



WELL INFORMATION					
MWD Run Number	100				
Date run completed	19-Aug-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (MD, ft)	776.00				
Log End Depth (MD, ft)	6,170.00				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	17-Aug-15 19:00				
Drill/Wipe End Date and Time	18-Aug-15 21:31				
Min Inc (deg) @ Depth (MD, ft)	0.03 @ 804.00				
Max Inc (deg) @ Depth (MD, ft)	83.58 @ 6,114.00				
Bit TFA(in2) / Bit Type	0.98 / PDC				
Flow Rate (gpm)	578.47				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Native/Spud Mud				
Density (ppg) / Viscosity (spqt)	9.85 / 43.00				
Filtrate CL (ppm)	2,200.00				
pH / Fluid Loss (mptm)	9.50 / 9				
PV (cP) / YP (lhf2)	11 / 11.00				
% Solids / % Sand	11.50 / 0.25				
% 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	128.00 / PDC				

Max Tool Temp (degF) / Source	162.80 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Matt Busche				
Customer Representative	Jeremy Stolz				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	11341339				
Insert Serial Number	11400992				
Date and Time Initialized	16-Aug-15 18:21				
Date and Time Read	19-Aug-15 03:50				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	56.00				
Software Version	6.21				
Sub Serial Number	11341339				
Sonde Serial Number	11297516				
Sensor ID Number	N/A				
Toolface Offset (deg)	316.90				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	48.84				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11341339				
Insert/Sonde Serial Number	12037420				

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. All data presented is recorded data unless otherwise specified.
4. 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

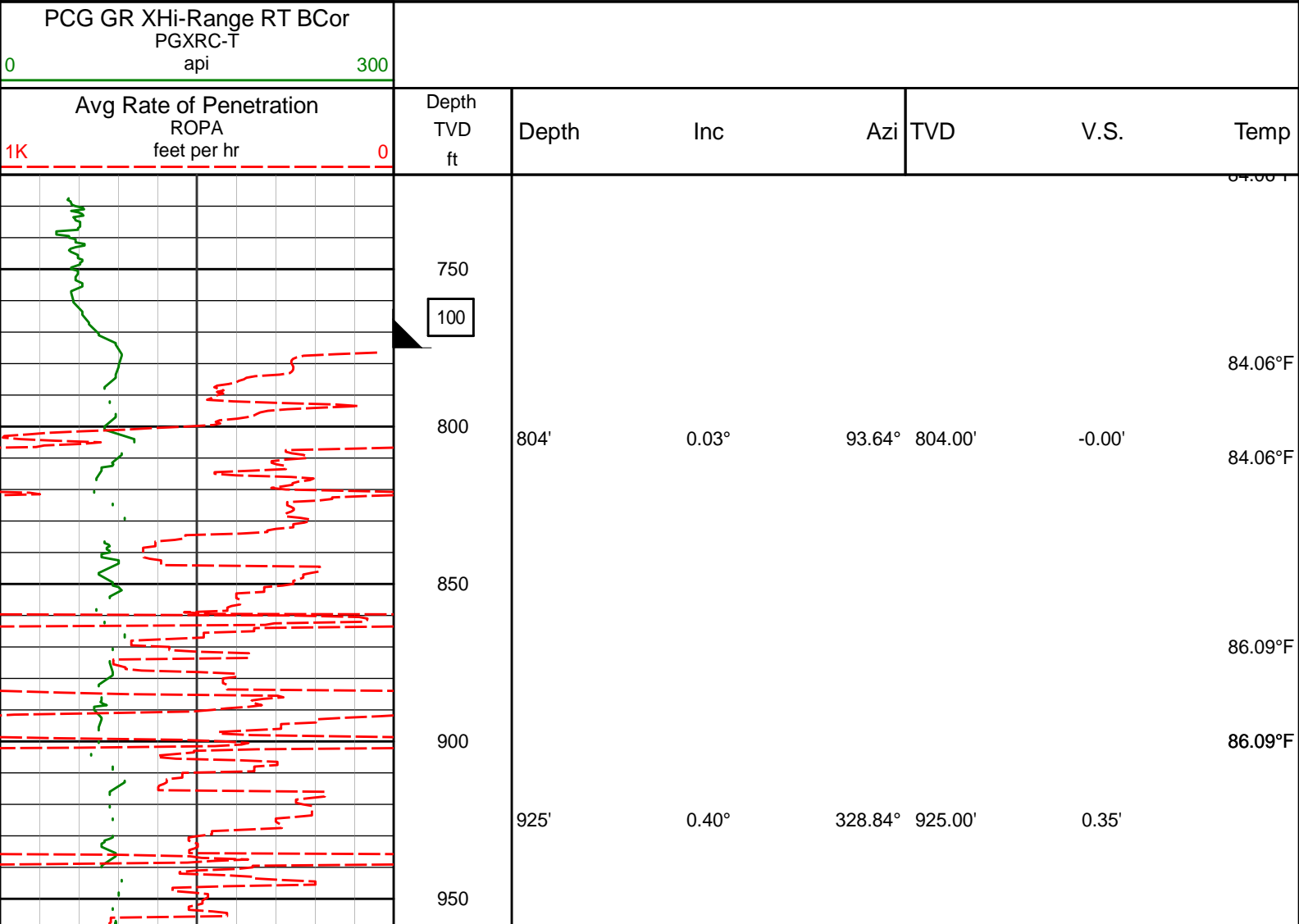
1:240 Log
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft

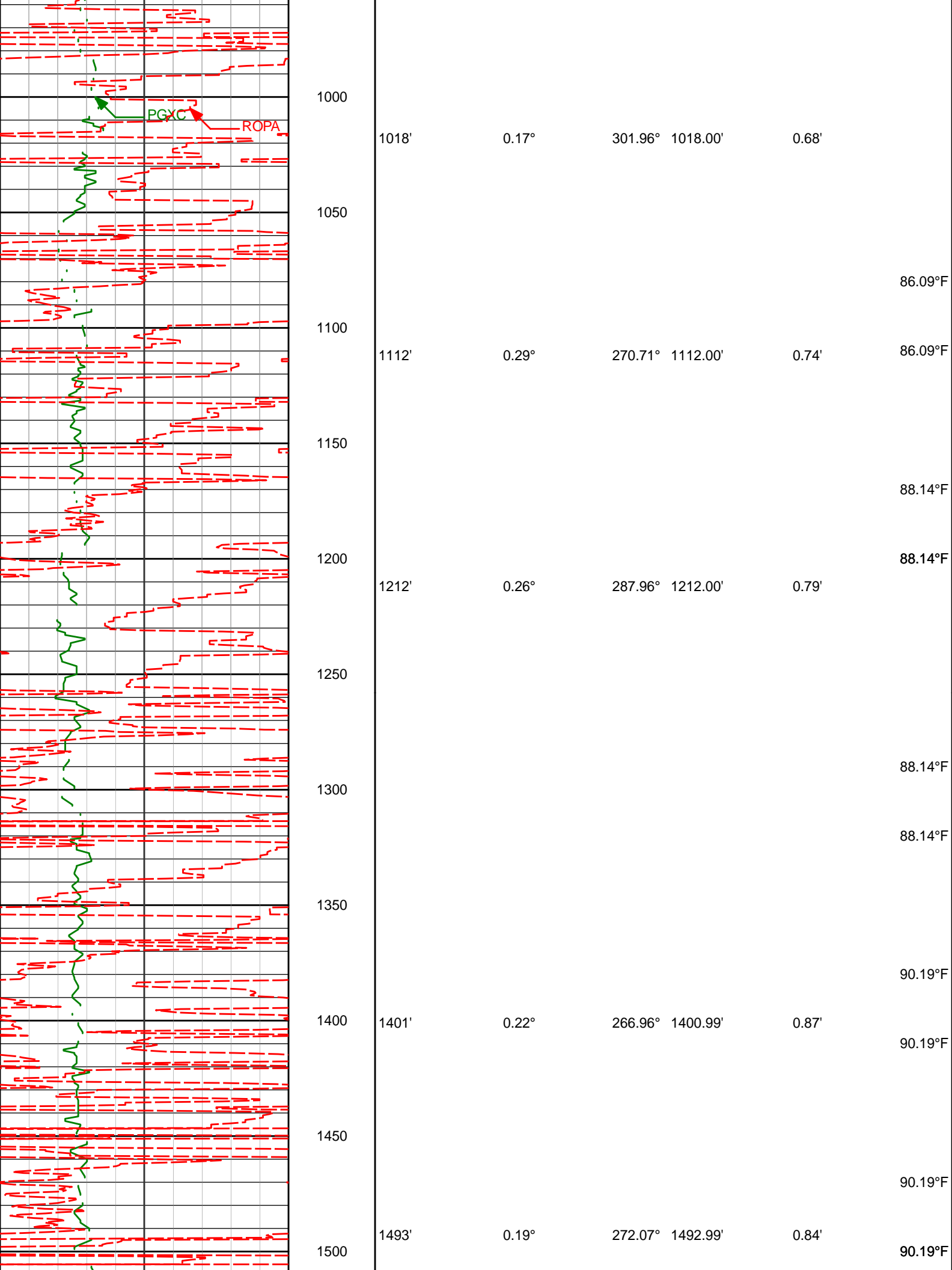
ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft

