



WELL INFORMATION					
MWD Run Number	100	200	300	400	
Date run completed	22-Nov-12	24-Nov-12	25-Nov-12	02-Dec-12	
Rig Bit Number	2	3	4	5	
Bit Size (in)	8.750	8.750	6.125	6.125	
Tool Nominal OD (in)	6.750	6.750	4.750	4.750	
Log Start Depth (MD, ft)	675.00	5,927.00	7,103.00	7,745.00	
Log End Depth (MD, ft)	5,927.00	7,103.00	7,745.00	16,294.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	21-Nov-12 17:00	22-Nov-12 21:45	25-Nov-12 06:30	25-Nov-12 22:30	
Drill/Wipe End Date and Time	22-Nov-12 12:15	23-Nov-12 19:45	25-Nov-12 12:15	01-Dec-12 17:30	
Min Inc (deg) @ Depth (MD, ft)	.63 @ 891.00	.59 @ 5,983.00	88.49 @ 7,209.00	86.33 @ 15,759.00	
Max Inc (deg) @ Depth (MD, ft)	16.90 @ 3,807.00	84.26 @ 7,047.00	91.36 @ 7,303.00	91.91 @ 15,333.00	
Bit TFA(in2) / Bit Type	.78 / PDC	.86 / PDC	.65 / PDC	.65 / PDC	
Flow Rate (gpm)	562.43	548.44	270.00	264.35	
Max AV (fpm) / CV (fpm) @ MWD	373.8 / NA	367.5 / NA	393.6 / NA	421.0 / NA	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	8.75 / 29.00	10.40 / 36.00	9.30 / 33.00	9.35 / 30.00	
Filtrate CL (ppm)	2,200.00	2,300.00	2,100.00	2,400.00	
pH / Fluid Loss (mptm)	9.40 / NA	10.20 / NA	8.20 / NA	9.80 / NA	
PV (cP) / YP (lbf2)	3 / 3.00	13 / 12.00	8 / 7.00	8 / 8.00	
% Solids / % Sand	4.7 / 0.50	10.7 / .25	6.7 / .15	4.8 / 0.25	
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:95	0 / 0:95	0 / 0:95	
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 (deg F) / S	159.43 / PDM	171.22 / PDM	124.22 / PDM	210.22 / PDM	

Max Tool Temp (degF) / Source	150.10 / PCM	171.20 / PCM	194.99 / PCM	242.90 / PCM	
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Lead MWD Engineer	Gary Eifert	Gary Eifert	Gary Eifert	Gary Eifert	
Customer Representative	Johnny Sanchez	Johnny Sanchez	Johnny Sanchez	Johnny Sanchez	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	5.76	
Sub Serial Number	11331929	11331929	11633669	11633669	
Insert Serial Number	10744810	10744810	11055839	10744810	
Date and Time Initialized	20-Nov-12 20:24	20-Nov-12 20:24	24-Nov-12 04:19	25-Nov-12 15:24	
Date and Time Read	24-Nov-12 03:38	24-Nov-12 03:44	25-Nov-12 21:09	02-Dec-12 04:11	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	56.00	56.00	63.00	63.00	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11331929	11331929	11633669	11633669	
Sonde Serial Number	11062085	11062085	11413053	11062085	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	75.02	326.84	186.81	335.75	

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	48.65	48.48	55.87	56.32	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	11331929	11331929	11633669	11633669	
Insert/Sonde Serial Number	11680977	11680977	11681015	11680977	

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. Gamma data from 13,501 to 13,730 measured depth is real time data.
6. 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
7. INSITE version 7.4.01

WARRANTY

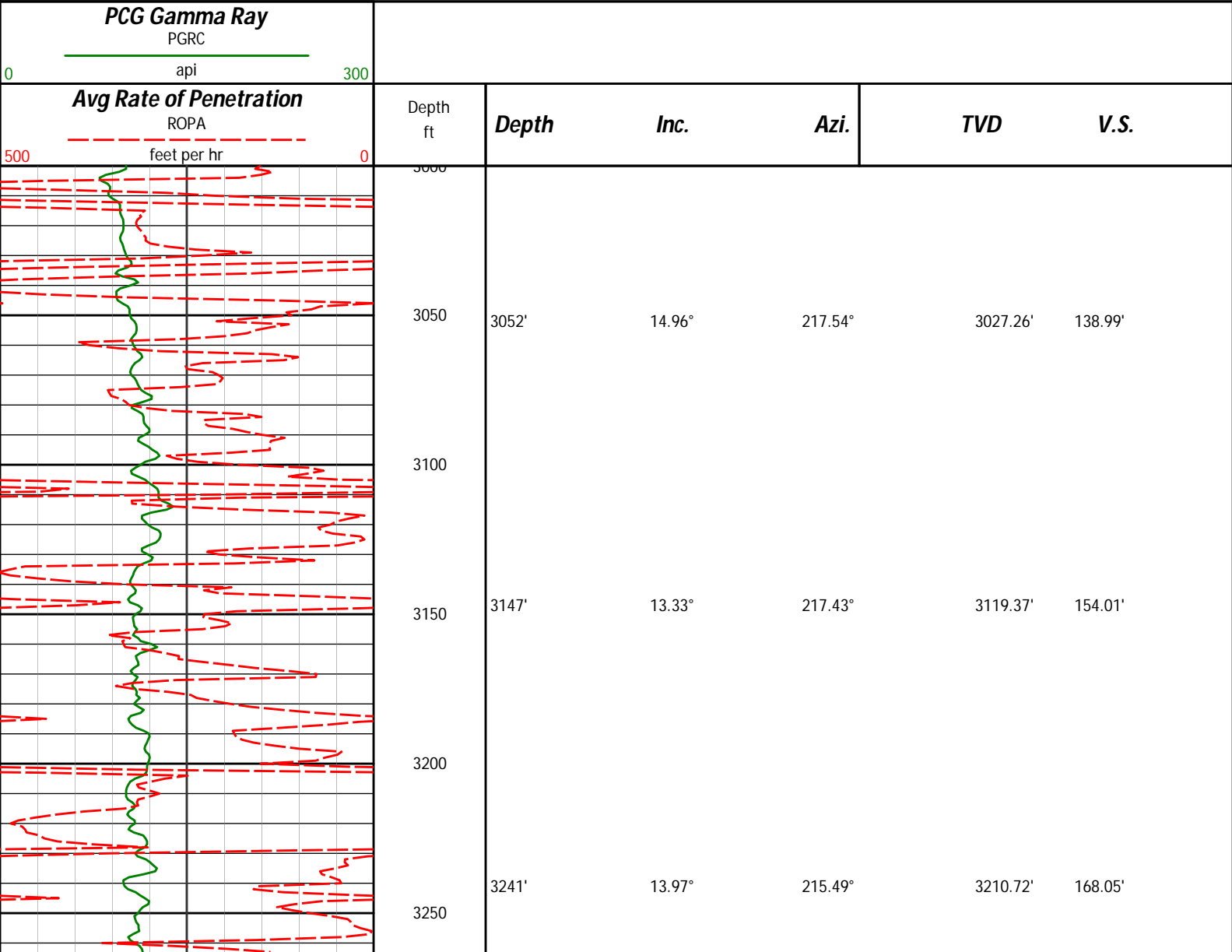
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

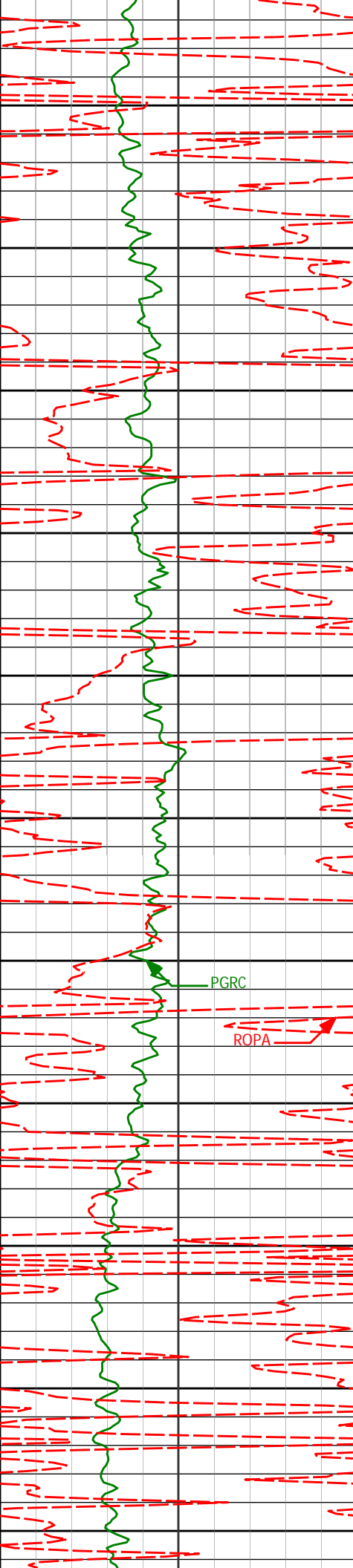
HALLIBURTON

Sperry Drilling Services

MD Main Log 1:600

Noble Energy
Wells Ranch State USX AA16-66-1HNL
H&P 343
T6N-R63W





3300

3335'

12.93°

217.19°

3302.14'

181.84'

3350

3400

3430'

13.31°

217.41°

3394.66'

195.74'

3450

3500

3525'

13.67°

217.54°

3487.03'

210.07'

3550

3600

3618'

14.03°

221.08°

3577.33'

225.01'

3650

3700

3713'

16.14°

219.66°

3669.05'

241.91'

3750

3800

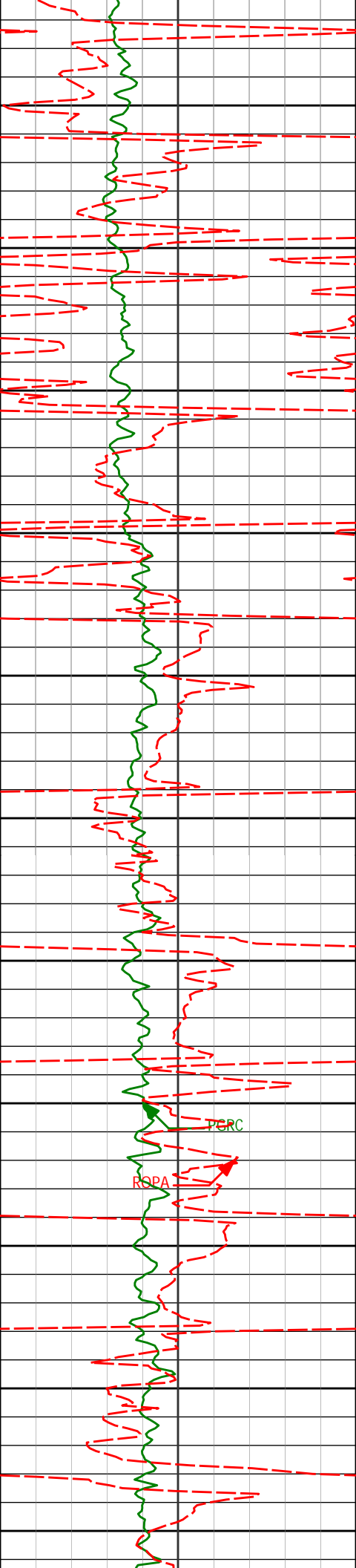
3807'

16.90°

217.92°

3759.17'

259.65'



3850

3900

3950

4000

4050

4100

4150

4200

4250

4300

4350

3902'

15.47°

219.49°

3850.41'

277.19'

3996'

13.75°

218.17°

3941.36'

292.96'

4090'

9.37°

218.31°

4033.44'

305.32'

4185'

7.12°

218.13°

4127.45'

314.26'

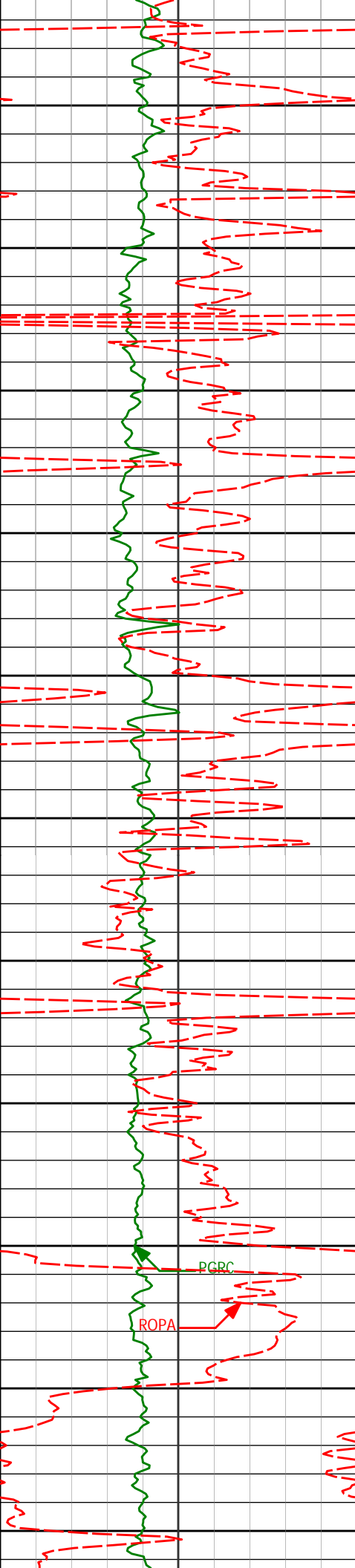
4280'

4.17°

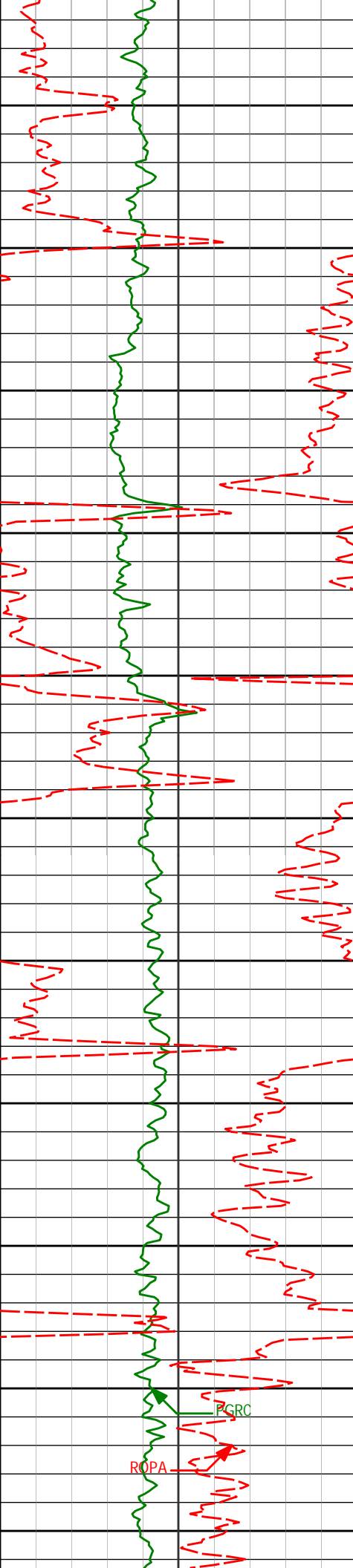
223.27°

4221.98'

320.61'



4374'	1.53°	197.44°	4315.86'	323.51'
4400				
4450				
4469'	1.24°	189.45°	4410.83'	324.17'
4500				
4550				
4563'	1.25°	166.64°	4504.81'	324.19'
4600				
4650				
4657'	1.94°	137.99°	4598.77'	323.00'
4700				
4750				
4752'	2.74°	123.96°	4693.69'	320.16'
4800				
4846'	1.87°	118.50°	4787.62'	317.05'
4900				



4950

5000

5050

5100

5150

5200

5250

5300

5350

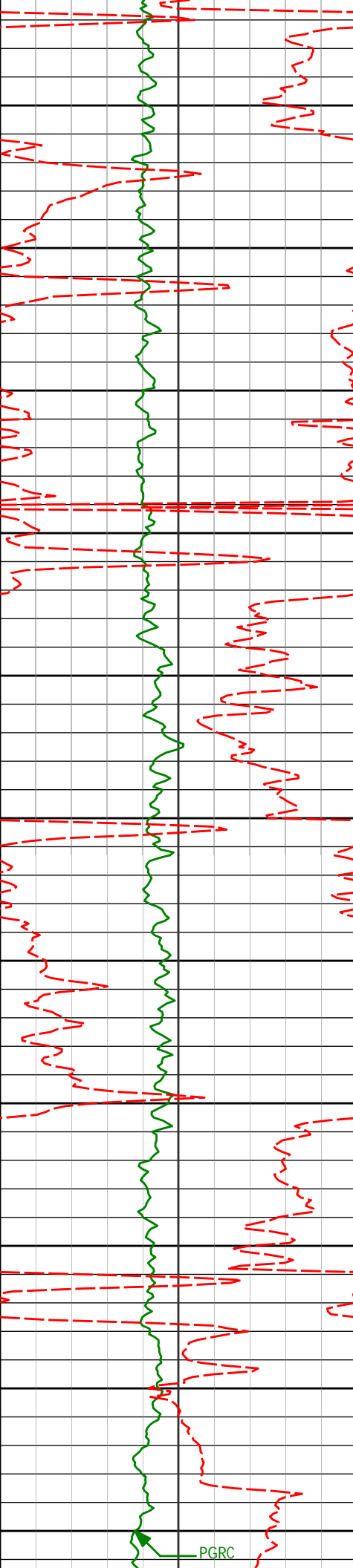
5400

5450

4940'	1.52°	141.68°	4881.58'	315.01'
5035'	1.96°	132.50°	4976.53'	313.14'
5129'	1.34°	127.88°	5070.49'	311.18'
5224'	0.99°	147.11°	5165.47'	309.92'
5319'	0.93°	148.88°	5260.46'	309.15'
5413'	1.07°	141.35°	5354.44'	308.27'

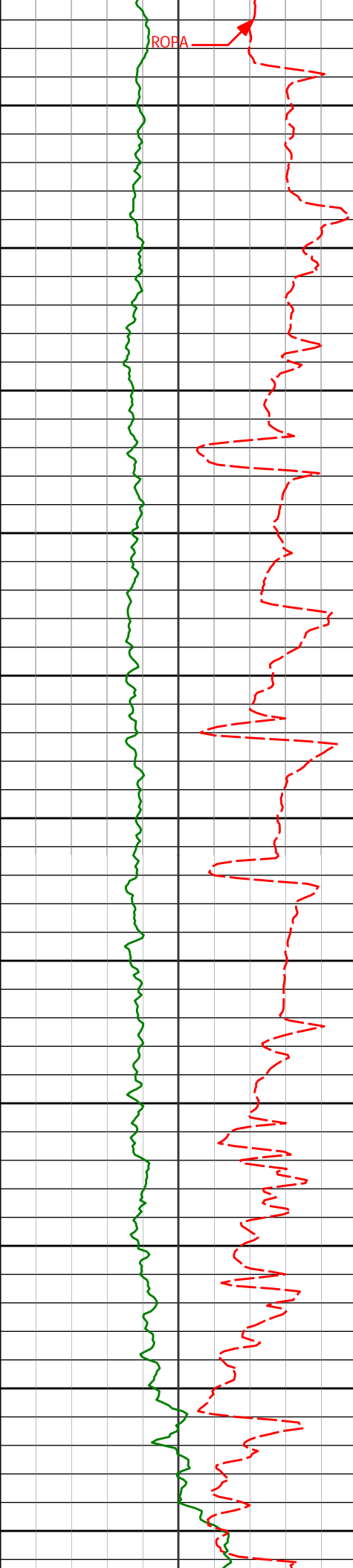
PGRC

ROPA

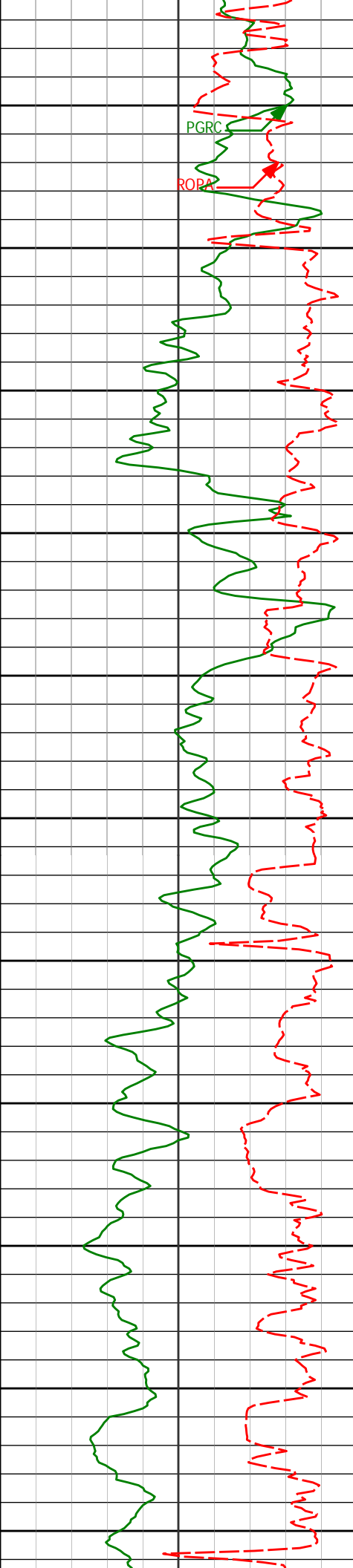


5500	5507'	1.15°	136.17°	5448.43'	307.14'
5550					
5600	5602'	0.83°	116.32°	5543.41'	305.90'
5650					
5700	5696'	1.21°	115.50°	5637.40'	304.44'
5750					
5800	5791'	0.70°	108.43°	5732.38'	303.02'
5850					
5900	5888'	1.01°	91.16°	5829.37'	301.62'
<Run 200>					
5950					
6000	5983'	0.59°	31.17°	5924.37'	300.51'

