

PCGC : Pressure Case Gamma
PCDC: Pressure Case Directional

1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	03-Nov-14	08-Nov-14			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	1,235.00	5,883.00			
Log End Depth (MD, ft)	5,883.00	14,605.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	30-Oct-14 19:14	04-Nov-14 00:20			
Drill/Wipe End Date and Time	30-Oct-14 19:14	08-Nov-14 04:50			
Min Inc (deg) @ Depth (MD, ft)	1.73 @ 1,290.00	81.80 @ 5,916.00			
Max Inc (deg) @ Depth (MD, ft)	84.40 @ 5,883.00	92.59 @ 6,389.00			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.75 / PDC			
Flow Rate (gpm)	577.92	281.95			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.70 / 27.00	10.32 / 39.00			
Filtrate CL (ppm)	150.00	200.00			
pH / Fluid Loss (mptm)	8.60 / 20	9.10 / 16			
PV (cP) / YP (lbf2)	10 / 7.00	10 / 6.00			
% Solids / % Sand	2.70 / 0.10	9.60 / 0.10			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (in F) / S	108.00 / PCM	255.00 / PCM			

Max Tool Temp (degF) / Source	162.80 / PCM	255.60 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Justin Fields	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11342275	12365893			
Insert Serial Number	12001076	11400937			
Date and Time Initialized	31-Oct-14 16:07	02-Nov-14 16:51			
Date and Time Read	04-Nov-14 07:32	08-Nov-14 19:31			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	51.86	63.07			
Software Version	6.21	6.21			
Sub Serial Number	11342275	12365893			
Sonde Serial Number	11478053	10835184			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	335.96	323.85			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	46.76	57.97			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11342275	12365893			
Insert/Sonde Serial Number	11579778	11680996			

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rig 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.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
 - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 8.0.20
6. Gamma presented inside casing/cement from 5825 ft. MD to 5877 ft. MD.

WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

HALLIBURTON

Sperry Drilling Services

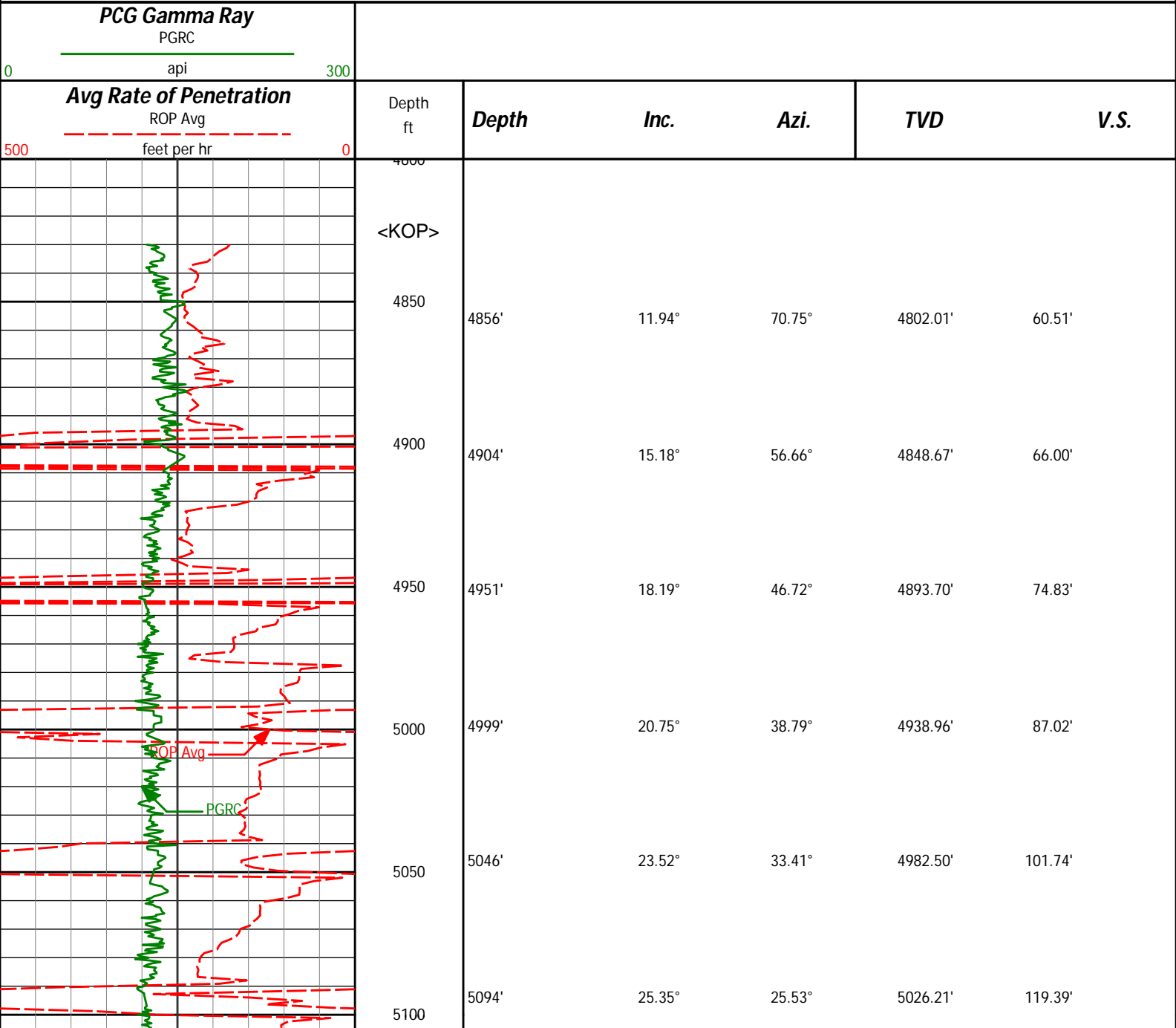
MD Main Log 1:600

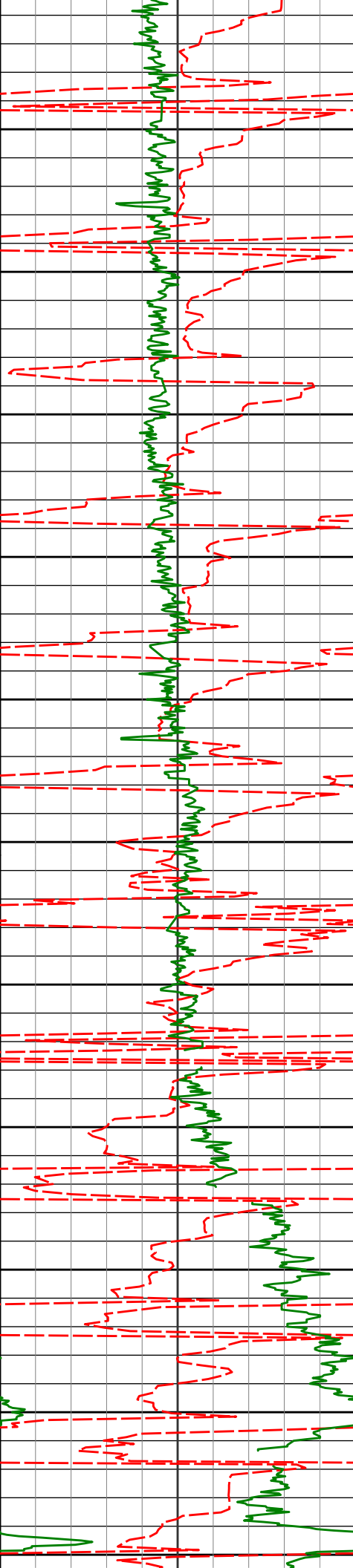
Noble Energy, Inc

Atwater State LD01-76-1AHN

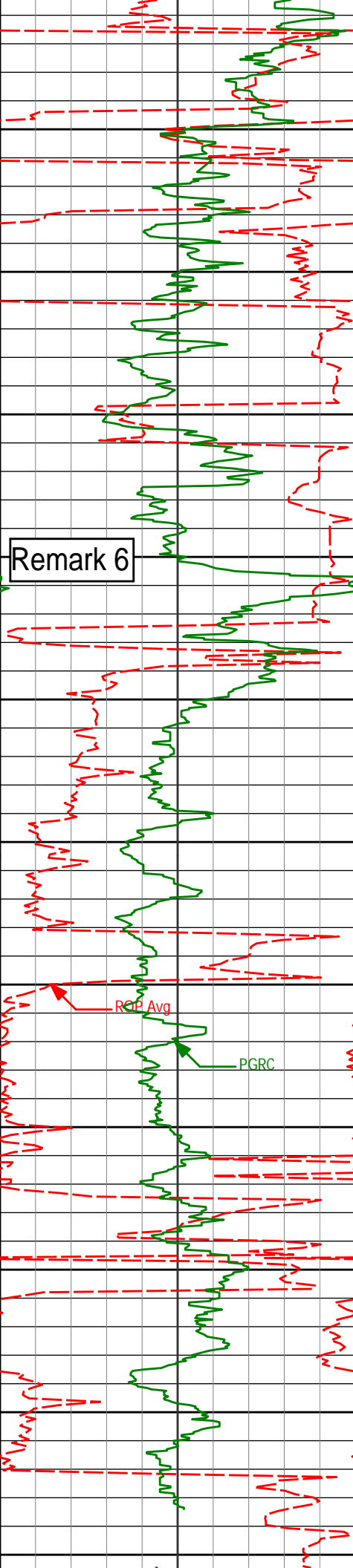
H&P 273

T9N R58W

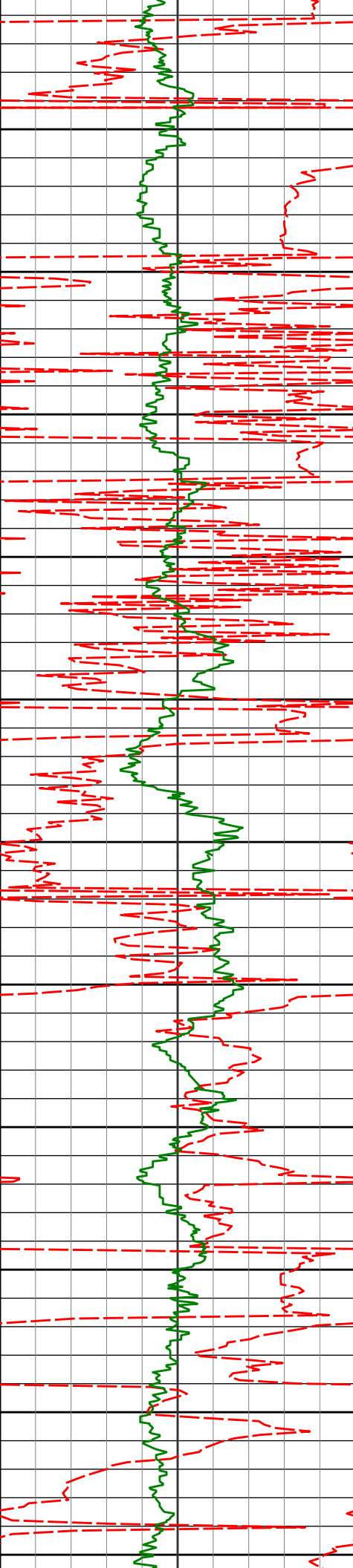




	5141'	28.22°	21.90°	5068.16'	139.11'
5150					
	5189'	31.71°	19.09°	5109.74'	161.89'
5200					
	5236'	35.51°	15.85°	5148.88'	186.99'
5250					
	5284'	39.21°	13.86°	5187.03'	215.42'
5300					
	5330'	42.92°	11.73°	5221.70'	245.13'
5350					
	5378'	46.55°	11.76°	5255.80'	278.45'
5400					
	5425'	50.40°	11.70°	5286.95'	313.16'
5450					
	5473'	54.11°	10.62°	5316.33'	350.65'
5500					
	5520'	57.93°	7.85°	5342.60'	389.33'
5550					
	5568'	62.04°	5.91°	5366.60'	430.75'
5600					
	5614'	65.55°	4.03°	5386.92'	471.97'
5650					



	5662'	68.76°	0.87°	5405.55'	516.19'
5700	5709'	71.11°	358.27°	5421.68'	560.28'
5750	5757'	72.46°	356.35°	5436.68'	605.70'
5800	5804'	75.96°	356.34°	5449.47'	650.68'
	5829'	78.22°	357.18°	5455.05'	674.93'
5850					
	<7" casing set at 5,877' MD>				
<Run 200>					
5900	5916'	81.80°	358.78°	5470.15'	760.35'
5950					
6000	6010'	81.87°	358.85°	5483.50'	853.22'
6050					
6100	6105'	83.29°	358.86°	5495.76'	947.26'
6150					
6200	6200'	86.64°	358.43°	5504.10'	1041.68'



6250

6300

6350

6400

6450

6500

6550

6600

6650

6700

6750

6295'

90.34°

356.06°

5506.60'

1136.26'

6389'

92.59°

355.93°

5504.20'

1229.65'

6484'

91.82°

356.05°

5500.54'

1324.01'

6579'

92.44°

355.76°

5497.02'

1418.35'

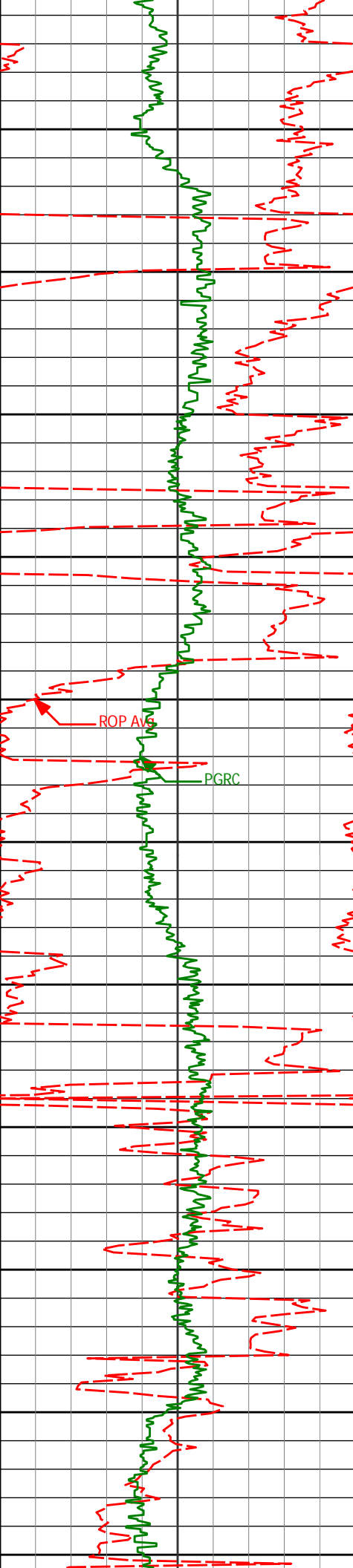
6673'

90.99°

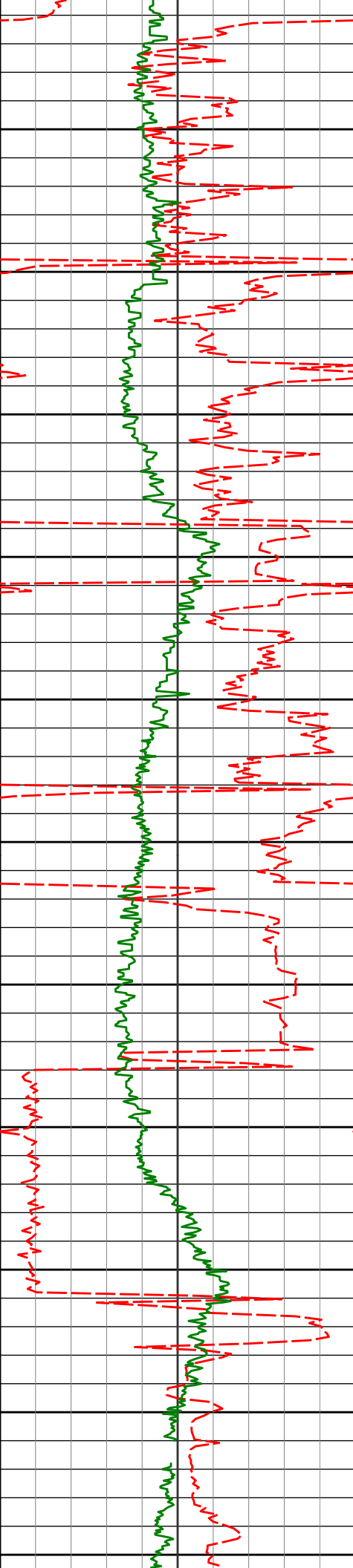
358.87°

5494.21'

1511.94'

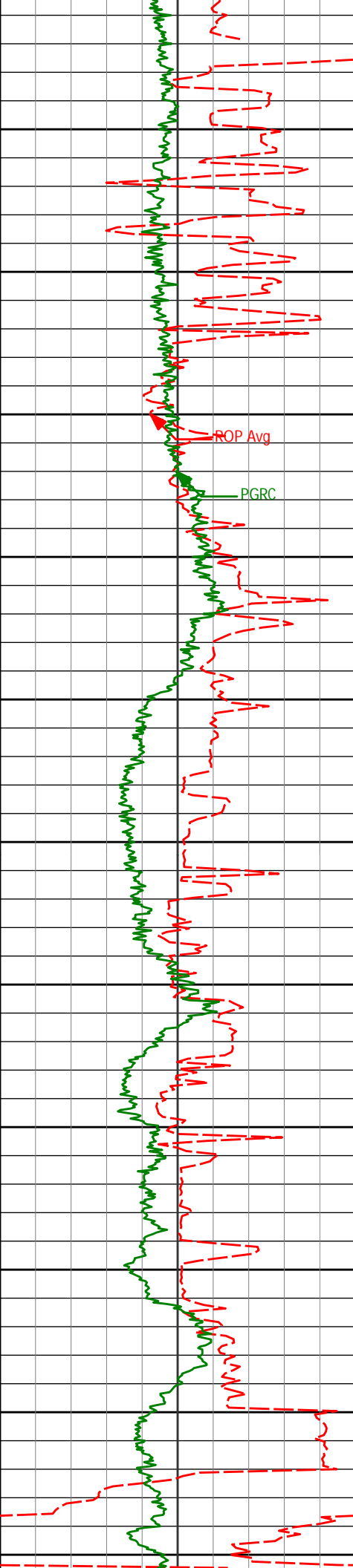


6768'	91.30°	358.30°	5492.32'	1606.72'
6800				
6863'	88.98°	359.10°	5492.09'	1701.52'
6900				
6958'	90.15°	0.36°	5492.80'	1796.42'
7000				
7053'	89.32°	359.17°	5493.24'	1891.32'
7100				
7147'	89.41°	357.91°	5494.27'	1985.12'
7200				
7240'	90.74°	357.50°	5494.15'	2077.81'
7300				