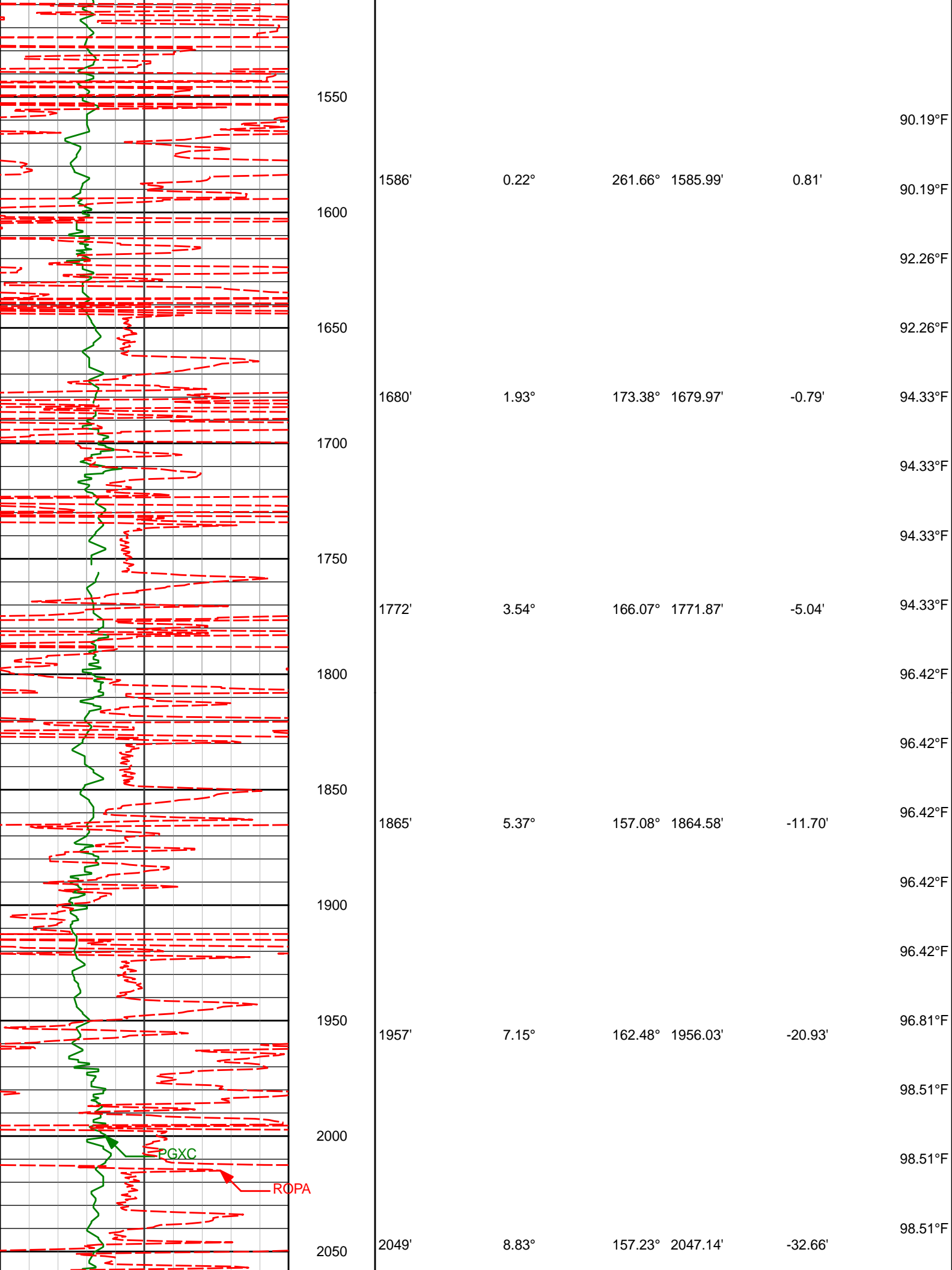
WARRANTY

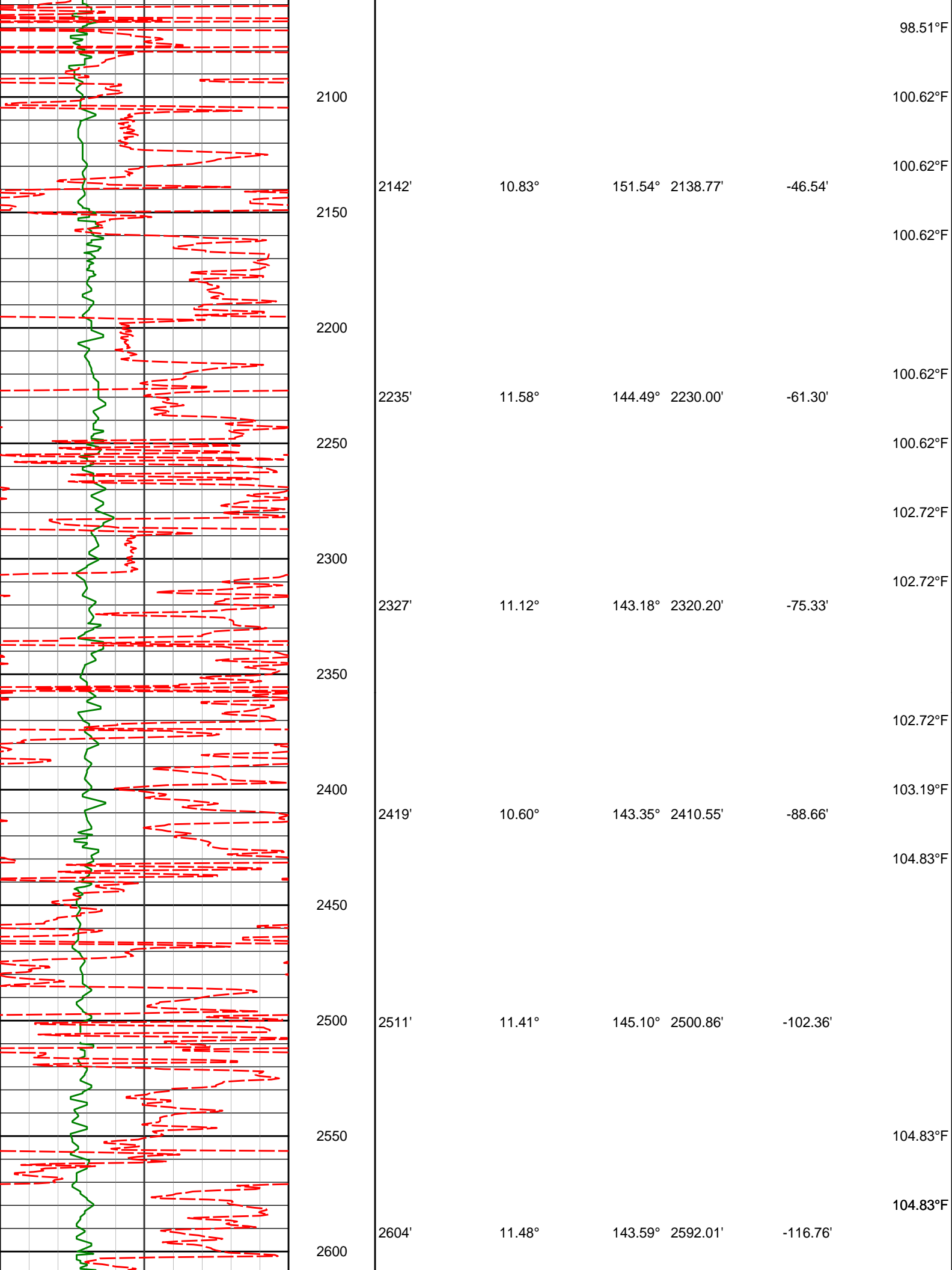
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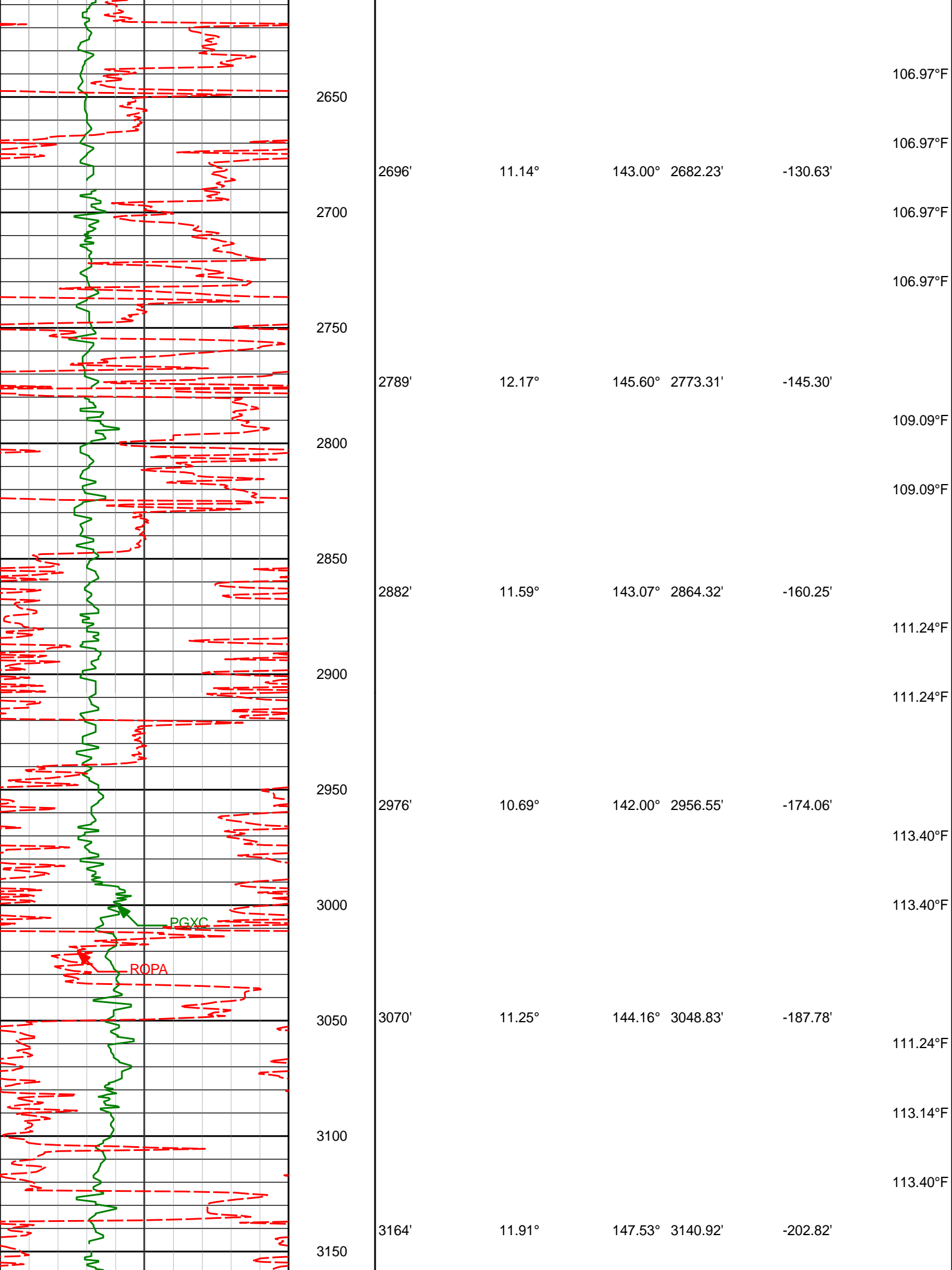
TVD Detail 1:600 Scale

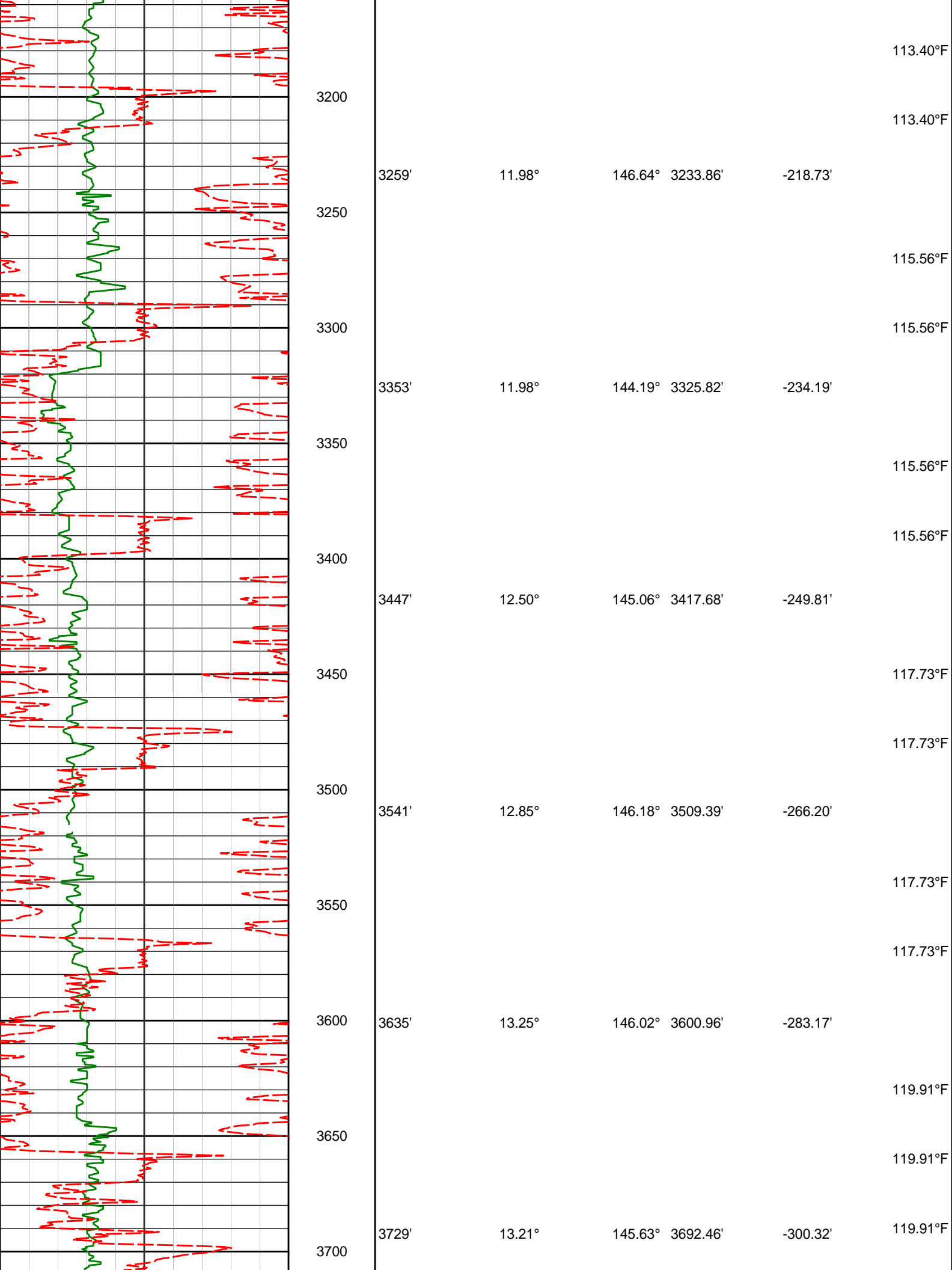


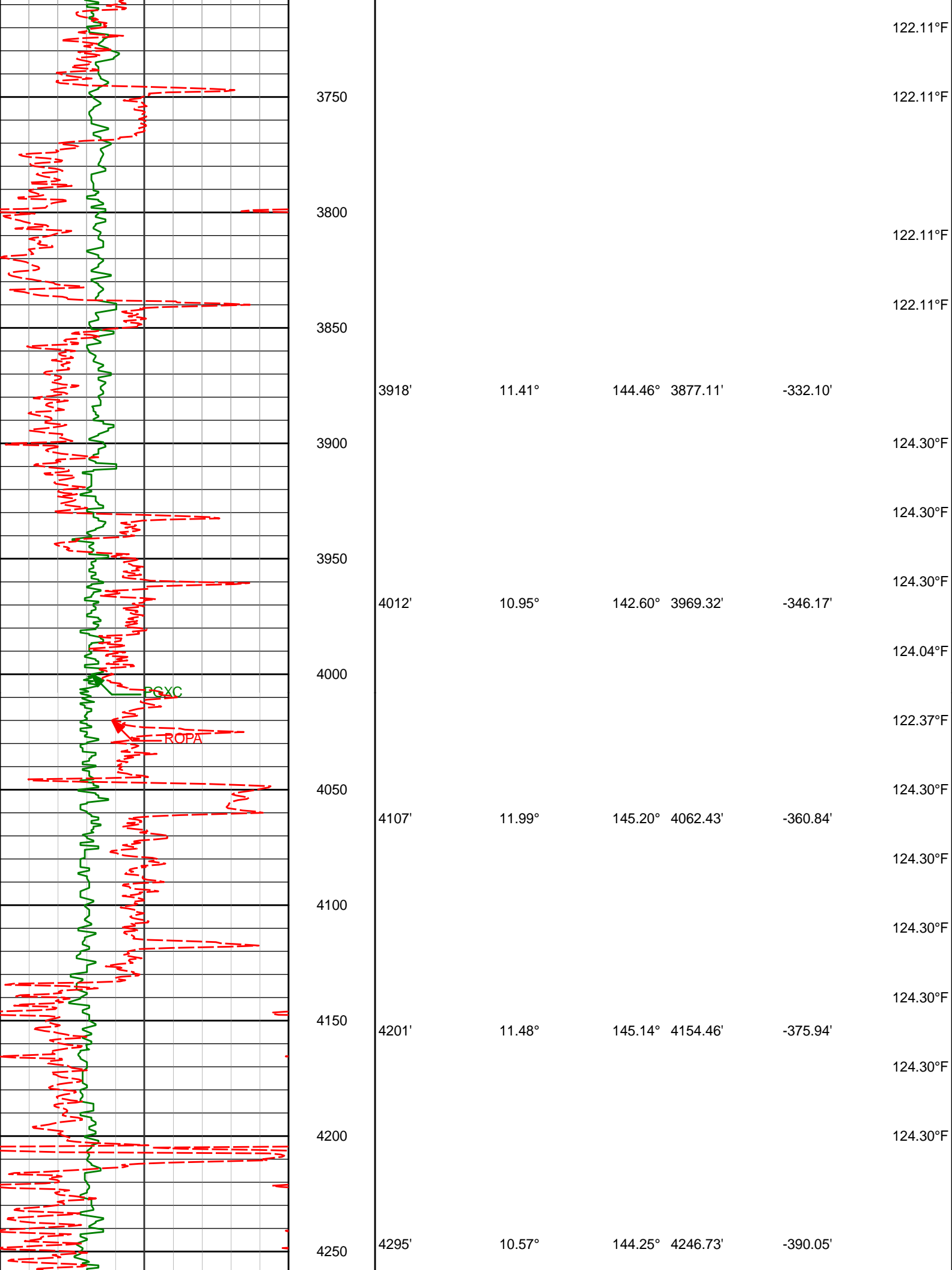


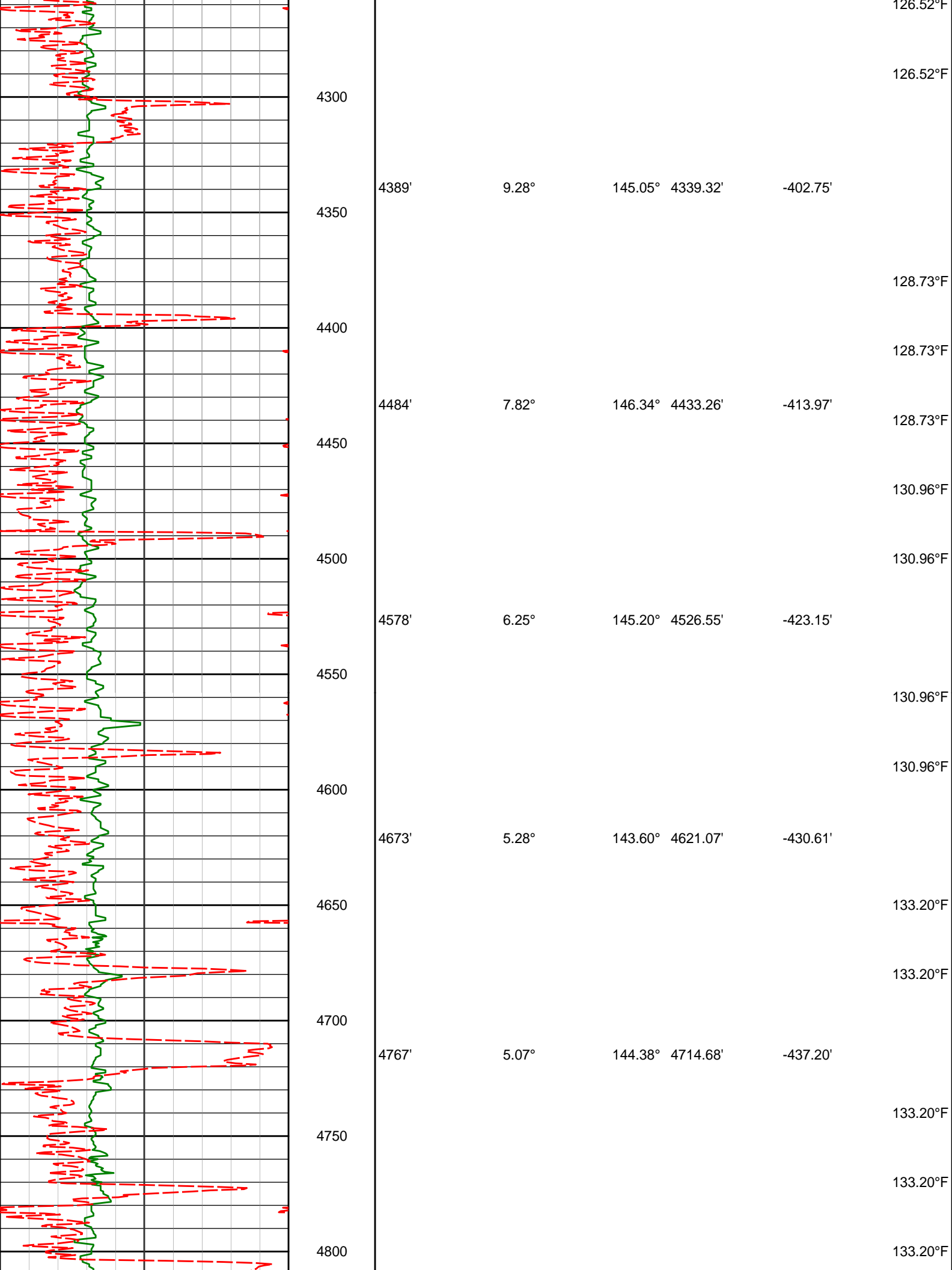












126.52°F

126.52°F

128.73°F

128.73°F

128.73°F

130.96°F

130.96°F

-423.15'

130.96°F

130.96°F

-430.61'

