

PCDC - Pressure Case Directional
PCGK - Pressure Case Gamma

1 : 600 / 1 : 240

| | | | | | | | |
|----------|--|---|--|--|--|--|--|
| Country | | : USA | | | | | |
| Field | | : Wattenburg | | | | | |
| Location | | : Lat: 40° 28' 34.32" North Long: 104° 21' 18.68" West | | | | | |
| Well | | : Wells Ranch AE20-67HN | | | | | |
| Company | | : Noble Energy | | | | | |
| Rig | | : H&P 321 | | | | | |
| LOCATION | | Latitude : 40° 28' 34.32" North Longitude : 104° 21' 18.68" West | | | | | |
| | | UTM Easting = 3,318,474.520 ft UTM Northing = 1,418,375.868 ft | | | | | |
| | | | | Other Services Directional Drilling | | | |

| | | | | | | | | | |
|------------------------|--|----------------|--|------------------------|--|-----------------------|--|--|--|
| Permanent Datum | | : Ground Level | | Elevation : 4841.00 ft | | Elev. | | KB N/A | |
| Log Measured From | | : Drill Floor | | 30.00 ft | | Above Permanent Datum | | DF 4871.00 ft GL 4841.00 ft WD N/A | |
| Drilling Measured From | | : Drill Floor | | TVD LOG | | | | | |

| | | | | | | | | | |
|----------------|--|---------------|--|-------------------|--|-----------------------|--|---------------------------|--|
| Depth Logged | | : 982.96 ft | | To 6,597.44 ft | | Unit No. : 11210424 | | Job No. :CA-XX-0900775409 | |
| Date Logged | | : 08-Oct-13 | | To 11-Oct-13 | | Plot Type : Final | | | |
| Total Depth MD | | : 6,980.00 ft | | TVD : 6,597.44 ft | | Plot Date : 11-Oct-13 | | | |
| Spud Date | | : 08-Oct-13 | | | | | | | |

| | | | | | |
|---------|-----------------------|-------------------------|---------|-----------------------|---------|
| Run No. | Borehole Record (TVD) | | Run No. | Borehole Record (TVD) | |
| | Size | From To | | Size | From To |
| 100 | 8.750 in | 982.96 ft 5,825.68 ft | | | |
| 200 | 8.750 in | 5,825.68 ft 6,597.44 ft | | | |
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|-------------------------------|--------------|-----------------|--|--|--|
| Max Tool Temp (degF) / Source | 141.70 / PCM | 162.80 / PCM | | | |
| Rm @ Max Tool Temp (degF) | N/A @ 141.70 | N/A @ 162.80 | | | |
| Lead MWD Engineer | Kyle Wass | Kyle Wass | | | |
| Customer Representative | Jim Turner | Stetson Nielson | | | |

SENSOR INFORMATION

Downhole Processor Information

| | | | | | |
|---------------------------|-----------------|-----------------|--|--|--|
| Tool Type | PCM | PCM | | | |
| Software Version | 5.84 | 5.84 | | | |
| Sub Serial Number | 11107082 | 11107082 | | | |
| Insert Serial Number | 11680773 | 11680773 | | | |
| Date and Time Initialized | 08-Oct-13 15:06 | 08-Oct-13 15:06 | | | |
| Date and Time Read | 11-Oct-13 12:47 | 11-Oct-13 12:54 | | | |
| ECMB SW Version | N/A | N/A | | | |

Directional Sensor Information

| | | | | | |
|------------------------|----------|----------|--|--|--|
| Tool Type | PCDC | PCDC | | | |
| Distance From Bit (ft) | 57.00 | 54.00 | | | |
| Software Version | 6.21 | 6.21 | | | |
| Sub Serial Number | 11107082 | 11107082 | | | |
| Sonde Serial Number | 11297617 | 11297617 | | | |
| Sensor ID Number | N/A | N/A | | | |
| Toolface Offset (deg) | 220.97 | 319.53 | | | |

Gamma Ray Sensor Information

| | | | | | |
|------------------------------|----------|----------|--|--|--|
| Tool Type | PCG | PCG | | | |
| Distance From Bit (ft) | 49.81 | 46.84 | | | |
| Recorded Sample Period (sec) | 10 | 10 | | | |
| Software Version | 8.15 | 8.15 | | | |
| Sub Serial Number | 11107082 | 11107082 | | | |
| Insert/Sonde Serial Number | 11293386 | 11293386 | | | |

REMARKS

1. All depths are calibrated to driller's pipe tally and are true vertical depth from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
1:600 Log
PGRC (Gamma CG) and ROPA (Average Rate of Penetration)
Interval Resolution: 1.0 ft
Interval Distance: 3.0 ft

1:240 Log
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft

ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft

Interval Resolution: 1.2 ft

6. Insite Version v8.0.0

WARRANTY

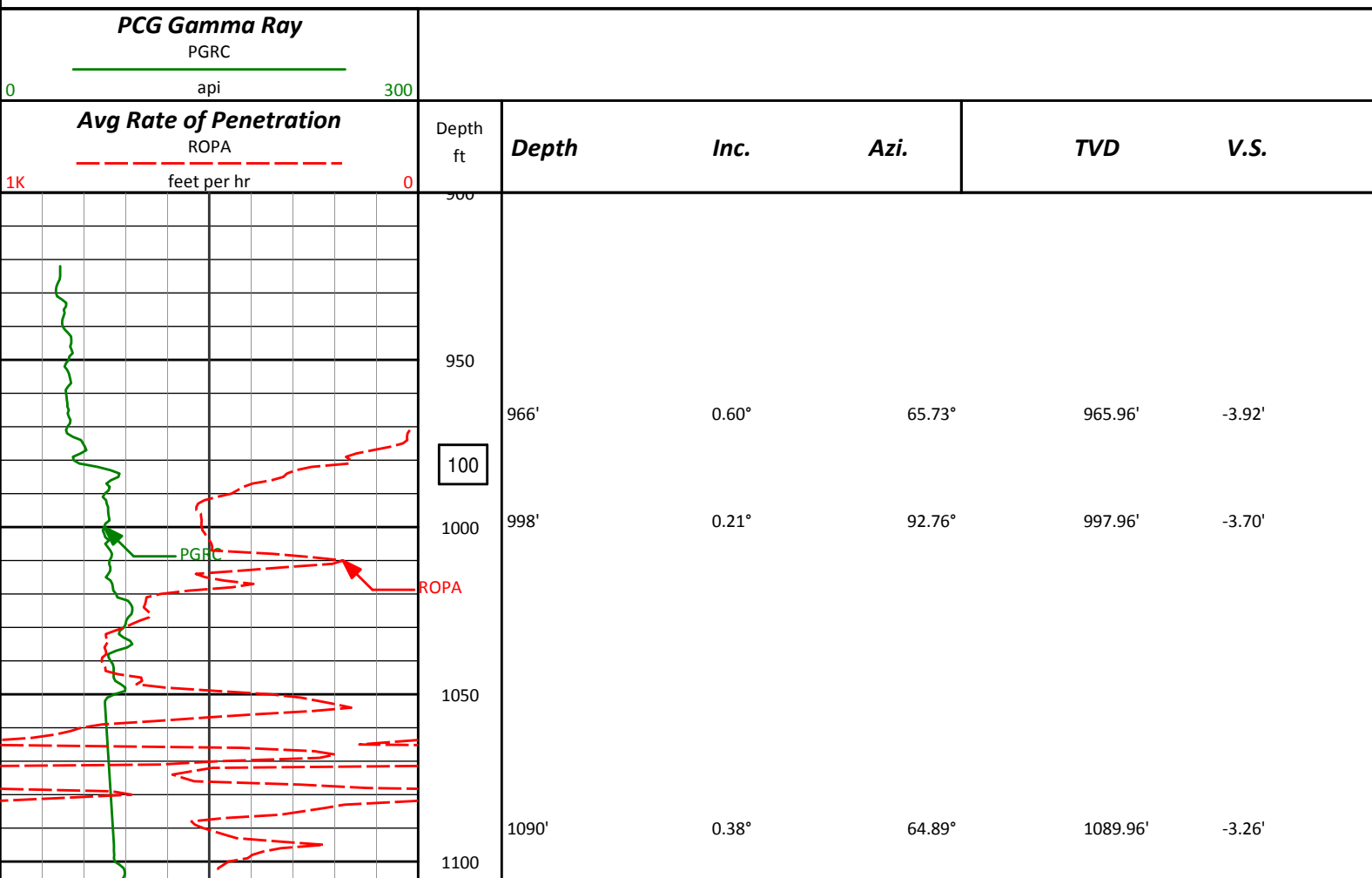
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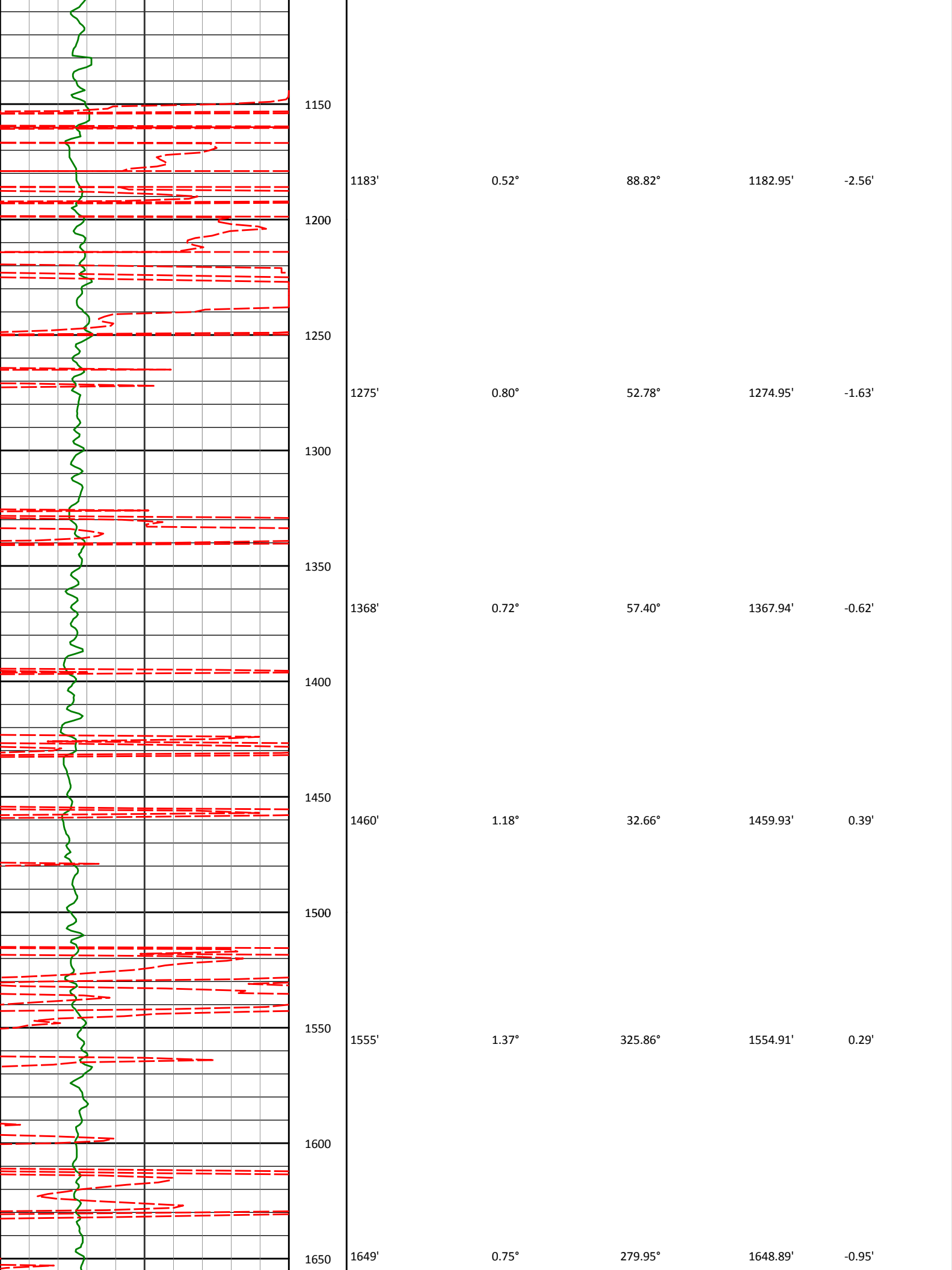
HALLIBURTON

