



1:600 / 1:240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	03-Sep-15	08-Sep-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	637.00	6,968.00			
Log End Depth (MD, ft)	6968	15,993.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	02-Sep-15 08:30	04-Sep-15 14:00			
Drill/Wipe End Date and Time	03-Sep-15 10:00	09-Sep-15 16:15			
Min Inc (deg) @ Depth (MD, ft)	0.25 @ 1,921.00	86.76 @ 13,516.00			
Max Inc (deg) @ Depth (MD, ft)	86.45 @ 6,968.00	93.70 @ 10,988.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.68 / PDC			
Flow Rate (gpm)	592.40	294.91			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	10.20 / 32.00	9.65 / 37.00			
Filtrate CL (ppm)	15,000.00	1,500.00			
pH / Fluid Loss (mptm)	8.00 / 0	9.00 / 6			
PV (cP) / YP (lhf2)	9 / 8.00	9 / 7.00			
% Solids / % Sand	6 / 0.2	31.00 / 0.00			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			

Max Tool Temp (degF) / Source	177.64 / PCM	238.70 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Adam Sampson	Adam Sampson			
Customer Representative	Justin Fields	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11619287	12463930			
Insert Serial Number	11680799	11145577			
Date and Time Initialized	02-Sep-15 05:05	03-Sep-15 22:48			
Date and Time Read	03-Sep-15 14:52	08-Sep-15 11:19			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	61.00	68.00			
Software Version	6.21	6.33			
Sub Serial Number	11619287	12463930			
Sonde Serial Number	11145703	11062074			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	163.80	128.30			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	54.62	55.87			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11619287	12463930			
Insert/Sonde Serial Number	11680952	11292594			

REMARKS

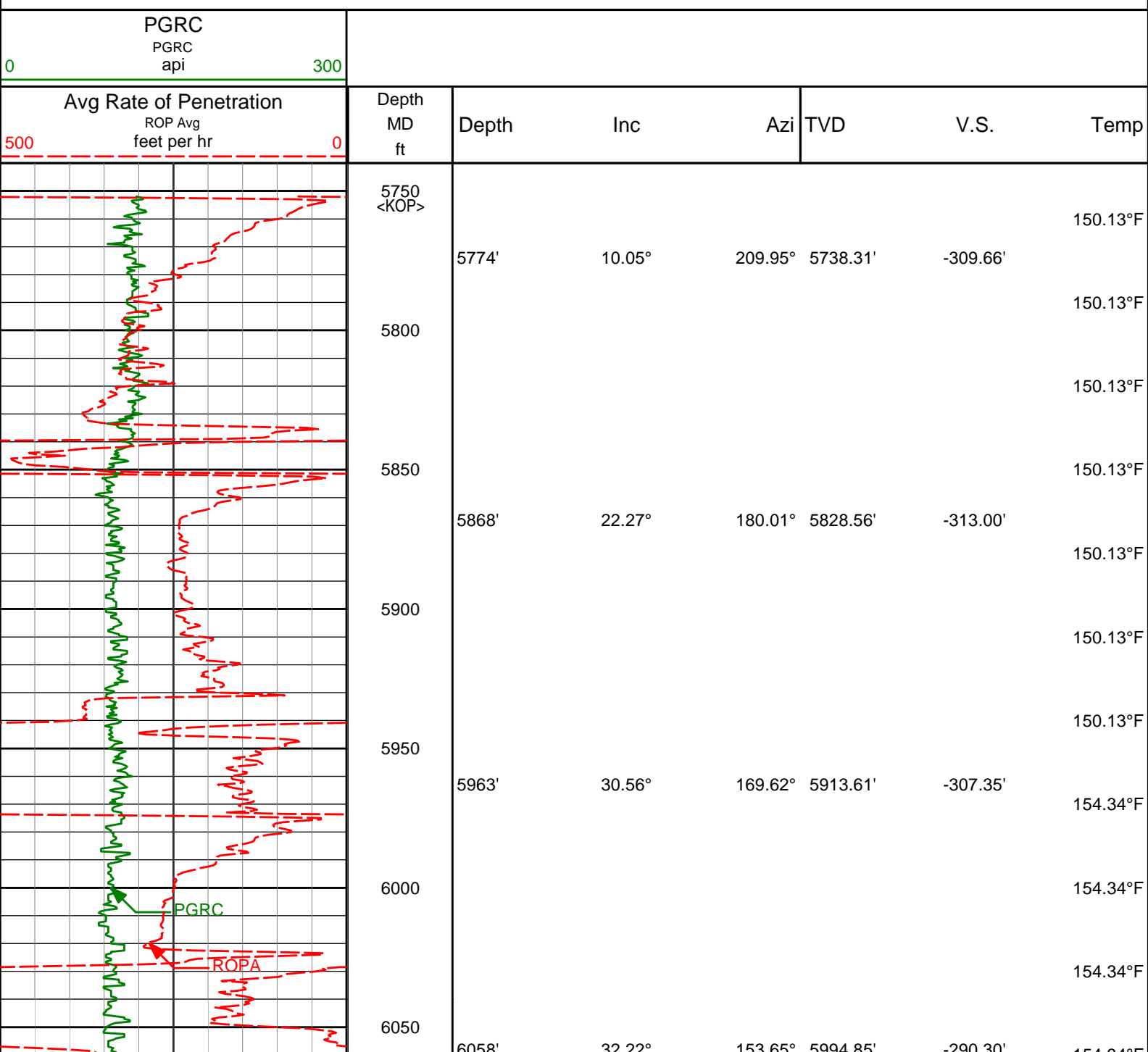
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
 - Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
 - Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.
5. INSITE version 8.3.0

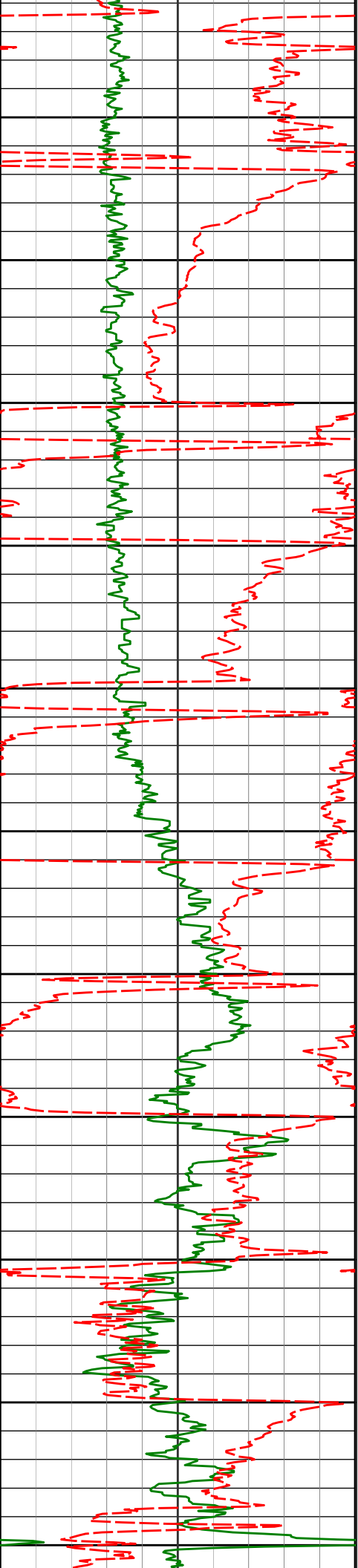
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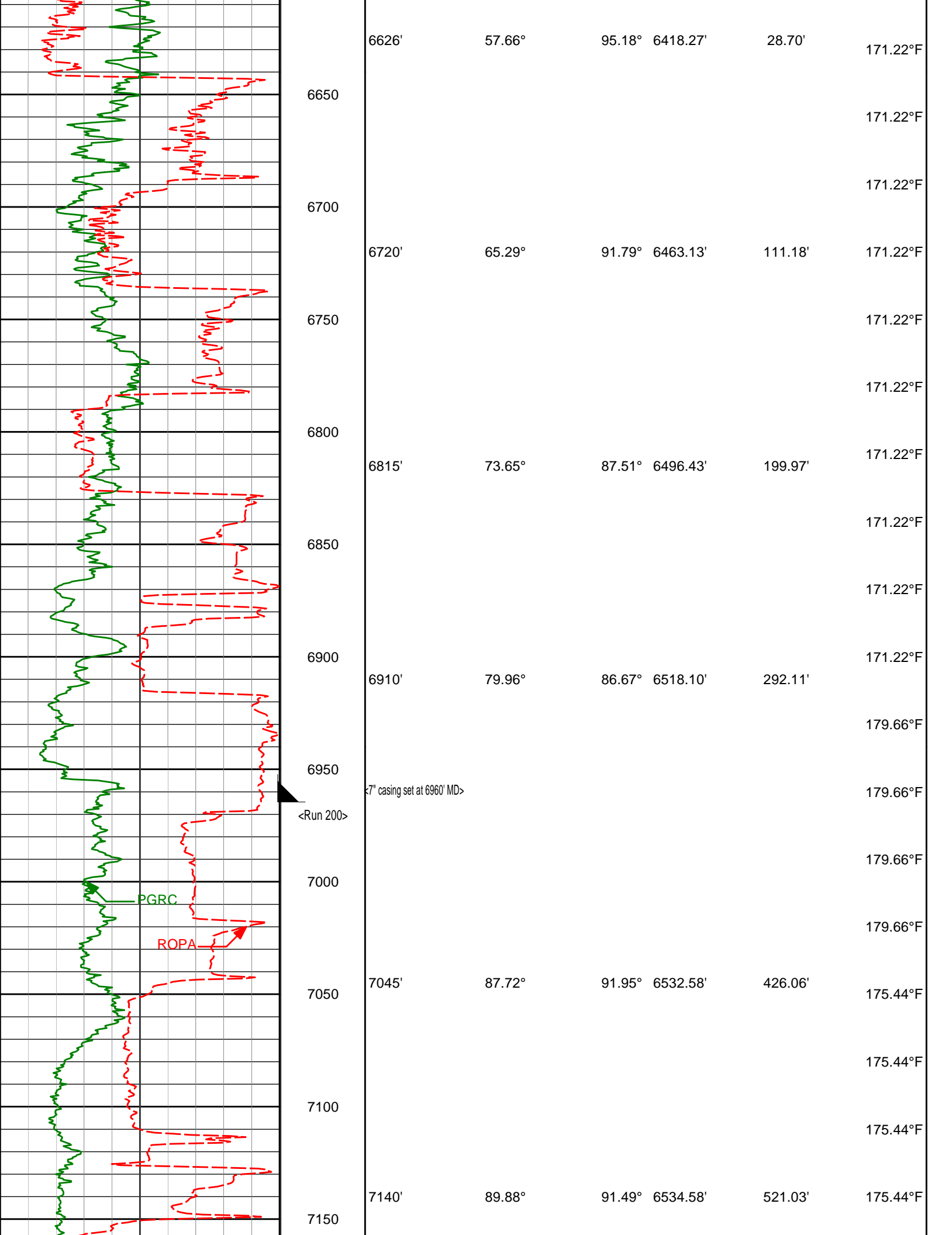
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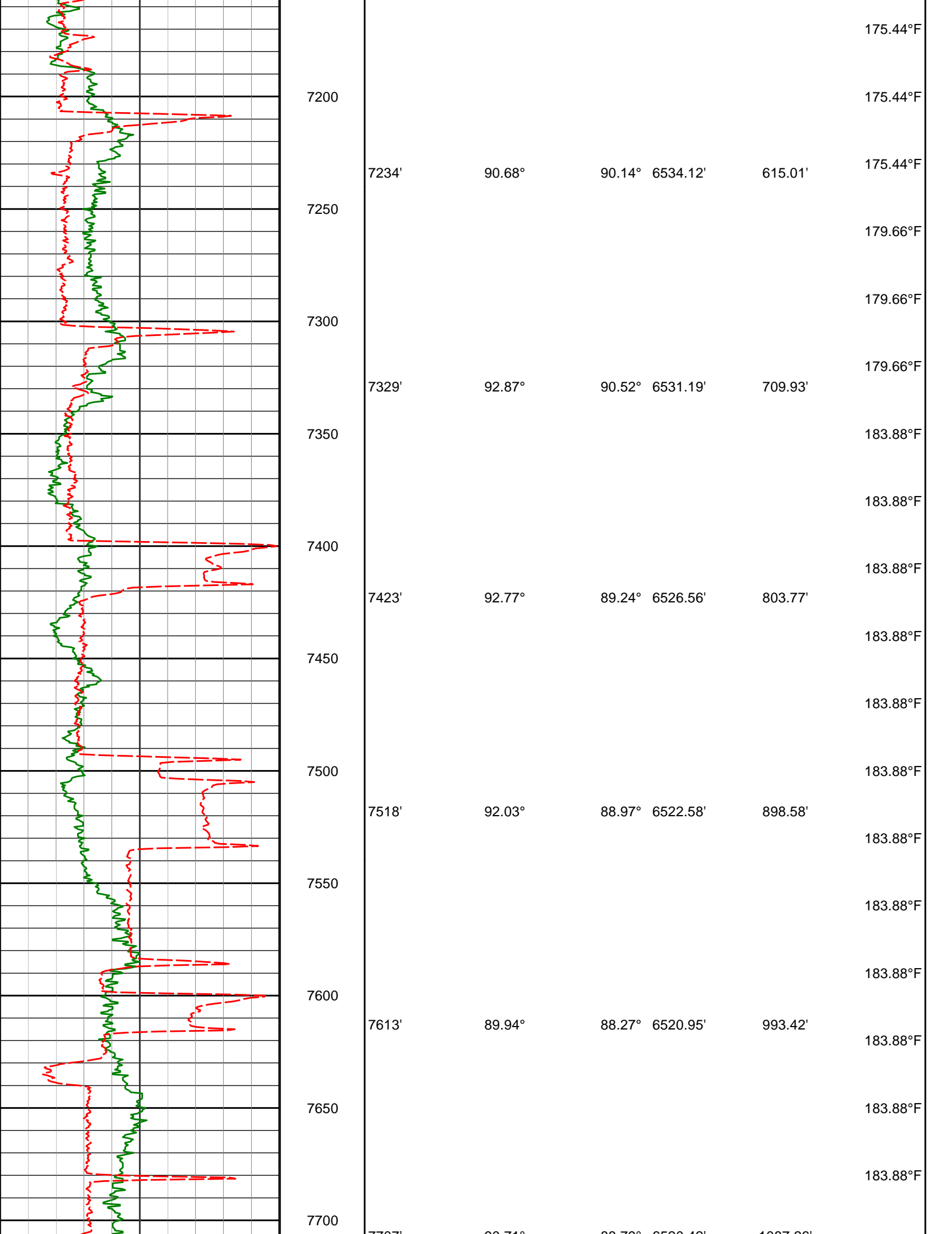
MD Detail 1:600 Scale