133.20°F

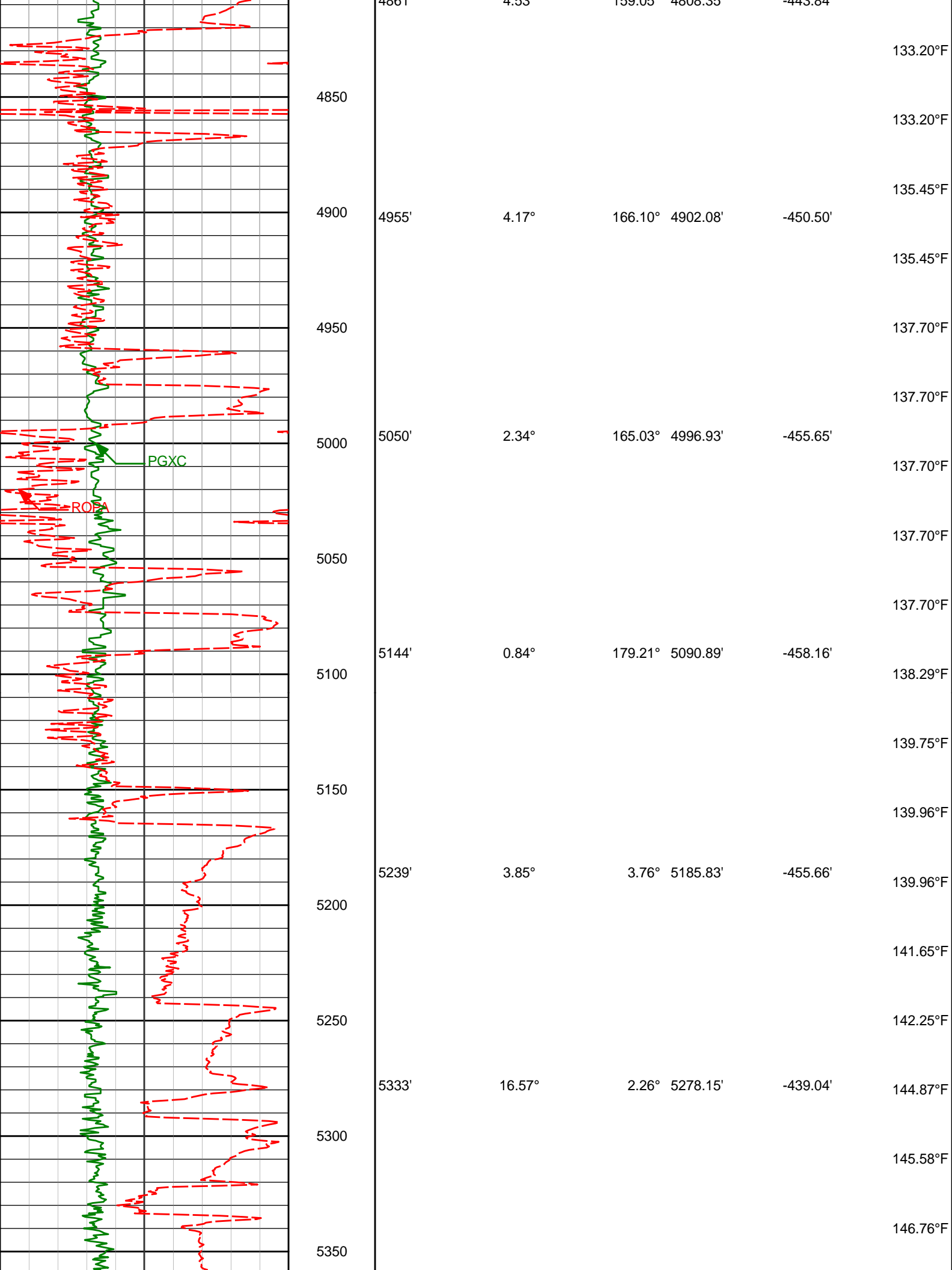
133.20°F

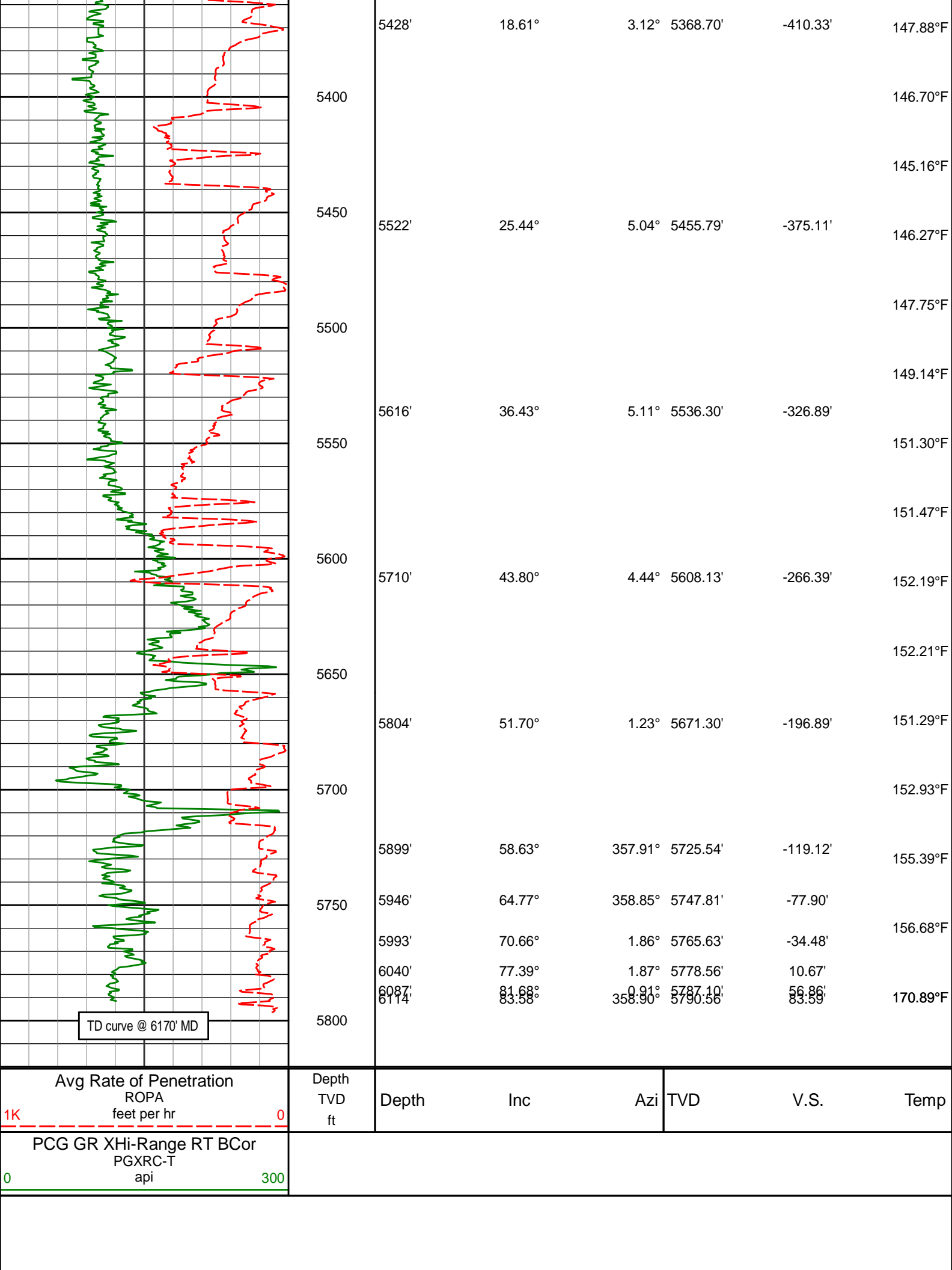
-437.20'

133.20°F

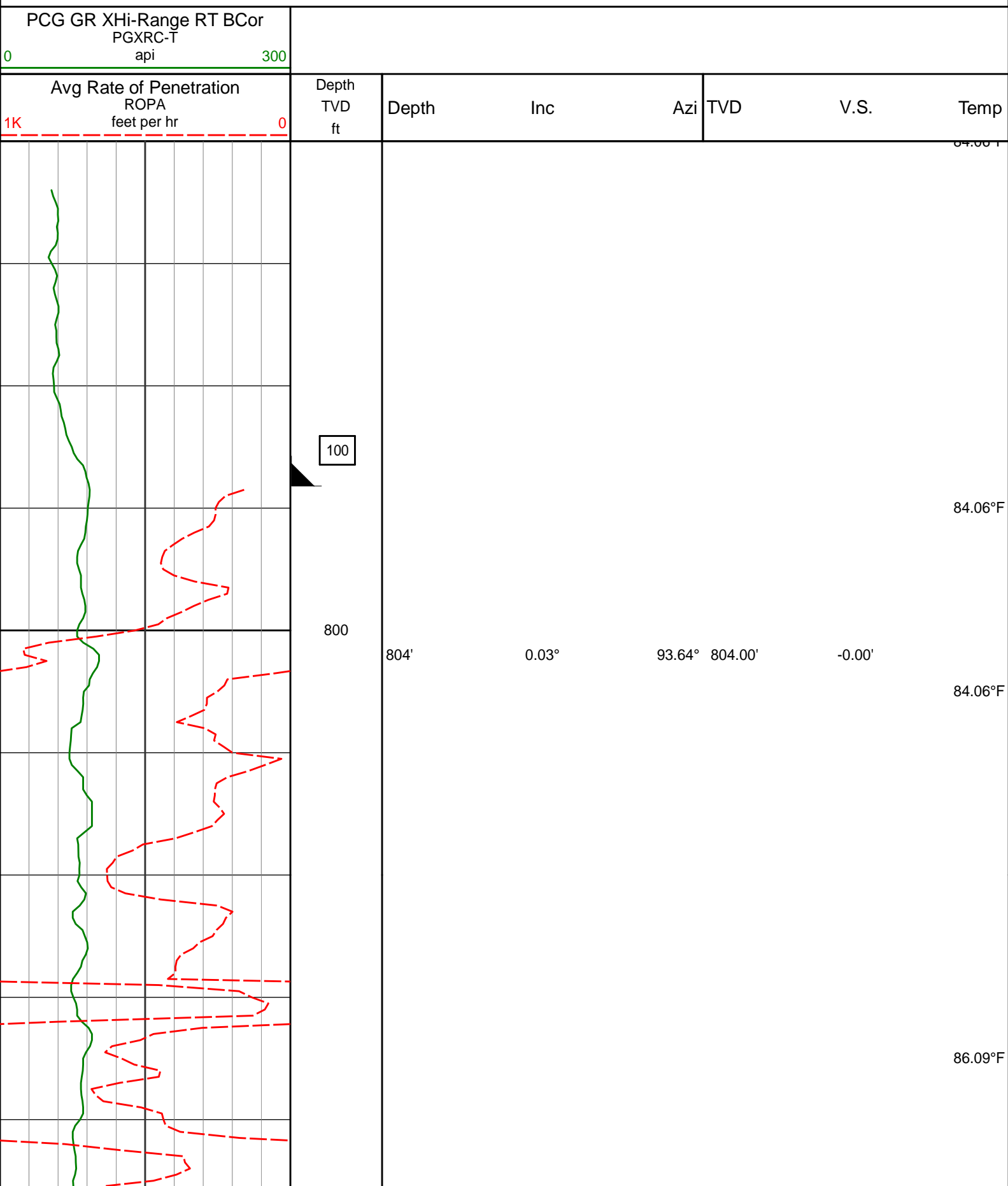
133.20°F

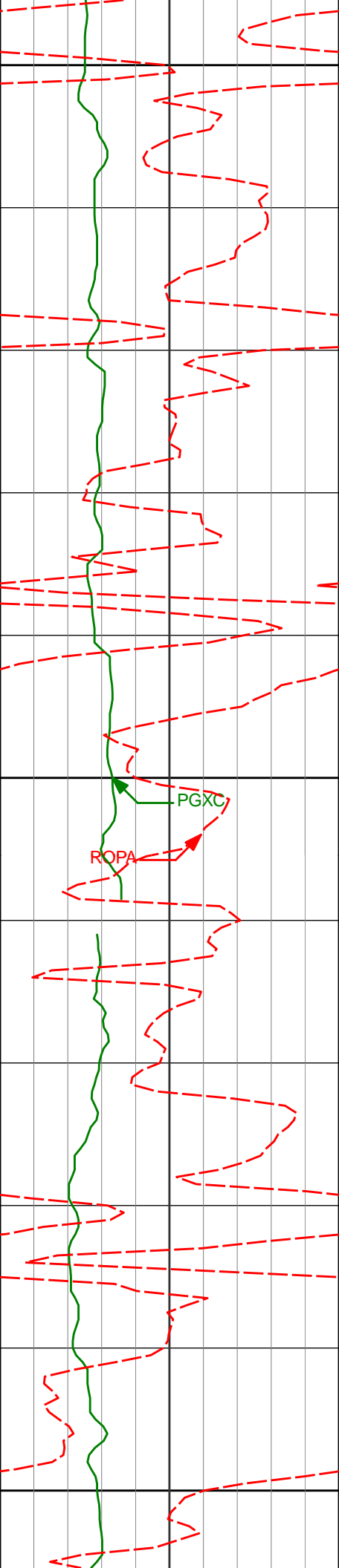
133.20°F





TVD Detail 1:240 Scale

PCG GR XHi-Range RT BCor PGXRC-T api						
Avg Rate of Penetration ROPA feet per hr						Depth TVD ft
						Inc
						Azi
						TVD
						V.S.
						Temp
						804'
						0.03°
						93.64°
						804.00'
						-0.00'
						84.06°F
						84.06°F
						86.09°F



900

925'

0.40°

328.84° 925.00'

0.35'

1000

PGXC

ROPA

1018'

0.17°

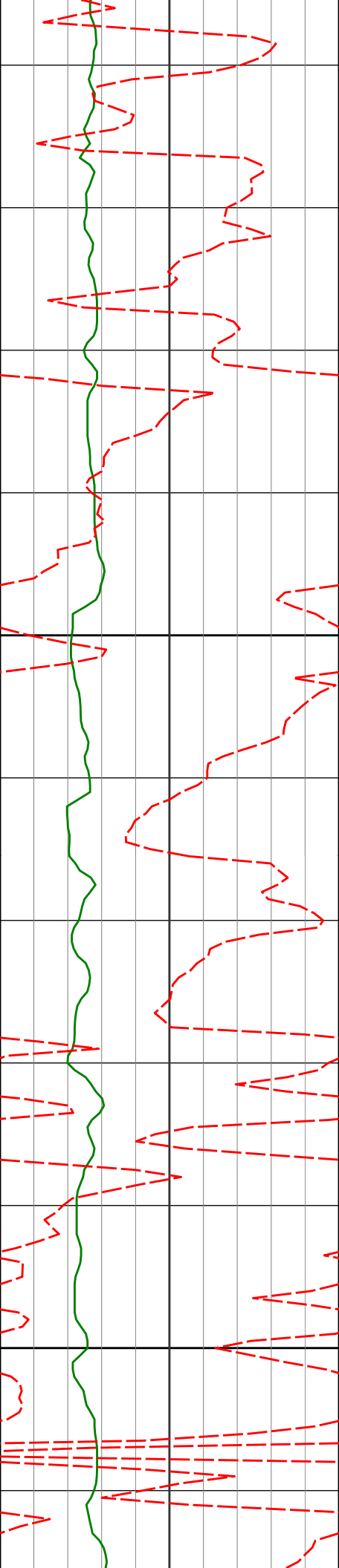
301.96° 1018.00'

0.68'

1100

86.09°F

86.09°F



1200

1300

1112'

1212'

0.29°

0.26°

270.71°

287.96°

1112.00'

1212.00'

0.74'

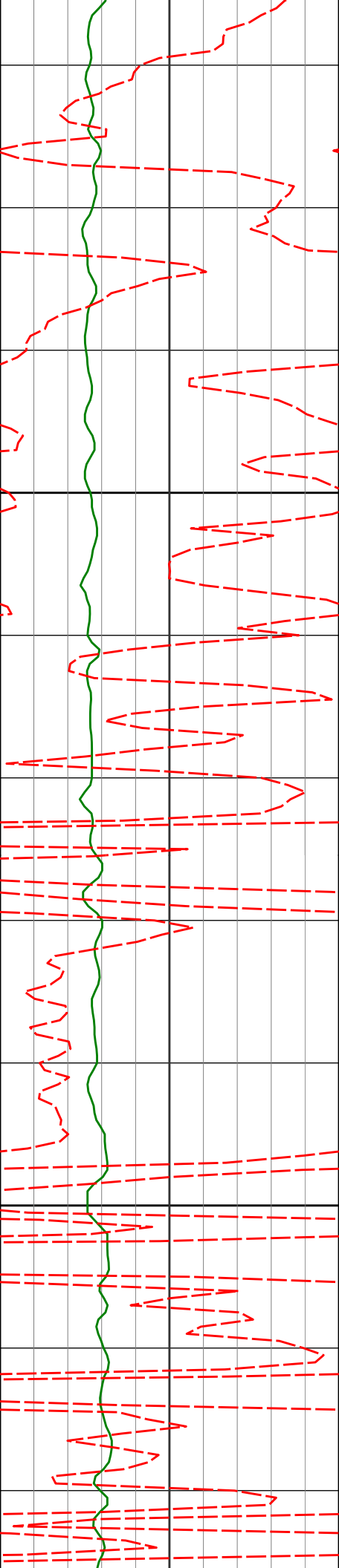
0.79'

