

PCG Pressure Case Gamma PCD Pressure Case Directional

1:600 / 1:240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	17-Dec-14	19-Dec-14			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	1,211.00	6,036.00			
Log End Depth (MD, ft)	6,036.00	9,885.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	15-Dec-14 18:30	18-Dec-14 07:00			
Drill/Wipe End Date and Time	16-Dec-14 21:00	19-Dec-14 11:15			
Min Inc (deg) @ Depth (MD, ft)	0.46 @ 1,289.00	86.98 @ 6,081.00			
Max Inc (deg) @ Depth (MD, ft)	85.77 @ 5,978.00	91.42 @ 9,308.00			
Bit TFA(in2) / Bit Type	1.21 / PDC	0.98 / PDC			
Flow Rate (gpm)	578.03	300.00			
Max AV (fpm) / CV (fpm) @ MWD	424.6 / 400.0	444.6 / 400.0			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	9.05 / 41.00	10.10 / 36.00			
Filtrate CL (ppm)	2,100.00	2,100.00			
pH / Fluid Loss (mptm)	10.10 / 7	10.90 / 10			
PV (cP) / YP (lbf2)	12 / 11.00	8 / 9.00			
% Solids / % Sand	5.7 / 0.25	8.20 / 0.20			
% Oil / Oil:Water Ratio	0.50 / NA	NA / NA			
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA			
Max Tool Temp (in F) / C	459.45 / 238.03	335.40 / 169.11			

Max Tool Temp (degF) / Source	158.47 / PCM	205.16 / PCM			
Rm @ Max Tool Temp (degF)	NA @ 158.47	NA @ NA			
Lead MWD Engineer	Kyle Wass	Kyle Wass			
Customer Representative	Seth Mulherin	Seth Mulherin			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11341350	11404285			
Insert Serial Number	11619985	11619985			
Date and Time Initialized	15-Dec-14 03:02	17-Dec-14 08:51			
Date and Time Read	17-Dec-14 03:28	19-Dec-14 18:37			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	58.00	57.00			
Software Version	6.21	6.21			
Sub Serial Number	11341350	12314810			
Sonde Serial Number	11478016	11478016			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	192.30	250.10			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	51.09	50.10			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341350	12314810			
Insert/Sonde Serial Number	12037419	12037419			

REMARKS

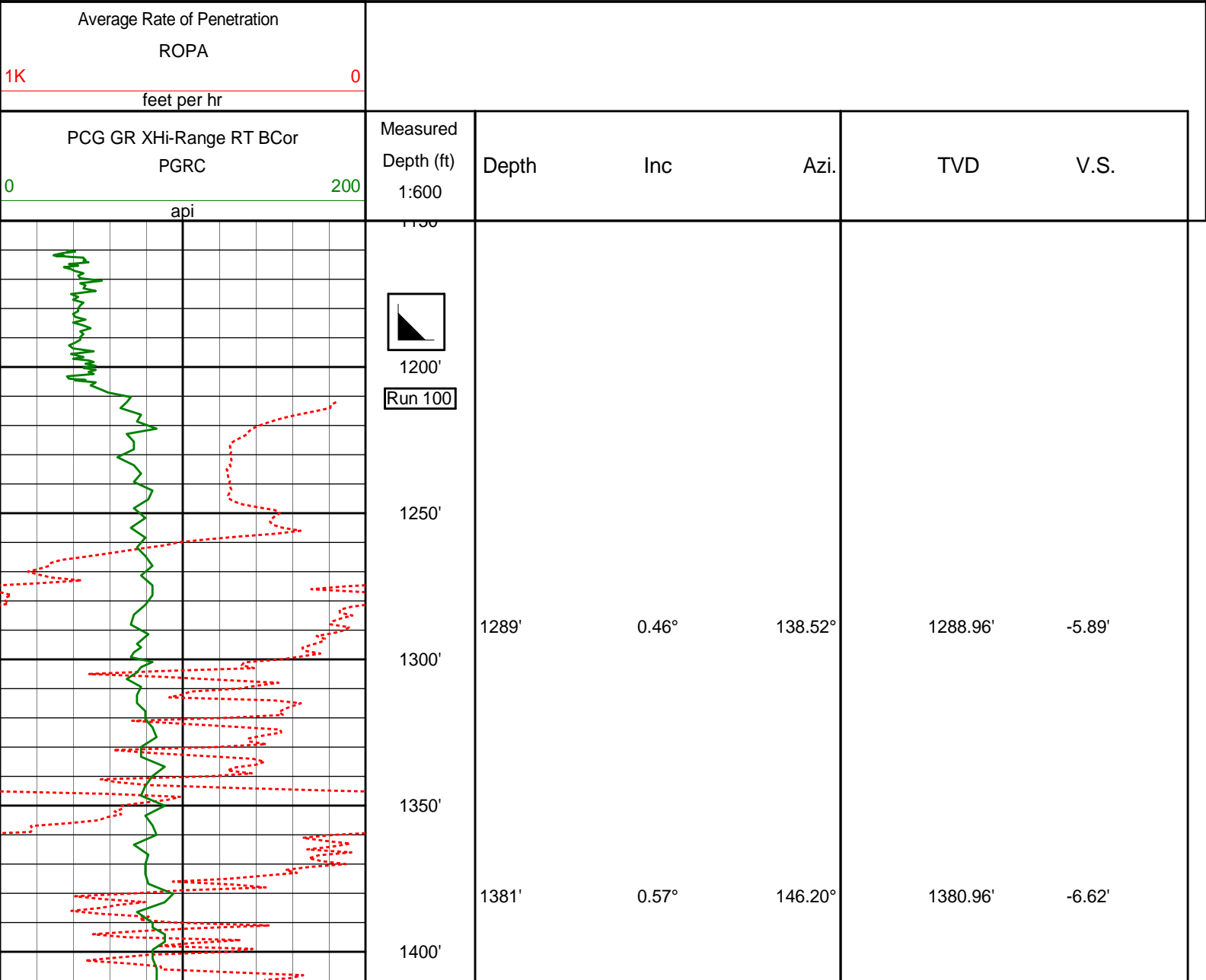
1. All depths are referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
PGRC (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft
ROPA (Average Rate of Penetration)
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill: 3.0 ft
6. INSITE version 8.0.2

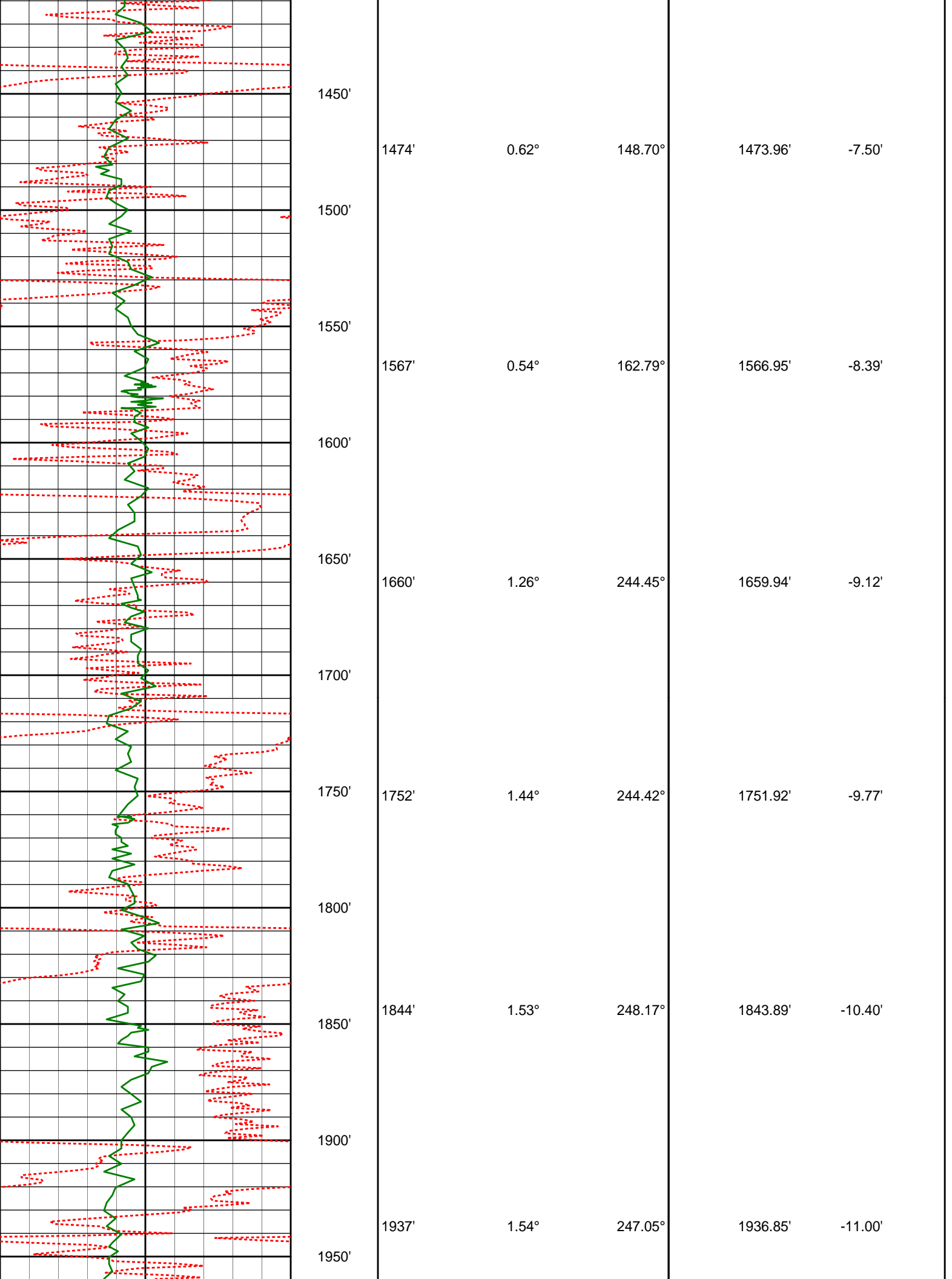
WARRANTY

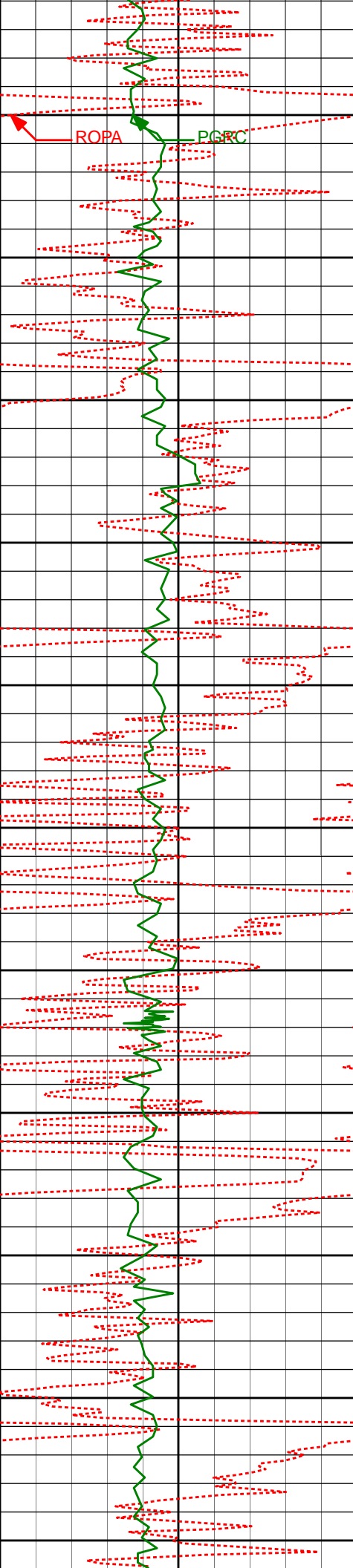
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HALLIBURTON

MD Main Log 1:600







2000'

2029'

1.65°

247.36°

2028.82'

-11.64'

2050'

2100'

2122'

1.53°

248.31°

2121.78'

-12.26'

2150'

2200'

2215'

1.53°

249.12°

2214.75'

-12.81'

2250'

2300'

2307'

1.32°

245.36°

2306.72'

-13.38'

2350'

2400'

2402'

0.52°

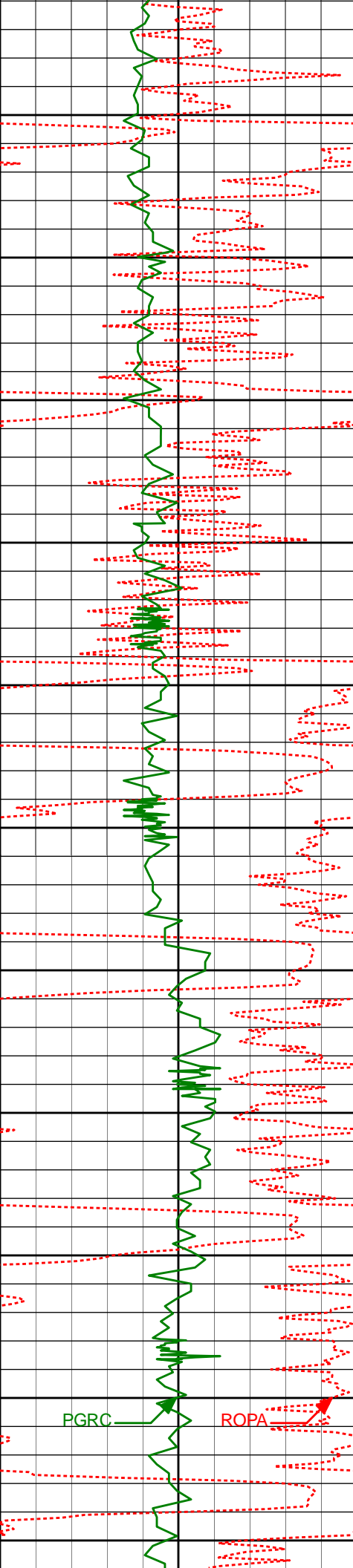
301.98°

2401.71'

-13.40'

2450'

2500'



2550'

2592'

0.80°

296.35°

2591.69'

-12.08'

2600'

2650'

2687'

0.90°

293.25°

2686.68'

-11.31'

2700'

2750'

2782'

1.82°

275.90°

2781.66'

-10.55'

2800'

2850'

2877'

3.85°

273.37°

2876.53'

-9.53'

2900'

2950'

2972'

4.63°

270.46°

2971.27'

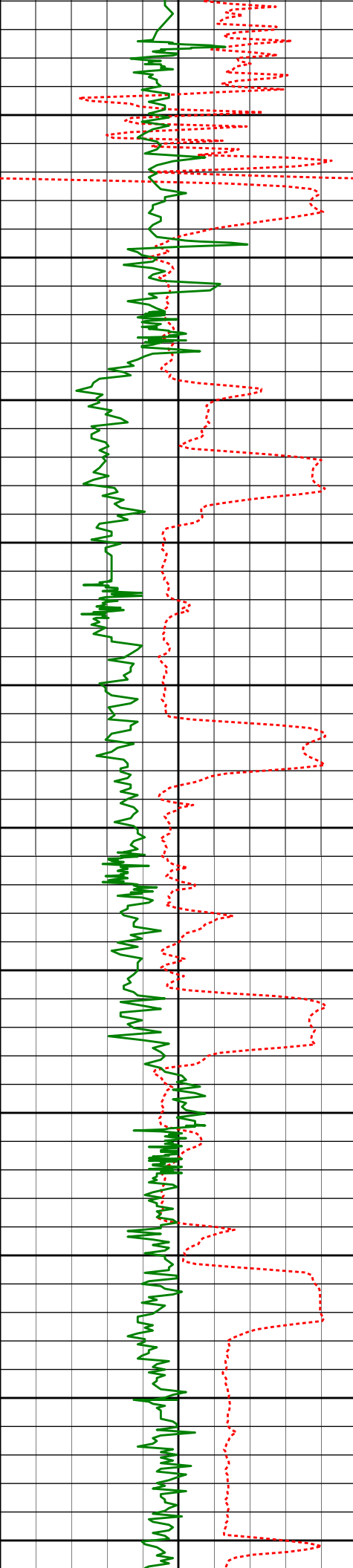
-8.29'

3000'

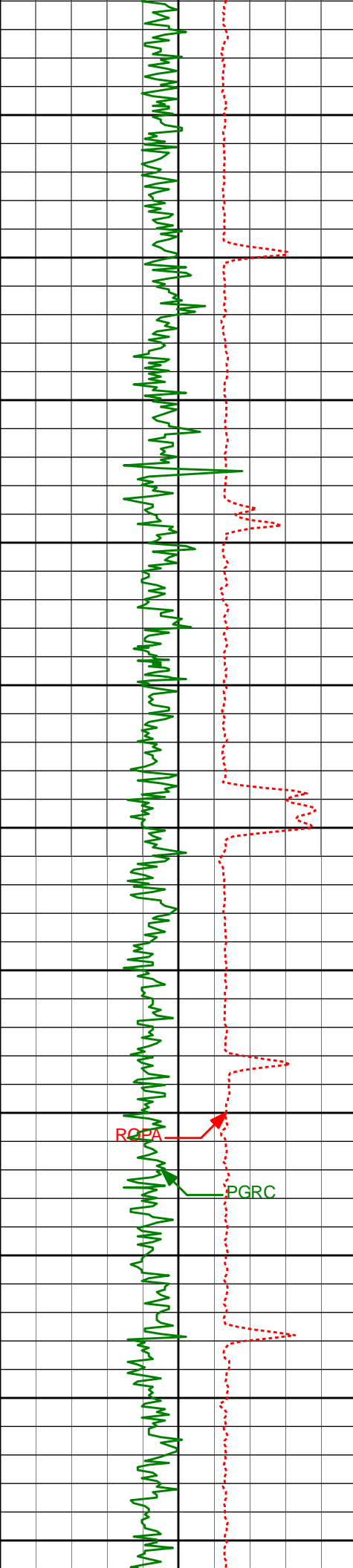
3050'

