

PCG-K Pressure Case Gamma

1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	18-Mar-14	01-Apr-14			
Rig Bit Number	0100	0200			
Bit Size (in)	8.75	6.125			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	991.00	7,445.00			
Log End Depth (MD, ft)	7,445.00	7,633.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	16-Mar-14 06:00	18-Mar-14 11:30			
Drill/Wipe End Date and Time	17-Mar-14 20:00	18-Mar-14 11:30			
Min Inc (deg) @ Depth (MD, ft)	0.03 @ 7,019.00	12.89 @ 7,443.00			
Max Inc (deg) @ Depth (MD, ft)	11.55 @ 7,396.00	27.34 @ 7,585.00			
Bit TFA(in2) / Bit Type	N/A / PDC	.8629 / PDC			
Flow Rate (gpm)	624.90	420.00			
Max AV (fpm) / CV (fpm) @ MWD	1.1781 / N/A	408.0 / N/A			
Fluid Type	N/A	N/A			
Density (ppg) / Viscosity (spqt)	10.00 / 47.00	10.00 / 47.00			
Filtrate CL (ppm)	1,800.00	1,800.00			
pH / Fluid Loss (mptm)	8.40 / 6	8.40 / 6			
PV (cP) / YP (lbf2)	15 / 16.00	15 / 16.00			
% Solids / % Sand	12 / .89	12 / .8			
% 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 (in F) / S	175.04 / PCM	175.04 / PCM			

Max Tool Temp (degF) / Source	175.21 / PCM	175.21 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 175.21	N/A @ 175.21			
Lead MWD Engineer	Patrick Lane	Patrick Lane			
Customer Representative	Stan Walters	Travis Kruckenberg			

SENSOR INFORMATION

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	53.00	48.00			
Software Version	6.21	6.21			
Sub Serial Number	11303511	11303511			
Sonde Serial Number	11145627	11478044			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	349.29	313.21			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	54.69	51.41			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11303511	11303511			
Insert/Sonde Serial Number	11293409	12037414			

Pulser Controller Sensor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
PIC Software Version	1.40	1.40			
Sub/HOC Serial Number	11303511	11303511			
Insert/Probe/Module SN	10744813	12001075			
Battery Serial Number	N/A	N/A			
Valve Insert SN	N/A	N/A			
DC Insert Serial Number	N/A	N/A			
Choke Size (32nd)	N/A	N/A			
Driver Current (amps)	N/A	N/A			
Driver SMI Current (amps)	N/A	N/A			
Boot Strap Version	4,130.00	4,130.00			

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" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified
5. The following smoothing parameters have been applied to the data:

PGRC (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

ROPA (Average Rate of Penetration):
Interval Resolution: 0.5 ft

Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill : 3.0 ft

6. INSITE version 8.0.10 Build 08

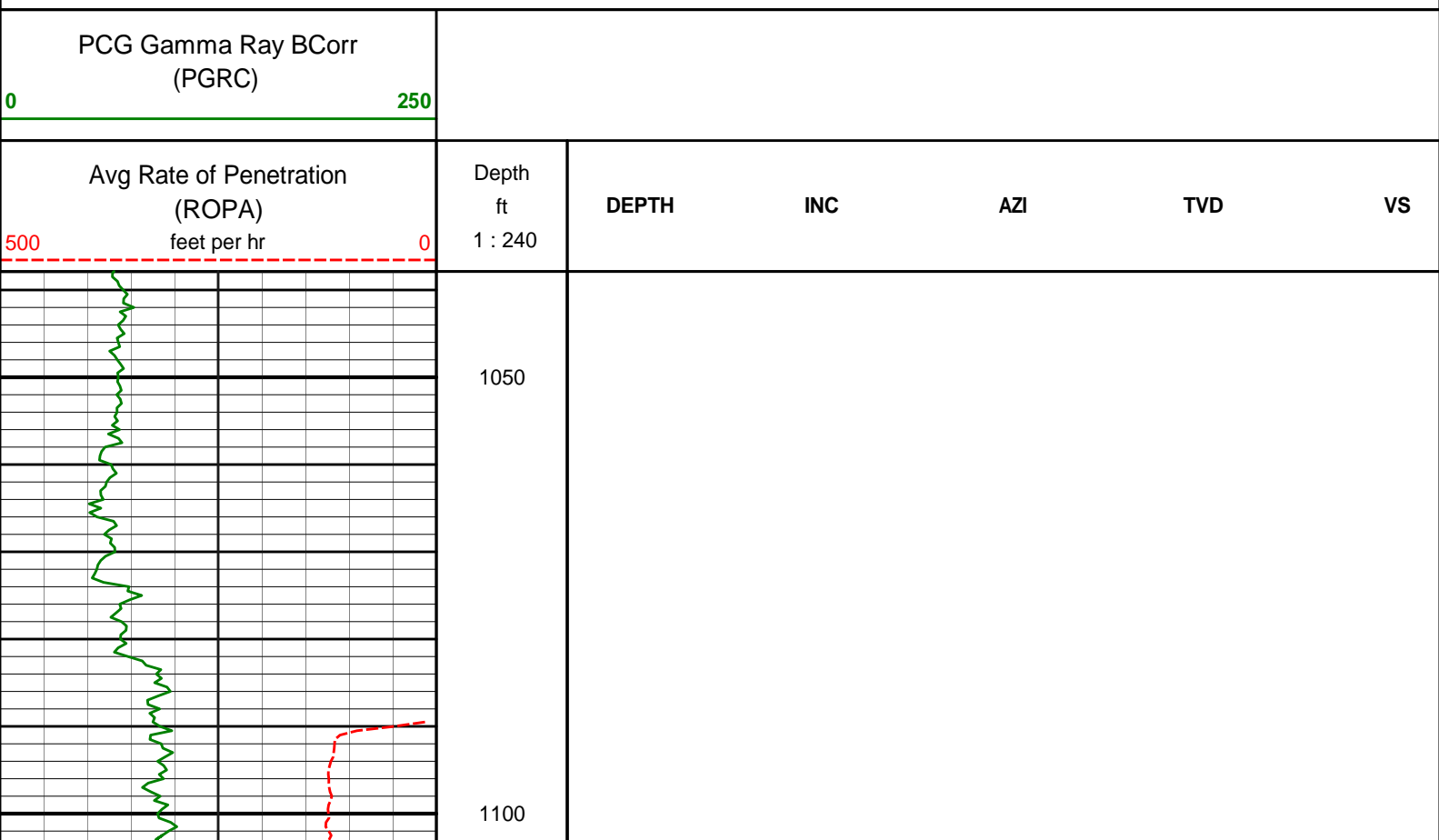
WARRANTY

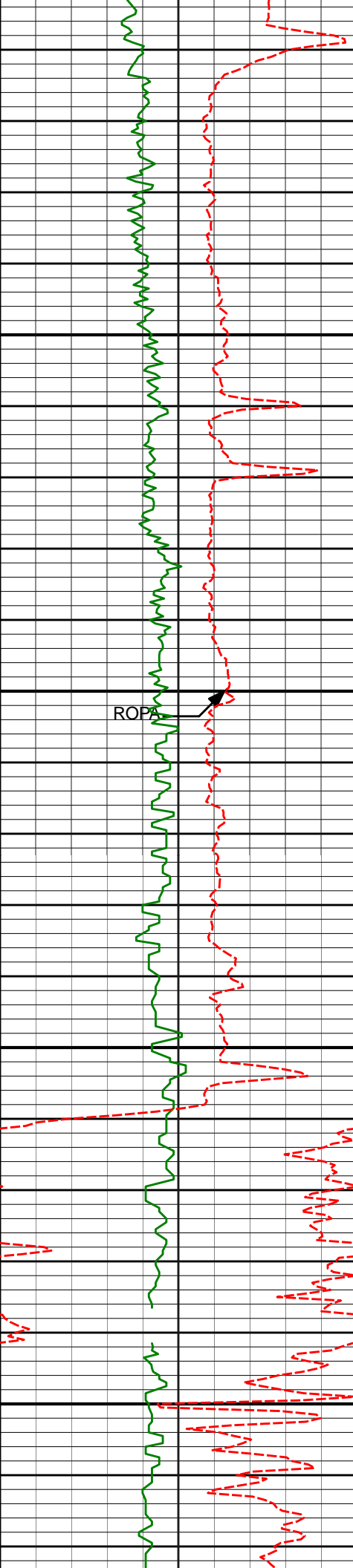
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HALLIBURTON

Sperry Drilling

MD 1:240 Detail Log





1150

1200

1250

1300

1197'

0.68°

277.61°

1196.96'

-0.72'

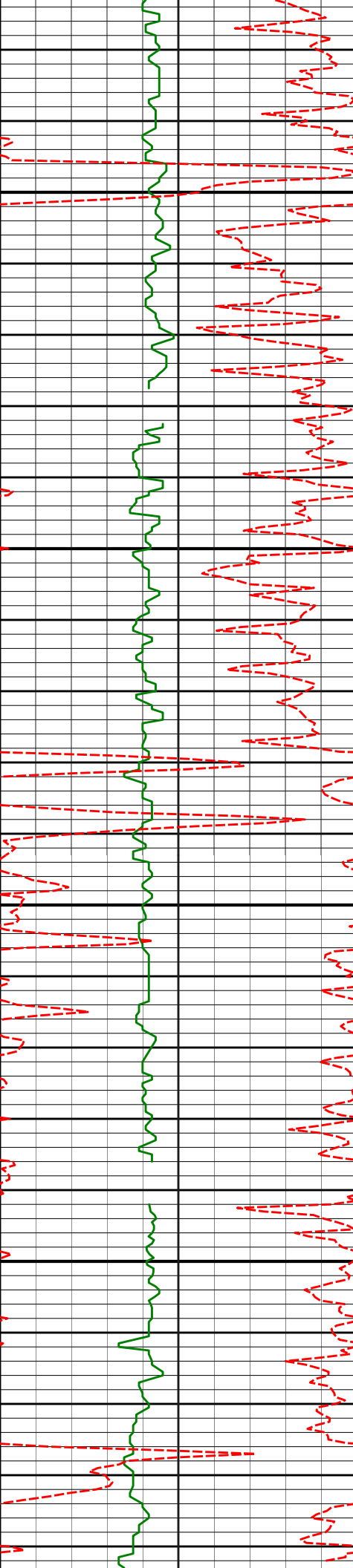
1289'

0.71°

284.34°

1288.95'

-0.50'



1350

1382'

1.09°

294.80°

1381.94'

0.01'

1400

1450

1475'

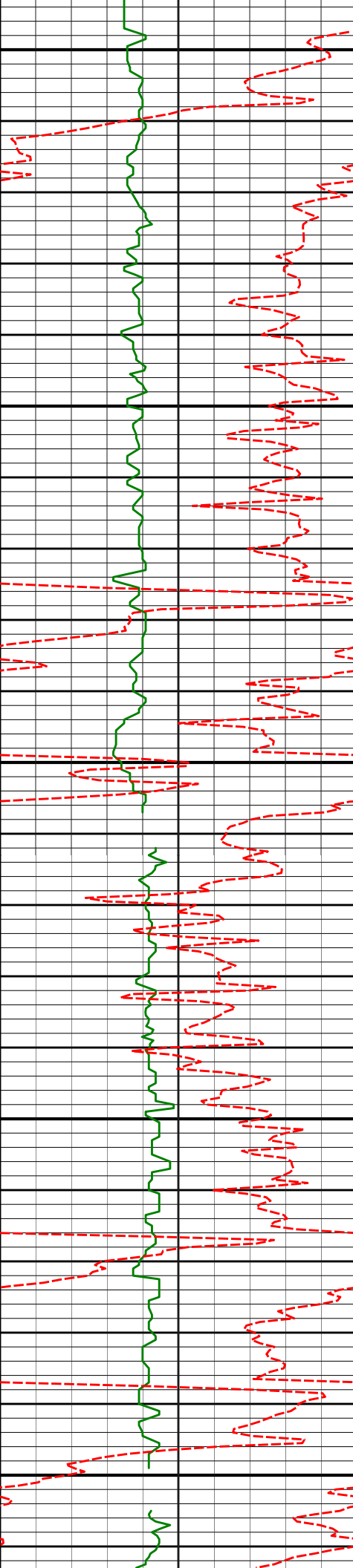
1.09°

282.67°

1474.92'

0.58'

1500



1550

1568'

0.40°

24.23°

1567.91'

1.07'

1600

1650

1660'

0.40°

355.62°

1659.91'

1.68'

1700

1750

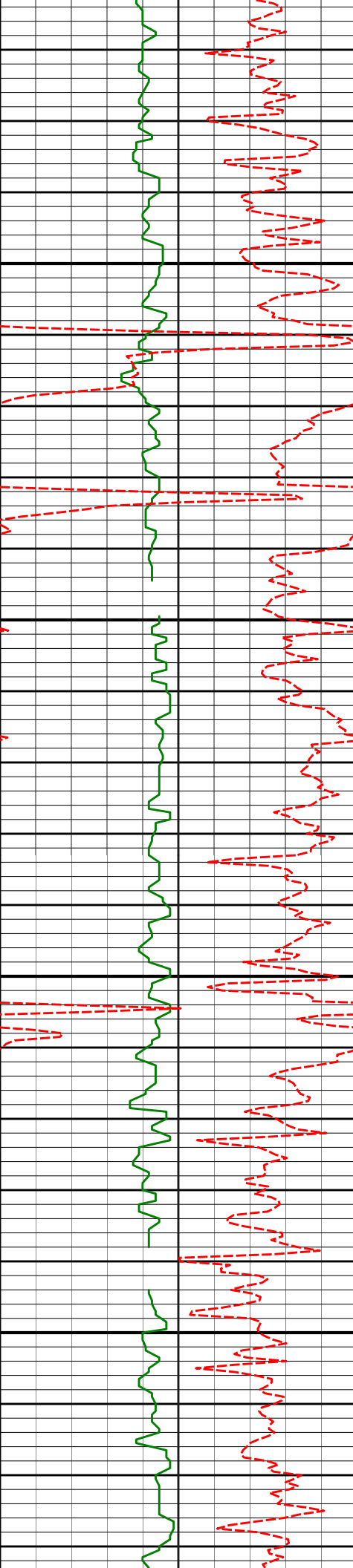
1753'

1.07°

82.16°

1752.91'

2.12'



1800

1850

1900

1950

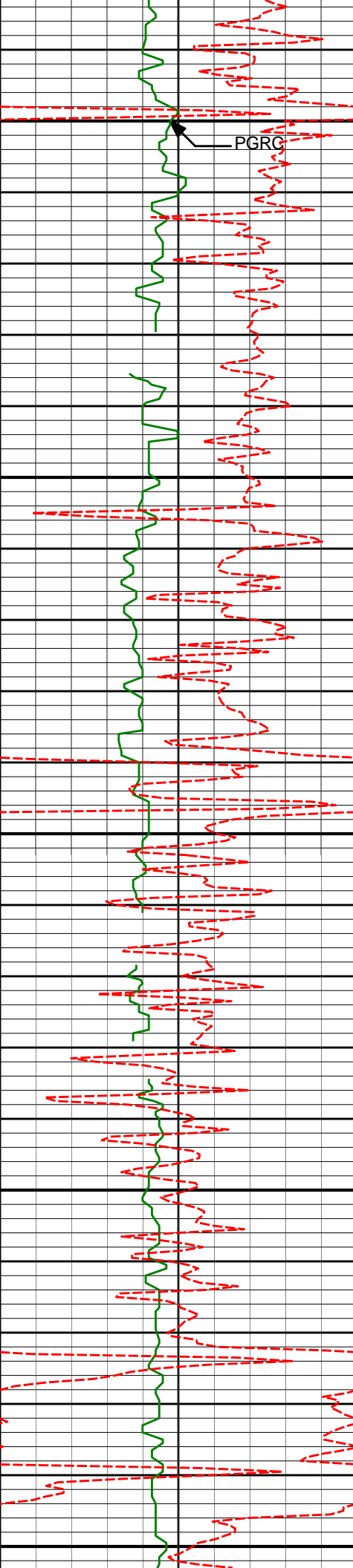
1938'

0.62°

63.31°

1937.89'

2.80'



2000

PGRG

2031'

0.84°

23.86°

2030.88'

3.65'

2050

2100

2124'

0.63°

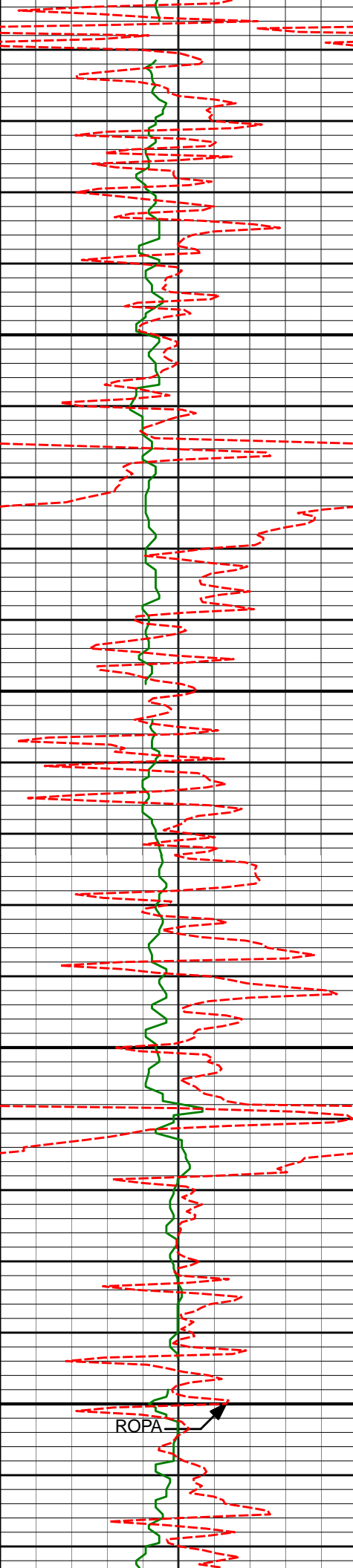
46.17°

2123.87'

4.63'

2150

2200



2250

2300

2350

2400

ROPA

2217'

0.96°

27.01°

2216.86'

5.67'

2309'

1.45°

17.80°

2308.84'

7.47'

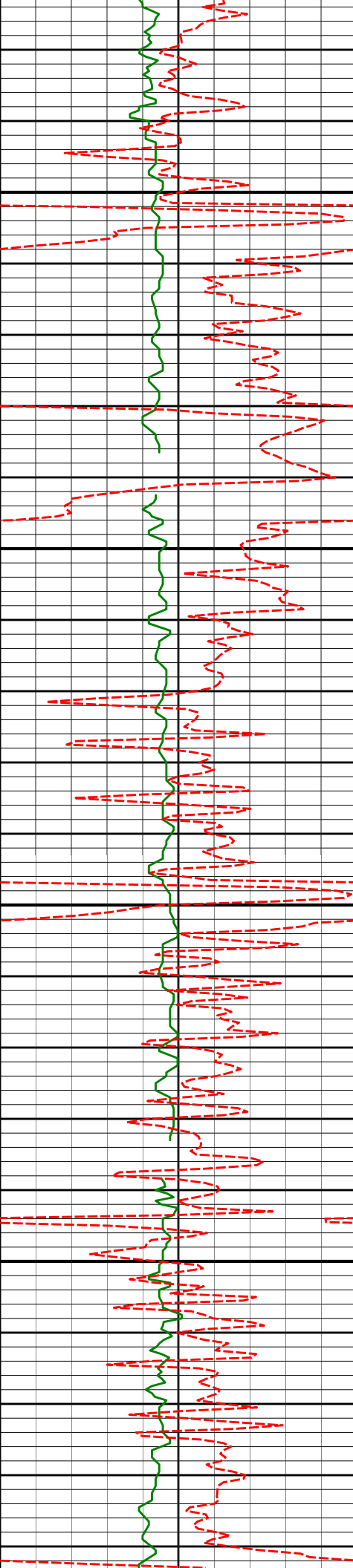
2402'

1.74°

16.88°

2401.81'

9.94'



2450

2500

2550

2600

2493'

1.94°

56.73°

2492.76'

12.10'

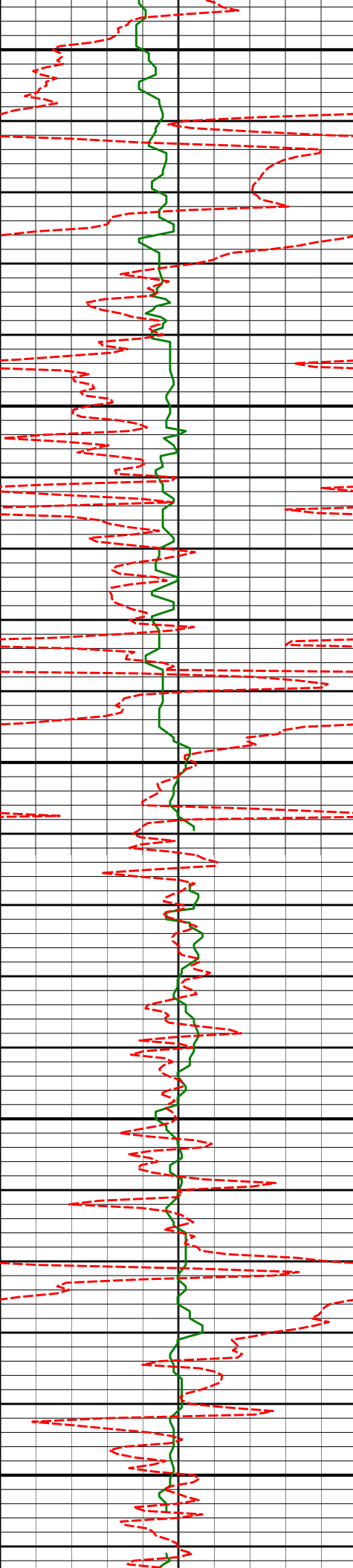
2586'

1.85°

42.25°

2585.71'

14.08'



2650

2679'

2.36°

94.98°

2678.66'

15.02'

2700

2750

2772'

2.05°

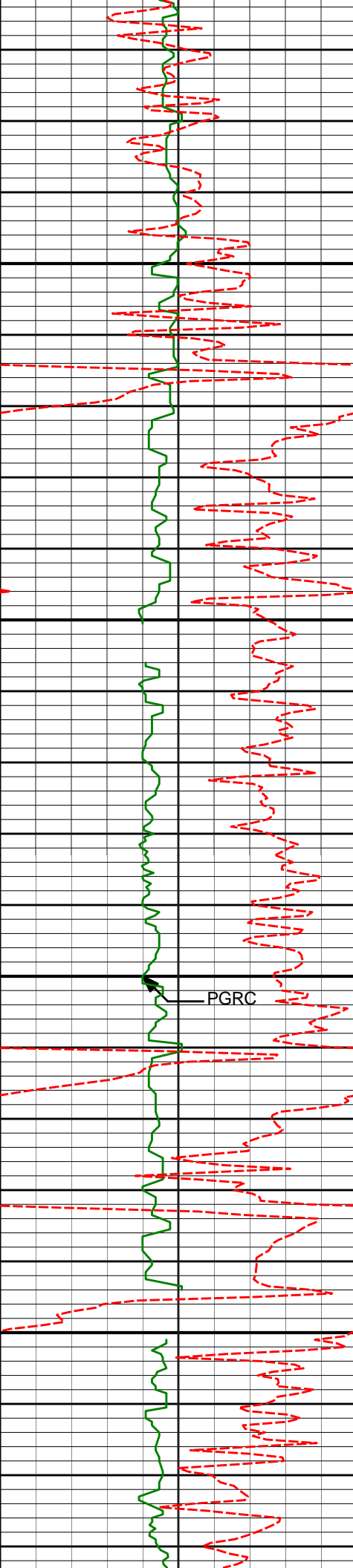
97.12°

2771.59'

