



WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	30-Apr-15	01-May-15	04-May-15		
Rig Bit Number	0100	0200	0300		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	626.00	5,913.00	6,349.00		
Log End Depth (MD, ft)	5,913.00	6,349.00	11,425.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	29-Apr-15 21:45	30-Apr-15 21:30	02-May-15 03:40		
Drill/Wipe End Date and Time	30-Apr-15 13:20	01-May-15 03:30	03-May-15 16:35		
Min Inc (deg) @ Depth (MD, ft)	0.09 @ 5,039.00	45.12 @ 5,988.00	87.29 @ 6,415.00		
Max Inc (deg) @ Depth (MD, ft)	32.65 @ 5,893.00	81.50 @ 6,294.00	92.07 @ 9,794.00		
Bit TFA(in2) / Bit Type	1.21 / PDC	1.18 / PDC	0.65 / PDC		
Flow Rate (gpm)	626.92	575.00	316.08		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Native/Spud Mud	Native/Spud Mud	Native/Spud Mud		
Density (ppg) / Viscosity (spqt)	8.80 / 28.00	10.80 / 38.00	10.07 / 34.00		
Filtrate CL (ppm)	1,800.00	1,800.00	2,600.00		
pH / Fluid Loss (mptm)	9.40 / 46	9.00 / 6	9.10 / 6		
PV (cP) / YP (lhf2)	4 / 3.00	15 / 14.00	9 / 10.00		
% Solids / % Sand	2.70 / 0.30	11.70 / 0.15	7.7 / 0.15		
% Oil / Oil:Water Ratio	0 / N/A	00 / N/A	1.00 / 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	224.42 / PDM		

Max Tool Temp (degF) / Source	160.83 / PCM	160.83 / PCM	234.12 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 160.83	N/A @ 160.83	N/A @ 234.12		
Lead MWD Engineer	Kyle Regan	Kyle Regan	Kyle Regan		
Customer Representative	JW Irwin	JW Irwin	JW Irwin		

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	29-Apr-15 12:36	01-Jan-70 00:00	01-May-15 16:27		
Date and Time Read	01-May-15 07:42	01-May-15 07:47	04-May-15 00:22		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	54.00	55.00	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)	68.67	53.30	181.68		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	47.11	47.95	61.12		
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 true vertical 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.

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

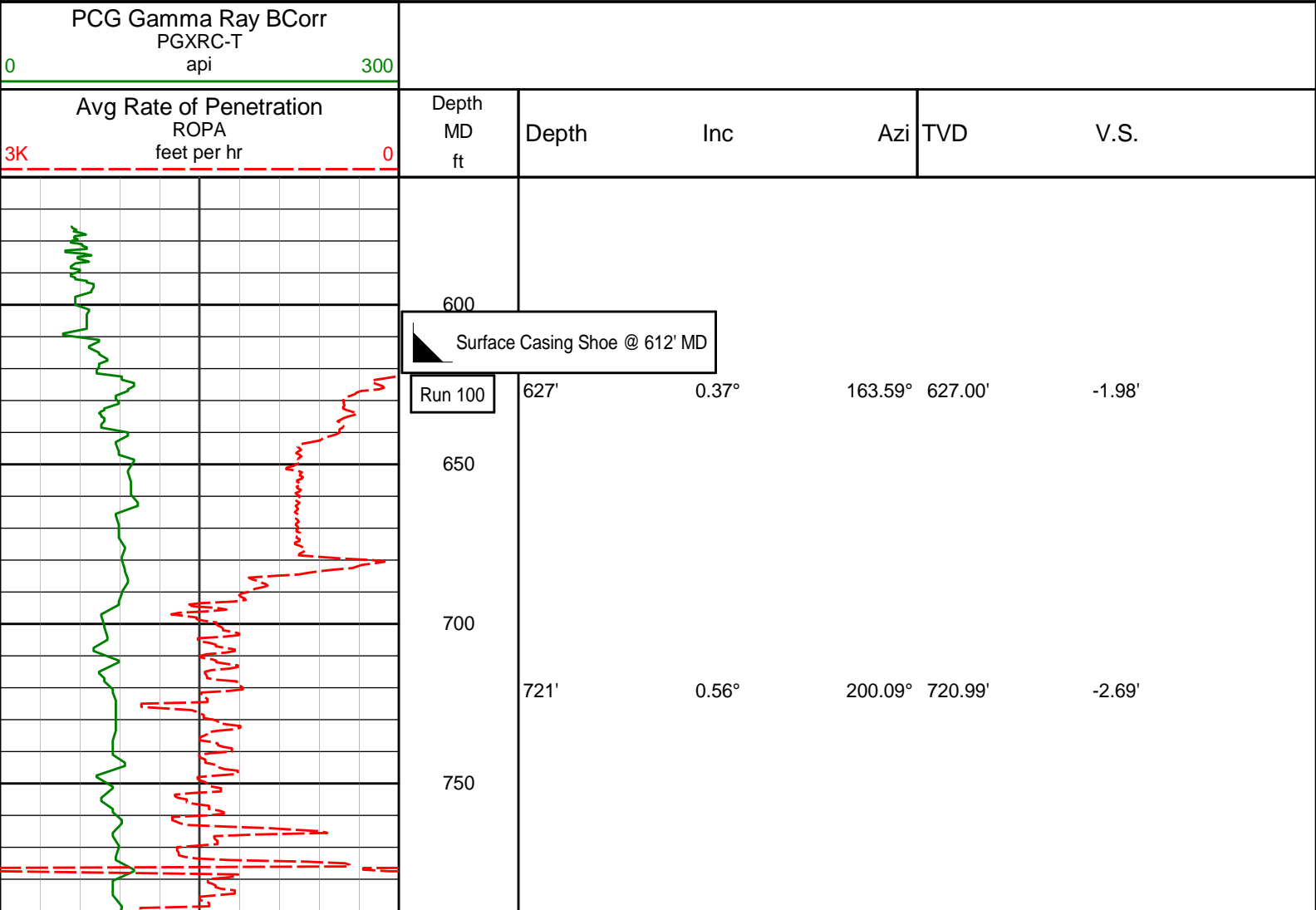
Interval Distance: 1.2 ft

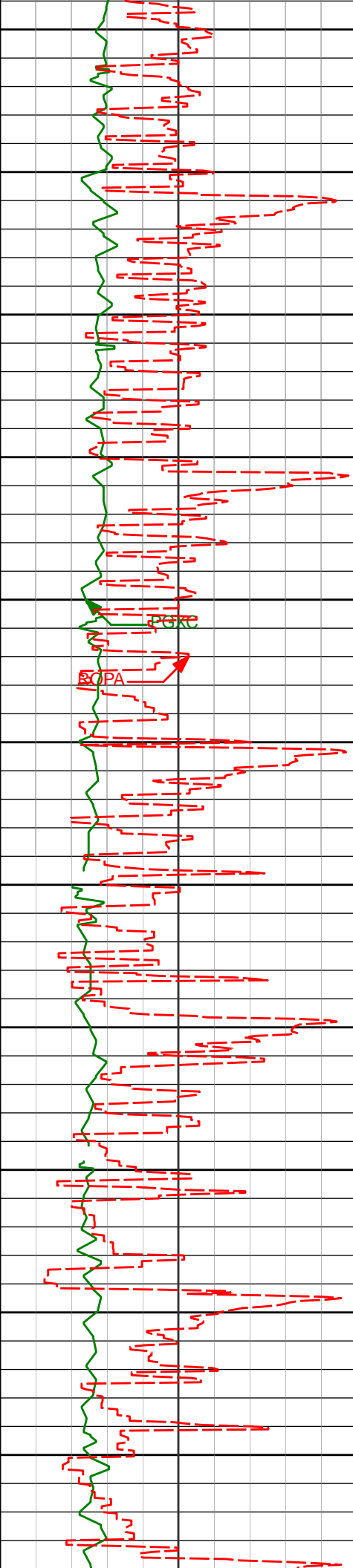
Gap Fill: 3.0 ft

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MD Detail 1:600 Scale





800

850

900

950

1000

1050

1100

1150

1200

1250

1283'

1300

910'

1.14°

203.12° 909.97'

-5.21'

1005'

1.13°

200.43° 1004.95'

-6.91'

1098'

1.17°

202.71° 1097.93'

-8.61'

1190'

1.35°

206.45° 1189.91'

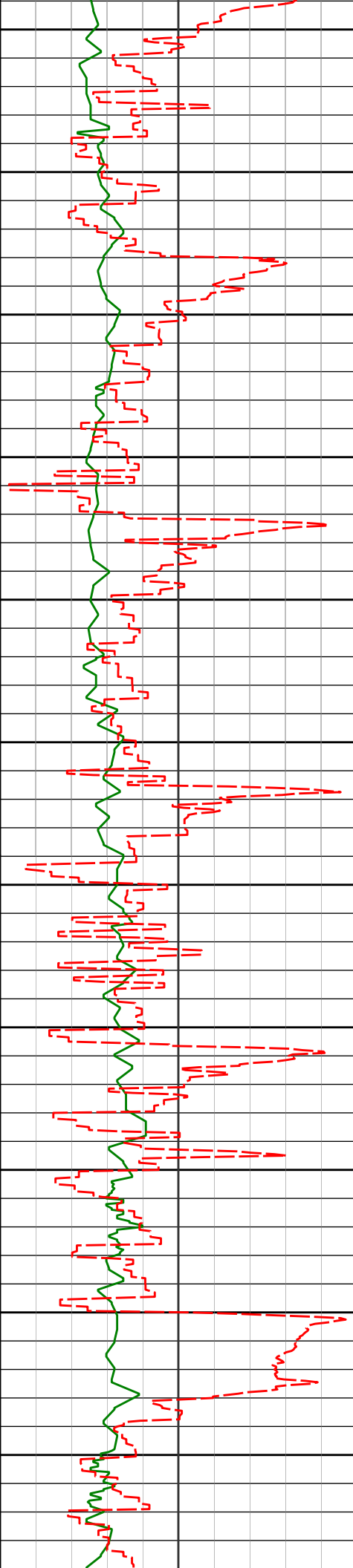
-10.39'

1283'

1.58°

213.06° 1282.88'

-12.38'



1350

1376'

1.71°

210.16°

1375.84'

-14.57'

1400

1450

1469'

1.59°

201.68°

1468.80'

-16.90'

1500

1550

1561'

1.64°

203.18°

1560.77'

-19.24'

1600

1650

1654'

1.64°

203.30°

1653.73'

-21.61'

1700

1750

1747'

1.25°

197.69°

1746.70'

-23.75'

1800

1850

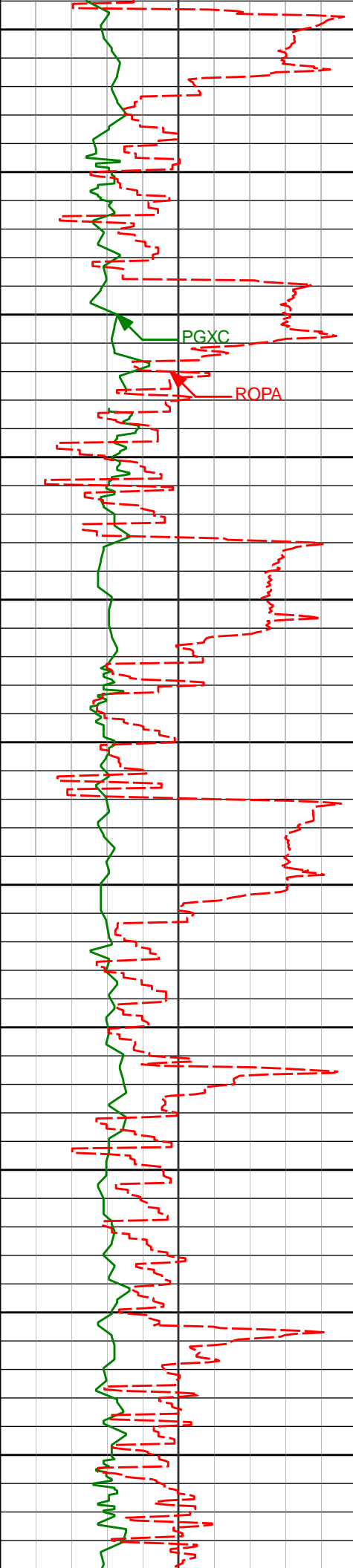
1839'

1.57°

315.88°

1838.69'

-23.73'



1900

1930'

1950

2000

2024'

2050

2100

2116'

2150

2200

2209'

2250

2300

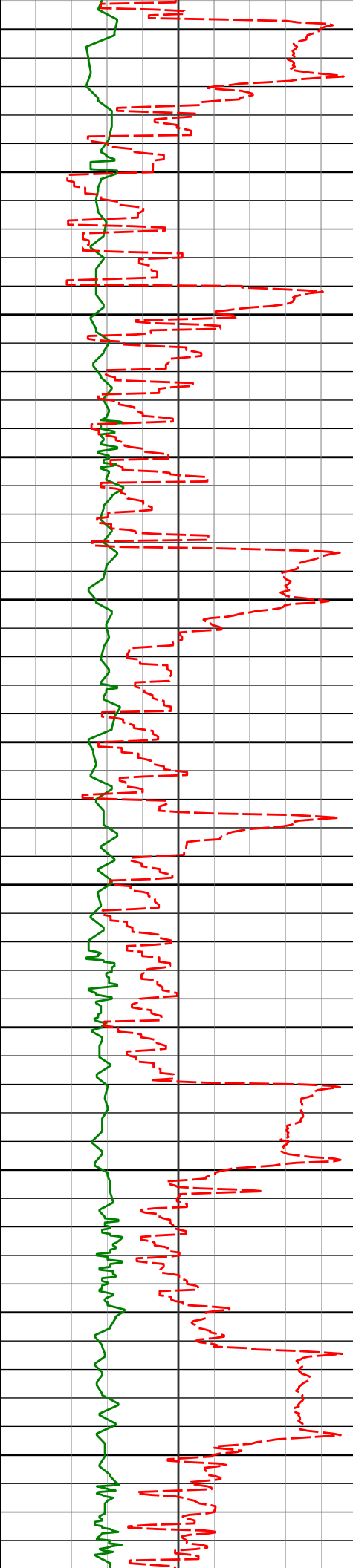
2301'

2350

2394'

2400

	3.47°	313.81°	1929.59'	-20.77'
2024'	5.00°	318.22°	2023.33'	-15.48'
2116'	7.58°	324.85°	2114.78'	-7.20'
2209'	9.61°	316.63°	2206.73'	3.94'
2301'	8.92°	316.51°	2297.53'	15.25'
2394'	8.24°	313.05°	2389.49'	25.58'



2450

2486'	8.81°	306.98°	2480.47'	34.89'
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2500

2550

2580'	9.44°	305.35°	2573.28'	44.35'
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2600

2650

2672'	10.12°	295.69°	2663.95'	52.96'
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2700

2750

2763'	10.45°	294.22°	2753.49'	60.63'
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2800

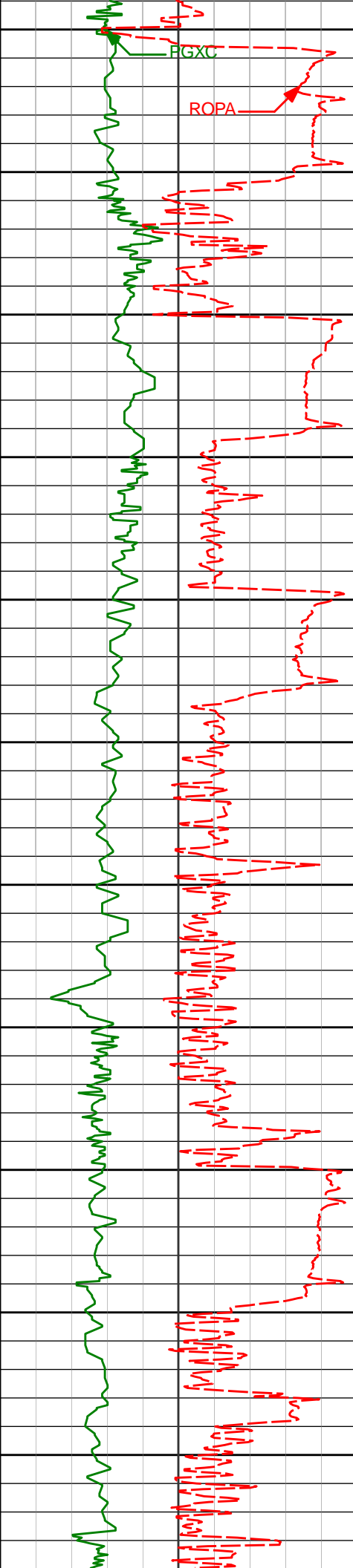
2850

2857'	8.67°	281.29°	2846.19'	66.34'
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2900

2950

2952'	8.28°	277.54°	2940.15'	69.41'
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FGXC

ROPA

3000

3050

3100

3150

3200

3250

3300

3350

3400

3450

3500

3047'

5.06°

267.59°

3034.50'

70.75'

3141'

2.00°

205.84°

3128.34'

69.37'

3236'

3.60°

172.39°

3223.23'

64.94'

3330'

4.08°

167.22°

3317.01'

58.70'

3425'

3.92°

151.60°

3411.79'

52.43'

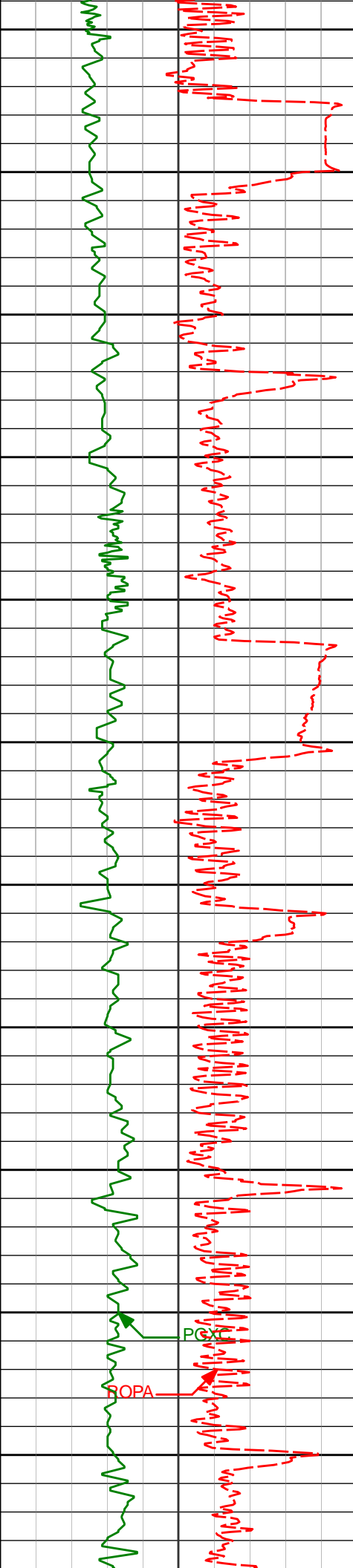
3520'

4.16°

136.28°

3506.55'

46.87'



3550

3600

3650

3700

3750

3800

3850

3900

3950

4000

4050

3615'

3.38°

114.57°

3601.35'

42.94'

3710'

3.54°

110.15°

3696.18'

40.47'

3804'

3.10°

47.07°

3790.05'

40.94'

3899'

2.36°

48.15°

3884.94'

43.80'

3994'

2.28°

36.59°

3979.86'

46.47'

4089'

