



1:240

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	02-Nov-17	03-Nov-17	07-Nov-17		
Rig Bit Number	2	3	4		
Bit Size (in)	8.500	8.500	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	1,880.00	3,130.00	5,984.00		
Log End Depth (MD, ft)	3,130.00	5,984.00	15,359.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	01-Nov-17 20:00	02-Nov-17 06:45	03-Nov-17 21:45		
Drill/Wipe End Date and Time	02-Nov-17 01:30	02-Nov-17 19:30	07-Nov-17 01:45		
Min Inc (deg) @ Depth (MD, ft)	16.92 @ 2,905.00	0.97 @ 5,939.00	0.15 @ 6,448.00		
Max Inc (deg) @ Depth (MD, ft)	18.90 @ 3,085.00	17.84 @ 3,982.00	92.23 @ 11,184.00		
Bit TFA(in2) / Bit Type	.7777 / PDC	.7777 / PDC	.7167 / PDC		
Flow Rate (gpm)	572.26	565.88	280.10		
Max AV (fpm) / CV (fpm) @ MWD	N/A	N/A	N/A		
Fluid Type	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base		
Density (ppg) / Viscosity (spqt)	9.20 / 59.00	9.00 / 61.00	9.38 / 62.00		
Filtrate CL (ppm)	43,000.00	37,000.00	35,000.00		
pH / API Filtrate (mptm)	N/A	N/A	N/A		
PV (cP) / YP (Ihf2)	16 / 10.00	21 / 12.00	22 / 12.00		
% Solids / % Sand	6.34 / 0	8.00 / N/A	10.00 / N/A		
% Oil / Oil:Water Ratio	N/A	69.00 / 75:25	70.00 / 78:22		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Mud Temp @ 10' (degF)	N/A	N/A	N/A		

Max Tool Temp (degF) / Source	N/A	N/A	N/A		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Max Trainoff	Max Trainoff	Max Trainoff		
Customer Representative	Josh Johnson	Josh Johnson	Josh Johnson		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	Sperry Next Gen	Sperry Next Gen	Sperry Next Gen		
Software Version	N/A	N/A	N/A		
Sub Serial Number	N/A	N/A	N/A		
Insert Serial Number	N/A	N/A	N/A		
Date and Time Initialized	01-Jan-70 00:00	01-Jan-70 00:00:00	01-Jan-70 00:00		
Date and Time Read	01-Jan-70 00:00	01-Jan-70 00:00:00	01-Jan-70 00:00		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	Sperry Next Gen DM	Sperry Next Gen DM	Sperry Next Gen DM		
Distance From Bit (ft)	45	45	45		
Software Version	N/A	N/A	N/A		
Sub Serial Number	N/A	N/A	N/A		
Sonde Serial Number	N/A	N/A	N/A		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	N/A	N/A	N/A		

Gamma Ray Sensor Information

Tool Type	Sperry Next Gen GM	Sperry Next Gen GM	Sperry Next Gen GM		
Distance From Bit (ft)	39.96	39.96	39.83		
Recorded Sample Period (sec)	N/A	N/A	N/A		
Software Version	N/A	N/A	N/A		
Sub Serial Number	N/A	N/A	N/A		
Insert/Sonde Serial Number	N/A	N/A	N/A		

REMARKS

1. All depths are calibrated 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. Run 100 was drilled with Sperry Next Gen MWD tools. Directional Module SN: D051, Gamma Module SN: G042
4. Runs 200 and 300 were drilled with Sperry Next Gen MWD tools. Directional Module SN: D042, Gamma Module SN: G066
5. All data presented is recorded data unless otherwise stated.
6. All runs' gamma data was only corrected for collar thickness
7. The following smoothing parameters have been applied to the data:

GR (Gamma Ray):
Interval Resolution: 0.5ft
Interval Distance: 0.6ft
Gap Fill: 3.0ft

ROPA (Average Rate of Penetration):
Interval Resolution: 0.5ft
Interval Distance: 1.2ft
Gap Fill: 3.0ft

8. Surveys from 1918-15314 corrected by Sperry Survey Management

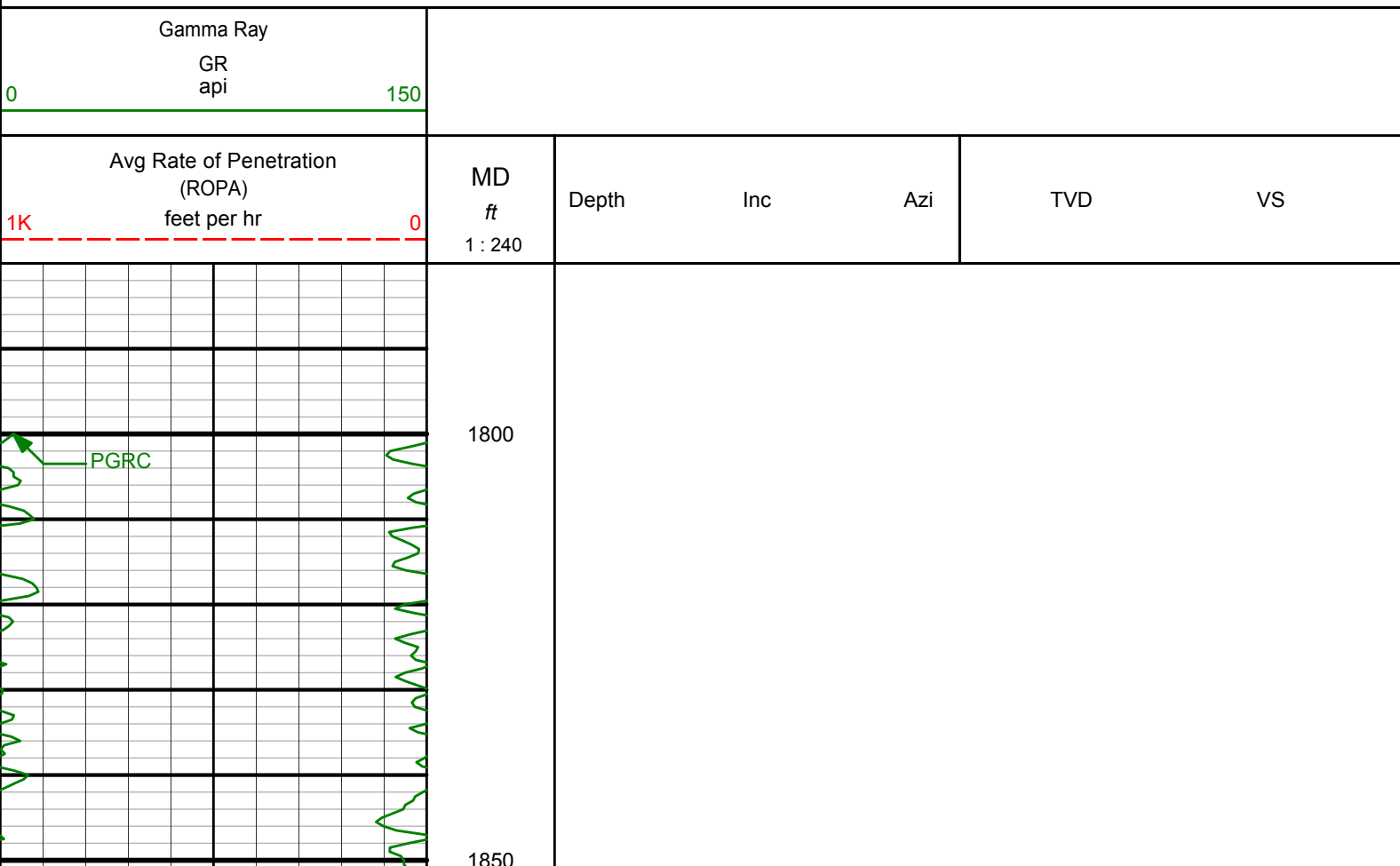
INSITE version 8.5

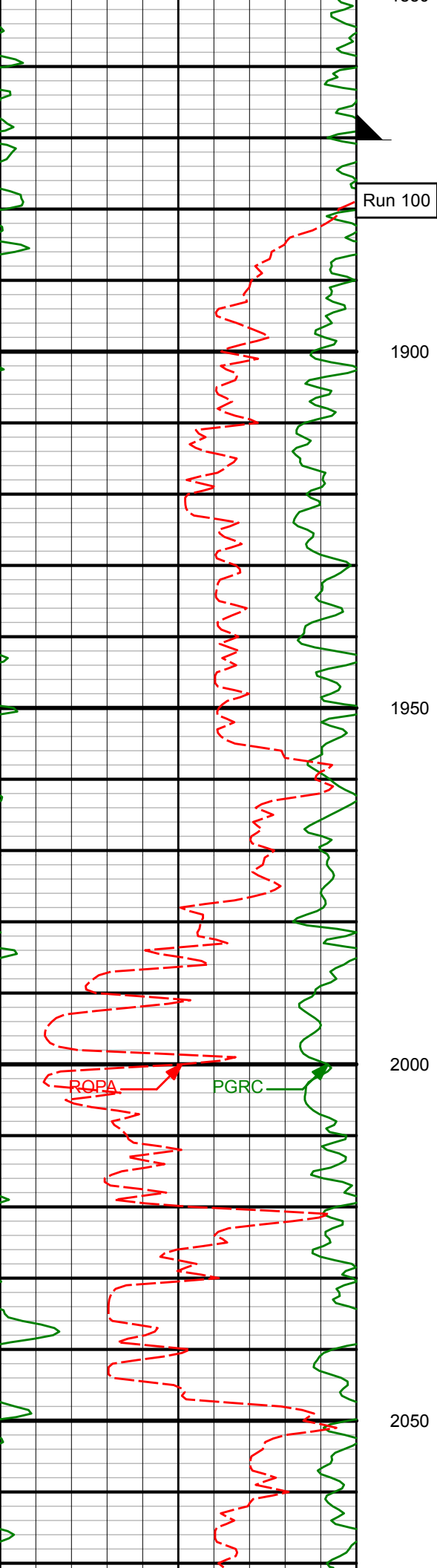
WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATION 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

Detail Log 1:240





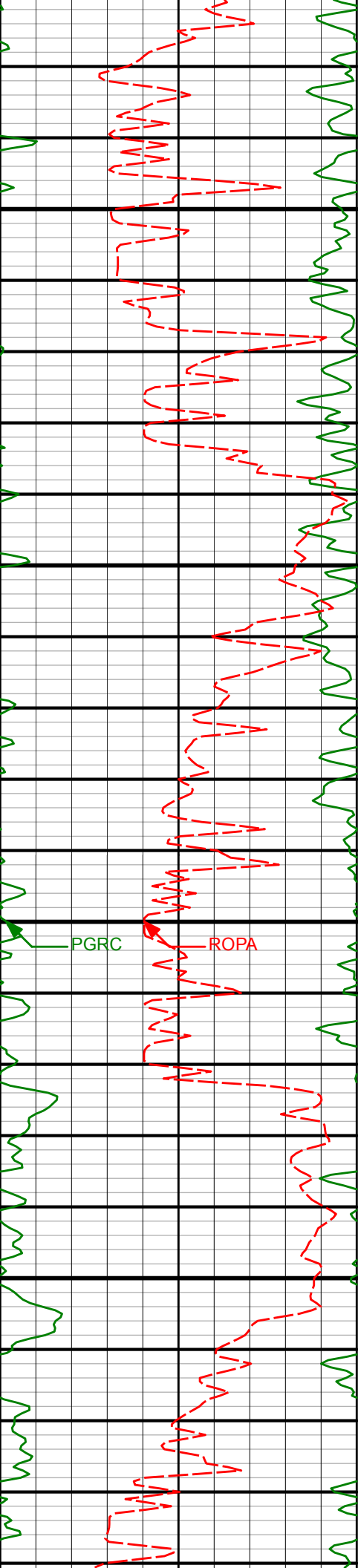
1918'

18.37°

229.54°

1869.99'

-107.82'



2100

2150

2200

2250

2097'

16.84°

225.92°

2040.61'

-144.27'

2187'

17.41°

229.38°

2126.62'

-162.16'

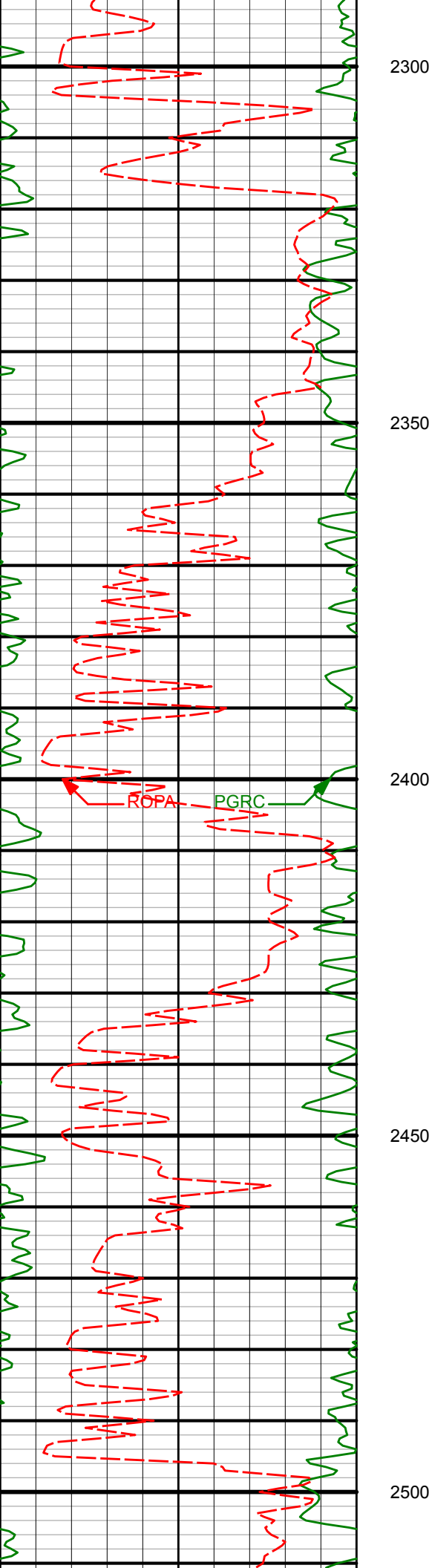
2277'

17.10°

233.92°

2212.57'

-178.78'



2367'

17.80°

234.64°

2298.43'

-194.60'

2400

ROPA

PGRC

2450

2456'

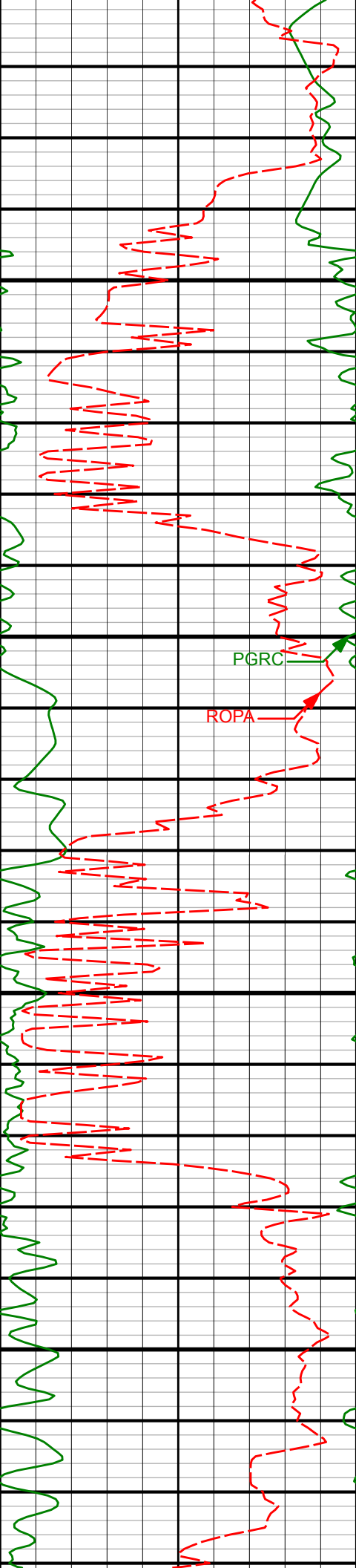
17.01°

231.53°

2383.36'

-210.63'

2500



2546' 17.98° 229.94° 2469.20' -227.82'

2550

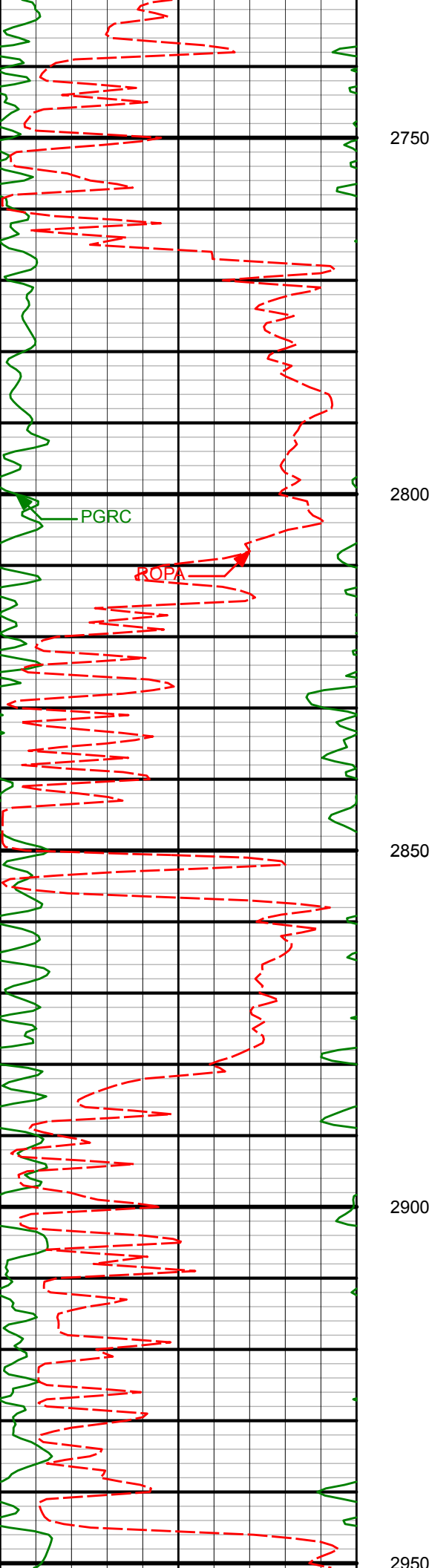
2600

2636' 17.80° 229.45° 2554.84' -245.76'

2650

2700

2726' 17.58° 231.12° 2640.59' -263.29'



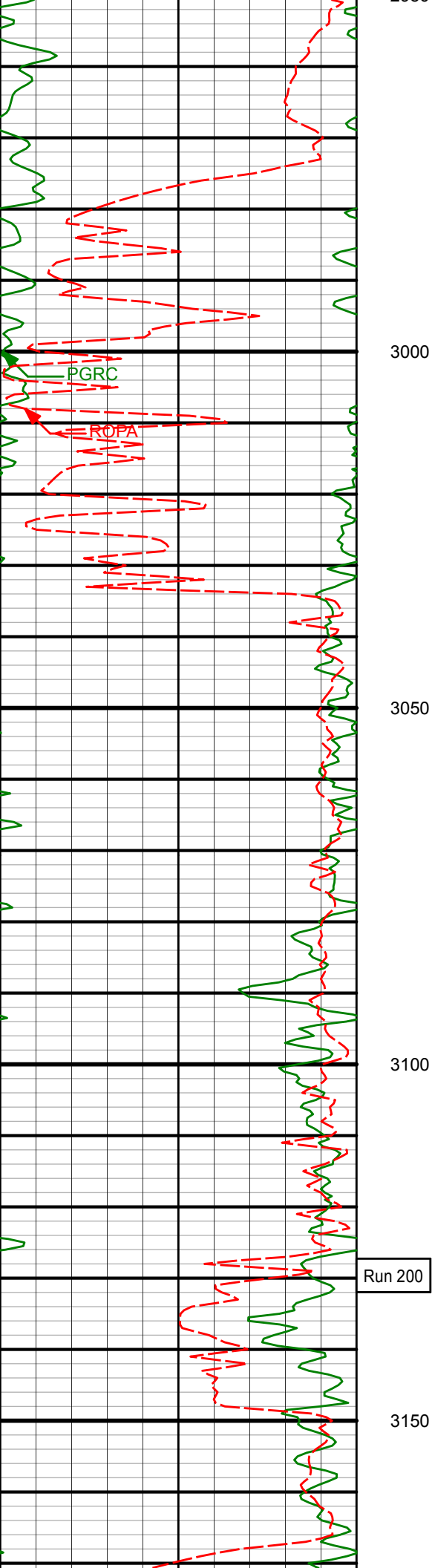
2905'

