



**1 : 600 / 1 : 240**

WELL INFORMATION					
MWD Run Number	100				
Date run completed	21-Aug-15				
Rig Bit Number	0100				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (TVD, ft)	1,099.97				
Log End Depth (TVD, ft)	5,899.13				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	20-Aug-15 08:00				
Drill/Wipe End Date and Time	21-Aug-15 02:30				
Min Inc (deg) @ Depth (TVD, ft)	0.22 @ 1,108.97				
Max Inc (deg) @ Depth (TVD, ft)	85.59 @ 5,896.48				
Bit TFA(in2) / Bit Type	0.98 /				
Flow Rate (gpm)	590.90				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Native/Spud Mud				
Density (ppg) / Viscosity (spqt)	8.90 / 27.00				
Filtrate CL (ppm)	900.00				
pH / Fluid Loss (mptm)	8.50 / 18				
PV (cP) / YP (lhf2)	2 / 3.00				
% Solids / % Sand	1.7 / .2				
% Oil / Oil:Water Ratio	N/A / N/A				
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) / S	127.00 / 12.00				

Max Tool Temp (degF) / Source	167.00 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Brian Neu				
Customer Representative	Jim Boyd				

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	11303511				
Insert Serial Number	11619985				
Date and Time Initialized	19-Aug-15 15:11				
Date and Time Read	21-Aug-15 07:42				
ECMB SW Version	N/A				

### Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	66.00				
Software Version	6.33				
Sub Serial Number	11303511				
Sonde Serial Number	10859920				
Sensor ID Number	N/A				
Toolface Offset (deg)	147.30				

### Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	59.26				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11303511				
Insert/Sonde Serial Number	11680918				

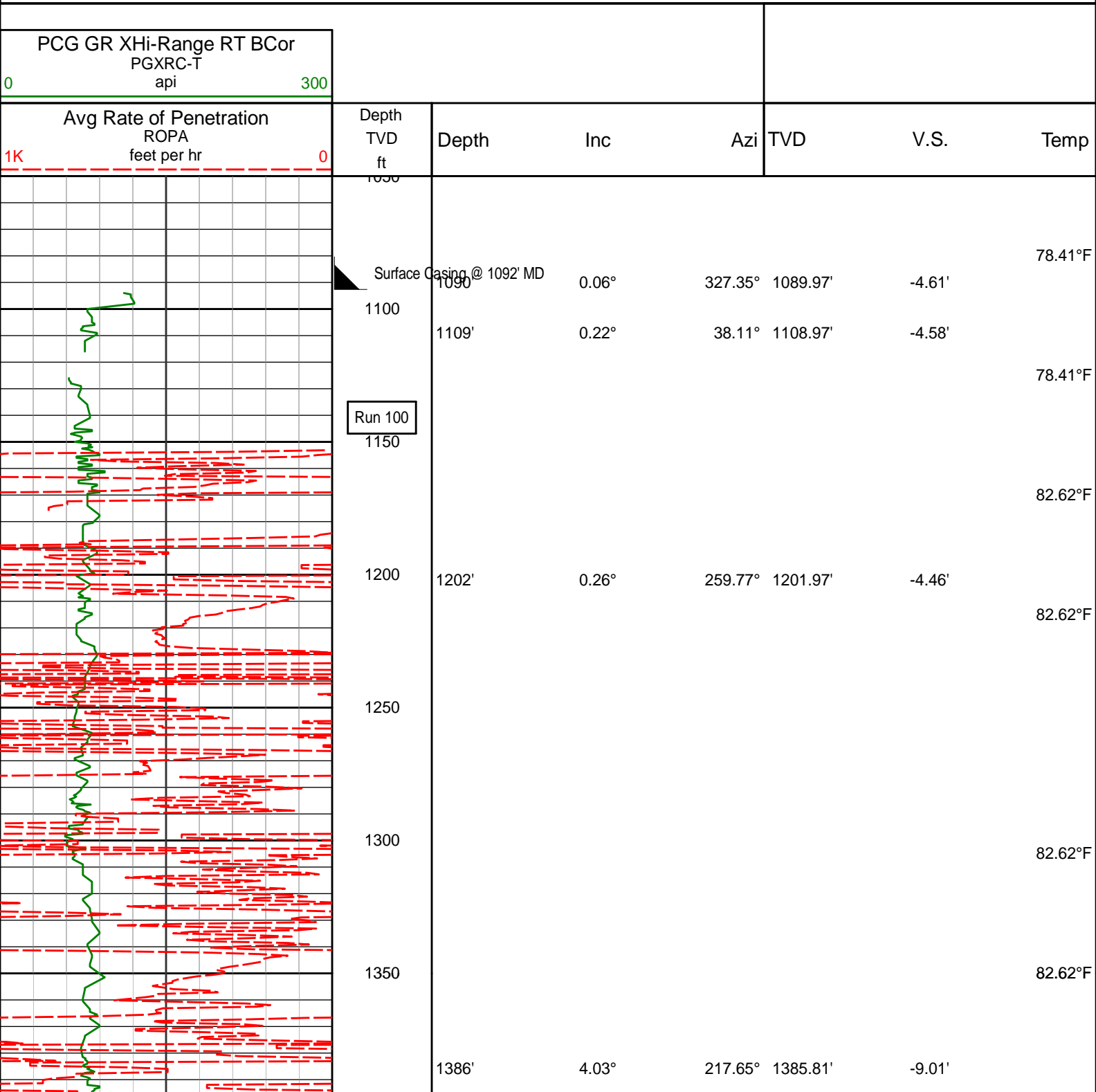
## REMARKS

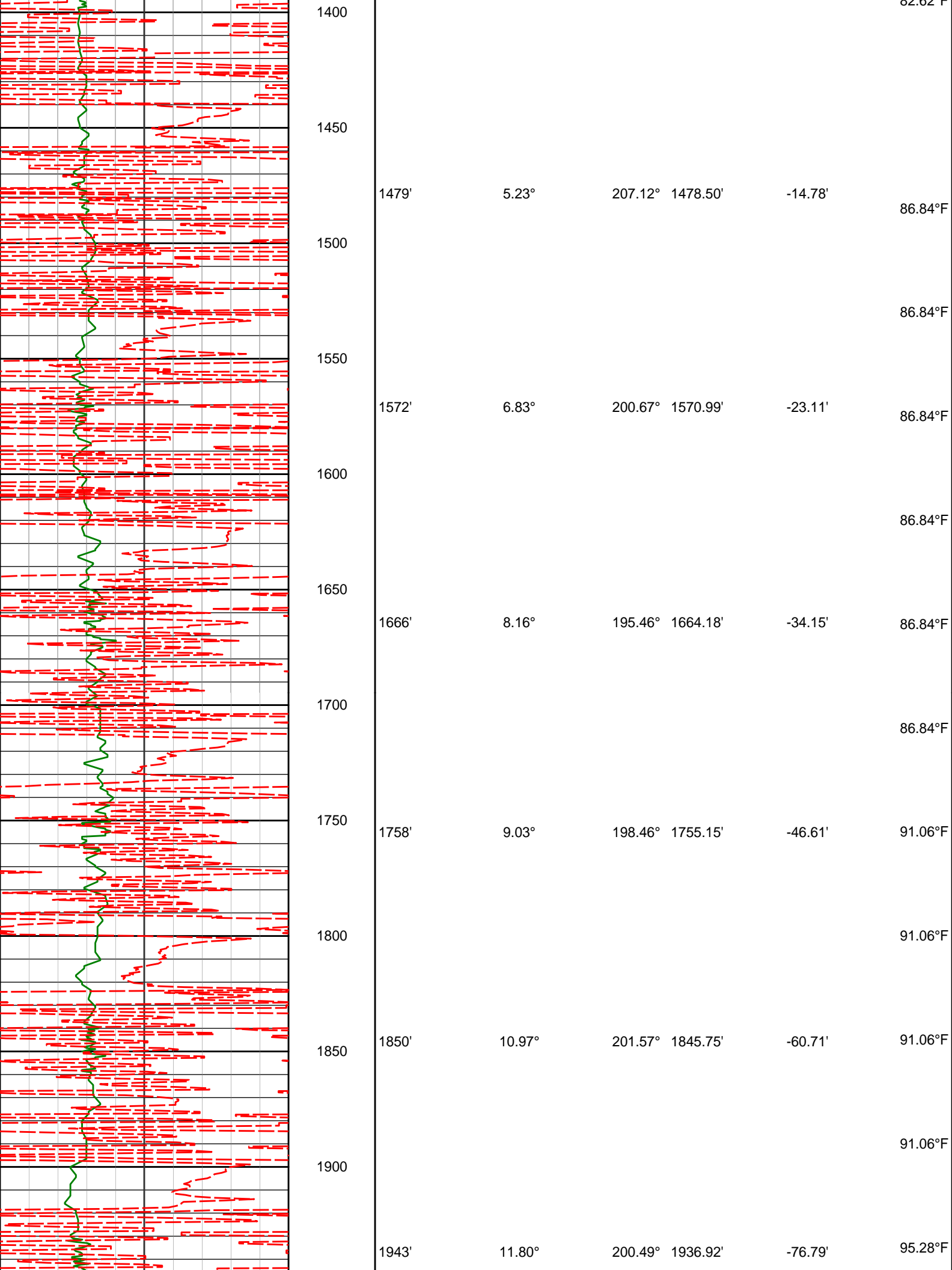
1. All depths are calibrated to driller's pipe tally and are total vertical depth from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Environmental parameters used in gamma and resistance processing:  
Hole Size: 8.75"  
Mud Density: 9.9-11.0
5. The following smoothing parameters have been applied to the data:  
Interval: 0.5 ft  
Coercion Distance: 1.2 ft (ROPA)  
Interval: 0.5 ft  
Coercion Distance: 0.6 ft (Gamma Ray)