1.79°

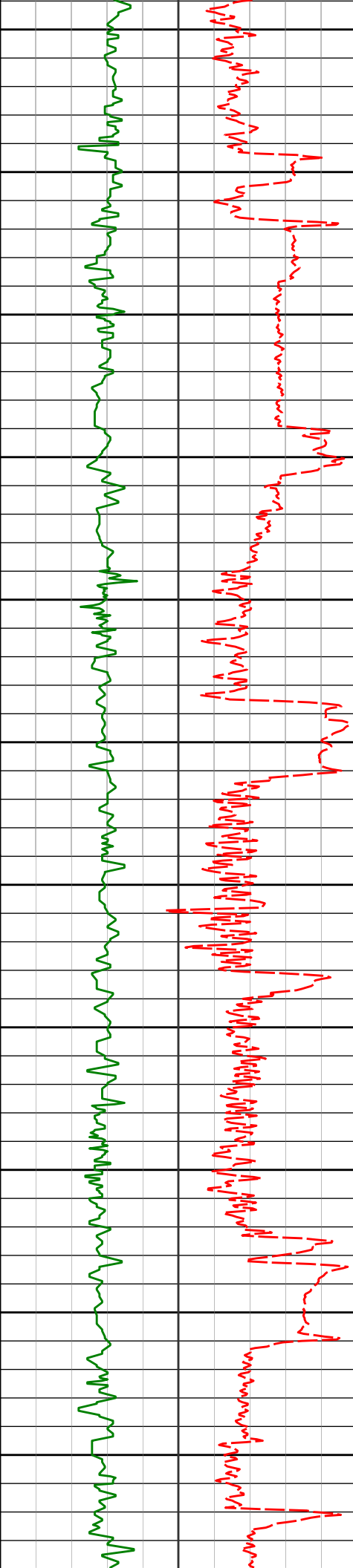
26.51°

4074.80'

49.21'

POC

POPA



4100

4150

4184'

2.11°

23.91°

4169.75'

52.06'

4200

4250

4279'

2.33°

20.83°

4264.68'

55.38'

4300

4350

4374'

1.49°

26.94°

4359.62'

58.22'

4400

4450

4469'

1.91°

35.57°

4454.58'

60.53'

4500

4550

4564'

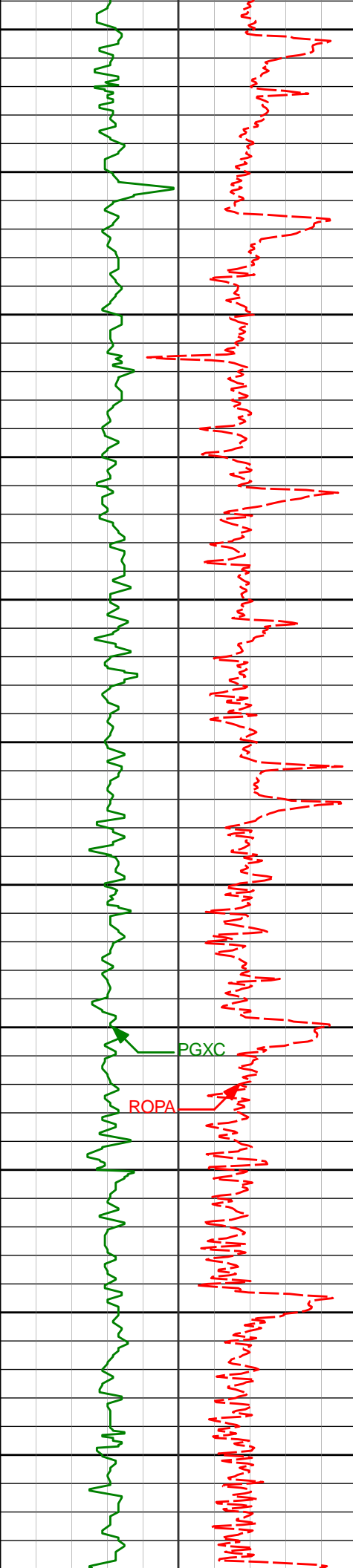
1.97°

331.01°

4549.54'

63.24'

4600



4650

4659'

1.50°

353.96° 4644.49'

65.95'

4700

4750

4754'

0.83°

6.30° 4739.47'

67.88'

4800

4850

4849'

0.49°

4.33° 4834.47'

68.96'

4900

4950

4944'

0.25°

342.92° 4929.46'

69.56'

5000

PGXC

ROPA

5050

5039'

0.09°

294.44° 5024.46'

69.79'

5100

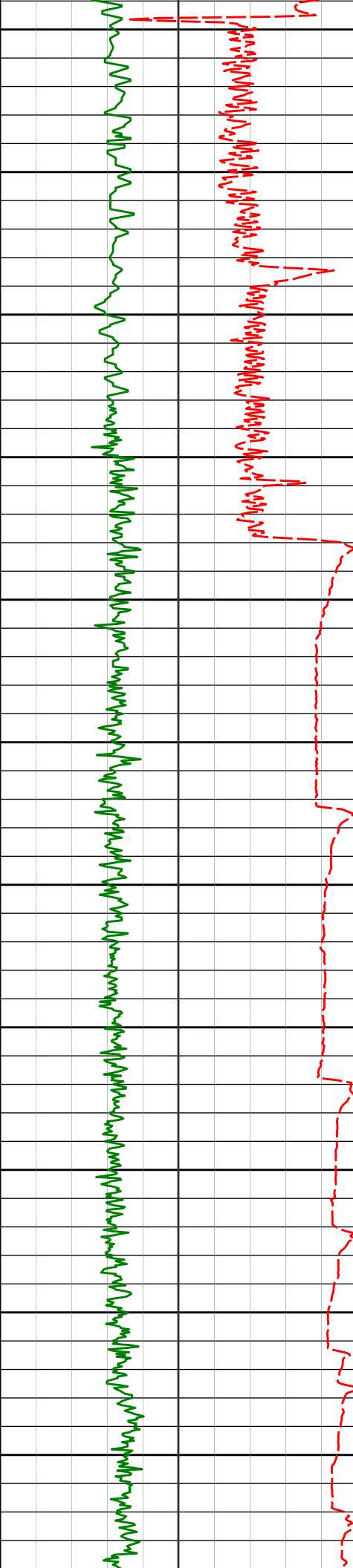
5150

5134'

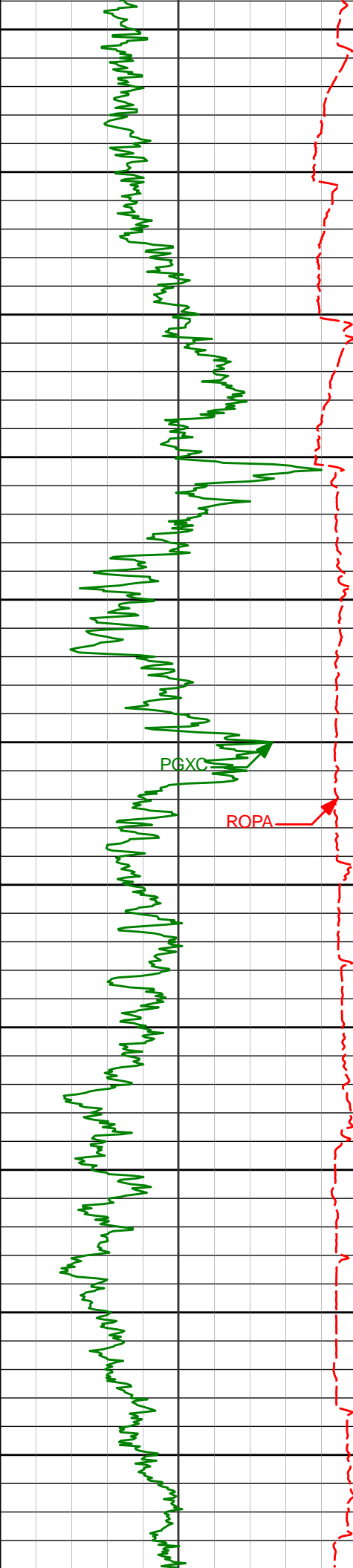
0.19°

199.51° 5119.46'

69.68'



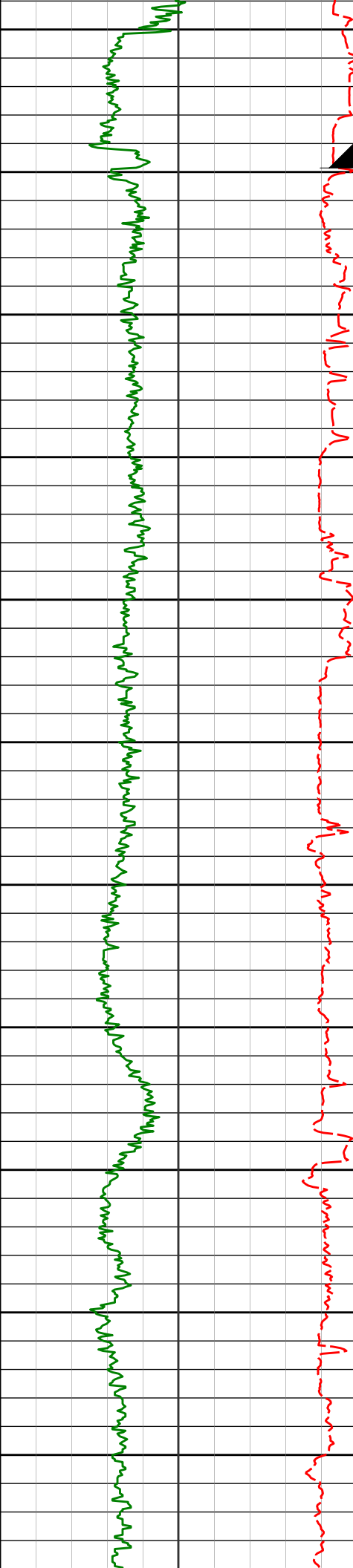
5200					
	5229'	0.57°	213.25°	5214.46'	69.15'
5250					
5300					
	5324'	0.39°	164.26°	5309.46'	68.46'
5350					
5400					
	5419'	3.99°	6.70°	5404.39'	71.40'
5450					
5500					
	5514'	11.73°	358.77°	5498.43'	84.33'
5550					
5600					
	5608'	17.81°	355.87°	5589.28'	108.27'
5650					
5700					
	5703'	22.81°	359.79°	5678.35'	141.20'



Run 200

5750
5800
5850
5900
5950
6000
6050
6100
6150
6200
6250

5798'	27.25°	4.38°	5764.42'	181.17'
5893'	32.65°	6.73°	5846.71'	228.00'
5988'	45.12°	356.93°	5920.58'	287.19'
6083'	65.89°	354.43°	5974.09'	365.03'
6178'	74.18°	355.83°	6006.50'	454.20'

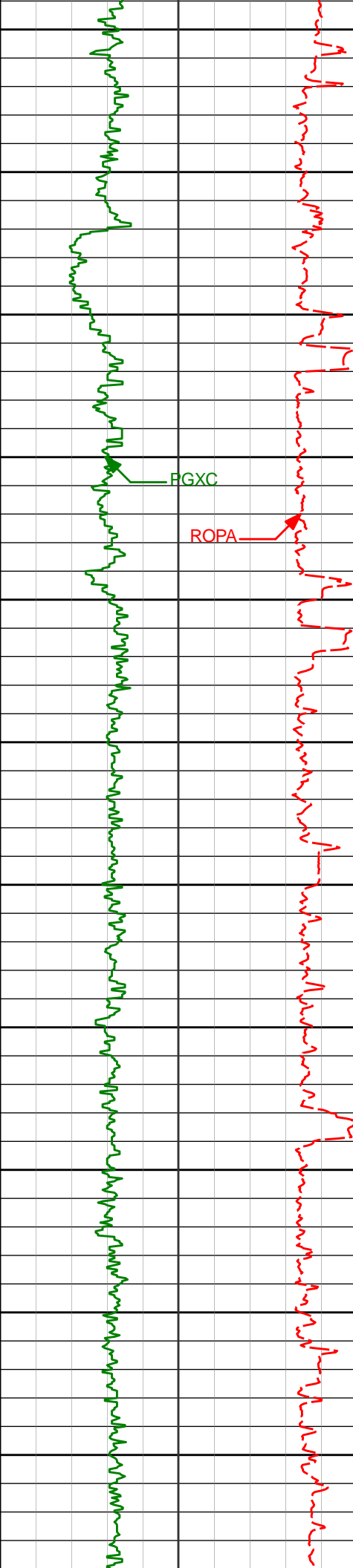


CSG
Run 300

Casing Shoe @ 6349' MD

6300
6350
6400
6450
6500
6550
6600
6650
6700
6750
6800

6294'	81.50°	356.13°	6030.92'	567.51'
6415'	87.29°	357.90°	6042.74'	687.88'
6508'	89.41°	357.91°	6045.41'	780.81'
6600'	89.88°	358.51°	6045.98'	872.78'
6693'	90.22°	359.19°	6045.91'	965.72'
6785'	90.59°	359.49°	6045.26'	1057.63'



6850

6879'	89.91°	358.40°	6044.86'	1151.56'
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6900

6950

6971'	91.54°	358.27°	6043.70'	1243.51'
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7000

FGXC

ROPA

7050

7062'	90.71°	358.80°	6041.91'	1334.45'
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7100

7150

7156'	89.94°	356.95°	6041.38'	1428.42'
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7200

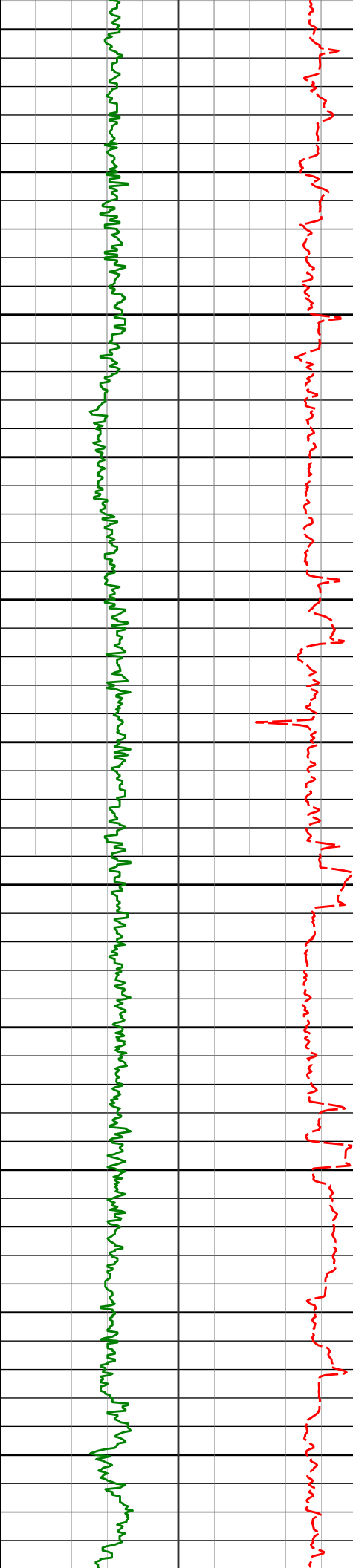
7250

7248'	90.96°	356.75°	6040.66'	1520.42'
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7300

7350

7341'	90.46°	357.32°	6039.51'	1613.41'
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7400

7450

7500

7550

7600

7650

7700

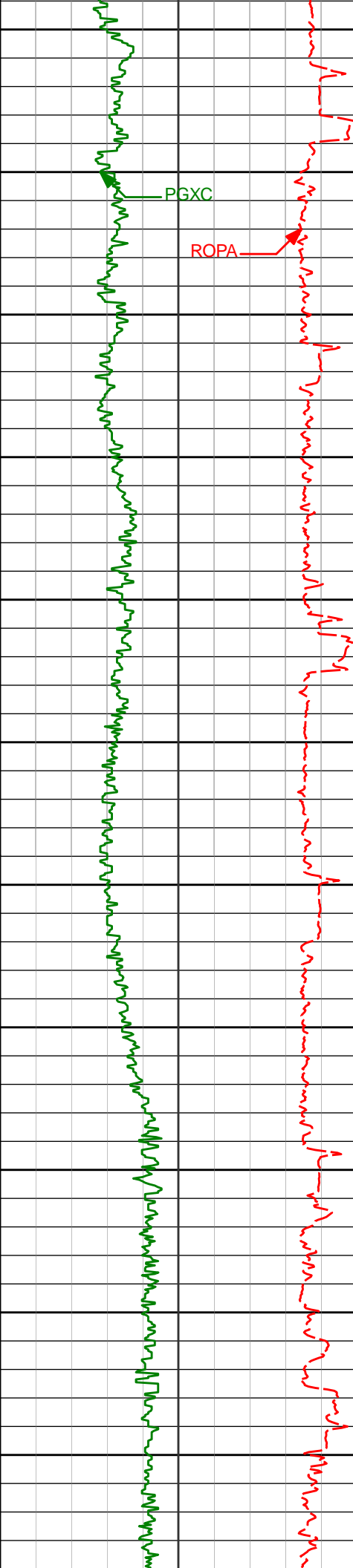
7750

7800

7850

7900

7433'	90.28°	356.86°	6038.92'	1705.41'
7526'	90.28°	356.18°	6038.46'	1798.41'
7618'	89.57°	356.32°	6038.59'	1890.40'
7711'	90.31°	356.42°	6038.69'	1983.40'
7804'	90.74°	357.26°	6037.84'	2076.39'
7895'	90.46°	357.06°	6036.88'	2167.39'



7950

7990'	90.68°	357.72°	6035.94'	2262.38'
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8000

8050

8084'	90.15°	357.63°	6035.26'	2356.36'
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8100

8150

8179'	90.62°	358.53°	6034.62'	2451.33'
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8200

8250

8275'	90.65°	358.27°	6033.56'	2547.29'
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8300

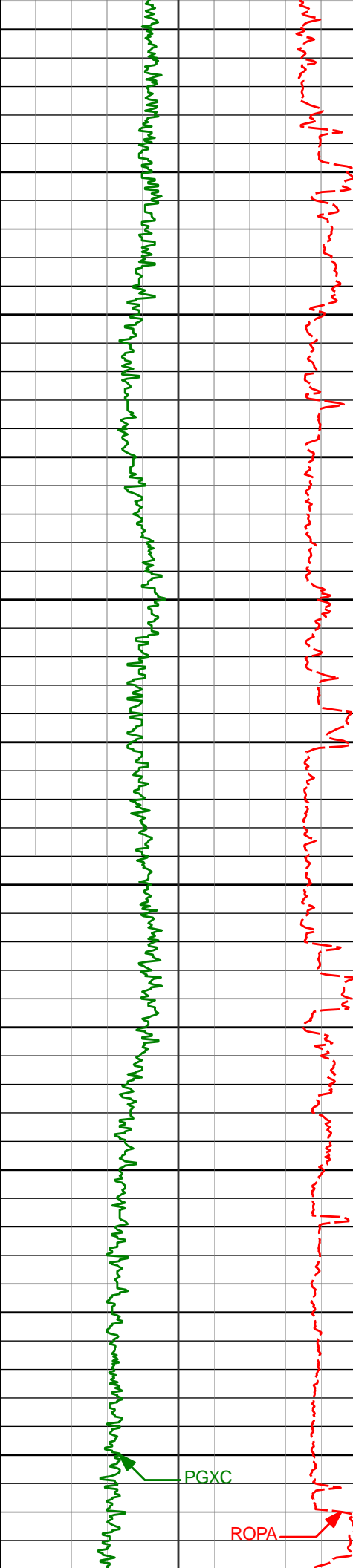
8350

8370'	90.89°	359.80°	6032.28'	2642.20'
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8400

