



WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	24-Apr-15	25-Apr-15	28-Apr-15		
Rig Bit Number	0100	0100	0300		
Bit Size (in)	8.750	8.750	6.130		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	626.00	5,683.00	6,493.00		
Log End Depth (MD, ft)	5,683.00	6,493.00	11,518.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	23-Apr-15 21:00	24-Apr-15 22:30	26-Apr-15 09:00		
Drill/Wipe End Date and Time	24-Apr-15 14:30	25-Apr-15 04:30	27-Apr-15 23:30		
Min Inc (deg) @ Depth (MD, ft)	0.10 @ 367.00	20.79 @ 5,710.00	87.53 @ 6,517.00		
Max Inc (deg) @ Depth (MD, ft)	17.99 @ 5,614.00	82.27 @ 6,440.00	92.53 @ 9,897.00		
Bit TFA(in2) / Bit Type	1.21 / PDC	1.21 / PDC	0.65 / PDC		
Flow Rate (gpm)	631.60	550.00	320.00		
Max AV (fpm) / CV (fpm) @ MWD	395.0 / N/A	395.0 /	467.0 / N/A		
Fluid Type	Native/Spud Mud	Native/Spud Mud	Native/Spud Mud		
Density (ppg) / Viscosity (spqt)	9.50 / 38.00	9.50 / 38.00	10.30 / 38.00		
Filtrate CL (ppm)	1,700.00	1,700.00	1,800.00		
pH / Fluid Loss (mptm)	10.10 / 29	10.10 / 26	9.30 / 13		
PV (cP) / YP (lhf2)	12 / 12.00	12 / 12.00	12 / 15.00		
% Solids / % Sand	11.5 / .15	11.5 / .15	9.7 / .25		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (degF) / S	122.22 / PDM	122.22 / PDM	234.12 / PDM		

Max Tool Temp (degF) / Source	162.80 / PCM	160.83 / PCM	231.42 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 162.80	N/A @ 160.83	N/A @ N/A		
Lead MWD Engineer	Brian Neu	Brian Neu	Brian Neu		
Customer Representative	Cliff Kester	Cliff Kester	Cliff Kester		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	246470	246470	12463933		
Insert Serial Number	11680738	11680738	11680771		
Date and Time Initialized	23-Apr-15 15:41	23-Apr-15 15:41	25-Apr-15 06:45		
Date and Time Read	25-Apr-15 08:26	25-Apr-15 08:31	28-Apr-15 07:47		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	58.00	53.00	68.00		
Software Version	6.33	6.33	6.21		
Sub Serial Number	246470	246470	12463933		
Sonde Serial Number	11638628	11638628	10993273		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	72.30	338.67	204.47		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	51.14	46.64	61.25		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	246470	246470	12463933		
Insert/Sonde Serial Number	12037421	12037421	11681055		

REMARKS

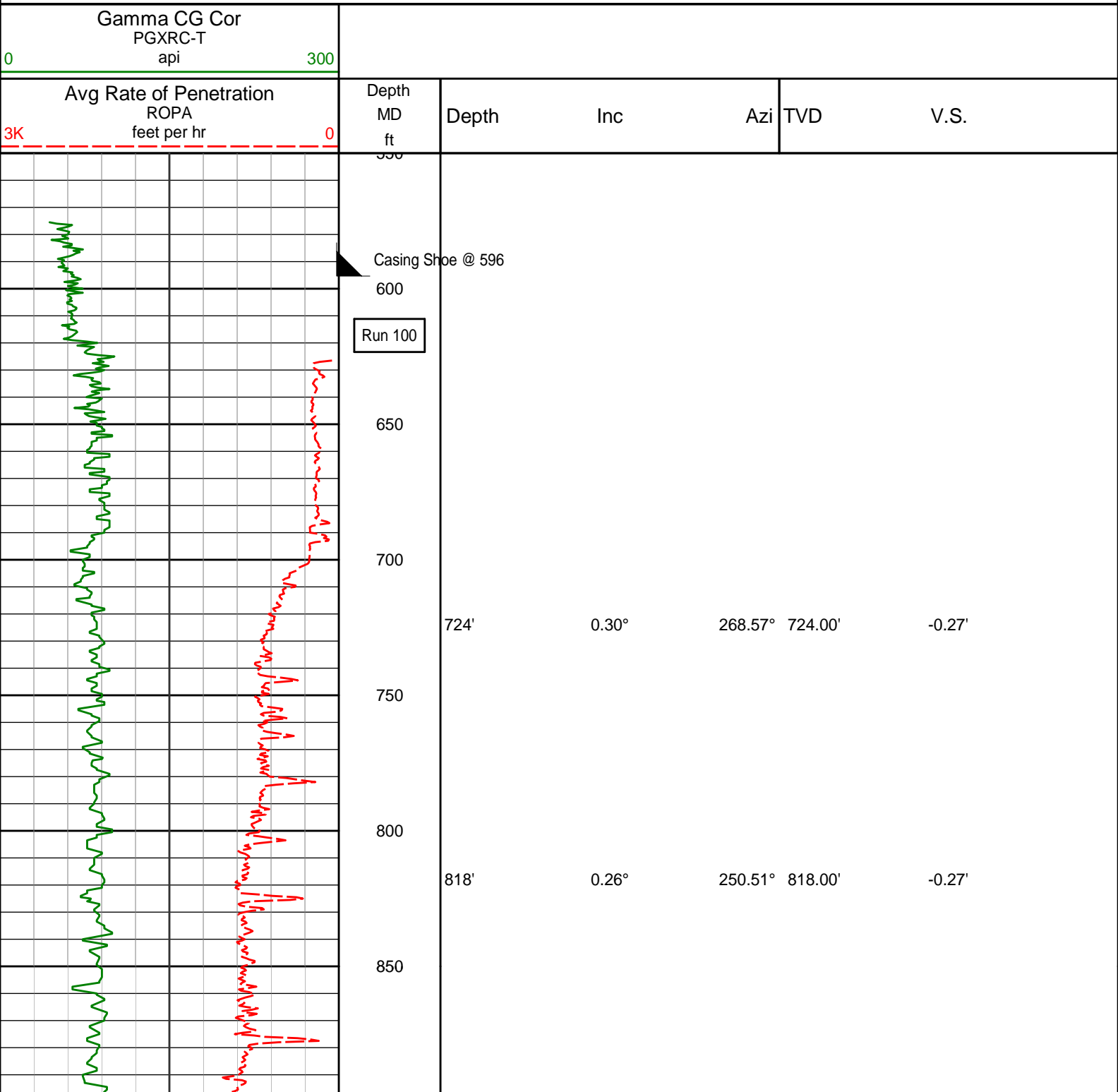
1. All depths are calibrated to driller's pipe tally and are total vertical depth from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Environmental parameters used in gamma and resistance processing:
Hole Size: 6.125"
Mud Density: 9.9-10.3
5. The following smoothing parameters have been applied to the data:
Interval: 0.5 ft
Coercion Distance: 1.2 ft (ROPA)
Interval: 0.5 ft
Coercion Distance: 0.6 ft (Gamma Ray)

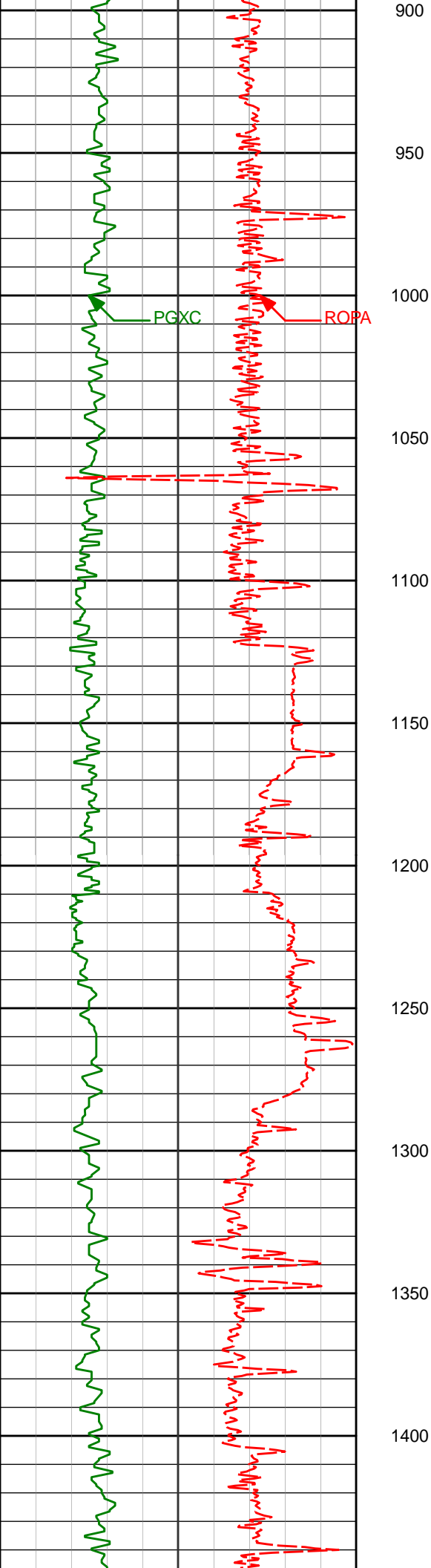
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MD Detail 1:600 Scale



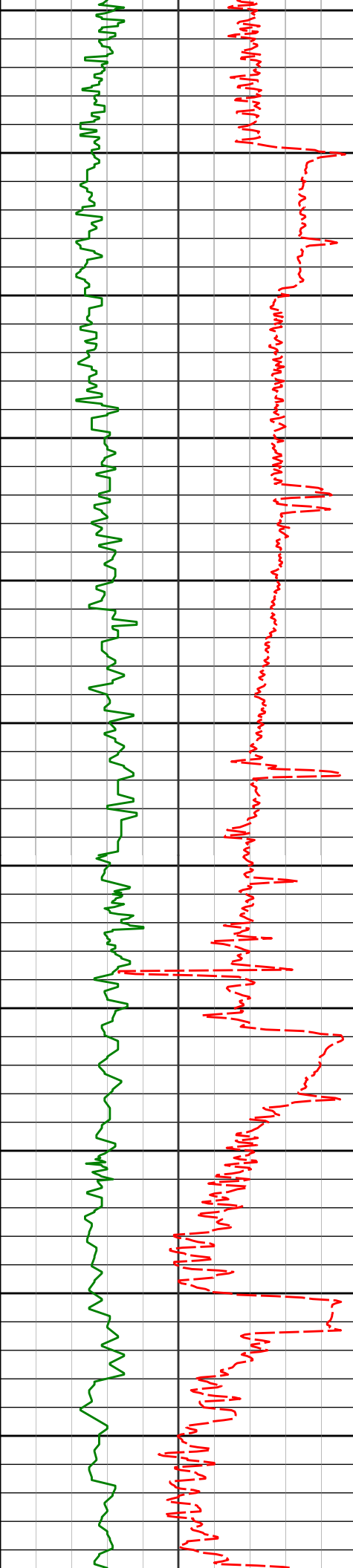


1008'	0.44°	273.38°	1007.99'	-0.18'
-------	-------	---------	----------	--------

1194'	0.56°	265.15°	1193.99'	0.05'
-------	-------	---------	----------	-------

1286'	0.42°	267.77°	1285.98'	0.13'
-------	-------	---------	----------	-------

1380'	0.40°	260.01°	1379.98'	0.17'
-------	-------	---------	----------	-------



1450

1472'

0.37°

258.44° 1471.98'

0.15'

1500

1550

1565'

0.41°

250.41° 1564.98'

0.08'

1600

1650

1657'

0.28°

258.20° 1656.97'

0.02'

1700

1750

1750'

0.17°

275.05° 1749.97'

0.04'

1800

1850

1843'

3.42°

271.78° 1842.92'

0.61'

1900

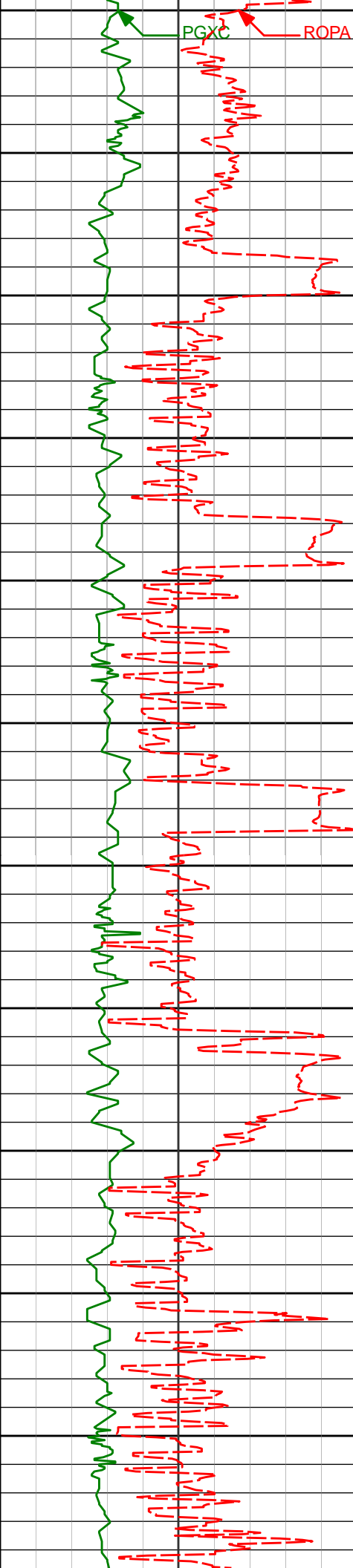
1950

1934'

4.81°

266.11° 1933.68'

1.51'



2000

2027'

4.81°

257.47° 2026.35'

1.68'

2050

2100

2120'

5.01°

283.84° 2119.02'

3.08'

2150

2200

2212'

7.46°

283.49° 2210.47'

7.00'

2250

2300

2305'

8.78°

275.73° 2302.54'

11.22'

2350

2400

2397'

9.79°

264.14° 2393.34'

13.55'

2450

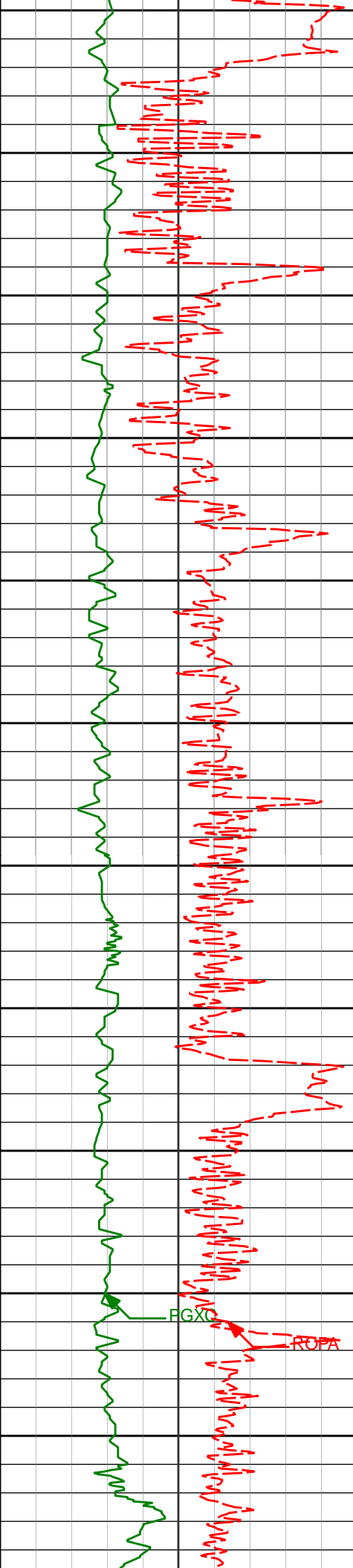
2500

2490'

9.49°

261.60° 2485.03'

14.19'



2550

2583'	10.81°	271.90°	2576.58'	16.05'
-------	--------	---------	----------	--------

2600

2650

2676'	11.21°	271.19°	2667.87'	19.43'
-------	--------	---------	----------	--------

2700

2750

2766'	11.11°	270.11°	2756.17'	22.49'
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2800

2850

2900

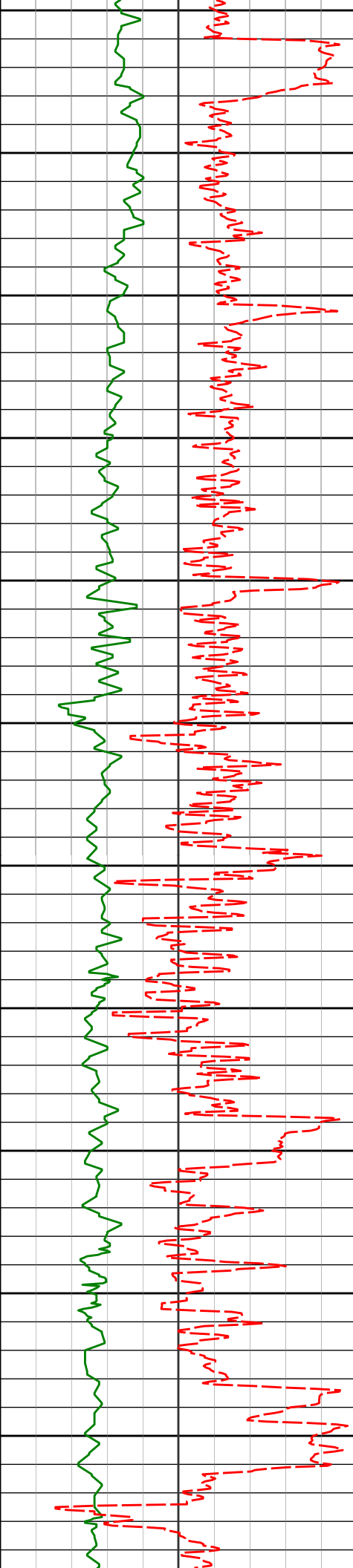
2950

2956'	11.68°	272.46°	2942.42'	29.51'
-------	--------	---------	----------	--------