7350
7400
7450
7500
7550
7600
7650
7700
7750
7800
7850

7333'	90.99°	357.18°	5492.75'	2170.45'
7425'	90.93°	356.82°	5491.20'	2262.05'
7517'	90.83°	358.89°	5489.79'	2353.76'
7811'	90.37°	357.93°	5486.71'	2647.06'



7900

7950

8000

8050

8100

8150

8200

8250

8300

8350

8400

ROP Avg

PGRC

8001'

89.75°

357.26°

5486.51'

2836.42'

8096'

89.23°

356.64°

5487.35'

2931.00'

8190'

89.35°

356.04°

5488.52'

3024.48'

8285'

88.70°

355.96°

5490.13'

3118.89'

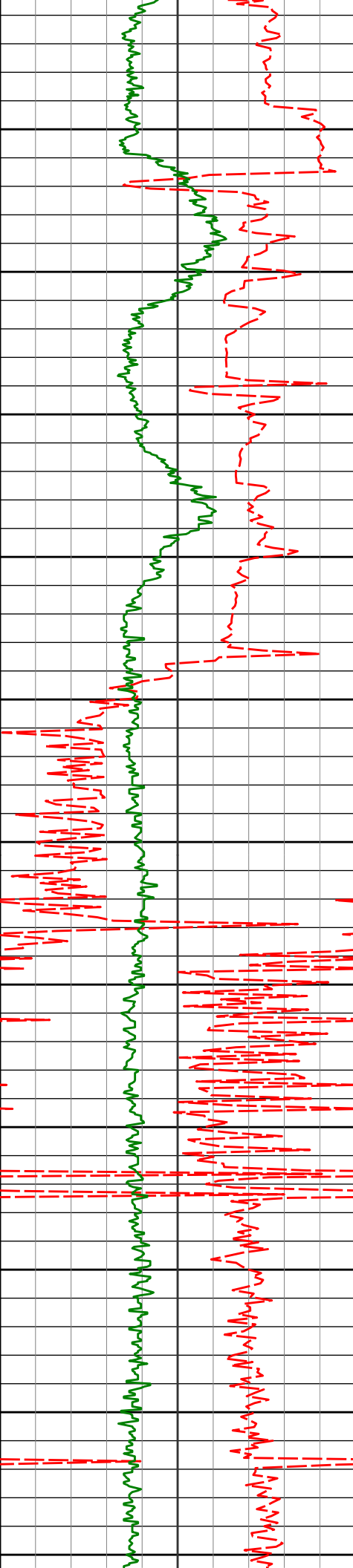
8380'

89.54°

357.54°

5491.58'

3213.43'



8450

8474'

90.34°

358.95°

5491.69'

3307.19'

8500

8550

8569'

90.34°

359.17°

5491.12'

3402.04'

8600

8650

8664'

91.30°

358.50°

5489.77'

3496.86'

8700

8750

8759'

91.36°

358.52°

5487.57'

3591.62'

8800

8850

8900

8950

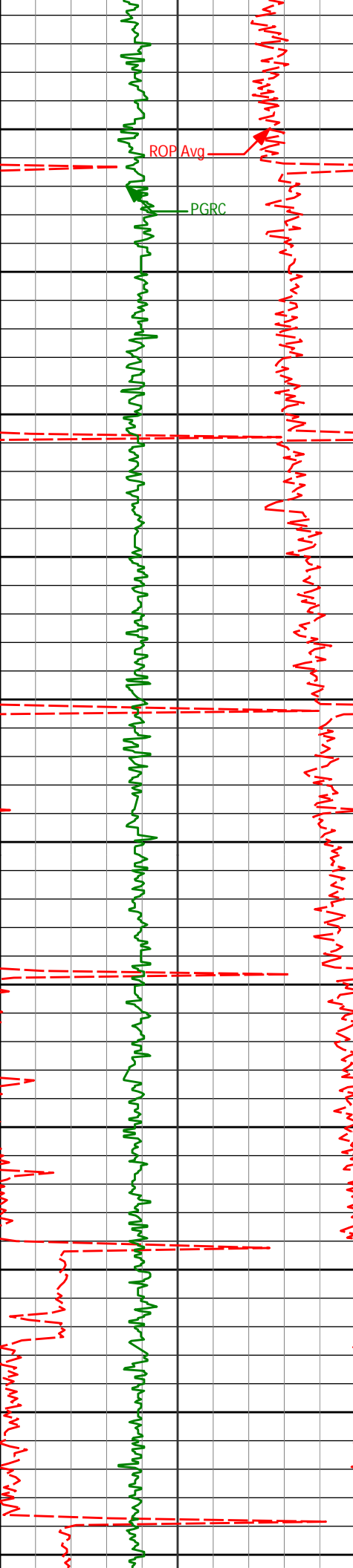
8948'

90.19°

357.15°

5485.03'

3780.03'



9000

9050

9100

9150

9200

9250

9300

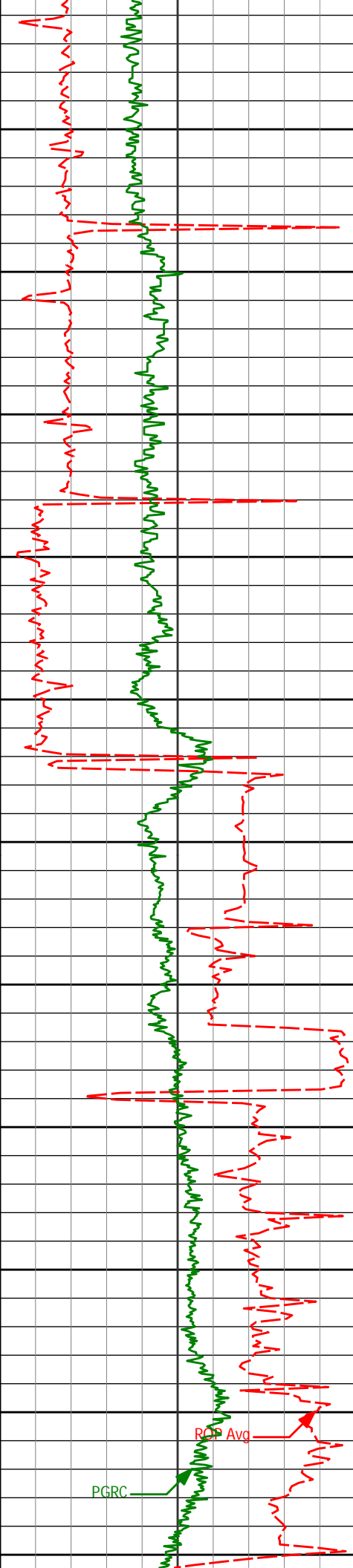
9350

9400

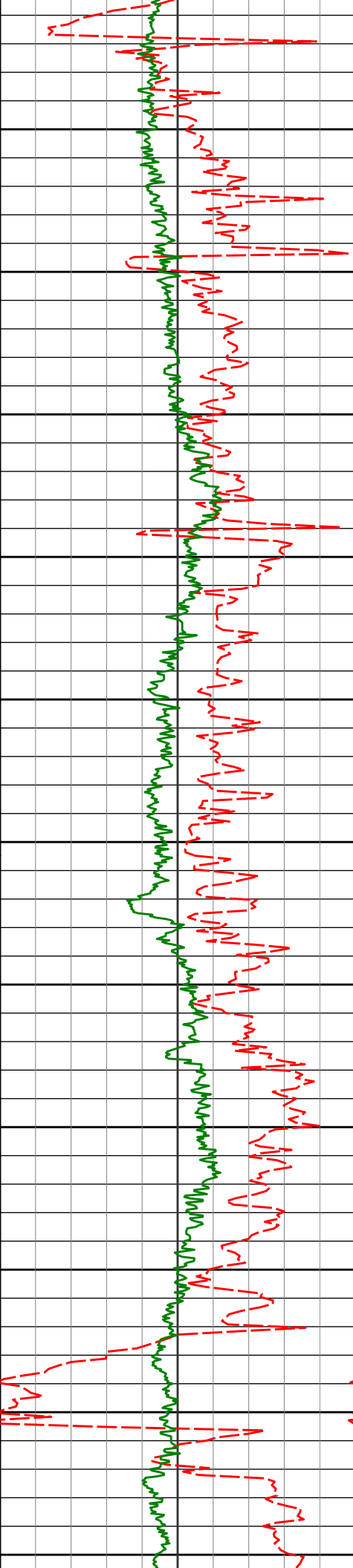
9450

9500

9043'	90.25°	357.56°	5484.67'	3874.67'
9138'	90.18°	356.81°	5484.31'	3969.29'
9233'	90.52°	359.04°	5483.72'	4064.01'
9328'	90.77°	0.58°	5482.65'	4158.91'
9423'	90.77°	1.28°	5481.37'	4253.87'



9518'	90.43°	0.78°	5480.37'	4348.84'
9550				
9600				
9612'	89.32°	359.53°	5480.57'	4442.77'
9650				
9700				
9707'	89.32°	359.54°	5481.70'	4537.66'
9750				
9800				
9802'	88.58°	359.56°	5483.44'	4632.53'
9850				
9900				
9897'	89.69°	358.15°	5484.87'	4727.34'
9950				
9992'	89.94°	357.54°	5485.18'	4822.06'
10000				
10050				



10100

10150

10200

10250

10300

10350

10400

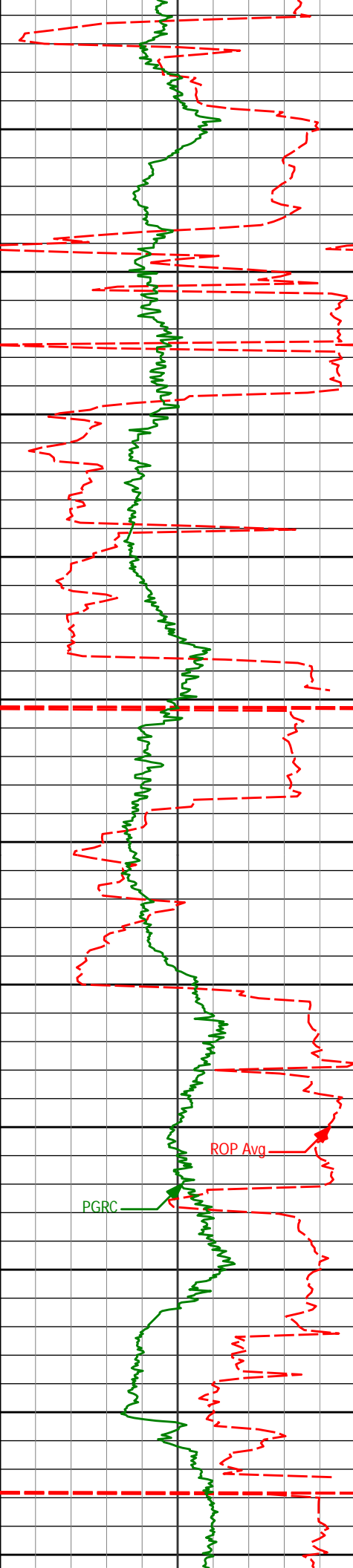
10450

10500

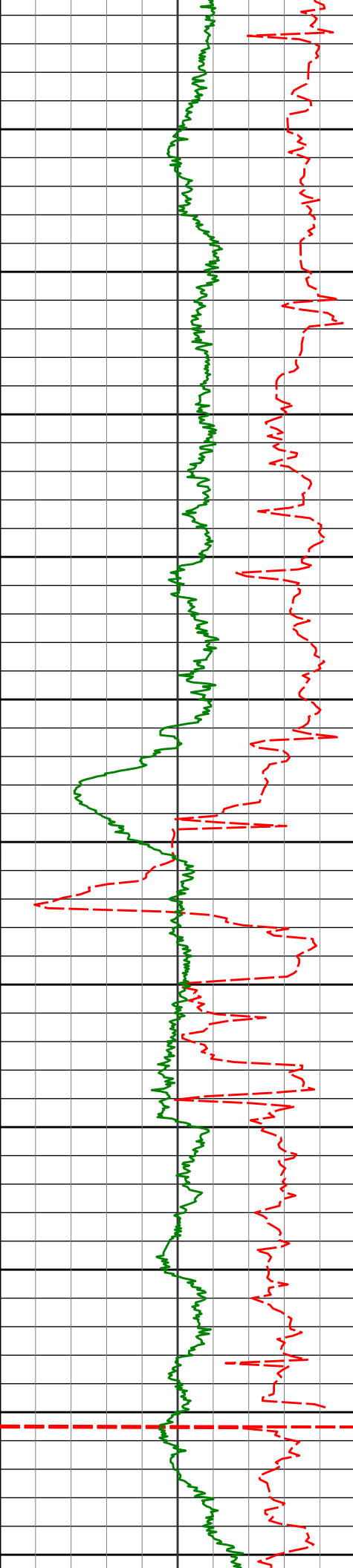
10550

10600

10084'	90.59°	357.39°	5484.75'	4913.73'
10177'	90.80°	357.20°	5483.63'	5006.37'
10269'	90.49°	357.14°	5482.59'	5097.99'
10362'	90.40°	356.44°	5481.86'	5190.56'
10454'	90.74°	356.08°	5480.95'	5282.04'
10546'	91.26°	356.19°	5479.34'	5373.49'



10650	10639'	91.67°	356.17°	5476.96'	5465.93'
10700					
10750	10731'	90.89°	356.83°	5474.91'	5557.44'
10800					
10850	10824'	90.40°	358.01°	5473.86'	5650.09'
10900					
10950	10917'	90.68°	357.68°	5472.98'	5742.81'
11000	11010'	90.34°	358.82°	5472.16'	5835.57'
11050					
11100	11103'	89.63°	358.94°	5472.18'	5928.41'
11150					



11200

11250

11300

11350

11400

11450

11500

11550

11600

11650

11700

11196'

89.97°

358.32°

5472.51'

6021.21'

11288'

90.12°

358.62°

5472.43'

6113.01'

11381'

90.25°

357.38°

5472.13'

6205.74'

11474'

89.75°

355.96°

5472.13'

6298.29'

11567'

89.75°

356.12°

5472.53'

6390.74'

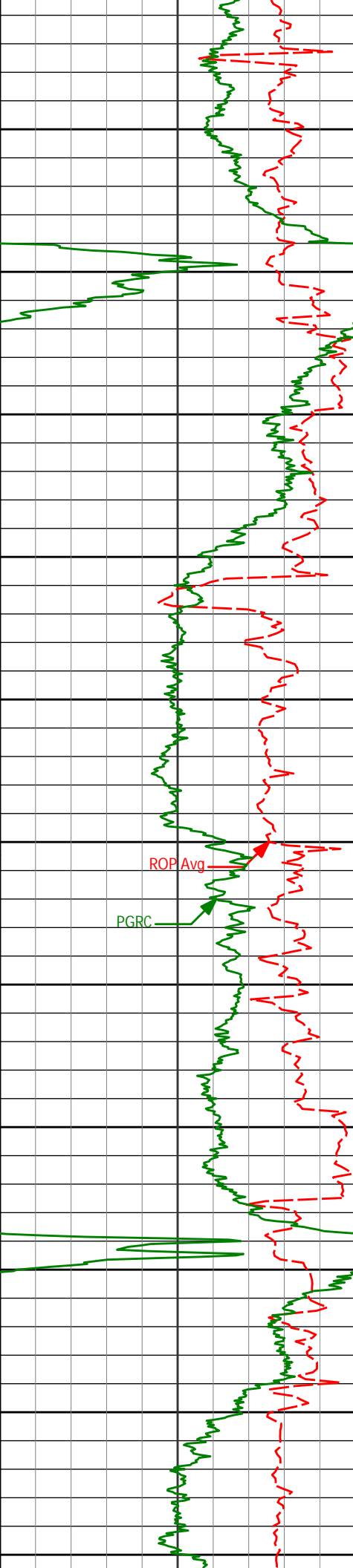
11659'

89.14°

355.68°

5473.42'

6482.16'



11750
11800
11850
11900
11950
12000
12050
12100
12150
12200
12250

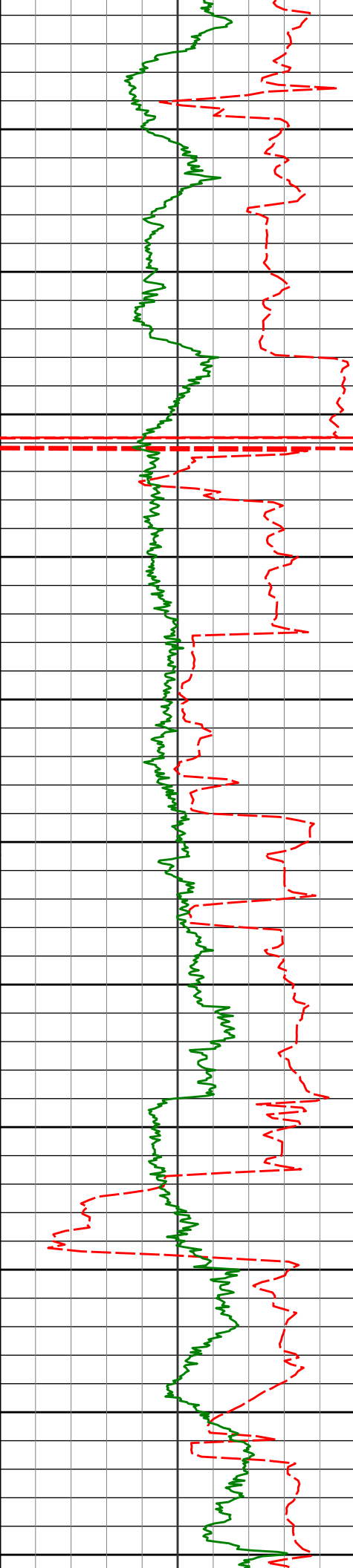
11751'
11842'
11937'
12031'
12126'
12221'

89.04°
89.26°
89.20°
89.07°
88.00°
88.24°

355.25°
356.13°
356.20°
355.52°
357.92°
357.82°

5474.89'
5476.23'
5477.51'
5478.93'
5481.36'
5484.48'

6573.49'
6663.87'
6758.32'
6851.72'
6946.23'
7040.89'



12300

12316'

87.87°

357.14°

5487.70'

7135.50'

12350

12400

12411'

90.12°

359.13°

5489.36'

7230.23'

12450

12500

12505'

90.22°

358.68°

5489.08'

7324.06'

12550

12600

12600'

90.03°

358.51°

5488.87'

7418.86'

12650

12700

12695'

89.66°

357.93°

5489.13'

7513.62'