PGRC

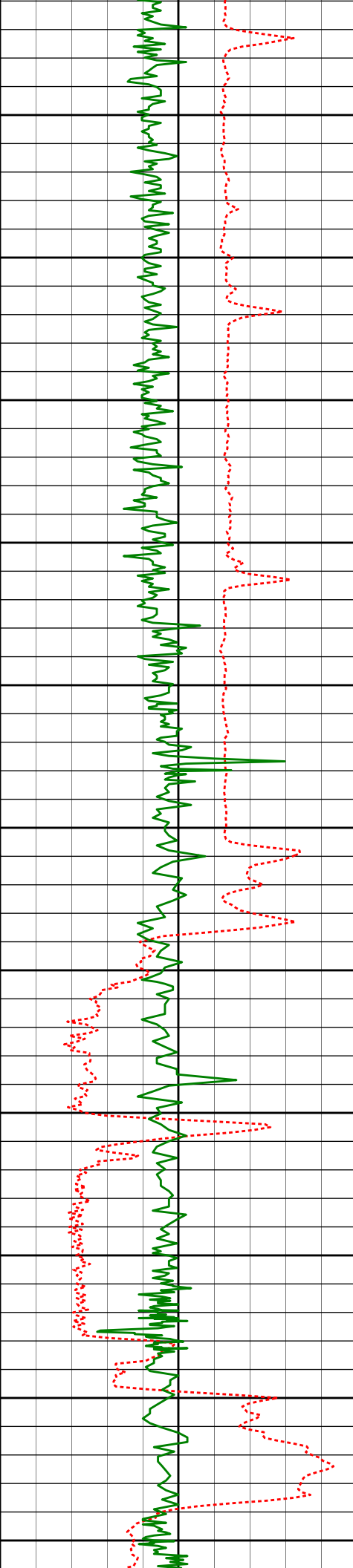
ROPA



3067'	5.76°	265.63°	3065.88'	-7.37'
3100'				
3150'				
3162'	6.48°	262.63°	3160.34'	-6.95'
3200'				
3250'	7.35°	258.57°	3254.65'	-7.18'
3300'				
3350'	9.10°	252.71°	3349.66'	-8.69'
3400'				
3448'	10.85°	245.24°	3443.22'	-12.38'
3500'				
3543'	11.75°	246.12°	3536.38'	-17.49'
3600'				



3650'	3638'	12.14°	247.61°	3629.32'	-22.50'
3700'					
3750'	3733'	11.95°	247.48°	3722.23'	-27.33'
3800'					
3850'	3828'	12.36°	246.70°	3815.10'	-32.35'
3900'					
3950'	3923'	11.85°	243.24°	3907.99'	-38.05'
4000'					
4050'	4018'	12.08°	242.70°	4000.93'	-44.36'
4100'					
4150'	4113'	11.84°	243.19°	4093.87'	-50.67'



4200'

4208'

11.52°

240.36°

4186.90'

-57.20'

4250'

4300'

4303'

11.51°

238.15°

4279.99'

-64.42'

4350'

4400'

4399'

10.81°

237.12°

4374.17'

-71.97'

4450'

4500'

4494'

12.16°

244.37°

4467.27'

-78.64'

4550'

4600'

4589'

10.19°

244.16°

4560.47'

-84.14'

4650'

4700'

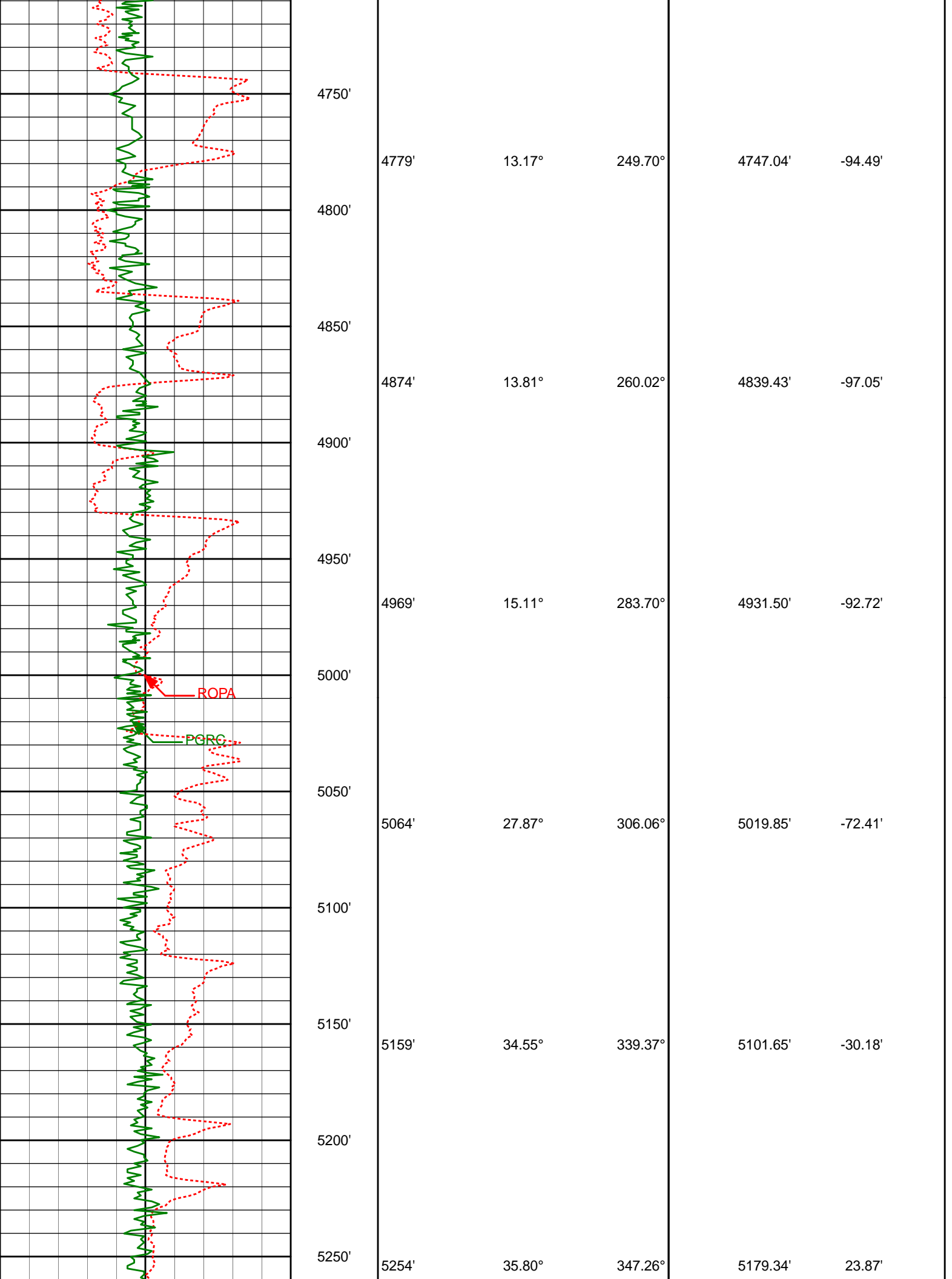
4684'

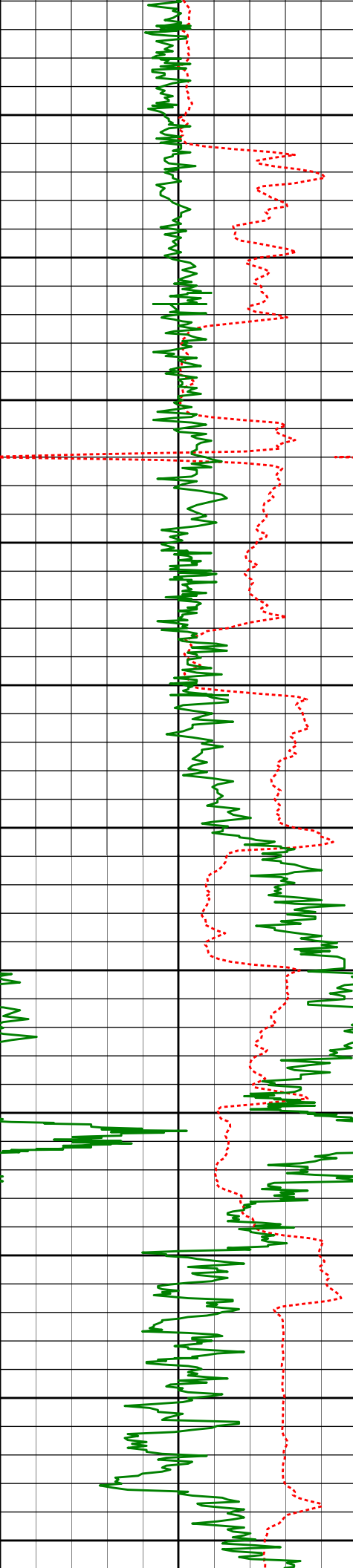
10.06°

241.95°

4653.99'

-89.46'





5300'

5350'

5400'

5450'

5500'

5550'

5600'

5650'

5700'

5750'

5800'

5349'

37.55°

344.90°

5255.54'

80.33'

5444'

44.27°

345.80°

5327.30'

142.13'

5539'

55.86°

351.64°

5388.21'

214.71'

5634'

65.74°

353.61°

5434.50'

297.52'

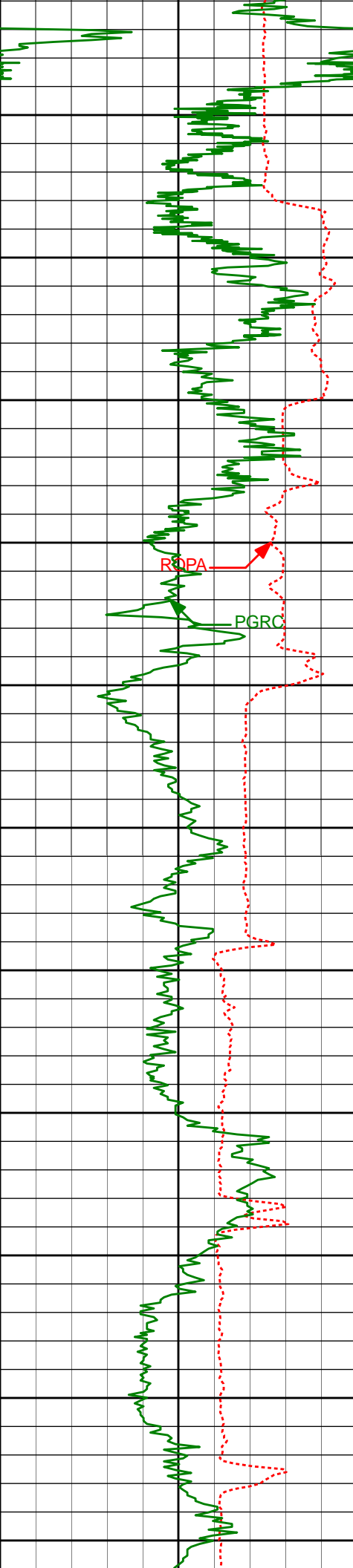
5730'

70.46°

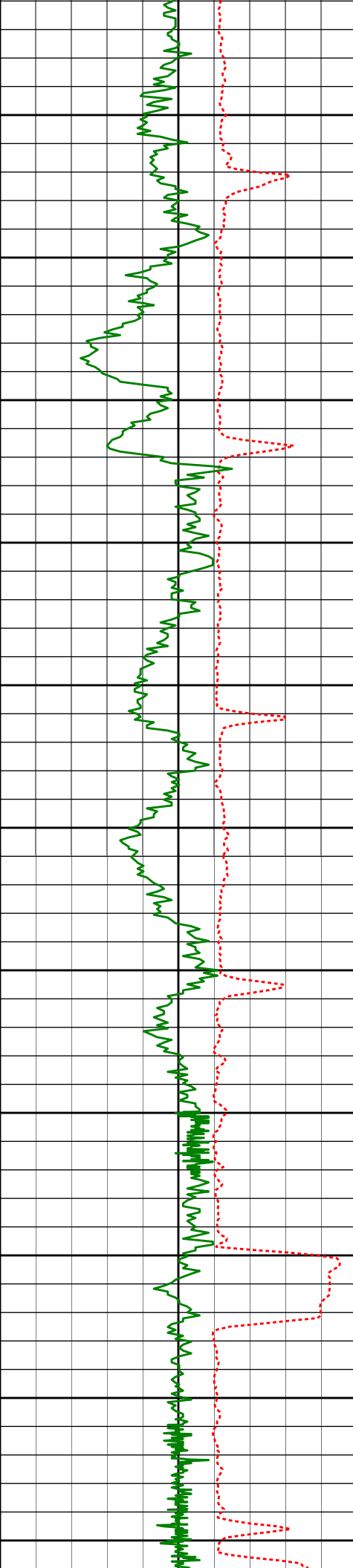
355.24°

5470.30'

386.46'



5825'	72.40°	355.69°	5500.55'	476.31'
5850'				
5900'				
5920'	81.77°	357.63°	5521.76'	568.44'
5950'				
5978'	85.77°	358.71°	5528.05'	625.71'
6000'				
6050'				
6081'	86.98°	358.66°	5534.56'	727.72'
6100'				
6150'				
6173'	87.78°	359.42°	5538.77'	818.86'
6200'				
6250'				
6267'	87.90°	359.16°	5542.31'	911.96'
6300'				
6350'				



6400'

6450'

6500'

6550'

6600'

6650'

6700'

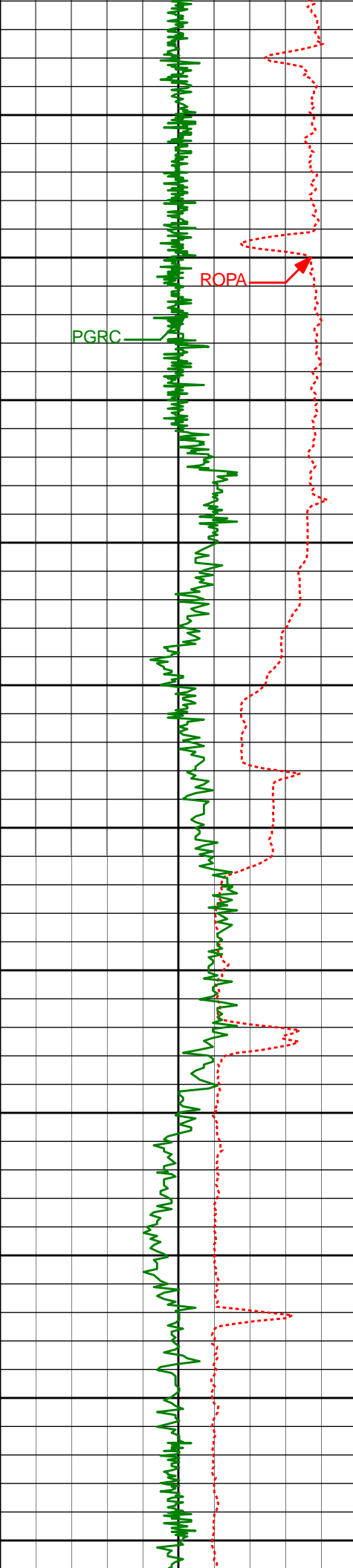
6750'

6800'

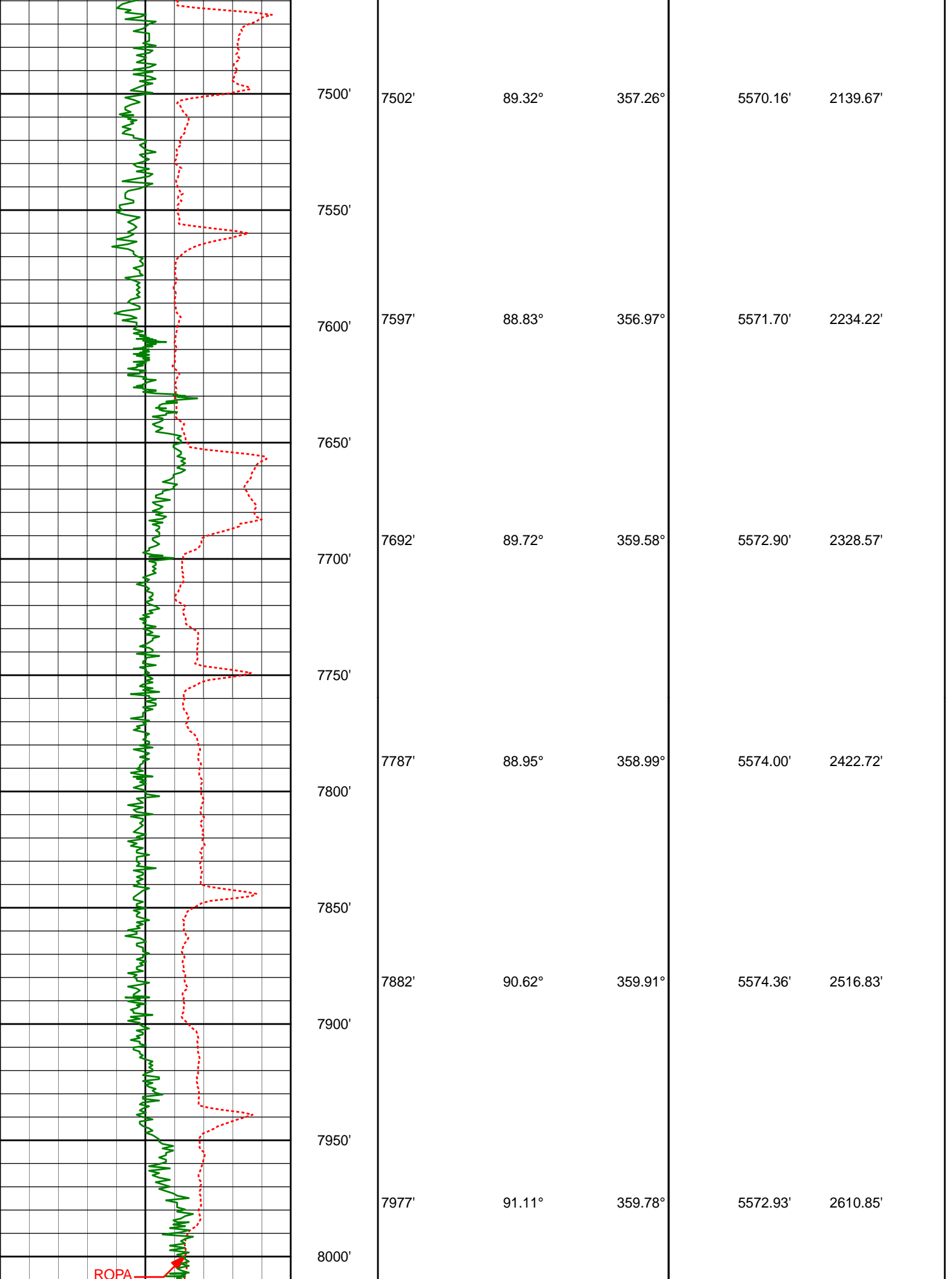
6850'

