

PCGK - Pressure Case Gamma

1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	09-Jun-14	10-Jun-14	16-Jun-14		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.840	6.750	4.970		
Log Start Depth (MD, ft)	877.00	5,943.00	6,985.00		
Log End Depth (MD, ft)	5,943.00	6,985.00	16,014.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	04-Jun-14 17:48	09-Jun-14 20:10	11-Jun-14 13:21		
Drill/Wipe End Date and Time	04-Jun-14 17:48	10-Jun-14 09:29	15-Jun-14 14:40		
Min Inc (deg) @ Depth (MD, ft)	0.10 @ 5,711.00	0.65 @ 5,949.00	87.72 @ 8,827.00		
Max Inc (deg) @ Depth (MD, ft)	11.22 @ 3,720.00	83.76 @ 6,931.00	92.25 @ 15,793.00		
Bit TFA(in2) / Bit Type	1.05 / PDC	1.74 / PDC	0.98 / PDC		
Flow Rate (gpm)	595.70	529.65	313.53		
Max AV (fpm) / CV (fpm) @ MWD	NA / NA	NA / NA	0.0 / NA		
Fluid Type	Native/Spud Mud	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.60 / 34.00	11.00 / 39.00	9.37 / 37.00		
Filtrate CL (ppm)	1,500.00	1,600.00	2,350.00		
pH / Fluid Loss (mptm)	9.30 / 14	9.60 / 8	9.70 / 6		
PV (cP) / YP (lbf2)	5 / 6.00	11 / 11.00	7 / 13.00		
% Solids / % Sand	2.10 / 0.75	12.40 / 0.25	5.90 / 0.02		
% Oil / Oil:Water Ratio	NA / NA	NA / NA	2.30 / NA		
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Max Tool Temp (in F) / S	159.40 / PCM	127.00 / PCM	224.50 / PCM		

Max Tool Temp (degF) / Source	150.10 / PCM	167.00 / PCM	234.50 / PCM		
Rm @ Max Tool Temp (degF)	NA @ 150.10	NA @ 167.00	NA @ 234.50		
Lead MWD Engineer	Kyle Wass	Kyle Wass	Kyle Wass		
Customer Representative	Jim Turner	Jim Turner	Jim Turner		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11341336	11341336	12365886		
Insert Serial Number	11145581	11145581	11145581		
Date and Time Initialized	08-Jun-14 03:26	01-Jan-70 00:00	10-Jun-14 22:27		
Date and Time Read	10-Jun-14 15:43	10-Jun-14 15:47	16-Jun-14 01:25		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	56.00	54.00	64.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341336	11341336	12365886		
Sonde Serial Number	11638573	11638573	11638573		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	330.58	189.05	59.25		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.21	46.92	67.20		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341336	11341336	12365886		
Insert/Sonde Serial Number	11120591	11120591	11120591		

REMARKS

1. All depths are calibrated to driller's pipe tally and are measured from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham 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:
 - 1: 600 Log
PGRC (Gamma CG) and ROPA (Average Rate of Penetration)
Interval Resolution: 1.0 ft
Interval Distance: 3.0 ft
 - 1: 240 Log
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
 - ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft

Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft

6. Insite Version V8.0.10

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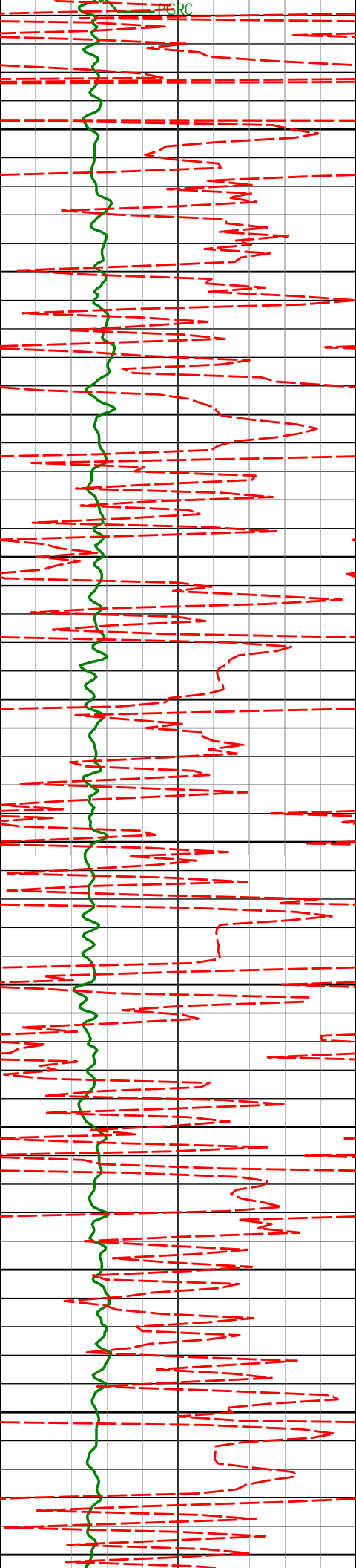
HALLIBURTON

Sperry Drilling Services

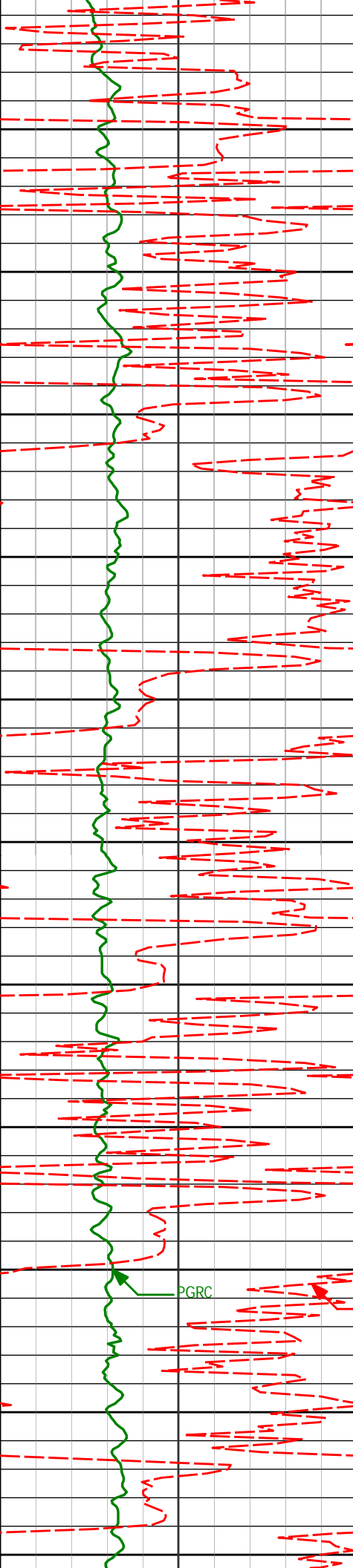
MD Correlation Log 1:600

Noble Energy
NCLP AA06-68-1BHNC
H&P 321
Sec. 4-T6N-R63W





1050				
1089'	0.70°	217.69°	1088.95'	6.61'
1100				
1150				
1183'	0.99°	72.02°	1182.95'	6.20'
1200				
1250				
1274'	1.22°	50.03°	1273.93'	4.67'
1300				
1350				
1366'	1.39°	53.48°	1365.91'	2.98'
1400				
1450	1457'	1.49°	50.58°	1456.88'
1500				
1550	1549'	0.20°	301.42°	1548.87'



1600

1642'

0.15°

246.15°

1641.87'

0.56'

1650

1700

1735'

0.15°

107.39°

1734.87'

0.55'

1750

1800

1828'

0.22°

15.69°

1827.87'

0.38'

1850

1900

1921'

0.25°

336.59°

1920.87'

0.40'

1950

2000

2015'

0.37°

41.73°

2014.86'

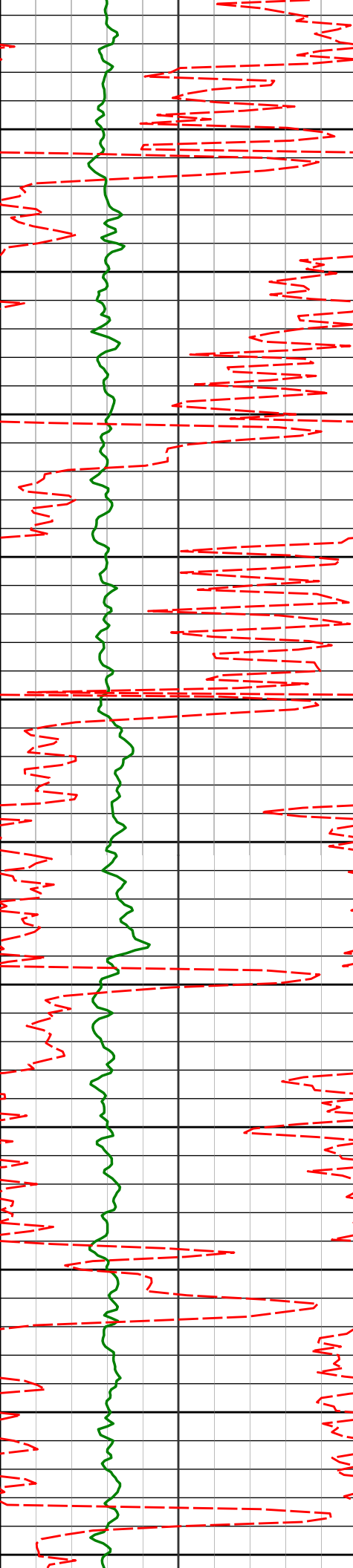
0.27'

2050

2100

PGRC

ROPA



2150

2200

2250

2300

2350

2400

2450

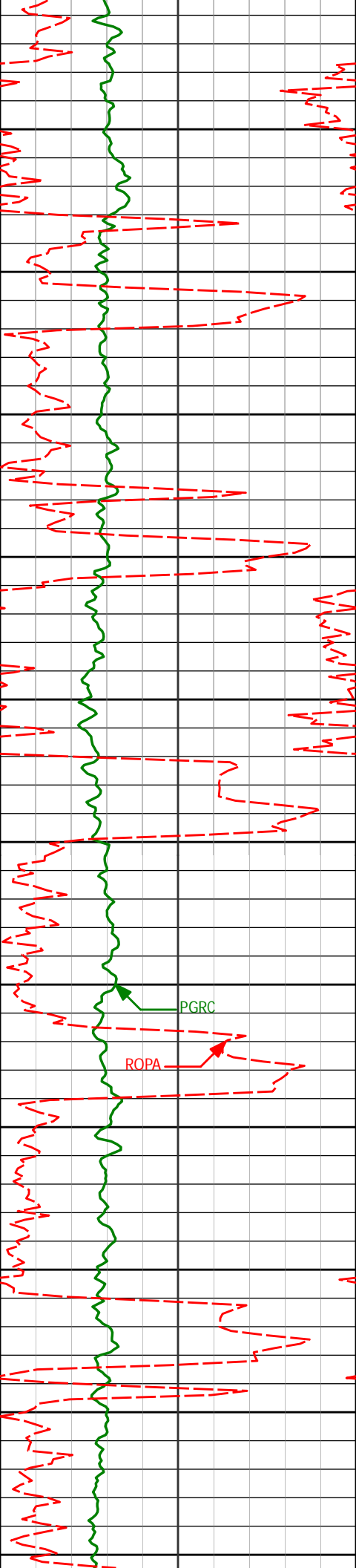
2500

2550

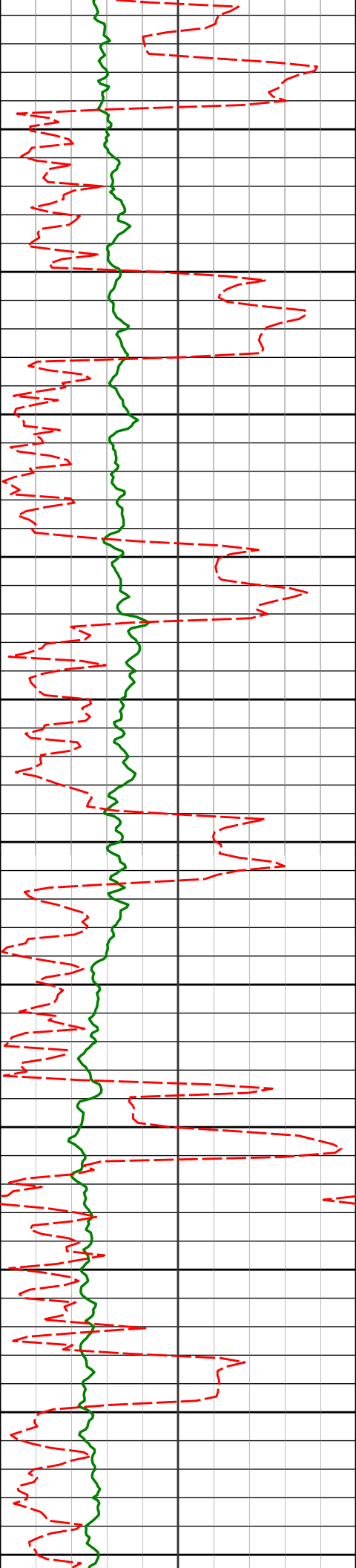
2600

2650

2110'	0.35°	24.11°	2109.86'	-0.07'
2204'	0.72°	55.44°	2203.86'	-0.70'
2299'	0.83°	75.89°	2298.85'	-1.88'
2394'	1.03°	60.08°	2393.84'	-3.31'
2488'	1.29°	67.25°	2487.82'	-5.05'
2583'	1.08°	90.51°	2582.80'	-6.94'



2677'	1.55°	76.45°	2676.77'	-9.07'
2700				
2750				
2772'	0.21°	204.55°	2771.76'	-10.25'
2800				
2867'	2.64°	226.31°	2866.73'	-8.54'
2900				
2962'	4.12°	225.44°	2961.56'	-4.38'
3000				
3057'	6.18°	222.94°	3056.17'	1.77'
3100				
3151'	5.60°	210.61°	3149.68'	7.84'
3200				



3250

3246'

6.99°

217.45°

3244.10'

14.04'

3300

3341'

8.26°

228.04°

3338.27'

22.97'

3350

3400

3436'

9.23°

231.72°

3432.16'

34.37'

3450

3500

3531'

8.88°

232.25°

3525.98'

46.50'

3550

3600

3625'

10.24°

236.48°

3618.67'

59.54'

3650

3700

3720'

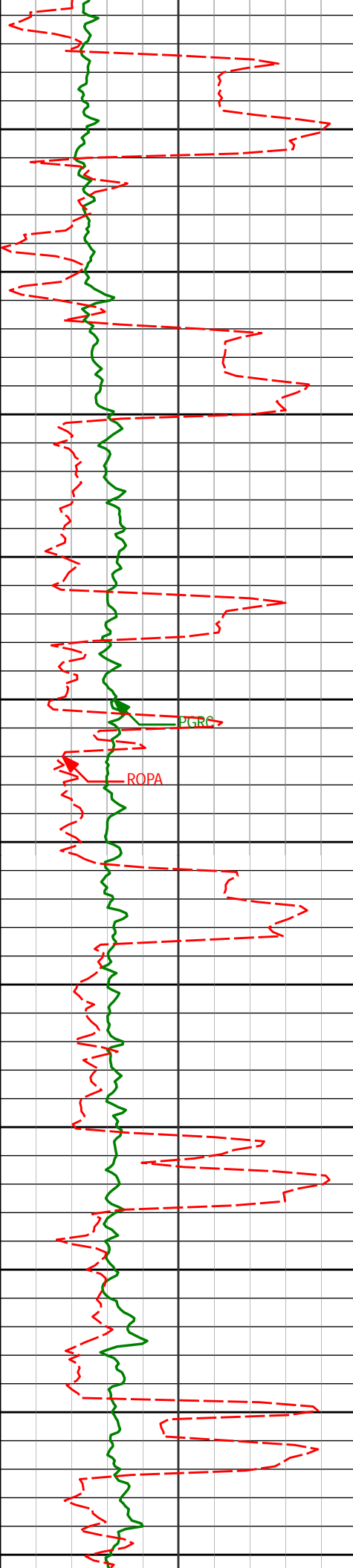
11.22°

237.89°

3712.01'

74.76'

3750



3800

3815'

10.01°

239.19°

3805.38'

90.02'

3850

3900

3909'

8.16°

235.27°

3898.20'

102.82'

3950

4000

4004'

7.28°

234.23°

3992.34'

113.51'

4050

4100

4099'

8.45°

231.91°

4086.44'

124.18'

4150

4200

4194'

9.29°

230.71°

4180.31'

135.95'

4250

4300

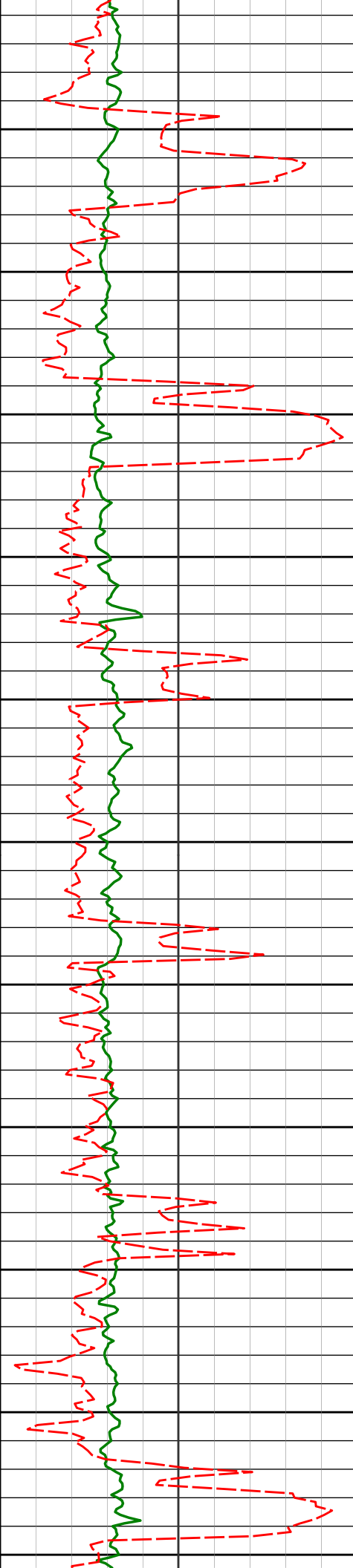
4289'

8.75°

241.26°

4274.14'

148.53'



4350

4383'

8.86°

240.21°

4367.03'

161.34'

4400

4450

4478'

10.29°

233.15°

4460.71'

174.81'

4500

4550

4573'

9.14°

230.50°

4554.34'

187.79'

4600

4650

4668'

7.04°

227.30°

4648.39'

198.22'

4700

4750

4763'

6.05°

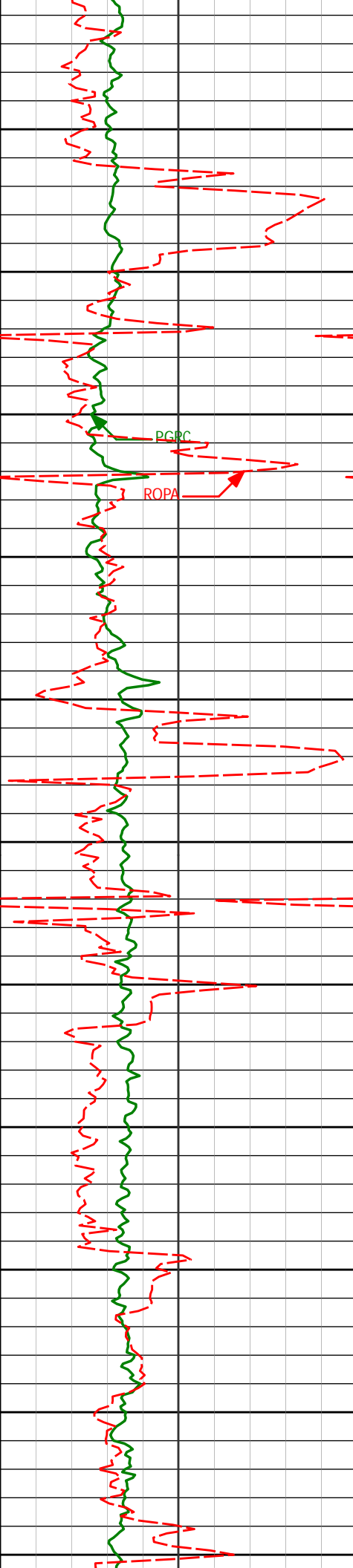
223.28°

4742.77'

206.21'

4800

4850



4900

4950

5000

5050

5100

5150

5200

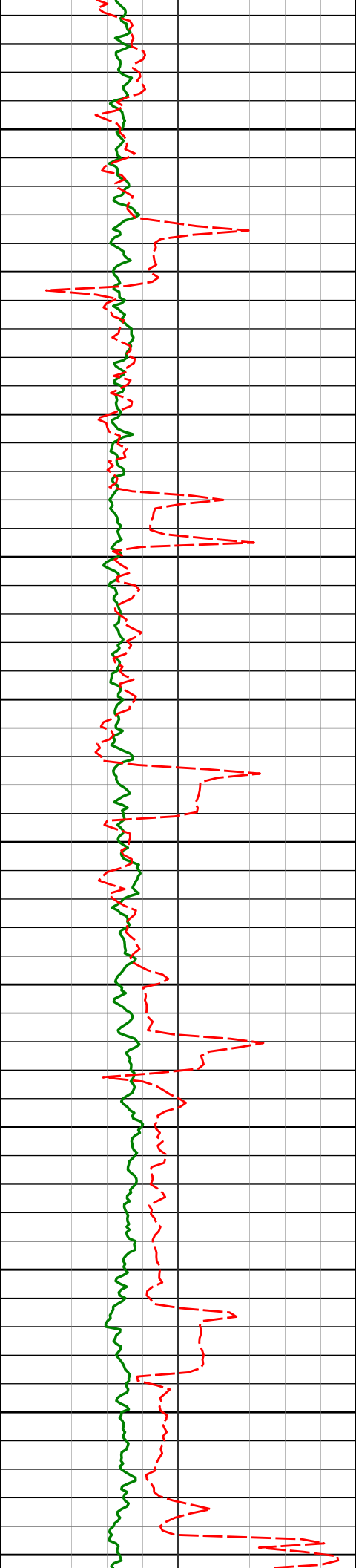
5250

5300

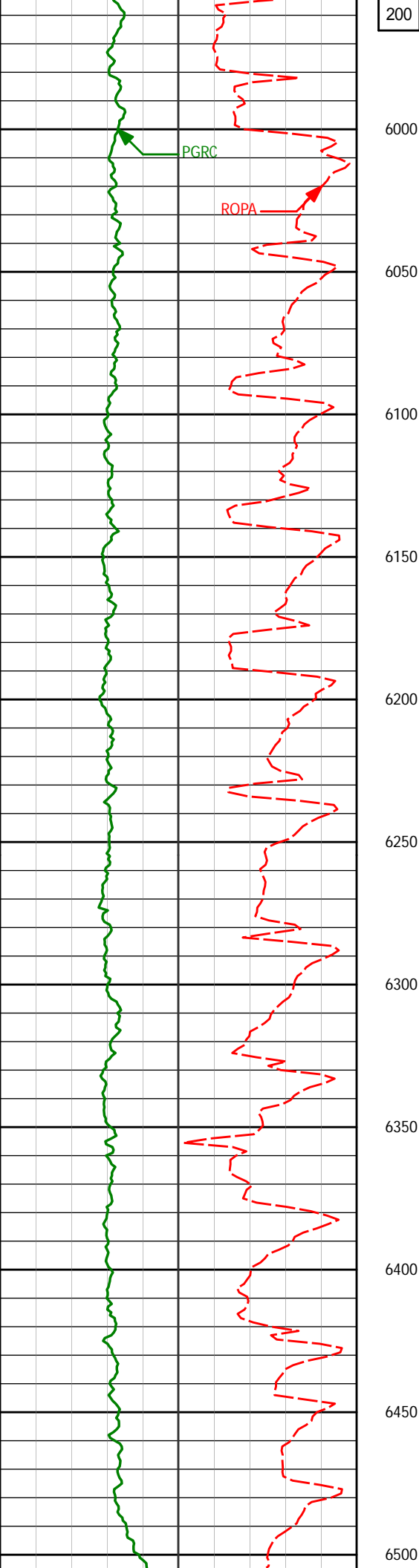
5350

5400

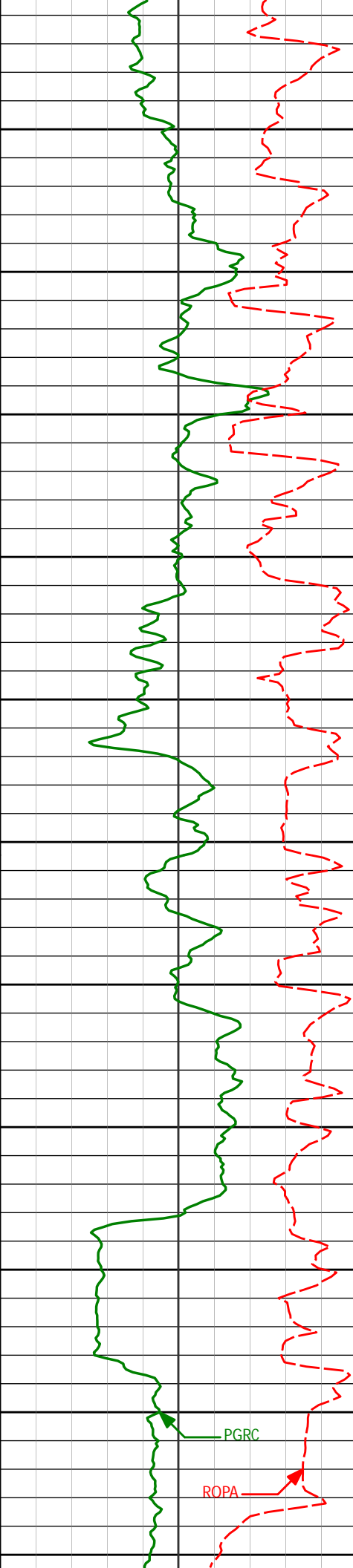
4857'	3.99°	230.14°	4836.41'	212.33'
4952'	0.70°	251.38°	4931.32'	215.51'
5047'	1.41°	279.50°	5026.30'	217.21'
5142'	0.35°	37.67°	5121.29'	218.17'
5237'	0.62°	329.82°	5216.29'	218.22'
5332'	0.36°	330.11°	5311.29'	218.60'