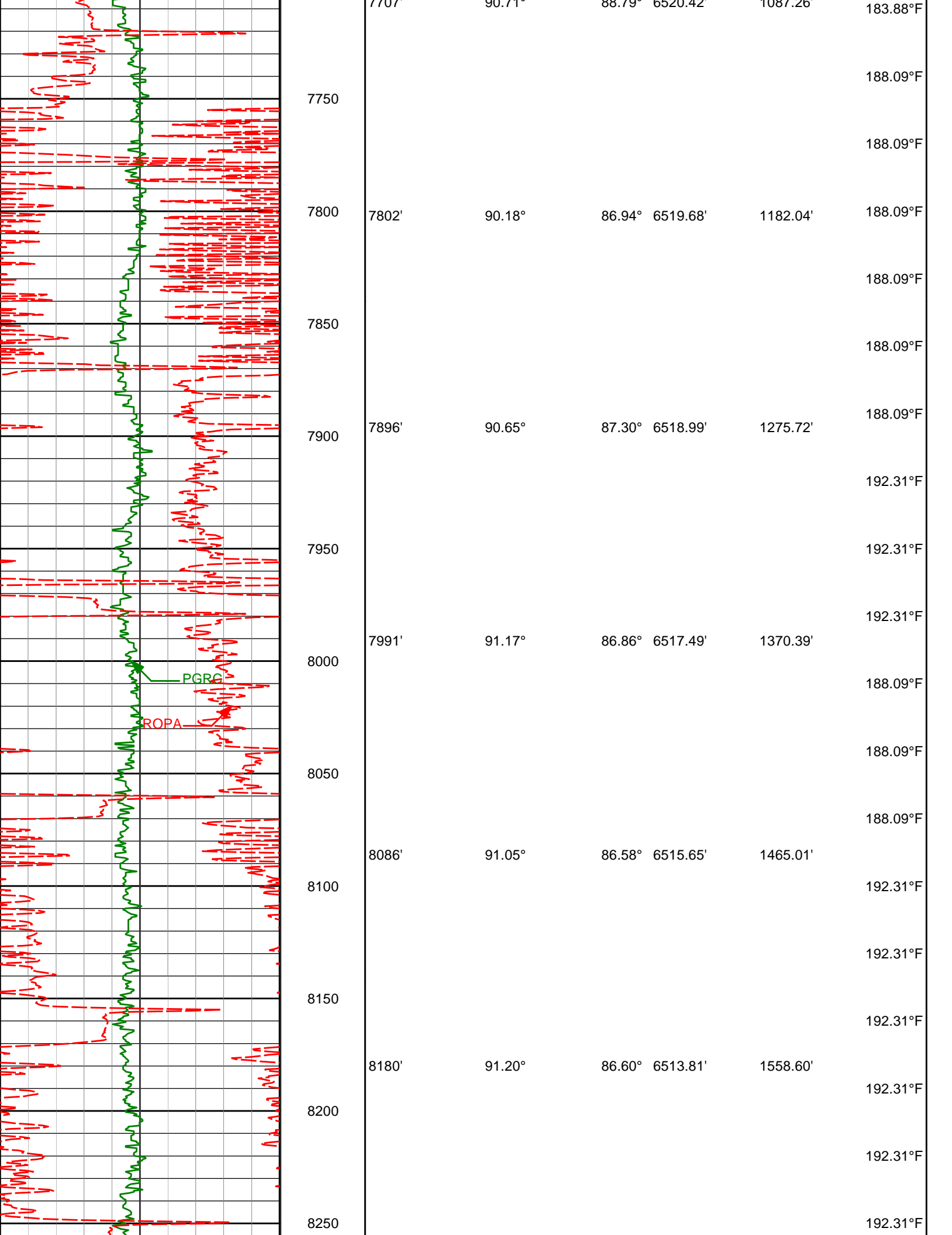


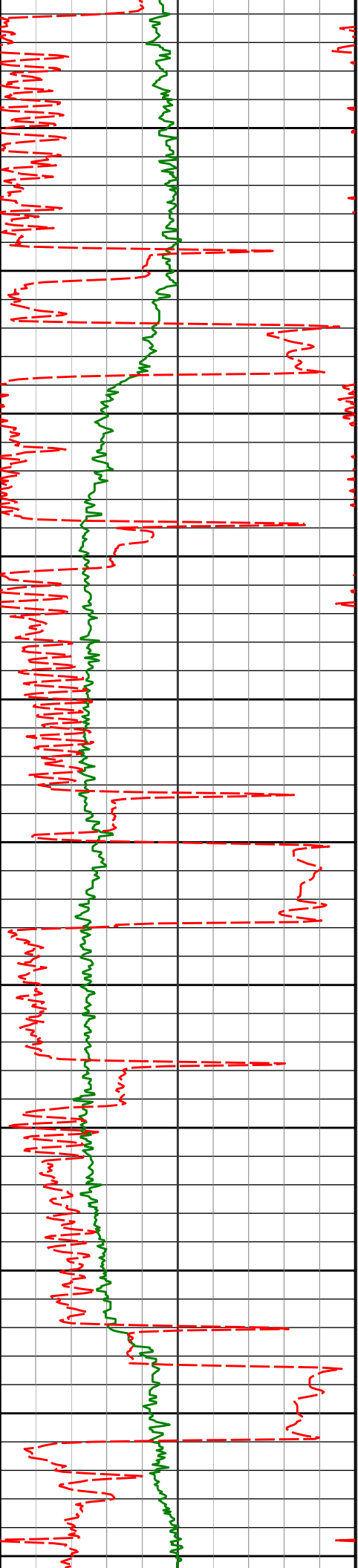


6000	6050	32.22°	133.63°	6034.63'	230.30'	154.34°F
						154.34°F
6100						154.34°F
						154.34°F
6150	6152'	32.25°	143.64°	6074.41'	-262.98'	154.34°F
						158.56°F
6200						158.56°F
						158.56°F
6250	6247'	37.70°	129.60°	6152.36'	-224.30'	158.56°F
						162.78°F
6300						162.78°F
						162.78°F
6350	6342'	38.19°	115.74°	6227.41'	-174.43'	162.78°F
						162.78°F
6400						162.78°F
						162.78°F
6450	6436'	43.47°	106.70°	6298.58'	-116.55'	167.00°F
						167.00°F
6500						167.00°F
						167.00°F
6550	6531'	51.16°	99.31°	6362.99'	-48.14'	167.00°F
						167.00°F
6600						167.00°F

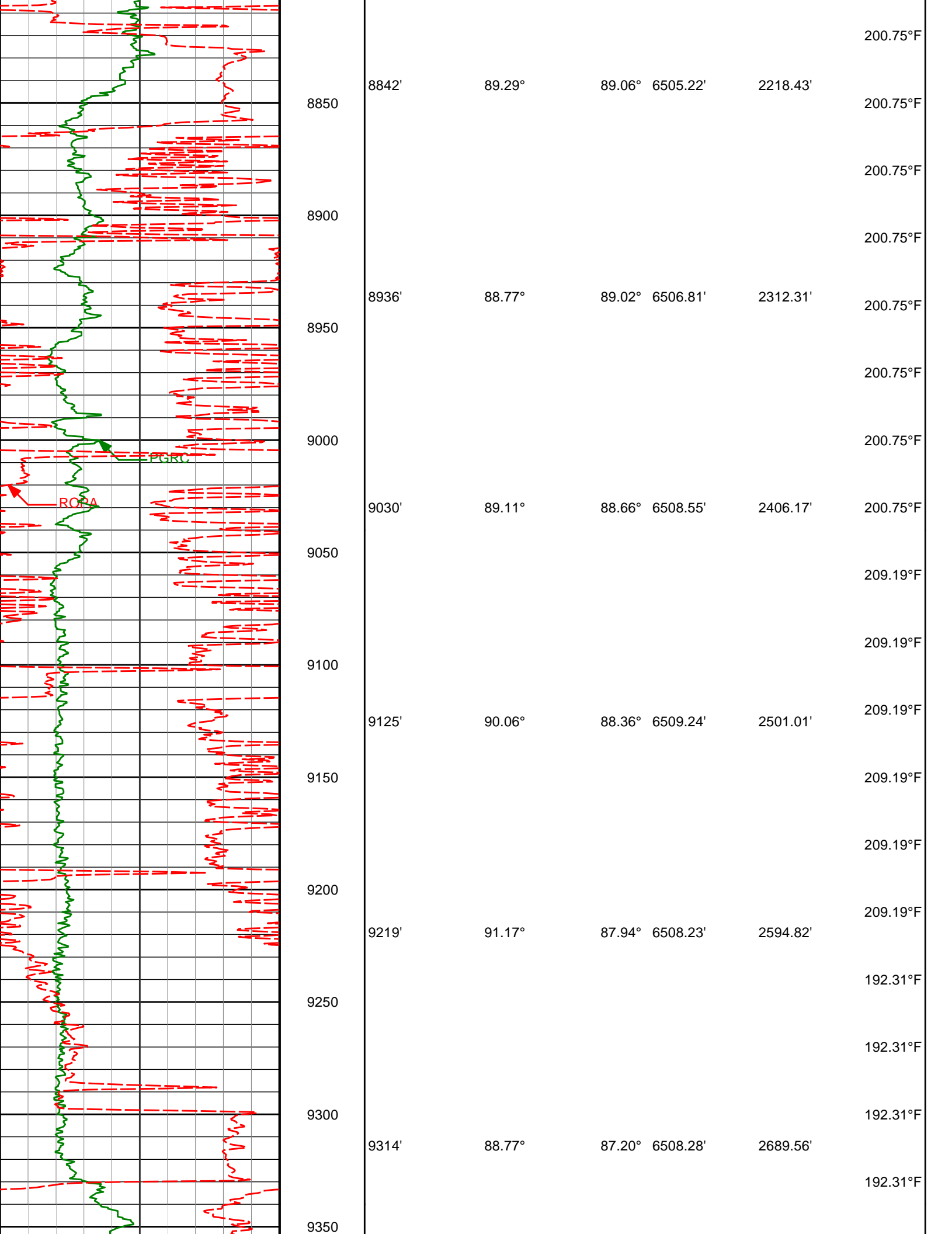


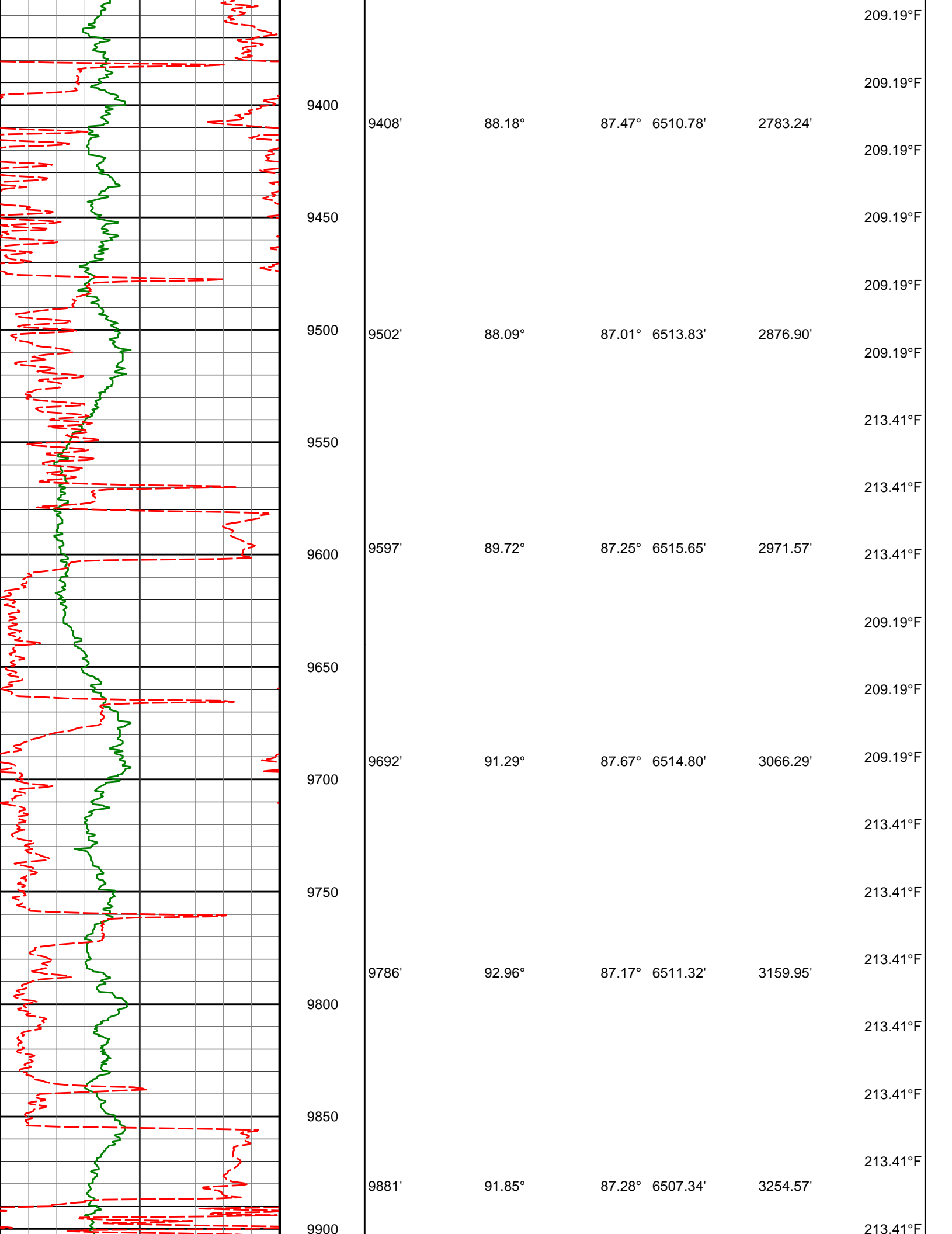


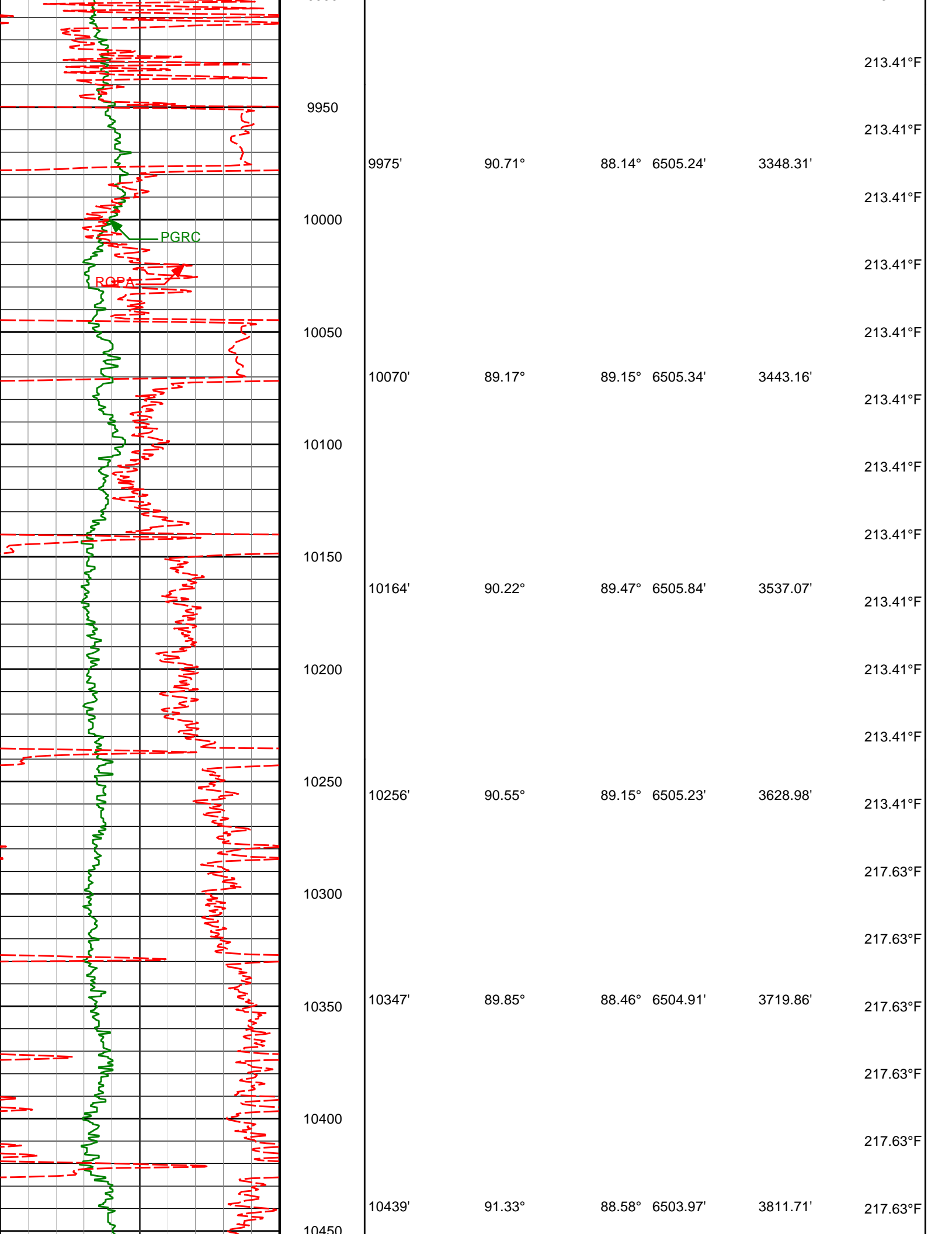


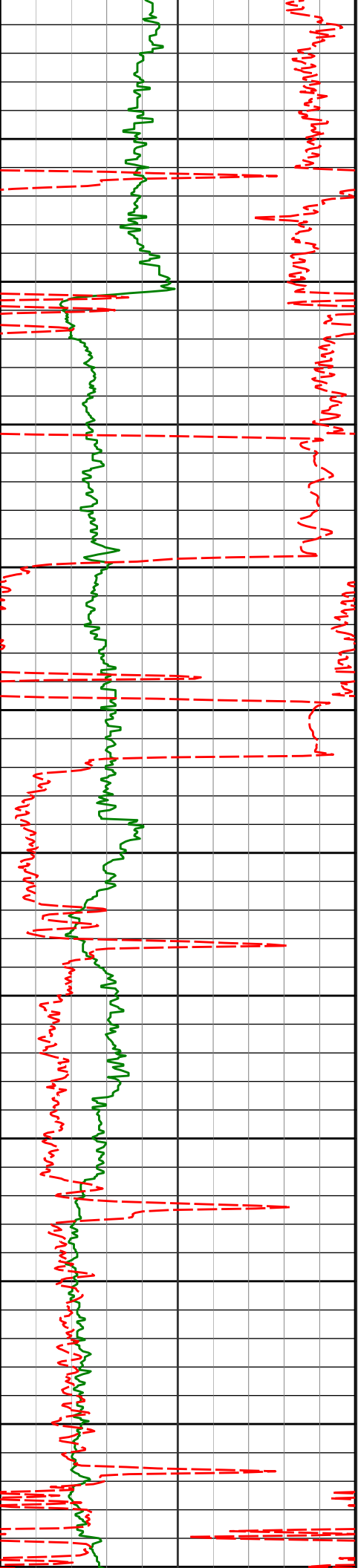


8275'	91.26°	86.75°	6511.76'	1653.21'	192.31°F
8300					192.31°F
					192.31°F
8350					192.31°F
8370'	90.18°	85.71°	6510.57'	1747.75'	192.31°F
8400					192.31°F
					192.31°F
8450					
8464'	90.55°	86.06°	6509.97'	1841.26'	
8500					200.75°F
					200.75°F
8550					200.75°F
8558'	90.74°	87.36°	6508.90'	1934.88'	
					200.75°F
8600					200.75°F
					200.75°F
8650	8653'	91.17°	88.76°	6507.32'	2029.67'
					200.75°F
8700					200.75°F
					200.75°F
8750	8747'	91.05°	89.18°	6505.50'	2123.54'
					200.75°F
8800					200.75°F

