

**PCG Pressure Case Gamma Ray
PCDC Pressure Case Directional**


Country : USA			
Field : Redtail			
Location : Lat: 40° 51' 15.18" North Long: 103° 50' 7.70" West			
Well : Razor 11F-0205A			
Company : Whiting Oil and Gas			
Rig : Frontier 26			
LOCATION		Company : Whiting Oil and Gas	
Latitude : 40° 51' 15.18" North Longitude : 103° 50' 7.70" West		Rig : Frontier 26	
UTM Easting = 3,460,454.940 ft UTM Northing = 1,558,361.830 ft		Well : Razor 11F-0205A	
		Field : Redtail	
		Country : USA	
API Number : 05-123-38701			
		Other Services	
		Directional Drilling	

Permanent Datum : Ground Level	Elevation : 4988.60 ft	Elev. KB NA
Log Measured From : Drill Floor	22.00 ft Above Permanent Datum	DF 5010.60 ft
Drilling Measured From : Drill Floor	MD LOG	GL 4988.60 ft
		WD NA

Depth Logged : 81.00 ft	To 13,662.00 ft	Unit No. : 11581668	Job No. : CA-XX-0901932192
Date Logged : 18-Feb-15	To 27-Feb-15		
Total Depth MD : 13,662.00 ft	TVD : 6,119.99 ft	Plot Type : Final	
Spud Date : 18-Feb-15		Plot Date : 27-Feb-15	

Run No.	Borehole Record (MD)			Casing Record (MD)			
	Size	From	To	Size	Weight	From	To
0100	13,500 in	81.00 ft	1,882.00 ft	9.625 in	36.00 lbpf	SURFACE	1,862.00 ft
0200	8,750 in	1,882.00 ft	6,585.00 ft	7.000 in	29.00 lbpf	SURFACE	6,550.00 ft
0300	6,125 in	6,585.00 ft	13,662.00 ft				

Max Tool Temp (degF) / Source	106.97 / PCM	175.21 / PCM	N/A / N/A		
Rm @ Max Tool Temp (degF)	NA @ 106.97	N/A @ 175.21	N/A @ 236.82		
Lead MWD Engineer	Cody Wurdeman	Cody Wurdeman	Cody Wurdeman		
Customer Representative	Kennith Wilkerson	Kennith Wilkerson	Kennith Wilkerson		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	12463931	12463931	12463933		
Insert Serial Number	11145604	11145582	11145604		
Date and Time Initialized	17-Feb-15 20:24	19-Feb-15 06:31	22-Feb-15 08:10		
Date and Time Read	18-Feb-15 19:04	21-Feb-15 20:32	27-Feb-15 06:03		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	55.00	40.09	41.52		
Software Version	6.33	6.21	6.33		
Sub Serial Number	12463931	12463931	12463933		
Sonde Serial Number	11638628	10993516	11638628		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	133.00	70.30	136.89		

Gamma Ray Sensor Information

Tool Type		PCG	PCG		
Distance From Bit (ft)		48.94	36.42		
Recorded Sample Period (sec)		10	10		
Software Version		8.15	8.15		
Sub Serial Number		12463931	12463933		
Insert/Sonde Serial Number		12037413	11681081		

REMARKS

1. All depths are measured bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.

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

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

4. All data is stored data unless otherwise specified.

5. The following smoothing parameters have been applied to the data:

PCG Gamma Ray BCorr (PGRC)
Interval Resolution: .5
Interval Distance: .6
Gap Fill: 3

Average Rate of Penetration (ROPA)
Interval Resolution: .5
Interval Distance: 1.2
Gap Fill: 3

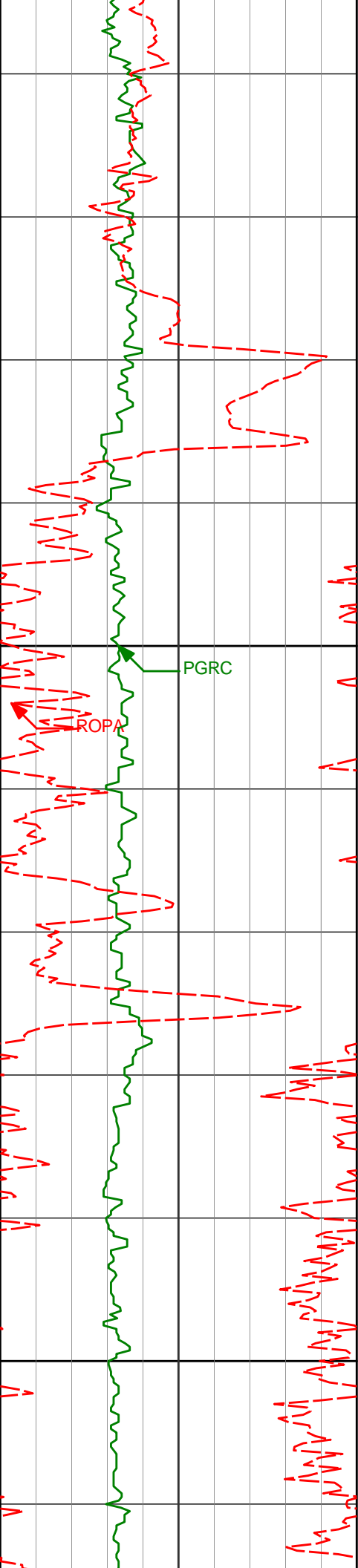
WARRANTY

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HALLIBURTON
Sperry Drilling Services
MD Main Log 1:240

Whiting Oil and Gas
Razor 11F-0205A
Frontier 26
Sec. 11-T10N-R58W

PCG Gamma Ray BCorr PCG Gamma Ray BCorr api								
0		300						
Avg Rate of Penetration Avg Rate of Penetration feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	DLS
500		0						
PGRC		Run 200	1825'	11.65°	221.92°	1808.22'	-165.55'	0.28°
		1900						



2000

2100

1917'

2009'

2100'

11.42°

11.59°

10.79°

220.05°

205.81°

201.41°

1898.36'

1988.53'

2077.80'

-178.60'

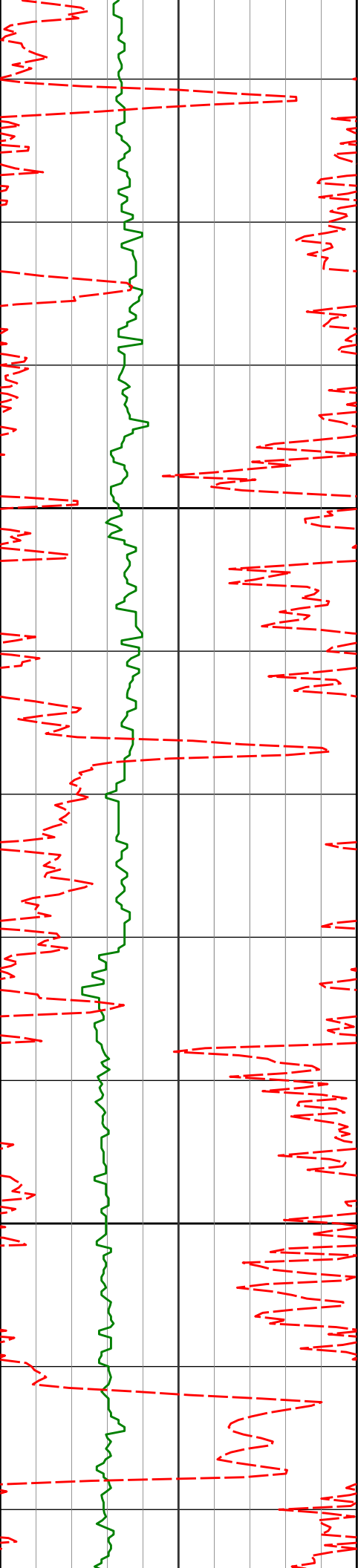
-193.19'

-208.84'

0.48°

3.09°

1.29°



2200

2300

2192'

10.58°

200.52°

2168.21'

-224.32'

0.29°

2283'

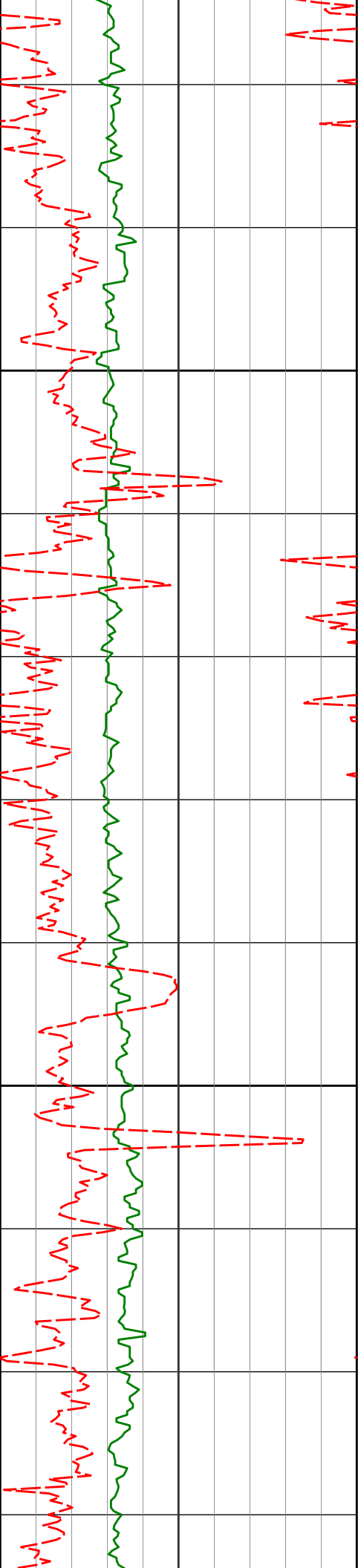
10.29°

198.84°

2257.70'

-239.43'

0.46°



2400

2500

2375'

11.97°

208.89°

2347.98'

-255.04'

2.78°

2466'

11.38°

207.89°

2437.09'

-270.61'

0.69°

2558'

