

Pressure Cased Gamma (PCGK)

1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	07-Jul-14	08-Jul-14	11-Jul -14		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	807.00	6,069.00	7,227.00		
Log End Depth (MD, ft)	6,069.00	7,227.00	11,144.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	06-Jul-14 06:00	07-Jul-14 14:10	09-Jul-14 17:45		
Drill/Wipe End Date and Time	07-Jul-14 04:00	08-Jul-14 06:15	10-Jul-14 20:00		
Min Inc (deg) @ Depth (MD, ft)	0.28 @ 902.00	11.18 @ 6,199.00	86.88 @ 7,320.00		
Max Inc (deg) @ Depth (MD, ft)	16.54 @ 4,021.00	83.13 @ 7,174.00	91.85 @ 9,786.00		
Bit TFA(in2) / Bit Type	1.37 /	1.03 /	0.75 /		
Flow Rate (gpm)	587.57	568.52	294.37		
Max AV (fpm) / CV (fpm) @ MWD	NA/ NA	NA/ NA	NA/ NA		
Fluid Type	Polymer	Polymer	Native/Spud Mud		
Density (ppg) / Viscosity (spqt)	8.90 / 32.00	10.60 / 44.00	9.20 / 33.00		
Filtrate CL (ppm)	1,600.00	1,900.00	1,900.00		
pH/ Fluid Loss (mptm)	8.90 / 0	9.00 / 9	9.30 / 10		
PV (cP) / YP (lbf2)	3 / 2.00	10 / 11.00	6 / 7.00		
% Solids / % Sand	2.5 / 1.00	12.2 / 0.50	0.7 / 0.30		
% Oil / Oil:Water Ratio	NA/ NA	NA/ NA	NA/ NA		
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Max Tool Temp (in) F / C	122.22 / 50.11	127.22 / 53.01	122.22 / 50.11		

Max Tool Temp (degF) / Source	160.83 / PCM	175.21 / PCM	239.54 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 160.83	N/A @ 175.21	N/A @ 239.54		
Lead MWD Engineer	Henry Schmeidler	Henry Schmeidler	Henry Schmeidler		
Customer Representative	Martin Suarez	Martin Suarez	Martin Suarez		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11331929	246470	12134695		
Insert Serial Number	10997272	11400826	11400826		
Date and Time Initialized	06-Jul-14 02:28	07-Jul-14 06:34	09-Jul-14 06:22		
Date and Time Read	07-Jul-14 08:19	08-Jul-14 14:29	01-Jan-70 00:00		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	54.17	51.43	58.04		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11331929	246470	12134695		
Sonde Serial Number	10835193	11833258	11833258		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	296.59	7.95	238.80		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.17	46.43	53.06		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11331929	246470	12134695		
Insert/Sonde Serial Number	12071301	11579809	11579809		

Pulser Controller Sensor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
PIC Software Version	1.40	1.40	1.40		
Sub/HOC Serial Number	11331929	246470	12134695		
Insert/Probe/Module SN	10997272	11400826	11400826		
Battery Serial Number	N/A	N/A	N/A		
Valve Insert SN	N/A	N/A	N/A		
DC Insert Serial Number	N/A	N/A	N/A		
Choke Size (32nd)	N/A	N/A	N/A		
Driver Current (amps)	N/A	N/A	N/A		
Driver SMI Current (amps)	N/A	N/A	N/A		
Boot Strap Version	4,130.00	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. All data presented is recorded data unless otherwise specified
4. The following smoothing parameters have been applied to the data:

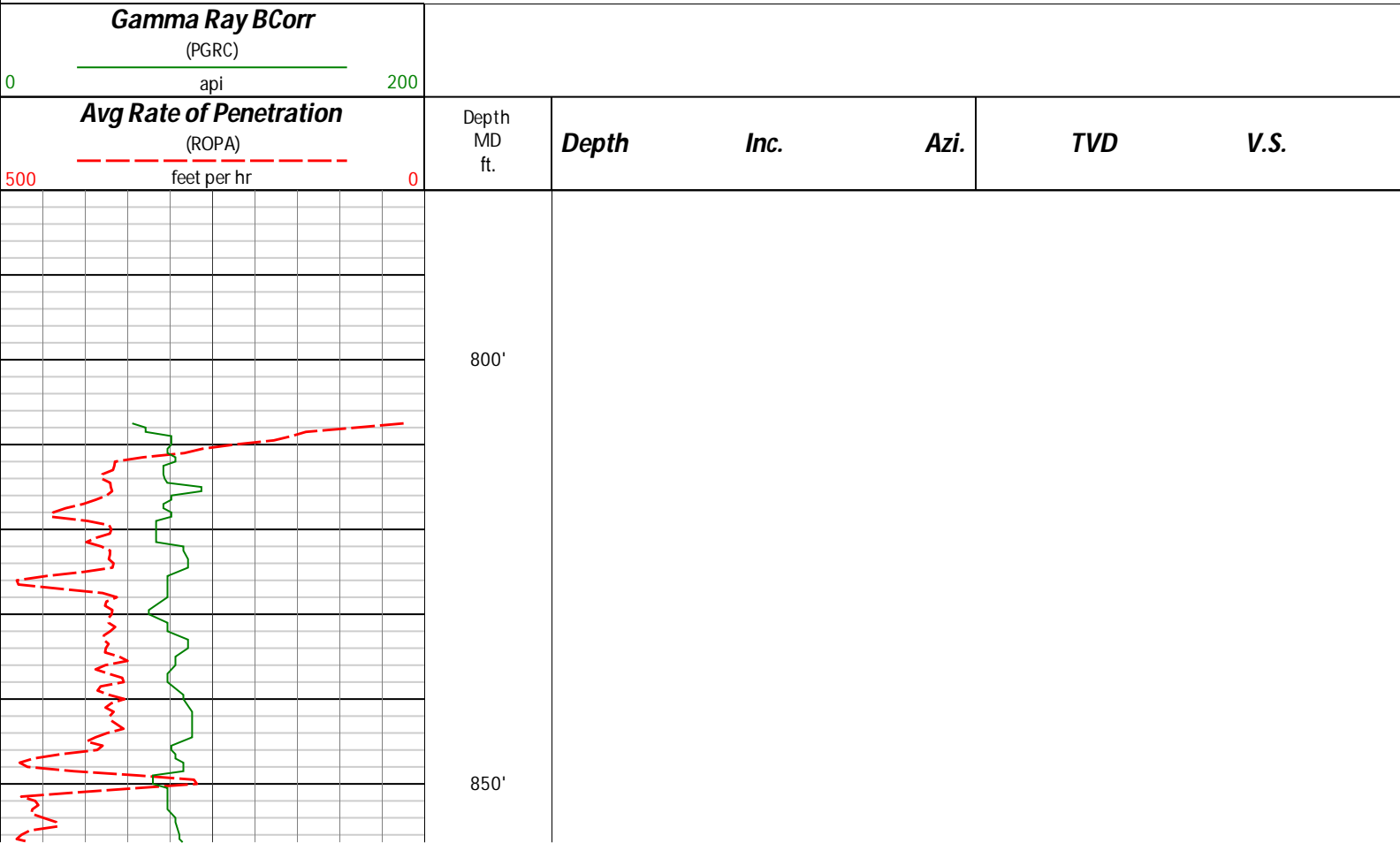
data:
PGRC(Gamma Ray Bor Corr)
Interval Resolution: 0.5 ft.
Interval Distance: 0.6 ft.
Gap Fill: 3.0 ft.
ROPA (Average Rate of Penetration)
Interval Resolution: 0.5 ft.
Interval Distance: 1.2 ft.
Gap Fill : 3.0 ft.
5. INSITE version 8.4.10

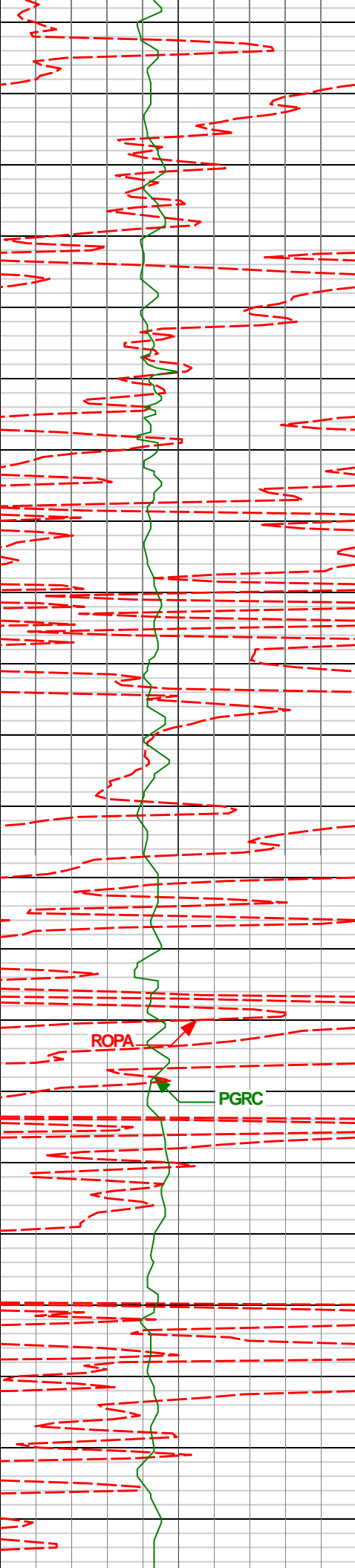
WARRANTY

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Sperry Drilling Services

MD Detail Log 1:240





900'

902'

0.28°

272.12°

901.98'

-5.65'

950'

994'

1.09°

108.12°

993.97'

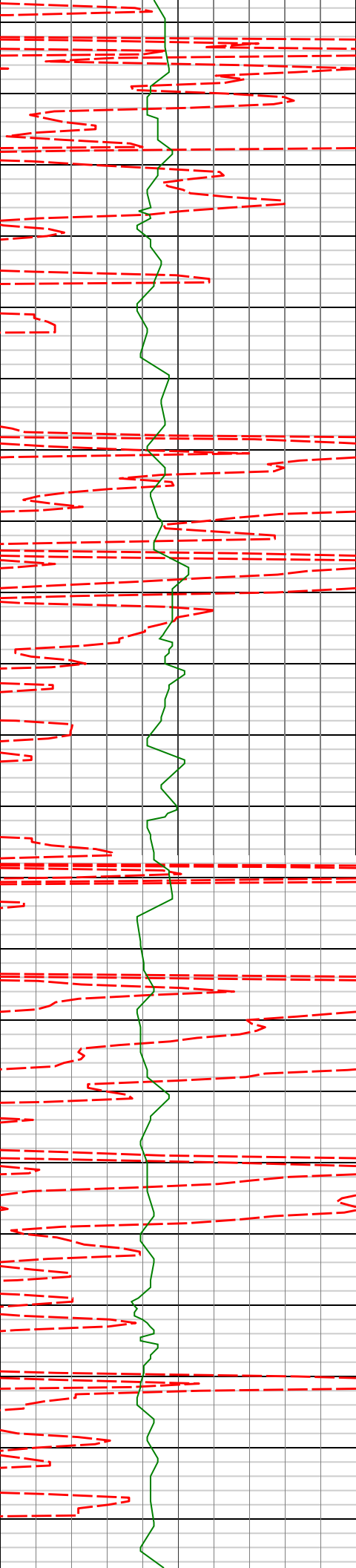
-5.23'

1000'

ROPA

PGRC

1050'



1100'

1150'

1200'

1250'

1179'

1.08°

112.20°

1178.94'

-3.12'

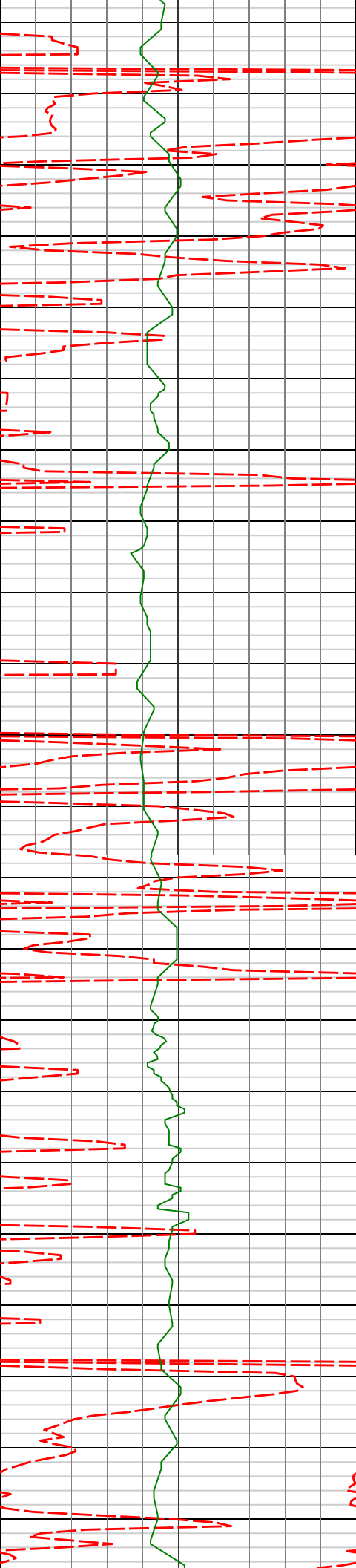
1273'

1.12°

104.85°

1272.92'

-2.07'



1300'

1350'

1400'

1450'

1500'

1366'

1.19°

96.10°

1365.90'

-1.21'

