

PCGK - Pressure Case Gamma  
PCDC - Pressure Case Directional  
DGR Dual Gamma Ray



1 : 240

|  |                                   |   |                            |  |
|--|-----------------------------------|---|----------------------------|--|
| Country : USA  |                                   |   |                            |  |
| Field : Wattenburg   |                                   |   |                            |  |
| Location :   | Lat: 40° 7' 1.71" North           |   |                            |  |
|  | Long: 104° 44' 32.62" West        |   |                            |  |
| Well : Gobbler 28N-23HZ  |                                   |   |                            |  |
| Company : Anadarko Petroleum Corp.   |                                   |   |                            |  |
| Rig : Ensign 132   |                                   |   |                            |  |
| LOCATION   |                                   | Company : Anadarko Petroleum Corp.          |                            |  |
|  |                                   | Rig : Ensign 132                            |                            |  |
| Latitude : 40° 7' 1.71" North<br>Longitude : 104° 44' 32.62" West<br>UTM Easting = 3,211,878.76 ft<br>UTM Northing = 1,286,423.86 ft |                                   | Well : Gobbler 28N-23HZ                     |                            |  |
|  |                                   | Field : Wattenburg                          |                            |  |
| API Number : 05-123-35999  |                                   | Country : USA                               |                            |  |
|  |                                   |   |                            |  |
| Permanent Datum : Ground Level   |                                   | Elevation : 5101.00 ft                      | Elev. KB 5114.00 ft        |  |
| Log Measured From : Drill Floor  |                                   | 13.00 ft Above Permanent Datum              | DF 5113.00 ft              |  |
| Drilling Measured From : Drill Floor   |                                   | MD LOG                                      | GL 5101.00 ft              |  |
|  |                                   |   | WD N/A                     |  |
| Depth Logged : 1,078.00 ft To 11,881.00 ft   |                                   | Unit No. : 11210429                         | Job No. : CA-XX-0900304811 |  |
| Date Logged : 02-Jul-13 To 09-Jul-13   |                                   |   |                            |  |
| Total Depth MD : 11,881.00 ft TVD : 7,389.24 ft  |                                   |   |                            |  |
| Spud Date : 02-Jul-13  |                                   | Plot Type : Final                           |                            |  |
|  |                                   | Plot Date : 09-Jul-13                       |                            |  |
| Run No.  | Borehole Record (MD)              |   | Borehole Record (MD)       |  |
|  | Size From To                      | Run No.                                     | Size From To               |  |
| 0100   | 8.750 in 1,073.00 ft 7,813.00 ft  |   |                            |  |
| 0200   | 6.125 in 7,813.00 ft 9,896.00 ft  |   |                            |  |
| 0300   | 6.125 in 9,896.00 ft 11,881.00 ft |   |                            |  |
|  |                                   | Casing Record (MD)                          |                            |  |
|  |                                   | Size Weight From To                         |                            |  |
|  |                                   | 9.625 in 36.00 lbpf SURFACE 1,063.00 ft     |                            |  |
|  |                                   | 7.000 in 27.00 lbpf 1,053.00 ft 7,803.00 ft |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |
|  |                                   |   |                            |  |

|                               |             |                |              |  |  |
|-------------------------------|-------------|----------------|--------------|--|--|
| Max Tool Temp (degF) / Source | 181.3 / PCM | 210.31 / PCM   | 228.74 / PCM |  |  |
| Rm @ Max Tool Temp (degF)     | N/A @ N/A   | N/A @ N/A      | N/A @ N/A    |  |  |
| Lead MWD Engineer             | Matt Busche | Matt Busche    | Matt Busche  |  |  |
| Customer Representative       | Sam Taylor  | Terry Bradshaw | Sam Taylor   |  |  |

## SENSOR INFORMATION

### Downhole Processor Information

|                           |                 |                 |                 |  |  |
|---------------------------|-----------------|-----------------|-----------------|--|--|
| Tool Type                 | PCM             | PCM             | PCM             |  |  |
| Software Version          | 5.84            | 5.84            | 5.84            |  |  |
| Sub Serial Number         | 11341336        | 12187587        | 12187587        |  |  |
| Insert Serial Number      | 11400991        | 11680802        | 11400991        |  |  |
| Date and Time Initialized | 02-Jul-13 06:12 | 05-Jul-13 15:33 | 07-Jul-13 05:23 |  |  |
| Date and Time Read        | 04-Jul-13 16:26 | 07-Jul-13 13:05 | 09-Jul-13 09:17 |  |  |
| ECMB SW Version           | N/A             | N/A             | N/A             |  |  |

### Directional Sensor Information

|                        |          |          |          |  |  |
|------------------------|----------|----------|----------|--|--|
| Tool Type              | PCDC     | PCDC     | PCDC     |  |  |
| Distance From Bit (ft) | 49.74    | 42.50    | 43.24    |  |  |
| Software Version       | 6.21     | 6.21     | 6.21     |  |  |
| Sub Serial Number      | 11341336 | 12187587 | 12187587 |  |  |
| Sonde Serial Number    | 11833221 | 11478086 | 11833221 |  |  |
| Sensor ID Number       | N/A      | N/A      | N/A      |  |  |
| Toolface Offset (deg)  | 17.89    | 266.50   | 78.61    |  |  |

### Gamma Ray Sensor Information

|                              |          |          |          |  |  |
|------------------------------|----------|----------|----------|--|--|
| Tool Type                    | PCG      | PCG      | PCG      |  |  |
| Distance From Bit (ft)       | 45.01    | 47.45    | 48.19    |  |  |
| Recorded Sample Period (sec) | 10       | 10       | 10       |  |  |
| Software Version             | 8.15     | 8.15     | 8.15     |  |  |
| Sub Serial Number            | 11341336 | 12187587 | 12187587 |  |  |
| Insert/Sonde Serial Number   | 11680968 | 11680944 | 11579782 |  |  |

## REMARKS

1. All depths are measured depths, referenced to the Driller's pipe tally and are measured from the Kelly Bushing, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded data unless otherwise specified.
4. The following smoothing parameters have been applied to the data:

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

Insite version: 7.4.10

## WARRANTY

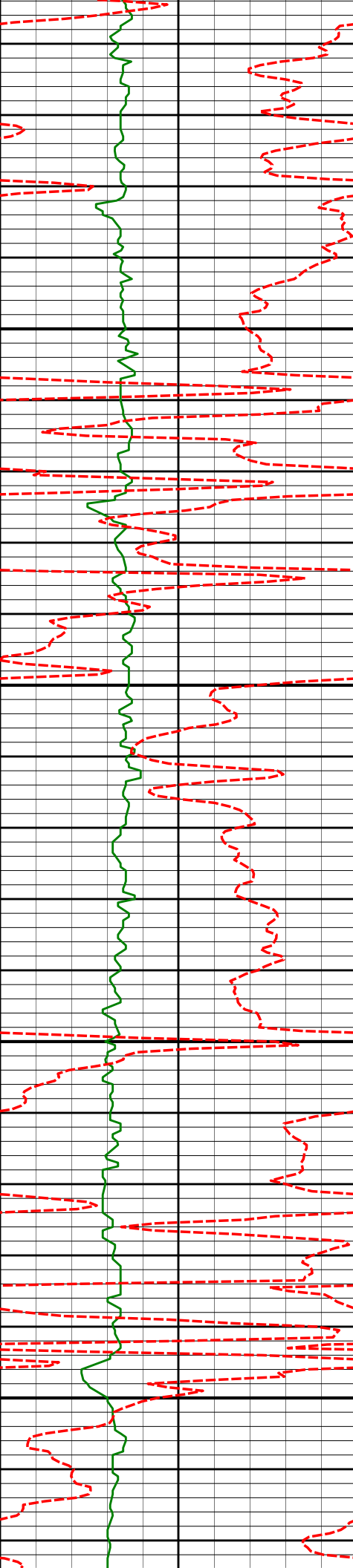
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES 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

# Gobbler 28N-23HZ Field Plot

## MD Main Log 1:240

|  |     |       |     |     |         |
|--|-----|-------|-----|-----|---------|
| PCG GR XHi-Range RT BCor<br>(PGRC)<br>api            |     |       |     |     |         |
| 0  | 300 |       |     |     |         |
| Average Rate of Penetration<br>(ROPA)<br>feet per hr |     | Depth |     |     |         |
| 500  | 0   | Depth | Inc | Azi | TVD V/S |
|  |     | 1050  |     |     |         |
|  |     | 1100  |     |     |         |
|  |     | 1150  |     |     |         |



1200

1250

1300

1350

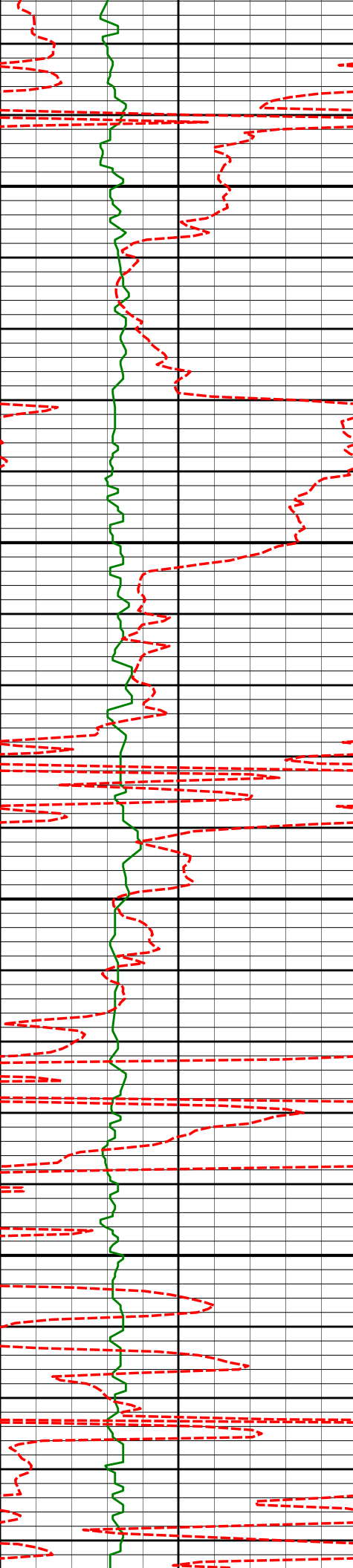
1157'

0.32°

167.04°

1156.98'

3.46'



1400

1450

1500

1550

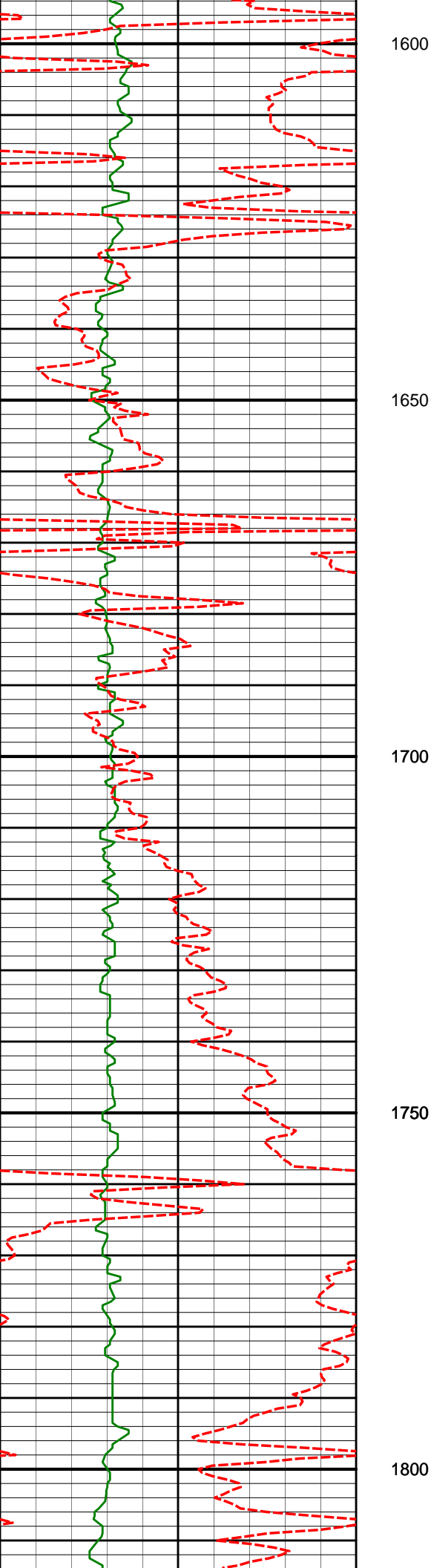
1433'

0.32°

135.44°

1432.97'

2.17'



1600

1650

1700

1750

1800

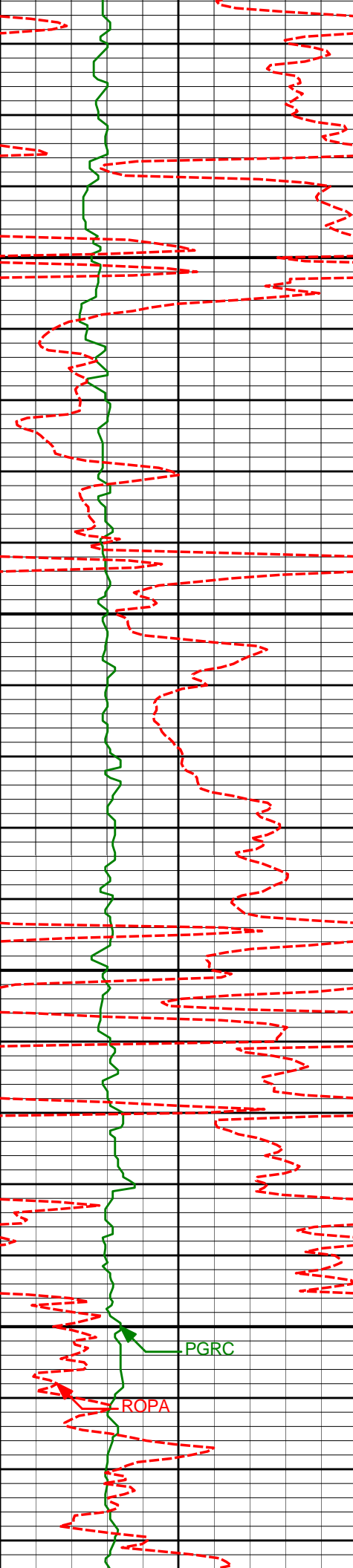
1709'

0.22°

154.27°

1708.97'

1.13'



