

## PCGK - Pressure Case Gamma

**1 : 600 / 1 : 240**

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200			
<b>Date run completed</b>	22-Jul-14	23-Jul-14			
<b>Rig Bit Number</b>	2	3			
<b>Bit Size (in)</b>	8.750	8.750			
<b>Tool Nominal OD (in)</b>	6.880	6.880			
<b>Log Start Depth (MD, ft)</b>	633.00	6,436.00			
<b>Log End Depth (MD, ft)</b>	6,436.00	7,491.00			
<b>Drill or Wipe</b>	Drill	Drill			
<b>Drill/Wipe Start Date and Time</b>	21-Jul-14 16:06	23-Jan-14 01:12			
<b>Drill/Wipe End Date and Time</b>	22-Jul-14 15:37	23-Jul-14 11:52			
<b>Min Inc (deg) @ Depth (MD, ft)</b>	0.11 @ 6,190.00	0.89 @ 6,474.00			
<b>Max Inc (deg) @ Depth (MD, ft)</b>	13.27 @ 3,917.00	80.06 @ 7,437.00			
<b>Bit TFA(in2) / Bit Type</b>	1.05 / PDC	1.74 / PDC			
<b>Flow Rate (gpm)</b>	598.40	584.50			
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	NA / NA	NA / NA			
<b>Fluid Type</b>	Fresh Water Gel	Fresh Water Gel			
<b>Density (ppg) / Viscosity (spqt)</b>	8.55 / 29.00	10.30 / 36.00			
<b>Filtrate CL (ppm)</b>	1,500.00	2,000.00			
<b>pH / Fluid Loss (mptm)</b>	8.50 / 16	9.30 / 9			
<b>PV (cP) / YP (lbf2)</b>	2 / 2.00	10 / 10.00			
<b>% Solids / % Sand</b>	1.70 / 0.10	9.70 / 0.25			
<b>% Oil / Oil:Water Ratio</b>	NA / NA	NA / NA			
<b>Rm @ Measured Temp (degF)</b>	NA @ NA	NA @ NA			
<b>Rmf @ Measured Temp (degF)</b>	NA @ NA	NA @ NA			
<b>Rmc @ Measured Temp (degF)</b>	NA @ NA	NA @ NA			
<b>Max Tool Temp (in F) / S</b>	168.00 / PCM	171.00 / PCM			

Max Tool Temp (degF) / Source	162.80 / PCM	171.20 / PCM			
Rm @ Max Tool Temp (degF)	NA @ 162.80	NA @ 171.20			
Lead MWD Engineer	Kyle Wass	Kyle Wass			
Customer Representative	Stetson Nielsen	Stetson Nielsen			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	241717	241717			
Insert Serial Number	11145509	11145509			
Date and Time Initialized	20-Jul-14 10:04	20-Jul-14 10:04			
Date and Time Read	23-Jul-14 17:07	23-Jul-14 17:07			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	54.00			
Software Version	6.21	6.21			
Sub Serial Number	241717	241717			
Sonde Serial Number	11297620	11297620			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	199.77	238.05			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	48.98	47.01			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	241717	241717			
Insert/Sonde Serial Number	11579840	11579840			

## REMARKS

1. All depths are calibrated to driller's pipe tally and are true vertical depth 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

## WARRANTY

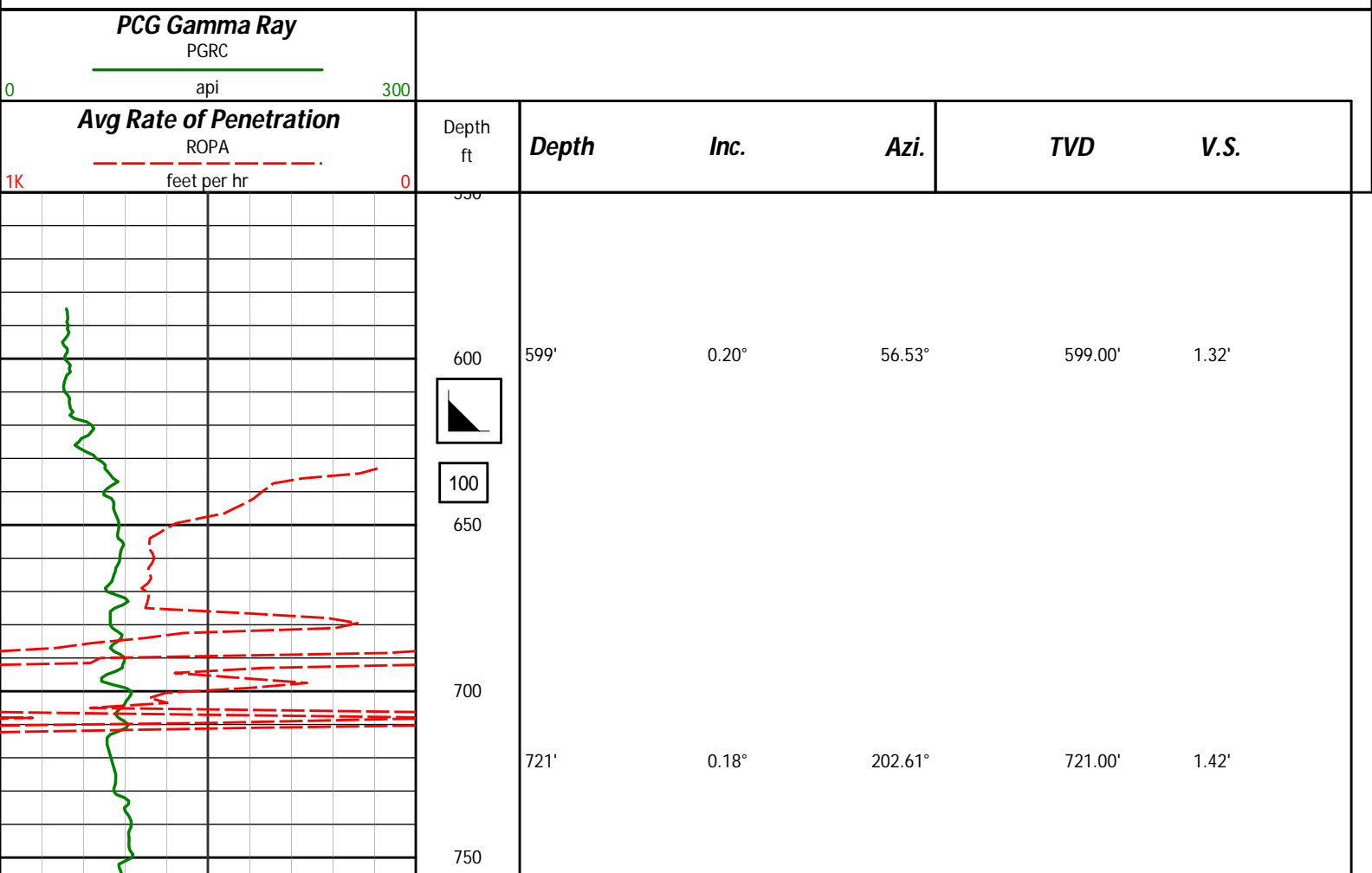
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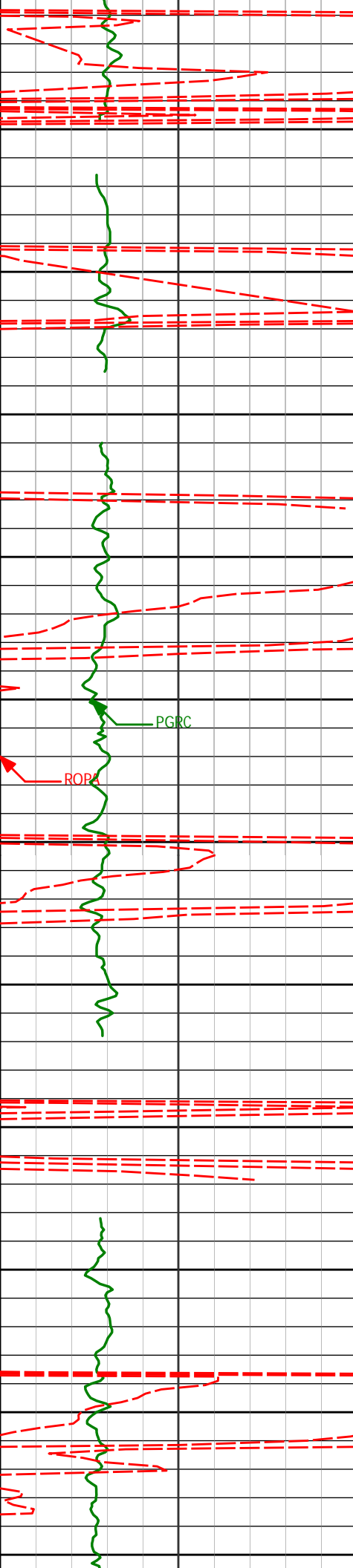
# HALLIBURTON

## Sperry Drilling Services

### TVD Correlation Log 1:600

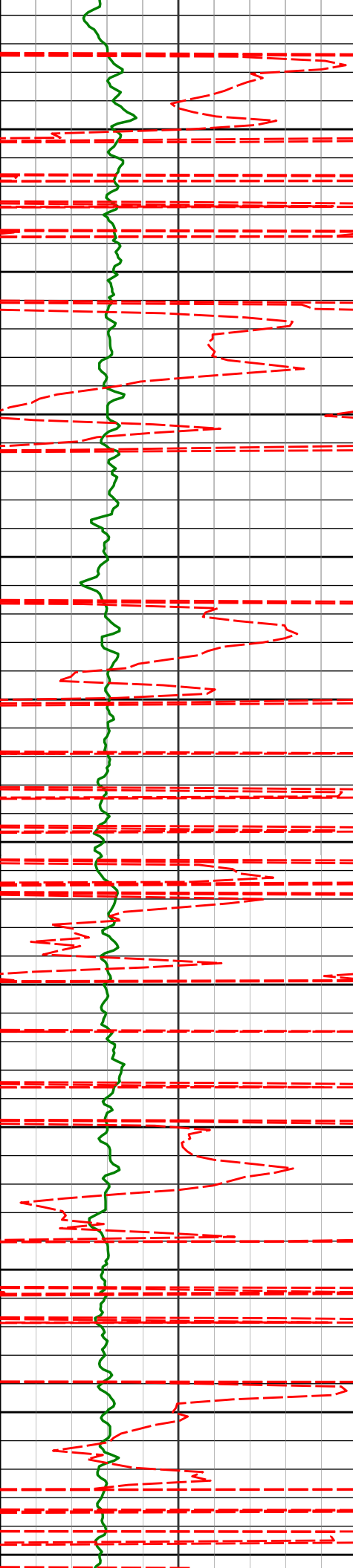
Noble Energy  
Shable K08-68-1HN  
H&P 321  
Sec. 7-T4N-R66W





800  
813'  
850  
900  
905'  
950  
996'  
1000  
1050  
1089'  
1100  
1150  
1180'  
1200  
1250  
1273'  
1300

813'	0.34°	214.58°	813.00'	1.23'
905'	0.25°	204.07°	905.00'	1.01'
996'	0.37°	169.13°	995.99'	1.01'
1089'	0.51°	169.39°	1088.99'	1.17'
1180'	0.50°	170.79°	1179.99'	1.34'
1273'	0.58°	171.95°	1272.98'	1.51'



1350

1365'

2.31°

143.33°

1364.95'

2.76'

1400

1450

1458'

3.69°

119.49°

1457.83'

6.61'

1500

1550

1550'

4.96°

105.49°

1549.56'

13.12'

1600

1650

1642'

6.61°

101.05°

1641.09'

22.24'

1700

1750

1737'

8.30°

98.08°

1735.29'

34.47'

1800

1850

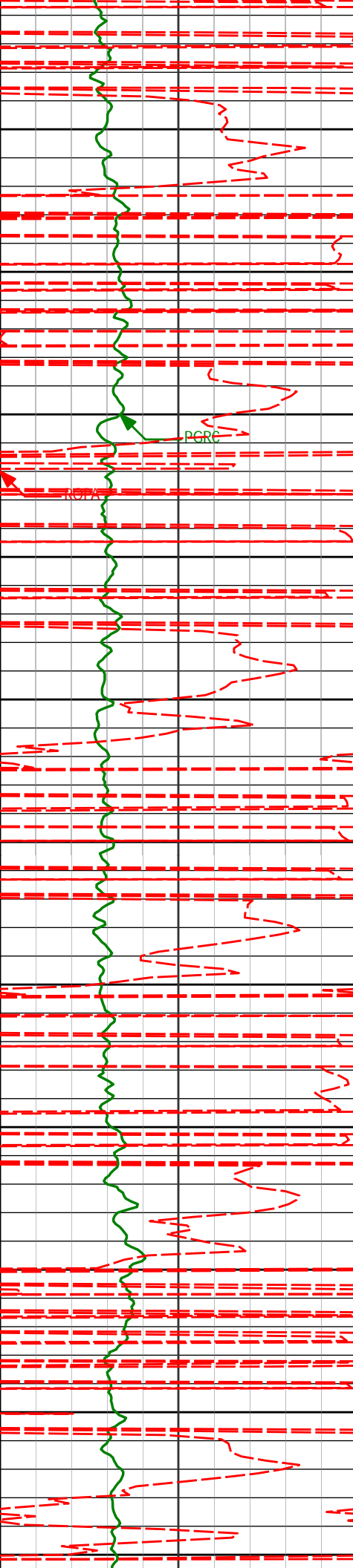
1831'

