



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	01-Aug-15	01-Aug-15	04-Aug-15		
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)	1,135.00	6,145.00	6,290.00		
Log End Depth (MD, ft)	6,145.00	6,290.00	10,640.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	30-Jul-15 23:00	01-Aug-15 05:00	02-Aug-15 12:30		
Drill/Wipe End Date and Time	31-Jul-15 22:45	01-Aug-15 10:45	03-Aug-15 18:00		
Min Inc (deg) @ Depth (MD, ft)	0.14 @ 1,223.00	0.14 @ 1,223.00	89.26 @ 7,877.00		
Max Inc (deg) @ Depth (MD, ft)	61.84 @ 6,012.00	84.60 @ 6,226.00	92.13 @ 9,108.00		
Bit TFA(in2) / Bit Type	0.98 / PDC	0.98 / PDC	0.98 / PDC		
Flow Rate (gpm)	596.14	560.00	301.43		
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)	10.65 / 40.00	10.60 / 29.00	10.20 / 38.00		
Filtrate CL (ppm)	400.00	400.00	1,600.00		
pH / Fluid Loss (mptm)	9.70 / 7	11.00 / 14	9.10 / 19		
PV (cP) / YP (lbf2)	12 / 12.00	3 / 3.00	10 / 10.00		
% Solids / % Sand	4.7 / 0.25	4.7 / .1	9.2 / .2		
% 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) @ Depth (MD, ft)	175.04 / 6,012.00	175.04 / 6,226.00	220.77 / 9,108.00		

Max Tool Temp (degF) / Source	175.21 / PCM	175.21 / PCM	220.77 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Brian Neu	Brian Neu	Brian Neu		
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	11303511	11303511	12361803		
Insert Serial Number	11400870	11400870	11619985		
Date and Time Initialized	29-Jul-15 21:09	29-Jul-15 21:09	01-Aug-15 13:00		
Date and Time Read	01-Aug-15 15:21	01-Aug-15 15:27	04-Aug-15 02:49		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	65.00	64.00	69.00		
Software Version	6.21	6.21	6.33		
Sub Serial Number	11303511	11303511	12361803		
Sonde Serial Number	11478016	11478016	10859920		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	41.80	172.80	113.50		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	58.24	57.27	61.79		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11303511	11303511	12361803		
Insert/Sonde Serial Number	12037418	12037418	11680918		

REMARKS

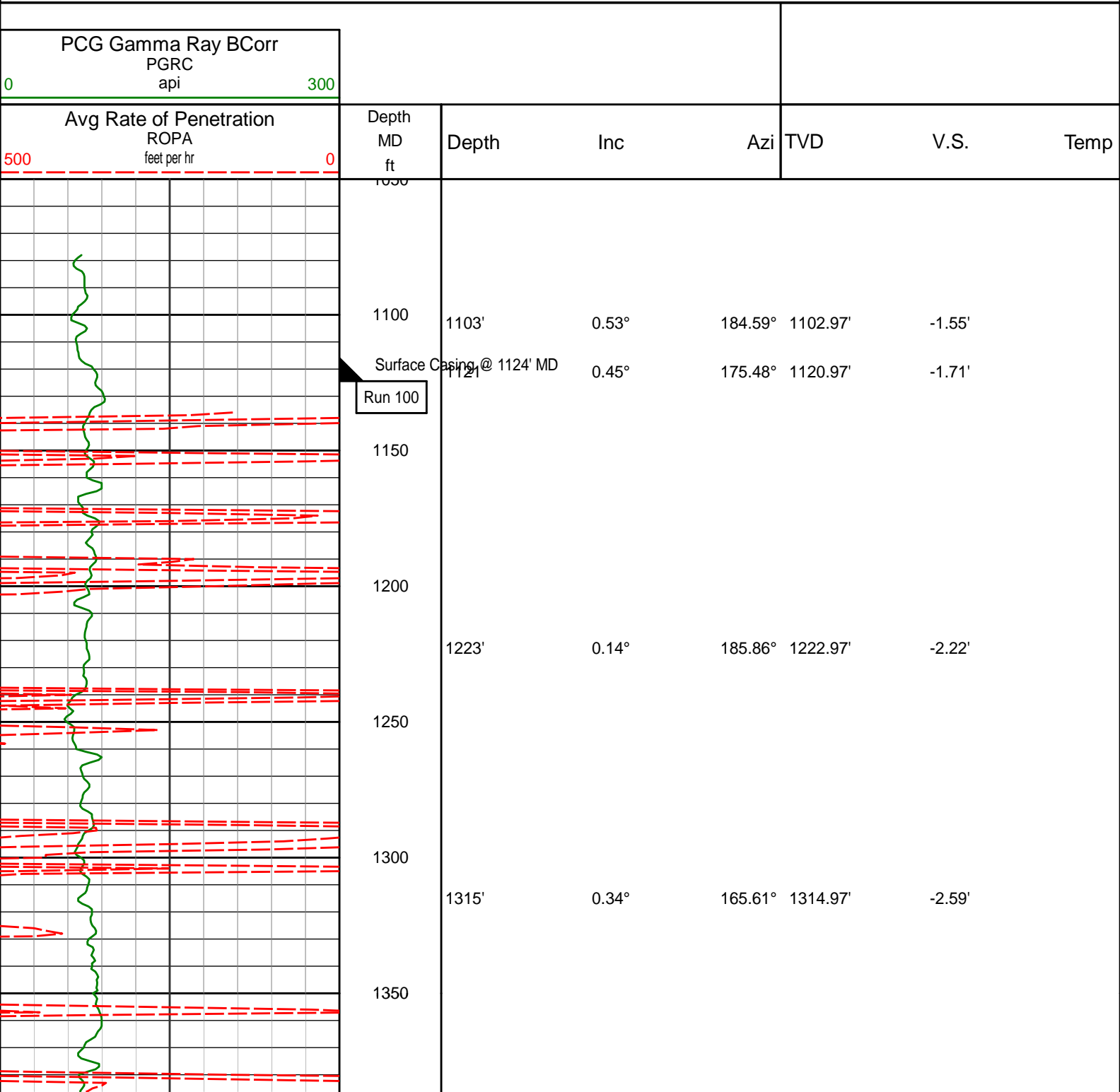
1. All depths are calibrated to driller's pipe tally and are total vertical depth from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Environmental parameters used in gamma and resistance 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)

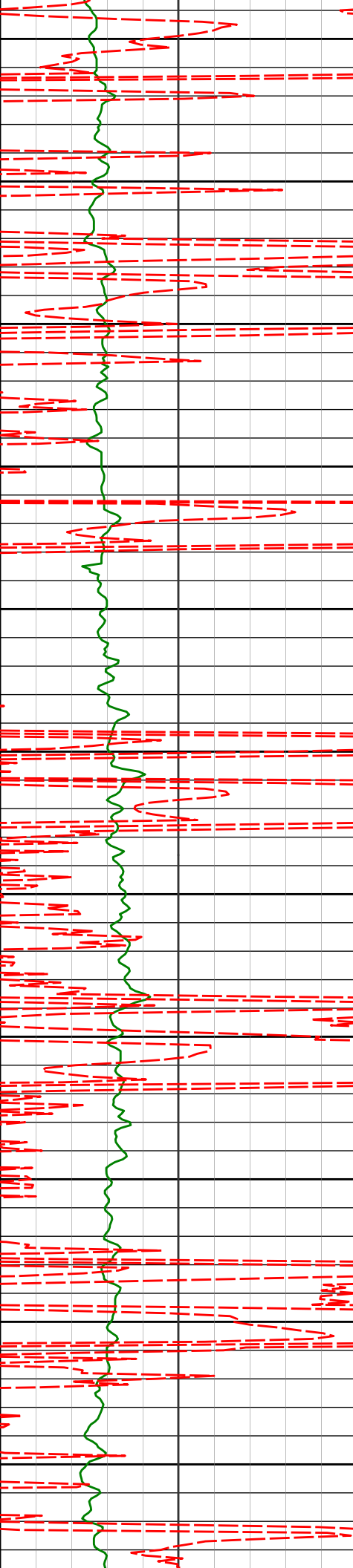
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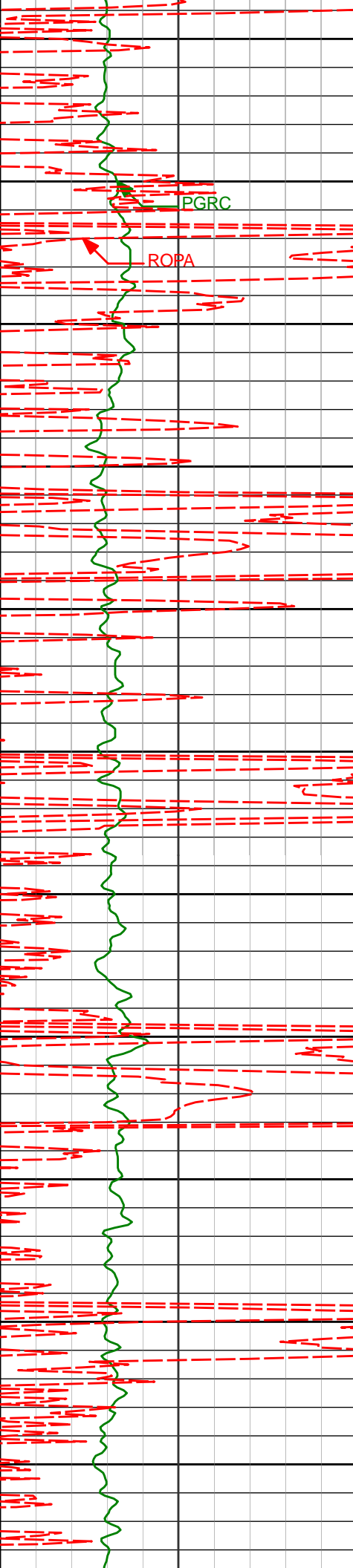
MD Detail 1:600 Scale





1400
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900

1407'	2.09°	170.57°	1406.95'	-4.45'
1500'	4.42°	159.39°	1499.79'	-9.22'
1592'	6.19°	151.06°	1591.39'	-16.31'
1686'	7.39°	142.99°	1684.73'	-24.64'
1778'	9.55°	144.99°	1775.73'	-34.43'
1871'	10.13°	145.62°	1867.36'	-46.13'



1950

1964'

9.86°

144.95° 1958.95'

-58.01'

2000

2050

2055'

9.05°

143.99° 2048.71'

-68.87'

2100

2150

2147'

9.62°

150.85° 2139.50'

-80.22'

2200

2250

2239'

9.13°

152.52° 2230.27'

-92.32'

2300

2350

2331'

10.26°

151.21° 2320.95'

-104.84'

2400

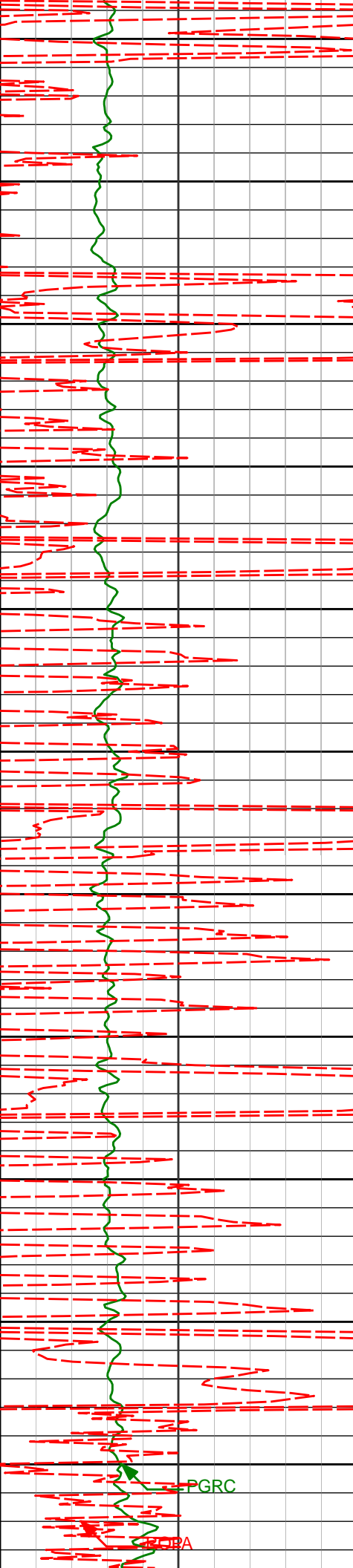
2450

2424'

10.45°

147.51° 2412.44'

-117.91'



2500

2517'

10.74°

146.54° 2503.85'

-130.84'

2550

2600

2610'

9.82°

147.09° 2595.36'

-143.35'

2650

2700

2703'

9.68°

148.60° 2687.01'

-155.41'

2750

2800

2797'

9.43°

148.42° 2779.71'

-167.48'

2850

2900

2889'

9.20°

146.54° 2870.50'

-178.81'

2950

3000

2984'

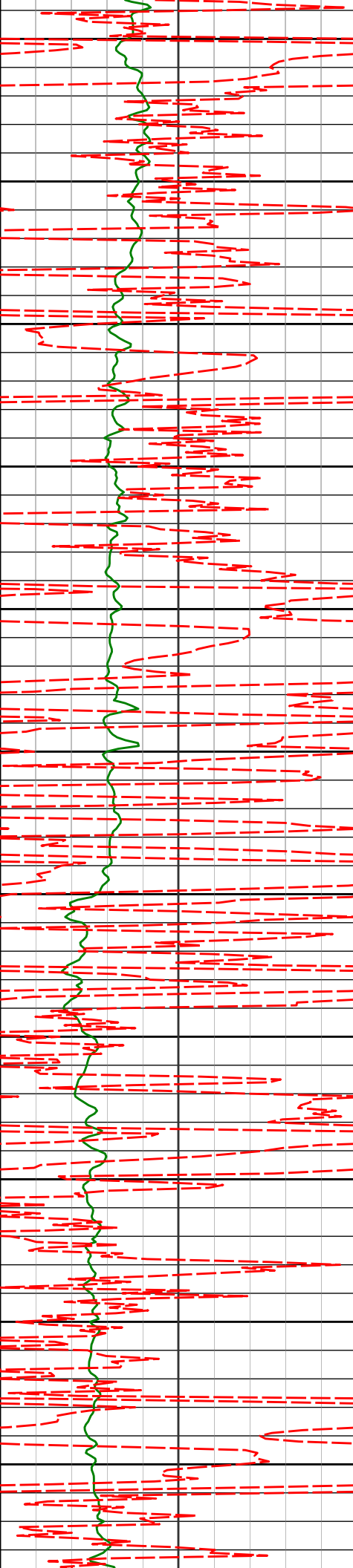
9.50°

156.00° 2964.24'

-191.17'

PGRC

PGRA



3050

3079'

8.03°

153.68°

3058.13'

-203.32'

3100

3150

3174'

8.91°

151.60°

3152.09'

-214.74'

3200

3250

3268'

11.01°

151.73°

3244.67'

-227.85'

3300

3350

3363'

10.73°

149.16°

3337.97'

-242.07'

3400

3450

3457'

11.29°

150.10°

3430.24'

-256.17'

3500

3550

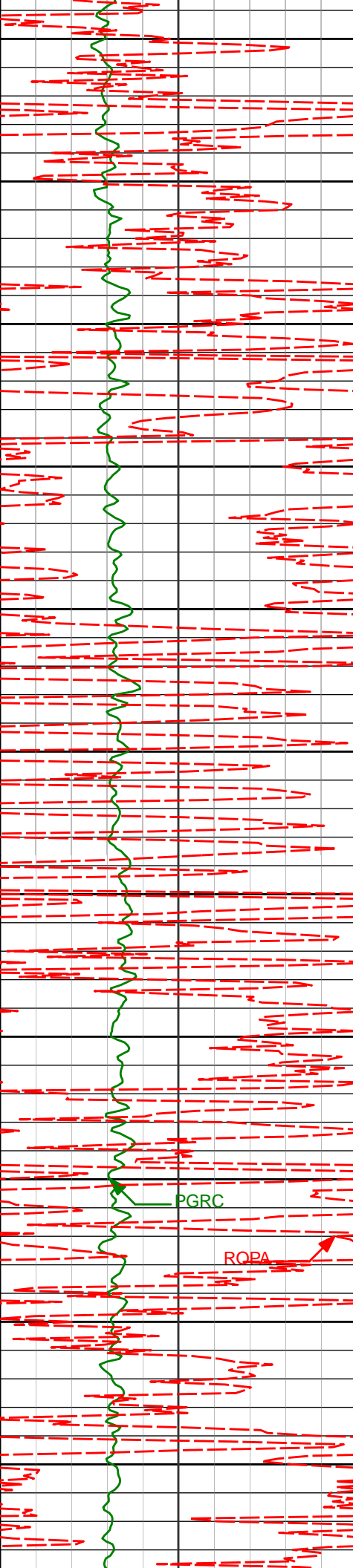
3552'

10.80°

150.05°

3523.48'

-270.55'



3600

3650

3700

3750

3800

3850

3900

3950

4000

4050

4100

3647'

11.02°

148.66°

3616.76'

-284.61'

3742'

10.55°

158.78°

3710.09'

-299.24'

3836'

10.44°

158.08°

3802.52'

-314.15'

3930'

9.89°

155.94°

3895.04'

-328.40'

4025'

9.43°

154.47°

3988.69'

-341.82'

4119'