16.92°

222.61°

2811.56'

-299.54'



2995'

17.43°

219.94°

2897.55'

-319.57'

3000

PGRC

ROPA

3050

3085'

18.90°

225.09°

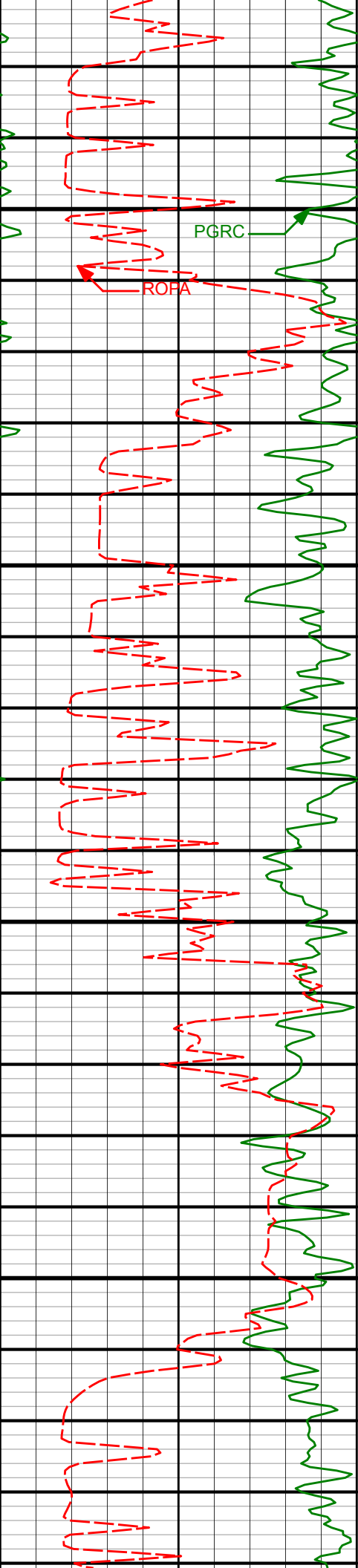
2983.07'

-340.25'

3100

Run 200

3150



3174'

17.62°

228.38°

3067.59'

-359.43'

3200

PGRC

ROPA

3250

3264'

15.93°

224.99°

3153.76'

-377.27'

3300

3350

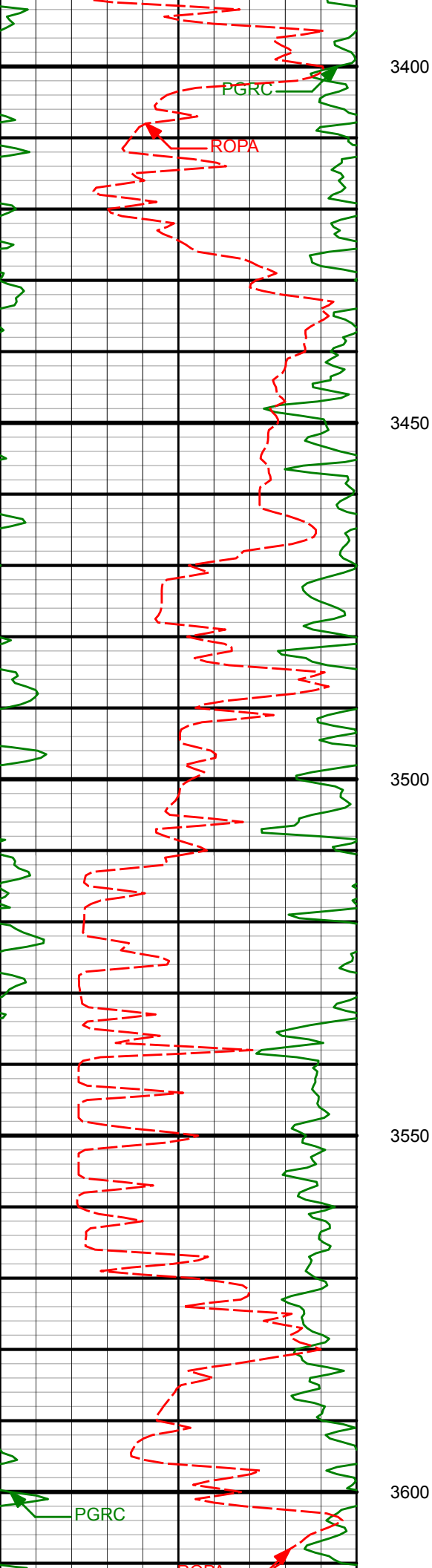
3354'

16.09°

228.06°

3240.27'

-394.39'



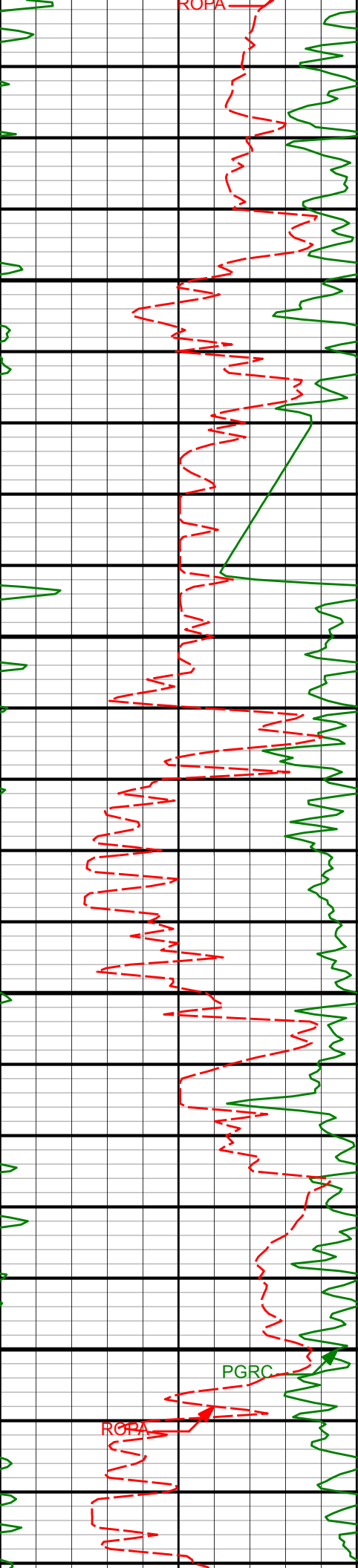
3534'

15.10°

234.42°

3413.65'

-424.81'



3623'

15.21°

232.81°

3499.56'

-438.66'

3650

3700

3713'

15.76°

229.98°

3586.29'

-453.71'

3750

3800

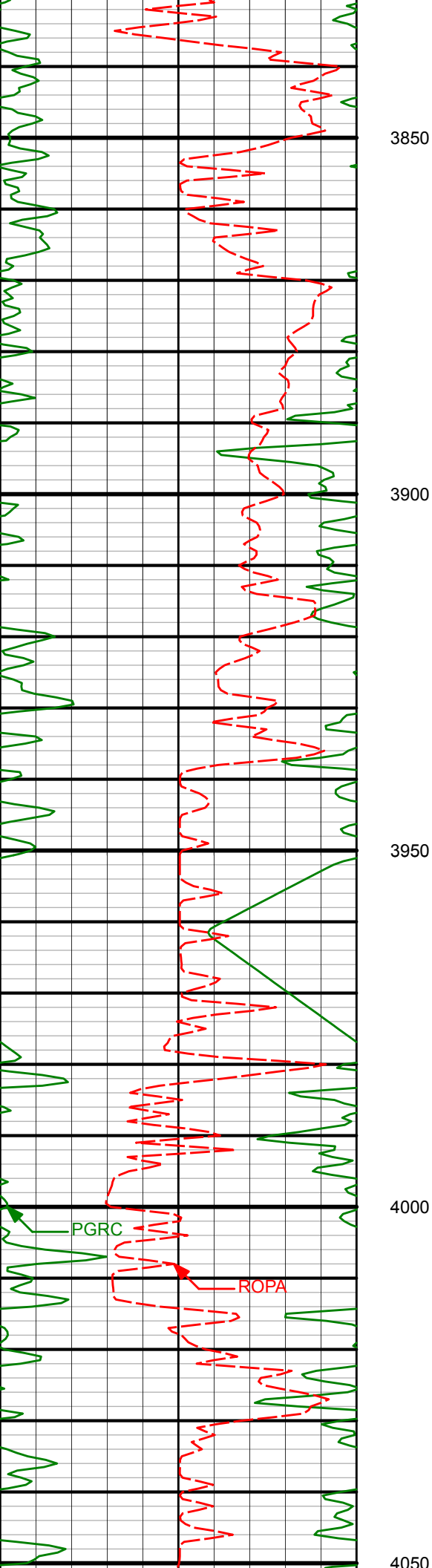
3802'

15.45°

231.10°

3672.01'

-468.98'



3892'

16.65°

228.62°

3758.50'

-485.08'

3982'

17.84°

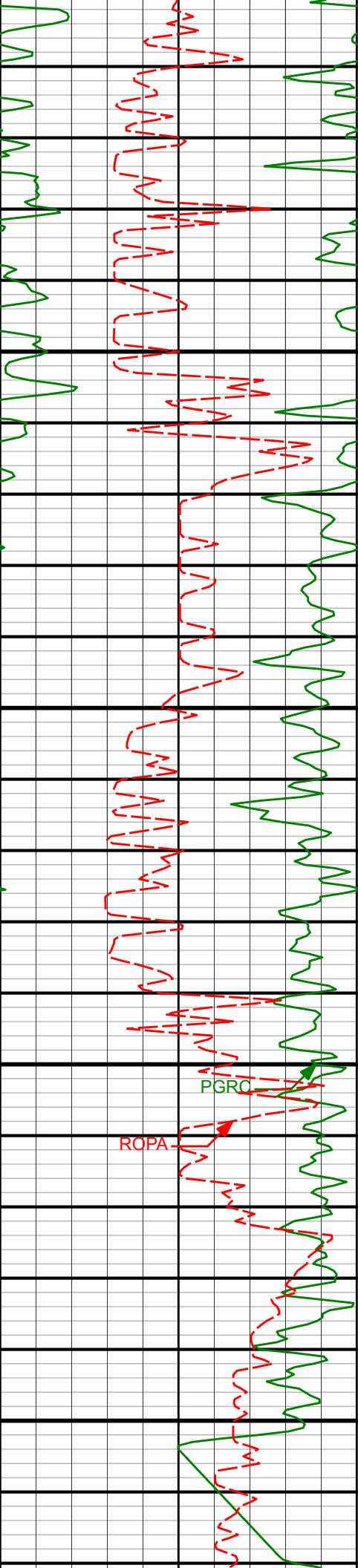
226.97°

3844.46'

-503.07'

PGRC

ROPA



4072'	15.91°	222.42°	3930.58'	-521.64'
-------	--------	---------	----------	----------

4100

4150

4161'	14.35°	217.07°	4016.50'	-539.49'
-------	--------	---------	----------	----------

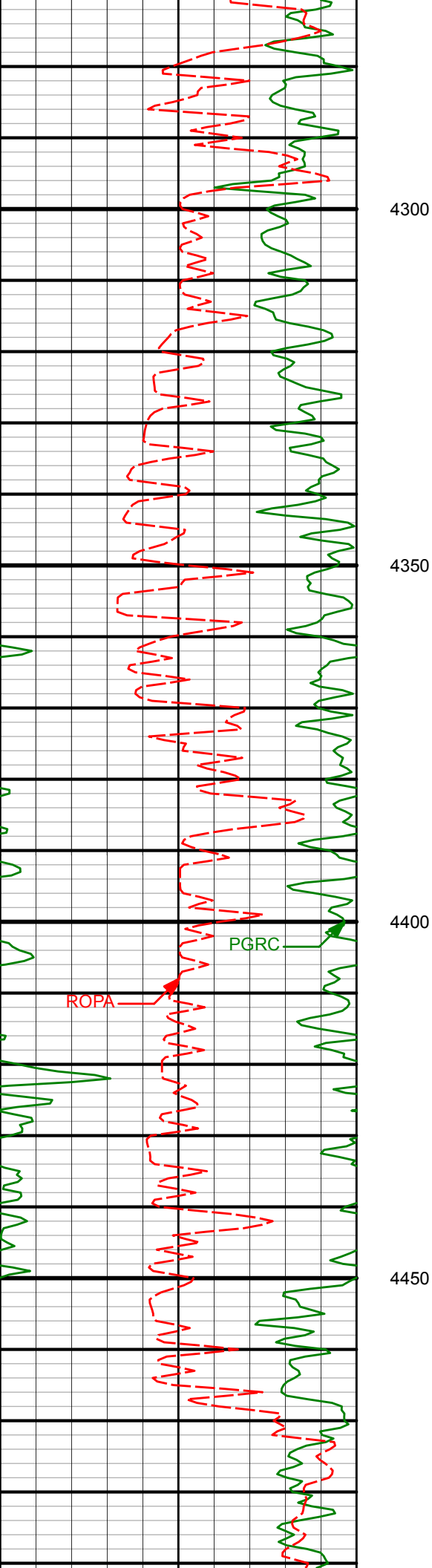
4200

PGRC

ROPA

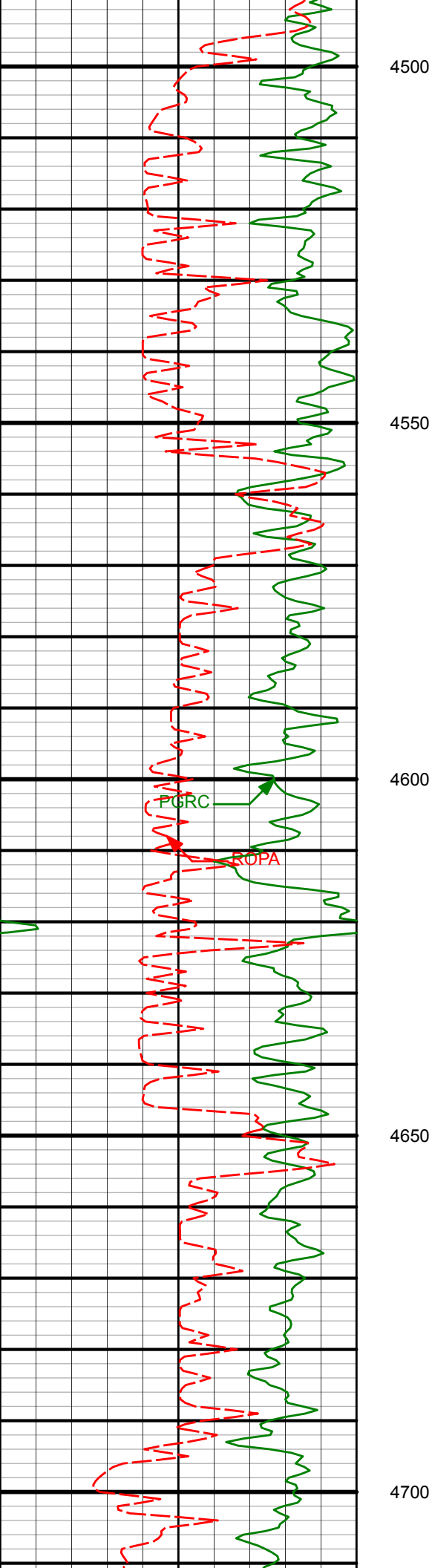
4250

4251'	16.77°	212.15°	4103.19'	-559.42'
-------	--------	---------	----------	----------



4341' 17.14° 213.17° 4189.28' -581.55'

4431' 15.18° 211.49° 4275.72' -602.74'



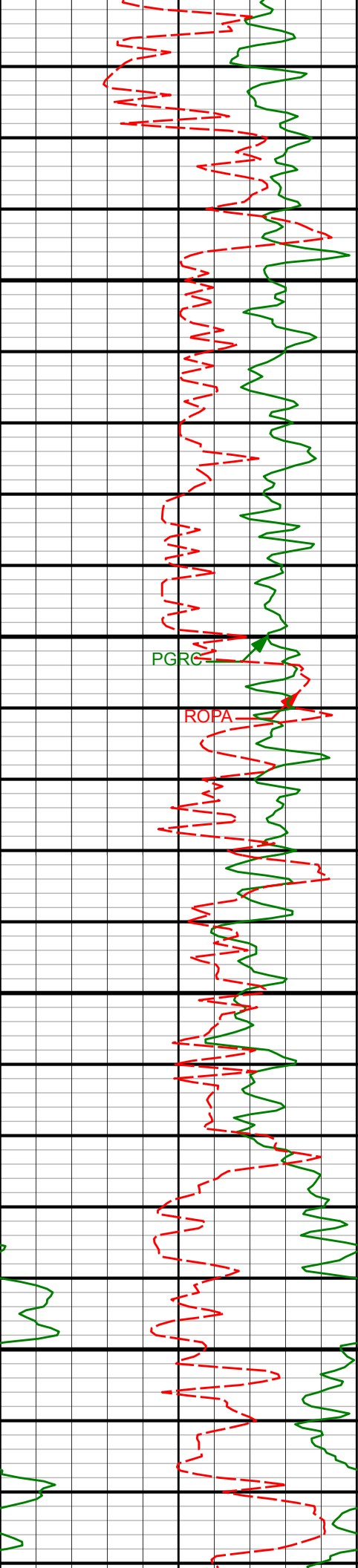
4610'

13.32°

221.42°

4449.23'

-638.27'



4750

4790'

10.37°

225.53°

4625.38'

-665.24'

4800

PGRCE

ROPA

4850

4880'

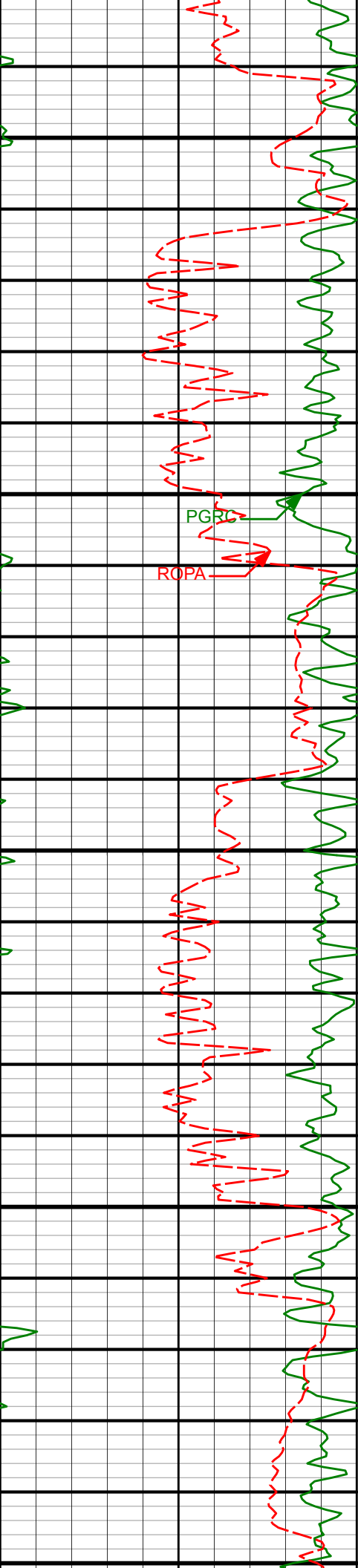
9.60°

228.01°

4714.02'

-675.97'

4900



4950

4969'

9.01°

231.95°

4801.85'

-685.26'

5000

PGRG

ROPA

5050

5059'

7.50°

243.64°

4890.92'

-692.24'

