

DC - Pressure Case Directional
PCGK - Pressure Case Gamma



1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300	400	
Date run completed	01-Sep-17	03-Sep-17	04-Sep-17	06-Sep-17	
Rig Bit Number	2	3	4	5	
Bit Size (in)	7.875	7.875	7.875	7.875	
Tool Nominal OD (in)	6.750	6.750	6.750	6.750	
Log Start Depth (MD, ft)	1,845.00	6,214.00	7,021.00	7,340.00	
Log End Depth (MD, ft)	6,214.00	7,021.00	7,340.00	13,384.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	28-Aug-17 17:00	02-Sep-17 10:30	04-Sep-17 13:00	05-Sep-17 03:45	
Drill/Wipe End Date and Time	31-Aug-17 23:00	03-Sep-17 09:00	04-Sep-17 19:20	06-Sep-17 16:45	
Min Inc (deg) @ Depth (MD, ft)	0.34 @ 4,823.00	0.74 @ 6,348.00	48.53 @ 7,066.00	88.18 @ 10,741.00	
Max Inc (deg) @ Depth (MD, ft)	11.90 @ 1,932.00	36.21 @ 6,976.00	89.85 @ 7,335.00	91.91 @ 12,892.00	
Bit TFA(in2) / Bit Type	0.90 /	0.90 /	0.90 /	1.05 / PDC	
Flow Rate (gpm)	592.00	550.00	550.00	546.75	
Max AV (fpm) / CV (fpm) @ MWD	N/A	N/A	N/A	N/A	
Fluid Type	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	
Density (ppg) / Viscosity (spqt)	9.30 / 55.00	9.35 / 62.00	9.35 / 62.00	9.35 / 55.00	
Filtrate CL (ppm)	14,000.00	13,000.00	12,000.00	12,000.00	
pH / API Filtrate (mptm)	N/A / 4	N/A / 4	N/A / 4	N/A / 4	
PV (cP) / YP (lbf2)	18 / 10.00	21 / 12.00	21 / 12.00	21 / 11.00	
% Solids / % Sand	10.00 / 0.00	.2 / .1	10.00 / 0.00	8.08 / 0.00	
% Oil / Oil:Water Ratio	76.00 / 3:1	77.00 / 9:3	69.00 / 77:23	76.00 / 3:1	
Rm @ Measured Temp (degF)	N/A @ N/A	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	N/A @ N/A	
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Max Tool Temp (in) F / C	165.53 / 63.1	202.51 / 78.1	202.51 / 78.1	202.51 / 78.1	

Max Tool Temp (degF) / Source	165.58 / PCM	239.54 / PCM	239.54 / PCM	239.54 / PCM	
Rm @ Max Tool Temp (degF)	N/A @ 165.58	N/A @ 239.54	N/A @ 239.54	N/A @ 239.54	
Lead MWD Engineer	Brian Neu	Brian Neu	Brian Neu	Brian Neu	
Customer Representative	Luke Rains	Luke Rains	Luke Rains	Luke Rains	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.93	5.93	5.93	5.93	
Sub Serial Number	11382329	11382329	11382329	11382329	
Insert Serial Number	12001076	11680814	11680814	11680814	
Date and Time Initialized	01-Sep-17 16:00	03-Sep-17 04:15	03-Sep-17 04:15	03-Sep-17 04:15:00	
Date and Time Read	03-Sep-17 14:18	06-Sep-17 23:51	06-Sep-17 23:59	07-Sep-17 00:06	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	45.00	45.00	41.00	43.00	
Software Version	6.33	6.33	6.33	6.33	
Sub Serial Number	11382329	11382329	11382329	11382329	
Sonde Serial Number	11478096	11478128	11478128	11478128	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	338.90	339.10	355.60	257.00	

Gamma Ray Sensor Information

Tool Type	PCGK	PCGK	PCGK	PCGK	
Distance From Bit (ft)	47.84	47.84	44.20	45.54	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	11382329	11382329	11382329	11382329	
Insert/Sonde Serial Number	11579809	11680983	11680983	11680983	

REMARKS

1. All depths are measured 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. All data presented is recorded data unless otherwise specified.

4. The following smoothing parameters have been applied to the data:

PGRC (Gamma Ray Corrected):

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

5. Gap in gamma due to probe failure in Run 100.

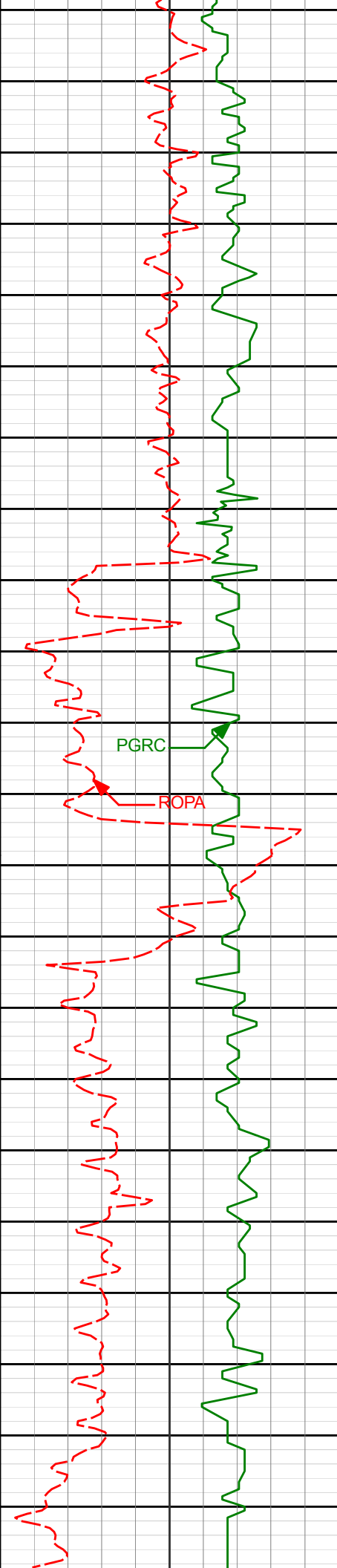
INSITE Version 8.5.2 -MLWD

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Detail Log 1:240

[illegible]



1932'	11.90°	348.07°	1902.91'	-289.03'
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2022'	10.17°	354.58°	1991.24'	-306.01'
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2111'	8.77°	354.96°	2079.02'	-320.59'
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2150'

2200'

2250'

2300'

2201'

8.51°

352.86°

2168.00'

-334.02'

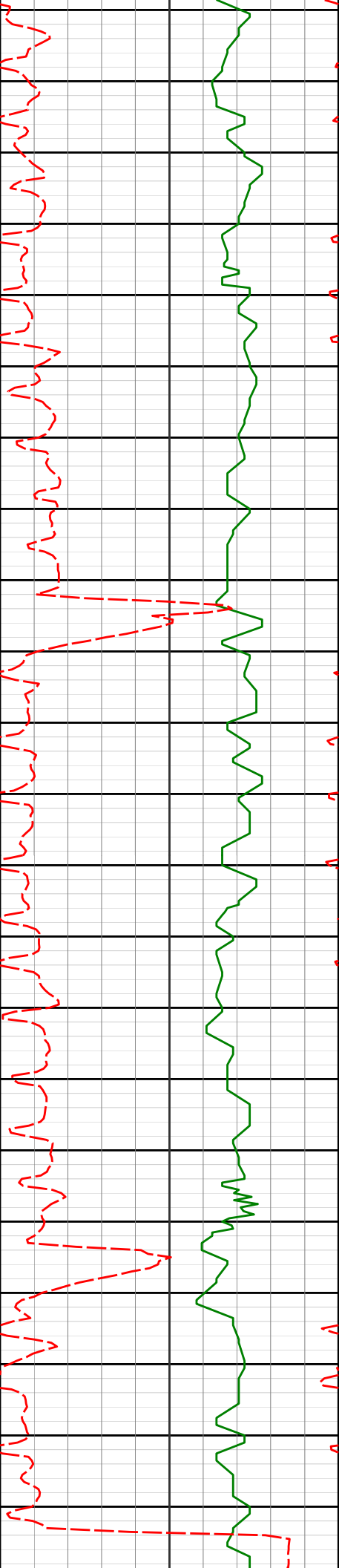
2290'

7.98°

354.65°

2256.08'

-346.70'



2350'

2380'

6.79°

1.02°

2345.34'

-358.23'

2400'

2450'

2469'

6.82°

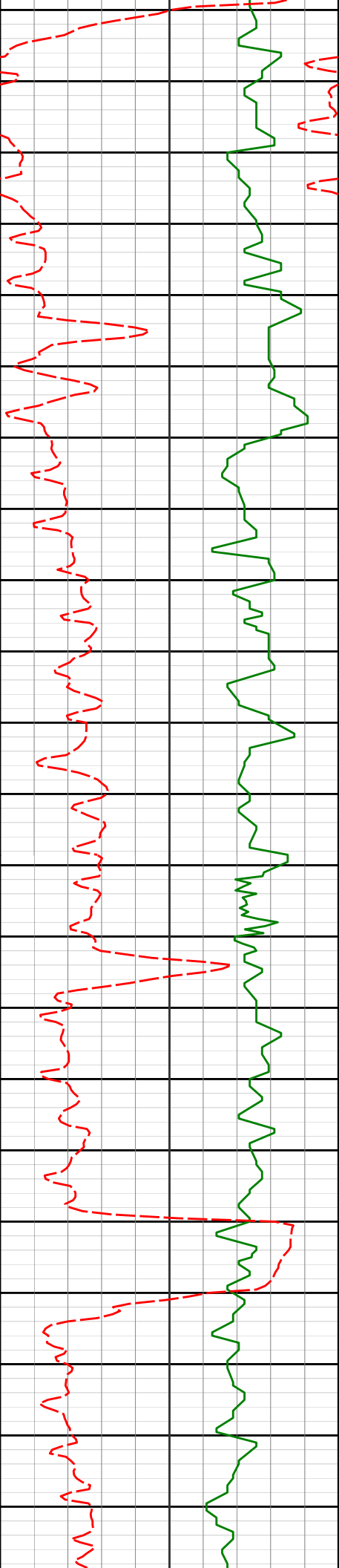
357.33°

2433.71'

-368.77'

2500'

2550'



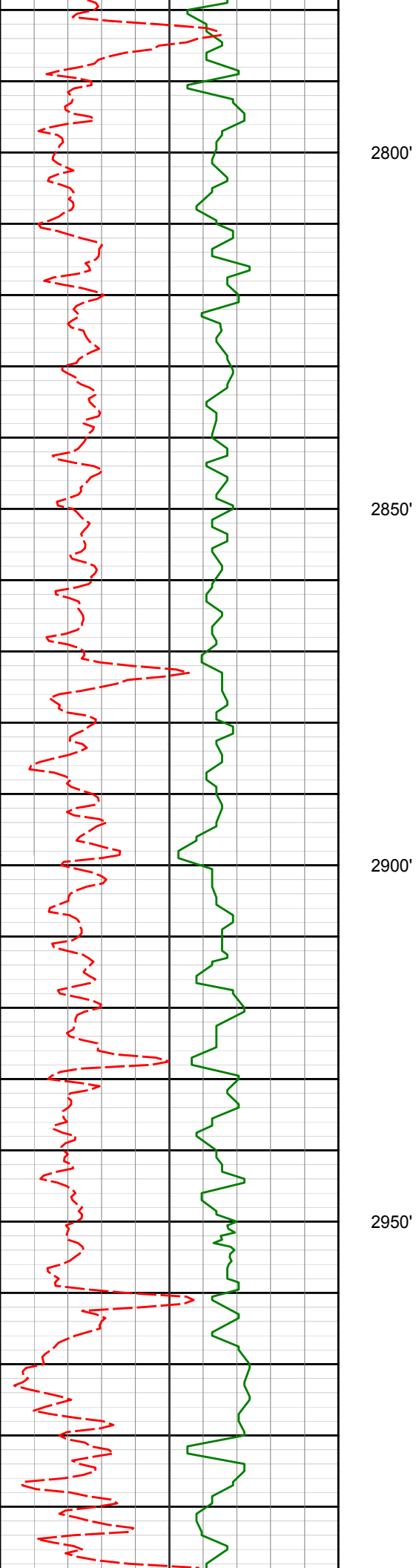
2600'

2650'

2700'

2750'

2559'	6.79°	356.17°	2523.08'	-379.42'
2648'	6.49°	353.17°	2611.48'	-389.66'
2738'	6.41°	358.71°	2700.91'	-399.72'



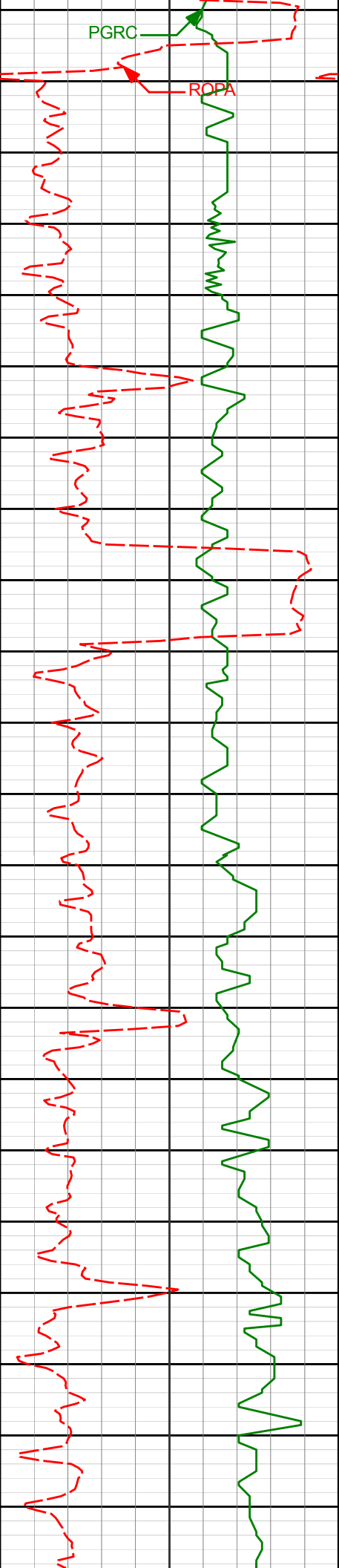
2917'

6.92°

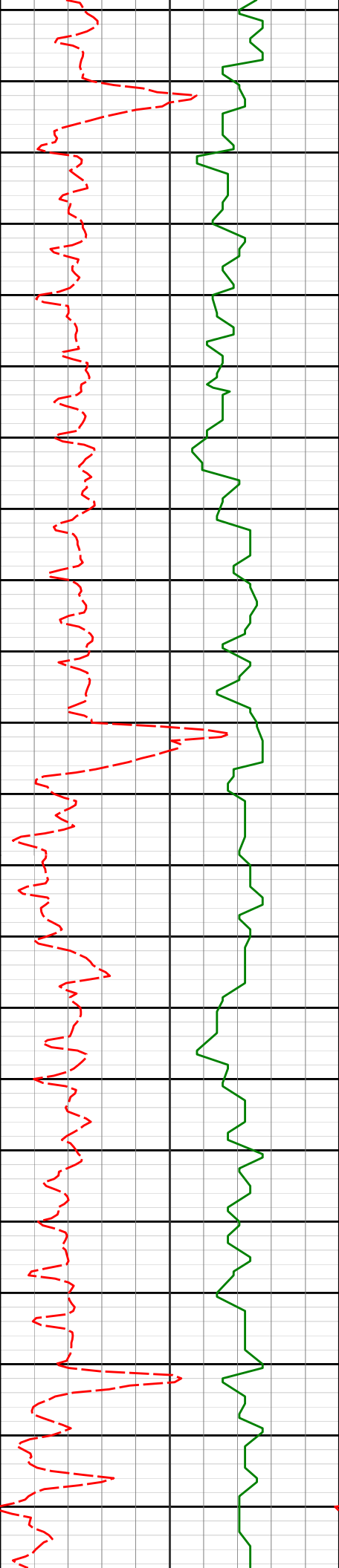
354.70°

2878.70'