1850

1900

1950

2000

PGRC

ROPA

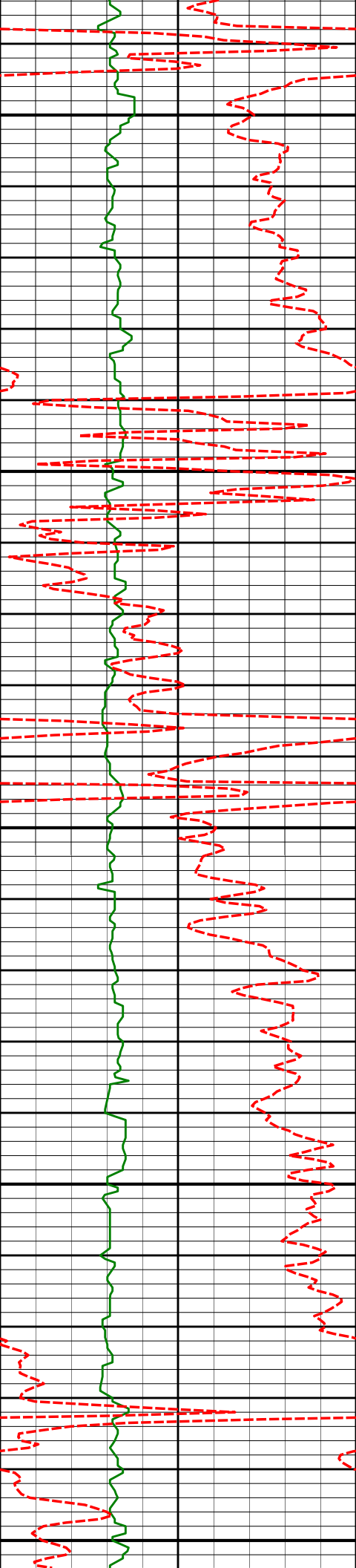
1989'

0.28°

159.46°

1988.97'

-0.00'



2050

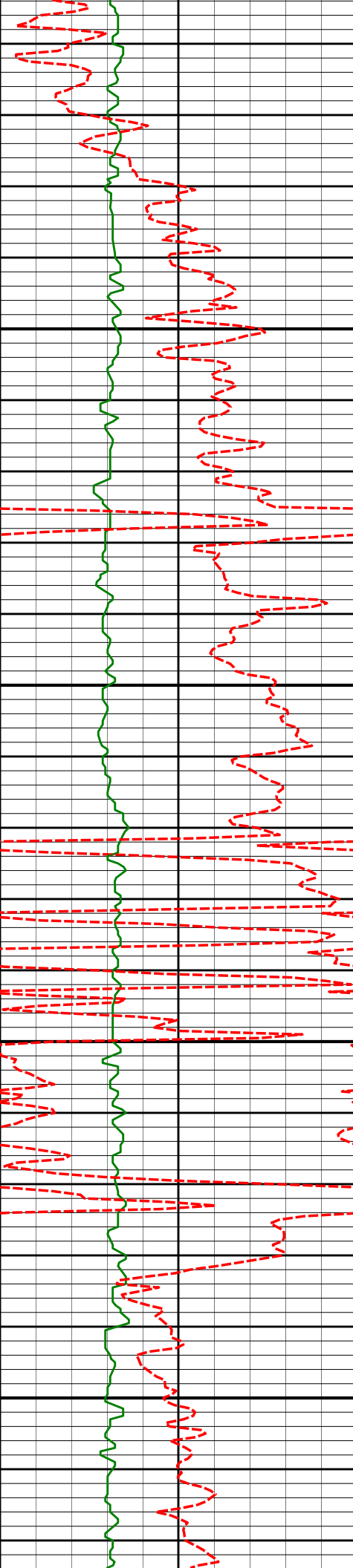
2100

2150

2200

2250





2300

2350

2400

2450

2276'

0.20°

234.92°

2275.97'

-0.94'

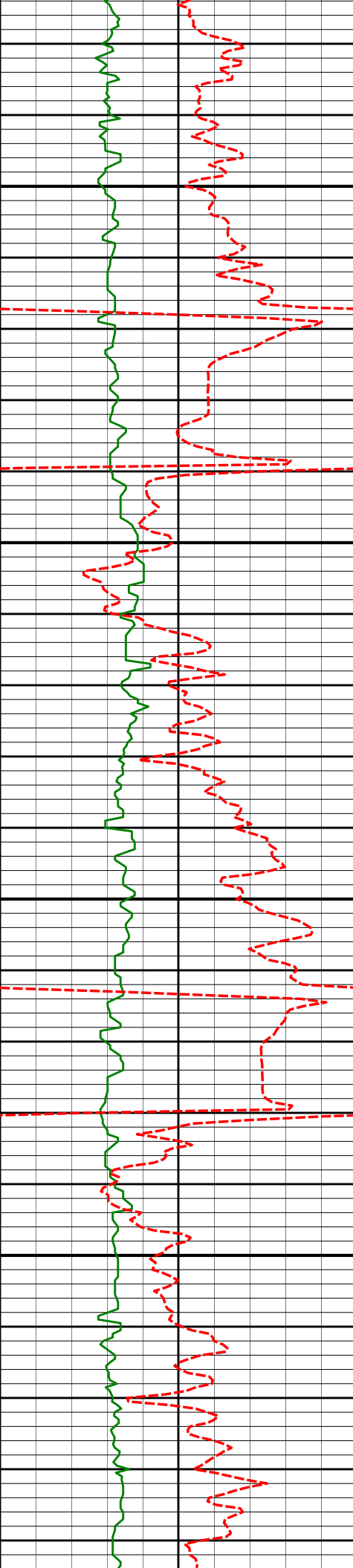
2465'

0.28°

313.66°

2464.96'

-0.80'



2500

2550

2600

2650

2560'

3.46°

291.07°

2559.90'

0.41'

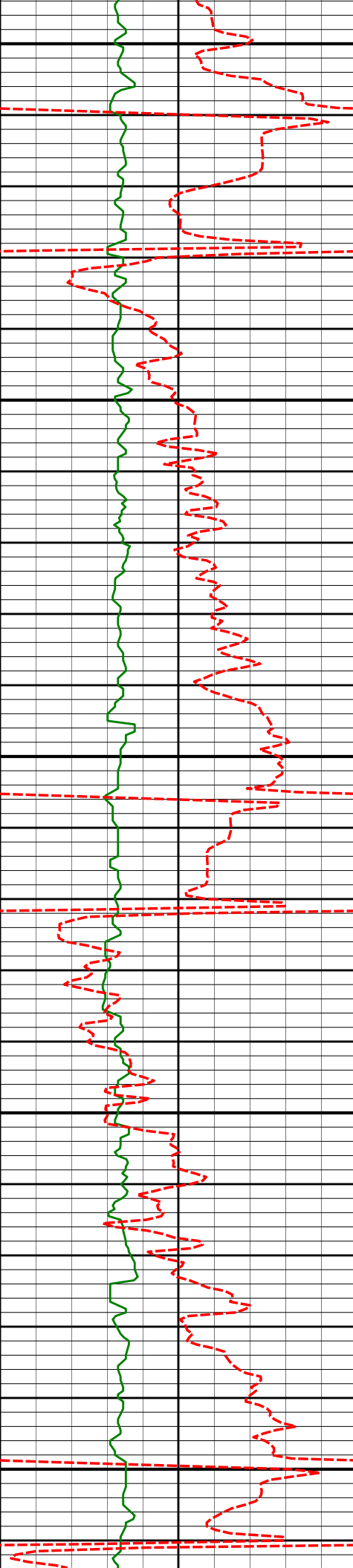
2656'

4.99°

264.19°

2655.65'

1.08'



2700

2750

2800

2850

2900

2751'

7.55°

264.53°

2750.07'

0.14'

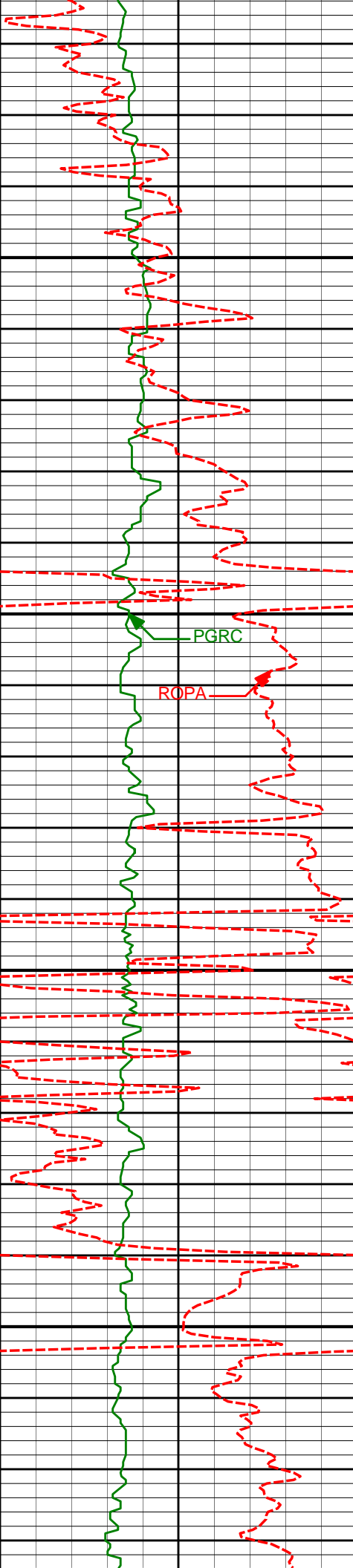
2847'

9.34°

250.86°

2845.04'

-2.92'



2950

3000

3050

3100

2943'

10.35°

253.14°

2939.62'

-7.86'

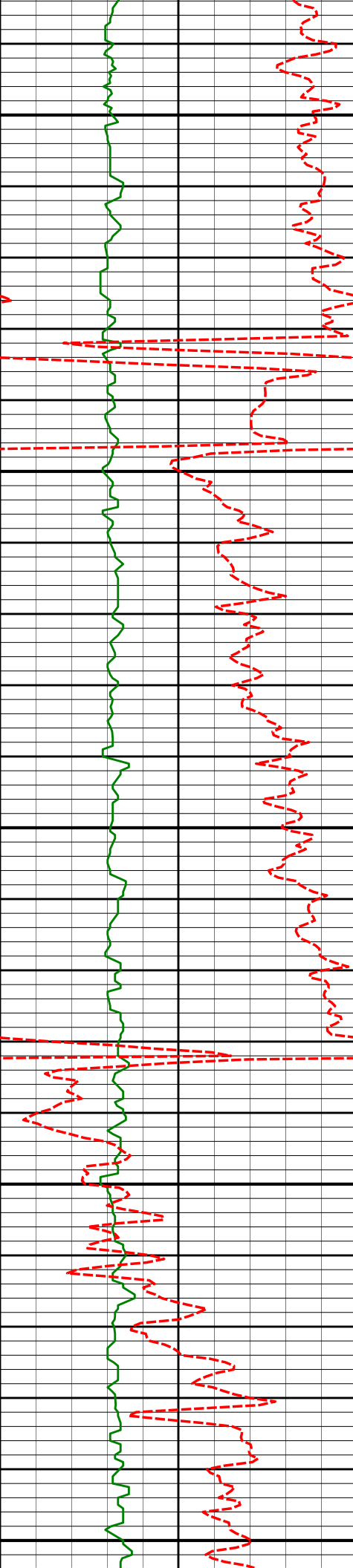
3039'

8.99°

253.75°

3034.26'

-12.35'



3150

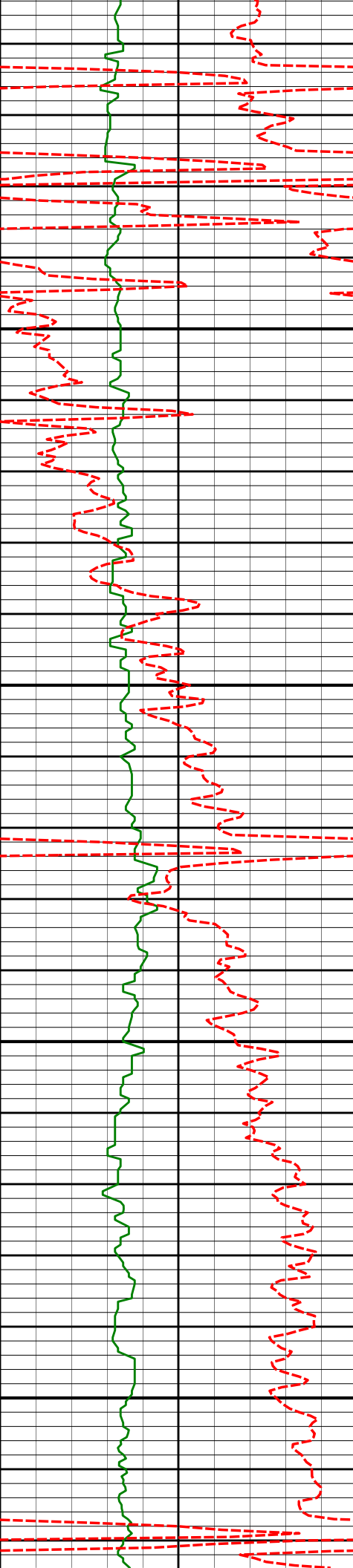
3200

3250

3300

3350

|       |        |         |          |         |
|-------|--------|---------|----------|---------|
| 3134  | 10.37  | 233.43  | 3127.90  | -16.73  |
| 3230' | 11.00° | 247.46° | 3222.24' | -22.60' |
| 3325' | 10.27° | 249.74° | 3315.61' | -28.89' |



3400

3421'

9.24°

250.76°

3410.22'

-34.28'

3450

3500

3517'

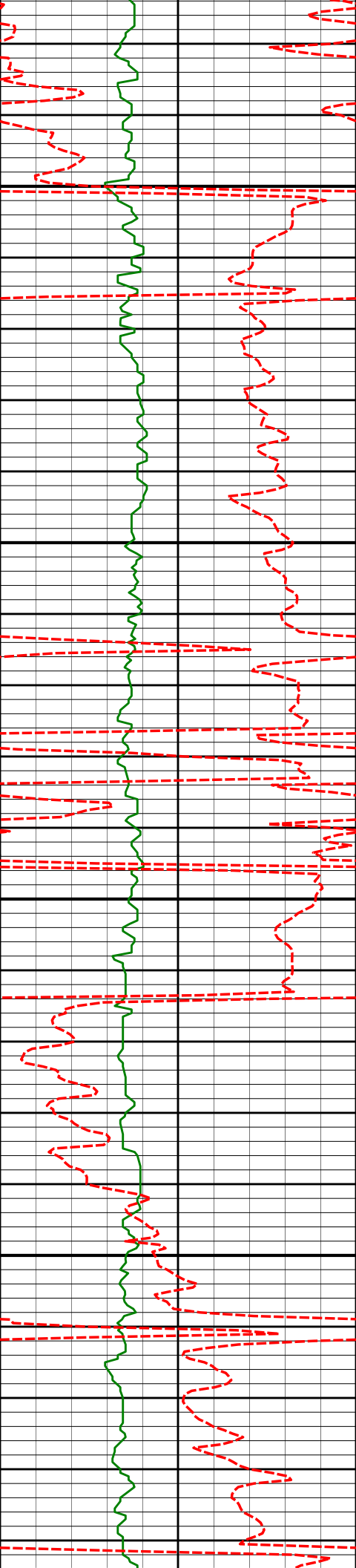
8.25°

253.38°

3505.10'