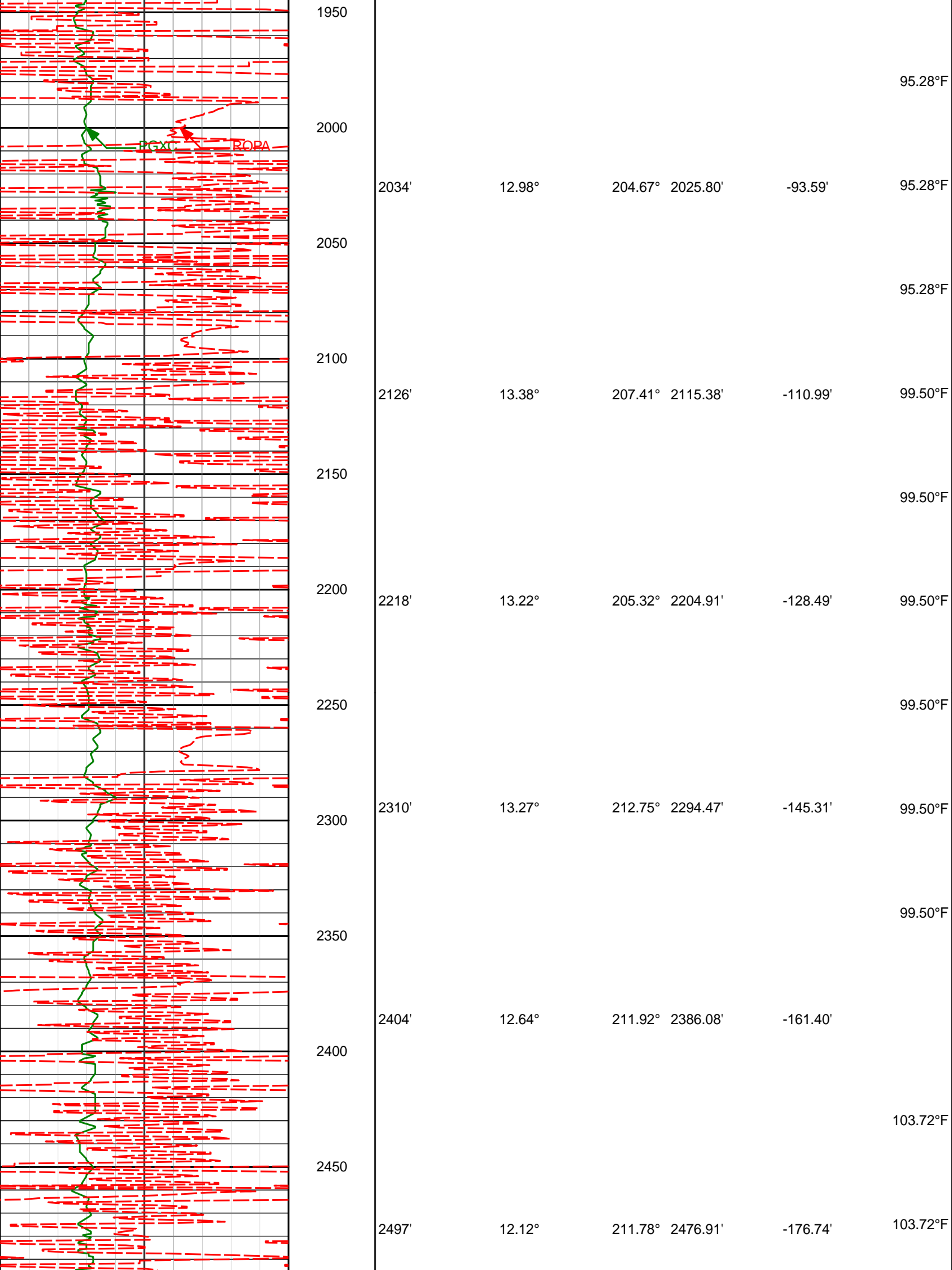
## WARRANTY

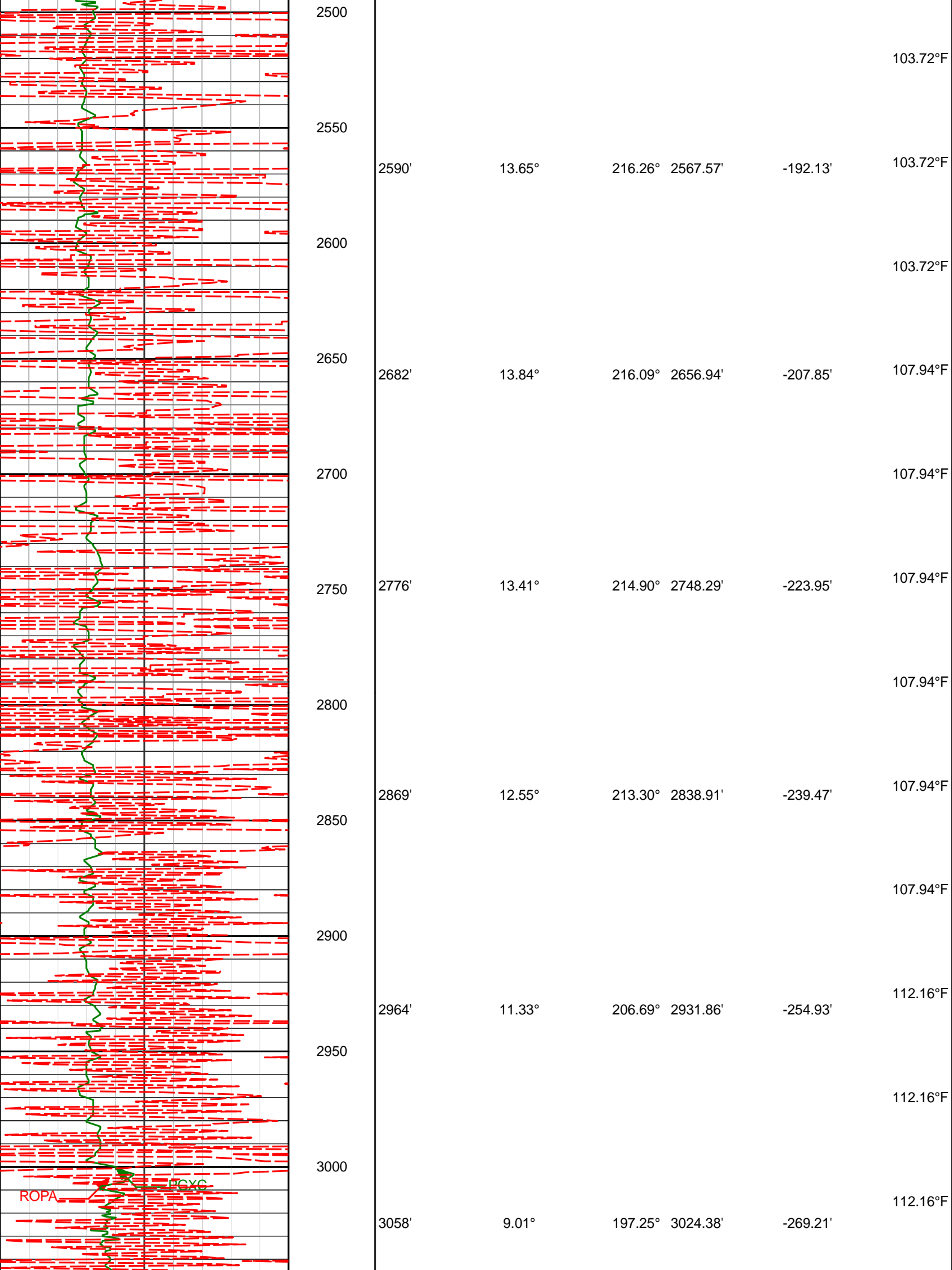
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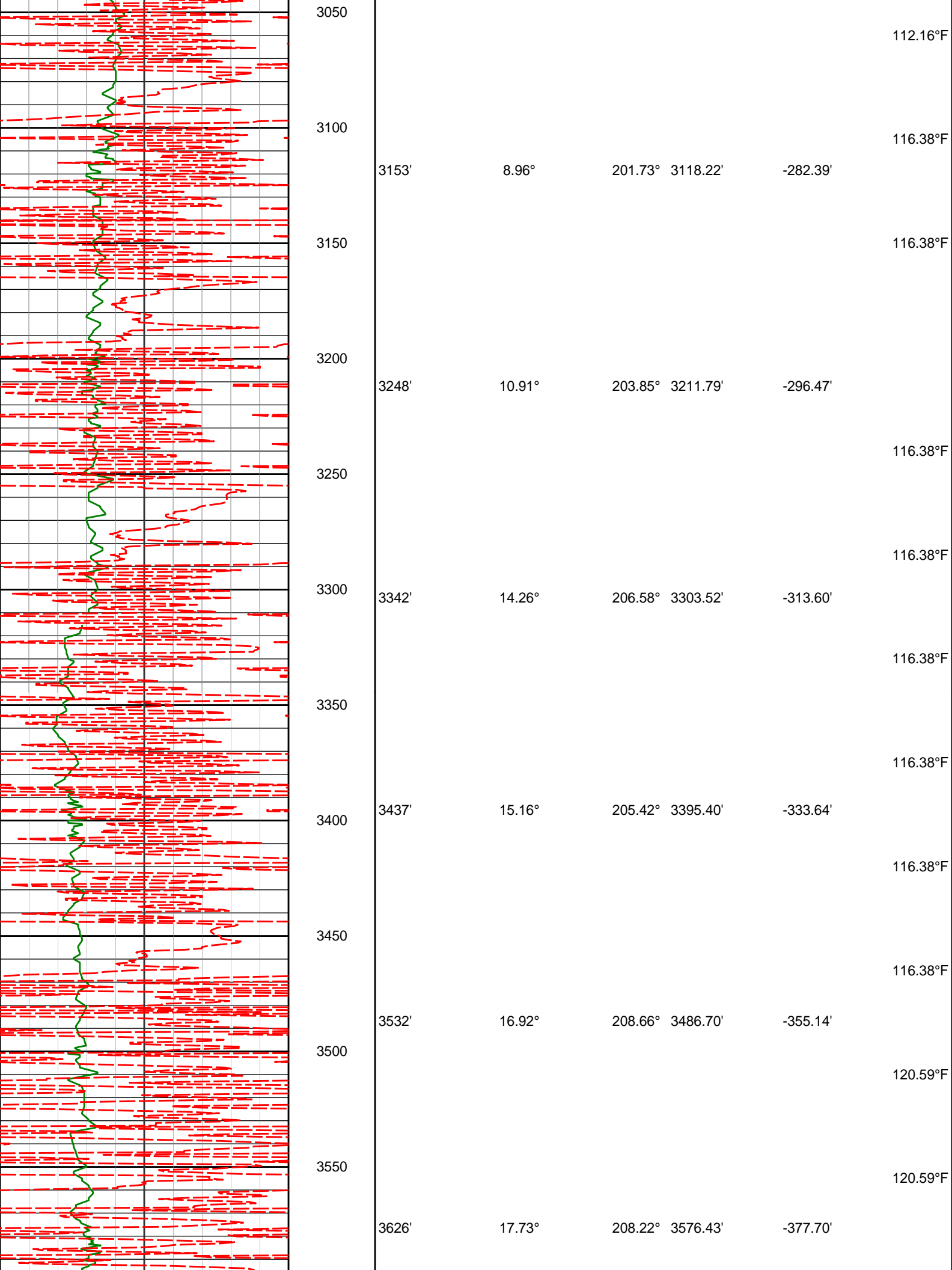
# TVD Detail 1:600 Scale

