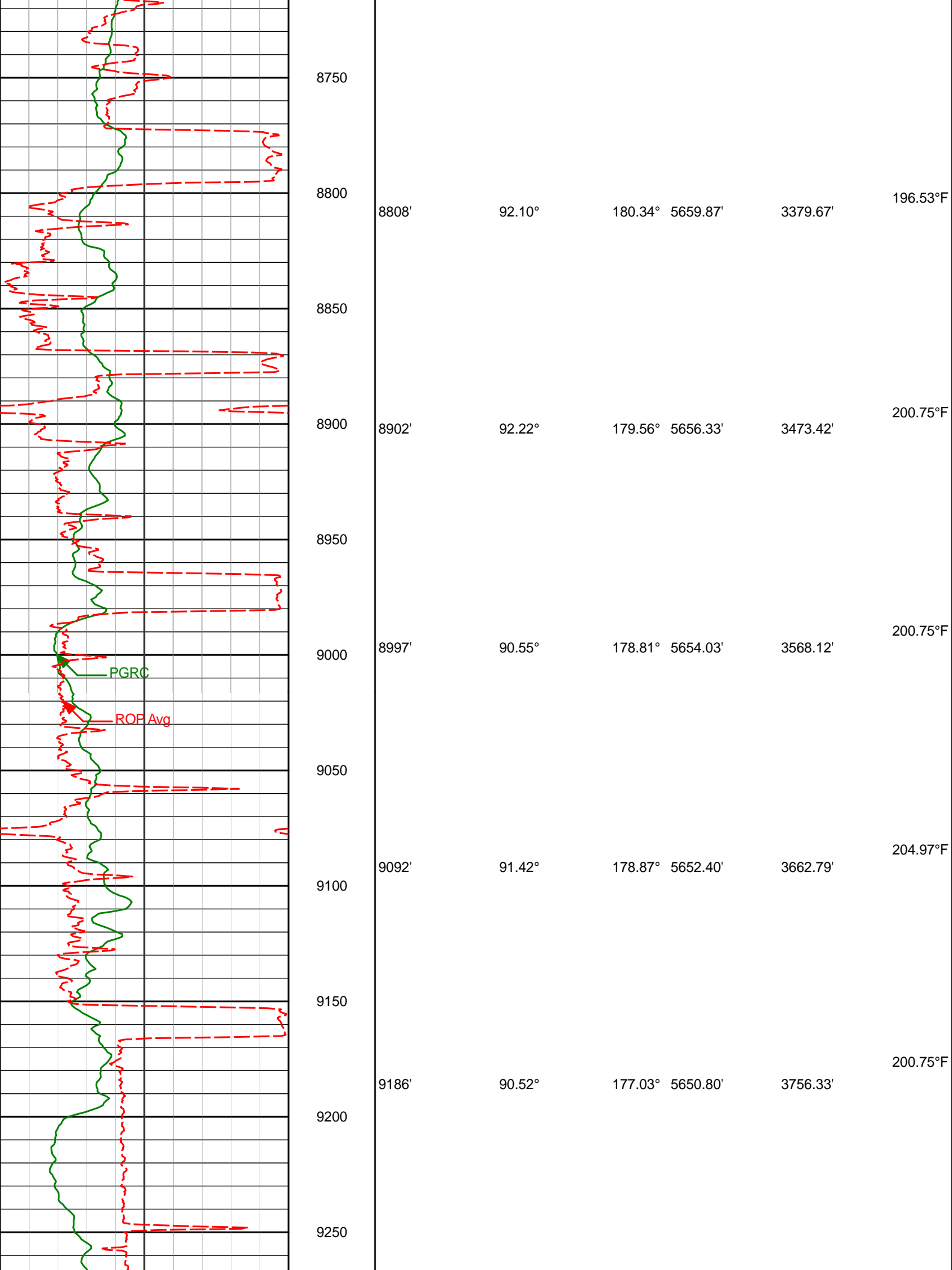


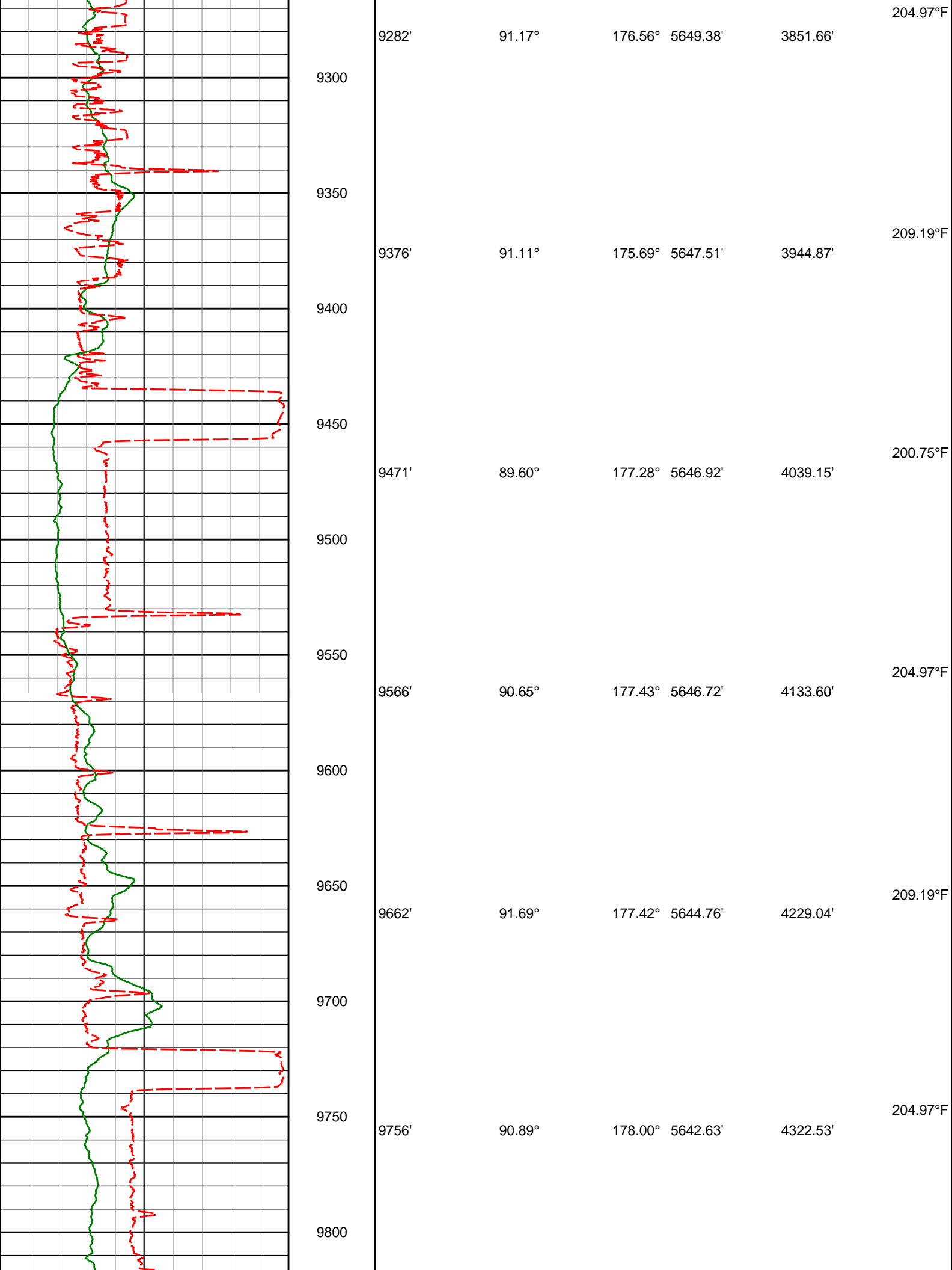


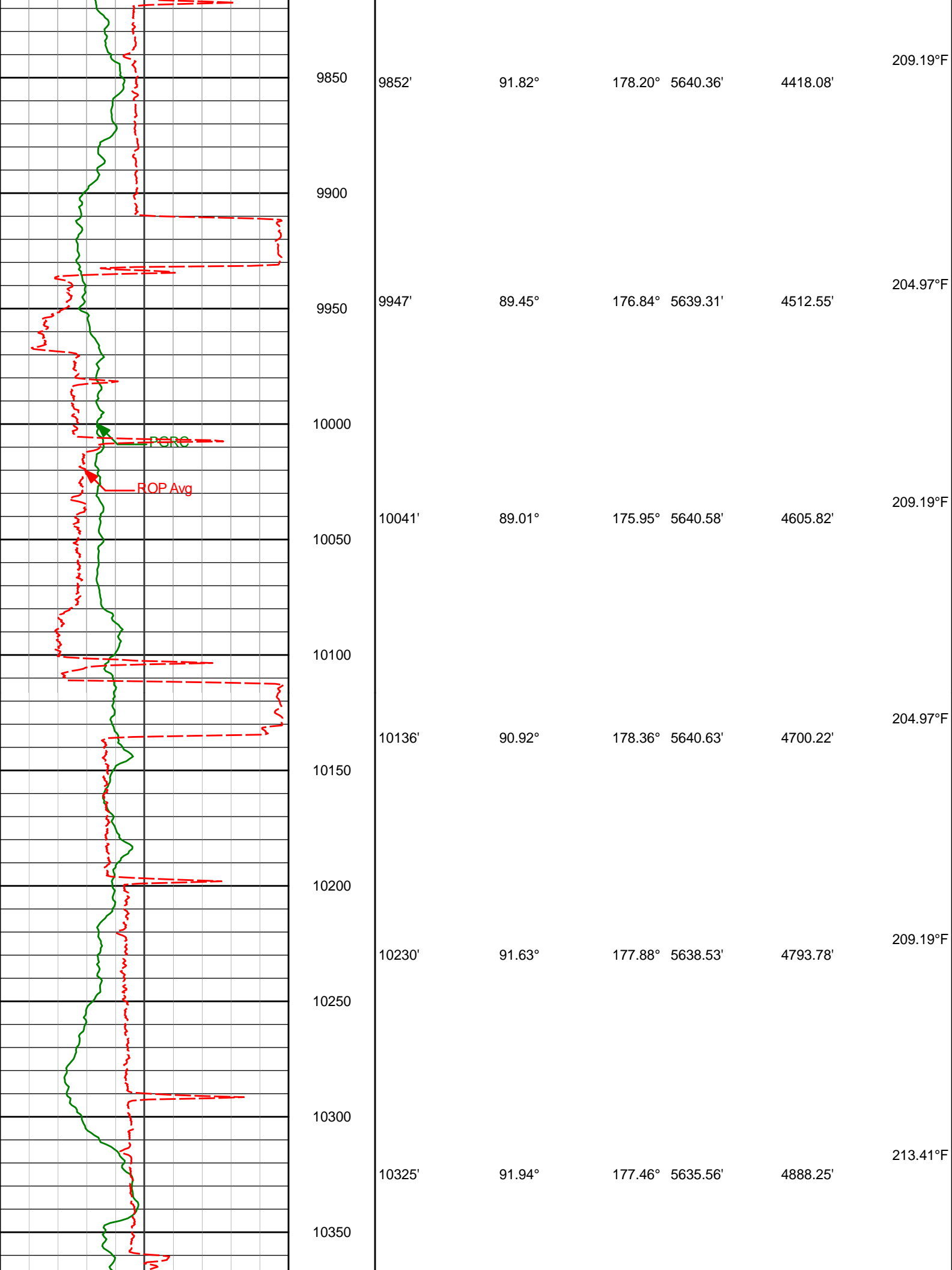


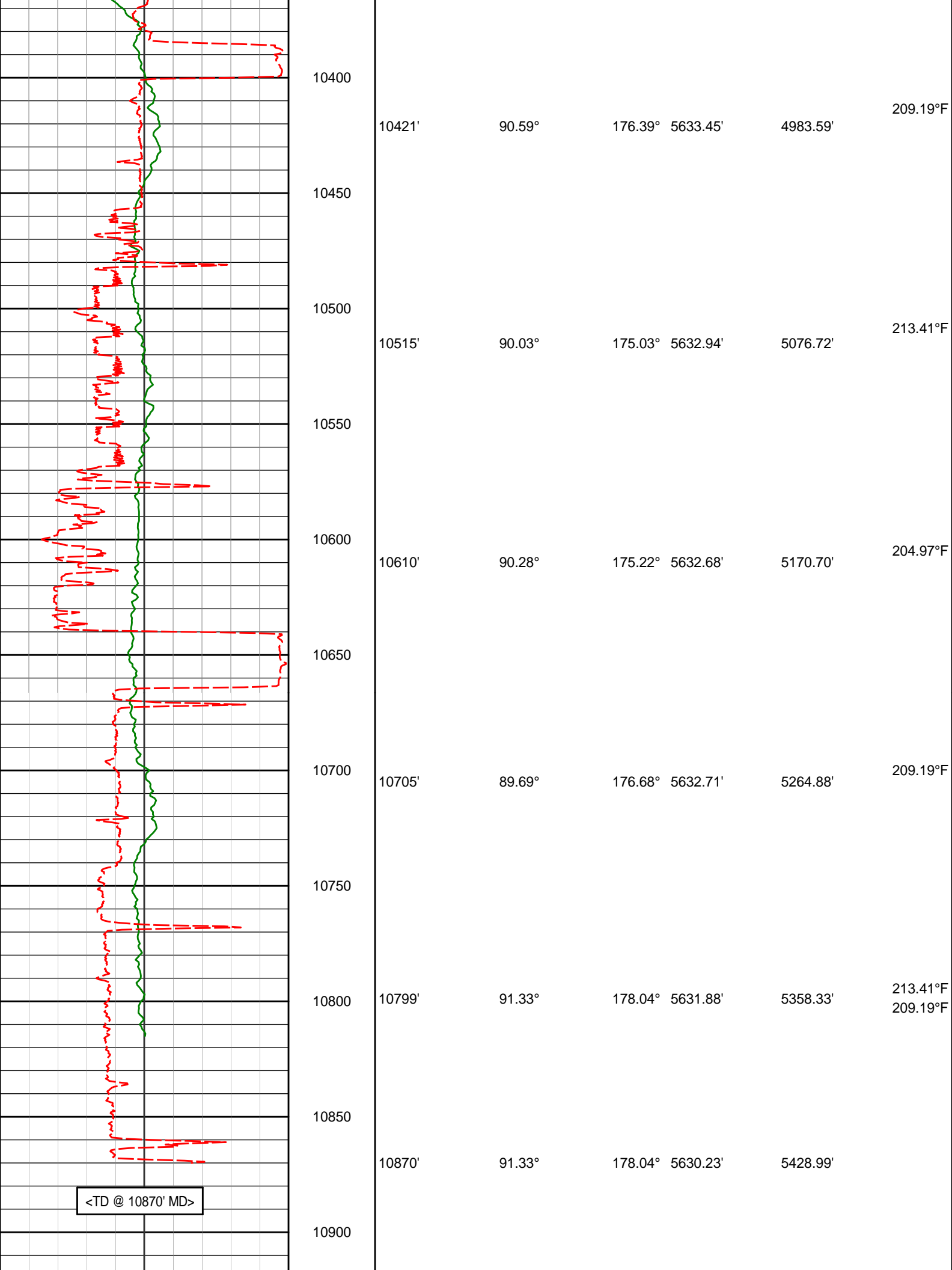


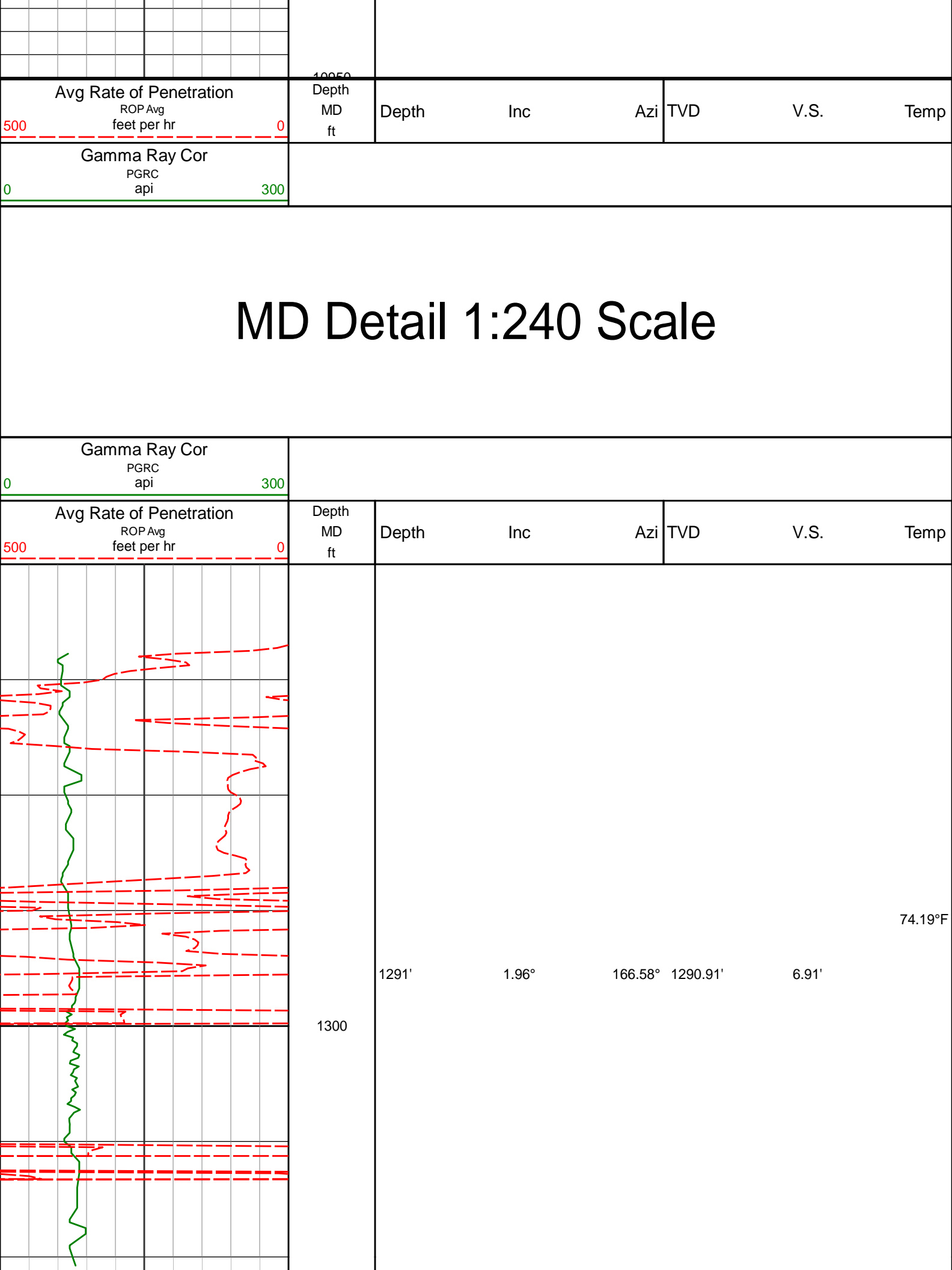


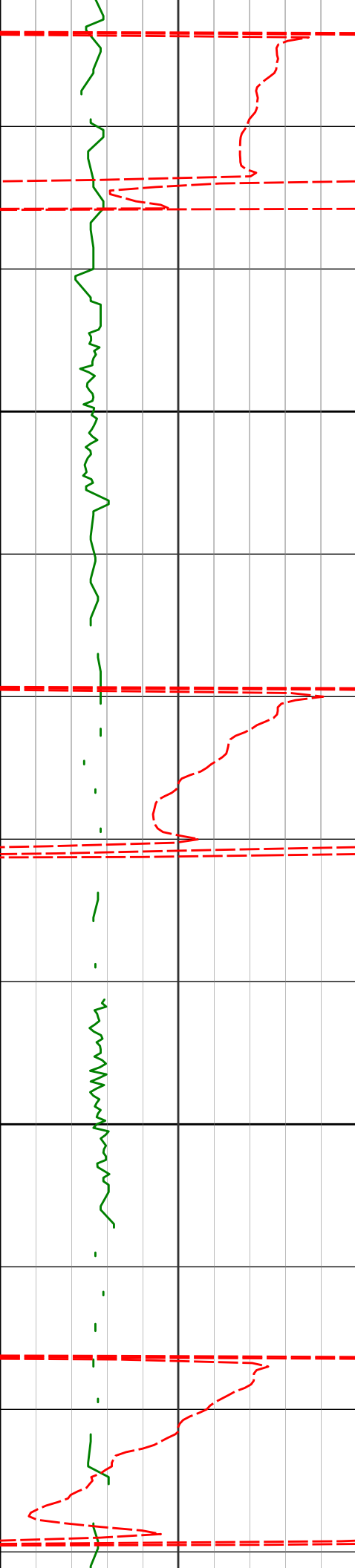












1400

1500

1384'

2.04°

248.42° 1383.87'

9.13'

74.19°F

1477'

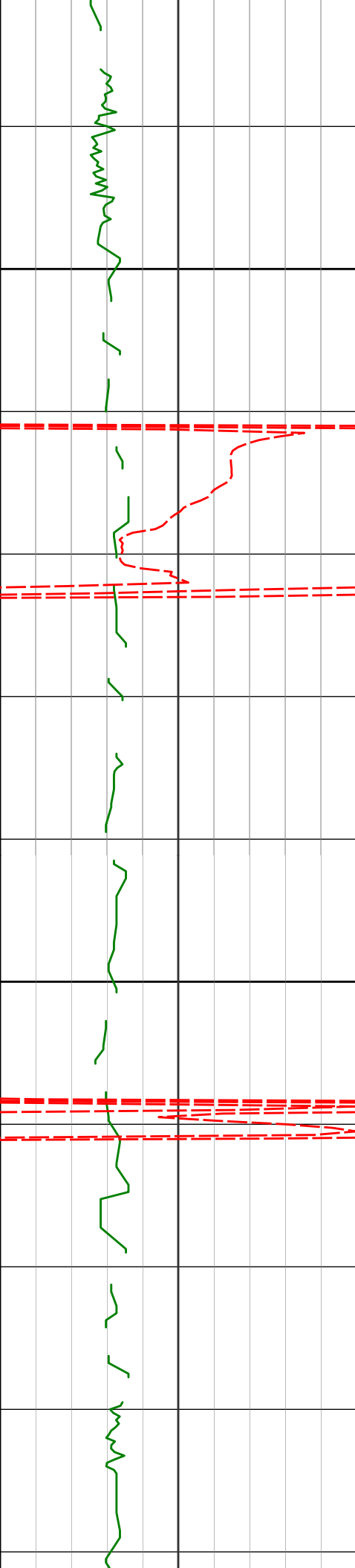
4.25°

281.44° 1476.73'

9.35'

78.41°F

78.41°F



1569'

7.28°

283.11° 1568.25'

7.90'

1600

1662'

9.28°

285.31° 1660.28'

5.38'

1700

1754'