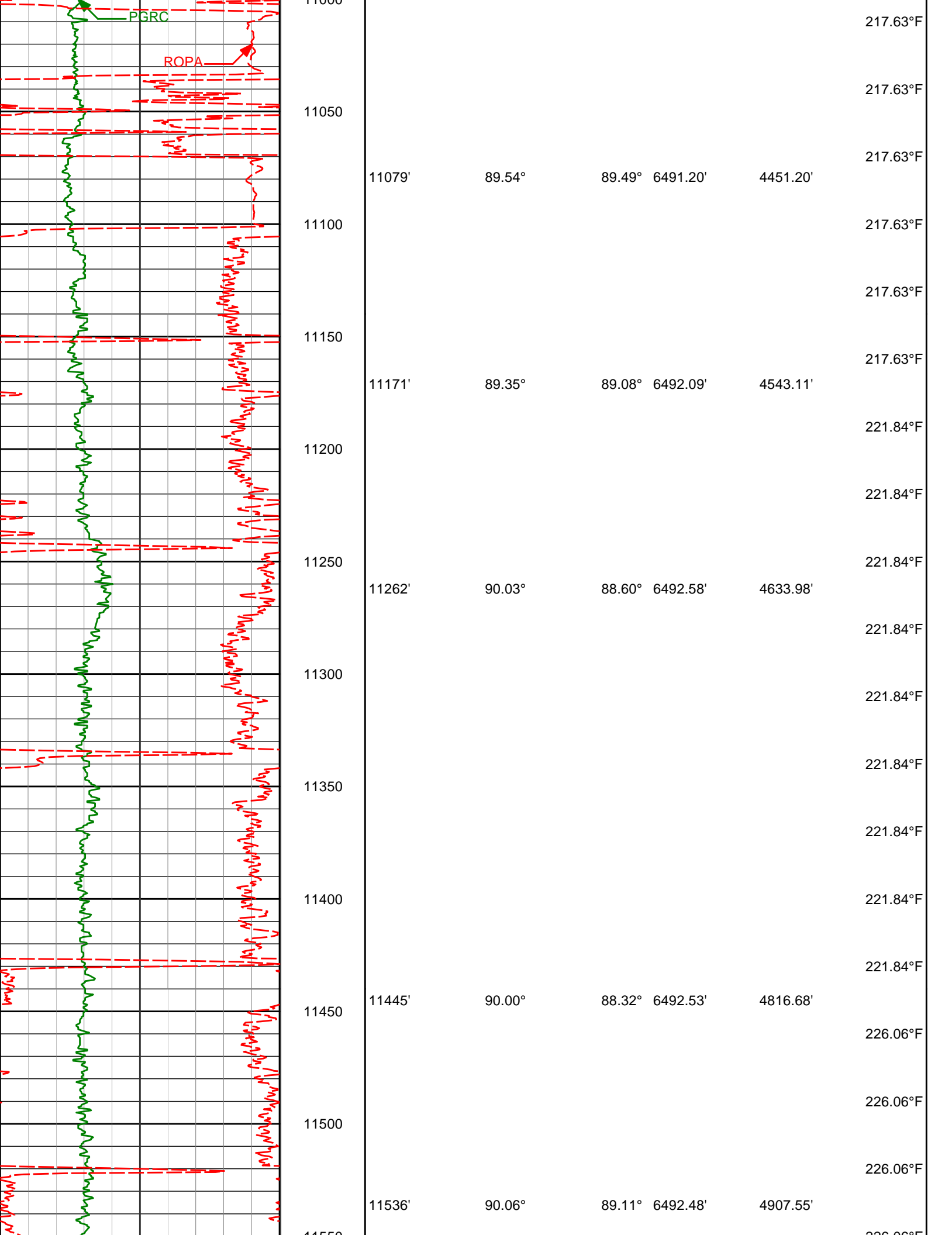


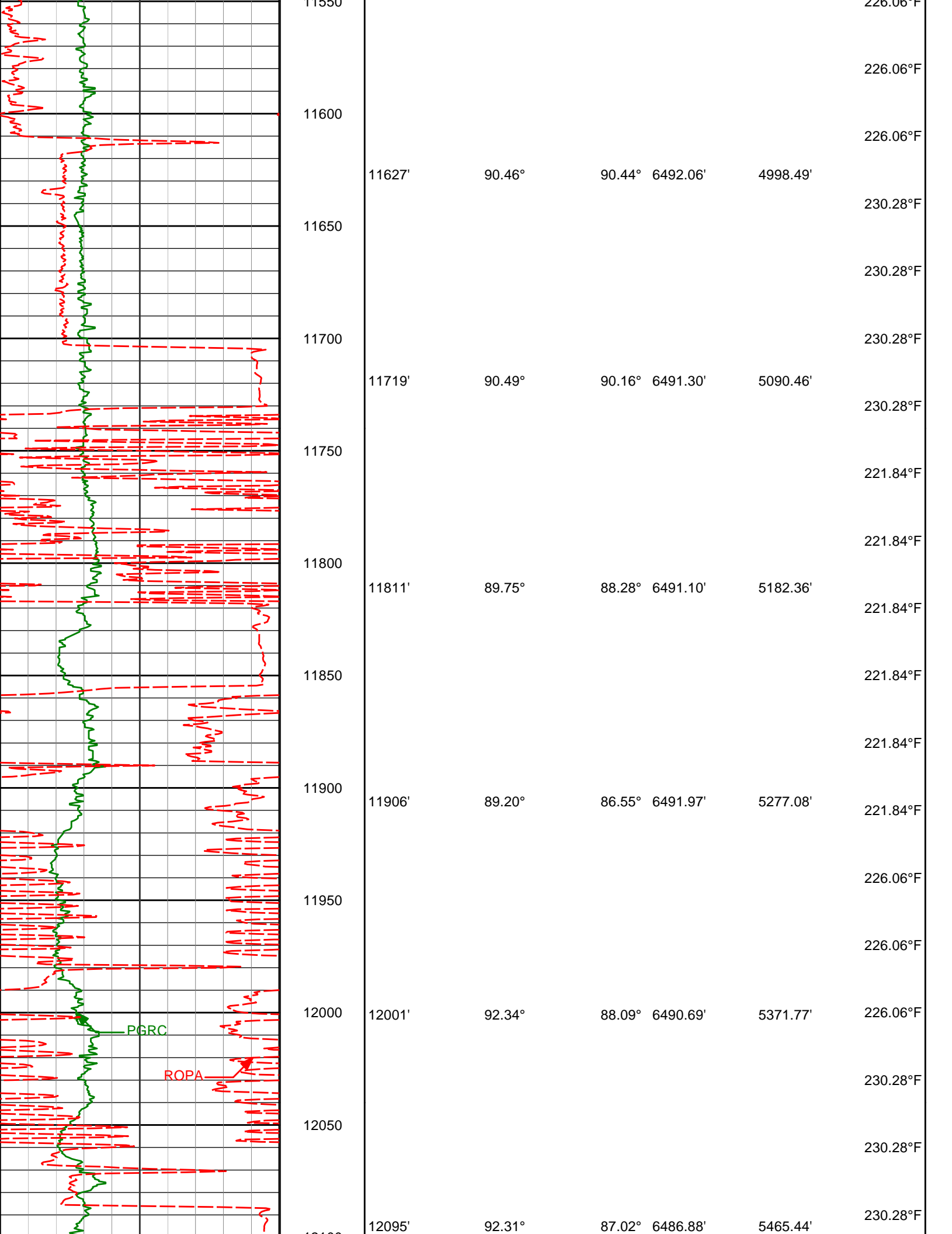


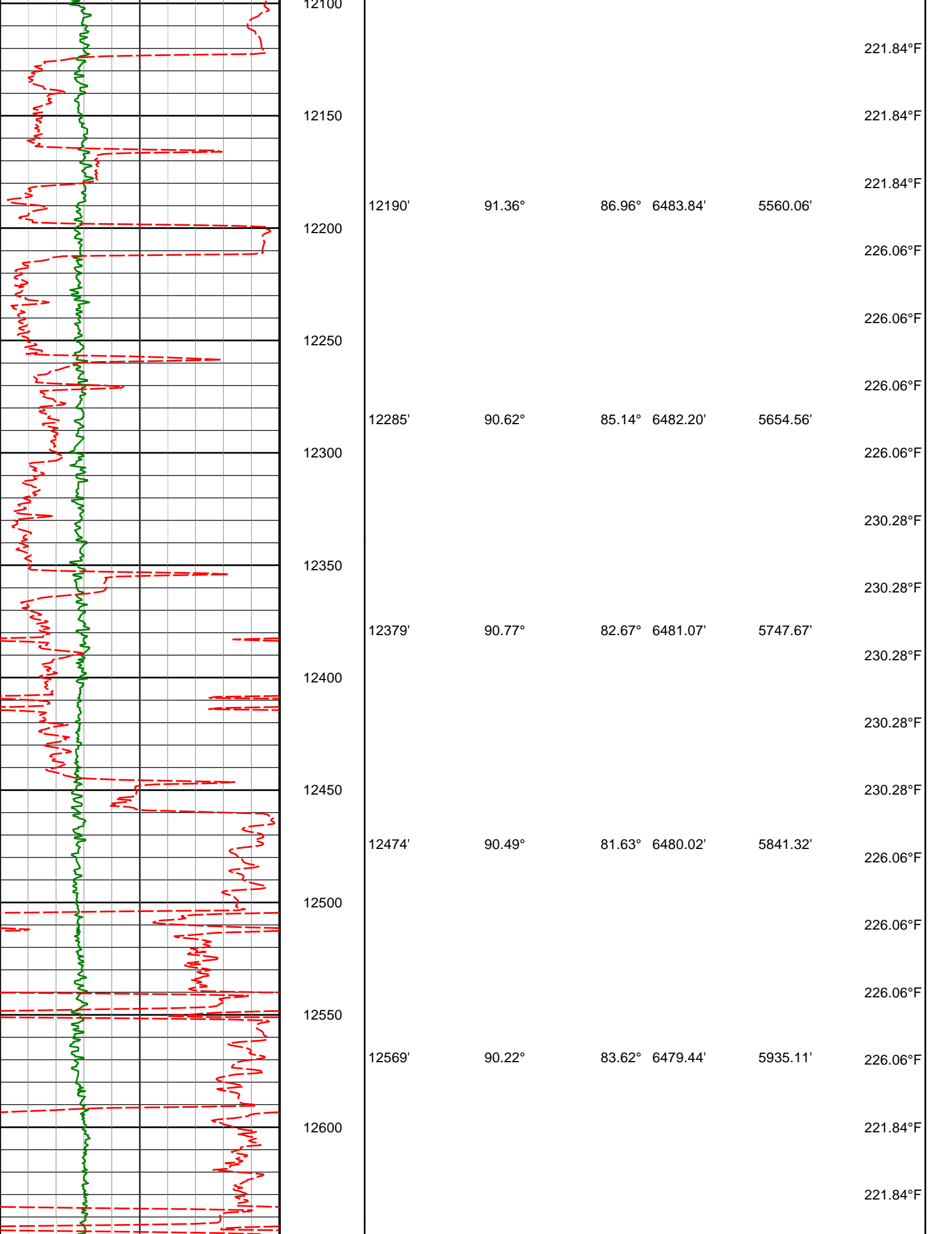


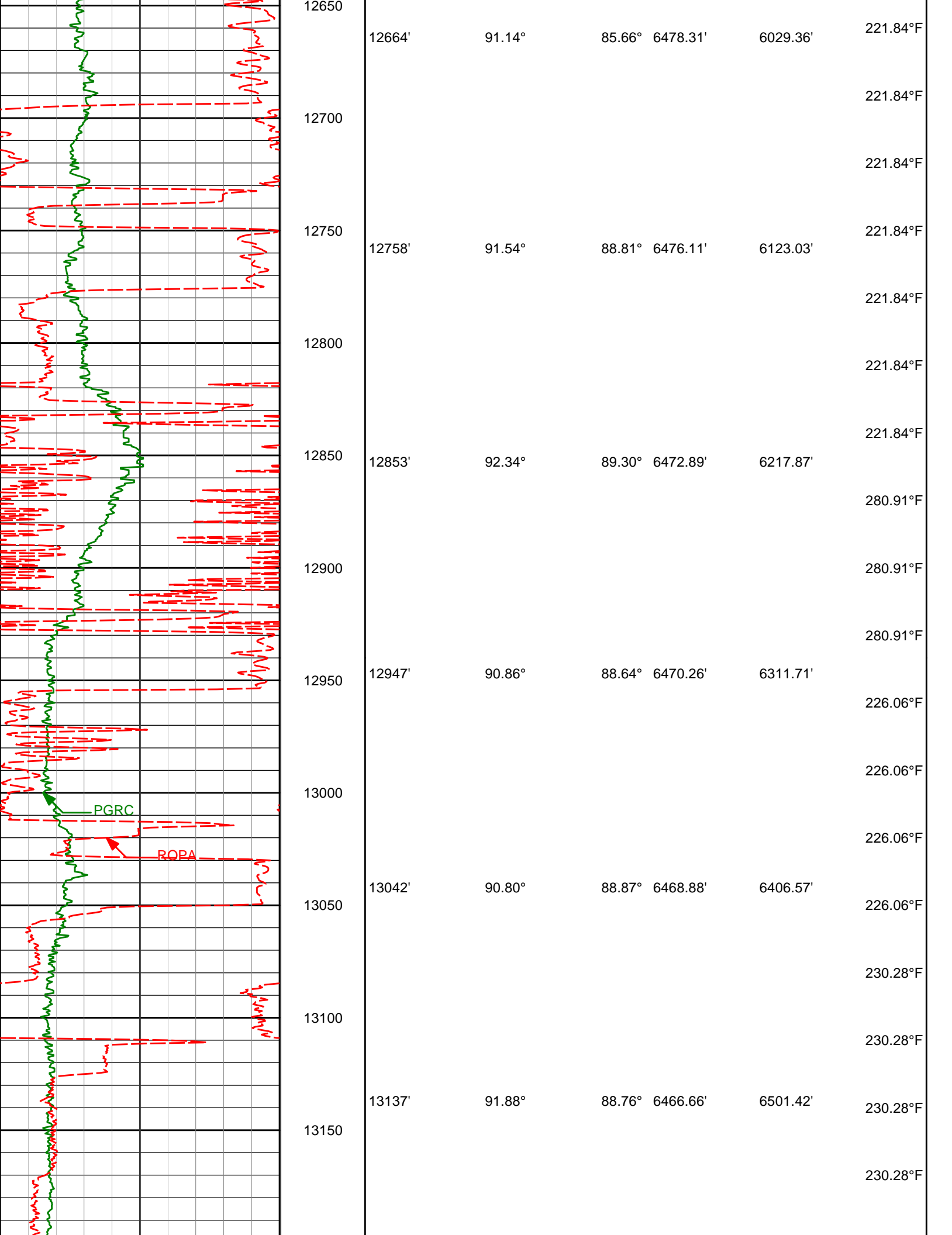


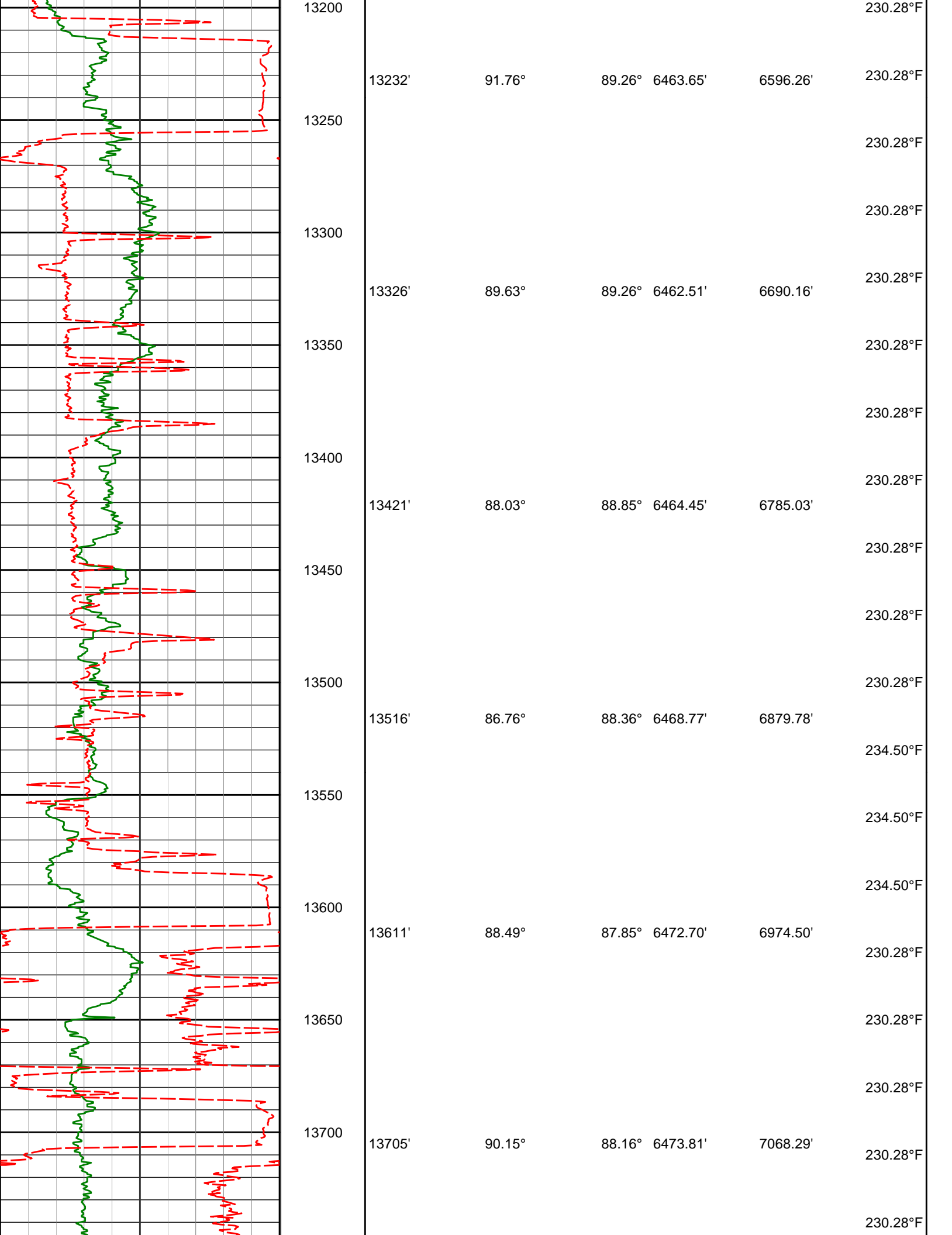
					221.84°F
					221.84°F
10530'	92.16°	89.64°	6501.20'	3902.56'	221.84°F
10550					221.84°F
					221.84°F
10622'	91.69°	90.95°	6498.11'	3994.48'	217.63°F
10650					217.63°F
					217.63°F
10714'	89.29°	91.07°	6497.32'	4086.46'	217.63°F
10750					217.63°F
					217.63°F
10804'	89.41°	90.22°	6498.34'	4176.44'	217.63°F
10850					221.84°F
					221.84°F
10896'	91.29°	90.48°	6497.77'	4268.40'	221.84°F
					221.84°F
10950					221.84°F
					221.84°F
10988'	93.70°	90.83°	6493.77'	4360.29'	221.84°F
11000					

