HALLIBURTON | Sperry Drilling

PCG Pressure Case Gamma Ray
PCDC Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Company	**Noble Energy**
Rig	**H&P 273**
Well	**Faith LC34-775**
Field	**Wattenberg**
Country	**USA**
API Number	**05-123-40648**

Country	: **USA**
Field	: **Wattenberg**
Location	: **Lat: 40° 42' 43.02" North** **Long: 103° 58' 8.51" West**
Well	: **Faith LC34-775**
Company	: **Noble Energy**
Rig	: **H&P 273**

LOCATION

Latitude : **40° 42' 43.02" North**
Longitude : **103° 58' 8.51" West**
UTM Easting = **3,424,414.649 ft**
UTM Northing = **1,505,874.032 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4828.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

Elev. KB **N/A**
DF **4852.00 ft**
GL **4828.00 ft**
WD **N/A**

MD LOG

Depth Logged : **619.00 ft** To **10,030.00 ft**
Date Logged : **26-Dec-15** To **01-Jan-16**
Total Depth MD : **10,030.00 ft** TVD: **5,935.93 ft**
Spud Date : **26-Dec-15**

Unit No. : **11703717** Job No. :**CA-XX-0902972918**
Plot Type : **Final**
Plot Date : **01-Mar-16**

Run No.	Borehole Record (MD) Size	From	To	Casing Record (MD) Size	Weight	From	To
2	8.750 in	619.00 ft	6,320.00 ft	7.000 in	26.00 lbpf	SURFACE	6,313.00 ft
3	6.125 in	6,320.00 ft	10,030.00 ft				

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	29-Dec-15	31-Dec-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)	619.00	6,320.00			
Log End Depth (MD, ft)	6,320.00	10,030.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	28-Dec-15 11:18	30-Dec-15 18:00			
Drill/Wipe End Date and Time	29-Dec-15 12:00	31-Dec-15 14:15			
Min Inc (deg) @ Depth (MD, ft)	0.22 @ 1,750.00	87.63 @ 6,426.00			
Max Inc (deg) @ Depth (MD, ft)	80.26 @ 6,265.00	92.59 @ 9,639.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.65 / PDC			
Flow Rate (gpm)	588.24	316.79			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.47 / 46.00	9.75 / 49.00			
Filtrate CL (ppm)	500.00	1,600.00			
pH / Fluid Loss (mptm)	10.30 / 8	8.30 / 9			
PV (cP) / YP (lhf2)	13 / 12.00	6 / 5.00			
% Solids / % Sand	10.40 / 0.40	7.40 / 0.10			
% 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	162.80 / PCM	209.20 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 162.80	N/A @ 209.20			
Lead MWD Engineer	Adam Sampson	Paul Kock			
Customer Representative	Justin Fields	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11619287	12187588			
Insert Serial Number	11400901	11680784			
Date and Time Initialized	27-Dec-15 10:11	30-Dec-15 09:38			
Date and Time Read	29-Dec-15 18:17	31-Dec-15 22:24			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	55.00	67.00			
Software Version	6.33	6.33			
Sub Serial Number	11619287	12187588			
Sonde Serial Number	11478096	10859920			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	219.10	339.80			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	43.03	54.79			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11619287	12187588			
Insert/Sonde Serial Number	11293307	11579789			

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured bit depths, measured from the drill floor.

2. No depth corrections have been made for pipe stretch or compression.

3. Critical annular velocities have been calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for synthetic and oil based fluids.

4. All data presented is recorded (memory) data unless otherwise stated
ROPA is realtime data

5. Gaps in data are due to high ROP

6. The following smoothing parameters have been applied to the data
1:600
All curves: 1 ft interval, 3 ft coercion distance, 5 ft gap fill
1:240
ROPA: 0.5 ft interval, 1.2 ft coercion distance, 3 ft gap fill
PGRC: 0.5 ft interval, 0.6 ft coercion distance, 3 ft gap fill

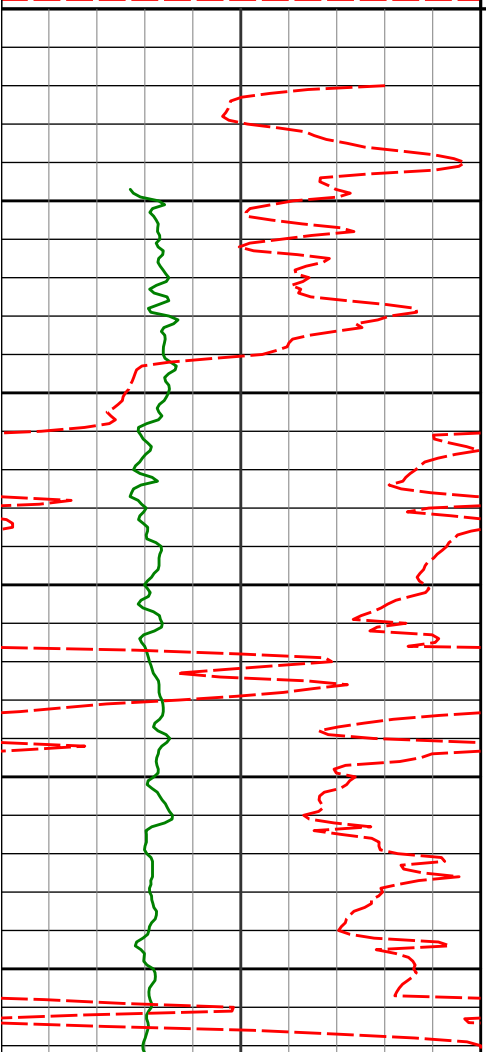
7. Insite Version 8.3.0

WARRANTY

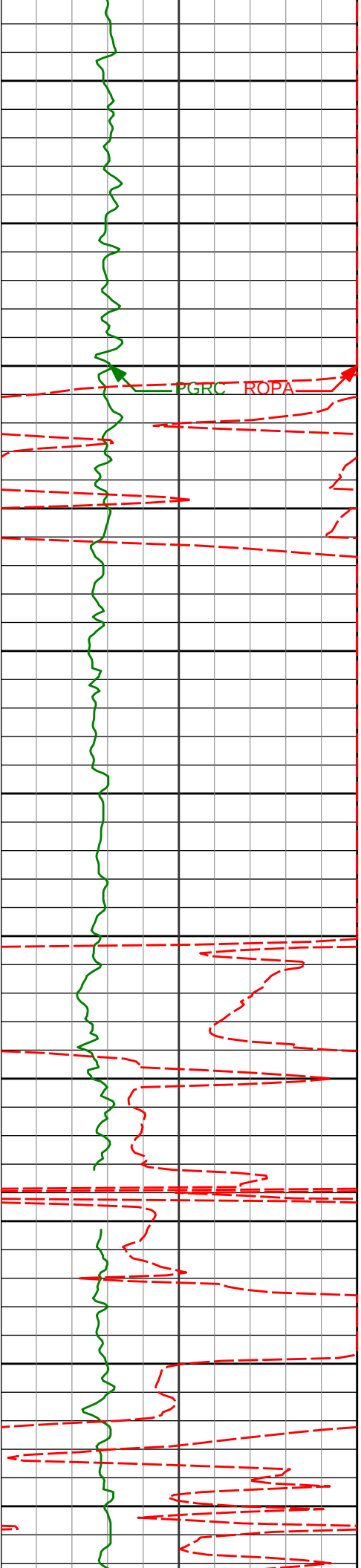
MD Detail 1:600 Scale

PCG Gamma Ray BCorr
PGRC
0 api 300

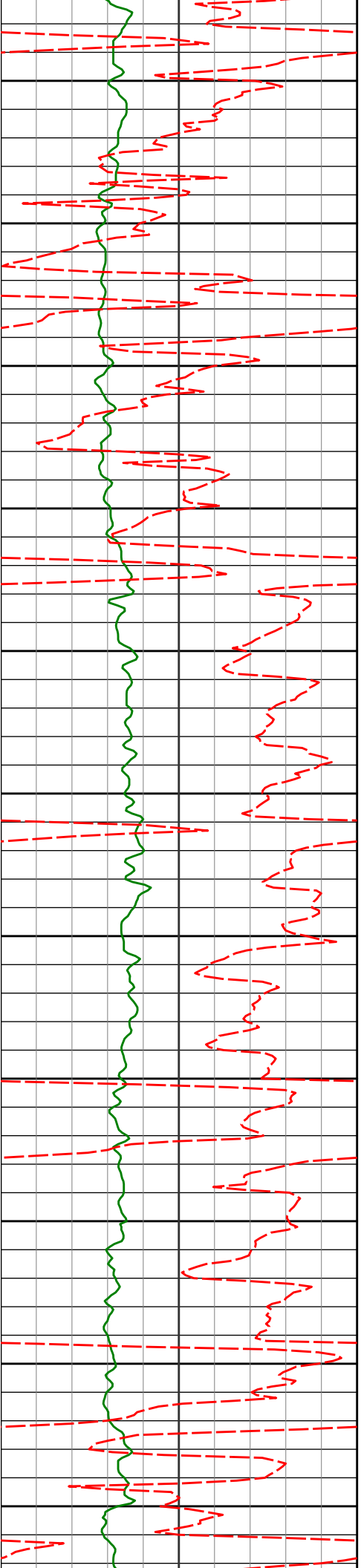
Avg Rate of Penetration
ROPA
1K feet per hr 0



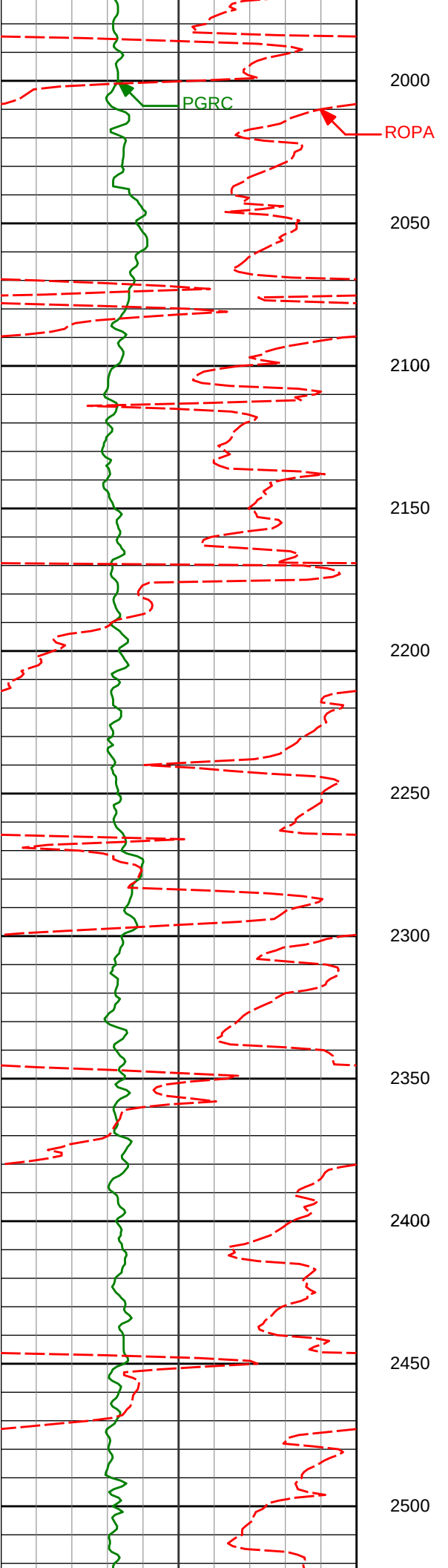
Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
Run 100	619'	0.36°	271.87°	619.00'	-0.01'	58.62°F
650						61.31°F
700						62.17°F
	725'	0.42°	271.87°	724.99'	-0.02'	62.17°F
750						62.17°F
						62.17°F
800						62.17°F
	819'	0.37°	287.58°	818.99'	-0.10'	
850						62.17°F
						62.17°F



900					62.17°F
	914'	0.39°	307.86°	913.99'	-0.38'
					64.11°F
950					
					64.11°F
					64.11°F
1000					
					64.11°F
1050					64.11°F
					64.11°F
1100	1103'	0.46°	282.05°	1102.98'	-0.91'
					64.11°F
					66.07°F
1150					
					65.96°F
1200	1198'	0.54°	297.36°	1197.98'	-1.17'
					64.81°F
					64.11°F
1250					
					64.11°F
	1292'	0.39°	287.41°	1291.98'	-1.45'
1300					
1350					
	1384'	0.47°	293.90°	1383.97'	-1.68'
1400					

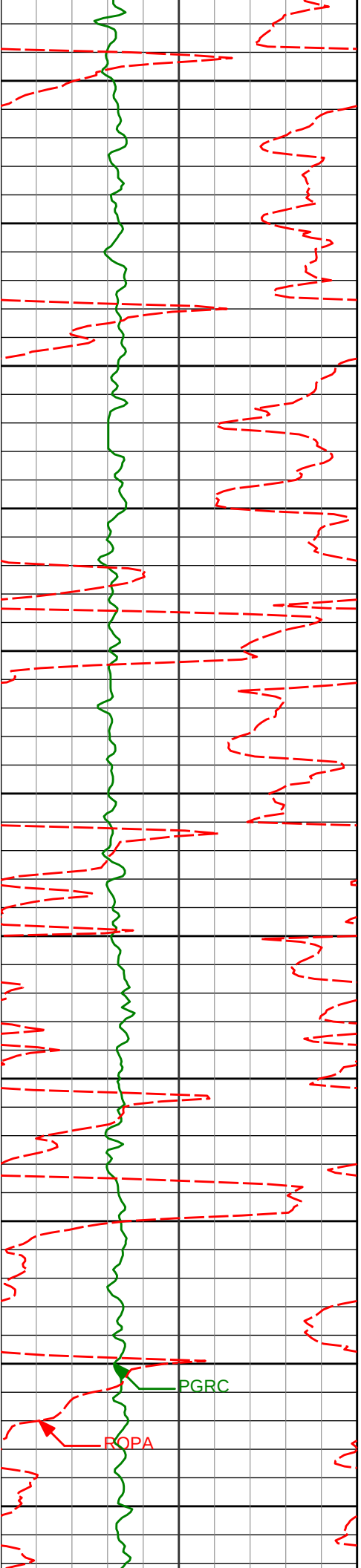


					66.07°F
1476'	0.43°	293.28°	1475.97'	-1.96'	66.07°F
					66.07°F
					68.04°F
1567'	0.28°	296.87°	1566.97'	-2.18'	68.04°F
					68.04°F
					68.04°F
					68.04°F
					70.02°F
1750'	0.22°	278.01°	1749.97'	-2.41'	70.02°F
					70.02°F
					70.02°F
1842'	2.30°	309.19°	1841.94'	-3.56'	70.02°F
					70.02°F
					70.17°F
1933'	4.50°	307.92°	1932.78'	-6.80'	71.29°F
					72.00°F

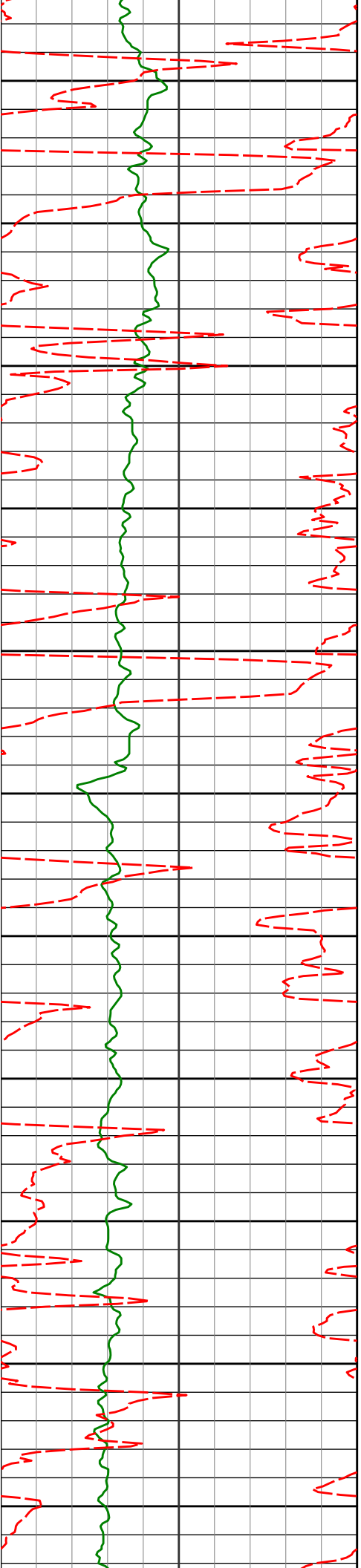


2116'	6.21°	295.72°	2114.98'	-15.13'
2299'	7.15°	297.81°	2296.73'	-24.24'
2482'	7.58°	294.22°	2478.22'	-33.96'

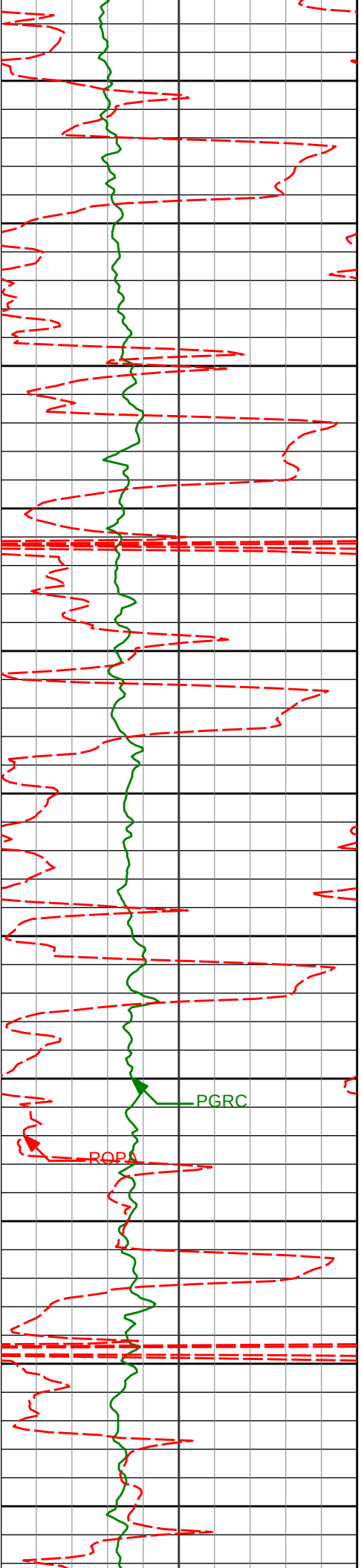
72.00°F
72.00°F
72.00°F
73.98°F
73.98°F
76.06°F
77.99°F
77.99°F
77.99°F
77.99°F
78.52°F
80.01°F
80.01°F
80.01°F
80.01°F
80.01°F
84.06°F
84.06°F