88.14°F

88.14°F

88.14°F

88.14°F



1400

1401'

0.22°

266.96° 1400.99'

0.87'

90.19°F

90.19°F

90.19°F

1500

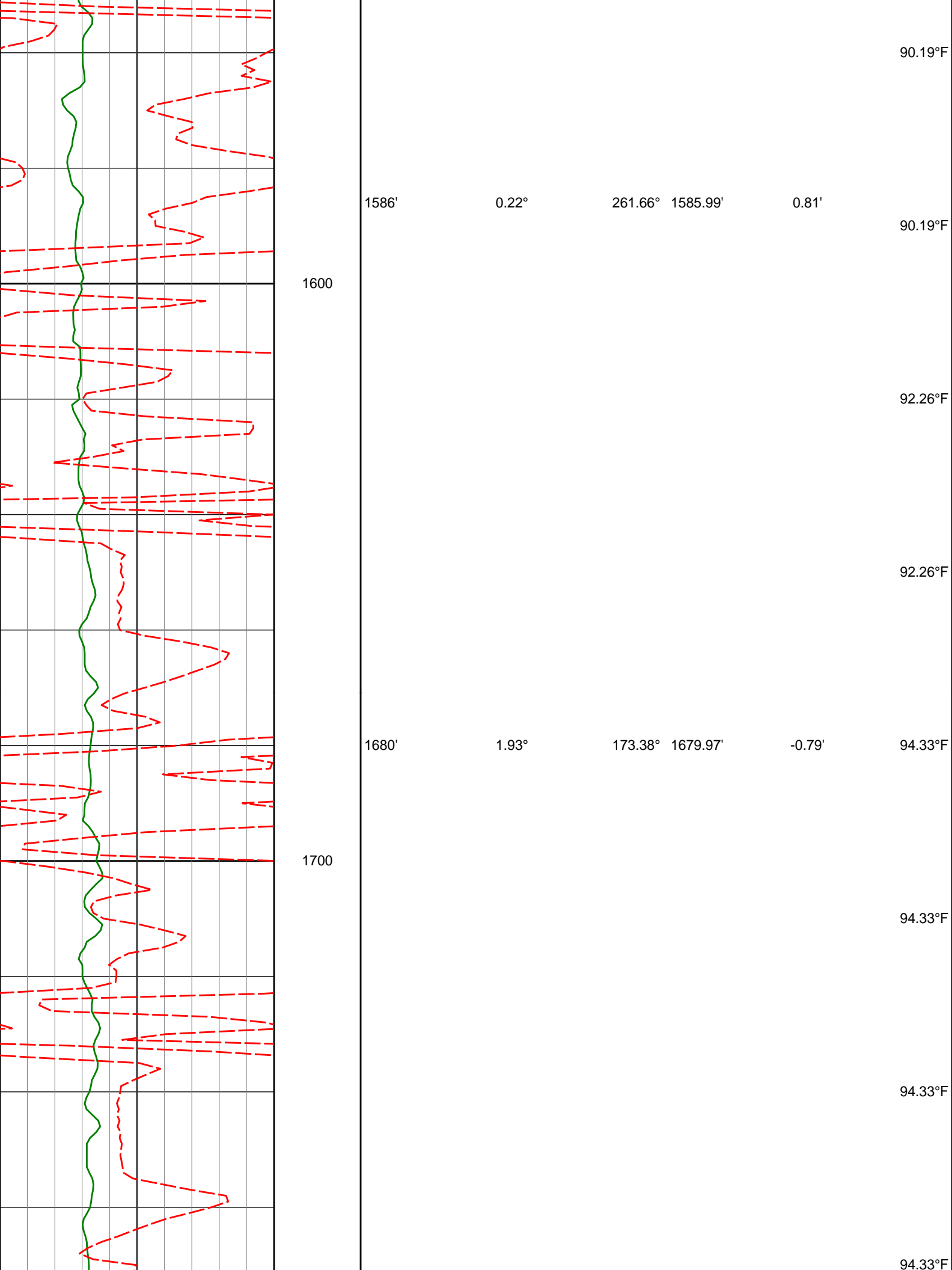
1493'

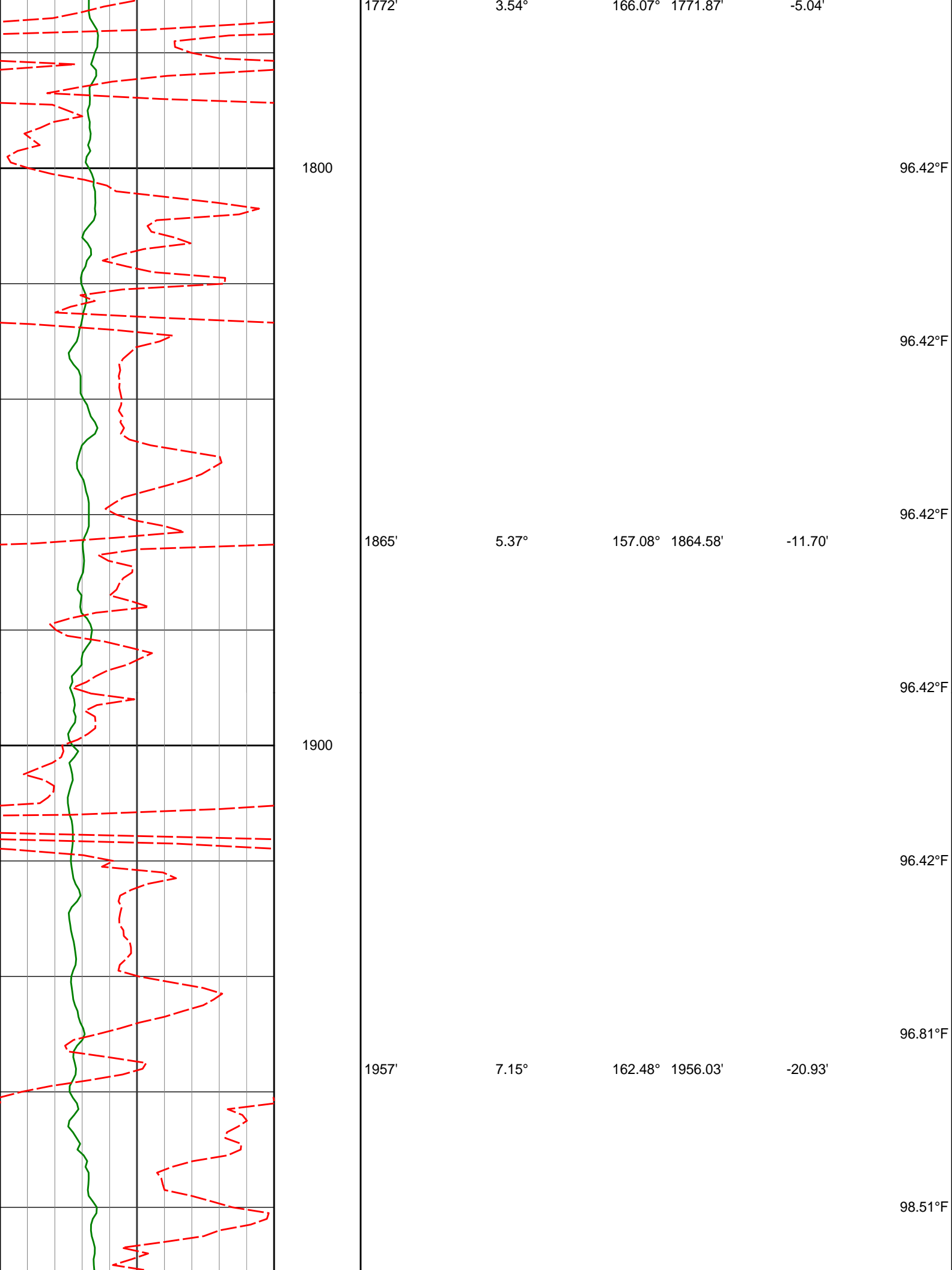
0.19°

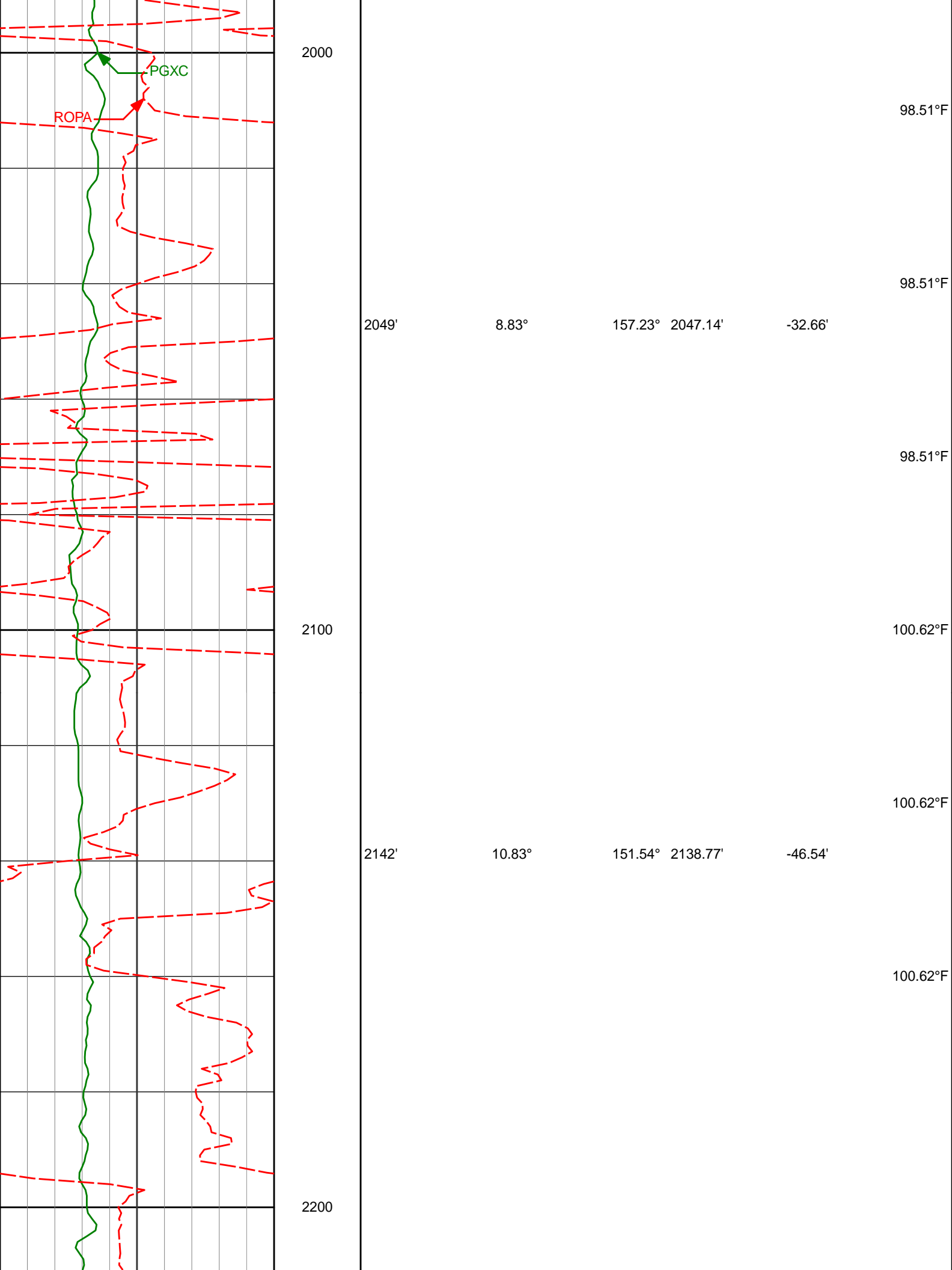
272.07° 1492.99'

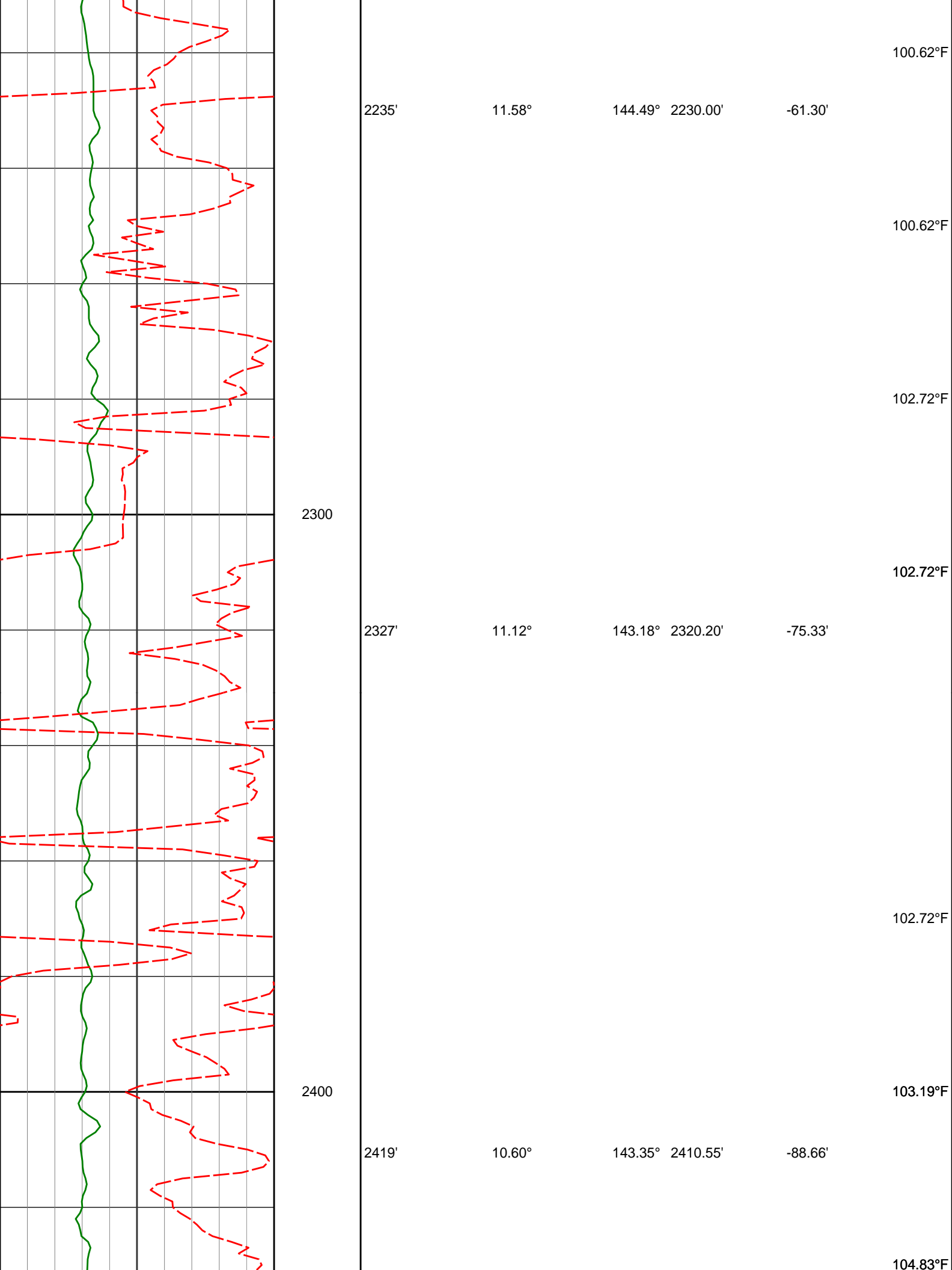
0.84'