-420.44'



3006'	7.26°	2.70°	2967.02'	-431.39'
3096'	4.67°	14.71°	3056.53'	-440.62'
3186'	3.93°	12.39°	3146.28'	-447.18'



3250'

3275'

3.33°

7.60°

3235.10'

-452.73'

3300'

3350'

3365'

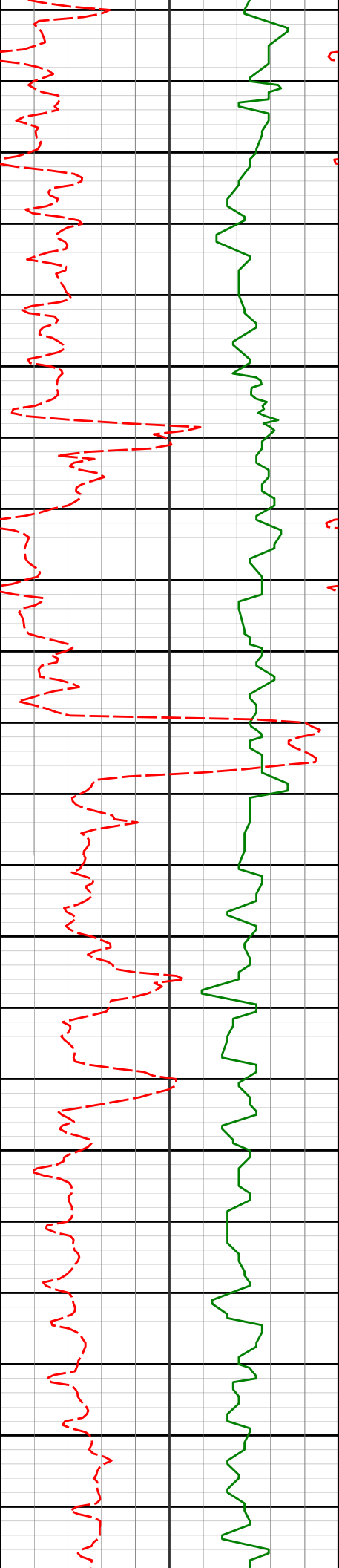
3.04°

0.10°

3324.96'

-457.71'

3400'



3450'

3454'

2.80°

348.00°

3413.85'

-462.20'

3500'

3544'

2.73°

353.46°

3503.74'

-466.48'

3550'

3600'

3634'

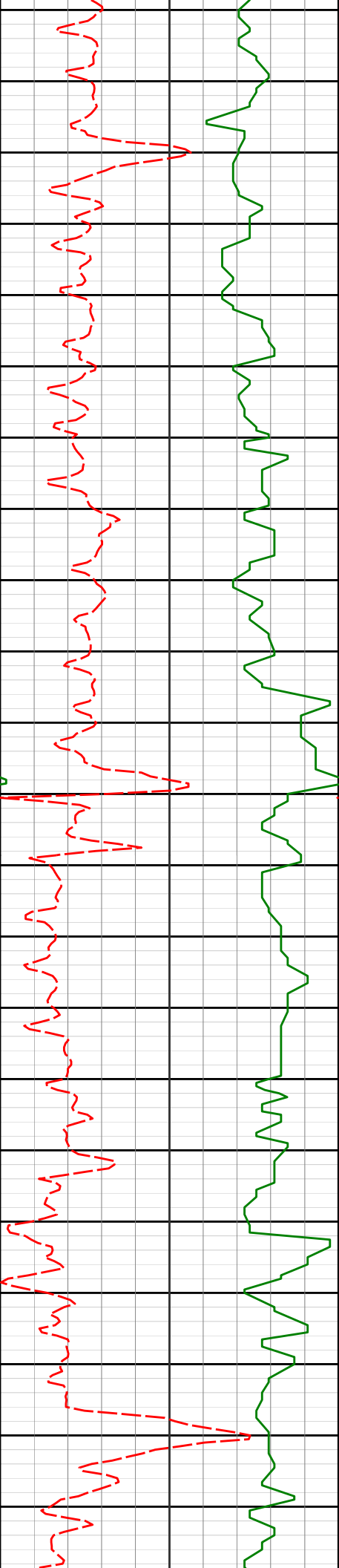
2.70°

1.65°

3593.64'

-470.73'

3650'



3700'

3723'

2.47°

348.72°

3682.55'

-474.70'

3750'

3800'

3813'

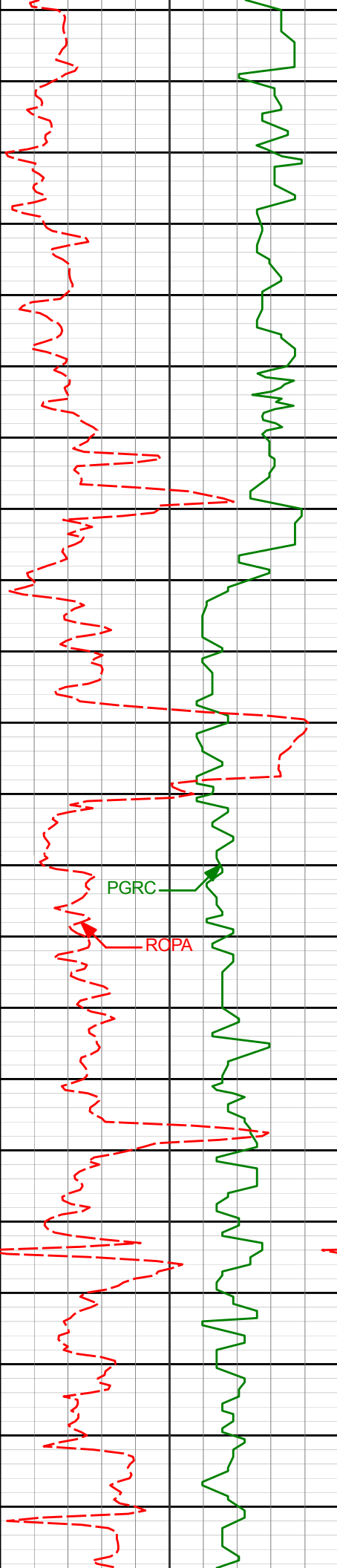
2.87°

345.84°

3772.45'

-478.78'

3850'



3900'

3902'

2.60°

344.22°

3861.35'

-482.87'

3950'

3992'

2.20°

11.09°

3951.28'

-486.53'

4000'

PGRC

ROPA

4050'

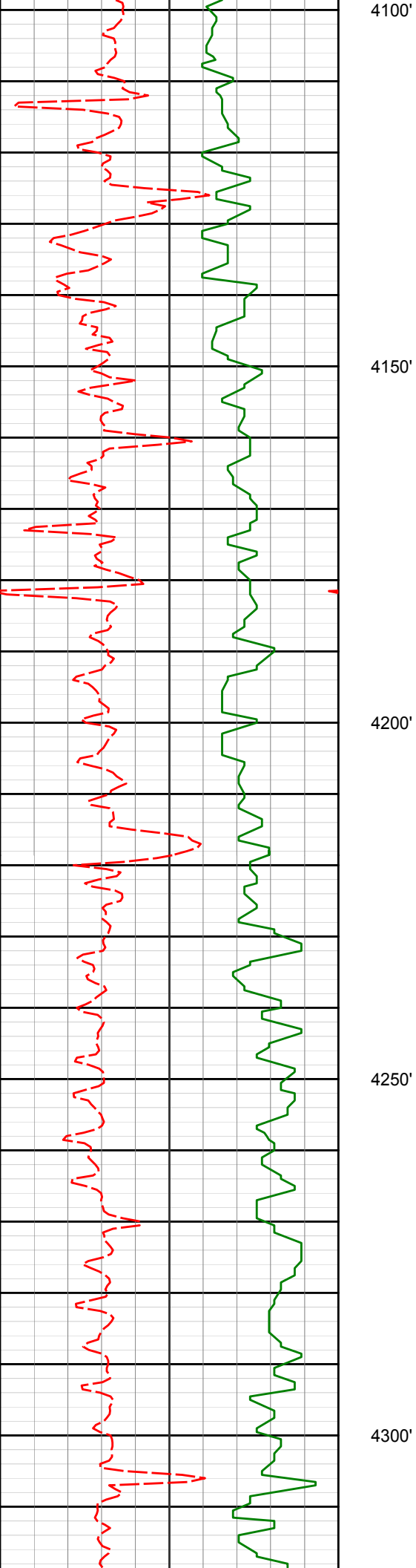
4081'

1.77°

5.65°

4040.22'

-489.58'



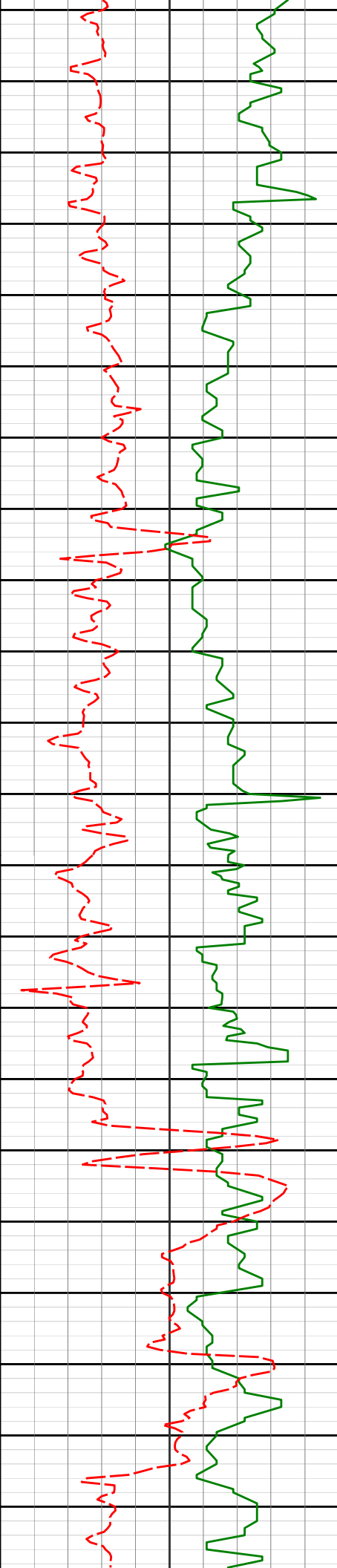
4171'

1.66°

16.33°

4130.18'

-492.22'



4350'

4350'

1.74°

0.41°

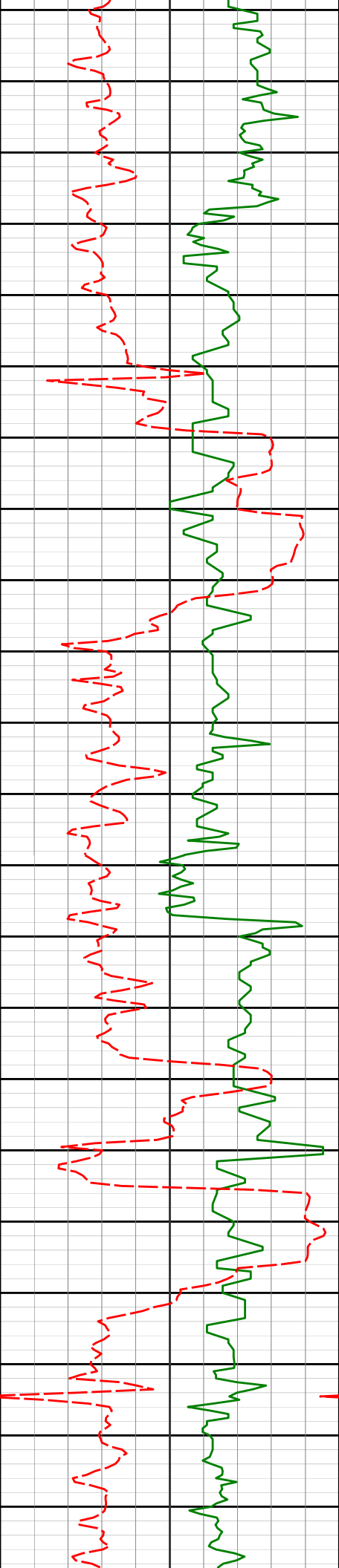
4309.10'

-497.43'

4400'

4450'

4500'



4550'

4554'

2.03°

7.96°

4512.99'

-504.11'

4600'

4644'

2.89°

12.21°

4602.91'

-507.92'

4650'

4700'

4733'

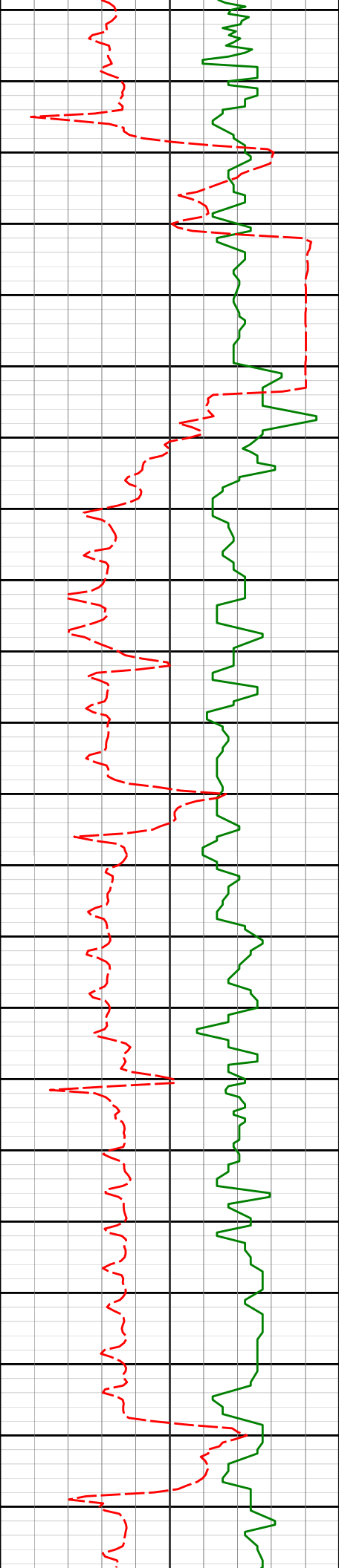
2.41°

4.23°

4691.81'

-511.98'

4750'



4800'

4823'

0.34°

244.58°

4781.79'

-513.75'

4850'

4900'

4913'

