

**PCDC - Pressure Case Directional
PCGK - Pressure Case Gamma**

1 : 240

Country	: USA
Field	: Wattenberg
Location	: Lat: 40° 2' 21.89" North Long: 104° 52' 11.98" West
Well	: Wagner 1N-W10HZ
Company	: Anadarko Petroleum Corp
Rig	: Precision 464
LOCATION	Company : Anadarko Petroleum Corp
	Rig : Precision 464
	Well : Wagner 1N-W10HZ
	Field : Wattenberg
	Country : USA
	API Number : 05-123-43476
Latitude : 40° 2' 21.89" North Longitude : 104° 52' 11.98" West UTM Easting = 1,676,803.910 usft UTM Northing = 14,541,112.271 usft	Other Services Directional Drilling
Permanent Datum : Ground Level	Elevation : 4971.00 ft
Log Measured From : Drill Floor	21.00 ft Above Permanent Datum
Drilling Measured From : Drill Floor	MD LOG
Depth Logged : 1,881.00 ft To 15,220.00 ft	Unit No. : 11852261
Date Logged : 16-Oct-17 To 23-Oct-17	Job No. : CA-XX-0904337676
Total Depth MD : 15,220.00 ft TVD : 7,377.98 ft	Plot Type : Final
Spud Date : 06-Oct-17	Plot Date : 29-Oct-17
Borehole Record (MD)	
Run No.	Size From To
2	8.500 in 1,881.00 ft 5,905.00 ft
3	6.125 in 5,905.00 ft 15,220.00 ft
Casing Record (MD)	
Run No.	Size From To
	Size Weight From To
	9.625 in 36.00 lbpf SURFACE 1,870.00 ft
	7.000 in 26.00 lbpf SURFACE 5,895.00 ft

WELL INFORMATION

MWD Run Number	100	200
Date run completed	18-Oct-17	22-Oct-17
Rig Bit Number	2	3
Bit Size (in)	8.500	6.125
Tool Nominal OD (in)	6.750	4.750
Log Start Depth (MD, ft)	1,881.00	5,905.00
Log End Depth (MD, ft)	5,905.00	15,220.00
Drill or Wipe	Drill	Drill
Drill/Wipe Start Date and Time	17-Oct-17 13:15	19-Oct-17 05:30
Drill/Wipe End Date and Time	18-Oct-17 04:45	22-Oct-17 00:30
Min Inc (deg) @ Depth (MD, ft)	0.17 @ 5,690.00	0.76 @ 6,448.00
Max Inc (deg) @ Depth (MD, ft)	19.13 @ 1,920.00	92.84 @ 13,157.00
Bit TFA(in2) / Bit Type	0.75 / PDC	0.65 / PDC
Flow Rate (gpm)	583.40	275.97
Max AV (fpm) / CV (fpm) @ MWD	N/A	380.2 / 291.7
Fluid Type	Diesel Mud Base	Diesel Mud Base
Density (ppg) / Viscosity (spqt)	8.90 / 59.00	9.40 / 58.00
Filtrate CL (ppm)	43,000.00	38,000.00
pH / API Filtrate (mptm)	N/A / 4	N/A / 0
PV (cP) / YP (lhf2)	16 / 10.00	15 / 9.00
% Solids / % Sand	8.00 / .01	10.00 / 0
% Oil / Oil:Water Ratio	69.00 / 3:1	68.00 / 76:24
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A

Max Tool Temp (degF) / Source	167.97 / PCM	250.56 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 167.97	N/A @ 250.56			
Lead MWD Engineer	Brian Neu	Brian Neu			
Customer Representative	Jackie McKinley	Jackie McKinley			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	12004211	12334774			
Insert Serial Number	11227417	11227417			
Date and Time Initialized	17-Oct-17 06:05	18-Oct-17 16:55			
Date and Time Read	18-Oct-17 09:40	22-Oct-17 12:08			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	45.00	46.00			
Software Version	6.33	6.33			
Sub Serial Number	12004211	12334774			
Sonde Serial Number	11902220	11902220			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	235.70	35.20			

Gamma Ray Sensor Information

Tool Type	PCG-K	PCG-K			
Distance From Bit (ft)	48.43	39.39			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	12004211	12334774			
Insert/Sonde Serial Number	11680954	11680954			

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

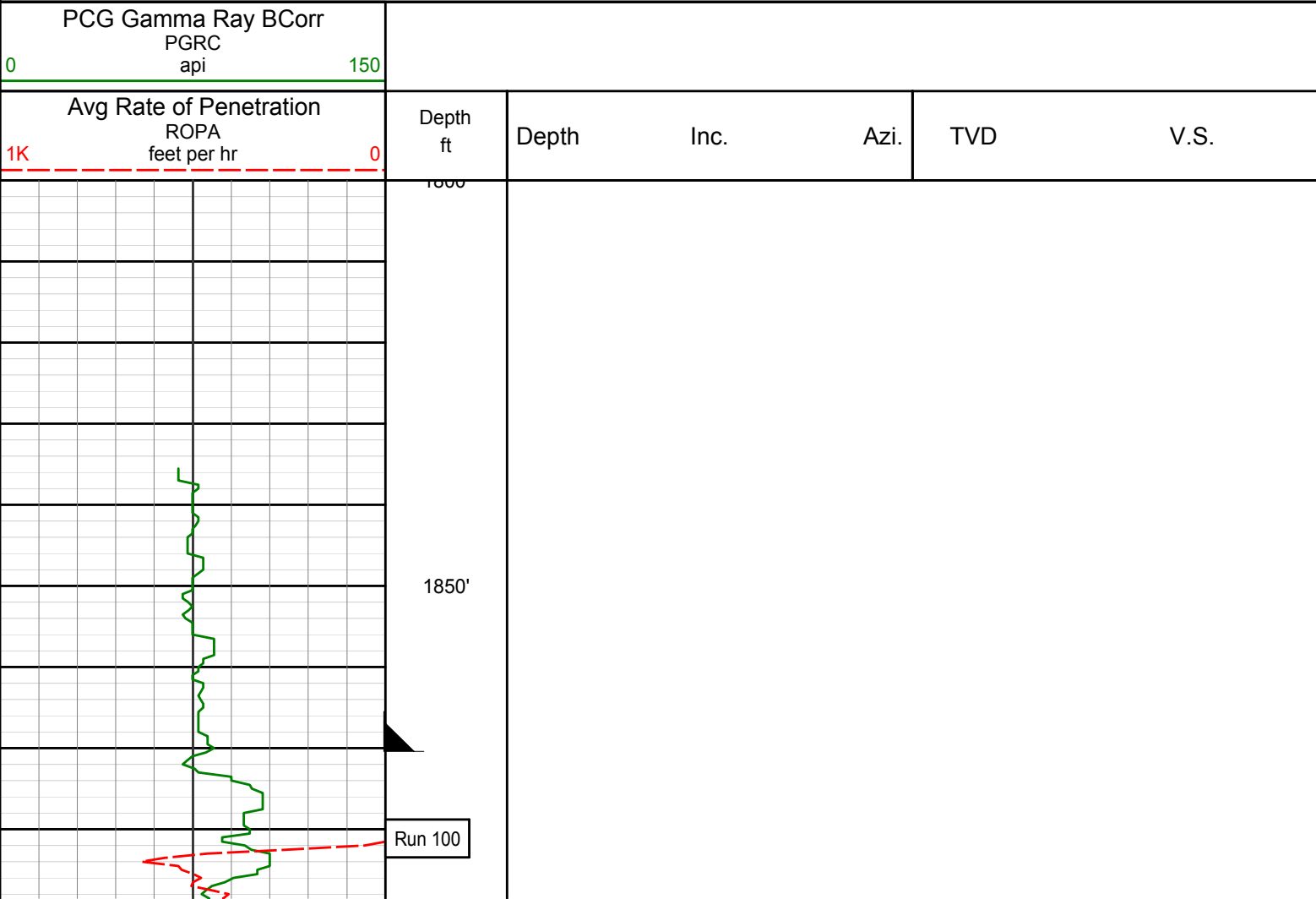
ROPA (Average Rate of Penetration):
Interval Resolution: 0.5ft
Interval Distance: 1.2ft
Gap Fill: 3.0ft
5. Surveys from 1920'MD to 15174'MD ft are corrected by Alaska Survey Management.
6. Gaps in gamma due to surface computer shutting off.
7. Gaps in gamma due to low flow not turning on tool while drilling cement.

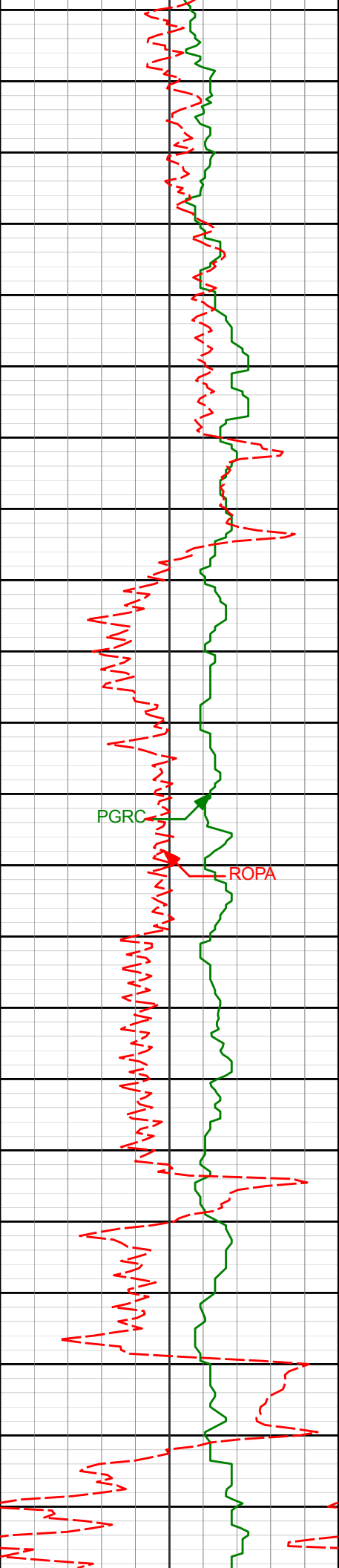
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Detail Log 1:240





1900'

1950'

2000'

2050'

2100'

1920'

19.13°

178.02°

1876.15'

-307.13'

2010'

19.11°

177.73°

1961.18'

-336.60'

2099'

17.43°

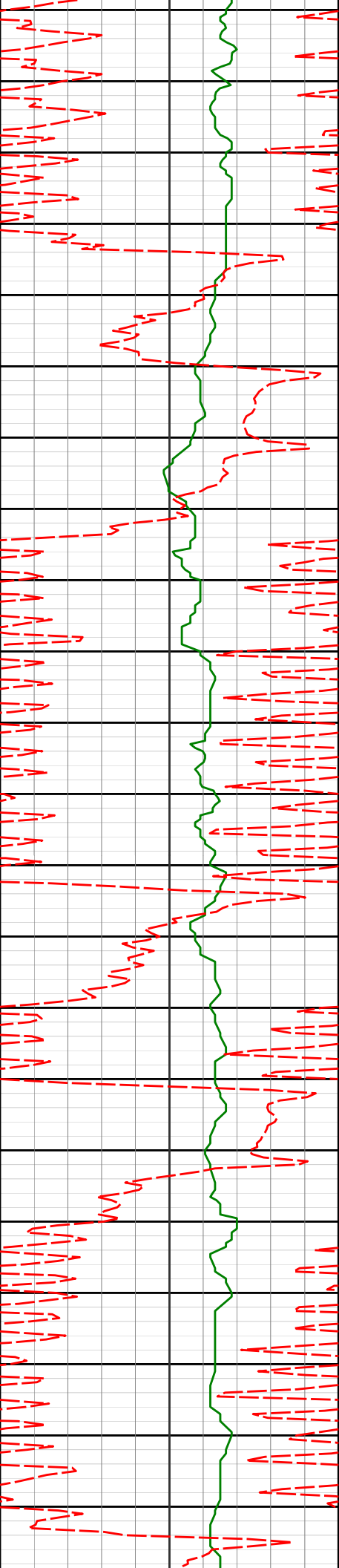
178.19°

2045.70'

-364.49'

PGRC

ROPA



2150'

2189'

15.66°

178.48°

2131.97'

-390.11'

2200'

2250'

2279'

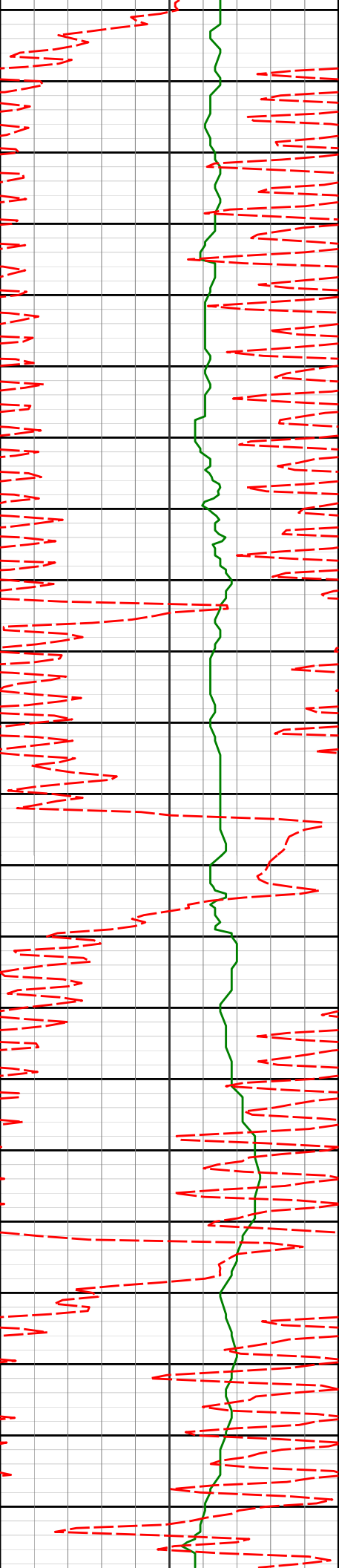
13.92°

177.96°

2218.98'

-413.08'

2300'



2350'

2368'

13.44°

176.73°

2305.46'

-434.12'

2400'

2450'

2458'

11.95°

177.05°

2393.26'

-453.87'

2500'

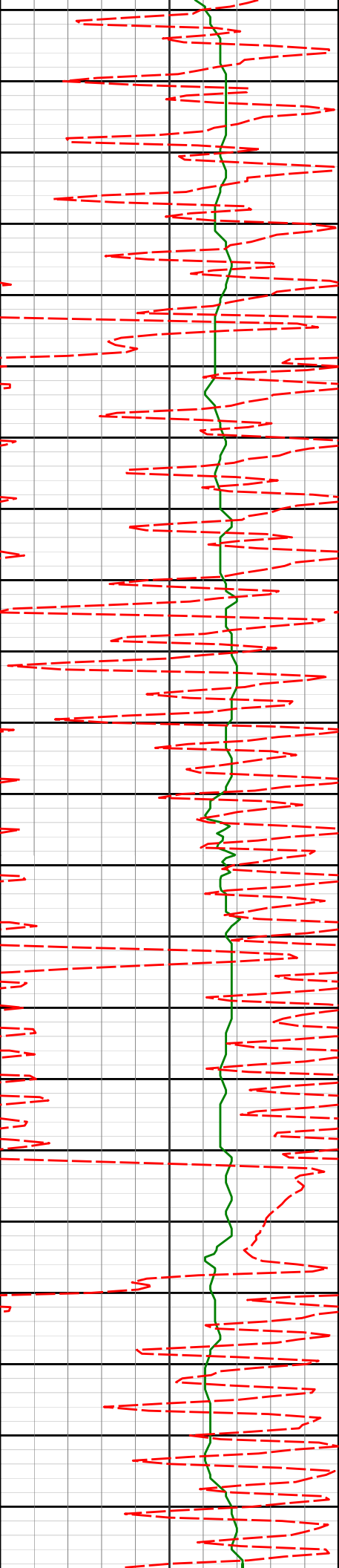
2548'

11.50°

176.19°

2481.38'

-472.14'



2550'

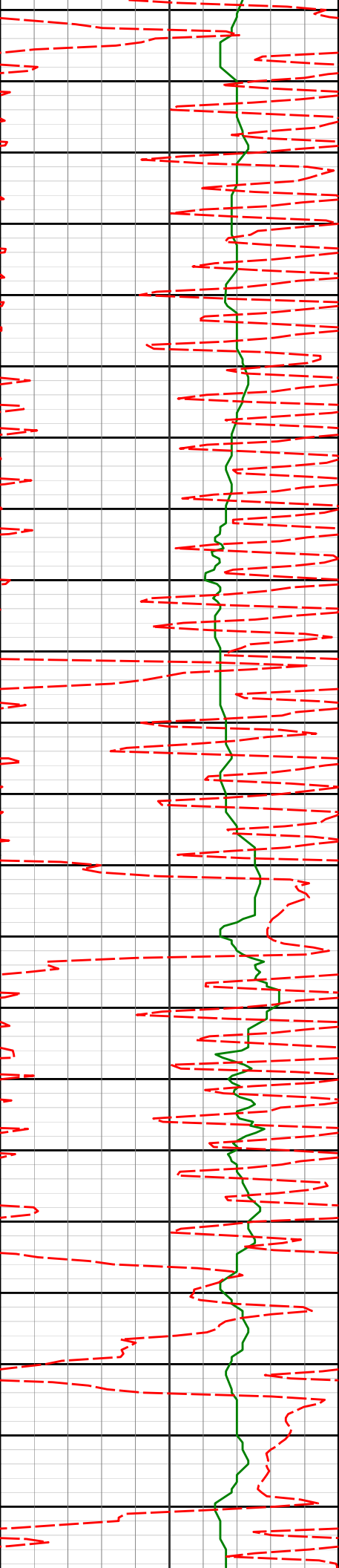
2600'

2650'

2700'

2750'

2575'	11.55°	170.15°	2457.55'	172.77'
2638'	10.97°	174.97°	2569.65'	-489.64'
2727'	10.56°	182.65°	2657.09'	-506.23'



2800'

2817'

9.93°

180.82°

2745.66'

-522.21'

2850'

2900'

2907'