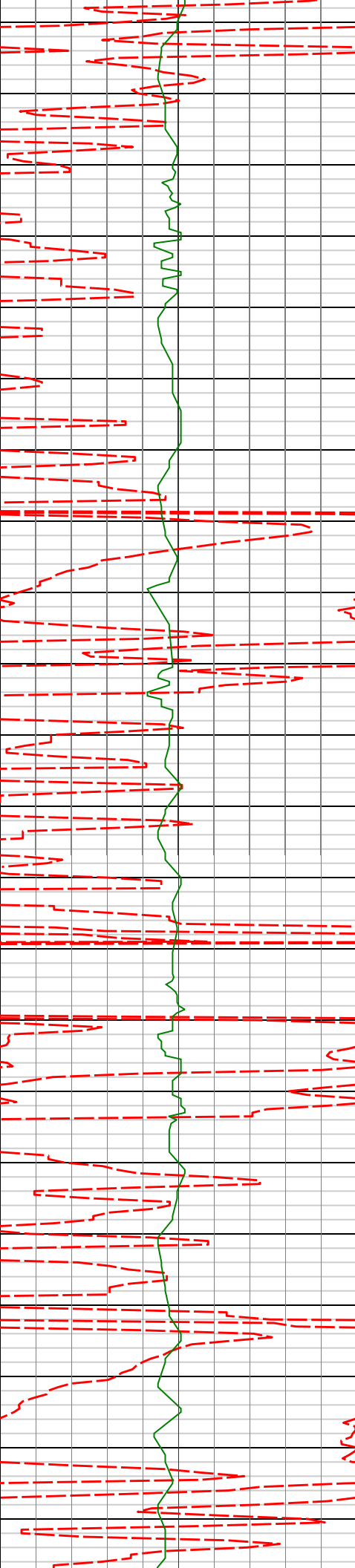
1458'

1.02°

104.43°

1457.89'

-0.41'



1550'

1600'

1650'

1700'

1553'

2.52°

83.78°

1552.84'

0.41'

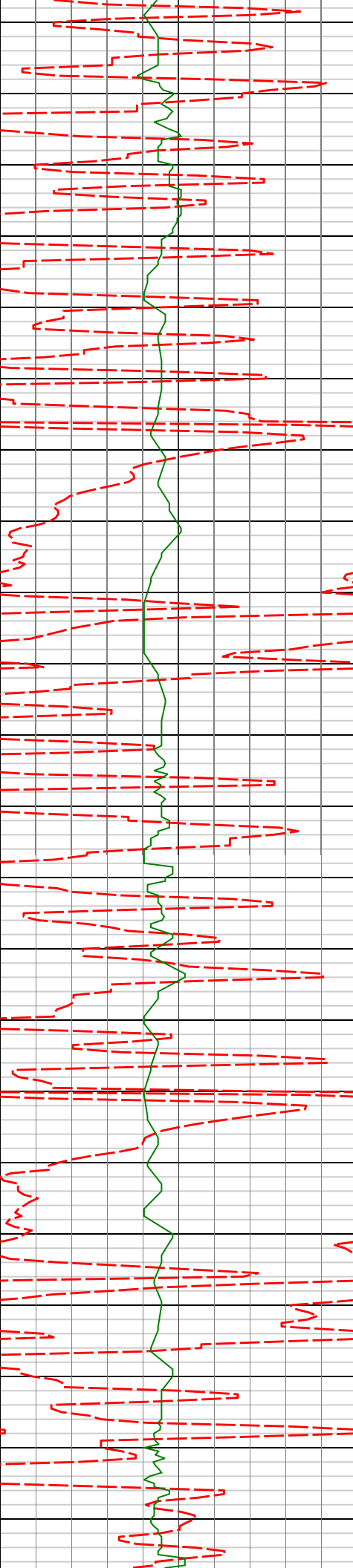
1648'

3.52°

75.22°

1647.71'

0.92'



1750'

1800'

1850'

1900'

1950'

1743'

4.26°

76.42°

1742.49'

1.24'

1838'

5.89°

75.35°

1837.11'

1.64'

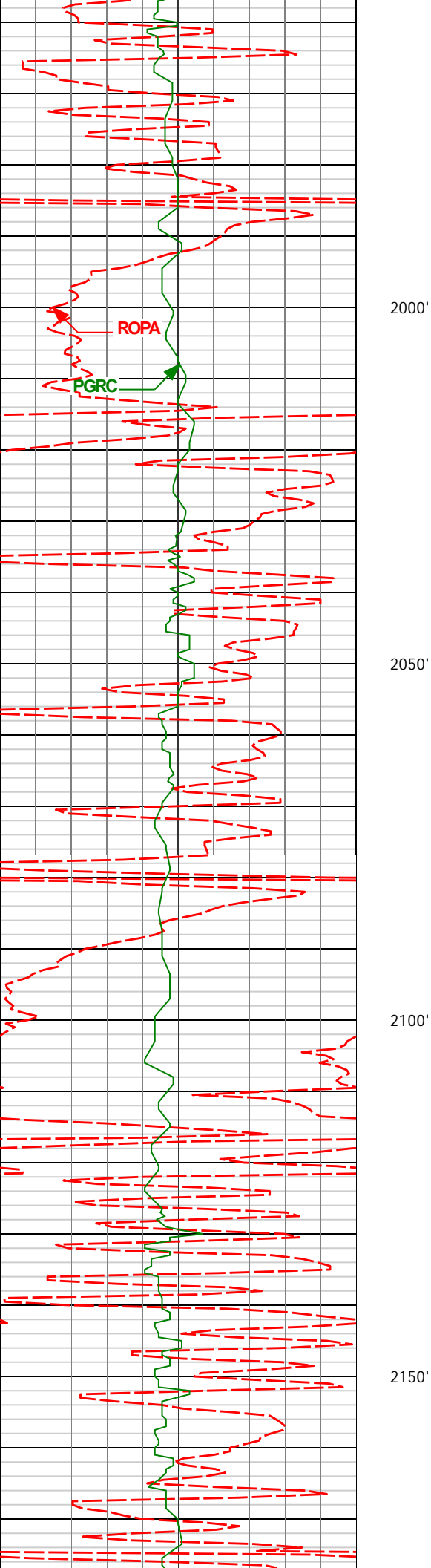
1932'

6.50°

80.09°

1930.56'

2.49'



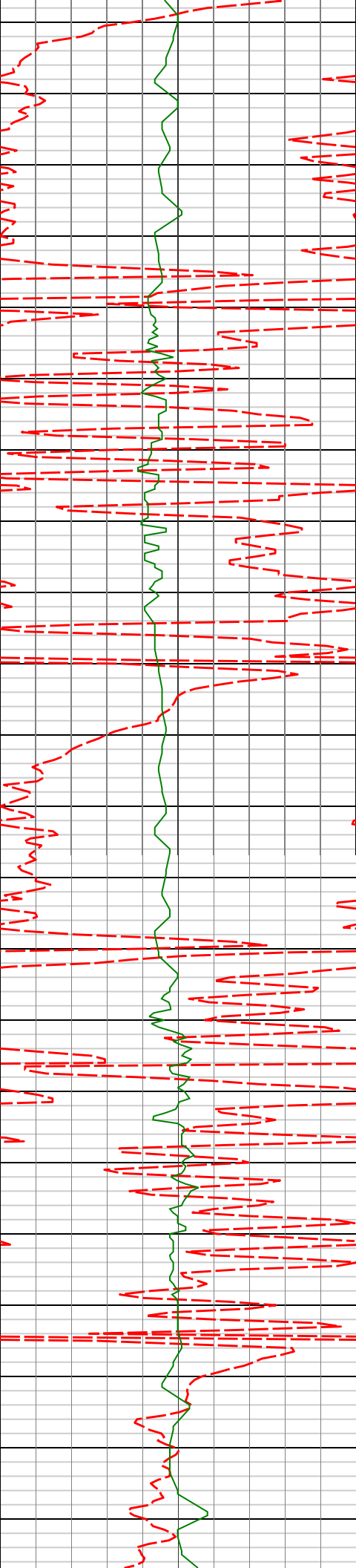
2122'

9.09°

78.24°

2118.79'

5.18'



2200'

2217'

10.58°

81.50°

2212.39'

7.15'

2250'

2300'

2312'

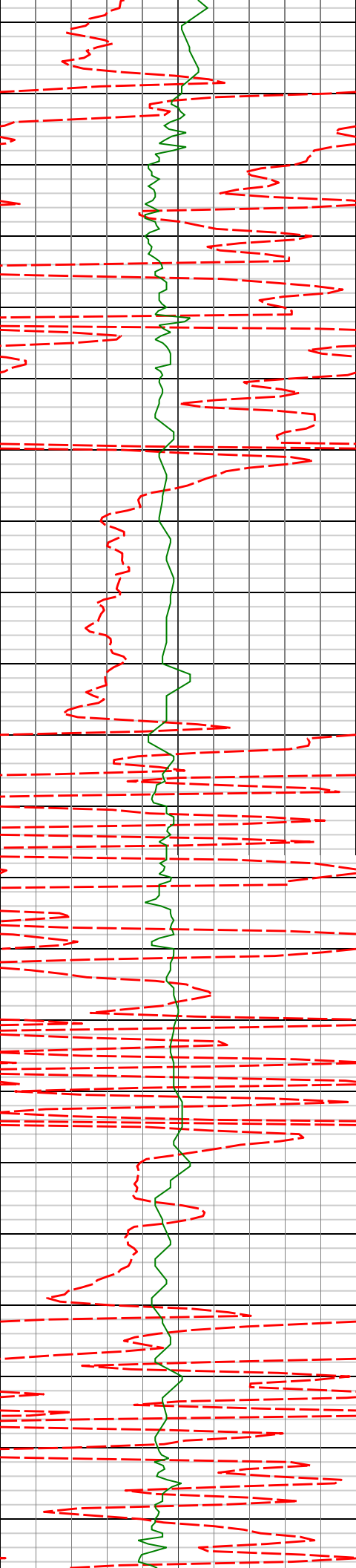
11.05°

78.72°

2305.71'

9.33'

2350'



2400'

2407'

11.49°

88.71°

2398.88'

12.79'

2450'

2500'

2502'

13.24°

89.84°

2491.68'

18.49'

2550'

2600'

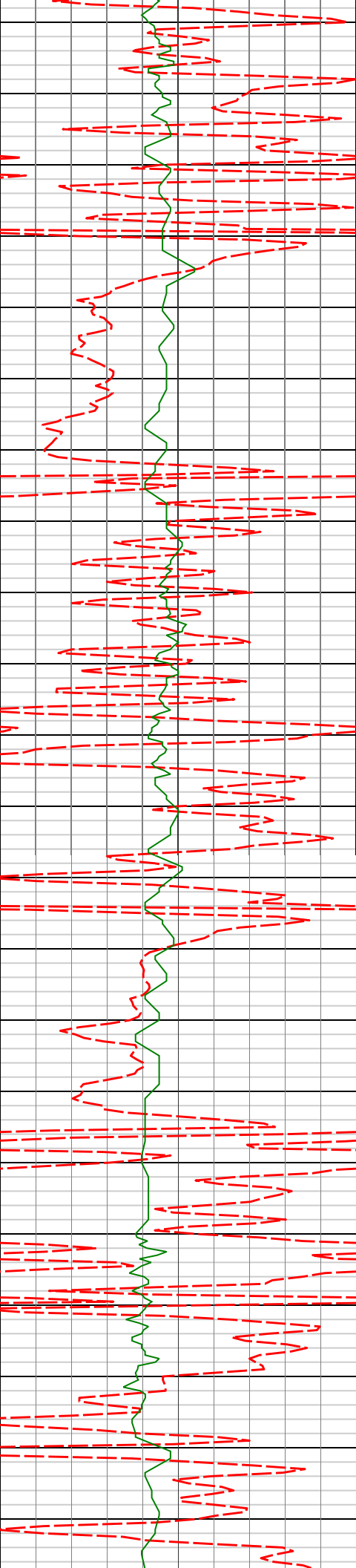
2597'

12.79°

86.62°

2584.24'

24.11'



2650'

2700'

2750'

2800'

2692'

13.38°

86.51°

2676.77'

29.14'

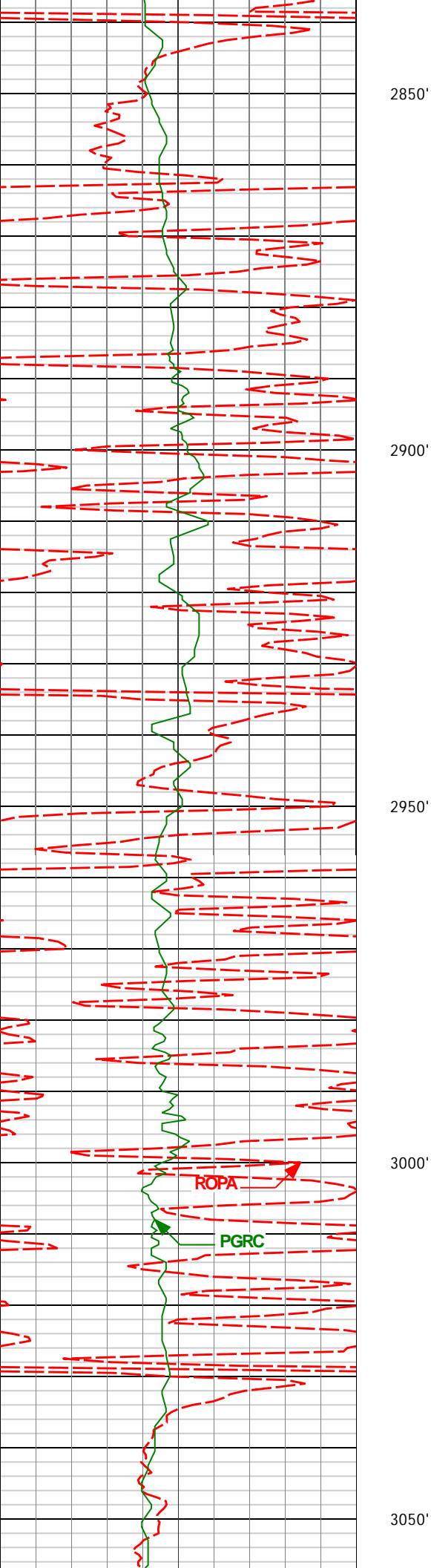
2787'