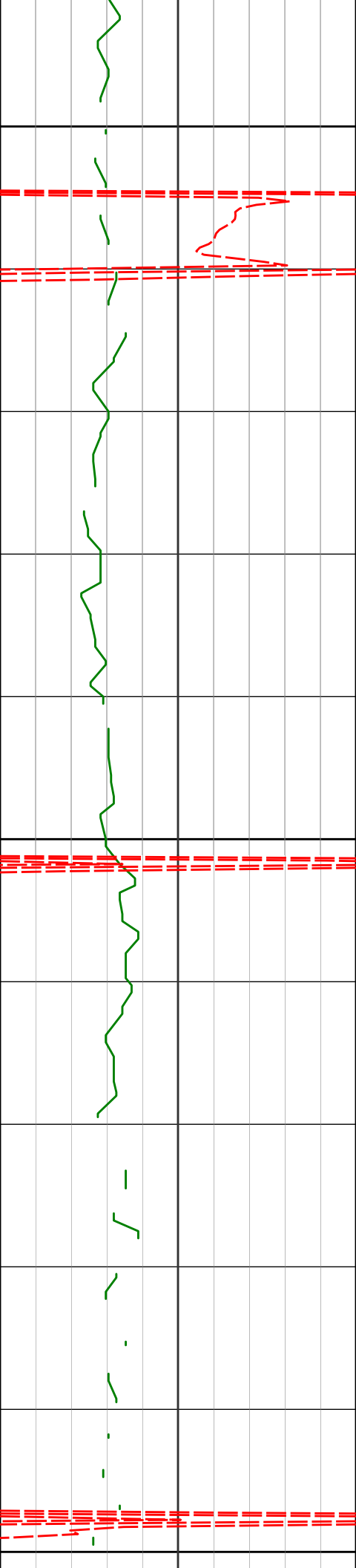
9.02°

281.90° 1751.11'

2.81'

82.62°F

82.62°F



1800

1847'

9.95°

281.30°

1842.84'

0.66'

82.62°F

1900

1939'

9.79°

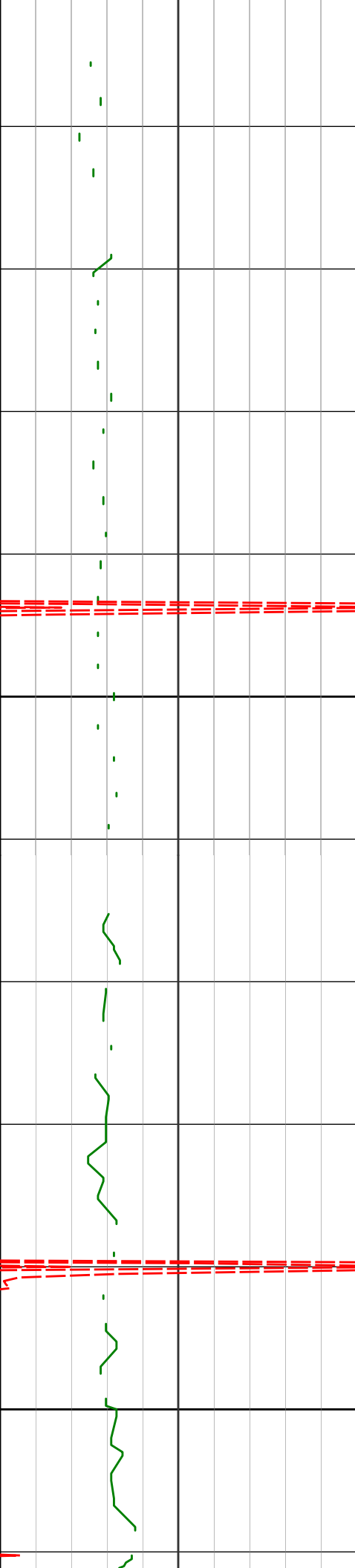
279.58°

1933.48'

-1.25'

82.62°F

2000



2100

2200

2031'

9.46°

279.15° 2024.18'

-2.82'

86.84°F

2124'

9.52°

276.53° 2115.91'

-3.98'

86.84°F

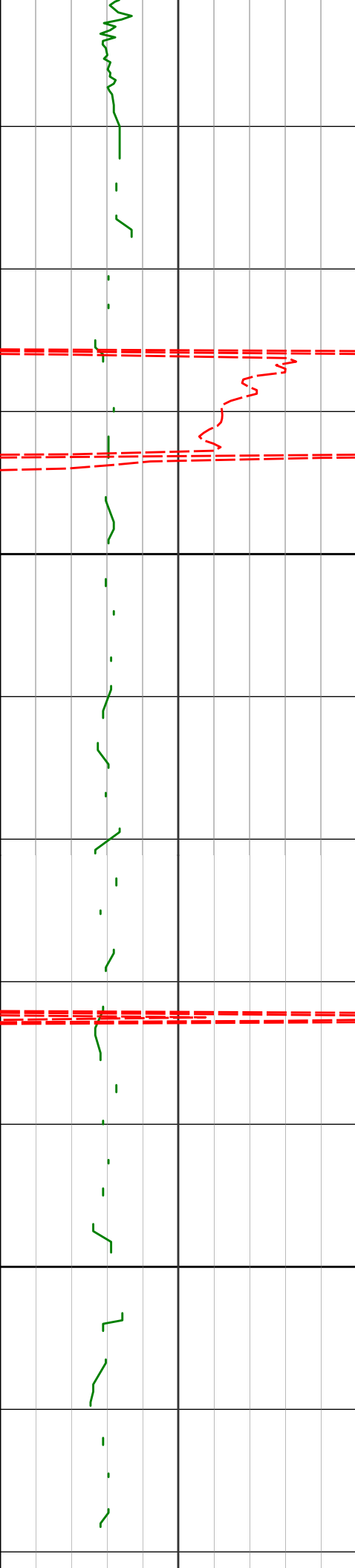
2216'

8.68°

275.97° 2206.75'

-4.68'

91.06°F



2300

2308'

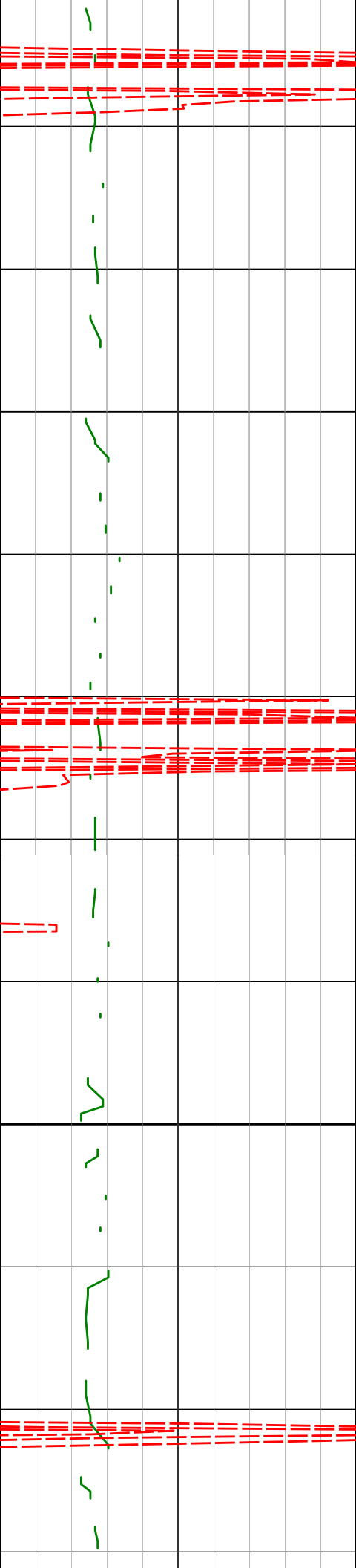
10.14°

275.56° 2297.51'