5100

5150

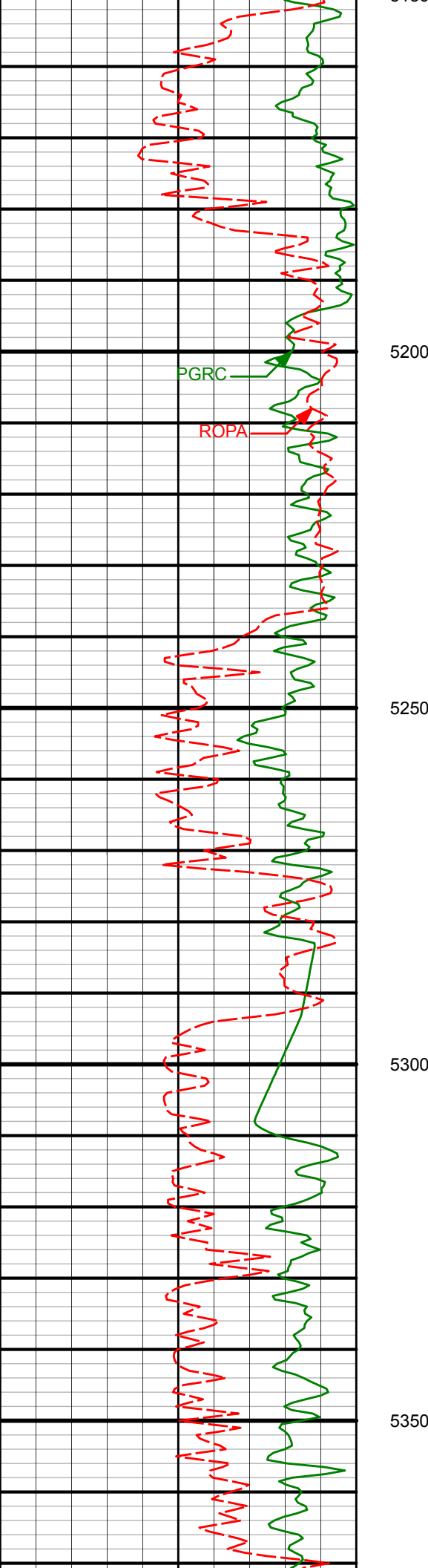
5149'

4.66°

258.60°

4980.41'

-695.60'



5239'

2.18°

286.26°

5070.25'

-695.86'

5250

5300

5328'

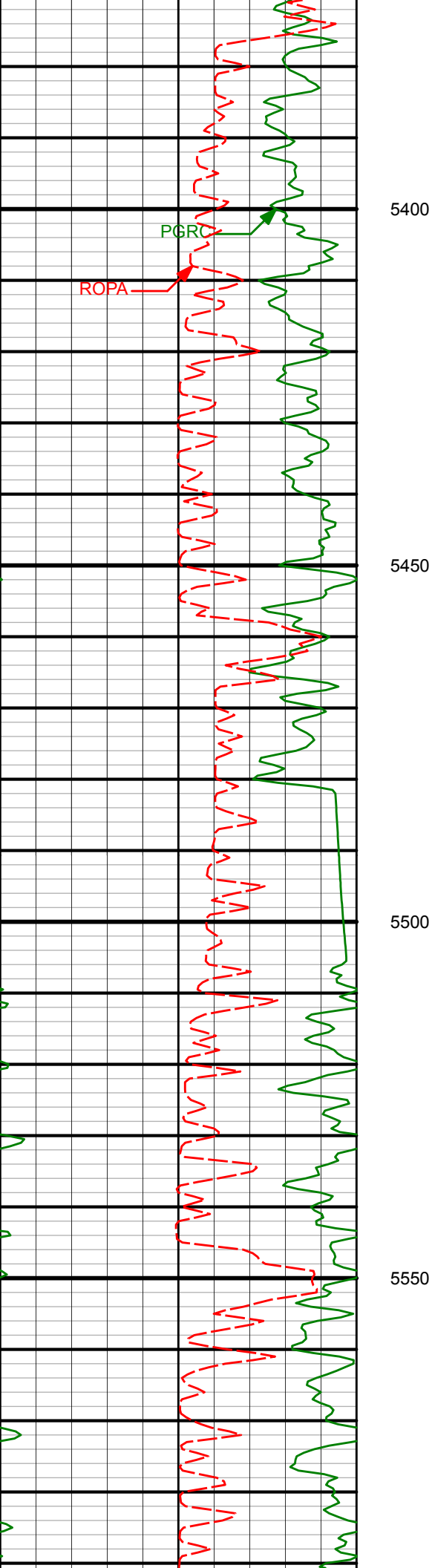
1.27°

288.65°

5159.21'

-695.08'

5350



5418'

1.05°

292.69°

5249.19'

-694.44'

5450

5500

5508'

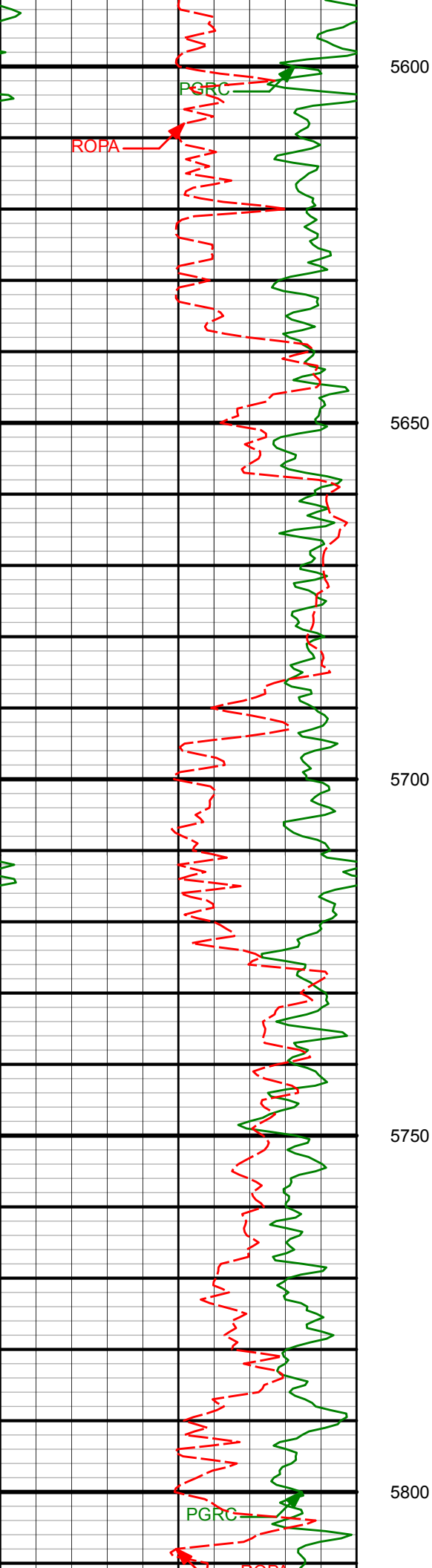
1.23°

293.97°

5339.17'

-693.74'

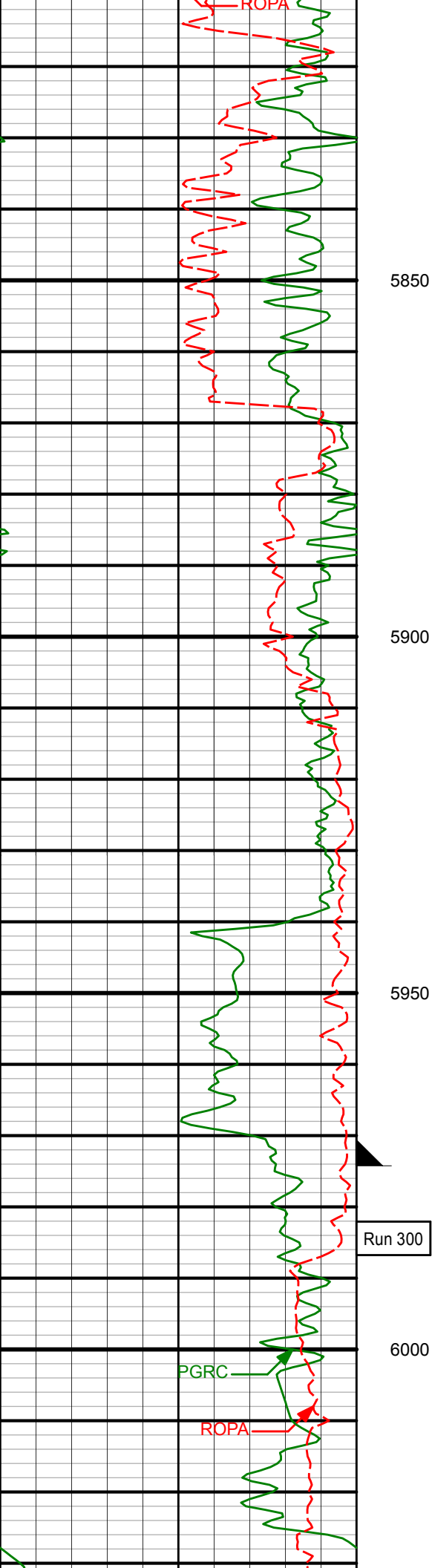
5550



5598'	1.27°	288.33°	5429.15'	-693.04'
-------	-------	---------	----------	----------

5687'	1.34°	358.56°	5518.13'	-691.69'
-------	-------	---------	----------	----------

5777'	1.63°	5.45°	5608.10'	-689.36'
-------	-------	-------	----------	----------



5867'

1.27°

348.12°

5698.07'

-687.11'

5939'

0.97°

323.92°

5770.06'

-685.84'

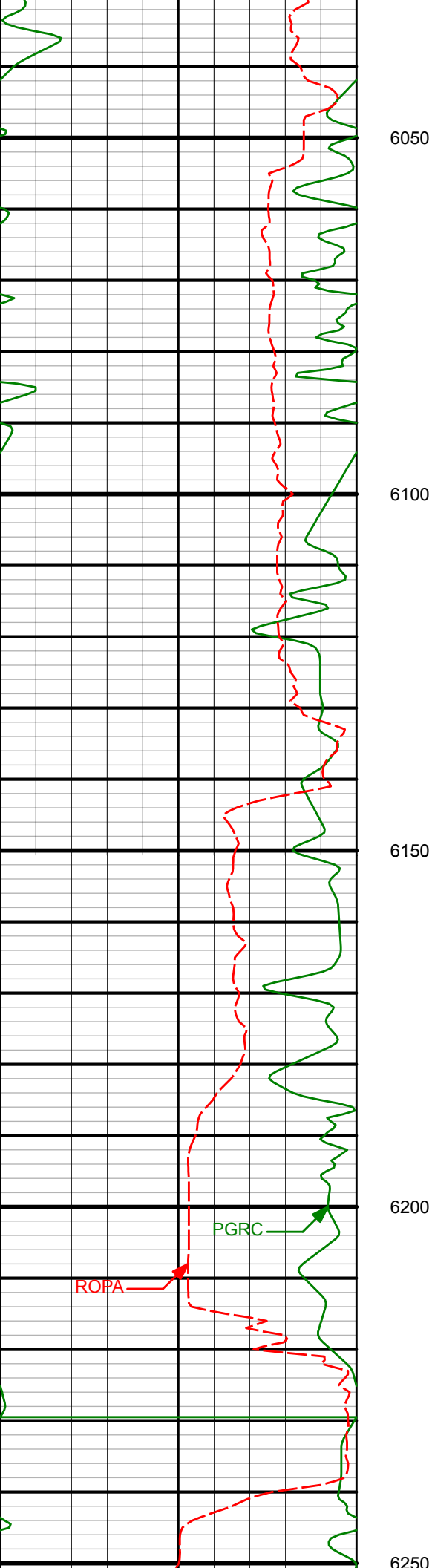
5999'

1.16°

291.05°

5830.05'

-685.21'



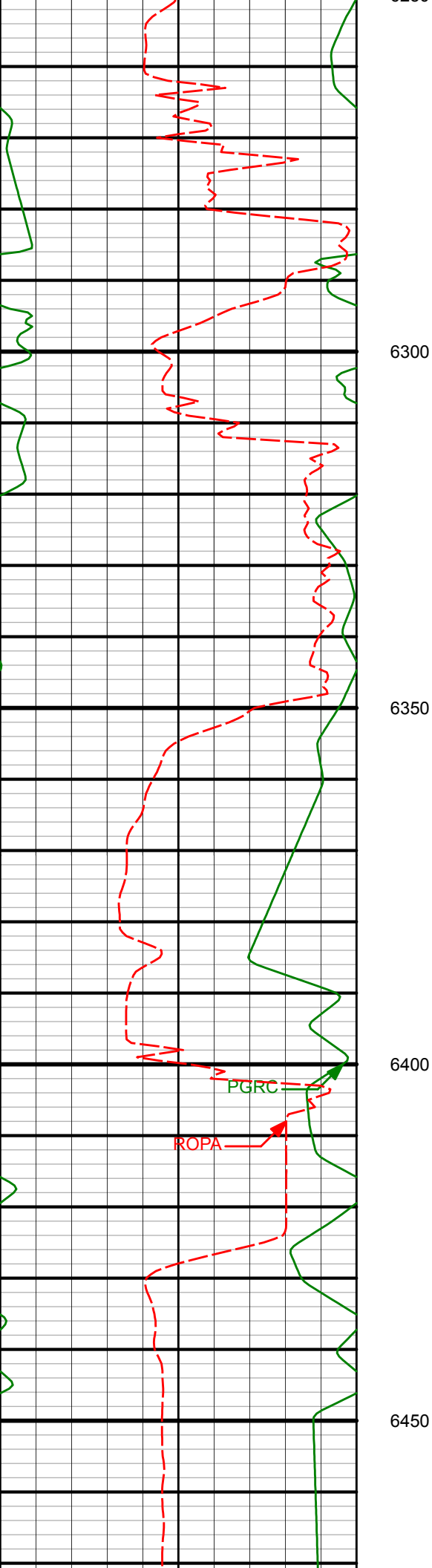
6179'

1.78°

298.18°

6009.99'

-683.25'



6268'

1.36°

304.63°

6098.96'

-682.00'

6358'

0.73°

108.89°

6188.95'

-681.58'

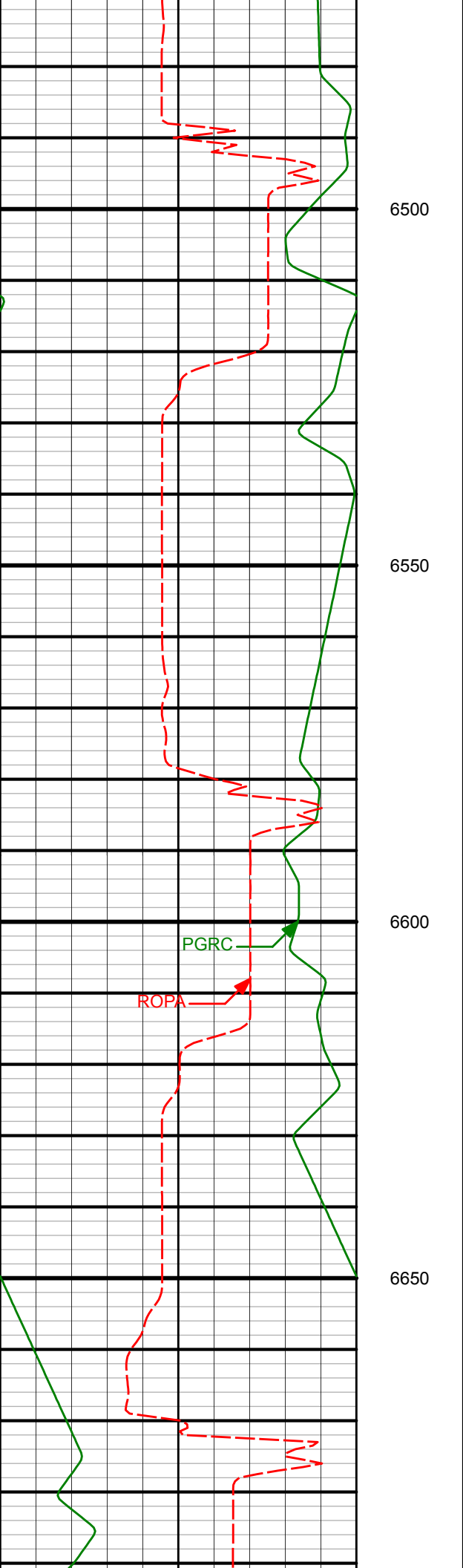
6448'

0.15°

297.46°

6278.95'

-681.71'



6538'

0.97°

320.88°

6368.94'

-681.07'

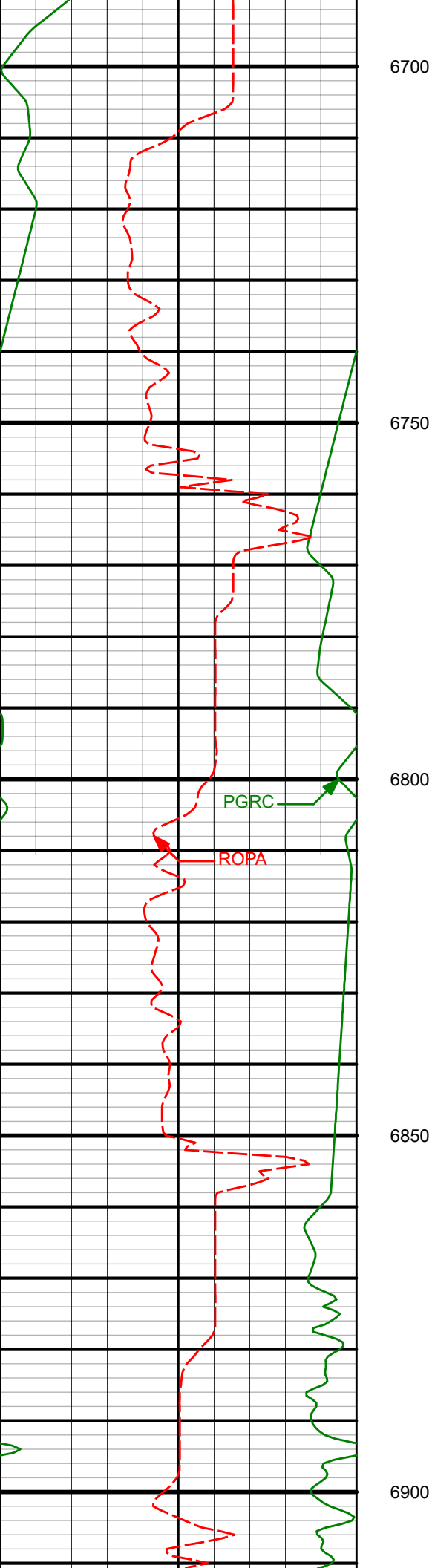
6627'

1.27°

326.39°

6457.93'

-679.67'



6700

6750

6800

6850

6900

6717'

1.60°

327.49°

6547.90'

-677.78'

6807'

1.25°

318.67°

6637.87'

-675.99'

6869'

0.62°

321.83°

6699.86'

-675.22'

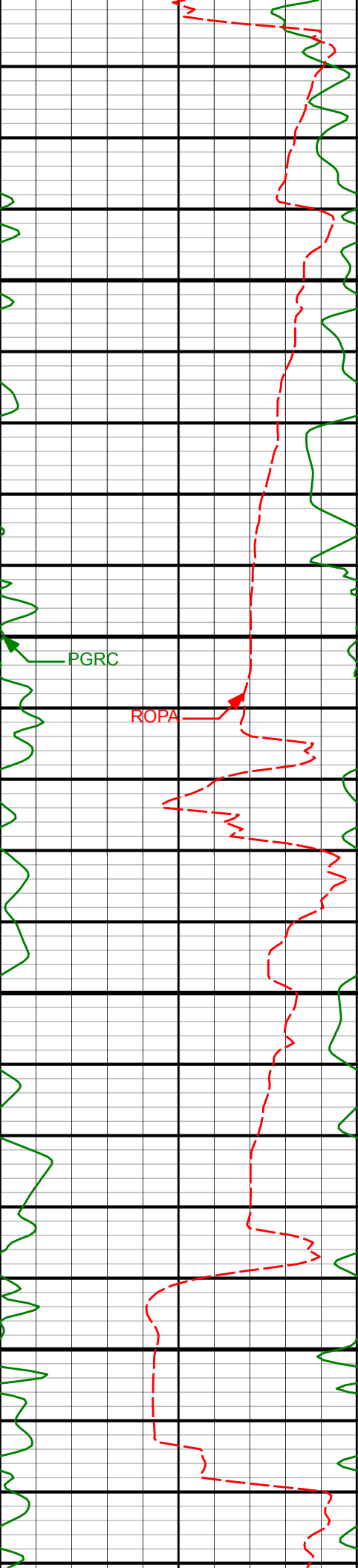
6897'

