

PCG Pressure Case Gamma PCD Pressure Case Directional

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	19-Jan-14	20-Jan-14	23-Jan-14		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	688.00	6,063.00	7,118.00		
Log End Depth (MD, ft)	6,063.00	7,118.00	11,120.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	19-Jan-14 04:15	20-Jan-14 04:45	22-Jan-14 01:30		
Drill/Wipe End Date and Time	19-Jan-14 20:15	20-Jan-14 04:45	23-Jan-14 05:15		
Min Inc (deg) @ Depth (MD, ft)	0.32 @ 808.00	1.25 @ 6,100.00	86.76 @ 7,146.00		
Max Inc (deg) @ Depth (MD, ft)	13.73 @ 3,826.00	83.10 @ 7,065.00	92.50 @ 10,557.00		
Bit TFA(in2) / Bit Type	0.91 / PDC	0.98 / PDC	0.98 / PDC		
Flow Rate (gpm)	581.96	555.39	300.00		
Max AV (fpm) / CV (fpm) @ MWD	466.0 / 500.0	423.0 / 425.0	448.0 / 400.0		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	9.00 / 33.00	10.50 / 35.00	9.50 / 35.00		
Filtrate CL (ppm)	2,300.00	2,600.00	2,600.00		
pH / Fluid Loss (mptm)	9.20 / 12	9.10 / 11	9.60 / 9		
PV (cP) / YP (lbf2)	7 / 4.00	8 / 5.00	8 / 9.00		
% Solids / % Sand	2.50 / 0.30	5.70 / 0.25	6.20 / 0.20		
% Oil / Oil:Water Ratio	N/A / N/A	NA / NA	NA / NA		
Rm @ Measured Temp (degF)	N/A @ N/A	NA @ NA	NA @ NA		
Rmf @ Measured Temp (degF)	N/A @ N/A	NA @ NA	NA @ NA		
Rmc @ Measured Temp (degF)	N/A @ N/A	NA @ NA	NA @ NA		
Max Tool Temp (in F) / S	158.00 / PDM	170.07 / PDM	220.00 / PDM		

Max Tool Temp (degF) / Source	158.60 / PCM	170.37 / PCM	226.00 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	NA @ NA	NA @ NA		
Lead MWD Engineer	Gary Eifert	Gary Eifert	Gary Eifert		
Customer Representative	Johnny Sanchez	Johnny Sanchez	Johnny Sanchez		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11341330	11341330	12310743		
Insert Serial Number	10997273	10997273	11227486		
Date and Time Initialized	18-Jan-14 13:31	01-Jan-70 00:00	20-Jan-14 22:57		
Date and Time Read	20-Jan-14 22:26	20-Jan-14 22:21	23-Jan-14 21:50		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	56.00	53.00	59.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341330	11341330	12310743		
Sonde Serial Number	11477956	11477956	11478086		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	289.81	266.13	275.87		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.62	45.93	62.16		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	1341330	1341330	12310743		
Insert/Sonde Serial Number	12037425	12037425	11120589		

REMARKS

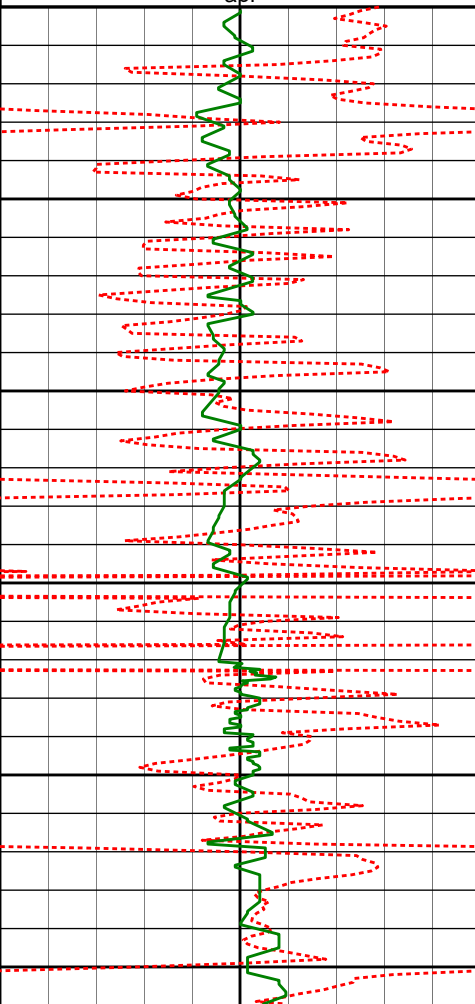
1. All depths are measured bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
PGRC (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft
ROPA (Average Rate of Penetration)
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill: 3.0 ft
6. INSITE version 8.0

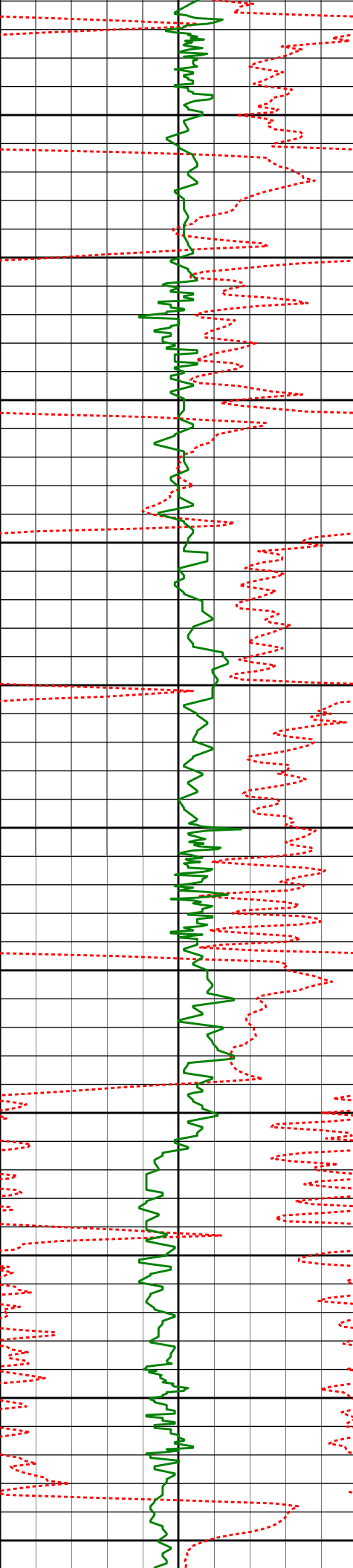
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MD Main Log 1:600

Average Rate of Penetration ROPA						
1K0						
feet per hr						
PCG Gamma Ray BCorr PGRC		Measured Depth (ft) 1:600	Depth	Inc	Azi.	TVDV.S.
0200						
api						
		3000'				
		3050'				
		3068'	12.37°	100.08°	3040.17'	-8.31'
		3100'				
		3150'				
		3163'	11.21°	98.12°	3133.16'	-8.81'
		3200'				
		3250'				
		3257'	11.41°	96.23°	3225.34'	-8.65'



3300'

3350'

3400'

3450'

3500'

3550'

3600'

3650'

3700'

3750'

3800'

3352'

11.10°

101.15°

3318.51'

-8.97'

3447'

12.86°

96.87°

3411.44'

-9.37'

3542'

11.27°

95.12°

3504.34'

-8.81'

3636'

11.72°

102.05°

3596.46'

-9.13'

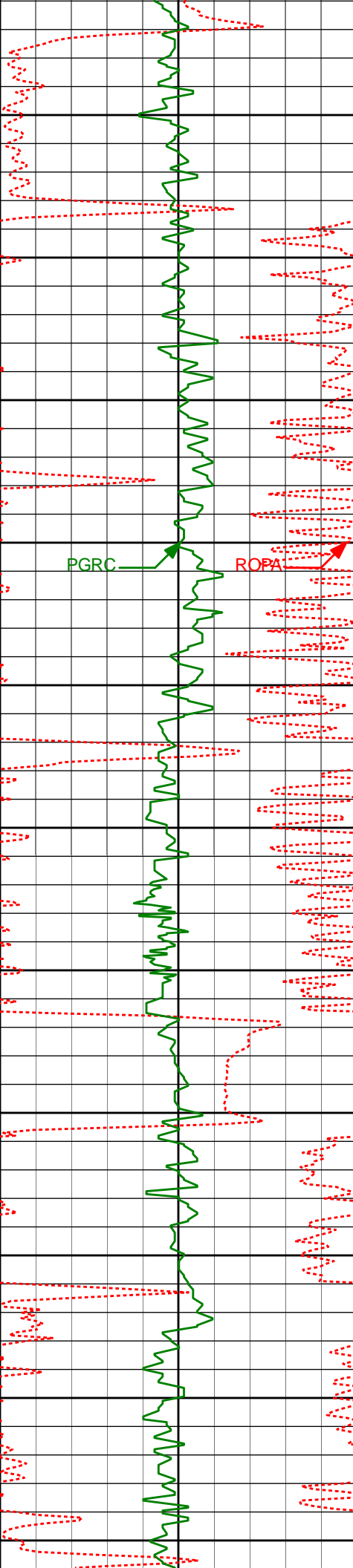
3731'

11.31°

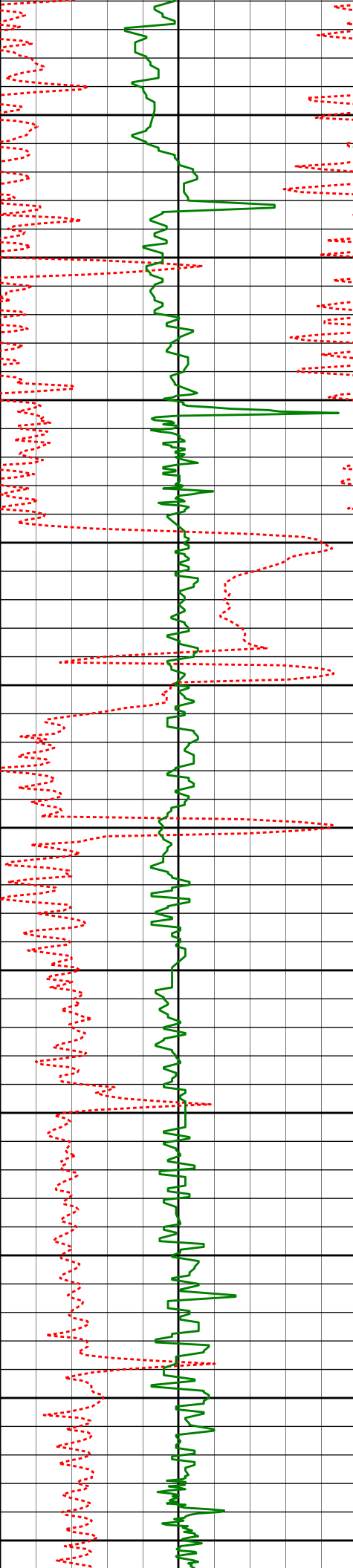
101.98°

3689.55'

-10.57'



3826'	13.73°	102.83°	3782.28'	-12.29'
3850'				
3900'				
3921'	13.30°	104.18°	3874.65'	-14.54'
3950'				
4000'				
4016'	11.79°	101.56°	3967.39'	-16.44'
4050'				
4100'				
4111'	10.50°	101.58°	4060.59'	-17.69'
4150'				
4200'				
4205'	13.06°	98.69°	4152.61'	-18.46'
4250'				
4300'				
4301'	11.88°	95.77°	4246.34'	-18.33'
4350'				



4400'

4450'

4500'

4550'

4600'

4650'

4700'

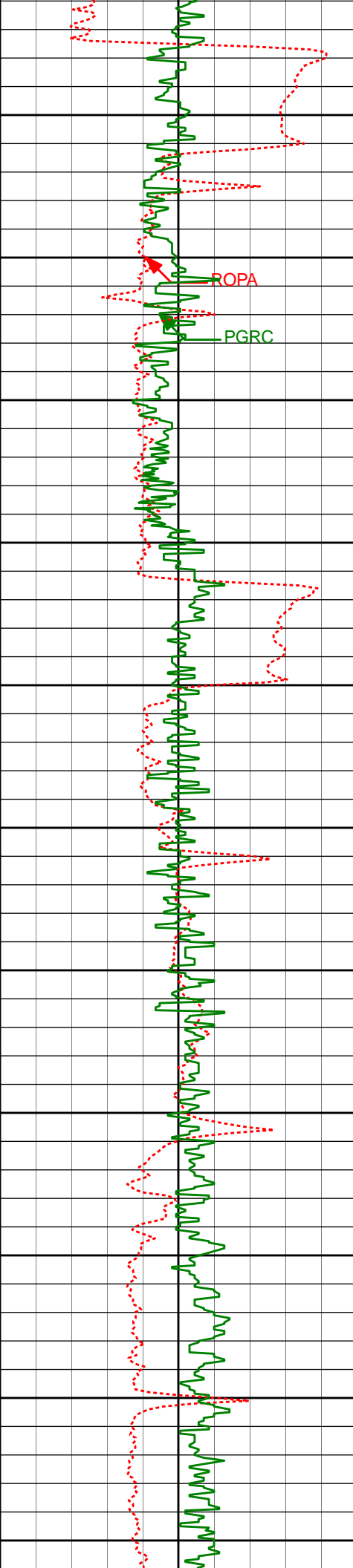
4750'

4800'

4850'

4900'

4396'	11.09°	96.12°	4339.44'	-17.76'
4490'	10.75°	95.33°	4431.73'	-17.15'
4585'	7.75°	90.11°	4525.49'	-15.95'
4680'	6.06°	85.05°	4619.80'	-14.01'
4774'	5.17°	77.21°	4713.35'	-11.45'
4869'	5.02°	72.99°	4807.97'	-8.21'



4950'

4964'

3.88°

106.45°

4902.70'

-6.97'

5000'

POPA

PGRC

5050'

5059'

3.41°

114.74°

4997.51'

-8.29'

5100'

5150'

5154'

0.98°

151.40°

5092.44'

-9.77'

5200'

5250'

5249'

1.07°

124.69°

5187.42'

-10.83'

5300'

5350'

5344'

0.59°

98.51°

5282.41'

-11.24'

5400'

5450'

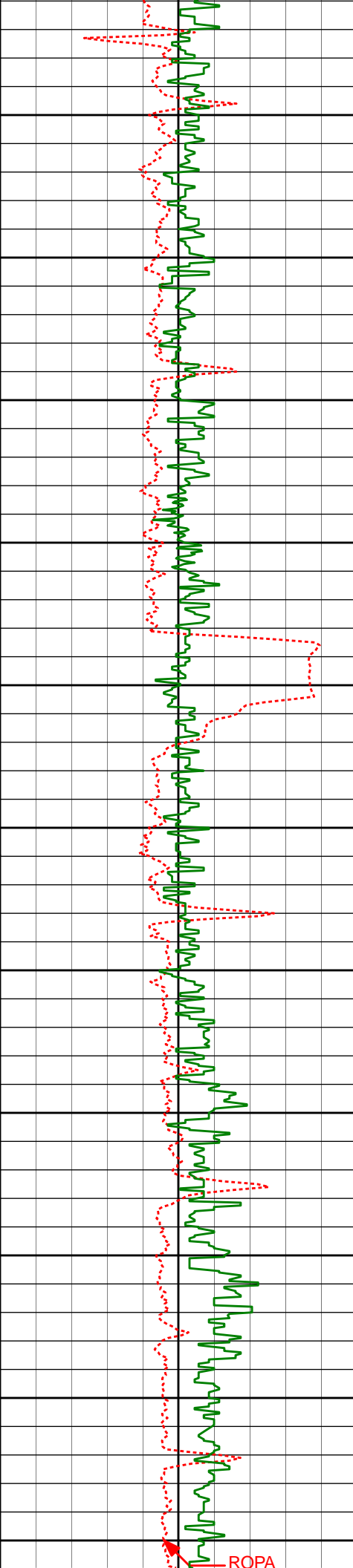
5438'

1.03°

112.87°

5376.40'

-11.47'



5500'

5533'

1.21°

88.50°

5471.38'

-11.53'

5550'

5600'

5628'

0.91°

81.98°

5566.37'

-11.17'

5650'

5700'

5723'

1.70°

180.99°

5661.35'

-12.37'

5750'

5800'

5817'

1.16°

164.92°

5755.32'

-14.63'

5850'

5900'

5912'

0.83°

153.14°

5850.31'

-16.08'

5950'

6000'

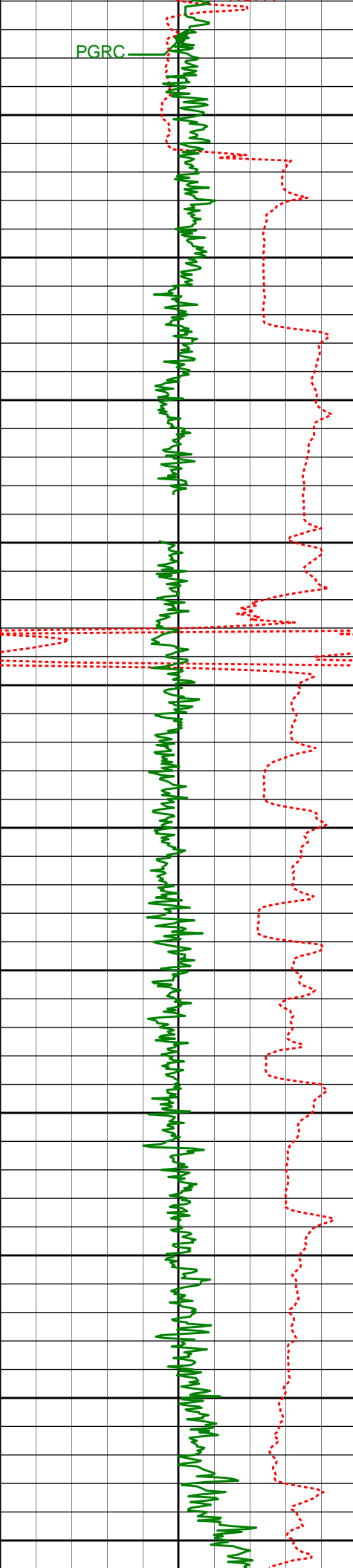
6007'