10.92°

100.13°

1827.96'

50.05'



1900

1926'

9.26°

105.31°

1921.49'

66.42'

1950

2000

2021'

9.02°

111.26°

2015.29'

80.92'

2050

2100

2116'

9.38°

119.24°

2109.07'

94.88'

2150

2200

2211'

9.40°

116.82°

2202.79'

108.86'

2250

2300

2305'

9.14°

122.74°

2295.57'

122.30'

2350

2400

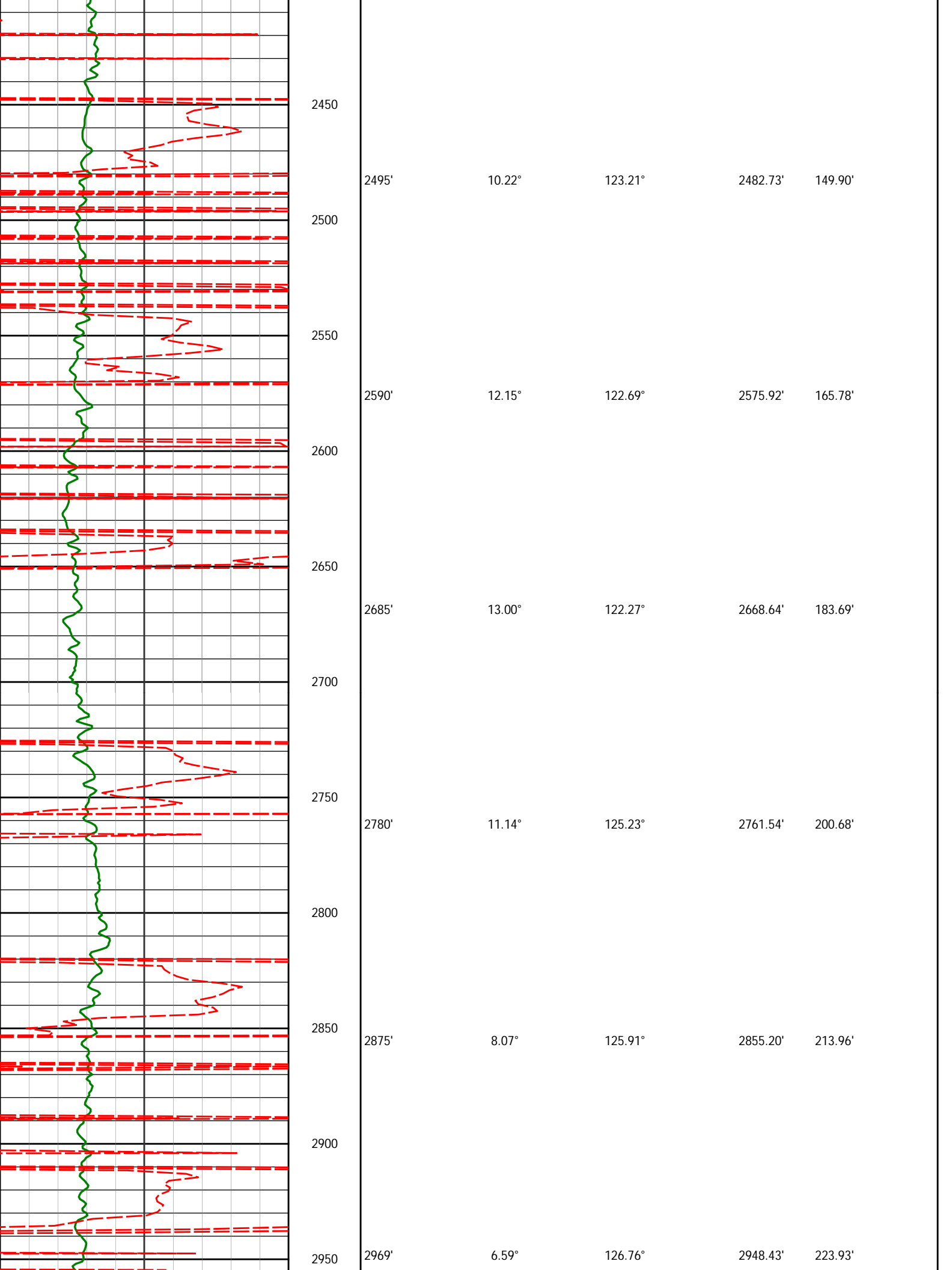
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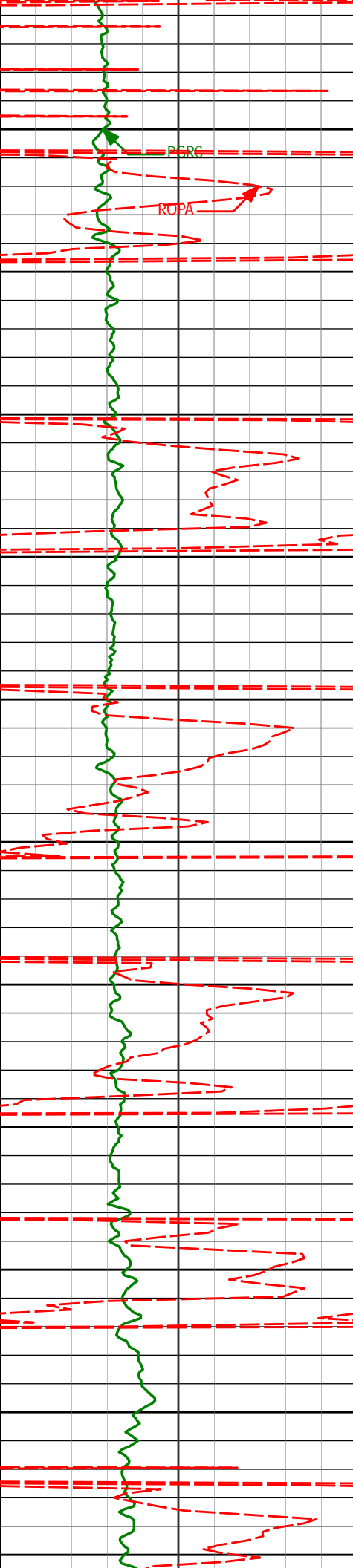
10.15°

126.66°

2390.21'

135.88'





3000

PCRC

ROPA

3050

3100

3150

3200

3250

3300

3350

3400

3450

3500

3064'

6.78°

114.89°

3042.78'

233.61'

3159'

6.47°

114.31°

3137.15'

243.76'

3253'

8.48°

110.05°

3230.35'

255.29'

3348'

10.04°

120.03°

3324.11'

269.31'

3443'

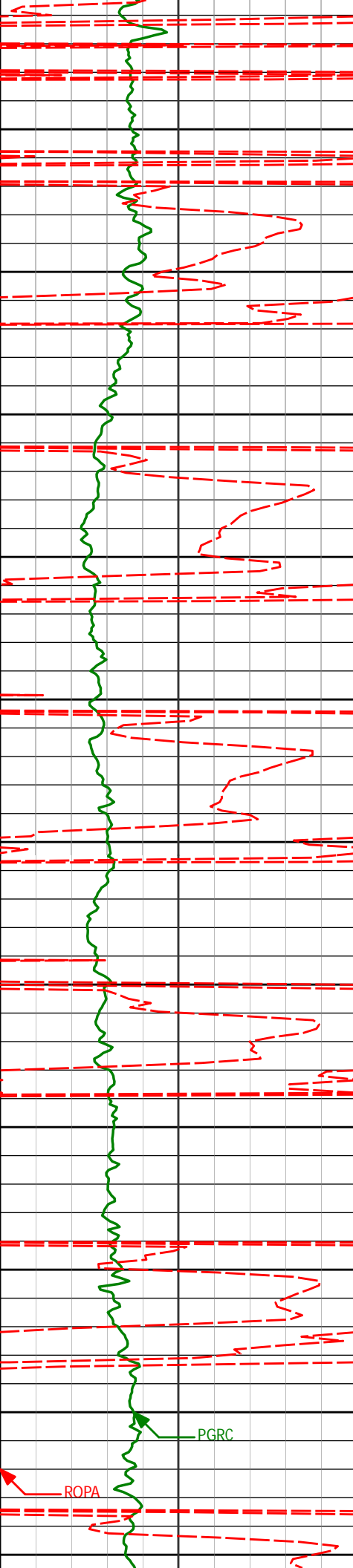
9.50°

129.68°

3417.74'

282.89'

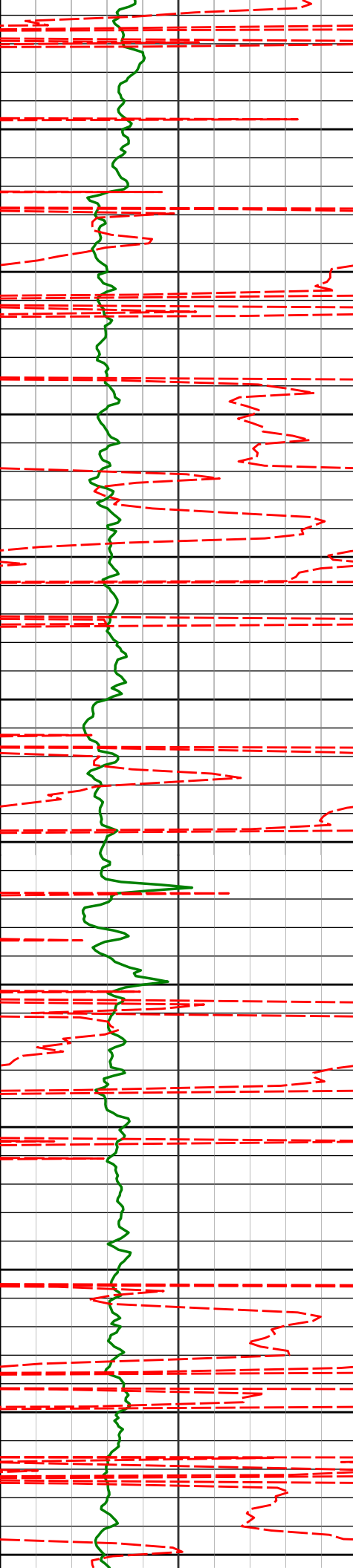




3538'	9.18°	125.73°	3511.48'	295.47'
3633'	9.01°	123.19°	3605.29'	308.20'
3727'	10.54°	116.79°	3697.92'	322.36'
3822'	12.55°	113.14°	3791.00'	339.94'
3917'	13.27°	118.15°	3883.60'	359.42'
4011'	12.76°	125.29°	3975.19'	377.87'

PGRC

ROPA



4106'

9.30°

128.63°

4068.42'

392.88'

4100

4150

4201'

6.89°

131.78°

4162.47'

403.49'

4200

4295'

6.51°

127.69°

4255.83'

412.21'

4300

4350

4390'

5.36°

121.54°

4350.32'

420.48'

4400

4450

4485'

5.24°

123.57°

4444.91'

428.07'

4500

4550

4580'

