

PCG Pressure Case Gamma PCD Pressure Case Directional

1:600 / 1:240

[illegible]

WELL INFORMATION

MWD Run Number	100				
Date run completed	04-Jan-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.830				
Log Start Depth (TVD, ft)	1,231.00				
Log End Depth (TVD, ft)	5,539.68				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	03-Jan-15 05:45				
Drill/Wipe End Date and Time	04-Jan-15 08:45				
Min Inc (deg) @ Depth (TVD, ft)	0.29 @ 1,390.00				
Max Inc (deg) @ Depth (TVD, ft)	81.74 @ 5,532.36				
Bit TFA(in2) / Bit Type	1.21 / PDC				
Flow Rate (gpm)	637.27				
Max AV (fpm) / CV (fpm) @ MWD	NA / NA				
Fluid Type	Native/Spud Mud				
Density (ppg) / Viscosity (spqt)	8.95 / 28.00				
Filtrate CL (ppm)	1,900.00				
pH / Fluid Loss (mptm)	9.80 / 36				
PV (cP) / YP (lbf2)	4 / 3.00				
% Solids / % Sand	10.5 / 0.25				
% Oil / Oil:Water Ratio	NA / NA				
Rm @ Measured Temp (degF)	N/A @ N/A				
Rmf @ Measured Temp (degF)	N/A @ N/A				
Rmc @ Measured Temp (degF)	N/A @ N/A				
Max Tool Temp (degF) @ Depth (ft)	105.50 / 5,539.68				

Max Tool Temp (degF) / Source	165.58 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Brett Vandergon				
Customer Representative	Jim Boyd				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	10789247				
Insert Serial Number	11400880				
Date and Time Initialized	01-Jan-15 10:30				
Date and Time Read	04-Jan-15 17:26				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	57.00				
Software Version	6.33				
Sub Serial Number	10789247				
Sonde Serial Number	10993517				
Sensor ID Number	N/A				
Toolface Offset (deg)	66.43				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	50.27				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	10789247				
Insert/Sonde Serial Number	11293261				

REMARKS

1. All depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
1: 600
PGRC (Corrected Gamma Ray):
Interval Resolution: 1.0 ft
Interval Distance: 3.0 ft
Gap Fill: 5.0 ft
ROPA (Average Rate of Penetration)
Interval Resolution: 1.0 ft
Interval Distance: 3.0 ft
Gap Fill: 5.0 ft
1: 240
PGRC (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

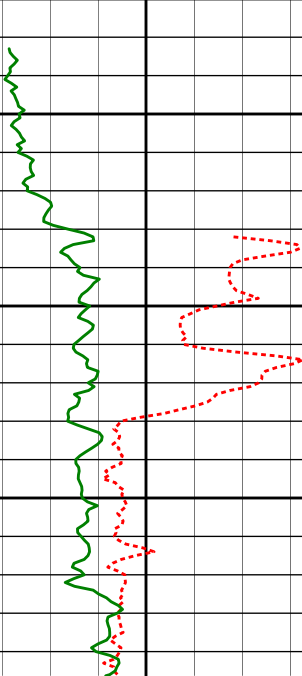
Gap Fill: 3.0 ft
ROPA (Average Rate of Penetration)
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill: 3.0 ft
6. INSITE version 8.0.2

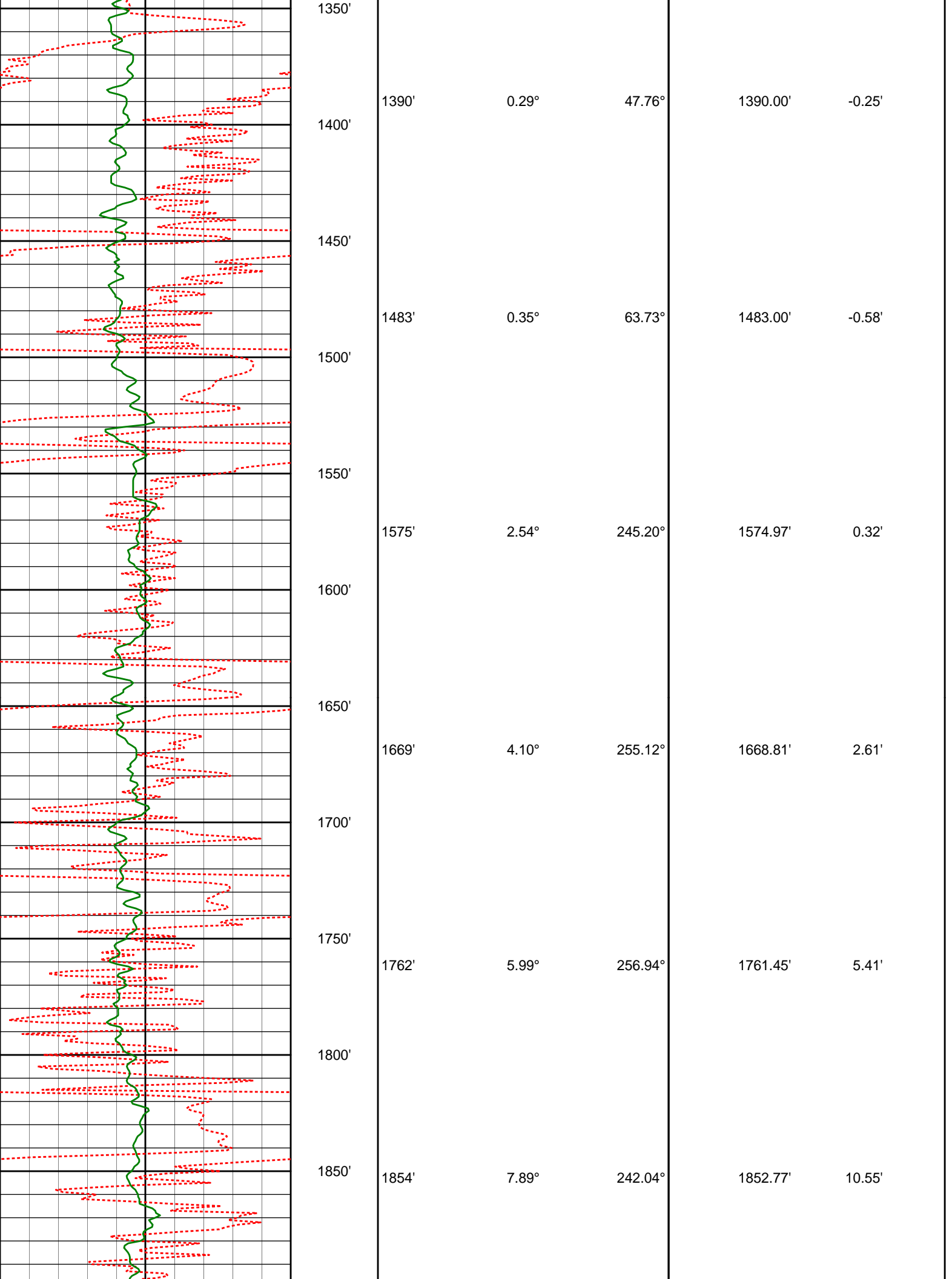
WARRANTY

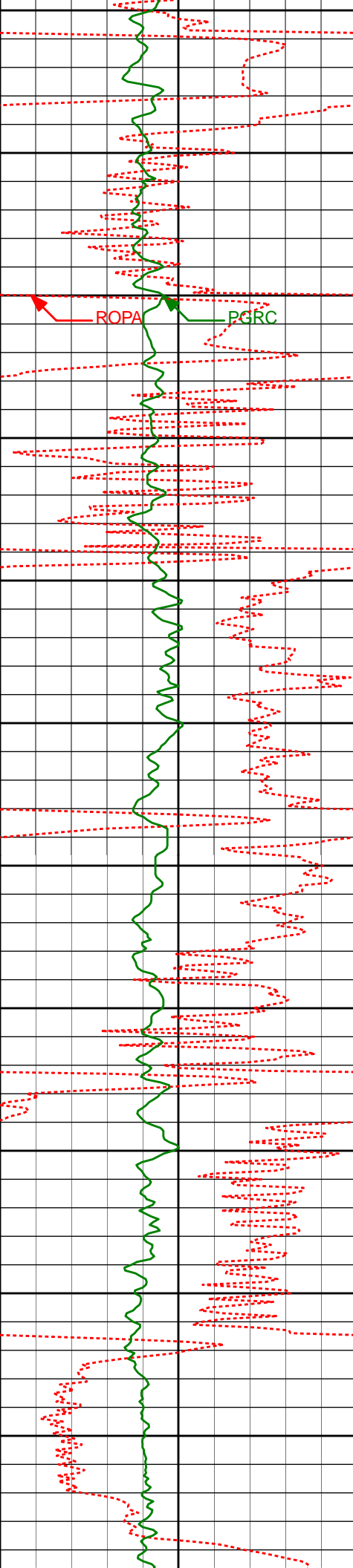
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TVD Main Log 1:600

Average Rate of Penetration ROPA						
1K	0					
feet per hr						
PCG Gamma Ray BCorr PGRC		True Vertical Depth (ft) 1:600	Depth	Inc	Azi.	TVD V.S.
0	200					
api						
		1200'				
		1250'				
		1300'	1298'	0.30°	20.99°	1298.00' 0.16'