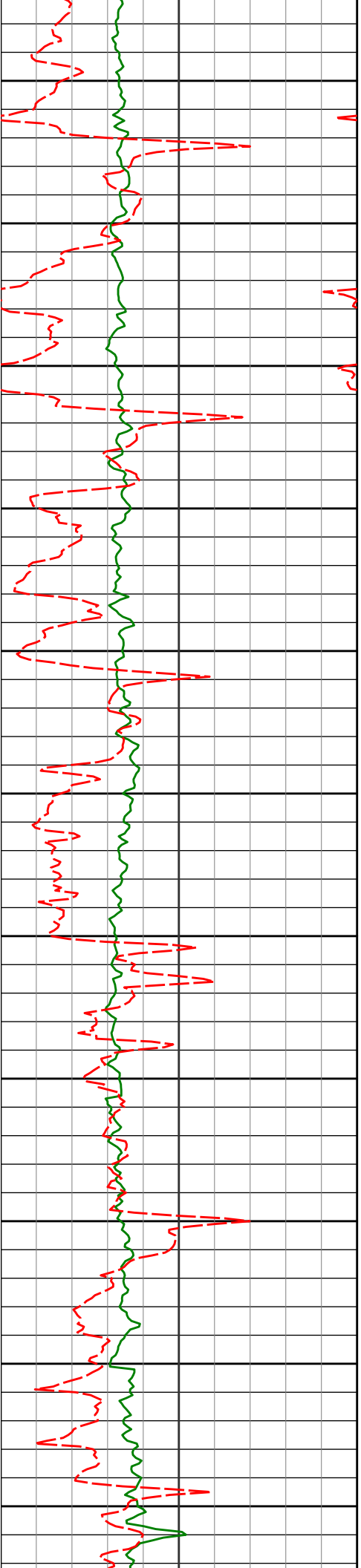
					84.06°F
2574'	7.34°	291.14°	2569.44'	-38.28'	84.06°F
					86.09°F
					86.09°F
2665'	7.47°	287.64°	2659.68'	-41.88'	86.09°F
2757'	7.79°	300.59°	2750.88'	-46.58'	88.14°F
					88.14°F
					88.14°F
2849'	7.35°	299.23°	2842.07'	-52.34'	88.14°F
2940'	6.84°	306.59°	2932.38'	-58.17'	
					92.26°F
					92.26°F
3035'	6.50°	310.74°	3026.74'	-64.82'	92.26°F
					94.33°F



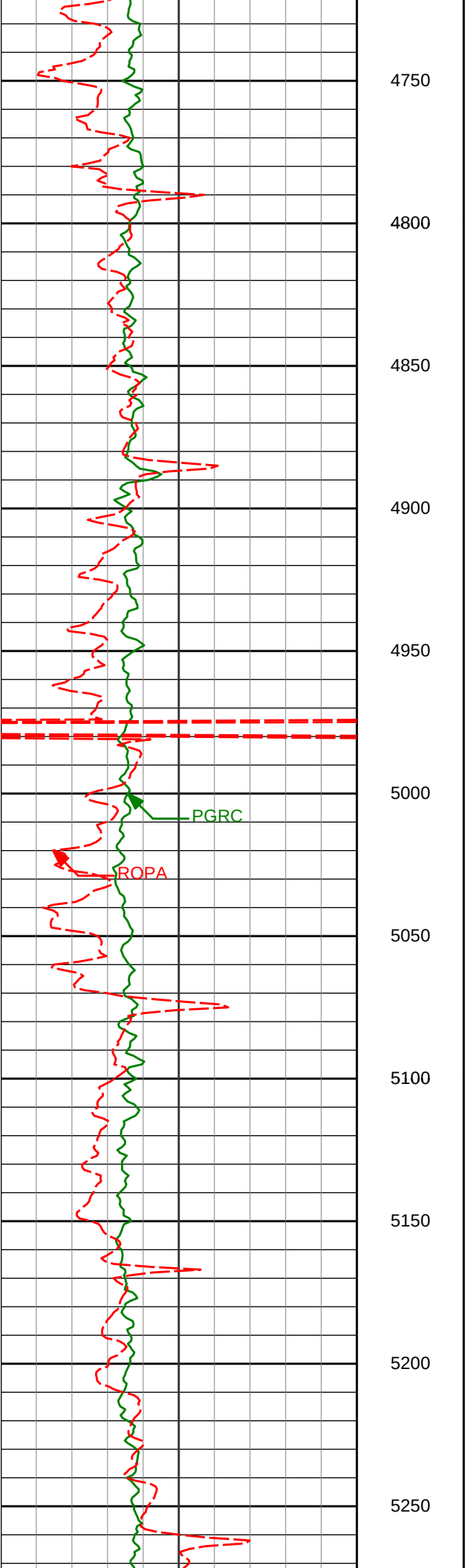
					94.33°F
					94.33°F
3129'	6.43°	313.86°	3120.14'	-71.74'	
					96.42°F
					96.42°F
					96.42°F
3222'	6.71°	314.91°	3212.53'	-78.98'	
					96.42°F
					96.42°F
3317'	7.89°	309.94°	3306.76'	-86.84'	
					96.98°F
					98.51°F
					98.51°F
3411'	8.19°	308.33°	3399.84'	-94.87'	
					99.72°F
					100.62°F
					100.62°F
3506'	8.47°	307.31°	3493.83'	-103.02'	
					101.61°F
					102.72°F
					102.72°F
3600'	8.73°	307.63°	3586.78'	-111.28'	102.72°F



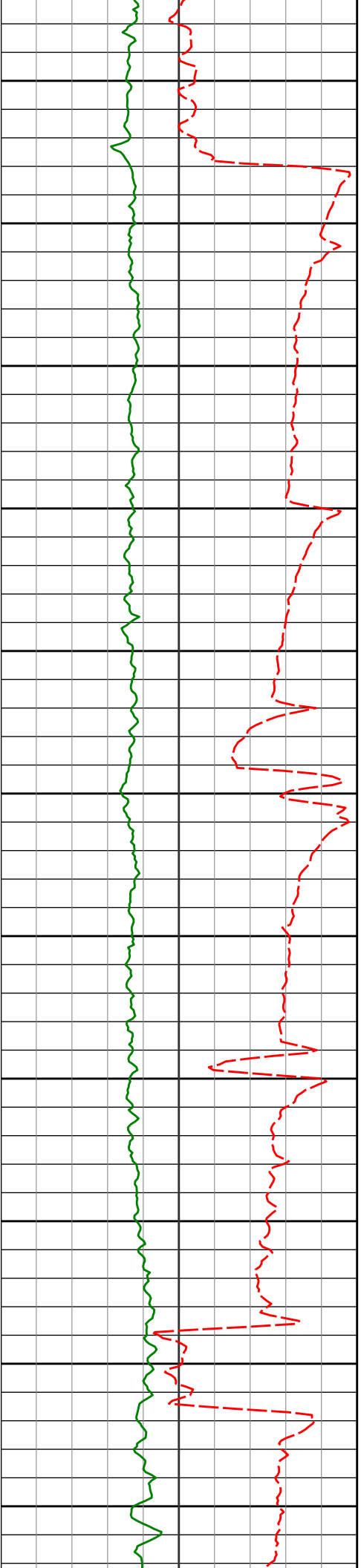
3650					102.72°F
					102.72°F
3700	3694'	7.94°	292.26°	3679.79'	-117.79' 102.72°F
					102.72°F
3750					102.72°F
	3788'	5.34°	292.52°	3773.16'	-121.66' 102.72°F
3800					104.83°F
					104.83°F
3850					104.83°F
	3882'	2.93°	298.98°	3866.90'	-124.34'
3900					104.83°F
					106.97°F
3950					106.97°F
	3976'	1.57°	316.45°	3960.83'	-126.35'
4000					106.97°F
					109.09°F
4050					109.32°F
	4071'	1.14°	274.92°	4055.81'	-127.33'
					110.06°F
4100					111.01°F
					111.24°F
4150	4165'	0.85°	271.12°	4149.79'	-127.38'



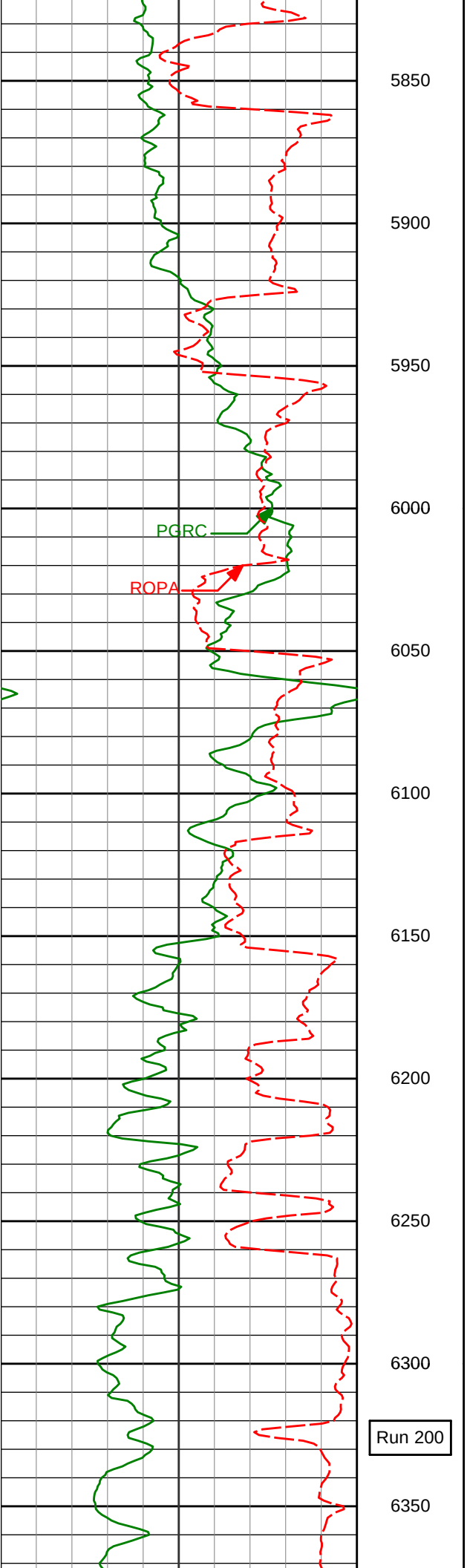
4259'	0.72°	253.92°	4243.78'	-127.20'	
					113.40°F
4354'	0.64°	237.15°	4338.78'	-126.72'	115.56°F
					115.56°F
					115.56°F
4449'	0.62°	217.45°	4433.77'	-126.00'	115.56°F
					117.73°F
					117.73°F
4544'	0.25°	186.14°	4528.77'	-125.37'	117.73°F
4638'	0.85°	173.43°	4622.76'	-124.48'	



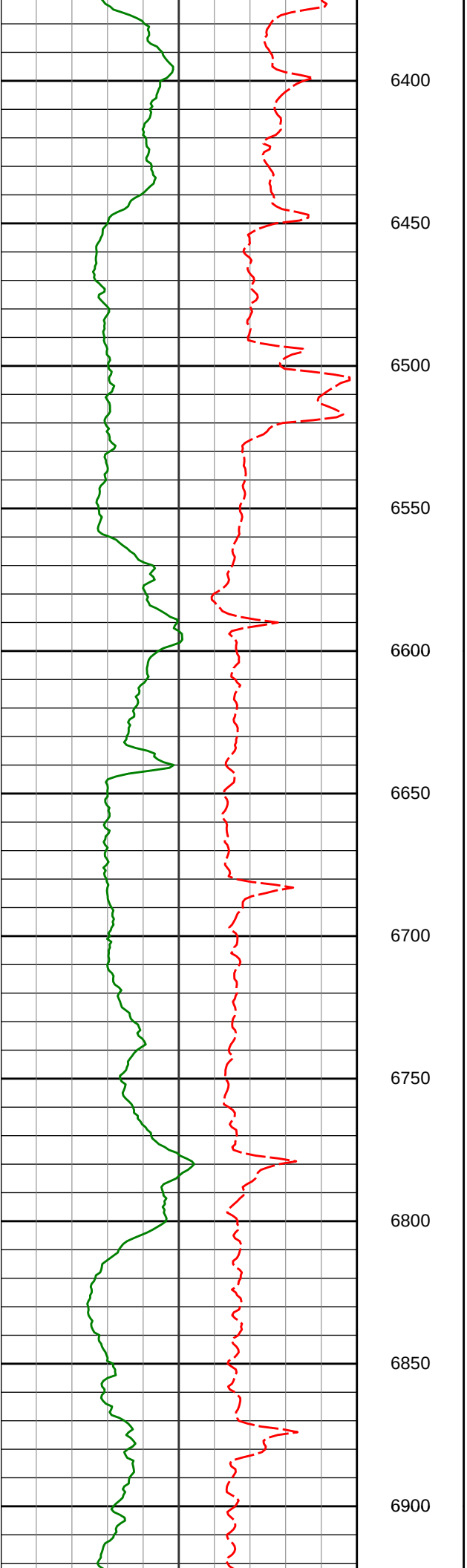
4733'	0.81°	160.95°	4717.75'	-123.15'	122.11°F
					122.11°F
					123.18°F
4828'	1.02°	172.93°	4812.74'	-121.69'	124.30°F
					124.30°F
					124.30°F
4923'	0.61°	178.80°	4907.73'	-120.36'	
5017'	0.69°	166.71°	5001.73'	-119.31'	
5111'	0.71°	149.41°	5095.72'	-118.27'	
5206'	0.62°	146.44°	5190.71'	-117.36'	132.47°F
					131.42°F



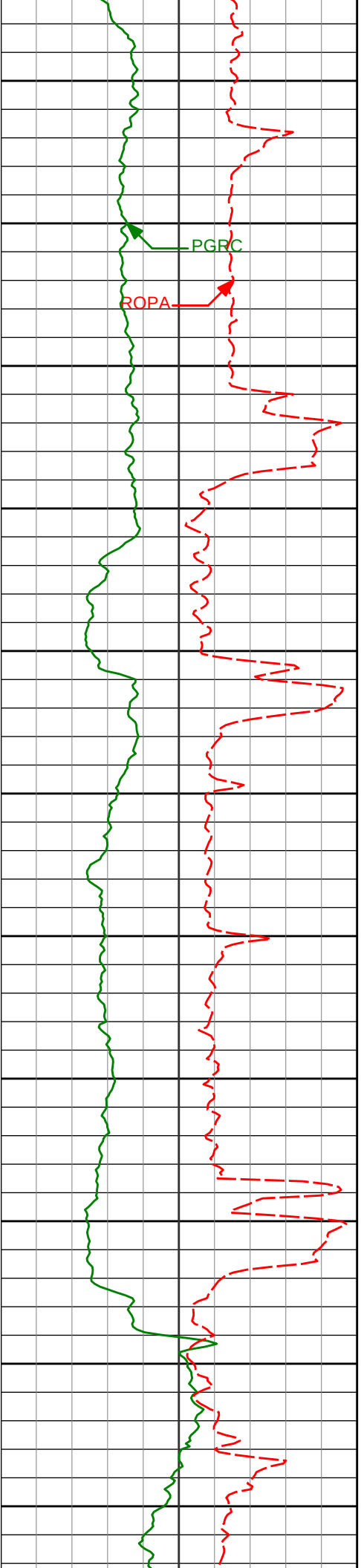
5301'	0.42°	87.68°	5285.71'	-116.96'	130.01°F
					131.25°F
					133.87°F
					135.36°F
5396'	7.66°	182.74°	5380.43'	-110.65'	137.72°F
					140.04°F
					142.40°F
5490'	18.72°	180.16°	5471.81'	-89.24'	145.03°F
					146.41°F
					148.08°F
5585'	24.63°	176.08°	5560.05'	-54.25'	149.34°F
					150.74°F
					151.39°F
5679'	34.73°	177.25°	5641.62'	-7.93'	151.47°F
					151.58°F
					152.36°F
					153.63°F
5774'	42.36°	177.27°	5715.86'	51.07'	153.79°F
					153.79°F



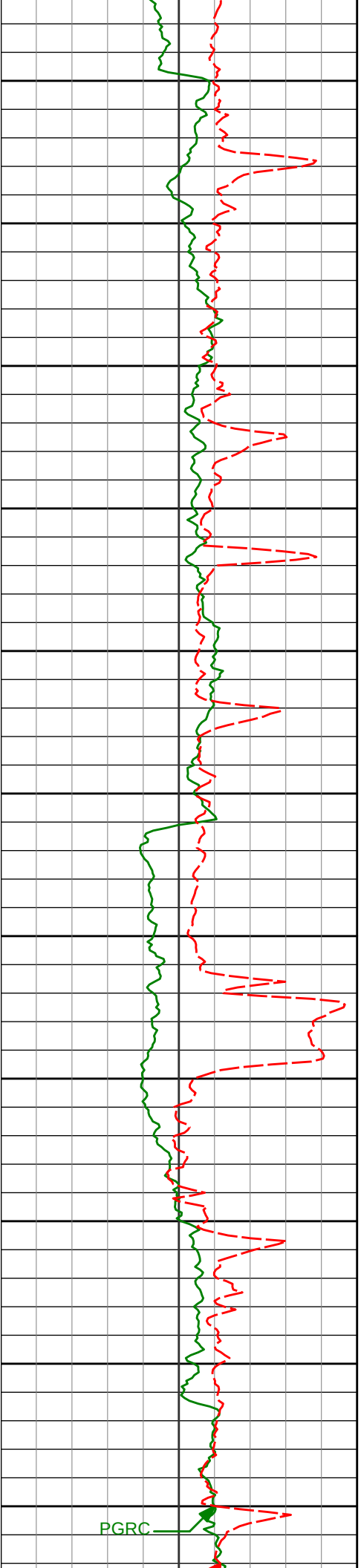
5850					153.79°F
	5869'	50.08°	175.29°	5781.54'	119.31'
					153.79°F
5900					154.28°F
					155.16°F
5950					
	5963'	57.47°	178.07°	5837.06'	194.81'
					155.39°F
6000					155.91°F
					156.13°F
6050					
	6058'	67.16°	179.64°	5881.15'	278.75'
					156.51°F
					158.15°F
6100					
					158.47°F
6150					158.57°F
	6153'	75.43°	180.84°	5911.59'	368.63'
					159.58°F
6200					
					160.67°F
					160.83°F
6250					
	6265'	80.26°	180.73°	5935.17'	478.08'
					160.83°F
6300					151.73°F
Run 200					
					146.84°F
6350					
					147.00°F