14.68°

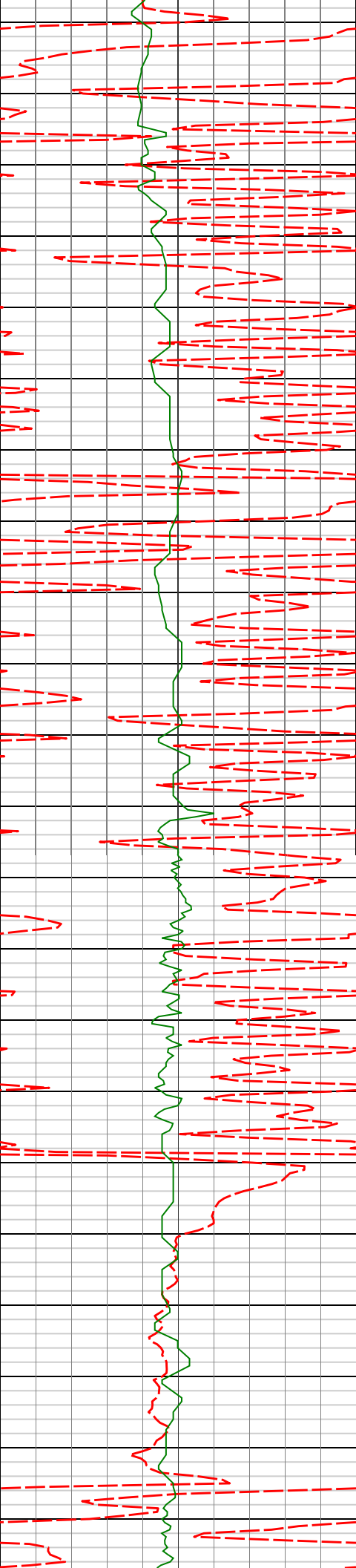
83.13°

2768.94'

33.82'



2882'	15.30°	87.41°	2860.71'	39.04'
2977'	14.25°	84.18°	2952.57'	44.41'



3072'

15.15°

87.04°

3044.46'

49.68'

3100'

3150'

3167'

12.97°

83.93°

3136.61'

54.70'

3200'

3250'

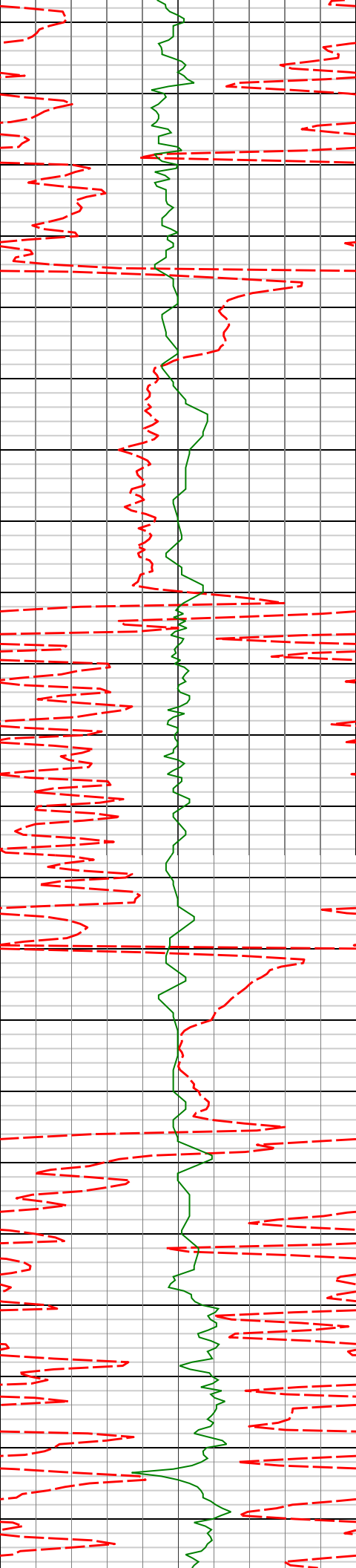
3262'

12.76°

83.93°

3229.23'

58.70'



3300'

3350'

3400'

3450'

3357'

12.50°

89.82°

3321.93'

63.65'

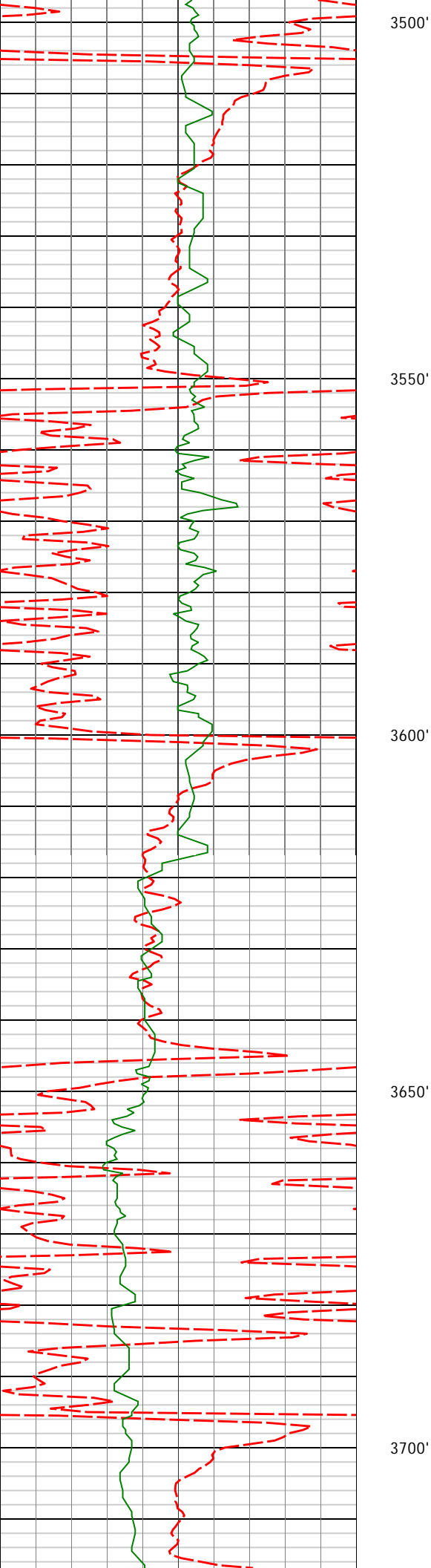
3452'

11.72°

87.53°

3414.82'

69.04'



3547'

12.28°

87.98°

3507.74'

74.06'

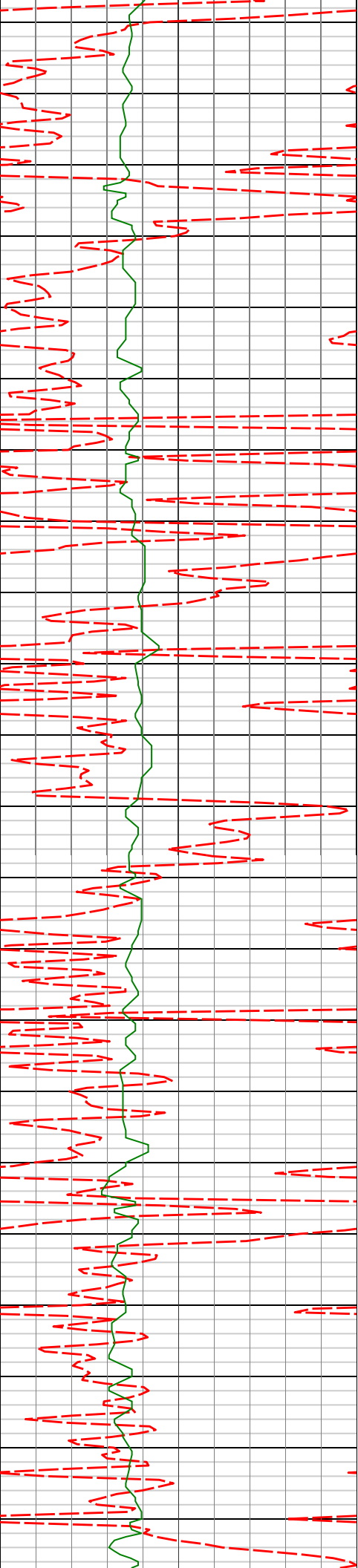
3641'

12.83°

85.28°

3599.50'

78.85'



3736'

14.80°

87.55°

3691.74'

84.13'

3750'

3800'

3831'

15.57°

87.95°

3783.43'

90.46'

3850'

3900'

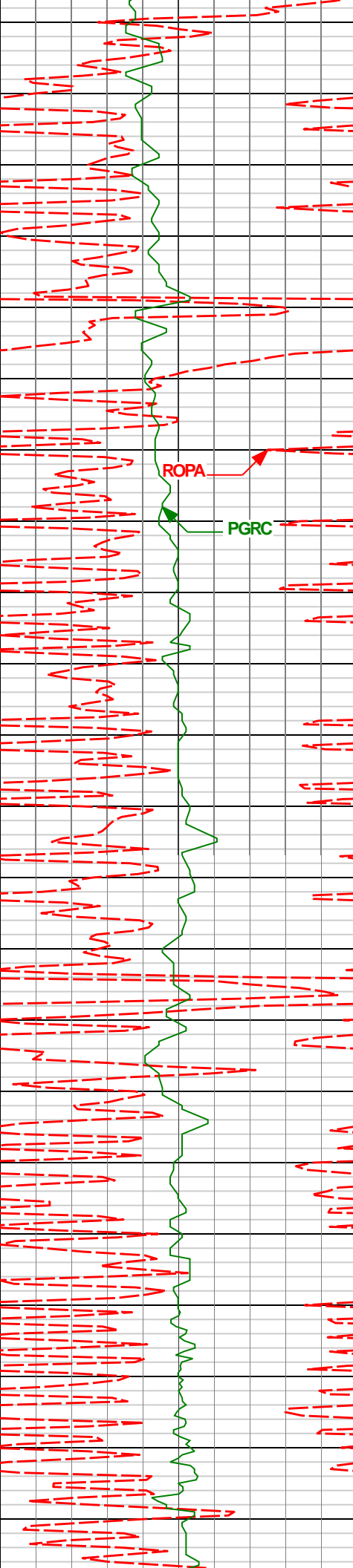
3926'

16.38°

87.95°

3874.76'

97.19'



3950'

4000'

4050'

4100'

4150'

ROPA

PGRC

4021'

16.54°

88.19°

3965.86'

104.17'

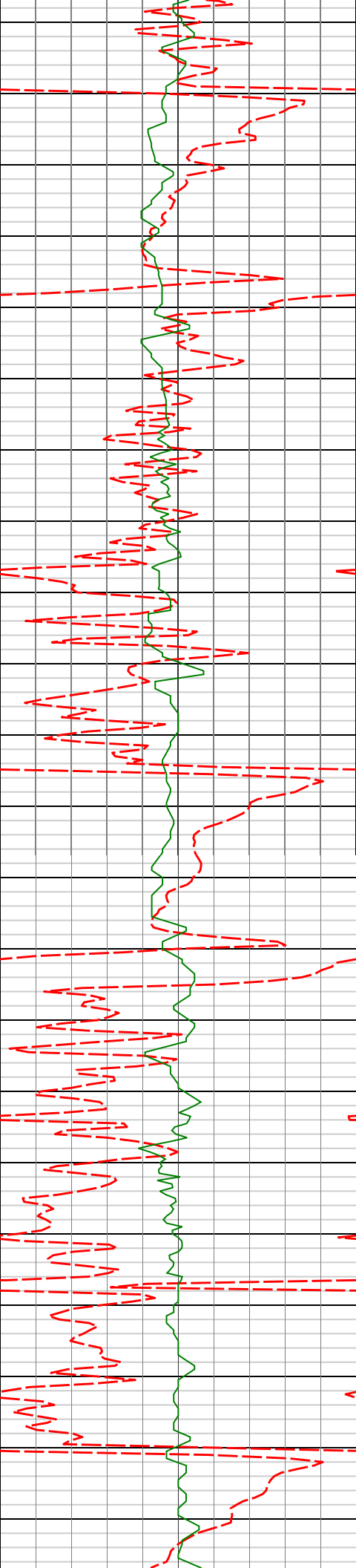
4116'

13.99°

87.14°

4057.50'

110.51'



4200'

4250'

4300'

4350'

4211'

13.92°

84.67°

4149.70'

115.62'

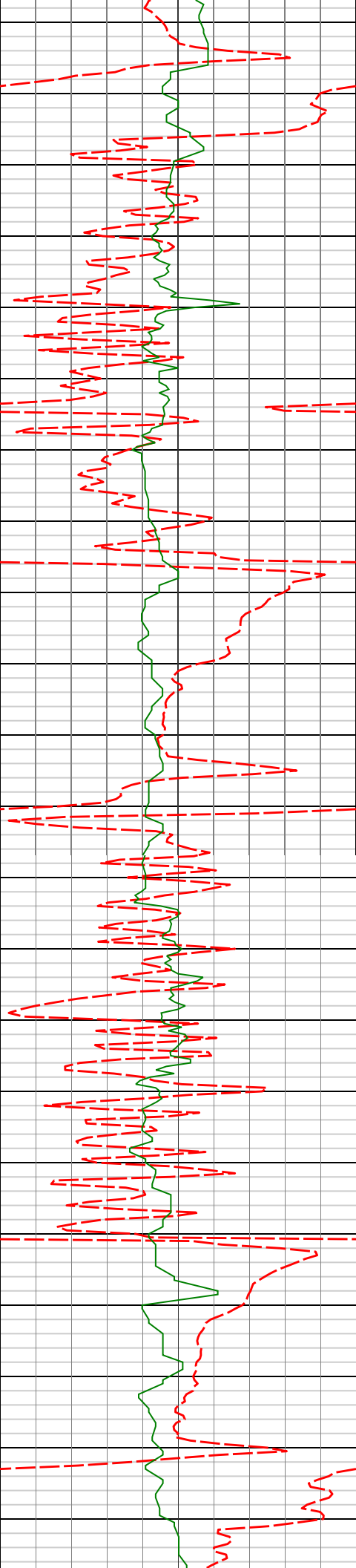
4306'

13.56°

83.72°

4241.98'

119.98'



4400'

4401'

12.50°

86.30°

4334.53'

124.41'

4450'

4500'

4550'

4496'

12.44°

84.41°

4427.29'

128.79'