-38.69'

3550



3600

3612'

9.55°

256.47°

3598.95'

-42.38'

3650

3700

3708'

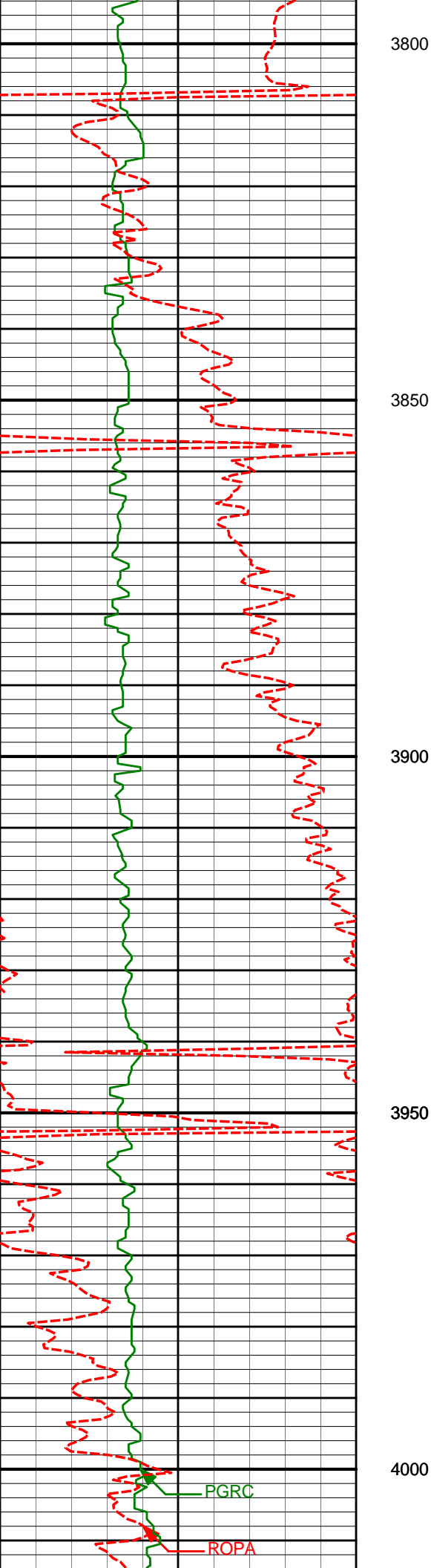
9.70°

253.09°

3693.60'

-46.48'

3750



3898'

10.16°

241.90°

3880.77'

-58.81'

3993'

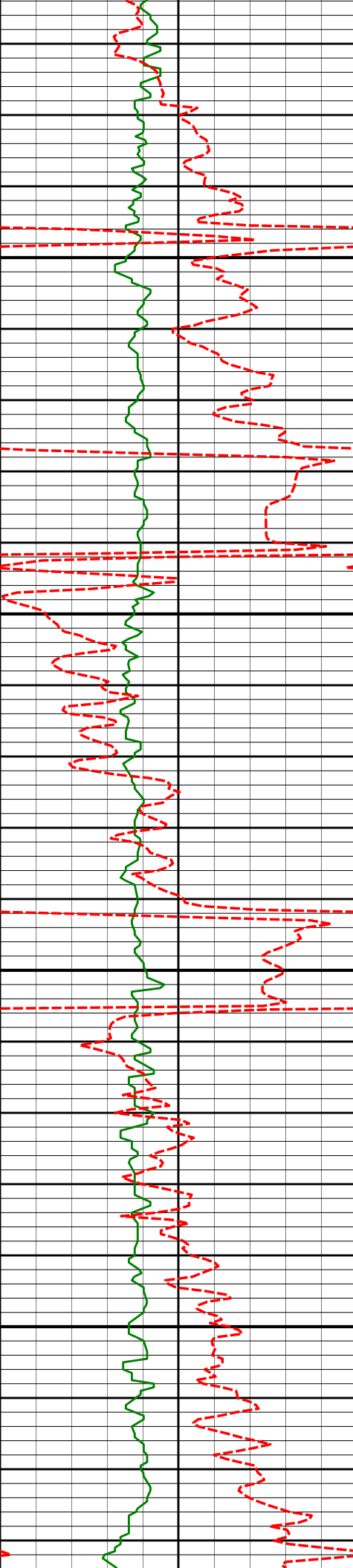
8.87°

239.51°

3974.47'

-66.37'





4050

4089'

8.62°

248.82°

4069.36'

-72.63'

4100

4150

4183'

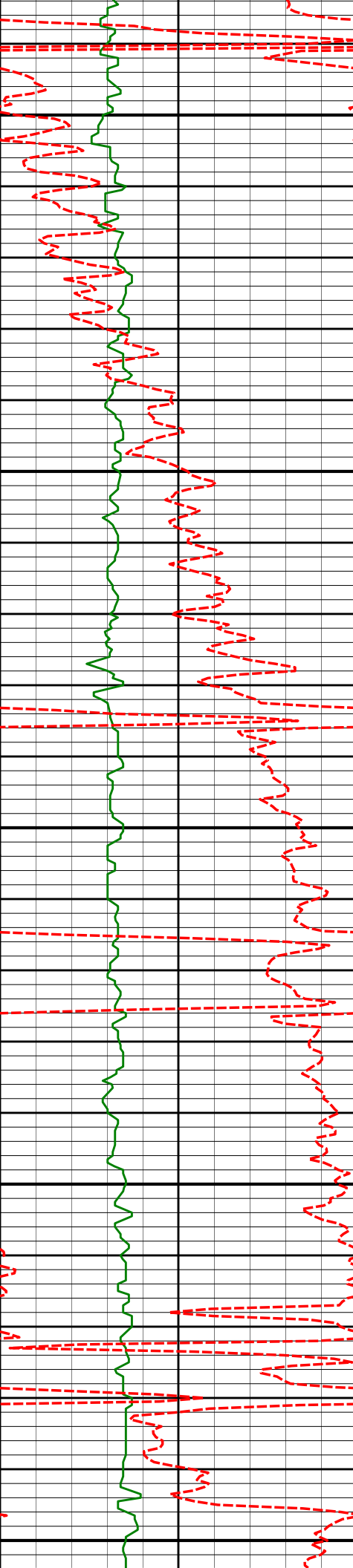
9.39°

258.83°

4162.20'

-76.56'

4200



4250

4300

4350

4400

4450

4279'

8.95°

257.77°

4256.97'

-79.55'

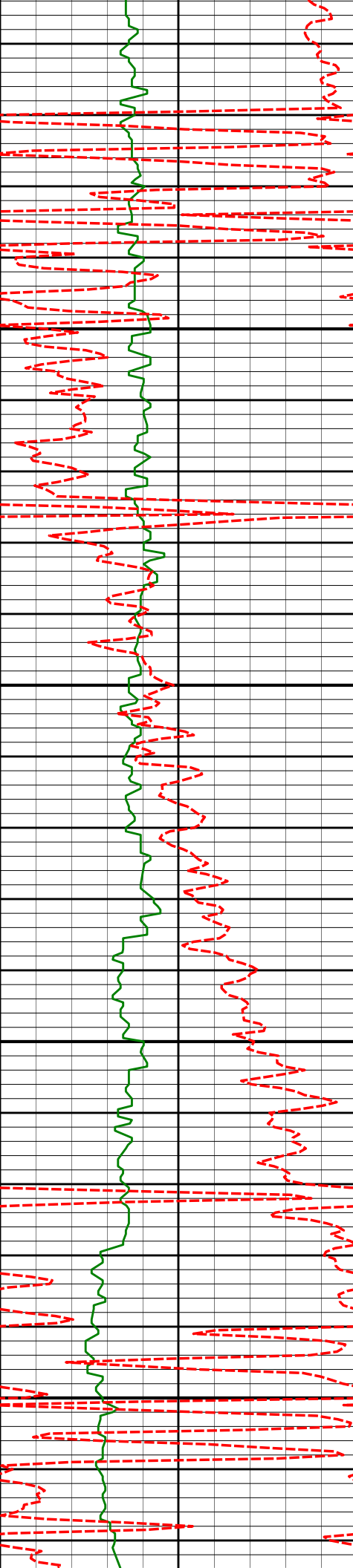
4374'

9.66°

259.75°

4350.72'

-82.42'



4470'

9.22°

261.36°

4445.42'

-84.89'

4500

4550

4600

4650

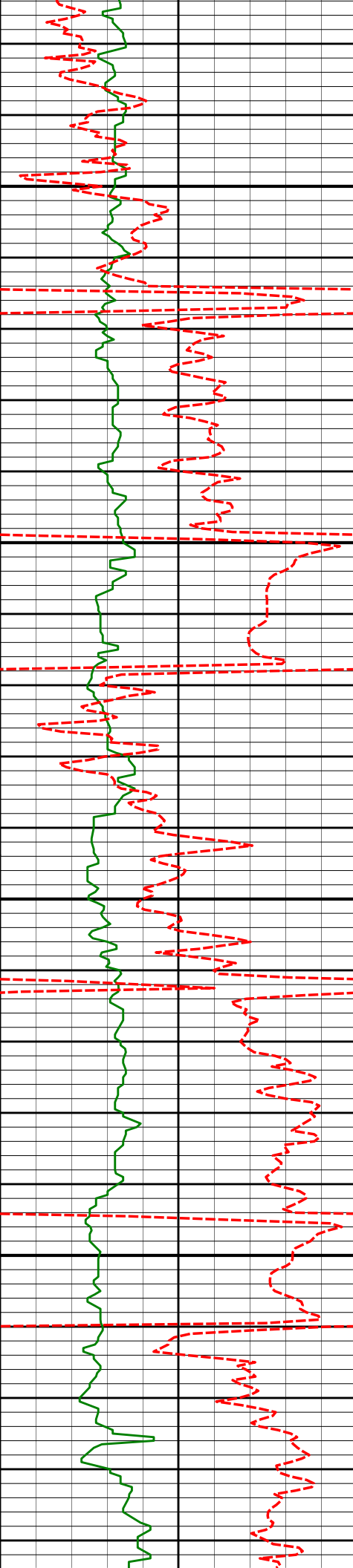
4661'

7.59°

260.27°

4634.36'

-89.12'



4700

4750

4800

4850

4757'

9.43°

256.41°

4729.30'

-91.94'

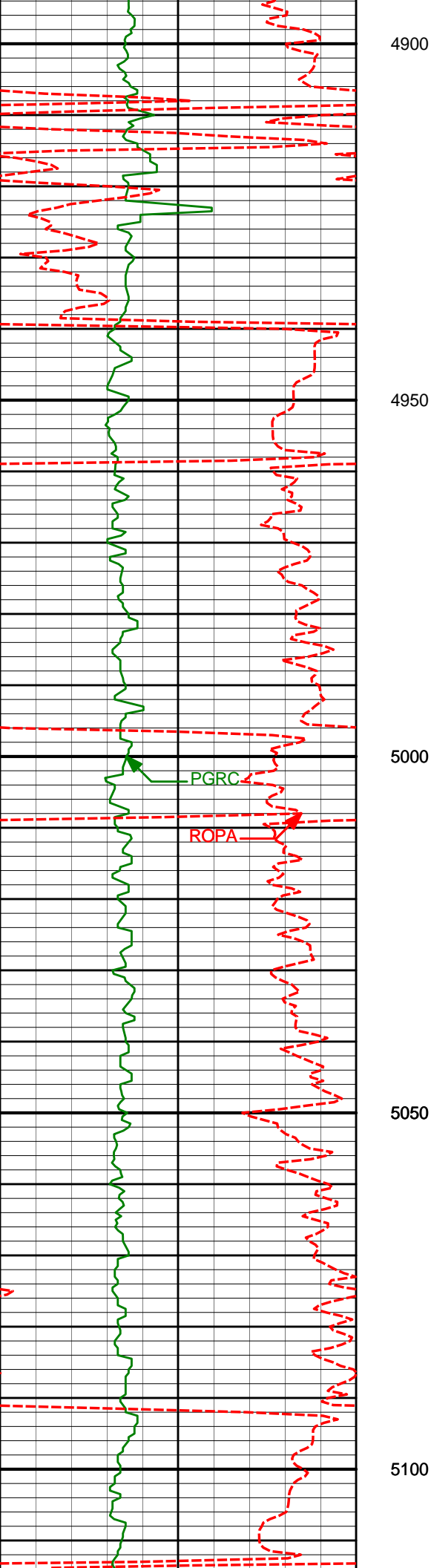
4851'

10.50°

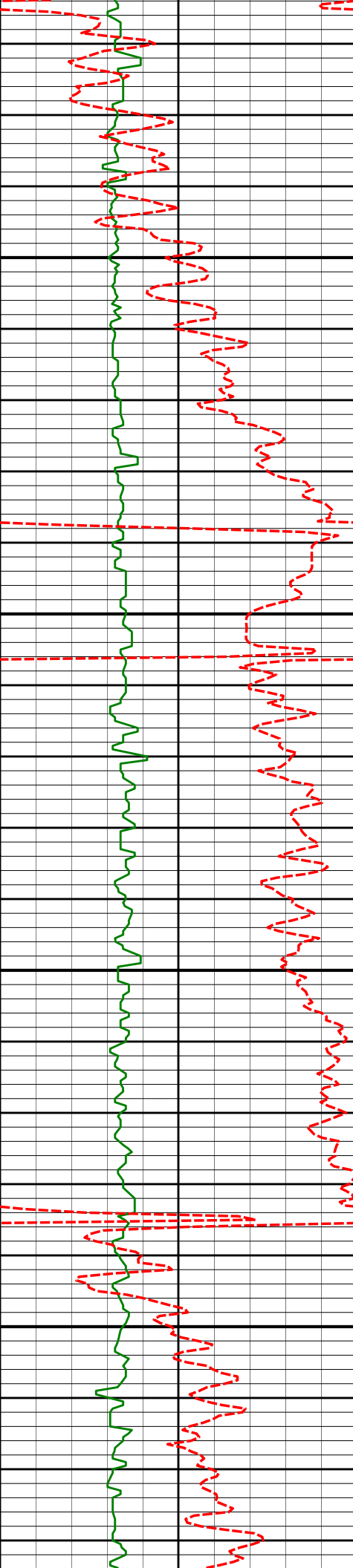
249.31°

4821.89'

-96.66'



|       |        |         |          |          |
|-------|--------|---------|----------|----------|
|       |        |         |          |          |
| 4946' | 11.63° | 240.43° | 4915.13' | -104.33' |
|       |        |         |          |          |
| 5042' | 11.17° | 226.95° | 5009.25' | -115.34' |
|       |        |         |          |          |