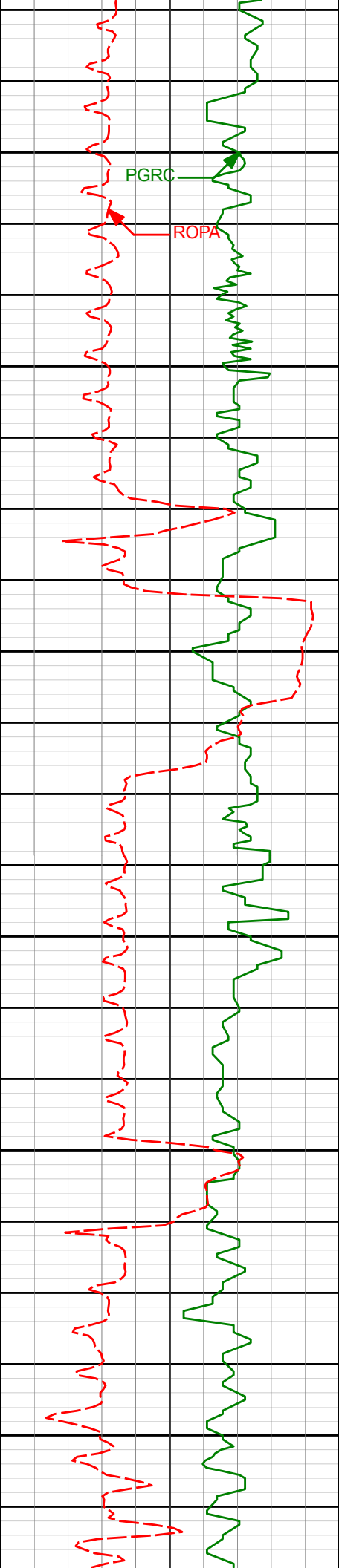
2.05°

260.92°

4871.77'

-513.37'

4950'



5000'

5002'

2.71°

264.94°

4960.69'

-512.91'

5050'

5092'

1.34°

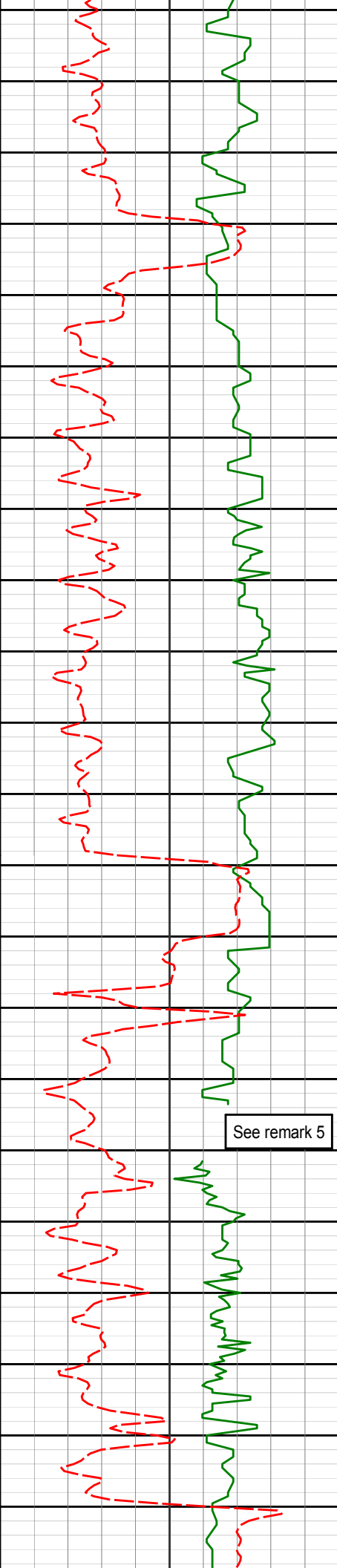
246.09°

5050.63'

-512.28'

5100'

5150'



5200'

5250'

5300'

5350'

5400'

See remark 5

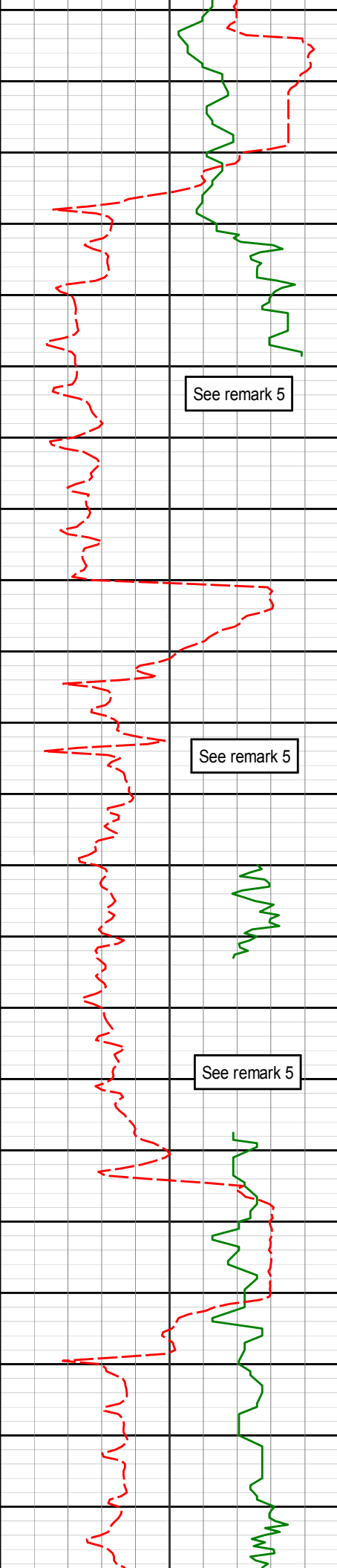
5361'

2.26°

248.12°

5319.50'

-508.97'



5450'

See remark 5

5500'

See remark 5

5550'

See remark 5

5600'

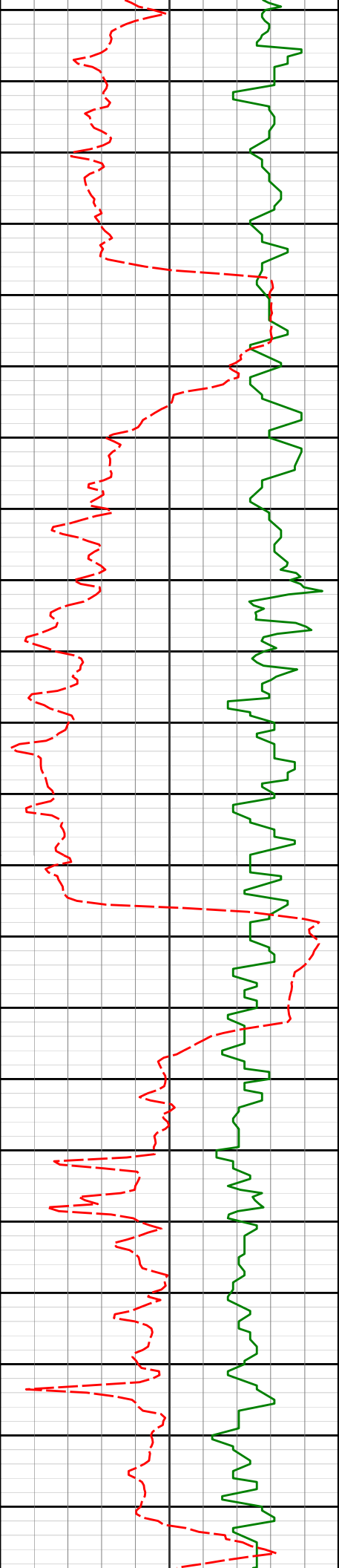
5630'

1.63°

289.67°

5588.35'

-508.23'



5650'

5700'

5721'

1.36°

314.75°

5679.32'

-509.41'

5750'

5800'

5810'

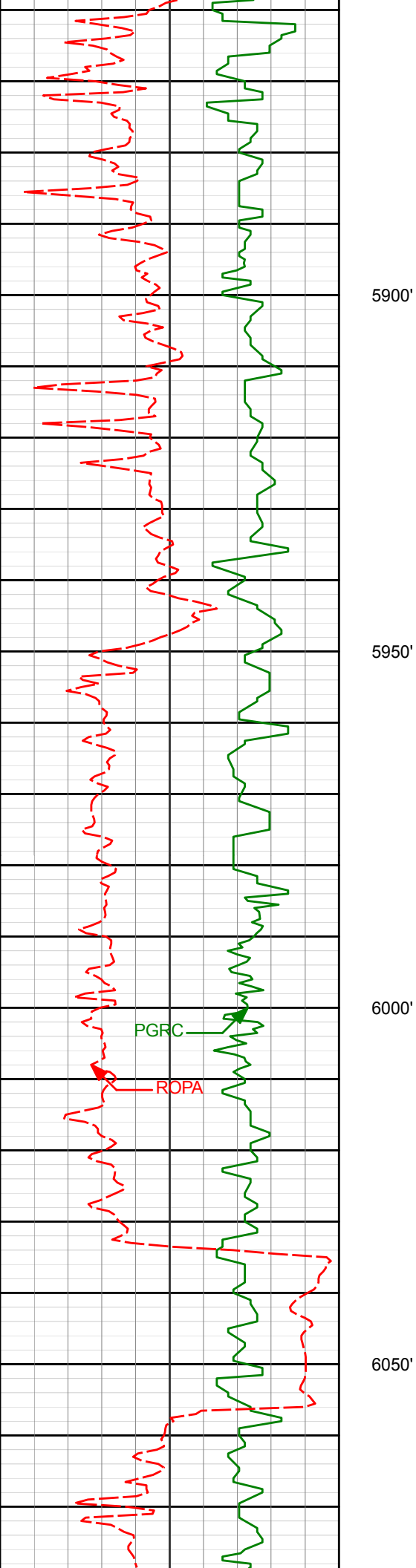
1.89°

8.55°

5768.29'

-511.61'

5850'



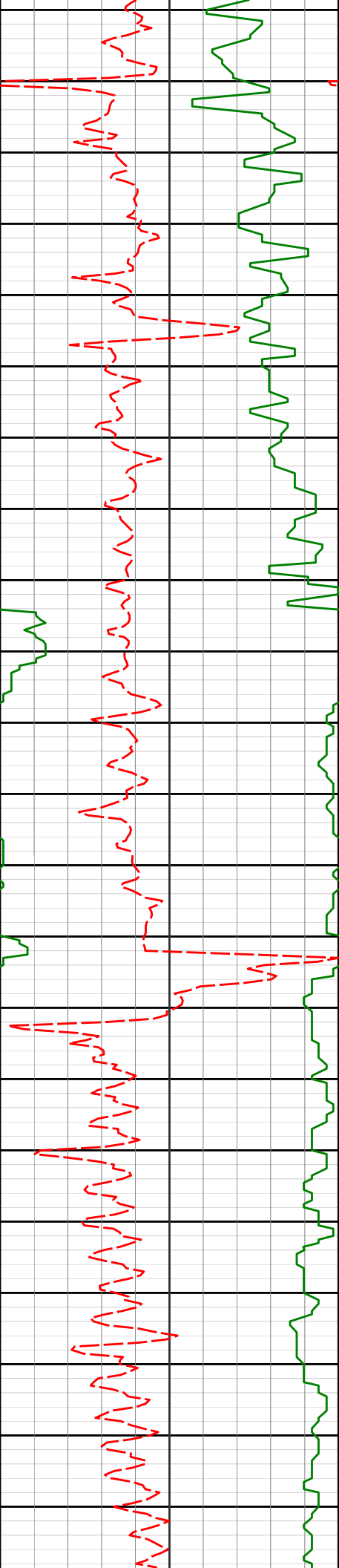
5990'

1.04°

326.11°

5948.23'

-515.90'



6100'

6150'

6169'

0.78°

162.36°

6127.23'

-516.10'

6200'

Run 200

6250'

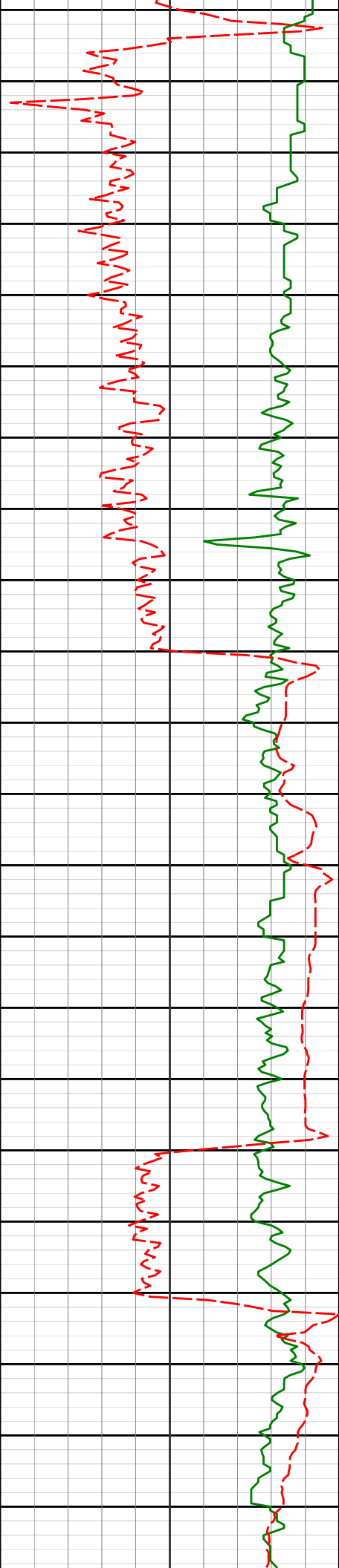
6259'

0.80°

195.30°

6217.22'

-514.91'



6300'

6350'

6400'

6450'

6500'

6348'

0.74°

216.26°

6306.21'

-513.85'

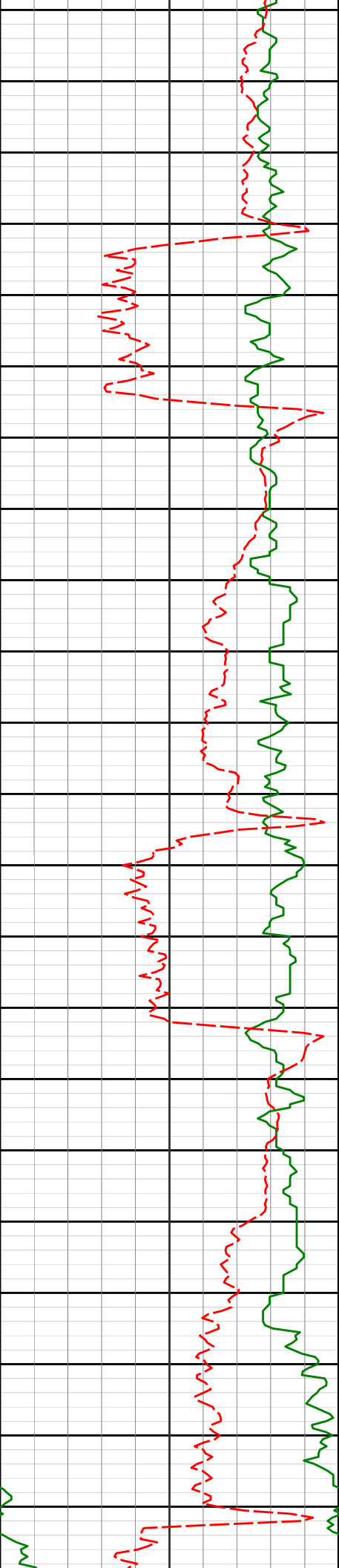
6438'

5.23°

165.20°

6396.07'

-509.42'



6528'

12.85°

165.88°

6484.89'

-495.75'

6550'

6600'

6618'

17.94°

167.28°

6571.63'

-472.55'

6650'

6700'