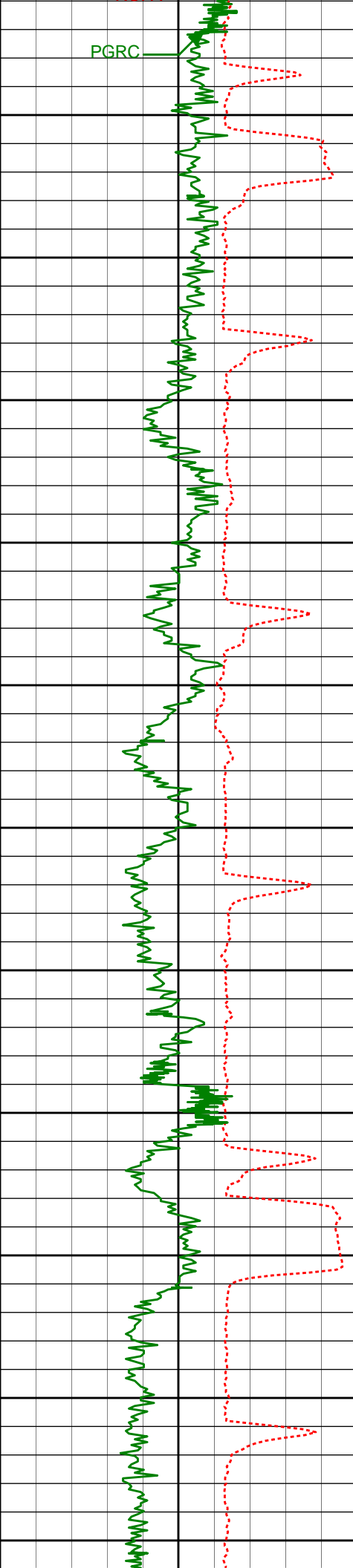
6900'

6362'	88.21°	359.22°	5545.53'	1006.08'
6457'	87.97°	358.92°	5548.70'	1100.23'
6552'	87.53°	358.26°	5552.43'	1194.46'
6647'	87.84°	358.50°	5556.26'	1288.73'
6742'	87.59°	358.16°	5560.04'	1383.00'
6837'	89.32°	356.84°	5562.60'	1477.47'

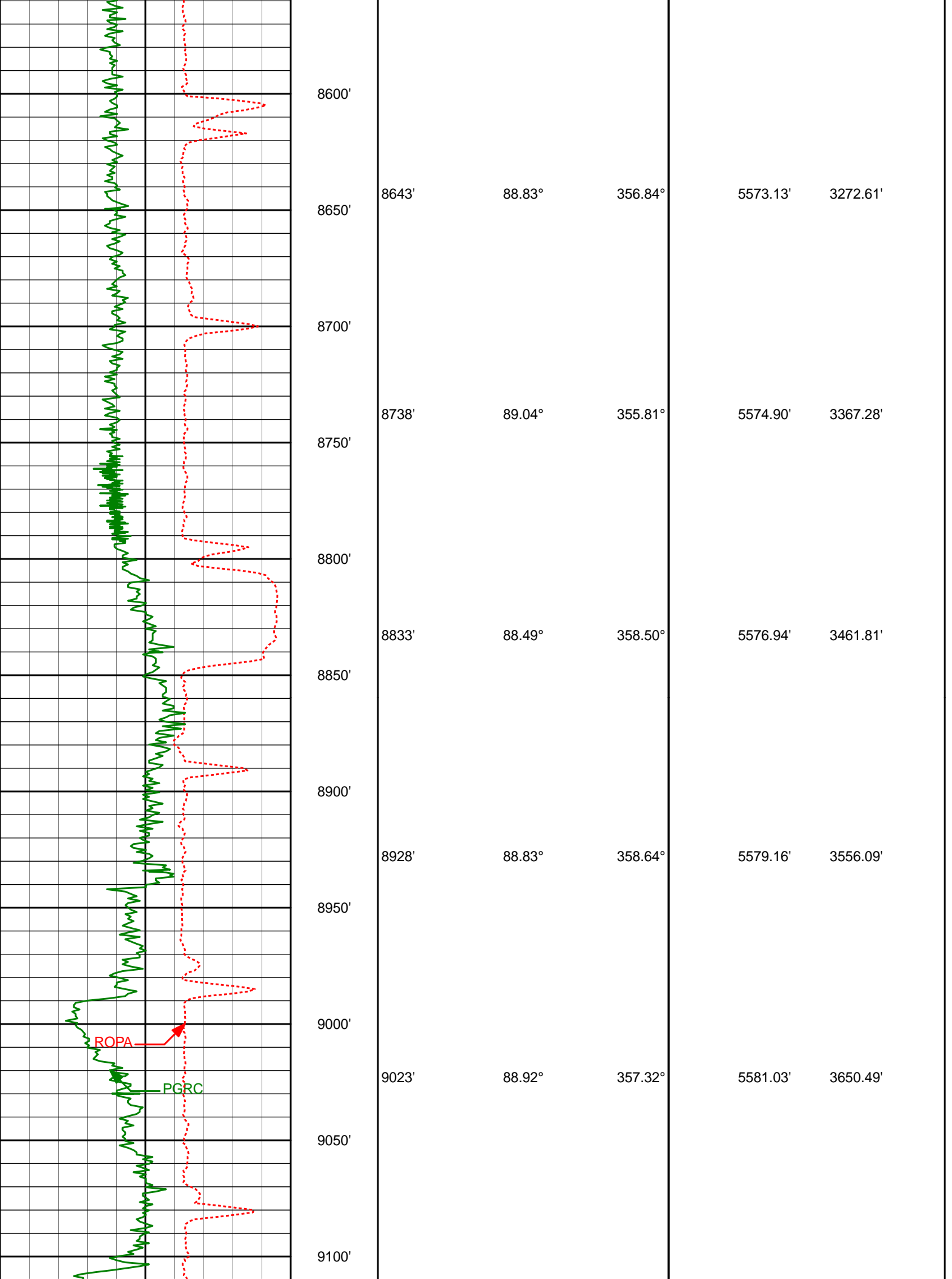


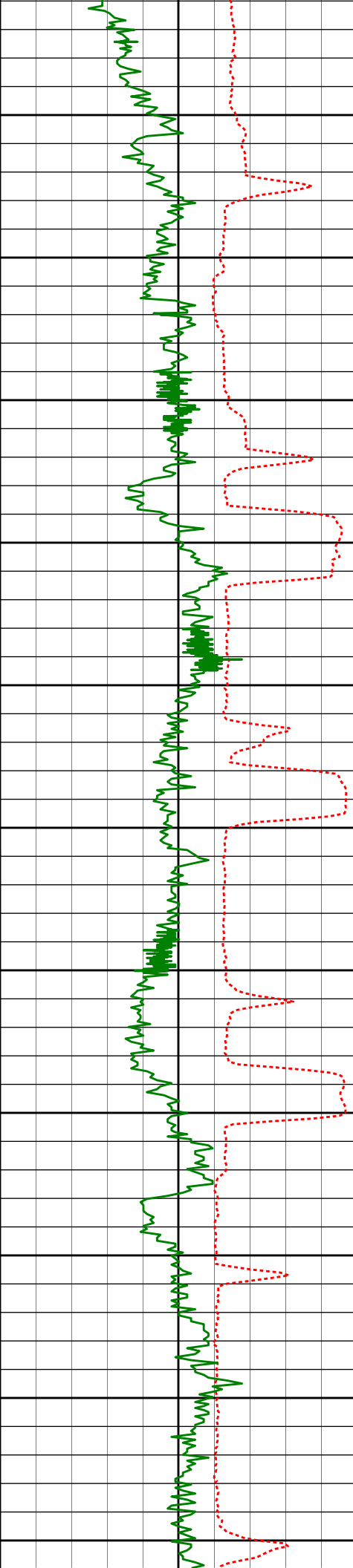
6932'	90.46°	358.69°	5562.78'	1571.92'
6950'				
7000'				
7027'	89.66°	357.94°	5562.68'	1666.27'
7050'				
7100'				
7122'	89.66°	356.85°	5563.24'	1760.79'
7150'				
7200'				
7217'	89.82°	356.56°	5563.67'	1855.42'
7250'				
7300'				
7312'	88.34°	355.17°	5565.21'	1950.14'
7350'				
7400'				
7407'	88.18°	354.40°	5568.09'	2044.96'
7450'				





8050'					
8072'	90.03°	358.94°	5571.98'	2704.98'	
8100'					
8150'					
8168'	89.97°	358.32°	5571.98'	2800.26'	
8200'					
8250'					
8263'	90.15°	357.73°	5571.88'	2894.68'	
8300'					
8350'					
8358'	90.83°	356.86°	5571.06'	2989.21'	
8400'					
8450'	89.78°	358.42°	5570.55'	3083.68'	
8500'					
8550'					
8548'	89.14°	357.66°	5571.44'	3178.09'	





9150'

9200'

9250'

9300'

9350'

9400'

9450'

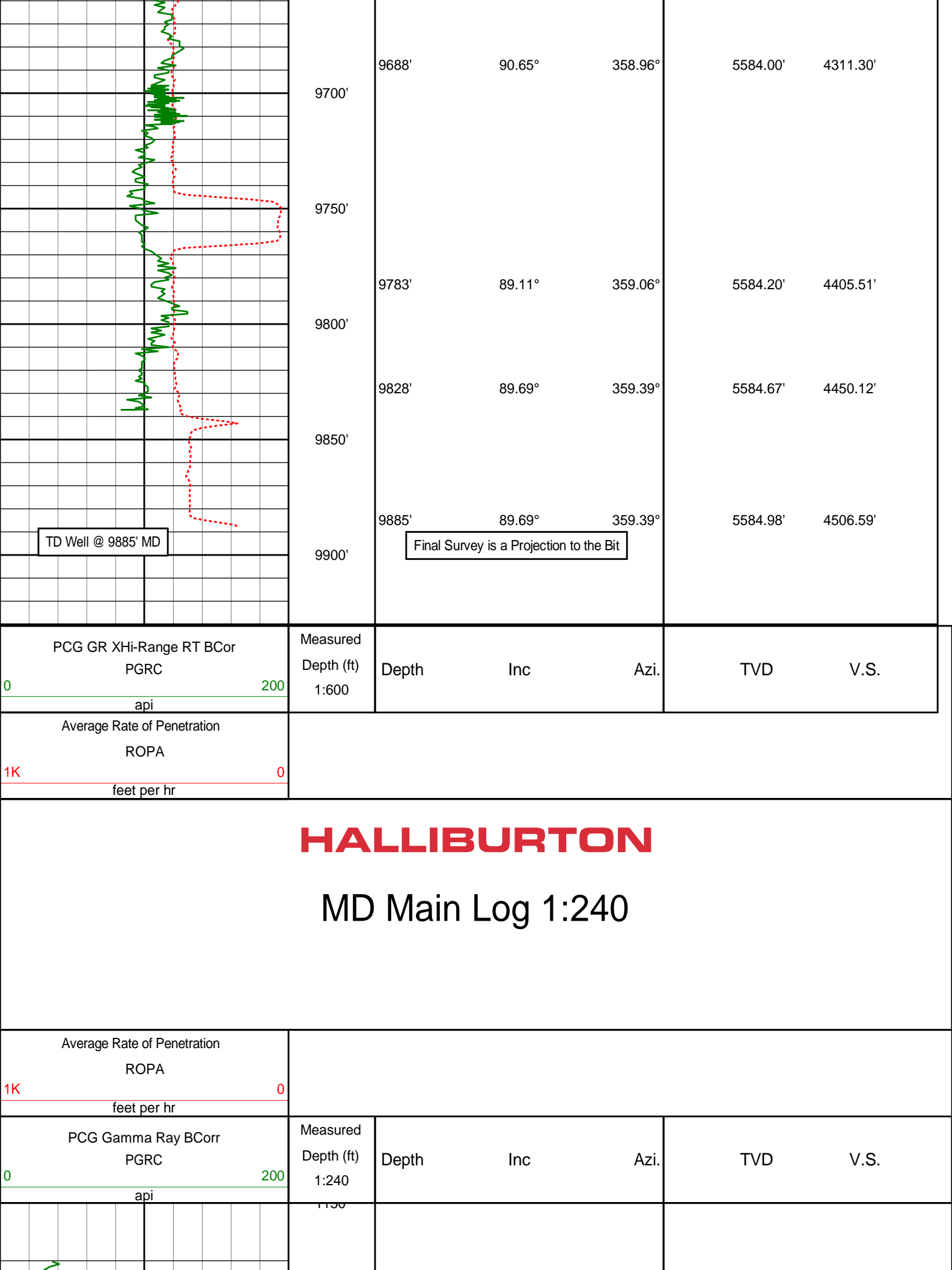
9500'

9550'

9600'

9650'

9118'	89.23°	356.80°	5582.56'	3745.05'
9213'	89.38°	355.99°	5583.71'	3839.71'
9308'	91.42°	358.54°	5583.05'	3934.24'
9403'	90.09°	359.07°	5581.80'	4028.49'
9498'	88.83°	358.75°	5582.69'	4122.72'
9593'	89.48°	358.38°	5584.10'	4217.02'



PCG GR XHI-Range RT BCor
PGRC
0 200
api

Average Rate of Penetration
ROPA
1K 0
feet per hr

Measured
Depth (ft)
1:600

Depth Inc Azi.

TVD V.S.

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MD Main Log 1:240

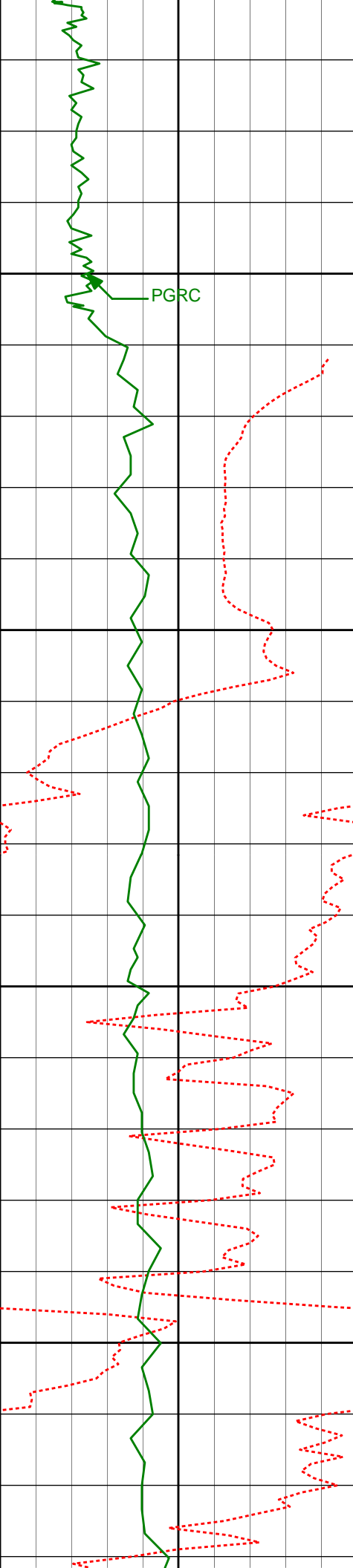
Average Rate of Penetration
ROPA
1K 0
feet per hr

PCG Gamma Ray BCor
PGRC
0 200
api

Measured
Depth (ft)
1:240

Depth Inc Azi.

TVD V.S.