12750

12800

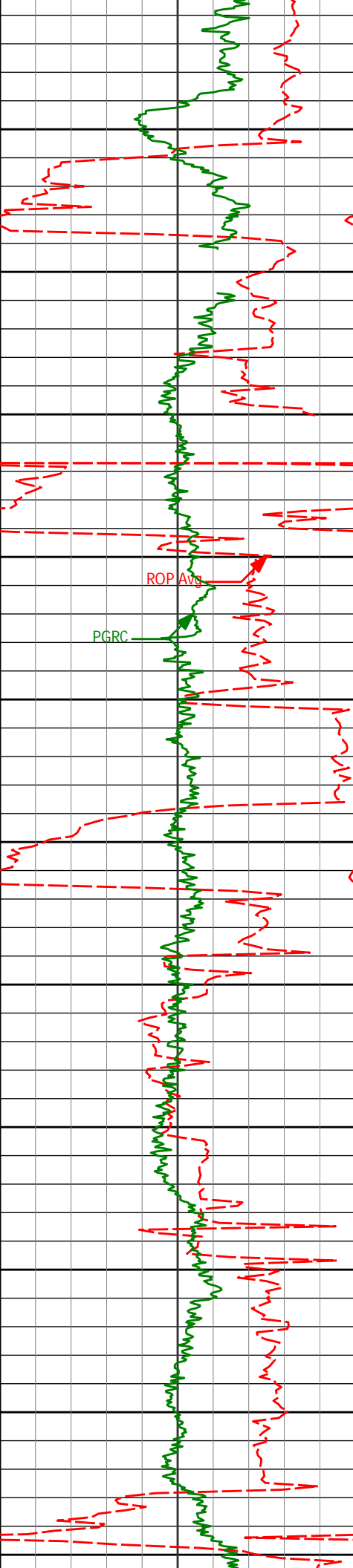
12790'

89.48°

357.62°

5489.85'

7608.32'



12850

12884'

89.14°

357.16°

5490.98'

7701.97'

12900

12950

12980'

88.86°

356.16°

5492.66'

7797.49'

13000

ROP Avg

PGRC

13050

13074'

90.34°

357.44°

5493.32'

7891.05'

13100

13150

13169'

91.33°

358.20°

5491.94'

7985.75'

13200

13250

13264'

91.94°

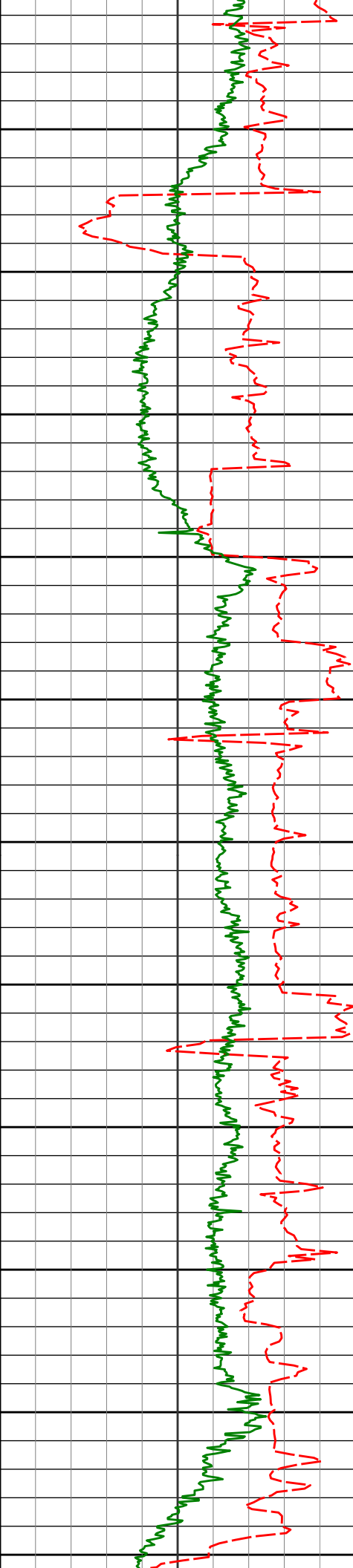
358.00°

5489.23'

8080.45'

13300

13350



13400

13450

13500

13550

13600

13650

13700

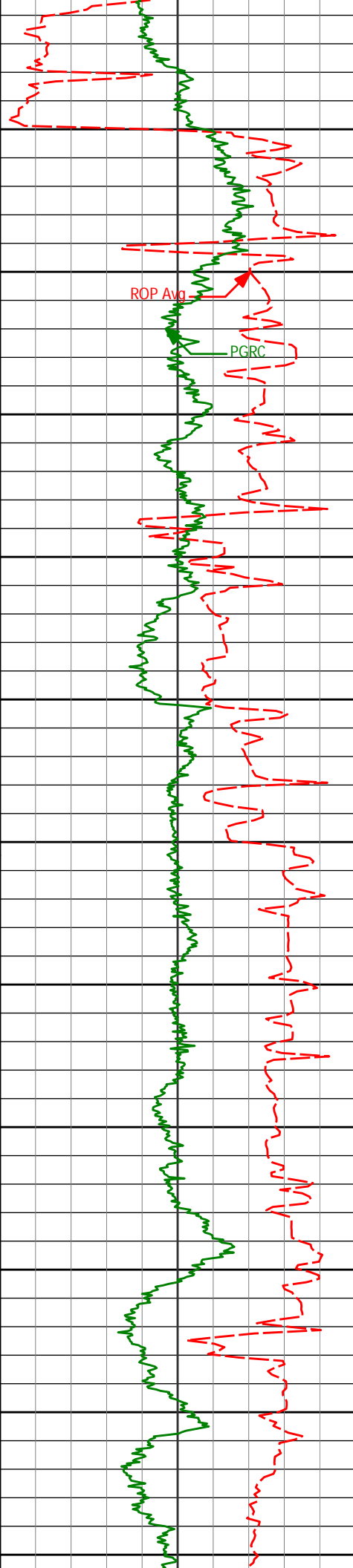
13750

13800

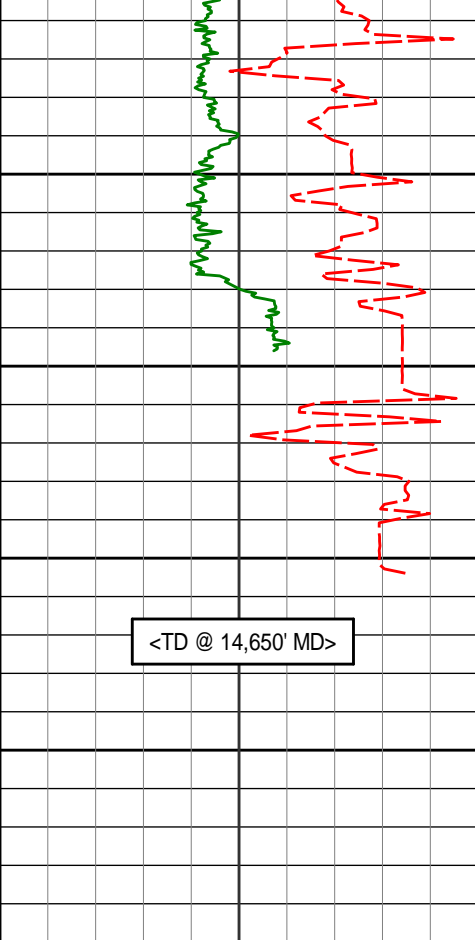
13850

13900

13358'	91.45°	359.14°	5486.45'	8174.21'
13453'	91.05°	357.97°	5484.38'	8268.98'
13548'	91.88°	357.78°	5481.95'	8363.67'
13643'	90.55°	358.58°	5479.93'	8458.40'
13737'	89.38°	359.36°	5479.98'	8552.24'
13832'	89.72°	359.18°	5480.72'	8647.10'



13927'	89.63°	359.09°	5481.26'	8741.95'
13950				
14000				
14021'	89.32°	358.56°	5482.12'	8835.78'
14050				
14100				
14116'	89.32°	357.69°	5483.24'	8930.52'
14150				
14200				
14211'	88.98°	357.34°	5484.65'	9025.18'
14250				
14300				
14306'	89.35°	357.26°	5486.03'	9119.80'
14350				
14400	89.63°	356.77°	5486.86'	9213.40'
14450				



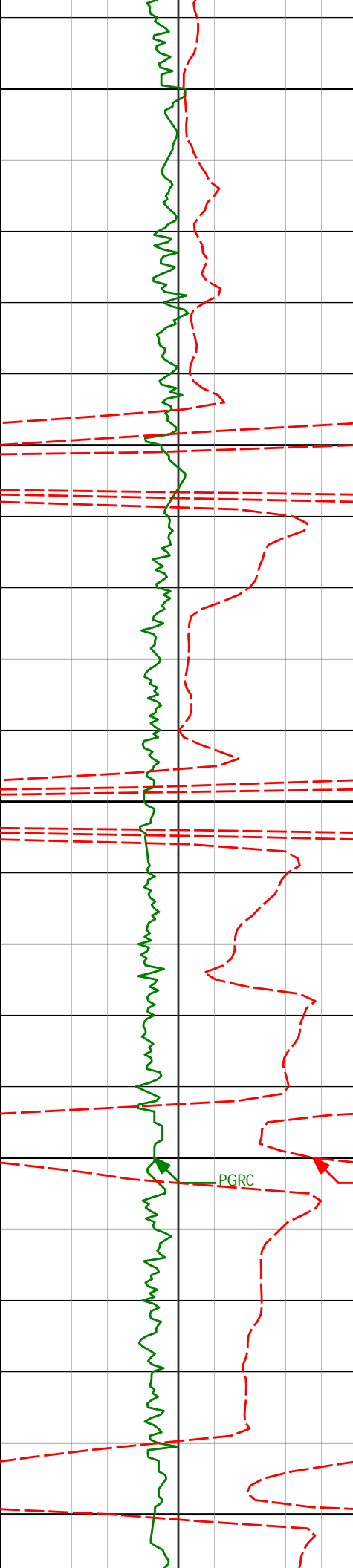
MD	Depth	Angle	Surf	Bottom
14494'	89.32°	355.53°	5487.72'	9306.85'
14500				
14540'	89.85°	355.98°	5488.06'	9352.55'
14550				
14600				
14605'	89.85°	355.98°	5488.23'	9417.16'
14650				
14700				

Avg Rate of Penetration <div> <div>ROP Avg</div> <div>5000 feet per hr</div> </div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
PCG Gamma Ray <div> <div>PGRC</div> <div>0 300</div> </div>							

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Noble Energy, Inc
Atwater State LD01-76-1AHN
H&P 273
T9N R58W

<p>PCG Gamma Ray PGRC</p> <p>0 300</p> <p style="text-align: center;">api</p>																			
<p>Avg Rate of Penetration ROP Avg</p> <p>500 0</p> <p style="text-align: center;">feet per hr</p>										<p>Depth ft</p> <p>Depth Inc. Azi. TVD V.S.</p>									
										<p><KOP></p>									



4850

4856'

11.94°

70.75°

4802.01'

60.51'

4900

4904'

15.18°

56.66°

4848.67'

66.00'

4950

4951'

18.19°

46.72°

4893.70'

74.83'

5000

4999'

20.75°

38.79°

4938.96'

87.02'

PGRC

ROP Avg

5050

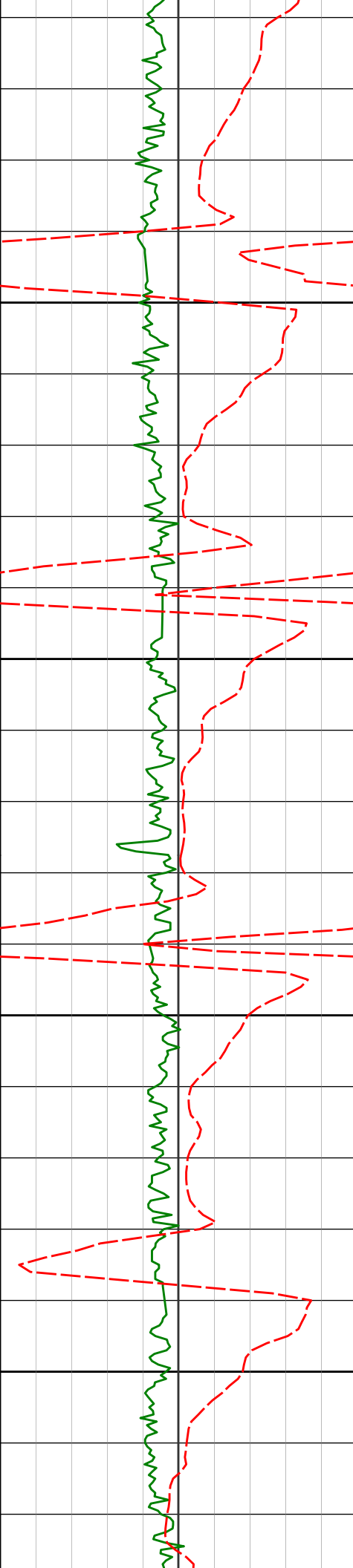
5046'

23.52°

33.41°

4982.50'

101.74'



5100

5150

5200

5250

5094'

25.35°

25.53°

5026.21'

119.39'

5141'

28.22°

21.90°

5068.16'

139.11'

5189'

31.71°

19.09°

5109.74'

161.89'

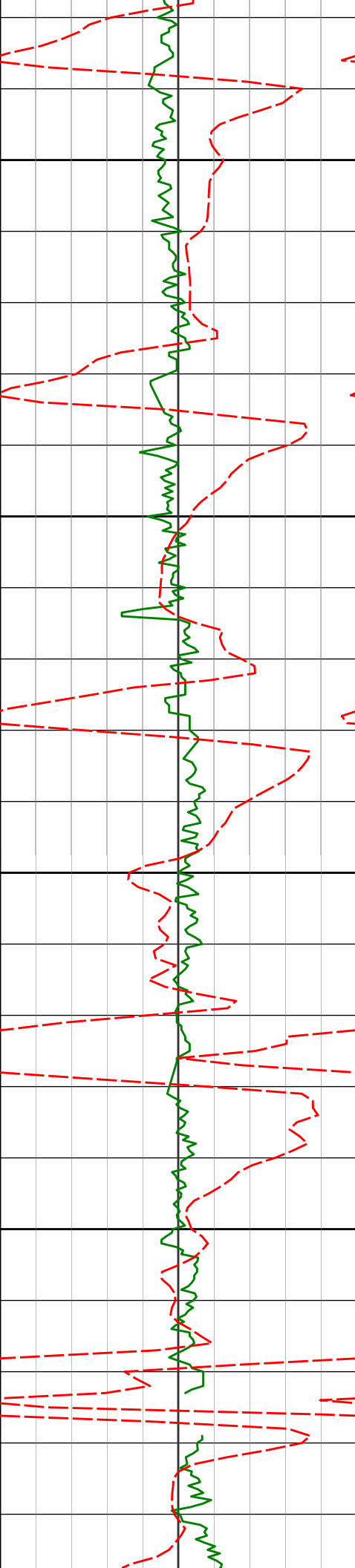
5236'

35.51°

15.85°

5148.88'

186.99'



5300

5350

5400

5450

5284'

39.21°

13.86°

5187.03'

215.42'

5330'

42.92°

11.73°

5221.70'

245.13'

5378'

46.55°

11.76°

5255.80'

278.45'

5425'

50.40°

11.70°

5286.95'

313.16'

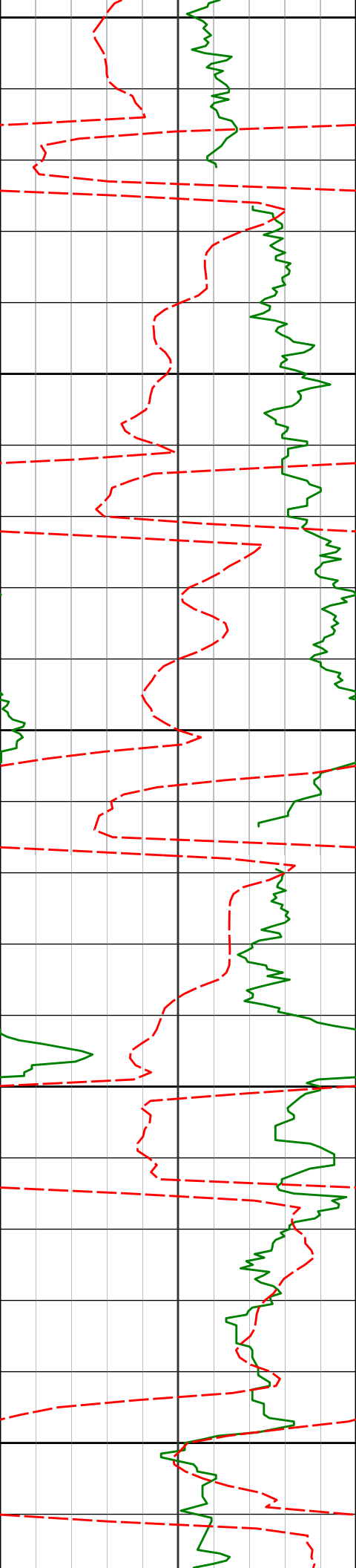
5473'

54.11°

10.62°

5316.33'

350.65'



5500

5520'

57.93°

7.85°

5342.60'

389.33'

5550

5568'

62.04°

5.91°

5366.60'

430.75'

5600

5614'

65.55°

4.03°

5386.92'

471.97'

5650

5662'

68.76°

0.87°

5405.55'

516.19'

5700

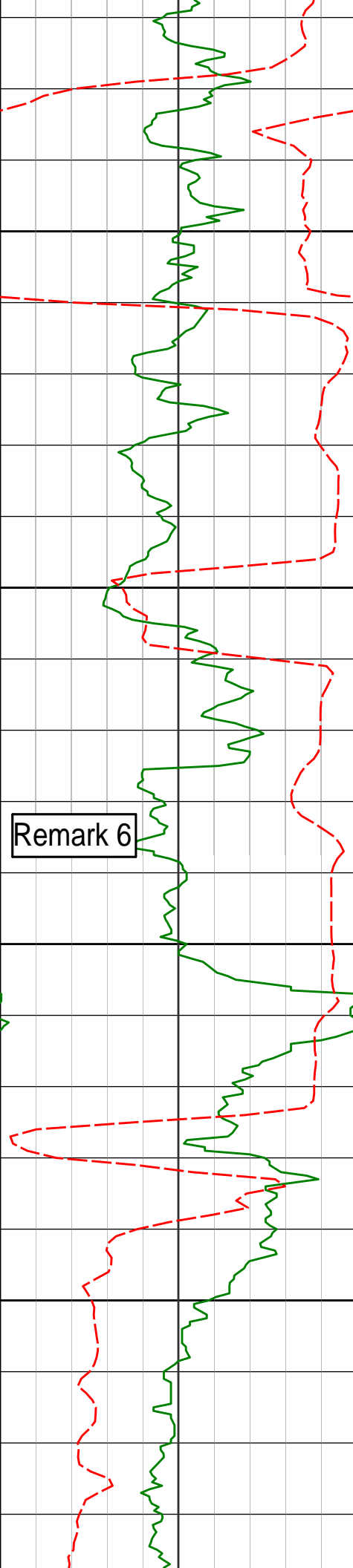
5709'

71.11°

358.27°

5421.68'

560.28'



5750

5757'

72.46°

356.35°

5436.68'

605.70'

5800

5804'

75.96°

356.34°

5449.47'

650.68'

5850

5829'

78.22°

357.18°

5455.05'

674.93'

5900

5916'