14.65'

2800

2850



2900

2950

3000

3050

PGRC

2867'

1.68°

102.77°

2866.54'

14.12'

2961'

1.03°

107.21°

2960.51'

13.57'

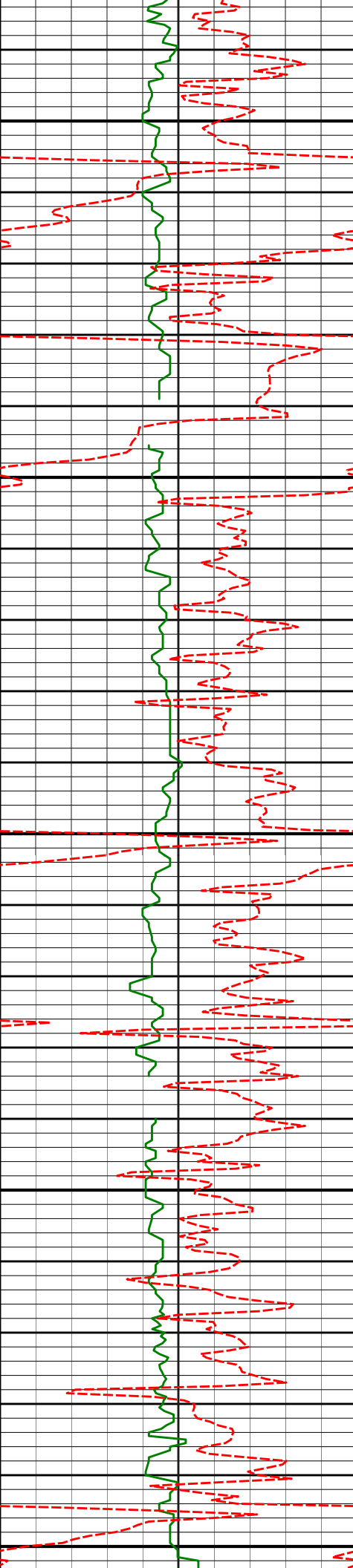
3056'

2.68°

98.18°

3055.46'

13.00'



3100

3150

3200

3250

3300

3150'

4.26°

110.30°

3149.28'

11.47'

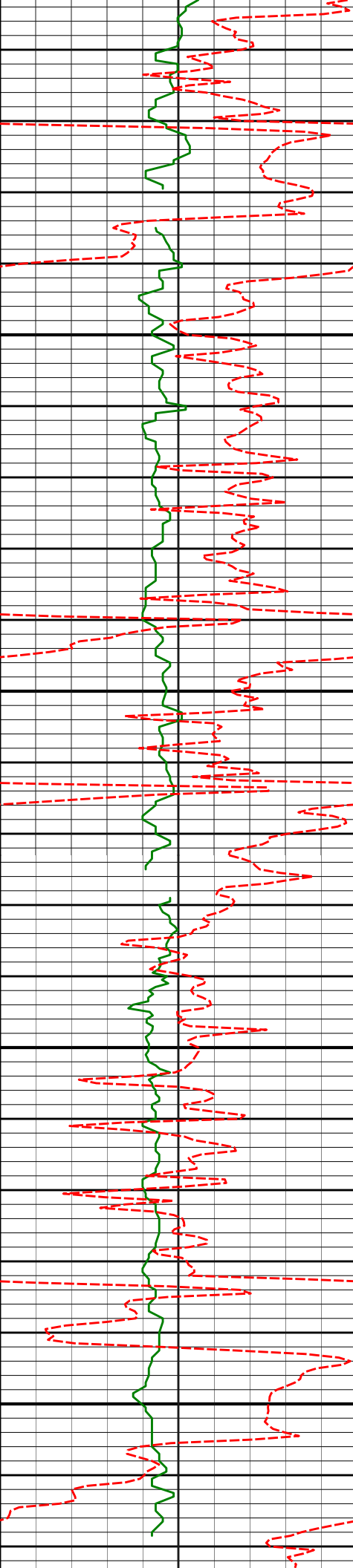
3244'

4.01°

108.04°

3243.04'

9.23'



3339'

5.45°

110.04°

3337.71'

6.65'

3350

3400

3433'

4.94°

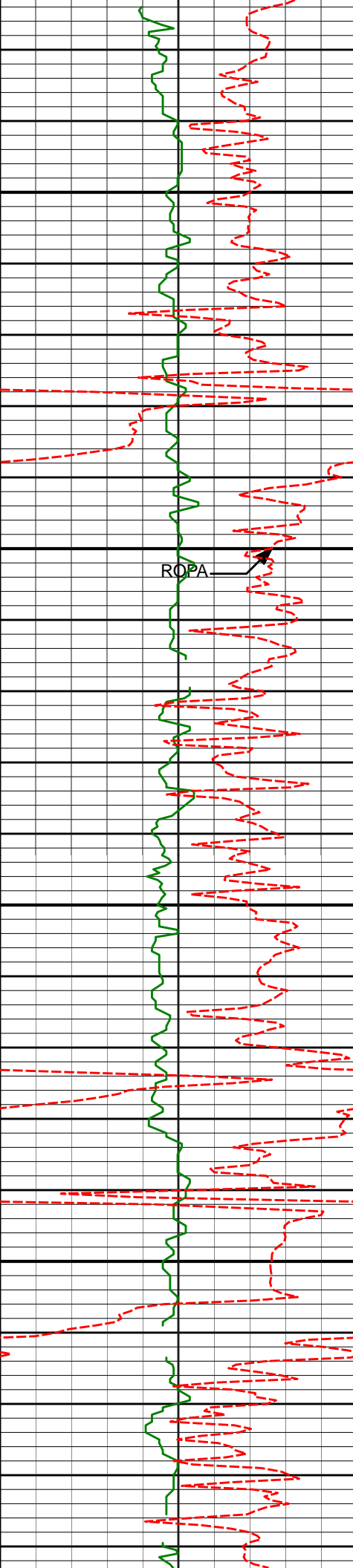
108.50°

3431.32'

3.51'

3450

3500



3550

3600

ROPA

3650

3700

3621'

5.10°

99.18°

3618.38'

-1.38'

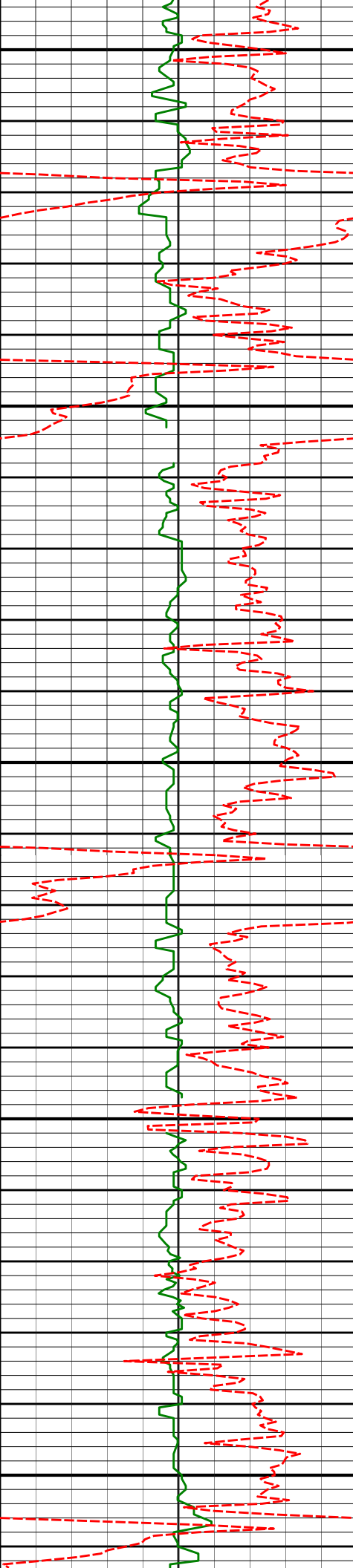
3715'

6.89°

108.34°

3711.87'

-3.83'



3750

3800

3850

3900

3950

3810'

6.49°

108.13°

3806.22'

-7.30'

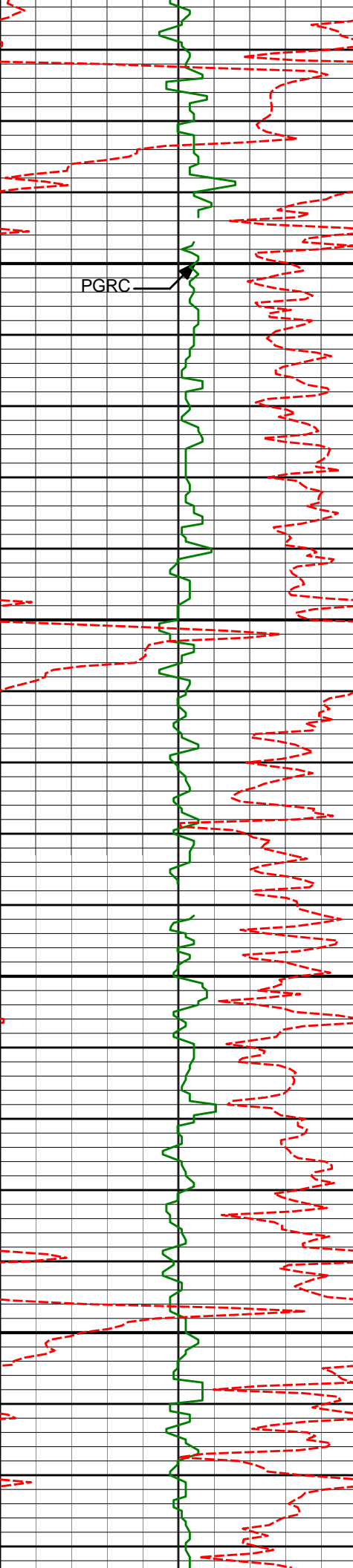
3904'

5.38°

102.62°

3899.72'

-9.92'



4000

4050

4100

4150

3999'

6.82°

99.45°

3994.18'

-11.83'

4093'

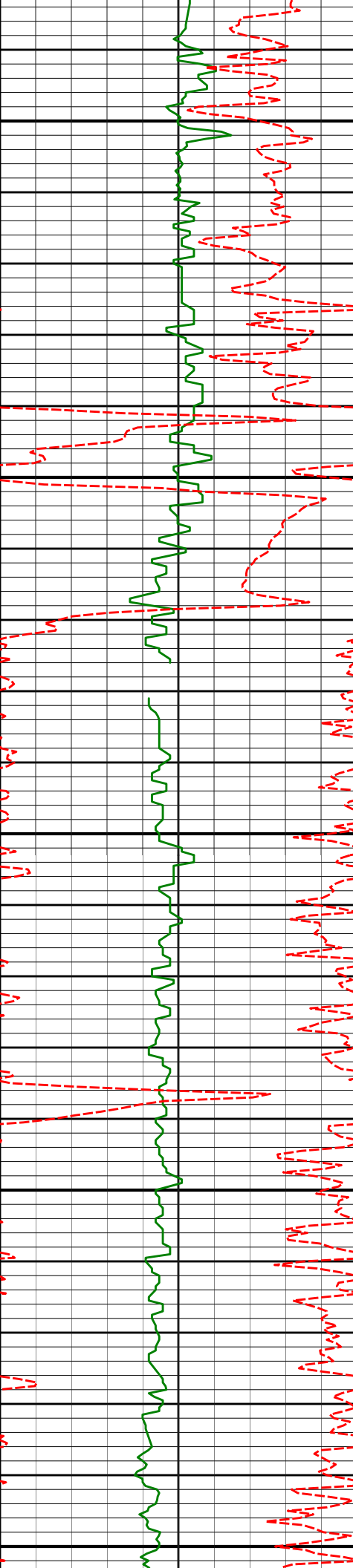
5.72°

97.30°

4087.61'

-13.35'

PGRC



4200

4250

4300

4350

4400

4187'

4.86°

100.63°

4181.21'

-14.68'

4282'

6.66°

95.95°

4275.73'

-16.00'

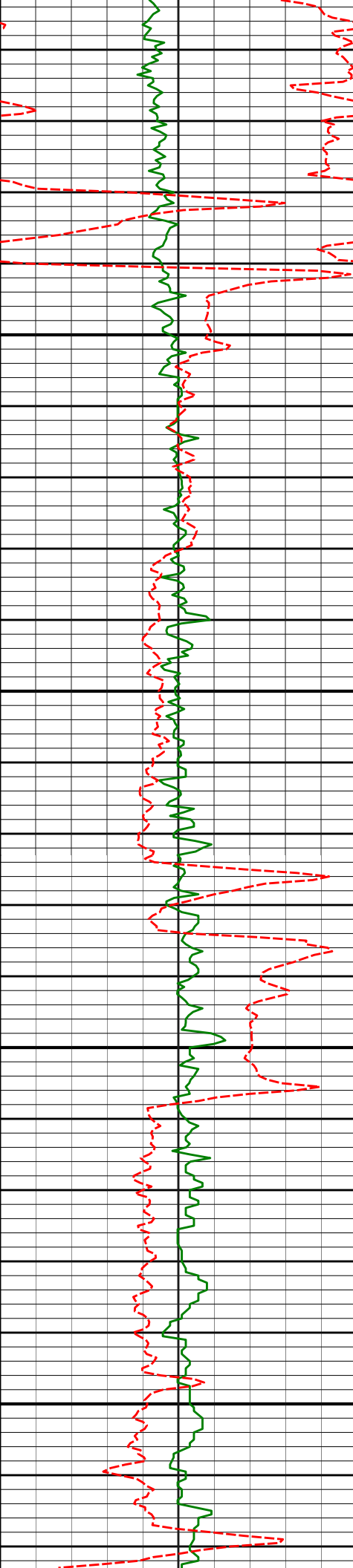
4376'

5.72°

91.42°

4369.18'

-16.69'



4450

4470'

5.29°

89.62°

4462.75'

-16.79'

4500

4550

4565'

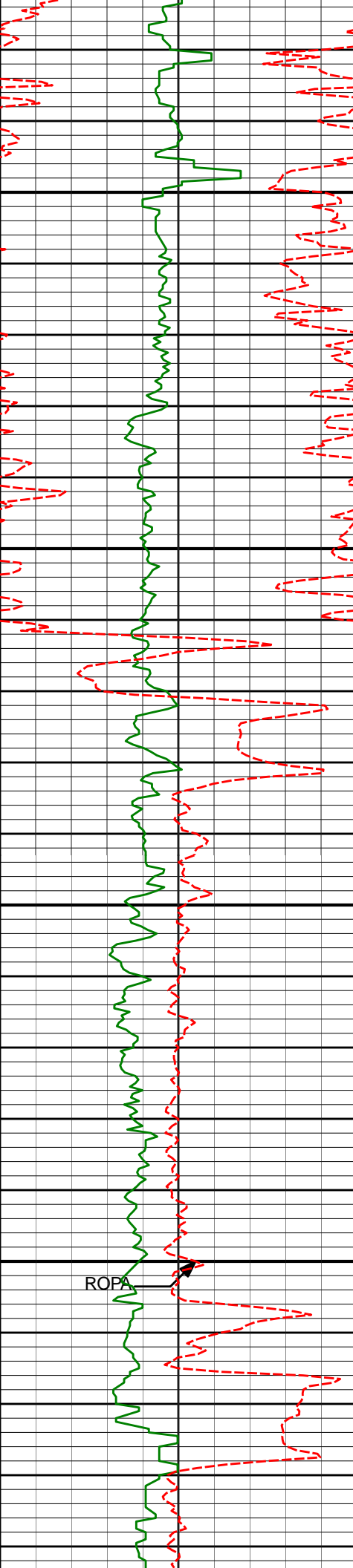
6.26°

73.16°

4557.27'

-15.26'

4600



4650

4659'

5.06°

69.36°

4650.81'

-12.32'

4700

4750

4753'

4.95°

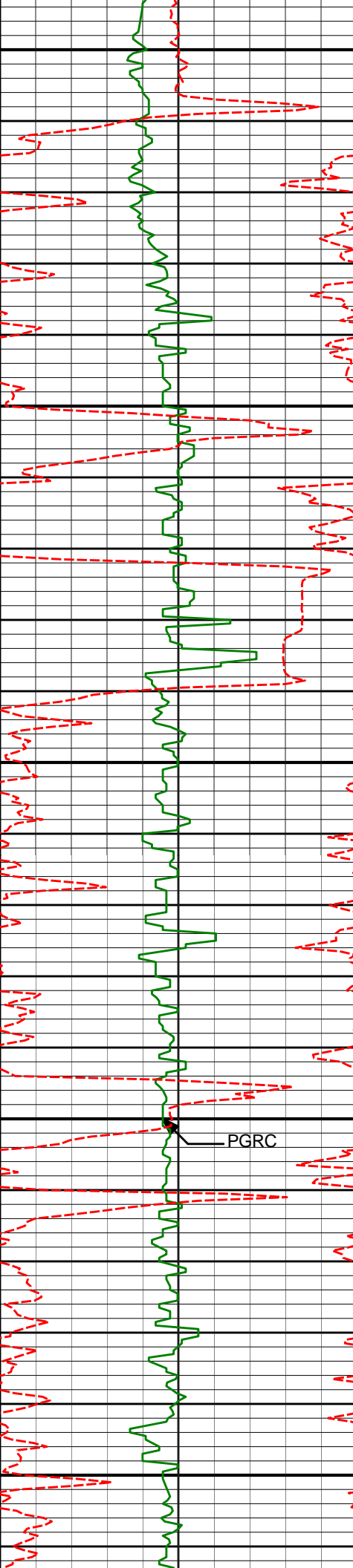
77.06°

4744.45'

-9.96'

4800

ROPA



4850

4900

4950

5000

5050

PGRC

4848'

5.56°

78.70°

4839.05'

-8.14'

4942'

7.00°

85.41°

4932.49'

-6.80'

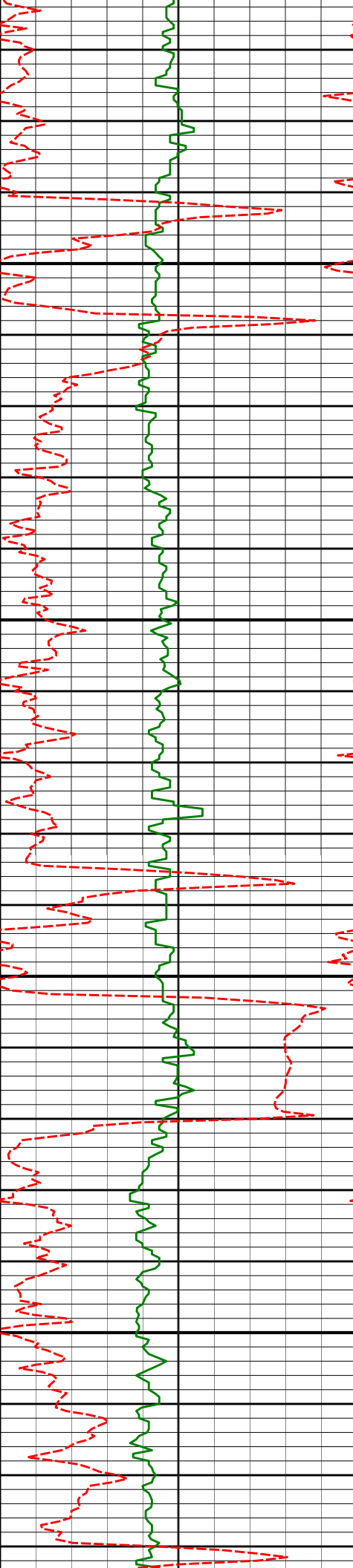
5036'

6.23°

86.30°

5025.86'

-6.02'



5100

5150

5200

5250

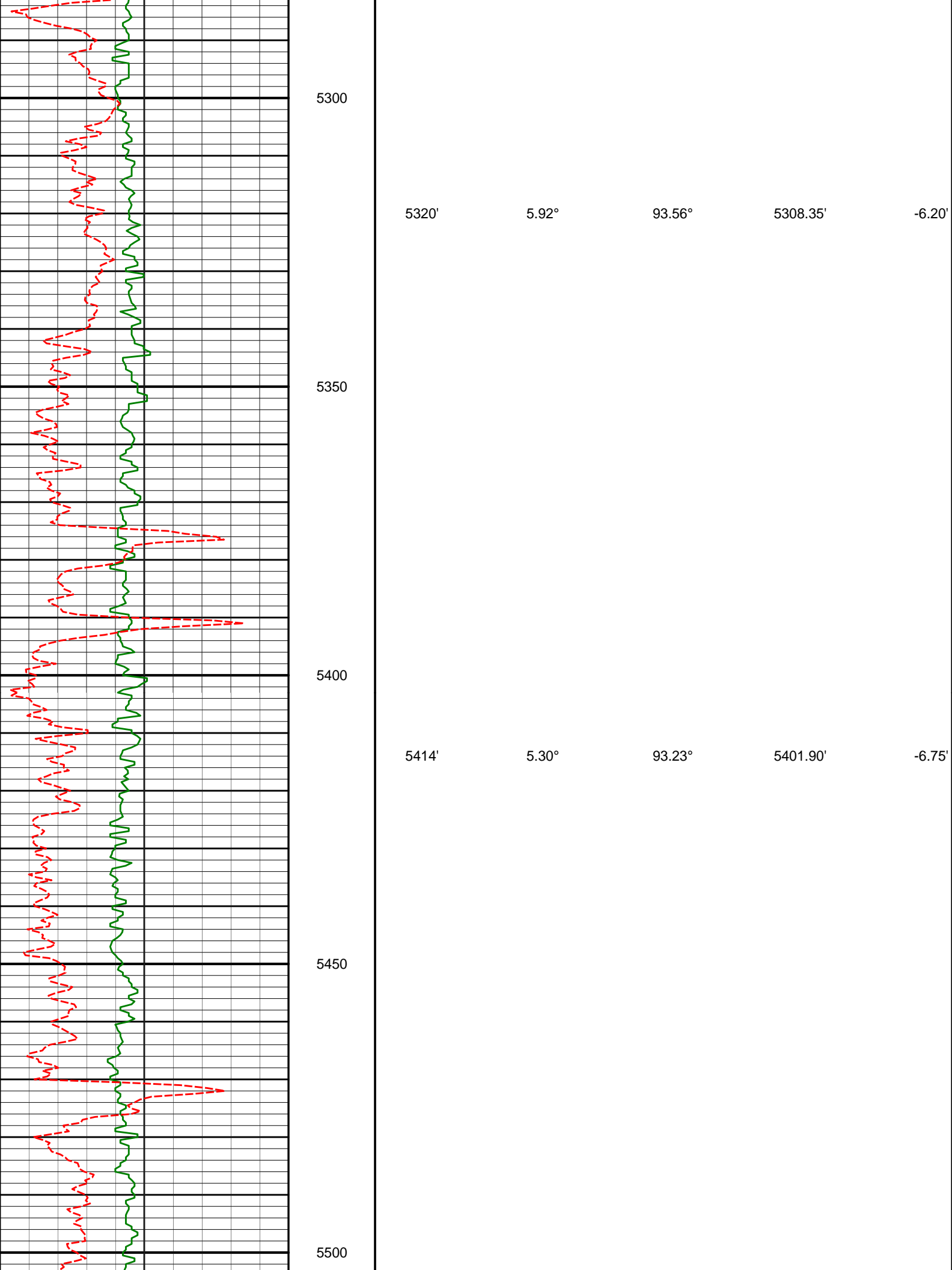
5131'