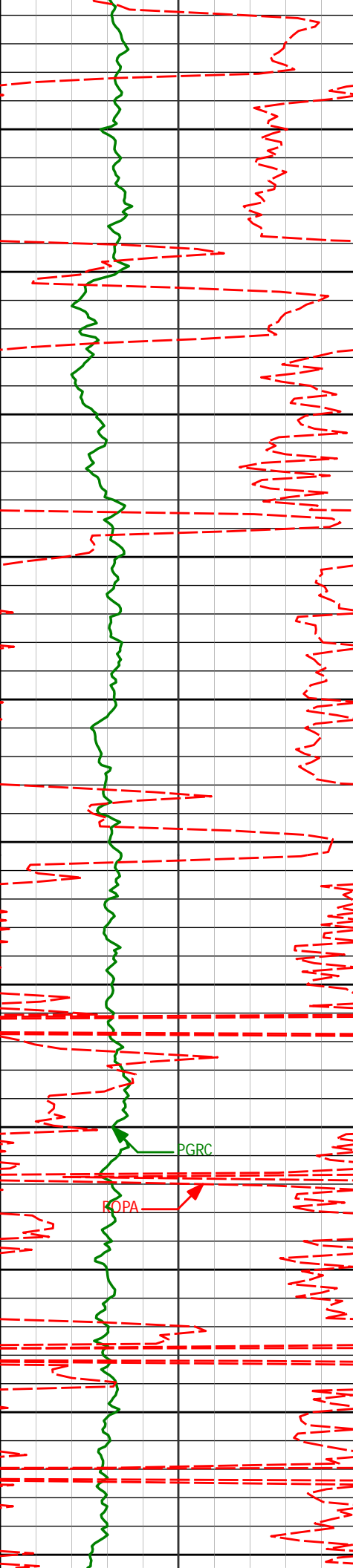
3.92°

124.83°

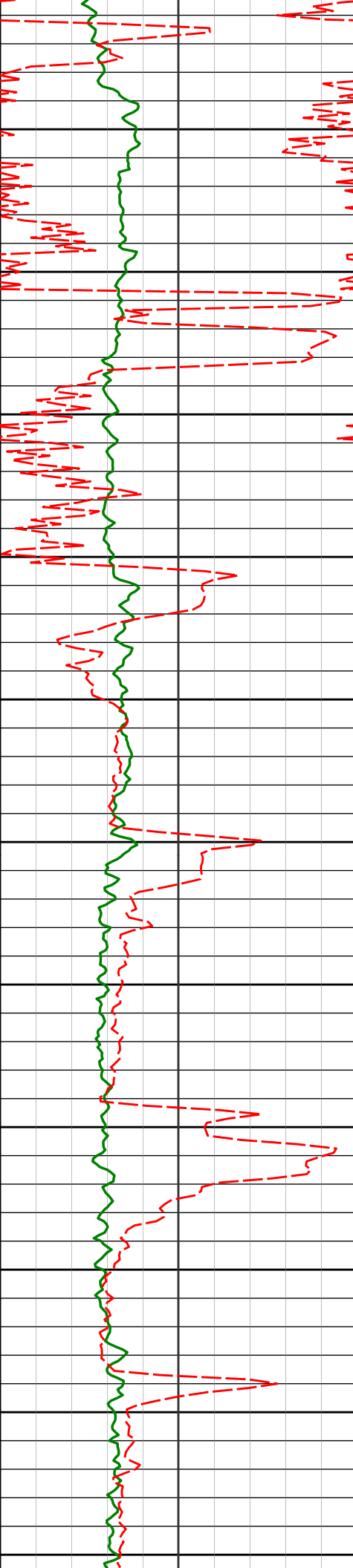
4539.60'

434.53'

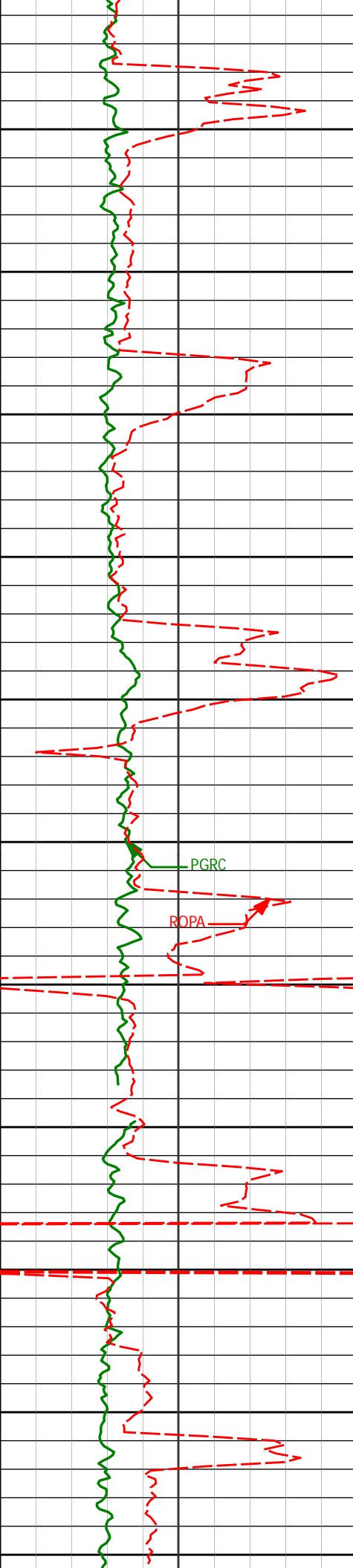
4600



4674'	2.09°	141.41°	4633.47'	438.37'
4650				
4700				
4769'	0.75°	172.90°	4728.44'	439.61'
4750				
4800				
4864'	0.28°	149.93°	4823.44'	439.84'
4850				
4900				
4958'	1.01°	239.15°	4917.43'	439.27'
4950				
5000				
5053'	0.83°	239.21°	5012.42'	438.00'
5050				
5100				
5148'	1.16°	253.86°	5107.41'	436.51'
5150				



5200	5243'	1.50°	255.84°	5202.38'	434.41'
5250					
5300	5337'	1.18°	318.57°	5296.36'	432.56'
5350					
5400	5432'	0.91°	320.10°	5391.34'	431.37'
5450					
5500	5527'	1.13°	327.64°	5486.33'	430.33'
5550					
5600	5622'	0.50°	69.83°	5581.32'	430.17'
5650					
5700	5717'	0.30°	68.04°	5676.32'	430.78'



5750

5811'

0.66°

208.70°

5770.32'

430.77'

5800

5850

5906'

1.01°

230.70°

5865.31'

429.90'

5900

5950

6001'

0.25°

284.69°

5960.30'

429.07'

6000

PGRC

ROPA

6050

6095'

0.44°

229.95°

6054.30'

428.61'

6100

6150

6190'

0.11°

18.75°

6149.30'

428.37'

6200

6250

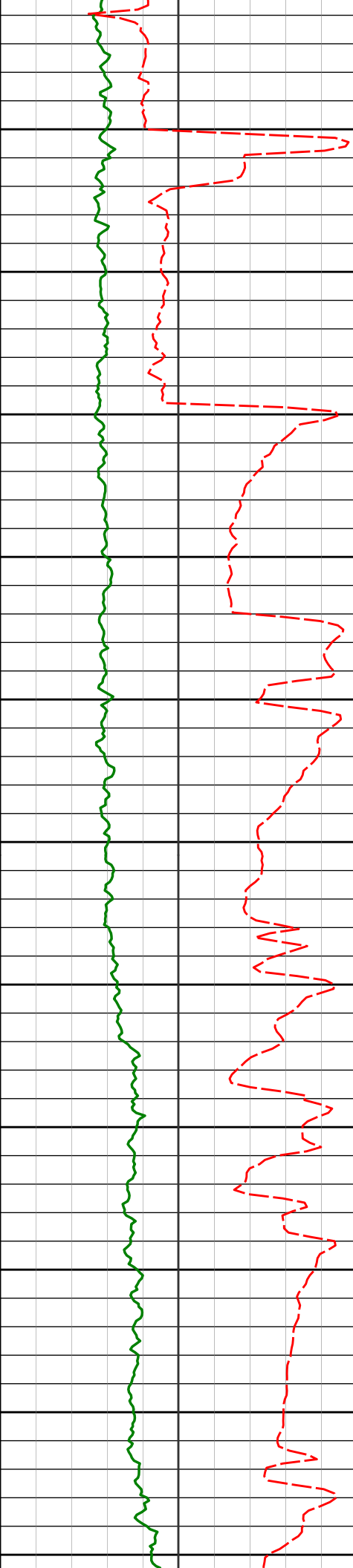
6285'

0.61°

249.68°

6244.30'

427.92'



6300

6380'

0.68°

253.38°

6339.29'

426.93'

6350

6400

200

6474'

0.89°

273.24°

6433.28'

425.67'

6450

6500

6569'

6.35°

77.64°

6528.11'

430.02'

6550

6600

6664'

14.72°

78.99°

6621.43'

446.86'

6650

6700

6758'

20.49°

85.32°

6711.00'

474.83'

6750

6800

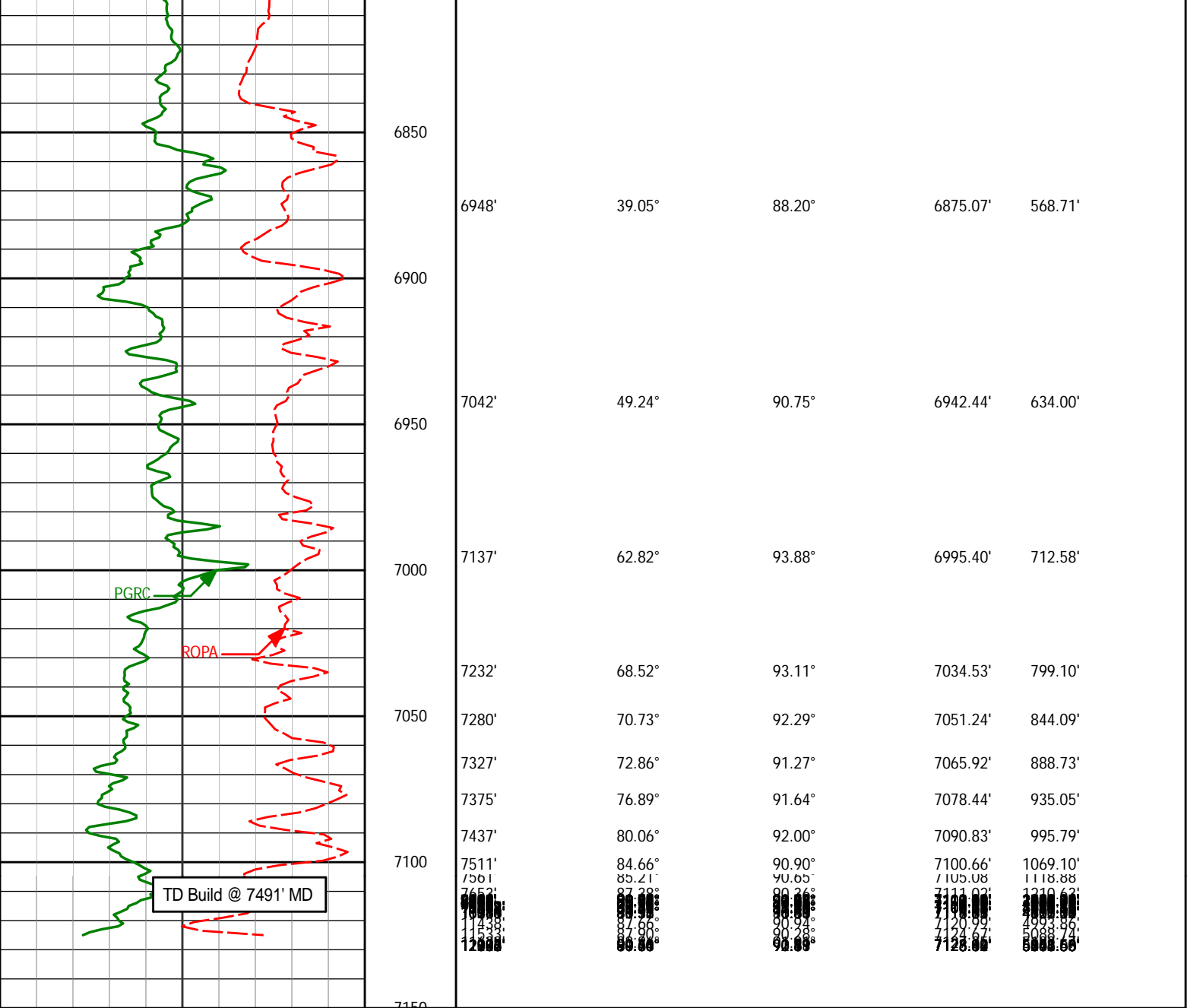
6853'

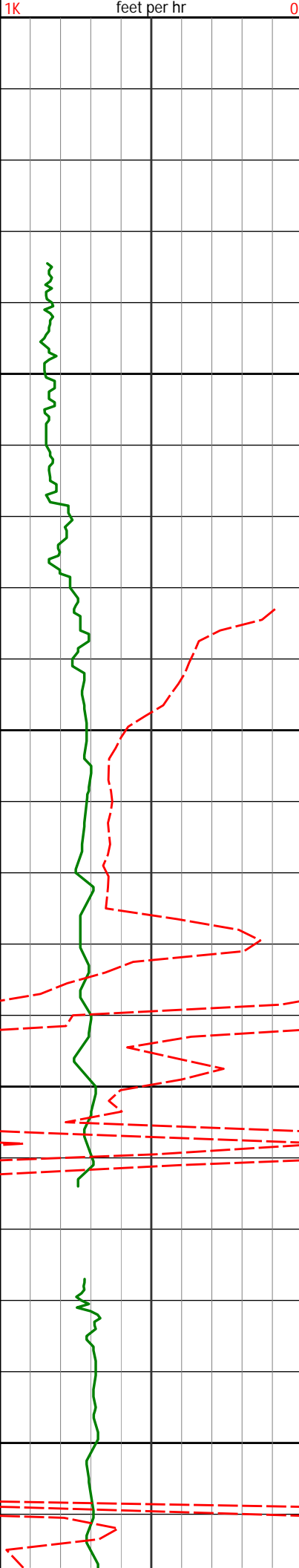
29.94°

89.11°

6796.85'

