

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


Country : USA		Company : Noble		
Field : Wattenburg		Rig : PD 829		
Location : Lat: 40°41' 5.00" North Long: 104° 7' 24.45" West		Well : Shable LF07-68HN		
Well : Shable LF07-68HN		Country : Wattenburg		
Company : Noble		Field : Shable LF07-68HN		
Rig : PD 829		Country : USA		
LOCATION		API Number : 05-123-36272		
Latitude : 40°41' 5.00" North Longitude : 104° 7' 24.45" West		Other Services		
UTM Easting = 3,381,755.572 ft UTM Northing = 1,495,250.615 ft		Directional Drilling		
Permanent Datum : Ground Level		Elev. KB NA		
Log Measured From : Drill Floor		DF 4937.00 ft GL 4921.00 ft WD NA		
Drilling Measured From : Drill Floor		MD LOG		
Depth Logged : 629.00 ft To 10,854.00 ft		Unit No. : 11703725		
Date Logged : 21-Mar-13 To 02-Apr-13		Job No. :CA-XX-0900145811		
Total Depth MD : 10,854.00 ft TVD : 6,409.57 ft		Plot Type : Final		
Spud Date : 19-Mar-13		Plot Date : 03-Apr-13		
Run No.	Borehole Record (MD)		Borehole Record (MD)	
	Size	From	To	Run No.
02	8.750 in	639.00 ft	6,052.00 ft	Size
03	8.750 in	6,052.00 ft	6,564.00 ft	From
04	8.750 in	6,564.00 ft	6,903.00 ft	To
05	6.125 in	6,903.00 ft	10,854.00 ft	Size
				Weight
				From
				To
				Size
				Weight
				From
				To
				Size
				Weight
				From
				To

WELL INFORMATION

MWD Run Number	100	200	300	400	
Date run completed	24-Mar-13	26-Mar-13	28-Mar-13	02-Apr-13	
Rig Bit Number	02	03	04	05	
Bit Size (in)	8.750	8.750	8.750	6.125	
Tool Nominal OD (in)	6.750	6.750	6.750	4.750	
Log Start Depth (MD, ft)	639.00	6,052.00	6,563.00	6,903.00	
Log End Depth (MD, ft)	6,052.00	6,563.00	6,903.00	10,854.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	21-Mar-13 06:20	25-Mar-13 00:00	27-Mar-13 05:15	30-Mar-13 12:10	
Drill/Wipe End Date and Time	23-Mar-13 23:15	26-Mar-13 09:30	28-Mar-13 11:15	01-Apr-13 22:05	
Min Inc (deg) @ Depth (MD, ft)	.14 @ 655.00	12.15 @ 6,047.00	50.45 @ 6,540.00	87.04 @ 9,890.00	
Max Inc (deg) @ Depth (MD, ft)	21.23 @ 3,716.00	47.84 @ 6,495.00	83.05 @ 6,854.00	94.38 @ 8,636.00	
Bit TFA(in2) / Bit Type	.77 / PDC	.75 / PDC	.75 / PDC	.46 / PDC	
Flow Rate (gpm)	500.00	487.14	501.73	269.00	
Max AV (fpm) / CV (fpm) @ MWD	294.0 / 281.0	267.0 / 0	265.0 / 269.0	427.3 / 331.9	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	10.00 / 34.00	11.20 / 43.00	11.20 / 43.00	9.75 / 42.00	
Filtrate CL (ppm)	900.00	900.00	900.00	1,000.00	
pH / Fluid Loss (mptm)	9.30 / 0	9.30 / 0	9.30 / 0	9.00 / 4	
PV (cP) / YP (Ihf2)	8 / 8.00	16 / 13.00	16 / 13.00	13 / 9.00	
% Solids / % Sand	4 / 0.25	12.2 / 0.3	12.2 / 0.25	7.3 / 0.25	
% Oil / Oil:Water Ratio	Na / Na	Na / Na	Na / Na	Na / Na	
Rm @ Measured Temp (degF)	Na @ Na	Na @ Na	Na @ Na	Na @ Na	
Rmf @ Measured Temp (degF)	Na @ Na	Na @ Na	Na @ Na	Na @ Na	
Rmc @ Measured Temp (degF)	Na @ Na	Na @ Na	Na @ Na	Na @ Na	

Max Tool Temp (degF) / Source	146.84 / PCM	150.10 / PCM	154.30 / PCM	200.80 / PCM	
Rm @ Max Tool Temp (degF)	Na @ 146.84	Na @ 150.10	Na @ 154.30	Na @ 200.80	
Lead MWD Engineer	Tyrell Foran	Tyrell Foran	Tyrell Foran	Tyrell Foran	
Customer Representative	JW Irwin	JW Irwin	Kevin Campbell	Kevin Campbell	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	5.76	
Sub Serial Number	233811	233811	233811	12134692	
Insert Serial Number	11680798	11227539	11680798	11227539	
Date and Time Initialized	19-Mar-13 16:54	24-Mar-13 02:37	26-Mar-13 12:53	29-Mar-13 07:35	
Date and Time Read	24-Mar-13 08:37	26-Mar-13 19:08	28-Mar-13 22:42	02-Apr-13 21:08	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	50.00	49.00	49.00	64.00	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	233811	233811	233811	12134692	
Sonde Serial Number	11478019	11638536	11478019	11638536	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	286.62	18.58	251.41	112.99	

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	56.57	55.79	55.57	56.62	
Recorded Sample Period (sec)	15	15	15	15	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	233811	233811	233811	12134692	
Insert/Sonde Serial Number	11579775	11680941	11579775	11680941	

REMARKS

1. All depths are true vertical 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 annular velocities are calculated using the "Power Law" for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.

4. All data is stored data unless otherwise specified.

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

PCG GR XHI-Range (Gamma Ray Cor)
Interval Resolution: 1
Interval Distance: 1
Gap Fill: 3

ROPA (Average Rate of Penetration)
Interval Resolution: 1
Interval Distance: 1
Gap Fill: 3

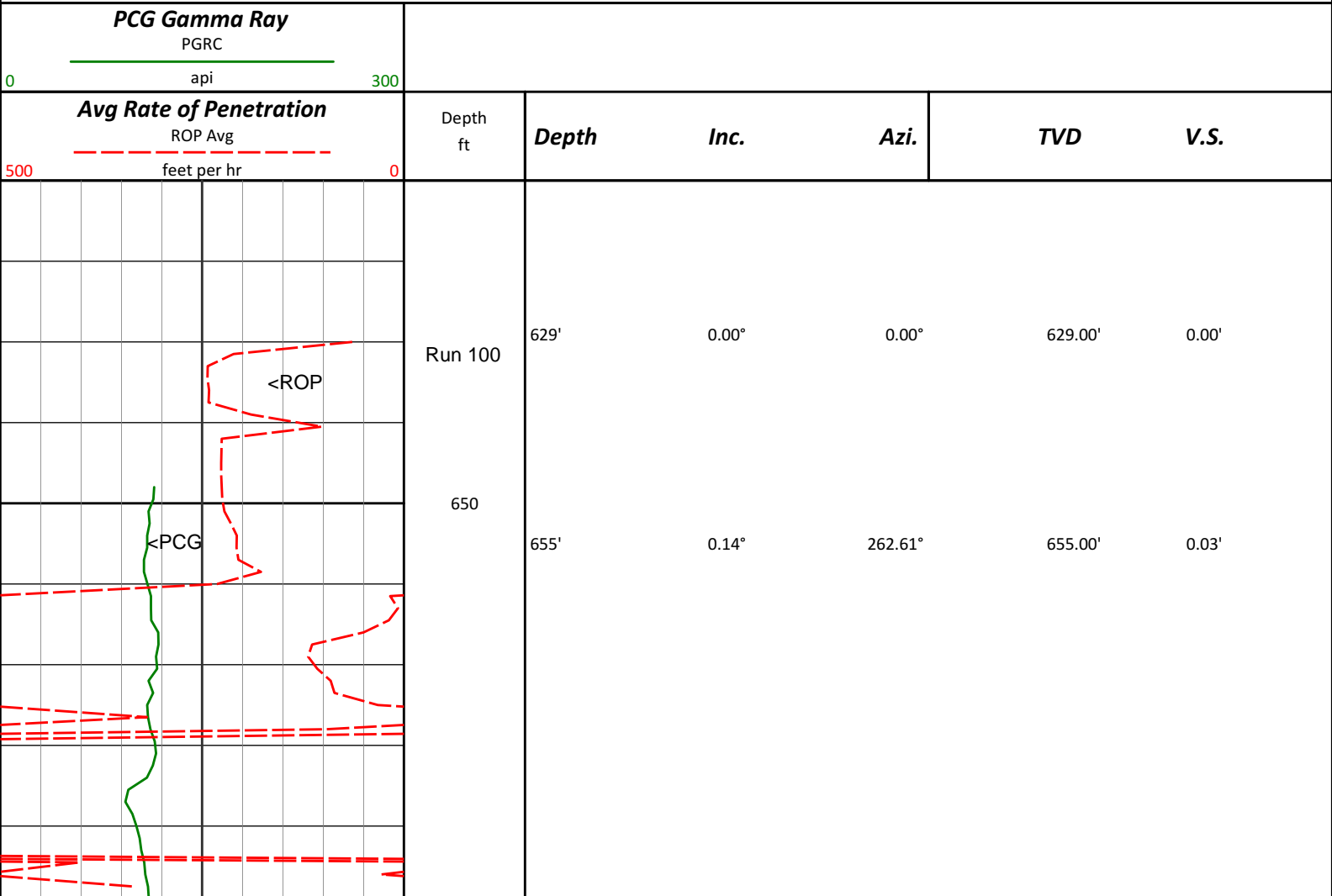
6. INSITE Version 7.4.20

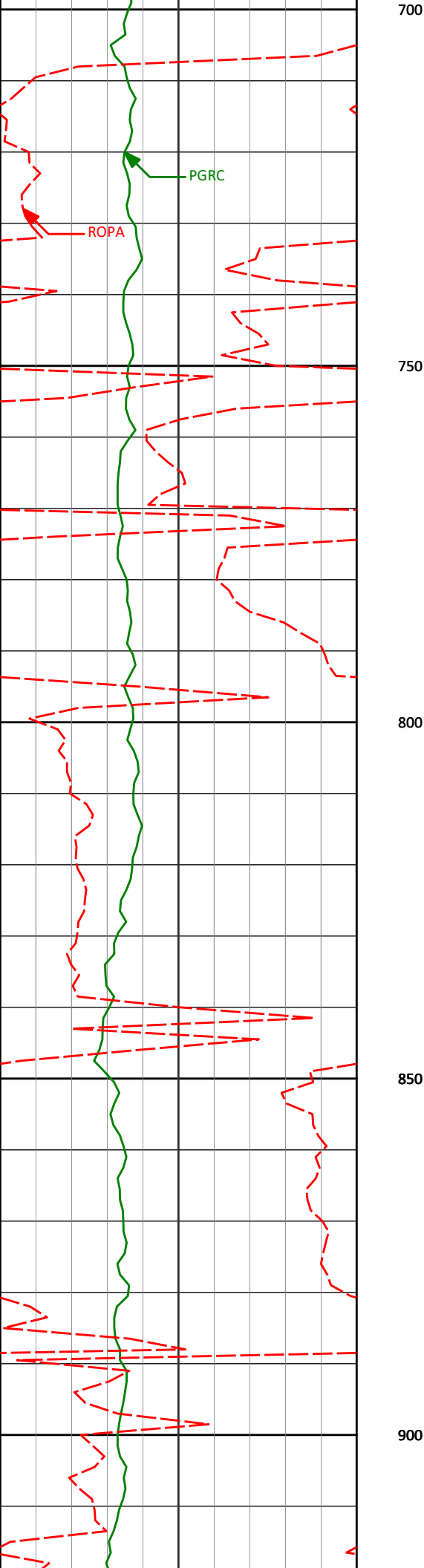
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HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Noble Energy
Shable LF07-68HN
PD 829
8N -60W





744'

0.35°

348.95°

744.00'

0.14'

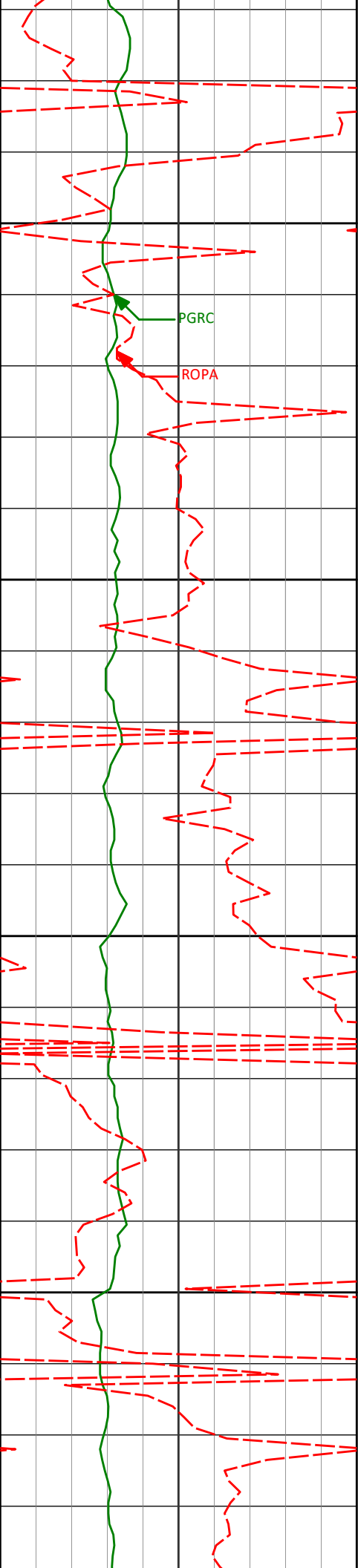
834'

0.40°

44.26°

834.00'

-0.13'



924'

0.41°

62.02°

924.00'

-0.70'

950

PGRC

ROPA

1000

1013'

0.48°

38.74°

1012.99'

-1.29'

1050

1100

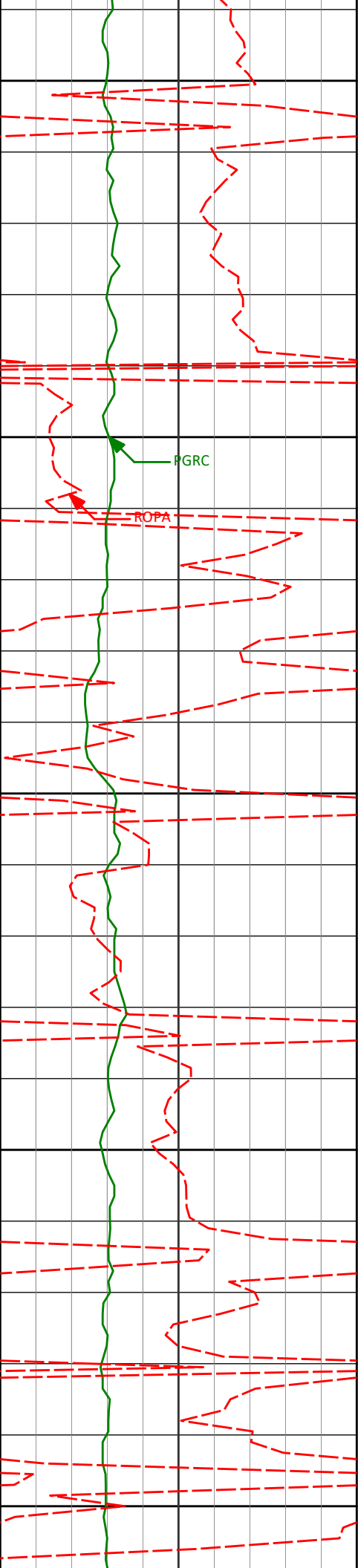
1103'

0.41°

55.82°

1102.99'

-1.88'



1150

1169'

0.44°

67.64°

1168.99'

-2.35'

1200

PGRC

ROPA

1250

1263'

0.65°

198.12°

1262.99'

-2.45'