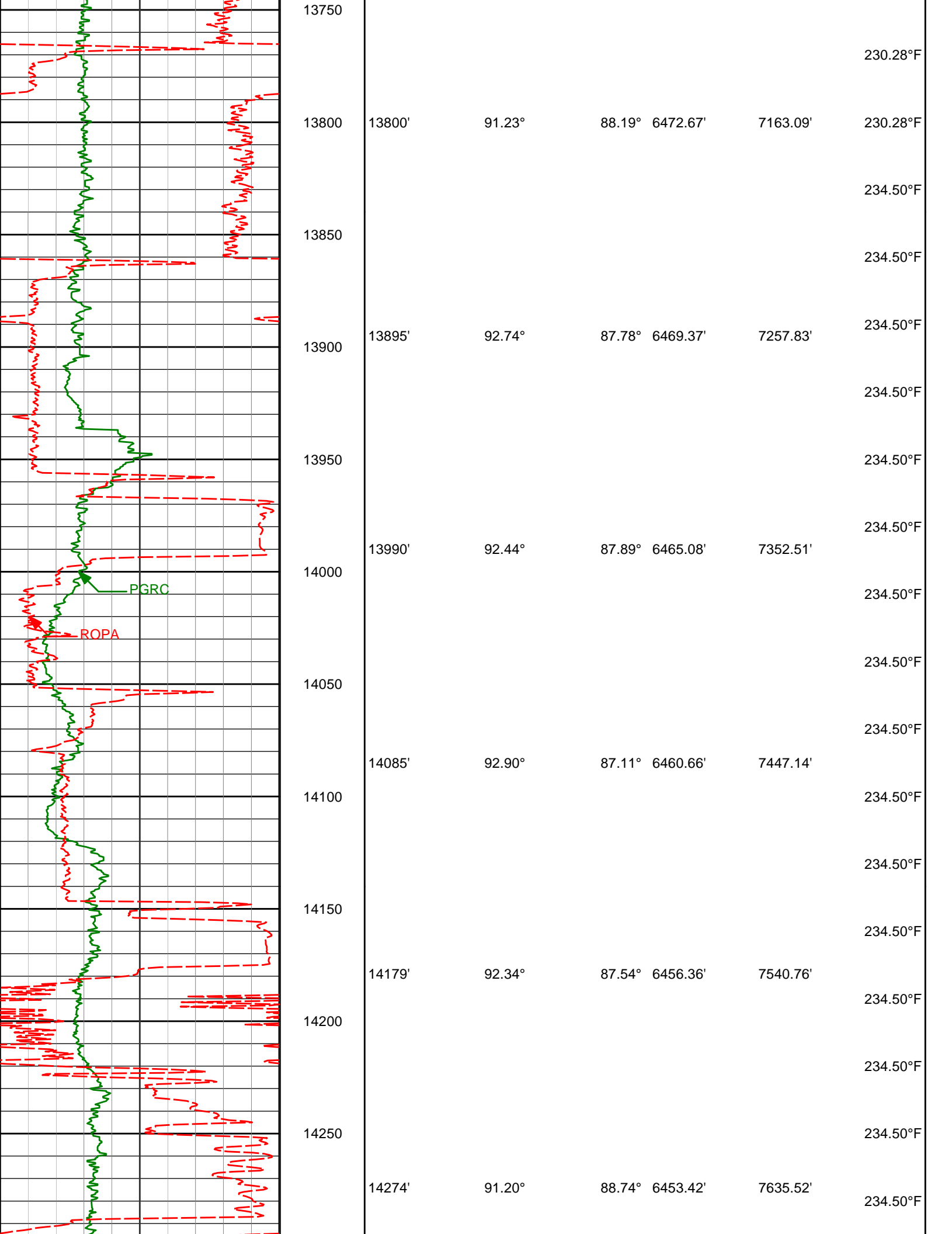


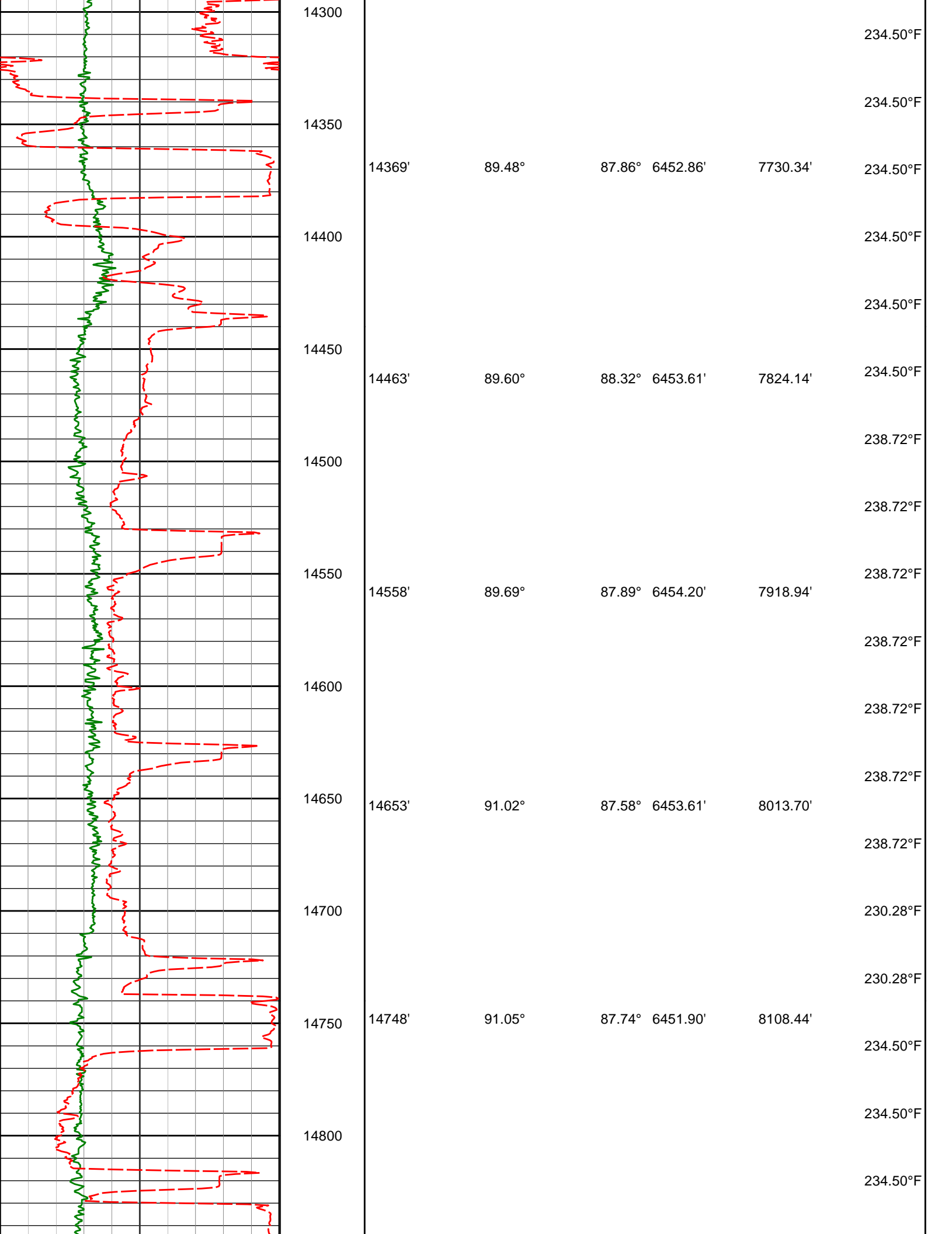


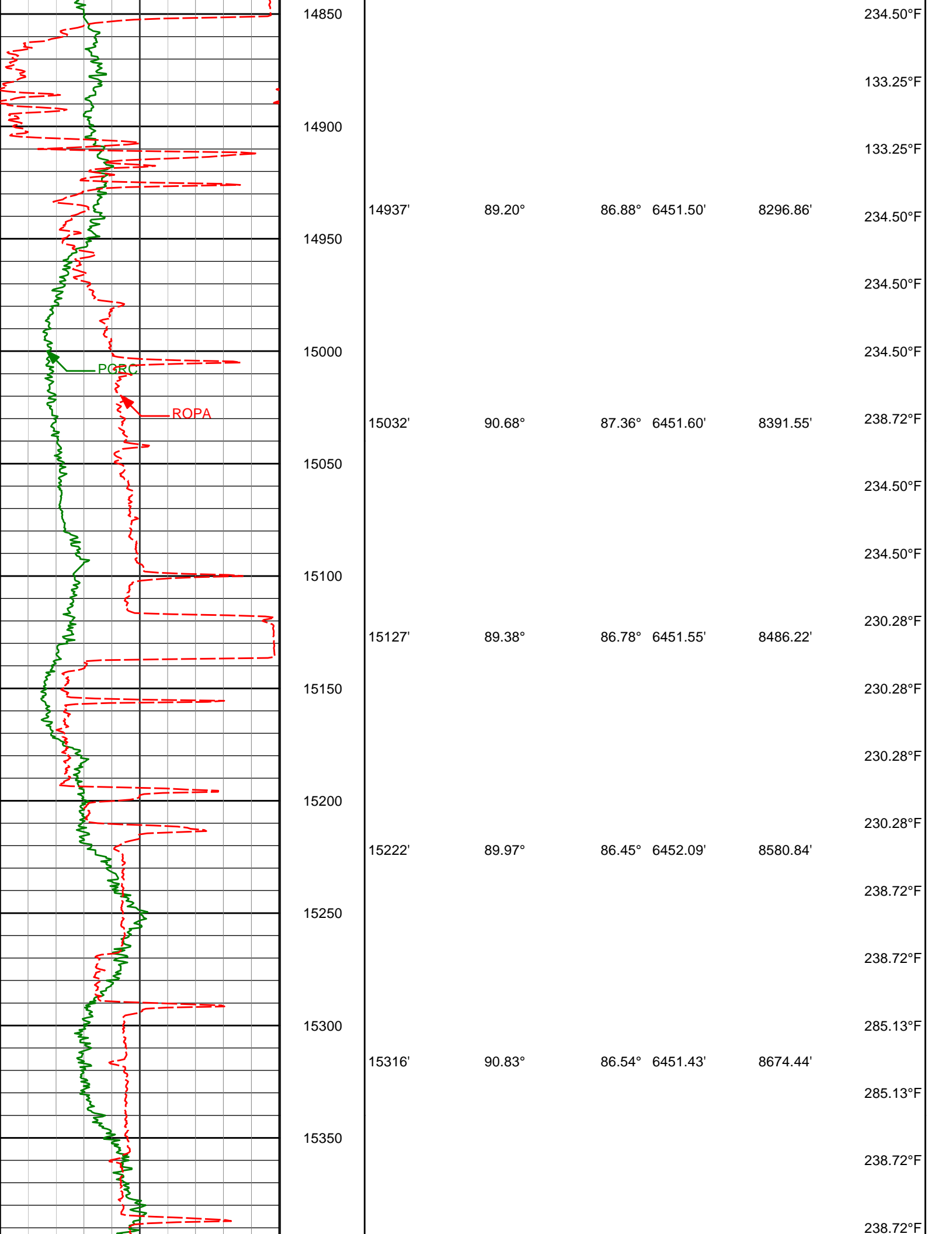


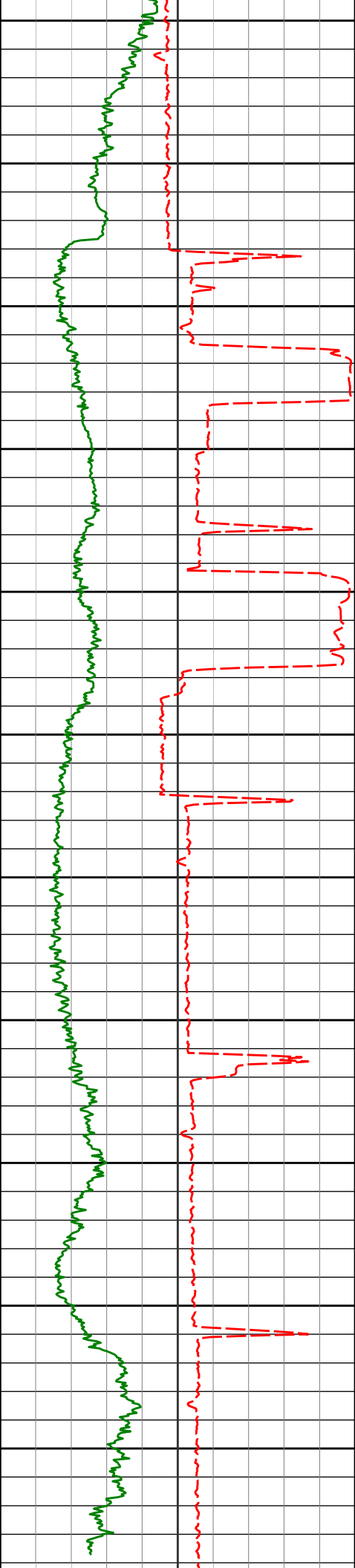




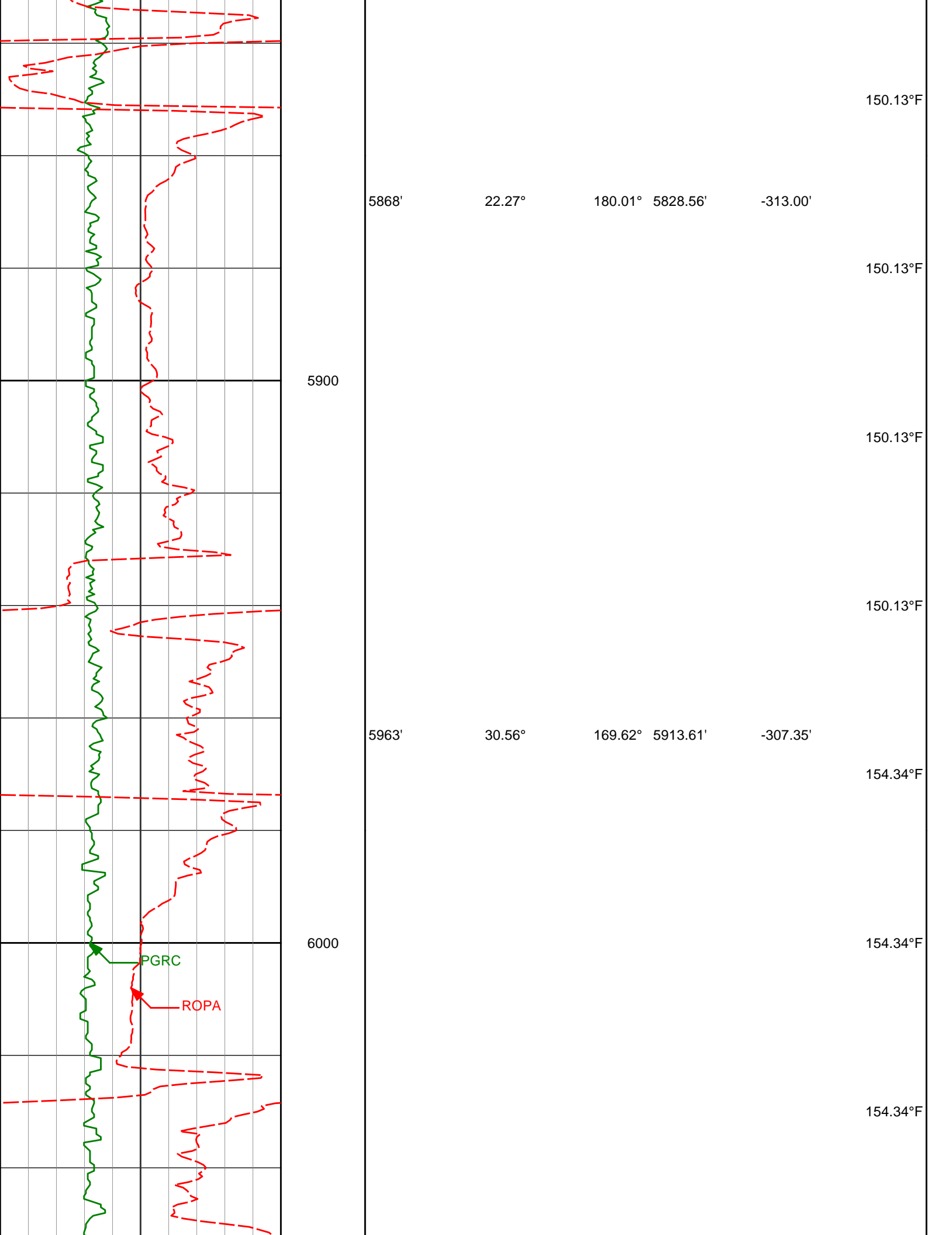


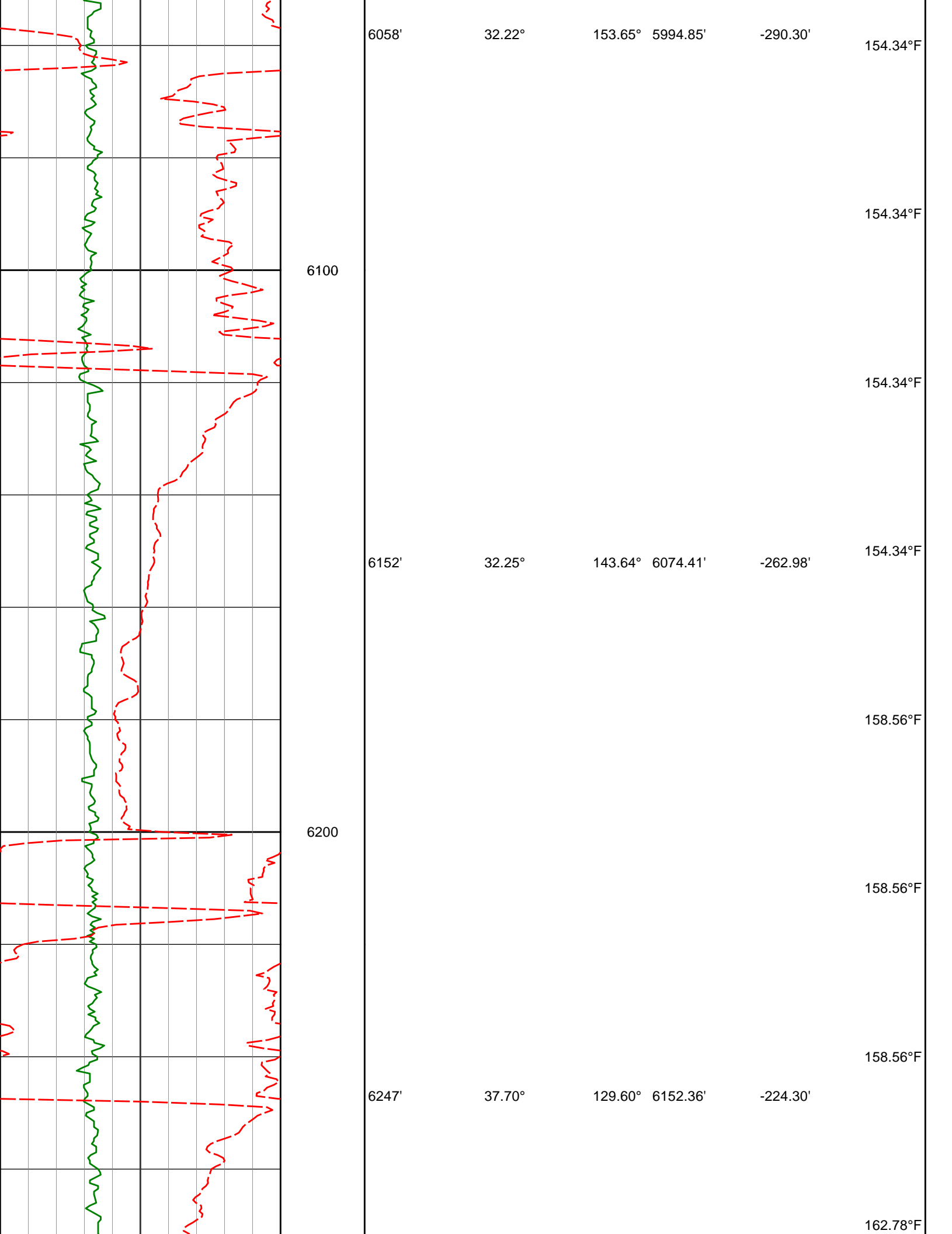


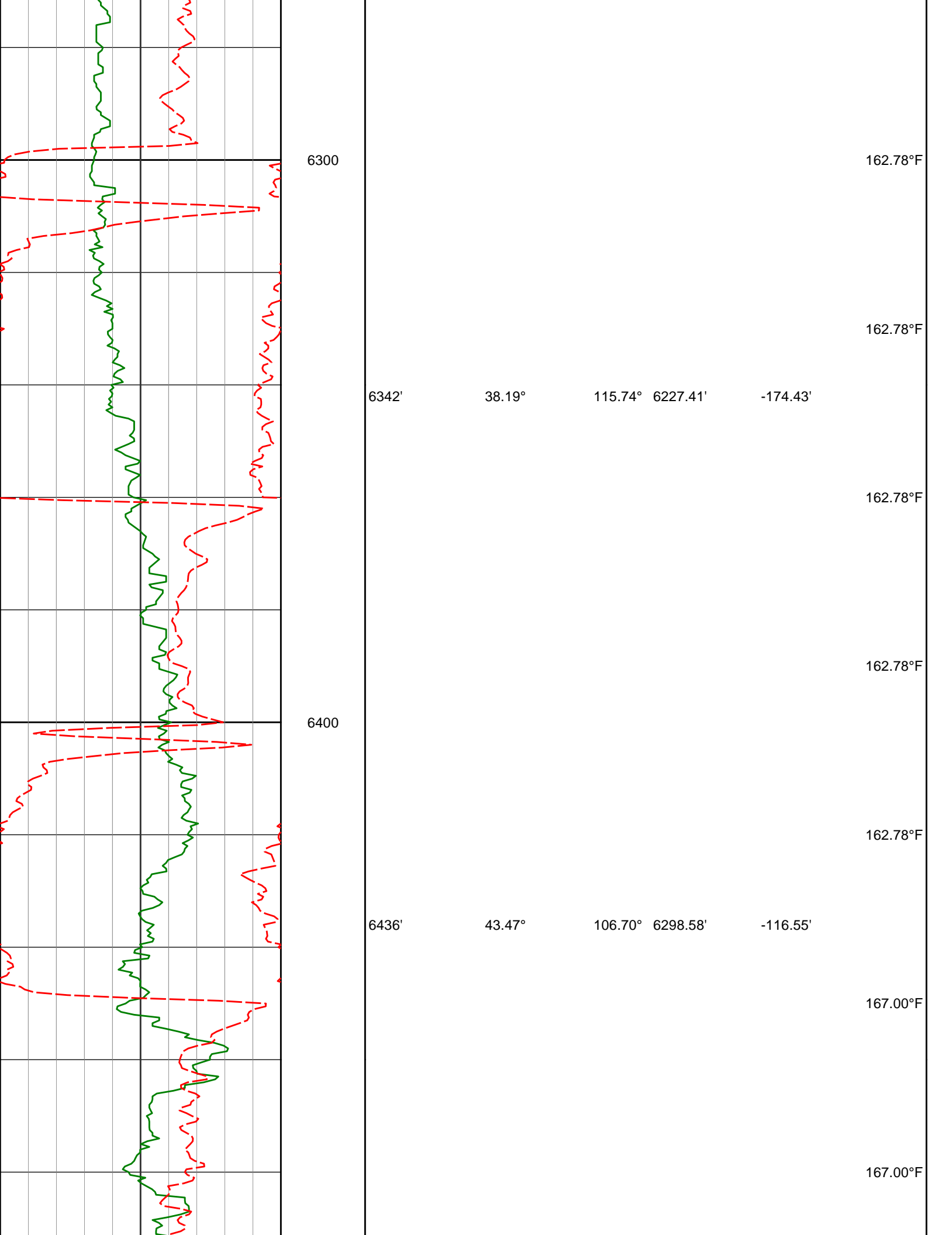


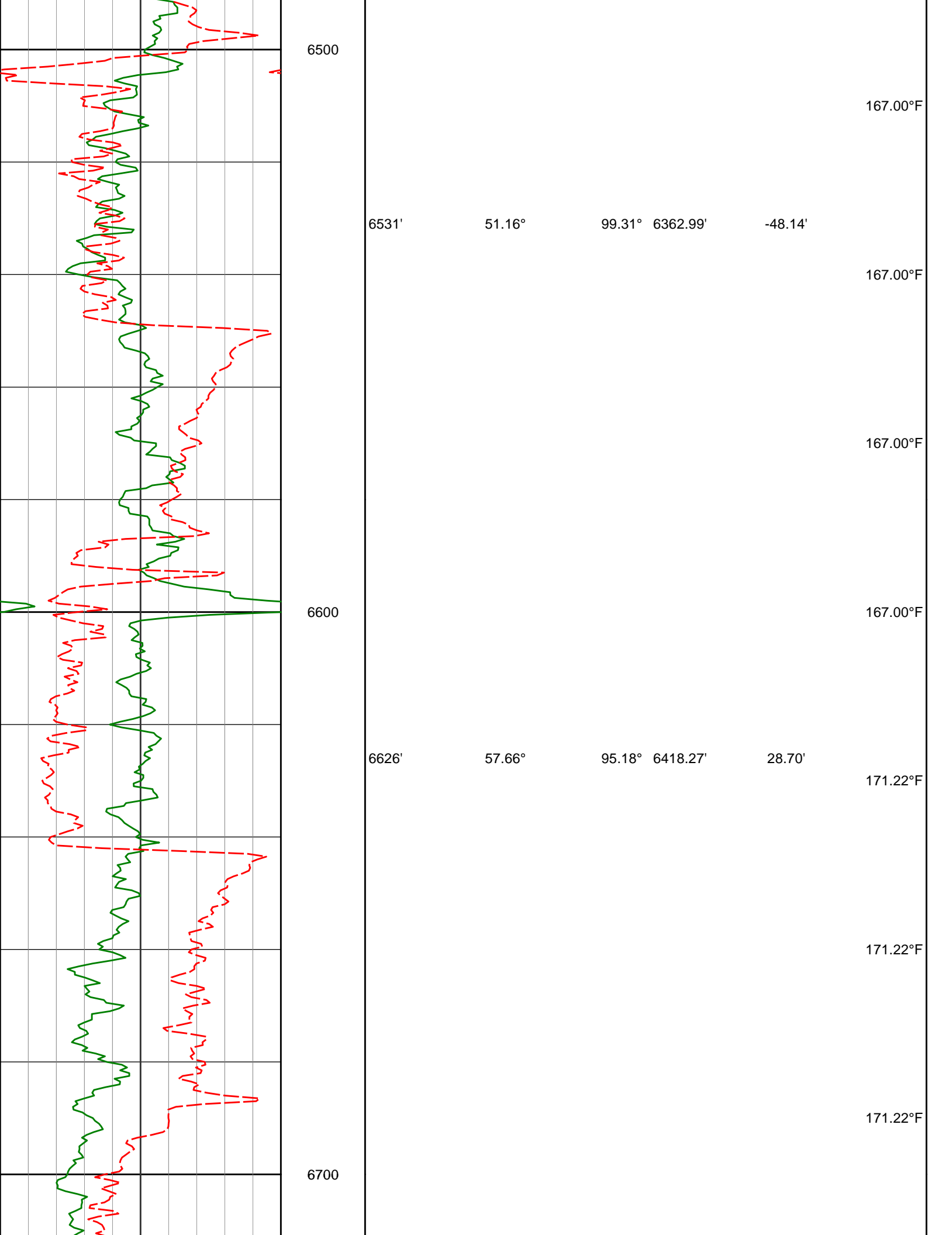


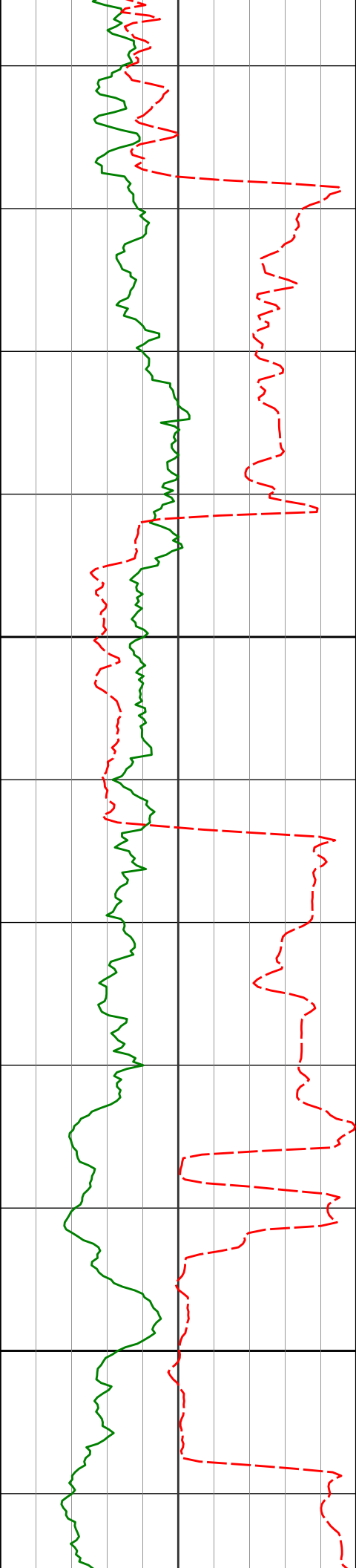
15400	15411'	91.42°	86.37°	6449.57'	8769.01'	238.72°F
15450						238.72°F
						234.50°F
15500	15506'	92.06°	86.02°	6446.68'	8863.51'	234.50°F
						234.50°F
15550						276.69°F
15600	15601'	90.06°	86.27°	6444.92'	8958.04'	221.84°F
						238.72°F
15650						238.72°F