1.44°

172.95°

5945.29'

-17.80'



Run200

6050'

6100'

6150'

6200'

6250'

6300'

6350'

6400'

6450'

6500'

6550'

6100'

6148'

6195'

6243'

6290'

6338'

6384'

6479'

6527'

1.25°

2.79°

8.24°

11.81°

14.14°

15.94°

17.56°

31.07°

40.47°

179.86°

345.26°

353.06°

357.27°

355.34°

355.52°

356.61°

2.90°

5.25°

6038.26'

6086.25'

6133.02'

6180.28'

6226.07'

6272.43'

6316.47'

6402.86'

6441.76'

-19.93'

-19.37'

-15.05'

-6.89'

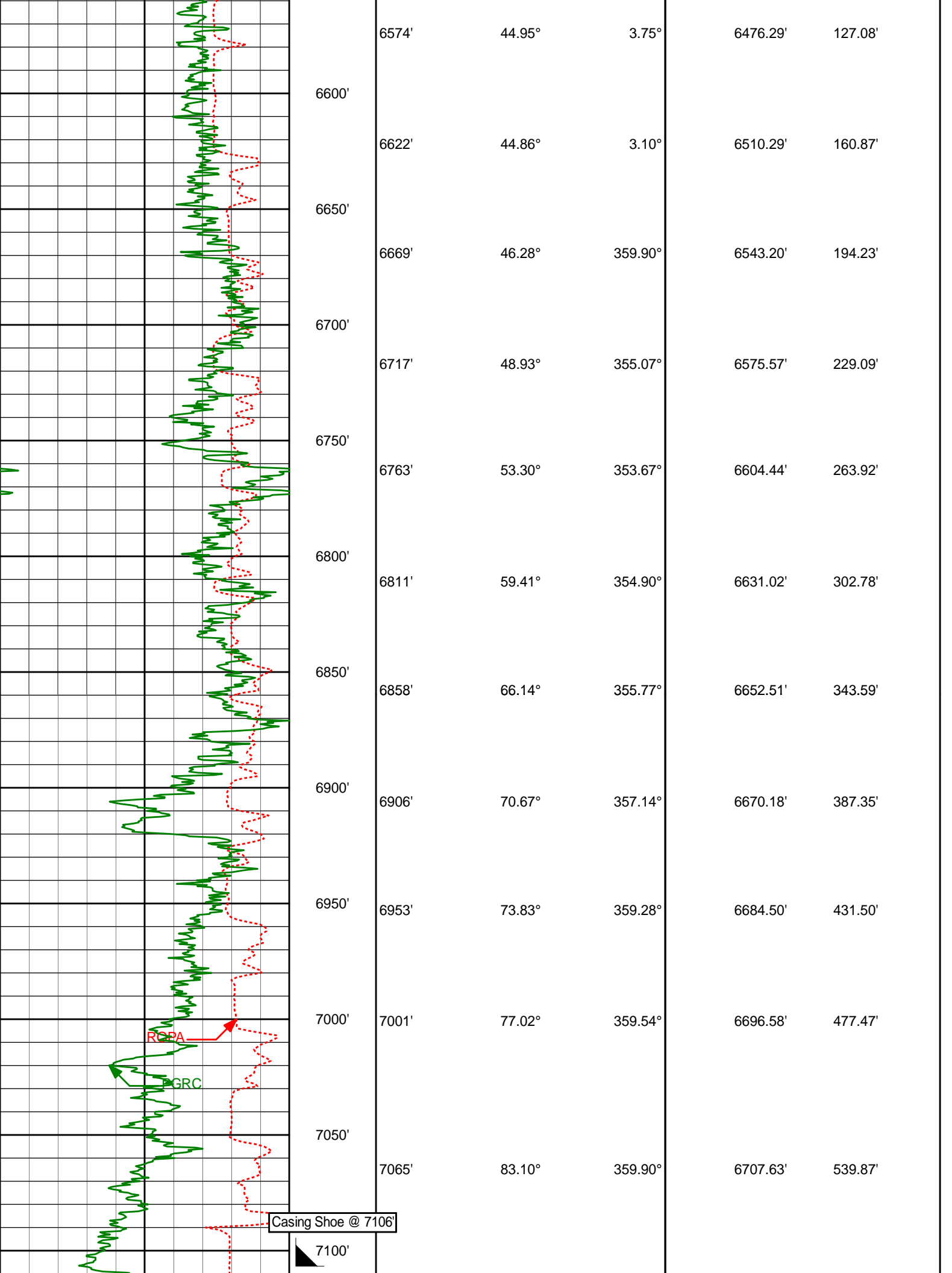
3.45'

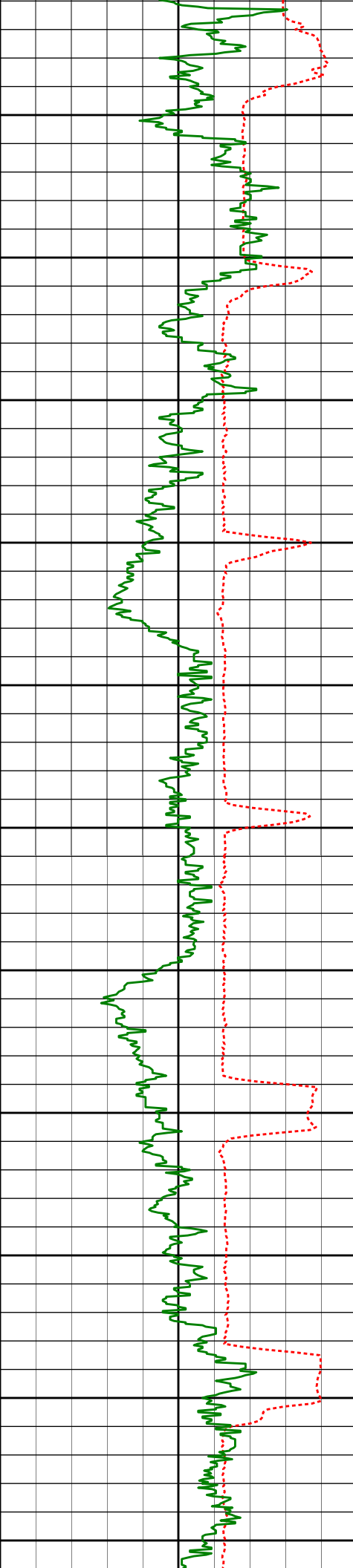
15.62'

28.61'

67.29'

95.26'





Run 300

7150'

7146'

86.76°

0.12°

6714.79'

619.82'

7200'

7250'

7241'

87.63°

0.75°

6719.44'

713.95'

7300'

7335'

88.58°

0.77°

6722.55'

807.21'

7350'

7400'

7430'

91.36°

0.94°

6722.60'

901.53'

7450'

7500'

7525'

91.48°

0.64°

6720.24'

995.82'

7550'

7600'

7620'

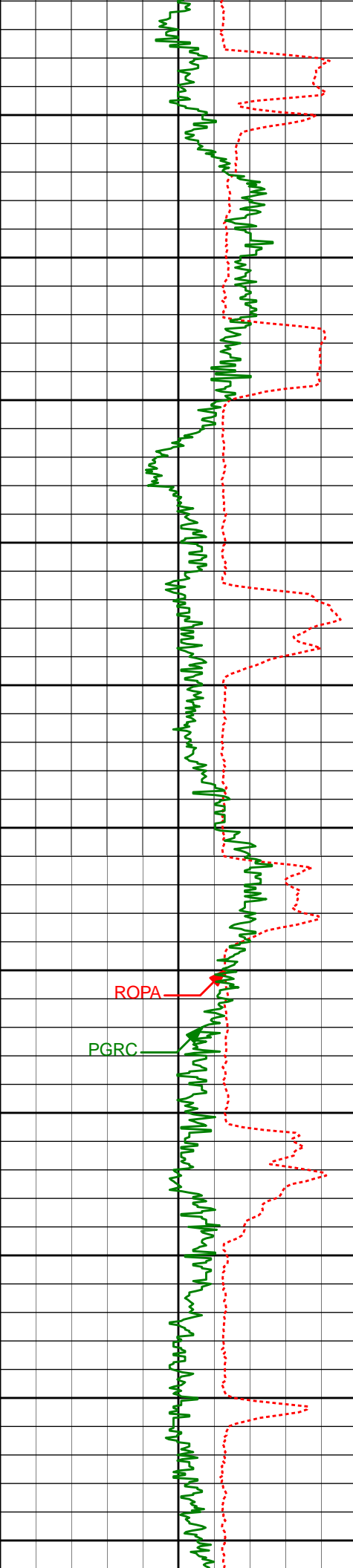
90.77°

359.53°

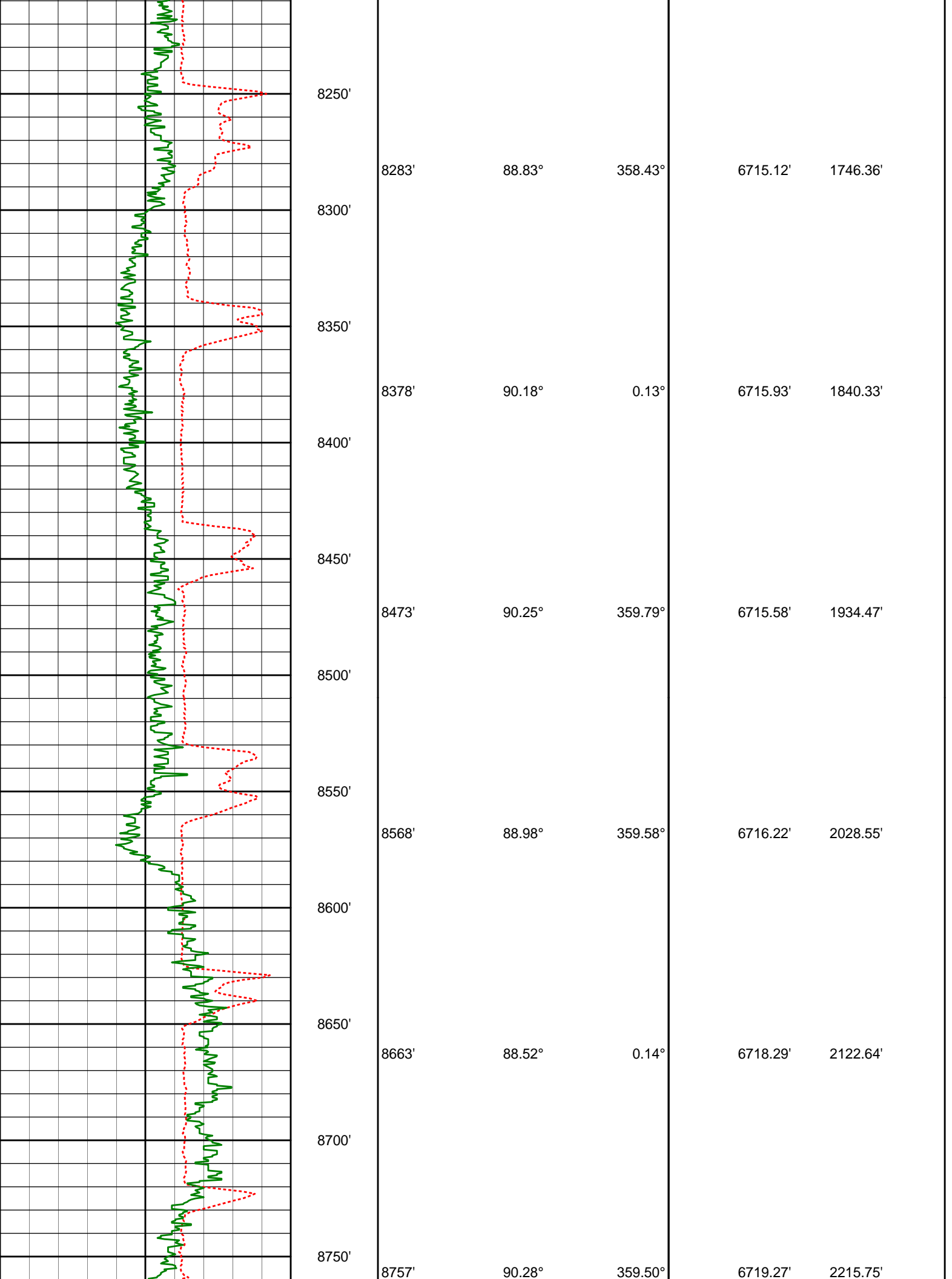
6718.38'

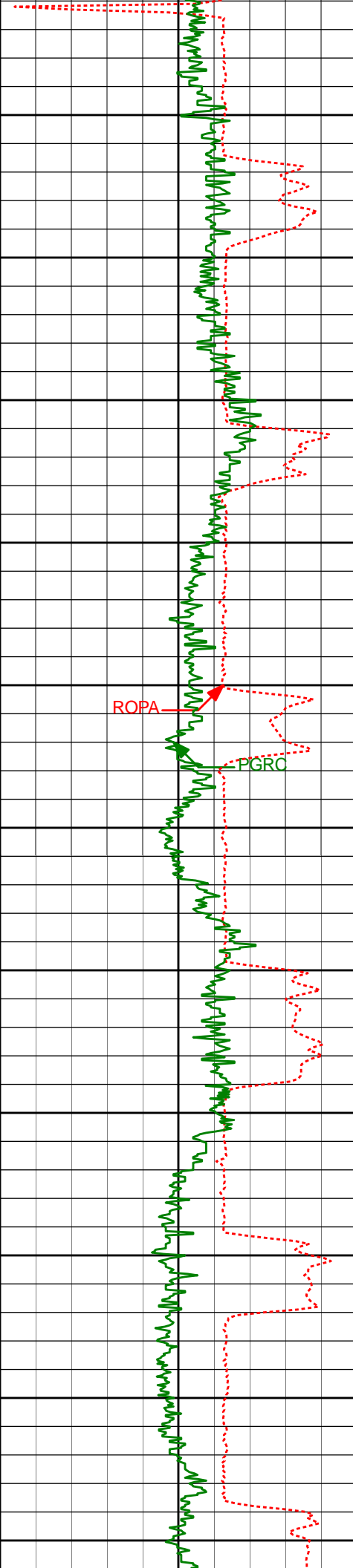
1089.97'

7650'



7700'	7714'	92.00°	358.75°	6716.10'	1182.90'
7750'					
7800'	7809'	91.05°	0.34°	6713.57'	1276.91'
7850'					
7900'	7903'	90.31°	1.84°	6712.46'	1370.28'
7950'					
8000'	7998'	89.26°	0.72°	6712.81'	1464.69'
8050'					
8100'	8093'	88.77°	359.71°	6714.45'	1558.87'
8150'					
8200'	8188'	90.80°	357.69°	6714.81'	1652.69'





8800'

8850'

8900'

8950'

9000'

9050'

9100'

9150'

9200'

9250'

9300'

8851'

90.43°

358.39°

6718.69'

2308.66'

8946'

89.97°

357.19°

6718.36'

2402.25'

9041'

89.14°

354.49°

6719.10'

2495.22'

9136'

91.08°

358.83°

6718.92'

2588.45'

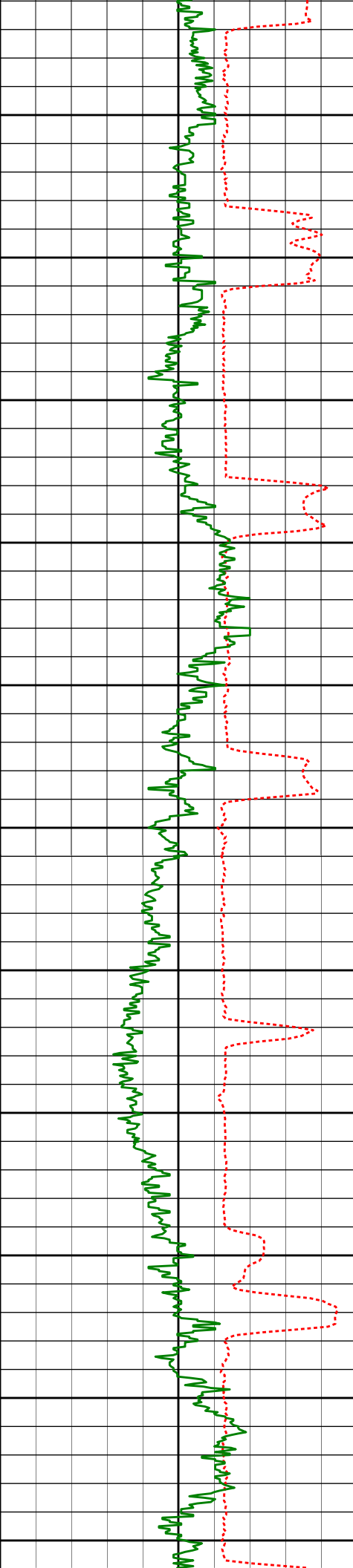
9231'

91.05°

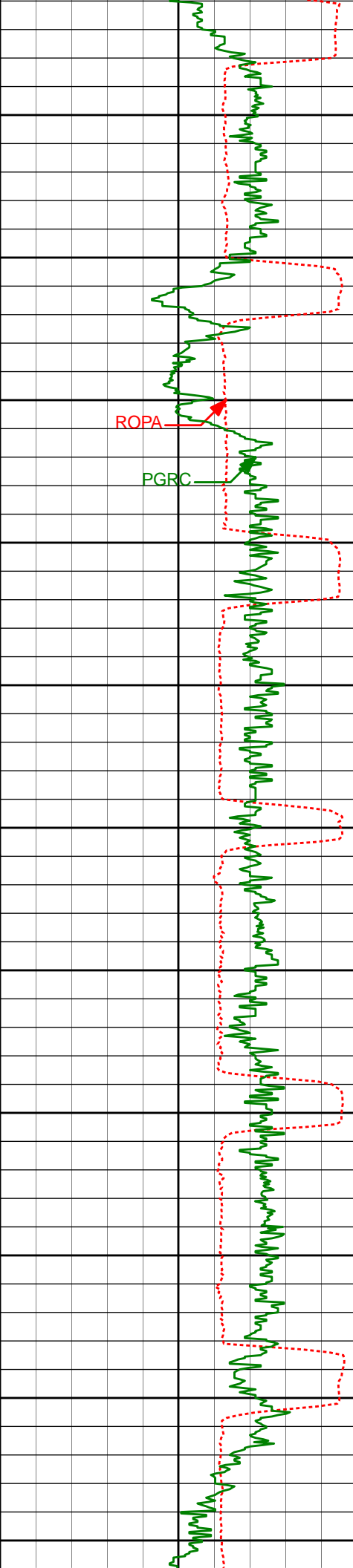
359.37°

6717.16'