8.91°

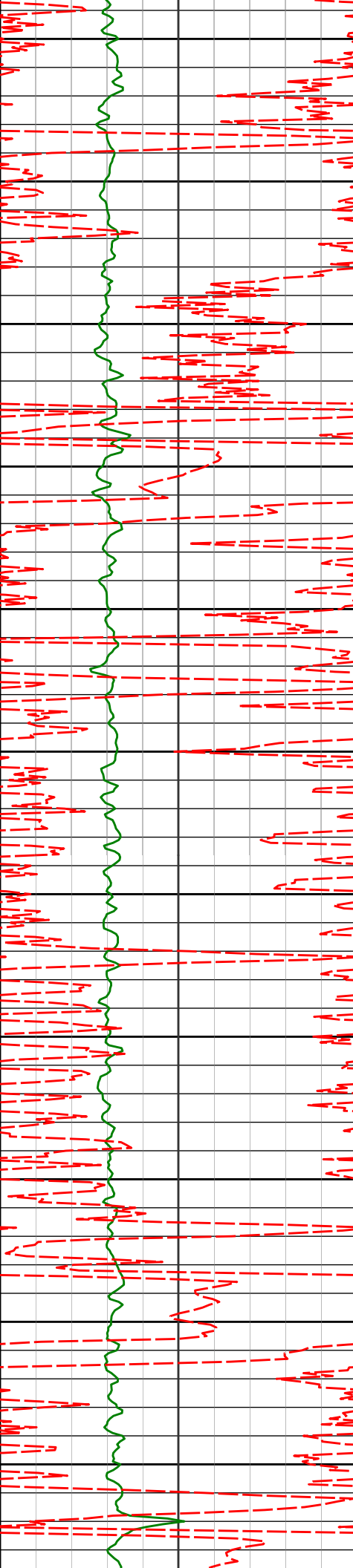
153.69°

4081.49'

-354.28'

PGRC

RQPA



4150

4200

4214'

8.40°

155.97°

4175.41'

-366.26'

4250

4300

4309'

9.76°

153.85°

4269.22'

-378.83'

4350

4400

4403'

9.37°

154.07°

4361.91'

-391.79'

4450

4500

4498'

8.15°

158.03°

4455.80'

-404.05'

4550

4600

4592'

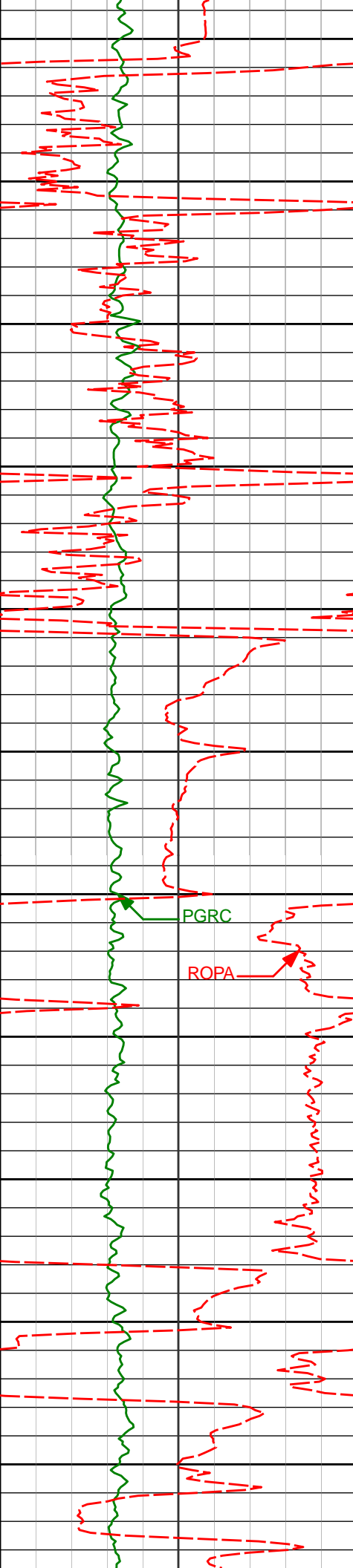
7.30°

166.03°

4548.95'

-415.38'

4650



4700

4750

4782'

9.13°

150.07° 4736.79'

-439.35'

4800

4850

4876'

8.14°

152.20° 4829.72'

-450.65'

4900

4950

4971'

17.94°

125.18° 4922.23'

-462.87'

5000

PGRC

ROPA

5050

5066'

19.85°

113.26° 5012.14'

-473.86'

5100

5150

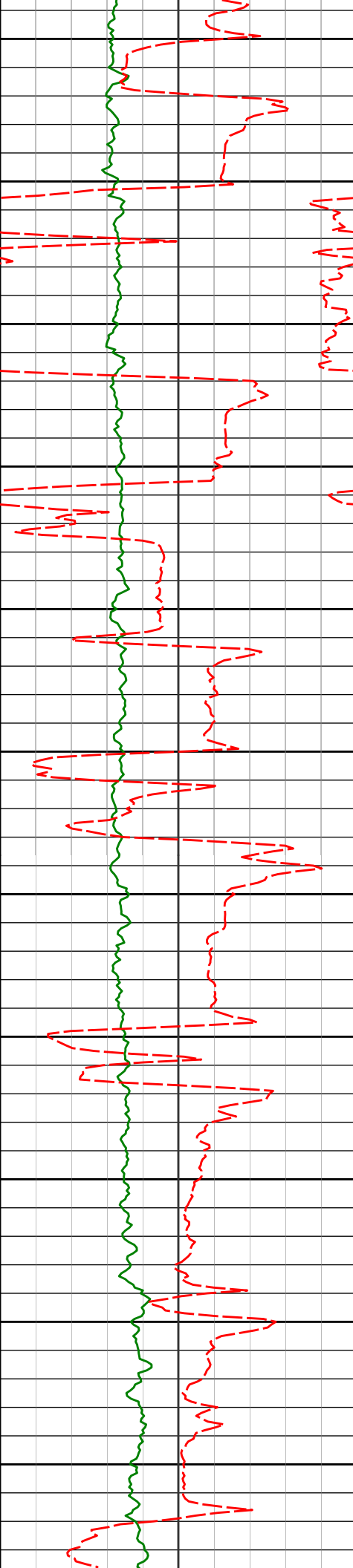
5160'

21.81°

108.46° 5100.00'

-481.30'

5200



5250

5255'

24.07°

95.06° 5187.54'

-483.59'

5300

5350

5349'

25.64°

83.77° 5272.88'

-477.68'

5400

5450

5444'

27.93°

73.20° 5357.73'

-463.37'

5500

5550

5539'

31.74°

62.16° 5440.19'

-439.46'

5600

5650

5633'

39.51°

51.04° 5516.62'

-403.11'

5700

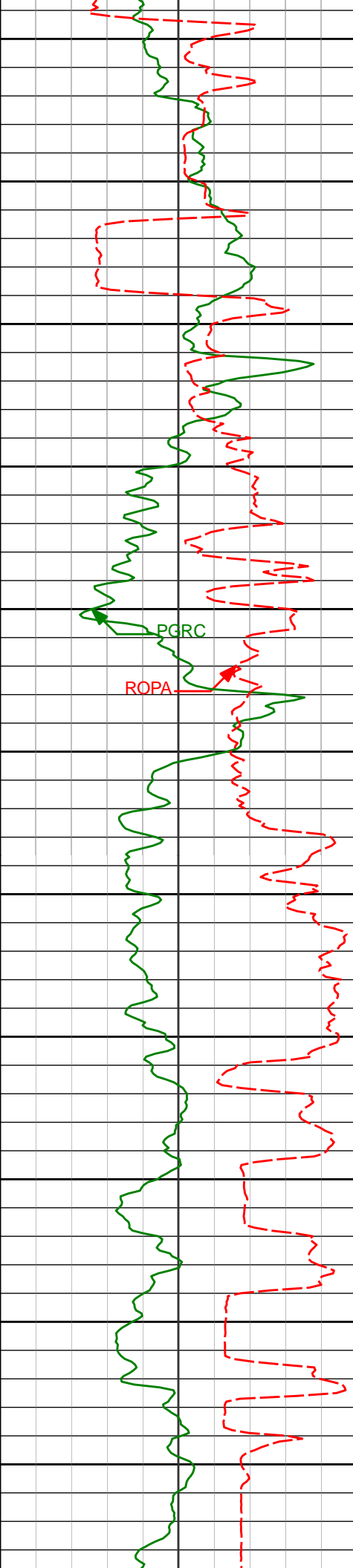
5750

5728'

43.77°

32.78° 5587.86'

-351.05'



5800

5823'

46.14°

22.27° 5655.18'

-287.97'

5850

5900

5917'

55.03°

17.57° 5714.83'

-217.02'

5950

6000

6012'

61.84°

11.04° 5764.57'

-136.68'

6050

6100

6106'

74.56°

3.68° 5799.45'

-49.67'

Run 200

6150

6200

6201'

82.49°

0.05° 5818.33'

42.83'

6226'

84.60°

359.62° 5821.14'

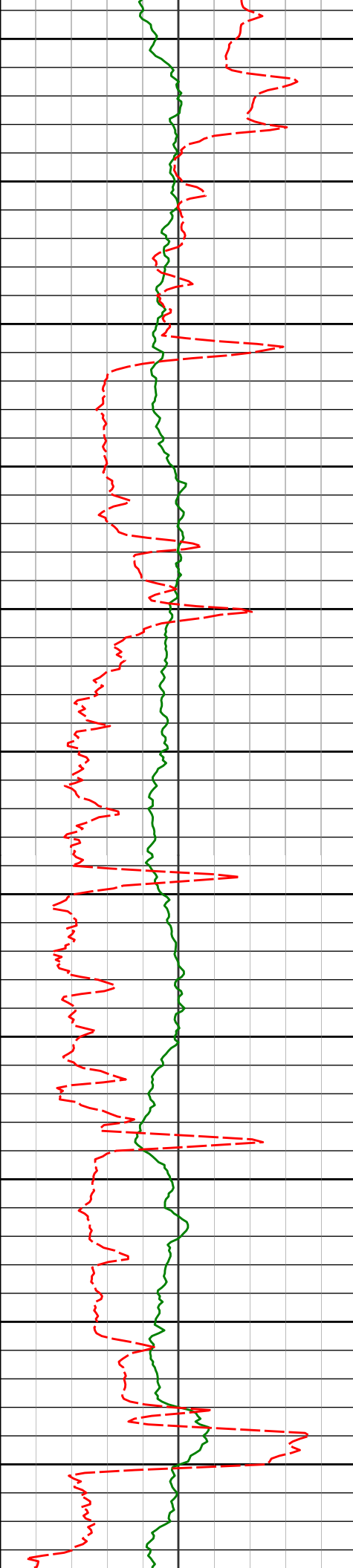
67.42'

6250

Casing Shoe @ 6273' MD

Run 300

6300



6350

6390'

89.41°

358.71° 5829.70'

229.26'

6400

6450

6482'

90.22°

358.67° 5830.00'

320.08'

6500

6550

6575'

90.15°

358.29° 5829.70'

411.83'

6600

6650

6667'

90.68°

358.06° 5829.03'

502.51'

6700

6750

6759'

91.26°

357.87° 5827.47'

593.12'

6800

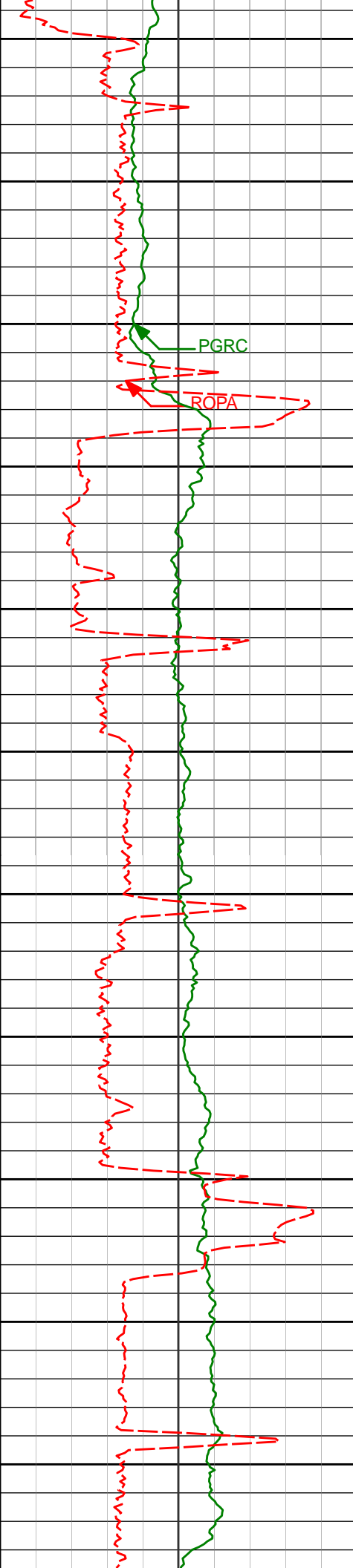
6850

6850'

90.31°

358.05° 5826.23'

682.75'



6900

6950

7000

7050

7100

7150

7200

7250

7300

7350

7400

6943'

90.80°

358.12° 5825.33'

774.39'

7035'

90.09°

359.08° 5824.61'

865.19'

7128'

90.37°

358.66° 5824.23'

957.04'

7221'

90.86°

358.29° 5823.23'

1048.78'

7314'

89.97°

358.74° 5822.56'

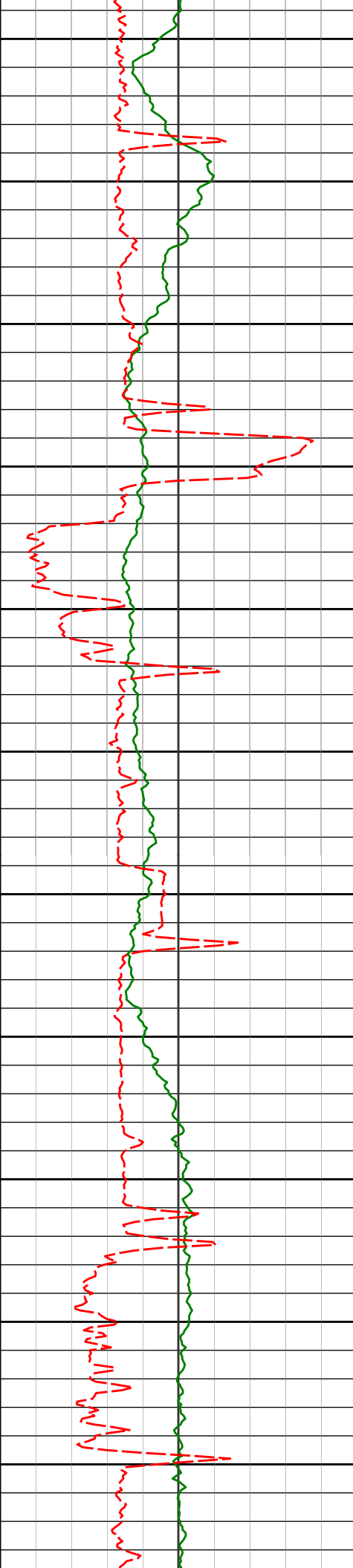
1140.54'

7407'

90.43°

358.54° 5822.23'

1232.33'



7450

7500

7550

7600

7650

7700

7750

7800

7850

7900

7950

7501'

90.83°

358.17° 5821.20'

1325.03'

7593'

89.66°

359.06° 5820.80'

1415.83'

7688'

90.62°

0.24° 5820.57'

1509.84'

7782'

90.83°

359.60° 5819.38'

1602.93'

7877'

89.26°

0.10° 5819.31'

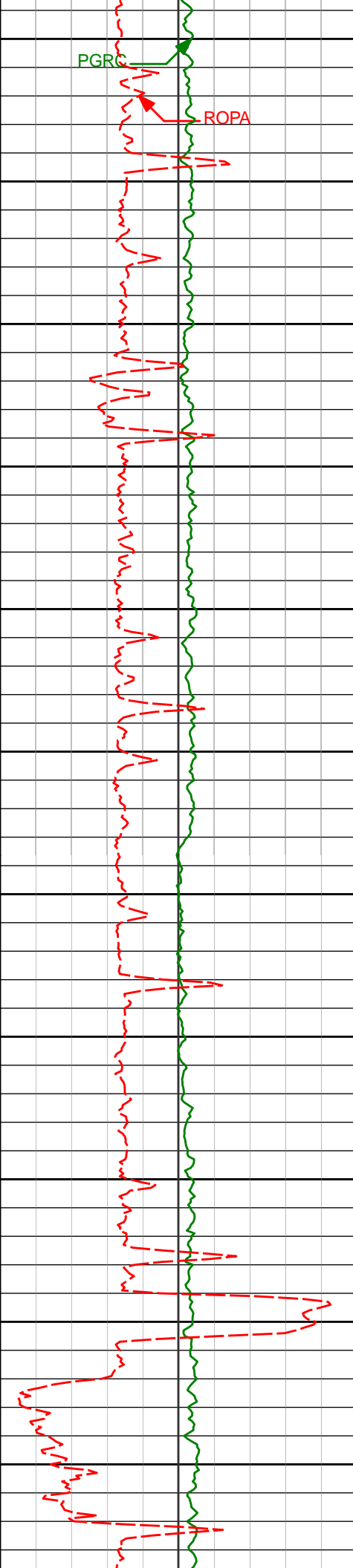
1697.00'

7972'

90.03°

359.97° 5819.89'

1791.11'



8000

8050

8100

8150

8200

8250

8300

8350

8400

8450

8500

8067'

90.00°

0.48° 5819.87'

1885.26'

8161'

90.28°

1.15° 5819.64'

1978.54'

8256'

89.88°

1.89° 5819.51'

2072.96'

8351'

90.40°

2.14° 5819.28'

2167.46'

8445'

90.49°

1.24° 5818.55'

2260.91'