	5427'	0.51°	103.25°	5406.28'	218.33'
5450					
5500					
	5522'	0.51°	96.33°	5501.28'	217.51'
5550					
5600					
	5616'	0.52°	89.28°	5595.28'	216.67'
5650					
5700					
	5711'	0.10°	312.01°	5690.28'	216.30'
5750					
5800					
	5806'	0.59°	328.04°	5785.27'	216.60'
5850					
5900					
	5887'	0.50°	342.83°	5866.27'	216.90'
5950					
	5949'	0.65°	292.53°	5928.27'	217.29'



5994'	1.01°	276.69°	5973.26'	217.91'
6042'	5.33°	265.45°	6021.18'	220.56'
6090'	9.46°	262.37°	6068.77'	226.71'
6138'	12.94°	264.47°	6115.85'	236.01'
6184'	15.47°	268.75°	6160.44'	247.29'
6232'	19.37°	268.46°	6206.23'	261.65'
6279'	23.57°	268.40°	6249.96'	278.85'
6327'	28.26°	270.34°	6293.12'	299.81'
6374'	31.40°	267.48°	6333.89'	323.18'
6422'	36.12°	264.23°	6373.79'	349.82'
6469'	40.90°	264.31°	6410.55'	379.02'



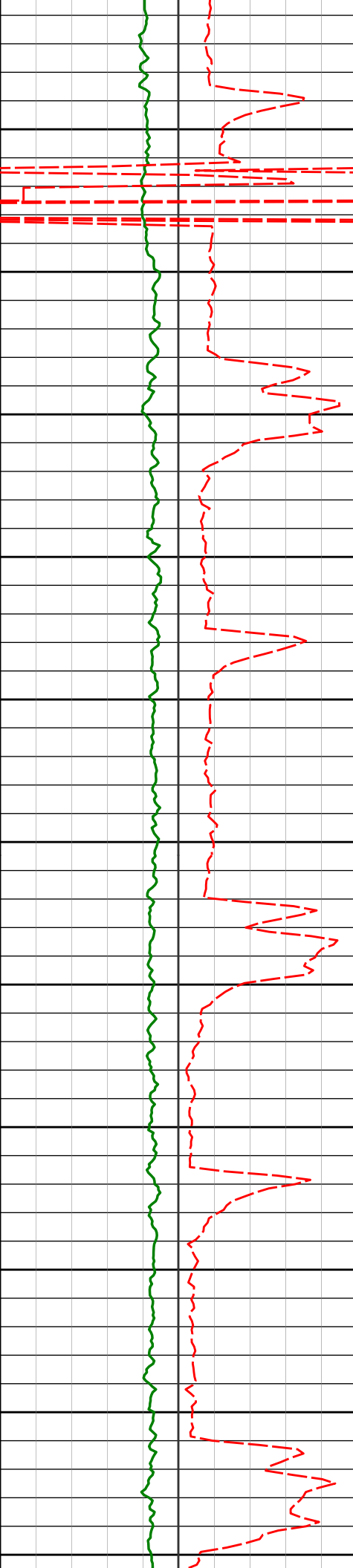
300

7000

PGRC

ROPA

6517'	46.88°	267.20°	6445.13'	412.25'
6550				
6564'	52.49°	269.31°	6475.53'	448.07'
6600				
6612'	58.04°	270.37°	6502.87'	487.48'
6650				
6658'	62.73°	269.72°	6525.60'	527.43'
6700				
6706'	66.57°	270.18°	6546.14'	570.77'
6750				
6753'	68.36°	270.21°	6564.16'	614.14'
6800				
6801'	69.88°	269.51°	6581.26'	658.96'
6850				
6848'	72.83°	269.85°	6596.29'	703.46'
6900				
6896'	78.18°	271.21°	6608.30'	749.86'
6950				
6931'	83.76°	271.91°	6613.79'	784.34'
7000				
7026'	89.14°	270.38°	6619.67'	878.96'
7050				



7100

7121'

90.06°

271.24°

6620.33'

973.83'

7150

7200

7215'

89.14°

269.91°

6620.99'

1067.71'

7250

7300

7310'

90.22°

270.52°

6621.52'

1162.62'

7350

7400

7404'

89.23°

267.94°

6621.97'

1256.58'

7450

7500

7499'

89.23°

263.16°

6623.25'

1351.47'

7550

7600

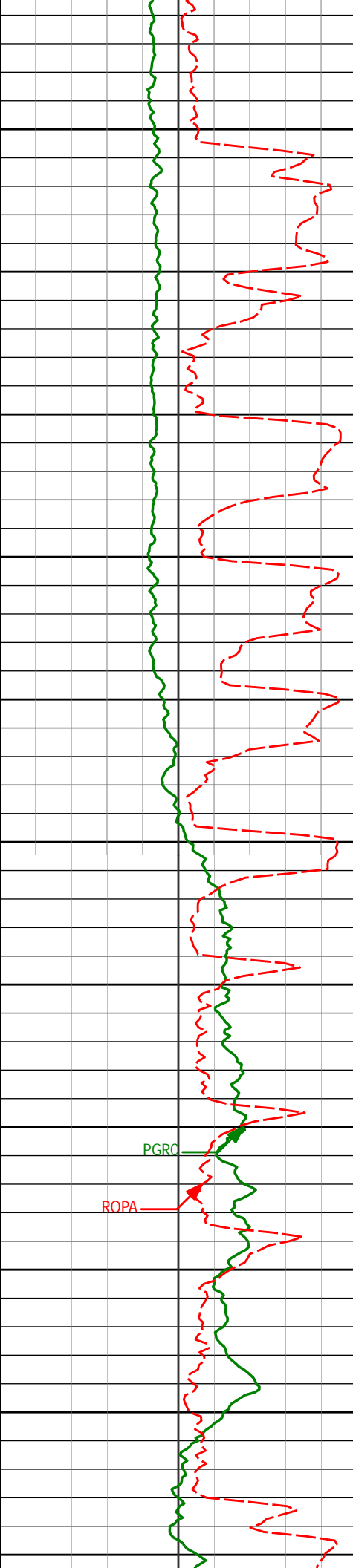
7594'

88.92°

261.14°

6624.78'

1445.99'



7650

7689'

87.90°

262.45°

6627.42'

1540.43'

7700

7750

7784'

88.80°

264.51°

6630.15'

1635.11'

7800

7850

7879'

90.15°

268.46°

6631.03'

1730.06'

7900

7950

7974'

90.40°

269.32°

6630.57'

1825.05'

8000

8050

8069'

90.74°

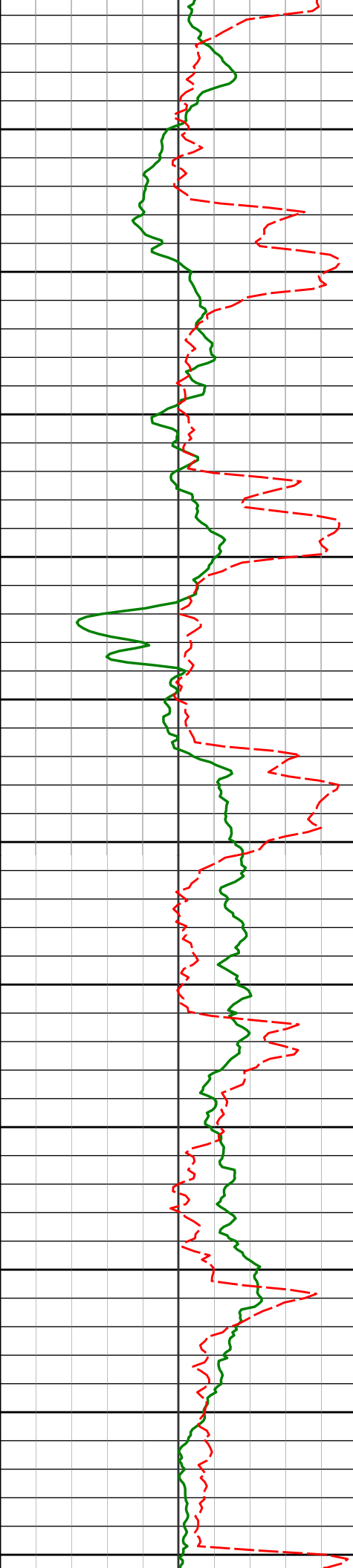
268.51°

6629.62'

1920.02'

8100

8150



8200

8250

8300

8350

8400

8450

8500

8550

8600

8650

8700

8163'

91.54°

269.36°

6627.75'

2013.98'

8258'

91.20°

269.82°

6625.48'

2108.91'

8353'

90.71°

269.99°

6623.90'

2203.83'

8447'

89.04°

269.60°

6624.10'

2297.77'

8542'

88.89°

268.51°

6625.82'

2392.73'

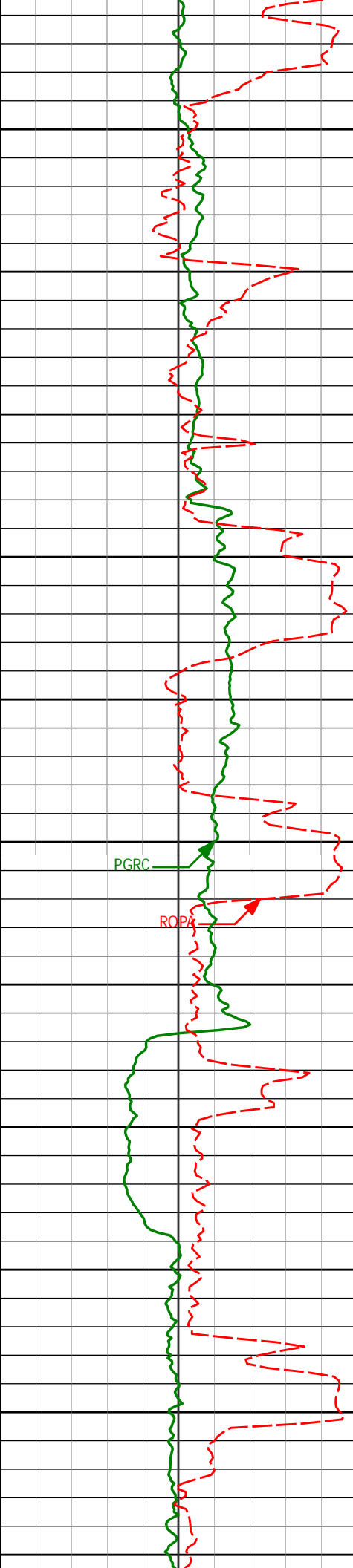
8637'

88.58°

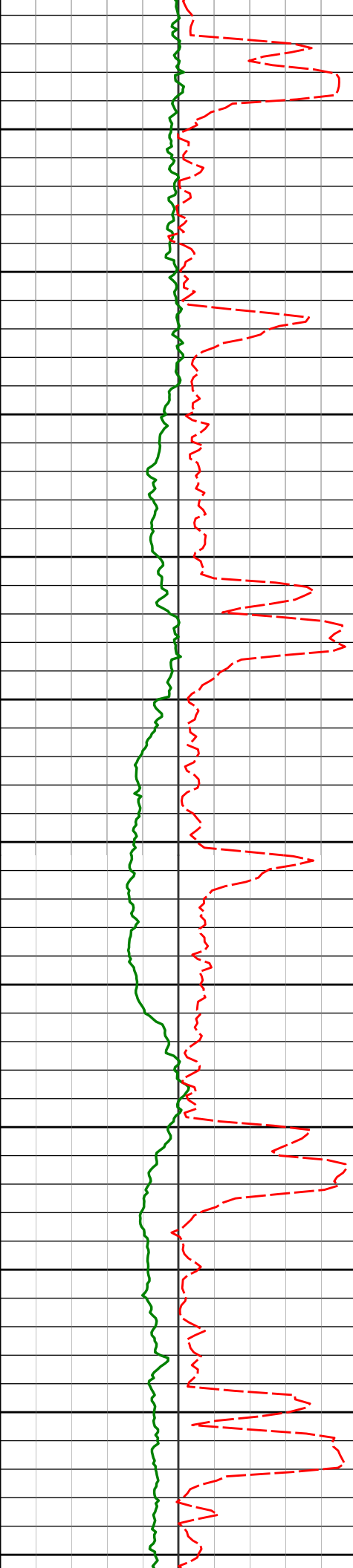
268.03°

6627.92'

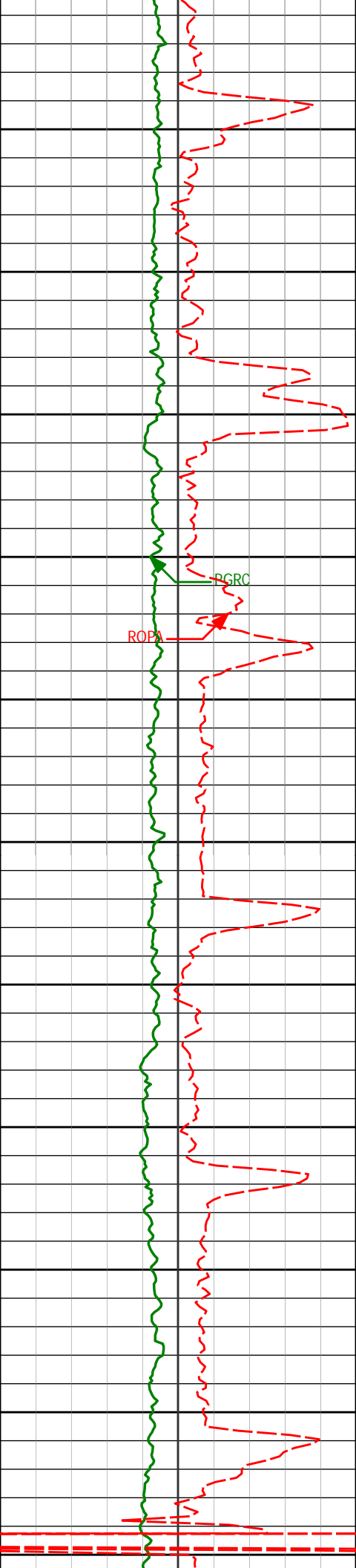
2487.71'



8732'	88.86°	268.86°	6630.04'	2582.68'
8750				
8800				
8827'	87.72°	267.76°	6632.88'	2677.63'
8850				
8900				
8922'	88.61°	269.64°	6635.92'	2772.56'
8950				
9000				
9017'	89.29°	270.46°	6637.66'	2867.47'
9050				
9100				
9111'	89.01°	269.89°	6639.05'	2961.38'
9150				
9200				
9206'	89.75°	270.05°	6640.08'	3056.31'
9250				



9300	9301'	90.31°	269.48°	6640.03'	3151.25'
9350					
9400	9396'	89.41°	269.23°	6640.26'	3246.22'
9450					
9500	9490'	91.11°	269.60°	6639.84'	3340.17'
9550					
9600	9585'	90.96°	268.76°	6638.12'	3435.13'
9650					
9700	9680'	91.29°	269.66°	6636.26'	3530.08'
9750					
9800	9775'	89.97°	269.01°	6635.21'	3625.04'



9850

9869'

90.12°

268.85°

6635.14'

3719.02'

9900

9950

9964'

89.23°

269.60°

6635.68'

3813.99'

10000

ROPA

RGRC

10050

10057'

89.63°

270.13°

6636.60'

3906.93'

10100

10150

10149'

89.66°

270.00°

6637.17'

3998.85'

10200

10250

10241'

89.91°

270.33°

6637.52'

4090.77'

10300

10333'

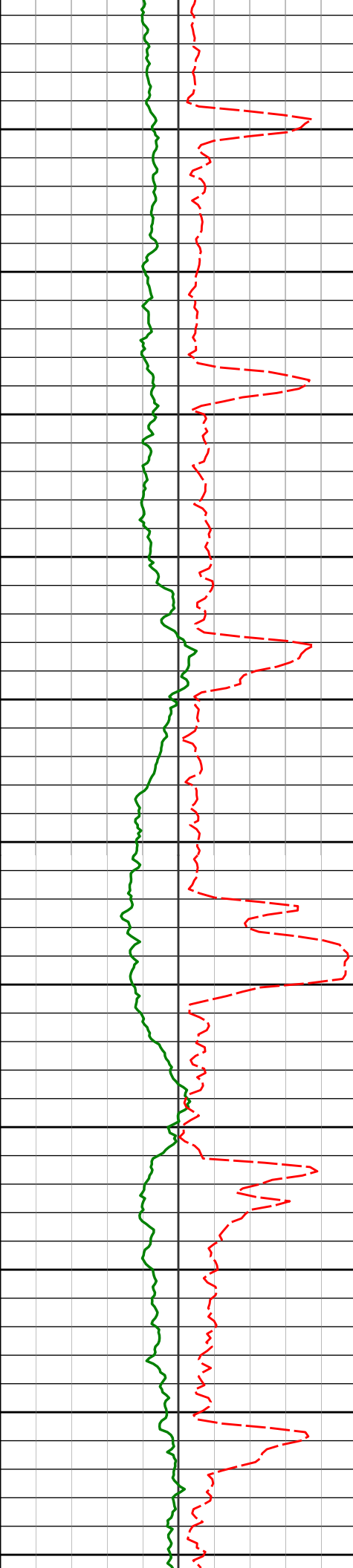
89.01°

269.18°

6638.38'

4182.71'

10350



10400

10425'

88.98°

269.09°

6640.00'

4274.68'

10450

10500

10518'

88.83°

269.09°

6641.77'

4367.64'

10550

10600

10610'

88.55°

268.87°

6643.88'

4459.59'

10650

10700

10701'

90.06°

268.87°

6644.98'

4550.57'

10750

10793'

90.22°

268.52°

6644.76'

4642.56'

10850

10884'

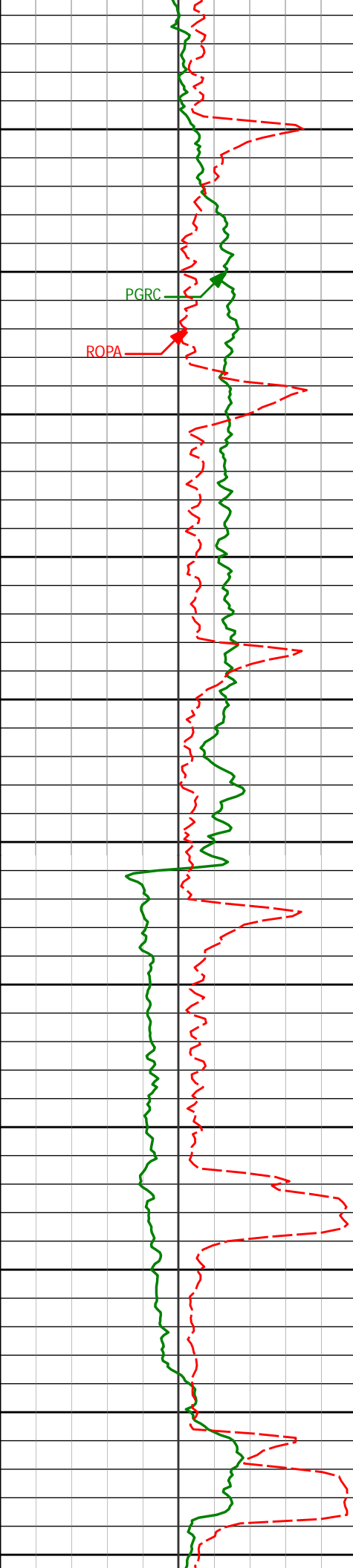
90.22°

267.98°

6644.41'

4733.55'

10900



10950

10977'

90.52°

268.18°

6643.81'

4826.55'

11000

PGRC

ROPA

11050

11071'

89.94°

267.75°

6643.43'

4920.55'

11100

11150

11162'

89.78°

267.82°

6643.65'

5011.55'

11200

11250

11254'

88.34°

267.95°

6645.16'

5103.53'

11300

11350

11345'

89.14°

267.81°

6647.16'

5194.51'

11400

11450

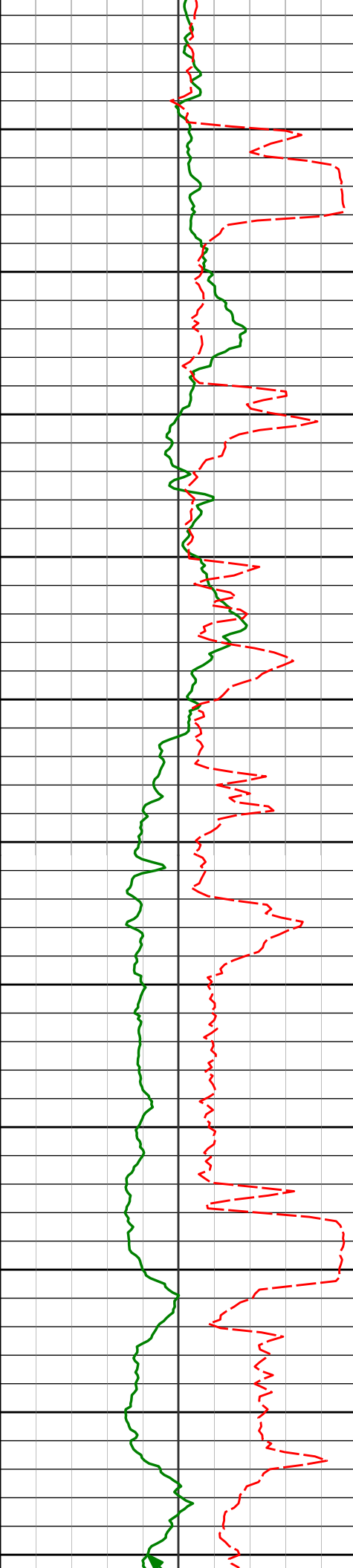
11437'

89.01°

268.62°

6648.65'

5286.49'



11500

11530'

89.66°

269.01°

6649.73'

5379.47'

11550

11600

11623'

89.94°

268.68°

6650.05'

5472.46'

11650

11700

11716'

89.54°

268.35°

6650.47'

5565.45'

11750

11800

11809'

88.89°

268.06°

6651.75'

5658.44'

11850

11900

11903'

91.11°

269.16°

6651.75'

5752.42'

11950

12000

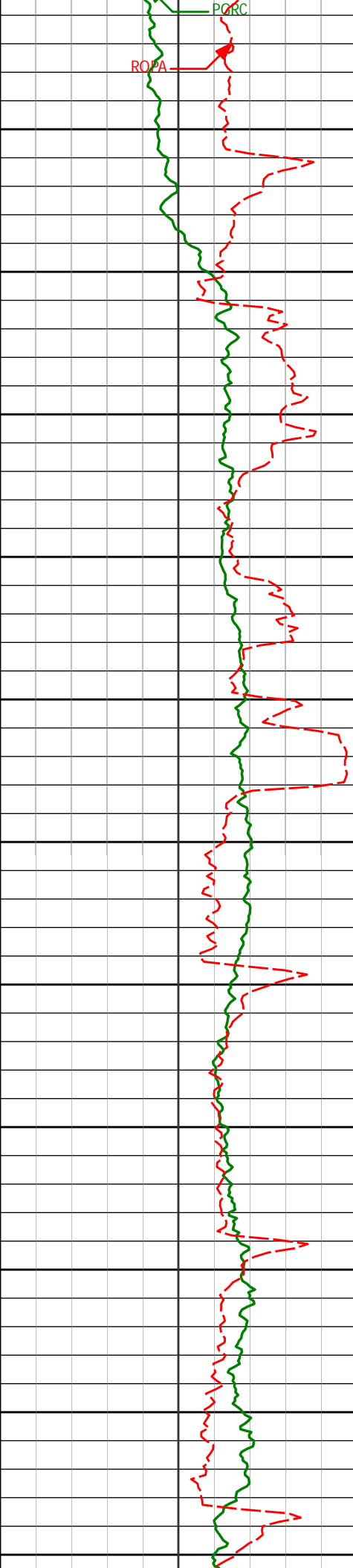
11998'

91.36°

269.02°

6649.70'

5847.38'



12050

12092'

91.17°

268.41°

6647.63'

5941.34'

12100

12150

12187'

90.43°

267.97°

6646.30'

6036.33'

12200

12250

12282'

90.37°

269.26°

6645.64'

6131.31'

12300

12350

12377'

90.03°

269.27°

6645.30'

6226.28'

12400

12450

12471'

90.06°

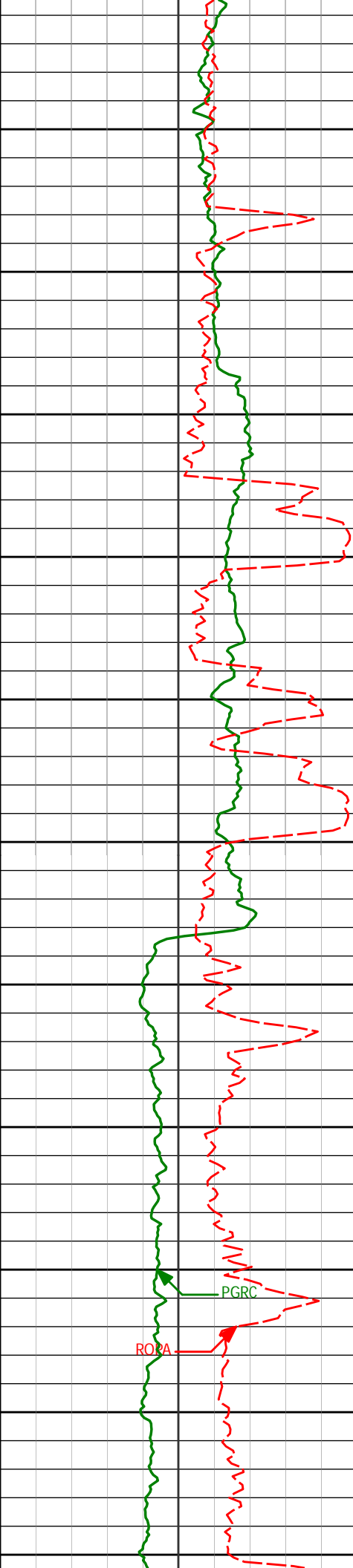
269.44°

6645.23'