-5.27'

91.06°F

2400



2500

2600

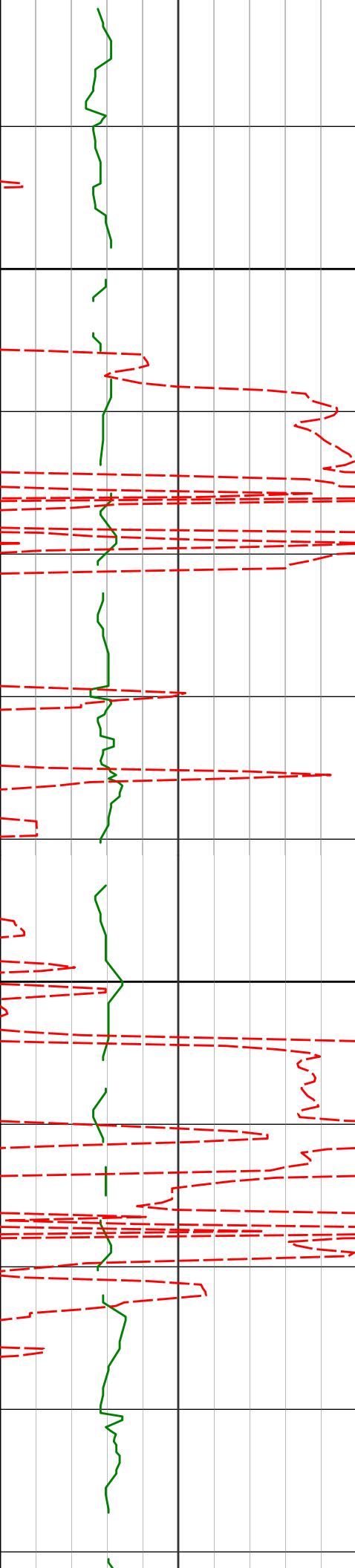
2493'

9.67°

274.03° 2479.75'

-6.00'

91.06°F



2683'

10.08°

272.90° 2666.94'

-5.97'

95.28°F

2700

2778'

9.90°

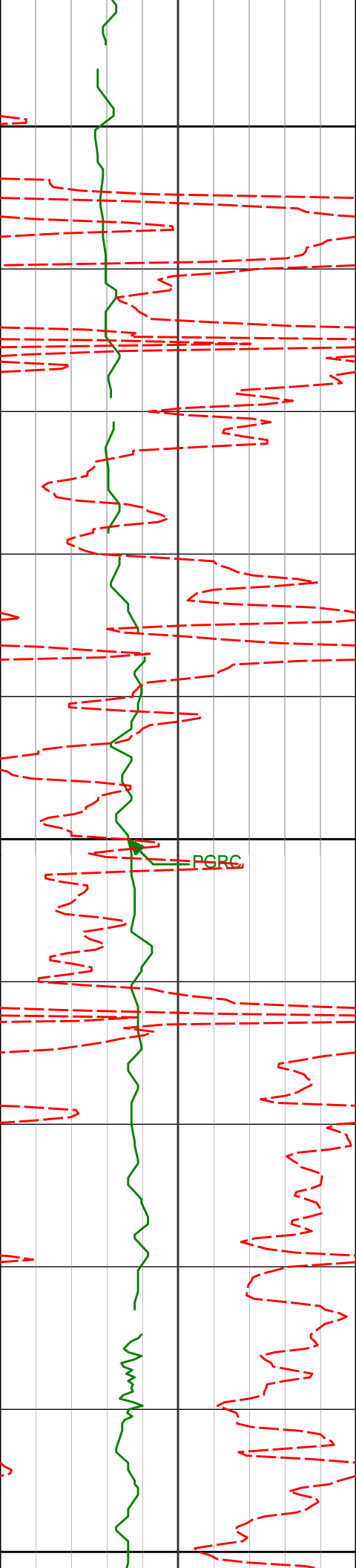
271.44° 2760.50'

-5.59'

95.28°F

2800

99.50°F



2900

2968'

8.98°

273.16°

2947.92'

-4.91'

99.50°F

3000

PCRC

3062'

7.45°

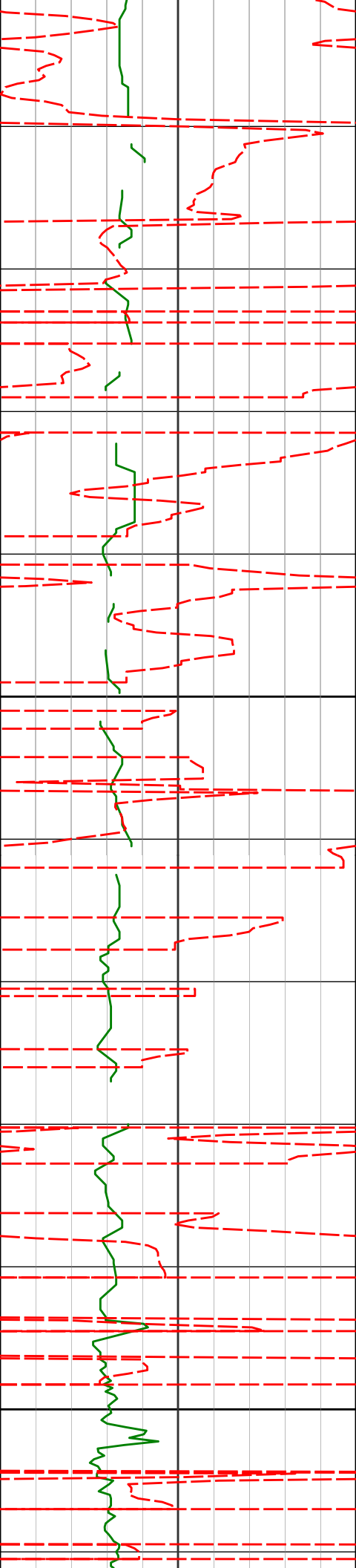
276.08°

3040.96'

-5.15'

103.72°F

3100



3157'

8.52°

268.74° 3135.03'

-4.84'

103.72°F

3200

3252'

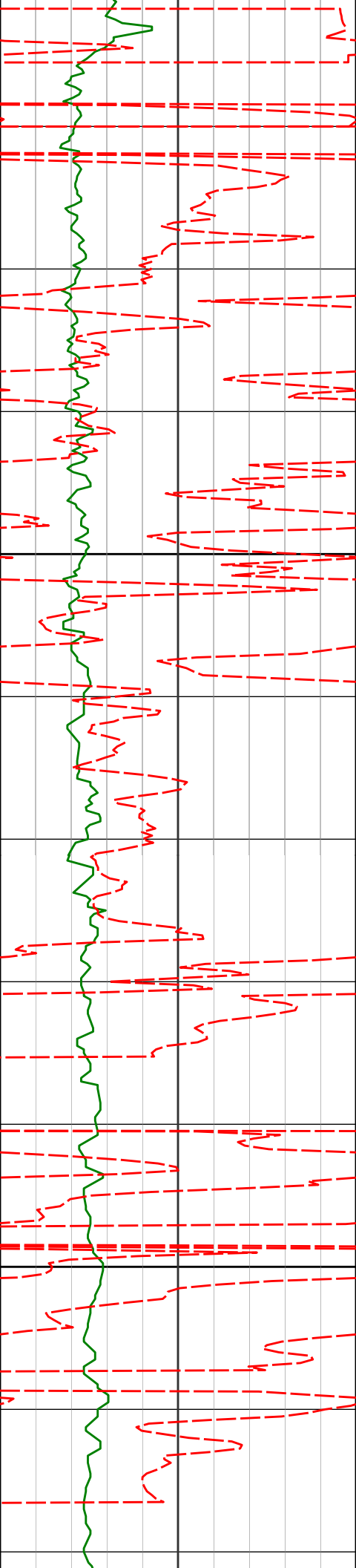
8.62°

266.94° 3228.97'

-3.44'

103.72°F

3300



3346'

8.58°

267.22° 3321.92'

-1.87'

103.72°F

3400

3441'

9.09°

267.90° 3415.79'

-0.36'

107.94°F

3500

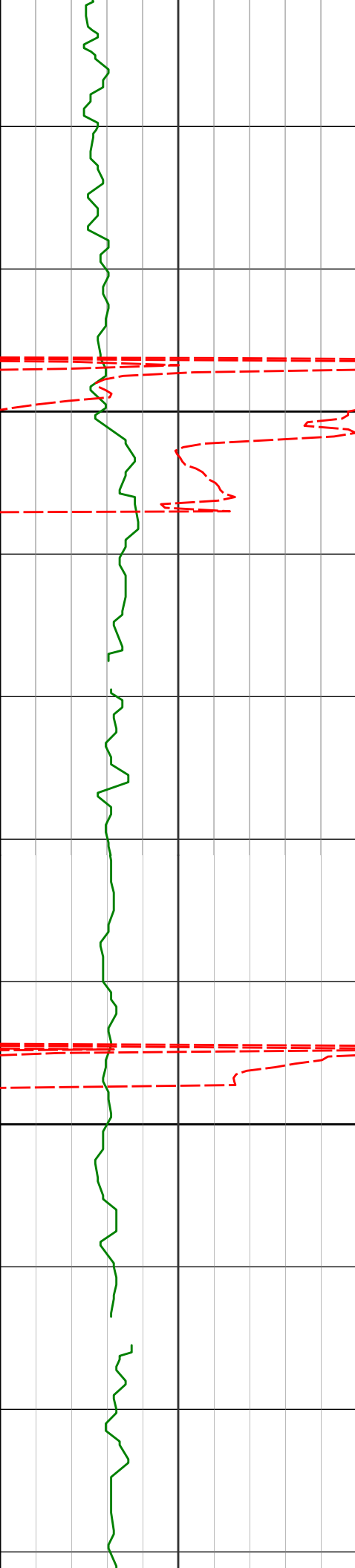
3536'

9.51°

268.28° 3509.54'

1.08'

107.94°F



3600

3631'

9.66°

268.60°

3603.21'

2.48'

107.94°F

3700

3725'

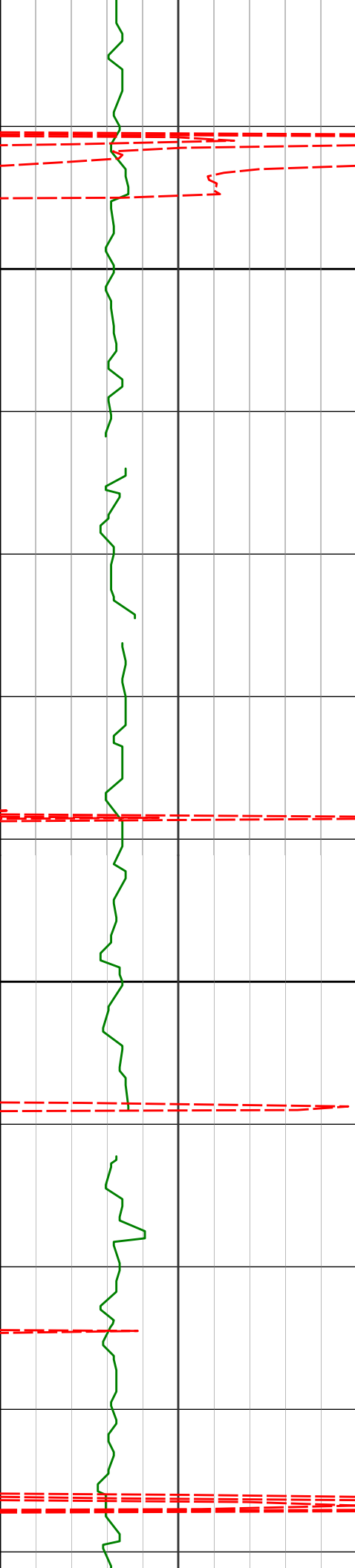
9.42°

268.53°

3695.91'

3.82'

112.16°F



3800

3820'

8.77°

268.25° 3789.72'

5.16'

112.16°F

3900

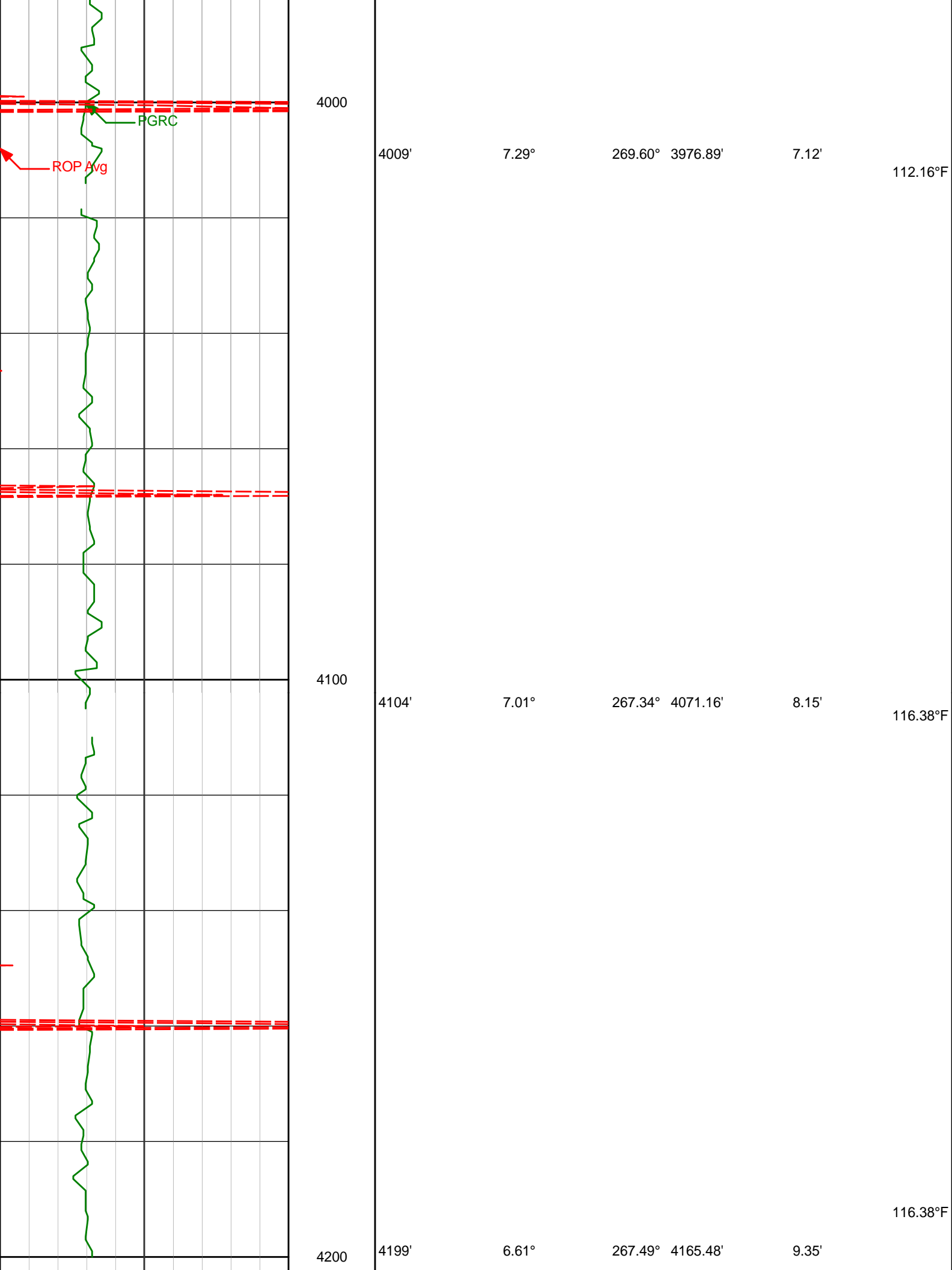
3915'