8550

8600

8650

8700

8750

8800

8850

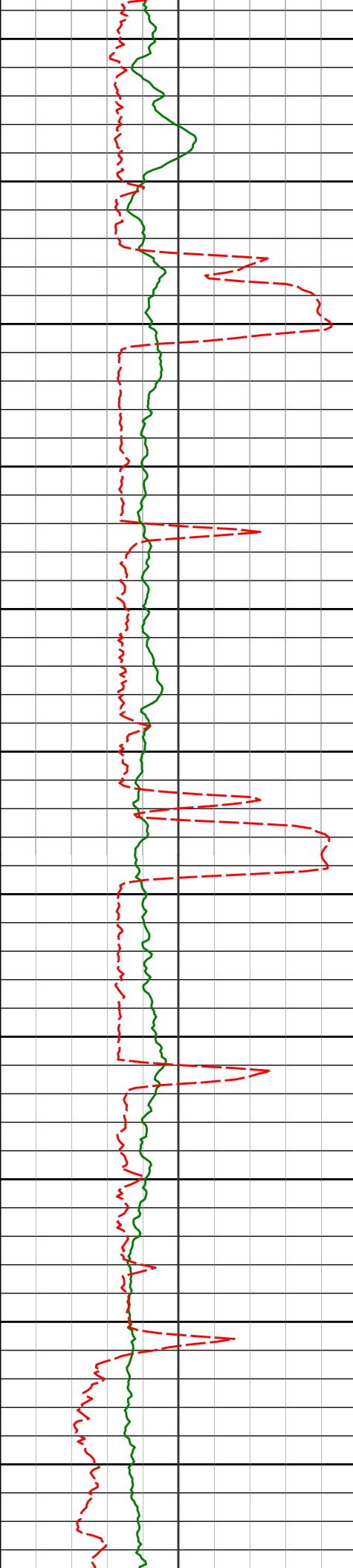
8900

8950

9000

9050

8540'	89.94°	0.35°	5818.19'	2355.18'
8635'	90.03°	359.47°	5818.22'	2449.26'
8729'	90.15°	358.84°	5818.07'	2542.17'
8824'	89.97°	358.43°	5817.96'	2635.94'
8918'	90.68°	358.26°	5817.43'	2728.64'
9013'	91.17°	358.08°	5815.90'	2822.26'



9100

9108'

92.13°

357.68° 5813.17'

2915.78'

9150

9200

9202'

90.77°

358.36° 5810.79'

3008.36'

9250

9300

9297'

91.20°

358.48° 5809.16'

3102.05'

9350

9400

9391'

89.35°

358.80° 5808.70'

3194.83'

9450

9500

9486'

89.38°

358.70° 5809.75'

3288.62'

9550

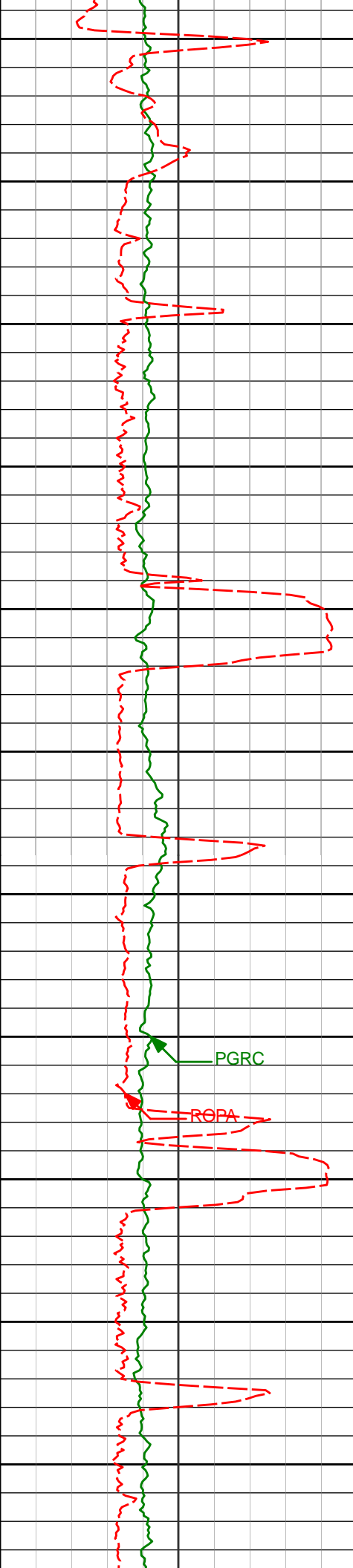
9600

9581'

90.18°

359.29° 5810.10'

3382.48'



9650

9675'

90.83°

359.41° 5809.27'

3475.43'

9700

9750

9770'

90.06°

356.94° 5808.53'

3569.06'

9800

9850

9865'

89.94°

358.11° 5808.53'

3662.51'

9900

9950

9960'

90.40°

357.83° 5808.25'

3756.10'

10000

PGRC

ROPA

10050

10054'

90.06°

358.85° 5807.87'

3848.80'

10100

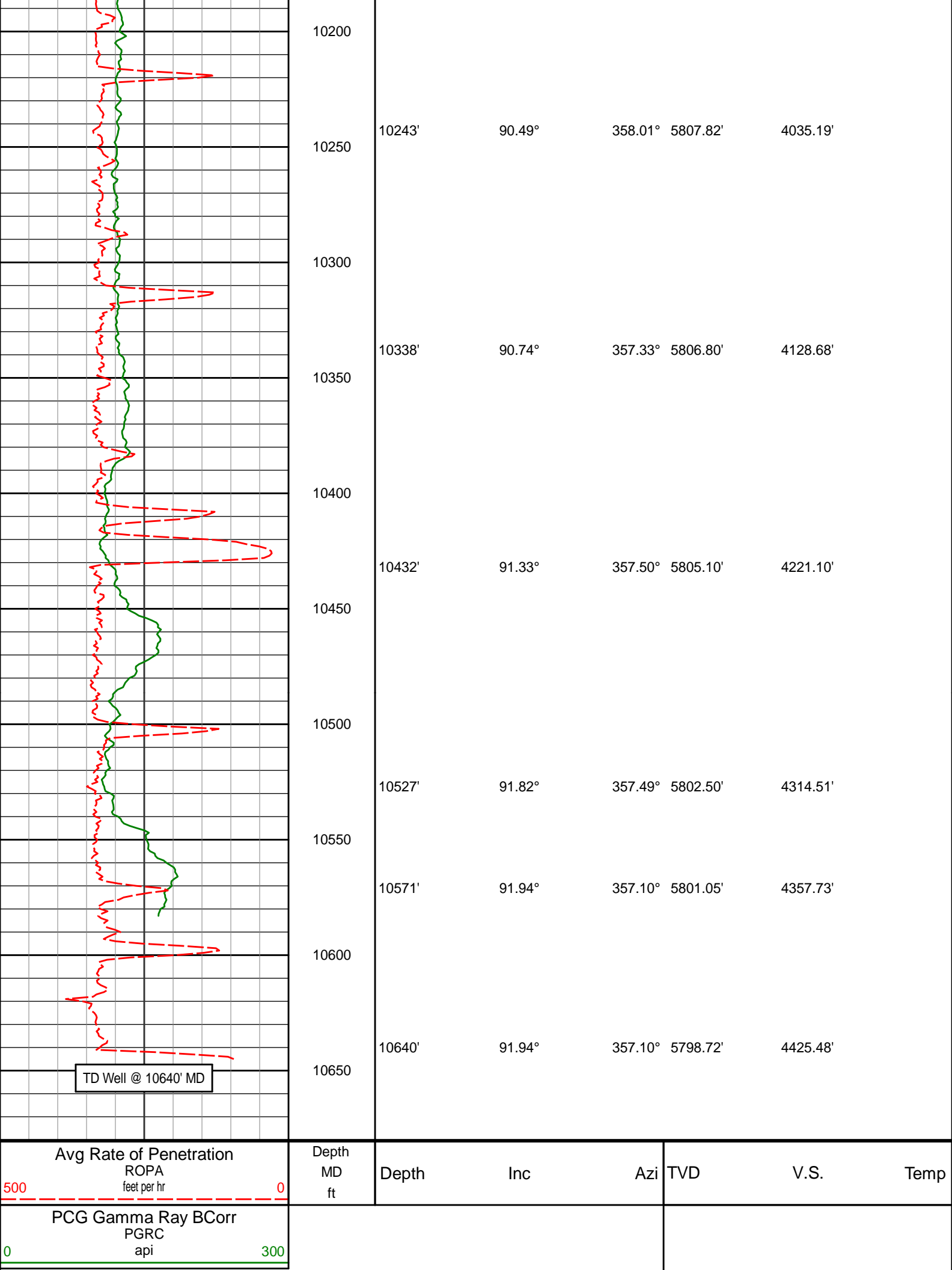
10150

10148'

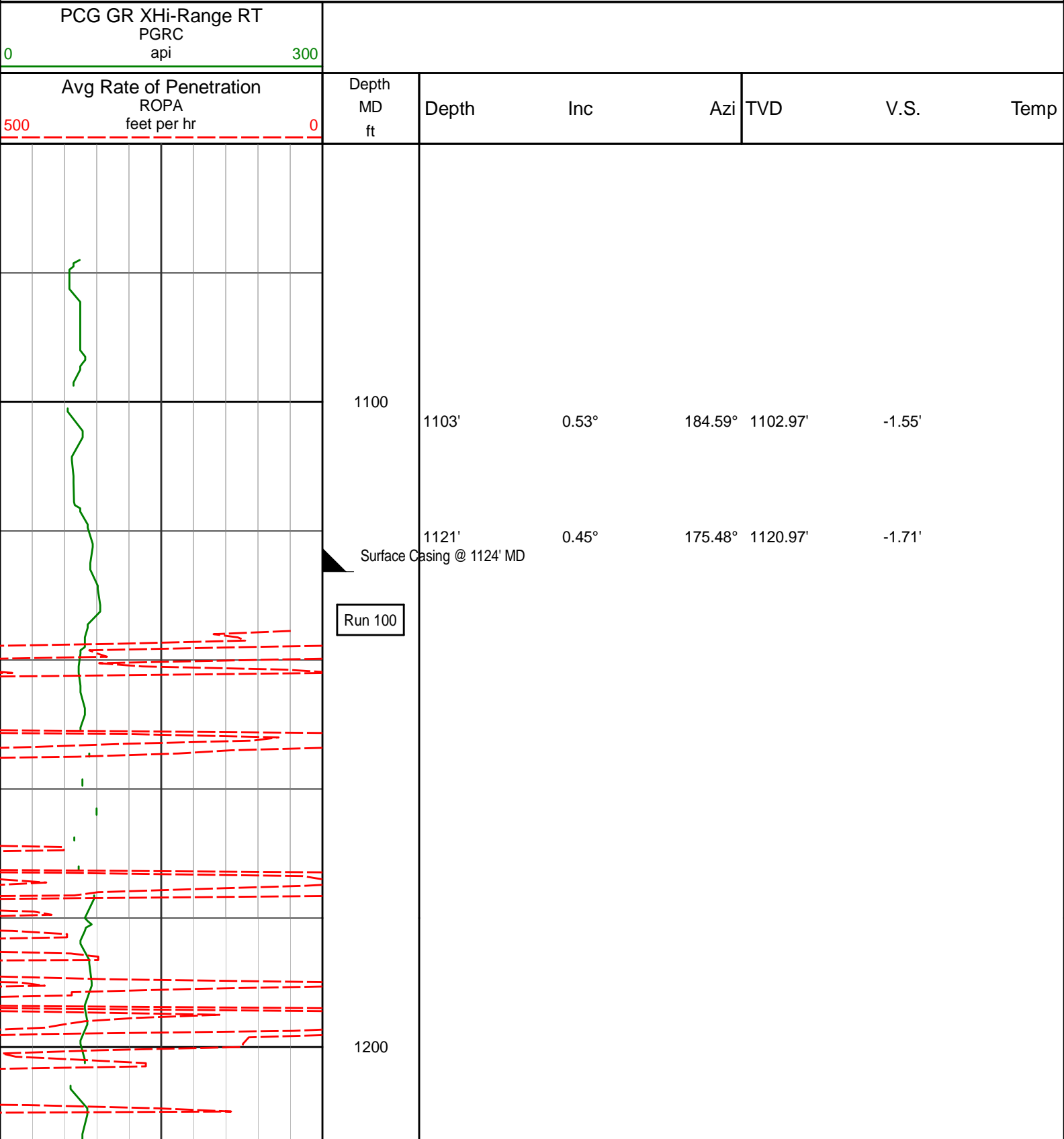
89.75°

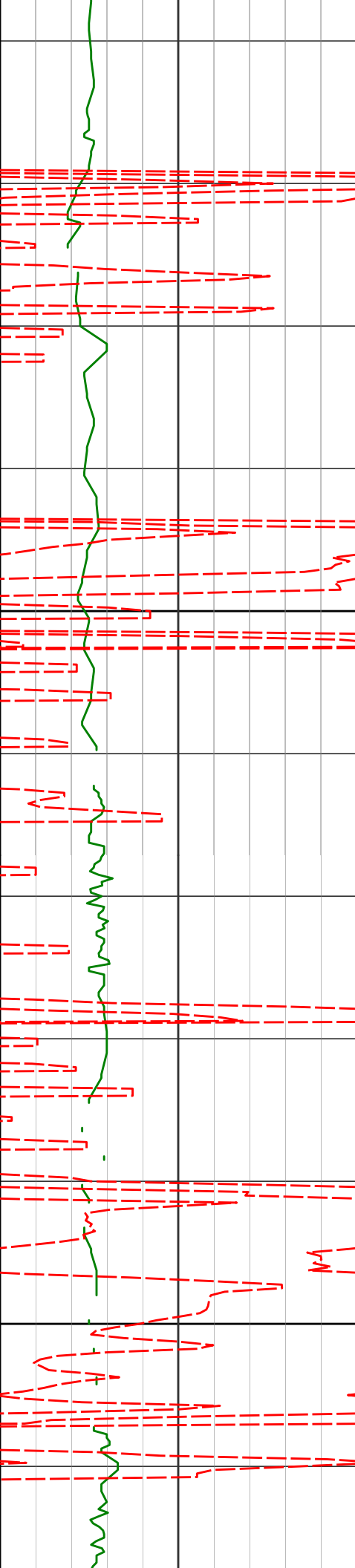
358.29° 5808.02'

3941.56'



MD Detail 1:240 Scale





1300

1400

1223'

0.14°

185.86° 1222.97'

-2.22'

1315'

0.34°

165.61° 1314.97'

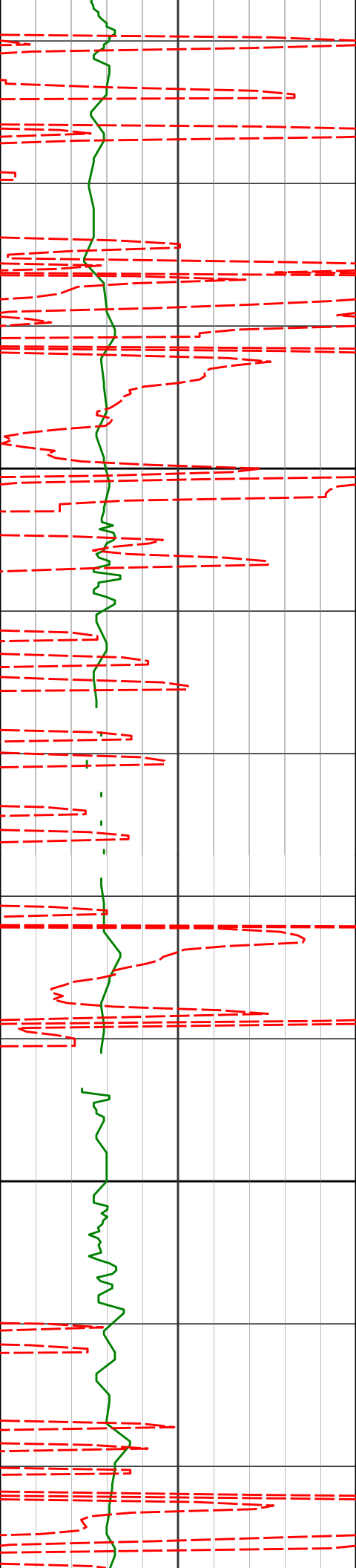
-2.59'

1407'

2.09°

170.57° 1406.95'

-4.45'



1500

1500'

4.42°

159.39° 1499.79'

-9.22'

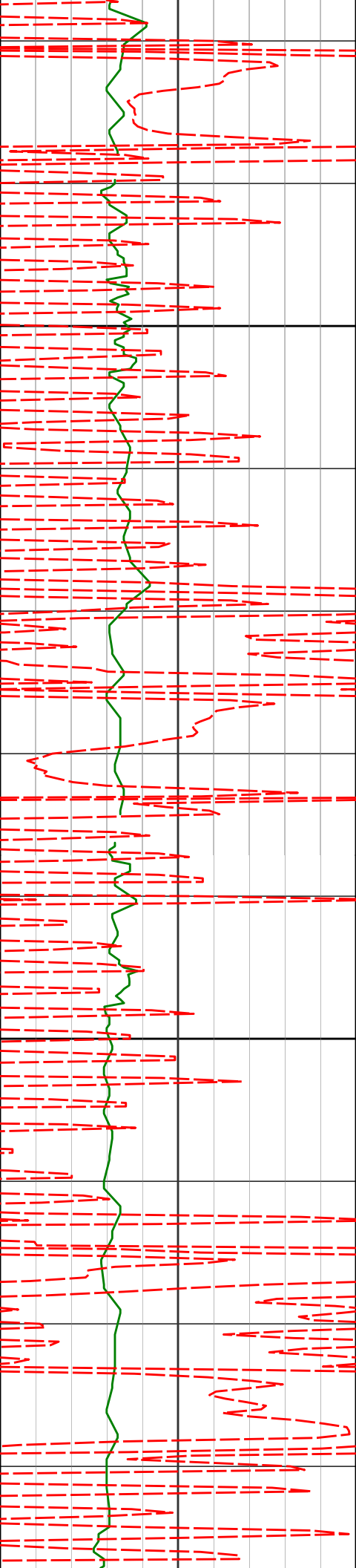
1600

1592'