1900'

1950'

2000'

2050'

2100'

2150'

2200'

2250'

2300'

2350'

2400'

1946'

9.08°

252.82°

1943.77'

17.00'

2039'

11.56°

263.06°

2035.27'

22.05'

2131'

10.94°

262.09°

2125.50'

26.30'

2224'

10.34°

260.74°

2216.90'

30.69'

2316'

10.23°

258.68°

2307.42'

35.37'

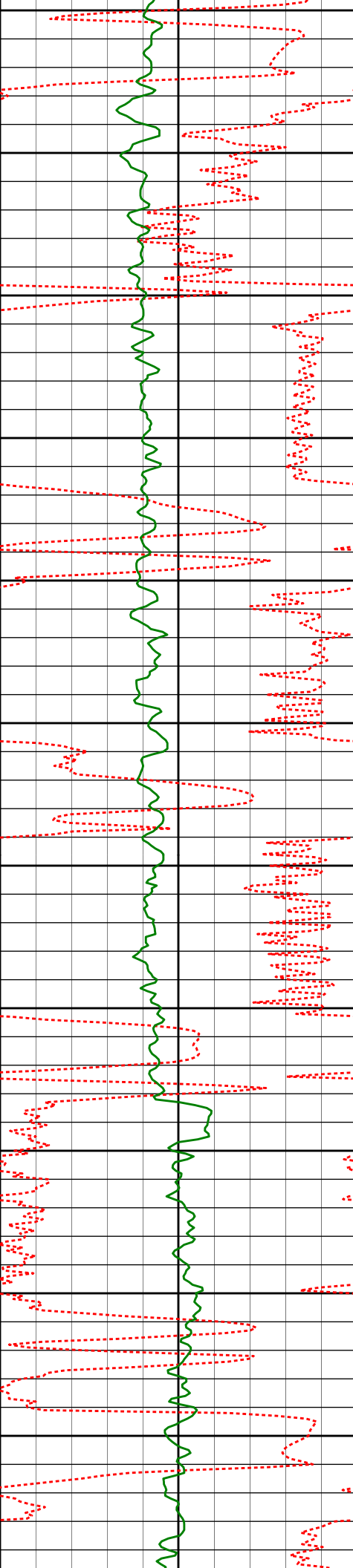
2408'

10.49°

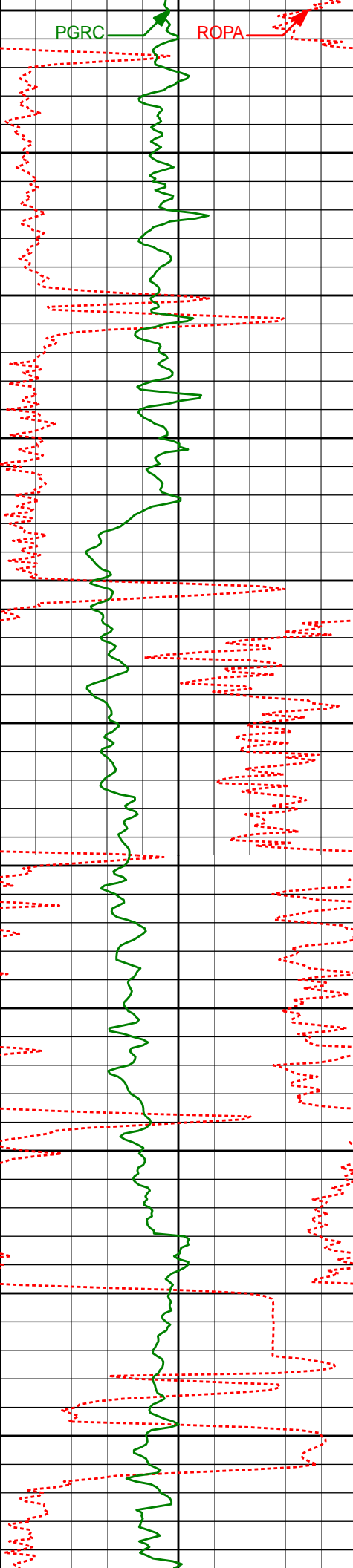
257.34°

2397.92'

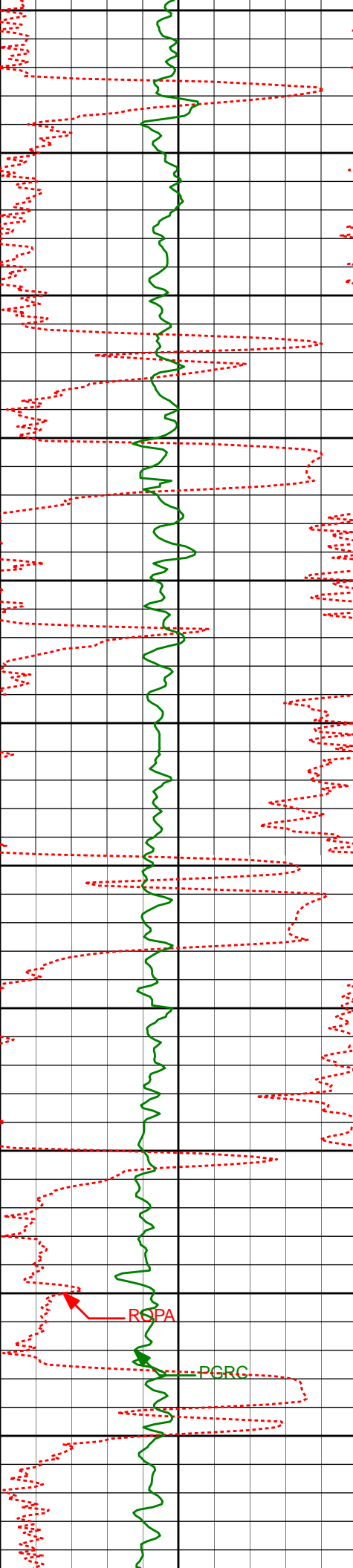
40.56'



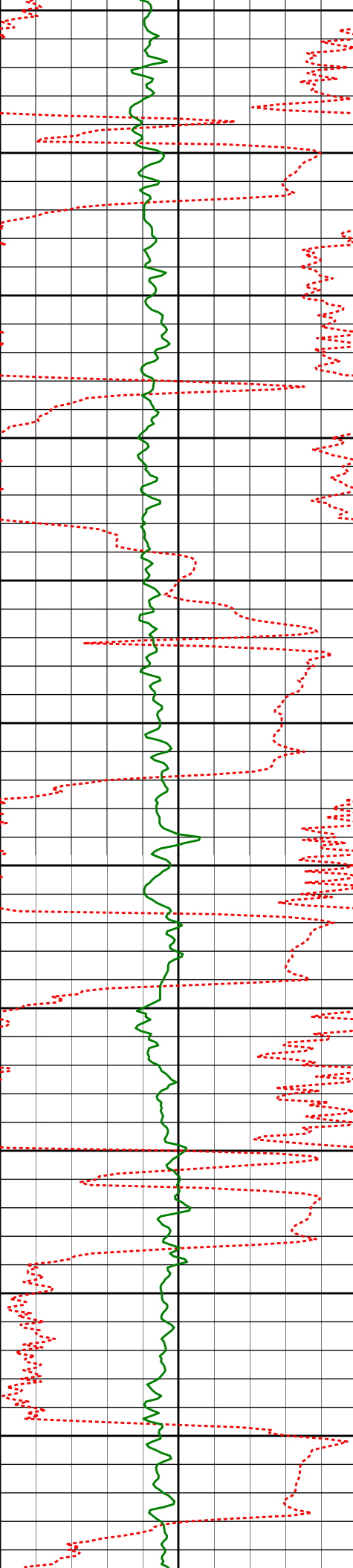
2504'	11.34°	265.09°	2492.19'	45.22'
2599'	11.37°	265.18°	2585.33'	48.84'
2694'	11.18°	265.21°	2678.49'	52.40'
2788'	10.85°	265.26°	2770.76'	55.84'
2884'	9.63°	264.49°	2865.23'	59.21'
2979'	10.36°	264.28°	2958.79'	62.60'



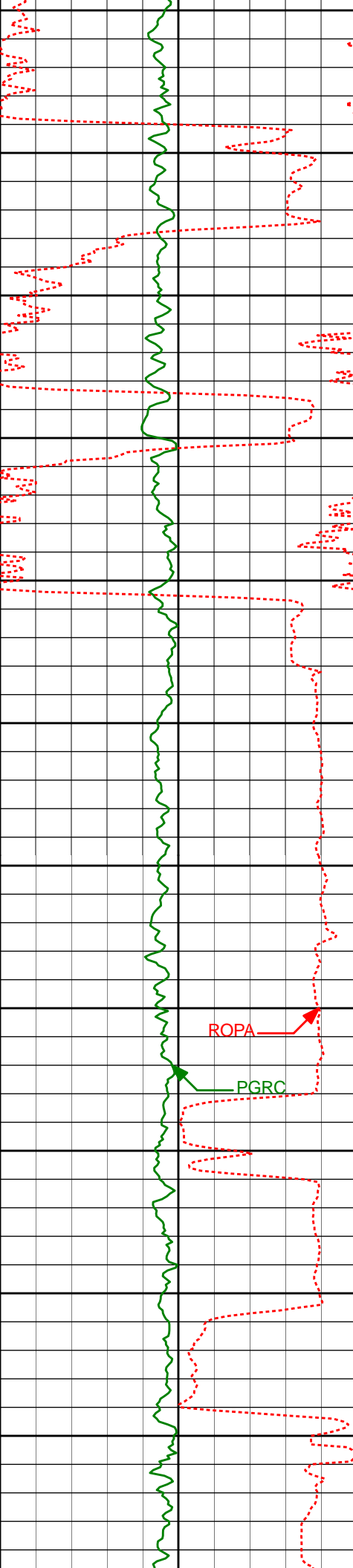
3000'					
3050'	3074'	10.54°	263.85°	3052.21'	66.25'
3100'					
3150'	3169'	10.71°	263.56°	3145.58'	70.06'
3200'					
3250'	3264'	11.23°	263.48°	3238.85'	74.04'
3300'					
3350'	3359'	11.78°	263.62°	3331.94'	78.21'
3400'					
3450'	3454'	12.32°	263.57°	3424.85'	82.57'
3500'					
	3549'	11.85°	257.47°	3517.75'	87.94'



