



WELL INFORMATION					
MWD Run Number	100	200	300	400	
Date run completed	12-Jan-13	13-Jan-13	16-Jan-13	18-Jan-13	
Rig Bit Number	2	3	4	5	
Bit Size (in)	8.750	8.750	6.125	6.125	
Tool Nominal OD (in)	6.750	6.750	4.750	4.750	
Log Start Depth (MD, ft)	665.00	6,018.00	7,203.00	11,186.00	
Log End Depth (MD, ft)	6,018.00	7,203.00	11,187.00	14,955.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	11-Jan-13 06:20	12-Jan-13 10:15	14-Jan-13 14:15	16-Jan-13 23:45	
Drill/Wipe End Date and Time	11-Jan-13 23:30	13-Jan-13 04:00	16-Jan-13 02:45	18-Jan-13 12:00	
Min Inc (deg) @ Depth (MD, ft)	.20 @ 5,739.00	.87 @ 6,021.00	86.49 @ 9,800.00	87.40 @ 14,143.00	
Max Inc (deg) @ Depth (MD, ft)	17.19 @ 2,034.00	84.26 @ 7,148.00	91.29 @ 8,200.00	92.07 @ 14,523.00	
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC	.86 / PDC	.86 / PDC	
Flow Rate (gpm)	590.19	546.62	290.92	270.00	
Max AV (fpm) / CV (fpm) @ MWD	417.4 / NA	392.5 / NA	454.9 / NA	401.4 / NA	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	9.00 / 29.00	9.90 / 37.00	8.97 / 30.00	9.30 / 35.00	
Filtrate CL (ppm)	2,800.00	2,800.00	2,400.00	2,600.00	
pH / Fluid Loss (mptm)	9.20 / NA	9.20 / NA	8.10 / NA	8.60 / NA	
PV (cP) / YP (lbf2)	4 / 4.00	12 / 8.00	5 / 3.00	9 / 13.00	
% Solids / % Sand	4.70 / 0.25	6.2 / 0.40	3.70 / 0.10	5.20 / 0.20	
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:88	2 / 2:93.5	1.5 / 1.5:92.2	
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Max Tool Temp (deg F) / S	444.78 / PDM	428.88 / PDM	348.12 / PDM	338.78 / PDM	

Max Tool Temp (degF) / Source	141.70 / PCM	160.83 / PCM	213.40 / PCM	238.70 / PCM	
Rm @ Max Tool Temp (degF)	NA @ 141.70	NA @ 160.83	NA @ 213.40	NA @ 238.70	
Lead MWD Engineer	Ryan Brunkhorst	Ryan Brunkhorst	Ryan Brunkhorst	Ryan Brunkhorst	
Customer Representative	Matt Settles	Matt Settles	Matt Settles	Johnny Sanchez	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	5.76	
Sub Serial Number	245494	245494	11744843	11744843	
Insert Serial Number	11400826	11400826	11680772	11680786	
Date and Time Initialized	06-Jan-13 01:30	06-Jan-13 01:30	13-Jan-13 06:10	16-Jan-13 05:15	
Date and Time Read	13-Jan-13 10:29	13-Jan-13 10:35	16-Jan-13 19:18	19-Jan-13 00:01	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	57.00	55.00	66.00	66.00	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	245494	245494	11744843	11744843	
Sonde Serial Number	10859920	10859920	11833026	11671055	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	181.06	108.75	72.88	267.62	

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	50.06	48.18	58.70	58.79	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	11909583	11909583	11744843	11744843	
Insert/Sonde Serial Number	11680972	11680972	11120599	11579820	

REMARKS

1. All depths are measured 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. The surveys presented on the log are Sperry surveys that were recorded while drilling. The surveys up to 11,000' MD in the Survey Report are gyro surveys that were recorded by Vaughn Energy Services after drilling to 11,187' MD. All surveys following 11,000' MD are Sperry surveys that were recorded while drilling.
7. INSITE version 7.4.01

WARRANTY

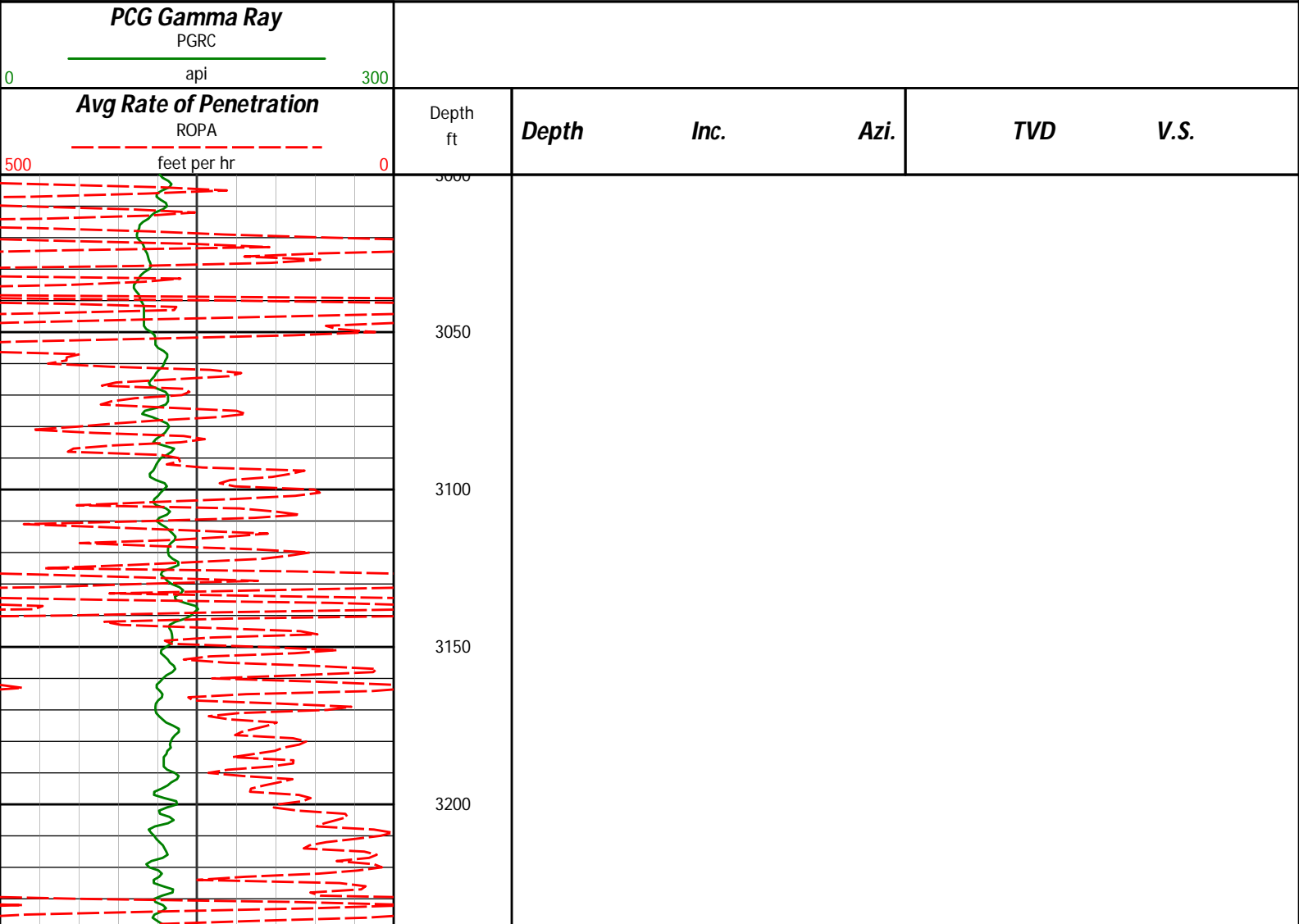
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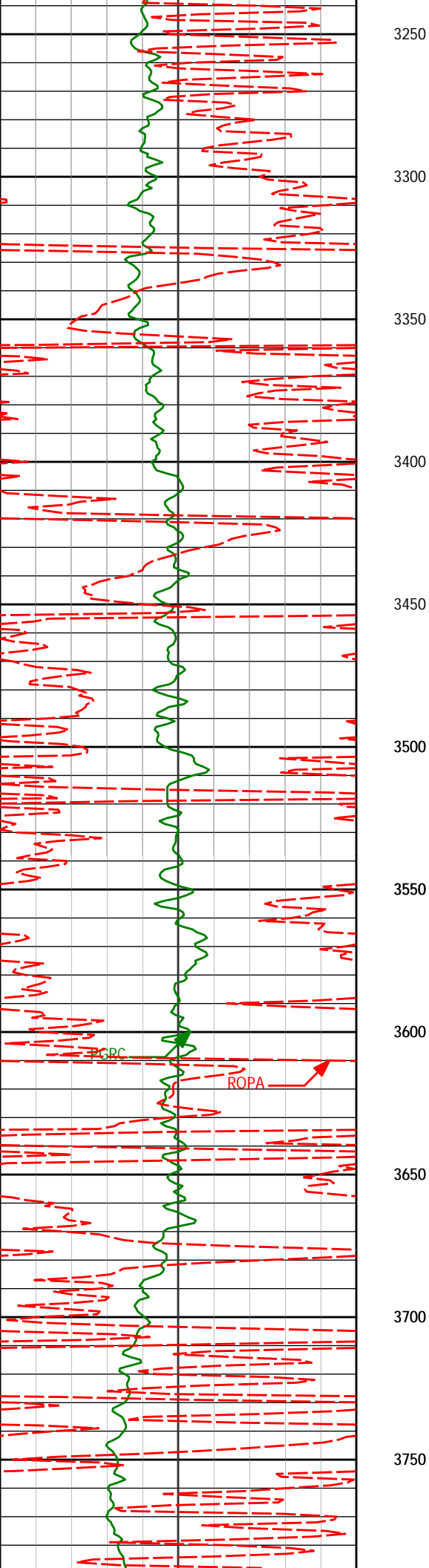
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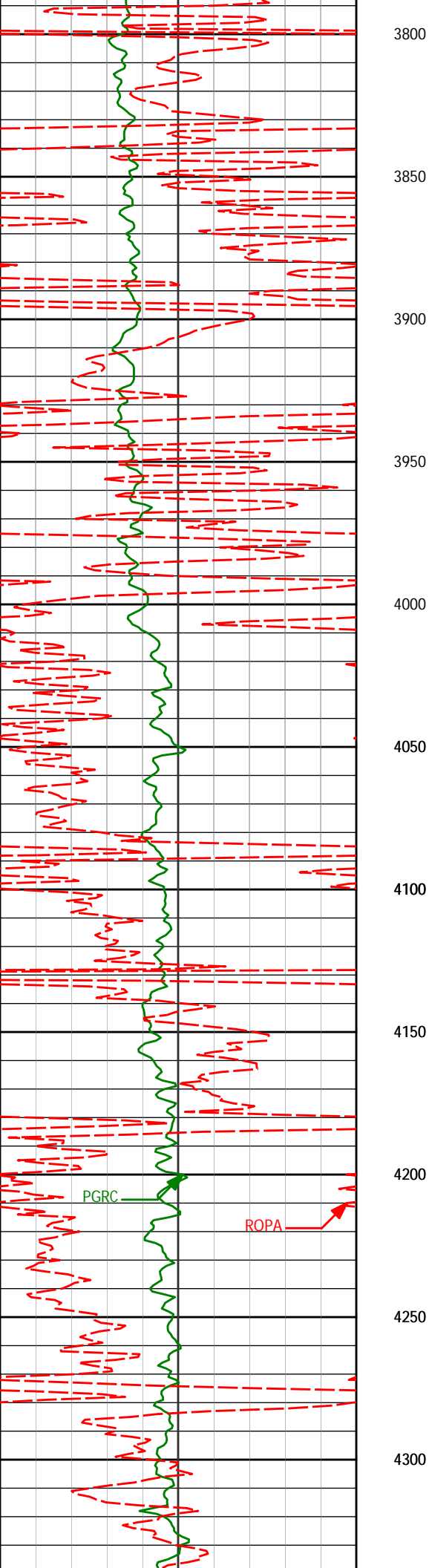
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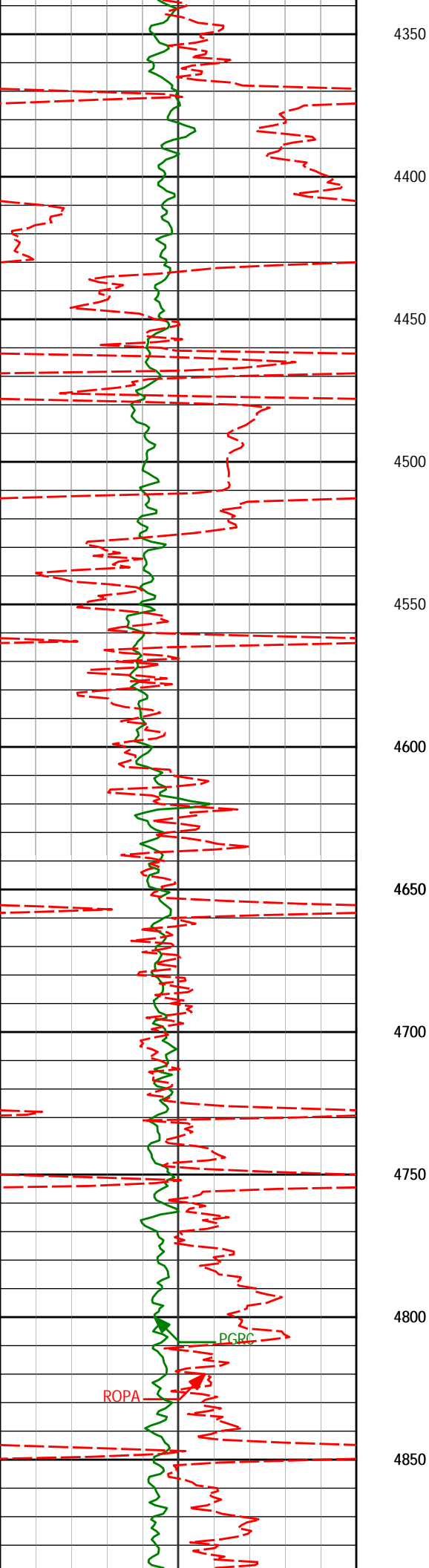
MD Main Log 1:600

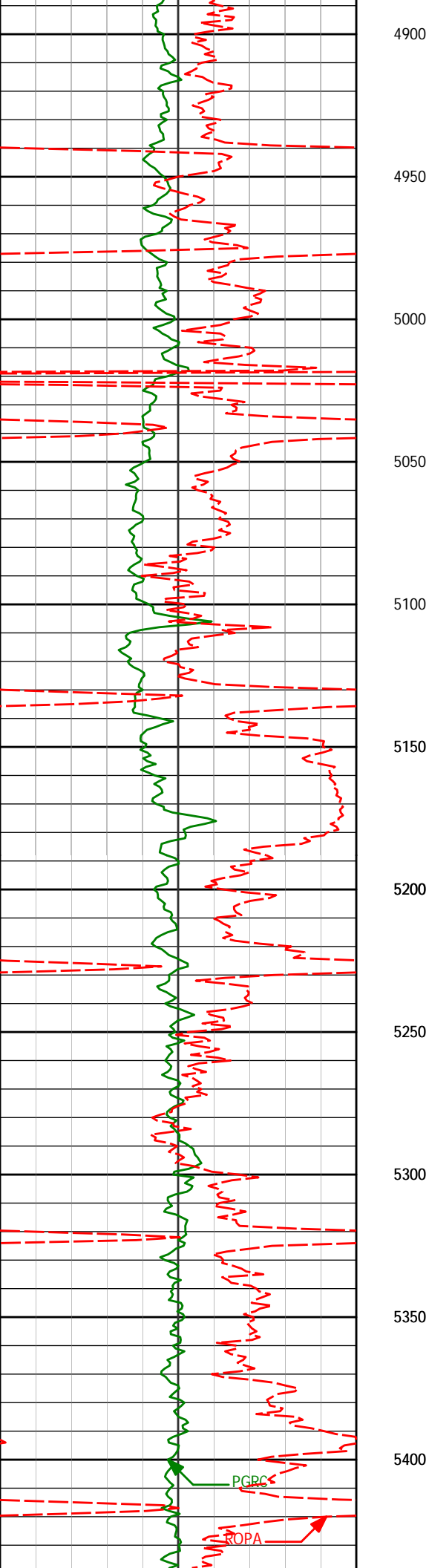
Noble Energy
Wells Ranch State USX AA16-68-1HNL
H&P 343
T6N-R63W

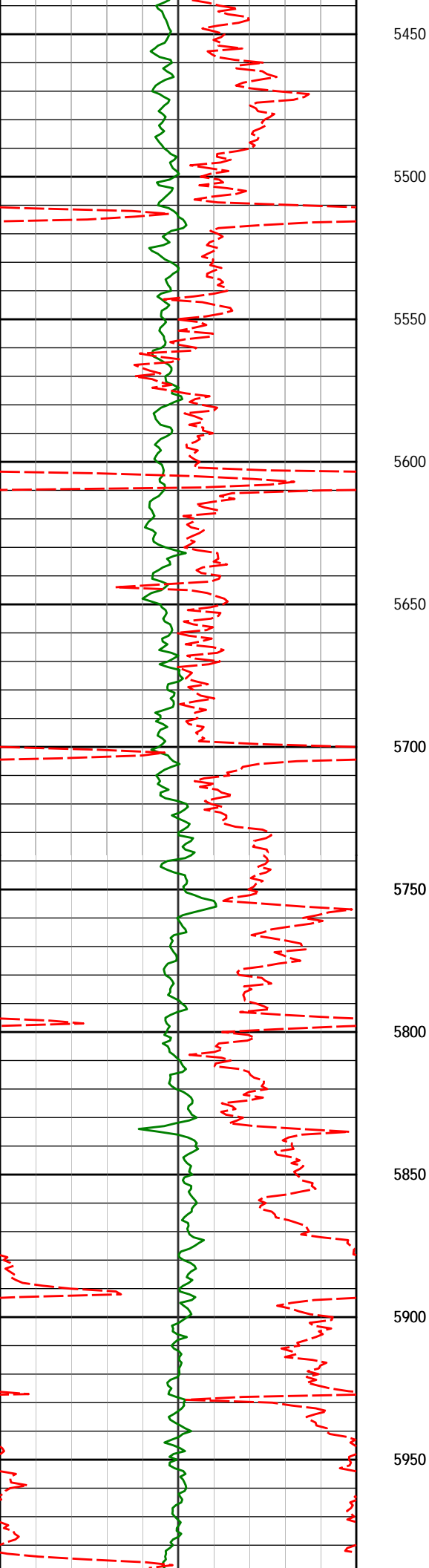


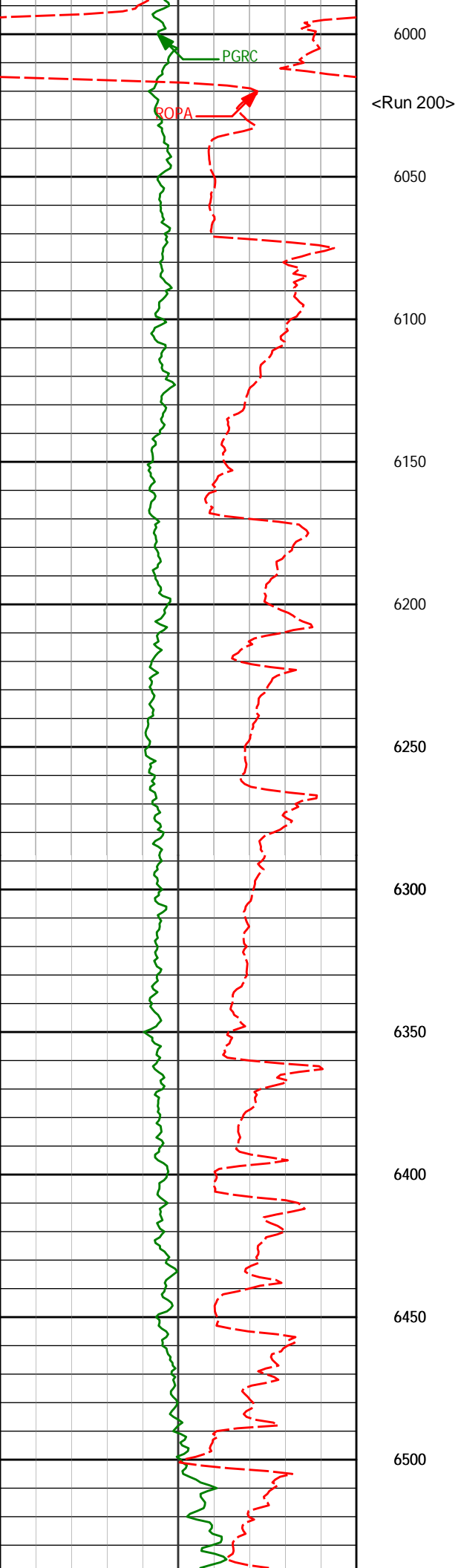


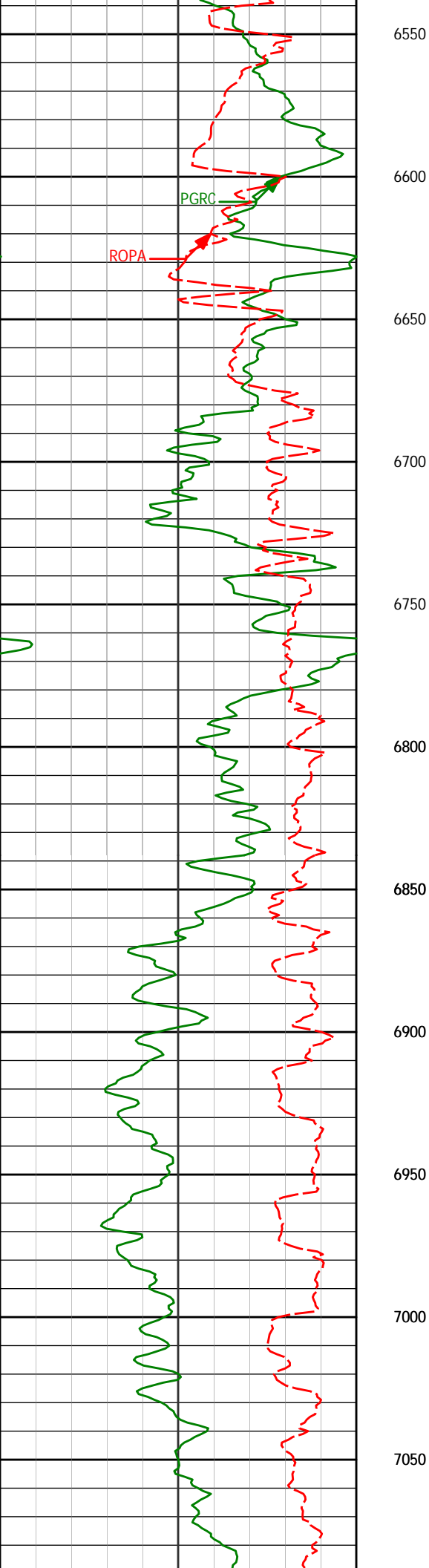


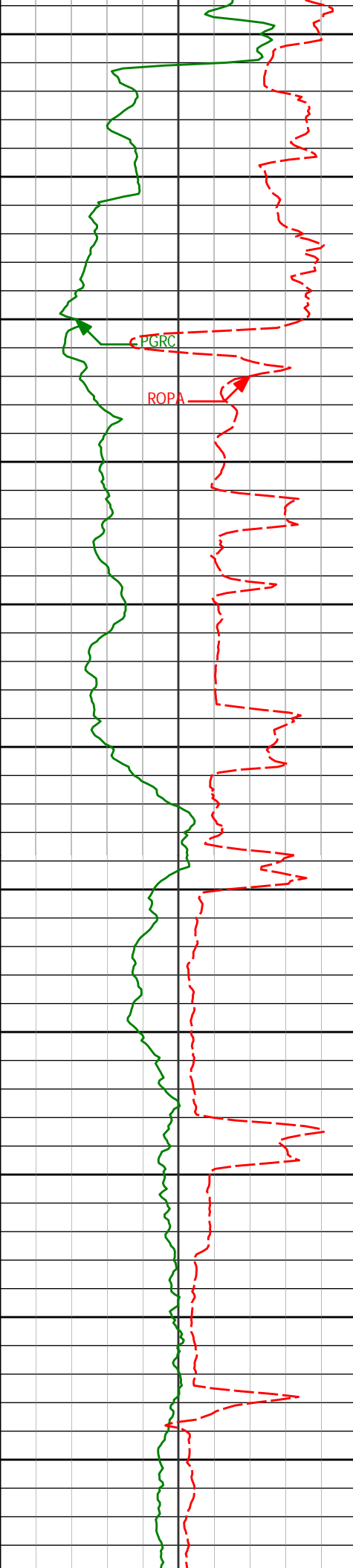












▲ Casing Set @ 7,193'