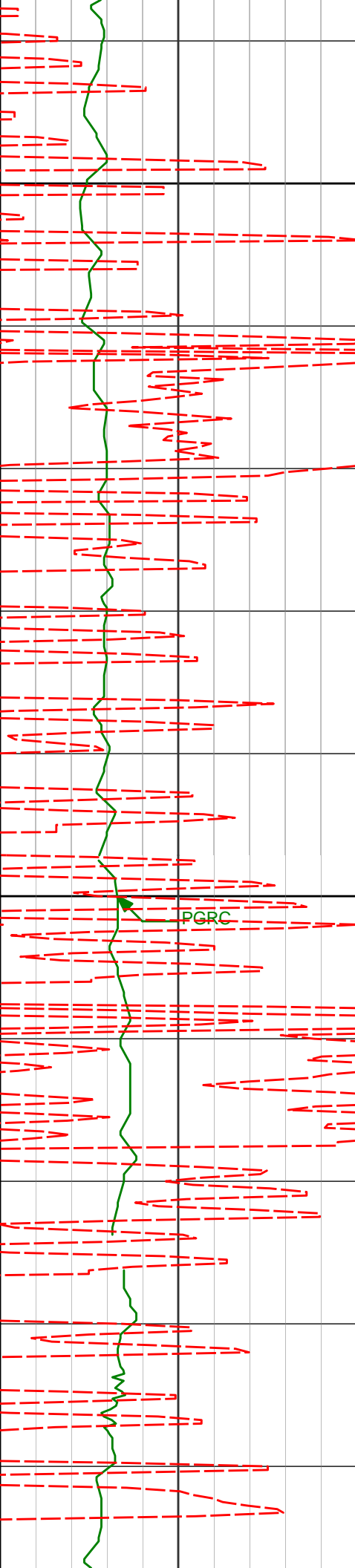
6.19°

151.06° 1591.39'

-16.31'



1686'	7.39°	142.99°	1684.73'	-24.64'
1700				
1778'	9.55°	144.99°	1775.73'	-34.43'
1800				
1871'	10.13°	145.62°	1867.36'	-46.13'



1900

1964'

9.86°

144.95°

1958.95'

-58.01'

2000

PGRC

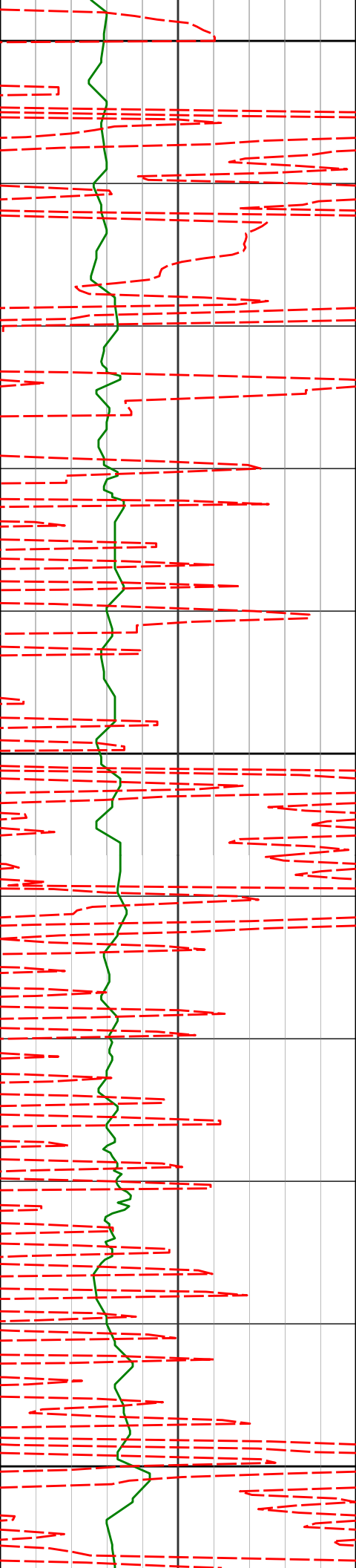
2055'

9.05°

143.99°

2048.71'

-68.87'



2100

2147'

9.62°

150.85° 2139.50'

-80.22'

2200

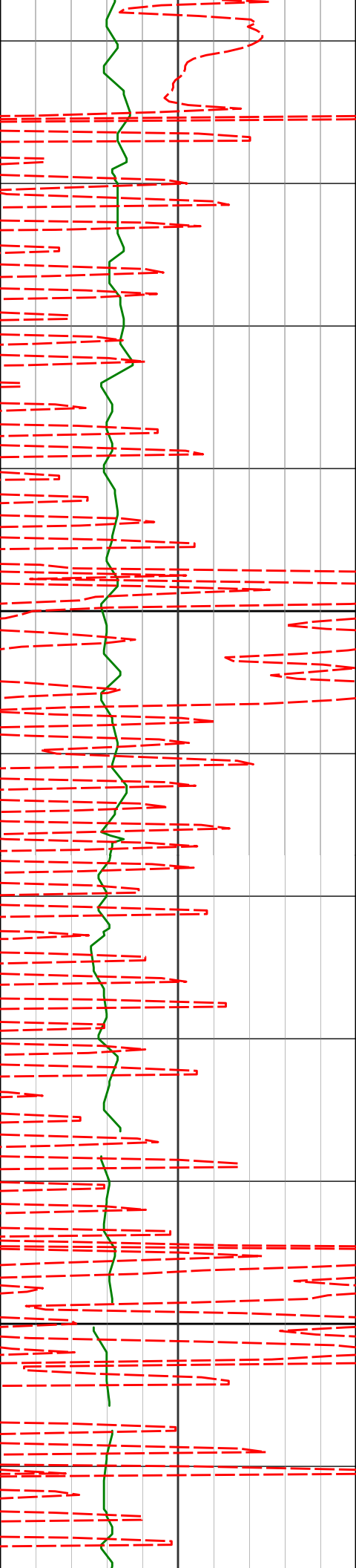
2239'

9.13°

152.52° 2230.27'

-92.32'

2300



2331'

10.26°

151.21° 2320.95'

-104.84'

2400

2424'

10.45°

147.51° 2412.44'

-117.91'

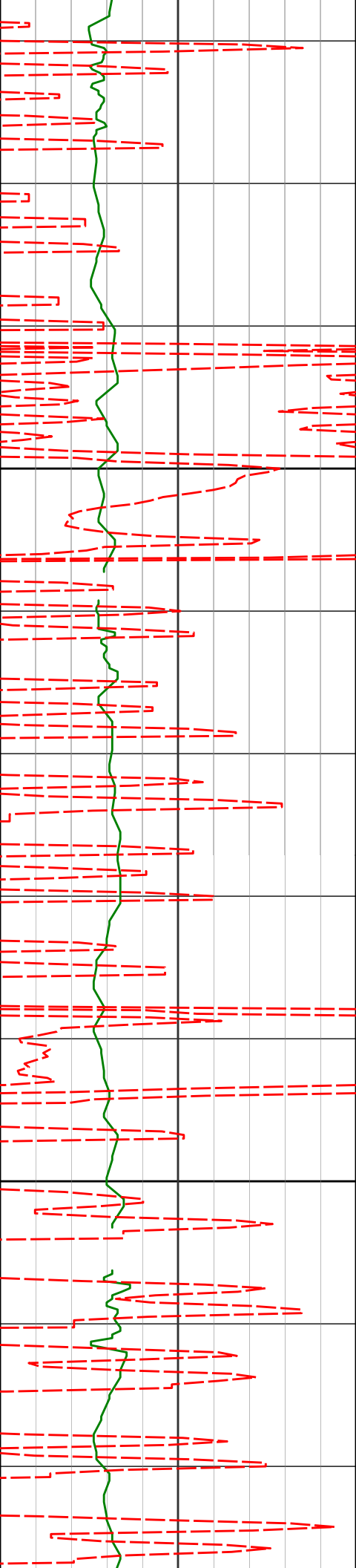
2500

2517'

10.74°

146.54° 2503.85'

-130.84'



2600

2610'

9.82°

147.09° 2595.36'

-143.35'

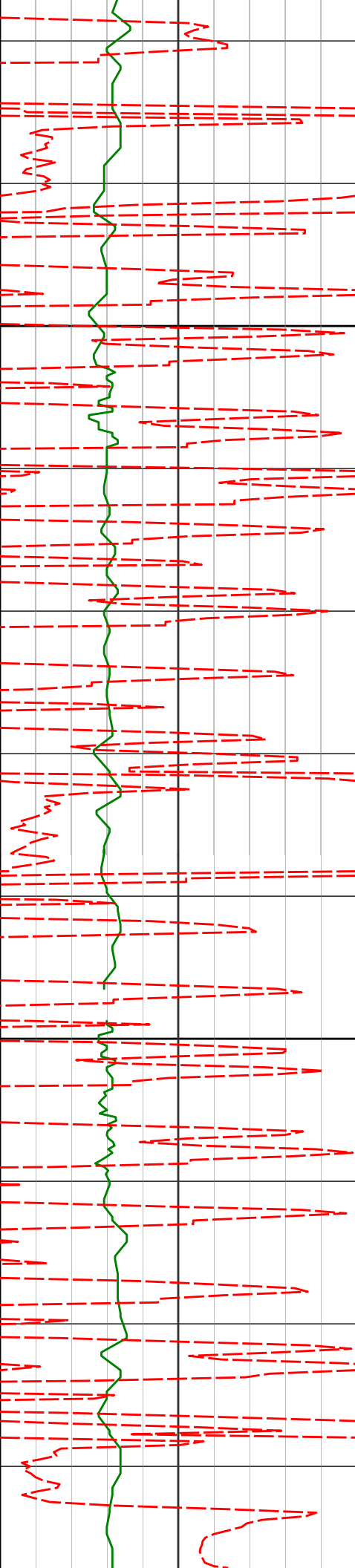
2700

2703'

9.68°

148.60° 2687.01'

-155.41'



2800

2797'

9.43°

148.42° 2779.71'

-167.48'

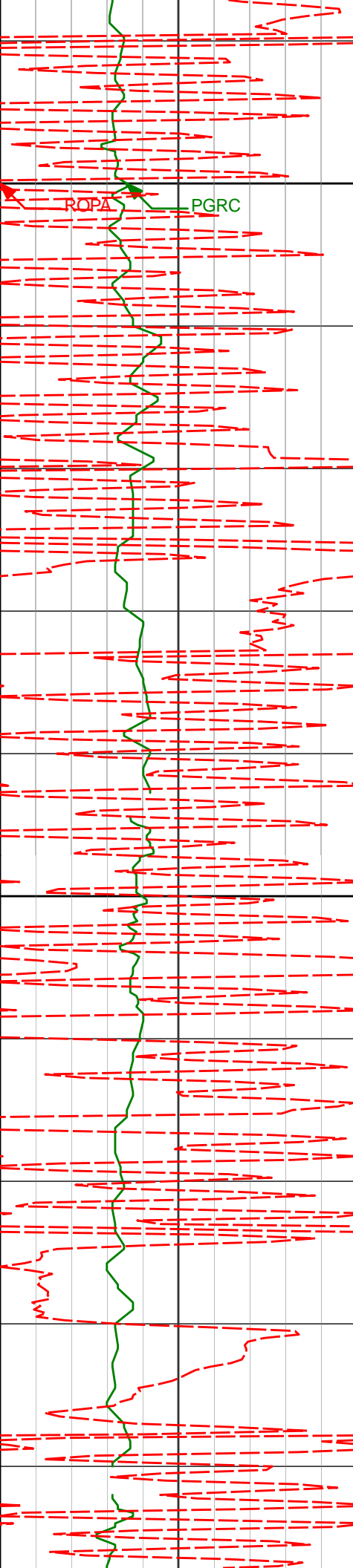
2900

2889'

9.20°

146.54° 2870.50'

-178.81'



3000

3100

2984'

9.50°

156.00° 2964.24'

-191.17'

3079'

8.03°

153.68° 3058.13'

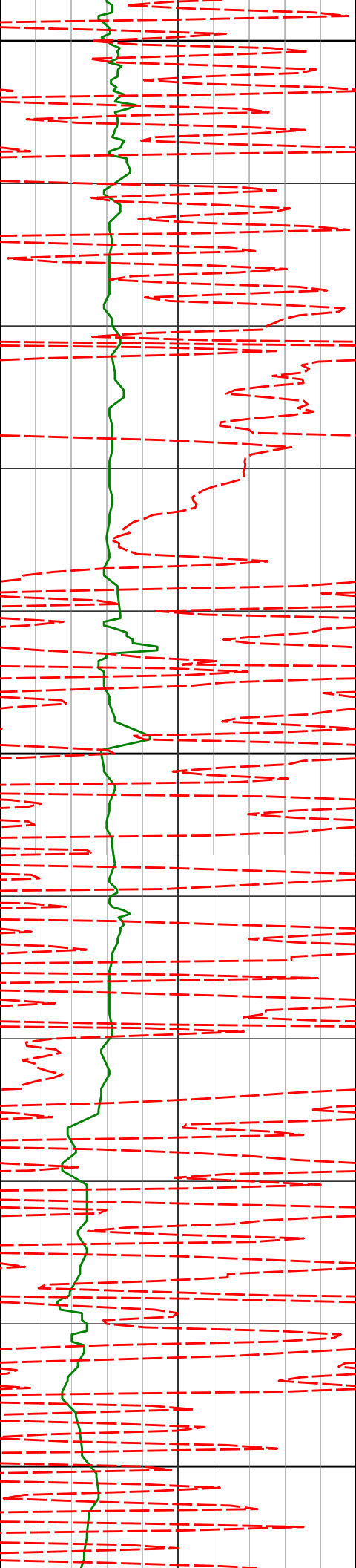
-203.32'

3174'

8.91°

151.60° 3152.09'

-214.74'



3200

3268'

11.01°

151.73° 3244.67'

-227.85'

3300

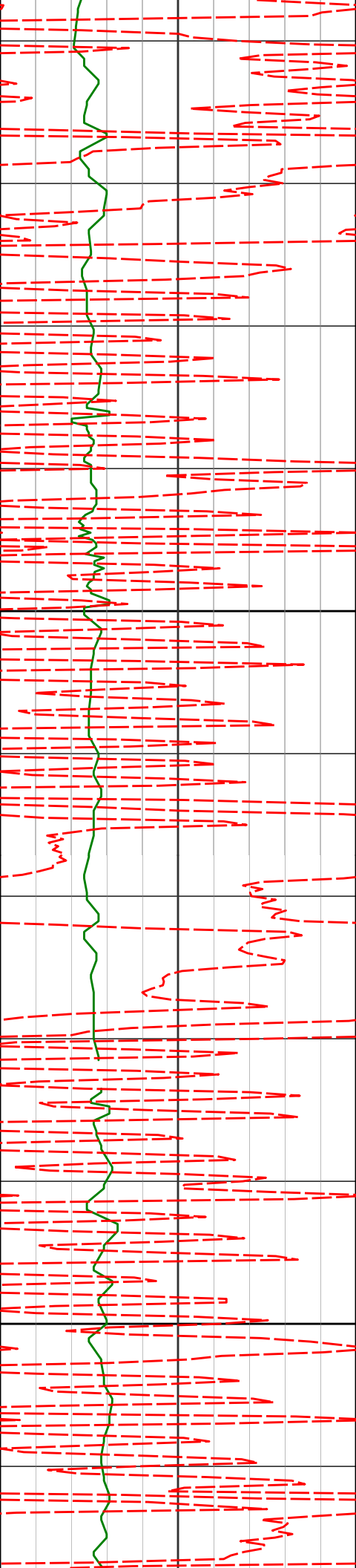
3363'

10.73°

149.16° 3337.97'

-242.07'

3400



3457'

11.29°

150.10° 3430.24'

-256.17'

3500

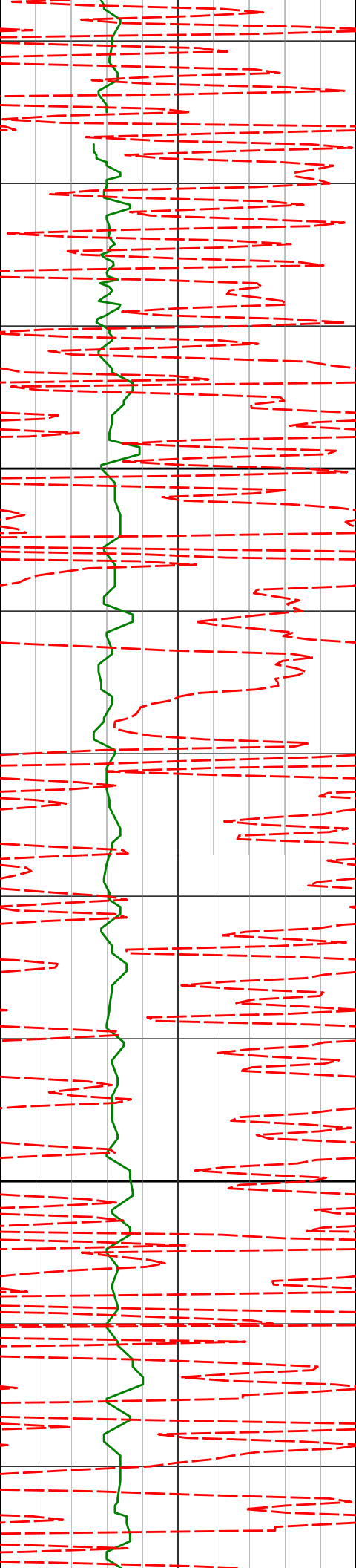
3552'