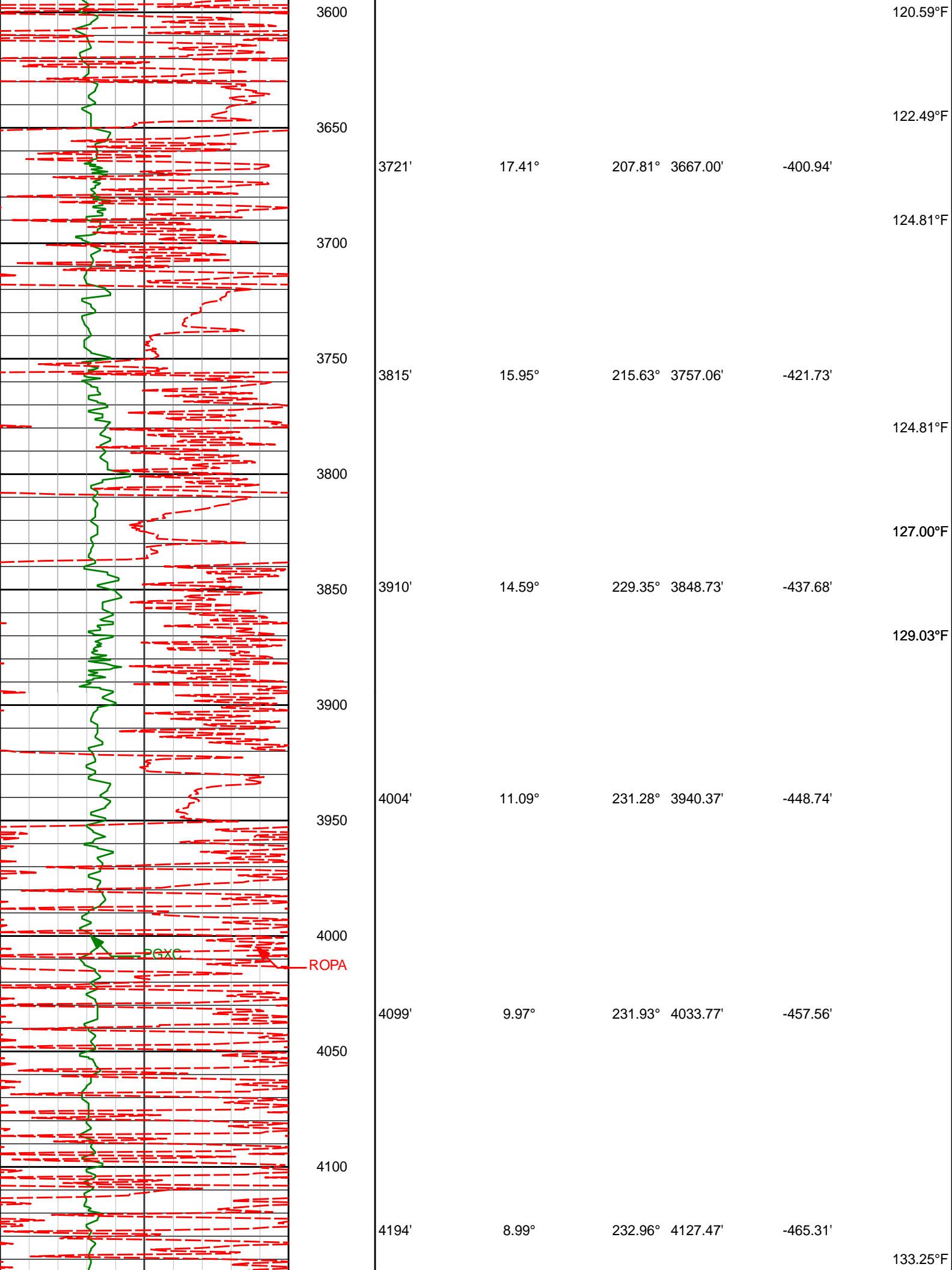




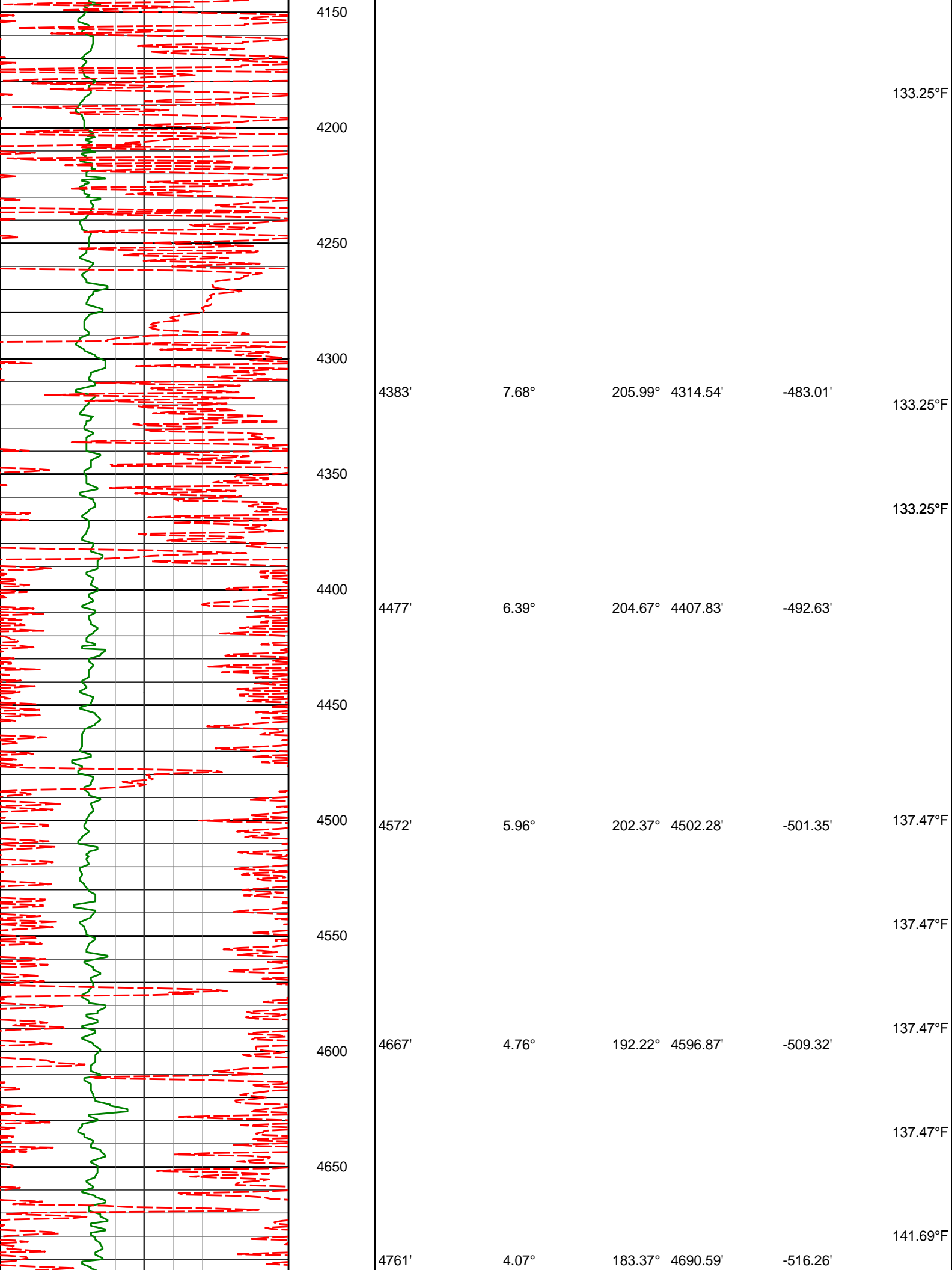


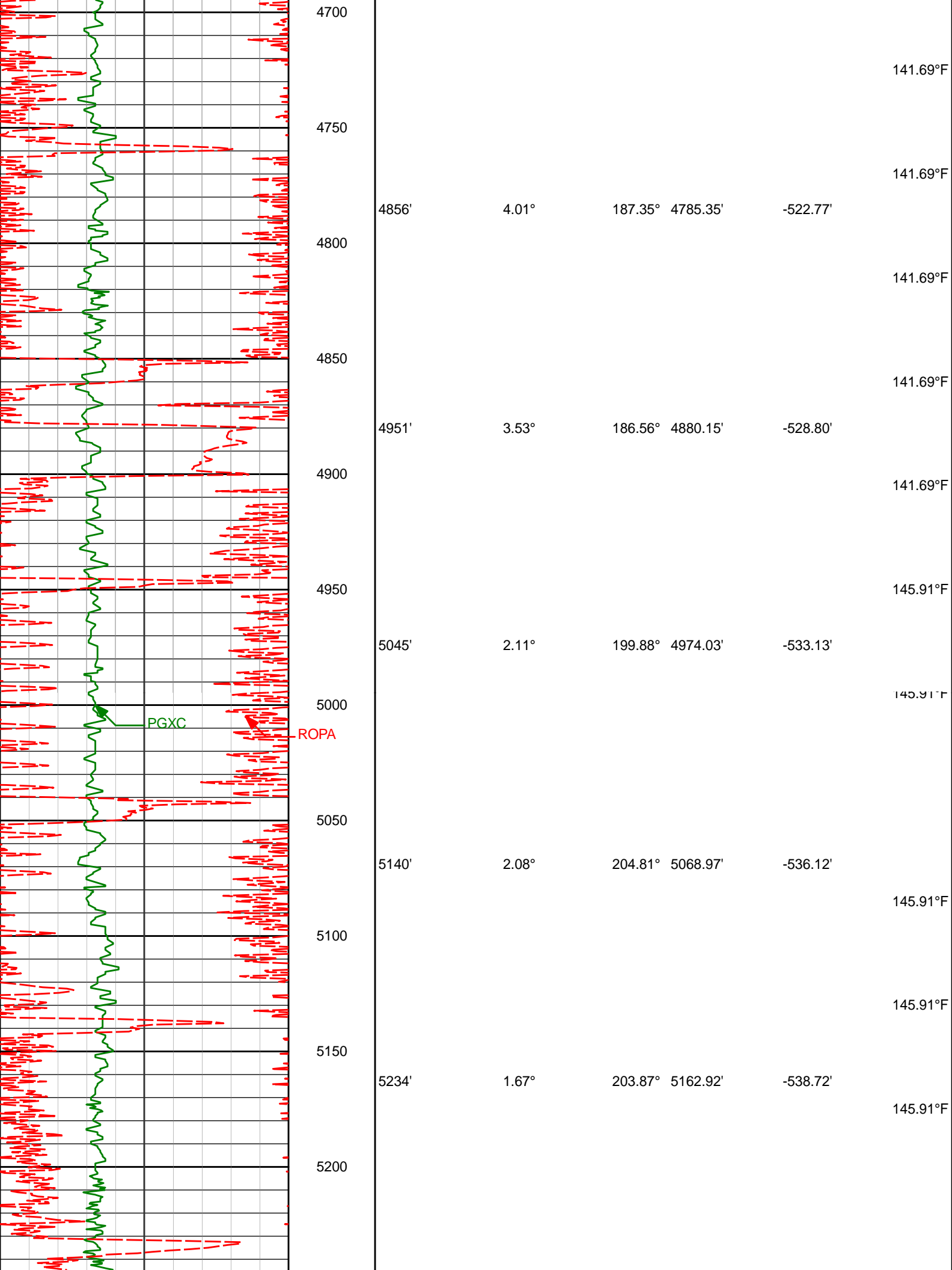


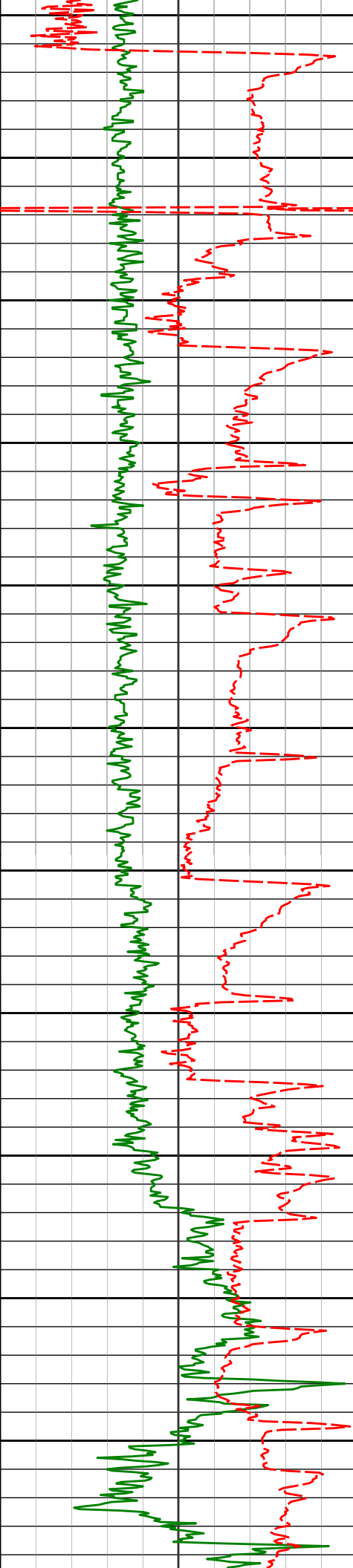












5250  
5300  
5350  
5400  
5450  
5500  
5550  
5600  
5650  
5700  
5750

5329'	0.62°	222.57°	5257.90'	-540.22'	145.91°F
					145.91°F
5424'	10.77°	344.44°	5352.35'	-531.72'	145.91°F
					145.91°F
5518'	16.93°	341.89°	5443.58'	-509.52'	150.13°F
					150.13°F
5613'	24.43°	345.87°	5532.40'	-476.34'	150.13°F
					152.41°F
5708'	32.39°	347.24°	5615.89'	-431.39'	154.34°F
					154.34°F