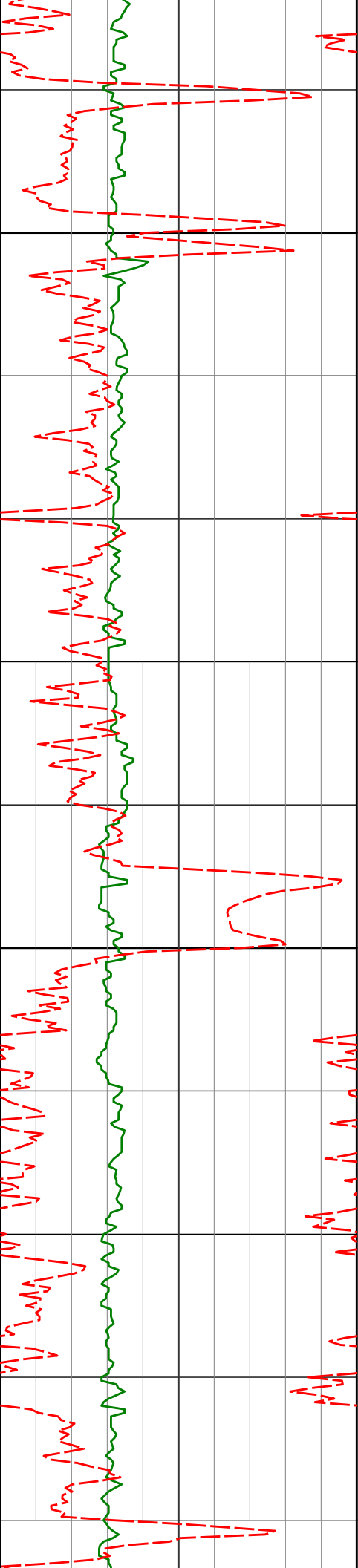
10.39°

207.30°

2527.44'

-285.43'

1.08°



2600

2700

2649'

9.96°

205.31°

2617.01'

-299.33'

0.61°

2741'

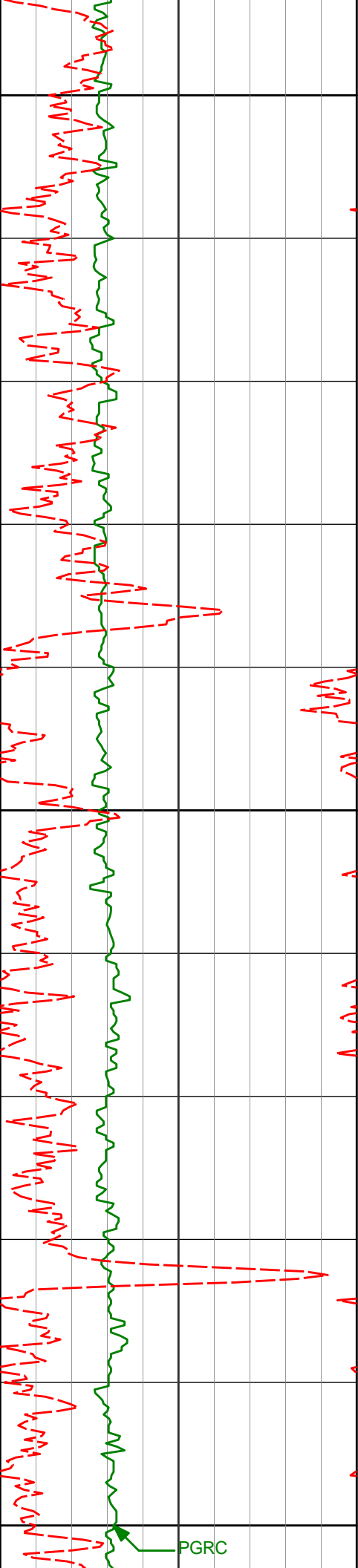
12.62°

208.86°

2707.22'

-314.73'

2.99°



2800

2833'

12.42°

209.15°

2797.03'

-331.49'

0.23°

2900

2924'

12.25°

207.23°

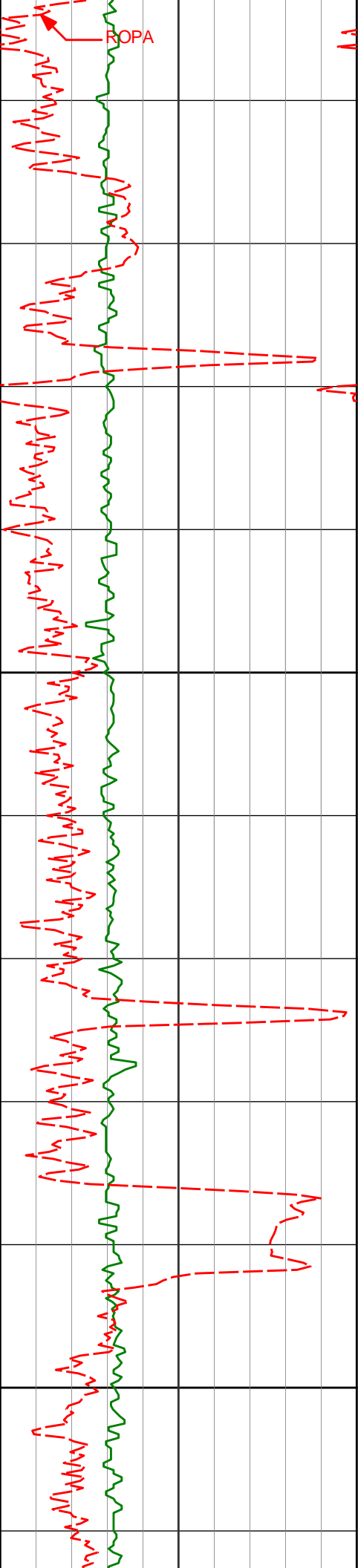
2885.93'

-347.96'

0.49°

3000

PGRC



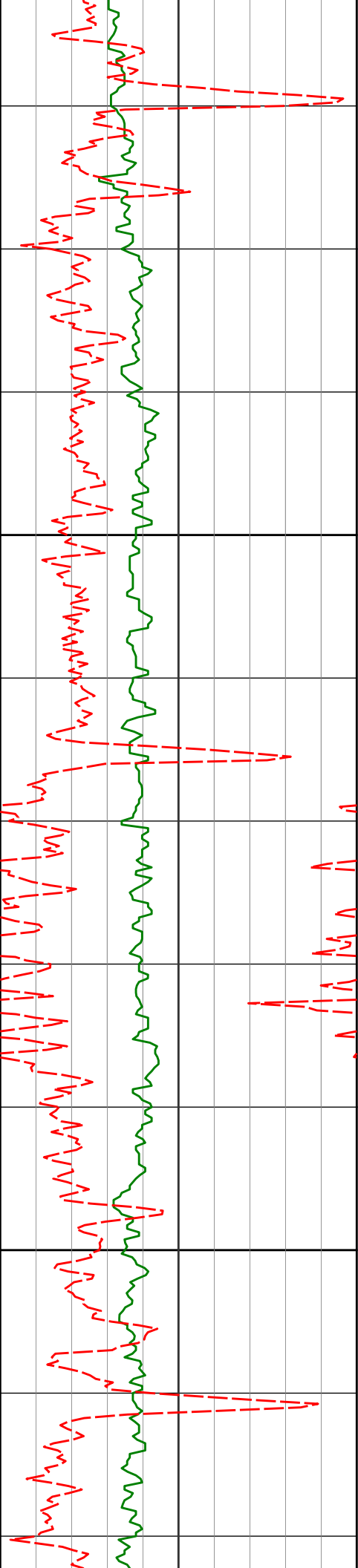
3016'	12.23°	204.74°	2975.84'	-364.88'	0.57°
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3100

3107'	12.34°	203.28°	3064.76'	-382.00'	0.36°
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3200

3199'	12.66°	212.79°	3154.59'	-398.84'	2.26°
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3300

3290'

11.63°

208.35°

3243.55'

-414.60'

1.53°

3400

3382'

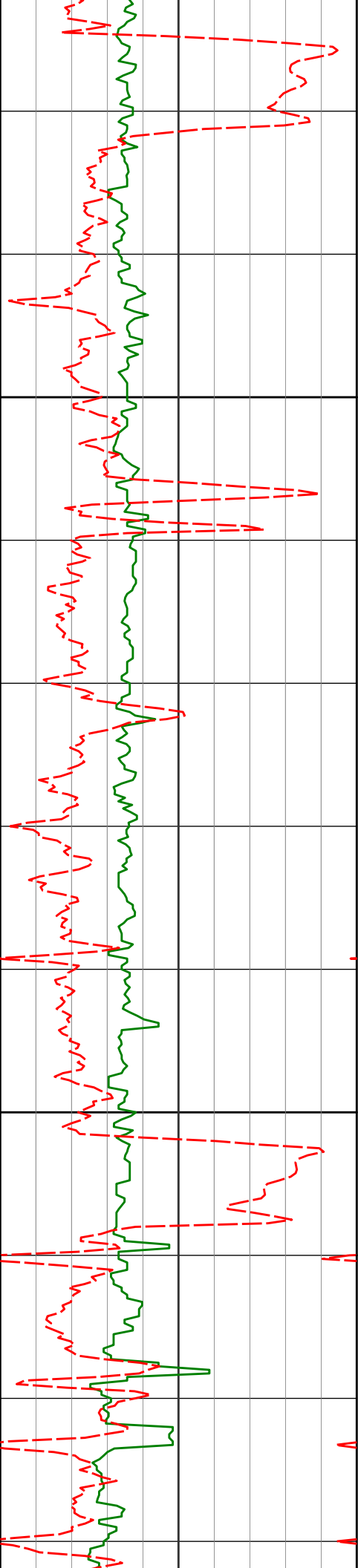
9.67°

200.31°

3333.97'

-429.50'

2.67°



3500

3600

3474'

10.20°

207.40°

3424.59'

-443.51'

1.45°

3565'

10.02°

205.94°

3514.18'

-457.27'

0.34°

3656'