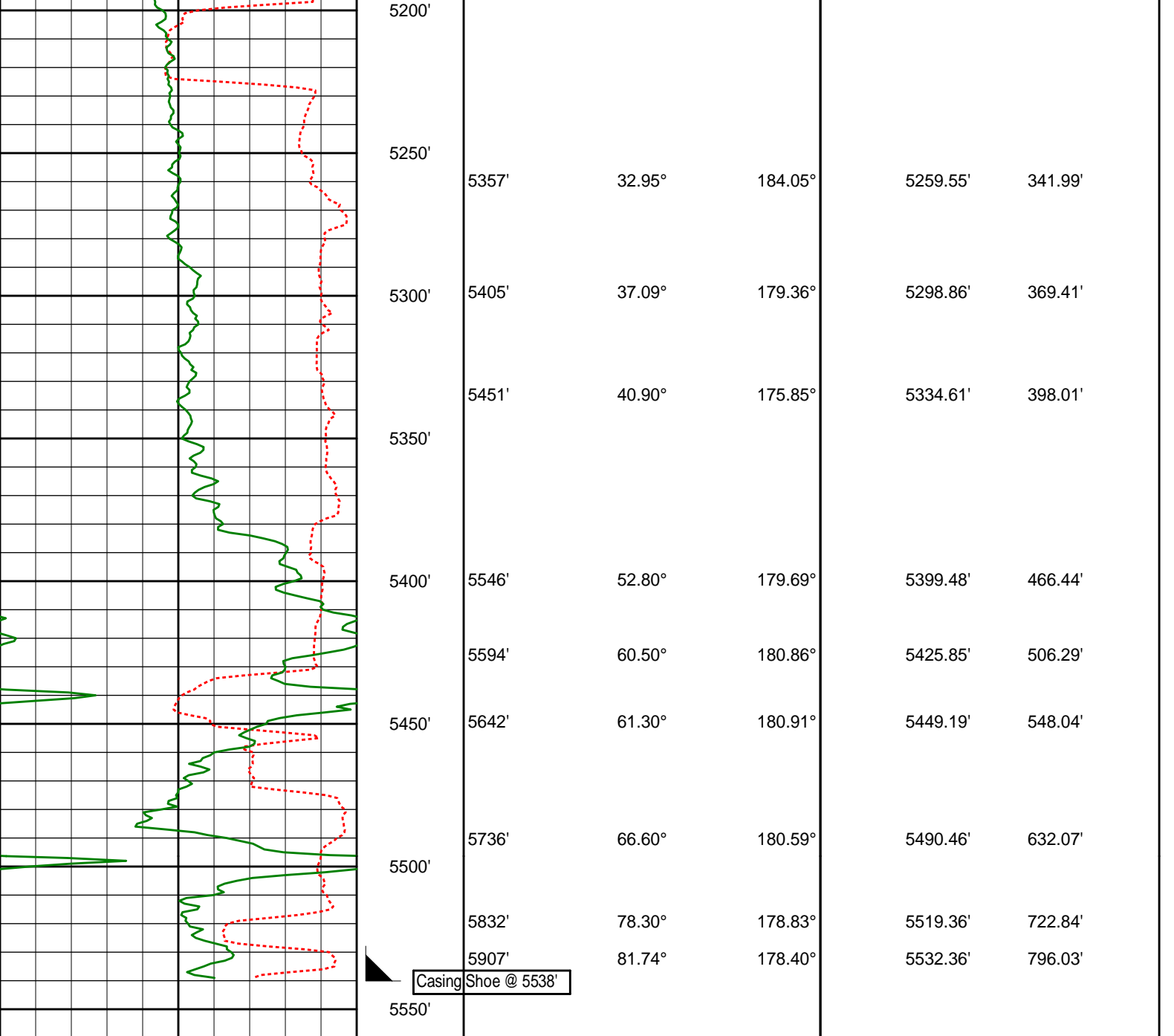
3645'	10.97°	254.28°	3611.85'	94.54'
3740'	10.10°	255.64°	3705.25'	100.85'
3835'	9.73°	257.45°	3798.83'	106.38'
3930'	11.19°	261.82°	3892.25'	111.27'
4025'	10.63°	260.32°	3985.53'	115.97'
4120'	9.85°	259.72°	4079.02'	120.69'



4100'				
4150'				
4215'	10.12°	266.99°	4172.58'	124.36'
4200'				
4250'				
4310'	8.62°	267.88°	4266.31'	126.74'
4300'				
4350'				
4405'	9.25°	261.39°	4360.16'	129.74'
4400'				
4450'				
4500'	10.61°	261.49°	4453.74'	133.93'
4550'				
4595'	9.96°	254.05°	4547.22'	139.27'
4600'				
4691'	11.64°	257.65°	4641.51'	145.51'



4786'	12.47°	251.40°	4734.42'	152.88'
4881'	11.53°	247.90°	4827.34'	161.70'
4976'	15.37°	218.14°	4919.83'	176.93'
5071'	26.43°	209.05°	5008.46'	207.22'
5166'	28.61°	195.22°	5092.79'	249.23'
5261'	27.54°	187.32°	5176.64'	293.67'



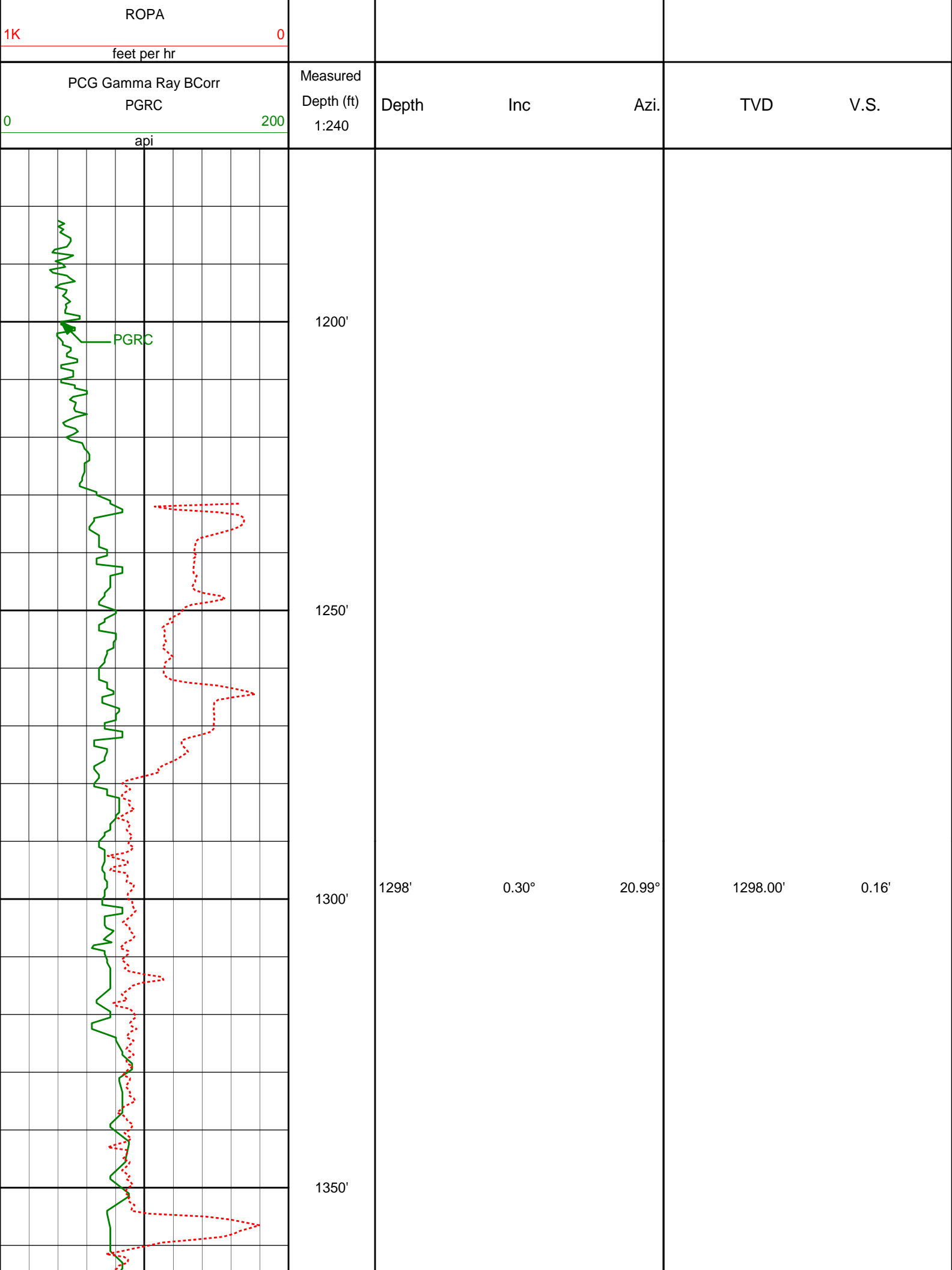
PCG Gamma Ray BCorr PGRC 0200 api	True Vertical Depth (ft) 1:600	Depth	Inc	Azi.	TVD	V.S.