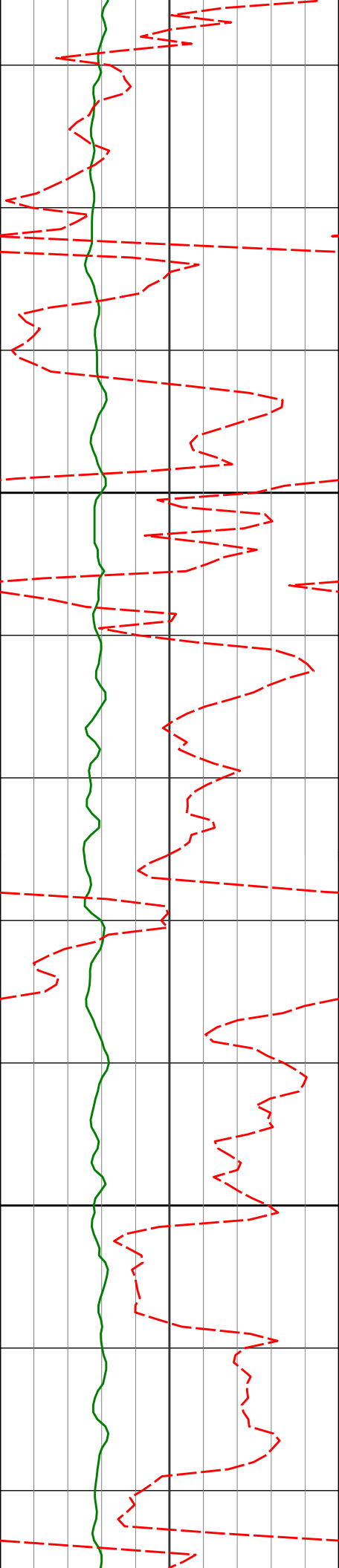
90.19°F











2500

2511'

11.41°

145.10° 2500.86'

-102.36'

104.83°F

104.83°F

2604'

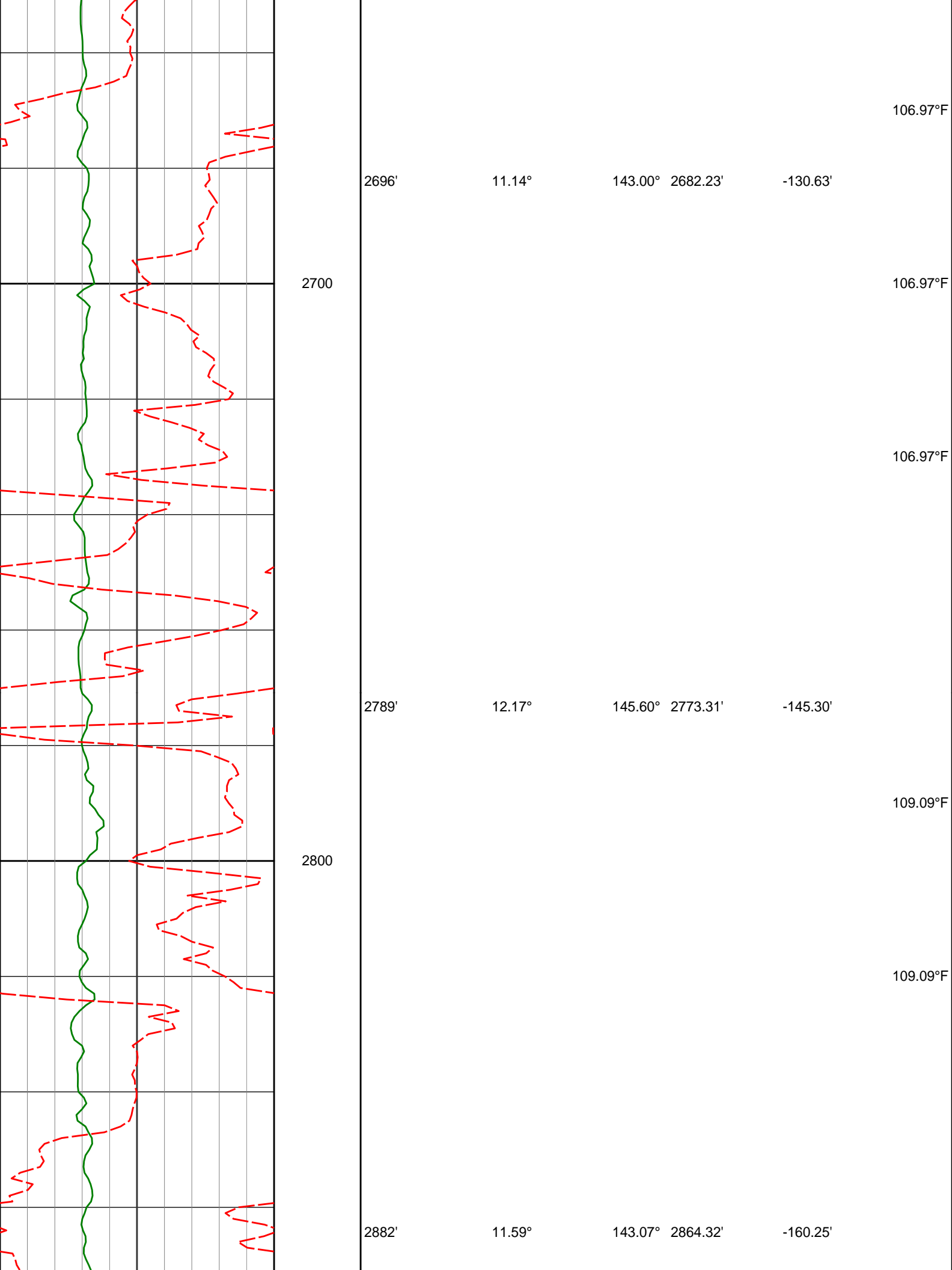
11.48°

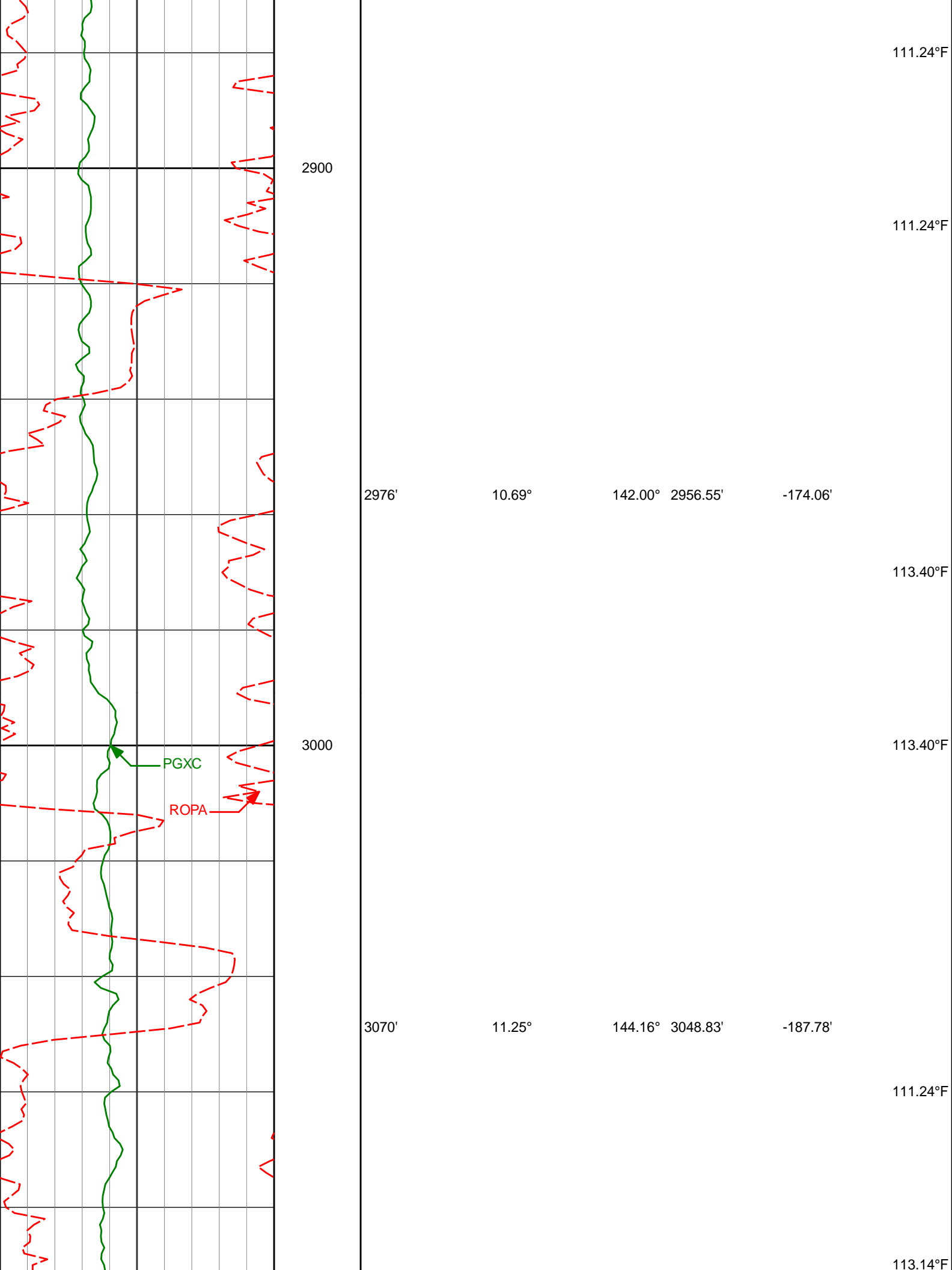
143.59° 2592.01'

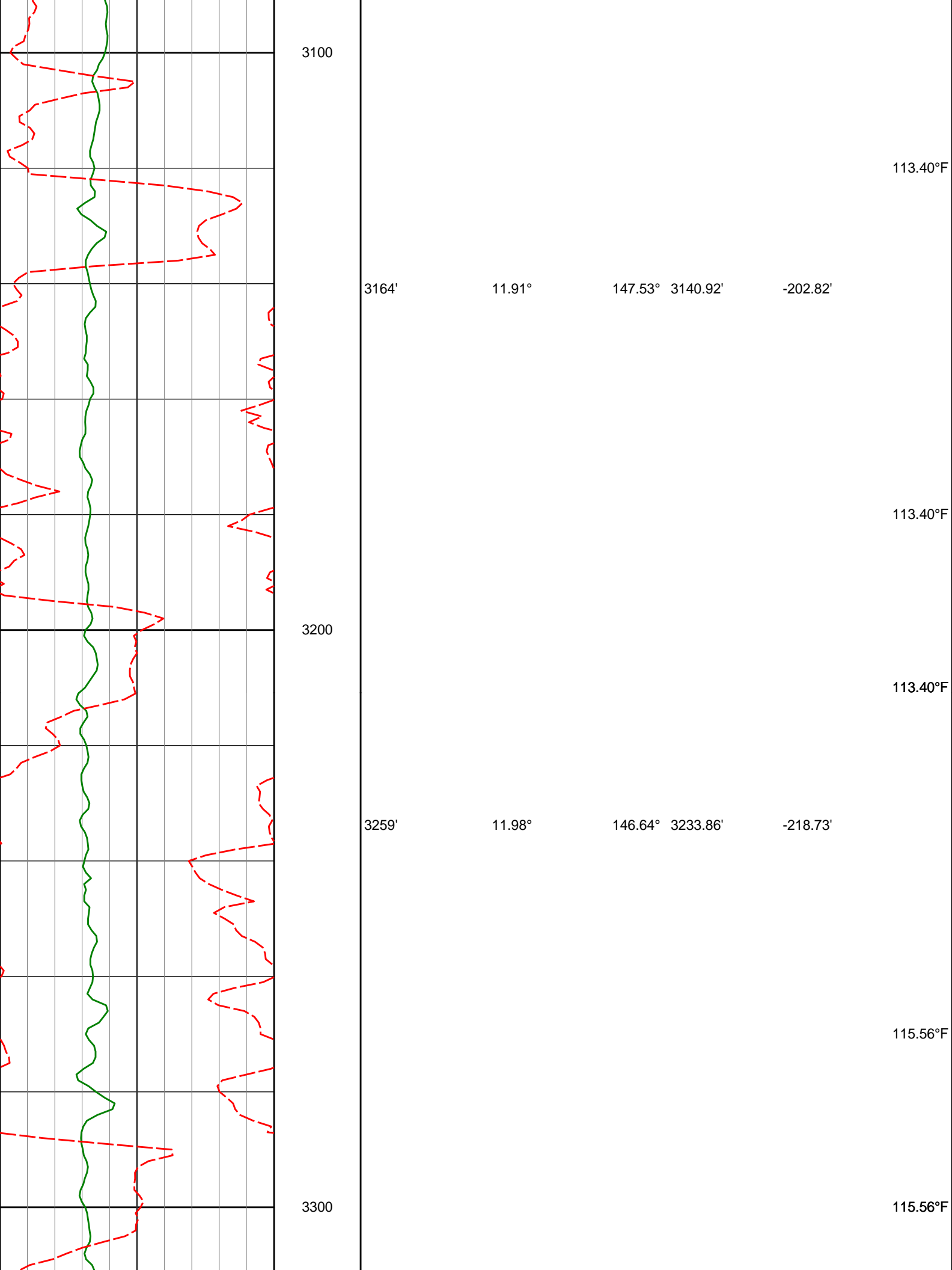
-116.76'