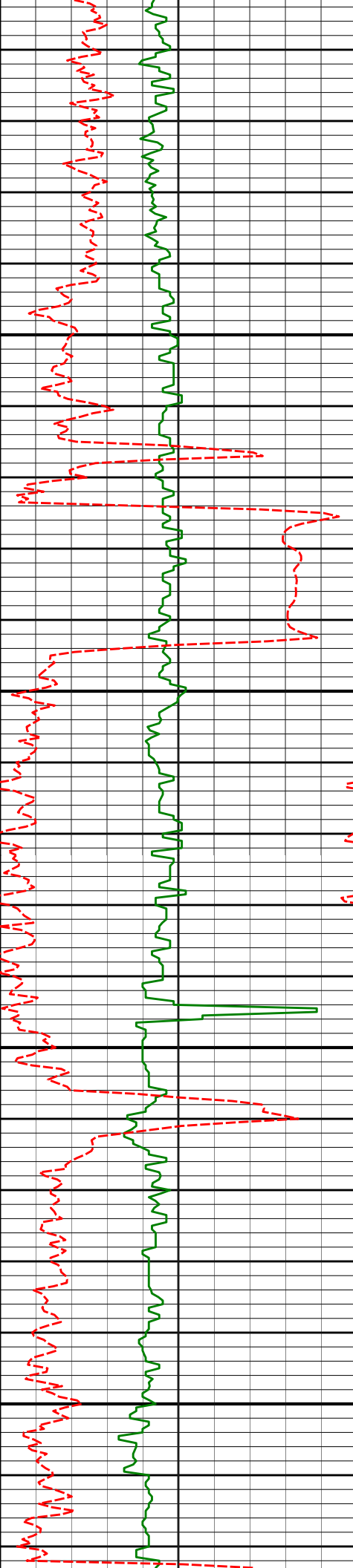
5.61°

84.91°

5120.35'

-5.28'





5550

5600

5650

5700

5508'

4.34°

91.18°

5495.57'

-7.08'

5603'

6.19°

93.97°

5590.16'

-7.51'

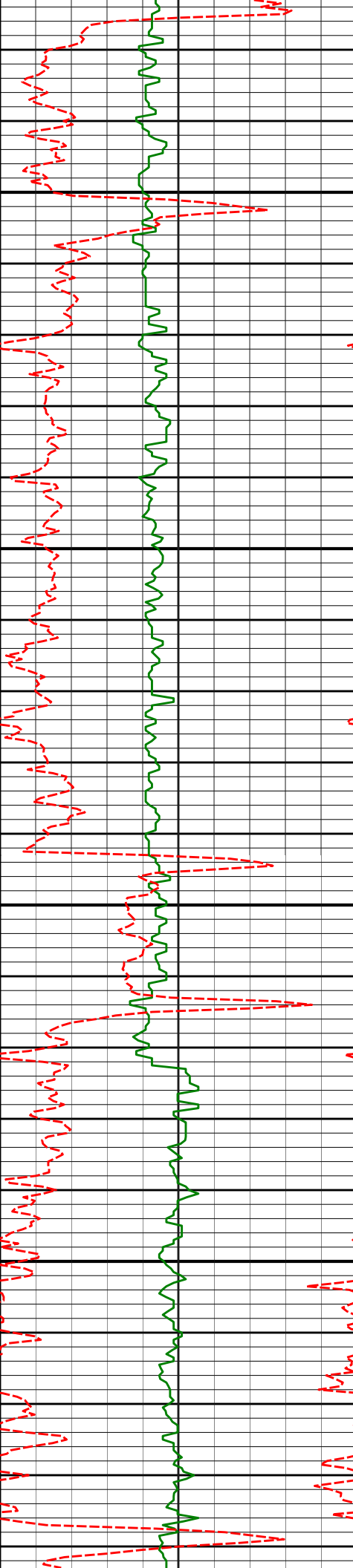
5697'

5.17°

88.11°

5683.70'

-7.72'



5750

5791'

4.32°

80.08°

5777.38'

-6.97'

5800

5850

5886'

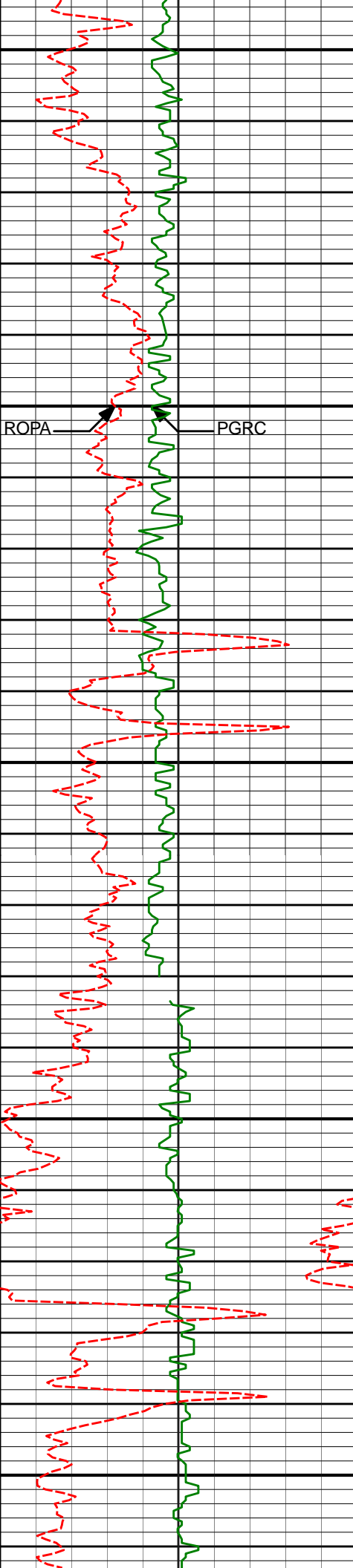
3.49°

95.51°

5872.16'

-6.64'

5900



5950

5980'

2.64°

98.01°

5966.03'

-7.22'

6000

ROPA

PGRC

6050

6074'

2.68°

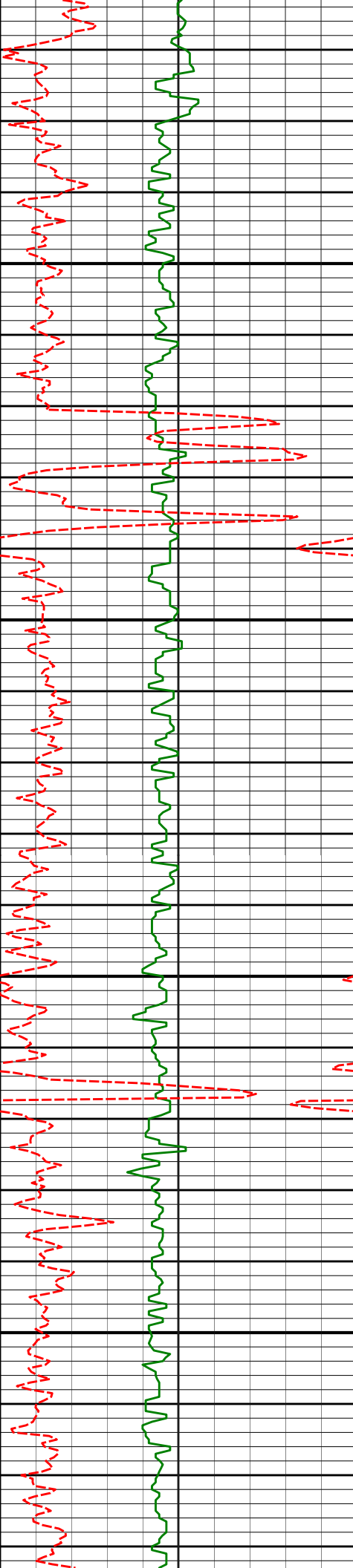
91.35°

6059.92'

-7.57'

6100

6150



6200

6250

6300

6350

6263'

2.13°

74.22°

6248.77'

-7.49'

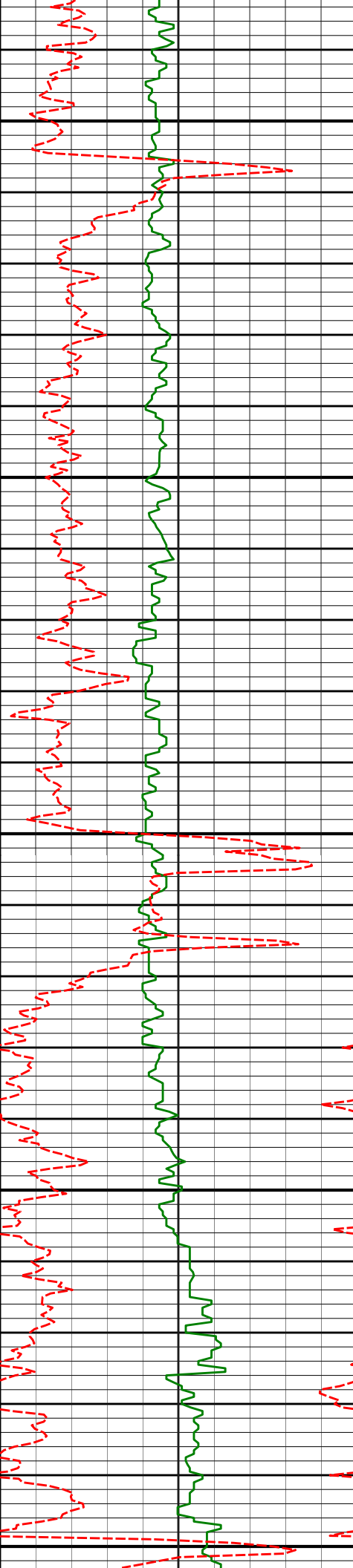
6358'

1.55°

70.66°

6343.72'

-6.58'



6400

6450

6500

6550

6600

6452'

1.56°

50.58°

6437.68'

-5.35'

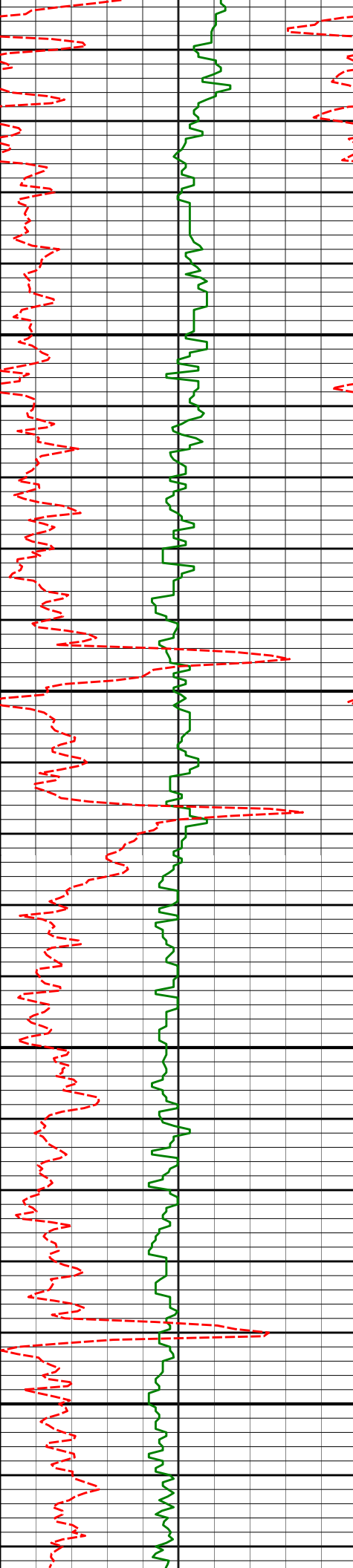
6547'

1.32°

71.02°

6532.65'

-4.18'



6650

6700

6750

6800

6641'

0.81°

36.11°

6626.64'

-3.29'

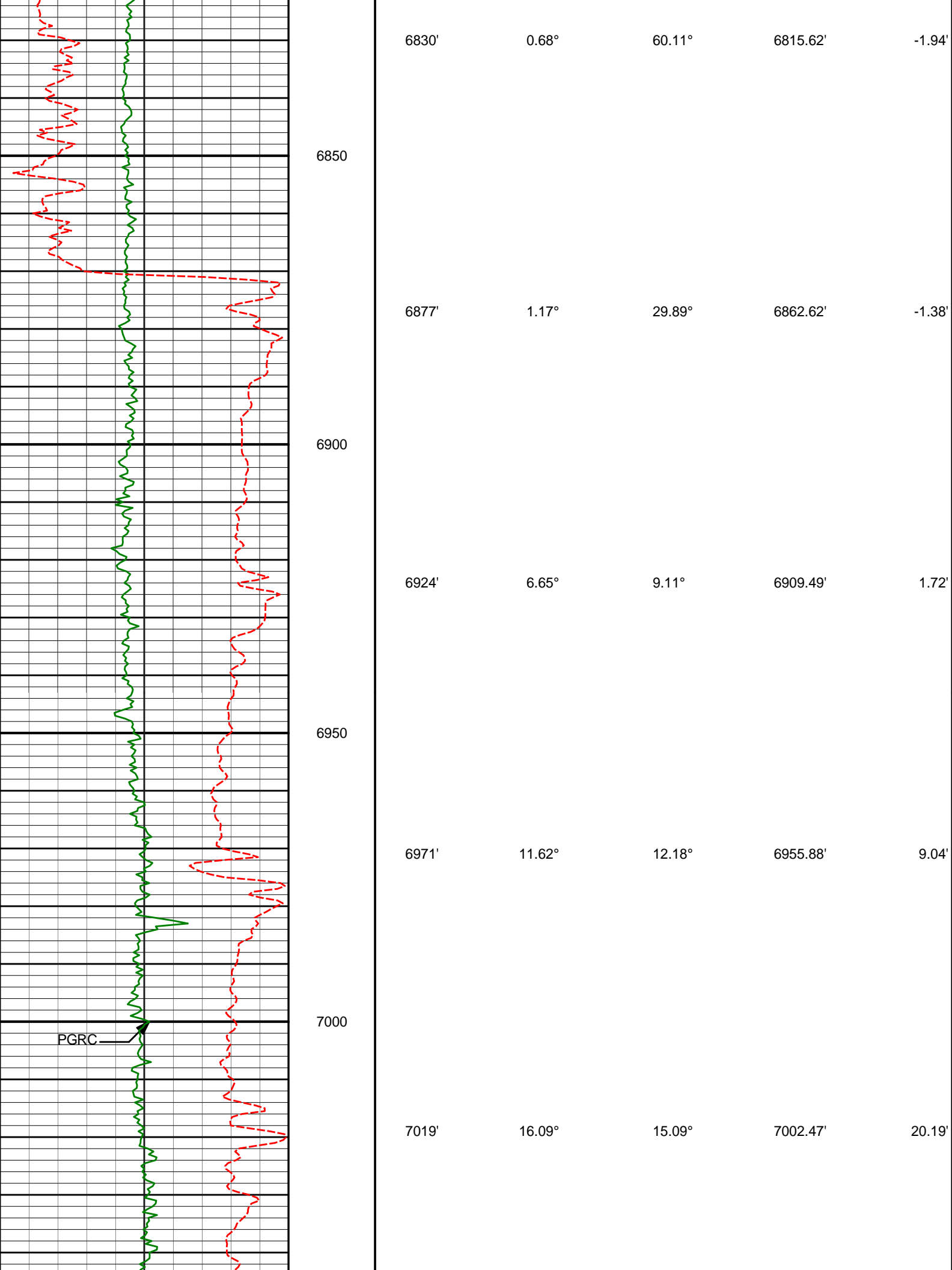
6735'

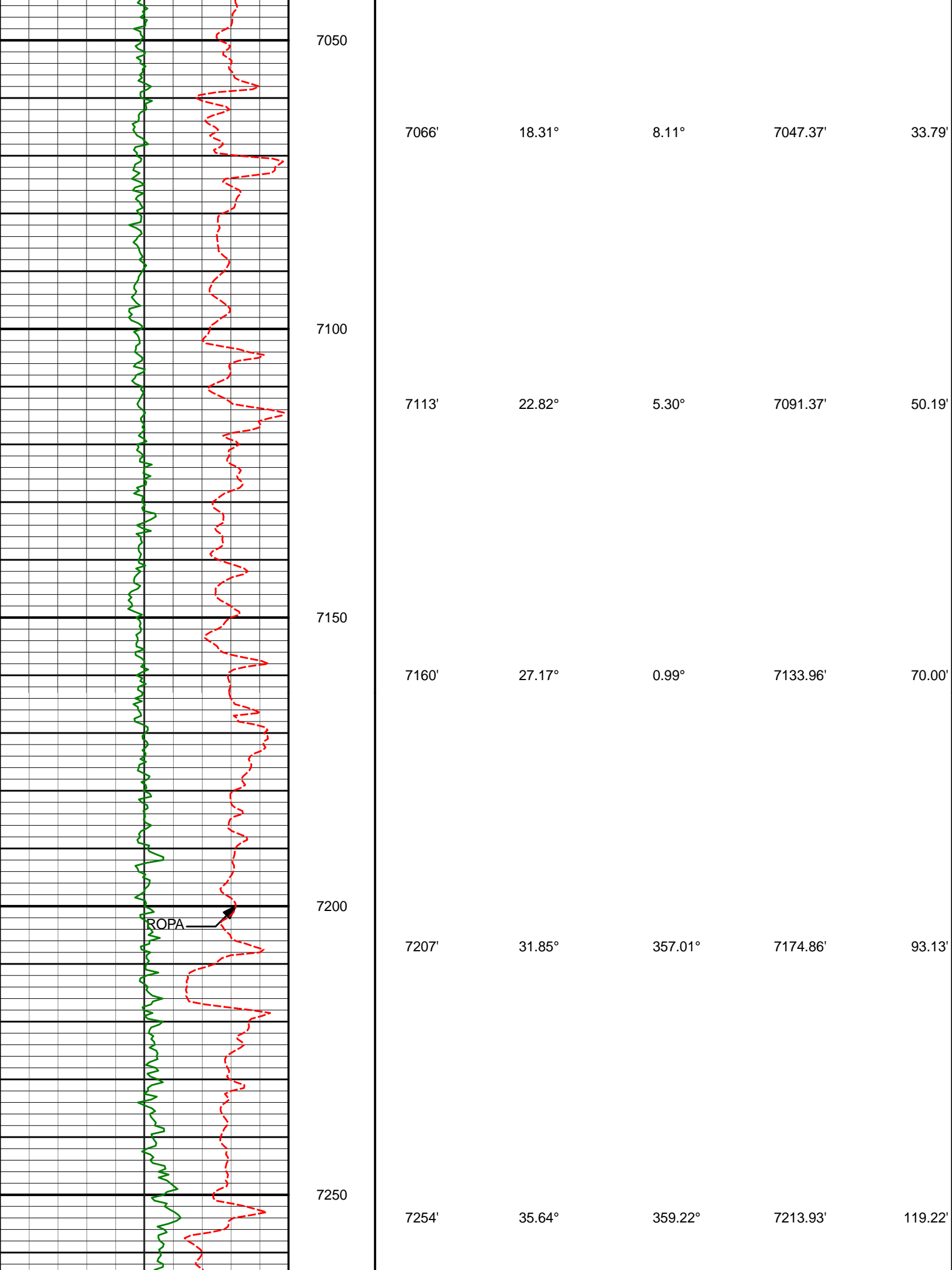
0.62°

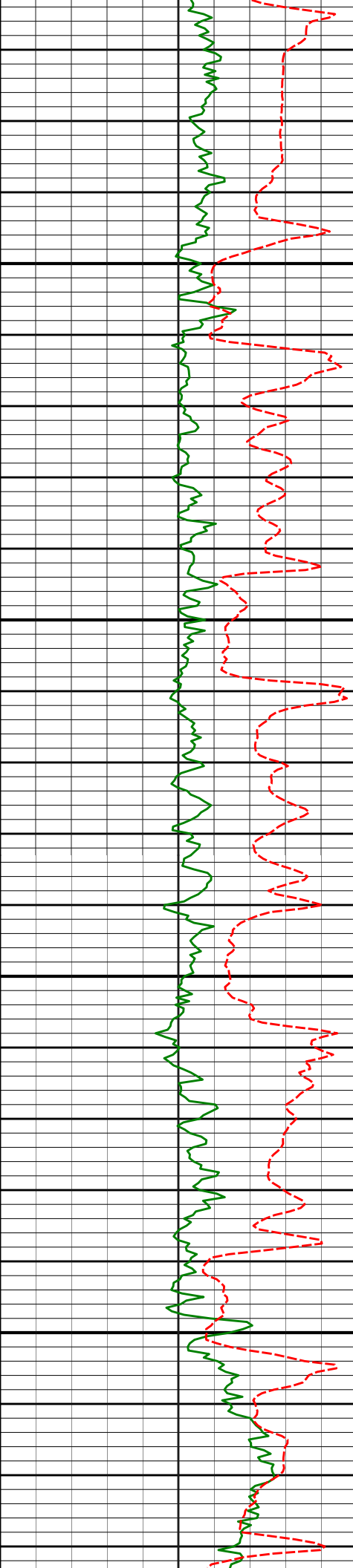
58.49°

6720.63'

-2.49'







7300

7302'

39.51°

0.50°

7251.97'

148.48'

7350

7349'

43.78°

1.56°

7287.08'

179.70'

7400

7396'

46.76°

0.42°

7320.16'

213.08'