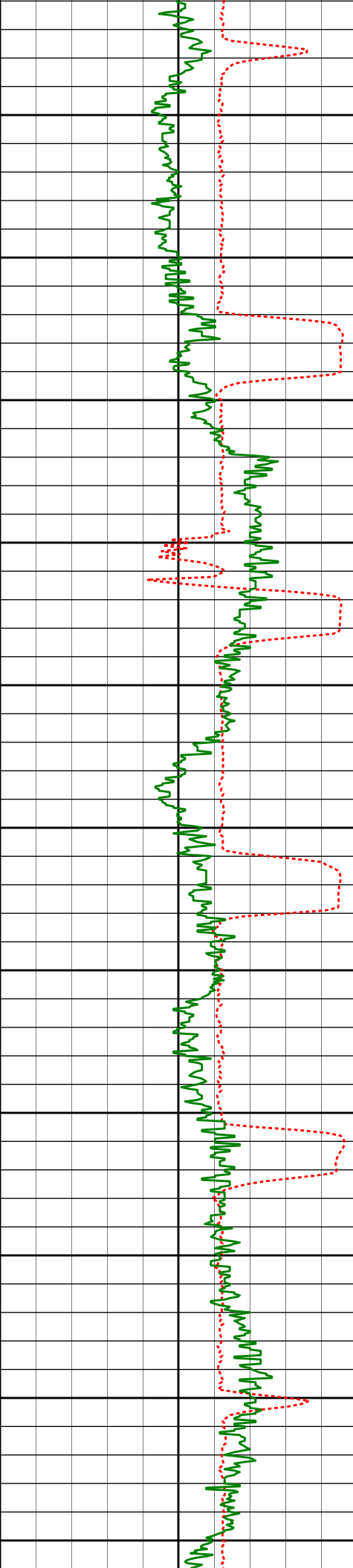
2682.37'



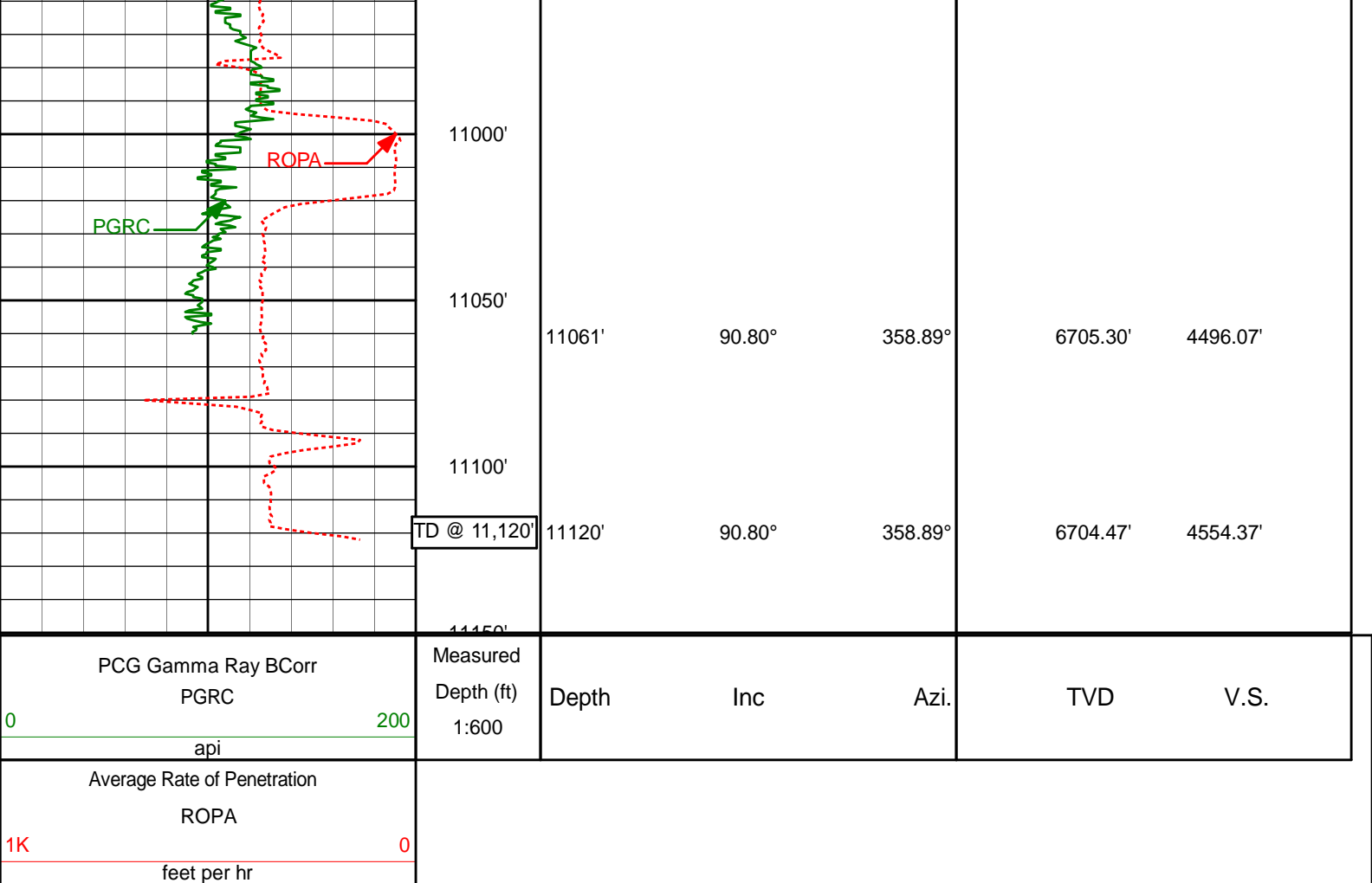
9326'	9326'	90.37°	0.84°	6715.98'	2776.53'
9350'					
9400'					
9421'	9421'	89.63°	2.16°	6715.98'	2870.98'
9450'					
9500'					
9516'	9516'	89.17°	2.52°	6716.98'	2965.56'
9550'					
9600'	9611'	88.52°	2.18°	6718.90'	3060.13'
9650'					
9700'	9706'	90.59°	1.80°	6719.64'	3154.66'
9750'					
9800'	9800'	91.70°	0.63°	6717.77'	3248.04'
9850'					



9900'	9894'	90.80°	0.10°	6715.72'	3341.25'
9950'					
10000'	9989'	90.93°	1.11°	6714.29'	3435.52'
10050'					
10100'	10084'	89.78°	359.97°	6713.71'	3529.78'
10150'					
10200'	10178'	90.03°	359.82°	6713.86'	3622.92'
10250'					
10300'	10273'	90.34°	358.25°	6713.55'	3716.84'
10350'					
10400'	10367'	88.49°	358.29°	6714.52'	3809.57'

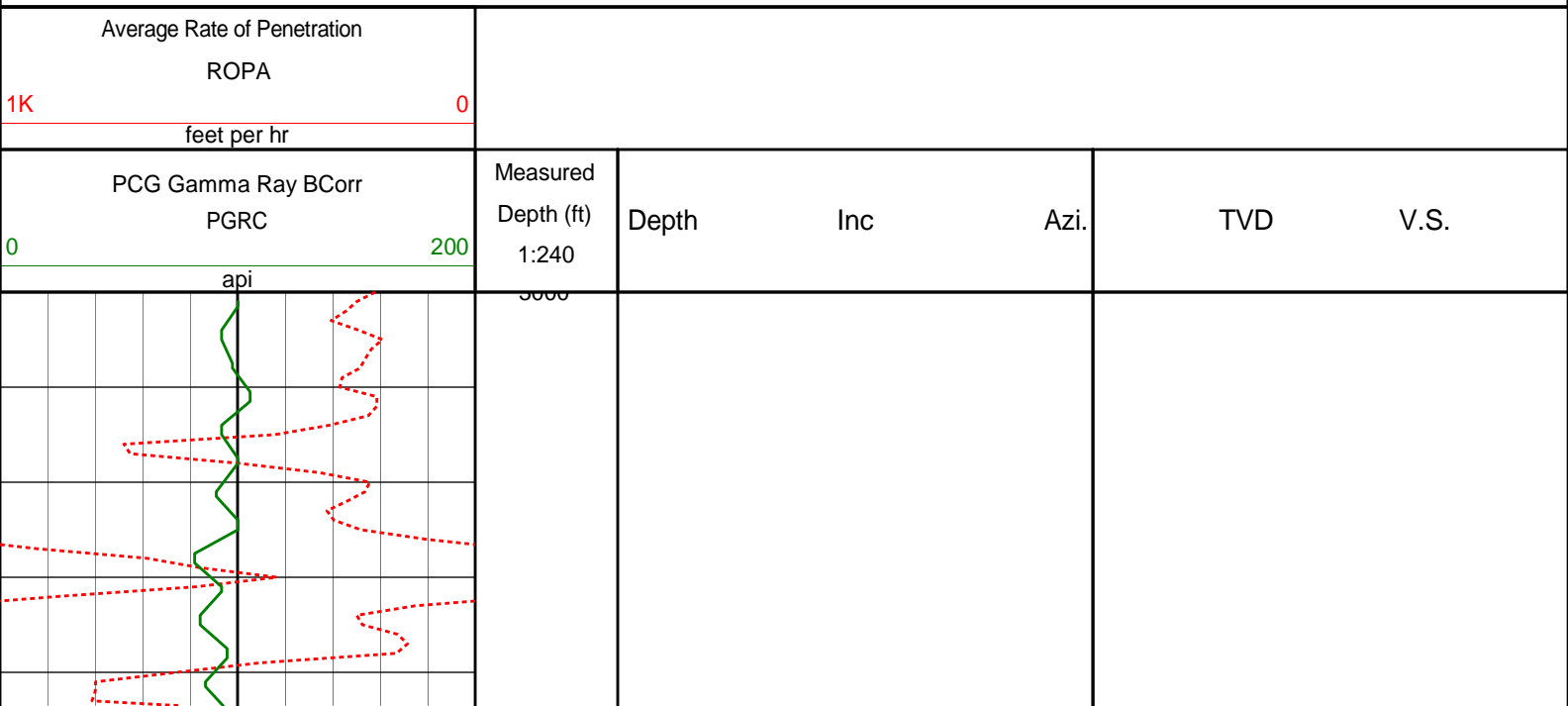


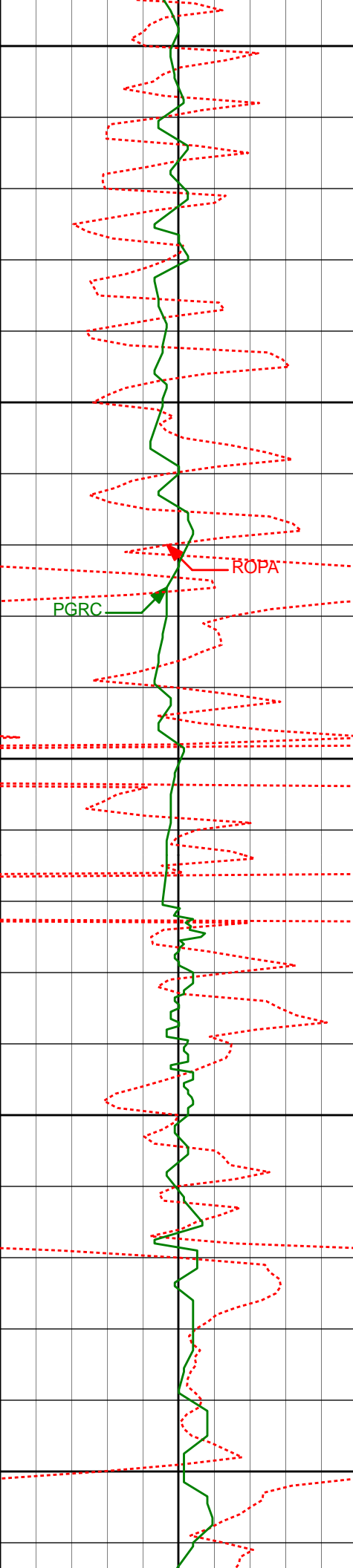
10450'	10462'	89.72°	357.53°	6716.00'	3903.18'
10500'					
10550'	10557'	92.50°	359.75°	6714.16'	3996.97'
10600'					
10650'	10652'	91.42°	359.66°	6710.91'	4091.00'
10700'					
10750'	10747'	90.68°	0.72°	6709.17'	4185.17'
10800'					
10850'	10842'	89.91°	359.90°	6708.69'	4279.38'
10900'					
10950'	10937'	91.36°	359.45°	6707.64'	4373.45'



HALLIBURTON

MD Main Log 1:240





3050'

3068'

12.37°

100.08°

3040.17'

-8.31'

3100'

3150'

3163'

11.21°

98.12°

3133.16'

-8.81'

3200'

3250'

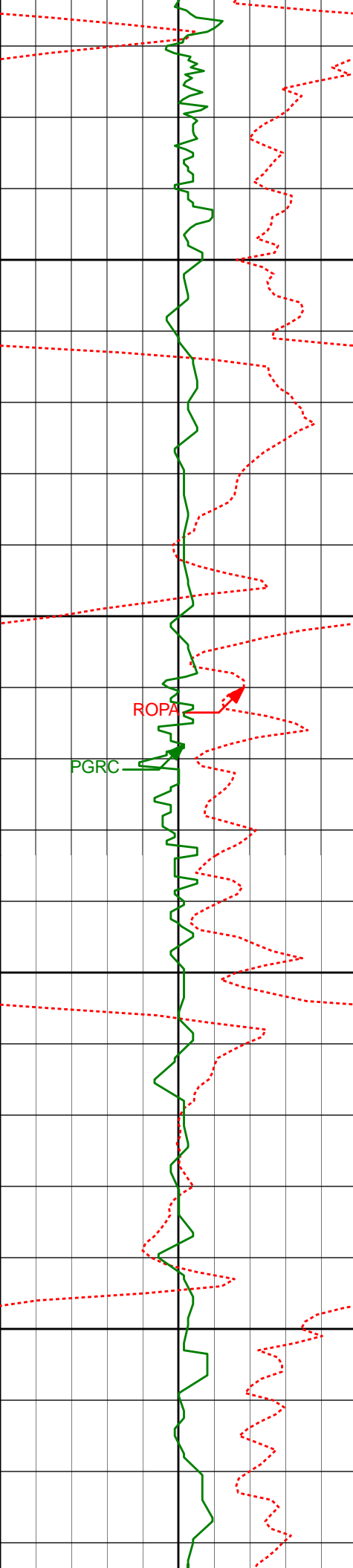
3257'

11.41°

96.23°

3225.34'

-8.65'



3300'

3350'

3400'

3450'

3352'

11.10°

101.15°

3318.51'

-8.97'

3447'

12.86°

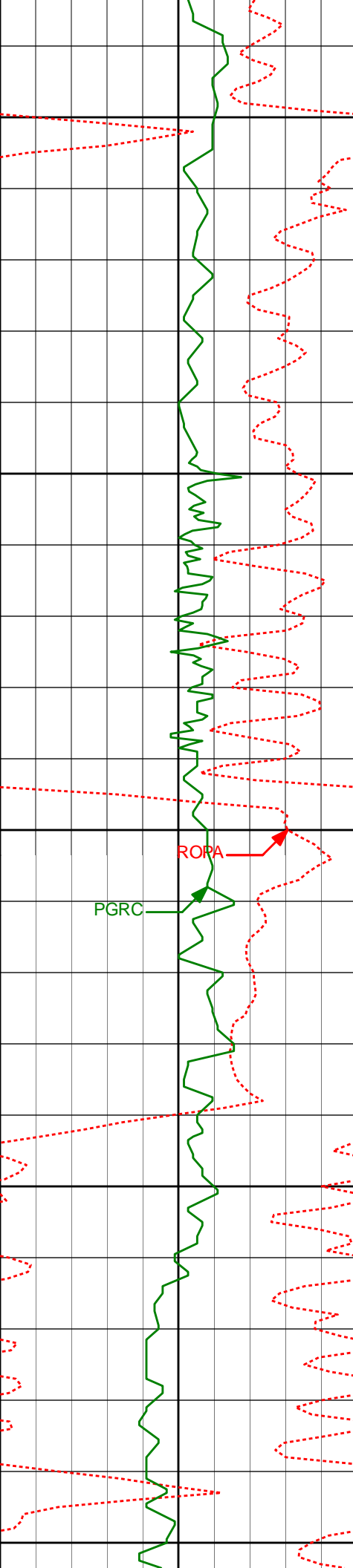
96.87°

3411.44'

-9.37'

ROPA

PGRC



3500'

3542'

11.27°

95.12°

3504.34'

-8.81'

3550'

3600'

ROPA

PGRC

3636'