<Run 300>

7100

7150

7200

7250

7300

7350

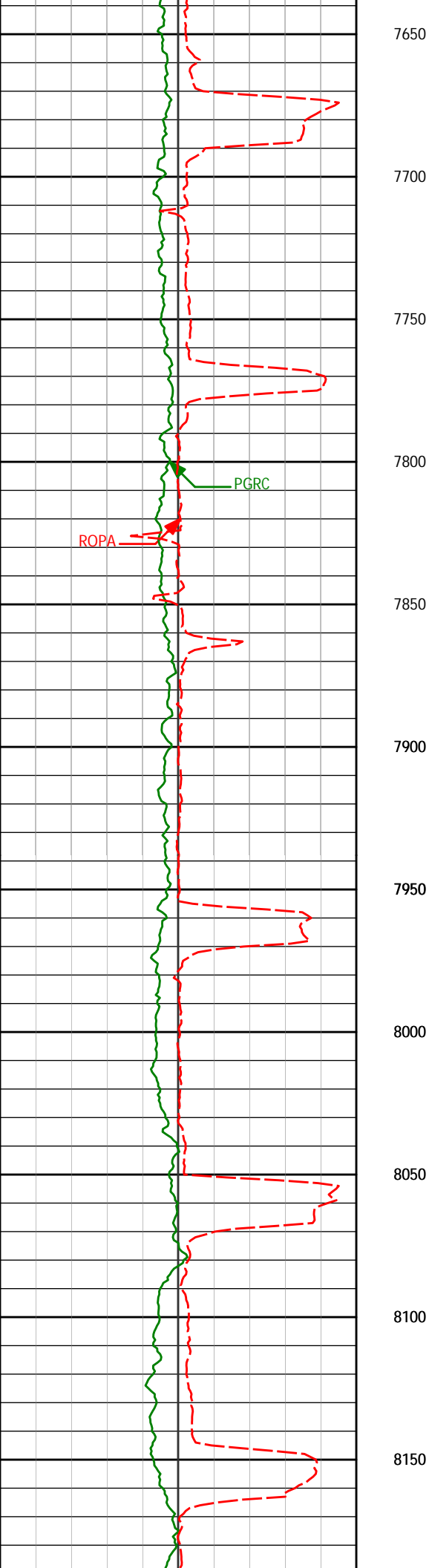
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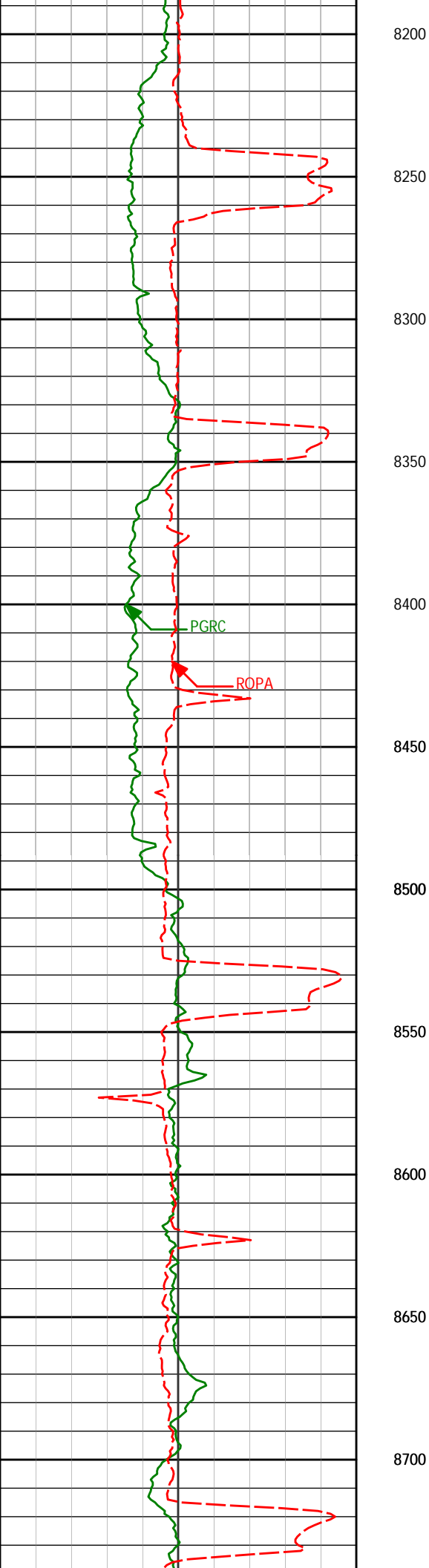
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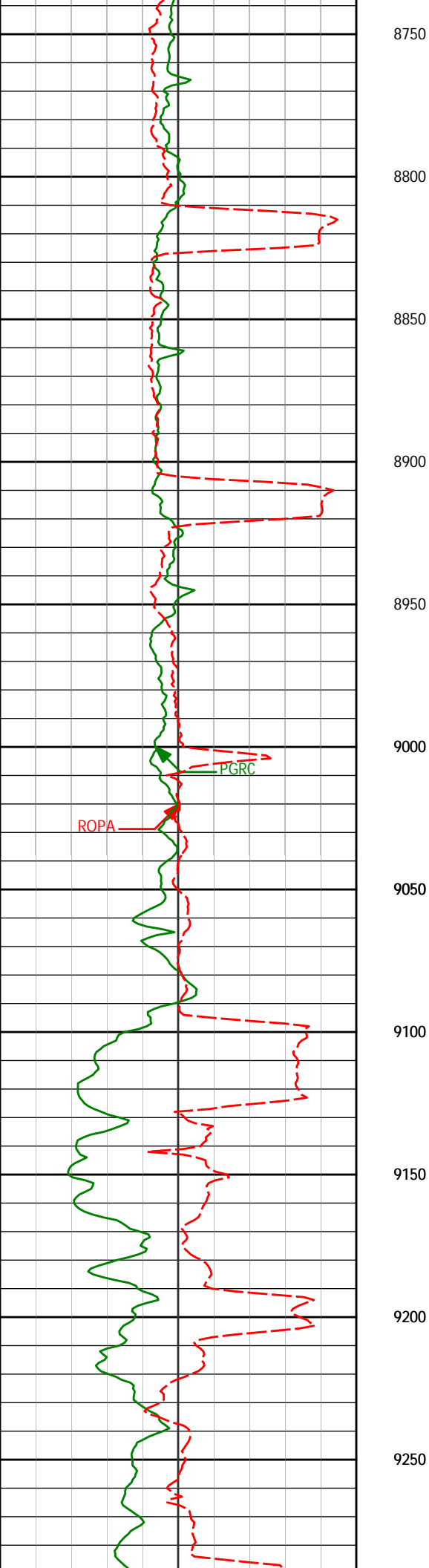
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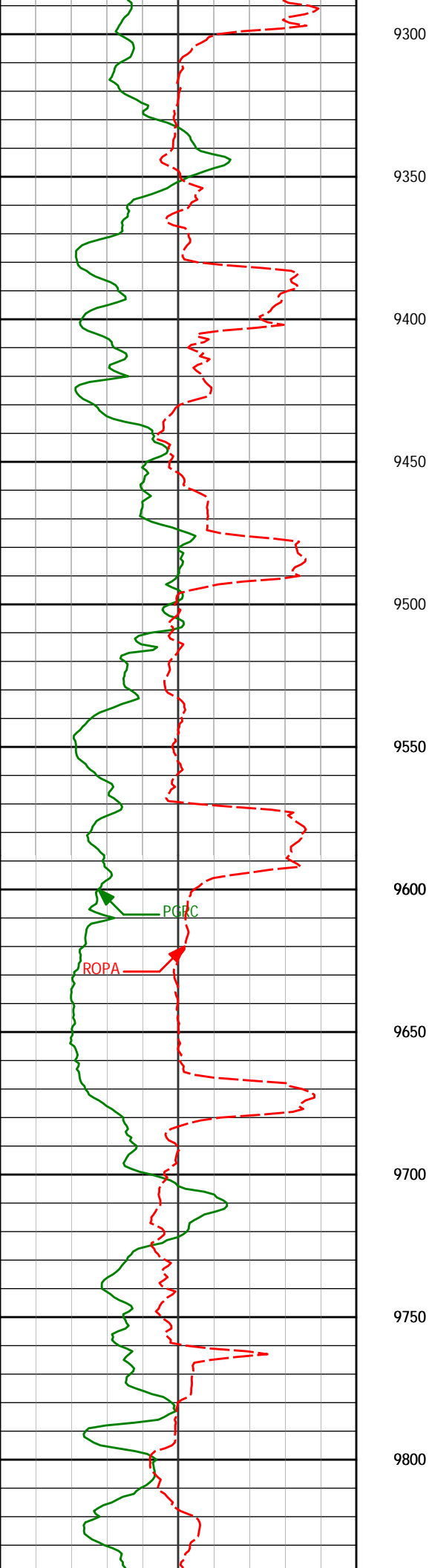
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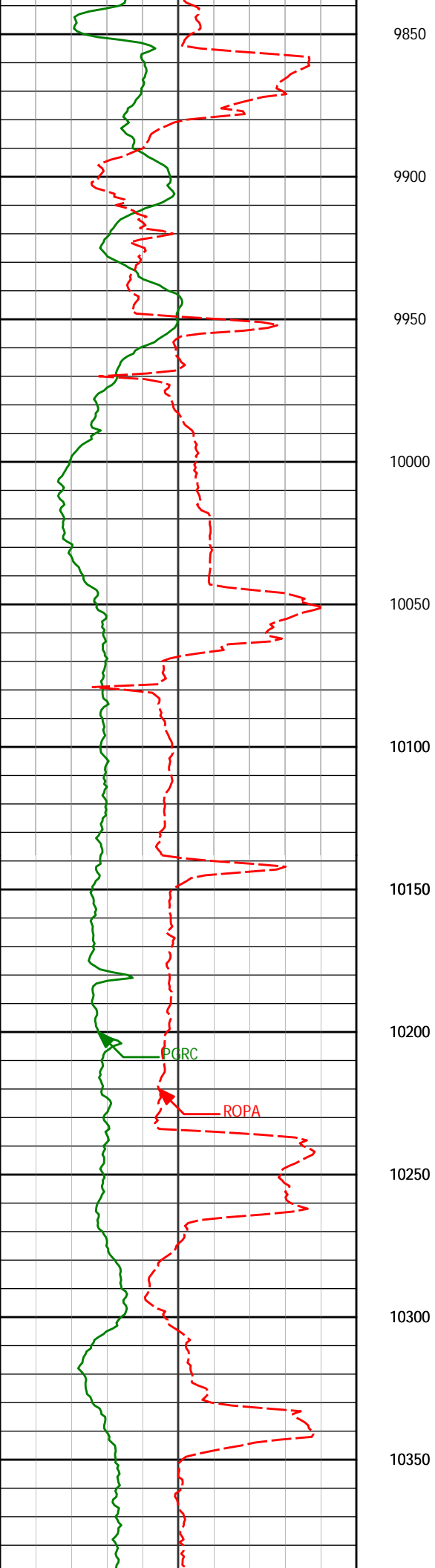
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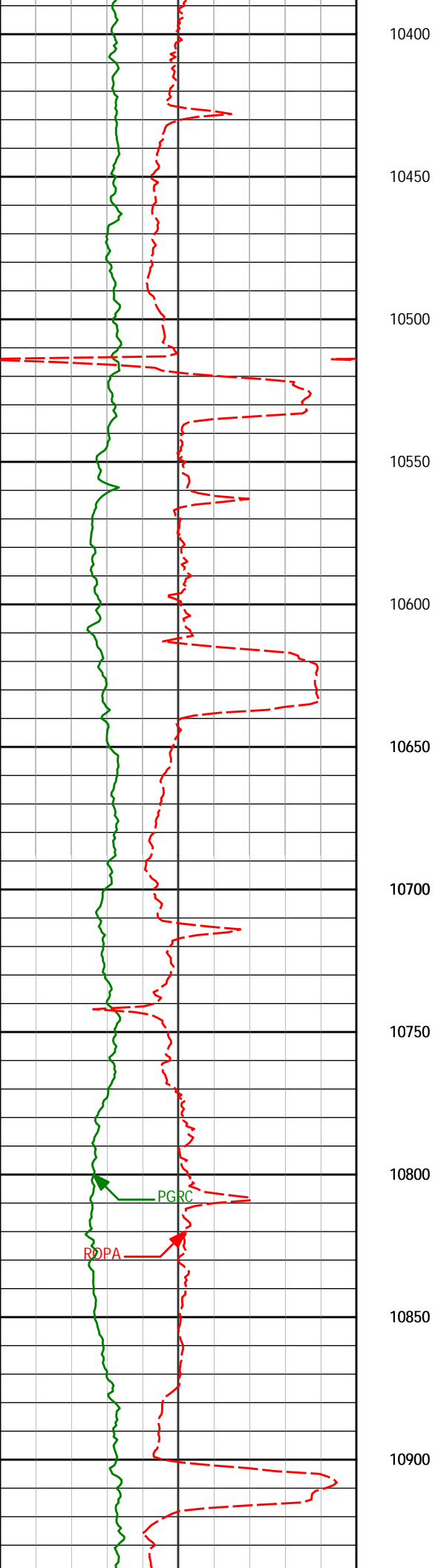


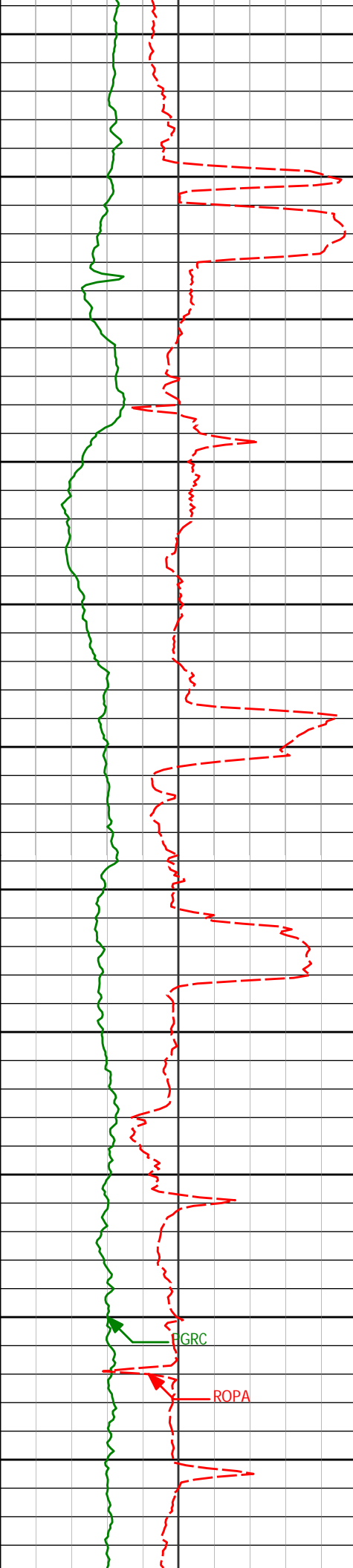




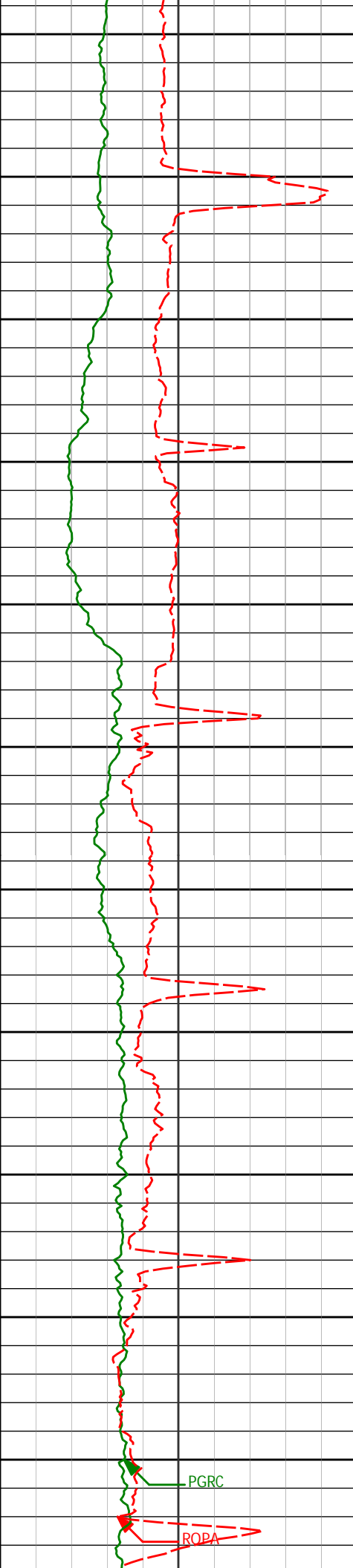








10950					
11000					
11050					
11100					
11150					
<Run 400> 11200	11198'	91.23°	270.42°	6753.63'	5047.41'
11250					
11300	11293'	88.89°	270.05°	6753.53'	5142.16'
11350					
11400	11388'	88.80°	269.80°	6755.45'	5236.94'
11450					
	11483'	89.69°	269.40°	6756.70'	5331.76'



11500

11550

11578'

88.36°

270.26°

6758.31'

5426.54'

11600

11650

11673'

88.74°

270.57°

6760.71'

5521.25'

11700

11750

11768'

89.14°

269.91°

6762.48'

5615.99'

11800

11850

11863'

89.88°

270.41°

6763.29'

5710.75'

11900

11950

11958'

89.88°

269.13°

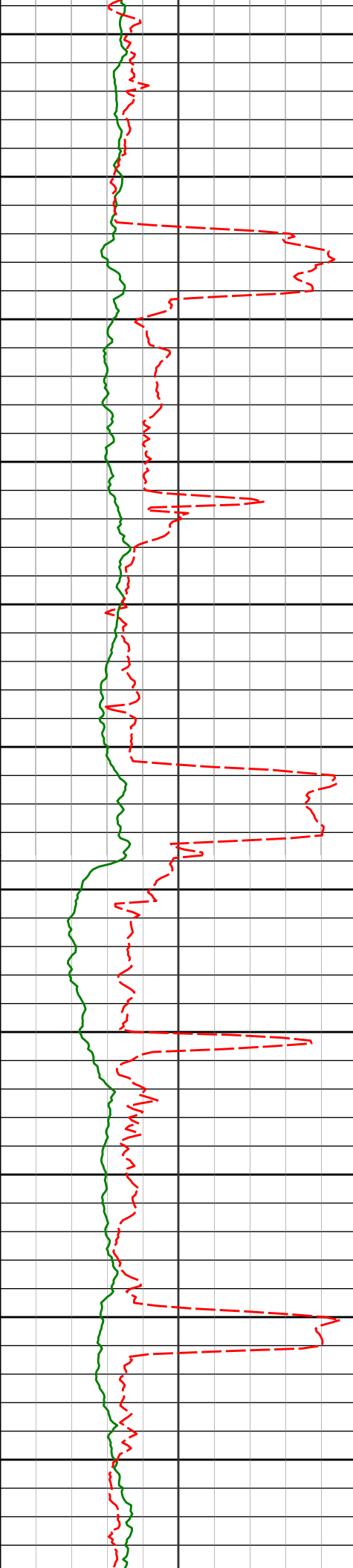
6763.50'

5805.56'

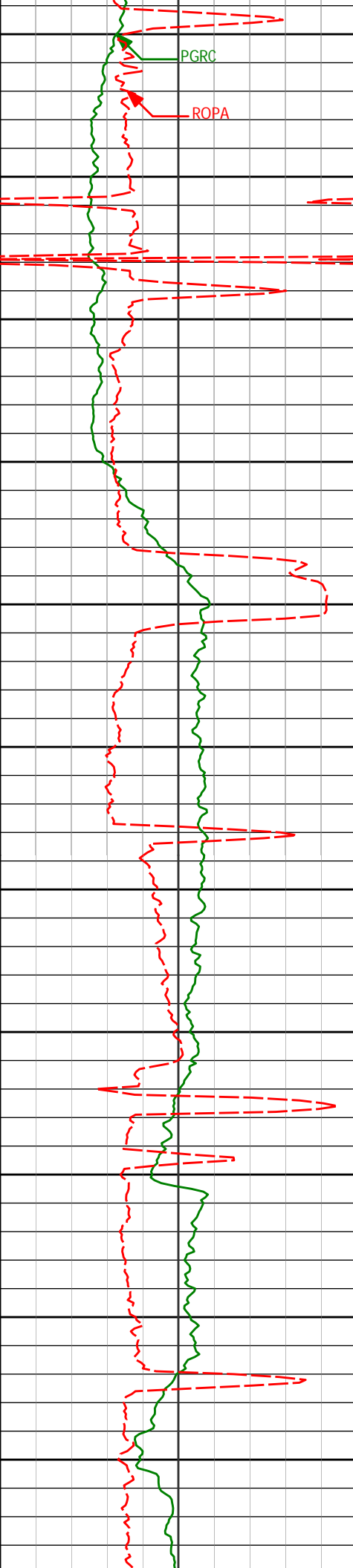
12000

PGRC

ROPA



12050	12053'	88.95°	266.64°	6764.47'	5900.50'
12100					
12150	12148'	89.60°	267.92°	6765.67'	5995.48'
12200					
12250	12243'	88.80°	267.09°	6767.00'	6090.44'
12300					
12350	12338'	90.52°	269.45°	6767.57'	6185.36'
12400					
12450	12433'	91.14°	269.08°	6766.19'	6280.21'
12500					
12550	12528'	90.09°	269.27°	6765.16'	6375.07'