7.86°

269.54° 3883.72'

6.27'

112.16°F



PGRC

ROP Avg

4000

4009'

7.29°

269.60° 3976.89'

7.12'

112.16°F

4100

4104'

7.01°

267.34° 4071.16'

8.15'

116.38°F

4200

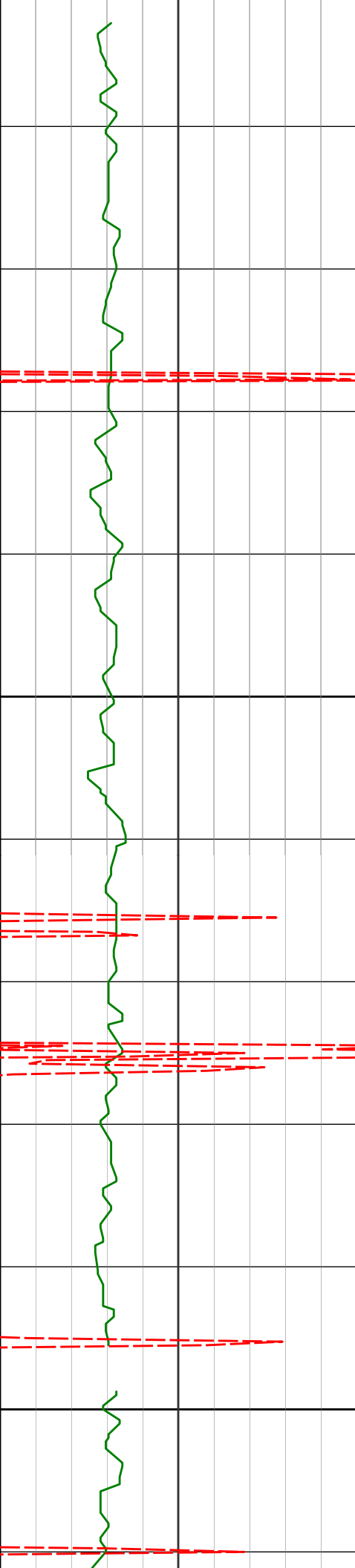
4199'

6.61°

267.49° 4165.48'

9.35'

116.38°F



4300

4400

4293'

5.92°

266.64° 4258.92'

10.49'

116.38°F

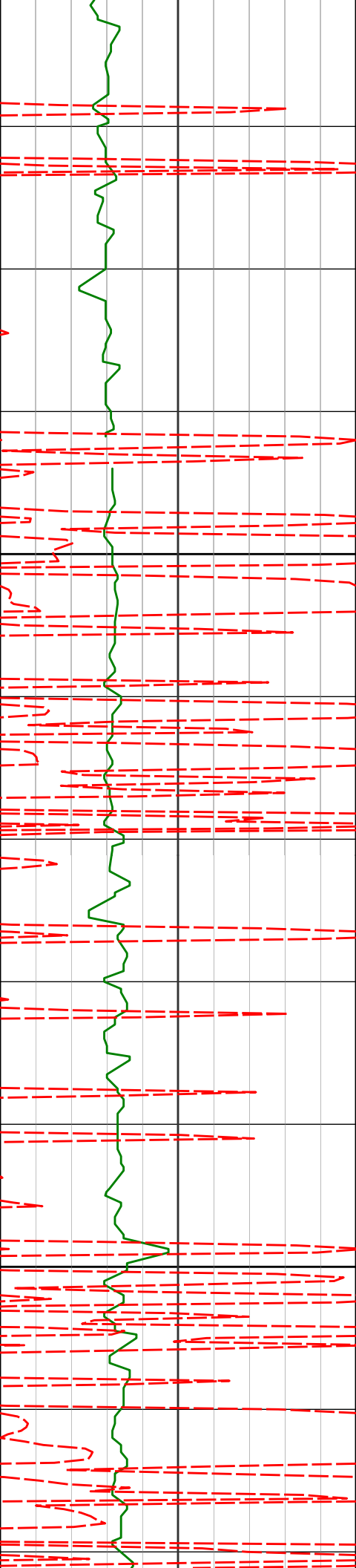
4387'

5.47°

265.32° 4352.46'

11.71'

116.38°F



4482'

5.10°

264.55° 4447.05'

13.01'

116.38°F

4500

4575'

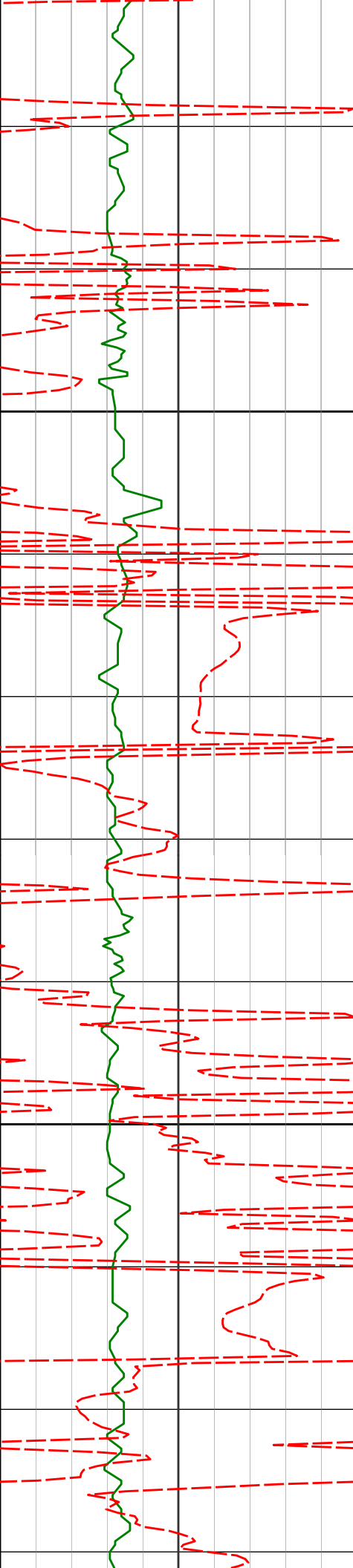
5.10°

262.77° 4539.68'

14.42'

120.59°F

4600



4700

4800

4670'

4765'

4860'

5.03°

2.31°

0.68°

260.82°

259.28°

240.36°

4634.31'

4729.11'

4824.07'

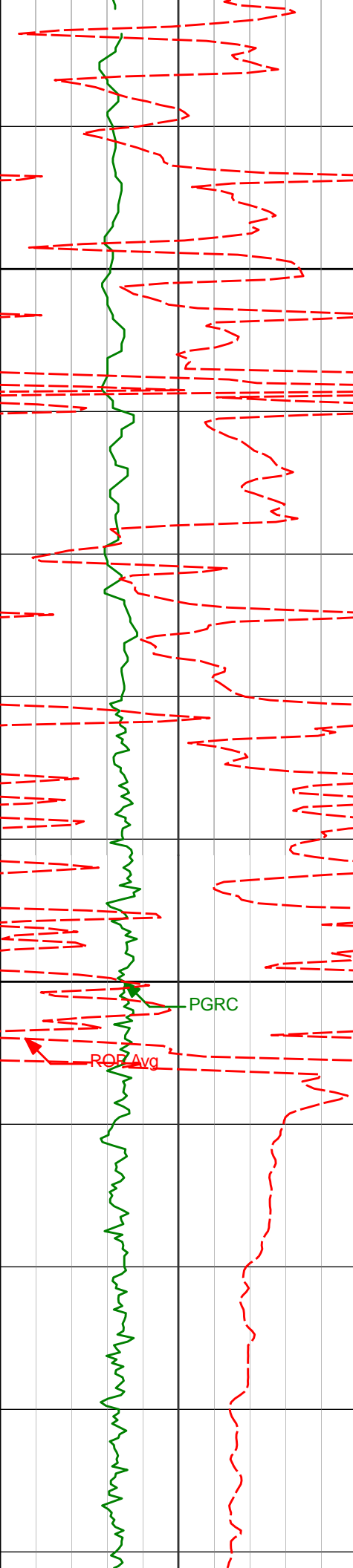
16.12'

17.51'

18.29'

120.59°F

124.81°F



4900

4955'

5000

<KOP>

5049'

0.68°

260.09°

4919.07'

18.73'

3.68°

184.39°

5013.00'

21.88'

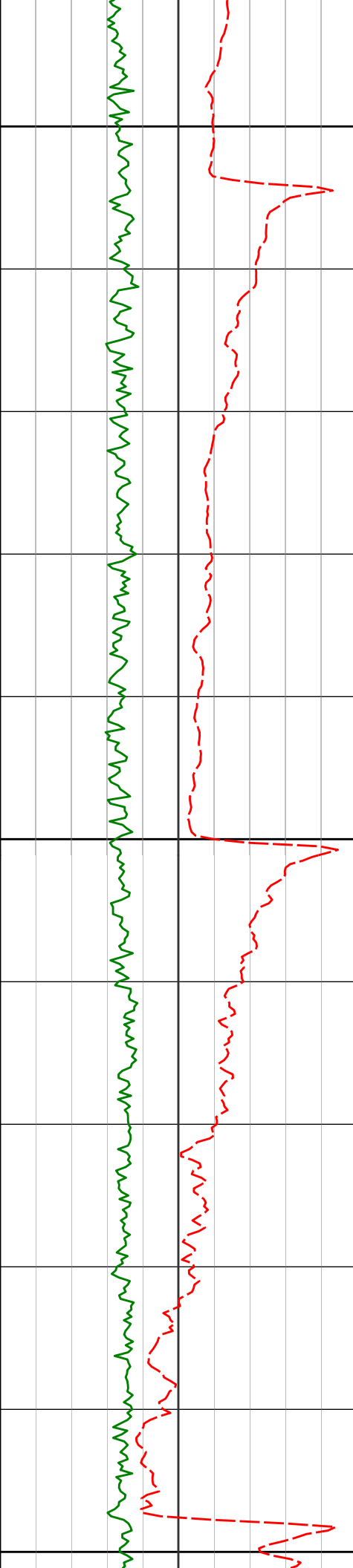
124.81°F

129.03°F

129.03°F

PGRC

ROZ Avg



5100

5200

5300

5144'

10.96°

179.77° 5107.16'

33.95'

137.47°F

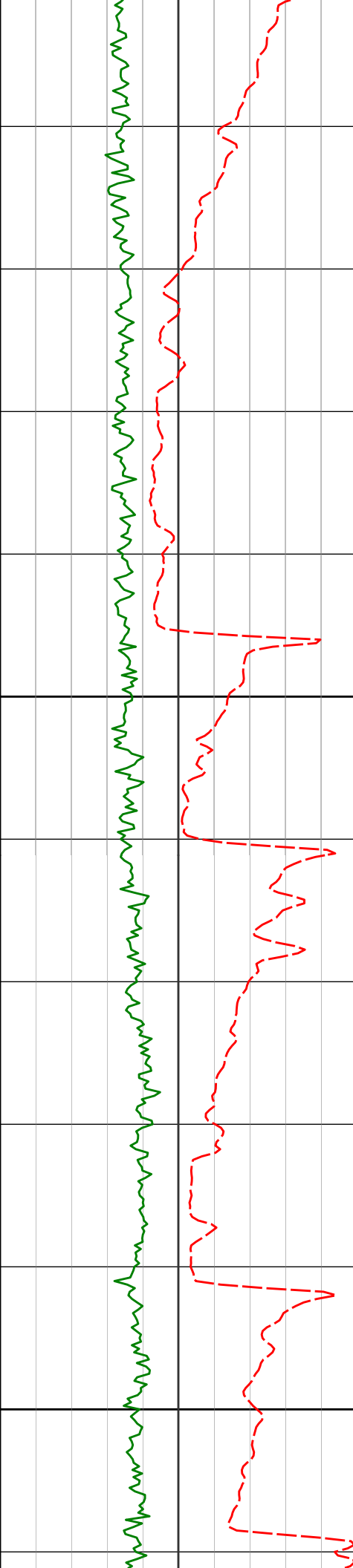
5238'

17.87°

179.41° 5198.15'

57.28'

137.47°F



5400

5500

5333'

24.31°

179.66° 5286.74'

91.36'

5428'

31.18°

182.11° 5370.77'

135.51'

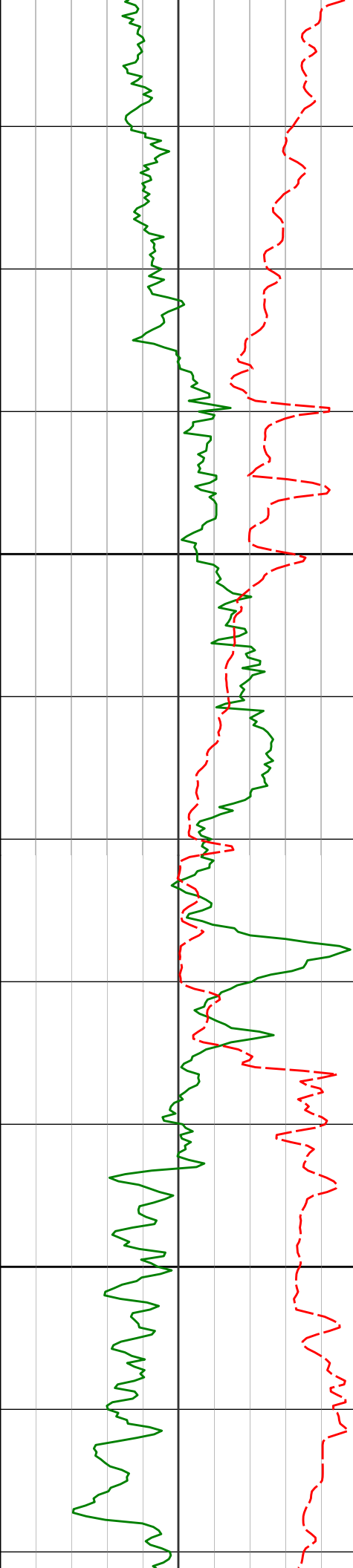
141.69°F

141.69°F

141.69°F

141.69°F

145.91°F



5523'

38.01°

181.69° 5448.92'

189.40'

150.13°F

5618'

46.28°

180.04° 5519.31'

253.01'