3000

3050

3051'	10.62°	268.69°	3035.63'	32.74'
-------	--------	---------	----------	--------



3100

3150

3200

3250

3300

3350

3400

3450

3500

3550

3600

3146'

9.98°

268.74°

3129.10'

35.15'

3241'

9.71°

268.26°

3222.70'

37.40'

3336'

10.20°

268.17°

3316.27'

39.60'

3431'

10.76°

268.59°

3409.68'

41.95'

3526'

10.84°

269.56°

3503.00'

44.60'

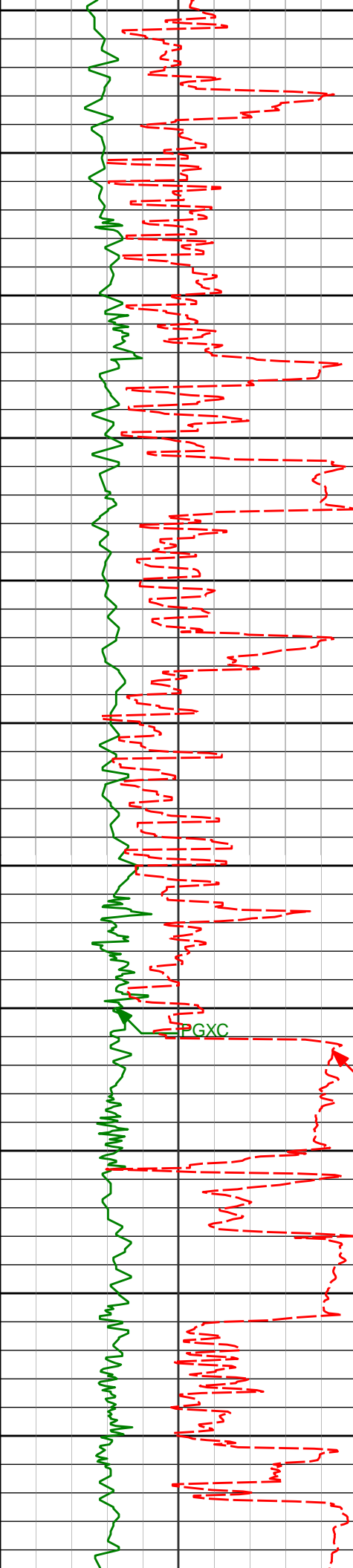
3621'

10.85°

271.15°

3596.30'

47.65'



3650

3700

3750

3800

3850

3900

3950

4000

4050

4100

4150

3716' 10.80° 270.62° 3689.61' 50.85'

3811' 10.76° 270.39° 3782.94' 53.92'

3906' 9.97° 269.11° 3876.38' 56.67'

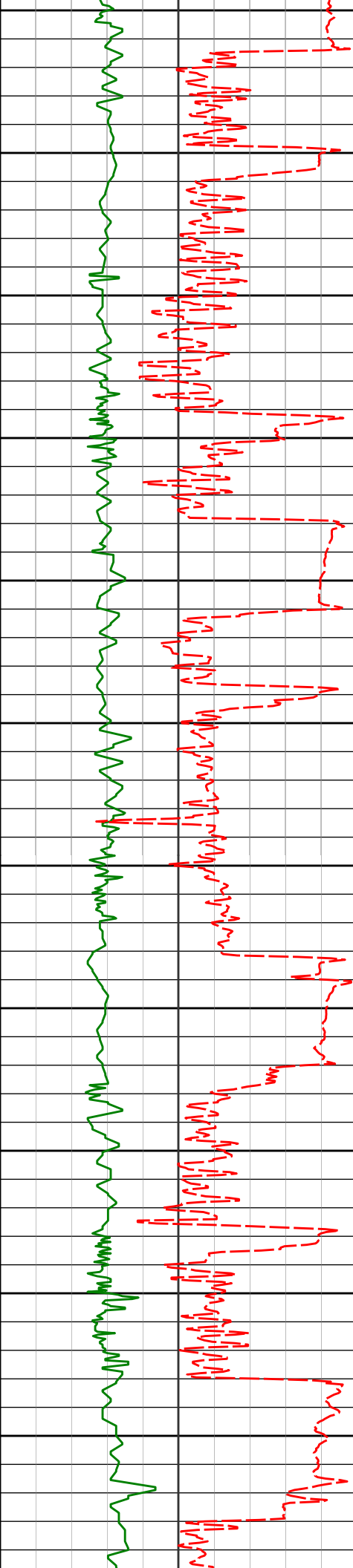
4001' 7.58° 268.86° 3970.26' 58.80'

4096' 4.05° 285.28° 4064.77' 61.11'

4190' 4.81° 285.97° 4158.48' 64.19'

PGXC

ROPA



4200

4250

4300

4350

4400

4450

4500

4550

4600

4650

4700

4285'

5.94°

280.88°

4253.07'

67.61'

4380'

6.33°

280.99°

4347.52'

71.15'

4475'

7.69°

274.62°

4441.81'

74.53'

4570'

8.90°

273.58°

4535.81'

77.73'

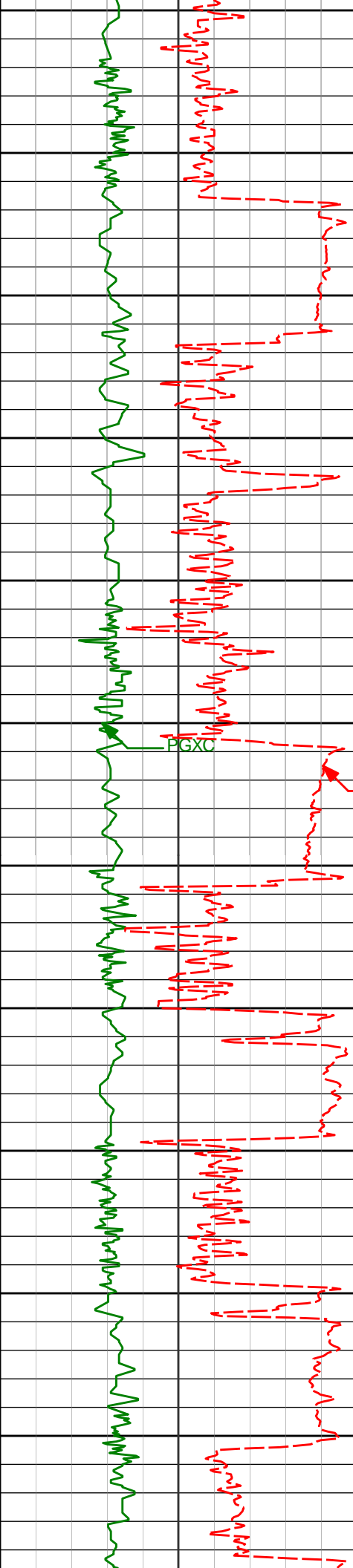
4665'

7.23°

278.48°

4629.87'

81.23'

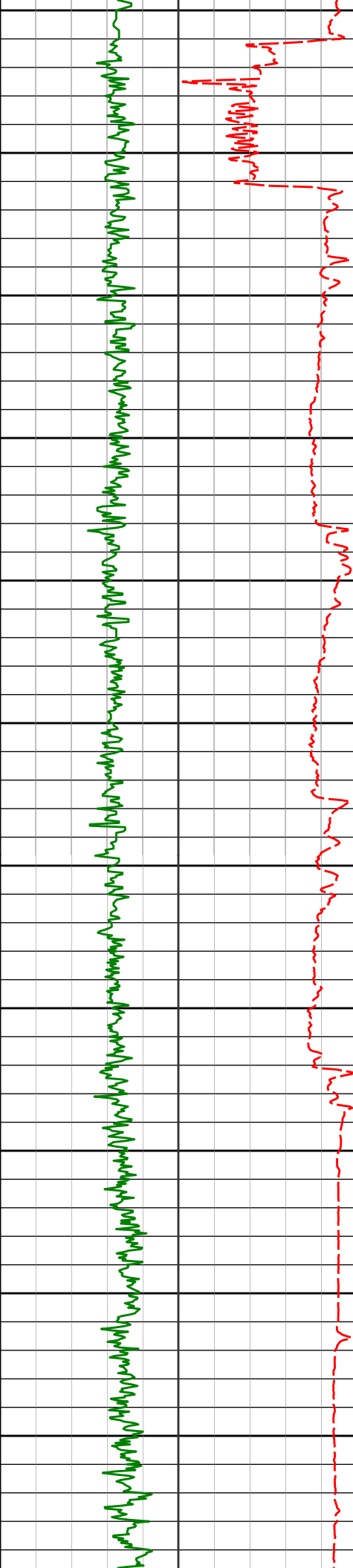


4750
4800
4850
4900
4950
5000
5050
5100
5150
5200
5250

4760'	8.50°	286.65°	4723.98'	86.16'
4855'	9.60°	274.97°	4817.80'	91.23'
4950'	7.44°	275.07°	4911.75'	94.74'
5045'	9.09°	290.08°	5005.77'	99.99'
5140'	9.69°	276.33°	5099.51'	105.87'
5235'	9.78°	267.67°	5193.15'	109.04'

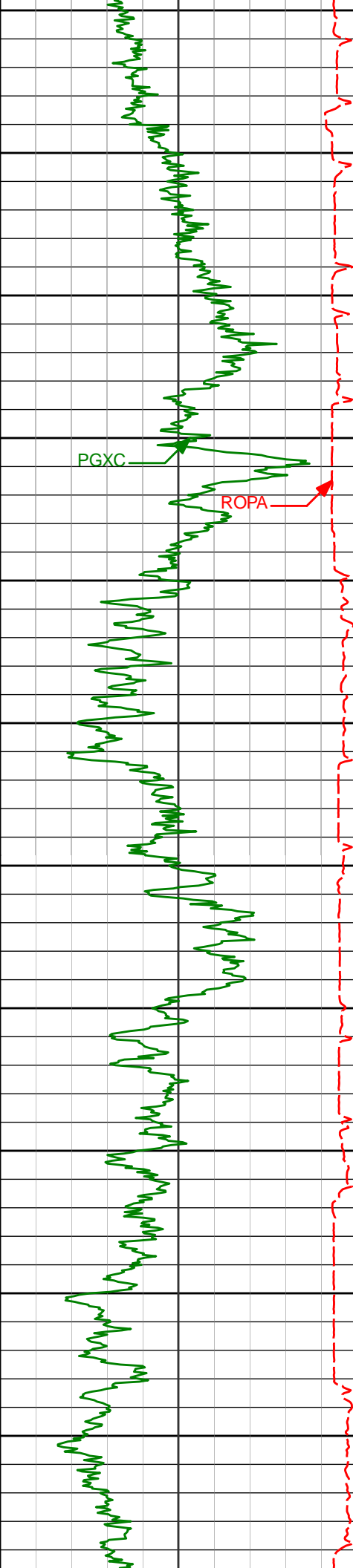
PGXC

ROPA



Run 200

5300				
5330'	10.28°	268.28°	5286.69'	111.19'
5350				
5400				
5425'	11.67°	269.07°	5379.95'	113.75'
5450				
5500				
5519'	15.49°	275.66°	5471.32'	118.44'
5550				
5600				
5614'	17.99°	281.73°	5562.29'	127.05'
5650				
5700				
5710'	20.79°	300.09°	5652.92'	143.28'
5750				
5800				
5805'	35.12°	317.59°	5736.75'	177.17'



5850

5900

5950

6000

6050

6100

6150

6200

6250

6300

6350

5899'

49.02°

326.18° 5806.42'

232.50'

5994'

57.00°

337.13° 5863.64'

304.18'

6089'

61.87°

343.08° 5911.97'

384.56'

6184'

69.42°

352.88° 5951.19'

470.83'

6279'

71.37°

358.15° 5983.09'

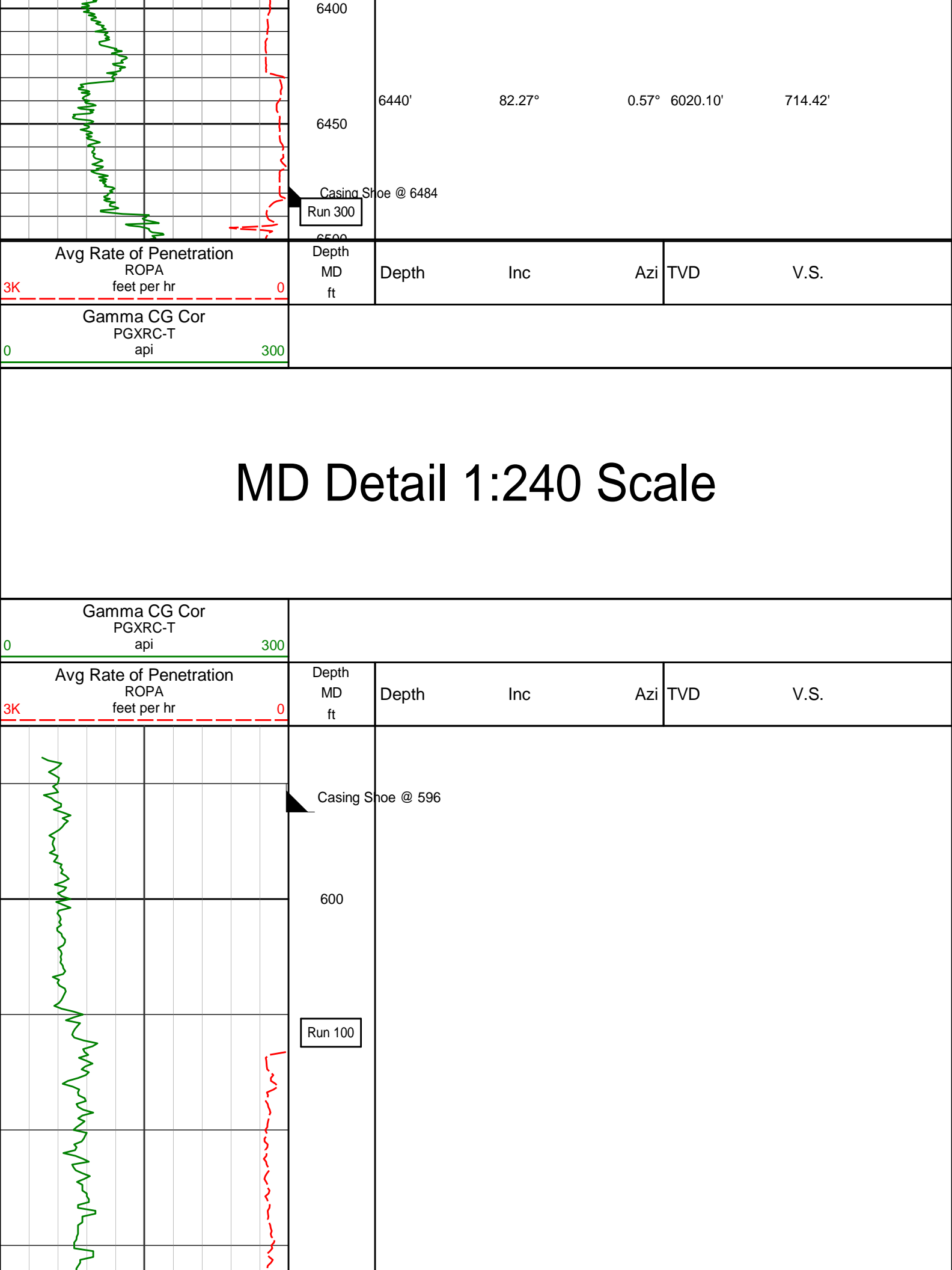
559.94'

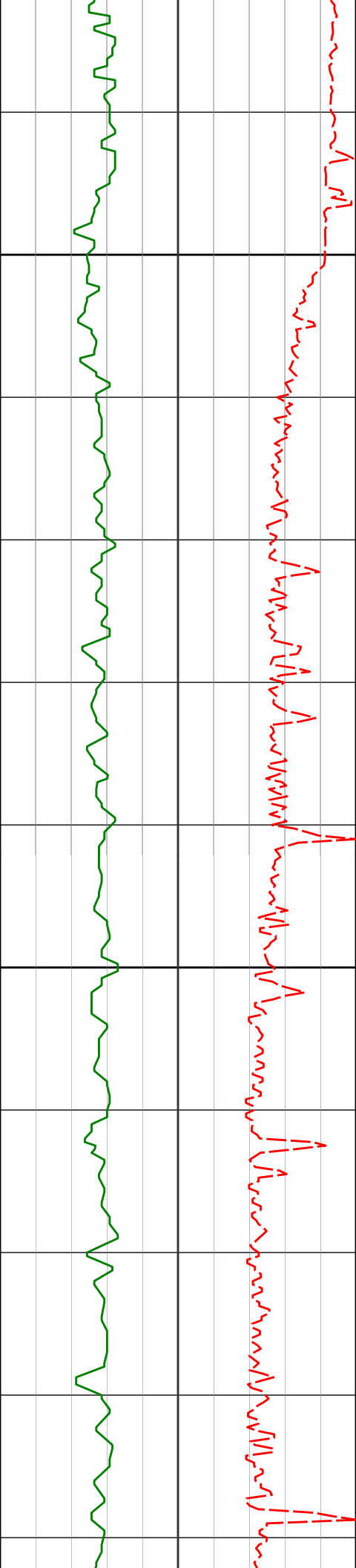
6374'

77.54°

0.01° 6008.54'

650.40'





700

724'

0.30°

268.57° 724.00'

-0.27'

