



| WELL INFORMATION | | | | | |
|----------------------------------|------------------|------------------|--|--|--|
| MWD Run Number | 100 | 200 | | | |
| Date run completed | 15-Sep-13 | 16-Sep-13 | | | |
| Rig Bit Number | 2 | 3 | | | |
| Bit Size (in) | 8.750 | 8.750 | | | |
| Tool Nominal OD (in) | 6.750 | 6.750 | | | |
| Log Start Depth (TVD, ft) | 980.99 | 5,833.22 | | | |
| Log End Depth (TVD, ft) | 5,833.22 | 6,520.62 | | | |
| Drill or Wipe | Drill | Drill | | | |
| Drill/Wipe Start Date and Time | 14-Sep-13 03:00 | 15-Sep-13 07:00 | | | |
| Drill/Wipe End Date and Time | 14-Sep-13 23:00 | 15-Sep-13 22:30 | | | |
| Min Inc (deg) @ Depth (TVD, ft) | 0 @ 650.00 | 7.81 @ 5,840.15 | | | |
| Max Inc (deg) @ Depth (TVD, ft) | 16.97 @ 3,873.72 | 85.56 @ 6,516.97 | | | |
| Bit TFA(in2) / Bit Type | .86 / PDC | 1.24 / PDC | | | |
| Flow Rate (gpm) | 600.00 | 598.21 | | | |
| Max AV (fpm) / CV (fpm) @ MWD | NA / NA | NA / NA | | | |
| Fluid Type | Fresh Water Gel | Fresh Water Gel | | | |
| Density (ppg) / Viscosity (spqt) | 9.30 / 27.00 | 9.30 / 33.00 | | | |
| Filtrate CL (ppm) | 2,200.00 | 2,200.00 | | | |
| pH / Fluid Loss (mptm) | 9.70 / 70 | 9.10 / 71 | | | |
| PV (cP) / YP (lbf2) | 3 / 3.00 | 10 / 8.00 | | | |
| % Solids / % Sand | 3 / 0.2 | 2 / 0.2 | | | |
| % Oil / Oil:Water Ratio | 0 / 0:95 | 0 / 0:95 | | | |
| Rm @ Measured Temp (degF) | NA @ NA | NA @ NA | | | |
| Rmf @ Measured Temp (degF) | NA @ NA | NA @ NA | | | |
| Rmc @ Measured Temp (degF) | NA @ NA | NA @ NA | | | |
| Max Tool Temp (deg F) / S | 127.07 / PDM | 127.07 / PDM | | | |

| | | | | | |
|-------------------------------|--------------|--------------|--|--|--|
| Max Tool Temp (degF) / Source | 167.97 / PCM | 167.97 / PCM | | | |
| Rm @ Max Tool Temp (degF) | NA @ NA | NA @ NA | | | |
| Lead MWD Engineer | Gary Eifert | Gary Eifert | | | |
| Customer Representative | Matt Settles | Matt Settles | | | |

SENSOR INFORMATION

Downhole Processor Information

| | | | | | |
|---------------------------|-----------------|-----------------|--|--|--|
| Tool Type | PCM | PCM | | | |
| Software Version | 5.84 | 5.84 | | | |
| Sub Serial Number | 11341325 | 11341325 | | | |
| Insert Serial Number | 11400826 | 11400826 | | | |
| Date and Time Initialized | 13-Sep-13 10:09 | 13-Sep-13 10:09 | | | |
| Date and Time Read | 16-Sep-13 02:51 | 16-Sep-13 02:57 | | | |
| ECMB SW Version | N/A | N/A | | | |

Directional Sensor Information

| | | | | | |
|------------------------|----------|----------|--|--|--|
| Tool Type | PCDC | PCDC | | | |
| Distance From Bit (ft) | 55.00 | 53.00 | | | |
| Software Version | 6.21 | 6.21 | | | |
| Sub Serial Number | 11341325 | 11341325 | | | |
| Sonde Serial Number | 11145627 | 11145627 | | | |
| Sensor ID Number | N/A | N/A | | | |
| Toolface Offset (deg) | 120.74 | 147.08 | | | |

Gamma Ray Sensor Information

| | | | | | |
|------------------------------|----------|----------|--|--|--|
| Tool Type | PCG | PCG | | | |
| Distance From Bit (ft) | 49.82 | 46.72 | | | |
| Recorded Sample Period (sec) | 10 | 10 | | | |
| Software Version | 8.15 | 8.15 | | | |
| Sub Serial Number | 11341325 | 11341325 | | | |
| Insert/Sonde Serial Number | 11293298 | 11293298 | | | |

REMARKS

1. All depths are true vertical bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham 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:
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
6. INSITE version 7.3.40

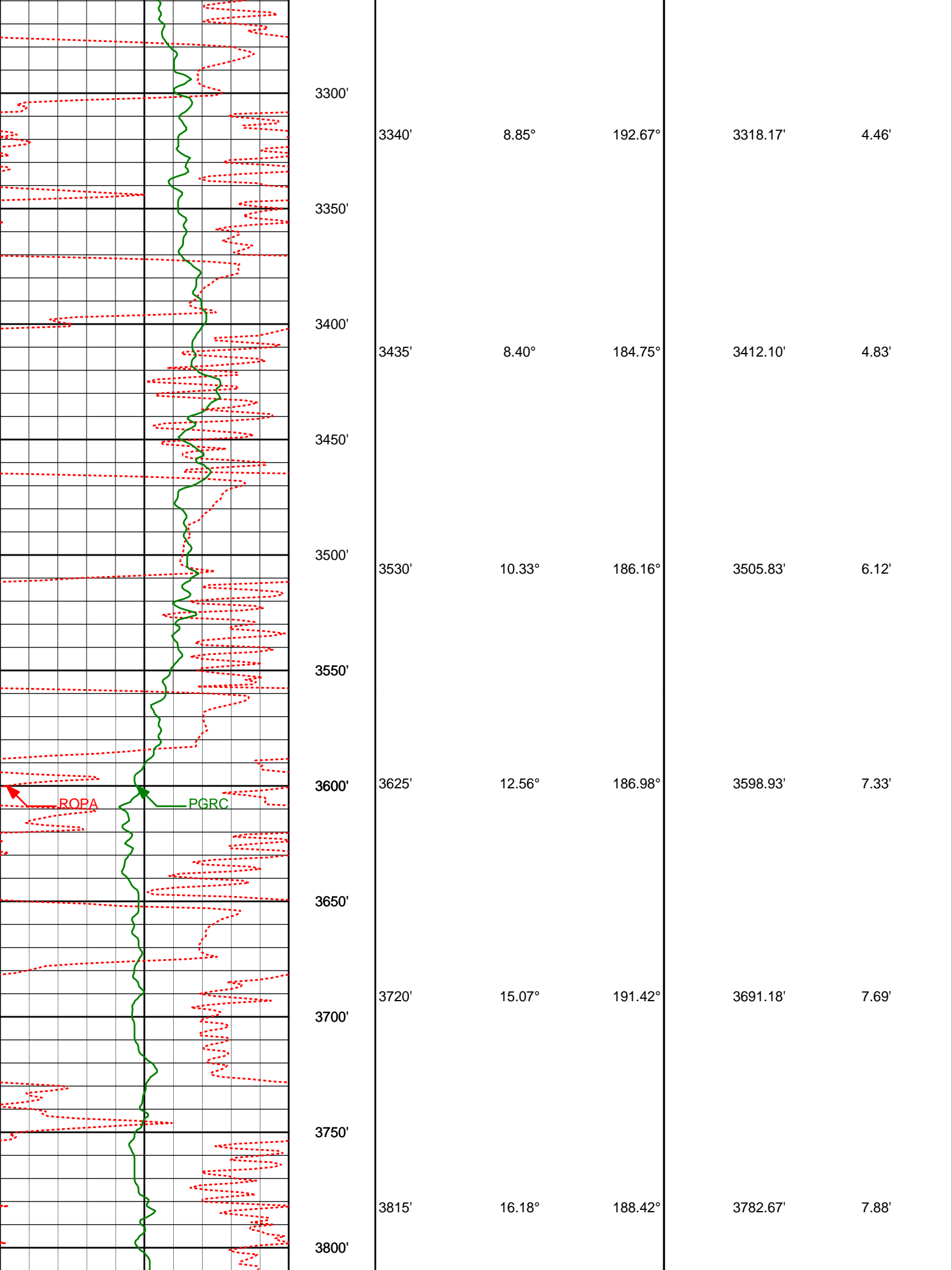
WARRANTY

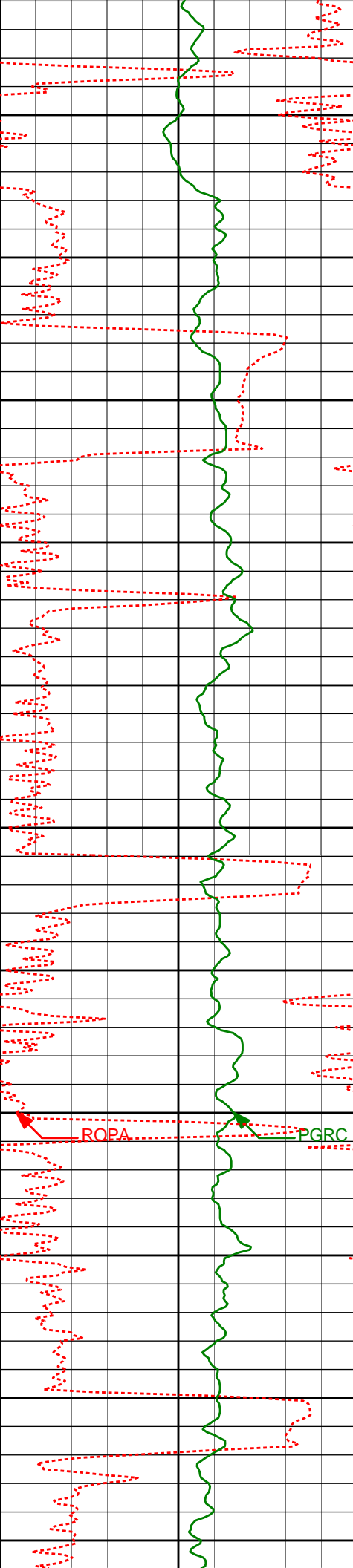
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HALLIBURTON