12600

12623'

89.94°

268.65°

6765.14'

6469.96'

12650

12700

12718'

90.09°

268.58°

6765.11'

6564.87'

12750

12800

12813'

89.35°

270.65°

6765.57'

6659.69'

12850

12900

12908'

89.29°

271.64°

6766.70'

6754.32'

12950

13000

13003'

89.82°

271.14°

6767.44'

6848.92'

13050

13100

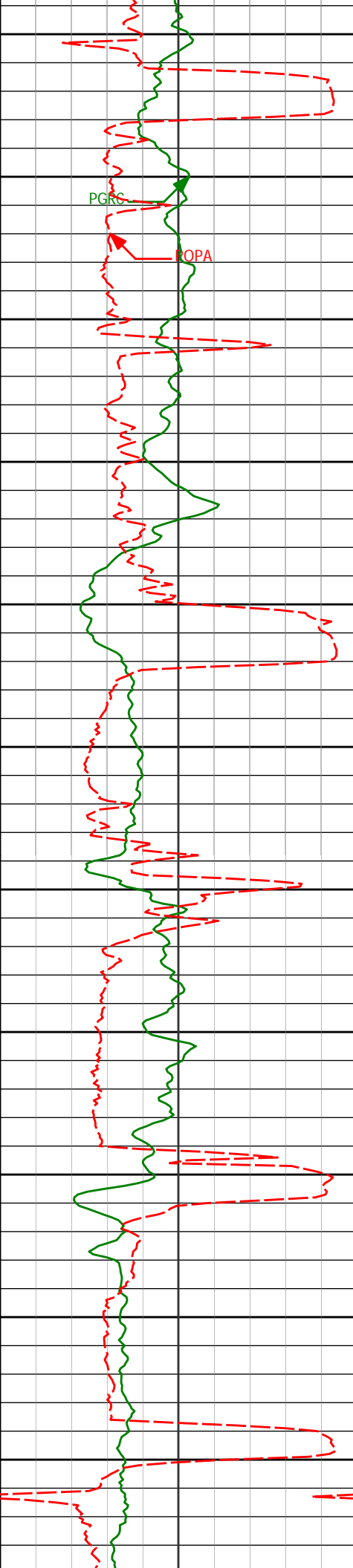
13098'

90.22°

270.74°

6767.41'

6943.59'



13150

13200

13250

13300

13350

13400

13450

13500

13550

13600

13650

13193'

89.41°

271.59°

6767.72'

7038.22'

13288'

90.00°

271.29°

6768.21'

7132.81'

13383'

88.52°

269.76°

6769.43'

7227.52'

13478'

88.02°

268.13°

6772.30'

7322.36'

13573'

88.18°

268.90°

6775.45'

7417.23'

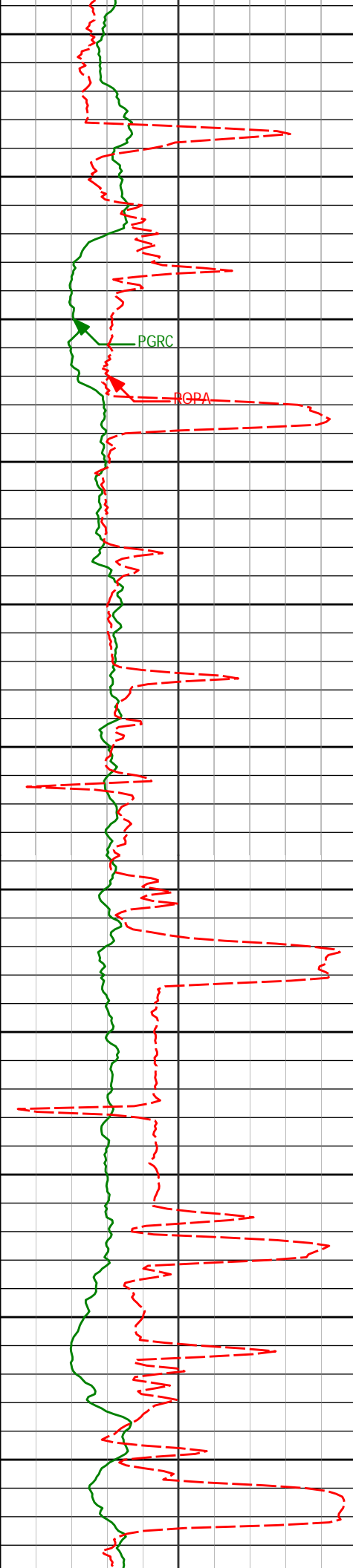
13668'

89.01°

271.64°

6777.78'

7511.95'



13700

13750

13800

13850

13900

13950

14000

14050

14100

14150

14200

13763'

89.69°

271.66°

6778.85'

7606.50'

13858'

89.51°

270.31°

6779.52'

7701.16'

13953'

89.94°

271.63°

6779.98'

7795.82'

14048'

87.72°

269.49°

6781.92'

7890.51'

14143'

87.40°

270.19°

6785.96'

7985.22'

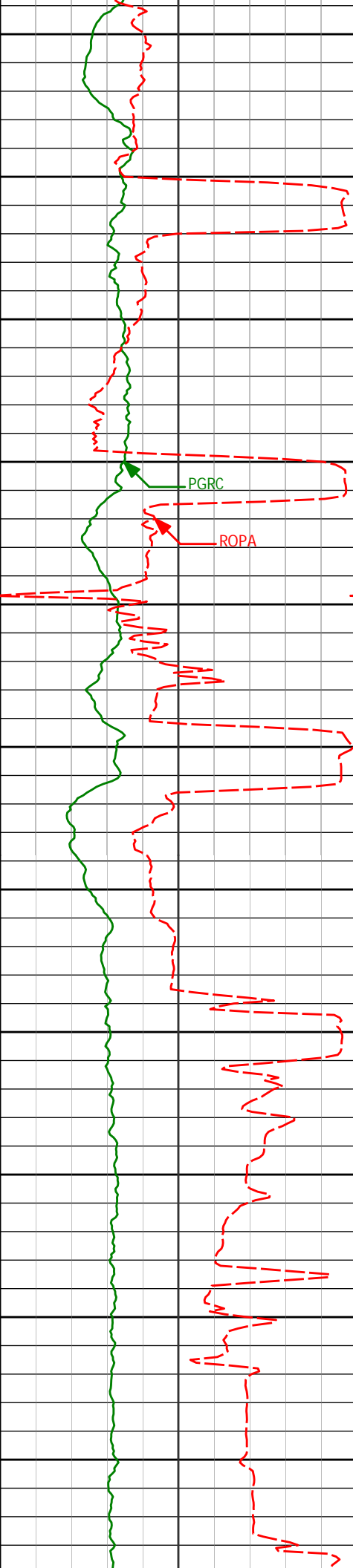
14228'

88.15°

269.00°

6789.64'

8079.98'



14250

14300

14333'

90.06°

270.12°

6791.12'

8174.79'

14350

14400

PGRC

ROPA

14428'

91.20°

269.05°

6790.07'

8269.61'

14450

14500

14523'

92.07°

266.66°

6787.36'

8364.52'

14550

14600

14618'

90.00°

267.06°

6785.65'

8459.50'

14650

14700

14713'

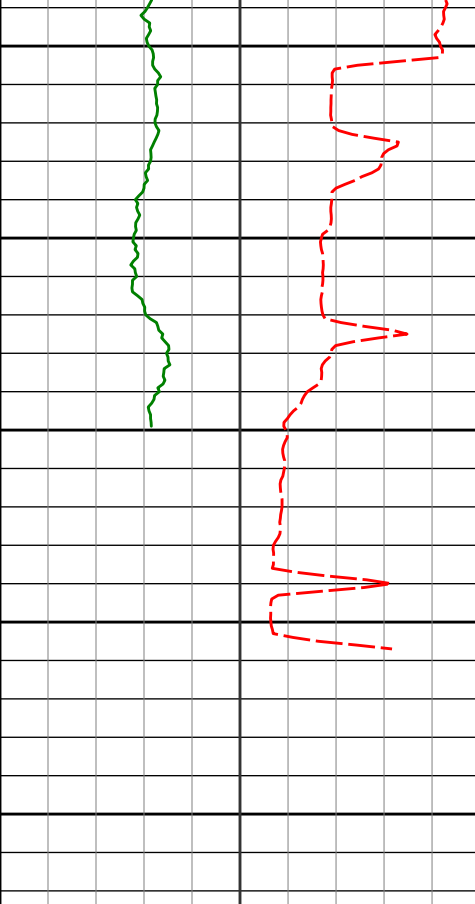
89.54°

265.39°

6786.03'

8554.49'

14750

[illegible]

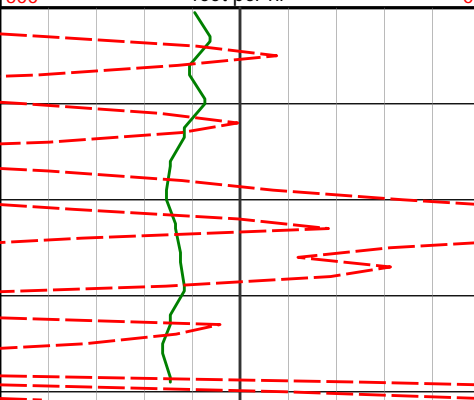
Avg Rate of Penetration ROPA <div> <div></div> <div>feet per hr</div> </div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
500	0						
PCG Gamma Ray PGRC <div> <div></div> <div>api</div> </div>							
0	300						

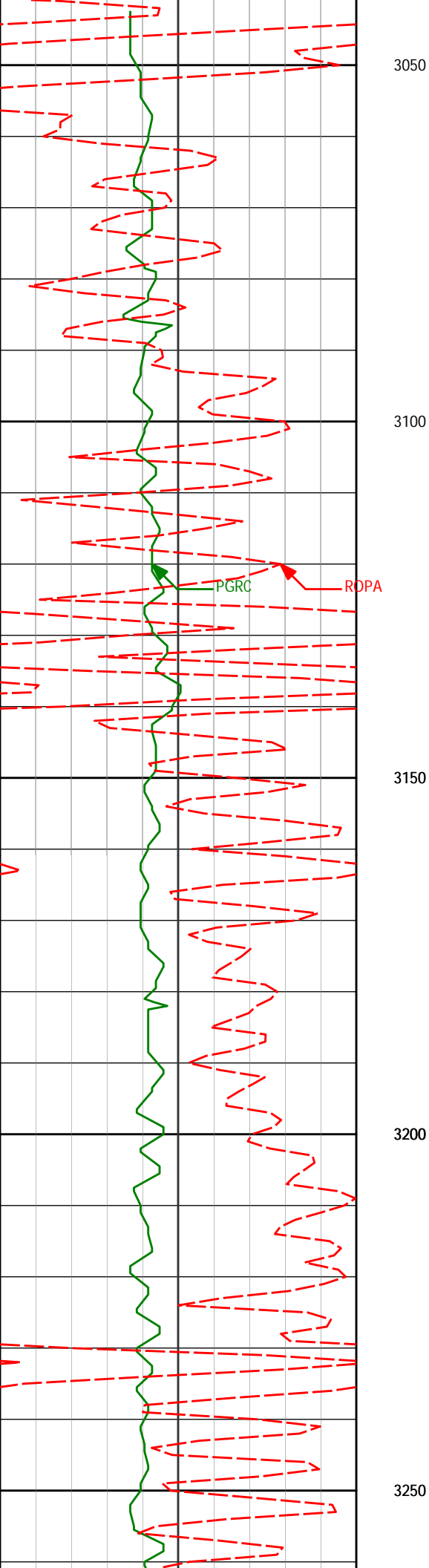
HALLIBURTON

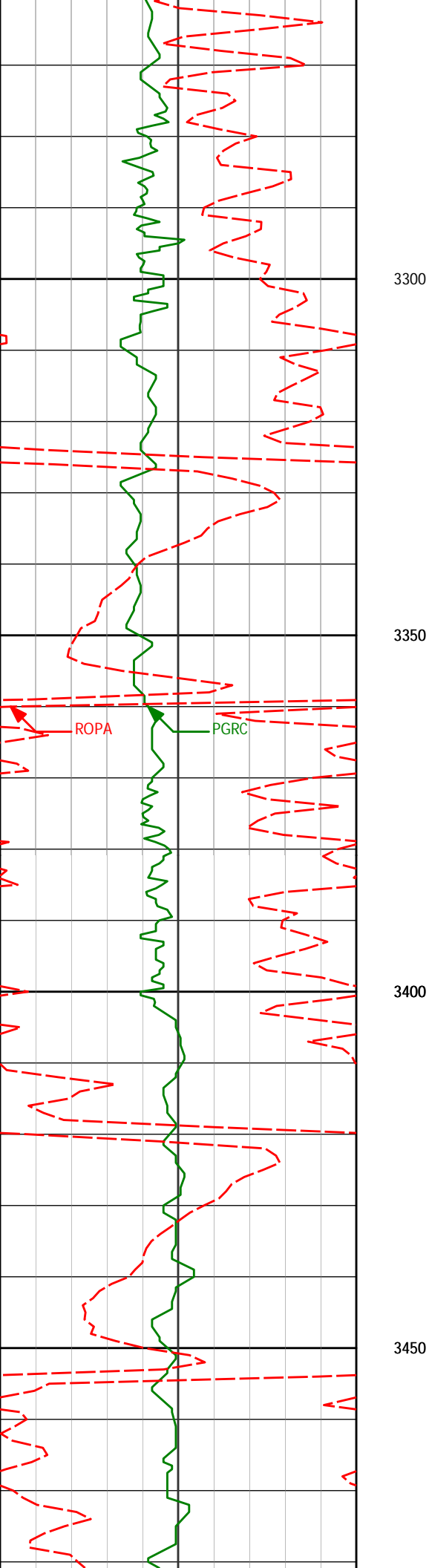
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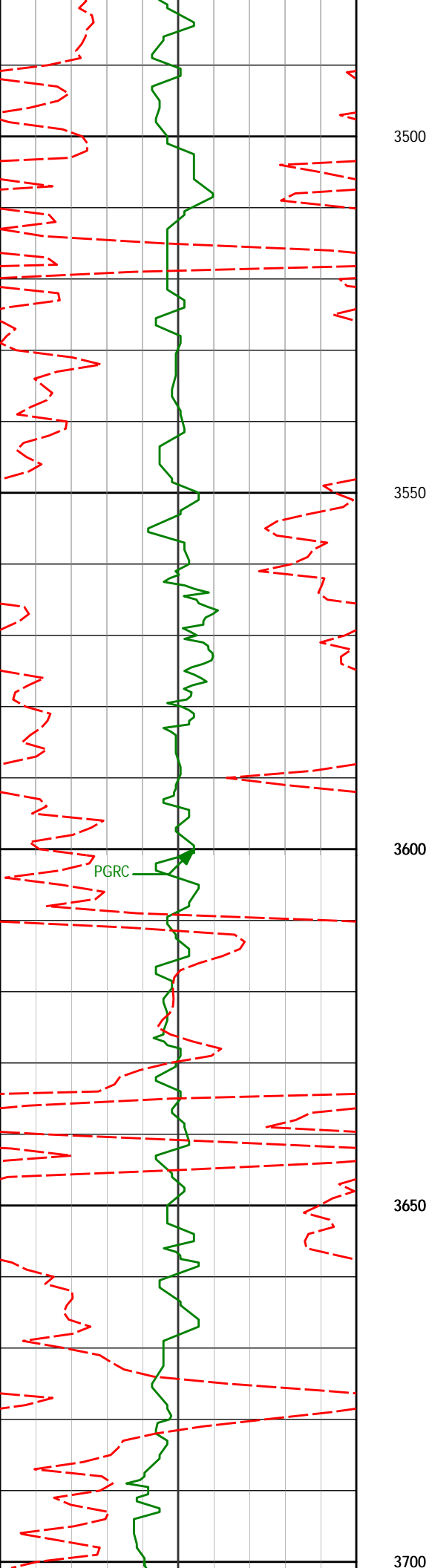
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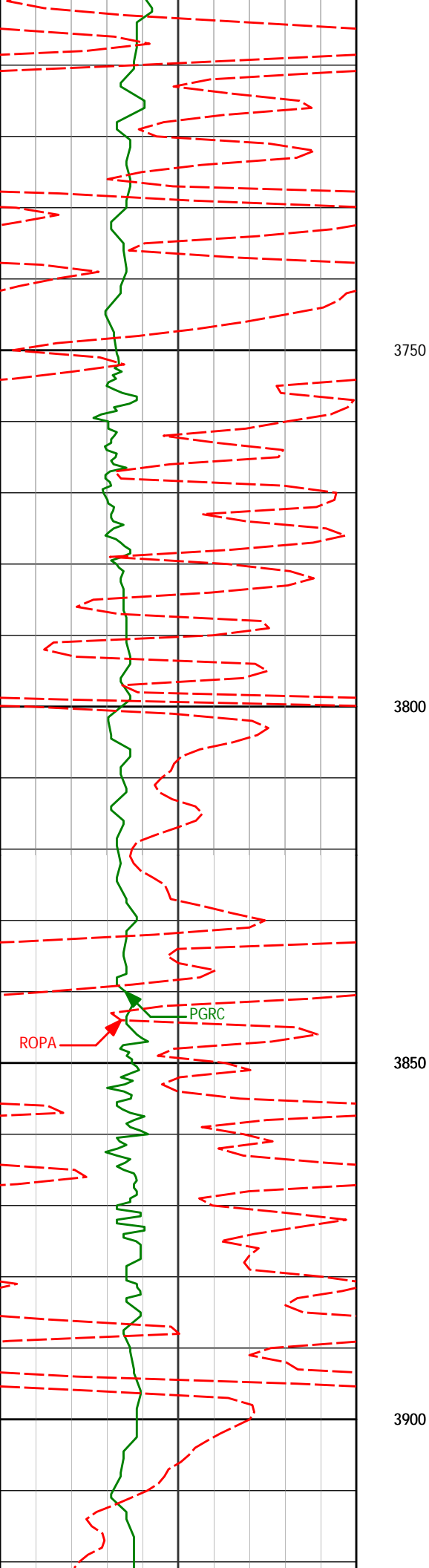
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H&P 343
T6N-R63W

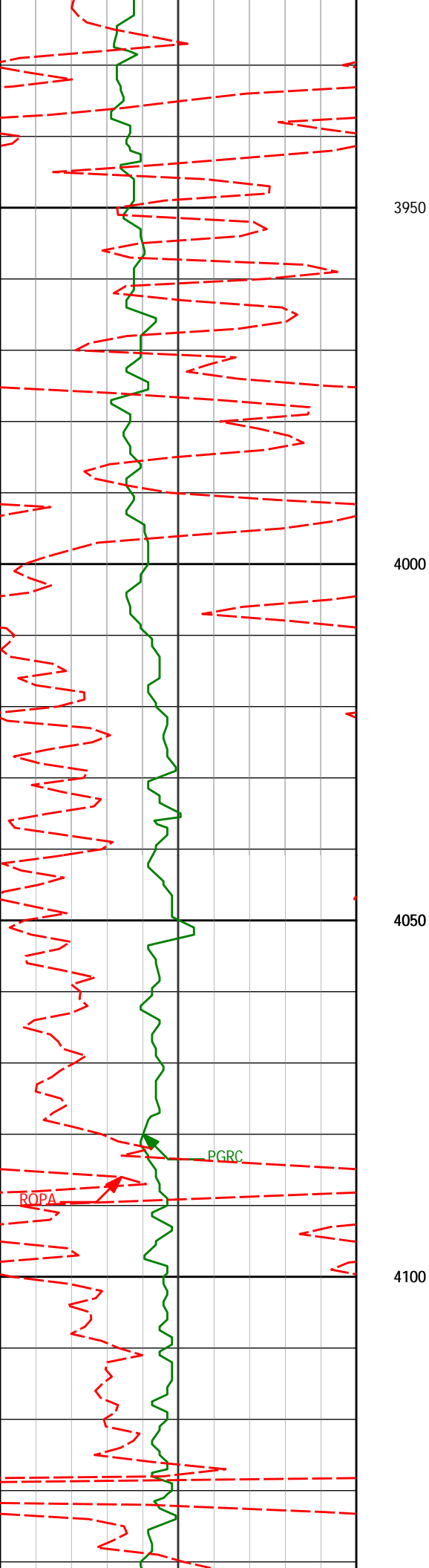
<div>PCG Gamma Ray</div> <div>PGRC</div> <div>0300</div> <div>api</div>							
<div>Avg Rate of Penetration</div> <div>ROPA</div> <div>5000</div> <div>feet per hr</div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
		5000					