8450

8465'	89.60°	358.17°	6031.87'	2737.13'
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8500

8550

8600

8650

8700

8750

8800

8850

8900

8950

9000

8560'

90.80°

0.08° 6031.54'

2832.04'

8655'

89.41°

358.47° 6031.36'

2926.94'

8750'

90.34°

357.16° 6031.57'

3021.92'

8845'

91.14°

357.34° 6030.34'

3116.91'

8939'

90.03°

356.51° 6029.38'

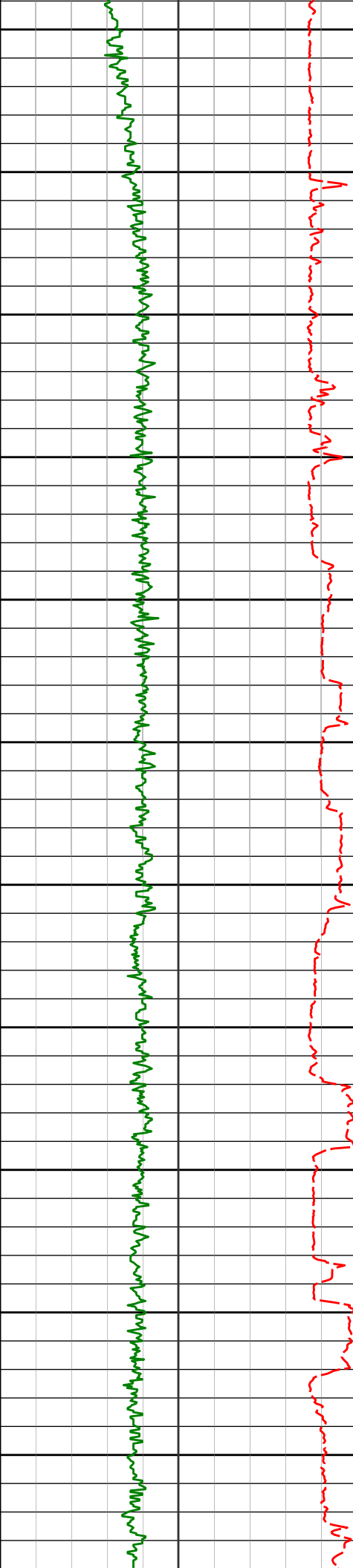
3210.90'

9034'

91.26°

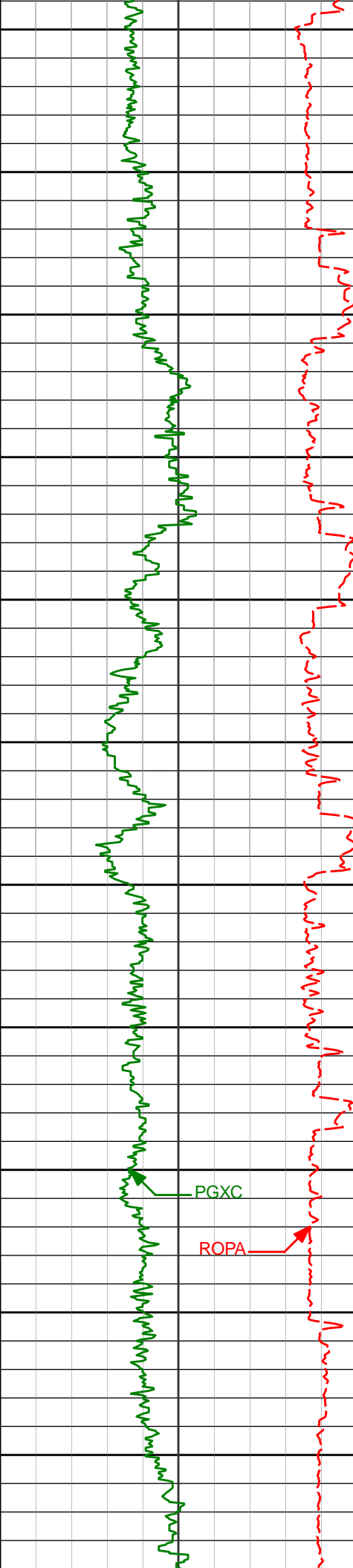
356.62° 6028.31'

3305.89'



9050
9100
9150
9200
9250
9300
9350
9400
9450
9500
9550

9129'	90.89°	356.85°	6026.52'	3400.88'
9223'	89.45°	354.90°	6026.24'	3494.86'
9319'	89.85°	353.73°	6026.83'	3590.77'
9413'	89.26°	352.97°	6027.57'	3684.60'
9508'	91.39°	354.79°	6027.03'	3779.46'

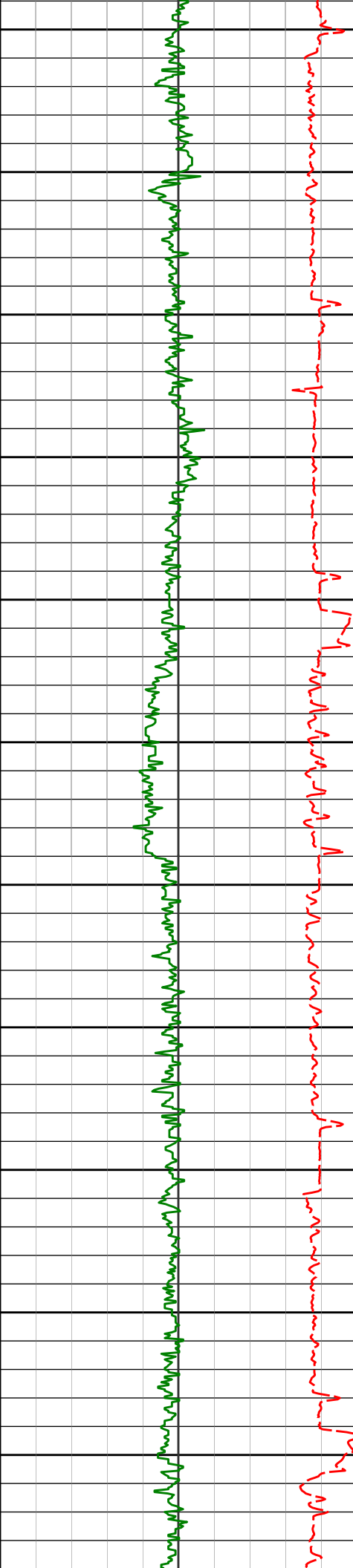


9600
9650
9700
9750
9800
9850
9900
9950
10000
10050
10100

9604'	90.52°	355.70°	6025.43'	3875.41'
9699'	90.80°	355.96°	6024.33'	3970.39'
9794'	92.07°	357.55°	6021.96'	4065.36'
9888'	91.51°	358.50°	6019.02'	4159.29'
9984'	90.68°	359.12°	6017.19'	4255.21'
10078'	90.43°	358.95°	6016.28'	4349.13'

PGXC

ROPA



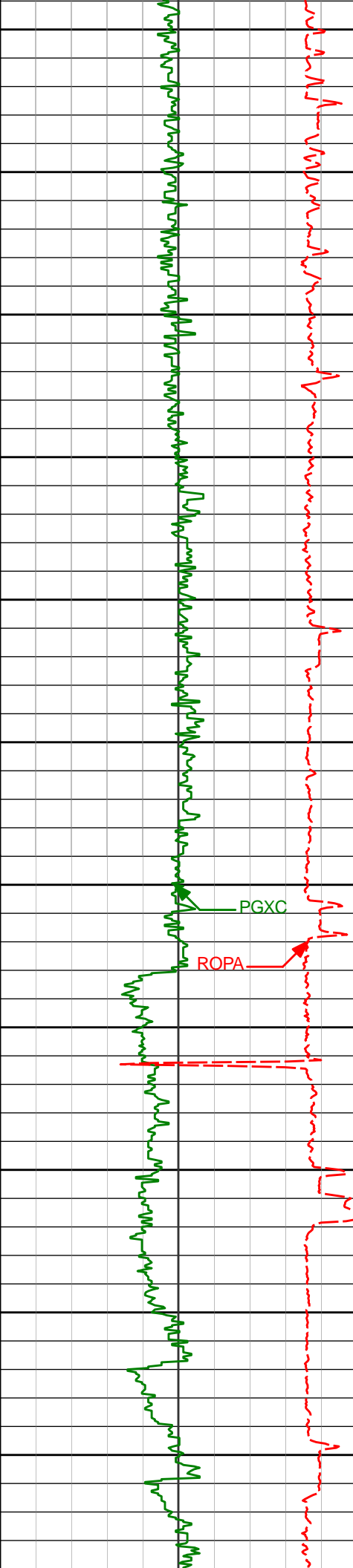
10150
10174'
10200
10250
10268'
10300
10350
10364'
10400
10450
10458'
10500
10550
10553'
10600
10650
10648'

10174'
10268'
10364'
10458'
10553'
10648'

90.31°
89.94°
90.62°
90.83°
91.17°
90.28°

358.65° 6015.66'
358.21° 6015.46'
358.99° 6014.99'
0.18° 6013.80'
1.38° 6012.14'
1.41° 6010.94'

4445.07'
4539.03'
4634.98'
4728.86'
4823.61'
4918.29'



10700

10750

10800

10850

10900

10950

11000

11050

11100

11150

11200

10743'

90.71°

2.08° 6010.12'

5012.93'

10839'

90.25°

1.07° 6009.32'

5108.58'

10934'

90.86°

1.96° 6008.40'

5203.25'

11029'

90.34°

0.62° 6007.41'

5297.95'

11124'

89.29°

0.02° 6007.71'

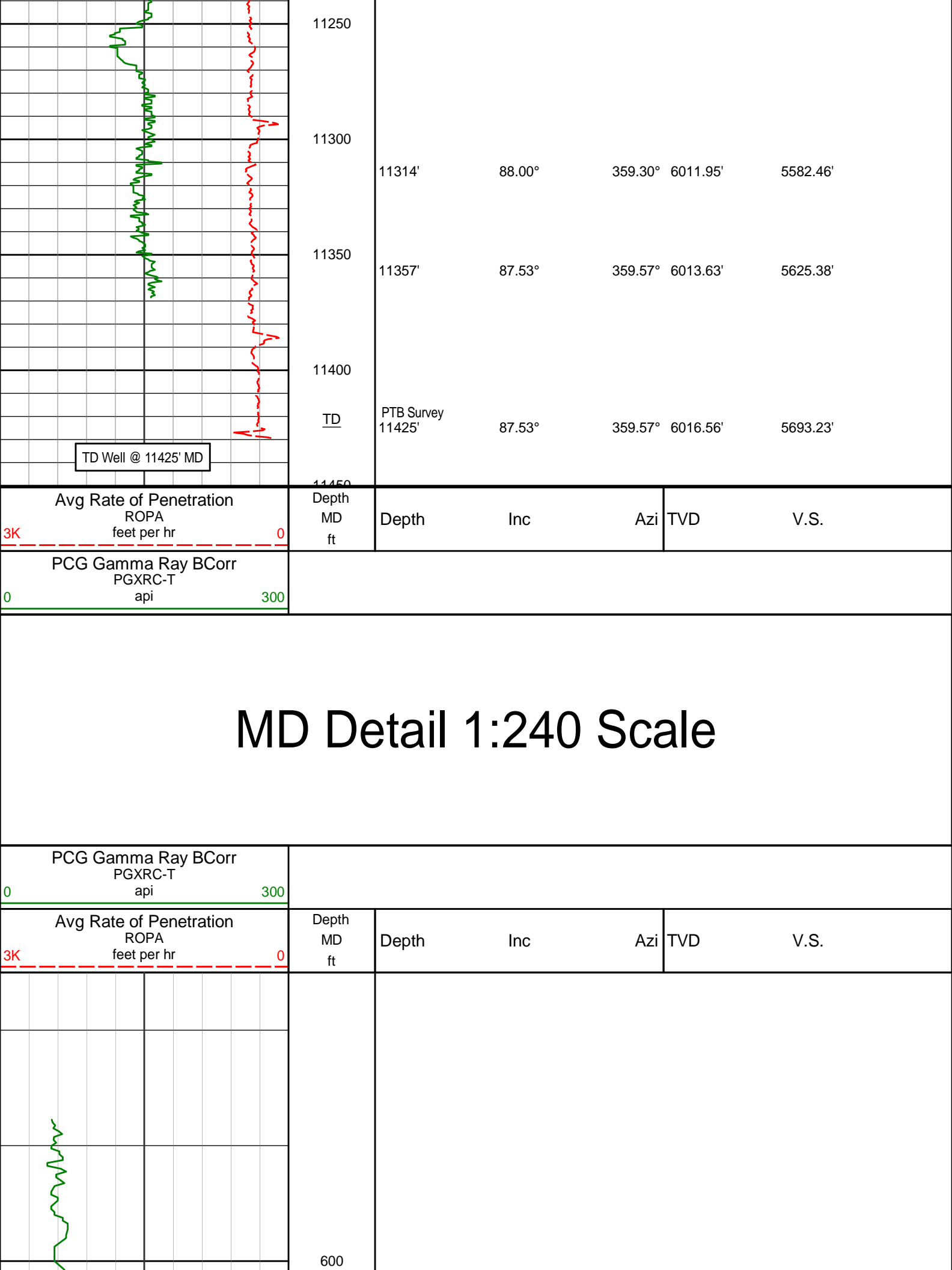
5392.77'

11219'

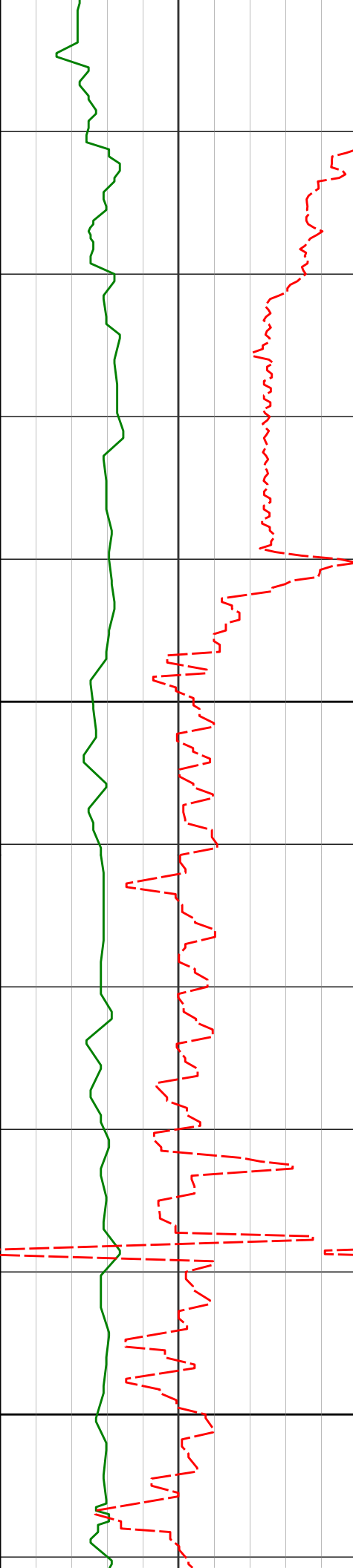
88.80°

359.82° 6009.30'

5487.61'



MD Detail 1:240 Scale



Surface Casing Shoe @ 612' MD

Run 100

627'

0.37°

163.59° 627.00'

-1.98'

700

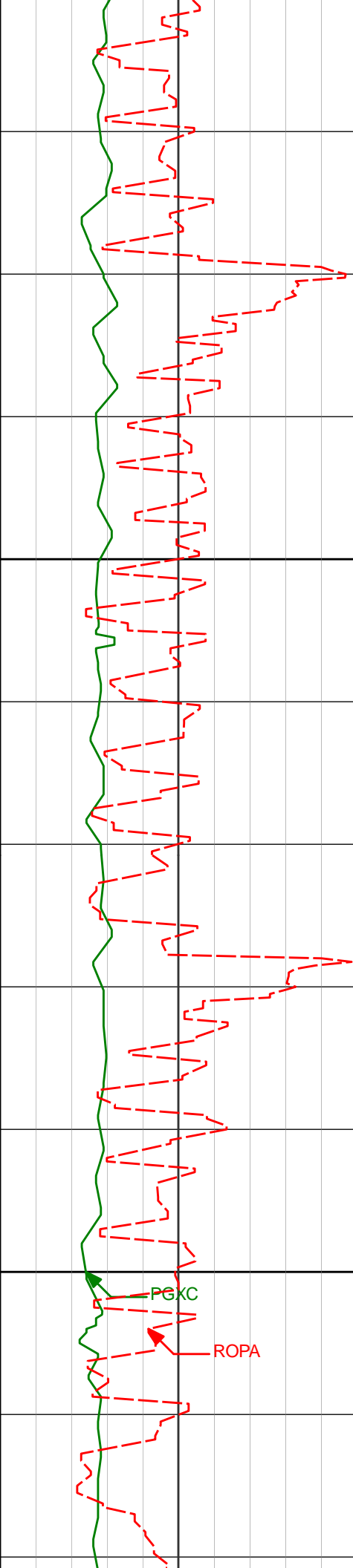
721'

0.56°

200.09° 720.99'

-2.69'

800



900

910'

1.14°

203.12° 909.97'

-5.21'

1000

1005'

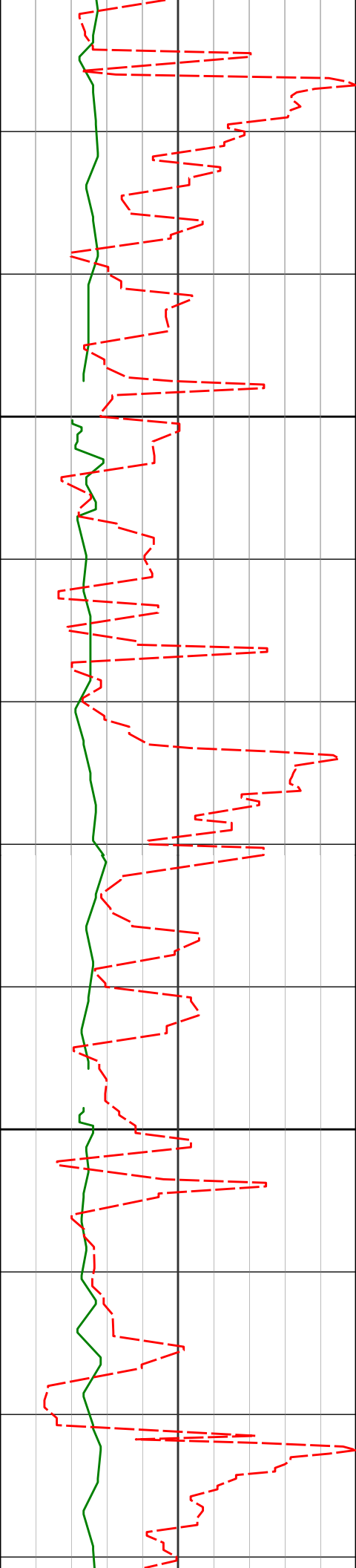
1.13°

200.43° 1004.95'

-6.91'

PGXC

ROPA



1100

1098'

1.17°

202.71° 1097.93'

-8.61'