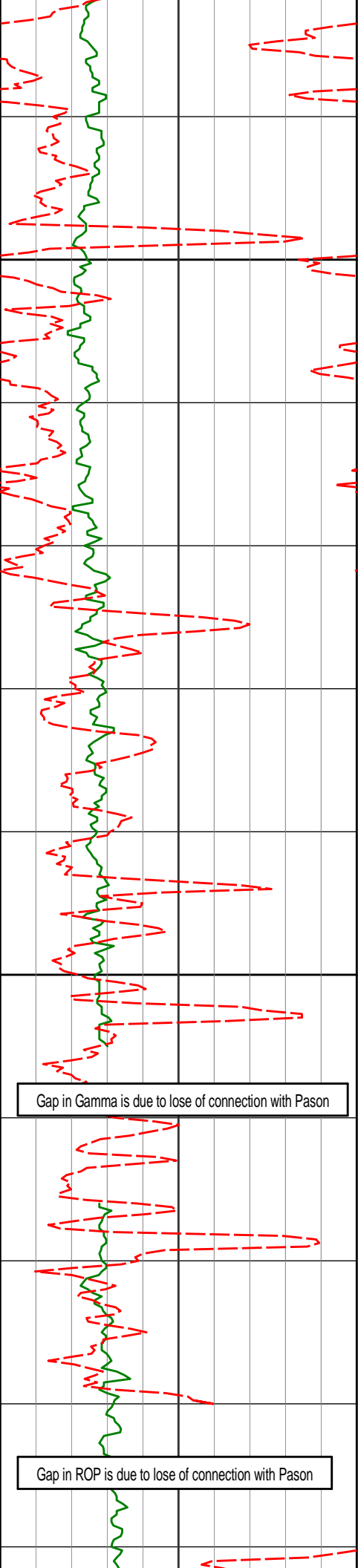
11.42°

211.40°

3603.59'

-471.50'

1.90°



3700

3748'

11.86°

211.07°

3693.70'

-486.69'

0.48°

3800

Gap in Gamma is due to lose of connection with Pason

3839'

12.21°

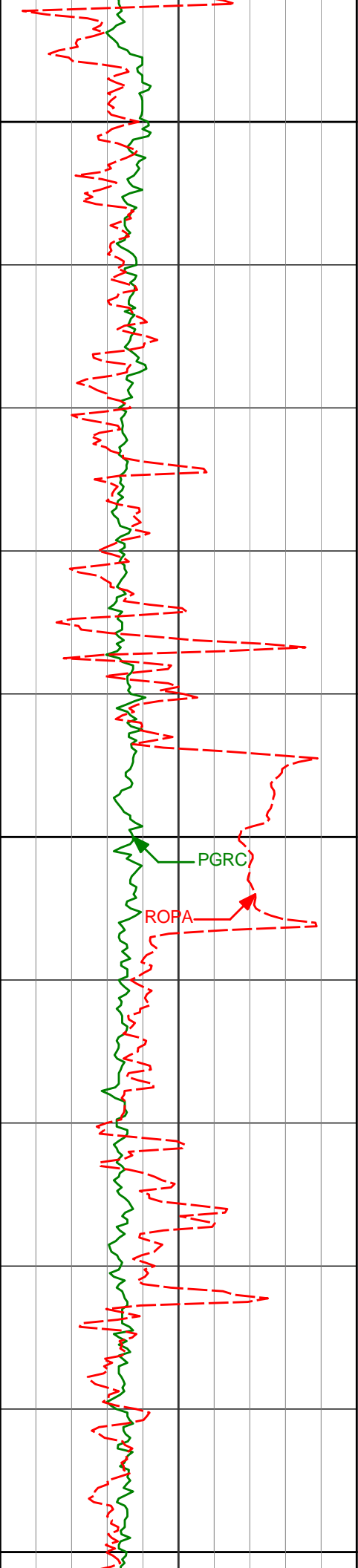
211.31°

3782.70'

-502.23'

0.39°

Gap in ROP is due to lose of connection with Pason



3900

3930'

11.30°

210.87°

3871.79'

-517.42'

1.00°

4000

PGRC

ROPA

4021'

14.09°

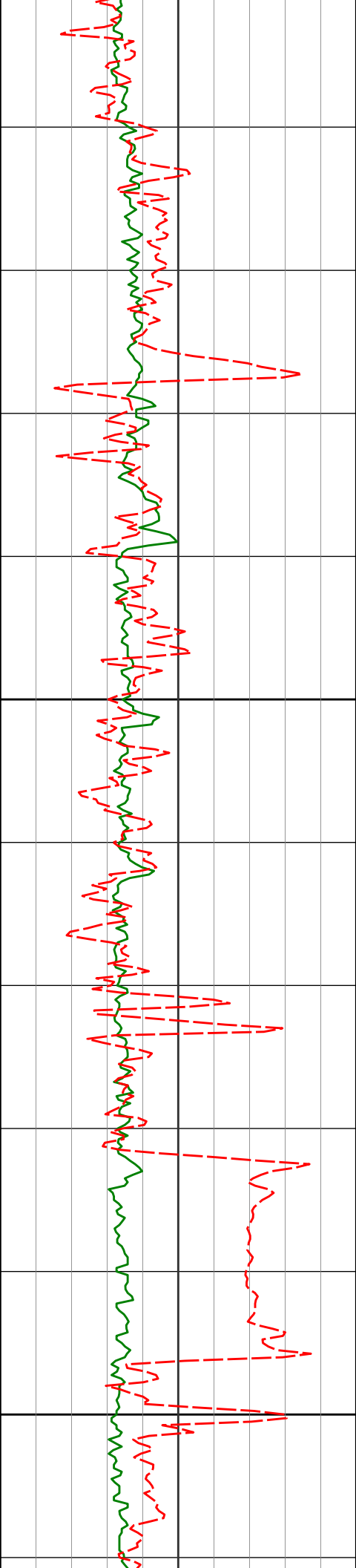
211.93°

3960.55'

-533.74'

3.08°

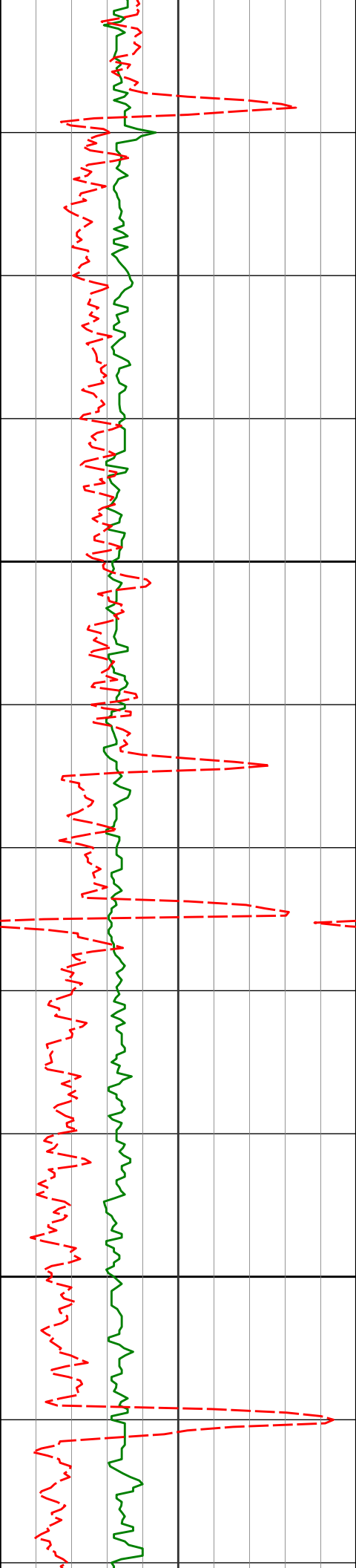
4100



4200

4300

4113'	13.42°	206.55°	4049.92'	-552.03'	1.57°
4205'	12.39°	204.93°	4139.59'	-569.89'	1.19°
4296'	14.09°	216.37°	4228.19'	-586.91'	3.42°

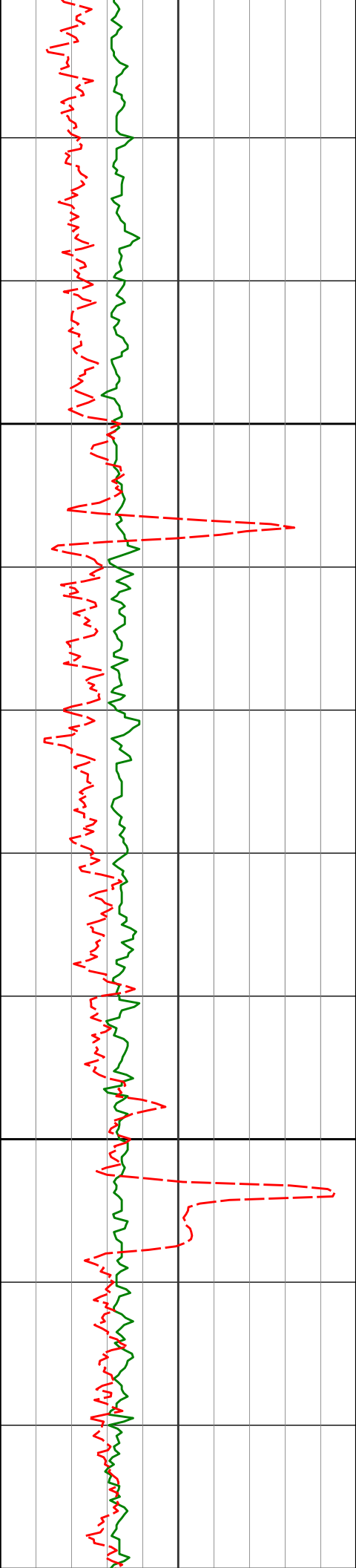


4387'	14.03°	215.49°	4316.46'	-603.90'	0.24°
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4400

4479'	13.53°	214.39°	4405.81'	-620.98'	0.61°
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4500



4600

4700

4571'

12.34°

213.23°

4495.48'

-637.27'

1.32°

4664'

11.61°

210.76°

4586.45'

-652.90'

0.96°

4754'