5150

5200

5250

5300

5137'

6.42°

227.25°

5103.11'

-125.15'

5232'

8.29°

237.56°

5197.33'

-132.36'

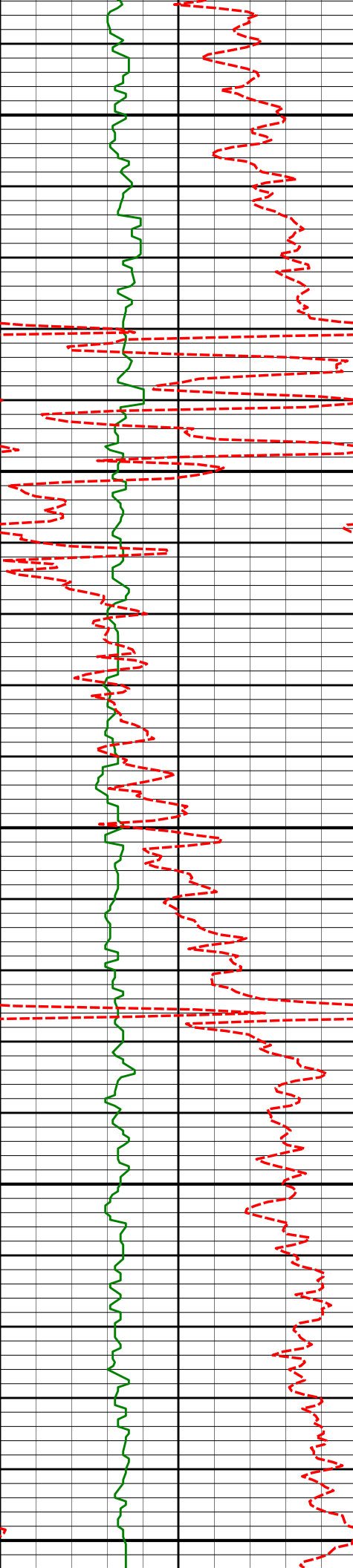
5327'

7.56°

237.18°

5291.42'

-139.34'



5350

5400

5450

5500

5550

5423'

7.12°

237.94°

5386.63'

-145.85'

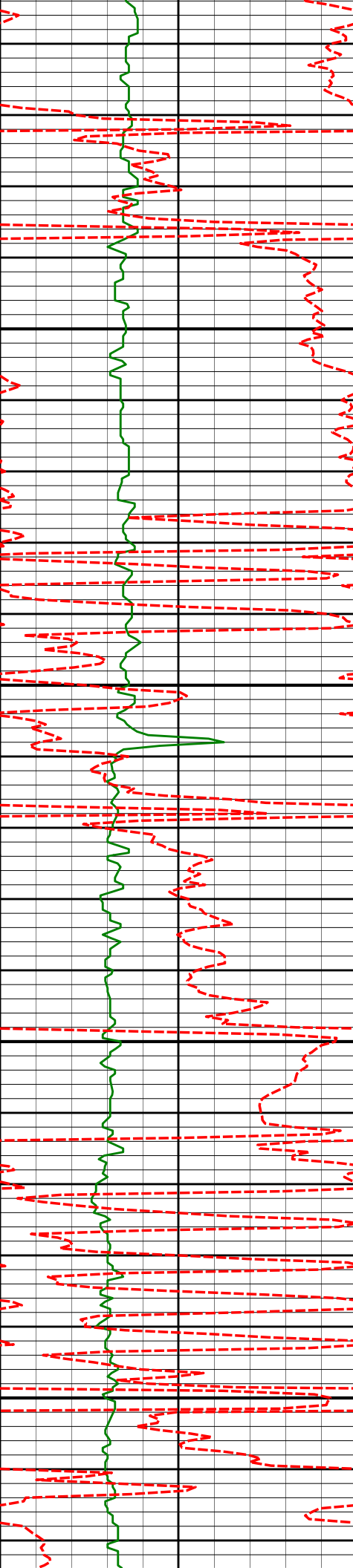
5518'

6.41°

236.09°

5480.97'

-151.86'



5600

5614'

5.49°

237.75°

5576.45'

-157.25'

5650

5700

5709'

3.28°

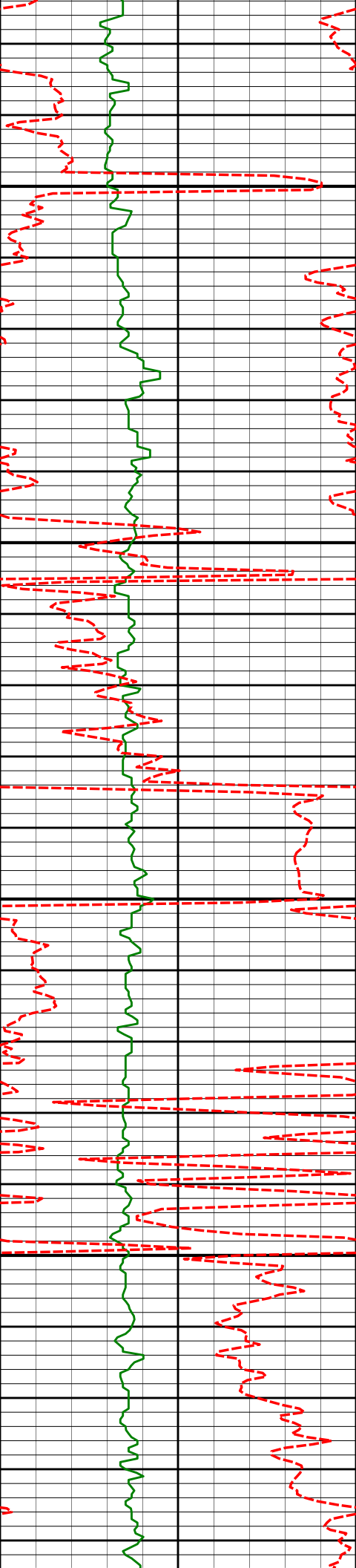
221.94°

5671.17'

-161.65'

5750





5800

5804'

2.81°

214.81°

5766.03'

-165.56'

5850

5900

5900'

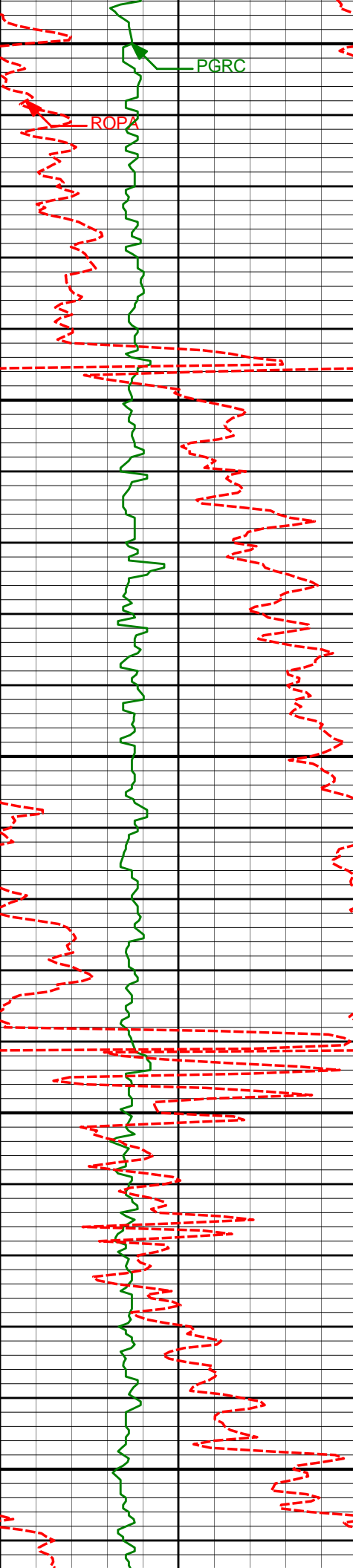
0.40°

176.22°

5861.99'

-167.82'

5950



6000

PGRC

ROPA

6050

6100

6150

6200

5996'

0.56°

66.96°

5957.99'

-167.98'

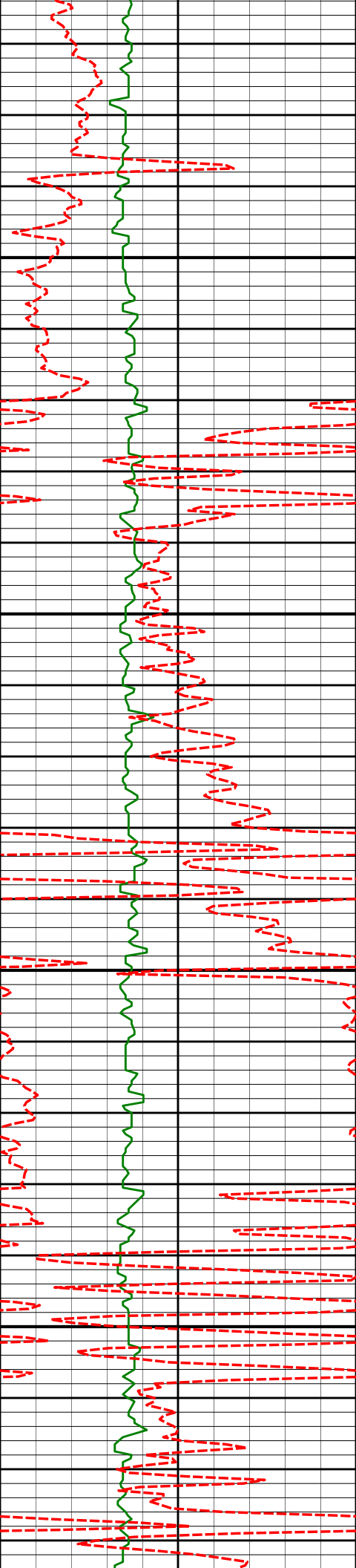
6187'

0.00°

39.80°

6148.99'

-167.62'

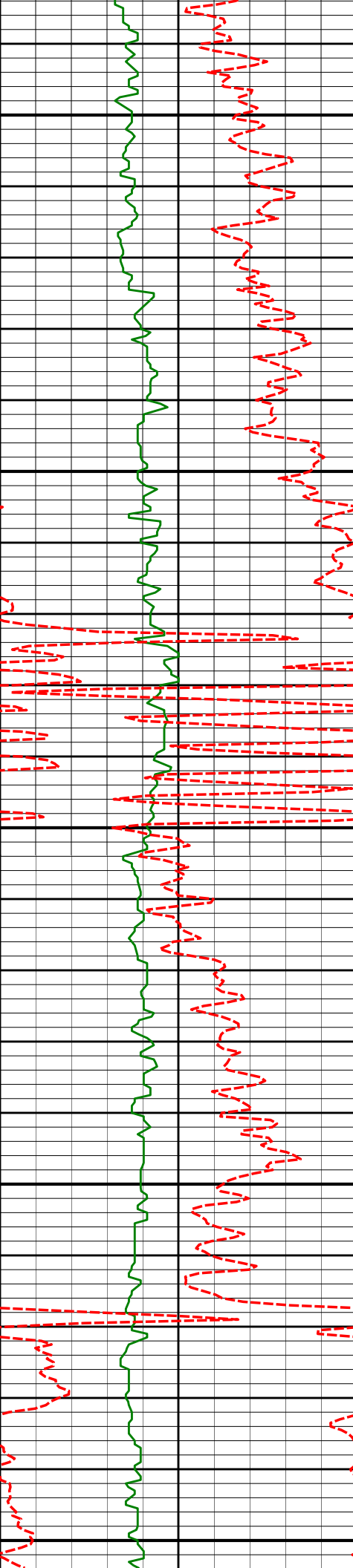


6250

6300

6350

6400



6450

6474'

1.09°

1.13°

6435.97'

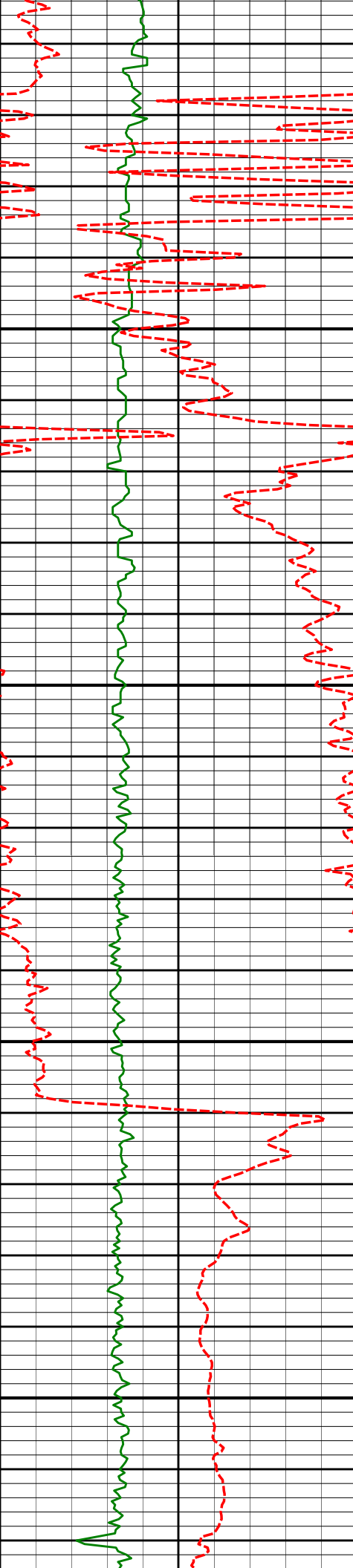
-164.88'

6500

6550

6600

6650



6700

6750

6800

6850

6760'

1.20°

325.40°

6721.92'

-159.67'

6809'

1.09°

332.75°

6770.91'

-158.83'

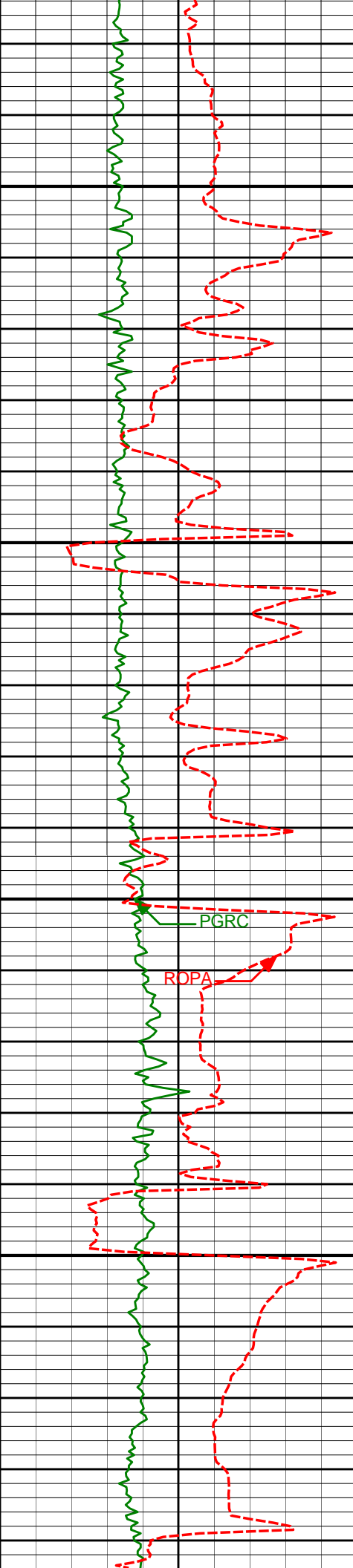
6856'