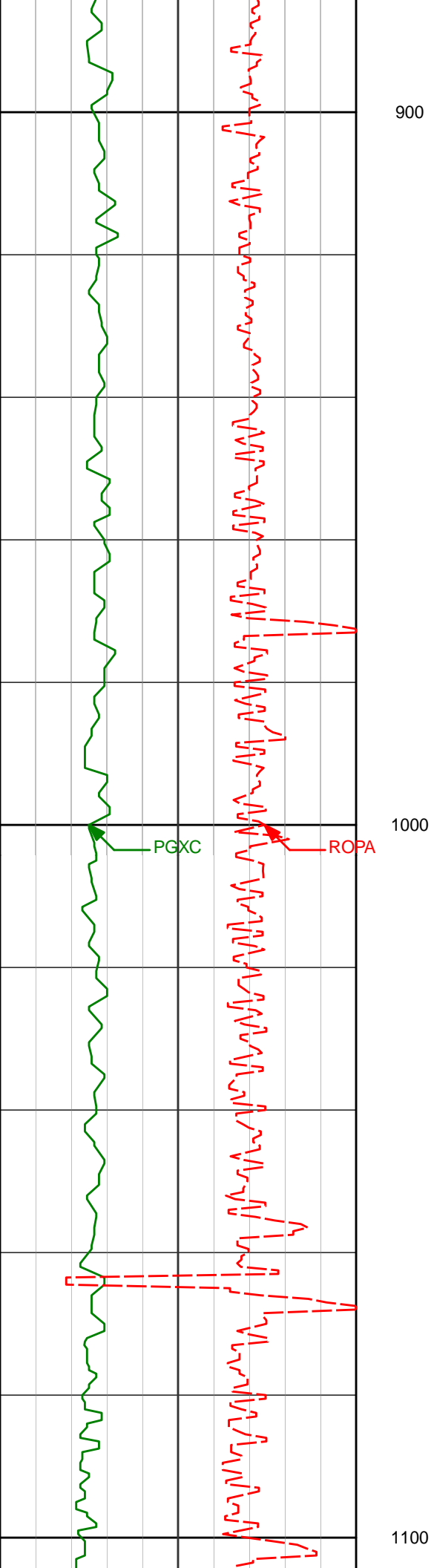
800

818'

0.26°

250.51° 818.00'

-0.27'

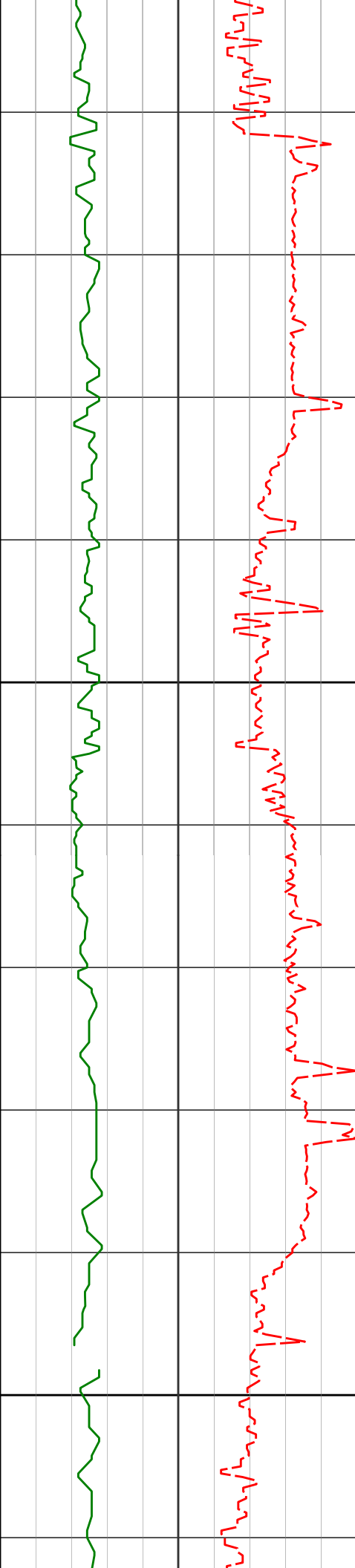


1008'

0.44°

273.38° 1007.99'

-0.18'



1200

1300

1194'

0.56°

265.15° 1193.99'

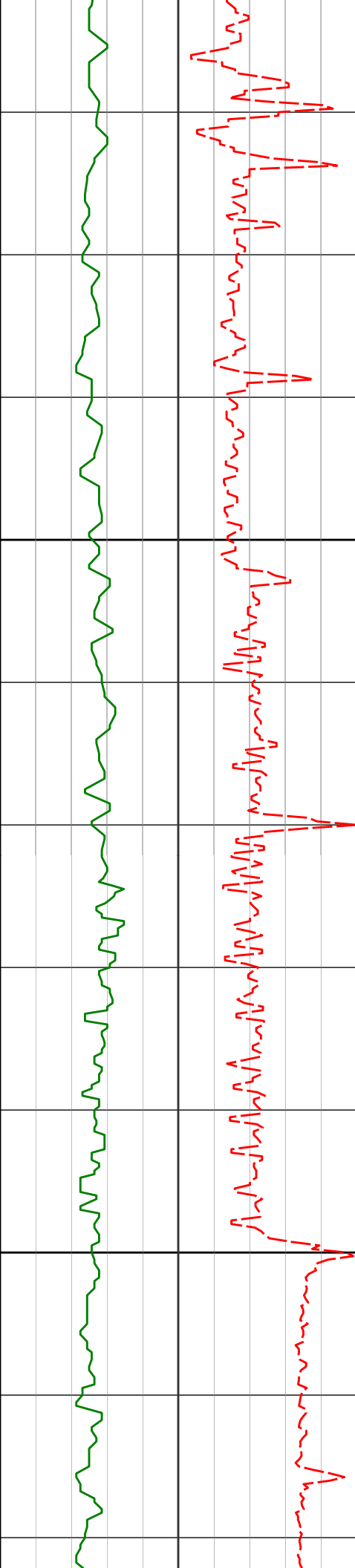
0.05'

1286'

0.42°

267.77° 1285.98'

0.13'



1400

1500

1380'

0.40°

260.01° 1379.98'

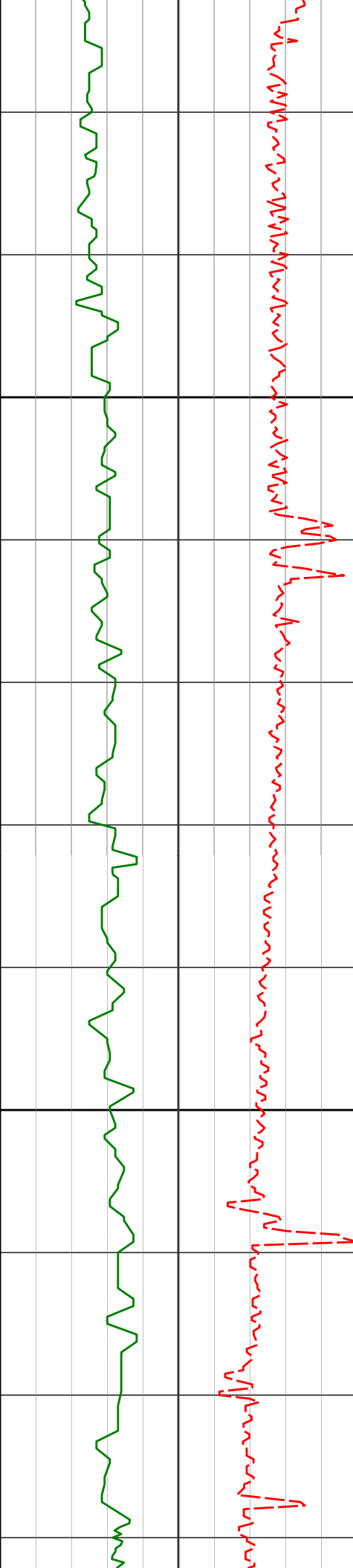
0.17'

1472'

0.37°

258.44° 1471.98'

0.15'



1600

1700

1565'

0.41°

250.41° 1564.98'

0.08'

1657'

0.28°

258.20° 1656.97'

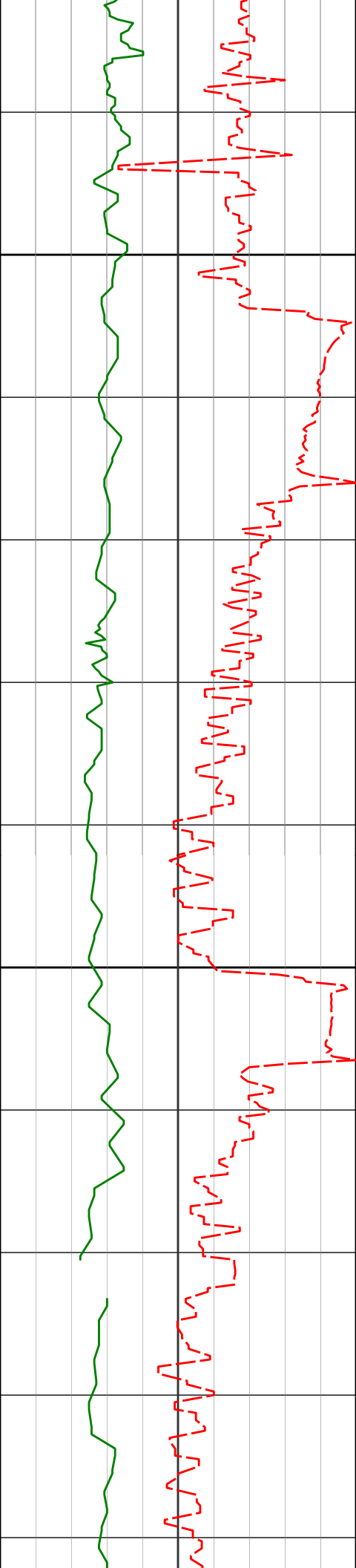
0.02'

1750'

0.17°

275.05° 1749.97'

0.04'



1800

1843'

3.42°

271.78° 1842.92'

0.61'

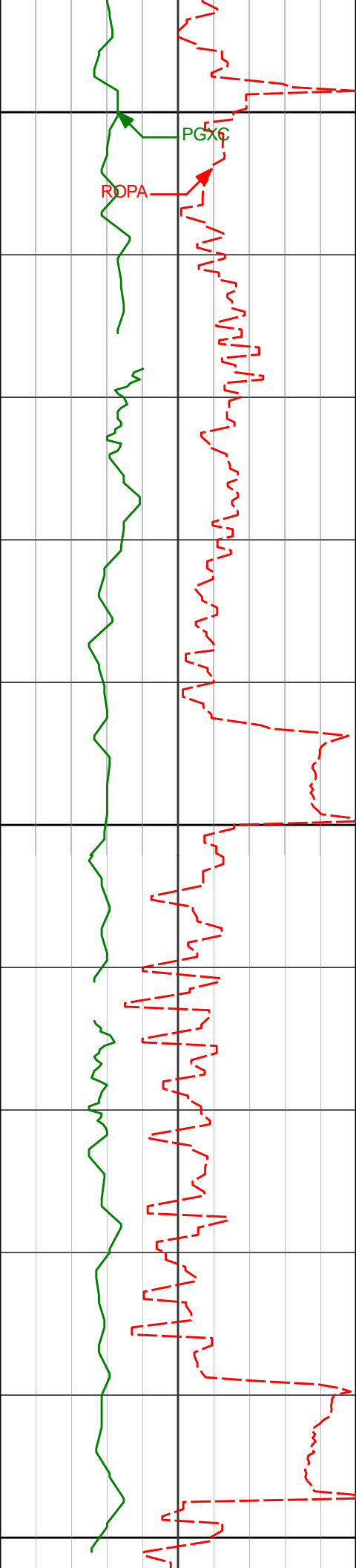
1900

1934'

4.81°

266.11° 1933.68'

1.51'



2000

2027'

4.81°

257.47° 2026.35'

1.68'

2100

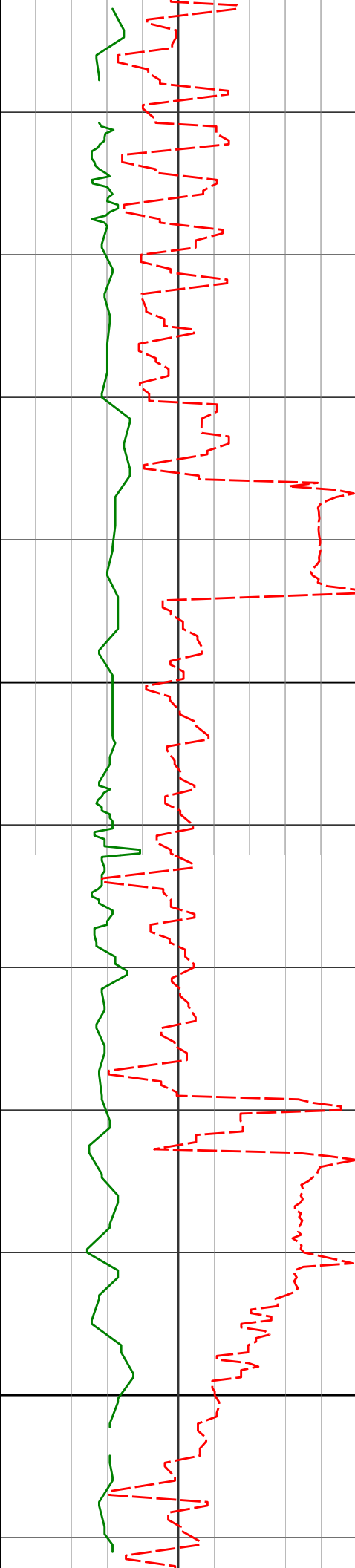
2120'

5.01°

283.84° 2119.02'

3.08'

2200



2300

2400

2212'

7.46°

283.49° 2210.47'

7.00'

2305'

8.78°

275.73° 2302.54'

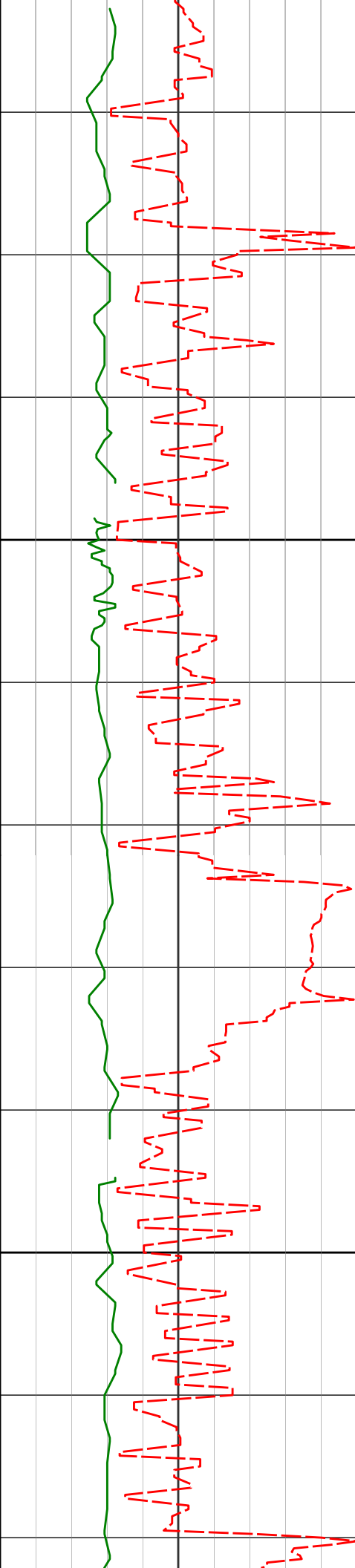
11.22'

2397'

9.79°

264.14° 2393.34'

13.55'



2500

2490'

9.49°

261.60° 2485.03'

14.19'

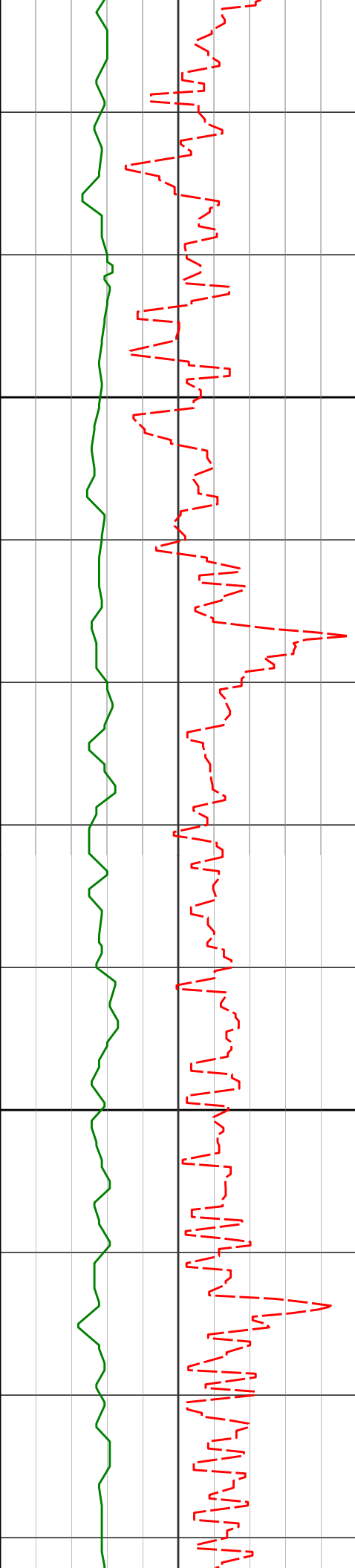
2600

2583'

10.81°

271.90° 2576.58'

16.05'



2700

2800

2676'

11.21°

271.19° 2667.87'