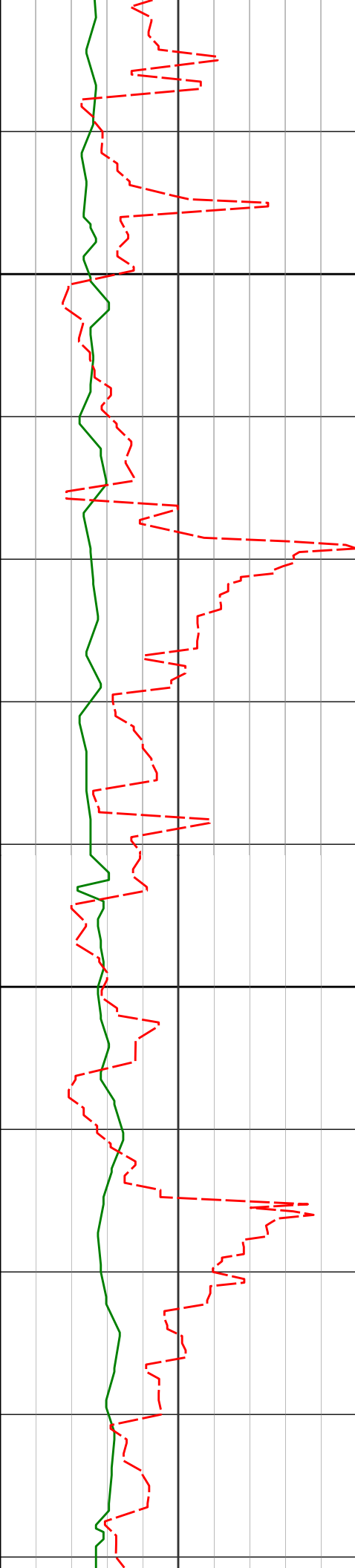
1200

1190'

1.35°

206.45° 1189.91'

-10.39'



1300

1400

1283'

1.58°

213.06° 1282.88'

-12.38'

1376'

1.71°

210.16° 1375.84'

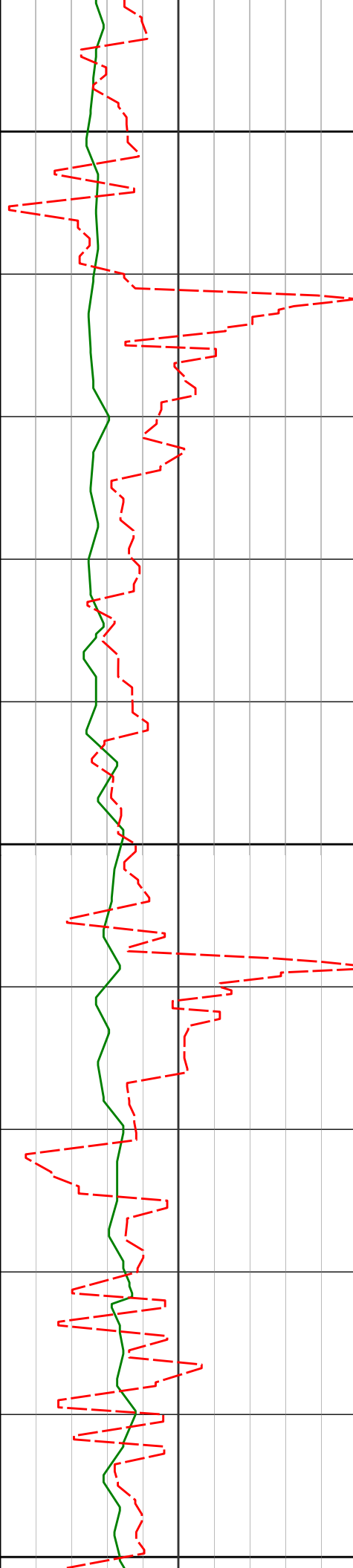
-14.57'

1469'

1.59°

201.68° 1468.80'

-16.90'



1500

1561'

1.64°

203.18° 1560.77'

-19.24'

1600

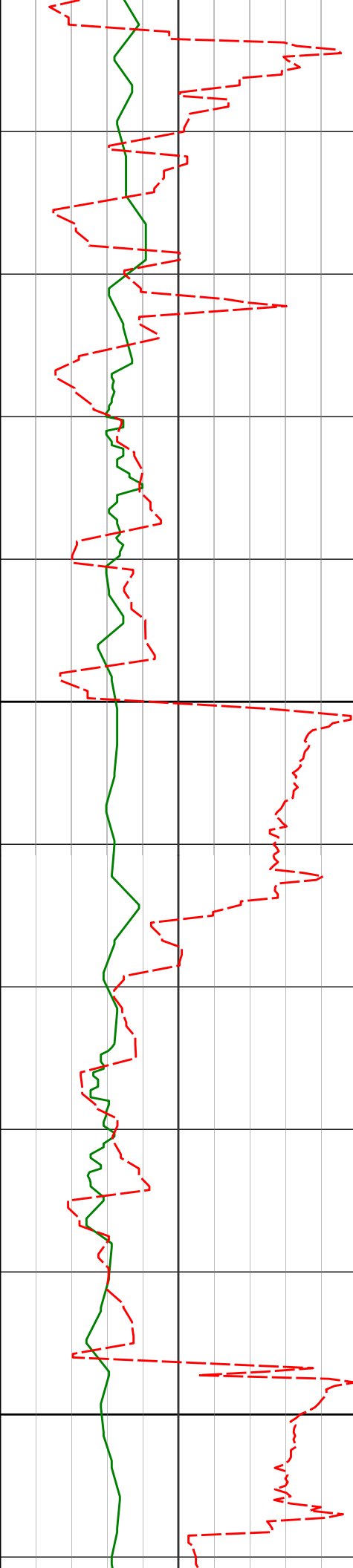
1654'

1.64°

203.30° 1653.73'

-21.61'

1700

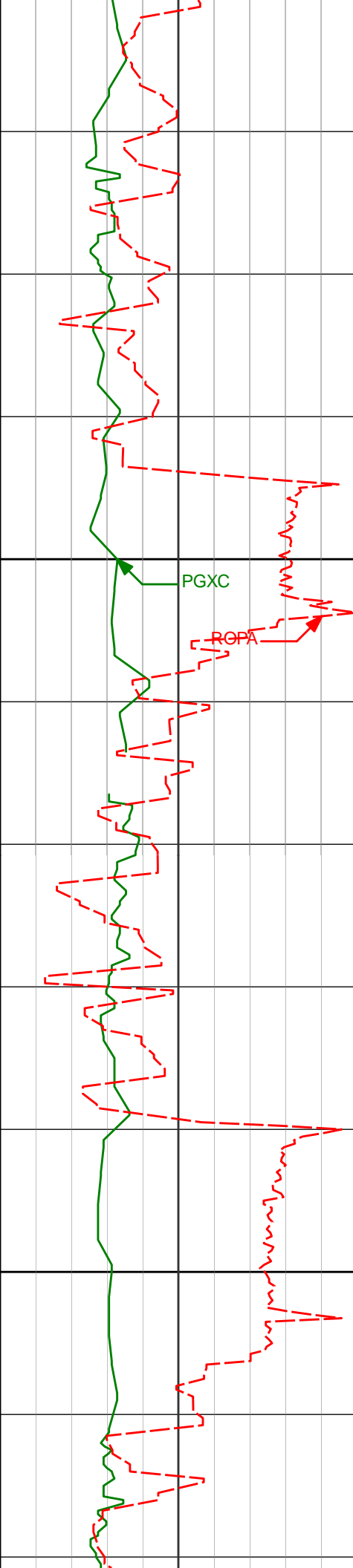


1747' 1.25° 197.69° 1746.70' -23.75'

1800

1839' 1.57° 315.88° 1838.69' -23.73'

1900



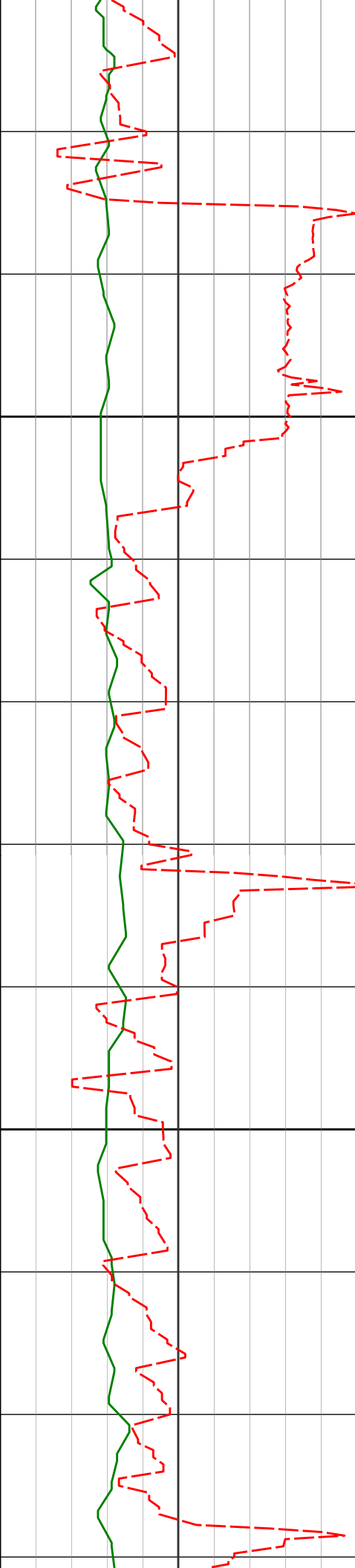
2000

2100

1930' 3.47° 313.81° 1929.59' -20.77'

2024' 5.00° 318.22° 2023.33' -15.48'

2116' 7.58° 324.85° 2114.78' -7.20'



2200

2209'

9.61°

316.63° 2206.73'

3.94'

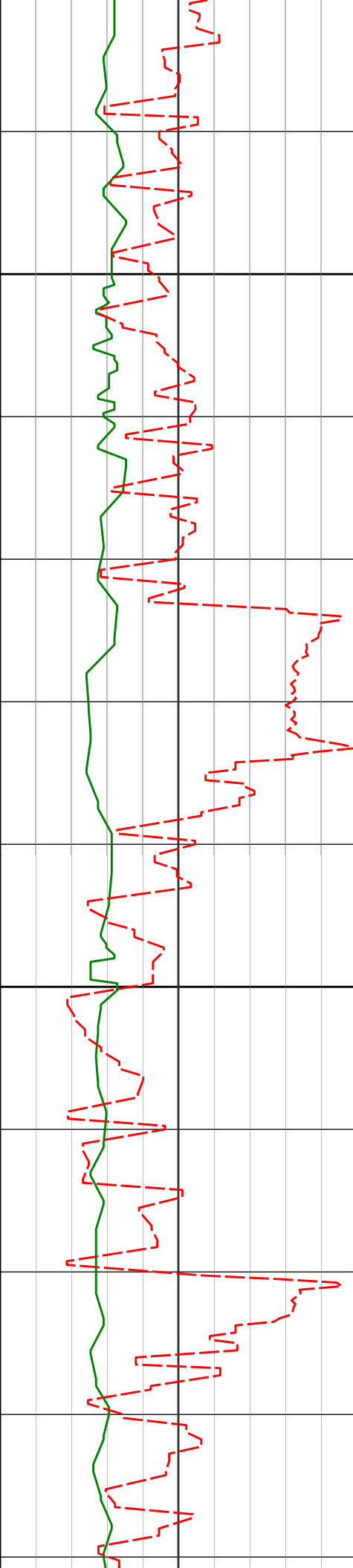
2300

2301'

8.92°

316.51° 2297.53'

15.25'



2400

2500

2394'

8.24°

313.05° 2389.49'

25.58'

2486'

8.81°

306.98° 2480.47'

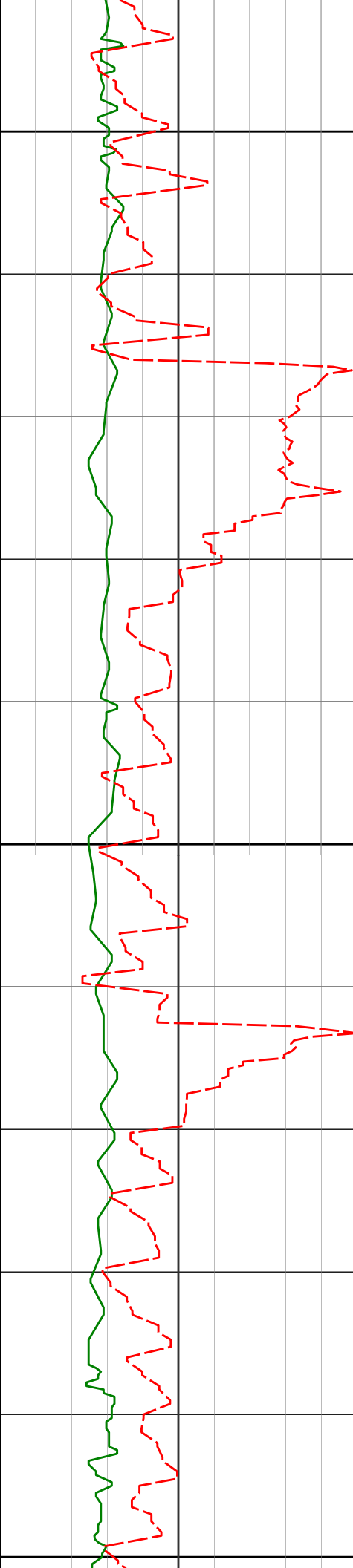
34.89'

2580'

9.44°

305.35° 2573.28'

44.35'



2600

2672'

10.12°

295.69° 2663.95'

52.96'

2700

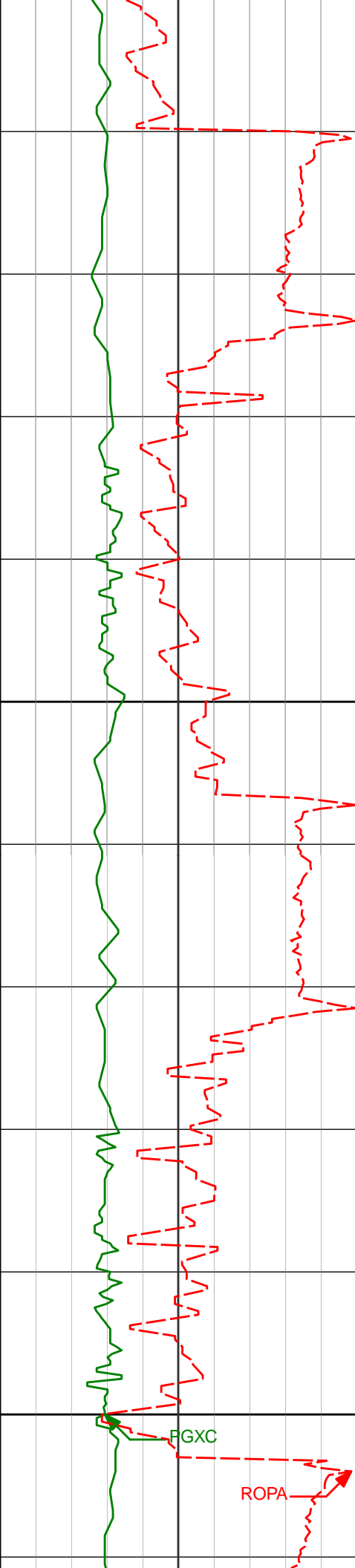
2763'

10.45°

294.22° 2753.49'

60.63'

2800



2900

3000

2857'

8.67°

281.29° 2846.19'

66.34'

2952'

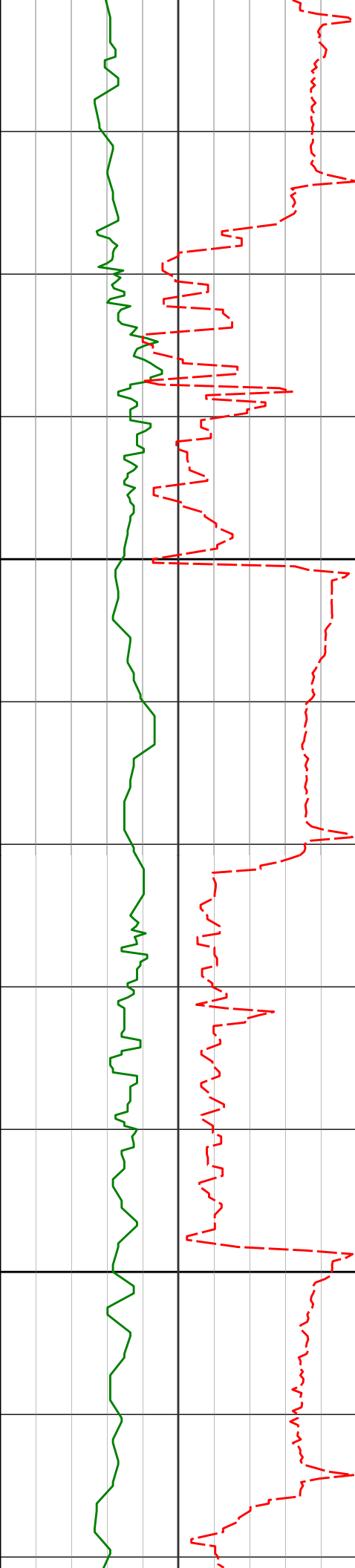
8.28°

277.54° 2940.15'

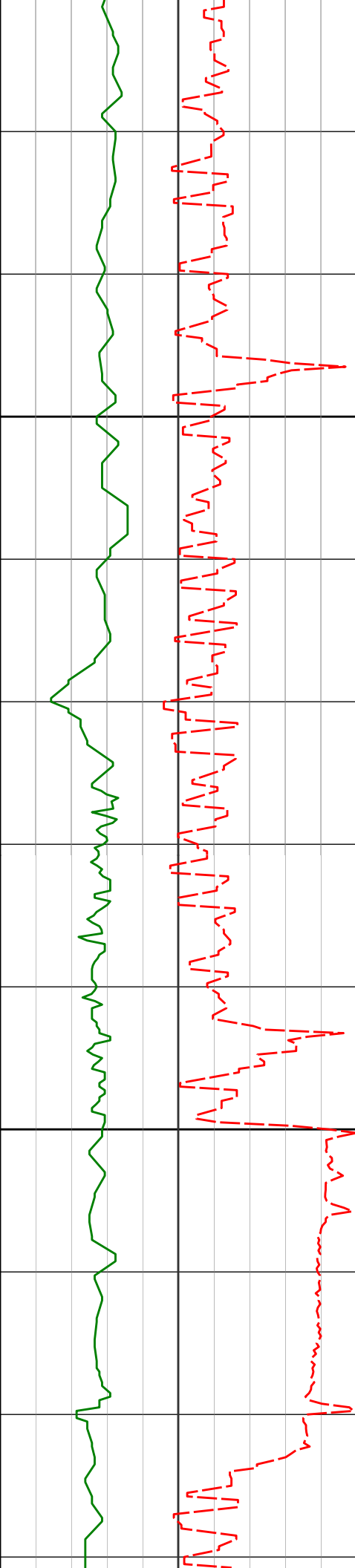
69.41'

PGXC

ROPA



3047'	5.06°	267.59°	3034.50'	70.75'
3100				
3141'	2.00°	205.84°	3128.34'	69.37'
3200				
3236'	3.60°	172.39°	3223.23'	64.94'



3300

3330'

4.08°

167.22° 3317.01'

58.70'