5802'	37.64°	351.02°	5692.86'	-377.56'	154.34°F
					154.34°F
5897'	46.95°	349.37°	5763.06'	-313.75'	162.78°F



78.41°F

Run 100

82.62°F

1200

1202'

0.26°

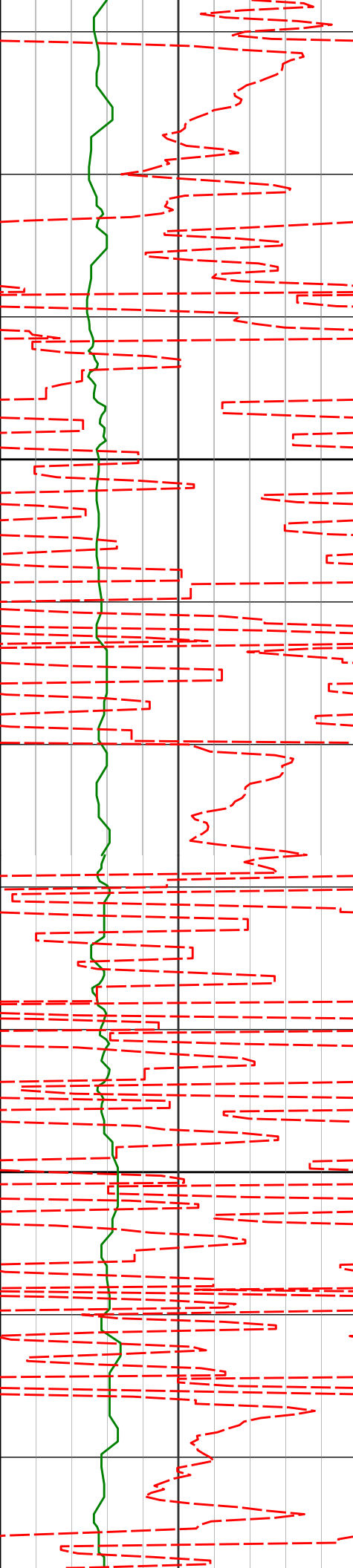
259.77° 1201.97'

-4.46'

82.62°F

1300

82.62°F



1400

1500

1386'

1479'

4.03°

5.23°

217.65°

207.12°

1385.81'

1478.50'

-9.01'

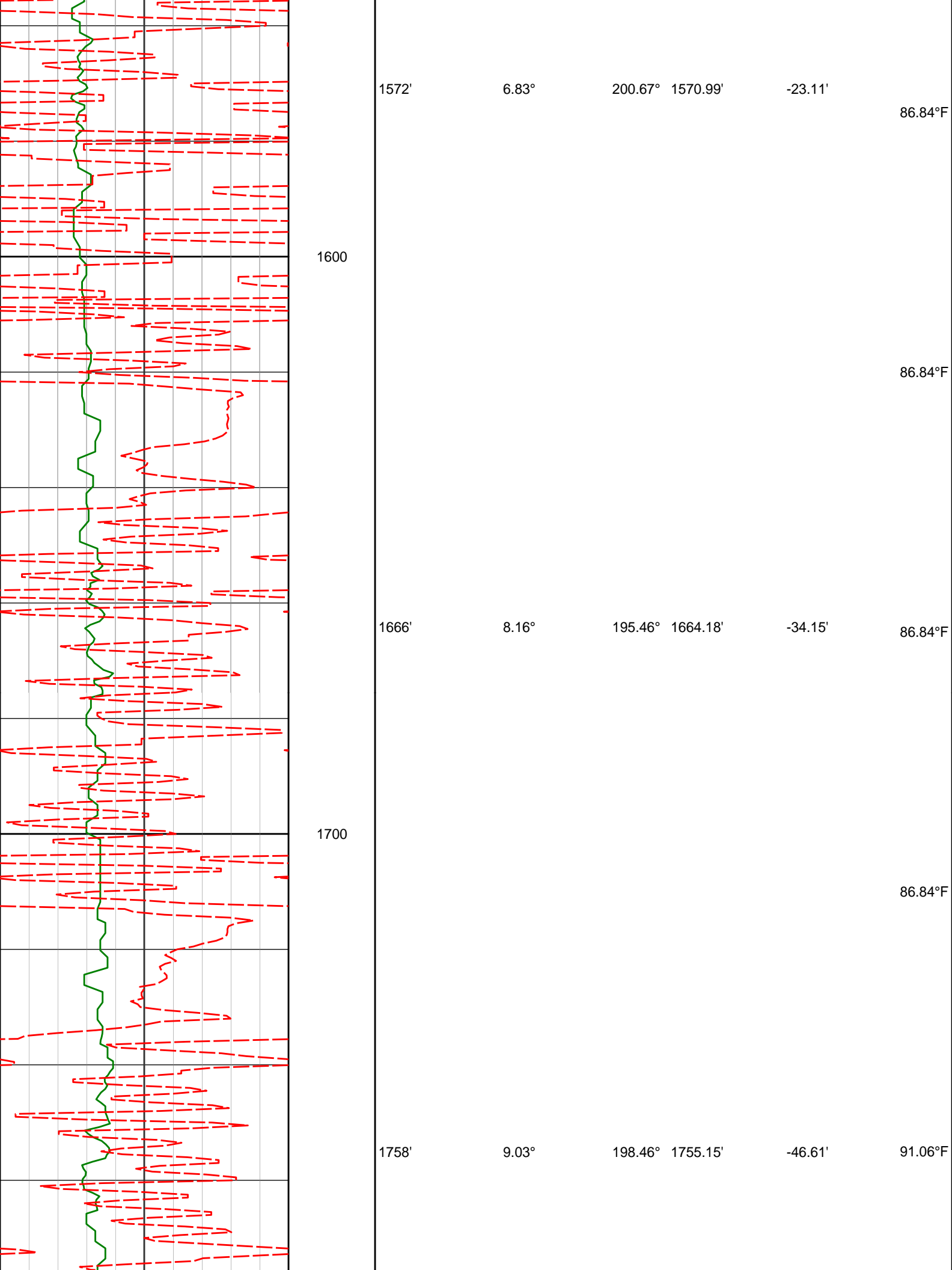
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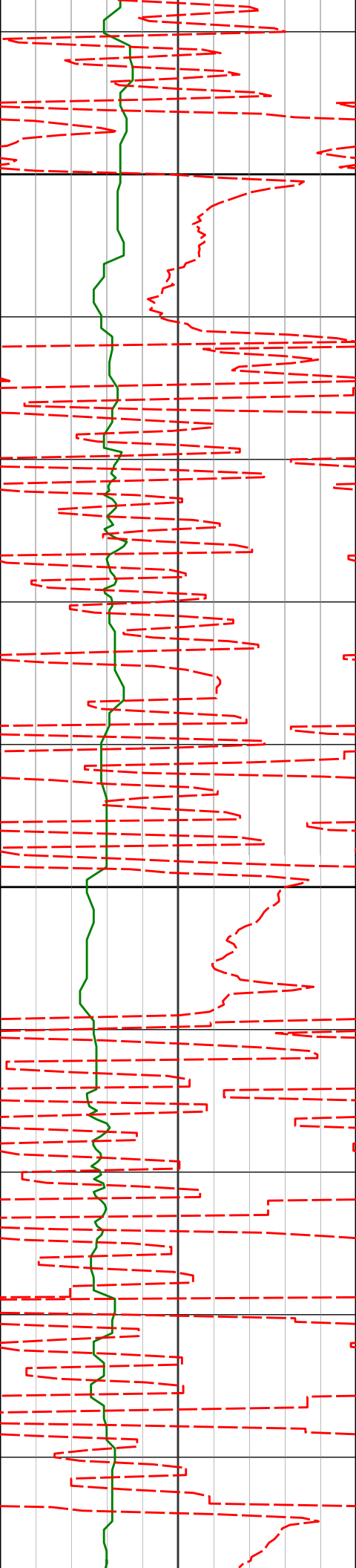
82.62°F

82.62°F

86.84°F

86.84°F





1800

91.06°F

1850'

10.97°

201.57°

1845.75'

-60.71'

91.06°F

1900

91.06°F

1943'