10.80°

150.05° 3523.48'

-270.55'

3600



3700

3800

3647'

11.02°

148.66° 3616.76'

-284.61'

3742'

10.55°

158.78° 3710.09'

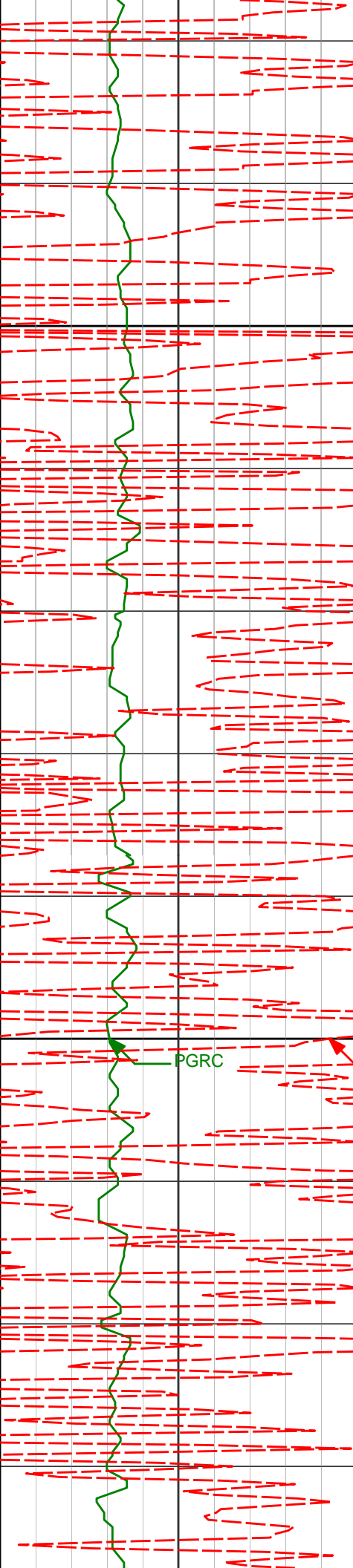
-299.24'

3836'

10.44°

158.08° 3802.52'

-314.15'



3900

3930'

9.89°

155.94° 3895.04'

-328.40'

4000

PGRC

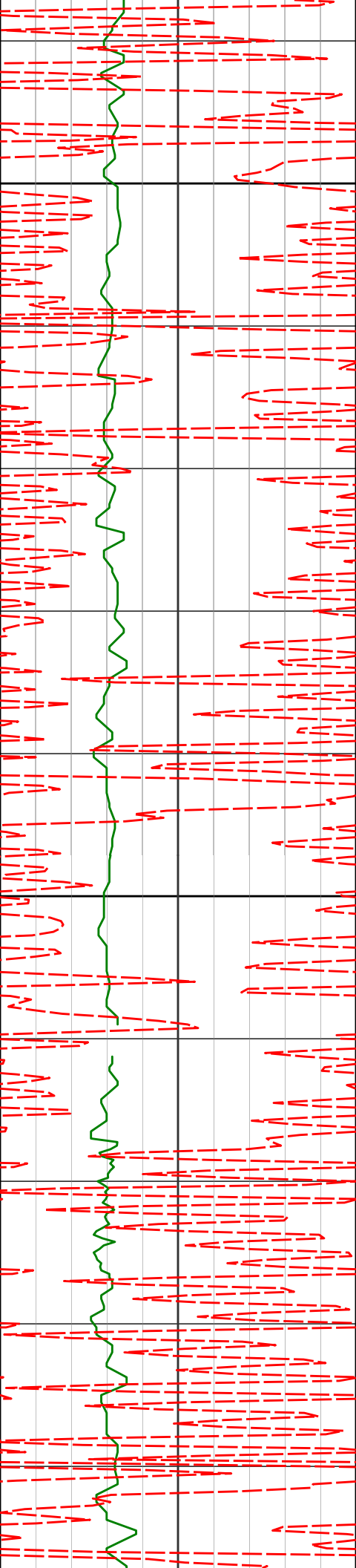
ROPA

4025'

9.43°

154.47° 3988.69'

-341.82'



4100

4119'

8.91°

153.69° 4081.49'

-354.28'

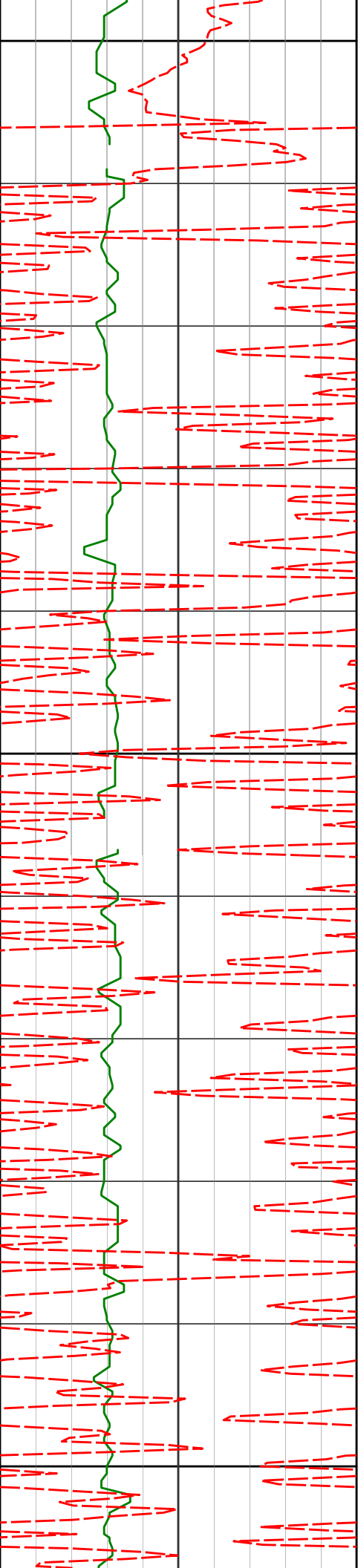
4200

4214'

8.40°

155.97° 4175.41'

-366.26'



4300

4309'

9.76°

153.85° 4269.22'

-378.83'

4400

4403'

9.37°

154.07° 4361.91'

-391.79'

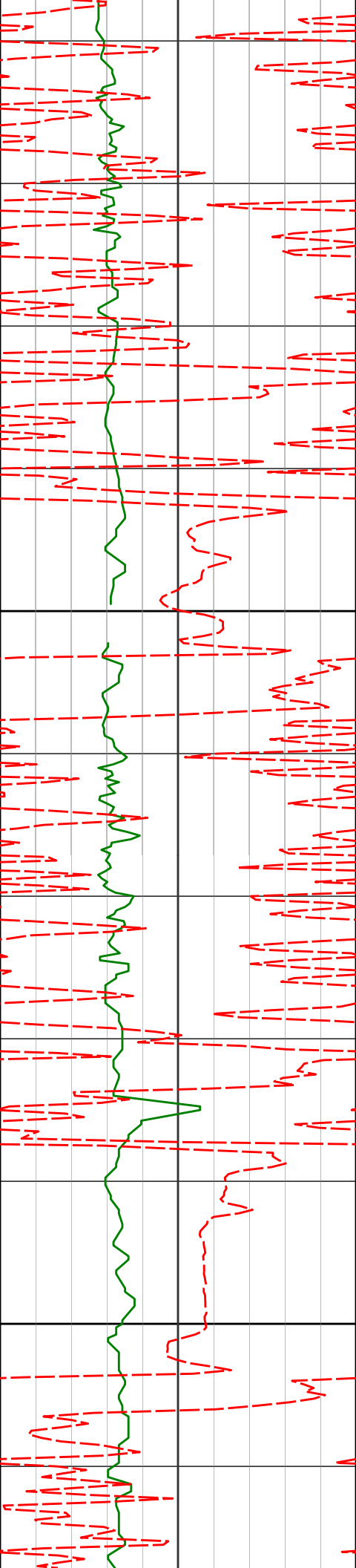
4500

4498'

8.15°

158.03° 4455.80'

-404.05'

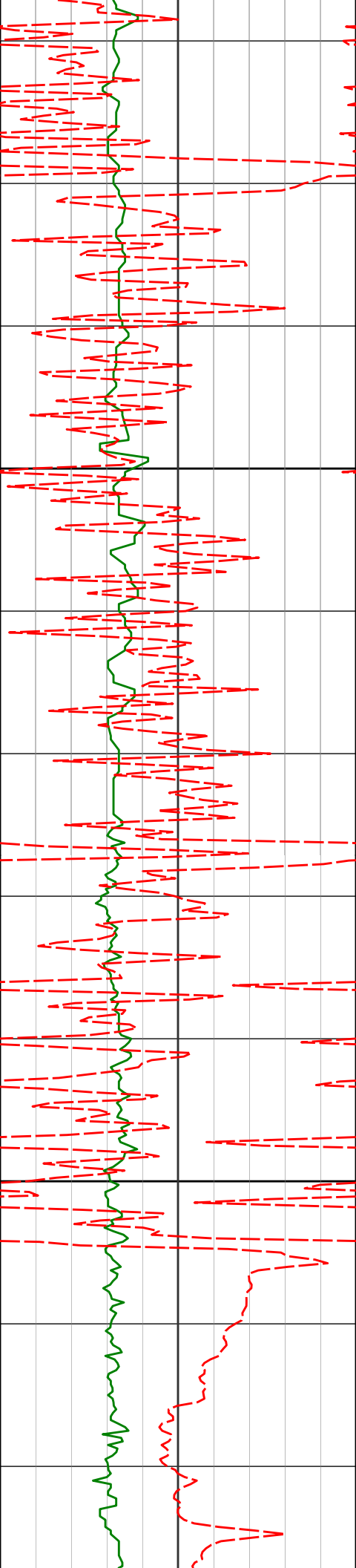


4592' 7.30° 166.03° 4548.95' -415.38'

4600

4687' 9.08° 153.80° 4642.98' -427.19'

4700

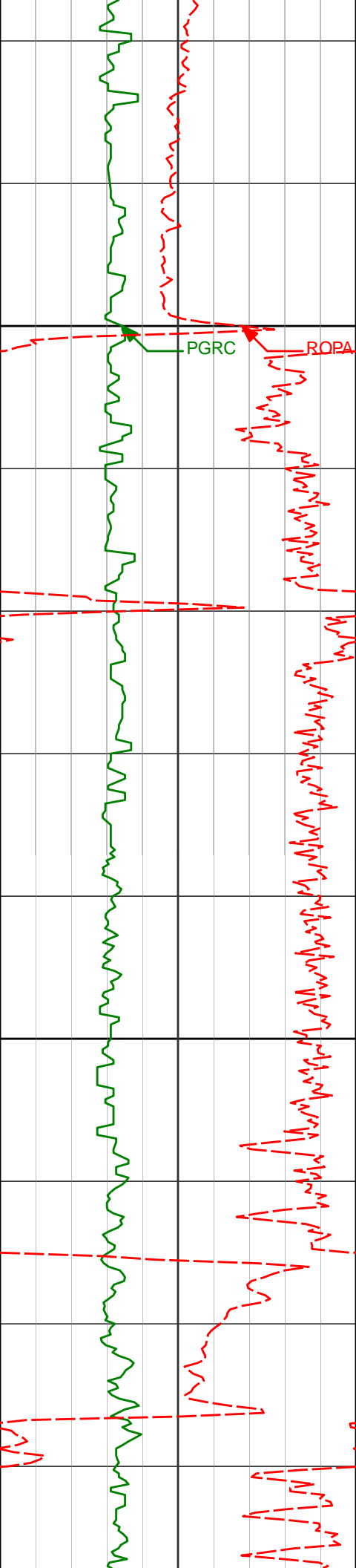


4782' 9.13° 150.07° 4736.79' -439.35'

4800

4876' 8.14° 152.20° 4829.72' -450.65'

4900



5000

5100

4971'

17.94°

125.18° 4922.23'

-462.87'

5066'

19.85°

113.26° 5012.14'

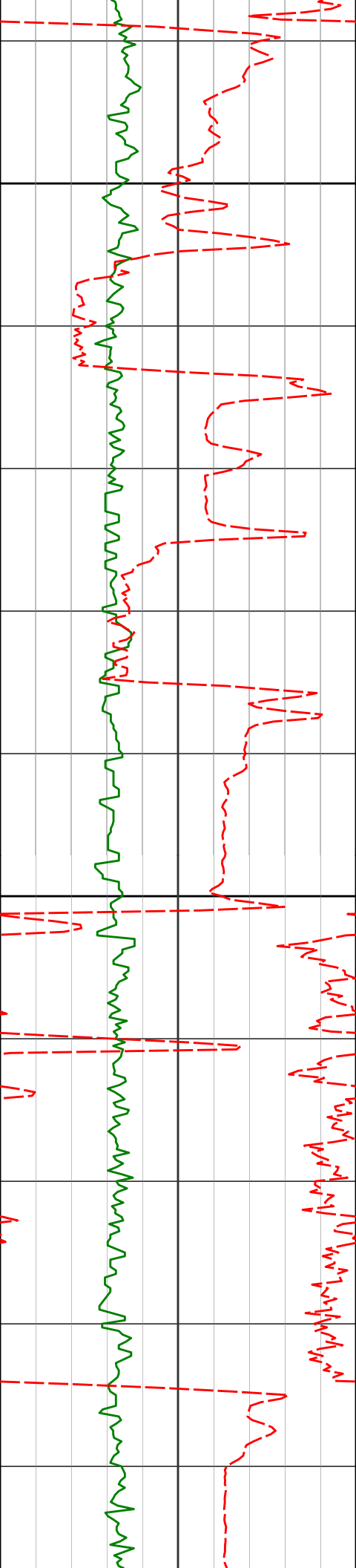
-473.86'

5160'

21.81°

108.46° 5100.00'

-481.30'



5200

5300

5255'

24.07°

95.06° 5187.54'

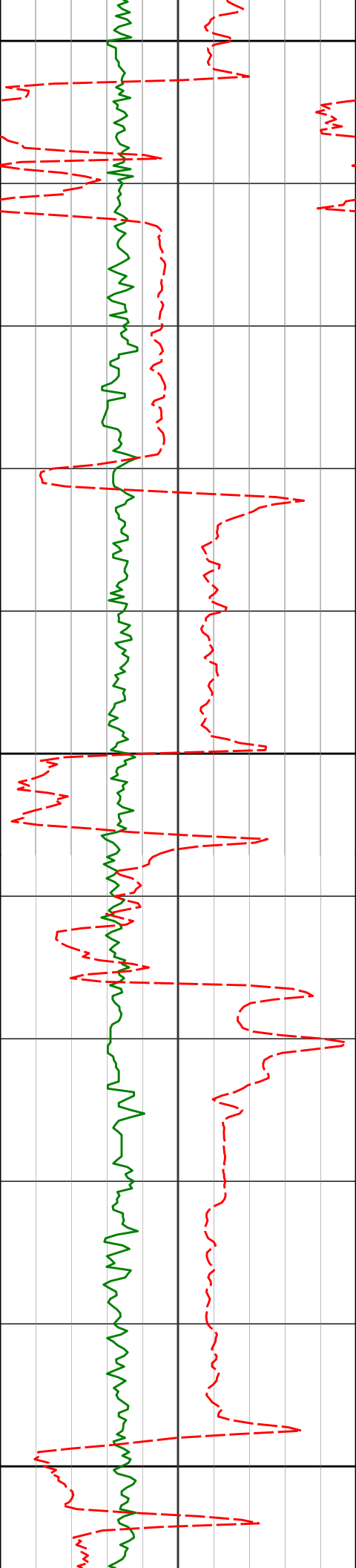
-483.59'

5349'

25.64°

83.77° 5272.88'

-477.68'



5400

5444'

27.93°

73.20° 5357.73'

-463.37'

5500

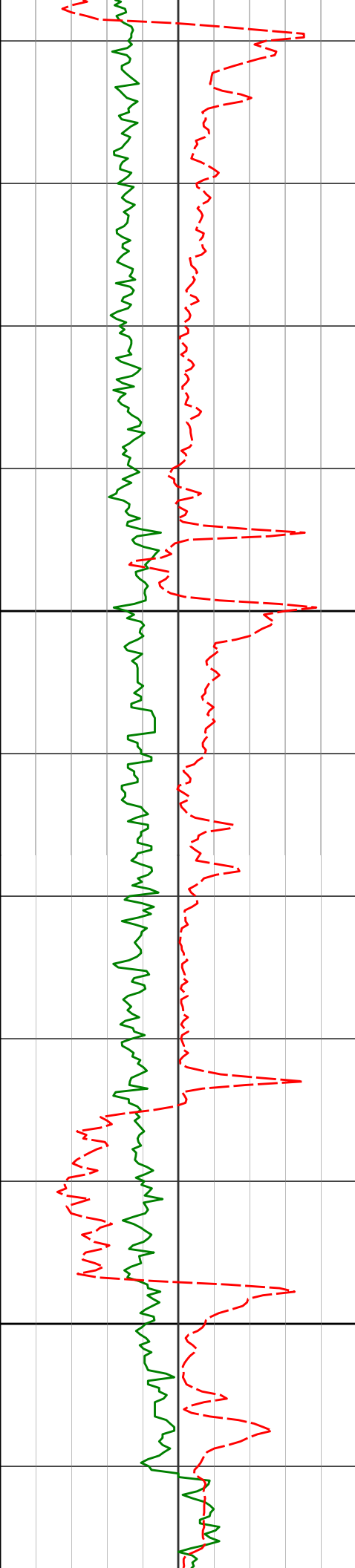
5539'