1300

1350

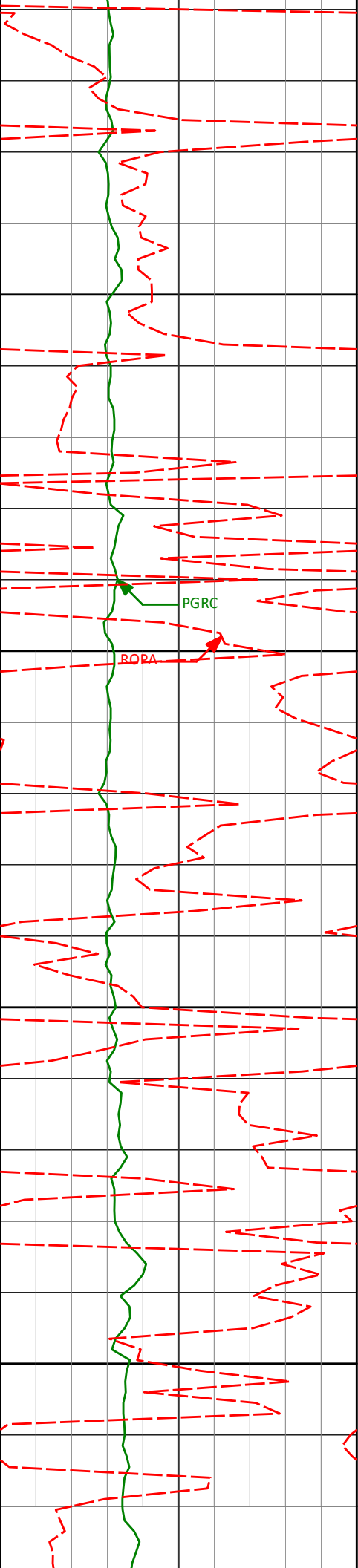
1357'

1.93°

213.49°

1356.96'

-1.06'



1400

1450

1500

1550

1452'

1546'

4.12°

7.99°

205.16°

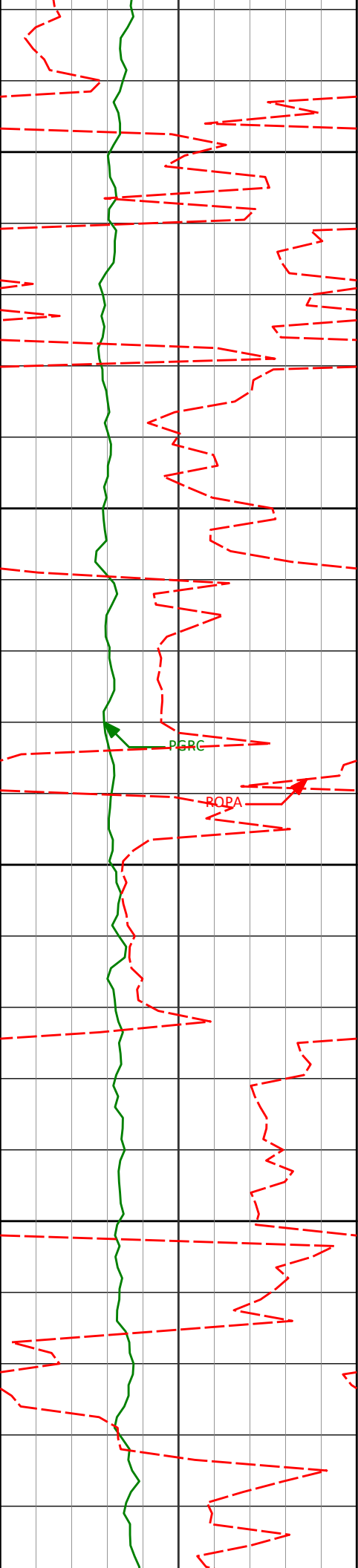
184.97°

1451.82'

1545.29'

2.12'

6.00'



1600

1640'

10.37°

177.93°

1638.08'

9.26'

1650

1700

1734'

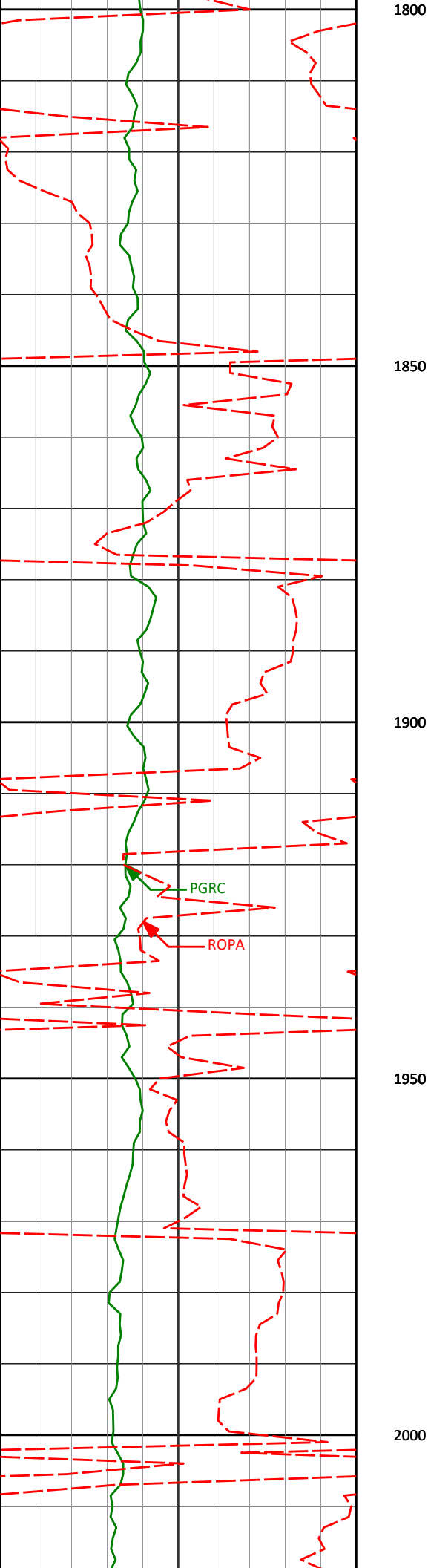
13.49°

188.51°

1730.05'

14.42'

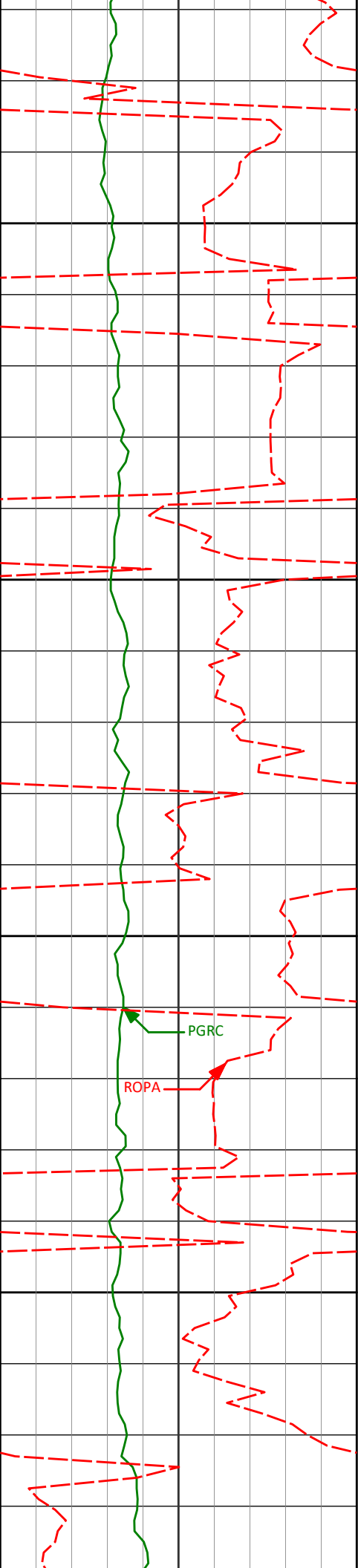
1750



1829' 15.01° 190.30° 1822.13' 22.81'

1923' 15.33° 187.74° 1912.85' 31.45'

2017' 15.93° 196.07° 2003.39' 41.54'



2050

2100

2150

2200

2111'

17.72°

200.92°

2093.37'

55.21'

ROPA

PGRC

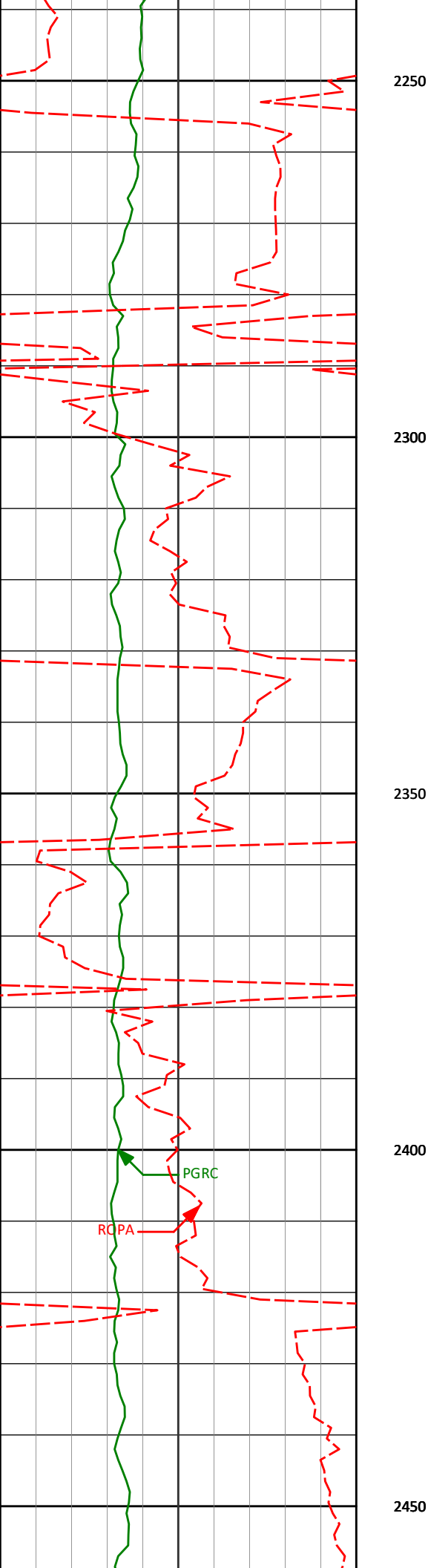
2206'

18.19°

200.00°

2183.74'

70.75'



2282'

18.70°

203.37°

2255.83'

83.94'

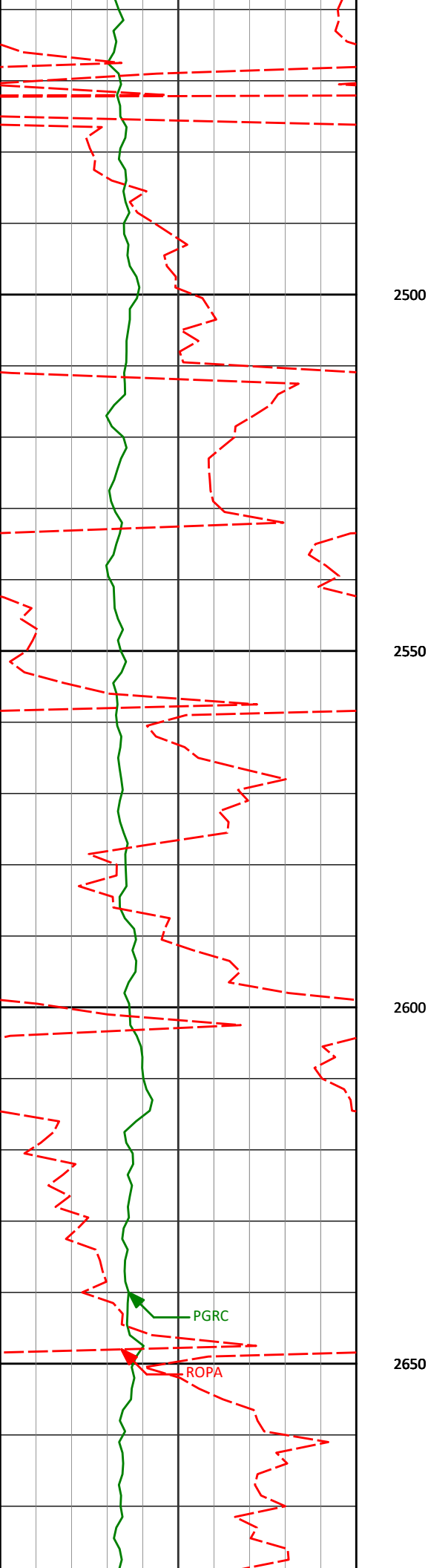
2372'

20.28°

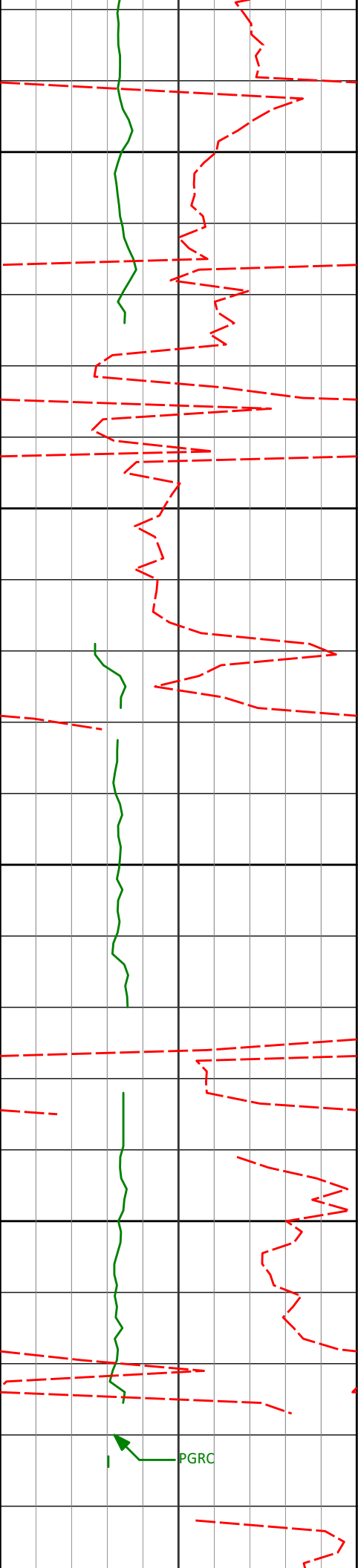
205.19°

2340.67'

101.54'



2461'	18.76°	202.80°	2424.56'	118.85'
2500				
2550				
2551'	19.49°	204.59°	2509.59'	135.87'
2600				
2640'	17.95°	202.39°	2593.88'	152.30'
2650				



2700

2750

2800

2850

2730'

19.45°

202.35°

2679.13'

168.41'

2820'

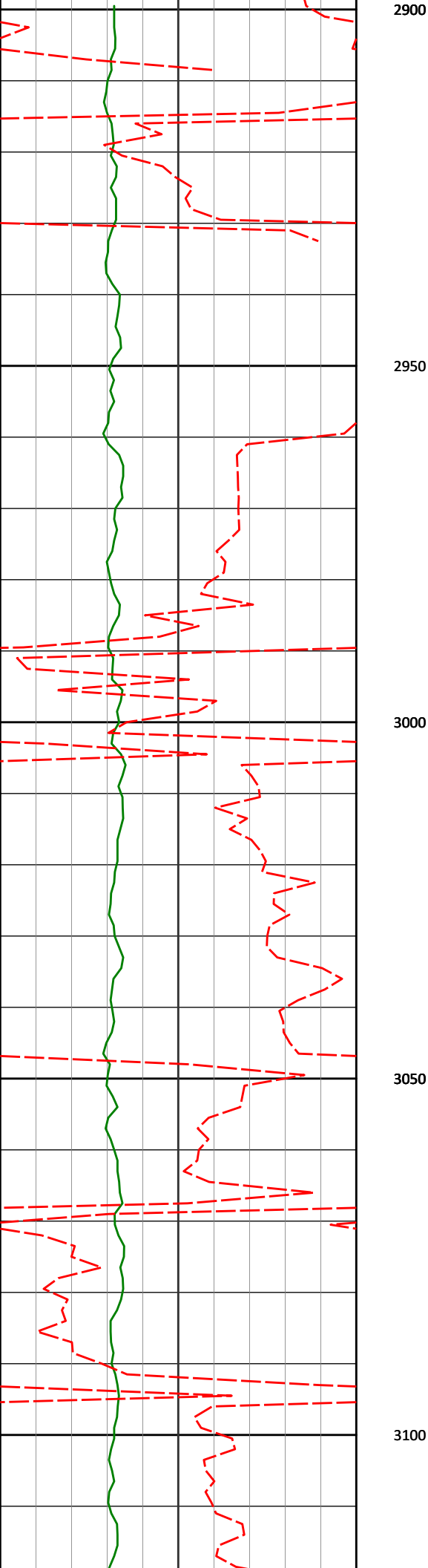
19.41°

201.33°

2764.01'