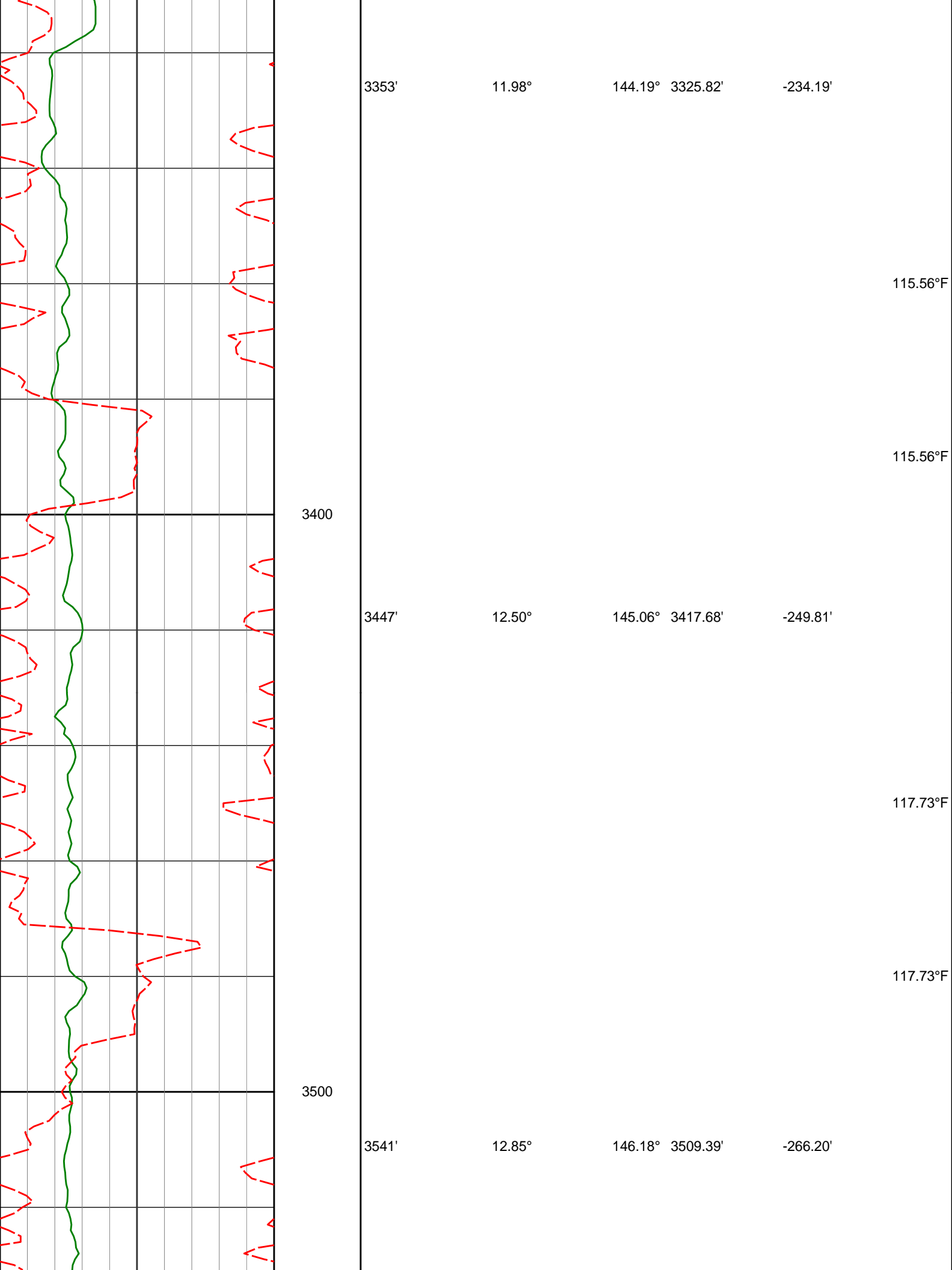
2600

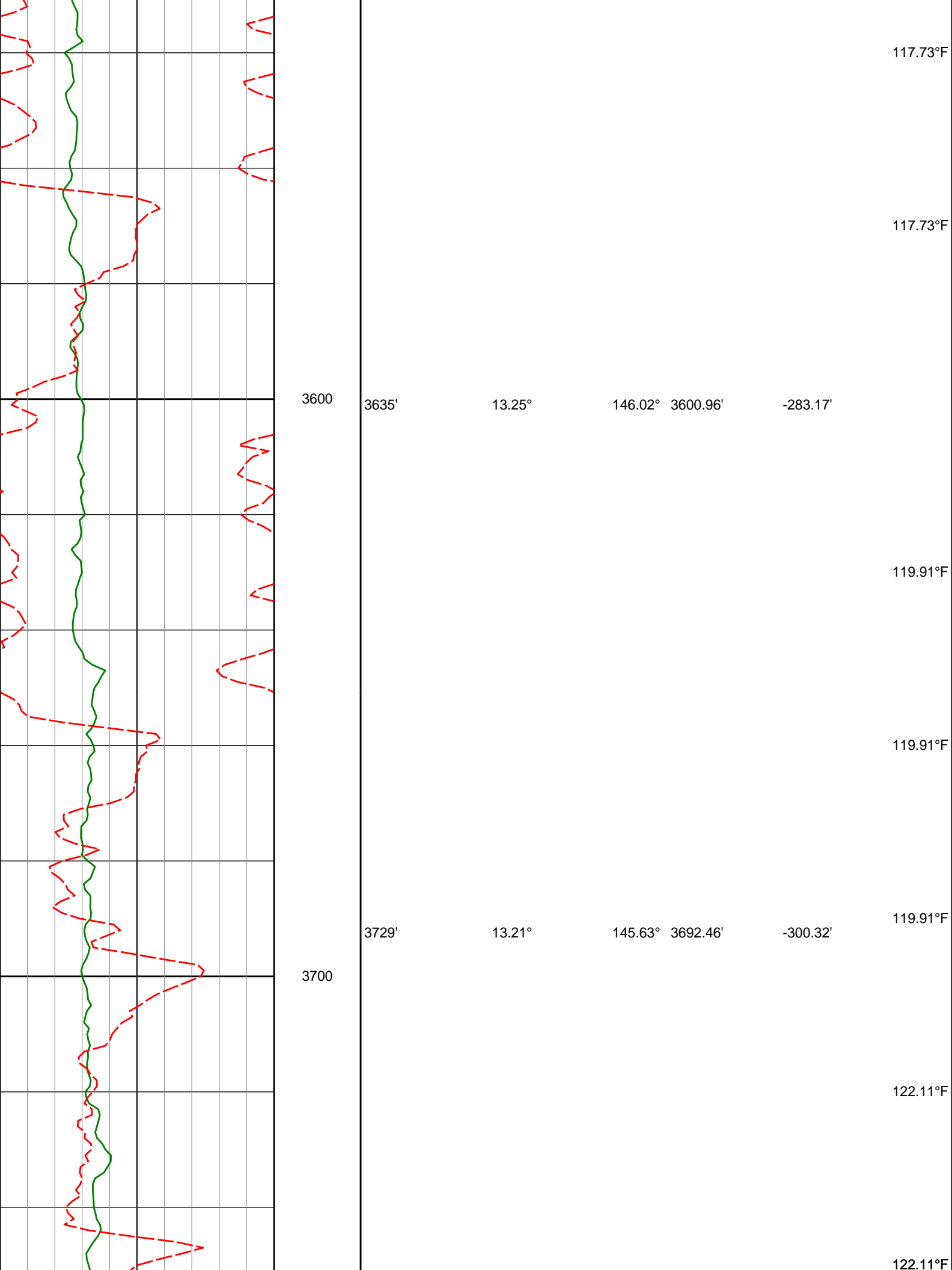
106.97°F

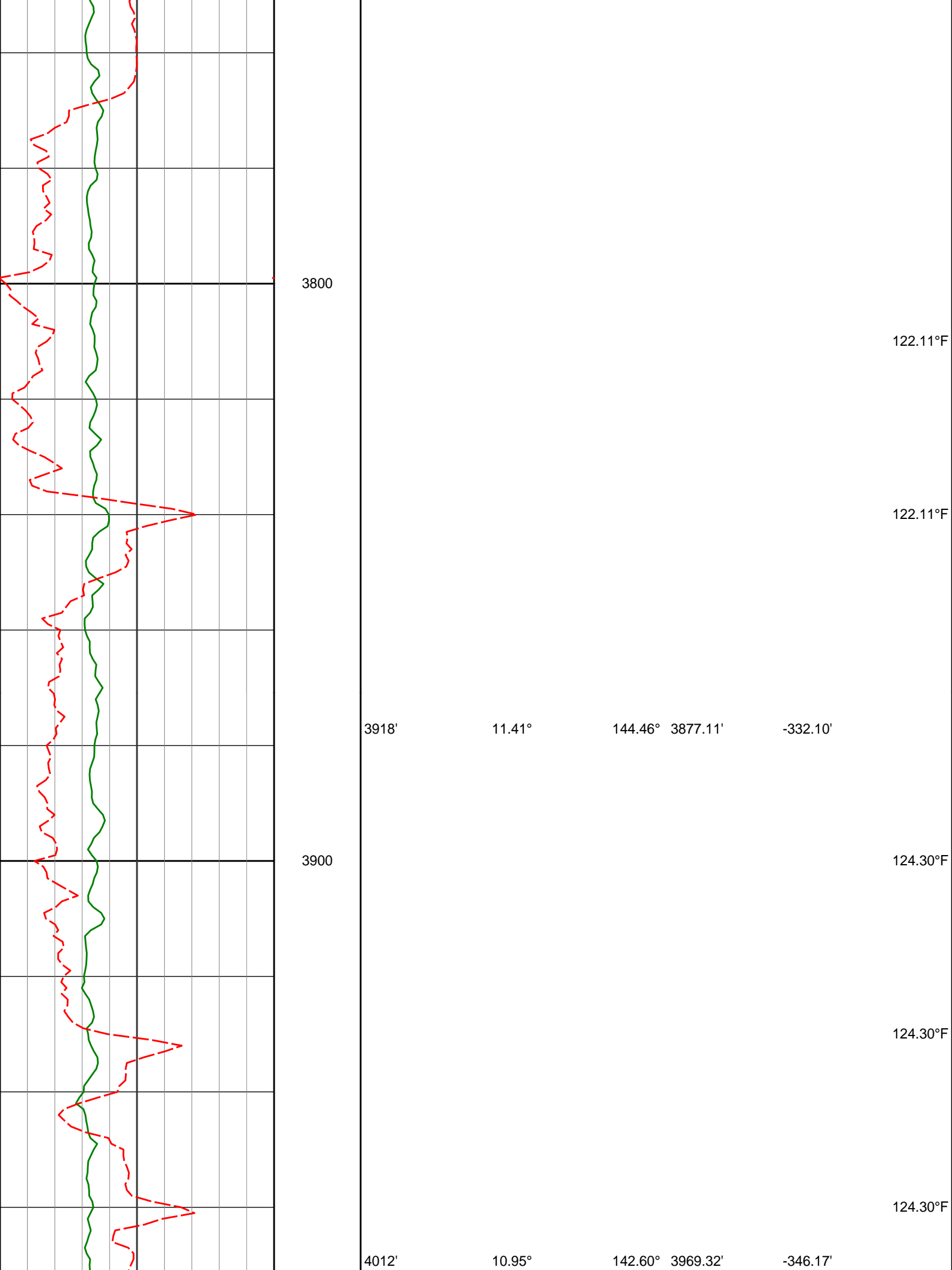


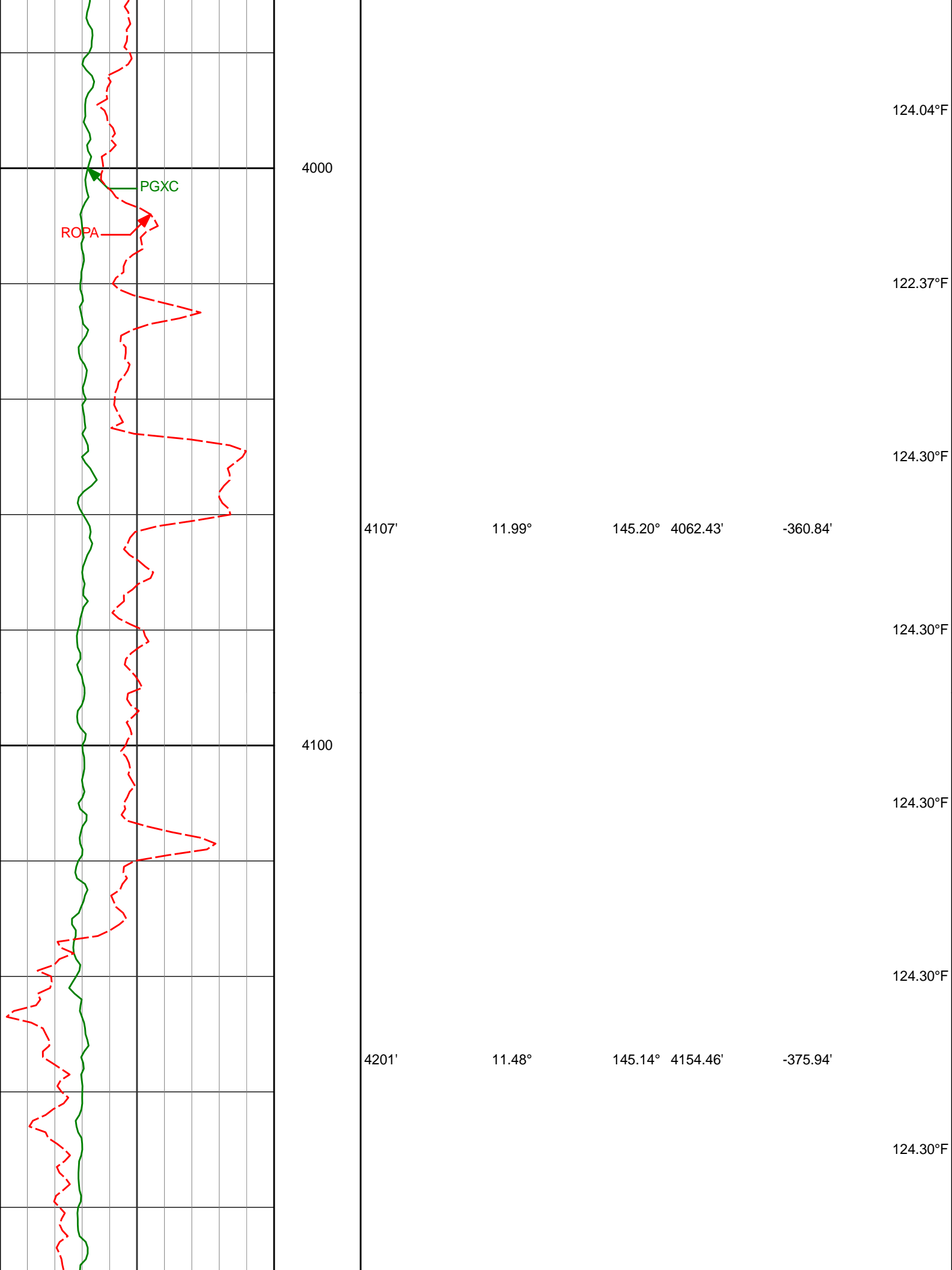


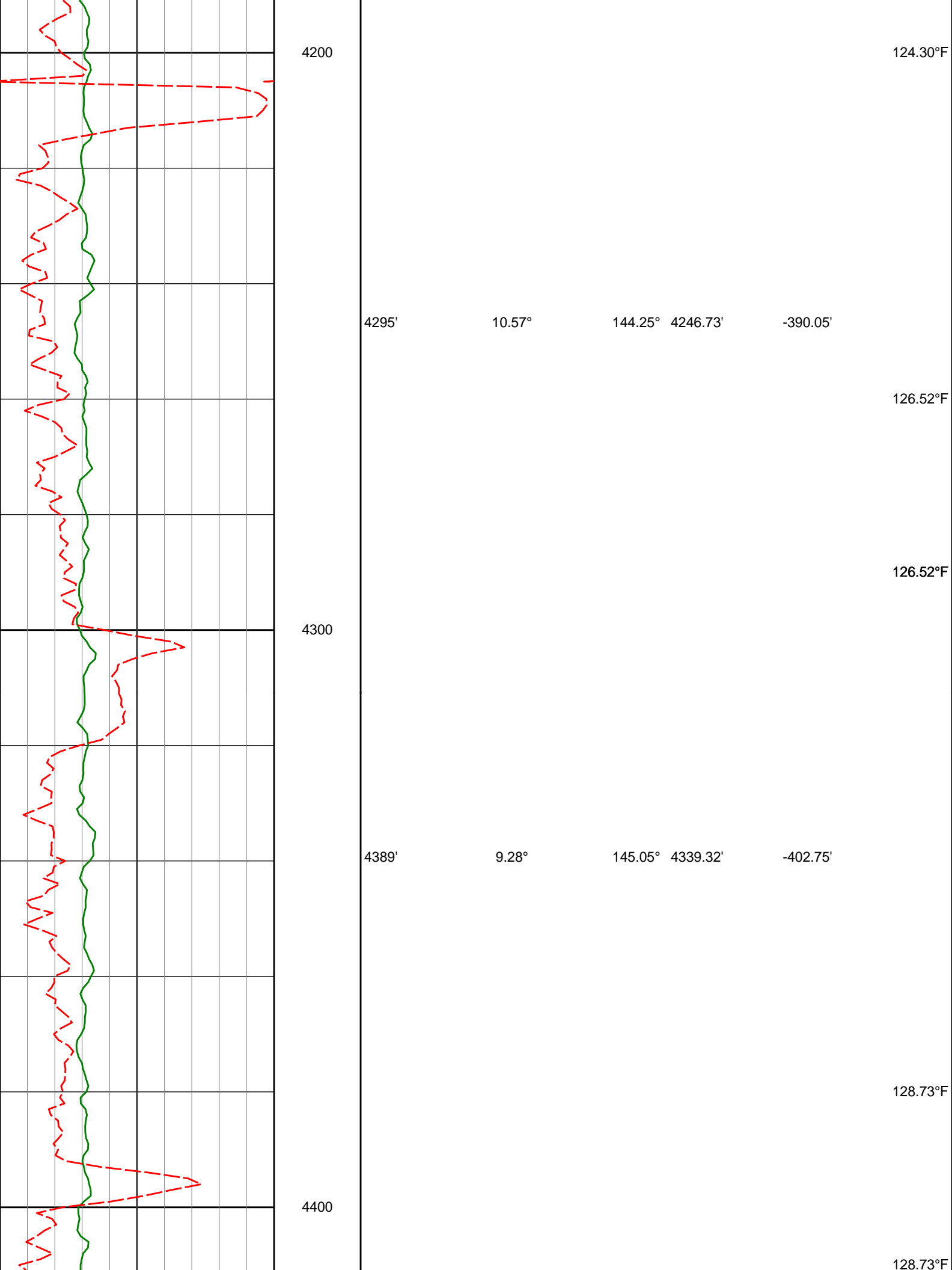


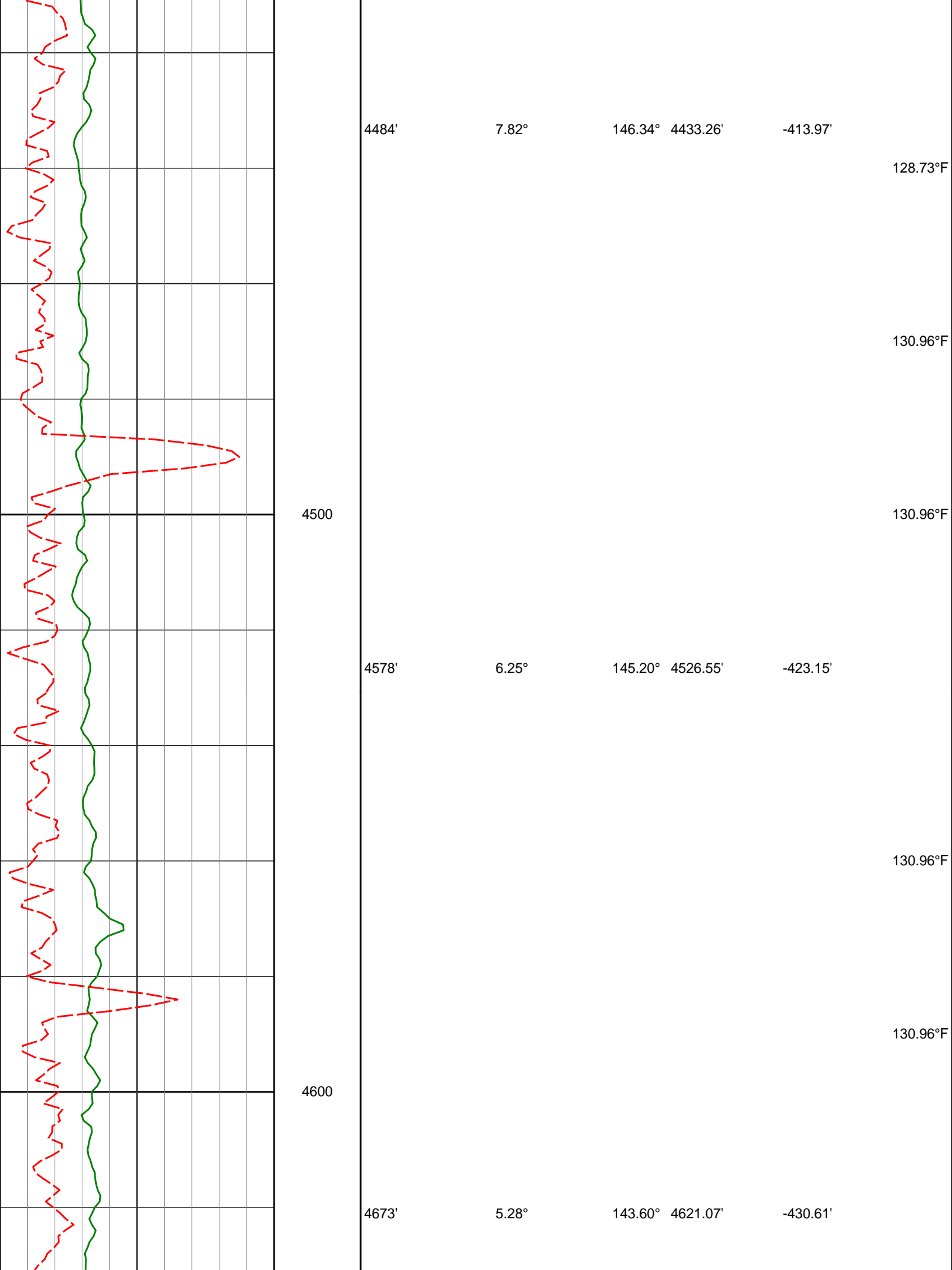


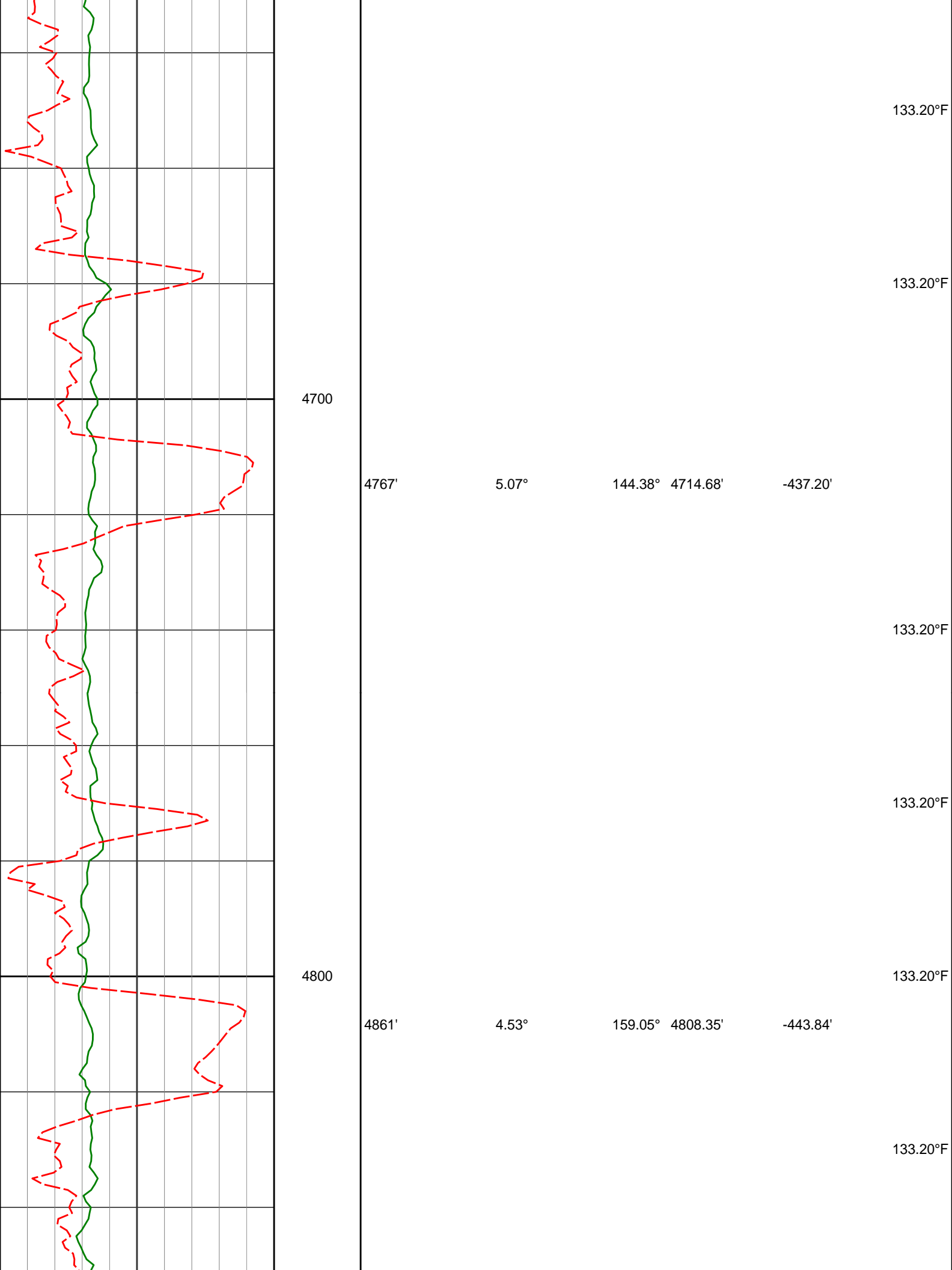


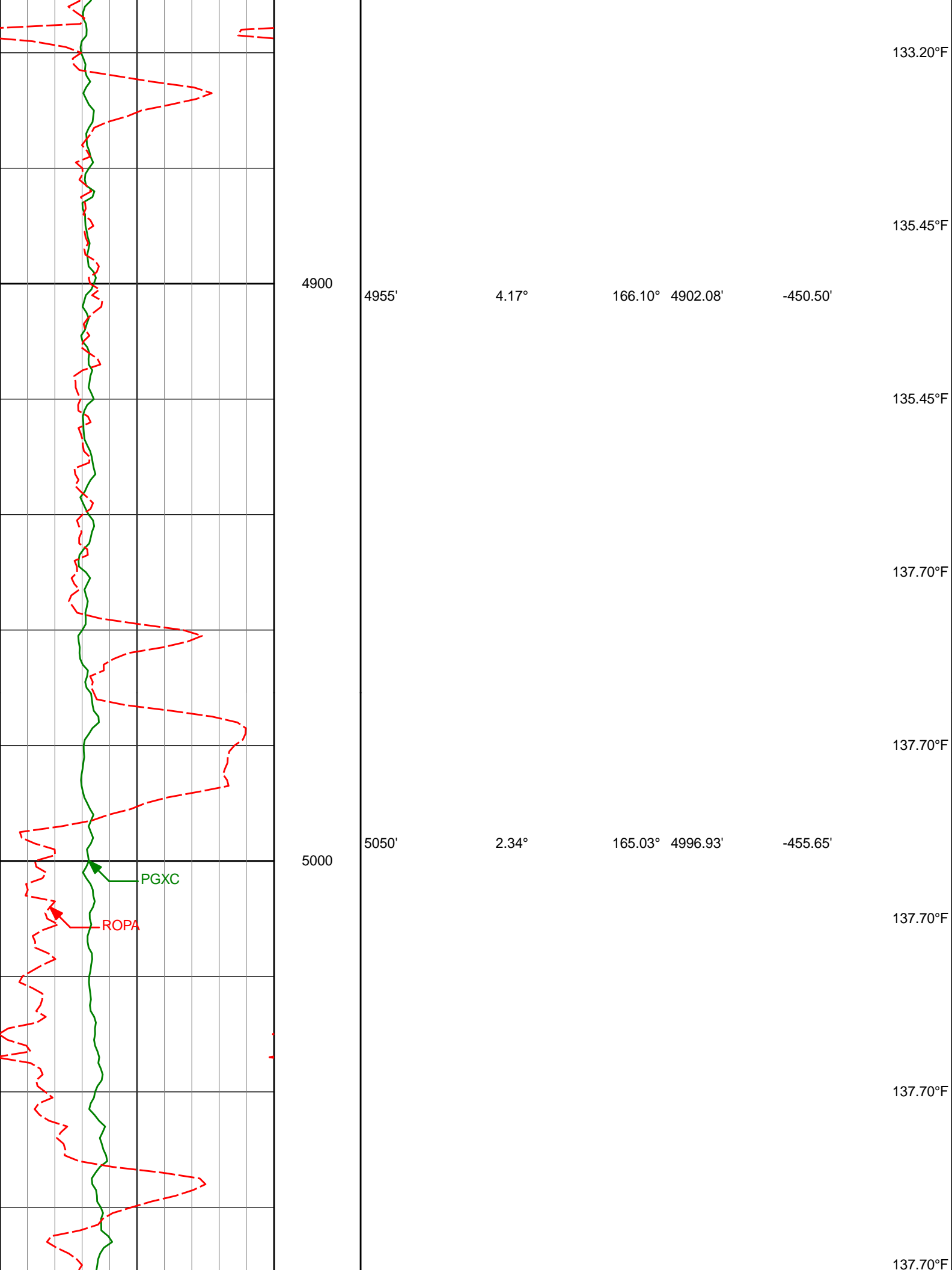


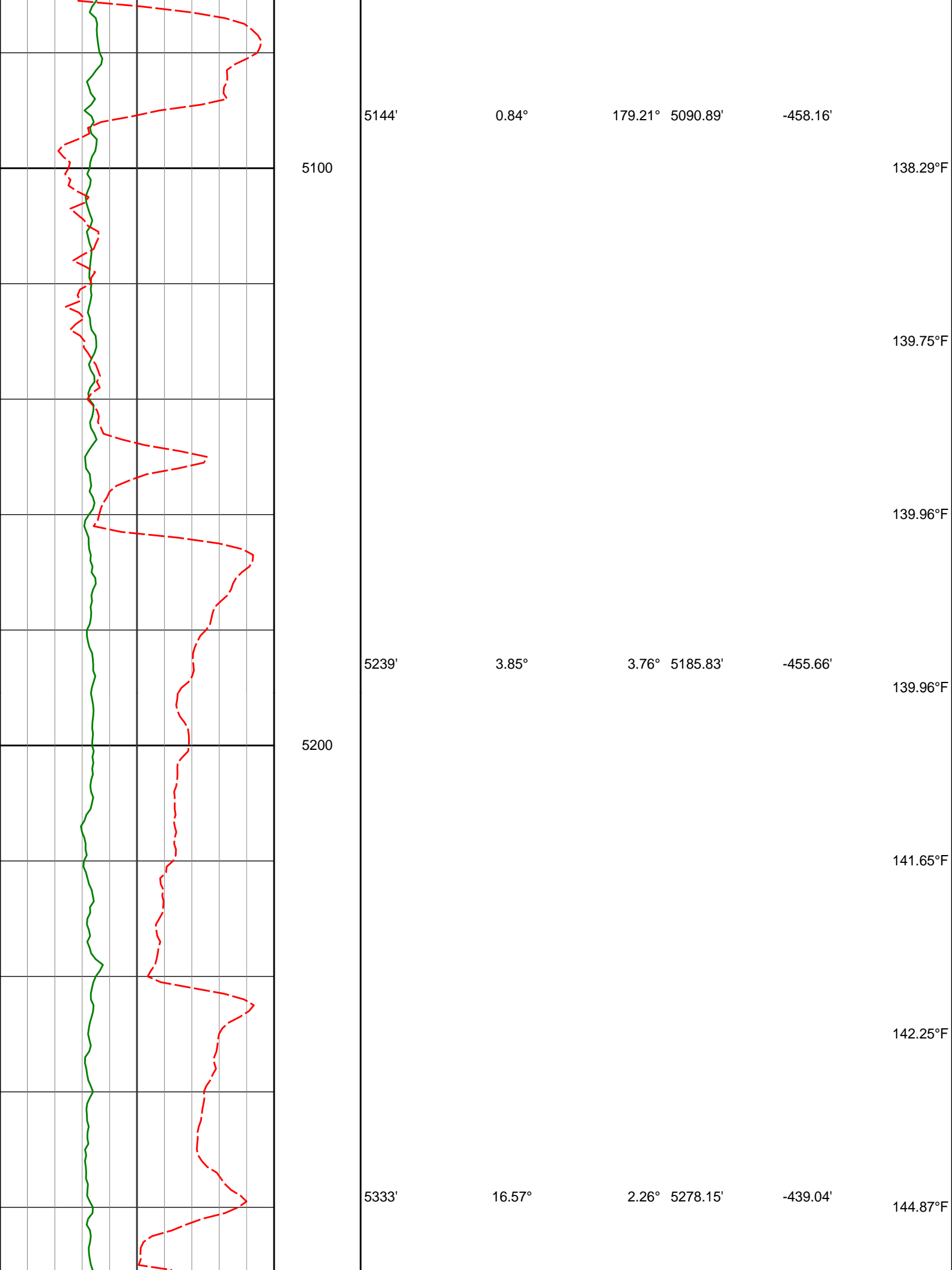


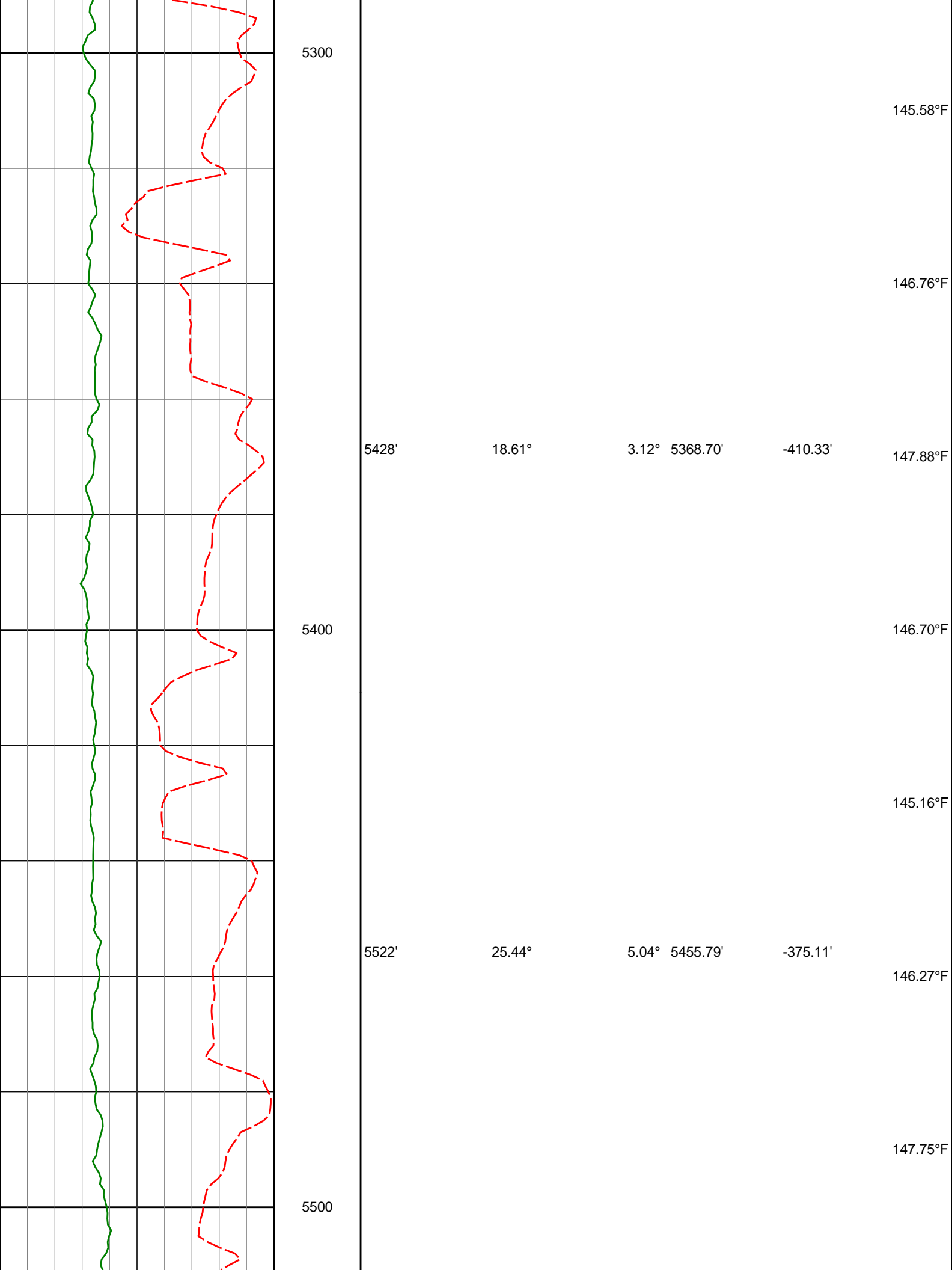


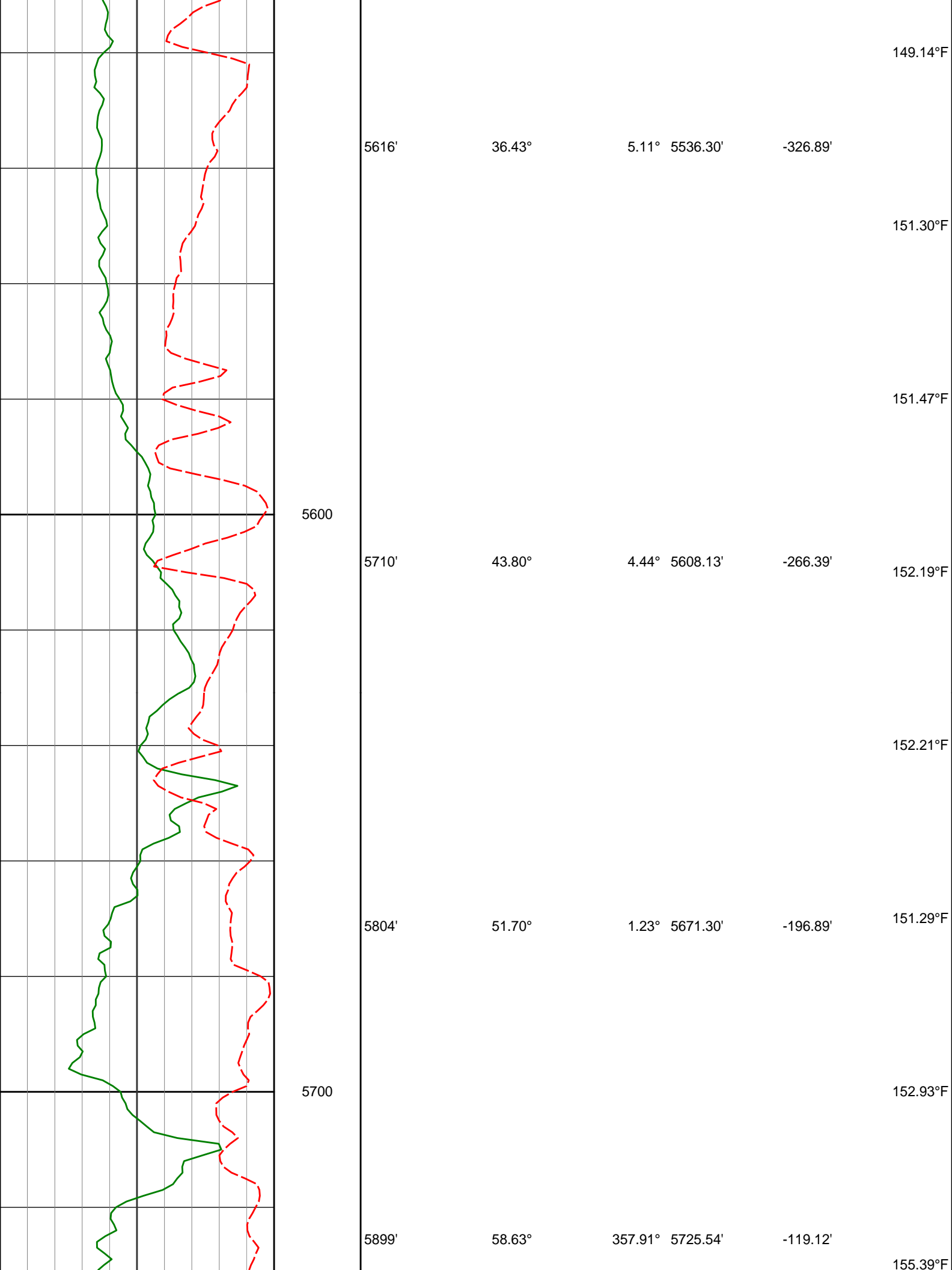


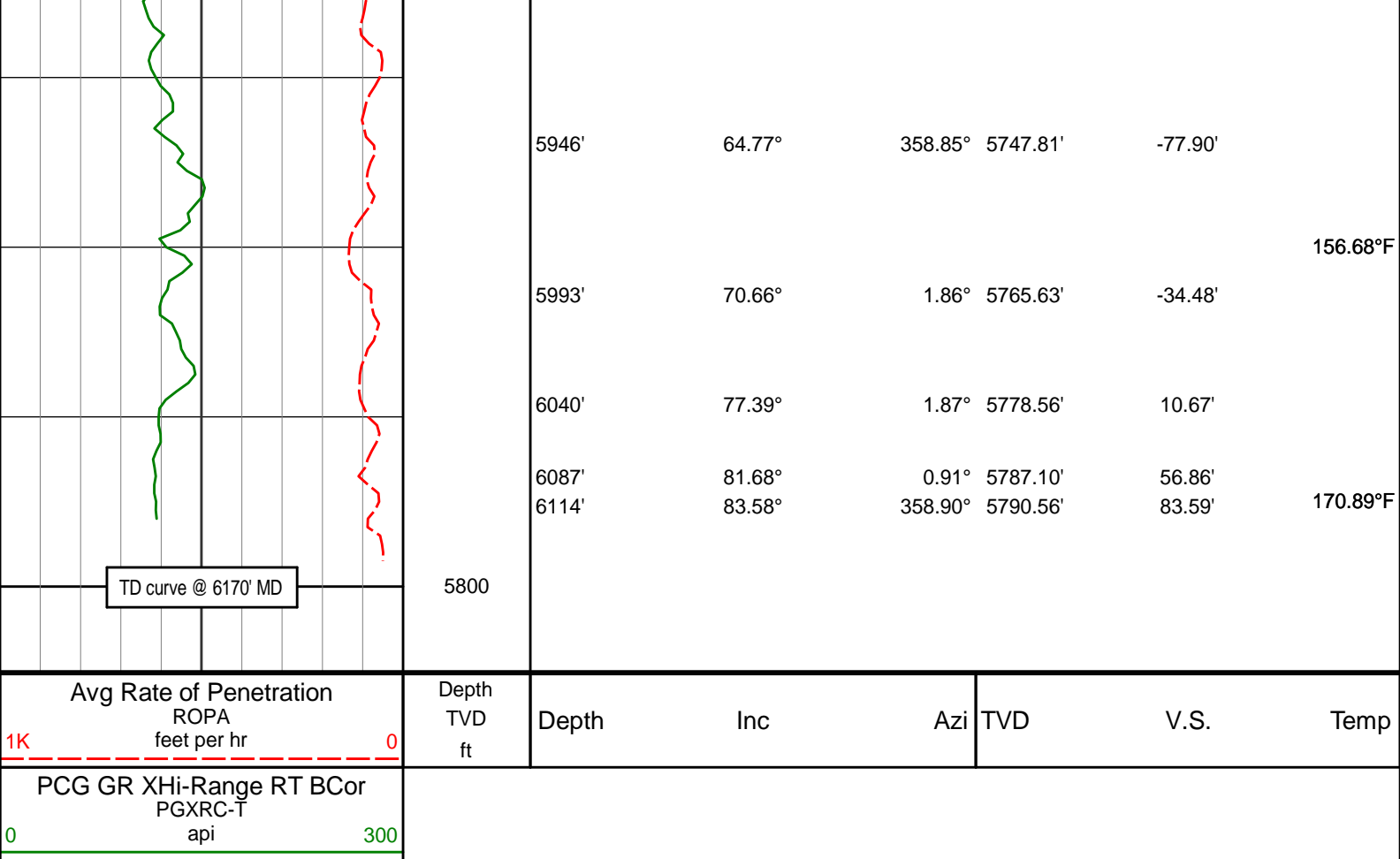












HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Gracie LD22-730
Wattenberg
Weld Colorado
USA
CA-XX-0902634325
Tied in @ Surface

Final survey projected to bit.

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
804.00	0.03	93.64	804.00	0.01 S	0.22 E	-0.00	0.00
925.00	0.40	328.84	925.00	0.35 N	0.03 E	0.35	0.35
1018.00	0.17	301.96	1018.00	0.70 N	0.26 W	0.68	0.28
1112.00	0.29	270.71	1112.00	0.78 N	0.62 W	0.74	0.18
1212.00	0.26	287.96	1212.00	0.85 N	1.09 W	0.79	0.09
1401.00	0.22	266.96	1400.99	0.97 N	1.87 W	0.87	0.05
1493.00	0.19	272.07	1492.99	0.96 N	2.21 W	0.84	0.04
1586.00	0.22	261.66	1585.99	0.94 N	2.54 W	0.81	0.05
1680.00	1.93	173.38	1679.97	0.66 S	2.54 W	-0.79	2.06
1772.00	3.54	166.07	1771.87	4.95 S	1.67 W	-5.04	1.79
1865.00	5.37	157.08	1864.58	11.75 S	0.71 E	-11.70	2.10
1957.00	7.15	162.48	1956.03	21.18 S	4.11 E	-20.93	2.04
2049.00	8.83	157.23	2047.14	33.15 S	8.57 E	-32.66	1.99
2142.00	10.83	151.54	2138.77	47.42 S	15.50 E	-46.54	2.39
2235.00	11.58	144.49	2230.00	62.70 S	25.09 E	-61.30	1.68
2327.00	11.12	143.18	2320.20	77.32 S	35.77 E	-75.33	0.57

2419.00	10.60	143.35	2410.55	91.21 S	46.14 E	-88.66	0.57
2511.00	11.41	145.10	2500.86	105.46 S	56.40 E	-102.36	0.95