81.80°

358.78°

5470.15'

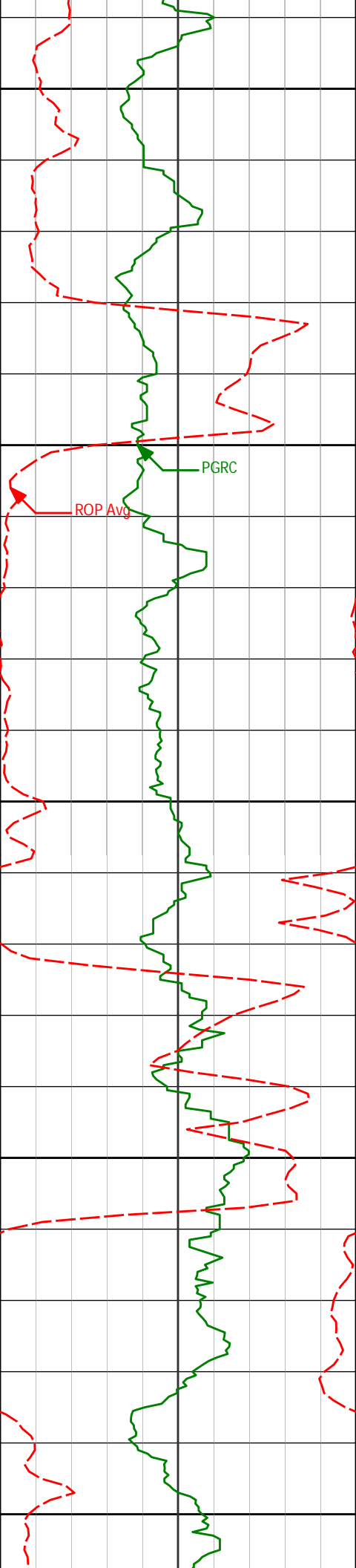
760.35'

Remark 6



<7" casing set at 5877' MD>

<Run 200>



5950

6000

6050

6100

6150

PGRC

ROP Avg

6010'

81.87°

358.85°

5483.50'

853.22'

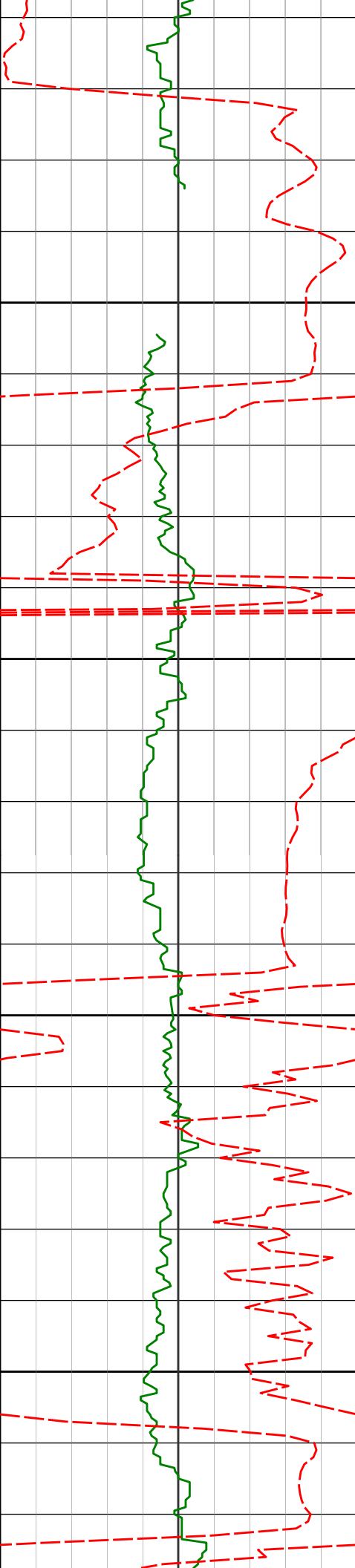
6105'

83.29°

358.86°

5495.76'

947.26'



6200

6200'

86.64°

358.43°

5504.10'

1041.68'

6250

6300

6350

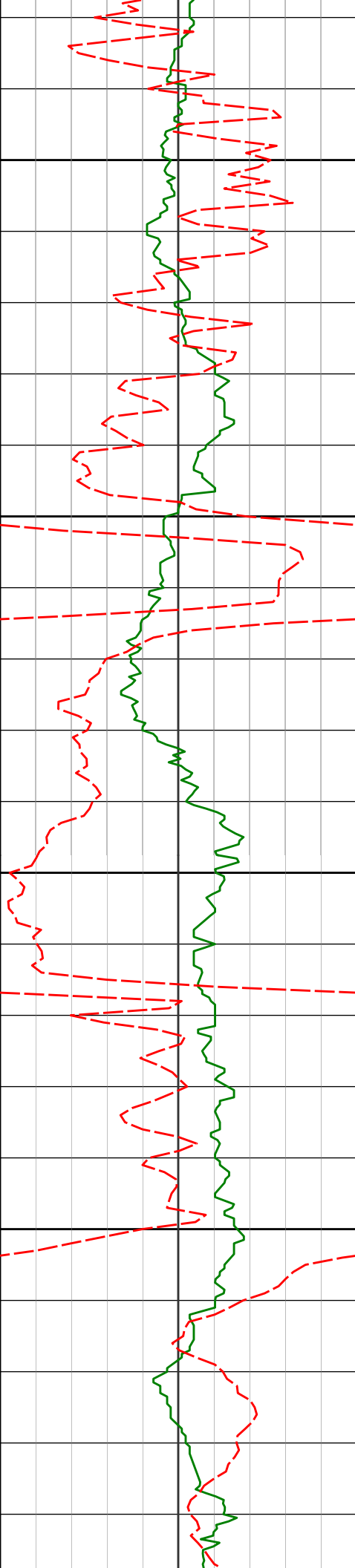
6295'

90.34°

356.06°

5506.60'

1136.26'



6389'

92.59°

355.93°

5504.20'

1229.65'

6400

6450

6484'

91.82°

356.05°

5500.54'

1324.01'

6500

6550

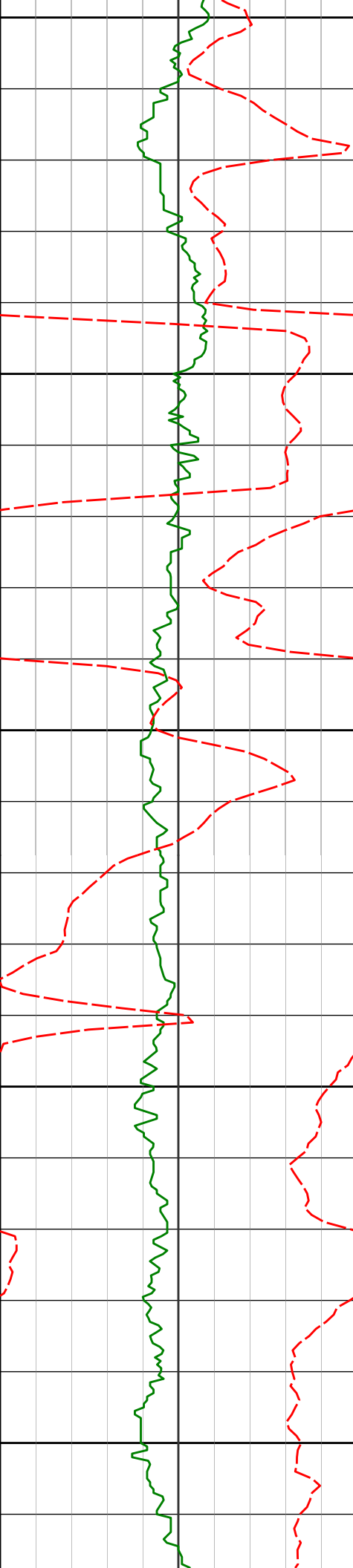
6579'

92.44°

355.76°

5497.02'

1418.35'



6600

6650

6700

6750

6800

6673'

90.99°

358.87°

5494.21'

1511.94'

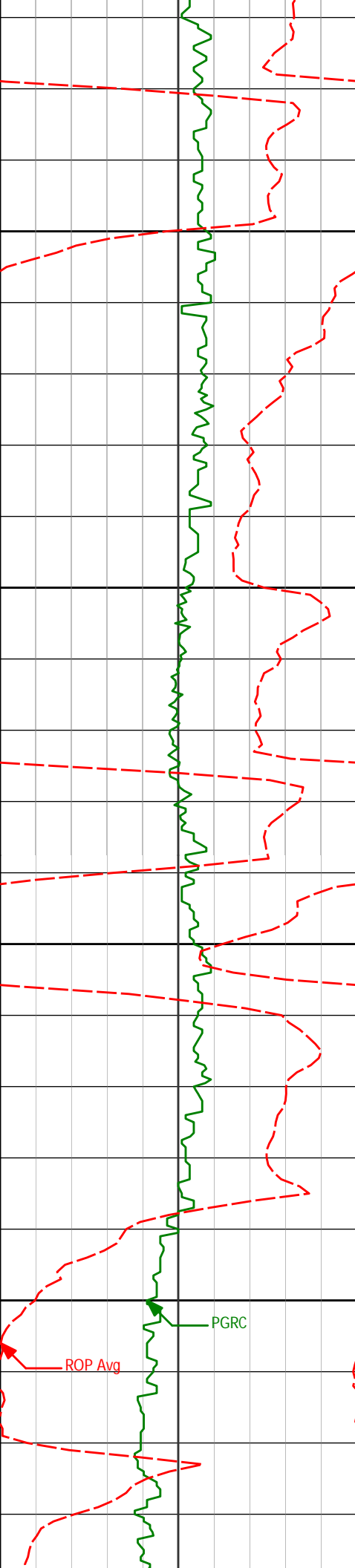
6768'

91.30°

358.30°

5492.32'

1606.72'



6850

6863'

88.98°

359.10°

5492.09'

1701.52'

6900

6950

6958'

90.15°

0.36°

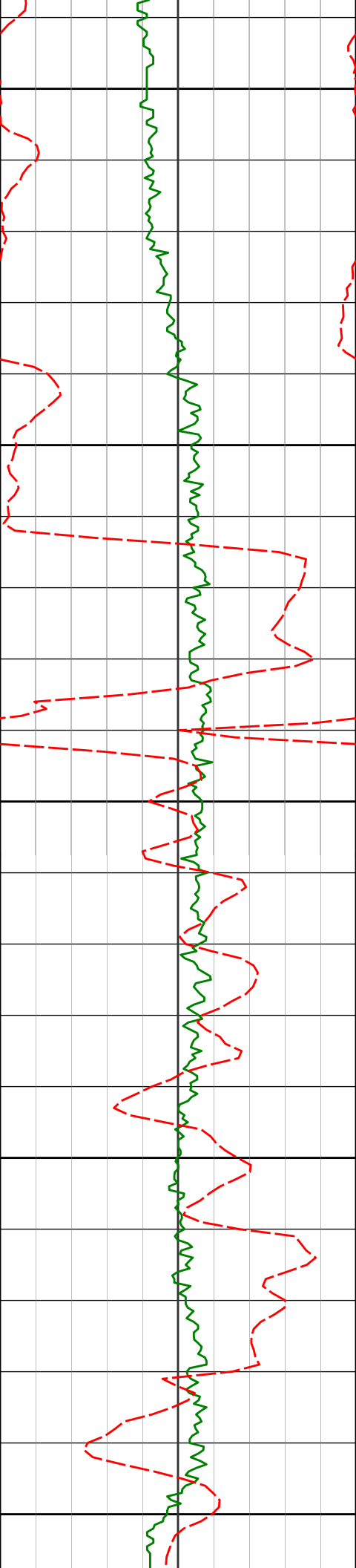
5492.80'

1796.42'

7000

PGRC

ROP Avg



7050

7053'

89.32°

359.17°

5493.24'

1891.32'

7100

7147'

89.41°

357.91°

5494.27'

1985.12'

7150

7200

7240'

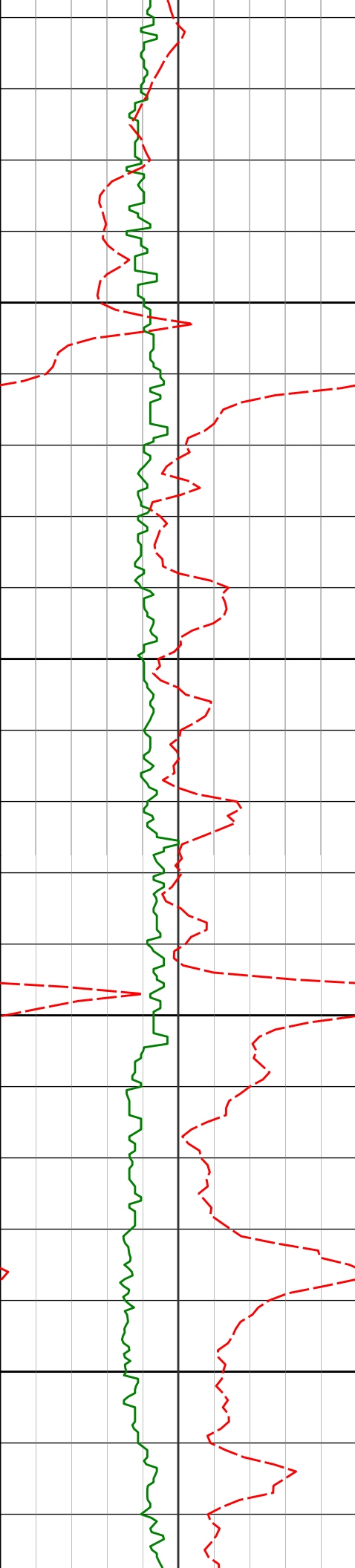
90.74°

357.50°

5494.15'

2077.81'

7250



7300

7350

7400

7450

7333'

90.99°

357.18°

5492.75'

2170.45'

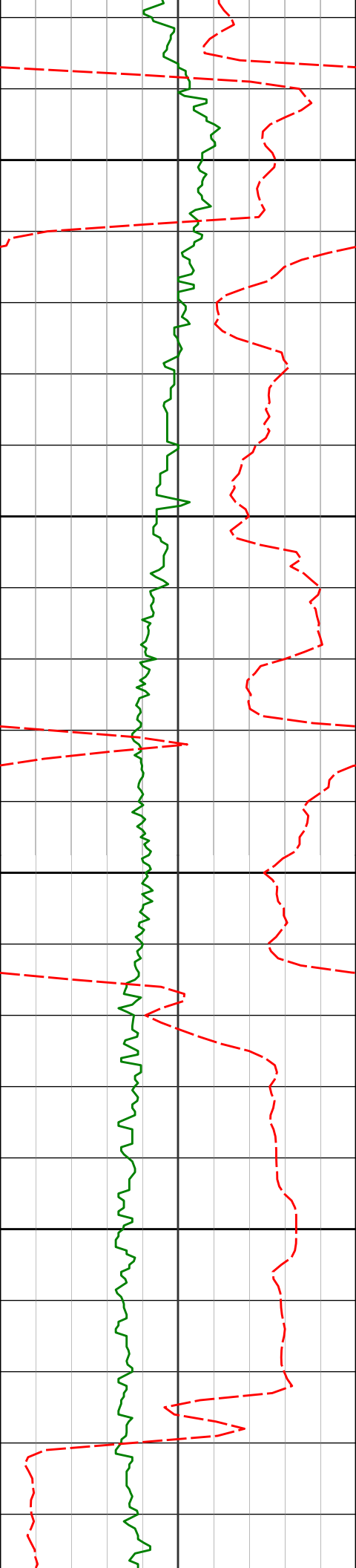
7425'

90.93°

356.82°

5491.20'

2262.05'



7500

7517'

90.83°

358.89°

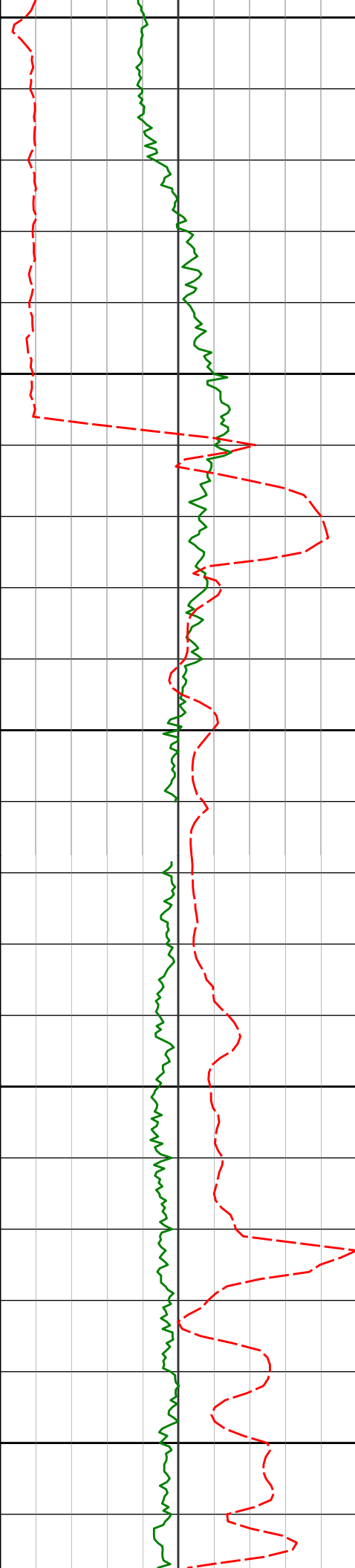
5489.79'

2353.76'

7550

7600

7650



7700

7750

7800

7850

7900

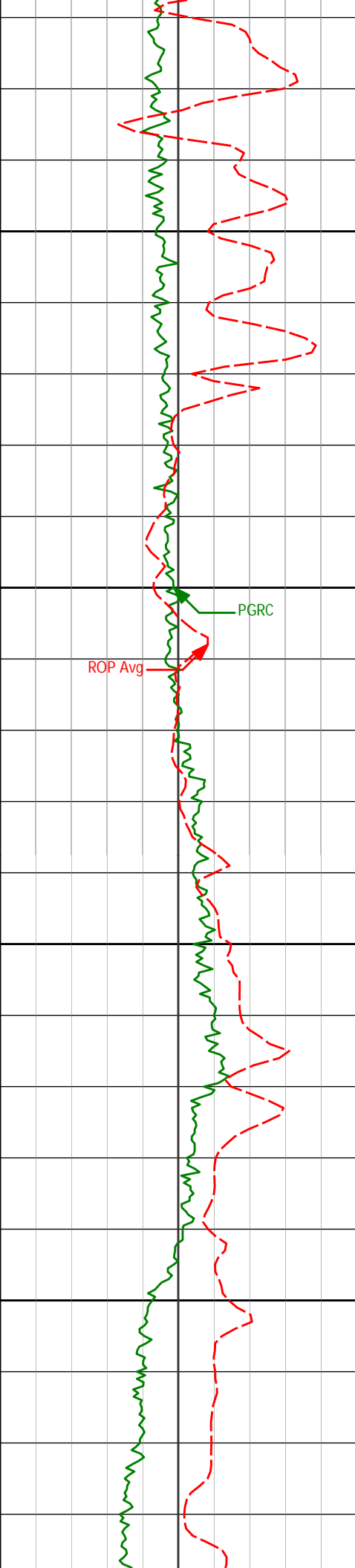
7811'