11.80°

200.49°

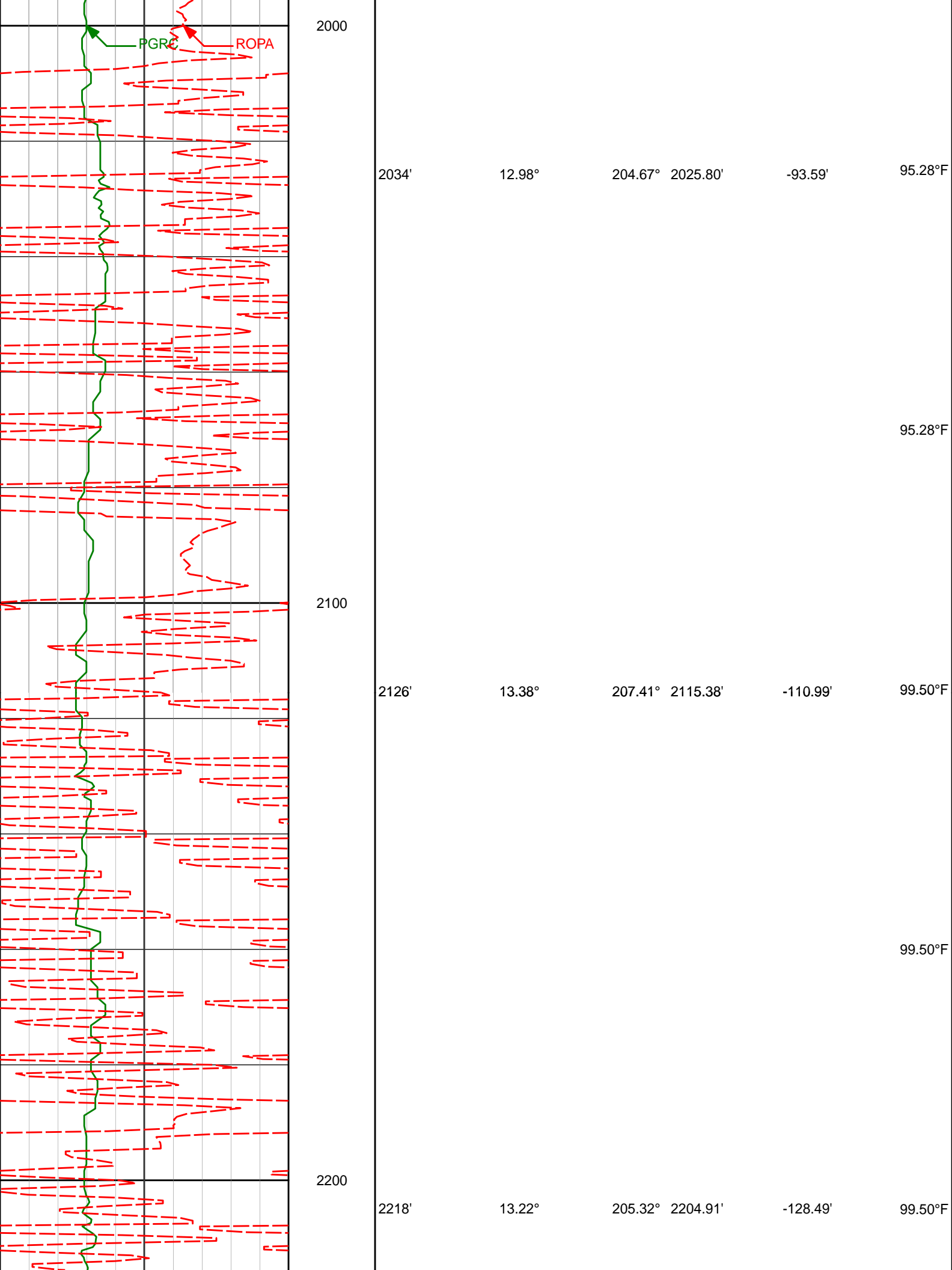
1936.92'

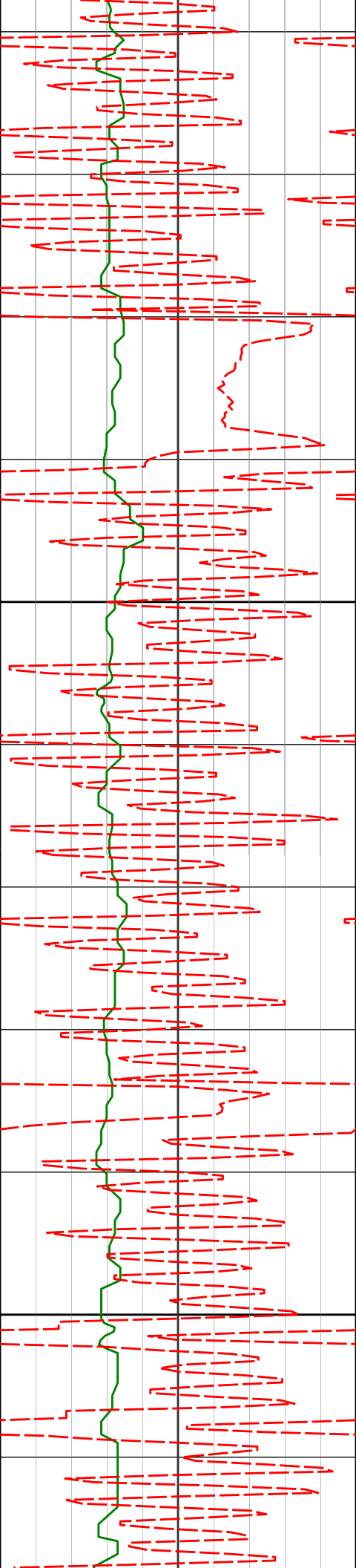
-76.79'

95.28°F

95.28°F







2300

2400

2310'

13.27°

212.75° 2294.47'

-145.31'

99.50°F

99.50°F

99.50°F

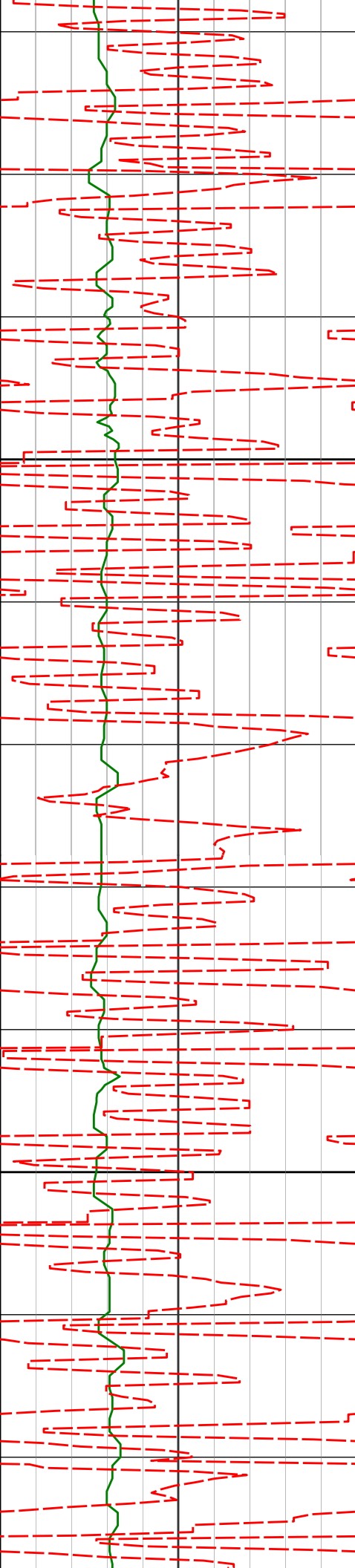
2404'

12.64°

211.92° 2386.08'

-161.40'

103.72°F



2497'

12.12°

211.78° 2476.91'

-176.74'

103.72°F

2500

103.72°F

2590'

13.65°

216.26° 2567.57'

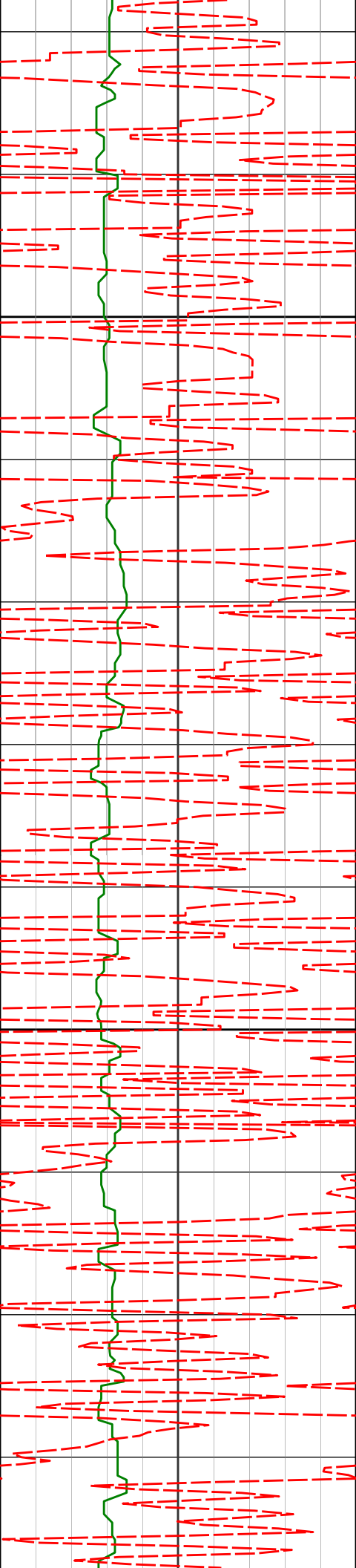
-192.13'

103.72°F

2600

103.72°F

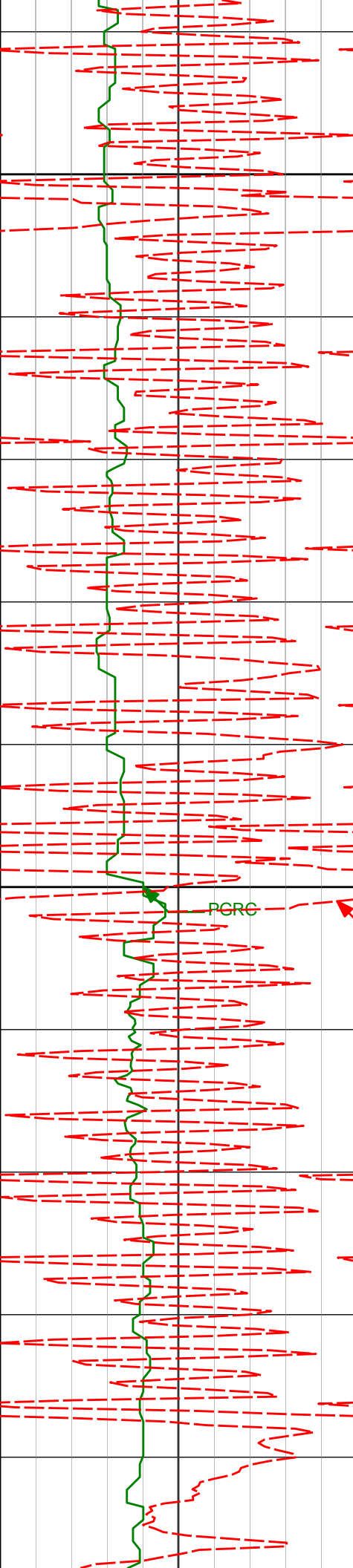
107.94°F



2700

2800

2682'	13.84°	216.09°	2656.94'	-207.85'	107.94°F
2776'	13.41°	214.90°	2748.29'	-223.95'	107.94°F
2869'	12.55°	213.30°	2838.91'	-239.47'	107.94°F



2900

2964'

11.33°

206.69°

2931.86'

-254.93'

3000

PCRC

ROPA

3058'

9.01°

197.25°

3024.38'

-269.21'