184.89'

PGRC



2909'

19.15°

198.79°

2848.02'

200.30'

2999'

20.71°

199.58°

2932.62'

215.99'

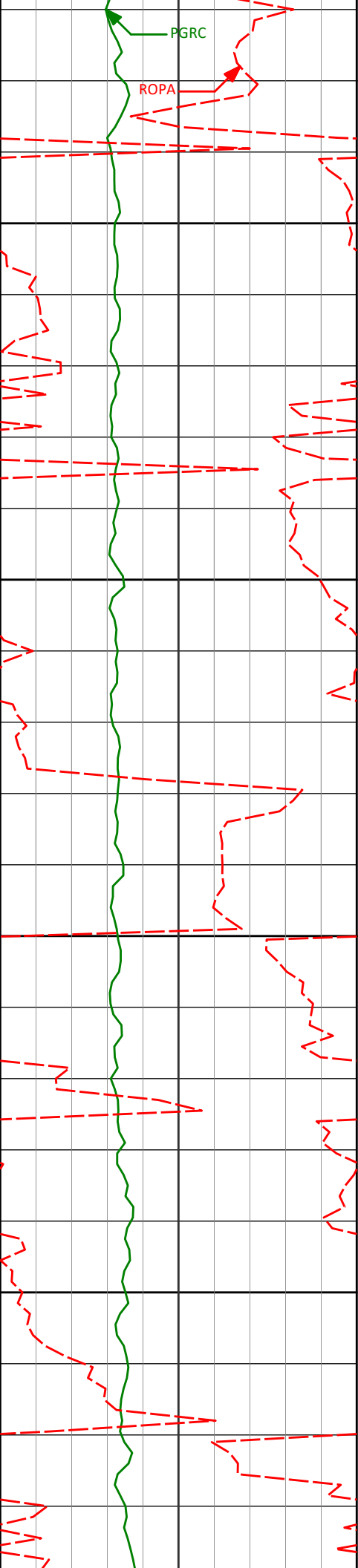
3089'

21.15°

204.20°

3016.69'

233.71'



3150

3178'

20.17°

199.89°

3099.98'

251.10'

3200

3250

3268'

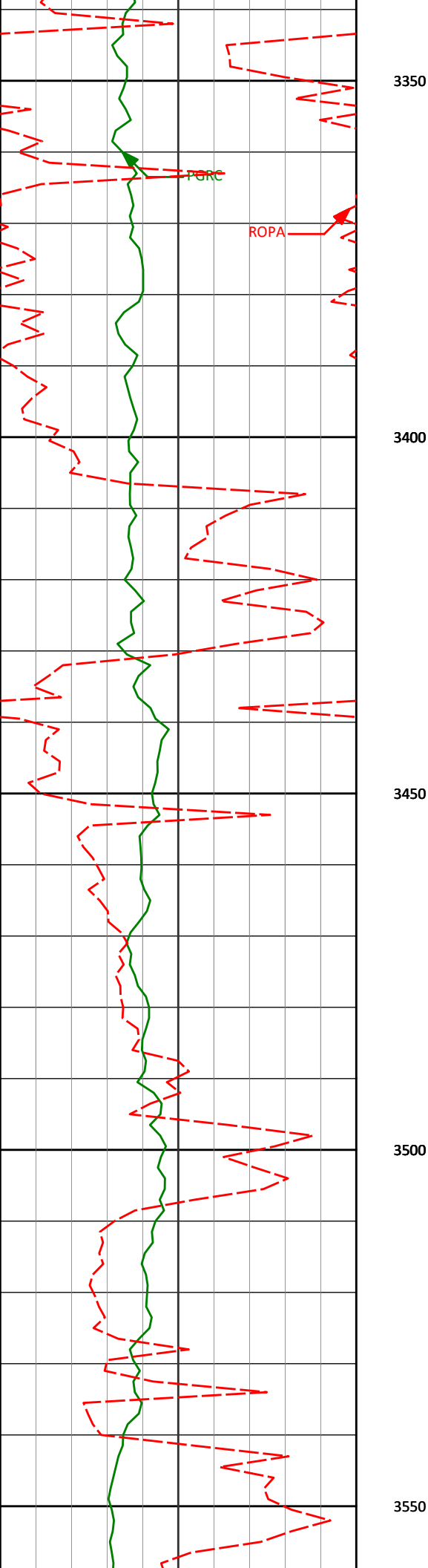
20.03°

205.98°

3184.51'

268.60'

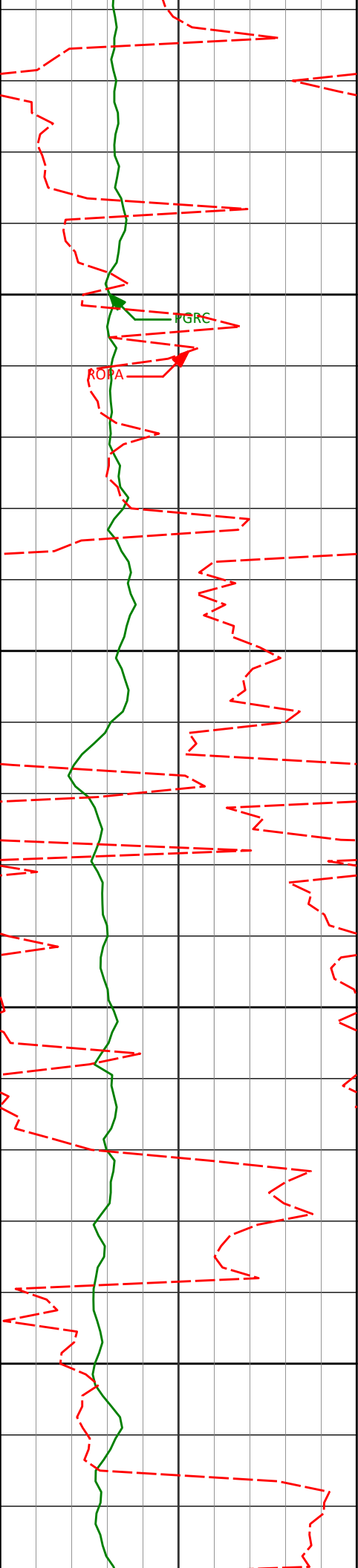
3300



3357'	18.60°	203.51°	3268.49'	286.04'
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3447'	17.71°	202.27°	3354.01'	301.92'
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3537'	18.20°	206.80°	3439.63'	318.27'
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3600

3626'

20.57°

207.05°

3523.58'

336.66'

3650

3700

3716'

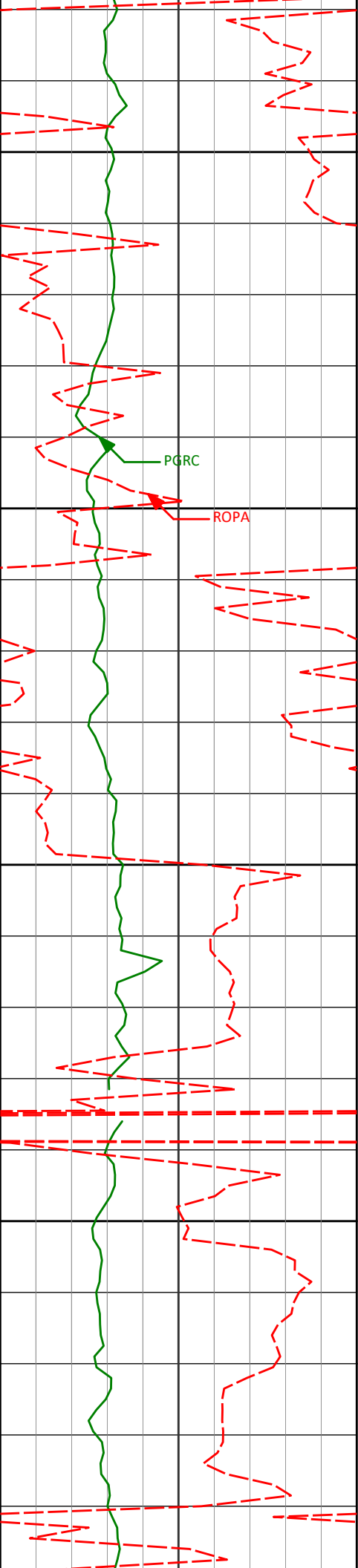
21.23°

207.18°

3607.66'

356.72'

3750



3800

3805'

19.68°

206.53°

3691.05'

376.06'

3850

PGRC

ROPA

3900

3895'

20.37°

205.55°

3775.61'

394.86'

3950

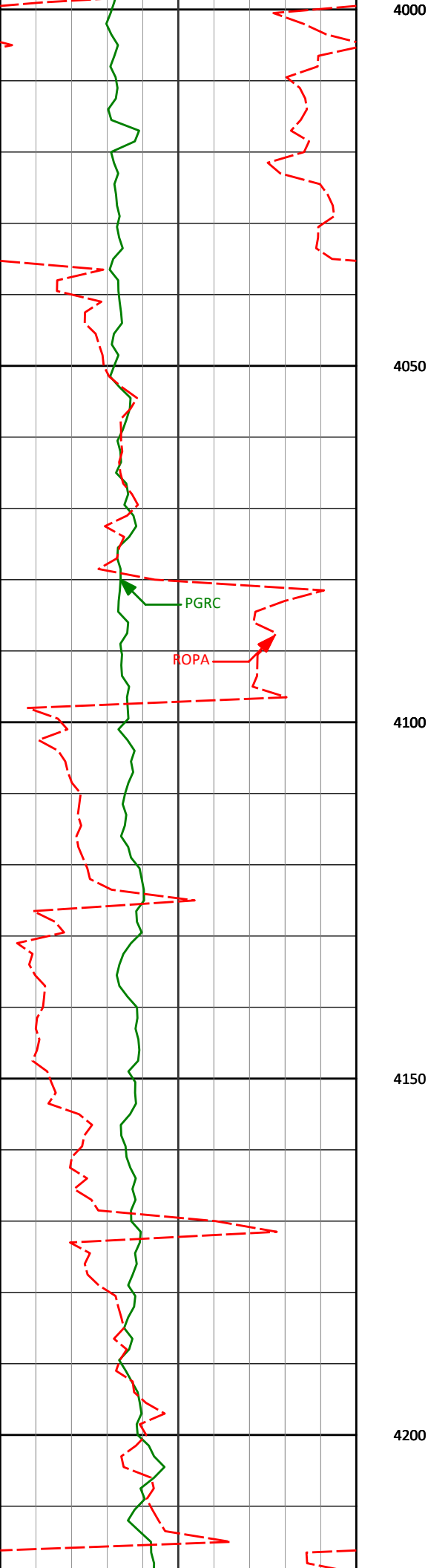
3985'

16.37°

203.44°

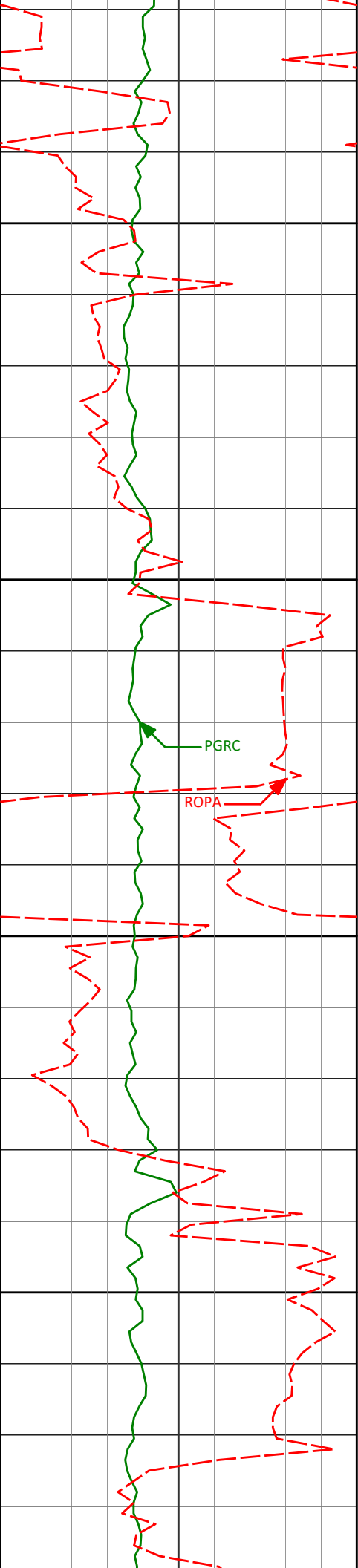
3861.00'

411.60'



4074' 16.34° 202.12° 3946.40' 425.74'

4164' 15.43° 197.83° 4032.97' 438.64'



4250

4254'

14.01°

197.43°

4120.01'

449.80'

4300

PGRC

ROPA

4343'

13.34°

190.66°

4206.49'

458.91'

4350

4400

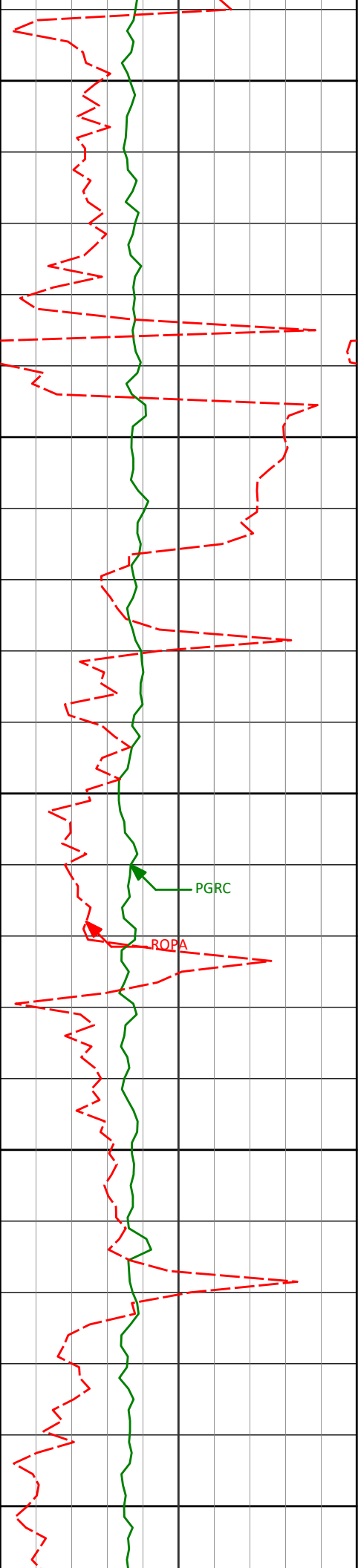
4433'

13.88°

191.97°

4293.96'

467.15'



4450

4500

4550

4600

4650

4522'

14.36°

188.84°

4380.28'

475.26'