6320.25'

12500

12550



12600

12650

12700

12750

12800

12850

12900

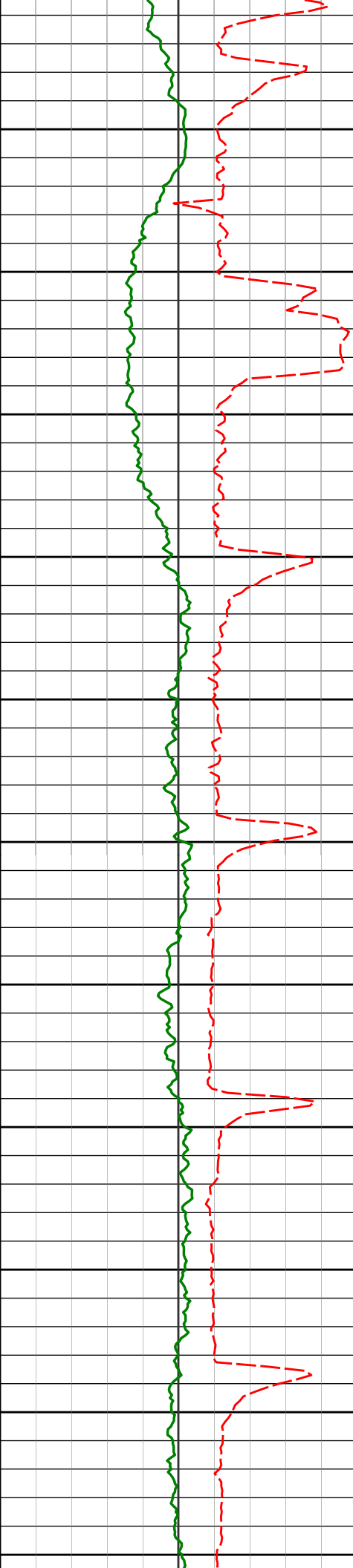
12950

13000

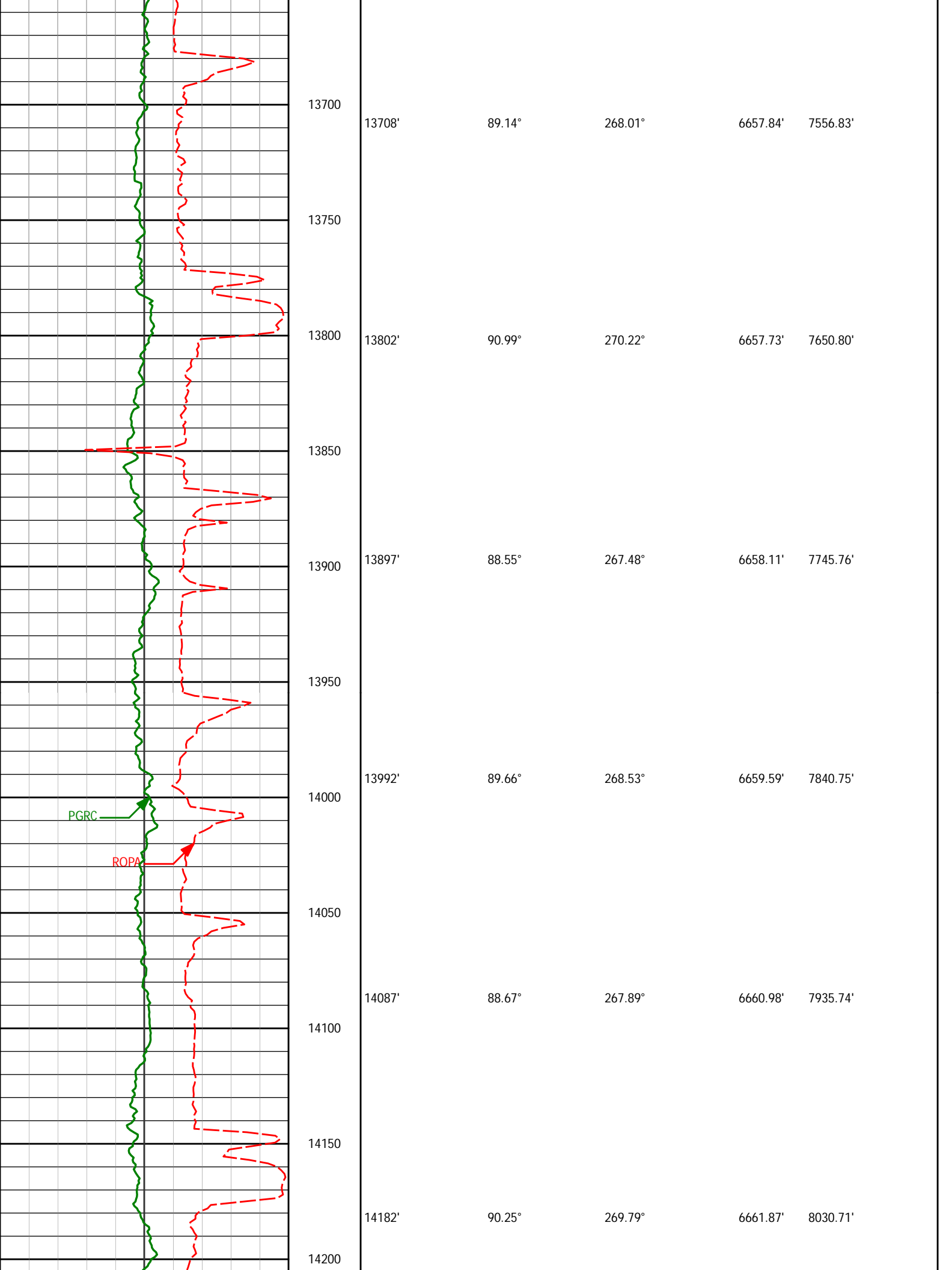
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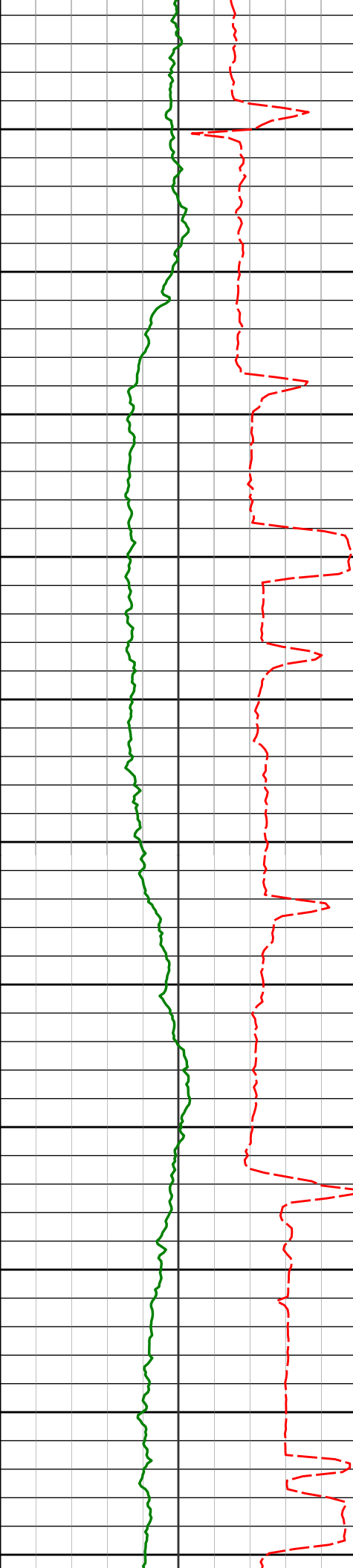
13100

12566'	89.41°	268.70°	6645.67'	6415.22'
12661'	88.58°	268.11°	6647.34'	6510.20'
12756'	89.48°	268.48°	6648.94'	6605.18'
12850'	89.63°	269.58°	6649.67'	6699.16'
12945'	89.20°	269.71°	6650.64'	6794.10'
13040'	88.80°	269.37°	6652.30'	6889.05'

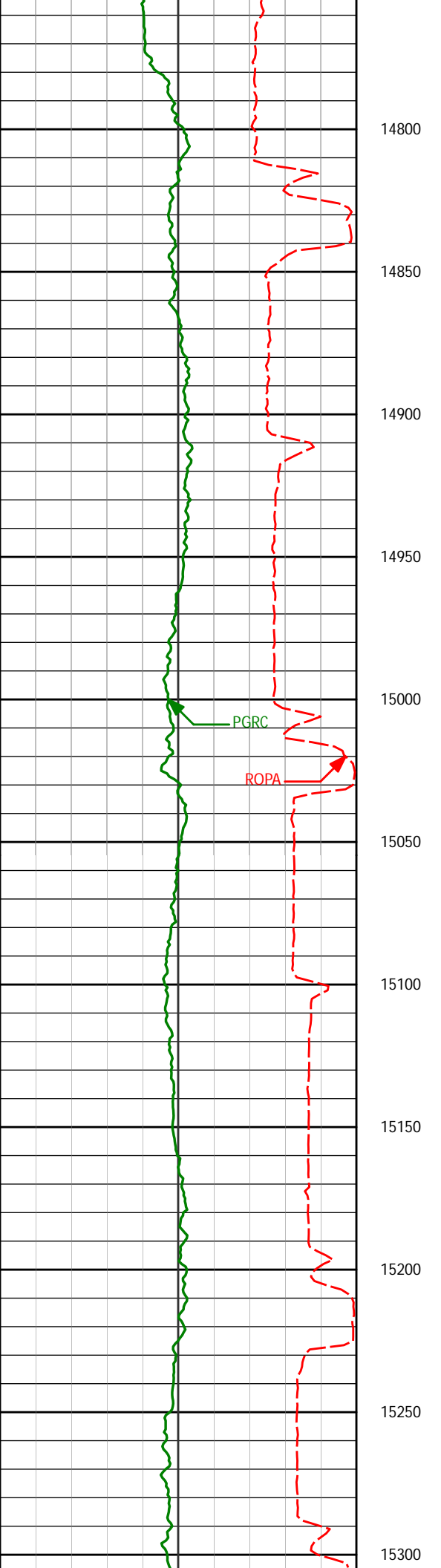


13140'	88.52°	268.97°	6654.64'	6988.99'
13150				
13200				
13234'	90.31°	269.20°	6655.60'	7082.96'
13250				
13300				
13329'	90.71°	269.63°	6654.75'	7177.92'
13350				
13400				
13424'	88.86°	268.43°	6655.11'	7272.89'
13450				
13500				
13518'	89.81°	269.28°	6656.20'	7366.87'
13550				
13600				
13613'	89.54°	268.71°	6656.74'	7461.84'
13650				

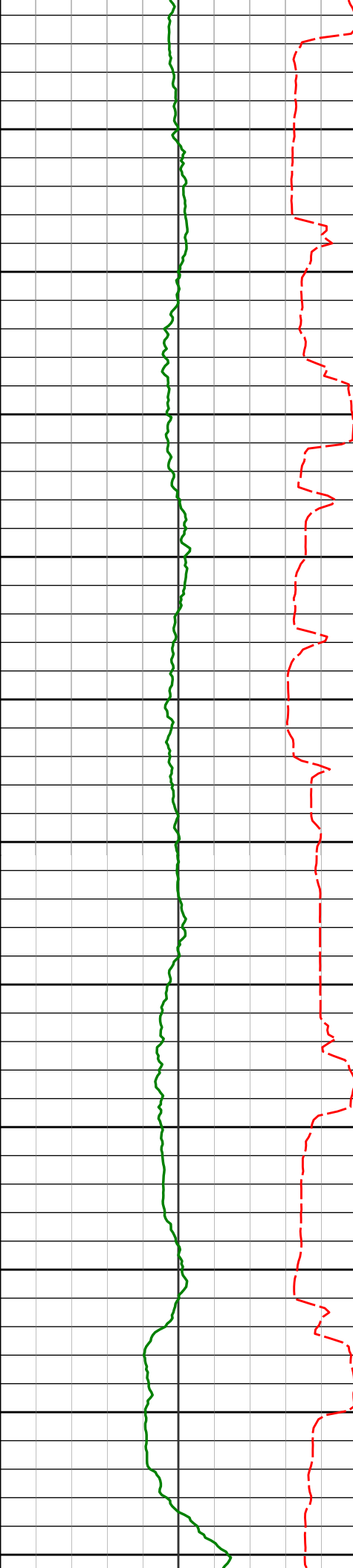




14250				
	14276'	88.61°	268.09°	6662.81' 8124.68'
14300				
14350				
	14371'	88.74°	268.32°	6665.01' 8219.65'
14400				
14450				
	14466'	89.75°	268.61°	6666.26' 8314.64'
14500				
14550				
	14561'	90.43°	268.52°	6666.11' 8409.63'
14600				
14650				
	14655'	89.35°	267.43°	6666.29' 8503.62'
14700				
14750	14750'	89.41°	268.85°	6667.32' 8598.61'



14800				
14845'	90.03°	269.46°	6667.78'	8693.58'
14850				
14900				
14940'	89.26°	268.48°	6668.37'	8788.56'
14950				
15000				
15035'	90.31°	269.47°	6668.73'	8883.54'
15050				
15100				
15130'	88.92°	267.10°	6669.36'	8978.52'
15150				
15200				
15225'	90.37°	267.83°	6669.95'	9073.52'
15250				
15300				



15320'	89.60°	266.78°	6669.98'	9168.51'
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15350

15400

15414'	89.54°	266.17°	6670.68'	9262.48'
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15450

15500

15509'	90.59°	268.26°	6670.58'	9357.47'
--------	--------	---------	----------	----------

15550

15600

15604'	89.44°	266.04°	6670.55'	9452.46'
--------	--------	---------	----------	----------

15650

15700

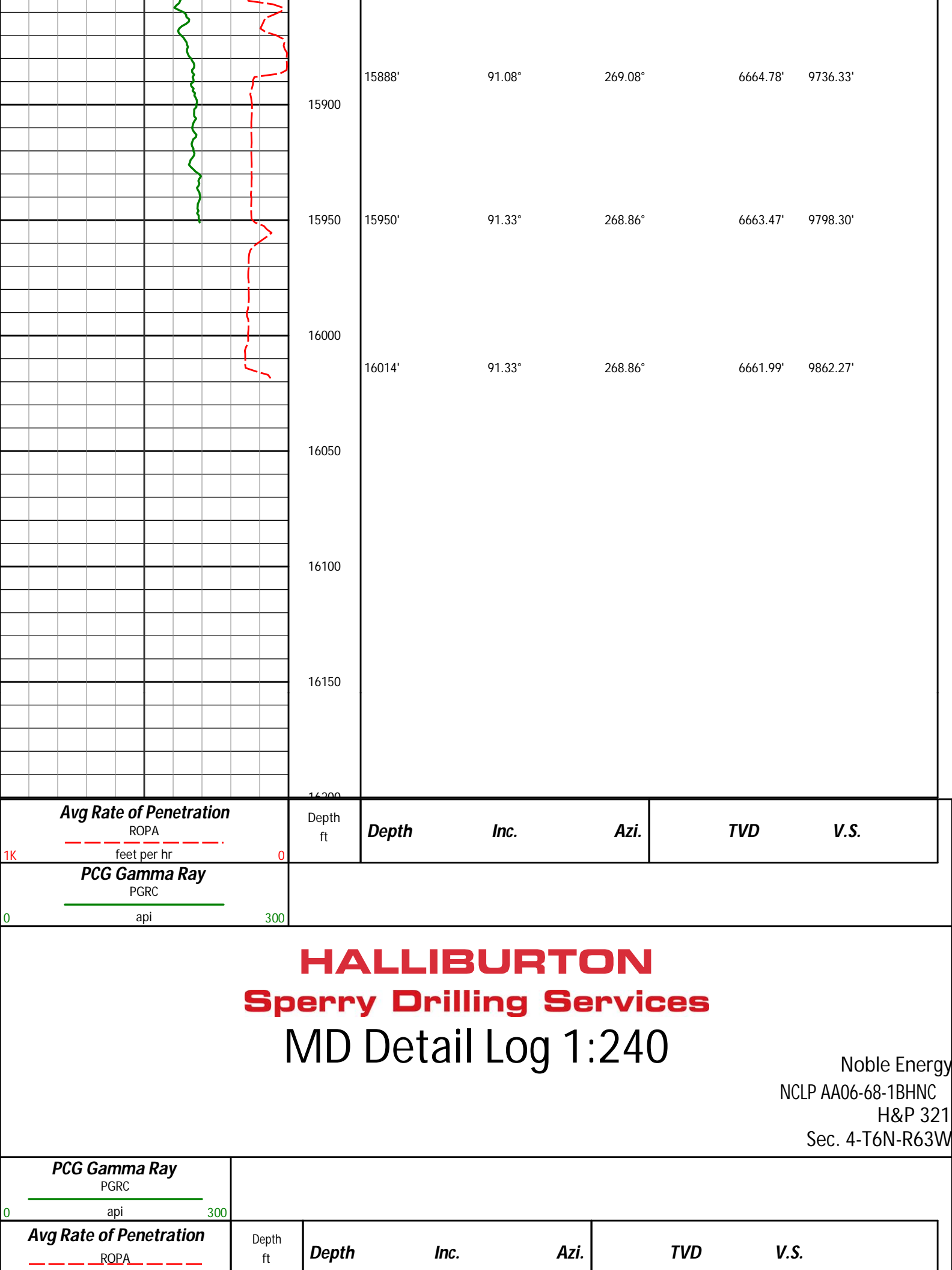
15699'	90.99°	267.14°	6670.19'	9547.43'
--------	--------	---------	----------	----------

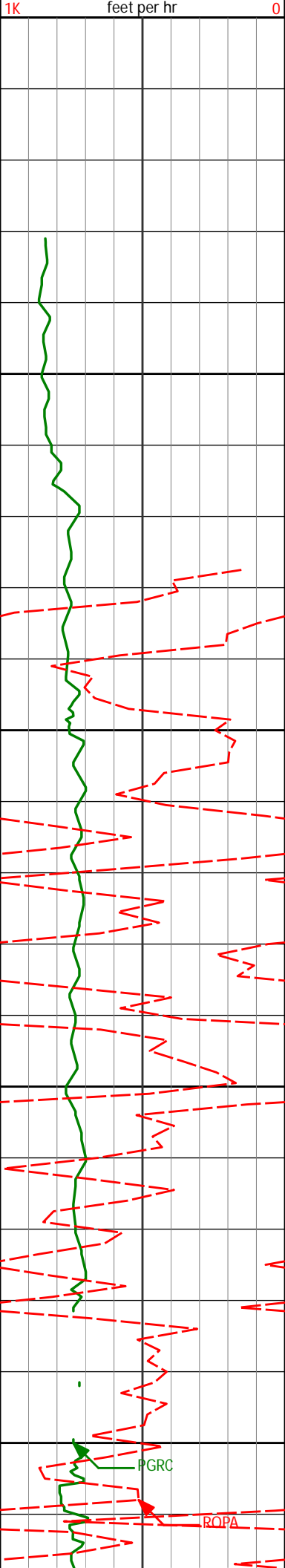
15750

15800

15793'	92.25°	268.82°	6667.54'	9641.39'
--------	--------	---------	----------	----------

15850





100

850

852'

0.50°

206.97°

851.97'

5.22'

900

905'

0.52°

219.42°

904.96'

5.49'

950

1000

996'

0.70°

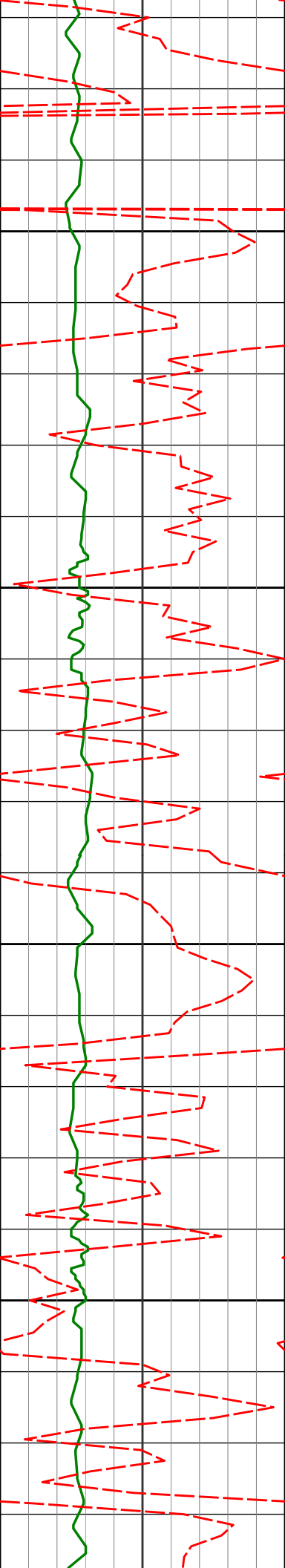
203.19°

995.96'

6.00'

PGRC

ROPA



1050

1100

1150

1200

1089'

0.70°

217.69°

1088.95'

6.61'

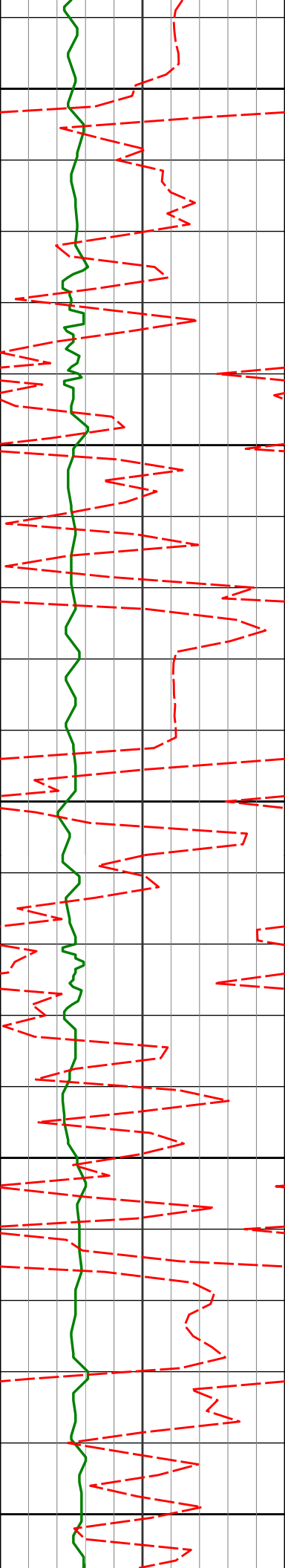
1183'

0.99°

72.02°

1182.95'

6.20'



1250

1274'

1.22°

50.03°

1273.93'

4.67'

1300

1350

1366'

1.39°

53.48°

1365.91'

2.98'

1400

1450

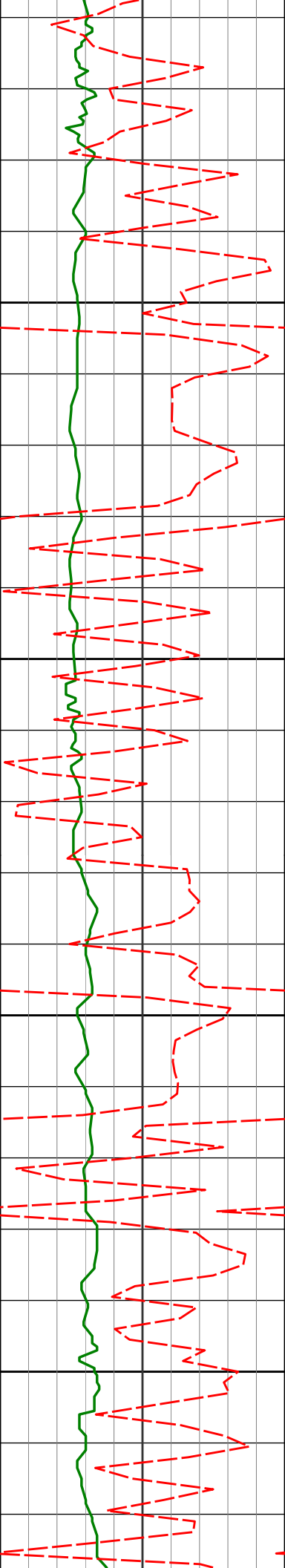
1457'

1.49°

50.58°

1456.88'

1.13'



1500

1550

1600

1650

1549'

0.20°

301.42°

1548.87'

0.31'

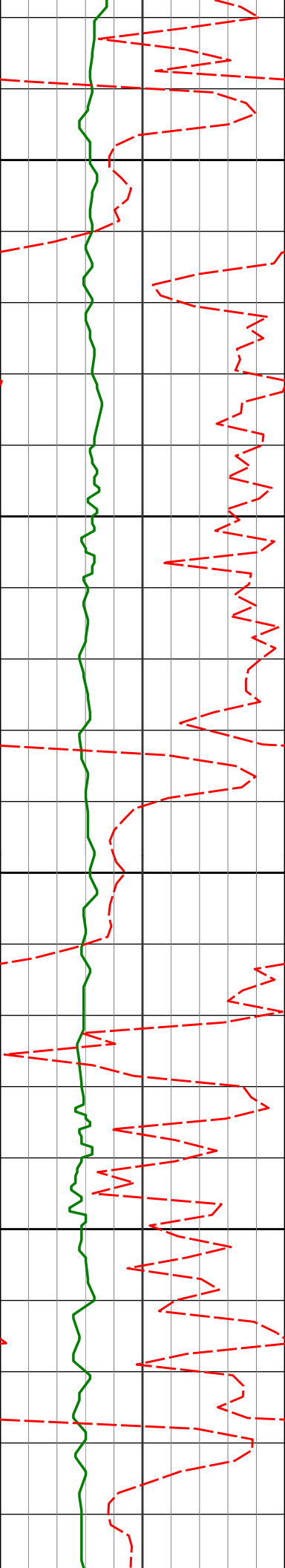
1642'