11.72°

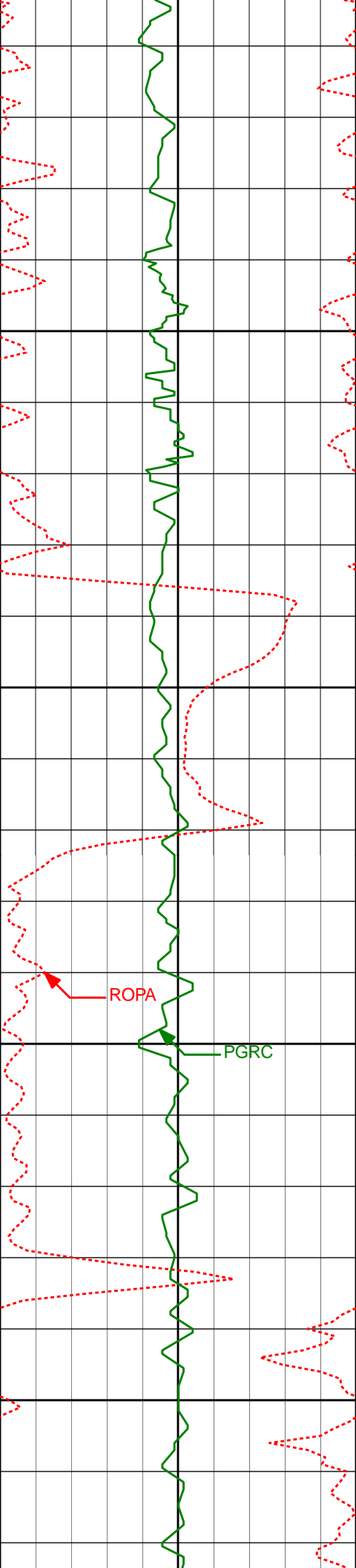
102.05°

3596.46'

-9.13'

3650'

3700'



3731'	11.31°	101.98°	3689.55'	-10.57'
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3750'

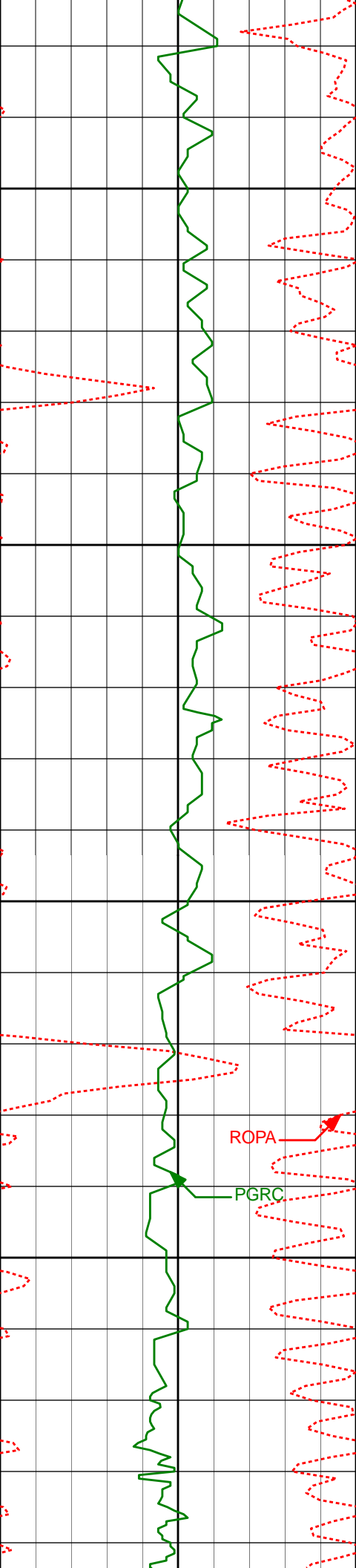
3800'

3826'	13.73°	102.83°	3782.28'	-12.29'
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3850'

3900'

3921'	13.30°	104.18°	3874.65'	-14.54'
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3950'

4000'

4050'

4100'

4016'

4111'

11.79°

10.50°

101.56°

101.58°

3967.39'

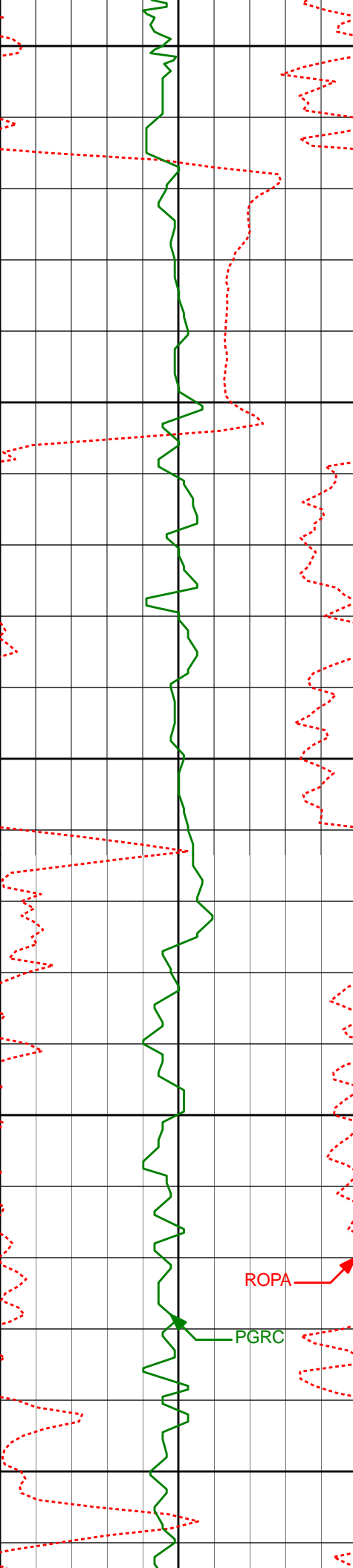
4060.59'

-16.44'

-17.69'

ROPA

PGRC



4150'

4200'

4250'

4300'

4350'

4205'

13.06°

98.69°

4152.61'

-18.46'

4301'

11.88°

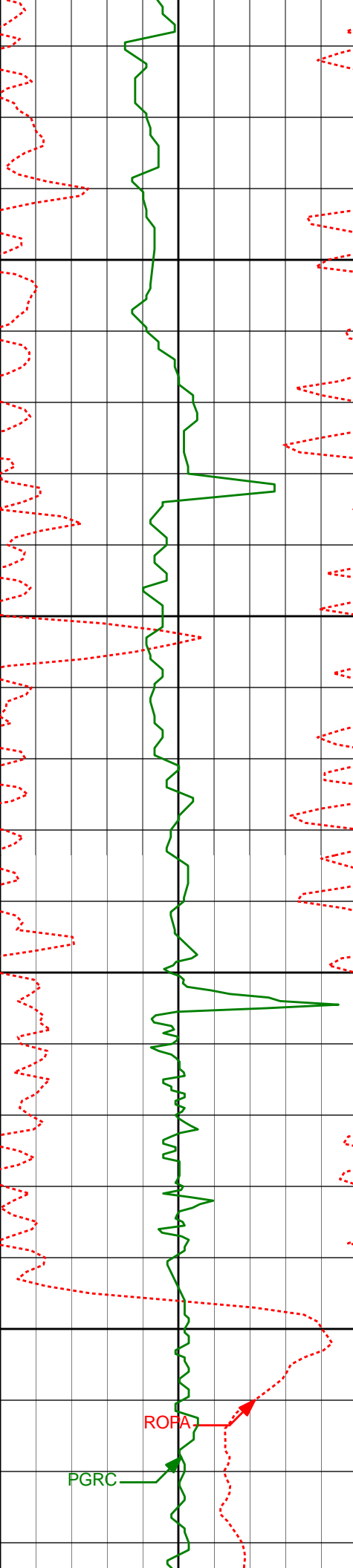
95.77°

4246.34'

-18.33'

ROPA

PGRC



4400'

4450'

4500'

4550'

4396'

11.09°

96.12°

4339.44'

-17.76'

4490'

10.75°

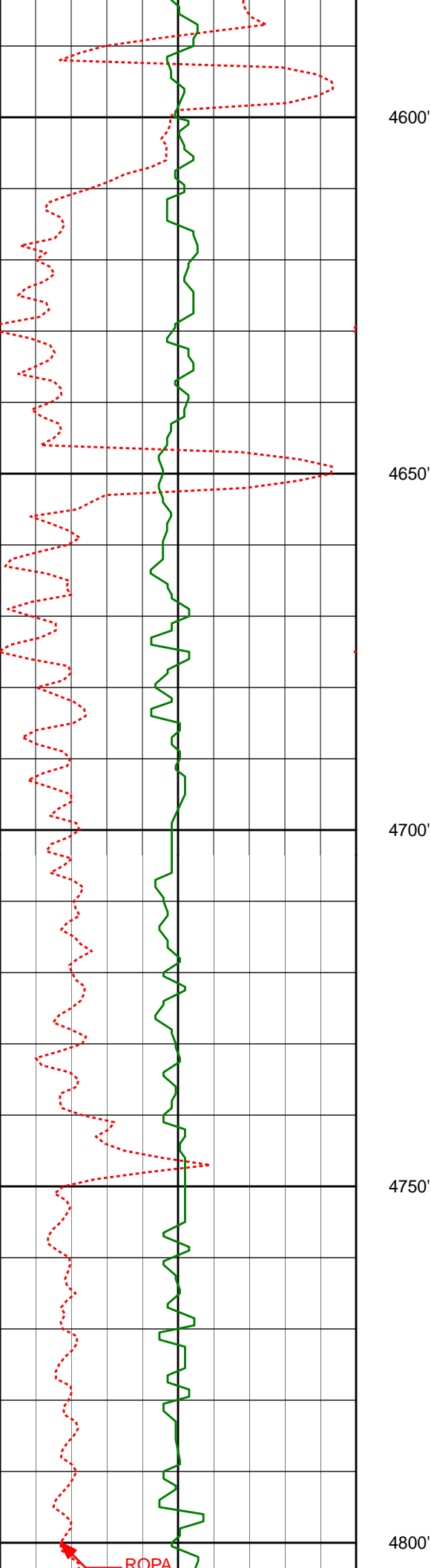
95.33°

4431.73'

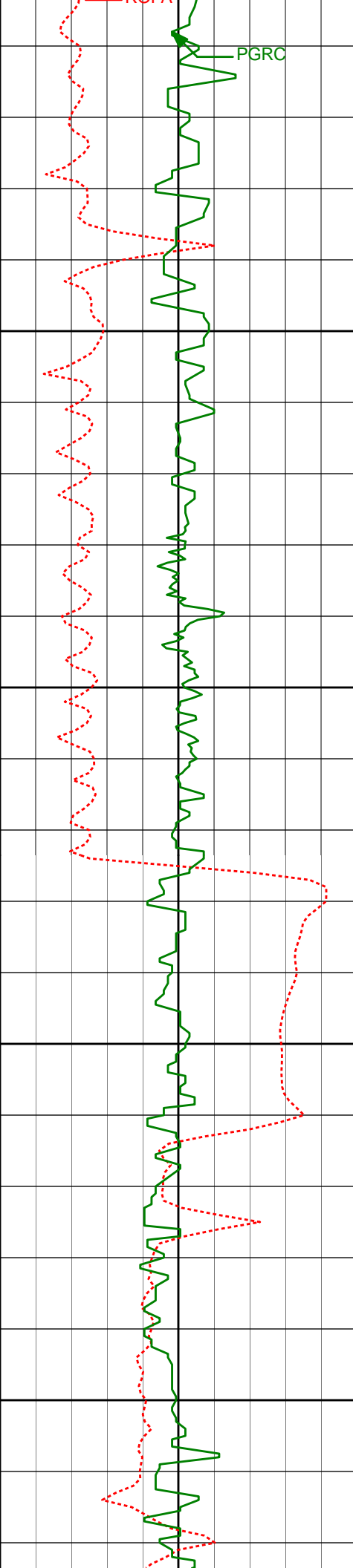
-17.15'

ROFA

PGRC



4585'	7.75°	90.11°	4525.49'	-15.95'
4680'	6.06°	85.05°	4619.80'	-14.01'
4774'	5.17°	77.21°	4713.35'	-11.45'



PGRC

4850'

4900'

4950'

5000'

4869'

5.02°

72.99°

4807.97'

-8.21'

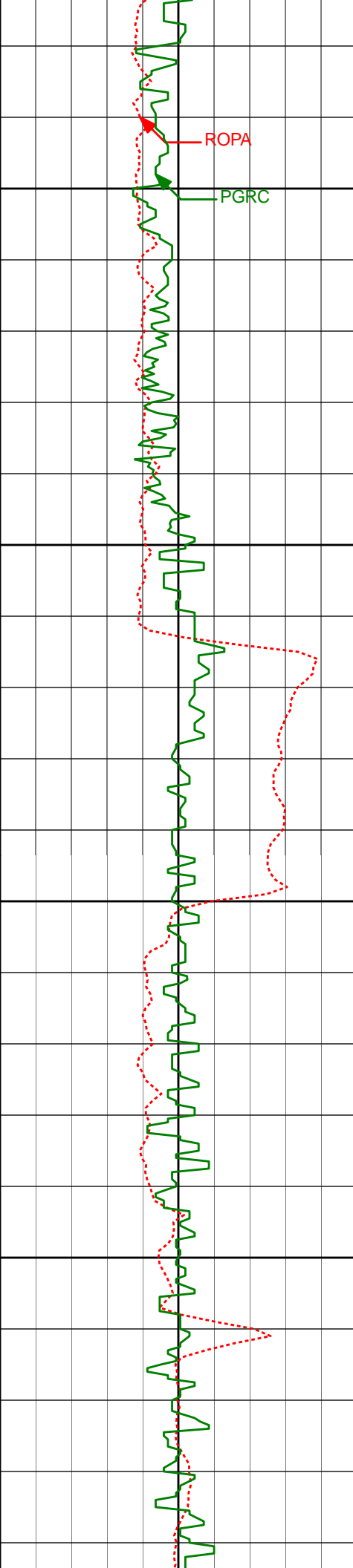
4964'

3.88°

106.45°

4902.70'

-6.97'



5050'

5100'

5150'

5200'

5059'

3.41°

114.74°

4997.51'

-8.29'

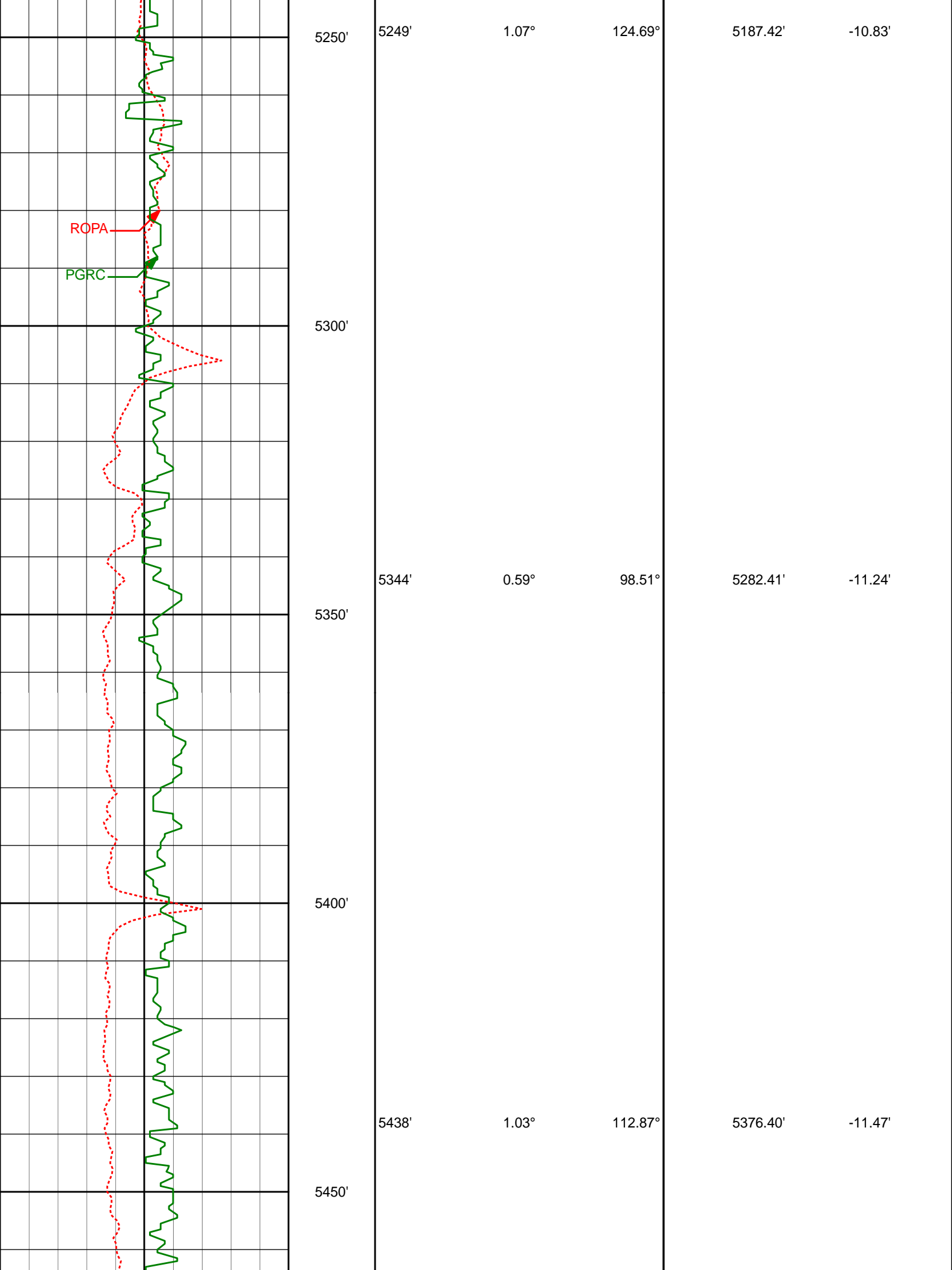
5154'