PGRC

ROPA

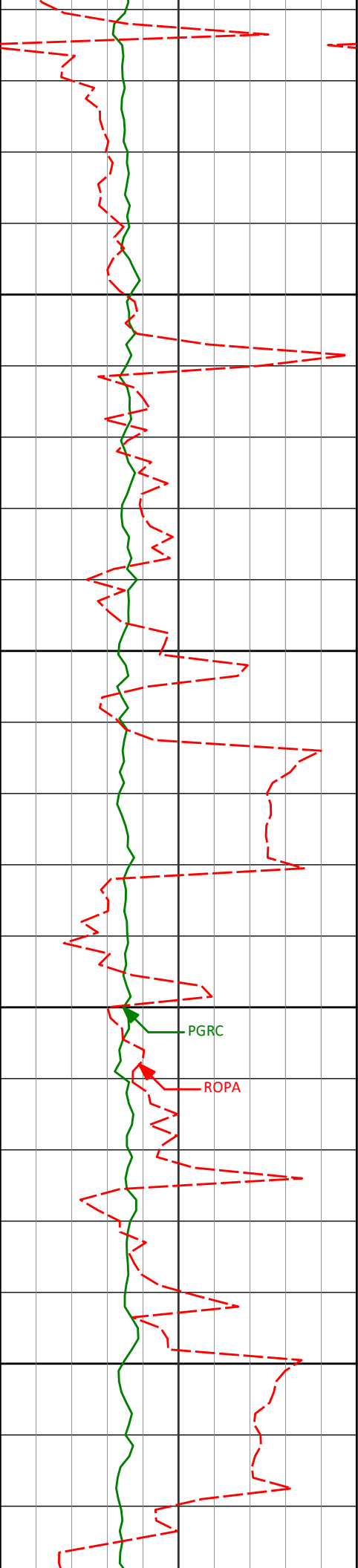
4612'

13.17°

188.96°

4467.69'

482.75'



4700

4702'

12.21°

189.58°

4555.49'

489.78'

4750

4800

PGRC

ROPA

4850

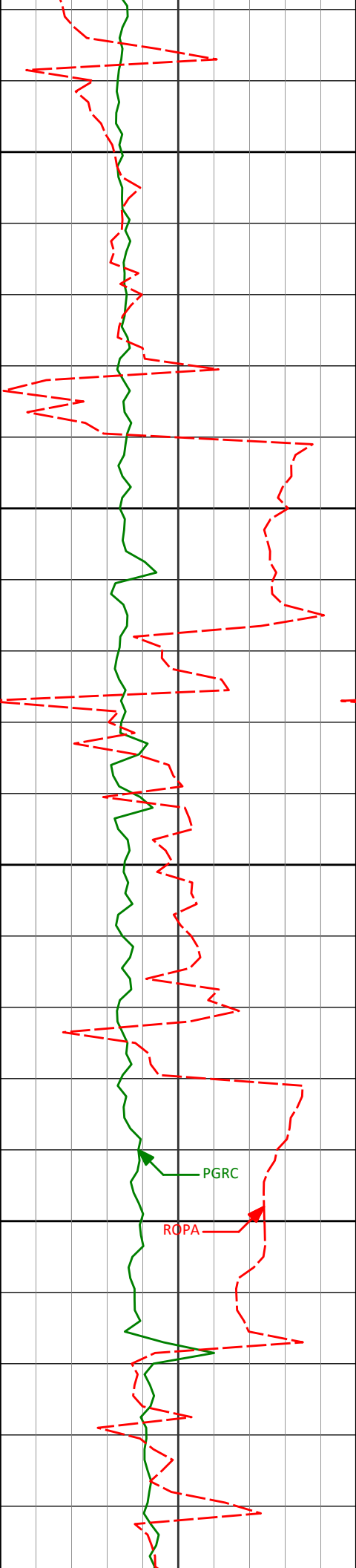
4791'

9.33°

194.40°

4642.92'

496.33'



4900

4950

5000

5050

4881'

6.81°

203.27°

4732.02'

502.58'

4971'

5.38°

211.11°

4821.51'

508.49'

5060'

2.74°

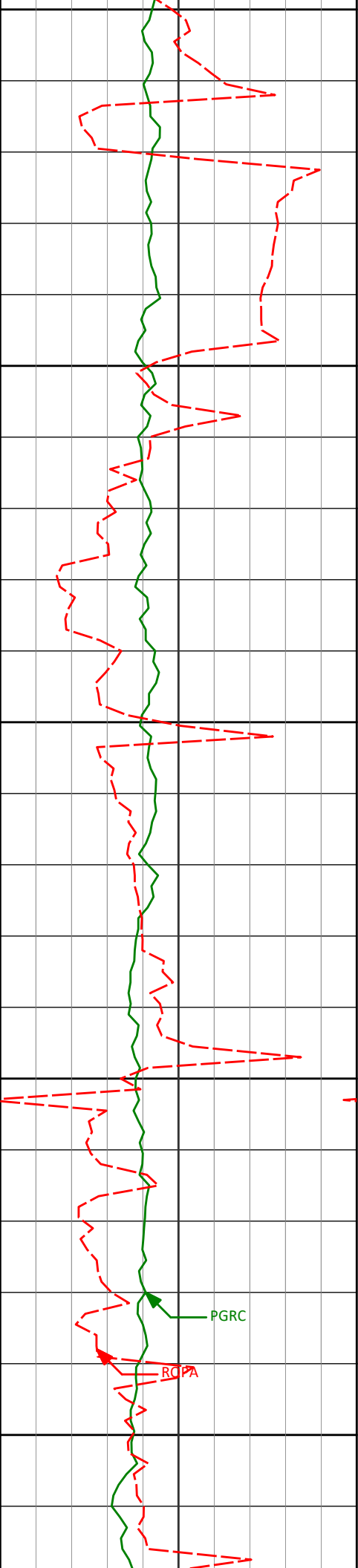
231.90°

4910.29'

513.22'

PGRC

ROPA



5100

5150

5200

5250

5300

5150'

1.08°

304.30°

5000.24'

515.74'

5240'

1.31°

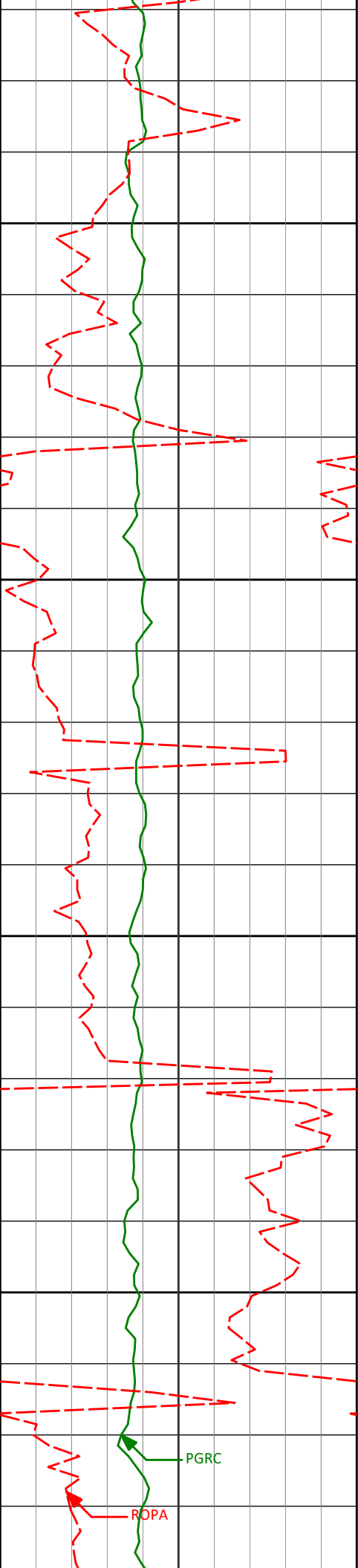
316.38°

5090.22'

516.88'

PGRC

ROPA



5329'

1.00°

307.42°

5179.20'

517.93'

5350

5400

5419'

0.39°

208.32°

5269.20'

518.64'

5450

5500

5509'

0.44°

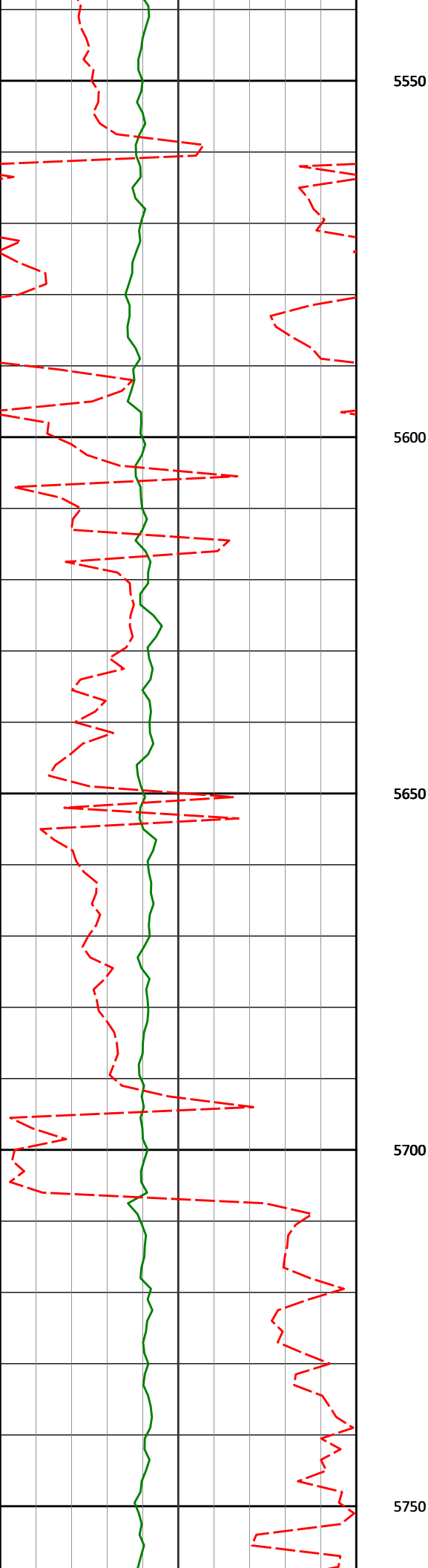
119.62°

5359.20'

518.58'

PGRC

ROPA



5599'

0.61°

116.60°

5449.19'

517.95'

5688'

0.47°

118.97°

5538.19'

517.29'

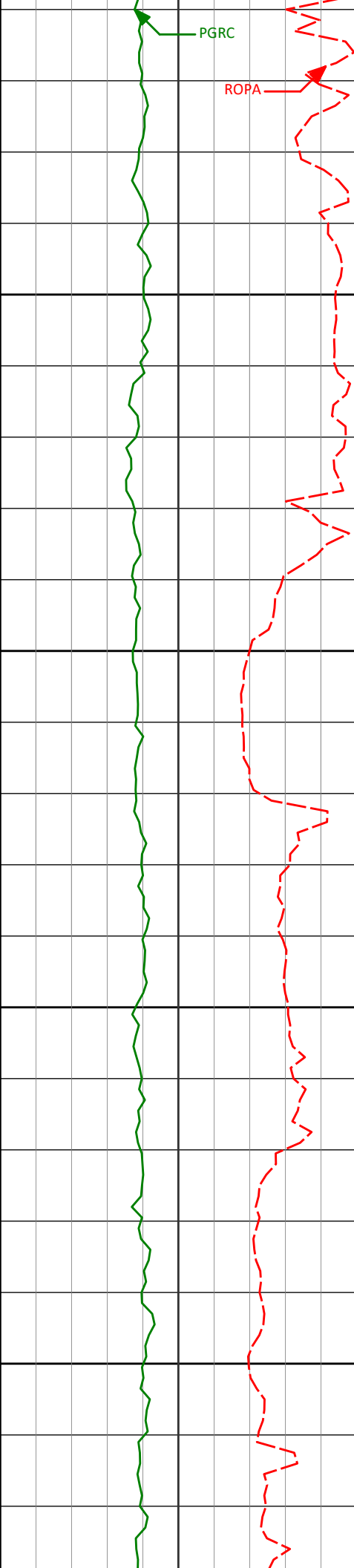
5733'

0.58°

220.51°

5583.19'

517.33'



5800

5850

5900

5950

5778'

1.26°

246.66°

5628.18'

518.00'

5823'

2.47°

249.25°

5673.16'

519.44'

5867'

4.60°

251.60°

5717.07'

522.13'

5912'

6.37°

248.90°

5761.86'

526.39'

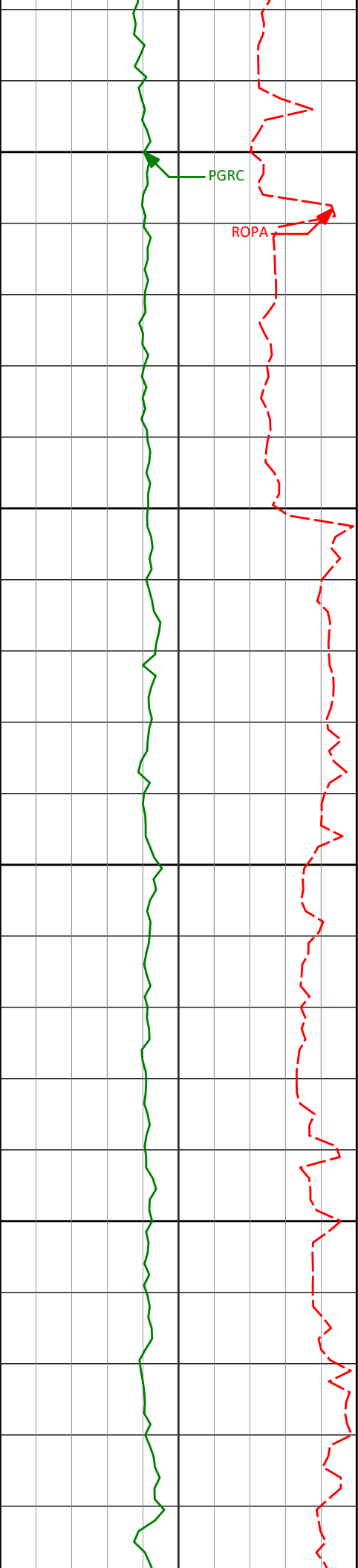
5957'

8.12°

245.77°

5806.50'

531.95'