2604.00	11.48	143.59	2592.01	120.45 S	67.15 E	-116.76	0.33
2696.00	11.14	143.00	2682.23	134.91 S	77.93 E	-130.63	0.39
2789.00	12.17	145.60	2773.31	150.17 S	88.87 E	-145.30	1.25
2882.00	11.59	143.07	2864.32	165.73 S	100.02 E	-160.25	0.84
2976.00	10.69	142.00	2956.55	180.14 S	111.06 E	-174.06	0.98
3070.00	11.25	144.16	3048.83	194.44 S	121.79 E	-187.78	0.74
3164.00	11.91	147.53	3140.92	210.06 S	132.37 E	-202.82	1.00
3259.00	11.98	146.64	3233.86	226.56 S	143.05 E	-218.73	0.21
3353.00	11.98	144.19	3325.82	242.61 S	154.12 E	-234.19	0.54
3447.00	12.50	145.06	3417.68	258.86 S	165.65 E	-249.81	0.59
3541.00	12.85	146.18	3509.39	275.89 S	177.30 E	-266.20	0.46
3635.00	13.25	146.02	3600.96	293.51 S	189.14 E	-283.17	0.42
3729.00	13.21	145.63	3692.46	311.31 S	201.23 E	-300.32	0.10
3918.00	11.41	144.46	3877.11	344.36 S	224.29 E	-332.10	0.96
4012.00	10.95	142.60	3969.32	359.01 S	235.12 E	-346.17	0.62
4107.00	11.99	145.20	4062.43	374.28 S	246.23 E	-360.84	1.22
4201.00	11.48	145.14	4154.46	389.98 S	257.15 E	-375.94	0.54
4295.00	10.57	144.25	4246.73	404.65 S	267.53 E	-390.05	0.98
4389.00	9.28	145.05	4339.32	417.87 S	276.92 E	-402.75	1.38
4484.00	7.82	146.34	4433.26	429.53 S	284.89 E	-413.97	1.56
4578.00	6.25	145.20	4526.55	439.05 S	291.35 E	-423.15	1.67
4673.00	5.28	143.60	4621.07	446.82 S	296.90 E	-430.61	1.04
4767.00	5.07	144.38	4714.68	453.68 S	301.89 E	-437.20	0.23
4861.00	4.53	159.05	4808.35	460.53 S	305.63 E	-443.84	1.42
4955.00	4.17	166.10	4902.08	467.31 S	307.78 E	-450.50	0.68
5050.00	2.34	165.03	4996.93	472.54 S	309.11 E	-455.65	1.93
5144.00	0.84	179.21	5090.89	475.08 S	309.62 E	-458.16	1.64
5239.00	3.85	3.76	5185.83	472.58 S	309.84 E	-455.66	4.94
5333.00	16.57	2.26	5278.15	455.97 S	310.58 E	-439.04	13.53