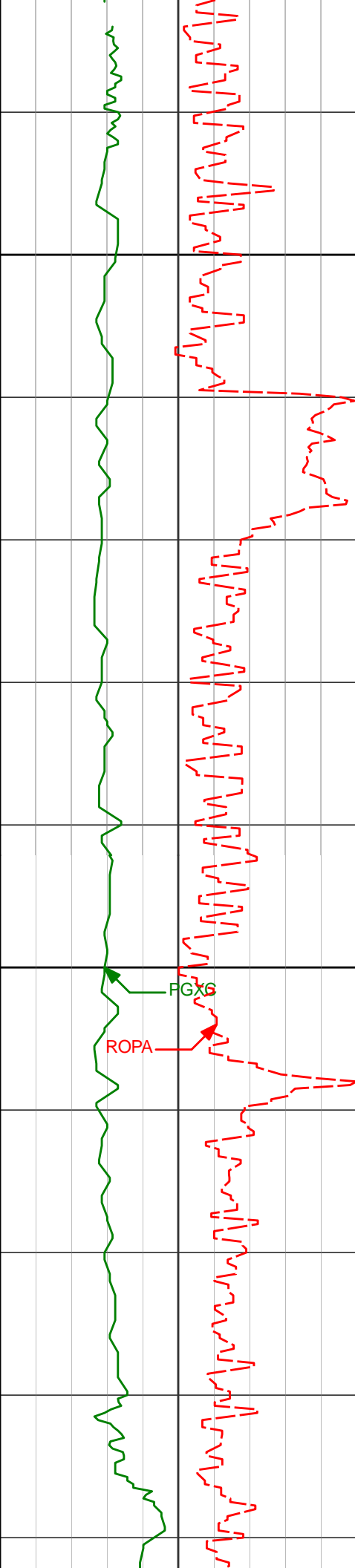
19.43'

2766'

11.11°

270.11° 2756.17'

22.49'



2900

2956'

11.68°

272.46° 2942.42'

29.51'

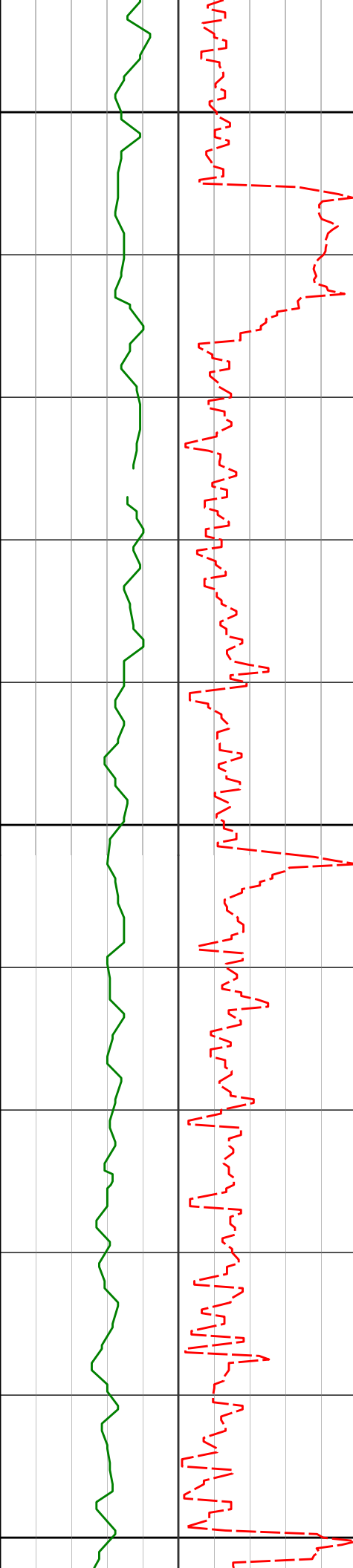
3000

3051'

10.62°

268.69° 3035.63'

32.74'



3100

3146'

9.98°

268.74° 3129.10'

35.15'

3200

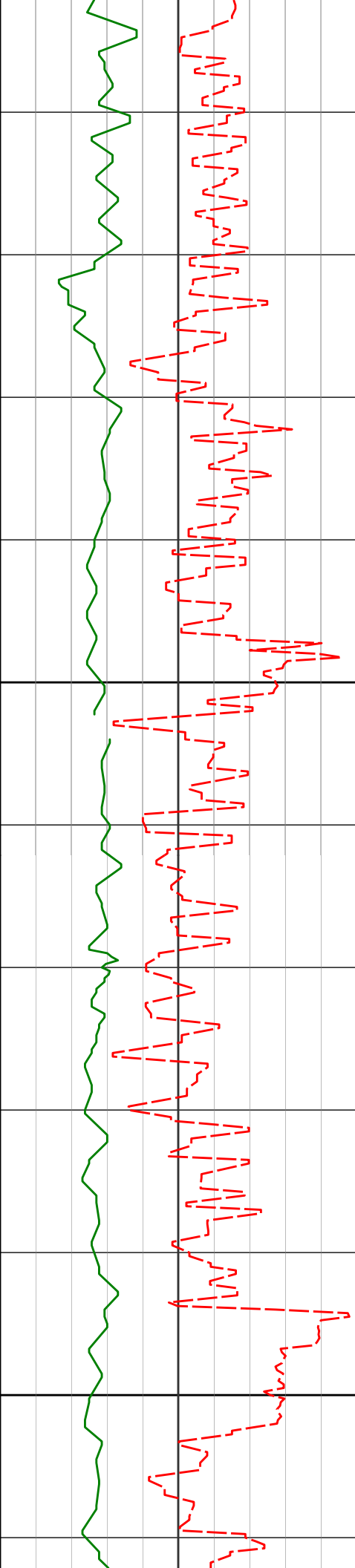
3241'

9.71°

268.26° 3222.70'

37.40'

3300



3400

3500

3336'

10.20°

268.17° 3316.27'

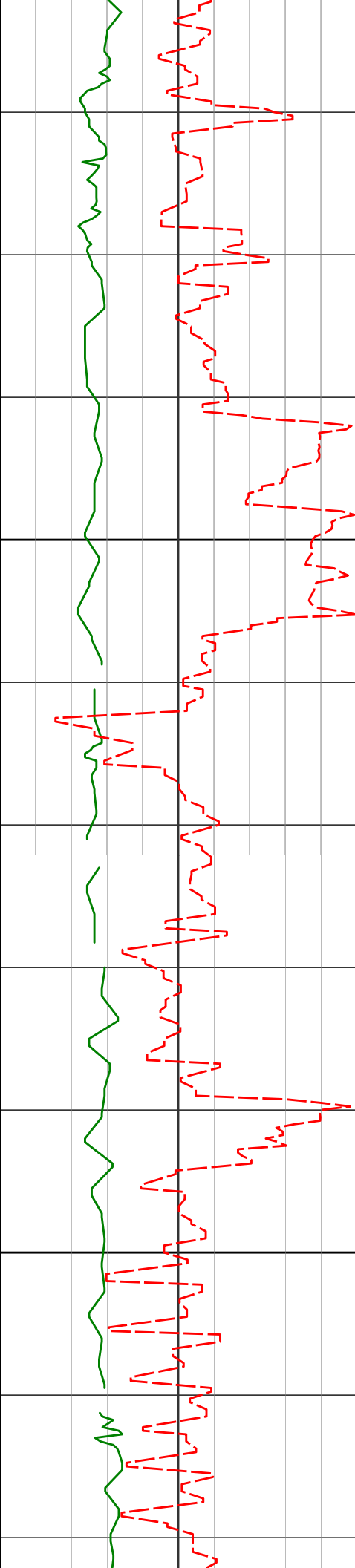
39.60'

3431'

10.76°

268.59° 3409.68'

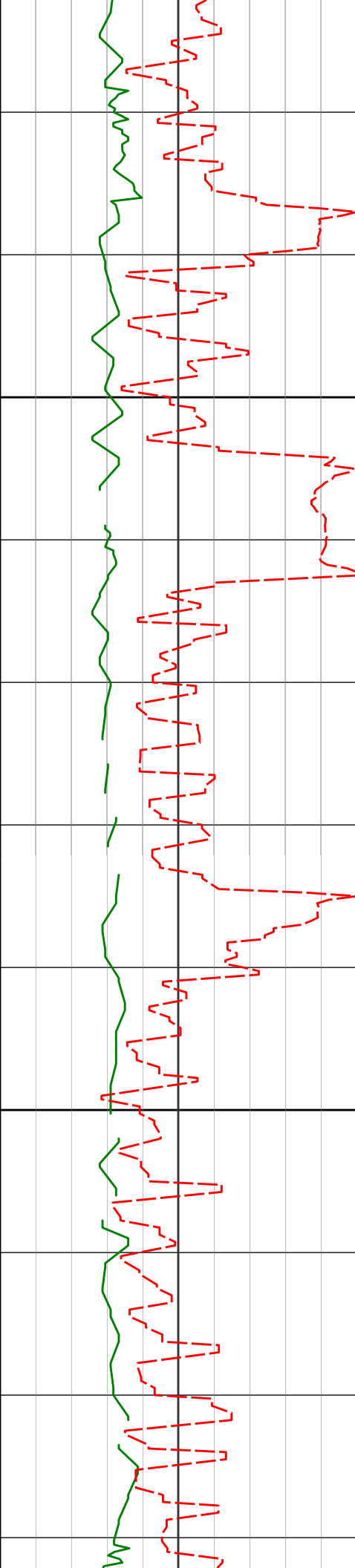
41.95'



3600

3700

3526'	10.84°	269.56°	3503.00'	44.60'
3621'	10.85°	271.15°	3596.30'	47.65'
3716'	10.80°	270.62°	3689.61'	50.85'



3800

3811'

10.76°

270.39° 3782.94'

53.92'

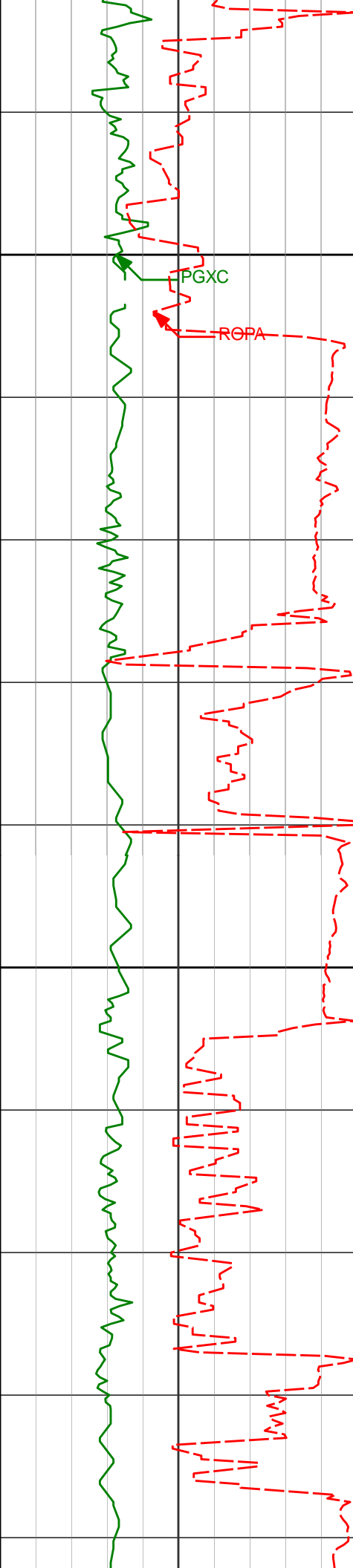
3900

3906'

9.97°

269.11° 3876.38'

56.67'



4000

4001'

7.58°

268.86° 3970.26'

58.80'

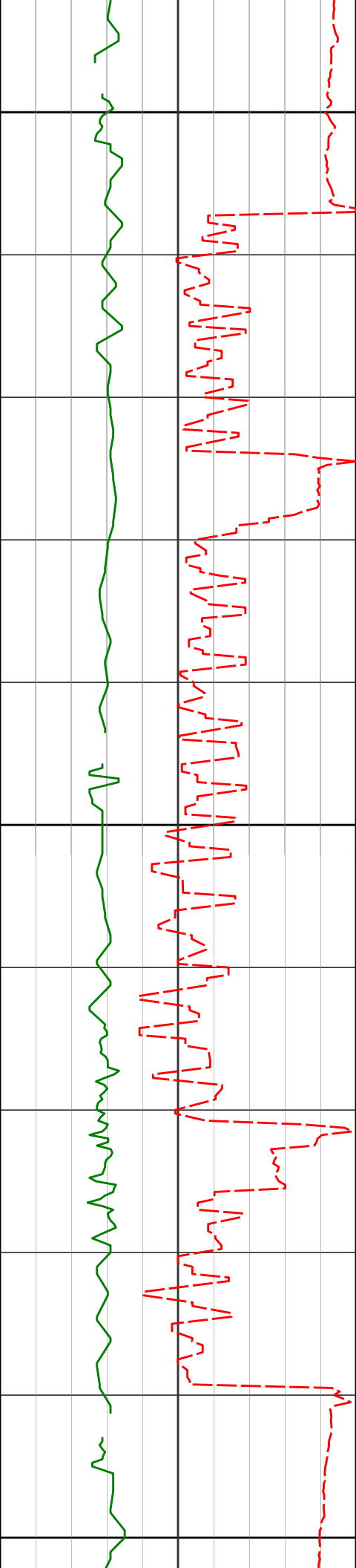
4100

4096'

4.05°

285.28° 4064.77'

61.11'



4190'

4.81°

285.97° 4158.48'

64.19'

4200

4285'

5.94°

280.88° 4253.07'

67.61'

4300

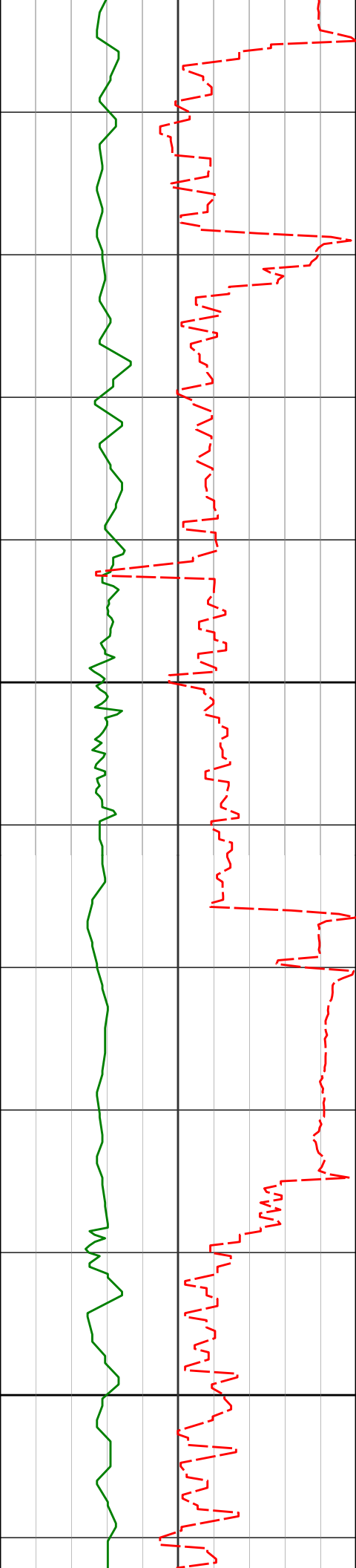
4380'

6.33°

280.99° 4347.52'

71.15'

4400



4500

4600

4475'

7.69°

274.62° 4441.81'

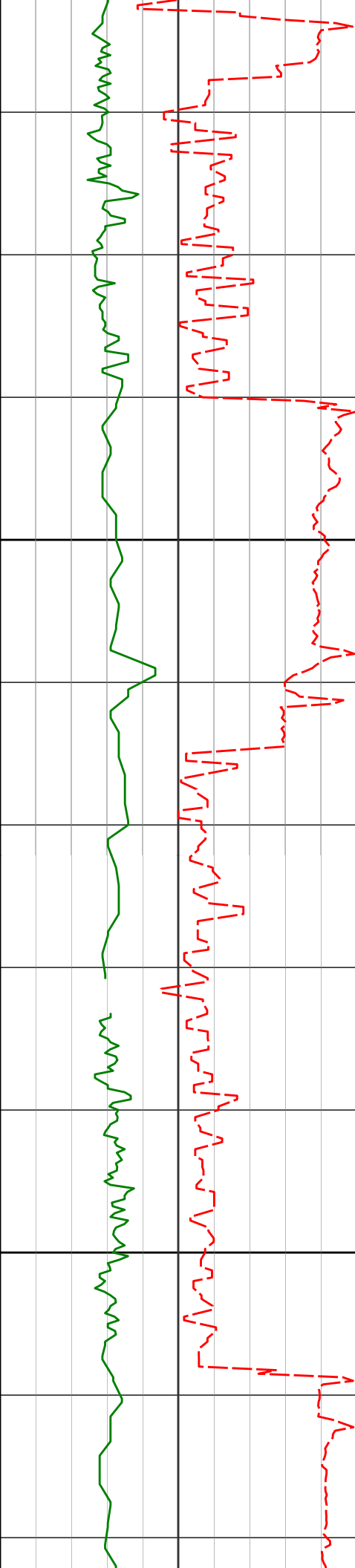
74.53'

4570'

8.90°

273.58° 4535.81'

77.73'



4700

4800

4665'

7.23°

278.48° 4629.87'

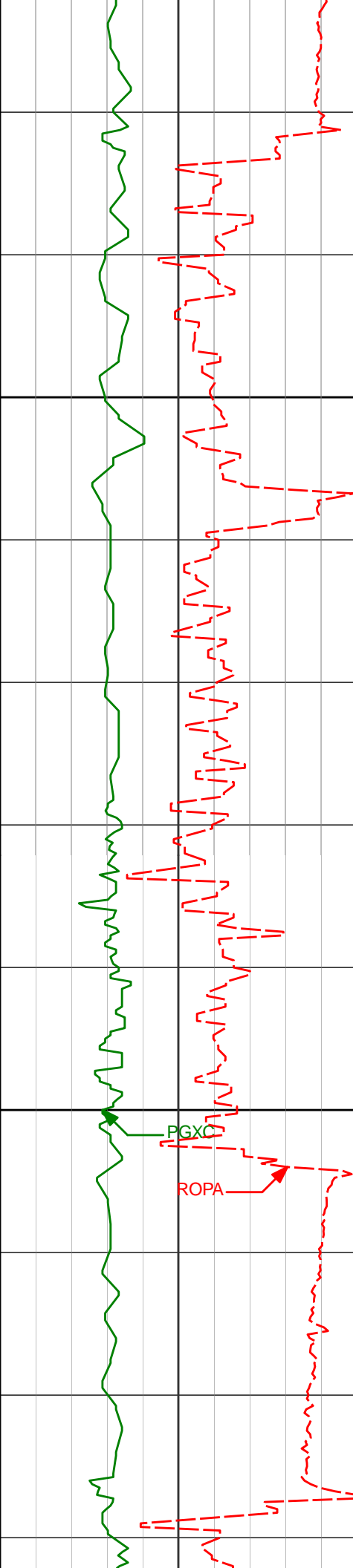
81.23'