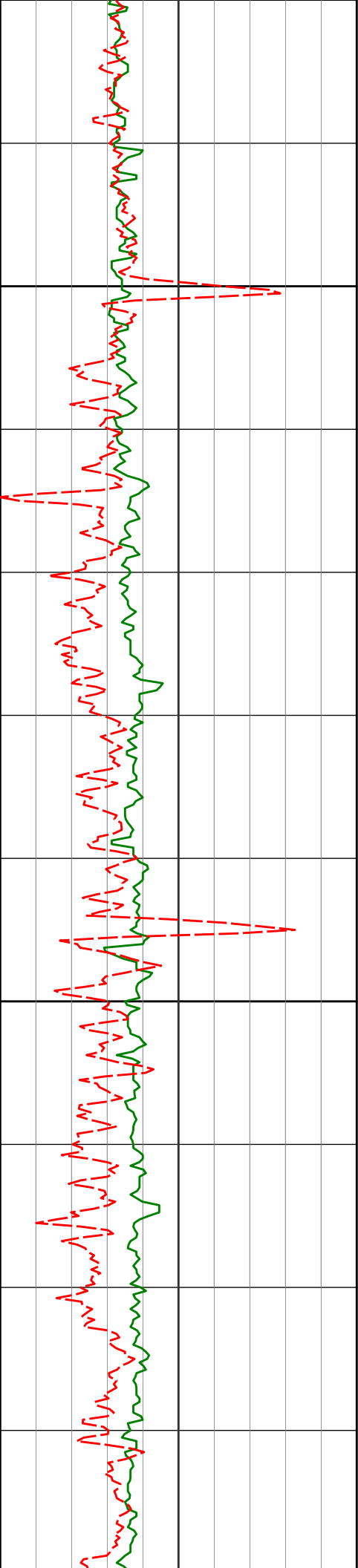
10.77°

206.47°

4674.74'

-667.62'

1.31°



4800

4847'

9.08°

200.87°

4766.35'

-681.79'

2.09°

4900

4939'

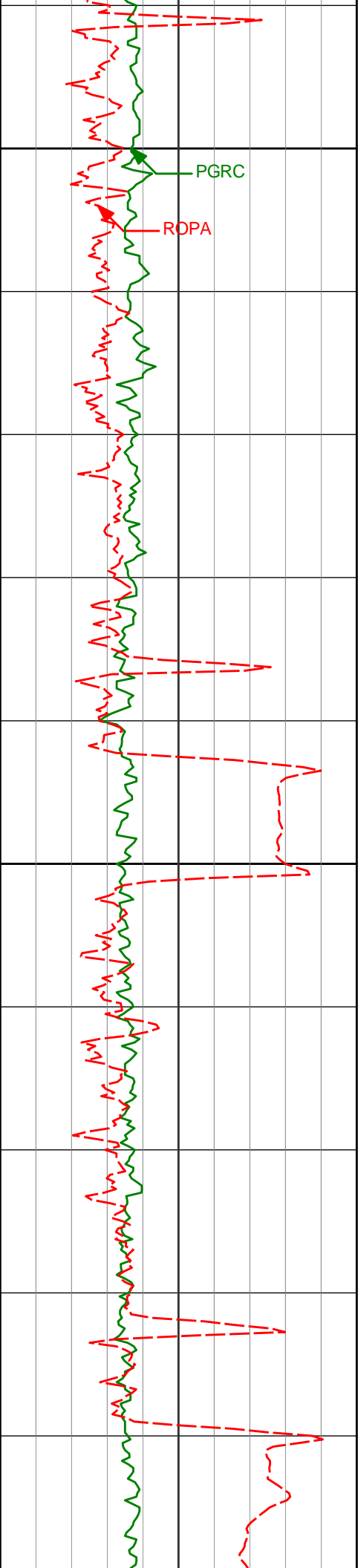
8.45°

196.11°

4857.28'

-694.73'

1.04°



5000

PGRC

ROPA

5100

5200

5031'

6.71°

192.43°

4948.47'

-706.25'

1.96°

5123'

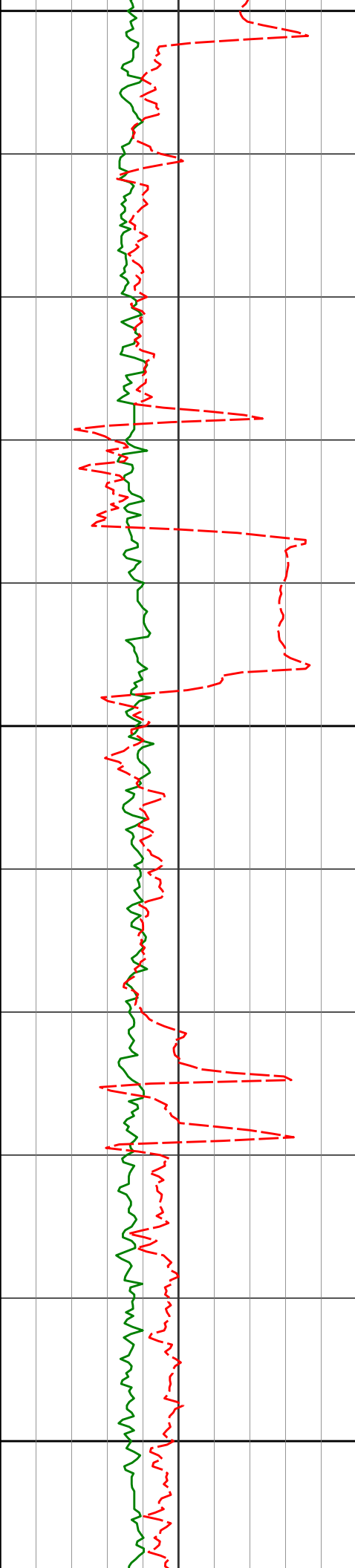
3.36°

194.18°

5040.10'

-713.97'

3.64°



5200

5215'

1.63°

217.73°

5132.01'

-717.52'

2.15°

5300

5307'

1.50°

1.88°

5224.00'

-717.30'

3.24°

5400

5398'

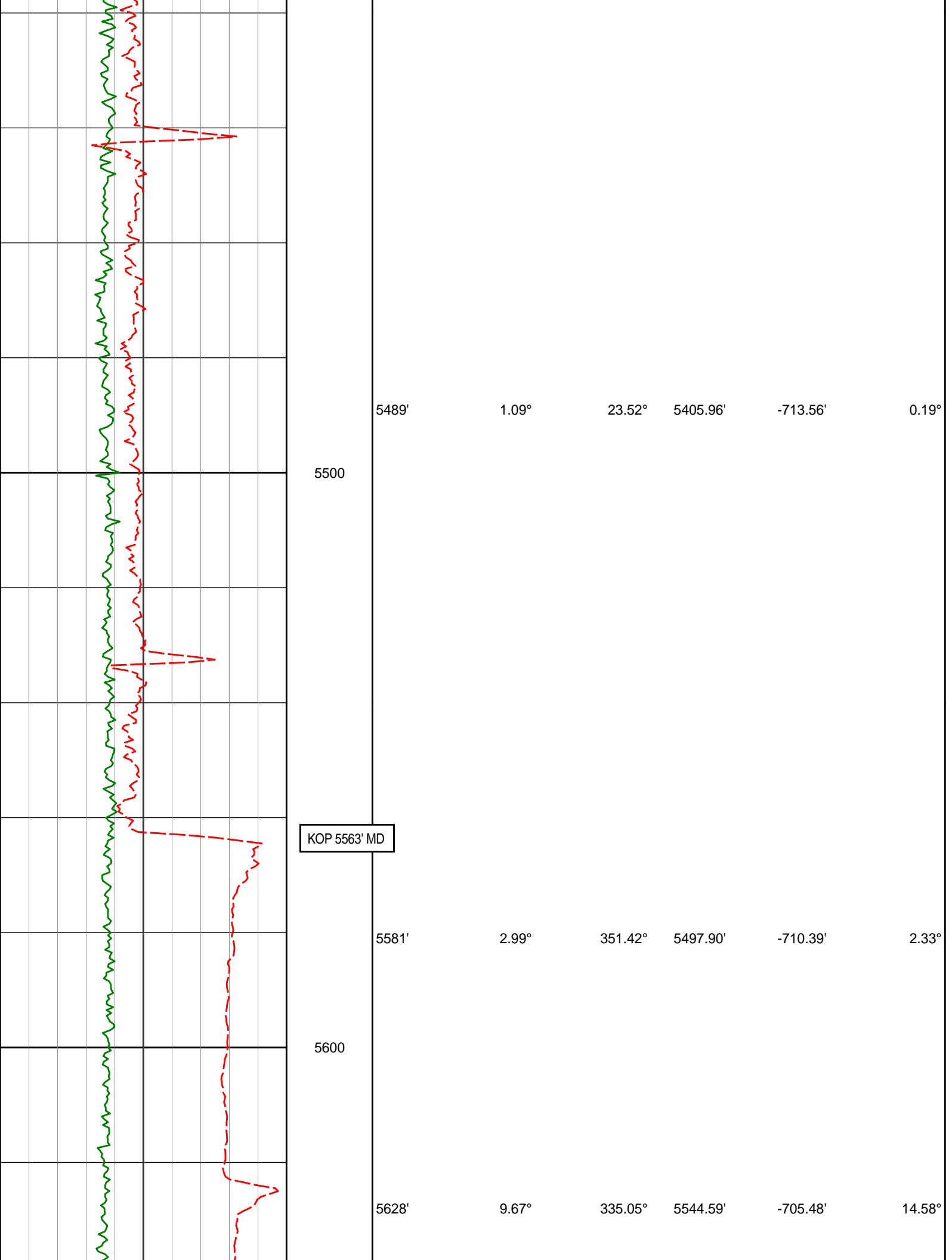
1.20°

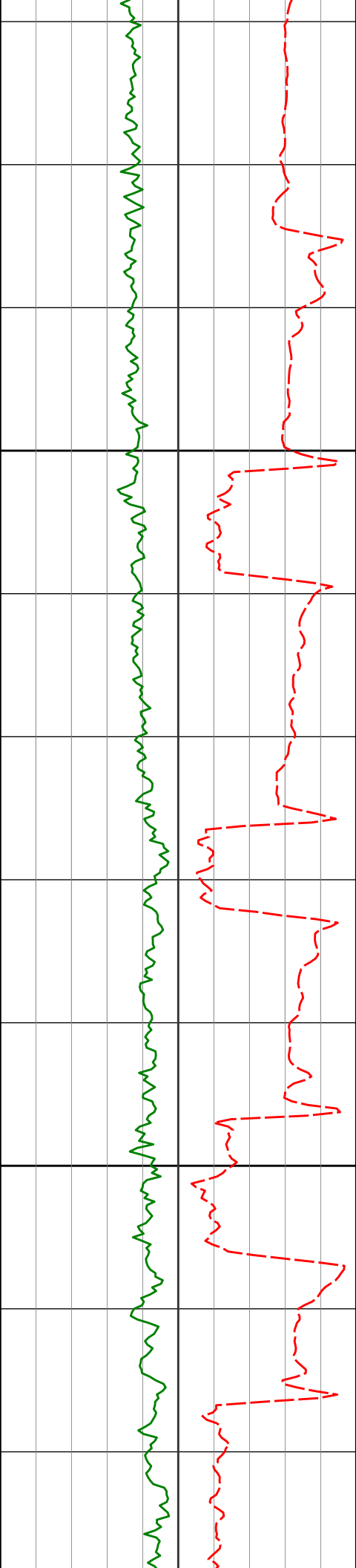
17.10°

5314.97'