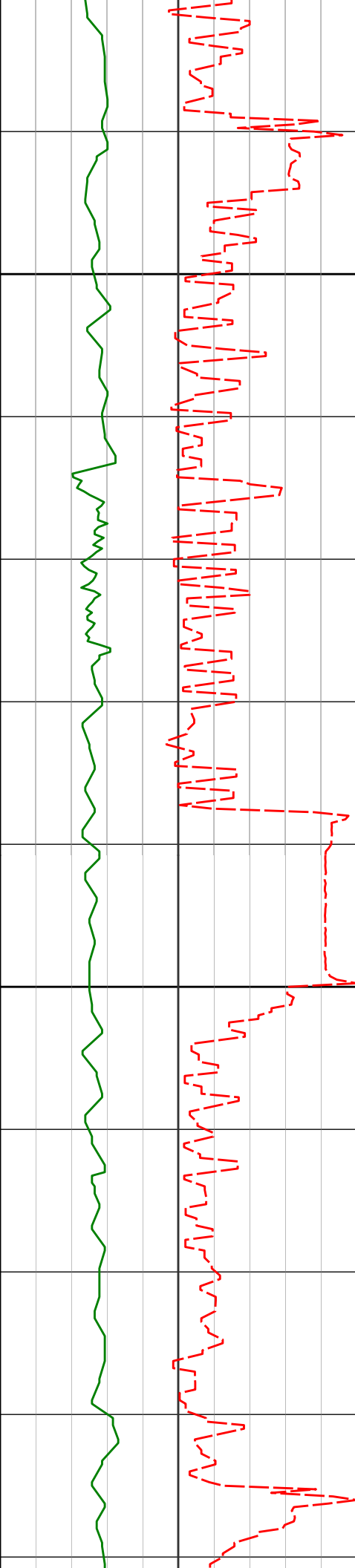
3400

3425'

3.92°

151.60° 3411.79'

52.43'



3500

3520'

4.16°

136.28° 3506.55'

46.87'

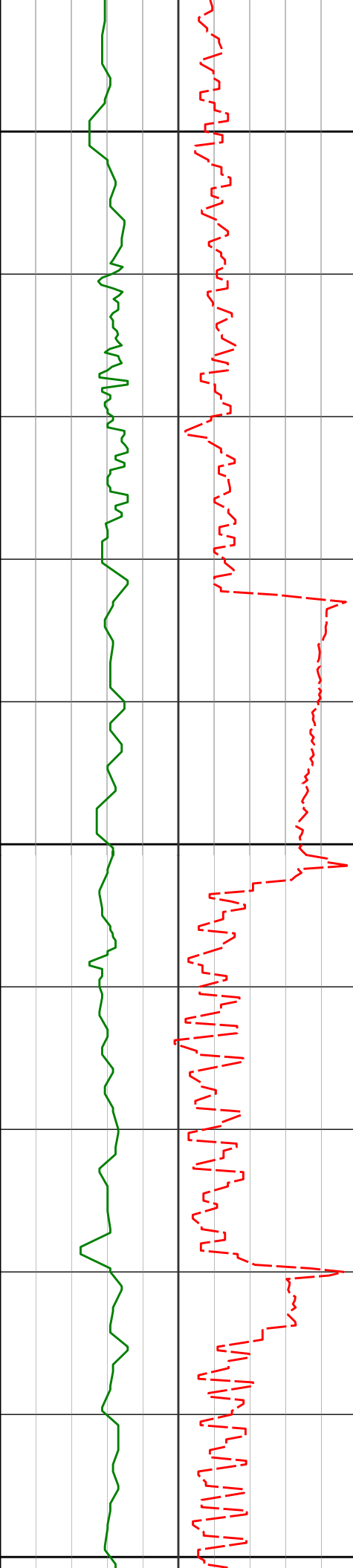
3600

3615'

3.38°

114.57° 3601.35'

42.94'



3700

3710'

3.54°

110.15° 3696.18'

40.47'

3800

3804'

3.10°

47.07° 3790.05'

40.94'

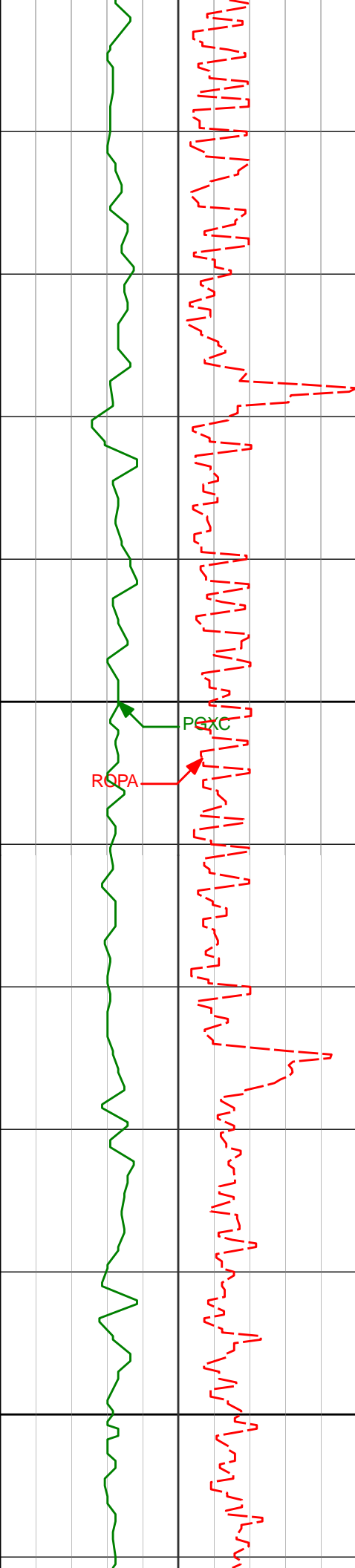
3900

3899'

2.36°

48.15° 3884.94'

43.80'



4000

3994'

2.28°

36.59° 3979.86'

46.47'

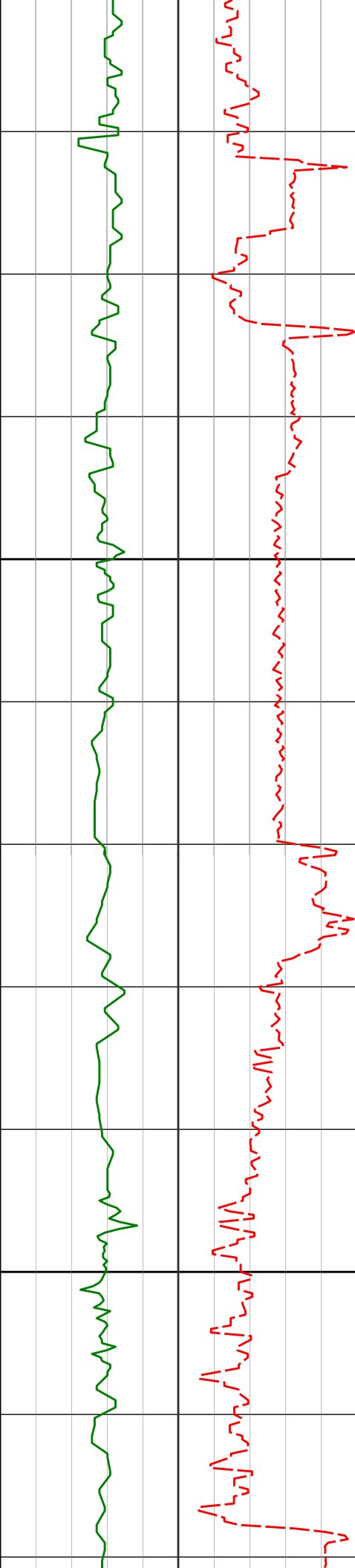
4100

4089'

1.79°

26.51° 4074.80'

49.21'



4200

4300

4184'

2.11°

23.91° 4169.75'

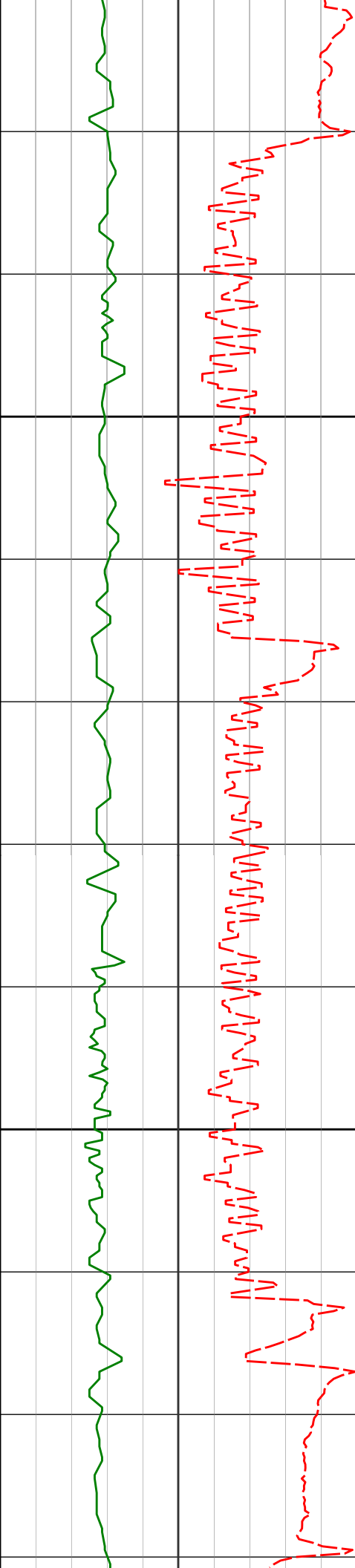
52.06'

4279'

2.33°

20.83° 4264.68'

55.38'



4400

4500

4374'

1.49°

26.94° 4359.62'

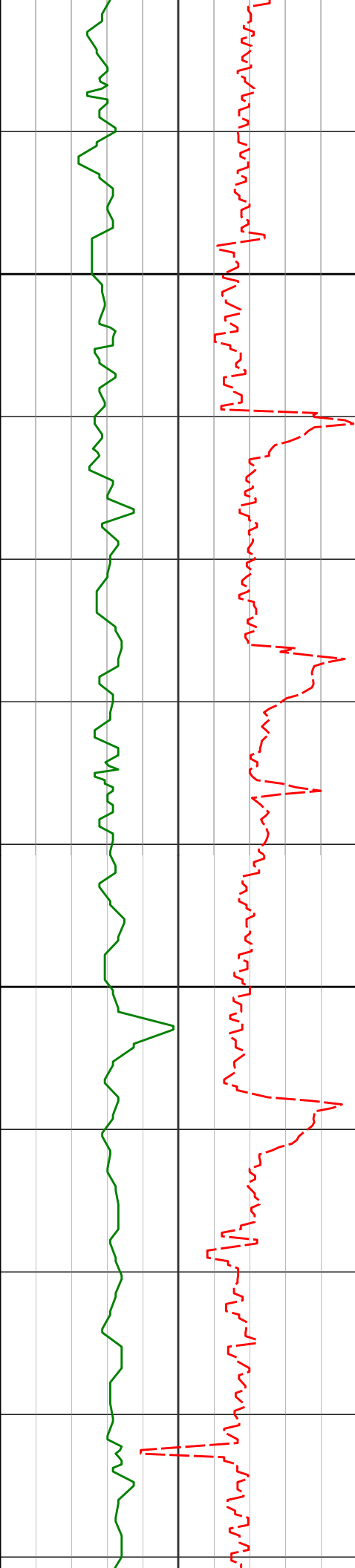
58.22'

4469'

1.91°

35.57° 4454.58'

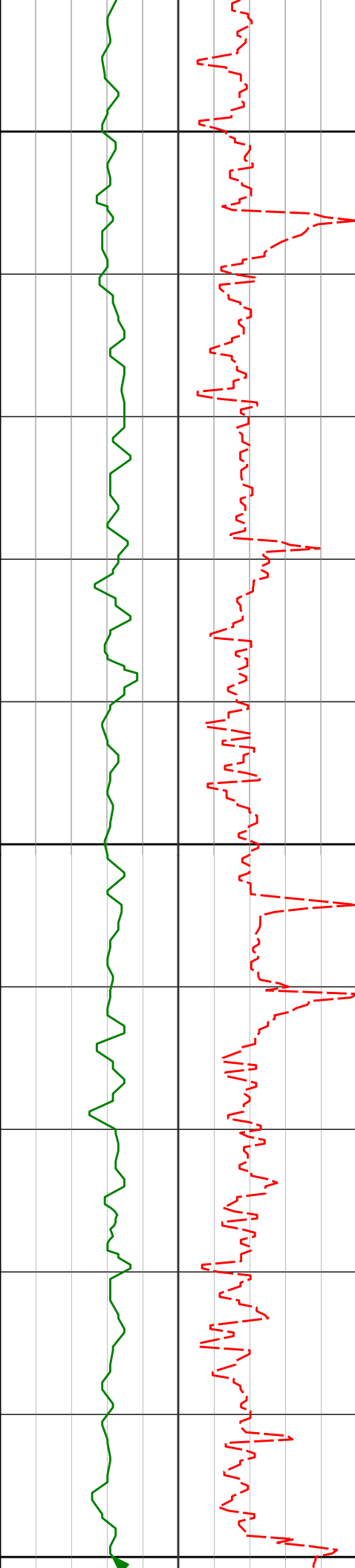
60.53'



4600

4700

4564'	1.97°	331.01°	4549.54'	63.24'
4659'	1.50°	353.96°	4644.49'	65.95'
4754'	0.83°	6.30°	4739.47'	67.88'



4800

4849'

0.49°

4.33° 4834.47'

68.96'

4900

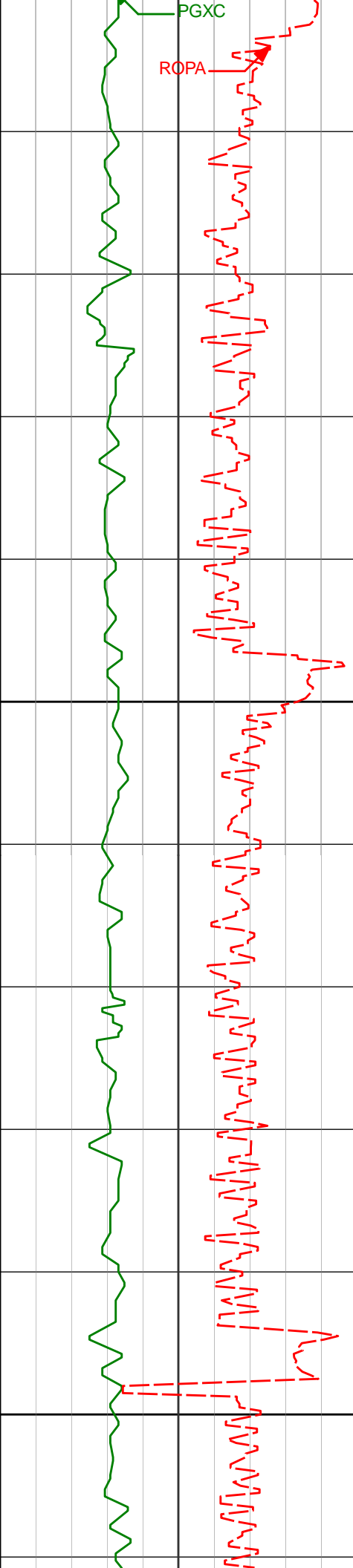
4944'

0.25°

342.92° 4929.46'

69.56'

5000



5039'

0.09°

294.44° 5024.46' 69.79'

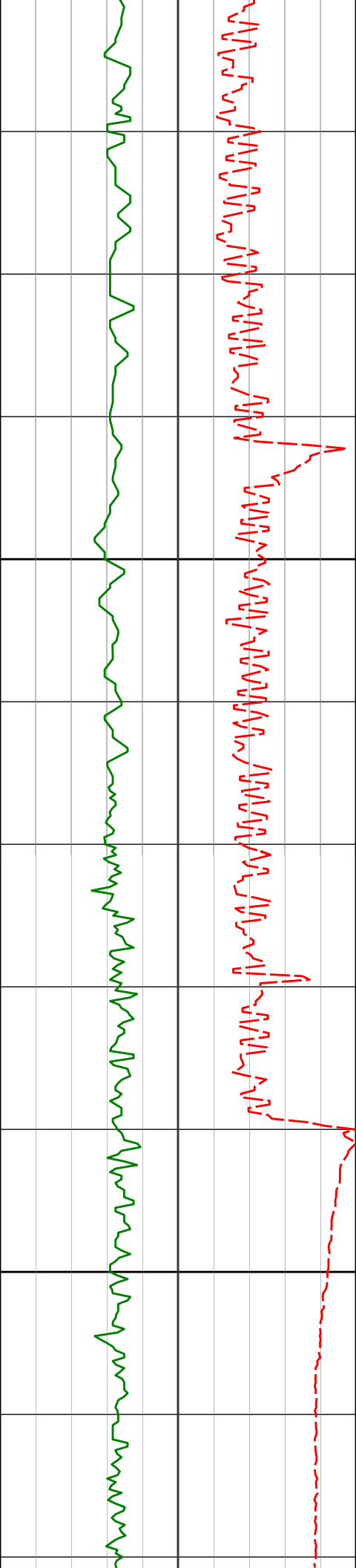
5100

5134'

0.19°

199.51° 5119.46' 69.68'

5200



5300

5400

5229'

0.57°

213.25° 5214.46'

69.15'

5324'

0.39°

164.26° 5309.46'

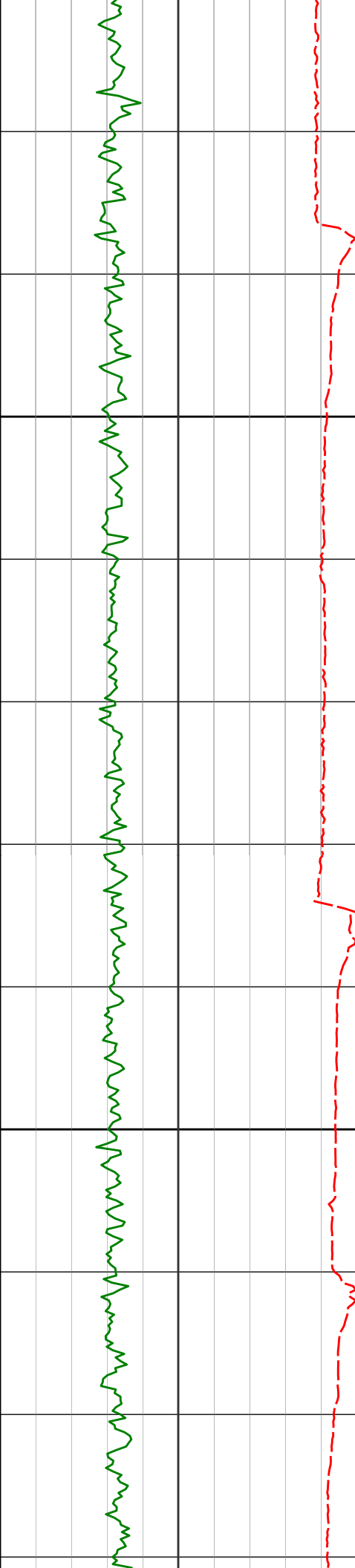
68.46'

5419'

3.99°

6.70° 5404.39'

71.40'



5500

5514'

11.73°

358.77° 5498.43'

84.33'