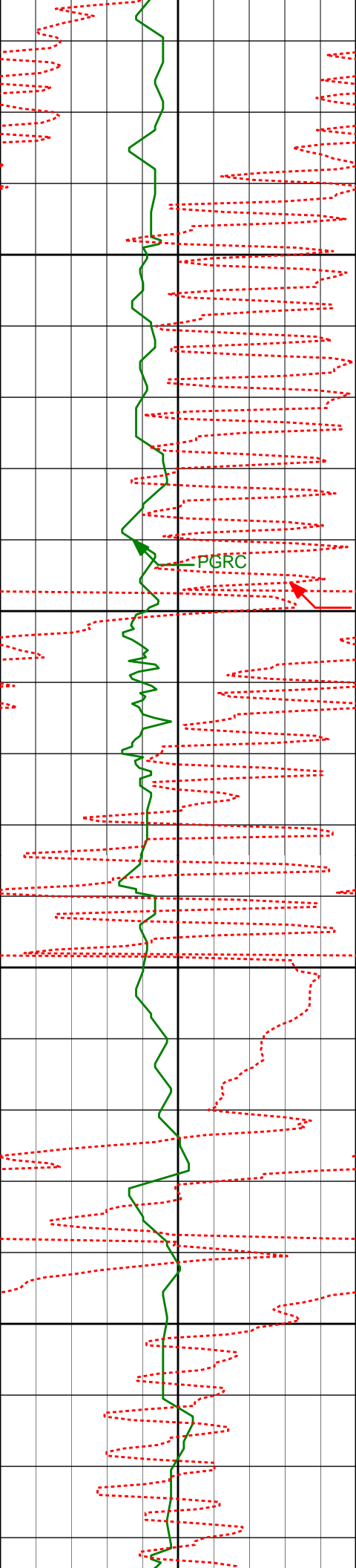
Average Rate of Penetration ROPA 1K0 feet per hr						
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HALLIBURTON

TVD Main Log 1:240

Average Rate of Penetration						
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1390'

0.29°

47.76°

1390.00'

-0.25'

1400'

1450'

1483'

0.35°

63.73°

1483.00'

-0.58'

1500'

1550'

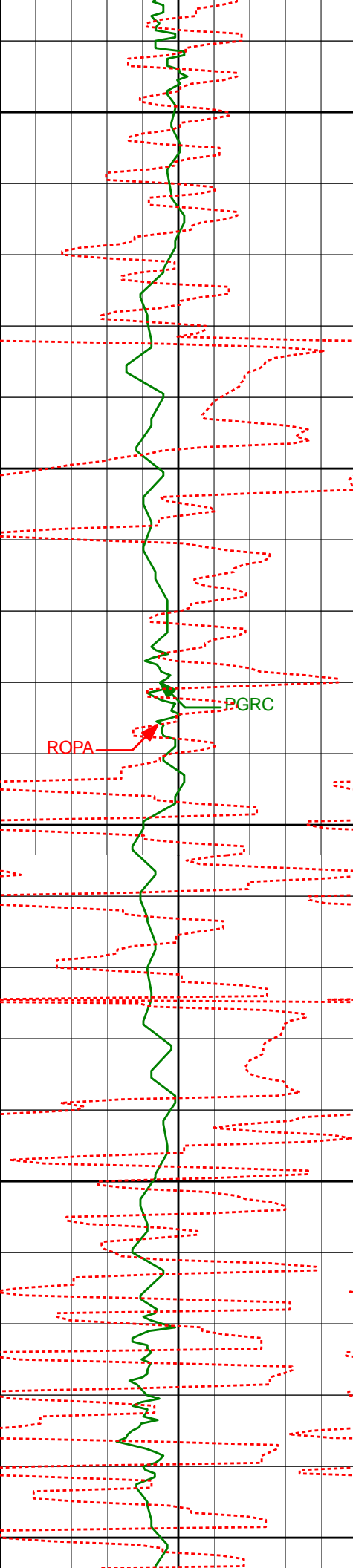
1575'

2.54°

245.20°

1574.97'

0.32'



1600'

1650'

1700'

1750'

1800'

1669'

4.10°

255.12°

1668.81'

2.61'

1762'

5.99°

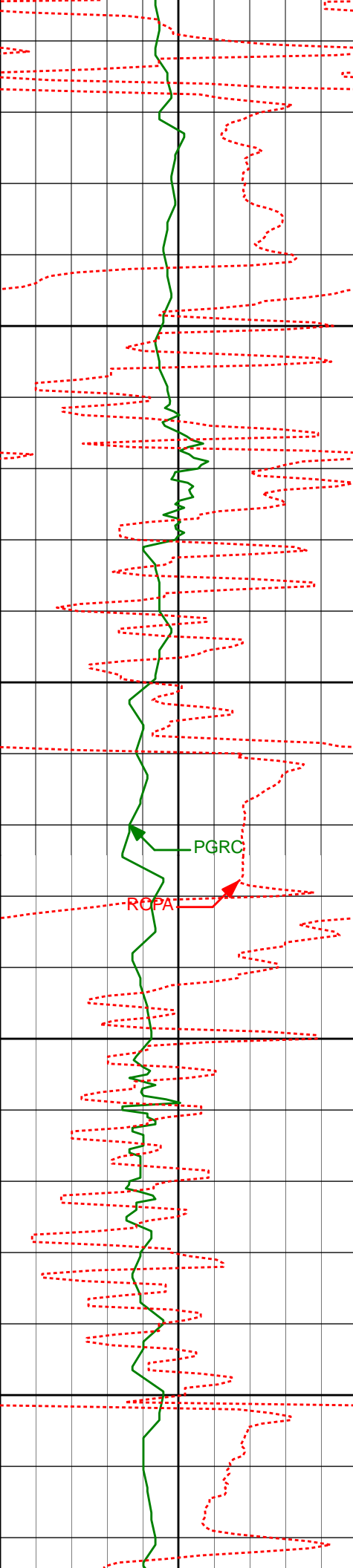
256.94°

1761.45'

5.41'

ROPA

PGRC



1850'

1900'

1950'

2000'

PGRC
RCPA

1854'

7.89°

242.04°

1852.77'

10.55'

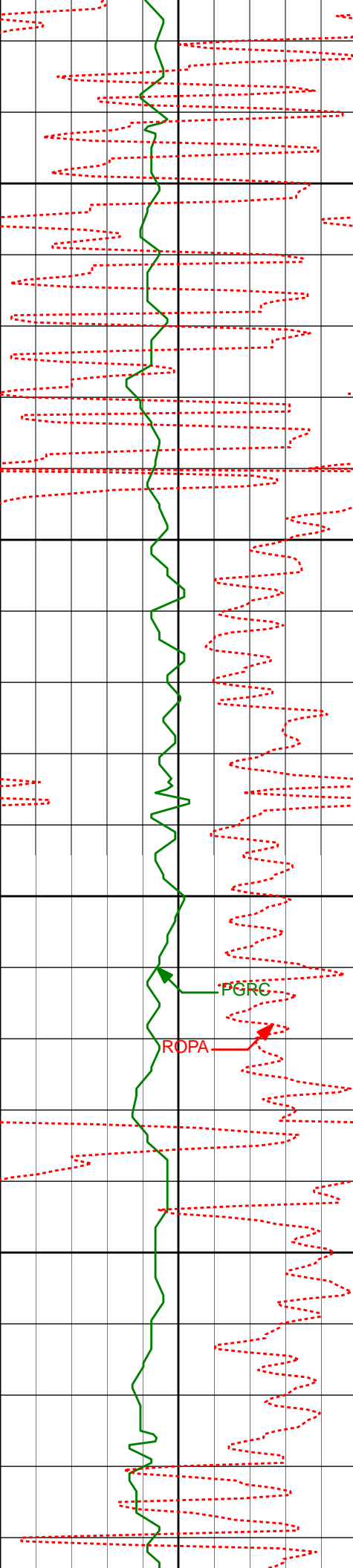
1946'