15700	15695'	90.00°	86.35°	6444.87'	9051.61'	238.72°F
						238.72°F
15750						238.72°F
						238.72°F
15800	15790'	91.66°	86.74°	6443.49'	9146.20'	238.72°F
						238.72°F
15850						238.72°F
						238.72°F
15900						238.72°F
	15925'	92.90°	85.88°	6438.11'	9280.48'	











6800

6900

6720'

6815'

6910'

65.29°

73.65°

79.96°

91.79°

87.51°

86.67°

6463.13'

6496.43'

6518.10'

111.18'

199.97'

292.11'

171.22°F

171.22°F

171.22°F

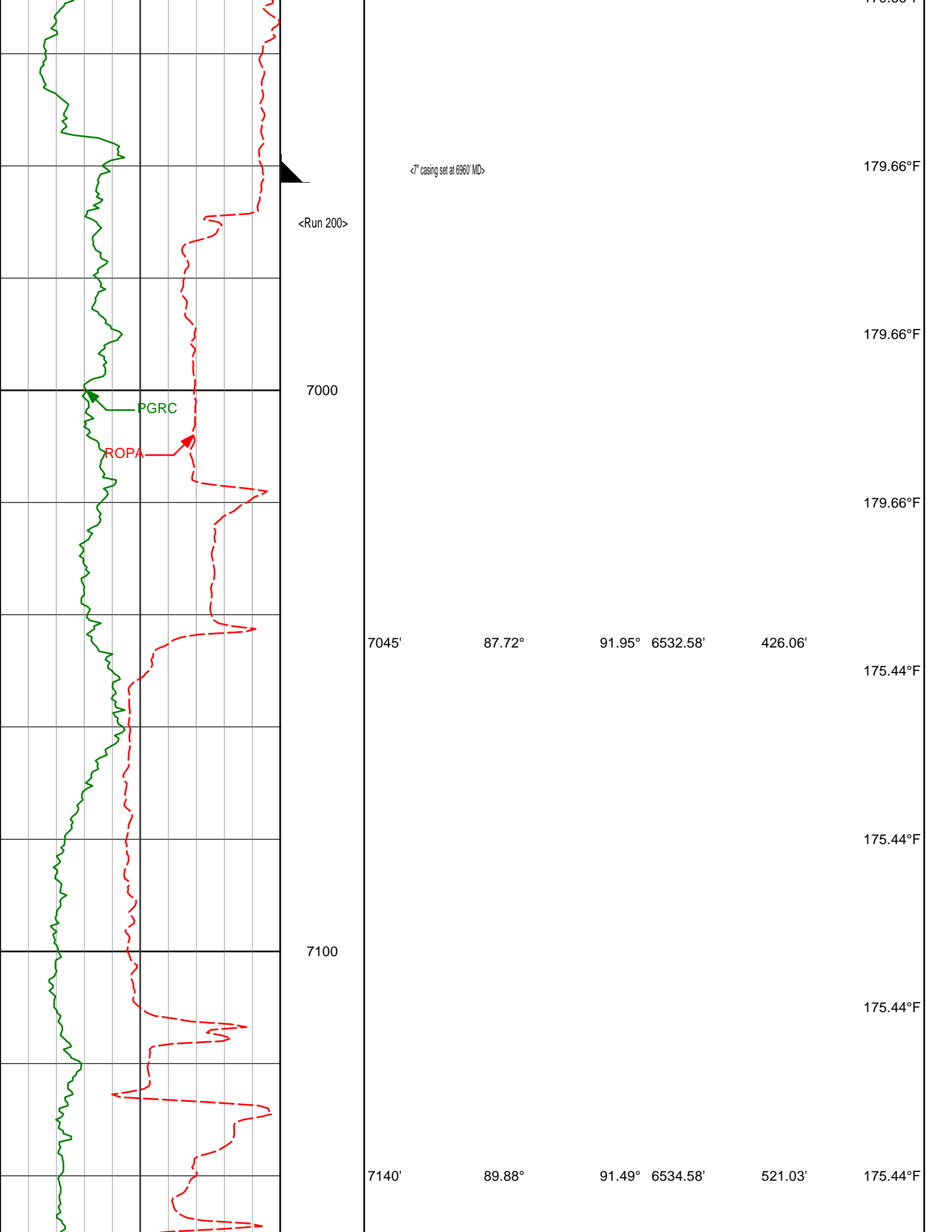
171.22°F

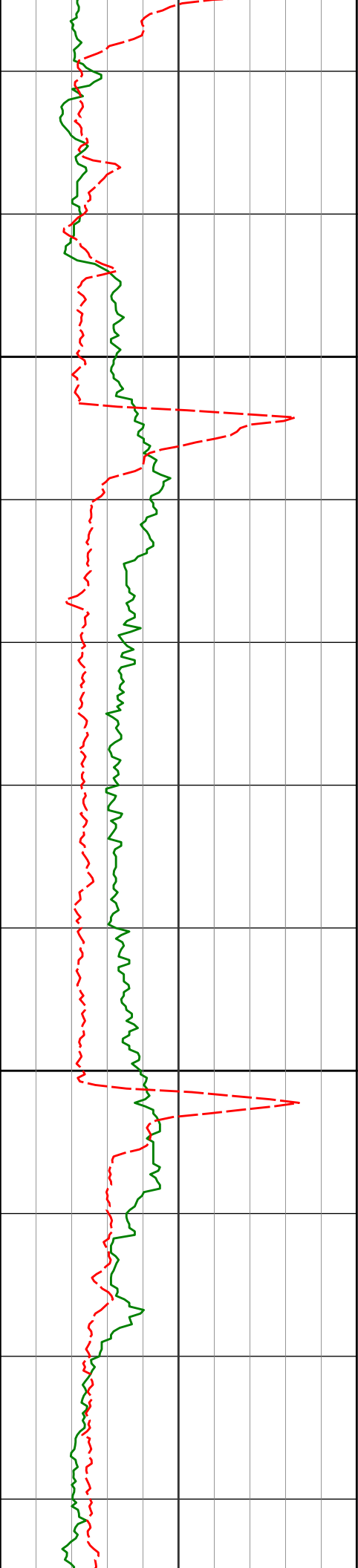
171.22°F

171.22°F

171.22°F

179.66°F





7200

7300

7234'

7329'

90.68°

92.87°

90.14°

90.52°

6534.12'