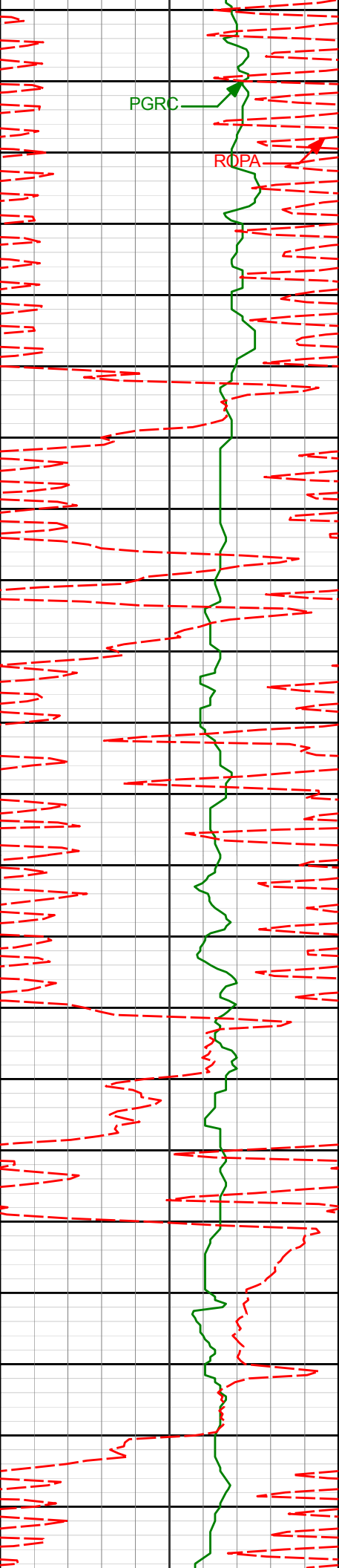
9.66°

182.31°

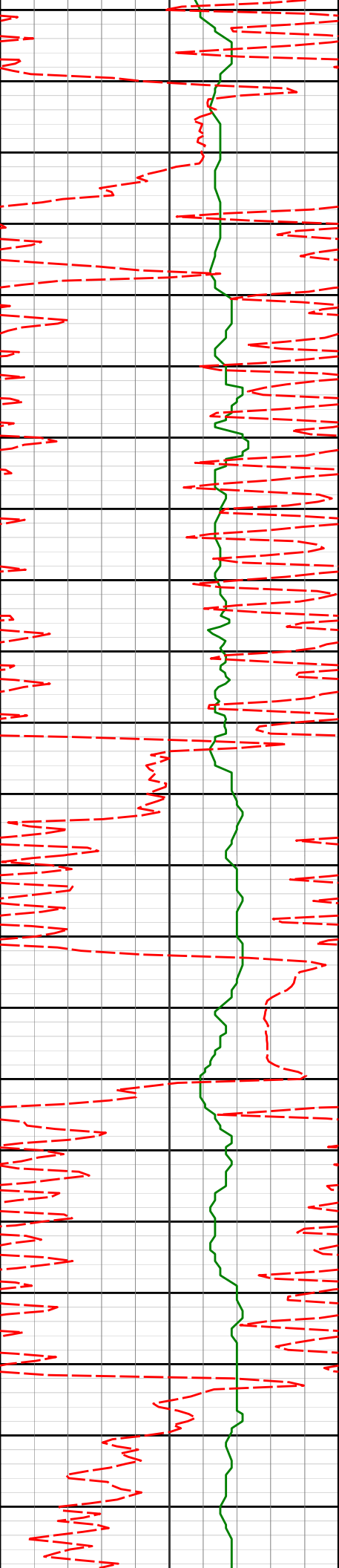
2834.35'

-537.51'

2950'



3000'	2997'	10.62°	182.43°	2922.94'	-553.32'
3050'					
3086'	3086'	9.93°	181.17°	3010.51'	-569.18'
3100'					
3150'					
3176'	3176'	11.95°	181.78°	3098.87'	-586.25'
3200'					



3250'

3266'

11.30°

181.20°

3187.02'

-604.37'

3300'

3350'

3356'

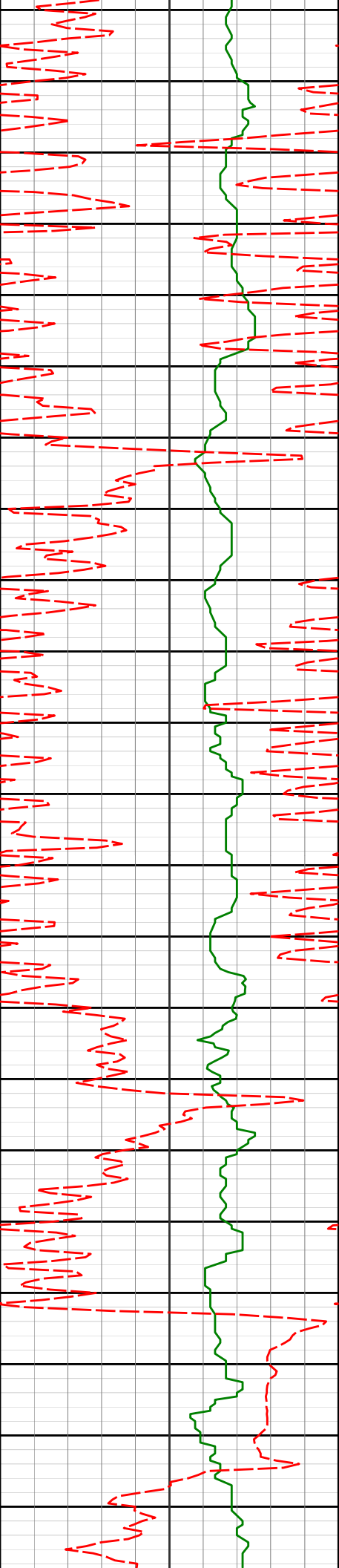
12.56°

177.66°

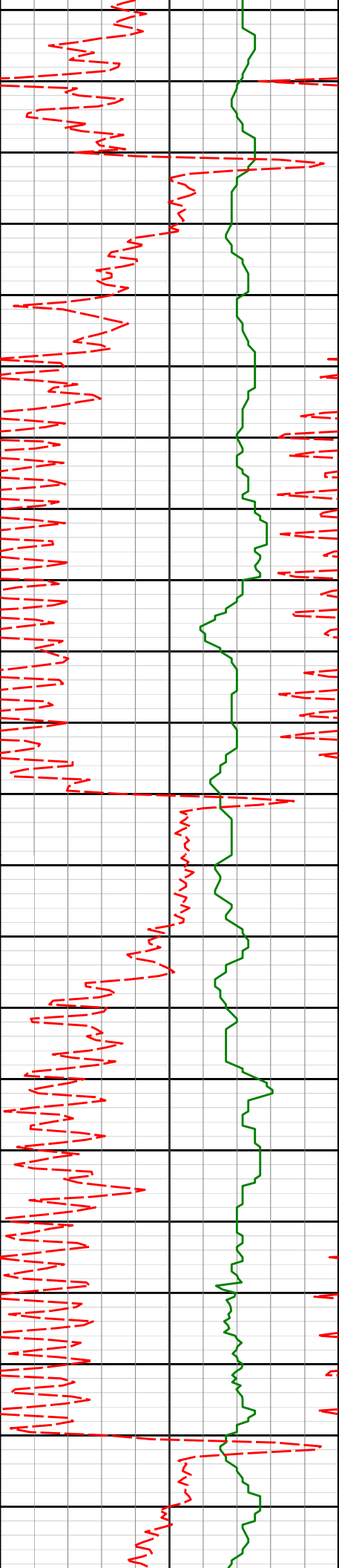
3275.08'

-622.97'

3400'



3446'	11.85°	175.82°	3363.04'	-641.98'
3450'				
3500'				
3535'	10.76°	176.75°	3450.32'	-659.40'
3550'				
3600'				
3625'	12.29°	180.10°	3538.50'	-677.37'



3650'

3700'

3750'

3800'

3850'

3715'

12.10°

180.17°

3626.47'

-696.37'

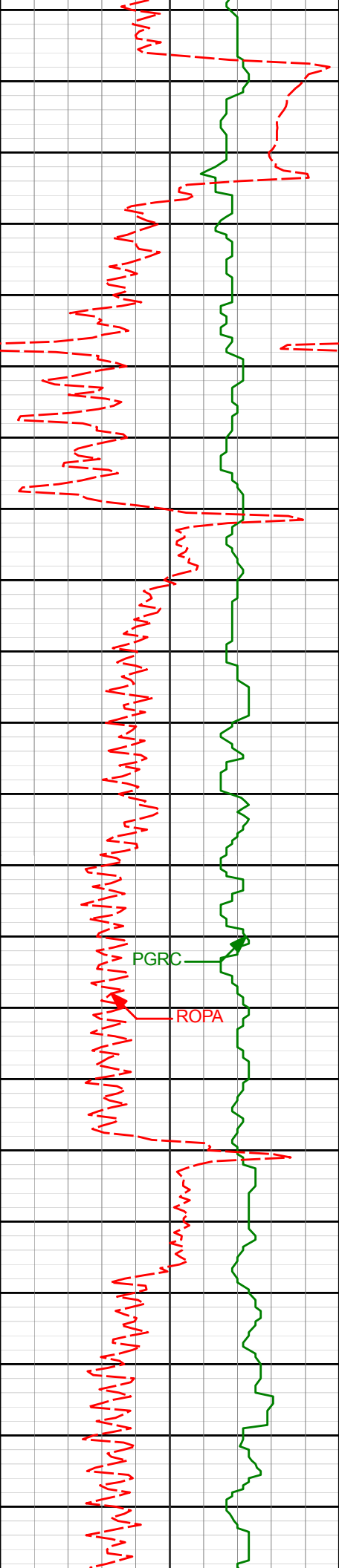
3805'

10.94°

178.88°

3714.66'

-714.34'



3894'

12.37°

179.63°

3801.82'

-732.31'

3900'

3950'

3984'

11.29°

179.76°

3889.91'

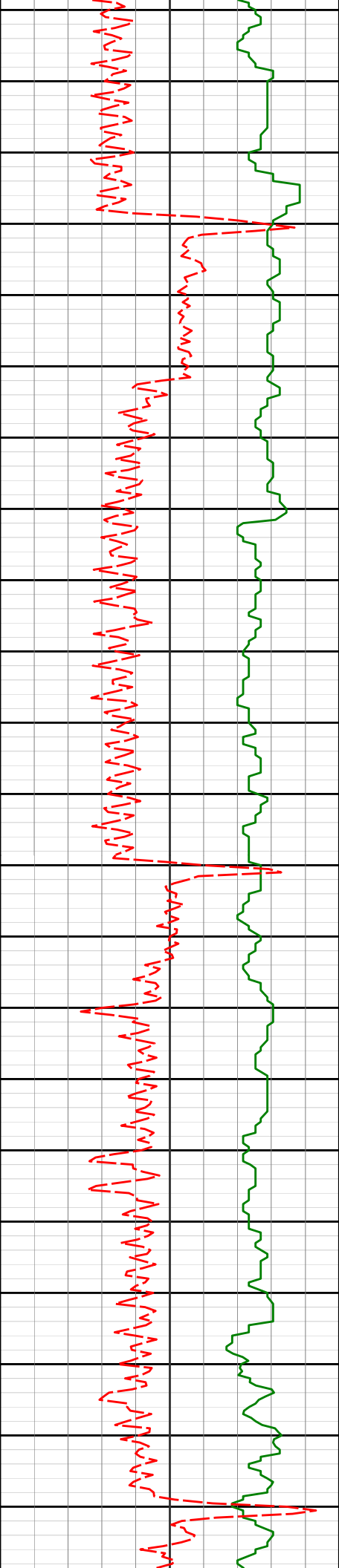
-750.77'

4000'

PGRC

ROPA

4050'



4100'

4150'

4164'

8.66°

178.88°

4067.17'

-781.94'

4200'

4250'

4254'

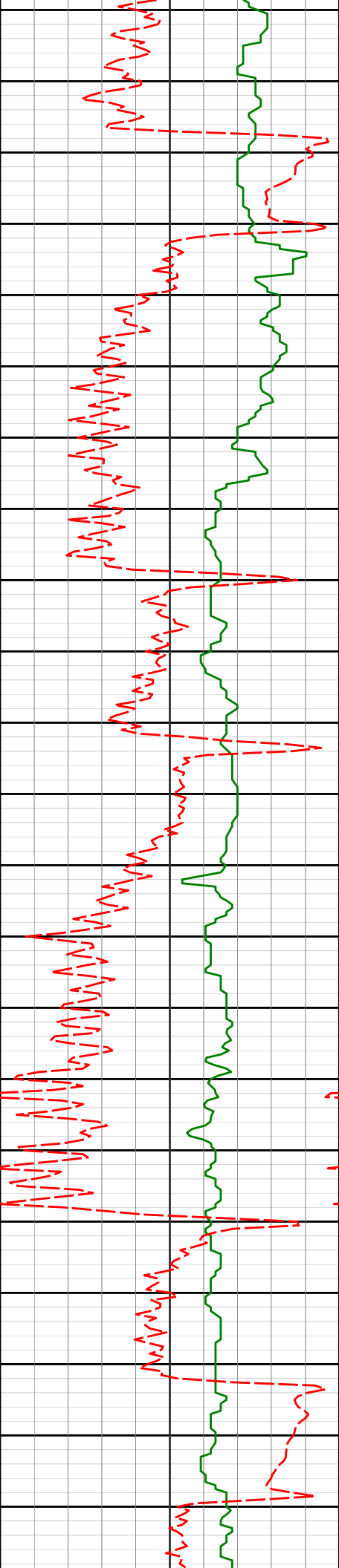
7.62°

179.45°

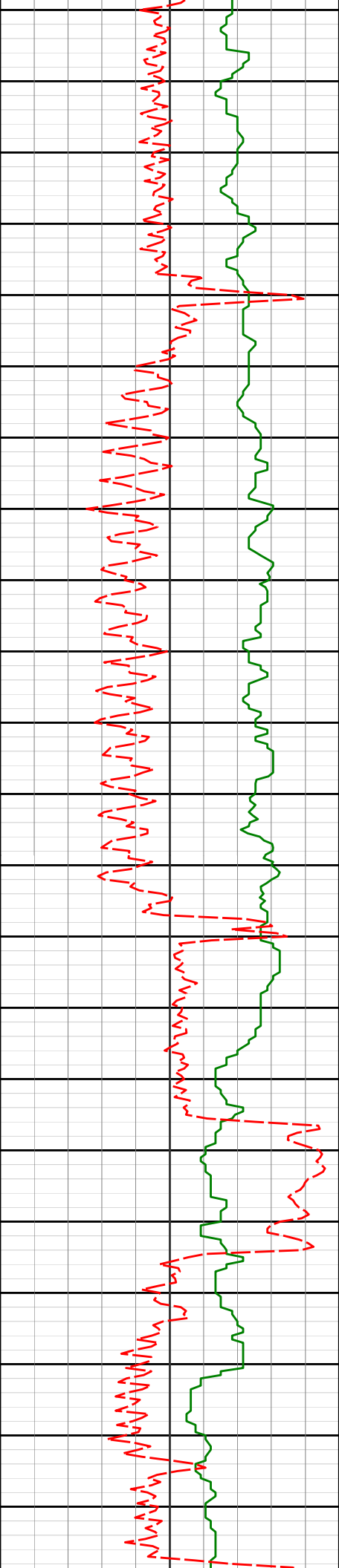
4156.26'

-794.68'

4300'



4343'	4.95°	181.41°	4244.72'	-804.42'
4350'				
4400'				
4433'	4.36°	188.17°	4334.42'	-811.68'
4450'				
4500'				
4523'	1.36°	219.45°	4424.31'	-815.88'



4550'

4600'

4650'

4700'

4613'

1.31°

245.27°

4514.28'

-817.12'

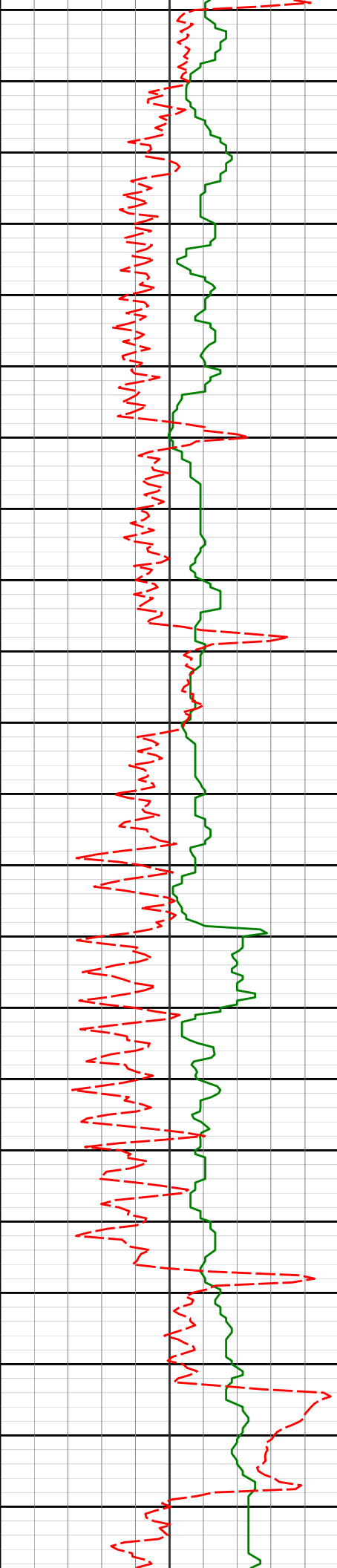
4702'

0.41°

350.05°

4603.27'

-817.21'



4750'

4792'

0.58°

2.40°

4693.27'

-816.43'

4800'

4850'

4882'

0.56°

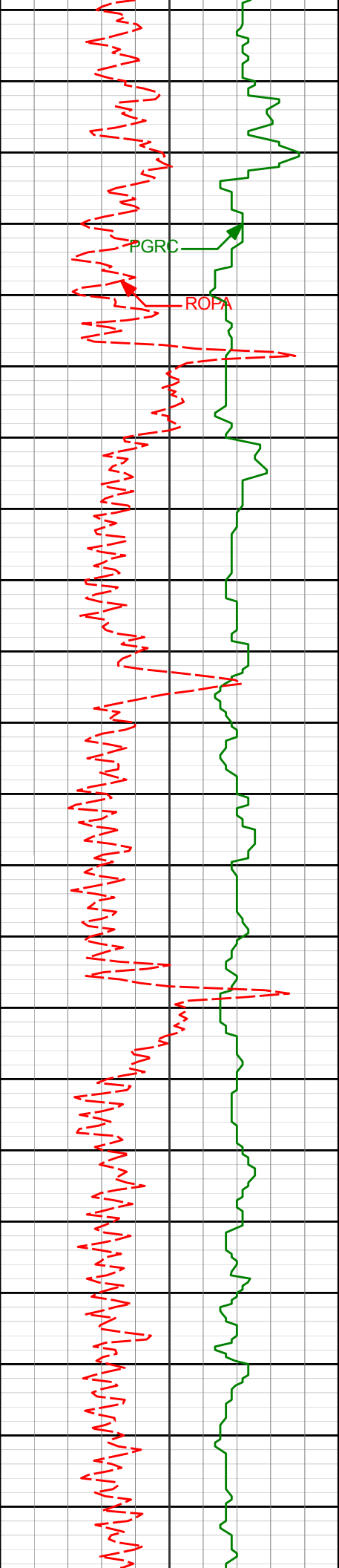
337.11°

4783.27'