9.08°

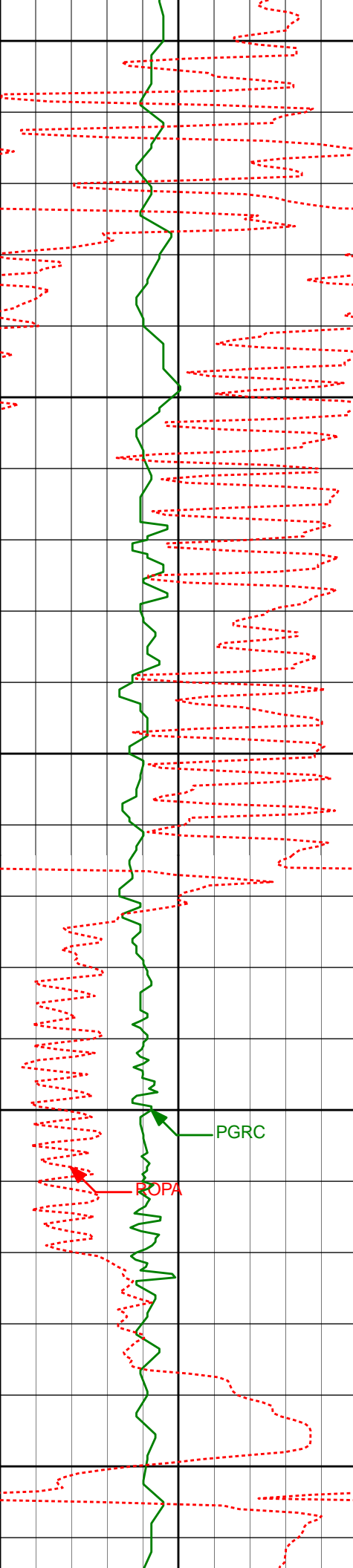
252.82°

1943.77'

17.00'



2039'	11.56°	263.06°	2035.27'	22.05'
2050'				
2100'				
2131'	10.94°	262.09°	2125.50'	26.30'
2150'				
2200'				
2224'	10.34°	260.74°	2216.90'	30.69'



2250'

2300'

2350'

2400'

2450'

2316'

10.23°

258.68°

2307.42'

35.37'

2408'

10.49°

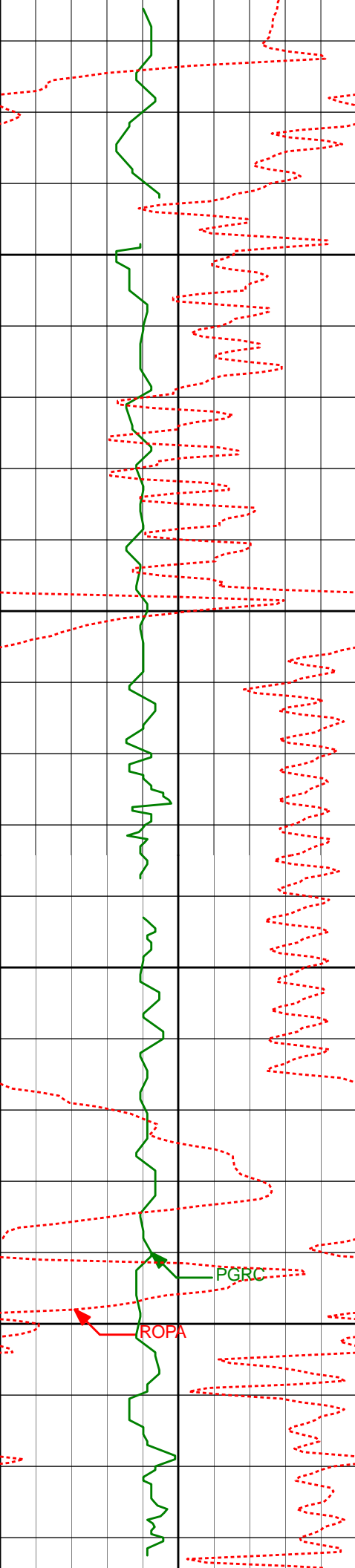
257.34°

2397.92'

40.56'

PGRC

ROPA



2500'

2550'

2600'

2650'

2504'

11.34°

265.09°

2492.19'

45.22'

2599'

11.37°

265.18°

2585.33'

48.84'

2694'

11.18°

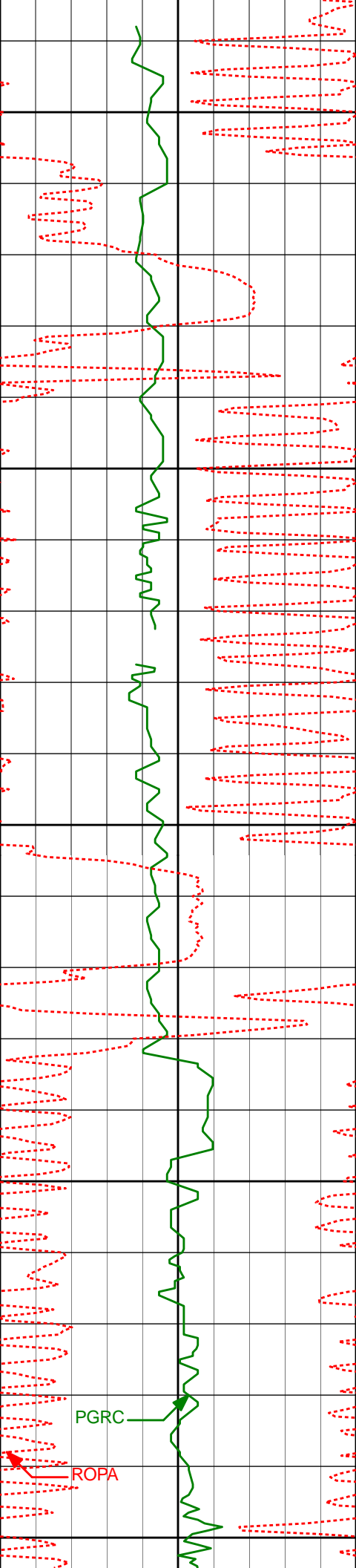
265.21°

2678.49'

52.40'

PGRC

ROPA



2700'

2750'

2800'

2850'

2900'

2788'

10.85°

265.26°

2770.76'

55.84'

2884'

9.63°

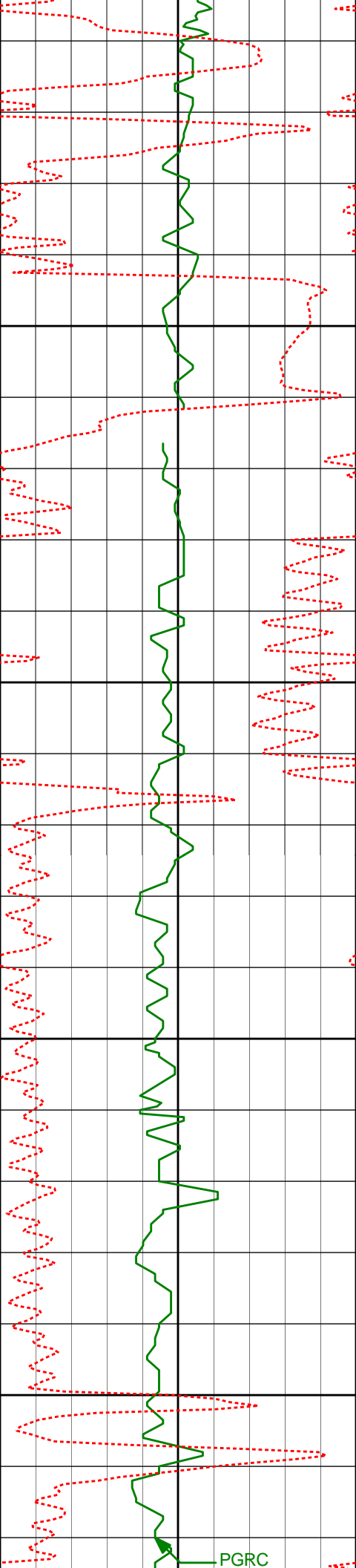
264.49°

2865.23'

59.21'

PGRC

ROPA



2950'

2979'

10.36°

264.28°

2958.79'

62.60'

3000'

3050'

3074'

10.54°

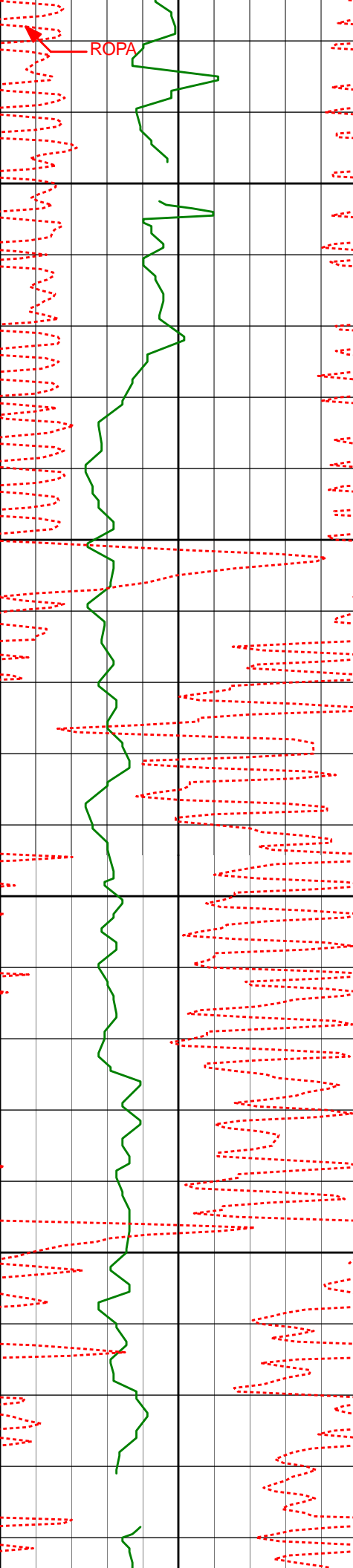
263.85°

3052.21'