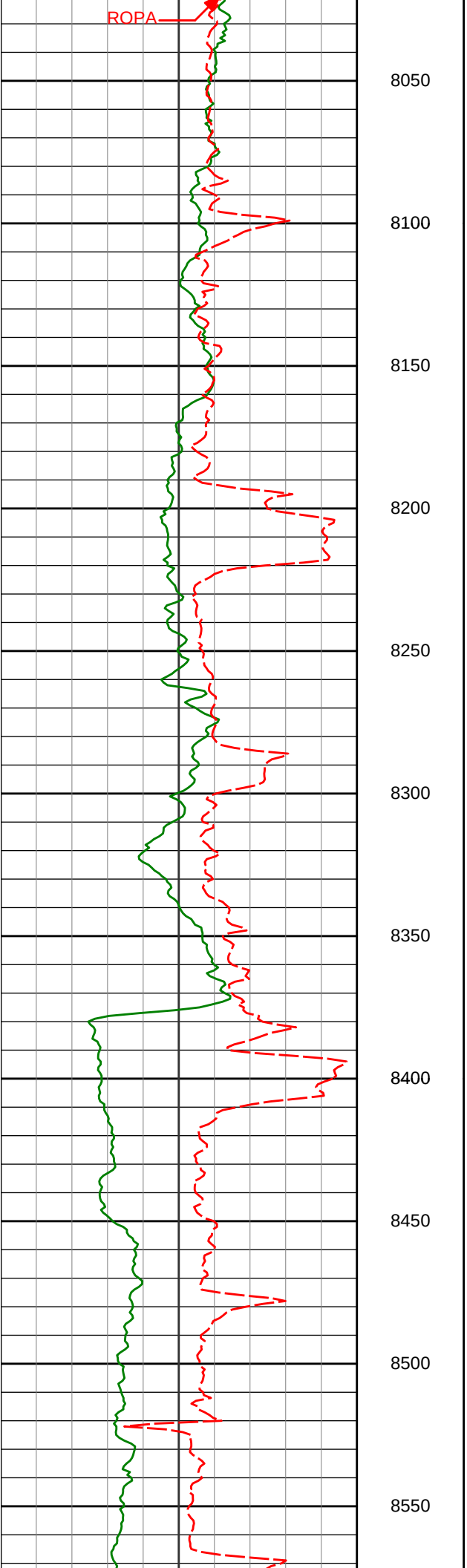
6379'	87.69°	179.47°	5947.13'	591.33'	148.68°F
6426'	87.63°	179.09°	5949.05'	638.26'	149.01°F
					148.44°F
					148.99°F
6520'	89.72°	179.40°	5951.22'	732.16'	151.49°F
					153.95°F
					155.84°F
6614'	89.88°	179.05°	5951.55'	826.08'	156.47°F
					158.57°F
					160.41°F
6708'	89.75°	177.67°	5951.85'	919.94'	161.00°F
					162.69°F
					163.48°F
6803'	90.12°	177.48°	5951.96'	1014.72'	164.95°F
					165.84°F
					166.92°F
6897'	90.43°	177.09°	5951.50'	1108.46'	167.97°F
					169.32°F



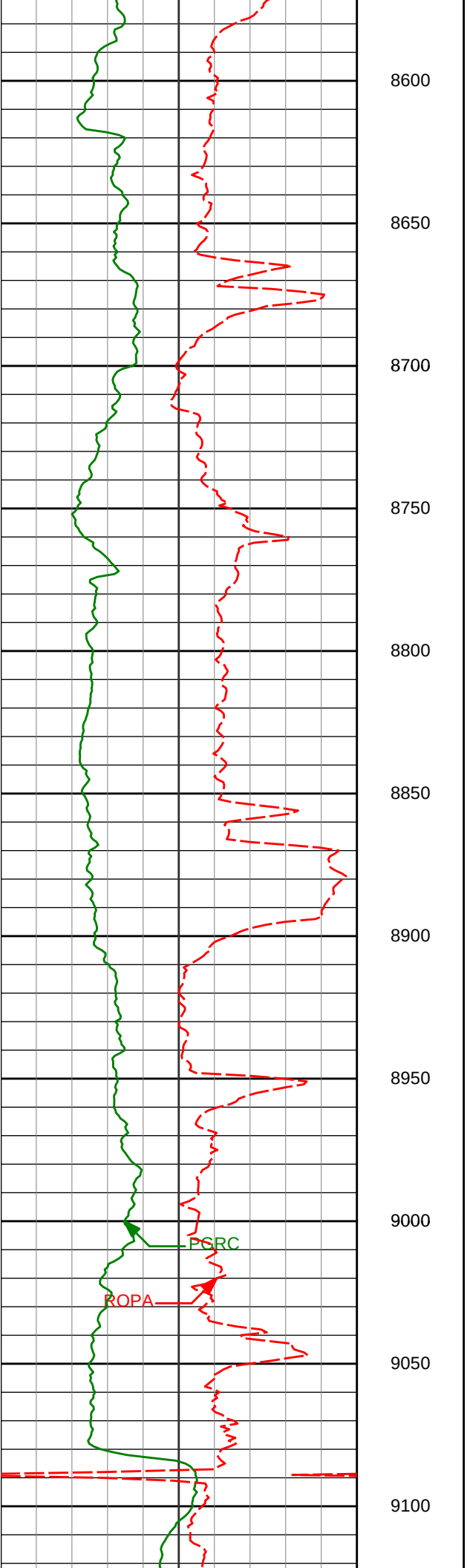
6950					170.45°F
					171.59°F
	6991'	90.65°	176.79°	5950.62'	1202.16'
7000					171.22°F
					170.49°F
7050					170.92°F
	7085'	90.71°	178.72°	5949.50'	1295.95'
					172.39°F
7100					172.40°F
					173.32°F
7150					174.97°F
	7179'	89.66°	178.35°	5949.20'	1389.82'
7200					175.52°F
					177.32°F
7250					177.19°F
	7273'	90.77°	178.68°	5948.85'	1483.69'
7300					176.10°F
					176.70°F
7350					177.92°F
	7368'	89.29°	178.67°	5948.80'	1578.58'
					179.43°F
7400					181.64°F
					182.77°F
7450					
	7462'	89.26°	177.94°	5949.98'	1672.42'
					184.15°F



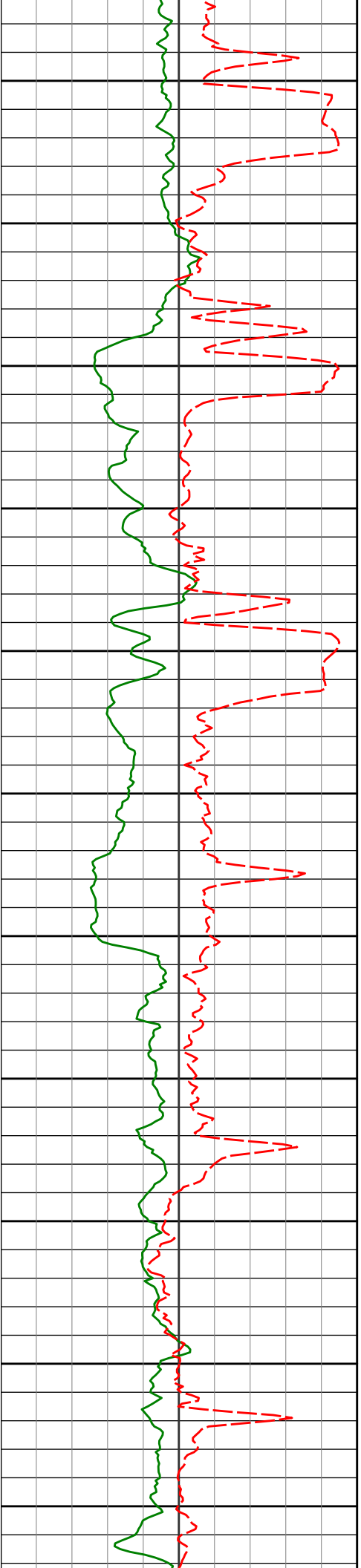
					185.02°F
					185.02°F
7556'	89.97°	178.20°	5950.62'	1766.25'	185.29°F
					186.45°F
					187.27°F
7651'	89.38°	177.12°	5951.15'	1861.04'	187.48°F
					187.80°F
					189.53°F
7745'	89.14°	176.40°	5952.37'	1954.71'	188.21°F
					186.28°F
					186.62°F
7840'	90.37°	179.14°	5952.77'	2049.50'	188.19°F
					189.84°F
					190.26°F
7935'	90.52°	178.54°	5952.03'	2144.39'	192.05°F
					192.49°F
					192.49°F
					192.74°F



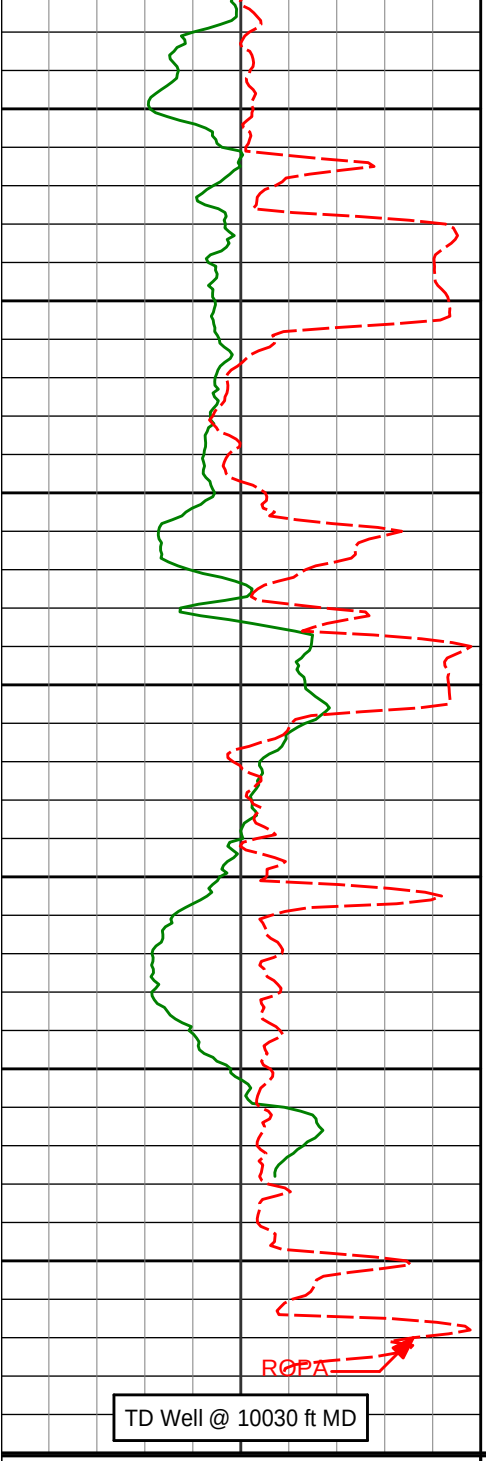
					193.93°F
					194.81°F
					194.29°F
8124'	90.37°	177.21°	5950.56'	2333.00'	
					192.58°F
					190.99°F
					190.95°F
8219'	91.08°	179.21°	5949.36'	2427.84'	
					192.42°F
					193.54°F
					194.68°F
8314'	91.26°	178.95°	5947.42'	2522.73'	
					193.34°F
					191.41°F
					191.93°F
8408'	89.38°	178.59°	5946.88'	2616.62'	
					193.54°F
					195.33°F
					197.17°F
8502'	89.54°	177.97°	5947.77'	2710.47'	
					197.51°F
					197.51°F
					197.74°F



					199.22°F
8597'	89.72°	178.06°	5948.38'	2805.29'	
					198.95°F
					198.16°F
					199.02°F
8692'	89.48°	177.39°	5949.05'	2900.08'	
					199.90°F
					200.24°F
					200.95°F
8787'	89.45°	176.14°	5949.94'	2994.75'	
					199.50°F
					198.13°F
					197.67°F
8881'	89.41°	177.00°	5950.87'	3088.40'	
					198.33°F
					199.82°F
					200.47°F
					202.30°F
					202.60°F
					202.88°F
					203.32°F
9071'	91.05°	176.75°	5950.11'	3277.78'	
					200.21°F
					198.89°F



9165'	90.59°	178.73°	5948.77'	3371.56'	199.85°F
					200.05°F
					200.05°F
					200.37°F
9260'	88.46°	178.30°	5949.56'	3466.43'	200.96°F
					200.35°F
					200.58°F
9355'	89.78°	179.38°	5951.02'	3561.31'	202.37°F
					203.23°F
					205.35°F
9450'	91.26°	180.01°	5950.15'	3656.26'	207.02°F
					205.96°F
					207.73°F
9544'	91.39°	178.48°	5947.97'	3750.16'	209.32°F
					208.47°F
					209.87°F
9639'	92.59°	178.56°	5944.68'	3844.97'	209.05°F
					207.23°F



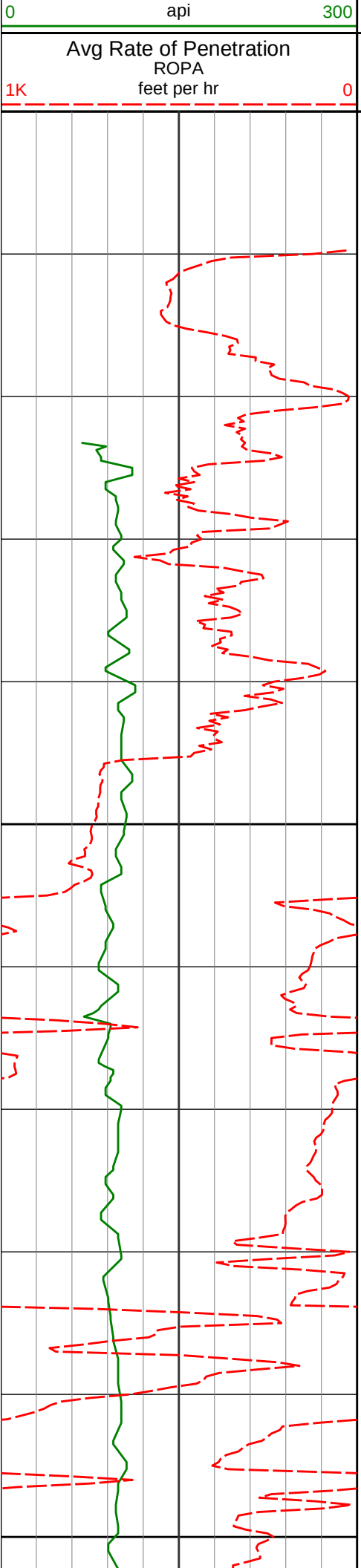
Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
9700						205.71°F
						205.52°F
	9734'	91.42°	179.06°	5941.36'	3939.81'	
9750						206.83°F
						206.28°F
9800						
						205.90°F
	9828'	90.83°	180.26°	5939.51'	4033.74'	
						207.32°F
9850						
						208.49°F
9900						210.10°F
						210.31°F
9950						
	9963'	91.11°	180.93°	5937.22'	4168.70'	210.31°F
10000						
	10030'	91.11°	180.93°	5935.93'	4235.69'	
10050						

Avg Rate of Penetration
ROPA
1K feet per hr 0

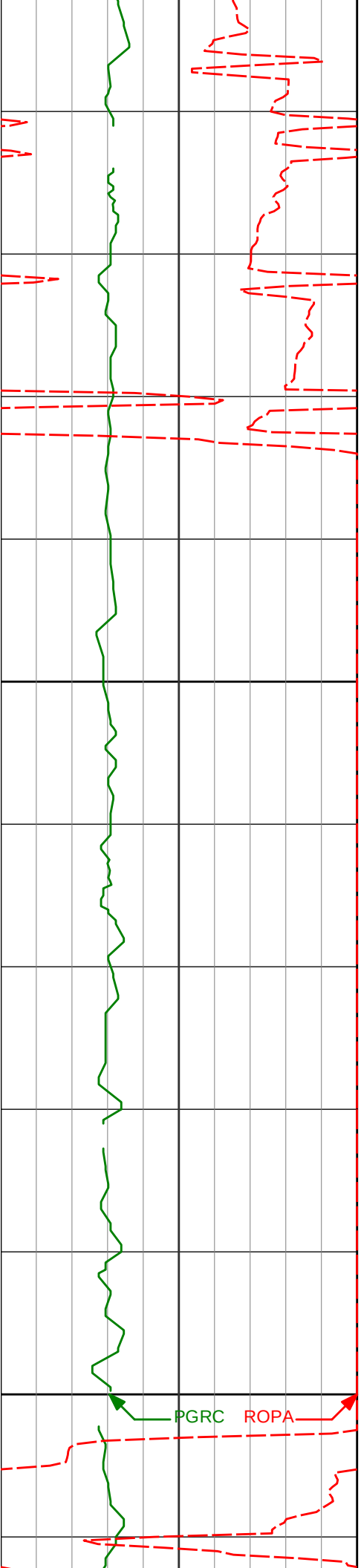
PCG Gamma Ray BCorr
PGRC
0 api 300

MD Detail 1:240 Scale

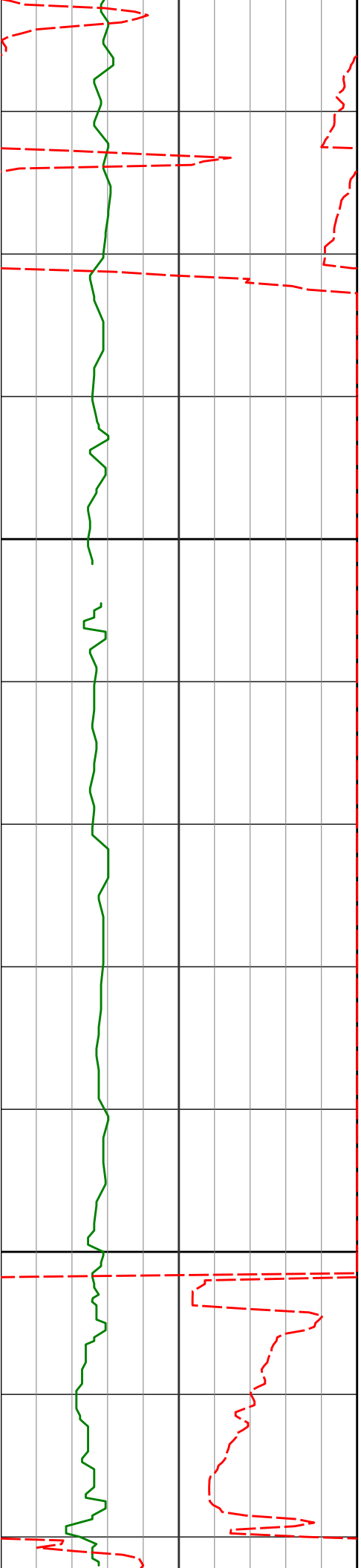
PCG Gamma Ray BCorr
PGRC



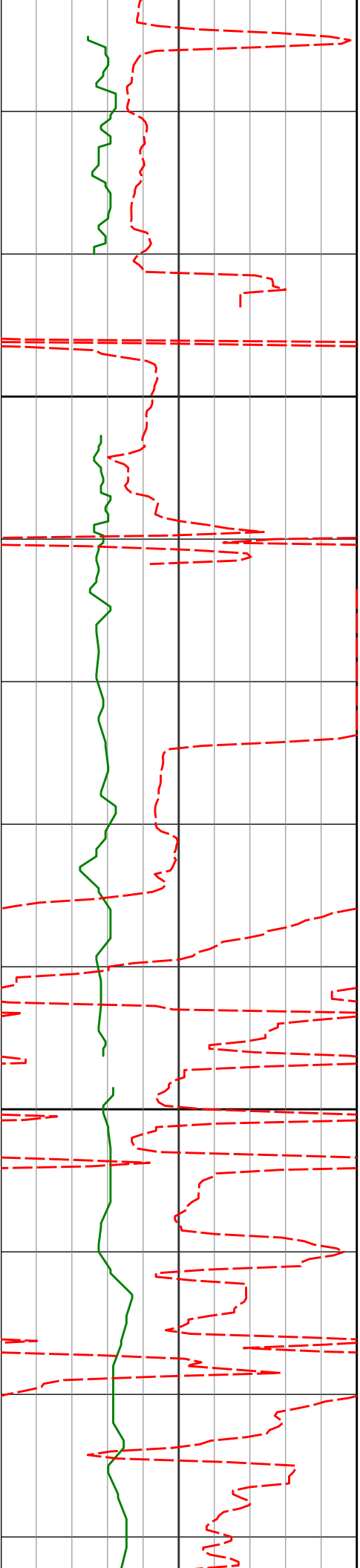
Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
	619'	0.36°	271.87°	619.00'	-0.01'	58.62°F
Run 100						
						61.31°F
						62.17°F
700						
	725'	0.42°	271.87°	724.99'	-0.02'	62.17°F
						62.17°F
						62.17°F
800						