-815.57'

4900'

4950'



4972'

1.28°

145.78°

4873.26'

-816.00'

5000'

PGRC

ROPA

5050'

5061'

0.98°

150.98°

4962.24'

-817.50'

5100'

5150'

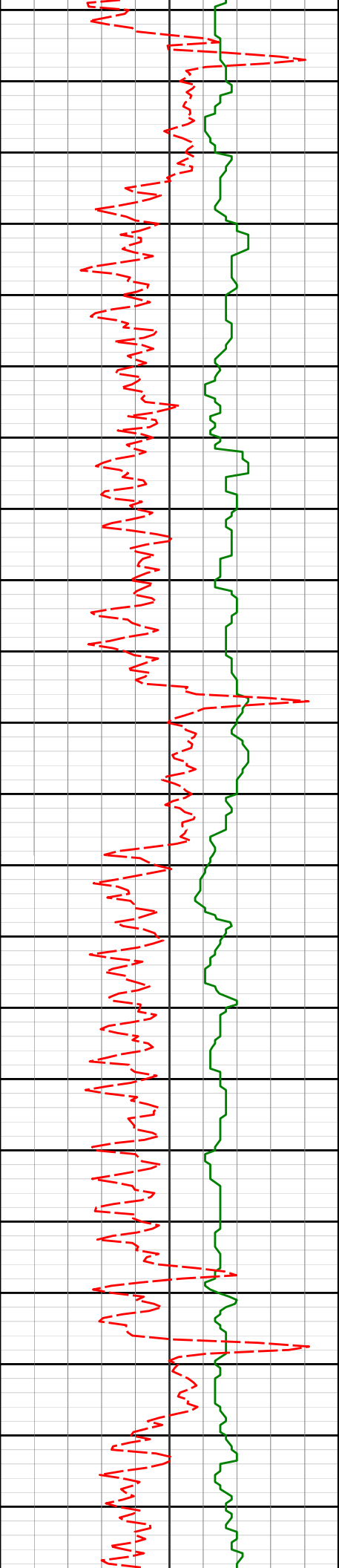
5151'

0.70°

151.43°

5052.23'

-818.66'



5200'

5241'

0.36°

173.89°

5142.23'

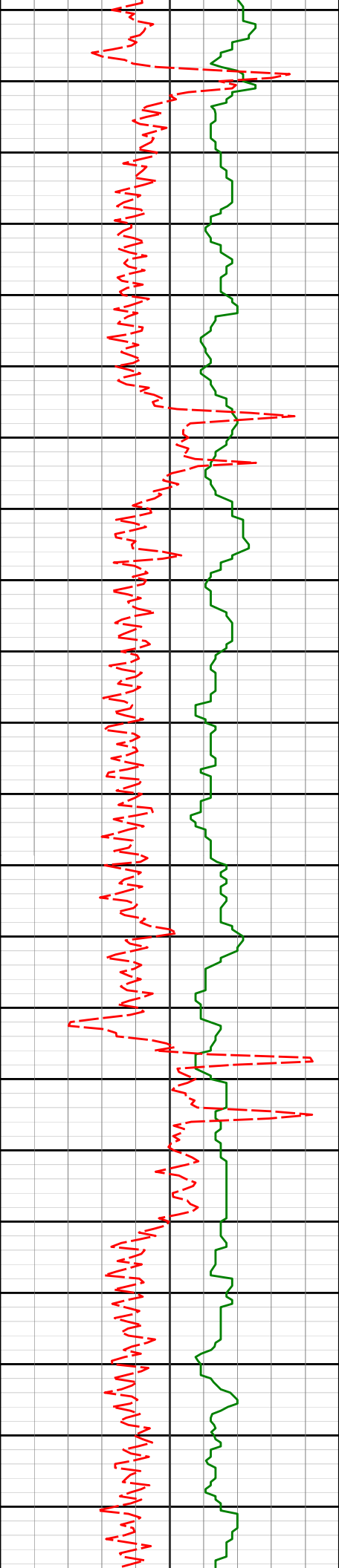
-819.43'

5250'

5300'

5350'

5400'



5421'

0.39°

179.59°

5322.23'

-820.61'

5450'

5500'

5510'

0.55°

175.00°

5411.22'

-821.33'

5550'

5600'

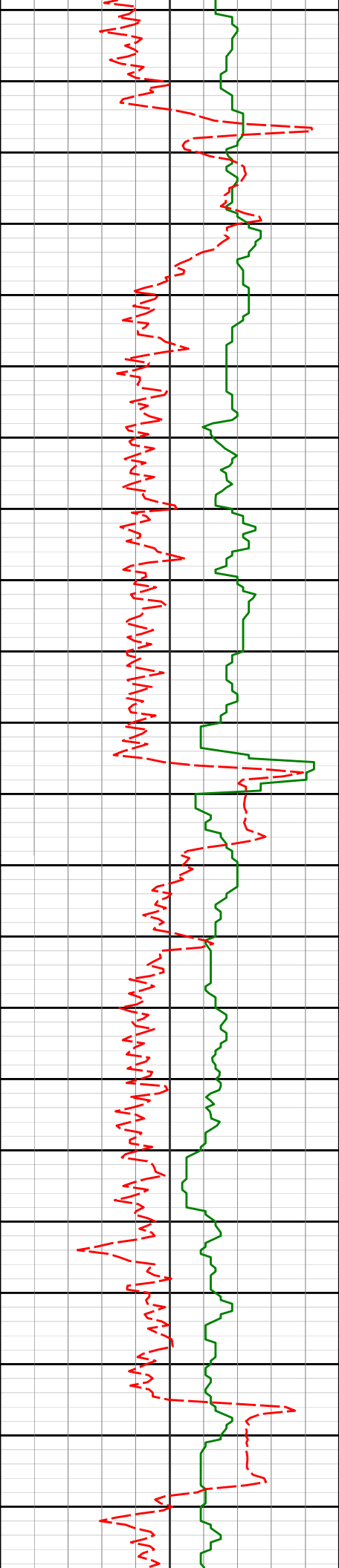
5600'

0.45°

203.29°

5501.22'

-822.08'



5650'

5690'

0.17°

347.90°

5591.22'

-822.27'

5700'

5750'

5780'

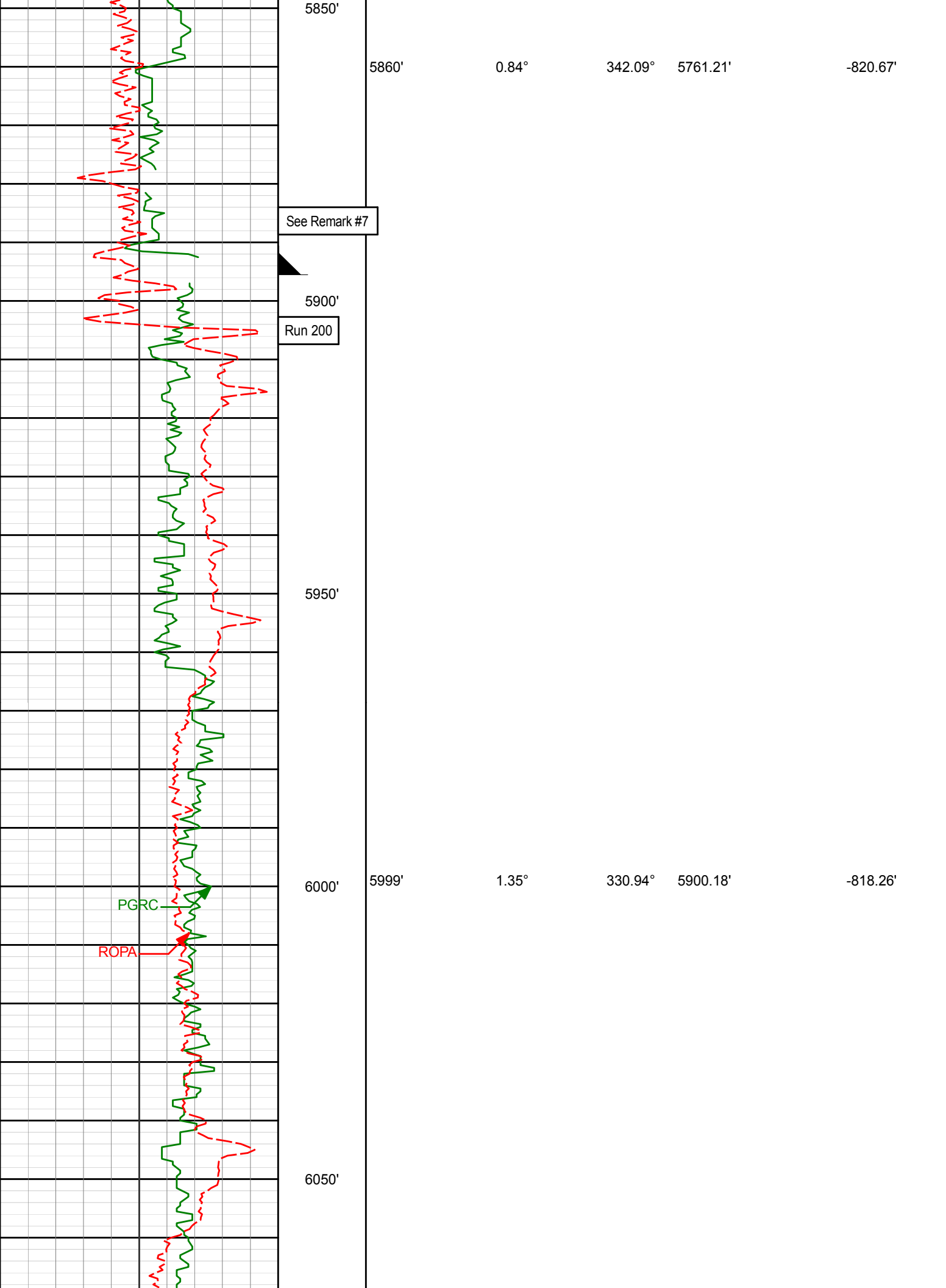
0.63°

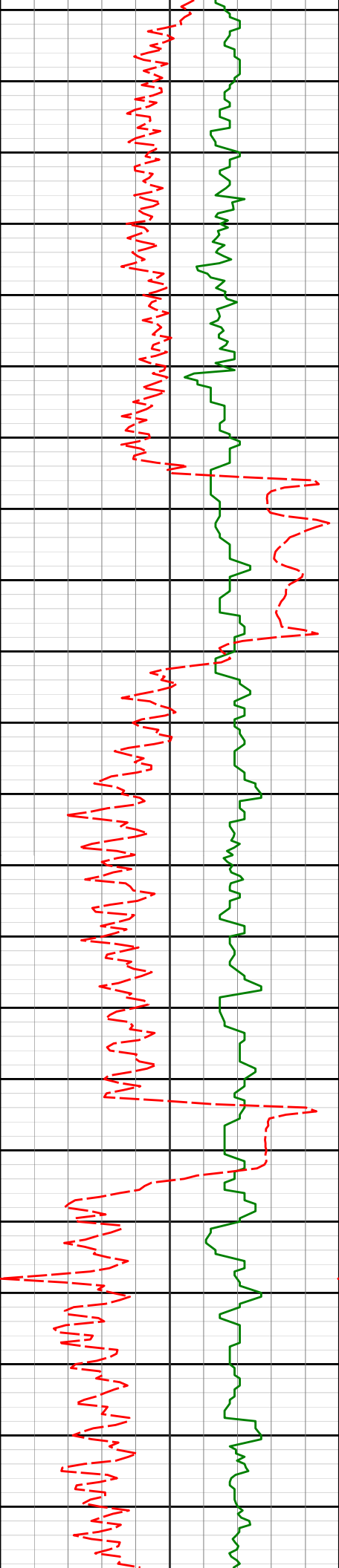
344.69°

5681.22'

-821.65'

5800'





6089'

1.76°

331.19°

5990.15'

-816.10'

6100'

6150'

6178'

1.46°

24.16°

6079.12'

-813.86'

6200'

6250'

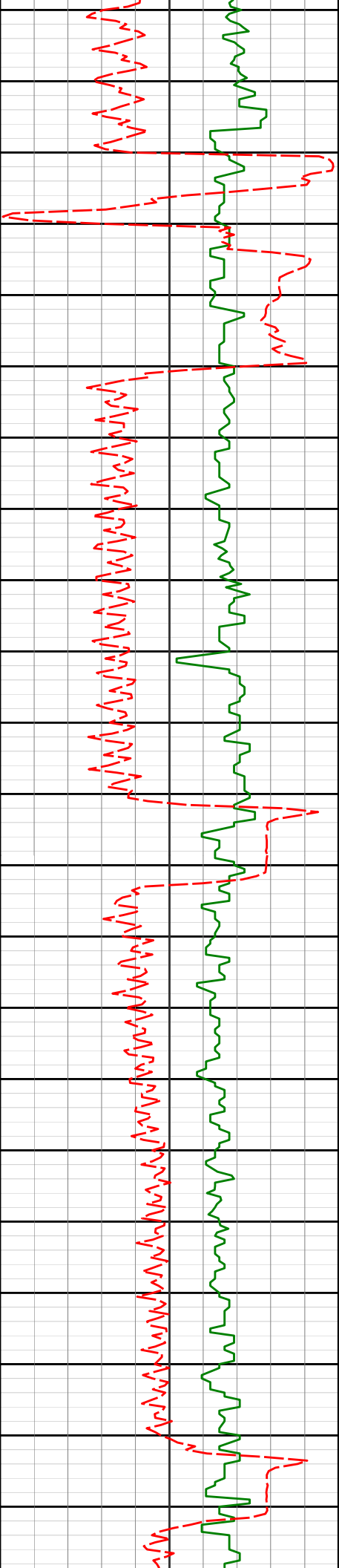
6268'

1.60°

8.02°

6169.09'

-811.58'



6300'

6350'

6400'

6450'

6500'

6358'

0.84°

60.90°

6259.07'

-810.02'

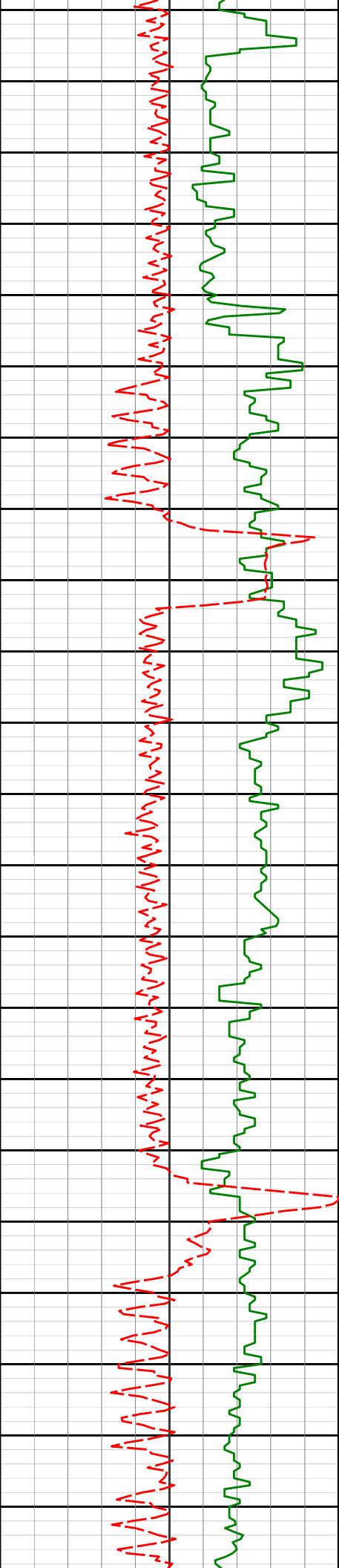
6448'

0.76°

29.50°

6349.06'

-809.19'



6538'

0.89°

20.64°

6439.05'

-808.03'

6550'

6600'

6627'

0.93°

9.66°

6528.04'

-806.68'

6650'

6700'

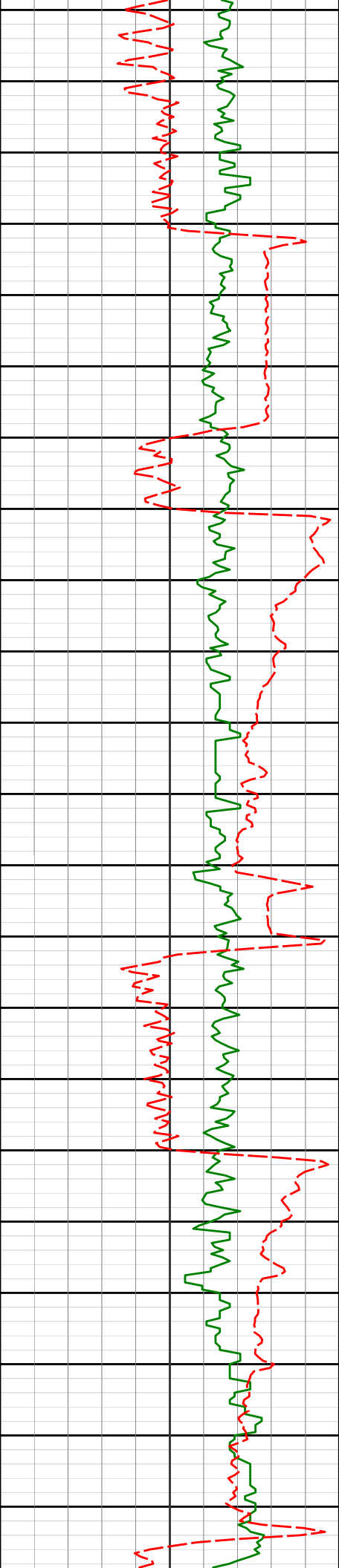
6717'

1.21°

7.00°

6618.02'

-805.03'



6750'

6800'

6850'

6900'

6807'

1.83°

13.00°

6707.99'

-802.69'