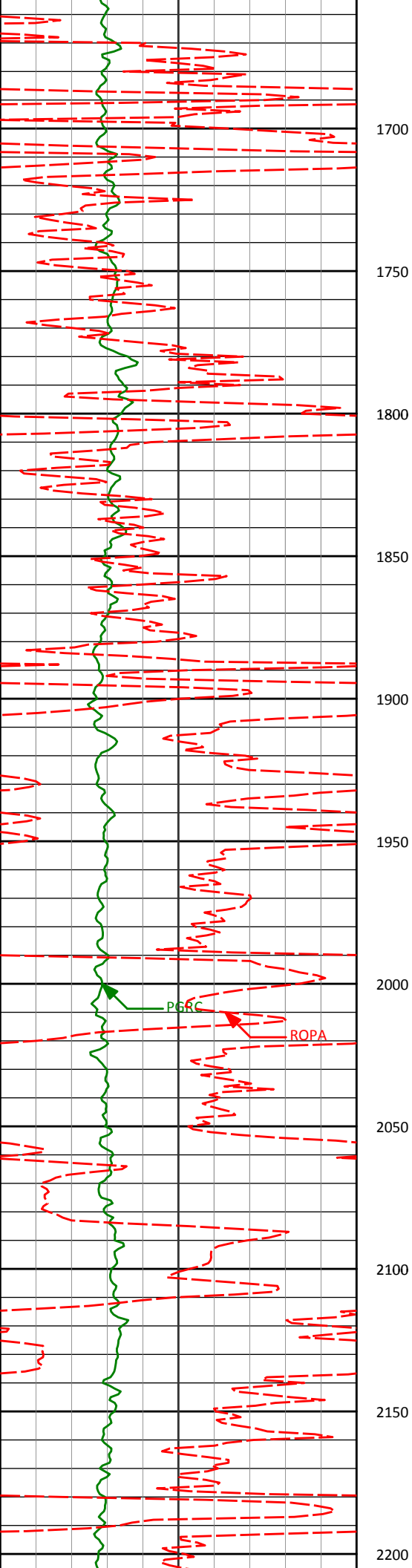
Sperry Drilling Services

TVD Correlation Log 1:600

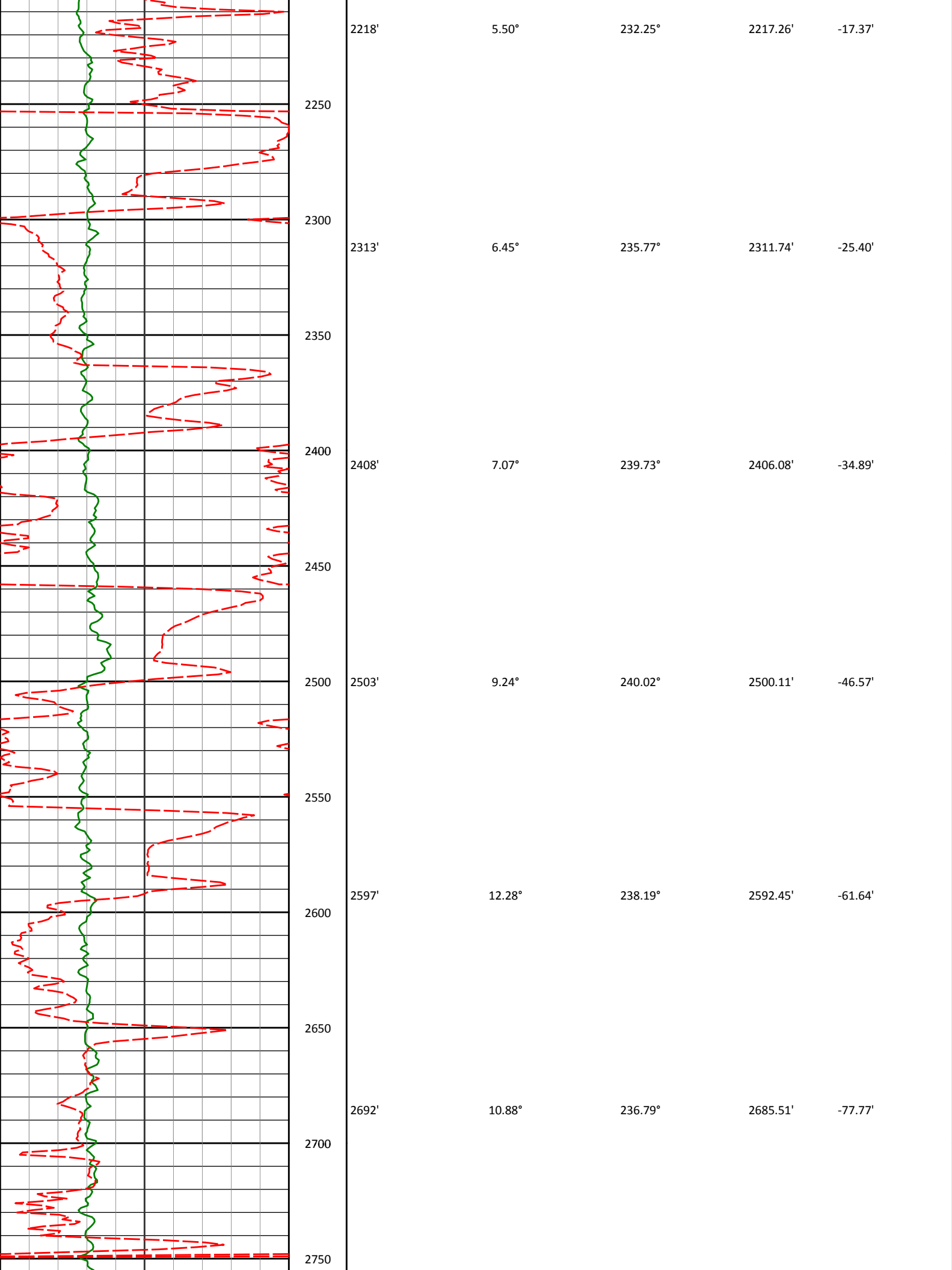
Noble Energy
Wells Ranch AE20-67HN
H&P 321
Sec. 20-T6N-R62W