7450

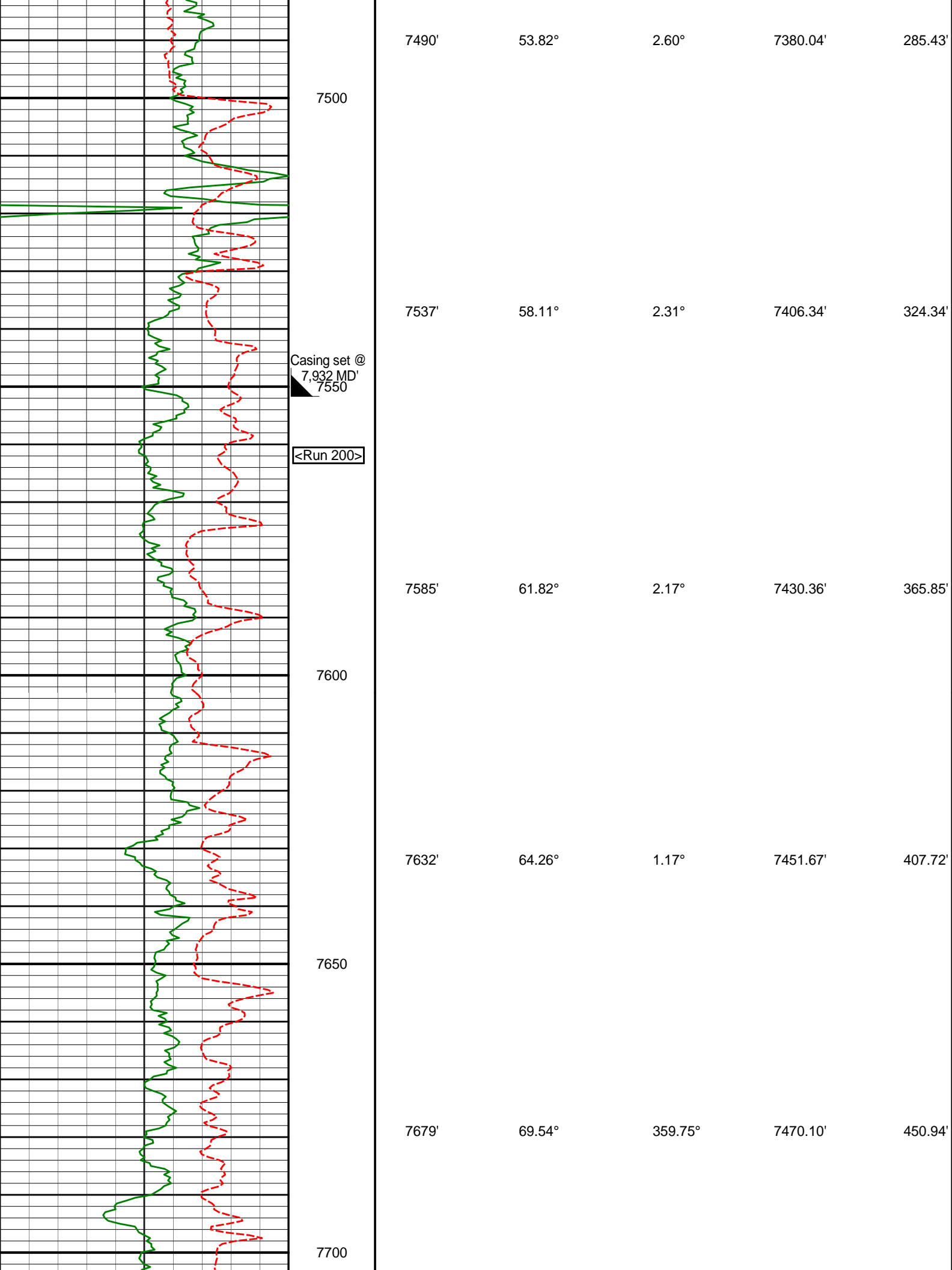
7443'

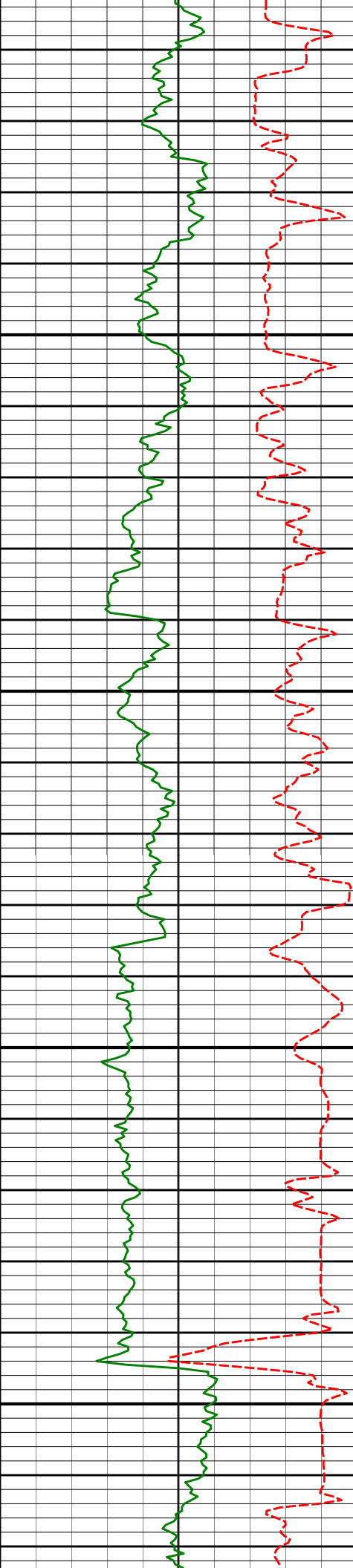
50.51°

1.24°

7351.21'

248.34'





7750

7800

7850

7900

7726'

73.47°

358.82°

7485.01'

495.50'

7773'

76.50°

0.10°

7497.18'

540.88'

7820'

81.61°

1.28°

7506.10'

587.01'

7836'

83.23°

1.23°

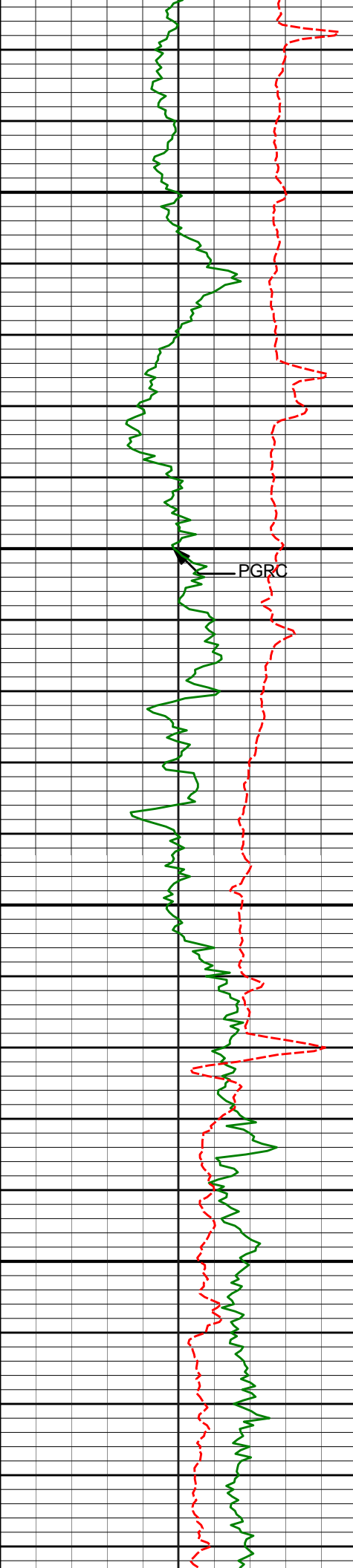
7508.21'

602.86'



7" casing at 7886

Run 200



7950

8000

8050

8100

7924'

87.90°

0.68°

7515.02'

690.56'

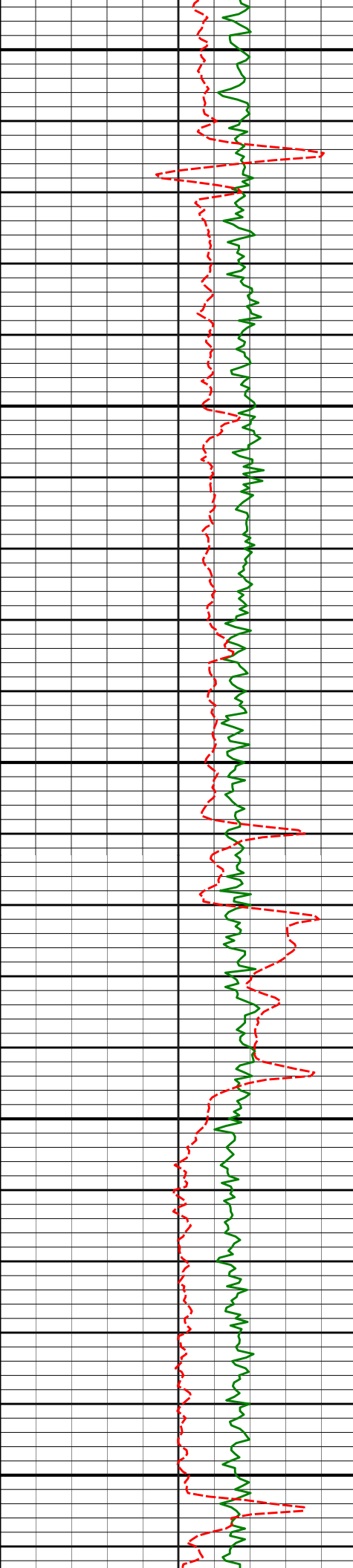
8019'

88.71°

0.44°

7517.83'

785.52'



8150

8200

8250

8300

8350

8208'

90.46°

359.12°

7519.31'

974.50'

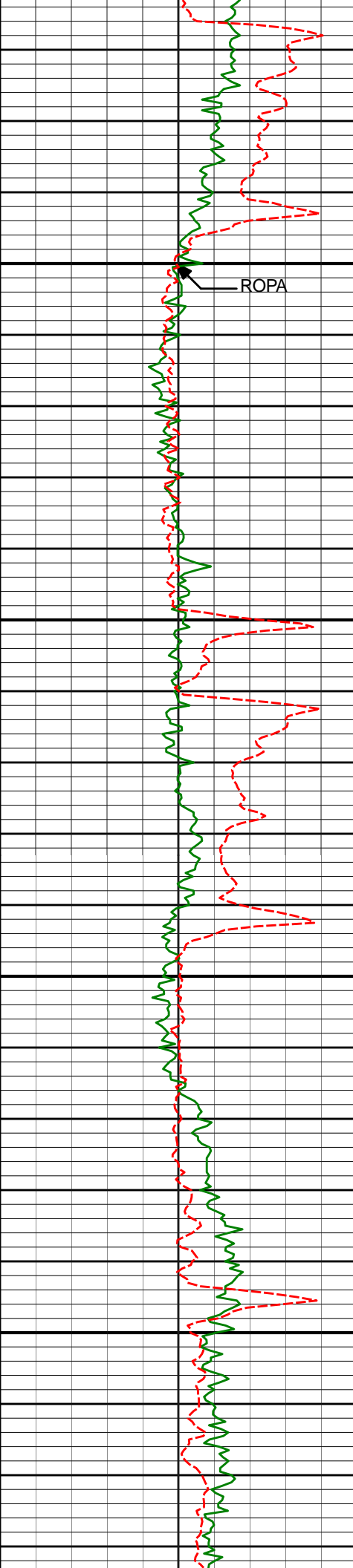
8302'

91.02°

359.81°

7518.10'

1068.48'



8400

8450

8500

8550

8397'

91.14°

1.30°

7516.31'

1163.46'

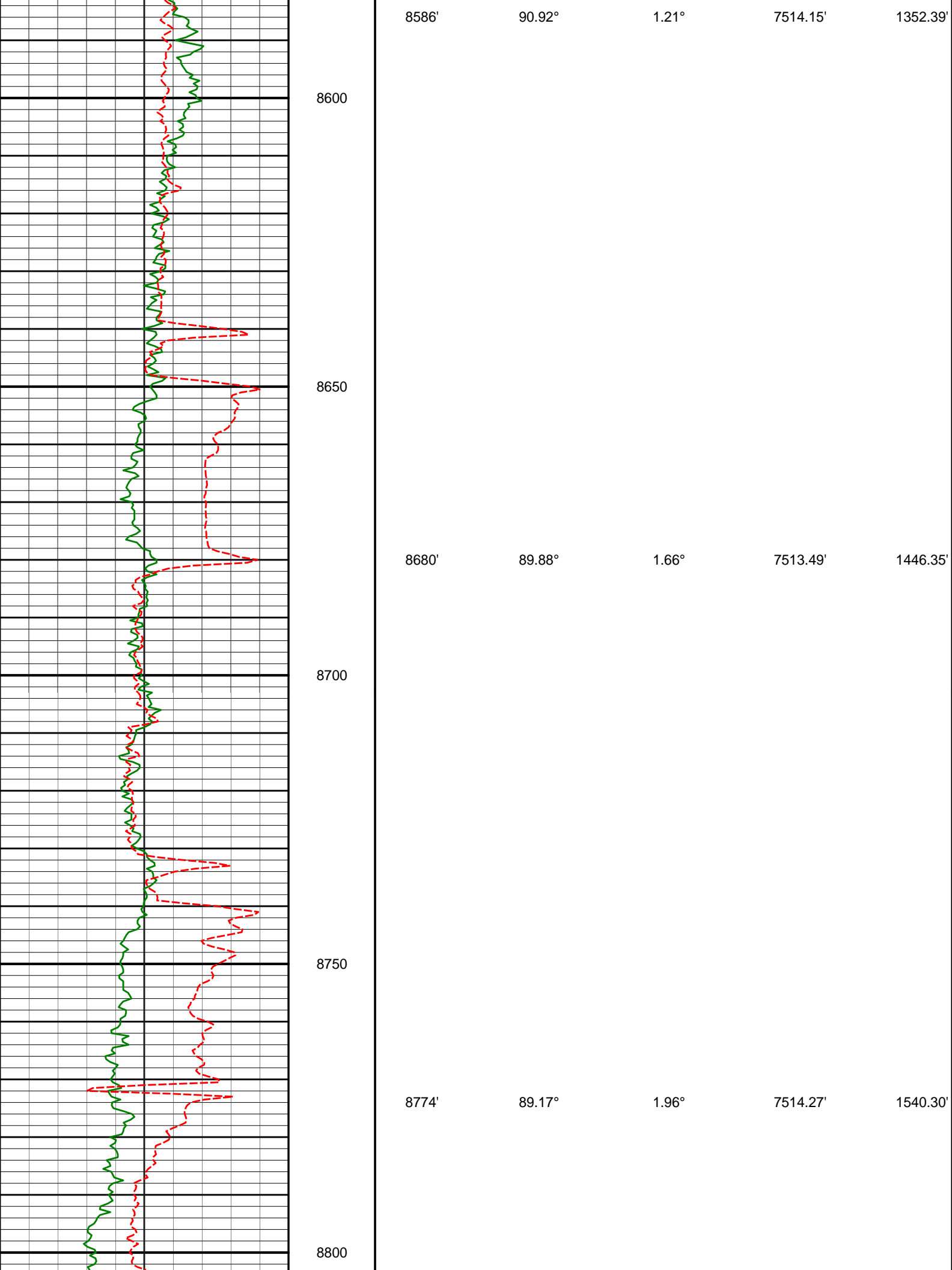
8491'

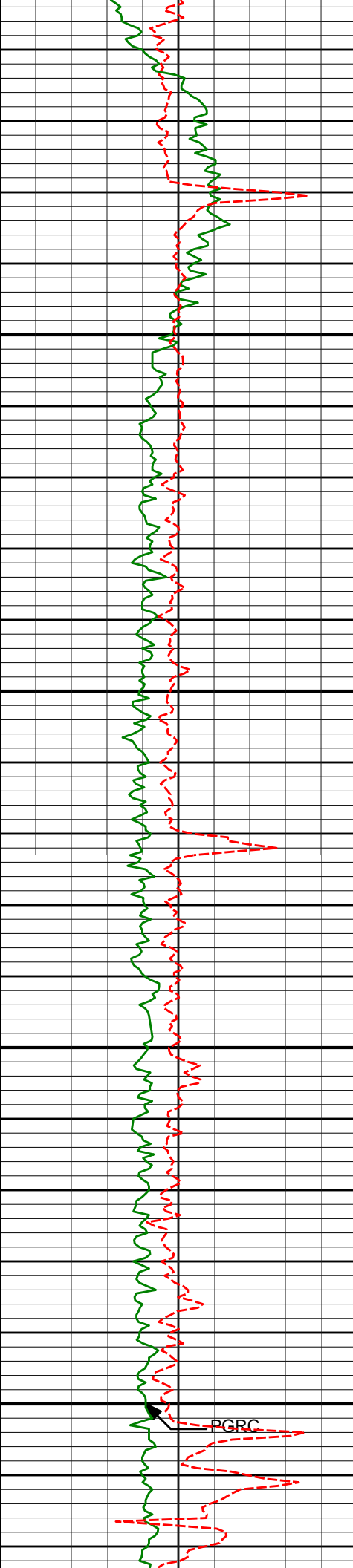
90.28°

1.49°

7515.14'

1257.42'





8850

8869'

89.78°

1.57°

7515.14'

1635.25'

8900

8950

8963'

90.56°

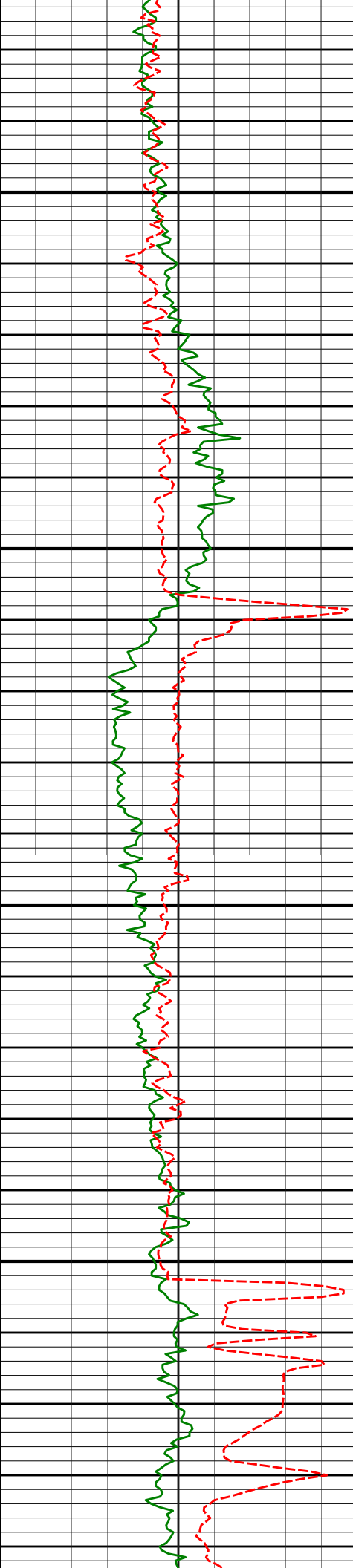
0.86°

7514.86'

1729.22'

9000

PGRC



9050

9100

9150

9200

9058'

91.30°

0.78°

7513.32'

1824.20'

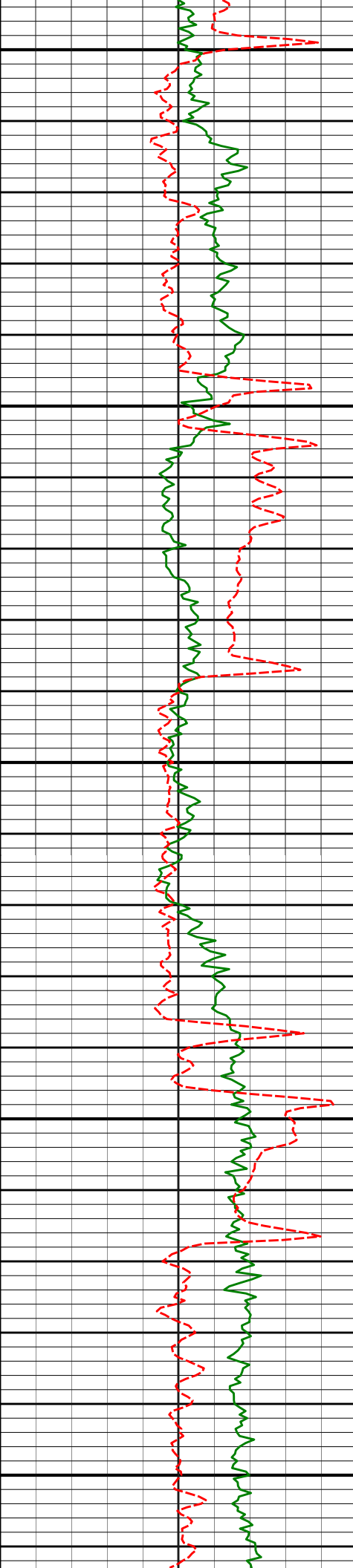
9243'

92.47°

0.01°

7506.66'

2009.07'



9250

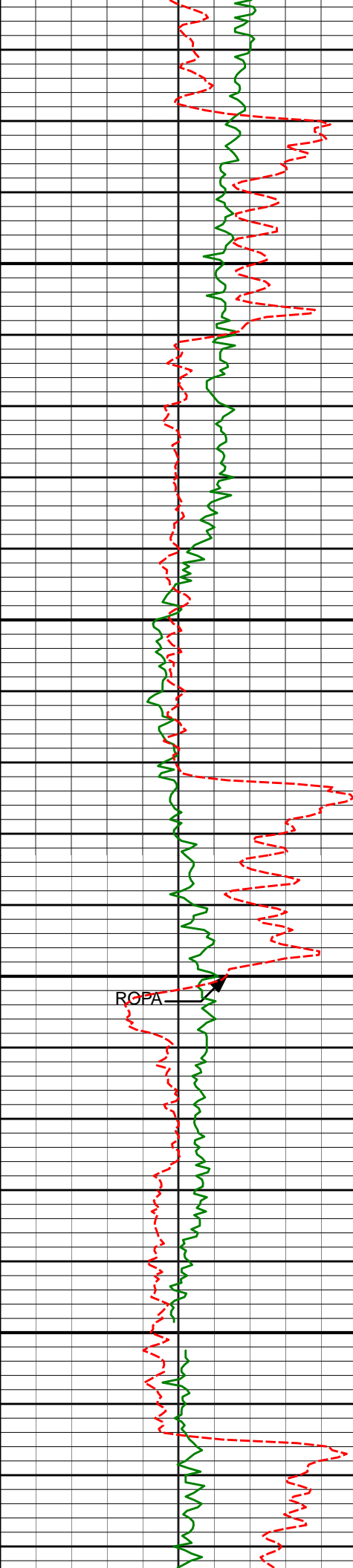
9300

9350

9400

9450

9243'	92.47°	0.01	7500.00	2009.07
9336'	91.79°	359.84°	7503.20'	2102.01'
9428'	91.51°	359.69°	7500.56'	2193.97'



9500

9550

9600

9650

ROPA

9520'

91.05°

359.41°

7498.50'

2285.94'

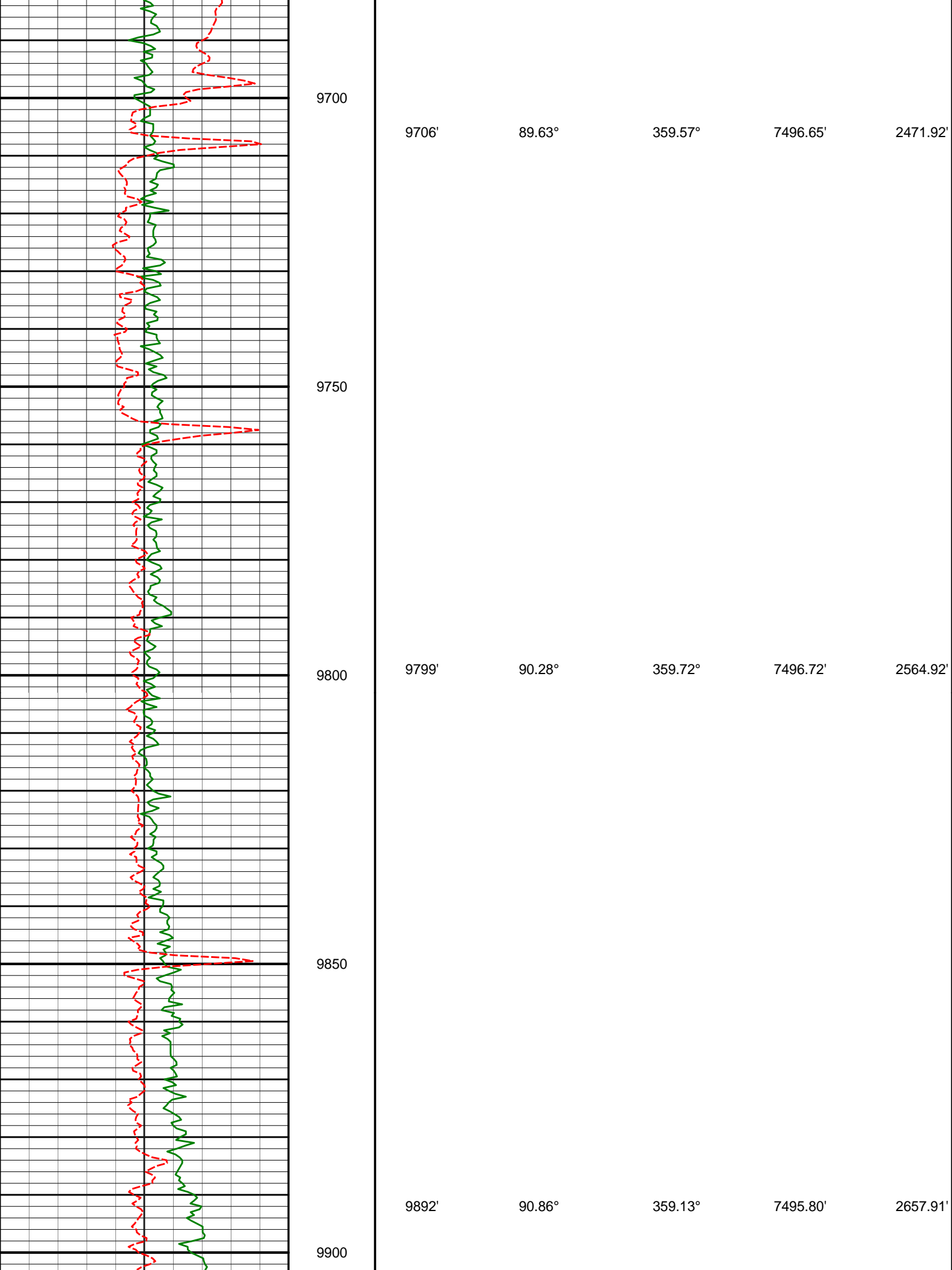
9613'