6531.19'

615.01'

709.93'

175.44°F

175.44°F

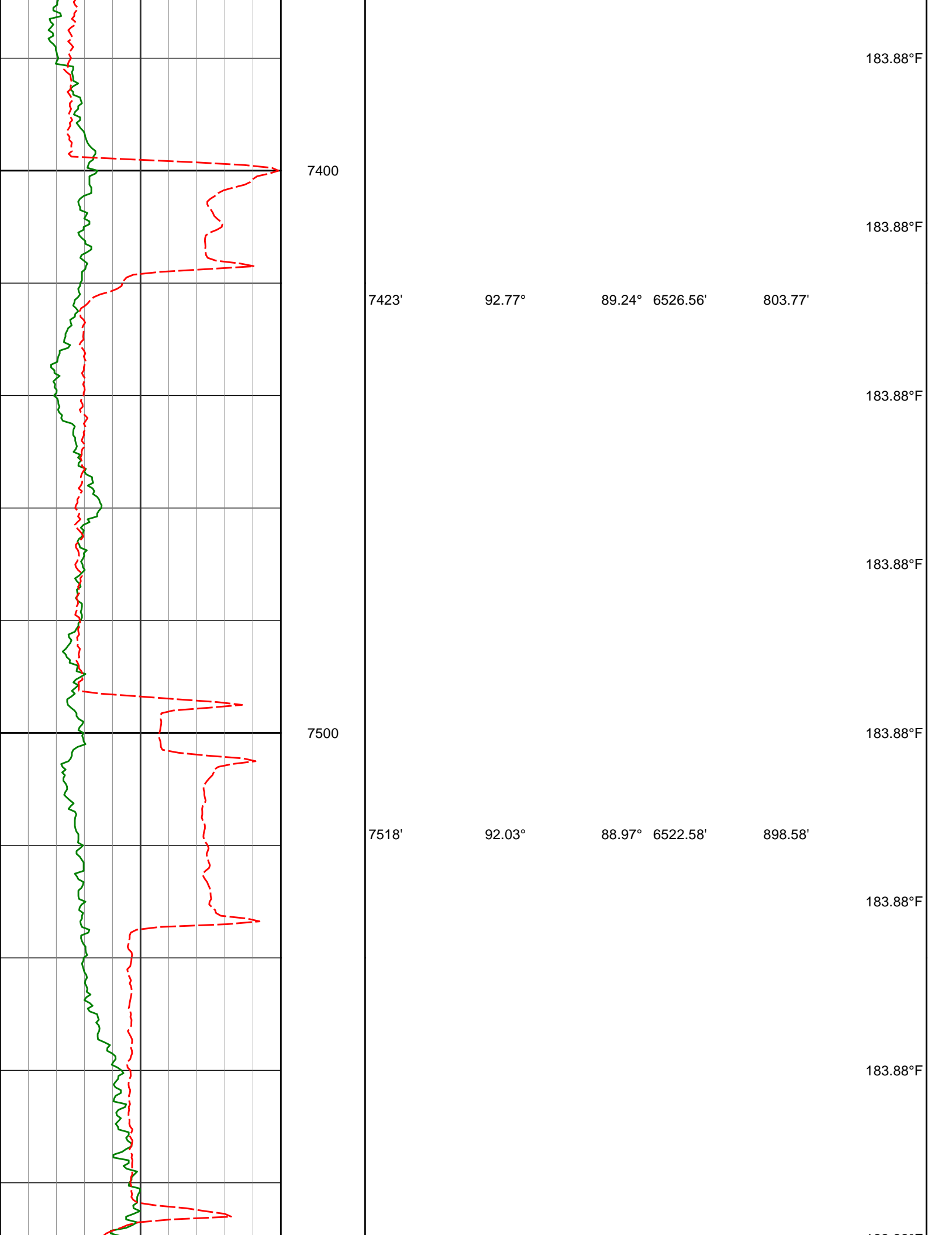
175.44°F

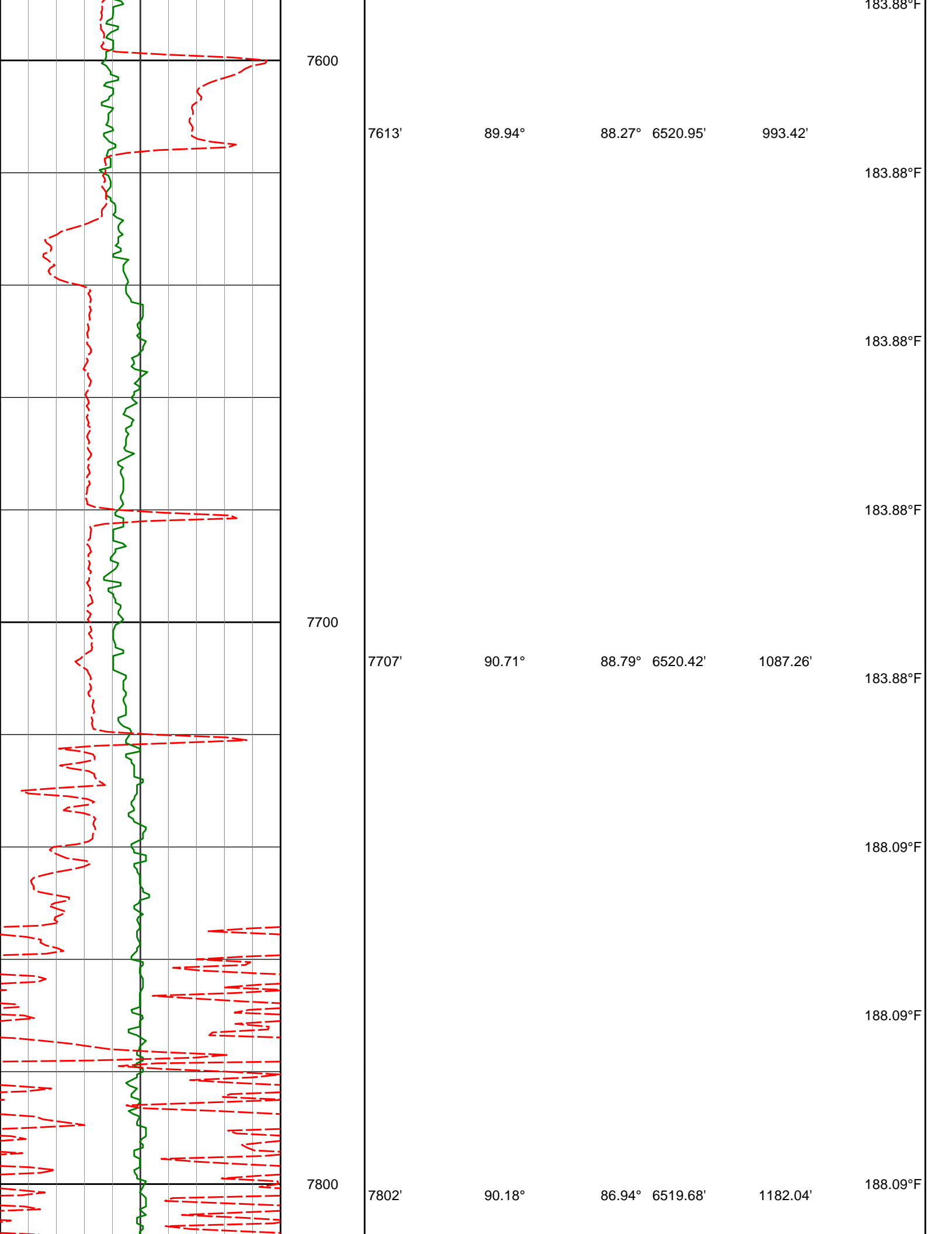
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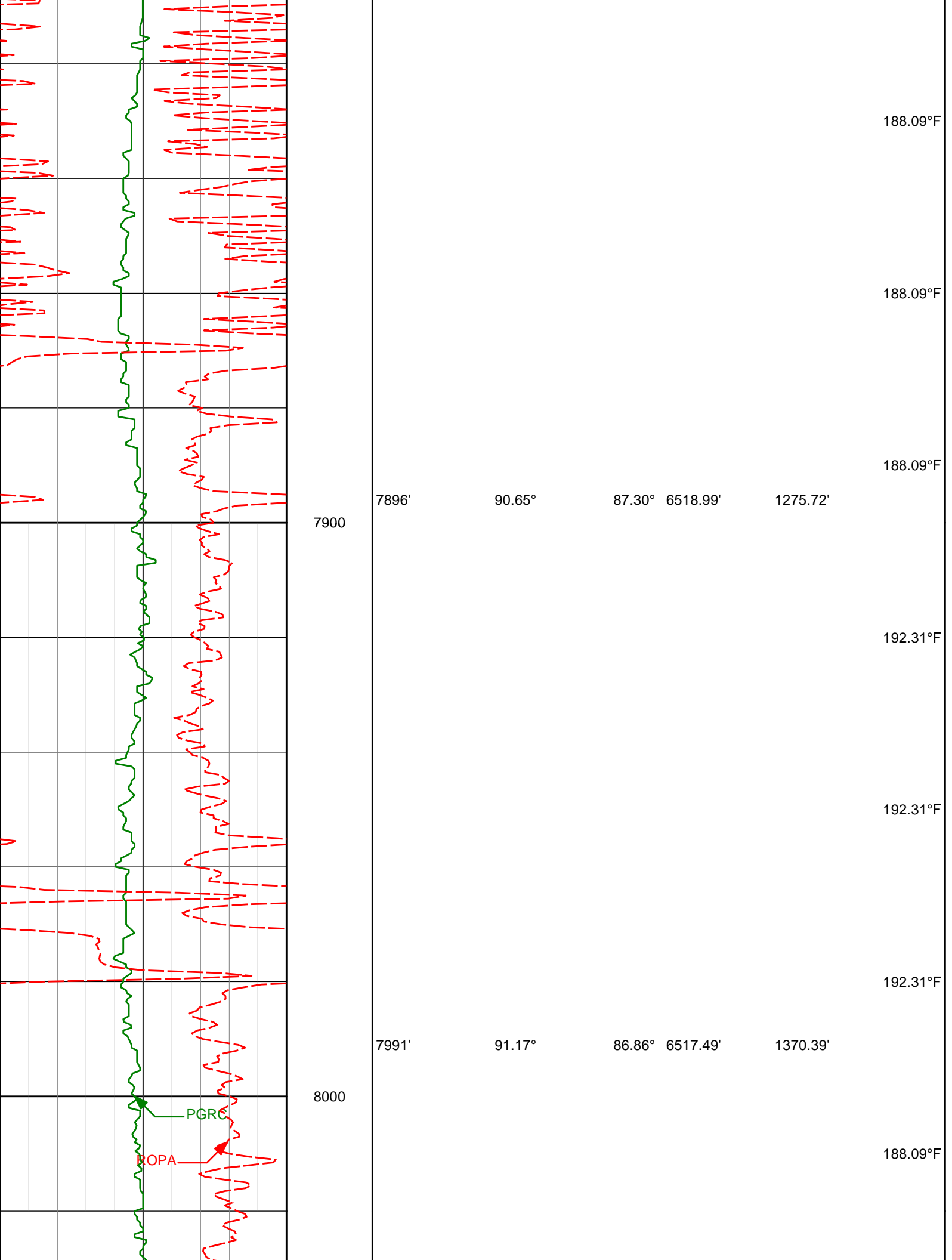
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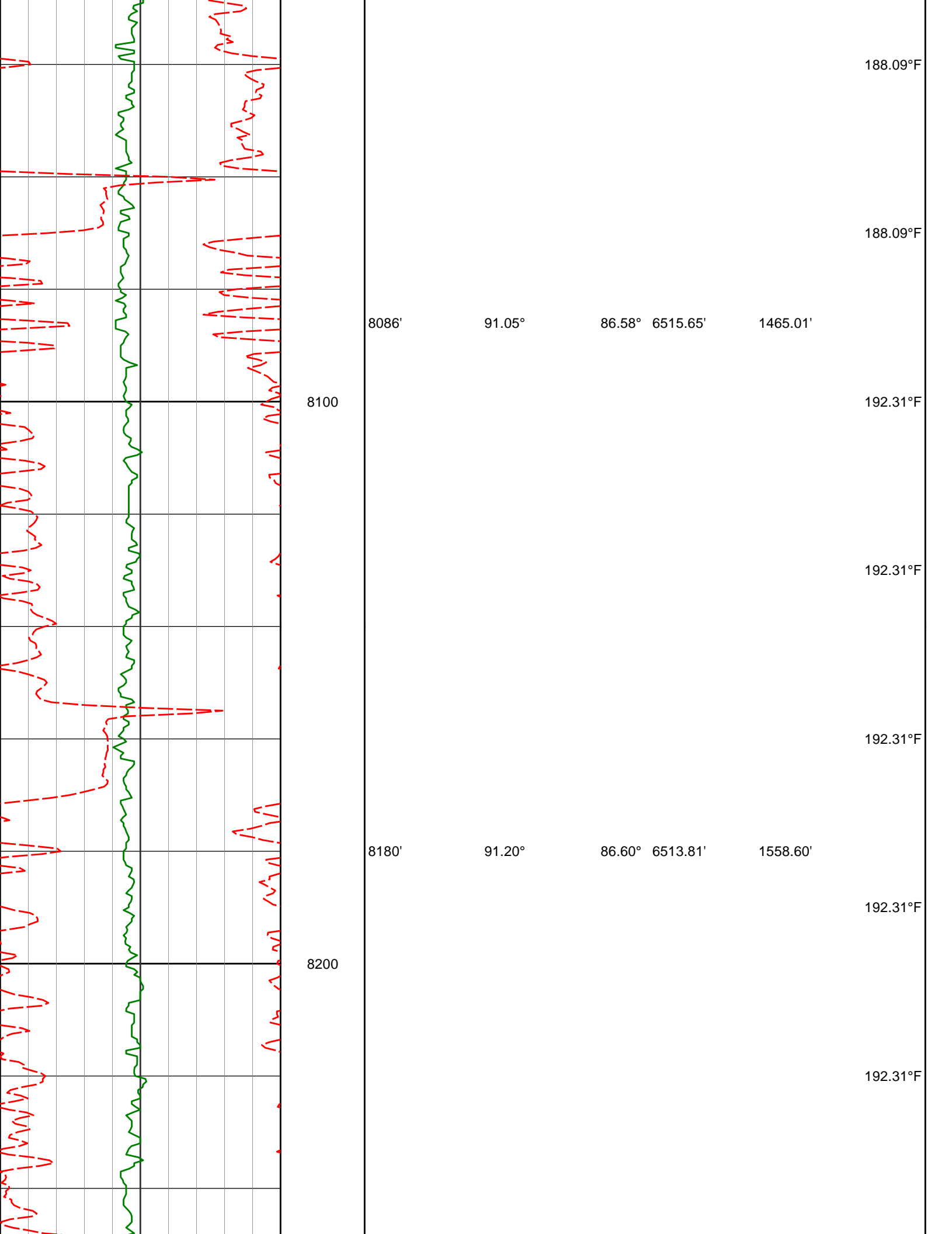
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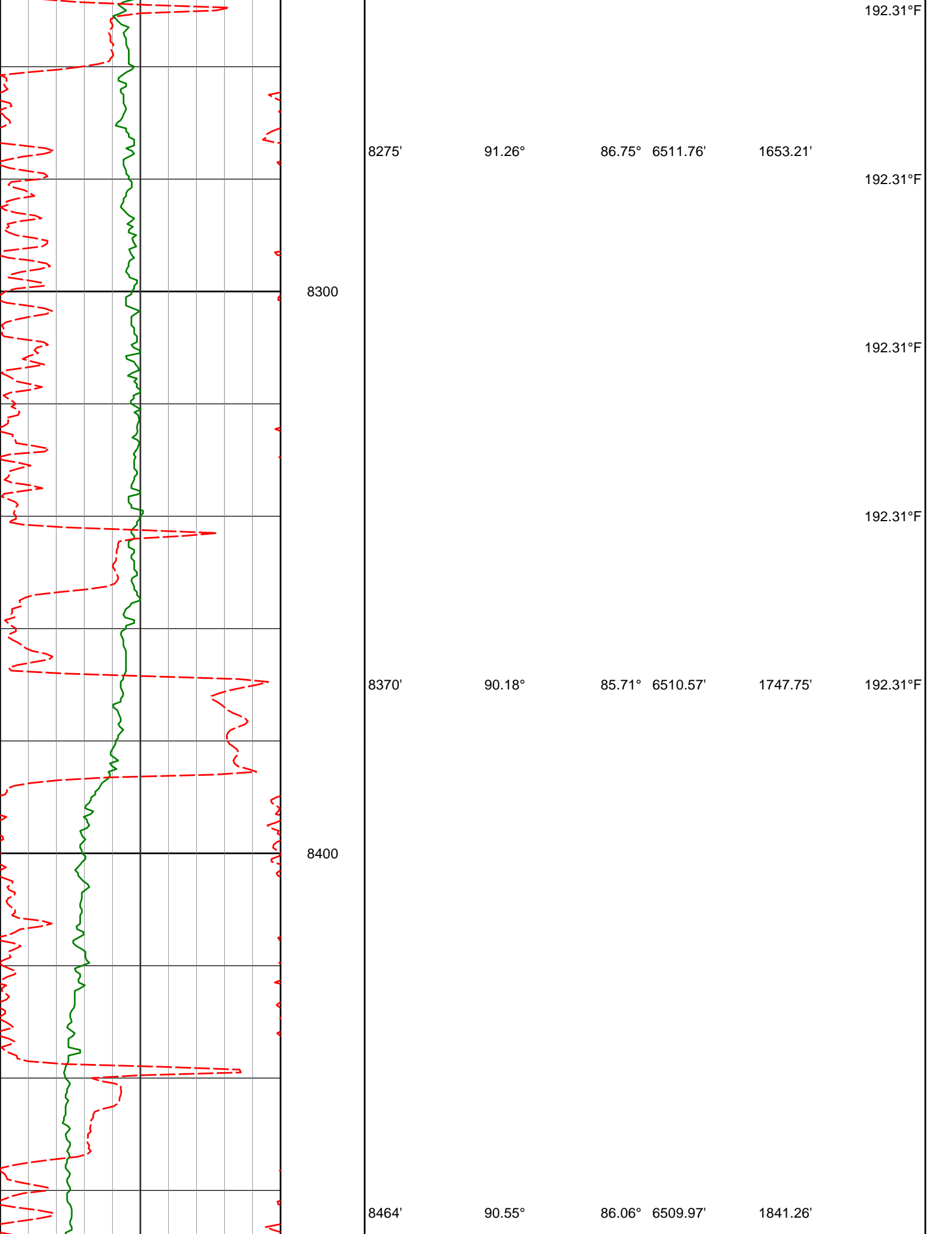
183.88°F