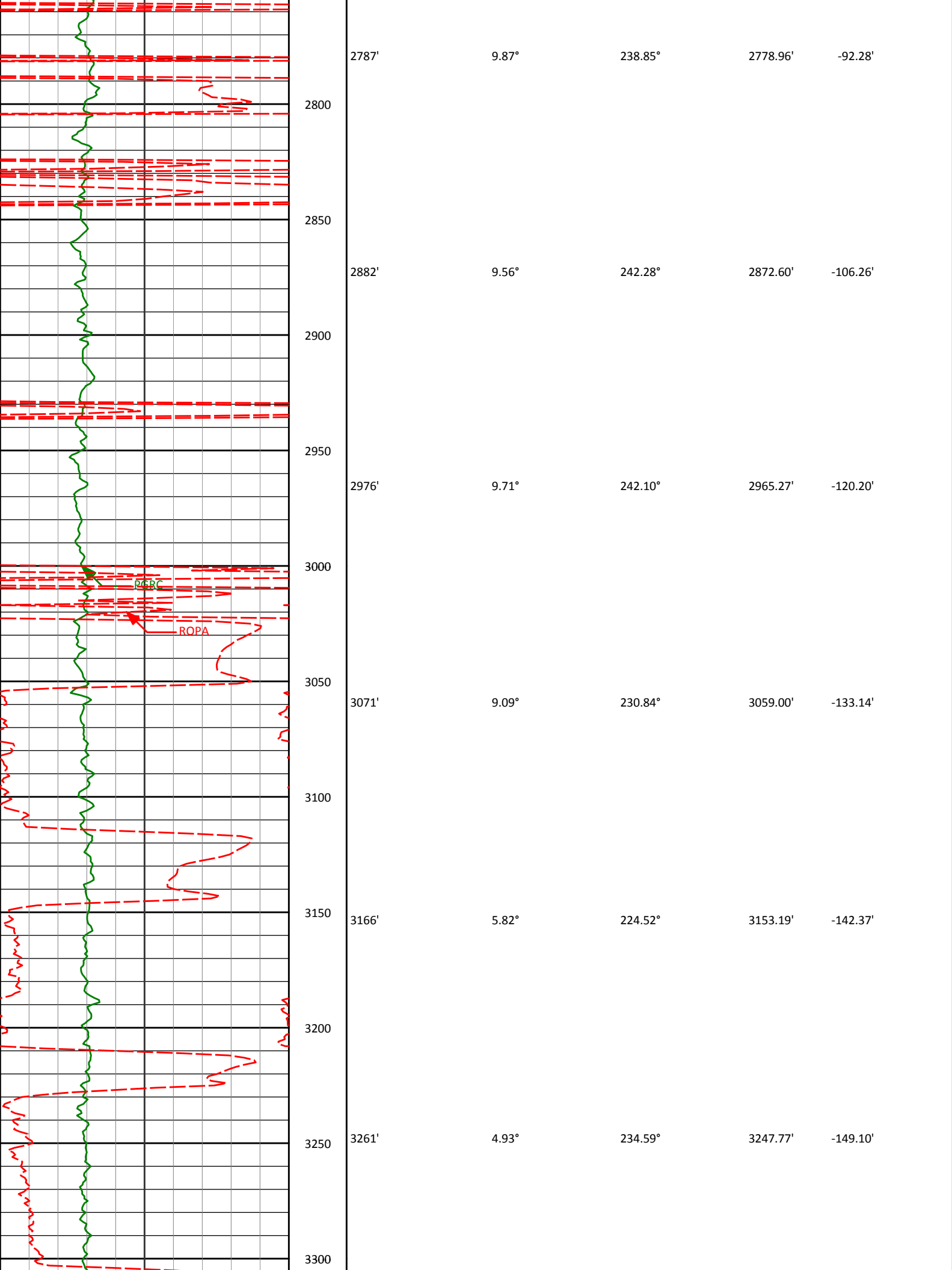


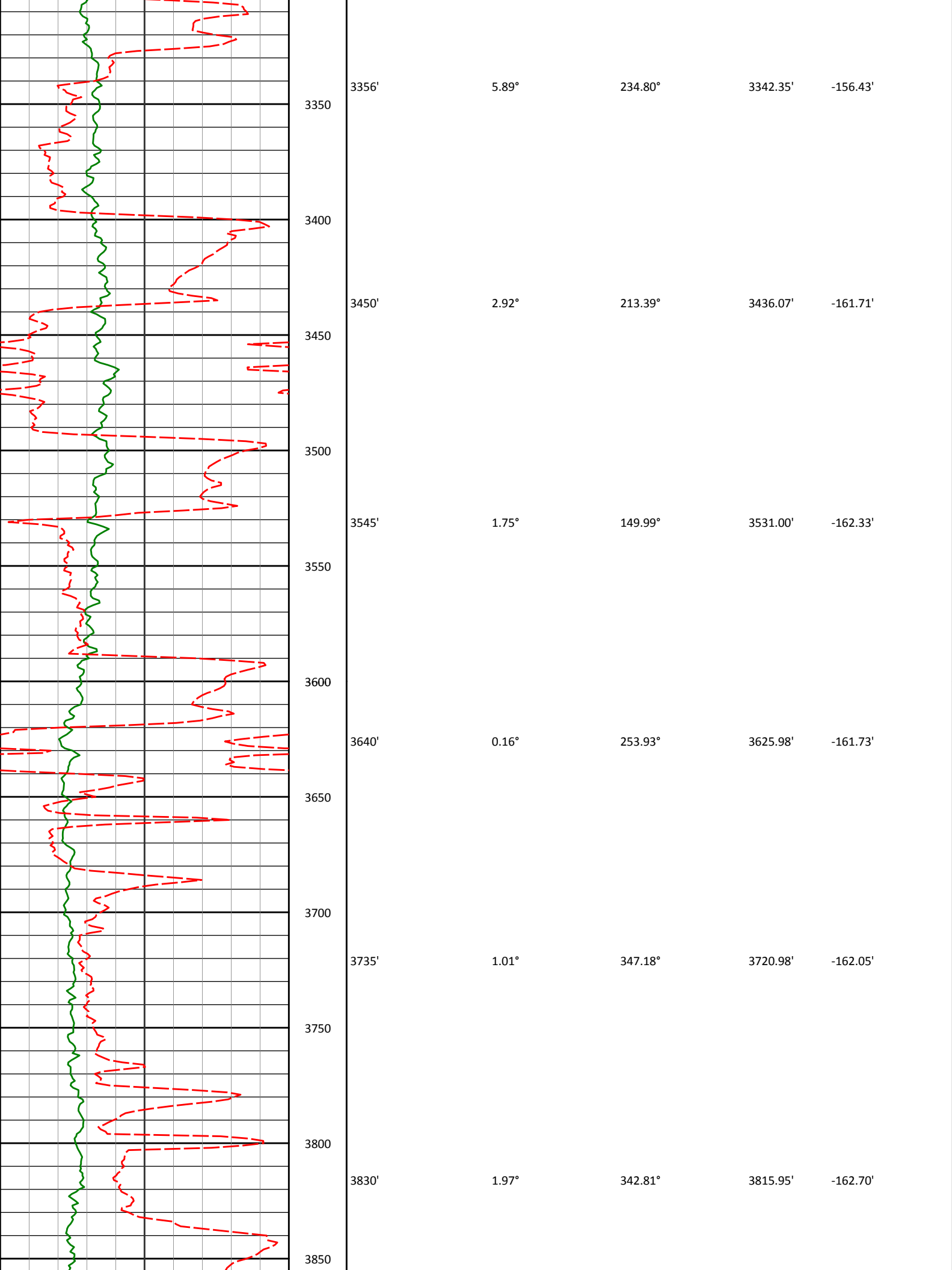


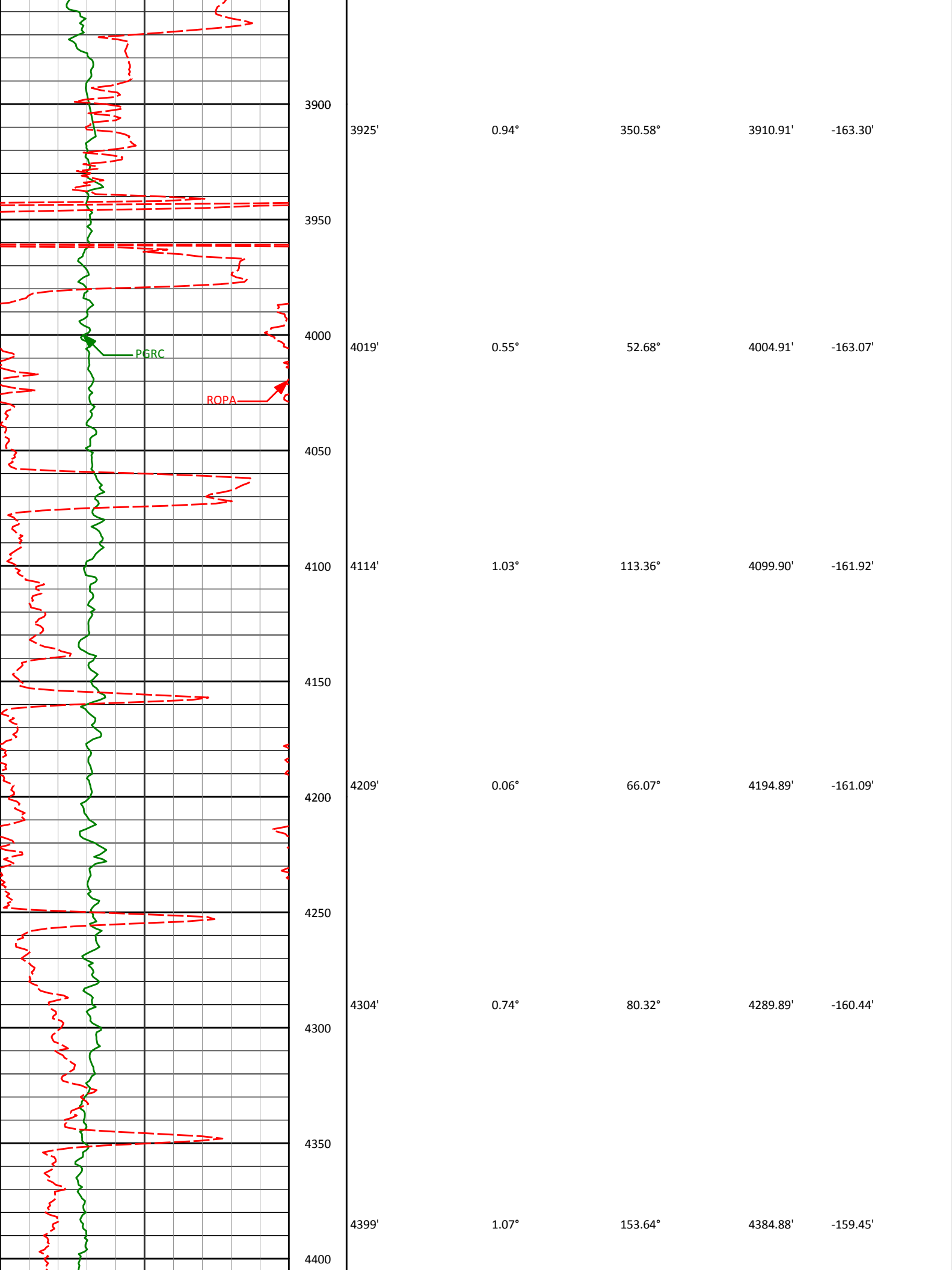


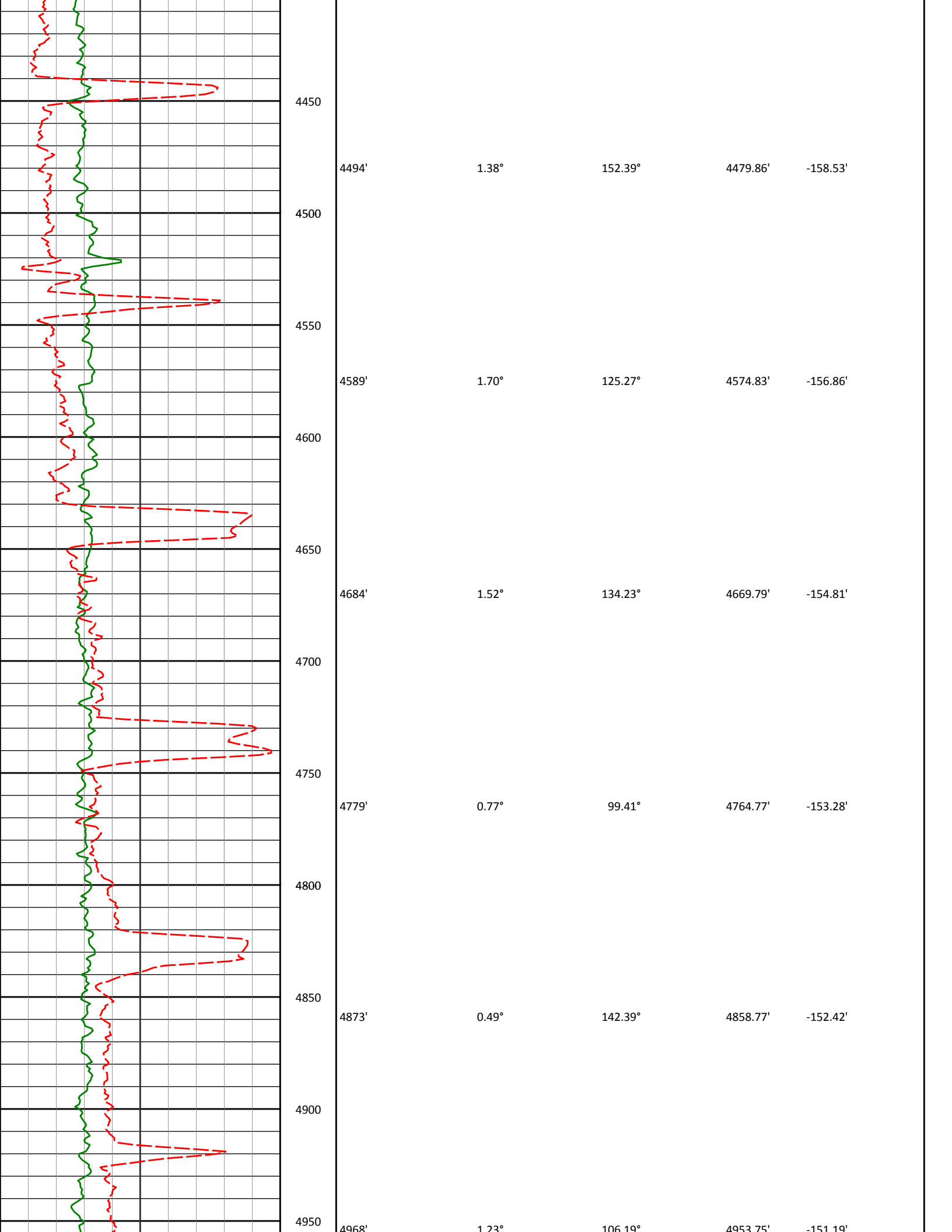
| | | | | |
|-------|-------|---------|----------|---------|
| 1700 | | | | |
| 1744' | 0.98° | 237.69° | 1743.88' | -2.25' |
| 1750 | | | | |
| 1800 | | | | |
| 1839' | 1.10° | 236.16° | 1838.87' | -3.70' |
| 1850 | | | | |
| 1900 | | | | |
| 1933' | 1.26° | 230.41° | 1932.85' | -5.25' |
| 1950 | | | | |
| 2000 | | | | |
| 2028' | 2.99° | 223.32° | 2027.78' | -7.76' |
| 2050 | | | | |
| 2100 | | | | |
| 2123' | 4.16° | 218.23° | 2122.59' | -11.61' |
| 2150 | | | | |
| 2200 | | | | |