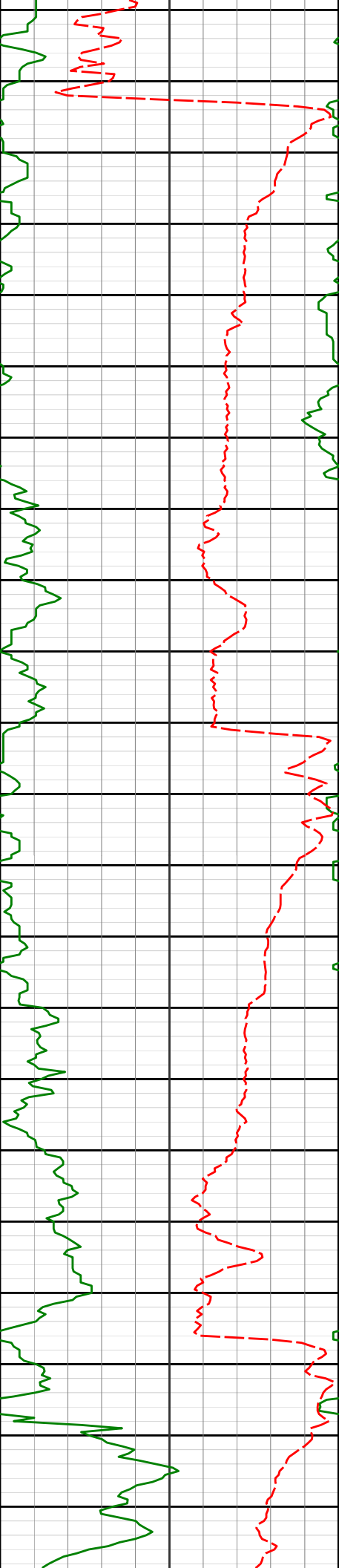
6707'

21.69°

155.12°

6655.38'

-444.30'



6750'

6800'

6850'

6900'

6950'

6797'

26.72°

159.50°

6737.45'

-410.33'

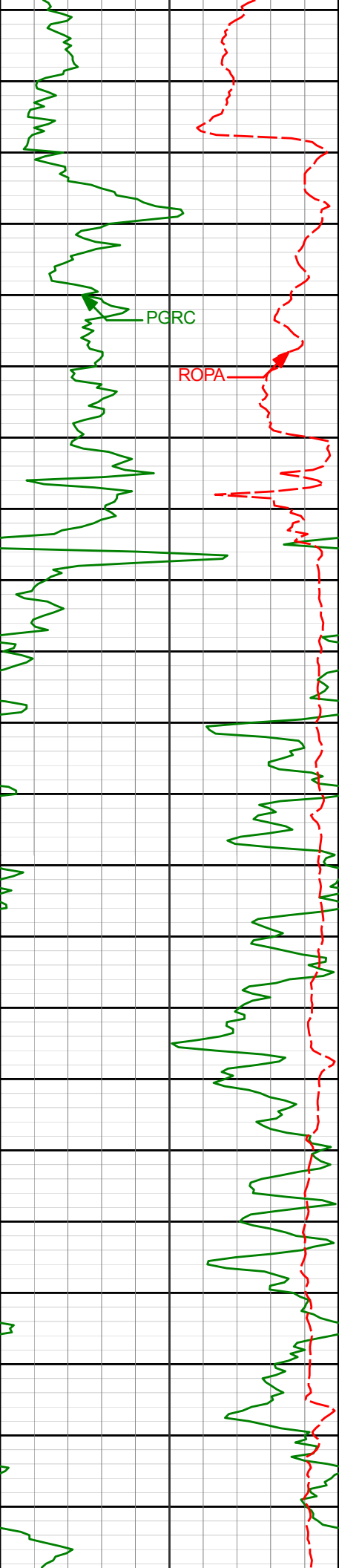
6887'

34.45°

163.71°

6814.88'

-366.96'



Run 300

6976'

36.21°

169.41°

6887.51'

-317.02'

7000'

PGRC

ROPA

7050'

7066'

48.53°

169.95°

6954.80'

-258.28'

7100'

7111'

57.34°

169.10°

6984.03'

-224.42'

7150'

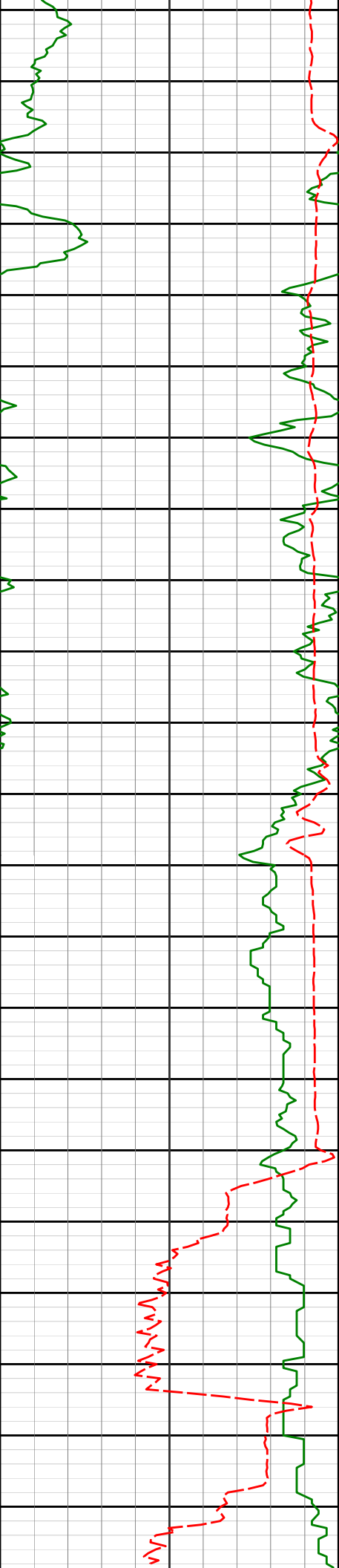
7156'

63.58°

171.71°

7009.95'

-187.94'



Run 400

7200'

7250'

7300'

7335'

7350'

7246'

76.54°

175.65°

7051.03'

-108.45'

7299'

85.03°

177.10°

7068.03'

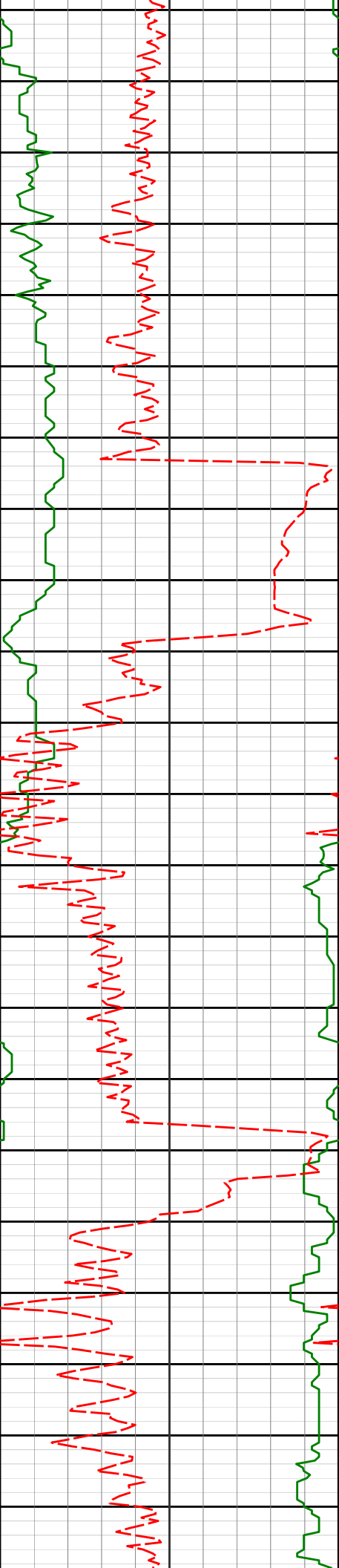
-58.47'

89.85°

178.60°

7076.40'

-23.56'



7424'

89.26°

177.26°

7085.72'

64.64'

7450'

7500'

7514'

90.43°

181.63°

7085.96'

154.60'

7550'

7600'

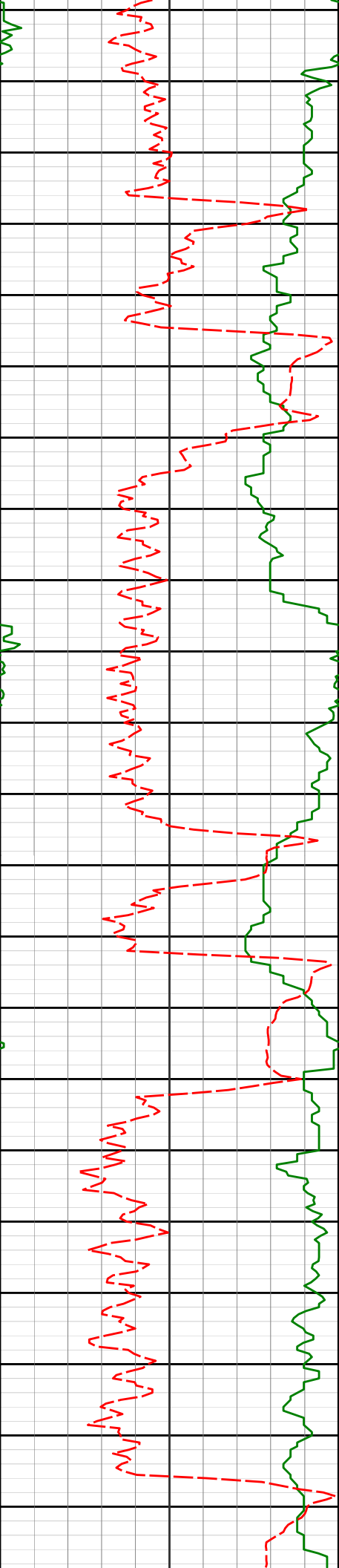
7603'

90.89°

182.51°

7084.93'

243.56'



7650'

7693'

7700'

7750'

7782'

7800'

90.96°

181.88°

7083.48'

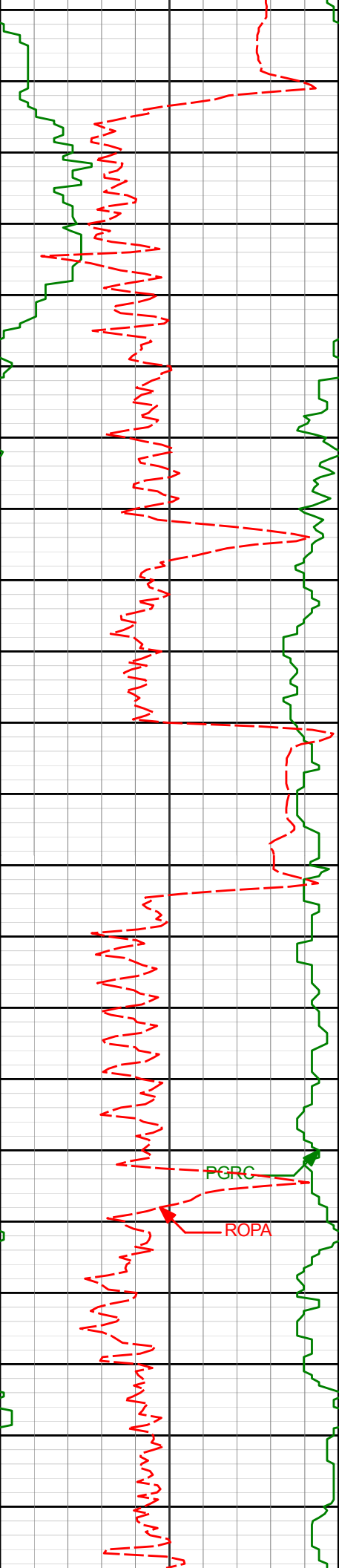
333.50'

91.45°

179.89°

7081.61'

422.47'



7850'

7872'

90.62°

177.41°

7079.99'

512.41'

7900'

7950'

7962'

90.12°

174.82°

7079.41'

602.15'

8000'

PGRC

ROPA

8050'

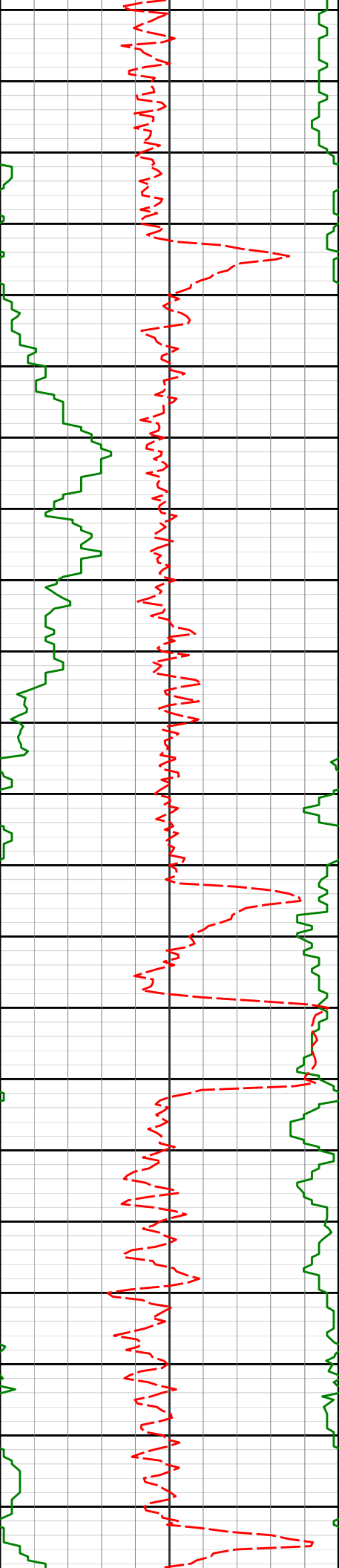
8052'

89.51°

175.34°

7079.70'

691.77'



8100'

8141'

88.98°

175.83°

7080.87'

780.45'

8150'

8200'

8231'

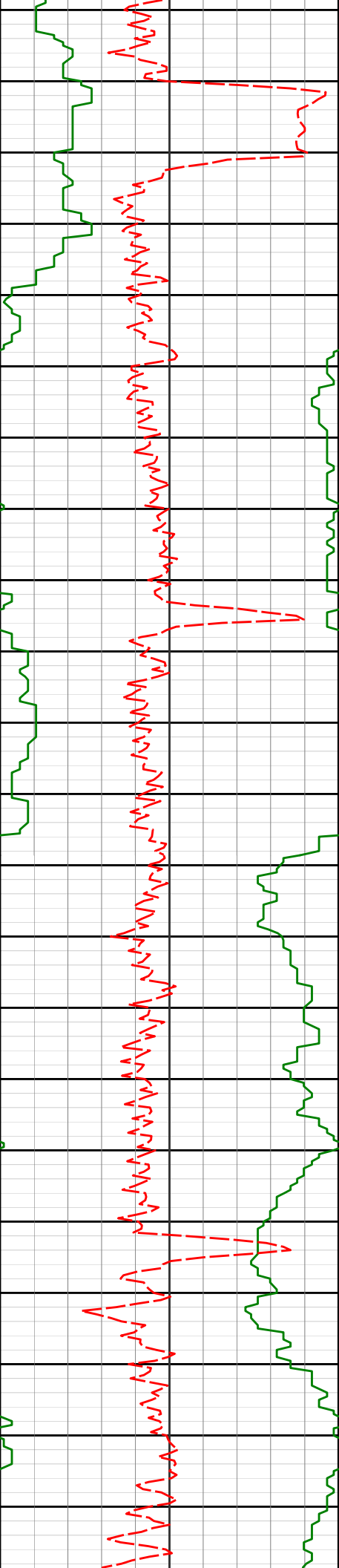
89.41°

175.74°

7082.13'

870.16'

8250'



8300'

8321'

90.34°

176.13°

7082.32'

959.89'

8350'

8400'

8410'