8.94°

19.13°

6817.70'

-154.99'



6900

6904'

18.52°

26.43°

6864.27'

-144.65'

6950

6951'

18.61°

29.33°

6908.83'

-131.47'

7000

7000'

20.00°

28.69°

6955.07'

-117.36'

7050

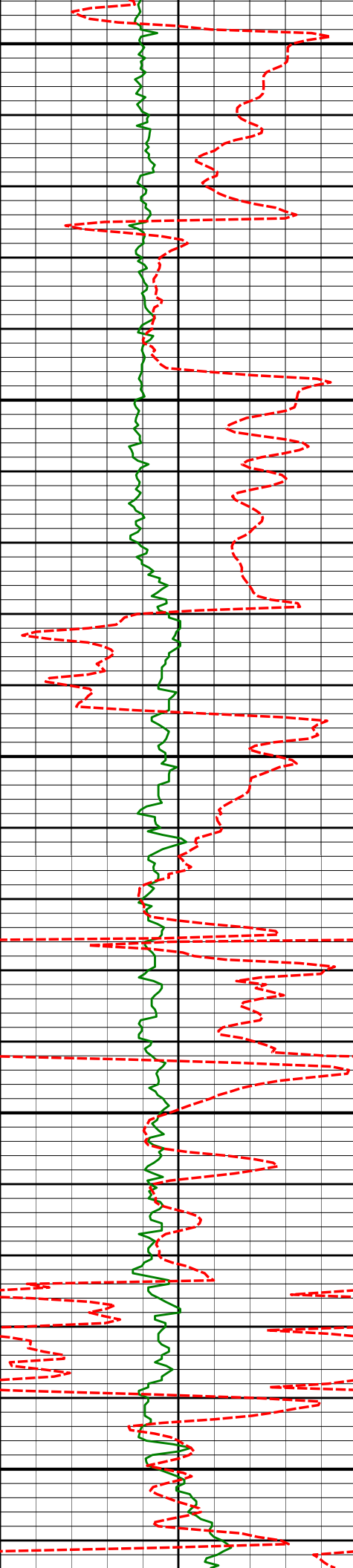
7047'

26.62°

24.54°

6998.22'

-100.78'



7100

7150

7200

7250

7300

7095'

7142'

7191'

7238'

7286'

33.44°

36.71°

40.00°

43.92°

47.31°

23.61°

17.28°

9.11°

3.74°

0.05°

7039.75'

7078.22'

7116.66'

7151.62'

7185.19'

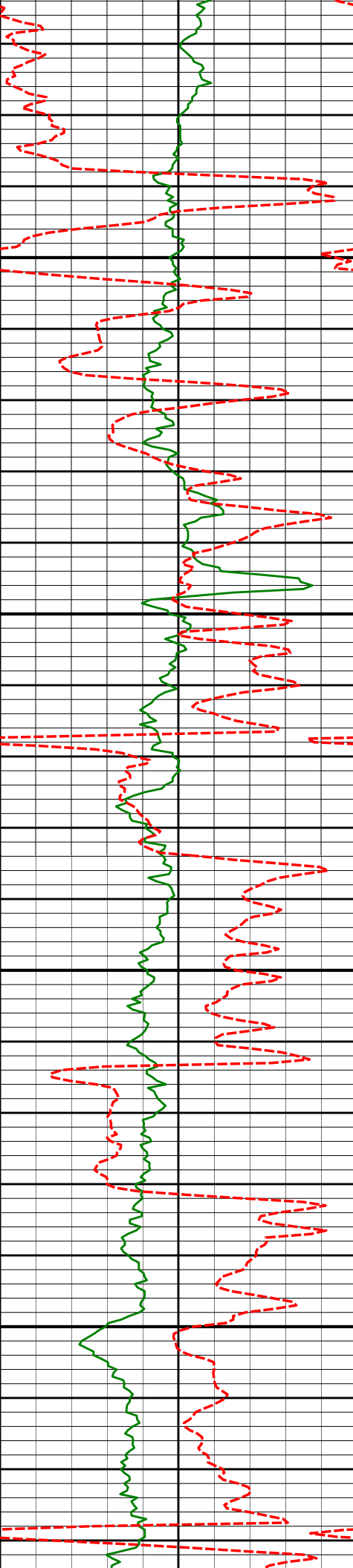
-78.93'

-53.70'

-24.19'

6.99'

41.25'



7350

7400

7450

7500

7334'

47.77°

3.55°

7217.60'

76.63'

7382'

51.17°

2.76°

7248.79'

113.03'

7430'

54.91°

358.01°

7277.66'

151.36'

7478'

59.05°

355.82°

7303.81'

191.55'

7525'

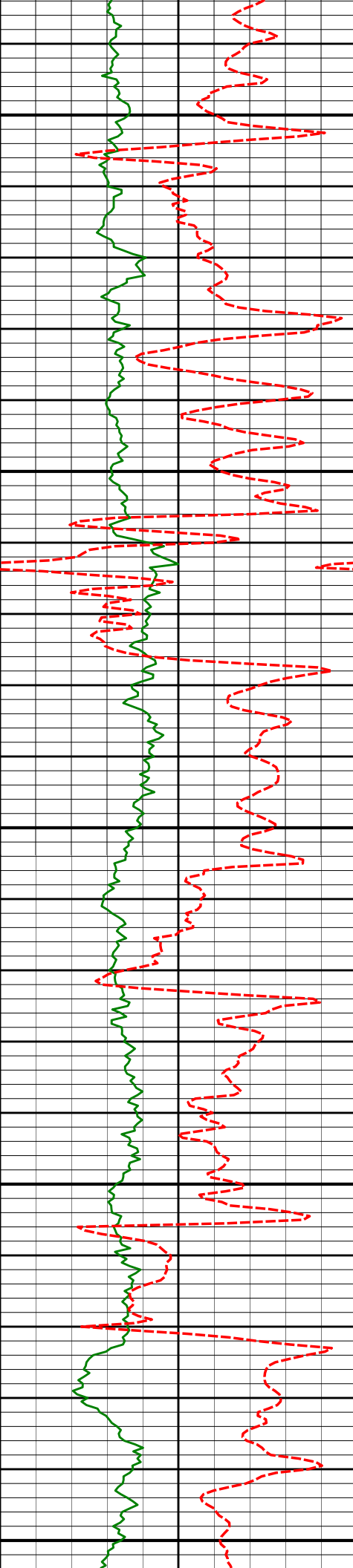
65.45°

352.50°

7325.68'

232.93'





7550

7573'

68.33°

354.18°

7344.52'

276.81'

7600

7620'

72.88°

352.09°

7360.13'

320.84'

7650

7668'

79.09°

352.06°

7371.75'

366.99'

7700

7750

7747'

90.18°

355.31°

7379.12'

445.10'



Gamma in casing from 7768' MD to 7803' MD

7800

7" Casing Shoe @ 7803 / 7377.11' TVD

Run 200

7829'

94.07°

356.41°

7376.08'

526.85'

7850

7900

7923'

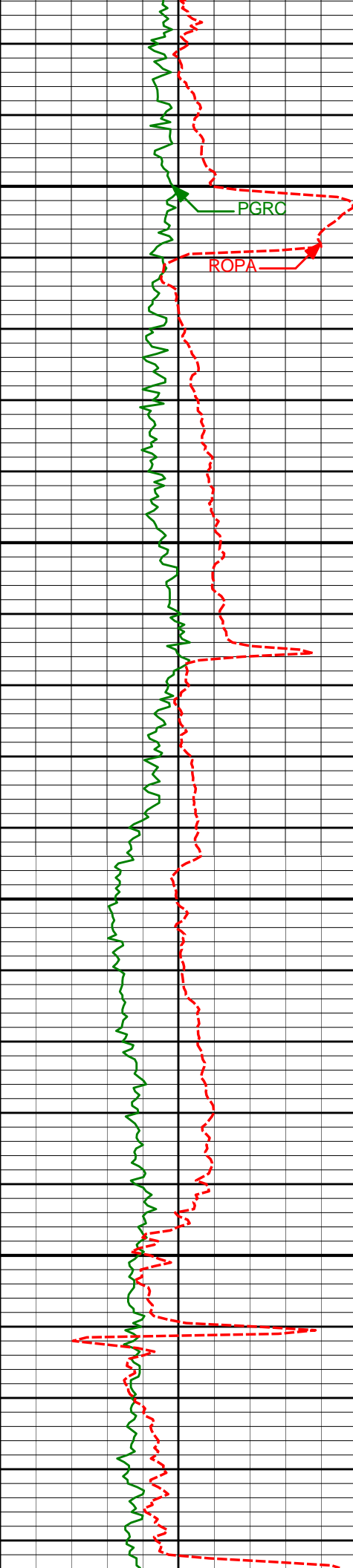
91.02°

357.54°

7371.91'

620.65'

7950



8000

PGRO

ROPA

8018'

88.21°

355.89°

7372.55'

715.52'

8050

8100

8114'

89.91°

355.83°

7374.12'

811.30'

8150



8200

8210'

89.20°

356.11°

7374.87'

907.11'

8250

8300

8305'

88.58°

357.75°

7376.71'

1001.98'

8350

8400

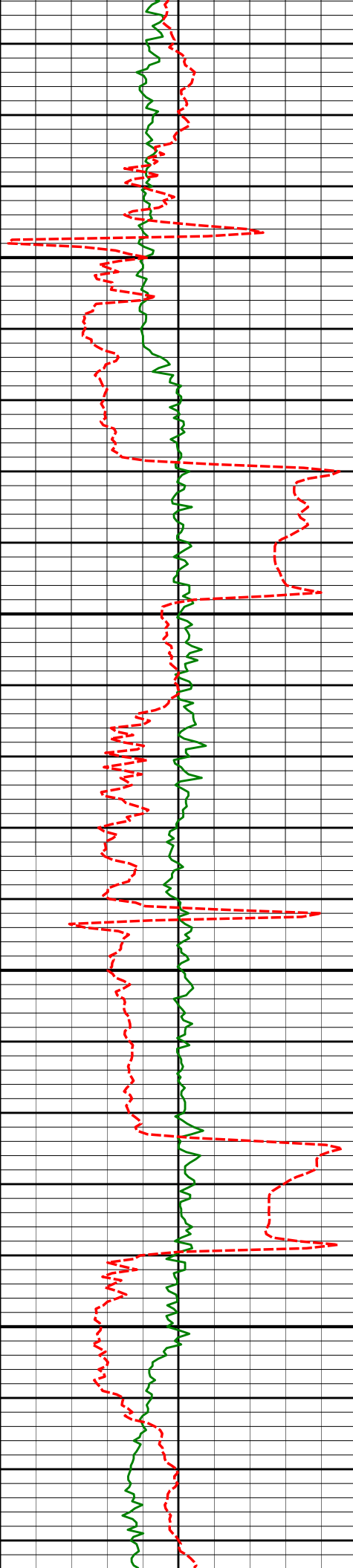
8401'

90.37°

357.44°

7377.59'

1097.92'



8450

8500

8550

8600

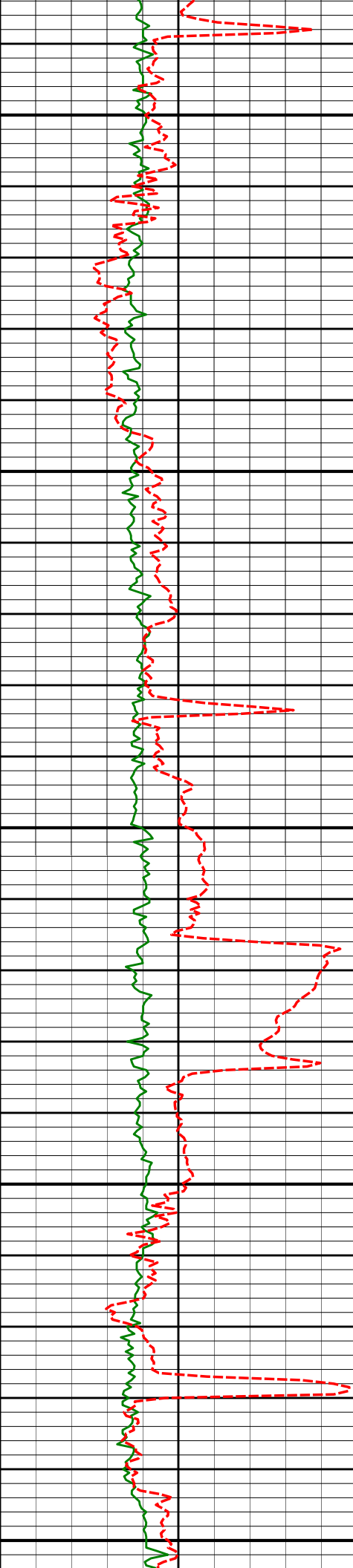
8496'

91.36°

359.80°

7376.16'

1192.88'



8650

8687'

89.48°

358.50°

7374.77'

1383.86'

8700

8750

8782'

89.51°

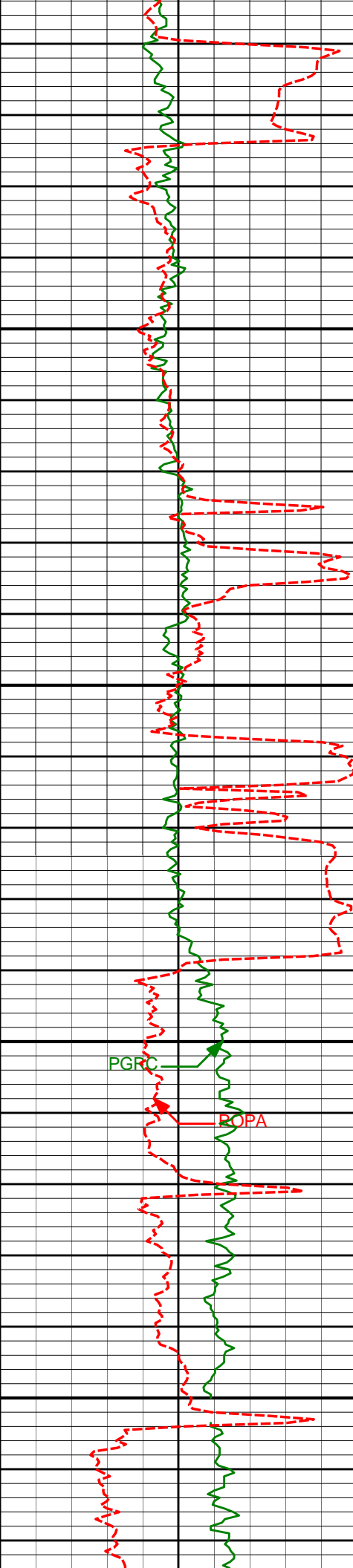
0.03°

7375.61'