TVD Main Log 1:600







3850'

3910'

3900'

3950'

4005'

4000'

4050'

4100'

4100'

4150'

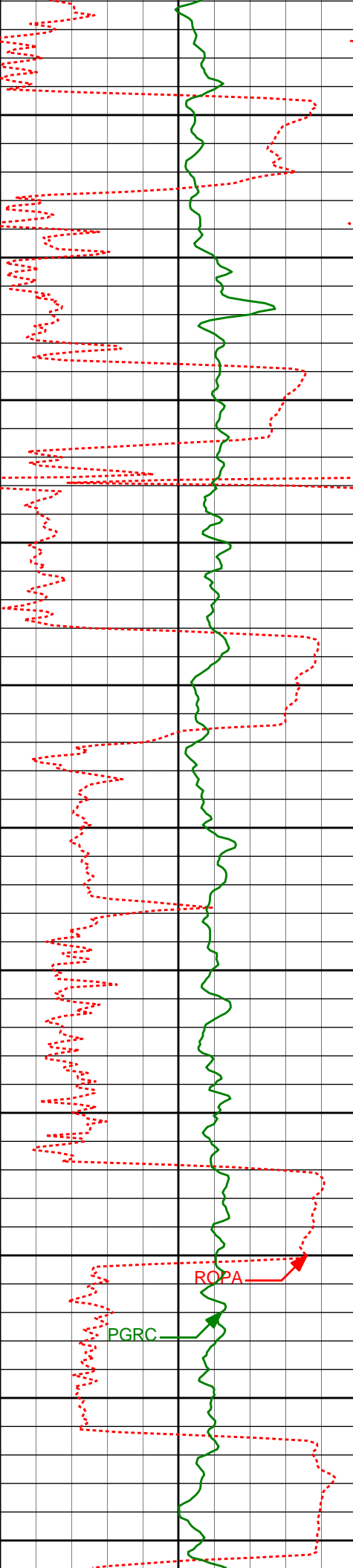
4200'

4250'

4300'

4350'

| | | | | |
|-------|--------|---------|----------|--------|
| 3910' | 16.97° | 190.17° | 3873.72' | 8.35' |
| 4005' | 14.13° | 198.82° | 3965.25' | 6.66' |
| 4100' | 12.20° | 204.87° | 4057.75' | 2.42' |
| 4195' | 9.81° | 205.03° | 4151.00' | -2.17' |
| 4290' | 6.94° | 210.09° | 4244.98' | -6.17' |
| 4385' | 6.37° | 205.57° | 4339.34' | -9.50' |



4400'

4480'

7.16°

196.35°

4433.68'

-11.51'

4450'

4500'

4575'

7.02°

195.59°

4527.95'

-12.67'

4550'

4600'

4669'

8.00°

184.17°

4621.15'

-12.50'

4650'

4700'

4764'

6.87°

185.58°

4715.35'

-11.33'

4750'

4800'

4858'

7.56°

186.41°

4808.60'

-10.45'

4850'

4900'

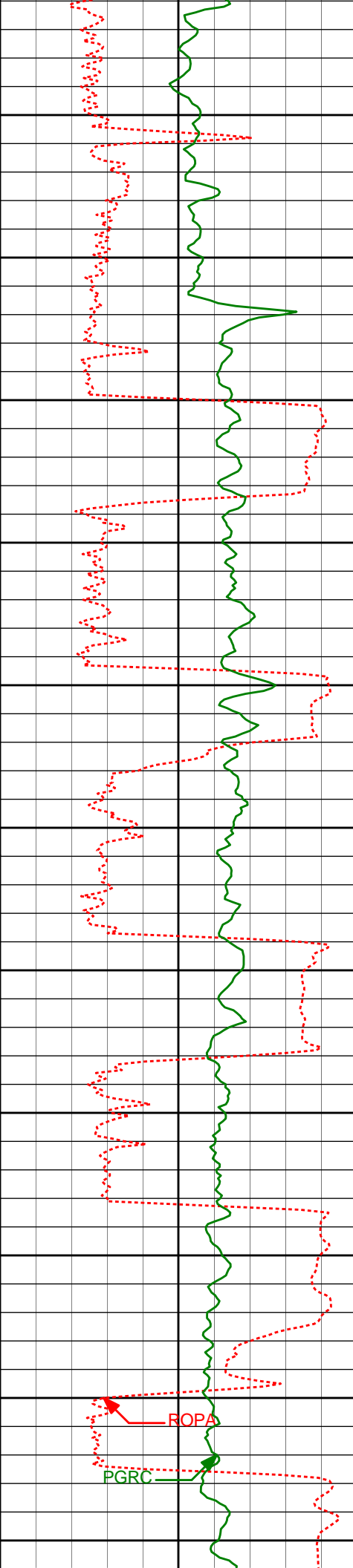
4953'

9.24°

188.29°

4902.58'

-9.76'



4950'

5000'

5050'

5100'

5150'

5200'

5250'

5300'

5350'

5400'

5450'

5048'

8.39°

186.42°

4996.46'

-9.02'

5143'

7.40°

186.26°

5090.56'

-8.12'

5238'

6.26°

178.21°

5184.88'

-6.60'

5333'

7.05°

174.32°

5279.24'

-3.91'

5428'

9.17°

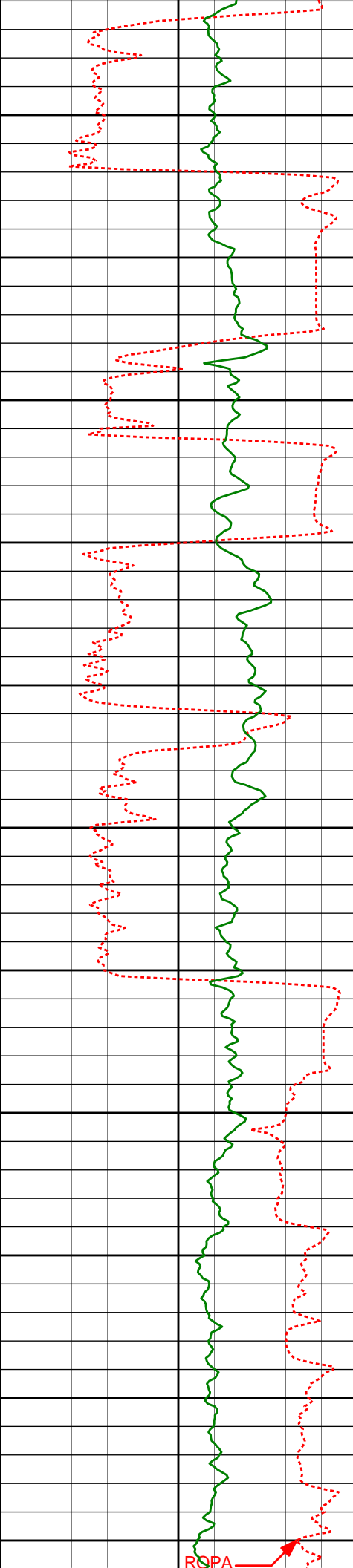
183.49°

5373.29'

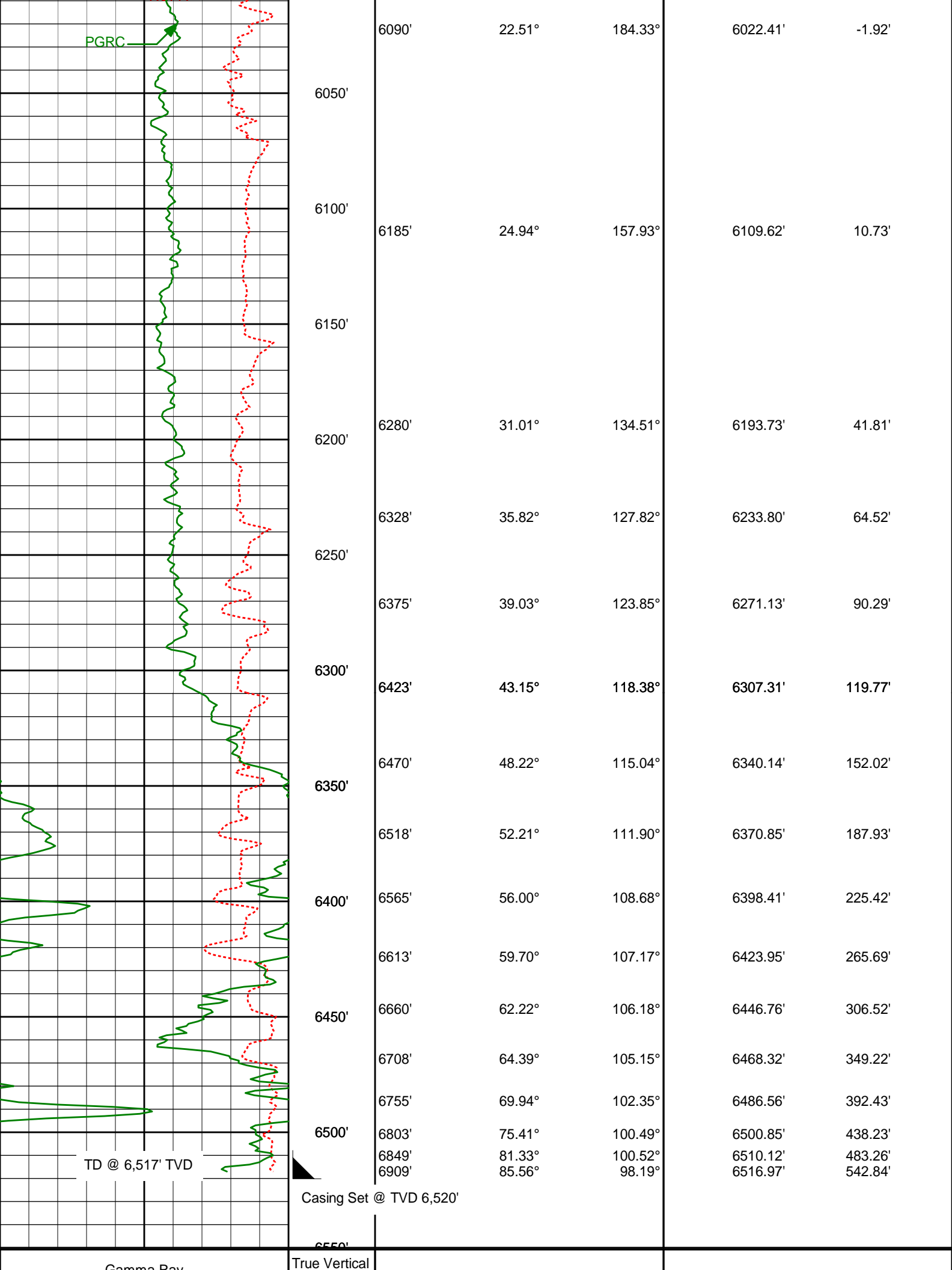
-1.41'