6000

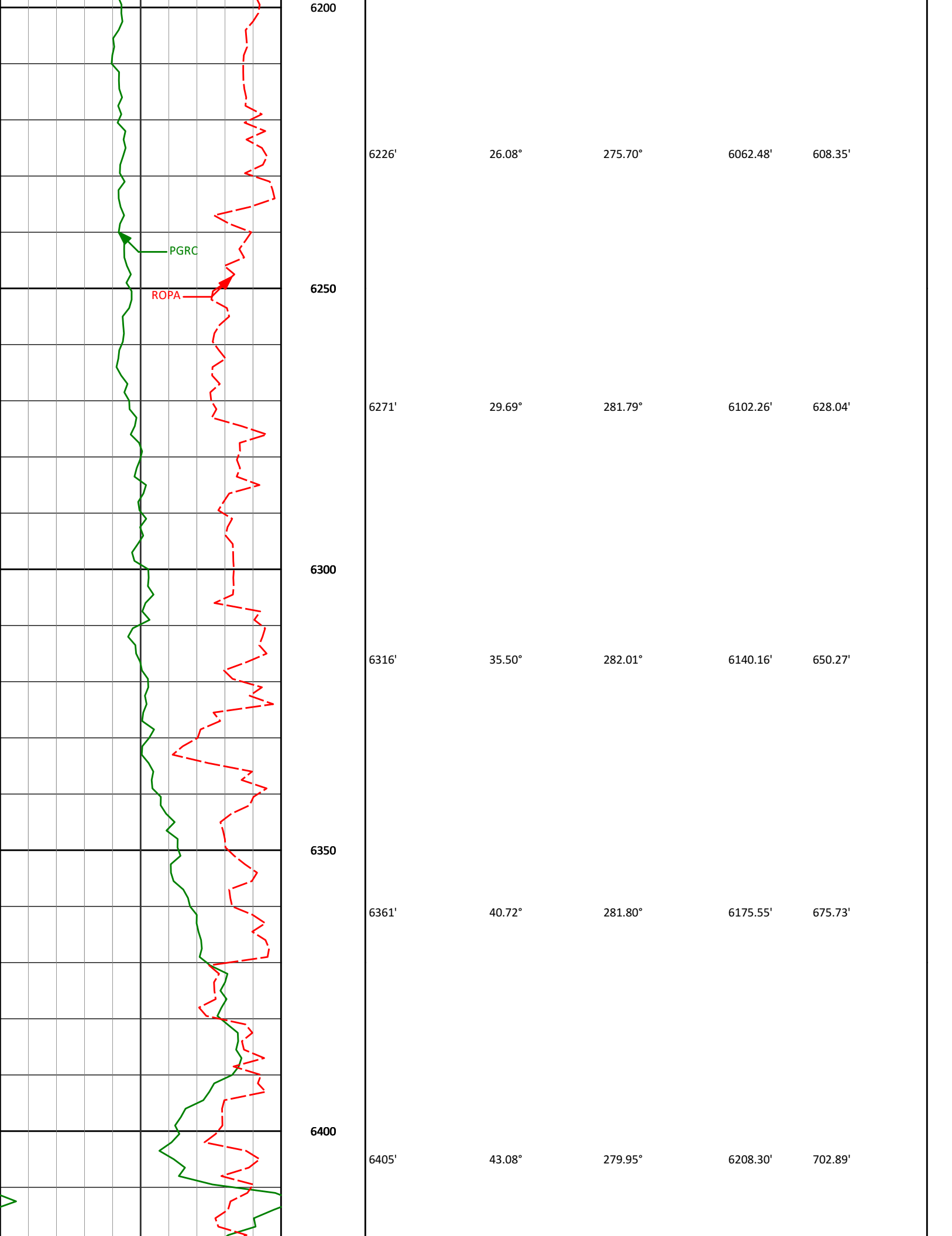
6050

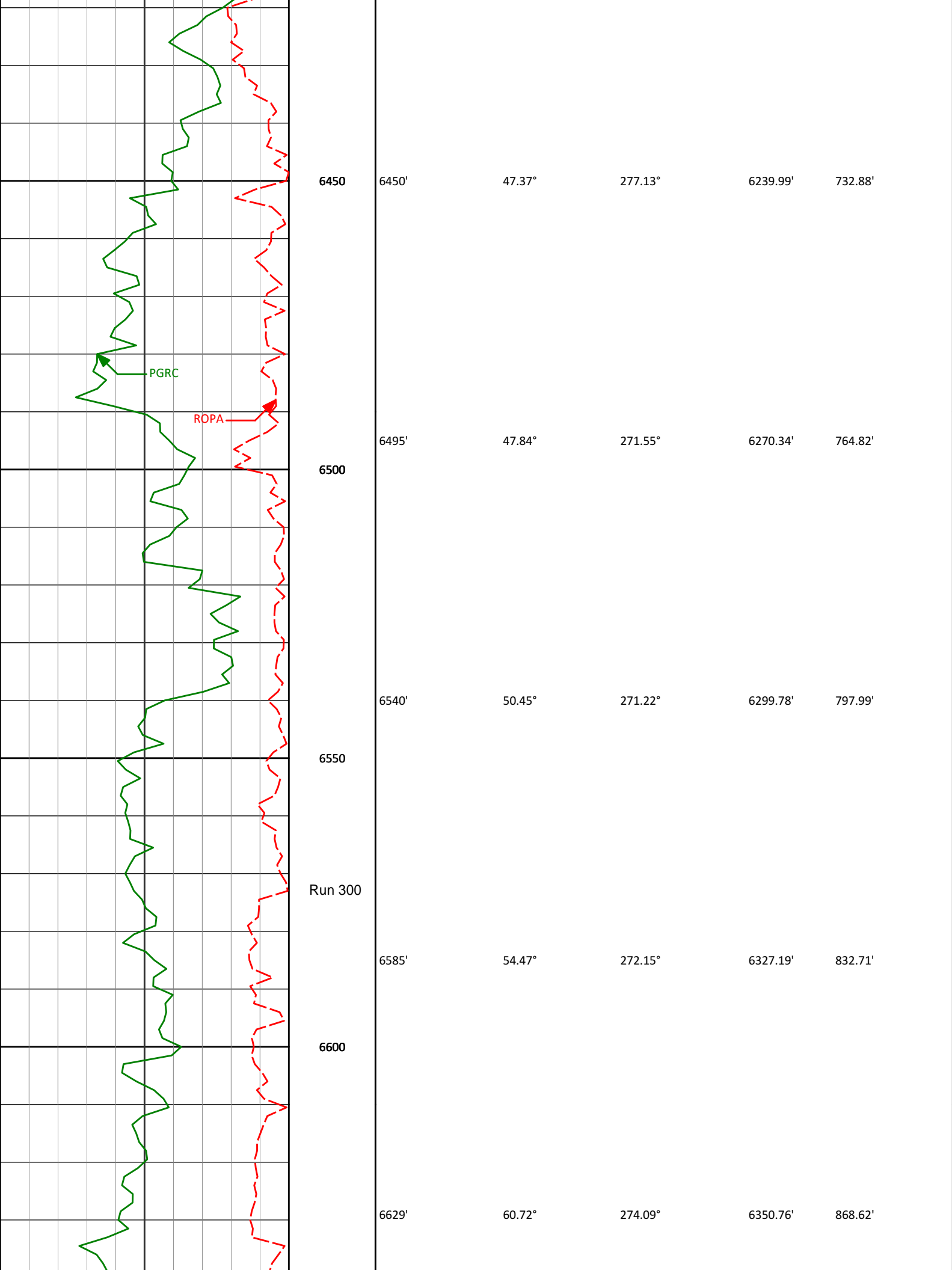
6100

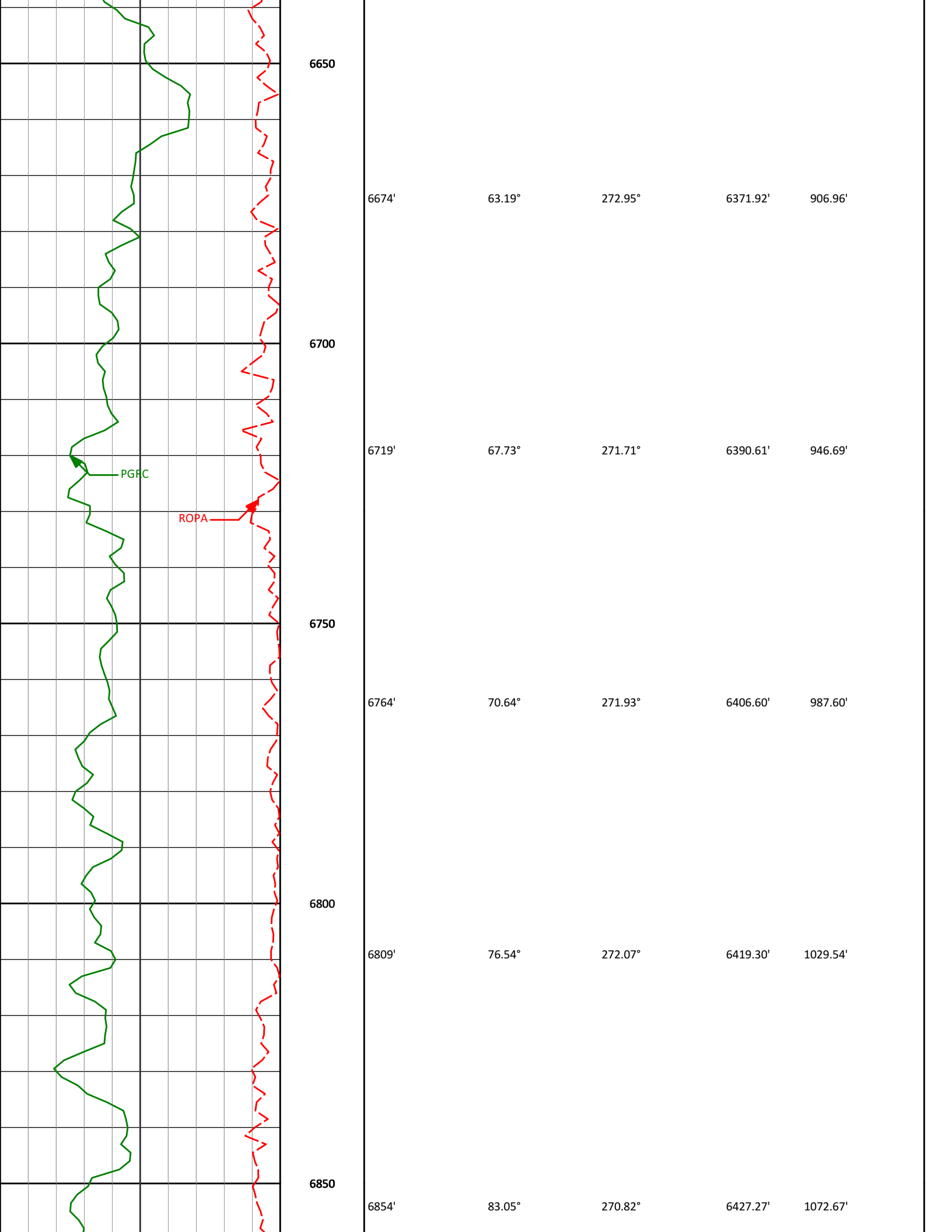
6150

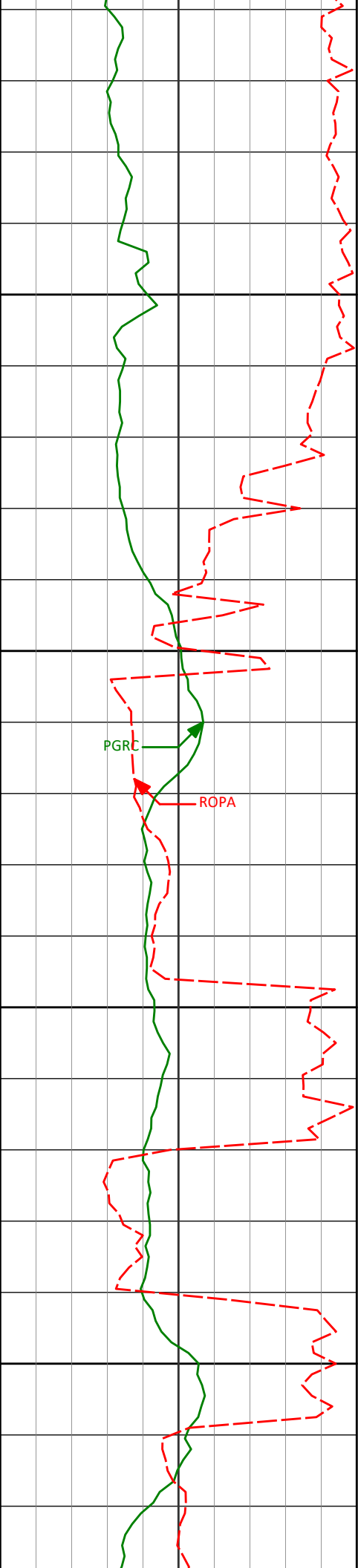
Run 200

6002'	9.43°	250.54°	5850.98'	538.70'
6047'	12.15°	250.21°	5895.18'	547.04'
6092'	16.94°	259.50°	5938.73'	558.30'
6136'	21.97°	266.75°	5980.21'	572.86'
6181'	23.76°	270.77°	6021.67'	590.05'









Shoe at 6893' md

6900

Run 400

6932'

92.03°

271.00°

6430.61'

1148.68'

6950

PGRC

ROPA

7000

7022'

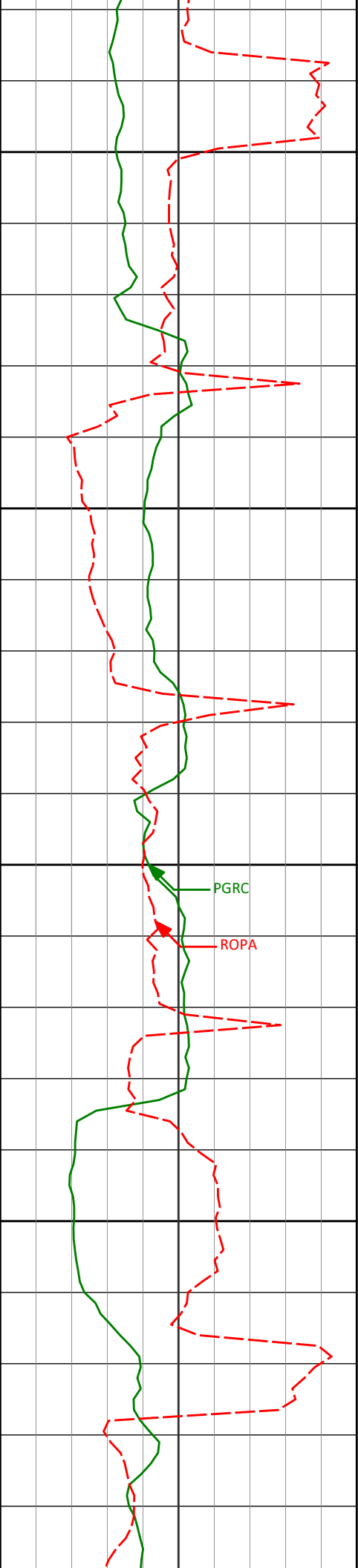
92.37°

268.36°

6427.15'

1236.88'

7050



7100

7112'

90.55°

266.00°

6424.85'

1325.79'

7150

7200

7201'

91.39°

265.57°

6423.34'

1414.04'

PGRC

ROPA

7250

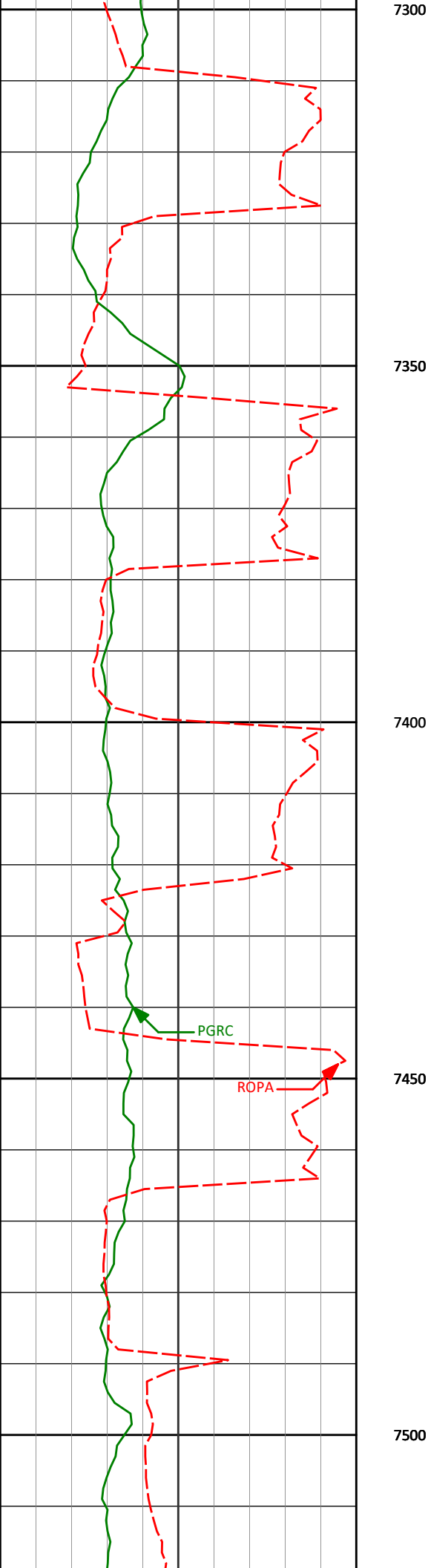
7291'

94.30°

267.46°

6418.88'

1503.03'



7381'

91.97°

268.47°

6413.96'

1591.64'