1478.85'

8800

8850



8900

8950

9000

9050

8878'

89.91°

1.61°

7376.10'

1574.83'

8972'

88.89°

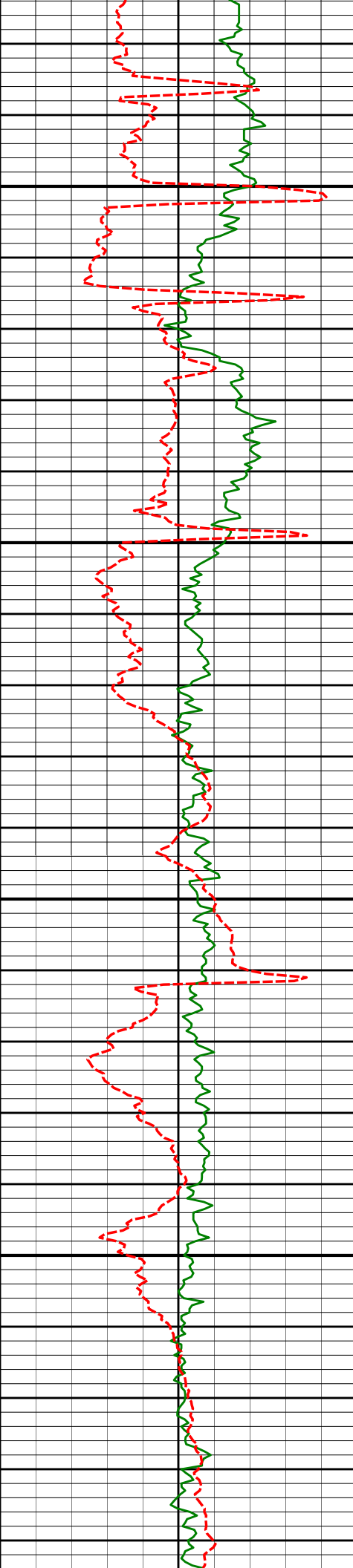
0.82°

7377.09'

1668.78'

PGRC

POPA



9100

9099'

89.23°

0.92°

7379.18'

1795.73'

9150

9162'

89.26°

0.54°

7380.01'

1858.71'

9200

9250

9258'

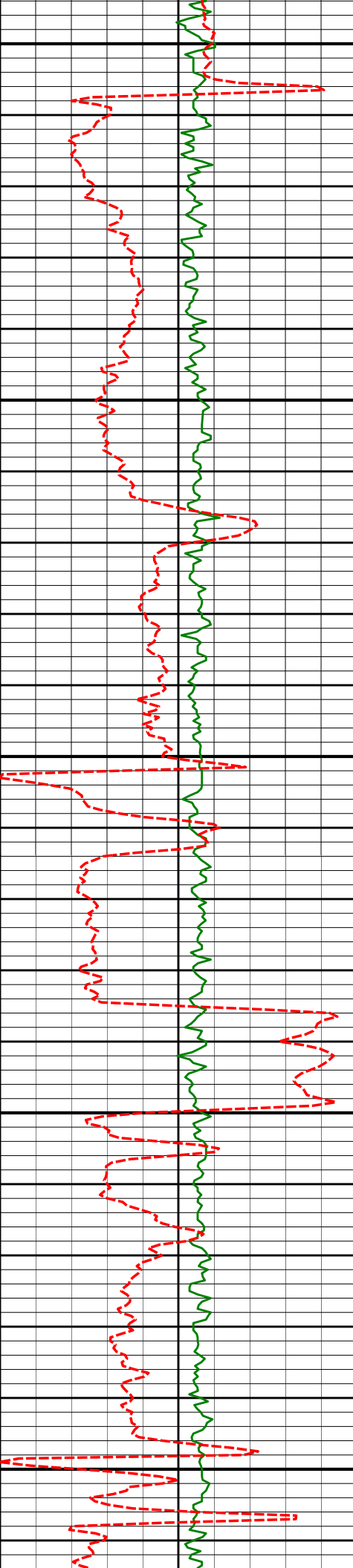
89.91°

1.20°

7380.70'

1954.69'





9300

9350

9400

9450

9500

9353'

91.51°

2.78°

7379.53'

2049.59'

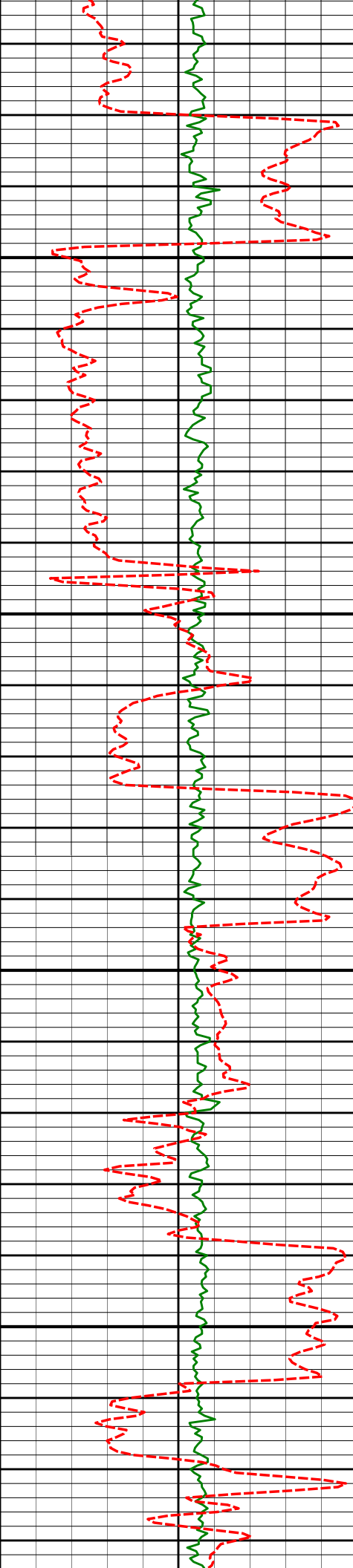
9481'

91.14°

5.89°

7376.57'

2177.10'



9550

9600

9650

9700

9544'

90.96°

7.56°

7375.41'

2239.60'

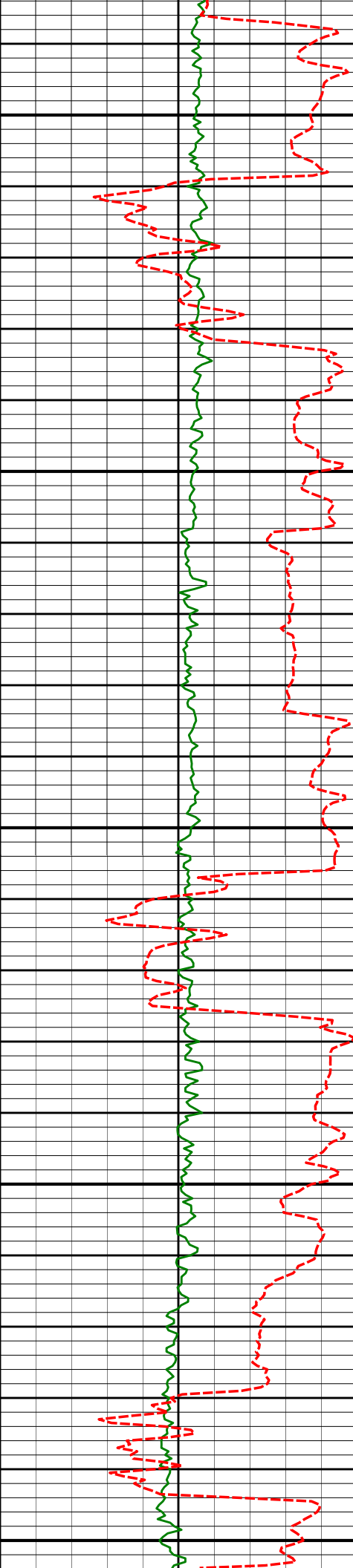
9640'

90.31°

10.99°

7374.35'

2334.21'



9750

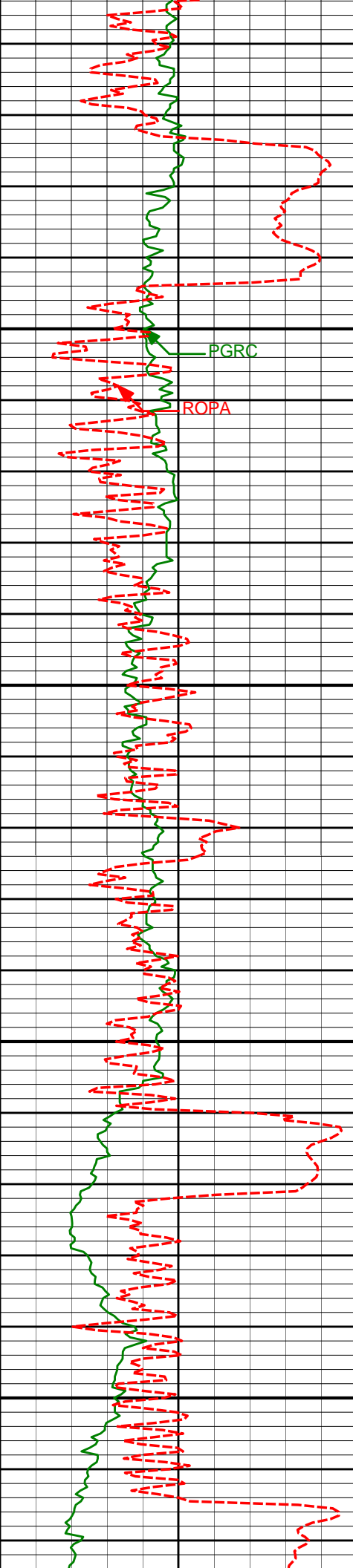
9800

9850

Run 300  
9900

9950

|       |        |        |          |          |
|-------|--------|--------|----------|----------|
| 9735' | 90.40° | 10.57° | 7373.77' | 2427.39' |
| 9831' | 91.14° | 12.64° | 7372.48' | 2521.27' |
| 9927' | 89.78° | 10.75° | 7371.70' | 2615.13' |



10000

PGRC

ROPA

10023'

87.56°

6.11°

7373.92'

2709.93'

10050

10100

10119'

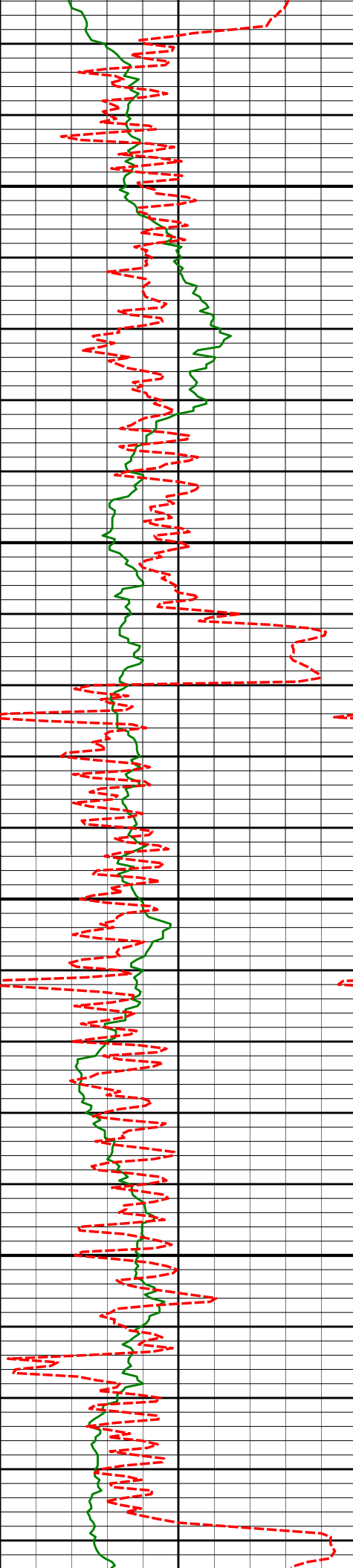
87.44°

4.03°

7378.11'

2805.39'

10150



10200

10214'

87.53°

1.45°

7382.28'

2900.15'

10250

10300

10310'

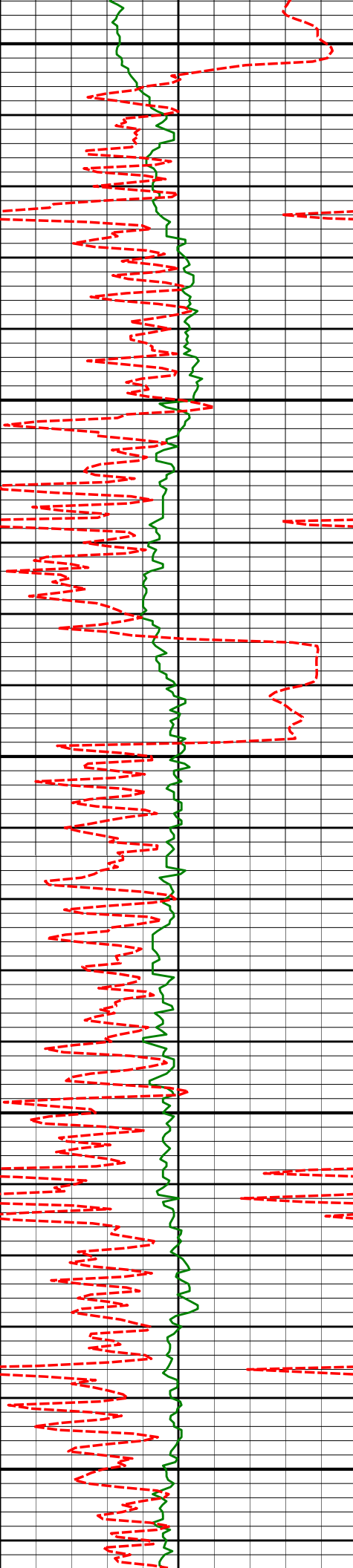
87.71°

359.90°

7386.26'

2996.04'

10350



10400

10405'

89.14°

358.21°

7388.87'

3091.00'

10450

10500

10501'

90.03°

356.44°

7389.57'

3186.92'