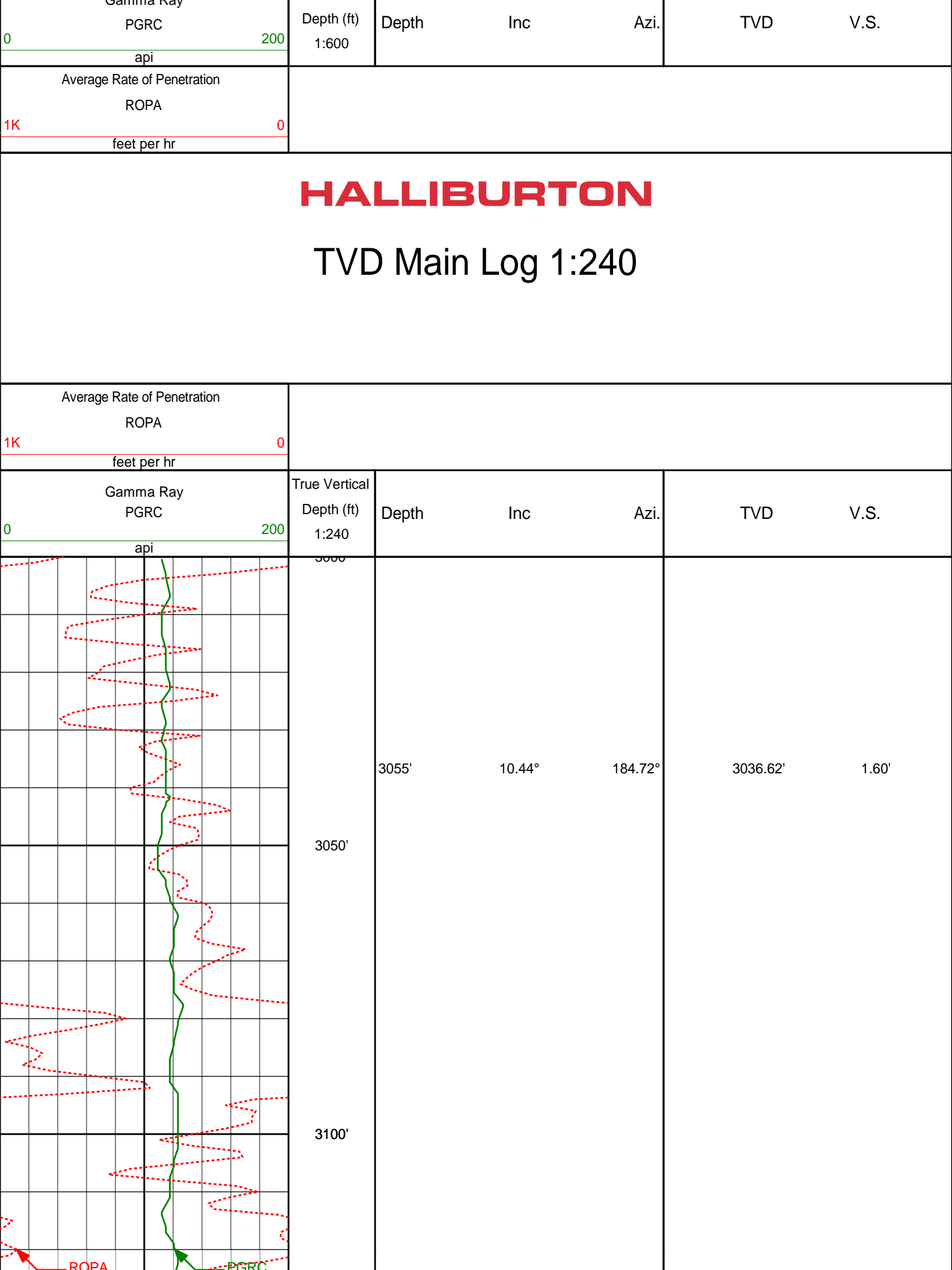
ROPA

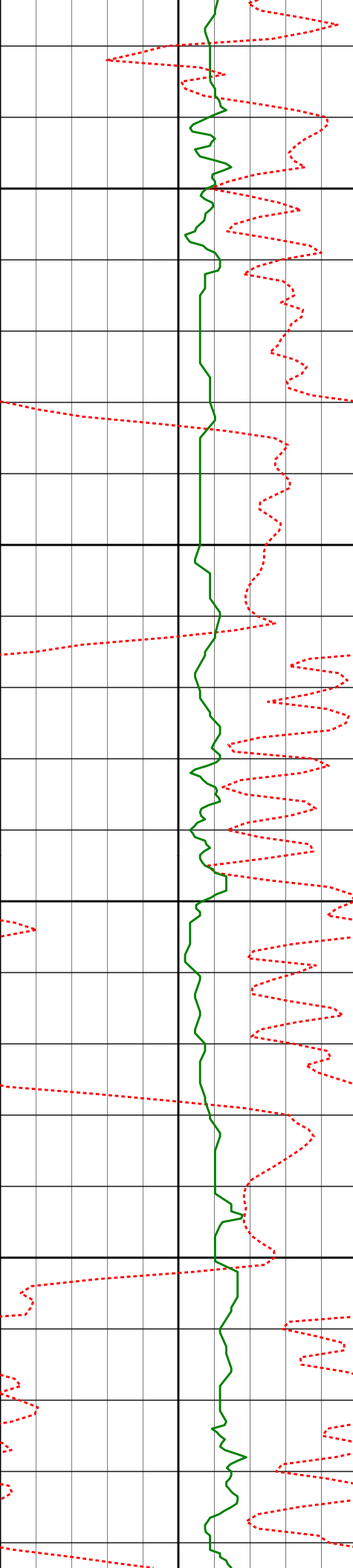
PGRC



| | | | | | |
|-----------|-------|--------|---------|----------|--------|
| | 5523' | 9.50° | 187.53° | 5467.03' | -0.13' |
| 5500' | | | | | |
| | | | | | |
| 5550' | | | | | |
| | 5619' | 9.01° | 189.26° | 5561.78' | 0.39' |
| 5600' | | | | | |
| | | | | | |
| 5650' | | | | | |
| | 5713' | 9.33° | 188.70° | 5654.58' | 0.73' |
| 5700' | | | | | |
| | | | | | |
| 5750' | 5808' | 6.15° | 185.89° | 5748.71' | 1.34' |
| | | | | | |
| | 5840' | 5.25° | 185.86° | 5780.55' | 1.58' |
| 5800' | | | | | |
| | | | | | |
| <Run 200> | | | | | |
| 5850' | 5900' | 7.81° | 194.20° | 5840.15' | 1.52' |
| | | | | | |
| | | | | | |
| | 5948' | 12.97° | 204.20° | 5887.36' | 0.00' |
| 5900' | | | | | |
| | | | | | |
| | 5995' | 16.35° | 197.62° | 5932.82' | -2.11' |
| 5950' | | | | | |
| | | | | | |
| 6000' | | | | | |







3150'

3200'

3250'

3300'

3150'

8.30°

183.86°

3130.35'

3.20'

3245'

8.79°

187.17°

3224.29'

4.37'

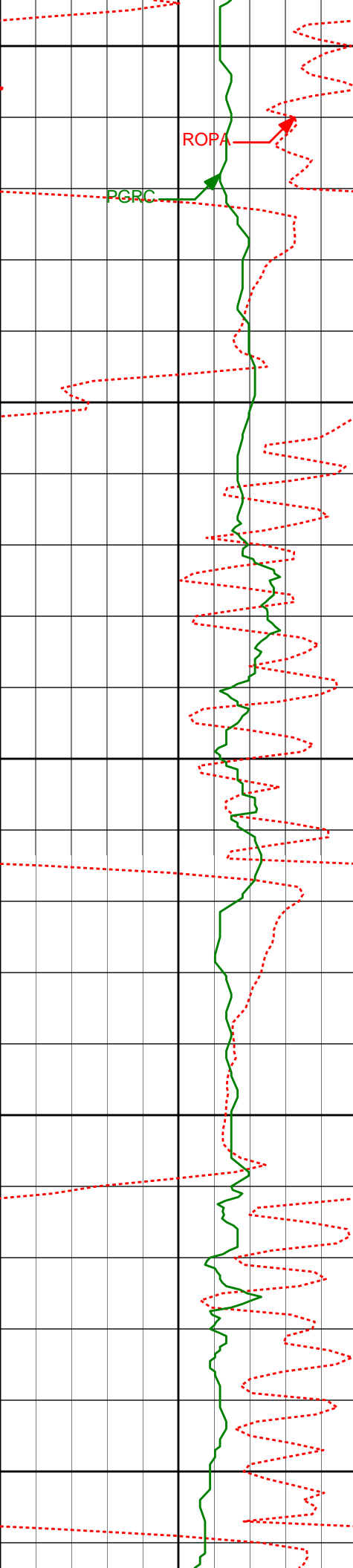
3340'

8.85°

192.67°

3318.17'

4.46'



3350'

ROPA

PGRC

3400'

3435'

8.40°

184.75°

3412.10'

4.83'

3450'

3500'

3530'