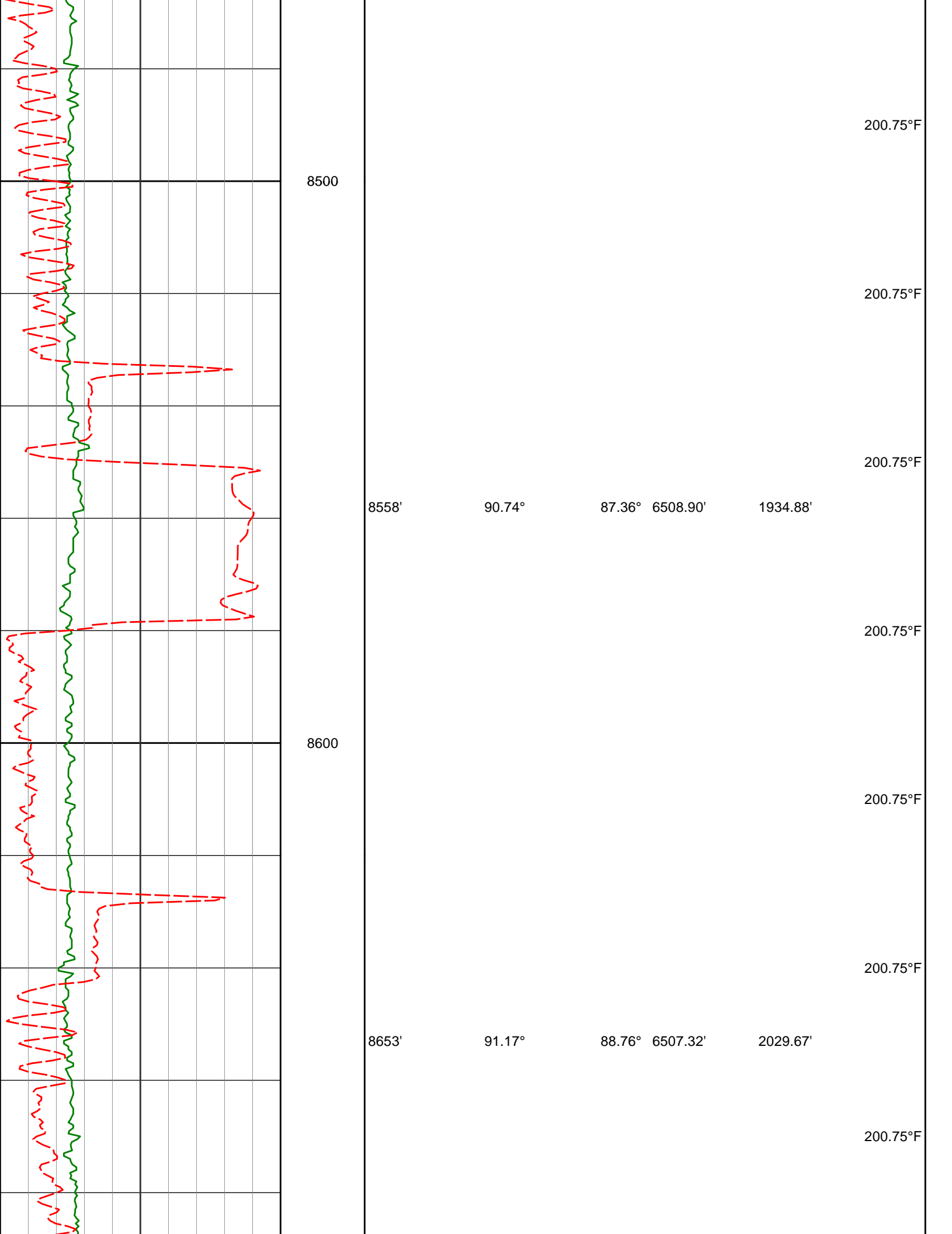


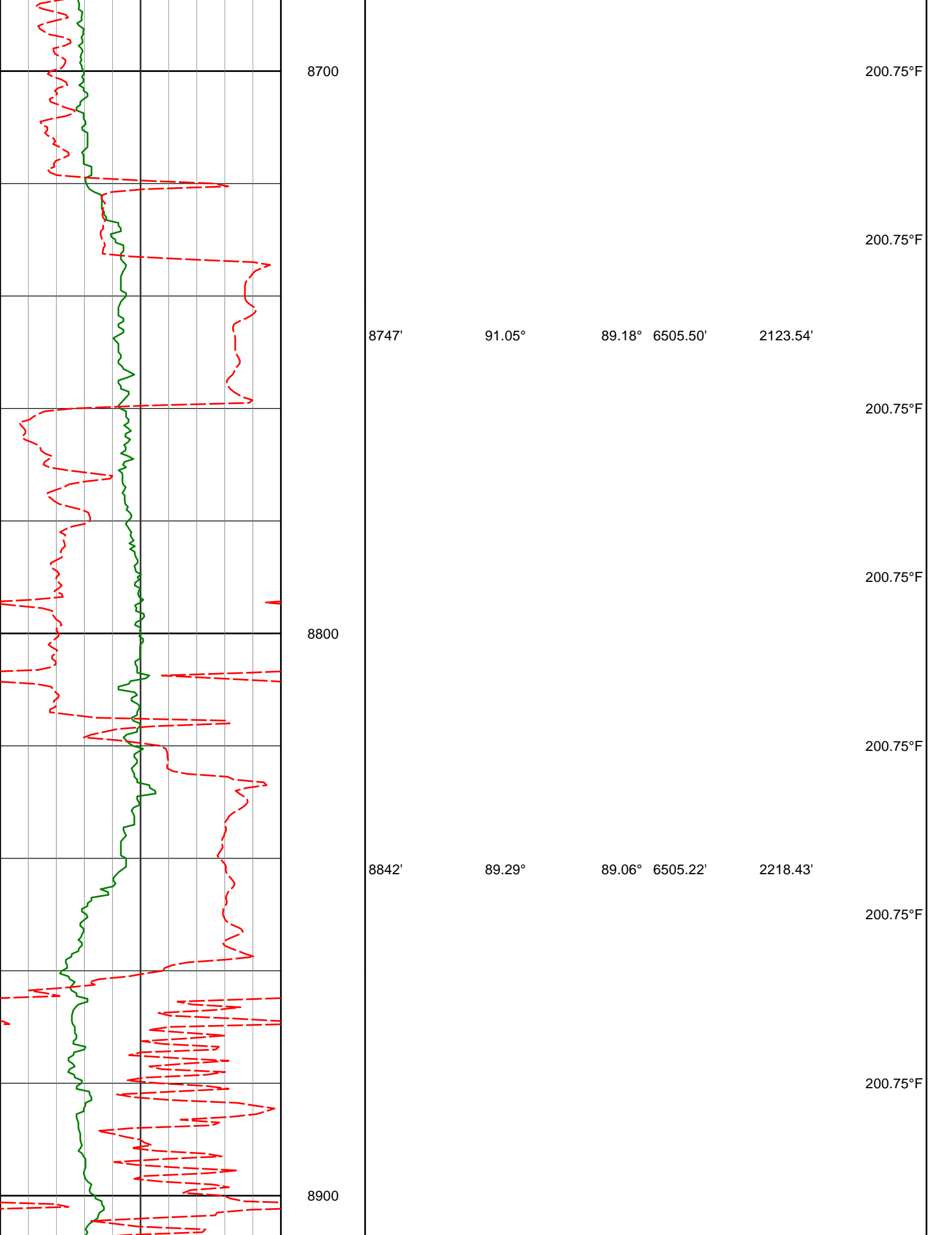


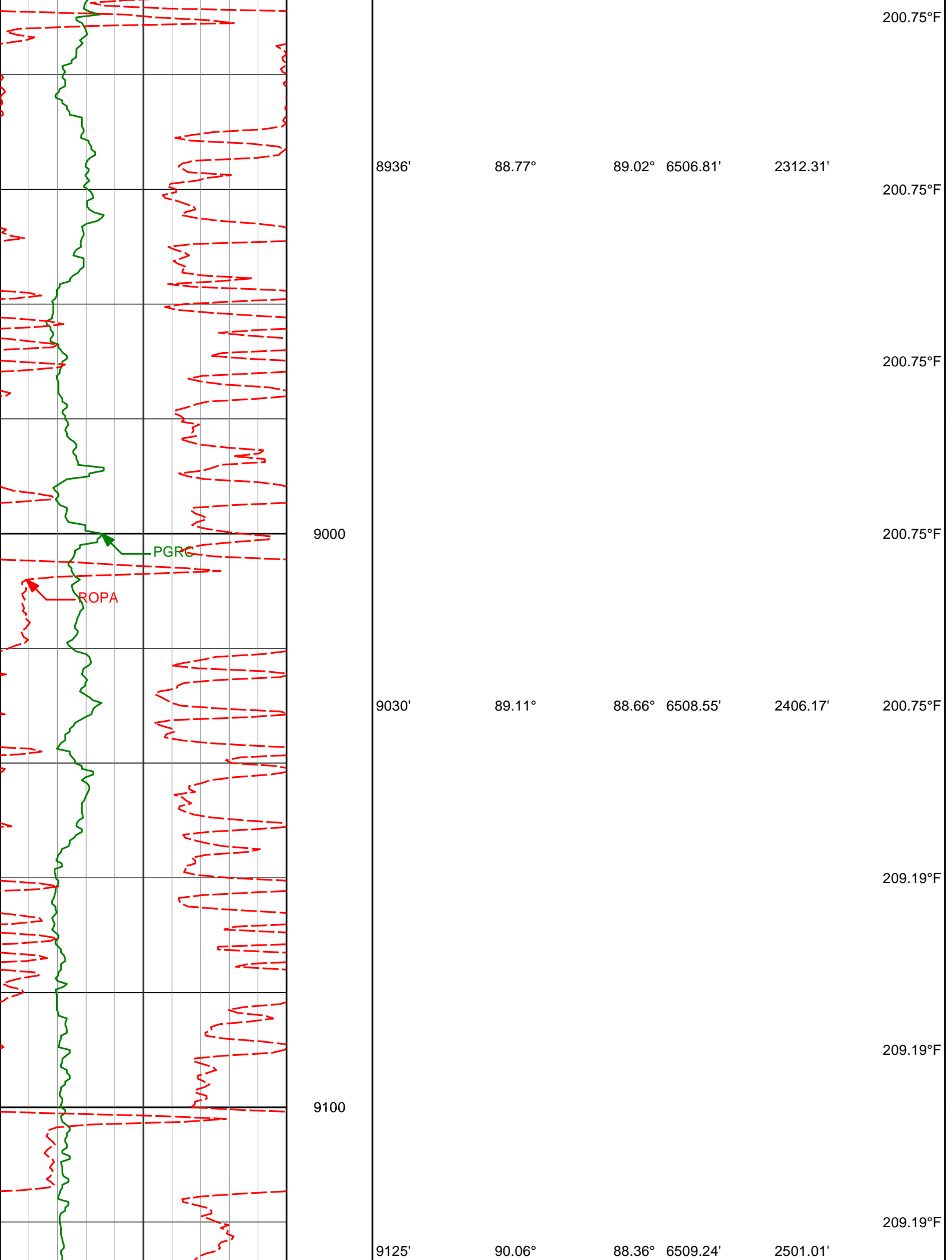


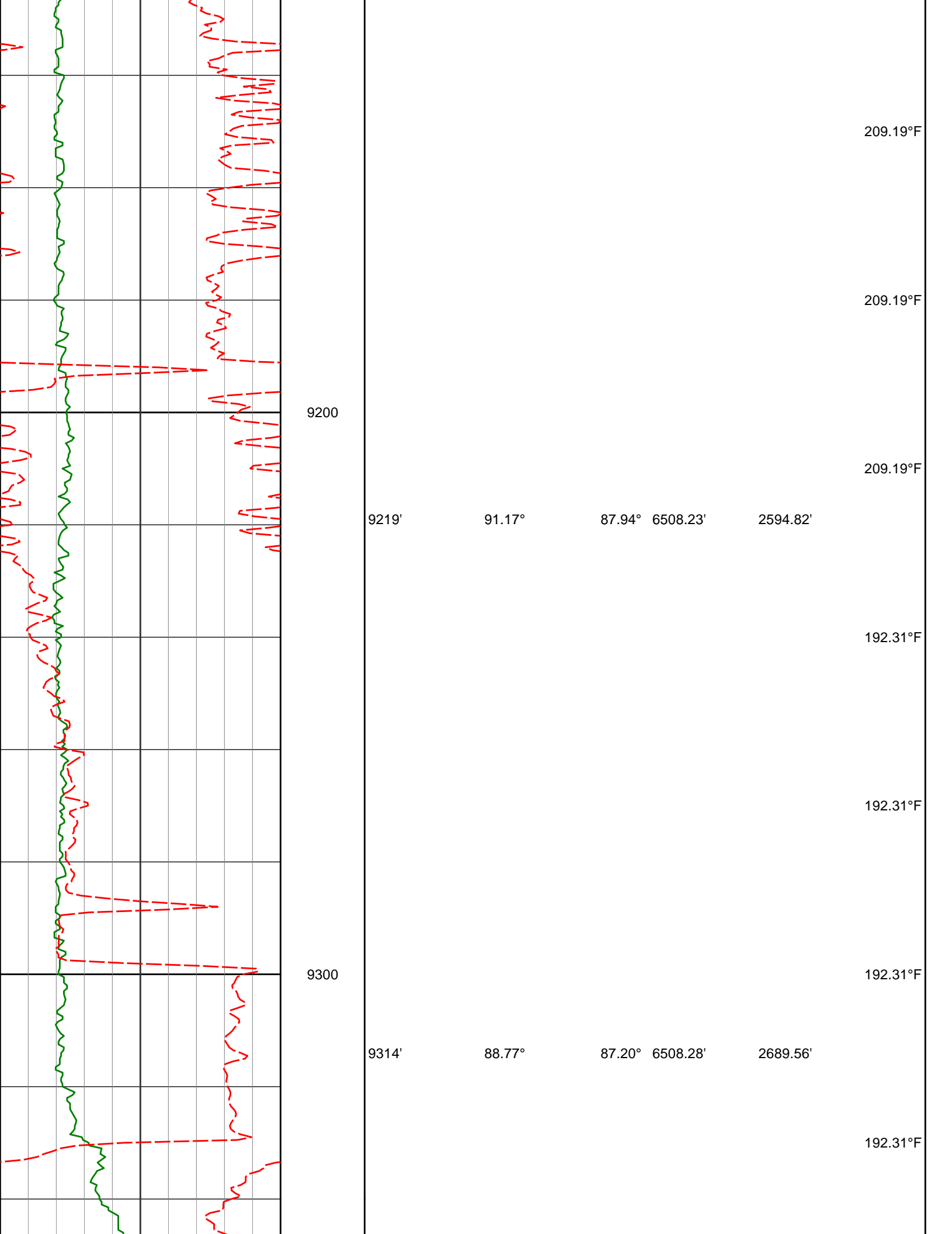


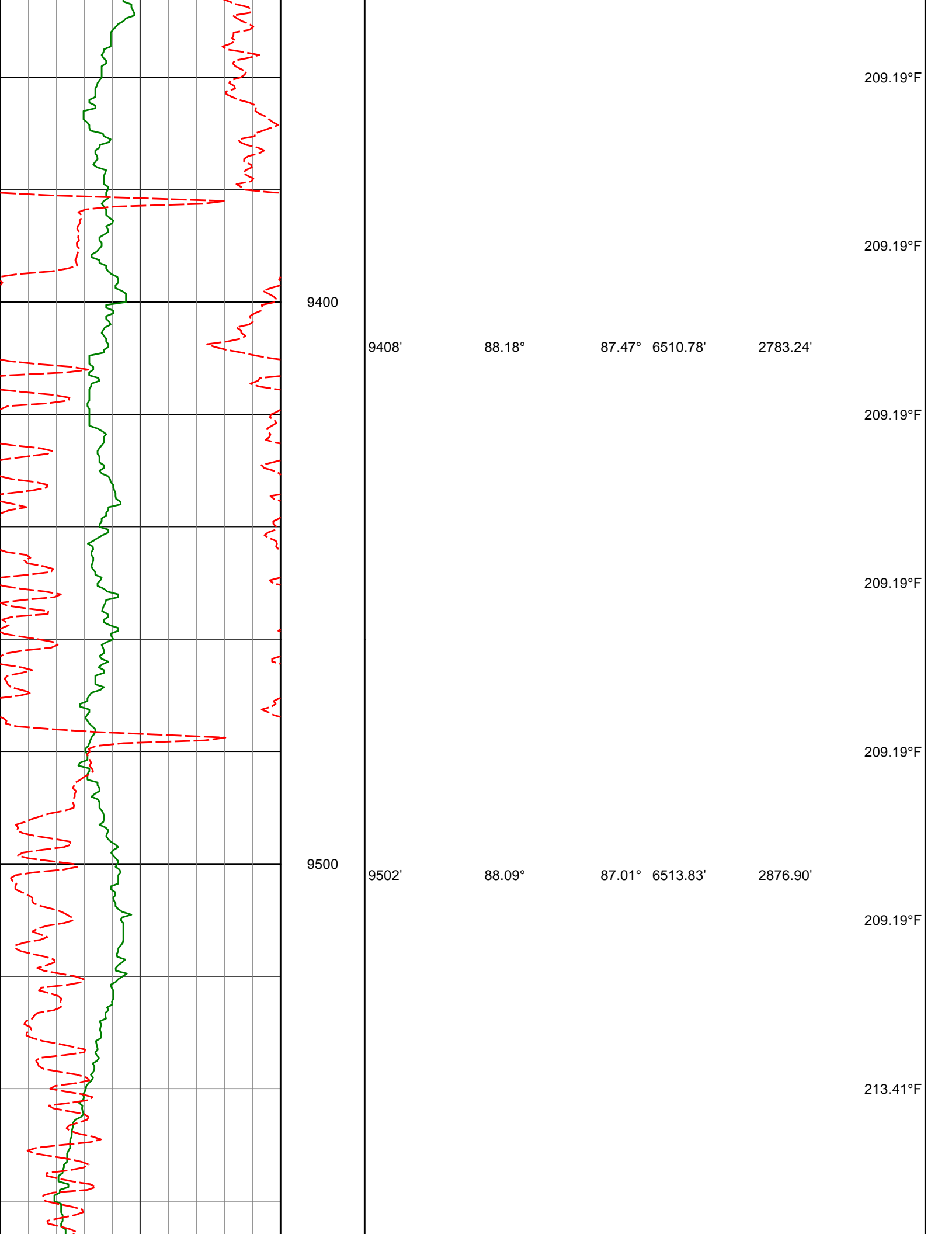


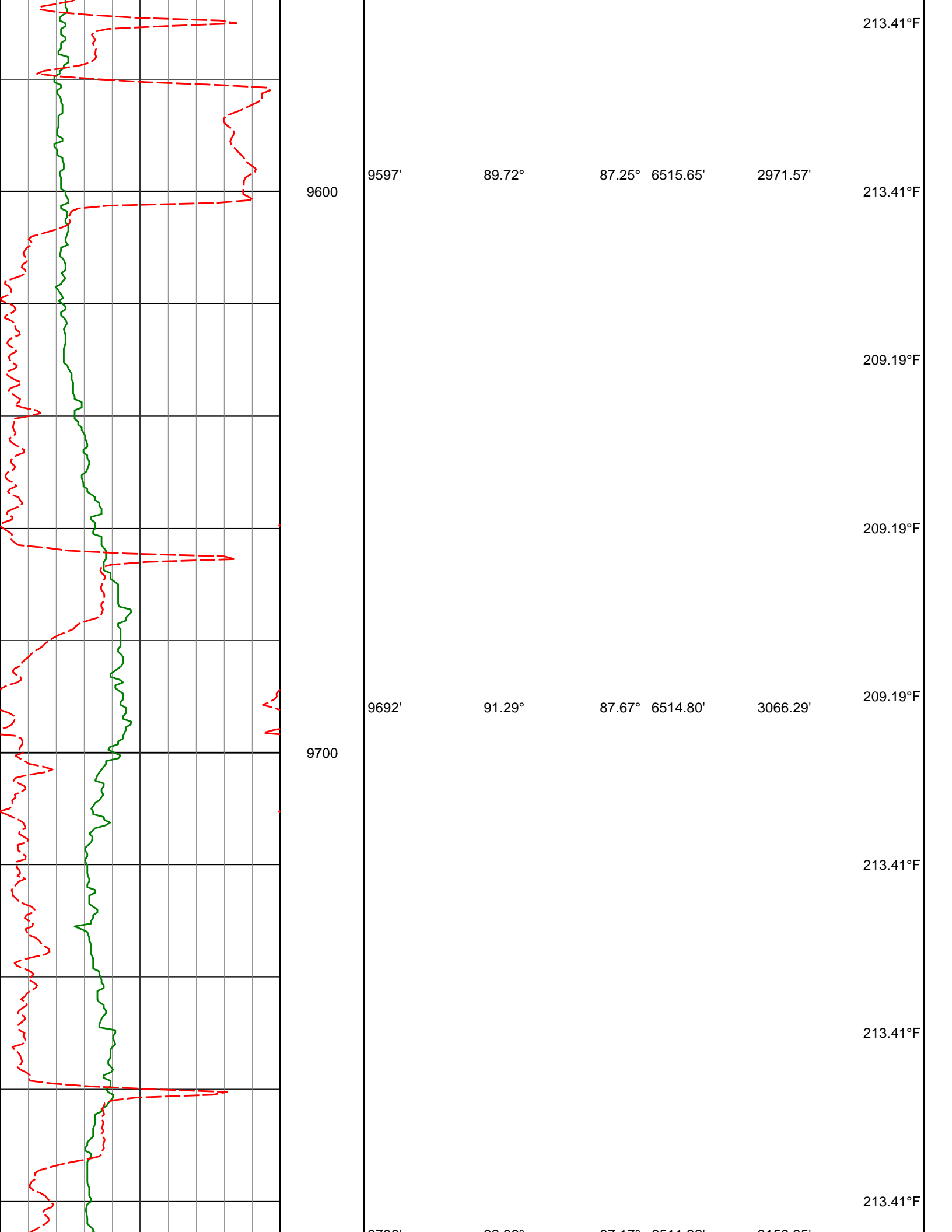


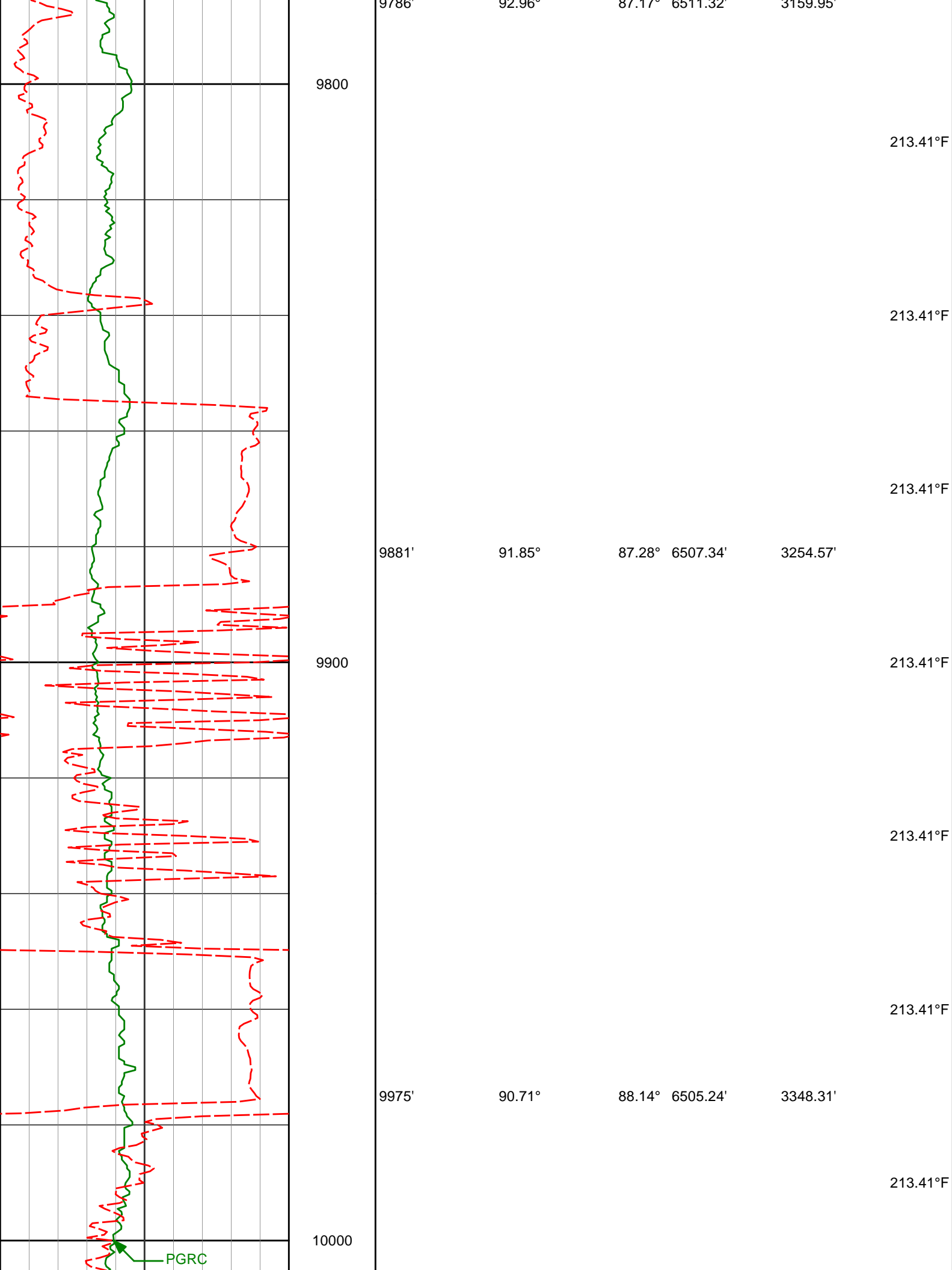


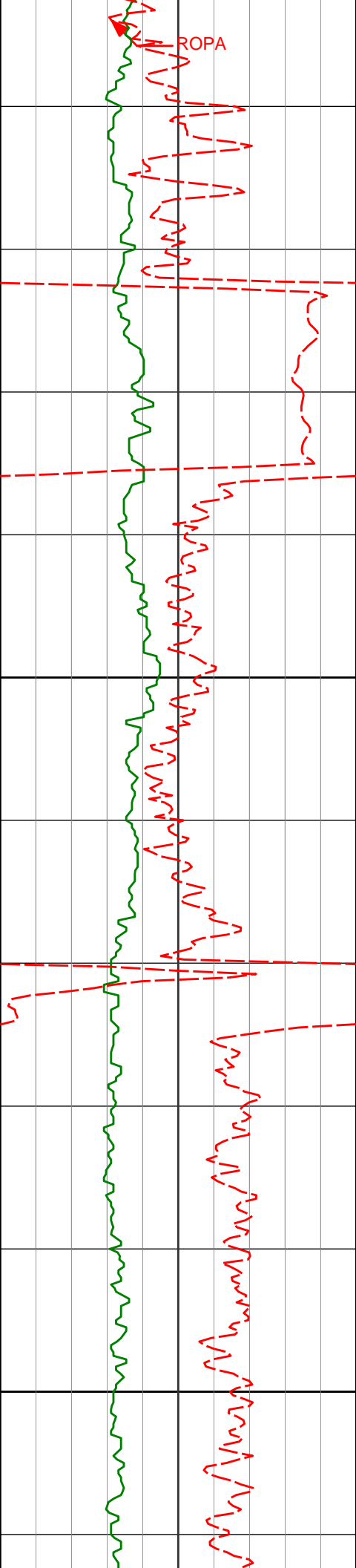