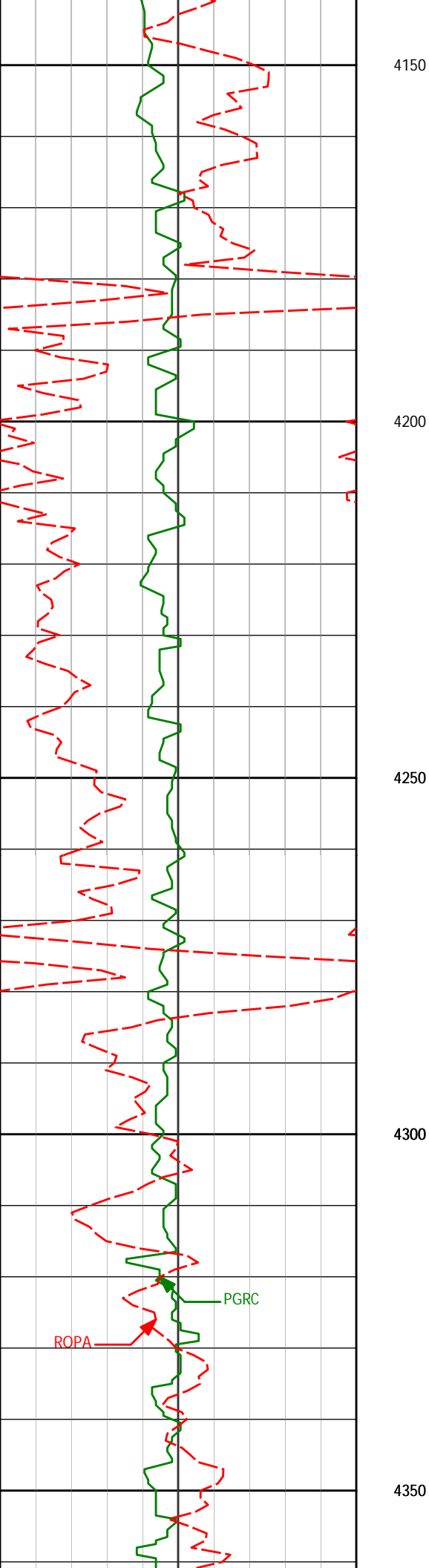


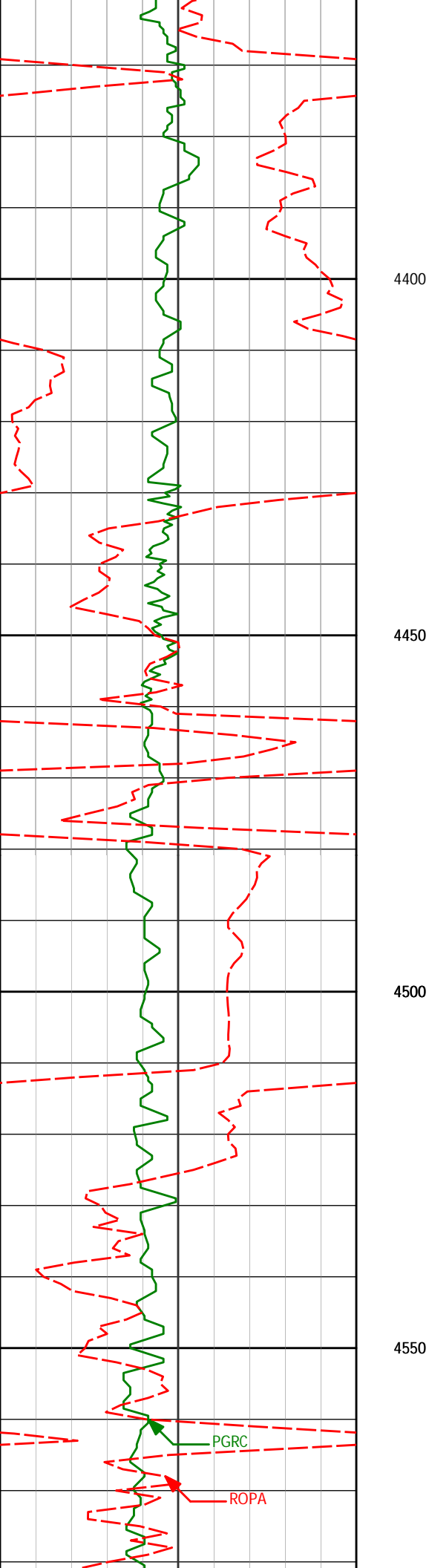


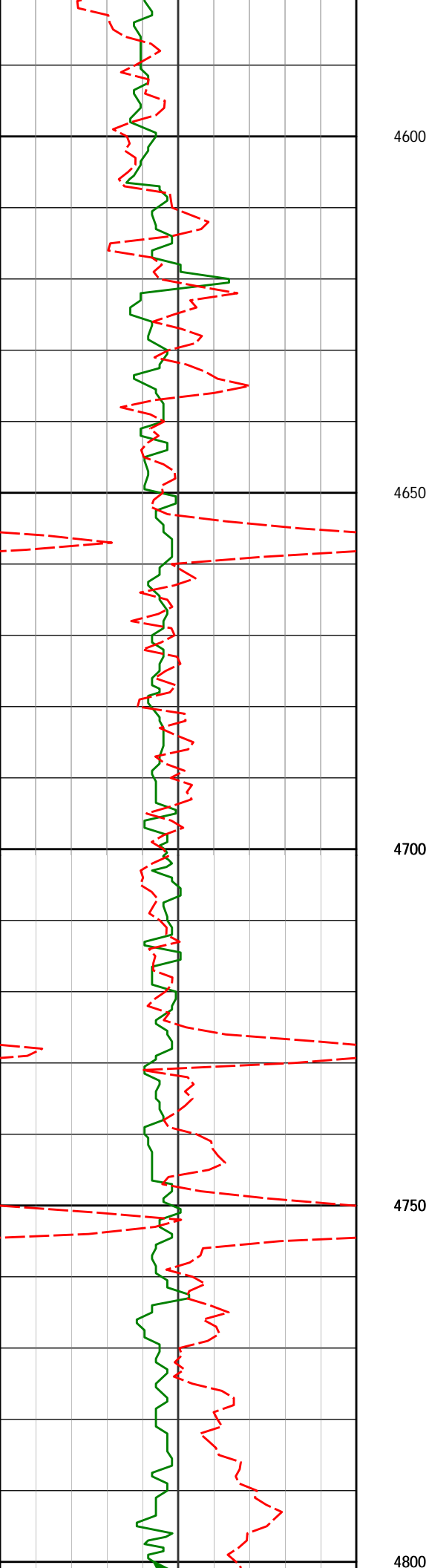


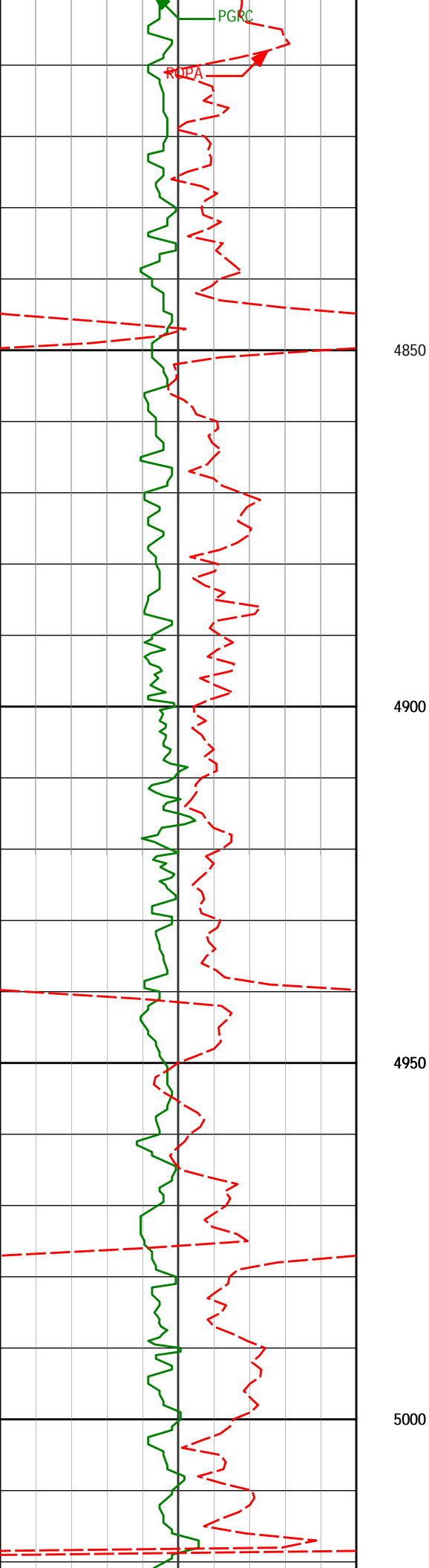


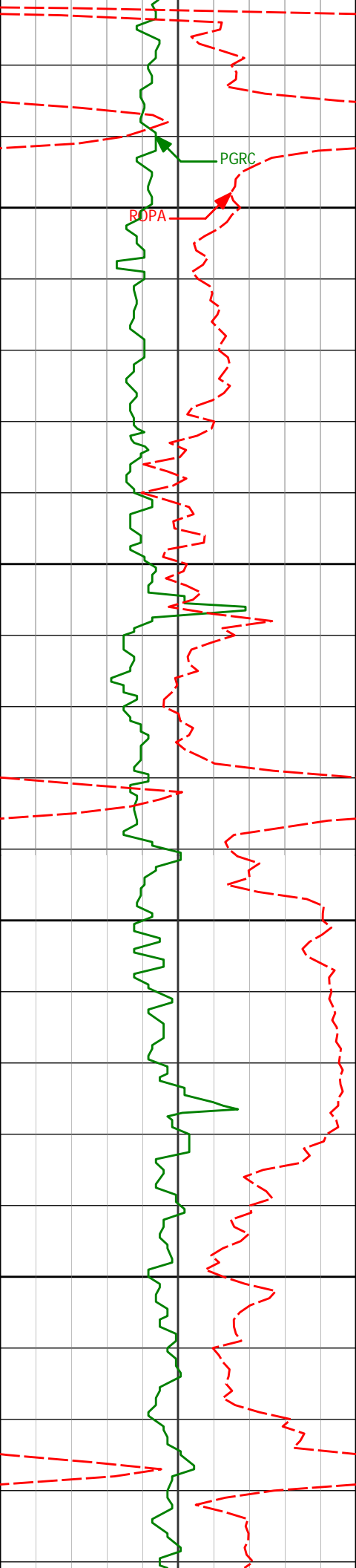










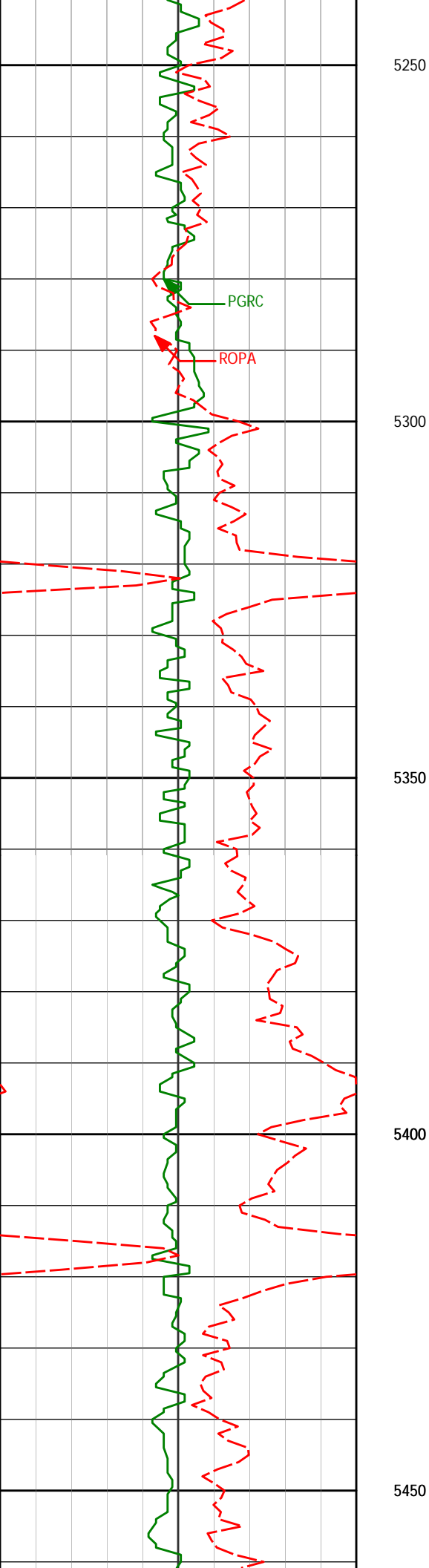


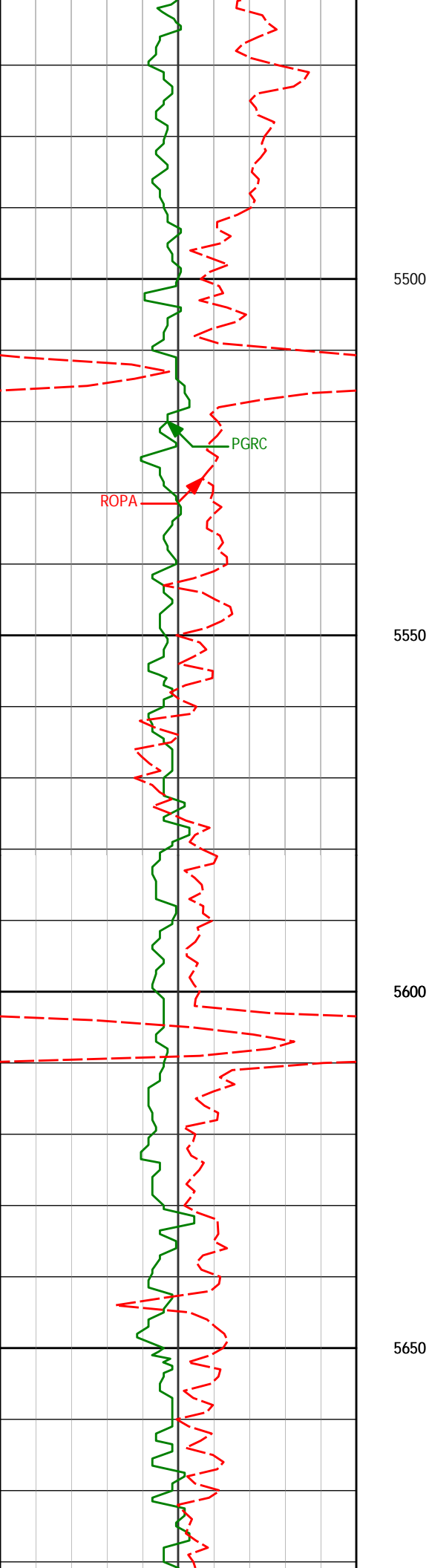
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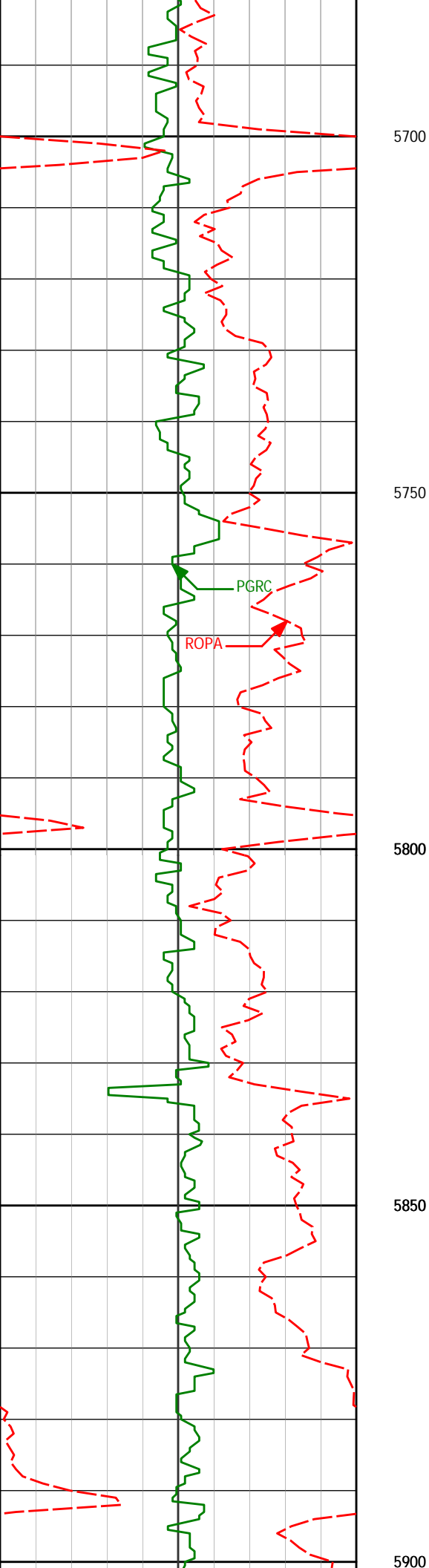
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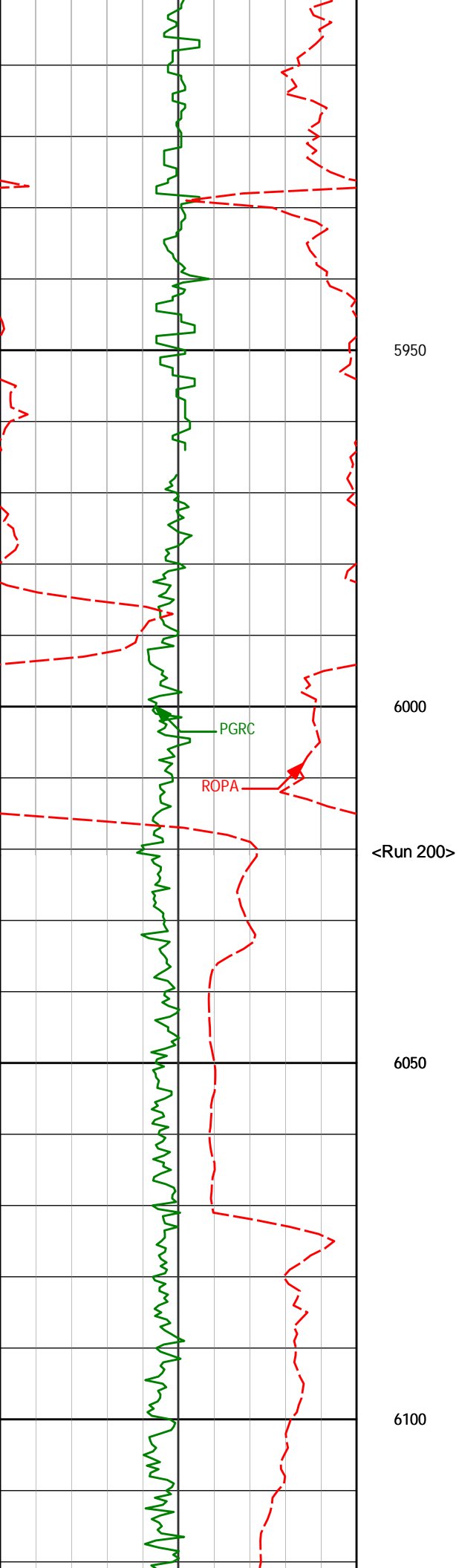
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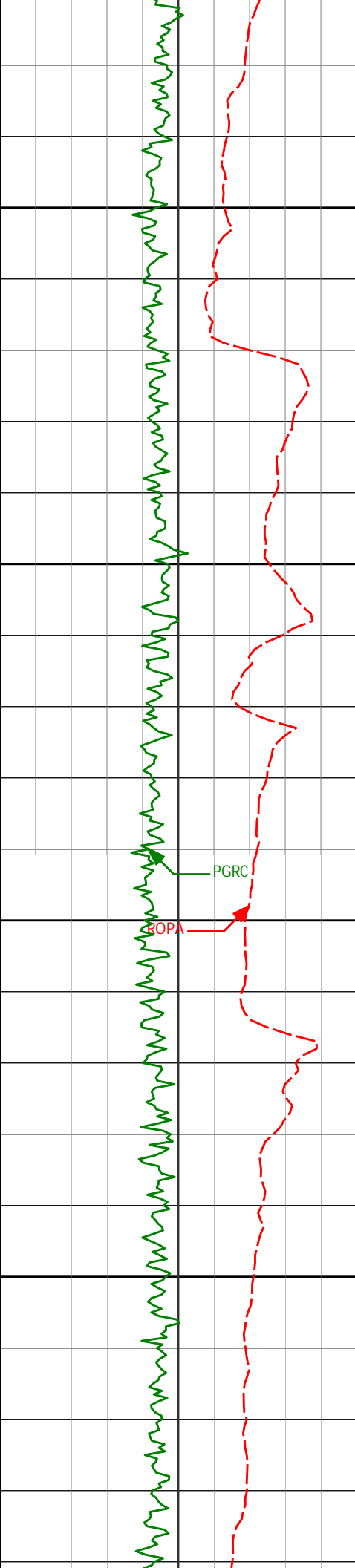
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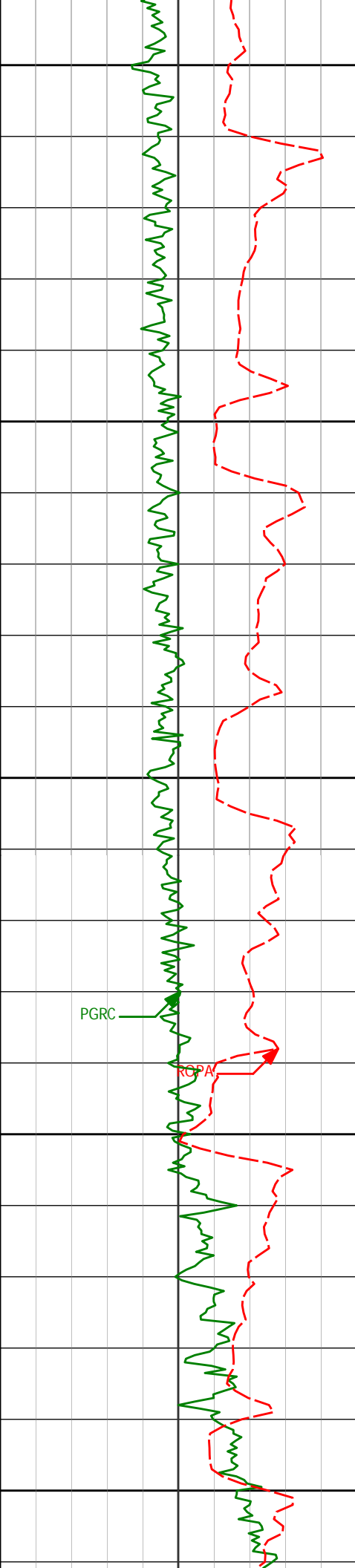