Surface Casing @ 1202' MD

1200'

Run 100

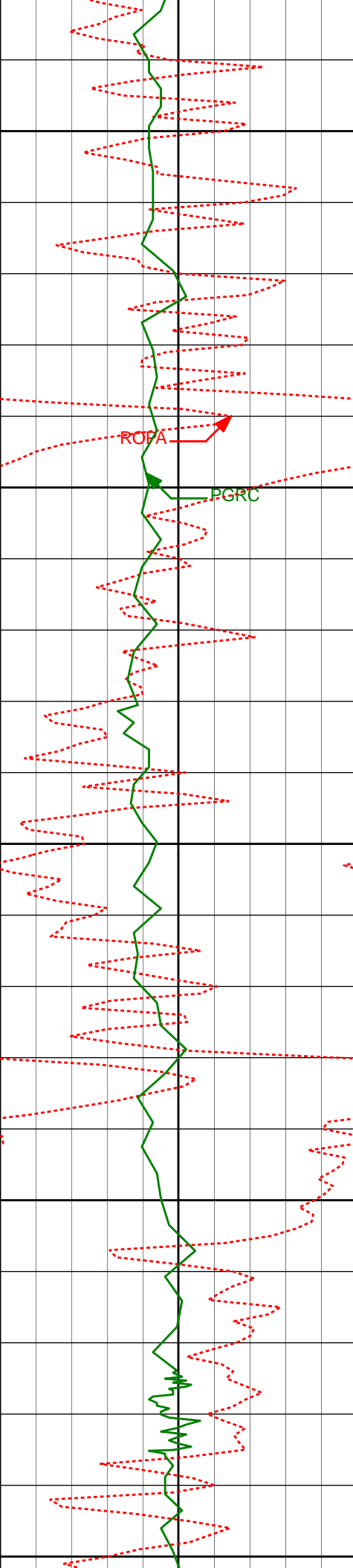
1250'

1300'

1350'

1289'	0.46°	138.52°	1288.96'	-5.89'
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1381'	0.57°	146.20°	1380.96'	-6.62'
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1400'

1450'

1500'

1550'

1600'

1474'

0.62°

148.70°

1473.96'

-7.50'

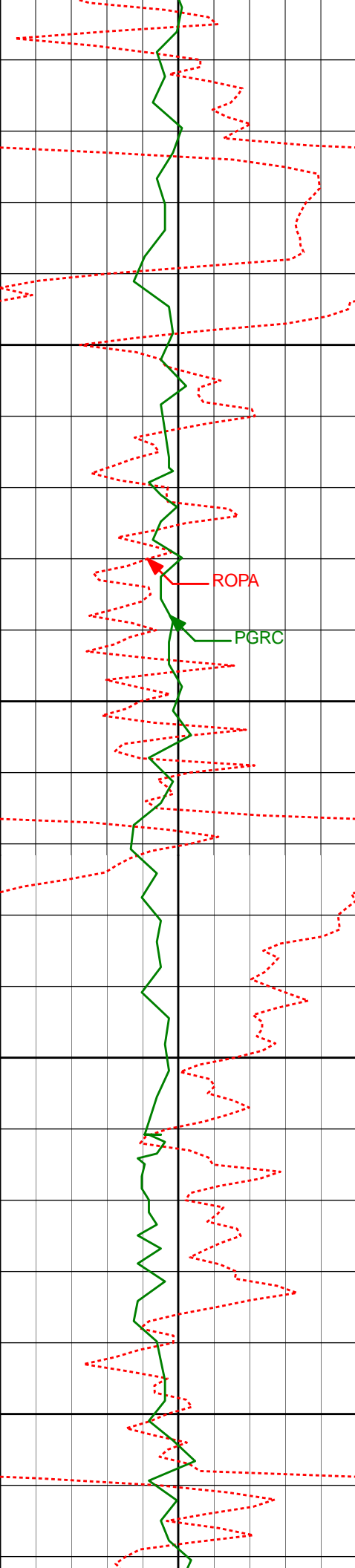
1567'

0.54°

162.79°

1566.95'

-8.39'



1650'

1660'

1.26°

244.45°

1659.94'

-9.12'

1700'

1750'

1800'

1752'

1.44°

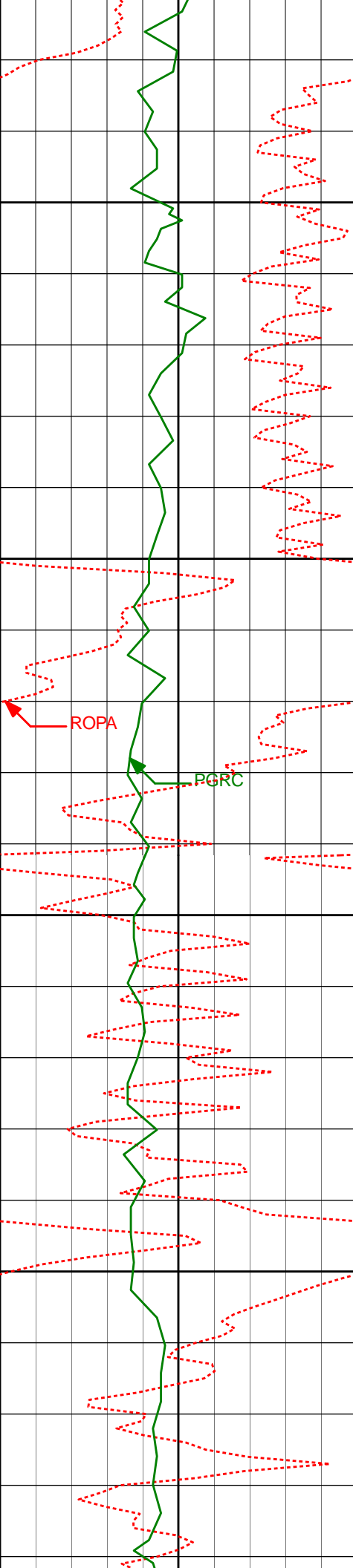
244.42°

1751.92'

-9.77'

ROPA

PGRC



1850'

1900'

1950'

2000'

1844'

1.53°

248.17°

1843.89'

-10.40'

1937'

1.54°

247.05°

1936.85'

-11.00'

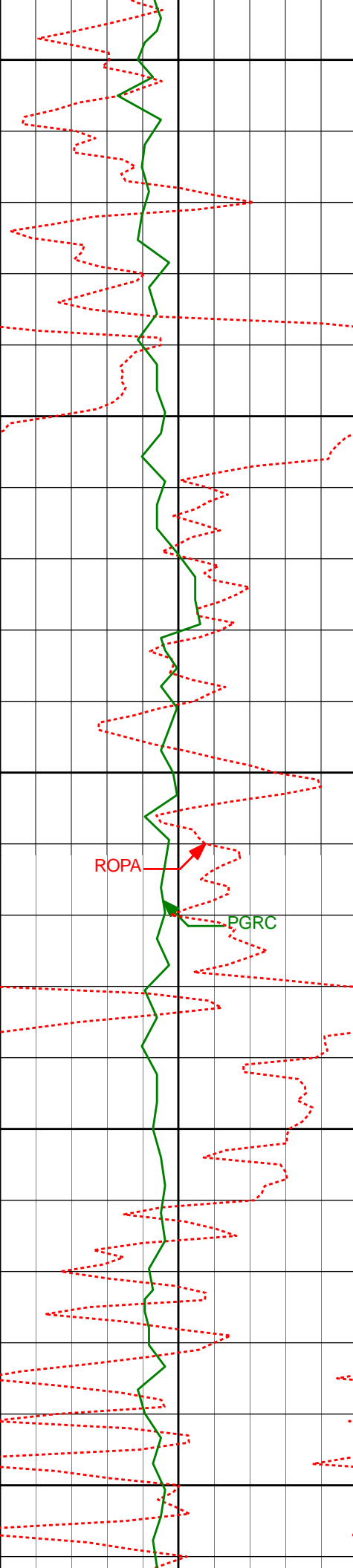
2029'

1.65°

247.36°

2028.82'

-11.64'



2050'

2100'

2150'

2200'

2250'

2122'

1.53°

248.31°

2121.78'

-12.26'

2215'

1.53°

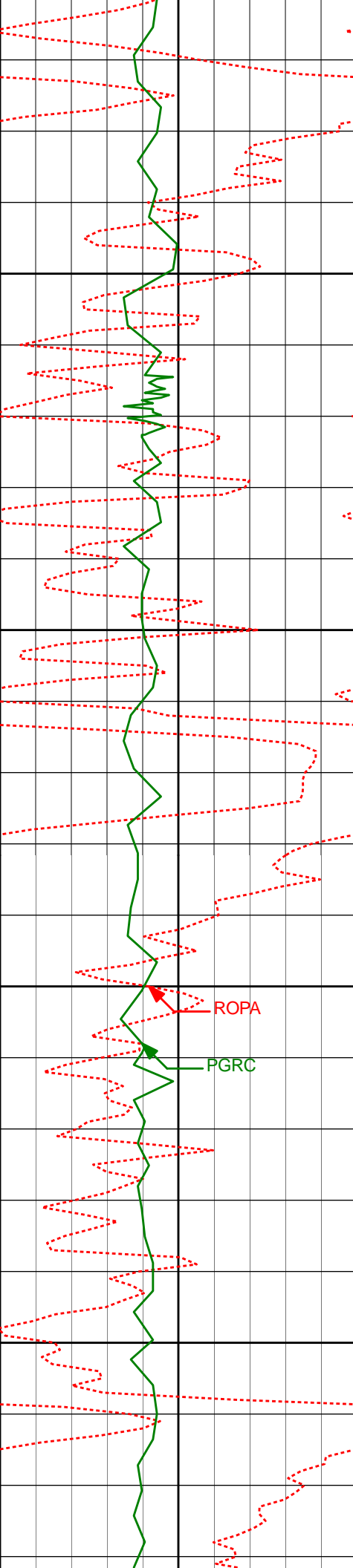
249.12°

2214.75'

-12.81'

ROPA

PGRC



2300'

2350'

2400'

2450'

2307'

1.32°

245.36°

2306.72'

-13.38'

2402'

0.52°

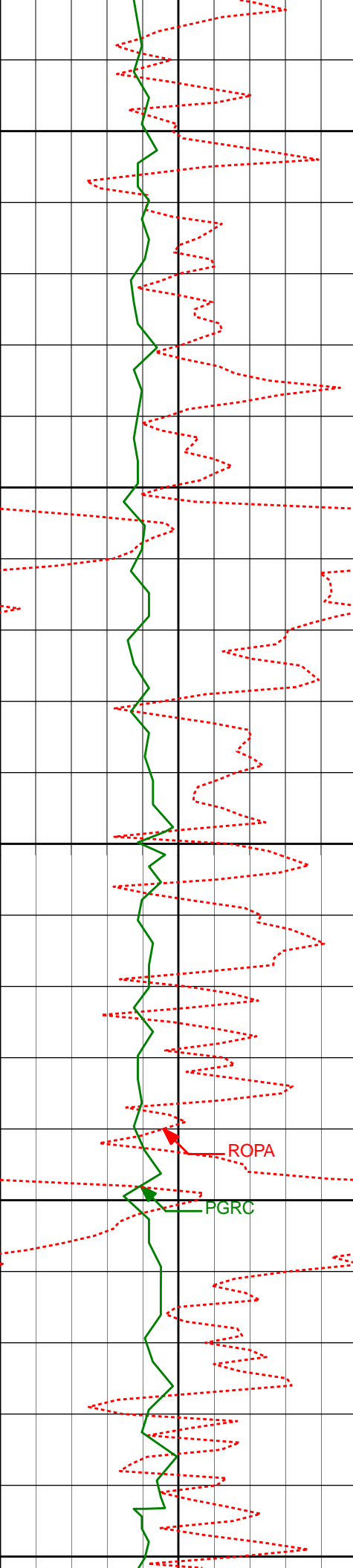
301.98°

2401.71'

-13.40'

ROPA

PGRC



2500'

2550'

2600'

2650'

2700'

2592'

0.80°

296.35°

2591.69'

-12.08'

ROPA

PGRC

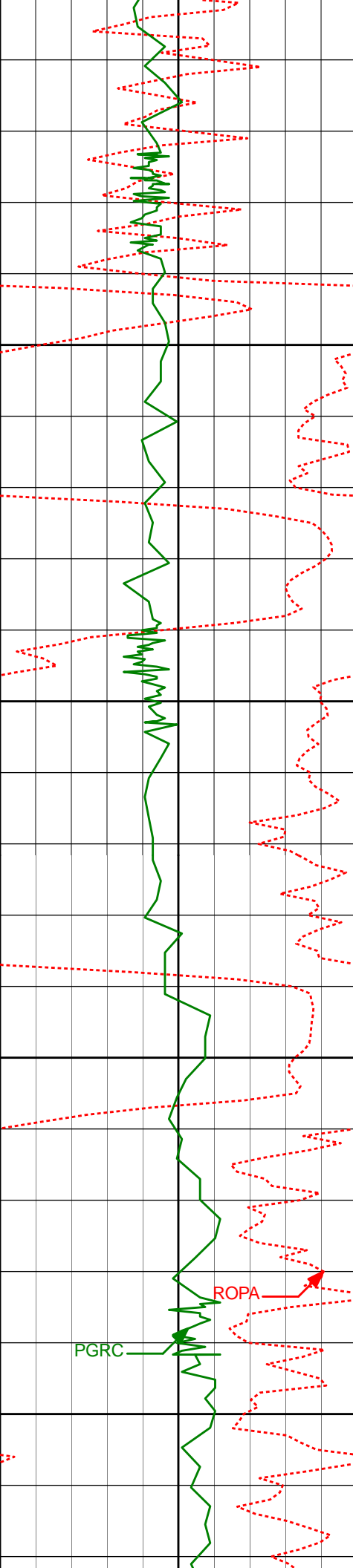
2687'

0.90°

293.25°

2686.68'

-11.31'



2750'

2782'

1.82°

275.90°

2781.66'

-10.55'

2800'

2850'

2877'

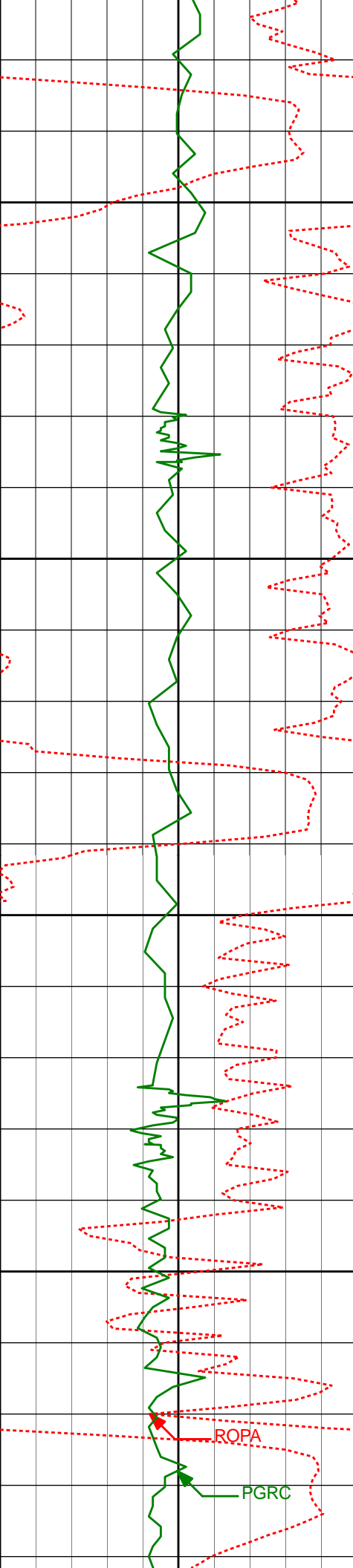
3.85°

273.37°

2876.53'

-9.53'

2900'



2950'

2972'

4.63°

270.46°

2971.27'

-8.29'

3000'

3050'

3067'

5.76°

265.63°

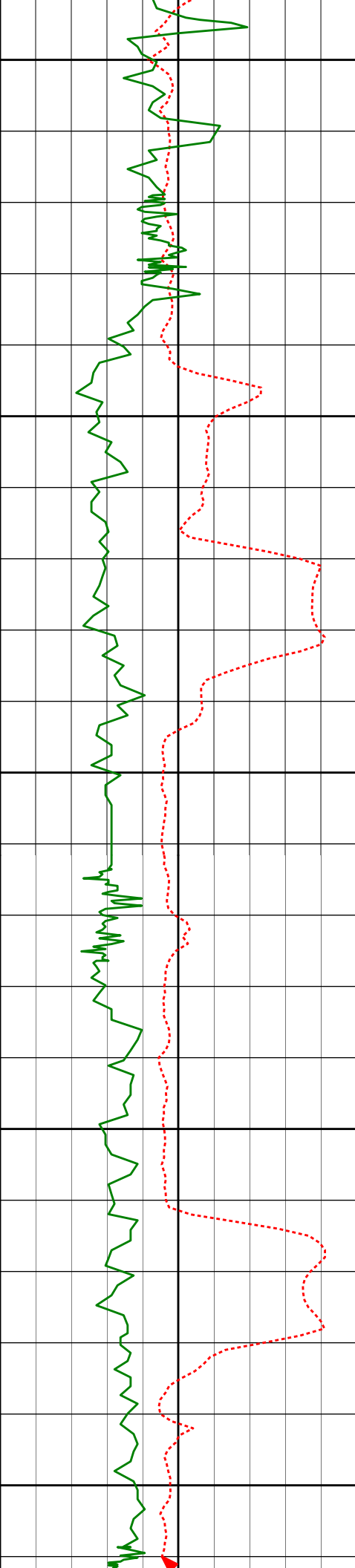
3065.88'

-7.37'

3100'

ROPA

PGRC



3150'

3162'

6.48°

262.63°

3160.34'

-6.95'

3200'

3250'

3257'

7.35°

258.57°

3254.65'

-7.18'

3300'

3350'