0.15°

246.15°

1641.87'

0.56'



1700

1750

1800

1850

1735'

0.15°

107.39°

1734.87'

0.55'

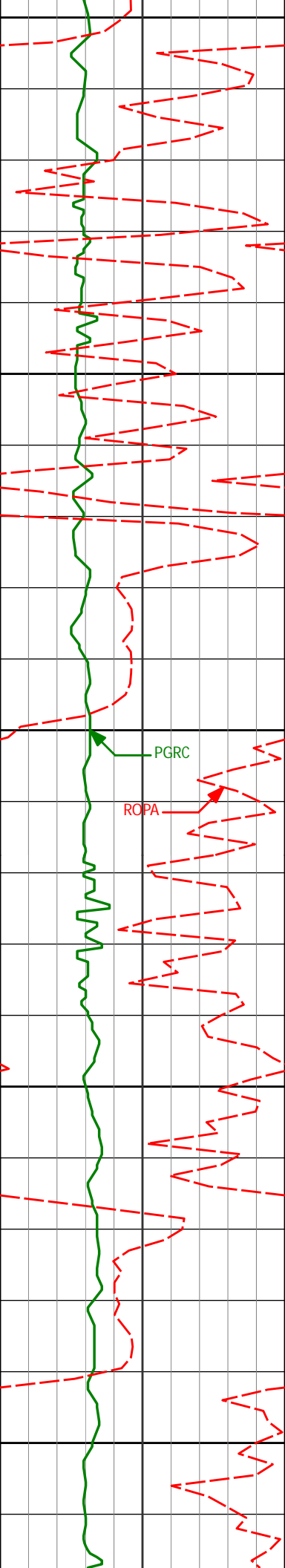
1828'

0.22°

15.69°

1827.87'

0.38'



1900

1921'

0.25°

336.59°

1920.87'

0.40'

1950

2000

2015'

0.37°

41.73°

2014.86'

0.27'

2050

2100

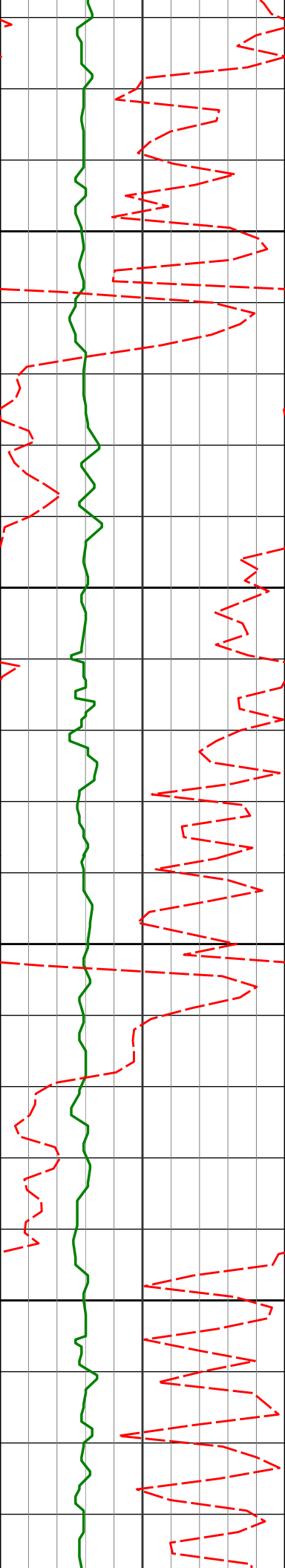
2110'

0.35°

24.11°

2109.86'

-0.07'



2150

2200

2250

2300

2204'

0.72°

55.44°

2203.86'

-0.70'

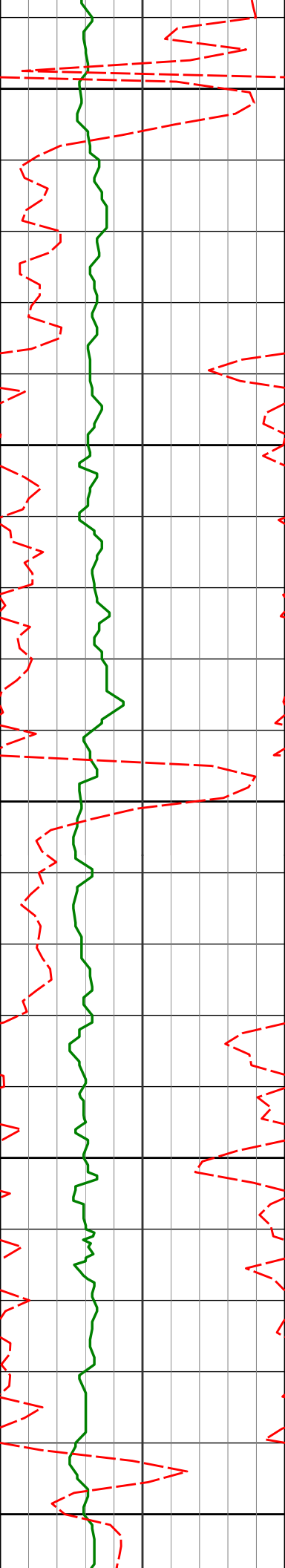
2299'

0.83°

75.89°

2298.85'

-1.88'



2350

2394'

1.03°

60.08°

2393.84'

-3.31'

2400

2450

2488'

1.29°

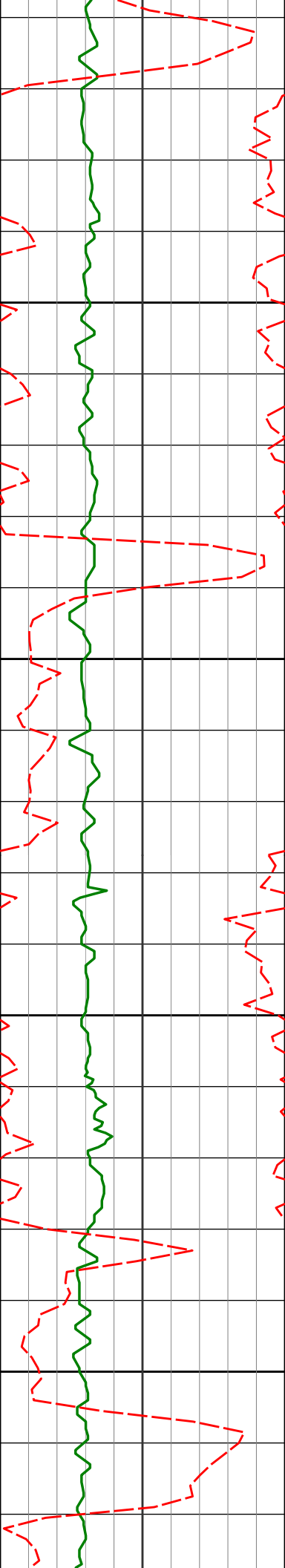
67.25°

2487.82'

-5.05'

2500

2550



2583'

1.08°

90.51°

2582.80'

-6.94'

2600

2650

2677'

1.55°

76.45°

2676.77'

-9.07'

2700

2750

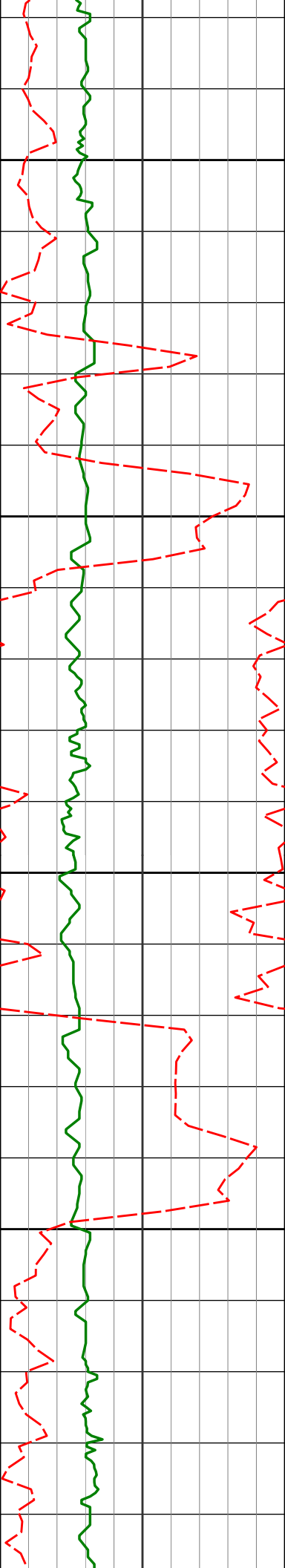
2772'

0.21°

204.55°

2771.76'

-10.25'



2800

2850

2900

2950

2867'

2.64°

226.31°

2866.73'

-8.54'

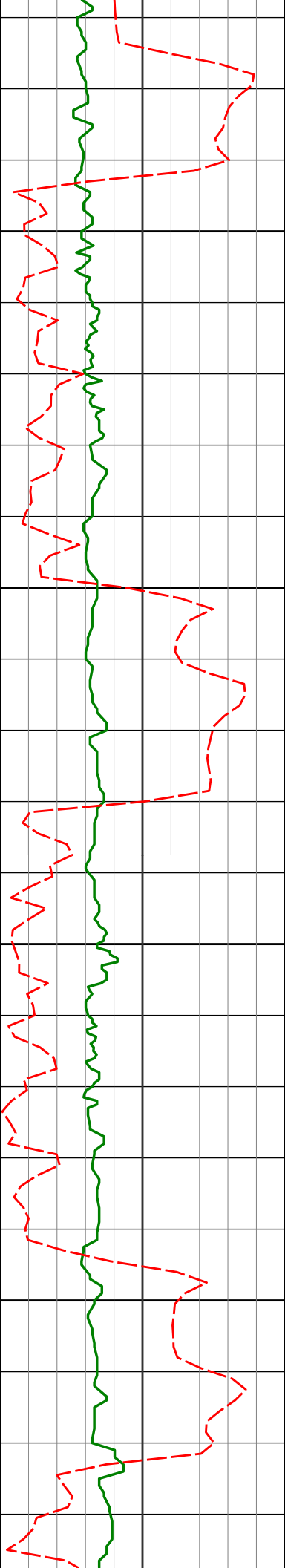
2962'

4.12°

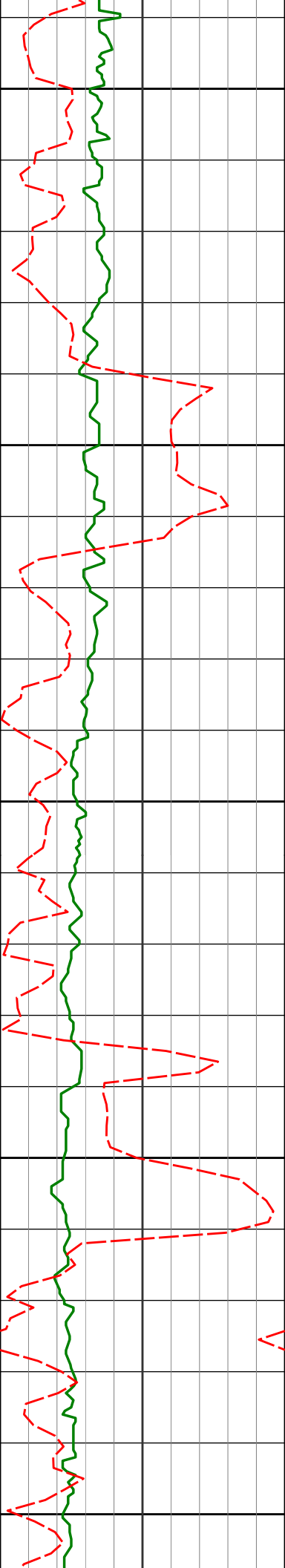
225.44°

2961.56'

-4.38'



3250	3246'	6.99°	217.45°	3244.10'	14.04'
3300					
3350	3341'	8.26°	228.04°	3338.27'	22.97'
3400					
	3436'	9.23°	231.72°	3432.16'	34.37'



3450

3500

3531'

8.88°

232.25°

3525.98'

46.50'

3550

3600

3625'

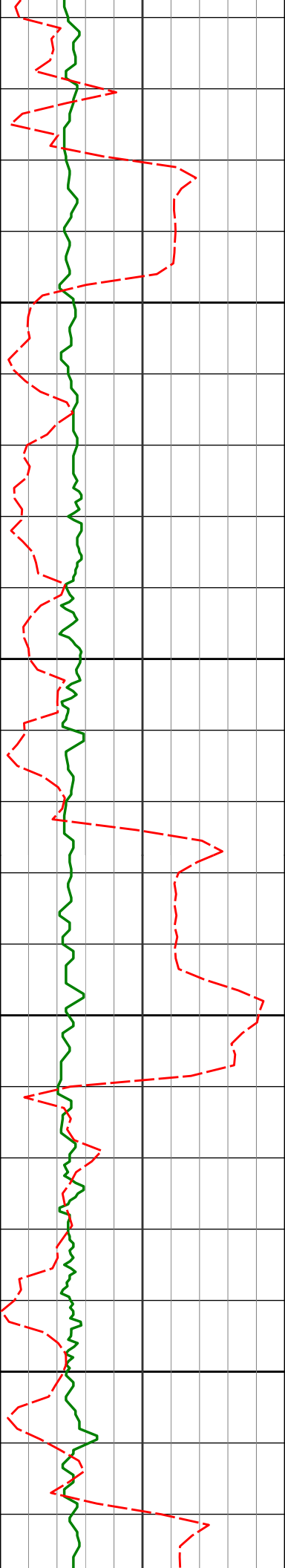
10.24°

236.48°

3618.67'

59.54'

3650



3700

3720'

11.22°

237.89°

3712.01'

74.76'

3750

3800

3815'

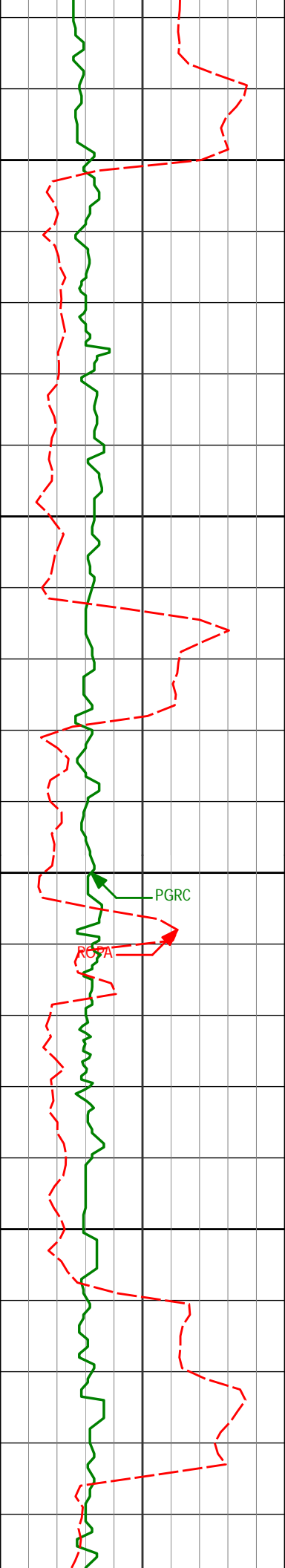
10.01°

239.19°

3805.38'

90.02'

3850



3900

3909'

8.16°

235.27°

3898.20'

102.82'

3950

4000

4004'

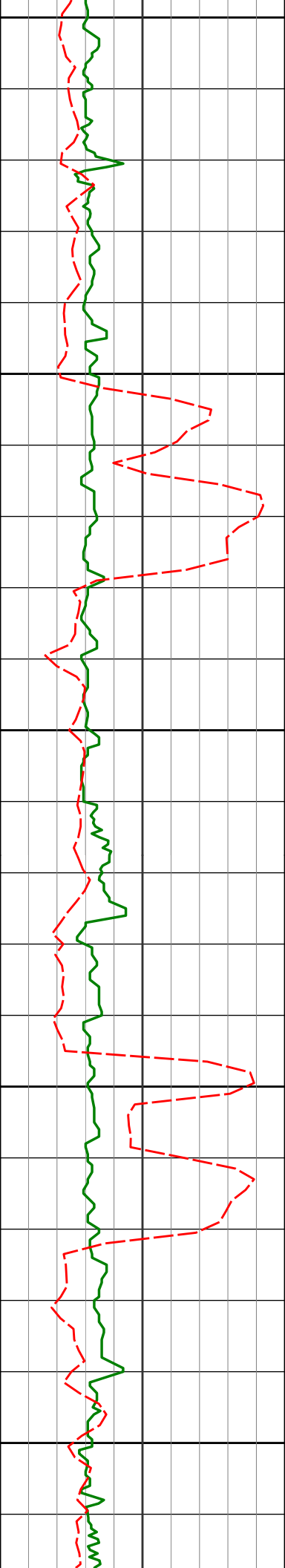
7.28°

234.23°

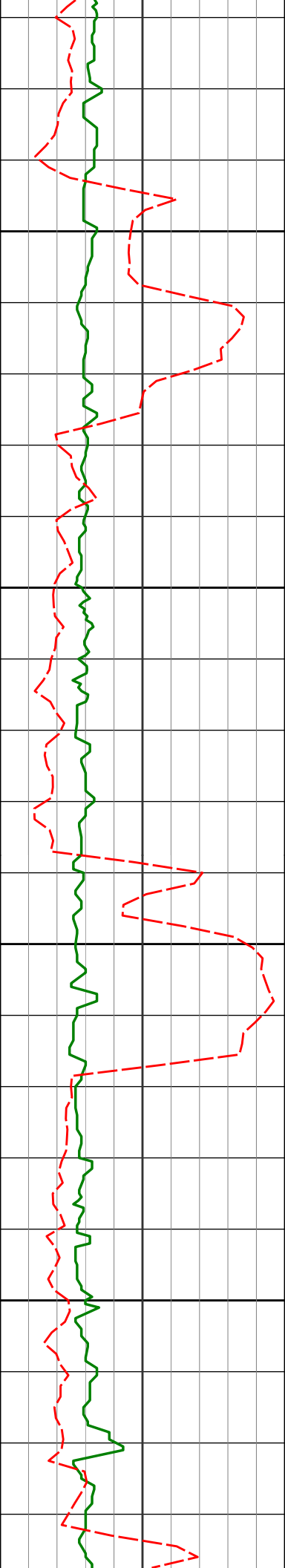
3992.34'

113.51'

4050



4100	4099'	8.45°	231.91°	4086.44'	124.18'
4150					
4194'		9.29°	230.71°	4180.31'	135.95'
4200					
4250					
4289'		8.75°	241.26°	4274.14'	148.53'
4300					



4350

4400

4450

4500

4383'

8.86°

240.21°

4367.03'

161.34'

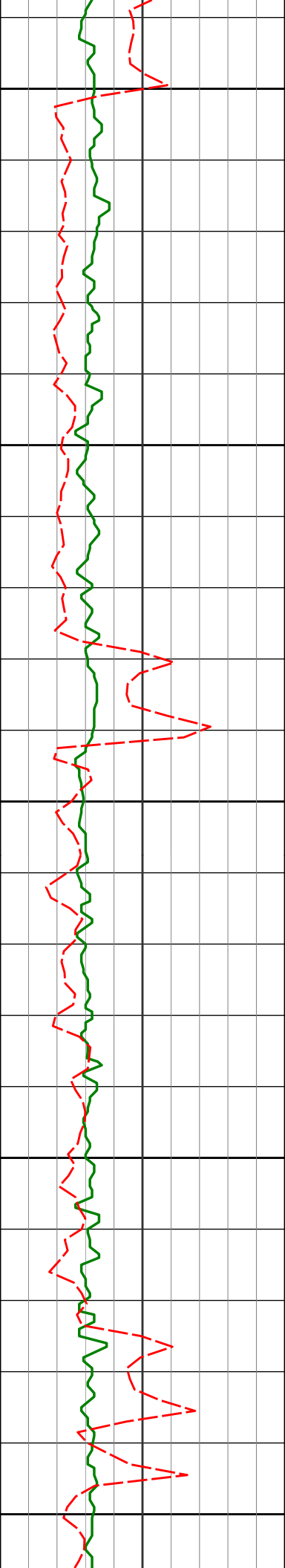
4478'

10.29°

233.15°

4460.71'

174.81'



4550

4573'

9.14°

230.50°

4554.34'

187.79'

4600

4650

4668'

7.04°

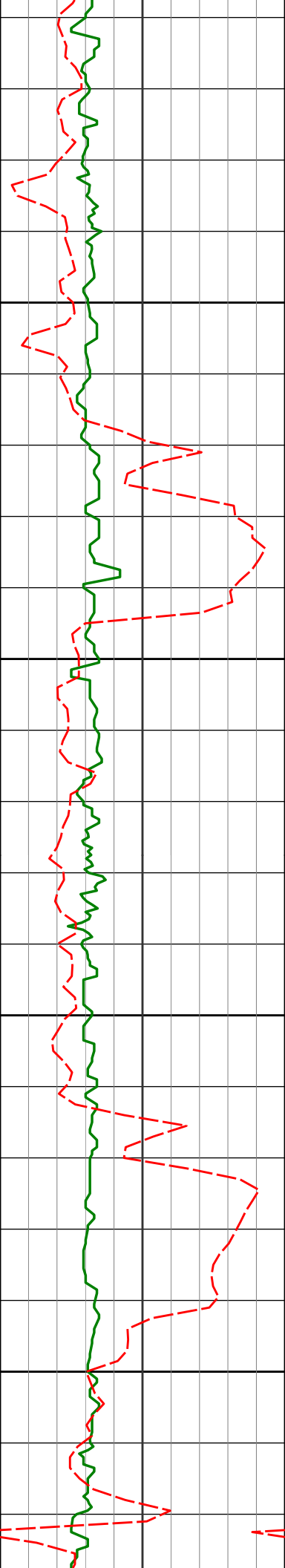
227.30°

4648.39'

198.22'

4700

4750



4763'

6.05°

223.28°

4742.77'

206.21'

4800

4850

4857'

3.99°

230.14°

4836.41'

212.33'

4900

4950

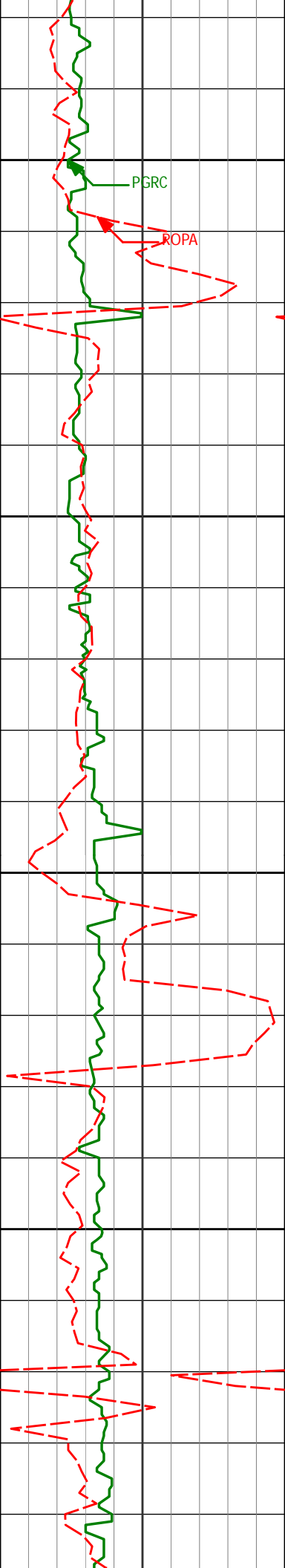
4952'

0.70°

251.38°

4931.32'

215.51'



5000

5050

5100

5150

5047'

1.41°

279.50°

5026.30'

217.21'

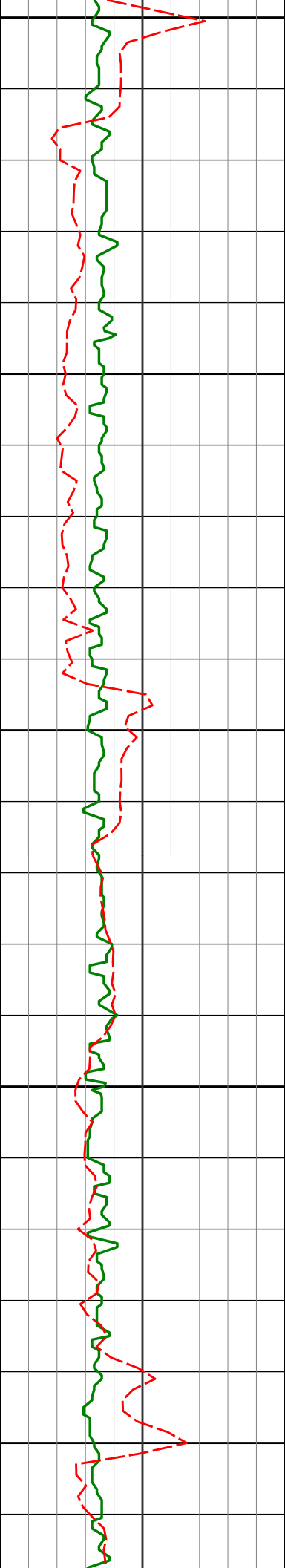
5142'

0.35°

37.67°

5121.29'

218.17'



5200

5237'

0.62°

329.82°

5216.29'

218.22'

5250

5300

5332'