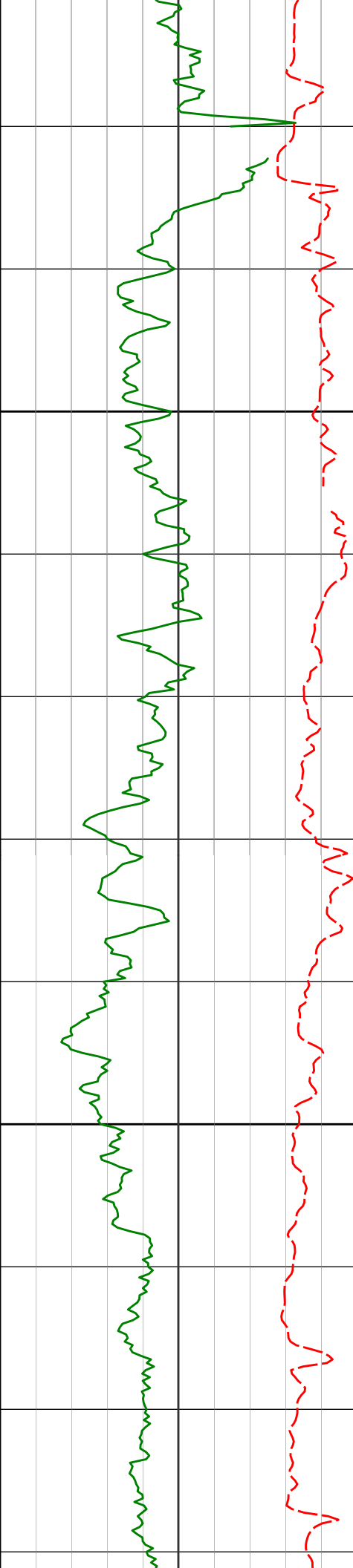
154.34°F

5713'

51.85°

183.00° 5581.54'

324.69'



5800

5808'

59.32°

181.63° 5635.20'

402.98'

175.44°F

5900

5903'

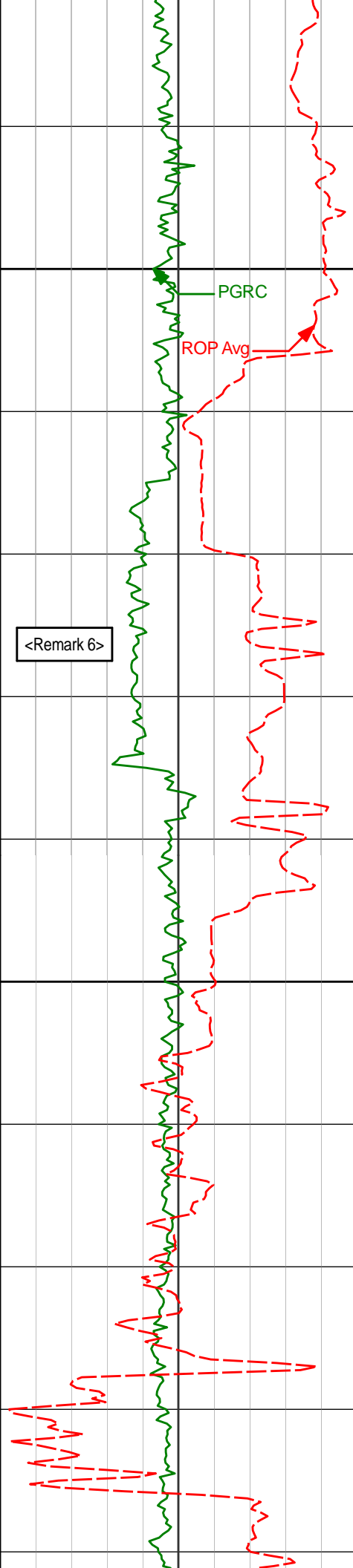
72.57°

176.93° 5673.85'

489.26'

150.13°F

95.28°F



6000

5997'

86.30°

176.73° 5691.04'

580.82'

154.34°F

6024'

87.47°

176.18° 5692.51'

607.58'

158.56°F

6100

6092'

88.09°

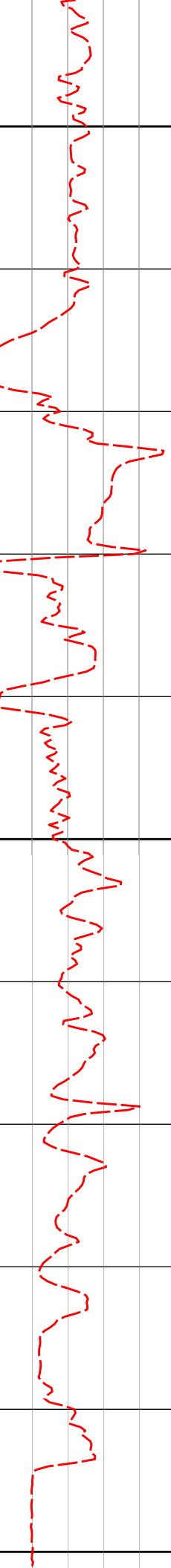
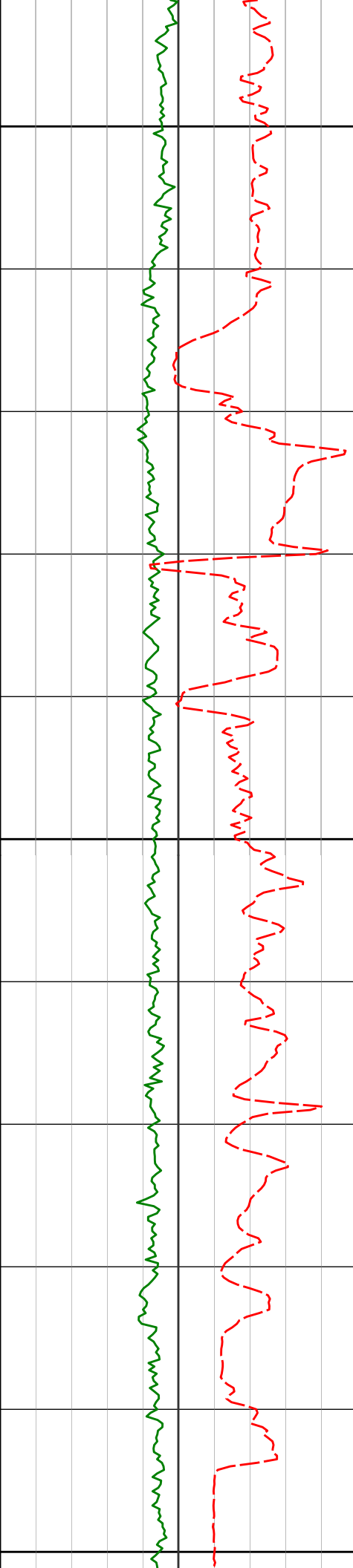
176.73° 5695.14'

675.01'

162.78°F

<7" casing set at 6069' MD>

167.00°F



6200

6300

6400

6184'

 87.75°

175.54° 5698.48'

766.19'

6277'

89.82°

177.03° 5700.46'

858.43'

167.00°F

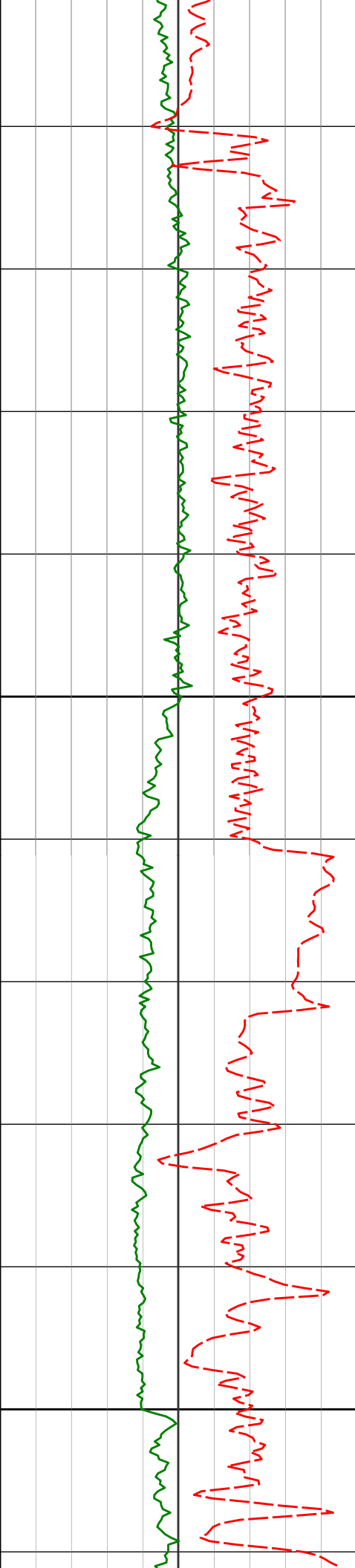
6369'

 90.59°

176.97° 5700.14'

949.83'

171.22°F



6500

6600

6461'

89.72°

175.84° 5699.89'

1041.13'

175.44°F

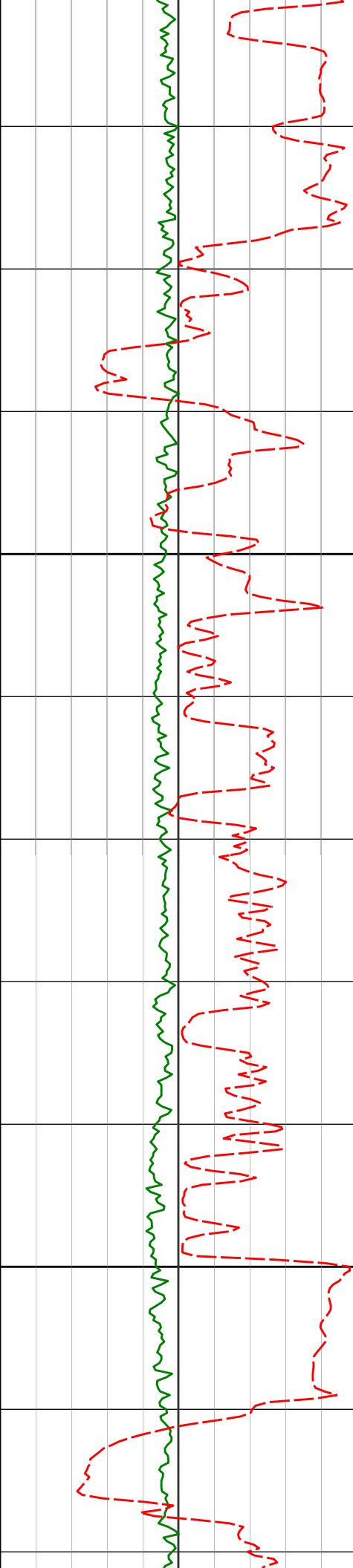
6554'

92.53°

177.24° 5698.06'

1133.41'

179.66°F



6700

6800

6646'

91.85°

177.21° 5694.55'

1224.79'

175.44°F

6738'

90.62°

175.81° 5692.57'

1316.09'

179.66°F

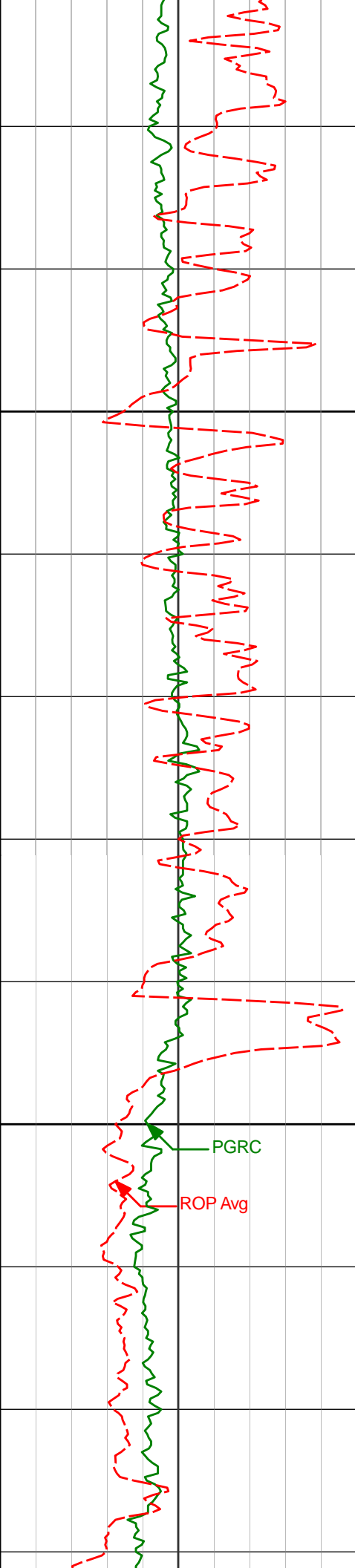
6831'

92.50°

178.34° 5690.04'

1408.46'

179.66°F



6900

6923'

92.10°

178.95° 5686.35'

1500.05'

183.88°F

7000

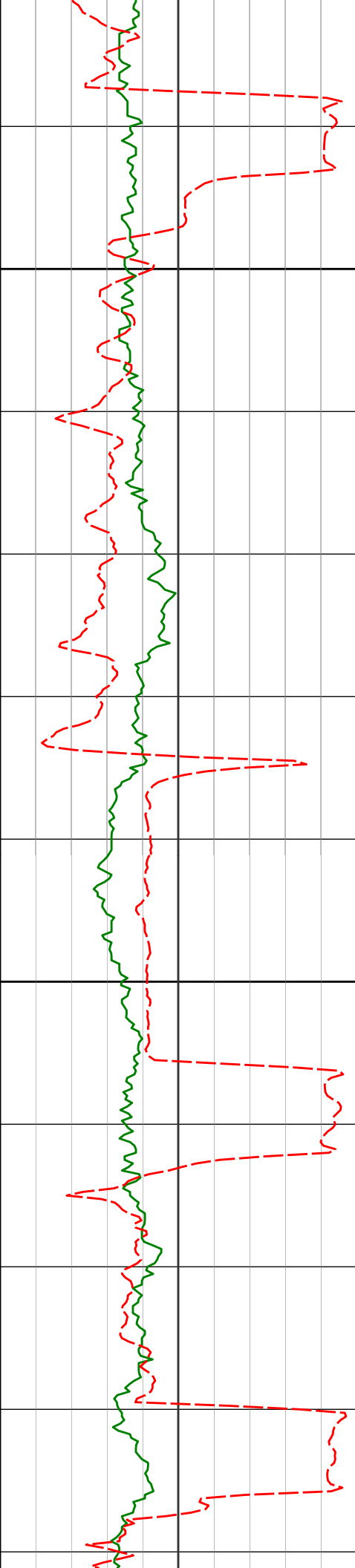
7016'

92.10°

179.41° 5682.95'

1592.72'

86.84°F



7100

183.88°F

7108'

91.60°

179.75° 5679.98'

1684.46'