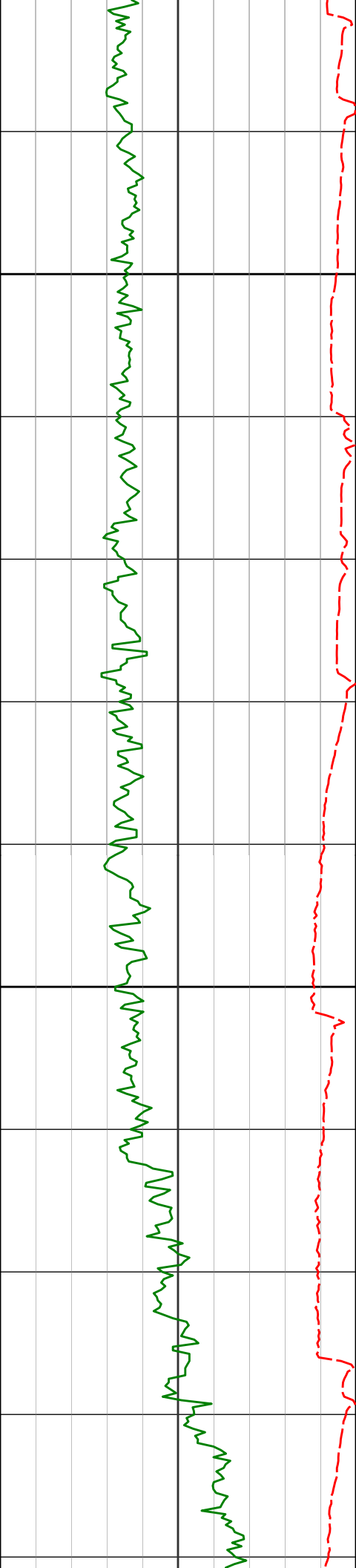
5600

5608'

17.81°

355.87° 5589.28'

108.27'



5700

5703'

22.81°

359.79° 5678.35'

141.20'

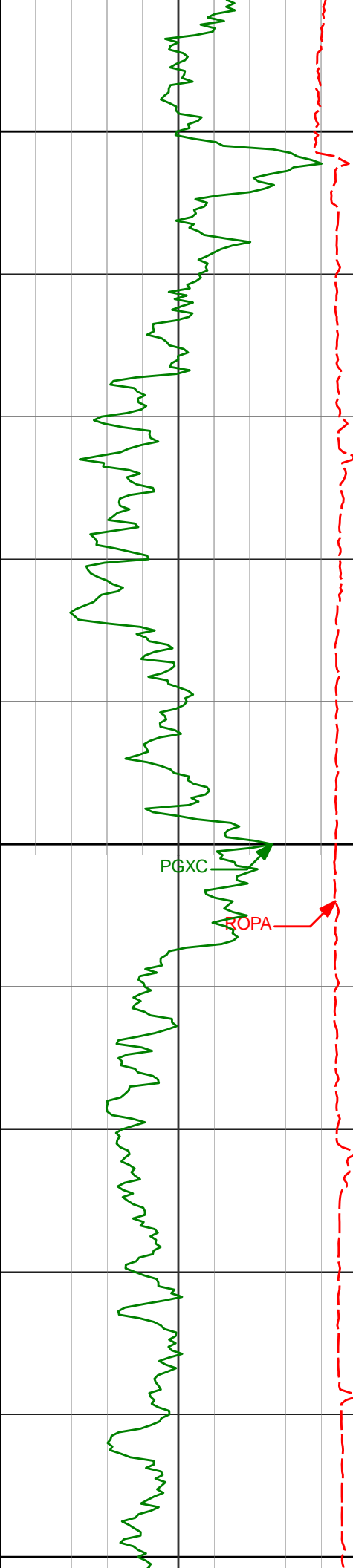
5800

5798'

27.25°

4.38° 5764.42'

181.17'



Run 200

5893'

32.65°

6.73° 5846.71'

228.00'

5900

5988'

45.12°

356.93° 5920.58'

287.19'

6000

PGXC

ROPA

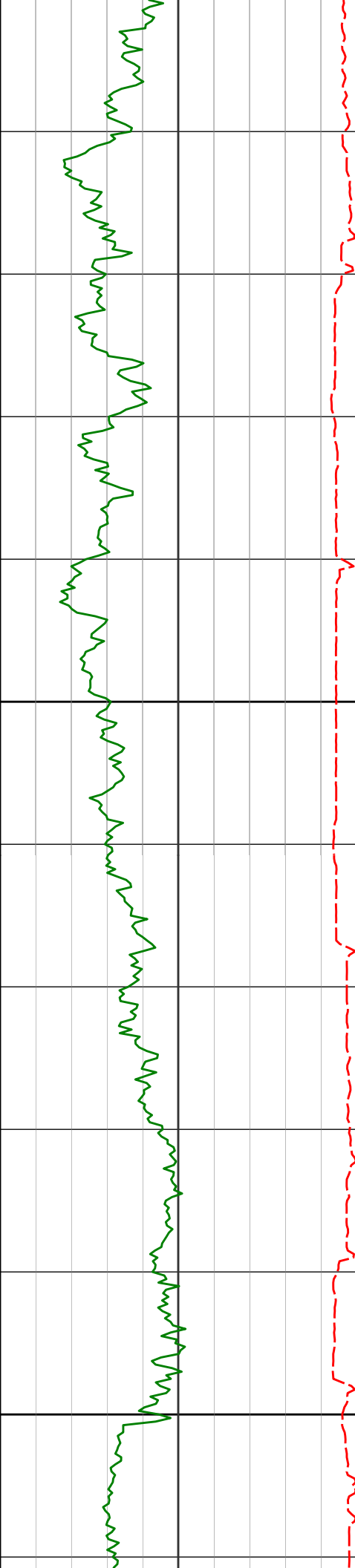
6083'

65.89°

354.43° 5974.09'

365.03'

6100



6200

6300

6178'

74.18°

355.83° 6006.50'

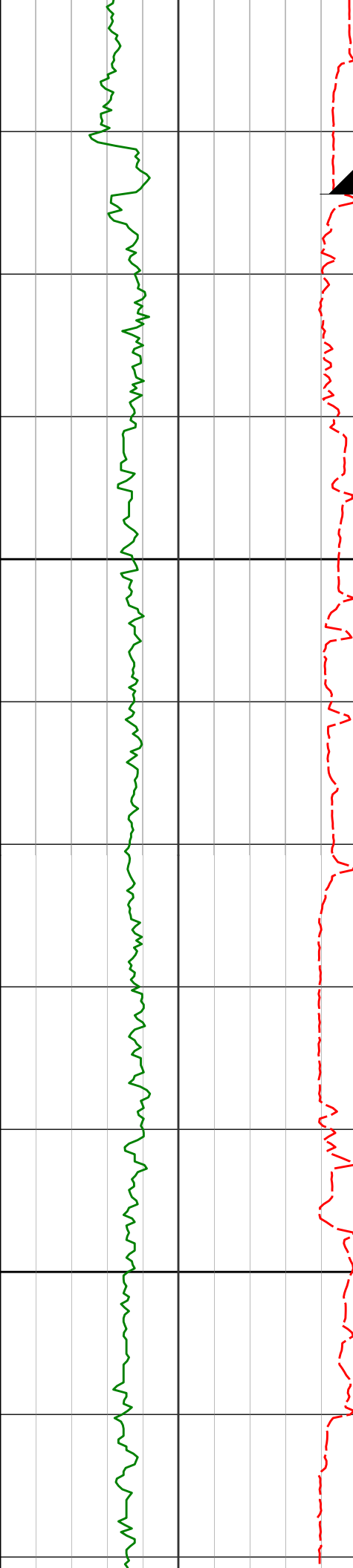
454.20'

6294'

81.50°

356.13° 6030.92'

567.51'



CSG
Run 300

Casing Shoe @ 596' MD

6400

6415'

87.29°

357.90° 6042.74'

687.88'

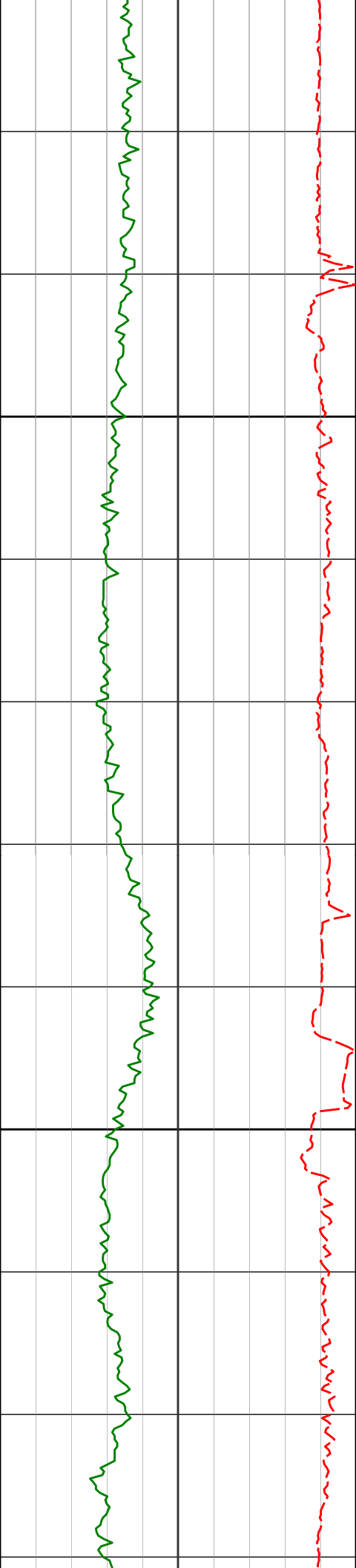
6500

6508'

89.41°

357.91° 6045.41'

780.81'



6600

6600'

89.88°

358.51° 6045.98'

872.78'

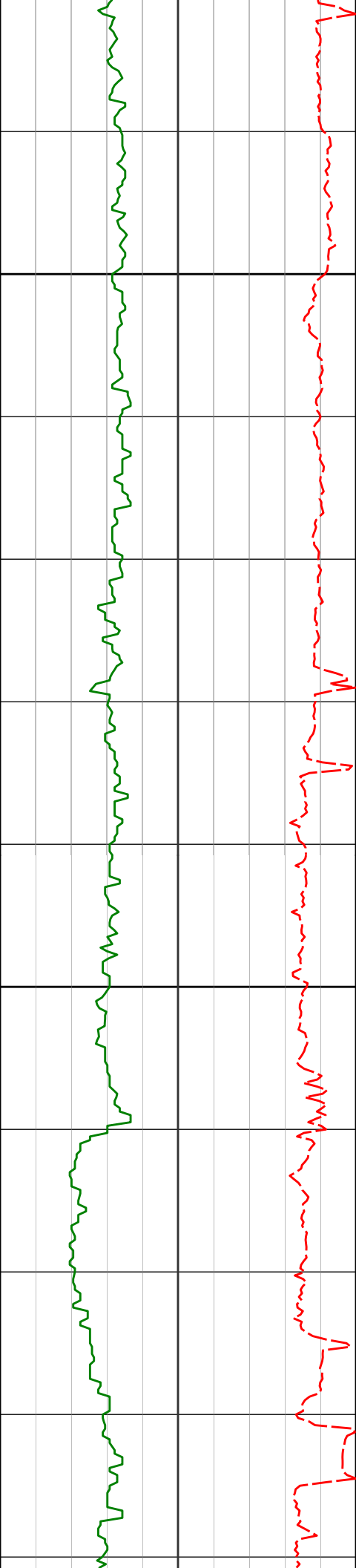
6700

6693'

90.22°

359.19° 6045.91'

965.72'

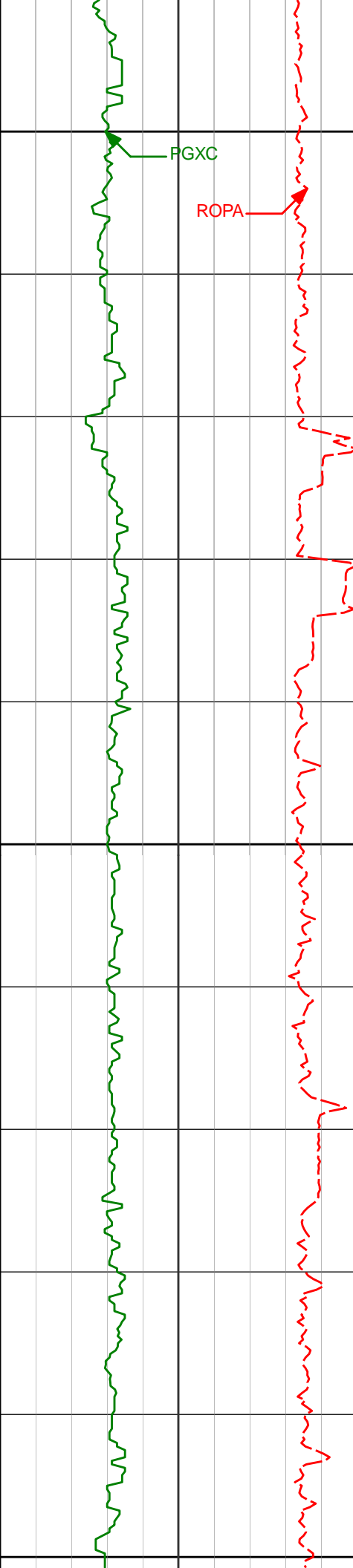


6800

6900

Run 200

6785'	90.59°	359.49°	6045.26'	1057.63'
6879'	89.91°	358.40°	6044.86'	1151.56'
6971'	91.54°	358.27°	6043.70'	1243.51'



7000

PGXC

ROPA

7100

7200

7062'

90.71°

358.80° 6041.91'

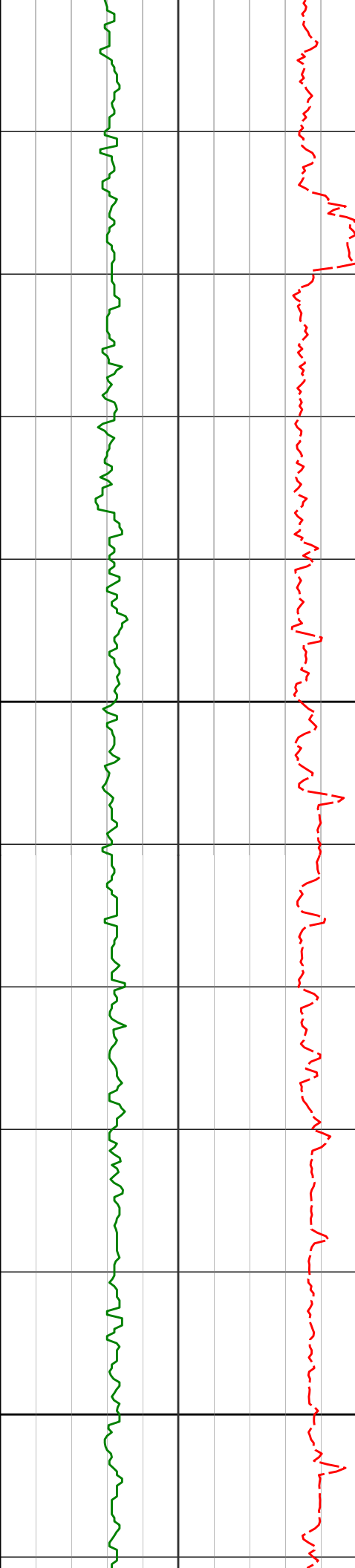
1334.45'

7156'

89.94°

356.95° 6041.38'

1428.42'



7248'

90.96°

356.75° 6040.66'

1520.42'

7300

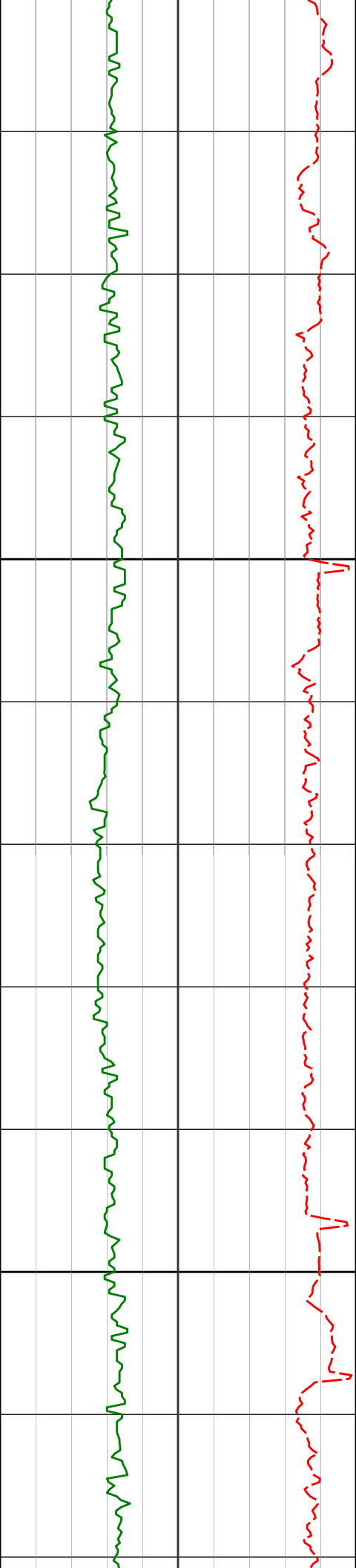
7341'

90.46°

357.32° 6039.51'

1613.41'

7400



7433'

90.28°

356.86° 6038.92'

1705.41'

7500

7526'

90.28°

356.18° 6038.46'

1798.41'

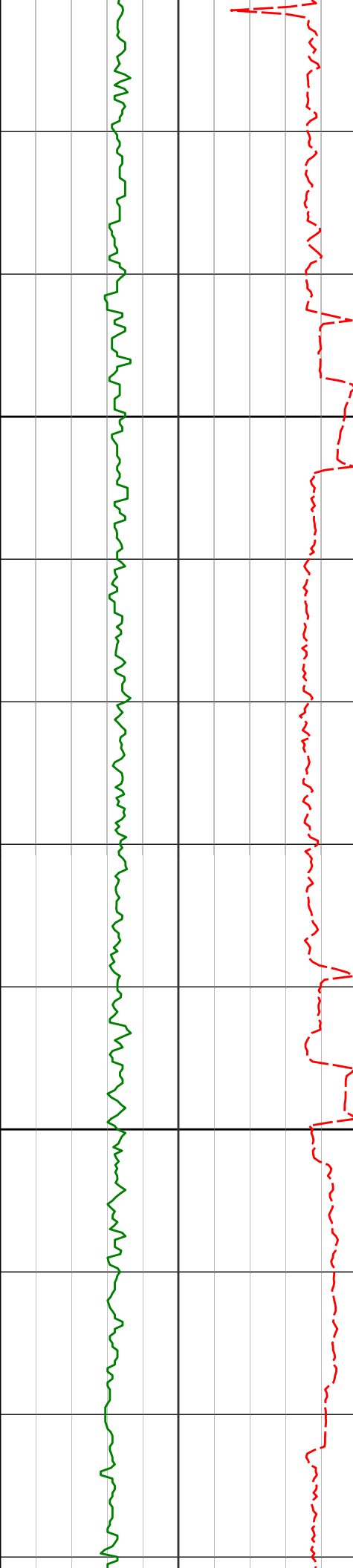
7600

7618'

89.57°

356.32° 6038.59'

1890.40'



7700

7711'

90.31°

356.42° 6038.69'

1983.40'