31.74°

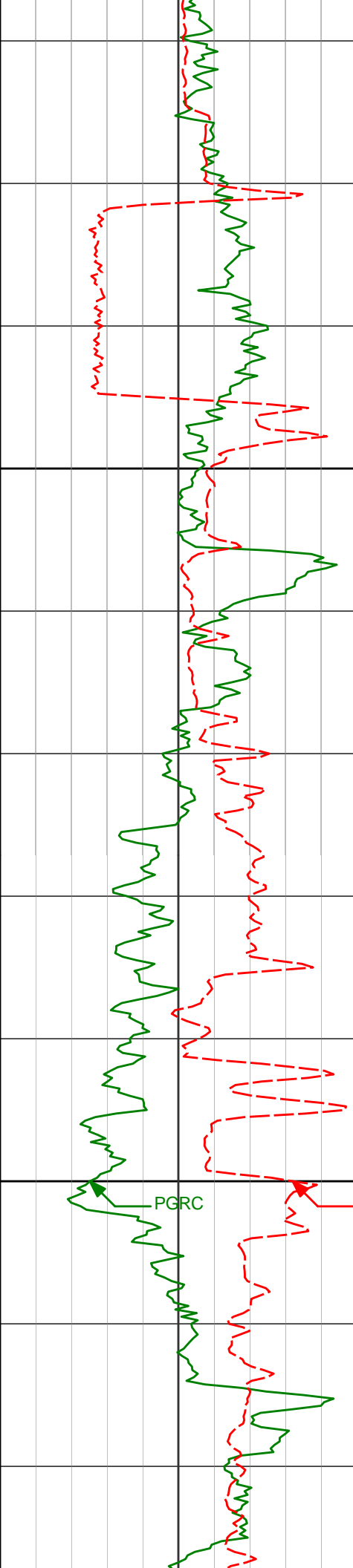
62.16° 5440.19'

-439.46'

5600



5633'	39.51°	51.04°	5516.62'	-403.11'
5700				
5728'	43.77°	32.78°	5587.86'	-351.05'
5800				
5823'	46.14°	22.27°	5655.18'	-287.97'



5900

5917'

55.03°

17.57° 5714.83'

-217.02'

6000

PGRC

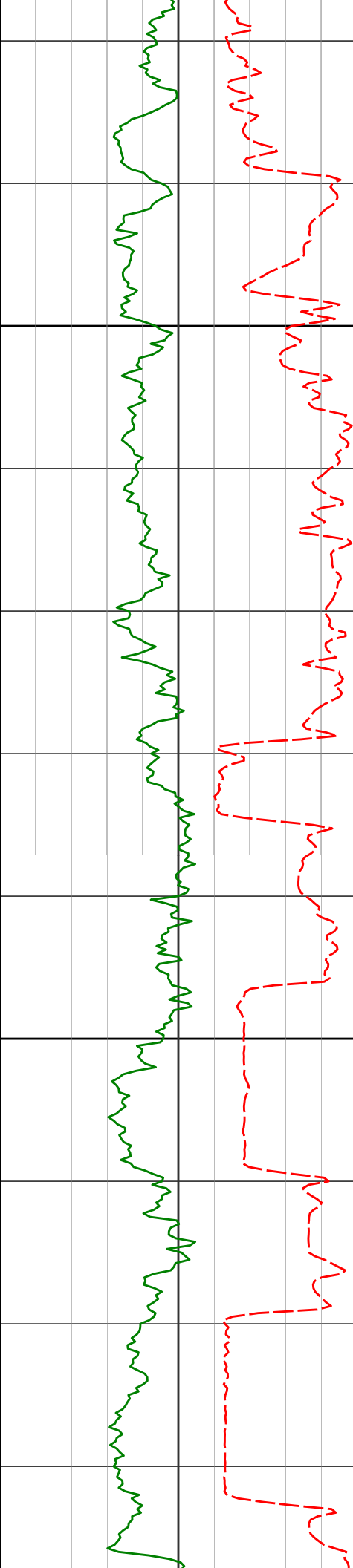
ROPA

6012'

61.84°

11.04° 5764.57'

-136.68'



6100

6106'	74.56°	3.68°	5799.45'	-49.67'
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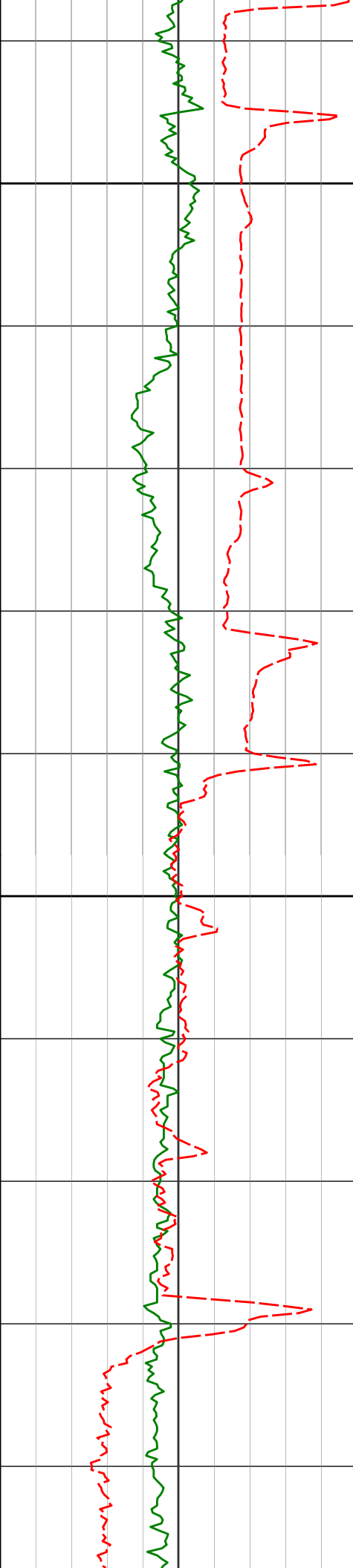
Run 200

6200

6201'	82.49°	0.05°	5818.33'	42.83'
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6226'	84.60°	359.62°	5821.14'	67.42'
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Casing Shoe @ 6273' MD



Run 300

6300

6400

6390'

89.41°

358.71° 5829.70'

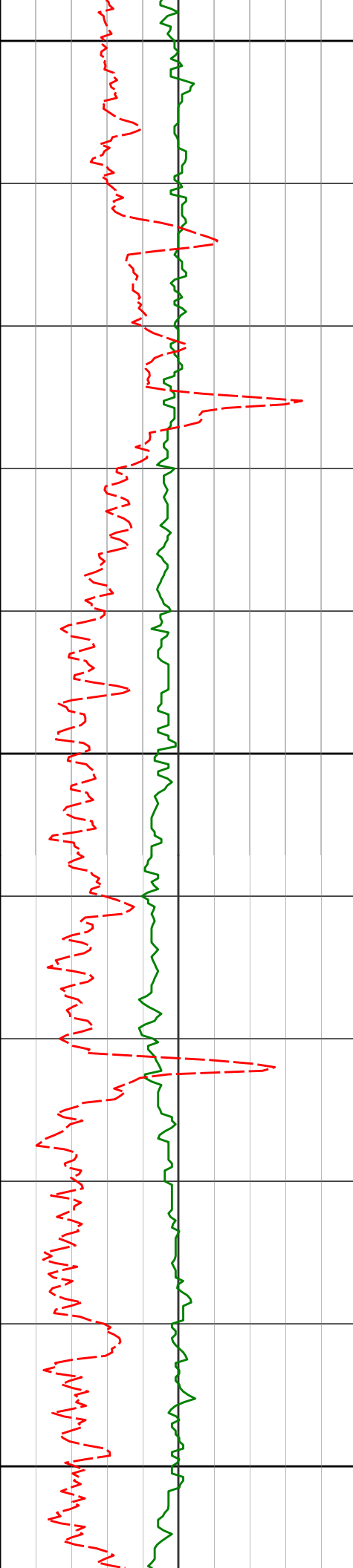
229.26'

6482'

90.22°

358.67° 5830.00'

320.08'



6500

6575'

90.15°

358.29° 5829.70'

411.83'

6600

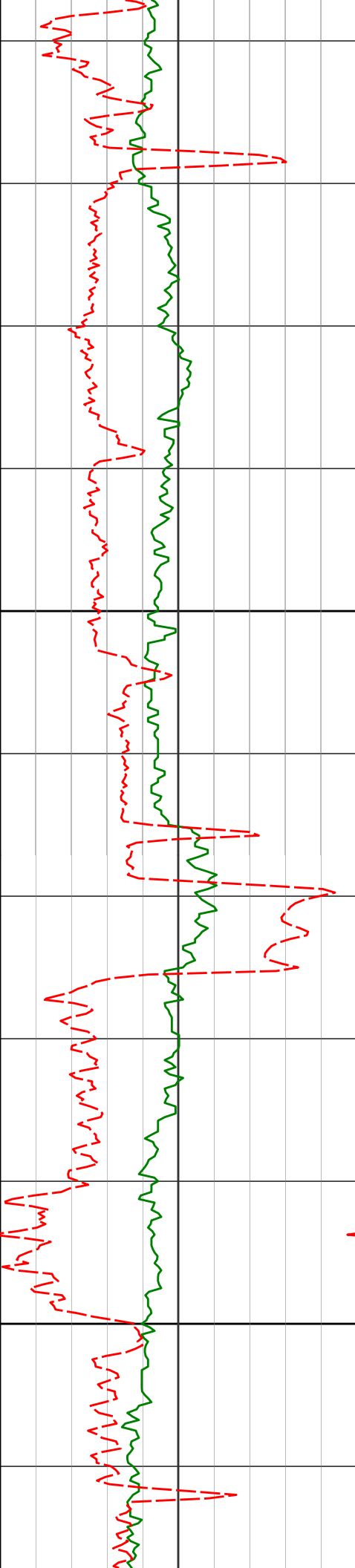
6667'

90.68°

358.06° 5829.03'

502.51'

6700



6800

6900

6759'

91.26°

357.87° 5827.47'

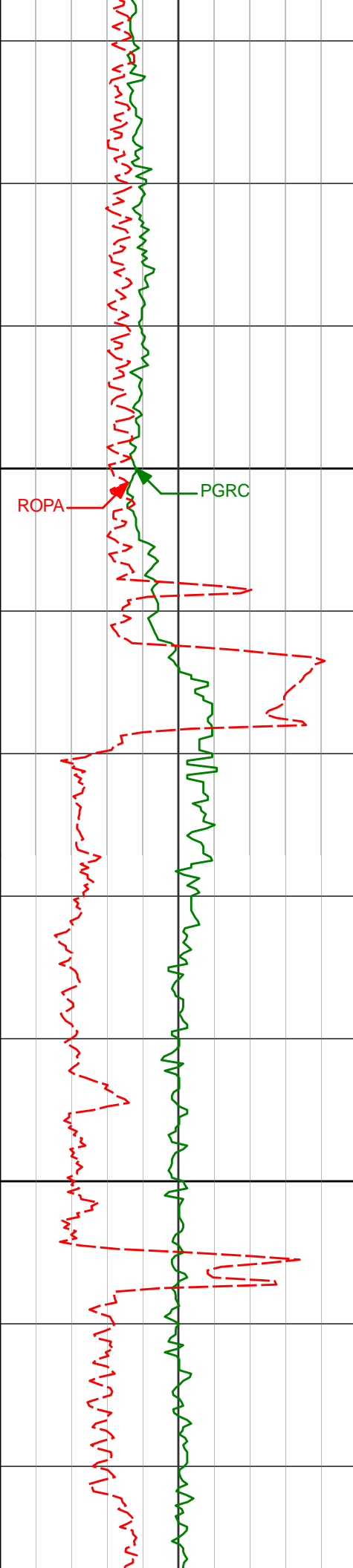
593.12'

6850'

90.31°

358.05° 5826.23'

682.75'



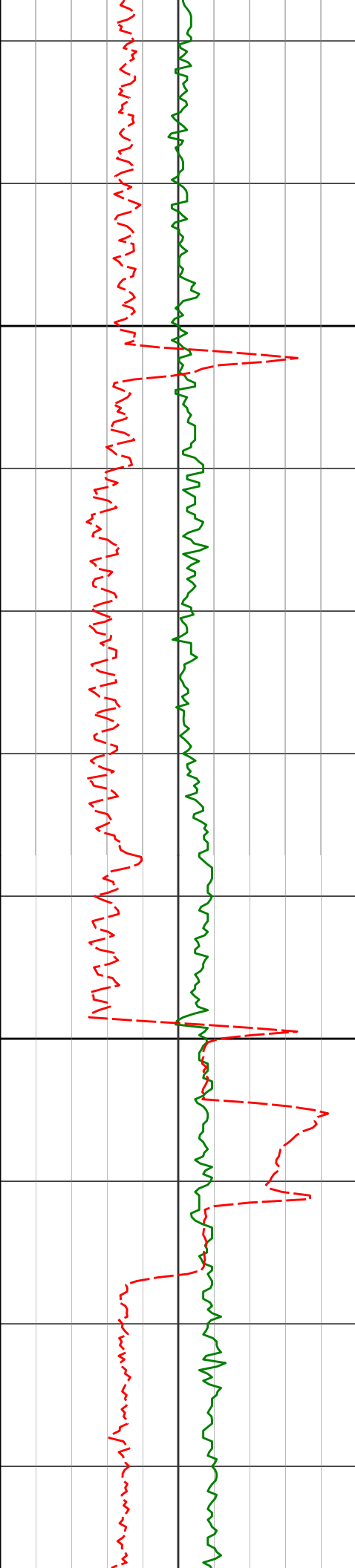
7000

7100

6943' 90.80° 358.12° 5825.33' 774.39'

7035' 90.09° 359.08° 5824.61' 865.19'

7128' 90.37° 358.66° 5824.23' 957.04'



7200

7221'

90.86°

358.29° 5823.23'

1048.78'

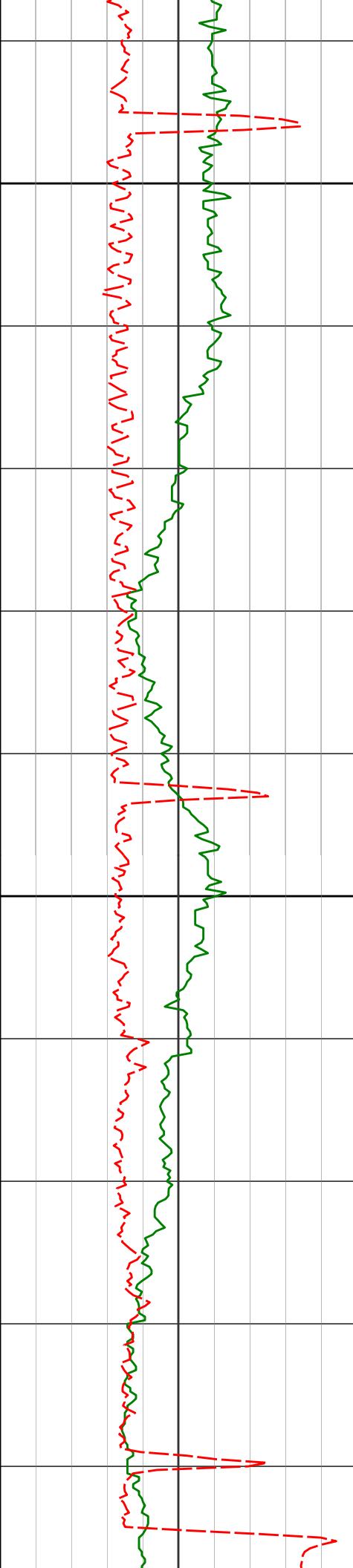
7300

7314'

89.97°

358.74° 5822.56'

1140.54'



7400

7407'

90.43°

358.54° 5822.23'

1232.33'

7500

7501'

90.83°

358.17° 5821.20'

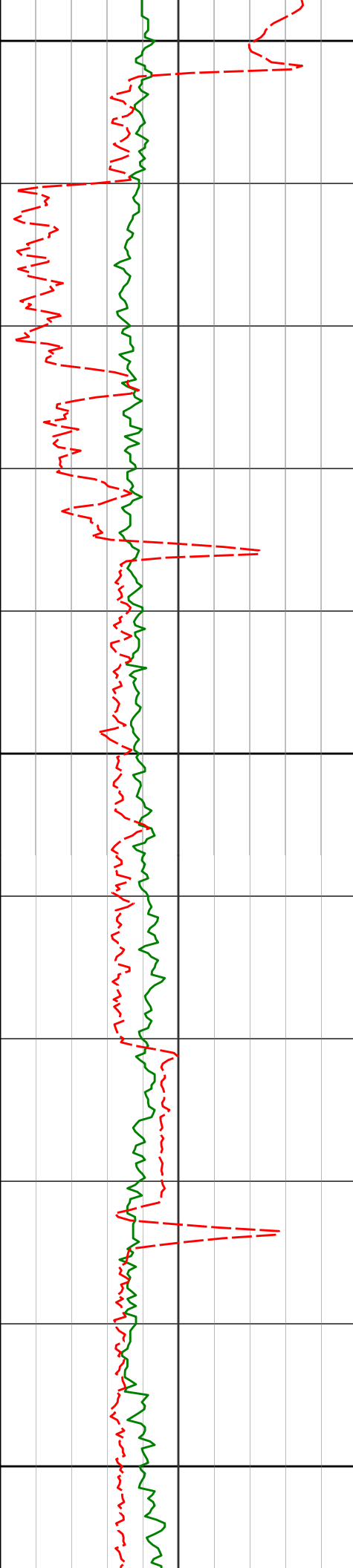
1325.03'