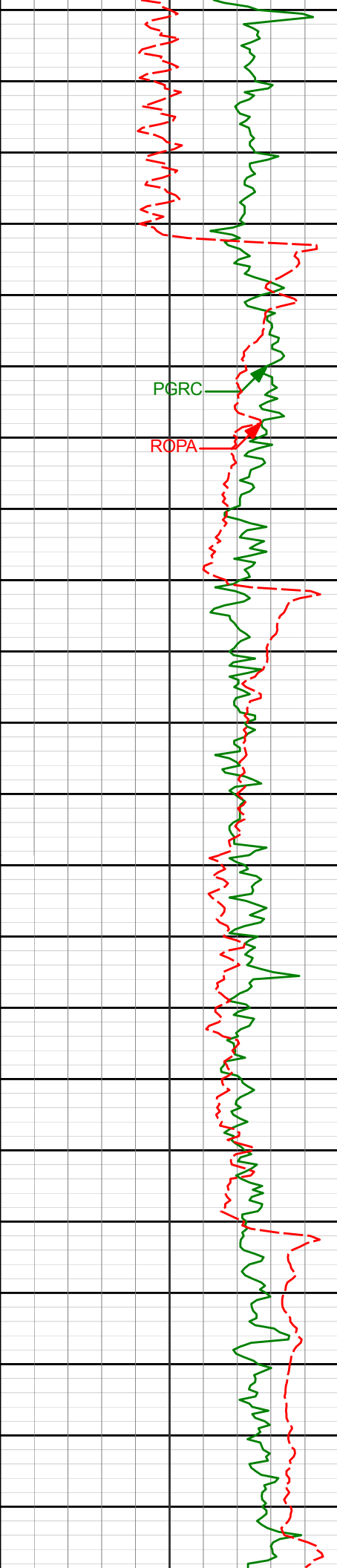
6896'

9.48°

9.99°

6796.49'

-794.10'



6950'

6986'

13.72°

12.60°

6884.64'

-776.43'

7000'

PGRC

ROPA

7050'

7076'

19.91°

5.49°

6970.76'

-750.79'

7100'

7150'

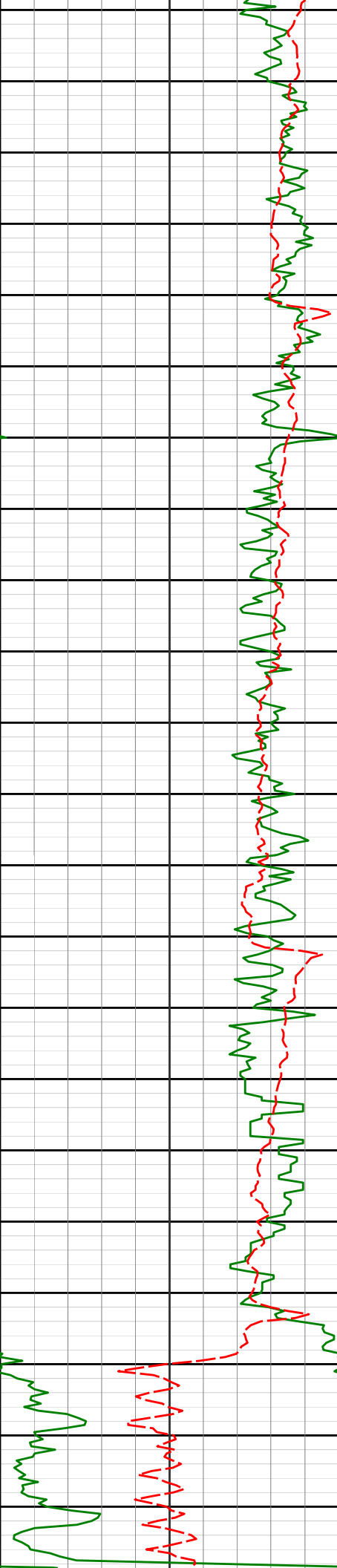
7166'

27.42°

3.69°

7053.13'

-714.85'



7200'

7250'

7300'

7350'

7256'

40.00°

359.65°

7127.86'

-665.06'

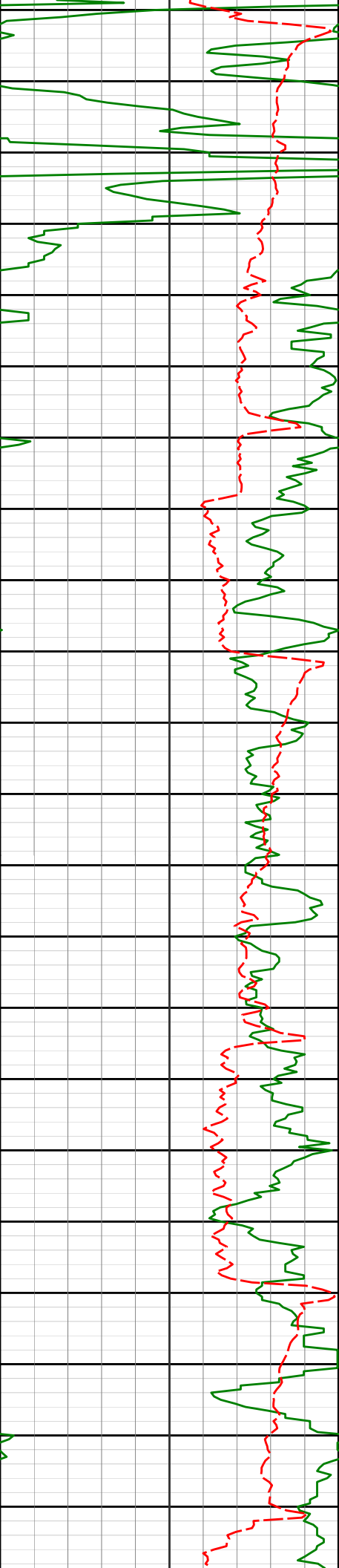
7345'

52.18°

356.33°

7189.48'

-601.10'



7400'

7435'

58.32°

355.45°

7240.76'

-527.32'

7450'

7500'

7525'

66.98°

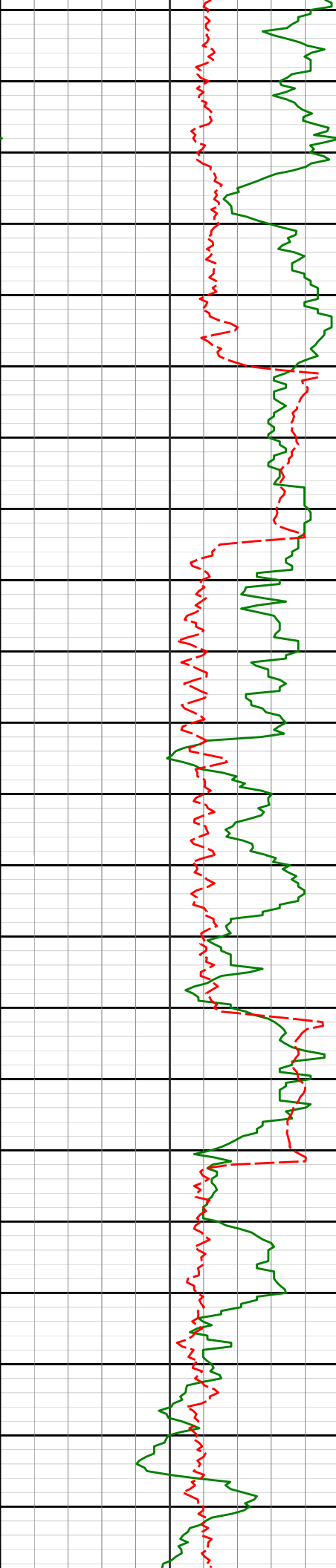
357.70°

7282.07'

-447.55'

7550'

7600'



7615'

72.86°

358.99°

7312.96'

-363.06'

7650'

7700'

7704'

77.01°

359.06°

7336.09'

-277.14'

7750'

7794'

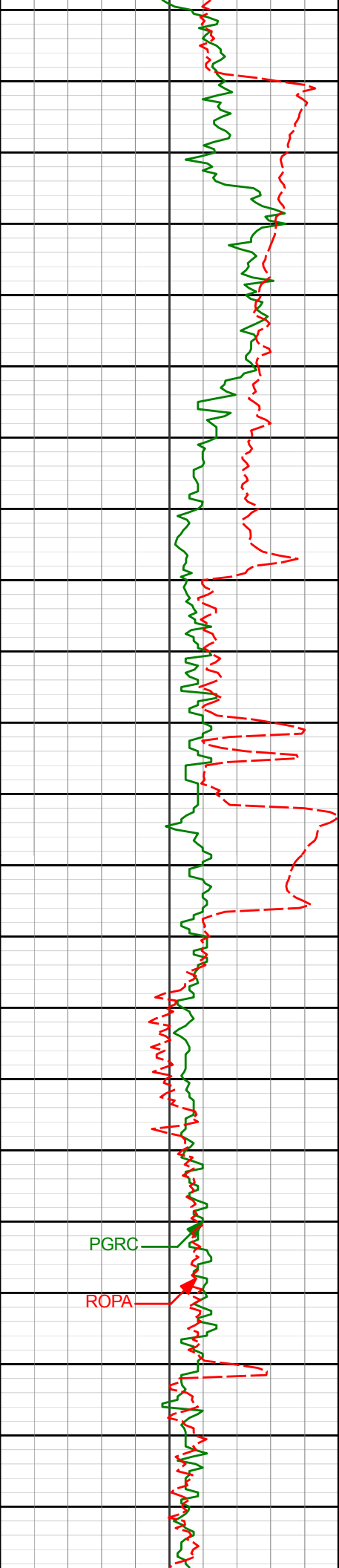
79.45°

0.10°

7354.44'

-189.04'

7800'



7850'

7884'

88.40°

359.86°

7363.96'

-99.65'

7900'

7950'

7974'

89.60°

1.18°

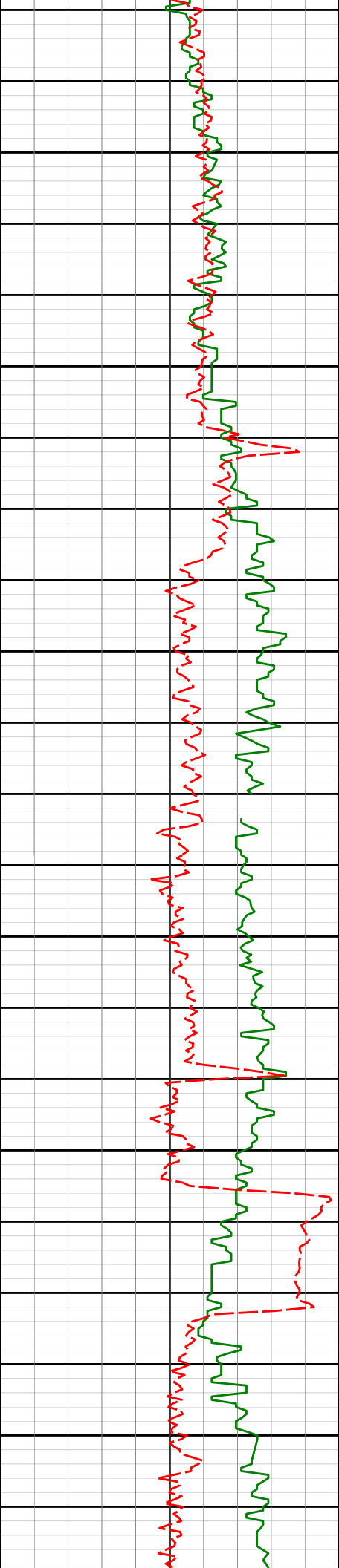
7365.53'

-9.69'

8000'

PGRC

ROPA



8063'

90.62°

0.40°

7365.36'

79.27'

8100'

8150'

8153'

91.57°

0.67°

7363.65'

169.23'

8200'

8250'

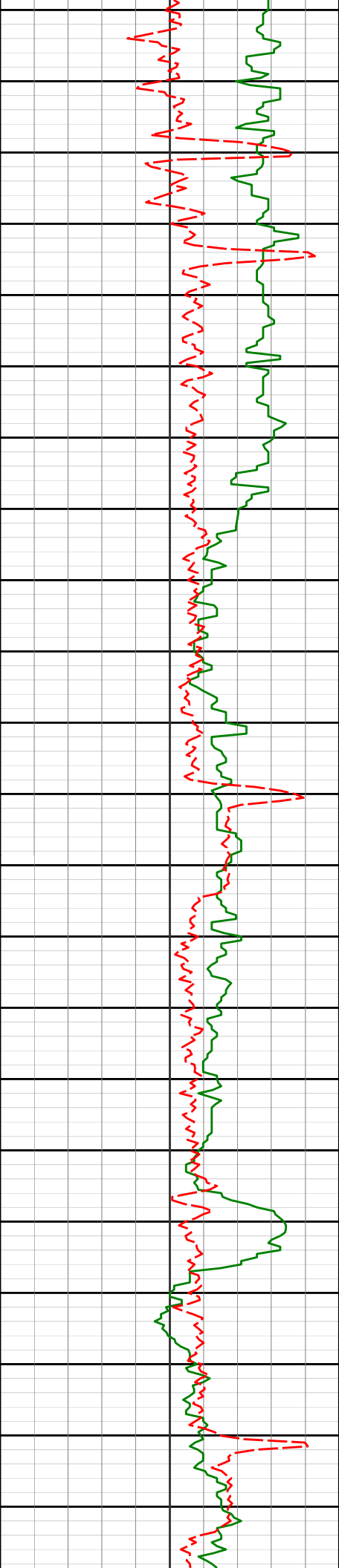
8243'

89.01°

2.96°

7363.19'

259.12'



8300'

8333'

89.54°

3.05°

7364.32'

348.92'

8350'

8400'

8423'

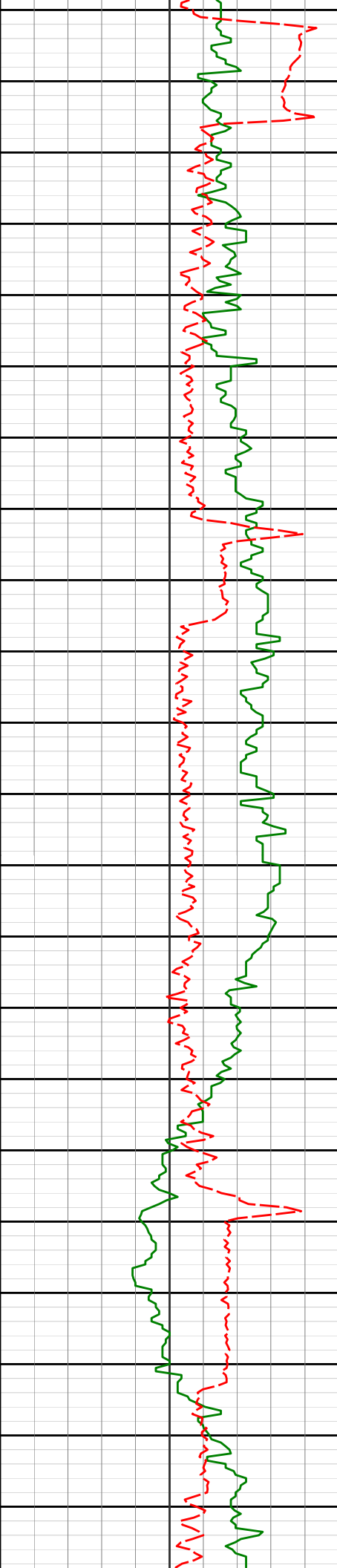
90.77°

2.98°

7364.08'

438.72'

8450'



8500'

8517'

88.64°

1.12°

7364.56'

532.59'

8550'

8600'

8611'

88.98°

0.91°

7366.51'

626.52'

8650'

8700'

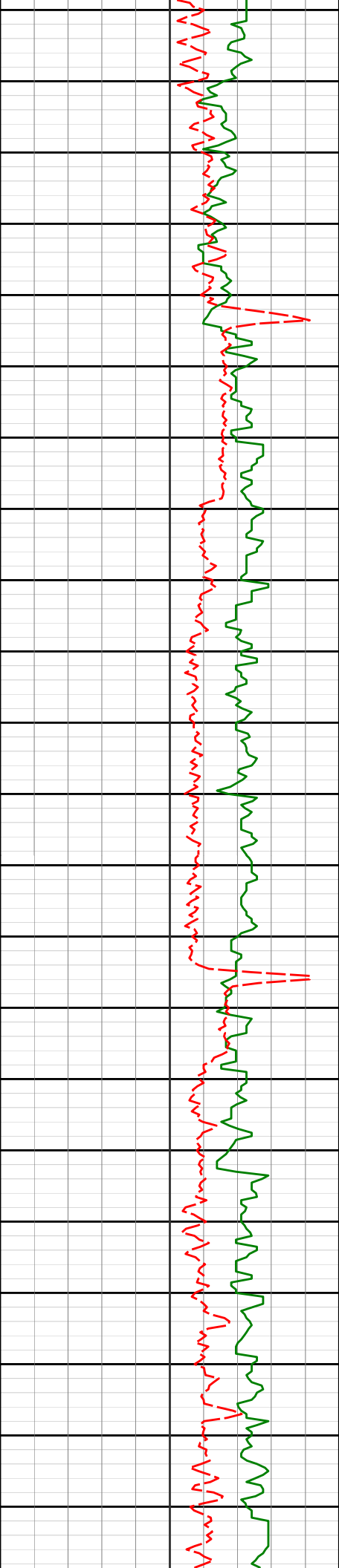
8705'

89.20°

0.03°

7368.00'

720.49'



8750'

8800'

8850'

8900'

8800'

8894'