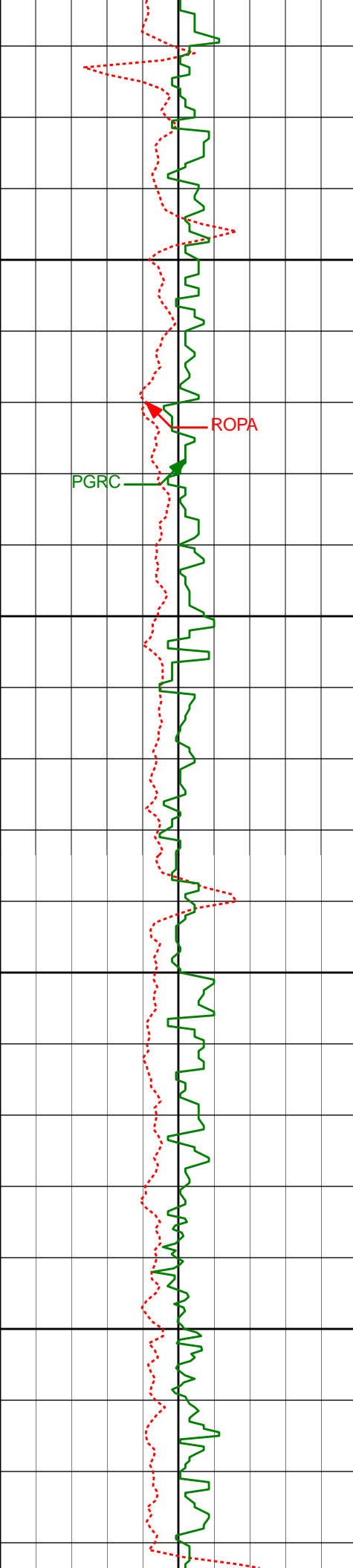
0.98°

151.40°

5092.44'

-9.77'





5500'

5550'

5600'

5650'

5533'

1.21°

88.50°

5471.38'

-11.53'

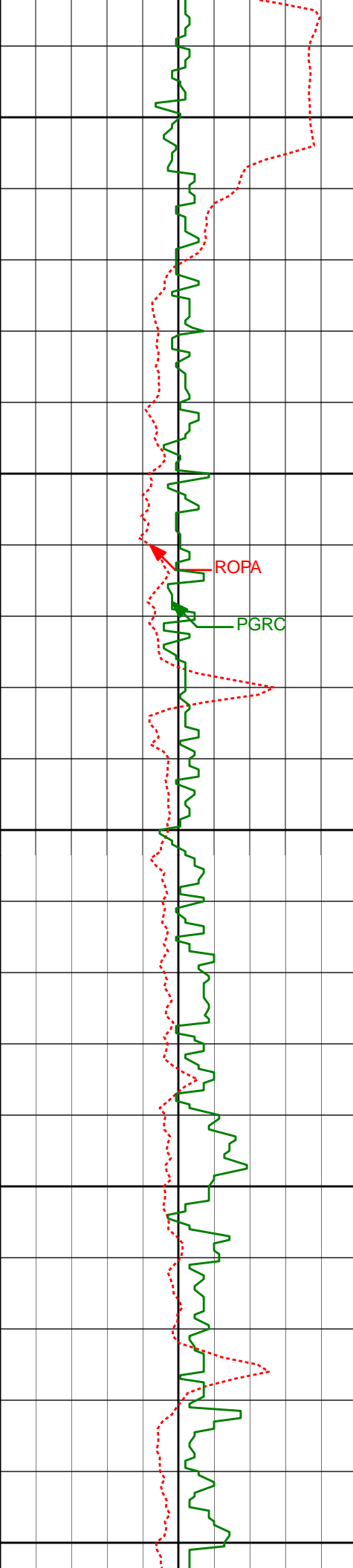
5628'

0.91°

81.98°

5566.37'

-11.17'



5700'

5723'

1.70°

180.99°

5661.35'

-12.37'

5750'

ROFA

PGRC

5800'

5817'

1.16°

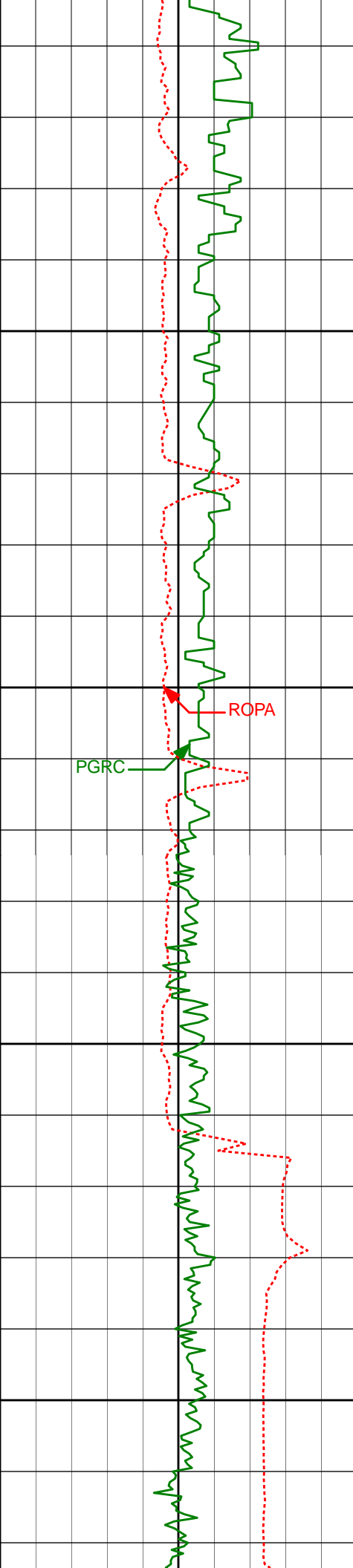
164.92°

5755.32'

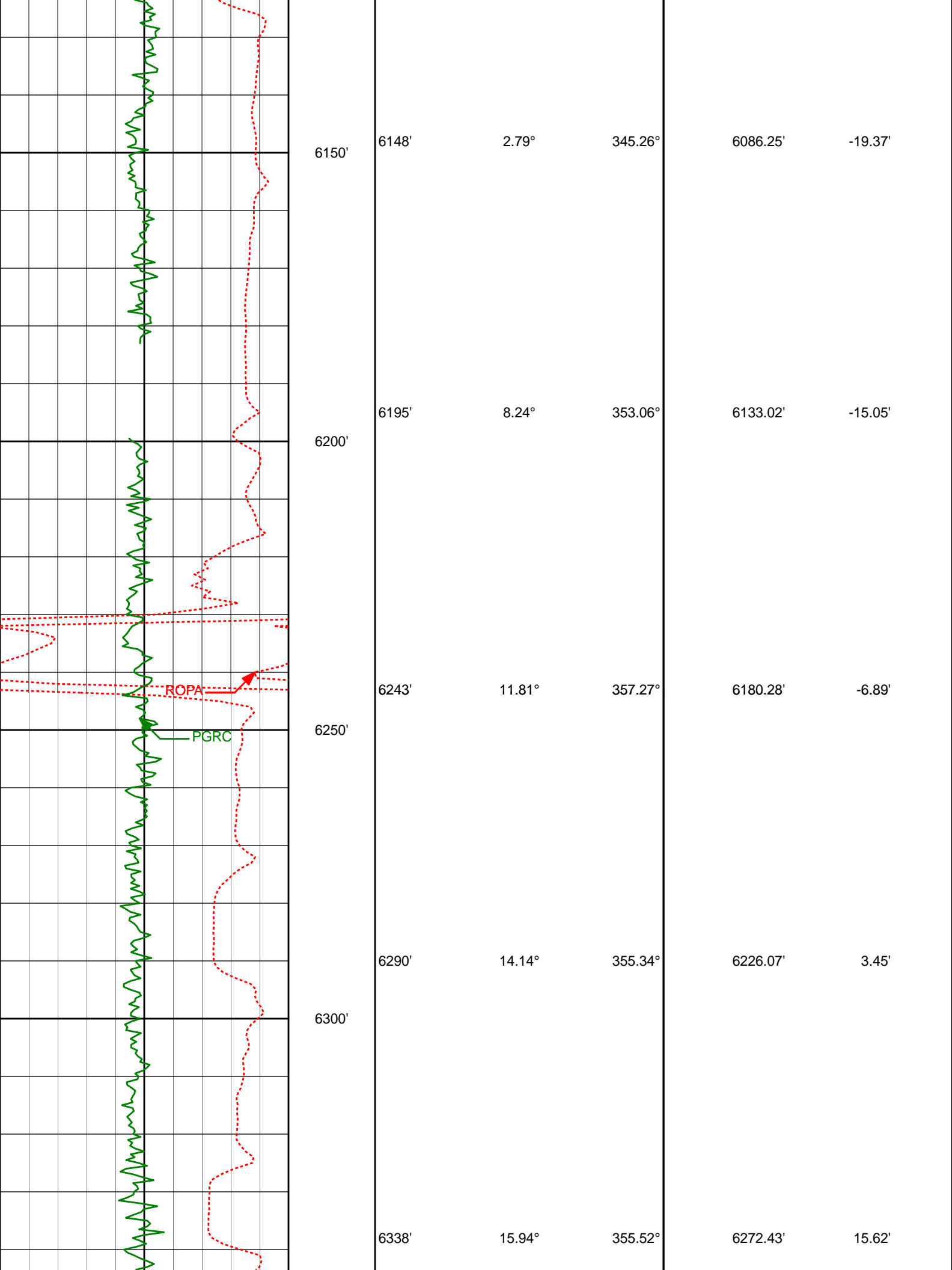
-14.63'

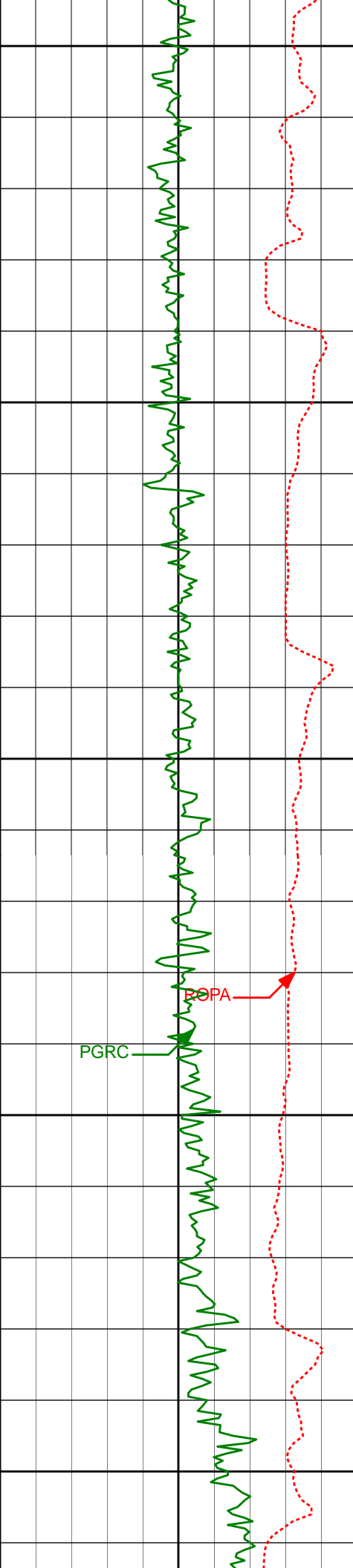
5850'

5900'



5912'	0.83°	153.14°	5850.31'	-16.08'
5950'				
6000'				
6007'	1.44°	172.95°	5945.29'	-17.80'
6050'				
Run200				
6100'	1.25°	179.86°	6038.26'	-19.93'





6350'

6384'

17.56°

356.61°

6316.47'

28.61'

6400'

6450'

6479'

31.07°

2.90°

6402.86'

67.29'

6500'

6527'

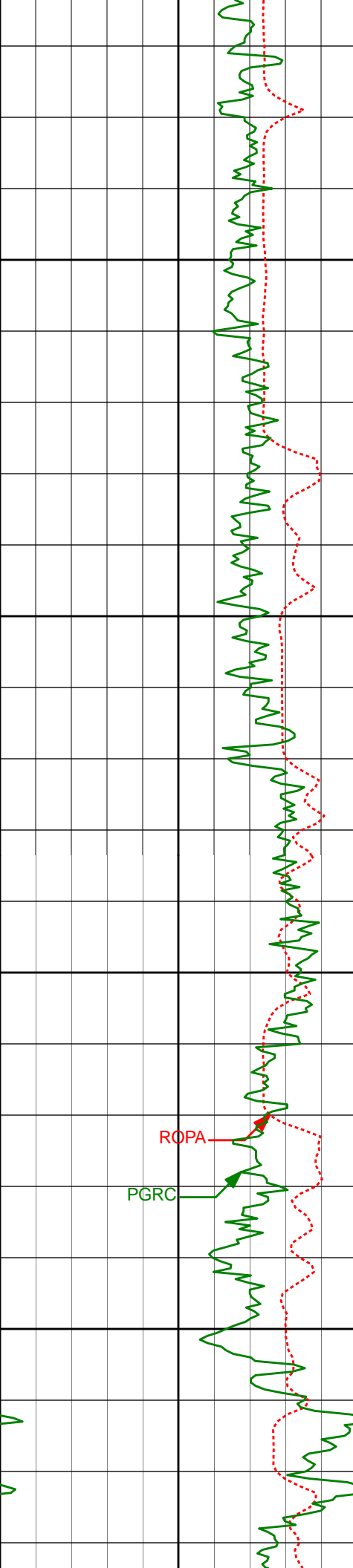
40.47°

5.25°

6441.76'

95.26'

6550'



6600'

6650'

6700'

6750'

6574'

44.95°

3.75°

6476.29'

127.08'

6622'

44.86°

3.10°

6510.29'

160.87'

6669'

46.28°

359.90°

6543.20'

194.23'

6717'

48.93°

355.07°

6575.57'

229.09'

6763'

53.30°

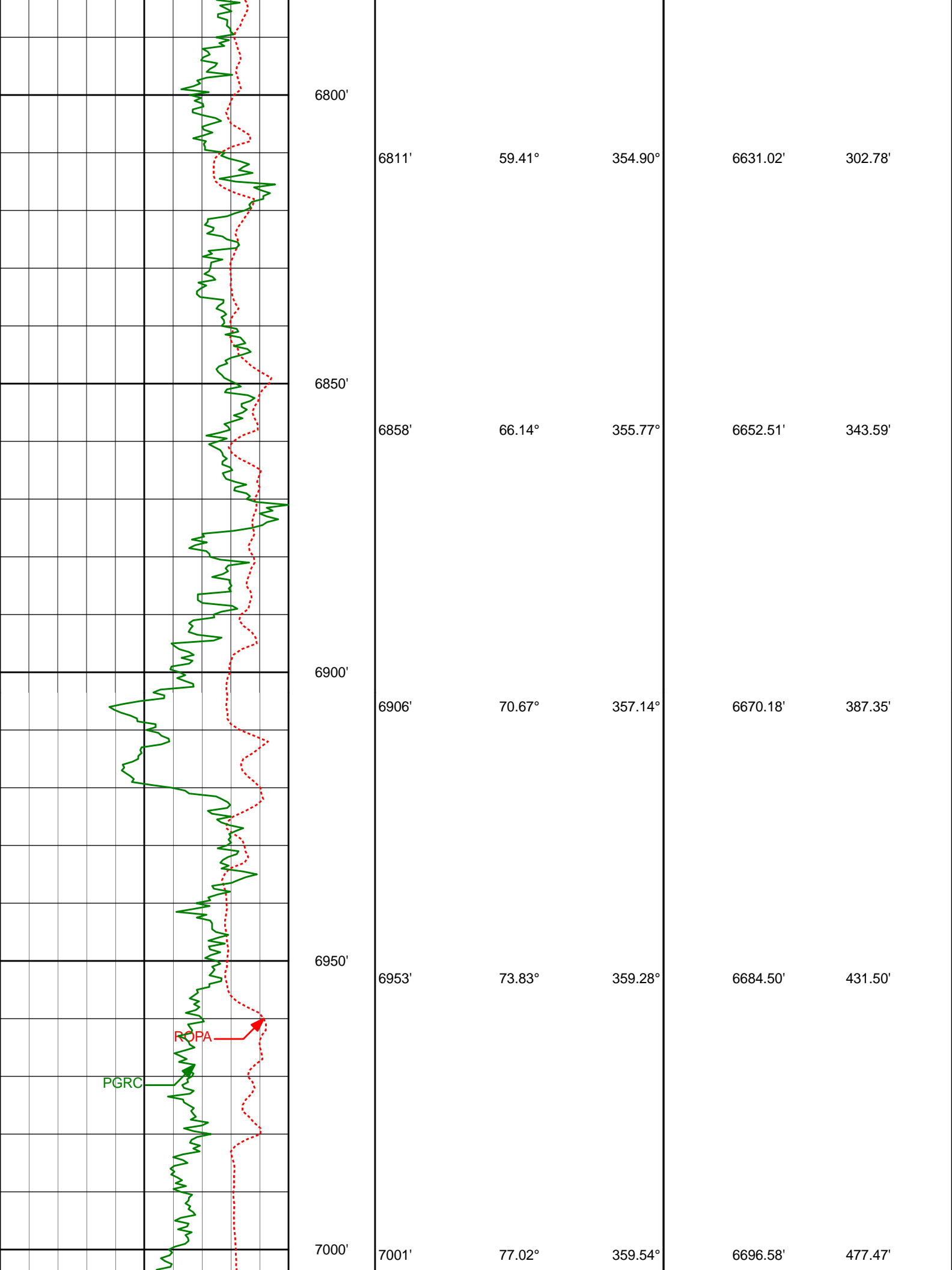
353.67°

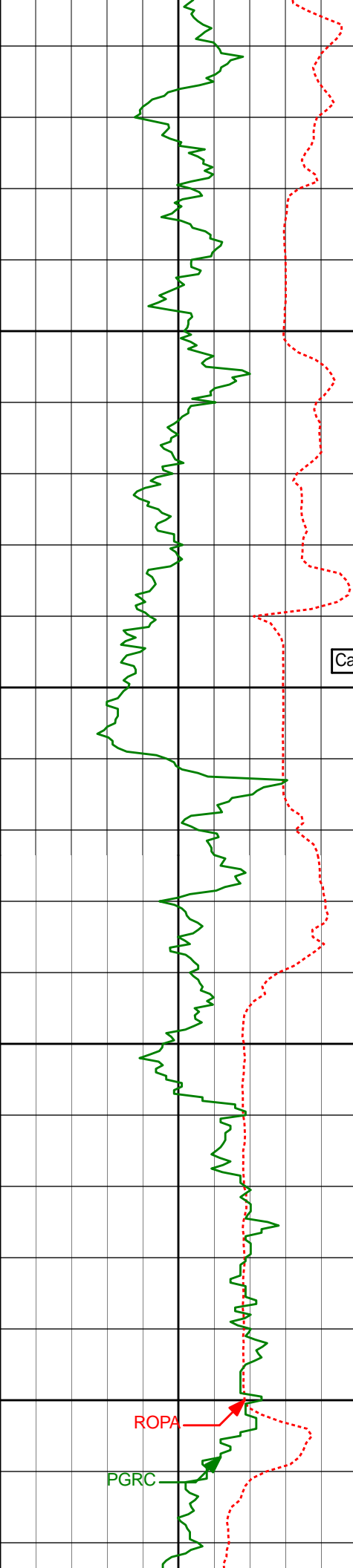
6604.44'