0.59°

314.21°

6727.86'

-675.00'



6950

6986'

9.47°

28.57°

6816.45'

-668.23'

7000

PGRC

ROPA

7050

7076'

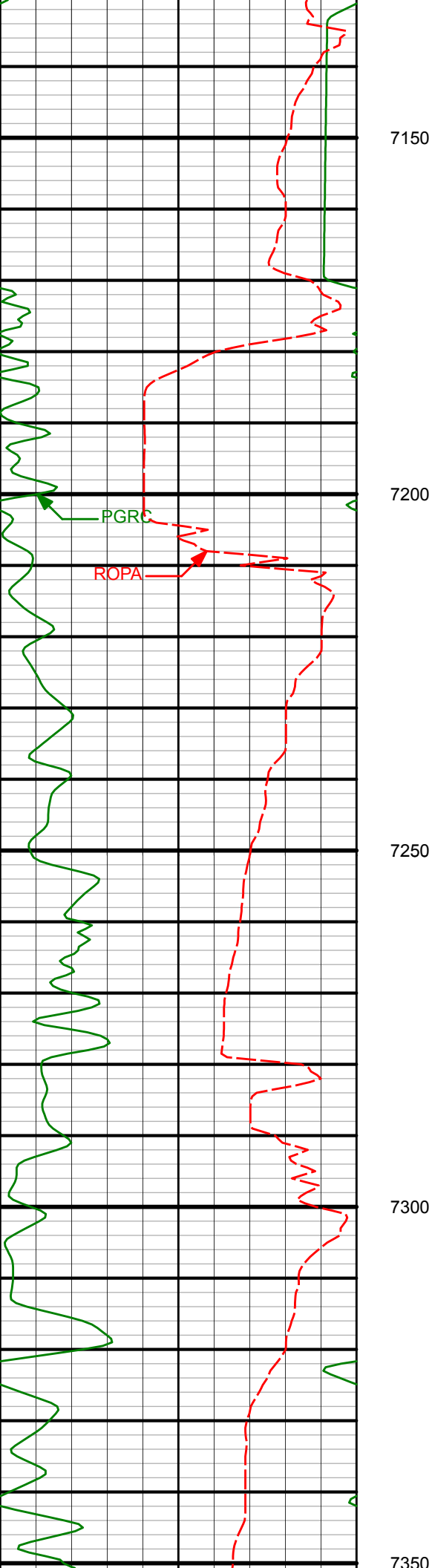
17.49°

21.02°

6903.90'

-649.04'

7100



7166'

19.54°

18.06°

6989.24'

-622.08'

7256'

24.17°

15.09°

7072.75'

-589.93'

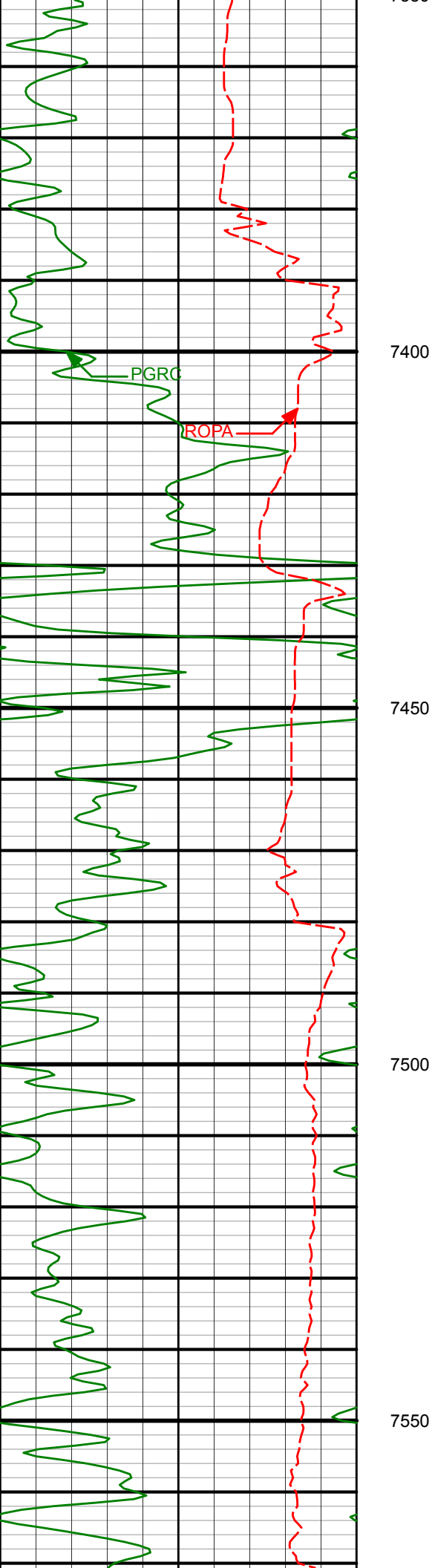
7345'

28.59°

4.47°

7152.51'

-551.05'



7435'

36.15°

1.84°

7228.47'

-502.97'

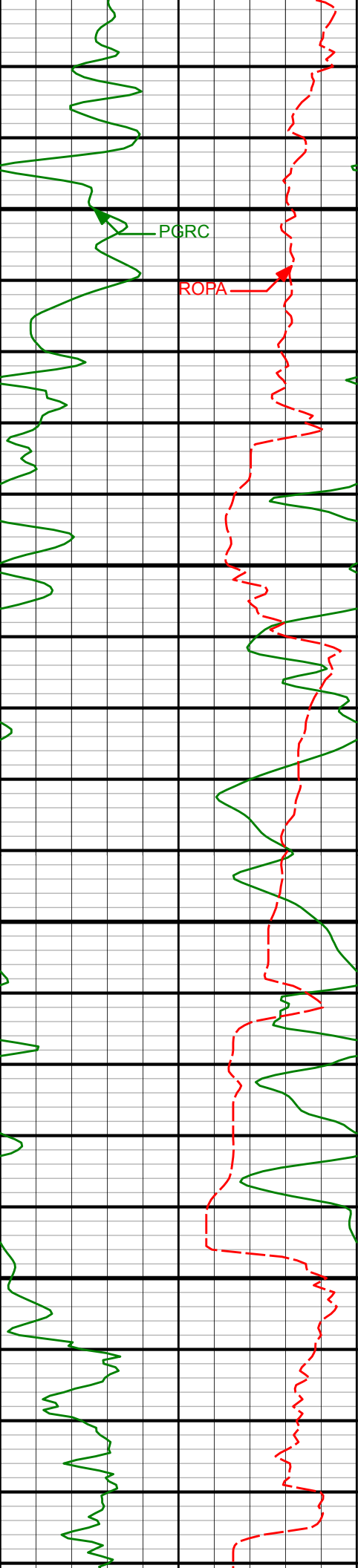
7525'

48.81°

359.03°

7294.72'

-442.33'



7600

7650

7700

7750

PGRC

ROPA

7615'

62.34°

1.00°

7345.49'

-368.27'

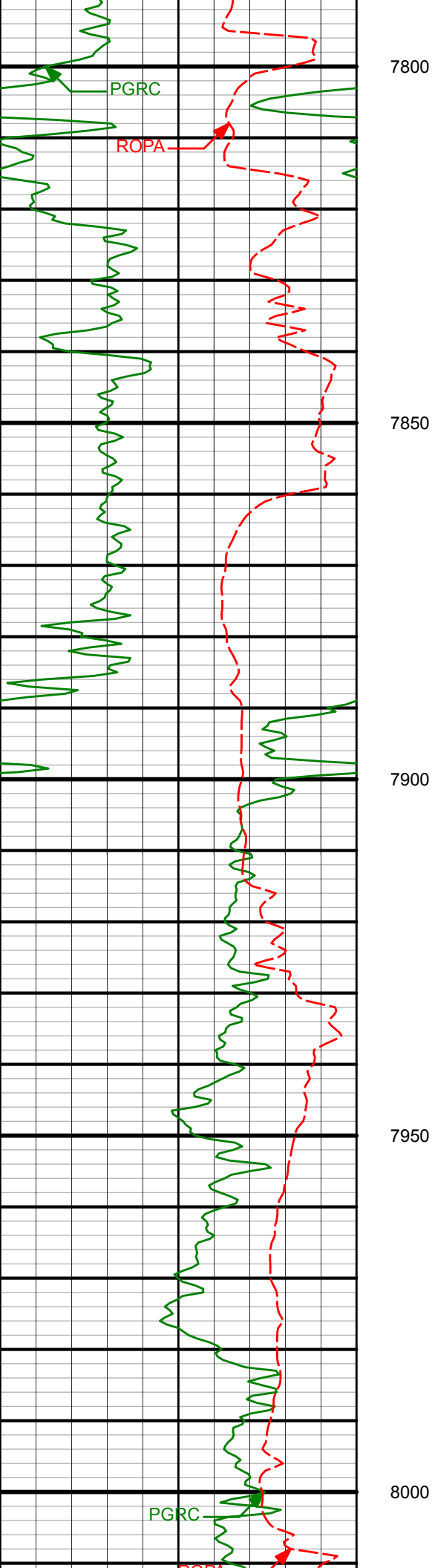
7705'

70.69°

357.20°

7381.33'

-285.83'



7794'

76.63°

356.45°

7406.36'

-200.61'

7884'

77.92°

357.50°

7426.18'

-112.96'

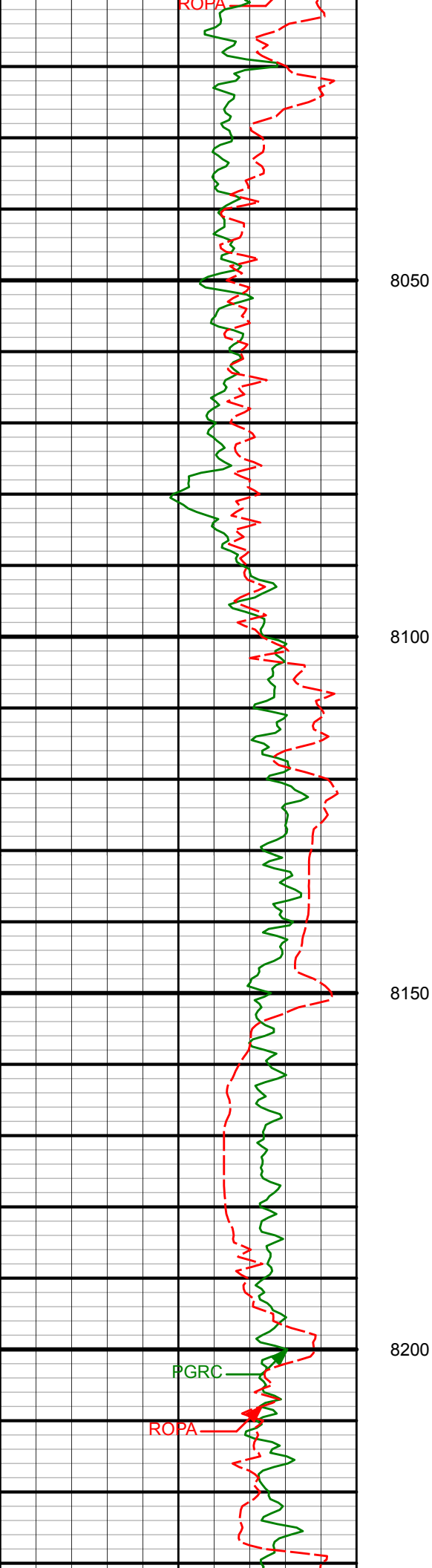
7974'

84.52°

356.84°

7439.91'

-24.19'



8064'

87.46°

357.19°

7446.21'

65.45'

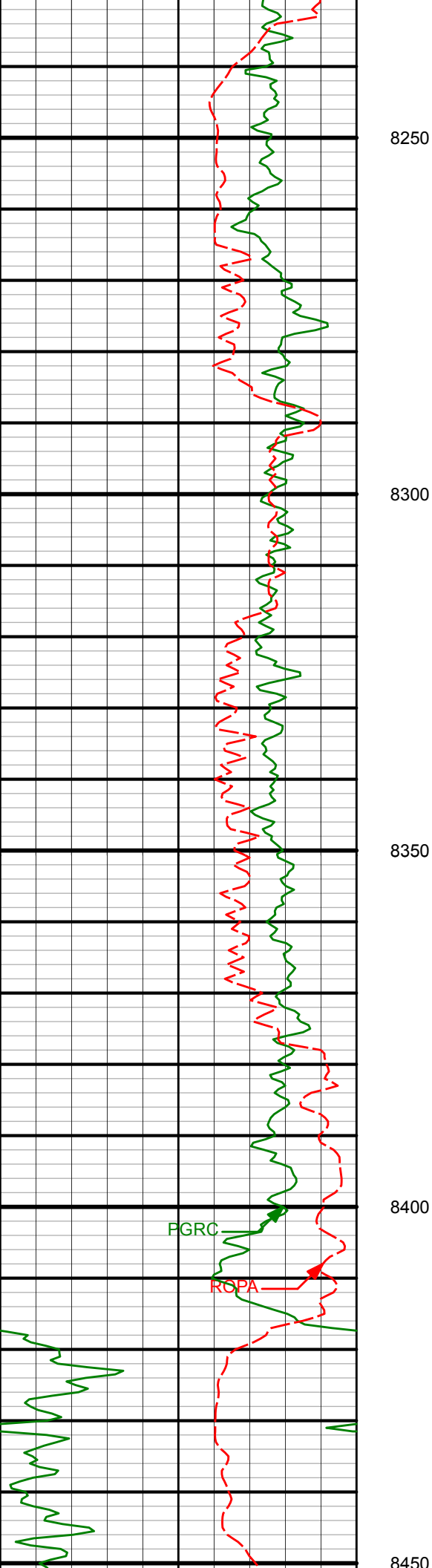
8154'

91.97°

359.19°

7446.65'

155.36'



8243'

91.77°

358.68°

7443.75'

244.30'

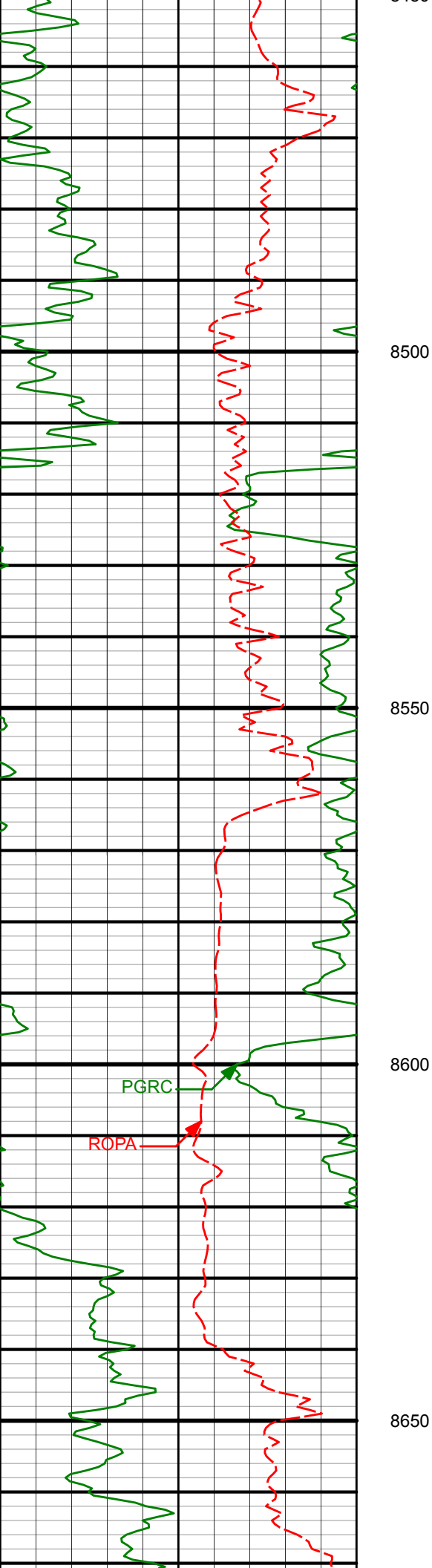
8333'

91.15°

358.19°

7441.46'

334.23'



8513'

91.07°

2.69°

7437.97'

514.14'

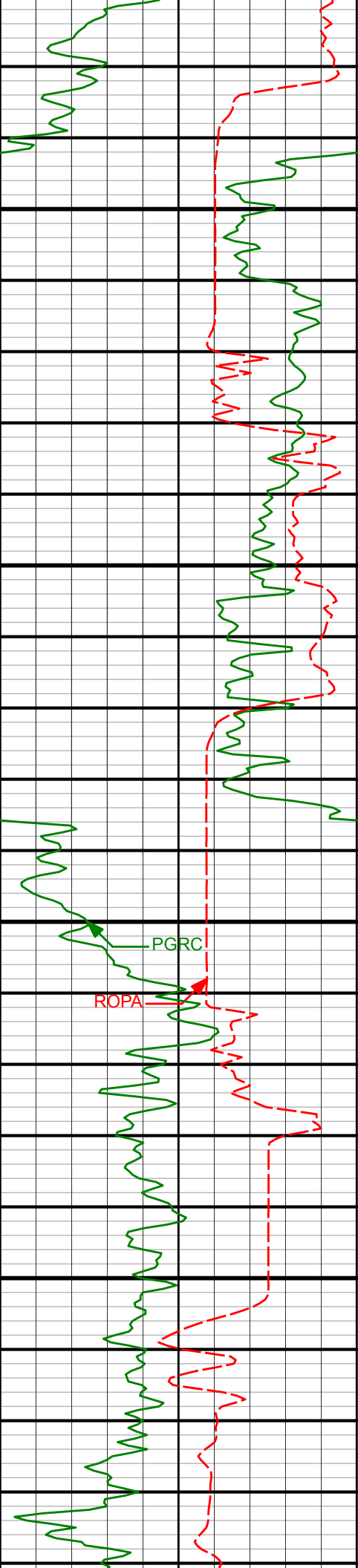
8603'

91.42°

3.02°

7436.01'

604.02'



8700

8750

8800

8850

8692'

90.41°

3.28°

7434.59'

692.89'

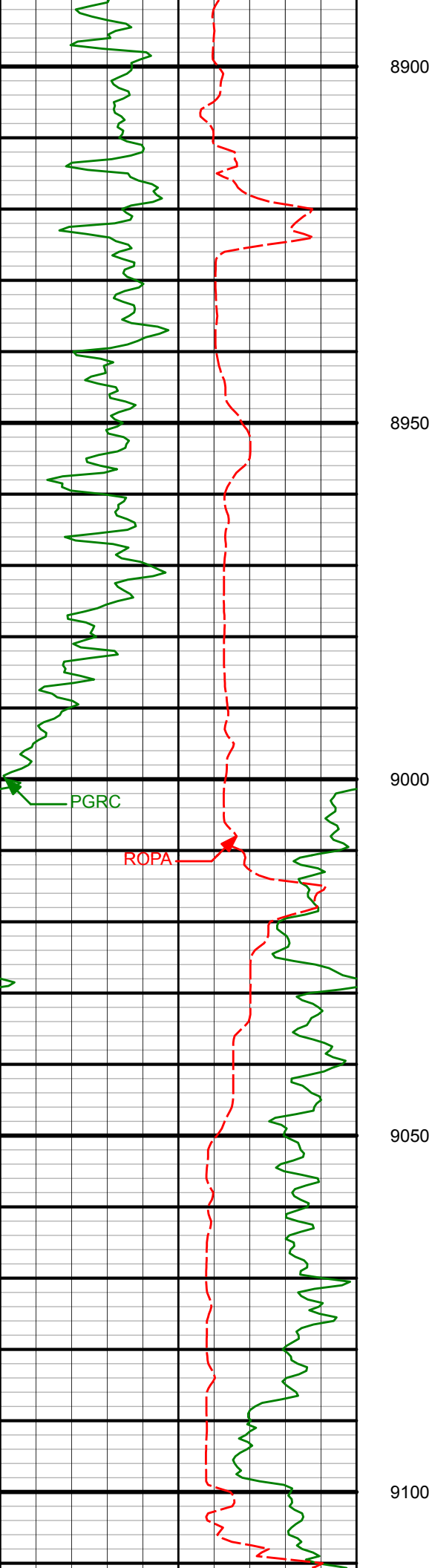
8782'