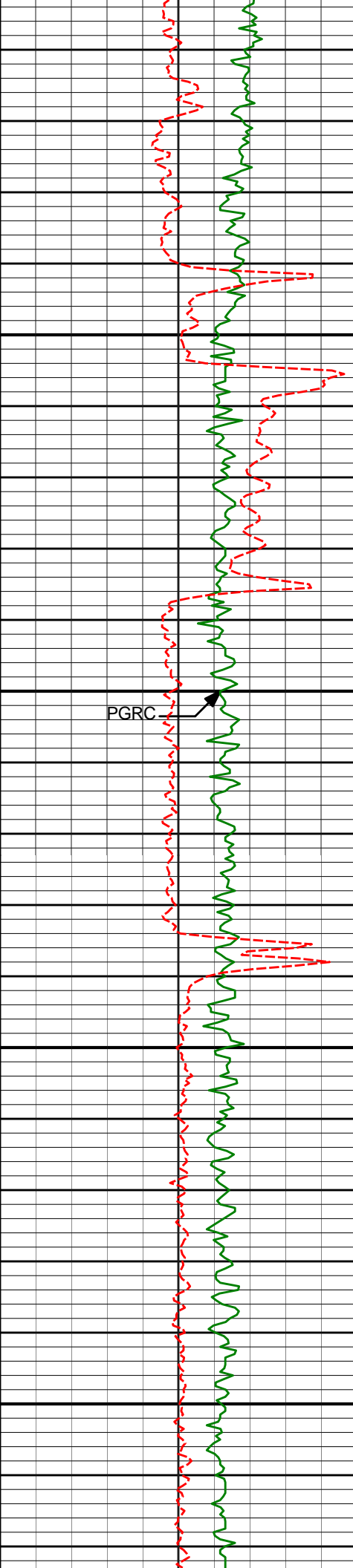
90.80°

359.61°

7497.00'

2378.93'





9950

10000

PGRC

10050

10100

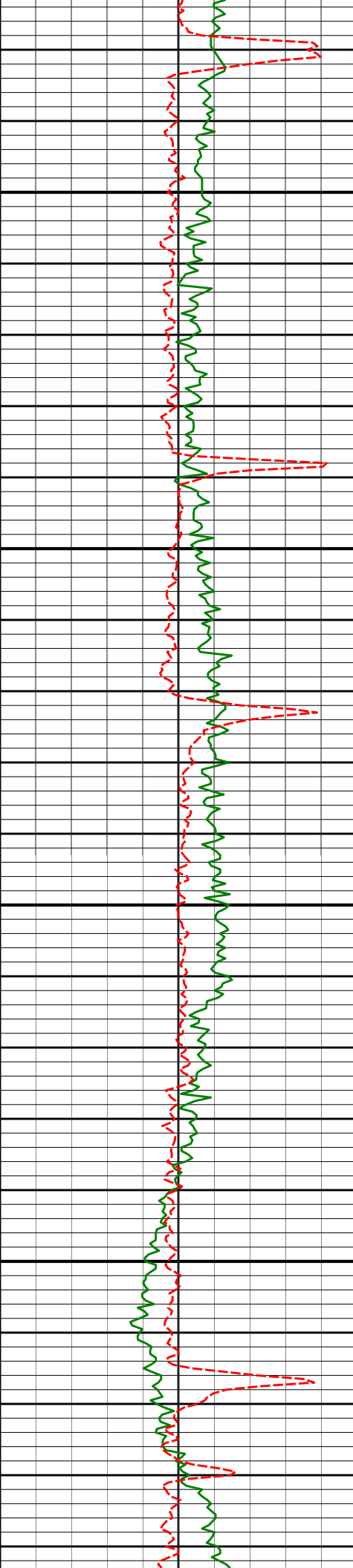
10076'

90.12°

359.04°

7495.60'

2841.88'



10150

10200

10250

10300

10169'

90.52°

358.34°

7495.09'

2934.85'

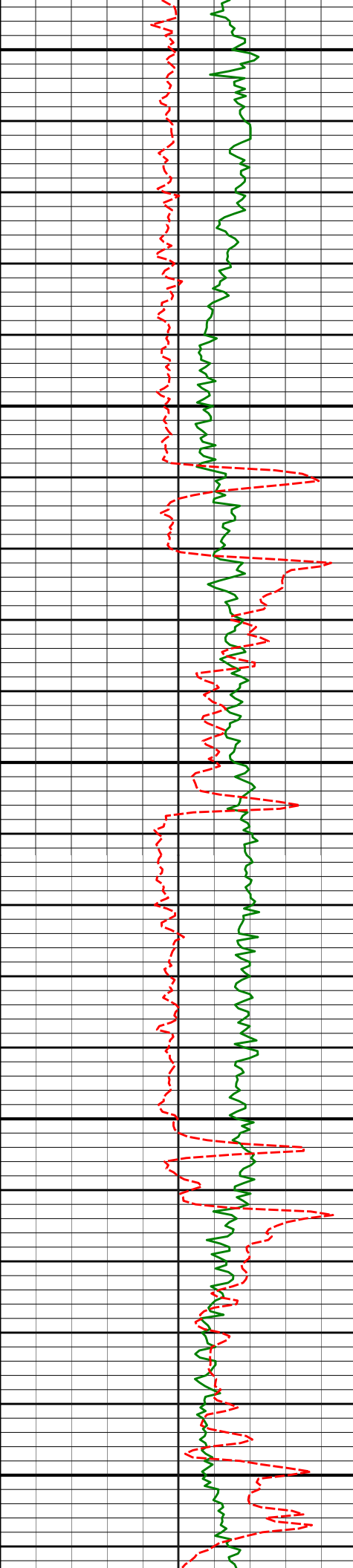
10262'

91.11°

358.08°

7493.76'

3027.80'



10350

10400

10450

10500

10550

10355'

91.76°

357.78°

7491.43'

3120.71'

10448'

90.31°

357.41°

7489.75'

3213.62'

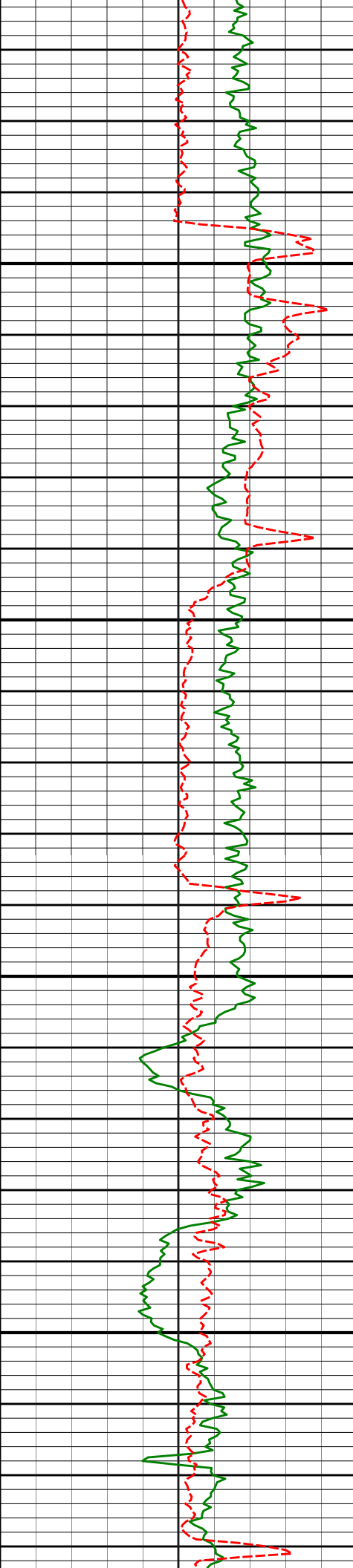
10540'

90.09°

359.94°

7489.43'

3305.58'



10600

10633'

88.98°

0.09°

7490.19'

3398.58'

10650

10700

10724'

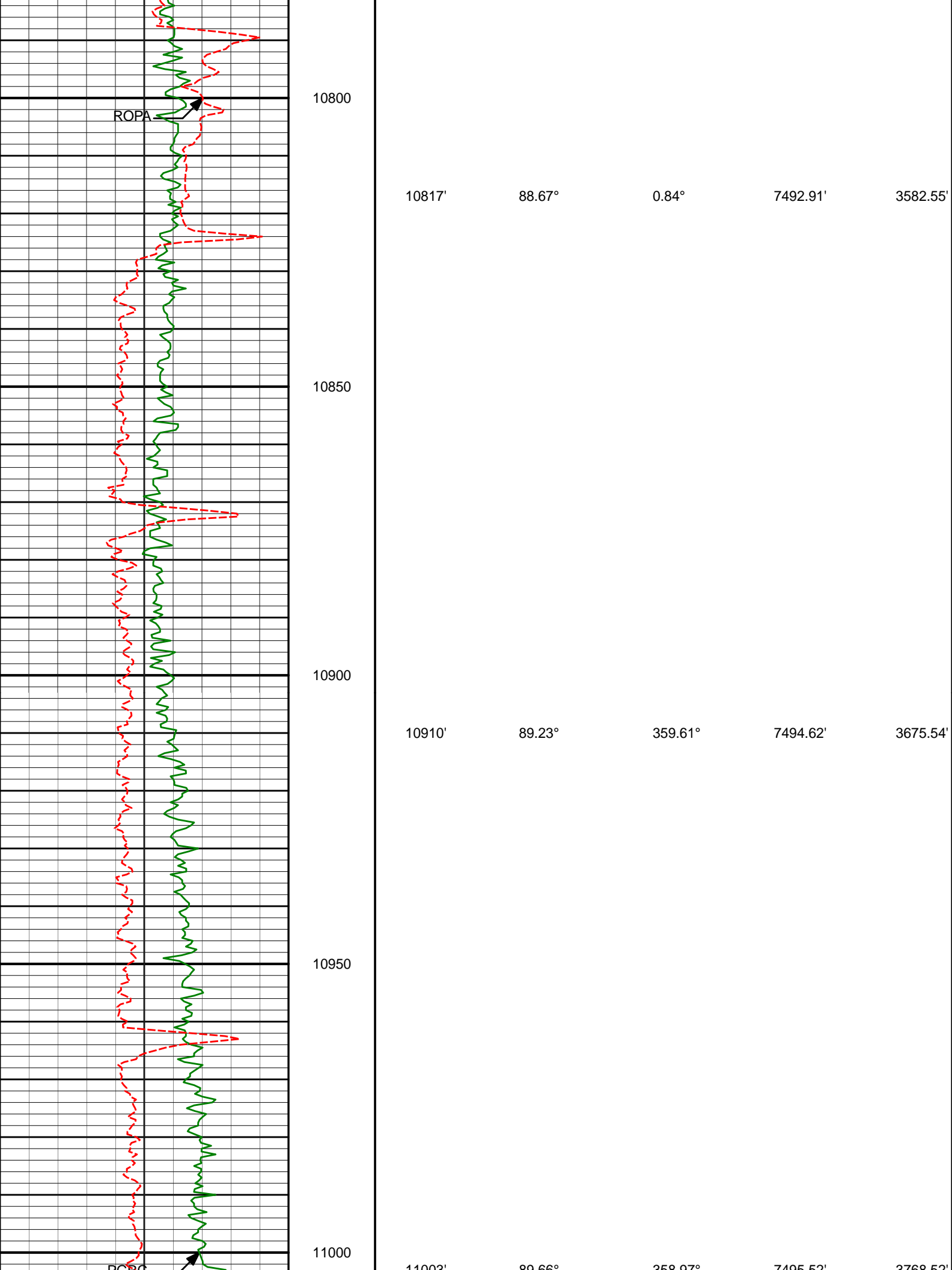
89.48°

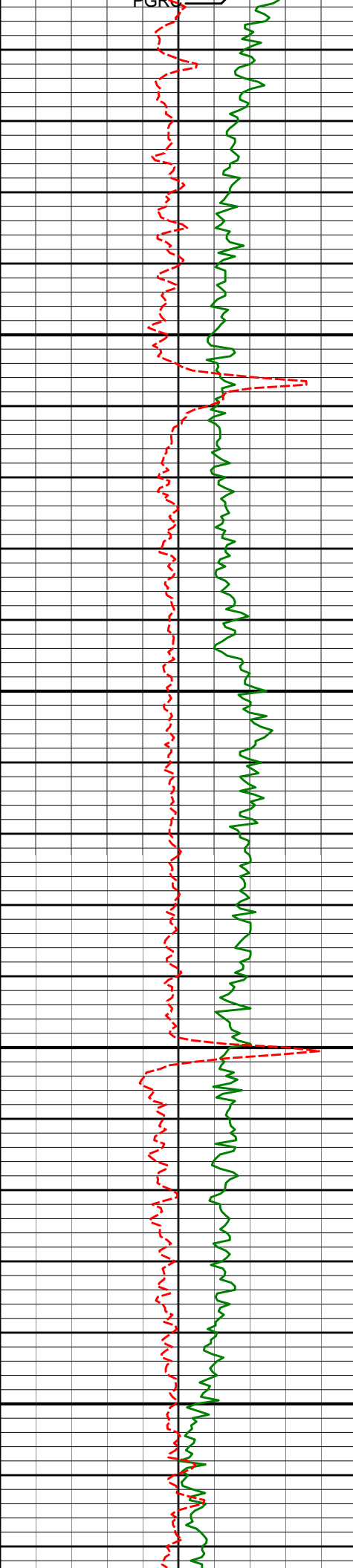
359.57°

7491.41'

3489.57'

10750





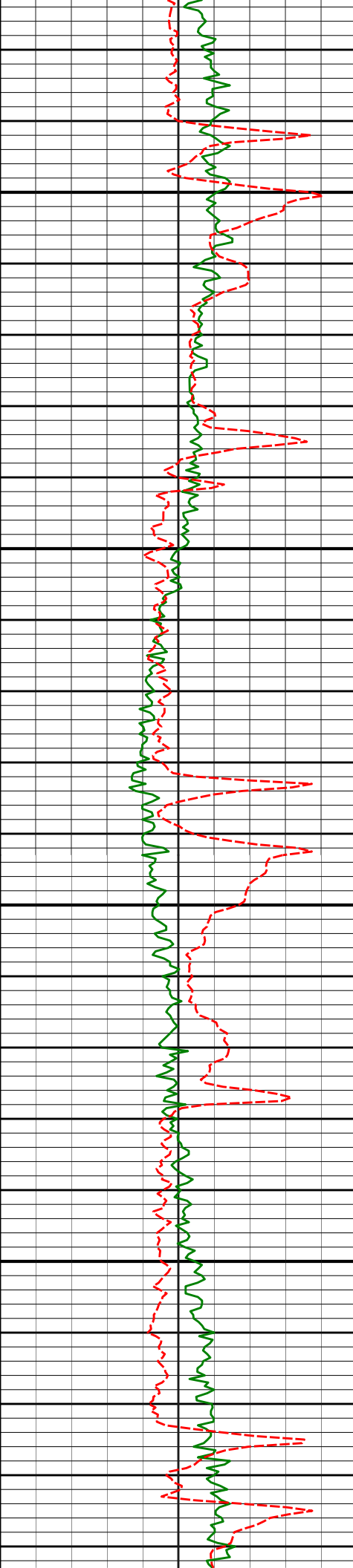
11050

11100

11150

11200

11003	89.00	358.97	7495.32	3700.32
11096'	90.12°	359.05°	7495.70'	3861.51'
11189'	91.11°	358.44°	7494.70'	3954.48'



11250

11300

11350

11400

11282'

90.80°

359.66°

7493.15'

4047.46'

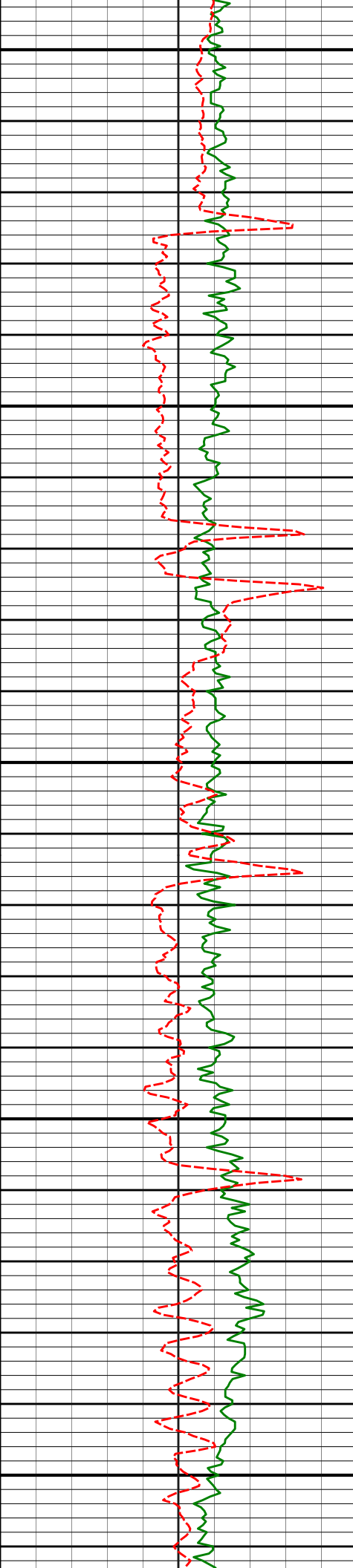
11374'

90.03°

359.35°

7492.48'

4139.45'



11450

11467'

89.66°

359.62°

7492.73'

4232.45'

11500

11550

11557'

88.89°

1.83°

7493.87'

4322.43'

11600

11650

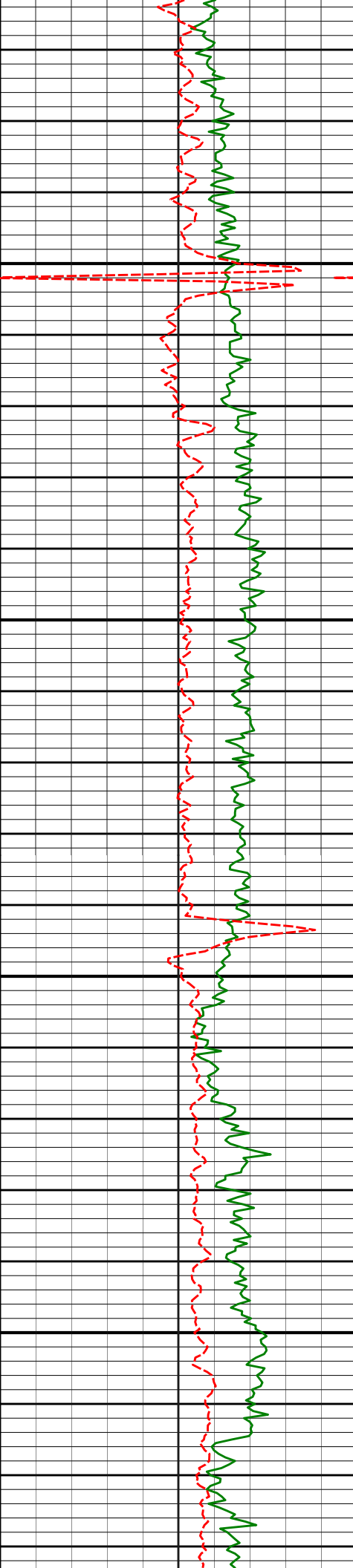
11649'

89.23°

1.71°

7495.38'

4414.37'



11700

11750

11800

11850

11741'

89.72°

1.39°

7496.22'

4506.33'

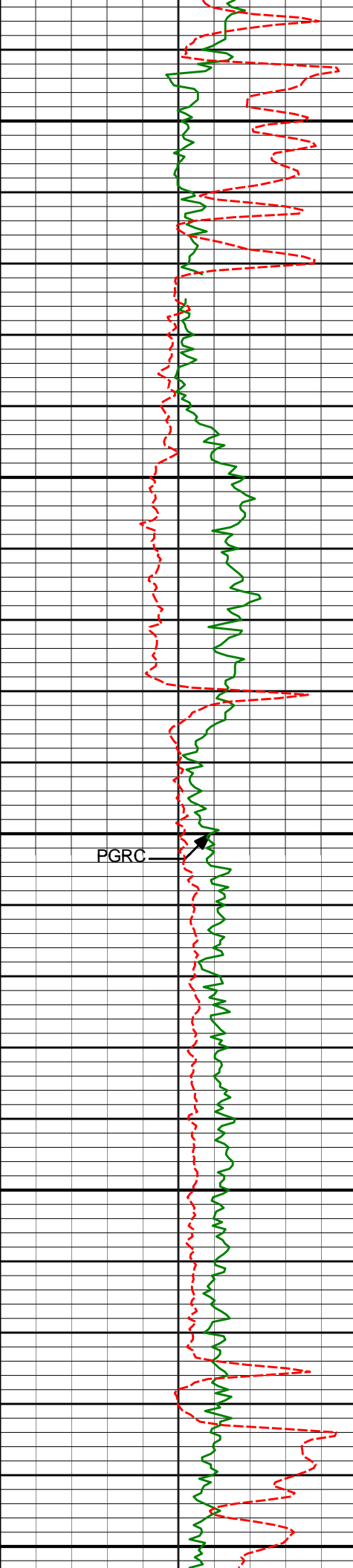
11832'

90.15°

1.06°

7496.33'

4597.31'



11900

11950

12000

12050

12100

PGRC



11926'

89.75°

1.17°

7496.41'

4691.29'