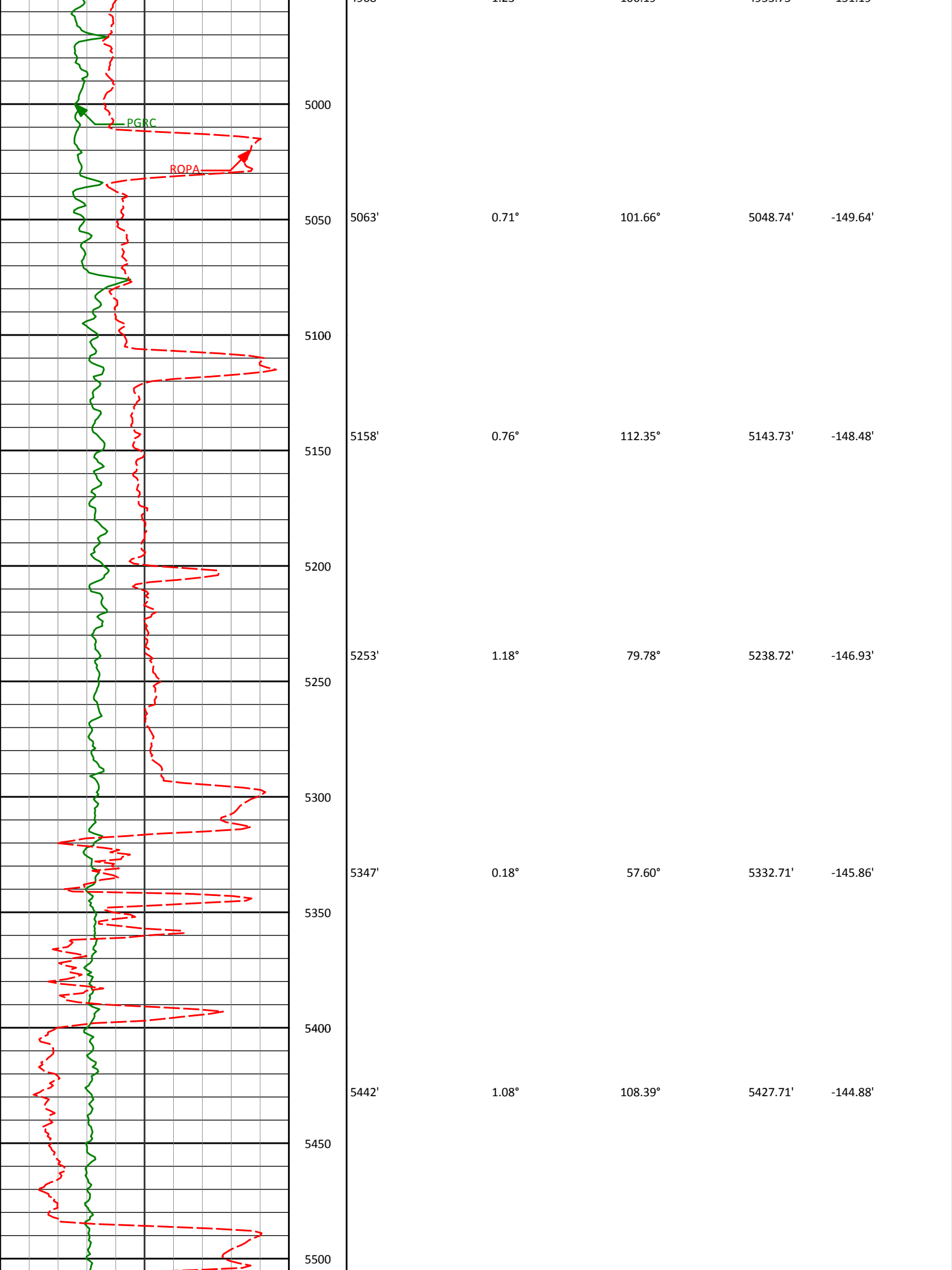


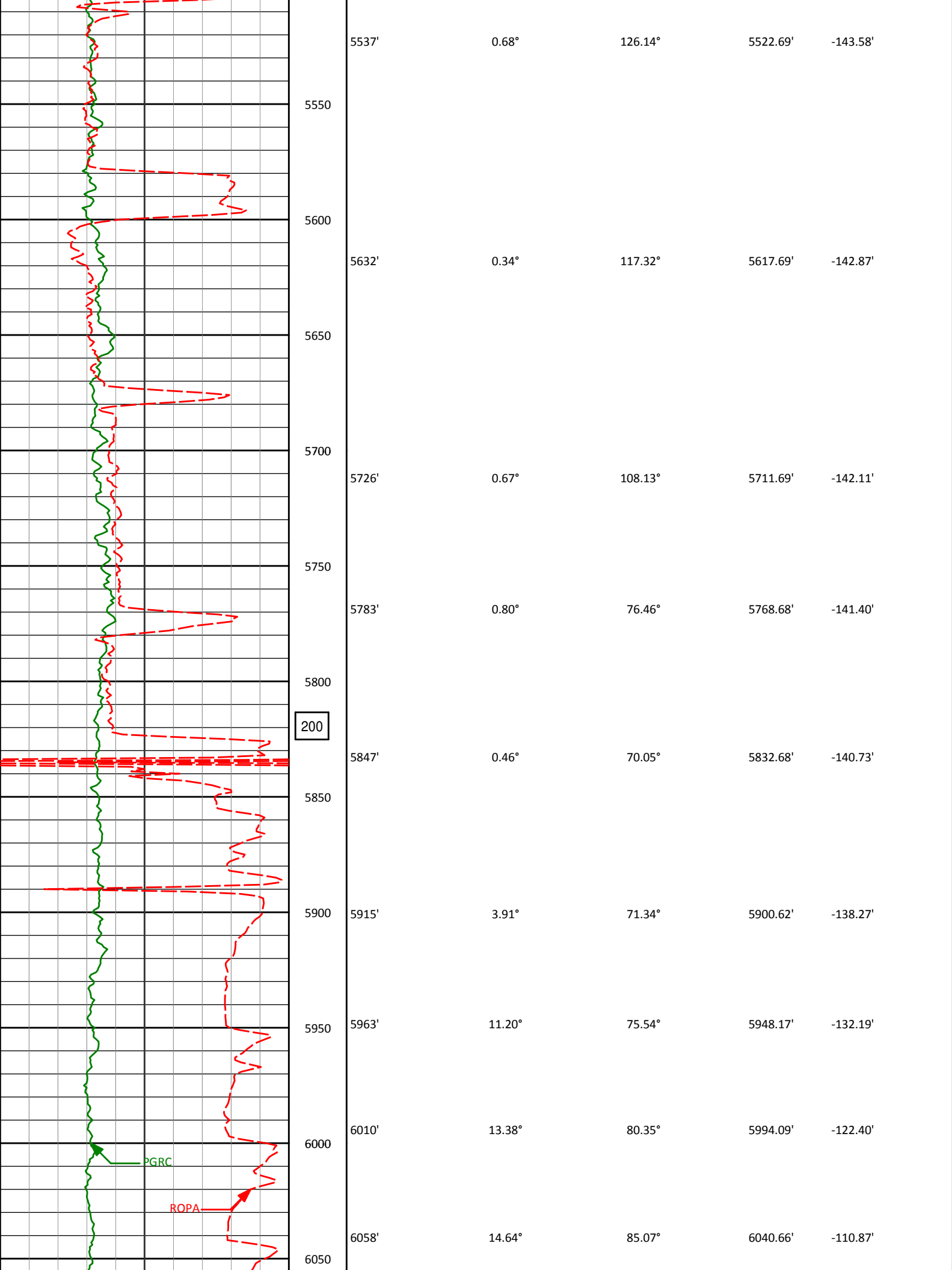


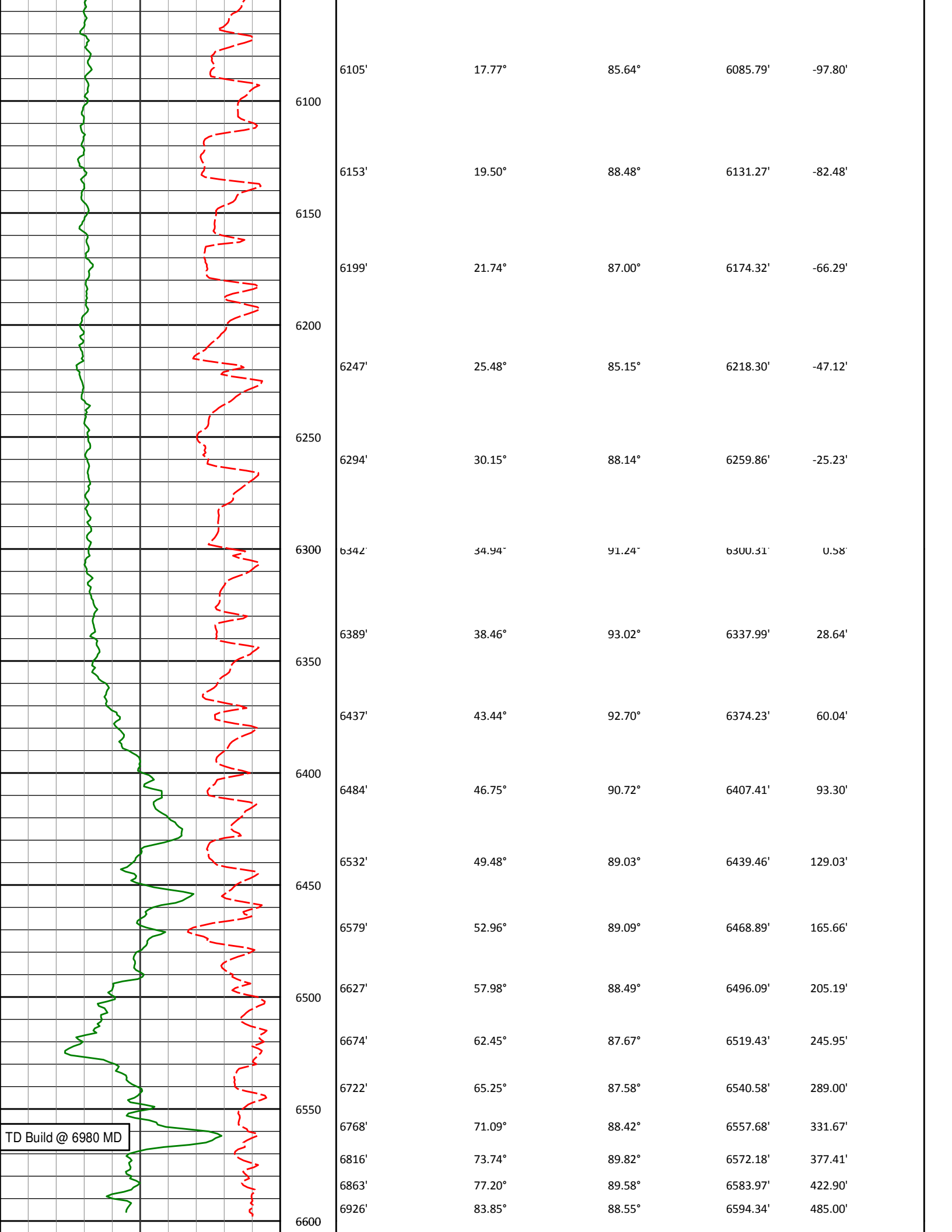


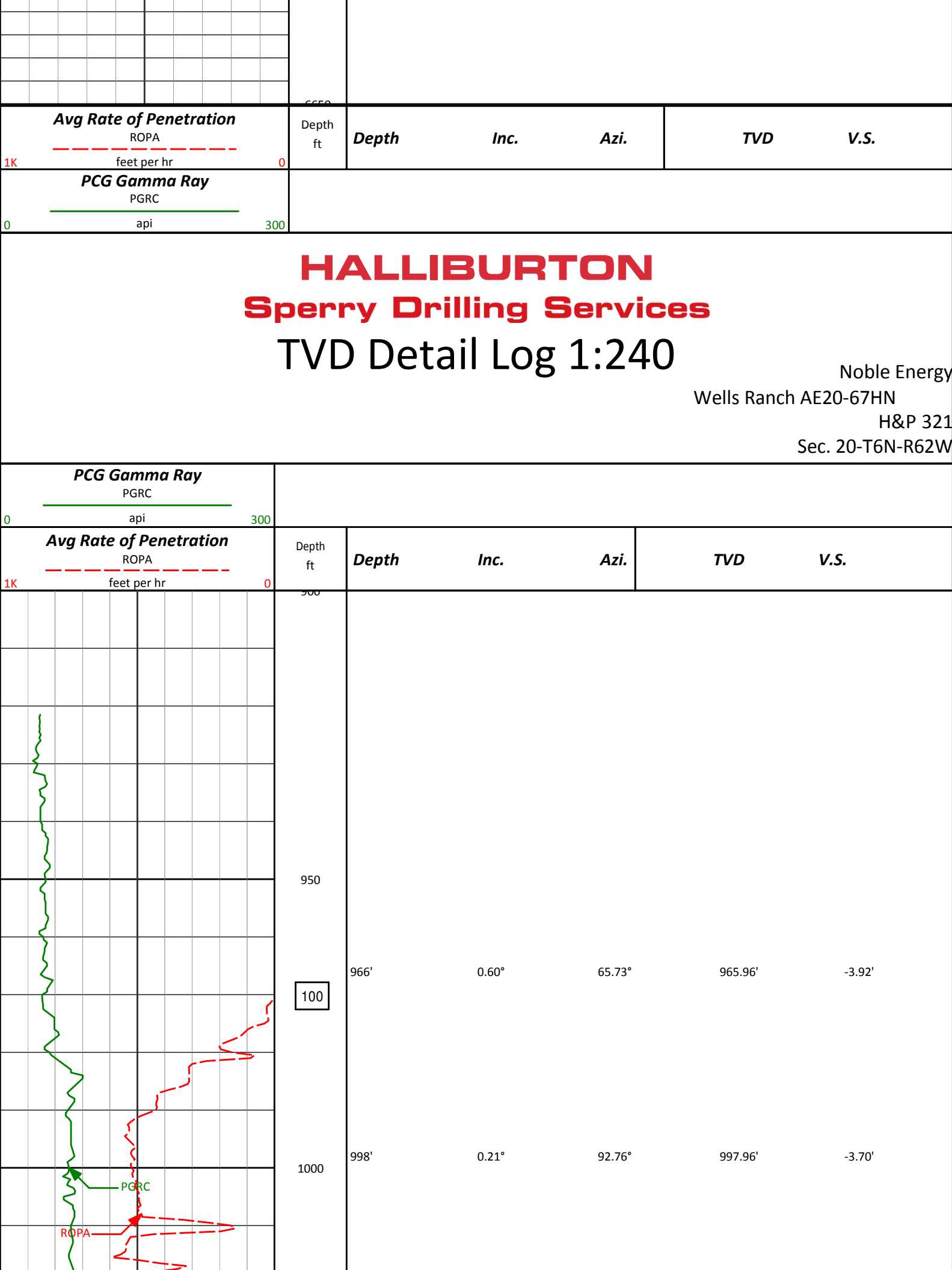


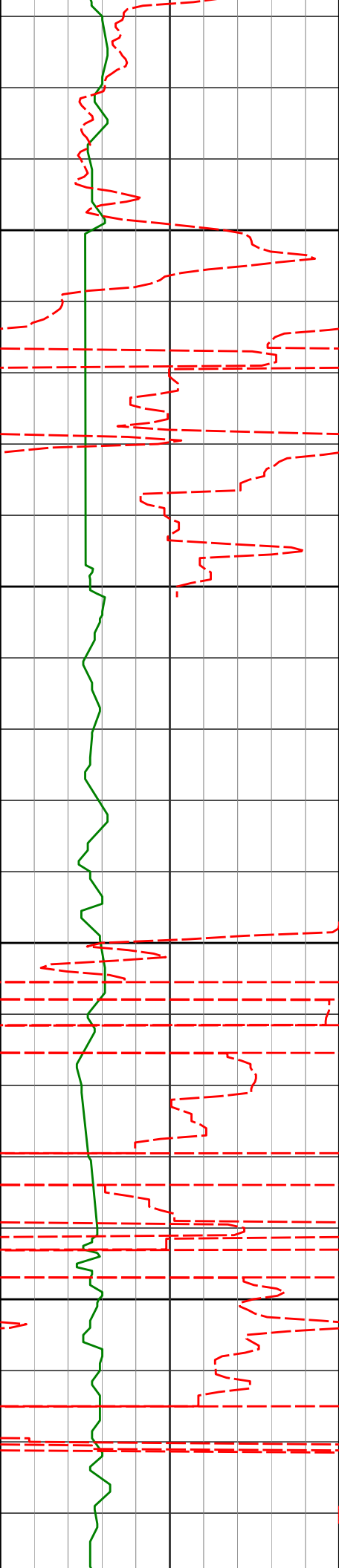












1050

1090'

0.38°

64.89°

1089.96'

-3.26'

1100

1150

1183'

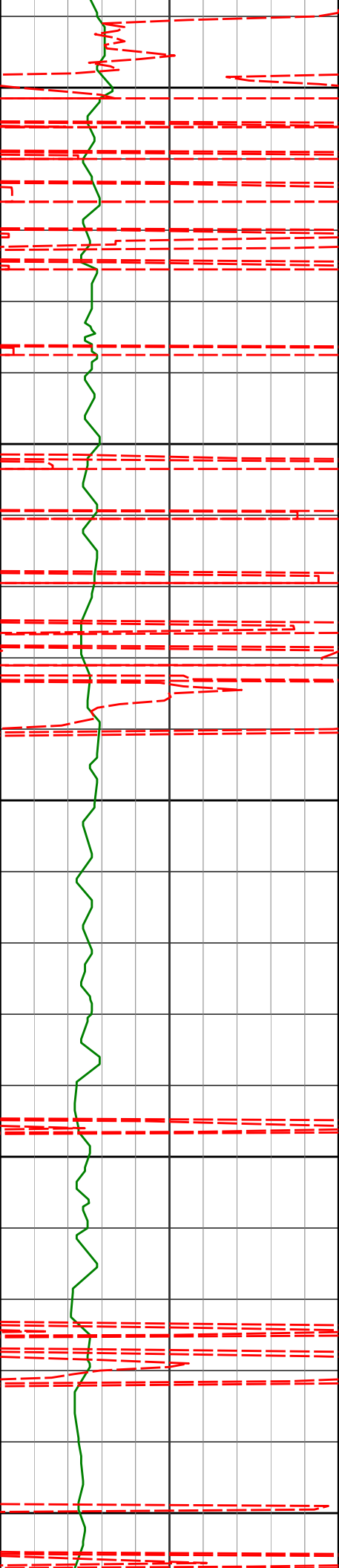
0.52°

88.82°

1182.95'

-2.56'

1200



1250

1275'

0.80°

52.78°

1274.95'

-1.63'

1300

1350

1368'

0.72°

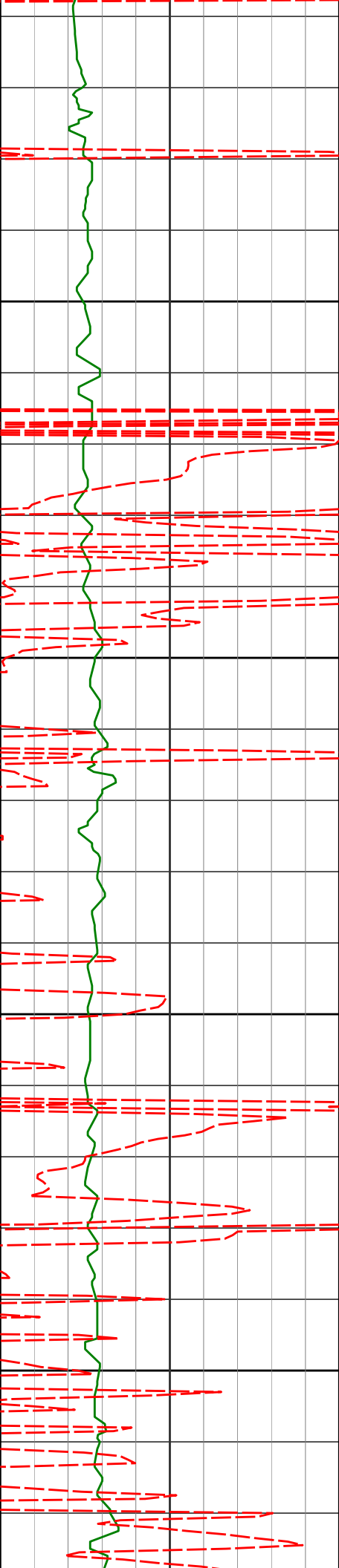
57.40°

1367.94'

-0.62'

1400

1450



1500

1550

1600

1650

1460'

1.18°

32.66°

1459.93'

0.39'

1555'

1.37°

325.86°

1554.91'

0.29'

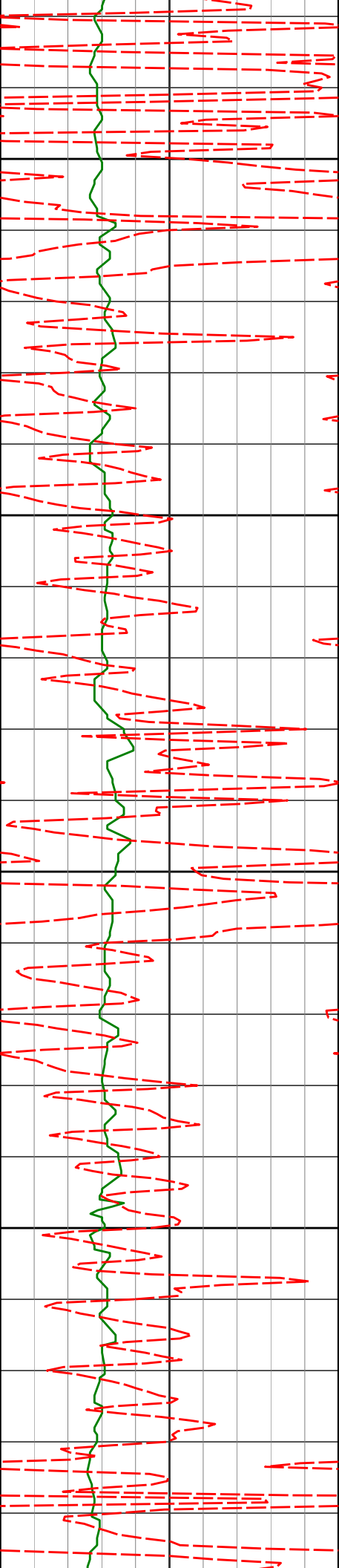
1649'

0.75°

279.95°

1648.89'

-0.95'



1700

1744'

0.98°

237.69°

1743.88'

-2.25'

1750

1800

1839'