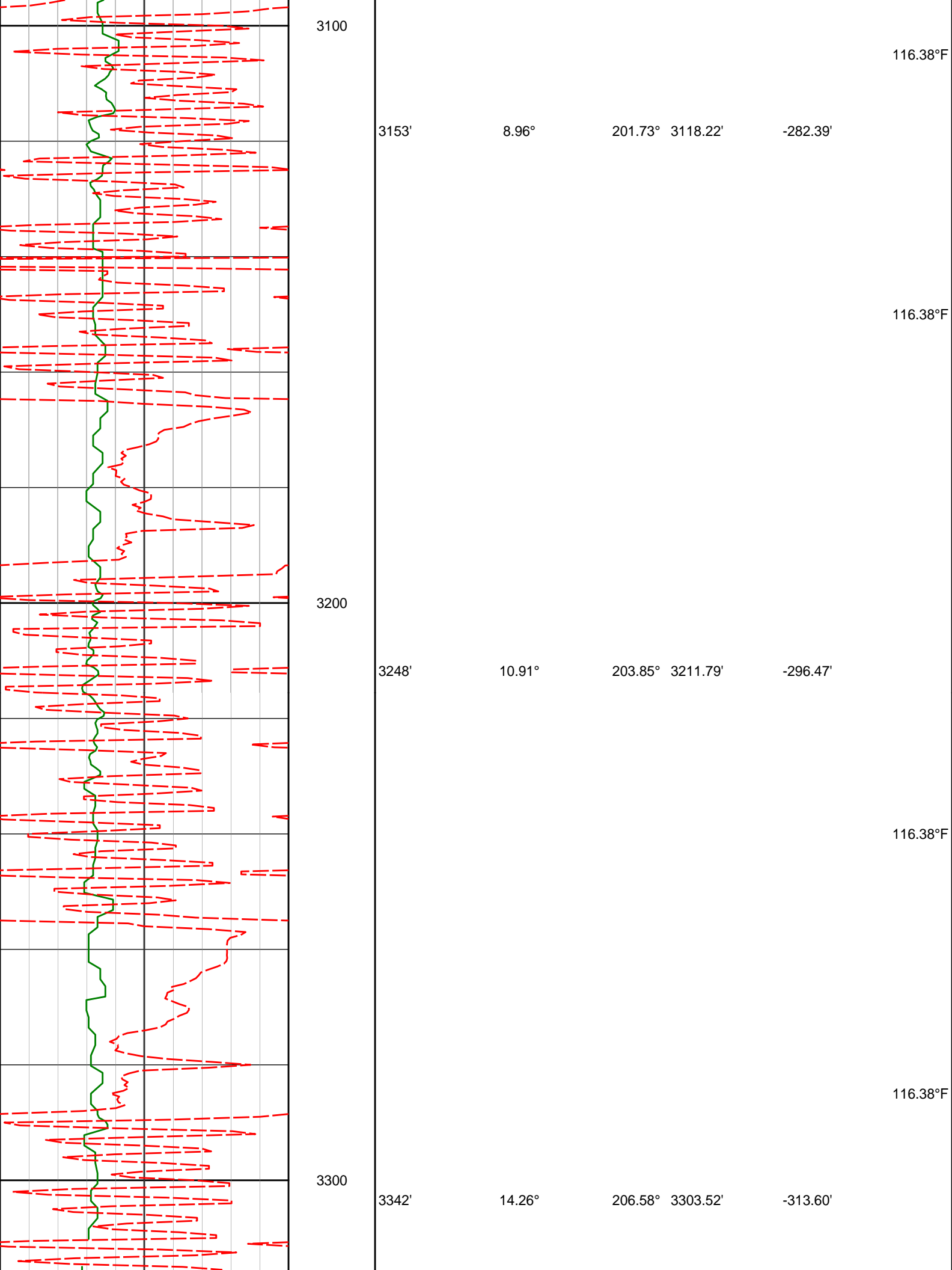
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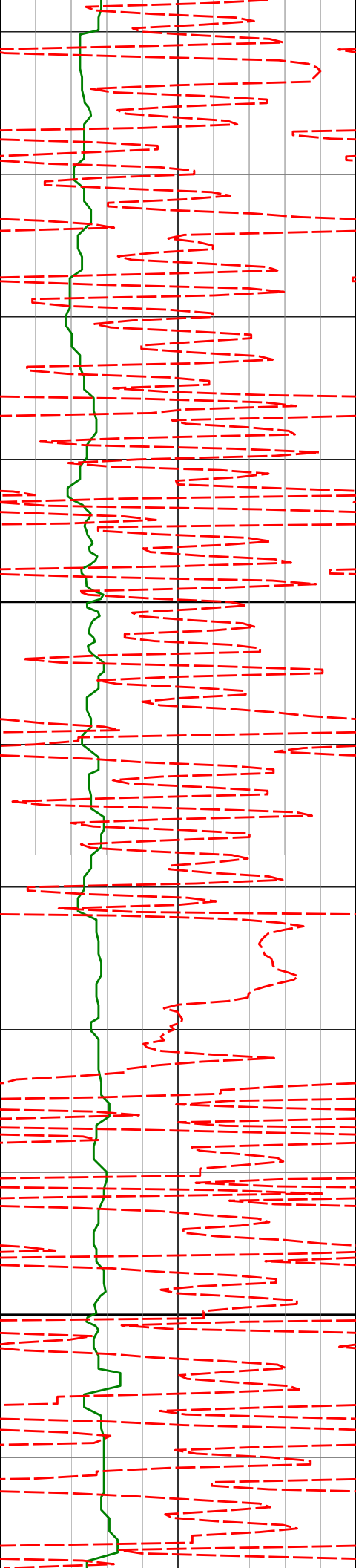
112.16°F

112.16°F

112.16°F

112.16°F





3400

3500

3437'

15.16°

205.42°

3395.40'

-333.64'

3532'

16.92°

208.66°

3486.70'

-355.14'

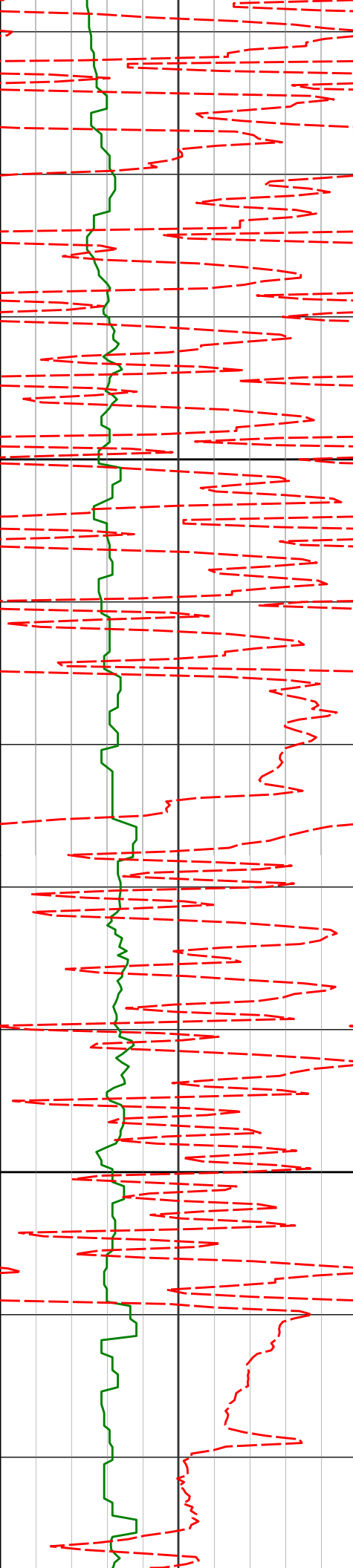
116.38°F

116.38°F

116.38°F

116.38°F

120.59°F



3600

3700

3626'

17.73°

208.22° 3576.43'

-377.70'

3721'

17.41°

207.81° 3667.00'

-400.94'

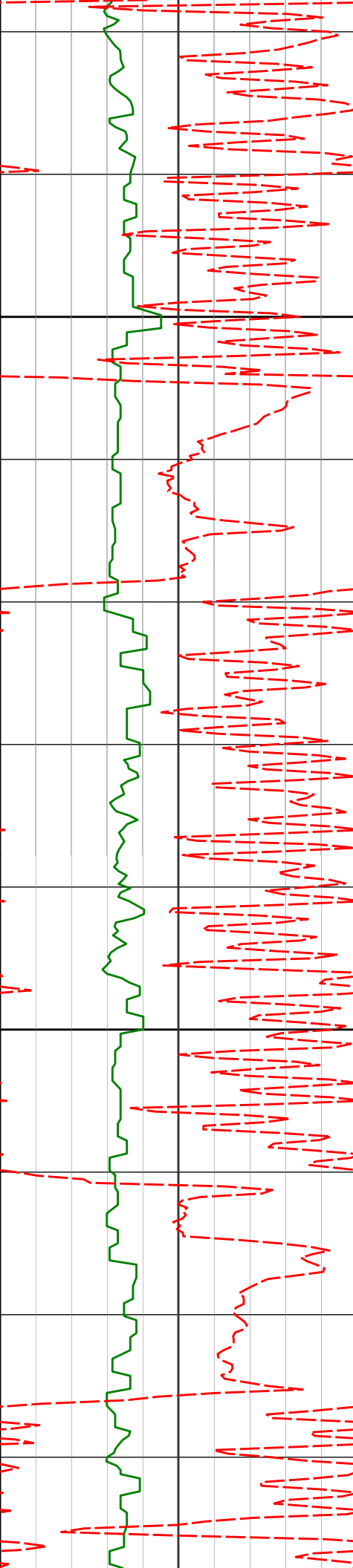
120.59°F

120.59°F

122.49°F

124.81°F





3800

3900

3815'

15.95°

215.63° 3757.06'

-421.73'

124.81°F

127.00°F

3910'

14.59°

229.35° 3848.73'

-437.68'

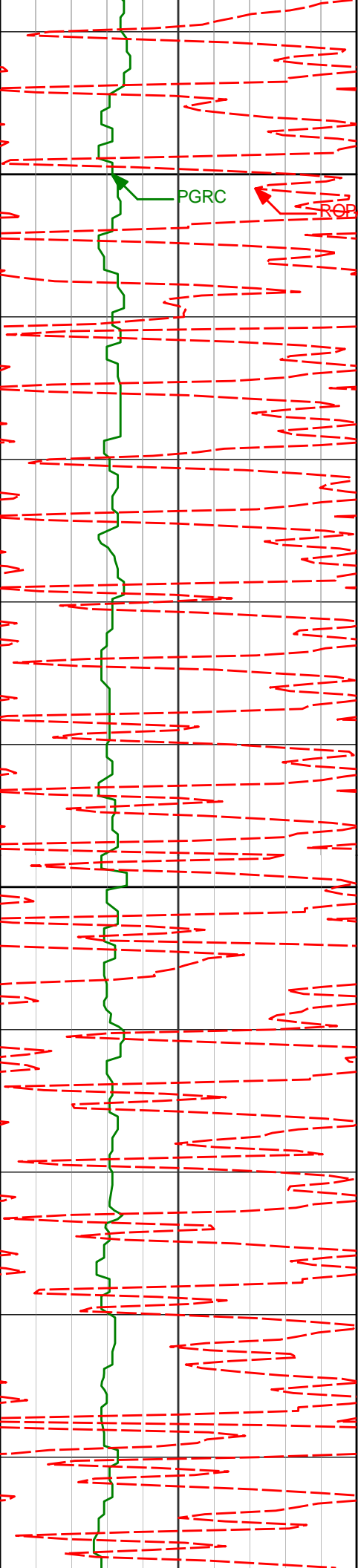
129.03°F

4004'

11.09°

231.28° 3940.37'

-448.74'



4000

PGRC

BOBA

4099'

9.97°

231.93° 4033.77'

-457.56'