6150

6200

6250

6300



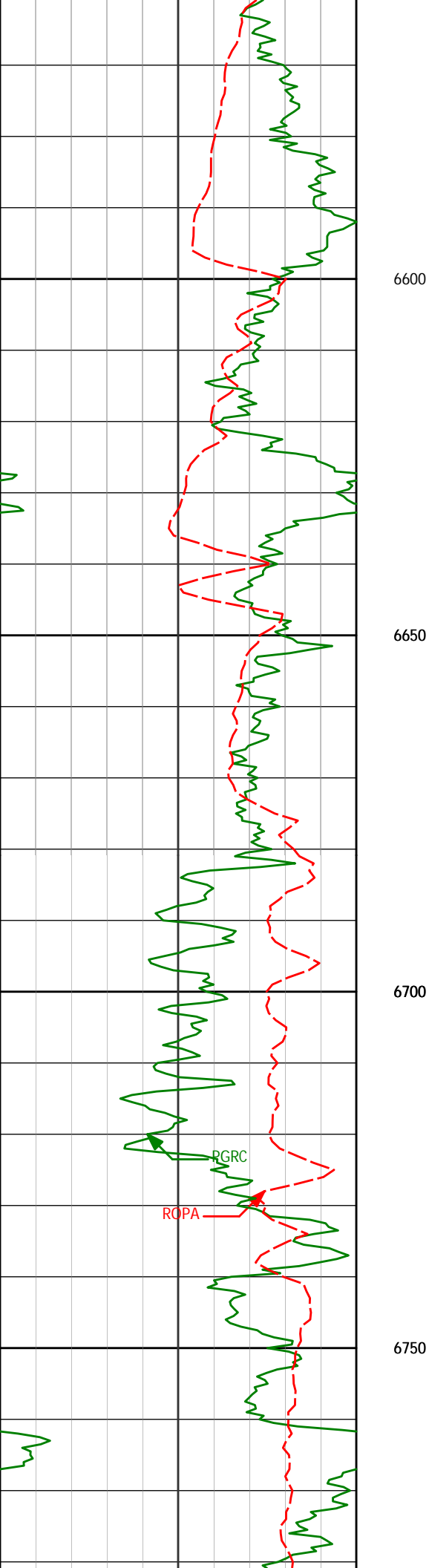
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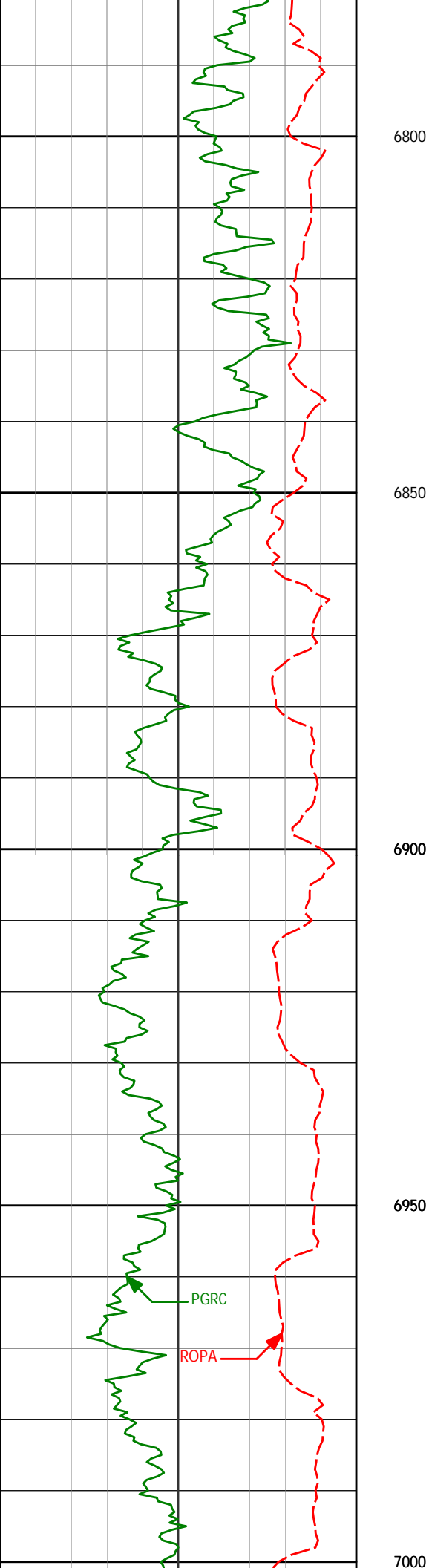
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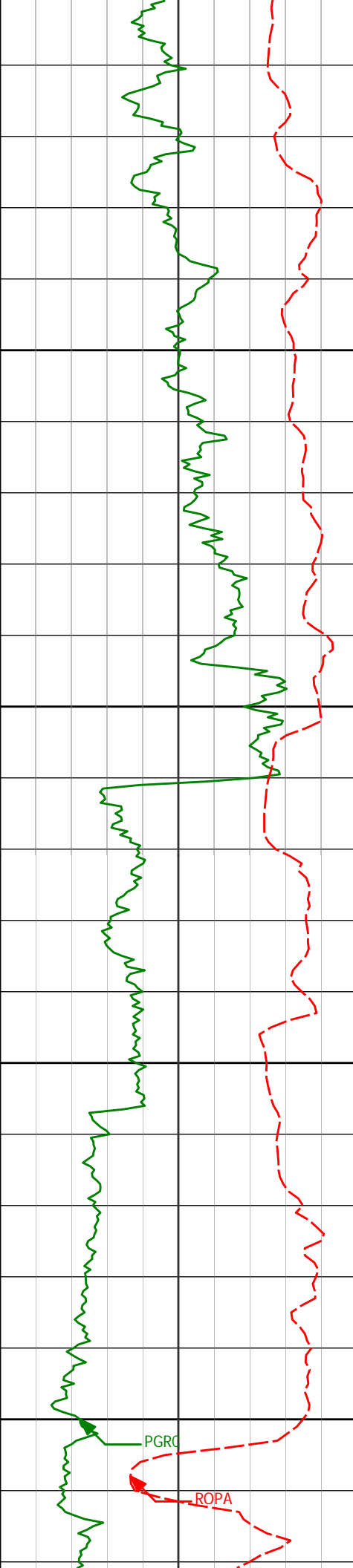
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6500

6550







7050

7100

7150

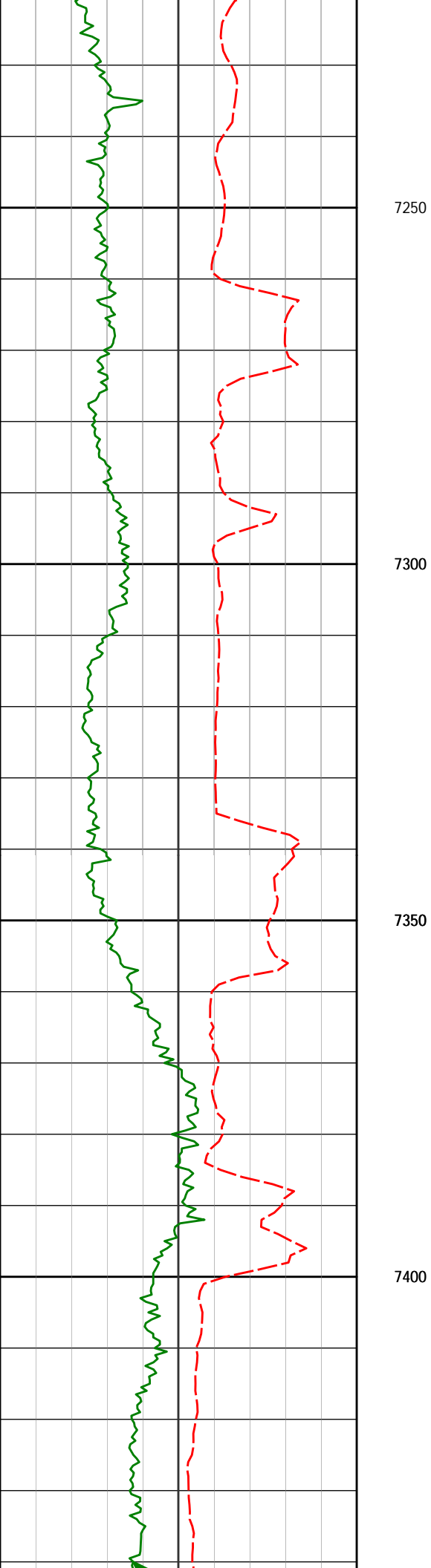
▲ Casing Set @ 7,193'

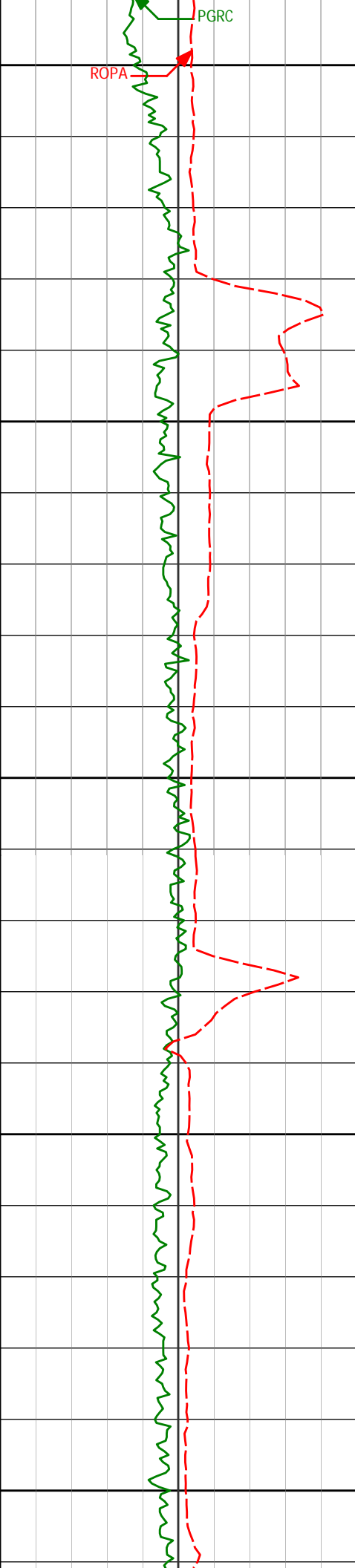
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<Run 300>

PGRC

ROPA





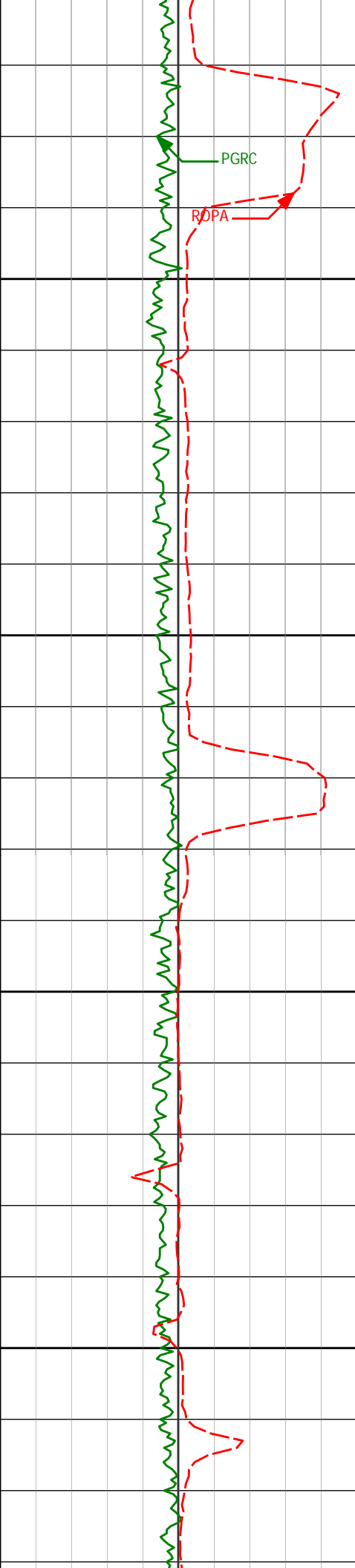
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7500