0.36°

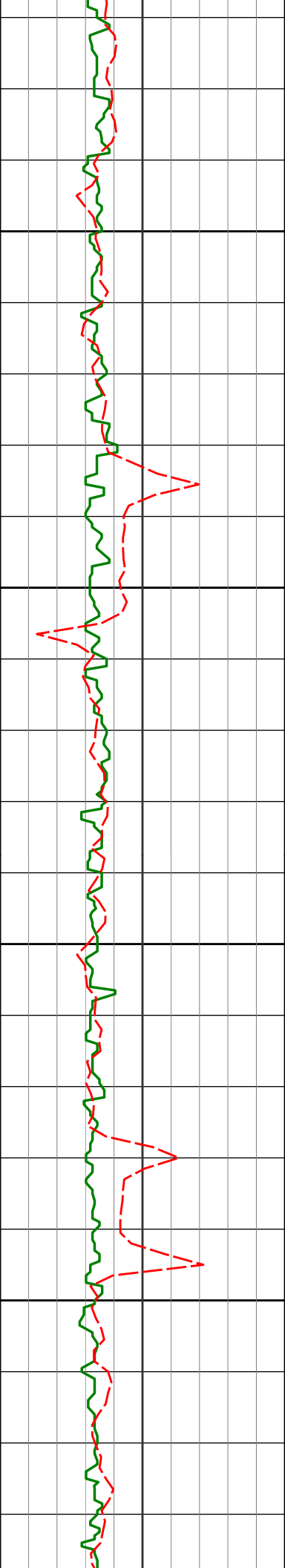
330.11°

5311.29'

218.60'

5350

5400



5427'

0.51°

103.25°

5406.28'

218.33'

5450

5500

5522'

0.51°

96.33°

5501.28'

217.51'

5550

5600

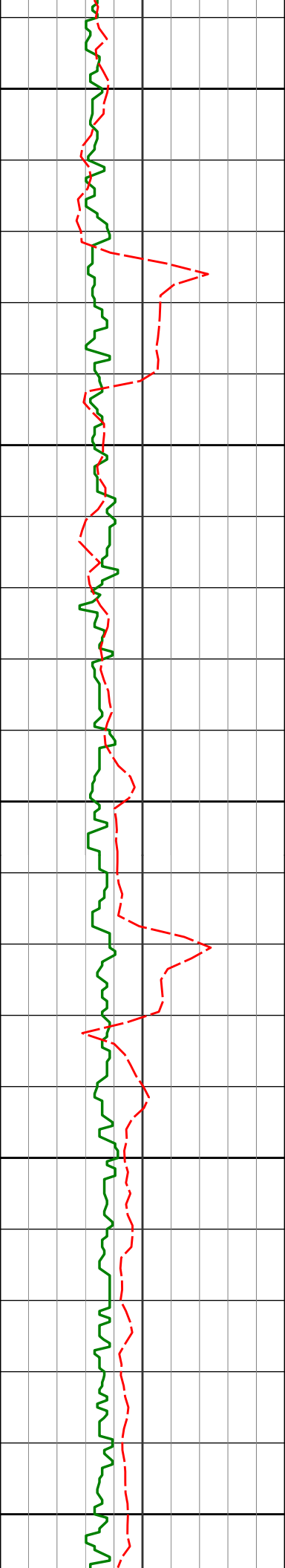
5616'

0.52°

89.28°

5595.28'

216.67'



5650

5700

5750

5800

5850

5711'

0.10°

312.01°

5690.28'

216.30'

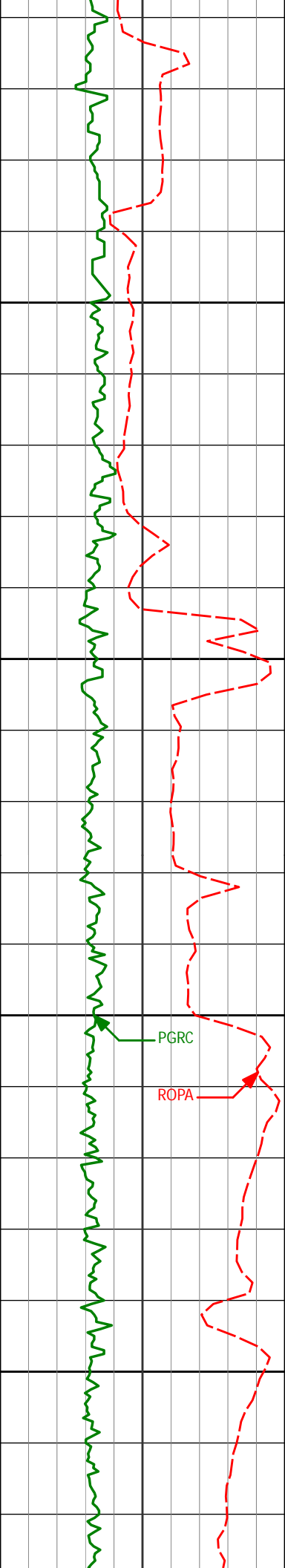
5806'

0.59°

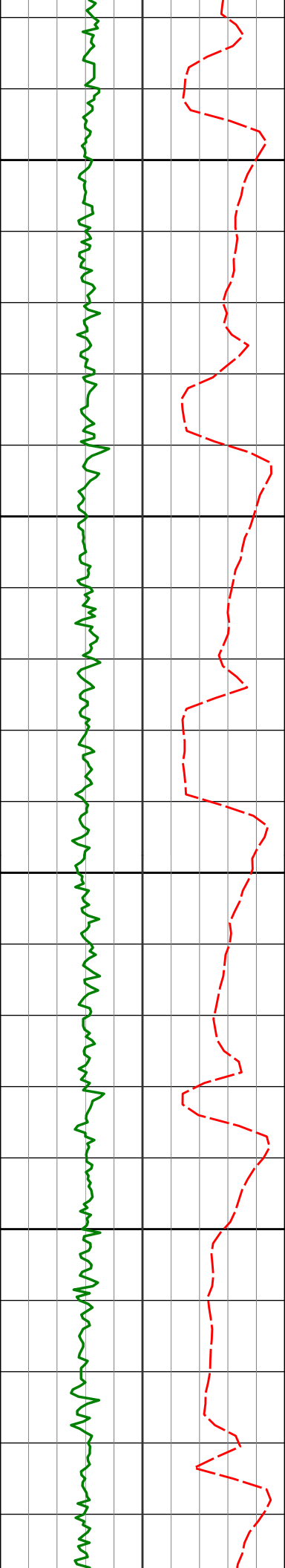
328.04°

5785.27'

216.60'



5900	5887'	0.50°	342.83°	5866.27'	216.90'
5950	5949'	0.65°	292.53°	5928.27'	217.29'
6000	5994'	1.01°	276.69°	5973.26'	217.91'
6050	6042'	5.33°	265.45°	6021.18'	220.56'



6100

6150

6200

6250

6090'

9.46°

262.37°

6068.77'

226.71'

6138'

12.94°

264.47°

6115.85'

236.01'

6184'

15.47°

268.75°

6160.44'

247.29'

6232'

19.37°

268.46°

6206.23'

261.65'

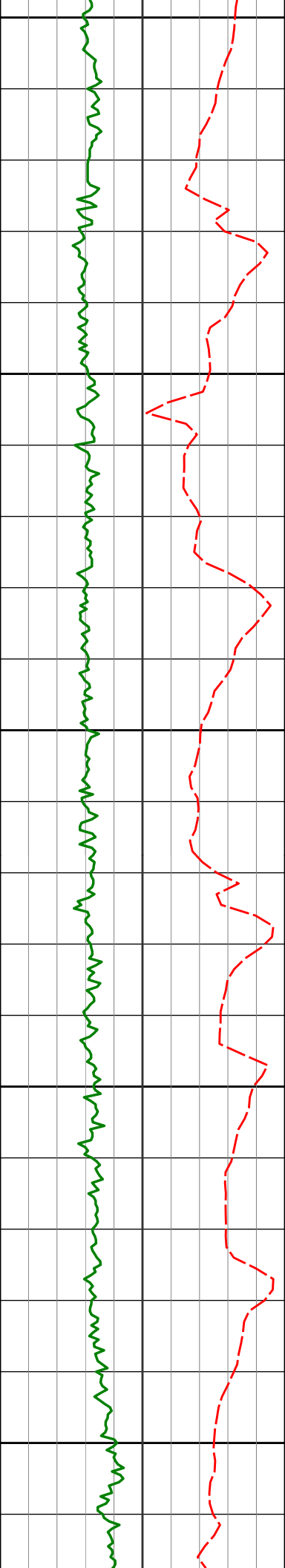
6279'

23.57°

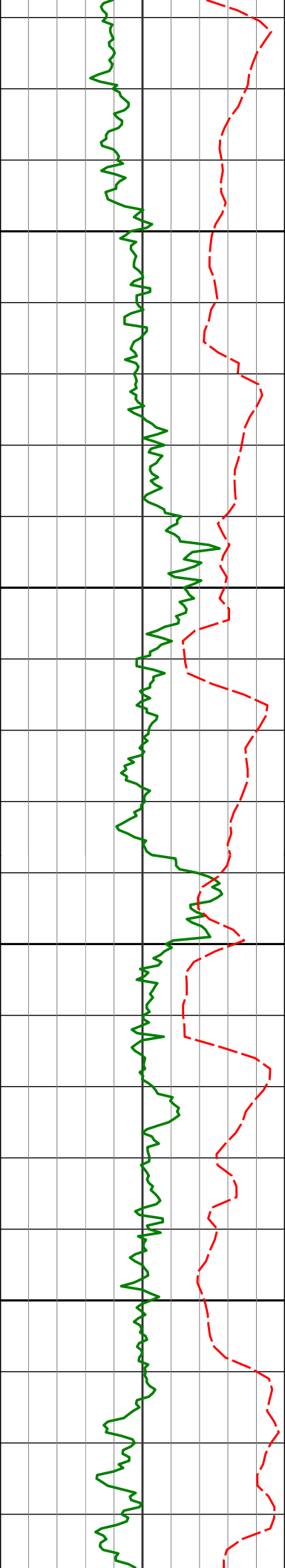
268.40°

6249.96'

278.85'



6300				
6327'	28.26°	270.34°	6293.12'	299.81'
6350				
6374'	31.40°	267.48°	6333.89'	323.18'
6400				
6422'	36.12°	264.23°	6373.79'	349.82'
6450				
6469'	40.90°	264.31°	6410.55'	379.02'
6500				
6517'	46.88°	267.20°	6445.13'	412.25'



6550

6564'

52.49°

269.31°

6475.53'

448.07'

6600

6612'

58.04°

270.37°

6502.87'

487.48'

6650

6658'

62.73°

269.72°

6525.60'

527.43'

6700

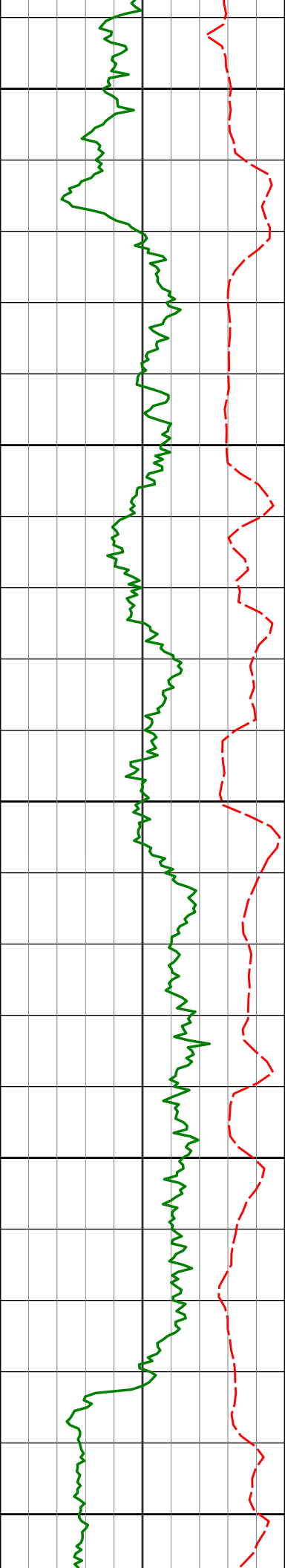
6706'

66.57°

270.18°

6546.14'

570.77'



6750

6753'

68.36°

270.21°

6564.16'

614.14'

6800

6801'

69.88°

269.51°

6581.26'

658.96'

6850

6848'

72.83°

269.85°

6596.29'

703.46'

6900

6896'

78.18°

271.21°

6608.30'

749.86'

6950

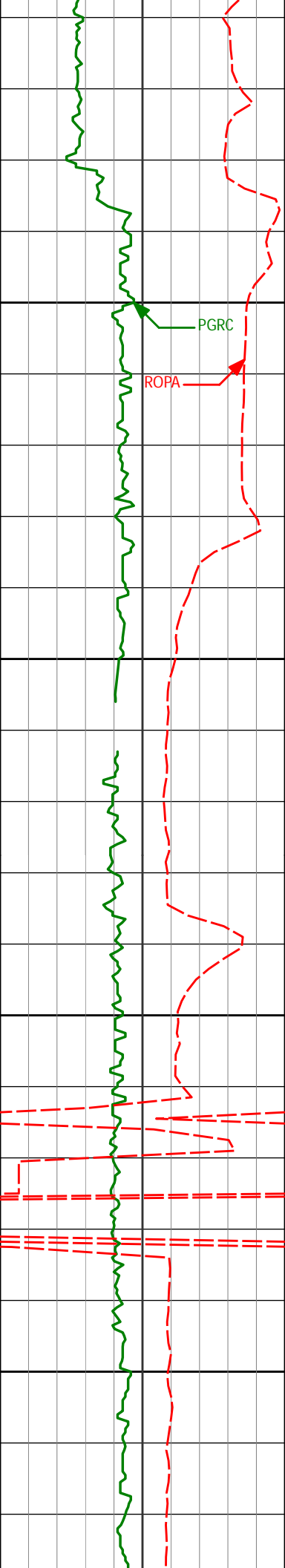
6931'

83.76°

271.91°

6613.79'

784.34'



300

7000

PGRC

ROPA

7026'

89.14°

270.38°

6619.67'

878.96'

7050

7100

7121'

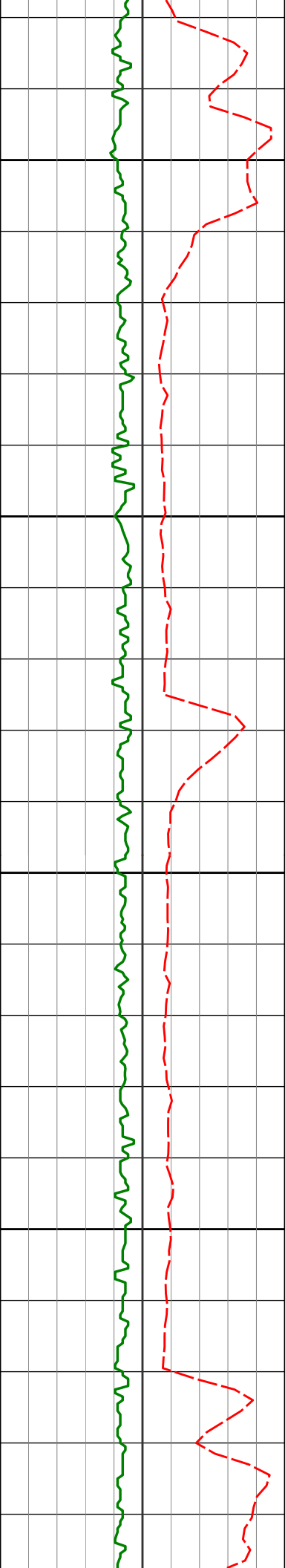
90.06°

271.24°

6620.33'

973.83'

7150



7200

7215'

89.14°

269.91°

6620.99'

1067.71'

7250

7300

7310'

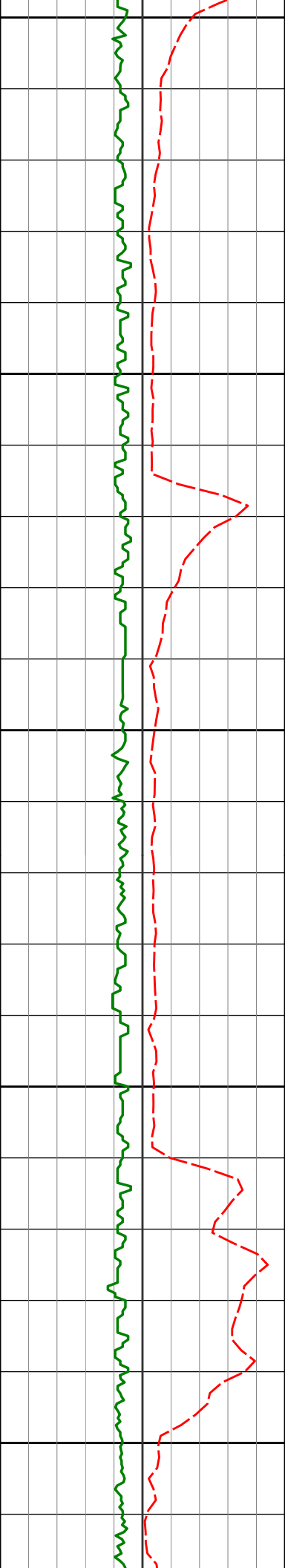
90.22°

270.52°

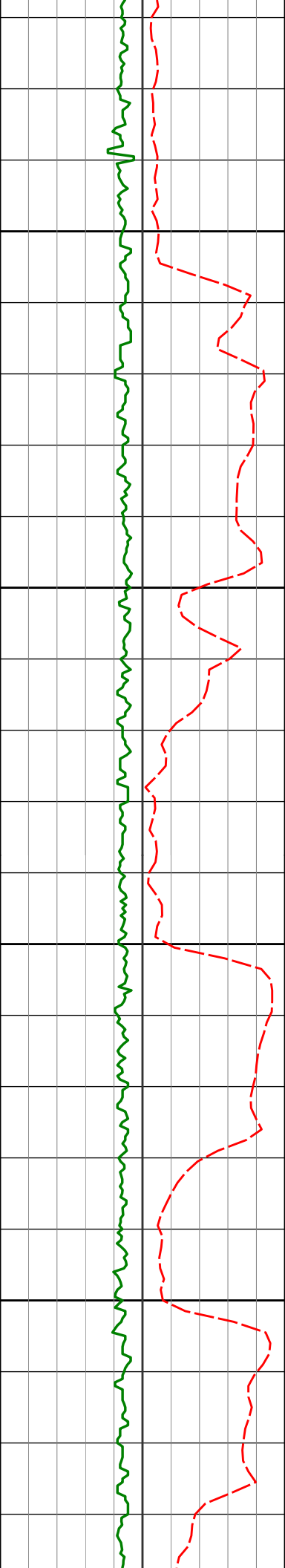
6621.52'

1162.62'

7350



7400	7404'	89.23°	267.94°	6621.97'	1256.58'
7450					
7500	7499'	89.23°	263.16°	6623.25'	1351.47'
7550					
7600	7594'	88.92°	261.14°	6624.78'	1445.99'



7650

7689'

87.90°

262.45°

6627.42'

1540.43'

7700

7750

7784'

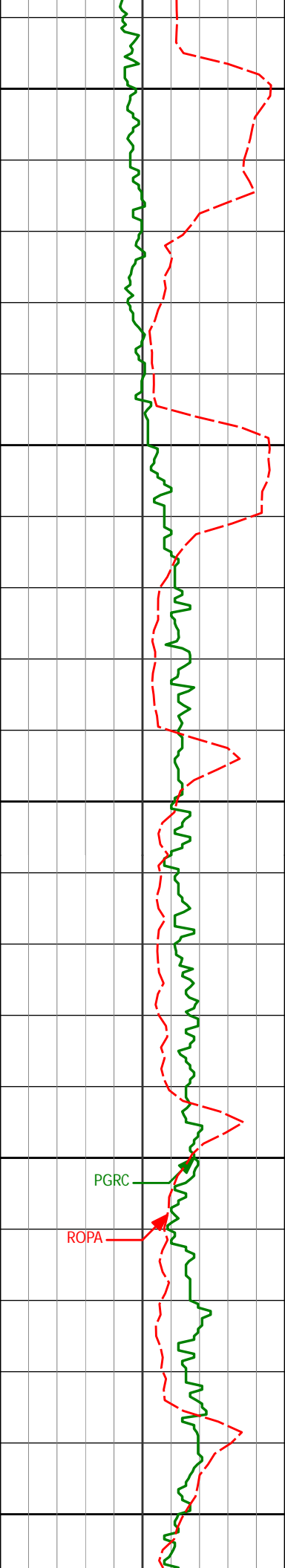
88.80°

264.51°

6630.15'

1635.11'

7800



7850

7879'

90.15°

268.46°

6631.03'

1730.06'

7900

7950

7974'

90.40°

269.32°

6630.57'

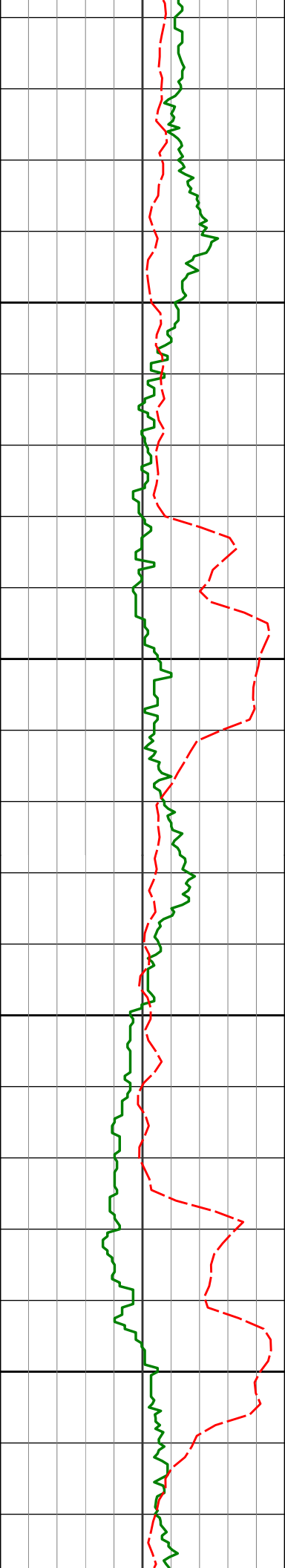
1825.05'

8000

PGRC

ROPA

8050



8069'

90.74°

268.51°

6629.62'

1920.02'

8100

8150

8163'

91.54°

269.36°

6627.75'

2013.98'

8200

8250

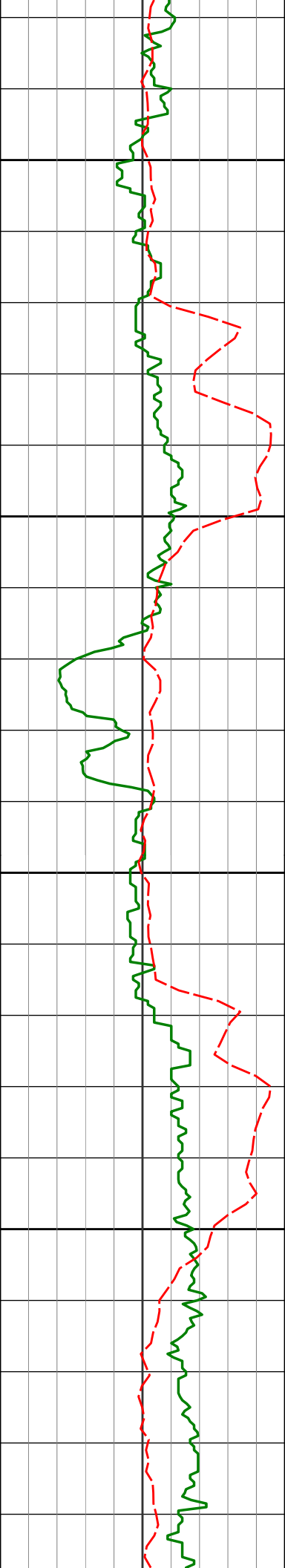
8258'

91.20°

269.82°

6625.48'

2108.91'



8300

8350

8400

8450

8353'

90.71°

269.99°

6623.90'

2203.83'

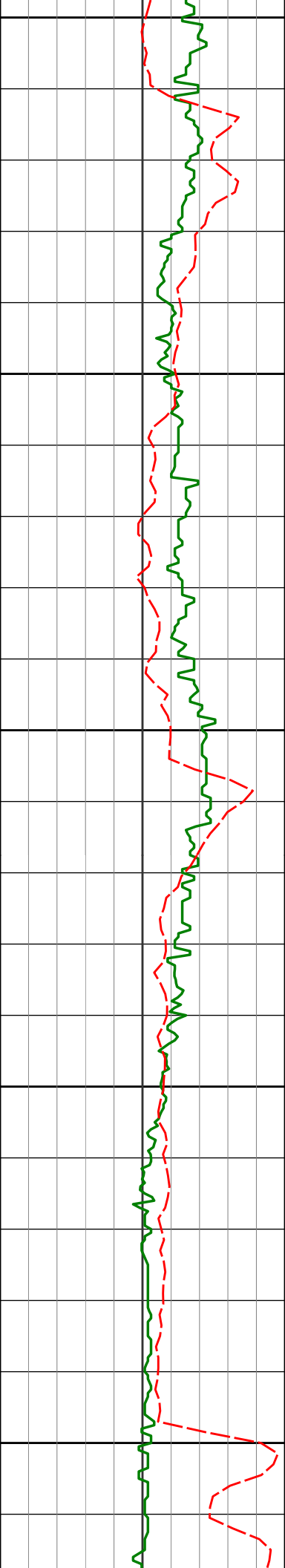
8447'

89.04°

269.60°

6624.10'

2297.77'



8500

8542'

88.89°

268.51°

6625.82'

2392.73'

8550

8600

8637'

88.58°

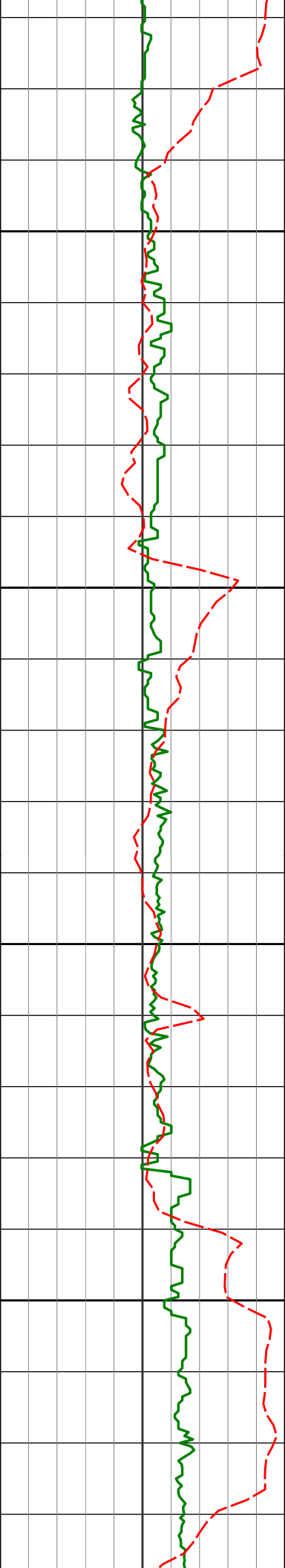
268.03°

6627.92'