					62.17°F
819'	0.37°	287.58°	818.99'	-0.10'	
					62.17°F
					62.17°F
					62.17°F
914'	0.39°	307.86°	913.99'	-0.38'	
					64.11°F
					64.11°F
					64.11°F
					64.11°F

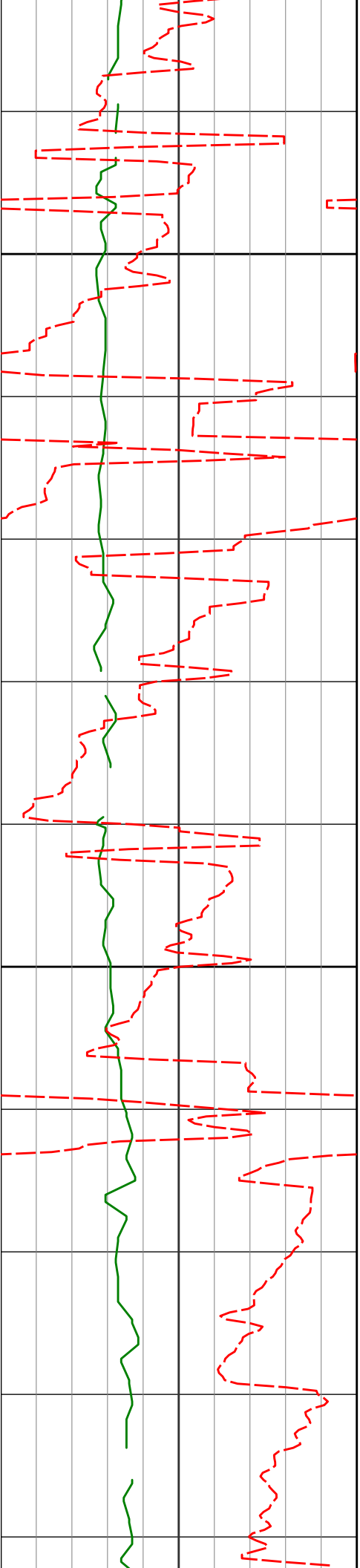


						64.11°F
						64.11°F
1100	1103'	0.46°	282.05°	1102.98'	-0.91'	
						64.11°F
						66.07°F
						65.96°F
1200	1198'	0.54°	297.36°	1197.98'	-1.17'	64.81°F
						64.11°F

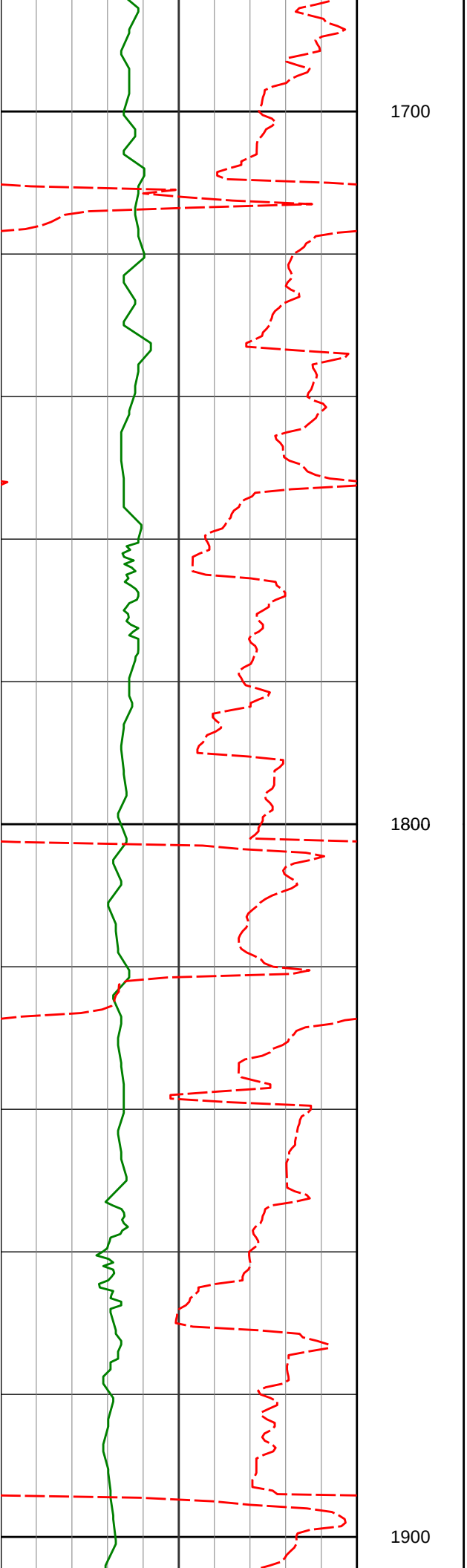


64.11°F

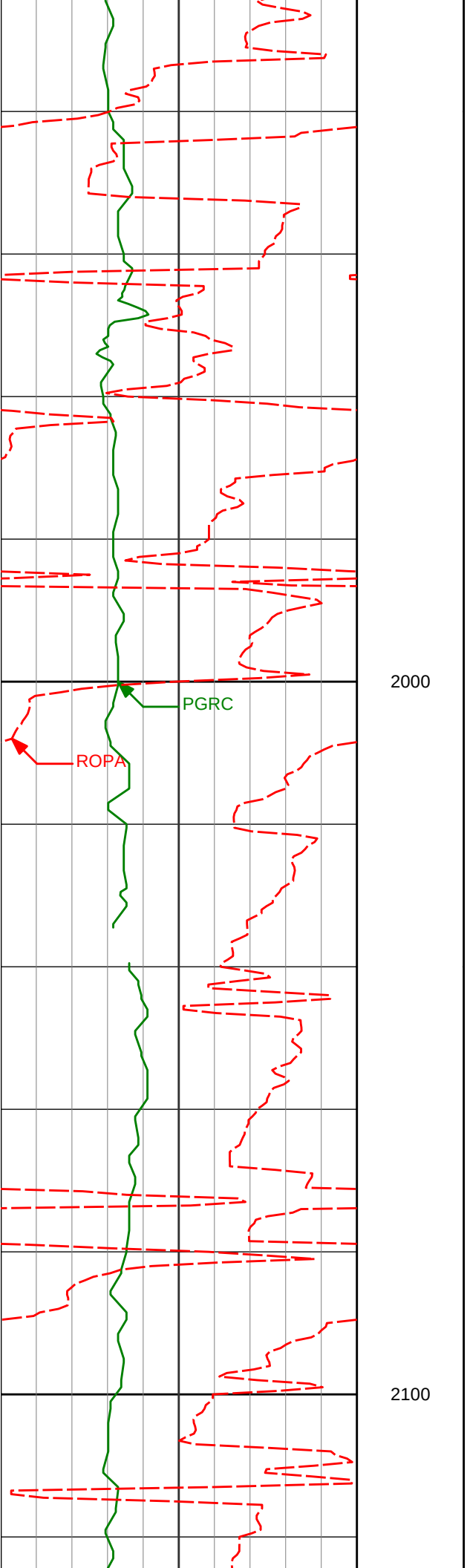
1292'	0.39°	287.41°	1291.98'	-1.45'
1384'	0.47°	293.90°	1383.97'	-1.68'



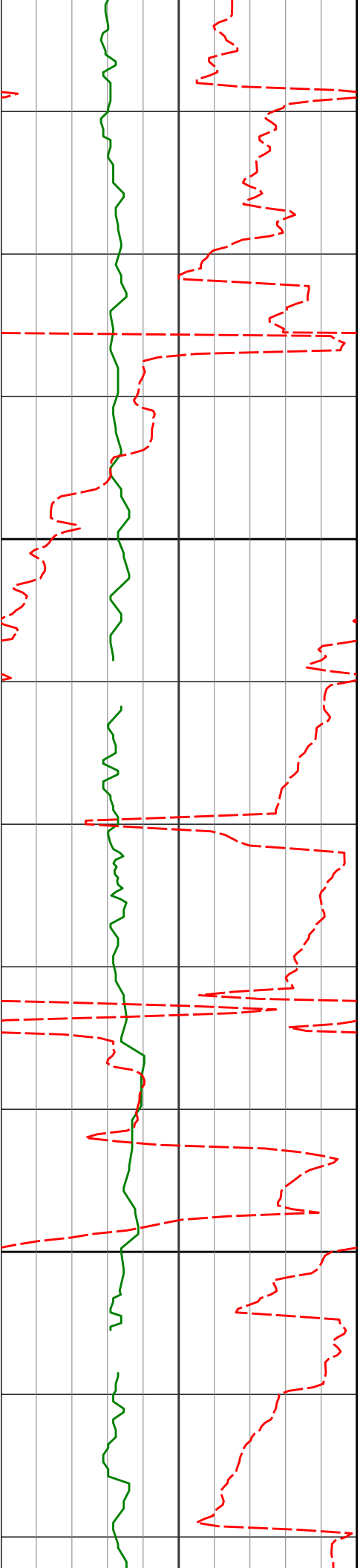
					66.07°F
1476'	0.43°	293.28°	1475.97'	-1.96'	
1500					66.07°F
					68.04°F
					68.04°F
1567'	0.28°	296.87°	1566.97'	-2.18'	
1600					68.04°F
					68.04°F
					68.04°F



					70.02°F
					70.02°F
1750'	0.22°	278.01°	1749.97'	-2.41'	
					70.02°F
					70.02°F
					70.02°F
1842'	2.30°	309.19°	1841.94'	-3.56'	
					70.02°F
					70.17°F



					71.29°F
1933'	4.50°	307.92°	1932.78'	-6.80'	
					72.00°F
					72.00°F
					72.00°F
					72.00°F
					73.98°F
					73.98°F
2116'	6.21°	295.72°	2114.98'	-15.13'	



76.06°F

77.99°F

77.99°F

2200

77.99°F

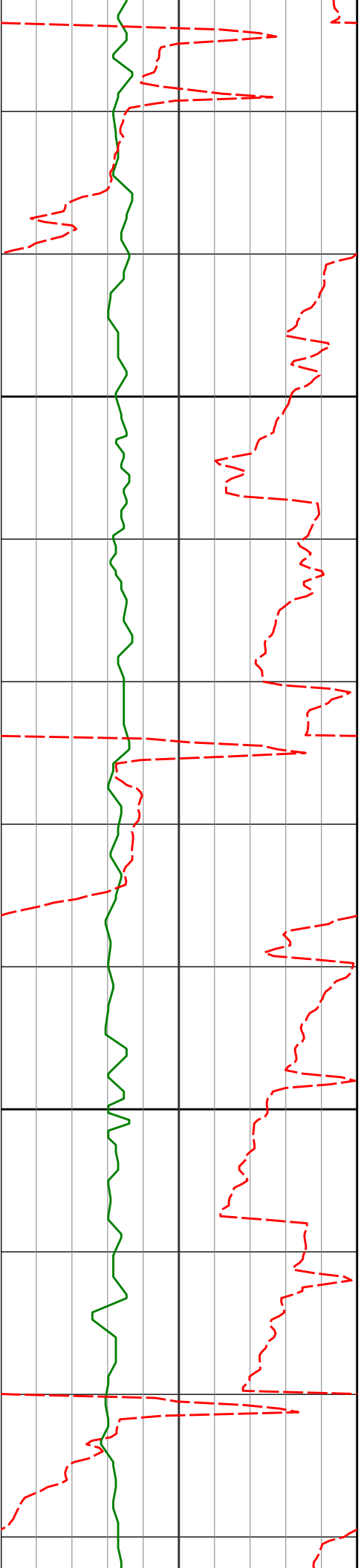
77.99°F

2300

2299' 7.15° 297.81° 2296.73' -24.24'

78.52°F

80.01°F



80.01°F

2400

80.01°F

80.01°F

80.01°F

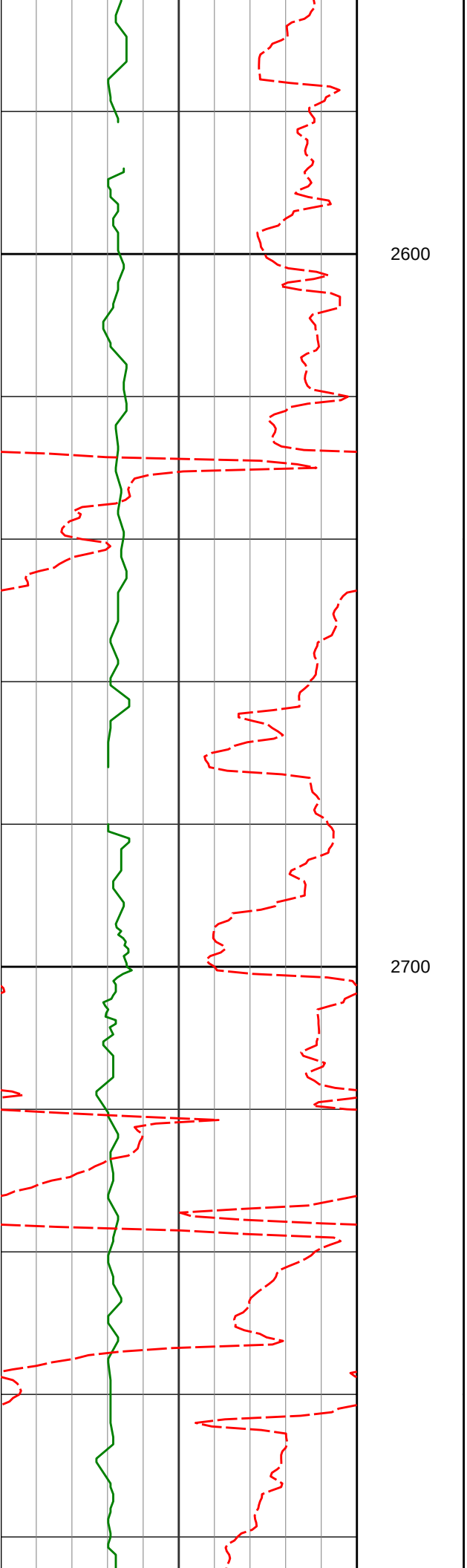
2482'	7.58°	294.22°	2478.22'	-33.96'

84.06°F

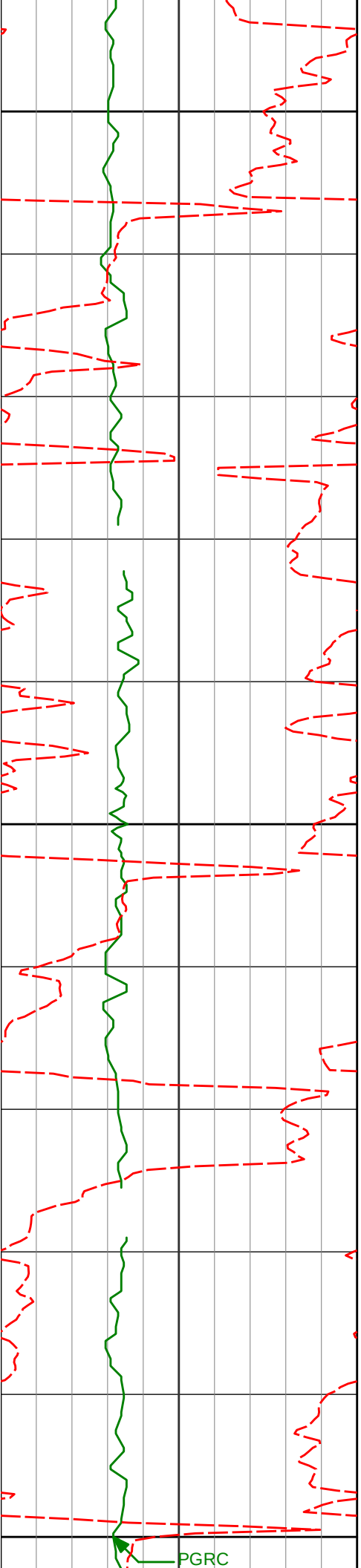
2500

84.06°F

84.06°F



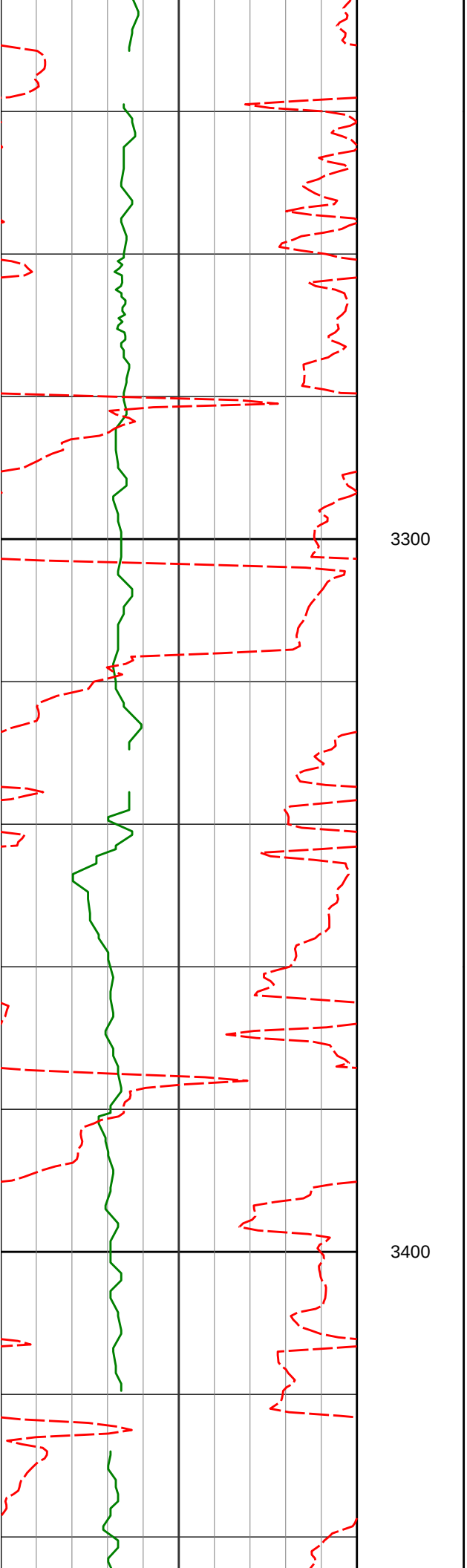
2574'	7.34°	291.14°	2569.44'	-38.28'	84.06°F
					86.09°F
					86.09°F
2665'	7.47°	287.64°	2659.68'	-41.88'	86.09°F
2757'	7.79°	300.59°	2750.88'	-46.58'	88.14°F



					88.14°F
					88.14°F
2849'	7.35°	299.23°	2842.07'	-52.34'	88.14°F
2940'	6.84°	306.59°	2932.38'	-58.17'	
					92.26°F
					92.26°F