7550

7600

7650

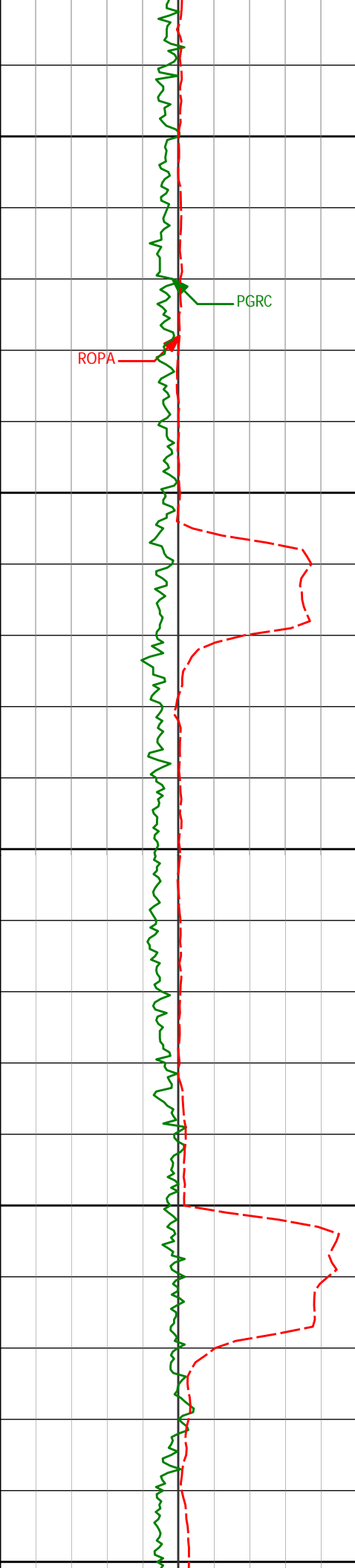


7700

7750

7800

7850



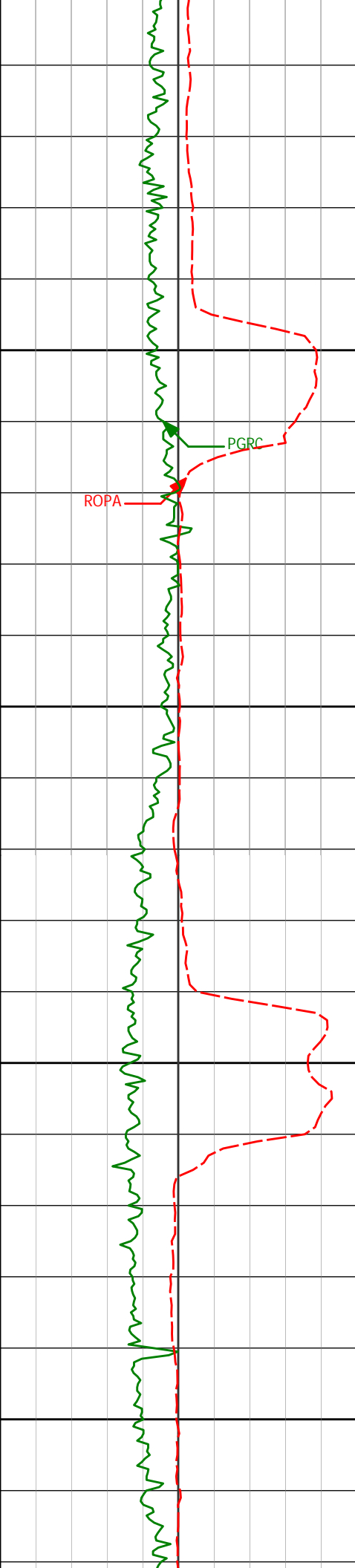
7900

7950

8000

8050

8100



8150

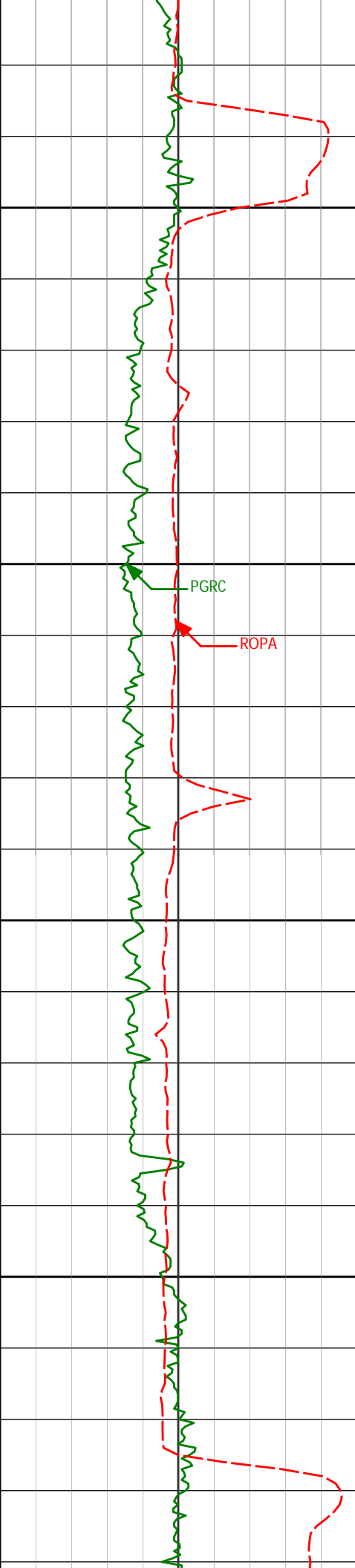
8200

8250

8300

ROPA

PGRC



8350

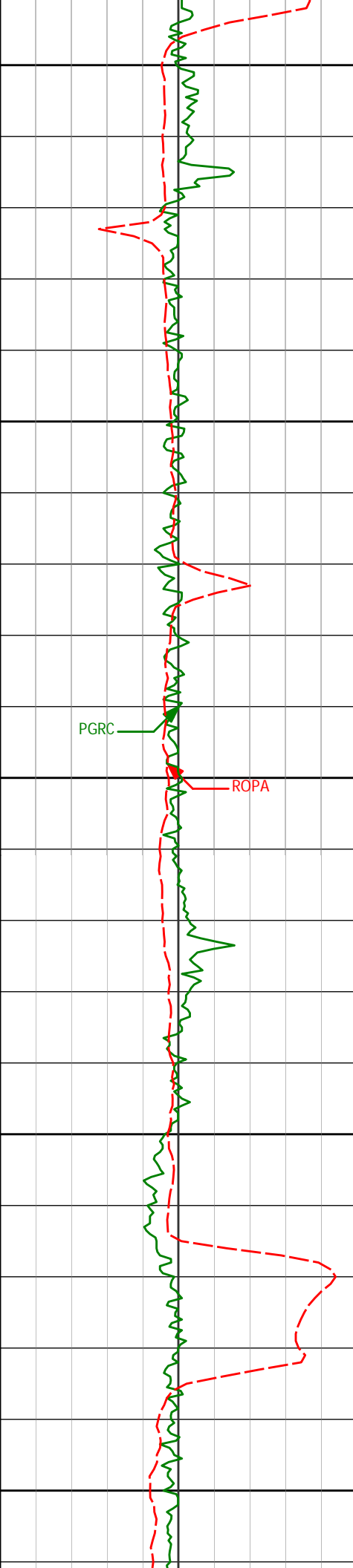
8400

8450

8500

PGRC

ROPA



8550

8600

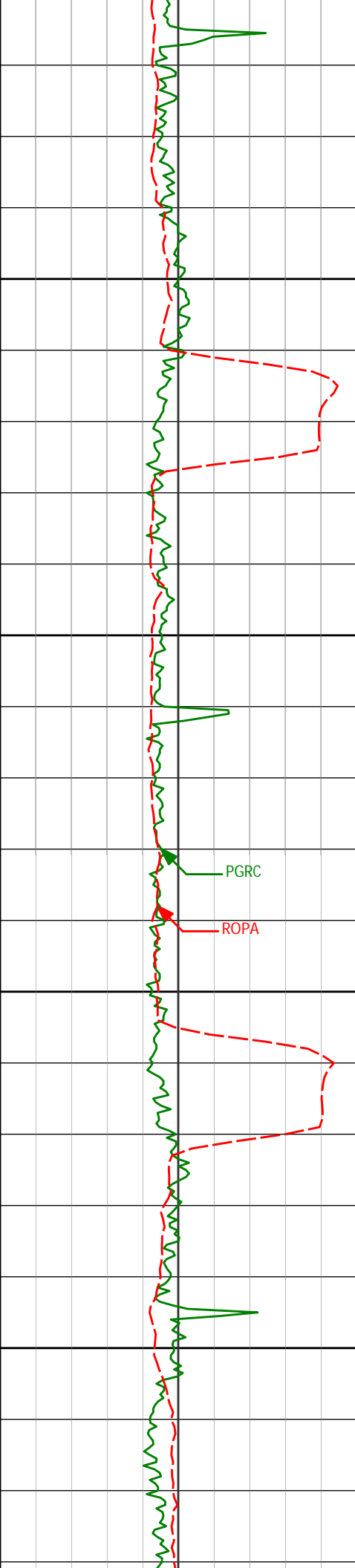
8650

8700

8750

PGRC

ROPA



8800

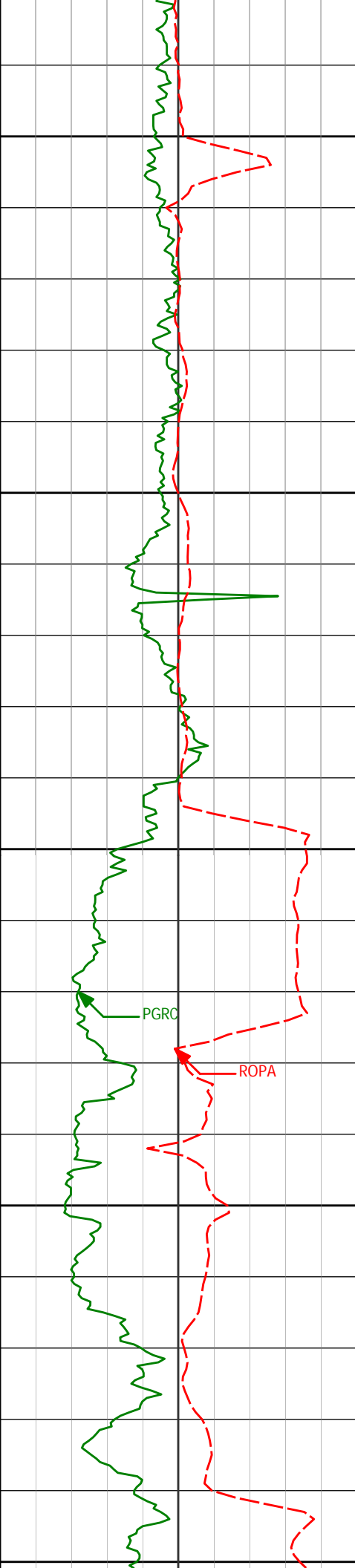
8850

8900

8950

PGRC

ROPA



9000

9050

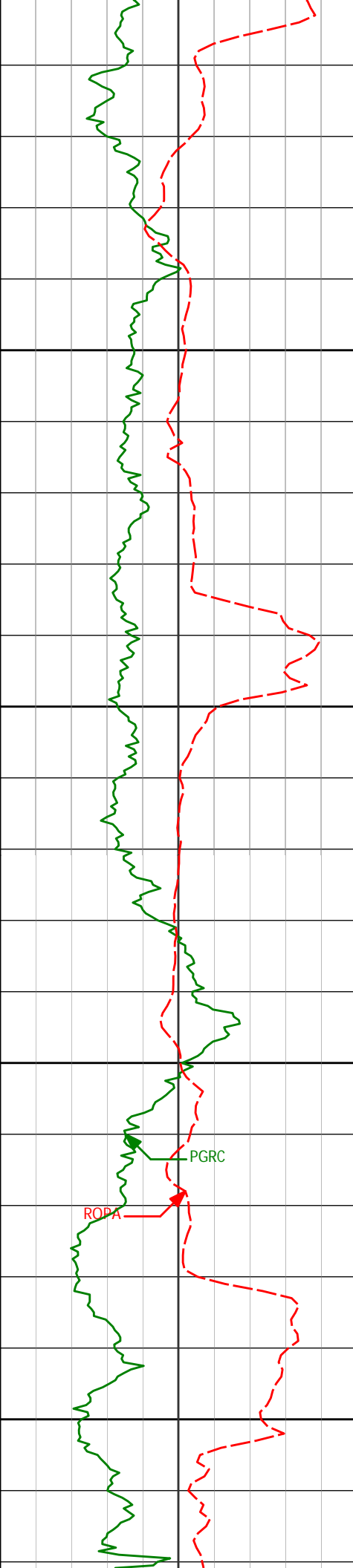
9100

9150

9200

PGRC

ROPA



9250

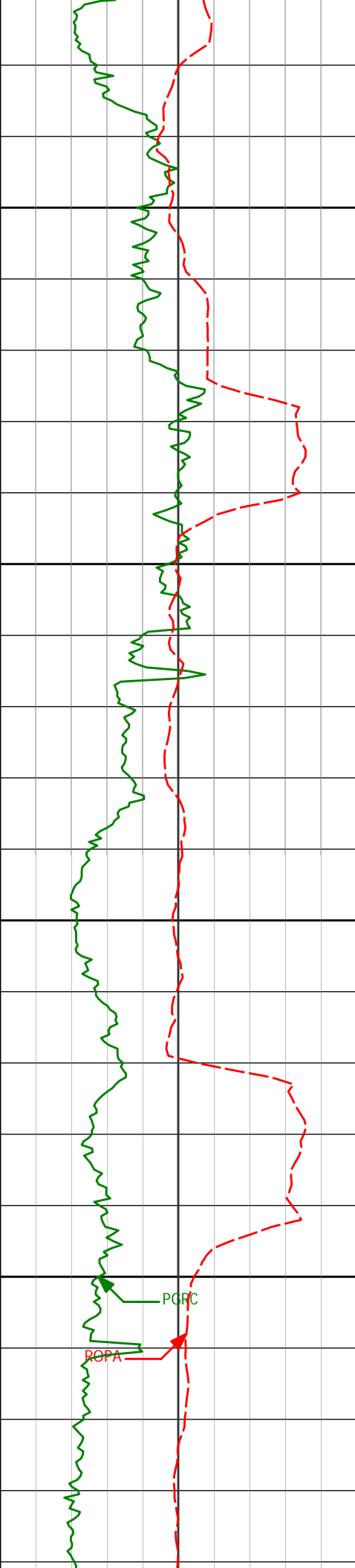
9300

9350

9400

PGRC

ROPA



9450

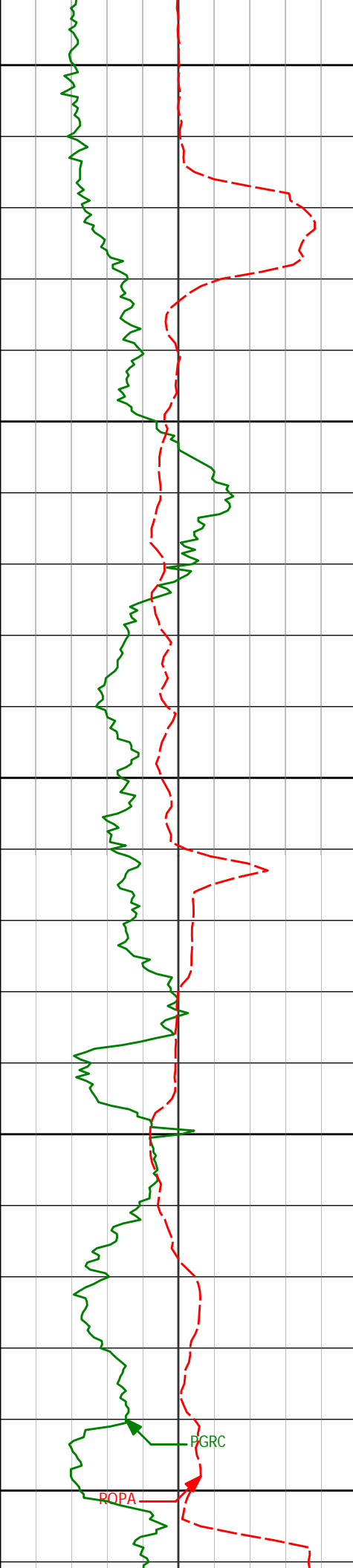
9500

9550

9600

PGRC

ROPA



9650

9700

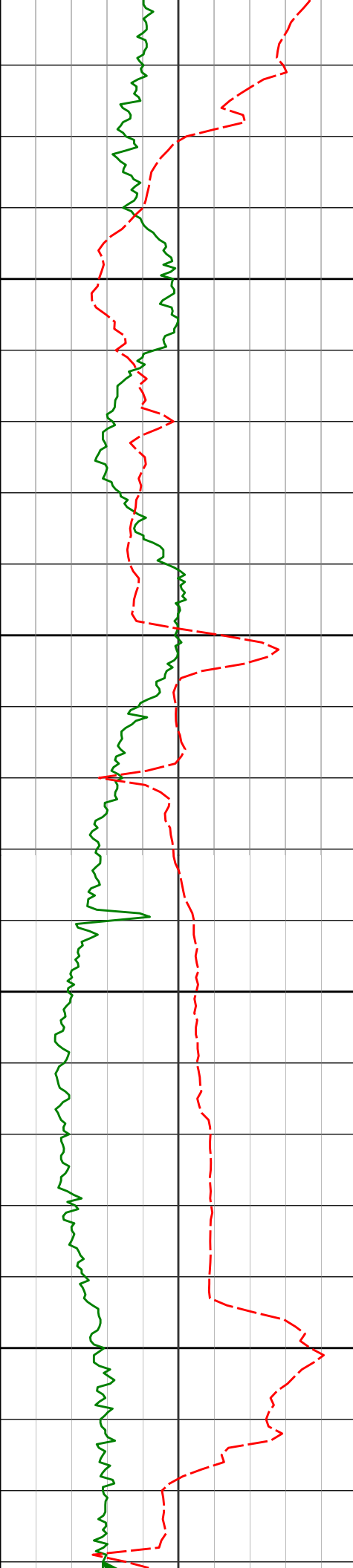
9750

9800

9850

PGRC

ROPA

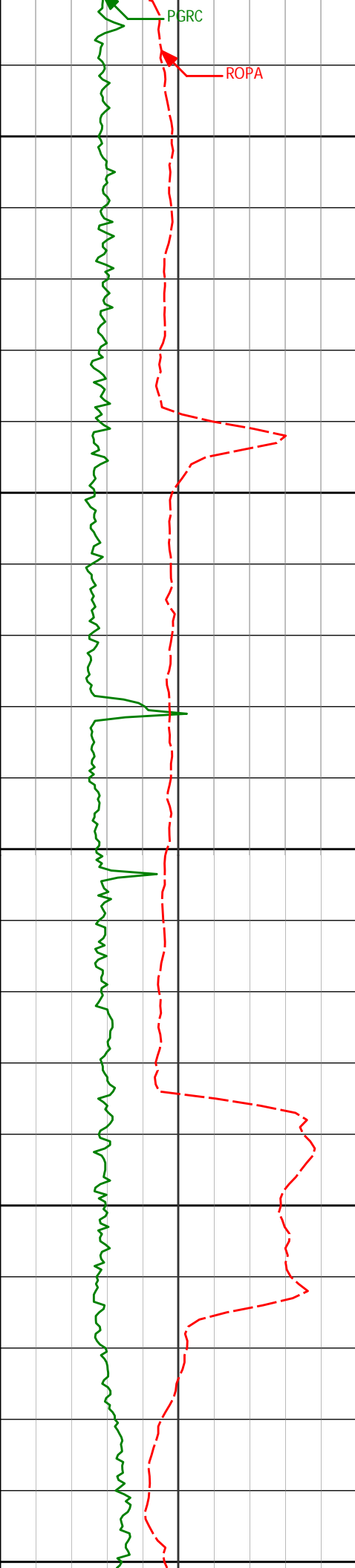


9900

9950

10000

10050



10100

10150

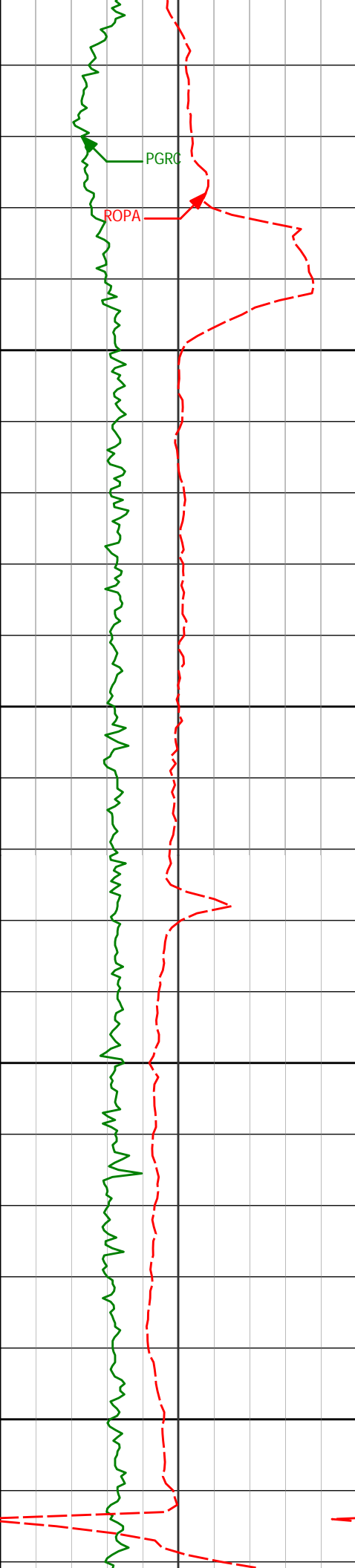
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10250

10300

PGRC

ROPA

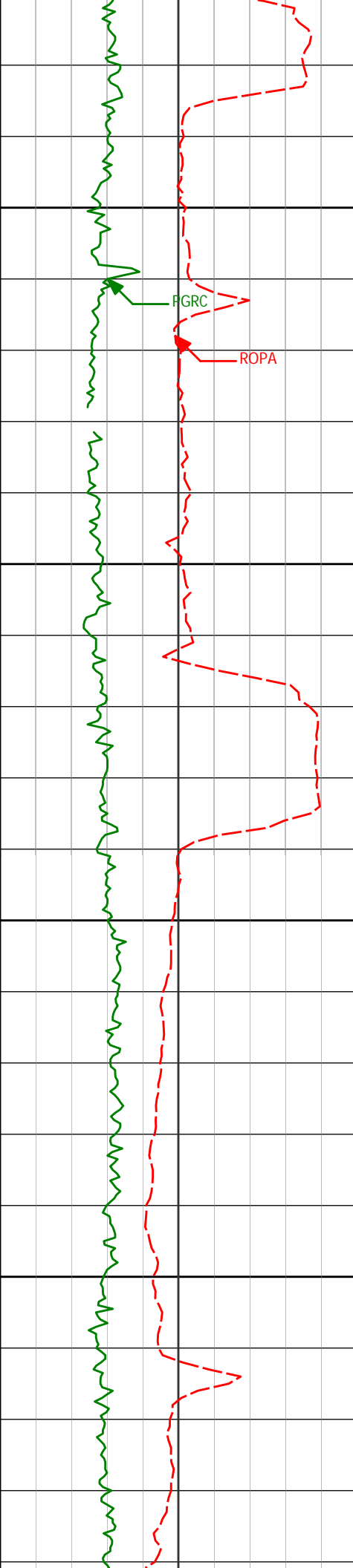


10350

10400

10450

10500

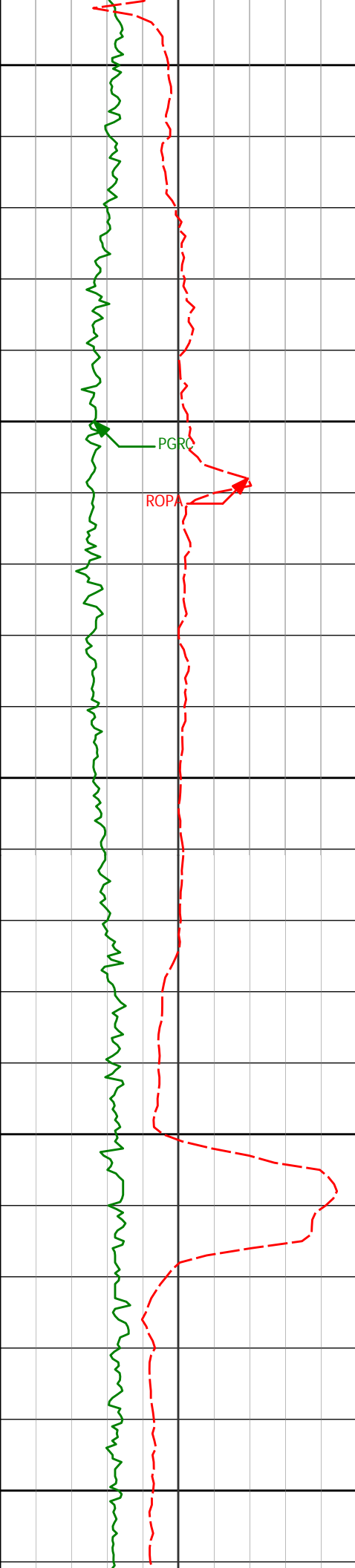


10550

10600

10650

10700



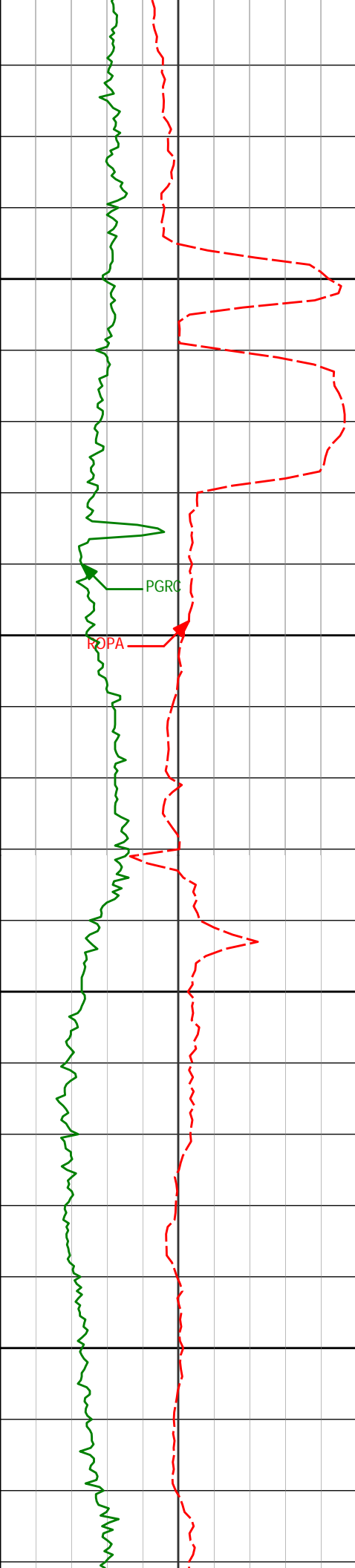
10750

10800

10850

10900

10950



11000

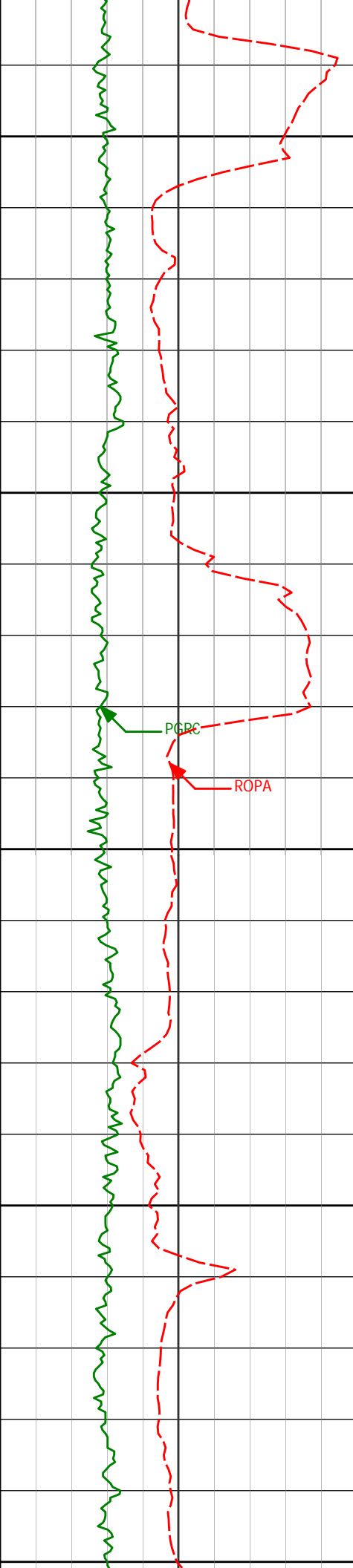
11050

11100

11150

PGRC

ROPA



<Run 400>

11200

11250

11300

11350

11400

11198'

91.23°

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6753.63'

5047.41'

11293'

88.89°

270.05°

6753.53'

5142.16'

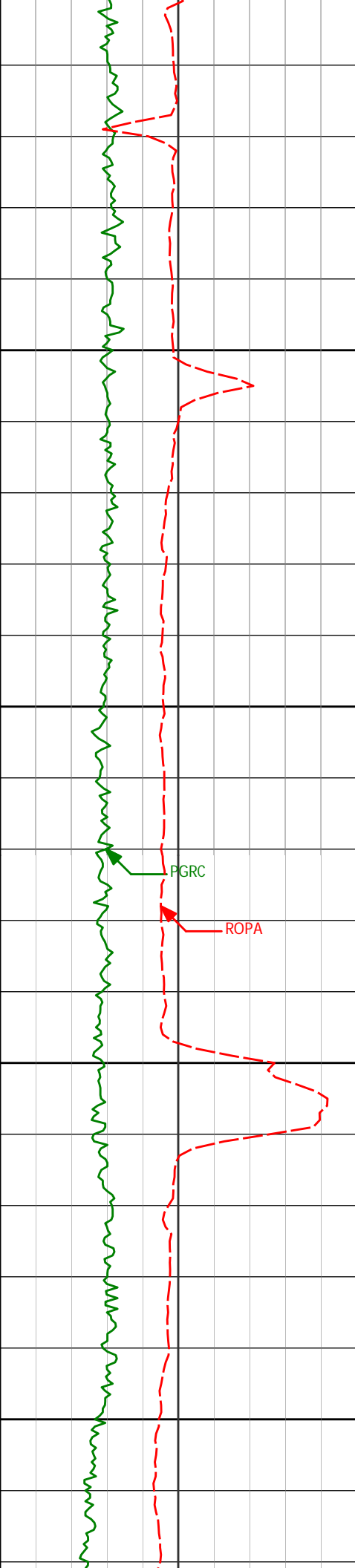
11388'

88.80°

269.80°

6755.45'

5236.94'



11450

11500

11550

11600

11483'

89.69°

269.40°

6756.70'

5331.76'

11578'

88.36°

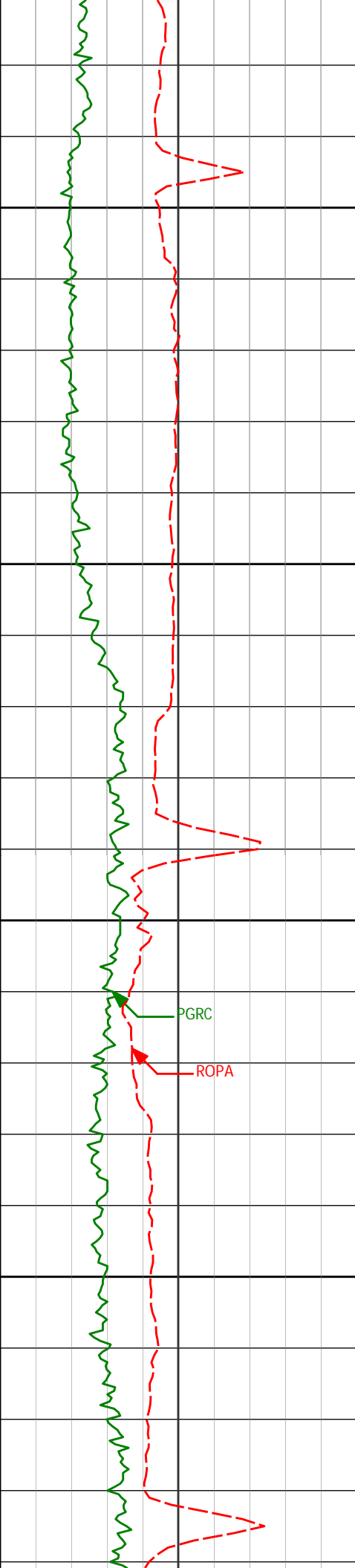
270.26°

6758.31'

5426.54'

PGRC

ROPA



11650

11673'

88.74°

270.57°

6760.71'

5521.25'

11700

11750

11768'

89.14°

269.91°

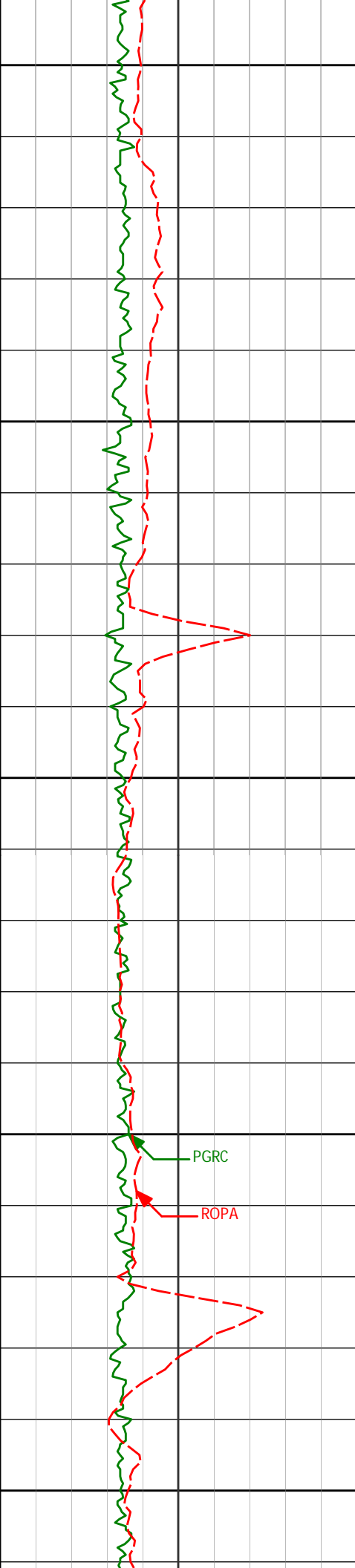
6762.48'

5615.99'