66.25'

3100'

PGRC



3169'	10.71°	263.56°	3145.58'	70.06'
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3150'

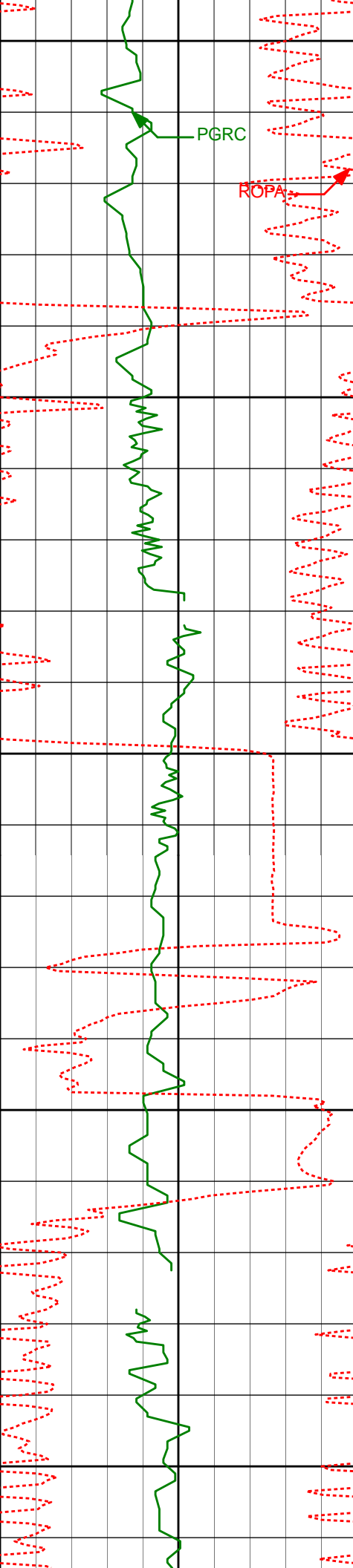
3200'

3264'	11.23°	263.48°	3238.85'	74.04'
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3250'

3300'

3359'	11.78°	263.62°	3331.94'	78.21'
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3350'

PGRC

ROPA

3400'

3454'

12.32°

263.57°

3424.85'

82.57'

3450'

3500'

3549'

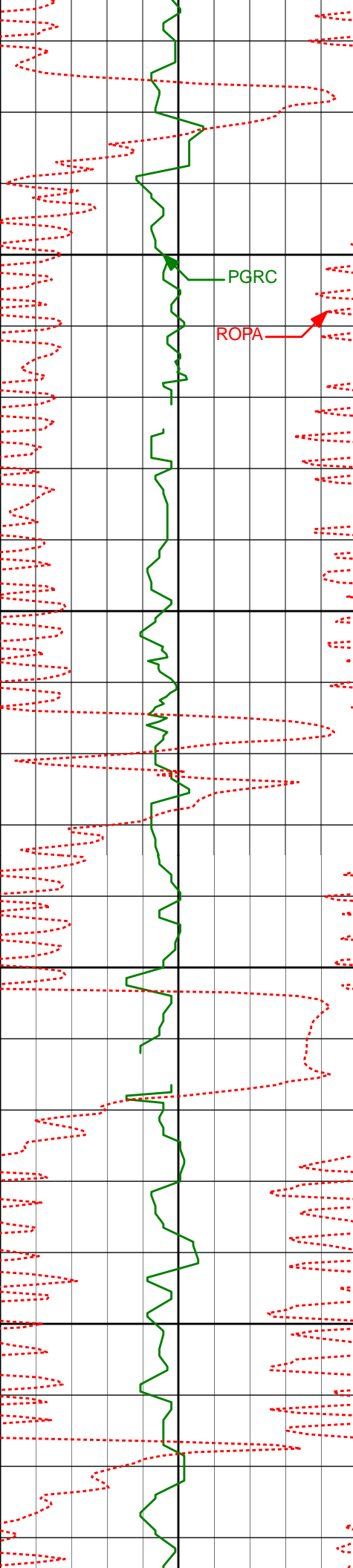
11.85°

257.47°

3517.75'

87.94'

3550'



3600'

PGRC

ROPA

3645'

10.97°

254.28°

3611.85'

94.54'

3650'

3700'

3740'

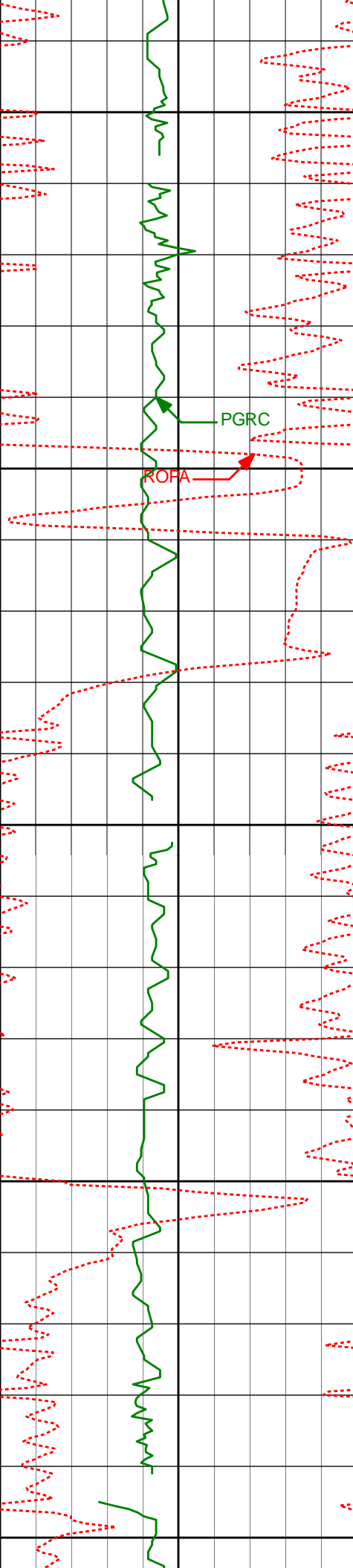
10.10°

255.64°

3705.25'

100.85'

3750'



3800'

3835'

9.73°

257.45°

3798.83'

106.38'

3850'

ROFA

PGRC

3900'

3930'

11.19°

261.82°

3892.25'

111.27'

3950'

4025'

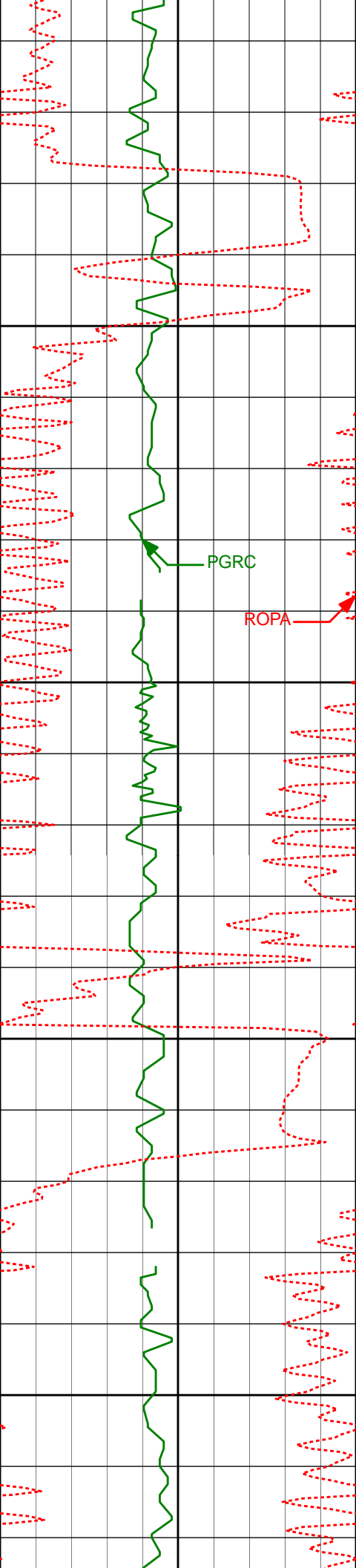
10.63°

260.32°

3985.53'

115.97'

4000'



4050'

4120'

9.85°

259.72°

4079.02'

120.69'

4100'

4150'

4215'