	3035'	6.50°	310.74°	3026.74'	-64.82'
3100					
	3129'	6.43°	313.86°	3120.14'	-71.74'
3200					
	3222'	6.71°	314.91°	3212.53'	-78.98'

92.26°F
94.33°F
94.33°F
94.33°F
96.42°F
96.42°F
96.42°F



3300					
	3317'	7.89°	309.94°	3306.76'	-86.84'
3400					
	3411'	8.19°	308.33°	3399.84'	-94.87'

96.42°F

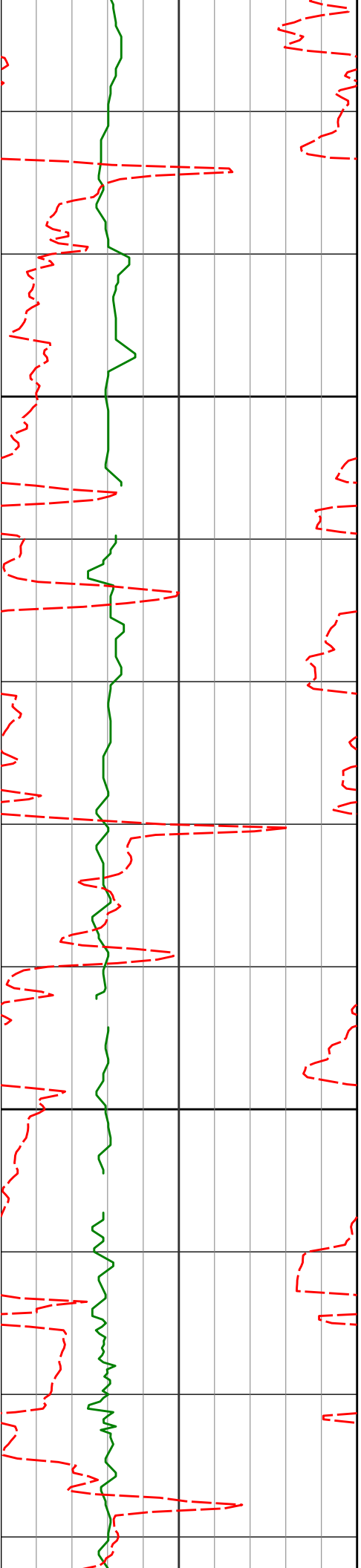
96.42°F

96.98°F

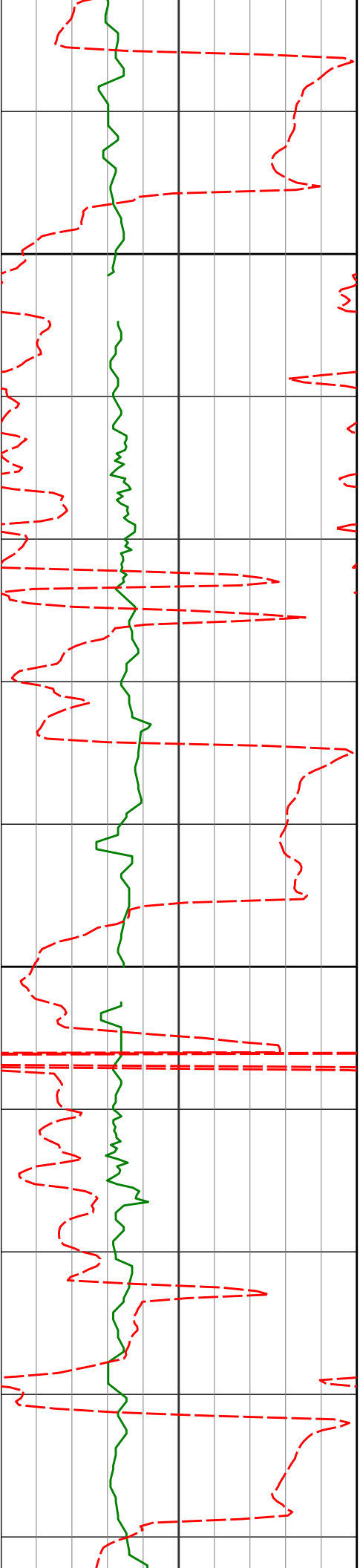
98.51°F

98.51°F

99.72°F



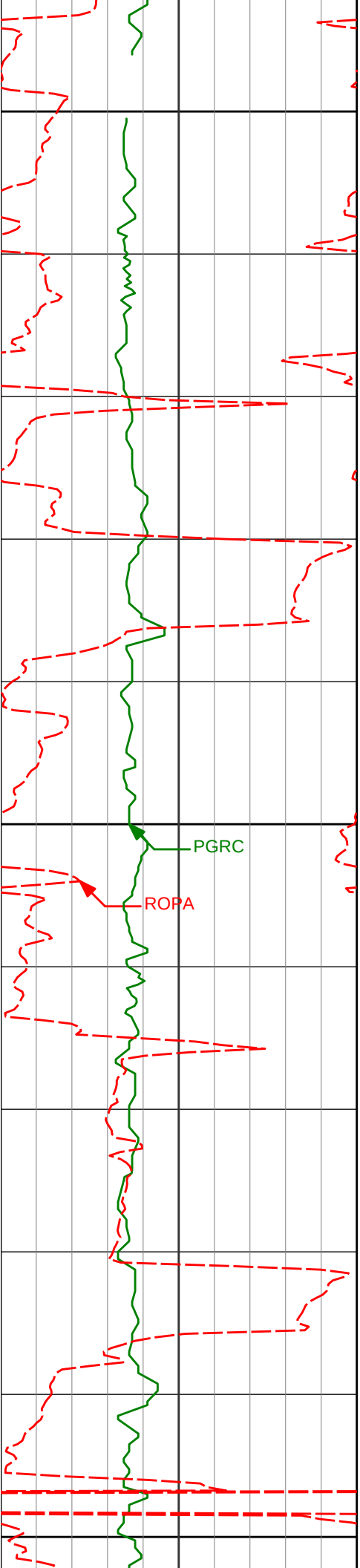
						100.62°F
						100.62°F
3500						
	3506'	8.47°	307.31°	3493.83'	-103.02'	101.61°F
						102.72°F
						102.72°F
3600	3600'	8.73°	307.63°	3586.78'	-111.28'	102.72°F
						102.72°F
						102.72°F



3694'	7.94°	292.26°	3679.79'	-117.79'	102.72°F
					102.72°F
					102.72°F
3788'	5.34°	292.52°	3773.16'	-121.66'	102.72°F
					104.83°F
					104.83°F
					104.83°F
3882'	2.93°	298.98°	3866.90'	-124.34'	

3700

3800



3900

4000

4100

104.83°F

106.97°F

106.97°F

3976' 1.57° 316.45° 3960.83' -126.35'

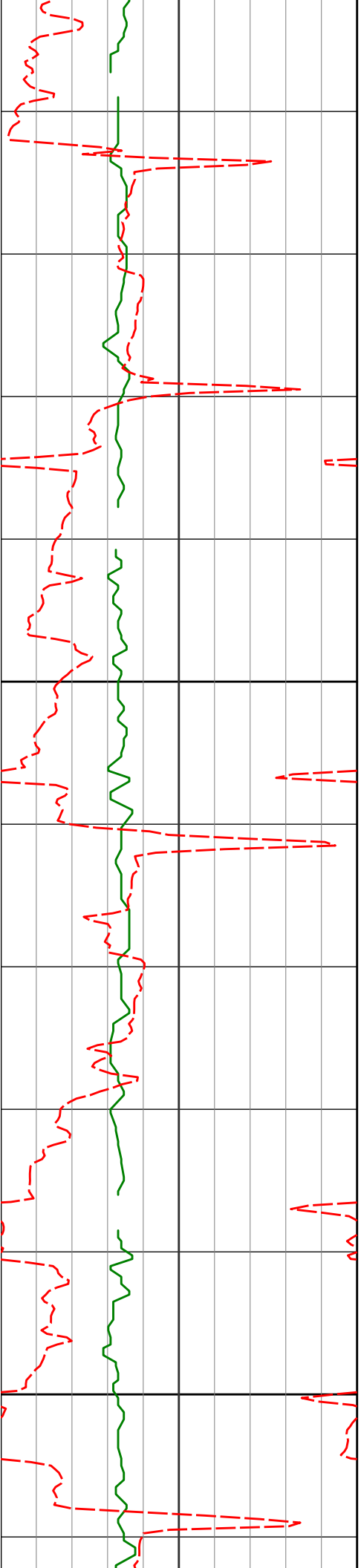
106.97°F

109.09°F

109.32°F

4071' 1.14° 274.92° 4055.81' -127.33'

110.06°F



111.01°F

111.24°F

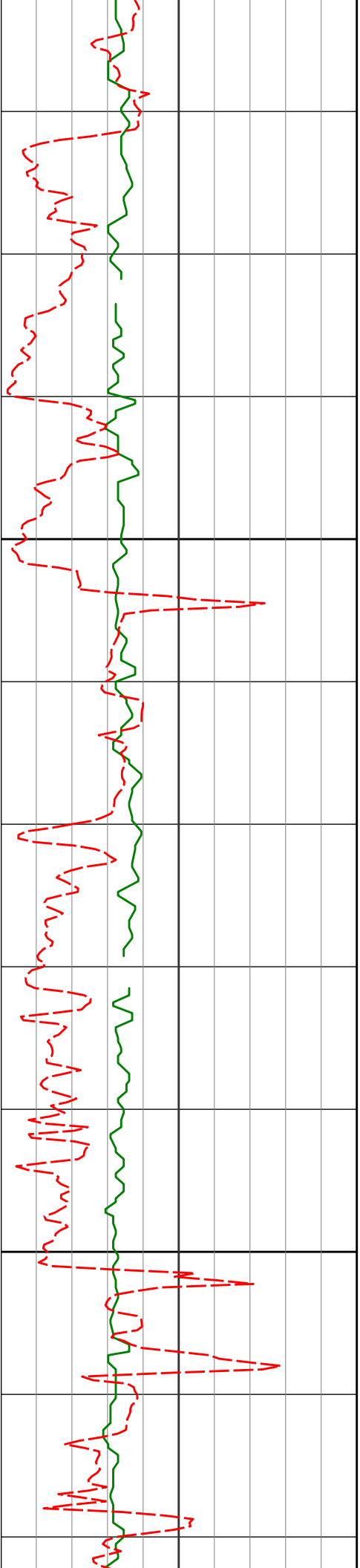
4165'	0.85°	271.12°	4149.79'	-127.38'

4200

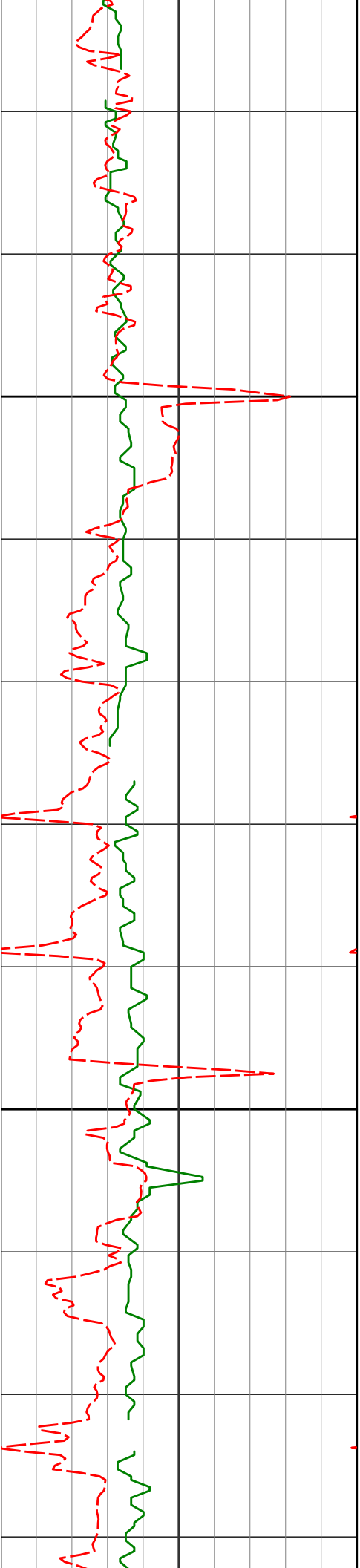
4259'	0.72°	253.92°	4243.78'	-127.20'

4300

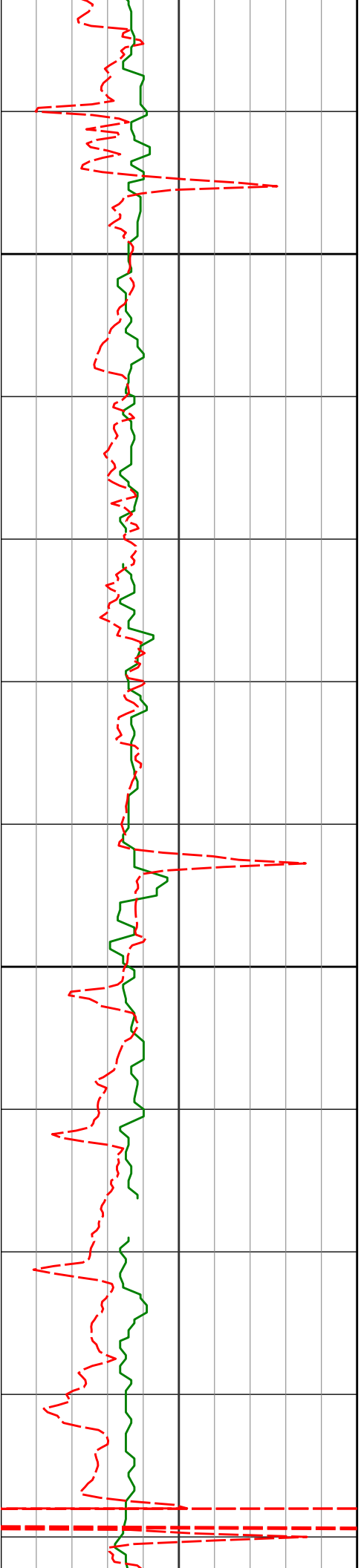
113.40°F



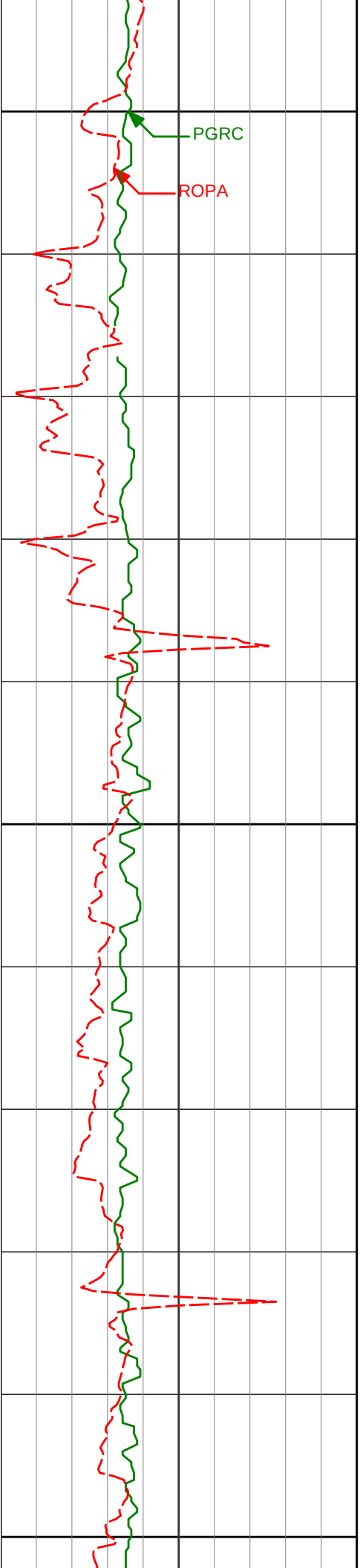
4354'	0.64°	237.15°	4338.78'	-126.72'	115.56°F
					115.56°F
4400					
					115.56°F
4449'	0.62°	217.45°	4433.77'	-126.00'	115.56°F
					117.73°F
4500					117.73°F
					117.73°F
4544'	0.25°	186.14°	4528.77'	-125.37'	



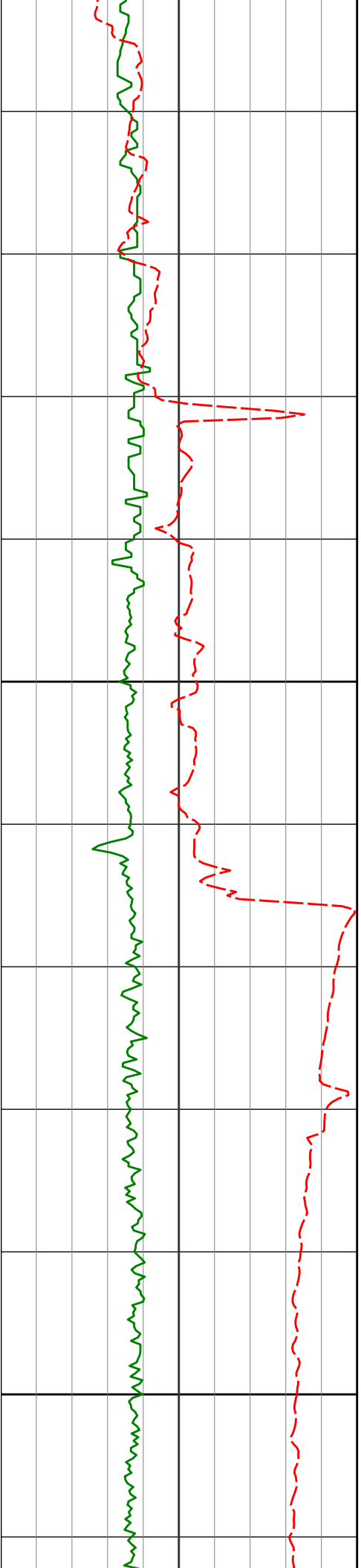
4638'	0.85°	173.43°	4622.76'	-124.48'
4733'	0.81°	160.95°	4717.75'	-123.15'



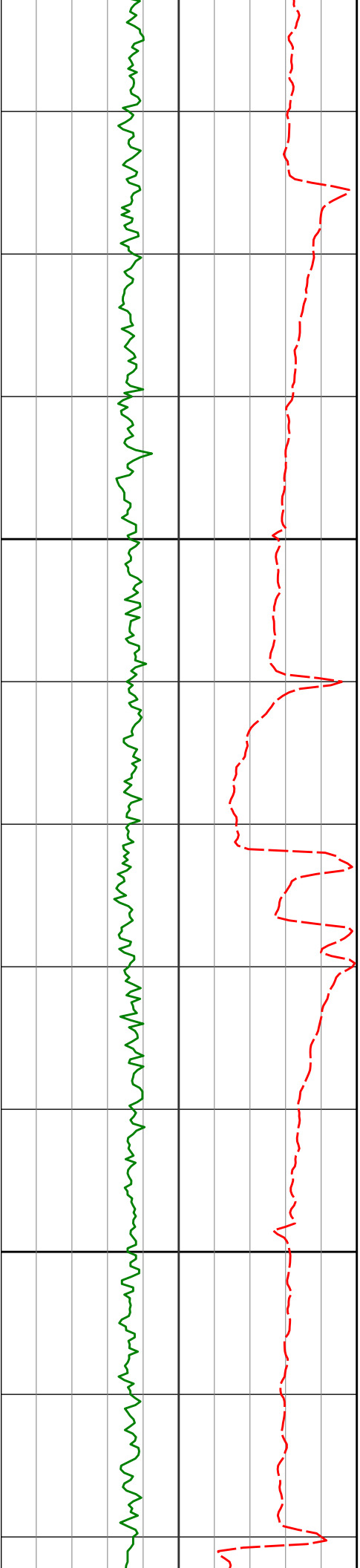
4800						123.18°F
	4828'	1.02°	172.93°	4812.74'	-121.69'	124.30°F
						124.30°F
						124.30°F
4900						
	4923'	0.61°	178.80°	4907.73'	-120.36'	