10550

10600

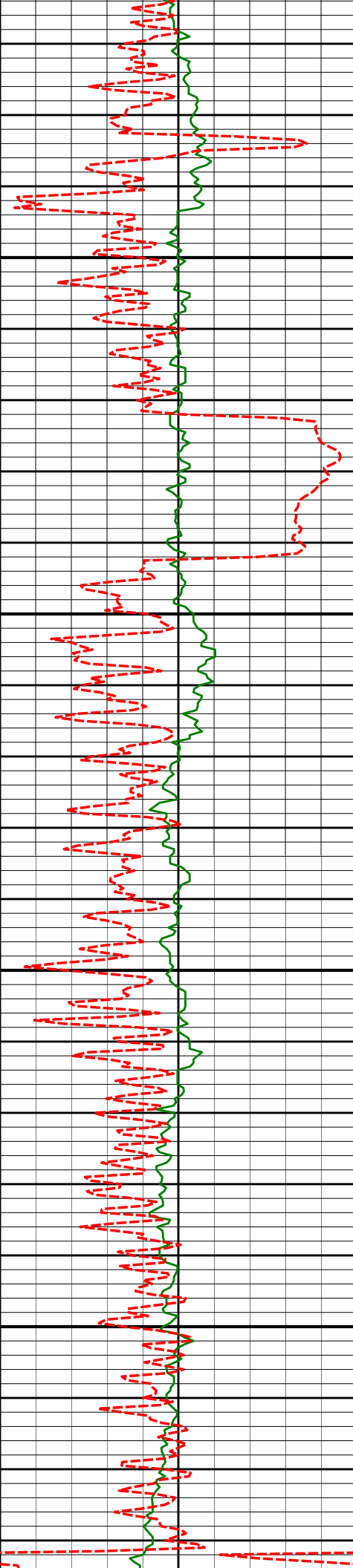
10595'

89.32°

356.28°

7390.10'

3280.77'



10650

10690'

91.39°

356.65°

7389.51'

3375.62'

10700

10750

10785'

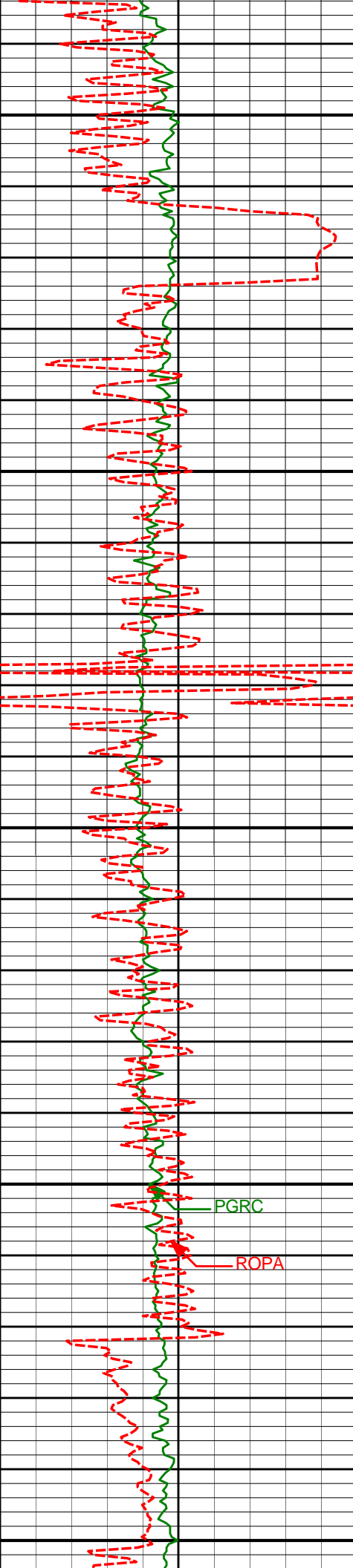
91.51°

356.12°

7387.10'

3470.44'

10800



10850

10880'

90.28°

354.95°

7385.62'

3565.19'

10900

10950

10975'

91.17°

355.17°

7384.42'

3659.88'

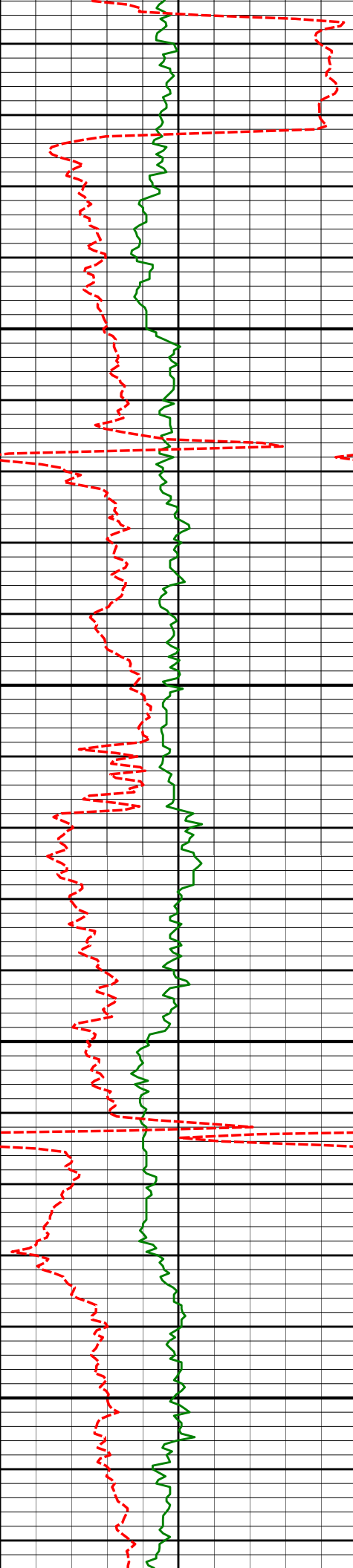
11000

PGRC

ROPA

11050





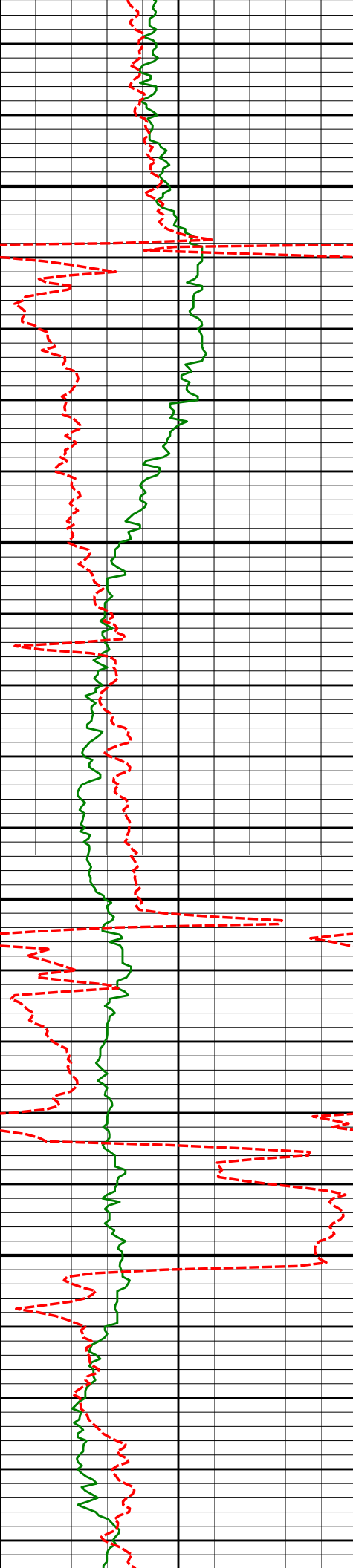
11100

11150

11200

11250

|        |        |         |          |          |
|--------|--------|---------|----------|----------|
| 11071' | 89.91° | 352.51° | 7383.51' | 3755.39' |
| 11167' | 89.72° | 351.89° | 7383.82' | 3850.59' |
| 11262' | 89.63° | 351.56° | 7384.36' | 3944.70' |



11300

11350

11400

11450

11358'

89.32°

351.52°

7385.24'

4039.75'

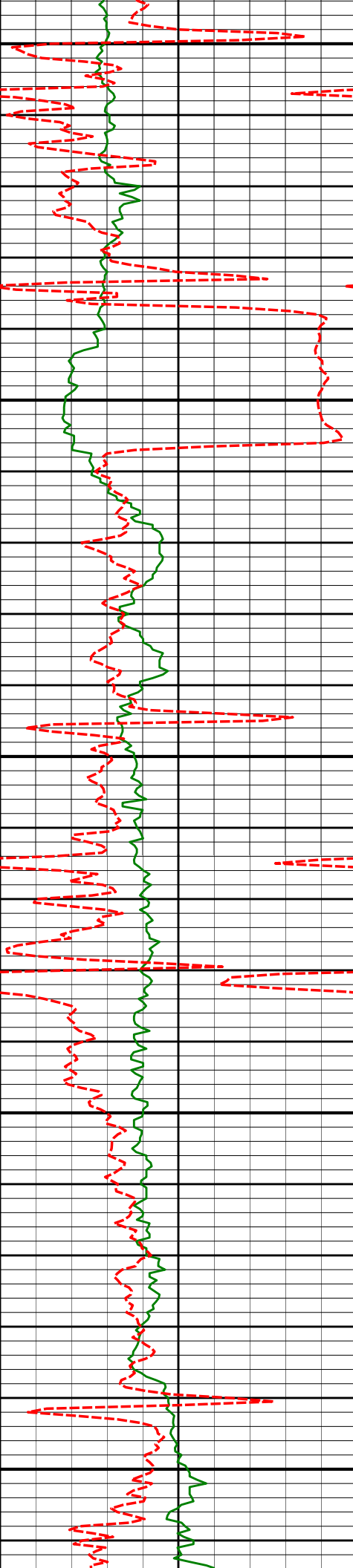
11453'

88.64°

351.66°

7386.93'

4133.81'



11500

11550

11600

11650

11700

11549'

89.78°

352.08°

7388.25'

4228.94'

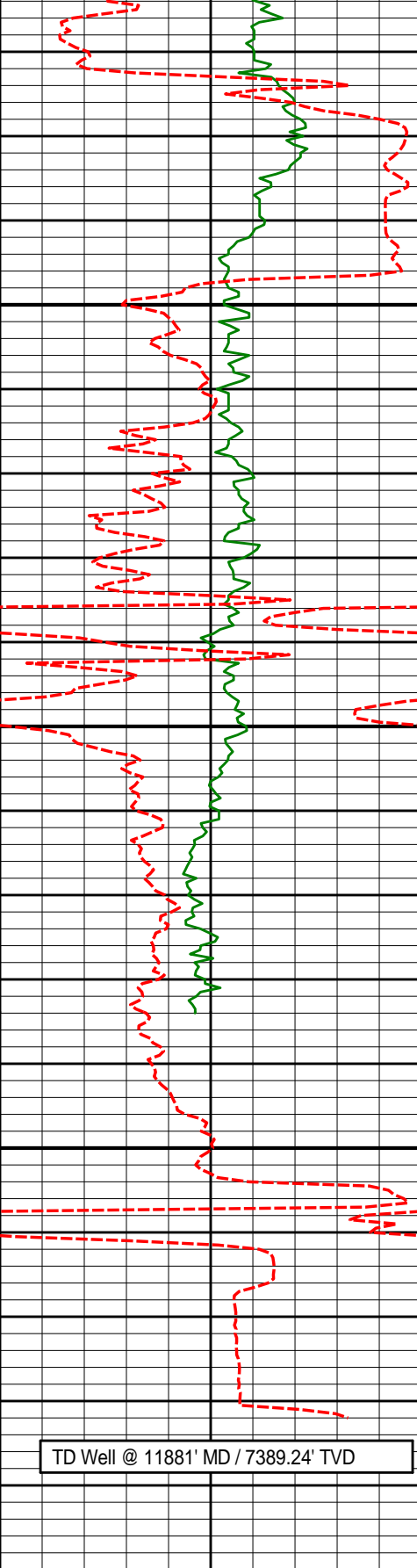
11645'

89.63°

351.26°

7388.74'

4324.02'



|        |        |         |          |          |
|--------|--------|---------|----------|----------|
| 11741' | 90.12° | 353.10° | 7388.94' | 4419.22' |
| 11750  |        |         |          |          |
| 11800  |        |         |          |          |
| 11836' | 89.75° | 353.29° | 7389.04' | 4513.63' |
| 11850  |        |         |          |          |
| 11881' | 89.75° | 353.29° | 7389.24' | 4558.36' |
| 11900  |        |         |          |          |

|  |  |       |       |     |     |     |
|--|--|-------|-------|-----|-----|-----|
| Average Rate of Penetration<br>(ROPA)<br>feet per hr |  | Depth |       |     |     |     |
| 500  |  |       | Depth | Inc | Azi | TVD |
| 0  |  |       |       |     |     | V/S |
| PCG GR XHi-Range RT BCor<br>(PGRC)<br>api            |  |       |       |     |     |     |
| 0  |  |       |       |     |     |     |
| 300  |  |       |       |     |     |     |