4760'

8.50°

286.65° 4723.98'

86.16'



4900

5000

4855'

9.60°

274.97° 4817.80'

91.23'

4950'

7.44°

275.07° 4911.75'

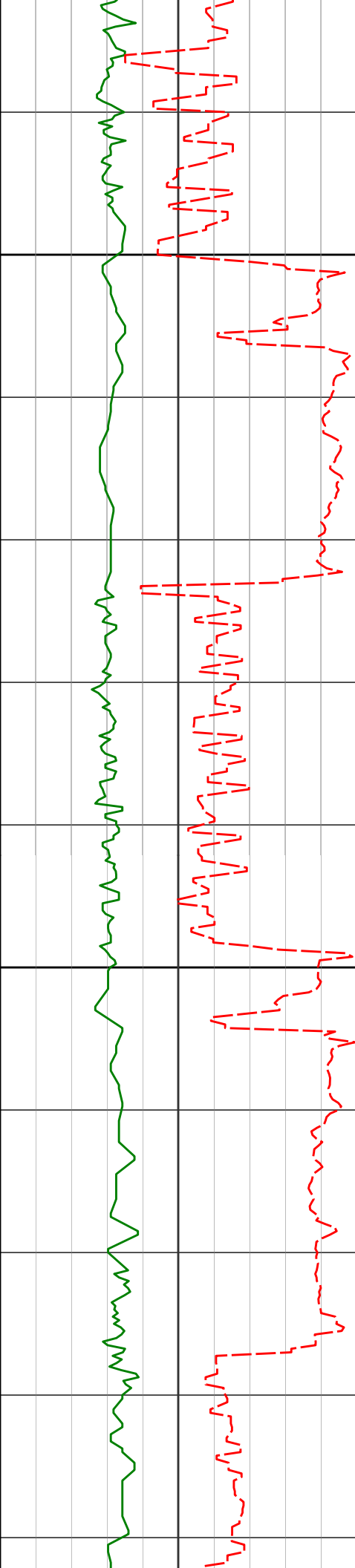
94.74'

5045'

9.09°

290.08° 5005.77'

99.99'



5100

5140'

9.69°

276.33° 5099.51'

105.87'

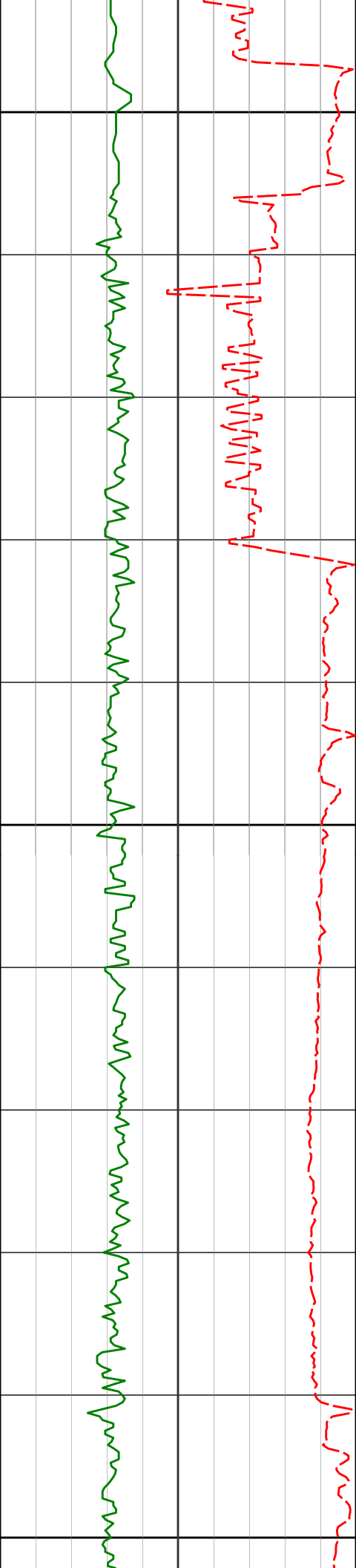
5200

5235'

9.78°

267.67° 5193.15'

109.04'



5300

5330'

10.28°

268.28° 5286.69'

111.19'

5400

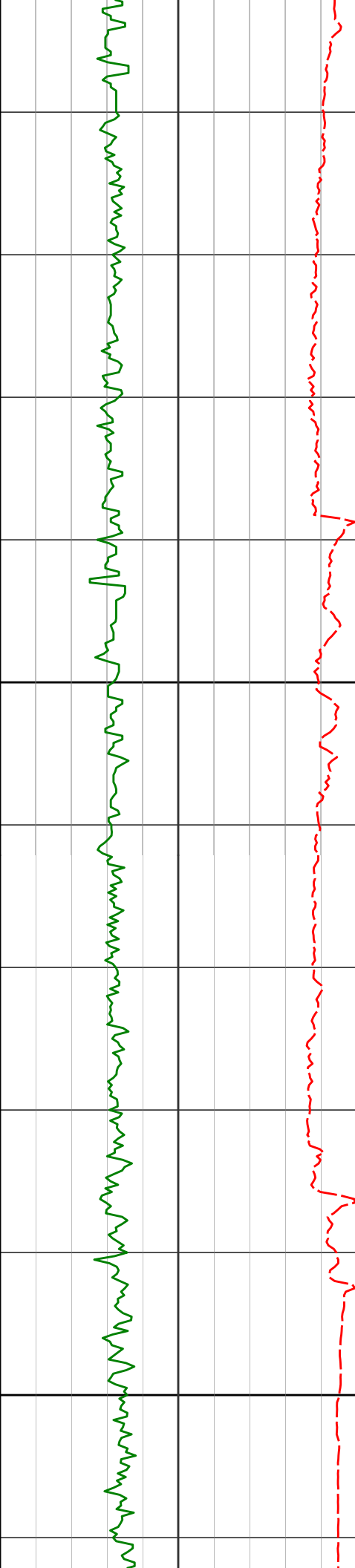
5425'

11.67°

269.07° 5379.95'

113.75'

5500

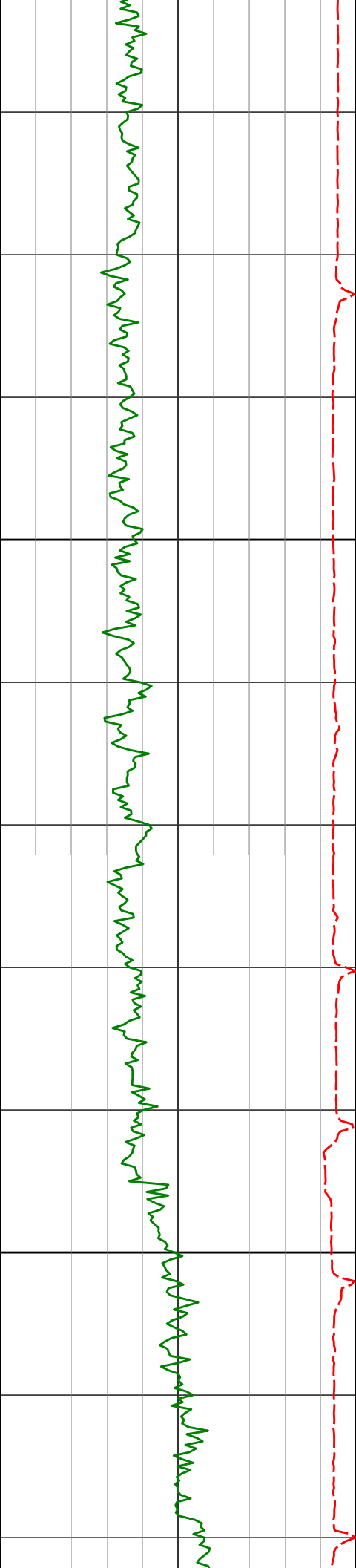


Run 200

5600

5700

5519'	15.49°	275.66°	5471.32'	118.44'
5614'	17.99°	281.73°	5562.29'	127.05'
5710'	20.79°	300.09°	5652.92'	143.28'



5800

5805'

35.12°

317.59° 5736.75'

177.17'

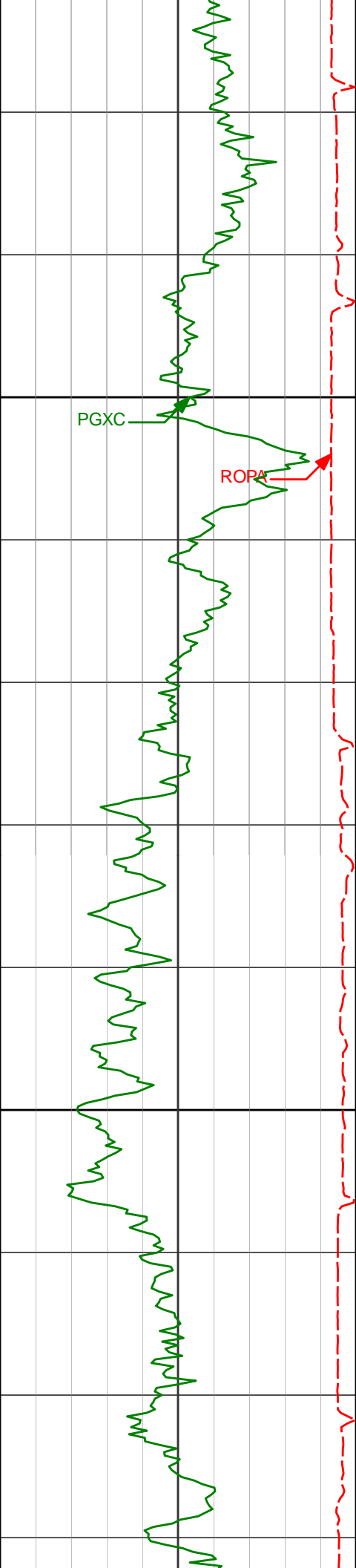
5900

5899'

49.02°

326.18° 5806.42'

232.50'



6000

6100

5994'

57.00°

337.13° 5863.64'

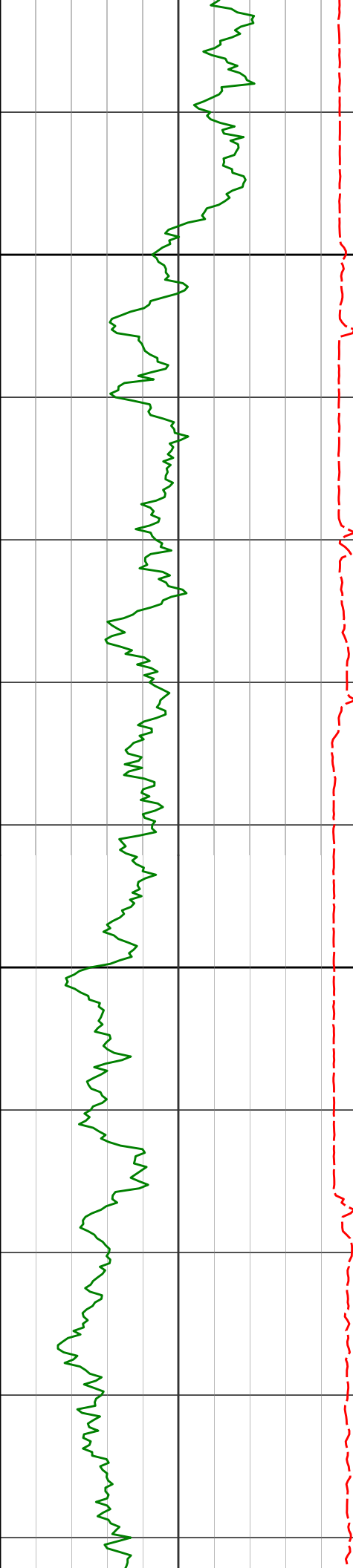
304.18'

6089'

61.87°

343.08° 5911.97'

384.56'



6200

6300

6400

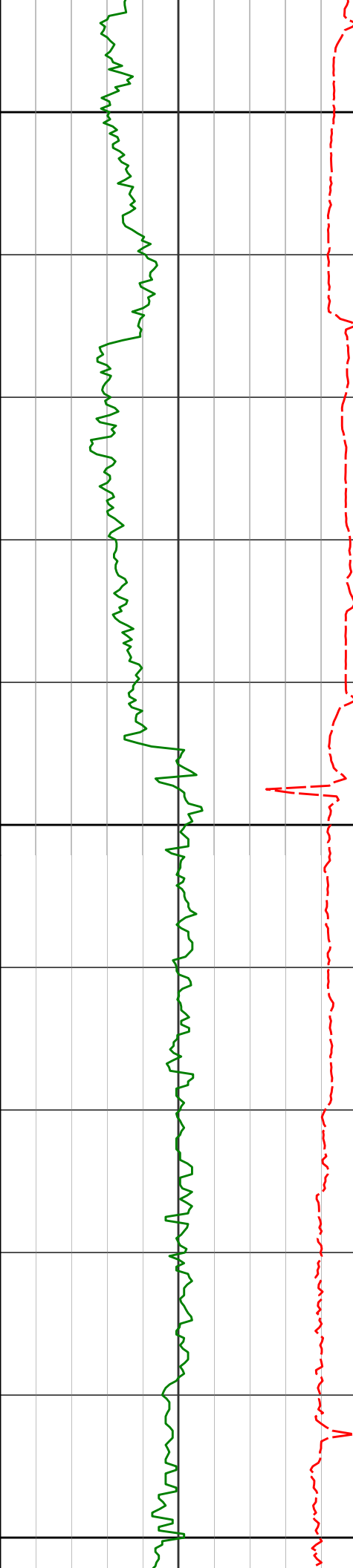
6184' 6279' 6374'

69.42° 71.37° 77.54°

352.88° 358.15° 0.01°

5951.19' 5983.09' 6008.54'

470.83' 559.94' 650.40'



6400

6440'

82.27°

0.57° 6020.10'

714.42'

Casing Shoe @ 6484

Run 300
6500

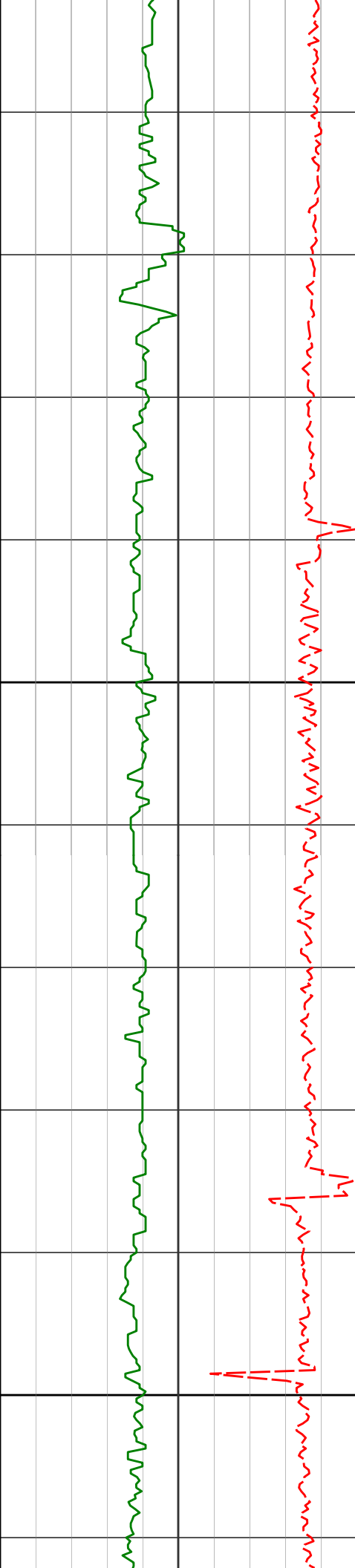
6517'

87.53°

0.03° 6026.94'

789.98'

6600



6700

6800

6609'

87.81°

359.94° 6030.67'

880.66'

6702'

88.12°

359.76° 6033.97'

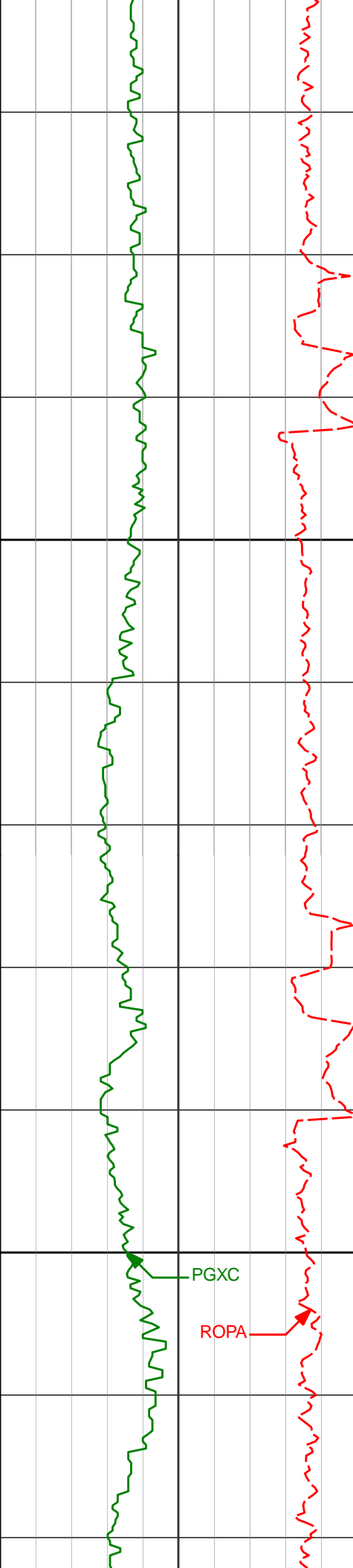
972.38'

6794'

87.72°

359.70° 6037.31'

1063.13'



6900

7000

PGXC

ROPA

6887'