2487.71'

8650

8700



8732'

88.86°

268.86°

6630.04'

2582.68'

8750

8800

8827'

87.72°

267.76°

6632.88'

2677.63'

8850

8900

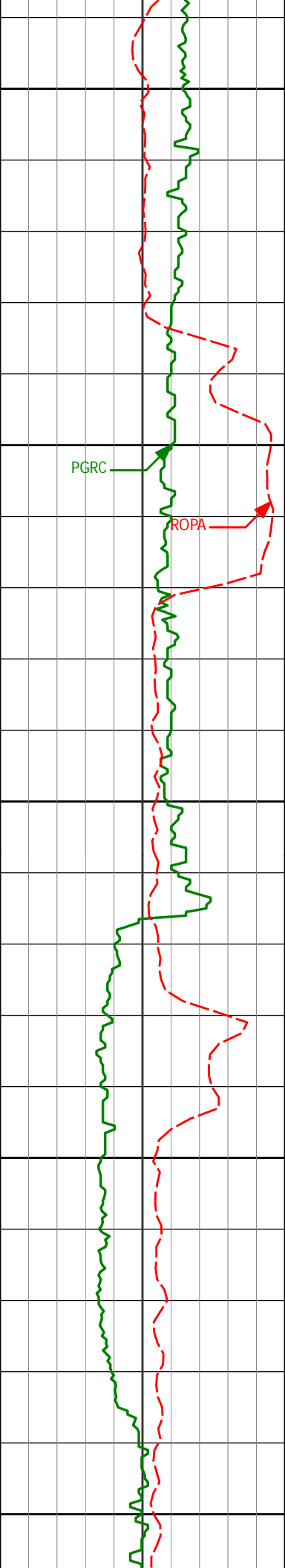
8922'

88.61°

269.64°

6635.92'

2772.56'



8950

9000

9050

9100

9150

PGRC

ROPA

9017'

89.29°

270.46°

6637.66'

2867.47'

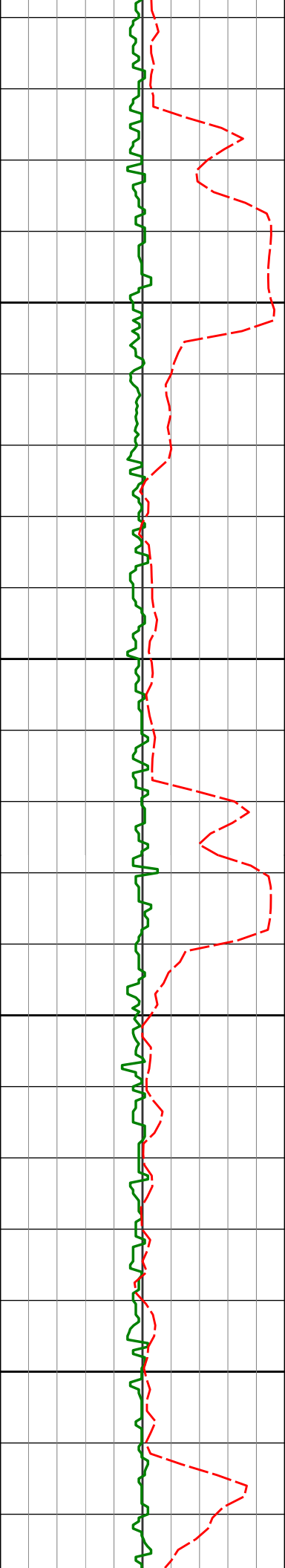
9111'

89.01°

269.89°

6639.05'

2961.38'



9200

9206'

89.75°

270.05°

6640.08'

3056.31'

9250

9300

9301'

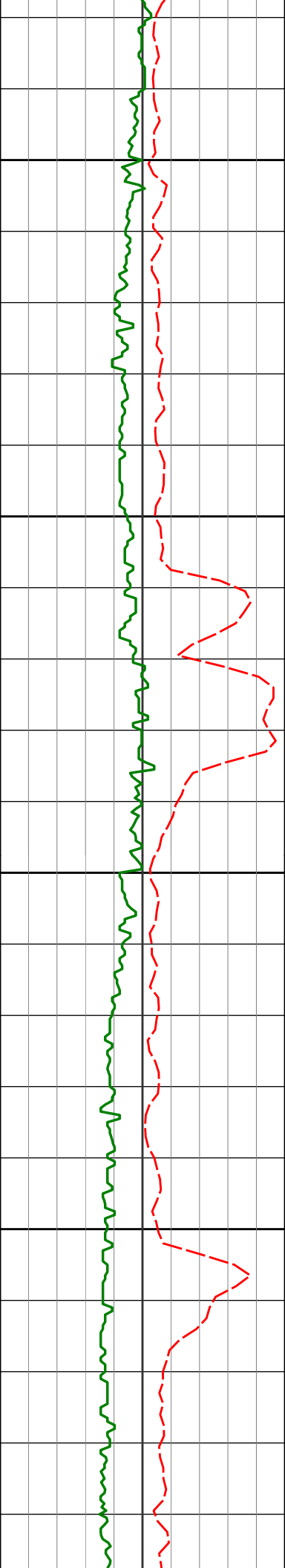
90.31°

269.48°

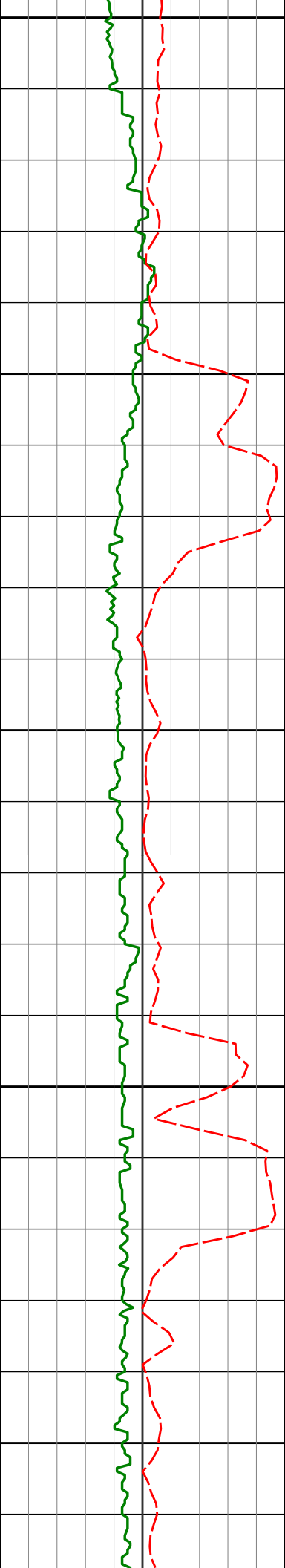
6640.03'

3151.25'

9350



9396'	89.41°	269.23°	6640.26'	3246.22'
9400				
9450				
9490'	91.11°	269.60°	6639.84'	3340.17'
9500				
9550				
9585'	90.96°	268.76°	6638.12'	3435.13'



9600

9650

9700

9750

9800

9680'

91.29°

269.66°

6636.26'

3530.08'

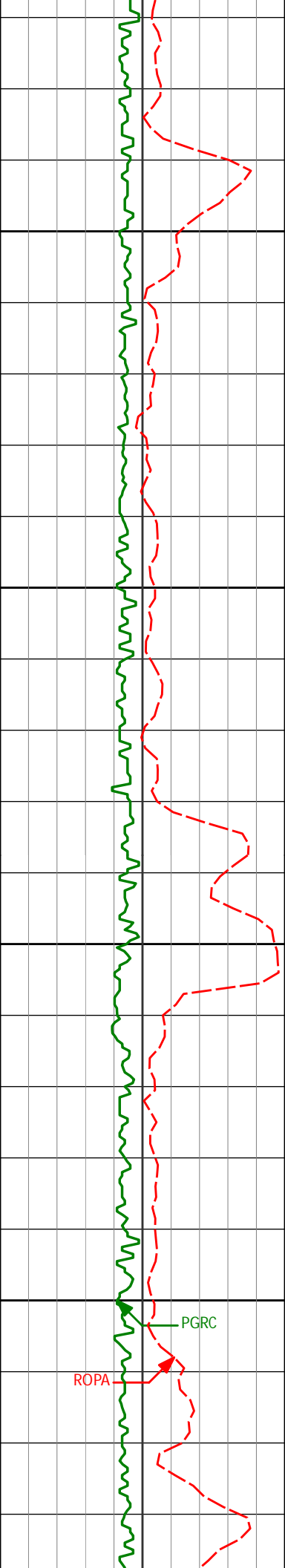
9775'

89.97°

269.01°

6635.21'

3625.04'



9850

9869'

90.12°

268.85°

6635.14'

3719.02'

9900

9950

9964'

89.23°

269.60°

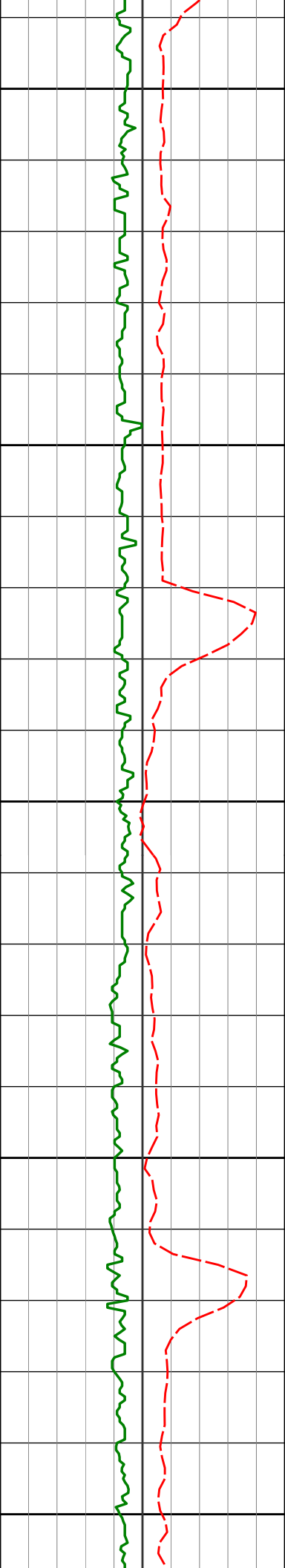
6635.68'

3813.99'

10000

PGRC

ROPA



10050

10057'

89.63°

270.13°

6636.60'

3906.93'

10100

10150

10149'

89.66°

270.00°

6637.17'

3998.85'

10200

10250

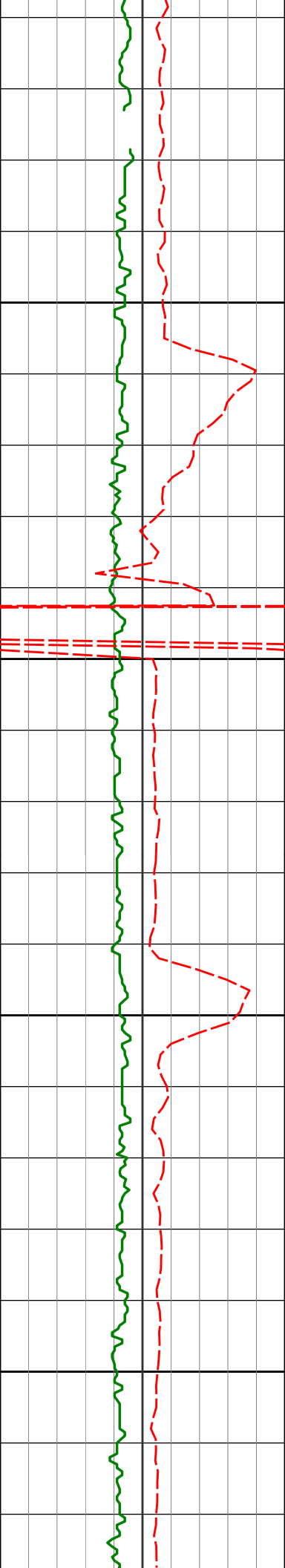
10241'

89.91°

270.33°

6637.52'

4090.77'



10300

10333'

89.01°

269.18°

6638.38'

4182.71'

10350

10400

10425'

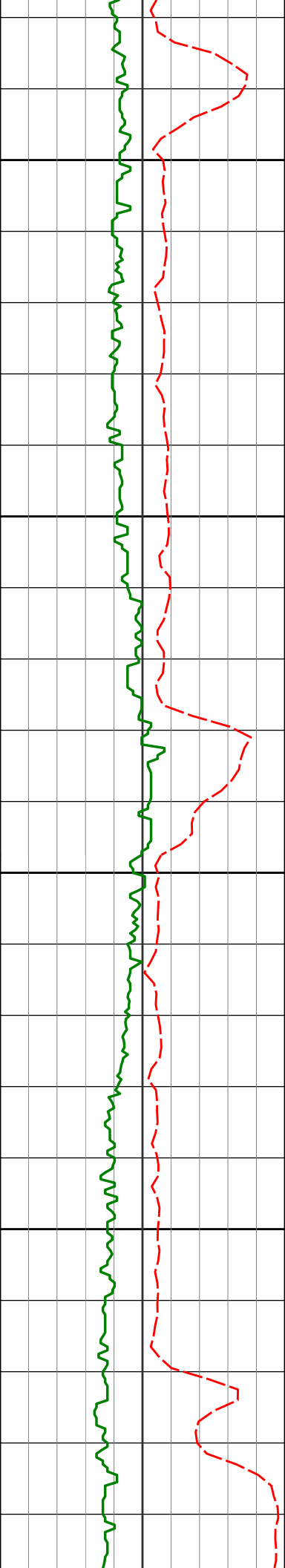
88.98°

269.09°

6640.00'

4274.68'

10450



10500

10518'

88.83°

269.09°

6641.77'

4367.64'

10550

10600

10610'

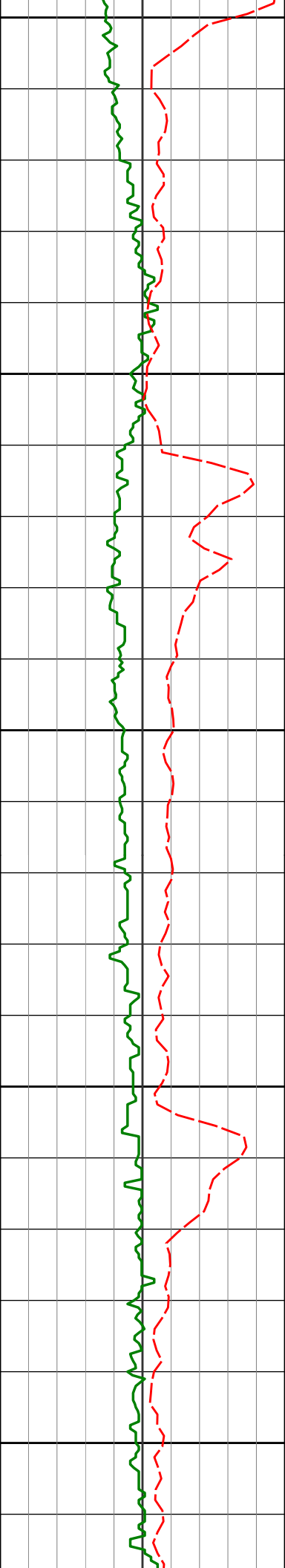
88.55°

268.87°

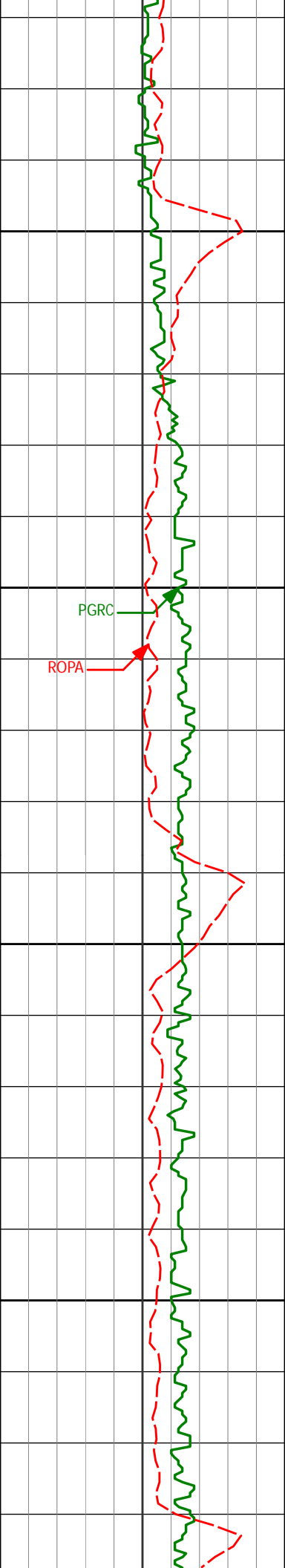
6643.88'

4459.59'

10650



10701'	90.06°	268.87°	6644.98'	4550.57'
10750				
10793'	90.22°	268.52°	6644.76'	4642.56'
10800				
10850				
10884'	90.22°	267.98°	6644.41'	4733.55'
10900				



10950

10977'

90.52°

268.18°

6643.81'

4826.55'

11000

PGRC

ROPA

11050

11071'

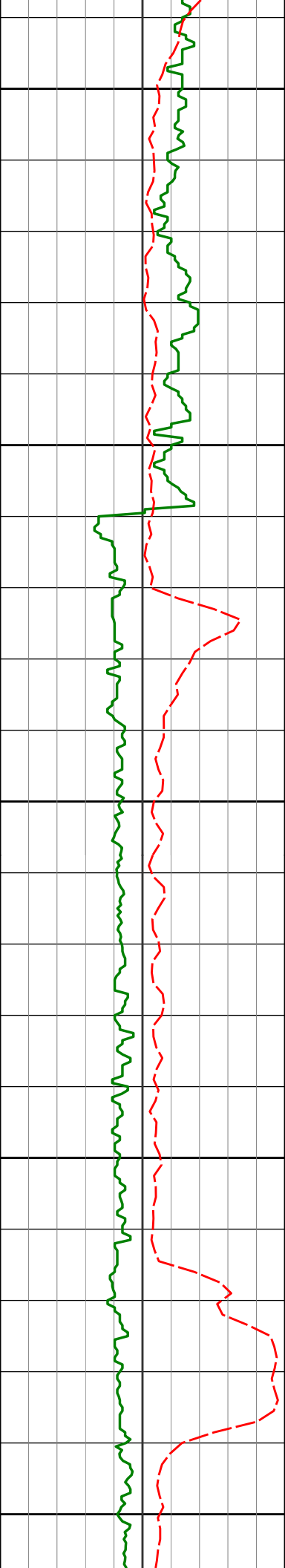
89.94°

267.75°

6643.43'

4920.55'

11100



11150

11162'

89.78°

267.82°

6643.65'

5011.55'

11200

11250

11254'

88.34°

267.95°

6645.16'

5103.53'

11300

11350

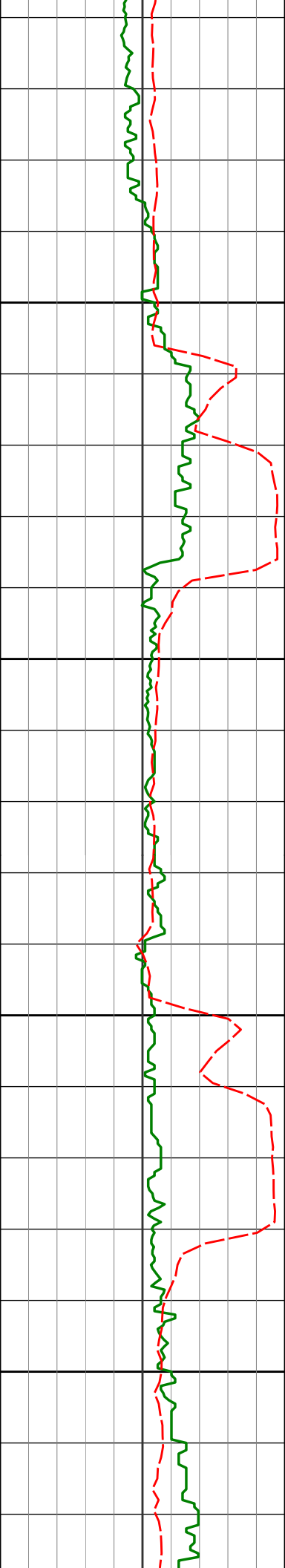
11345'

89.14°

267.81°

6647.16'

5194.51'



11400

11450

11500

11550

11437'

11530'

89.01°

89.66°

268.62°

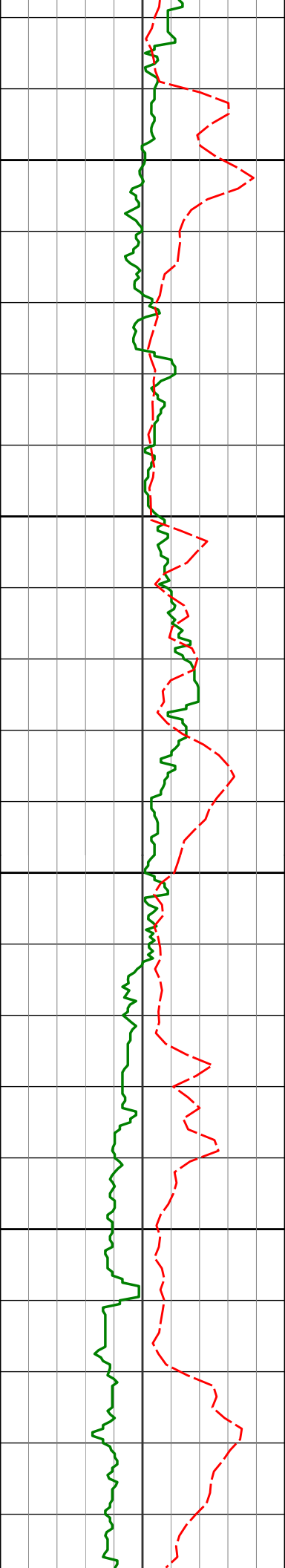
269.01°

6648.65'

6649.73'

5286.49'

5379.47'



11600

11623'

89.94°

268.68°

6650.05'

5472.46'

11650

11700

11716'

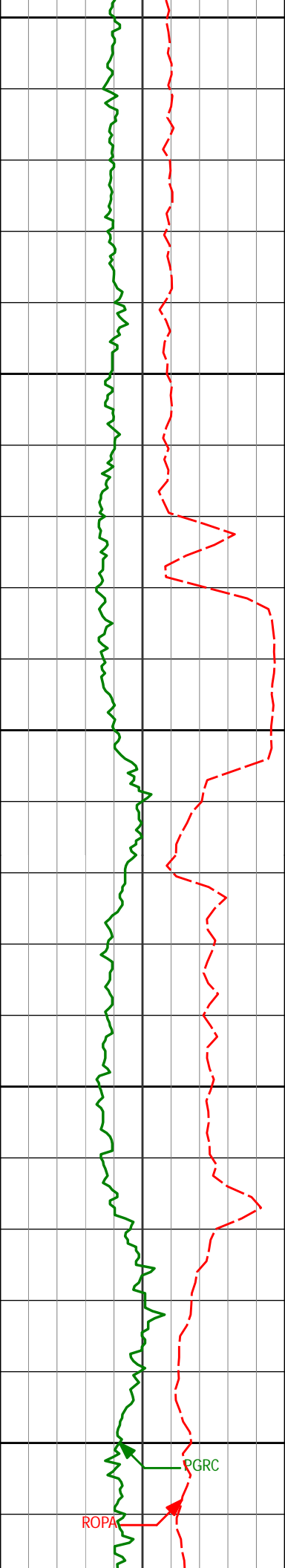
89.54°

268.35°

6650.47'

5565.45'

11750



11800

11850

11900

11950

12000

11809'

88.89°

268.06°

6651.75'

5658.44'

11903'

91.11°

269.16°

6651.75'

5752.42'

11998'

91.36°

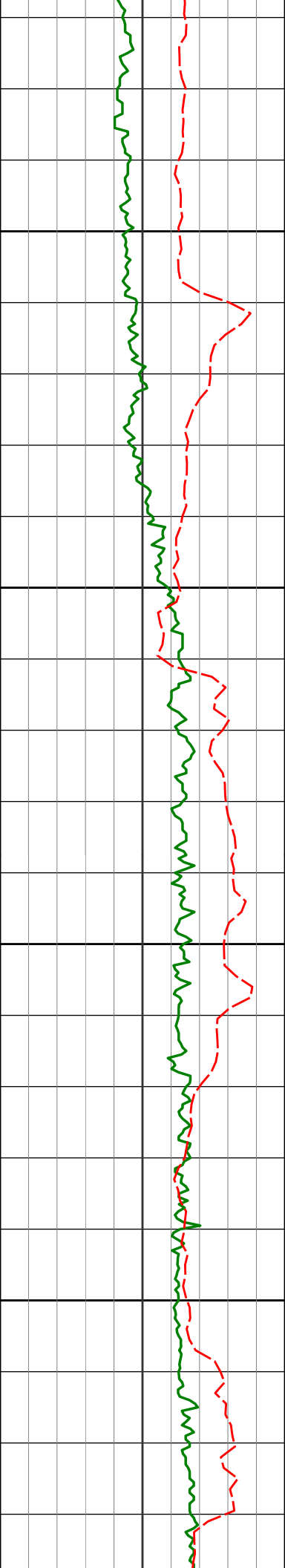
269.02°

6649.70'

5847.38'