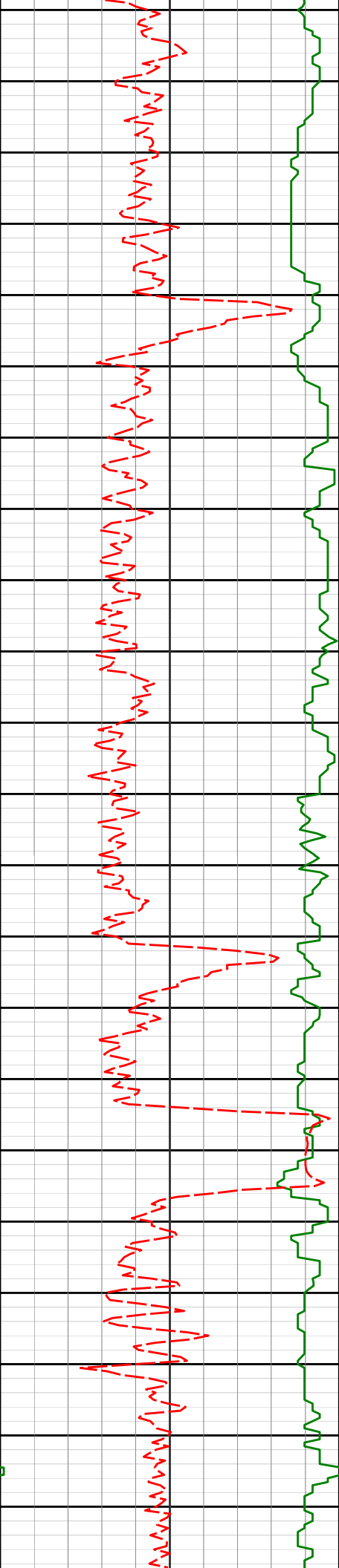
90.12°

176.70°

7081.96'

1048.67'

8450'



8500'

8500'

90.00°

176.81°

7081.87'

1138.50'

8550'

8590'

89.48°

176.95°

7082.28'

1228.33'

8600'

8650'

8679'

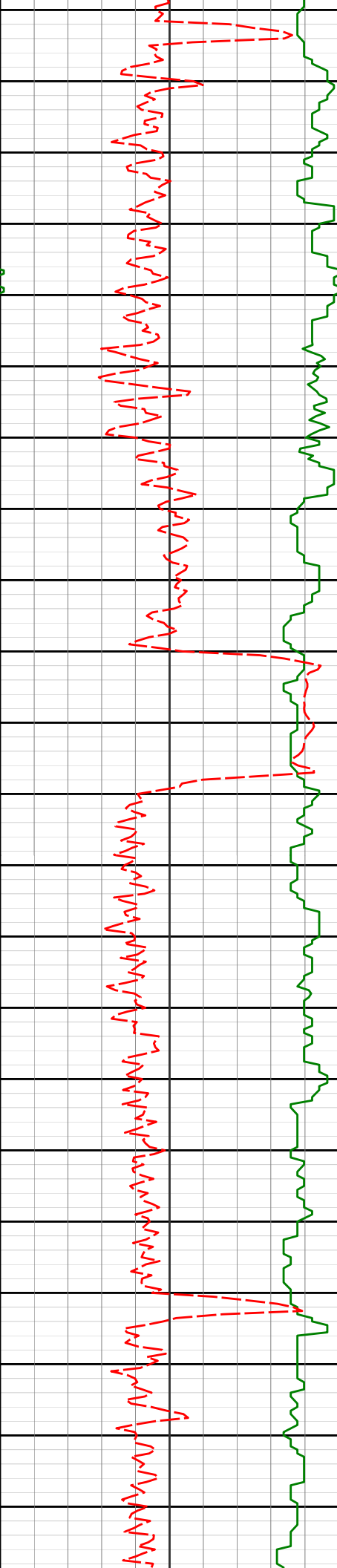
89.94°

177.62°

7082.73'

1317.20'

8700'



8750'

8769'

89.60°

177.95°

7083.10'

1407.11'

8800'

8850'

8859'

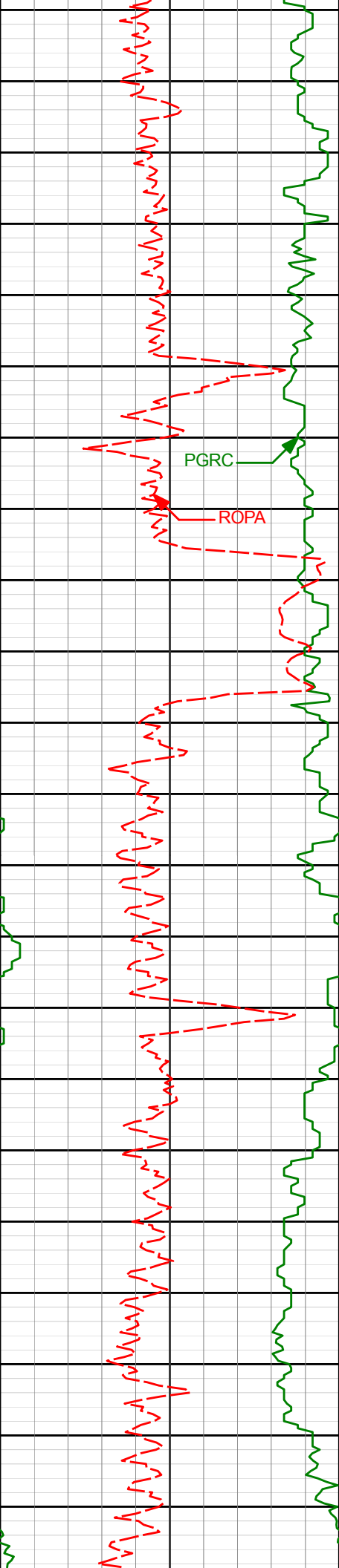
90.74°

180.05°

7082.83'

1497.08'

8900'



8950'

8948'

91.11°

182.29°

7081.40'

1586.05'

9000'

9038'

90.31°

181.72°

7080.28'

1676.00'

9050'

9100'

9128'

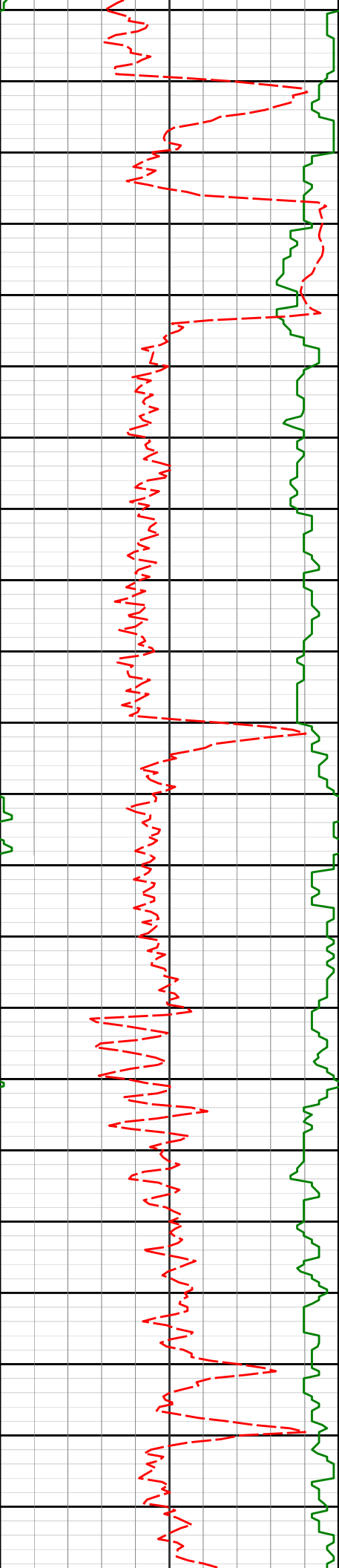
89.63°

181.90°

7080.33'

1765.98'

9150'



9200'

9218'

90.52°

181.49°

7080.21'

1855.95'

9250'

9300'

9307'

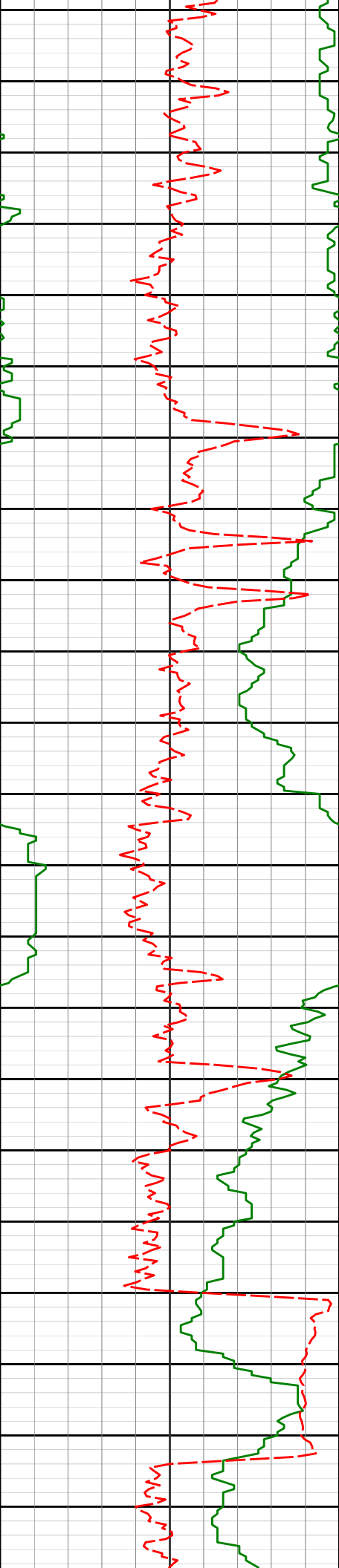
89.94°

181.75°

7079.85'

1944.93'

9350'



9400'

9397'

89.54°

181.14°

7080.26'

2034.91'

9450'

9486'

89.01°

181.05°

7081.39'

2123.89'

9500'

9550'

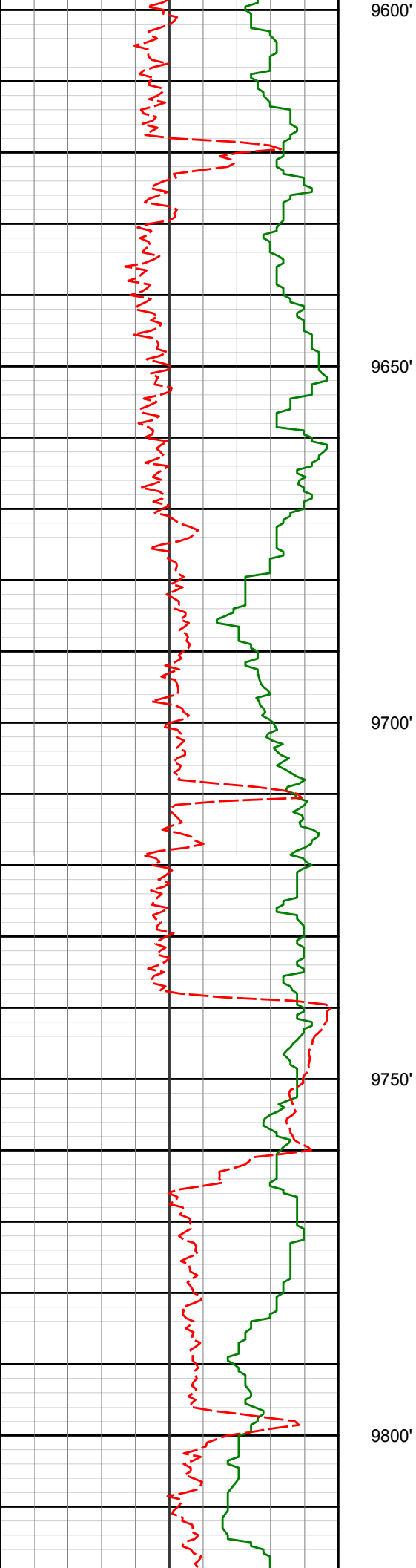
9576'

89.97°

181.74°

7082.19'

2213.87'



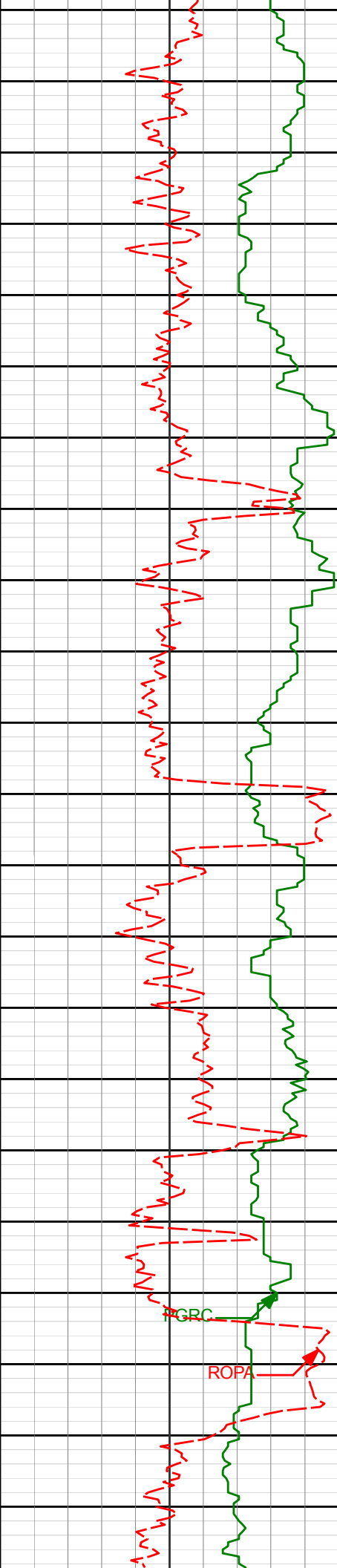
9666'

89.97°

181.46°

7082.23'

2303.85'



9850'

9900'

9950'

10000'

9845'

91.79°

182.83°

7079.49'

2482.73'

9934'

91.66°

182.88°

7076.81'

2571.61'

10024'

90.43°

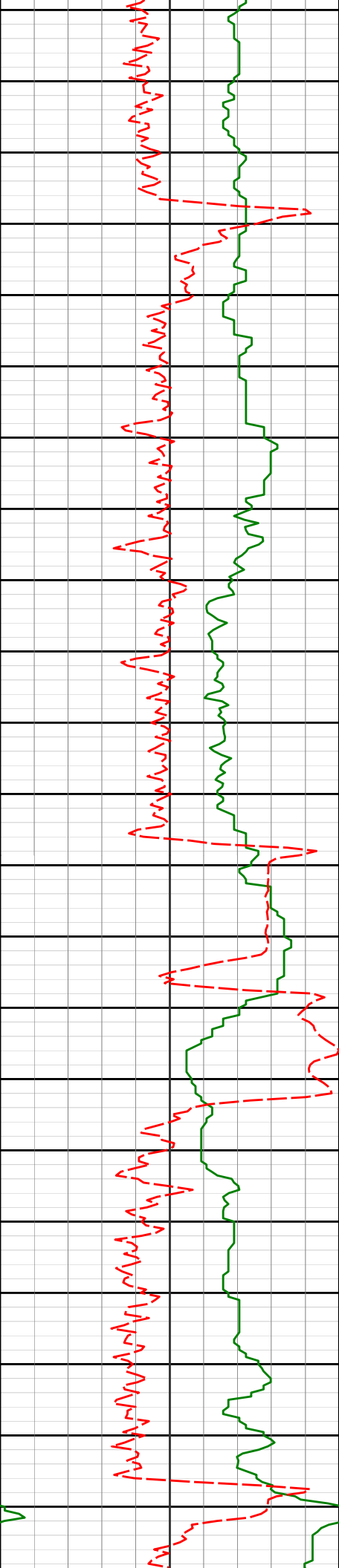
182.65°

7075.17'

2661.51'