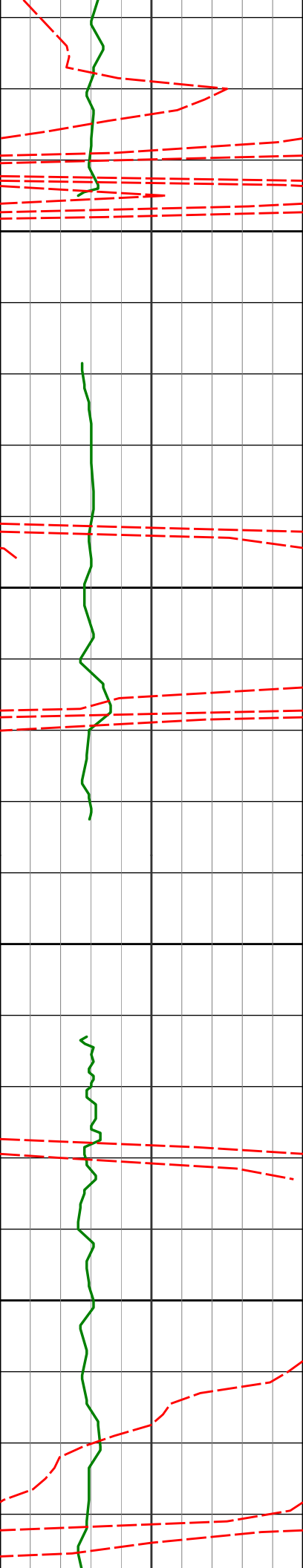
515.08'





550					
600	599'	0.20°	56.53°	599.00'	1.32'
650					
700					
721'		0.18°	202.61°	721.00'	1.42'
750					





800

813'

0.34°

214.58°

813.00'

1.23'

850

900

905'

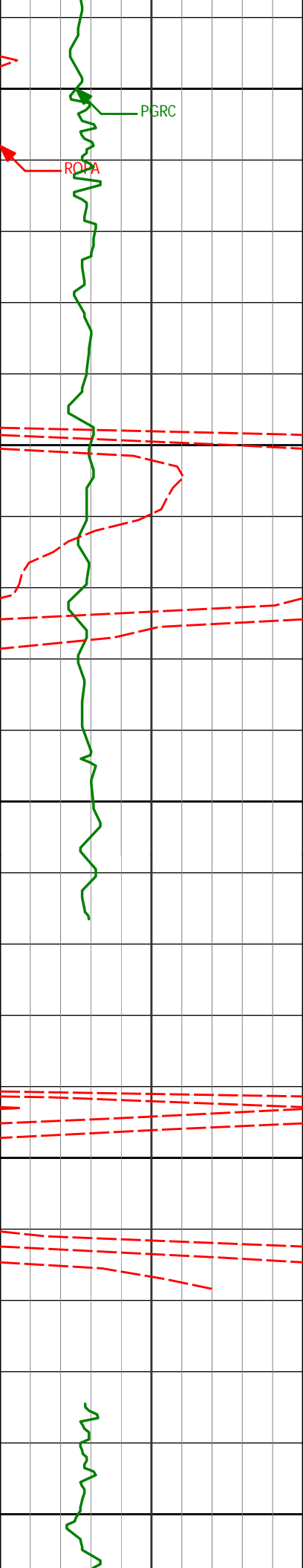
0.25°

204.07°

905.00'

1.01'

950



996'	0.37°	169.13°	995.99'	1.01'
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1000

PGRC

ROTA

1050

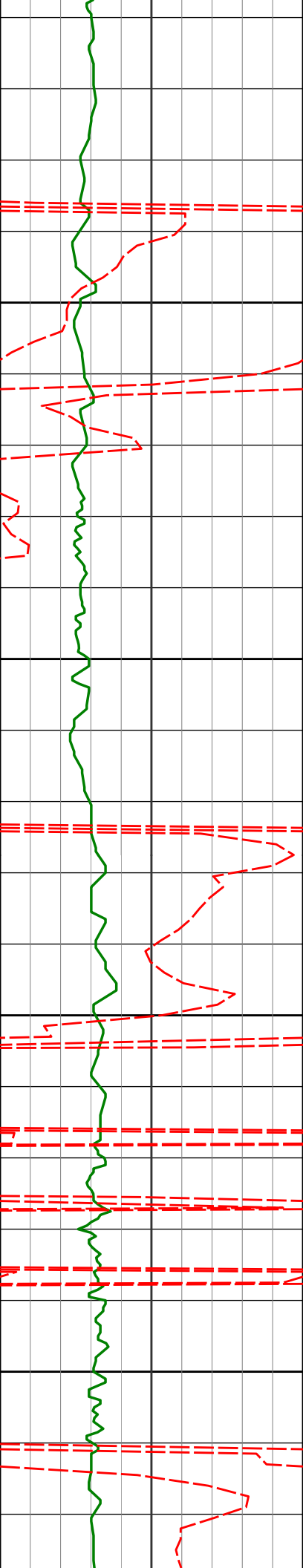
1089'	0.51°	169.39°	1088.99'	1.17'
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1100

1150

1180'	0.50°	170.79°	1179.99'	1.34'
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1200



1250

1300

1350

1400

1273'

0.58°

171.95°

1272.98'

1.51'

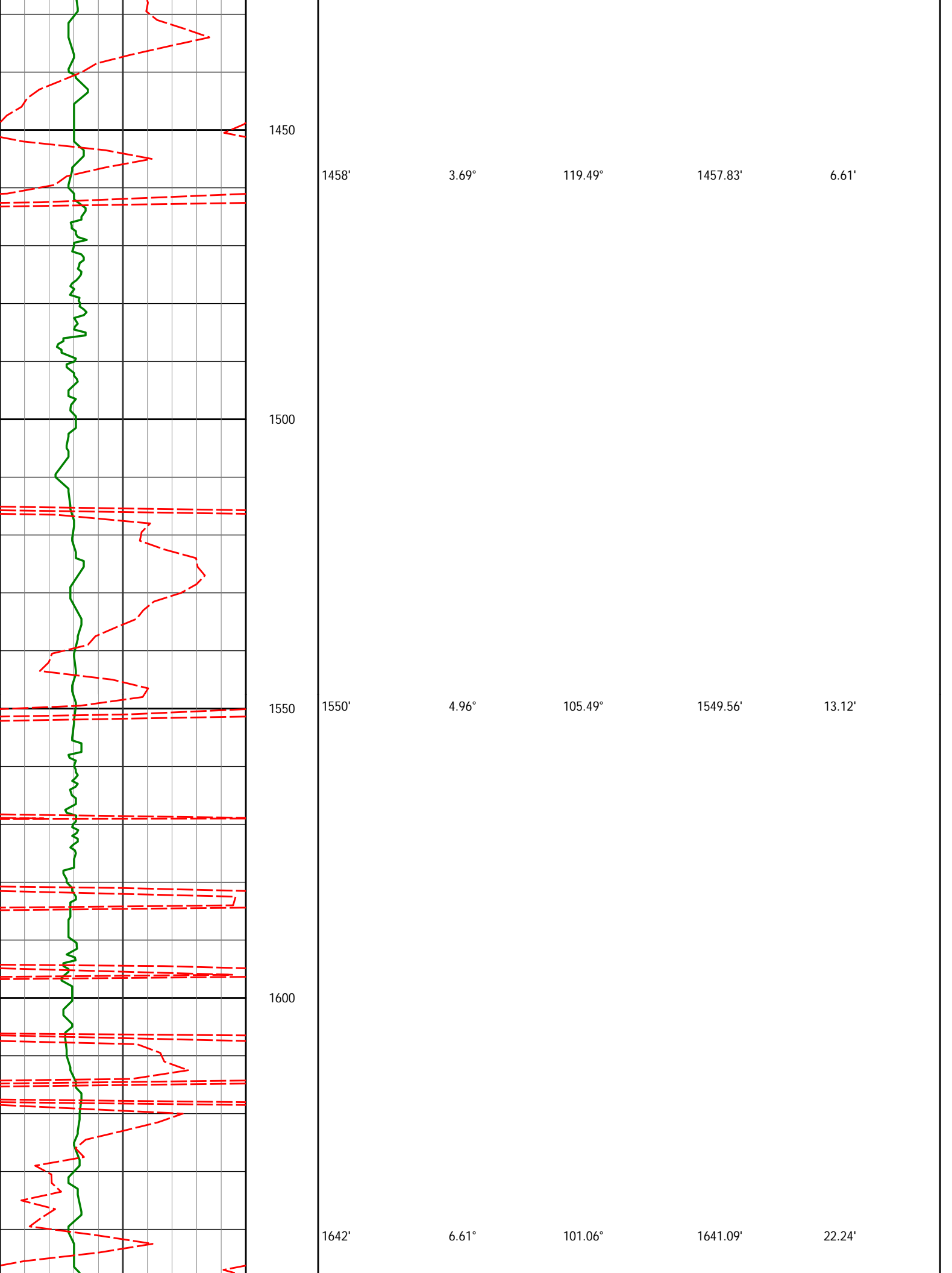
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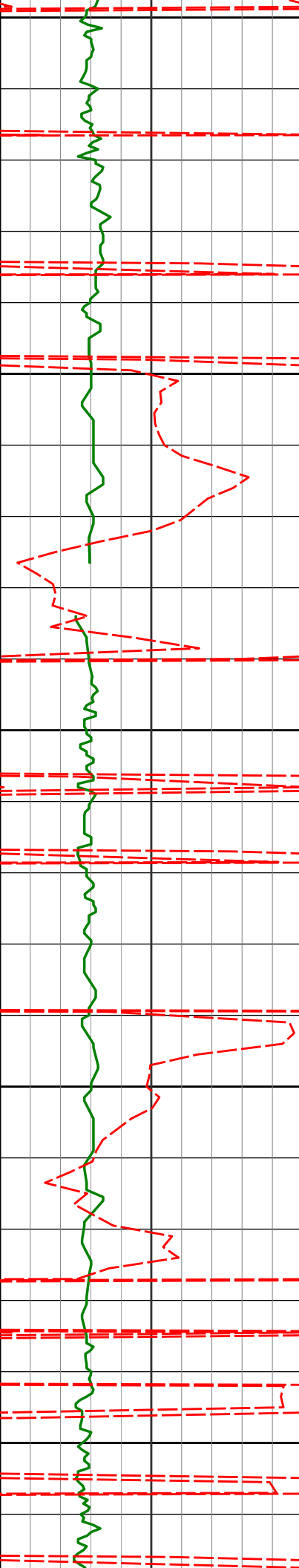
2.31°

143.33°

1364.95'

2.76'





1650

1700

1750

1800

1850

1737'

8.30°

98.08°

1735.29'

34.47'

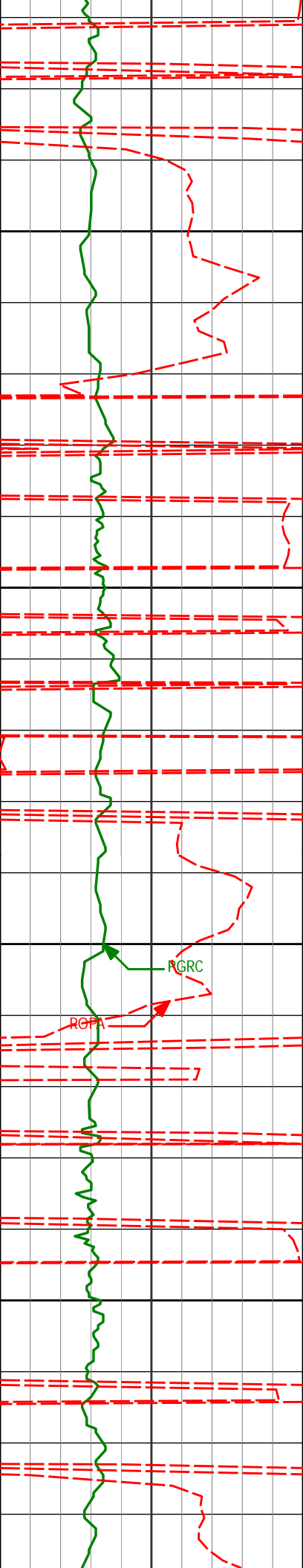
1831'

10.92°

100.14°

1827.96'

50.05'



1900

1950

2000

2050

1926'

9.26°

105.32°

1921.49'

66.42'

2021'

9.02°

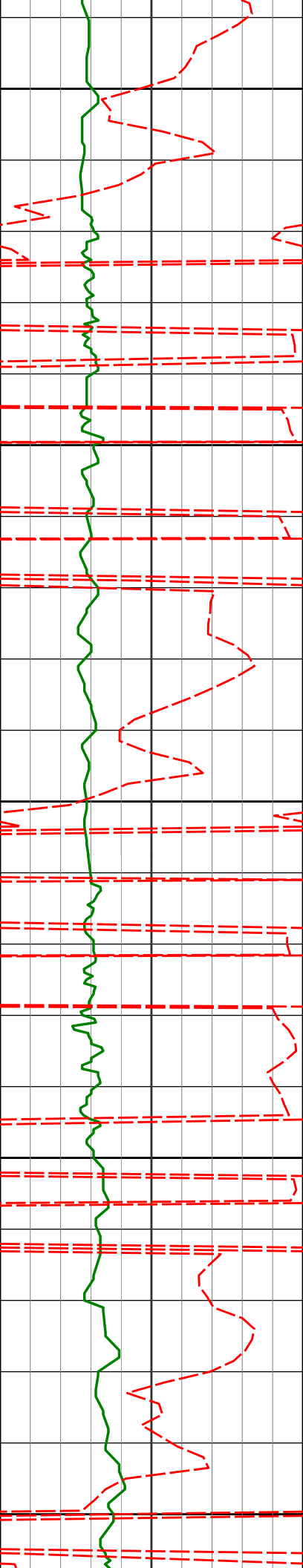
111.27°

2015.29'