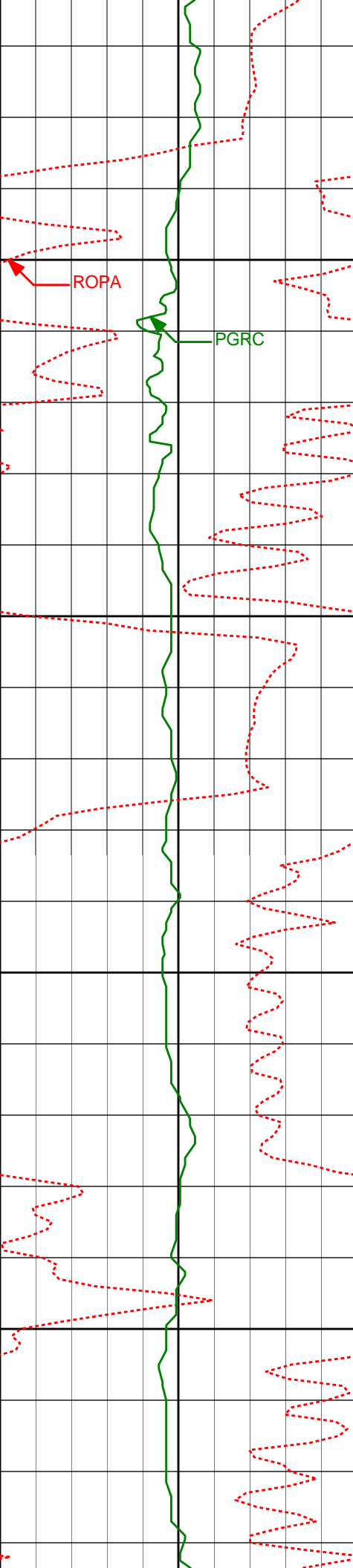
10.33°

186.16°

3505.83'

6.12'

3550'



3600'

3650'

3700'

3750'

3625'

3720'

3815'

12.56°

15.07°

16.18°

186.98°

191.42°

188.42°

3598.93'

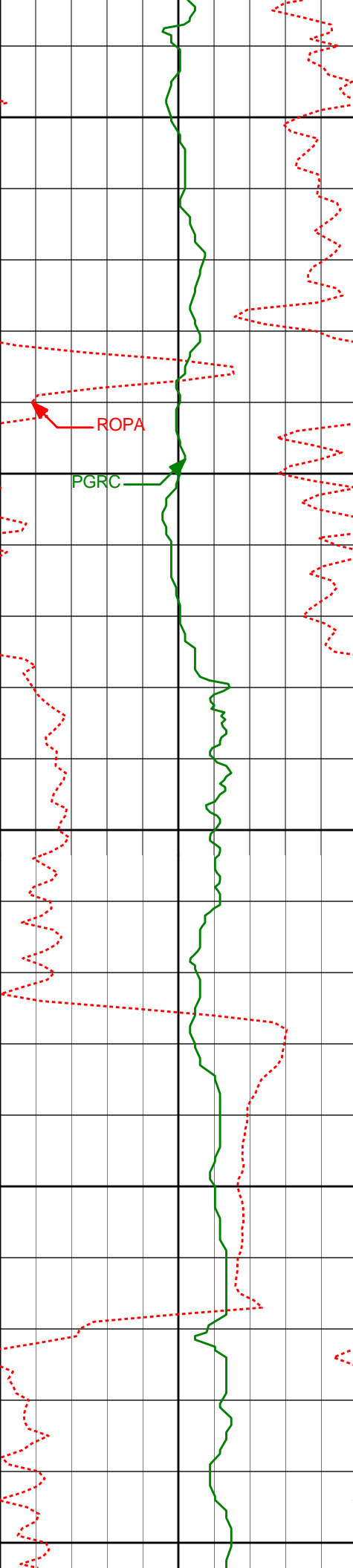
3691.18'

3782.67'

7.33'

7.69'

7.88'



3800'

3850'

3900'

3950'

4000'

3910'

16.97°

190.17°

3873.72'

8.35'

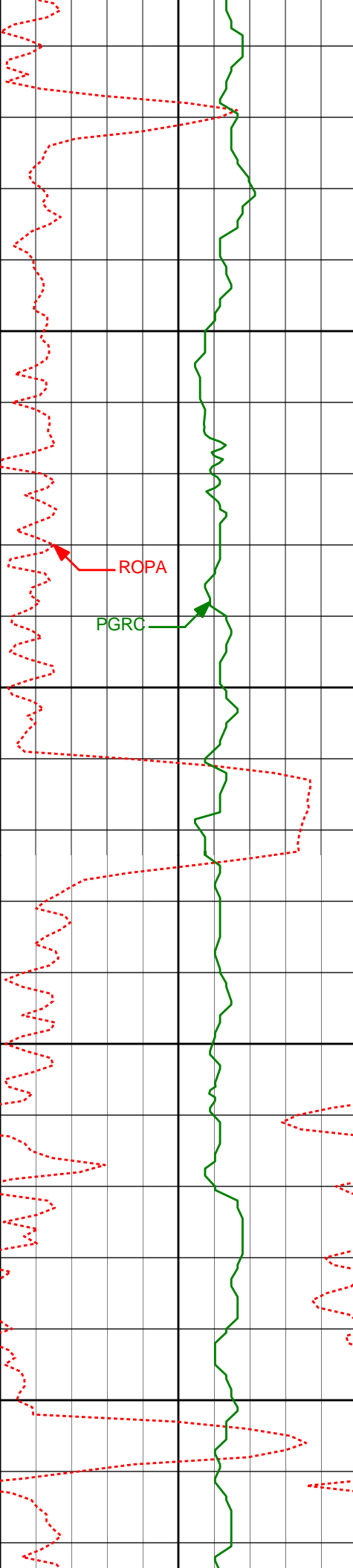
4005'

14.13°

198.82°

3965.25'

6.66'



4050'

4100'

12.20°

204.87°

4057.75'

2.42'

4100'

4150'

4195'

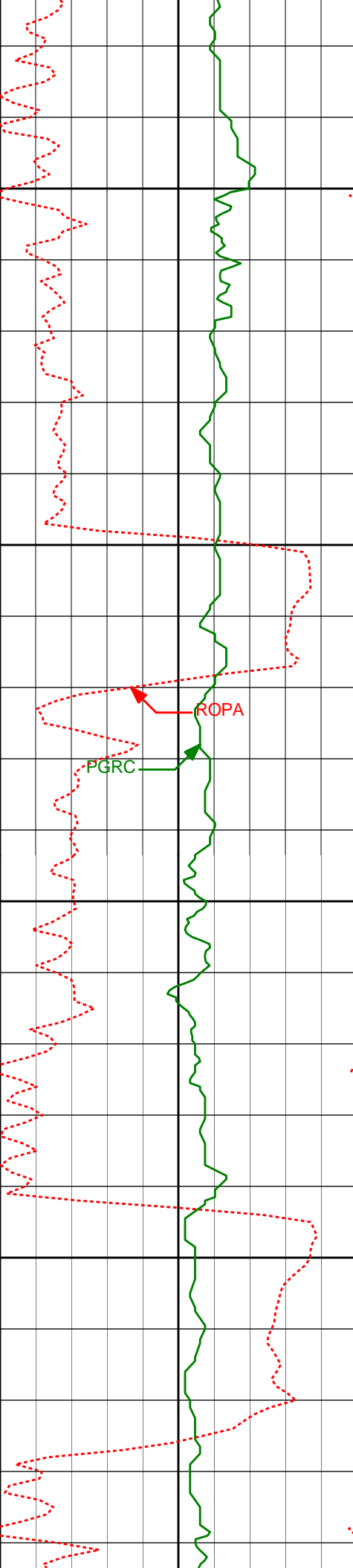
9.81°

205.03°

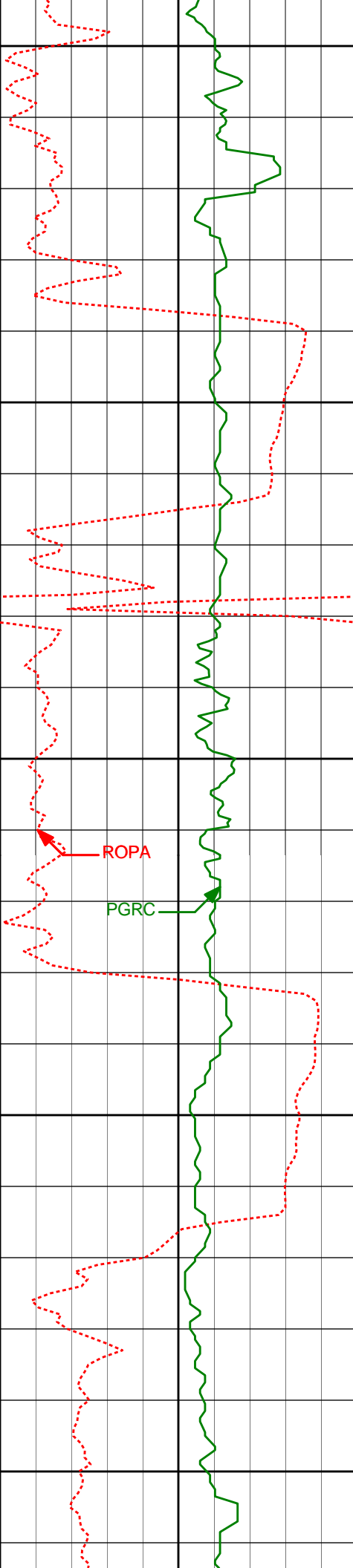
4151.00'

-2.17'

4200'



| | | | | |
|-------|-------|---------|----------|---------|
| 4290' | 6.94° | 210.09° | 4244.98' | -6.17' |
| 4250' | | | | |
| | | | | |
| | | | | |
| | | | | |
| 4300' | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 4385' | 6.37° | 205.57° | 4339.34' | -9.50' |
| 4350' | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 4400' | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 4480' | 7.16° | 196.35° | 4433.68' | -11.51' |



4450'

4500'

4575'

4550'

4600'

4650'

7.02°

195.59°

4527.95'

-12.67'