7200

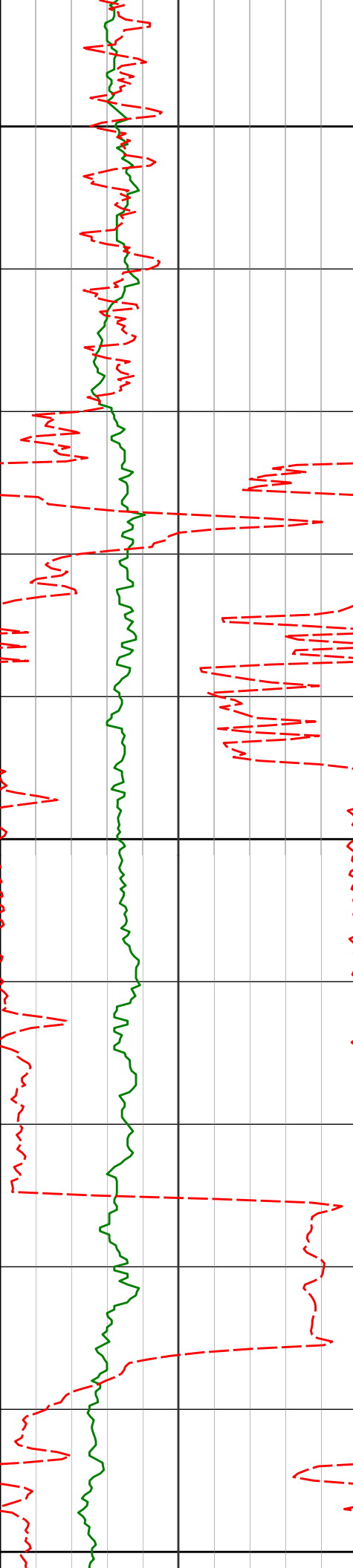
183.88°F

7200'

91.94°

179.30° 5677.14'

1776.20'



7300

7295'

89.32°

178.34° 5676.09'

1870.86'

183.88°F

7400

7389'

89.66°

176.02° 5676.92'

1964.28'

188.09°F

7500

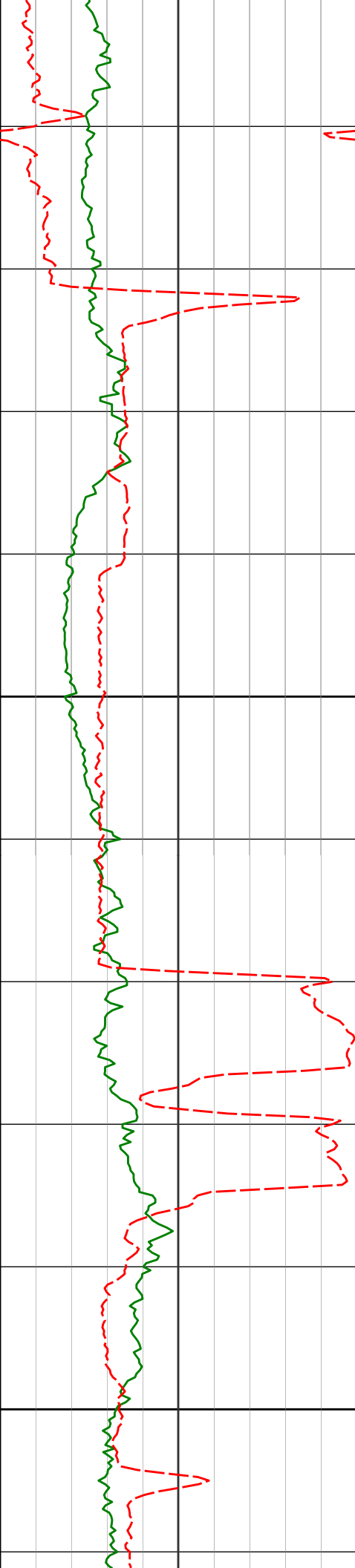
7484'

90.59°

178.20° 5676.72'

2058.69'

188.09°F



7600

7700

7579'

91.45°

177.80° 5675.03'

2153.23'

192.31°F

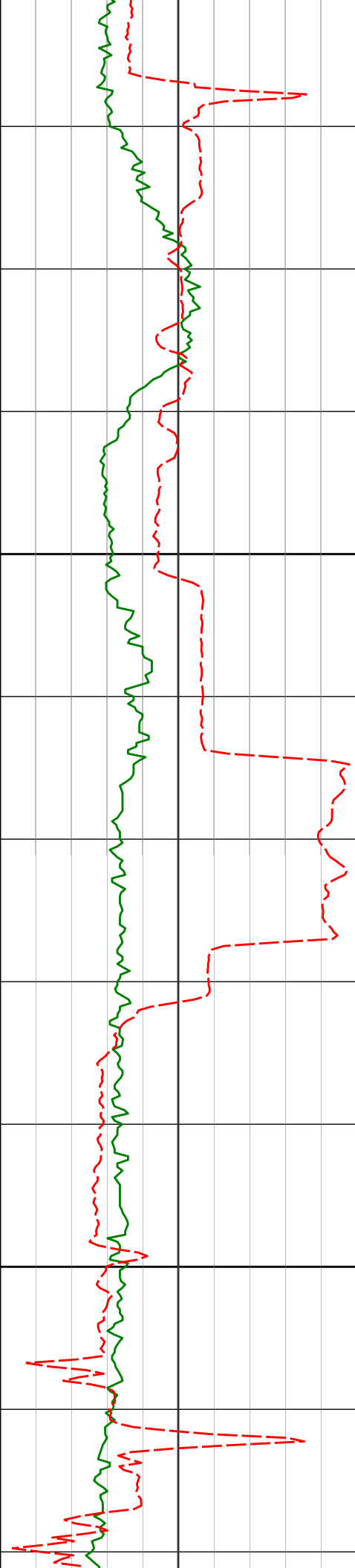
7674'

90.80°

179.25° 5673.17'

2247.85'

188.09°F



7800

7900

7768'

91.85°

179.23° 5670.99'

2341.57'

192.31°F

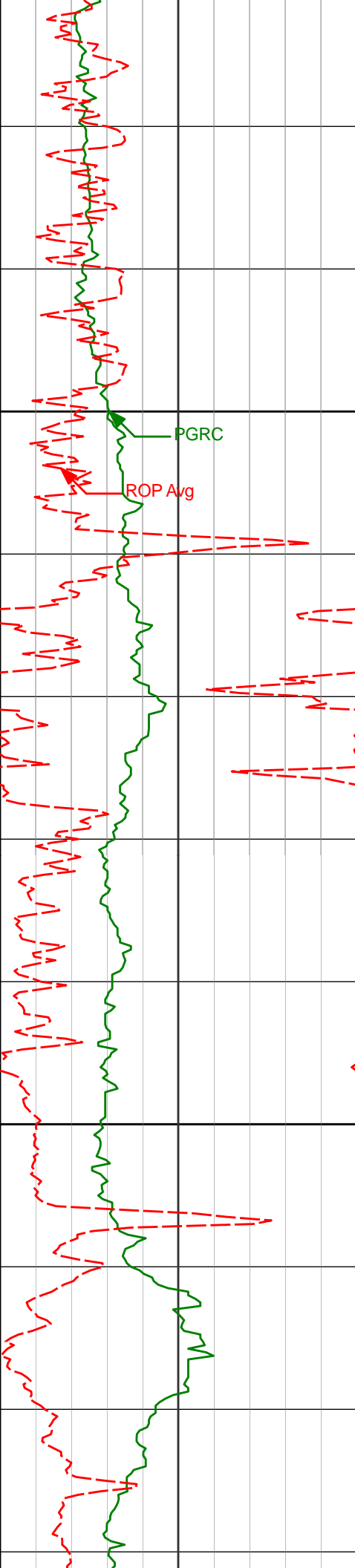
7863'

89.51°

180.41° 5669.87'

2436.36'

192.31°F



8000

8100

7958'

89.51°

179.83° 5670.68'

2531.19'

196.53°F

8052'

89.57°

179.15° 5671.44'

2624.95'

196.53°F

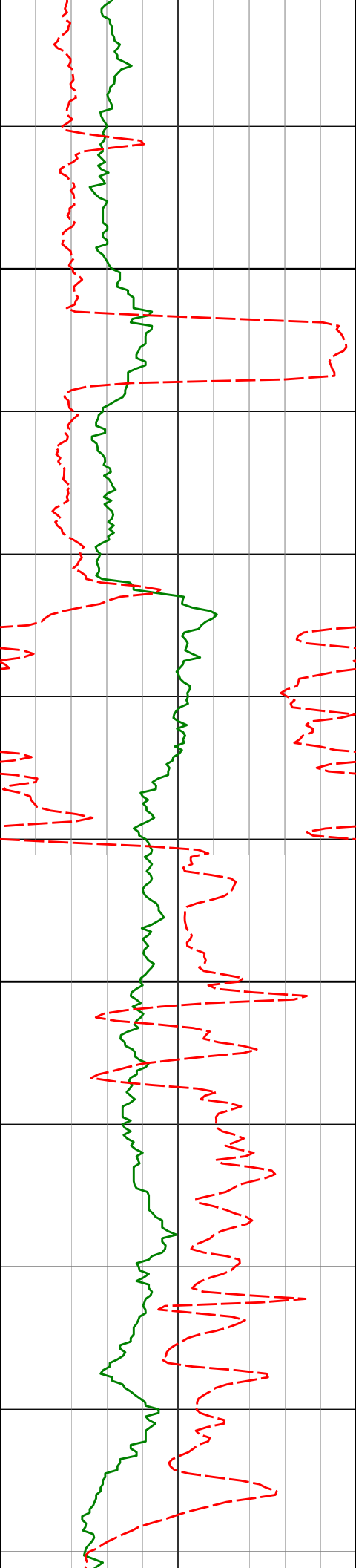
8146'

89.75°

179.23° 5672.00'

2718.69'

200.75°F



8200

8240'

91.14°

180.12° 5671.27'

2812.47'

200.75°F

8300

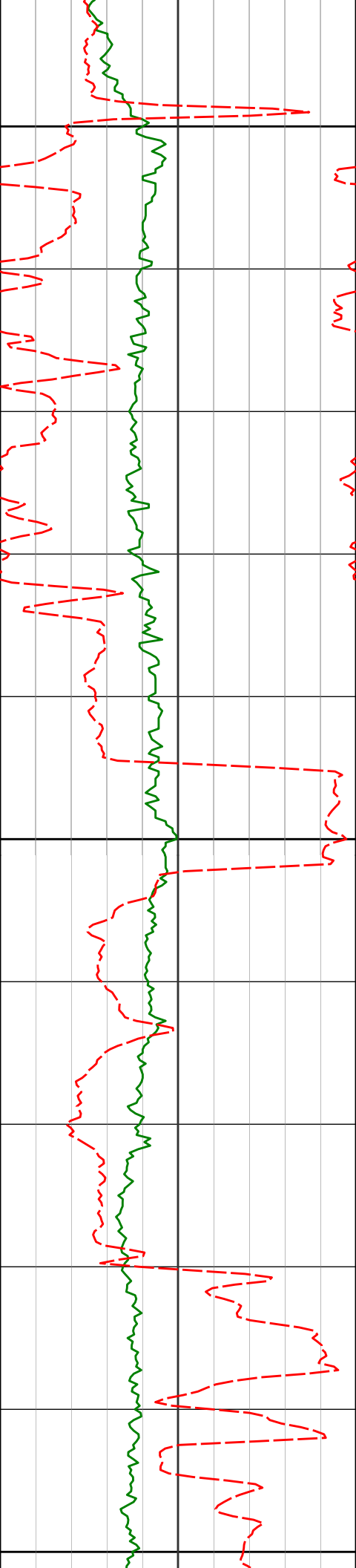
8335'

90.59°

179.38° 5669.84'

2907.26'

200.75°F



8400

8429'

89.94°

179.34° 5669.41'

3001.01'

200.75°F

8500

8524'

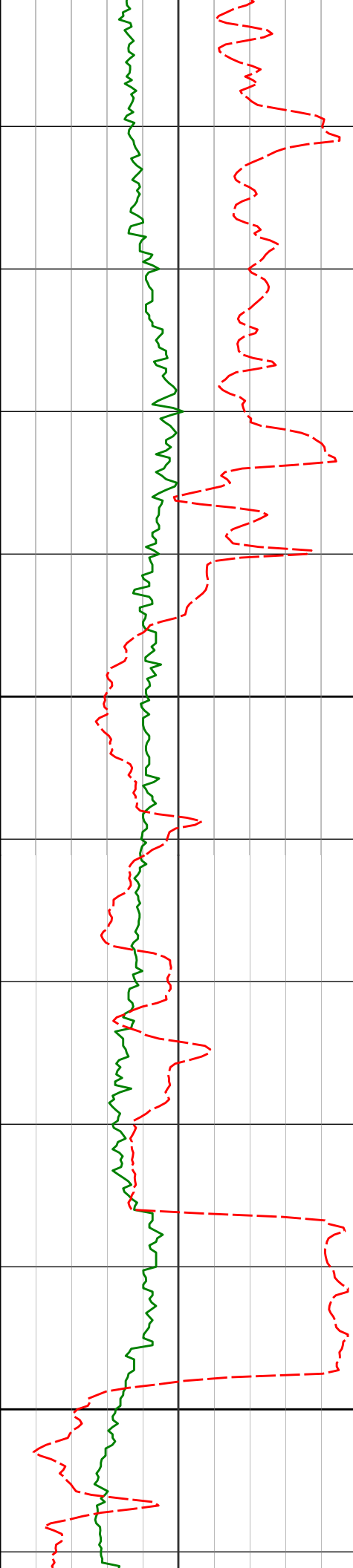
91.67°

181.90° 5668.08'

3095.87'

200.75°F

8600



8700

8800

8619'

8713'

8808'

91.69°

91.39°

92.10°

182.80° 5665.29'

183.04° 5662.76'

180.34° 5659.87'

3190.81'

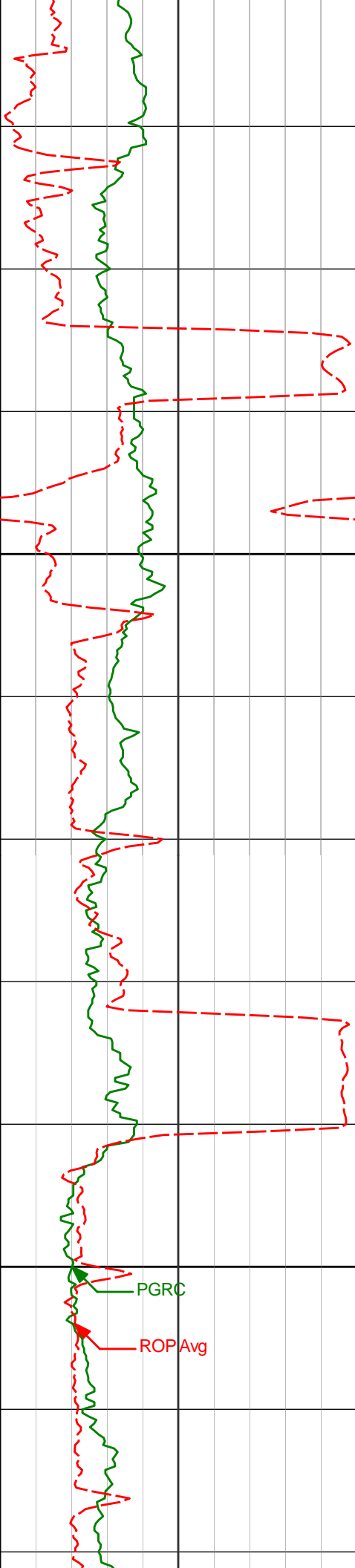
3284.77'