88.55°

0.53° 6040.34'

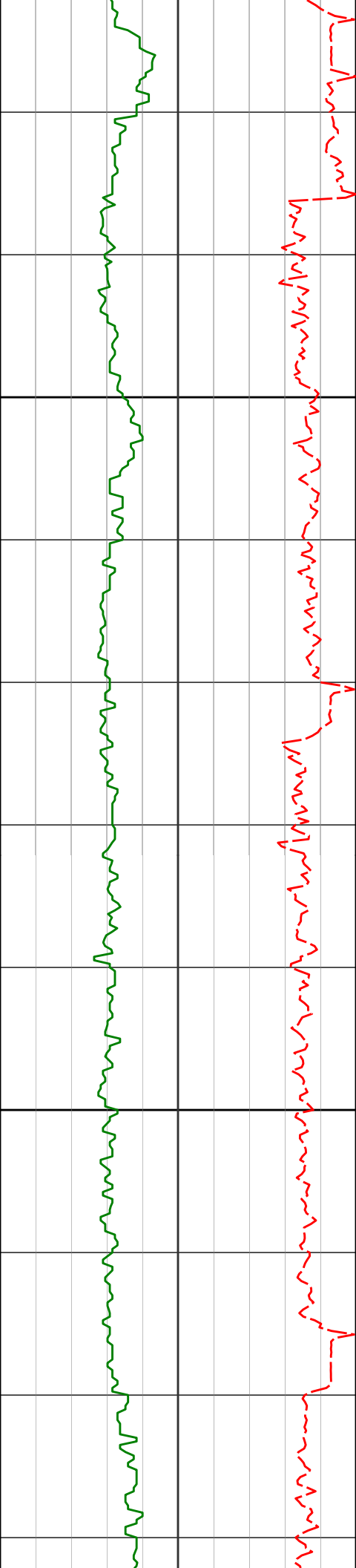
1154.79'

6980'

89.11°

359.72° 6042.24'

1246.47'



7071'

91.45°

0.70° 6041.80'

1336.17'

7100

7164'

91.17°

1.31° 6039.67'

1427.59'

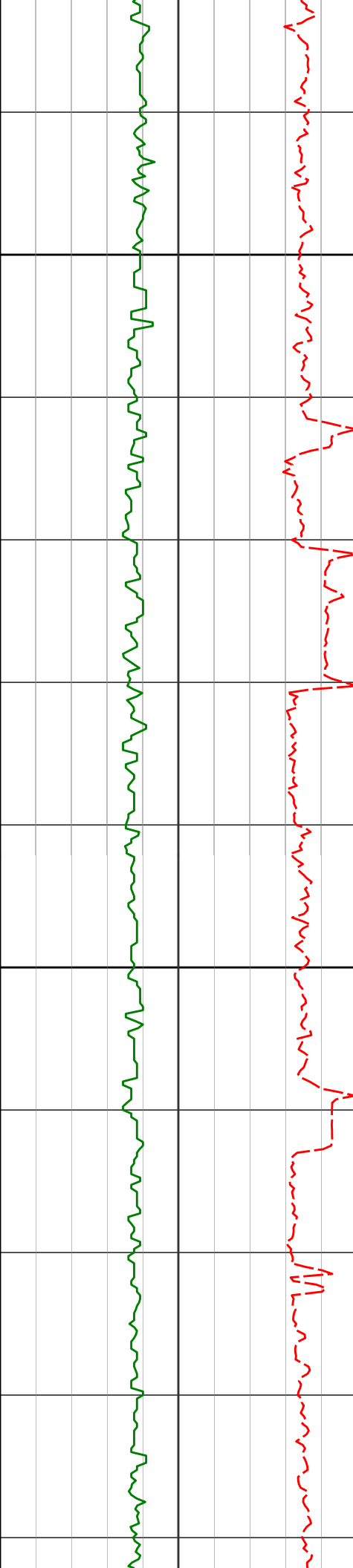
7200

7257'

91.73°

1.38° 6037.32'

1518.92'



7300

7349'

90.92°

0.80° 6035.20'

1609.34'

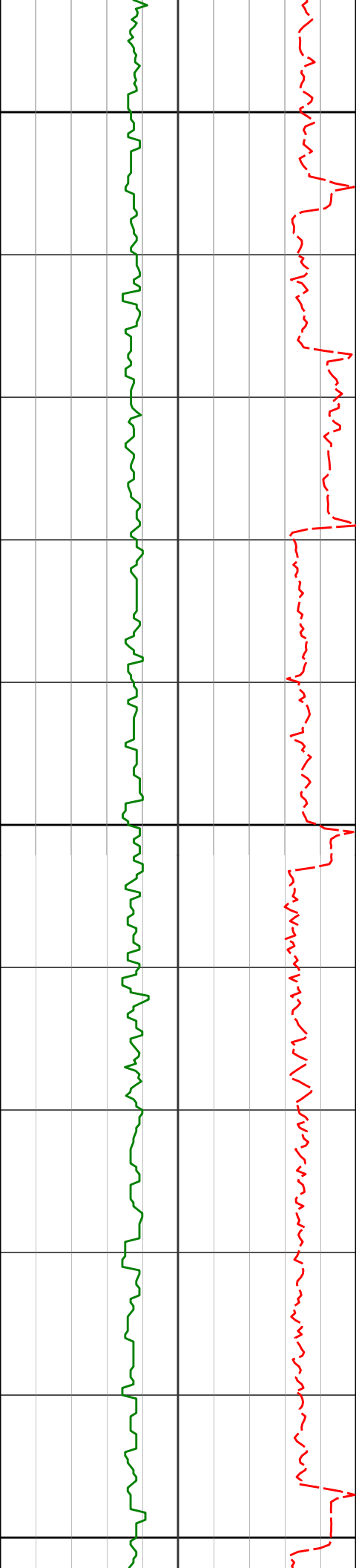
7400

7442'

90.46°

1.07° 6034.08'

1700.80'



7500

7535'

89.69°

0.38° 6033.95'

1792.34'

7600

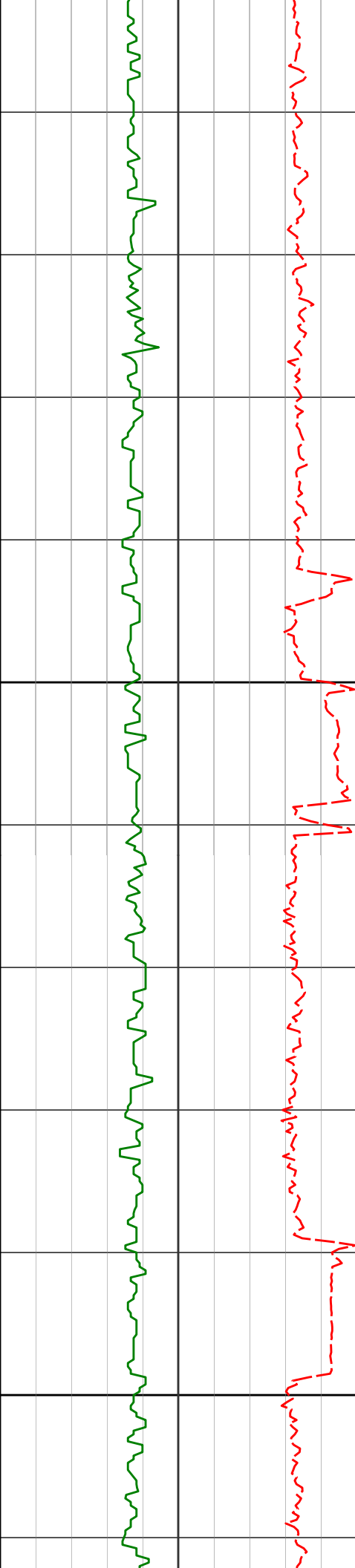
7627'

89.57°

358.40° 6034.55'

1883.23'

7700



7800

7900

7720'

90.00°

359.06° 6034.90'

1975.28'

7813'

90.59°

357.62° 6034.42'

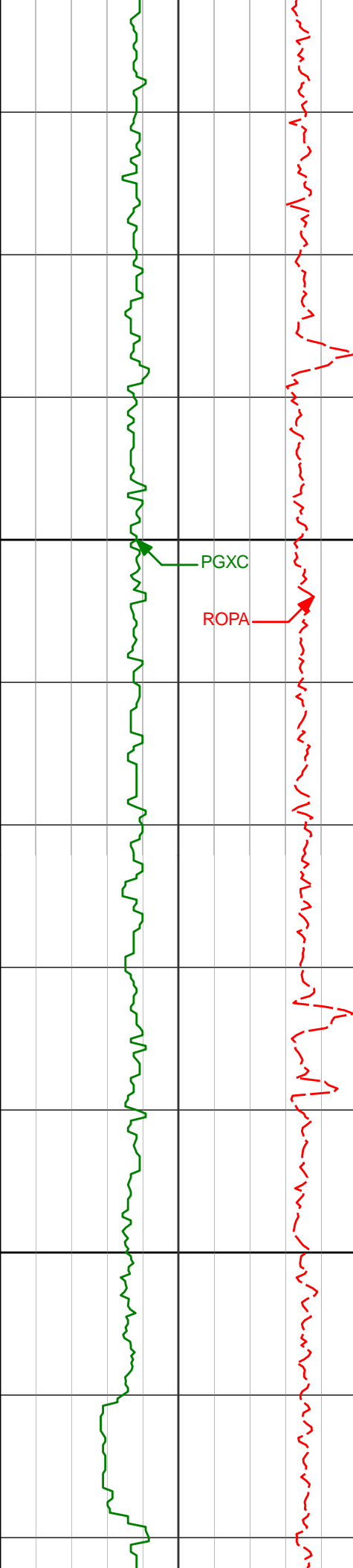
2067.42'

7903'

89.60°

356.02° 6034.28'

2156.87'



8000

7998'

89.94°

357.07° 6034.66'

2251.35'

PGXC

ROPA

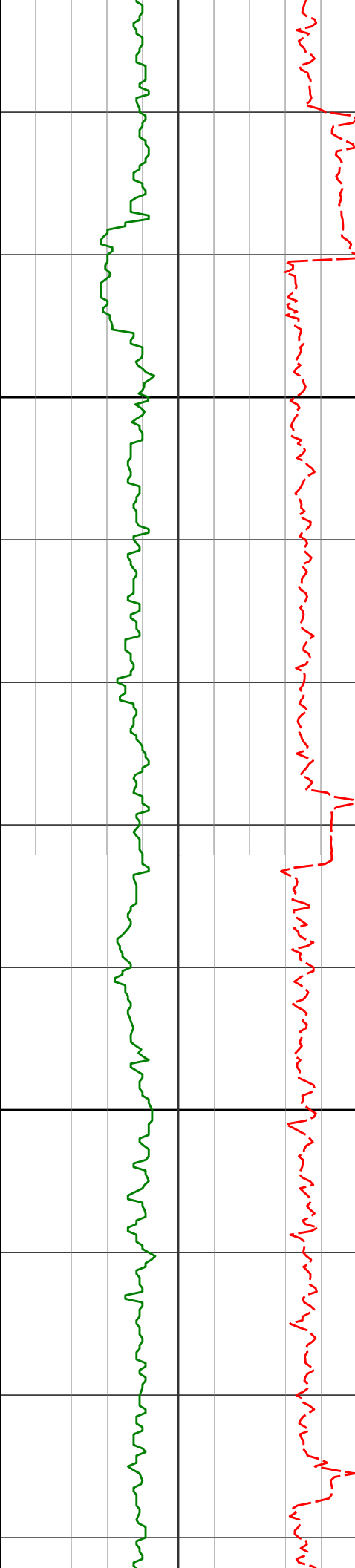
8100

8093'

89.48°

355.36° 6035.15'

2345.88'



8200

8188'

92.19°

356.99° 6033.77'

2440.40'

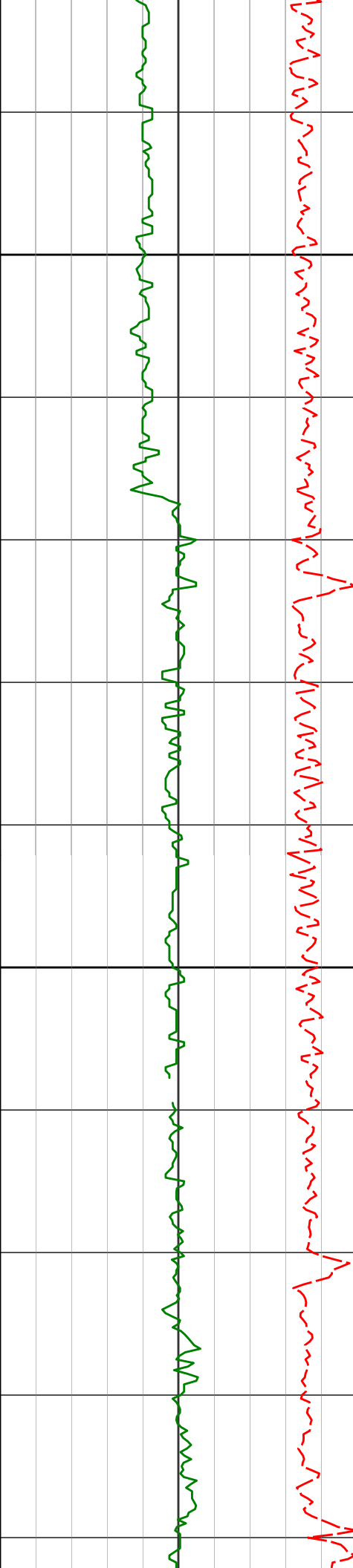
8300

8283'

91.94°

356.57° 6030.34'

2534.77'



8400

8500

8379'

91.29°

356.58° 6027.63'

2630.20'

8473'

89.91°

356.72° 6026.65'

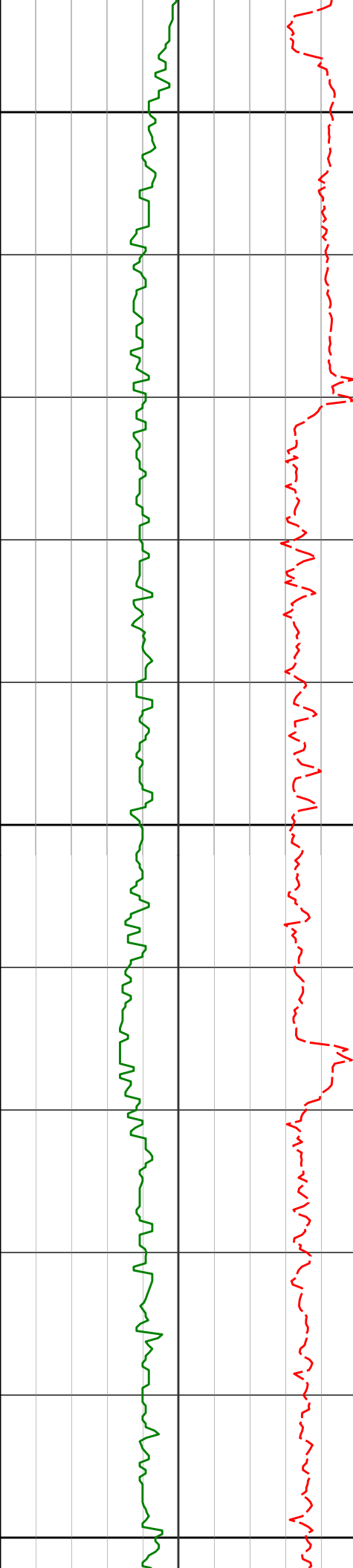
2723.66'

8569'

89.69°

356.18° 6026.98'

2819.15'



8600

8700

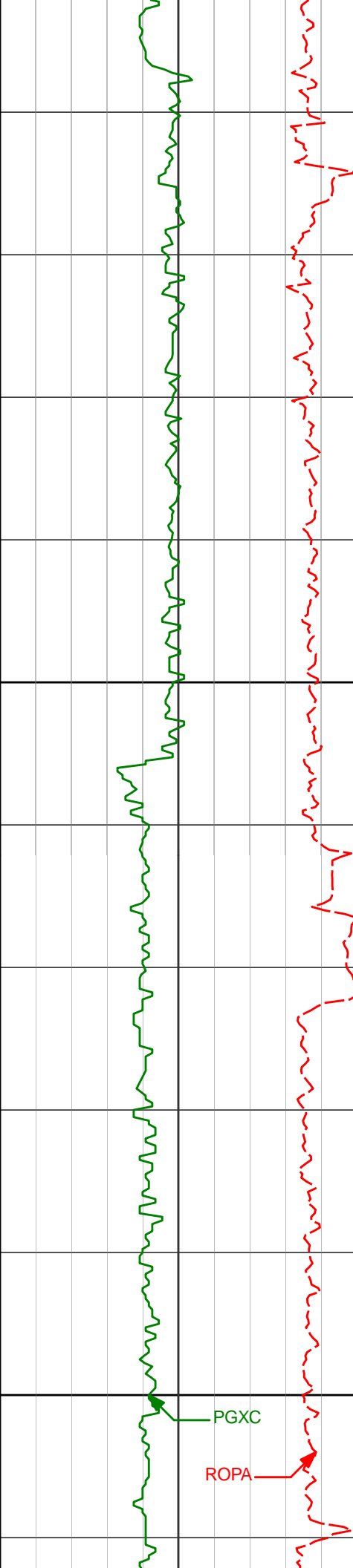
8800

8759'

90.09°

356.47° 6027.34'

3008.18'



8900

9000

8854'

89.54°

356.52° 6027.65'

3102.67'

8948'