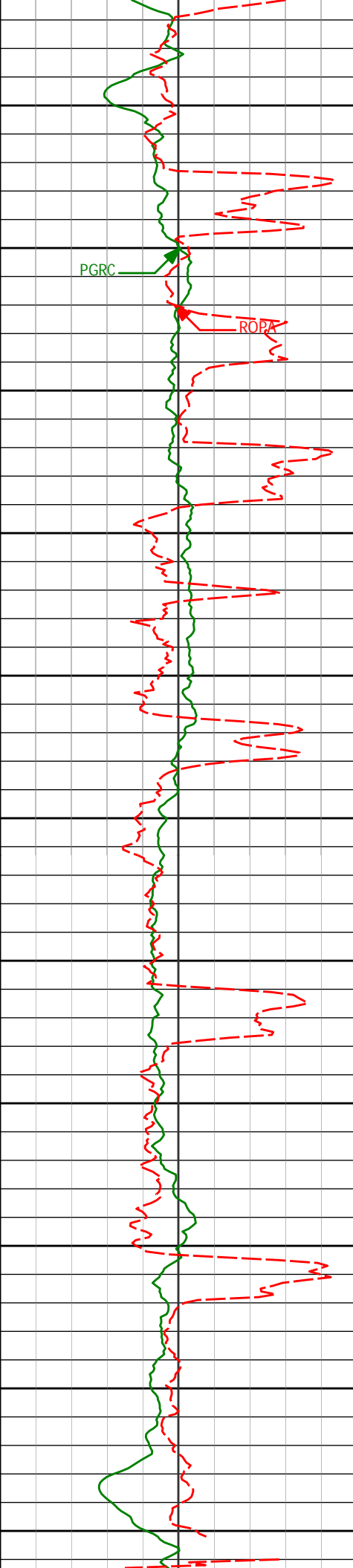
PGRC



	6030'	4.20°	289.66°	5971.32'	301.96'
6050					
	6077'	9.31°	275.00°	6017.99'	307.32'
6100					
	6124'	13.10°	266.97°	6064.08'	316.42'
6150					
	6172'	16.50°	266.10°	6110.48'	328.68'
6200					
	6219'	19.93°	265.75°	6155.12'	343.36'
6250					
	6266'	23.51°	265.72°	6198.78'	360.75'
6300					
	6313'	26.79°	268.96°	6241.32'	380.71'
6350					
	6361'	30.28°	272.63°	6283.49'	403.58'
6400					
	6408'	33.20°	276.41°	6323.46'	428.08'
6450					
	6455'	33.77°	273.15°	6362.66'	453.78'
6500					
	6502'	37.71°	269.07°	6400.81'	481.15'
6550					
	6549'	43.14°	269.50°	6436.57'	511.60'



6600	6596'	47.89°	269.02°	6469.50'	545.10'
6650	6644'	54.07°	269.30°	6499.70'	582.35'
6700	6691'	59.25°	269.04°	6525.52'	621.58'
6750	6738'	60.84°	268.65°	6548.99'	662.28'
6800	6785'	63.76°	269.27°	6570.84'	703.87'
6850	6833'	68.54°	269.59°	6590.24'	747.72'
6900	6880'	72.16°	270.88°	6606.05'	791.91'
6950	6927'	75.33°	271.01°	6619.20'	836.93'
7000	6974'	77.39°	270.81°	6630.28'	882.51'
7050	7022'	81.94°	269.61°	6638.89'	929.65'
	7047'	84.26°	269.10°	6641.89'	954.45'
7100					



7150

7200

7250

7300

7350

7400

7450

7500

7550

7600

7650

PGRC

ROPA

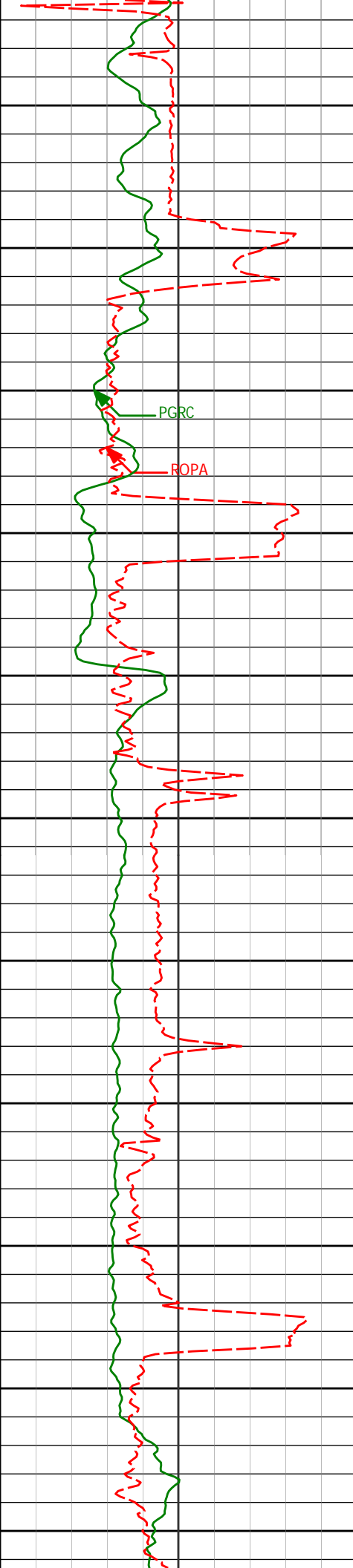
7209'	88.49°	266.68°	6652.13'	1116.06'
-------	--------	---------	----------	----------

7303'	91.36°	269.54°	6652.25'	1210.03'
-------	--------	---------	----------	----------

7398'	88.67°	267.85°	6652.23'	1304.98'
-------	--------	---------	----------	----------

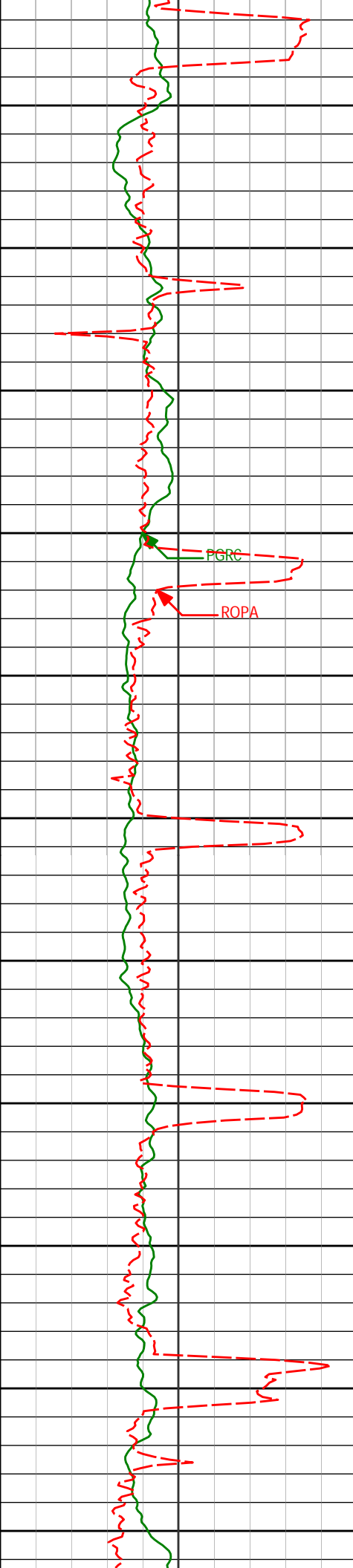
7492'	91.17°	269.44°	6652.36'	1398.94'
-------	--------	---------	----------	----------

7587'	90.68°	269.51°	6650.82'	1493.85'
-------	--------	---------	----------	----------

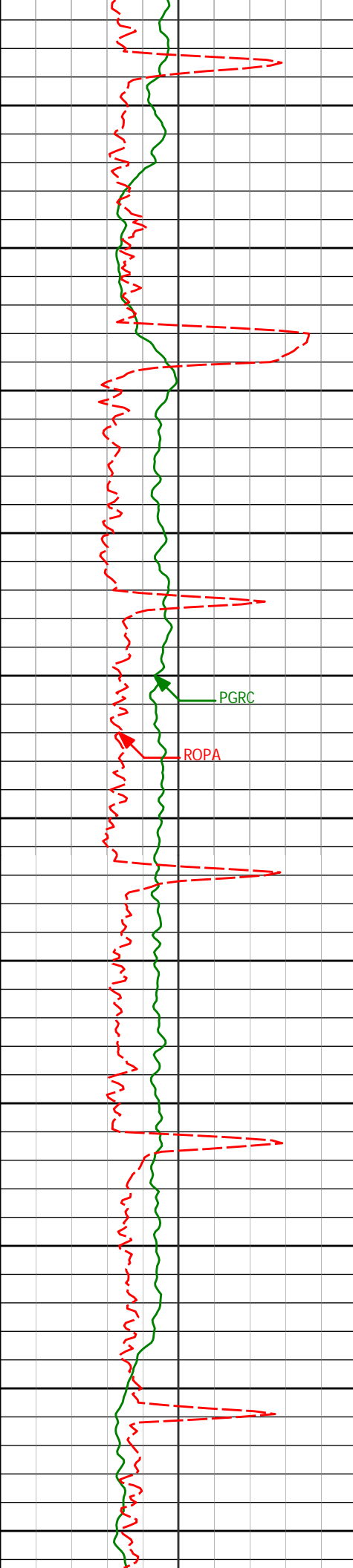


<Run 400>
7750

7682'	91.08°	272.02°	6649.37'	1588.65'
7700				
7777'	91.51°	271.09°	6647.22'	1683.35'
7800				
7871'	89.20°	270.99°	6646.64'	1777.13'
7900				
7966'	89.26°	270.07°	6647.92'	1871.95'
8000				
8061'	90.00°	270.41°	6648.53'	1966.82'
8100				
8155'	87.47°	268.87°	6650.61'	2060.70'
8200				



8250	8250'	90.80°	269.84°	6652.04'	2155.60'
8300					
8350	8344'	91.02°	268.85°	6650.54'	2249.52'
8400					
8450	8439'	90.31°	269.35°	6649.45'	2344.46'
8500					
8550	8533'	89.94°	269.22°	6649.24'	2438.40'
8600					
8650	8627'	90.28°	270.19°	6649.07'	2532.30'
8700					
8750	8722'	88.31°	268.56°	6650.24'	2627.22'



8800

8816'

87.85°

267.80°

6653.39'

2721.15'

8850

8900

8910'

88.92°

269.02°

6656.05'

2815.09'

8950

9000

9005'

89.08°

270.32°

6657.71'

2909.98'

9050

9100

9100'

89.32°

269.92°

6659.03'

3004.85'

9150

9200

9194'

89.08°

270.26°

6660.35'

3098.72'

9250

9300

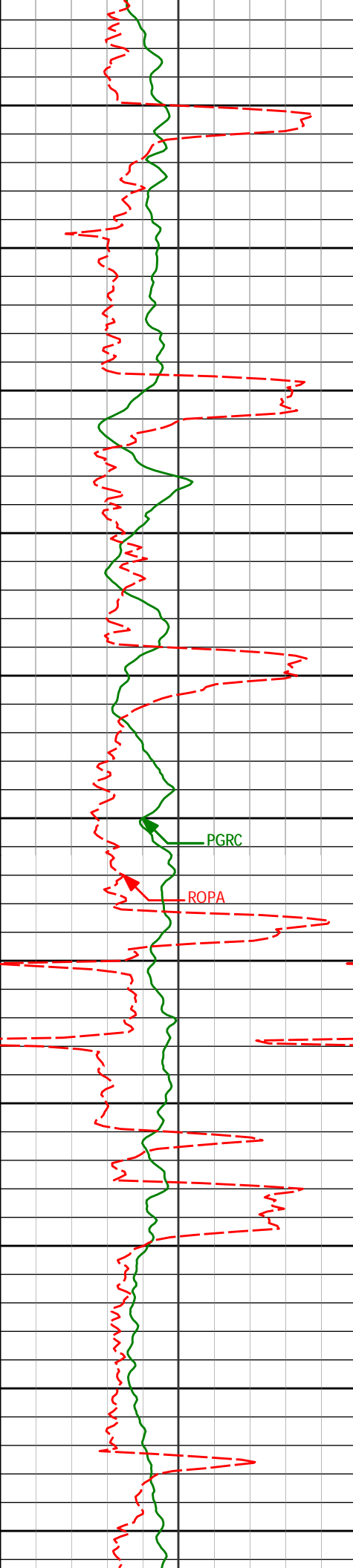
9289'

88.74°

270.05°

6662.16'

3193.57'



9350

9384'

89.01°

268.12°

6664.03'

3288.50'

9400

9450

9478'

91.20°

268.71°

6663.85'

3382.47'

9500

9550

9572'

90.40°

268.68°

6662.53'

3476.43'

9600

PGRC

ROPA

9650

9667'

88.12°

267.63°

6663.76'

3571.40'

9700

9750

9761'

89.23°

268.99°

6665.93'

3665.35'

9800

9850

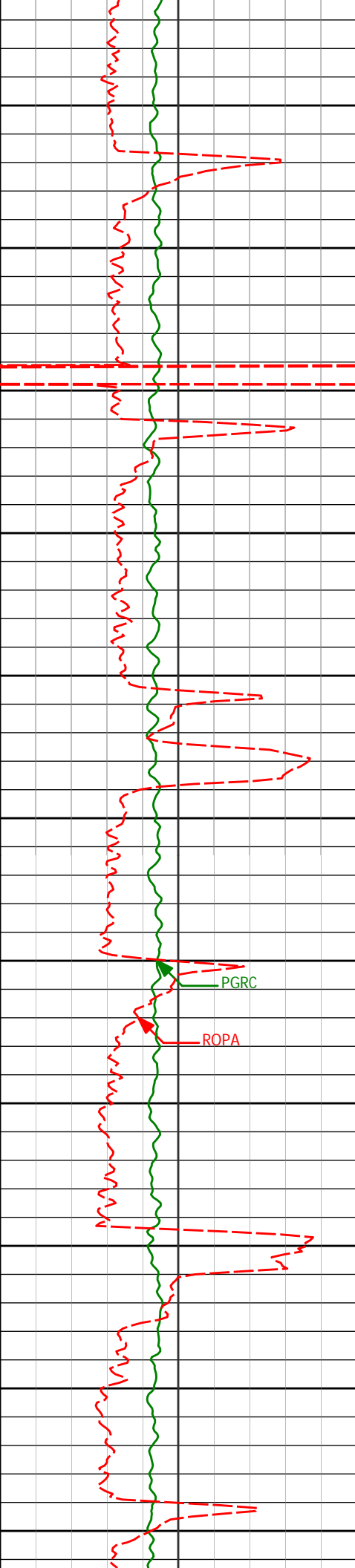
9856'

89.44°

268.87°

6667.03'

3760.30'



9900

9950

10000

10050

10100

10150

10200

10250

10300

10350

10400

9950'

89.48°

268.75°

6667.92'

3854.26'

10044'

89.82°

268.59°

6668.50'

3948.22'

10139'

89.66°

269.13°

6668.94'

4043.18'

10233'

89.51°

269.04°

6669.62'

4137.13'

10328'

89.38°

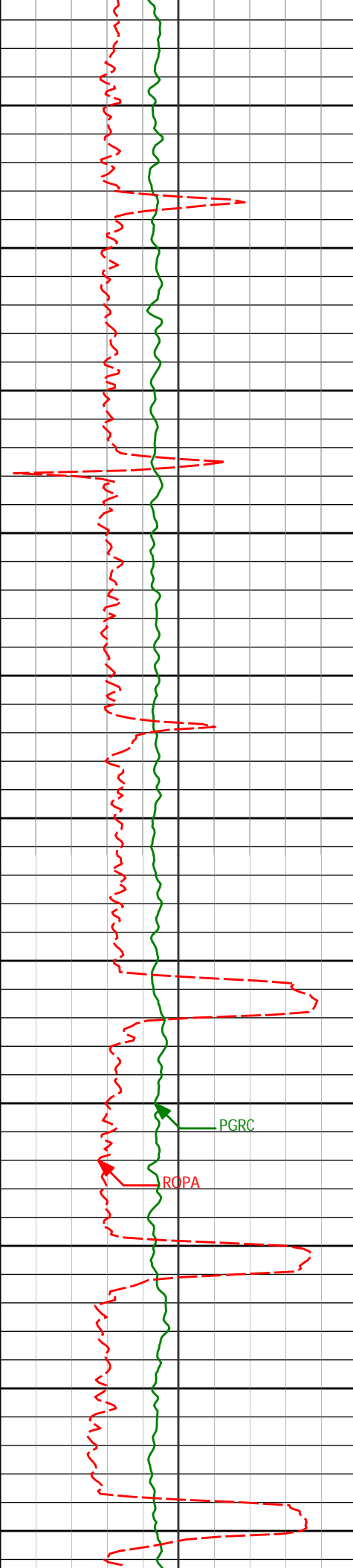
270.05°

6670.54'

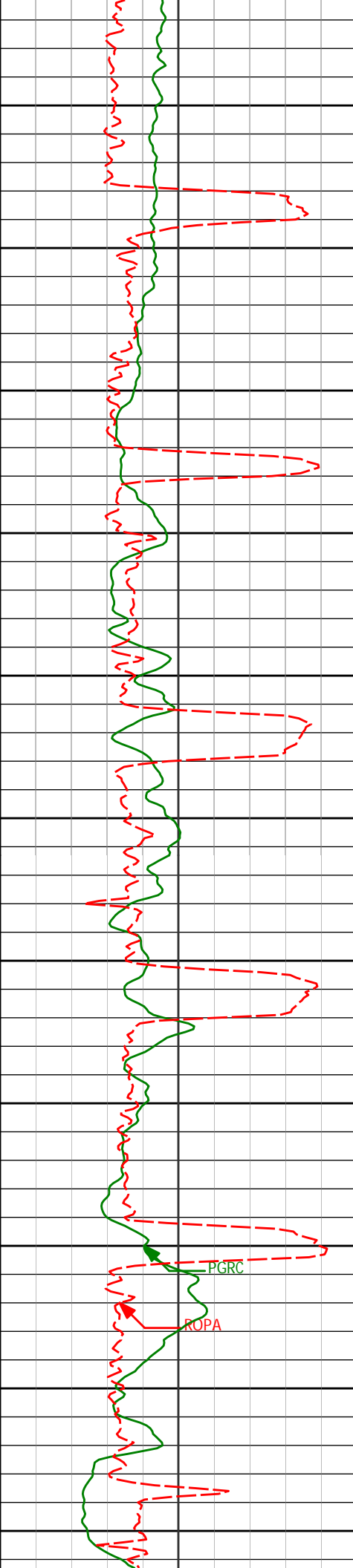
4232.04'

PGRC

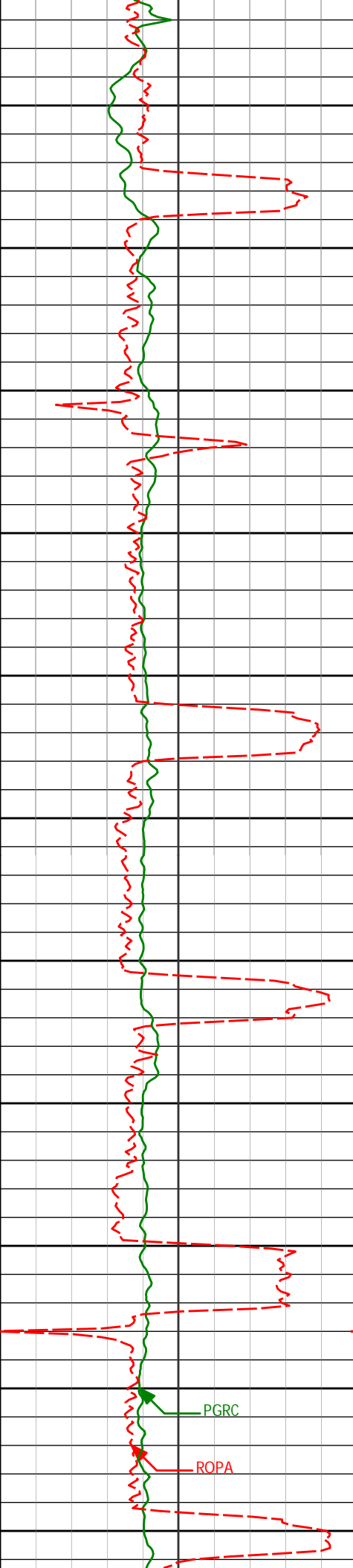
ROPA



10420'	89.72°	269.89°	6671.26'	4323.93'
10450				
10500				
10512'	89.54°	269.56°	6671.85'	4415.83'
10550				
10600				
10603'	89.75°	268.64°	6672.41'	4506.78'
10650				
10694'	89.69°	268.47°	6672.85'	4597.75'
10700				
10750				
10785'	89.23°	269.72°	6673.71'	4688.70'
10800				
10850				
10876'	89.32°	269.70°	6674.86'	4779.60'
10900				
10950				



11000	10968'	90.71°	270.77°	6674.84'	4871.47'
11050	11059'	90.15°	271.97°	6674.15'	4962.22'
11100					
11150	11150'	89.54°	272.17°	6674.40'	5052.89'
11200					
11240'	11240'	88.83°	270.30°	6675.68'	5142.65'
11250					
11300					
11330'	11330'	90.86°	269.90°	6675.92'	5232.52'
11350					
11400					
11421'	11421'	89.20°	268.71°	6675.87'	5323.46'
11450					
11500					
	11512'	88.58°	268.15°	6677.66'	5415.42'