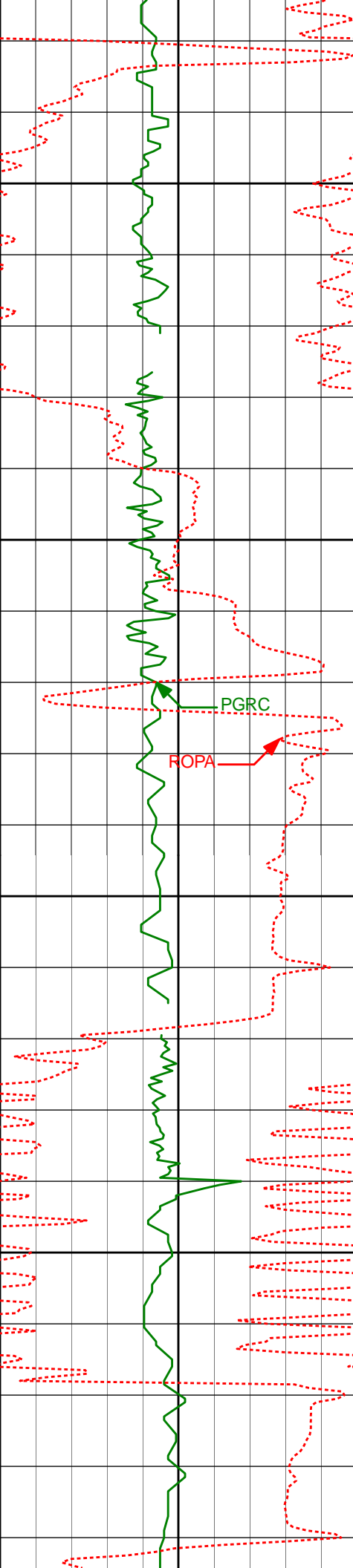
10.12°

266.99°

4172.58'

124.36'

4200'



4250'

4310'

8.62°

267.88°

4266.31'

126.74'

4300'

PGRC

ROPA

4350'

4405'

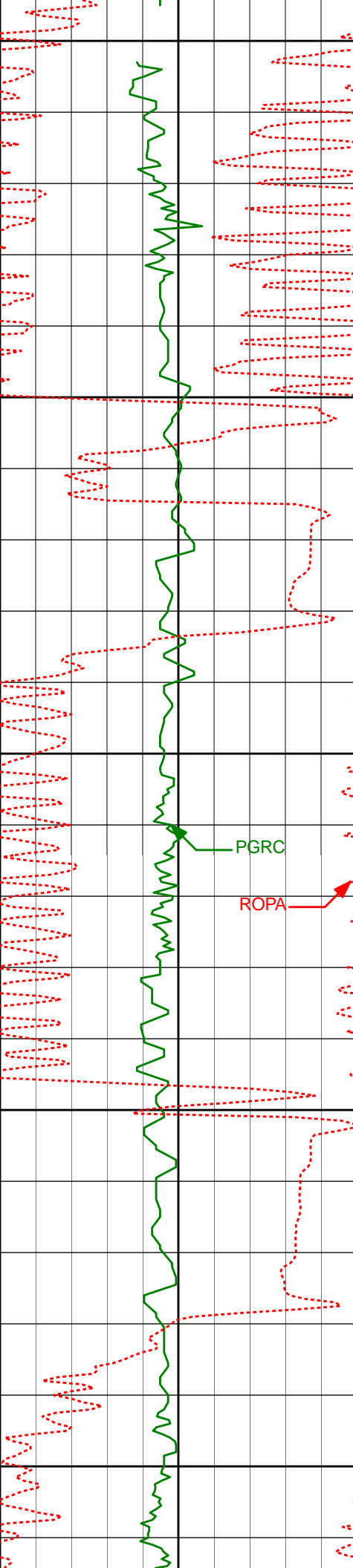
9.25°

261.39°

4360.16'

129.74'

4400'



4450'

4500'

10.61°

261.49°

4453.74'

133.93'

4500'

4550'

4595'

9.96°

254.05°

4547.22'

139.27'

PGRC

ROPA

4600'

4650'

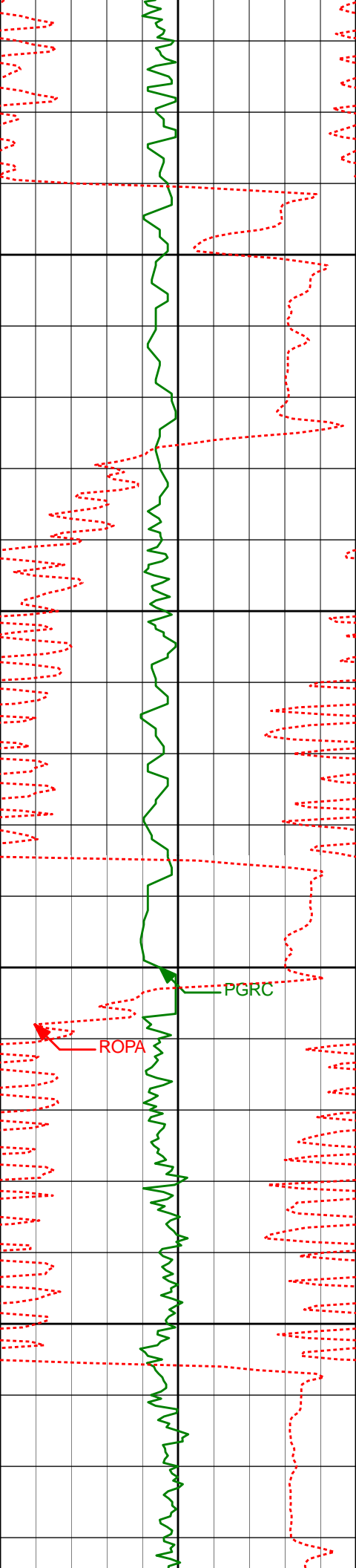
4691'

11.64°

257.65°

4641.51'

145.51'



4700'

4786'

12.47°

251.40°

4734.42'

152.88'

4750'

4800'

PGRC

ROPA

4881'

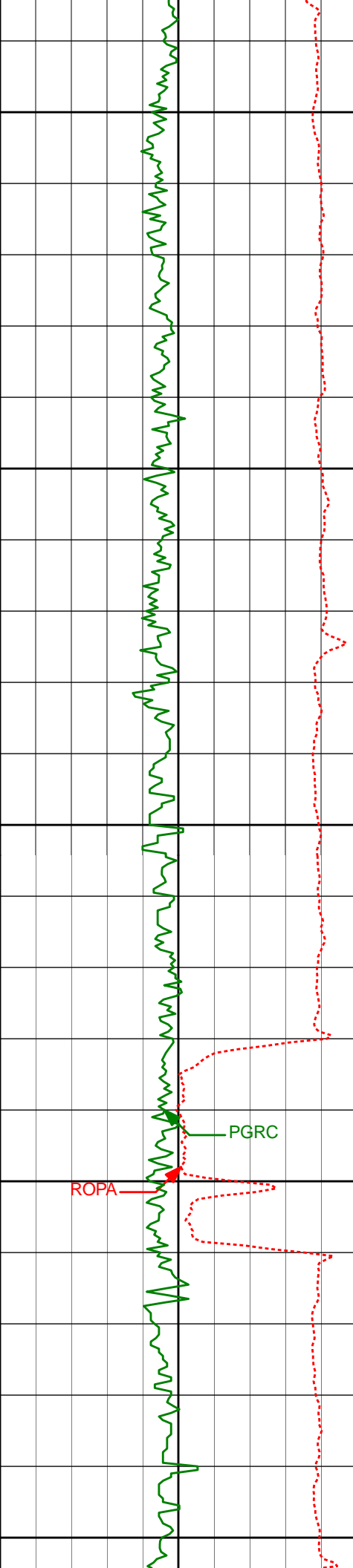
11.53°

247.90°

4827.34'

161.70'

4850'



4900'

4976'

15.37°

218.14°

4919.83'

176.93'

4950'

5000'

5071'

26.43°

209.05°

5008.46'

207.22'

PGRC

ROPA

5050'

5166'

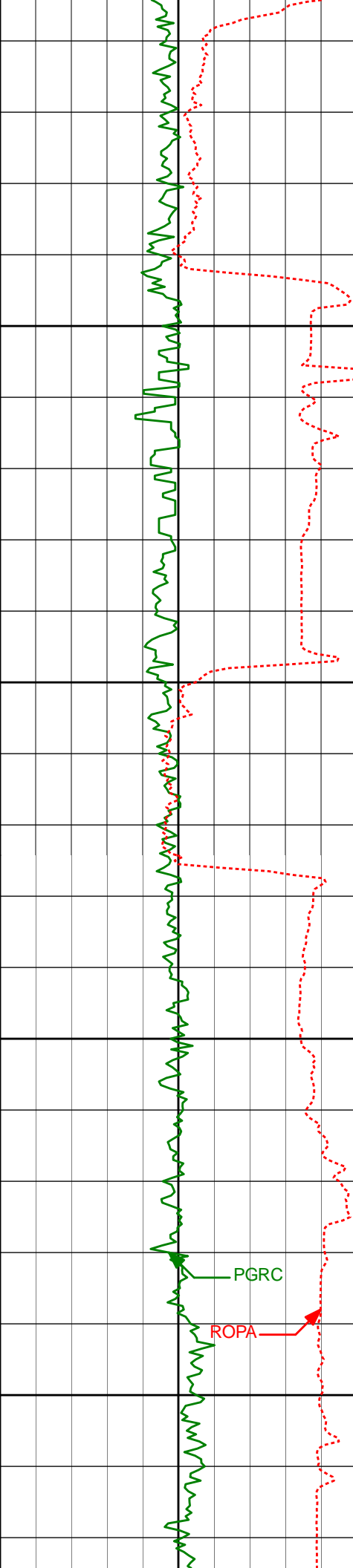
28.61°

195.22°

5092.79'

249.23'