80.92'

ROPA

RGRC



2100

2116'

9.38°

119.24°

2109.07'

94.88'

2150

2200

2211'

9.40°

116.83°

2202.79'

108.86'

2250

2300

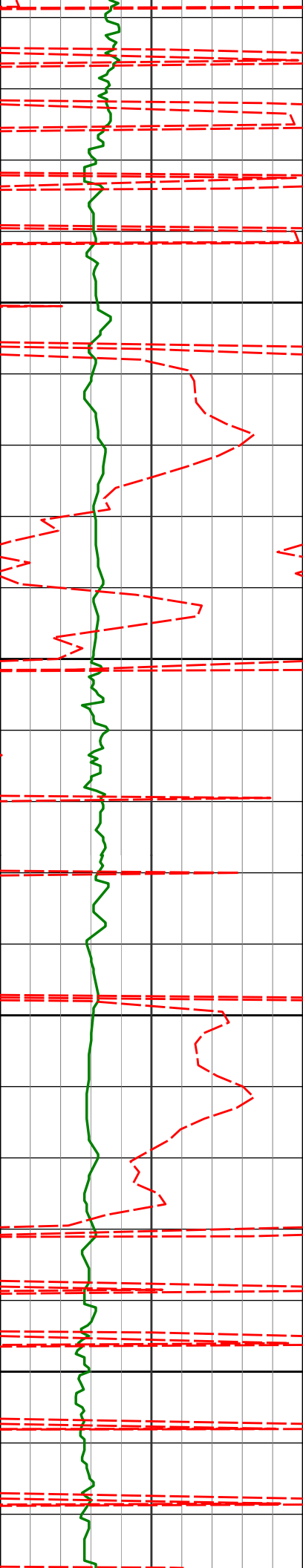
2305'

9.14°

122.74°

2295.57'

122.30'



2350

2401'

10.15°

126.66°

2390.21'

135.88'

2400

2450

2495'

10.22°

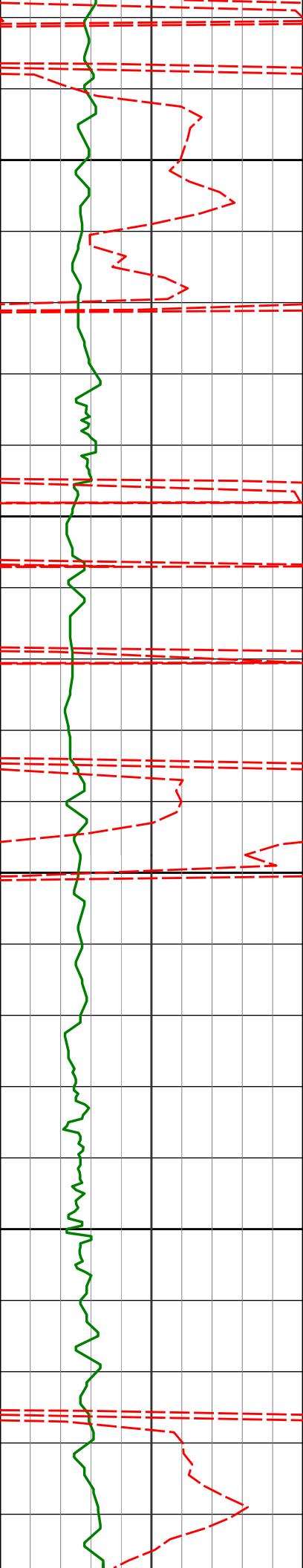
123.21°

2482.73'

149.90'

2500





2550

2590'

12.15°

122.69°

2575.92'

165.78'

2600

2650

2685'

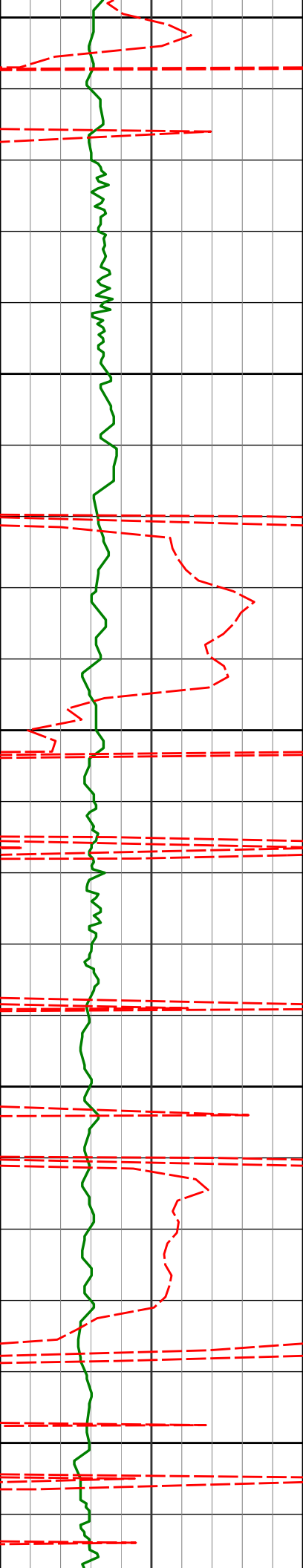
13.00°

122.27°

2668.64'

183.69'

2700



2750

2780'

11.14°

125.23°

2761.54'

200.68'

2800

2850

2875'

8.07°

125.91°

2855.20'

213.96'

2900

2950

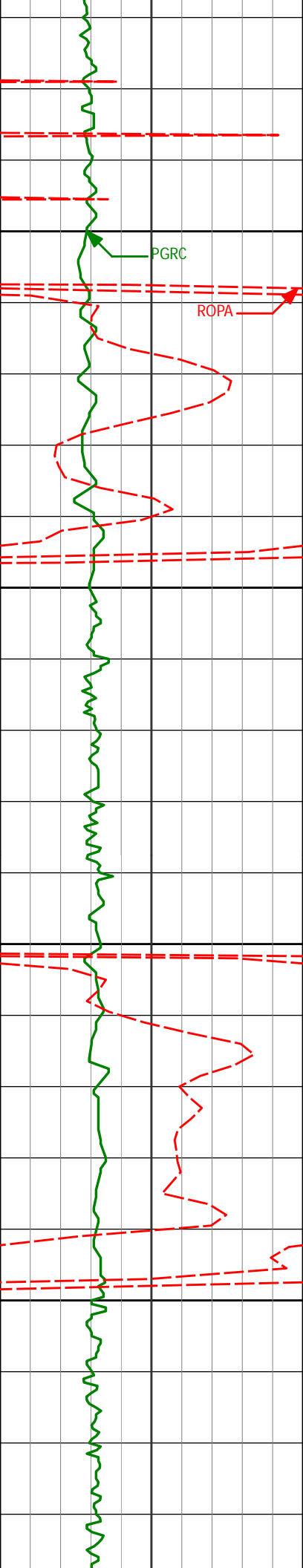
2969'

6.59°

126.76°

2948.43'

223.93'



3000

3064'

6.78°

114.89°

3042.78'

233.61'

3050

3100

3159'

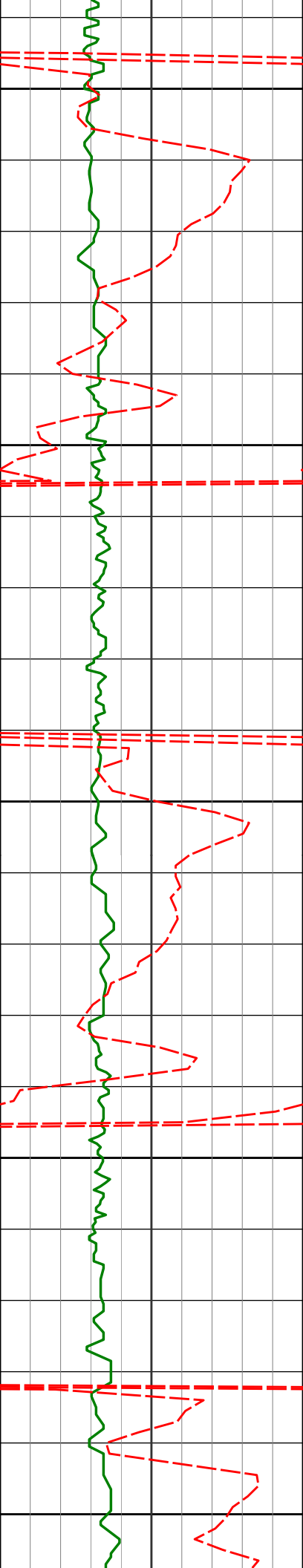
6.47°

114.31°

3137.15'

243.76'

3150



3200

3253'

8.48°

110.05°

3230.35'

255.29'

3250

3300

3348'

10.04°

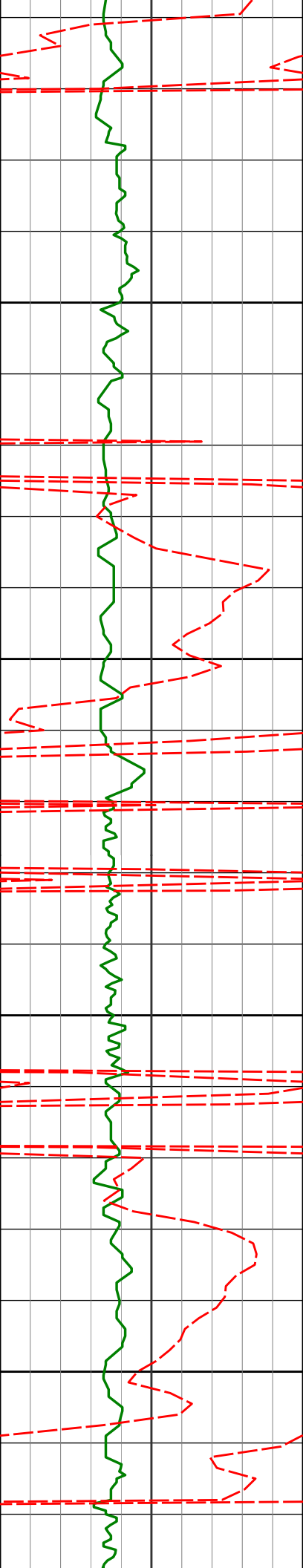
120.03°

3324.11'

269.31'

3350

3400



3443'

9.50°

129.68°

3417.74'

282.89'

3450

3500

3538'

9.18°

125.73°

3511.48'

295.47'

3550

3600

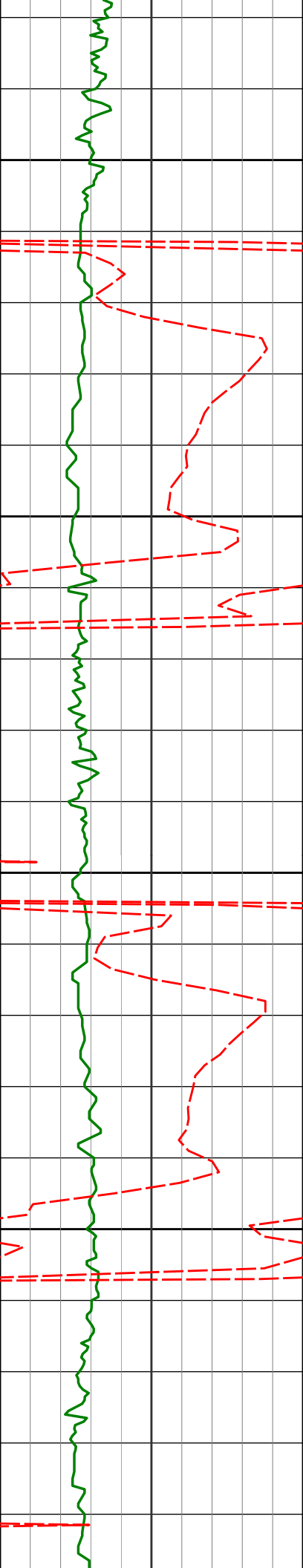
3633'

9.01°

123.19°

3605.29'

308.20'



3650

3700

3750

3800

3727'

10.54°

116.80°

3697.92'

322.36'