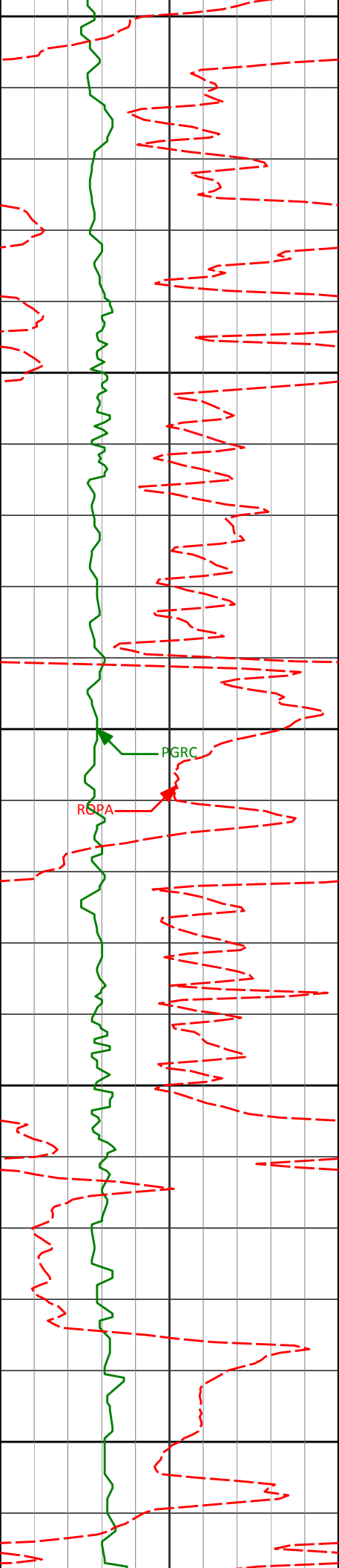
1.10°

236.16°

1838.87'

-3.70'

1850



1900

1933'

1.26°

230.41°

1932.85'

-5.25'

1950

2000

PGRC

RSPA

2028'

2.99°

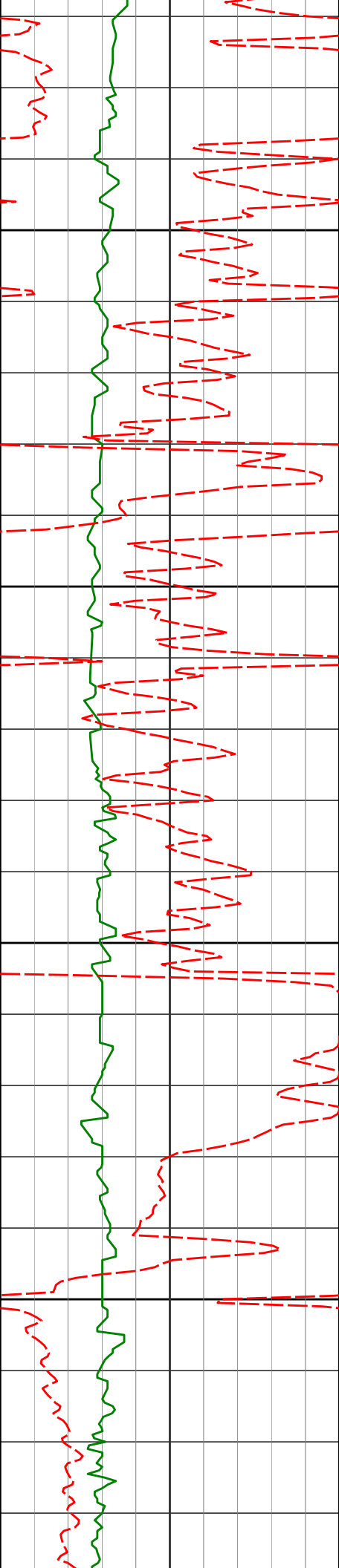
223.32°

2027.78'

-7.76'

2050

2100



2123'

4.16°

218.23°

2122.59'

-11.61'

2150

2200

2218'

5.50°

232.25°

2217.26'

-17.37'

2250

2300

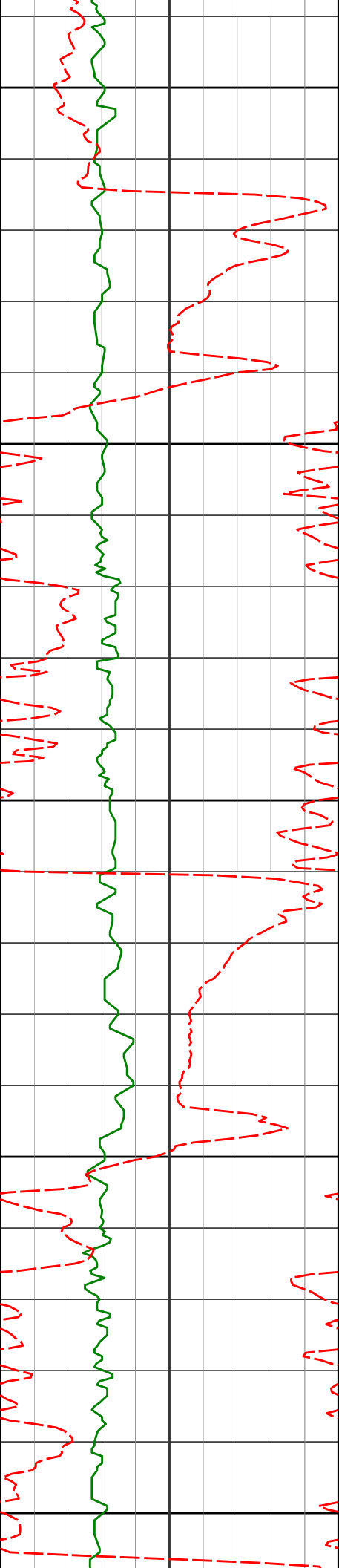
2313'

6.45°

235.77°

2311.74'

-25.40'



2350

2400

2450

2500

2550

2408'

7.07°

239.73°

2406.08'

-34.89'

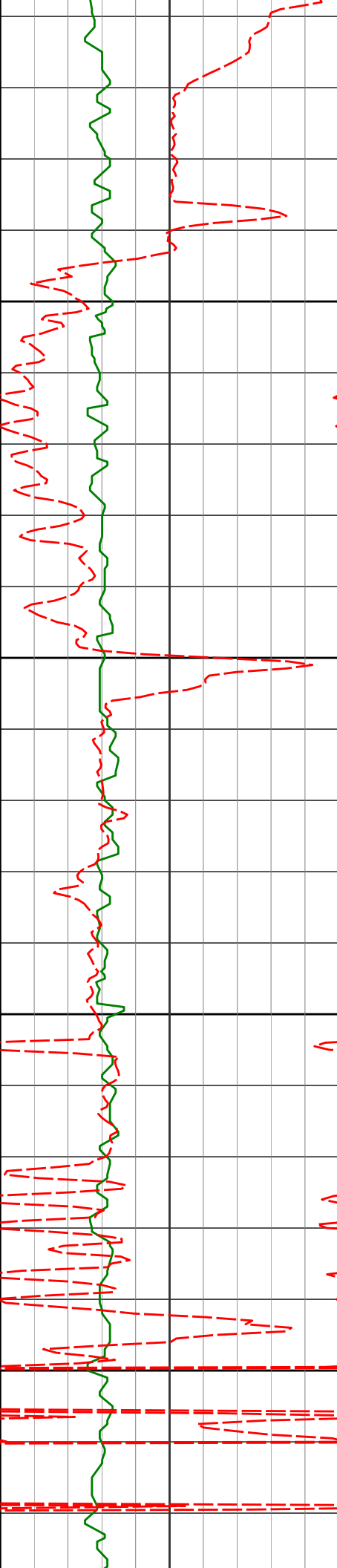
2503'

9.24°

240.02°

2500.11'

-46.57'



2597'

12.28°

238.19°

2592.45'

-61.64'

2600

2650

2692'

10.88°

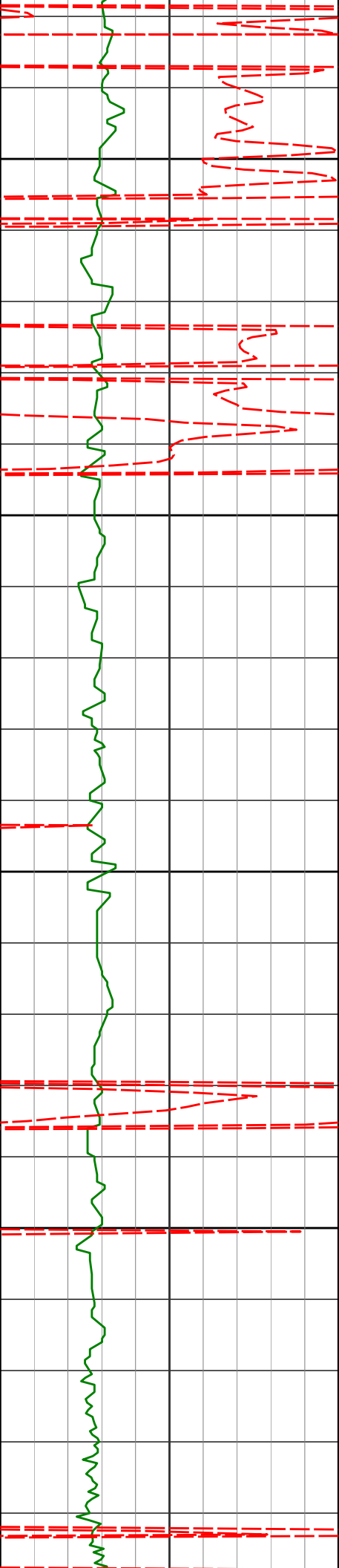
236.79°

2685.51'

-77.77'

2700

2750



2787'

9.87°

238.85°

2778.96'

-92.28'

2800

2850

2882'

9.56°

242.28°

2872.60'

-106.26'

2900

2950

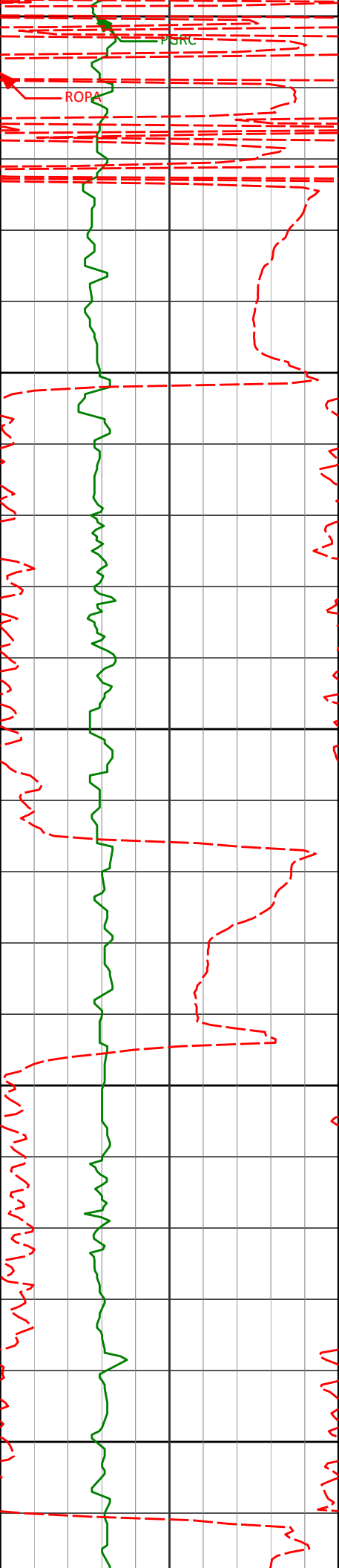
2976'

9.71°

242.10°

2965.27'

-120.20'



3000

3050

3100

3150

3200

3071'

9.09°

230.84°

3059.00'

-133.14'

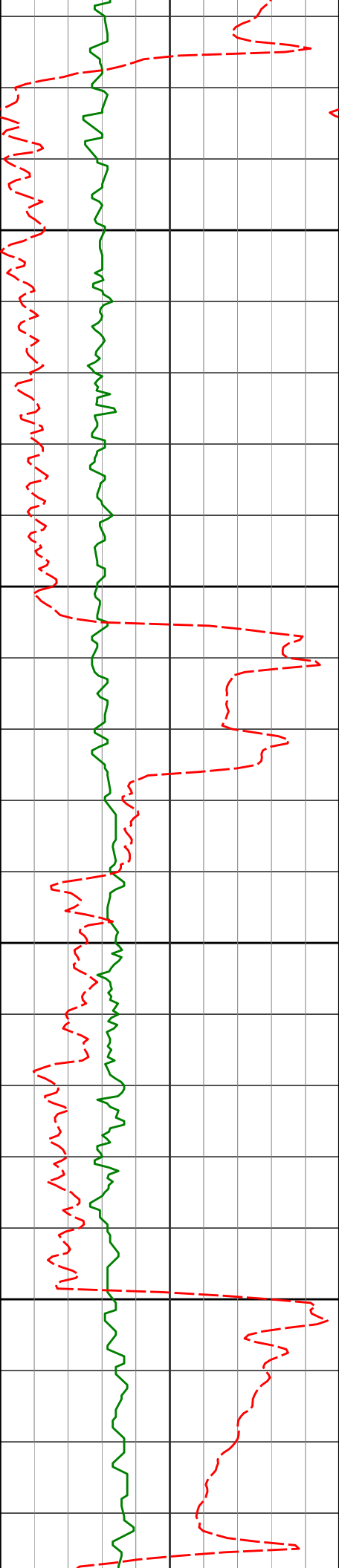
3166'

5.82°

224.52°

3153.19'

-142.37'



| | | | | | |
|------|-------|-------|---------|----------|----------|
| 3250 | 3261' | 4.93° | 234.59° | 3247.77' | -149.10' |
|------|-------|-------|---------|----------|----------|