GRC

ROPA



10050'

10100'

10150'

10200'

10250'

10114'

10203'

90.34°

90.12°

182.69°

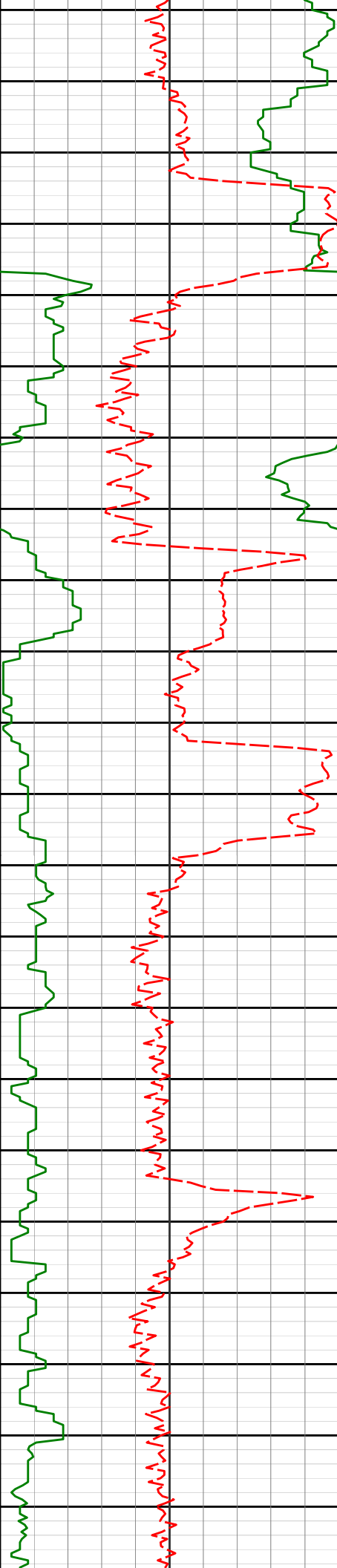
183.22°

7074.56'

7074.20'

2751.44'

2840.35'



10293'

91.02°

183.11°

7073.31'

2930.23'

10300'

10350'

10382'

89.44°

182.48°

7072.95'

3019.15'

10400'

10450'

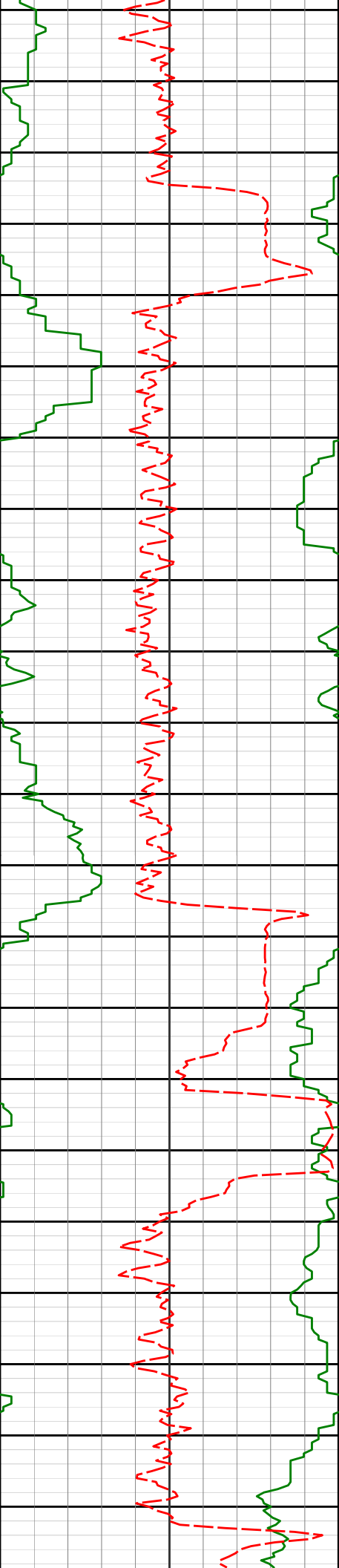
10472'

89.08°

182.28°

7074.11'

3109.08'



10500'

10550'

10600'

10650'

10562'

88.61°

182.79°

7075.92'

3199.00'

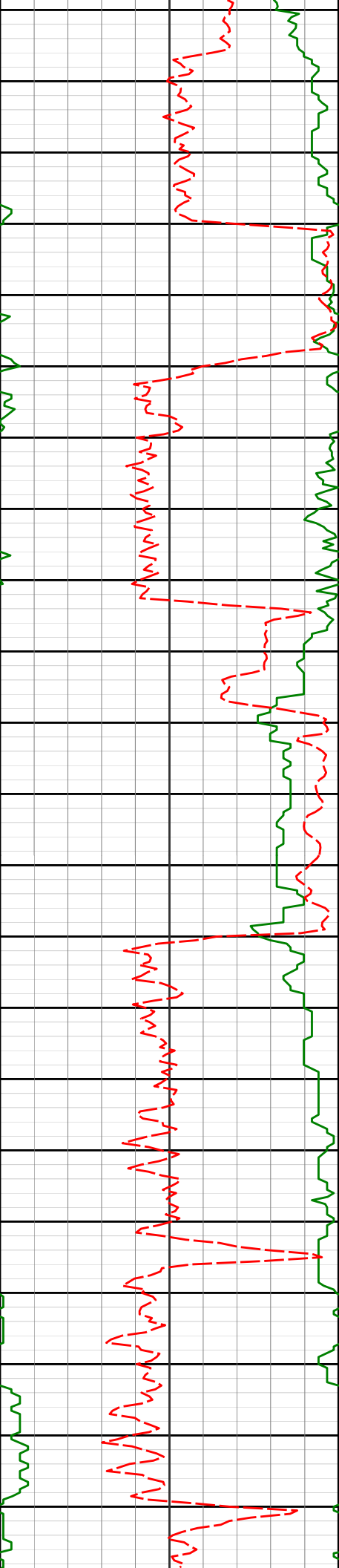
10651'

88.46°

183.28°

7078.20'

3287.88'



10741'

88.18°

183.16°

7080.84'

3377.72'

10750'

10800'

10831'

90.80°

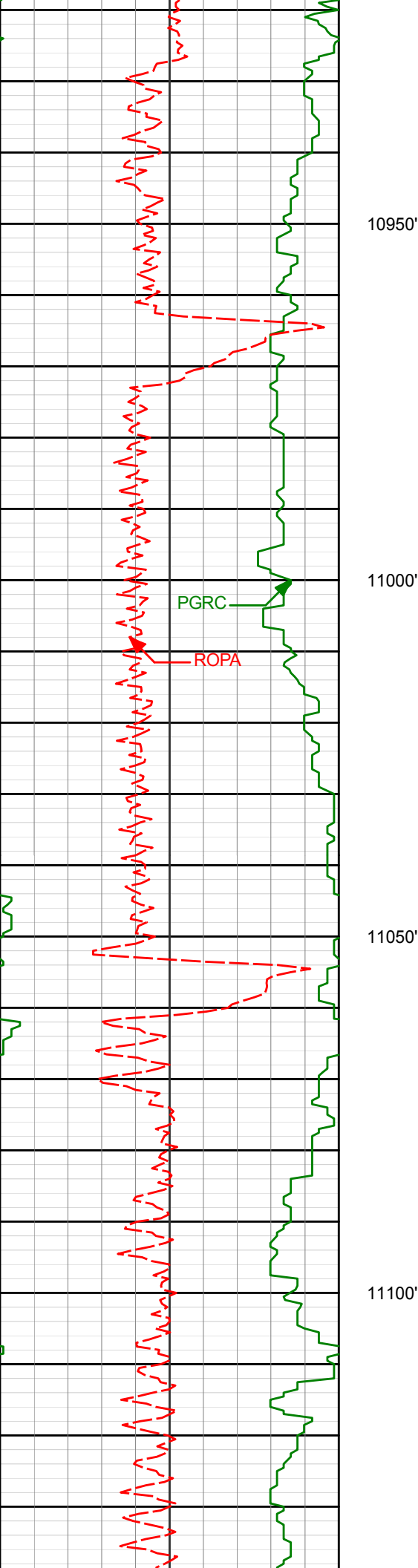
181.38°

7081.64'

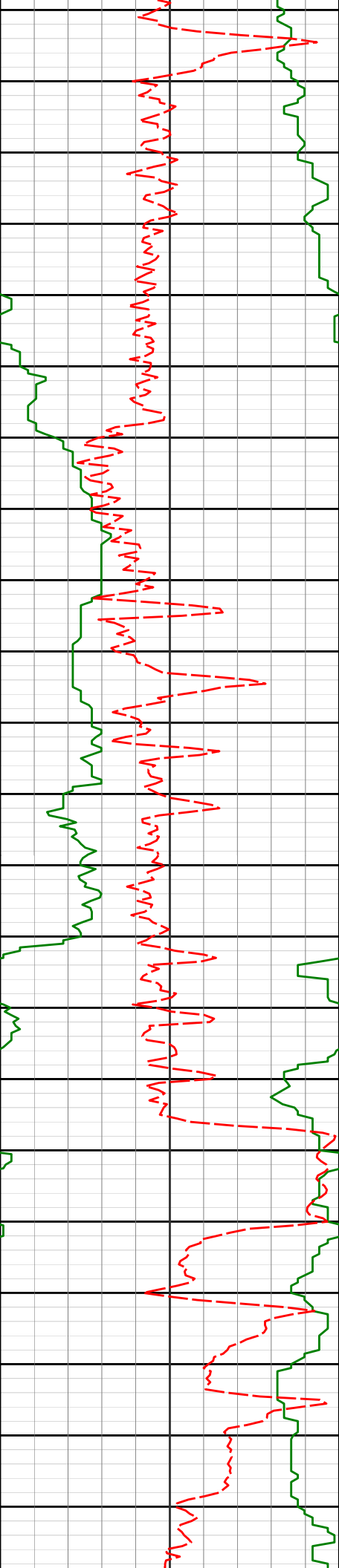
3467.66'

10850'

10900'



10920'	90.77°	181.54°	7080.42'	3556.63'
11099'	90.25°	181.34°	7078.83'	3735.59'



11150'

11200'

11250'

11278'

11300'

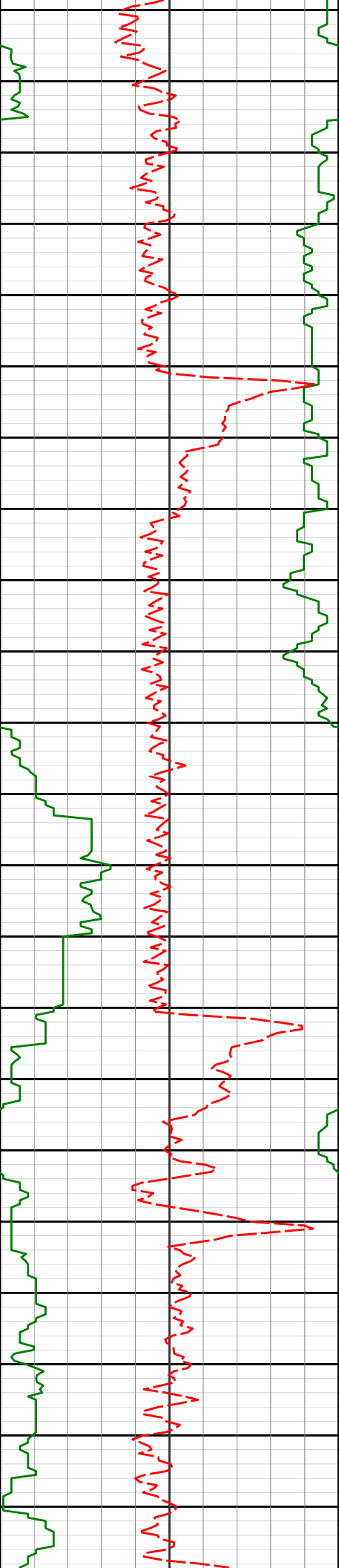
11350'

90.00°

182.33°

7078.44'

3914.53'



11400'

11450'

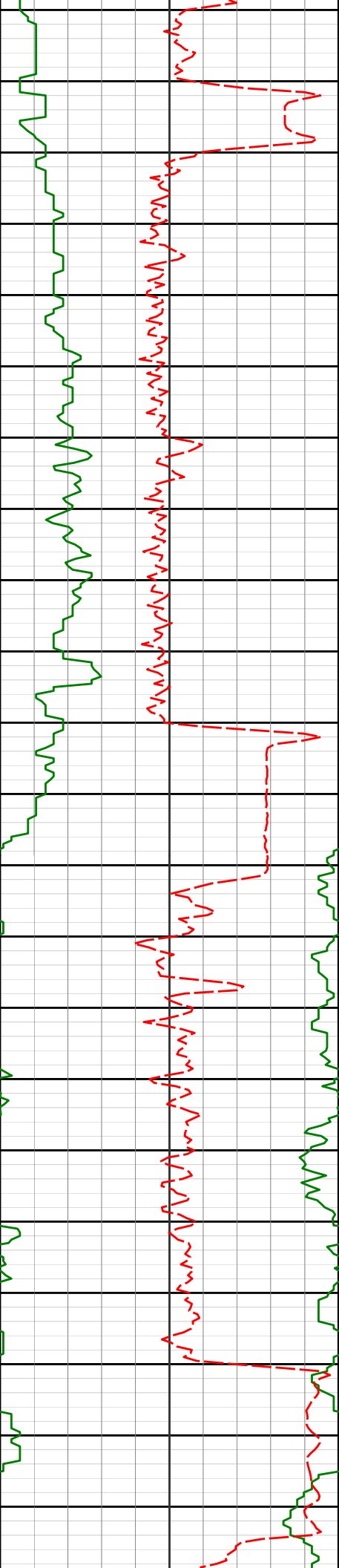
11500'

11550'

11368'	91.48°	181.98°	7077.28'	4004.48'
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11458'	90.92°	181.74°	7075.39'	4094.43'
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11547'	90.83°	181.74°	7074.03'	4183.39'
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11600'

11650'

11700'

11750'

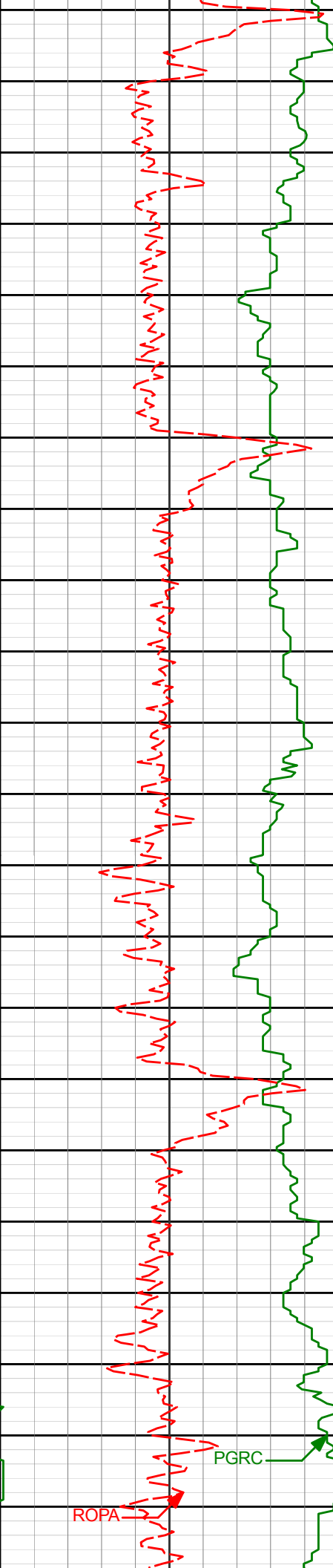
11727'