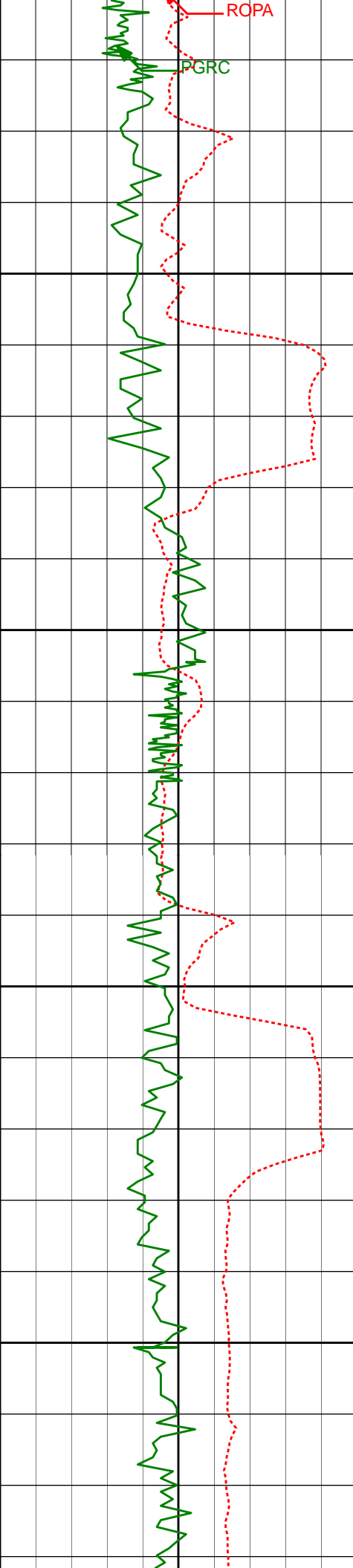
3353'

9.10°

252.71°

3349.66'

-8.69'



ROPA

PGRC

3400'

3450'

3500'

3550'

3448'

10.85°

245.24°

3443.22'

-12.38'

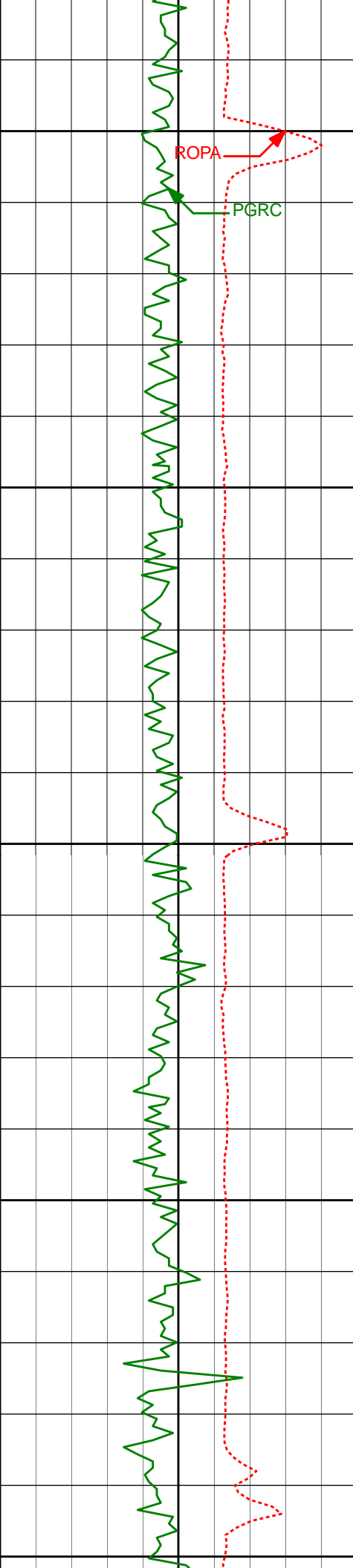
3543'

11.75°

246.12°

3536.38'

-17.49'



ROPA

PGRC

3600'

3650'

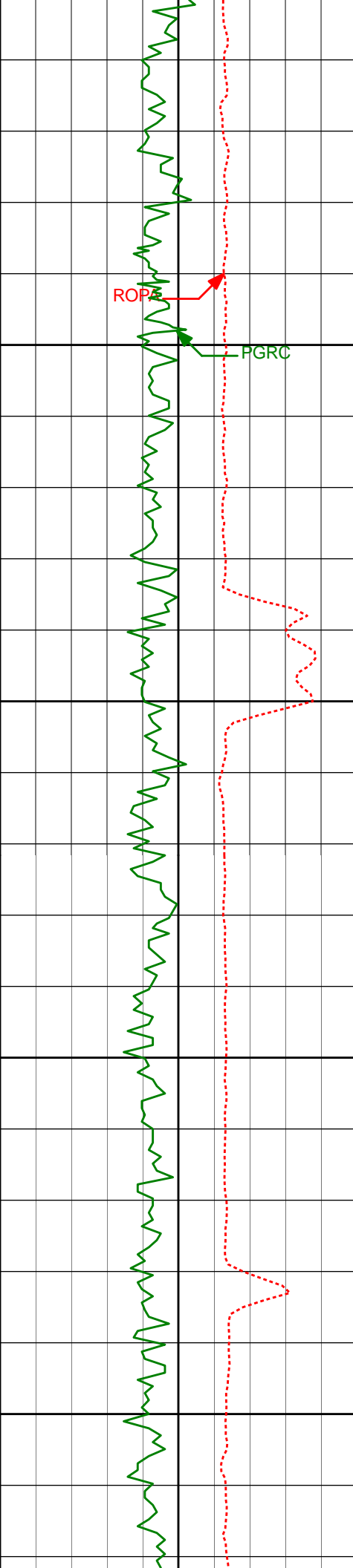
3700'

3750'

3800'

3638'	12.14°	247.61°	3629.32'	-22.50'
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3733'	11.95°	247.48°	3722.23'	-27.33'
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3828'

3850'

3900'

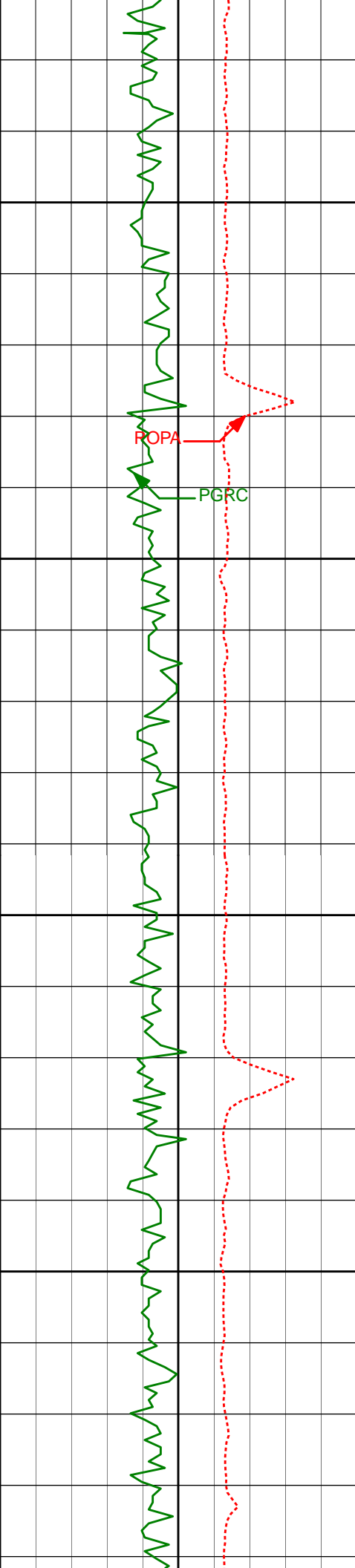
3950'

4000'

3828'	12.36°	246.70°	3815.10'	-32.35'
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3923'	11.85°	243.24°	3907.99'	-38.05'
-------	--------	---------	----------	---------

4018'	12.08°	242.70°	4000.93'	-44.36'
-------	--------	---------	----------	---------



4050'

ROPA

PGRC

4100'

4113'

11.84°

243.19°

4093.87'

-50.67'

4150'

4200'

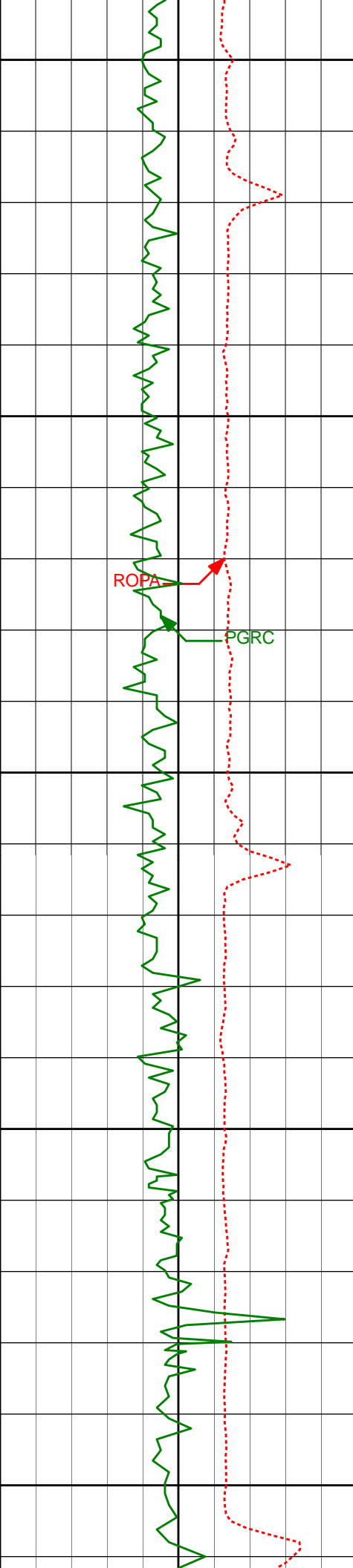
4208'

11.52°

240.36°

4186.90'

-57.20'



4250'

4300'

4350'

4400'

4450'

4303'

11.51°

238.15°

4279.99'

-64.42'

4399'

10.81°

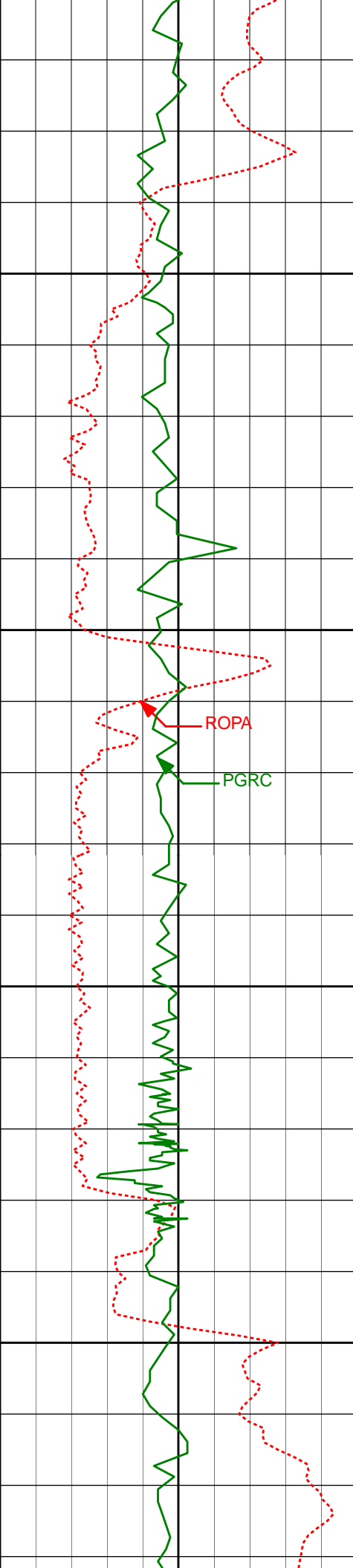
237.12°

4374.17'

-71.97'

ROPA

PGRC



4500'

4550'

4600'

4650'

ROPA

PGRC

4494'

12.16°

244.37°

4467.27'

-78.64'

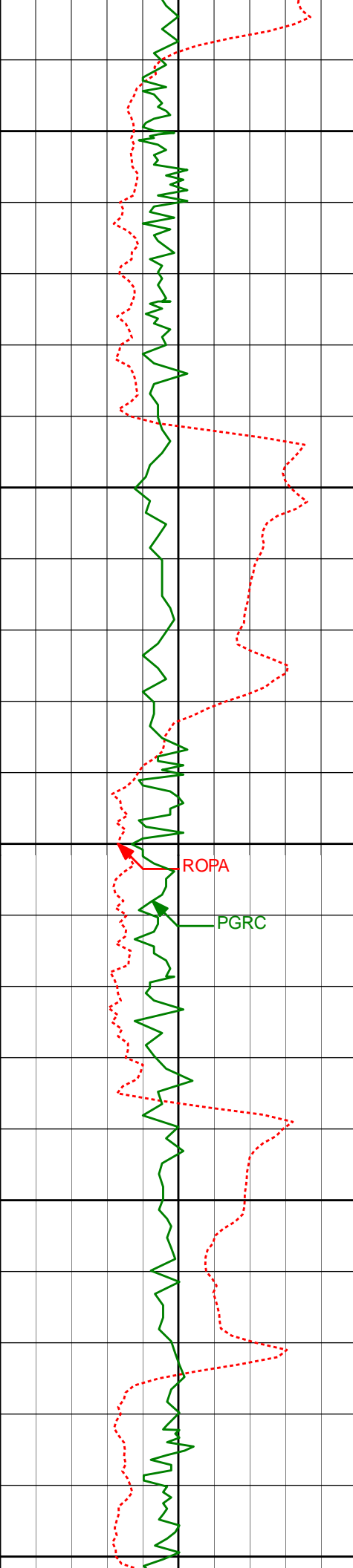
4589'

10.19°

244.16°

4560.47'

-84.14'



4700'

4750'

4800'

4850'

4900'

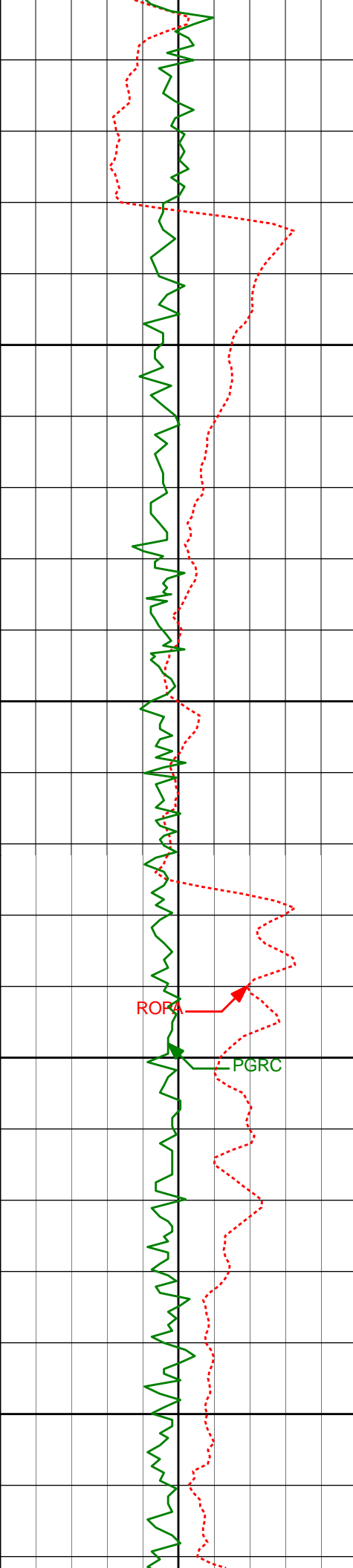
ROPA

PGRC

4684' 10.06° 241.95° 4653.99' -89.46'

4779' 13.17° 249.70° 4747.04' -94.49'

4874' 13.81° 260.02° 4839.43' -97.05'



4950'

5000'

5050'

5100'

ROPA

PGRC

4969'

15.11°

283.70°

4931.50'

-92.72'

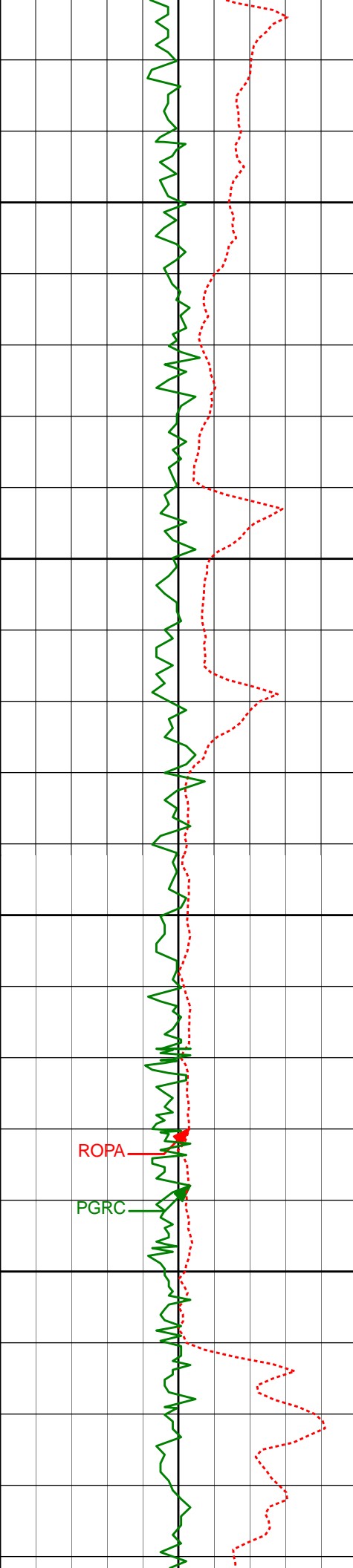
5064'

27.87°

306.06°

5019.85'

-72.41'



5150'

5159'

34.55°

339.37°

5101.65'

-30.18'

5200'

5250'