5428.00	18.61	3.12	5368.70	427.30 S	311.94 E	-410.33	2.17
5522.00	25.44	5.04	5455.79	392.17 S	314.53 E	-375.11	7.30
5616.00	36.43	5.11	5536.30	344.11 S	318.80 E	-326.89	11.69
5710.00	43.80	4.44	5608.13	283.79 S	323.82 E	-266.39	7.85
5804.00	51.70	1.23	5671.30	214.36 S	327.14 E	-196.89	8.77
5899.00	58.63	357.91	5725.54	136.45 S	326.46 E	-119.12	7.84
5946.00	64.77	358.85	5747.81	95.11 S	325.31 E	-77.90	13.17
5993.00	70.66	1.86	5765.63	51.65 S	325.60 E	-34.48	13.85
6040.00	77.39	1.87	5778.56	6.51 S	327.07 E	10.67	14.33
6087.00	81.68	0.91	5787.10	39.68 N	328.19 E	56.86	9.35
6114.00	83.58	358.90	5790.56	66.46 N	328.14 E	83.59	10.20
6324.00	89.23	358.85	5803.73	275.92 N	324.02 E	292.55	2.69
6417.00	89.69	359.40	5804.61	368.90 N	322.60 E	385.33	0.78
6509.00	89.48	0.15	5805.27	460.90 N	322.24 E	477.18	0.85
6601.00	89.85	358.53	5805.82	552.89 N	321.18 E	568.99	1.81
6693.00	90.83	359.37	5805.27	644.87 N	319.49 E	660.75	1.41
6786.00	91.23	359.67	5803.60	737.85 N	318.71 E	753.57	0.54
6878.00	90.59	359.01	5802.14	829.83 N	317.65 E	845.36	1.01
7254.00	90.34	358.91	5799.11	1205.75 N	310.82 E	1220.41	0.07
7349.00	90.43	359.15	5798.47	1300.74 N	309.21 E	1315.18	0.27
7445.00	89.88	359.94	5798.21	1396.73 N	308.45 E	1411.00	1.00
7539.00	89.17	358.63	5798.99	1490.72 N	307.27 E	1504.80	1.58
7634.00	88.77	358.59	5800.71	1585.68 N	304.96 E	1599.50	0.43
7728.00	89.41	358.33	5802.20	1679.63 N	302.43 E	1693.19	0.74
7823.00	90.34	357.14	5802.40	1774.55 N	298.67 E	1787.79	1.58

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 3.01 DEGREES (GRID)
A TOTAL CORRECTION OF 6.94 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7823.00 FEET
IS 1799.51 FEET ALONG 9.55 DEGREES (GRID)**