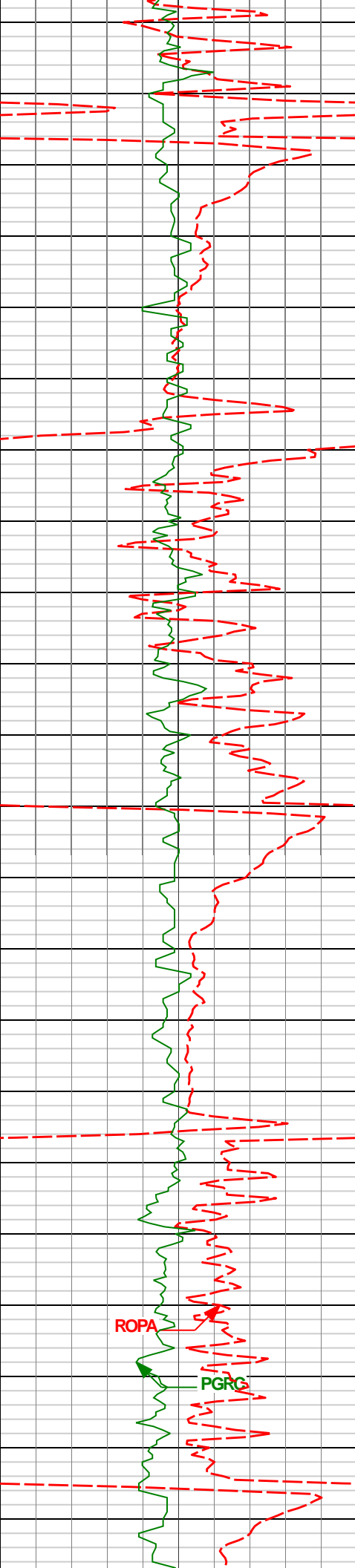
4591'

12.78°

86.42°

4520.00'

133.25'



4850'

4875'

11.61°

81.03°

4798.22'

145.80'

4900'

4950'

4970'

12.21°

79.09°

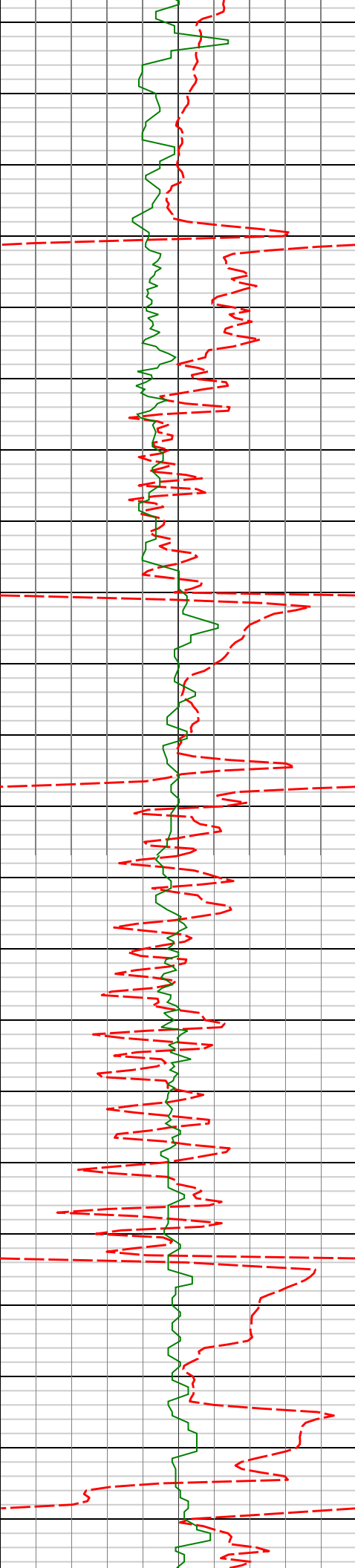
4891.17'

148.19'

5000'

ROPA

PGRG



5050'

5065'

13.66°

77.31°

4983.76'

150.09'

5100'

5150'

5160'

13.61°

80.64°

5076.08'

152.41'

5200'

5250'

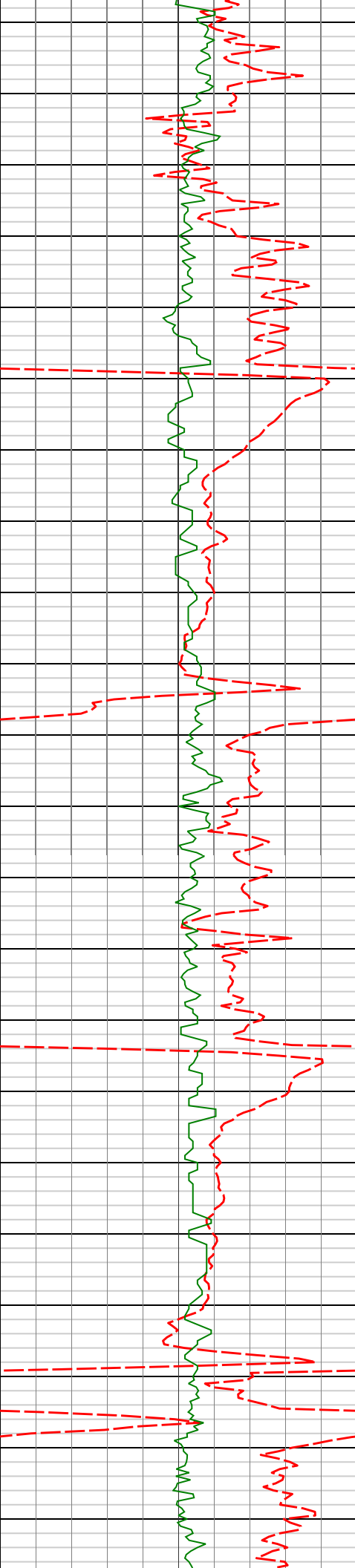
5255'

12.37°

79.98°

5168.65'

155.12'



5300'

5350'

5400'

5450'

5350'

12.89°

82.54°

5261.35'

158.10'

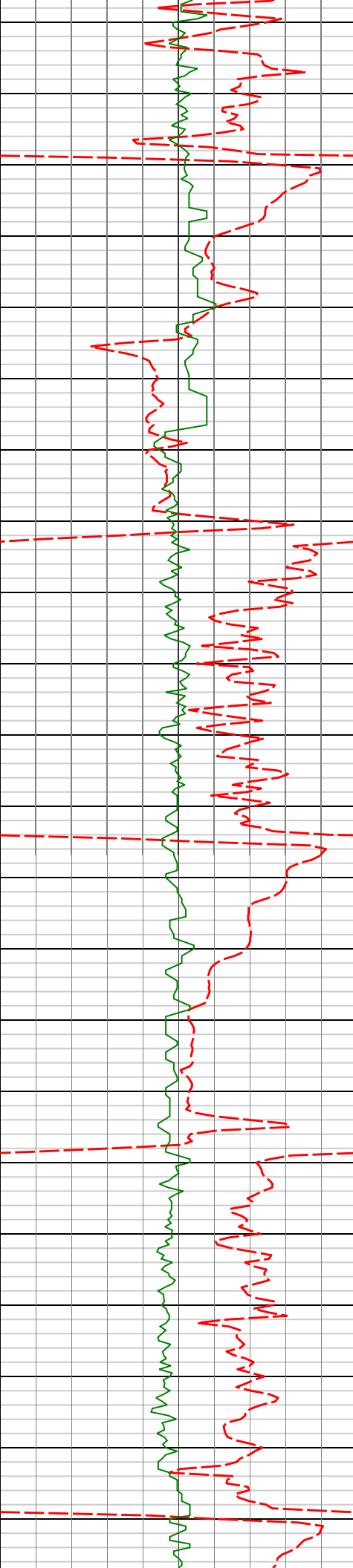
5445'

13.03°

82.98°

5353.93'

161.70'



5500'

5540'

13.84°

78.07°

5446.34'

164.55'

5550'

5600'

5635'

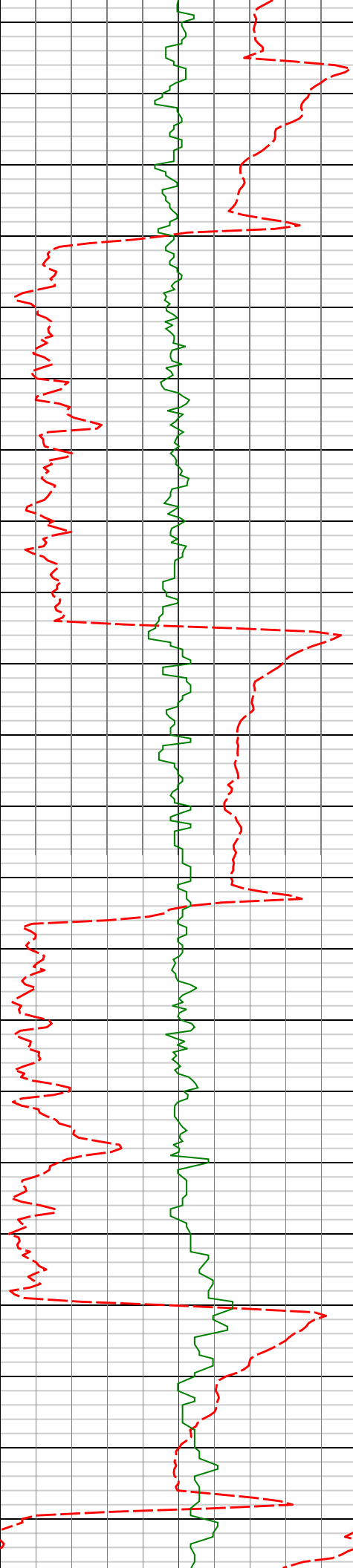
13.83°

80.78°

5538.58'

167.08'

5650'



5700'

5730'

13.44°

84.00°

5630.91'

170.71'

5750'

5800'

5825'

13.84°

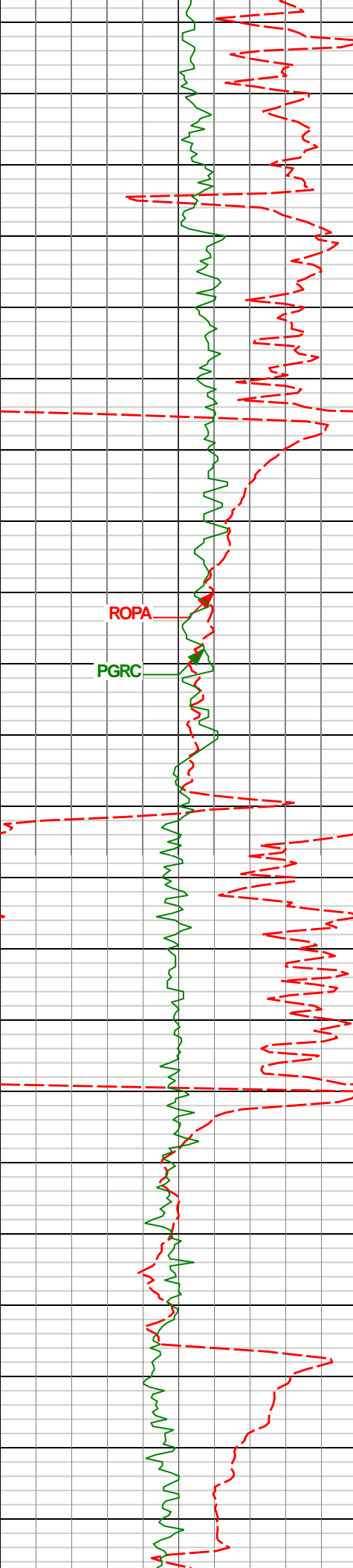
81.80°

5723.23'

174.54'

5850'

5900'



5950'

6000'

6050'

6100'

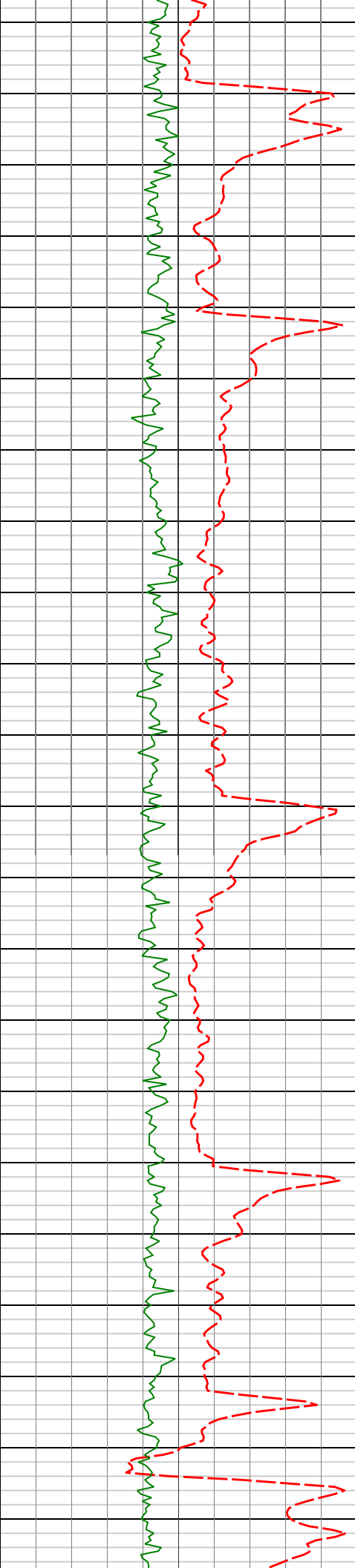
ROPA

PGRC

5920' 12.55° 79.54° 5815.72' 177.44'

6013' 12.22° 87.63° 5906.56' 181.07'

6055' 11.18° 87.25° 5947.69' 183.19'



6150'

6200'

6250'

6300'

6350'

6199'

18.44°

96.16°

6086.83'

195.58'

6247'

23.90°

97.89°

6131.57'

202.66'

6294'

27.90°

101.76°

6173.85'

211.95'