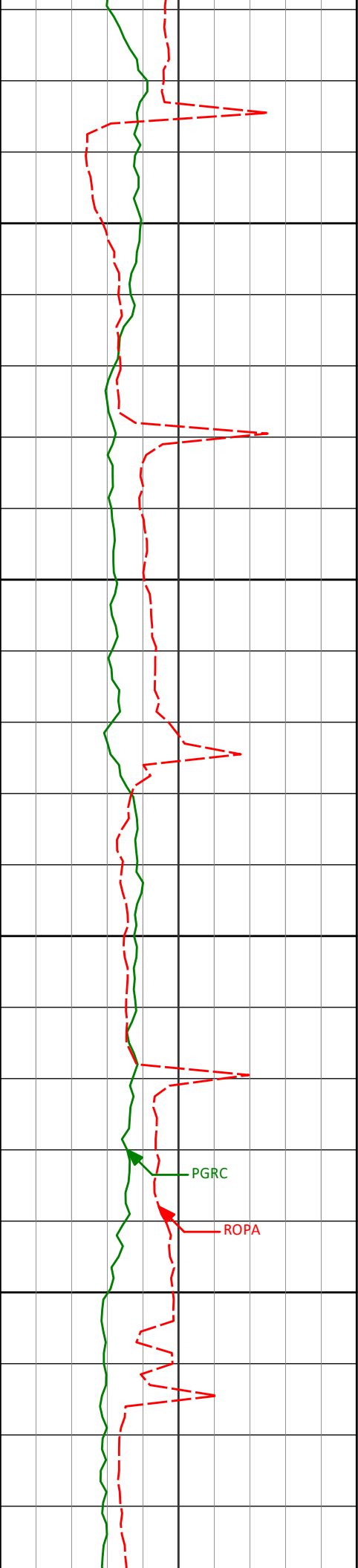
7471'

87.99°

269.59°

6413.98'

1680.09'



7550

7560'	88.77°	268.56°	6416.50'	1767.52'
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7600

7650

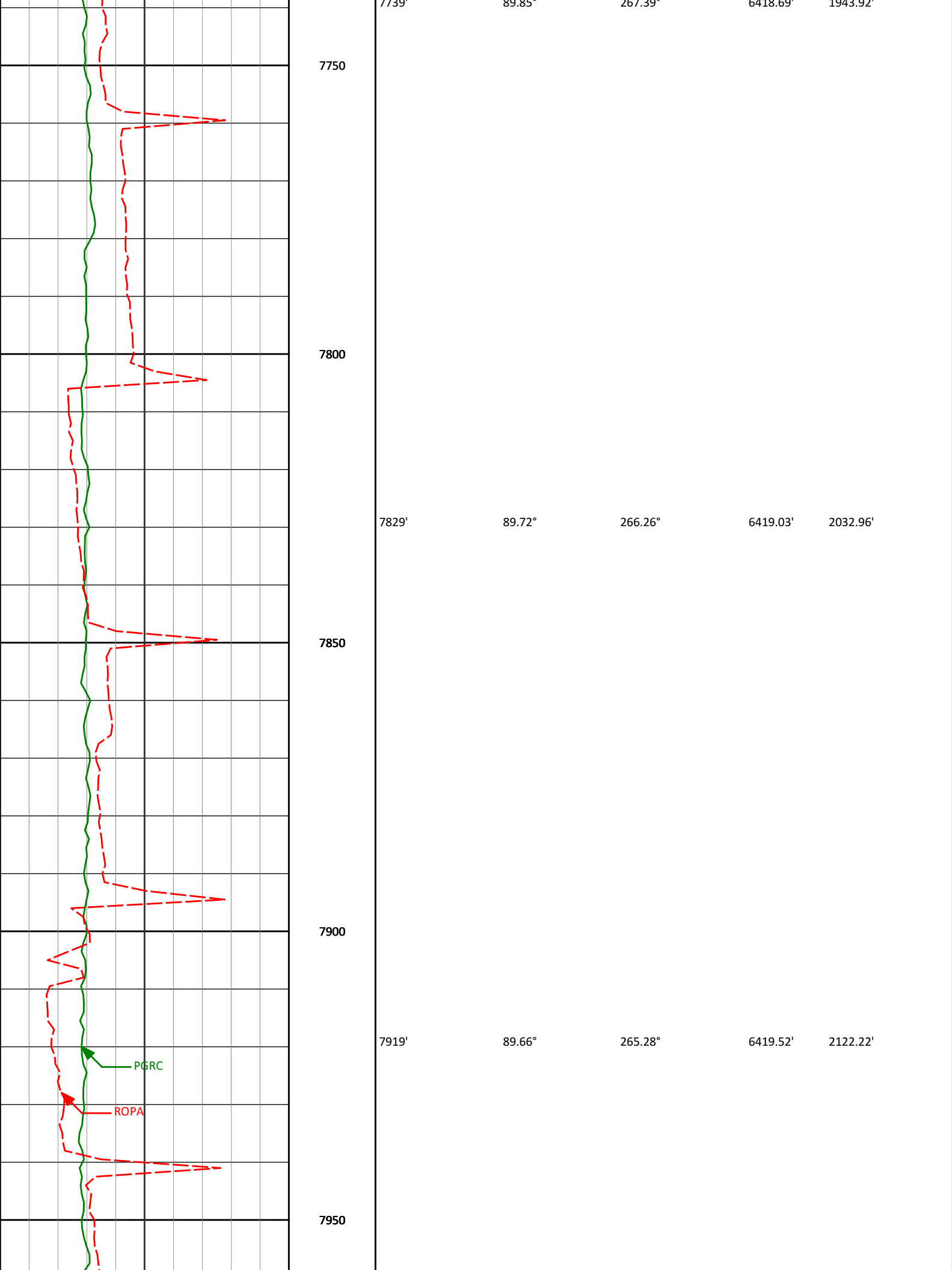
7650'	89.29°	268.36°	6418.02'	1856.13'
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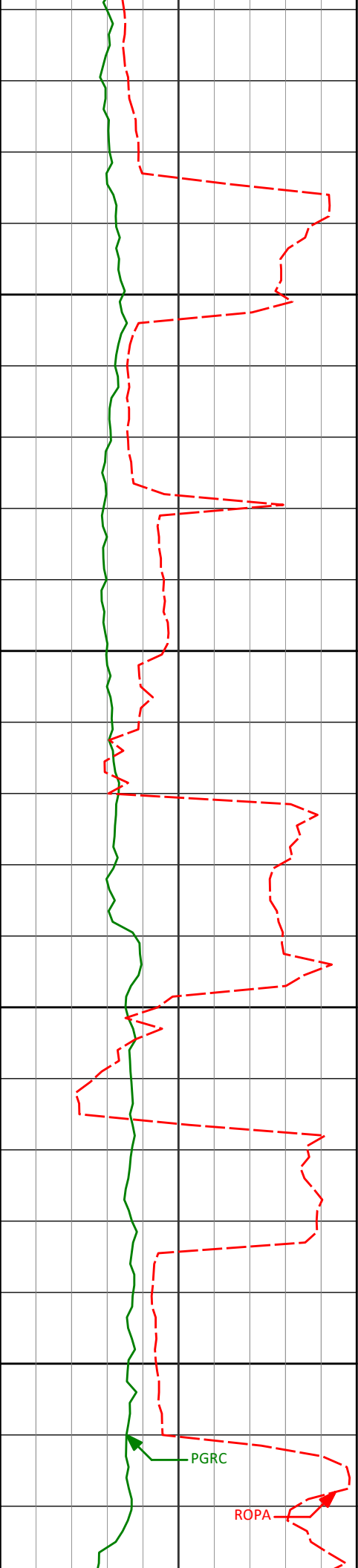
7700

PGRC

ROPA

7700'	89.25°	267.38°	6418.50'	1842.82'
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8000

8050

8100

8150

8009'

89.41°

265.94°

6420.24'

2211.51'

8098'

90.65°

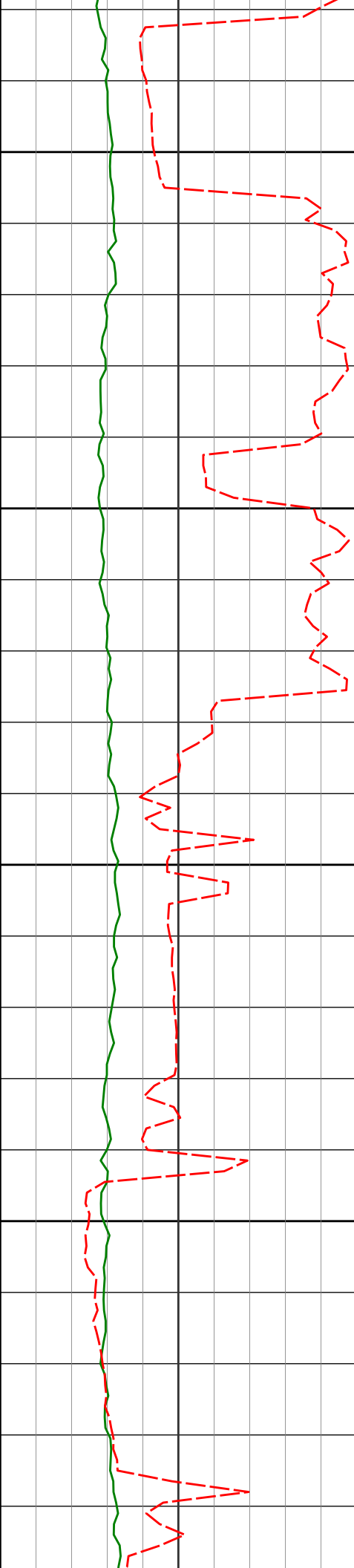
267.28°

6420.19'

2299.60'

PGRC

ROPA



8200

8250

8300

8350

8188'

89.17°

267.98°

6420.34'

2388.44'

8277'

90.25°

273.02°

6420.79'

2475.44'

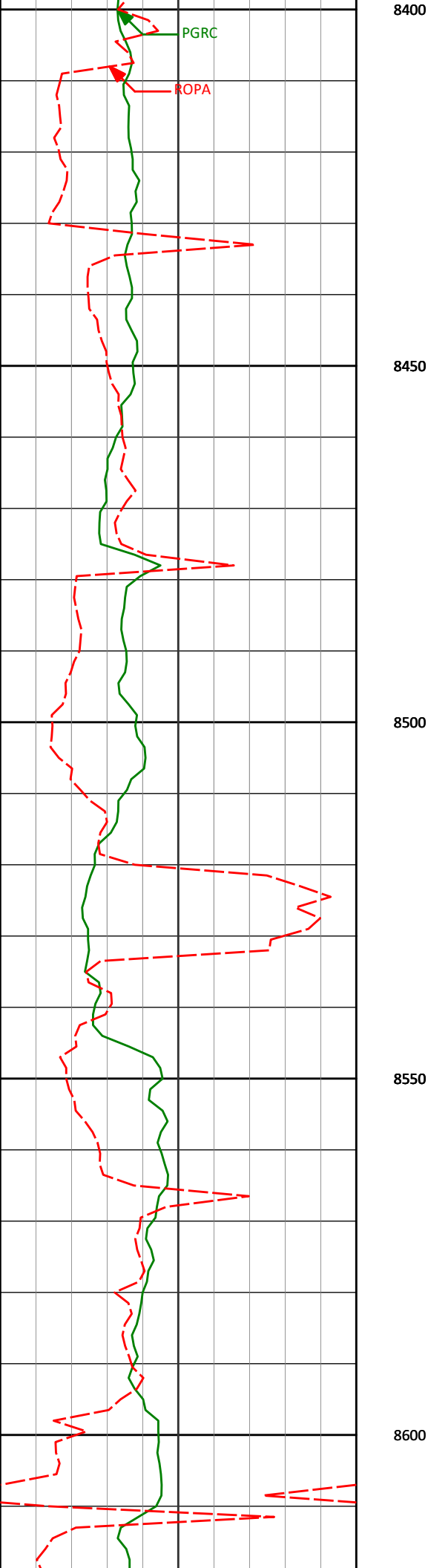
8367'

89.69°

271.59°

6420.84'

2562.81'



8457'

90.00°

269.96°

6421.08'

2650.72'

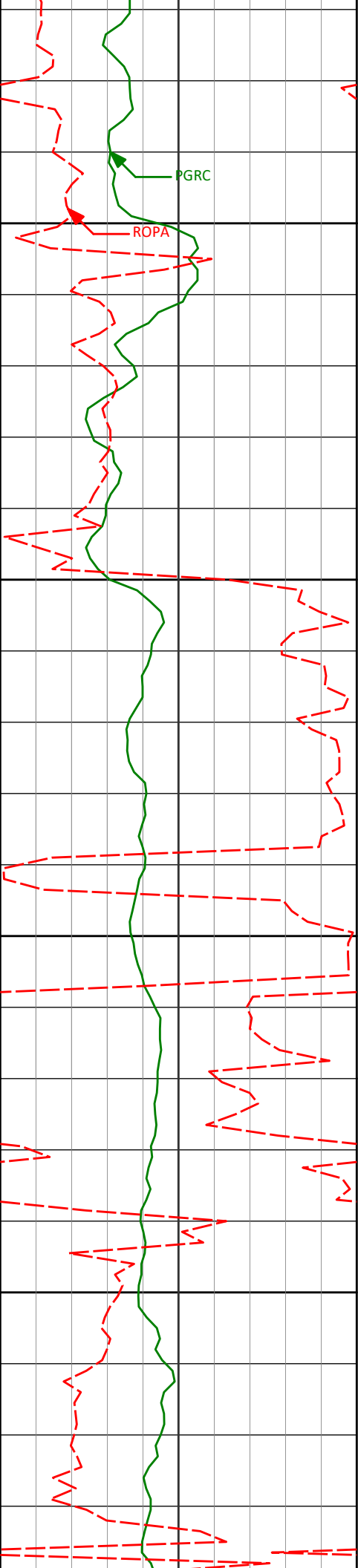
8546'

92.52°

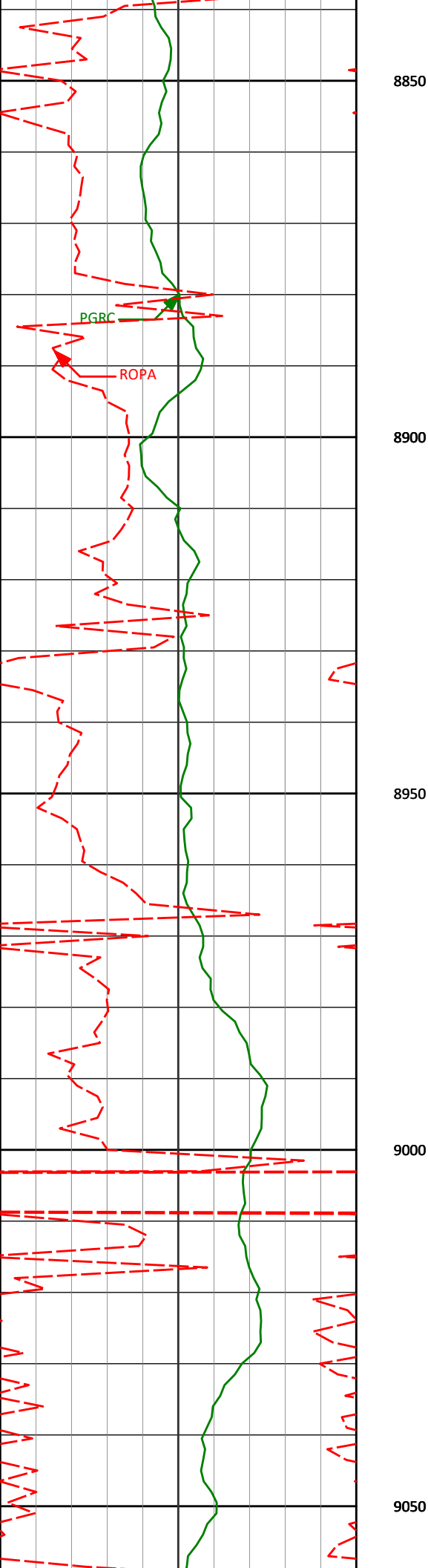
270.18°

6419.12'

2737.87'



8636'	94.38°	269.39°	6413.71'	2825.94'
8650				
8700				
8725'	94.35°	270.01°	6406.93'	2912.97'
8750				
8800				
8815'	92.53°	270.29°	6401.53'	3000.93'



8905'

93.21°

269.63°

6397.02'

3089.00'