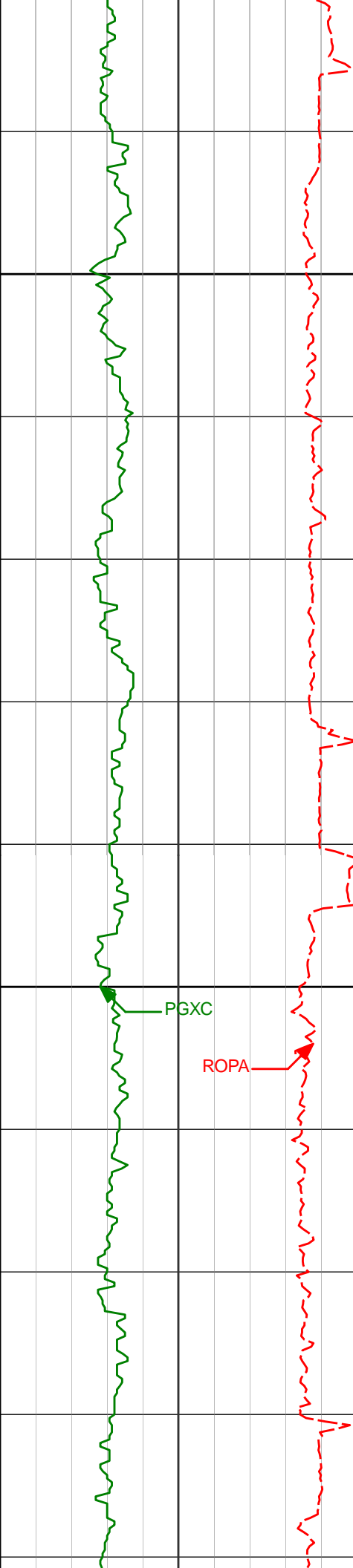
7800

7804'

90.74°

357.26° 6037.84'

2076.39'

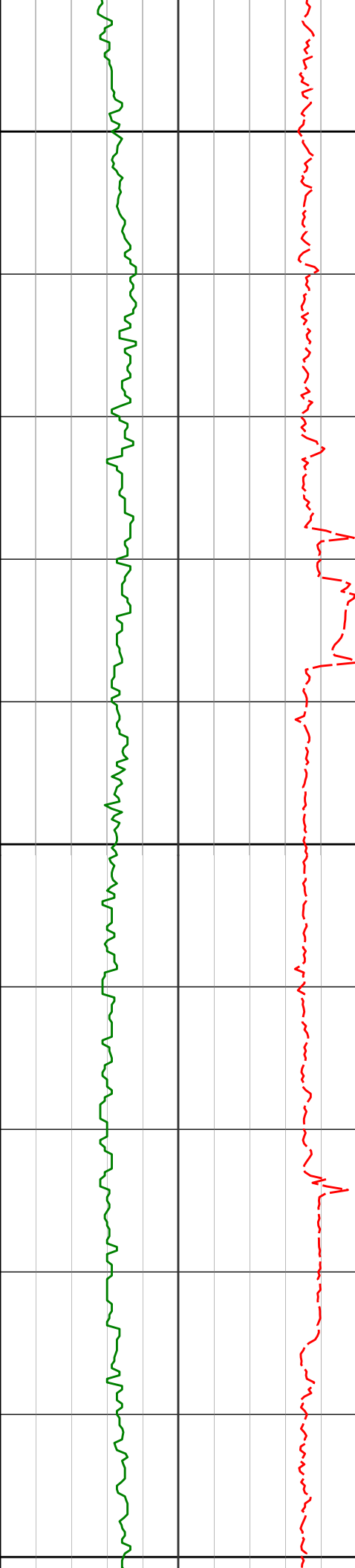


7900

8000

7895' 90.46° 357.06° 6036.88' 2167.39'

7990' 90.68° 357.72° 6035.94' 2262.38'



8100

8200

8300

8084'

90.15°

357.63° 6035.26'

2356.36'

8179'

90.62°

358.53° 6034.62'

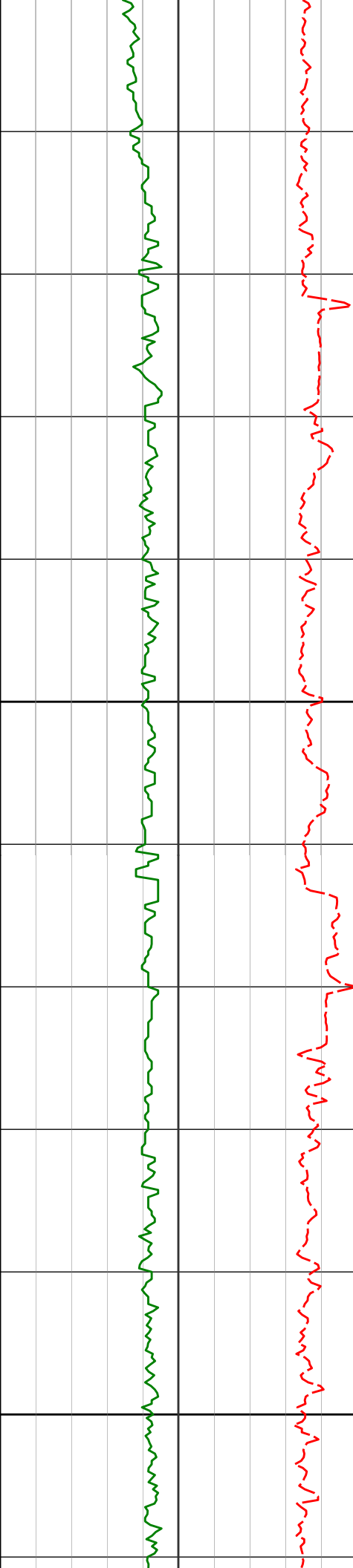
2451.33'

8275'

90.65°

358.27° 6033.56'

2547.29'



8400

8500

8370'

90.89°

359.80° 6032.28'

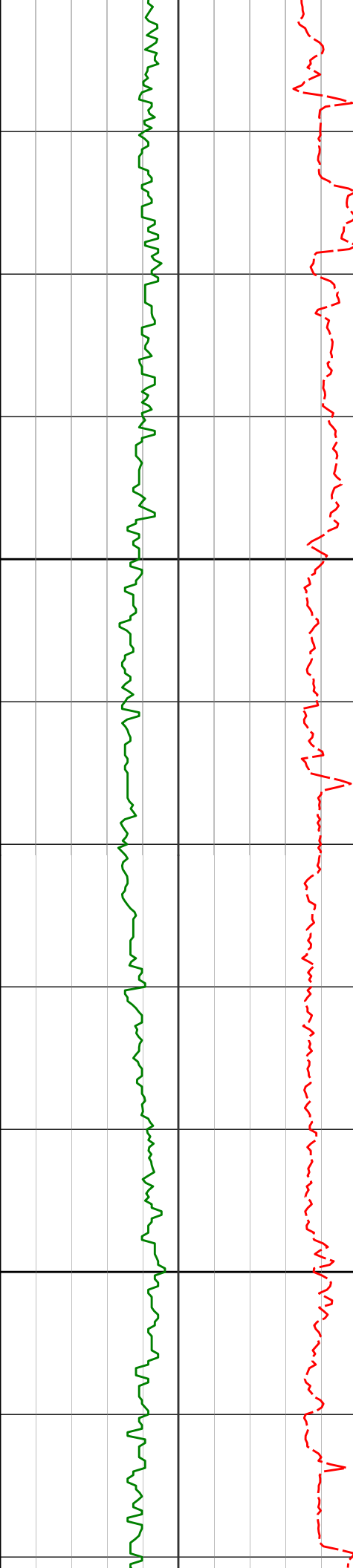
2642.20'

8465'

89.60°

358.17° 6031.87'

2737.13'



8600

8700

8560'

90.80°

0.08° 6031.54'

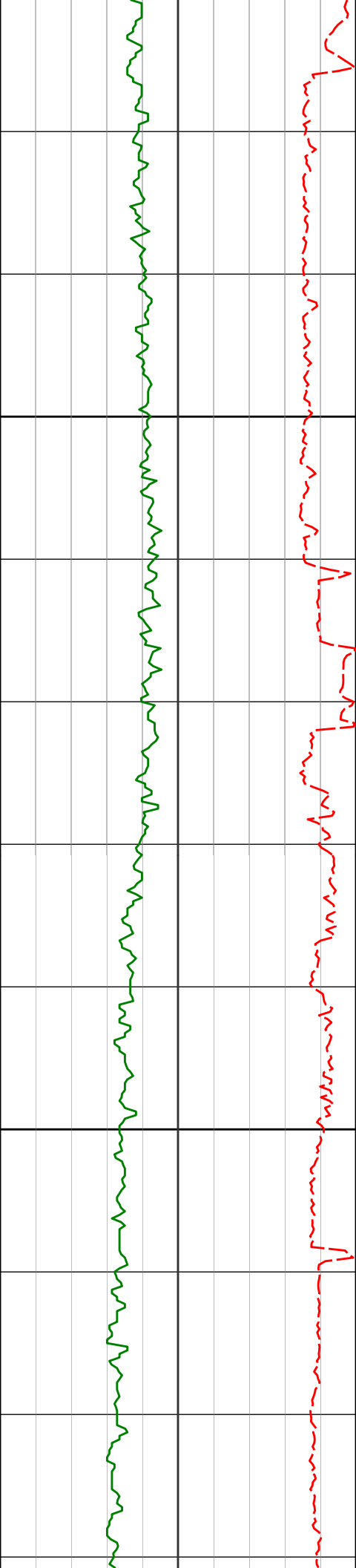
2832.04'

8655'

89.41°

358.47° 6031.36'

2926.94'



8750'

90.34°

357.16° 6031.57'

3021.92'

8800

8845'

91.14°

357.34° 6030.34'

3116.91'

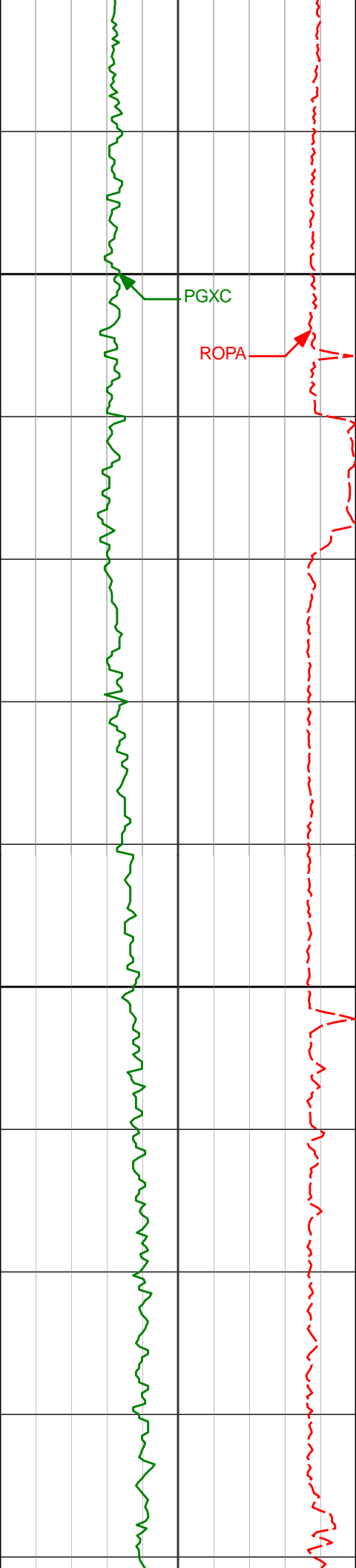
8900

8939'

90.03°

356.51° 6029.38'

3210.90'



9000

9034'

91.26°

356.62° 6028.31'

3305.89'

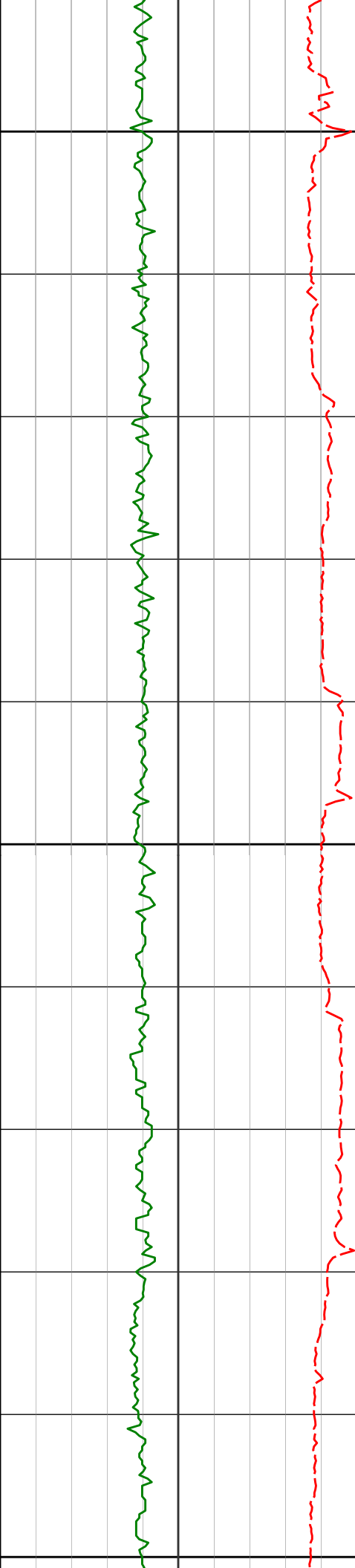
9100

9129'

90.89°

356.85° 6026.52'

3400.88'



9200

9223'

89.45°

354.90° 6026.24'

3494.86'

9300

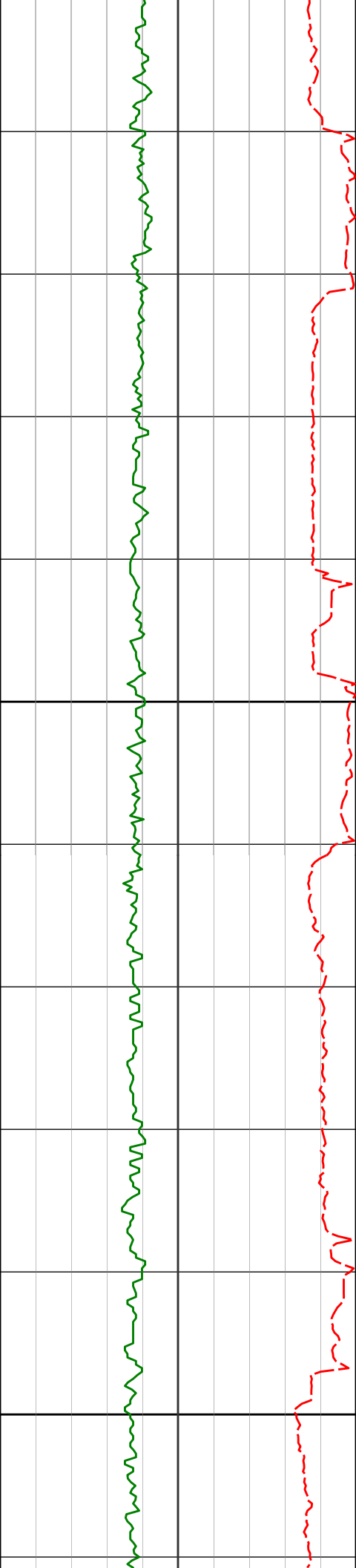
9319'

89.85°

353.73° 6026.83'

3590.77'

9400



9500

9600

9413'

89.26°

352.97° 6027.57'

3684.60'

9508'

91.39°

354.79° 6027.03'

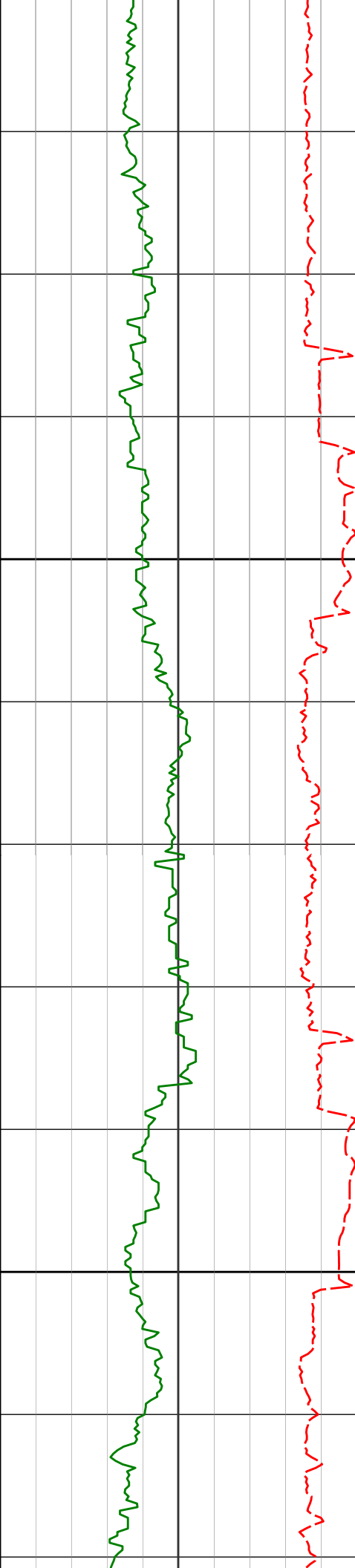
3779.46'

9604'

90.52°

355.70° 6025.43'

3875.41'



9700

9699'

90.80°

355.96° 6024.33'

3970.39'

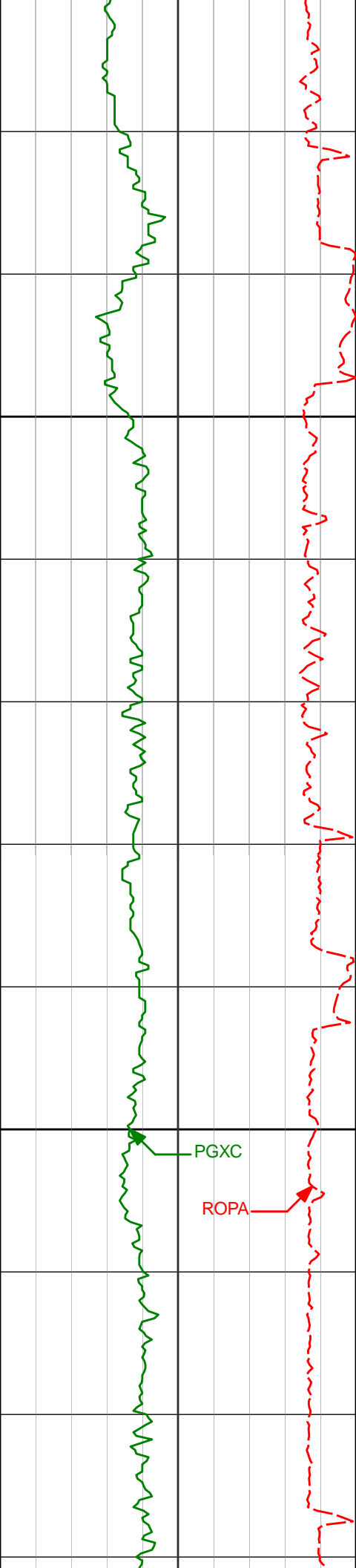
9800

9794'

92.07°

357.55° 6021.96'

4065.36'



9900

10000

9888'

91.51°

358.50° 6019.02'

4159.29'

9984'