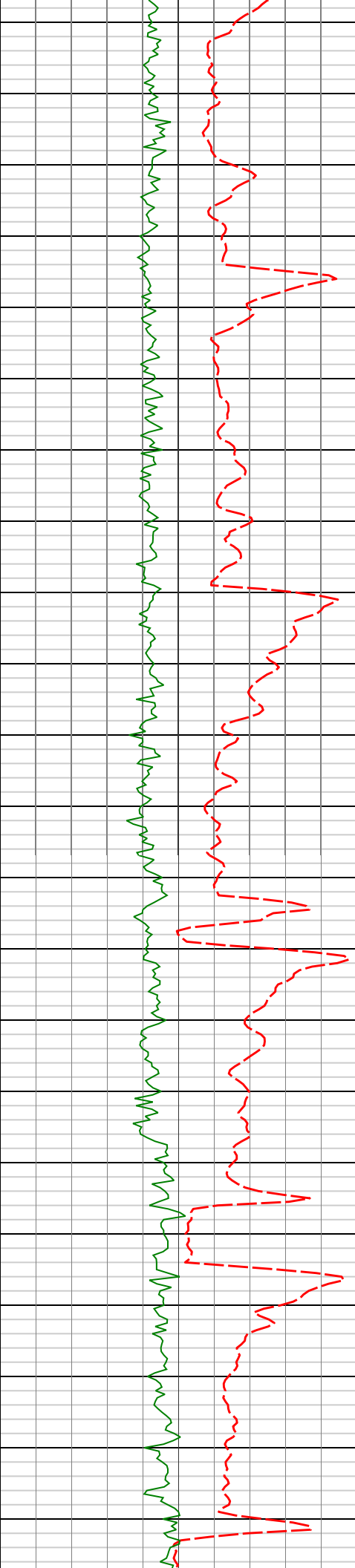
6342'

30.85°

106.73°

6215.68'

224.18'



6400'

6450'

6500'

6550'

6389'

33.87°

112.11°

6255.38'

239.13'

6437'

38.47°

118.97°

6294.14'

258.31'

6484'

41.25°

126.32°

6330.23'

281.26'

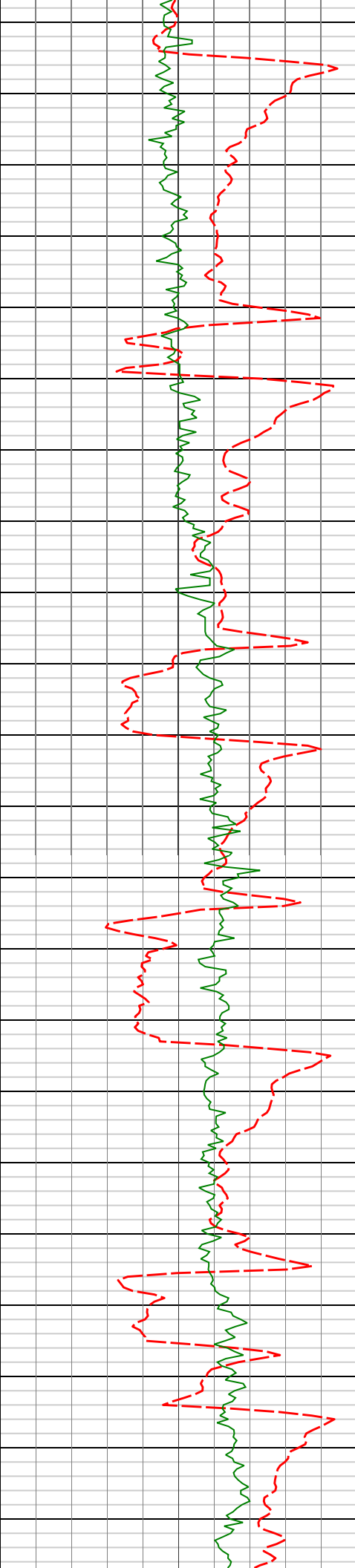
6532'

41.79°

132.69°

6366.18'

307.76'



6600'

6650'

6700'

6750'

6579'

42.58°

138.91°

6401.03'

335.80'

6627'

46.37°

144.74°

6435.29'

367.14'

6674'

50.52°

147.70°

6466.46'

400.80'

6722'

52.66°

151.40°

6496.29'

437.36'

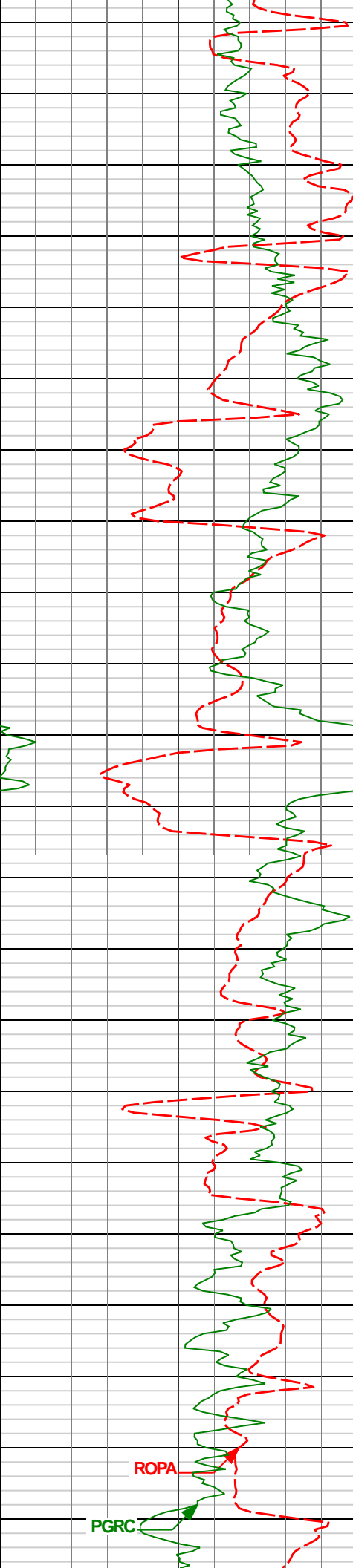
6769'

52.83°

156.32°

6524.75'

474.28'



6800'

6817'	54.84°	160.01°	6553.08'	512.88'
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6850'

6864'	56.76°	162.66°	6579.50'	551.72'
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6900'

6912'	61.49°	165.84°	6604.13'	592.89'
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6950'

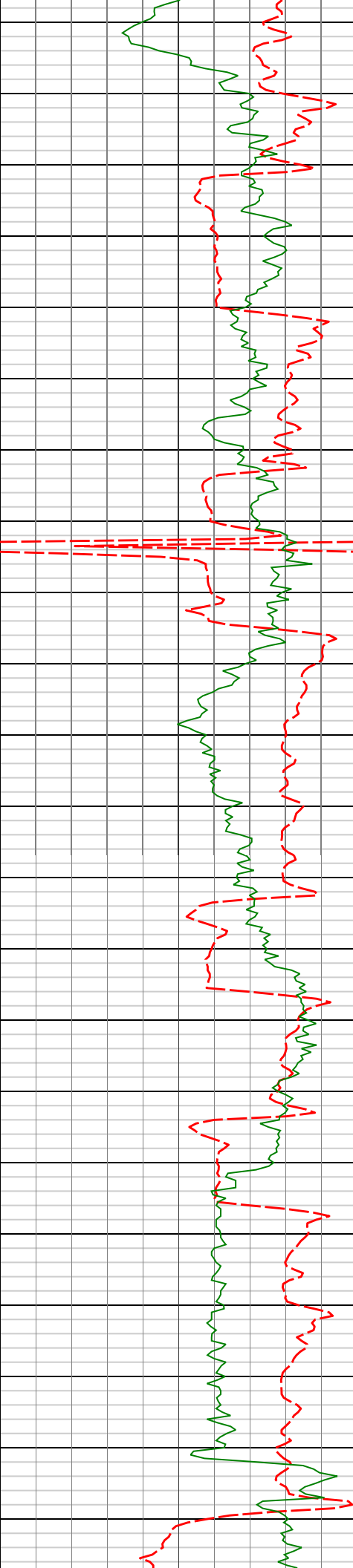
6959'	66.47°	167.27°	6624.75'	635.03'
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7000'

7007'	70.73°	169.22°	6642.26'	679.52'
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ROPA

PGRC



7050'

7054'

73.62°

172.08°

6656.65'

723.86'

7100'

7102'

76.59°

174.98°

6668.99'

769.46'

7150'

7174'

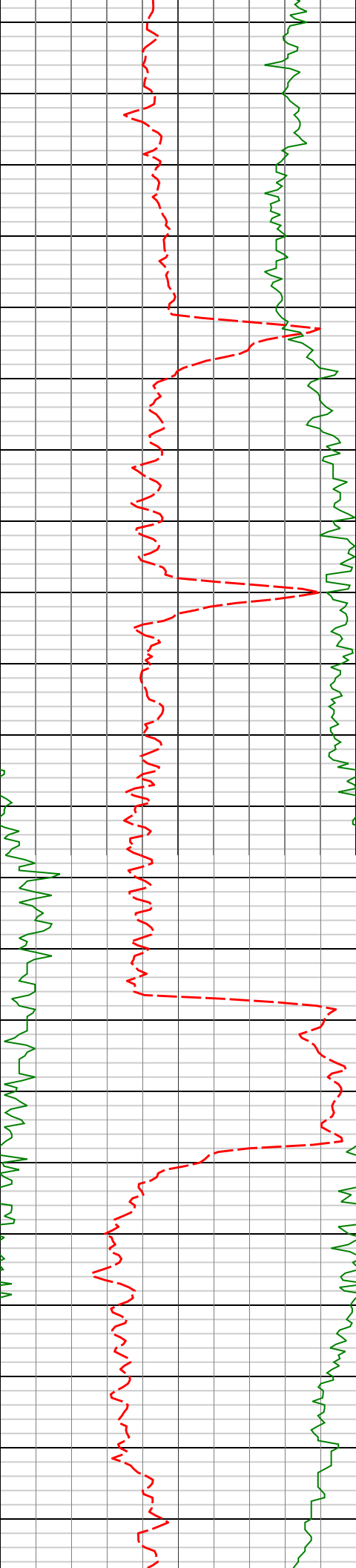
83.13°

176.13°

6681.65'

838.61'

7200'



7250'

7260'

87.53°

180.02°

6688.65'

921.35'

7300'

7320'

86.88°

179.39°

6691.57'

978.75'

7350'

7400'

7415'

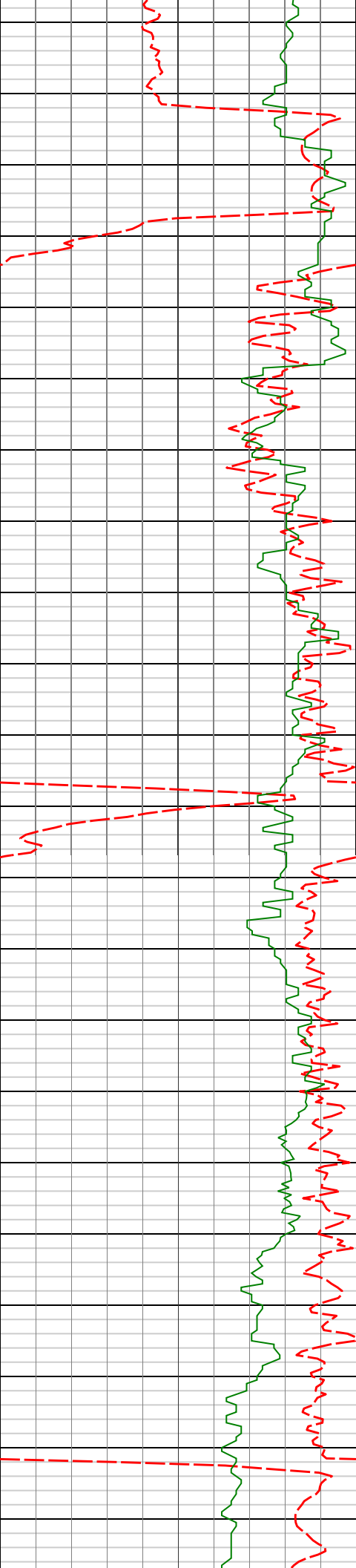
88.71°

179.51°

6695.23'

1069.81'

7450'



7500'

7510'

90.12°

179.92°

6696.20'

1160.80'

7550'

7600'

7604'

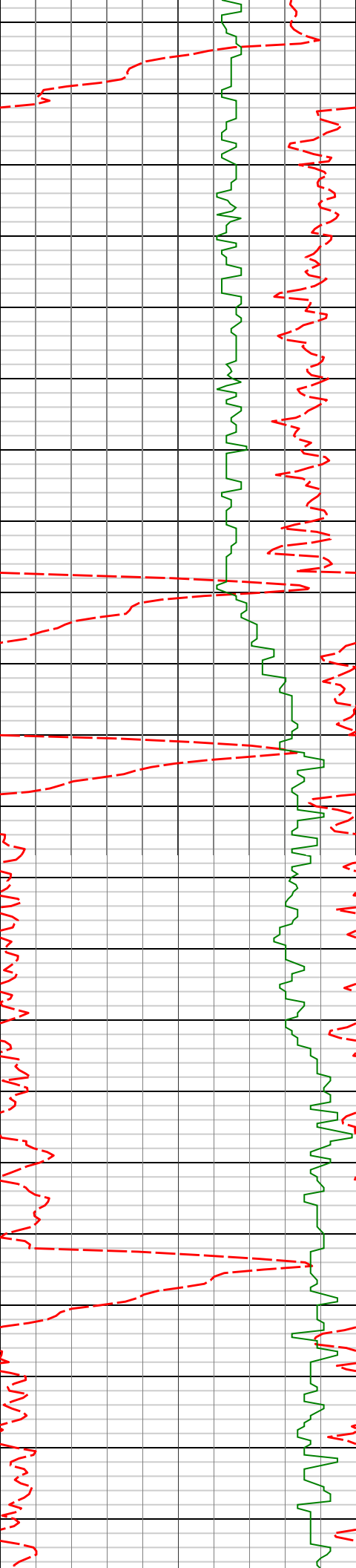
88.46°

180.14°

6697.36'

1250.68'

7650'



7700'

7750'

7800'

7850'

7699'

7794'

7889'

90.80°

90.40°

89.72°

179.39°

179.12°

179.57°

6697.98'