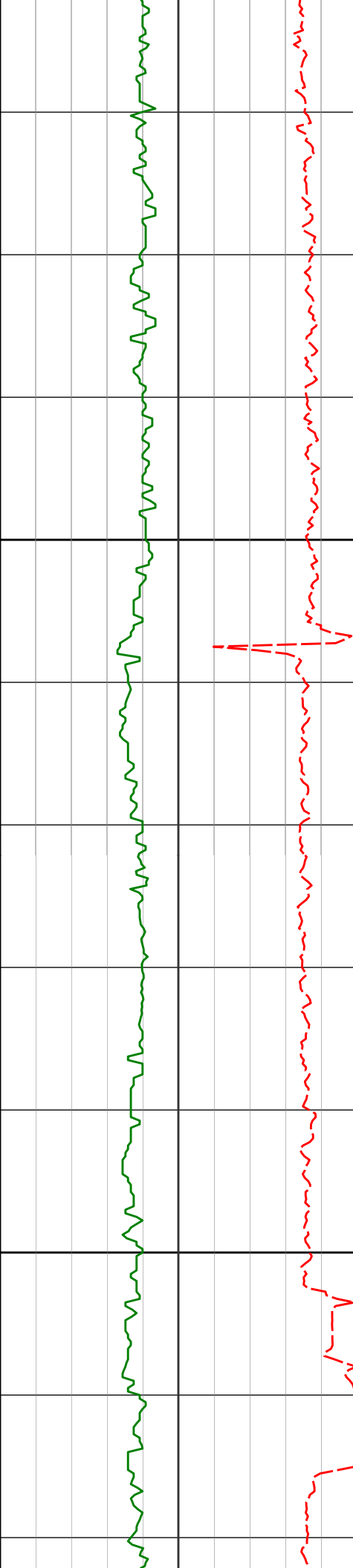
90.12°

357.52° 6027.92'

3196.06'

PGXC

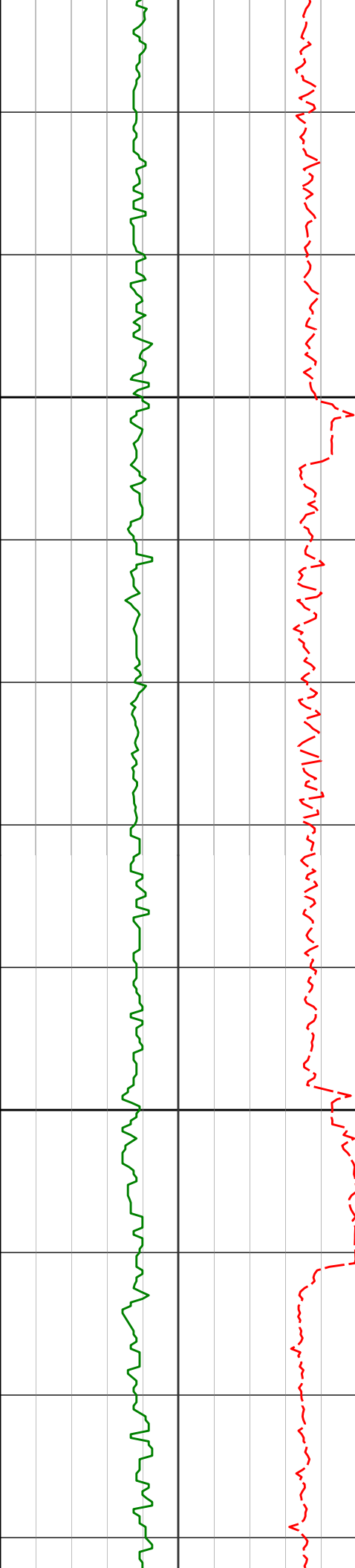
ROPA



9100

9200

9043'	89.11°	356.97°	6028.56'	3290.41'
9138'	88.55°	357.22°	6030.50'	3384.77'
9233'	89.23°	357.75°	6032.34'	3479.06'



9300

9327'

89.82°

358.07° 6033.13'

3572.28'

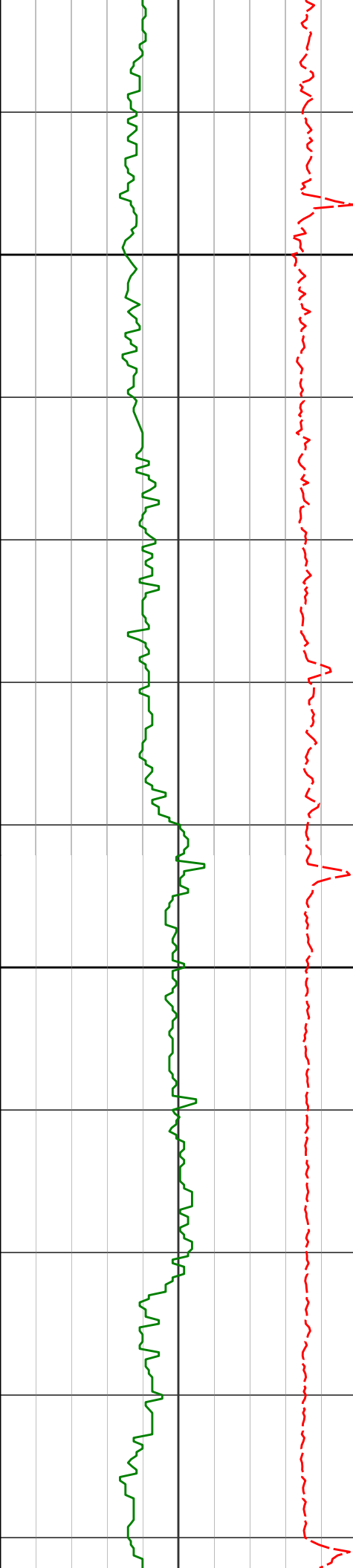
9400

9422'

90.49°

358.88° 6032.87'

3666.37'



9500

9517'

90.46°

359.08° 6032.08'

3760.33'

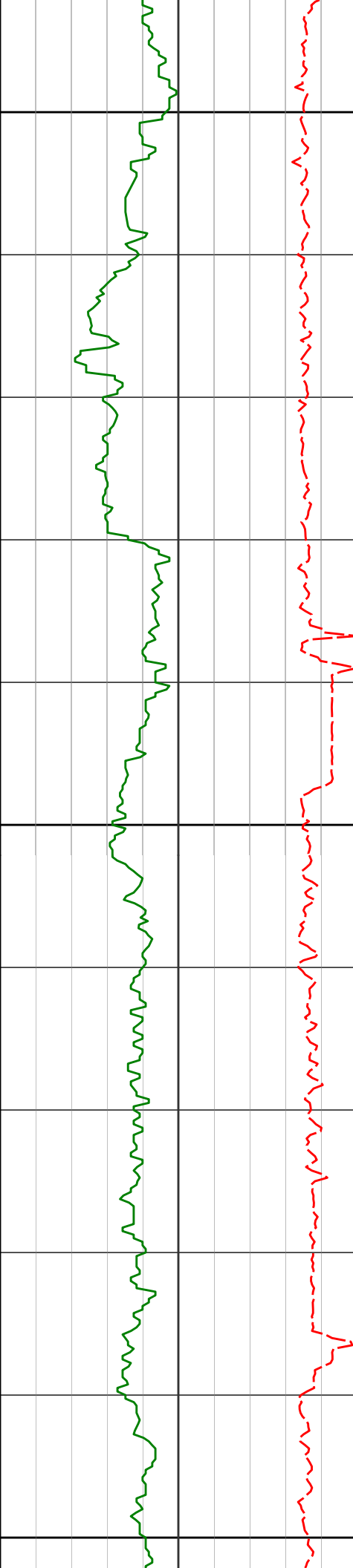
9600

9613'

90.74°

358.88° 6031.07'

3855.29'



9700

9708'

91.48°

359.43° 6029.23'

3949.20'

9800

9803'

92.34°

358.97° 6026.07'

4043.06'

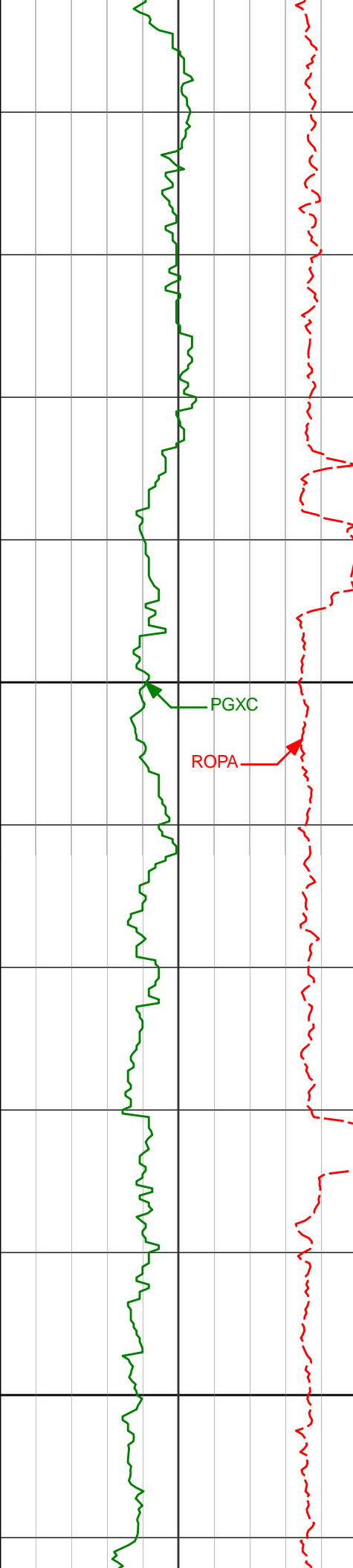
9900

9897'

92.53°

358.88° 6022.08'

4135.97'

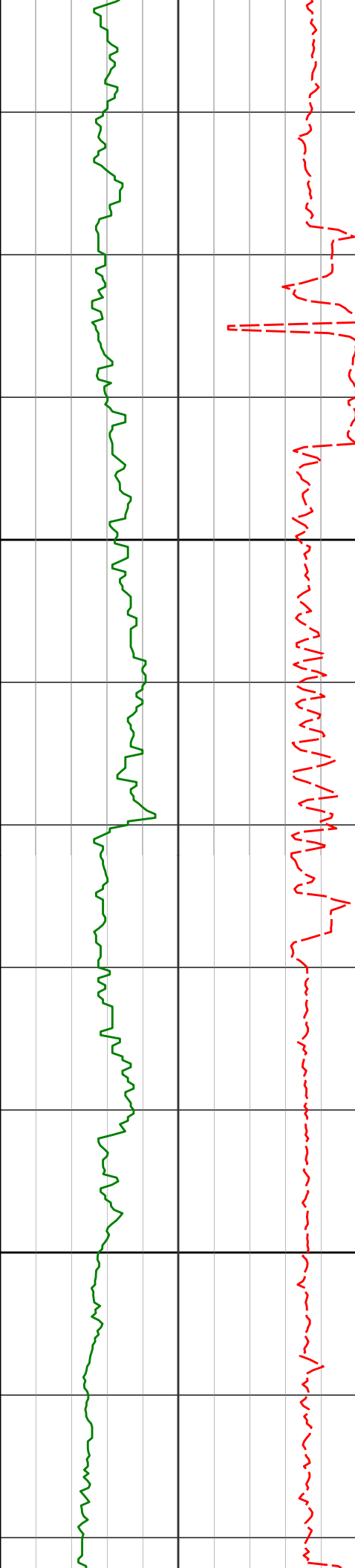


10000

10100

9992' 92.40° 358.39° 6017.99' 4229.94'

10087' 92.50° 358.87° 6013.93' 4323.91'



10200

10300

10182'

91.36°

358.71° 6010.73'

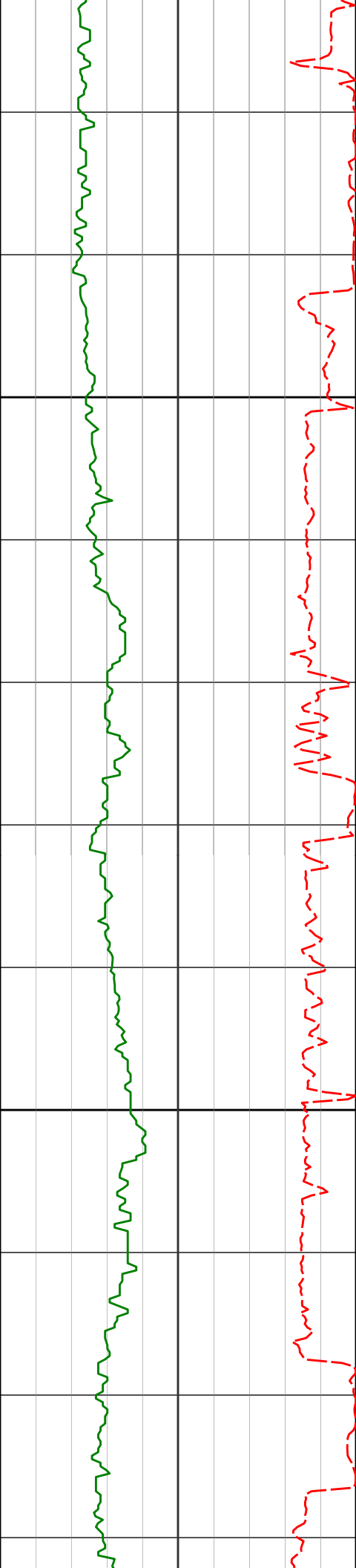
4417.87'

10277'

91.69°

358.58° 6008.21'

4511.89'



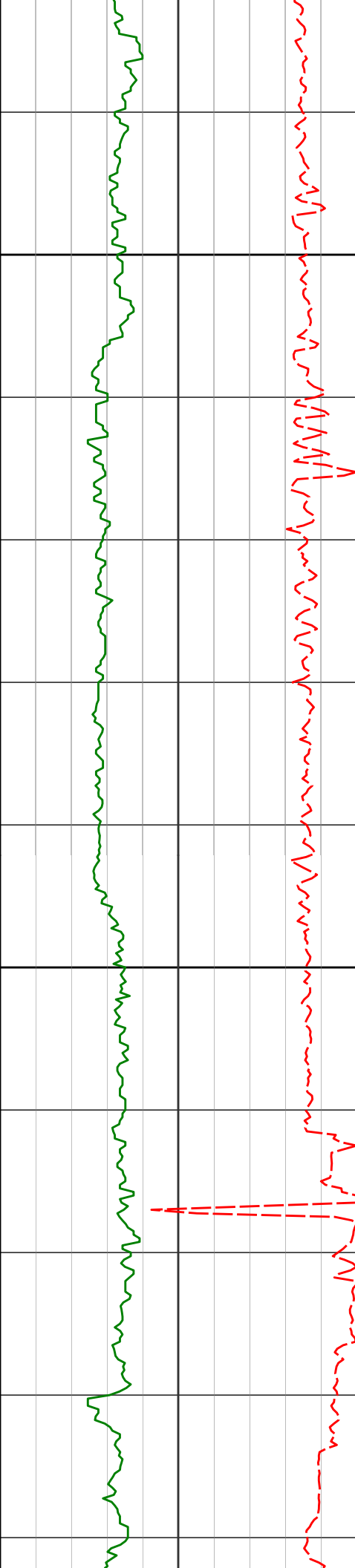
10400

10500

10372' 91.14° 358.75° 6005.86' 4605.91'

10467' 90.65° 358.80° 6004.37' 4699.92'

10562' 89.51° 359.55° 6004.25' 4793.84'



10600

10657'

90.37°

0.27° 6004.35'

4887.57'

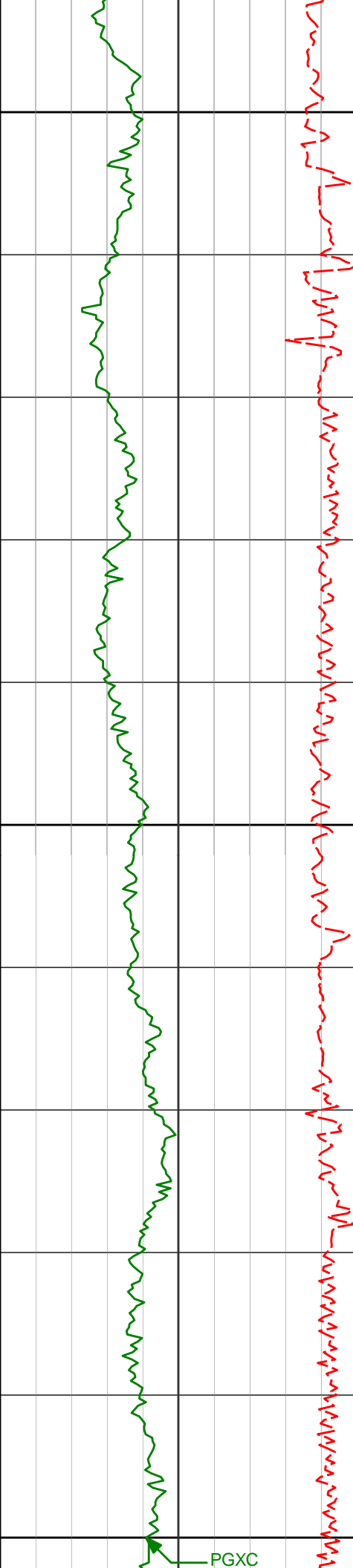
10700

10752'

88.27°

0.28° 6005.47'

4981.19'



10800

10847'

88.15°

0.51° 6008.44'

5074.74'

10900

10942'

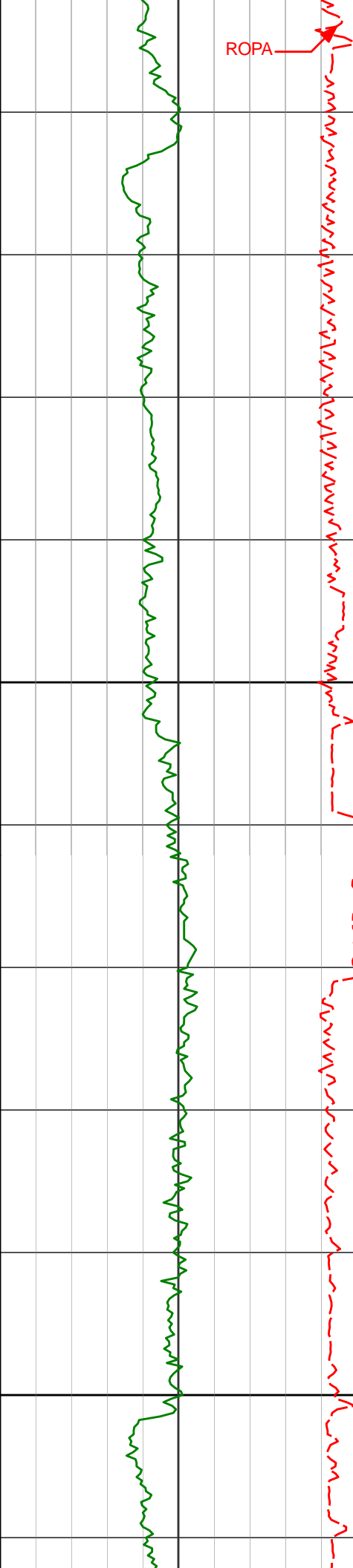
88.21°

0.58° 6011.45'