90.60°

359.91°

7433.80'

782.84'



8971'

90.43°

357.80°

7432.10'

971.78'

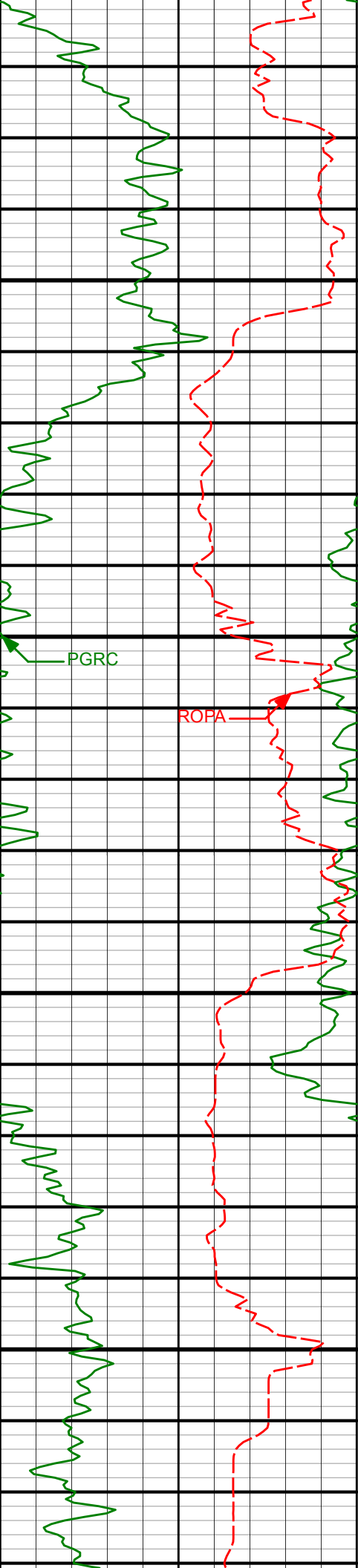
9065'

90.54°

356.72°

7431.30'

1065.65'



9150

9159'

91.18°

0.72°

7429.89'

1159.59'

9200

9250

9254'

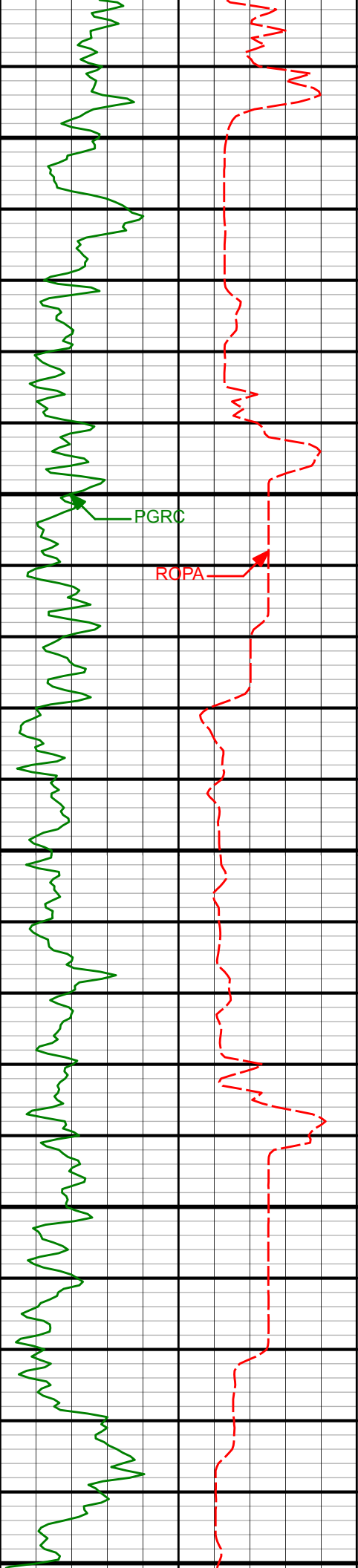
89.29°

2.12°

7429.50'

1254.56'

9300



9350

9400

9450

9500

9550

9348'

89.44°

1.62°

7430.54'

1348.51'

9442'

89.55°

0.81°

7431.37'

1442.49'

9537'

89.29°

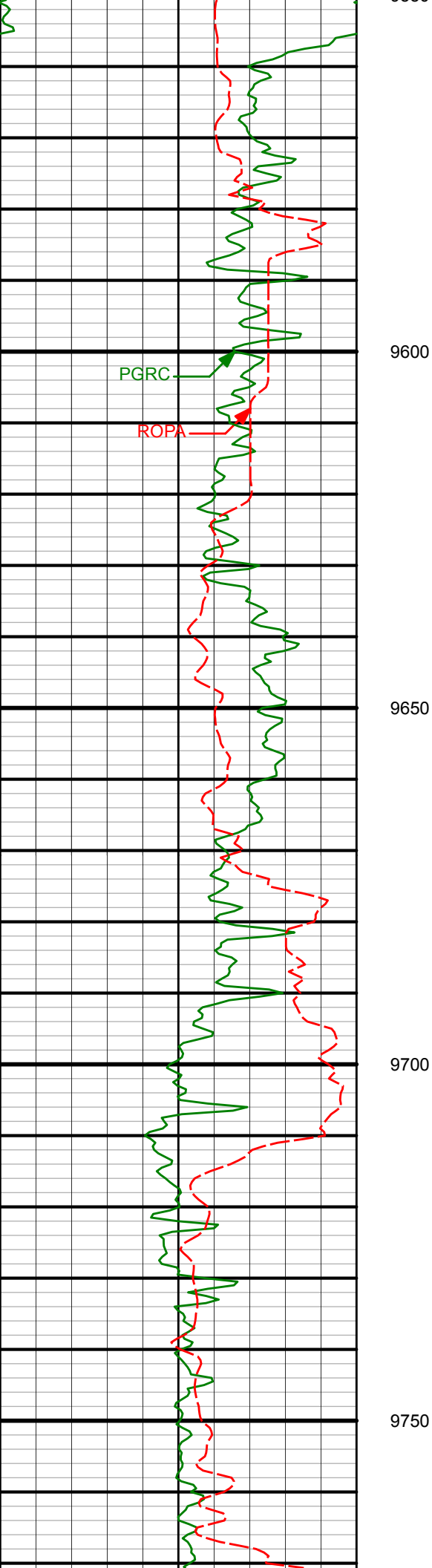
359.98°

7432.33'

1537.49'

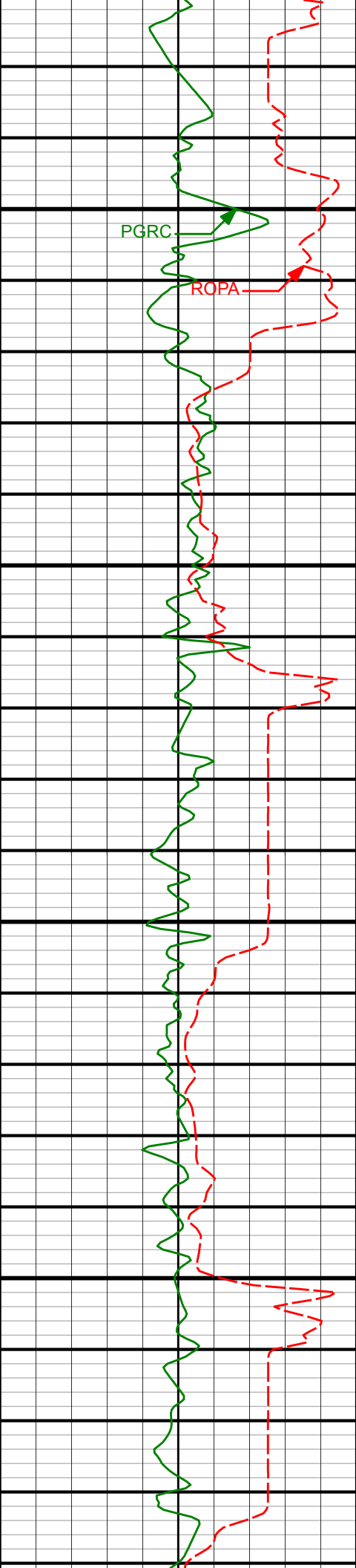
PGRC

RQPA



9631'	89.46°	359.39°	7433.36'	1631.48'
-------	--------	---------	----------	----------

9725'	88.96°	0.55°	7434.66'	1725.47'
-------	--------	-------	----------	----------



9800

9819'

89.79°

2.25°

7435.68'

1819.43'

9850

9900

9914'

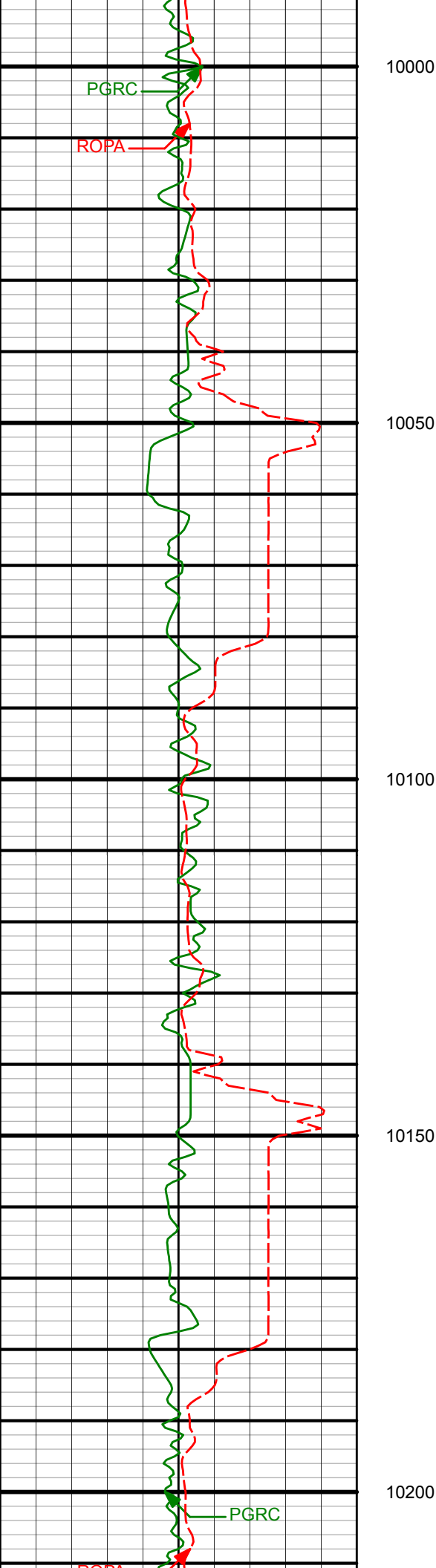
90.03°

2.34°

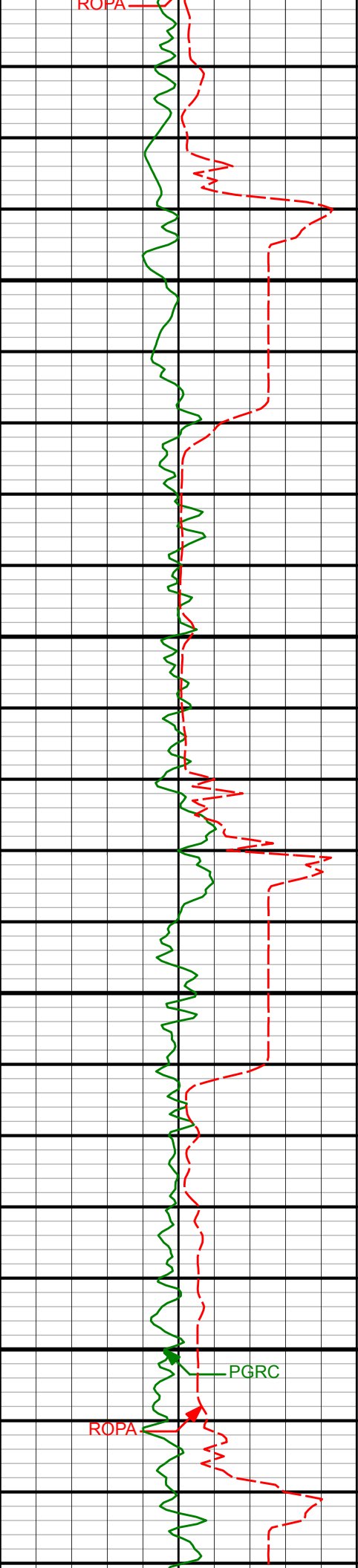
7435.83'

1914.37'

9950



10008'	90.43°	2.35°	7435.45'	2008.30'
10102'	90.58°	1.51°	7434.63'	2102.25'
10197'	90.34°	0.17°	7433.86'	2197.24'



10250

10300

10350

10400

10286'

90.91°

1.12°

7432.89'

2286.23'

10376'

90.67°

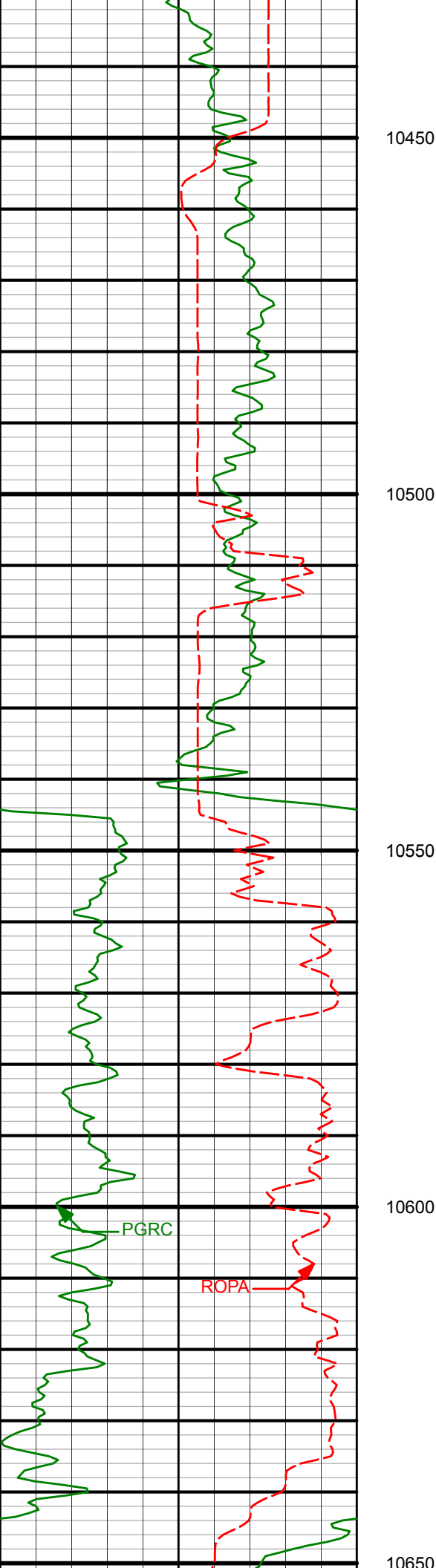
0.30°

7431.65'

2376.21'

ROP

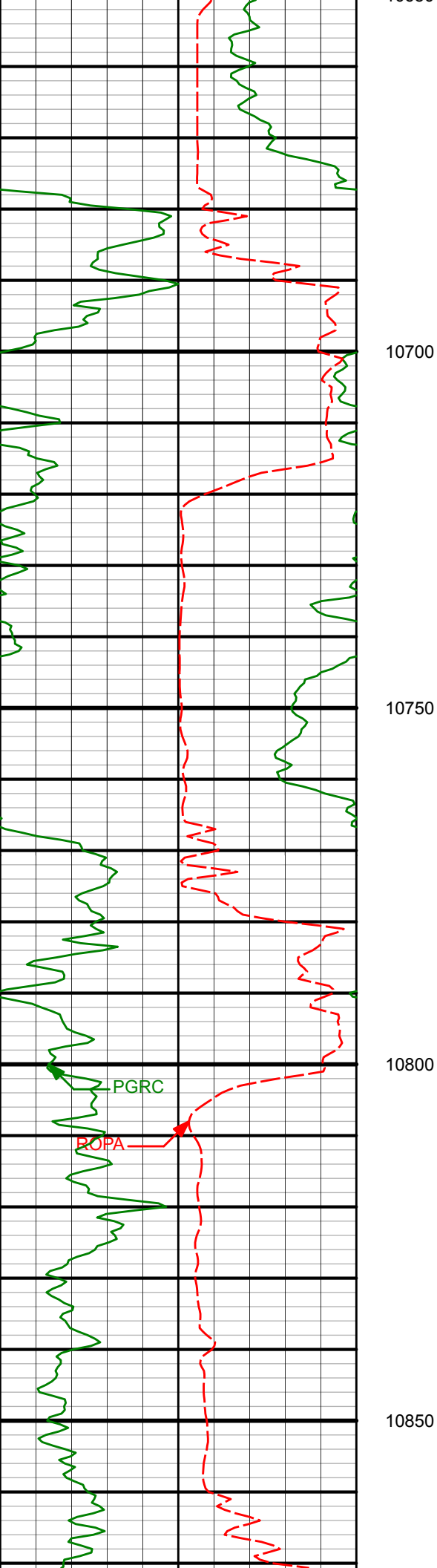
PGR



10466' 90.65° 1.54° 7430.61' 2466.20'

10556' 91.66° 359.12° 7428.80' 2556.17'

10645' 89.42° 357.65° 7427.96' 2645.12'



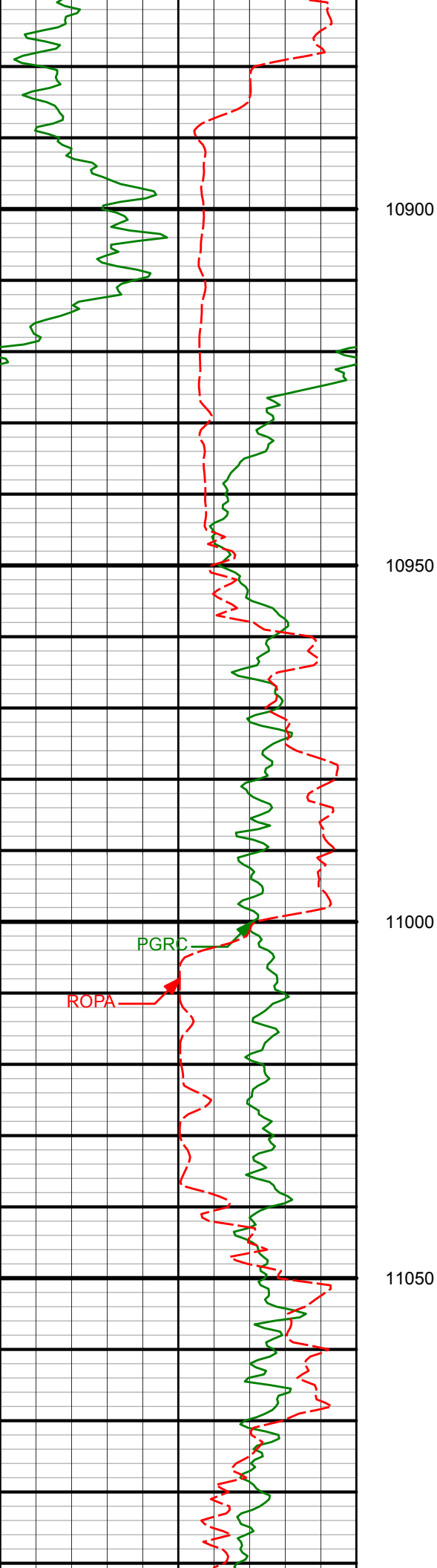
10735'