90.52°

182.37°

7071.90'

4363.30'



11816'

90.99°

180.09°

7070.72'

4452.28'

11850'

11900'

11906'

90.55°

179.89°

7069.51'

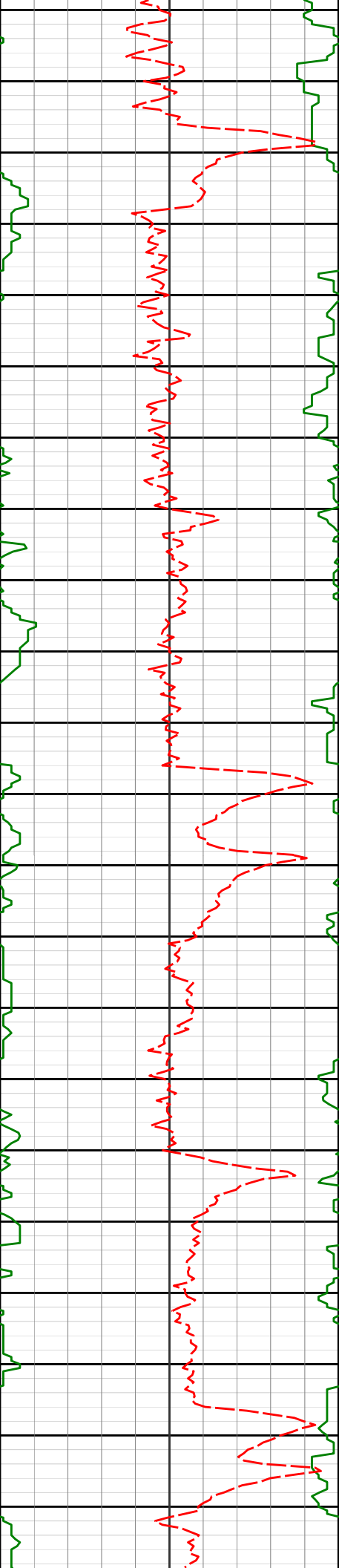
4542.26'

11950'

12000'

ROPA

PGRC



12050'

12085'

89.85°

180.14°

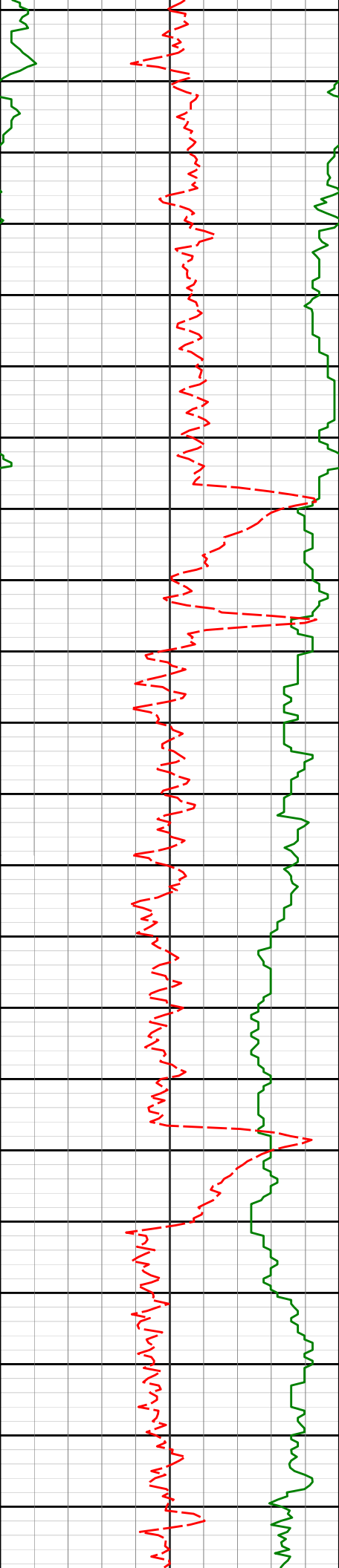
7068.89'

4721.26'

12100'

12150'

12200'



12250'

12265'

90.43°

180.12°

7068.45'

4901.26'

12300'

12350'

12400'

12444'

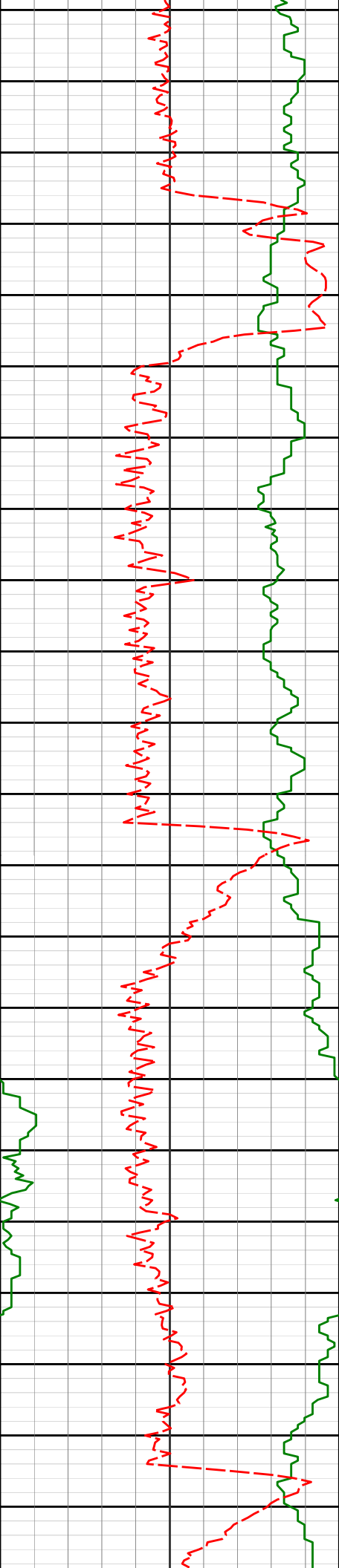
90.18°

179.61°

7067.49'

5080.25'

12450'



12500'

12534'

91.05°

180.50°

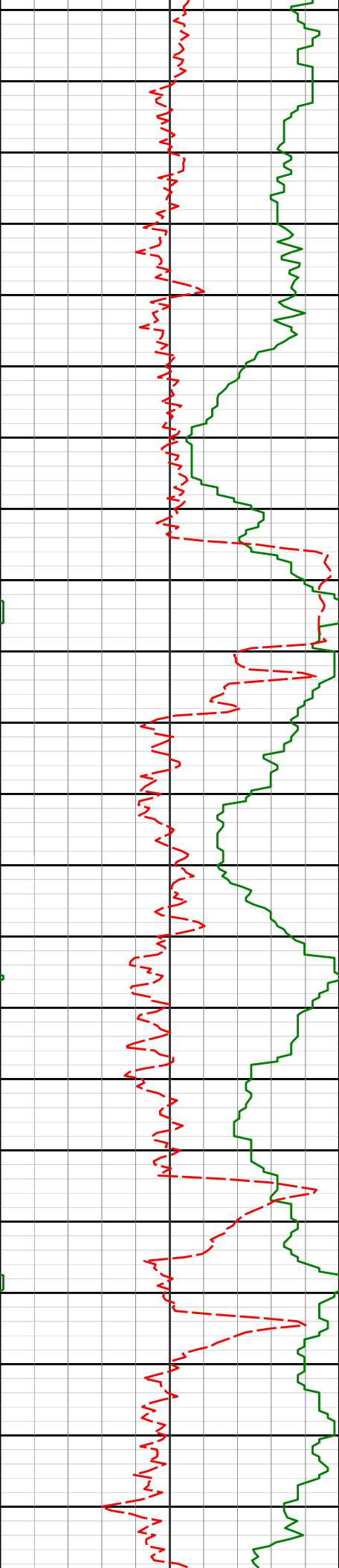
7066.52'

5170.24'

12550'

12600'

12650'



12700'

12713'

90.92°

180.51°

7063.44'

5349.21'

12750'

12800'

12803'

91.60°

180.29°

7061.46'

5439.19'

12850'

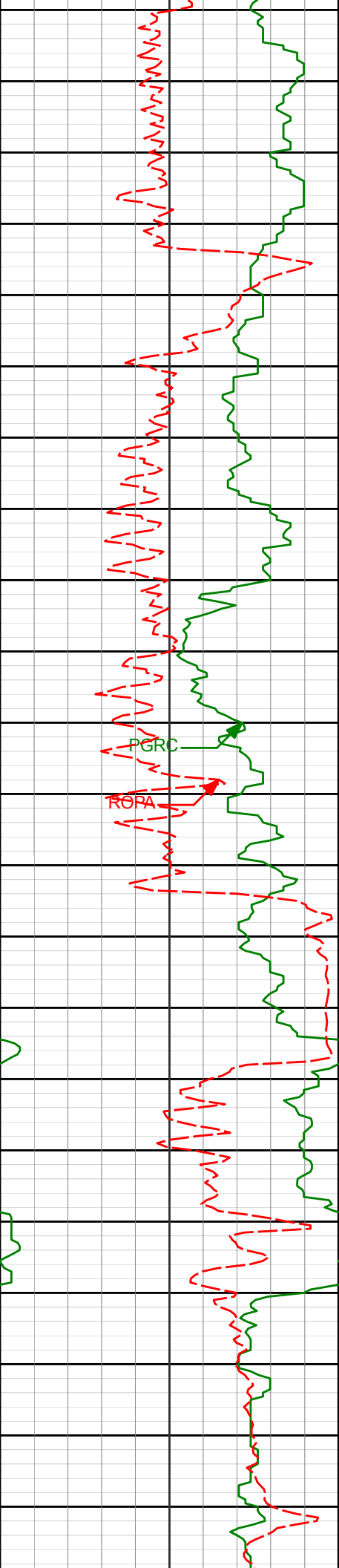
12892'

91.91°

180.50°

7058.73'

5528.15'



12900'

12950'

13000'

13050'

13100'

PGRC

ROPA

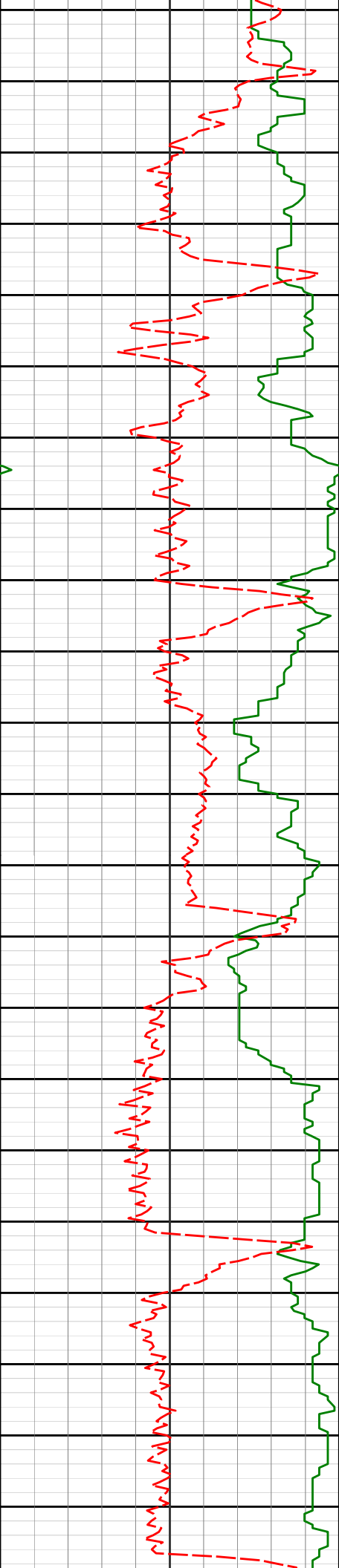
13072'

90.89°

180.16°

7054.32'

5708.09'



13150'

13200'

13250'

13300'

13206'

89.48°

179.96°

7053.89'

5842.08'

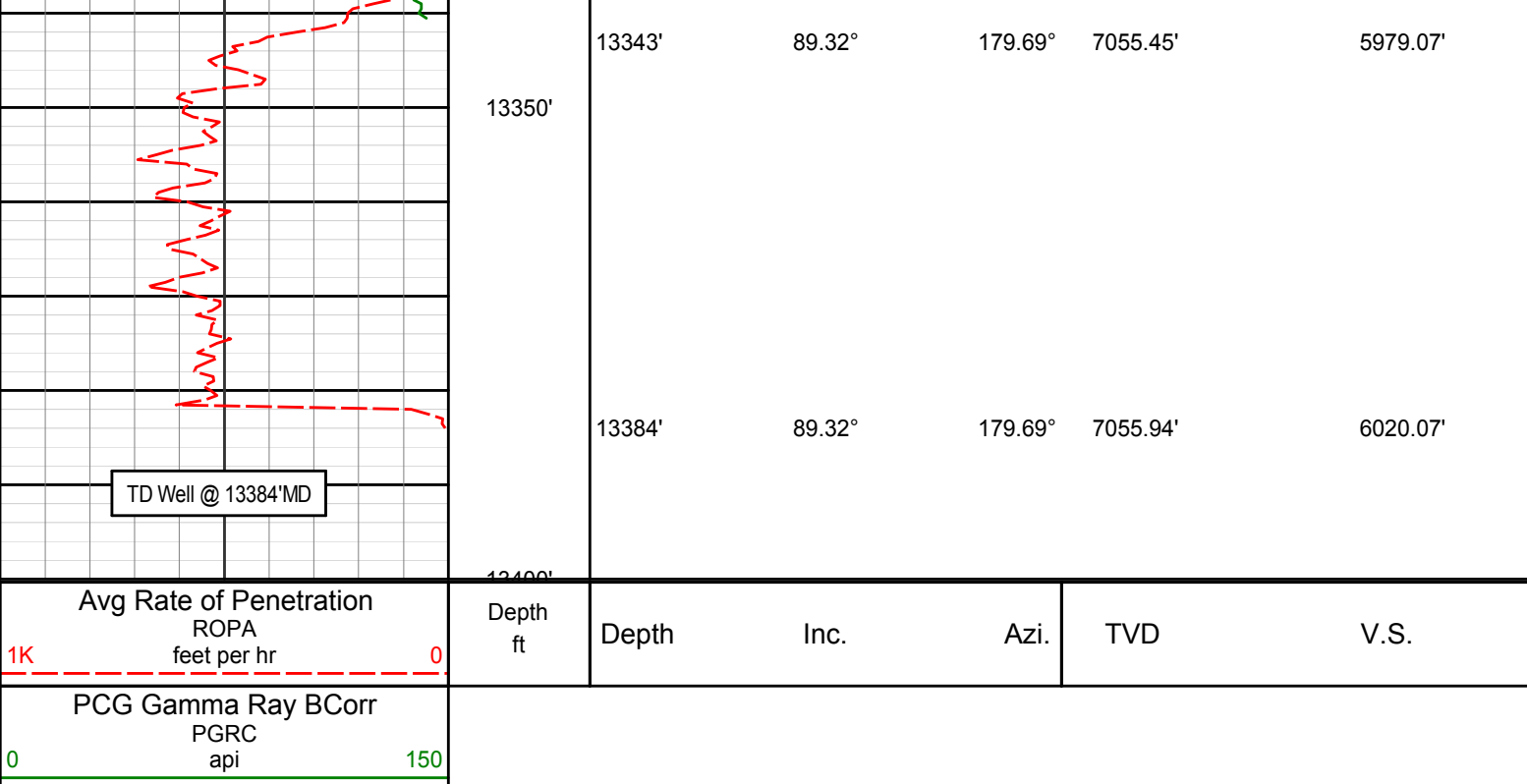
13251'