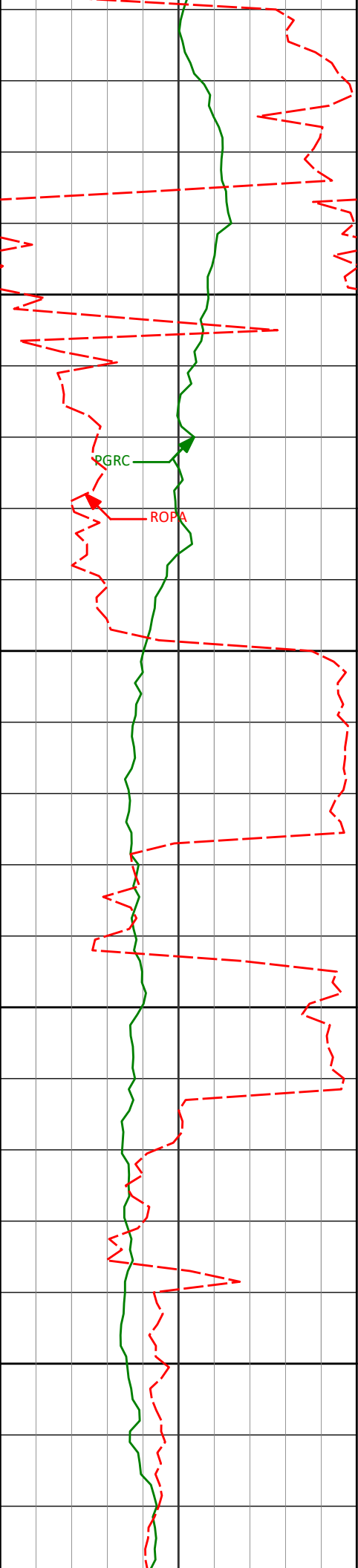
8994'

93.30°

268.20°

6391.97'

3176.37'



9084'

91.97°

268.07°

6387.83'

3264.99'

9100

9150

9174'

90.12°

269.16°

6386.18'

3353.55'

9200

9250

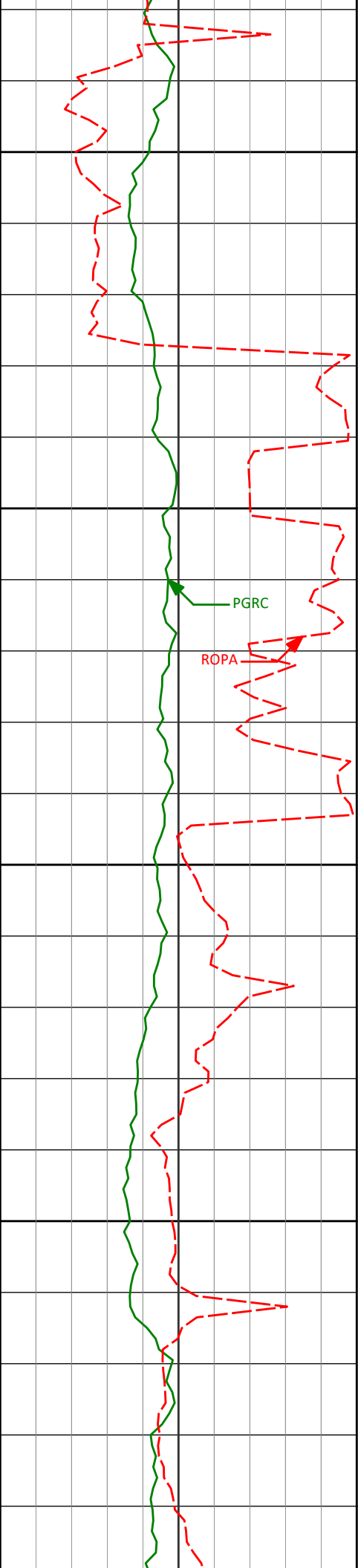
9263'

90.40°

270.55°

6385.77'

3440.79'



9300

9350

9400

9450

PGRC

ROPA

9353'

89.97°

269.93°

6385.48'

3528.88'

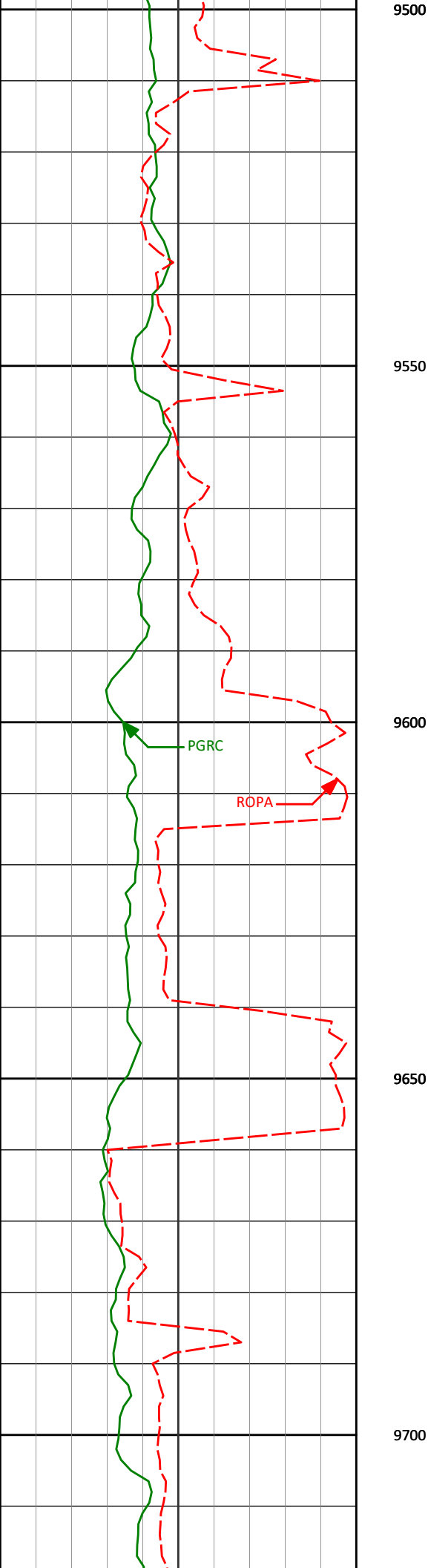
9443'

89.01°

268.97°

6386.28'

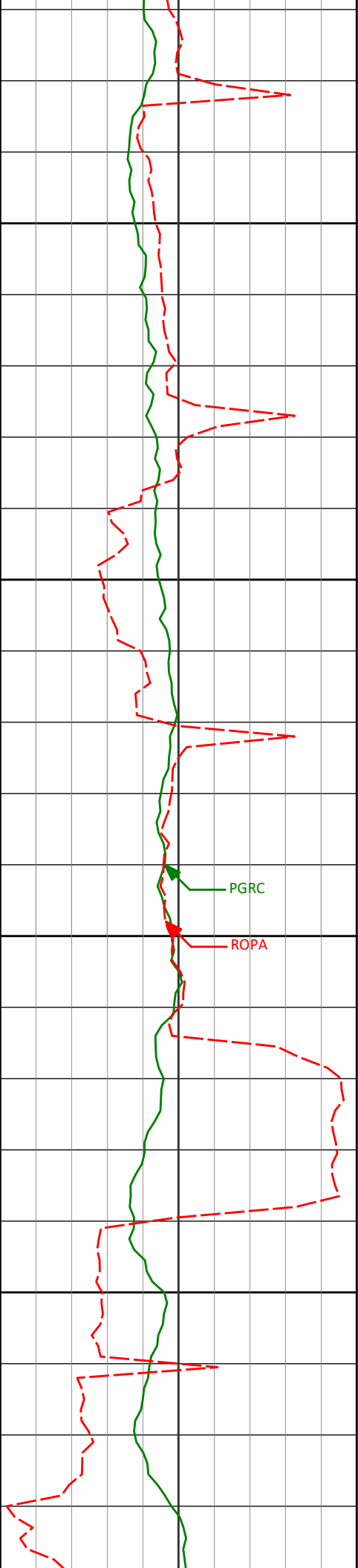
3617.22'



9532'	91.94°	269.67°	6385.54'	3704.60'
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9622'	90.46°	267.73°	6383.66'	3793.13'
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9712'	88.89°	266.81°	6384.16'	3882.06'
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9750

9800

9850

9900

PGRC

ROPA

9801'

89.81°

265.67°

6385.17'

3970.22'

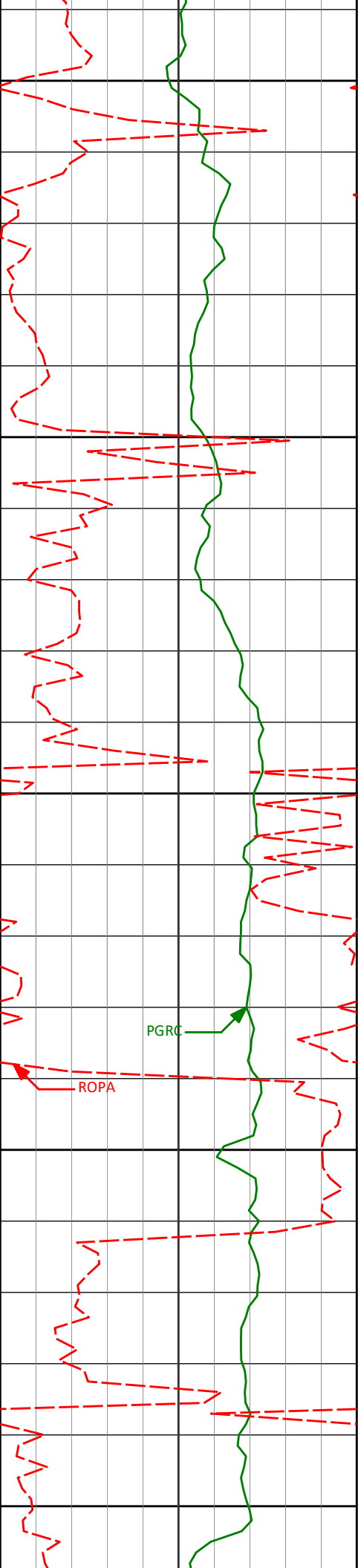
9890'

87.04°

267.08°

6387.61'

4058.32'



9950

10000

10050

10100

10150

9980'

87.13°

267.40°

6392.18'

4147.15'

10070'

87.16°

266.29°

6396.66'

4236.07'

PGR

ROPA

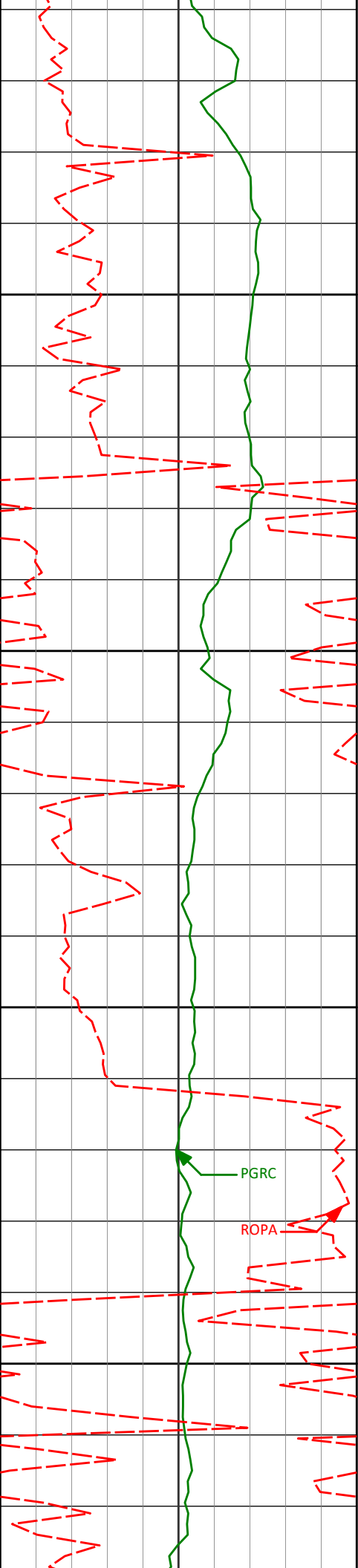
10150'

87.13°

267.40°

6392.18'

4147.15'



10200

10250

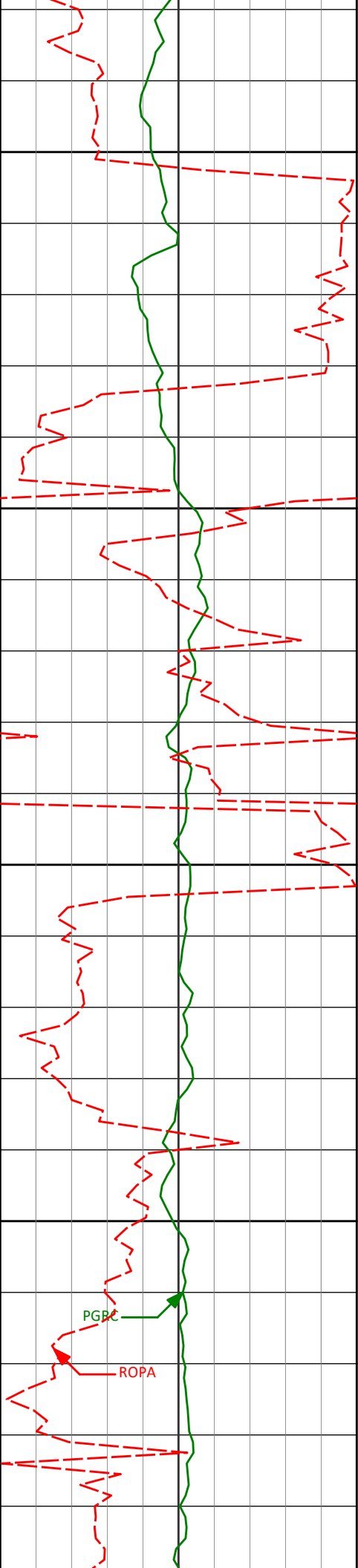
10300

10350

PGRC

ROPA

10159'	88.49°	268.73°	6400.04'	4323.88'
10249'	88.40°	266.58°	6402.49'	4412.68'
10338'	87.72°	267.74°	6405.50'	4500.60'



10400

10428'

89.14°

267.70°

6407.97'

4589.38'

10450

10500

10518'

90.40°

268.36°

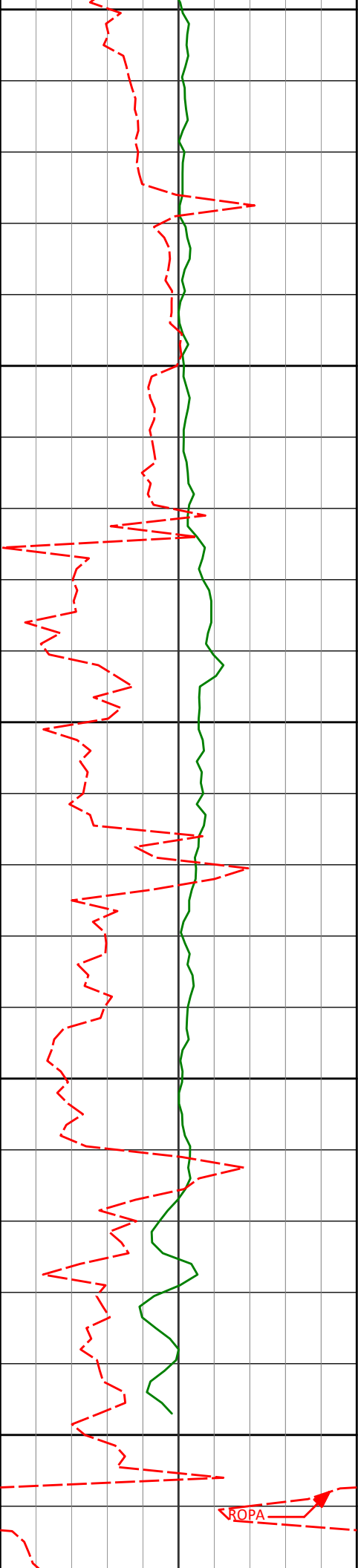
6408.33'

4678.11'

10550

PGRC

ROPA



10600

10608'

90.18°

268.27°

6407.87'

4766.78'

10650

10700

10697'

89.48°

264.80°

6408.13'

4854.87'