ROPA

PGRC

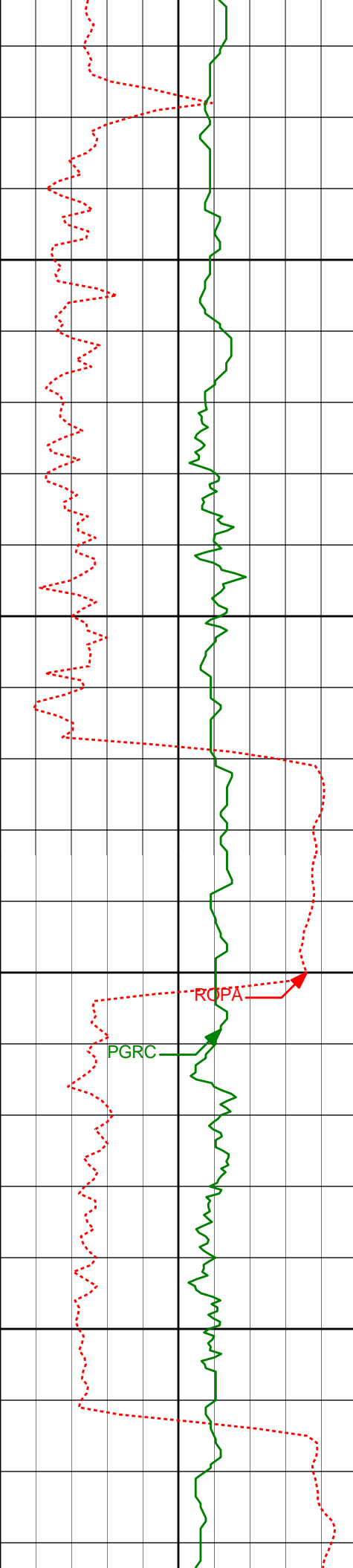
4669'

8.00°

184.17°

4621.15'

-12.50'



4700'

4750'

4800'

4850'

4764'

6.87°

185.58°

4715.35'

-11.33'

4858'

7.56°

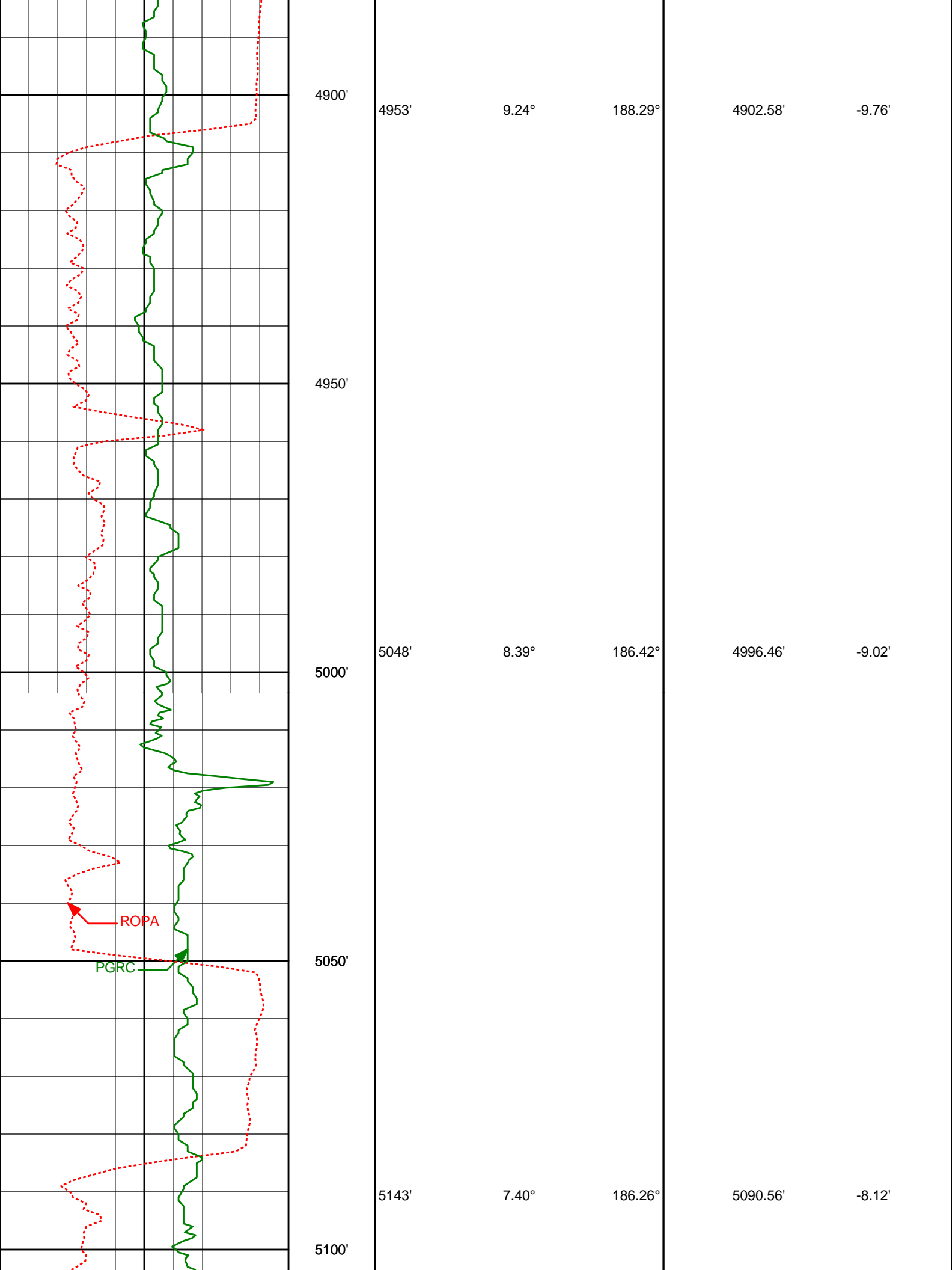
186.41°

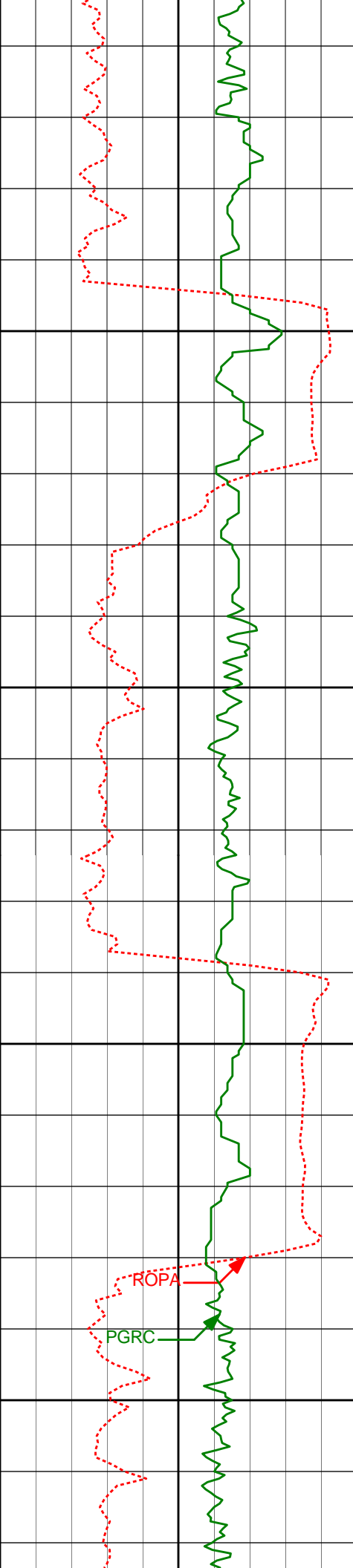
4808.60'

-10.45'

PGRC

ROPA





5150'

5238'

6.26°

178.21°

5184.88'

-6.60'

5200'

5250'

5333'

7.05°

174.32°

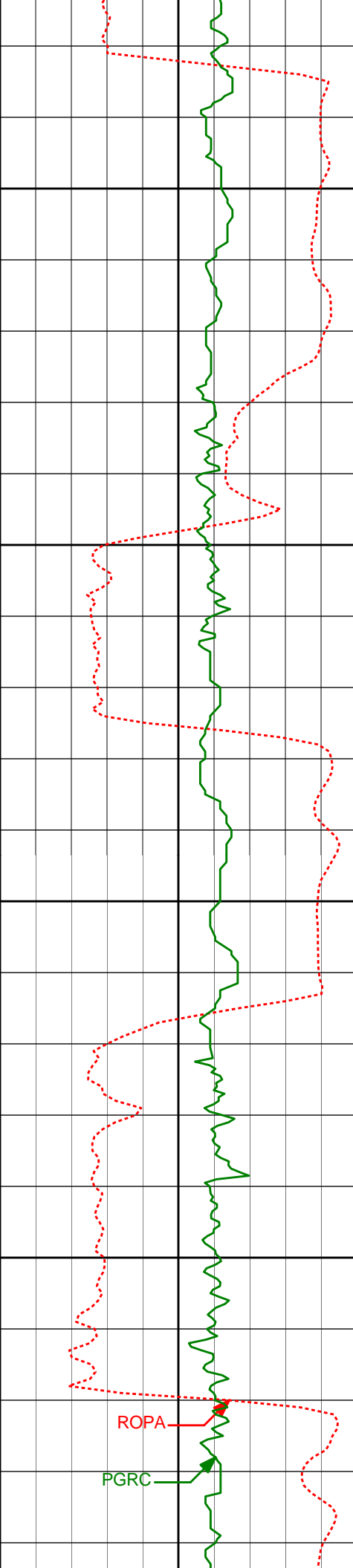
5279.24'

-3.91'

5300'

RÖPA

PGRC



5350'

5428'

9.17°

183.49°

5373.29'

-1.41'

5400'

5450'

5523'

9.50°

187.53°

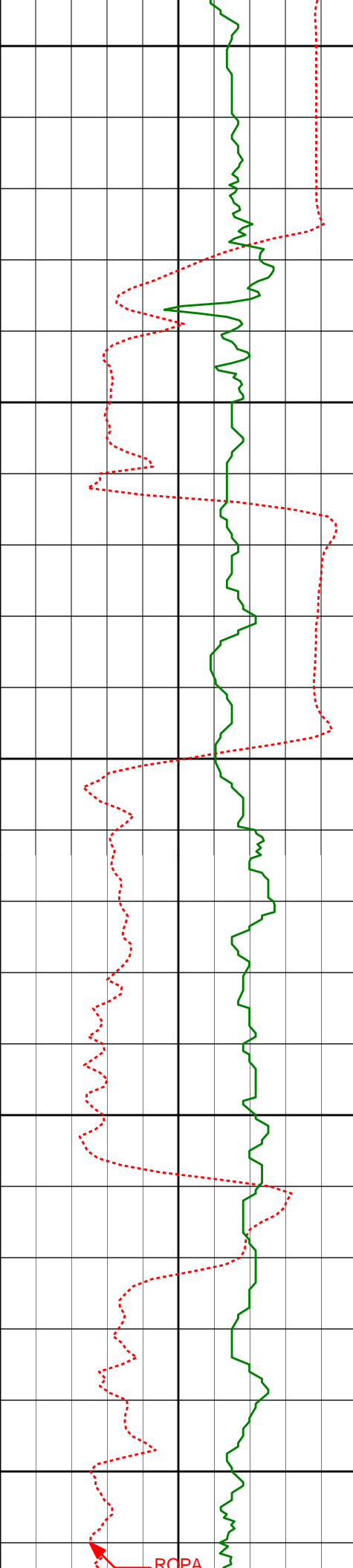
5467.03'