87.77°

359.10°

7430.17'

2735.04'



10915'

88.25°

357.43°

7436.42'

2914.83'

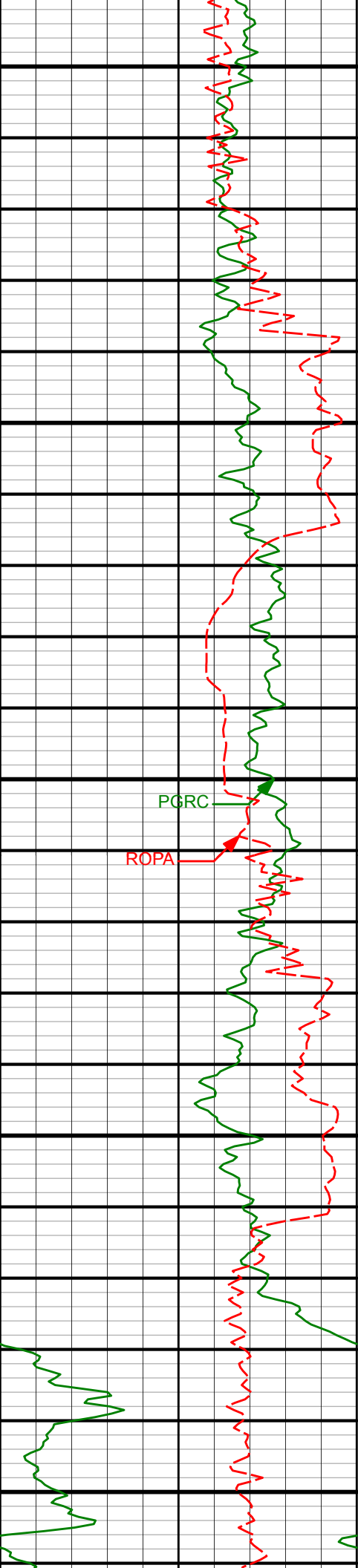
11004'

89.88°

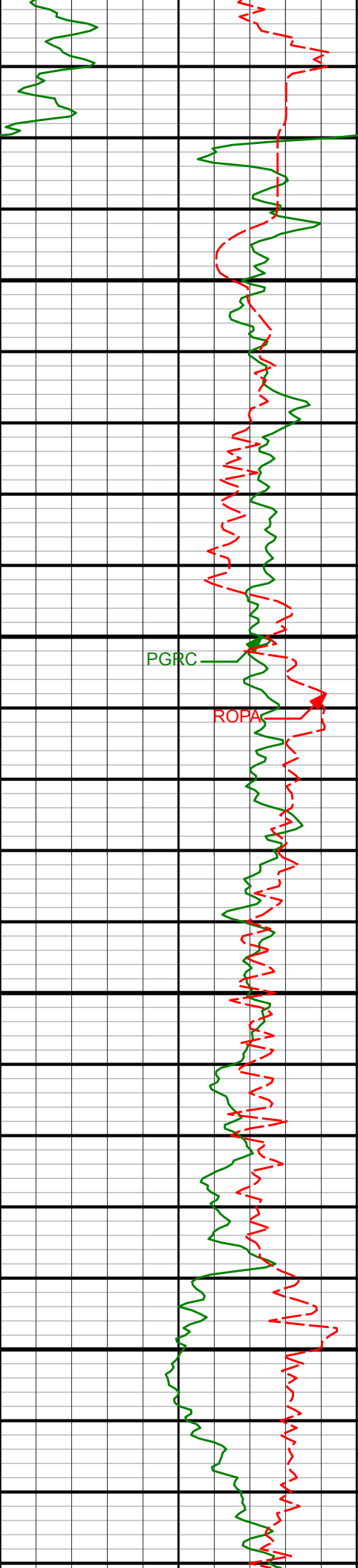
359.88°

7437.87'

3003.77'



11094'	89.59°	359.74°	7438.29'	3093.77'
11100				
11150				
11184'	92.23°	2.40°	7436.86'	3183.73'
11200				
11250				
11274'	90.56°	0.58°	7434.67'	3273.67'
11300				



11350

11363'

90.14°

0.27°

7434.12'

3362.67'

11400

11450

11453'

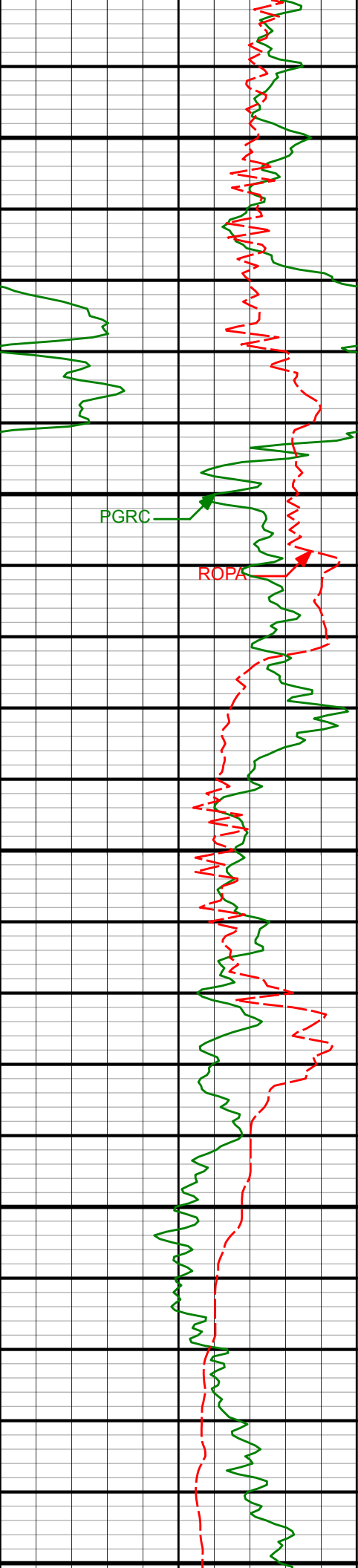
90.47°

1.04°

7433.64'

3452.67'

11500



11543'

90.60°

0.69°

7432.80'

3542.66'

11550

11600

11650

11700

11722'

89.99°

0.88°

7431.88'

3721.64'

11750



11812'

90.25°

0.30°

7431.69'

3811.64'

11800

11850

11900

11902'

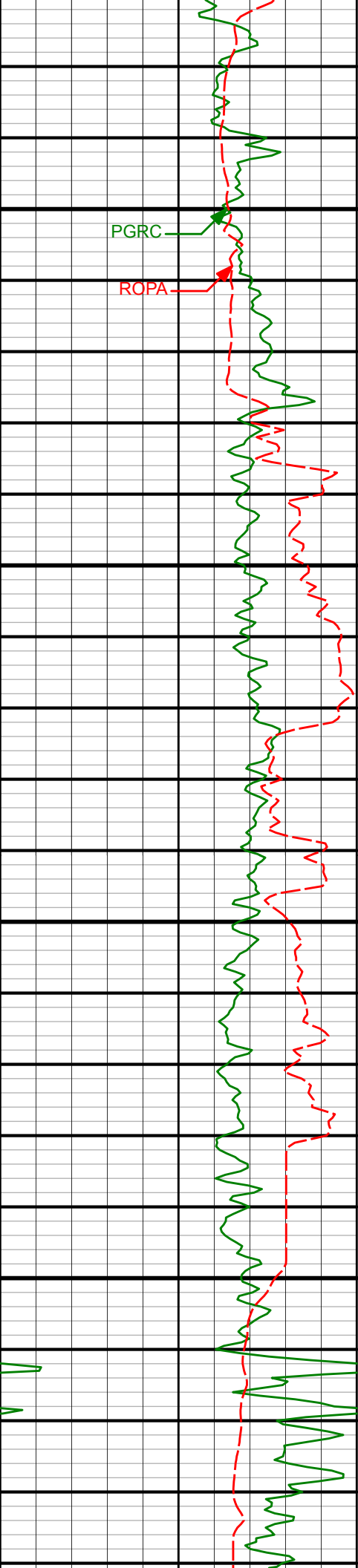
87.92°

359.26°

7433.13'

3901.62'

11950



12000

12050

12100

12150

11992'

87.57°

358.59°

7436.67'

3991.53'

12082'

88.36°

358.58°

7439.87'

4081.43'

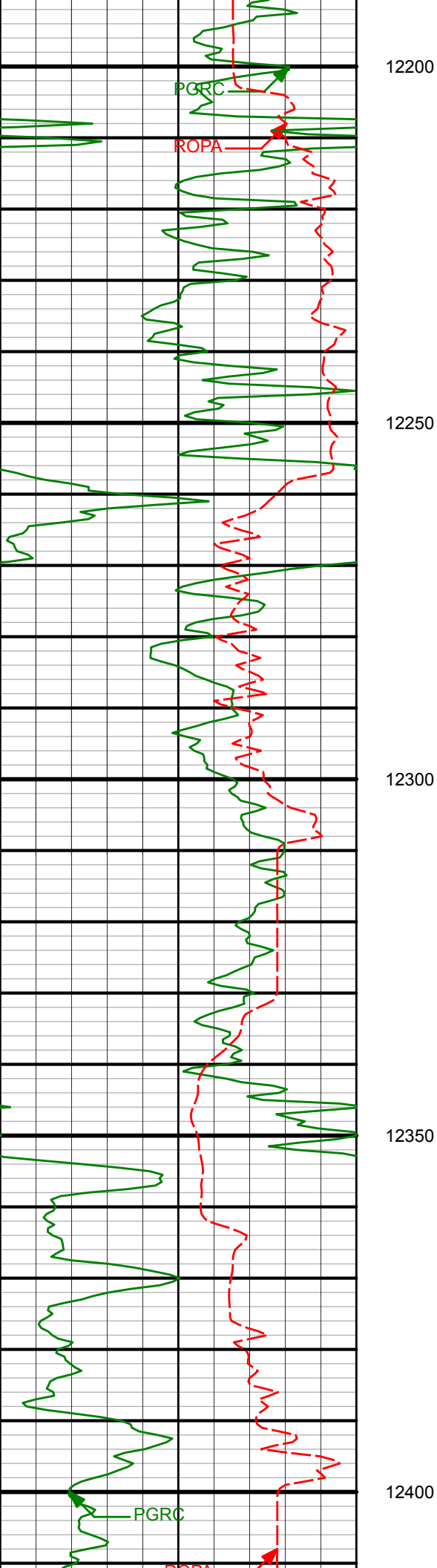
12172'

87.33°

357.88°

7443.25'

4171.32'



12261'

89.62°

359.53°

7445.62'

4260.25'

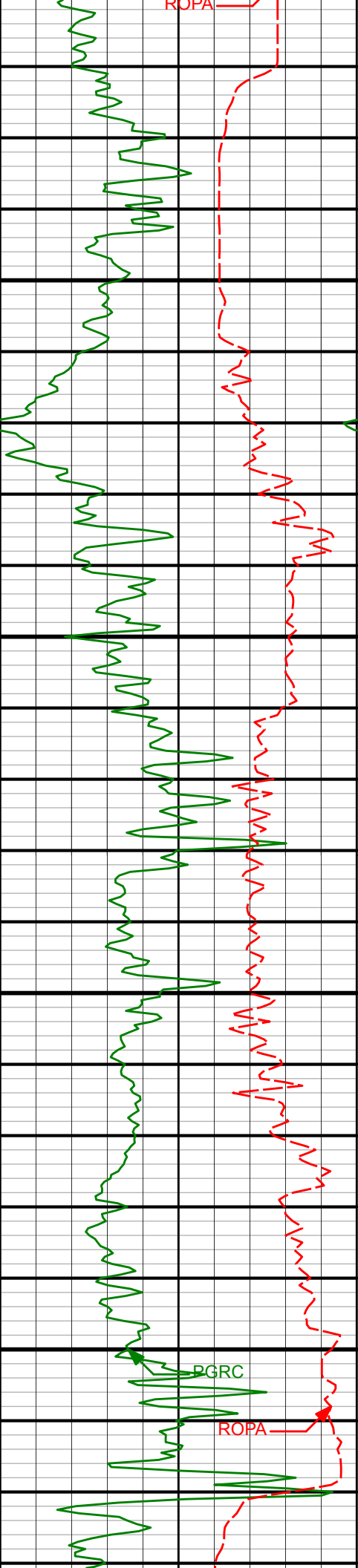
12351'

89.79°

0.23°

7446.08'

4350.25'



12441' 90.21° 359.31° 7446.08' 4440.24'

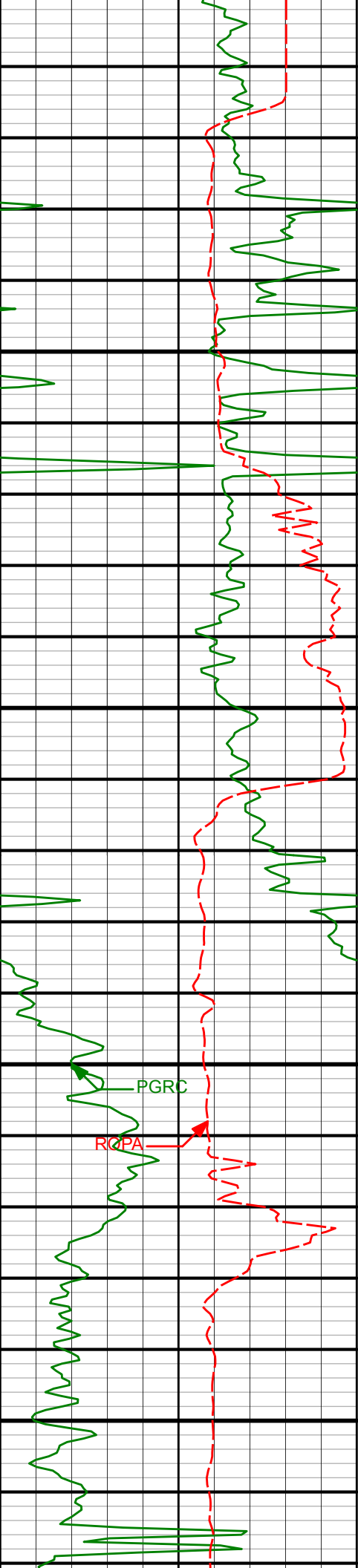
12450

12500

12550

12600

12621' 88.63° 358.98° 7447.91' 4620.20'



12890'	89.37°	1.06°	7450.20'	4889.13'
--------	--------	-------	----------	----------

12900

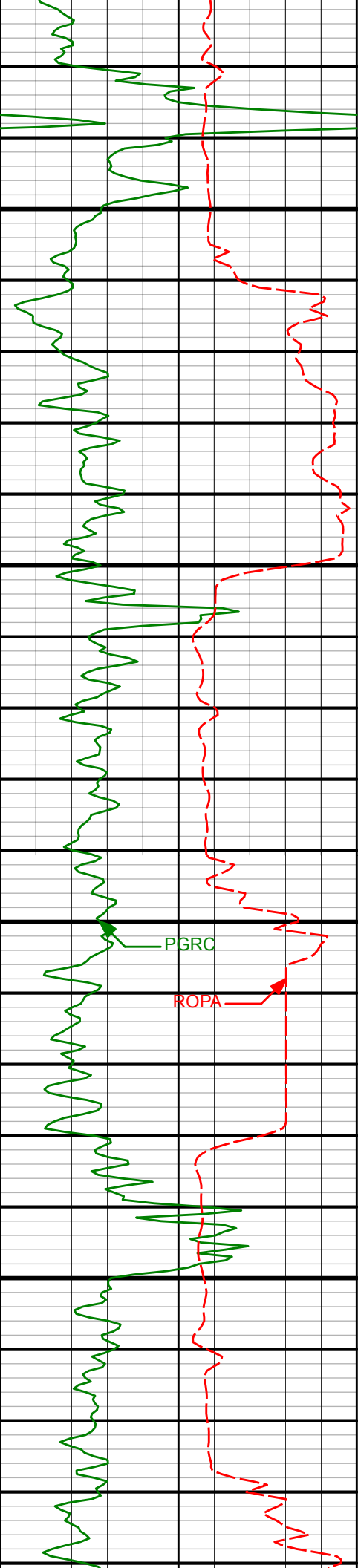
12950

12980'	91.00°	3.76°	7449.91'	4979.05'
--------	--------	-------	----------	----------

13000

13050

13069'	91.73°	3.23°	7447.79'	5067.87'
--------	--------	-------	----------	----------



13100

13150

13200

13250

PGRC

ROPA

13159'

89.40°

3.24°

7446.90'

5157.73'

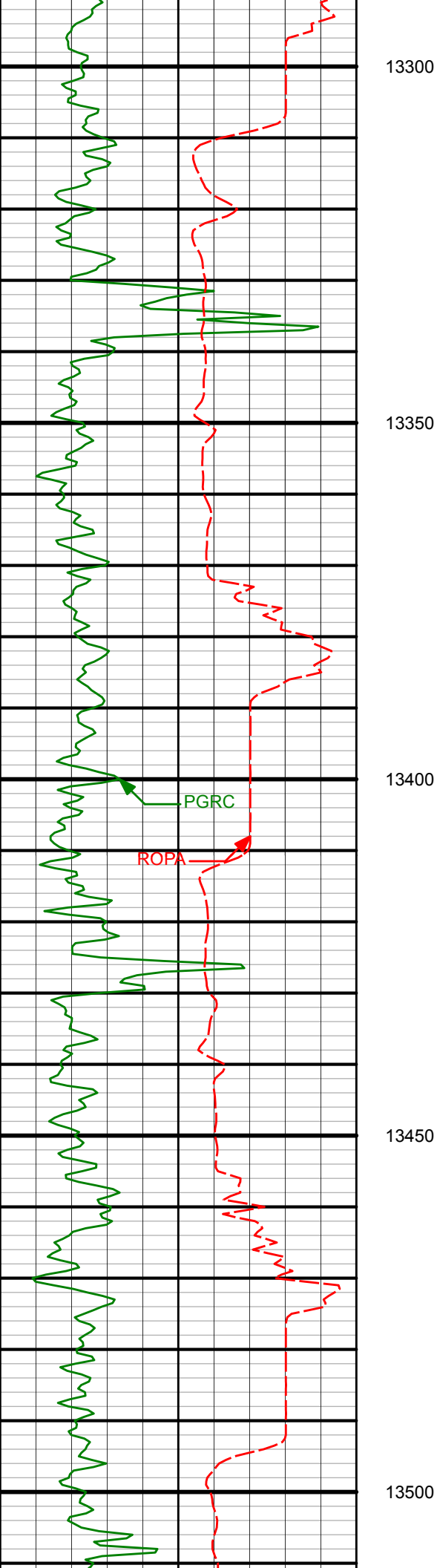
13249'

89.55°

3.00°

7447.72'

5247.61'



13339'

89.35°

2.16°

7448.59'

5337.52'

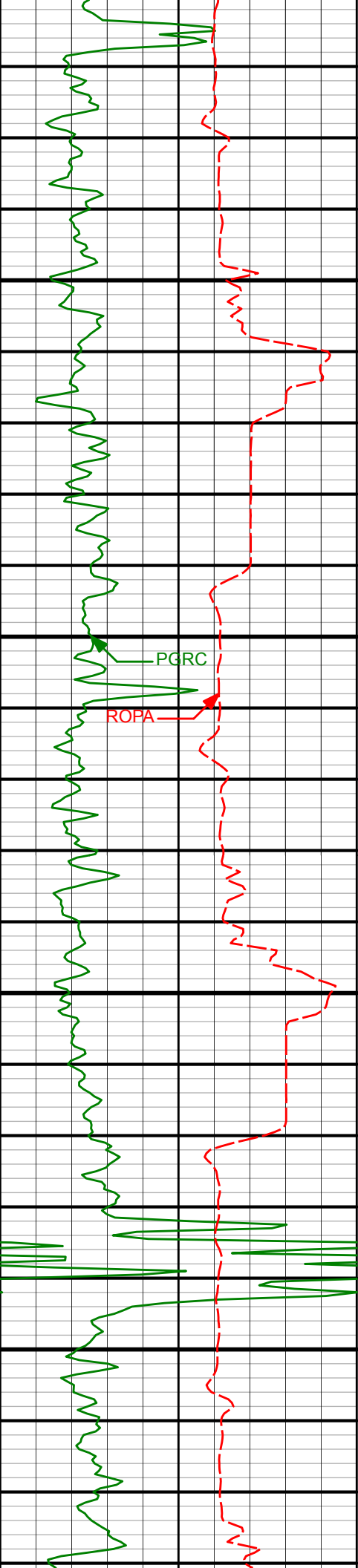
13429'