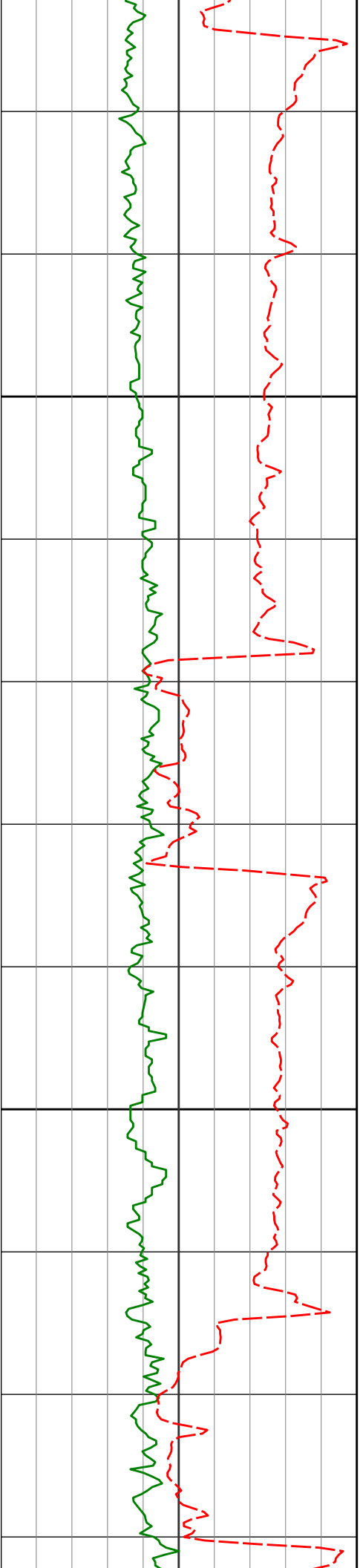
5017'	0.69°	166.71°	5001.73'	-119.31'
5111'	0.71°	149.41°	5095.72'	-118.27'



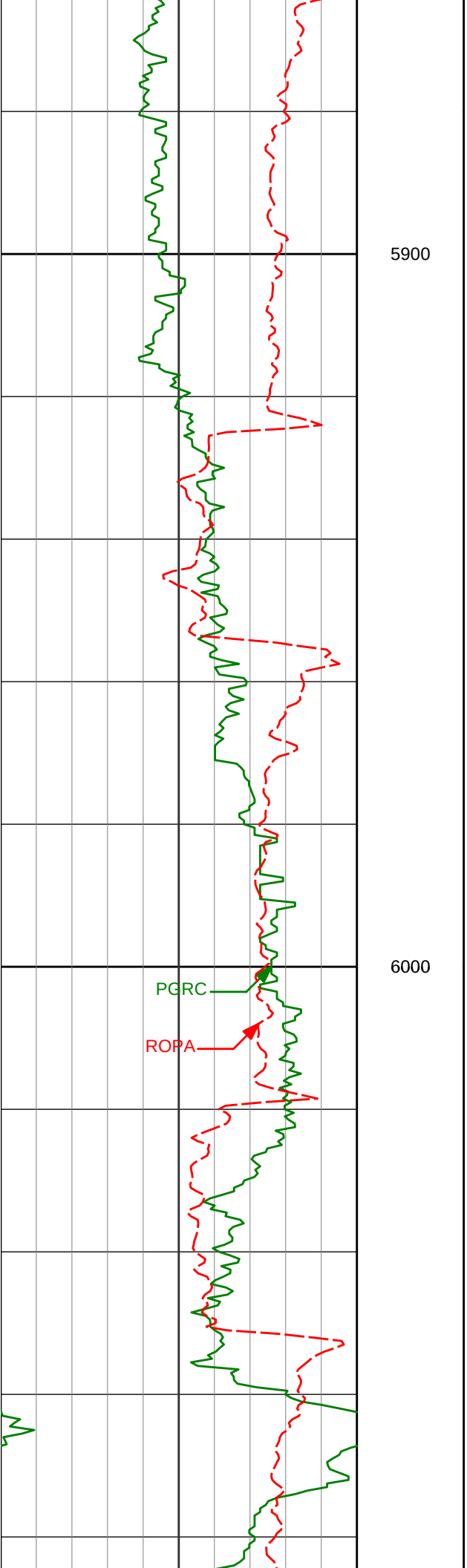
5206'	0.62°	146.44°	5190.71'	-117.36'	132.47°F
					131.42°F
					130.01°F
5300					
5301'	0.42°	87.68°	5285.71'	-116.96'	131.25°F
					133.87°F
					135.36°F
5396'	7.66°	182.74°	5380.43'	-110.65'	
5400					137.72°F



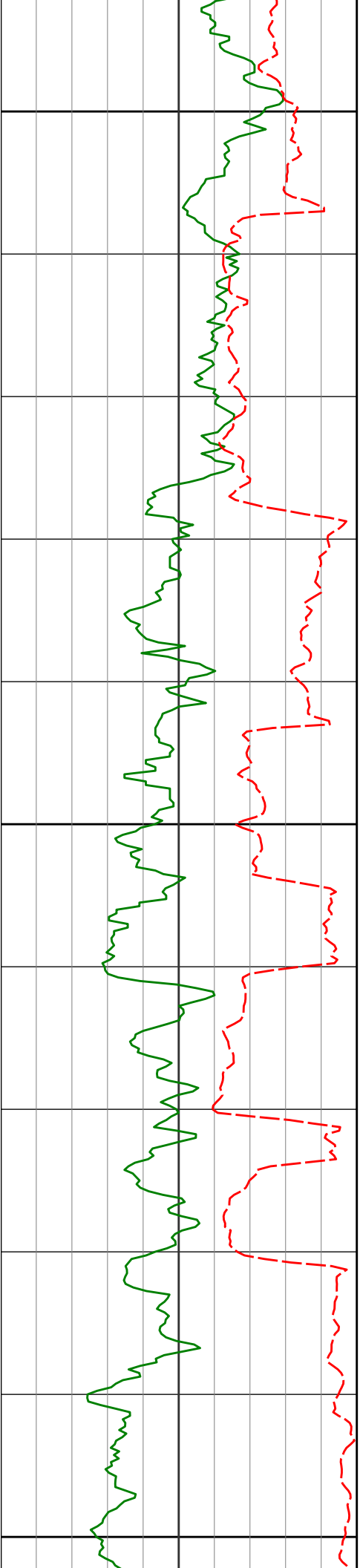
					140.04°F
					142.40°F
5490'	18.72°	180.16°	5471.81'	-89.24'	145.03°F
5500					
					146.41°F
					148.08°F
					149.34°F
5585'	24.63°	176.08°	5560.05'	-54.25'	
5600					
					150.74°F
					151.39°F



5679'	34.73°	177.25°	5641.62'	-7.93'	151.47°F
5700					151.58°F
					152.36°F
					153.63°F
5774'	42.36°	177.27°	5715.86'	51.07'	
					153.79°F
5800					
					153.79°F
					153.79°F



5869'	50.08°	175.29°	5781.54'	119.31'	153.79°F
					154.28°F
					155.16°F
5963'	57.47°	178.07°	5837.06'	194.81'	155.39°F
					155.91°F
					156.13°F
6058'	67.16°	179.64°	5881.15'	278.75'	156.51°F



6100

6200

6300

6153'	75.43°	180.84°	5911.59'	368.63'
6265'	80.26°	180.73°	5935.17'	478.08'

158.15°F

158.47°F

158.57°F

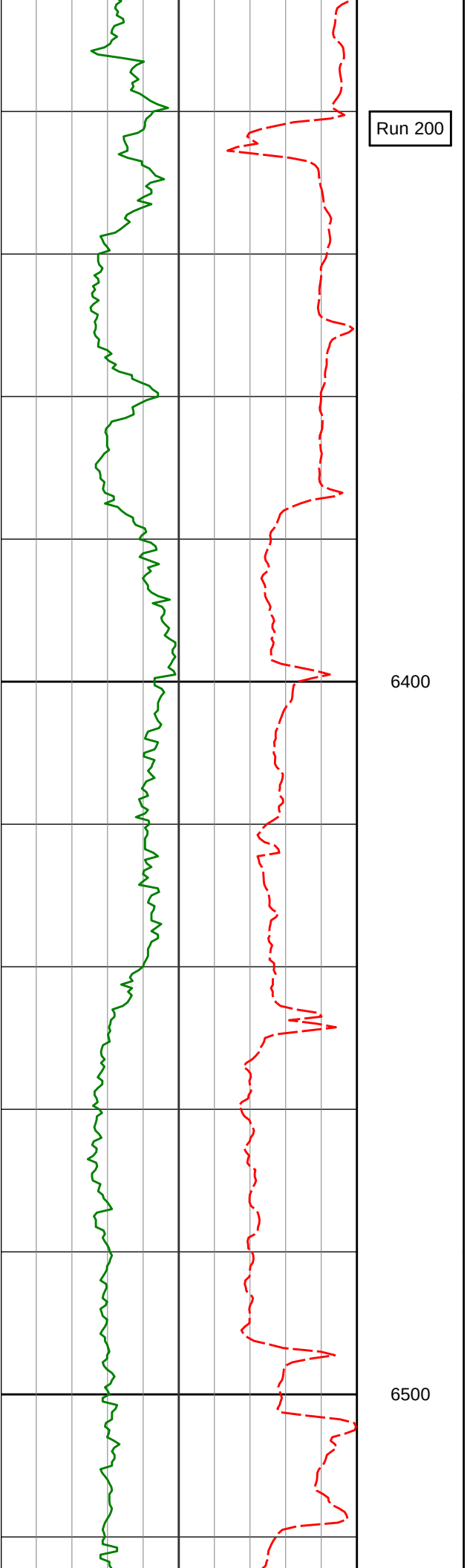
159.58°F

160.67°F

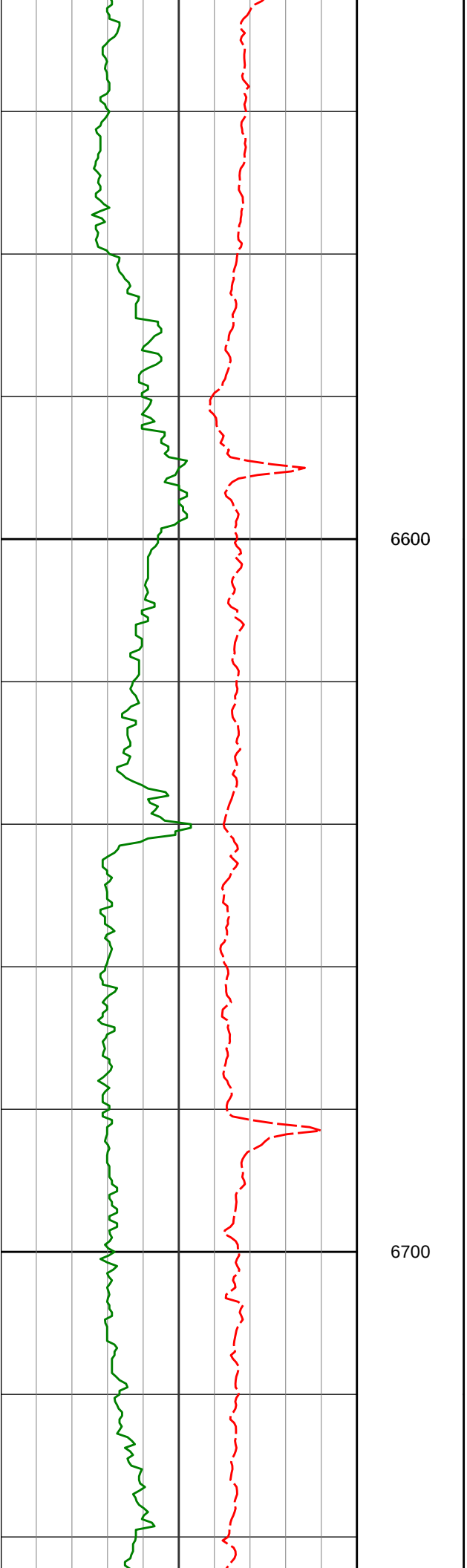
160.83°F

160.83°F

151.73°F



					146.84°F
					147.00°F
6379'	87.69°	179.47°	5947.13'	591.33'	
					148.68°F
					149.01°F
6426'	87.63°	179.09°	5949.05'	638.26'	
					148.44°F
					148.99°F
					151.49°F
6520'	89.72°	179.40°	5951.22'	732.16'	



153.95°F

155.84°F

6600

156.47°F

6614' 89.88° 179.05° 5951.55' 826.08'

158.57°F

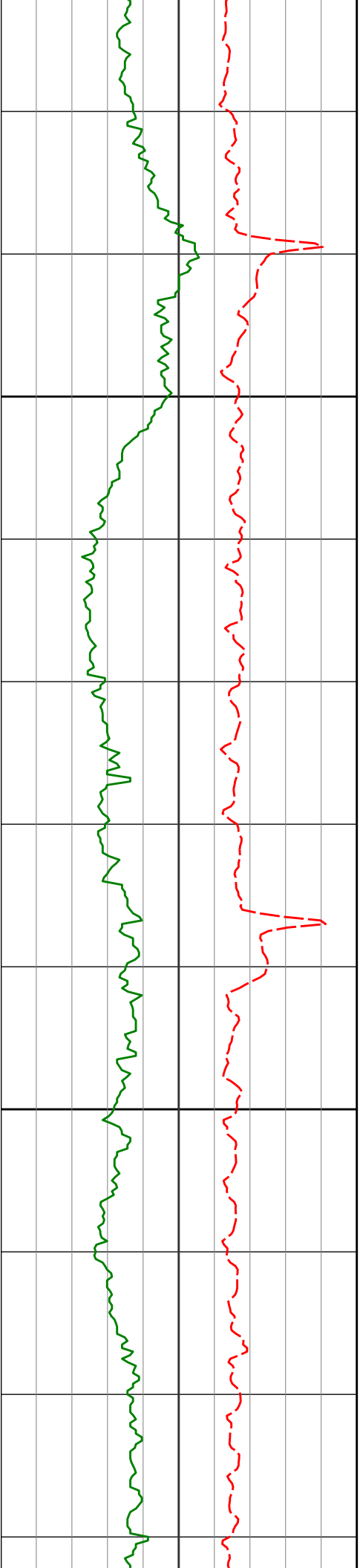
160.41°F

161.00°F

6700

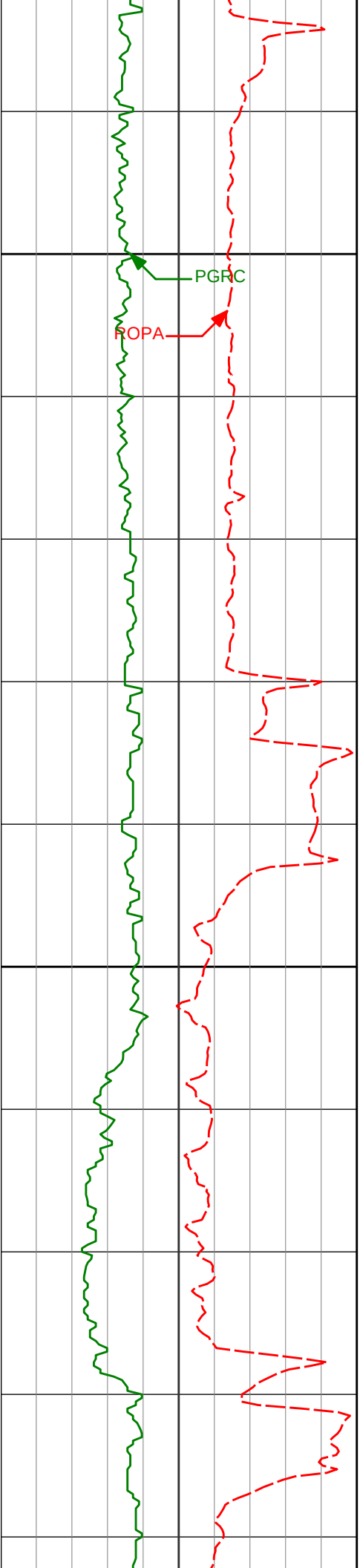
6708' 89.75° 177.67° 5951.85' 919.94'

162.69°F

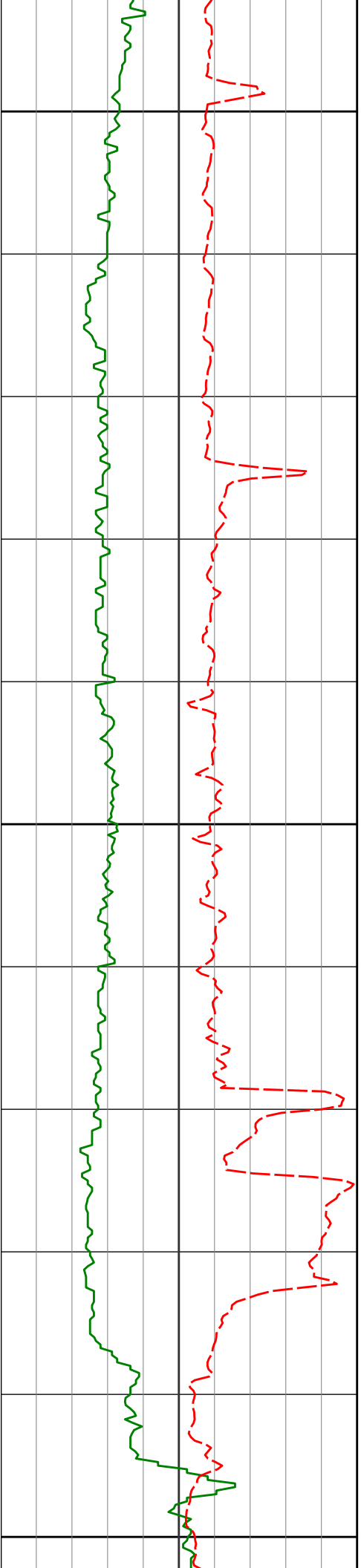


6800	6803'	90.12°	177.48°	5951.96'	1014.72'
6900	6897'	90.43°	177.09°	5951.50'	1108.46'