PGRC

ROPA



12050

12092'

91.17°

268.41°

6647.63'

5941.34'

12100

12150

12187'

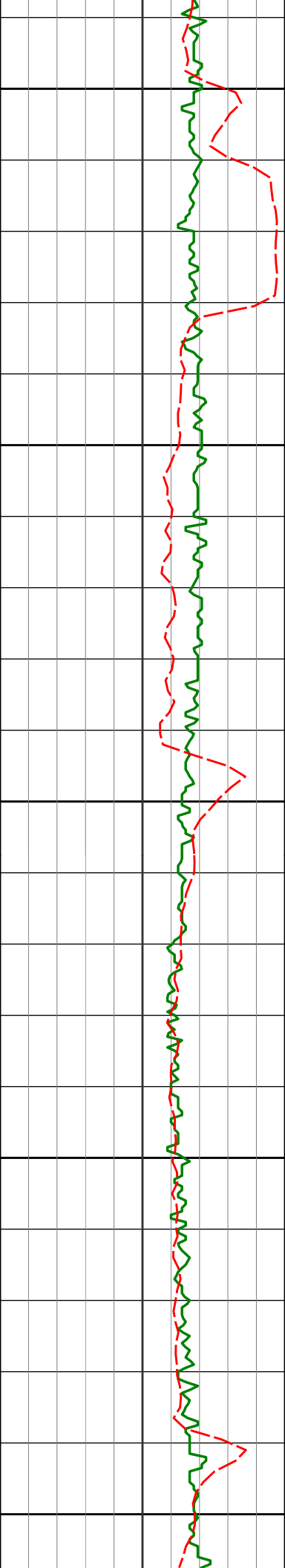
90.43°

267.97°

6646.30'

6036.33'

12200



12250

12282'

90.37°

269.26°

6645.64'

6131.31'

12300

12350

12377'

90.03°

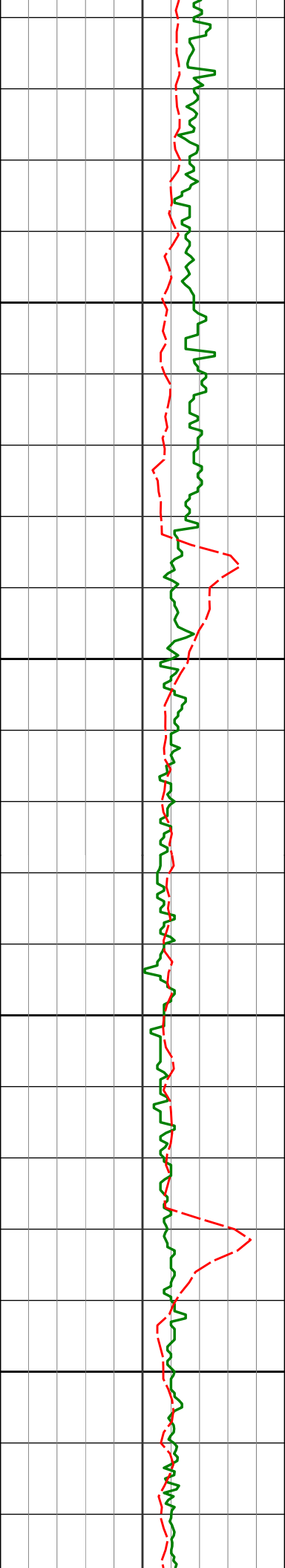
269.27°

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6226.28'

12400

12450



12471'

90.06°

269.44°

6645.23'

6320.25'

12500

12550

12566'

89.41°

268.70°

6645.67'

6415.22'

12600

12650

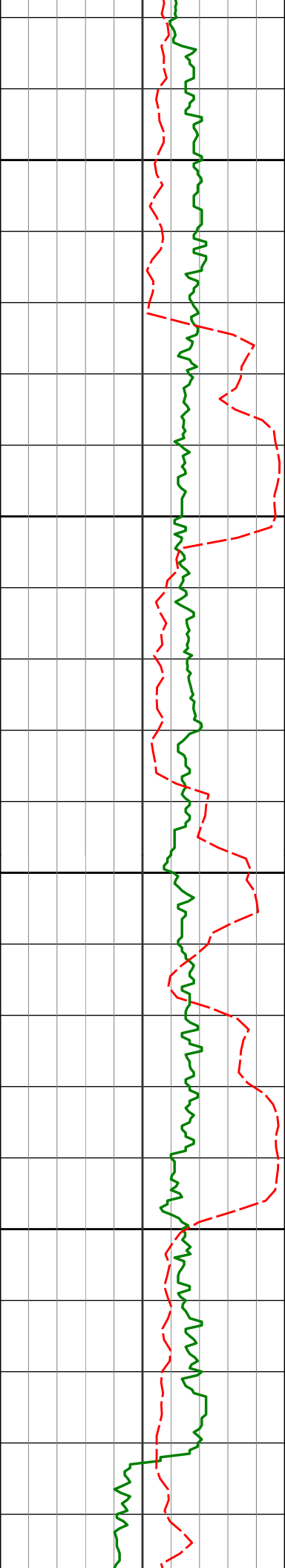
12661'

88.58°

268.11°

6647.34'

6510.20'



12700

12750

12800

12850

12756'

89.48°

268.48°

6648.94'

6605.18'

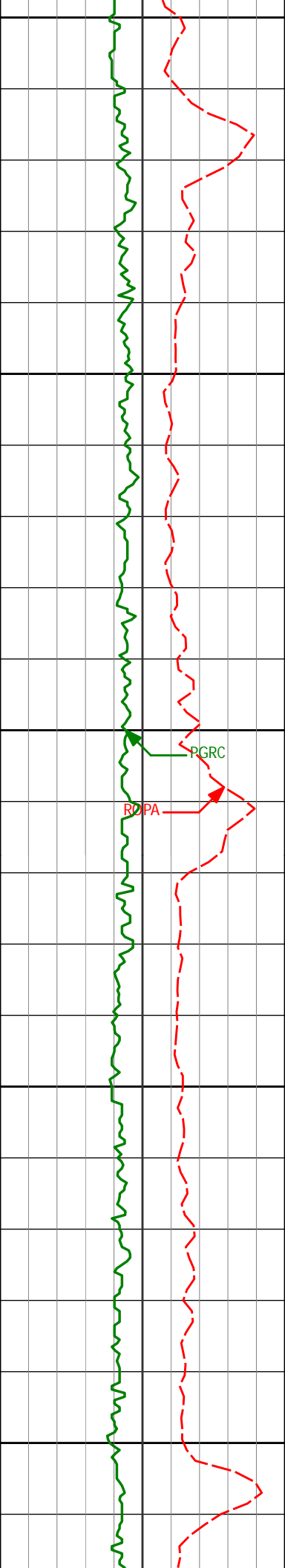
12850'

89.63°

269.58°

6649.67'

6699.16'



12900

12945'

89.20°

269.71°

6650.64'

6794.10'

12950

13000

PGRC

RPA

13040'

88.80°

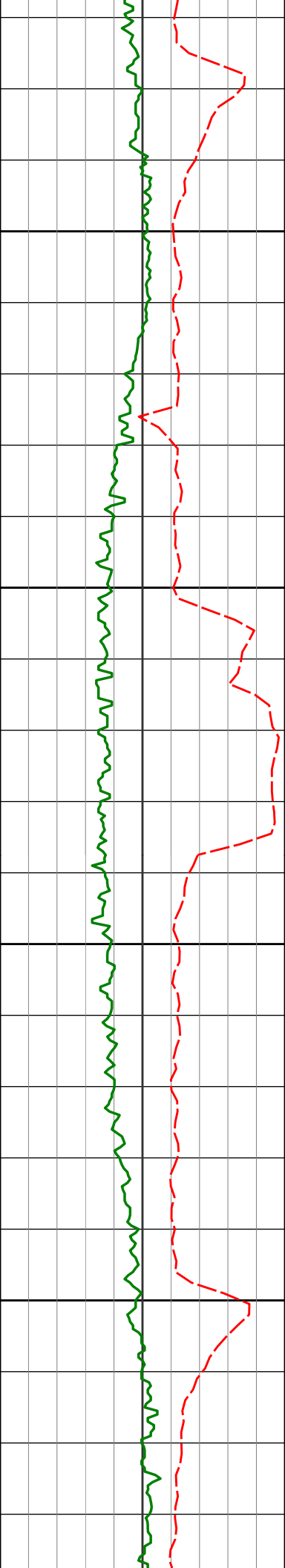
269.37°

6652.30'

6889.05'

13050

13100



13150

13200

13250

13300

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88.52°

268.97°

6654.64'

6988.99'

13234'

90.31°

269.20°

6655.60'

7082.96'

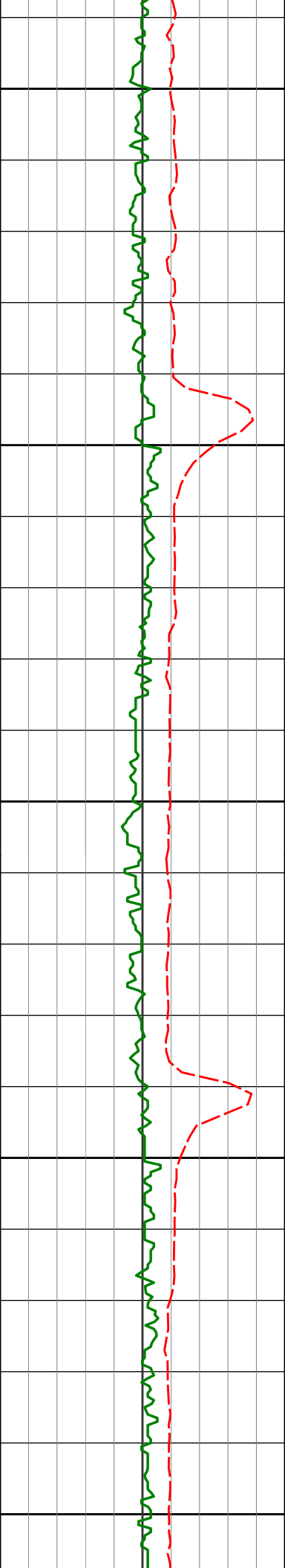
13329'

90.71°

269.63°

6654.75'

7177.92'



13350

13400

13450

13500

13550

13424'

88.86°

268.43°

6655.11'

7272.89'

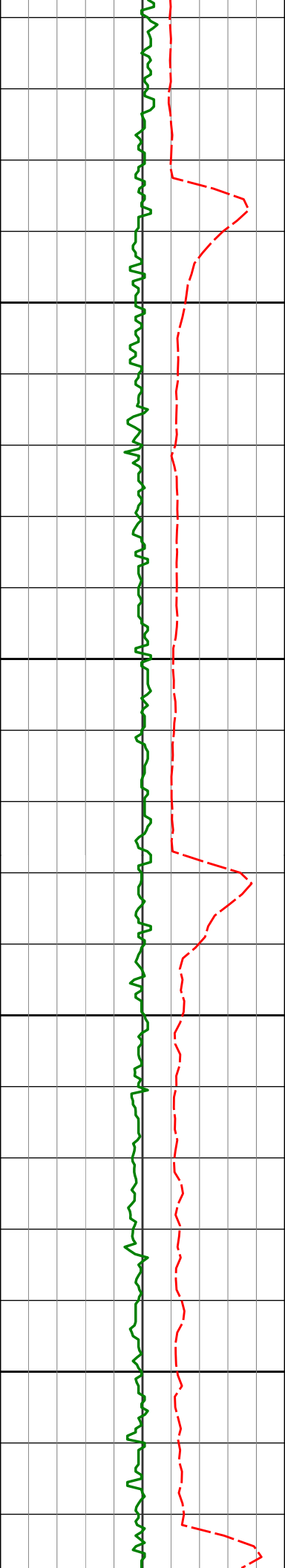
13518'

89.81°

269.28°

6656.20'

7366.87'



13600

13613'

89.54°

268.71°

6656.74'

7461.84'

13650

13700

13708'

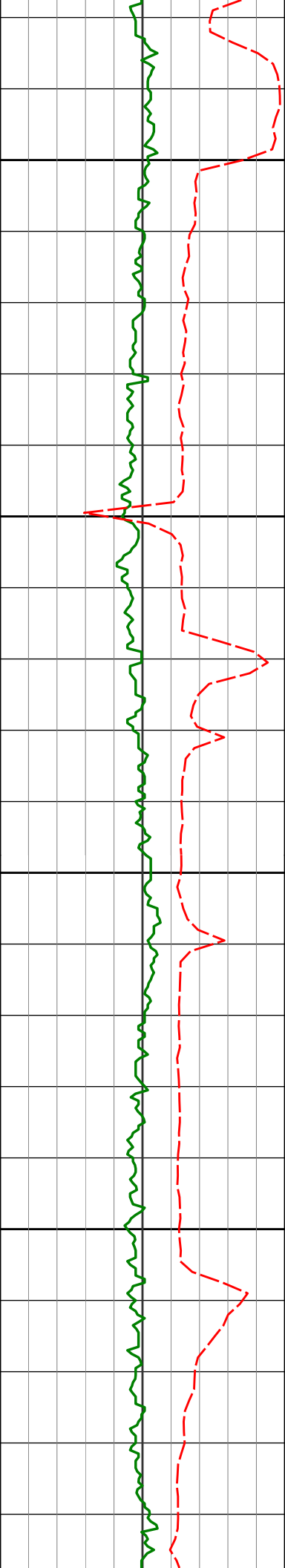
89.14°

268.01°

6657.84'

7556.83'

13750



13800

13802'

90.99°

270.22°

6657.73'

7650.80'

13850

13900

13897'

88.55°

267.48°

6658.11'

7745.76'

13950

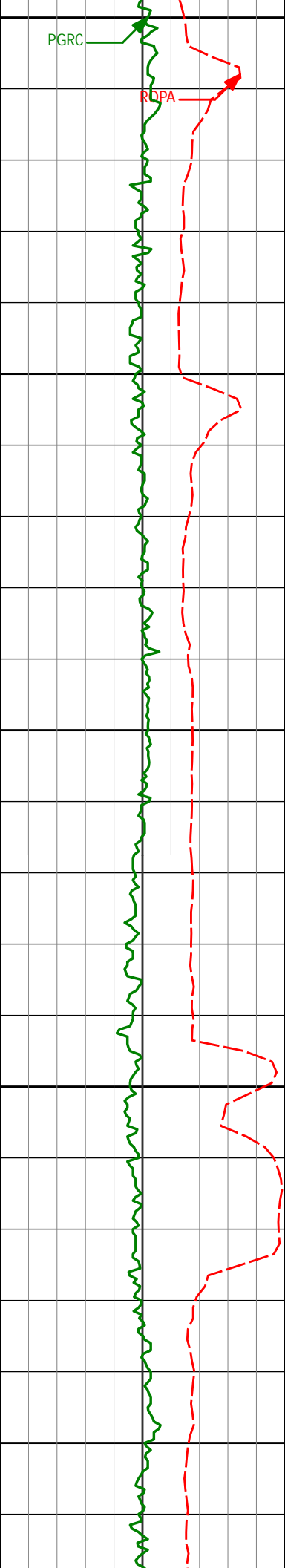
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89.66°

268.53°

6659.59'

7840.75'



14000

14050

14087'

88.67°

267.89°

6660.98'

7935.74'

14100

14150

14182'

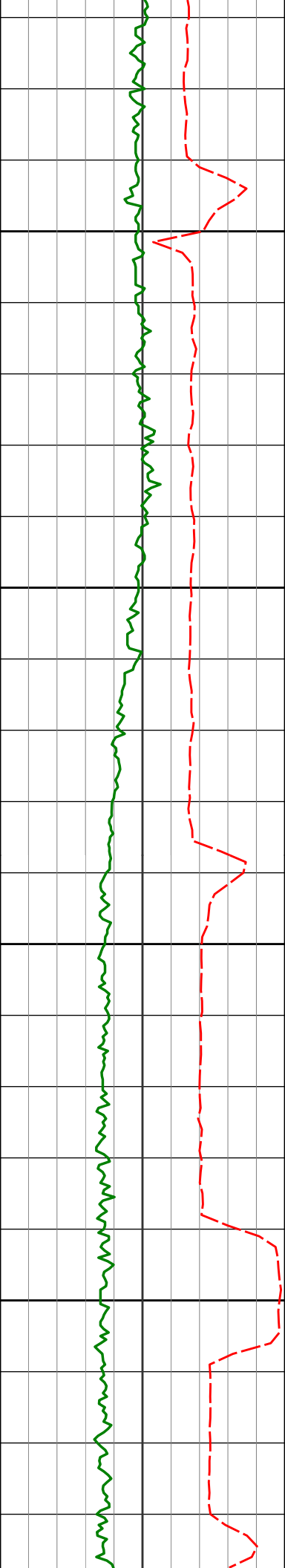
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8030.71'

14200



14250

14276'

88.61°

268.09°

6662.81'

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14300

14350

14371'

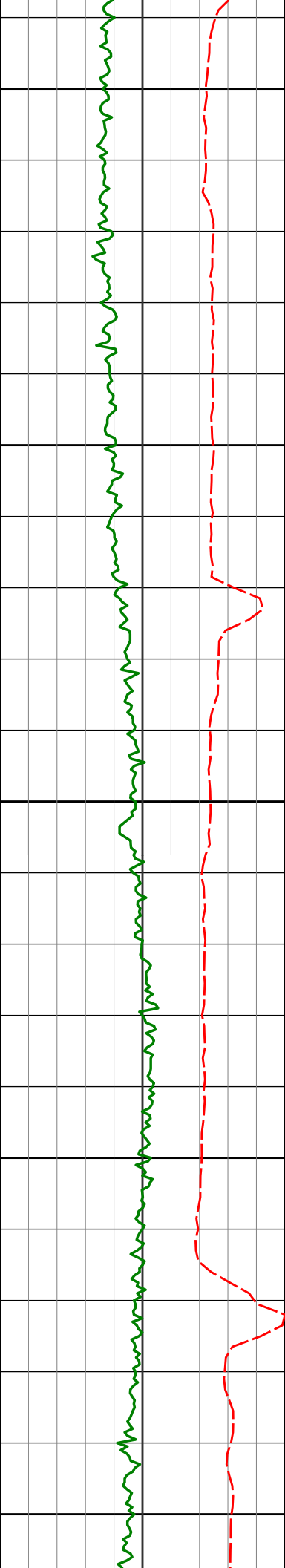
88.74°

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6665.01'

8219.65'

14400



14450

14466'

89.75°

268.61°

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14500

14550

14561'

90.43°

268.52°

6666.11'

8409.63'

14600

14650

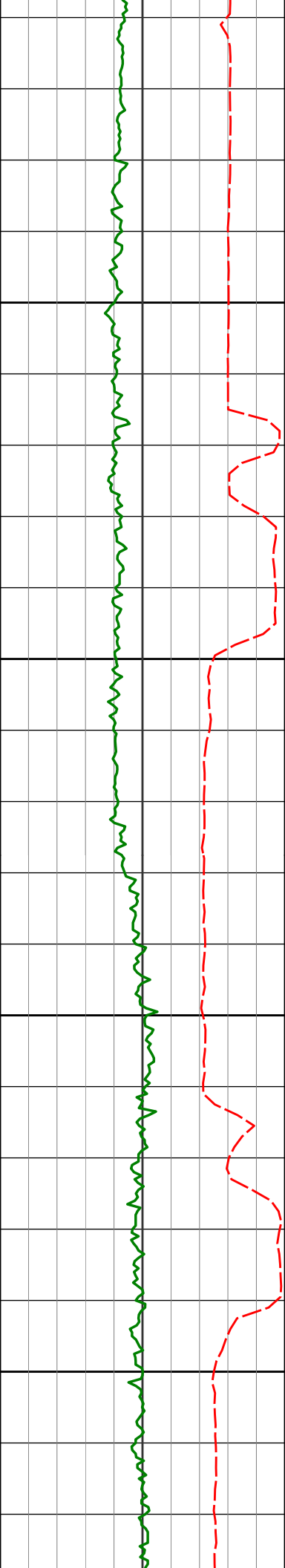
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89.35°

267.43°

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8503.62'



14700

14750

14800

14850

14750'

14845'

89.41°

90.03°

268.85°

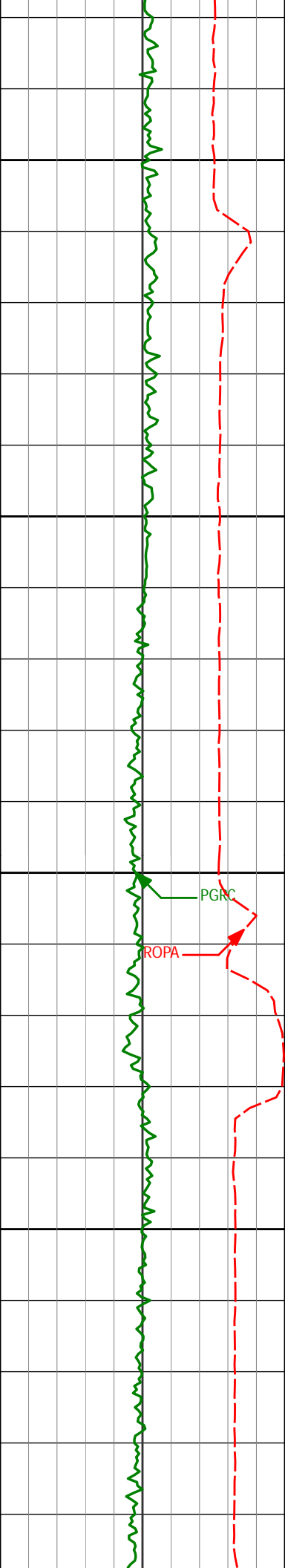
269.46°

6667.32'

6667.78'

8598.61'

8693.58'



14900

14940'

89.26°

268.48°

6668.37'

8788.56'

14950

15000

PGR

ROPA

15035'

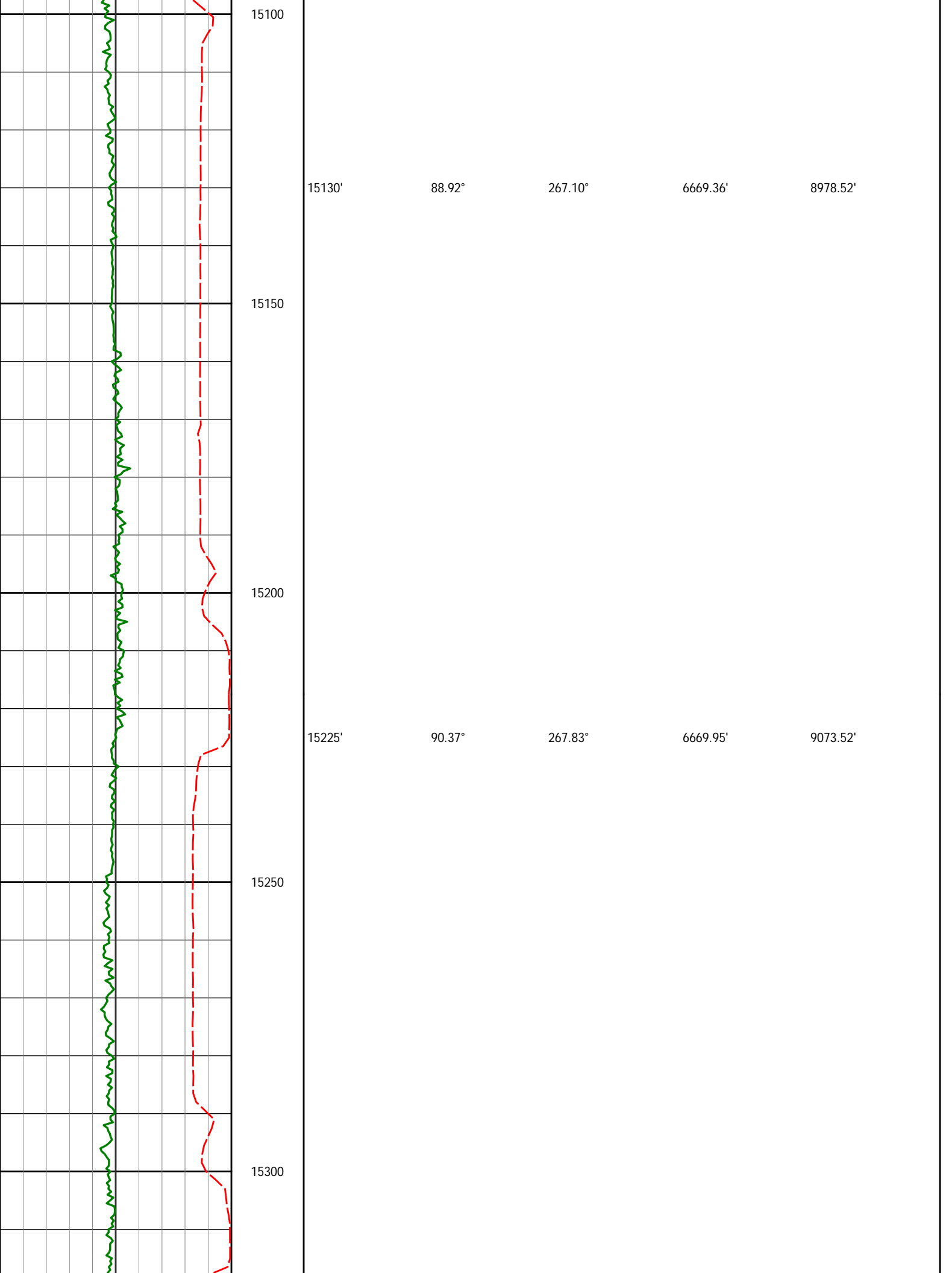
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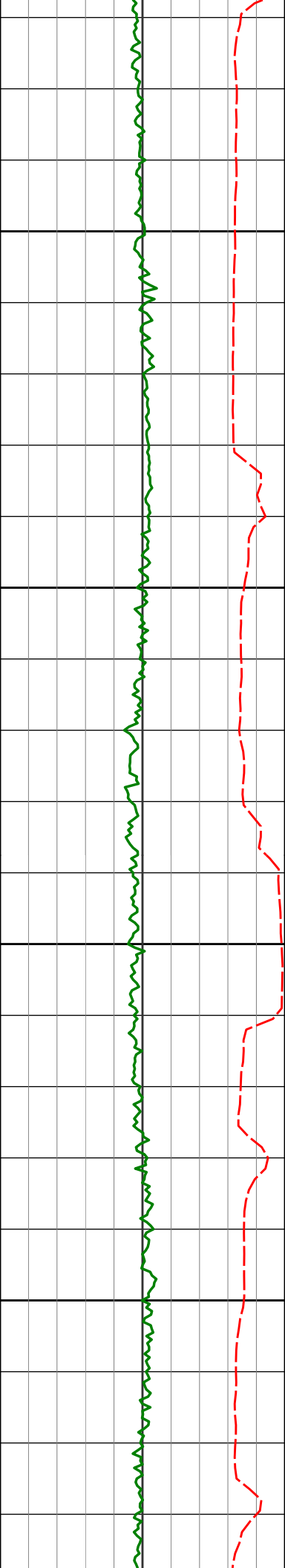
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8883.54'