7593'

89.66°

359.06° 5820.80'

1415.83'



7600

7688'

90.62°

0.24° 5820.57'

1509.84'

7700

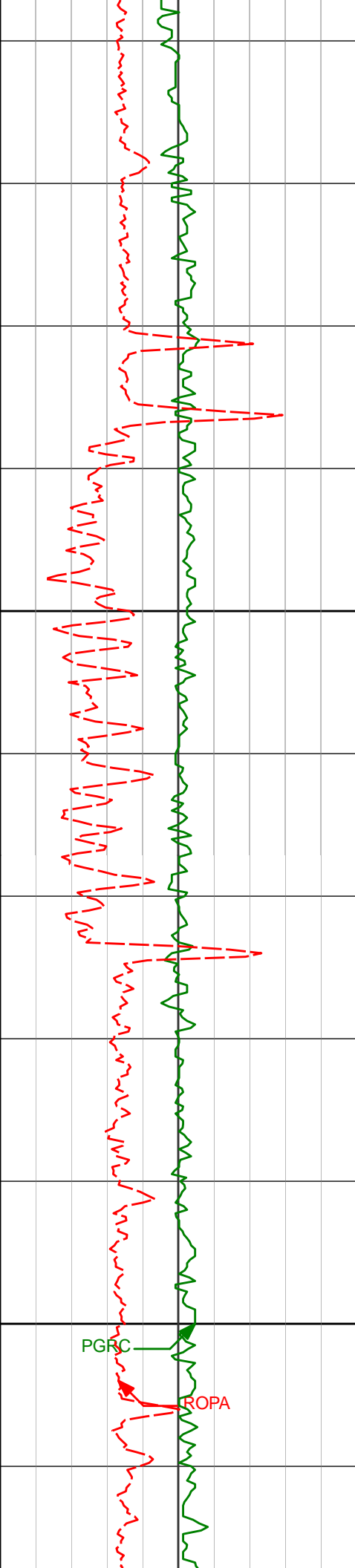
7782'

90.83°

359.60° 5819.38'

1602.93'

7800



7900

8000

7877'

89.26°

0.10° 5819.31'

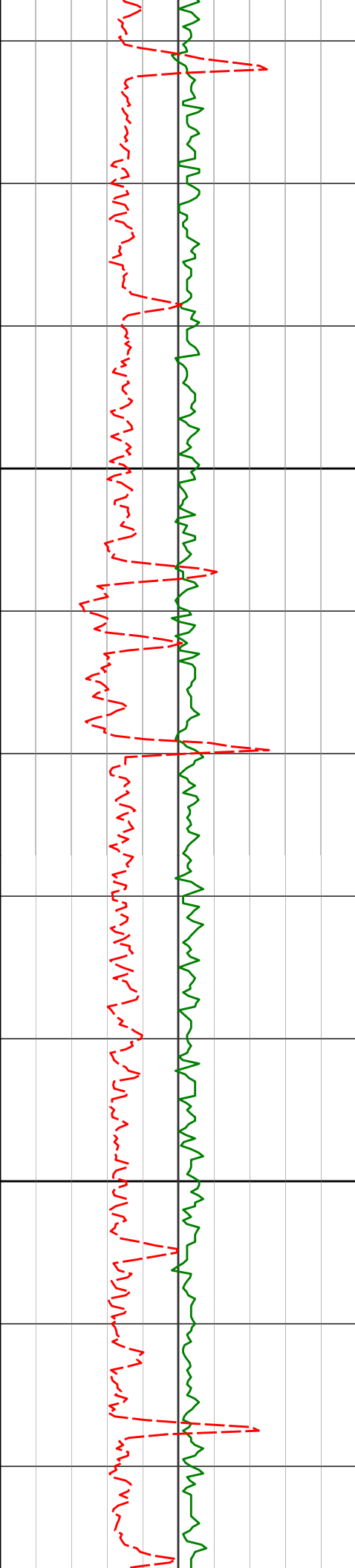
1697.00'

7972'

90.03°

359.97° 5819.89'

1791.11'



8100

8200

8067'

90.00°

0.48° 5819.87'

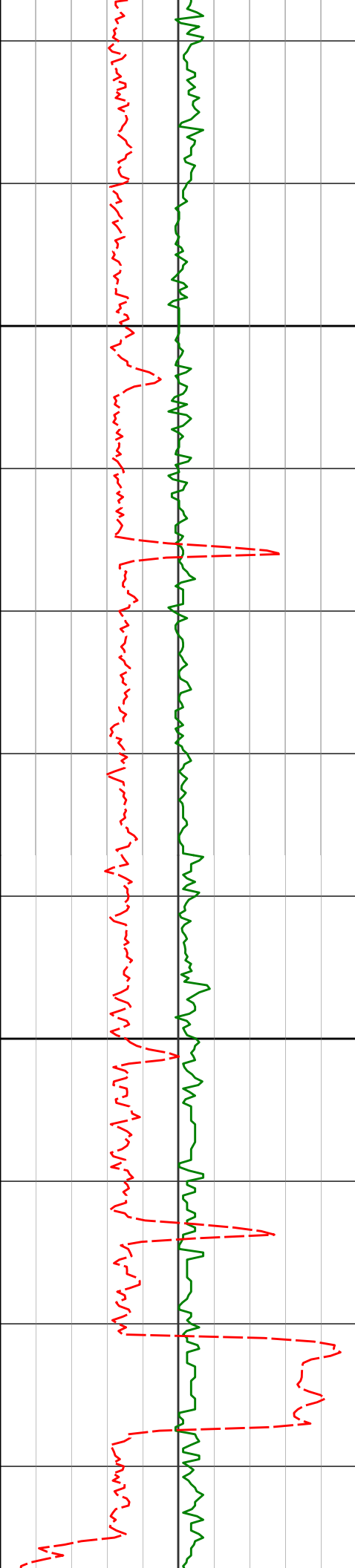
1885.26'

8161'

90.28°

1.15° 5819.64'

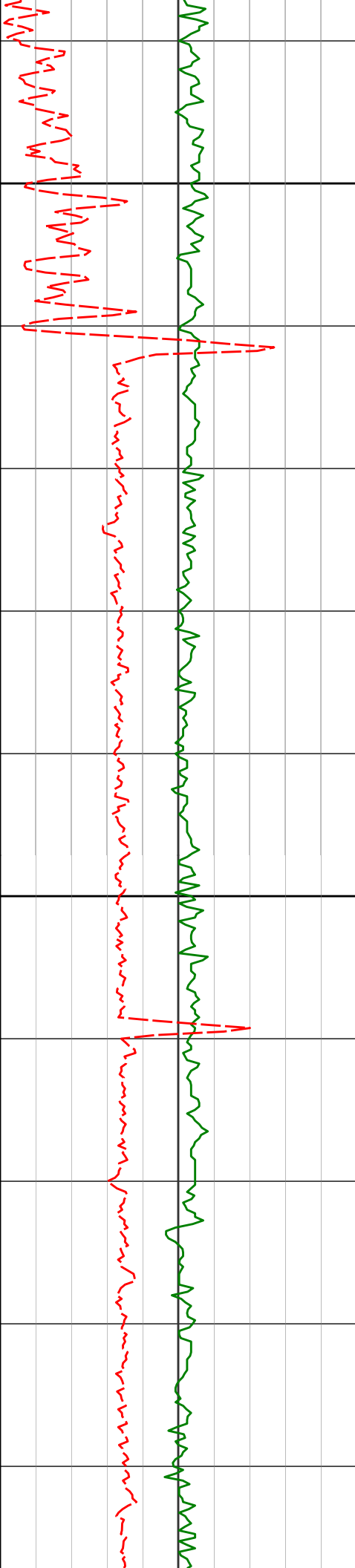
1978.54'



8300

8400

8256'	89.88°	1.89°	5819.51'	2072.96'
8351'	90.40°	2.14°	5819.28'	2167.46'
8445'	90.49°	1.24°	5818.55'	2260.91'



8500

8540'

89.94°

0.35° 5818.19'

2355.18'

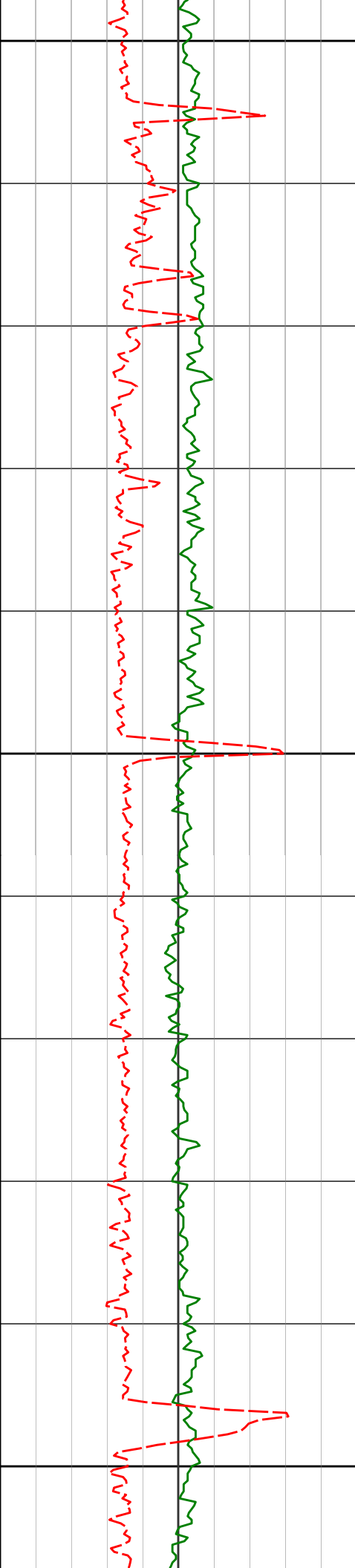
8600

8635'

90.03°

359.47° 5818.22'

2449.26'



8700

8729'

90.15°

358.84° 5818.07'

2542.17'

8800

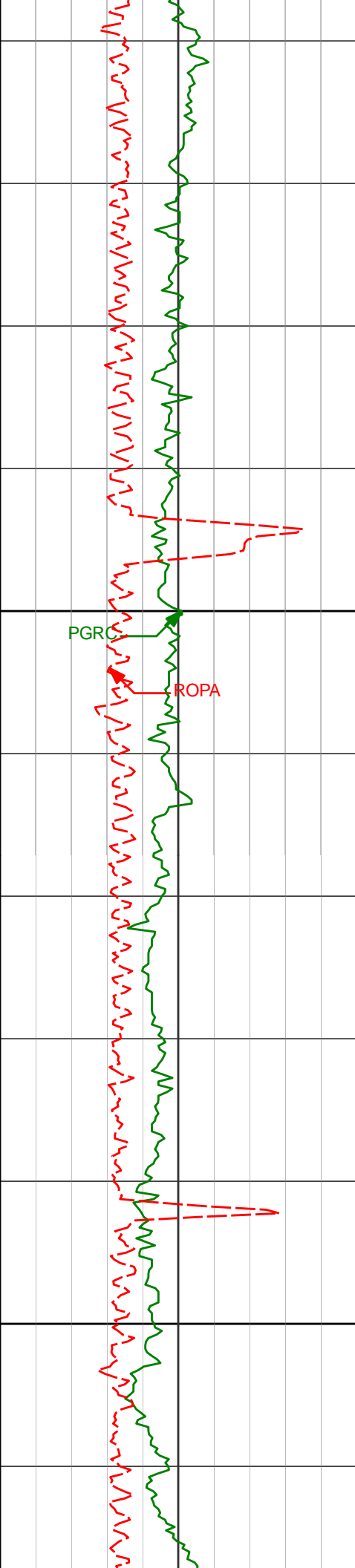
8824'

89.97°

358.43° 5817.96'

2635.94'

8900



8918'

90.68°

358.26° 5817.43'

2728.64'

9000

PGR

ROPA

9013'

91.17°

358.08° 5815.90'

2822.26'

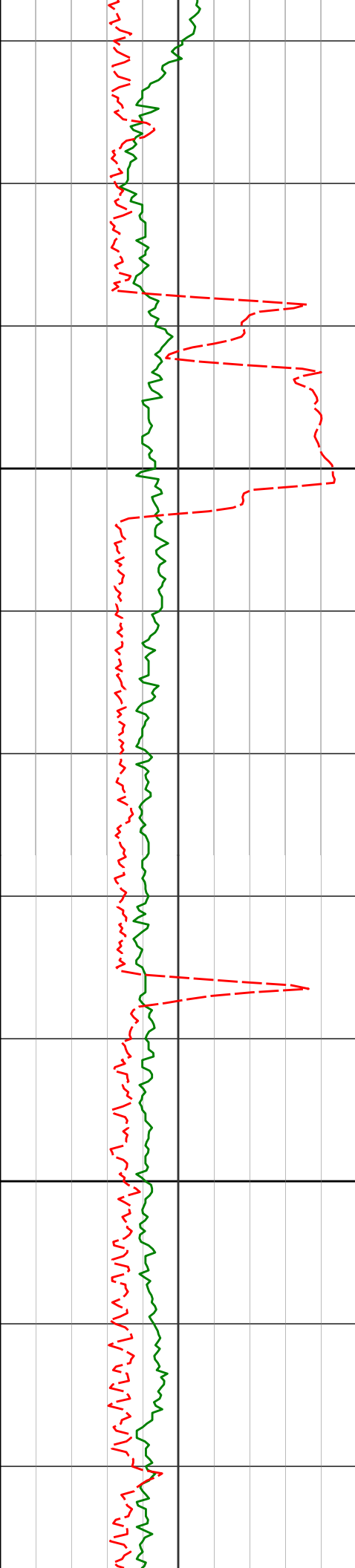
9100

9108'

92.13°

357.68° 5813.17'

2915.78'



9200

9202'

90.77°

358.36° 5810.79'

3008.36'

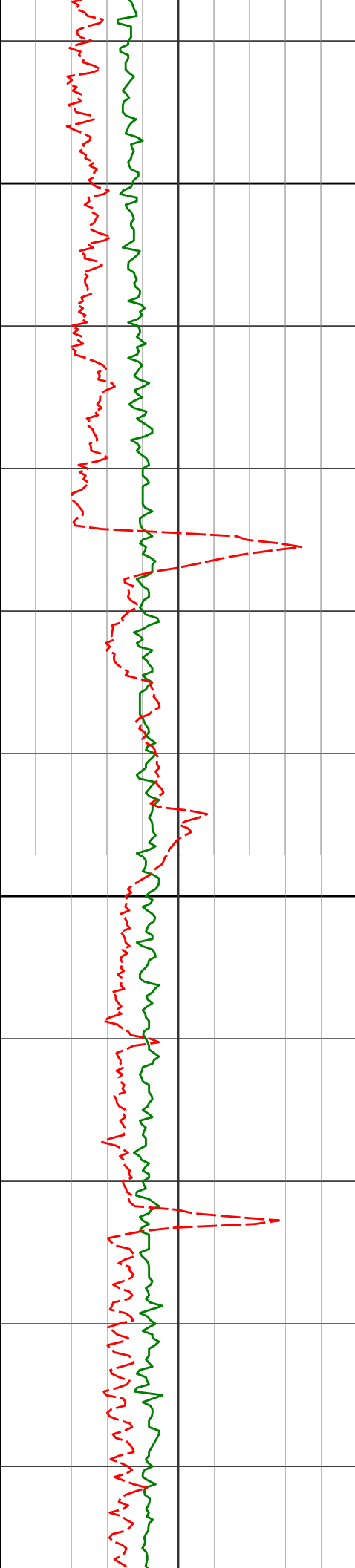
9300

9297'

91.20°

358.48° 5809.16'

3102.05'



9600

9700

9581'

90.18°

359.29° 5810.10'

3382.48'

9675'

90.83°

359.41° 5809.27'

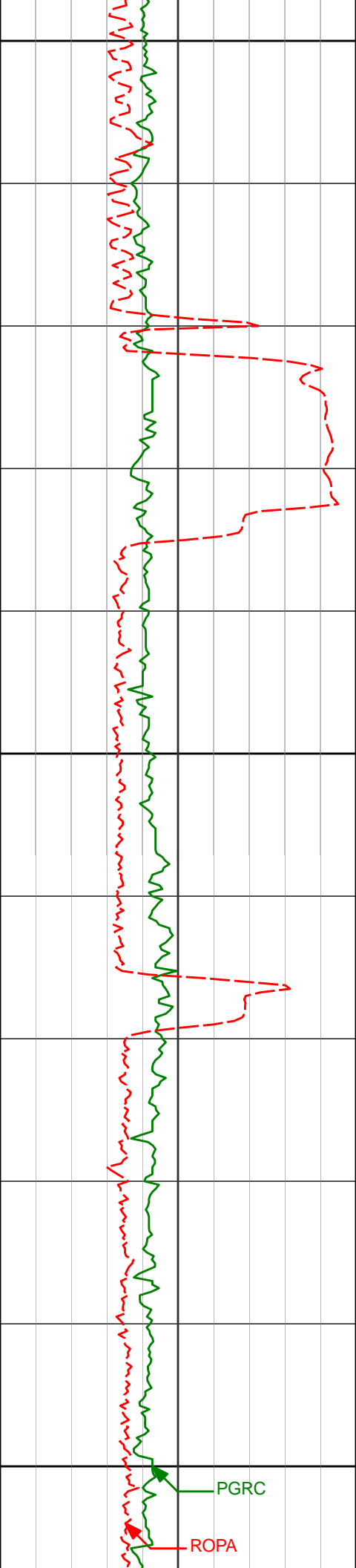
3475.43'

9770'

90.06°

356.94° 5808.53'

3569.06'