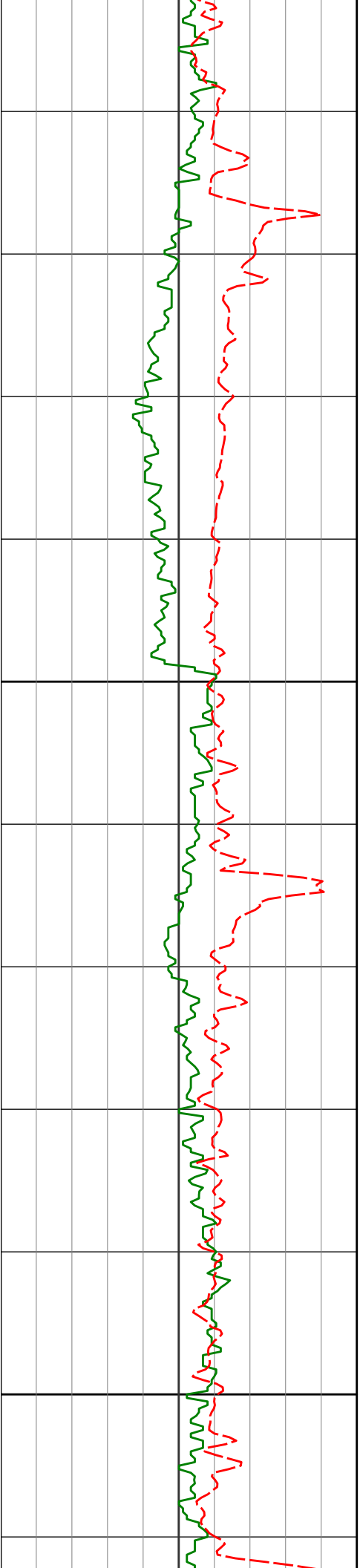
163.48°F
164.95°F
165.84°F
166.92°F
167.97°F
169.32°F
170.45°F
171.59°F



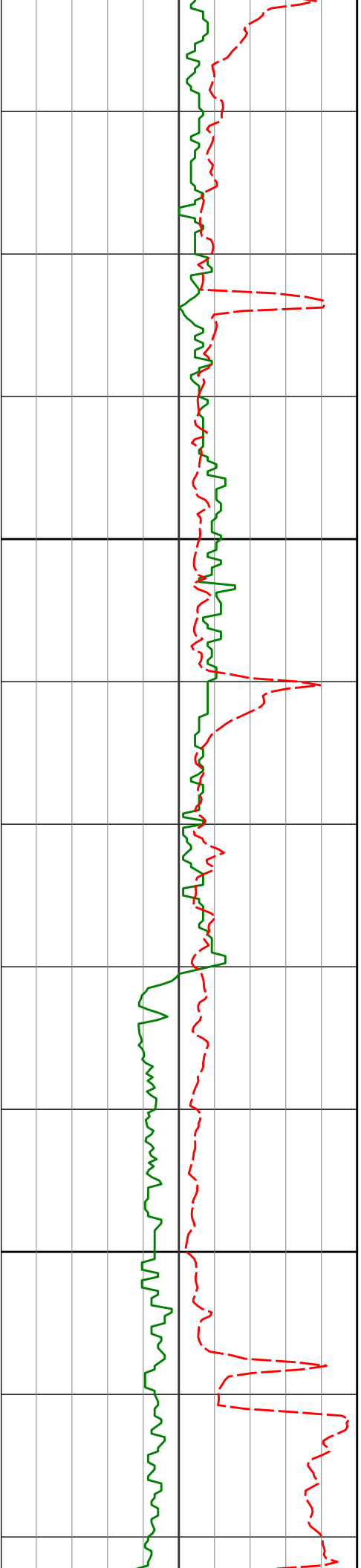
7000					
	6991'	90.65°	176.79°	5950.62'	1202.16'
					171.22°F
					170.49°F
					170.92°F
					172.39°F
	7085'	90.71°	178.72°	5949.50'	1295.95'
7100					
					172.40°F
					173.32°F
					174.97°F
	7179'	89.66°	178.35°	5949.20'	1389.82'



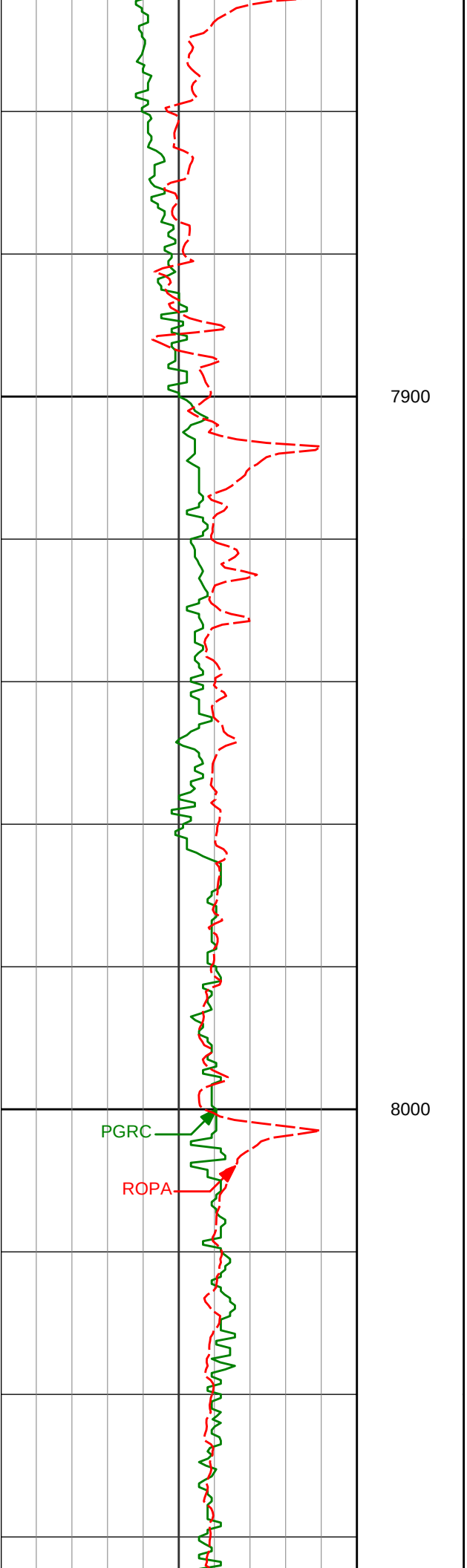
7200					175.52°F
					177.32°F
					177.19°F
	7273'	90.77°	178.68°	5948.85'	1483.69'
					176.10°F
7300					
					176.70°F
					177.92°F
	7368'	89.29°	178.67°	5948.80'	1578.58'
					179.43°F
7400					



					181.64°F
					182.77°F
7462'	89.26°	177.94°	5949.98'	1672.42'	
					184.15°F
7500					185.02°F
					185.02°F
7556'	89.97°	178.20°	5950.62'	1766.25'	
					185.29°F
					186.45°F
7600					
					187.27°F



7651'	89.38°	177.12°	5951.15'	1861.04'	187.48°F
					187.80°F
7700					
					189.53°F
					188.21°F
7745'	89.14°	176.40°	5952.37'	1954.71'	
					186.28°F
7800					186.62°F
					188.19°F
7840'	90.37°	179.14°	5952.77'	2049.50'	



189.84°F

190.26°F

192.05°F

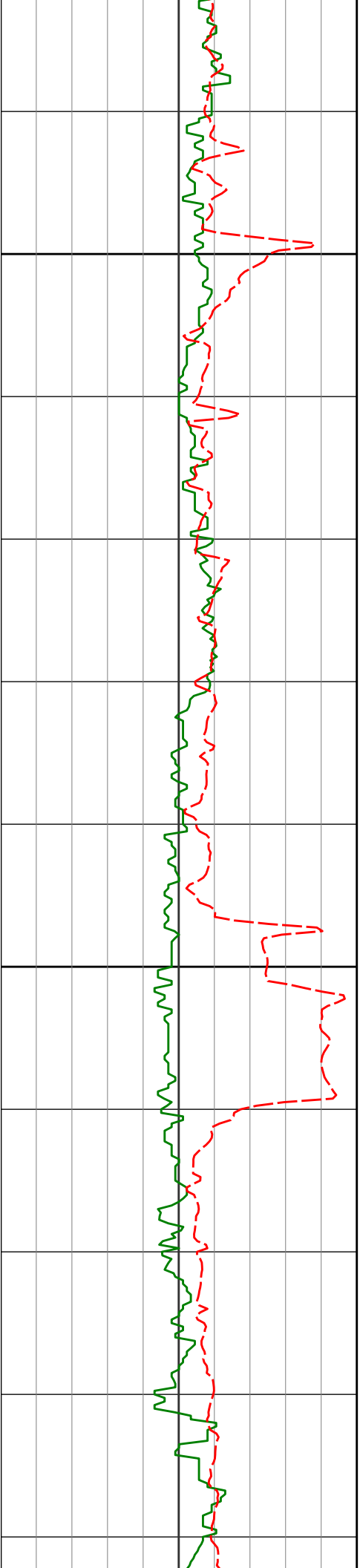
7935' 90.52° 178.54° 5952.03' 2144.39'

192.49°F

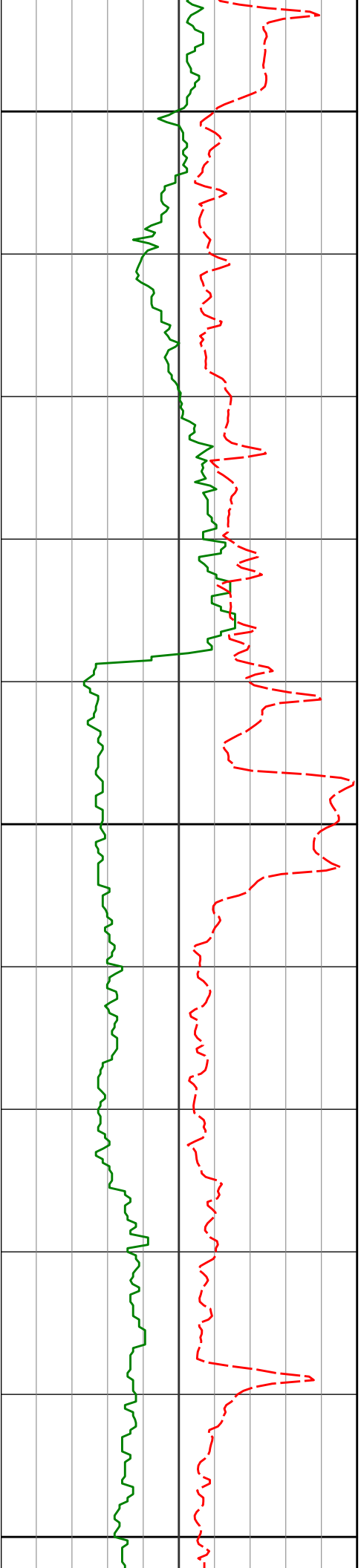
192.49°F

192.74°F

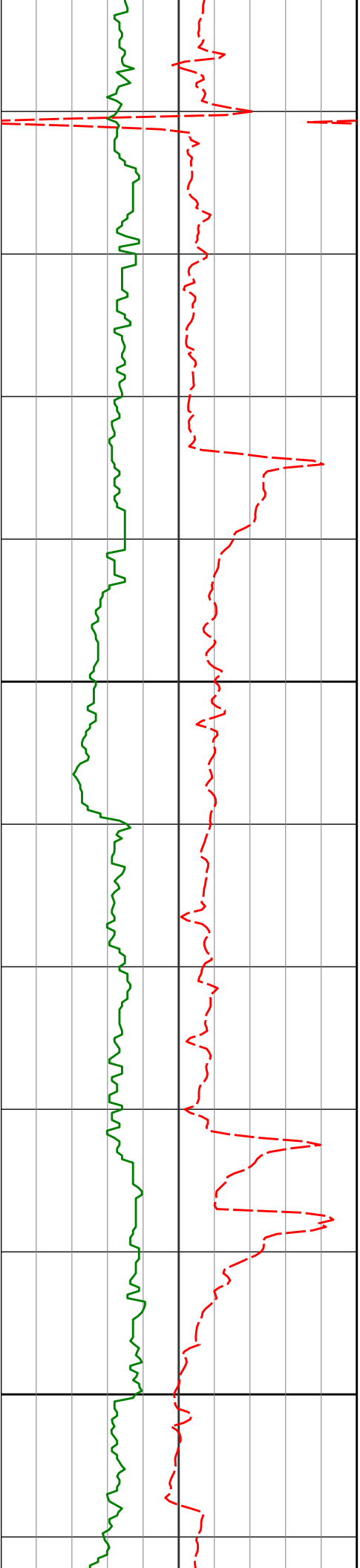
193.93°F



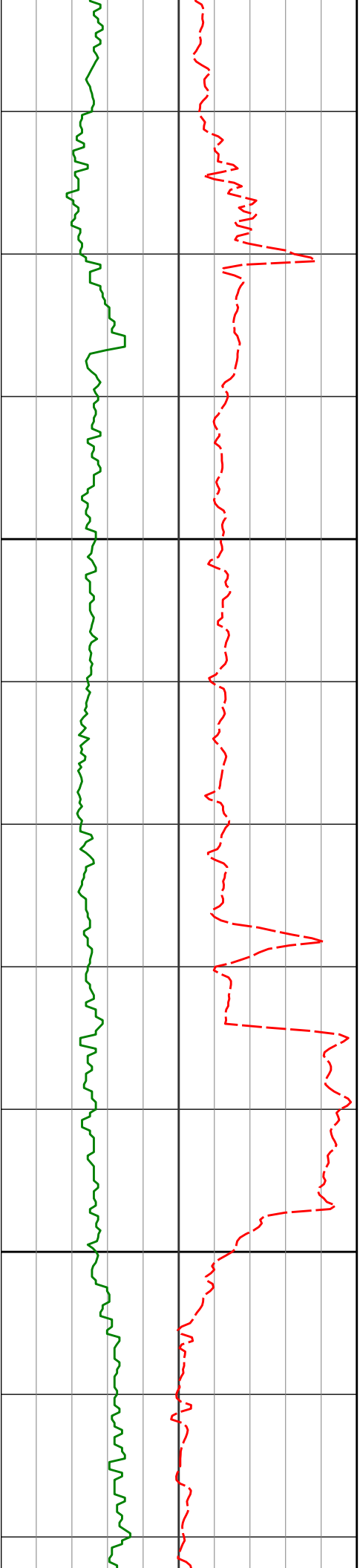
8100					194.81°F
					194.29°F
	8124'	90.37°	177.21°	5950.56'	2333.00'
					192.58°F
					190.99°F
8200					190.95°F
	8219'	91.08°	179.21°	5949.36'	2427.84'
					192.42°F
					193.54°F
					194.68°F



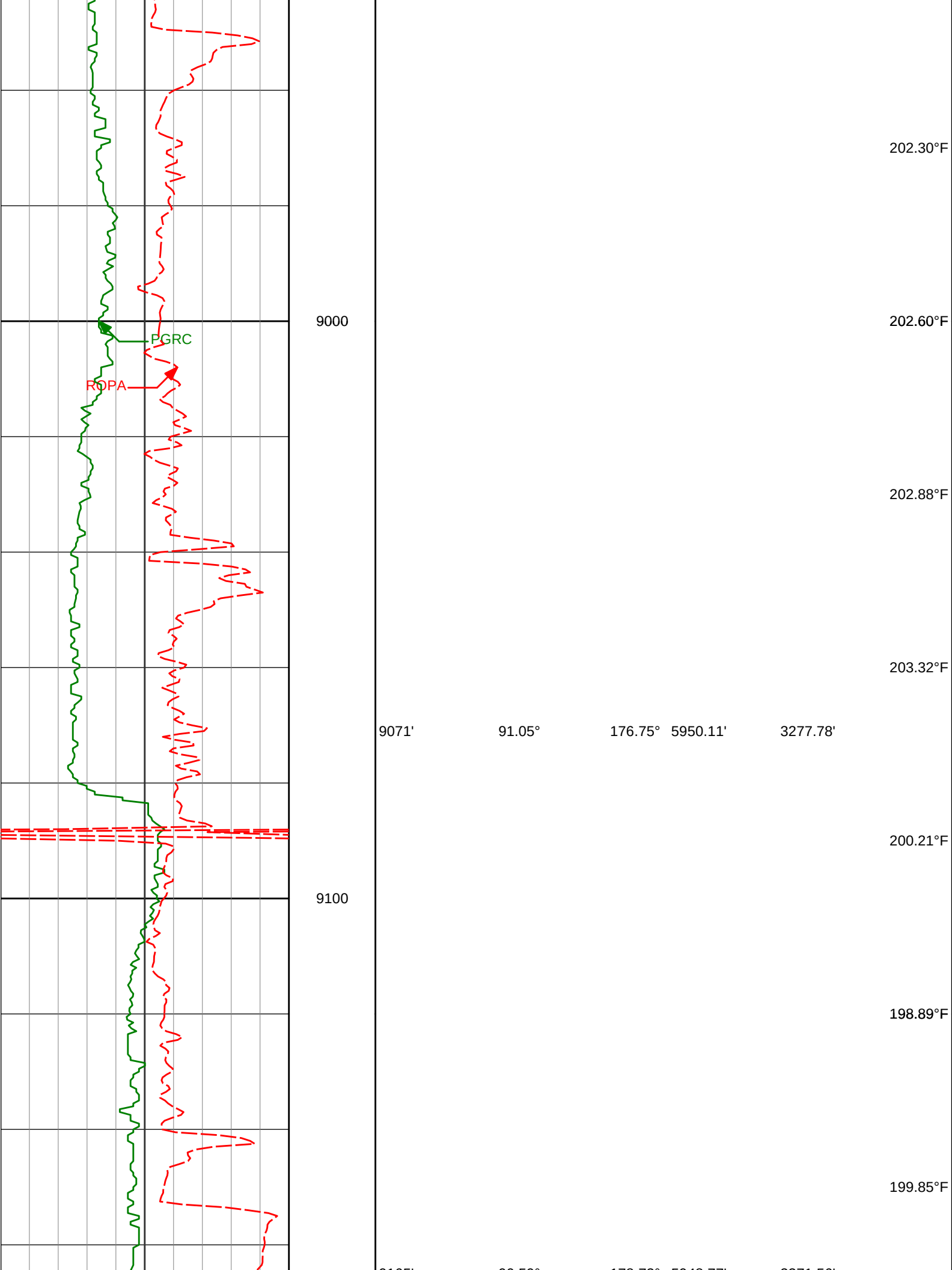
8300					
	8314'	91.26°	178.95°	5947.42'	2522.73'
					193.34°F
					191.41°F
					191.93°F
8400					193.54°F
	8408'	89.38°	178.59°	5946.88'	2616.62'
					195.33°F
					197.17°F
					197.51°F
8500					
	8502'	89.54°	177.97°	5947.77'	2710.47'