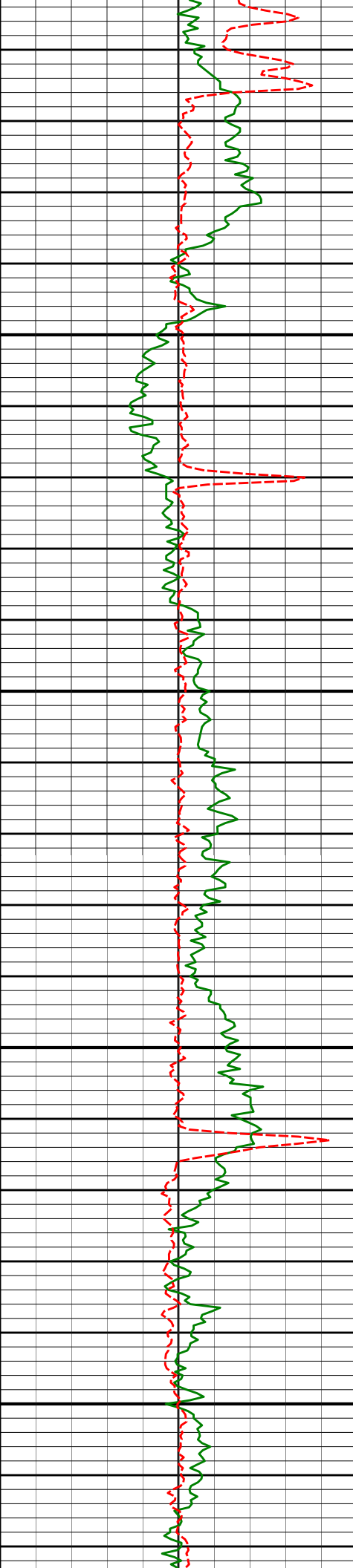
12021'

90.37°

0.91°

7496.31'

4786.27'



12150

12200

12250

12300

12115'

89.41°

1.61°

7496.49'

4880.24'

12209'

89.78°

1.15°

7497.15'

4974.21'

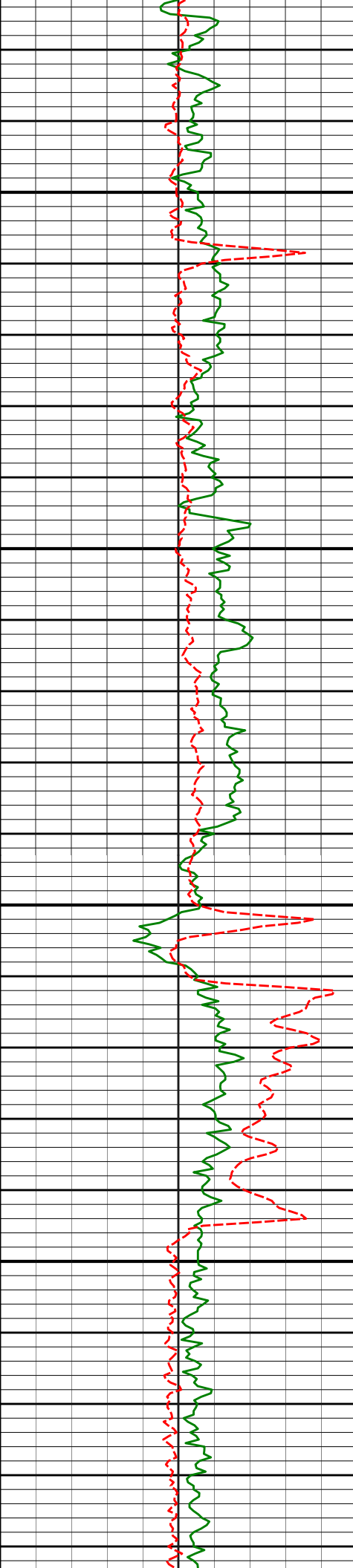
12304'

90.00°

1.24°

7497.34'

5069.19'



12350

12400

12450

12500

12398'

90.34°

0.54°

7497.06'

5163.17'

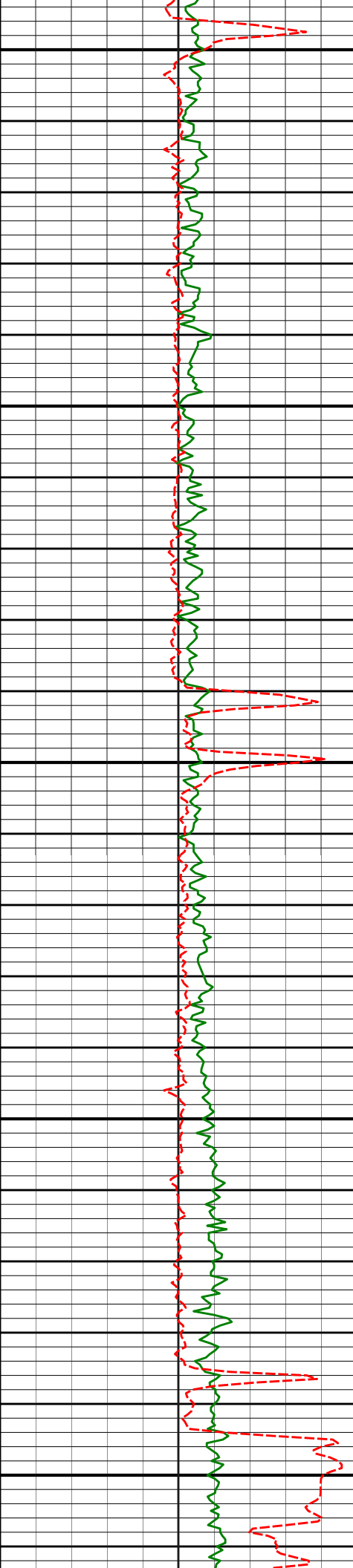
12492'

89.17°

1.29°

7497.46'

5257.16'



12550

12587'

89.91°

1.12°

7498.22'

5352.13'

12600

12650

12681'

90.34°

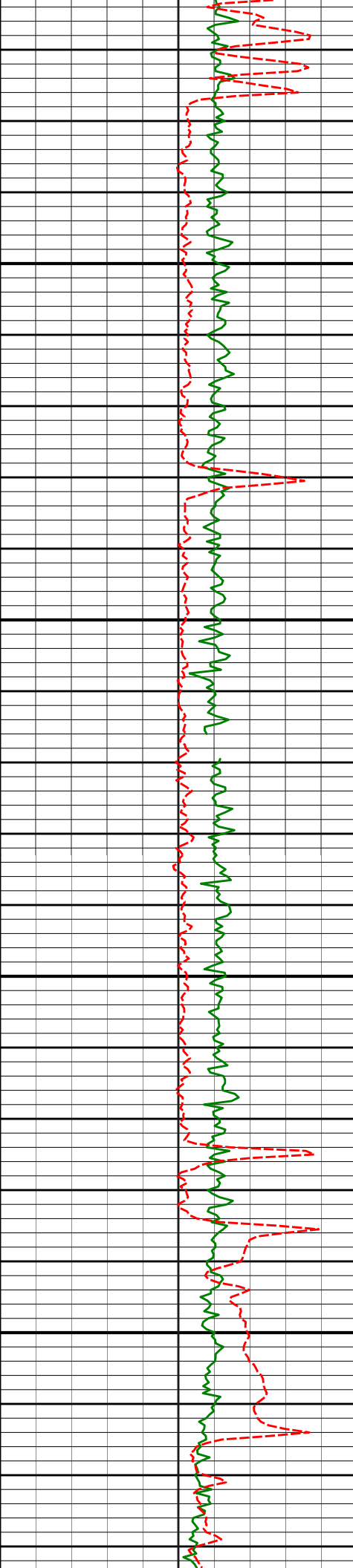
0.86°

7498.02'

5446.11'

12700

12750



12800

12850

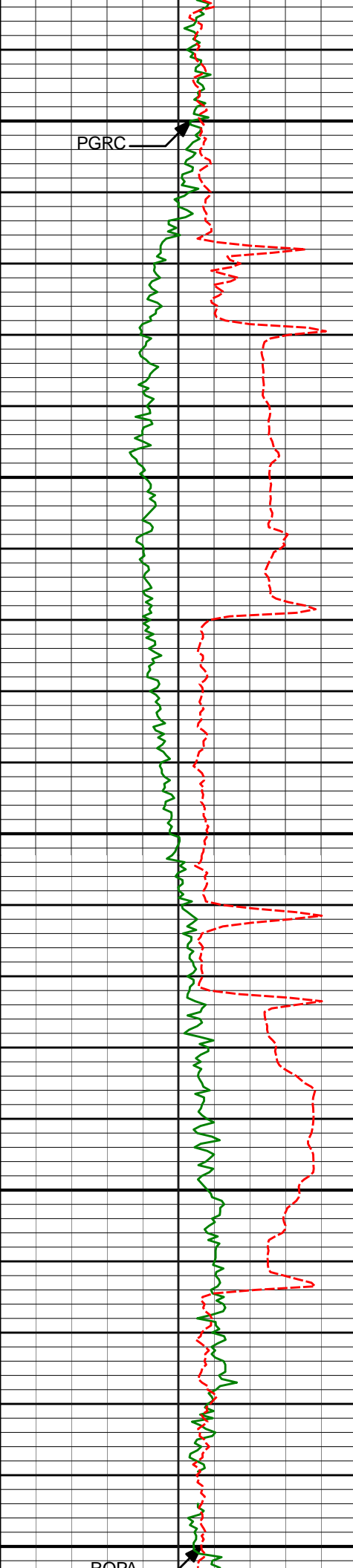
12900

12950

12776'	89.69°	1.10°	7497.99'	5541.10'
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12870'	90.31°	0.84°	7497.99'	5635.08'
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12964'	90.52°	0.16°	7497.31'	5729.07'
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13000

PGRC

13050

13059'

89.69°

0.48°

7497.14'

5824.07'

13100

13150

13153'

88.40°

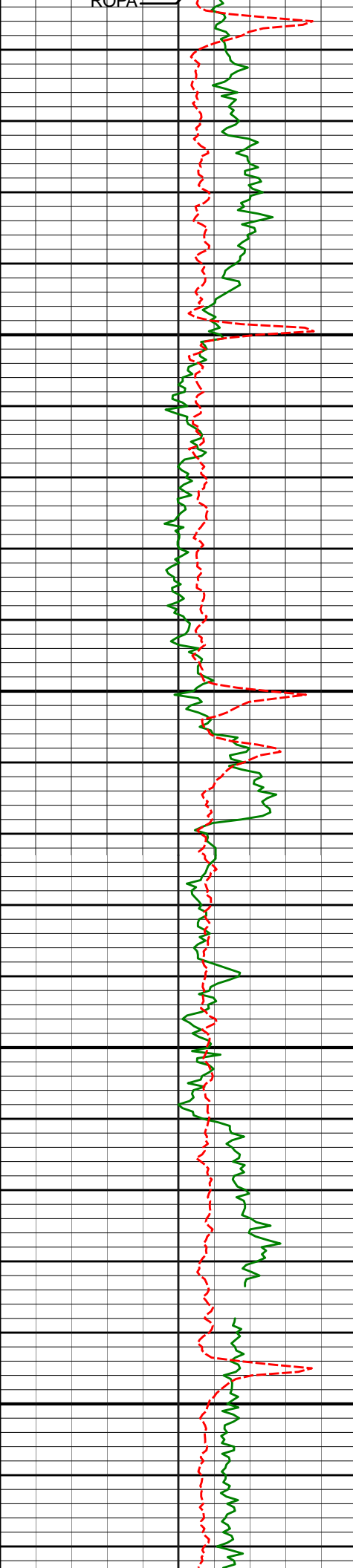
0.65°

7498.71'

5918.05'

13200

BOPA



13250

13300

13350

13400

13247'

88.49°

359.85°

7501.26'

6012.01'

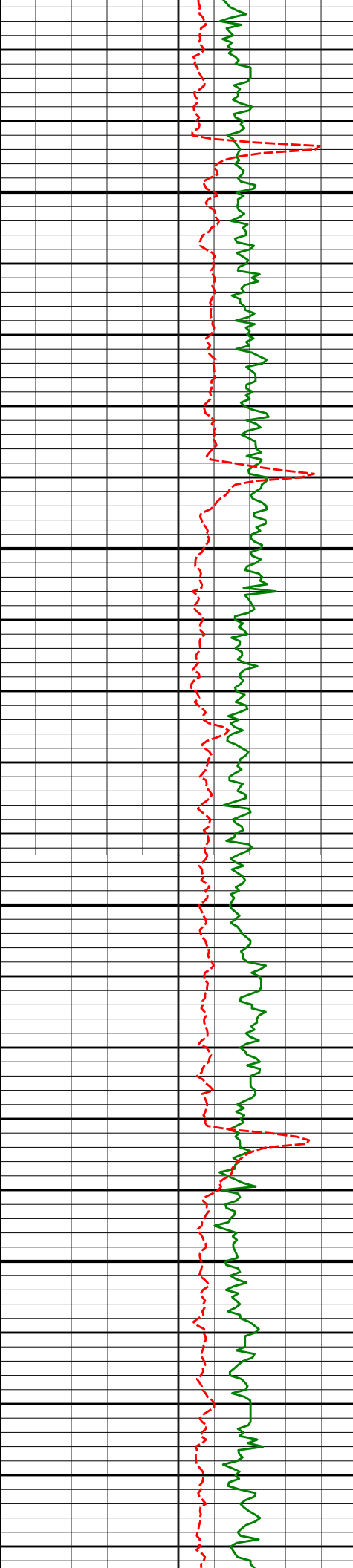
13342'

88.77°

359.69°

7503.53'

6106.98'



13450

13500

13550

13600

13436'

89.20°

359.33°

7505.19'

6200.96'

13530'

89.38°

358.85°

7506.36'

6294.95'

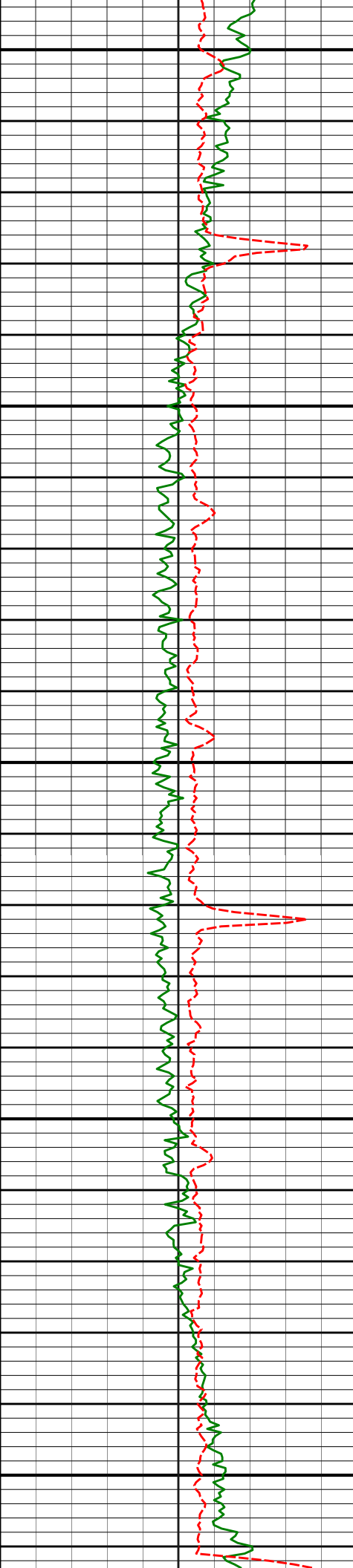
13625'

89.72°

358.34°

7507.10'

6389.92'



13650

13700

13750

13800

13850

13719'

90.15°

357.96°

7507.21'

6483.87'

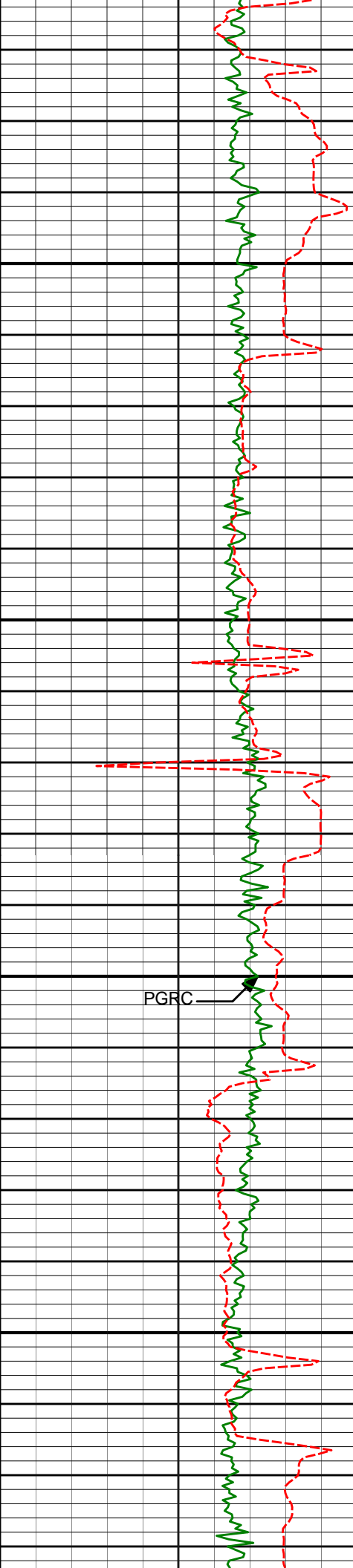
13813'

90.89°

357.13°

7506.36'

6577.78'



13900

13950

14000

14050

PGRC

13908'

90.74°

357.53°

7505.01'

6672.68'

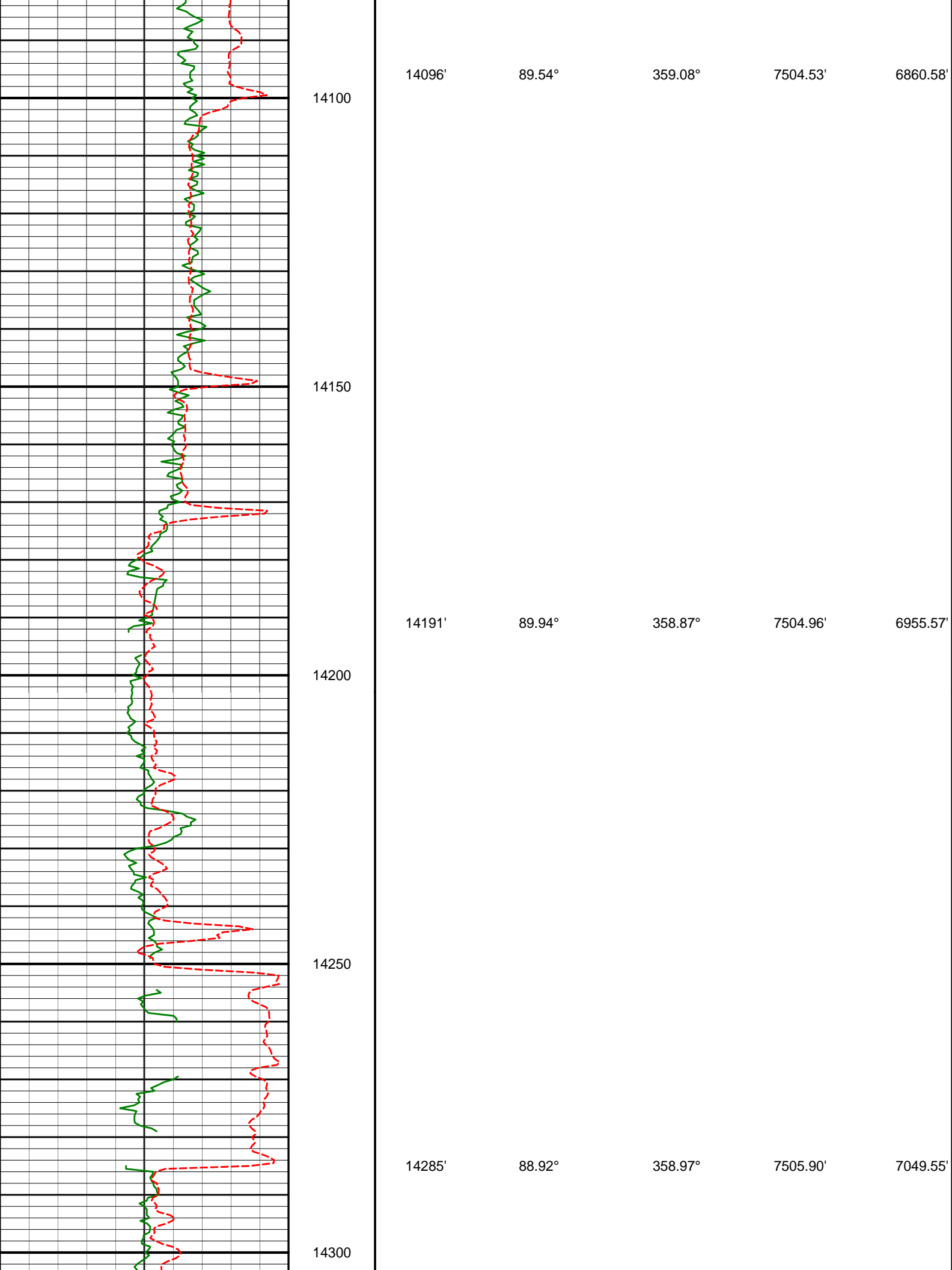
14002'

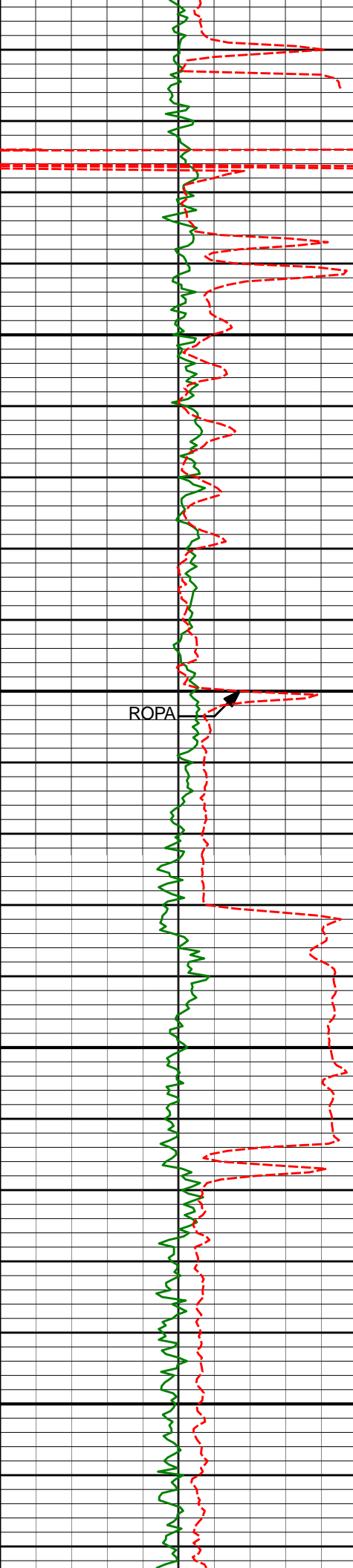
90.15°

358.09°

7504.28'

6766.61'





14350

14380'

89.57°

358.87°

7507.15'

7144.52'

14400

ROPA

14450

14474'