11550

11600

11650

11700

11750

11800

11850

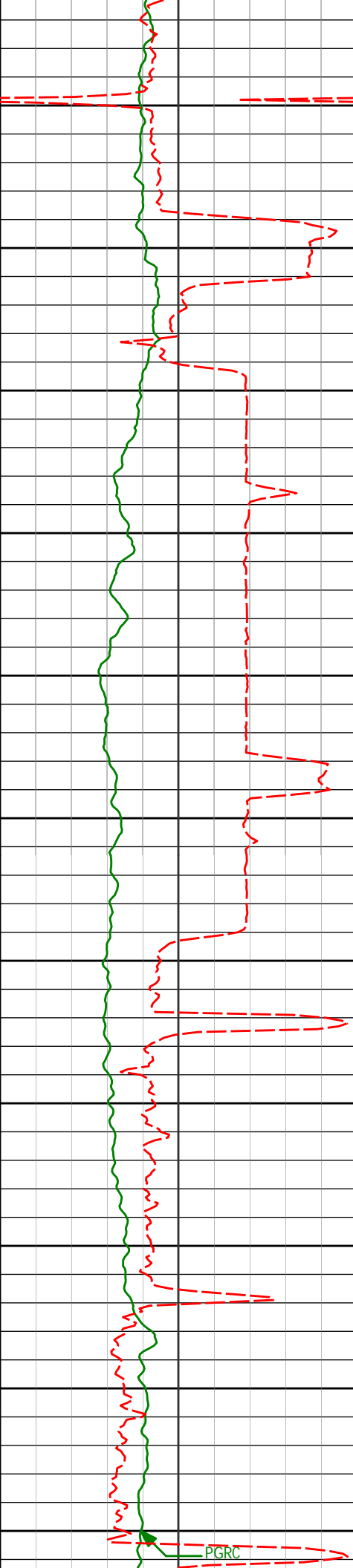
11900

11950

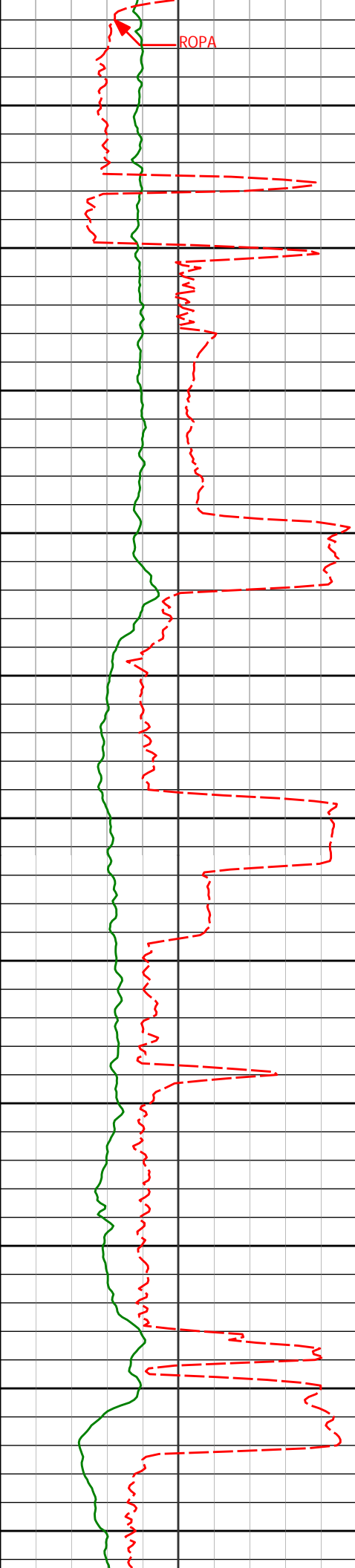
12000

12050

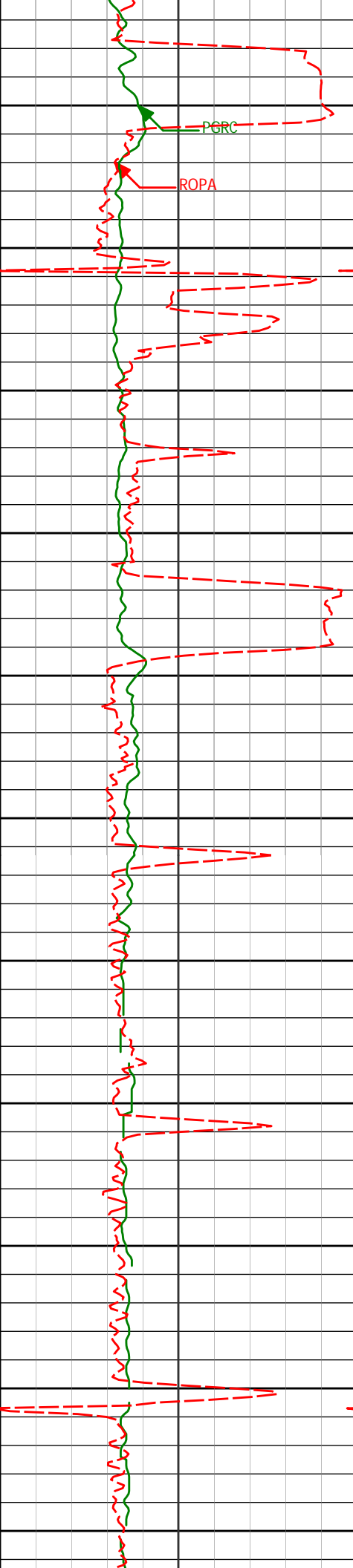
11513'	88.36°	268.13°	6677.66'	5413.42'
11605'	89.54°	268.72°	6679.17'	5507.38'
11699'	89.63°	267.49°	6679.85'	5601.36'
11794'	89.44°	267.94°	6680.62'	5696.36'
11888'	89.14°	266.97°	6681.78'	5790.35'
11982'	89.41°	268.34°	6682.97'	5884.33'



12077'	89.26°	267.95°	6684.07'	5979.31'
12100				
12150				
12172'	89.72°	269.61°	6684.91'	6074.27'
12200				
12250				
12267'	90.80°	270.09°	6684.48'	6169.17'
12300				
12350				
12362'	89.26°	270.05°	6684.42'	6264.04'
12400				
12450				
12456'	89.72°	270.92°	6685.26'	6357.88'
12500				
12550				
12551'	90.19°	270.23°	6685.33'	6452.71'
12600				



12650	12645'	89.69°	270.80°	6685.44'	6546.55'
12700					
12750	12739'	89.91°	273.86°	6685.76'	6640.16'
12800					
12850	12834'	88.64°	272.72°	6686.97'	6734.61'
12900					
12950	12928'	89.60°	270.50°	6688.41'	6828.31'
13000					
13050	13023'	90.83°	270.46°	6688.05'	6923.15'
13100					
13150	13117'	91.57°	270.79°	6686.08'	7016.96'



13200

13211'

90.28°

269.73°

6684.57'

7110.81'

13250

13300

13305'

89.72°

270.73°

6684.57'

7204.67'

13350

13400

13399'

88.21°

269.61°

6686.26'

7298.53'

13450

13500

13494'

89.35°

269.10°

6688.28'

7393.44'

13550

13600

13588'

89.85°

269.61°

6688.94'

7487.36'

13650

13700

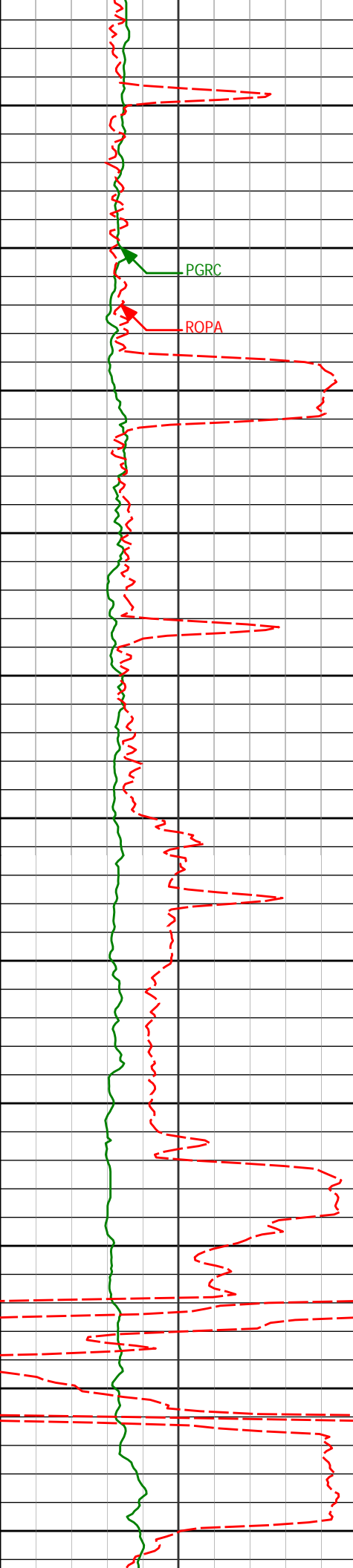
13682'

89.75°

268.56°

6689.27'

7581.31'



13750

13777'

89.54°

267.38°

6689.86'

7676.30'

13800

13850

13871'

89.57°

268.45°

6690.59'

7770.29'

13900

13950

13965'

89.69°

268.85°

6691.20'

7864.25'

14000

14050

14059'

89.85°

268.48°

6691.57'

7958.22'

14100

14150

14153'

89.10°

266.06°

6692.44'

8052.21'

14200

14250

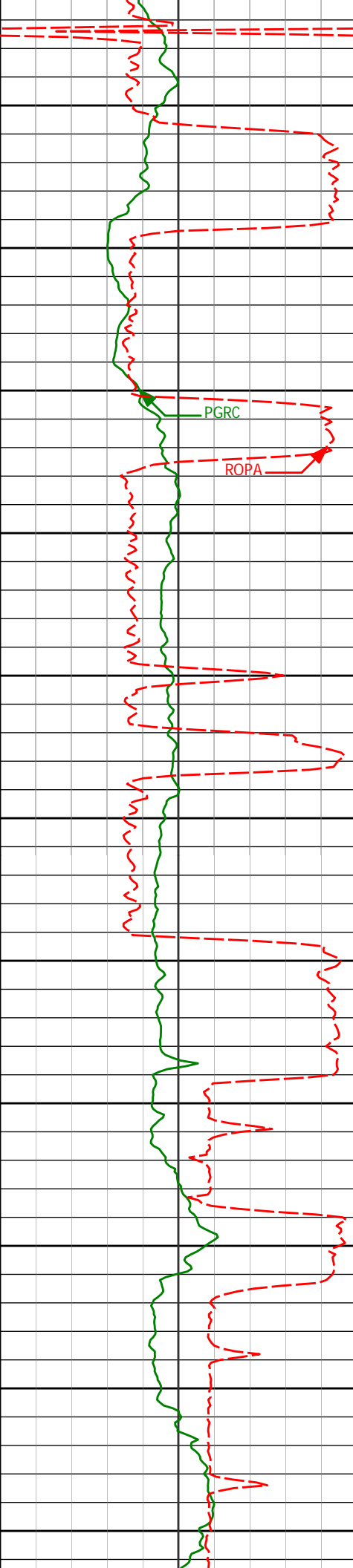
14248'

90.92°

266.35°

6692.41'

8147.19'



14300

14342'

91.11°

269.01°

6690.75'

8241.16'

14350

14400

PGRC

ROPA

14437'

89.75°

269.20°

6690.03'

8336.11'

14450

14500

14531'

89.63°

265.93°

6690.54'

8430.09'

14550

14592'

89.60°

265.77°

6690.95'

8491.07'

14600

14626'

89.69°

268.25°

6691.16'

8525.07'

14650

14673'

90.68°

269.82°

6691.00'

8572.04'

14700

14719'

89.05°

272.25°

6691.12'

8617.93'

14750

14766'

90.43°

273.33°

6691.33'

8664.70'

14800

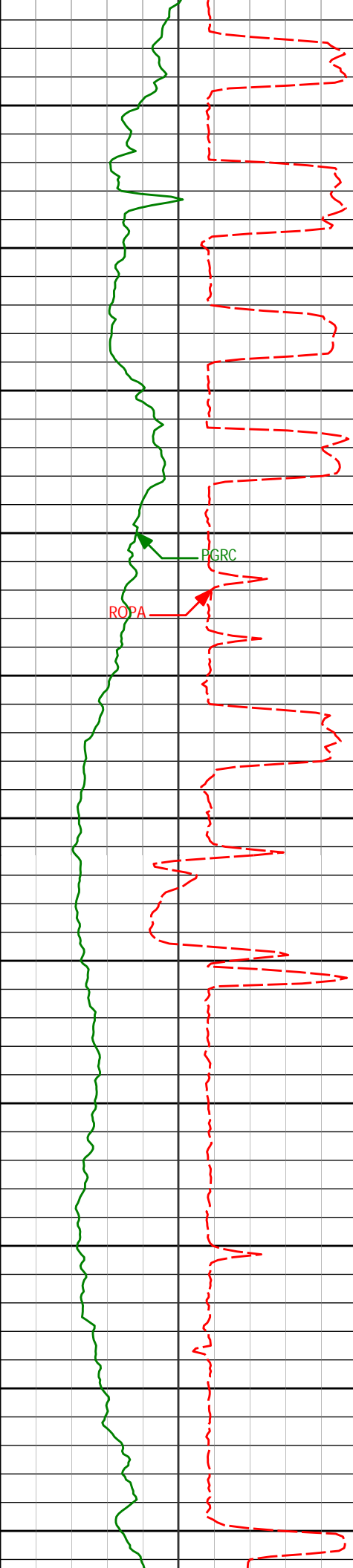
14812'

90.11°

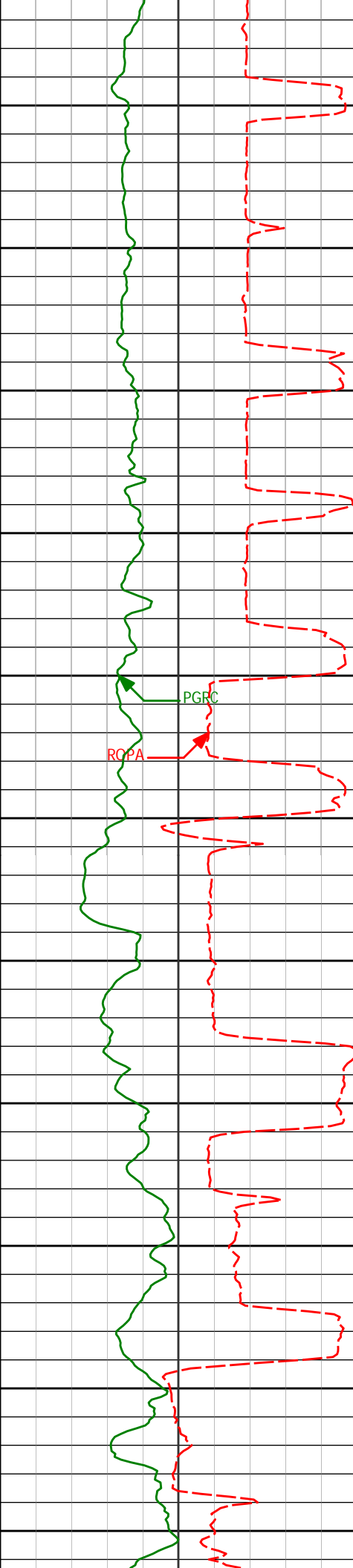
272.42°

6691.52'

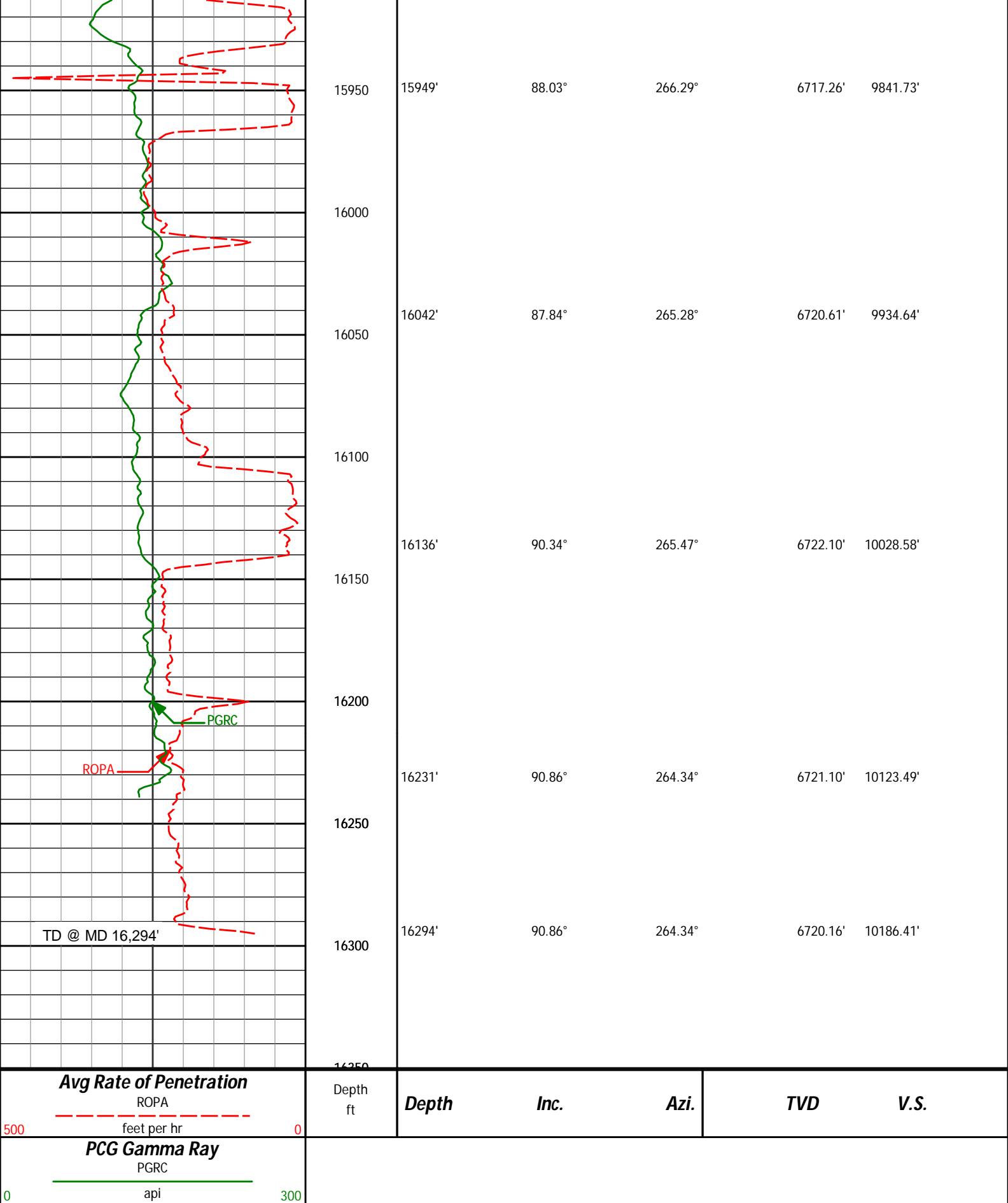
8711.47'



	14813	89.11°	272.43°	6691.32'	8711.47'
14850	14860'	88.59°	272.60°	6692.47'	8758.26'
14900	14907'	89.38°	272.70°	6693.30'	8805.04'
14950	14954'	88.06°	273.93°	6694.35'	8851.75'
15000	15002'	87.97°	275.31°	6696.01'	8899.32'
15050	15049'	87.47°	274.28°	6697.88'	8945.87'
15100	15097'	88.95°	274.08°	6699.38'	8993.49'
15150					
	15191'	89.81°	274.09°	6700.39'	9086.80'
15200					
15250					
	15286'	90.96°	273.42°	6699.75'	9181.17'
15300					
	15333'	91.91°	274.04°	6698.58'	9227.85'
15350					



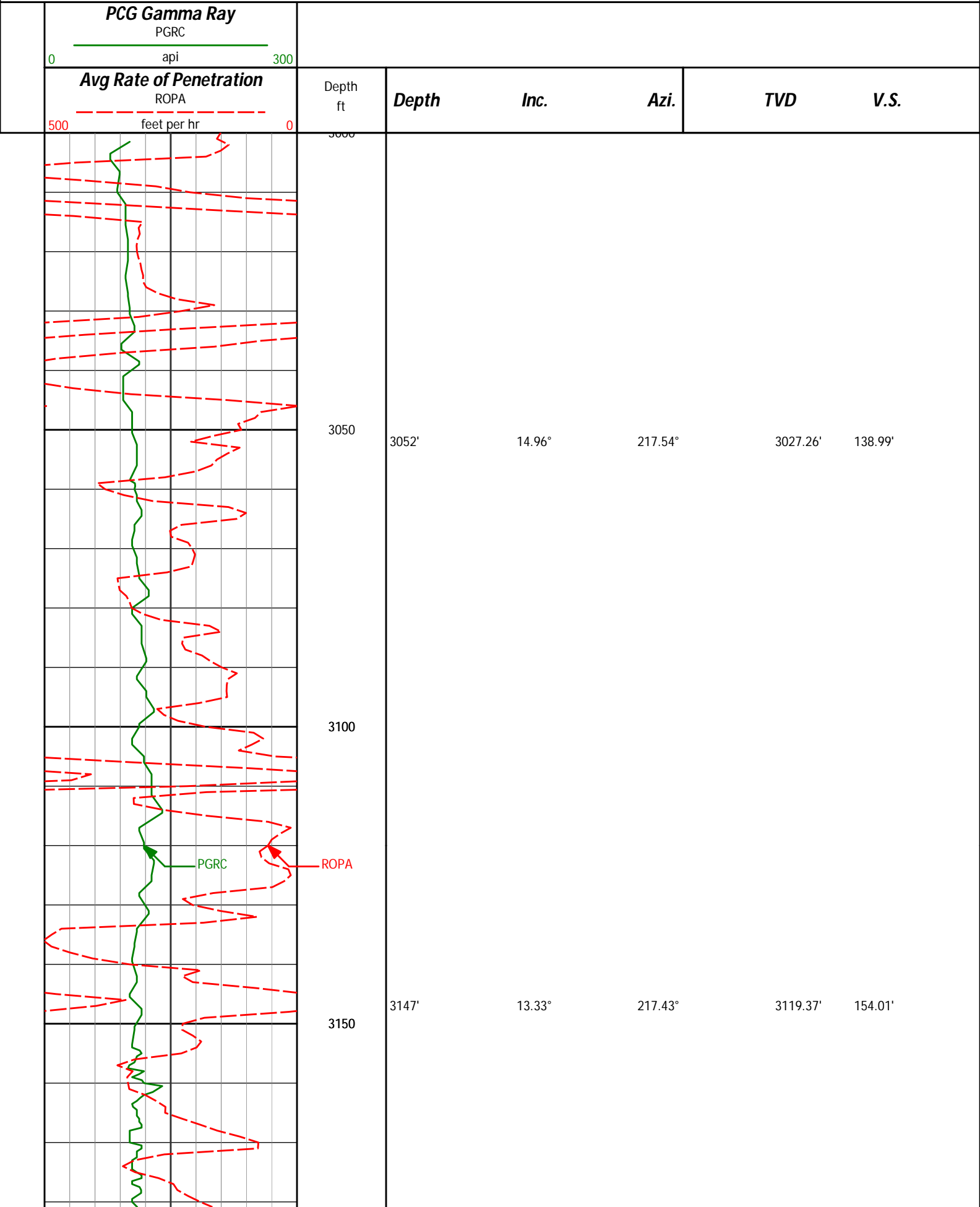
	15380'	89.14°	272.26°	6698.15'	9274.58'
15400					
	15427'	90.31°	273.68°	6698.38'	9321.34'
15450					
	15475'	89.38°	270.79°	6698.51'	9369.15'
15500					
	15522'	90.46°	272.60°	6698.57'	9416.00'
15550					
	15570'	90.31°	272.30°	6698.25'	9463.79'
15600					
15650					
	15665'	86.39°	271.51°	6700.98'	9558.41'
15700					
15750					
	15759'	86.33°	269.55°	6706.95'	9652.06'
15800					
15850					
	15854'	86.60°	267.86°	6712.80'	9746.84'
15900					