# HALLIBURTON

## DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.  
Gobbler 28N-23HZ  
Wattenburg  
Weld Colorado  
USA  
CA-XX-0900304811

| <i>Measured<br/>Depth<br/>(feet)</i> | <i>Inclination<br/>(degrees)</i> | <i>Direction<br/>(degrees)</i> | <i>Vertical<br/>Depth<br/>(feet)</i> | <i>Latitude<br/>(feet)</i> | <i>Departure<br/>(feet)</i> | <i>Vertical<br/>Section<br/>(feet)</i> | <i>Dogleg<br/>(deg/100ft)</i> |
|--------------------------------------|----------------------------------|--------------------------------|--------------------------------------|----------------------------|-----------------------------|--|-------------------------------|
| 1013.00                              | 0.42                             | 221.67                         | 1012.98                              | 4.26 N                     | 2.26 E                      | 4.24                                   | TIE-IN                        |
| 1157.00                              | 0.32                             | 167.04                         | 1156.98                              | 3.48 N                     | 2.00 E                      | 3.46                                   | 0.24                          |
| 1433.00                              | 0.32                             | 135.44                         | 1432.97                              | 2.19 N                     | 2.71 E                      | 2.17                                   | 0.06                          |
| 1709.00                              | 0.22                             | 154.27                         | 1708.97                              | 1.16 N                     | 3.48 E                      | 1.13                                   | 0.05                          |
| 1989.00                              | 0.28                             | 159.46                         | 1988.97                              | 0.03 N                     | 3.95 E                      | -0.00                                  | 0.02                          |
| 2276.00                              | 0.20                             | 234.92                         | 2275.97                              | 0.91 S                     | 3.79 E                      | -0.94                                  | 0.10                          |
| 2465.00                              | 0.28                             | 313.66                         | 2464.96                              | 0.78 S                     | 3.20 E                      | -0.80                                  | 0.16                          |
| 2560.00                              | 3.46                             | 291.07                         | 2559.90                              | 0.41 N                     | 0.35 E                      | 0.41                                   | 3.38                          |
| 2656.00                              | 4.99                             | 264.19                         | 2655.65                              | 1.03 N                     | 6.50 W                      | 1.08                                   | 2.56                          |
| 2751.00                              | 7.55                             | 264.53                         | 2750.07                              | 0.02 N                     | 16.82 W                     | 0.14                                   | 2.70                          |
| 2847.00                              | 9.34                             | 250.86                         | 2845.04                              | 3.14 S                     | 30.46 W                     | -2.92                                  | 2.79                          |
| 2943.00                              | 10.35                            | 253.14                         | 2939.62                              | 8.20 S                     | 46.07 W                     | -7.86                                  | 1.13                          |
| 3039.00                              | 8.99                             | 253.75                         | 3034.26                              | 12.80 S                    | 61.53 W                     | -12.35                                 | 1.42                          |
| 3134.00                              | 10.37                            | 253.43                         | 3127.90                              | 17.31 S                    | 76.85 W                     | -16.75                                 | 1.45                          |
| 3230.00                              | 11.00                            | 247.46                         | 3222.24                              | 23.29 S                    | 93.60 W                     | -22.60                                 | 1.33                          |
| 3325.00                              | 10.27                            | 249.74                         | 3315.61                              | 29.70 S                    | 109.91 W                    | -28.89                                 | 0.89                          |
| 3421.00                              | 9.24                             | 250.76                         | 3410.22                              | 35.20 S                    | 125.22 W                    | -34.28                                 | 1.09                          |
| 3517.00                              | 8.25                             | 253.38                         | 3505.10                              | 39.71 S                    | 139.09 W                    | -38.69                                 | 1.11                          |
| 3612.00                              | 9.55                             | 256.47                         | 3598.95                              | 43.51 S                    | 153.29 W                    | -42.38                                 | 1.46                          |
| 3708.00                              | 9.70                             | 253.09                         | 3693.60                              | 47.72 S                    | 168.77 W                    | -46.48                                 | 0.61                          |
| 3898.00                              | 10.16                            | 241.90                         | 3880.77                              | 60.27 S                    | 198.87 W                    | -58.81                                 | 1.04                          |
| 3993.00                              | 8.87                             | 239.51                         | 3974.47                              | 67.93 S                    | 212.57 W                    | -66.37                                 | 1.42                          |
| 4089.00                              | 8.62                             | 248.82                         | 4069.36                              | 74.29 S                    | 225.66 W                    | -72.63                                 | 1.49                          |
| 4183.00                              | 9.39                             | 258.83                         | 4162.20                              | 78.32 S                    | 239.75 W                    | -76.56                                 | 1.86                          |
| 4279.00                              | 8.95                             | 257.77                         | 4256.97                              | 81.42 S                    | 254.74 W                    | -79.55                                 | 0.50                          |
| 4374.00                              | 9.66                             | 259.75                         | 4350.72                              | 84.40 S                    | 269.80 W                    | -82.42                                 | 0.82                          |
| 4470.00                              | 9.22                             | 261.36                         | 4445.42                              | 86.99 S                    | 285.33 W                    | -84.89                                 | 0.53                          |
| 4661.00                              | 7.59                             | 260.27                         | 4634.36                              | 91.42 S                    | 312.90 W                    | -89.12                                 | 0.86                          |
| 4757.00                              | 9.43                             | 256.41                         | 4729.30                              | 94.34 S                    | 326.80 W                    | -91.94                                 | 2.00                          |
| 4851.00                              | 10.50                            | 249.31                         | 4821.89                              | 99.18 S                    | 342.29 W                    | -96.66                                 | 1.74                          |
| 4946.00                              | 11.63                            | 240.43                         | 4915.13                              | 106.96 S                   | 358.72 W                    | -104.33                                | 2.15                          |
| 5042.00                              | 11.17                            | 226.95                         | 5009.25                              | 118.09 S                   | 373.93 W                    | -115.34                                | 2.81                          |
| 5137.00                              | 6.42                             | 227.25                         | 5103.11                              | 127.98 S                   | 384.56 W                    | -125.15                                | 5.01                          |
| 5232.00                              | 8.29                             | 237.56                         | 5197.33                              | 135.25 S                   | 394.24 W                    | -132.36                                | 2.40                          |
| 5327.00                              | 7.56                             | 237.18                         | 5291.42                              | 142.32 S                   | 405.27 W                    | -139.34                                | 0.77                          |
| 5423.00                              | 7.12                             | 237.94                         | 5386.63                              | 148.90 S                   | 415.62 W                    | -145.85                                | 0.47                          |
| 5518.00                              | 6.41                             | 236.09                         | 5480.97                              | 154.98 S                   | 425.01 W                    | -151.86                                | 0.78                          |
| 5614.00                              | 5.49                             | 237.75                         | 5576.45                              | 160.43 S                   | 433.35 W                    | -157.25                                | 0.98                          |
| 5709.00                              | 3.28                             | 221.94                         | 5671.17                              | 164.88 S                   | 439.01 W                    | -161.65                                | 2.64                          |
| 5804.00                              | 2.81                             | 214.81                         | 5766.03                              | 168.81 S                   | 442.16 W                    | -165.56                                | 0.63                          |
| 5900.00                              | 0.40                             | 176.22                         | 5861.99                              | 171.08 S                   | 443.48 W                    | -167.82                                | 2.62                          |
| 5996.00                              | 0.56                             | 66.96                          | 5957.99                              | 171.23 S                   | 443.03 W                    | -167.98                                | 0.82                          |
| 6187.00                              | 0.00                             | 39.80                          | 6148.99                              | 170.87 S                   | 442.18 W                    | -167.62                                | 0.29                          |
| 6474.00                              | 1.09                             | 1.13                           | 6435.97                              | 168.13 S                   | 442.13 W                    | -164.88                                | 0.38                          |
| 6760.00                              | 1.20                             | 325.40                         | 6721.92                              | 162.93 S                   | 443.77 W                    | -159.67                                | 0.25                          |
| 6809.00                              | 1.09                             | 332.75                         | 6770.91                              | 162.09 S                   | 444.28 W                    | -158.83                                | 0.37                          |
| 6856.00                              | 8.94                             | 19.13                          | 6817.70                              | 158.24 S                   | 443.28 W                    | -154.99                                | 17.50                         |
| 6904.00                              | 18.52                            | 26.43                          | 6864.27                              | 147.87 S                   | 438.66 W                    | -144.65                                | 20.24                         |
| 6951.00                              | 18.61                            | 29.33                          | 6908.83                              | 134.64 S                   | 431.66 W                    | -131.47                                | 1.97                          |
| 7000.00                              | 20.00                            | 28.69                          | 6955.07                              | 120.47 S                   | 423.81 W                    | -117.36                                | 2.85                          |
| 7047.00                              | 26.62                            | 24.54                          | 6998.22                              | 103.83 S                   | 415.57 W                    | -100.78                                | 14.50                         |
| 7095.00                              | 33.44                            | 23.61                          | 7039.75                              | 81.90 S                    | 405.79 W                    | -78.93                                 | 14.25                         |
| 7142.00                              | 36.71                            | 17.28                          | 7078.22                              | 56.61 S                    | 396.43 W                    | -53.70                                 | 10.41                         |
| 7191.00                              | 40.00                            | 9.11                           | 7116.66                              | 27.04 S                    | 389.57 W                    | -24.19                                 | 12.32                         |
| 7238.00                              | 43.92                            | 3.74                           | 7151.62                              | 4.16 N                     | 386.12 W                    | 6.99                                   | 11.31                         |

|          |       |        |         |           |          |         |       |
|----------|-------|--------|---------|-----------|----------|---------|-------|
| 7286.00  | 47.31 | 0.05   | 7185.19 | 38.43 N   | 385.01 W | 41.25   | 8.94  |
| 7334.00  | 47.77 | 3.55   | 7217.60 | 73.81 N   | 383.90 W | 76.63   | 5.47  |
| 7382.00  | 51.17 | 2.76   | 7248.79 | 110.24 N  | 381.89 W | 113.03  | 7.19  |
| 7430.00  | 54.91 | 358.01 | 7277.66 | 148.56 N  | 381.67 W | 151.36  | 11.10 |
| 7478.00  | 59.05 | 355.82 | 7303.81 | 188.74 N  | 383.86 W | 191.55  | 9.44  |
| 7525.00  | 65.45 | 352.50 | 7325.68 | 230.09 N  | 388.12 W | 232.93  | 14.98 |
| 7573.00  | 68.33 | 354.18 | 7344.52 | 273.93 N  | 393.23 W | 276.81  | 6.80  |
| 7620.00  | 72.88 | 352.09 | 7360.13 | 317.93 N  | 398.54 W | 320.84  | 10.56 |
| 7668.00  | 79.09 | 352.06 | 7371.75 | 364.03 N  | 404.96 W | 366.99  | 12.92 |
| 7747.00  | 90.18 | 355.31 | 7379.12 | 442.08 N  | 413.57 W | 445.10  | 14.64 |
| 7829.00  | 94.07 | 356.41 | 7376.08 | 523.79 N  | 419.49 W | 526.85  | 4.92  |
| 7923.00  | 91.02 | 357.54 | 7371.91 | 617.56 N  | 424.44 W | 620.65  | 3.46  |
| 8018.00  | 88.21 | 355.89 | 7372.55 | 712.39 N  | 429.88 W | 715.52  | 3.43  |
| 8114.00  | 89.91 | 355.83 | 7374.12 | 808.12 N  | 436.81 W | 811.30  | 1.77  |
| 8210.00  | 89.20 | 356.11 | 7374.87 | 903.88 N  | 443.56 W | 907.11  | 0.79  |
| 8305.00  | 88.58 | 357.75 | 7376.71 | 998.72 N  | 448.65 W | 1001.98 | 1.85  |
| 8401.00  | 90.37 | 357.44 | 7377.59 | 1094.63 N | 452.68 W | 1097.92 | 1.89  |
| 8496.00  | 91.36 | 359.80 | 7376.16 | 1189.58 N | 454.97 W | 1192.88 | 2.69  |
| 8687.00  | 89.48 | 358.50 | 7374.77 | 1380.54 N | 457.81 W | 1383.86 | 1.20  |
| 8782.00  | 89.51 | 0.03   | 7375.61 | 1475.53 N | 459.04 W | 1478.85 | 1.61  |
| 8878.00  | 89.91 | 1.61   | 7376.10 | 1571.51 N | 457.67 W | 1574.83 | 1.70  |
| 8972.00  | 88.89 | 0.82   | 7377.09 | 1665.49 N | 455.67 W | 1668.78 | 1.37  |
| 9099.00  | 89.23 | 0.92   | 7379.18 | 1792.45 N | 453.74 W | 1795.73 | 0.28  |
| 9162.00  | 89.26 | 0.54   | 7380.01 | 1855.44 N | 452.93 W | 1858.71 | 0.62  |
| 9258.00  | 89.91 | 1.20   | 7380.70 | 1951.43 N | 451.48 W | 1954.69 | 0.96  |
| 9353.00  | 91.51 | 2.78   | 7379.53 | 2046.36 N | 448.19 W | 2049.59 | 2.37  |
| 9481.00  | 91.14 | 5.89   | 7376.57 | 2173.94 N | 438.52 W | 2177.10 | 2.45  |
| 9544.00  | 90.96 | 7.56   | 7375.41 | 2236.50 N | 431.15 W | 2239.60 | 2.66  |
| 9640.00  | 90.31 | 10.99  | 7374.35 | 2331.22 N | 415.69 W | 2334.21 | 3.64  |
| 9735.00  | 90.40 | 10.57  | 7373.77 | 2424.54 N | 397.92 W | 2427.39 | 0.45  |
| 9831.00  | 91.14 | 12.64  | 7372.48 | 2518.57 N | 378.61 W | 2521.27 | 2.28  |
| 9927.00  | 89.78 | 10.75  | 7371.70 | 2612.56 N | 359.16 W | 2615.13 | 2.42  |
| 10023.00 | 87.56 | 6.11   | 7373.92 | 2707.47 N | 345.09 W | 2709.93 | 5.35  |
| 10119.00 | 87.44 | 4.03   | 7378.11 | 2803.00 N | 336.62 W | 2805.39 | 2.17  |
| 10214.00 | 87.53 | 1.45   | 7382.28 | 2897.79 N | 332.08 W | 2900.15 | 2.71  |
| 10310.00 | 87.71 | 359.90 | 7386.26 | 2993.70 N | 330.95 W | 2996.04 | 1.63  |
| 10405.00 | 89.14 | 358.21 | 7388.87 | 3088.64 N | 332.52 W | 3091.00 | 2.32  |
| 10501.00 | 90.03 | 356.44 | 7389.57 | 3184.53 N | 337.00 W | 3186.92 | 2.07  |
| 10595.00 | 89.32 | 356.28 | 7390.10 | 3278.34 N | 342.98 W | 3280.77 | 0.77  |
| 10690.00 | 91.39 | 356.65 | 7389.51 | 3373.15 N | 348.84 W | 3375.62 | 2.21  |
| 10785.00 | 91.51 | 356.12 | 7387.10 | 3467.93 N | 354.83 W | 3470.44 | 0.57  |
| 10880.00 | 90.28 | 354.95 | 7385.62 | 3562.63 N | 362.23 W | 3565.19 | 1.79  |
| 10975.00 | 91.17 | 355.17 | 7384.42 | 3657.27 N | 370.40 W | 3659.88 | 0.97  |
| 11071.00 | 89.91 | 352.51 | 7383.51 | 3752.70 N | 380.69 W | 3755.39 | 3.07  |
| 11167.00 | 89.72 | 351.89 | 7383.82 | 3847.81 N | 393.72 W | 3850.59 | 0.68  |
| 11262.00 | 89.63 | 351.56 | 7384.36 | 3941.82 N | 407.40 W | 3944.70 | 0.36  |
| 11358.00 | 89.32 | 351.52 | 7385.24 | 4036.77 N | 421.52 W | 4039.75 | 0.32  |
| 11453.00 | 88.64 | 351.66 | 7386.93 | 4130.73 N | 435.40 W | 4133.81 | 0.73  |
| 11549.00 | 89.78 | 352.08 | 7388.25 | 4225.76 N | 448.98 W | 4228.94 | 1.27  |
| 11645.00 | 89.63 | 351.26 | 7388.74 | 4320.74 N | 462.88 W | 4324.02 | 0.86  |
| 11741.00 | 90.12 | 353.10 | 7388.94 | 4415.85 N | 475.94 W | 4419.22 | 1.98  |
| 11836.00 | 89.75 | 353.29 | 7389.04 | 4510.18 N | 487.19 W | 4513.63 | 0.44  |
| 11881.00 | 89.75 | 353.29 | 7389.24 | 4554.87 N | 492.45 W | 4558.36 | 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 359.58 DEGREES (TRUE)  
A TOTAL CORRECTION OF 8.58 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11881.00 FEET  
IS 4581.41 FEET ALONG 353.83 DEGREES (TRUE)**

**All directional surveys tied onto gyro survey at 1013' MD. Final survey is a straight-line projection to the bit.**