-715.22'

0.51°

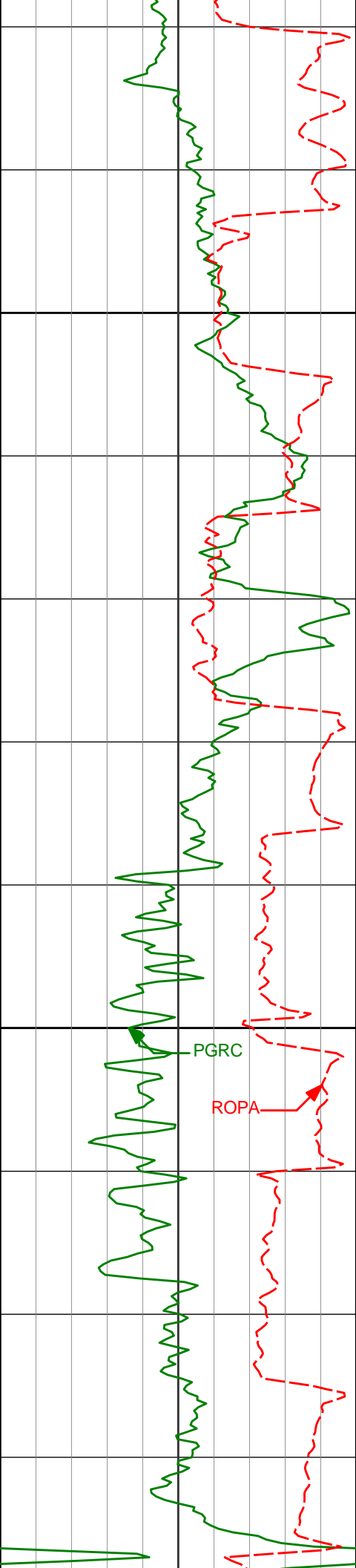




5700

5800

5676'	15.88°	338.76°	5591.38'	-695.45'	13.04°
5723'	20.63°	344.22°	5636.00'	-681.20'	10.73°
5771'	25.79°	349.20°	5680.10'	-662.55'	11.49°
5818'	30.21°	351.46°	5721.59'	-640.60'	9.67°



5900

6000

5866'

33.13°

352.86°

5762.44'

-615.46'

6.27°

5913'

36.82°

355.08°

5800.95'

-588.55'

8.30°

5961'

39.76°

357.09°

5838.62'

-558.81'

6.65°

6008'

41.75°

357.68°

5874.22'

-528.14'

4.31°

6056'

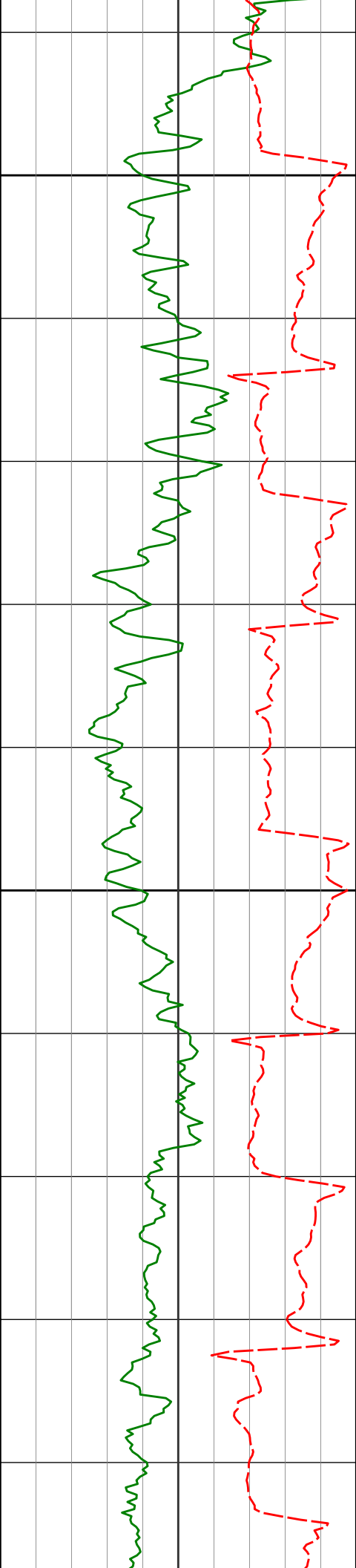
45.31°

357.43°

5909.02'

-495.10'

7.43°



6100

6103'

49.59°

358.55°

5940.79'

-460.50'

9.27°

6151'

54.40°

359.40°

5970.34'

-422.74'

10.12°

6200

6198'

58.06°

359.59°

5996.46'

-383.74'

7.79°

6246'

62.93°

359.62°

6020.09'

-342.05'

10.15°

6293'

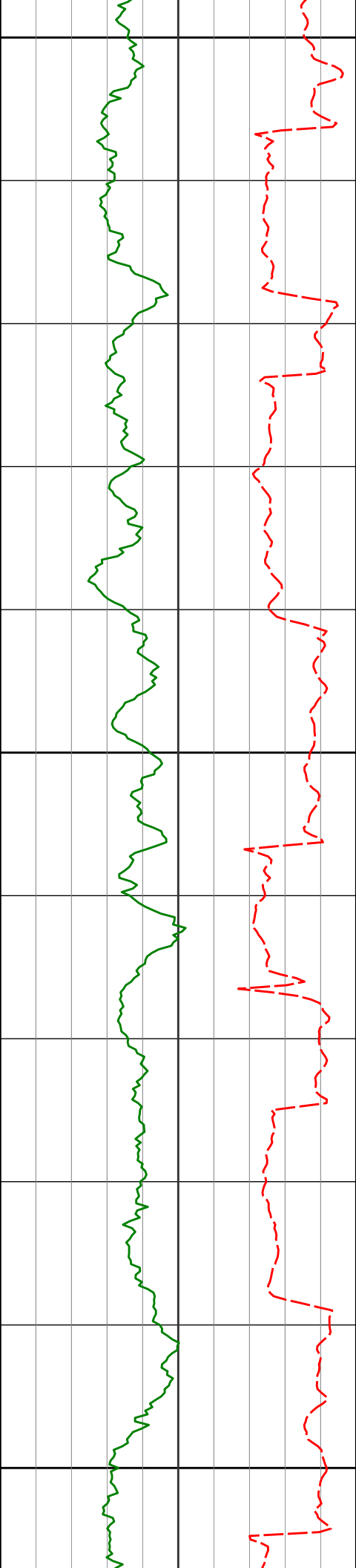
67.85°

0.94°

6039.66'

-299.45'

10.77°



6300

6341'

70.60°

1.23°

6056.69'

-254.74'

5.76°

6388'

74.94°

0.37°

6070.60'

-210.01'

9.40°

6400

6436'

78.62°

0.42°

6081.58'

-163.42'

7.67°

6483'

83.02°

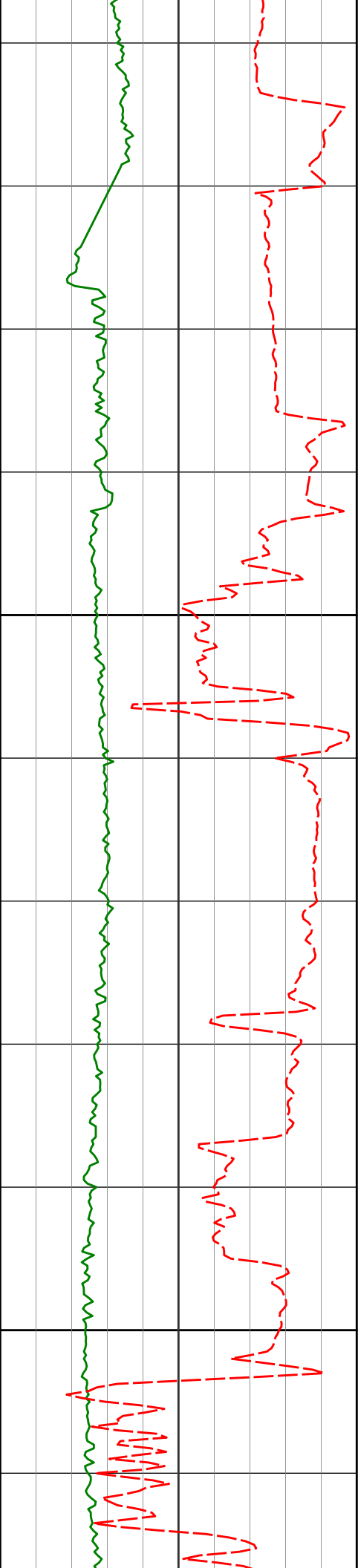
359.31°

6089.08'