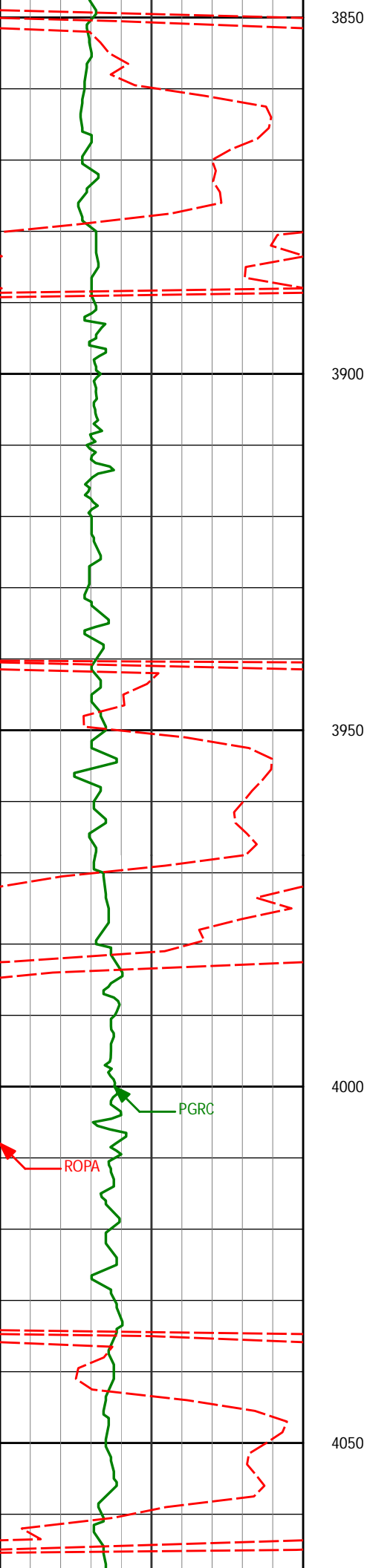
3822'

12.55°

113.14°

3791.00'

339.94'



3917'

13.27°

118.15°

3883.60'

359.42'

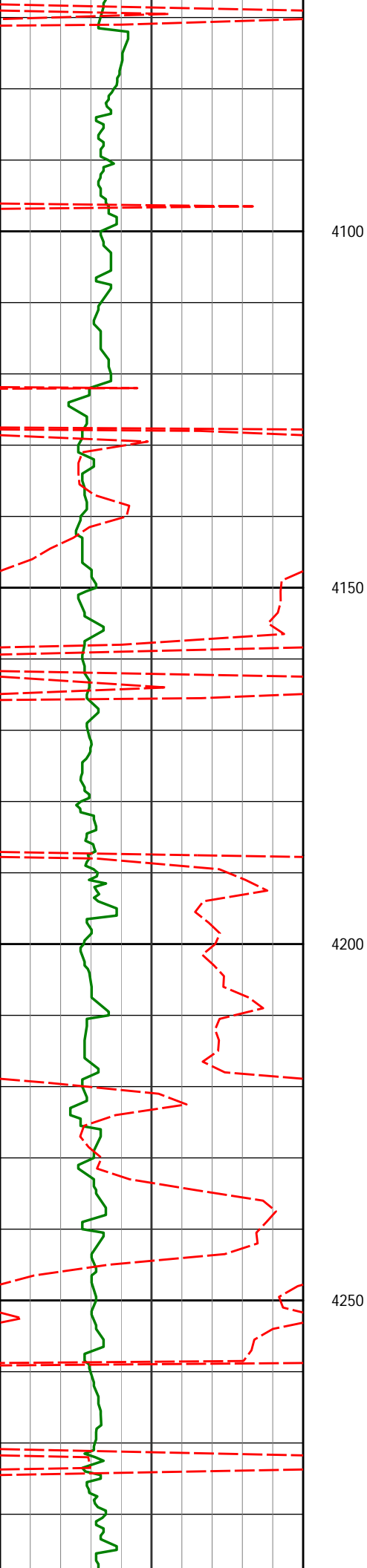
4011'

12.76°

125.30°

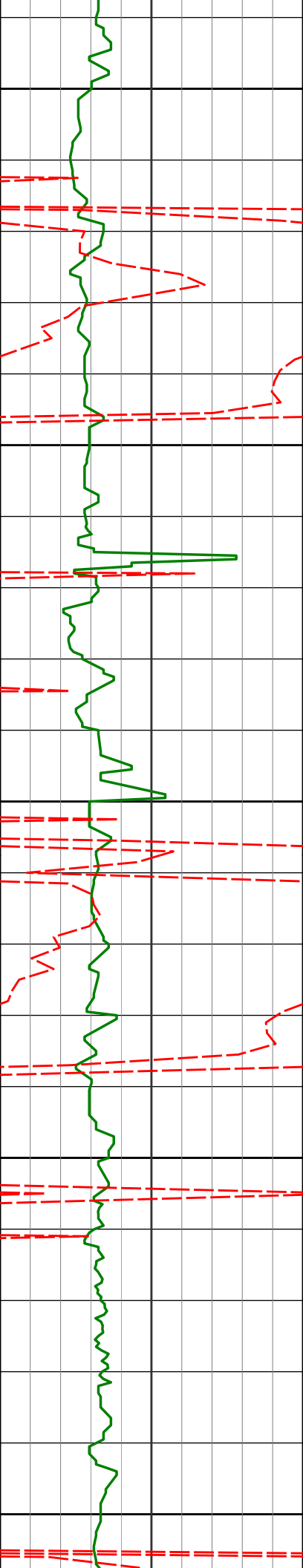
3975.19'

377.87'



4106'	9.30°	128.63°	4068.42'	392.88'
4201'	6.89°	131.78°	4162.47'	403.49'
4295'	6.51°	127.70°	4255.83'	412.21'





4300

4350

4400

4450

4500

4390'

5.36°

121.54°

4350.32'

420.48'

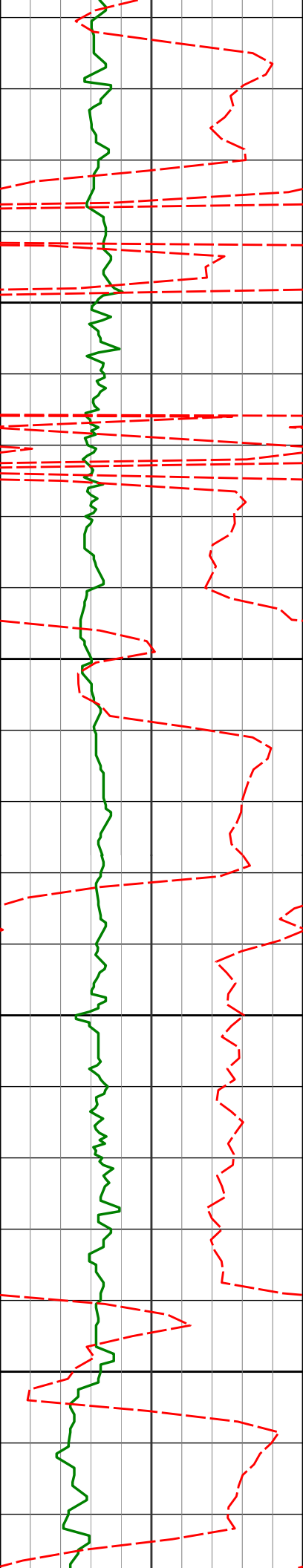
4485'

5.24°

123.57°

4444.91'

428.07'



4580'

3.92°

124.83°

4539.60'

434.53'

4550

4600

4674'

2.09°

141.41°

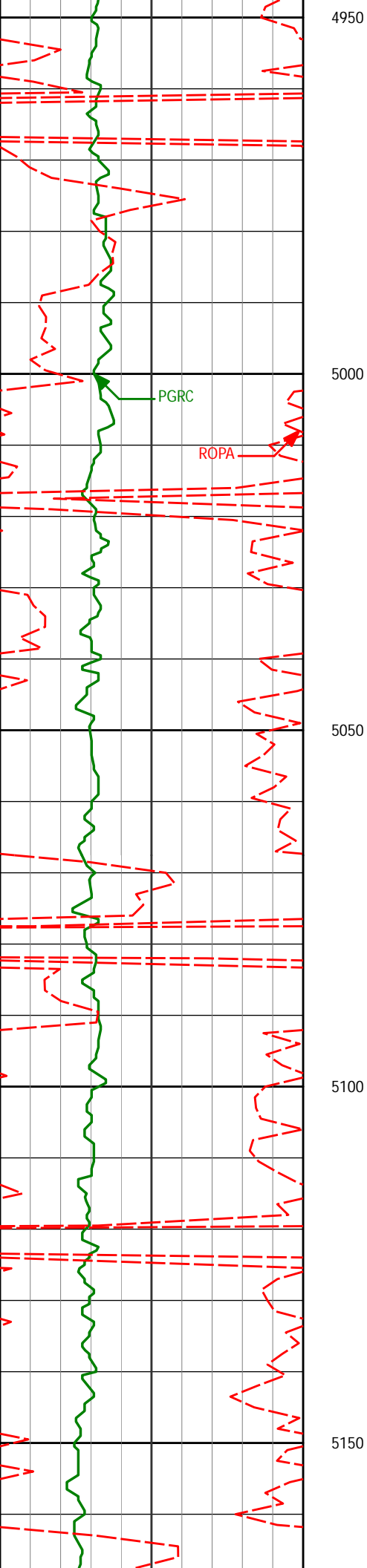
4633.47'

438.37'

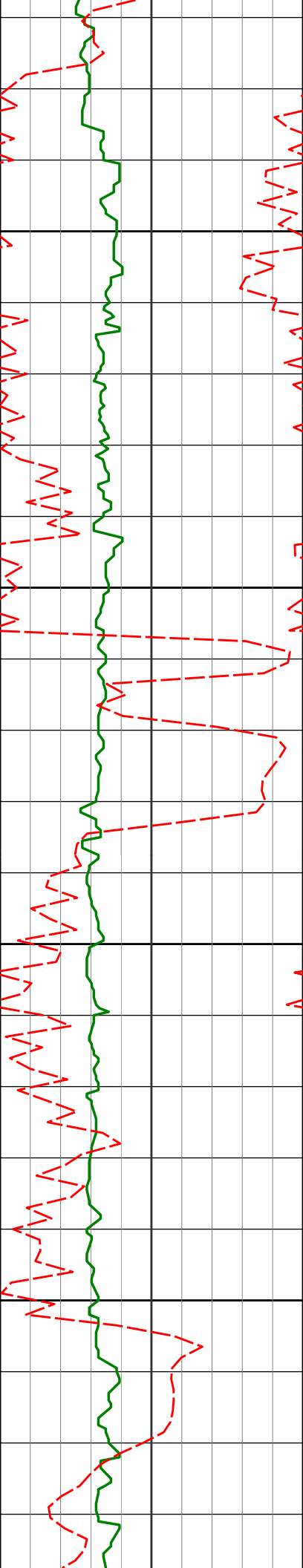
4650

4700





4950				
5000				
5053'	0.83°	239.21°	5012.42'	438.00'
5050				
5100				
5148'	1.16°	253.86°	5107.41'	436.51'
5150				



5200

5250

5300

5350

5243'

1.50°

255.84°

5202.38'

434.41'

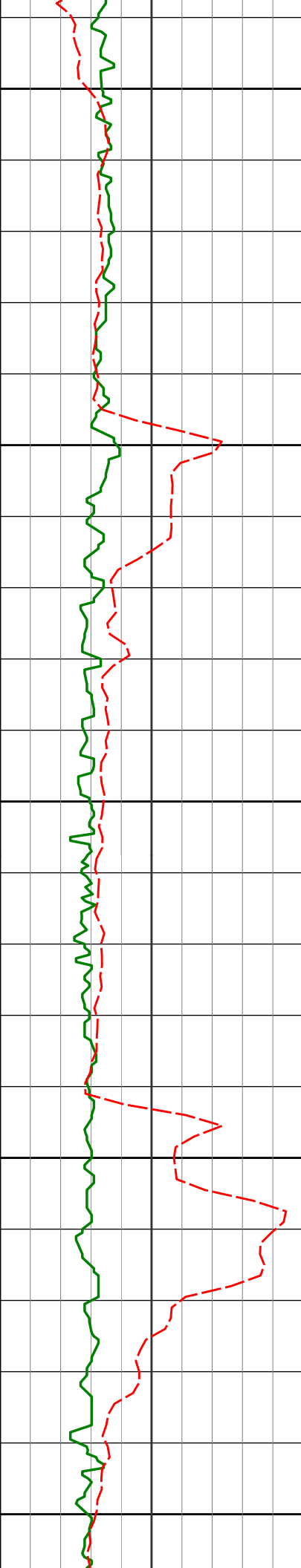
5337'

1.18°

318.57°

5296.36'

432.56'



5400

5450

5500

5550

5600

5432'

0.91°

320.09°

5391.34'

431.37'

5527'

1.13°

327.64°

5486.33'

430.33'