5254'

35.80°

347.26°

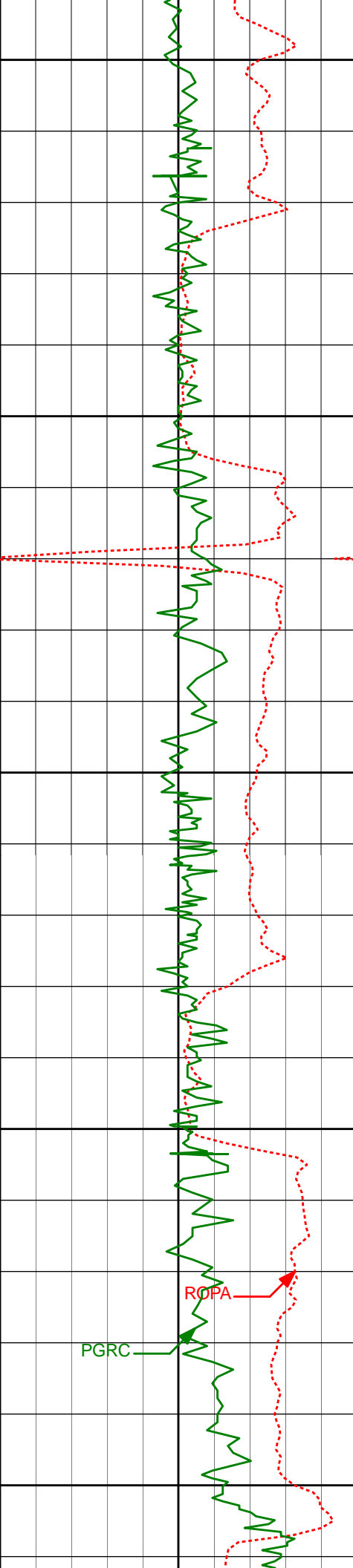
5179.34'

23.87'

5300'

ROPA

PGRC



5350'

5349'

37.55°

344.90°

5255.54'

80.33'

5400'

5450'

5444'

44.27°

345.80°

5327.30'

142.13'

5500'

5550'

5539'

55.86°

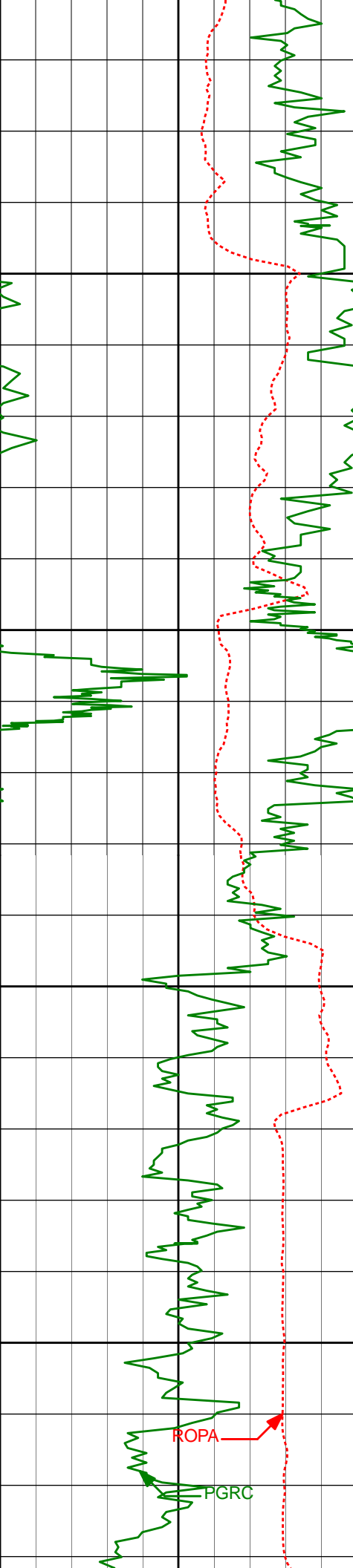
351.64°

5388.21'

214.71'

ROPA

PGRC



5600'

5650'

5700'

5750'

5634'

65.74°

353.61°

5434.50'

297.52'

5730'

70.46°

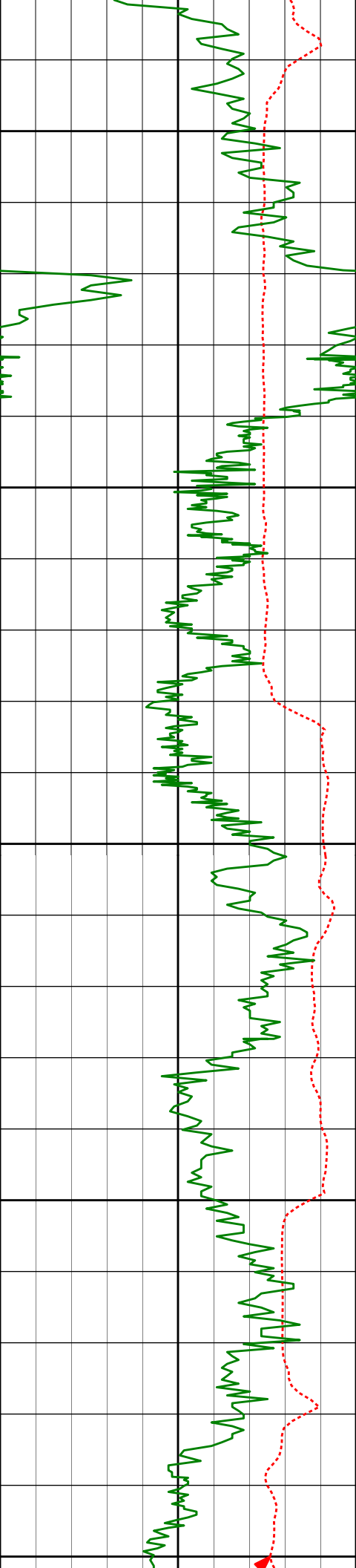
355.24°

5470.30'

386.46'

ROPA

PGRC



5800'

5825'

72.40°

355.69°

5500.55'

476.31'

5850'

5900'

5920'

81.77°

357.63°

5521.76'

568.44'

5950'

5978'

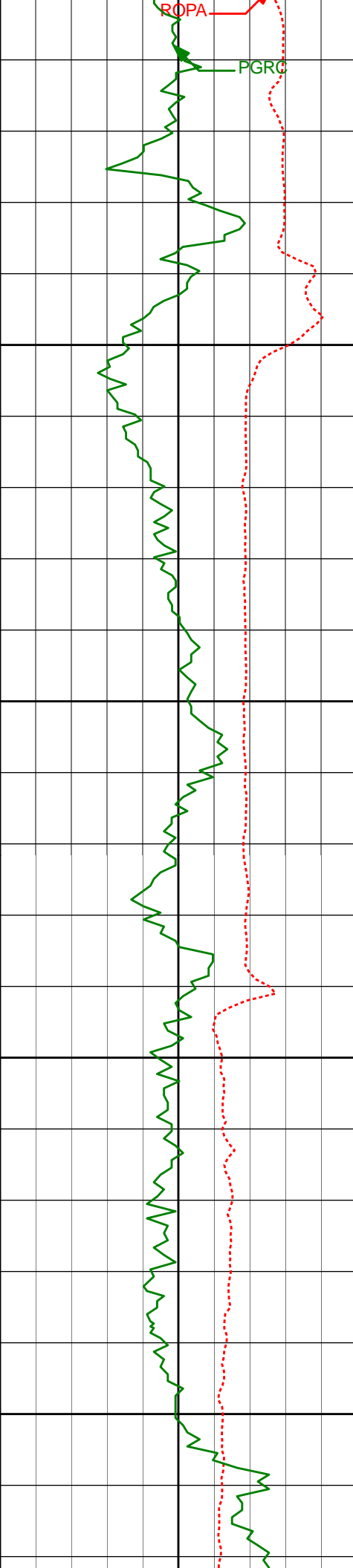
85.77°

358.71°

5528.05'

625.71'

6000'



Casing Shoe @ 6026'

Run200

6050'

6100'

6150'

6200'

6081'

86.98°

358.66°

5534.56'

727.72'

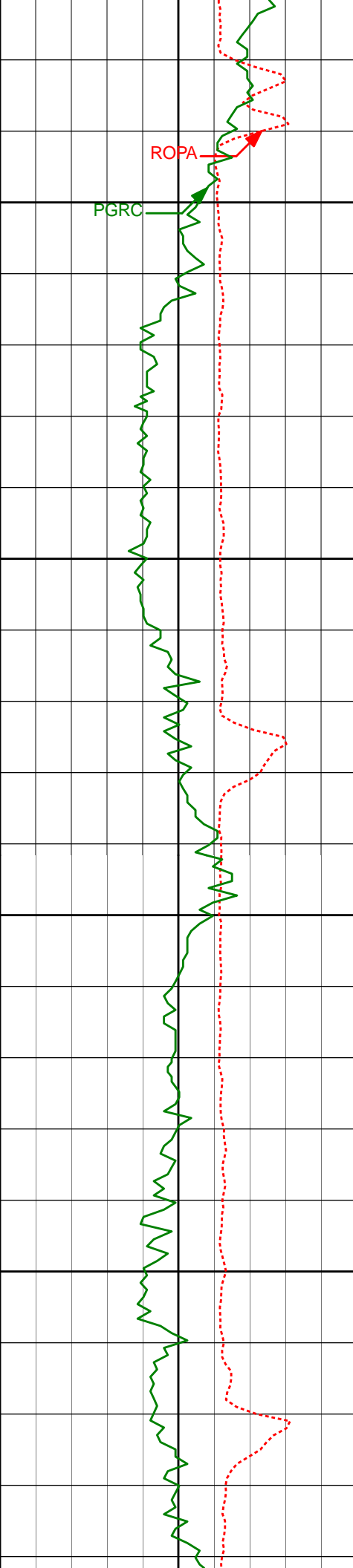
6173'

87.78°

359.42°

5538.77'

818.86'



6250'

6267'

87.90°

359.16°

5542.31'

911.96'

6300'

6350'

6362'

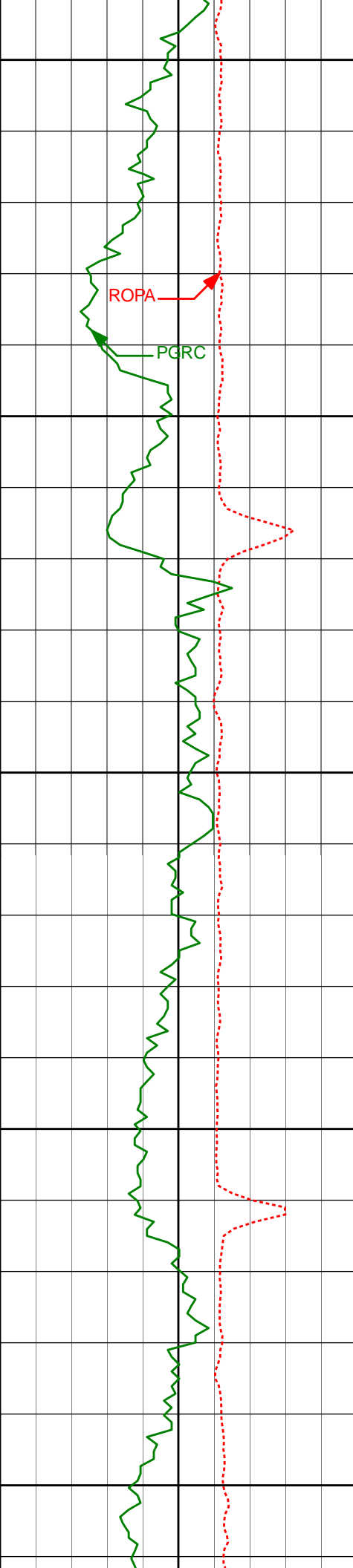
88.21°

359.22°

5545.53'

1006.08'

6400'



6450'

6457'

87.97°

358.92°

5548.70'

1100.23'

6500'

6550'

6552'

87.53°

358.26°

5552.43'

1194.46'

6600'

6650'

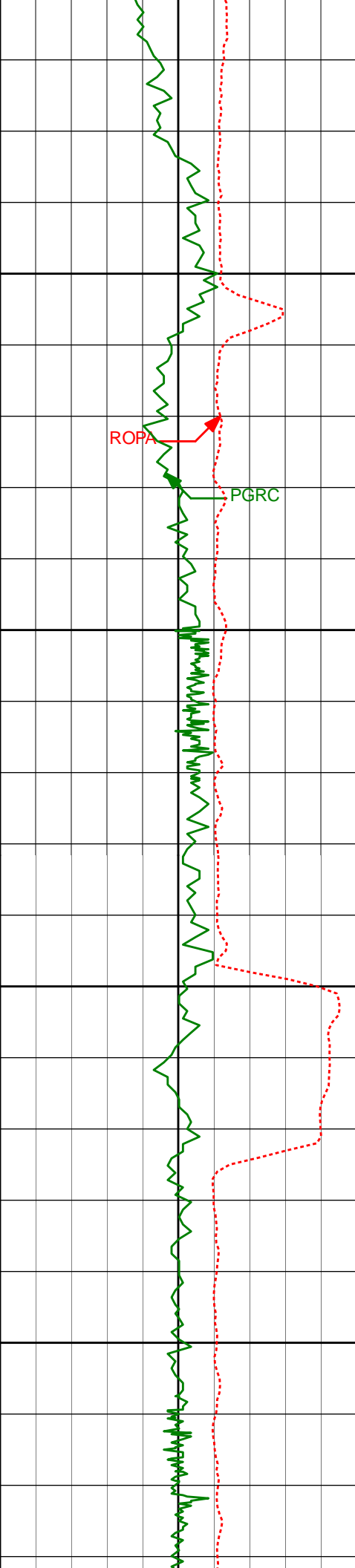
6647'

87.84°

358.50°

5556.26'

1288.73'



6700'

6750'

6800'

6850'

6742'

87.59°

358.16°

5560.04'

1383.00'

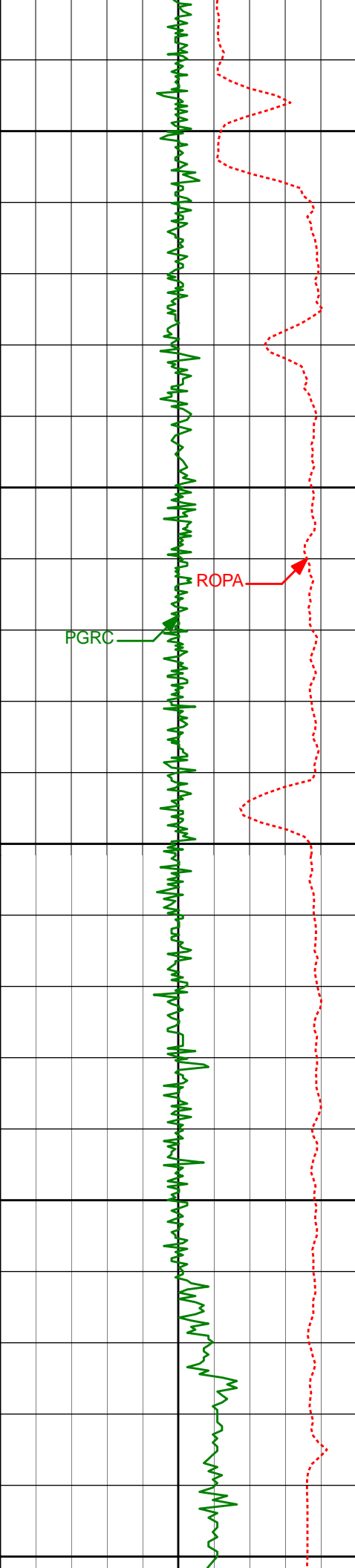
6837'

89.32°

356.84°

5562.60'

1477.47'



6900'

6932'

90.46°

358.69°

5562.78'

1571.92'

6950'

7000'

7050'

7100'

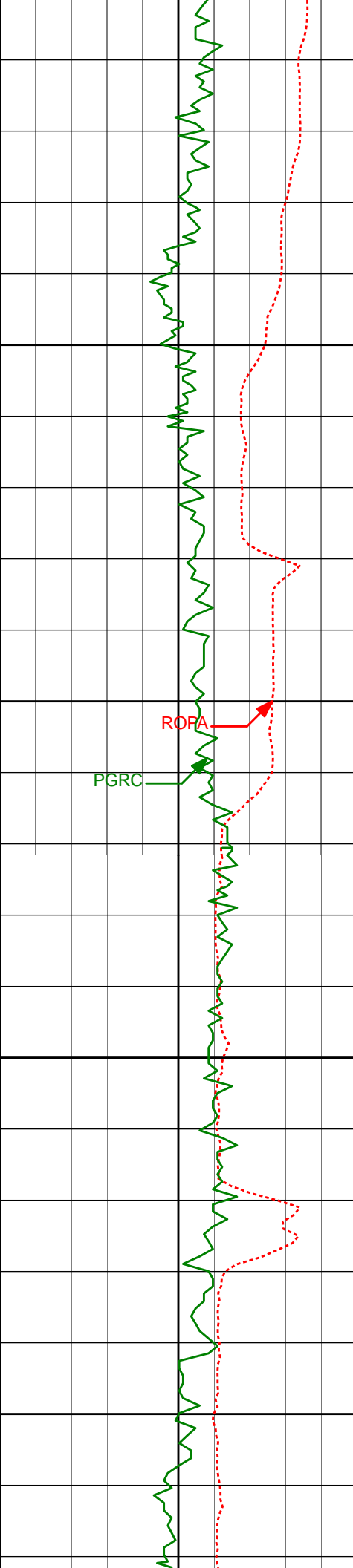
7027'