263.92'

ROPA

PGRC





7050'

7065'

83.10°

359.90°

6707.63'

539.87'

Casing Shoe @ 7106'

7100'



Run 300

7150'

7146'

86.76°

0.12°

6714.79'

619.82'

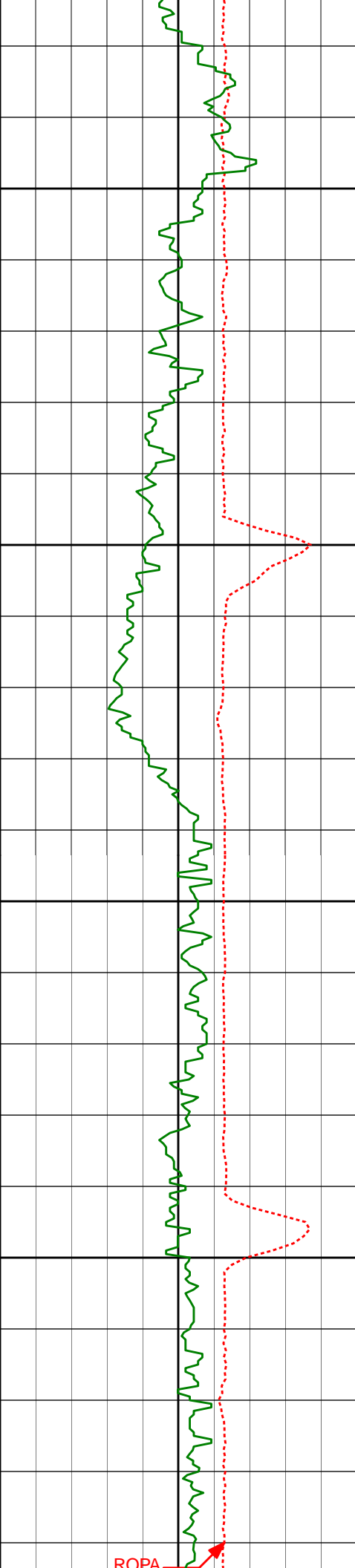
7200'

ROPA



PGRC





7250'

7300'

7350'

7400'

7241'

87.63°

0.75°

6719.44'

713.95'

7335'

88.58°

0.77°

6722.55'

807.21'

7430'

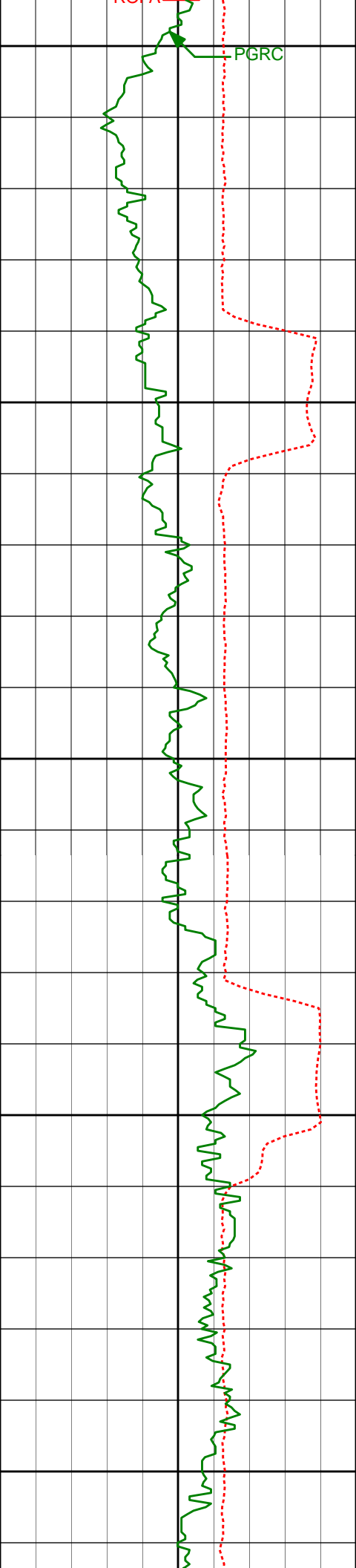
91.36°

0.94°

6722.60'

901.53'

ROPA



7450'

7500'

7525'

7550'

7600'

7620'

7650'

91.48°

0.64°

6720.24'

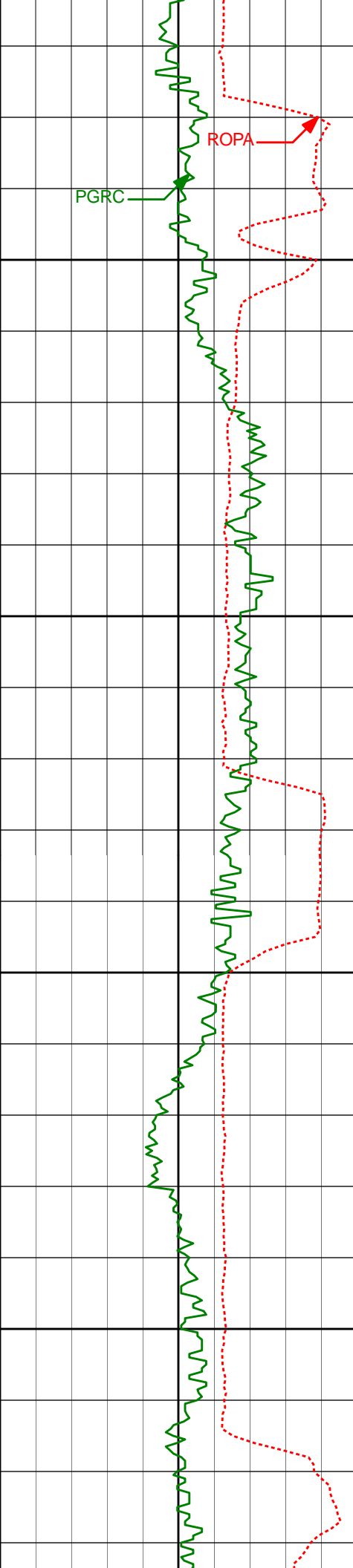
995.82'

90.77°

359.53°

6718.38'

1089.97'



7700'

7750'

7800'

7850'

7714'

92.00°

358.75°

6716.10'

1182.90'

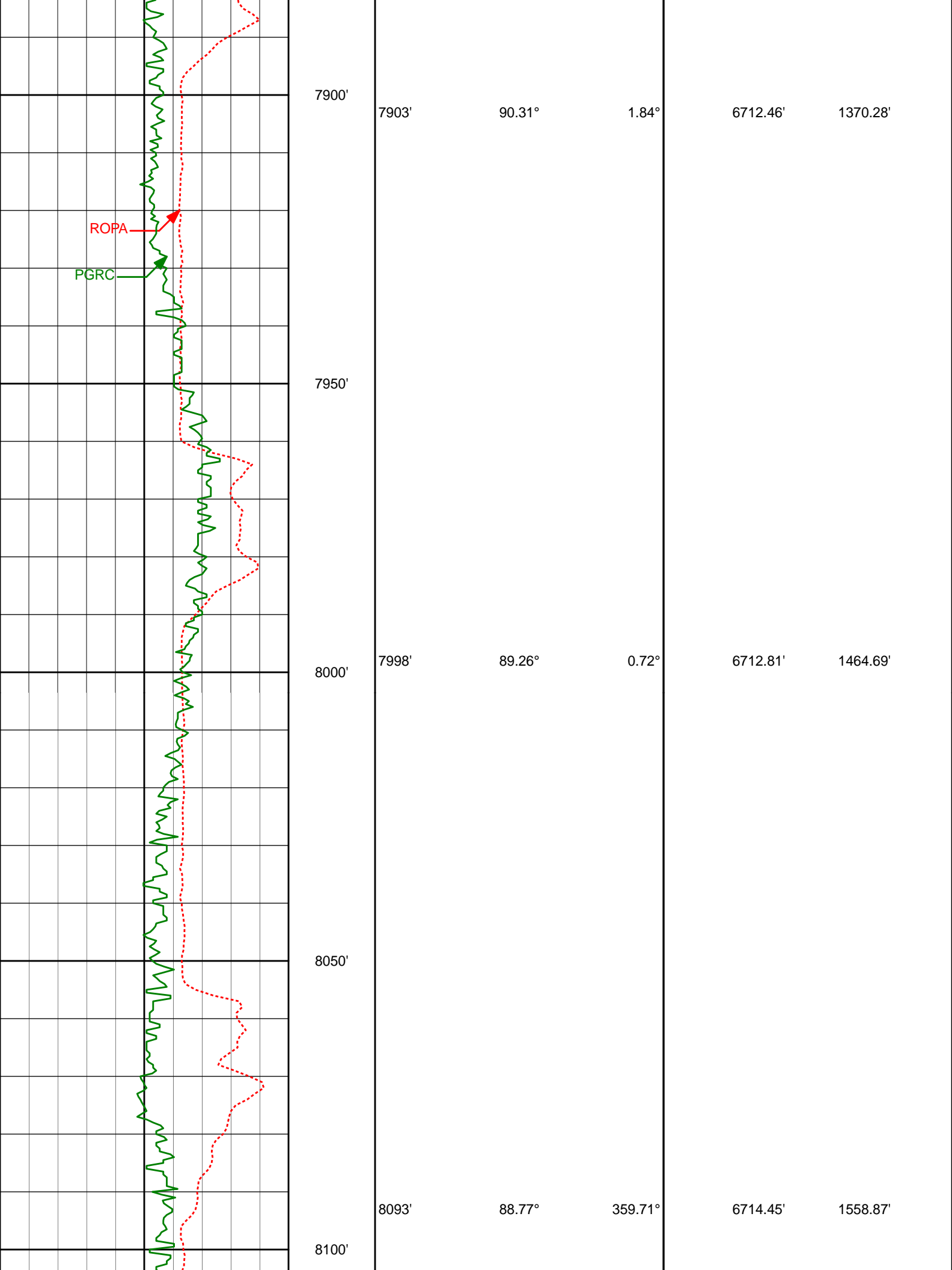
7809'

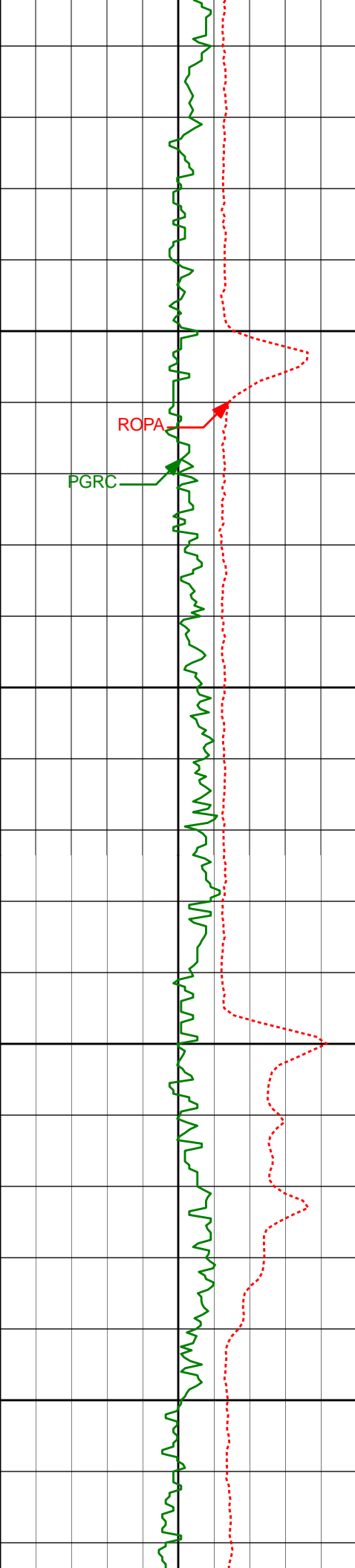
91.05°

0.34°

6713.57'

1276.91'





8150'

ROPA

PGRC

8200'

8250'

8300'

8188'

90.80°

357.69°

6714.81'

1652.69'

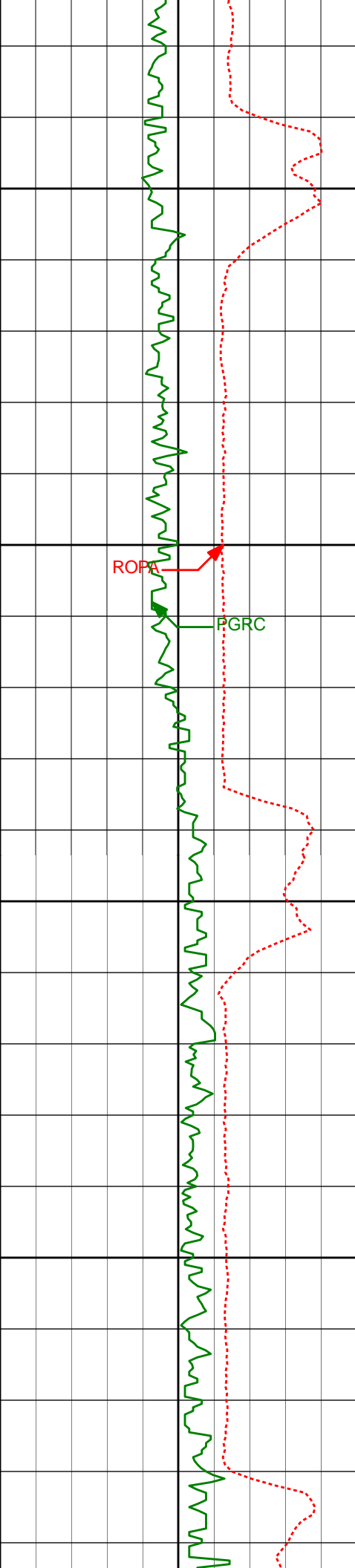
8283'

88.83°

358.43°

6715.12'

1746.36'



8350'

8378'

90.18°

0.13°

6715.93'

1840.33'

8400'

ROPA

PGRC

8450'

8473'

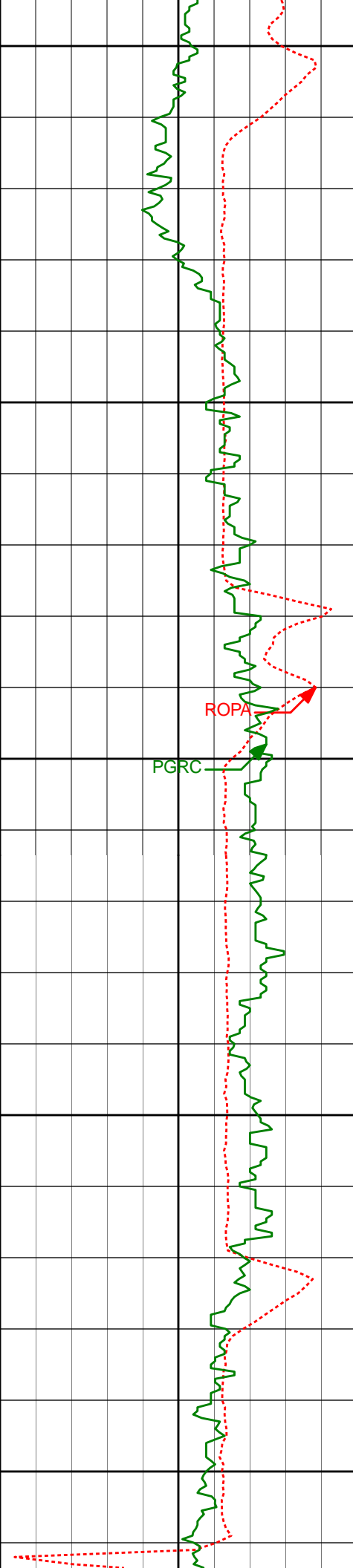
90.25°

359.79°

6715.58'

1934.47'

8500'



8550'

8568'

88.98°

359.58°

6716.22'

2028.55'

8600'

8650'

8663'

88.52°

0.14°

6718.29'

2122.64'

8700'

8750'

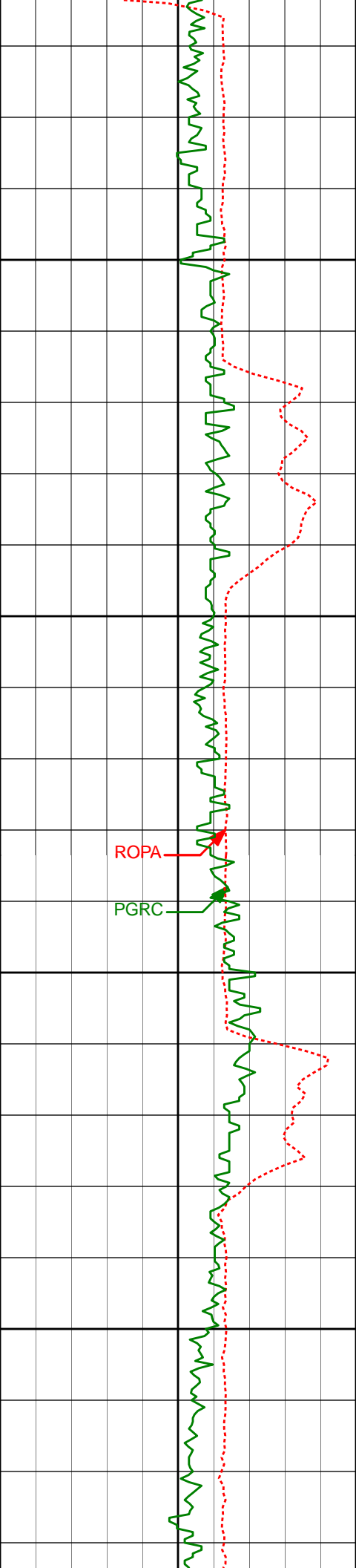
8757'