-0.13'

5500'

ROPA

PGRC



5550'

5619'

9.01°

189.26°

5561.78'

0.39'

5600'

5650'

5713'

9.33°

188.70°

5654.58'

0.73'

5700'

5750'

5808'

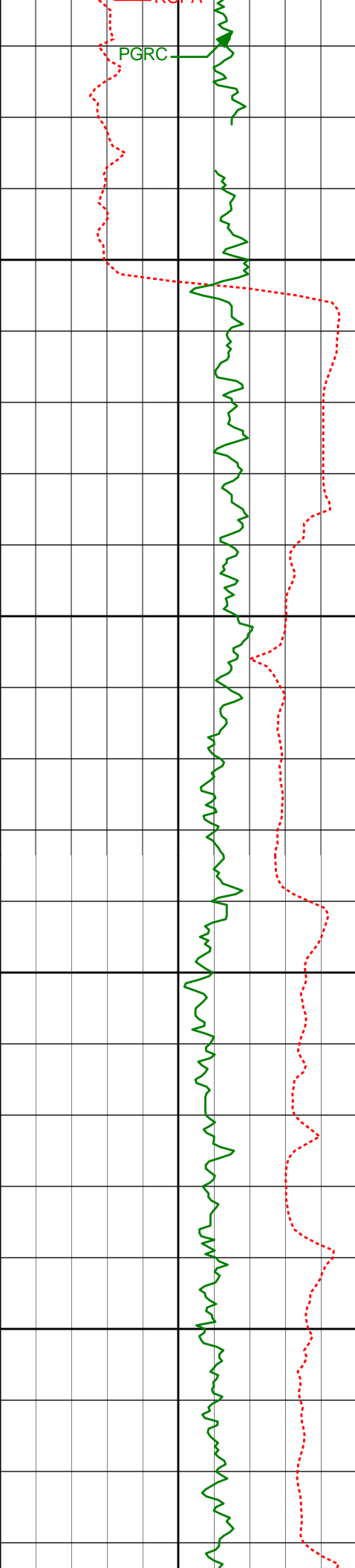
6.15°

185.89°

5748.71'

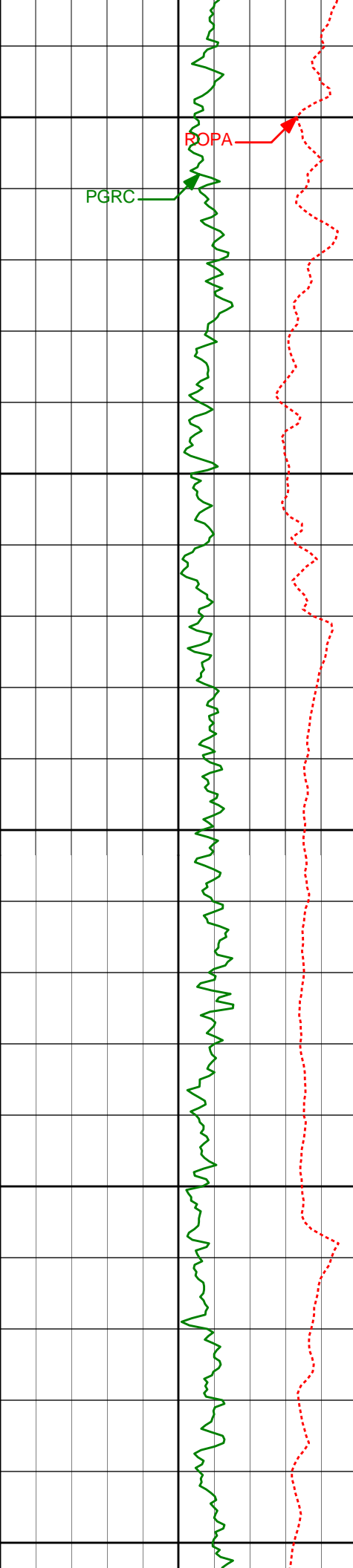
1.34'

RCPA



<Run 200>

| | | | | |
|-------|--------|---------|----------|--------|
| 5840' | 5.25° | 185.86° | 5780.55' | 1.58' |
| 5900' | 7.81° | 194.20° | 5840.15' | 1.52' |
| 5948' | 12.97° | 204.20° | 5887.36' | 0.00' |
| 5995' | 16.35° | 197.62° | 5932.82' | -2.11' |



6000'

6050'

6100'

6150'

6200'

6090'

22.51°

184.33°

6022.41'

-1.92'

6185'

24.94°

157.93°

6109.62'

10.73'

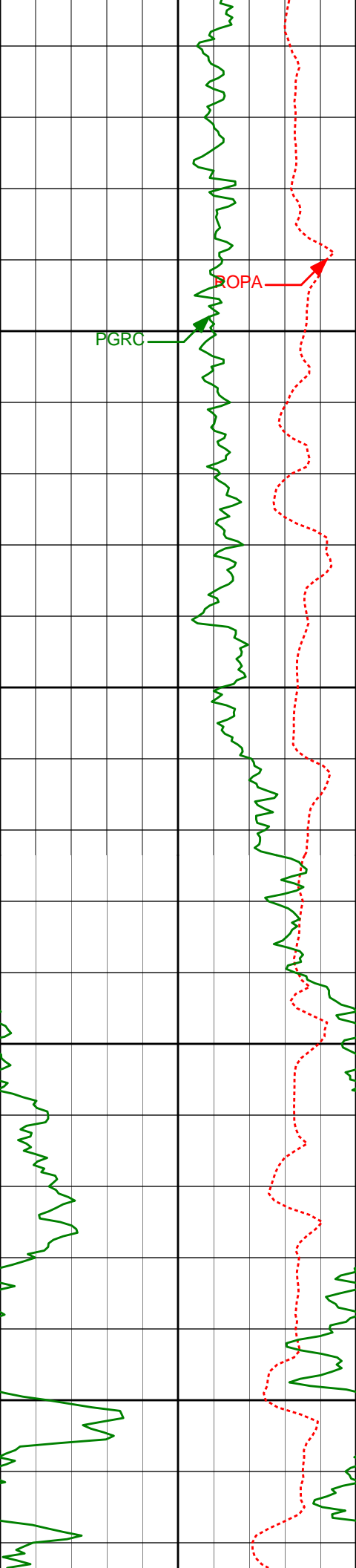
6280'

31.01°

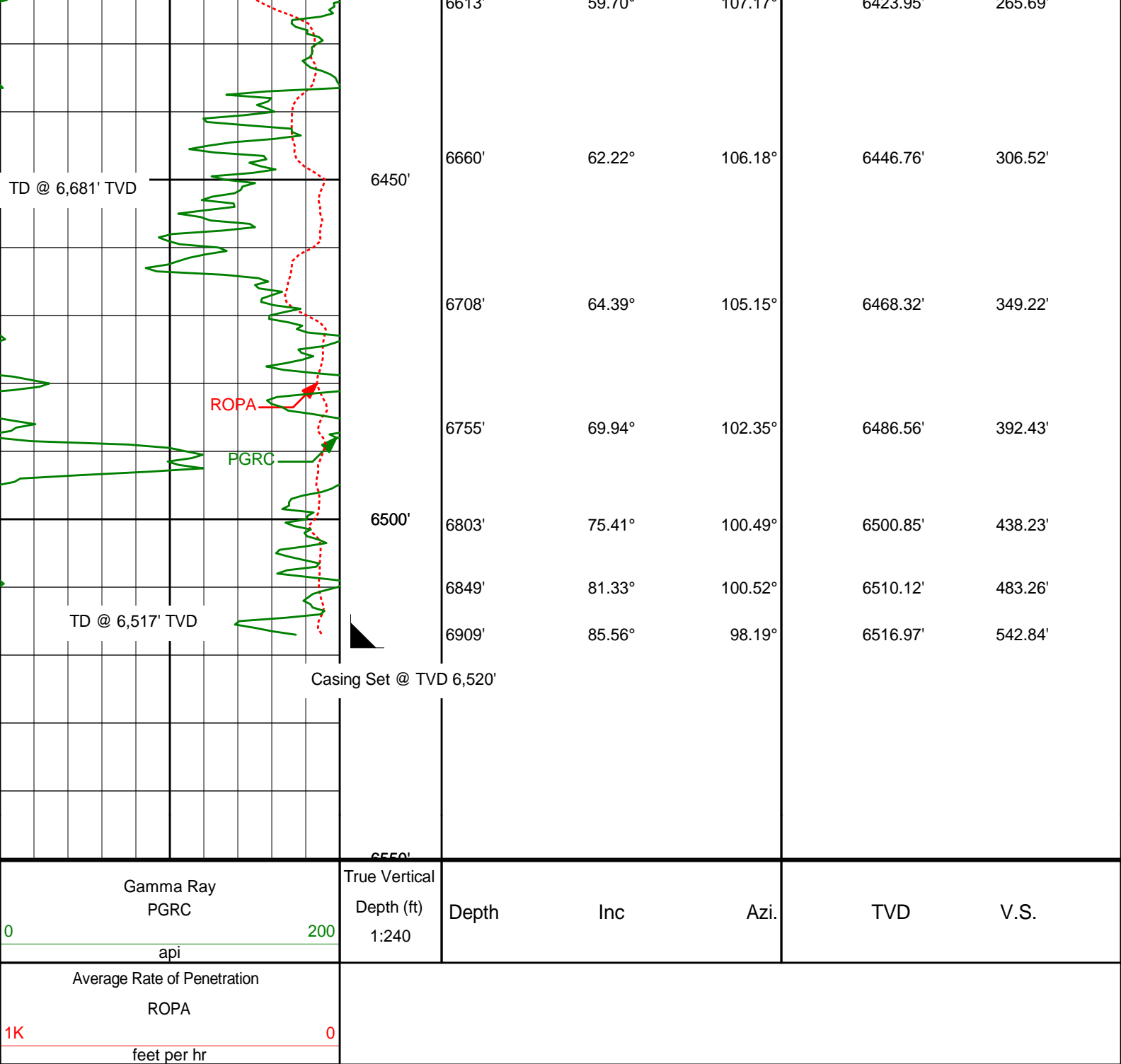
134.51°

6193.73'