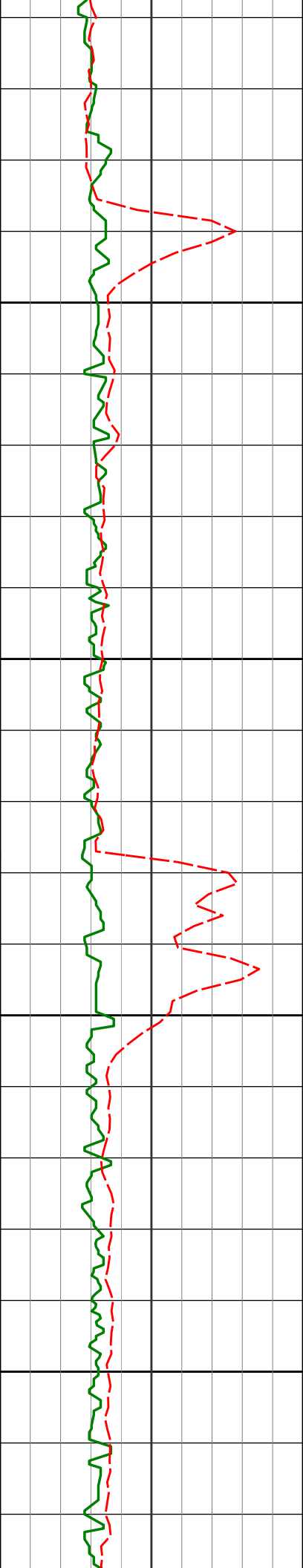
5622'

0.50°

69.83°

5581.32'

430.17'



5650

5717'

0.30°

68.04°

5676.32'

430.78'

5700

5750

5811'

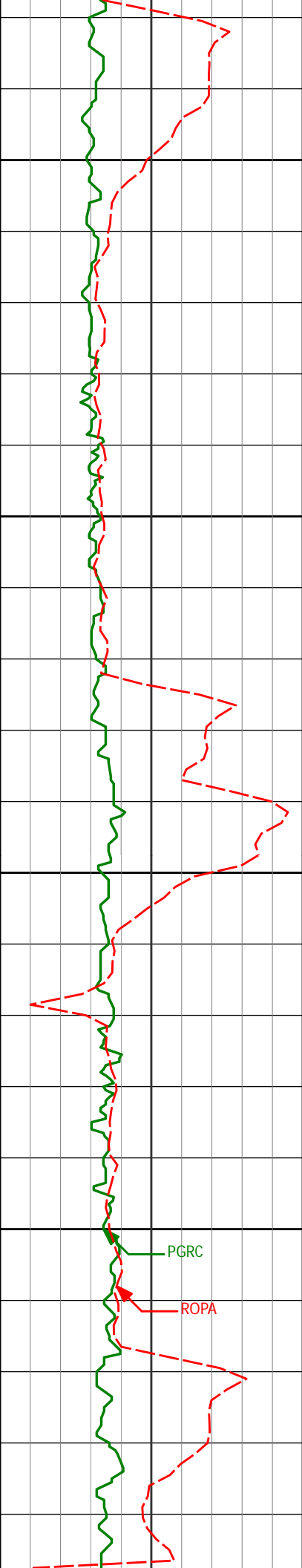
0.66°

208.70°

5770.32'

430.77'

5800



5850

5906'

1.01°

230.70°

5865.31'

429.90'

5900

5950

6001'

0.25°

284.69°

5960.30'

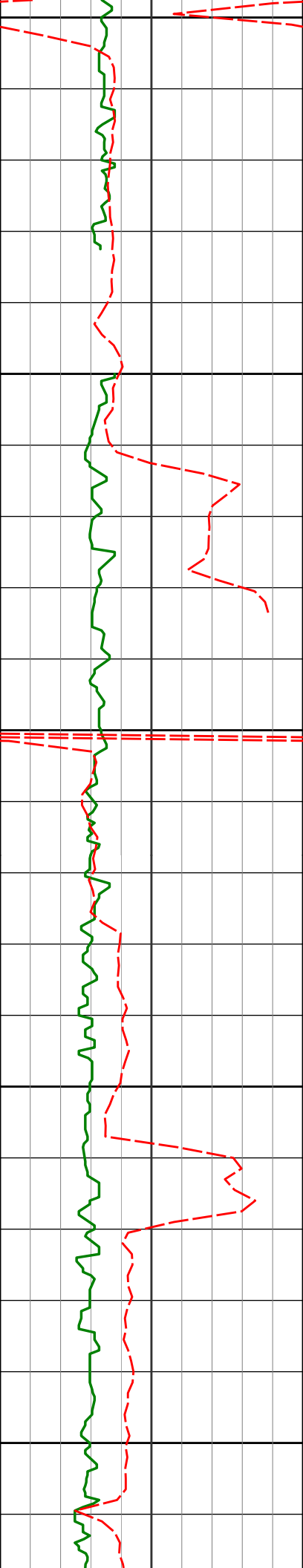
429.07'

6000

PGRC

ROPA





6050

6095'

0.44°

229.95°

6054.30'

428.61'

6100

6150

6190'

0.11°

18.75°

6149.30'

428.37'

6200

6250

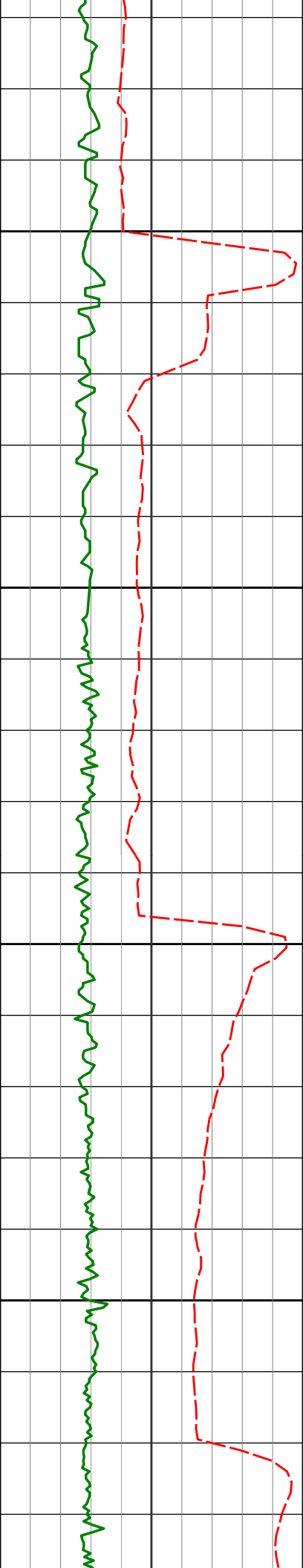
6285'

0.61°

249.68°

6244.30'

427.92'



6300

6380'

0.68°

253.38°

6339.29'

426.93'

6350

6400

200

6474'

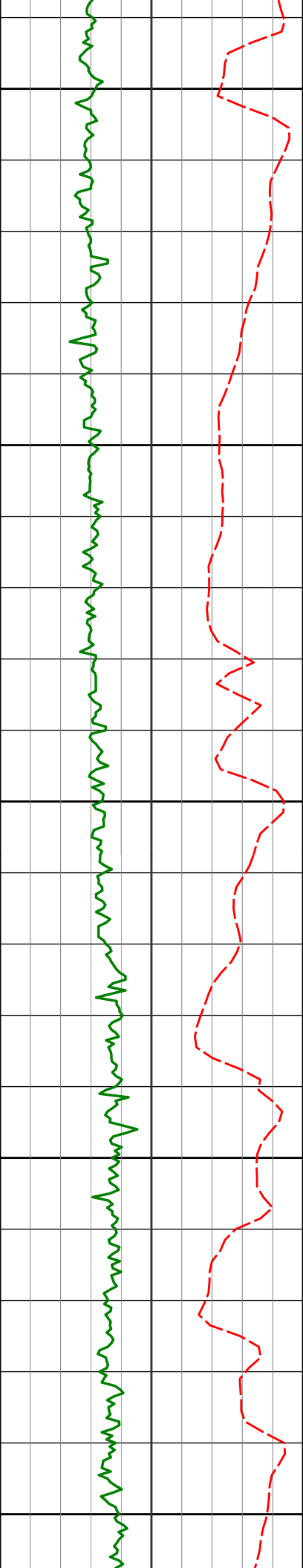
0.89°

273.24°

6433.28'

425.67'

6450



6500

6569'

6.35°

77.64°

6528.11'

430.02'

6550

6600

6664'

14.72°

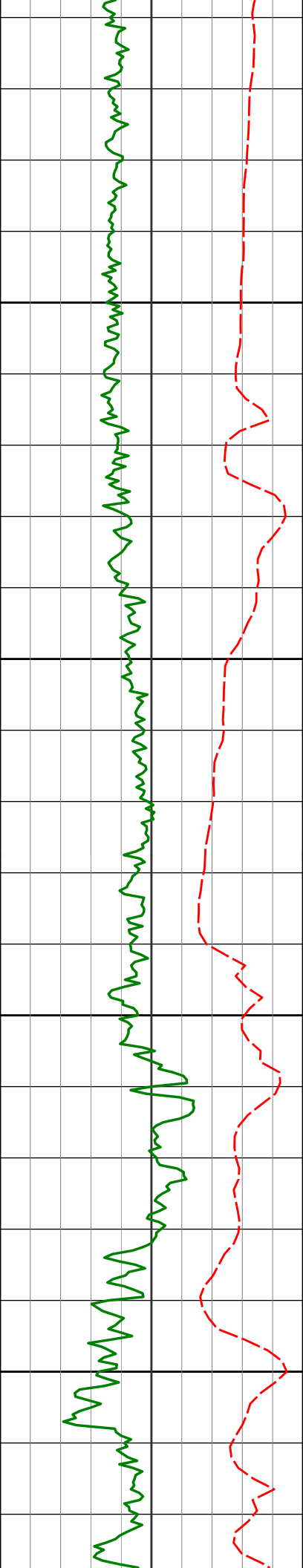
78.99°

6621.43'

446.86'

6650

6700



6758'

20.49°

85.33°

6711.00'

474.83'

6750

6853'

29.94°

89.12°

6796.85'

515.08'

6800

6850

6948'

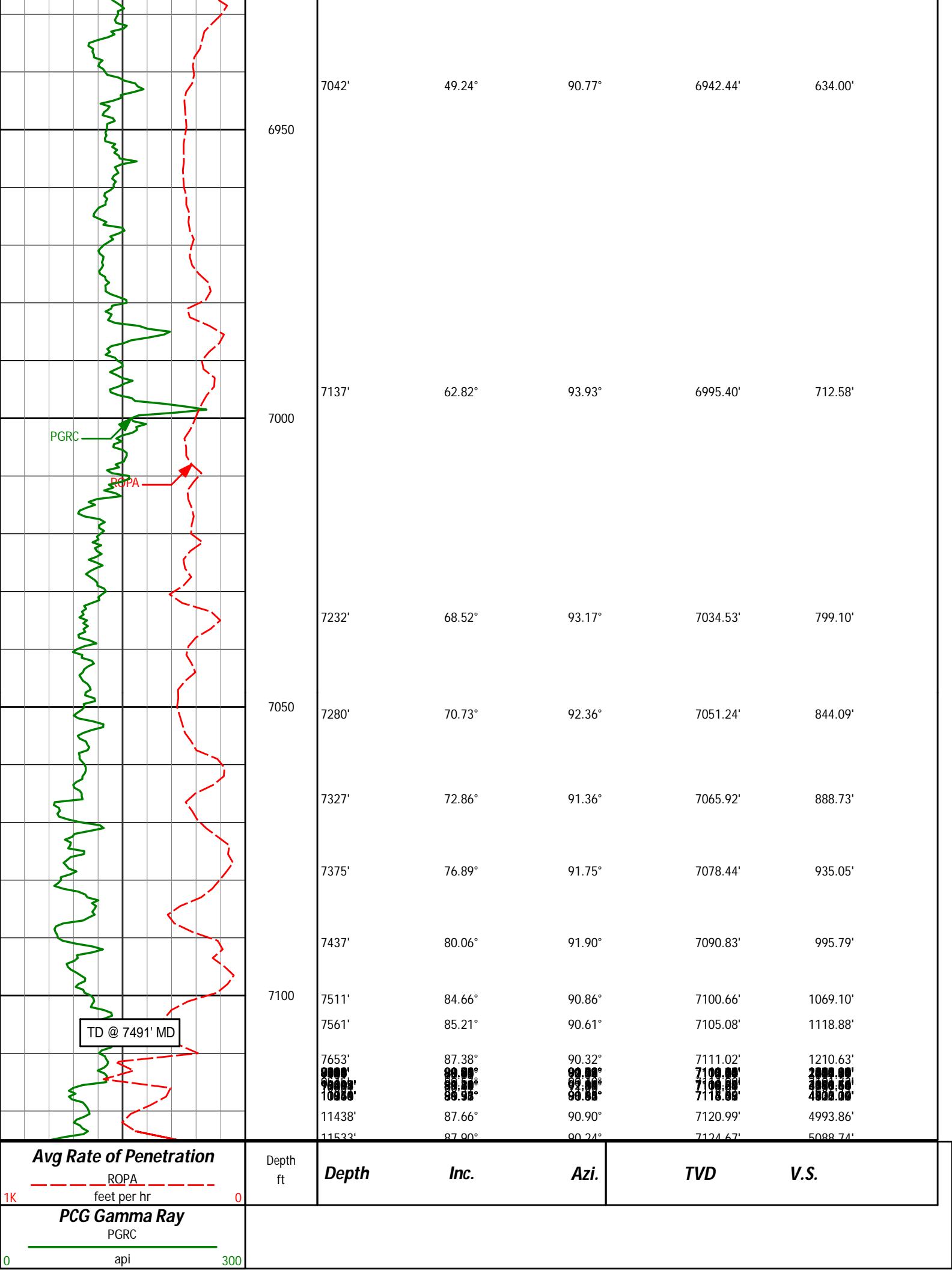
39.05°

88.22°

6875.07'