5168.25'

11000

PGXC



ROPA

11038'

88.33°

0.94° 6014.34'

5262.69'

11100

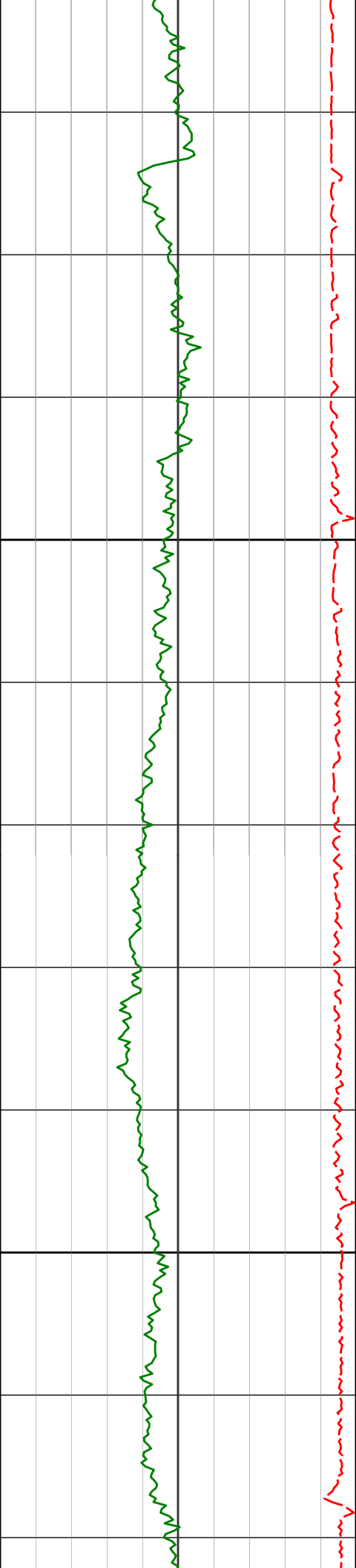
11133'

89.57°

359.18° 6016.08'

5356.36'

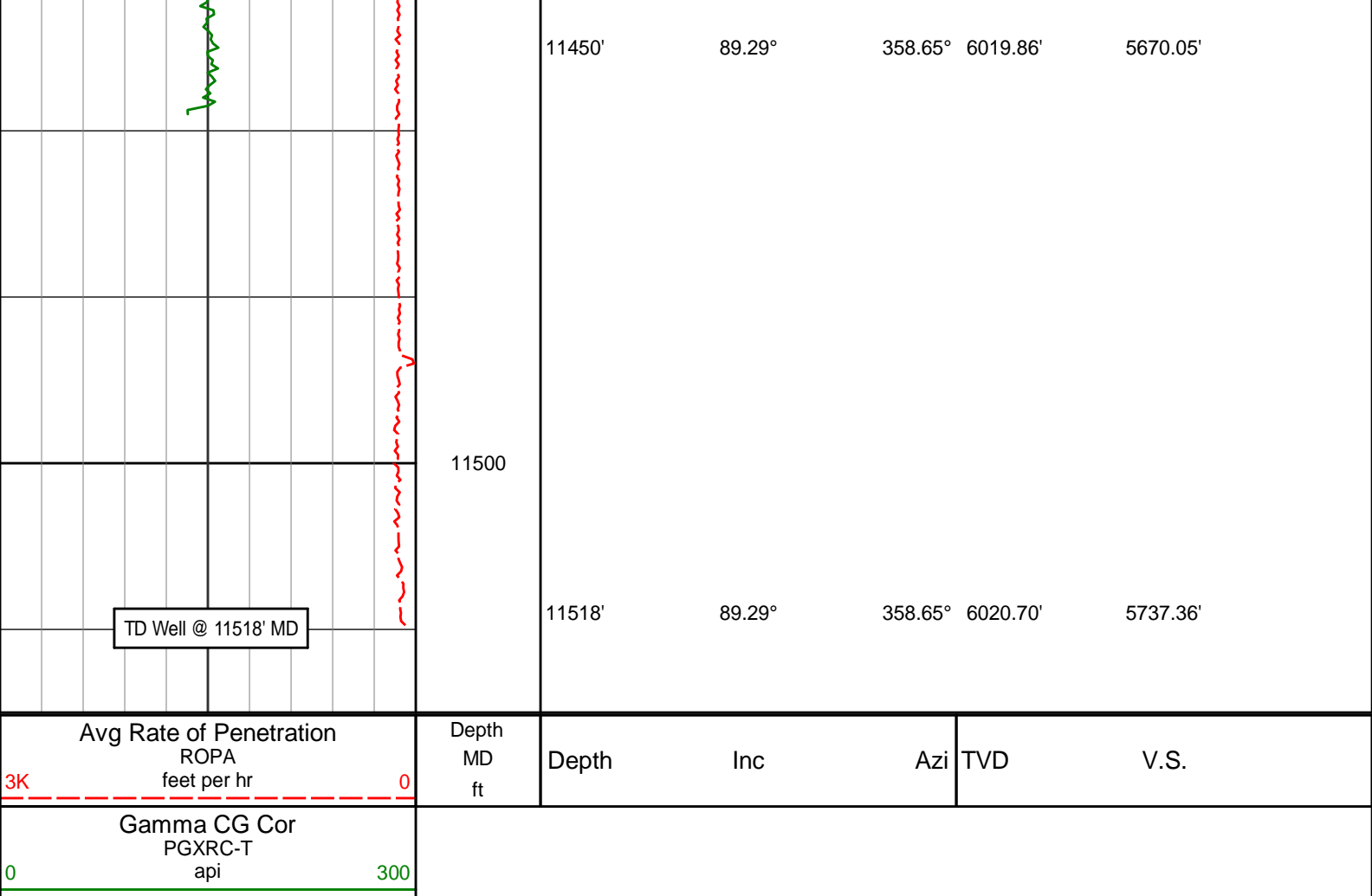
11200



11300

11400

11228'	89.38°	359.06°	6016.95'	5450.29'
11323'	89.17°	358.59°	6018.15'	5544.29'
11418'	89.26°	358.45°	6019.45'	5638.36'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Engery
Haley LC27-745
Wattenburg
Weld Colorado
USA
CA-XX-0902281676
First survey was provided by HP.

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
367.00	0.10	221.50	367.00	0.24 S	0.21 W	-0.20	0.03
724.00	0.30	268.57	724.00	0.50 S	1.36 W	-0.27	0.07
818.00	0.26	250.51	818.00	0.57 S	1.82 W	-0.27	0.10
1008.00	0.44	273.38	1007.99	0.68 S	2.96 W	-0.18	0.12
1194.00	0.56	265.15	1193.99	0.71 S	4.57 W	0.05	0.07
1286.00	0.42	267.77	1285.98	0.76 S	5.35 W	0.13	0.15
1380.00	0.40	260.01	1379.98	0.83 S	6.01 W	0.17	0.06
1472.00	0.37	258.44	1471.98	0.95 S	6.63 W	0.15	0.03
1565.00	0.41	250.41	1564.98	1.12 S	7.24 W	0.08	0.07
1657.00	0.28	258.20	1656.97	1.28 S	7.77 W	0.02	0.15
1750.00	0.17	275.05	1749.97	1.31 S	8.13 W	0.04	0.14
1843.00	3.42	271.78	1842.92	1.22 S	11.03 W	0.61	3.50
1934.00	4.81	266.11	1933.68	1.39 S	17.55 W	1.51	1.59
2027.00	4.81	257.47	2026.35	2.50 S	25.24 W	1.68	0.78
2120.00	5.01	283.84	2119.02	2.37 S	32.99 W	3.08	2.42
2212.00	7.46	283.49	2210.47	0.02 S	42.70 W	7.00	2.66
2305.00	8.78	275.73	2302.54	2.10 N	55.64 W	11.22	1.84
2397.00	9.79	264.14	2393.34	2.00 N	70.41 W	13.55	2.30

2490.00	9.49	261.60	2485.03	0.08 N	85.85 W	14.19	0.56
2583.00	10.81	271.90	2576.58	0.75 S	102.15 W	16.05	2.41
2676.00	11.21	271.19	2667.87	0.28 S	119.91 W	19.43	0.45
2766.00	11.11	270.11	2756.17	0.08 S	137.33 W	22.49	0.26
2956.00	11.68	272.46	2942.42	0.78 N	174.86 W	29.51	0.39
3051.00	10.62	268.69	3035.63	0.99 N	193.22 W	32.74	1.36
3146.00	9.98	268.74	3129.10	0.61 N	210.19 W	35.15	0.67
3241.00	9.71	268.26	3222.70	0.19 N	226.42 W	37.40	0.29
3336.00	10.20	268.17	3316.27	0.32 S	242.84 W	39.60	0.52
3431.00	10.76	268.59	3409.68	0.81 S	260.12 W	41.95	0.59
3526.00	10.84	269.56	3503.00	1.10 S	277.92 W	44.60	0.21
3621.00	10.85	271.15	3596.30	0.98 S	295.79 W	47.65	0.31
3716.00	10.80	270.62	3689.61	0.71 S	313.63 W	50.85	0.12
3811.00	10.76	270.39	3782.94	0.55 S	331.40 W	53.92	0.06
3906.00	9.97	269.11	3876.38	0.62 S	348.49 W	56.67	0.86
4001.00	7.58	268.86	3970.26	0.87 S	362.99 W	58.80	2.52
4096.00	4.05	285.28	4064.77	0.11 S	372.49 W	61.11	4.07
4190.00	4.81	285.97	4158.48	1.85 N	379.48 W	64.19	0.81
4285.00	5.94	280.88	4253.07	3.87 N	388.14 W	67.61	1.30
4380.00	6.33	280.99	4347.52	5.79 N	398.10 W	71.15	0.41
4475.00	7.69	274.62	4441.81	7.31 N	409.58 W	74.53	1.65
4570.00	8.90	273.58	4535.81	8.28 N	423.26 W	77.73	1.27
4665.00	7.23	278.48	4629.87	9.62 N	436.50 W	81.23	1.90
4760.00	8.50	286.65	4723.98	12.51 N	449.14 W	86.16	1.78
4855.00	9.60	274.97	4817.80	15.21 N	463.76 W	91.23	2.25
4950.00	7.44	275.07	4911.75	16.44 N	477.78 W	94.74	2.28
5045.00	9.09	290.08	5005.77	19.56 N	490.95 W	99.99	2.85
5140.00	9.69	276.33	5099.51	23.02 N	505.96 W	105.87	2.44
5235.00	9.78	267.67	5193.15	23.57 N	521.97 W	109.04	1.54
5330.00	10.28	268.28	5286.69	22.99 N	538.50 W	111.19	0.54
5425.00	11.67	269.07	5379.95	22.58 N	556.59 W	113.75	1.47
5519.00	15.49	275.66	5471.32	23.66 N	578.59 W	118.44	4.38
5614.00	17.99	281.73	5562.29	27.90 N	605.58 W	127.05	3.21
5710.00	20.79	300.09	5652.92	39.47 N	634.87 W	143.28	6.95
5805.00	35.12	317.59	5736.75	68.29 N	668.11 W	177.17	17.23
5899.00	49.02	326.18	5806.42	118.02 N	706.32 W	232.50	15.98
5994.00	57.00	337.13	5863.64	184.75 N	741.89 W	304.18	12.44
6089.00	61.87	343.08	5911.97	261.63 N	769.59 W	384.56	7.44
6184.00	69.42	352.88	5951.19	346.13 N	787.36 W	470.83	12.30
6279.00	71.37	358.15	5983.09	435.31 N	794.33 W	559.94	5.61
6374.00	77.54	0.01	6008.54	526.77 N	795.78 W	650.40	6.76
6440.00	82.27	0.57	6020.10	591.73 N	795.45 W	714.42	7.22
6517.00	87.53	0.03	6026.94	668.40 N	795.05 W	789.98	6.87
6609.00	87.81	359.94	6030.67	760.32 N	795.08 W	880.66	0.32
6702.00	88.12	359.76	6033.97	853.26 N	795.32 W	972.38	0.38
6794.00	87.72	359.70	6037.31	945.20 N	795.75 W	1063.13	0.44
6887.00	88.55	0.53	6040.34	1038.15 N	795.55 W	1154.79	1.26
6980.00	89.11	359.72	6042.24	1131.13 N	795.35 W	1246.47	1.06
7071.00	91.45	0.70	6041.80	1222.12 N	795.01 W	1336.17	2.79
7164.00	91.17	1.31	6039.67	1315.08 N	793.38 W	1427.59	0.71
7257.00	91.73	1.38	6037.32	1408.02 N	791.20 W	1518.92	0.60
7349.00	90.92	0.80	6035.20	1499.98 N	789.45 W	1609.34	1.08
7442.00	90.46	1.07	6034.08	1592.96 N	787.94 W	1700.80	0.57
7535.00	89.69	0.38	6033.95	1685.95 N	786.76 W	1792.34	1.11
7627.00	89.57	358.40	6034.55	1777.94 N	787.74 W	1883.23	2.16
7720.00	90.00	359.06	6034.90	1870.92 N	789.80 W	1975.28	0.84
7813.00	90.59	357.62	6034.42	1963.87 N	792.49 W	2067.42	1.67
7903.00	89.60	356.02	6034.28	2053.73 N	797.48 W	2156.87	2.09
7998.00	89.94	357.07	6034.66	2148.56 N	803.20 W	2251.35	1.17
8093.00	89.48	355.36	6035.15	2243.34 N	809.47 W	2345.88	1.87
8188.00	92.19	356.99	6033.77	2338.11 N	815.80 W	2440.40	3.33
8283.00	91.94	356.57	6030.34	2432.90 N	821.13 W	2534.77	0.51
8379.00	91.29	356.58	6027.63	2528.69 N	826.86 W	2630.20	0.67
8473.00	89.91	356.72	6026.65	2622.52 N	832.35 W	2723.66	1.48
8569.00	89.69	356.18	6026.98	2718.34 N	838.30 W	2819.15	0.61
8759.00	90.09	356.47	6027.34	2907.94 N	850.48 W	3008.18	0.26
8854.00	89.54	356.52	6027.65	3002.77 N	856.28 W	3102.67	0.59
8948.00	90.12	357.52	6027.92	3096.64 N	861.16 W	3196.06	1.23
9043.00	89.11	356.97	6028.56	3191.52 N	865.73 W	3290.41	1.22
9138.00	88.55	357.22	6030.50	3286.38 N	870.55 W	3384.77	0.64
9233.00	89.23	357.75	6032.34	3381.27 N	874.72 W	3479.06	0.90
9327.00	89.82	358.07	6033.13	3475.20 N	878.16 W	3572.28	0.71
9422.00	90.49	358.88	6032.87	3570.17 N	880.69 W	3666.37	1.12
9517.00	90.46	359.08	6032.08	3665.15 N	882.38 W	3760.33	0.21

9613.00	90.74	358.88	6031.07	3761.13 N	884.09 W	3855.29	0.35
9708.00	91.48	359.43	6029.23	3856.10 N	885.50 W	3949.20	0.97
9803.00	92.34	358.97	6026.07	3951.04 N	886.83 W	4043.06	1.03
9897.00	92.53	358.88	6022.08	4044.94 N	888.59 W	4135.97	0.22
9992.00	92.40	358.39	6017.99	4139.82 N	890.85 W	4229.94	0.54
10087.00	92.50	358.87	6013.93	4234.71 N	893.13 W	4323.91	0.51
10182.00	91.36	358.71	6010.73	4329.63 N	895.13 W	4417.87	1.21
10277.00	91.69	358.58	6008.21	4424.57 N	897.38 W	4511.89	0.38
10372.00	91.14	358.75	6005.86	4519.51 N	899.59 W	4605.91	0.61
10467.00	90.65	358.80	6004.37	4614.48 N	901.62 W	4699.92	0.52
10562.00	89.51	359.55	6004.25	4709.47 N	902.99 W	4793.84	1.44
10657.00	90.37	0.27	6004.35	4804.47 N	903.14 W	4887.57	1.18
10752.00	88.27	0.28	6005.47	4899.45 N	902.69 W	4981.19	2.21
10847.00	88.15	0.51	6008.44	4994.40 N	902.04 W	5074.74	0.28
10942.00	88.21	0.58	6011.45	5089.35 N	901.14 W	5168.25	0.10
11038.00	88.33	0.94	6014.34	5185.30 N	899.87 W	5262.69	0.39
11133.00	89.57	359.18	6016.08	5280.28 N	899.77 W	5356.36	2.26
11228.00	89.38	359.06	6016.95	5375.26 N	901.24 W	5450.29	0.23
11323.00	89.17	358.59	6018.15	5470.24 N	903.18 W	5544.29	0.54
11418.00	89.26	358.45	6019.45	5565.20 N	905.63 W	5638.36	0.18
11450.00	89.29	358.65	6019.86	5597.18 N	906.44 W	5670.05	0.64
11518.00	89.29	358.65	6020.70	5665.16 N	908.04 W	5737.36	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 350.54 DEGREES (GRID)
A TOTAL CORRECTION OF 7.04 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11518.00 FEET
IS 5737.47 FEET ALONG 350.89 DEGREES (GRID)**

Final survey is a straight line projection to TD.