41.81'



| | | | | |
|-------|--------|---------|----------|---------|
| 6328' | 35.82° | 127.82° | 6233.80' | 64.52' |
| 6250' | | | | |
| 6375' | 39.03° | 123.85° | 6271.13' | 90.29' |
| 6300' | | | | |
| 6423' | 43.15° | 118.38° | 6307.31' | 119.77' |
| 6470' | 48.22° | 115.04° | 6340.14' | 152.02' |
| 6350' | | | | |
| 6518' | 52.21° | 111.90° | 6370.85' | 187.93' |
| 6400' | | | | |
| 6565' | 56.00° | 108.68° | 6398.41' | 225.42' |



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch USX AA13-65HN
Wattenberg
Weld Colorado
USA

CA-XX-0900630177

Surveys are tied into three non-Haliburton surveys at MD 368', 650' and 970' taken while drilling the surface hole. Final survey is a straight-line projection to bit.

| 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 |

| | | | | | | | |
|---------|--------|--------|---------|-----------|-----------|---------|--------|
| 367.00 | 0.30 | 241.57 | 367.00 | 0.46 S | 0.84 W | 0.74 | 0.08 |
| 615.00 | 0.50 | 274.57 | 614.99 | 0.68 S | 2.49 W | 2.31 | 0.12 |
| 717.00 | 0.30 | 319.52 | 716.99 | 0.44 S | 3.11 W | 2.96 | 0.35 |
| 809.00 | 0.33 | 297.98 | 808.99 | 0.13 S | 3.50 W | 3.41 | 0.13 |
| 903.00 | 0.27 | 338.50 | 902.99 | 0.20 N | 3.82 W | 3.79 | 0.23 |
| 996.00 | 0.35 | 294.31 | 995.99 | 0.52 N | 4.16 W | 4.18 | 0.26 |
| 1088.00 | 0.50 | 331.88 | 1087.98 | 0.99 N | 4.61 W | 4.71 | 0.34 |
| 1180.00 | 0.31 | 295.86 | 1179.98 | 1.45 N | 5.02 W | 5.21 | 0.34 |
| 1273.00 | 3.19 | 340.66 | 1272.93 | 4.00 N | 6.10 W | 6.77 | 3.20 |
| 1365.00 | 5.33 | 347.19 | 1364.67 | 10.59 N | 7.90 W | 9.83 | 2.38 |
| 1457.00 | 7.88 | 351.82 | 1456.05 | 21.00 N | 9.74 W | 13.70 | 2.83 |
| 1549.00 | 9.96 | 353.21 | 1546.94 | 35.14 N | 11.58 W | 18.29 | 2.27 |
| 1642.00 | 11.47 | 352.45 | 1638.31 | 52.30 N | 13.75 W | 23.80 | 1.63 |
| 1735.00 | 12.59 | 349.29 | 1729.27 | 71.42 N | 16.85 W | 30.62 | 1.40 |
| 1827.00 | 11.79 | 350.03 | 1819.19 | 90.53 N | 20.34 W | 37.82 | 0.89 |
| 1917.00 | 10.41 | 347.35 | 1907.51 | 107.52 N | 23.71 W | 44.48 | 1.64 |
| 2012.00 | 11.98 | 352.71 | 2000.70 | 125.68 N | 26.84 W | 51.13 | 1.98 |
| 2107.00 | 10.49 | 349.07 | 2093.88 | 143.95 N | 29.73 W | 57.57 | 1.74 |
| 2202.00 | 12.48 | 349.68 | 2186.97 | 162.54 N | 33.21 W | 64.66 | 2.10 |
| 2297.00 | 11.72 | 347.70 | 2279.86 | 182.07 N | 37.11 W | 72.33 | 0.91 |
| 2392.00 | 11.04 | 346.09 | 2372.99 | 200.32 N | 41.35 W | 80.09 | 0.79 |
| 2487.00 | 11.56 | 342.70 | 2466.15 | 218.24 N | 46.37 W | 88.55 | 0.89 |
| 2582.00 | 12.68 | 346.82 | 2559.03 | 237.48 N | 51.57 W | 97.46 | 1.49 |
| 2677.00 | 13.03 | 352.02 | 2651.66 | 258.24 N | 55.44 W | 105.34 | 1.27 |
| 2772.00 | 12.36 | 351.27 | 2744.33 | 278.90 N | 58.47 W | 112.39 | 0.73 |
| 2867.00 | 11.59 | 350.09 | 2837.27 | 298.35 N | 61.65 W | 119.36 | 0.85 |
| 2962.00 | 12.23 | 353.18 | 2930.22 | 317.74 N | 64.49 W | 125.97 | 0.95 |
| 3057.00 | 12.53 | 353.65 | 3023.01 | 337.97 N | 66.83 W | 132.25 | 0.33 |
| 3152.00 | 12.94 | 353.90 | 3115.68 | 358.79 N | 69.10 W | 138.59 | 0.44 |
| 3247.00 | 12.06 | 353.36 | 3208.42 | 379.23 N | 71.37 W | 144.86 | 0.93 |
| 3341.00 | 11.29 | 353.32 | 3300.48 | 398.12 N | 73.58 W | 150.75 | 0.82 |
| 3436.00 | 9.53 | 349.79 | 3393.91 | 415.10 N | 76.06 W | 156.53 | 1.97 |
| 3531.00 | 9.51 | 350.84 | 3487.60 | 430.59 N | 78.70 W | 162.18 | 0.18 |
| 3626.00 | 10.73 | 351.19 | 3581.12 | 447.07 N | 81.30 W | 167.99 | 1.29 |
| 3721.00 | 12.25 | 349.47 | 3674.22 | 465.72 N | 84.50 W | 174.81 | 1.64 |
| 3816.00 | 13.00 | 351.41 | 3766.92 | 486.20 N | 87.94 W | 182.22 | 0.91 |
| 3911.00 | 14.00 | 352.04 | 3859.29 | 508.14 N | 91.12 W | 189.68 | 1.06 |
| 4006.00 | 14.89 | 354.57 | 3951.29 | 531.68 N | 93.87 W | 197.02 | 1.15 |
| 4101.00 | 13.74 | 351.91 | 4043.34 | 555.00 N | 96.61 W | 204.31 | 1.39 |
| 4196.00 | 13.65 | 349.68 | 4135.64 | 577.19 N | 100.21 W | 212.22 | 0.56 |
| 4290.00 | 10.30 | 344.24 | 4227.58 | 596.20 N | 104.48 W | 220.16 | 3.76 |
| 4385.00 | 8.97 | 345.11 | 4321.24 | 611.53 N | 108.69 W | 227.32 | 1.41 |
| 4480.00 | 10.26 | 343.15 | 4414.91 | 626.79 N | 113.05 W | 234.60 | 1.40 |
| 4575.00 | 10.07 | 350.52 | 4508.42 | 643.08 N | 116.87 W | 241.56 | 1.38 |
| 4670.00 | 9.45 | 347.60 | 4602.04 | 658.89 N | 119.91 W | 247.67 | 0.83 |
| 4765.00 | 8.14 | 344.66 | 4695.92 | 672.99 N | 123.36 W | 253.84 | 1.46 |
| 4860.00 | 9.19 | 351.21 | 4789.84 | 686.97 N | 126.30 W | 259.48 | 1.52 |
| 4955.00 | 10.00 | 358.80 | 4883.52 | 702.72 N | 127.63 W | 263.90 | 1.58 |
| 5050.00 | 10.42 | 353.58 | 4977.01 | 719.50 N | 128.77 W | 268.32 | 1.07 |
| 5145.00 | 12.12 | 358.93 | 5070.18 | 738.01 N | 129.91 W | 273.10 | 2.10 |
| 5239.00 | 9.25 | 354.64 | 5162.54 | 755.41 N | 130.80 W | 277.41 | 3.17 |
| 5334.00 | 9.92 | 356.22 | 5256.22 | 771.17 N | 132.06 W | 281.75 | 0.76 |
| 5429.00 | 9.51 | 1.78 | 5349.85 | 787.18 N | 132.35 W | 285.20 | 1.08 |
| 5524.00 | 9.96 | 358.83 | 5443.49 | 803.24 N | 132.28 W | 288.30 | 0.71 |
| 5619.00 | 10.03 | 358.08 | 5537.05 | 819.72 N | 132.72 W | 291.99 | 0.16 |
| 5714.00 | 10.81 | 355.03 | 5630.48 | 836.87 N | 133.77 W | 296.41 | 1.01 |
| 5809.00 | 11.29 | 348.19 | 5723.72 | 854.85 N | 136.45 W | 302.58 | 1.47 |
| 5904.00 | 11.53 | 344.23 | 5816.85 | 873.09 N | 140.93 W | 310.58 | 0.86 |
| 5999.00 | 12.01 | 346.17 | 5909.85 | 891.82 N | 145.87 W | 319.12 | 0.65 |
| 6091.00 | 12.11 | 347.41 | 5999.82 | 910.53 N | 150.26 W | 327.12 | 0.30 |
| 6139.00 | 14.61 | 345.53 | 6046.52 | 921.31 N | 152.88 W | 331.81 | 5.29 |
| 6186.00 | 17.08 | 339.82 | 6091.73 | 933.53 N | 156.74 W | 338.01 | 6.21 |
| 6234.00 | 18.72 | 334.80 | 6137.41 | 947.12 N | 162.45 W | 346.29 | 4.69 |
| 6281.00 | 20.41 | 329.61 | 6181.69 | 961.01 N | 169.81 W | 356.25 | 5.15 |
| 6329.00 | 22.91 | 314.52 | 6226.34 | 974.80 N | 180.71 W | 369.66 | 12.68 |
| 6376.00 | 26.35 | 301.83 | 6269.08 | 986.72 N | 196.11 W | 387.12 | 13.39 |
| 6424.00 | 30.04 | 291.04 | 6311.41 | 996.67 N | 216.40 W | 408.96 | 13.08 |