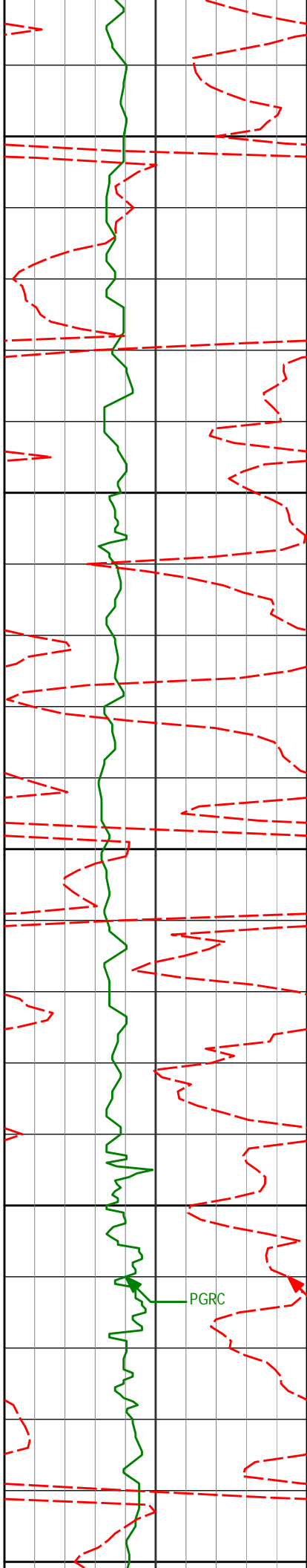


HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240





3200

3241'

13.97°

215.49°

3210.72'

168.05'

3250

3300

3335'

12.93°

217.19°

3302.14'

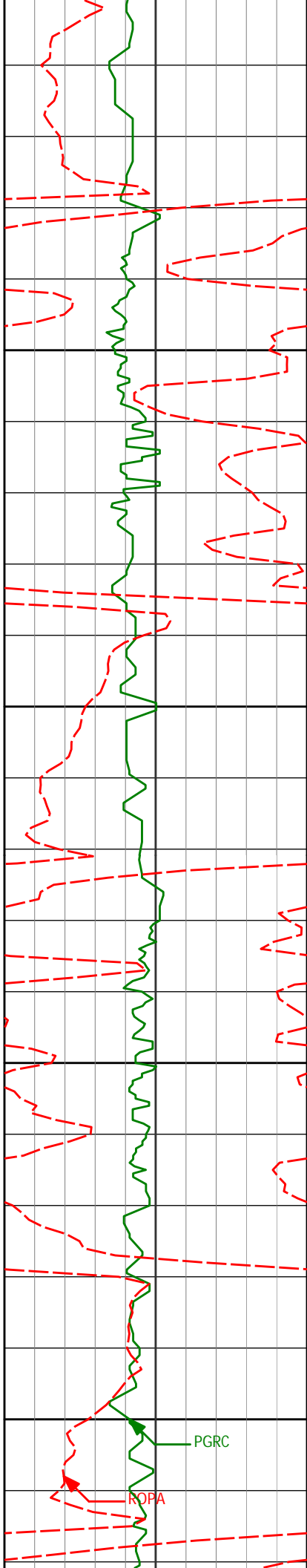
181.84'

3350

PGRC

ROPA

3400



3430'	13.31°	217.41°	3394.66'	195.74'
-------	--------	---------	----------	---------

3450

3500

3525'	13.67°	217.54°	3487.03'	210.07'
-------	--------	---------	----------	---------

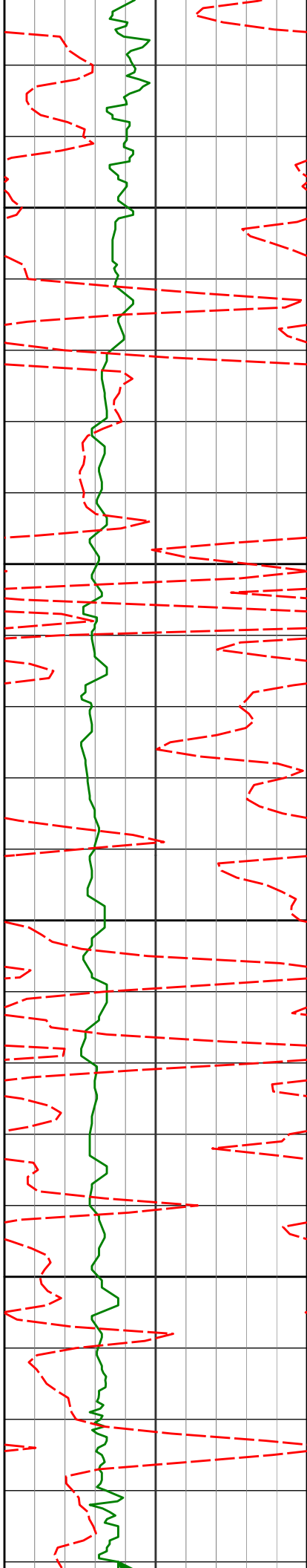
3550

3600

3618'	14.03°	221.08°	3577.33'	225.01'
-------	--------	---------	----------	---------

PGRC

ROPA



3650

3700

3750

3800

3713'

16.14°

219.66°

3669.05'

241.91'

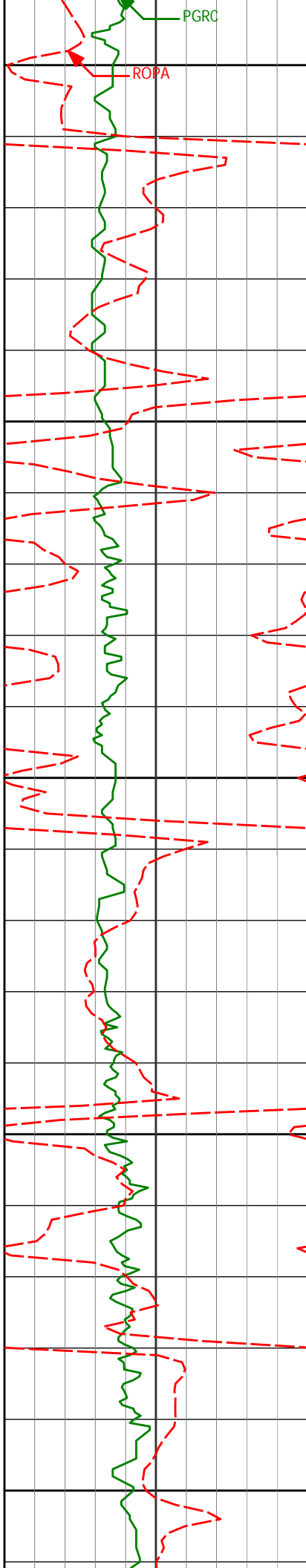
3807'

16.90°

217.92°

3759.17'

259.65'



3850

3900

3950

4000

4050

3902'

15.47°

219.49°

3850.41'

277.19'

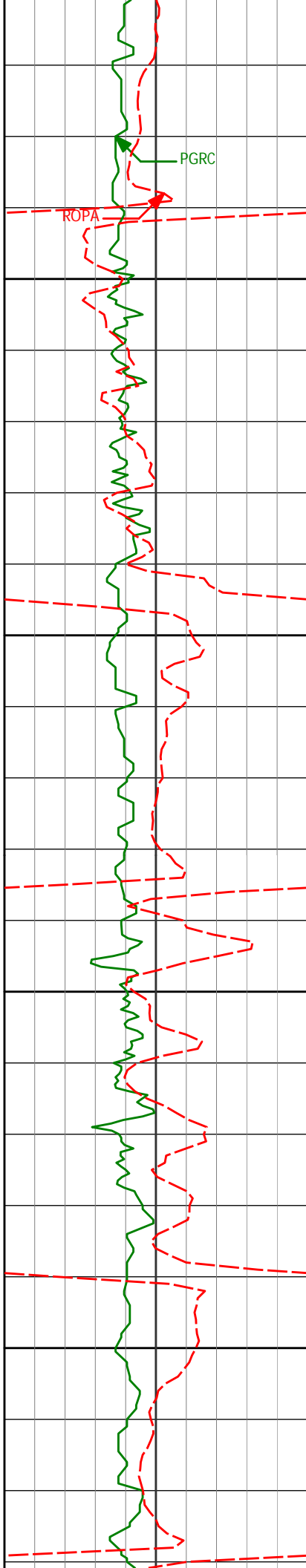
3996'

13.75°

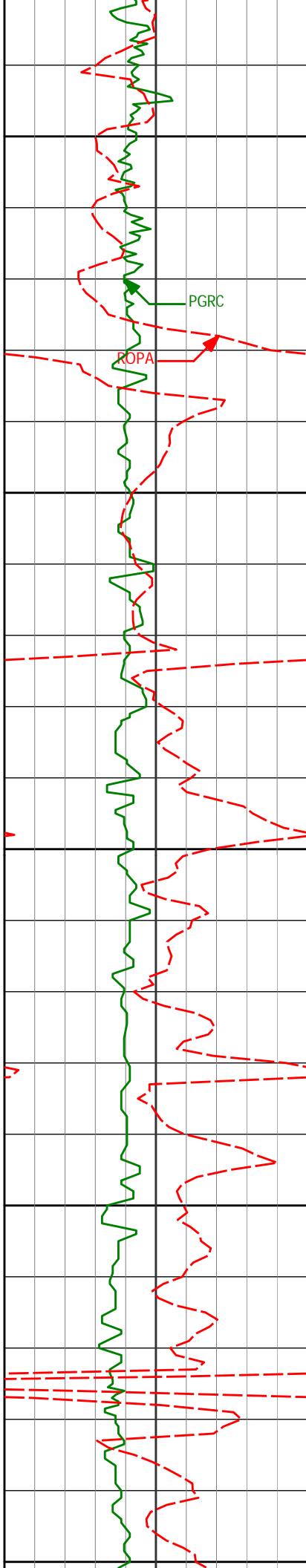
218.17°

3941.36'

292.96'



4090'	9.37°	218.31°	4033.44'	305.32'
4100				
4150				
4185'	7.12°	218.13°	4127.45'	314.26'
4200				
4250				
4280'	4.17°	223.27°	4221.98'	320.61'



4300

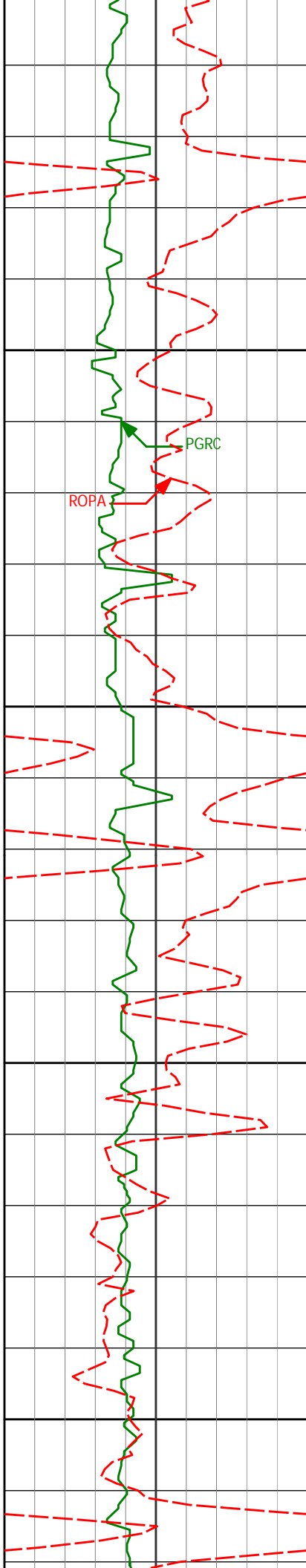
4350

4400

4450

4500

4374'	1.53°	197.44°	4315.86'	323.51'
4469'	1.24°	189.45°	4410.83'	324.17'



4550

4600

4650

4700

4563'

1.25°

166.64°

4504.81'

324.19'

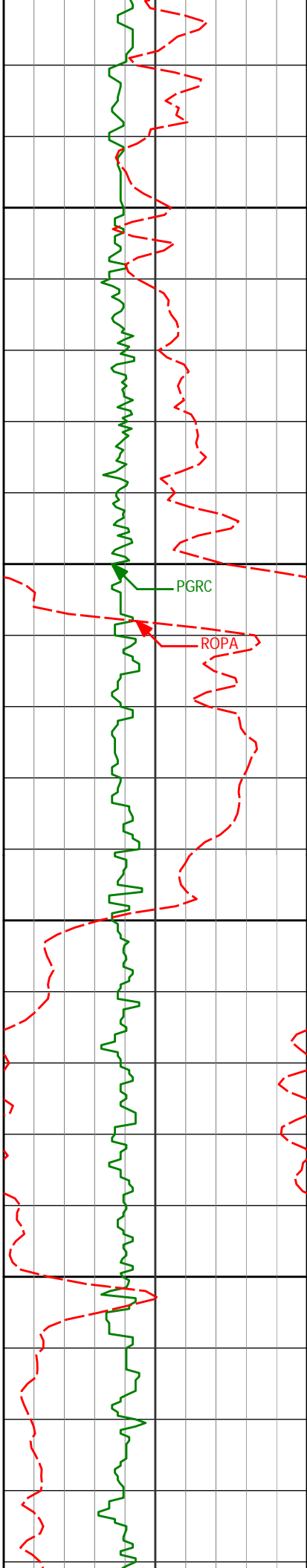
4657'

1.94°

137.99°

4598.77'

323.00'



4750

4752'

2.74°

123.96°

4693.69'

320.16'

4800

PGRC

ROPA

4846'

1.87°

118.50°

4787.62'

317.05'

4850

4900

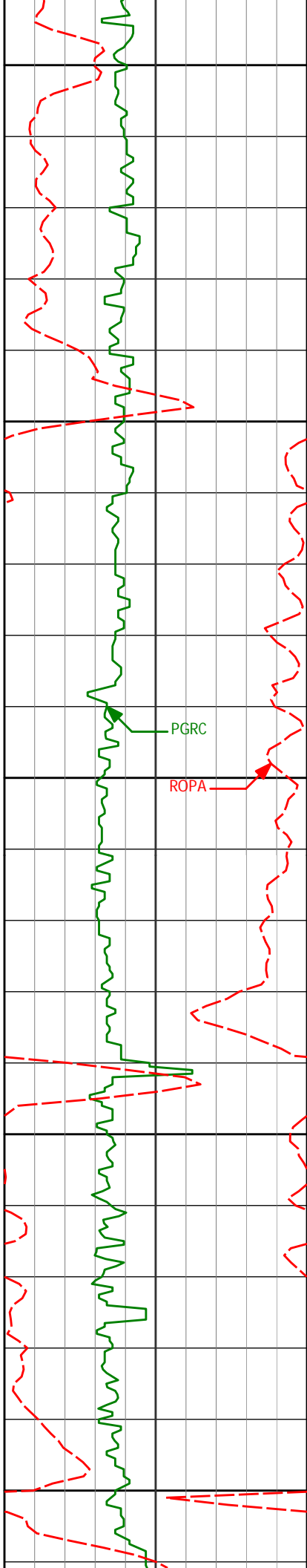
4940'

1.52°

141.68°

4881.58'

315.01'



4950

5000

5050

5100

5150

5035'

1.96°

132.50°

4976.53'

313.14'

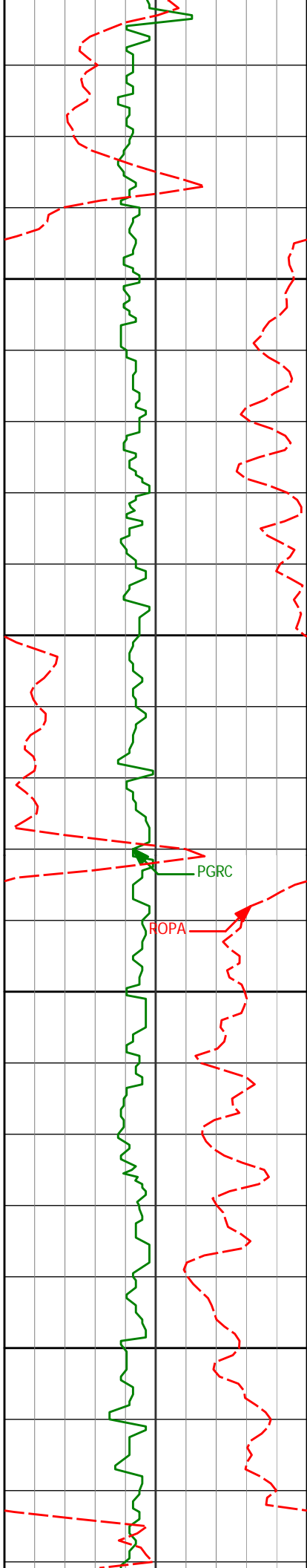
5129'

1.34°

127.88°

5070.49'

311.18'



5200

5224'

0.99°

147.11°

5165.47'

309.92'

5250

PGRC

ROPA

5300

5319'

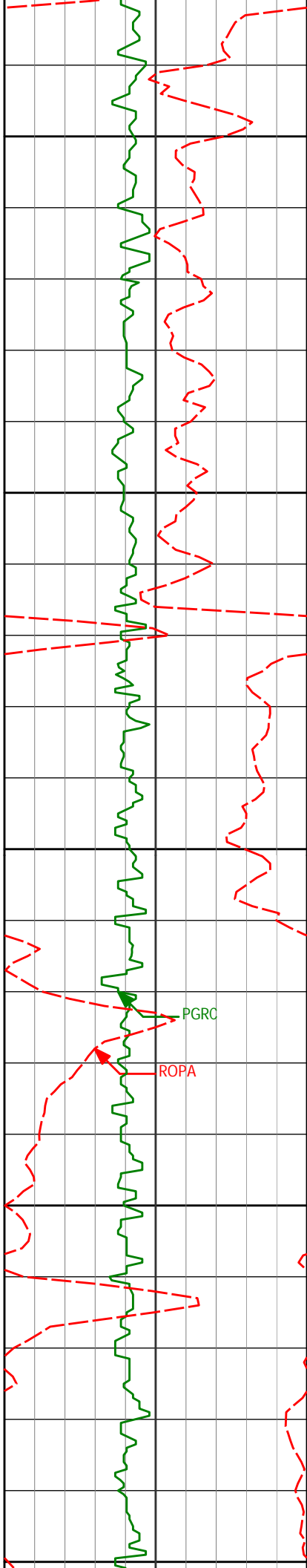
0.93°

148.88°

5260.46'

309.15'

5350



5400

5450

5500

5550

5600

5413'

1.07°

141.35°

5354.44'

308.27'

5507'

1.15°

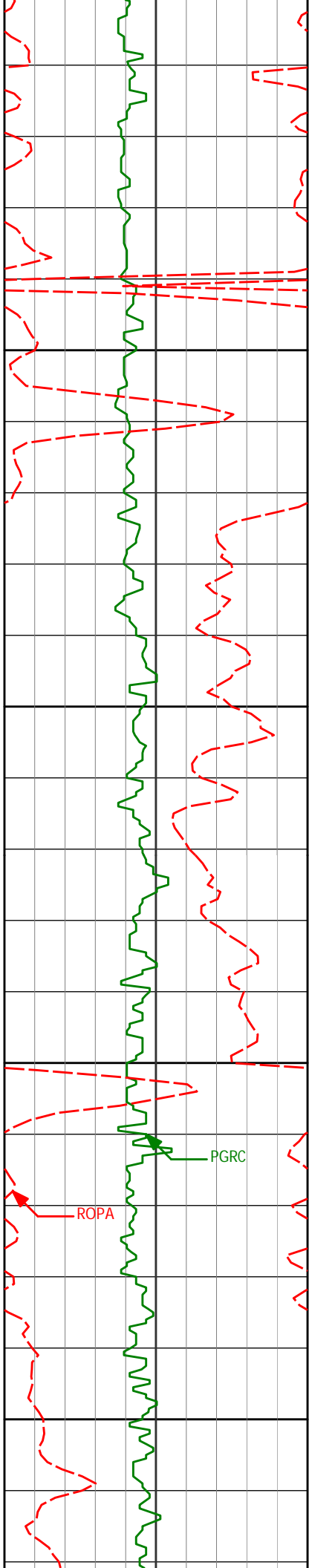
136.17°

5448.43'

307.14'

PGRC

ROPA



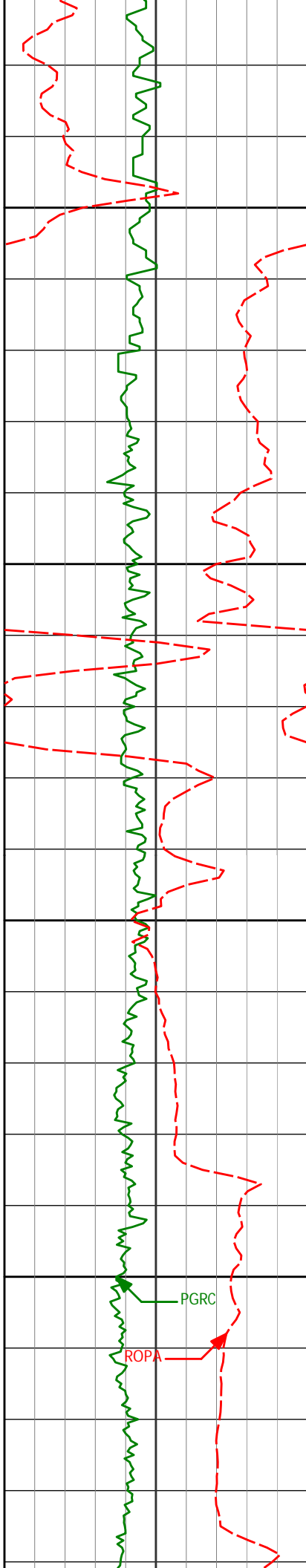
5650

5700

5750

5800

5602'	0.83°	116.32°	5543.41'	305.90'
5696'	1.21°	115.50°	5637.40'	304.44'
5791'	0.70°	108.43°	5732.38'	303.02'



5850

5888'

1.01°

91.16°

5829.37'

301.62'

5900

<Run 200>

5950

5983'

0.59°

31.17°

5924.37'

300.51'