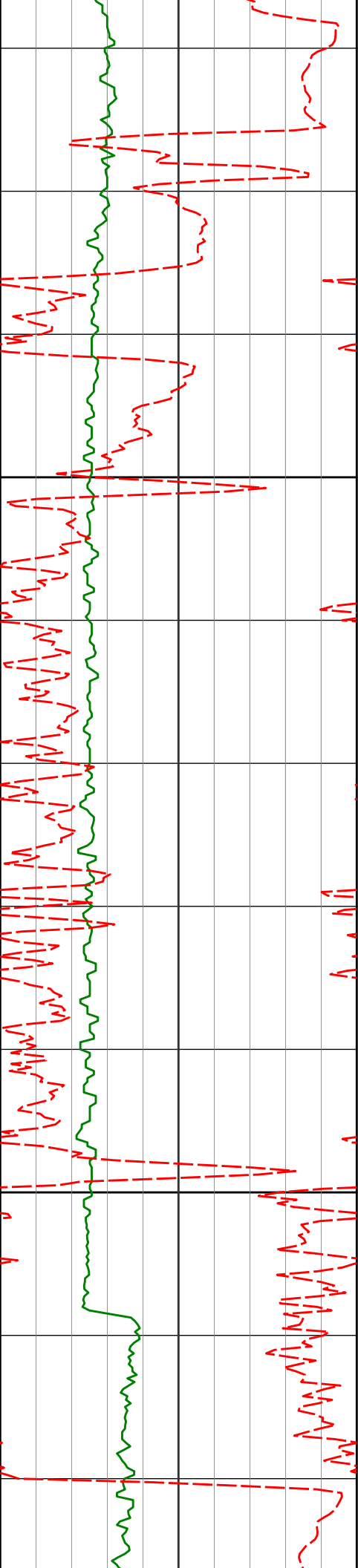
-117.13'

9.65°

6500



<div>Casing Shoe @ 6550' MD</div>	6531'	86.52°	358.16°	6093.45'	-69.38'	7.67°
	6543'	87.33°	357.96°	6094.09'	-57.41'	6.95°
	6568'	89.22°	357.85°	6094.85'	-32.43'	7.57°
	6663'	90.51°	358.06°	6095.07'	62.52'	1.38°
Run 300	6600					
	6700					



6758'

89.10°

358.70°

6095.39'

157.44'

1.63°

6800

6853'

90.64°

1.94°

6095.61'

252.18'

3.78°

6900

6947'

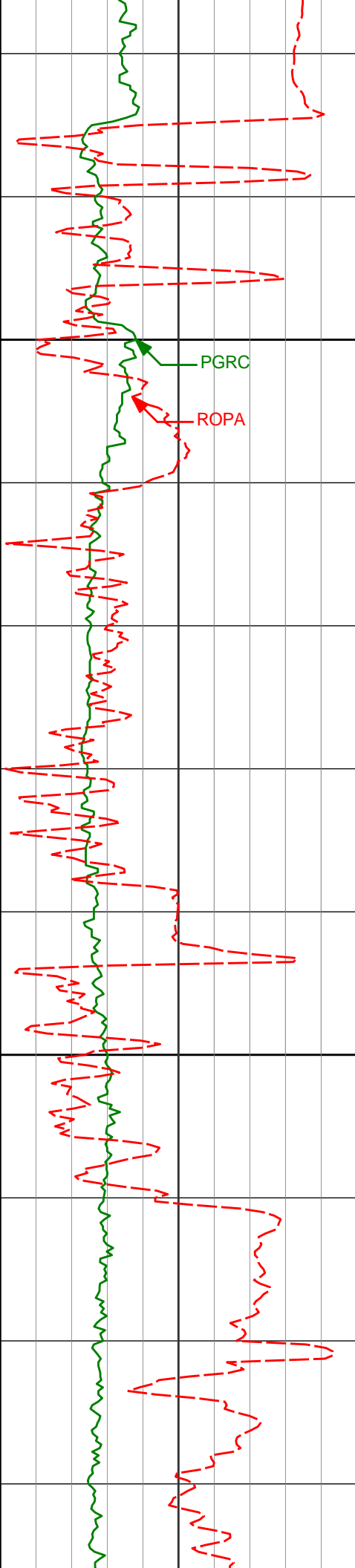
89.78°

1.79°

6095.27'

345.71'

0.93°



7000

7100

7042'

88.90°

3.04°

6096.36'

440.13'

1.61°

7137'

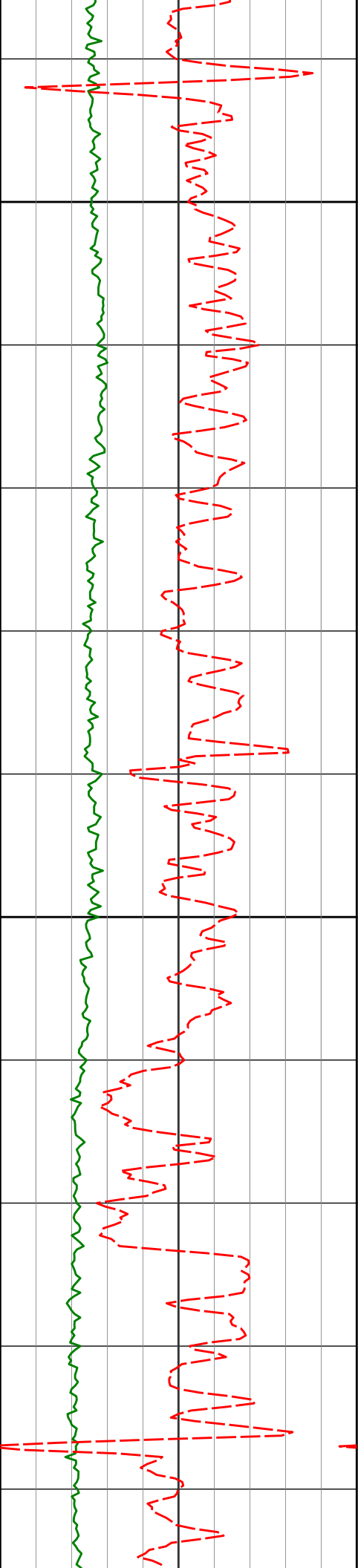
88.31°

2.37°

6098.67'

534.48'

0.94°



7200

7233'

88.68°

1.87°

6101.19'

629.93'

0.65°

7300

7328'

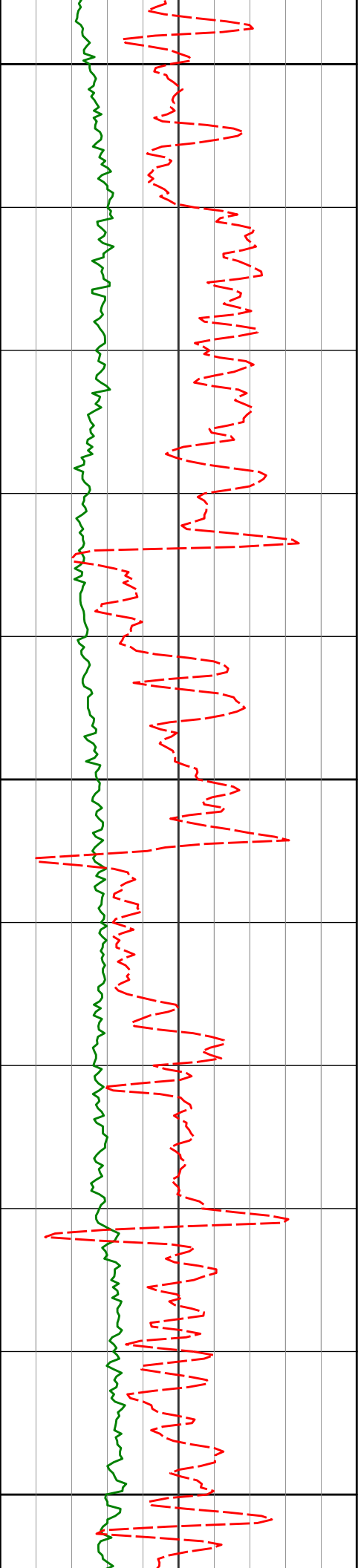
88.83°

1.68°

6103.26'

724.45'

0.25°



7400

7422'

88.68°

1.05°

6105.30'

818.04'

0.69°

7500

7517'

88.61°

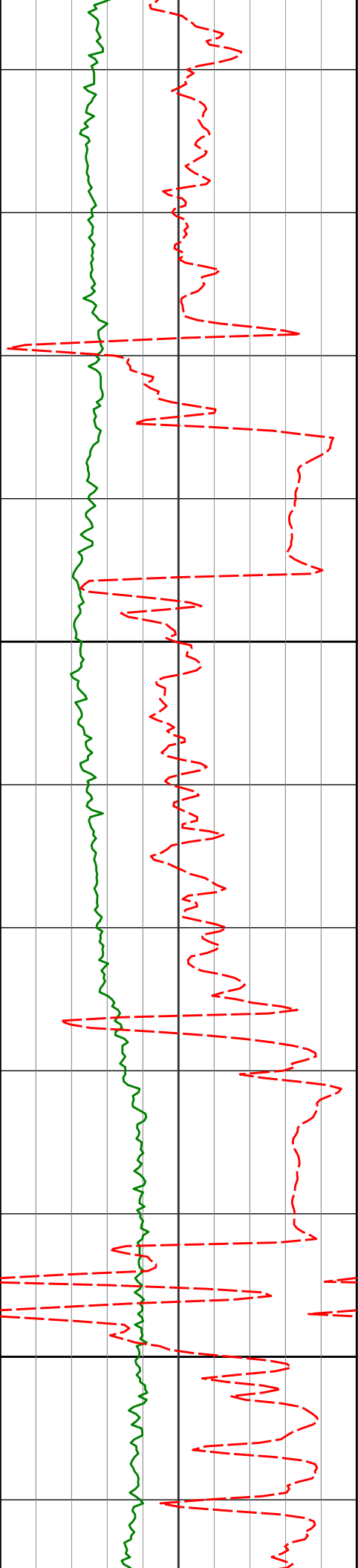
0.99°

6107.55'