89.32°

180.11°

7054.36'

5887.08'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp
RW 27N-5HZ
Wattenberg
Weld Colorado
USA
CA-XX-0904218781

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
132.00	0.79	356.47	132.00	0.82 N	0.05 W	-0.82	0.66
163.00	0.44	11.41	162.99	1.15 N	0.04 W	-1.15	1.23
195.00	0.31	10.36	194.99	1.35 N	0.00 W	-1.35	0.41
227.00	0.88	344.78	226.99	1.68 N	0.05 W	-1.68	1.92
259.00	1.67	357.61	258.98	2.38 N	0.13 W	-2.38	2.61
290.00	1.67	359.37	289.97	3.28 N	0.16 W	-3.28	0.17
322.00	2.02	9.47	321.95	4.31 N	0.07 W	-4.30	1.49
354.00	2.59	2.27	353.93	5.58 N	0.05 E	-5.58	1.99
385.00	2.99	0.42	384.89	7.09 N	0.09 E	-7.09	1.32
417.00	2.55	5.16	416.85	8.64 N	0.16 E	-8.64	1.55
481.00	3.69	354.89	480.76	12.11 N	0.10 E	-12.11	1.98
512.00	4.31	359.54	511.68	14.26 N	0.00 E	-14.26	2.26
544.00	4.48	358.14	543.59	16.72 N	0.05 W	-16.71	0.63
575.00	5.14	354.36	574.48	19.31 N	0.22 W	-19.31	2.36
607.00	6.24	353.57	606.32	22.46 N	0.56 W	-22.46	3.45
638.00	6.59	352.60	637.13	25.90 N	0.98 W	-25.89	1.18
670.00	7.65	353.57	668.88	29.84 N	1.45 W	-29.83	3.33
702.00	7.60	353.30	700.60	34.06 N	1.94 W	-34.04	0.19

RW 27N-5HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
765.00	9.10	354.01	762.93	43.15 N	2.94 W	-43.13	2.39
797.00	9.71	352.25	794.50	48.34 N	3.57 W	-48.32	2.11
829.00	10.24	353.04	826.01	53.84 N	4.28 W	-53.81	1.71
860.00	10.20	351.02	856.52	59.28 N	5.04 W	-59.25	1.16
892.00	11.21	352.25	887.96	65.16 N	5.90 W	-65.13	3.24
923.00	11.60	353.04	918.35	71.24 N	6.69 W	-71.20	1.36
987.00	11.69	349.96	981.04	84.02 N	8.60 W	-83.96	0.98
1018.00	11.73	348.65	1011.39	90.20 N	9.77 W	-90.13	0.87
1050.00	11.82	352.69	1042.72	96.64 N	10.82 W	-96.57	2.59
1082.00	11.82	353.66	1074.04	103.15 N	11.60 W	-103.07	0.62
1145.00	11.73	350.58	1135.71	115.88 N	13.36 W	-115.79	1.01
1177.00	11.87	349.79	1167.04	122.32 N	14.48 W	-122.23	0.67
1240.00	12.70	352.95	1228.60	135.57 N	16.48 W	-135.47	1.70
1272.00	12.74	353.66	1259.81	142.57 N	17.30 W	-142.46	0.50
1303.00	13.52	350.14	1290.00	149.54 N	18.30 W	-149.42	3.60
1366.00	13.84	352.95	1351.21	164.27 N	20.48 W	-164.14	1.17
1398.00	14.19	353.66	1382.26	171.97 N	21.39 W	-171.83	1.22
1430.00	14.33	353.92	1413.27	179.81 N	22.24 W	-179.66	0.48
1461.00	13.97	355.15	1443.33	187.35 N	22.96 W	-187.20	1.51
1493.00	13.75	354.53	1474.40	194.98 N	23.65 W	-194.83	0.83
1525.00	13.62	356.03	1505.49	202.53 N	24.27 W	-202.37	1.18
1588.00	13.18	356.47	1566.78	217.10 N	25.23 W	-216.93	0.72
1620.00	13.18	356.64	1597.94	224.38 N	25.67 W	-224.21	0.12
1650.00	13.27	355.41	1627.14	231.23 N	26.14 W	-231.06	0.98
1682.00	13.23	354.18	1658.29	238.53 N	26.81 W	-238.36	0.89
1714.00	12.17	352.86	1689.51	245.52 N	27.60 W	-245.34	3.43
1746.00	11.42	350.14	1720.83	251.99 N	28.56 W	-251.80	2.92
1778.00	12.00	347.33	1752.16	258.36 N	29.83 W	-258.16	2.54
1808.00	11.69	349.70	1781.52	264.39 N	31.06 W	-264.19	1.92
1932.00	11.90	348.07	1902.91	289.26 N	35.95 W	-289.03	0.32
2022.00	10.17	354.58	1991.24	306.26 N	38.62 W	-306.01	2.37
2111.00	8.77	354.96	2079.02	320.84 N	39.96 W	-320.59	1.58
2201.00	8.51	352.86	2168.00	334.29 N	41.39 W	-334.02	0.46
2290.00	7.98	354.65	2256.08	346.97 N	42.78 W	-346.70	0.67
2380.00	6.79	1.02	2345.34	358.51 N	43.27 W	-358.23	1.60
2469.00	6.82	357.33	2433.71	369.05 N	43.42 W	-368.77	0.49
2559.00	6.79	356.17	2523.08	379.70 N	44.03 W	-379.42	0.16
2648.00	6.49	353.17	2611.48	389.95 N	44.98 W	-389.66	0.52
2738.00	6.41	358.71	2700.91	400.02 N	45.69 W	-399.72	0.70
2917.00	6.92	354.70	2878.70	420.75 N	46.91 W	-420.44	0.38
3006.00	7.26	2.70	2967.02	431.70 N	47.14 W	-431.39	1.17
3096.00	4.67	14.71	3056.53	440.92 N	45.95 W	-440.62	3.18
3186.00	3.93	12.39	3146.28	447.47 N	44.35 W	-447.18	0.84
3275.00	3.33	7.60	3235.10	453.01 N	43.36 W	-452.73	0.75
3365.00	3.04	0.10	3324.96	457.99 N	43.01 W	-457.71	0.56
3454.00	2.80	348.00	3413.85	462.48 N	43.46 W	-462.20	0.74
3544.00	2.73	353.46	3503.74	466.76 N	44.16 W	-466.48	0.30
3634.00	2.70	1.65	3593.64	471.01 N	44.34 W	-470.73	0.43
3723.00	2.47	348.72	3682.55	474.99 N	44.66 W	-474.70	0.70
3813.00	2.87	345.84	3772.45	479.07 N	45.59 W	-478.78	0.46
3902.00	2.60	344.22	3861.35	483.17 N	46.68 W	-482.87	0.31
3992.00	2.20	11.09	3951.28	486.83 N	46.90 W	-486.53	1.31
4081.00	1.77	5.65	4040.22	489.88 N	46.44 W	-489.58	0.53
4171.00	1.66	16.33	4130.18	492.51 N	45.93 W	-492.22	0.37
4350.00	1.74	0.41	4309.10	497.72 N	45.18 W	-497.43	0.27
4554.00	2.03	7.96	4512.99	504.40 N	44.66 W	-504.11	0.19
4644.00	2.89	12.21	4602.91	508.20 N	43.96 W	-507.92	0.98
4733.00	2.41	4.23	4691.81	512.26 N	43.35 W	-511.98	0.68
4823.00	0.34	244.58	4781.79	514.04 N	43.45 W	-513.75	2.88
4913.00	2.05	260.92	4871.77	513.67 N	45.28 W	-513.37	1.92

RW 27N-5HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
5002.00	2.71	264.94	4960.69	513.23 N	48.95 W	-512.91	0.76
5092.00	1.34	246.09	5050.63	512.61 N	52.03 W	-512.28	1.67
5361.00	2.26	248.12	5319.50	509.36 N	59.84 W	-508.97	0.34
5630.00	1.63	289.67	5588.35	508.67 N	68.38 W	-508.23	0.56
5721.00	1.36	314.75	5679.32	509.86 N	70.37 W	-509.41	0.77
5810.00	1.89	8.55	5768.29	512.06 N	70.90 W	-511.61	1.74
5990.00	1.04	326.11	5948.23	516.36 N	71.37 W	-515.90	0.74
6169.00	0.78	162.36	6127.23	516.56 N	71.92 W	-516.10	1.01
6259.00	0.80	195.30	6217.22	515.38 N	71.90 W	-514.91	0.50
6348.00	0.74	216.26	6306.21	514.31 N	72.40 W	-513.85	0.32
6438.00	5.23	165.20	6396.07	509.88 N	71.70 W	-509.42	5.33
6528.00	12.85	165.88	6484.89	496.19 N	68.21 W	-495.75	8.47
6618.00	17.94	167.28	6571.63	472.96 N	62.71 W	-472.55	5.67
6707.00	21.69	155.12	6655.38	444.64 N	52.76 W	-444.30	6.24
6797.00	26.72	159.50	6737.45	410.58 N	38.67 W	-410.33	5.92
6887.00	34.45	163.71	6814.88	367.12 N	24.42 W	-366.96	8.91
6976.00	36.21	169.41	6887.51	317.10 N	12.52 W	-317.02	4.20
7066.00	48.53	169.95	6954.80	258.31 N	2.99 W	-258.28	11.93
7111.00	57.34	169.10	6984.03	224.41 N	1.55 E	-224.42	11.93
7156.00	63.58	171.71	7009.95	187.91 N	5.87 E	-187.94	11.93
7246.00	76.54	175.65	7051.03	108.36 N	13.72 E	-108.45	11.93
7299.00	85.03	177.10	7068.03	58.36 N	17.77 E	-58.47	11.93
7424.00	89.26	177.26	7085.72	64.80 S	25.29 E	64.64	11.93
7514.00	90.43	181.63	7085.96	154.77 S	26.17 E	154.60	5.03
7603.00	90.89	182.51	7084.93	243.71 S	22.95 E	243.56	1.12
7693.00	90.96	181.88	7083.48	333.63 S	19.50 E	333.50	0.71
7782.00	91.45	179.89	7081.61	422.59 S	18.12 E	422.47	2.30
7872.00	90.62	177.41	7079.99	512.55 S	20.23 E	512.41	2.91
7962.00	90.12	174.82	7079.41	602.33 S	26.33 E	602.15	2.92
8052.00	89.51	175.34	7079.70	692.00 S	34.04 E	691.77	0.89
8141.00	88.98	175.83	7080.87	780.72 S	40.90 E	780.45	0.81
8231.00	89.41	175.74	7082.13	870.47 S	47.51 E	870.16	0.49
8321.00	90.34	176.13	7082.32	960.24 S	53.89 E	959.89	1.11
8410.00	90.12	176.70	7081.96	1049.07 S	59.45 E	1048.67	0.69
8500.00	90.00	176.81	7081.87	1138.92 S	64.55 E	1138.50	0.18
8590.00	89.48	176.95	7082.28	1228.79 S	69.44 E	1228.33	0.60
8679.00	89.94	177.62	7082.73	1317.69 S	73.65 E	1317.20	0.91
8769.00	89.60	177.95	7083.10	1407.62 S	77.13 E	1407.11	0.52
8859.00	90.74	180.05	7082.83	1497.60 S	78.70 E	1497.08	2.65
8948.00	91.11	182.29	7081.40	1586.56 S	76.89 E	1586.05	2.56
9038.00	90.31	181.72	7080.28	1676.50 S	73.74 E	1676.00	1.09
9128.00	89.63	181.90	7080.33	1766.46 S	70.90 E	1765.98	0.78
9218.00	90.52	181.49	7080.21	1856.41 S	68.24 E	1855.95	1.09
9307.00	89.94	181.75	7079.85	1945.38 S	65.73 E	1944.93	0.72
9397.00	89.54	181.14	7080.26	2035.35 S	63.46 E	2034.91	0.80
9486.00	89.01	181.05	7081.39	2124.32 S	61.76 E	2123.89	0.60
9576.00	89.97	181.74	7082.19	2214.29 S	59.57 E	2213.87	1.31
9666.00	89.97	181.46	7082.23	2304.26 S	57.05 E	2303.85	0.31
9845.00	91.79	182.83	7079.49	2483.10 S	50.36 E	2482.73	1.27
9934.00	91.66	182.88	7076.81	2571.95 S	45.93 E	2571.61	0.15
10024.00	90.43	182.65	7075.17	2661.83 S	41.60 E	2661.51	1.39
10114.00	90.34	182.69	7074.56	2751.73 S	37.40 E	2751.44	0.11
10203.00	90.12	183.22	7074.20	2840.61 S	32.81 E	2840.35	0.64
10293.00	91.02	183.11	7073.31	2930.47 S	27.84 E	2930.23	1.00
10382.00	89.44	182.48	7072.95	3019.36 S	23.50 E	3019.15	1.91
10472.00	89.08	182.28	7074.11	3109.27 S	19.77 E	3109.08	0.46
10562.00	88.61	182.79	7075.92	3199.16 S	15.79 E	3199.00	0.76
10651.00	88.46	183.28	7078.20	3288.01 S	11.08 E	3287.88	0.58
10741.00	88.18	183.16	7080.84	3377.83 S	6.02 E	3377.72	0.34
10831.00	90.80	181.38	7081.64	3467.74 S	2.46 E	3467.66	3.52

RW 27N-5HZ

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
10920.00	90.77	181.54	7080.42	3556.71 S	0.19 E	3556.63	0.18
11099.00	90.25	181.34	7078.83	3735.64 S	4.29 W	3735.59	0.31
11278.00	90.00	182.33	7078.44	3914.55 S	10.01 W	3914.53	0.57
11368.00	91.48	181.98	7077.28	4004.47 S	13.40 W	4004.48	1.69
11458.00	90.92	181.74	7075.39	4094.41 S	16.32 W	4094.43	0.67
11547.00	90.83	181.74	7074.03	4183.35 S	19.02 W	4183.39	0.10
11727.00	90.52	182.37	7071.90	4363.23 S	25.47 W	4363.30	0.39
11816.00	90.99	180.09	7070.72	4452.19 S	27.37 W	4452.28	2.61
11906.00	90.55	179.89	7069.51	4542.18 S	27.36 W	4542.26	0.53
12085.00	89.85	180.14	7068.89	4721.18 S	27.40 W	4721.26	0.42
12265.00	90.43	180.12	7068.45	4901.18 S	27.80 W	4901.26	0.33
12444.00	90.18	179.61	7067.49	5080.17 S	27.37 W	5080.25	0.32
12534.00	91.05	180.50	7066.52	5170.17 S	27.46 W	5170.24	1.38
12713.00	90.92	180.51	7063.44	5349.13 S	29.03 W	5349.21	0.07
12803.00	91.60	180.29	7061.46	5439.11 S	29.66 W	5439.19	0.79
12892.00	91.91	180.50	7058.73	5528.07 S	30.28 W	5528.15	0.42
13072.00	90.89	180.16	7054.32	5708.01 S	31.32 W	5708.09	0.60
13206.00	89.48	179.96	7053.89	5842.00 S	31.47 W	5842.08	1.07
13251.00	89.32	180.11	7054.36	5887.00 S	31.50 W	5887.08	0.48
13343.00	89.32	179.69	7055.45	5978.99 S	31.34 W	5979.07	0.46
13384.00	89.32	179.69	7055.94	6019.99 S	31.12 W	6020.07	0.01

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 180.36 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.22 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 13384.00 FEET
IS 6020.07 FEET ALONG 180.30 DEGREES (TRUE)

Surveys from 132' to 1808' provided by third party
First Sperry Survey at 1932'.
Last survey is a projection to bit at TD.