6000

PGRC

ROPA

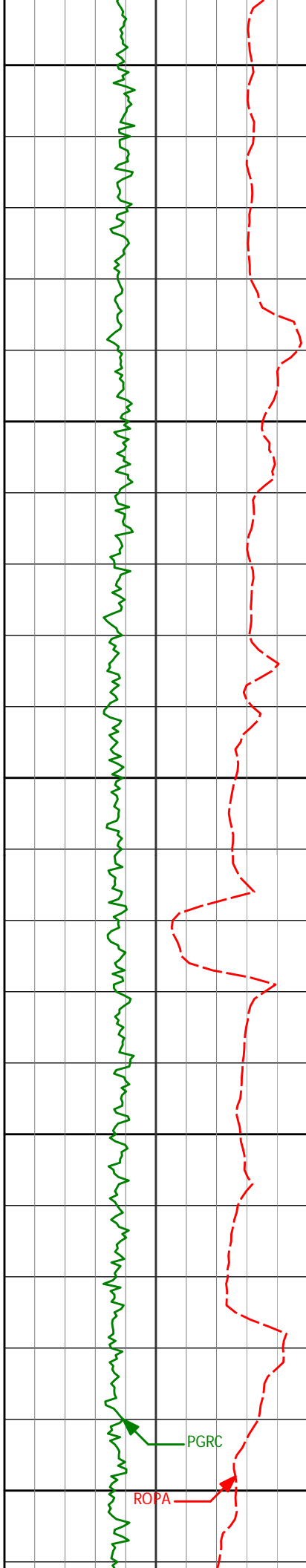
6030'

4.20°

289.66°

5971.32'

301.96'



6050

6077'

9.31°

275.00°

6017.99'

307.32'

6100

6124'

13.10°

266.97°

6064.08'

316.42'

6150

6172'

16.50°

266.10°

6110.48'

328.68'

6200

6219'

19.93°

265.75°

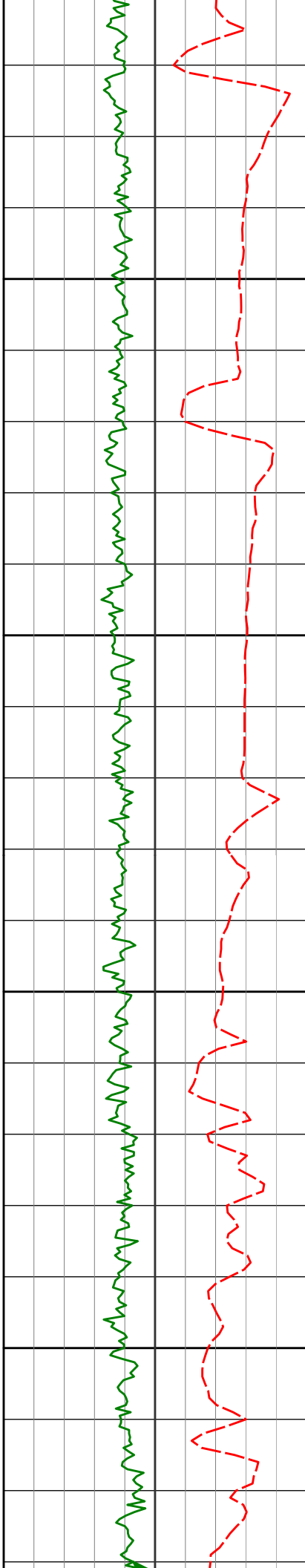
6155.12'

343.36'

6250

PGRC

ROPA



6266'

23.51°

265.72°

6198.78'

360.75'

6300

6313'

26.79°

268.96°

6241.32'

380.71'

6350

6361'

30.28°

272.63°

6283.49'

403.58'

6400

6408'

33.20°

276.41°

6323.46'

428.08'

6450

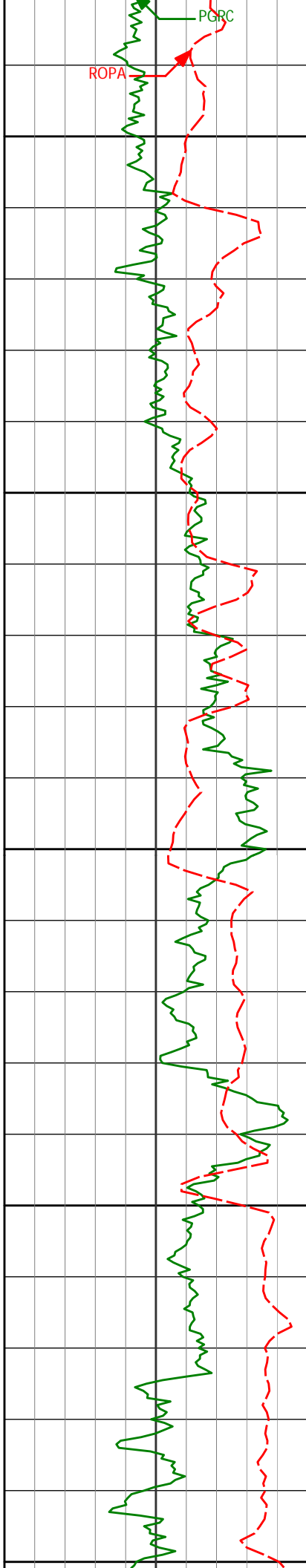
6455'

33.77°

273.15°

6362.66'

453.78'



6500

6502'

37.71°

269.07°

6400.81'

481.15'

6550

6549'

43.14°

269.50°

6436.57'

511.60'

6600

6596'

47.89°

269.02°

6469.50'

545.10'

6650

6644'

54.07°

269.30°

6499.70'

582.35'

6700

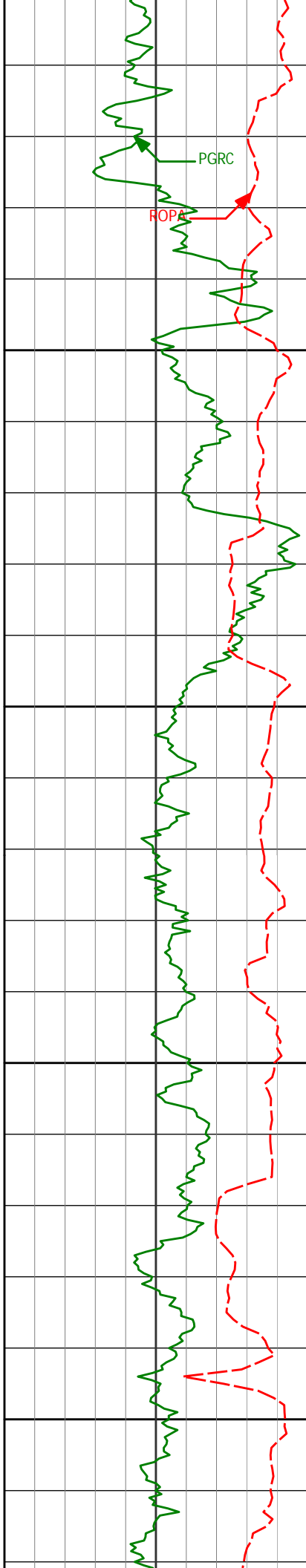
6691'

59.25°

269.04°

6525.52'

621.58'



6738'	60.84°	268.65°	6548.99'	662.28'
-------	--------	---------	----------	---------

6750

6785'	63.76°	269.27°	6570.84'	703.87'
-------	--------	---------	----------	---------

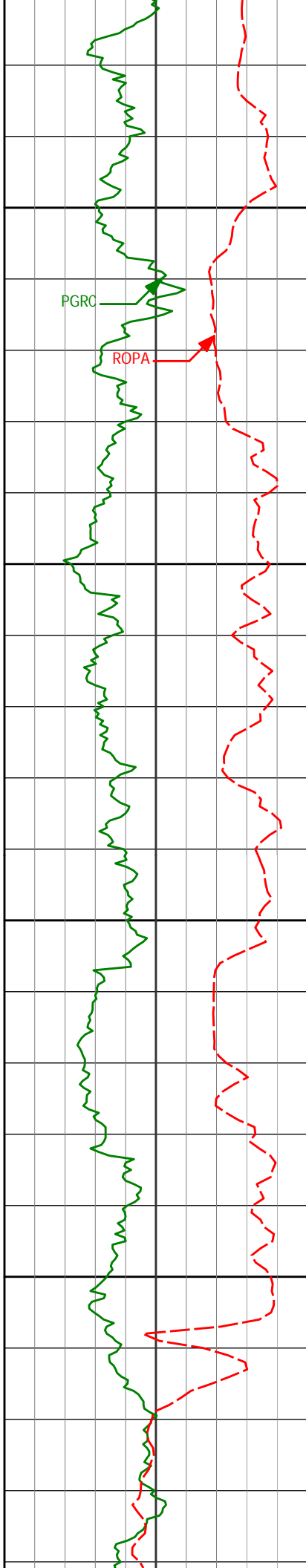
6800

6833'	68.54°	269.59°	6590.24'	747.72'
-------	--------	---------	----------	---------

6850

6880'	72.16°	270.88°	6606.05'	791.91'
-------	--------	---------	----------	---------

6900



6927' 75.33° 271.01° 6619.20' 836.93'

6950


6974' 77.39° 270.81° 6630.28' 882.51'

7000

7022' 81.94° 269.61° 6638.89' 929.65'

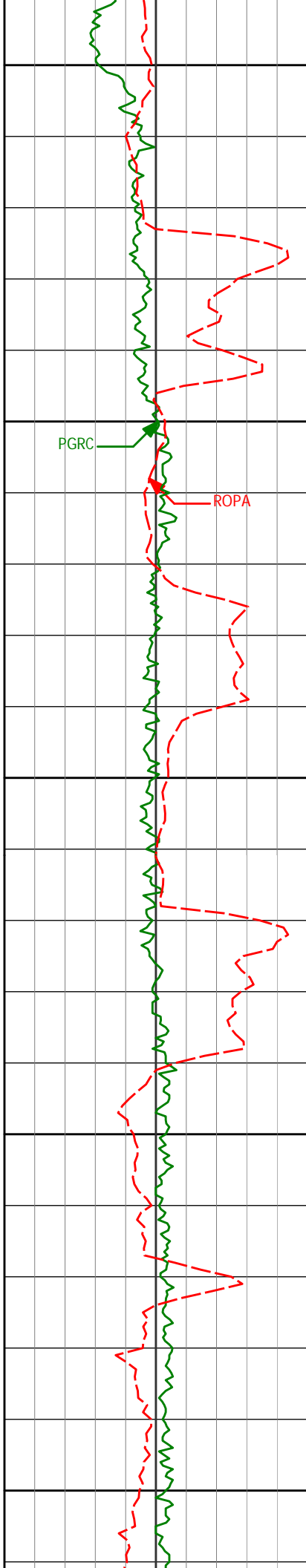
7050

7047' 84.26° 269.10° 6641.89' 954.45'

 Casing Set @ 7,093'

7100

<Run 300>



7150

7200

7250

7300

7350

7209'

88.49°

266.68°

6652.13'

1116.06'

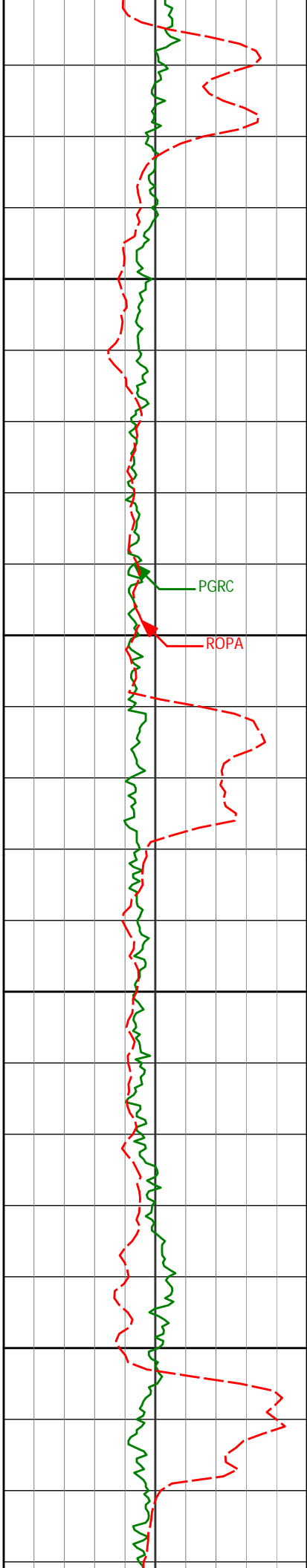
7303'

91.36°

269.54°

6652.25'

1210.03'



7400

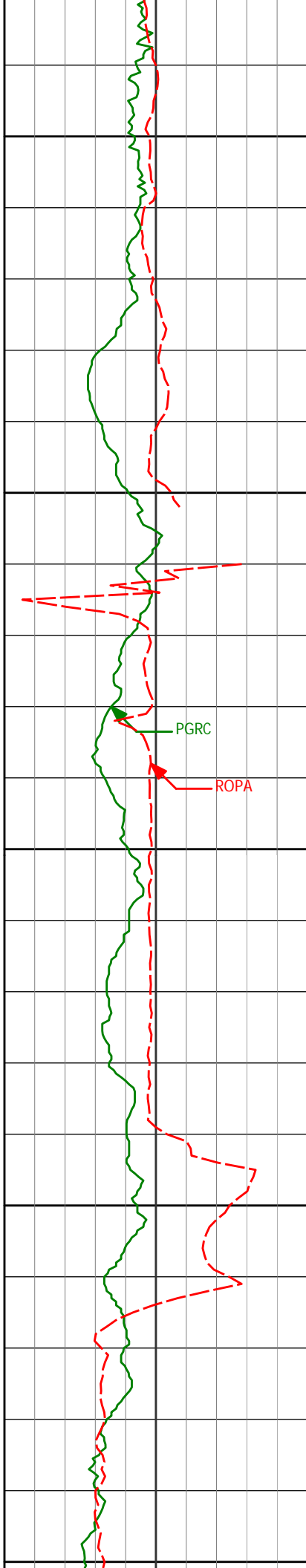
7450

7500

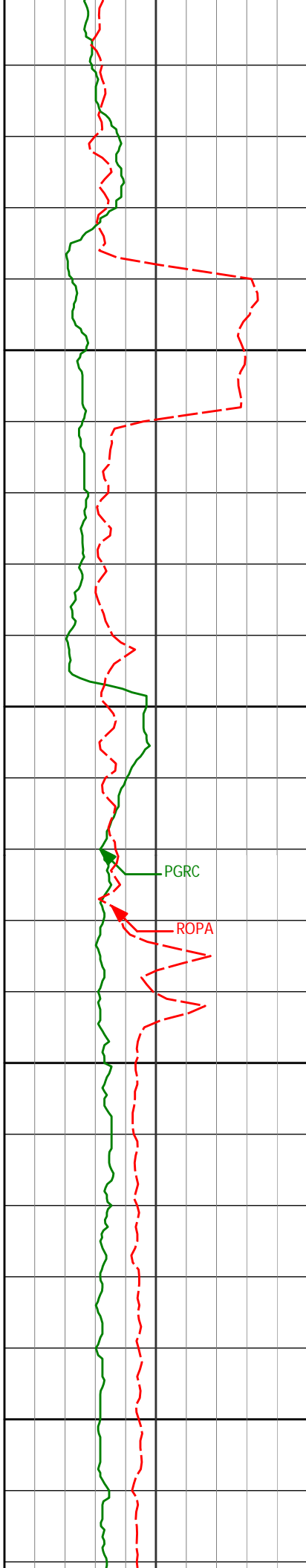
7550

7398'	88.67°	267.85°	6652.23'	1304.98'
-------	--------	---------	----------	----------

7492'	91.17°	269.44°	6652.36'	1398.94'
-------	--------	---------	----------	----------



	7587'	90.68°	269.51°	6650.82'	1493.85'
7600					
7650					
7682'		91.08°	272.02°	6649.37'	1588.65'
7700					
<Run 400> 7750					
7777'		91.51°	271.09°	6647.22'	1683.35'
7800					



7850

7871'

89.20°

270.99°

6646.64'

1777.13'

7900

PGRC

ROPA

7950

7966'

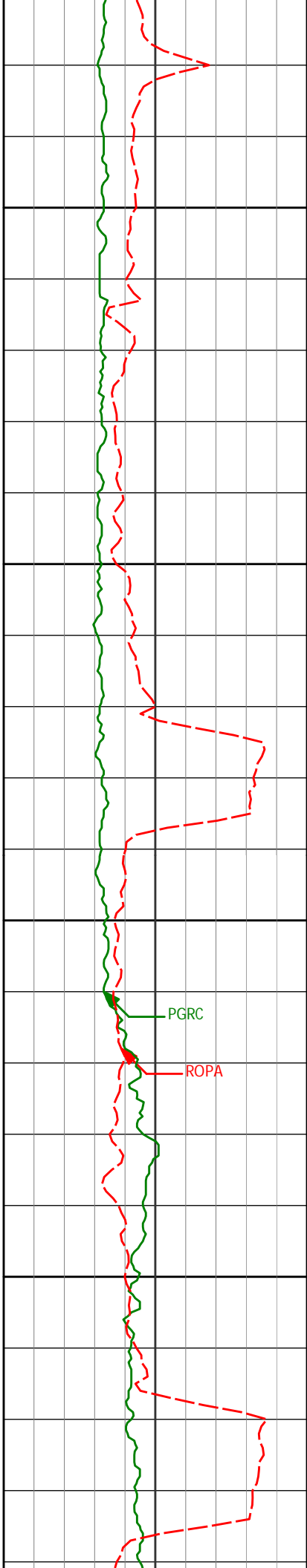
89.26°

270.07°

6647.92'

1871.95'

8000



8050

8061'

90.00°

270.41°

6648.53'

1966.82'

8100

8150

8155'

87.47°

268.87°

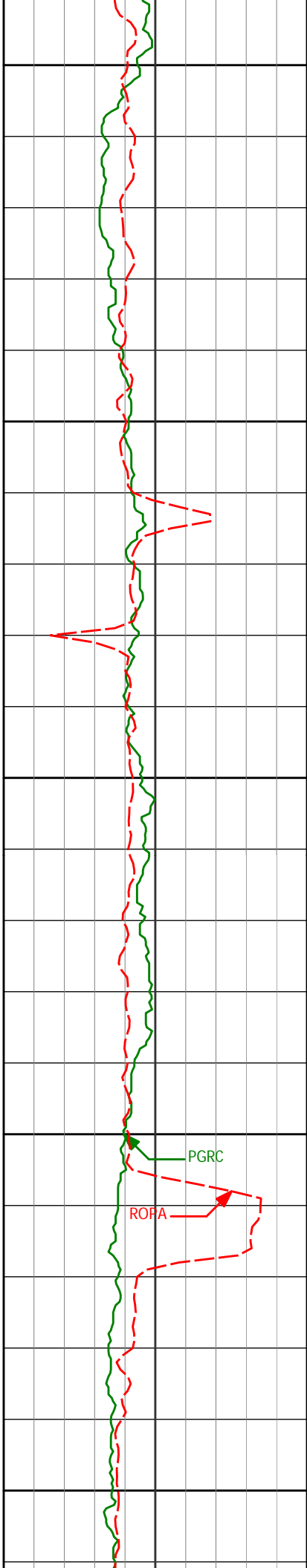
6650.61'

2060.70'

PGRC

ROPA

8200



8250

8250'

90.80°

269.84°

6652.04'

2155.60'

8300

8350

8344'

91.02°

268.85°

6650.54'

2249.52'

8400

PGRC

ROPA

8450

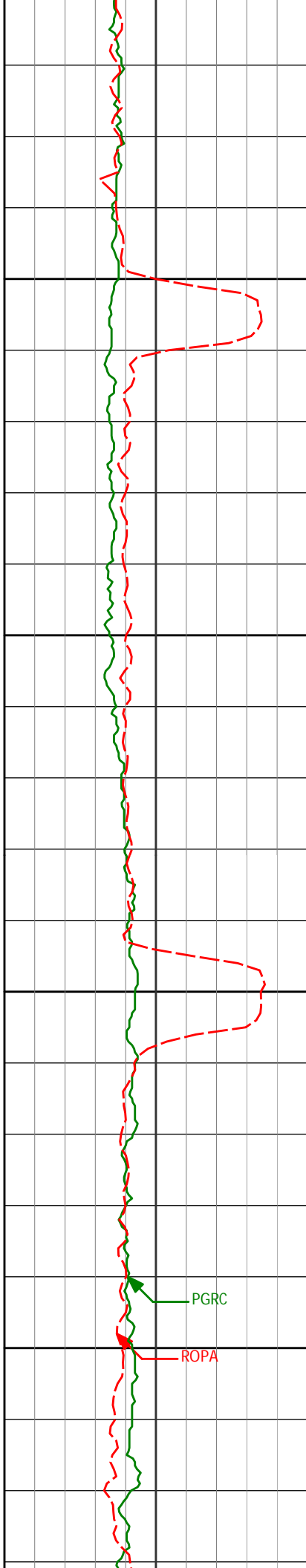
8439'

90.31°

269.35°

6649.45'

2344.46'



8500

8533'

89.94°

269.22°

6649.24'

2438.40'

8550

8600

8627'

90.28°

270.19°

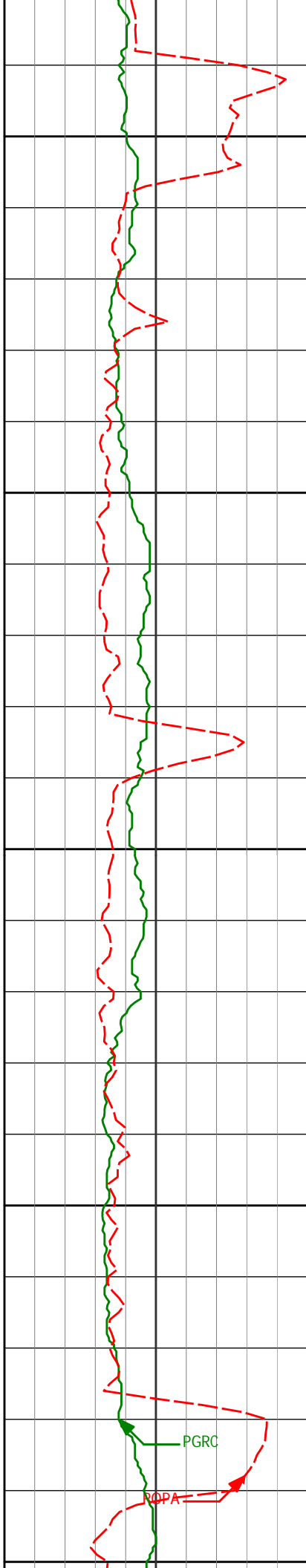
6649.07'

2532.30'

8650

PGRC

ROPA



8700

8722' 88.31° 268.56° 6650.24' 2627.22'