4100

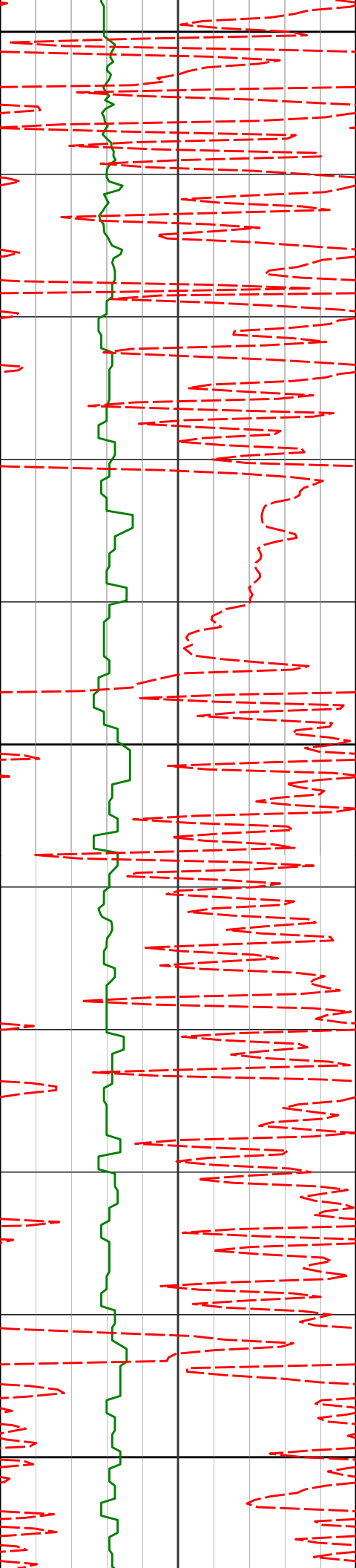
4194'

8.99°

232.96° 4127.47'

-465.31'

133.25°F



4200

4300

4383'

7.68°

205.99° 4314.54'

-483.01'

133.25°F

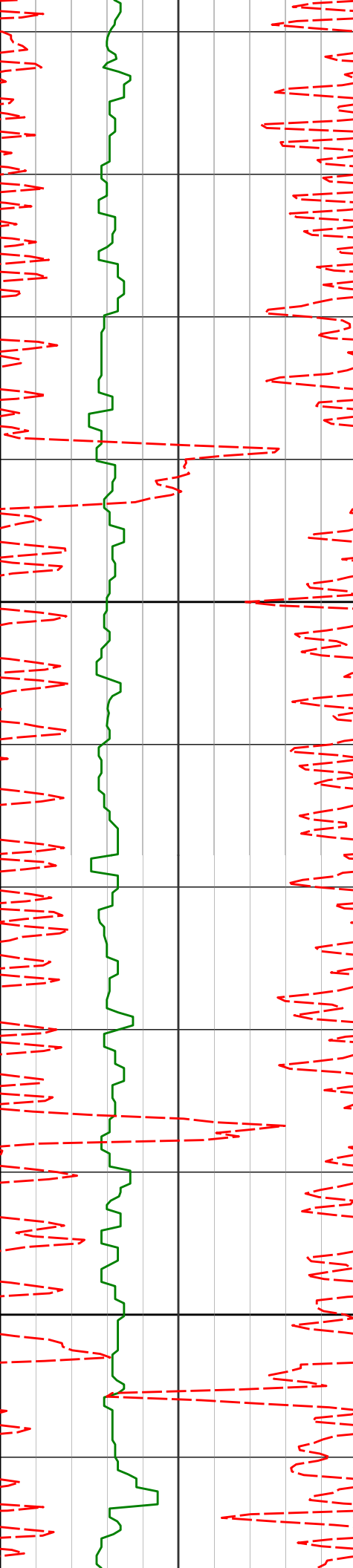
4400

4477'

6.39°

204.67° 4407.83'

-492.63'



4500

4572'

5.96°

202.37° 4502.28'

-501.35'

137.47°F

137.47°F

137.47°F

4600

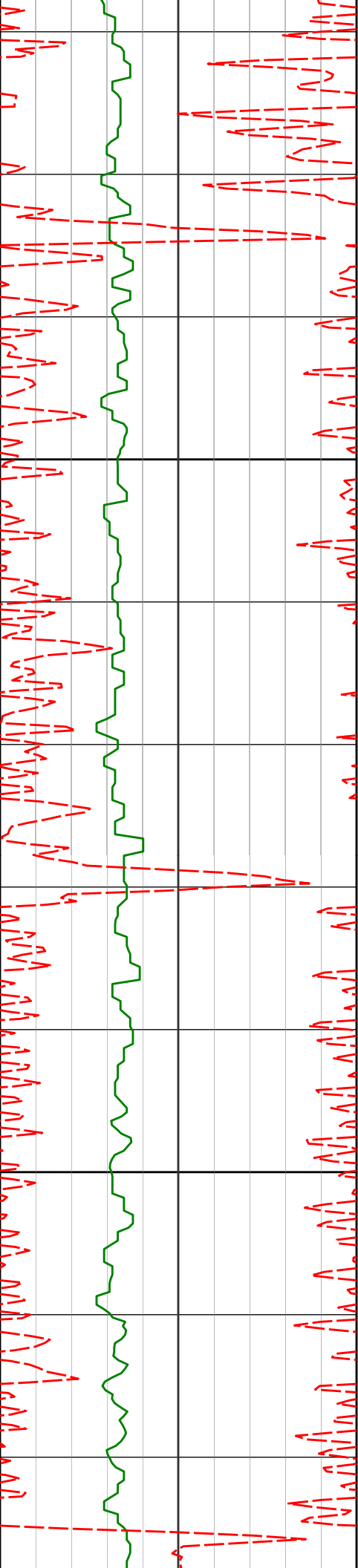
4667'

4.76°

192.22° 4596.87'

-509.32'

137.47°F



4700

4800

4761'

4.07°

183.37° 4690.59'

-516.26'

4856'

4.01°

187.35° 4785.35'

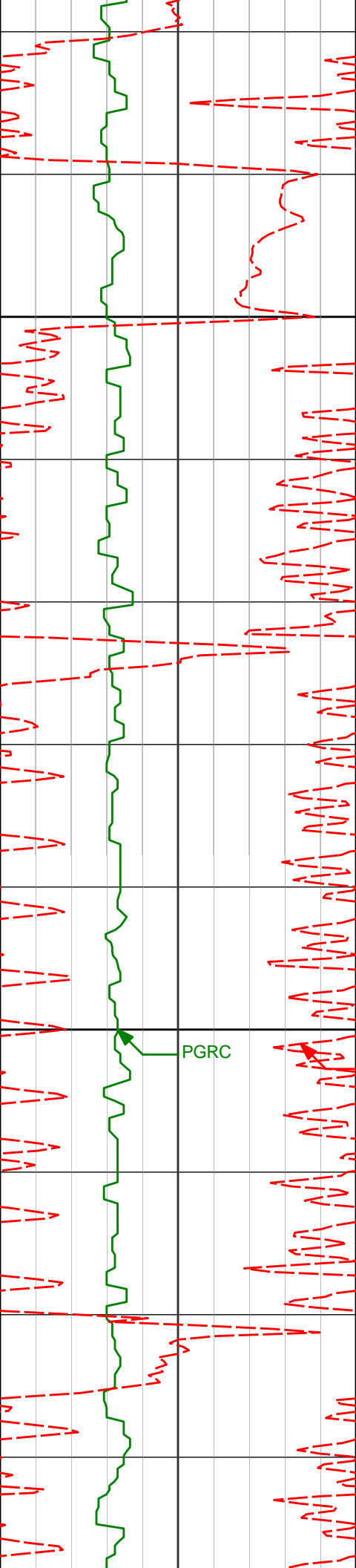
-522.77'

141.69°F

141.69°F

141.69°F

141.69°F



4951'

3.53°

186.56° 4880.15'

-528.80'

4900

141.69°F

141.69°F

145.91°F

5045'

2.11°

199.88° 4974.03'

-533.13'

5000

PGRC

ROPA

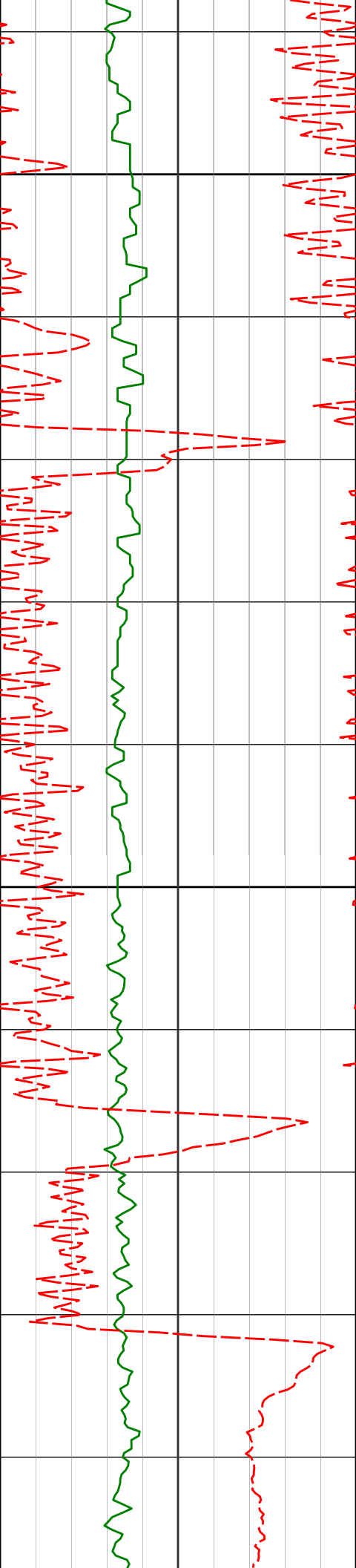
145.91°F

5140'

2.08°

204.81° 5068.97'

-536.12'



5100

5200

5234'

5329'

1.67°

0.62°

203.87°

222.57°

5162.92'

5257.90'

-538.72'

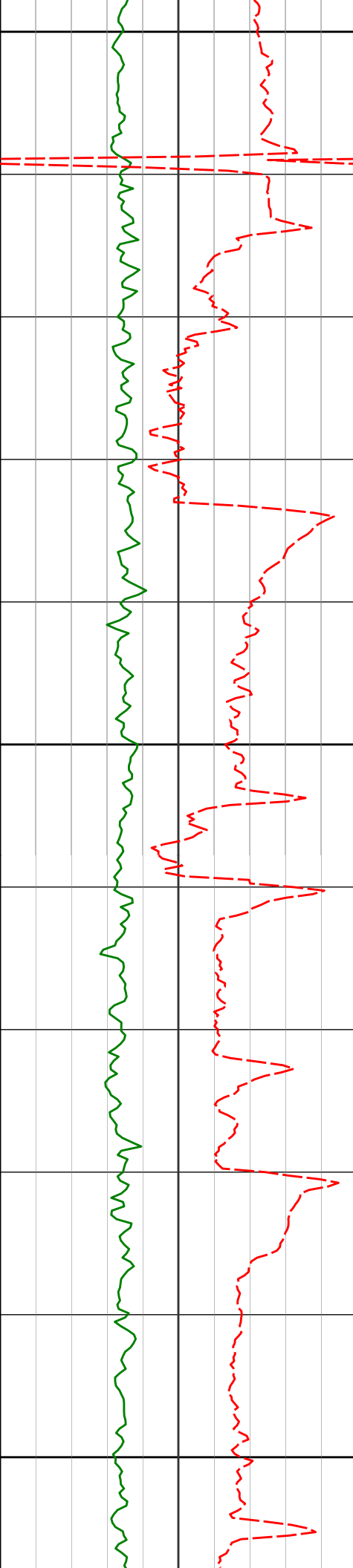
-540.22'