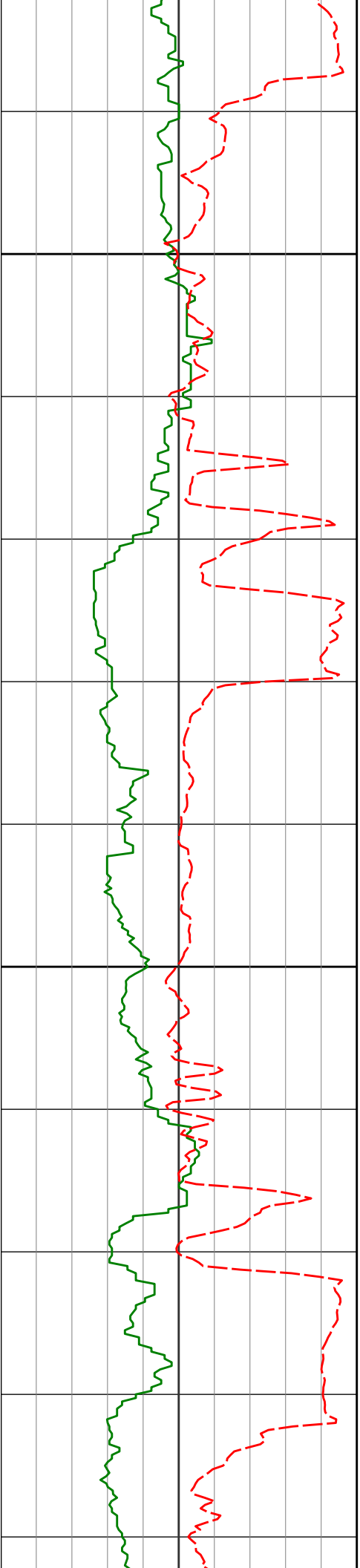


						197.51°F
						197.74°F
						199.22°F
8600	8597'	89.72°	178.06°	5948.38'	2805.29'	
						198.95°F
						198.16°F
						199.02°F
8700	8692'	89.48°	177.39°	5949.05'	2900.08'	
						199.90°F



					200.24°F
					200.95°F
8787'	89.45°	176.14°	5949.94'	2994.75'	199.50°F
8800					
					198.13°F
					197.67°F
8881'	89.41°	177.00°	5950.87'	3088.40'	198.33°F
8900					
					199.82°F
					200.47°F


PGRC
ROPA
9000
9100
202.30°F
202.60°F
202.88°F
203.32°F
200.21°F
198.89°F
199.85°F
9071'
91.05°
176.75°
5950.11'
3277.78'



9165'	90.59°	178.73°	5948.77'	3371.56'
9260'	88.46°	178.30°	5949.56'	3466.43'
9355'	89.78°	179.38°	5951.02'	3561.31'

9200

9300

200.05°F

200.05°F

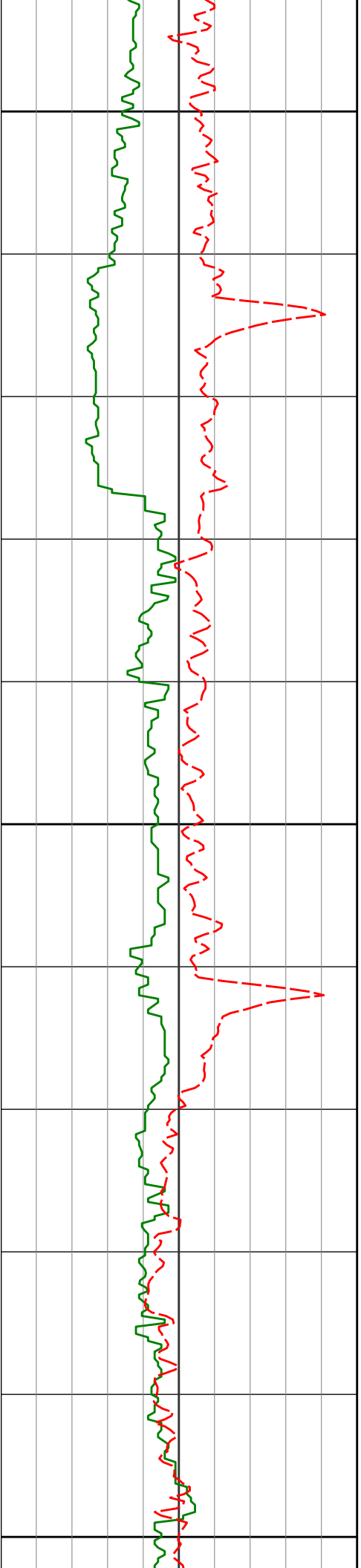
200.37°F

200.96°F

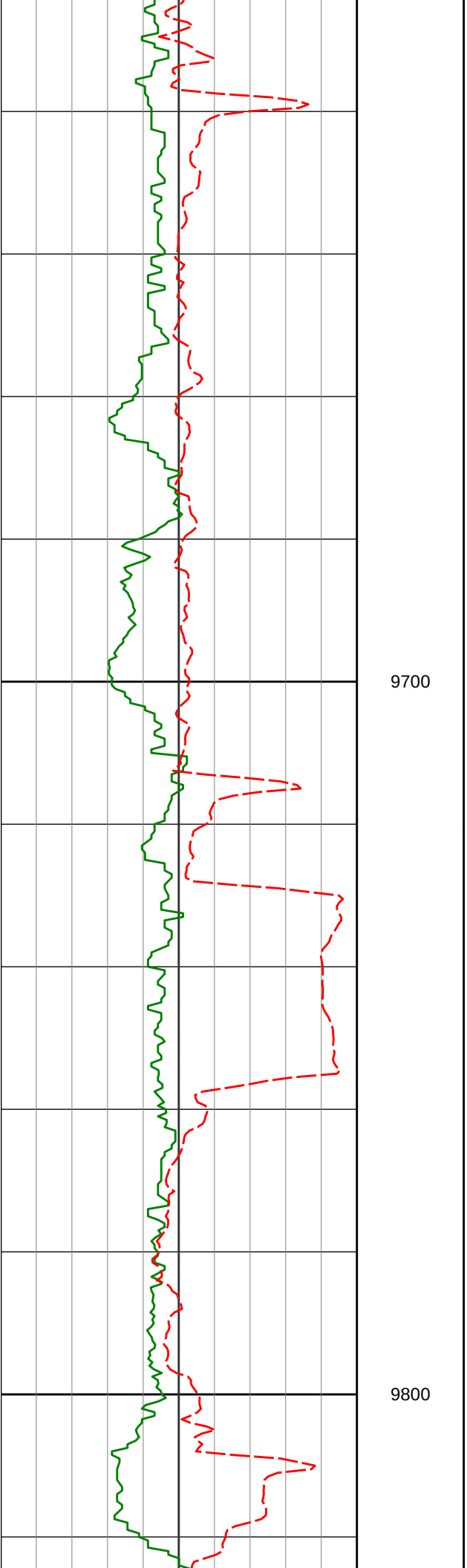
200.35°F

200.58°F

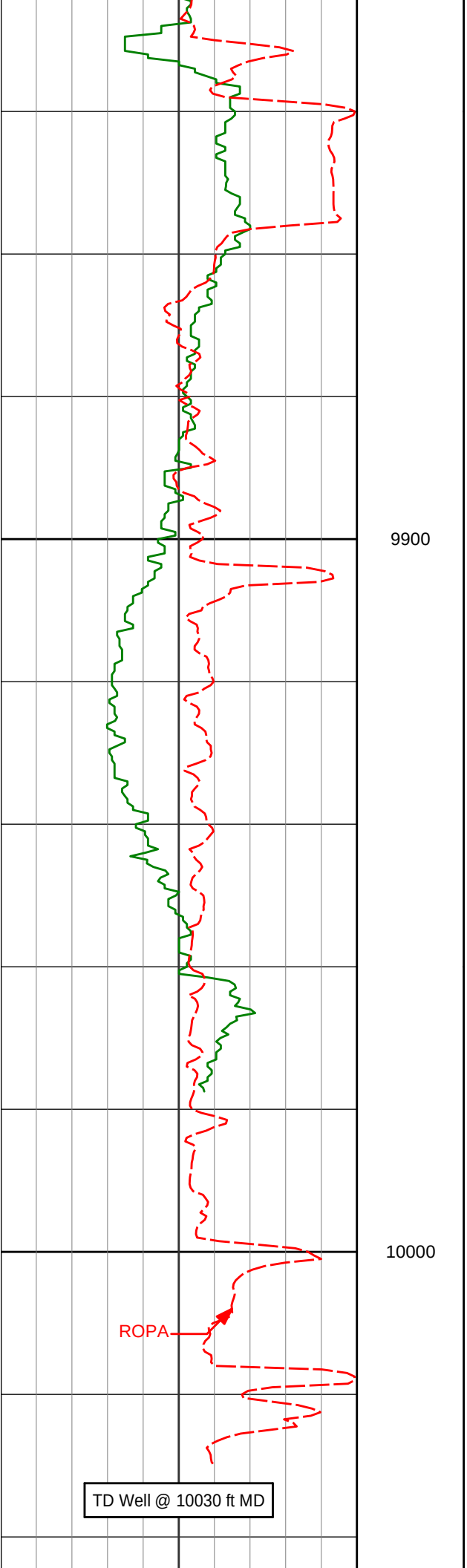
202.37°F



9400					203.23°F
					205.35°F
9450'	91.26°	180.01°	5950.15'	3656.26'	207.02°F
					205.96°F
9500					
					207.73°F
9544'	91.39°	178.48°	5947.97'	3750.16'	209.32°F
					208.47°F
9600					209.87°F



					209.05°F
9639'	92.59°	178.56°	5944.68'	3844.97'	
					207.23°F
					205.71°F
					205.52°F
9734'	91.42°	179.06°	5941.36'	3939.81'	
					206.83°F
					206.28°F
					205.90°F



9828'	90.83°	180.26°	5939.51'	4033.74'	207.32°F
					208.49°F
					210.10°F
					210.31°F
9963'	91.11°	180.93°	5937.22'	4168.70'	**210.31°F**
10030'	91.11°	180.93°	5935.93'	4235.69'	

Avg Rate of Penetration ROPA 1K feet per hr 0	Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
PCG Gamma Ray BCorr PGRC 0 api 300							

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Faith LC34-775
Wattenberg
Weld Colorado
USA
CA-XX-0902972918

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
250.00	0.14	271.87	250.00	0.01 N	0.31 W	-0.00	0.06
500.00	0.29	271.87	500.00	0.04 N	1.24 W	-0.01	0.06
619.00	0.36	271.87	619.00	0.06 N	1.92 W	-0.01	0.06
725.00	0.42	271.87	724.99	0.09 N	2.64 W	-0.02	0.06
819.00	0.37	287.58	818.99	0.19 N	3.27 W	-0.10	0.13
914.00	0.39	307.86	913.99	0.48 N	3.82 W	-0.38	0.14
1103.00	0.46	282.05	1102.98	1.04 N	5.08 W	-0.91	0.11
1198.00	0.54	297.36	1197.98	1.33 N	5.85 W	-1.17	0.16
1292.00	0.39	287.41	1291.98	1.63 N	6.55 W	-1.45	0.18
1384.00	0.47	293.90	1383.97	1.87 N	7.20 W	-1.68	0.10
1476.00	0.43	293.28	1475.97	2.16 N	7.86 W	-1.96	0.05
1567.00	0.28	296.87	1566.97	2.40 N	8.37 W	-2.18	0.17
1750.00	0.22	278.01	1749.97	2.65 N	9.11 W	-2.41	0.06
1842.00	2.30	309.19	1841.94	3.84 N	10.72 W	-3.56	2.30
1933.00	4.50	307.92	1932.78	7.19 N	14.95 W	-6.80	2.42
2116.00	6.21	295.72	2114.98	15.90 N	29.54 W	-15.13	1.12
2299.00	7.15	297.81	2296.73	25.51 N	48.54 W	-24.24	0.53
2482.00	7.58	294.22	2478.22	35.78 N	69.62 W	-33.96	0.34
2574.00	7.34	291.14	2569.44	40.39 N	80.64 W	-38.28	0.50
2665.00	7.47	287.64	2659.68	44.28 N	91.70 W	-41.88	0.51
2757.00	7.79	300.59	2750.88	49.26 N	102.77 W	-46.58	1.90
2849.00	7.35	299.23	2842.07	55.31 N	113.27 W	-52.34	0.52
2940.00	6.84	306.59	2932.38	61.38 N	122.70 W	-58.17	1.14
3035.00	6.50	310.74	3026.74	68.26 N	131.31 W	-64.82	0.62
3129.00	6.43	313.86	3120.14	75.38 N	139.14 W	-71.74	0.38
3222.00	6.71	314.91	3212.53	82.82 N	146.74 W	-78.98	0.32
3317.00	7.89	309.94	3306.76	90.92 N	155.66 W	-86.84	1.41
3411.00	8.19	308.33	3399.84	99.21 N	165.86 W	-94.87	0.40
3506.00	8.47	307.31	3493.83	107.65 N	176.73 W	-103.02	0.33
3600.00	8.73	307.63	3586.78	116.20 N	187.89 W	-111.28	0.28
3694.00	7.94	292.26	3679.79	123.02 N	199.55 W	-117.79	2.50
3788.00	5.34	292.52	3773.16	127.15 N	209.60 W	-121.66	2.76
3882.00	2.93	298.98	3866.90	129.99 N	215.74 W	-124.34	2.61
3976.00	1.57	316.45	3960.83	132.09 N	218.73 W	-126.35	1.61
4071.00	1.14	274.92	4055.81	133.11 N	220.56 W	-127.33	1.09
4165.00	0.85	271.12	4149.79	133.20 N	222.19 W	-127.38	0.32
4259.00	0.72	253.92	4243.78	133.05 N	223.45 W	-127.20	0.28
4354.00	0.64	237.15	4338.78	132.60 N	224.47 W	-126.72	0.22
4449.00	0.62	217.45	4433.77	131.90 N	225.23 W	-126.00	0.23
4544.00	0.25	186.14	4528.77	131.28 N	225.56 W	-125.37	0.45
4638.00	0.85	173.43	4622.76	130.38 N	225.50 W	-124.48	0.64
4733.00	0.81	160.95	4717.75	129.05 N	225.20 W	-123.15	0.19
4828.00	1.02	172.93	4812.74	127.58 N	224.88 W	-121.69	0.30
4923.00	0.61	178.80	4907.73	126.24 N	224.77 W	-120.36	0.44

5017.00	0.69	166.71	5001.73	125.20 N	224.63 W	-119.31	0.17
5111.00	0.71	149.41	5095.72	124.15 N	224.20 W	-118.27	0.22
5206.00	0.62	146.44	5190.71	123.21 N	223.62 W	-117.36	0.10
5301.00	0.42	87.68	5285.71	122.80 N	222.99 W	-116.96	0.56
5396.00	7.66	182.74	5380.43	116.48 N	222.94 W	-110.65	8.11
5490.00	18.72	180.16	5471.81	95.07 N	223.29 W	-89.24	11.78
5585.00	24.63	176.08	5560.05	60.04 N	221.98 W	-54.25	6.42
5679.00	34.73	177.25	5641.62	13.64 N	219.35 W	-7.93	10.76
5774.00	42.36	177.27	5715.86	45.45 S	216.52 W	51.07	8.04
5869.00	50.08	175.29	5781.54	113.83 S	212.00 W	119.31	8.25
5963.00	57.47	178.07	5837.06	189.48 S	207.70 W	194.81	8.22
6058.00	67.16	179.64	5881.15	273.48 S	206.07 W	278.75	10.30
6153.00	75.43	180.84	5911.59	363.38 S	206.47 W	368.63	8.78
6265.00	80.26	180.73	5935.17	472.83 S	207.97 W	478.08	4.32
6379.00	87.69	179.47	5947.13	586.12 S	208.16 W	591.33	6.61
6426.00	87.63	179.09	5949.05	633.08 S	207.57 W	638.26	0.81
6520.00	89.72	179.40	5951.22	727.04 S	206.33 W	732.16	2.25
6614.00	89.88	179.05	5951.55	821.03 S	205.05 W	826.08	0.40
6708.00	89.75	177.67	5951.85	914.99 S	202.36 W	919.94	1.48
6803.00	90.12	177.48	5951.96	1009.90 S	198.34 W	1014.72	0.44
6897.00	90.43	177.09	5951.50	1103.79 S	193.89 W	1108.46	0.53
6991.00	90.65	176.79	5950.62	1197.66 S	188.88 W	1202.16	0.40
7085.00	90.71	178.72	5949.50	1291.57 S	185.19 W	1295.95	2.05
7179.00	89.66	178.35	5949.20	1385.54 S	182.78 W	1389.82	1.18
7273.00	90.77	178.68	5948.85	1479.51 S	180.35 W	1483.69	1.23
7368.00	89.29	178.67	5948.80	1574.48 S	178.15 W	1578.58	1.56
7462.00	89.26	177.94	5949.98	1668.43 S	175.37 W	1672.42	0.78
7556.00	89.97	178.20	5950.62	1762.37 S	172.20 W	1766.25	0.80
7651.00	89.38	177.12	5951.15	1857.29 S	168.31 W	1861.04	1.29
7745.00	89.14	176.40	5952.37	1951.13 S	163.00 W	1954.71	0.81
7840.00	90.37	179.14	5952.77	2046.05 S	159.30 W	2049.50	3.16
7935.00	90.52	178.54	5952.03	2141.02 S	157.37 W	2144.39	0.65
8124.00	90.37	177.21	5950.56	2329.88 S	150.35 W	2333.00	0.71
8219.00	91.08	179.21	5949.36	2424.82 S	147.38 W	2427.84	2.24
8314.00	91.26	178.95	5947.42	2519.79 S	145.86 W	2522.73	0.34
8408.00	89.38	178.59	5946.88	2613.76 S	143.84 W	2616.62	2.04
8502.00	89.54	177.97	5947.77	2707.72 S	141.01 W	2710.47	0.67
8597.00	89.72	178.06	5948.38	2802.66 S	137.73 W	2805.29	0.22
8692.00	89.48	177.39	5949.05	2897.58 S	133.96 W	2900.08	0.76
8787.00	89.45	176.14	5949.94	2992.42 S	128.60 W	2994.75	1.31
8881.00	89.41	177.00	5950.87	3086.25 S	122.98 W	3088.40	0.92
9071.00	91.05	176.75	5950.11	3275.96 S	112.64 W	3277.78	0.87
9165.00	90.59	178.73	5948.77	3369.87 S	108.93 W	3371.56	2.15
9260.00	88.46	178.30	5949.56	3464.83 S	106.46 W	3466.43	2.28
9355.00	89.78	179.38	5951.02	3559.80 S	104.54 W	3561.31	1.80
9450.00	91.26	180.01	5950.15	3654.79 S	104.03 W	3656.26	1.70
9544.00	91.39	178.48	5947.97	3748.75 S	102.79 W	3750.16	1.64
9639.00	92.59	178.56	5944.68	3843.66 S	100.34 W	3844.97	1.27
9734.00	91.42	179.06	5941.36	3938.58 S	98.37 W	3939.81	1.34
9828.00	90.83	180.26	5939.51	4032.56 S	97.82 W	4033.74	1.42
9963.00	91.11	180.93	5937.22	4167.53 S	99.23 W	4168.70	0.54
10030.00	91.11	180.93	5935.93	4234.51 S	100.32 W	4235.69	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 181.49 DEGREES (GRID)
A TOTAL CORRECTION OF 7.06 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10030.00 FEET
IS 4235.70 FEET ALONG 181.36 DEGREES (GRID)

Final Survey is a Straightline Projection to Bit

Date Printed:01 March 2016