8750

8800

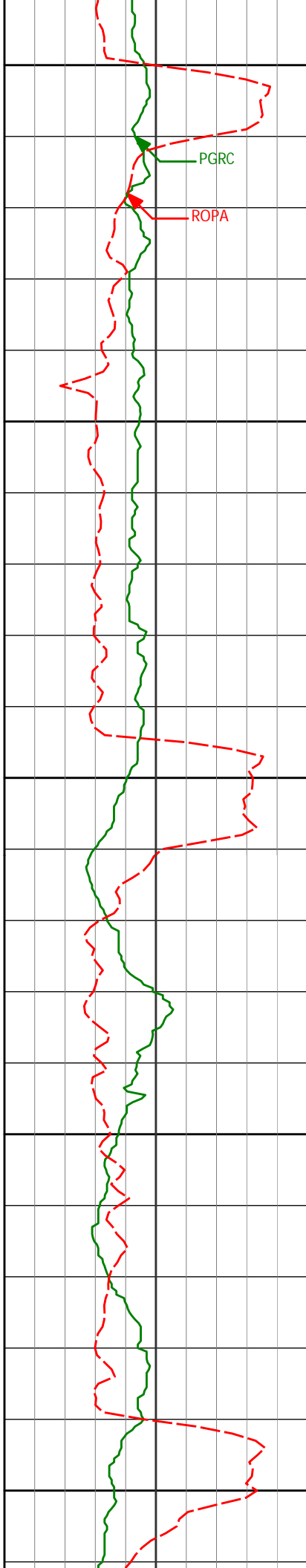
8816' 87.85° 267.80° 6653.39' 2721.15'

8850

8900

PGRC

LOPA



9350

PGRC

ROPA

9384'

89.01°

268.12°

6664.03'

3288.50'

9400

9450

9478'

91.20°

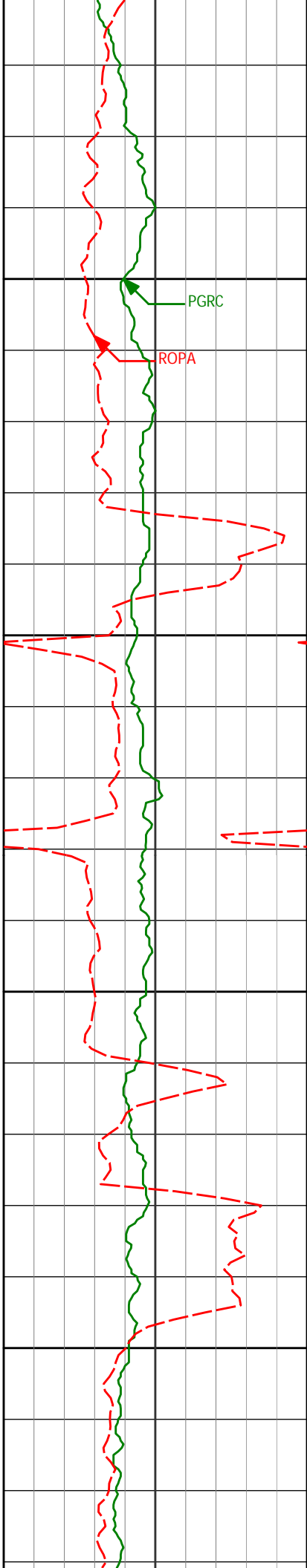
268.71°

6663.85'

3382.47'

9500

9550



9572'	90.40°	268.68°	6662.53'	3476.43'
-------	--------	---------	----------	----------

9600

PGRC

ROPA

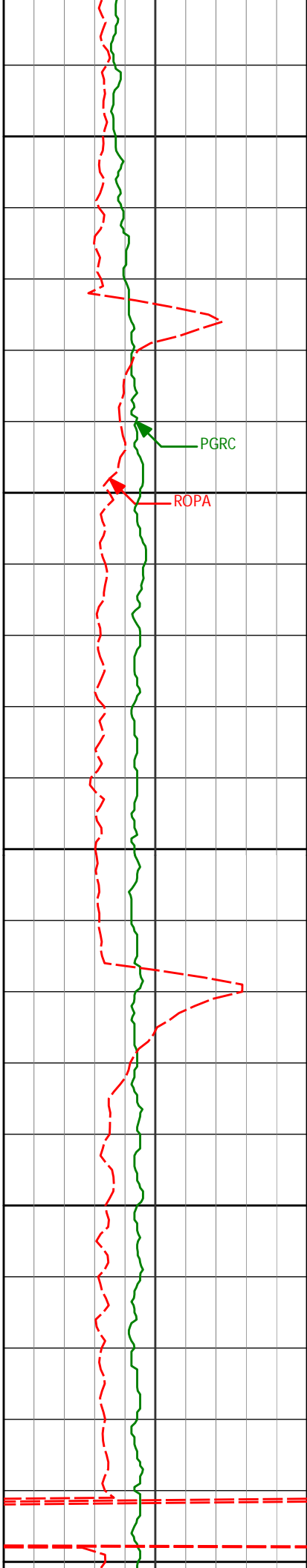
9650

9667'	88.12°	267.63°	6663.76'	3571.40'
-------	--------	---------	----------	----------

9700

9750

9761'	89.23°	268.99°	6665.93'	3665.35'
-------	--------	---------	----------	----------



9800

9850

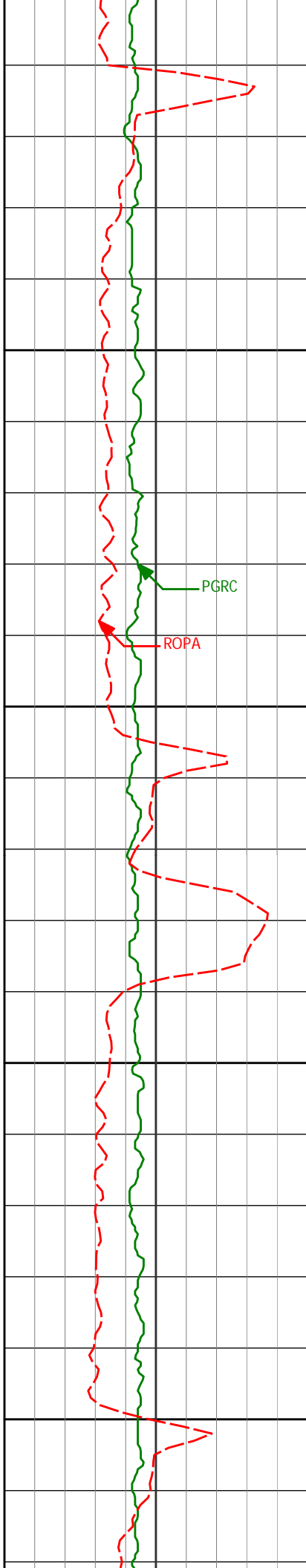
9900

9950

10000

9856' 89.44° 268.87° 6667.03' 3760.30'

9950' 89.48° 268.75° 6667.92' 3854.26'



10050

10100

10150

10200

10044'

89.82°

268.59°

6668.50'

3948.22'

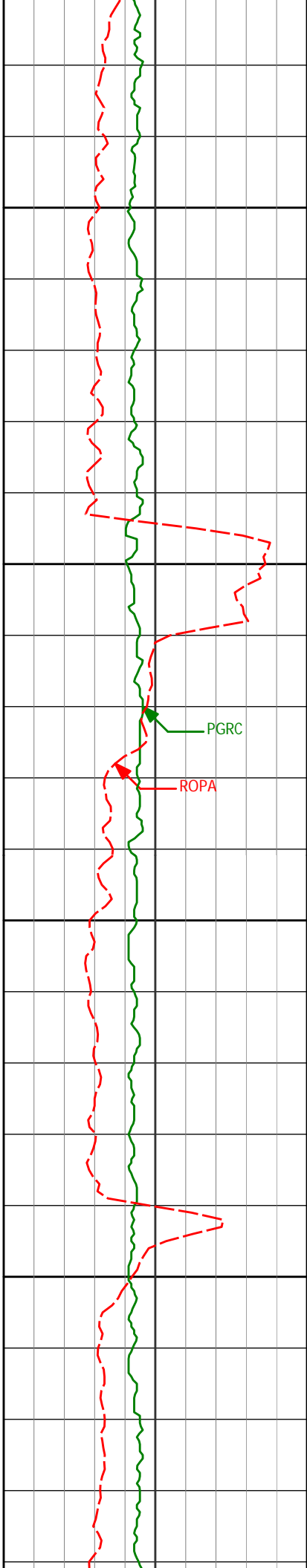
10139'

89.66°

269.13°

6668.94'

4043.18'



10233'	89.51°	269.04°	6669.62'	4137.13'
--------	--------	---------	----------	----------

10250

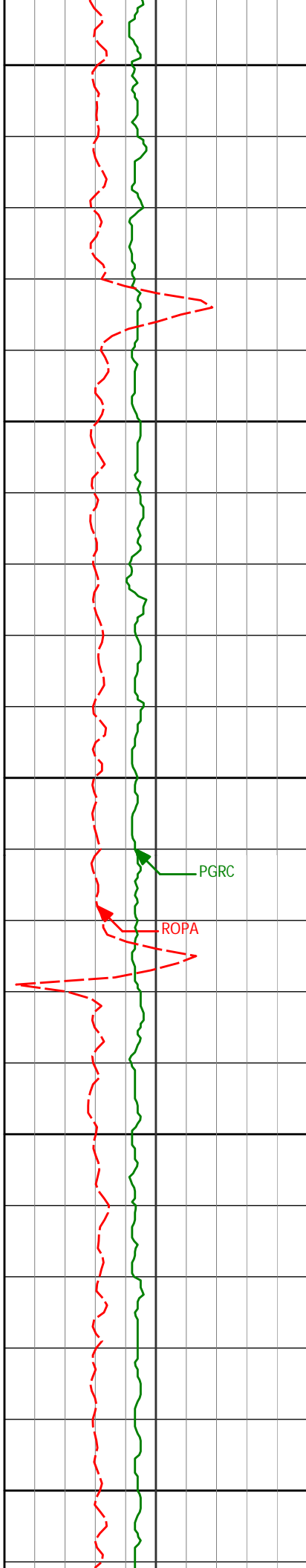
10300

10328'	89.38°	270.05°	6670.54'	4232.04'
--------	--------	---------	----------	----------

10350

10400

10420'	89.72°	269.89°	6671.26'	4323.93'
--------	--------	---------	----------	----------



10450

10500

10550

10600

10650

10512'

89.54°

269.56°

6671.85'

4415.83'

10603'

89.75°

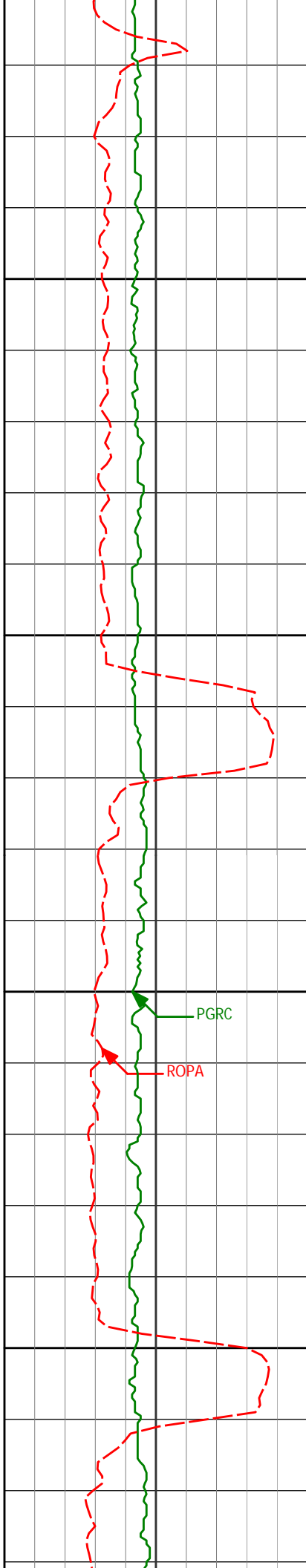
268.64°

6672.41'

4506.78'

PGRC

ROPA



10700

10750

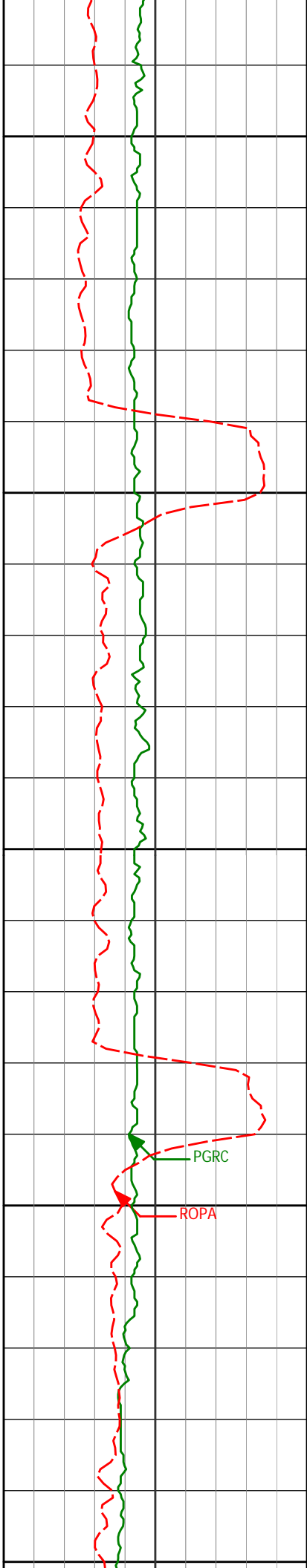
10800

10850

10694'	89.69°	268.47°	6672.85'	4597.75'
--------	--------	---------	----------	----------

10785'	89.23°	269.72°	6673.71'	4688.70'
--------	--------	---------	----------	----------

10876'	89.32°	269.70°	6674.86'	4779.60'
--------	--------	---------	----------	----------



10900

10950

11000

11050

11100

10968'

90.71°

270.77°

6674.84'

4871.47'

11059'

90.15°

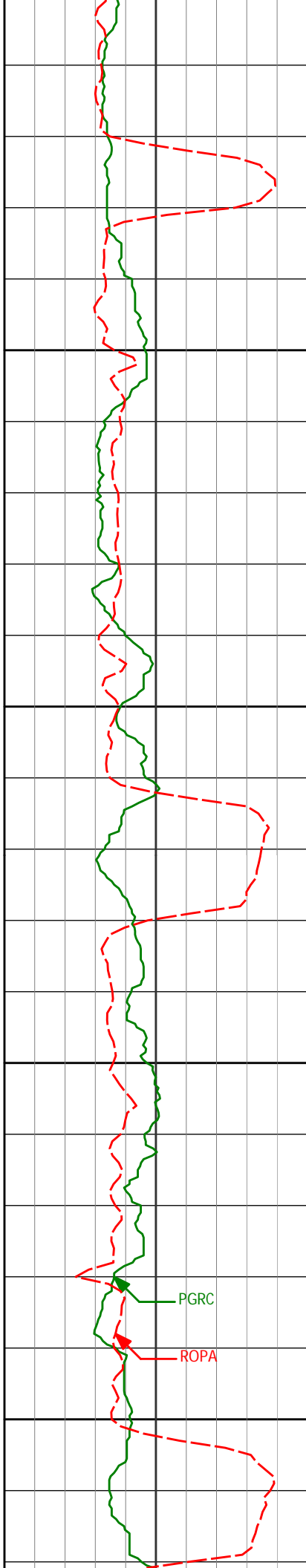
271.97°

6674.15'

4962.22'

PGRC

ROPA



11150

11150'

89.54°

272.17°

6674.40'

5052.89'

11200

11240'

88.83°

270.30°

6675.68'

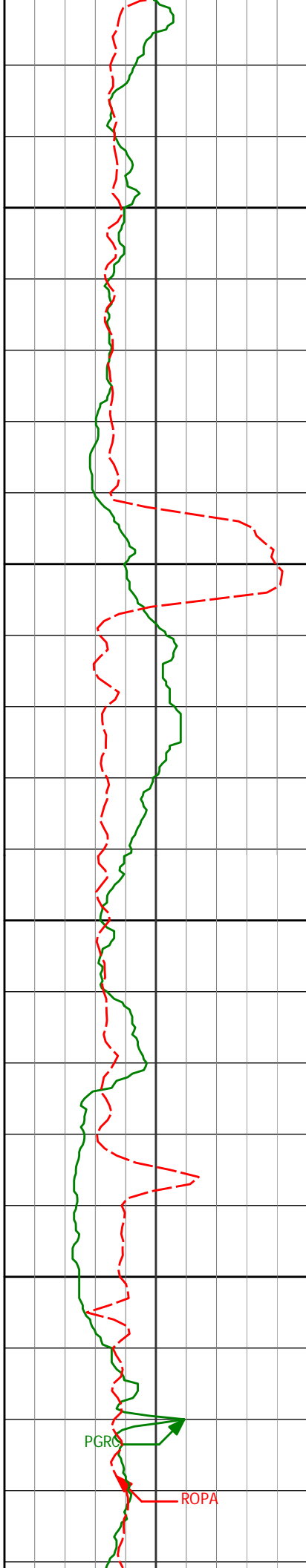
5142.65'

11250

11300

PGRC

ROPA



11330'

90.86°

269.90°

6675.92'

5232.52'

11350

11400

11421'

89.20°

268.71°

6675.87'

5323.46'

11450

11500

11513'

88.58°

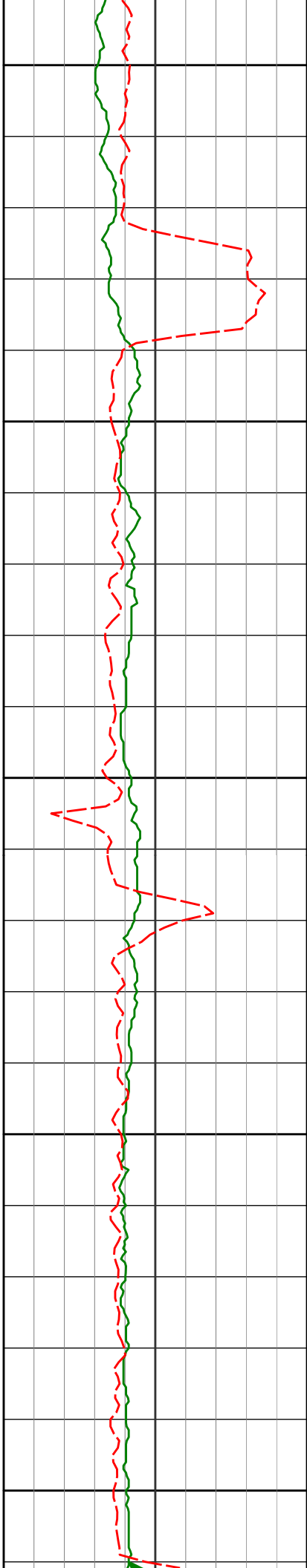
268.15°

6677.66'

5415.42'

PGRO

ROPA



11550

11600

11650

11700

11750

11605'

89.54°

268.72°

6679.17'

5507.38'

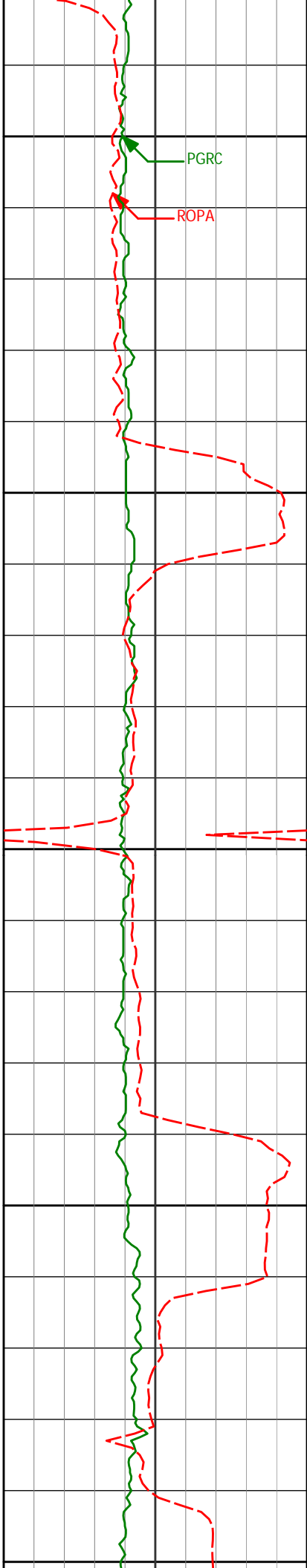
11699'

89.63°

267.49°

6679.85'

5601.36'



12000

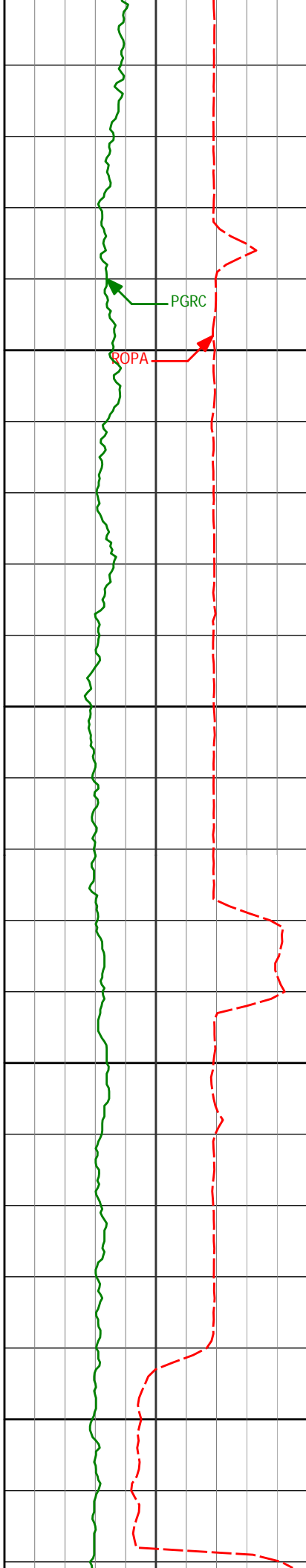
12050

12100

12150

12200

11982'	89.41°	268.34°	6682.97'	5884.33'
12077'	89.26°	267.95°	6684.07'	5979.31'
12172'	89.72°	269.61°	6684.91'	6074.27'



12250

12267'

90.80°

270.09°

6684.48'

6169.17'

12300

12350

12362'