90.28°

359.50°

6719.27'

2215.75'



8800'

8850'

8900'

8950'

8851'

90.43°

358.39°

6718.69'

2308.66'

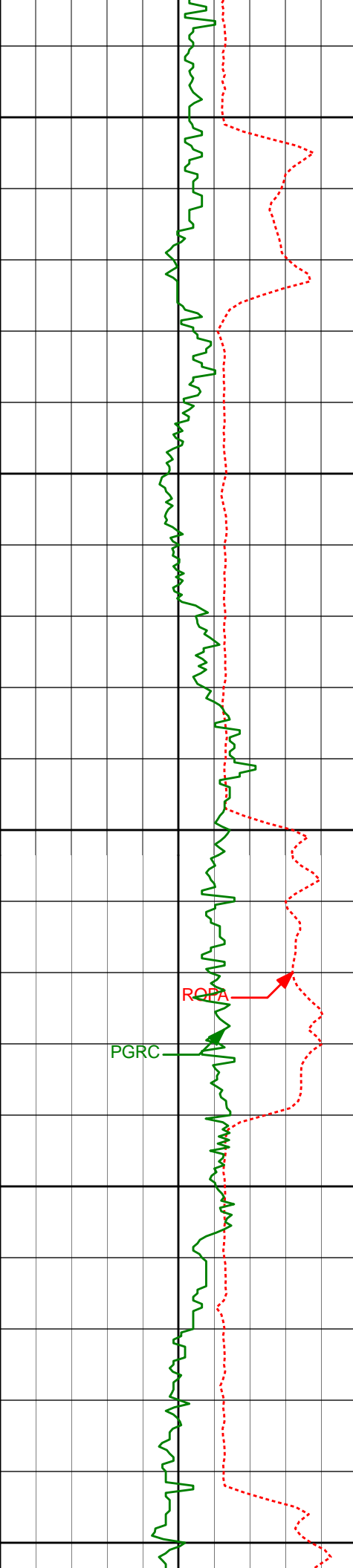
8946'

89.97°

357.19°

6718.36'

2402.25'



9000'

9041'

89.14°

354.49°

6719.10'

2495.22'

9050'

9100'

RODA

PGRC

9136'

91.08°

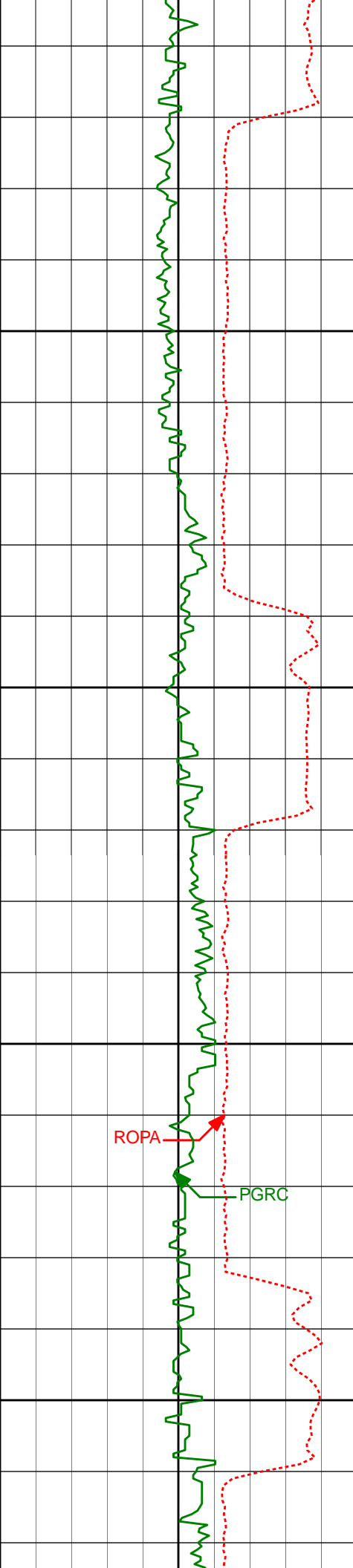
358.83°

6718.92'

2588.45'

9150'

9200'



9250'

9300'

9350'

9400'

9231'

91.05°

359.37°

6717.16'

2682.37'

9326'

90.37°

0.84°

6715.98'

2776.53'

9421'

89.63°

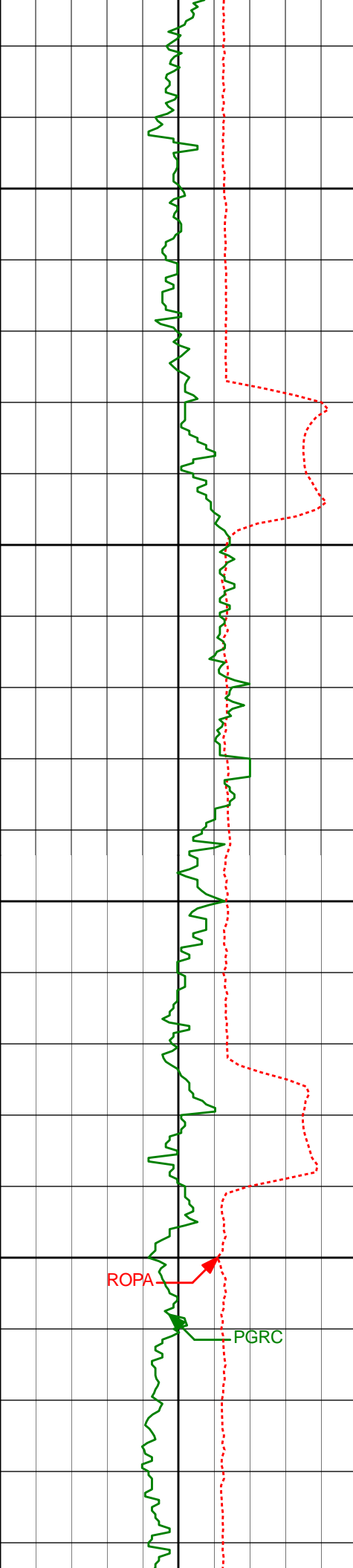
2.16°

6715.98'

2870.98'

ROPA

PGRC



9450'

9500'

9550'

9600'

ROPA

PGRC

9516'

89.17°

2.52°

6716.98'

2965.56'

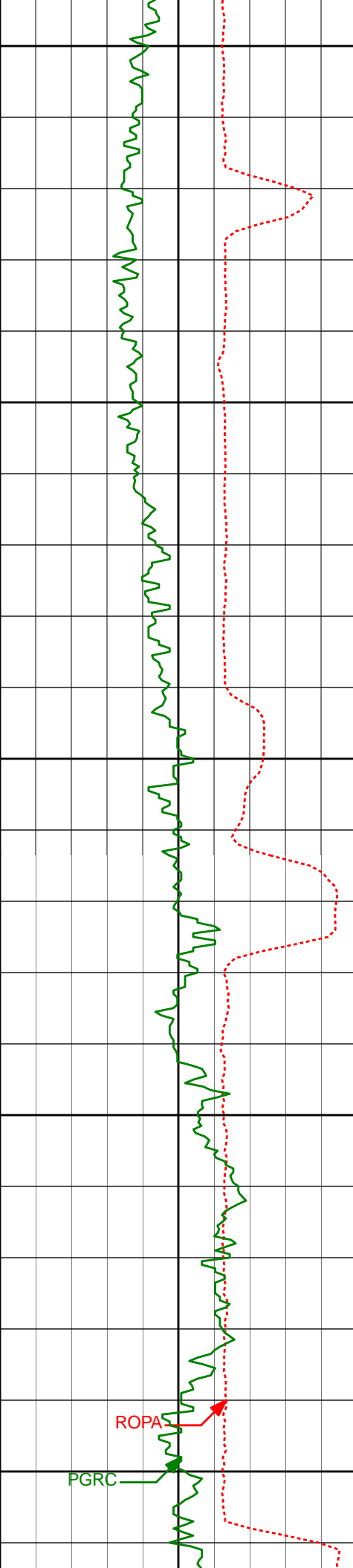
9611'

88.52°

2.18°

6718.90'

3060.13'



9650'

9700'

9750'

9800'

9850'

9706'

90.59°

1.80°

6719.64'

3154.66'

9800'

91.70°

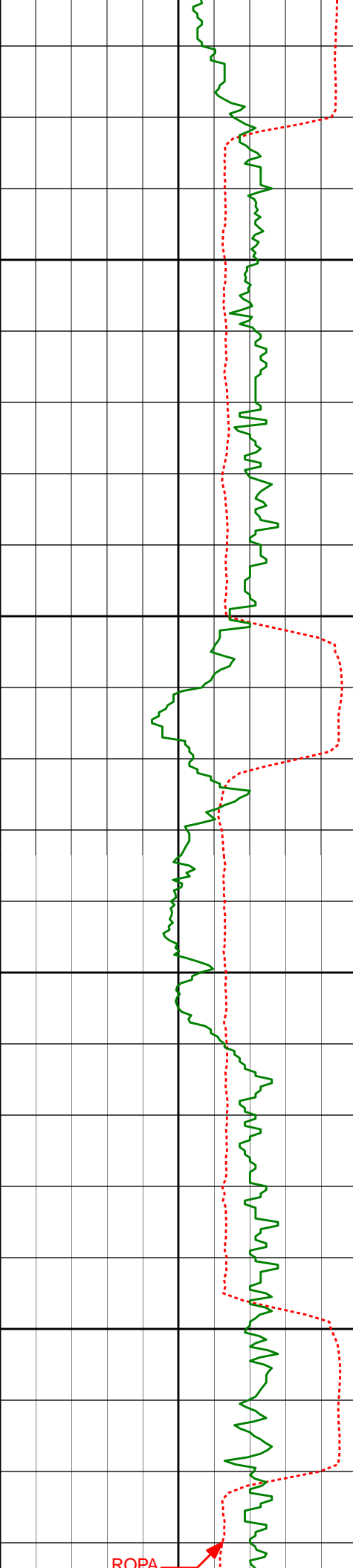
0.63°

6717.77'

3248.04'

ROPA

PGRC



9900'

9950'

10000'

10050'

9894'

90.80°

0.10°

6715.72'

3341.25'

9989'

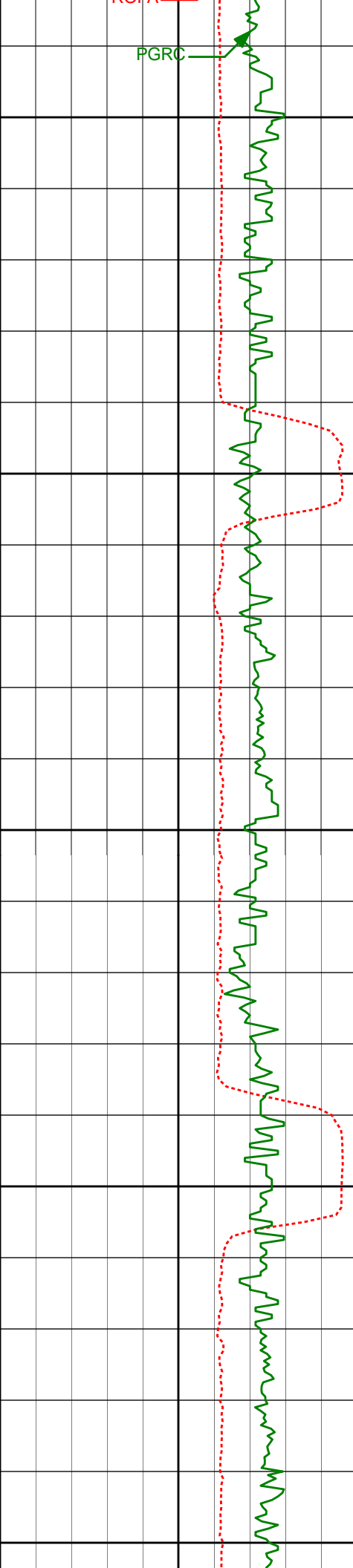
90.93°

1.11°

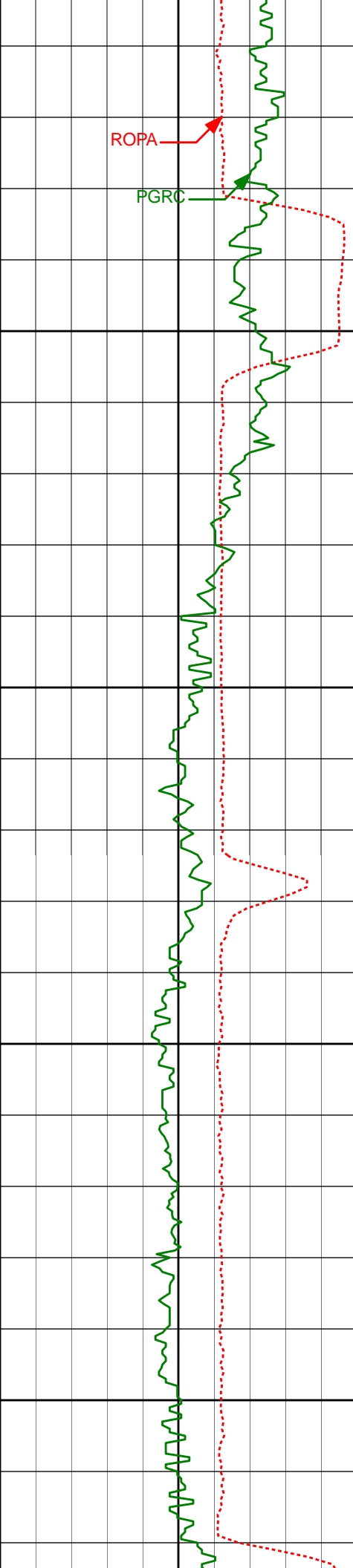
6714.29'

3435.52'

ROPA



10084'	89.78°	359.97°	6713.71'	3529.78'
10178'	90.03°	359.82°	6713.86'	3622.92'
10273'	90.34°	358.25°	6713.55'	3716.84'



10350'

10367'

88.49°

358.29°

6714.52'

3809.57'

10400'

10450'

10462'

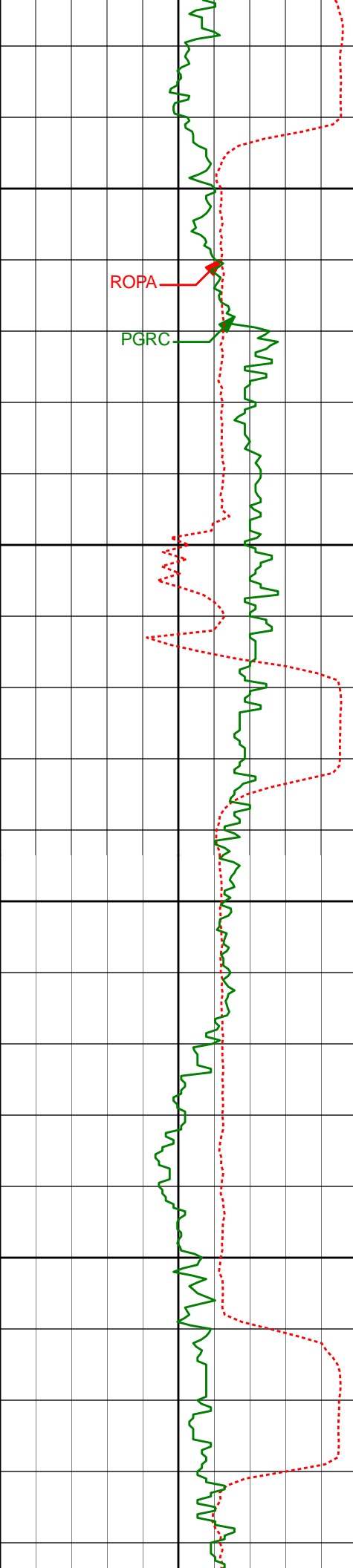
89.72°

357.53°

6716.00'

3903.18'

10500'



10550'

10557'

92.50°

359.75°

6714.16'

3996.97'

10600'

10650'

10652'