89.66°

357.94°

5562.68'

1666.27'



7122'

7150'

7200'

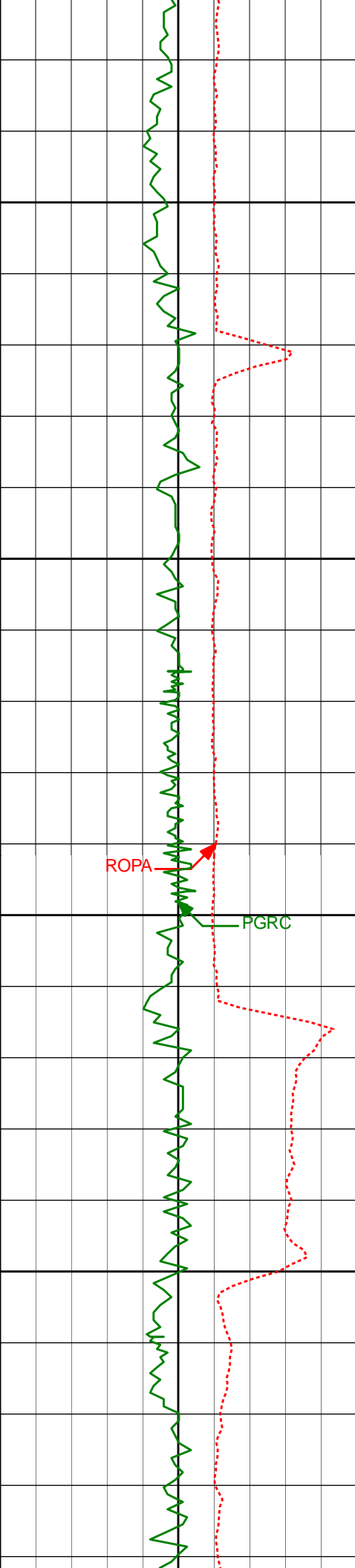
7217'

7250'

7300'

7312'

7122'	89.66°	356.85°	5563.24'	1760.79'
7217'	89.82°	356.56°	5563.67'	1855.42'
7312'	88.34°	355.17°	5565.21'	1950.14'



7350'

7400'

7450'

7500'

7407'

88.18°

354.40°

5568.09'

2044.96'

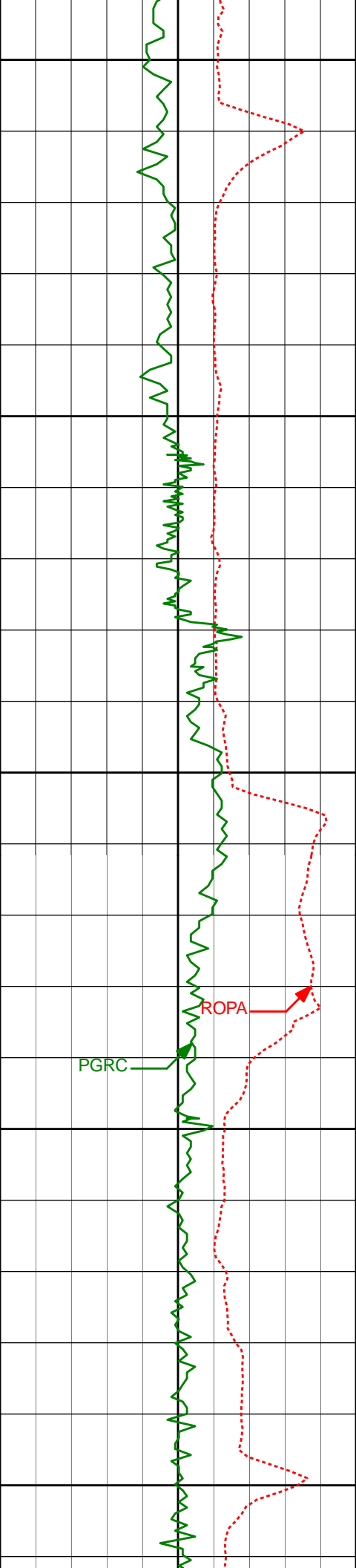
7502'

89.32°

357.26°

5570.16'

2139.67'



7550'

7600'

7650'

7700'

7750'

7597'

88.83°

356.97°

5571.70'

2234.22'

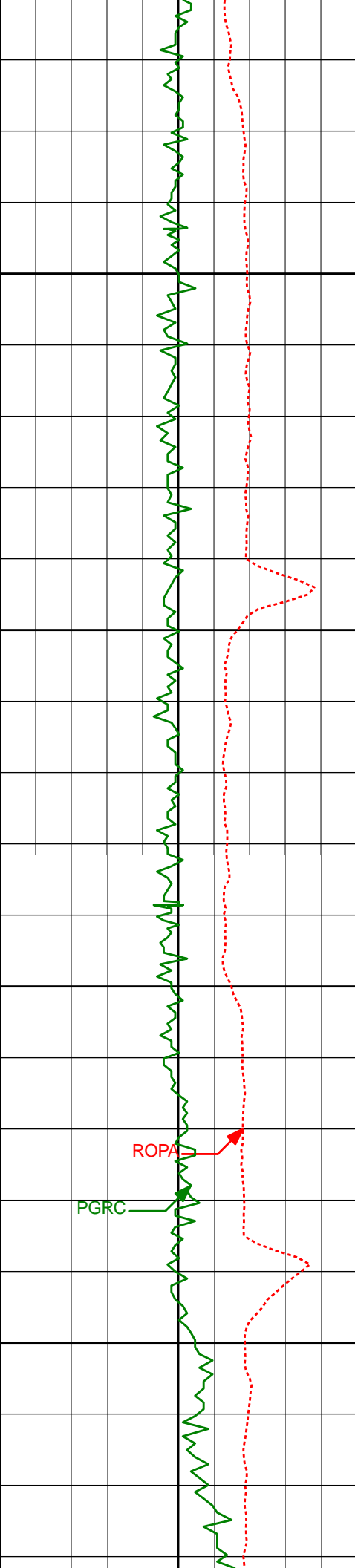
7692'

89.72°

359.58°

5572.90'

2328.57'



7787'	88.95°	358.99°	5574.00'	2422.72'
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7800'

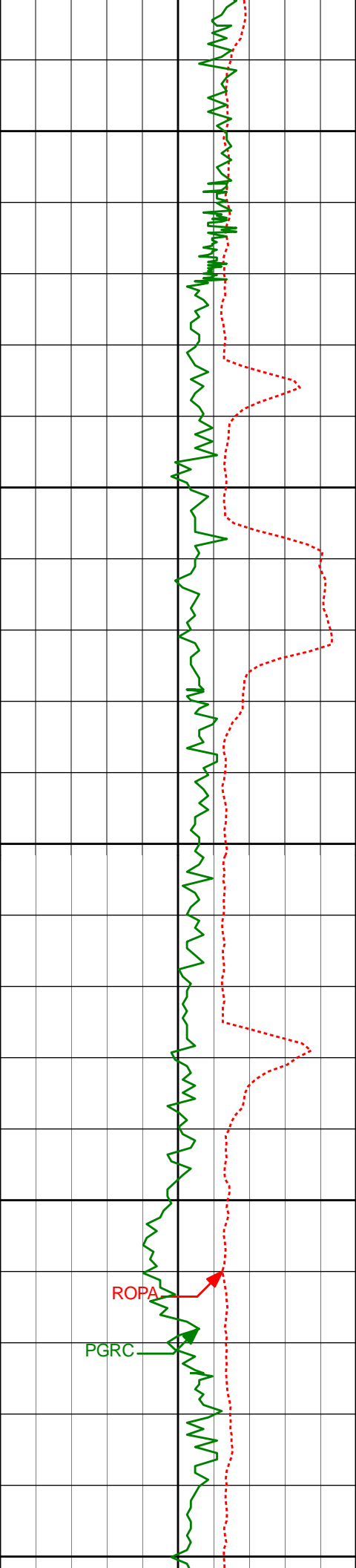
7850'

7882'	90.62°	359.91°	5574.36'	2516.83'
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7900'

7950'

7977'	91.11°	359.78°	5572.93'	2610.85'
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8000'

8050'

8100'

8150'

8200'

8072'

90.03°

358.94°

5571.98'

2704.98'

8168'

89.97°

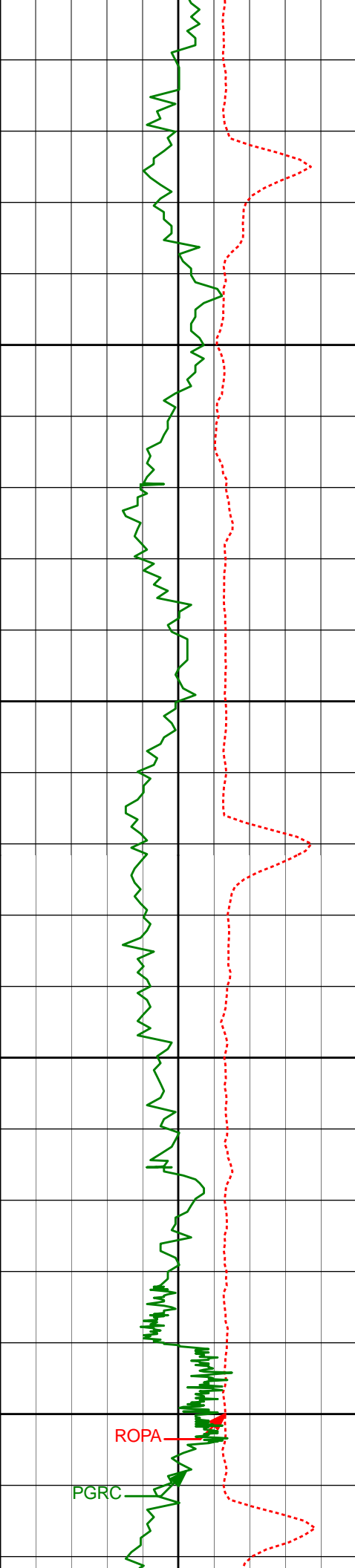
358.32°

5571.98'

2800.26'

ROPA

PGRC



8250'

8263'

90.15°

357.73°

5571.88'

2894.68'

8300'

8350'

8358'

90.83°

356.86°

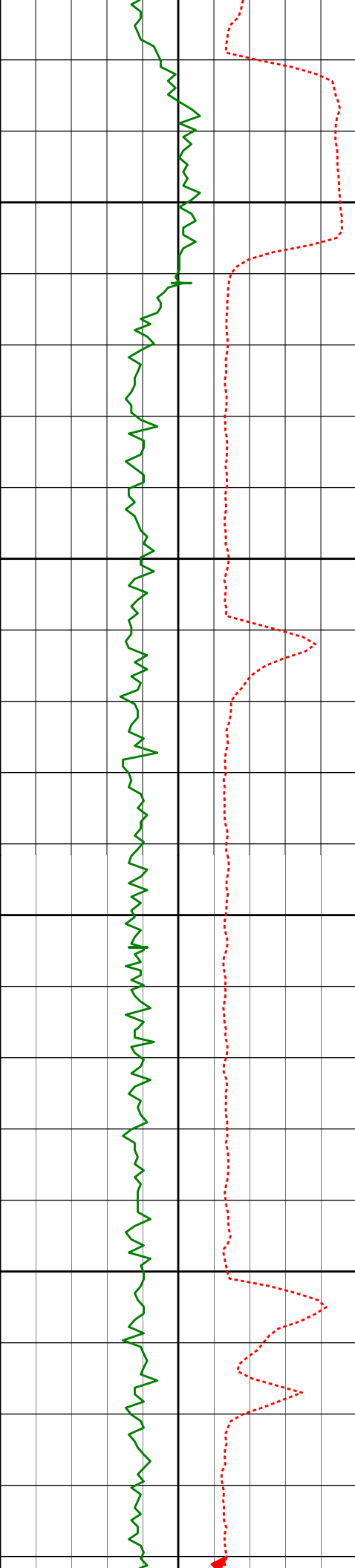
5571.06'

2989.21'

8400'

ROPA

PGRC



8450'

8453'

89.78°

358.42°

5570.55'

3083.68'

8500'

8550'

8548'

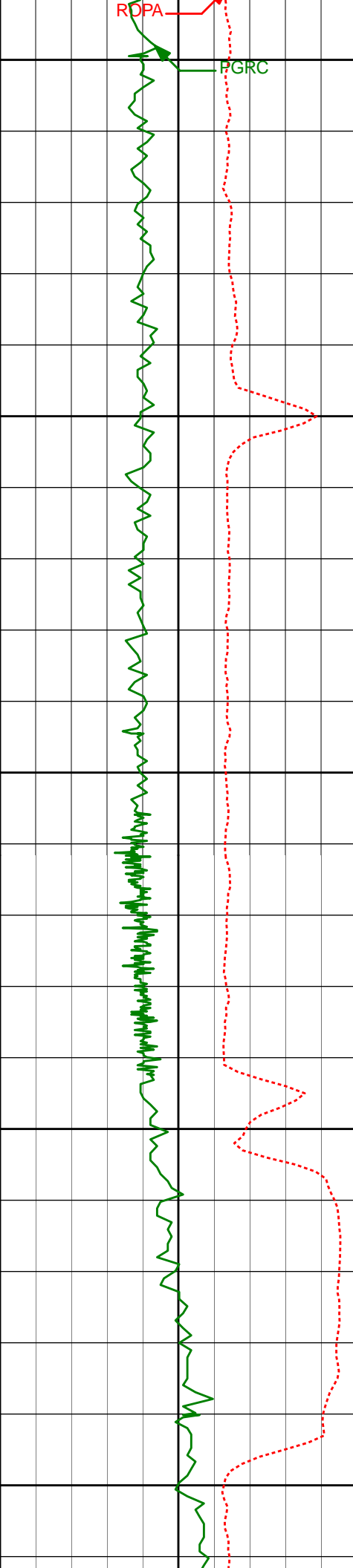
89.14°

357.66°

5571.44'

3178.09'

8600'



8650'

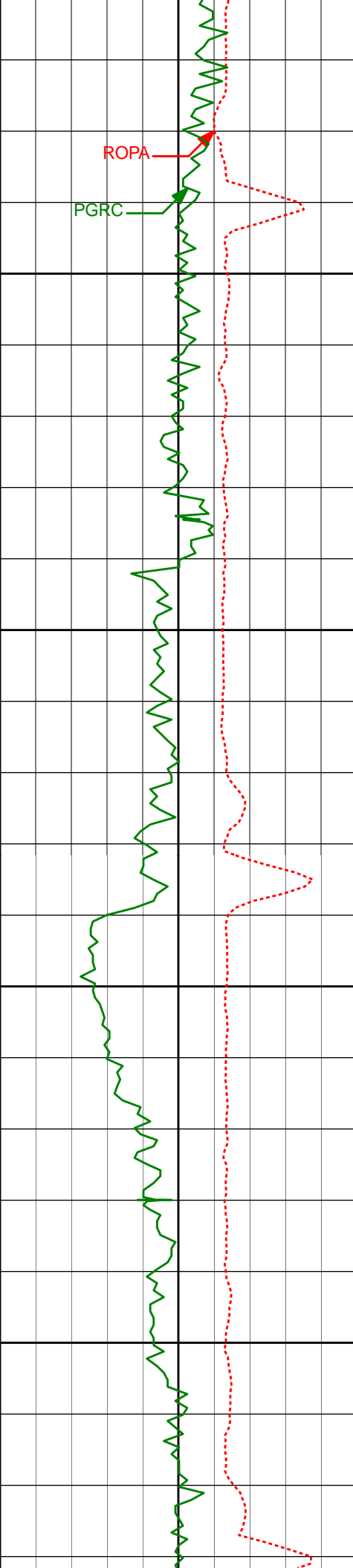
8700'

8750'

8800'

8850'

8643'	88.83°	356.84°	5573.13'	3272.61'
8738'	89.04°	355.81°	5574.90'	3367.28'
8833'	88.49°	358.50°	5576.94'	3461.81'



8900'

8950'

9000'

9050'

8928'

88.83°

358.64°

5579.16'

3556.09'

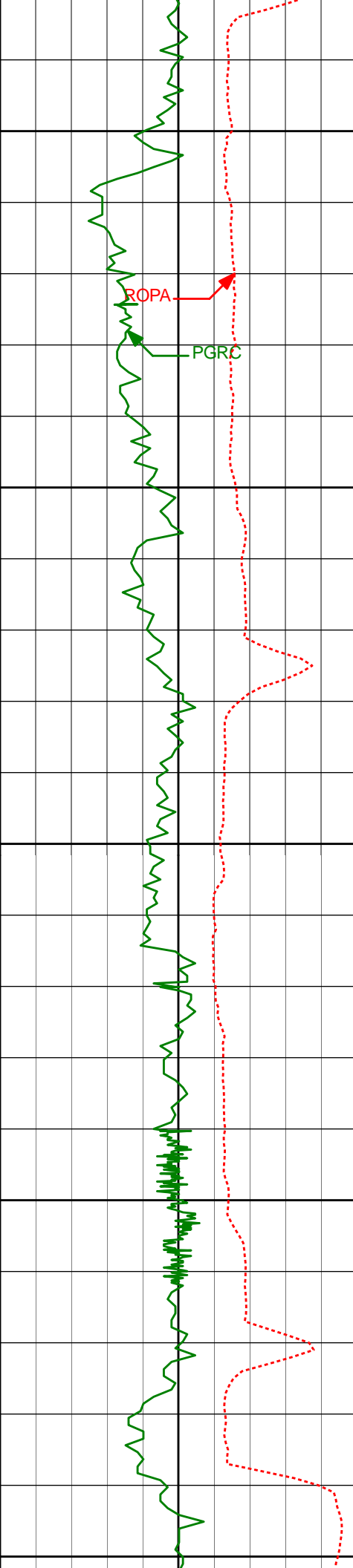
9023'