568.71'

6900



# HALLIBURTON

## DIRECTIONAL SURVEY REPORT

Noble  
SHABLE K08-68-1HN  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0901457114

### Other Information:

First two Survey's from 3rd party source (Multi Shot EMS)  
Survey Depth 295 Inc 0.20 Azi 124.23  
Survey Depth 600 Inc 0.20 Azi 56.53

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
295.00	0.20	124.23	295.00	0.29 S	0.43 E	0.44	0.07
599.00	0.20	56.53	599.00	0.30 S	1.31 E	1.32	0.07
721.00	0.18	202.61	721.00	0.35 S	1.41 E	1.42	0.30
813.00	0.34	214.58	813.00	0.71 S	1.20 E	1.23	0.18
905.00	0.25	204.07	905.00	1.12 S	0.96 E	1.01	0.11
996.00	0.37	169.13	995.99	1.59 S	0.94 E	1.01	0.24
1089.00	0.51	169.39	1088.99	2.29 S	1.07 E	1.17	0.15
1180.00	0.50	170.79	1179.99	3.08 S	1.21 E	1.34	0.02
1273.00	0.58	171.95	1272.98	3.95 S	1.34 E	1.51	0.09
1365.00	2.31	143.33	1364.95	5.90 S	2.51 E	2.76	1.98
1458.00	3.69	119.49	1457.83	8.87 S	6.24 E	6.61	1.97
1550.00	4.96	105.49	1549.56	11.39 S	12.65 E	13.12	1.79
1642.00	6.61	101.05	1641.09	13.47 S	21.68 E	22.24	1.86
1737.00	8.30	98.08	1735.29	15.48 S	33.83 E	34.47	1.82
1831.00	10.92	100.13	1827.96	18.00 S	49.32 E	50.05	2.81
1926.00	9.26	105.31	1921.49	21.60 S	65.55 E	66.42	1.99
2021.00	9.02	111.26	2015.29	26.32 S	79.86 E	80.92	1.03
2116.00	9.38	119.24	2109.07	32.81 S	93.56 E	94.88	1.39
2211.00	9.40	116.82	2202.79	40.09 S	107.24 E	108.86	0.42
2305.00	9.14	122.74	2295.57	47.59 S	120.37 E	122.30	1.05
2401.00	10.15	126.66	2390.21	56.76 S	133.57 E	135.88	1.25
2495.00	10.22	123.21	2482.73	66.28 S	147.19 E	149.90	0.65
2590.00	12.15	122.69	2575.92	76.29 S	162.66 E	165.78	2.03
2685.00	13.00	122.27	2668.64	87.40 S	180.10 E	183.69	0.90
2780.00	11.14	125.23	2761.54	98.40 S	196.64 E	200.68	2.06
2875.00	8.07	125.91	2855.20	107.60 S	209.54 E	213.96	3.23
2969.00	6.59	126.76	2948.43	114.70 S	219.20 E	223.93	1.58
3064.00	6.78	114.89	3042.78	120.33 S	228.66 E	233.61	1.47
3159.00	6.47	114.31	3137.15	124.89 S	238.62 E	243.76	0.33
3253.00	8.48	110.05	3230.35	129.45 S	249.96 E	255.29	2.22
3348.00	10.04	120.03	3324.11	135.99 S	263.71 E	269.31	2.35
3443.00	9.50	129.68	3417.74	145.14 S	276.92 E	282.89	1.81
3538.00	9.18	125.73	3511.48	154.57 S	289.10 E	295.47	0.75
3633.00	9.01	123.19	3605.29	163.07 S	301.48 E	308.20	0.46
3727.00	10.54	116.79	3697.92	170.98 S	315.31 E	322.36	1.99
3822.00	12.55	113.14	3791.00	178.95 S	332.56 E	339.94	2.25
3917.00	13.27	118.15	3883.60	188.15 S	351.67 E	359.42	1.40
4011.00	12.76	125.29	3975.19	199.24 S	369.66 E	377.87	1.79
4106.00	9.30	128.63	4068.42	210.09 S	384.22 E	392.88	3.70
4201.00	6.89	131.78	4162.47	218.68 S	394.47 E	403.49	2.58
4295.00	6.51	127.69	4255.83	225.70 S	402.89 E	412.21	0.65

4390.00	5.36	121.54	4350.32	231.31 S	410.93 E	420.48	1.38
4485.00	5.24	123.57	4444.91	236.03 S	418.33 E	428.07	0.23
4580.00	3.92	124.83	4539.60	240.29 S	424.61 E	434.53	1.39
4674.00	2.09	141.41	4633.47	243.46 S	428.32 E	438.37	2.14
4769.00	0.75	172.90	4728.44	245.43 S	429.47 E	439.61	1.58
4864.00	0.28	149.93	4823.44	246.25 S	429.67 E	439.84	0.53
4958.00	1.01	239.15	4917.43	246.87 S	429.07 E	439.27	1.11
5053.00	0.83	239.21	5012.42	247.66 S	427.76 E	438.00	0.19
5148.00	1.16	253.86	5107.41	248.27 S	426.25 E	436.51	0.44
5243.00	1.50	255.84	5202.38	248.85 S	424.12 E	434.41	0.36
5337.00	1.18	318.57	5296.36	248.42 S	422.28 E	432.56	1.51
5432.00	0.91	320.10	5391.34	247.11 S	421.15 E	431.37	0.29
5527.00	1.13	327.64	5486.33	245.74 S	420.17 E	430.33	0.27
5622.00	0.50	69.83	5581.32	244.81 S	420.05 E	430.17	1.40
5717.00	0.30	68.04	5676.32	244.57 S	420.67 E	430.78	0.21
5811.00	0.66	208.70	5770.32	244.95 S	420.64 E	430.77	0.97
5906.00	1.01	230.70	5865.31	245.96 S	419.73 E	429.90	0.49
6001.00	0.25	284.69	5960.30	246.44 S	418.88 E	429.07	0.93
6095.00	0.44	229.95	6054.30	246.62 S	418.41 E	428.61	0.38
6190.00	0.11	18.75	6149.30	246.77 S	418.16 E	428.37	0.57
6285.00	0.61	249.68	6244.30	246.86 S	417.71 E	427.92	0.72
6380.00	0.68	253.38	6339.29	247.19 S	416.70 E	426.93	0.09
6474.00	0.89	273.24	6433.28	247.31 S	415.44 E	425.67	0.36
6569.00	6.35	77.64	6528.11	246.15 S	419.84 E	430.02	7.59
6664.00	14.72	78.99	6621.43	242.71 S	436.85 E	446.86	8.81
6758.00	20.49	85.32	6711.00	239.08 S	464.99 E	474.83	6.46
6853.00	29.94	89.11	6796.85	237.35 S	505.36 E	515.08	10.09
6948.00	39.05	88.20	6875.07	236.04 S	559.09 E	568.71	9.60
7042.00	49.24	90.75	6942.44	235.58 S	624.46 E	634.00	11.00
7137.00	62.82	93.88	6995.40	238.92 S	702.98 E	712.58	14.55
7232.00	68.52	93.11	7034.53	244.19 S	789.34 E	799.10	6.05
7280.00	70.73	92.29	7051.24	246.30 S	834.29 E	844.09	4.87
7327.00	72.86	91.27	7065.92	247.69 S	878.91 E	888.73	4.98
7375.00	76.89	91.64	7078.44	248.87 S	925.22 E	935.05	8.43
7437.00	80.06	92.00	7090.83	250.80 S	985.93 E	995.79	5.14
7511.00	84.66	90.90	7100.66	252.65 S	1059.23 E	1069.10	6.39
7561.00	85.21	90.65	7105.08	253.32 S	1109.03 E	1118.88	1.21
7653.00	87.38	90.36	7111.02	254.13 S	1200.83 E	1210.63	2.38
7744.00	89.75	90.18	7113.30	254.56 S	1291.79 E	1301.53	2.61
7840.00	90.40	89.63	7113.18	254.40 S	1387.79 E	1397.43	0.89
7935.00	90.96	91.07	7112.05	254.98 S	1482.78 E	1492.36	1.63
8029.00	89.78	92.23	7111.44	257.69 S	1576.74 E	1586.34	1.76
8124.00	90.34	92.36	7111.34	261.49 S	1671.66 E	1681.34	0.61
8219.00	90.86	91.73	7110.35	264.88 S	1766.59 E	1776.33	0.86
8314.00	91.54	91.72	7108.36	267.74 S	1861.53 E	1871.31	0.72
8408.00	89.88	91.57	7107.19	270.44 S	1955.48 E	1965.29	1.77
8503.00	88.74	91.77	7108.34	273.20 S	2050.43 E	2060.27	1.22
8598.00	88.77	91.27	7110.40	275.72 S	2145.37 E	2155.23	0.53
8693.00	89.72	91.23	7111.65	277.80 S	2240.34 E	2250.20	1.00
8788.00	90.03	90.58	7111.86	279.30 S	2335.33 E	2345.17	0.76
8882.00	90.96	90.82	7111.05	280.45 S	2429.32 E	2439.12	1.02
8977.00	89.41	91.06	7110.74	282.00 S	2524.30 E	2534.08	1.65
9071.00	89.94	90.63	7111.27	283.39 S	2618.29 E	2628.04	0.73
9166.00	90.74	90.79	7110.71	284.57 S	2713.28 E	2722.99	0.86
9261.00	88.89	90.54	7111.02	285.67 S	2808.27 E	2817.94	1.97
9356.00	89.54	90.15	7112.32	286.24 S	2903.26 E	2912.87	0.80
9451.00	88.83	90.58	7113.67	286.85 S	2998.25 E	3007.79	0.87
9545.00	89.57	90.44	7114.98	287.68 S	3092.23 E	3101.73	0.80
9640.00	89.72	91.59	7115.57	289.37 S	3187.21 E	3196.70	1.22
9734.00	91.14	91.44	7114.87	291.85 S	3281.18 E	3290.68	1.52
9829.00	91.26	91.58	7112.88	294.35 S	3376.12 E	3385.64	0.19
9924.00	91.14	91.18	7110.89	296.64 S	3471.07 E	3480.61	0.44
10019.00	90.80	91.50	7109.28	298.86 S	3566.03 E	3575.57	0.49
10114.00	89.69	91.91	7108.87	301.69 S	3660.99 E	3670.56	1.25
10208.00	90.31	91.95	7108.87	304.85 S	3754.93 E	3764.56	0.66
10303.00	89.75	91.94	7108.82	308.08 S	3849.88 E	3859.56	0.59
10397.00	89.23	92.20	7109.66	311.47 S	3943.81 E	3953.55	0.62
10492.00	89.29	91.88	7110.89	314.86 S	4038.75 E	4048.54	0.34
10587.00	88.12	91.53	7113.03	317.68 S	4133.68 E	4143.50	1.29
10681.00	88.49	91.10	7115.81	319.84 S	4227.61 E	4237.44	0.60
10776.00	89.51	88.98	7117.47	319.90 S	4322.59 E	4332.34	2.48
10871.00	91.51	90.65	7116.63	319.60 S	4417.58 E	4427.22	2.74
10966.00	89.57	91.57	7115.73	321.44 S	4512.55 E	4522.19	2.26
11060.00	90.93	90.69	7115.32	323.29 S	4606.53 E	4616.16	1.72
11155.00	89.58	89.88	7114.88	324.88 S	4701.54 E	4711.18	0.48

11155.00	90.56	90.60	7114.09	324.36 S	4701.51 E	4711.10	0.40
11249.00	89.72	91.49	7113.86	326.07 S	4795.50 E	4805.07	1.30
11344.00	86.98	90.86	7116.59	328.02 S	4890.43 E	4900.00	2.96
11438.00	87.66	90.94	7120.99	329.50 S	4984.31 E	4993.86	0.73
11533.00	87.90	90.28	7124.67	330.51 S	5079.24 E	5088.74	0.74
11628.00	88.86	91.91	7127.35	332.32 S	5174.18 E	5183.67	1.99
11723.00	89.75	91.69	7128.50	335.31 S	5269.12 E	5278.66	0.97
11818.00	90.71	90.49	7128.12	337.11 S	5364.10 E	5373.63	1.62
11913.00	90.74	92.37	7126.92	339.48 S	5459.06 E	5468.60	1.98

**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 92.46 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.93 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11913.00 FEET  
IS 5469.60 FEET ALONG 93.56 DEGREES (GRID)**

**Tied in @ Surface**