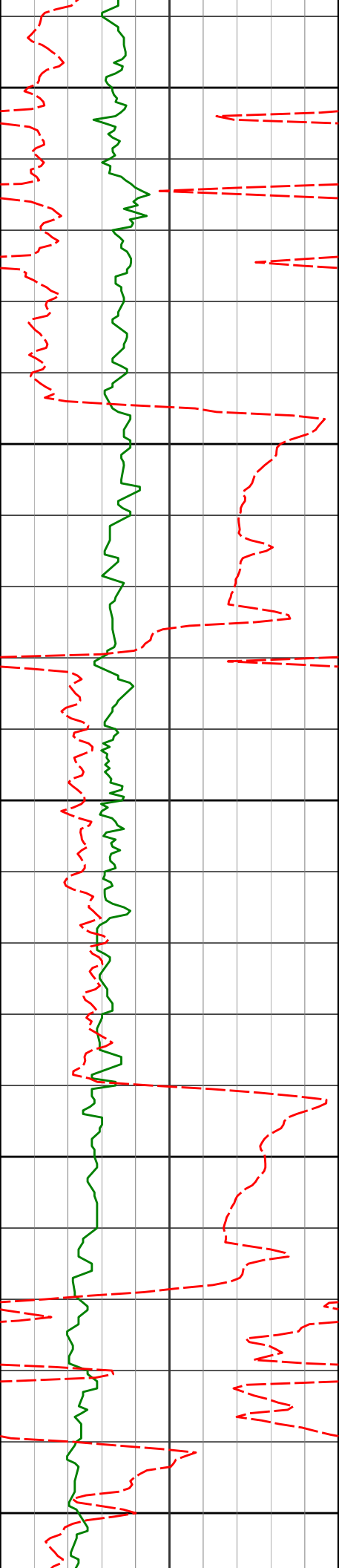
3300

| | | | | |
|-------|-------|---------|----------|----------|
| 3356' | 5.89° | 234.80° | 3342.35' | -156.43' |
|-------|-------|---------|----------|----------|

3350

3400

| | | | | |
|-------|-------|---------|----------|----------|
| 3450' | 2.92° | 213.39° | 3436.07' | -161.71' |
|-------|-------|---------|----------|----------|



3450

3500

3550

3600

3650

3545'

1.75°

149.99°

3531.00'

-162.33'

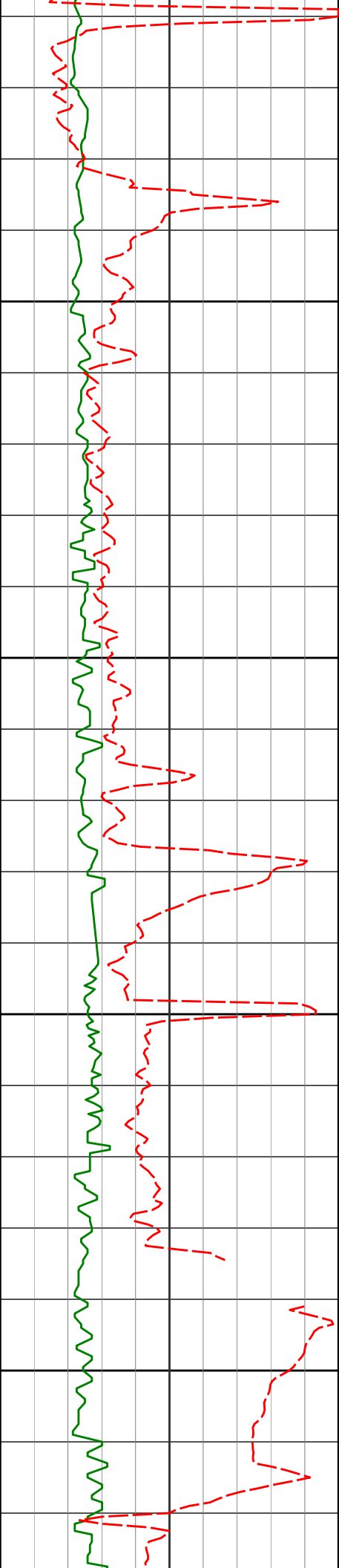
3640'

0.16°

253.93°

3625.98'

-161.73'



3700

3735'

1.01°

347.18°

3720.98'

-162.05'

3750

3800

3830'

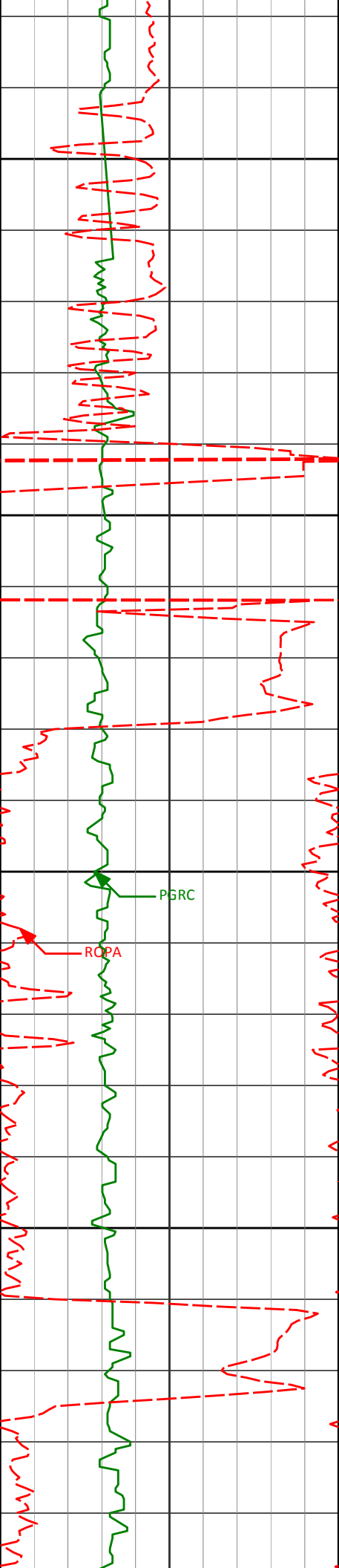
1.97°

342.81°

3815.95'

-162.70'

3850



3900

3925'

0.94°

350.58°

3910.91'

-163.30'

3950

4000

4019'

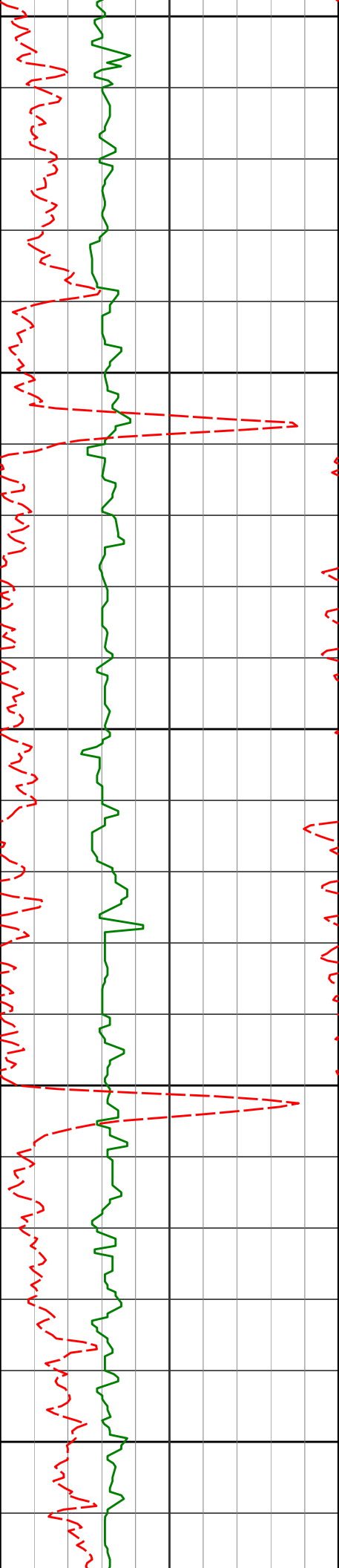
0.55°

52.68°

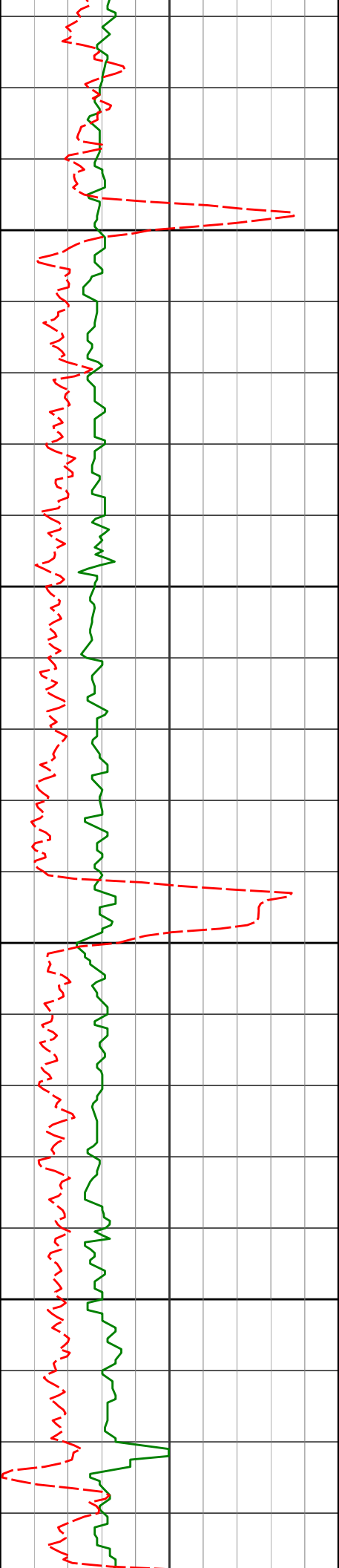
4004.91'

-163.07'

4050



| | | | | | |
|------|-------|-------|---------|----------|----------|
| 4100 | 4114' | 1.03° | 113.36° | 4099.90' | -161.92' |
| 4150 | | | | | |
| 4200 | 4209' | 0.06° | 66.07° | 4194.89' | -161.09' |
| 4250 | | | | | |
| 4300 | 4304' | 0.74° | 80.32° | 4289.89' | -160.44' |



4350

4399'

1.07°

153.64°

4384.88'

-159.45'

4400

4450

4494'

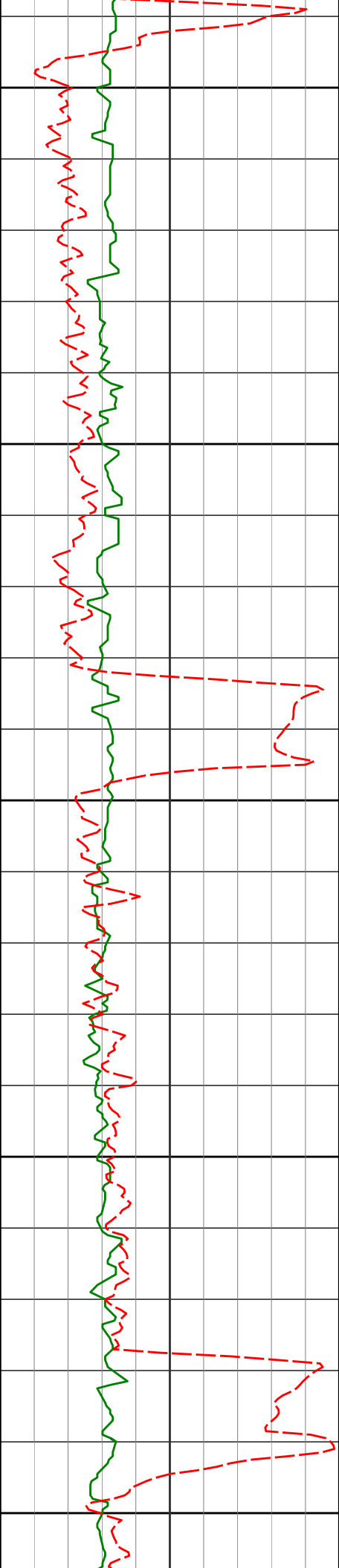
1.38°

152.39°

4479.86'

-158.53'

4500



4550

4589'

1.70°

125.27°

4574.83'

-156.86'

4600

4650

4684'

1.52°

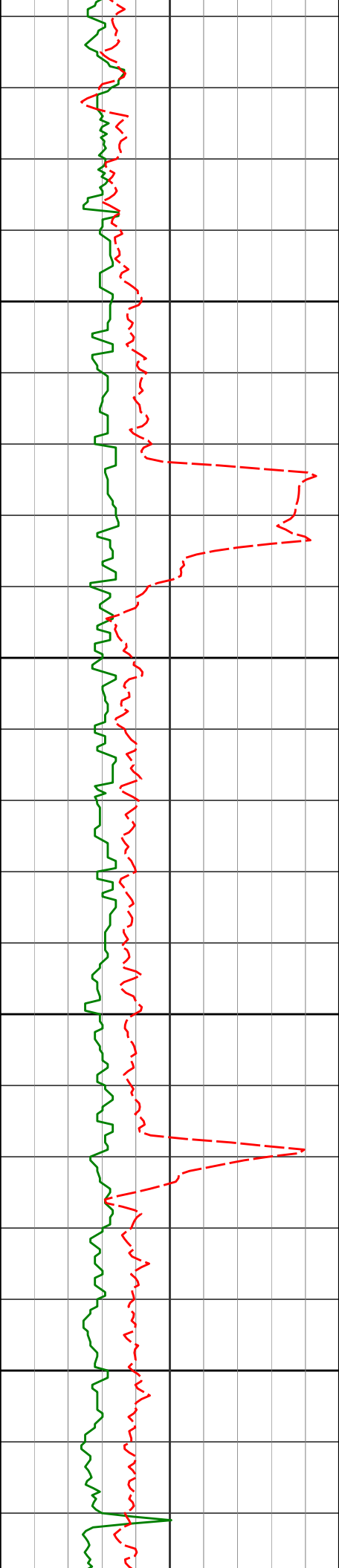
134.23°

4669.79'

-154.81'

4700

4750



4779'

0.77°

99.41°

4764.77'

-153.28'

4800

4850

4873'

0.49°

142.39°

4858.77'

-152.42'

4900

4950

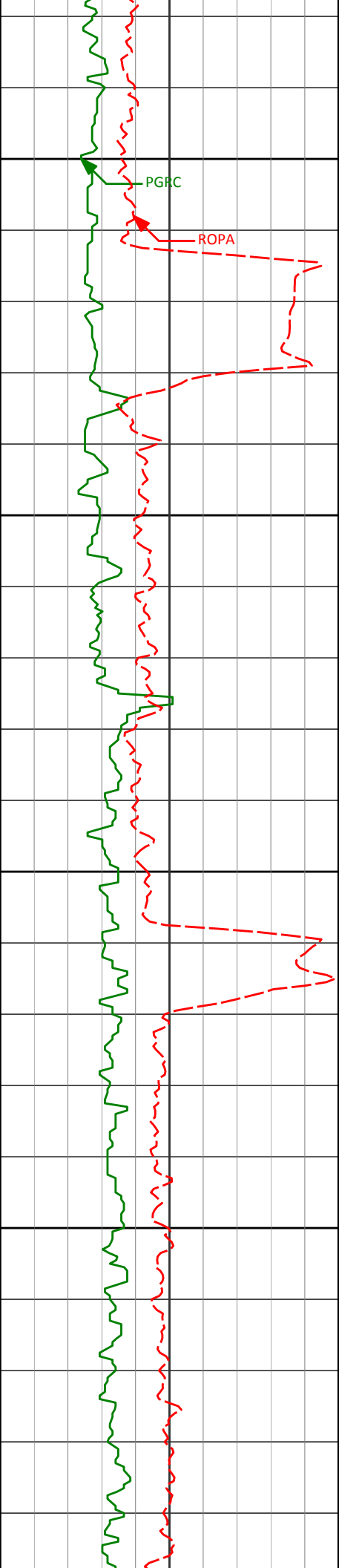
4968'