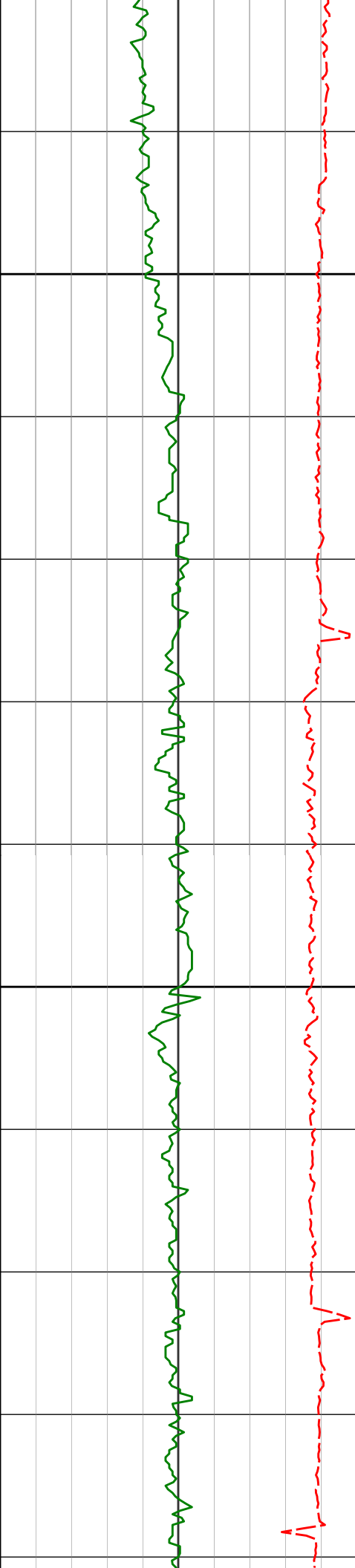
90.68°

359.12° 6017.19'

4255.21'

PGXC

ROPA



10078'

90.43°

358.95° 6016.28'

4349.13'

10100

10174'

90.31°

358.65° 6015.66'

4445.07'

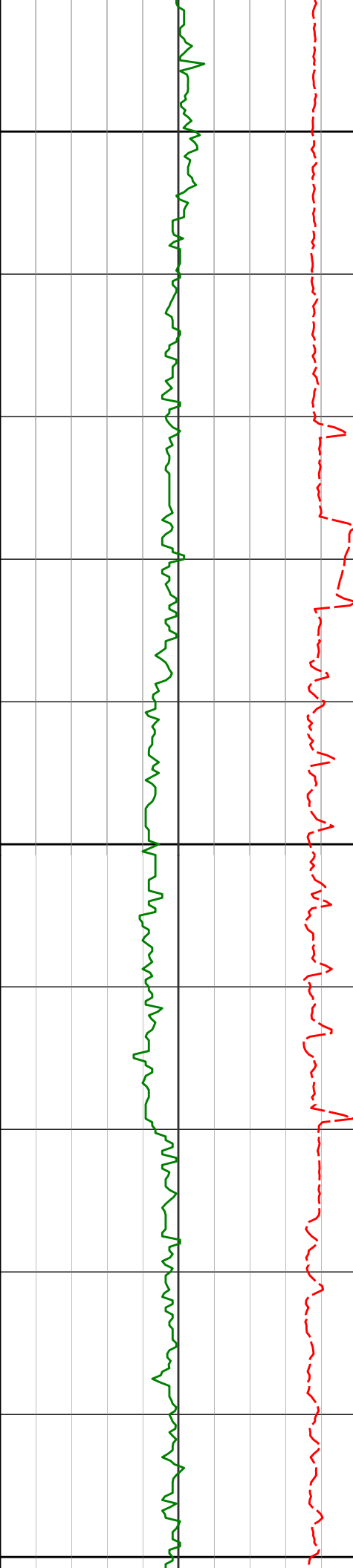
10200

10268'

89.94°

358.21° 6015.46'

4539.03'



10300

10364'

90.62°

358.99° 6014.99'

4634.98'

10400

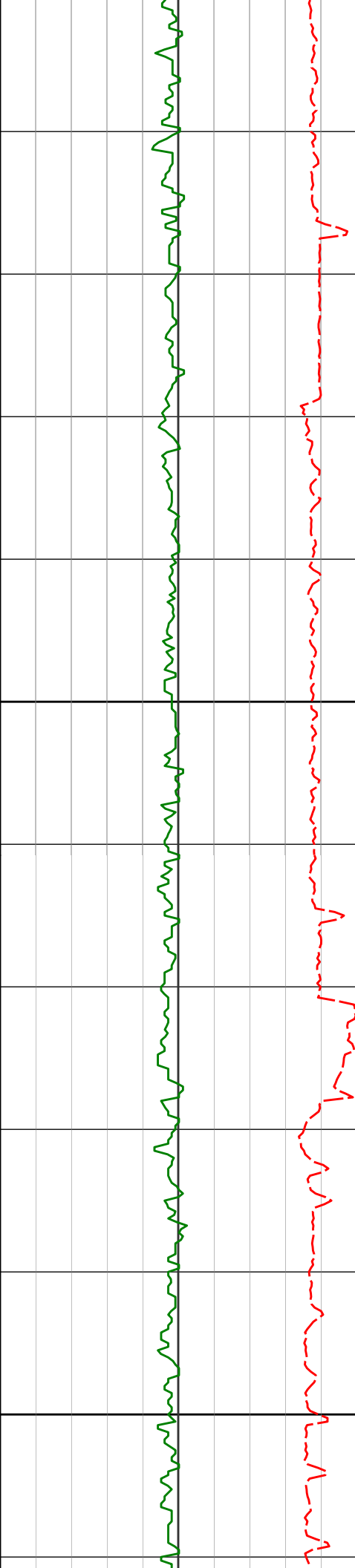
10458'

90.83°

0.18° 6013.80'

4728.86'

10500



10600

10700

10553'

91.17°

1.38° 6012.14'

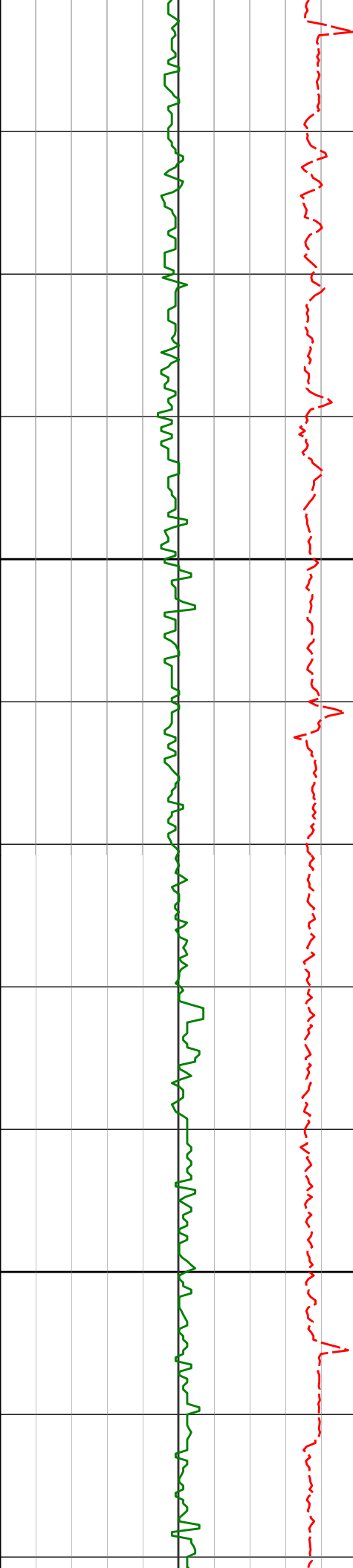
4823.61'

10648'

90.28°

1.41° 6010.94'

4918.29'



10800

10900

10743'

90.71°

2.08° 6010.12'

5012.93'

10839'

90.25°

1.07° 6009.32'

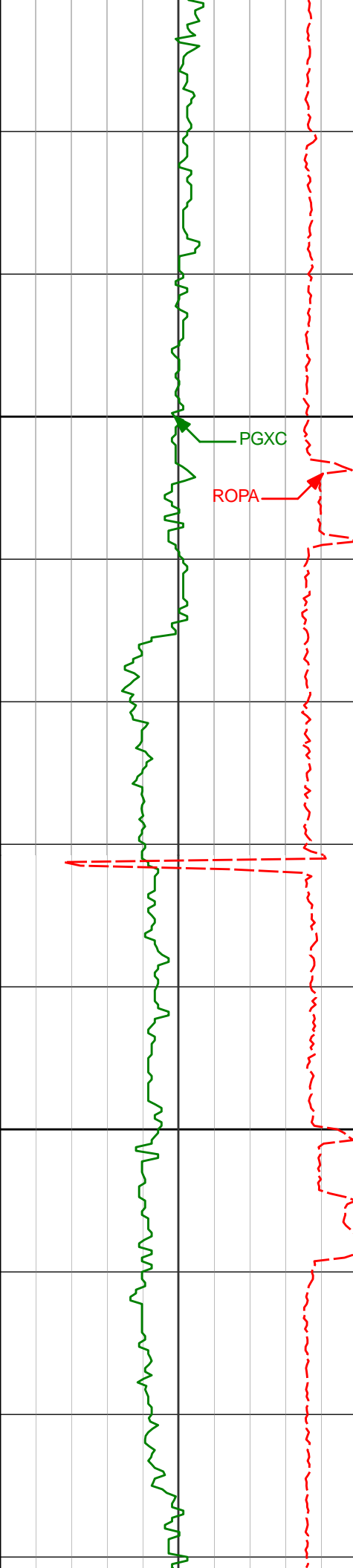
5108.58'

10934'

90.86°

1.96° 6008.40'

5203.25'



11000

11029'

90.34°

0.62° 6007.41'

5297.95'

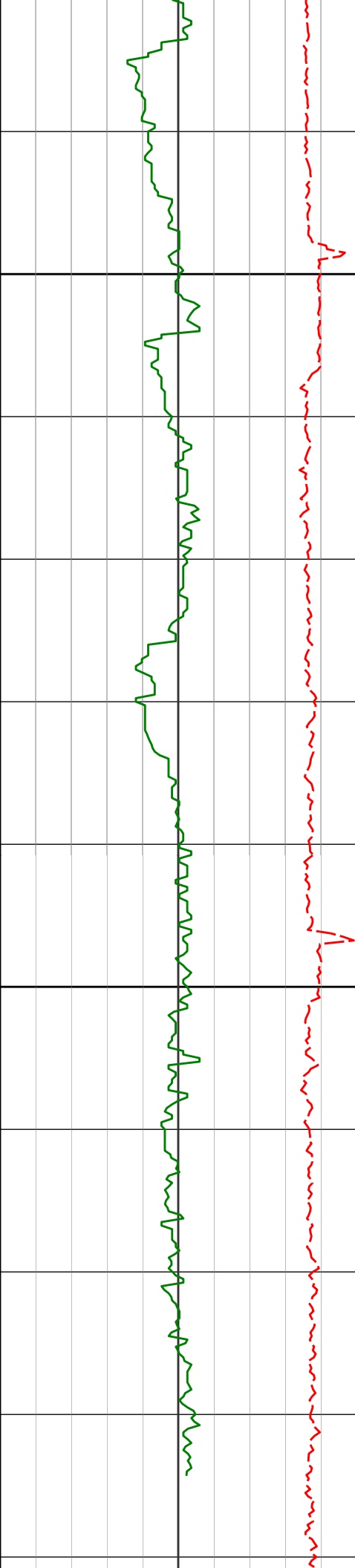
11100

11124'

89.29°

0.02° 6007.71'

5392.77'



11200

11219'

88.80°

359.82° 6009.30'

5487.61'

11300

11314'

88.00°

359.30° 6011.95'

5582.46'

11357'

87.53°

359.57° 6013.63'

5625.38'

3236.00	3.60	172.39	3223.23	56.66 N	148.61 W	64.94	2.34
3330.00	4.08	167.22	3317.01	50.47 N	147.48 W	58.70	0.62
3425.00	3.92	151.60	3411.79	44.32 N	145.19 W	52.43	1.15
3520.00	4.16	136.28	3506.55	38.98 N	141.26 W	46.87	1.16
3615.00	3.38	114.57	3601.35	35.32 N	136.33 W	42.94	1.70
3710.00	3.54	110.15	3696.18	33.14 N	131.03 W	40.47	0.33
3804.00	3.10	47.07	3790.05	33.87 N	126.44 W	40.94	3.71
3899.00	2.36	48.15	3884.94	36.92 N	123.10 W	43.80	0.77
3994.00	2.28	36.59	3979.86	39.75 N	120.52 W	46.47	0.50
4089.00	1.79	26.51	4074.80	42.59 N	118.73 W	49.21	0.64
4184.00	2.11	23.91	4169.75	45.52 N	117.36 W	52.06	0.35
4279.00	2.33	20.83	4264.68	48.93 N	115.96 W	55.38	0.26
4374.00	1.49	26.94	4359.62	51.84 N	114.71 W	58.22	0.90
4469.00	1.91	35.57	4454.58	54.23 N	113.23 W	60.53	0.51
4564.00	1.97	331.01	4549.54	56.95 N	113.10 W	63.24	2.19
4659.00	1.50	353.96	4644.49	59.62 N	114.02 W	65.95	0.88
4754.00	0.83	6.30	4739.47	61.55 N	114.08 W	67.88	0.75
4849.00	0.49	4.33	4834.47	62.64 N	113.97 W	68.96	0.37
4944.00	0.25	342.92	4929.46	63.24 N	114.00 W	69.56	0.29
5039.00	0.09	294.44	5024.46	63.46 N	114.13 W	69.79	0.21
5134.00	0.19	199.51	5119.46	63.34 N	114.25 W	69.68	0.23
5229.00	0.57	213.25	5214.46	62.79 N	114.56 W	69.15	0.40
5324.00	0.39	164.26	5309.46	62.09 N	114.73 W	68.46	0.45
5419.00	3.99	6.70	5404.39	65.07 N	114.26 W	71.40	4.57
5514.00	11.73	358.77	5498.43	78.02 N	114.08 W	84.33	8.21
5608.00	17.81	355.87	5589.28	101.93 N	115.32 W	108.27	6.51
5703.00	22.81	359.79	5678.35	134.86 N	116.43 W	141.20	5.45
5798.00	27.25	4.38	5764.42	174.98 N	114.84 W	181.17	5.10
5893.00	32.65	6.73	5846.71	222.14 N	110.17 W	228.00	5.82
5988.00	45.12	356.93	5920.58	281.50 N	108.97 W	287.19	14.61
6083.00	65.89	354.43	5974.09	359.12 N	115.05 W	365.03	21.96
6178.00	74.18	355.83	6006.50	448.01 N	122.60 W	454.20	8.84
6294.00	81.50	356.13	6030.92	561.05 N	130.54 W	567.51	6.31
6415.00	87.29	357.90	6042.74	681.25 N	136.80 W	687.88	5.00
6508.00	89.41	357.91	6045.41	774.14 N	140.21 W	780.81	2.28
6600.00	89.88	358.51	6045.98	866.10 N	143.09 W	872.78	0.82
6693.00	90.22	359.19	6045.91	959.08 N	144.95 W	965.72	0.82
6785.00	90.59	359.49	6045.26	1051.07 N	146.01 W	1057.63	0.51
6879.00	89.91	358.40	6044.86	1145.05 N	147.75 W	1151.56	1.36
6971.00	91.54	358.27	6043.70	1237.00 N	150.41 W	1243.51	1.78
7062.00	90.71	358.80	6041.91	1327.95 N	152.74 W	1334.45	1.08
7156.00	89.94	356.95	6041.38	1421.88 N	156.22 W	1428.42	2.13
7248.00	90.96	356.75	6040.66	1513.74 N	161.28 W	1520.42	1.13
7341.00	90.46	357.32	6039.51	1606.61 N	166.09 W	1613.41	0.82
7433.00	90.28	356.86	6038.92	1698.49 N	170.75 W	1705.41	0.54
7526.00	90.28	356.18	6038.46	1791.31 N	176.40 W	1798.41	0.73
7618.00	89.57	356.32	6038.59	1883.11 N	182.41 W	1890.40	0.79
7711.00	90.31	356.42	6038.69	1975.93 N	188.29 W	1983.40	0.80
7804.00	90.74	357.26	6037.84	2068.78 N	193.41 W	2076.39	1.02
7895.00	90.46	357.06	6036.88	2159.67 N	197.92 W	2167.39	0.38
7990.00	90.68	357.72	6035.94	2254.56 N	202.25 W	2262.38	0.73
8084.00	90.15	357.63	6035.26	2348.48 N	206.06 W	2356.36	0.56
8179.00	90.62	358.53	6034.62	2443.42 N	209.24 W	2451.33	1.06
8275.00	90.65	358.27	6033.56	2539.38 N	211.93 W	2547.29	0.27
8370.00	90.89	359.80	6032.28	2634.36 N	213.53 W	2642.20	1.63
8465.00	89.60	358.17	6031.87	2729.33 N	215.21 W	2737.13	2.19
8560.00	90.80	0.08	6031.54	2824.32 N	216.66 W	2832.04	2.38
8655.00	89.41	358.47	6031.36	2919.30 N	217.86 W	2926.94	2.24
8750.00	90.34	357.16	6031.57	3014.23 N	221.49 W	3021.92	1.69
8845.00	91.14	357.34	6030.34	3109.11 N	226.04 W	3116.91	0.87
8939.00	90.03	356.51	6029.38	3202.97 N	231.08 W	3210.90	1.48
9034.00	91.26	356.62	6028.31	3297.79 N	236.77 W	3305.89	1.30
9129.00	90.89	356.85	6026.52	3392.62 N	242.17 W	3400.88	0.46
9223.00	89.45	354.90	6026.24	3486.37 N	248.93 W	3494.86	2.58
9319.00	89.85	353.73	6026.83	3581.90 N	258.43 W	3590.77	1.29
9413.00	89.26	352.97	6027.57	3675.26 N	269.32 W	3684.60	1.02
9508.00	91.39	354.79	6027.03	3769.71 N	279.45 W	3779.46	2.94
9604.00	90.52	355.70	6025.43	3865.36 N	287.41 W	3875.41	1.31
9699.00	90.80	355.96	6024.33	3960.10 N	294.32 W	3970.39	0.40
9794.00	92.07	357.55	6021.96	4054.91 N	299.70 W	4065.36	2.14
9888.00	91.51	358.50	6019.02	4148.81 N	302.94 W	4159.29	1.18
9984.00	90.68	359.12	6017.19	4244.77 N	304.93 W	4255.21	1.08
10078.00	90.43	358.95	6016.28	4338.75 N	306.51 W	4349.13	0.32
10174.00	90.31	358.65	6015.66	4434.73 N	308.53 W	4445.07	0.34

10268.00	89.94	358.21	6015.46	4528.70 N	311.10 W	4539.03	0.61
10364.00	90.62	358.99	6014.99	4624.66 N	313.44 W	4634.98	1.07
10458.00	90.83	0.18	6013.80	4718.65 N	314.12 W	4728.86	1.29
10553.00	91.17	1.38	6012.14	4813.63 N	312.83 W	4823.61	1.32
10648.00	90.28	1.41	6010.94	4908.59 N	310.51 W	4918.29	0.94
10743.00	90.71	2.08	6010.12	5003.54 N	307.62 W	5012.93	0.84
10839.00	90.25	1.07	6009.32	5099.50 N	304.99 W	5108.58	1.15
10934.00	90.86	1.96	6008.40	5194.46 N	302.48 W	5203.25	1.14
11029.00	90.34	0.62	6007.41	5289.43 N	300.34 W	5297.95	1.51
11124.00	89.29	0.02	6007.71	5384.43 N	299.80 W	5392.77	1.27
11219.00	88.80	359.82	6009.30	5479.41 N	299.93 W	5487.61	0.56
11314.00	88.00	359.30	6011.95	5574.37 N	300.66 W	5582.46	1.01
11357.00	87.53	359.57	6013.63	5617.34 N	301.08 W	5625.38	1.26
11425.00	87.53	359.57	6016.56	5685.27 N	301.59 W	5693.23	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 356.77 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 11425.00 FEET
IS 5693.27 FEET ALONG 356.96 DEGREES (GRID)**

Final survey is a straight line projection to TD.