88.92°

357.32°

5581.03'

3650.49'



9100'

9118'

89.23°

356.80°

5582.56'

3745.05'

9150'

9200'

9213'

89.38°

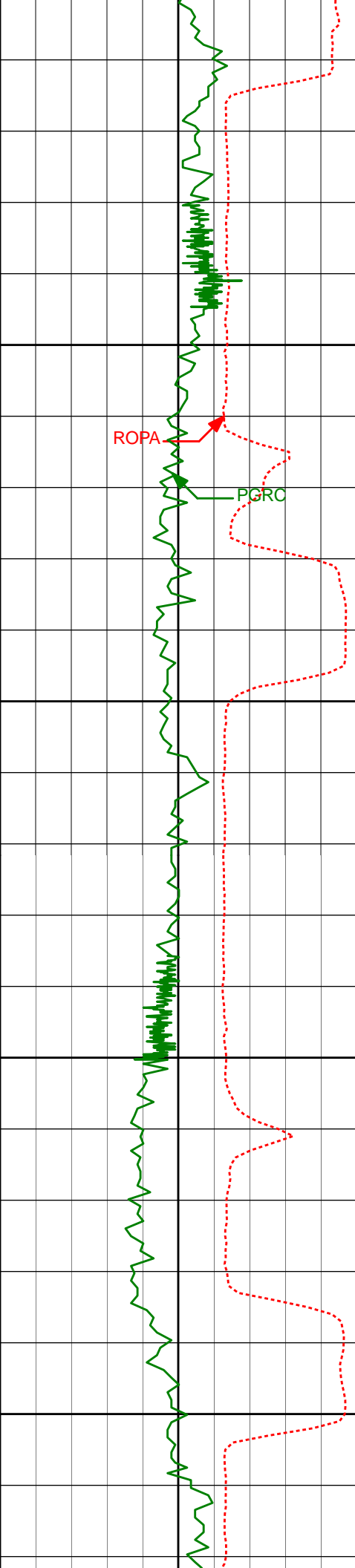
355.99°

5583.71'

3839.71'

9250'

9300'



9350'

9400'

9450'

9500'

9308'

91.42°

358.54°

5583.05'

3934.24'

9403'

90.09°

359.07°

5581.80'

4028.49'

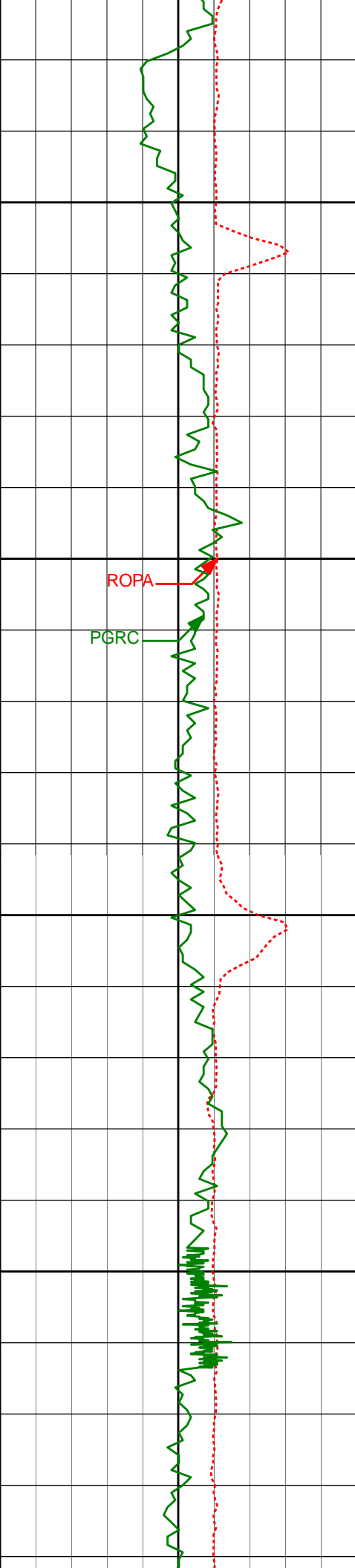
9498'

88.83°

358.75°

5582.69'

4122.72'



9550'

9593'

89.48°

358.38°

5584.10'

4217.02'

9600'

9650'

9688'

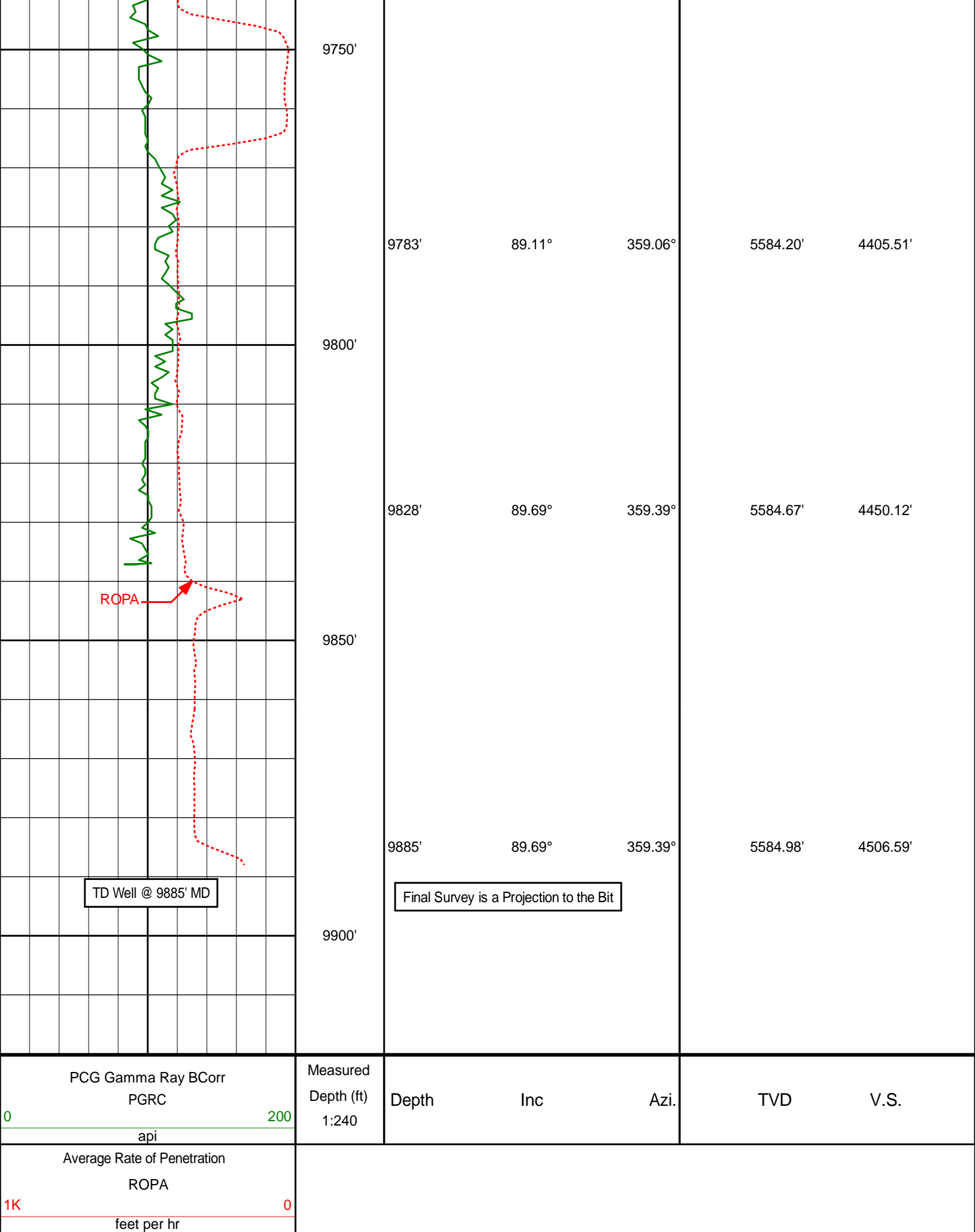
90.65°

358.96°

5584.00'

4311.30'

9700'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Davis State LD02-73-1BHN
Wattenberg
Weld Colorado
USA

CA-XX-0901828869

The first three surveys at 355', 635' and 1005' are provided by HP.

<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
355.00	0.60	110.92	354.99	0.66 S	1.74 E	-0.91	0.17
635.00	0.20	147.01	634.99	1.60 S	3.37 E	-2.07	0.16
1005.00	0.60	123.51	1004.98	3.21 S	5.34 E	-3.95	0.11
1289.00	0.46	138.52	1288.96	4.88 S	7.33 E	-5.89	0.07
1381.00	0.57	146.20	1380.96	5.54 S	7.83 E	-6.62	0.15
1474.00	0.62	148.70	1473.96	6.35 S	8.35 E	-7.50	0.05
1567.00	0.54	162.79	1566.95	7.20 S	8.74 E	-8.39	0.17
1660.00	1.26	244.45	1659.94	8.06 S	7.94 E	-9.12	1.40
1752.00	1.44	244.42	1751.92	8.99 S	5.98 E	-9.77	0.20
1844.00	1.53	248.17	1843.89	9.95 S	3.80 E	-10.40	0.14
1937.00	1.54	247.05	1936.85	10.90 S	1.49 E	-11.00	0.03
2029.00	1.65	247.36	2028.82	11.89 S	0.87 W	-11.64	0.12
2122.00	1.53	248.31	2121.78	12.87 S	3.26 W	-12.26	0.14
2215.00	1.53	249.12	2214.75	13.77 S	5.58 W	-12.81	0.02
2307.00	1.32	245.36	2306.72	14.65 S	7.69 W	-13.38	0.26
2402.00	0.52	301.98	2401.71	14.87 S	9.05 W	-13.40	1.18
2592.00	0.80	296.35	2591.69	13.82 S	10.97 W	-12.08	0.15
2687.00	0.90	293.25	2686.68	13.23 S	12.26 W	-11.31	0.12
2782.00	1.82	275.90	2781.66	12.78 S	14.45 W	-10.55	1.05
2877.00	3.85	273.37	2876.53	12.44 S	19.14 W	-9.53	2.14
2972.00	4.63	270.46	2971.27	12.22 S	26.15 W	-8.29	0.85
3067.00	5.76	265.63	3065.88	12.55 S	34.74 W	-7.37	1.28
3162.00	6.48	262.63	3160.34	13.61 S	44.81 W	-6.95	0.82
3257.00	7.35	258.57	3254.65	15.50 S	56.09 W	-7.18	1.05
3353.00	9.10	252.71	3349.66	18.97 S	69.36 W	-8.69	2.02
3448.00	10.85	245.24	3443.22	24.95 S	84.65 W	-12.38	2.28
3543.00	11.75	246.12	3536.38	32.61 S	101.62 W	-17.49	0.97
3638.00	12.14	247.61	3629.32	40.33 S	119.70 W	-22.50	0.52
3733.00	11.95	247.48	3722.23	47.91 S	138.03 W	-27.33	0.21
3828.00	12.36	246.70	3815.10	55.69 S	156.45 W	-32.35	0.47
3923.00	11.85	243.24	3907.99	64.11 S	174.49 W	-38.05	0.93
4018.00	12.08	242.70	4000.93	73.05 S	192.03 W	-44.36	0.27
4113.00	11.84	243.19	4093.87	82.01 S	209.56 W	-50.67	0.27
4208.00	11.52	240.36	4186.90	91.10 S	226.51 W	-57.20	0.69
4303.00	11.51	238.15	4279.99	100.79 S	242.80 W	-64.42	0.46
4399.00	10.81	237.12	4374.17	110.73 S	258.50 W	-71.97	0.75
4494.00	12.16	244.37	4467.27	119.90 S	275.00 W	-78.64	2.08
4589.00	10.19	244.16	4560.47	127.89 S	291.59 W	-84.14	2.07
4684.00	10.06	241.95	4653.99	135.46 S	306.48 W	-89.46	0.43
4779.00	13.17	249.70	4747.04	143.11 S	323.96 W	-94.49	3.66
4874.00	13.81	260.02	4839.43	148.83 S	345.27 W	-97.05	2.62
4969.00	15.11	283.70	4931.50	147.86 S	368.49 W	-92.72	6.33
5064.00	27.87	306.06	5019.85	131.77 S	398.64 W	-72.41	15.74
5159.00	34.55	339.37	5101.65	93.16 S	426.32 W	-30.18	19.22
5254.00	35.80	347.26	5179.34	40.82 S	441.95 W	23.87	4.96
5349.00	37.55	344.90	5255.54	14.24 N	455.62 W	80.33	2.37
5444.00	44.27	345.80	5327.30	74.40 N	471.31 W	142.13	7.10
5539.00	55.86	351.64	5388.21	145.72 N	485.21 W	214.71	13.07
5634.00	65.74	353.61	5434.50	227.86 N	495.78 W	297.52	10.56
5730.00	70.46	355.24	5470.30	316.48 N	504.41 W	386.46	5.16
5825.00	72.40	355.69	5500.55	406.25 N	511.52 W	476.31	2.09
5920.00	81.77	357.63	5521.76	498.59 N	516.88 W	568.44	10.06
5978.00	85.77	358.71	5528.05	556.20 N	518.71 W	625.71	7.15
6081.00	86.98	358.66	5534.56	658.97 N	521.08 W	727.72	1.17
6173.00	87.78	359.42	5538.77	750.86 N	522.62 W	818.86	1.20

6267.00	87.90	359.16	5542.31	844.78 N	523.79 W	911.96	0.30
6362.00	88.21	359.22	5545.53	939.72 N	525.13 W	1006.08	0.33
6457.00	87.97	358.92	5548.70	1034.65 N	526.67 W	1100.23	0.40
6552.00	87.53	358.26	5552.43	1129.55 N	529.00 W	1194.46	0.83
6647.00	87.84	358.50	5556.26	1224.43 N	531.68 W	1288.73	0.41
6742.00	87.59	358.16	5560.04	1319.32 N	534.45 W	1383.00	0.44
6837.00	89.32	356.84	5562.60	1414.19 N	538.60 W	1477.47	2.29
6932.00	90.46	358.69	5562.78	1509.11 N	542.30 W	1571.92	2.29
7027.00	89.66	357.94	5562.68	1604.07 N	545.09 W	1666.27	1.15
7122.00	89.66	356.85	5563.24	1698.97 N	549.40 W	1760.79	1.15
7217.00	89.82	356.56	5563.67	1793.81 N	554.86 W	1855.42	0.35
7312.00	88.34	355.17	5565.21	1888.54 N	561.71 W	1950.14	2.14
7407.00	88.18	354.40	5568.09	1983.11 N	570.34 W	2044.96	0.82
7502.00	89.32	357.26	5570.16	2077.82 N	577.24 W	2139.67	3.24
7597.00	88.83	356.97	5571.70	2172.69 N	582.02 W	2234.22	0.61
7692.00	89.72	359.58	5572.90	2267.63 N	584.88 W	2328.57	2.91
7787.00	88.95	358.99	5574.00	2362.61 N	586.06 W	2422.72	1.02
7882.00	90.62	359.91	5574.36	2457.60 N	586.98 W	2516.83	2.00
7977.00	91.11	359.78	5572.93	2552.59 N	587.24 W	2610.85	0.54
8072.00	90.03	358.94	5571.98	2647.58 N	588.29 W	2704.98	1.44
8168.00	89.97	358.32	5571.98	2743.55 N	590.59 W	2800.26	0.65
8263.00	90.15	357.73	5571.88	2838.49 N	593.86 W	2894.68	0.65
8358.00	90.83	356.86	5571.06	2933.38 N	598.35 W	2989.21	1.16
8453.00	89.78	358.42	5570.55	3028.30 N	602.27 W	3083.68	1.98
8548.00	89.14	357.66	5571.44	3123.24 N	605.52 W	3178.09	1.05
8643.00	88.83	356.84	5573.13	3218.11 N	610.08 W	3272.61	0.92
8738.00	89.04	355.81	5574.90	3312.90 N	616.16 W	3367.28	1.12
8833.00	88.49	358.50	5576.94	3407.75 N	620.88 W	3461.81	2.89
8928.00	88.83	358.64	5579.16	3502.69 N	623.25 W	3556.09	0.39
9023.00	88.92	357.32	5581.03	3597.61 N	626.60 W	3650.49	1.39
9118.00	89.23	356.80	5582.56	3692.48 N	631.46 W	3745.05	0.63
9213.00	89.38	355.99	5583.71	3787.28 N	637.43 W	3839.71	0.87
9308.00	91.42	358.54	5583.05	3882.16 N	641.96 W	3934.24	3.43
9403.00	90.09	359.07	5581.80	3977.13 N	643.94 W	4028.49	1.50
9498.00	88.83	358.75	5582.69	4072.10 N	645.75 W	4122.72	1.37
9593.00	89.48	358.38	5584.10	4167.06 N	648.13 W	4217.02	0.79
9688.00	90.65	358.96	5584.00	4262.03 N	650.34 W	4311.30	1.38
9783.00	89.11	359.06	5584.20	4357.02 N	651.98 W	4405.51	1.63
9828.00	89.69	359.39	5584.67	4402.01 N	652.59 W	4450.12	1.49
9885.00	89.69	359.39	5584.98	4459.01 N	653.20 W	4506.59	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

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

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 351.64 DEGREES (GRID)
A TOTAL CORRECTION OF 6.91 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 9885.00 FEET
IS 4506.60 FEET ALONG 351.67 DEGREES (GRID)**

Final survey is a straight line projection to TD.