| 6471.00 | 33.12 | 283.83 | 6351.46 | 1003.96 N | 239.86 W | 433.41 | 10.36 |
| 6519.00 | 35.06 | 281.75 | 6391.21 | 1009.91 N | 266.10 W | 460.30 | 4.71 |
| 6565.00 | 38.11 | 281.53 | 6428.14 | 1015.44 N | 292.95 W | 487.71 | 6.64 |
| 6613.00 | 42.50 | 284.02 | 6464.74 | 1022.33 N | 323.21 W | 518.74 | 9.74 |
| 6661.00 | 48.01 | 285.51 | 6498.52 | 1031.03 N | 356.15 W | 552.75 | 11.69 |
| 6755.00 | 55.82 | 284.06 | 6556.46 | 1049.85 N | 427.64 W | 626.55 | 8.40 |
| 6803.00 | 62.93 | 283.86 | 6580.89 | 1059.81 N | 467.70 W | 667.79 | 14.82 |
| 6855.00 | 71.43 | 283.43 | 6723.66 | 1069.88 N | 508.43 W | 738.33 | 18.86 |
| 6907.00 | 80.41 | 283.00 | 6866.43 | 1079.95 N | 549.15 W | 818.96 | 22.90 |
| 6959.00 | 89.89 | 282.57 | 6909.20 | 1089.99 N | 589.87 W | 899.59 | 26.94 |
| 7011.00 | 99.87 | 282.14 | 6951.97 | 1099.99 N | 630.59 W | 980.21 | 30.98 |
| 7063.00 | 109.85 | 281.71 | 6994.74 | 1109.99 N | 671.31 W | 1060.83 | 35.02 |
| 7115.00 | 119.83 | 281.28 | 7037.51 | 1119.99 N | 712.03 W | 1141.45 | 39.06 |
| 7167.00 | 129.81 | 280.85 | 7080.28 | 1129.99 N | 752.75 W | 1222.07 | 43.10 |
| 7219.00 | 139.79 | 280.42 | 7123.05 | 1139.99 N | 793.47 W | 1302.69 | 47.14 |
| 7271.00 | 149.77 | 280.00 | 7165.82 | 1149.99 N | 834.19 W | 1383.31 | 51.18 |
| 7323.00 | 159.75 | 279.57 | 7208.59 | 1159.99 N | 874.91 W | 1463.93 | 55.22 |
| 7375.00 | 169.73 | 279.14 | 7251.36 | 1169.99 N | 915.63 W | 1544.55 | 59.26 |
| 7427.00 | 179.71 | 278.71 | 7294.13 | 1179.99 N | 956.35 W | 1625.17 | 63.30 |
| 7479.00 | 189.69 | 278.28 | 7336.90 | 1189.99 N | 997.07 W | 1705.79 | 67.34 |
| 7531.00 | 199.67 | 277.85 | 7379.67 | 1199.99 N | 1037.79 W | 1786.41 | 71.38 |
| 7583.00 | 209.65 | 277.42 | 7422.44 | 1209.99 N | 1078.51 W | 1867.03 | 75.42 |
| 7635.00 | 219.63 | 276.99 | 7465.21 | 1219.99 N | 1119.23 W | 1947.65 | 79.46 |
| 7687.00 | 229.61 | 276.56 | 7507.98 | 1229.99 N | 1159.95 W | 2028.27 | 83.50 |
| 7739.00 | 239.59 | 276.13 | 7550.75 | 1239.99 N | 1200.67 W | 2108.89 | 87.54 |
| 7791.00 | 249.57 | 275.70 | 7593.52 | 1249.99 N | 1241.39 W | 2189.51 | 91.58 |
| 7843.00 | 259.55 | 275.27 | 7636.29 | 1259.99 N | 1282.11 W | 2270.13 | 95.62 |
| 7895.00 | 269.53 | 274.84 | 7679.06 | 1269.99 N | 1322.83 W | 2350.75 | 99.66 |
| 7947.00 | 279.51 | 274.41 | 7721.83 | 1279.99 N | 1363.55 W | 2431.37 | 103.70 |
| 8000.00 | 289.49 | 273.98 | 7764.60 | 1289.99 N | 1404.27 W | 2511.99 | 107.74 |
| 8052.00 | 299.47 | 273.55 | 7807.37 | 1299.99 N | 1444.99 W | 2592.61 | 111.78 |
| 8104.00 | 309.45 | 273.12 | 7850.14 | 1309.99 N | 1485.71 W | 2673.23 | 115.82 |
| 8156.00 | 319.43 | 272.69 | 7892.91 | 1319.99 N | 1526.43 W | 2753.85 | 119.86 |
| 8208.00 | 329.41 | 272.26 | 7935.68 | 1329.99 N | 1567.15 W | 2834.47 | 123.90 |
| 8260.00 | 339.39 | 271.83 | 7978.45 | 1339.99 N | 1607.87 W | 2915.09 | 127.94 |
| 8312.00 | 349.37 | 271.40 | 8021.22 | 1349.99 N | 1648.59 W | 2995.71 | 131.98 |
| 8364.00 | 359.35 | 270.97 | 8063.99 | 1359.99 N | 1689.31 W | 3076.33 | 136.02 |
| 8416.00 | 369.33 | 270.54 | 8106.76 | 1369.99 N | 1729.99 W | 3156.95 | 140.06 |
| 8468.00 | 379.31 | 270.11 | 8149.53 | 1379.99 N | 1770.71 W | 3237.57 | 144.10 |
| 8520.00 | 389.29 | 269.68 | 8192.30 | 1389.99 N | 1811.43 W | 3318.19 | 148.14 |
| 8572.00 | 399.27 | 269.25 | 8235.07 | 1399.99 N | 1852.15 W | 3398.81 | 152.18 |
| 8624.00 | 409.25 | 268.82 | 8277.84 | 1409.99 N | 1892.87 W | 3479.43 | 156.22 |
| 8676.00 | 419.23 | 268.39 | 8320.61 | 1419.99 N | 1933.59 W | 3560.05 | 160.26 |
| 8728.00 | 429.21 | 267.96 | 8363.38 | 1429.99 N | 1974.31 W | 3640.67 | 164.30 |
| 8780.00 | 439.19 | 267.53 | 8406.15 | 1439.99 N | 2015.03 W | 3721.29 | 168.34 |
| 8832.00 | 449.17 | 267.10 | 8448.92 | 1449.99 N | 2055.75 W | 3801.91 | 172.38 |
| 8884.00 | 459.15 | 266.67 | 8491.69 | 1459.99 N | 2096.47 W | 3882.53 | 176.42 |
| 8936.00 | 469.13 | 266.24 | 8534.46 | 1469.99 N | 2137.19 W | 3963.15 | 180.46 |
| 8988.00 | 479.11 | 265.81 | 8577.23 | 1479.99 N | 2177.91 W | 4043.77 | 184.50 |
| 9040.00 | 489.09 | 265.38 | 8619.99 | 1489.99 N | 2218.63 W | 4124.39 | 188.54 |
| 9092.00 | 499.07 | 264.95 | 8662.76 | 1499.99 N | 2259.35 W | 4205.01 | 192.58 |
| 9144.00 | 509.05 | 264.52 | 8705.53 | 1509.99 N | 2300.07 W | 4285.63 | 196.62 |
| 9196.00 | 519.03 | 264.09 | 8748.30 | 1519.99 N | 2340.79 W | 4366.25 | 200.66 |
| 9248.00 | 529.01 | 263.66 | 8791.07 | 1529.99 N | 2381.51 W | 4446.87 | 204.70 |
| 9300.00 | 538.99 | 263.23 | 8833.84 | 1539.99 N | 2422.23 W | 4527.49 | 208.74 |
| 9352.00 | 548.97 | 262.80 | 8876.61 | 1549.99 N | 2462.95 W | 4608.11 | 212.78 |
| 9404.00 | 558.95 | 262.37 | 8919.38 | 1559.99 N | 2503.67 W | 4688.73 | 216.82 |
| 9456.00 | 568.93 | 261.94 | 8962.15 | 1569.99 N | 2544.39 W | 4769.35 | 220.86 |
| 9508.00 | 578.91 | 261.51 | 9004.92 | 1579.99 N | 2585.11 W | 4849.97 | 224.90 |
| 9560.00 | 588.89 | 261.08 | 9047.69 | 1589.99 N | 2625.83 W | 4930.59 | 228.94 |
| 9612.00 | 598.87 | 260.65 | 9090.46 | 1599.99 N | 2666.55 W | 5011.21 | 232.98 |
| 9664.00 | 608.85 | 260.22 | 9133.23 | 1609.99 N | 2707.27 W | 5091.83 | 237.02 |
| 9716.00 | 618.83 | 259.79 | 9176.00 | 1619.99 N | 2747.99 W | 5172.45 | 241.06 |
| 9768.00 | 628.81 | 259.36 | 9218.77 | 1629.99 N | 2788.71 W | 5253.07 | 245.10 |
| | | | | | | | |

| | | | | | | | |
|---------|-------|--------|---------|-----------|----------|--------|-------|
| 6850.00 | 69.12 | 283.40 | 6599.98 | 1069.92 N | 509.42 W | 710.68 | 13.20 |
| 6898.00 | 75.85 | 280.99 | 6614.42 | 1079.56 N | 554.14 W | 756.42 | 14.81 |
| 6945.00 | 82.80 | 279.30 | 6623.12 | 1087.68 N | 599.57 W | 802.57 | 15.20 |
| 7028.00 | 89.48 | 278.46 | 6628.71 | 1100.46 N | 681.34 W | 885.25 | 8.11 |

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 281.39 DEGREES (GRID)
A TOTAL CORRECTION OF 7.67 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7028.00 FEET
IS 1294.31 FEET ALONG 328.24 DEGREES (GRID)**

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