10750

10800

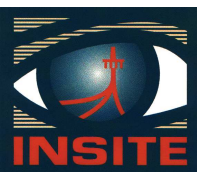
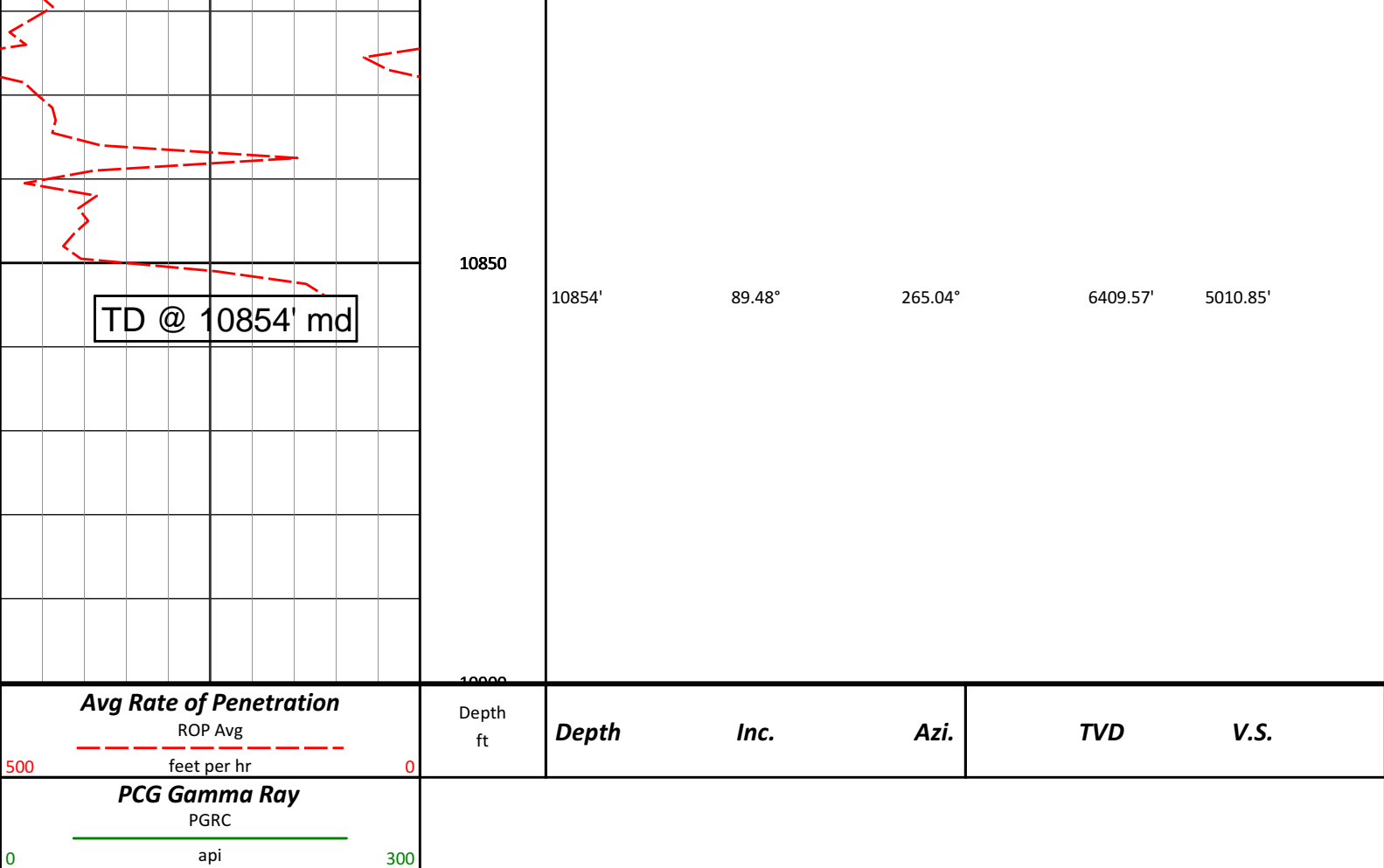
10790'

89.48°

265.04°

6408.98'

4947.27'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble
Shable LF07-68HN
Wattenburg
Weld Colorado
USA
CA-XX-0900145811
Tie in to shoe at 629' md

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
629.00	0.00	0.00	629.00	0.00 N	0.00 E	0.00	TIE-IN
655.00	0.14	262.61	655.00	0.00 S	0.03 W	0.03	0.53
744.00	0.35	348.95	744.00	0.25 N	0.19 W	0.14	0.41
834.00	0.40	44.26	834.00	0.75 N	0.02 W	-0.13	0.39
924.00	0.41	62.02	924.00	1.12 N	0.48 E	-0.70	0.14
1013.00	0.48	38.74	1012.99	1.57 N	1.00 E	-1.29	0.22
1103.00	0.41	55.82	1102.99	2.04 N	1.50 E	-1.88	0.17
1169.00	0.44	67.64	1168.99	2.27 N	1.94 E	-2.35	0.14
1263.00	0.65	198.12	1262.99	1.90 N	2.11 E	-2.45	1.06
1357.00	1.93	213.49	1356.96	0.07 N	1.07 E	-1.06	1.40
1452.00	4.12	205.16	1451.82	4.35 S	1.27 W	2.12	2.34
1546.00	7.99	184.97	1545.29	13.92 S	3.27 W	6.00	4.64
1640.00	10.37	177.93	1638.08	28.89 S	3.53 W	9.26	2.80
1734.00	13.49	188.51	1730.05	48.20 S	4.85 W	14.42	4.04
1829.00	15.01	190.30	1822.13	71.26 S	8.69 W	22.81	1.66
1923.00	15.33	187.74	1912.85	95.55 S	12.54 W	31.45	0.79
2017.00	15.93	196.07	2003.39	120.26 S	17.78 W	41.54	2.47
2111.00	17.72	200.92	2093.37	146.01 S	26.47 W	55.21	2.42
2206.00	18.19	200.00	2183.74	173.46 S	36.70 W	70.75	0.58
2282.00	18.70	203.37	2255.83	195.79 S	45.59 W	83.94	1.55

2262.00	18.70	203.37	2233.83	193.79 S	43.39 W	83.94	1.33
2372.00	20.28	205.19	2340.67	223.16 S	57.96 W	101.54	1.88
2461.00	18.76	202.80	2424.56	250.31 S	70.07 W	118.85	1.94
2551.00	19.49	204.59	2509.59	277.30 S	81.92 W	135.87	1.04
2640.00	17.95	202.39	2593.88	303.48 S	93.33 W	152.30	1.90
2730.00	19.45	202.35	2679.13	330.16 S	104.31 W	168.41	1.66
2820.00	19.41	201.33	2764.01	357.95 S	115.44 W	184.89	0.38
2909.00	19.15	198.79	2848.02	385.54 S	125.53 W	200.30	0.98
2999.00	20.71	199.58	2932.62	414.51 S	135.61 W	215.99	1.75
3089.00	21.15	204.20	3016.69	444.31 S	147.60 W	233.71	1.89
3178.00	20.17	199.89	3099.98	473.38 S	159.40 W	251.10	2.03
3268.00	20.03	205.98	3184.51	501.83 S	171.43 W	268.60	2.33
3357.00	18.60	203.51	3268.49	528.54 S	183.77 W	286.04	1.85
3447.00	17.71	202.27	3354.01	554.38 S	194.69 W	301.92	1.07
3537.00	18.20	206.80	3439.63	579.59 S	206.21 W	318.27	1.64
3626.00	20.57	207.05	3523.58	605.93 S	219.59 W	336.66	2.67
3716.00	21.23	207.18	3607.66	634.51 S	234.22 W	356.72	0.73
3805.00	19.68	206.53	3691.05	662.25 S	248.28 W	376.06	1.76
3895.00	20.37	205.55	3775.61	689.94 S	261.80 W	394.86	0.86
3985.00	16.37	203.44	3861.00	715.72 S	273.61 W	411.60	4.50
4074.00	16.34	202.12	3946.40	738.82 S	283.31 W	425.74	0.42
4164.00	15.43	197.83	4032.97	761.95 S	291.75 W	438.64	1.65
4254.00	14.01	197.43	4120.01	783.75 S	298.68 W	449.80	1.58
4343.00	13.34	190.66	4206.49	804.12 S	303.80 W	458.91	1.95
4433.00	13.88	191.97	4293.96	824.88 S	307.96 W	467.15	0.70
4522.00	14.36	188.84	4380.28	846.23 S	311.87 W	475.26	1.01
4612.00	13.17	188.96	4467.69	867.38 S	315.18 W	482.75	1.32
4702.00	12.21	189.58	4555.49	886.89 S	318.36 W	489.78	1.08
4791.00	9.33	194.40	4642.92	903.17 S	321.73 W	496.33	3.39
4881.00	6.81	203.27	4732.02	915.14 S	325.65 W	502.58	3.12
4971.00	5.38	211.11	4821.51	923.65 S	329.94 W	508.49	1.83
5060.00	2.74	231.90	4910.29	928.54 S	333.77 W	513.22	3.35
5150.00	1.08	304.30	5000.24	929.39 S	336.17 W	515.74	2.92
5240.00	1.31	316.38	5090.22	928.17 S	337.58 W	516.88	0.37
5329.00	1.00	307.42	5179.20	926.96 S	338.90 W	517.93	0.40
5419.00	0.39	208.32	5269.20	926.76 S	339.67 W	518.64	1.26
5509.00	0.44	119.62	5359.20	927.20 S	339.52 W	518.58	0.65
5599.00	0.61	116.60	5449.19	927.58 S	338.79 W	517.95	0.20
5688.00	0.47	118.97	5538.19	927.97 S	338.04 W	517.29	0.16
5733.00	0.58	220.51	5583.19	928.24 S	338.03 W	517.33	1.83
5778.00	1.26	246.66	5628.18	928.61 S	338.63 W	518.00	1.74
5823.00	2.47	249.25	5673.16	929.15 S	340.00 W	519.44	2.69
5867.00	4.60	251.60	5717.07	930.04 S	342.56 W	522.13	4.85
5912.00	6.37	248.90	5761.86	931.51 S	346.60 W	526.39	3.97
5957.00	8.12	245.77	5806.50	933.72 S	351.83 W	531.95	3.98
6002.00	9.43	250.54	5850.98	936.25 S	358.20 W	538.70	3.34
6047.00	12.15	250.21	5895.18	939.08 S	366.14 W	547.04	6.04
6092.00	16.94	259.50	5938.73	941.88 S	377.05 W	558.30	11.81
6136.00	21.97	266.75	5980.21	943.52 S	391.58 W	572.86	12.65
6181.00	23.76	270.77	6021.67	943.87 S	409.05 W	590.05	5.29
6226.00	26.08	275.70	6062.48	942.77 S	427.96 W	608.35	6.91
6271.00	29.69	281.79	6102.26	939.51 S	448.73 W	628.04	10.22
6316.00	35.50	282.01	6140.16	934.50 S	472.44 W	650.27	12.90
6361.00	40.72	281.80	6175.55	928.78 S	499.60 W	675.73	11.61
6405.00	43.08	279.95	6208.30	923.25 S	528.46 W	702.89	6.05
6450.00	47.37	277.13	6239.99	918.54 S	560.04 W	732.88	10.52
6495.00	47.84	271.55	6270.34	916.03 S	593.15 W	764.82	9.22
6540.00	50.45	271.22	6299.78	915.21 S	627.17 W	797.99	5.82
6585.00	54.47	272.15	6327.19	914.15 S	662.83 W	832.71	9.09
6629.00	60.72	274.09	6350.76	912.11 S	699.90 W	868.62	14.68
6674.00	63.19	272.95	6371.92	909.67 S	739.54 W	906.96	5.93
6719.00	67.73	271.71	6390.61	908.02 S	780.43 W	946.69	10.39
6764.00	70.64	271.93	6406.60	906.68 S	822.46 W	987.60	6.50
6809.00	76.54	272.07	6419.30	905.17 S	865.59 W	1029.54	13.11
6854.00	83.05	270.82	6427.27	904.06 S	909.84 W	1072.67	14.72
6932.00	92.03	271.00	6430.61	902.83 S	987.67 W	1148.68	11.52
7022.00	92.37	268.36	6427.15	903.33 S	1077.60 W	1236.88	2.95
7112.00	90.55	266.00	6424.85	907.75 S	1167.45 W	1325.79	3.31
7201.00	91.39	265.57	6423.34	914.28 S	1256.20 W	1414.04	1.06
7291.00	94.30	267.46	6418.88	919.75 S	1345.91 W	1503.03	3.85
7381.00	91.97	268.47	6413.96	922.94 S	1435.71 W	1591.64	2.82

7471.00	87.99	269.59	6413.98	924.46 S	1525.67 W	1680.09	4.59
7560.00	88.77	268.56	6416.50	925.90 S	1614.63 W	1767.52	1.44
7650.00	89.29	268.36	6418.02	928.32 S	1704.58 W	1856.13	0.62
7739.00	89.85	267.39	6418.69	931.62 S	1793.51 W	1943.92	1.26
7829.00	89.72	266.26	6419.03	936.61 S	1883.37 W	2032.96	1.26
7919.00	89.66	265.28	6419.52	943.25 S	1973.13 W	2122.22	1.09
8009.00	89.41	265.94	6420.24	950.13 S	2062.86 W	2211.51	0.79
8098.00	90.65	267.28	6420.19	955.40 S	2151.70 W	2299.60	2.04
8188.00	89.17	267.98	6420.34	959.12 S	2241.62 W	2388.44	1.82
8277.00	90.25	273.02	6420.79	958.35 S	2330.58 W	2475.44	5.79
8367.00	89.69	271.59	6420.84	954.73 S	2420.51 W	2562.81	1.70
8457.00	90.00	269.96	6421.08	953.50 S	2510.50 W	2650.72	1.84
8546.00	92.52	270.18	6419.12	953.39 S	2599.47 W	2737.87	2.85
8636.00	94.38	269.39	6413.71	953.73 S	2689.30 W	2825.94	2.24
8725.00	94.35	270.01	6406.93	954.19 S	2778.04 W	2912.97	0.70
8815.00	92.53	270.29	6401.53	953.96 S	2867.87 W	3000.93	2.04
8905.00	93.21	269.63	6397.02	954.02 S	2957.76 W	3089.00	1.05
8994.00	93.30	268.20	6391.97	955.71 S	3046.60 W	3176.37	1.60
9084.00	91.97	268.07	6387.83	958.63 S	3136.45 W	3264.99	1.48
9174.00	90.12	269.16	6386.18	960.81 S	3226.41 W	3353.55	2.39
9263.00	90.40	270.55	6385.77	961.05 S	3315.40 W	3440.79	1.59
9353.00	89.97	269.93	6385.48	960.67 S	3405.40 W	3528.88	0.83
9443.00	89.01	268.97	6386.28	961.53 S	3495.39 W	3617.22	1.51
9532.00	91.94	269.67	6385.54	962.59 S	3584.37 W	3704.60	3.38
9622.00	90.46	267.73	6383.66	964.63 S	3674.32 W	3793.13	2.71
9712.00	88.89	266.81	6384.16	968.92 S	3764.21 W	3882.06	2.02
9801.00	89.81	265.67	6385.17	974.75 S	3853.01 W	3970.22	1.65
9890.00	87.04	267.08	6387.61	980.37 S	3941.79 W	4058.32	3.50
9980.00	87.13	267.40	6392.18	984.70 S	4031.57 W	4147.15	0.36
10070.00	87.16	266.29	6396.66	989.65 S	4121.32 W	4236.07	1.23
10159.00	88.49	268.73	6400.04	993.52 S	4210.17 W	4323.88	3.12
10249.00	88.40	266.58	6402.49	997.20 S	4300.05 W	4412.68	2.39
10338.00	87.72	267.74	6405.50	1001.60 S	4388.89 W	4500.60	1.51
10428.00	89.14	267.70	6407.97	1005.18 S	4478.78 W	4589.38	1.57
10518.00	90.40	268.36	6408.33	1008.27 S	4568.73 W	4678.11	1.58
10608.00	90.18	268.27	6407.87	1010.91 S	4658.69 W	4766.78	0.26
10697.00	89.48	264.80	6408.13	1016.29 S	4747.51 W	4854.87	3.97
10790.00	89.48	265.04	6408.98	1024.52 S	4840.14 W	4947.27	0.25
10854.00	89.48	265.04	6409.57	1030.05 S	4903.90 W	5010.85	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 258.43 DEGREES (GRID)
A TOTAL CORRECTION OF 7.47 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10854.00 FEET
IS 5010.91 FEET ALONG 258.14 DEGREES (GRID)**