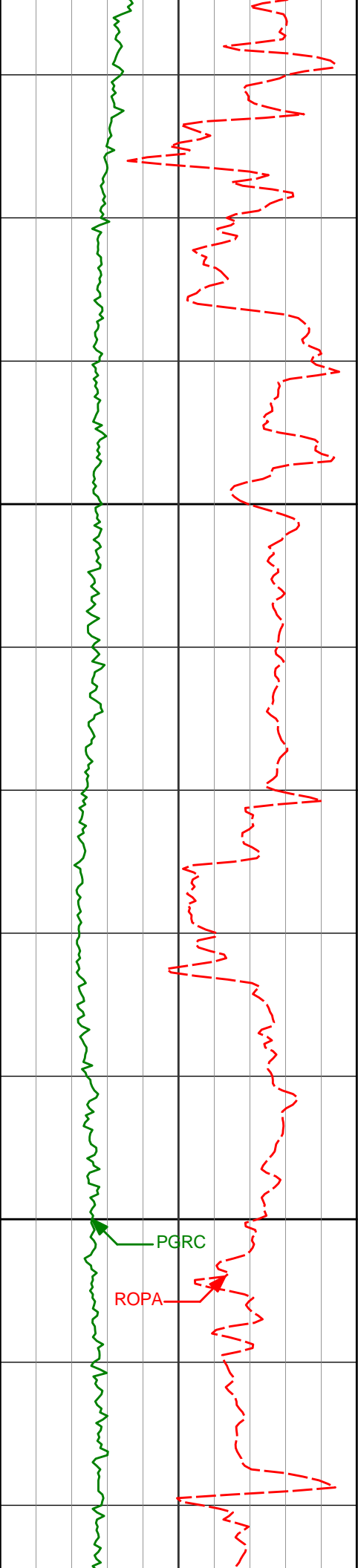
912.67'

0.10°

7600



	7612'	88.46°	1.21°	6109.98'	1007.28'	0.28°
7700	7707'	88.27°	359.45°	6112.69'	1101.99'	1.86°
7800	7802'	90.28°	358.38°	6113.89'	1196.86'	2.40°



7900

7896'

90.52°

357.57°

6113.23'

1290.81'

0.90°

8000

7991'

90.86°

357.72°

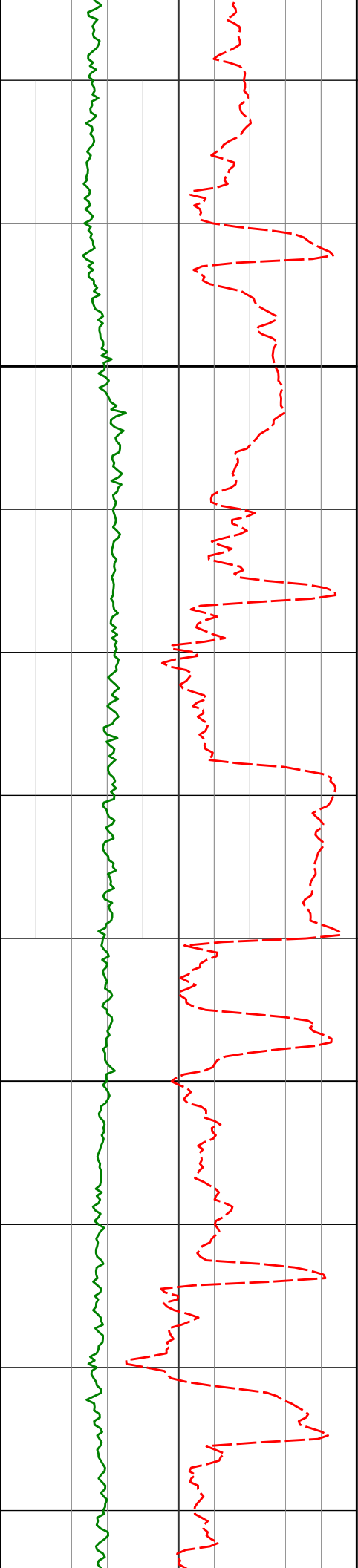
6112.09'

1385.77'

0.39°

PGRC

ROPA



8100

8086'

90.80°

356.70°

6110.71'

1480.74'

1.08°

8200

8181'

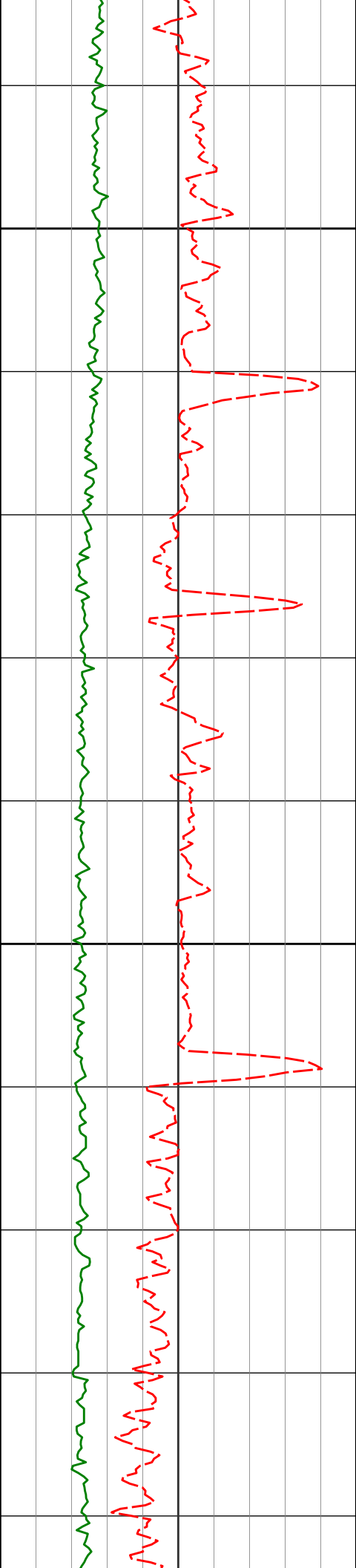
89.94°

358.87°

6110.10'

1575.70'

2.46°



8300

8276'

90.49°

358.62°

6109.74'

1670.60'

0.64°

8371'

90.03°

358.41°

6109.31'

1765.52'

0.53°

8400

8465'

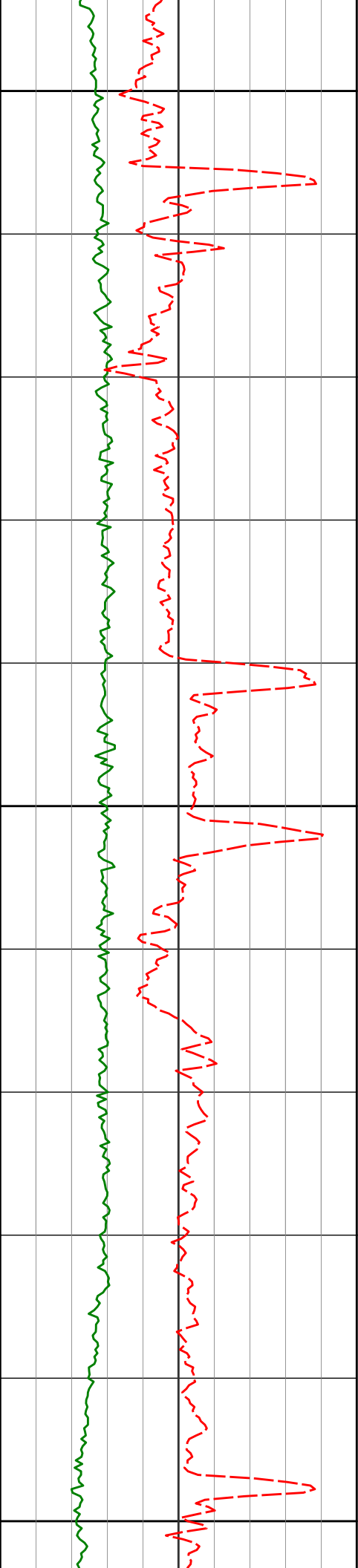
90.15°

358.16°

6109.16'

1859.45'

0.30°



8500

8556'

90.31°

359.45°

6108.80'

1950.35'

1.43°

8600

8648'

90.28°

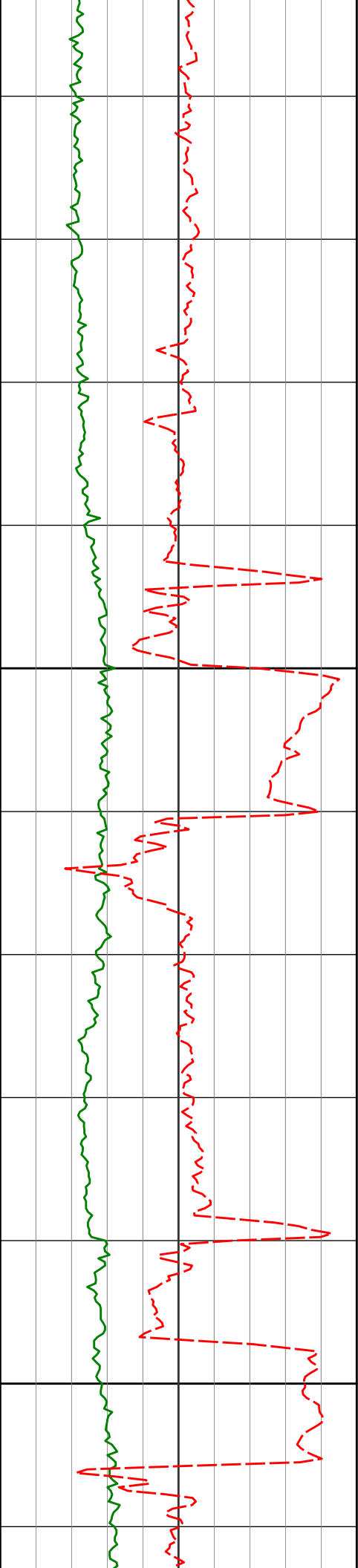
359.67°

6108.32'

2042.19'