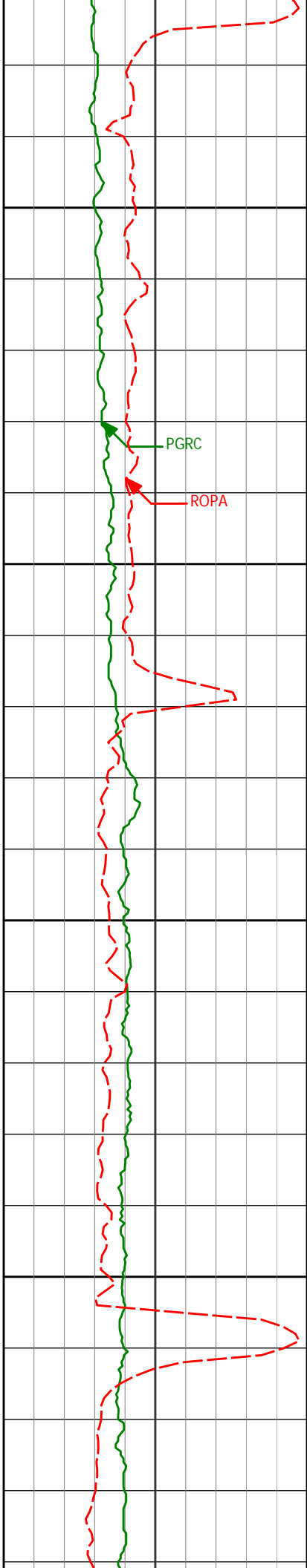
89.26°

270.05°

6684.42'

6264.04'

12400



12450

12456'

89.72°

270.92°

6685.26'

6357.88'

12500

12550

12551'

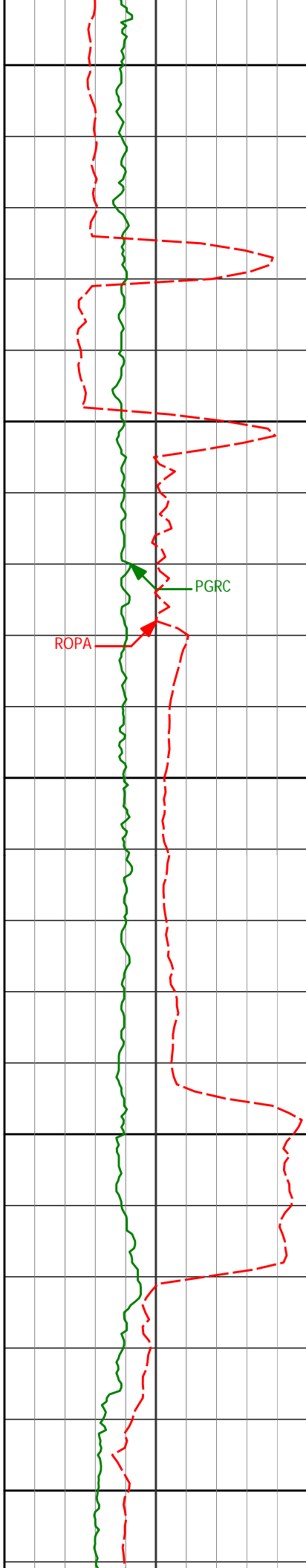
90.19°

270.23°

6685.33'

6452.71'

12600



12645'	89.69°	270.80°	6685.44'	6546.55'
--------	--------	---------	----------	----------

12650

12700

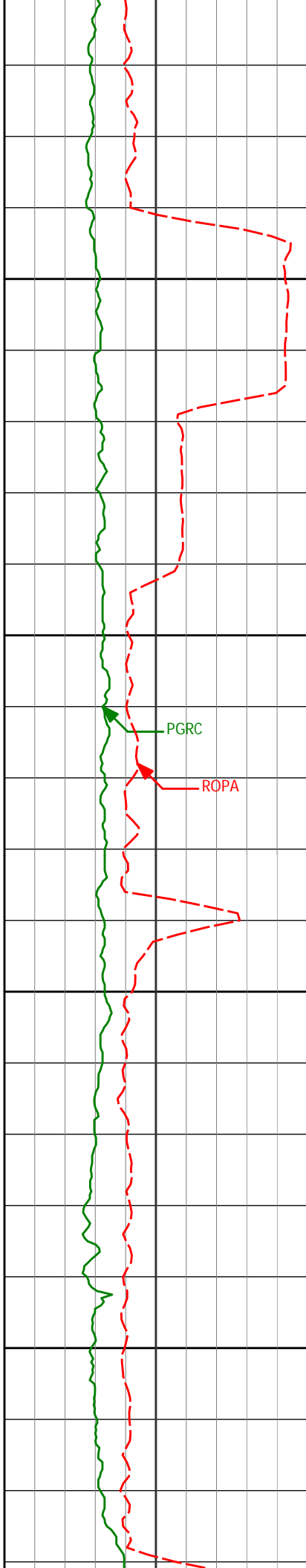
12739'	89.91°	273.86°	6685.76'	6640.16'
--------	--------	---------	----------	----------

12750

12800

12834'	88.64°	272.72°	6686.97'	6734.61'
--------	--------	---------	----------	----------

12850



12900

12950

13000

13050

12928'

89.60°

270.50°

6688.41'

6828.31'

PGRC

ROPA

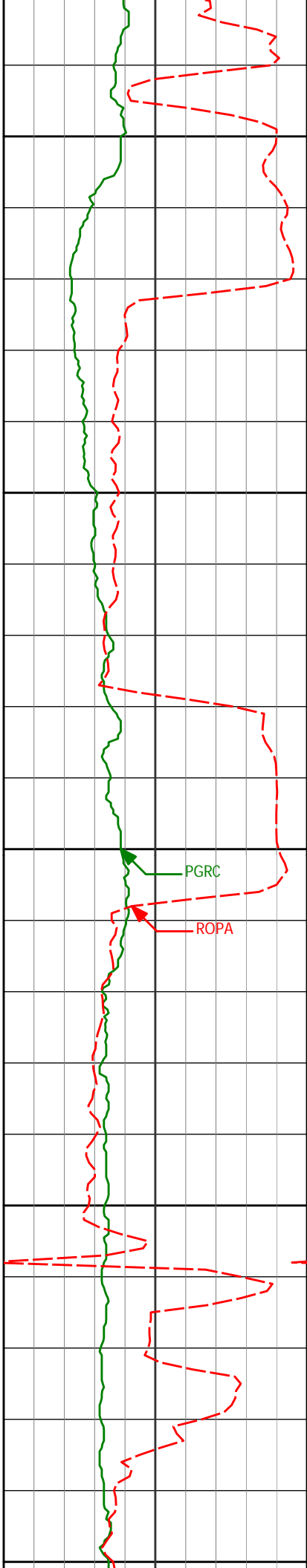
13023'

90.83°

270.46°

6688.05'

6923.15'



13100

13150

13200

13250

13300

13117'

91.57°

270.79°

6686.08'

7016.96'

13211'

90.28°

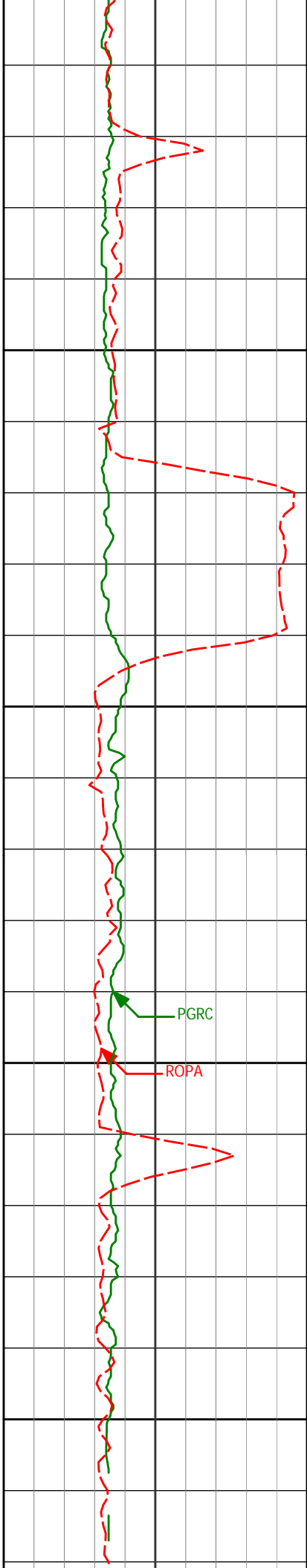
269.73°

6684.57'

7110.81'

PGRC

ROPA



13350

13400

13450

13500

13305'

89.72°

270.73°

6684.57'

7204.67'

13399'

88.21°

269.61°

6686.26'

7298.53'

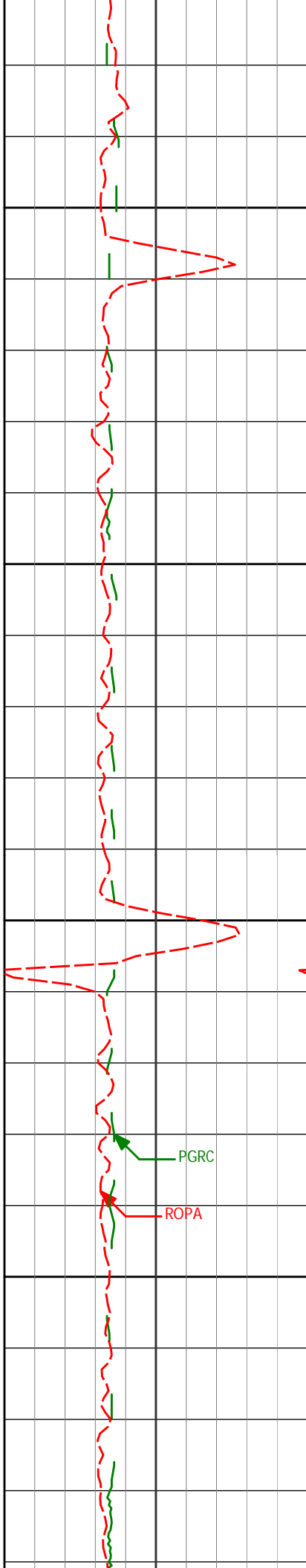
13494'

89.35°

269.10°

6688.28'

7393.44'



13550

13588'

89.85°

269.61°

6688.94'

7487.36'

13600

13650

13682'

89.75°

268.56°

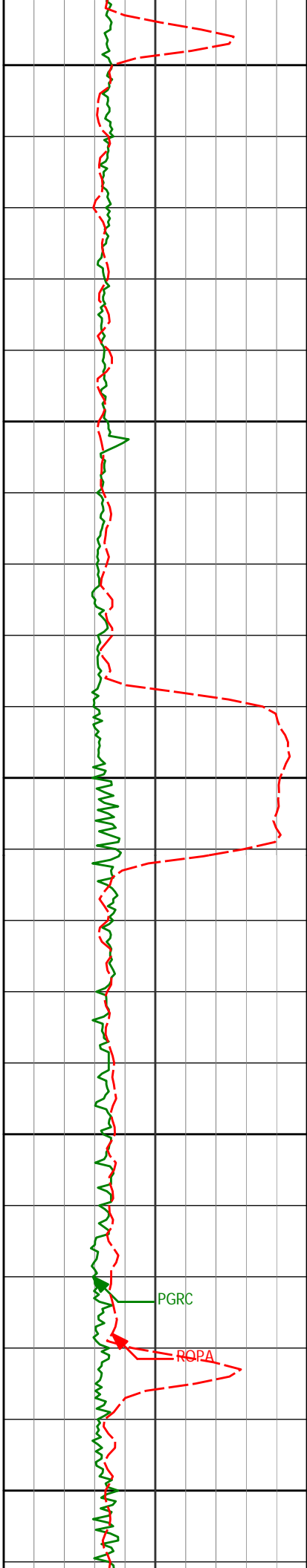
6689.27'

7581.31'

13700

PGRC

ROPA



13750

13777'

89.54°

267.38°

6689.86'

7676.30'

13800

13850

13871'

89.57°

268.45°

6690.59'

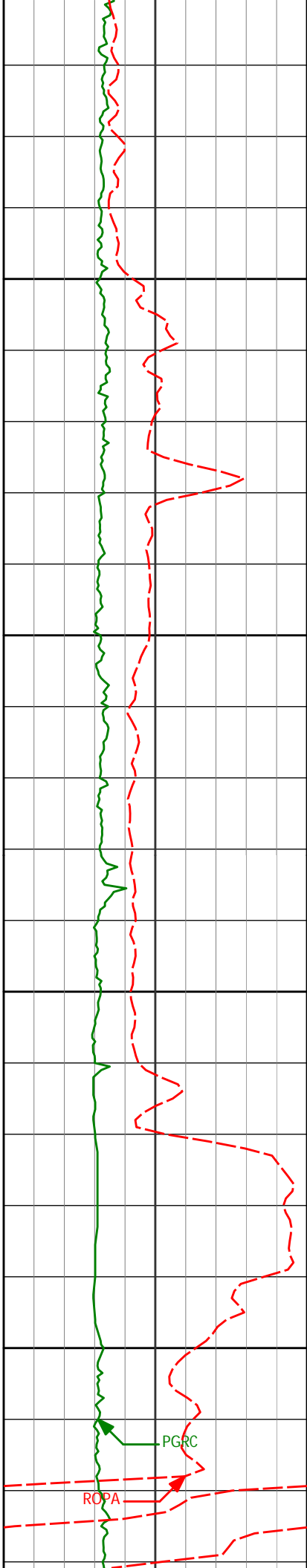
7770.29'

13900

PGRC

ROPA

13950



13965'

89.69°

268.85°

6691.20'

7864.25'

14000

14050

14059'

89.85°

268.48°

6691.57'

7958.22'

14100

14150

14153'

89.10°

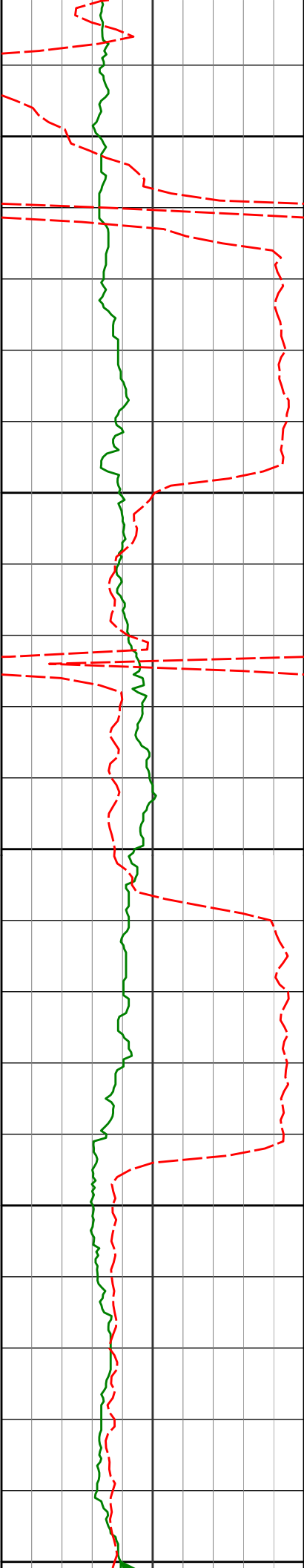
266.06°

6692.44'

8052.21'

PGRC

ROPA



14200

14250

14300

14350

14400

14248'

90.92°

266.35°

6692.41'

8147.19'

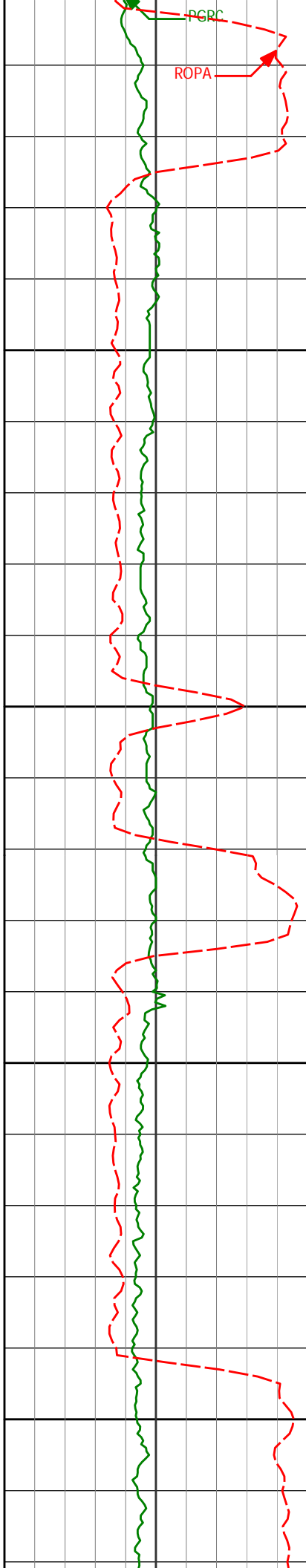
14342'

91.11°

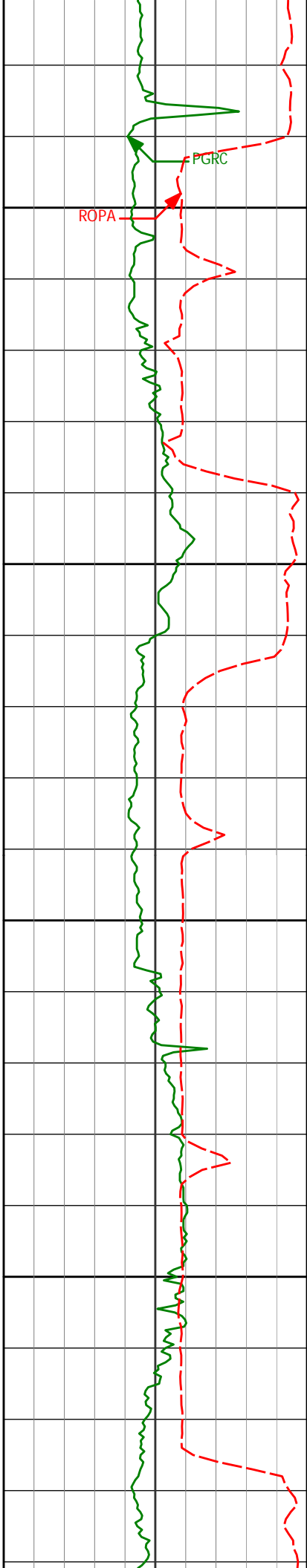
269.01°

6690.75'

8241.16'



14437'	89.75°	269.20°	6690.03'	8336.11'
14450				
14500				
14531'	89.63°	265.93°	6690.54'	8430.09'
14550				
14592'	89.60°	265.77°	6690.95'	8491.07'
14600				



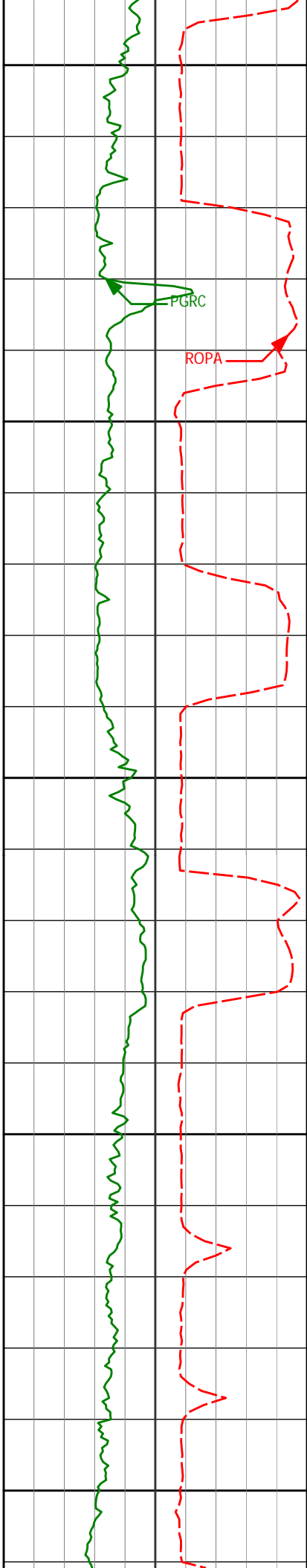
14650

14700

14750

14800

14626'	89.69°	268.25°	6691.16'	8525.07'
14673'	90.68°	269.82°	6691.00'	8572.04'
14719'	89.05°	272.25°	6691.12'	8617.93'
14766'	90.43°	273.33°	6691.33'	8664.70'
14813'	89.11°	272.43°	6691.52'	8711.47'



14850

14860'

88.59°

272.60°

6692.47'

8758.26'

PGRC

ROPA

14900

14907'

89.38°

272.70°

6693.30'

8805.04'

14950

14954'

88.06°

273.93°

6694.35'

8851.75'

15000

15002'

87.97°

275.31°

6696.01'

8899.32'

15050

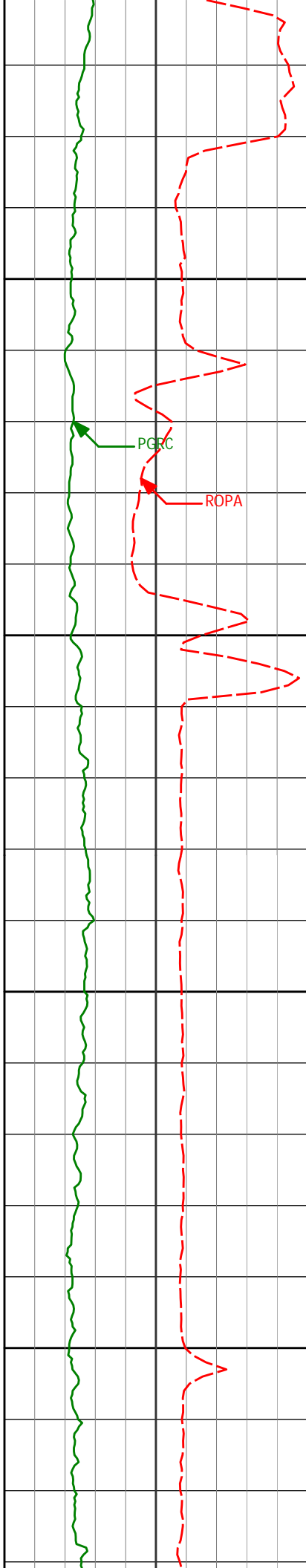
15049'

87.47°

274.28°

6697.88'

8945.87'



15100

15150

15200

15250

15097'

88.95°

274.08°

6699.38'

8993.49'