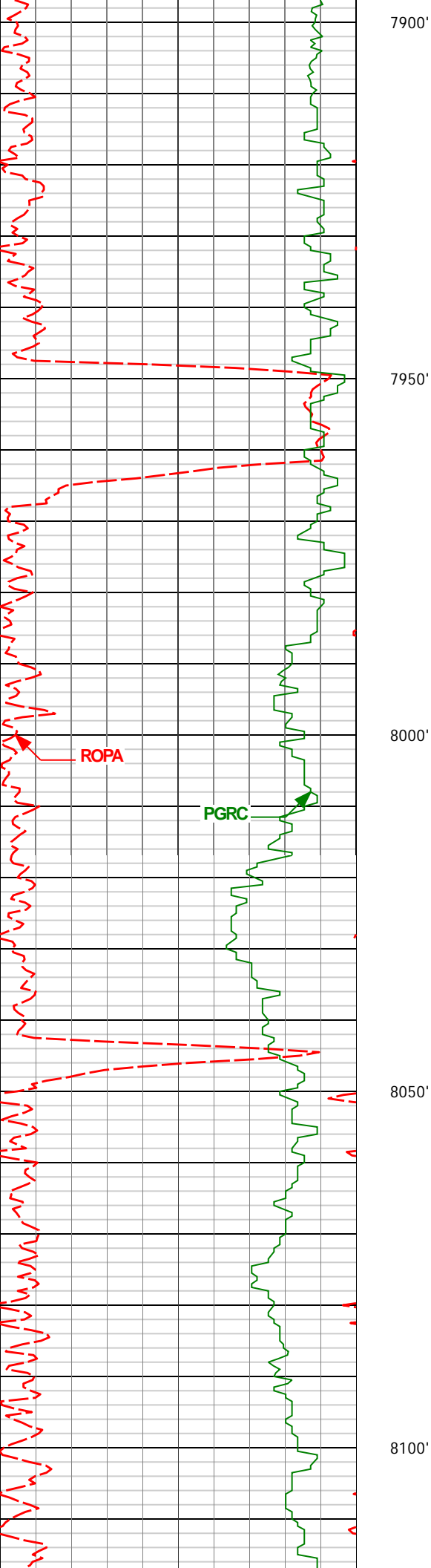
6696.98'

6696.88'

1341.65'

1432.86'

1524.03'



7984'

90.71°

179.66°

6696.52'

1615.08'

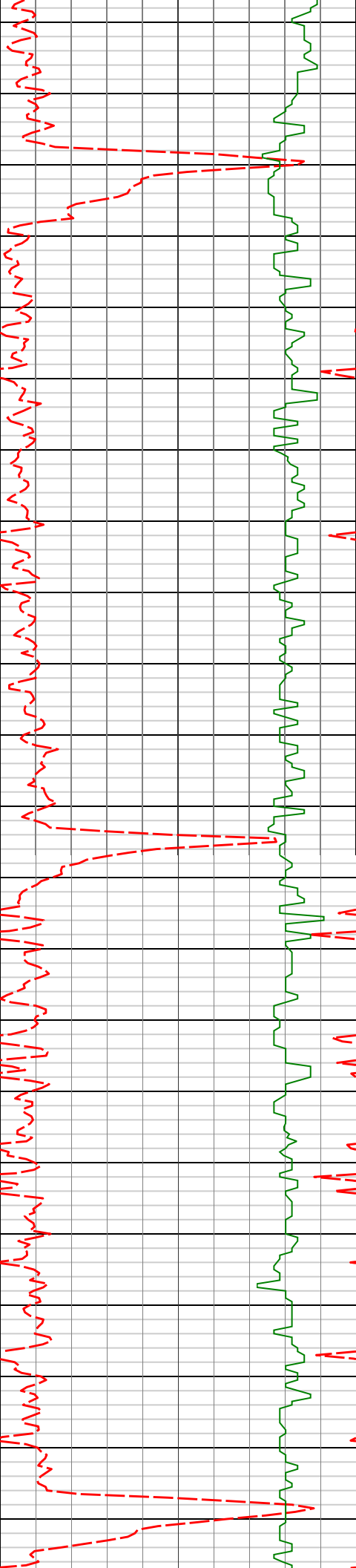
8079'

91.05°

179.35°

6695.07'

1706.17'



8150'

8200'

8250'

8300'

8173'

91.17°

179.12°

6693.25'

1796.42'

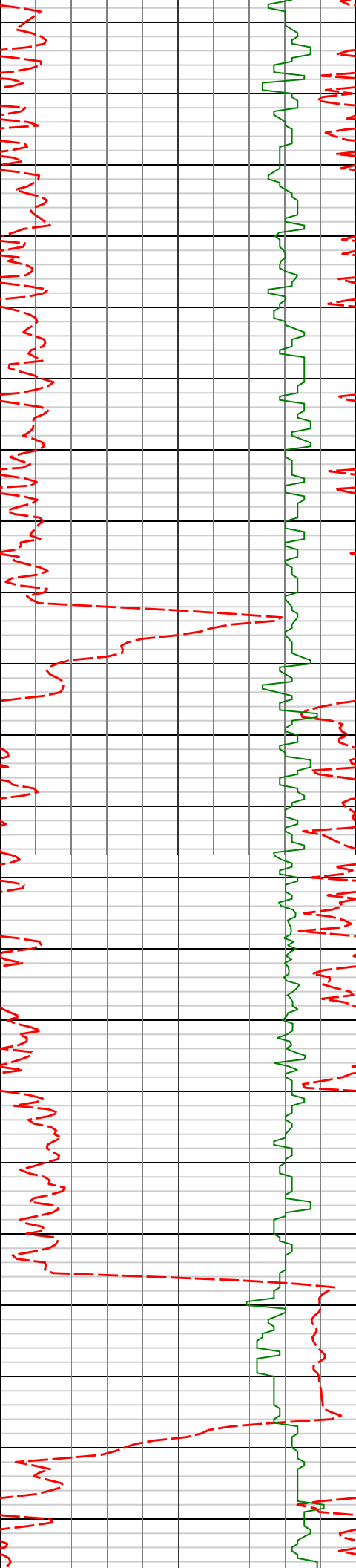
8268'

89.57°

178.62°

6692.63'

1887.81'



8350'

8363'

90.03°

177.84°

6692.96'

1979.48'

8400'

8450'

8458'

90.00°

176.92°

6692.94'

2071.52'

8500'

8550'

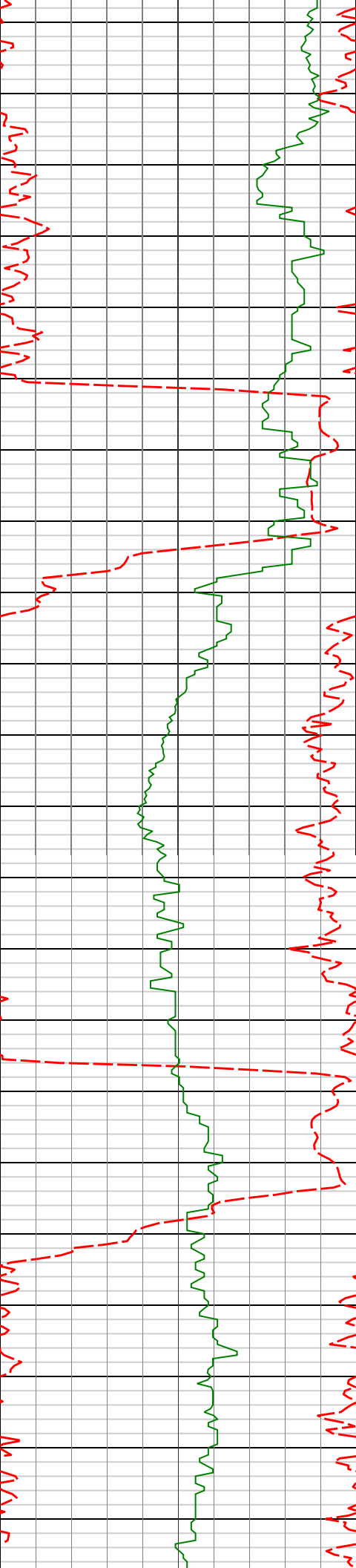
8553'

90.25°

177.94°

6692.73'

2163.53'



8600'

8650'

8700'

8750'

8647'

90.37°

179.27°

6692.23'

2254.08'

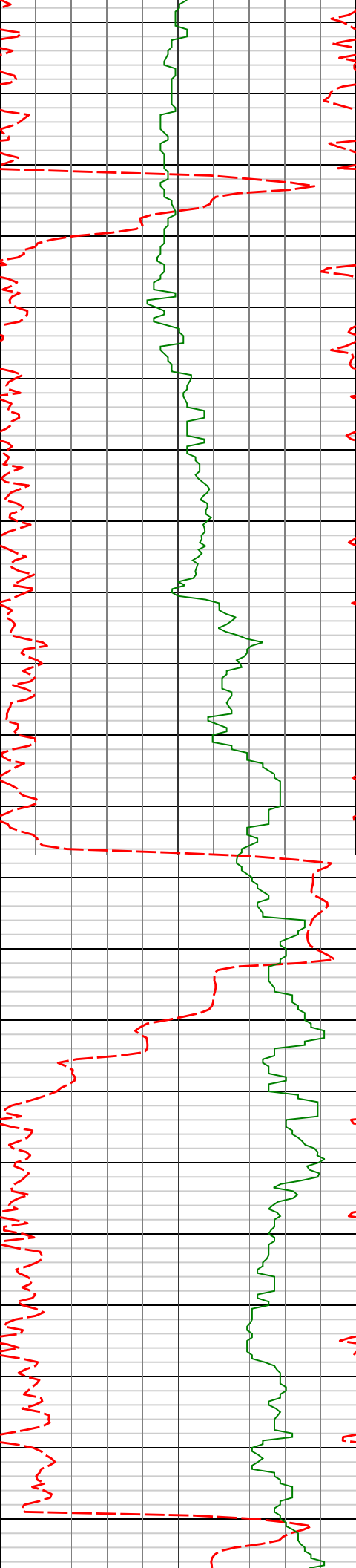
8742'

89.78°

180.44°

6692.10'

2345.01'



8800'

8837'

90.52°

179.39°

6691.85'

2435.91'

8850'

8900'

8932'

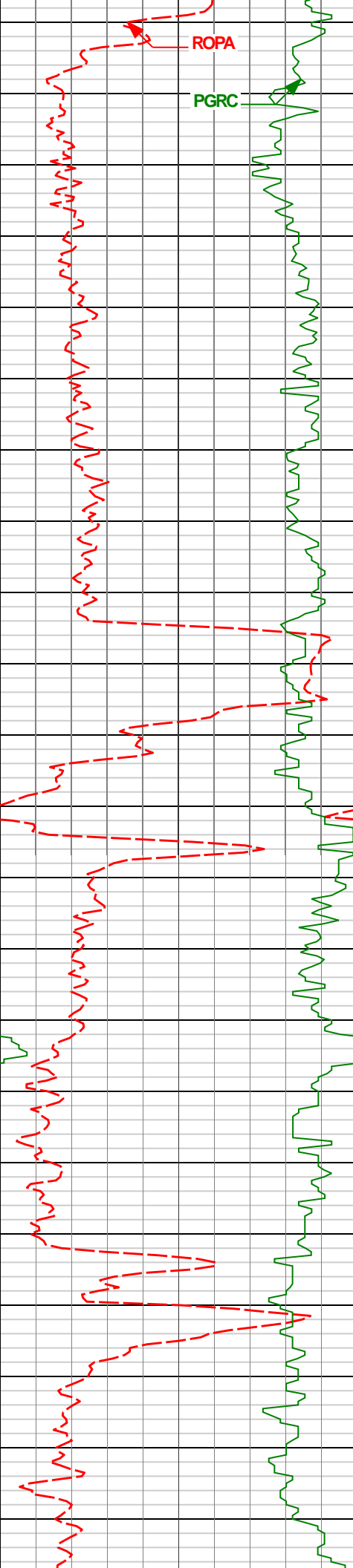
89.54°

180.75°

6691.80'

2526.74'

8950'



ROPA

PGRC

9000'

9050'

9100'

9150'

9200'

9027'

88.77°

180.98°

6693.20'

2617.16'

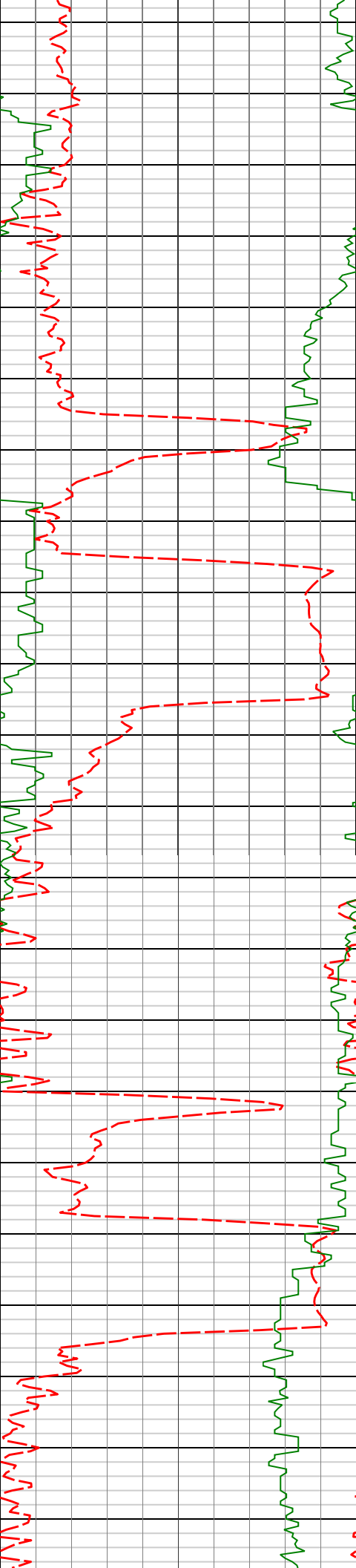
9122'

89.44°

180.89°

6694.69'

2707.55'