3379.67'

204.97°F

209.19°F

196.53°F



8900

8902'

92.22°

179.56° 5656.33'

3473.42'

200.75°F

9000

8997'

90.55°

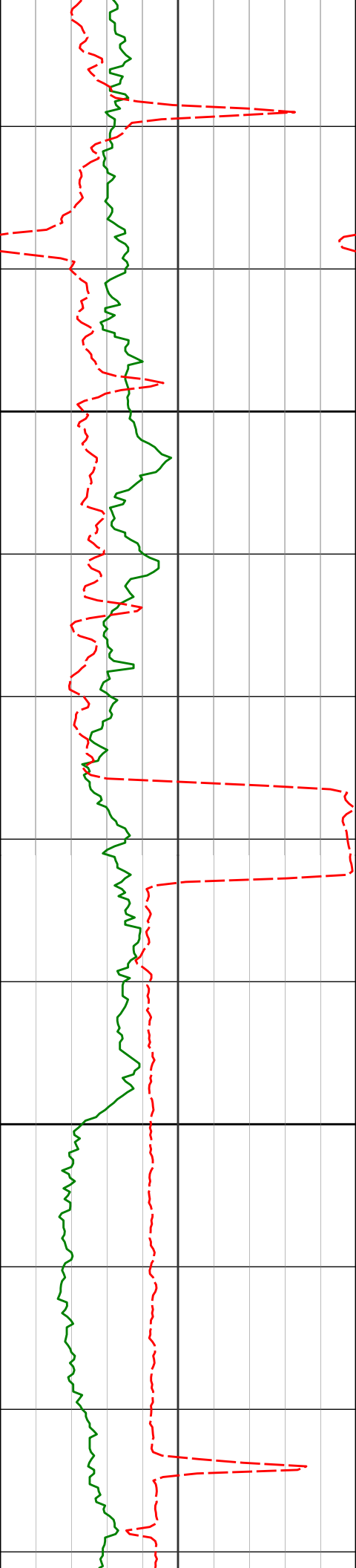
178.81° 5654.03'

3568.12'

200.75°F

PGRC

ROP Avg



9100

9092'

91.42°

178.87° 5652.40'

3662.79'

204.97°F

9200

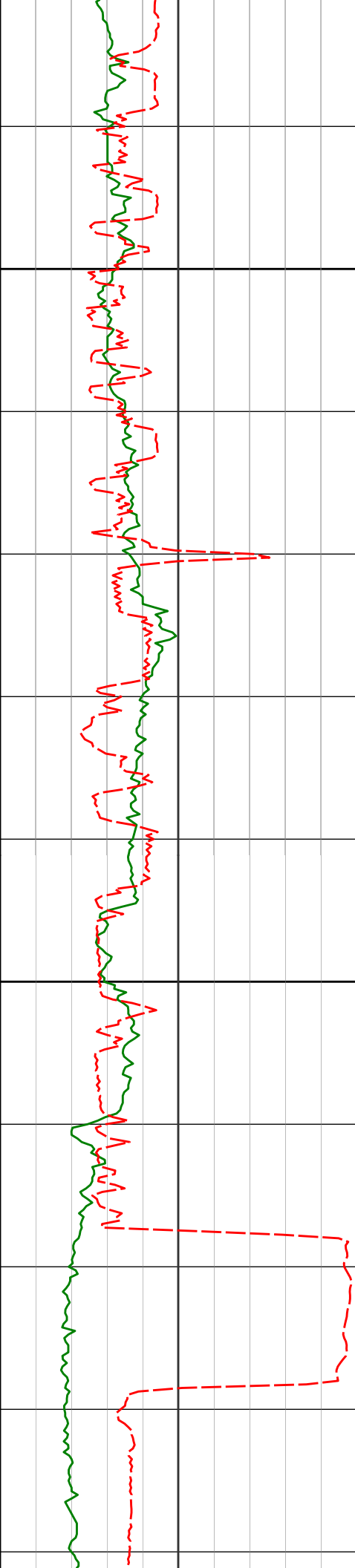
9186'

90.52°

177.03° 5650.80'

3756.33'

200.75°F



9300

9400

9282'

91.17°

176.56° 5649.38'

3851.66'

9376'

91.11°

175.69° 5647.51'

3944.87'

9471'

89.60°

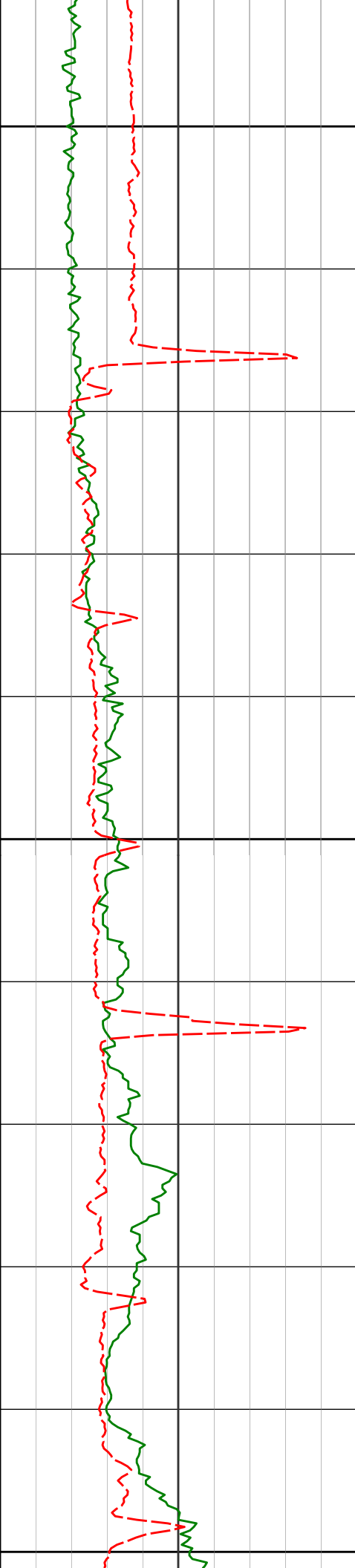
177.28° 5646.92'

4039.15'

204.97°F

209.19°F

200.75°F



9500

204.97°F

9566'

90.65°

177.43° 5646.72'

4133.60'

9600

209.19°F

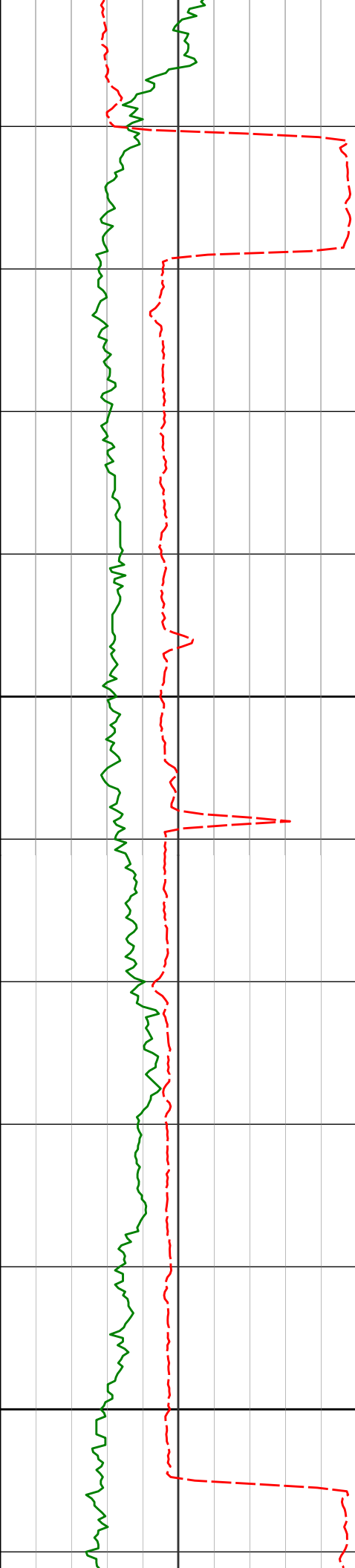
9662'

91.69°

177.42° 5644.76'

4229.04'

9700



9800

9900

9756'

90.89°

178.00° 5642.63'

4322.53'

204.97°F

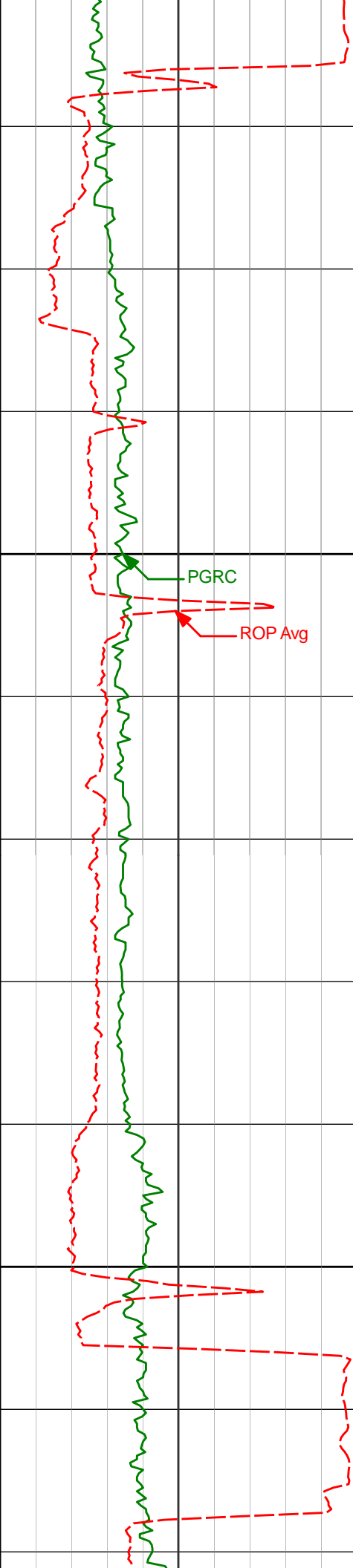
9852'

91.82°

178.20° 5640.36'

4418.08'

209.19°F



10000

10100

PGRC

ROP Avg

9947'

89.45°

176.84° 5639.31'

4512.55'

204.97°F

10041'

89.01°

175.95° 5640.58'

4605.82'

209.19°F

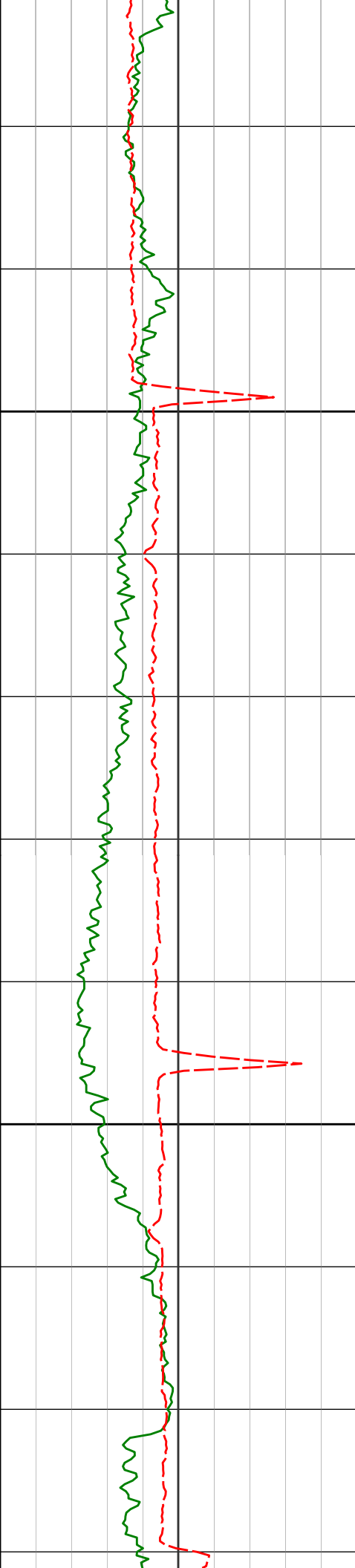
10136'

90.92°

178.36° 5640.63'

4700.22'

204.97°F



10200

10300

10230'

91.63°

177.88° 5638.53'

4793.78'

209.19°F

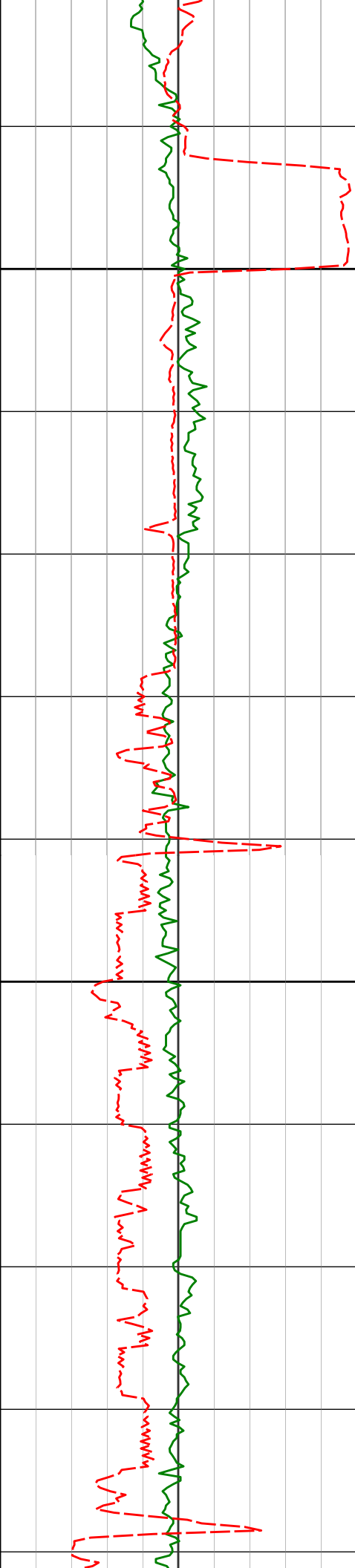
10325'

91.94°

177.46° 5635.56'

4888.25'

213.41°F



10400

10421'

90.59°

176.39° 5633.45'

4983.59'

209.19°F

10500

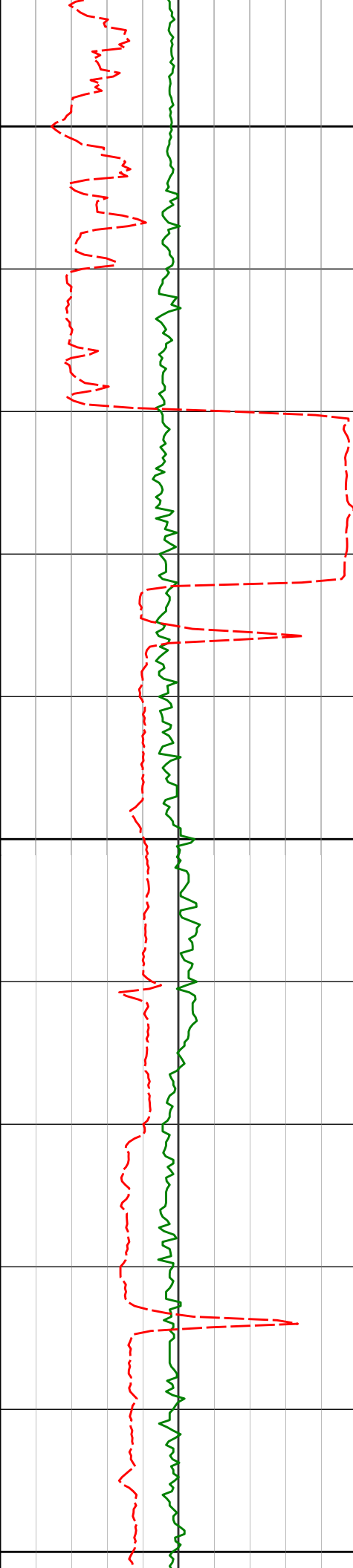
10515'