145.91°F

145.91°F

145.91°F

145.91°F



5300

145.91°F

5424'

10.77°

344.44° 5352.35'

-531.72'

145.91°F

5400

145.91°F

5518'

16.93°

341.89° 5443.58'

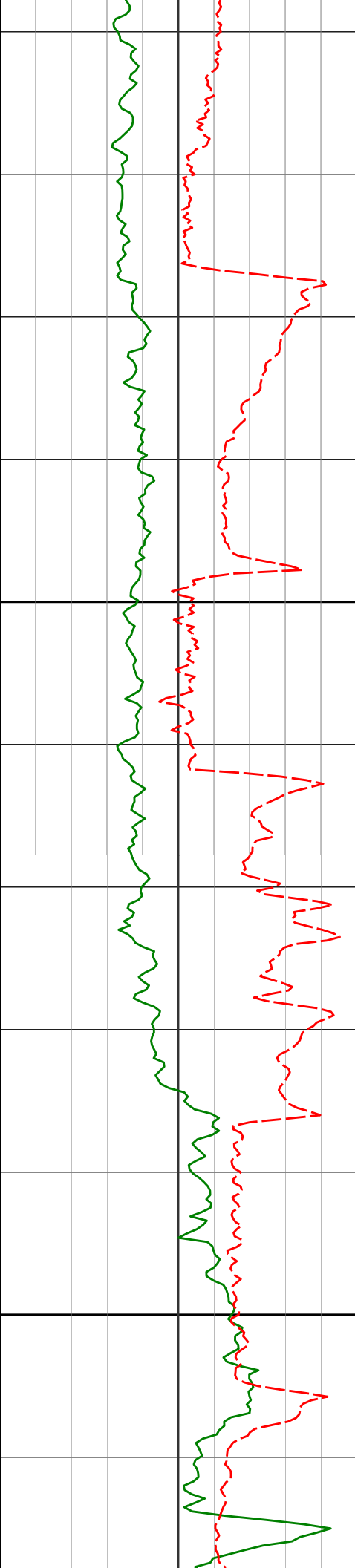
-509.52'

150.13°F

5500

150.13°F





5600

5700

5613'

24.43°

345.87° 5532.40'

-476.34'

150.13°F

5708'

32.39°

347.24° 5615.89'

-431.39'

154.34°F

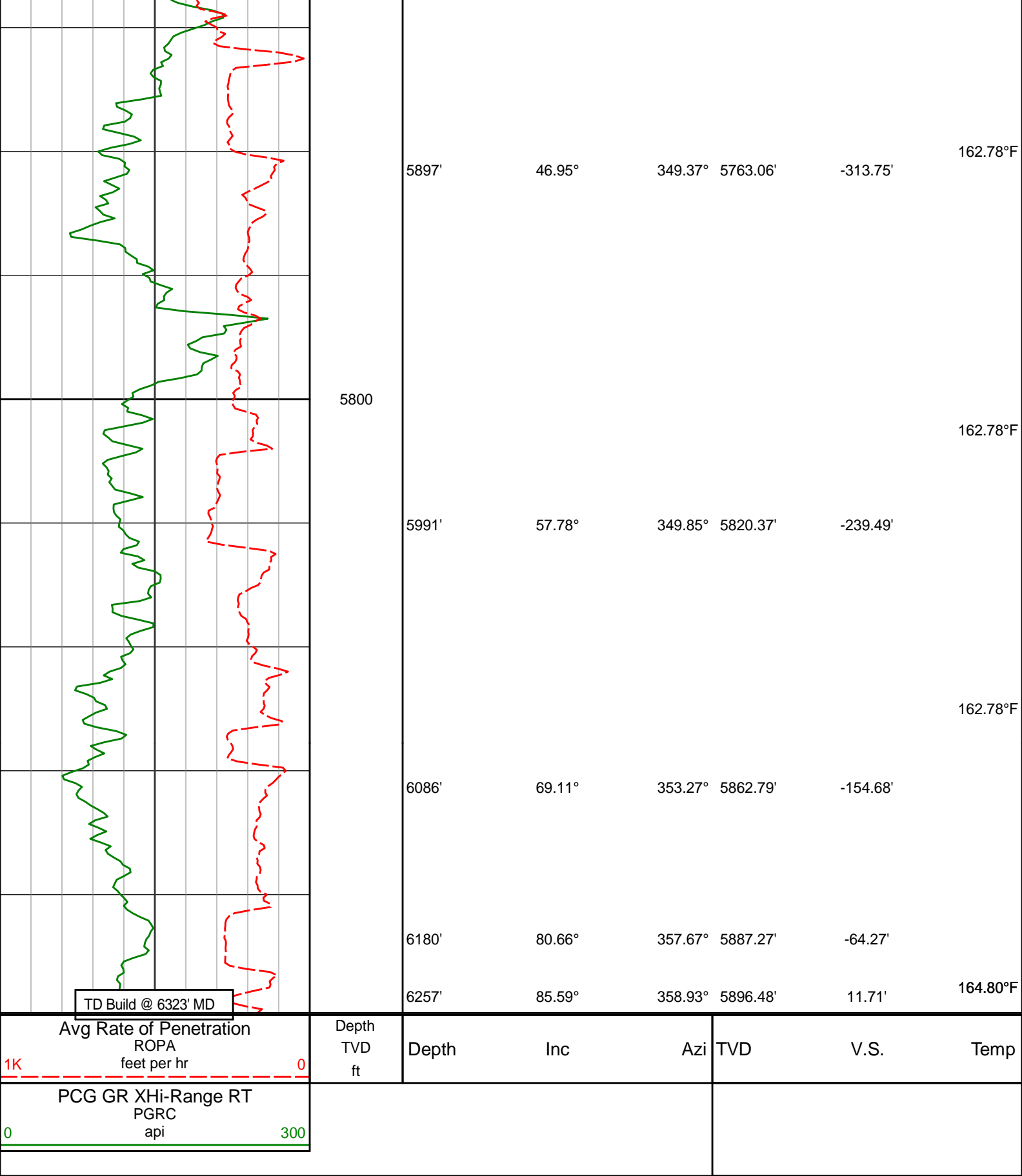
5802'

37.64°

351.02° 5692.86'

-377.56'

154.34°F



**HALLIBURTON**

**DIRECTIONAL SURVEY REPORT**

Noble Energy  
Greyson LD28-773

0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
92.52	0.15	115.55	92.52	0.05 S	0.11 E	-0.07	0.16
183.20	0.39	126.86	183.20	0.29 S	0.46 E	-0.35	0.27
273.88	0.73	107.57	273.87	0.65 S	1.26 E	-0.81	0.42
364.56	0.69	118.77	364.55	1.08 S	2.29 E	-1.39	0.16
455.24	0.78	140.28	455.22	1.82 S	3.16 E	-2.24	0.32
545.92	0.42	132.34	545.90	2.52 S	3.80 E	-3.01	0.41
636.60	0.41	118.93	636.57	2.90 S	4.33 E	-3.46	0.11
727.28	0.41	173.41	727.25	3.38 S	4.65 E	-3.98	0.42
817.96	0.31	191.22	817.93	3.94 S	4.64 E	-4.54	0.17
908.64	0.24	272.40	908.61	4.18 S	4.40 E	-4.74	0.40
999.32	0.13	275.87	999.29	4.16 S	4.10 E	-4.68	0.13
1090.00	0.06	327.35	1089.97	4.11 S	3.98 E	-4.61	0.12
1109.00	0.22	38.11	1108.97	4.07 S	3.99 E	-4.58	1.11
1202.00	0.26	259.77	1201.97	3.97 S	3.89 E	-4.46	0.49
1386.00	4.03	217.65	1385.81	9.16 S	0.48 W	-9.01	2.09
1479.00	5.23	207.12	1478.50	15.53 S	4.41 W	-14.78	1.58
1572.00	6.83	200.67	1570.99	24.47 S	8.29 W	-23.11	1.87
1666.00	8.16	195.46	1664.18	36.13 S	12.04 W	-34.15	1.59
1758.00	9.03	198.46	1755.15	49.27 S	16.07 W	-46.61	1.06
1850.00	10.97	201.57	1845.75	64.26 S	21.57 W	-60.71	2.20
1943.00	11.80	200.49	1936.92	81.40 S	28.15 W	-76.79	0.91
2034.00	12.98	204.67	2025.80	99.41 S	35.68 W	-93.59	1.63
2126.00	13.38	207.41	2115.38	118.24 S	44.89 W	-110.99	0.81
2218.00	13.22	205.32	2204.91	137.20 S	54.29 W	-128.49	0.55
2310.00	13.27	212.75	2294.47	155.59 S	64.50 W	-145.31	1.85
2404.00	12.64	211.92	2386.08	173.39 S	75.77 W	-161.40	0.69
2497.00	12.12	211.78	2476.91	190.33 S	86.29 W	-176.74	0.57
2590.00	13.65	216.26	2567.57	207.47 S	97.92 W	-192.13	1.96
2682.00	13.84	216.09	2656.94	225.12 S	110.83 W	-207.85	0.22
2776.00	13.41	214.90	2748.29	243.15 S	123.69 W	-223.95	0.55
2869.00	12.55	213.30	2838.91	260.44 S	135.40 W	-239.47	1.01
2964.00	11.33	206.69	2931.86	277.40 S	145.26 W	-254.93	1.92
3058.00	9.01	197.25	3024.38	292.69 S	151.60 W	-269.21	3.03
3153.00	8.96	201.73	3118.22	306.67 S	156.55 W	-282.39	0.74
3248.00	10.91	203.85	3211.79	321.78 S	162.92 W	-296.47	2.09
3342.00	14.26	206.58	3303.52	340.28 S	171.70 W	-313.60	3.62
3437.00	15.16	205.42	3395.40	361.96 S	182.27 W	-333.64	1.00
3532.00	16.92	208.66	3486.70	385.32 S	194.24 W	-355.14	2.08
3626.00	17.73	208.22	3576.43	409.94 S	207.56 W	-377.70	0.87
3721.00	17.41	207.81	3667.00	435.25 S	221.03 W	-400.94	0.36
3815.00	15.95	215.63	3757.06	458.19 S	235.11 W	-421.73	2.85
3910.00	14.59	229.35	3848.73	476.60 S	251.80 W	-437.68	4.05
4004.00	11.09	231.28	3940.37	489.97 S	267.84 W	-448.74	3.76
4099.00	9.97	231.93	4033.77	500.75 S	281.44 W	-457.56	1.18
4194.00	8.99	232.96	4127.47	510.29 S	293.84 W	-465.31	1.04

**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 352.14 DEGREES (GRID)  
A TOTAL CORRECTION OF 6.97 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6257.00 FEET  
IS 417.13 FEET ALONG 263.75 DEGREES (GRID)**

**Surveys from surface to 1090' MD are flexi-shot surveys.  
Final survey is a straight line projection to TD.**