89.66°

90.19°

359.61°

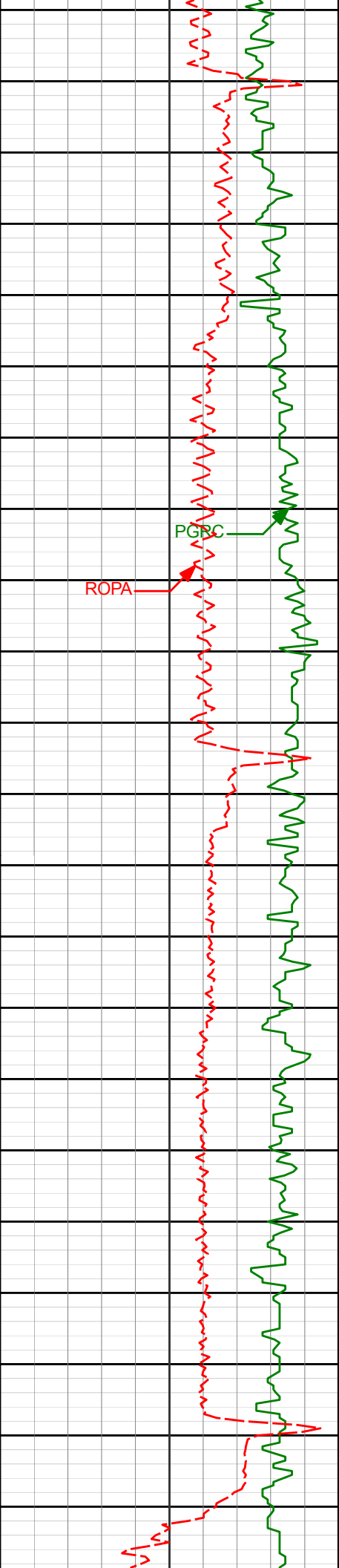
358.82°

7368.95'

7369.08'

815.48'

909.47'



8950'

8988'

90.12°

357.43°

7368.82'

1003.45'

9000'

PGRC

ROPA

9050'

9082'

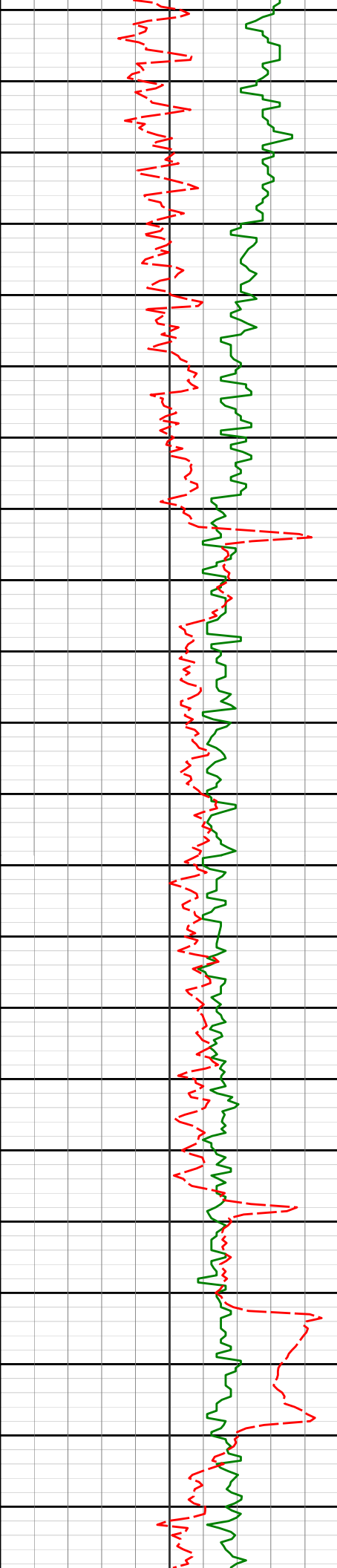
89.94°

357.06°

7368.77'

1097.40'

9100'



9177'

89.75°

356.67°

7369.03'

1192.32'

9200'

9250'

9271'

90.12°

356.36°

7369.13'

1286.22'

9300'

9350'

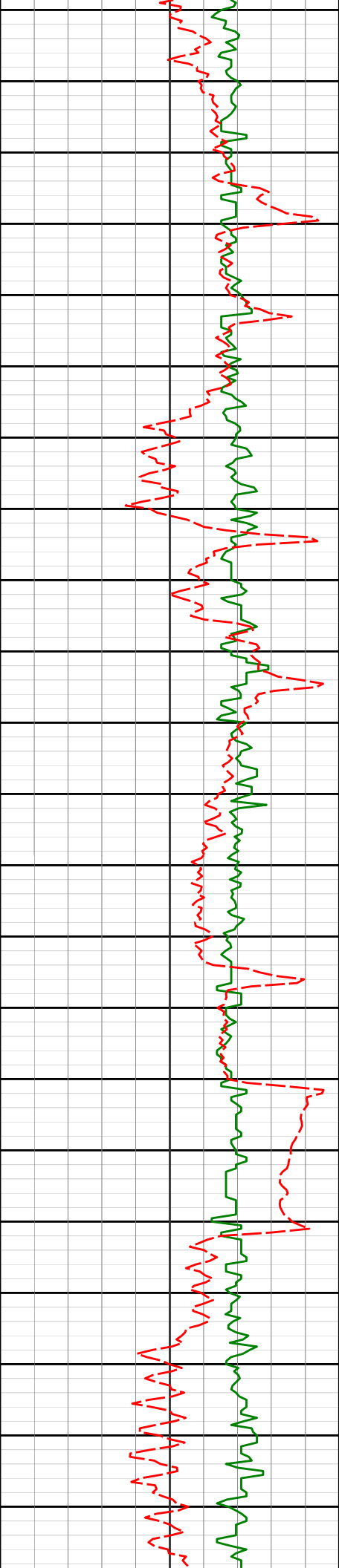
9365'

90.34°

358.25°

7368.75'

1380.16'



9400'

9450'

9500'

9550'

9459'

89.88°

357.29°

7368.57'

1474.13'

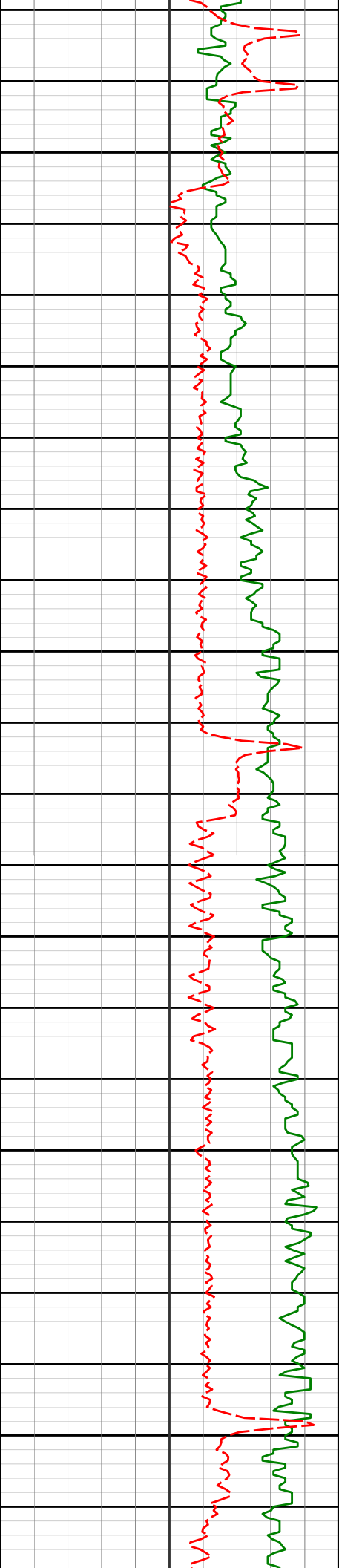
9553'

91.11°

1.40°

7367.76'

1568.10'



9600'

9650'

9700'

9750'

9800'

9648'

91.36°

0.74°

7365.72'

1663.03'

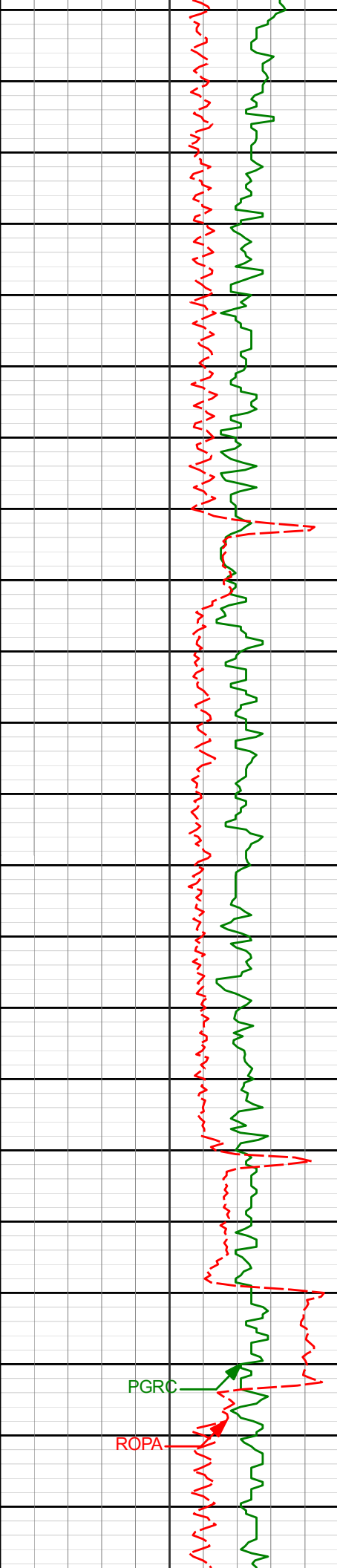
9742'

91.33°

359.86°

7363.52'

1756.99'



9836' 91.14° 358.29° 7361.49' 1850.96'

9850'

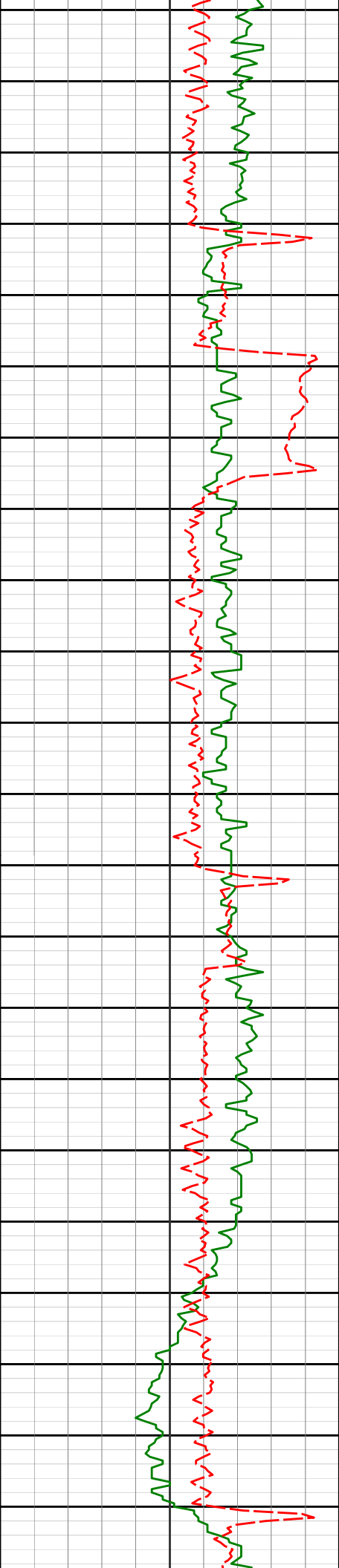
9900'

9926' 91.26° 357.39° 7359.61' 1940.92'

9950'

10000'

10016' 91.36° 358.80° 7357.55' 2030.87'



10050'

10100'

10150'

10200'

10105'

89.85°

0.96°

7356.61'

2119.85'

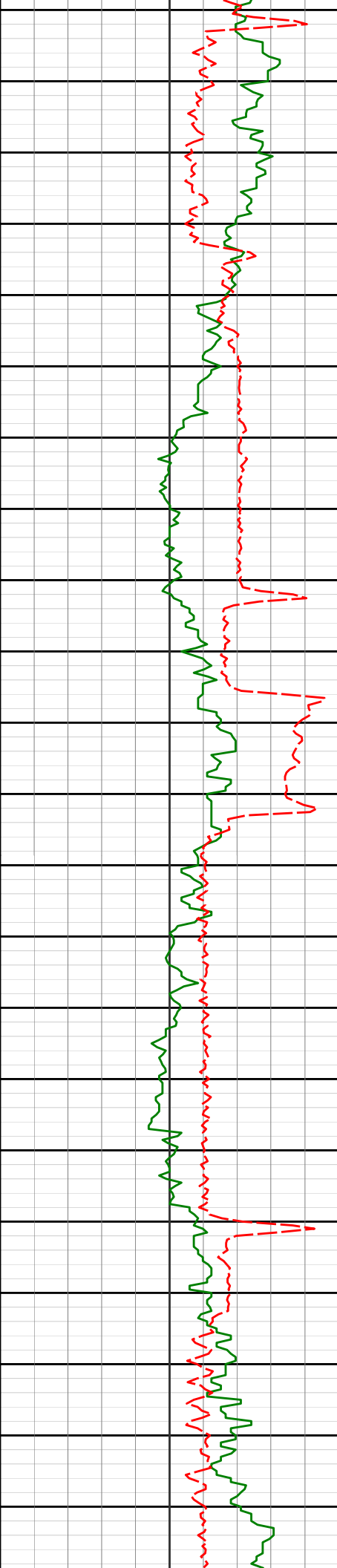
10195'

90.31°

0.02°

7356.49'

2209.83'



10250'

10285'

90.89°

359.32°

7355.55'

2299.82'

10300'

10350'

10374'

88.74°

359.96°

7355.84'

2388.81'

10400'

10450'

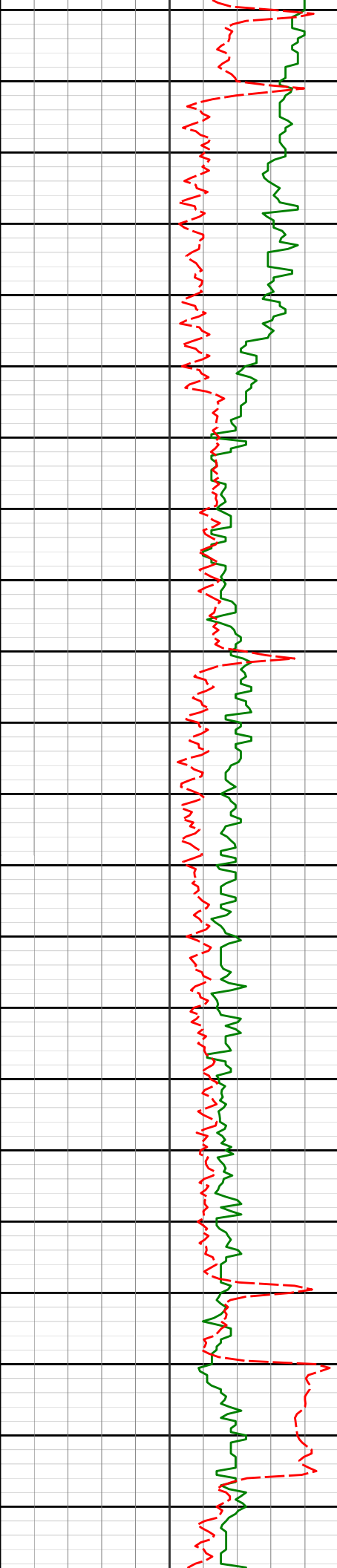
10464'

88.64°

359.03°

7357.89'

2478.79'



10700'

10734'

89.14°

357.24°

7363.18'

2748.66'

10750'

10800'

10823'

89.20°

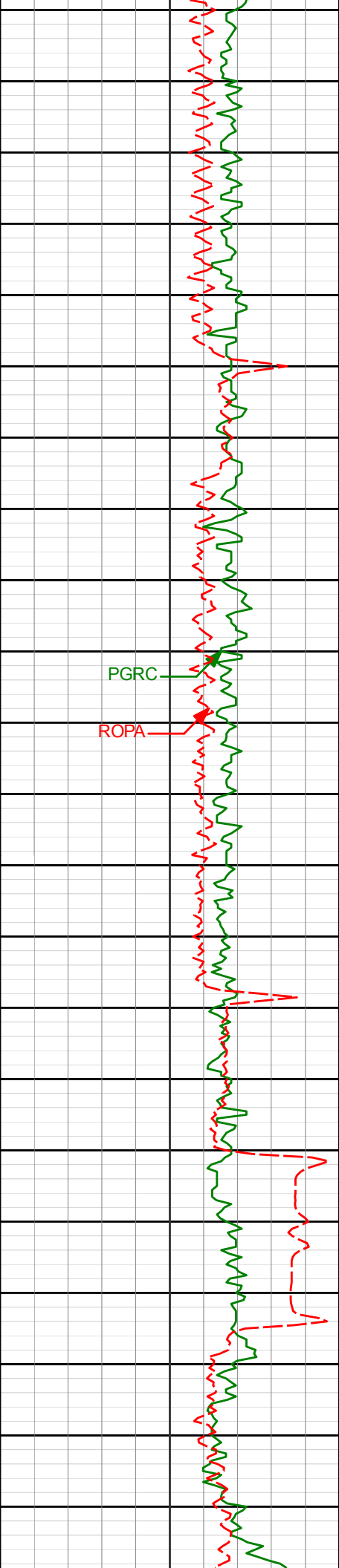
356.38°

7364.47'

2837.57'

10850'

10900'



10950'

11000'

11050'

11100'

10913'

89.57°

357.10°

7365.44'

2927.48'

11003'

89.82°

355.84°

7365.92'

3017.38'

11093'

90.52°

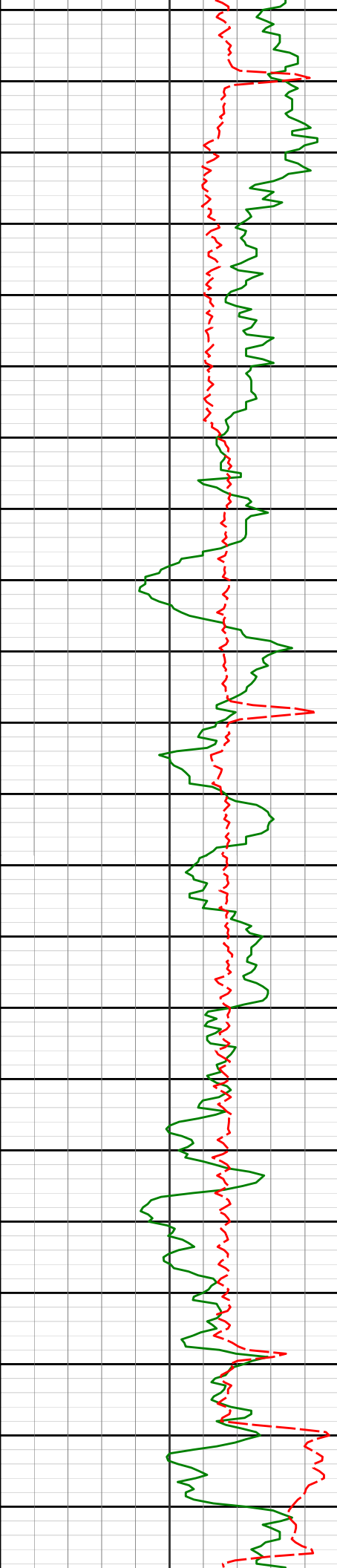
359.91°

7365.66'