90.37°

357.93°

5486.71'

2647.06'



7950

8000

8050

8100

8001'

89.75°

357.26°

5486.51'

2836.42'

8096'

89.23°

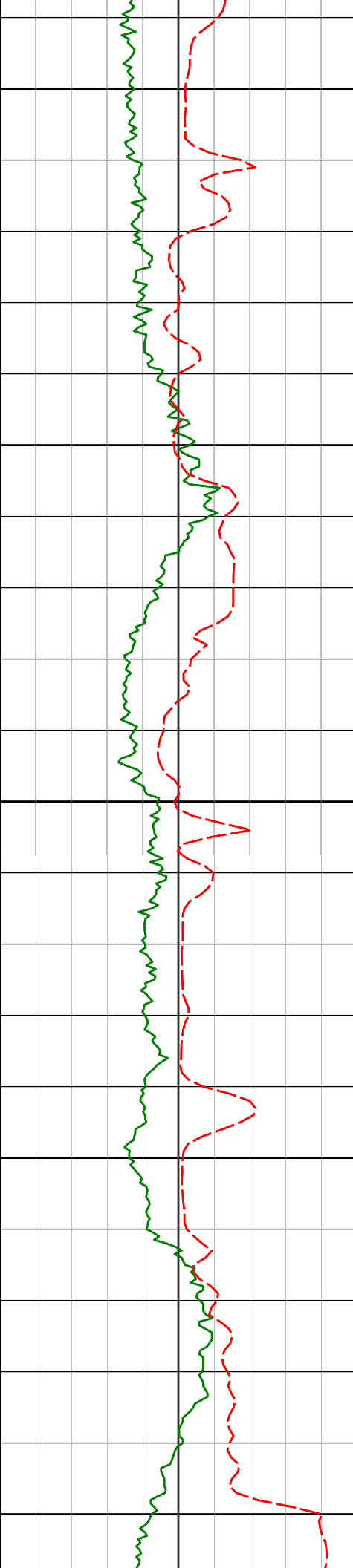
356.64°

5487.35'

2931.00'

ROP Avg

PGRC



8150

8190'

89.35°

356.04°

5488.52'

3024.48'

8200

8250

8285'

88.70°

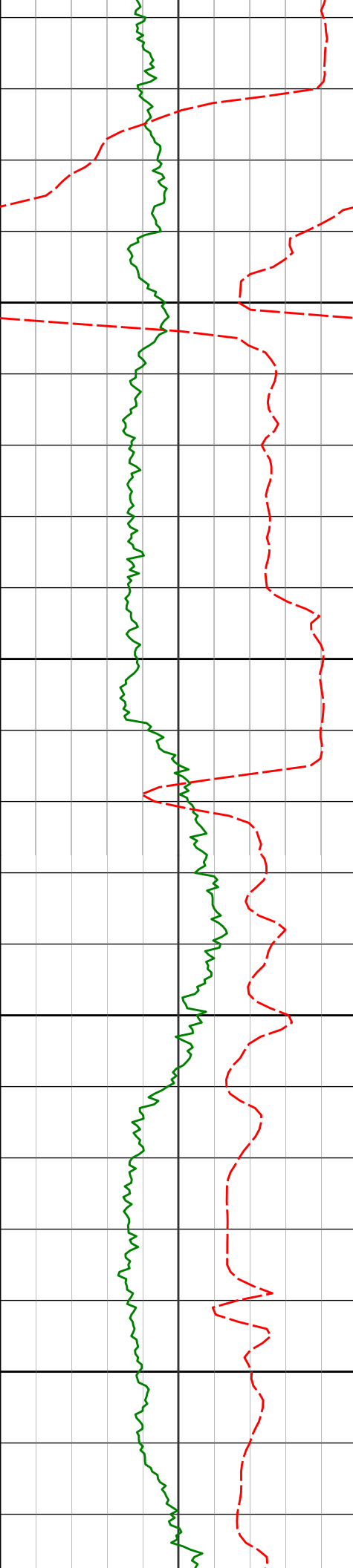
355.96°

5490.13'

3118.89'

8300

8350



8380'

89.54°

357.54°

5491.58'

3213.43'

8400

8450

8474'

90.34°

358.95°

5491.69'

3307.19'

8500

8550

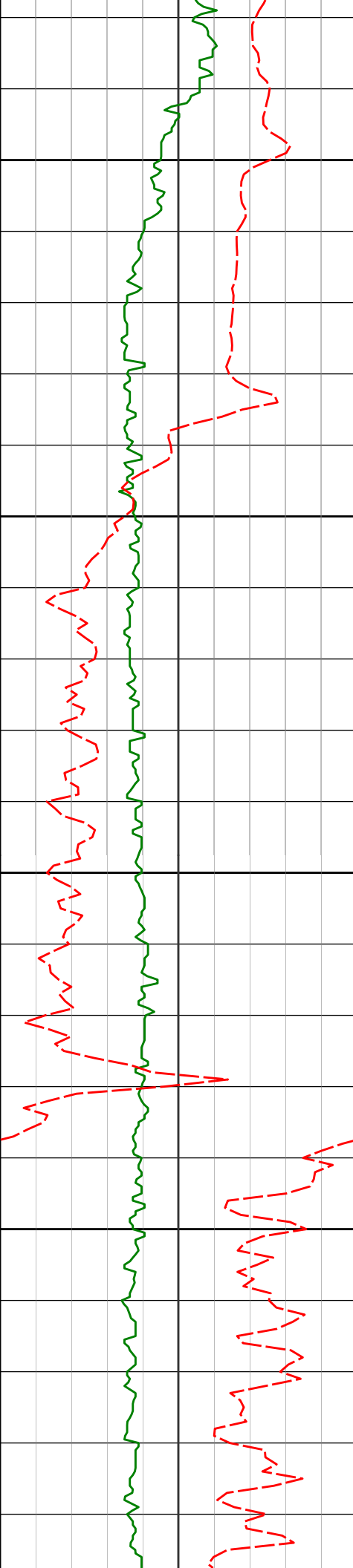
8569'

90.34°

359.17°

5491.12'

3402.04'



8600

8650

8700

8750

8664'

91.30°

358.50°

5489.77'

3496.86'

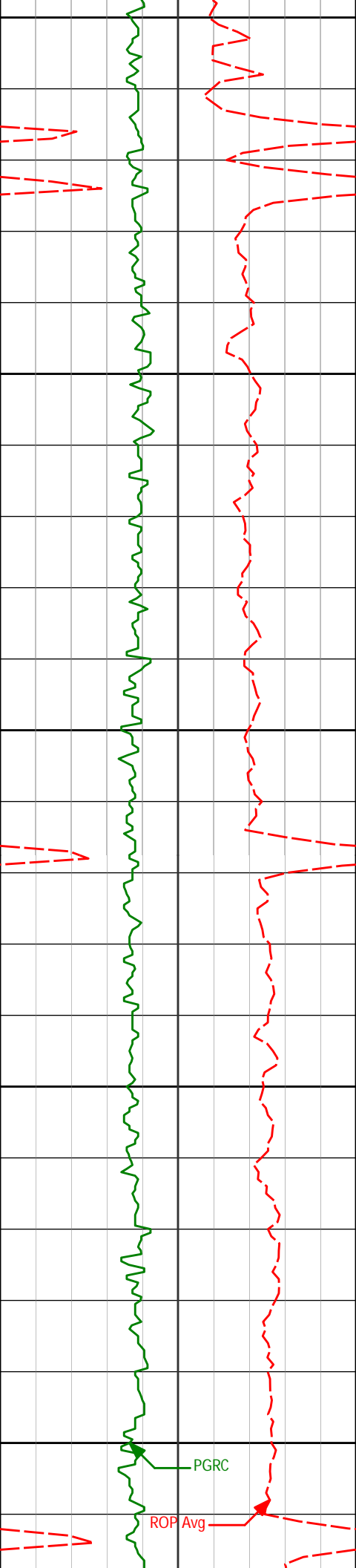
8759'

91.36°

358.52°

5487.57'

3591.62'



8800

8850

8900

8950

9000

8948'

90.19°

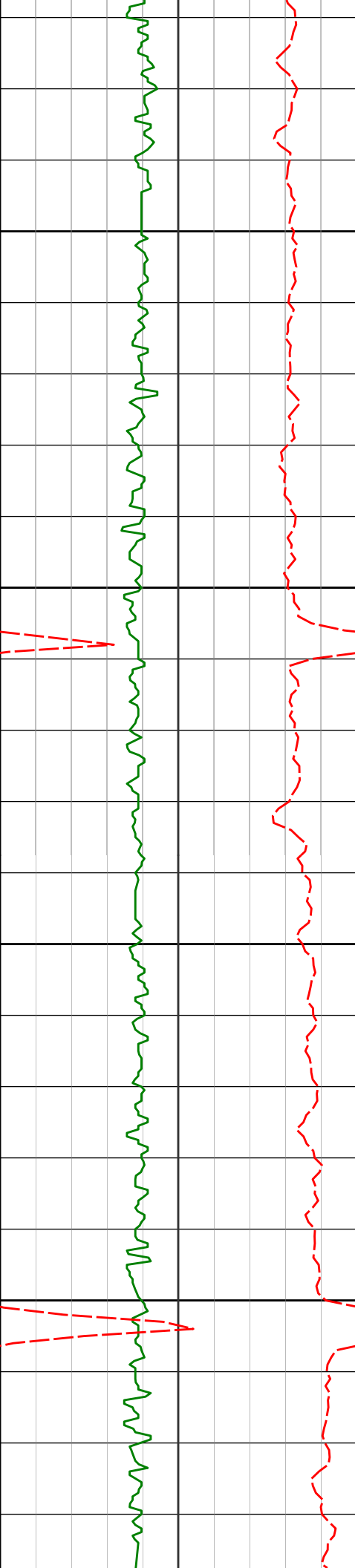
357.15°

5485.03'

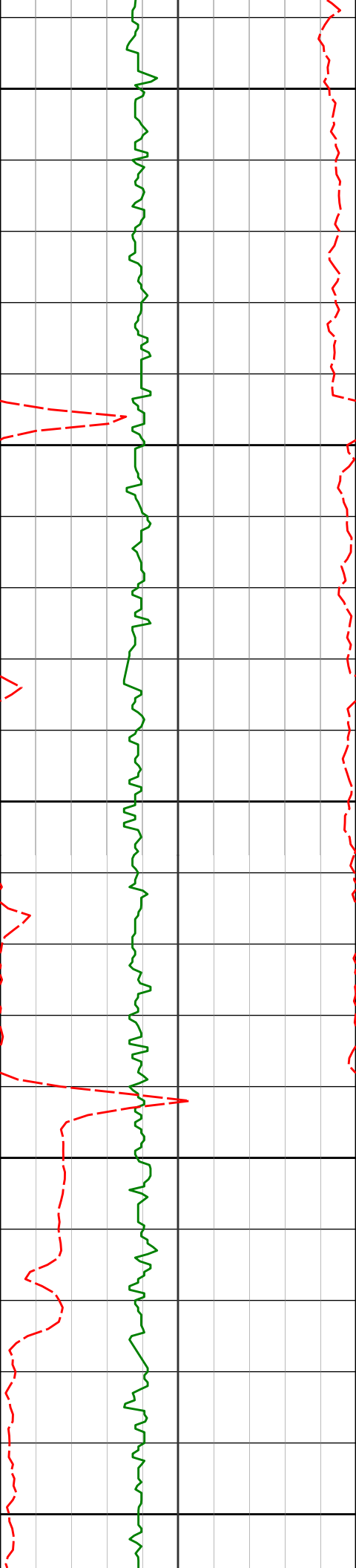
3780.03'

PGRC

ROP Avg



9043'	90.25°	357.56°	5484.67'	3874.67'
9050				
9100				
9138'	90.18°	356.81°	5484.31'	3969.29'
9150				
9200				
9233'	90.52°	359.04°	5483.72'	4064.01'



9250

9300

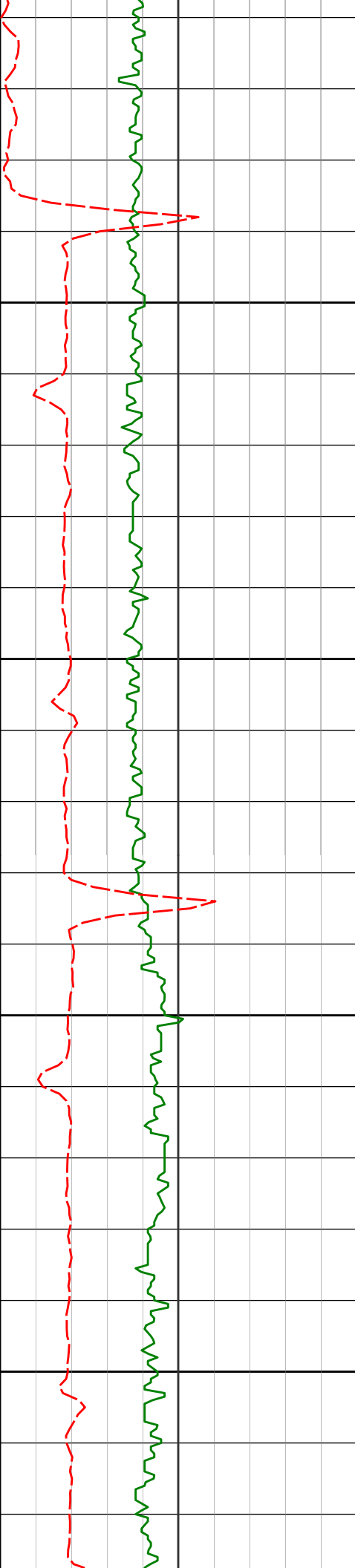
9350

9400

9450

9328'	90.77°	0.58°	5482.65'	4158.91'
-------	--------	-------	----------	----------

9423'	90.77°	1.28°	5481.37'	4253.87'
-------	--------	-------	----------	----------



9500

9518'

90.43°

0.78°

5480.37'

4348.84'

9550

9600

9612'

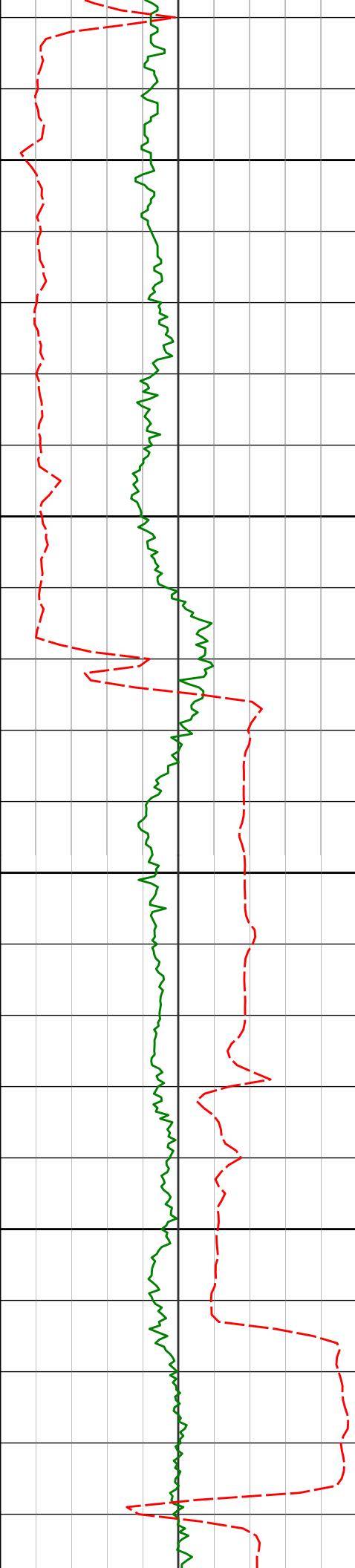
89.32°

359.53°

5480.57'

4442.77'

9650



9700

9707'

89.32°

359.54°

5481.70'

4537.66'

9750

9800

9802'

88.58°

359.56°

5483.44'

4632.53'

9850

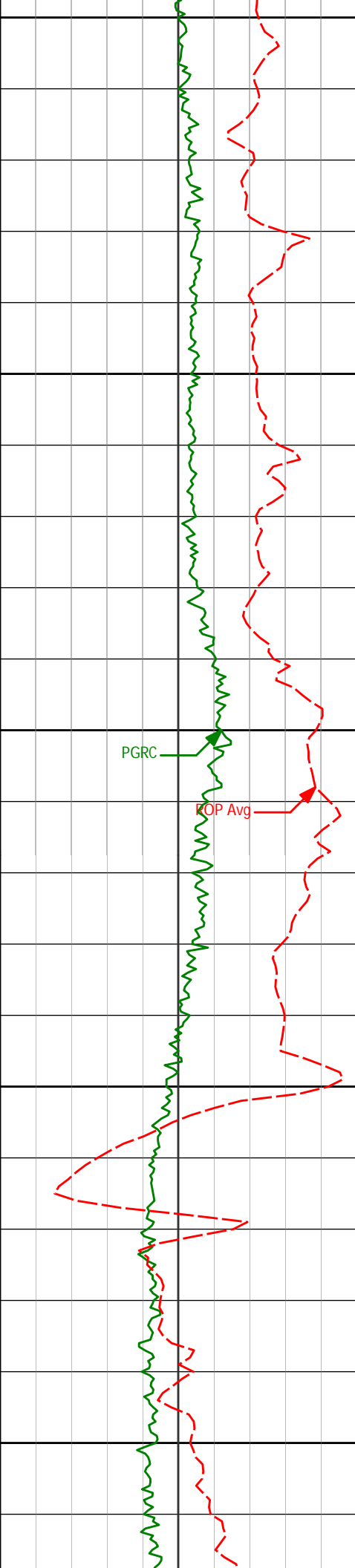
9897'

89.69°

358.15°

5484.87'

4727.34'



9900

9950

10000

10050

10100

PGRC

ROP Avg

9992'

89.94°

357.54°

5485.18'

4822.06'