1.23°

106.19°

4953.75'

-151.19'



5000

PGRC

ROPA

5050

5063'

0.71°

101.66°

5048.74'

-149.64'

5100

5150

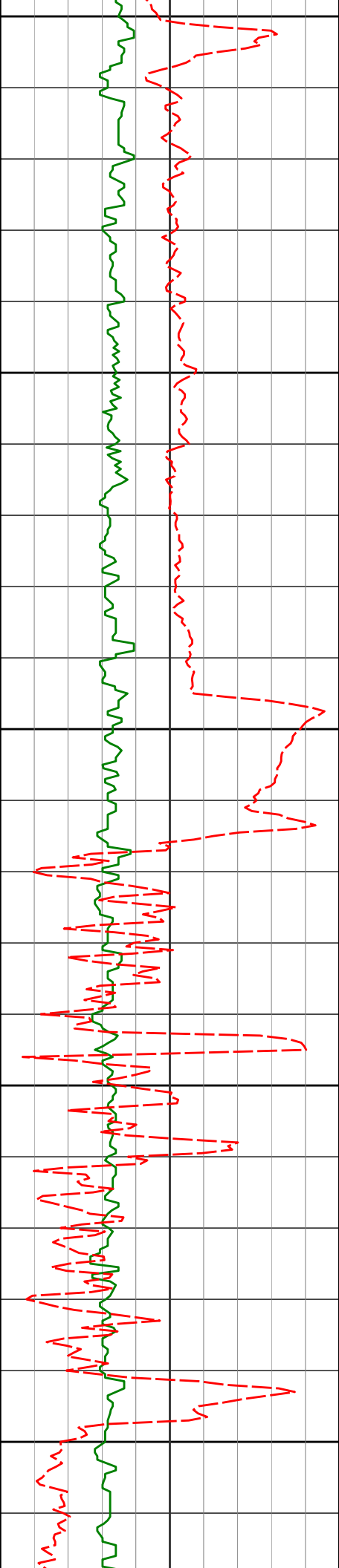
5158'

0.76°

112.35°

5143.73'

-148.48'



5200

5253'

1.18°

79.78°

5238.72'

-146.93'

5250

5300

5347'

0.18°

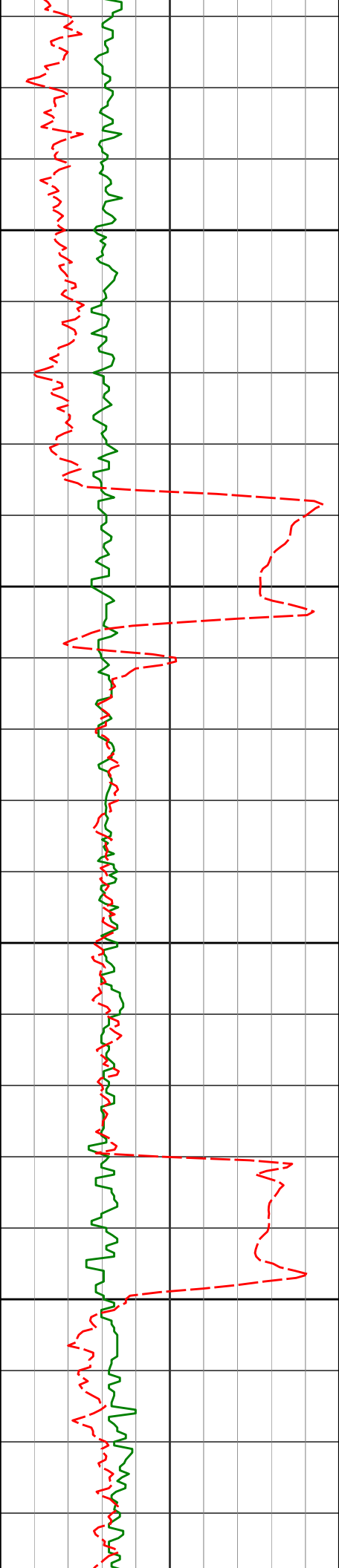
57.60°

5332.71'

-145.86'

5350

5400



5442'

1.08°

108.39°

5427.71'

-144.88'

5450

5500

5537'

0.68°

126.14°

5522.69'

-143.58'

5550

5600

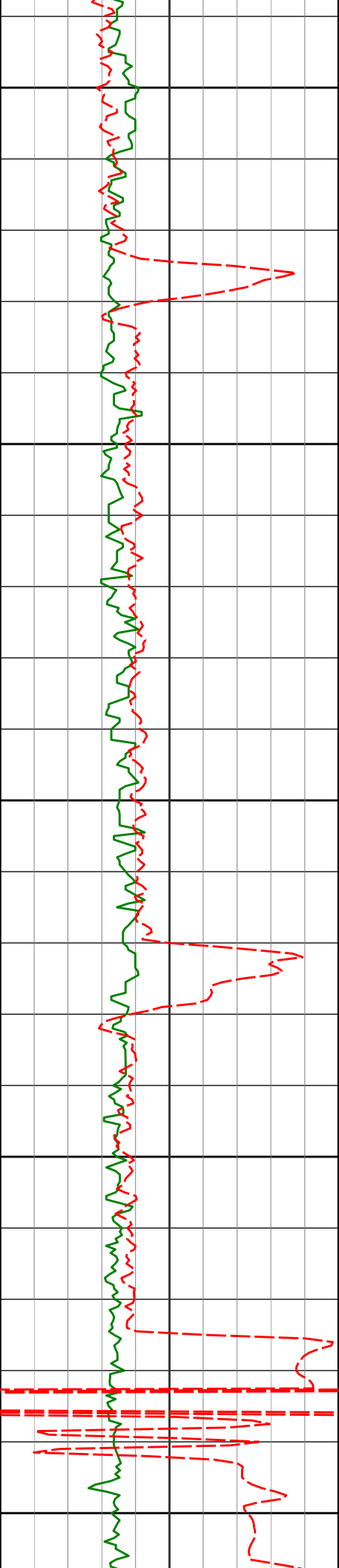
5632'

0.34°

117.32°

5617.69'

-142.87'



5650

5700

5750

5800

200

5850

5726'

0.67°

108.13°

5711.69'

-142.11'

5783'

0.80°

76.46°

5768.68'

-141.40'

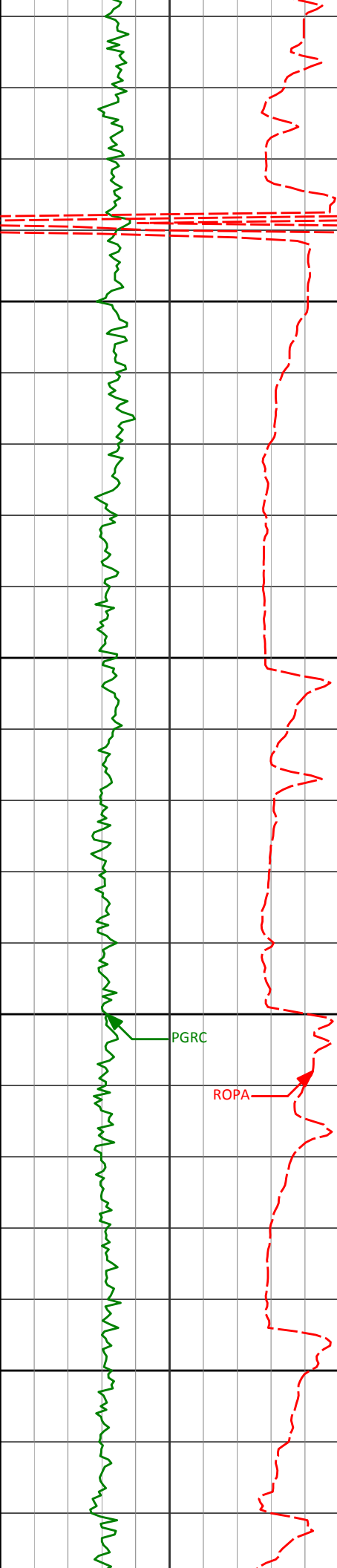
5847'

0.46°

70.05°

5832.68'

-140.73'



5900

5915'

3.91°

71.34°

5900.62'

-138.27'

5950

5963'

11.20°

75.54°

5948.17'

-132.19'

6000

6010'

13.38°

80.35°

5994.09'

-122.40'

6058'

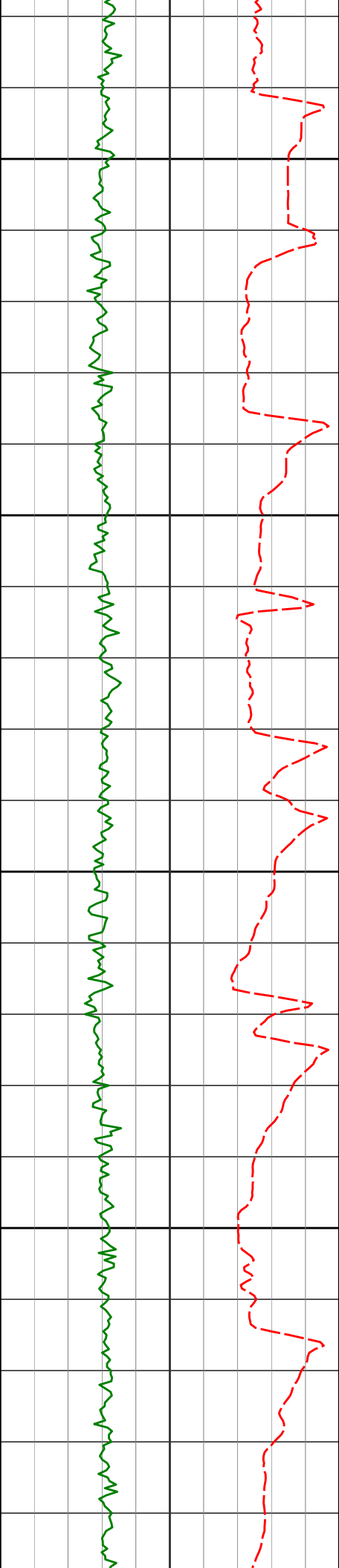
14.64°

85.07°

6040.66'

-110.87'

6050



6100

6105'

17.77°

85.64°

6085.79'

-97.80'

6153'

19.50°

88.48°

6131.27'

-82.48'

6150

6199'

21.74°

87.00°

6174.32'

-66.29'

6200

6247'

25.48°

85.15°

6218.30'

-47.12'

6250

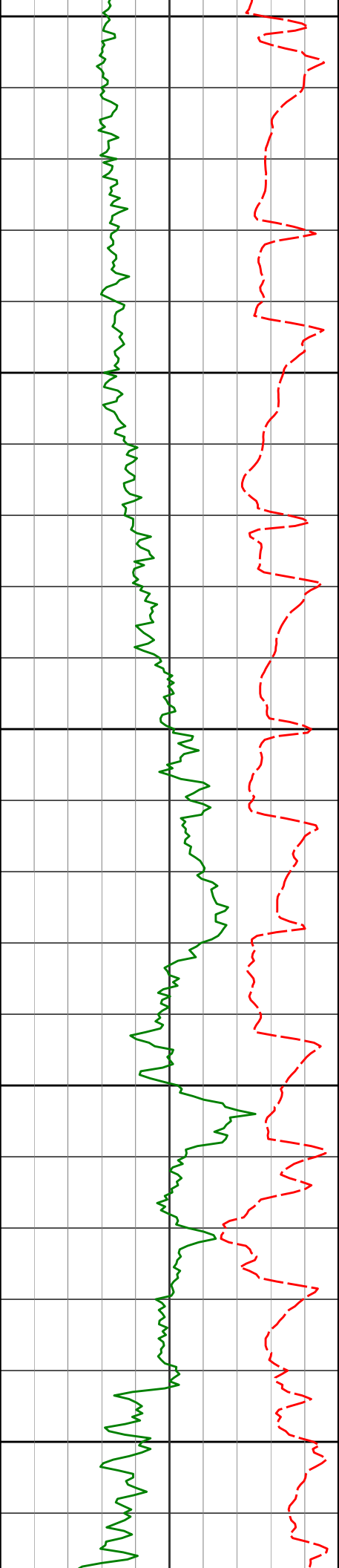
6294'