3107.33'

PGRC

ROPA



11150'

11182'

90.59°

359.44°

7364.79'

3196.33'

11200'

11250'

11272'

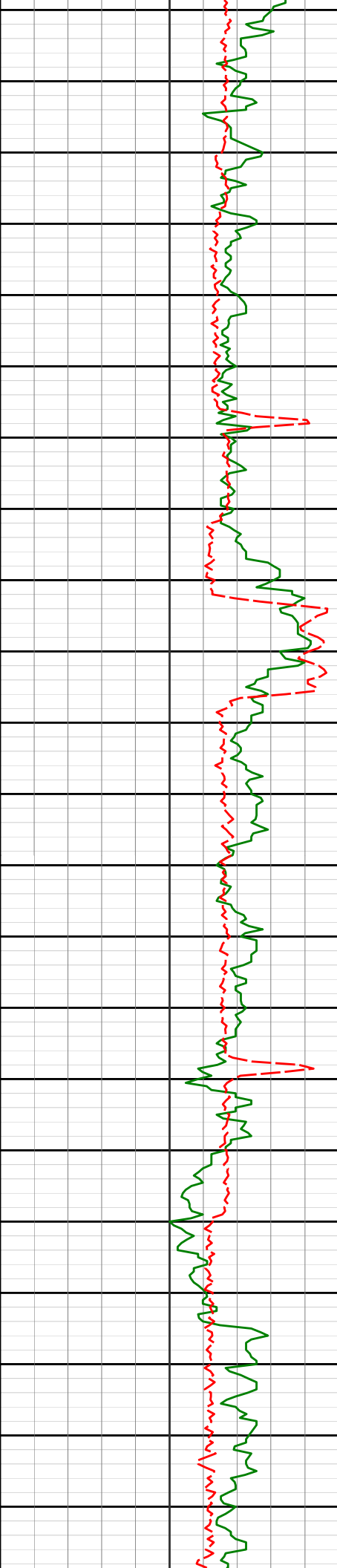
92.19°

359.28°

7362.61'

3286.30'

11300'



11350'

11362'

90.37°

0.69°

7360.60'

3376.26'

11400'

11450'

11452'

89.88°

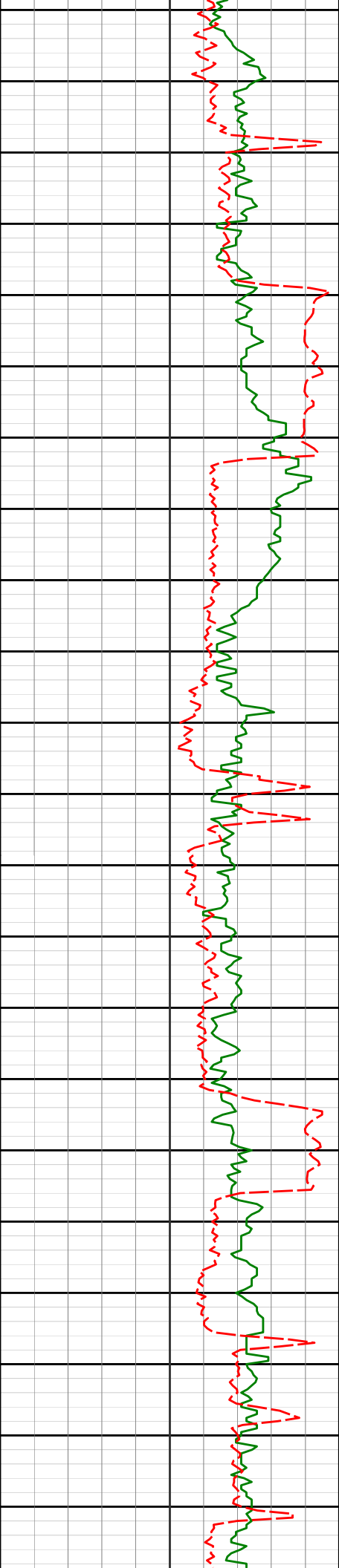
1.98°

7360.41'

3466.20'

11500'

11550'



11600'

11631'

86.67°

0.48°

7365.81'

3644.97'

11650'

11700'

11721'

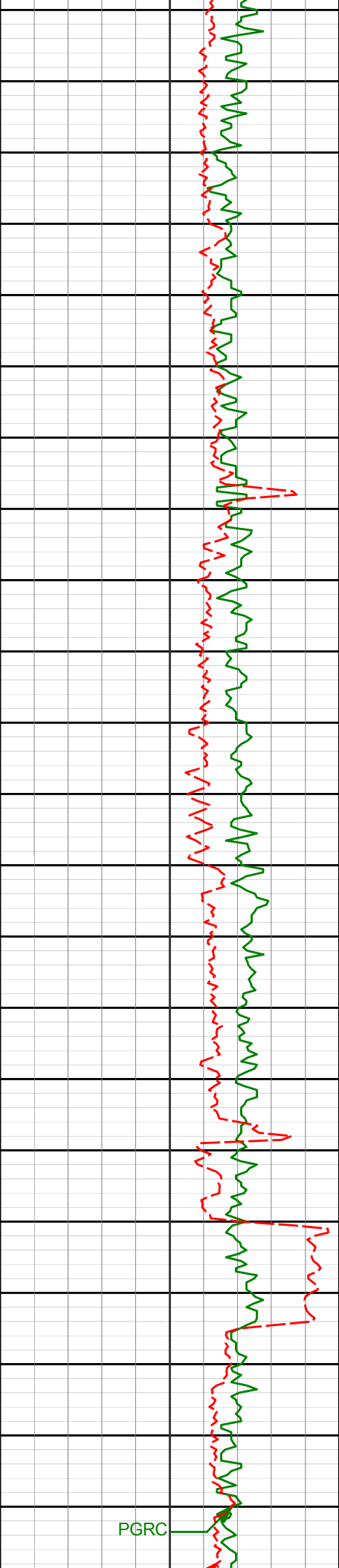
87.69°

359.42°

7370.24'

3734.85'

11750'



11800'

11811'

88.77°

358.47°

7373.02'

3824.81'

11850'

11900'

11900'

88.80°

357.34°

7374.91'

3913.76'

11950'

11990'

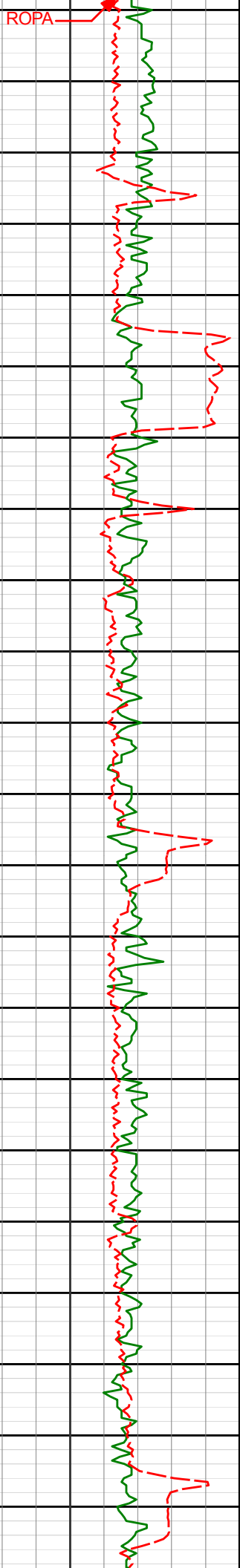
91.42°

357.44°

7374.74'

4003.71'

12000'



12050'

12080'

12100'

12150'

12170'

12200'

90.40°

359.02°

7373.32'

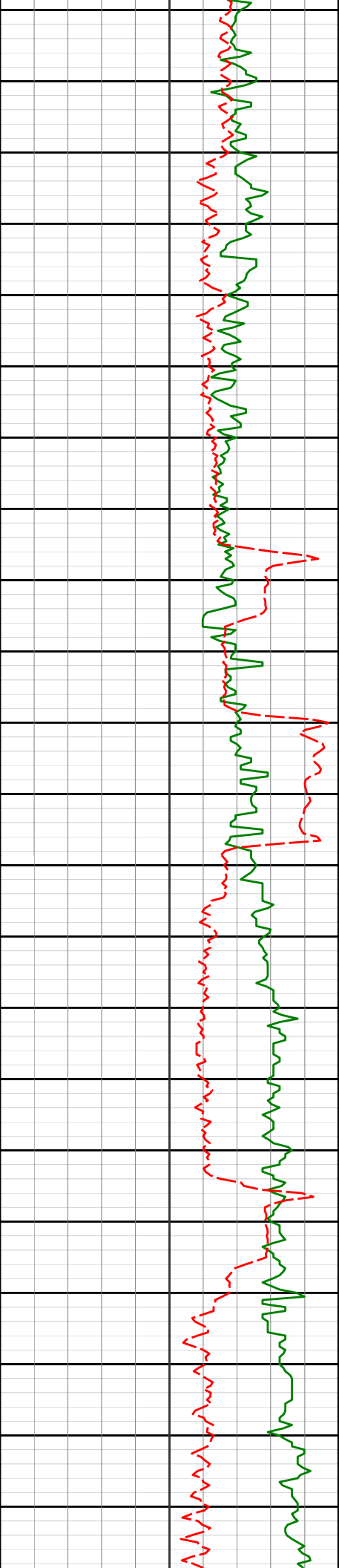
4093.68'

90.46°

358.12°

7372.64'

4183.67'



12250'

12260'

90.86°

357.27°

7371.60'

4273.63'

12300'

12350'

12349'

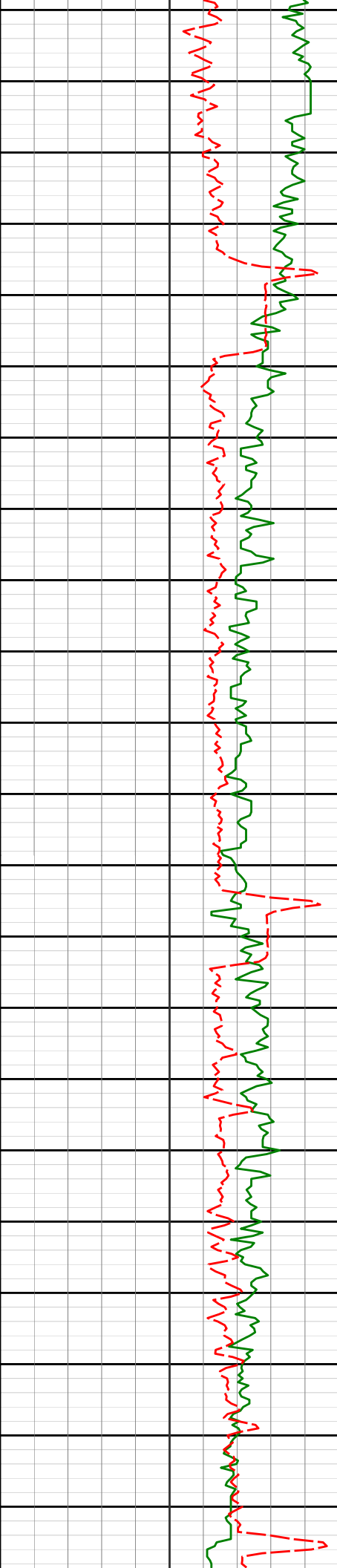
90.65°

359.39°

7370.42'

4362.61'

12400'



12529'

91.20°

357.37°

7367.51'

4542.56'

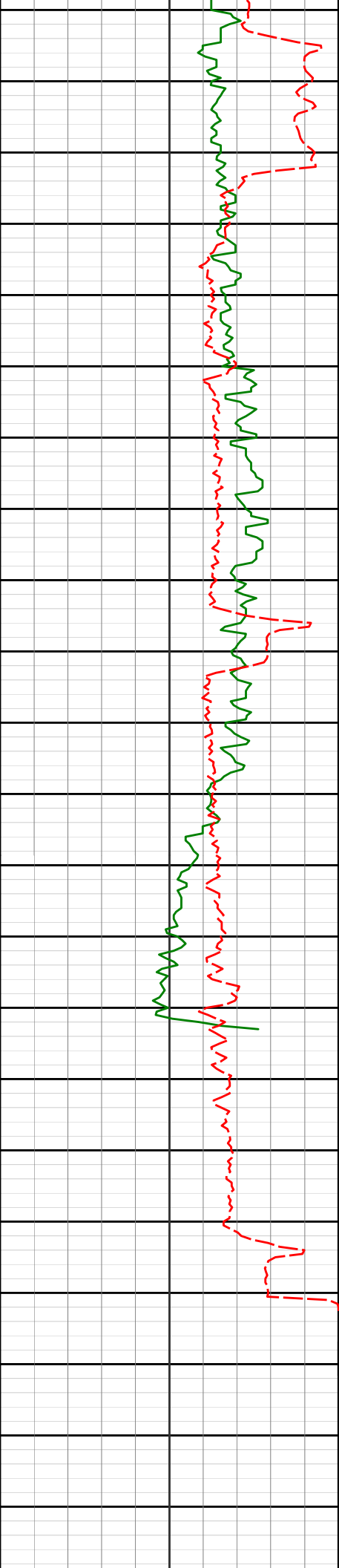
12619'

90.86°

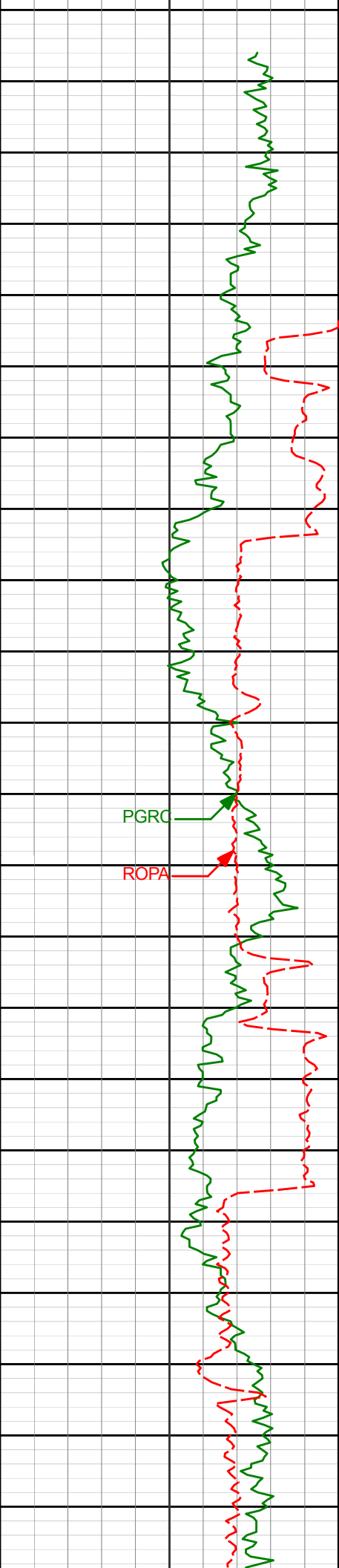
356.58°

7365.89'

4632.48'



12700'					
12708'	90.99°	359.43°	7364.46'	4721.44'	
12750'					
12800'	12798'	90.89°	358.14°	7362.98'	4811.42'
12850'					
See Remark #6					
12888'	91.30°	357.71°	7361.26'	4901.38'	



12900'

12950'

13000'

13050'

13100'

PGRC

ROPA

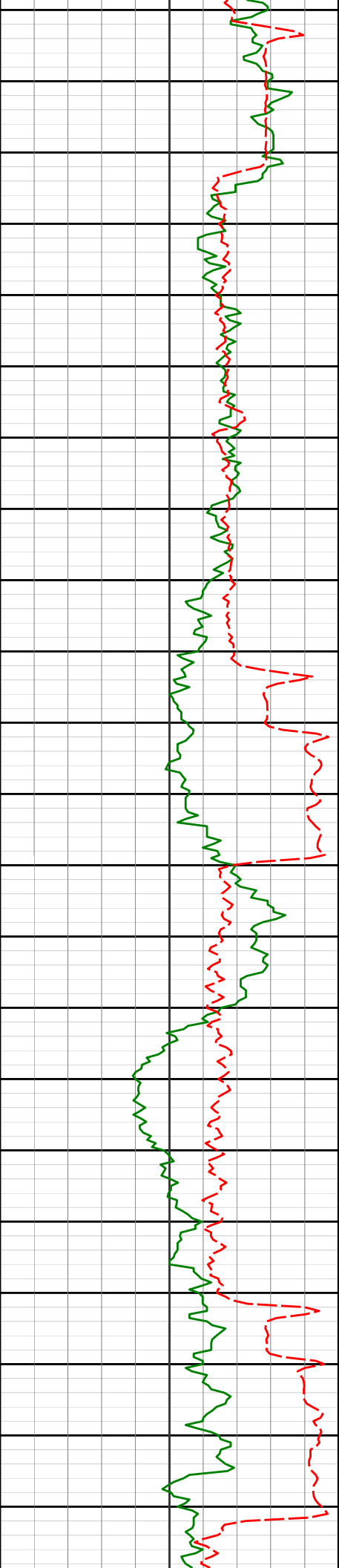
12977'

91.88°

358.90°

7358.79'

4990.33'



13150'

13157'

92.84°

1.89°

7351.38'

5170.12'

13200'

13250'

13247'

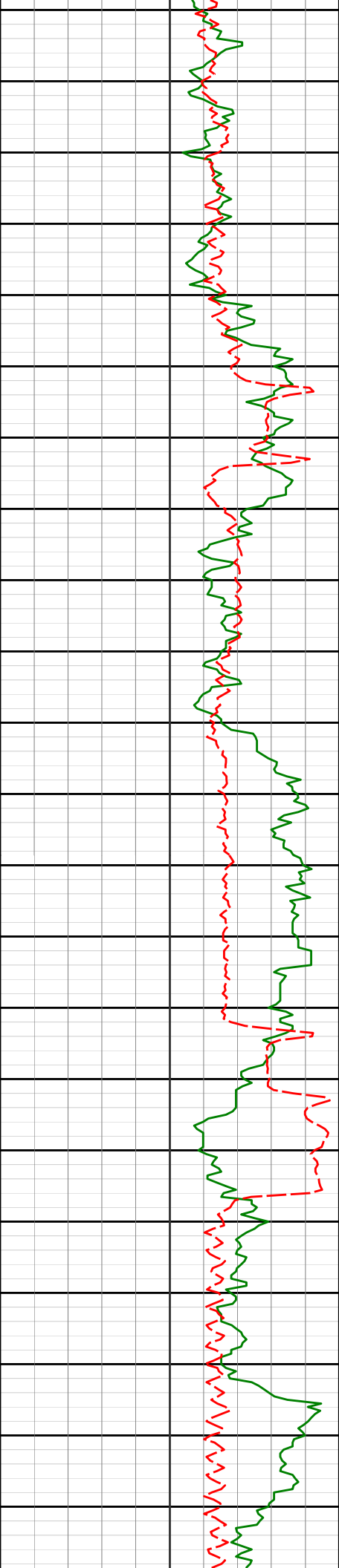
91.39°

2.88°

7348.06'