11800

PGRC

ROPA



11850

11863'

89.88°

270.41°

6763.29'

5710.75'

11900

11950

11958'

89.88°

269.13°

6763.50'

5805.56'

12000

PGRC

ROPA

12050

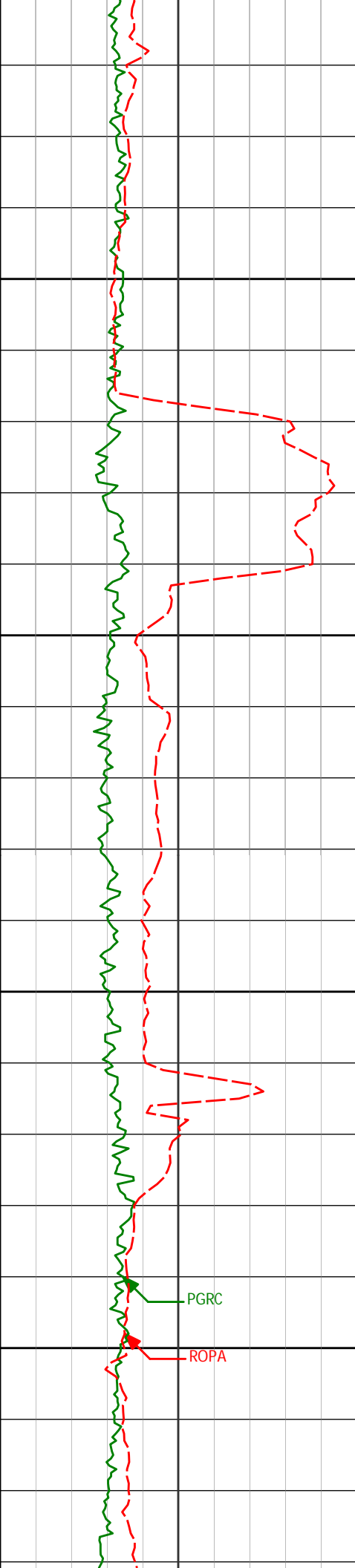
12053'

88.95°

266.64°

6764.47'

5900.50'



12100

12150

12200

12250

12148'

89.60°

267.92°

6765.67'

5995.48'

12243'

88.80°

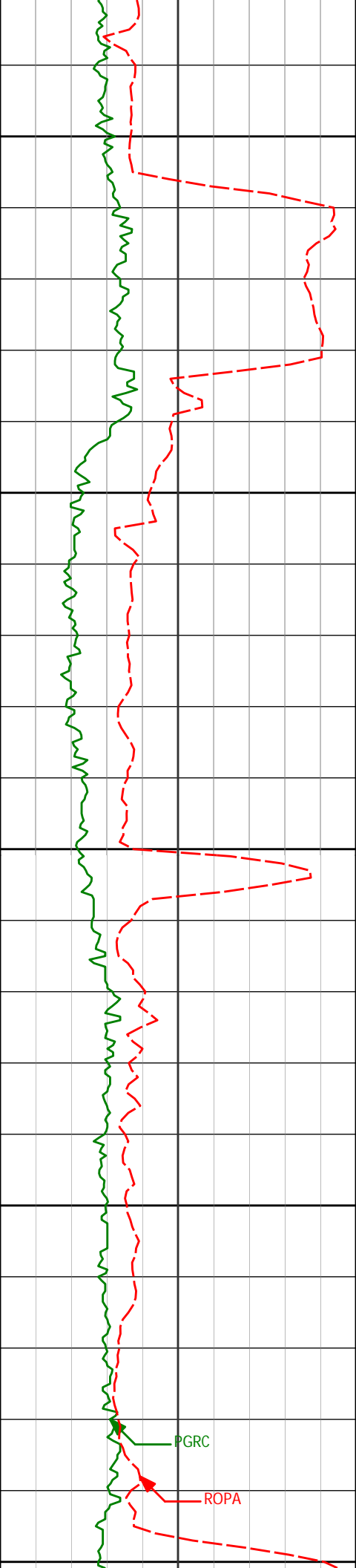
267.09°

6767.00'

6090.44'

PGRC

ROPA



12300

12338'

90.52°

269.45°

6767.57'

6185.36'

12350

12400

12433'

91.14°

269.08°

6766.19'

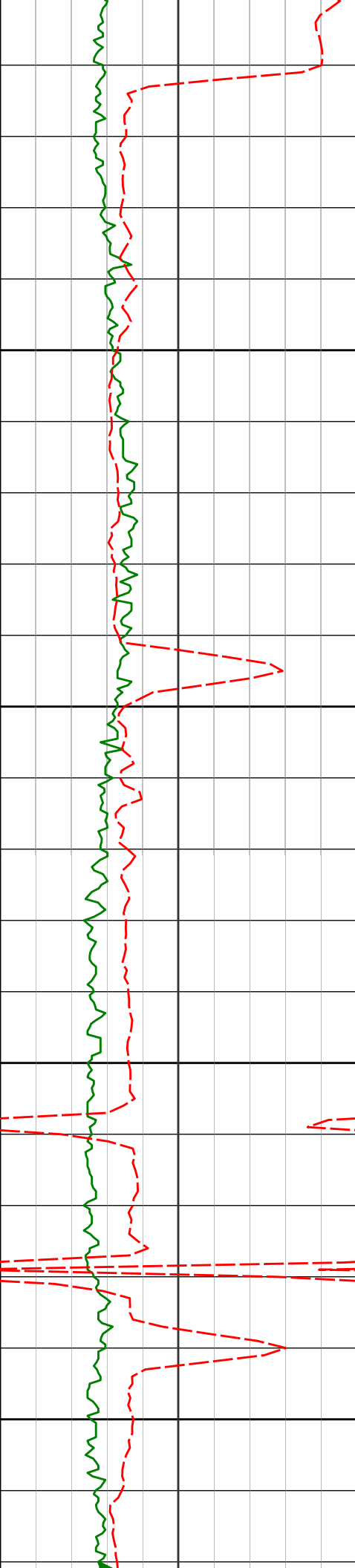
6280.21'

12450

12500

PGRC

ROPA



12528'	90.09°	269.27°	6765.16'	6375.07'
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12550

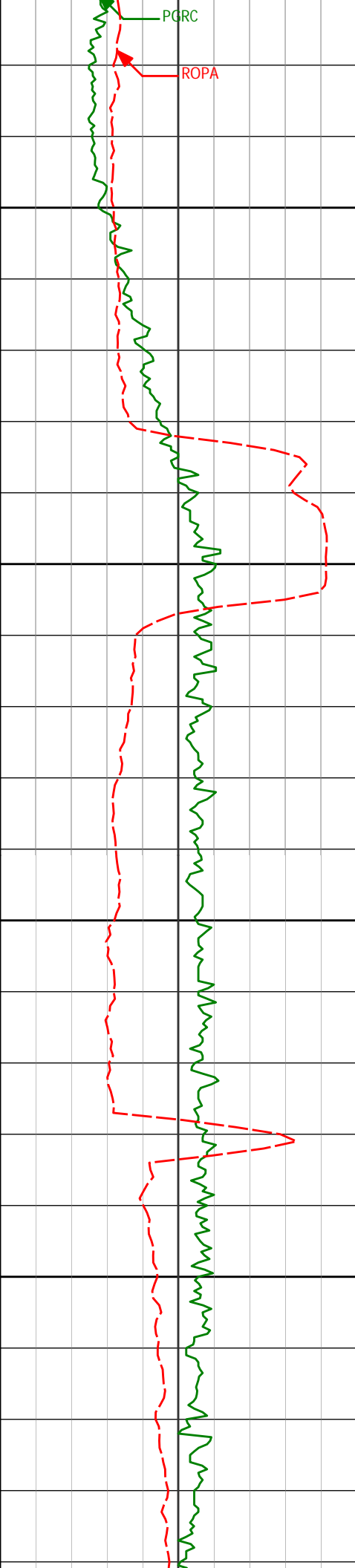
12600

12623'	89.94°	268.65°	6765.14'	6469.96'
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12650

12700

12718'	90.09°	268.58°	6765.11'	6564.87'
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12750

12800

12850

12900

12813'

89.35°

270.65°

6765.57'

6659.69'

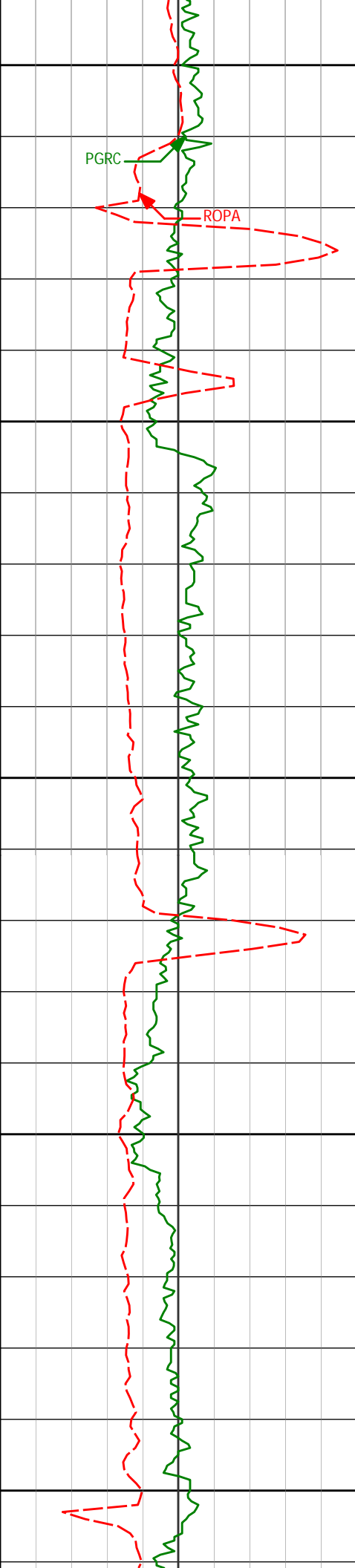
12908'

89.29°

271.64°

6766.70'

6754.32'



12950

PGRC

ROPA

13000

13003'

89.82°

271.14°

6767.44'

6848.92'

13050

13100

13098'

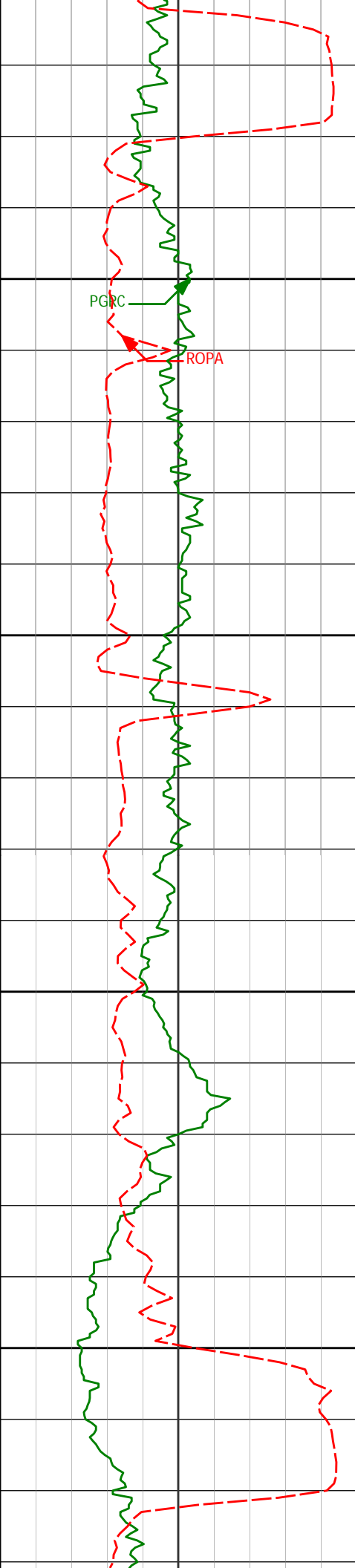
90.22°

270.74°

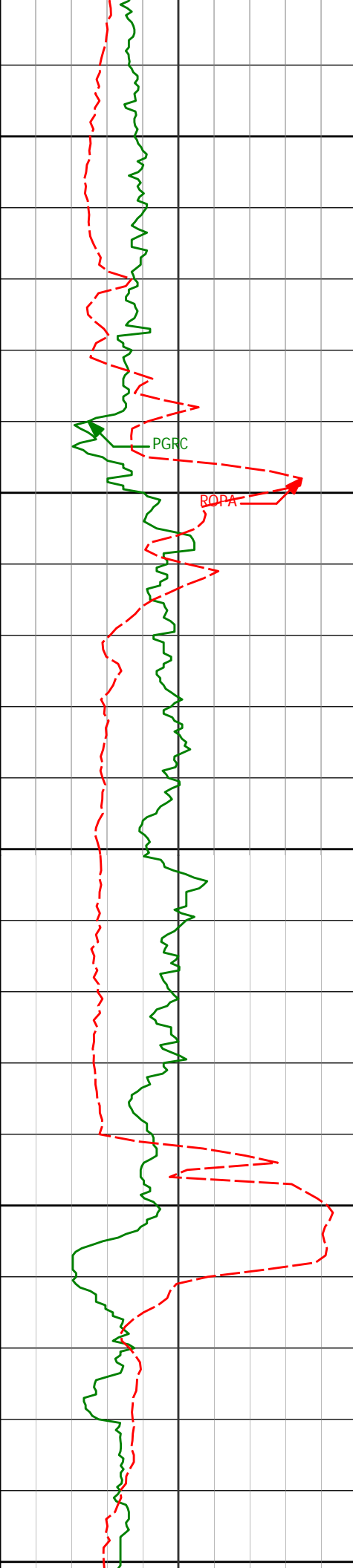
6767.41'

6943.59'

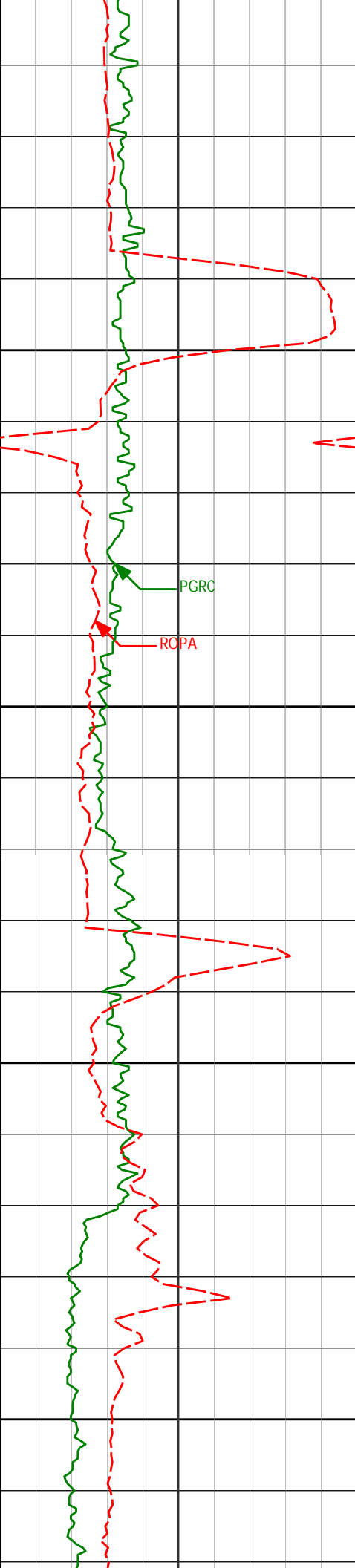
13150



13193'	89.41°	271.59°	6767.72'	7038.22'
13200				
13250				
13288'	90.00°	271.29°	6768.21'	7132.81'
13300				
13350				



Station	Distance (ft)	Bearing	Distance (ft)	Bearing	Distance (ft)	Bearing	Distance (ft)	Bearing
13383'		88.52°		269.76°		6769.43'		7227.52'
13478'		88.02°		268.13°		6772.30'		7322.36'
13573'		88.18°		268.90°		6775.45'		7417.23'



13650

13668'

89.01°

271.64°

6777.78'

7511.95'

PGRC

ROPA

13700

13750

13763'

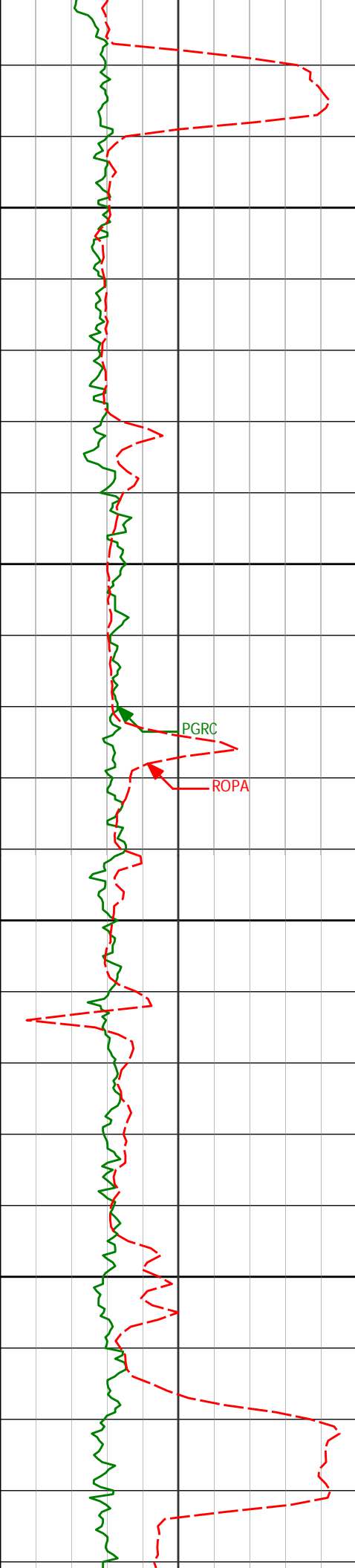
89.69°

271.66°

6778.85'

7606.50'

13800



13850

13858'

89.51°

270.31°

6779.52'

7701.16'

13900

PGRC

ROPA

13950

13953'

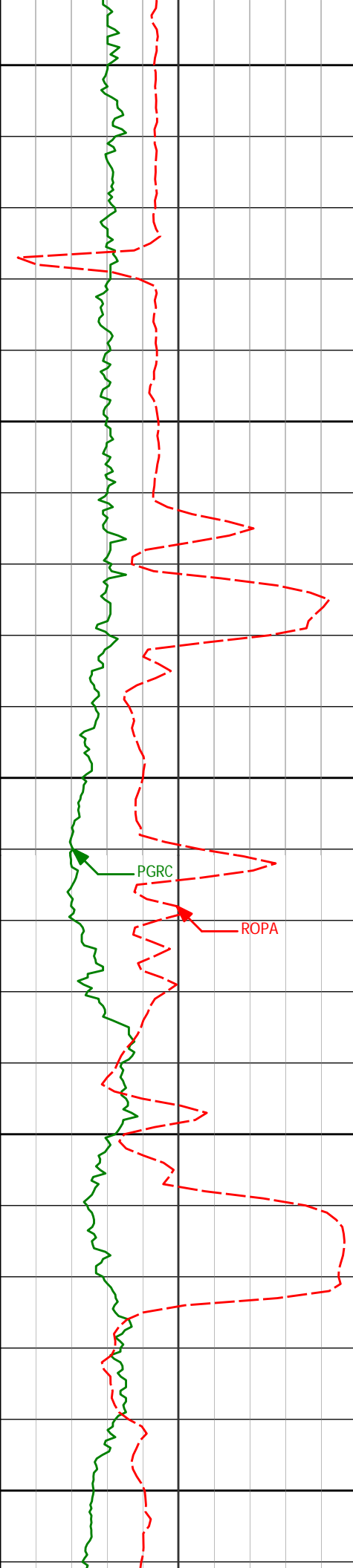
89.94°

271.63°

6779.98'

7795.82'

14000



14050

14100

14150

14200

14250

14048'

87.72°

269.49°

6781.92'

7890.51'

14143'

87.40°

270.19°

6785.96'

7985.22'

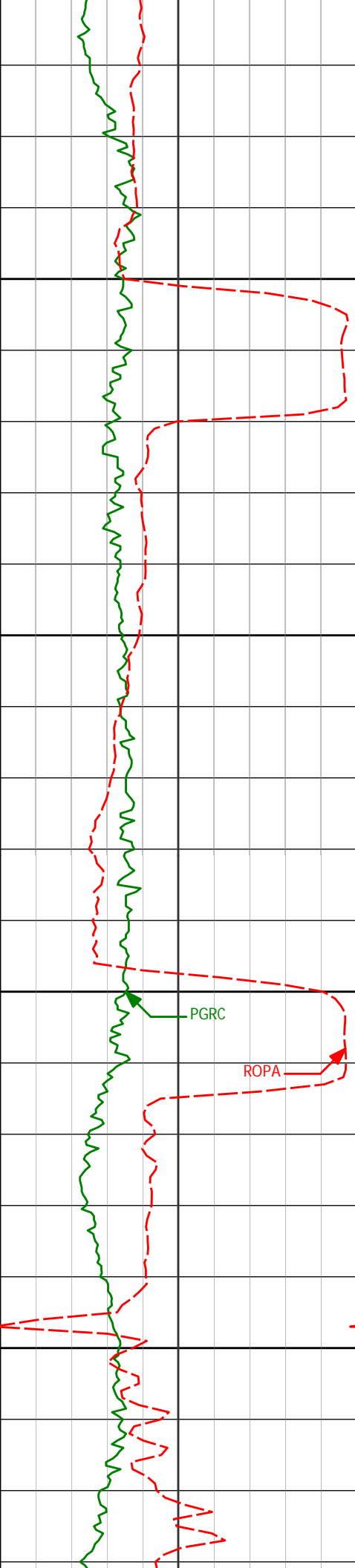
14238'

88.15°

269.00°

6789.64'

8079.98'



14300

14333'

90.06°

270.12°

6791.12'

8174.79'

14350

14400

PGRC

ROPA

14428'

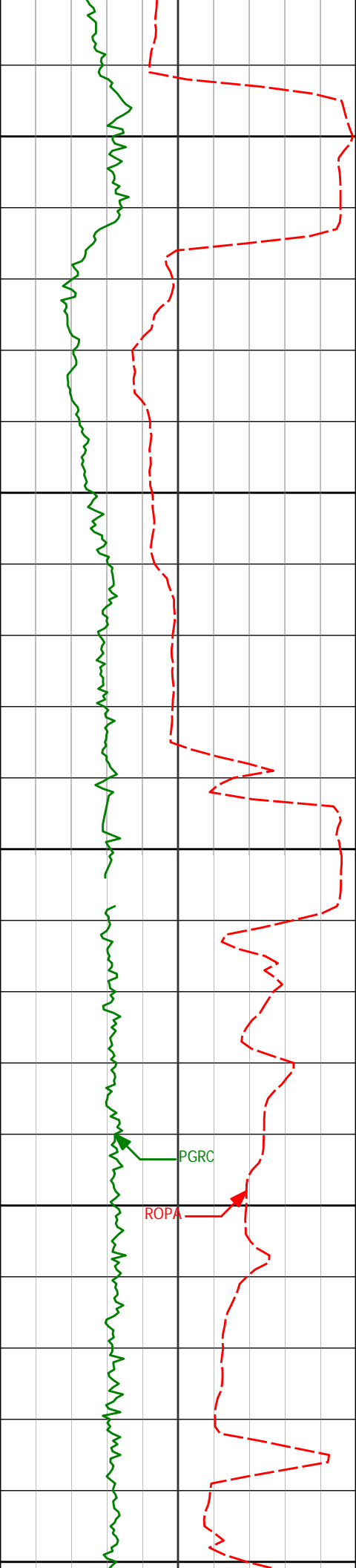
91.20°

269.05°

6790.07'