0.24°

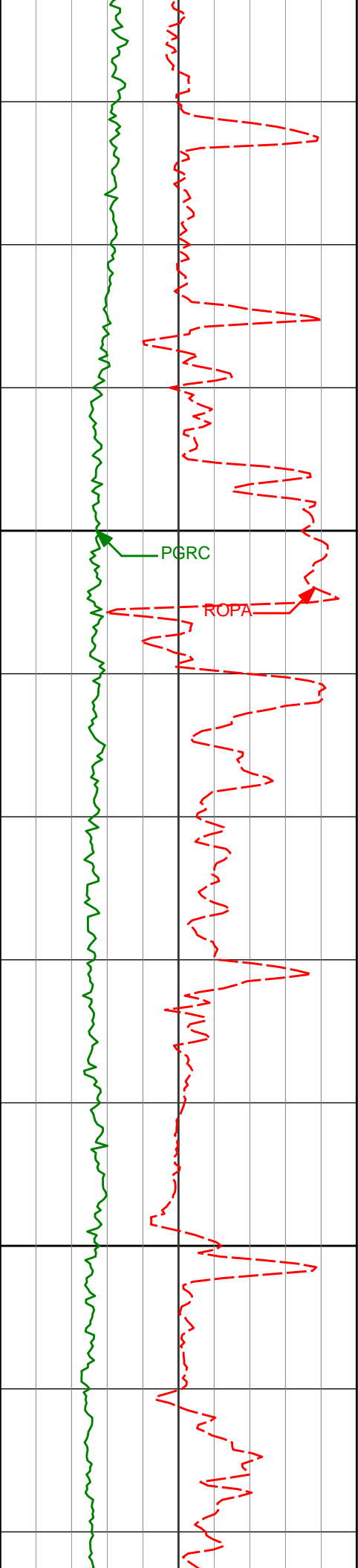
8700



8800

8900

8739'	89.38°	357.95°	6108.59'	2133.08'	2.13°
8831'	89.45°	359.39°	6109.53'	2224.99'	1.57°
8922'	89.48°	0.69°	6110.38'	2315.77'	1.43°



9000

9014'

89.97°

2.94°

6110.83'

2407.31'

2.50°

9100

9106'

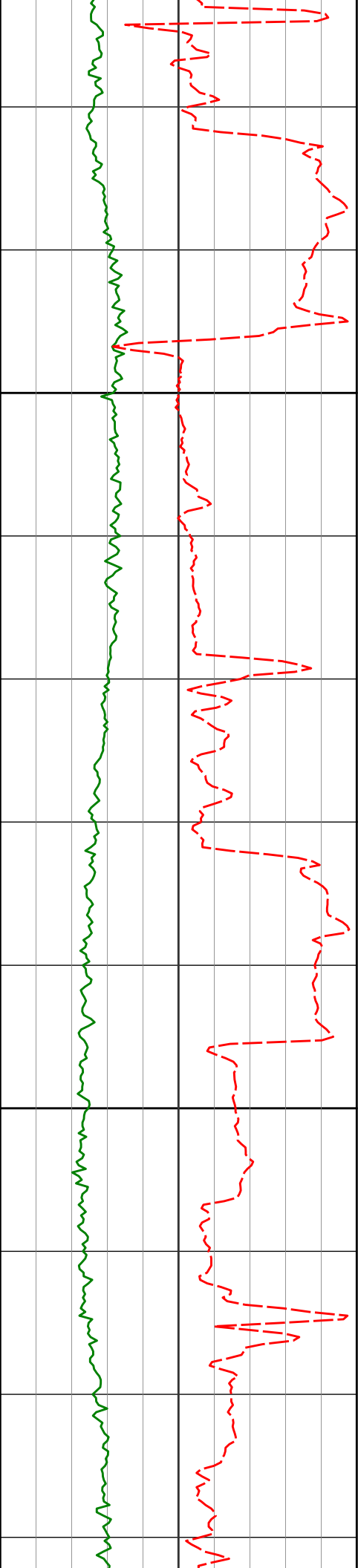
89.98°

3.43°

6110.87'

2498.62'

0.53°



9200

9197'

89.58°

1.65°

6111.21'

2589.05'

2.00°

9300

9289'

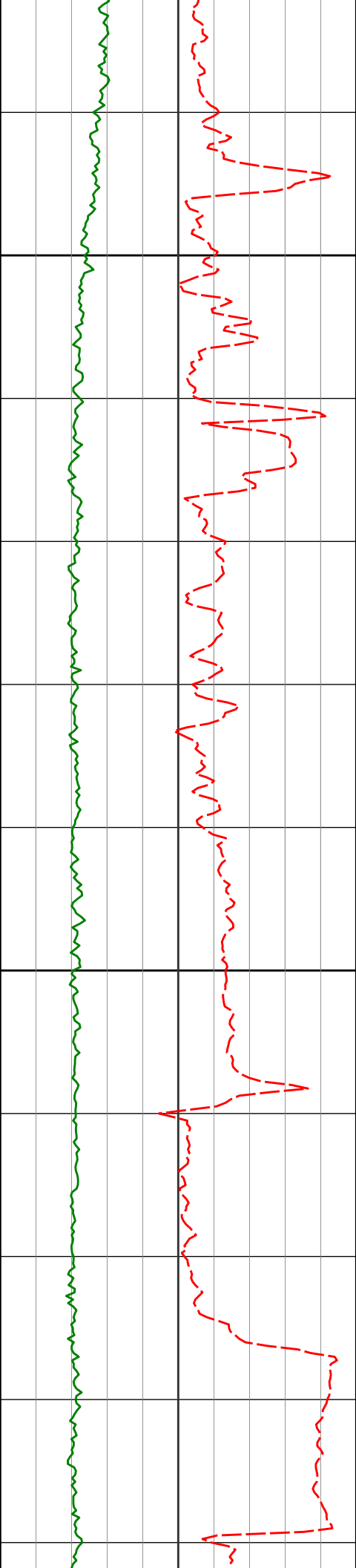
90.50°

359.40°

6111.15'

2680.78'

2.64°



9400

9500

9380'

90.80°

358.77°

6110.12'

2771.65'

0.77°

9472'

90.47°

358.47°

6109.10'

2863.56'

0.48°

9564'

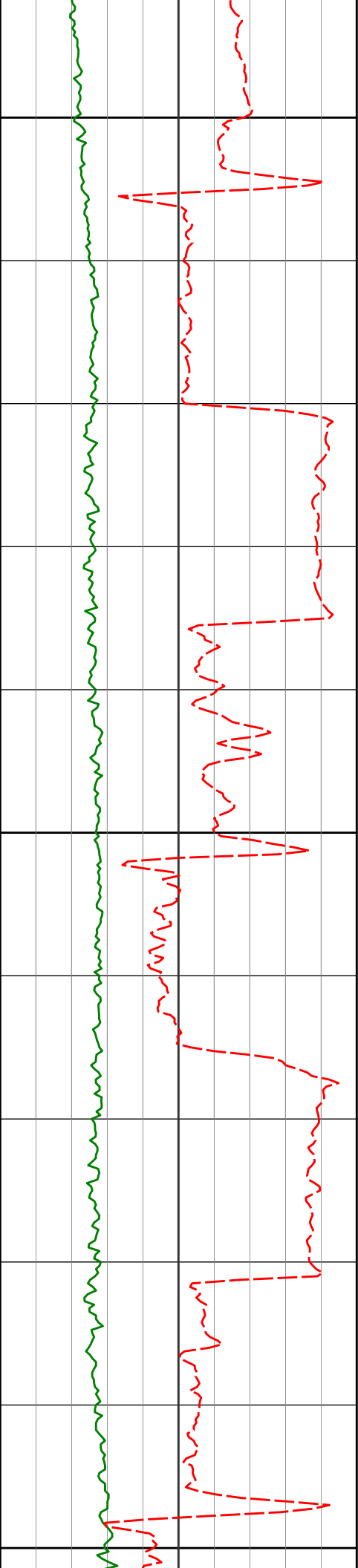
90.90°

356.76°

6108.00'

2955.52'

1.92°



9600

9657'

91.23°

358.26°

6106.27'

3048.47'

1.65°

9700

9748'

90.86°

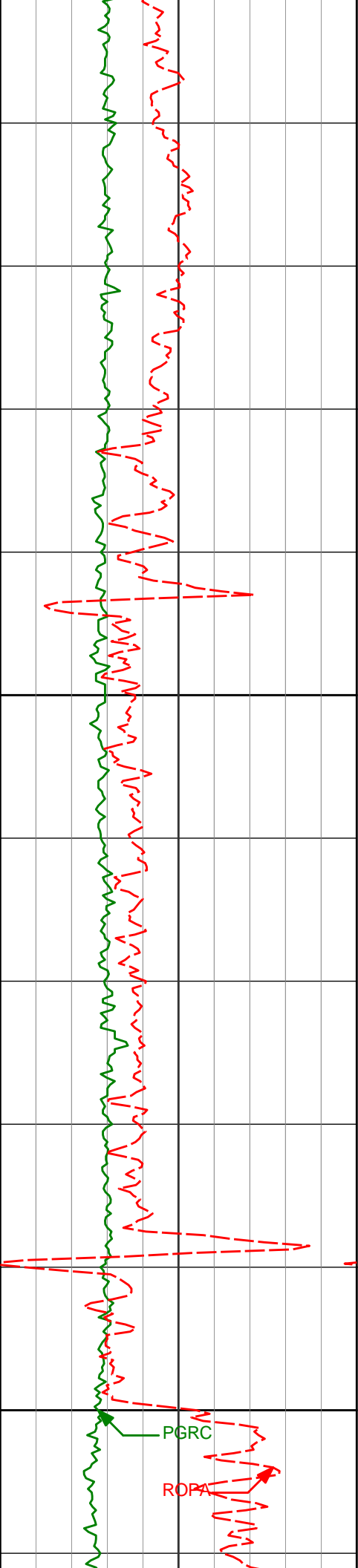
1.14°

6104.61'

3139.28'

3.19°

9800



9900

10000

9840'

90.40°

1.94°

6103.60'

3230.86'

1.00°

9932'

89.51°

2.03°

6103.67'

3322.38'

0.97°

PGRC

ROPA