15050





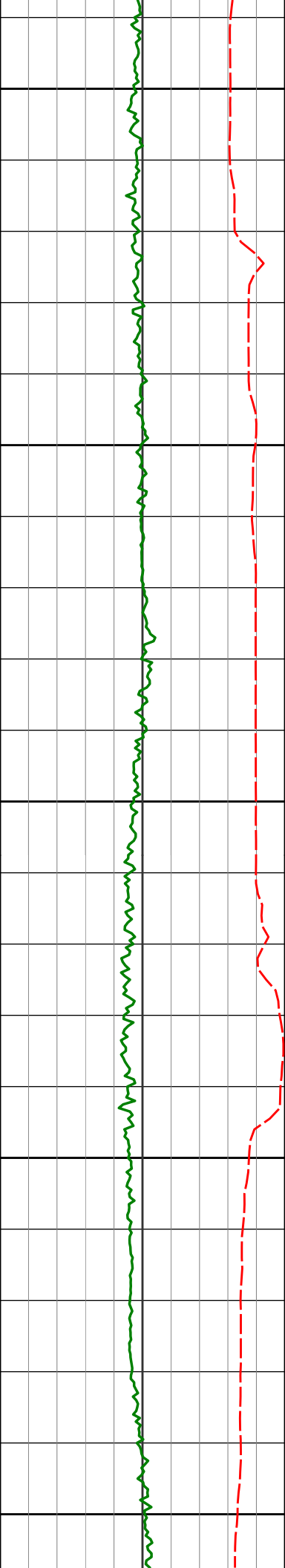
15350

15400

15450

15500

15320'	89.60°	266.78°	6669.98'	9168.51'
15414'	89.54°	266.17°	6670.68'	9262.48'
15509'	90.59°	268.26°	6670.58'	9357.47'



15550

15600

15650

15700

15750

15604'

89.44°

266.04°

6670.55'

9452.46'

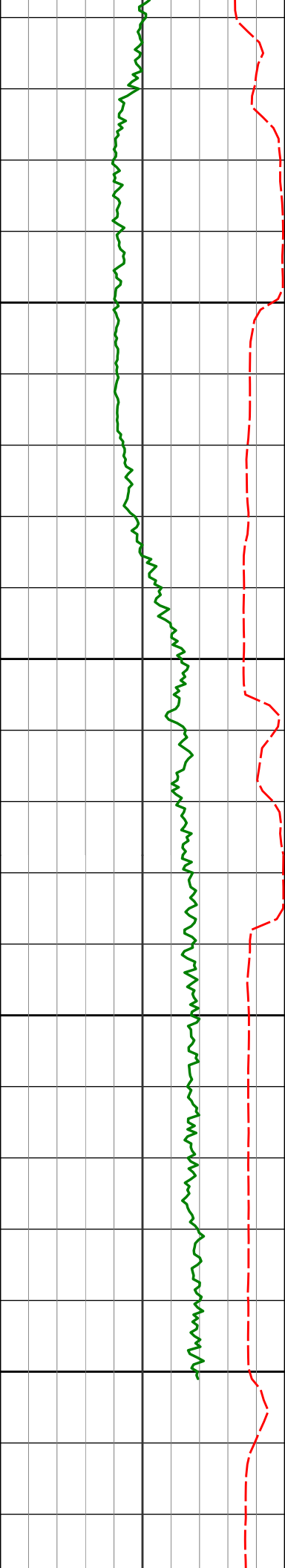
15699'

90.99°

267.14°

6670.19'

9547.43'



15793'

92.25°

268.82°

6667.54'

9641.39'

15800

15850

15888'

91.08°

269.08°

6664.78'

9736.33'

15900

15950

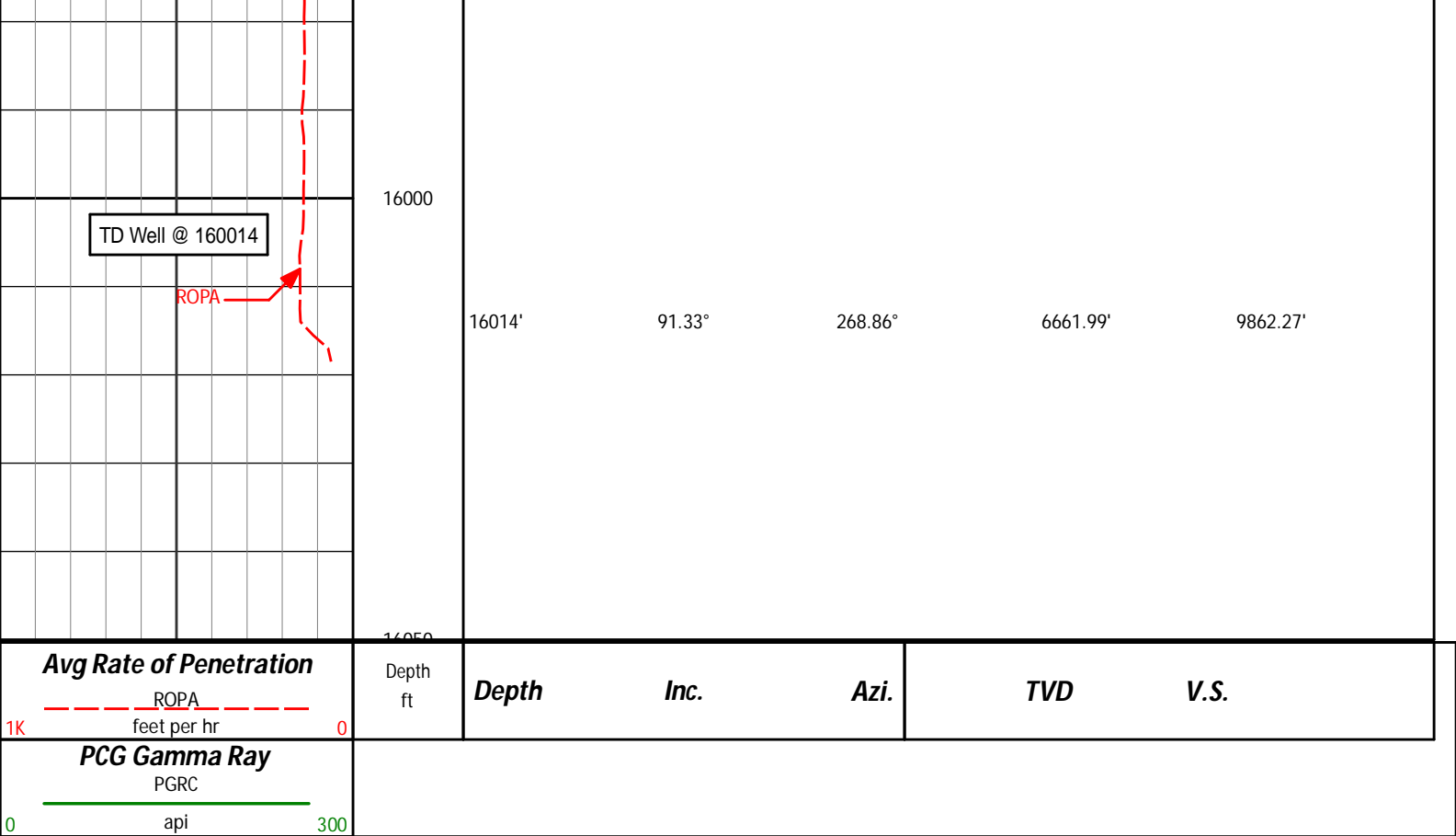
15950'

91.33°

268.86°

6663.47'

9798.30'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble
NCLP AA06-68-1HNA
Wattenberg
Weld Colorado
USA
CA-XX-0901287355

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
269.00	0.10	327.47	269.00	0.20 N	0.13 W	0.12	0.04
543.00	1.00	299.67	542.98	1.58 N	2.33 W	2.27	0.33
852.00	0.50	206.97	851.97	1.72 N	5.29 W	5.22	0.37
905.00	0.52	219.42	904.96	1.32 N	5.54 W	5.49	0.21
996.00	0.70	203.19	995.96	0.49 N	6.03 W	6.00	0.27
1089.00	0.70	217.69	1088.95	0.48 S	6.60 W	6.61	0.19
1183.00	0.99	72.02	1182.95	0.68 S	6.18 W	6.20	1.72
1274.00	1.22	50.03	1273.93	0.18 N	4.68 W	4.67	0.53
1366.00	1.39	53.48	1365.91	1.48 N	3.04 W	2.98	0.20
1457.00	1.49	50.58	1456.88	2.89 N	1.24 W	1.13	0.14
1549.00	0.20	301.42	1548.87	3.73 N	0.45 W	0.31	1.70
1642.00	0.15	246.15	1641.87	3.76 N	0.70 W	0.56	0.18
1735.00	0.15	107.39	1734.87	3.68 N	0.69 W	0.55	0.30
1828.00	0.22	15.69	1827.87	3.81 N	0.53 W	0.38	0.29
1921.00	0.25	336.59	1920.87	4.17 N	0.56 W	0.40	0.17
2015.00	0.37	41.73	2014.86	4.59 N	0.44 W	0.27	0.37
2110.00	0.35	24.11	2109.86	5.08 N	0.12 W	-0.07	0.12
2204.00	0.72	55.44	2203.86	5.68 N	0.48 E	-0.70	0.49
2299.00	0.83	75.89	2298.85	6.18 N	1.64 E	-1.88	0.31
2394.00	1.03	60.08	2393.84	6.78 N	3.05 E	-3.31	0.34
2488.00	1.29	67.25	2487.82	7.61 N	4.76 E	-5.05	0.32
2583.00	1.08	90.51	2582.80	8.01 N	6.64 E	-6.94	0.55
2677.00	1.55	76.45	2676.77	8.30 N	8.76 E	-9.07	0.60
2771.00	0.21	324.55	2770.76	8.45 N	8.24 E	-12.57	0.78

2772.00	0.21	204.55	2771.76	8.45 N	9.94 E	-10.25	1.78
2867.00	2.64	226.31	2866.73	6.78 N	8.28 E	-8.54	2.57
2962.00	4.12	225.44	2961.56	2.87 N	4.27 E	-4.38	1.56
3057.00	6.18	222.94	3056.17	3.27 S	1.65 W	1.77	2.18
3151.00	5.60	210.61	3149.68	10.92 S	7.43 W	7.84	1.48
3246.00	6.99	217.45	3244.10	19.50 S	13.30 W	14.04	1.66
3341.00	8.26	228.04	3338.27	28.65 S	21.89 W	22.97	1.99
3436.00	9.23	231.72	3432.16	37.93 S	32.95 W	34.37	1.18
3531.00	8.88	232.25	3525.98	47.14 S	44.73 W	46.50	0.38
3625.00	10.24	236.48	3618.67	56.20 S	57.43 W	59.54	1.63
3720.00	11.22	237.89	3712.01	65.78 S	72.30 W	74.76	1.07
3815.00	10.01	239.19	3805.38	74.92 S	87.22 W	90.02	1.30
3909.00	8.16	235.27	3898.20	82.90 S	99.72 W	102.82	2.07
4004.00	7.28	234.23	3992.34	90.26 S	110.15 W	113.51	0.94
4099.00	8.45	231.91	4086.44	98.09 S	120.52 W	124.18	1.28
4194.00	9.29	230.71	4180.31	107.25 S	131.95 W	135.95	0.91
4289.00	8.75	241.26	4274.14	115.58 S	144.22 W	148.53	1.83
4383.00	8.86	240.21	4367.03	122.61 S	156.77 W	161.34	0.21
4478.00	10.29	233.15	4460.71	131.34 S	169.91 W	174.81	1.95
4573.00	9.14	230.50	4554.34	141.23 S	182.53 W	187.79	1.30
4668.00	7.04	227.30	4648.39	149.98 S	192.63 W	198.22	2.26
4763.00	6.05	223.28	4742.77	157.57 S	200.34 W	206.21	1.15
4857.00	3.99	230.14	4836.41	163.27 S	206.25 W	212.33	2.28
4952.00	0.70	251.38	4931.32	165.58 S	209.33 W	215.51	3.52
5047.00	1.41	279.50	5026.30	165.57 S	211.04 W	217.21	0.90
5142.00	0.35	37.67	5121.29	165.15 S	212.01 W	218.17	1.69
5237.00	0.62	329.82	5216.29	164.47 S	212.09 W	218.22	0.62
5332.00	0.36	330.11	5311.29	163.77 S	212.50 W	218.60	0.27
5427.00	0.51	103.25	5406.28	163.61 S	212.24 W	218.33	0.84
5522.00	0.51	96.33	5501.28	163.75 S	211.41 W	217.51	0.06
5616.00	0.52	89.28	5595.28	163.79 S	210.56 W	216.67	0.07
5711.00	0.10	312.01	5690.28	163.73 S	210.19 W	216.30	0.63
5806.00	0.59	328.04	5785.27	163.26 S	210.51 W	216.60	0.52
5887.00	0.50	342.83	5866.27	162.57 S	210.84 W	216.90	0.21
5949.00	0.65	292.53	5928.27	162.17 S	211.24 W	217.29	0.82
5994.00	1.01	276.69	5973.26	162.03 S	211.87 W	217.91	0.94
6042.00	5.33	265.45	6021.18	162.16 S	214.52 W	220.56	9.05
6090.00	9.46	262.37	6068.77	162.86 S	220.65 W	226.71	8.64
6138.00	12.94	264.47	6115.85	163.90 S	229.91 W	236.01	7.30
6184.00	15.47	268.75	6160.44	164.53 S	241.18 W	247.29	5.95
6232.00	19.37	268.46	6206.23	164.89 S	255.54 W	261.65	8.13
6279.00	23.57	268.40	6249.96	165.36 S	272.73 W	278.85	8.94
6327.00	28.26	270.34	6293.12	165.56 S	293.70 W	299.81	9.93
6374.00	31.40	267.48	6333.89	166.03 S	317.07 W	323.18	7.33
6422.00	36.12	264.23	6373.79	168.00 S	343.65 W	349.82	10.53
6469.00	40.90	264.31	6410.55	170.92 S	372.76 W	379.02	10.17
6517.00	46.88	267.20	6445.13	173.34 S	405.93 W	412.25	13.14
6564.00	52.49	269.31	6475.53	174.40 S	441.73 W	448.07	12.42
6612.00	58.04	270.37	6502.87	174.50 S	481.16 W	487.48	11.70
6658.00	62.73	269.72	6525.60	174.48 S	521.14 W	527.43	10.27
6706.00	66.57	270.18	6546.14	174.51 S	564.51 W	570.77	8.05
6753.00	68.36	270.21	6564.16	174.36 S	607.92 W	614.14	3.81
6801.00	69.88	269.51	6581.26	174.47 S	652.77 W	658.96	3.45
6848.00	72.83	269.85	6596.29	174.72 S	697.29 W	703.46	6.31
6896.00	78.18	271.21	6608.30	174.28 S	743.74 W	749.86	11.48
6931.00	83.76	271.91	6613.79	173.34 S	778.28 W	784.34	16.06
7026.00	89.14	270.38	6619.67	171.45 S	873.05 W	878.96	5.89
7121.00	90.06	271.24	6620.33	170.11 S	968.03 W	973.83	1.33
7215.00	89.14	269.91	6620.99	169.17 S	1062.02 W	1067.71	1.72
7310.00	90.22	270.52	6621.52	168.81 S	1157.02 W	1162.62	1.31
7404.00	89.23	267.94	6621.97	170.07 S	1251.00 W	1256.58	2.94
7499.00	89.23	263.16	6623.25	177.44 S	1345.68 W	1351.47	5.03
7594.00	88.92	261.14	6624.78	190.41 S	1439.77 W	1445.99	2.15
7689.00	87.90	262.45	6627.42	203.97 S	1533.76 W	1540.43	1.75
7784.00	88.80	264.51	6630.15	214.75 S	1628.10 W	1635.11	2.37
7879.00	90.15	268.46	6631.03	220.57 S	1722.89 W	1730.06	4.39
7974.00	90.40	269.32	6630.57	222.41 S	1817.87 W	1825.05	0.94
8069.00	90.74	268.51	6629.62	224.21 S	1912.85 W	1920.02	0.92
8163.00	91.54	269.36	6627.75	225.96 S	2006.81 W	2013.98	1.24
8258.00	91.20	269.82	6625.48	226.64 S	2101.78 W	2108.91	0.60
8353.00	90.71	269.99	6623.90	226.79 S	2196.77 W	2203.83	0.55
8447.00	89.04	269.60	6624.10	227.13 S	2290.77 W	2297.77	1.82
8542.00	88.89	268.51	6625.82	228.70 S	2385.74 W	2392.73	1.16
8637.00	88.58	268.03	6627.92	231.56 S	2480.67 W	2487.71	0.60
8732.00	88.86	268.86	6630.04	234.14 S	2575.61 W	2582.68	0.92

	8827.00	87.72	267.76	6632.88	236.94 S	2670.52 W	2677.63	1.67
	8922.00	88.61	269.64	6635.92	239.10 S	2765.45 W	2772.56	2.19
	9017.00	89.29	270.46	6637.66	239.01 S	2860.43 W	2867.47	1.12
	9111.00	89.01	269.89	6639.05	238.73 S	2954.42 W	2961.38	0.68
	9206.00	89.75	270.05	6640.08	238.78 S	3049.41 W	3056.31	0.80
	9301.00	90.31	269.48	6640.03	239.17 S	3144.41 W	3151.25	0.84
	9396.00	89.41	269.23	6640.26	240.23 S	3239.40 W	3246.22	0.98
	9490.00	91.11	269.60	6639.84	241.19 S	3333.39 W	3340.17	1.85
	9585.00	90.96	268.76	6638.12	242.55 S	3428.37 W	3435.13	0.90
	9680.00	91.29	269.66	6636.26	243.86 S	3523.34 W	3530.08	1.01
	9775.00	89.97	269.01	6635.21	244.97 S	3618.32 W	3625.04	1.55
	9869.00	90.12	268.85	6635.14	246.72 S	3712.31 W	3719.02	0.23
	9964.00	89.23	269.60	6635.68	248.01 S	3807.29 W	3813.99	1.23
	10057.00	89.63	270.13	6636.60	248.23 S	3900.29 W	3906.93	0.71
	10149.00	89.66	270.00	6637.17	248.12 S	3992.29 W	3998.85	0.15
	10241.00	89.91	270.33	6637.52	247.86 S	4084.29 W	4090.77	0.45
	10333.00	89.01	269.18	6638.38	248.25 S	4176.28 W	4182.71	1.59
	10425.00	88.98	269.09	6640.00	249.64 S	4268.25 W	4274.68	0.10
	10518.00	88.83	269.09	6641.77	251.12 S	4361.23 W	4367.64	0.16
	10610.00	88.55	268.87	6643.88	252.75 S	4453.19 W	4459.59	0.39
	10701.00	90.06	268.87	6644.98	254.55 S	4544.16 W	4550.57	1.66
	10793.00	90.22	268.52	6644.76	256.64 S	4636.14 W	4642.56	0.42
	10884.00	90.22	267.98	6644.41	259.42 S	4727.09 W	4733.55	0.59
	10977.00	90.52	268.18	6643.81	262.54 S	4820.04 W	4826.55	0.39
	11071.00	89.94	267.75	6643.43	265.88 S	4913.98 W	4920.55	0.77
	11162.00	89.78	267.82	6643.65	269.39 S	5004.91 W	5011.55	0.19
	11254.00	88.34	267.95	6645.16	272.79 S	5096.83 W	5103.53	1.57
	11345.00	89.14	267.81	6647.16	276.15 S	5187.75 W	5194.51	0.89
	11437.00	89.01	268.62	6648.65	279.02 S	5279.69 W	5286.49	0.89
	11530.00	89.66	269.01	6649.73	280.94 S	5372.66 W	5379.47	0.82
	11623.00	89.94	268.68	6650.05	282.82 S	5465.64 W	5472.46	0.47
	11716.00	89.54	268.35	6650.47	285.23 S	5558.61 W	5565.45	0.56
	11809.00	88.89	268.06	6651.75	288.14 S	5651.55 W	5658.44	0.77
	11903.00	91.11	269.16	6651.75	290.42 S	5745.52 W	5752.42	2.64
	11998.00	91.36	269.02	6649.70	291.93 S	5840.49 W	5847.38	0.30
	12092.00	91.17	268.41	6647.63	294.04 S	5934.44 W	5941.34	0.68
	12187.00	90.43	267.97	6646.30	297.04 S	6029.38 W	6036.33	0.91
	12282.00	90.37	269.26	6645.64	299.33 S	6124.35 W	6131.31	1.36
	12377.00	90.03	269.27	6645.30	300.55 S	6219.34 W	6226.28	0.36
	12471.00	90.06	269.44	6645.23	301.61 S	6313.33 W	6320.25	0.18
	12566.00	89.41	268.70	6645.67	303.15 S	6408.32 W	6415.22	1.04
	12661.00	88.58	268.11	6647.34	305.79 S	6503.27 W	6510.20	1.07
	12756.00	89.48	268.48	6648.94	308.62 S	6598.21 W	6605.18	1.02
	12850.00	89.63	269.58	6649.67	310.21 S	6692.19 W	6699.16	1.18
	12945.00	89.20	269.71	6650.64	310.80 S	6787.19 W	6794.10	0.47
	13040.00	88.80	269.37	6652.30	311.56 S	6882.17 W	6889.05	0.55
	13140.00	88.52	268.97	6654.64	313.01 S	6982.13 W	6988.99	0.49
	13234.00	90.31	269.20	6655.60	314.51 S	7076.11 W	7082.96	1.92
	13329.00	90.71	269.63	6654.75	315.48 S	7171.10 W	7177.92	0.62
	13424.00	88.86	268.43	6655.11	317.09 S	7266.08 W	7272.89	2.32
	13518.00	89.81	269.28	6656.20	318.97 S	7360.05 W	7366.87	1.36
	13613.00	89.54	268.71	6656.74	320.64 S	7455.04 W	7461.84	0.66
	13708.00	89.14	268.01	6657.84	323.35 S	7549.99 W	7556.83	0.85
	13802.00	90.99	270.22	6657.73	324.81 S	7643.97 W	7650.80	3.07
	13897.00	88.55	267.48	6658.11	326.71 S	7738.93 W	7745.76	3.86
	13992.00	89.66	268.53	6659.59	330.02 S	7833.86 W	7840.75	1.61
	14087.00	88.67	267.89	6660.98	332.99 S	7928.80 W	7935.74	1.24
	14182.00	90.25	269.79	6661.87	334.91 S	8023.77 W	8030.71	2.60
	14276.00	88.61	268.09	6662.81	336.65 S	8117.74 W	8124.68	2.51
	14371.00	88.74	268.32	6665.01	339.62 S	8212.67 W	8219.65	0.28
	14466.00	89.75	268.61	6666.26	342.17 S	8307.63 W	8314.64	1.11
	14561.00	90.43	268.52	6666.11	344.55 S	8402.60 W	8409.63	0.72
	14655.00	89.35	267.43	6666.29	347.87 S	8496.54 W	8503.62	1.63
	14750.00	89.41	268.85	6667.32	350.95 S	8591.48 W	8598.61	1.50
	14845.00	90.03	269.46	6667.78	352.35 S	8686.47 W	8693.58	0.92
	14940.00	89.26	268.48	6668.37	354.06 S	8781.45 W	8788.56	1.31
	15035.00	90.31	269.47	6668.73	355.76 S	8876.43 W	8883.54	1.52
	15130.00	88.92	267.10	6669.36	358.60 S	8971.37 W	8978.52	2.89
	15225.00	90.37	267.83	6669.95	362.80 S	9066.28 W	9073.52	1.71
	15320.00	89.60	266.78	6669.98	367.27 S	9161.17 W	9168.51	1.37
	15414.00	89.54	266.17	6670.68	373.05 S	9254.99 W	9262.48	0.65
	15509.00	90.59	268.26	6670.58	377.66 S	9349.87 W	9357.47	2.46
	15604.00	89.44	266.04	6670.55	382.39 S	9444.74 W	9452.46	2.63
	15699.00	90.99	267.14	6670.19	388.04 S	9539.57 W	9547.43	2.00

15793.00	92.25	268.82	6667.54	391.35 S	9633.47 W	9641.39	2.23
15888.00	91.08	269.08	6664.78	393.09 S	9728.41 W	9736.33	1.26
15950.00	91.33	268.86	6663.47	394.20 S	9790.39 W	9798.30	0.54
16014.00	91.33	268.86	6661.99	395.48 S	9854.36 W	9862.27	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

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

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 267.81 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 16014.00 FEET
IS 9862.29 FEET ALONG 267.70 DEGREES (GRID)**

First Surveys from 3rd party source (Muilti Shot EMS) and provided by CO-man on location before drilling.

Survey Depth 269 Inc 0.1 Azi 327.47

Survey Depth 543 Inc 1.0 Azi 299.67

Survey Depth 852 Inc 0.5 Azi 219.44

Tied in @ Surface

Magnetic direction of 7.4721 has been added to AZI for grid direction correction.

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