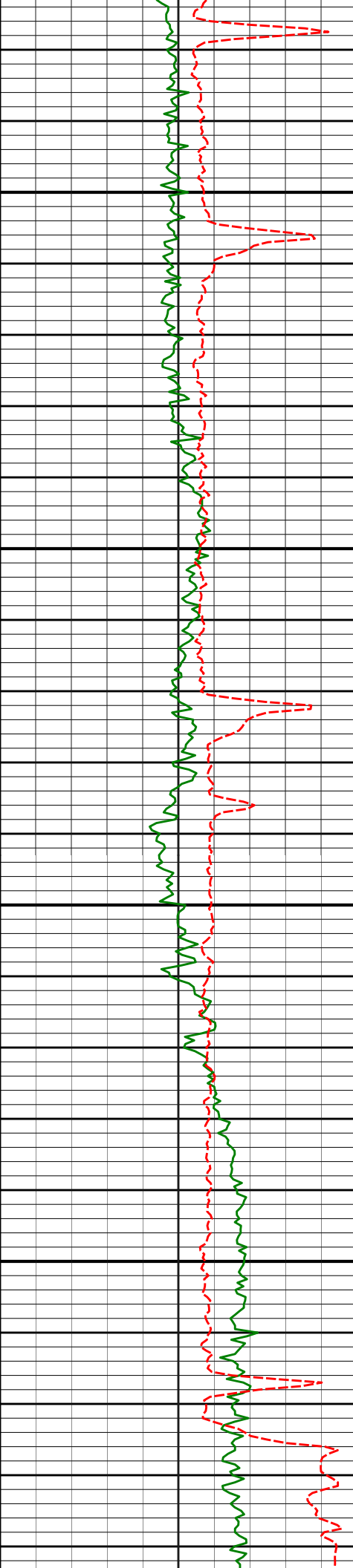
88.98°

0.07°

7508.34'

7238.51'

14500



14550

14600

14650

14700

14569'

89.75°

0.36°

7509.39'

7333.50'

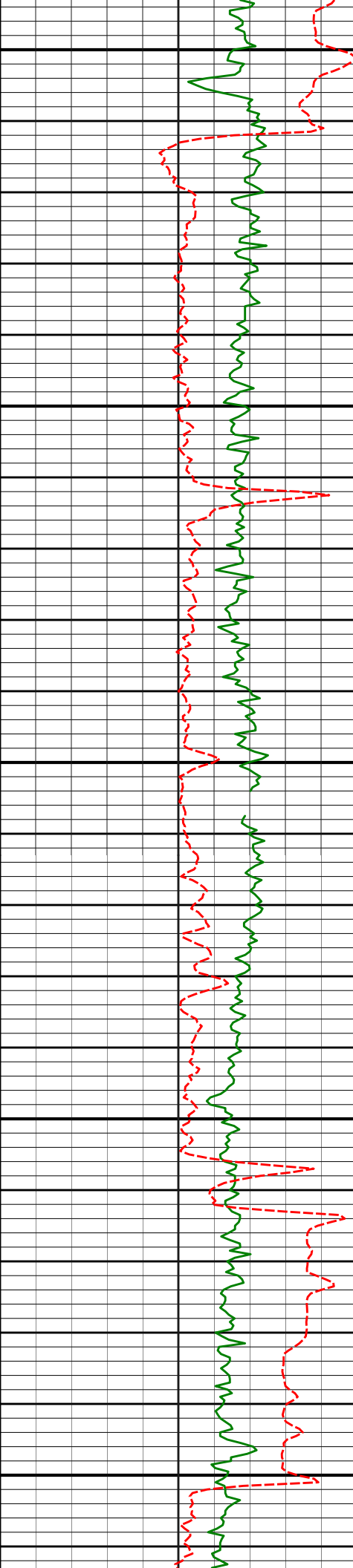
14663'

90.31°

359.94°

7509.34'

7427.50'



14750

14757'

90.19°

0.52°

7508.93'

7521.50'

14800

14850

14852'

90.56°

359.88°

7508.31'

7616.49'

14900

14950

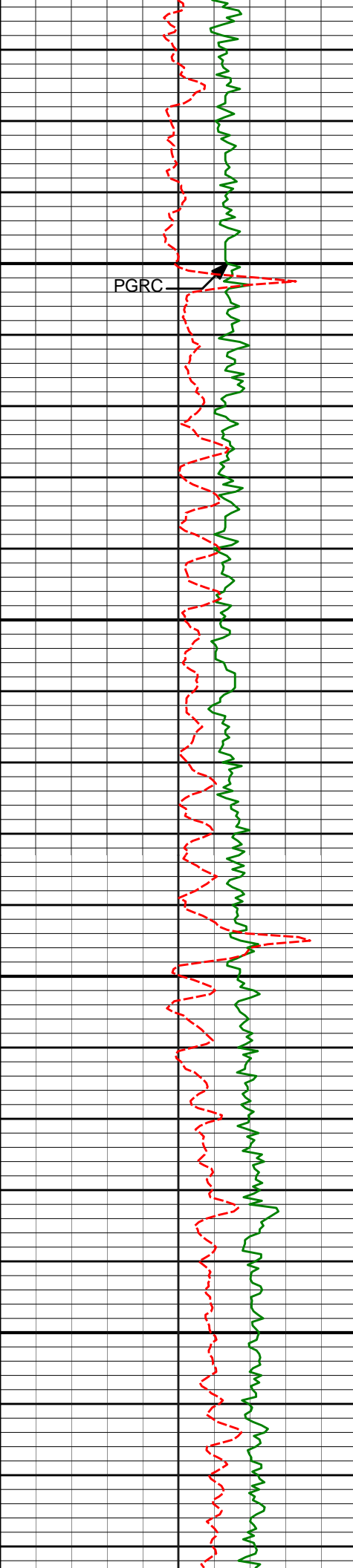
14946'

89.04°

0.30°

7508.64'

7710.49'



15000

PGRC

15050

15100

15150

15041'

89.29°

359.73°

7510.02'

7805.48'

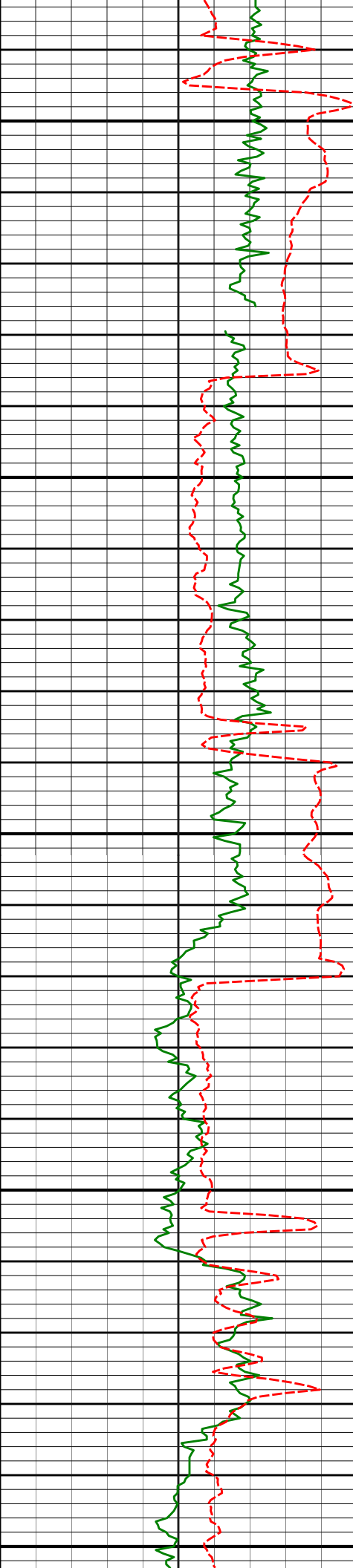
15135'

89.51°

359.17°

7511.01'

7899.47'



15200

15250

15300

15350

15400

15230'

89.51°

0.98°

7511.82'

7994.46'

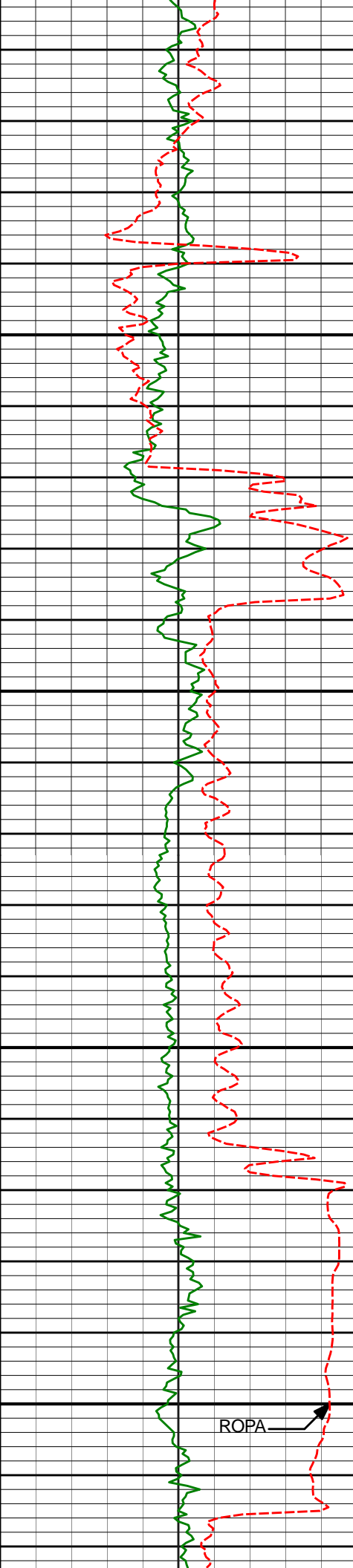
15324'

89.29°

0.82°

7512.80'

8088.44'



15450

15500

15550

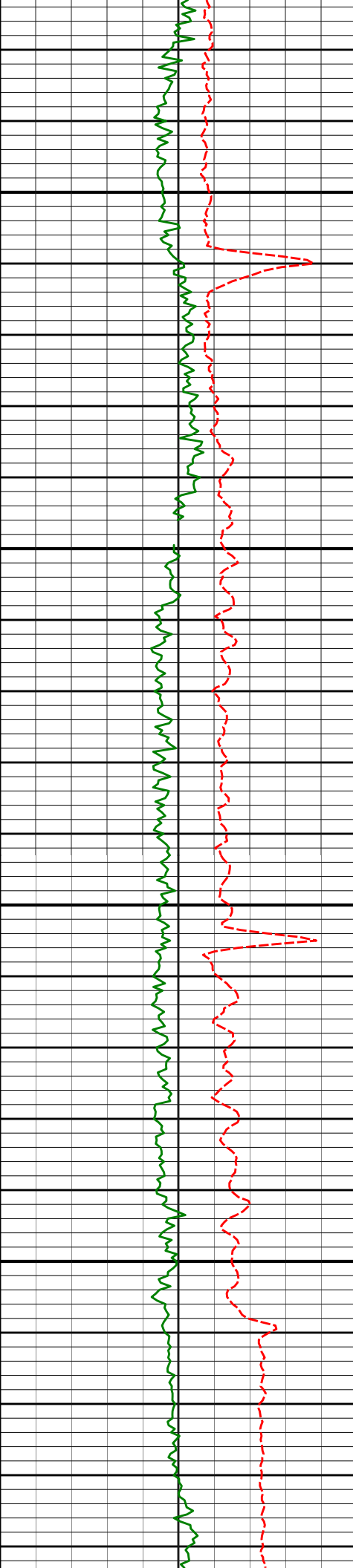
15600

ROPA →

15418'	89.63°	359.65°	7513.69'	8182.44'
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15512'	90.40°	359.44°	7513.66'	8276.43'
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15607'	88.98°	359.60°	7514.18'	8371.43'
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15650

15700

15750

15800

15701'

89.57°

359.27°

7515.37'

8465.42'

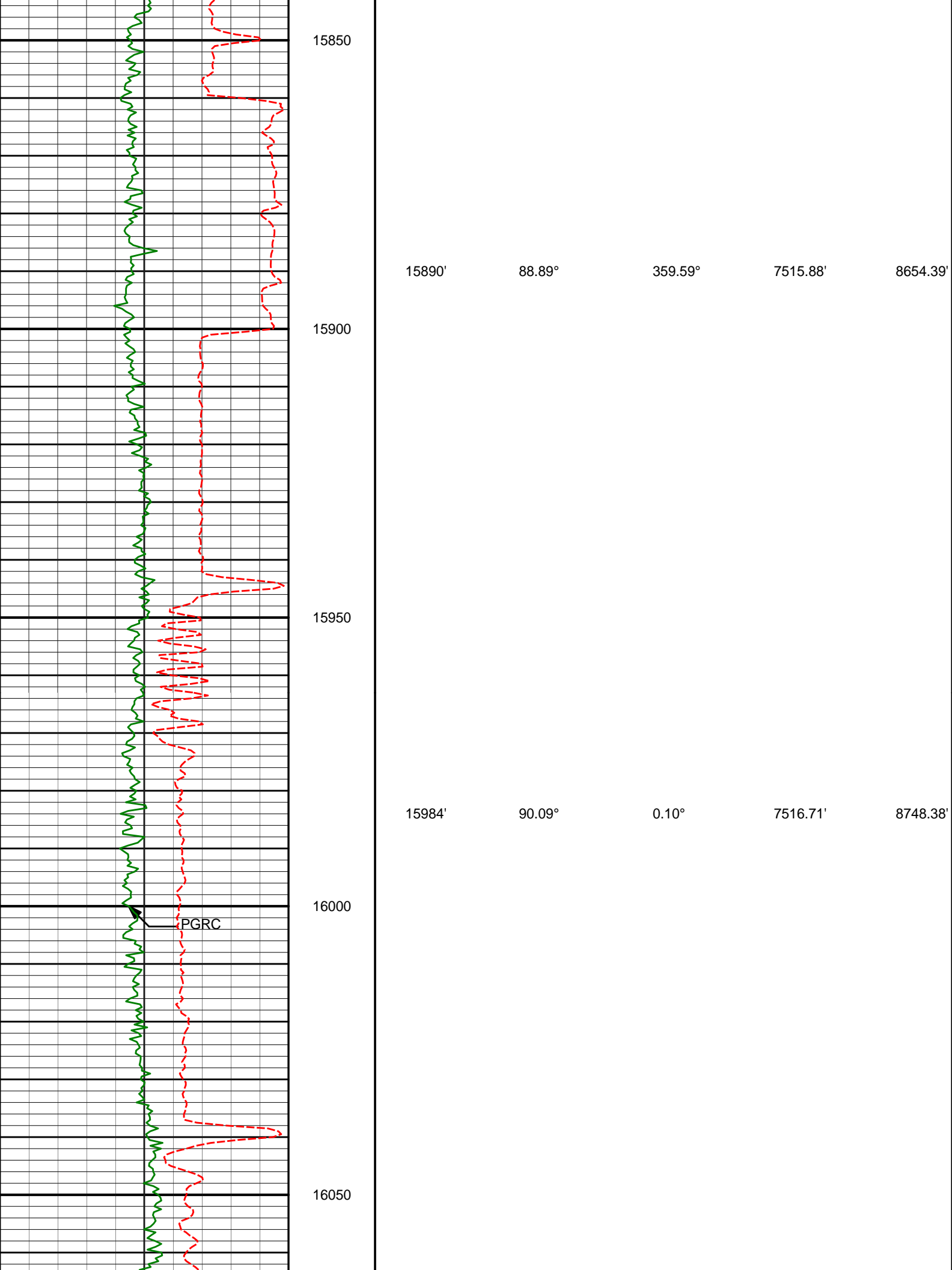
15796'

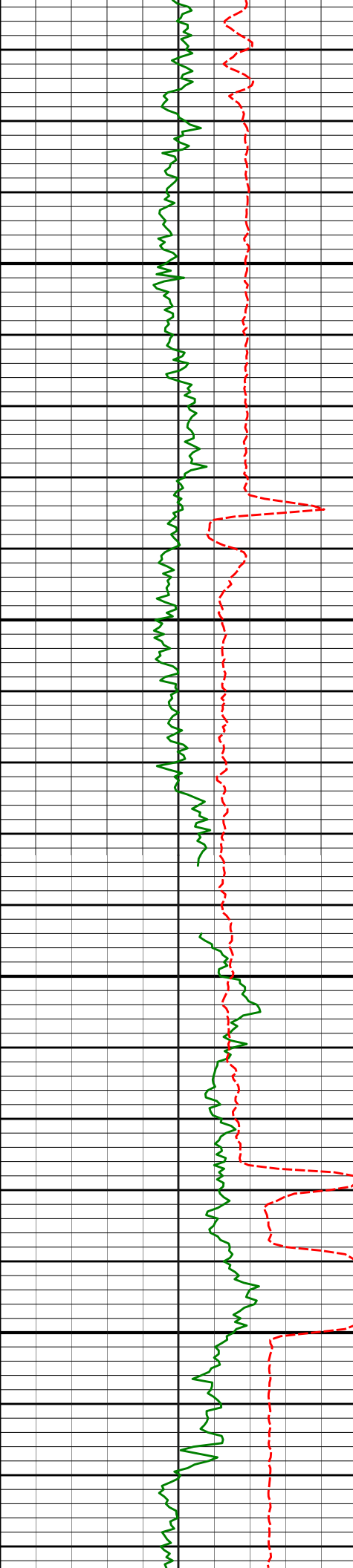
90.46°

358.82°

7515.34'

8560.40'





16100

16150

16200

16250

16078'

90.15°

359.06°

7516.52'

8842.38'

16173'

90.86°

358.98°

7515.68'

8937.37'

Computer Reboot

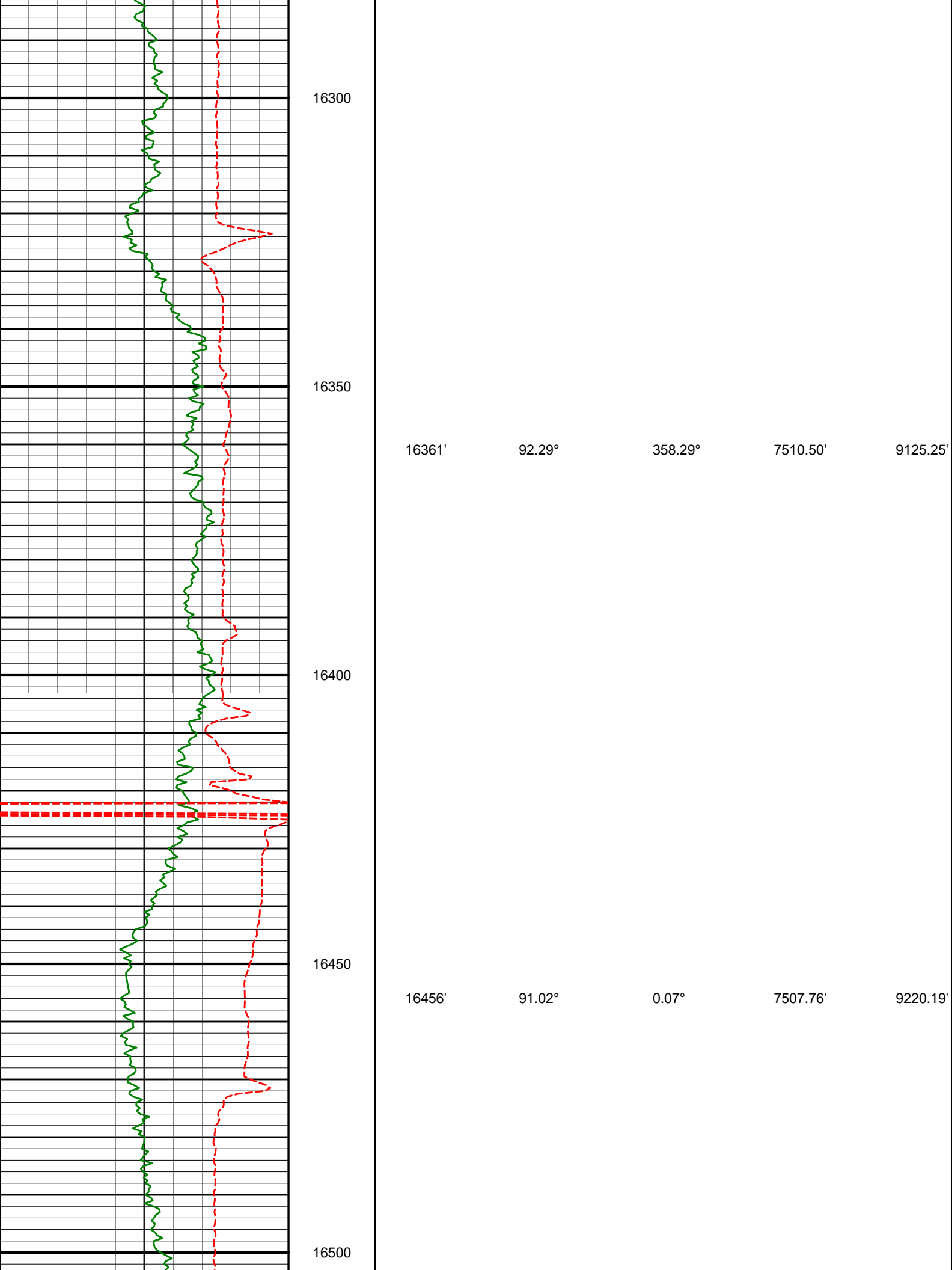
16267'

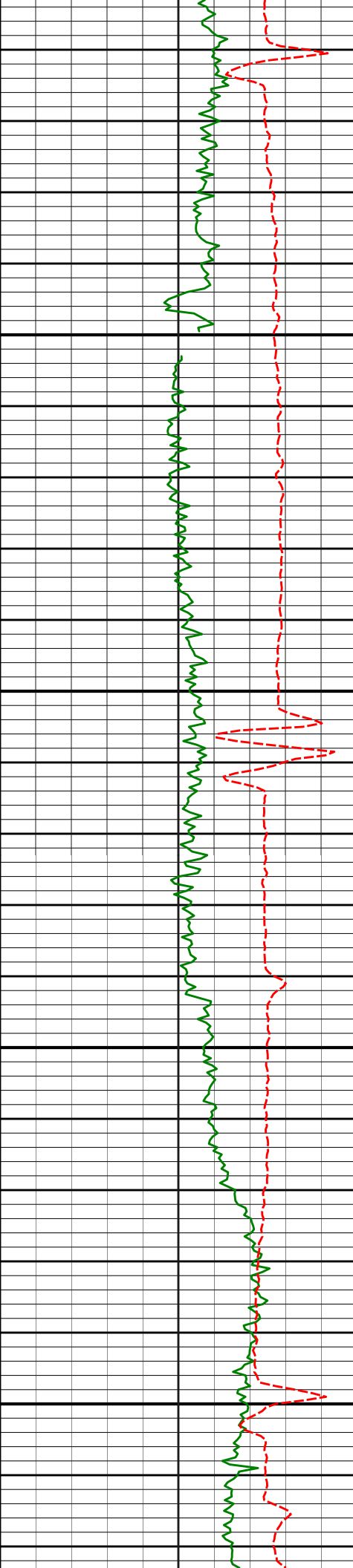
91.58°

358.76°

7513.68'

9031.33'





16550

16550'

91.33°

0.47°

7505.83'

9314.17'

16600

16650

16645'