89.22°

1.22°

7449.71'

5427.48'



13550

13600

13650

13700

13518'

89.11°

0.70°

7451.01'

5516.46'

13608'

88.91°

0.28°

7452.56'

5606.45'

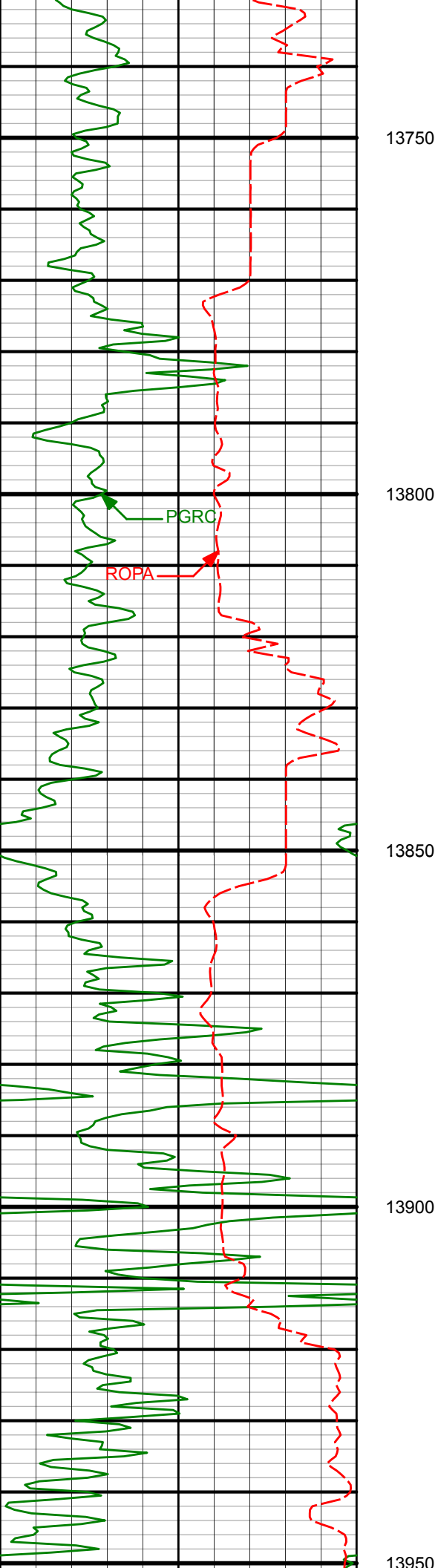
13698'

89.04°

359.35°

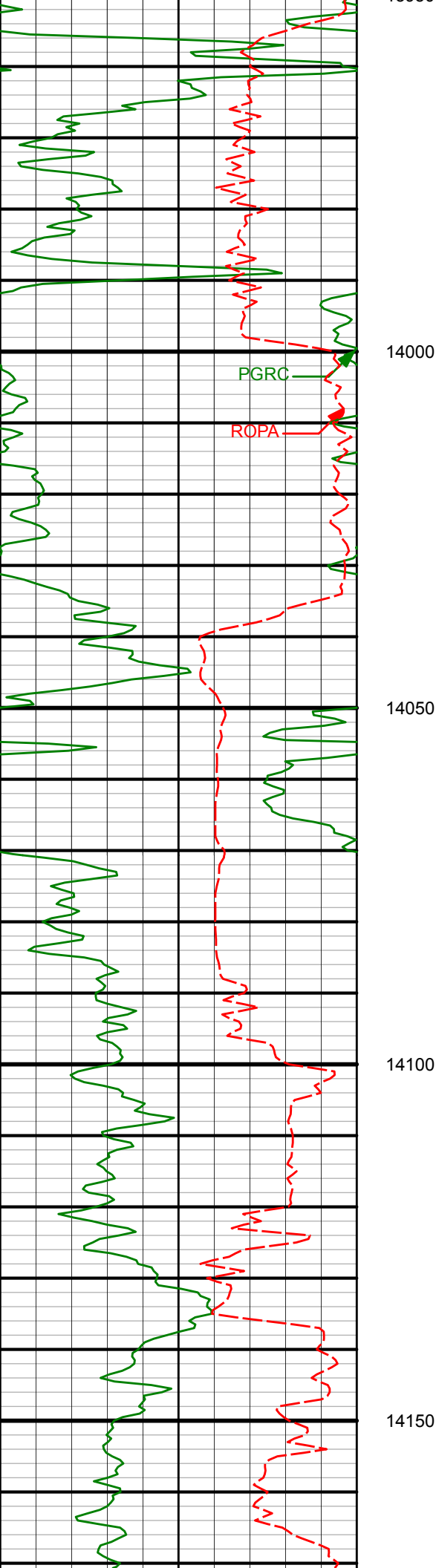
7454.17'

5696.43'



13788' 88.30° 359.17° 7456.26' 5786.39'

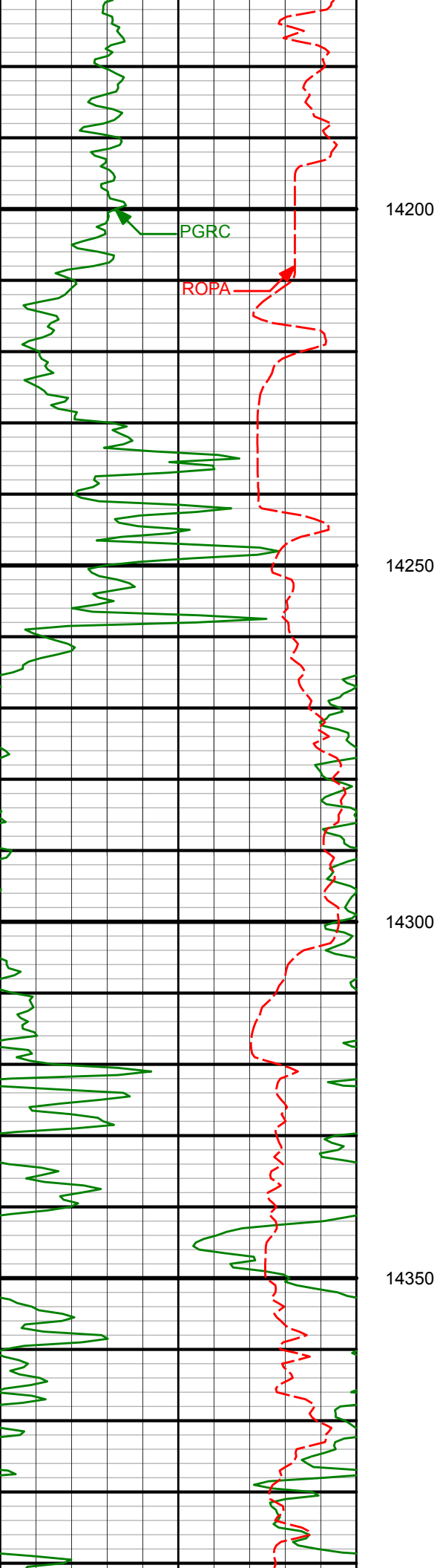
13877' 87.37° 358.67° 7459.63' 5875.31'



13967'	88.03°	359.33°	7463.24'	5965.22'
--------	--------	---------	----------	----------

14057'	89.51°	0.52°	7465.17'	6055.19'
--------	--------	-------	----------	----------

14147'	91.11°	0.74°	7464.68'	6145.18'
--------	--------	-------	----------	----------



14237'

91.20°

0.21°

7462.87'

6235.16'

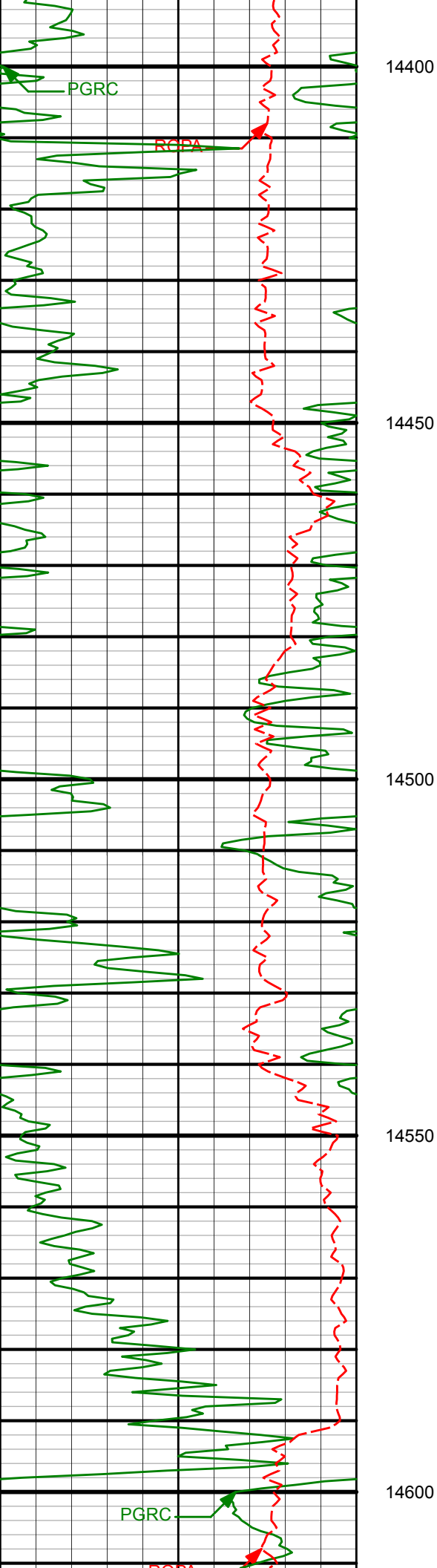
14326'

89.37°

2.18°

7462.43'

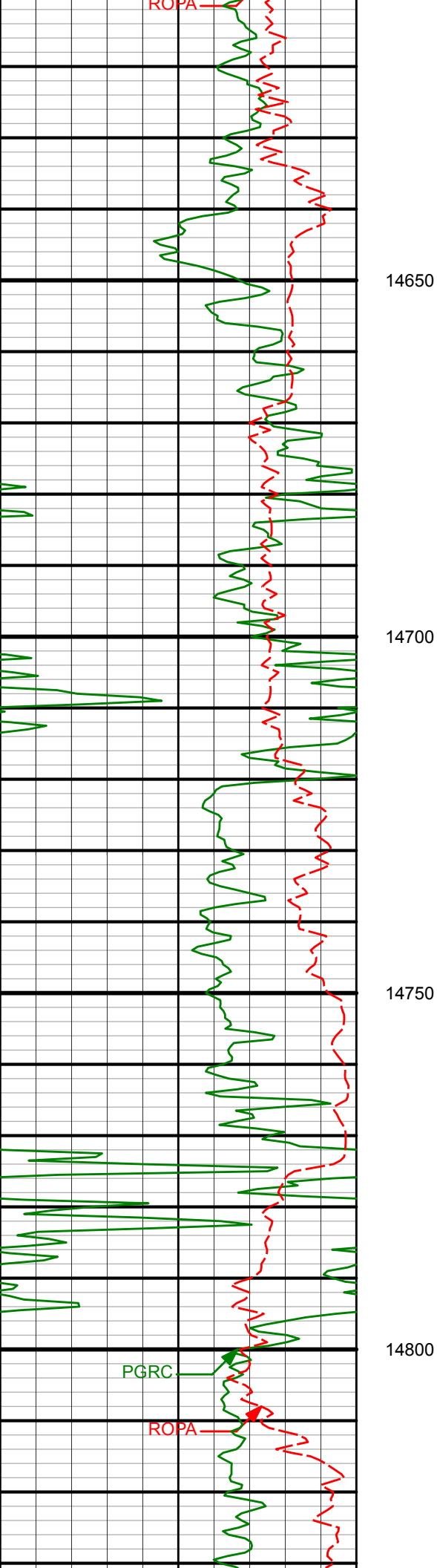
6324.14'



14416'	90.30°	1.84°	7462.68'	6414.09'
--------	--------	-------	----------	----------

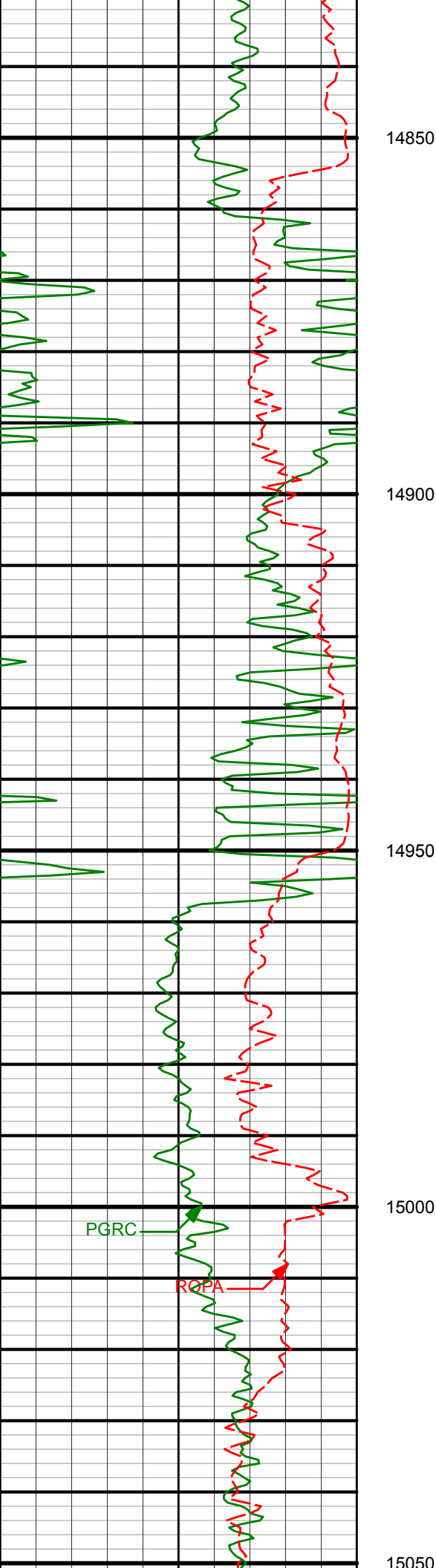
14506'	91.24°	1.50°	7461.48'	6504.05'
--------	--------	-------	----------	----------

14596'	90.25°	359.90°	7460.30'	6594.04'
--------	--------	---------	----------	----------



14685' 91.64° 0.00° 7458.84' 6683.02'

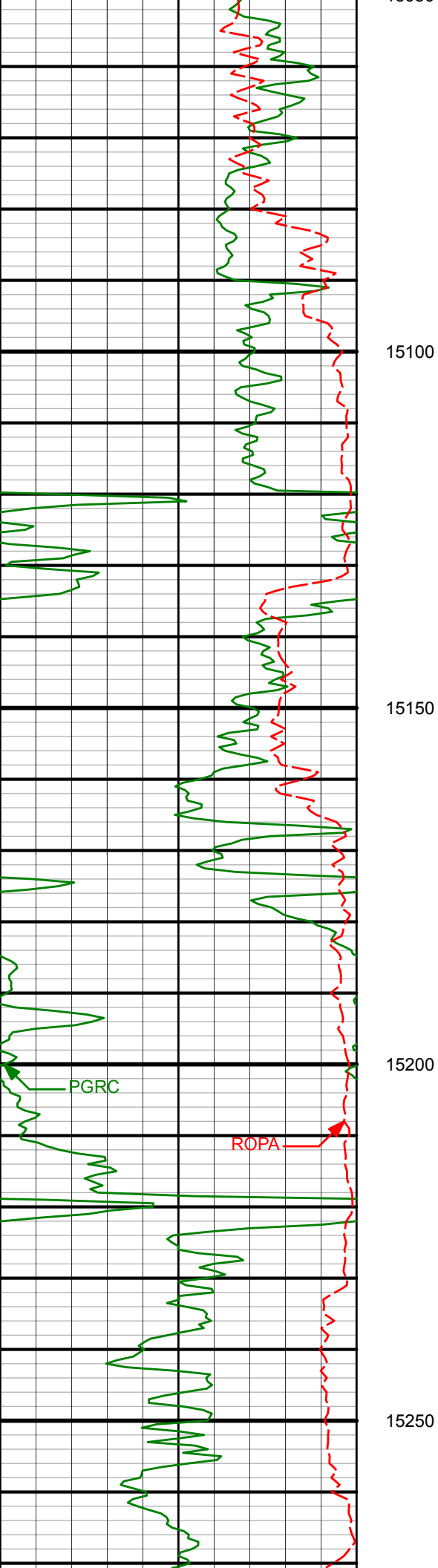
14775' 89.35° 359.35° 7458.06' 6773.01'



14865' 86.45° 359.10° 7461.36' 6862.93'

14955' 87.02° 359.79° 7466.48' 6952.77'

15045' 86.96° 359.44° 7471.21' 7042.64'



15134'

85.26°

358.04°

7477.25'

7131.41'

15150

15200

15224'

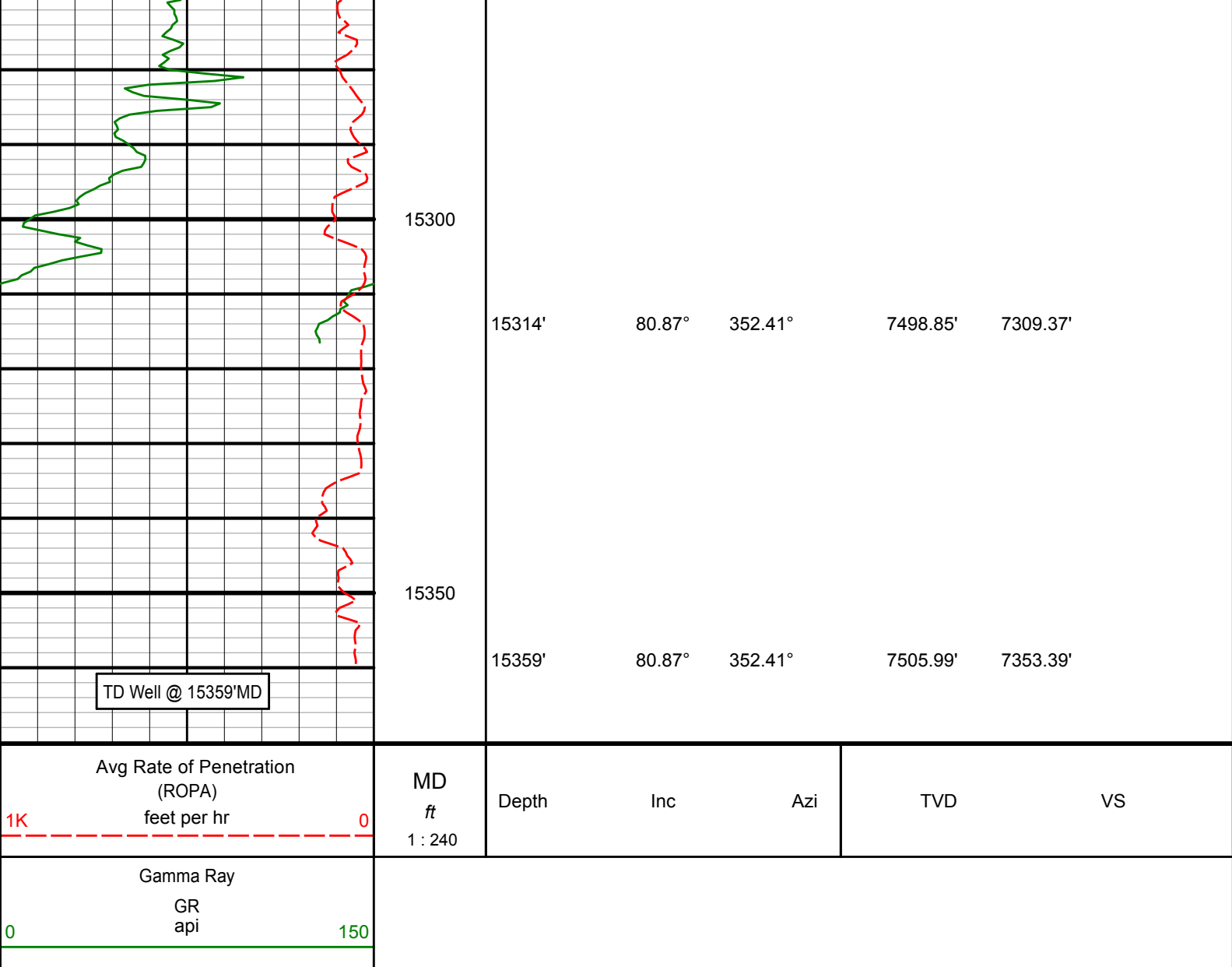
83.15°

355.52°

7486.33'

7220.78'

15250



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.