8269.61'

14450



14500

14523'

92.07°

266.66°

6787.36'

8364.52'

14550

14600

14618'

90.00°

267.06°

6785.65'

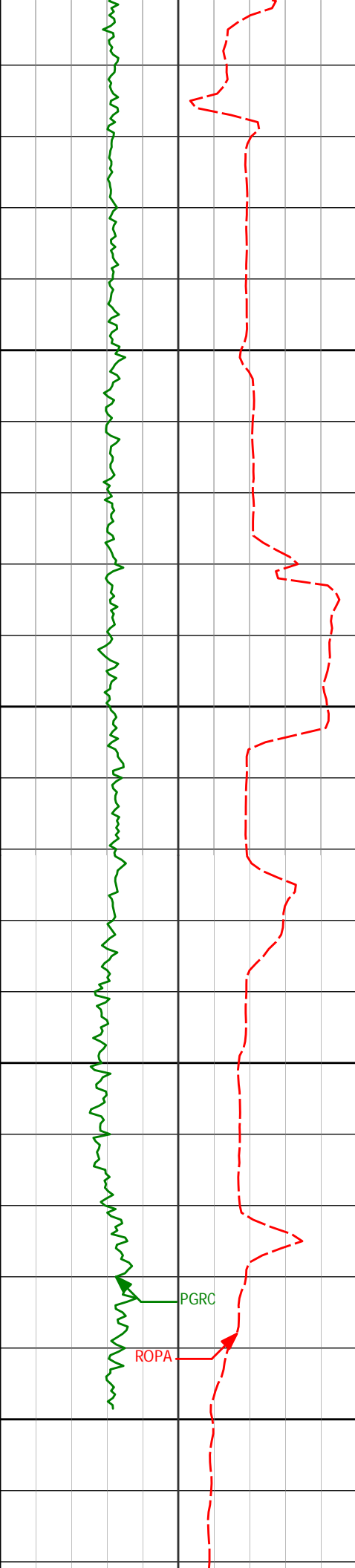
8459.50'

14650

14700

PGRC

ROPA



14750

14800

14850

14900

14713'

89.54°

265.39°

6786.03'

8554.49'

14808'

90.65°

267.93°

6785.88'

8649.48'

14889'

91.42°

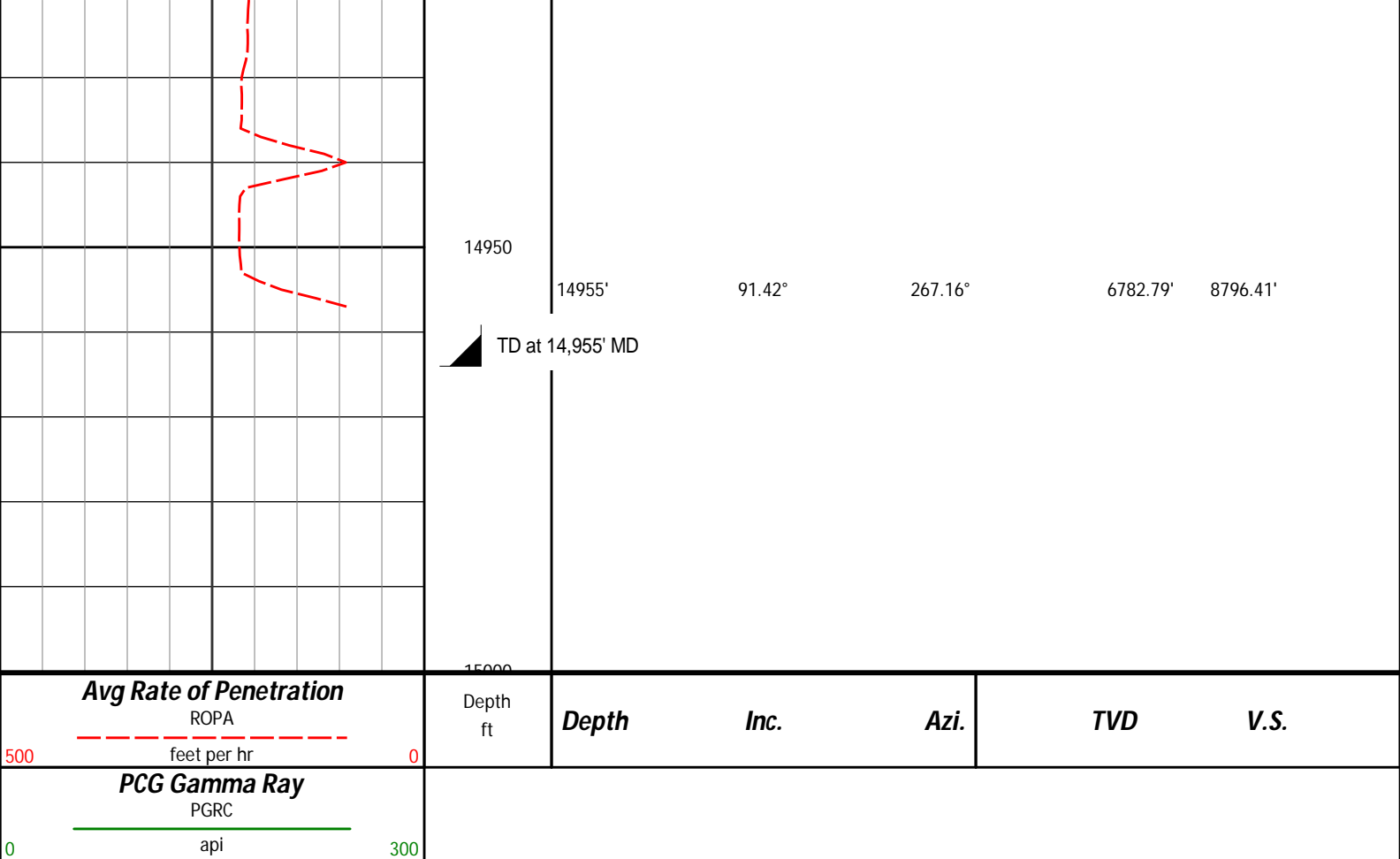
267.16°

6784.42'

8730.44'

PGRC

ROPA



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch State USX AA16-68-1
Wattenberg
Weld Colorado
USA
CA-XX-0900067301

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
100.00	0.10	0.00	100.00	0.09 N	0.00 E	-0.01	0.10
200.00	0.28	15.68	200.00	0.42 N	0.07 E	-0.09	0.18
300.00	0.12	30.50	300.00	0.74 N	0.18 E	-0.23	0.17
400.00	0.13	61.09	400.00	0.88 N	0.34 E	-0.40	0.07
500.00	0.29	30.60	500.00	1.16 N	0.57 E	-0.64	0.19
600.00	0.26	62.71	600.00	1.48 N	0.90 E	-1.00	0.16
700.00	0.20	333.41	700.00	1.74 N	1.02 E	-1.14	0.33
800.00	0.40	323.05	799.99	2.18 N	0.74 E	-0.88	0.20
900.00	0.62	345.52	899.99	2.98 N	0.39 E	-0.59	0.30
1000.00	0.64	31.29	999.99	3.98 N	0.55 E	-0.81	0.49
1100.00	0.84	233.07	1099.98	4.02 N	0.25 E	-0.52	1.46
1200.00	4.20	223.14	1199.87	0.91 N	2.84 W	2.77	3.38
1300.00	7.26	222.82	1299.36	6.40 S	9.64 W	10.04	3.06
1400.00	9.08	219.65	1398.34	17.11 S	18.97 W	20.07	1.87
1500.00	11.98	217.13	1496.65	31.46 S	30.26 W	32.31	2.93
1600.00	14.21	214.58	1594.04	49.84 S	43.49 W	46.74	2.30
1700.00	15.88	210.91	1690.62	71.68 S	57.49 W	62.17	1.92
1800.00	15.06	211.16	1786.99	94.53 S	71.23 W	77.42	0.82
1900.00	15.36	208.66	1883.49	117.26 S	84.31 W	91.99	0.72
2000.00	16.88	206.37	1979.56	141.90 S	97.11 W	106.42	1.65
2100.00	15.73	203.45	2075.54	167.34 S	108.96 W	119.95	1.42

2100.00	15.75	205.68	2075.94	107.95 S	100.90 W	119.95	1.42
2200.00	15.75	205.68	2171.79	192.01 S	120.24 W	132.86	0.60
2300.00	16.76	205.66	2267.79	217.24 S	132.36 W	146.65	1.01
2400.00	15.67	206.13	2363.81	242.36 S	144.55 W	160.50	1.09
2500.00	13.68	205.19	2460.54	265.19 S	155.54 W	172.99	2.00
2600.00	14.79	209.31	2557.47	287.02 S	166.82 W	185.72	1.50
2700.00	14.99	210.70	2654.11	309.27 S	179.67 W	200.03	0.41
2800.00	14.43	215.53	2750.84	330.54 S	193.52 W	215.28	1.35
2900.00	15.85	216.65	2847.36	351.64 S	208.91 W	232.05	1.45
3000.00	15.86	215.89	2943.56	373.67 S	225.08 W	249.66	0.21
3100.00	16.09	214.03	3039.70	396.22 S	240.84 W	266.91	0.56
3200.00	15.19	212.88	3135.99	418.72 S	255.72 W	283.25	0.95
3300.00	14.72	209.88	3232.60	440.74 S	269.16 W	298.14	0.91
3400.00	11.04	210.23	3330.07	460.03 S	280.31 W	310.56	3.68
3500.00	7.20	211.80	3428.79	473.63 S	288.43 W	319.58	3.85
3600.00	6.49	210.79	3528.08	483.81 S	294.63 W	326.45	0.72
3700.00	4.01	205.34	3627.65	491.82 S	299.01 W	331.36	2.52
3800.00	3.61	202.36	3727.43	497.90 S	301.71 W	334.46	0.45
3900.00	2.36	207.68	3827.29	502.64 S	303.87 W	336.93	1.28
4000.00	1.68	206.72	3927.23	505.78 S	305.49 W	338.76	0.68
4100.00	1.66	206.51	4027.19	508.39 S	306.79 W	340.24	0.02
4200.00	1.26	179.21	4127.16	510.79 S	307.42 W	341.03	0.79
4300.00	1.33	111.38	4227.14	512.31 S	306.33 W	340.03	1.45
4400.00	2.57	118.37	4327.08	513.80 S	303.27 W	337.09	1.25
4500.00	1.84	82.01	4427.01	514.64 S	299.71 W	333.59	1.54
4600.00	1.15	85.09	4526.97	514.34 S	297.12 W	330.98	0.69
4700.00	1.07	91.81	4626.95	514.28 S	295.18 W	329.05	0.15
4800.00	1.24	144.37	4726.93	515.19 S	293.61 W	327.54	1.04
4900.00	1.60	133.40	4826.90	517.03 S	291.97 W	326.02	0.45
5000.00	1.15	326.54	4926.89	517.16 S	291.50 W	325.57	2.74
5100.00	0.85	326.44	5026.88	515.70 S	292.47 W	326.43	0.30
5200.00	1.17	356.18	5126.86	514.06 S	292.94 W	326.80	0.61
5300.00	1.34	328.23	5226.84	512.05 S	293.63 W	327.35	0.63
5400.00	0.97	311.04	5326.82	510.50 S	294.88 W	328.49	0.50
5500.00	0.91	303.33	5426.81	509.51 S	296.17 W	329.72	0.14
5600.00	0.28	259.61	5526.80	509.12 S	297.07 W	330.59	0.73
5700.00	0.27	246.56	5626.80	509.26 S	297.53 W	331.06	0.06
5800.00	0.32	40.42	5726.80	509.14 S	297.57 W	331.09	0.57
5900.00	1.56	351.22	5826.78	507.59 S	297.60 W	331.01	1.37
6000.00	1.20	329.31	5926.76	505.34 S	298.34 W	331.60	0.64
6050.00	0.90	332.46	5976.75	504.55 S	298.79 W	331.99	0.59
6100.00	0.91	320.20	6026.74	503.89 S	299.22 W	332.38	0.39
6150.00	5.63	261.48	6076.65	503.95 S	301.91 W	335.06	10.44
6200.00	10.50	252.70	6126.14	505.67 S	308.69 W	341.94	10.01
6250.00	17.00	258.97	6174.69	508.43 S	320.23 W	353.64	13.33
6300.00	20.58	263.40	6222.02	510.84 S	336.14 W	369.68	7.69
6350.00	25.47	268.31	6268.02	512.17 S	355.62 W	389.21	10.50
6400.00	29.02	268.59	6312.47	512.78 S	378.50 W	412.08	7.11
6450.00	30.65	267.60	6355.84	513.61 S	403.36 W	436.94	3.40
6500.00	33.55	267.77	6398.20	514.69 S	429.90 W	463.49	5.82
6550.00	36.77	270.56	6439.07	515.08 S	458.69 W	492.24	7.19
6600.00	41.33	271.97	6477.89	514.37 S	490.17 W	523.60	9.29
6650.00	46.54	273.12	6513.88	512.81 S	524.81 W	558.06	10.54
6700.00	49.62	273.58	6547.28	510.63 S	561.95 W	594.97	6.18
6750.00	53.42	270.29	6578.40	509.34 S	601.05 W	633.89	9.19
6800.00	58.07	269.27	6606.54	509.51 S	642.36 W	675.12	9.46
6850.00	63.86	269.83	6630.79	509.85 S	686.06 W	718.74	11.61
6900.00	69.41	268.53	6650.62	510.52 S	731.93 W	764.56	11.36
6950.00	73.07	269.85	6666.69	511.18 S	779.26 W	811.83	7.74
7000.00	76.23	269.20	6679.92	511.58 S	827.47 W	859.96	6.44
7050.00	78.00	269.71	6691.07	512.05 S	876.21 W	908.61	3.67
7100.00	80.45	271.07	6700.42	511.71 S	925.32 W	957.59	5.58
7150.00	84.03	270.98	6707.17	510.83 S	974.85 W	1006.95	7.16
7200.00	88.30	271.32	6710.52	509.82 S	1024.71 W	1056.63	8.58
7300.00	90.90	270.51	6711.21	508.23 S	1124.69 W	1156.28	2.72
7400.00	90.11	268.23	6710.33	509.33 S	1224.67 W	1256.11	2.41
7500.00	88.96	267.59	6711.14	512.97 S	1324.60 W	1356.05	1.32
7600.00	89.12	266.04	6712.82	518.53 S	1424.43 W	1456.03	1.56
7700.00	89.55	268.30	6713.99	523.47 S	1524.29 W	1556.00	2.31
7800.00	89.82	270.79	6714.54	524.26 S	1624.28 W	1655.82	2.50
7900.00	89.55	270.83	6715.10	522.85 S	1724.27 W	1755.48	0.27
8000.00	89.77	269.59	6715.69	522.49 S	1824.26 W	1855.23	1.26
8100.00	89.05	270.88	6716.72	522.08 S	1924.26 W	1954.97	1.48
8200.00	91.29	270.20	6716.42	521.13 S	2024.24 W	2054.67	2.33
8300.00	90.19	269.69	6715.13	521.23 S	2124.23 W	2154.44	1.21

8400.00	89.23	269.89	6715.64	521.60 S	2224.23 W	2254.23	0.98
8500.00	90.00	270.08	6716.31	521.62 S	2324.23 W	2354.01	0.79
8600.00	89.68	270.26	6716.59	521.33 S	2424.23 W	2453.76	0.37
8700.00	89.99	269.46	6716.88	521.58 S	2524.22 W	2553.55	0.86
8800.00	90.08	270.38	6716.83	521.72 S	2624.22 W	2653.33	0.93
8900.00	88.58	269.95	6718.00	521.43 S	2724.21 W	2753.08	1.56
9000.00	90.89	270.66	6718.46	520.89 S	2824.20 W	2852.80	2.42
9100.00	91.05	268.51	6716.77	521.61 S	2924.18 W	2952.60	2.16
9200.00	88.95	268.44	6716.77	524.28 S	3024.14 W	3052.52	2.10
9300.00	89.66	268.08	6717.98	527.32 S	3124.08 W	3152.44	0.80
9400.00	89.40	267.73	6718.79	530.97 S	3224.01 W	3252.39	0.43
9500.00	89.12	268.57	6720.08	534.20 S	3323.95 W	3352.32	0.88
9600.00	87.73	268.94	6722.82	536.37 S	3423.89 W	3452.18	1.44
9700.00	86.82	269.14	6727.58	538.04 S	3523.76 W	3551.94	0.94
9800.00	86.49	268.20	6733.42	540.36 S	3623.56 W	3651.67	1.00
9900.00	88.46	268.36	6737.83	543.36 S	3723.41 W	3751.50	1.98
10000.00	88.89	268.60	6740.14	546.01 S	3823.35 W	3851.39	0.50
10100.00	88.42	267.22	6742.49	549.66 S	3923.26 W	3951.31	1.46
10200.00	89.11	268.70	6744.64	553.21 S	4023.17 W	4051.23	1.63
10300.00	90.81	269.36	6744.71	554.90 S	4123.15 W	4151.10	1.82
10400.00	89.00	269.45	6744.87	555.94 S	4223.14 W	4250.94	1.81
10500.00	89.79	269.38	6745.92	556.96 S	4323.13 W	4350.77	0.79
10600.00	89.32	270.42	6746.70	557.13 S	4423.12 W	4450.55	1.14
10700.00	88.44	269.92	6748.65	556.83 S	4523.10 W	4550.28	1.01
10800.00	89.49	269.45	6750.45	557.38 S	4623.08 W	4650.07	1.15
10900.00	88.28	269.00	6752.40	558.73 S	4723.05 W	4749.91	1.30
11000.00	89.22	269.36	6754.59	560.16 S	4823.02 W	4849.74	1.01
11103.00	90.37	268.90	6754.96	561.73 S	4926.00 W	4952.60	1.20
11198.00	91.23	270.42	6753.63	562.29 S	5020.99 W	5047.41	1.84
11293.00	88.89	270.05	6753.53	561.91 S	5115.98 W	5142.16	2.50
11388.00	88.80	269.80	6755.45	562.03 S	5210.96 W	5236.94	0.28
11483.00	89.69	269.40	6756.70	562.70 S	5305.95 W	5331.76	1.04
11578.00	88.36	270.26	6758.31	562.98 S	5400.93 W	5426.54	1.67
11673.00	88.74	270.57	6760.71	562.29 S	5495.90 W	5521.25	0.51
11768.00	89.14	269.91	6762.48	561.90 S	5590.88 W	5615.99	0.81
11863.00	89.88	270.41	6763.29	561.63 S	5685.87 W	5710.75	0.94
11958.00	89.88	269.13	6763.50	562.01 S	5780.87 W	5805.56	1.35
12053.00	88.95	266.64	6764.47	565.52 S	5875.79 W	5900.50	2.79
12148.00	89.60	267.92	6765.67	570.02 S	5970.68 W	5995.48	1.51
12243.00	88.80	267.09	6767.00	574.15 S	6065.58 W	6090.44	1.22
12338.00	90.52	269.45	6767.57	577.02 S	6160.52 W	6185.36	3.08
12433.00	91.14	269.08	6766.19	578.24 S	6255.50 W	6280.21	0.76
12528.00	90.09	269.27	6765.16	579.60 S	6350.49 W	6375.07	1.12
12623.00	89.94	268.65	6765.14	581.33 S	6445.47 W	6469.96	0.68
12718.00	90.09	268.58	6765.11	583.62 S	6540.44 W	6564.87	0.18
12813.00	89.35	270.65	6765.57	584.26 S	6635.43 W	6659.69	2.31
12908.00	89.29	271.64	6766.70	582.36 S	6730.41 W	6754.32	1.05
13003.00	89.82	271.14	6767.44	580.06 S	6825.37 W	6848.92	0.77
13098.00	90.22	270.74	6767.41	578.50 S	6920.36 W	6943.59	0.59
13193.00	89.41	271.59	6767.72	576.56 S	7015.34 W	7038.22	1.23
13288.00	90.00	271.29	6768.21	574.17 S	7110.31 W	7132.81	0.69
13383.00	88.52	269.76	6769.43	573.30 S	7205.29 W	7227.52	2.24
13478.00	88.02	268.13	6772.30	575.05 S	7300.23 W	7322.36	1.79
13573.00	88.18	268.90	6775.45	577.51 S	7395.14 W	7417.23	0.82
13668.00	89.01	271.64	6777.78	577.06 S	7490.10 W	7511.95	3.02
13763.00	89.69	271.66	6778.85	574.32 S	7585.06 W	7606.50	0.71
13858.00	89.51	270.31	6779.52	572.69 S	7680.04 W	7701.16	1.44
13953.00	89.94	271.63	6779.98	571.08 S	7775.02 W	7795.82	1.47
14048.00	87.72	269.49	6781.92	570.16 S	7869.98 W	7890.51	3.24
14143.00	87.40	270.19	6785.96	570.43 S	7964.90 W	7985.22	0.81
14238.00	88.15	269.00	6789.64	571.10 S	8059.82 W	8079.98	1.47
14333.00	90.06	270.12	6791.12	571.82 S	8154.80 W	8174.79	2.33
14428.00	91.20	269.05	6790.07	572.51 S	8249.79 W	8269.61	1.65
14523.00	92.07	266.66	6787.36	576.07 S	8344.68 W	8364.52	2.67
14618.00	90.00	267.06	6785.65	581.27 S	8439.51 W	8459.50	2.22
14713.00	89.54	265.39	6786.03	587.52 S	8534.30 W	8554.49	1.82
14808.00	90.65	267.93	6785.88	593.05 S	8629.13 W	8649.48	2.91
14889.00	91.42	267.16	6784.42	596.52 S	8710.04 W	8730.44	1.34
14955.00	91.42	267.16	6782.79	599.79 S	8775.94 W	8796.41	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 CLOSURE OF 266.09 DEGREES (GRID)
A TOTAL CORRECTION OF 7.82 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 14955.00 FEET
IS 8796.41 FEET ALONG 266.09 DEGREES (GRID)

Survey at TD is a straight-line projection to bit.

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