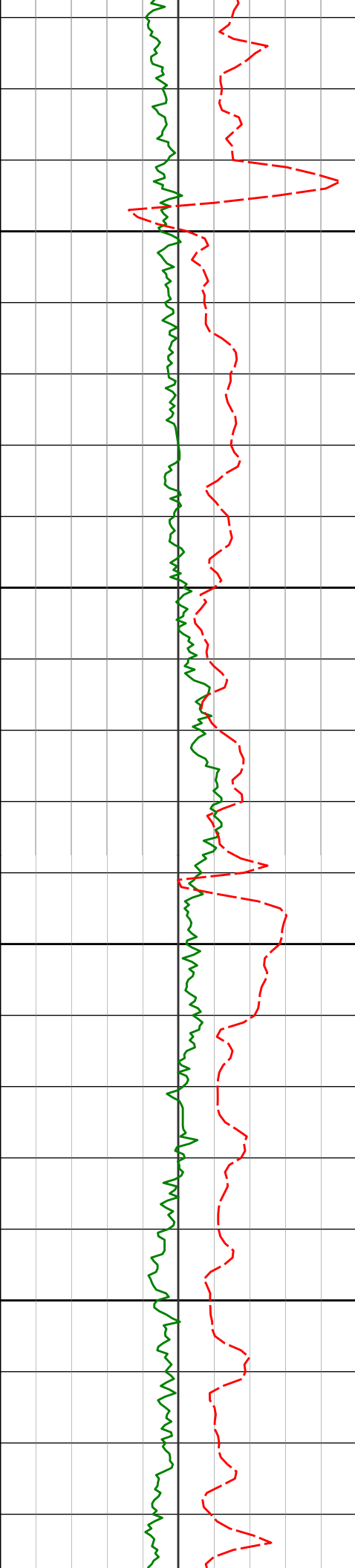
10084'

90.59°

357.39°

5484.75'

4913.73'



10150

10177'

90.80°

357.20°

5483.63'

5006.37'

10200

10250

10269'

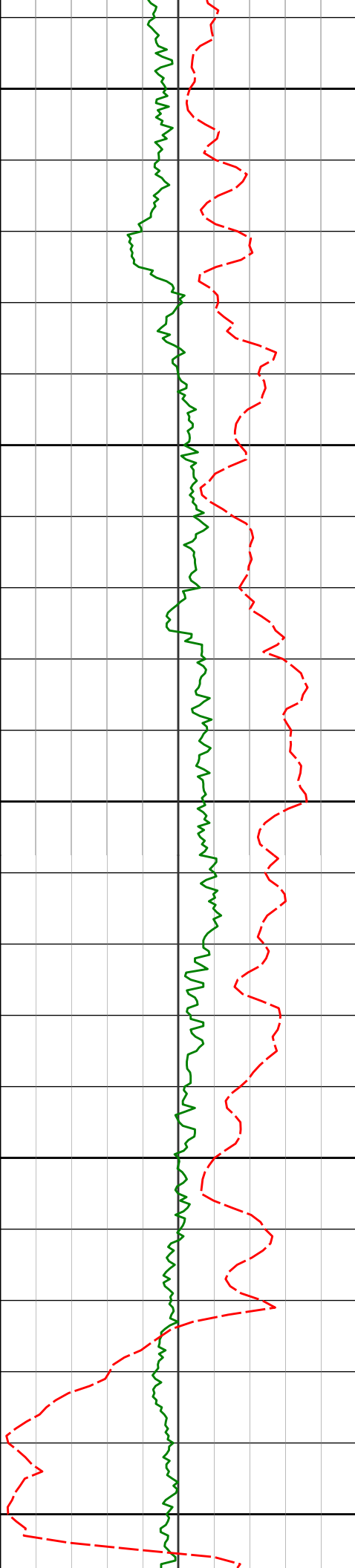
90.49°

357.14°

5482.59'

5097.99'

10300



10350

10362'

90.40°

356.44°

5481.86'

5190.56'

10400

10450

10454'

90.74°

356.08°

5480.95'

5282.04'

10500

10550

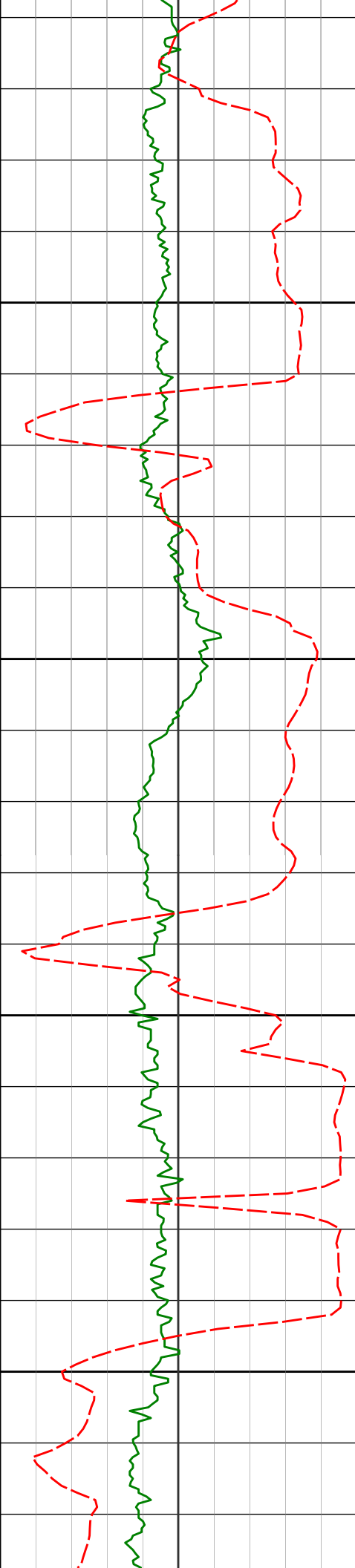
10546'

91.26°

356.19°

5479.34'

5373.49'



10600

10650

10700

10750

10639'

91.67°

356.17°

5476.96'

5465.93'

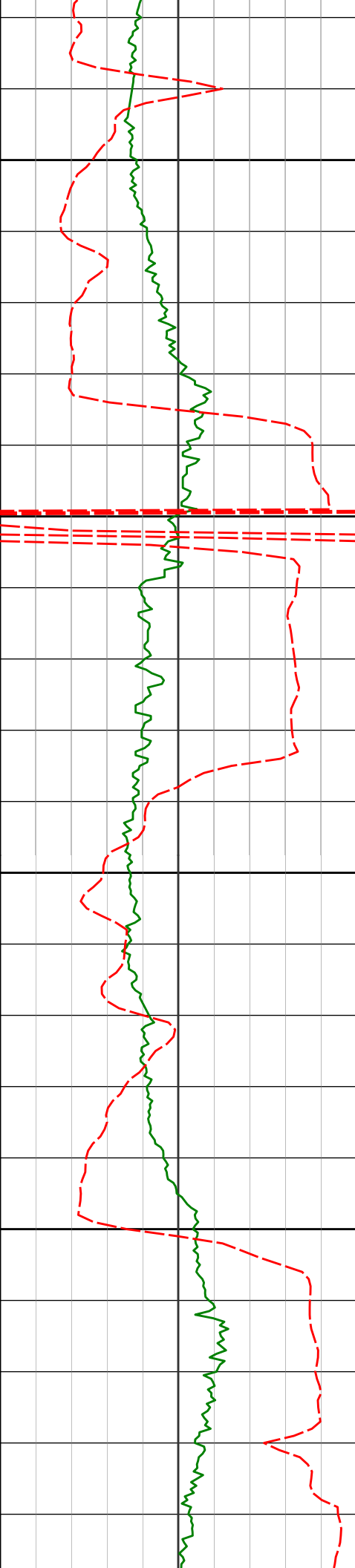
10731'

90.89°

356.83°

5474.91'

5557.44'



10800

10824'

90.40°

358.01°

5473.86'

5650.09'

10850

10900

10917'

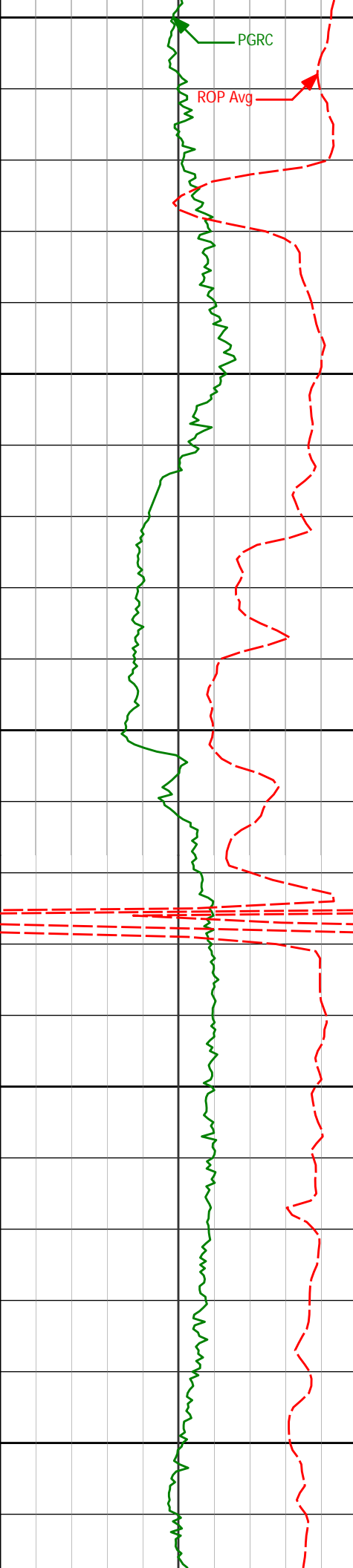
90.68°

357.68°

5472.98'

5742.81'

10950



11000

11010'

90.34°

358.82°

5472.16'

5835.57'

11050

11100

11103'

89.63°

358.94°

5472.18'

5928.41'

11150

11200

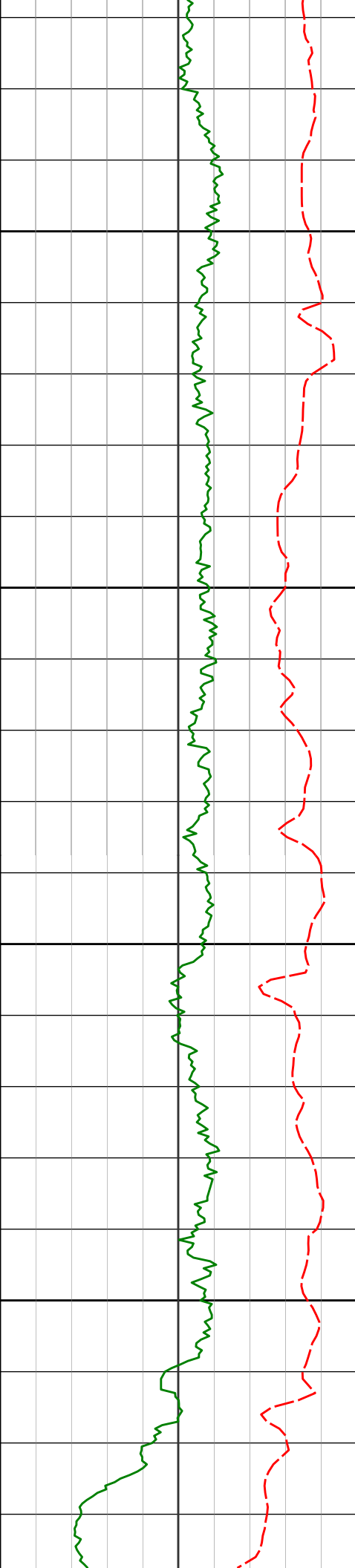
11196'

89.97°

358.32°

5472.51'

6021.21'



11250

11300

11350

11400

11288'

90.12°

358.62°

5472.43'

6113.01'

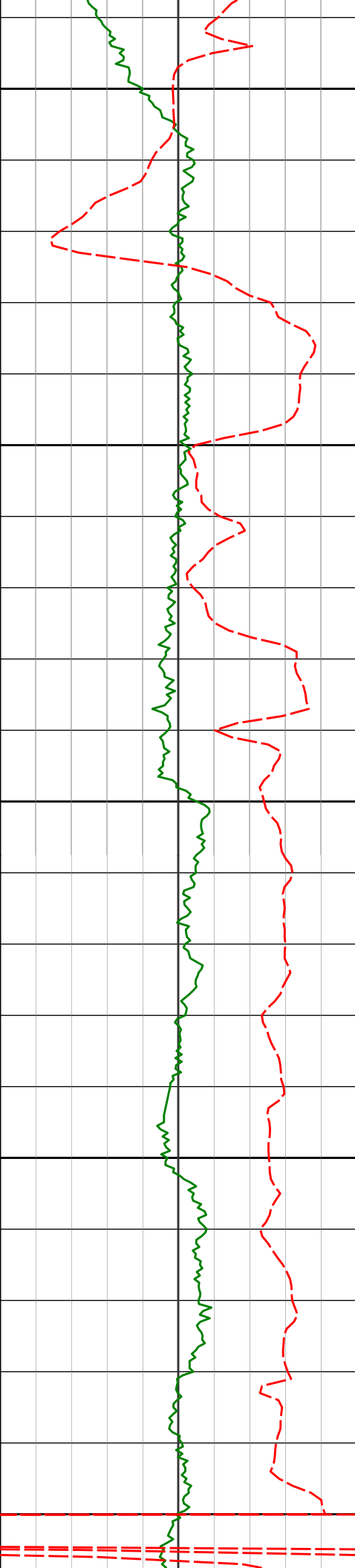
11381'

90.25°

357.38°

5472.13'

6205.74'



11450

11474'

89.75°

355.96°

5472.13'

6298.29'

11500

11550

11567'

89.75°

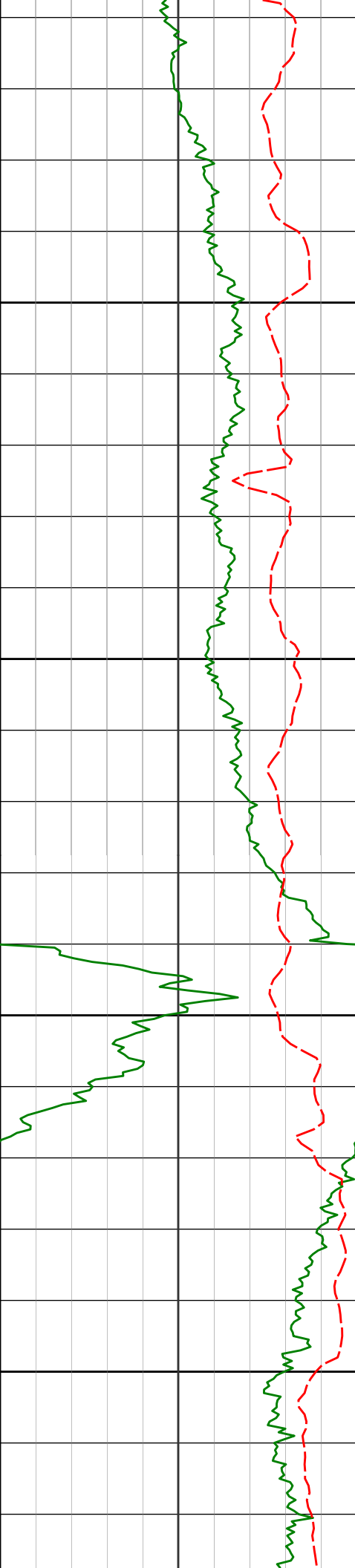
356.12°

5472.53'

6390.74'

11600

11650



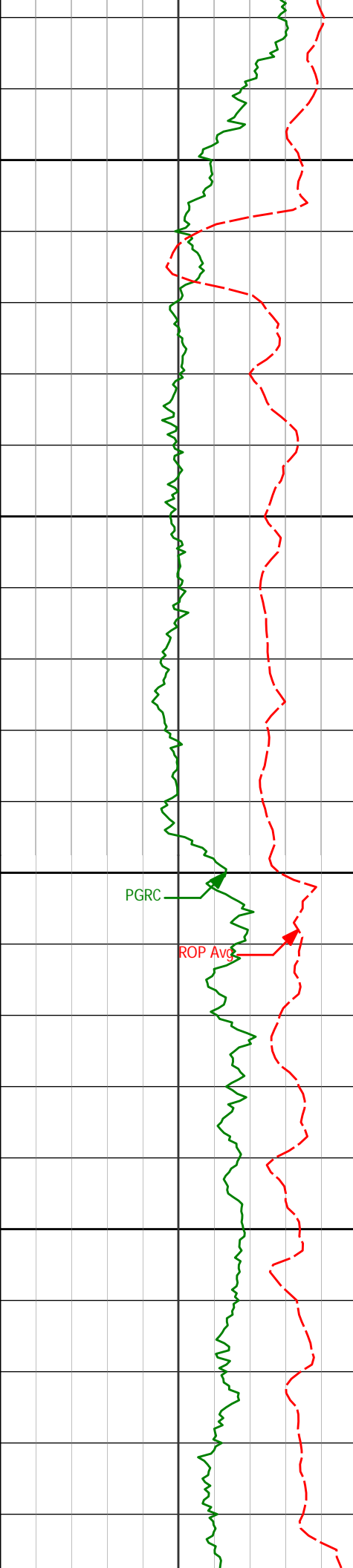
11700

11750

11800

11850

11659'	89.14°	355.68°	5473.42'	6482.16'
11751'	89.04°	355.25°	5474.89'	6573.49'
11842'	89.26°	356.13°	5476.23'	6663.87'



11900

11950

12000

12050

PGRC

ROP Avg

11937'

89.20°

356.20°

5477.51'

6758.32'

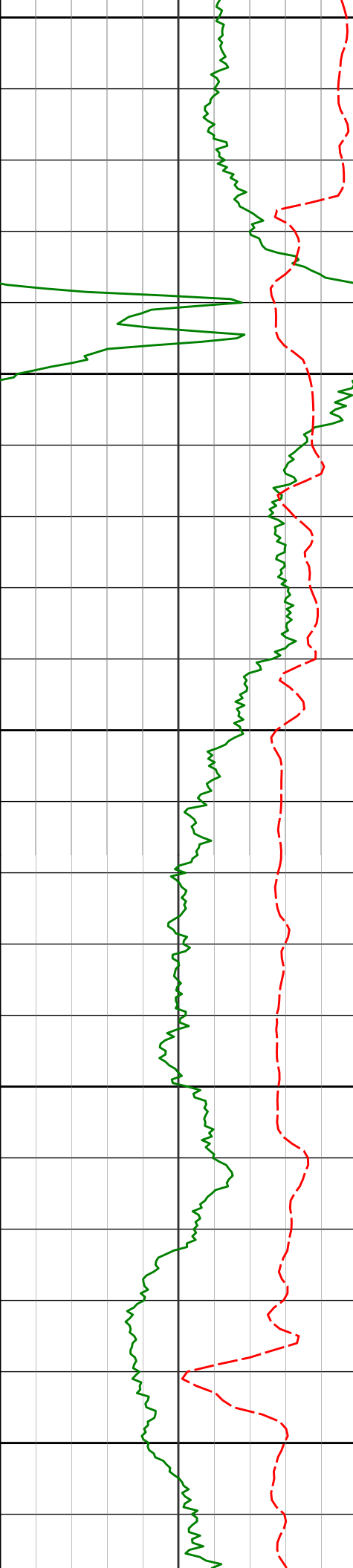
12031'

89.07°

355.52°

5478.93'

6851.72'



12100

12126'

88.00°

357.92°

5481.36'

6946.23'

12150

12200

12221'

88.24°

357.82°

5484.48'

7040.89'