Wagner 28N-W10HZ

Wattenberg

Weld Colorado

USA

CA-XX-0904405884

Surveys from 13'-1830' provided by 3rd party

First Sperry survey @ 1918'

Survey corrections provided by Sperry Survey Management

Final survey @ 15359 is projected to TD

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
-----------------------------	--------------------------	------------------------	-----------------------------	--------------------	---------------------	-------------------------------	-----------------------

Wagner 28N-W10HZ

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
13.00	0.00	0.00	13.00	0.00 N	0.00 E	0.00	0.00
133.00	0.26	149.72	133.00	0.24 S	0.14 E	-0.23	0.22
165.00	0.62	168.18	165.00	0.47 S	0.21 E	-0.47	1.19
197.00	0.75	220.74	197.00	0.80 S	0.11 E	-0.80	1.93
228.00	1.10	239.11	227.99	1.10 S	0.28 W	-1.10	1.47
260.00	1.45	240.34	259.98	1.46 S	0.90 W	-1.46	1.10
323.00	2.15	232.43	322.95	2.57 S	2.52 W	-2.58	1.18
355.00	2.55	249.22	354.93	3.19 S	3.67 W	-3.20	2.47
387.00	2.94	246.23	386.89	3.78 S	5.08 W	-3.79	1.30
419.00	2.99	253.52	418.85	4.34 S	6.63 W	-4.36	1.19
450.00	2.81	256.95	449.81	4.75 S	8.15 W	-4.77	0.81
482.00	3.16	263.37	481.76	5.02 S	9.79 W	-5.05	1.51
514.00	3.96	271.19	513.70	5.10 S	11.77 W	-5.14	2.92
577.00	4.83	270.75	576.52	5.02 S	16.60 W	-5.07	1.38
608.00	5.93	267.85	607.38	5.07 S	19.50 W	-5.12	3.65
640.00	6.20	271.54	639.20	5.08 S	22.88 W	-5.15	1.48
672.00	7.21	266.79	670.98	5.15 S	26.61 W	-5.22	3.60
703.00	7.78	269.69	701.72	5.27 S	30.65 W	-5.35	2.21
735.00	8.26	264.33	733.40	5.51 S	35.11 W	-5.61	2.78
767.00	8.88	262.84	765.05	6.04 S	39.85 W	-6.15	2.06
798.00	10.24	262.14	795.62	6.72 S	44.95 W	-6.84	4.40
830.00	10.63	260.73	827.09	7.58 S	50.68 W	-7.72	1.46
862.00	11.21	259.85	858.51	8.61 S	56.66 W	-8.76	1.89
893.00	12.13	259.32	888.87	9.74 S	62.82 W	-9.92	2.99
925.00	12.35	258.88	920.14	11.02 S	69.48 W	-11.22	0.75
957.00	12.04	258.18	951.42	12.37 S	76.11 W	-12.58	1.07
988.00	12.30	259.85	981.72	13.61 S	82.52 W	-13.84	1.41
1020.00	13.45	259.15	1012.91	14.91 S	89.53 W	-15.16	3.63
1051.00	14.59	260.03	1042.99	16.27 S	96.92 W	-16.54	3.74
1083.00	14.28	257.92	1073.98	17.79 S	104.75 W	-18.08	1.91
1114.00	14.33	257.74	1104.02	19.41 S	112.24 W	-19.72	0.22
1146.00	14.94	259.06	1134.98	21.03 S	120.16 W	-21.36	2.17
1178.00	15.78	259.68	1165.84	22.59 S	128.49 W	-22.95	2.67
1210.00	16.79	260.91	1196.55	24.10 S	137.33 W	-24.48	3.34
1241.00	16.79	260.55	1226.23	25.54 S	146.17 W	-25.95	0.34
1273.00	16.39	259.94	1256.90	27.09 S	155.17 W	-27.52	1.36
1305.00	16.74	259.06	1287.57	28.75 S	164.14 W	-29.21	1.35
1336.00	16.79	257.48	1317.25	30.57 S	172.90 W	-31.05	1.48
1368.00	16.66	255.54	1347.90	32.72 S	181.85 W	-33.23	1.79
1400.00	17.58	256.51	1378.48	34.99 S	190.99 W	-35.53	3.01
1431.00	17.45	254.84	1408.05	37.30 S	200.03 W	-37.86	1.67
1463.00	17.40	253.79	1438.58	39.89 S	209.26 W	-40.47	0.99
1494.00	17.71	251.06	1468.13	42.71 S	218.17 W	-43.32	2.84
1526.00	18.24	251.50	1498.57	45.88 S	227.52 W	-46.52	1.71
1590.00	18.54	247.55	1559.31	52.95 S	246.42 W	-53.64	2.00
1621.00	19.25	246.40	1588.64	56.88 S	255.66 W	-57.59	2.59
1652.00	19.25	245.35	1617.90	61.05 S	264.99 W	-61.79	1.12
1684.00	18.94	244.73	1648.14	65.47 S	274.48 W	-66.24	1.16
1715.00	18.85	243.68	1677.47	69.84 S	283.52 W	-70.63	1.13
1747.00	18.81	239.64	1707.76	74.74 S	292.60 W	-75.55	4.08
1811.00	18.46	233.48	1768.41	85.98 S	309.65 W	-86.85	3.12
1830.00	18.24	232.87	1786.44	89.57 S	314.44 W	-90.45	1.54
1918.00	18.37	229.54	1869.99	106.88 S	335.97 W	-107.82	1.20
2097.00	16.84	225.92	2040.61	143.22 S	376.06 W	-144.27	1.05

Wagner 28N-W10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
2187.00	17.41	229.38	2126.62	161.06 S	395.65 W	-162.16	1.30
2277.00	17.10	233.92	2212.57	177.62 S	416.56 W	-178.78	1.54
2367.00	17.80	234.64	2298.43	193.37 S	438.48 W	-194.60	0.81
2456.00	17.01	231.53	2383.36	209.34 S	459.76 W	-210.63	1.37
2546.00	17.98	229.94	2469.20	226.47 S	480.70 W	-227.82	1.20
2636.00	17.80	229.45	2554.84	244.36 S	501.79 W	-245.76	0.26
2726.00	17.58	231.12	2640.59	261.83 S	522.82 W	-263.29	0.61
2905.00	16.92	222.61	2811.56	297.98 S	561.50 W	-299.54	1.46
2995.00	17.43	219.94	2897.55	317.95 S	579.02 W	-319.57	1.04
3085.00	18.90	225.09	2983.07	338.58 S	598.00 W	-340.25	2.42
3174.00	17.62	228.38	3067.59	357.70 S	618.28 W	-359.43	1.85
3264.00	15.93	224.99	3153.76	375.49 S	637.20 W	-377.27	2.17
3354.00	16.09	228.06	3240.27	392.56 S	655.21 W	-394.39	0.96
3534.00	15.10	234.42	3413.65	422.87 S	692.83 W	-424.81	1.10
3623.00	15.21	232.81	3499.56	436.68 S	711.56 W	-438.66	0.49
3713.00	15.76	229.98	3586.29	451.67 S	730.33 W	-453.71	1.04
3802.00	15.45	231.10	3672.01	466.89 S	748.81 W	-468.98	0.49
3892.00	16.65	228.62	3758.50	482.94 S	767.82 W	-485.08	1.54
3982.00	17.84	226.97	3844.46	500.87 S	787.57 W	-503.07	1.43
4072.00	15.91	222.42	3930.58	519.39 S	805.97 W	-521.64	2.60
4161.00	14.35	217.07	4016.50	537.20 S	820.85 W	-539.49	2.35
4251.00	16.77	212.15	4103.19	557.09 S	834.48 W	-559.42	3.06
4341.00	17.14	213.17	4189.28	579.19 S	848.65 W	-581.55	0.53
4431.00	15.18	211.49	4275.72	600.34 S	862.06 W	-602.74	2.24
4610.00	13.32	221.42	4449.23	635.79 S	887.95 W	-638.27	1.71
4790.00	10.37	225.53	4625.38	662.70 S	913.24 W	-665.24	1.70
4880.00	9.60	228.01	4714.02	673.39 S	924.59 W	-675.97	0.98
4969.00	9.01	231.95	4801.85	682.65 S	935.60 W	-685.26	0.98
5059.00	7.50	243.64	4890.92	689.60 S	946.41 W	-692.24	2.50
5149.00	4.66	258.60	4980.41	692.94 S	955.26 W	-695.60	3.59
5239.00	2.18	286.26	5070.25	693.18 S	960.49 W	-695.86	3.23
5328.00	1.27	288.65	5159.21	692.39 S	963.05 W	-695.08	1.03
5418.00	1.05	292.69	5249.19	691.75 S	964.75 W	-694.44	0.26
5508.00	1.23	293.97	5339.17	691.04 S	966.40 W	-693.74	0.20
5598.00	1.27	288.33	5429.15	690.34 S	968.23 W	-693.04	0.14
5687.00	1.34	358.56	5518.13	688.99 S	969.19 W	-691.69	1.69
5777.00	1.63	5.45	5608.10	686.66 S	969.09 W	-689.36	0.38
5867.00	1.27	348.12	5698.07	684.41 S	969.18 W	-687.11	0.63
5939.00	0.97	323.92	5770.06	683.14 S	969.70 W	-685.84	0.77
5999.00	1.16	291.05	5830.05	682.51 S	970.57 W	-685.21	1.05
6179.00	1.78	298.18	6009.99	680.53 S	974.73 W	-683.25	0.36
6268.00	1.36	304.63	6098.96	679.28 S	976.82 W	-682.00	0.51
6358.00	0.73	108.89	6188.95	678.86 S	977.16 W	-681.58	2.30
6448.00	0.15	297.46	6278.95	678.99 S	976.72 W	-681.71	0.98
6538.00	0.97	320.88	6368.94	678.34 S	977.30 W	-681.07	0.93
6627.00	1.27	326.39	6457.93	676.94 S	978.32 W	-679.67	0.36
6717.00	1.60	327.49	6547.90	675.05 S	979.55 W	-677.78	0.37
6807.00	1.25	318.67	6637.87	673.25 S	980.88 W	-675.99	0.46
6869.00	0.62	321.83	6699.86	672.48 S	981.53 W	-675.22	1.02
6897.00	0.59	314.21	6727.86	672.26 S	981.73 W	-675.00	0.31
6986.00	9.47	28.57	6816.45	665.50 S	978.55 W	-668.23	10.48
7076.00	17.49	21.02	6903.90	646.34 S	970.14 W	-649.04	9.10
7166.00	19.54	18.06	6989.24	619.40 S	960.62 W	-622.08	2.51
7256.00	24.17	15.09	7072.75	587.28 S	951.15 W	-589.93	5.29
7345.00	28.59	4.47	7152.51	548.42 S	944.74 W	-551.05	7.25

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
7435.00	36.15	1.84	7228.47	500.35 S	942.21 W	-502.97	8.54
7525.00	48.81	359.03	7294.72	439.70 S	941.93 W	-442.33	14.22
7615.00	62.34	1.00	7345.49	365.64 S	941.81 W	-368.27	15.14
7705.00	70.69	357.20	7381.33	283.20 S	943.19 W	-285.83	10.05
7794.00	76.63	356.45	7406.36	197.97 S	947.92 W	-200.61	6.72
7884.00	77.92	357.50	7426.18	110.30 S	952.56 W	-112.96	1.83
7974.00	84.52	356.84	7439.91	21.52 S	956.95 W	-24.19	7.37
8064.00	87.46	357.19	7446.21	68.13 N	961.62 W	65.45	3.29
8154.00	91.97	359.19	7446.65	158.06 N	964.47 W	155.36	5.48
8243.00	91.77	358.68	7443.75	246.99 N	966.12 W	244.30	0.62
8333.00	91.15	358.19	7441.46	336.93 N	968.58 W	334.23	0.88
8513.00	91.07	2.69	7437.97	516.85 N	967.19 W	514.14	2.50
8603.00	91.42	3.02	7436.01	606.71 N	962.71 W	604.02	0.53
8692.00	90.41	3.28	7434.59	695.57 N	957.82 W	692.89	1.17
8782.00	90.60	359.91	7433.80	785.51 N	955.32 W	782.84	3.75
8971.00	90.43	357.80	7432.10	974.46 N	959.09 W	971.78	1.12
9065.00	90.54	356.72	7431.30	1068.35 N	963.59 W	1065.65	1.15
9159.00	91.18	0.72	7429.89	1162.29 N	965.69 W	1159.59	4.31
9254.00	89.29	2.12	7429.50	1257.26 N	963.33 W	1254.56	2.48
9348.00	89.44	1.62	7430.54	1351.20 N	960.27 W	1348.51	0.56
9442.00	89.55	0.81	7431.37	1445.17 N	958.27 W	1442.49	0.87
9537.00	89.29	359.98	7432.33	1540.17 N	957.62 W	1537.49	0.92
9631.00	89.46	359.39	7433.36	1634.16 N	958.13 W	1631.48	0.65
9725.00	88.96	0.55	7434.66	1728.15 N	958.18 W	1725.47	1.34
9819.00	89.79	2.25	7435.68	1822.11 N	955.89 W	1819.43	2.01
9914.00	90.03	2.34	7435.83	1917.03 N	952.08 W	1914.37	0.27
10008.00	90.43	2.35	7435.45	2010.95 N	948.24 W	2008.30	0.43
10102.00	90.58	1.51	7434.63	2104.90 N	945.07 W	2102.25	0.91
10197.00	90.34	0.17	7433.86	2199.88 N	943.68 W	2197.24	1.43
10286.00	90.91	1.12	7432.89	2288.87 N	942.68 W	2286.23	1.24
10376.00	90.67	0.30	7431.65	2378.85 N	941.56 W	2376.21	0.95
10466.00	90.65	1.54	7430.61	2468.83 N	940.12 W	2466.20	1.38
10556.00	91.66	359.12	7428.80	2558.80 N	939.60 W	2556.17	2.91
10645.00	89.42	357.65	7427.96	2647.76 N	942.11 W	2645.12	3.01
10735.00	87.77	359.10	7430.17	2737.69 N	944.66 W	2735.04	2.44
10915.00	88.25	357.43	7436.42	2917.49 N	950.11 W	2914.83	0.96
11004.00	89.88	359.88	7437.87	3006.44 N	952.19 W	3003.77	3.31
11094.00	89.59	359.74	7438.29	3096.44 N	952.49 W	3093.77	0.36
11184.00	92.23	2.40	7436.86	3186.40 N	950.81 W	3183.73	4.16
11274.00	90.56	0.58	7434.67	3276.34 N	948.47 W	3273.67	2.74
11363.00	90.14	0.27	7434.12	3365.33 N	947.81 W	3362.67	0.59
11453.00	90.47	1.04	7433.64	3455.32 N	946.79 W	3452.67	0.93
11543.00	90.60	0.69	7432.80	3545.31 N	945.43 W	3542.66	0.41
11722.00	89.99	0.88	7431.88	3724.29 N	942.97 W	3721.64	0.36
11812.00	90.25	0.30	7431.69	3814.28 N	942.05 W	3811.64	0.71
11902.00	87.92	359.26	7433.13	3904.26 N	942.39 W	3901.62	2.84
11992.00	87.57	358.59	7436.67	3994.18 N	944.08 W	3991.53	0.84
12082.00	88.36	358.58	7439.87	4084.09 N	946.30 W	4081.43	0.88
12172.00	87.33	357.88	7443.25	4173.98 N	949.08 W	4171.32	1.38
12261.00	89.62	359.53	7445.62	4262.92 N	951.09 W	4260.25	3.17
12351.00	89.79	0.23	7446.08	4352.92 N	951.28 W	4350.25	0.80
12441.00	90.21	359.31	7446.08	4442.92 N	951.64 W	4440.24	1.12
12621.00	88.63	358.98	7447.91	4622.88 N	954.32 W	4620.20	0.90
12710.00	89.37	1.75	7449.46	4711.86 N	953.76 W	4709.18	3.22
12800.00	90.16	1.43	7449.83	4801.82 N	951.26 W	4799.15	0.95

Wagner 28N-W10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
12890.00	89.37	1.06	7450.20	4891.80 N	949.30 W	4889.13	0.97
12980.00	91.00	3.76	7449.91	4981.71 N	945.52 W	4979.05	3.50
13069.00	91.73	3.23	7447.79	5070.52 N	940.10 W	5067.87	1.01
13159.00	89.40	3.24	7446.90	5160.36 N	935.02 W	5157.73	2.59
13249.00	89.55	3.00	7447.72	5250.22 N	930.12 W	5247.61	0.31
13339.00	89.35	2.16	7448.59	5340.13 N	926.07 W	5337.52	0.96
13429.00	89.22	1.22	7449.71	5430.08 N	923.42 W	5427.48	1.05
13518.00	89.11	0.70	7451.01	5519.06 N	921.92 W	5516.46	0.60
13608.00	88.91	0.28	7452.56	5609.04 N	921.15 W	5606.45	0.52
13698.00	89.04	359.35	7454.17	5699.03 N	921.45 W	5696.43	1.04
13788.00	88.30	359.17	7456.26	5788.99 N	922.61 W	5786.39	0.85
13877.00	87.37	358.67	7459.63	5877.91 N	924.28 W	5875.31	1.19
13967.00	88.03	359.33	7463.24	5967.83 N	925.85 W	5965.22	1.04
14057.00	89.51	0.52	7465.17	6057.80 N	925.97 W	6055.19	2.11
14147.00	91.11	0.74	7464.68	6147.79 N	924.98 W	6145.18	1.79
14237.00	91.20	0.21	7462.87	6237.77 N	924.24 W	6235.16	0.60
14326.00	89.37	2.18	7462.43	6326.74 N	922.38 W	6324.14	3.02
14416.00	90.30	1.84	7462.68	6416.68 N	919.22 W	6414.09	1.10
14506.00	91.24	1.50	7461.48	6506.64 N	916.60 W	6504.05	1.11
14596.00	90.25	359.90	7460.30	6596.62 N	915.50 W	6594.04	2.09
14685.00	91.64	0.00	7458.84	6685.60 N	915.58 W	6683.02	1.57
14775.00	89.35	359.35	7458.06	6775.59 N	916.09 W	6773.01	2.64
14865.00	86.45	359.10	7461.36	6865.51 N	917.31 W	6862.93	3.23
14955.00	87.02	359.79	7466.48	6955.36 N	918.18 W	6952.77	0.99
15045.00	86.96	359.44	7471.21	7045.24 N	918.78 W	7042.64	0.39
15134.00	85.26	358.04	7477.25	7134.00 N	920.73 W	7131.41	2.47
15224.00	83.15	355.52	7486.33	7223.39 N	925.76 W	7220.78	3.64
15314.00	80.87	352.41	7498.85	7312.01 N	935.12 W	7309.37	4.26
15359.00	80.87	352.41	7505.99	7356.05 N	940.99 W	7353.39	0.00

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 0.16 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.15 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 15359.00 FEET
IS 7415.99 FEET ALONG 352.71 DEGREES (TRUE)**