5100'



5150'

5261'

27.54°

187.32°

5176.64'

293.67'

5200'

5250'

5357'

32.95°

184.05°

5259.55'

341.99'

PGRC

ROPA

5300'

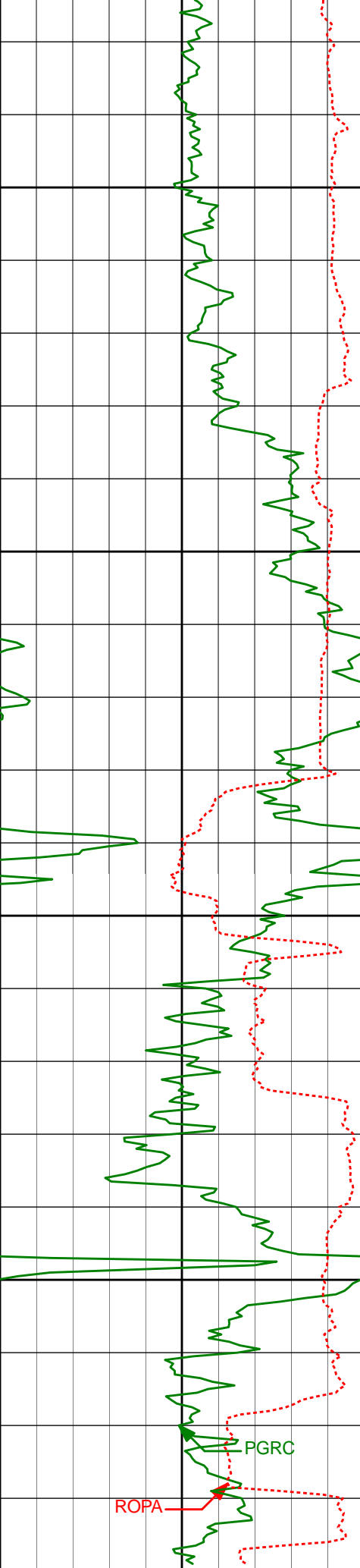
5405'

37.09°

179.36°

5298.86'

369.41'



	5451'	40.90°	175.85°	5334.61'	398.01'
5350'					
5400'	5546'	52.80°	179.69°	5399.48'	466.44'
	5594'	60.50°	180.86°	5425.85'	506.29'
5450'	5642'	61.30°	180.91°	5449.19'	548.04'
5500'	5736'	66.60°	180.59°	5490.46'	632.07'
	5832'	78.30°	178.83°	5519.36'	722.84'
	5907'	81.74°	178.40°	5532.36'	796.03'

Casing Shoe @ 5538'

4691.00	11.64	257.65	4641.51	87.43 S	536.52 W	145.51	1.89
4786.00	12.47	251.40	4734.42	92.75 S	555.61 W	152.88	1.62
4881.00	11.53	247.90	4827.34	99.60 S	574.13 W	161.70	1.25
4976.00	15.37	218.14	4919.83	113.09 S	590.72 W	176.93	8.20
5071.00	26.43	209.05	5008.46	141.57 S	608.83 W	207.22	12.10
5166.00	28.61	195.22	5092.79	182.05 S	625.09 W	249.23	7.09
5261.00	27.54	187.32	5176.64	225.80 S	633.86 W	293.67	4.07
5357.00	32.95	184.05	5259.55	273.89 S	638.54 W	341.99	5.88
5405.00	37.09	179.36	5298.86	301.40 S	639.30 W	369.41	10.29
5451.00	40.90	175.85	5334.61	330.30 S	638.05 W	398.01	9.57
5546.00	52.80	179.69	5399.48	399.41 S	635.59 W	466.44	12.87
5594.00	60.50	180.86	5425.85	439.48 S	635.80 W	506.29	16.17
5642.00	61.30	180.91	5449.19	481.41 S	636.45 W	548.04	1.68
5736.00	66.60	180.59	5490.46	565.83 S	637.55 W	632.07	5.65
5832.00	78.30	178.83	5519.36	657.19 S	637.04 W	722.84	12.31
5907.00	81.74	178.40	5532.36	731.03 S	635.26 W	796.03	4.63
5999.00	84.57	178.14	5543.32	822.32 S	632.50 W	886.48	3.08
6092.00	88.98	179.01	5548.55	915.12 S	630.19 W	978.47	4.84
6185.00	90.15	180.21	5549.25	1008.11 S	629.55 W	1070.84	1.80
6278.00	90.18	179.47	5548.97	1101.11 S	629.29 W	1163.25	0.79
6370.00	89.51	178.45	5549.22	1193.09 S	627.62 W	1254.50	1.33
6463.00	90.92	181.29	5548.87	1286.08 S	627.41 W	1346.91	3.41
6555.00	88.77	181.53	5549.12	1378.05 S	629.68 W	1438.57	2.36
6648.00	88.80	180.90	5551.10	1471.00 S	631.65 W	1531.19	0.68
6740.00	88.64	180.85	5553.15	1562.97 S	633.05 W	1622.76	0.18
6833.00	88.67	180.27	5555.33	1655.94 S	633.96 W	1715.27	0.62
6925.00	88.86	179.88	5557.31	1747.92 S	634.09 W	1806.71	0.47
7020.00	88.95	180.07	5559.12	1842.90 S	634.05 W	1901.12	0.22
7114.00	89.85	180.63	5560.10	1936.89 S	634.62 W	1994.62	1.12
7209.00	90.56	180.73	5559.77	2031.88 S	635.74 W	2089.16	0.75
7304.00	90.74	180.74	5558.70	2126.87 S	636.96 W	2183.71	0.20
7399.00	89.26	180.49	5558.70	2221.86 S	637.98 W	2278.25	1.58
7494.00	89.88	180.64	5559.41	2316.86 S	638.91 W	2372.77	0.67
7589.00	89.91	181.79	5559.59	2411.83 S	640.92 W	2467.40	1.21
7684.00	89.08	179.09	5560.43	2506.82 S	641.65 W	2561.90	2.97
7779.00	88.77	178.26	5562.22	2601.77 S	639.45 W	2656.05	0.93
7874.00	88.18	177.50	5564.75	2696.67 S	635.93 W	2749.99	1.01
7969.00	87.56	176.87	5568.28	2791.49 S	631.27 W	2843.74	0.93
8064.00	89.41	179.18	5570.78	2886.39 S	628.00 W	2937.71	3.12
8160.00	89.32	179.79	5571.84	2982.38 S	627.13 W	3033.03	0.64
8255.00	88.74	179.54	5573.45	3077.37 S	626.58 W	3127.39	0.67
8350.00	88.34	179.16	5575.88	3172.33 S	625.50 W	3221.67	0.59
8445.00	88.12	179.58	5578.82	3267.28 S	624.45 W	3315.93	0.50
8540.00	89.17	178.79	5581.07	3362.24 S	623.10 W	3410.18	1.38
8635.00	89.08	178.77	5582.53	3457.21 S	621.09 W	3504.36	0.10
8730.00	89.20	178.56	5583.96	3552.17 S	618.87 W	3598.51	0.26
8825.00	88.83	178.32	5585.60	3647.12 S	616.29 W	3692.61	0.46
8920.00	88.40	178.00	5587.90	3742.04 S	613.24 W	3786.63	0.57
9015.00	89.82	178.94	5589.38	3836.99 S	610.70 W	3880.74	1.79
9110.00	89.97	178.97	5589.56	3931.98 S	608.97 W	3974.97	0.16
9205.00	89.78	178.35	5589.76	4026.95 S	606.75 W	4069.13	0.67
9300.00	89.97	178.24	5589.97	4121.91 S	603.93 W	4163.21	0.23
9395.00	90.55	177.96	5589.53	4216.85 S	600.77 W	4257.24	0.68
9490.00	90.09	176.70	5589.00	4311.75 S	596.34 W	4351.09	1.41
9585.00	91.51	178.82	5587.67	4406.66 S	592.63 W	4445.02	2.69
9680.00	91.73	179.37	5584.98	4501.61 S	591.14 W	4539.24	0.62
9775.00	90.15	180.26	5583.42	4596.59 S	590.83 W	4633.62	1.90
9870.00	89.97	180.24	5583.31	4691.59 S	591.25 W	4728.10	0.20
9965.00	89.54	179.97	5583.72	4786.59 S	591.42 W	4822.55	0.53
10060.00	89.45	179.27	5584.57	4881.58 S	590.79 W	4916.90	0.74
10154.00	89.85	179.62	5585.15	4975.58 S	589.89 W	5010.24	0.57
10249.00	89.85	179.54	5585.40	5070.57 S	589.19 W	5104.59	0.09
10344.00	89.81	179.18	5585.69	5165.57 S	588.13 W	5198.90	0.38
10393.00	89.75	178.52	5585.87	5214.56 S	587.15 W	5247.49	1.36
10448.00	89.75	178.52	5586.11	5269.54 S	585.73 W	5301.98	0.01

CALCULATION BASED ON MINIMUM CURVATURE METHOD

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

VERTICAL SECTION RELATIVE TO WELL HEAD

VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 186.27 DEGREES (GRID)
A TOTAL CORRECTION OF 6.91 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10448.00 FEET
IS 5301.99 FEET ALONG 186.34 DEGREES (GRID)

Final survey is a straight line projection to TD.

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