12250

12300

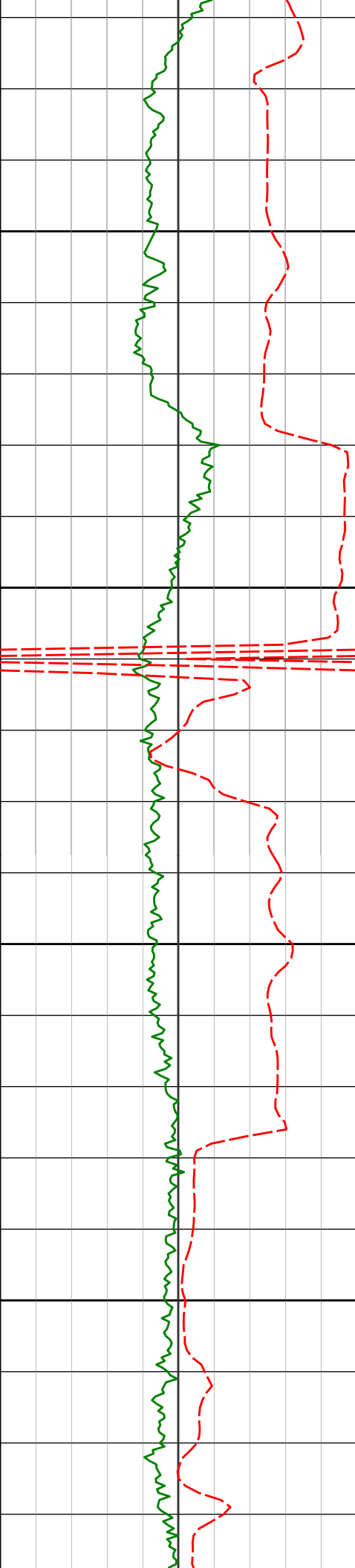
12316'

87.87°

357.14°

5487.70'

7135.50'



12350

12400

12450

12500

12411'

12505'

90.12°

90.22°

359.13°

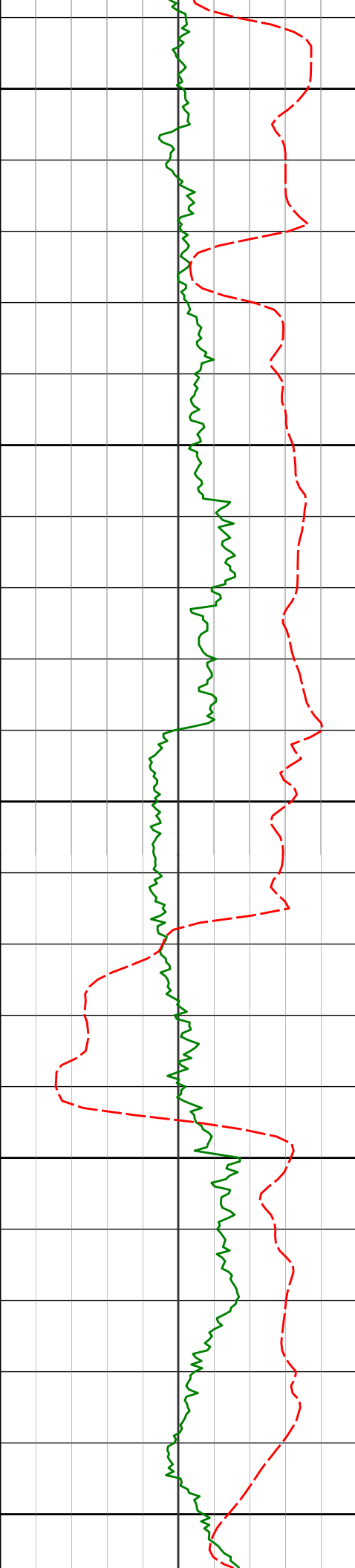
358.68°

5489.36'

5489.08'

7230.23'

7324.06'



12550

12600

12650

12700

12750

12600'

12695'

90.03°

89.66°

358.51°

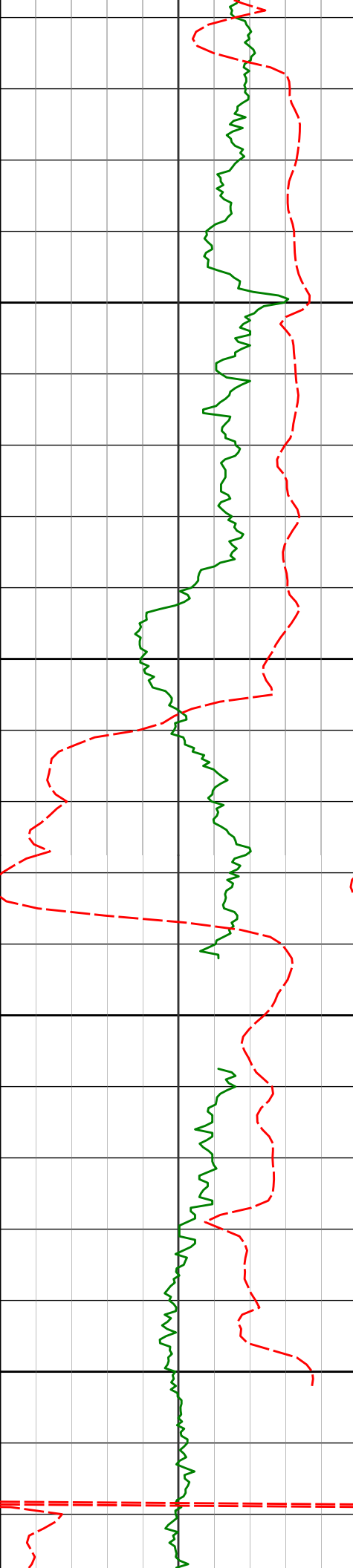
357.93°

5488.87'

5489.13'

7418.86'

7513.62'



12800

12850

12900

12950

12790'

89.48°

357.62°

5489.85'

7608.32'

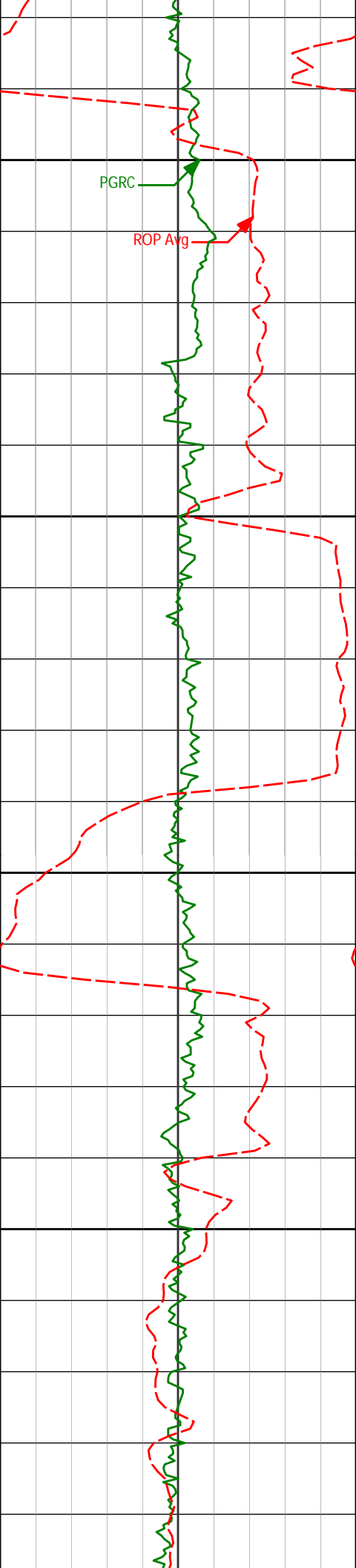
12884'

89.14°

357.16°

5490.98'

7701.97'



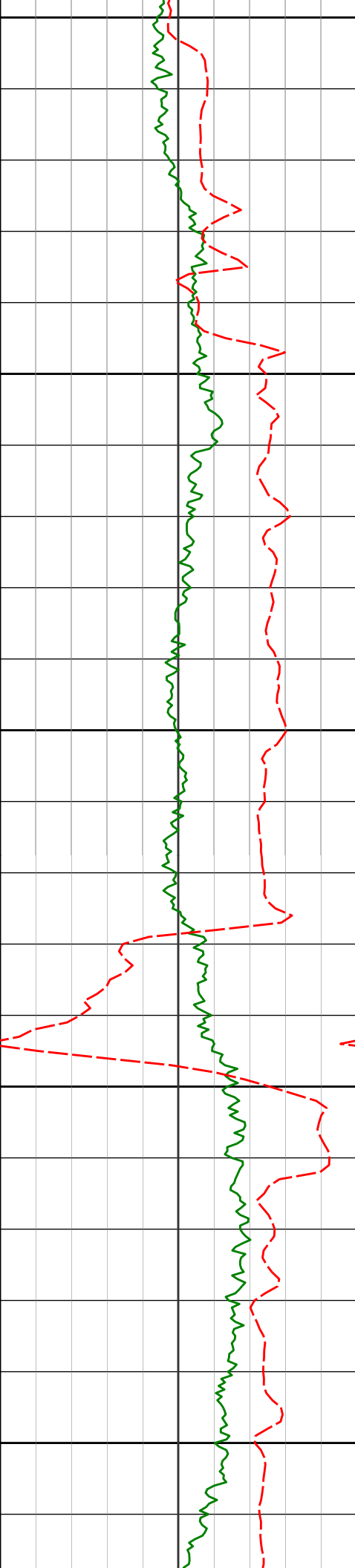
13000

13050

13100

13150

12980'	88.86°	356.16°	5492.66'	7797.49'
13074'	90.34°	357.44°	5493.32'	7891.05'
13169'	91.33°	358.20°	5491.94'	7985.75'



13200

13250

13300

13350

13400

13264'

91.94°

358.00°

5489.23'

8080.45'

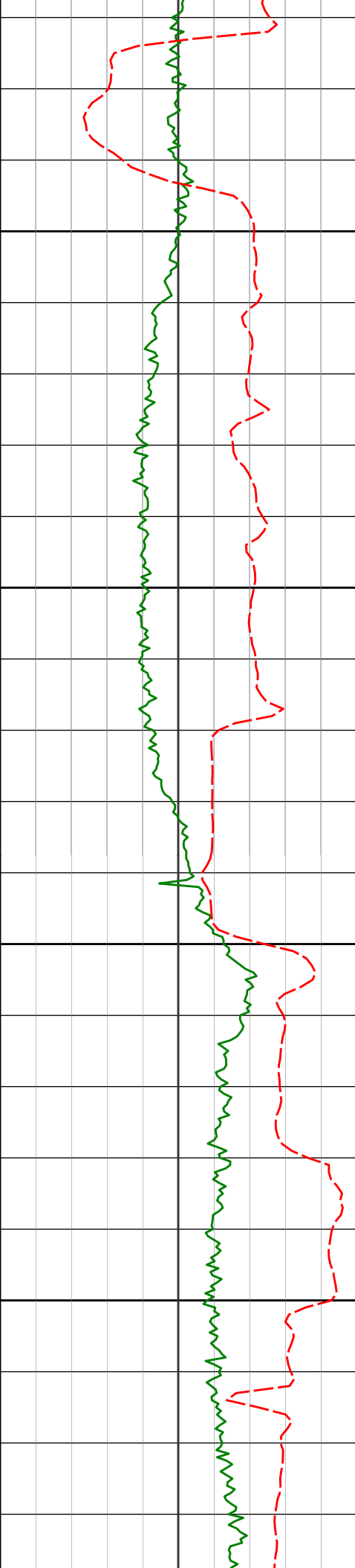
13358'

91.45°

359.14°

5486.45'

8174.21'



13450

13500

13550

13600

13453'

13548'

91.05°

91.88°

357.97°

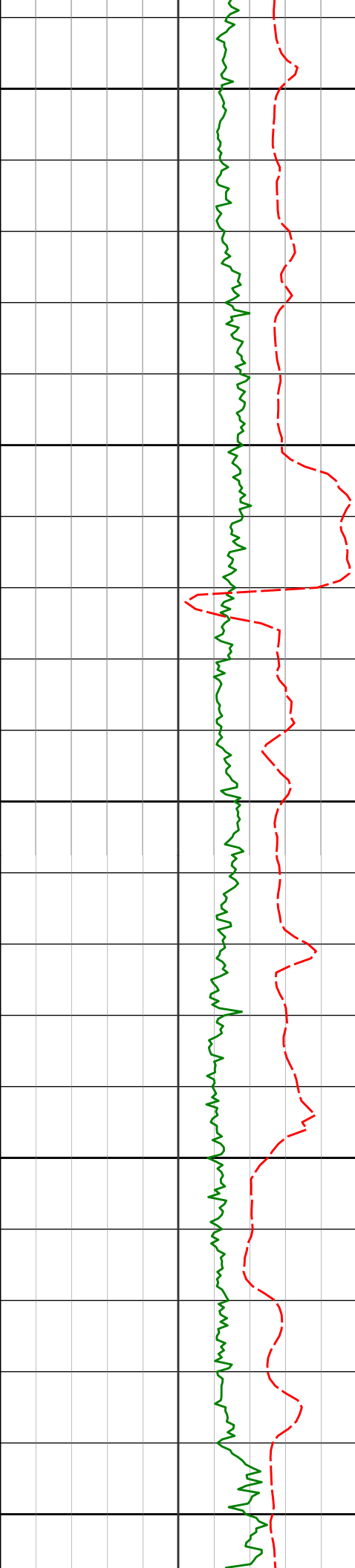
357.78°

5484.38'

5481.95'

8268.98'

8363.67'



13650

13700

13750

13800

13850

13643'

90.55°

358.58°

5479.93'

8458.40'

13737'

89.38°

359.36°

5479.98'

8552.24'

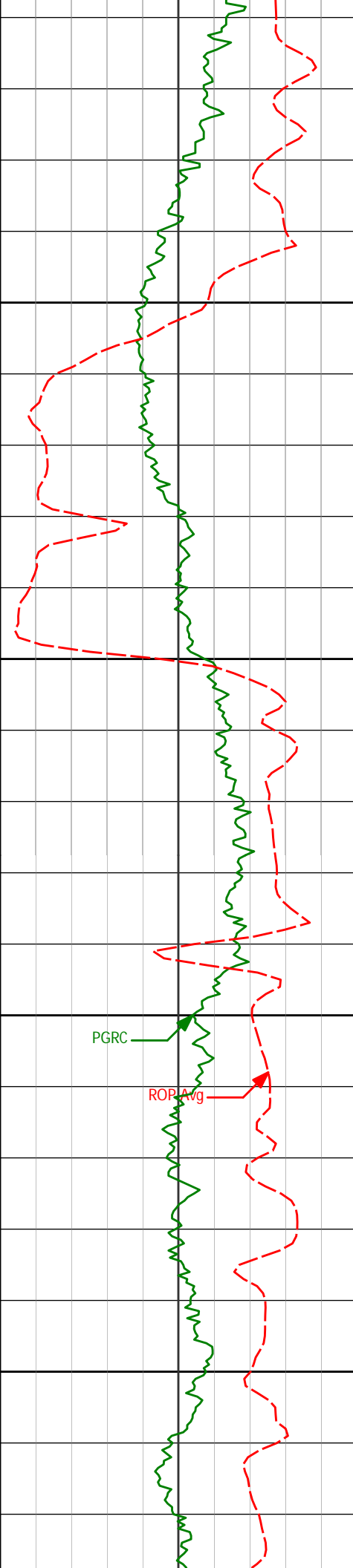
13832'

89.72°

359.18°

5480.72'

8647.10'



13900

13927'

89.63°

359.09°

5481.26'

8741.95'

13950

14000

PGRC

ROP Avg

14021'

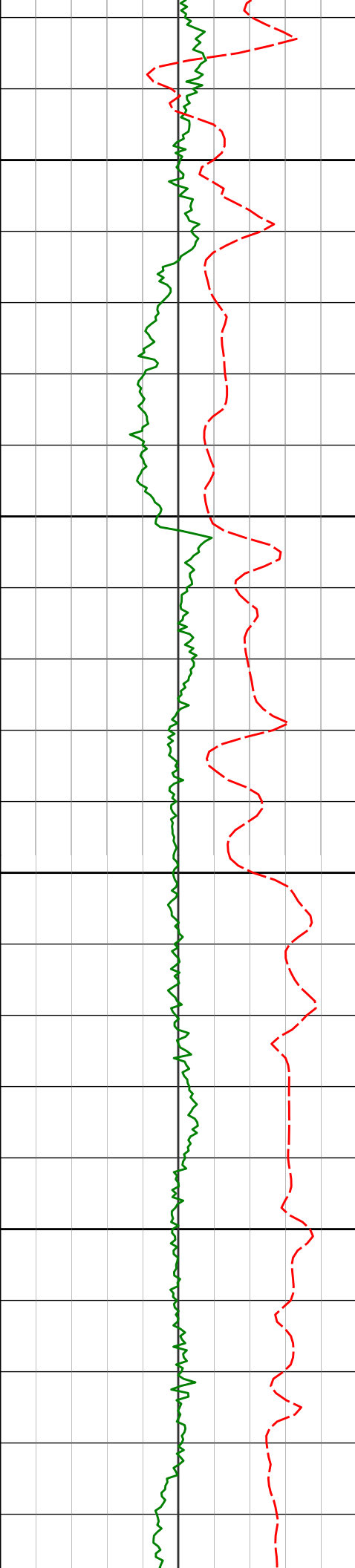
89.32°

358.56°

5482.12'

8835.78'

14050



14100

14116'

89.32°

357.69°

5483.24'

8930.52'

14150

14200

14211'

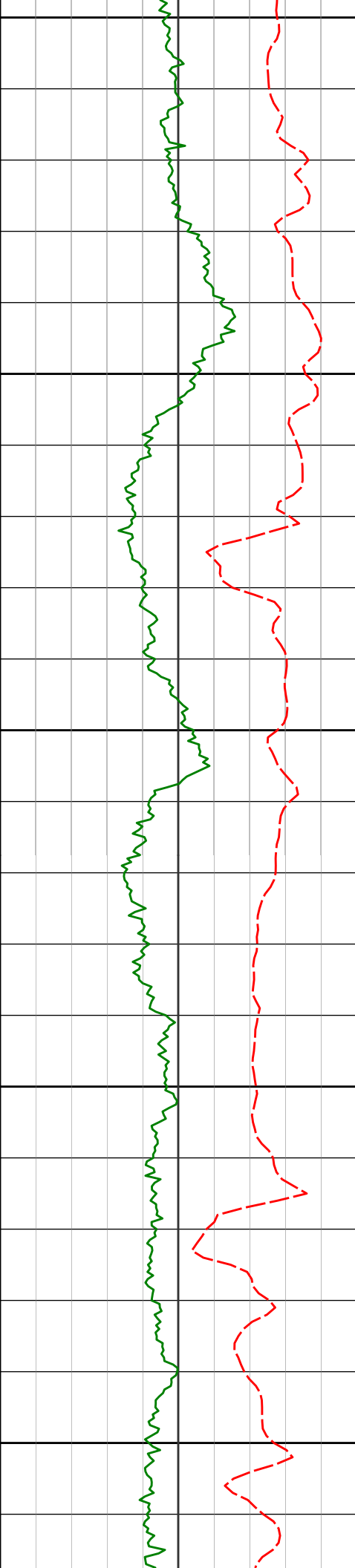
88.98°

357.34°

5484.65'