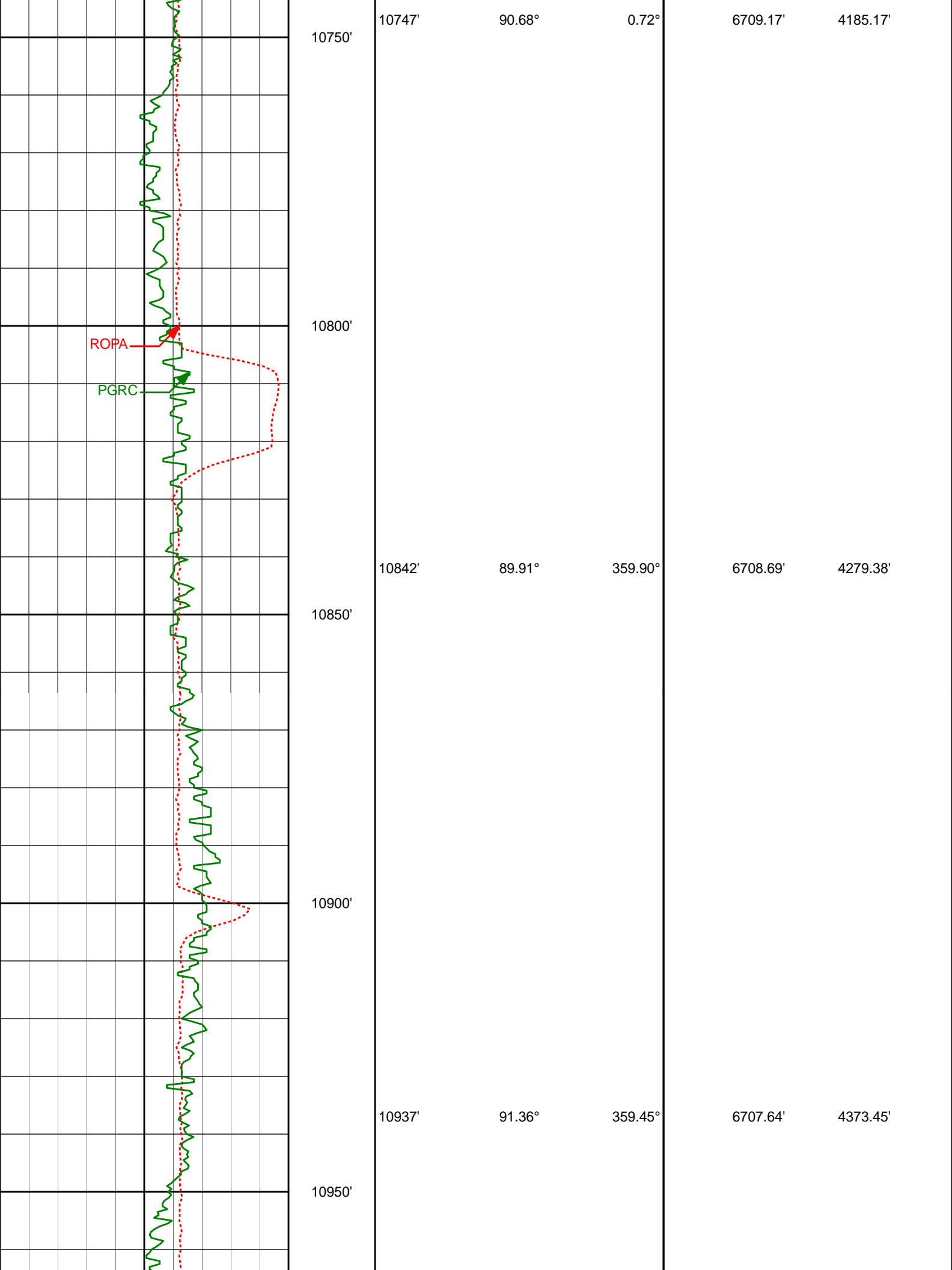
91.42°

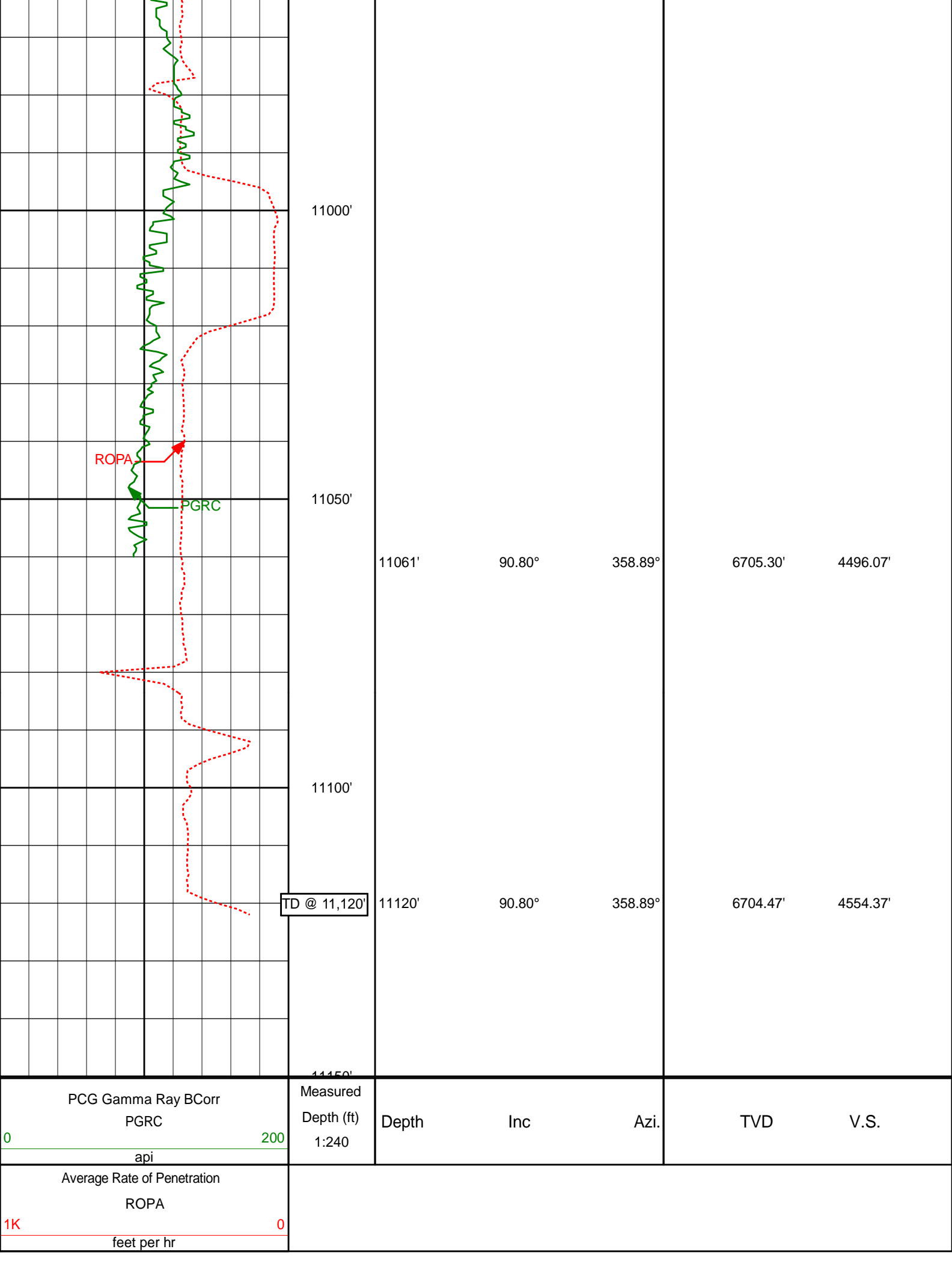
359.66°

6710.91'

4091.00'

10700'





ROPA

PGRC

TD @ 11,120'

PCG Gamma Ray BCorr

PGRC

200

api

Average Rate of Penetration

ROPA

0

feet per hr

Measured

Depth (ft)

1:240

Depth

Inc

Azi.

TVD

V.S.

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Marie D04-73-1HN
Wattenberg
Weld Colorado
USA

CA-XX-0900918615

Tie into existing surveys at 325' and 664' 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
325.00	0.60	354.61	324.99	1.69 N	0.16 W	1.66	0.18
664.00	0.60	152.01	663.99	1.89 N	0.51 E	1.94	0.35
808.00	0.32	296.29	807.99	1.41 N	0.50 E	1.46	0.61
993.00	0.52	51.16	992.98	2.17 N	0.69 E	2.24	0.39
1085.00	0.65	70.48	1084.98	2.60 N	1.51 E	2.78	0.25
1178.00	0.58	80.45	1177.97	2.86 N	2.47 E	3.16	0.14
1271.00	0.80	86.88	1270.97	2.97 N	3.58 E	3.42	0.25
1360.00	0.39	96.97	1359.96	2.97 N	4.51 E	3.54	0.47
1457.00	0.52	84.29	1456.96	2.97 N	5.28 E	3.65	0.17
1551.00	2.66	123.92	1550.92	1.80 N	7.52 E	2.79	2.42
1646.00	5.14	116.79	1645.69	1.35 S	13.15 E	0.42	2.66
1740.00	7.47	115.36	1739.12	5.87 S	22.43 E	-2.82	2.48
1835.00	8.52	111.94	1833.19	11.14 S	34.53 E	-6.43	1.21
1930.00	10.84	107.68	1926.83	16.48 S	49.57 E	-9.72	2.56
2024.00	10.26	98.28	2019.25	20.37 S	66.28 E	-11.34	1.93
2119.00	11.63	97.52	2112.52	22.84 S	84.15 E	-11.41	1.44
2214.00	10.55	95.57	2205.75	24.94 S	102.30 E	-11.06	1.20
2309.00	11.11	97.85	2299.05	27.03 S	120.02 E	-10.77	0.74
2404.00	12.04	96.08	2392.12	29.33 S	138.94 E	-10.53	1.05
2499.00	11.67	94.73	2485.10	31.17 S	158.36 E	-9.76	0.49
2594.00	11.42	90.68	2578.18	32.08 S	177.34 E	-8.12	0.89
2689.00	13.23	90.91	2670.99	32.36 S	197.61 E	-5.70	1.90
2783.00	13.41	101.07	2762.47	34.63 S	219.06 E	-5.08	2.49
2878.00	13.36	100.84	2854.89	38.81 S	240.65 E	-6.34	0.08
2973.00	12.73	100.23	2947.44	42.73 S	261.73 E	-7.41	0.68
3068.00	12.37	100.08	3040.17	46.37 S	282.04 E	-8.31	0.38
3163.00	11.21	98.12	3133.16	49.45 S	301.20 E	-8.81	1.29
3257.00	11.41	96.23	3225.34	51.75 S	319.49 E	-8.65	0.45
3352.00	11.10	101.15	3318.51	54.54 S	337.80 E	-8.97	1.06
3447.00	12.86	96.87	3411.44	57.57 S	357.27 E	-9.37	2.08
3542.00	11.27	95.12	3504.34	59.67 S	377.01 E	-8.81	1.72
3636.00	11.72	102.05	3596.46	62.48 S	395.50 E	-9.13	1.55
3731.00	11.31	101.98	3689.55	66.43 S	414.05 E	-10.57	0.44
3826.00	13.73	102.83	3782.28	70.86 S	434.15 E	-12.29	2.56
3921.00	13.30	104.18	3874.65	76.05 S	455.74 E	-14.54	0.57
4016.00	11.79	101.56	3967.39	80.67 S	475.83 E	-16.44	1.70
4111.00	10.50	101.58	4060.59	84.35 S	493.82 E	-17.69	1.36
4205.00	13.06	98.69	4152.61	87.68 S	512.71 E	-18.46	2.80
4301.00	11.88	95.77	4246.34	90.31 S	533.27 E	-18.33	1.39
4396.00	11.09	96.12	4339.44	92.27 S	552.08 E	-17.76	0.83
4490.00	10.75	95.33	4431.73	94.05 S	569.80 E	-17.15	0.40
4585.00	7.75	90.11	4525.49	94.88 S	585.03 E	-15.95	3.28
4680.00	6.06	85.05	4619.80	94.46 S	596.43 E	-14.01	1.89
4774.00	5.17	77.21	4713.35	93.09 S	605.50 E	-11.45	1.24
4869.00	5.02	72.99	4807.97	90.93 S	613.66 E	-8.21	0.43
4964.00	3.88	106.45	4902.70	90.62 S	620.71 E	-6.97	2.93
5059.00	3.41	114.74	4997.51	92.72 S	626.36 E	-8.29	0.74
5154.00	0.98	151.40	5092.44	94.61 S	629.31 E	-9.77	2.83
5249.00	1.07	124.69	5187.42	95.83 S	630.43 E	-10.83	0.51
5344.00	0.59	98.51	5282.41	96.40 S	631.64 E	-11.24	0.63
5438.00	1.03	112.87	5376.40	96.80 S	632.90 E	-11.47	0.51
5533.00	1.21	88.50	5471.38	97.11 S	634.69 E	-11.53	0.53
5628.00	0.91	81.98	5566.37	96.98 S	636.43 E	-11.17	0.34

5723.00	1.70	180.99	5661.35	98.28 S	637.15 E	-12.37	2.16
5817.00	1.16	164.92	5755.32	100.59 S	637.37 E	-14.63	0.71
5912.00	0.83	153.14	5850.31	102.14 S	637.94 E	-16.08	0.40
6007.00	1.44	172.95	5945.29	103.94 S	638.39 E	-17.80	0.75
6100.00	1.25	179.86	6038.26	106.10 S	638.54 E	-19.93	0.27
6148.00	2.79	345.26	6086.25	105.50 S	638.24 E	-19.37	8.35
6195.00	8.24	353.06	6133.02	101.05 S	637.55 E	-15.05	11.68
6243.00	11.81	357.27	6180.28	92.72 S	636.90 E	-6.89	7.59
6290.00	14.14	355.34	6226.07	82.20 S	636.20 E	3.45	5.04
6338.00	15.94	355.52	6272.43	69.78 S	635.21 E	15.62	3.76
6384.00	17.56	356.61	6316.47	56.55 S	634.31 E	28.61	3.58
6479.00	31.07	2.90	6402.86	17.58 S	634.70 E	67.29	14.47
6527.00	40.47	5.25	6441.76	10.37 N	636.76 E	95.26	19.78
6574.00	44.95	3.75	6476.29	42.14 N	639.24 E	127.08	9.77
6622.00	44.86	3.10	6510.29	75.96 N	641.26 E	160.87	0.96
6669.00	46.28	359.90	6543.20	109.50 N	642.13 E	194.23	5.73
6717.00	48.93	355.07	6575.57	144.89 N	640.55 E	229.09	9.26
6763.00	53.30	353.67	6604.44	180.52 N	637.02 E	263.92	9.79
6811.00	59.41	354.90	6631.02	220.26 N	633.06 E	302.78	12.90
6858.00	66.14	355.77	6652.51	261.89 N	629.67 E	343.59	14.42
6906.00	70.67	357.14	6670.18	306.42 N	626.92 E	387.35	9.80
6953.00	73.83	359.28	6684.50	351.15 N	625.53 E	431.50	8.01
7001.00	77.02	359.54	6696.58	397.60 N	625.05 E	477.47	6.66
7065.00	83.10	359.90	6707.63	460.61 N	624.74 E	539.87	9.52
7146.00	86.76	0.12	6714.79	541.28 N	624.76 E	619.82	4.53
7241.00	87.63	0.75	6719.44	636.16 N	625.48 E	713.95	1.12
7335.00	88.58	0.77	6722.55	730.10 N	626.72 E	807.21	1.02
7430.00	91.36	0.94	6722.60	825.08 N	628.14 E	901.53	2.93
7525.00	91.48	0.64	6720.24	920.04 N	629.45 E	995.82	0.34
7620.00	90.77	359.53	6718.38	1015.02 N	629.59 E	1089.97	1.38
7714.00	92.00	358.75	6716.10	1108.98 N	628.19 E	1182.90	1.55
7809.00	91.05	0.34	6713.57	1203.94 N	627.44 E	1276.91	1.95
7903.00	90.31	1.84	6712.46	1297.91 N	629.22 E	1370.28	1.77
7998.00	89.26	0.72	6712.81	1392.88 N	631.34 E	1464.69	1.61
8093.00	88.77	359.71	6714.45	1487.87 N	631.70 E	1558.87	1.18
8188.00	90.80	357.69	6714.81	1582.83 N	629.54 E	1652.69	3.02
8283.00	88.83	358.43	6715.12	1677.77 N	626.33 E	1746.36	2.22
8378.00	90.18	0.13	6715.93	1772.76 N	625.14 E	1840.33	2.29
8473.00	90.25	359.79	6715.58	1867.75 N	625.08 E	1934.47	0.37
8568.00	88.98	359.58	6716.22	1962.75 N	624.56 E	2028.55	1.35
8663.00	88.52	0.14	6718.29	2057.73 N	624.33 E	2122.64	0.77
8757.00	90.28	359.50	6719.27	2151.72 N	624.04 E	2215.75	1.99
8851.00	90.43	358.39	6718.69	2245.70 N	622.31 E	2308.66	1.19
8946.00	89.97	357.19	6718.36	2340.62 N	618.65 E	2402.25	1.35
9041.00	89.14	354.49	6719.10	2435.36 N	611.76 E	2495.22	2.98
9136.00	91.08	358.83	6718.92	2530.17 N	606.22 E	2588.45	5.01
9231.00	91.05	359.37	6717.16	2625.14 N	604.73 E	2682.37	0.58
9326.00	90.37	0.84	6715.98	2720.13 N	604.90 E	2776.53	1.70
9421.00	89.63	2.16	6715.98	2815.10 N	607.39 E	2870.98	1.60
9516.00	89.17	2.52	6716.98	2910.01 N	611.27 E	2965.56	0.61
9611.00	88.52	2.18	6718.90	3004.91 N	615.16 E	3060.13	0.77
9706.00	90.59	1.80	6719.64	3099.85 N	618.46 E	3154.66	2.21
9800.00	91.70	0.63	6717.77	3193.80 N	620.45 E	3248.04	1.71
9894.00	90.80	0.10	6715.72	3287.78 N	621.05 E	3341.25	1.10
9989.00	90.93	1.11	6714.29	3382.76 N	622.06 E	3435.52	1.06
10084.00	89.78	359.97	6713.71	3477.75 N	622.95 E	3529.78	1.70
10178.00	90.03	359.82	6713.86	3571.75 N	622.78 E	3622.92	0.31
10273.00	90.34	358.25	6713.55	3666.73 N	621.18 E	3716.84	1.69
10367.00	88.49	358.29	6714.52	3760.68 N	618.35 E	3809.57	1.97
10462.00	89.72	357.53	6716.00	3855.61 N	614.88 E	3903.18	1.53
10557.00	92.50	359.75	6714.16	3950.55 N	612.63 E	3996.97	3.74
10652.00	91.42	359.66	6710.91	4045.49 N	612.15 E	4091.00	1.14
10747.00	90.68	0.72	6709.17	4140.47 N	612.46 E	4185.17	1.36
10842.00	89.91	359.90	6708.69	4235.47 N	612.97 E	4279.38	1.18
10937.00	91.36	359.45	6707.64	4330.46 N	612.43 E	4373.45	1.60
11061.00	90.80	358.89	6705.30	4454.42 N	610.63 E	4496.07	0.64
11120.00	90.80	358.89	6704.47	4513.40 N	609.49 E	4554.37	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 7.67 DEGREES (GRID)
A TOTAL CORRECTION OF 7.81 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11120.00 FEET
IS 4554.37 FEET ALONG 7.69 DEGREES (GRID)

Final survey is a straight line projection to TD.

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