5259.91'

13300'



13350'

13400'

13450'

13500'

13426'

90.00°

1.87°

7345.89'

5438.62'

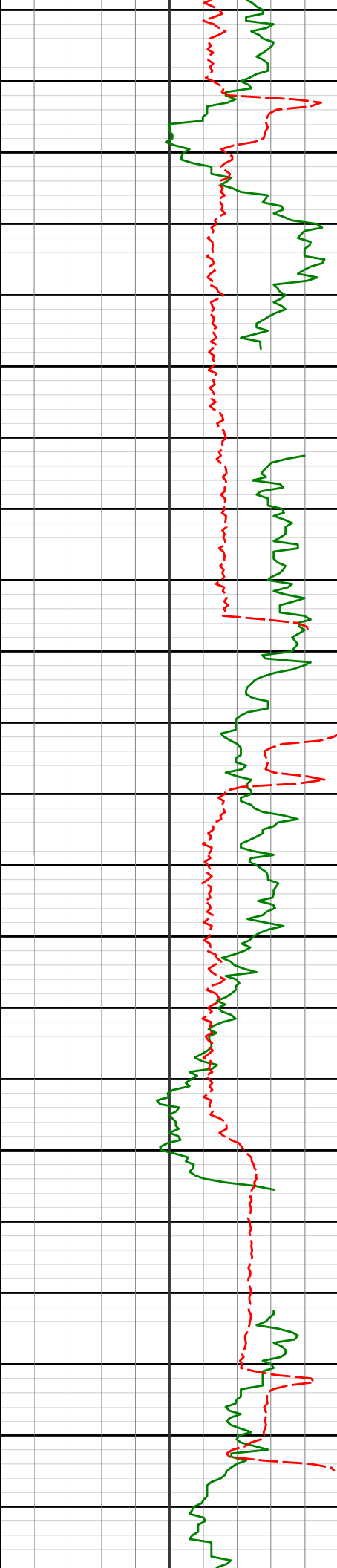
13516'

88.80°

1.91°

7346.84'

5528.51'



13550'

See Remark #6

13606'

13650'

13700'

See Remark #6

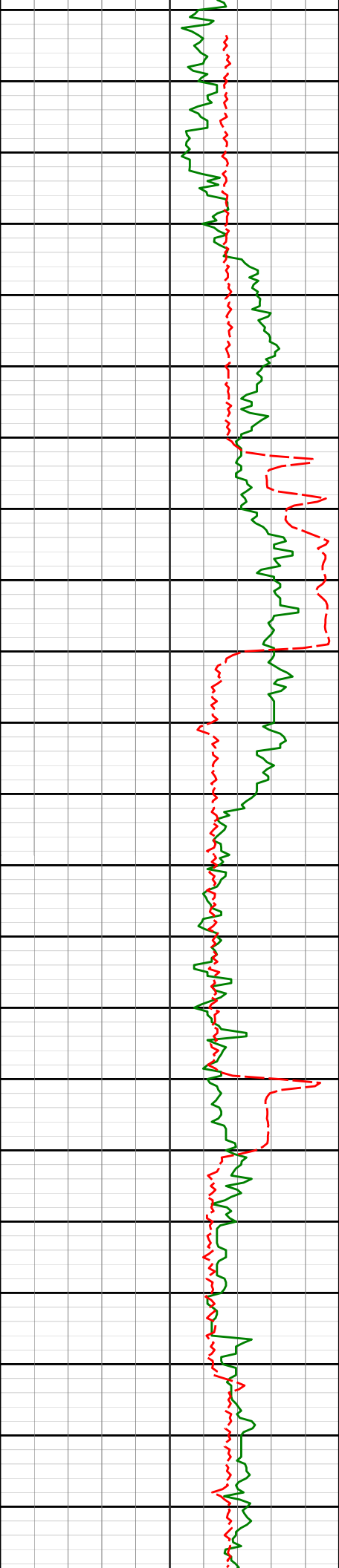
13750'

89.63°

1.16°

7348.07'

5618.43'



13785'

90.71°

359.50°

7347.54'

5797.39'

13800'

13850'

13875'

89.04°

358.96°

7347.74'

5887.38'

13900'

13950'

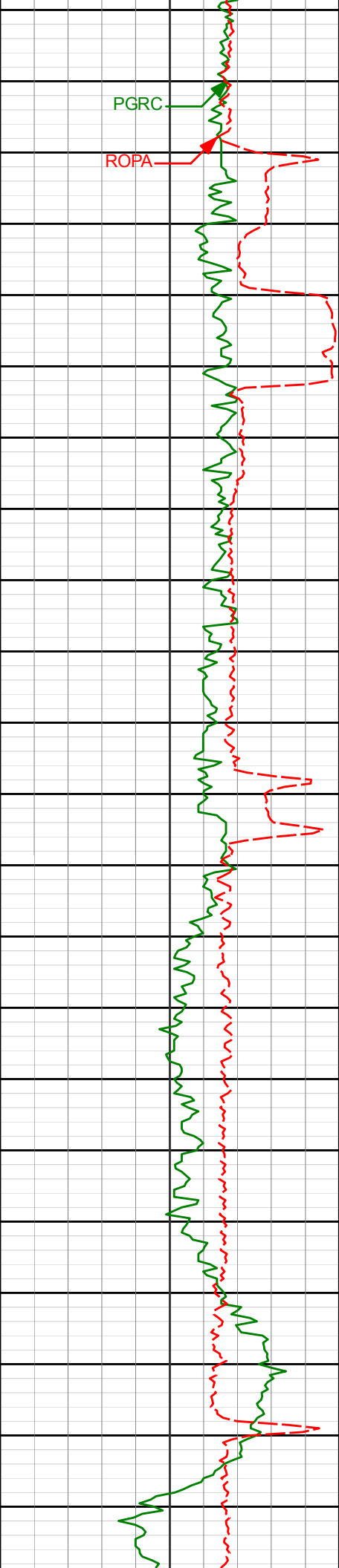
13965'

90.15°

358.37°

7348.37'

5977.37'



14000'

14050'

14100'

14150'

14200'

14055'

88.98°

359.40°

7349.04'

6067.37'

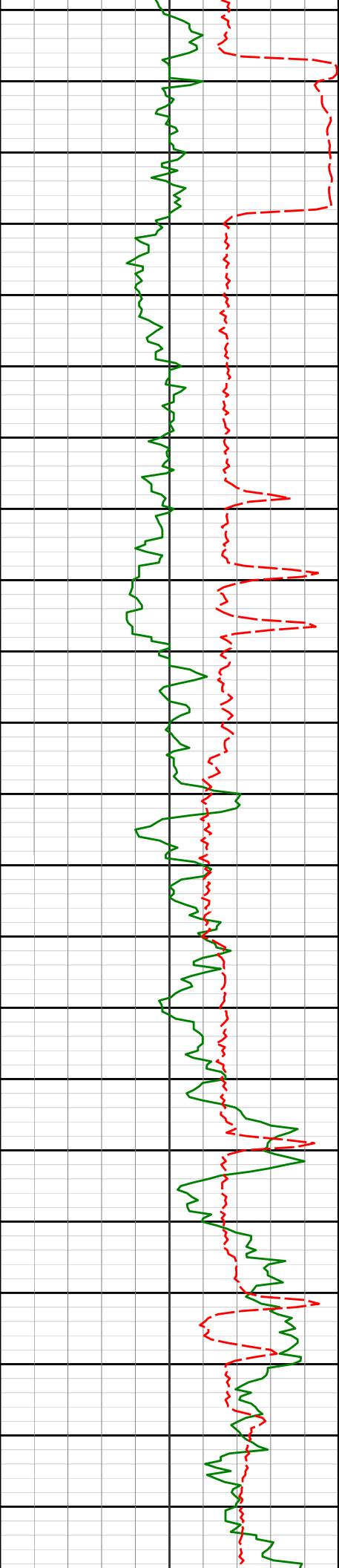
14144'

90.28°

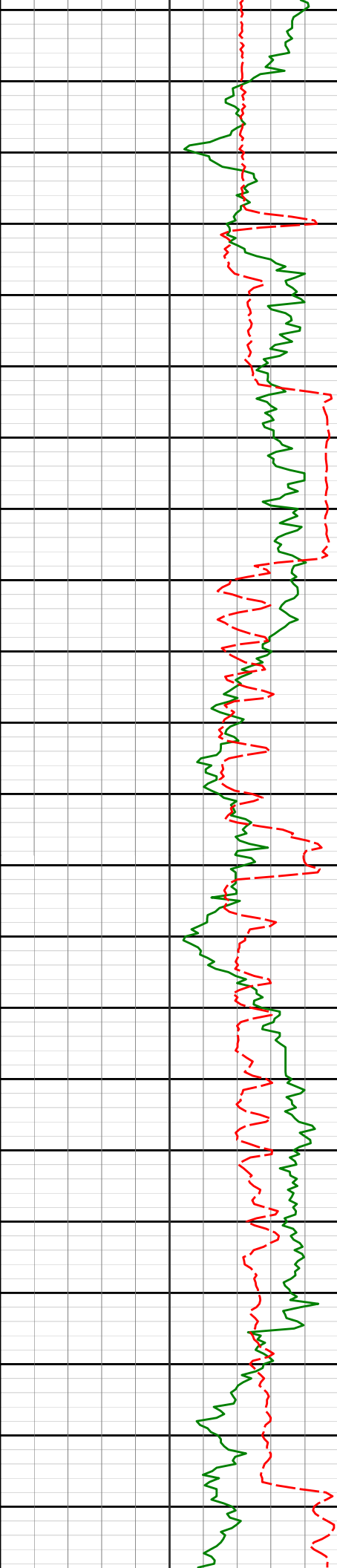
358.70°

7349.62'

6156.36'



14234'	88.52°	0.07°	7350.56'	6246.35'
14250'				
14300'				
14350'				
14400'				
14414'	91.23°	359.53°	7350.95'	6426.32'



14450'

14500'

14550'

14600'

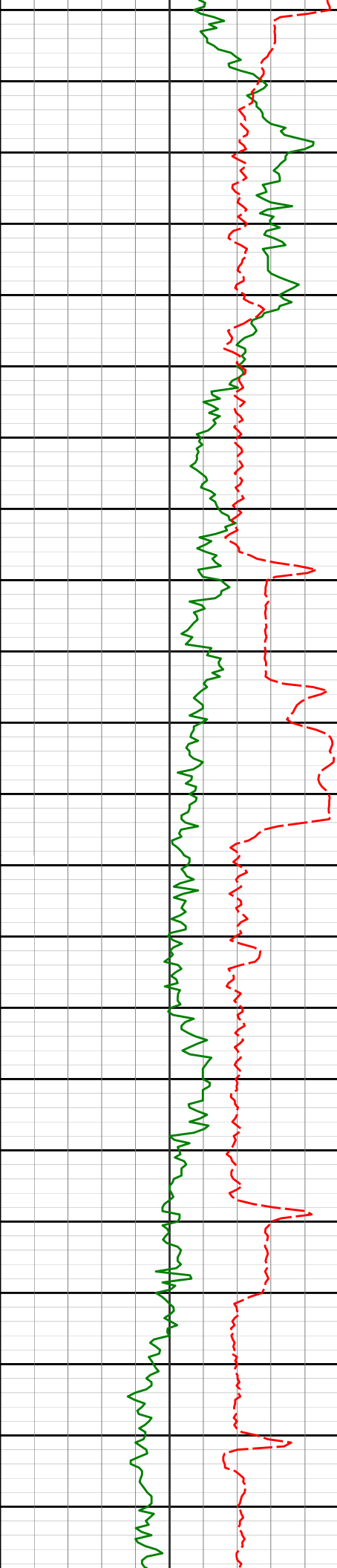
14503'

86.73°

359.97°

7352.53'

6515.28'



14683'

86.89°

359.42°

7362.56'

6695.00'

14700'

14750'

14800'

14850'

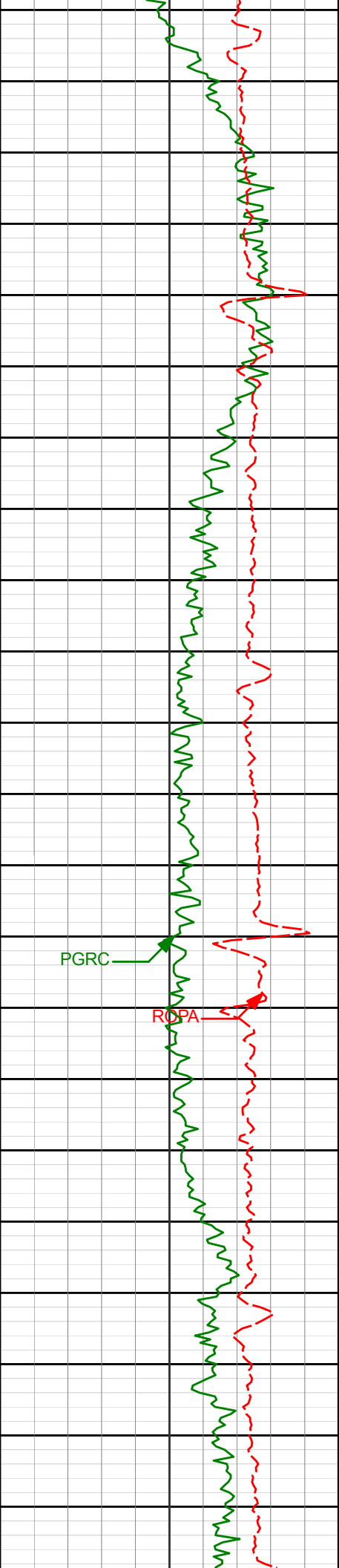
14862'

88.52°

357.79°

7369.74'

6873.83'



14900'

14950'

15000'

15050'

14952'

88.61°

357.22°

7371.99'

6963.76'

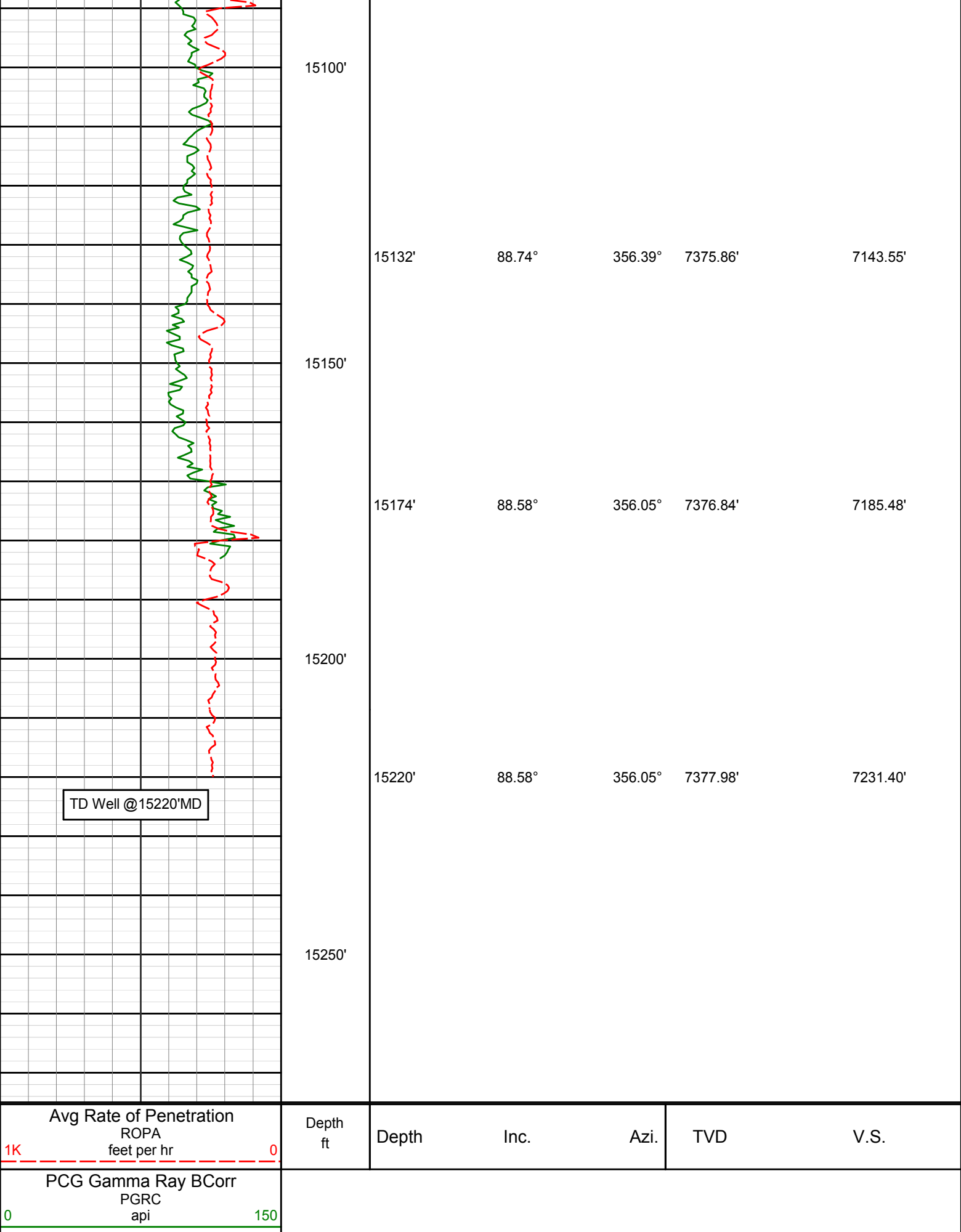
15042'

88.86°

356.65°

7373.97'

7053.67'



DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp
Wagner 1N-W10HZ
Wattenberg
Weld Colorado
USA