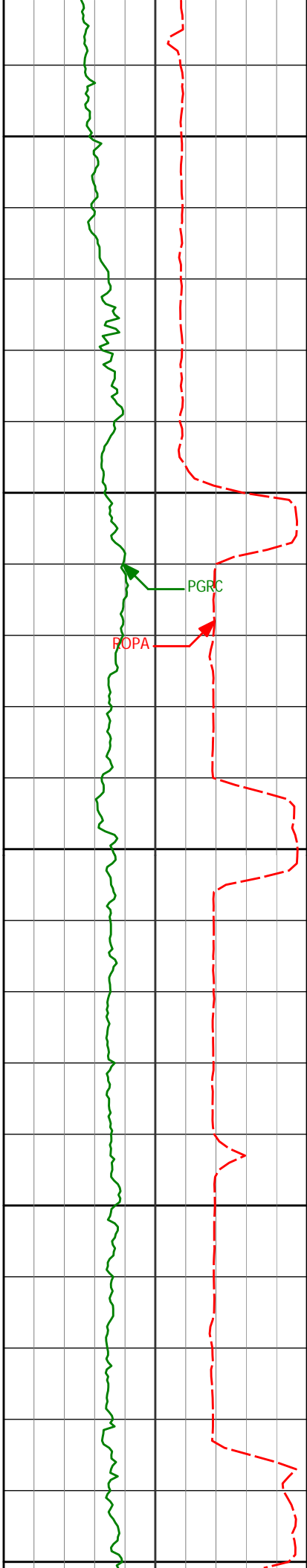
15191'

89.81°

274.09°

6700.39'

9086.80'



15286' 90.96° 273.42° 6699.75' 9181.17'

15300

15333' 91.91° 274.04° 6698.58' 9227.85'

15350

15380' 89.14° 272.26° 6698.15' 9274.58'

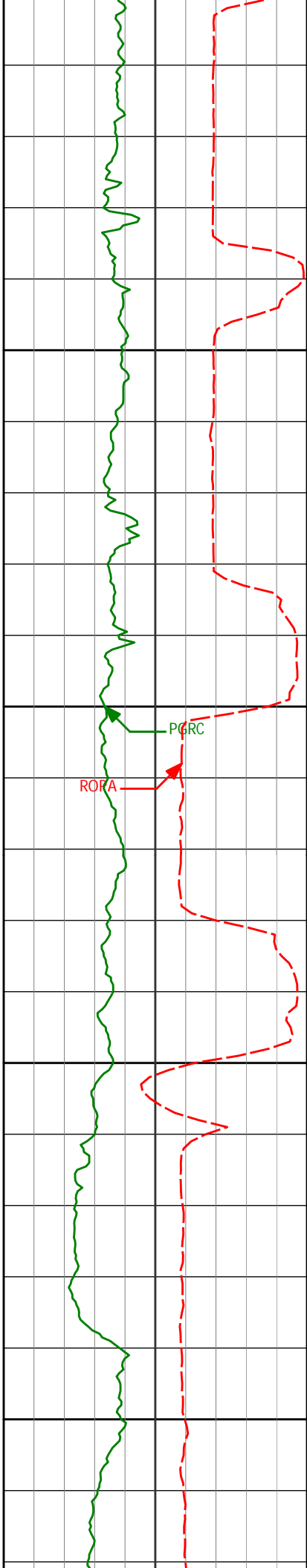
15400

15427' 90.31° 273.68° 6698.38' 9321.34'

15450

15475' 89.38° 270.79° 6698.51' 9369.15'

15500



15550

15600

15650

15700

15522'

90.46°

272.60°

6698.57'

9416.00'

15570'

90.31°

272.30°

6698.25'

9463.79'

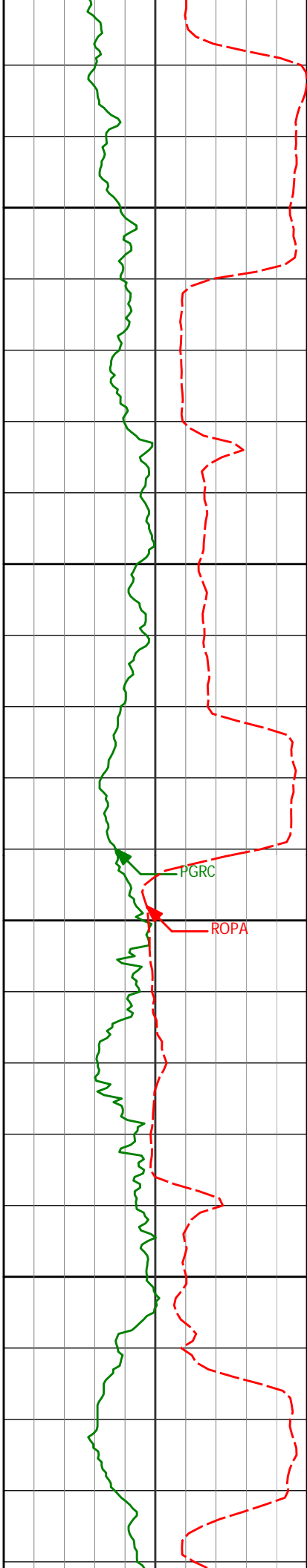
15665'

86.39°

271.51°

6700.98'

9558.41'



15750

15800

15850

15900

15759'

86.33°

269.55°

6706.95'

9652.06'

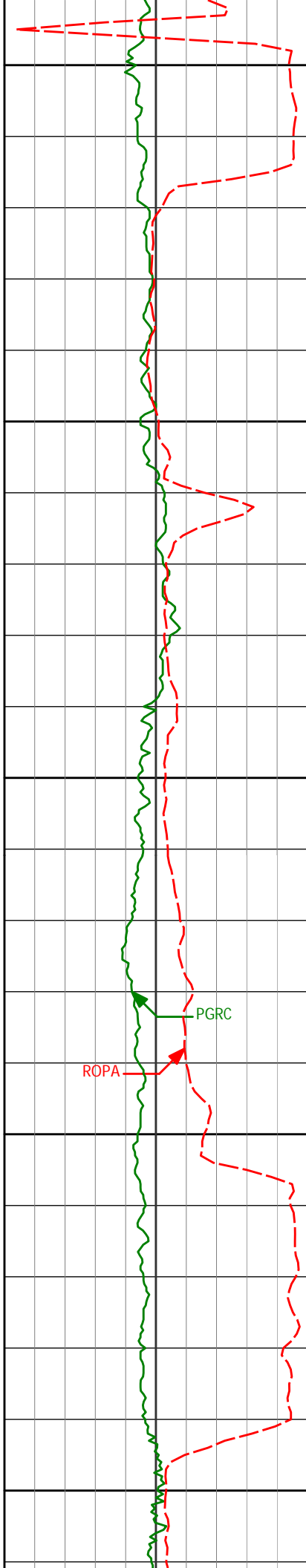
15854'

86.60°

267.86°

6712.80'

9746.84'



15950

16000

16050

16100

16150

15949'

16042'

16136'

88.03°

87.84°

90.34°

266.29°

265.28°

265.47°

6717.26'

6720.61'

6722.10'

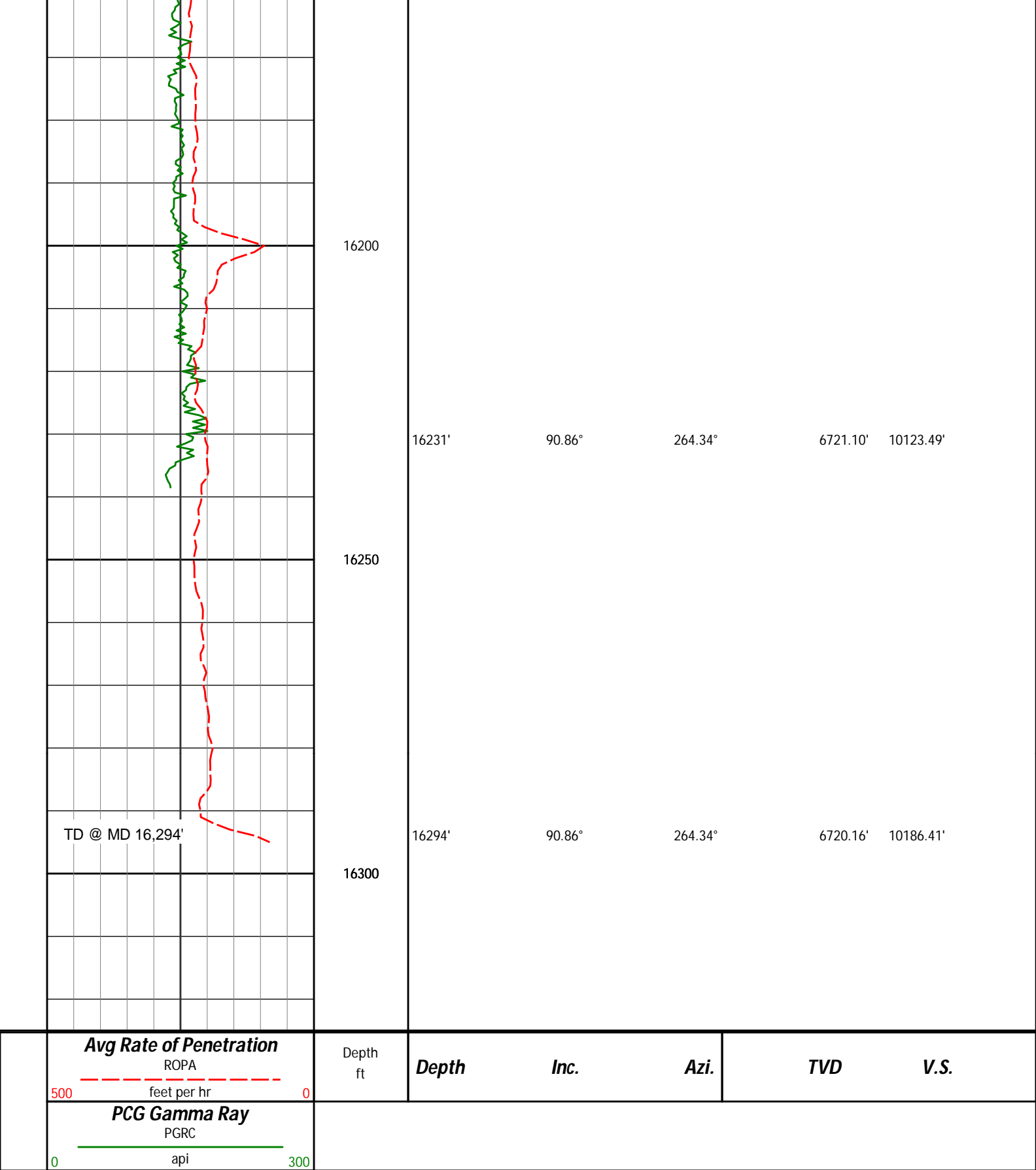
9841.73'

9934.64'

10028.58'

PGRC

ROPA



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch State USX AA16-66-1
Wattenberg

6455.00	33.77	273.15	6362.66	422.30 S	433.53 W	453.78	4.01
6502.00	37.71	269.07	6400.81	421.82 S	460.96 W	481.15	9.79
6549.00	42.44	269.50	6436.57	422.10 S	491.42 W	511.60	14.56

6549.00	43.14	269.30	6436.37	422.19 S	491.42 W	511.60	11.36
6596.00	47.89	269.02	6469.50	422.63 S	524.94 W	545.10	10.14
6644.00	54.07	269.30	6499.70	423.17 S	562.21 W	582.35	12.88
6691.00	59.25	269.04	6525.52	423.75 S	601.46 W	621.58	11.02
6738.00	60.84	268.65	6548.99	424.57 S	642.17 W	662.28	3.45
6785.00	63.76	269.27	6570.84	425.33 S	683.77 W	703.87	6.33
6833.00	68.54	269.59	6590.24	425.76 S	727.65 W	747.72	9.98
6880.00	72.16	270.88	6606.05	425.57 S	771.91 W	791.91	8.12
6927.00	75.33	271.01	6619.20	424.83 S	817.02 W	836.93	6.77
6974.00	77.39	270.81	6630.28	424.10 S	862.68 W	882.51	4.40
7022.00	81.94	269.61	6638.89	423.93 S	909.89 W	929.65	9.79
7047.00	84.26	269.10	6641.89	424.21 S	934.71 W	954.45	9.49
7209.00	88.49	266.68	6652.13	430.16 S	1096.23 W	1116.06	3.01
7303.00	91.36	269.54	6652.25	433.26 S	1190.16 W	1210.03	4.30
7398.00	88.67	267.85	6652.23	435.43 S	1285.12 W	1304.98	3.34
7492.00	91.17	269.44	6652.36	437.65 S	1379.08 W	1398.94	3.15
7587.00	90.68	269.51	6650.82	438.52 S	1474.06 W	1493.85	0.53
7682.00	91.08	272.02	6649.37	437.25 S	1569.04 W	1588.65	2.68
7777.00	91.51	271.09	6647.22	434.67 S	1663.98 W	1683.35	1.09
7871.00	89.20	270.99	6646.64	432.97 S	1757.95 W	1777.13	2.46
7966.00	89.26	270.07	6647.92	432.08 S	1852.94 W	1871.95	0.97
8061.00	90.00	270.41	6648.53	431.68 S	1947.94 W	1966.82	0.86
8155.00	87.47	268.87	6650.61	432.27 S	2041.90 W	2060.70	3.15
8250.00	90.80	269.84	6652.04	433.33 S	2136.87 W	2155.60	3.65
8344.00	91.02	268.85	6650.54	434.41 S	2230.85 W	2249.52	1.08
8439.00	90.31	269.35	6649.45	435.90 S	2325.83 W	2344.46	0.91
8533.00	89.94	269.22	6649.24	437.08 S	2419.82 W	2438.40	0.42
8627.00	90.28	270.19	6649.07	437.57 S	2513.82 W	2532.30	1.10
8722.00	88.31	268.56	6650.24	438.60 S	2608.80 W	2627.22	2.69
8816.00	87.85	267.80	6653.39	441.59 S	2702.70 W	2721.15	0.95
8910.00	88.92	269.02	6656.05	444.20 S	2796.62 W	2815.09	1.73
9005.00	89.08	270.32	6657.71	444.74 S	2891.60 W	2909.98	1.38
9100.00	89.32	269.92	6659.03	444.54 S	2986.59 W	3004.85	0.49
9194.00	89.08	270.26	6660.35	444.39 S	3080.58 W	3098.72	0.45
9289.00	88.74	270.05	6662.16	444.13 S	3175.57 W	3193.57	0.42
9384.00	89.01	268.12	6664.03	445.65 S	3270.53 W	3288.50	2.05
9478.00	91.20	268.71	6663.85	448.24 S	3364.49 W	3382.47	2.41
9572.00	90.40	268.68	6662.53	450.39 S	3458.45 W	3476.43	0.85
9667.00	88.12	267.63	6663.76	453.45 S	3553.39 W	3571.40	2.64
9761.00	89.23	268.99	6665.93	456.22 S	3647.32 W	3665.35	1.87
9856.00	89.44	268.87	6667.03	458.00 S	3742.30 W	3760.30	0.26
9950.00	89.48	268.75	6667.92	459.95 S	3836.27 W	3854.26	0.13
10044.00	89.82	268.59	6668.50	462.13 S	3930.25 W	3948.22	0.40
10139.00	89.66	269.13	6668.94	464.02 S	4025.23 W	4043.18	0.59
10233.00	89.51	269.04	6669.62	465.51 S	4119.21 W	4137.13	0.19
10328.00	89.38	270.05	6670.54	466.26 S	4214.20 W	4232.04	1.06
10420.00	89.72	269.89	6671.26	466.32 S	4306.20 W	4323.93	0.41
10512.00	89.54	269.56	6671.85	466.75 S	4398.20 W	4415.83	0.41
10603.00	89.75	268.64	6672.41	468.18 S	4489.18 W	4506.78	1.05
10694.00	89.69	268.47	6672.85	470.48 S	4580.15 W	4597.75	0.20
10785.00	89.23	269.72	6673.71	471.92 S	4671.13 W	4688.70	1.46
10876.00	89.32	269.70	6674.86	472.38 S	4762.13 W	4779.60	0.10
10968.00	90.71	270.77	6674.84	472.00 S	4854.12 W	4871.47	1.90
11059.00	90.15	271.97	6674.15	469.83 S	4945.09 W	4962.22	1.45
11150.00	89.54	272.17	6674.40	466.55 S	5036.03 W	5052.89	0.71
11240.00	88.83	270.30	6675.68	464.61 S	5126.00 W	5142.65	2.22
11330.00	90.86	269.90	6675.92	464.45 S	5215.99 W	5232.52	2.31
11421.00	89.20	268.71	6675.87	465.54 S	5306.98 W	5323.46	2.25
11513.00	88.58	268.15	6677.66	468.06 S	5398.93 W	5415.42	0.91
11605.00	89.54	268.72	6679.17	470.57 S	5490.88 W	5507.38	1.21
11699.00	89.63	267.49	6679.85	473.69 S	5584.82 W	5601.36	1.31
11794.00	89.44	267.94	6680.62	477.48 S	5679.74 W	5696.36	0.52
11888.00	89.14	266.97	6681.78	481.65 S	5773.64 W	5790.35	1.09
11982.00	89.41	268.34	6682.97	485.50 S	5867.55 W	5884.33	1.49
12077.00	89.26	267.95	6684.07	488.58 S	5962.50 W	5979.31	0.44
12172.00	89.72	269.61	6684.91	490.60 S	6057.47 W	6074.27	1.81
12267.00	90.80	270.09	6684.48	490.85 S	6152.47 W	6169.17	1.24
12362.00	89.26	270.05	6684.42	490.74 S	6247.46 W	6264.04	1.62
12456.00	89.72	270.92	6685.26	489.94 S	6341.45 W	6357.88	1.05
12551.00	90.19	270.23	6685.33	488.98 S	6436.45 W	6452.71	0.87
12645.00	89.69	270.80	6685.44	488.13 S	6530.44 W	6546.55	0.80
12739.00	89.91	273.86	6685.76	484.32 S	6624.36 W	6640.16	3.26
12834.00	88.64	272.72	6686.97	478.87 S	6719.19 W	6734.61	1.79
12928.00	89.60	270.50	6688.41	476.23 S	6813.13 W	6828.31	2.57
13023.00	90.83	270.46	6688.05	475.43 S	6908.13 W	6923.15	1.30

13117.00	91.57	270.79	6686.08	474.41 S	7002.10 W	7016.96	0.86
13211.00	90.28	269.73	6684.57	473.98 S	7096.08 W	7110.81	1.78
13305.00	89.72	270.73	6684.57	473.60 S	7190.08 W	7204.67	1.21
13399.00	88.21	269.61	6686.26	473.32 S	7284.06 W	7298.53	2.00
13494.00	89.35	269.10	6688.28	474.39 S	7379.03 W	7393.44	1.31
13588.00	89.85	269.61	6688.94	475.45 S	7473.02 W	7487.36	0.75
13682.00	89.75	268.56	6689.27	476.95 S	7567.01 W	7581.31	1.12
13777.00	89.54	267.38	6689.86	480.32 S	7661.95 W	7676.30	1.26
13871.00	89.57	268.45	6690.59	483.73 S	7755.88 W	7770.29	1.14
13965.00	89.69	268.85	6691.20	485.95 S	7849.85 W	7864.25	0.44
14059.00	89.85	268.48	6691.57	488.14 S	7943.82 W	7958.22	0.43
14153.00	89.10	266.06	6692.44	492.62 S	8037.71 W	8052.21	2.69
14248.00	90.92	266.35	6692.41	498.91 S	8132.49 W	8147.19	1.94
14342.00	91.11	269.01	6690.75	502.71 S	8226.39 W	8241.16	2.84
14437.00	89.75	269.20	6690.03	504.19 S	8321.38 W	8336.11	1.44
14531.00	89.63	265.93	6690.54	508.18 S	8415.28 W	8430.09	3.48
14592.00	89.60	265.77	6690.95	512.59 S	8476.12 W	8491.07	0.27
14626.00	89.69	268.25	6691.16	514.36 S	8510.07 W	8525.07	7.29
14673.00	90.68	269.82	6691.00	515.15 S	8557.06 W	8572.04	3.95
14719.00	89.05	272.25	6691.12	514.32 S	8603.05 W	8617.93	6.36
14766.00	90.43	273.33	6691.33	512.04 S	8649.99 W	8664.70	3.73
14813.00	89.11	272.43	6691.52	509.68 S	8696.93 W	8711.47	3.41
14860.00	88.59	272.60	6692.47	507.62 S	8743.87 W	8758.26	1.16
14907.00	89.38	272.70	6693.30	505.45 S	8790.81 W	8805.04	1.71
14954.00	88.06	273.93	6694.35	502.73 S	8837.72 W	8851.75	3.85
15002.00	87.97	275.31	6696.01	498.87 S	8885.54 W	8899.32	2.88
15049.00	87.47	274.28	6697.88	494.95 S	8932.33 W	8945.87	2.43
15097.00	88.95	274.08	6699.38	491.45 S	8980.18 W	8993.49	3.11
15191.00	89.81	274.09	6700.39	484.75 S	9073.94 W	9086.80	0.92
15286.00	90.96	273.42	6699.75	478.53 S	9168.73 W	9181.17	1.39
15333.00	91.91	274.04	6698.58	475.47 S	9215.61 W	9227.85	2.42
15380.00	89.14	272.26	6698.15	472.89 S	9262.53 W	9274.58	7.01
15427.00	90.31	273.68	6698.38	470.46 S	9309.47 W	9321.34	3.92
15475.00	89.38	270.79	6698.51	468.58 S	9357.43 W	9369.15	6.32
15522.00	90.46	272.60	6698.57	467.19 S	9404.40 W	9416.00	4.48
15570.00	90.31	272.30	6698.25	465.13 S	9452.36 W	9463.79	0.70
15665.00	86.39	271.51	6700.98	461.97 S	9547.25 W	9558.41	4.21
15759.00	86.33	269.55	6706.95	461.10 S	9641.05 W	9652.06	2.08
15854.00	86.60	267.86	6712.80	463.25 S	9735.84 W	9746.84	1.80
15949.00	88.03	266.29	6717.26	468.10 S	9830.61 W	9841.73	2.23
16042.00	87.84	265.28	6720.61	474.93 S	9923.29 W	9934.64	1.11
16136.00	90.34	265.47	6722.10	482.51 S	10016.97 W	10028.58	2.66
16231.00	90.86	264.34	6721.10	490.95 S	10111.58 W	10123.49	1.31
16294.00	90.86	264.34	6720.16	497.16 S	10174.27 W	10186.41	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 CLOSURE OF 267.20 DEGREES (GRID)
A TOTAL CORRECTION OF 7.84 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16294.00 FEET
IS 10186.41 FEET ALONG 267.20 DEGREES (GRID)**