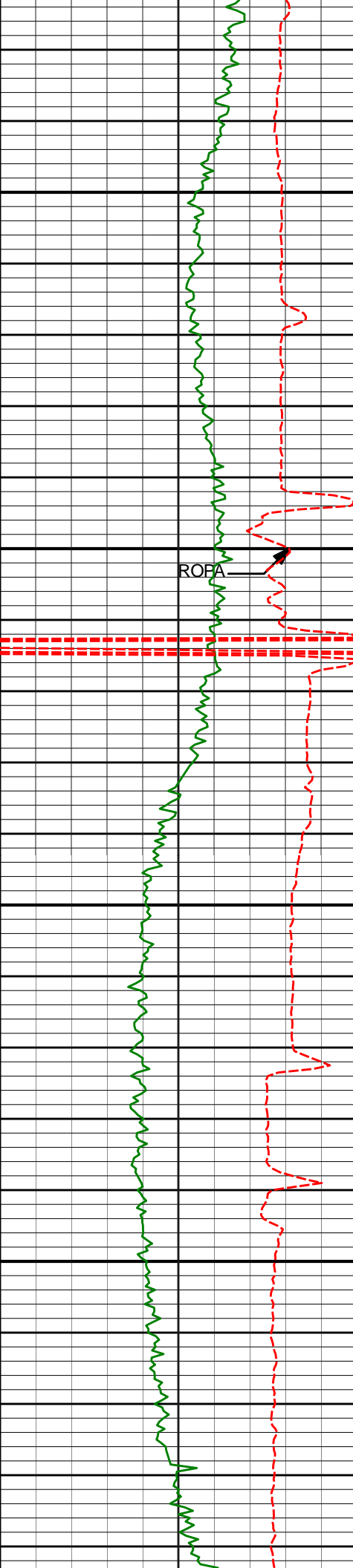
91.79°

0.05°

7503.25'

9409.13'

16700



16750

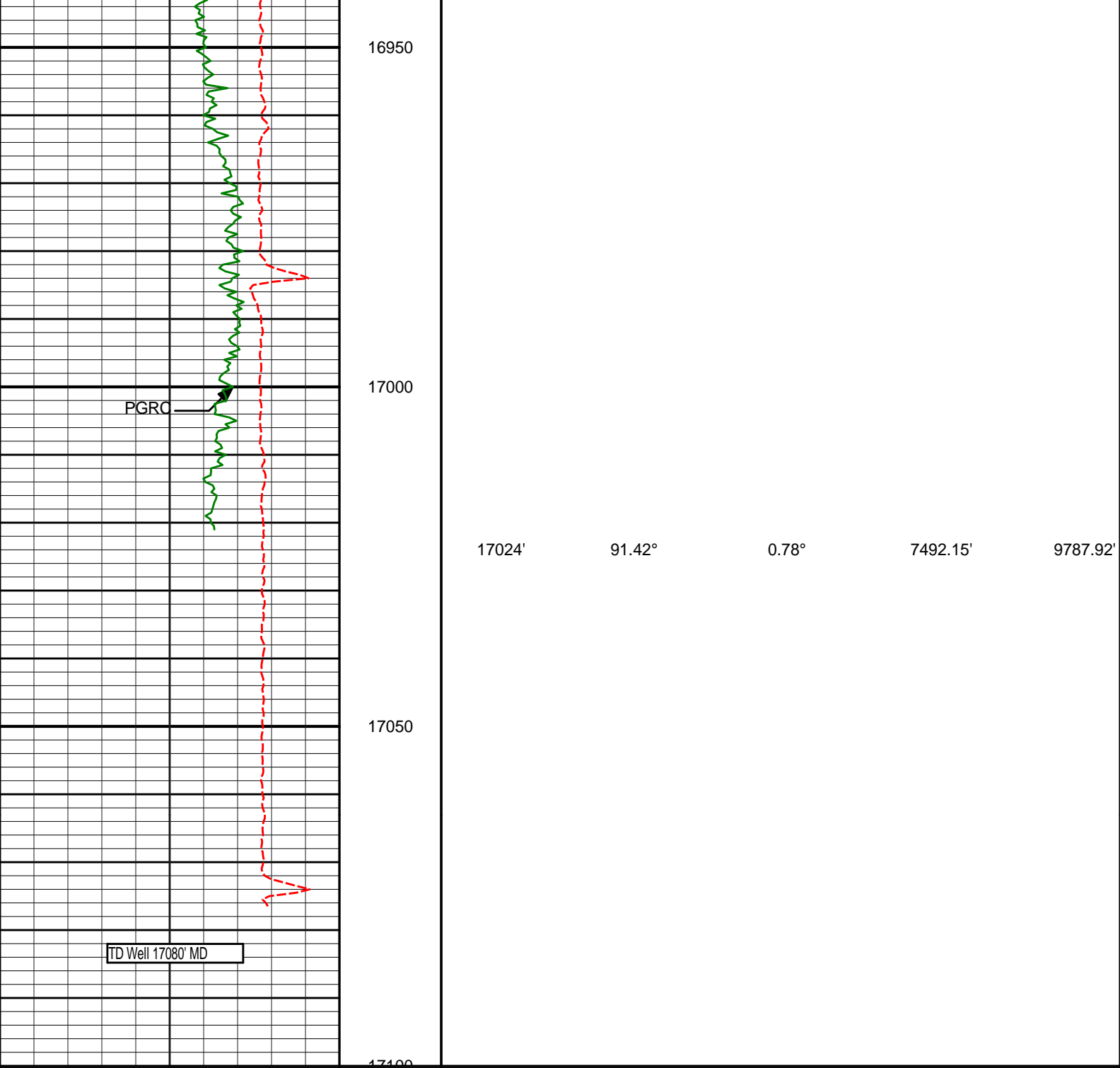
16800

16850

16900

ROPA

16739'	92.28°	0.05°	7499.91'	9503.07'
16834'	91.97°	0.83°	7496.39'	9598.00'
16928'	90.86°	1.30°	7494.06'	9691.95'



<div> <div>Avg Rate of Penetration (ROPA)</div> <div>feet per hr</div> <div>5000</div> </div>	<div> <div>Depth</div> <div>ft</div> <div>1 : 240</div> </div>	<div> <div>DEPTH</div> <div>INC</div> <div>AZI</div> <div>TVD</div> <div>VS</div> </div>
<div> <div>PCG Gamma Ray BCorr (PGRC)</div> <div>0250</div> </div>		

HALLIBURTON

Snerry Drilling

MD 1:240 Detail Log

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp
NRC 4N-4HZ
Wattenburg
Weld Colorado
USA
CA-XX-0901165847
Survey's tied on to surface gyro's.

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
971.00	0.32	324.06	970.97	2.05 S	2.22 E	-2.05	TIE-IN
1105.00	0.81	306.87	1104.96	1.18 S	1.24 E	-1.18	0.38
1197.00	0.68	277.60	1196.96	0.72 S	0.18 E	-0.72	0.43
1289.00	0.71	284.32	1288.95	0.50 S	0.91 W	-0.50	0.09
1382.00	1.09	294.78	1381.94	0.01 N	2.27 W	0.01	0.44
1475.00	1.09	282.65	1474.92	0.57 N	3.94 W	0.58	0.25
1568.00	0.40	24.22	1567.91	1.06 N	4.67 W	1.07	1.33
1660.00	0.40	355.60	1659.91	1.68 N	4.56 W	1.68	0.21
1753.00	1.07	82.15	1752.91	2.12 N	3.73 W	2.12	1.20
1845.00	0.82	75.32	1844.89	2.40 N	2.24 W	2.41	0.30
1938.00	0.62	63.30	1937.89	2.80 N	1.15 W	2.80	0.27
2031.00	0.84	23.85	2030.88	3.65 N	0.42 W	3.65	0.57
2124.00	0.63	46.16	2123.87	4.63 N	0.22 E	4.63	0.38
2217.00	0.96	27.00	2216.86	5.67 N	0.95 E	5.67	0.45
2309.00	1.45	17.79	2308.84	7.47 N	1.65 E	7.47	0.57
2402.00	1.74	16.87	2401.81	9.94 N	2.42 E	9.94	0.31
2493.00	1.94	56.72	2492.76	12.11 N	4.11 E	12.10	1.39
2586.00	1.85	42.24	2585.71	14.08 N	6.43 E	14.08	0.52
2679.00	2.36	94.98	2678.66	15.03 N	9.35 E	15.02	2.07
2772.00	2.05	97.11	2771.59	14.66 N	12.91 E	14.65	0.34
2867.00	1.68	102.77	2866.54	14.14 N	15.95 E	14.12	0.43
2961.00	1.03	107.21	2960.51	13.58 N	18.10 E	13.57	0.70
3056.00	2.68	98.18	3055.46	13.02 N	21.12 E	13.00	1.76
3150.00	4.26	110.31	3149.28	11.49 N	26.57 E	11.47	1.84
3244.00	4.01	108.05	3243.04	9.26 N	32.97 E	9.23	0.32
3339.00	5.45	110.05	3337.71	6.68 N	40.36 E	6.65	1.53
3433.00	5.09	112.55	3431.32	3.55 N	48.41 E	3.51	0.45
3527.00	6.32	104.63	3524.85	0.65 N	57.27 E	0.60	1.55
3621.00	5.10	99.17	3618.38	1.32 S	66.40 E	-1.38	1.42
3715.00	6.89	108.33	3711.87	3.76 S	75.88 E	-3.83	2.15
3810.00	6.49	108.12	3806.22	7.23 S	86.39 E	-7.30	0.42
3904.00	5.38	102.61	3899.72	9.84 S	95.74 E	-9.92	1.33
3999.00	6.82	99.44	3994.18	11.74 S	105.65 E	-11.83	1.56
4093.00	5.72	97.29	4087.61	13.25 S	115.80 E	-13.35	1.20
4187.00	4.86	100.62	4181.21	14.58 S	124.36 E	-14.68	0.97
4282.00	6.66	95.95	4275.73	15.89 S	133.80 E	-16.00	1.96
4376.00	5.72	91.41	4369.18	16.57 S	143.90 E	-16.69	1.13
4470.00	5.29	89.60	4462.75	16.65 S	152.92 E	-16.79	0.49
4565.00	6.26	73.15	4557.27	15.12 S	162.25 E	-15.26	2.01
4659.00	5.06	69.35	4650.81	12.17 S	171.04 E	-12.32	1.34
4753.00	4.95	77.05	4744.45	9.80 S	178.87 E	-9.96	0.72
4848.00	5.56	78.68	4839.05	7.98 S	187.38 E	-8.14	0.66
4942.00	7.00	85.40	4932.49	6.63 S	197.55 E	-6.80	1.72
5036.00	6.23	86.29	5025.86	5.84 S	208.35 E	-6.02	0.83
5131.00	5.61	84.89	5120.35	5.09 S	218.12 E	-5.28	0.67
5225.00	6.05	95.82	5213.87	5.18 S	227.63 E	-5.38	1.27
5320.00	5.92	93.55	5308.35	6.00 S	237.50 E	-6.20	0.28
5414.00	5.30	93.22	5401.90	6.54 S	246.67 E	-6.75	0.66
5508.00	4.34	91.15	5495.57	6.85 S	254.56 E	-7.08	1.04
5603.00	6.19	93.93	5590.16	7.28 S	263.26 E	-7.51	1.97

5697.00	5.17	88.08	5683.70	7.48 S	272.55 E	-7.72	1.25
5791.00	4.32	80.05	5777.38	6.73 S	280.27 E	-6.97	1.15
5886.00	3.49	95.48	5872.16	6.39 S	286.68 E	-6.64	1.40
5980.00	2.64	97.98	5966.03	6.96 S	291.67 E	-7.22	0.92
6074.00	2.68	91.31	6059.92	7.31 S	296.01 E	-7.57	0.33
6169.00	2.29	95.13	6154.83	7.53 S	300.12 E	-7.79	0.45
6263.00	2.13	74.19	6248.77	7.22 S	303.67 E	-7.49	0.87
6358.00	1.55	70.62	6343.72	6.32 S	306.58 E	-6.58	0.62
6452.00	1.56	50.55	6437.68	5.08 S	308.77 E	-5.35	0.58
6547.00	1.32	71.02	6532.65	3.90 S	310.80 E	-4.18	0.59
6641.00	0.81	36.11	6626.64	3.02 S	312.22 E	-3.29	0.85
6735.00	0.62	58.46	6720.63	2.21 S	313.04 E	-2.49	0.36
6830.00	0.68	60.07	6815.62	1.66 S	313.97 E	-1.94	0.07
6877.00	1.17	29.86	6862.62	1.11 S	314.45 E	-1.38	1.44
6924.00	6.65	9.08	6909.49	2.00 N	315.12 E	1.72	11.85
6971.00	11.62	12.14	6955.88	9.32 N	316.54 E	9.04	10.62
7019.00	16.09	15.05	7002.47	20.47 N	319.29 E	20.19	9.42
7066.00	18.31	8.07	7047.37	34.08 N	322.02 E	33.79	6.44
7113.00	22.82	5.26	7091.37	50.47 N	323.89 E	50.19	9.82
7160.00	27.17	0.96	7133.96	70.29 N	324.91 E	70.00	10.02
7207.00	31.85	356.98	7174.86	93.41 N	324.43 E	93.13	10.79
7254.00	35.64	359.18	7213.93	119.50 N	323.58 E	119.22	8.47
7302.00	39.51	0.46	7251.97	148.76 N	323.51 E	148.48	8.22
7349.00	43.78	1.52	7287.08	179.98 N	324.06 E	179.70	9.21
7396.00	46.76	0.39	7320.16	213.36 N	324.61 E	213.08	6.57
7443.00	50.51	1.21	7351.21	248.63 N	325.10 E	248.34	8.09
7490.00	53.82	2.57	7380.04	285.72 N	326.34 E	285.43	7.40
7537.00	58.11	2.27	7406.34	324.62 N	327.98 E	324.34	9.14
7585.00	61.82	2.14	7430.36	366.14 N	329.58 E	365.85	7.73
7632.00	64.26	1.14	7451.67	408.01 N	330.77 E	407.72	5.53
7679.00	69.54	359.73	7470.10	451.23 N	331.09 E	450.94	11.57
7726.00	73.47	358.80	7485.01	495.79 N	330.51 E	495.50	8.57
7773.00	76.50	0.08	7497.18	541.17 N	330.07 E	540.88	6.96
7820.00	81.61	1.25	7506.10	587.30 N	330.61 E	587.01	11.14
7836.00	83.23	1.20	7508.21	603.15 N	330.95 E	602.86	10.13
7924.00	87.90	0.67	7515.02	690.85 N	332.38 E	690.56	5.34
8019.00	88.71	0.43	7517.83	785.81 N	333.29 E	785.52	0.89
8113.00	89.51	359.49	7519.29	879.79 N	333.23 E	879.50	1.31
8208.00	90.46	359.11	7519.31	974.79 N	332.07 E	974.50	1.08
8302.00	91.02	359.80	7518.10	1068.77 N	331.17 E	1068.48	0.95
8397.00	91.14	1.29	7516.31	1163.75 N	332.08 E	1163.46	1.57
8491.00	90.28	1.48	7515.14	1257.71 N	334.35 E	1257.42	0.94
8586.00	90.92	1.20	7514.15	1352.68 N	336.57 E	1352.39	0.74
8680.00	89.88	1.65	7513.49	1446.65 N	338.91 E	1446.35	1.21
8774.00	89.17	1.95	7514.27	1540.60 N	341.86 E	1540.30	0.82
8869.00	89.78	1.56	7515.14	1635.55 N	344.77 E	1635.25	0.76
8963.00	90.56	0.85	7514.86	1729.53 N	346.75 E	1729.22	1.12
9058.00	91.30	0.77	7513.32	1824.50 N	348.09 E	1824.20	0.78
9152.00	92.25	0.23	7510.41	1918.45 N	348.91 E	1918.15	1.16
9243.00	92.47	0.01	7506.66	2009.38 N	349.10 E	2009.07	0.34
9336.00	91.79	359.83	7503.20	2102.31 N	348.97 E	2102.01	0.76
9428.00	91.51	359.69	7500.56	2194.27 N	348.58 E	2193.97	0.34
9520.00	91.05	359.40	7498.50	2286.25 N	347.85 E	2285.94	0.59
9613.00	90.80	359.60	7497.00	2379.23 N	347.04 E	2378.93	0.34
9706.00	89.63	359.57	7496.65	2472.23 N	346.37 E	2471.92	1.26
9799.00	90.28	359.71	7496.72	2565.22 N	345.78 E	2564.92	0.71
9892.00	90.86	359.12	7495.80	2658.21 N	344.84 E	2657.91	0.89
9984.00	89.63	358.77	7495.40	2750.19 N	343.14 E	2749.89	1.39
10076.00	90.12	359.03	7495.60	2842.18 N	341.38 E	2841.88	0.60
10169.00	90.52	358.33	7495.09	2935.15 N	339.23 E	2934.85	0.87
10262.00	91.11	358.07	7493.76	3028.09 N	336.31 E	3027.80	0.69
10355.00	91.76	357.78	7491.43	3121.00 N	332.95 E	3120.71	0.77
10448.00	90.31	357.40	7489.75	3213.90 N	329.04 E	3213.62	1.61
10540.00	90.09	359.93	7489.43	3305.87 N	326.89 E	3305.58	2.76
10633.00	88.98	0.08	7490.19	3398.87 N	326.90 E	3398.58	1.20
10724.00	89.48	359.56	7491.41	3489.86 N	326.61 E	3489.57	0.79
10817.00	88.67	0.83	7492.91	3582.84 N	326.93 E	3582.55	1.62
10910.00	89.23	359.60	7494.62	3675.82 N	327.28 E	3675.54	1.45
11003.00	89.66	358.96	7495.52	3768.81 N	326.11 E	3768.52	0.83
11096.00	90.12	359.04	7495.70	3861.80 N	324.49 E	3861.51	0.50
11189.00	91.11	358.44	7494.70	3954.77 N	322.44 E	3954.48	1.24
11282.00	90.80	359.65	7493.15	4047.74 N	320.89 E	4047.46	1.34
11374.00	90.03	359.34	7492.48	4139.73 N	320.08 E	4139.45	0.90
11467.00	89.66	359.61	7492.73	4232.73 N	319.23 E	4232.45	0.49

11557.00	88.89	1.82	7493.87	4322.71 N	320.35 E	4322.43	2.60
11649.00	89.23	1.70	7495.38	4414.65 N	323.18 E	4414.37	0.39
11741.00	89.72	1.38	7496.22	4506.61 N	325.65 E	4506.33	0.64
11832.00	90.15	1.05	7496.33	4597.59 N	327.58 E	4597.31	0.60
11926.00	89.75	1.16	7496.41	4691.58 N	329.39 E	4691.29	0.44
12021.00	90.37	0.90	7496.31	4786.56 N	331.10 E	4786.27	0.71
12115.00	89.41	1.60	7496.49	4880.54 N	333.15 E	4880.24	1.26
12209.00	89.78	1.14	7497.15	4974.51 N	335.40 E	4974.21	0.63
12304.00	90.00	1.23	7497.34	5069.48 N	337.36 E	5069.19	0.25
12398.00	90.34	0.53	7497.06	5163.47 N	338.81 E	5163.17	0.83
12492.00	89.17	1.32	7497.46	5257.46 N	340.32 E	5257.16	1.50
12587.00	89.91	1.15	7498.22	5352.43 N	342.37 E	5352.13	0.80
12681.00	90.34	0.89	7498.02	5446.42 N	344.04 E	5446.11	0.53
12776.00	89.69	1.13	7497.99	5541.40 N	345.72 E	5541.10	0.73
12870.00	90.31	0.87	7497.99	5635.39 N	347.36 E	5635.08	0.72
12964.00	90.52	0.19	7497.31	5729.38 N	348.23 E	5729.07	0.76
13059.00	89.69	0.51	7497.14	5824.38 N	348.81 E	5824.07	0.94
13153.00	88.40	0.68	7498.71	5918.36 N	349.79 E	5918.05	1.38
13247.00	88.49	359.88	7501.26	6012.32 N	350.24 E	6012.01	0.86
13342.00	88.77	359.43	7503.53	6107.29 N	349.67 E	6106.98	0.56
13436.00	89.20	359.36	7505.19	6201.27 N	348.68 E	6200.96	0.46
13530.00	89.38	358.88	7506.36	6295.25 N	347.24 E	6294.95	0.55
13625.00	89.72	358.36	7507.10	6390.22 N	344.95 E	6389.92	0.65
13719.00	90.15	357.98	7507.21	6484.17 N	341.95 E	6483.87	0.61
13813.00	90.89	357.15	7506.36	6578.08 N	337.95 E	6577.78	1.18
13908.00	90.74	357.55	7505.01	6672.97 N	333.56 E	6672.68	0.45
14002.00	90.15	358.11	7504.28	6766.90 N	330.00 E	6766.61	0.87
14096.00	89.54	359.10	7504.53	6860.87 N	327.71 E	6860.58	1.24
14191.00	89.94	358.89	7504.96	6955.85 N	326.05 E	6955.57	0.48
14285.00	88.92	359.00	7505.90	7049.83 N	324.32 E	7049.55	1.09
14380.00	89.57	358.90	7507.15	7144.81 N	322.58 E	7144.52	0.69
14474.00	88.98	0.10	7508.34	7238.79 N	321.75 E	7238.51	1.42
14569.00	89.75	0.39	7509.39	7333.79 N	322.16 E	7333.50	0.87
14663.00	90.31	359.97	7509.34	7427.78 N	322.46 E	7427.50	0.74
14757.00	90.19	0.55	7508.93	7521.78 N	322.88 E	7521.50	0.63
14852.00	90.56	359.91	7508.31	7616.78 N	323.26 E	7616.49	0.78
14946.00	89.04	0.33	7508.64	7710.78 N	323.46 E	7710.49	1.68
15041.00	89.29	359.75	7510.02	7805.76 N	323.53 E	7805.48	0.66
15135.00	89.51	359.20	7511.01	7899.76 N	322.67 E	7899.47	0.63
15230.00	89.51	1.01	7511.82	7994.75 N	322.84 E	7994.46	1.91
15324.00	89.29	0.85	7512.80	8088.73 N	324.37 E	8088.44	0.29
15418.00	89.63	359.65	7513.69	8182.72 N	324.78 E	8182.44	1.33
15512.00	90.40	359.47	7513.66	8276.72 N	324.05 E	8276.43	0.84
15607.00	88.98	359.63	7514.18	8371.71 N	323.31 E	8371.43	1.50
15701.00	89.57	359.30	7515.37	8465.70 N	322.43 E	8465.42	0.72
15796.00	90.46	358.85	7515.34	8560.69 N	320.90 E	8560.40	1.05
15890.00	88.89	359.61	7515.88	8654.67 N	319.63 E	8654.39	1.86
15984.00	90.09	0.13	7516.71	8748.67 N	319.42 E	8748.38	1.39
16078.00	90.15	359.08	7516.52	8842.66 N	318.77 E	8842.38	1.12
16173.00	90.86	359.01	7515.68	8937.65 N	317.19 E	8937.37	0.75
16267.00	91.58	358.79	7513.68	9031.61 N	315.38 E	9031.33	0.80
16361.00	92.29	358.31	7510.50	9125.52 N	313.01 E	9125.25	0.91
16456.00	91.02	0.10	7507.76	9220.47 N	311.69 E	9220.19	2.31
16550.00	91.33	0.50	7505.83	9314.45 N	312.18 E	9314.17	0.54
16645.00	91.79	0.08	7503.25	9409.41 N	312.66 E	9409.13	0.66
16739.00	92.28	0.08	7499.91	9503.35 N	312.79 E	9503.07	0.52
16834.00	91.97	0.86	7496.39	9598.28 N	313.57 E	9598.00	0.88
16928.00	90.86	1.33	7494.06	9692.23 N	315.37 E	9691.95	1.28
17024.00	91.42	0.81	7492.15	9788.20 N	317.16 E	9787.92	0.80
17076.00	91.42	0.81	7490.87	9840.18 N	317.90 E	9839.89	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 359.95 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.53 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 17076.00 FEET
IS 9845.31 FEET ALONG 1.85 DEGREES (TRUE)

Final survey is a straight line projection to bit.

IFR Corrections have been applied to all surveys.

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