9800

9900

10000

PGRC

ROPA

9865'

89.94°

358.11° 5808.53'

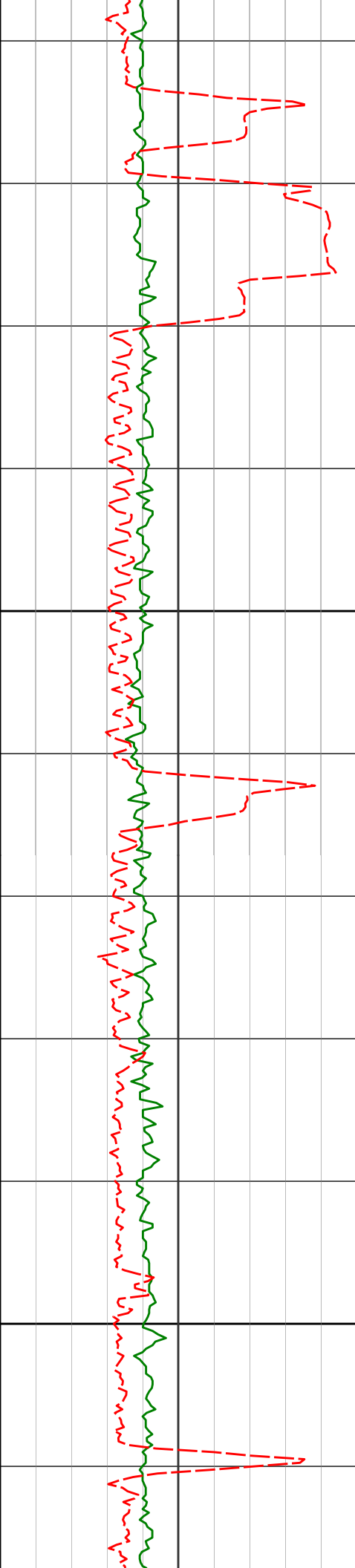
3662.51'

9960'

90.40°

357.83° 5808.25'

3756.10'



10054'

90.06°

358.85° 5807.87'

3848.80'

10100

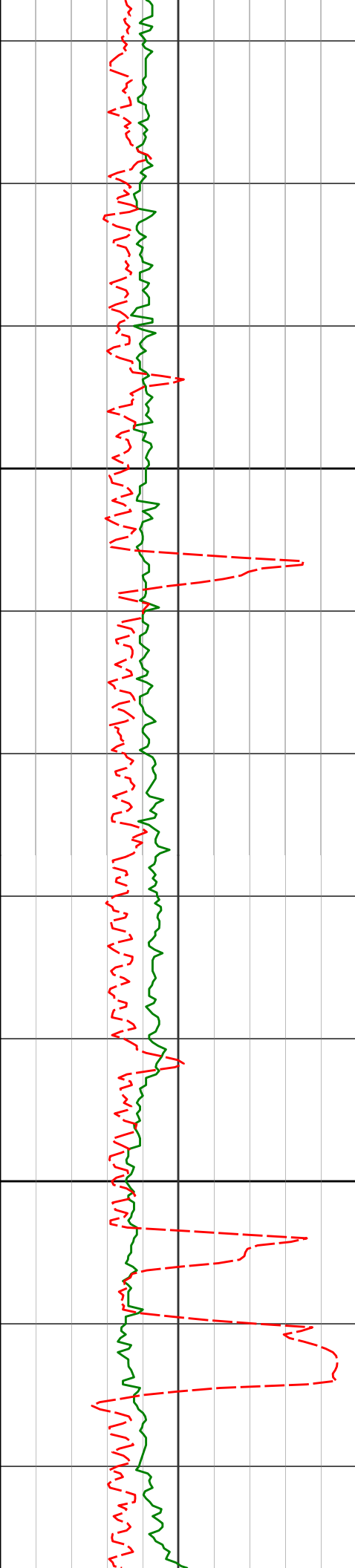
10148'

89.75°

358.29° 5808.02'

3941.56'

10200



10300

10400

10243'

90.49°

358.01° 5807.82'

4035.19'

10338'

90.74°

357.33° 5806.80'

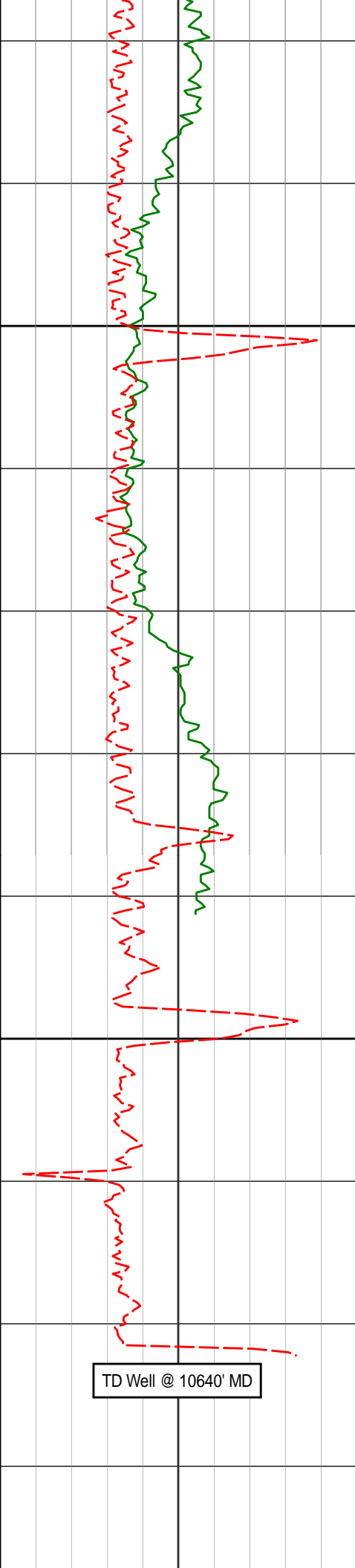
4128.68'

10432'

91.33°

357.50° 5805.10'

4221.10'



10500

10527'

91.82°

357.49° 5802.50'

4314.51'

10571'

91.94°

357.10° 5801.05'

4357.73'

10600

10640'

91.94°

357.10° 5798.72'

4425.48'

TD Well @ 10640' MD

[illegible]

HALLIBURTON

DIRECTIONAL SURVEY REPORT

**Noble Energy Inc.
Greyson LD28-753
Wattenburg
Weld Colorado
USA
CA-XX-0902594951**

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
39.00	0.20	282.17	39.00	0.01 N	0.07 W	0.01	0.52
102.00	0.29	252.81	102.00	0.01 S	0.33 W	-0.05	0.24
193.00	0.51	331.37	193.00	0.28 N	0.74 W	0.18	0.59
284.00	0.50	327.41	283.99	0.98 N	1.15 W	0.81	0.04
375.00	0.58	348.27	374.99	1.77 N	1.46 W	1.55	0.23
466.00	0.21	313.08	465.99	2.33 N	1.68 W	2.08	0.46
557.00	0.20	243.13	556.99	2.38 N	1.94 W	2.09	0.26
648.00	0.51	209.64	647.99	1.95 N	2.28 W	1.62	0.40
739.00	0.16	209.98	738.98	1.49 N	2.55 W	1.12	0.38
830.00	0.44	171.79	829.98	1.03 N	2.56 W	0.67	0.36
921.00	0.44	181.38	920.98	0.34 N	2.52 W	-0.01	0.08
1012.00	0.51	172.90	1011.98	0.41 S	2.48 W	-0.75	0.11
1103.00	0.53	184.59	1102.97	1.23 S	2.46 W	-1.55	0.12
1121.00	0.45	175.48	1120.97	1.38 S	2.47 W	-1.71	0.60
1223.00	0.14	185.86	1222.97	1.91 S	2.45 W	-2.22	0.31
1315.00	0.34	165.61	1314.97	2.28 S	2.39 W	-2.59	0.24
1407.00	2.09	170.57	1406.95	4.20 S	2.05 W	-4.45	1.90
1500.00	4.42	159.39	1499.79	9.24 S	0.50 W	-9.22	2.59
1592.00	6.19	151.06	1591.39	16.90 S	3.14 E	-16.31	2.08
1686.00	7.39	142.99	1684.73	26.16 S	9.23 E	-24.64	1.63
1778.00	9.55	144.99	1775.73	37.13 S	17.18 E	-34.43	2.36
1871.00	10.13	145.62	1867.36	50.20 S	26.22 E	-46.13	0.63
1964.00	9.86	144.95	1958.95	63.46 S	35.40 E	-58.01	0.32
2055.00	9.05	143.99	2048.71	75.63 S	44.09 E	-68.87	0.90
2147.00	9.62	150.85	2139.50	88.20 S	52.09 E	-80.22	1.36
2239.00	9.13	152.52	2230.27	101.39 S	59.20 E	-92.32	0.61
2331.00	10.26	151.21	2320.95	115.05 S	66.52 E	-104.84	1.25
2424.00	10.45	147.51	2412.44	129.42 S	75.03 E	-117.91	0.75
2517.00	10.74	146.54	2503.85	143.76 S	84.34 E	-130.84	0.37
2610.00	9.82	147.09	2595.36	157.65 S	93.43 E	-143.35	0.99
2703.00	9.68	148.60	2687.01	170.99 S	101.81 E	-155.41	0.31
2797.00	9.43	148.42	2779.71	184.29 S	109.97 E	-167.48	0.28
2889.00	9.20	146.54	2870.50	196.85 S	117.97 E	-178.81	0.42
2984.00	9.50	156.00	2964.24	210.34 S	125.34 E	-191.17	1.65
3079.00	8.03	153.68	3058.13	223.45 S	131.47 E	-203.32	1.58
3174.00	8.91	151.60	3152.09	235.87 S	137.91 E	-214.74	0.97
3268.00	11.01	151.73	3244.67	250.18 S	145.63 E	-227.85	2.23
3363.00	10.73	149.16	3337.97	265.75 S	154.45 E	-242.07	0.59
3457.00	11.29	150.10	3430.24	281.24 S	163.53 E	-256.17	0.63
3552.00	10.80	150.05	3523.48	297.01 S	172.61 E	-270.55	0.51
3647.00	11.02	148.66	3616.76	312.48 S	181.77 E	-284.61	0.36
3742.00	10.55	158.78	3710.09	328.34 S	189.64 E	-299.24	2.05
3836.00	10.44	158.08	3802.52	344.27 S	195.94 E	-314.15	0.18
3930.00	9.89	155.94	3895.04	359.54 S	202.41 E	-328.40	0.71
4025.00	9.43	154.47	3988.69	374.02 S	209.09 E	-341.82	0.55
4119.00	9.24	153.69	4081.49	387.59 S	215.64 E	-354.99	0.53

4119.00	8.91	153.69	4081.49	387.50 S	215.64 E	-354.28	0.57
4214.00	8.40	155.97	4175.41	400.44 S	221.73 E	-366.26	0.64
4309.00	9.76	153.85	4269.22	414.01 S	228.10 E	-378.83	1.47
4403.00	9.37	154.07	4361.91	428.04 S	234.96 E	-391.79	0.42
4498.00	8.15	158.03	4455.80	441.24 S	240.86 E	-404.05	1.43
4592.00	7.30	166.03	4548.95	453.22 S	244.80 E	-415.38	1.45
4687.00	9.08	153.80	4642.98	465.81 S	249.56 E	-427.19	2.61
4782.00	9.13	150.07	4736.79	479.06 S	256.63 E	-439.35	0.62
4876.00	8.14	152.20	4829.72	491.41 S	263.46 E	-450.65	1.10
4971.00	17.94	125.18	4922.23	505.84 S	278.61 E	-462.87	11.89
5066.00	19.85	113.26	5012.14	520.64 S	305.39 E	-473.86	4.52
5160.00	21.81	108.46	5100.00	532.48 S	336.62 E	-481.30	2.77
5255.00	24.07	95.06	5187.54	539.78 S	372.69 E	-483.59	5.98
5349.00	25.64	83.77	5272.88	539.26 S	412.03 E	-477.68	5.31
5444.00	27.93	73.20	5357.73	530.59 S	453.79 E	-463.37	5.55
5539.00	31.74	62.16	5440.19	512.47 S	497.23 E	-439.46	7.03
5633.00	39.51	51.04	5516.62	482.04 S	542.46 E	-403.11	10.73
5728.00	43.77	32.78	5587.86	435.21 S	583.92 E	-351.05	13.49
5823.00	46.14	22.27	5655.18	375.80 S	614.74 E	-287.97	8.19
5917.00	55.03	17.57	5714.83	307.57 S	639.27 E	-217.02	10.21
6012.00	61.84	11.04	5764.57	229.21 S	659.07 E	-136.68	9.25
6106.00	74.56	3.68	5799.45	142.87 S	669.98 E	-49.67	15.35
6201.00	82.49	0.05	5818.33	49.90 S	672.96 E	42.83	9.15
6226.00	84.60	359.62	5821.14	25.06 S	672.89 E	67.42	8.61
6390.00	89.41	358.71	5829.70	138.64 N	670.51 E	229.26	2.99
6482.00	90.22	358.67	5830.00	230.62 N	668.41 E	320.08	0.87
6575.00	90.15	358.29	5829.70	323.59 N	665.95 E	411.83	0.41
6667.00	90.68	358.06	5829.03	415.54 N	663.02 E	502.51	0.63
6759.00	91.26	357.87	5827.47	507.46 N	659.75 E	593.12	0.67
6850.00	90.31	358.05	5826.23	598.40 N	656.51 E	682.75	1.07
6943.00	90.80	358.12	5825.33	691.34 N	653.41 E	774.39	0.54
7035.00	90.09	359.08	5824.61	783.31 N	651.16 E	865.19	1.29
7128.00	90.37	358.66	5824.23	876.29 N	649.32 E	957.04	0.54
7221.00	90.86	358.29	5823.23	969.25 N	646.84 E	1048.78	0.66
7314.00	89.97	358.74	5822.56	1062.22 N	644.43 E	1140.54	1.07
7407.00	90.43	358.54	5822.23	1155.19 N	642.23 E	1232.33	0.54
7501.00	90.83	358.17	5821.20	1249.14 N	639.54 E	1325.03	0.58
7593.00	89.66	359.06	5820.80	1341.11 N	637.32 E	1415.83	1.60
7688.00	90.62	0.24	5820.57	1436.11 N	636.74 E	1509.84	1.60
7782.00	90.83	359.60	5819.38	1530.10 N	636.61 E	1602.93	0.72
7877.00	89.26	0.10	5819.31	1625.10 N	636.37 E	1697.00	1.74
7972.00	90.03	359.97	5819.89	1720.10 N	636.42 E	1791.11	0.82
8067.00	90.00	0.48	5819.87	1815.09 N	636.80 E	1885.26	0.54
8161.00	90.28	1.15	5819.64	1909.08 N	638.13 E	1978.54	0.77
8256.00	89.88	1.89	5819.51	2004.05 N	640.65 E	2072.96	0.89
8351.00	90.40	2.14	5819.28	2098.99 N	643.98 E	2167.46	0.61
8445.00	90.49	1.24	5818.55	2192.95 N	646.75 E	2260.91	0.96
8540.00	89.94	0.35	5818.19	2287.93 N	648.07 E	2355.18	1.10
8635.00	90.03	359.47	5818.22	2382.93 N	647.92 E	2449.26	0.94
8729.00	90.15	358.84	5818.07	2476.92 N	646.52 E	2542.17	0.68
8824.00	89.97	358.43	5817.96	2571.90 N	644.26 E	2635.94	0.47
8918.00	90.68	358.26	5817.43	2665.85 N	641.55 E	2728.64	0.77
9013.00	91.17	358.08	5815.90	2760.79 N	638.52 E	2822.26	0.55
9108.00	92.13	357.68	5813.17	2855.69 N	635.01 E	2915.78	1.09
9202.00	90.77	358.36	5810.79	2949.60 N	631.76 E	3008.36	1.61
9297.00	91.20	358.48	5809.16	3044.55 N	629.14 E	3102.05	0.47
9391.00	89.35	358.80	5808.70	3138.52 N	626.91 E	3194.83	2.00
9486.00	89.38	358.70	5809.75	3233.49 N	624.83 E	3288.62	0.10
9581.00	90.18	359.29	5810.10	3328.47 N	623.17 E	3382.48	1.05
9675.00	90.83	359.41	5809.27	3422.46 N	622.11 E	3475.43	0.70
9770.00	90.06	356.94	5808.53	3517.40 N	619.08 E	3569.06	2.73
9865.00	89.94	358.11	5808.53	3612.31 N	614.97 E	3662.51	1.25
9960.00	90.40	357.83	5808.25	3707.25 N	611.62 E	3756.10	0.57
10054.00	90.06	358.85	5807.87	3801.21 N	608.90 E	3848.80	1.14
10148.00	89.75	358.29	5808.02	3895.18 N	606.55 E	3941.56	0.68
10243.00	90.49	358.01	5807.82	3990.13 N	603.49 E	4035.19	0.83
10338.00	90.74	357.33	5806.80	4085.04 N	599.62 E	4128.68	0.76
10432.00	91.33	357.50	5805.10	4178.93 N	595.37 E	4221.10	0.65
10527.00	91.82	357.49	5802.50	4273.81 N	591.22 E	4314.51	0.52
10571.00	91.94	357.10	5801.05	4317.73 N	589.14 E	4357.73	0.93
10640.00	91.94	357.10	5798.72	4386.61 N	585.65 E	4425.48	0.00

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 7.88 DEGREES (GRID)
A TOTAL CORRECTION OF 6.97 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10640.00 FEET
IS 4425.53 FEET ALONG 7.60 DEGREES (GRID)

Surveys to 1121 are flexi-shot surveys. Final survey is a straight line projection to TD.

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