90.03°

175.03° 5632.94'

5076.72'

213.41°F



10600

10610'

90.28°

175.22° 5632.68'

5170.70'

204.97°F

10700

10705'

89.69°

176.68° 5632.71'

5264.88'

209.19°F

10800

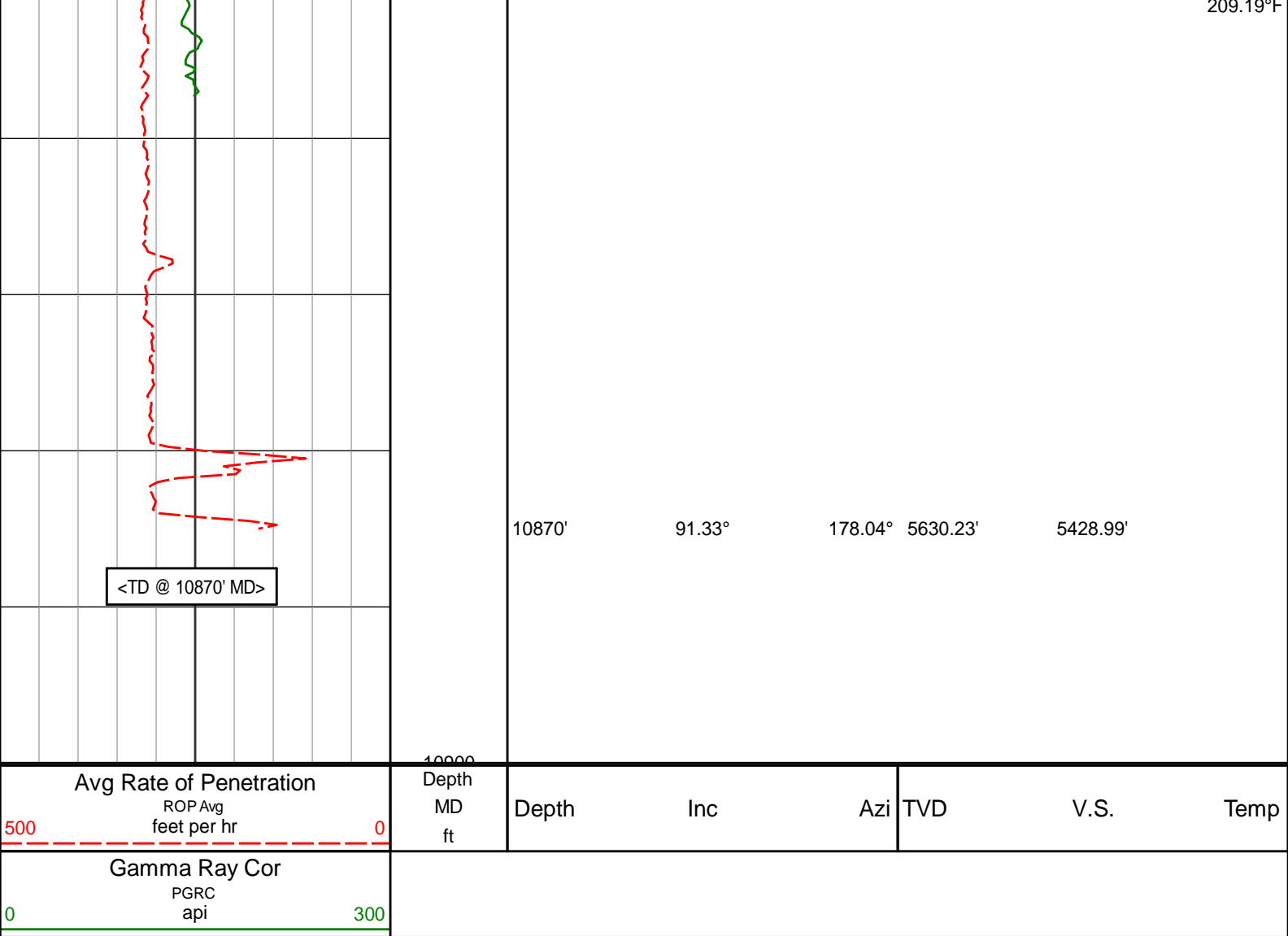
10799'

91.33°

178.04° 5631.88'

5358.33'

213.41°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy Inc
Moses State LD11-78HN
Wattenberg
Weld Colorado
USA
CA-XX-0902009415

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
475.00	0.20	282.52	475.00	0.18 N	0.81 W	-0.13	0.04
847.00	0.20	88.92	847.00	0.33 N	0.79 W	-0.28	0.11
1291.00	1.96	166.58	1290.91	7.03 S	1.74 E	6.91	0.43
1384.00	2.04	248.42	1383.87	9.18 S	0.57 E	9.13	2.81
1477.00	4.25	281.44	1476.73	9.10 S	4.35 W	9.35	2.99
1569.00	7.28	283.11	1568.25	7.10 S	13.37 W	7.90	3.30
1662.00	9.28	285.31	1660.28	3.78 S	26.35 W	5.38	2.17
1754.00	9.02	281.90	1751.11	0.34 S	40.56 W	2.81	0.66
1847.00	9.95	281.30	1842.84	2.74 N	55.57 W	0.66	1.01
1939.00	9.79	279.58	1933.48	5.60 N	71.07 W	-1.25	0.36
2031.00	9.46	279.15	2024.18	8.10 N	86.25 W	-2.82	0.36
2124.00	9.52	276.53	2115.91	10.19 N	101.43 W	-3.98	0.47
2216.00	8.68	275.97	2206.75	11.78 N	115.89 W	-4.68	0.92
2308.00	10.14	275.56	2297.51	13.28 N	130.85 W	-5.27	1.59

2493.00	9.67	274.03	2479.75	15.95 N	162.56 W	-6.00	0.29
2683.00	10.08	272.90	2666.94	17.91 N	195.09 W	-5.97	0.24
2778.00	9.90	271.44	2760.50	18.54 N	211.56 W	-5.59	0.33
2968.00	8.98	273.16	2947.92	19.77 N	242.70 W	-4.91	0.51
3062.00	7.45	276.08	3040.96	20.82 N	256.08 W	-5.15	1.68
3157.00	8.52	268.74	3135.03	21.32 N	269.24 W	-4.84	1.56
3252.00	8.62	266.94	3228.97	20.78 N	283.39 W	-3.44	0.30
3346.00	8.58	267.22	3321.92	20.07 N	297.43 W	-1.87	0.06
3441.00	9.09	267.90	3415.79	19.45 N	312.01 W	-0.36	0.55
3536.00	9.51	268.28	3509.54	18.94 N	327.36 W	1.08	0.44
3631.00	9.66	268.60	3603.21	18.51 N	343.17 W	2.48	0.17
3725.00	9.42	268.53	3695.91	18.12 N	358.75 W	3.82	0.26
3820.00	8.77	268.25	3789.72	17.69 N	373.77 W	5.16	0.68
3915.00	7.86	269.54	3883.72	17.42 N	387.51 W	6.27	0.98
4009.00	7.29	269.60	3976.89	17.33 N	399.91 W	7.12	0.61
4104.00	7.01	267.34	4071.16	17.02 N	411.73 W	8.15	0.42
4199.00	6.61	267.49	4165.48	16.51 N	422.99 W	9.35	0.42
4293.00	5.92	266.64	4258.92	15.99 N	433.24 W	10.49	0.74
4387.00	5.47	265.32	4352.46	15.34 N	442.55 W	11.71	0.50
4482.00	5.10	264.55	4447.05	14.57 N	451.27 W	13.01	0.40
4575.00	5.10	262.77	4539.68	13.65 N	459.48 W	14.42	0.17
4670.00	5.03	260.82	4634.31	12.46 N	467.78 W	16.12	0.19
4765.00	2.31	259.28	4729.11	11.44 N	473.78 W	17.51	2.87
4860.00	0.68	240.36	4824.07	10.80 N	476.16 W	18.29	1.77
4955.00	0.68	260.09	4919.07	10.42 N	477.20 W	18.73	0.25
5049.00	3.68	184.39	5013.00	7.32 N	477.98 W	21.88	3.80
5144.00	10.96	179.77	5107.16	4.77 S	478.18 W	33.95	7.68
5238.00	17.87	179.41	5198.15	28.15 S	477.99 W	57.28	7.36
5333.00	24.31	179.66	5286.74	62.31 S	477.73 W	91.36	6.78
5428.00	31.18	182.11	5370.77	106.50 S	478.52 W	135.51	7.33
5523.00	38.01	181.69	5448.92	160.38 S	480.28 W	189.40	7.19
5618.00	46.28	180.04	5519.31	224.05 S	481.17 W	253.01	8.78
5713.00	51.85	183.00	5581.54	295.75 S	483.15 W	324.69	6.31
5808.00	59.32	181.63	5635.20	374.00 S	486.27 W	402.98	7.96
5903.00	72.57	176.93	5673.85	460.51 S	485.00 W	489.26	14.66
5997.00	86.30	176.73	5691.04	552.56 S	479.89 W	580.82	14.61
6024.00	87.47	176.18	5692.51	579.46 S	478.23 W	607.58	4.78
6092.00	88.09	176.73	5695.14	647.28 S	474.02 W	675.01	1.21
6184.00	87.75	175.54	5698.48	739.01 S	467.83 W	766.19	1.33
6277.00	89.82	177.03	5700.46	831.79 S	461.81 W	858.43	2.74
6369.00	90.59	176.97	5700.14	923.66 S	456.99 W	949.83	0.84
6461.00	89.72	175.84	5699.89	1015.48 S	451.22 W	1041.13	1.55
6554.00	92.53	177.24	5698.06	1108.28 S	445.61 W	1133.41	3.37
6646.00	91.85	177.21	5694.55	1200.10 S	441.16 W	1224.79	0.74
6738.00	90.62	175.81	5692.57	1291.90 S	435.56 W	1316.09	2.03
6831.00	92.50	178.34	5690.04	1384.74 S	430.82 W	1408.46	3.39
6923.00	92.10	178.95	5686.35	1476.64 S	428.65 W	1500.05	0.79
7016.00	92.10	179.41	5682.95	1569.57 S	427.31 W	1592.72	0.50
7108.00	91.60	179.75	5679.98	1661.51 S	426.64 W	1684.46	0.65
7200.00	91.94	179.30	5677.14	1753.47 S	425.88 W	1776.20	0.61
7295.00	89.32	178.34	5676.09	1848.43 S	423.93 W	1870.86	2.94
7389.00	89.66	176.02	5676.92	1942.31 S	419.31 W	1964.28	2.50
7484.00	90.59	178.20	5676.72	2037.18 S	414.52 W	2058.69	2.50
7579.00	91.45	177.80	5675.03	2132.11 S	411.21 W	2153.23	1.00
7674.00	90.80	179.25	5673.17	2227.05 S	408.77 W	2247.85	1.67
7768.00	91.85	179.23	5670.99	2321.02 S	407.52 W	2341.57	1.12
7863.00	89.51	180.41	5669.87	2416.00 S	407.23 W	2436.36	2.76
7958.00	89.51	179.83	5670.68	2511.00 S	407.43 W	2531.19	0.62
8052.00	89.57	179.15	5671.44	2604.99 S	406.59 W	2624.95	0.72
8146.00	89.75	179.23	5672.00	2698.98 S	405.26 W	2718.69	0.21
8240.00	91.14	180.12	5671.27	2792.97 S	404.72 W	2812.47	1.75
8335.00	90.59	179.38	5669.84	2887.96 S	404.30 W	2907.26	0.97
8429.00	89.94	179.34	5669.41	2981.95 S	403.25 W	3001.01	0.69
8524.00	91.67	181.90	5668.08	3076.93 S	404.27 W	3095.87	3.25
8619.00	91.69	182.80	5665.29	3171.81 S	408.15 W	3190.81	0.95
8713.00	91.39	183.04	5662.76	3265.65 S	412.94 W	3284.77	0.42
8808.00	92.10	180.34	5659.87	3360.55 S	415.74 W	3379.67	2.94
8902.00	92.22	179.56	5656.33	3454.49 S	415.66 W	3473.42	0.83
8997.00	90.55	178.81	5654.03	3549.45 S	414.31 W	3568.12	1.92
9092.00	91.42	178.87	5652.40	3644.41 S	412.38 W	3662.79	0.91
9186.00	90.52	177.03	5650.80	3738.33 S	409.02 W	3756.33	2.17
9282.00	91.17	176.56	5649.38	3834.17 S	403.66 W	3851.66	0.84
9376.00	91.11	175.69	5647.51	3927.94 S	397.31 W	3944.87	0.93
9471.00	89.60	177.28	5646.92	4022.75 S	391.48 W	4039.15	2.30
9566.00	90.65	177.43	5646.72	4117.65 S	387.10 W	4133.60	1.11

9662.00	91.69	177.42	5644.76	4213.53 S	382.79 W	4229.04	1.09
9756.00	90.89	178.00	5642.63	4307.43 S	379.03 W	4322.53	1.05
9852.00	91.82	178.20	5640.36	4403.35 S	375.85 W	4418.08	0.99
9947.00	89.45	176.84	5639.31	4498.24 S	371.74 W	4512.55	2.88
10041.00	89.01	175.95	5640.58	4592.05 S	365.82 W	4605.82	1.05
10136.00	90.92	178.36	5640.63	4686.92 S	361.10 W	4700.22	3.24
10230.00	91.63	177.88	5638.53	4780.84 S	358.01 W	4793.78	0.91
10325.00	91.94	177.46	5635.56	4875.72 S	354.15 W	4888.25	0.55
10421.00	90.59	176.39	5633.45	4971.55 S	349.01 W	4983.59	1.80
10515.00	90.03	175.03	5632.94	5065.29 S	341.98 W	5076.72	1.56
10610.00	90.28	175.22	5632.68	5159.94 S	333.91 W	5170.70	0.32
10705.00	89.69	176.68	5632.71	5254.70 S	327.19 W	5264.88	1.66
10799.00	91.33	178.04	5631.88	5348.59 S	322.86 W	5358.33	2.26
10870.00	91.33	178.04	5630.23	5419.53 S	320.44 W	5428.99	0.01

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 183.50 DEGREES (GRID)
A TOTAL CORRECTION OF 6.92 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10870.00 FEET
IS 5429.00 FEET ALONG 183.38 DEGREES (GRID)**

Surface surveys at 475 ft and 847 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 10799 ft MD to TD at 10870 ft MD.