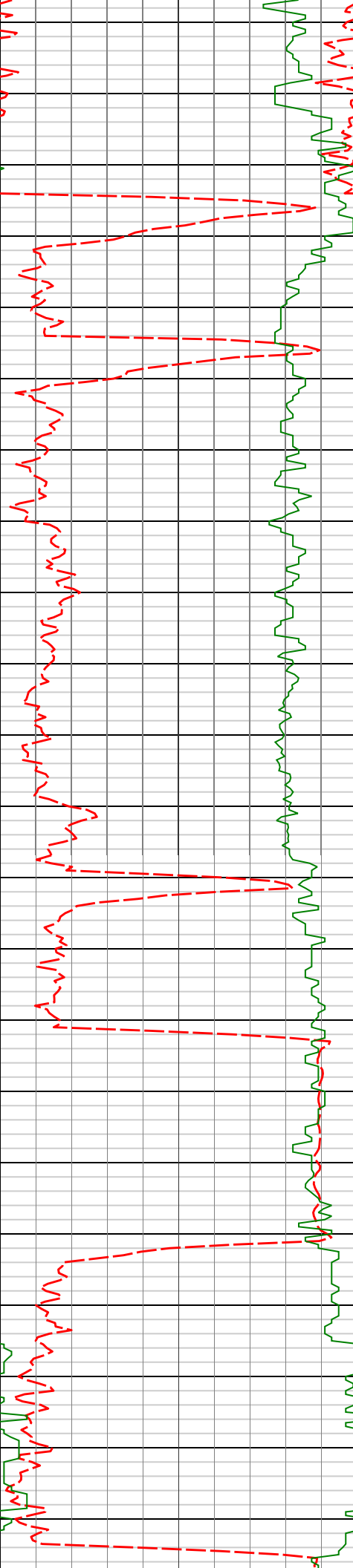
9250'

9300'

9350'

9400'

9217'	88.12°	180.82°	6698.70'	2798.02'
9312'	89.38°	179.43°	6698.77'	2888.85'
9407'	90.59°	178.93°	6698.80'	2980.09'



9450'

9500'

9550'

9600'

9650'

9501'

90.83°

178.18°

6697.64'

3070.65'

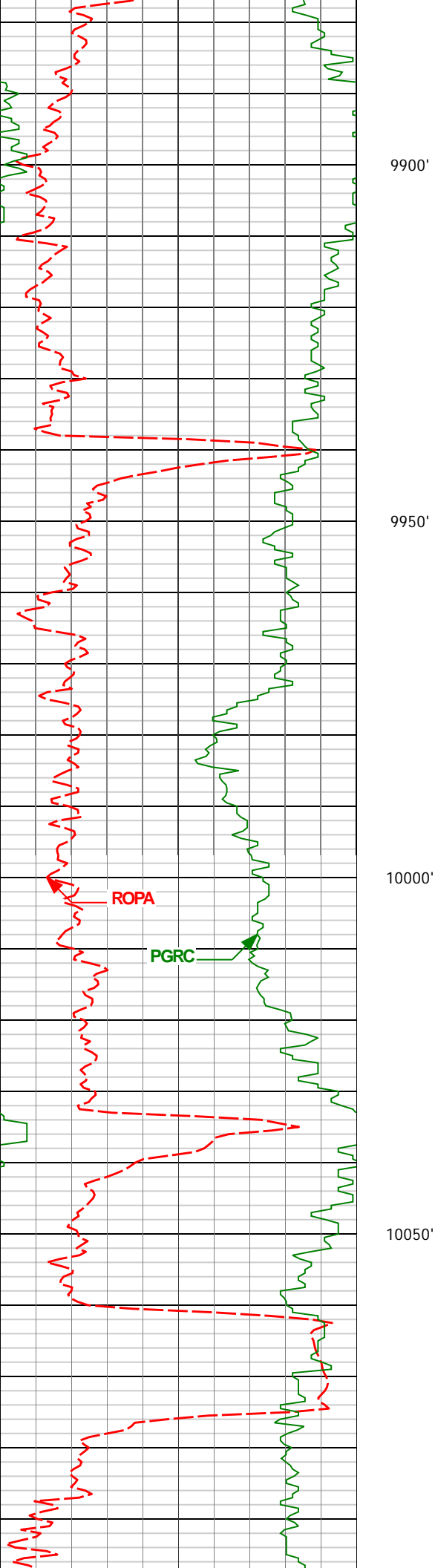
9596'

91.39°

180.58°

6695.80'

3161.79'



9881'

90.40°

180.92°

6688.39'

3432.76'

9900'

9950'

9975'

89.63°

181.25°

6688.36'

3522.13'

10000'

ROPA

PGRC

10050'

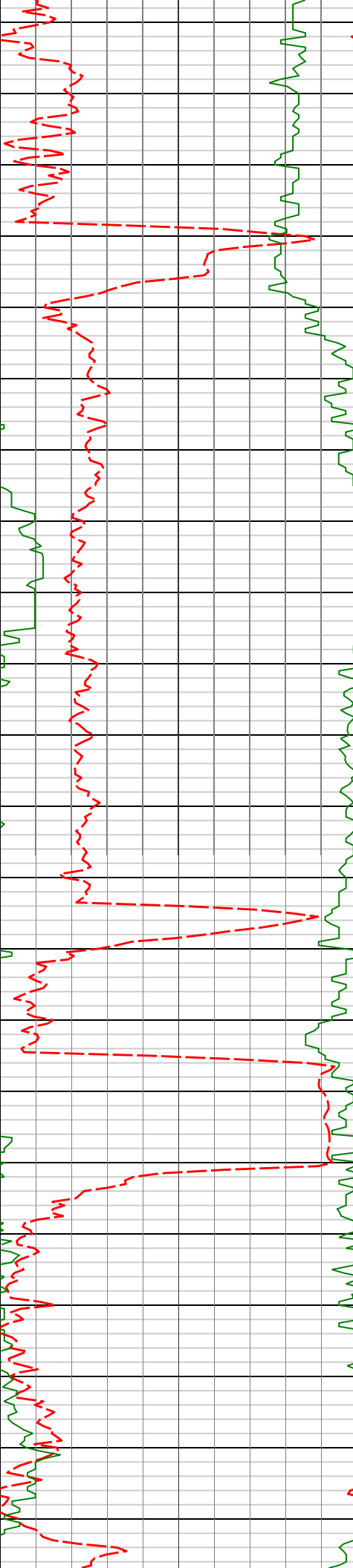
10070'

89.66°

180.76°

6688.95'

3612.49'



10100'

10150'

10200'

10250'

10300'

10165'

89.20°

180.67°

6689.90'

3703.00'

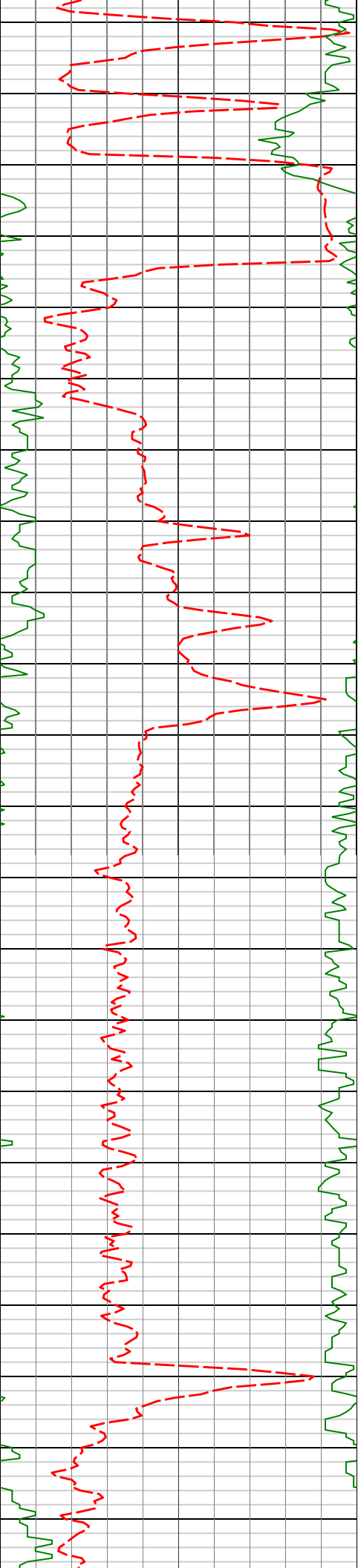
10260'

88.74°

179.51°

6691.61'

3793.80'



10350'

10355'

90.22°

179.02°

6692.48'

3885.00'

10400'

10450'

10450'

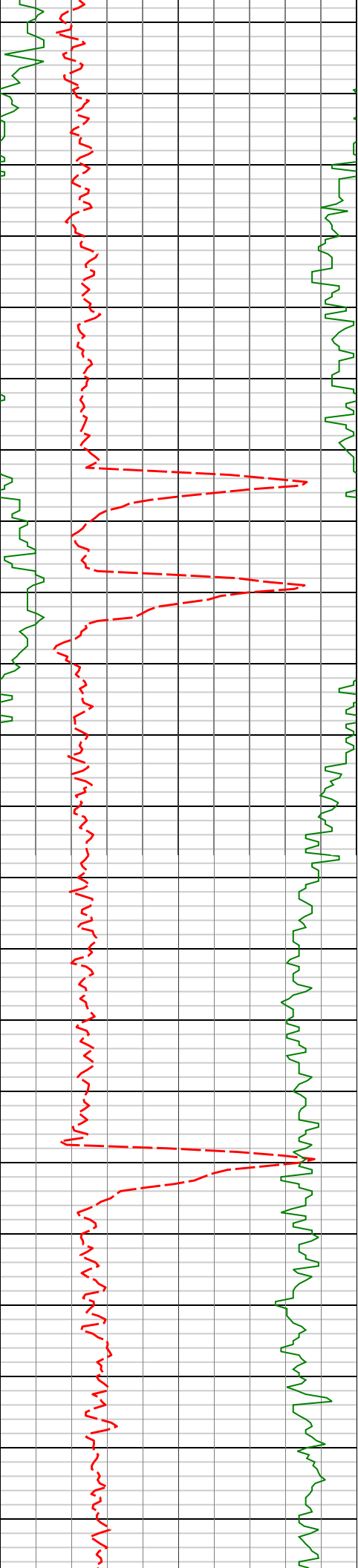
90.46°

178.38°

6691.92'

3976.47'

10500'



10545'	90.40°	177.14°	6691.20'	4068.34'
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10550'

10600'

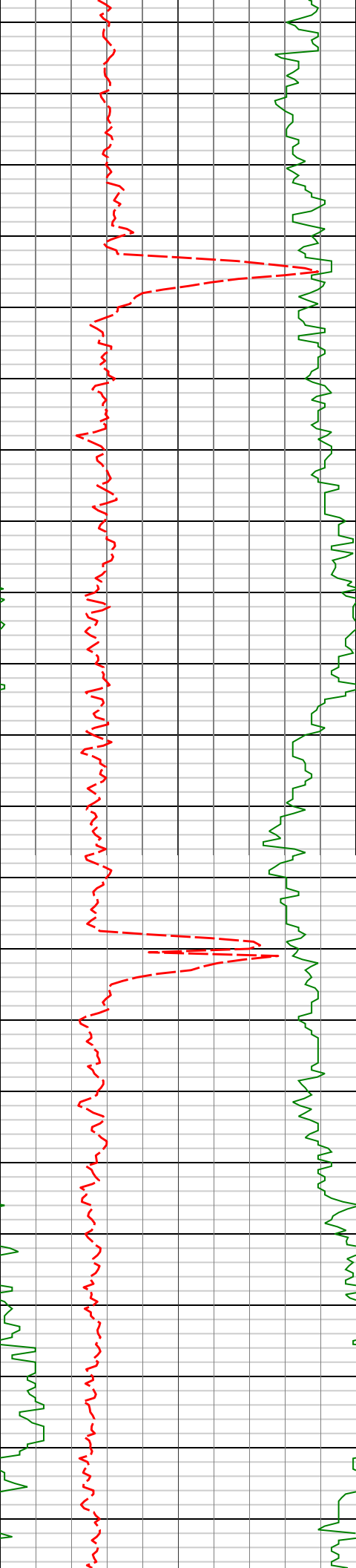
10640'	90.09°	176.62°	6690.79'	4160.58'
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10650'

10700'

10735'	89.94°	175.37°	6690.76'	4253.16'
--------	--------	---------	----------	----------

10750'



10800'

10850'

10900'

10950'

10829'

89.75°

174.39°

6691.02'

4345.15'