CA-XX-0904337676

Surveys from 133' to 1831' provided by third party

<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>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
133.00	0.18	52.43	133.00	0.13 N	0.17 E	0.13	0.14
165.00	0.31	125.20	165.00	0.11 N	0.28 E	0.10	0.97
197.00	0.04	98.22	197.00	0.06 N	0.36 E	0.05	0.86
229.00	0.22	210.63	229.00	0.00 N	0.34 E	-0.00	0.74
260.00	0.31	162.12	260.00	0.13 S	0.33 E	-0.13	0.75
292.00	0.35	169.68	292.00	0.31 S	0.38 E	-0.31	0.18
324.00	0.57	217.14	324.00	0.53 S	0.30 E	-0.53	1.32
355.00	0.88	191.74	355.00	0.89 S	0.16 E	-0.89	1.42
387.00	1.32	167.21	386.99	1.49 S	0.19 E	-1.49	1.98
419.00	1.41	175.30	418.98	2.24 S	0.30 E	-2.24	0.66
451.00	1.54	164.93	450.97	3.05 S	0.45 E	-3.05	0.93
483.00	1.76	155.79	482.96	3.91 S	0.76 E	-3.92	1.07
514.00	2.24	147.09	513.94	4.85 S	1.28 E	-4.87	1.83
546.00	2.55	142.43	545.91	5.94 S	2.06 E	-5.97	1.14
577.00	3.30	140.41	576.87	7.18 S	3.05 E	-7.22	2.44
609.00	4.31	138.65	608.80	8.79 S	4.43 E	-8.85	3.18
640.00	5.14	140.50	639.69	10.73 S	6.08 E	-10.82	2.72
672.00	5.67	139.53	671.55	13.04 S	8.02 E	-13.15	1.68
704.00	6.50	135.75	703.37	15.54 S	10.31 E	-15.69	2.88
736.00	7.43	135.57	735.13	18.32 S	13.02 E	-18.50	2.91
767.00	8.13	136.01	765.85	21.33 S	15.95 E	-21.55	2.27
799.00	8.57	136.72	797.51	24.69 S	19.15 E	-24.95	1.41
830.00	9.01	136.72	828.14	28.14 S	22.40 E	-28.45	1.42
862.00	9.98	136.63	859.71	31.98 S	26.02 E	-32.34	3.03
894.00	10.37	139.79	891.20	36.19 S	29.79 E	-36.61	2.13
925.00	11.03	143.48	921.66	40.71 S	33.35 E	-41.17	3.07
957.00	11.65	146.47	953.04	45.86 S	36.96 E	-46.37	2.67
988.00	12.08	147.97	983.38	51.22 S	40.41 E	-51.78	1.71
1020.00	12.44	148.67	1014.65	57.00 S	43.98 E	-57.61	1.22
1052.00	12.70	147.97	1045.88	62.93 S	47.63 E	-63.59	0.94
1083.00	12.83	147.53	1076.11	68.72 S	51.29 E	-69.43	0.52
1115.00	13.01	150.69	1107.30	74.86 S	54.96 E	-75.62	2.28
1147.00	13.58	153.59	1138.45	81.37 S	58.39 E	-82.17	2.74
1178.00	14.46	155.52	1168.52	88.15 S	61.62 E	-89.00	3.21
1210.00	14.90	155.79	1199.48	95.54 S	64.96 E	-96.43	1.39
1242.00	14.59	160.53	1230.43	103.09 S	67.99 E	-104.03	3.89
1274.00	14.63	160.45	1261.39	110.70 S	70.69 E	-111.67	0.14
1305.00	14.46	160.97	1291.40	118.05 S	73.26 E	-119.06	0.69
1337.00	14.33	164.14	1322.39	125.63 S	75.64 E	-126.68	2.50
1368.00	14.59	165.54	1352.41	133.10 S	77.67 E	-134.17	1.41
1400.00	14.99	167.65	1383.35	141.05 S	79.56 E	-142.15	2.10
1432.00	15.51	170.03	1414.22	149.31 S	81.18 E	-150.42	2.54
1463.00	16.35	173.54	1444.03	157.72 S	82.39 E	-158.86	4.12
1495.00	17.05	174.51	1474.68	166.87 S	83.35 E	-168.02	2.35
1527.00	17.67	174.51	1505.23	176.37 S	84.26 E	-177.53	1.94
1558.00	18.15	173.63	1534.72	185.85 S	85.25 E	-187.03	1.78
1590.00	18.94	173.54	1565.06	195.97 S	86.38 E	-197.16	2.47
1622.00	19.16	176.35	1595.31	206.37 S	87.30 E	-207.57	2.95
1652.00	19.91	176.71	1623.58	216.38 S	87.91 E	-217.59	2.53

Wagner 1N-W10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
1684.00	20.17	177.23	1653.65	227.33 S	88.49 E	-228.55	0.98
1716.00	20.08	177.41	1683.69	238.33 S	89.00 E	-239.55	0.34
1748.00	19.64	176.79	1713.79	249.19 S	89.55 E	-250.41	1.52
1780.00	19.38	175.65	1743.95	259.85 S	90.26 E	-261.09	1.44
1811.00	19.34	176.18	1773.20	270.10 S	90.99 E	-271.35	0.58
1831.00	19.20	176.44	1792.08	276.69 S	91.41 E	-277.94	0.82
1920.00	19.13	178.02	1876.15	305.87 S	92.83 E	-307.13	0.59
2010.00	19.11	177.73	1961.18	335.32 S	93.92 E	-336.60	0.11
2099.00	17.43	178.19	2045.70	363.20 S	94.92 E	-364.49	1.89
2189.00	15.66	178.48	2131.97	388.82 S	95.67 E	-390.11	1.98
2279.00	13.92	177.96	2218.98	411.78 S	96.38 E	-413.08	1.93
2368.00	13.44	176.73	2305.46	432.80 S	97.35 E	-434.12	0.64
2458.00	11.95	177.05	2393.26	452.54 S	98.42 E	-453.87	1.66
2548.00	11.50	176.19	2481.38	470.80 S	99.50 E	-472.14	0.53
2638.00	10.97	174.97	2569.65	488.28 S	100.85 E	-489.64	0.65
2727.00	10.56	182.65	2657.09	504.86 S	101.21 E	-506.23	1.68
2817.00	9.93	180.82	2745.66	520.86 S	100.72 E	-522.21	0.78
2907.00	9.66	182.31	2834.35	536.16 S	100.30 E	-537.51	0.41
2997.00	10.62	182.43	2922.94	551.98 S	99.65 E	-553.32	1.07
3086.00	9.93	181.17	3010.51	567.85 S	99.14 E	-569.18	0.81
3176.00	11.95	181.78	3098.87	584.92 S	98.70 E	-586.25	2.25
3266.00	11.30	181.20	3187.02	603.06 S	98.22 E	-604.37	0.73
3356.00	12.56	177.66	3275.08	621.65 S	98.44 E	-622.97	1.62
3446.00	11.85	175.82	3363.04	640.65 S	99.51 E	-641.98	0.90
3535.00	10.76	176.75	3450.32	658.06 S	100.65 E	-659.40	1.25
3625.00	12.29	180.10	3538.50	676.02 S	101.11 E	-677.37	1.85
3715.00	12.10	180.17	3626.47	695.03 S	101.06 E	-696.37	0.21
3805.00	10.94	178.88	3714.66	712.99 S	101.20 E	-714.34	1.32
3894.00	12.37	179.63	3801.82	730.97 S	101.43 E	-732.31	1.62
3984.00	11.29	179.76	3889.91	749.42 S	101.53 E	-750.77	1.20
4164.00	8.66	178.88	4067.17	780.59 S	101.87 E	-781.94	1.47
4254.00	7.62	179.45	4156.26	793.33 S	102.06 E	-794.68	1.15
4343.00	4.95	181.41	4244.72	803.08 S	102.02 E	-804.42	3.01
4433.00	4.36	188.17	4334.42	810.35 S	101.44 E	-811.68	0.90
4523.00	1.36	219.45	4424.31	814.56 S	100.27 E	-815.88	3.63
4613.00	1.31	245.27	4514.28	815.82 S	98.66 E	-817.12	0.67
4702.00	0.41	350.05	4603.27	815.92 S	97.68 E	-817.21	1.65
4792.00	0.58	2.40	4693.27	815.15 S	97.64 E	-816.43	0.22
4882.00	0.56	337.11	4783.27	814.28 S	97.49 E	-815.57	0.28
4972.00	1.28	145.78	4873.26	814.71 S	97.89 E	-816.00	2.03
5061.00	0.98	150.98	4962.24	816.20 S	98.81 E	-817.50	0.35
5151.00	0.70	151.43	5052.23	817.36 S	99.45 E	-818.66	0.32
5241.00	0.36	173.89	5142.23	818.12 S	99.74 E	-819.43	0.43
5421.00	0.39	179.59	5322.23	819.29 S	99.81 E	-820.61	0.03
5510.00	0.55	175.00	5411.22	820.02 S	99.85 E	-821.33	0.18
5600.00	0.45	203.29	5501.22	820.77 S	99.75 E	-822.08	0.29
5690.00	0.17	347.90	5591.22	820.96 S	99.58 E	-822.27	0.67
5780.00	0.63	344.69	5681.22	820.35 S	99.42 E	-821.65	0.51
5860.00	0.84	342.09	5761.21	819.36 S	99.12 E	-820.67	0.26
5999.00	1.35	330.94	5900.18	816.97 S	98.01 E	-818.26	0.39
6089.00	1.76	331.19	5990.15	814.83 S	96.83 E	-816.10	0.47
6178.00	1.46	24.16	6079.12	812.59 S	96.64 E	-813.86	1.65
6268.00	1.60	8.02	6169.09	810.30 S	97.29 E	-811.58	0.50
6358.00	0.84	60.90	6259.07	808.73 S	98.04 E	-810.02	1.43
6448.00	0.76	29.50	6349.06	807.89 S	98.91 E	-809.19	0.49
6538.00	0.89	20.64	6439.05	806.72 S	99.45 E	-808.03	0.20
6627.00	0.93	9.66	6528.04	805.37 S	99.81 E	-806.68	0.20
6717.00	1.21	7.00	6618.02	803.71 S	100.05 E	-805.03	0.32
6807.00	1.83	13.00	6707.99	801.37 S	100.49 E	-802.69	0.72
6896.00	9.48	9.99	6796.49	792.75 S	102.08 E	-794.10	8.59

Wagner 1N-W10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
6986.00	13.72	12.60	6884.64	775.03 S	105.69 E	-776.43	4.75
7076.00	19.91	5.49	6970.76	749.33 S	109.49 E	-750.79	7.23
7166.00	27.42	3.69	7053.13	713.35 S	112.29 E	-714.85	8.38
7256.00	40.00	359.65	7127.86	663.54 S	113.45 E	-665.06	14.19
7345.00	52.18	356.33	7189.48	599.61 S	111.02 E	-601.10	13.94
7435.00	58.32	355.45	7240.76	525.89 S	105.70 E	-527.32	6.87
7525.00	66.98	357.70	7282.07	446.18 S	100.99 E	-447.55	9.88
7615.00	72.86	358.99	7312.96	361.72 S	98.56 E	-363.06	6.67
7704.00	77.01	359.06	7336.09	275.81 S	97.10 E	-277.14	4.66
7794.00	79.45	0.10	7354.44	187.72 S	96.45 E	-189.04	2.94
7884.00	88.40	359.86	7363.96	98.31 S	96.42 E	-99.65	9.94
7974.00	89.60	1.18	7365.53	8.33 S	97.23 E	-9.69	1.98
8063.00	90.62	0.40	7365.36	80.66 N	98.45 E	79.27	1.44
8153.00	91.57	0.67	7363.65	170.64 N	99.29 E	169.23	1.10
8243.00	89.01	2.96	7363.19	260.58 N	102.14 E	259.12	3.81
8333.00	89.54	3.05	7364.32	350.44 N	106.86 E	348.92	0.59
8423.00	90.77	2.98	7364.08	440.32 N	111.59 E	438.72	1.37
8517.00	88.64	1.12	7364.56	534.25 N	114.96 E	532.59	3.01
8611.00	88.98	0.91	7366.51	628.21 N	116.62 E	626.52	0.43
8705.00	89.20	0.03	7368.00	722.20 N	117.40 E	720.49	0.96
8800.00	89.66	359.61	7368.95	817.19 N	117.10 E	815.48	0.66
8894.00	90.19	358.82	7369.08	911.18 N	115.80 E	909.47	1.01
8988.00	90.12	357.43	7368.82	1005.13 N	112.72 E	1003.45	1.48
9082.00	89.94	357.06	7368.77	1099.02 N	108.20 E	1097.40	0.44
9177.00	89.75	356.67	7369.03	1193.87 N	103.01 E	1192.32	0.46
9271.00	90.12	356.36	7369.13	1287.70 N	97.29 E	1286.22	0.51
9365.00	90.34	358.25	7368.75	1381.59 N	92.87 E	1380.16	2.02
9459.00	89.88	357.29	7368.57	1475.52 N	89.22 E	1474.13	1.13
9553.00	91.11	1.40	7367.76	1569.49 N	88.15 E	1568.10	4.56
9648.00	91.36	0.74	7365.72	1664.45 N	89.92 E	1663.03	0.74
9742.00	91.33	359.86	7363.52	1758.42 N	90.41 E	1756.99	0.94
9836.00	91.14	358.29	7361.49	1852.38 N	88.89 E	1850.96	1.68
9926.00	91.26	357.39	7359.61	1942.30 N	85.49 E	1940.92	1.01
10016.00	91.36	358.80	7357.55	2032.22 N	82.49 E	2030.87	1.57
10105.00	89.85	0.96	7356.61	2121.21 N	82.31 E	2119.85	2.97
10195.00	90.31	0.02	7356.49	2211.20 N	83.08 E	2209.83	1.17
10285.00	90.89	359.32	7355.55	2301.20 N	82.55 E	2299.82	1.02
10374.00	88.74	359.96	7355.84	2390.19 N	81.99 E	2388.81	2.53
10464.00	88.64	359.03	7357.89	2480.16 N	81.20 E	2478.79	1.03
10644.00	88.95	357.52	7361.67	2660.03 N	75.78 E	2658.72	0.86
10734.00	89.14	357.24	7363.18	2749.93 N	71.66 E	2748.66	0.37
10823.00	89.20	356.38	7364.47	2838.78 N	66.71 E	2837.57	0.96
10913.00	89.57	357.10	7365.44	2928.63 N	61.60 E	2927.48	0.90
11003.00	89.82	355.84	7365.92	3018.45 N	56.07 E	3017.38	1.43
11093.00	90.52	359.91	7365.66	3108.37 N	52.73 E	3107.33	4.59
11182.00	90.59	359.44	7364.79	3197.37 N	52.23 E	3196.33	0.54
11272.00	92.19	359.28	7362.61	3287.33 N	51.22 E	3286.30	1.79
11362.00	90.37	0.69	7360.60	3377.30 N	51.19 E	3376.26	2.56
11452.00	89.88	1.98	7360.41	3467.28 N	53.28 E	3466.20	1.54
11631.00	86.67	0.48	7365.81	3646.13 N	57.13 E	3644.97	1.98
11721.00	87.69	359.42	7370.24	3736.01 N	57.05 E	3734.85	1.63
11811.00	88.77	358.47	7373.02	3825.95 N	55.39 E	3824.81	1.60
11900.00	88.80	357.34	7374.91	3914.87 N	52.14 E	3913.76	1.27
11990.00	91.42	357.44	7374.74	4004.77 N	48.04 E	4003.71	2.91
12080.00	90.40	359.02	7373.32	4094.71 N	45.25 E	4093.68	2.09
12170.00	90.46	358.12	7372.64	4184.68 N	43.01 E	4183.67	1.00
12260.00	90.86	357.27	7371.60	4274.60 N	39.39 E	4273.63	1.04
12349.00	90.65	359.39	7370.42	4363.55 N	36.79 E	4362.61	2.39
12529.00	91.20	357.37	7367.51	4543.44 N	31.70 E	4542.56	1.16
12619.00	90.86	356.58	7365.89	4633.30 N	26.94 E	4632.48	0.96

Wagner 1N-W10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
12708.00	90.99	359.43	7364.46	4722.23 N	23.84 E	4721.44	3.21
12798.00	90.89	358.14	7362.98	4812.19 N	21.93 E	4811.42	1.44
12888.00	91.30	357.71	7361.26	4902.12 N	18.67 E	4901.38	0.65
12977.00	91.88	358.90	7358.79	4991.04 N	16.04 E	4990.33	1.48
13157.00	92.84	1.89	7351.38	5170.86 N	17.28 E	5170.12	1.75
13247.00	91.39	2.88	7348.06	5260.72 N	21.02 E	5259.91	1.95
13426.00	90.00	1.87	7345.89	5439.55 N	28.43 E	5438.62	0.96
13516.00	88.80	1.91	7346.84	5529.49 N	31.40 E	5528.51	1.34
13606.00	89.63	1.16	7348.07	5619.45 N	33.80 E	5618.43	1.25
13785.00	90.71	359.50	7347.54	5798.44 N	34.83 E	5797.39	1.10
13875.00	89.04	358.96	7347.74	5888.43 N	33.62 E	5887.38	1.94
13965.00	90.15	358.37	7348.37	5978.40 N	31.53 E	5977.37	1.40
14055.00	88.98	359.40	7349.04	6068.38 N	29.78 E	6067.37	1.73
14144.00	90.28	358.70	7349.62	6157.36 N	28.30 E	6156.36	1.65
14234.00	88.52	0.07	7350.56	6247.34 N	27.33 E	6246.35	2.47
14414.00	91.23	359.53	7350.95	6427.32 N	26.69 E	6426.32	1.54
14503.00	86.73	359.97	7352.53	6516.29 N	26.30 E	6515.28	5.09
14683.00	86.89	359.42	7362.56	6696.00 N	25.35 E	6695.00	0.32
14862.00	88.52	357.79	7369.74	6874.79 N	20.99 E	6873.83	1.29
14952.00	88.61	357.22	7371.99	6964.68 N	17.07 E	6963.76	0.64
15042.00	88.86	356.65	7373.97	7054.53 N	12.26 E	7053.67	0.68
15132.00	88.74	356.39	7375.86	7144.34 N	6.80 E	7143.55	0.32
15174.00	88.58	356.05	7376.84	7186.24 N	4.04 E	7185.48	0.89
15220.00	88.58	356.05	7377.98	7232.12 N	0.87 E	7231.40	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 359.20 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 15220.00 FEET
IS 7232.12 FEET ALONG 0.01 DEGREES (TRUE)

First Sperry survey at 1920'.
Last survey is a projection to bit at TD.
Surveys from 1920 to 15174 are corrected by Alaska Survey Management.