30.15°

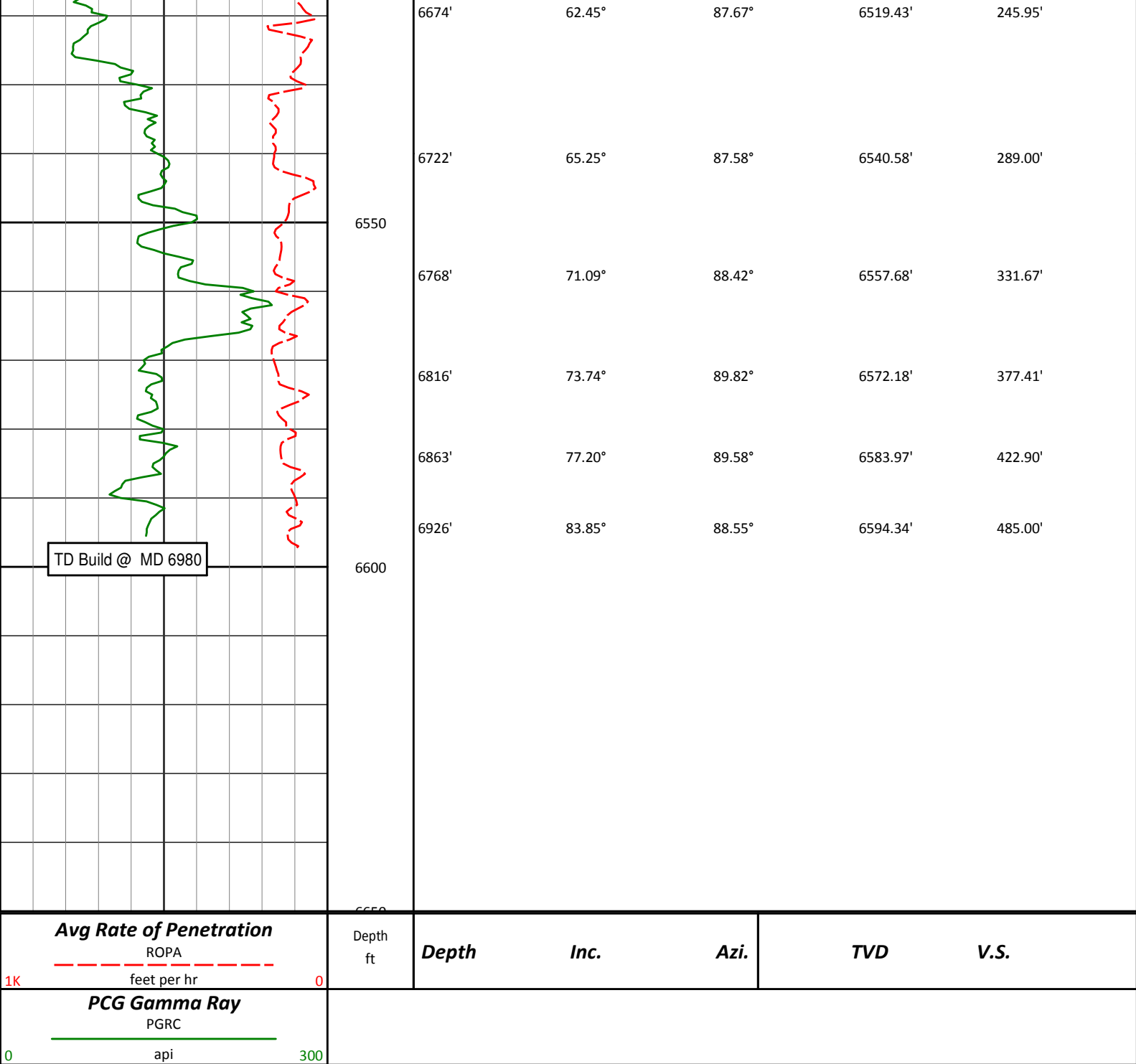
88.14°

6259.86'

-25.23'



| | | | | | |
|------|-------|--------|--------|----------|---------|
| 6300 | 6342' | 34.94° | 91.24° | 6300.31' | 0.58' |
| | | | | | |
| | 6389' | 38.46° | 93.02° | 6337.99' | 28.64' |
| | | | | | |
| 6350 | | | | | |
| | | | | | |
| | 6437' | 43.44° | 92.70° | 6374.23' | 60.04' |
| | | | | | |
| | | | | | |
| 6400 | | | | | |
| | 6484' | 46.75° | 90.72° | 6407.41' | 93.30' |
| | | | | | |
| | | | | | |
| | | | | | |
| | 6532' | 49.48° | 89.03° | 6439.46' | 129.03' |
| 6450 | | | | | |
| | | | | | |
| | 6579' | 52.96° | 89.09° | 6468.89' | 165.66' |
| | | | | | |
| | | | | | |
| | | | | | |
| | 6627' | 57.98° | 88.49° | 6496.09' | 205.19' |
| 6500 | | | | | |
| | | | | | |
| | | | | | |



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AE20-67HN
Wattenburg
Weld Colorado
USA
CA-XX-0900775409

| 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 |
| 356.00 | 0.80 | 324.63 | 355.99 | 2.03 N | 1.44 W | -1.43 | 0.22 |
| 663.00 | 0.60 | 302.03 | 662.97 | 4.63 N | 4.04 W | -4.02 | 0.11 |
| 966.00 | 0.60 | 65.73 | 965.96 | 6.12 N | 3.94 W | -3.92 | 0.35 |

| | | | | | | | |
|---------|-------|--------|---------|----------|----------|---------|-------|
| 998.00 | 0.21 | 92.76 | 997.96 | 6.19 N | 3.73 W | -3.70 | 1.32 |
| 1090.00 | 0.38 | 64.89 | 1089.96 | 6.31 N | 3.28 W | -3.26 | 0.24 |
| 1183.00 | 0.52 | 88.82 | 1182.95 | 6.45 N | 2.58 W | -2.56 | 0.25 |
| 1275.00 | 0.80 | 52.78 | 1274.95 | 6.84 N | 1.65 W | -1.63 | 0.53 |
| 1368.00 | 0.72 | 57.40 | 1367.94 | 7.55 N | 0.65 W | -0.62 | 0.11 |
| 1460.00 | 1.18 | 32.66 | 1459.93 | 8.66 N | 0.35 E | 0.39 | 0.66 |
| 1555.00 | 1.37 | 325.86 | 1554.91 | 10.42 N | 0.24 E | 0.29 | 1.49 |
| 1649.00 | 0.75 | 279.95 | 1648.89 | 11.46 N | 0.99 W | -0.95 | 1.07 |
| 1744.00 | 0.98 | 237.69 | 1743.88 | 11.13 N | 2.29 W | -2.25 | 0.69 |
| 1839.00 | 1.10 | 236.16 | 1838.87 | 10.19 N | 3.74 W | -3.70 | 0.13 |
| 1933.00 | 1.26 | 230.41 | 1932.85 | 9.03 N | 5.28 W | -5.25 | 0.21 |
| 2028.00 | 2.99 | 223.32 | 2027.78 | 6.56 N | 7.79 W | -7.76 | 1.84 |
| 2123.00 | 4.16 | 218.23 | 2122.59 | 2.05 N | 11.62 W | -11.61 | 1.27 |
| 2218.00 | 5.50 | 232.25 | 2217.26 | 3.44 S | 17.35 W | -17.37 | 1.87 |
| 2313.00 | 6.45 | 235.77 | 2311.74 | 9.23 S | 25.36 W | -25.40 | 1.07 |
| 2408.00 | 7.07 | 239.73 | 2406.08 | 15.18 S | 34.82 W | -34.89 | 0.82 |
| 2503.00 | 9.24 | 240.02 | 2500.11 | 21.94 S | 46.48 W | -46.57 | 2.28 |
| 2597.00 | 12.28 | 238.19 | 2592.45 | 30.98 S | 61.52 W | -61.64 | 3.25 |
| 2692.00 | 10.88 | 236.79 | 2685.51 | 41.22 S | 77.61 W | -77.77 | 1.50 |
| 2787.00 | 9.87 | 238.85 | 2778.96 | 50.34 S | 92.08 W | -92.28 | 1.13 |
| 2882.00 | 9.56 | 242.28 | 2872.60 | 58.22 S | 106.03 W | -106.26 | 0.69 |
| 2976.00 | 9.71 | 242.10 | 2965.27 | 65.56 S | 119.94 W | -120.20 | 0.16 |
| 3071.00 | 9.09 | 230.84 | 3059.00 | 74.05 S | 132.84 W | -133.14 | 2.04 |
| 3166.00 | 5.82 | 224.52 | 3153.19 | 82.23 S | 142.04 W | -142.37 | 3.54 |
| 3261.00 | 4.93 | 234.59 | 3247.77 | 88.03 S | 148.75 W | -149.10 | 1.36 |
| 3356.00 | 5.89 | 234.80 | 3342.35 | 93.20 S | 156.06 W | -156.43 | 1.01 |
| 3450.00 | 2.92 | 213.39 | 3436.07 | 97.98 S | 161.32 W | -161.71 | 3.56 |
| 3545.00 | 1.75 | 149.99 | 3531.00 | 101.26 S | 161.92 W | -162.33 | 2.79 |
| 3640.00 | 0.16 | 253.93 | 3625.98 | 102.55 S | 161.32 W | -161.73 | 1.89 |
| 3735.00 | 1.01 | 347.18 | 3720.98 | 101.77 S | 161.64 W | -162.05 | 1.09 |
| 3830.00 | 1.97 | 342.81 | 3815.95 | 99.39 S | 162.31 W | -162.70 | 1.02 |
| 3925.00 | 0.94 | 350.58 | 3910.91 | 97.07 S | 162.92 W | -163.30 | 1.10 |
| 4019.00 | 0.55 | 52.68 | 4004.91 | 96.03 S | 162.68 W | -163.07 | 0.89 |
| 4114.00 | 1.03 | 113.36 | 4099.90 | 96.09 S | 161.54 W | -161.92 | 0.95 |
| 4209.00 | 0.06 | 66.07 | 4194.89 | 96.41 S | 160.71 W | -161.09 | 1.04 |
| 4304.00 | 0.74 | 80.32 | 4289.89 | 96.29 S | 160.06 W | -160.44 | 0.72 |
| 4399.00 | 1.07 | 153.64 | 4384.88 | 96.98 S | 159.06 W | -159.45 | 1.17 |
| 4494.00 | 1.38 | 152.39 | 4479.86 | 98.79 S | 158.14 W | -158.53 | 0.33 |
| 4589.00 | 1.70 | 125.27 | 4574.83 | 100.62 S | 156.45 W | -156.86 | 0.83 |
| 4684.00 | 1.52 | 134.23 | 4669.79 | 102.31 S | 154.40 W | -154.81 | 0.33 |
| 4779.00 | 0.77 | 99.41 | 4764.77 | 103.29 S | 152.87 W | -153.28 | 1.04 |
| 4873.00 | 0.49 | 142.39 | 4858.77 | 103.71 S | 152.00 W | -152.42 | 0.56 |
| 4968.00 | 1.23 | 106.19 | 4953.75 | 104.32 S | 150.77 W | -151.19 | 0.93 |
| 5063.00 | 0.71 | 101.66 | 5048.74 | 104.72 S | 149.22 W | -149.64 | 0.55 |
| 5158.00 | 0.76 | 112.35 | 5143.73 | 105.08 S | 148.06 W | -148.48 | 0.15 |
| 5253.00 | 1.18 | 79.78 | 5238.72 | 105.15 S | 146.51 W | -146.93 | 0.71 |
| 5347.00 | 0.18 | 57.60 | 5332.71 | 104.90 S | 145.44 W | -145.86 | 1.08 |
| 5442.00 | 1.08 | 108.39 | 5427.71 | 105.10 S | 144.46 W | -144.88 | 1.03 |
| 5537.00 | 0.68 | 126.14 | 5522.69 | 105.71 S | 143.15 W | -143.58 | 0.50 |
| 5632.00 | 0.34 | 117.32 | 5617.69 | 106.18 S | 142.45 W | -142.87 | 0.37 |
| 5726.00 | 0.67 | 108.13 | 5711.69 | 106.48 S | 141.68 W | -142.11 | 0.36 |
| 5783.00 | 0.80 | 76.46 | 5768.68 | 106.49 S | 140.98 W | -141.40 | 0.74 |
| 5847.00 | 0.46 | 70.05 | 5832.68 | 106.29 S | 140.30 W | -140.73 | 0.54 |
| 5915.00 | 3.91 | 71.34 | 5900.62 | 105.46 S | 137.85 W | -138.27 | 5.07 |
| 5963.00 | 11.20 | 75.54 | 5948.17 | 103.77 S | 131.77 W | -132.19 | 15.22 |
| 6010.00 | 13.38 | 80.35 | 5994.09 | 101.72 S | 121.99 W | -122.40 | 5.12 |
| 6058.00 | 14.64 | 85.07 | 6040.66 | 100.26 S | 110.47 W | -110.87 | 3.54 |
| 6105.00 | 17.77 | 85.64 | 6085.79 | 99.21 S | 97.40 W | -97.80 | 6.67 |
| 6153.00 | 19.50 | 88.48 | 6131.27 | 98.44 S | 82.09 W | -82.48 | 4.07 |
| 6199.00 | 21.74 | 87.00 | 6174.32 | 97.79 S | 65.90 W | -66.29 | 5.00 |
| 6247.00 | 25.48 | 85.15 | 6218.30 | 96.45 S | 46.73 W | -47.12 | 7.94 |
| 6294.00 | 30.15 | 88.14 | 6259.86 | 95.21 S | 24.85 W | -25.23 | 10.37 |
| 6342.00 | 34.94 | 91.24 | 6300.31 | 95.12 S | 0.96 E | 0.58 | 10.56 |
| 6389.00 | 38.46 | 93.02 | 6337.99 | 96.18 S | 29.02 E | 28.64 | 7.82 |
| 6437.00 | 43.44 | 92.70 | 6374.23 | 97.74 S | 60.43 E | 60.04 | 10.38 |
| 6484.00 | 46.75 | 90.72 | 6407.41 | 98.72 S | 93.70 E | 93.30 | 7.65 |
| 6532.00 | 49.48 | 89.03 | 6439.46 | 98.63 S | 129.43 E | 129.03 | 6.26 |
| 6579.00 | 52.96 | 89.09 | 6468.89 | 98.03 S | 166.06 E | 165.66 | 7.40 |
| 6627.00 | 57.98 | 88.49 | 6496.09 | 97.19 S | 205.58 E | 205.19 | 10.51 |
| 6674.00 | 62.45 | 87.67 | 6519.43 | 95.82 S | 246.34 E | 245.95 | 9.63 |
| 6722.00 | 65.25 | 87.58 | 6540.58 | 94.03 S | 289.38 E | 289.00 | 5.84 |

| | | | | | | | |
|----------------|--------------|--------------|----------------|----------------|-----------------|---------------|--------------|
| 6768.00 | 71.09 | 88.42 | 6557.68 | 92.55 S | 332.04 E | 331.67 | 12.81 |
| 6816.00 | 73.74 | 89.82 | 6572.18 | 91.85 S | 377.79 E | 377.41 | 6.18 |
| 6863.00 | 77.20 | 89.58 | 6583.97 | 91.61 S | 423.27 E | 422.90 | 7.38 |
| 6926.00 | 83.85 | 88.55 | 6594.34 | 90.59 S | 485.37 E | 485.00 | 10.68 |

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 89.77 DEGREES (GRID)
A TOTAL CORRECTION OF 7.63 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6926.00 FEET
IS 493.75 FEET ALONG 100.57 DEGREES (GRID)**

First three survey's are from 3rd party source (Muulti Shot EMS) and provided by CO-man on location before drilling.

Depth 356 Inc 0.80 Azi 324.63

Depth 663 Inc 0.60 Azi 302.03

Depth 966 Inc 0.60 Azi 65.73

Tied in @ Surface

Magnettic direction of 7.631 has been added to AZI for grid direction correction.

Date Printed:11 October 2013