9025.18'

14250



14300

14306'

89.35°

357.26°

5486.03'

9119.80'

14350

14400

14400'

89.63°

356.77°

5486.86'

9213.40'

14450

14500

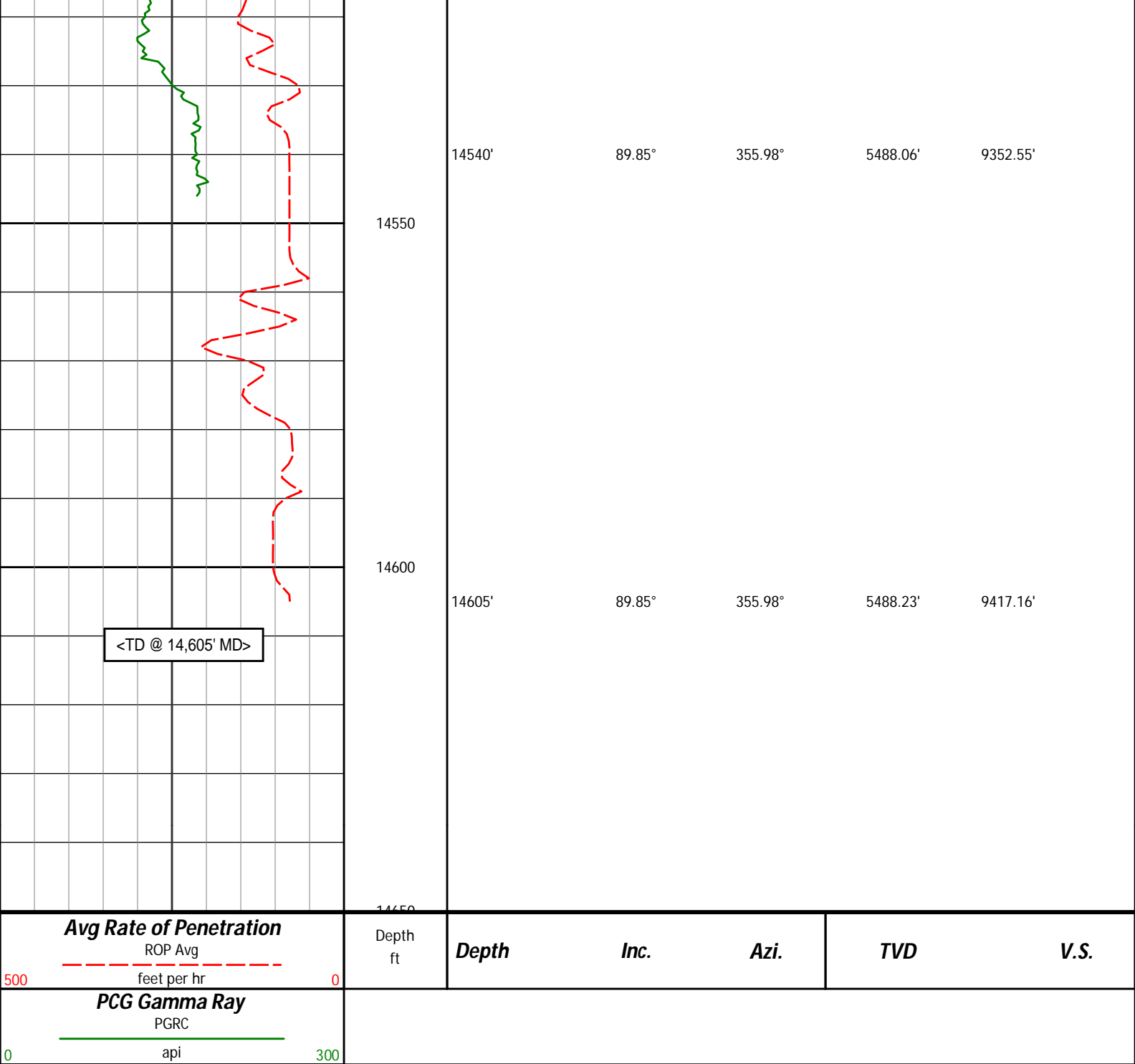
14494'

89.32°

355.53°

5487.72'

9306.85'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Atwater State LD01-76-1AHN
Wattenberg
Weld Colorado
USA
CA-XX-0901782069

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
380.00	0.40	179.62	380.00	1.33 S	0.01 E	-1.32	0.11
830.00	0.40	159.12	829.99	4.36 S	0.58 E	-4.34	0.03
1290.00	1.73	8.90	1289.93	0.99 N	2.22 E	1.07	0.45

1382.00	2.86	78.33	1381.87	2.82 N	4.69 E	3.01	3.01
1474.00	5.48	103.54	1473.62	2.26 N	11.21 E	2.70	3.41
1567.00	9.21	106.69	1565.84	0.92 S	22.66 E	-0.01	4.03
1659.00	10.90	98.93	1656.43	4.39 S	38.30 E	-2.85	2.35
1752.00	10.97	87.60	1747.75	5.38 S	55.83 E	-3.14	2.31
1938.00	10.91	84.66	1930.38	3.00 S	91.03 E	0.65	0.30
2124.00	10.17	81.40	2113.24	1.09 N	124.79 E	6.10	0.51
2217.00	10.41	89.14	2204.75	2.44 N	141.30 E	8.11	1.51
2495.00	10.34	85.04	2478.21	4.98 N	191.28 E	12.65	0.27
2588.00	10.50	83.87	2569.67	6.61 N	208.02 E	14.95	0.28
2681.00	10.51	80.17	2661.11	8.96 N	224.80 E	17.97	0.73
2773.00	10.11	86.23	2751.63	10.92 N	241.13 E	20.59	1.25
2963.00	9.68	83.42	2938.81	13.85 N	273.64 E	24.82	0.34
3057.00	9.40	81.02	3031.51	15.95 N	289.06 E	27.54	0.52
3152.00	10.63	89.23	3125.06	17.28 N	305.49 E	29.53	1.98
3342.00	11.51	89.37	3311.53	17.73 N	341.97 E	31.43	0.46
3437.00	12.06	88.90	3404.52	18.02 N	361.37 E	32.51	0.59
3531.00	12.02	89.04	3496.45	18.37 N	380.98 E	33.65	0.05
3626.00	10.99	80.92	3589.55	19.97 N	399.81 E	36.00	2.02
3721.00	10.17	78.25	3682.93	23.10 N	416.97 E	39.82	1.00
3816.00	9.83	76.97	3776.49	26.64 N	433.08 E	44.00	0.43
3910.00	9.23	73.69	3869.19	30.57 N	448.14 E	48.53	0.86
4004.00	9.36	80.33	3961.96	33.97 N	462.91 E	52.52	1.15
4099.00	9.75	88.18	4055.65	35.52 N	478.56 E	54.70	1.43
4193.00	9.46	87.50	4148.33	36.11 N	494.24 E	55.92	0.34
4288.00	9.71	87.42	4242.00	36.81 N	510.04 E	57.25	0.27
4383.00	9.93	88.53	4335.61	37.38 N	526.23 E	58.47	0.30
4478.00	8.42	84.49	4429.40	38.26 N	541.34 E	59.95	1.72
4572.00	9.05	98.29	4522.31	37.85 N	555.51 E	60.12	2.32
4667.00	10.75	97.03	4615.90	35.69 N	571.70 E	58.61	1.79
4762.00	8.82	96.02	4709.51	33.84 N	587.74 E	57.40	2.03
4856.00	11.94	70.75	4802.01	36.30 N	604.10 E	60.51	5.80
4904.00	15.18	56.66	4848.67	41.39 N	614.04 E	66.00	9.59
4951.00	18.19	46.72	4893.70	49.80 N	624.53 E	74.83	8.81
4999.00	20.75	38.79	4938.96	61.57 N	635.31 E	87.02	7.65
5046.00	23.52	33.41	4982.50	75.89 N	645.70 E	101.74	7.31
5094.00	25.35	25.53	5026.21	93.16 N	655.40 E	119.39	7.77
5141.00	28.22	21.90	5068.16	112.56 N	663.89 E	139.11	7.04
5189.00	31.71	19.09	5109.74	135.02 N	672.25 E	161.89	7.82
5236.00	35.51	15.85	5148.88	159.83 N	680.02 E	186.99	8.95
5284.00	39.21	13.86	5187.03	187.99 N	687.46 E	215.42	8.10
5330.00	42.92	11.73	5221.70	217.45 N	694.13 E	245.13	8.62
5378.00	46.55	11.76	5255.80	250.52 N	701.01 E	278.45	7.55
5425.00	50.40	11.70	5286.95	284.97 N	708.15 E	313.16	8.19
5473.00	54.11	10.62	5316.33	322.20 N	715.49 E	350.65	7.93
5520.00	57.93	7.85	5342.60	360.66 N	721.72 E	389.33	9.49
5568.00	62.04	5.91	5366.60	401.91 N	726.68 E	430.75	9.26
5614.00	65.55	4.03	5386.92	443.02 N	730.24 E	471.97	8.45
5662.00	68.76	0.87	5405.55	487.20 N	732.12 E	516.19	9.04
5709.00	71.11	358.27	5421.68	531.34 N	731.78 E	560.28	7.22
5757.00	72.46	356.35	5436.68	576.88 N	729.63 E	605.70	4.73
5804.00	75.96	356.34	5449.47	622.01 N	726.75 E	650.68	7.45
5829.00	78.22	357.18	5455.05	646.34 N	725.38 E	674.93	9.59
5916.00	81.80	358.78	5470.15	731.95 N	722.37 E	760.35	4.50
6010.00	81.87	358.85	5483.50	824.98 N	720.44 E	853.22	0.10
6105.00	83.29	358.86	5495.76	919.16 N	718.57 E	947.26	1.50
6200.00	86.64	358.43	5504.10	1013.75 N	716.33 E	1041.68	3.55
6295.00	90.34	356.06	5506.60	1108.59 N	711.76 E	1136.26	4.63
6389.00	92.59	355.93	5504.20	1202.32 N	705.19 E	1229.65	2.40
6484.00	91.82	356.05	5500.54	1297.02 N	698.55 E	1324.01	0.82
6579.00	92.44	355.76	5497.02	1391.71 N	691.77 E	1418.35	0.72
6673.00	90.99	358.87	5494.21	1485.55 N	687.37 E	1511.94	3.65
6768.00	91.30	358.30	5492.32	1580.50 N	685.02 E	1606.72	0.68
6863.00	88.98	359.10	5492.09	1675.47 N	682.86 E	1701.52	2.58
6958.00	90.15	0.36	5492.80	1770.46 N	682.41 E	1796.42	1.82
7053.00	89.32	359.17	5493.24	1865.46 N	682.02 E	1891.32	1.53
7147.00	89.41	357.91	5494.27	1959.42 N	679.63 E	1985.12	1.34
7240.00	90.74	357.50	5494.15	2052.34 N	675.91 E	2077.81	1.49
7333.00	90.99	357.18	5492.75	2145.23 N	671.59 E	2170.45	0.43
7425.00	90.93	356.82	5491.20	2237.09 N	666.78 E	2262.05	0.40
7517.00	90.83	358.89	5489.79	2329.01 N	663.33 E	2353.76	2.25
7811.00	90.37	357.93	5486.71	2622.88 N	655.17 E	2647.06	0.36
8001.00	89.75	357.26	5486.51	2812.71 N	647.20 E	2836.42	0.48
8096.00	89.23	356.64	5487.35	2907.57 N	642.14 E	2931.00	0.86
8188.00	89.25	356.84	5488.58	2994.27 N	638.42 E	2984.48	0.85

8190.00	89.35	356.04	5488.52	3001.37 N	636.13 E	3024.48	0.65
8285.00	88.70	355.96	5490.13	3096.12 N	629.51 E	3118.89	0.69
8380.00	89.54	357.54	5491.58	3190.96 N	624.13 E	3213.43	1.88
8474.00	90.34	358.95	5491.69	3284.91 N	621.25 E	3307.19	1.72
8569.00	90.34	359.17	5491.12	3379.89 N	619.70 E	3402.04	0.24
8664.00	91.30	358.50	5489.77	3474.86 N	617.77 E	3496.86	1.23
8759.00	91.36	358.52	5487.57	3569.81 N	615.31 E	3591.62	0.07
8948.00	90.19	357.15	5485.03	3758.65 N	608.17 E	3780.03	0.96
9043.00	90.25	357.56	5484.67	3853.54 N	603.78 E	3874.67	0.44
9138.00	90.18	356.81	5484.31	3948.43 N	599.12 E	3969.29	0.79
9233.00	90.52	359.04	5483.72	4043.36 N	595.69 E	4064.01	2.37
9328.00	90.77	0.58	5482.65	4138.35 N	595.37 E	4158.91	1.64
9423.00	90.77	1.28	5481.37	4233.33 N	596.92 E	4253.87	0.74
9518.00	90.43	0.78	5480.37	4328.31 N	598.63 E	4348.84	0.64
9612.00	89.32	359.53	5480.57	4422.30 N	598.89 E	4442.77	1.78
9707.00	89.32	359.54	5481.70	4517.29 N	598.12 E	4537.66	0.01
9802.00	88.58	359.56	5483.44	4612.27 N	597.37 E	4632.53	0.78
9897.00	89.69	358.15	5484.87	4707.24 N	595.46 E	4727.34	1.89
9992.00	89.94	357.54	5485.18	4802.17 N	591.89 E	4822.06	0.69
10084.00	90.59	357.39	5484.75	4894.08 N	587.82 E	4913.73	0.72
10177.00	90.80	357.20	5483.63	4986.97 N	583.43 E	5006.37	0.30
10269.00	90.49	357.14	5482.59	5078.85 N	578.89 E	5097.99	0.34
10362.00	90.40	356.44	5481.86	5171.70 N	573.68 E	5190.56	0.76
10454.00	90.74	356.08	5480.95	5263.50 N	567.67 E	5282.04	0.54
10546.00	91.26	356.19	5479.34	5355.28 N	561.47 E	5373.49	0.58
10639.00	91.67	356.17	5476.96	5448.04 N	555.28 E	5465.93	0.43
10731.00	90.89	356.83	5474.91	5539.84 N	549.67 E	5557.44	1.10
10824.00	90.40	358.01	5473.86	5632.74 N	545.48 E	5650.09	1.38
10917.00	90.68	357.68	5472.98	5725.67 N	541.99 E	5742.81	0.46
11010.00	90.34	358.82	5472.16	5818.62 N	539.15 E	5835.57	1.27
11103.00	89.63	358.94	5472.18	5911.60 N	537.33 E	5928.41	0.77
11196.00	89.97	358.32	5472.51	6004.58 N	535.10 E	6021.21	0.76
11288.00	90.12	358.62	5472.43	6096.54 N	532.64 E	6113.01	0.36
11381.00	90.25	357.38	5472.13	6189.48 N	529.39 E	6205.74	1.34
11474.00	89.75	355.96	5472.13	6282.32 N	523.98 E	6298.29	1.62
11567.00	89.75	356.12	5472.53	6375.10 N	517.56 E	6390.74	0.17
11659.00	89.14	355.68	5473.42	6466.86 N	510.97 E	6482.16	0.82
11751.00	89.04	355.25	5474.89	6558.56 N	503.69 E	6573.49	0.48
11842.00	89.26	356.13	5476.23	6649.29 N	496.85 E	6663.87	1.00
11937.00	89.20	356.20	5477.51	6744.07 N	490.49 E	6758.32	0.10
12031.00	89.07	355.52	5478.93	6837.81 N	483.70 E	6851.72	0.73
12126.00	88.00	357.92	5481.36	6932.62 N	478.27 E	6946.23	2.77
12221.00	88.24	357.82	5484.48	7027.50 N	474.74 E	7040.89	0.28
12316.00	87.87	357.14	5487.70	7122.35 N	470.57 E	7135.50	0.82
12411.00	90.12	359.13	5489.36	7217.28 N	467.48 E	7230.23	3.16
12505.00	90.22	358.68	5489.08	7311.26 N	465.69 E	7324.06	0.49
12600.00	90.03	358.51	5488.87	7406.23 N	463.36 E	7418.86	0.27
12695.00	89.66	357.93	5489.13	7501.19 N	460.41 E	7513.62	0.72
12790.00	89.48	357.62	5489.85	7596.11 N	456.72 E	7608.32	0.38
12884.00	89.14	357.16	5490.98	7690.01 N	452.44 E	7701.97	0.61
12980.00	88.86	356.16	5492.66	7785.83 N	446.84 E	7797.49	1.08
13074.00	90.34	357.44	5493.32	7879.67 N	441.60 E	7891.05	2.08
13169.00	91.33	358.20	5491.94	7974.59 N	437.98 E	7985.75	1.31
13264.00	91.94	358.00	5489.23	8069.50 N	434.83 E	8080.45	0.68
13358.00	91.45	359.14	5486.45	8163.43 N	432.49 E	8174.21	1.32
13453.00	91.05	357.97	5484.38	8258.37 N	430.10 E	8268.98	1.30
13548.00	91.88	357.78	5481.95	8353.28 N	426.58 E	8363.67	0.90
13643.00	90.55	358.58	5479.93	8448.21 N	423.57 E	8458.40	1.63
13737.00	89.38	359.36	5479.98	8542.19 N	421.88 E	8552.24	1.50
13832.00	89.72	359.18	5480.72	8637.18 N	420.67 E	8647.10	0.41
13927.00	89.63	359.09	5481.26	8732.16 N	419.24 E	8741.95	0.13
14021.00	89.32	358.56	5482.12	8826.14 N	417.31 E	8835.78	0.66
14116.00	89.32	357.69	5483.24	8921.08 N	414.20 E	8930.52	0.91
14211.00	88.98	357.34	5484.65	9015.98 N	410.08 E	9025.18	0.52
14306.00	89.35	357.26	5486.03	9110.87 N	405.60 E	9119.80	0.40
14400.00	89.63	356.77	5486.86	9204.73 N	400.71 E	9213.40	0.61
14494.00	89.32	355.53	5487.72	9298.52 N	394.40 E	9306.85	1.36
14540.00	89.85	355.98	5488.06	9344.39 N	390.99 E	9352.55	1.50
14605.00	89.85	355.98	5488.23	9409.23 N	386.43 E	9417.16	0.01

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 2.30 DEGREES (GRID)
A TOTAL CORRECTION OF 6.92 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 14605.00 FEET
IS 9417.16 FEET ALONG 2.35 DEGREES (GRID)

Surface surveys at 380 ft and 830 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 14540 ft MD to TD at 14605 ft MD.

Date Printed:08 November 2014