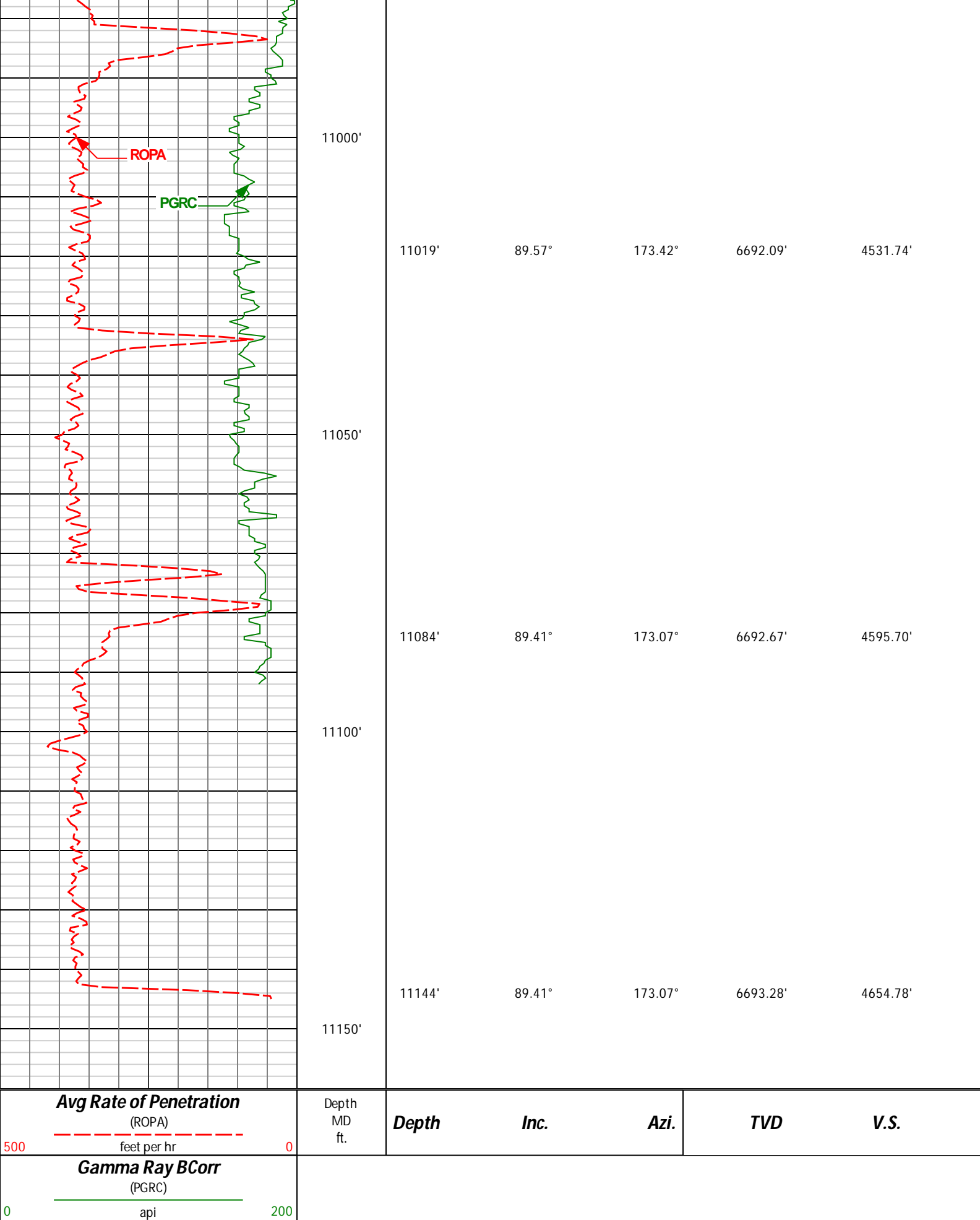
10924'

89.69°

173.89°

6691.48'

4438.37'



DIRECTIONAL SURVEY REPORT

Noble Energy
Mackinaw A19-79HNA
Wattenberg
Weld Colorado
USA
CA-XX-0901175137

<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>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
275.00	0.50	0.00	275.00	1.20 N	0.00 E	-1.15	0.18
520.00	0.20	0.00	519.99	2.70 N	0.00 E	-2.58	0.12
770.00	0.80	0.00	769.98	4.88 N	0.00 E	-4.67	0.24
902.00	0.28	272.12	901.98	5.81 N	0.33 W	-5.65	0.64
994.00	1.09	108.12	993.97	5.55 N	0.28 E	-5.23	1.48
1179.00	1.08	112.20	1178.94	4.34 N	3.56 E	-3.12	0.04
1273.00	1.12	104.85	1272.92	3.77 N	5.27 E	-2.07	0.16
1366.00	1.19	96.10	1365.90	3.44 N	7.11 E	-1.21	0.20
1458.00	1.02	104.43	1457.89	3.13 N	8.85 E	-0.41	0.26
1553.00	2.52	83.78	1552.84	3.15 N	11.74 E	0.41	1.69
1648.00	3.52	75.22	1647.71	4.12 N	16.63 E	0.92	1.15
1743.00	4.26	76.42	1742.49	5.69 N	22.88 E	1.24	0.79
1838.00	5.89	75.35	1837.11	7.75 N	31.02 E	1.64	1.72
1932.00	6.50	80.09	1930.56	9.89 N	40.93 E	2.49	0.85
2122.00	9.09	78.24	2118.79	14.80 N	66.23 E	5.18	1.37
2217.00	10.58	81.50	2212.39	17.62 N	82.21 E	7.15	1.67
2312.00	11.05	78.72	2305.71	20.68 N	99.76 E	9.33	0.74
2407.00	11.49	88.71	2398.88	22.68 N	118.14 E	12.79	2.10
2502.00	13.24	89.84	2491.68	22.92 N	138.47 E	18.49	1.86
2597.00	12.79	86.62	2584.24	23.57 N	159.84 E	24.11	0.90
2692.00	13.38	86.51	2676.77	24.86 N	181.31 E	29.14	0.63
2787.00	14.68	83.13	2768.94	26.97 N	204.24 E	33.82	1.61
2882.00	15.30	87.41	2860.71	28.97 N	228.71 E	39.04	1.33
2977.00	14.25	84.18	2952.57	30.73 N	252.86 E	44.41	1.40
3072.00	15.15	87.04	3044.46	32.55 N	276.88 E	49.68	1.21
3167.00	12.97	83.93	3136.61	34.32 N	299.88 E	54.70	2.43
3262.00	12.76	83.93	3229.23	36.56 N	320.91 E	58.70	0.22
3357.00	12.50	89.82	3321.93	37.70 N	341.62 E	63.65	1.38
3452.00	11.72	87.53	3414.82	38.15 N	361.54 E	69.04	0.97
3547.00	12.28	87.98	3507.74	38.92 N	381.27 E	74.06	0.60
3641.00	12.83	85.28	3599.50	40.13 N	401.67 E	78.85	0.86
3736.00	14.80	87.55	3691.74	41.52 N	424.31 E	84.13	2.15
3831.00	15.57	87.95	3783.43	42.50 N	449.17 E	90.46	0.81
3926.00	16.38	87.95	3874.76	43.43 N	475.30 E	97.19	0.86
4021.00	16.54	88.19	3965.86	44.34 N	502.21 E	104.17	0.18
4116.00	13.99	87.14	4057.50	45.34 N	527.20 E	110.51	2.70
4211.00	13.92	84.67	4149.70	46.97 N	550.05 E	115.62	0.63
4306.00	13.56	83.72	4241.98	49.25 N	572.49 E	119.98	0.45
4401.00	12.50	86.30	4334.53	51.14 N	593.82 E	124.41	1.27
4496.00	12.44	84.41	4427.29	52.80 N	614.27 E	128.79	0.43
4591.00	12.78	86.42	4520.00	54.45 N	634.95 E	133.25	0.58
4685.00	11.35	85.23	4611.92	55.87 N	654.55 E	137.61	1.55
4780.00	11.19	88.41	4705.09	56.90 N	673.08 E	142.03	0.68
4875.00	11.61	81.03	4798.22	58.65 N	691.74 E	145.80	1.60
4970.00	12.21	79.09	4891.17	62.05 N	711.05 E	148.19	0.76
5065.00	13.66	77.31	4983.76	66.41 N	731.86 E	150.09	1.58
5160.00	13.61	80.64	5076.08	70.69 N	753.83 E	152.41	0.83
5255.00	12.37	79.98	5168.65	74.28 N	774.88 E	155.12	1.32
5350.00	12.89	82.54	5261.35	77.43 N	795.41 E	158.10	0.81
5445.00	13.03	82.98	5353.93	80.11 N	816.54 E	161.70	0.17
5540.00	13.84	78.07	5446.34	83.77 N	838.29 E	164.55	1.47
5635.00	13.83	80.78	5538.58	87.94 N	860.60 E	167.08	0.68
5730.00	13.44	84.00	5630.91	90.91 N	882.79 E	170.71	0.90
5825.00	13.84	81.80	5723.23	93.69 N	905.01 E	174.54	0.69
5920.00	12.55	79.54	5815.72	97.18 N	926.41 E	177.44	1.46
6013.00	12.22	87.63	5906.56	99.43 N	946.19 E	181.07	1.90

6055.00	11.18	87.25	5947.69	99.81 N	954.70 E	183.19	2.50
6199.00	18.44	96.16	6086.83	98.03 N	991.33 E	195.58	5.27
6247.00	23.90	97.89	6131.57	95.88 N	1008.52 E	202.66	11.44
6294.00	27.90	101.76	6173.85	92.33 N	1028.73 E	211.95	9.25
6342.00	30.85	106.73	6215.68	86.49 N	1051.52 E	224.18	7.96
6389.00	33.87	112.11	6255.38	78.09 N	1075.20 E	239.13	8.88
6437.00	38.47	118.97	6294.14	65.81 N	1100.68 E	258.31	12.75
6484.00	41.25	126.32	6330.23	49.54 N	1125.98 E	281.26	11.63
6532.00	41.79	132.69	6366.18	29.32 N	1150.50 E	307.76	8.86
6579.00	42.58	138.91	6401.03	6.71 N	1172.47 E	335.80	9.04
6627.00	46.37	144.74	6435.29	19.74 S	1193.19 E	367.14	11.62
6674.00	50.52	147.70	6466.46	48.98 S	1212.71 E	400.80	9.99
6722.00	52.66	151.40	6496.29	81.40 S	1231.75 E	437.36	7.52
6769.00	52.83	156.32	6524.75	114.96 S	1248.21 E	474.28	8.34
6817.00	54.84	160.01	6553.08	150.93 S	1262.61 E	512.88	7.48
6864.00	56.76	162.66	6579.50	187.75 S	1275.03 E	551.72	6.19
6912.00	61.49	165.84	6604.13	227.39 S	1286.19 E	592.89	11.39
6959.00	66.47	167.27	6624.75	268.46 S	1295.99 E	635.03	10.94
7007.00	70.73	169.22	6642.26	312.20 S	1305.08 E	679.52	9.65
7054.00	73.62	172.08	6656.65	356.34 S	1312.34 E	723.86	8.43
7102.00	76.59	174.98	6668.99	402.42 S	1317.56 E	769.46	8.51
7174.00	83.13	176.13	6681.65	473.05 S	1323.04 E	838.61	9.23
7260.00	87.53	180.02	6688.65	558.68 S	1325.91 E	921.35	6.81
7320.00	86.88	179.39	6691.57	618.60 S	1326.22 E	978.75	1.50
7415.00	88.71	179.51	6695.23	713.53 S	1327.12 E	1069.81	1.92
7510.00	90.12	179.92	6696.20	808.52 S	1327.59 E	1160.80	1.55
7604.00	88.46	180.14	6697.36	902.51 S	1327.55 E	1250.68	1.79
7699.00	90.80	179.39	6697.98	997.50 S	1327.94 E	1341.65	2.59
7794.00	90.40	179.12	6696.98	1092.48 S	1329.17 E	1432.86	0.51
7889.00	89.72	179.57	6696.88	1187.48 S	1330.26 E	1524.03	0.85
7984.00	90.71	179.66	6696.52	1282.47 S	1330.90 E	1615.08	1.04
8079.00	91.05	179.35	6695.07	1377.46 S	1331.72 E	1706.17	0.48
8173.00	91.17	179.12	6693.25	1471.43 S	1332.98 E	1796.42	0.29
8268.00	89.57	178.62	6692.63	1566.41 S	1334.85 E	1887.81	1.77
8363.00	90.03	177.84	6692.96	1661.36 S	1337.79 E	1979.48	0.95
8458.00	90.00	176.92	6692.94	1756.26 S	1342.13 E	2071.52	0.98
8553.00	90.25	177.94	6692.73	1851.16 S	1346.40 E	2163.53	1.10
8647.00	90.37	179.27	6692.23	1945.13 S	1348.68 E	2254.08	1.43
8742.00	89.78	180.44	6692.10	2040.13 S	1348.92 E	2345.01	1.37
8837.00	90.52	179.39	6691.85	2135.13 S	1349.07 E	2435.91	1.35
8932.00	89.54	180.75	6691.80	2230.12 S	1348.95 E	2526.74	1.77
9027.00	88.77	180.98	6693.20	2325.10 S	1347.52 E	2617.16	0.85
9122.00	89.44	180.89	6694.69	2420.08 S	1345.97 E	2707.55	0.72
9217.00	88.12	180.62	6696.70	2515.04 S	1344.72 E	2798.02	1.42
9312.00	89.38	179.43	6698.77	2610.02 S	1344.68 E	2888.85	1.82
9407.00	90.59	178.93	6698.80	2705.01 S	1346.04 E	2980.09	1.37
9501.00	90.83	178.18	6697.64	2798.97 S	1348.41 E	3070.65	0.84
9596.00	91.39	180.58	6695.80	2893.94 S	1349.43 E	3161.79	2.58
9691.00	91.73	181.09	6693.22	2988.89 S	1348.05 E	3252.21	0.65
9786.00	91.85	181.21	6690.25	3083.83 S	1346.15 E	3342.45	0.19
9881.00	90.40	180.92	6688.39	3178.79 S	1344.38 E	3432.76	1.55
9975.00	89.63	181.25	6688.36	3272.77 S	1342.59 E	3522.13	0.89
10070.00	89.66	180.76	6688.95	3367.75 S	1340.92 E	3612.49	0.52
10165.00	89.20	180.67	6689.90	3462.74 S	1339.73 E	3703.00	0.49
10260.00	88.74	179.51	6691.61	3557.72 S	1339.58 E	3793.80	1.31
10355.00	90.22	179.02	6692.48	3652.71 S	1340.80 E	3885.00	1.64
10450.00	90.46	178.38	6691.92	3747.68 S	1342.95 E	3976.47	0.72
10545.00	90.40	177.14	6691.20	3842.61 S	1346.67 E	4068.34	1.31
10640.00	90.09	176.62	6690.79	3937.46 S	1351.84 E	4160.58	0.63
10735.00	89.94	175.37	6690.76	4032.23 S	1358.47 E	4253.16	1.33
10829.00	89.75	174.39	6691.02	4125.85 S	1366.86 E	4345.15	1.06
10924.00	89.69	173.89	6691.48	4220.36 S	1376.56 E	4438.37	0.53
11019.00	89.57	173.42	6692.09	4314.77 S	1387.05 E	4531.74	0.51
11084.00	89.41	173.07	6692.67	4379.32 S	1394.69 E	4595.70	0.59
11144.00	89.41	173.07	6693.28	4438.88 S	1401.93 E	4654.78	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 163.03 DEGREES (GRID)
A TOTAL CORRECTION OF 7.88 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11144.00 FEET
IS 4655.00 FEET ALONG 162.47 DEGREES (GRID)

Date Printed:12 September 2016