10100

10200

10070'

10164'

89.17°

90.22°

89.15°

89.47°

6505.34'

6505.84'

3443.16'

3537.07'

213.41°F

213.41°F

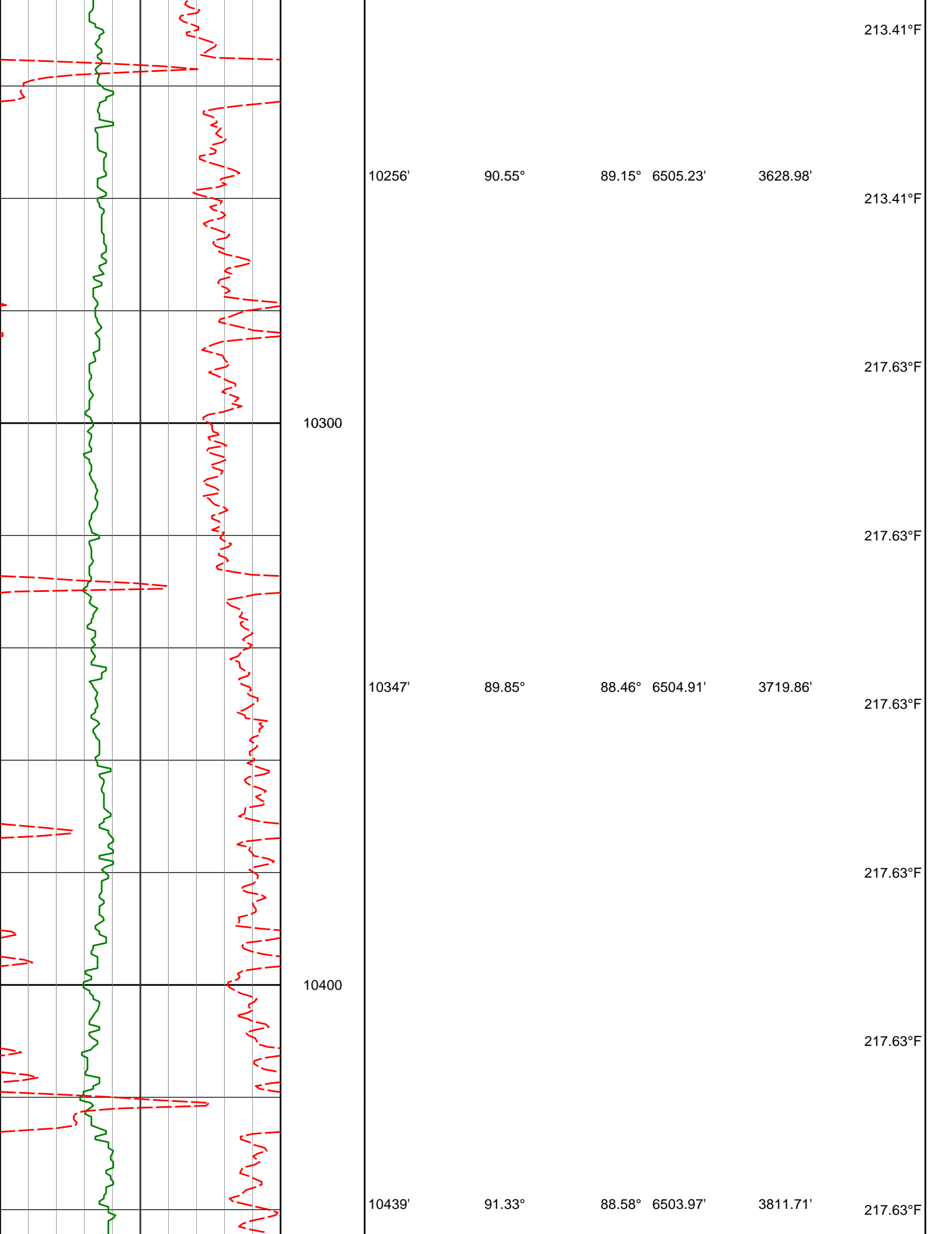
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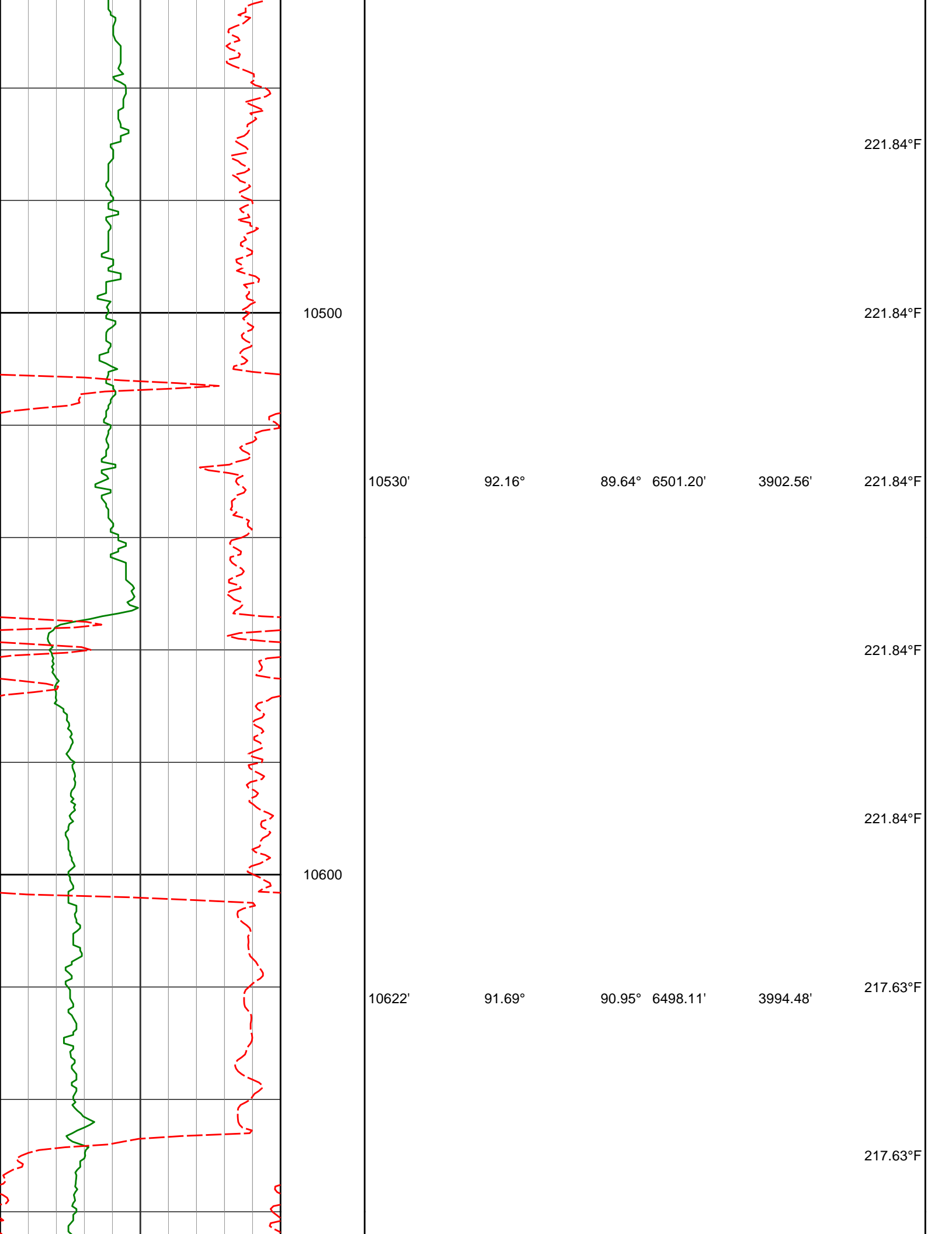
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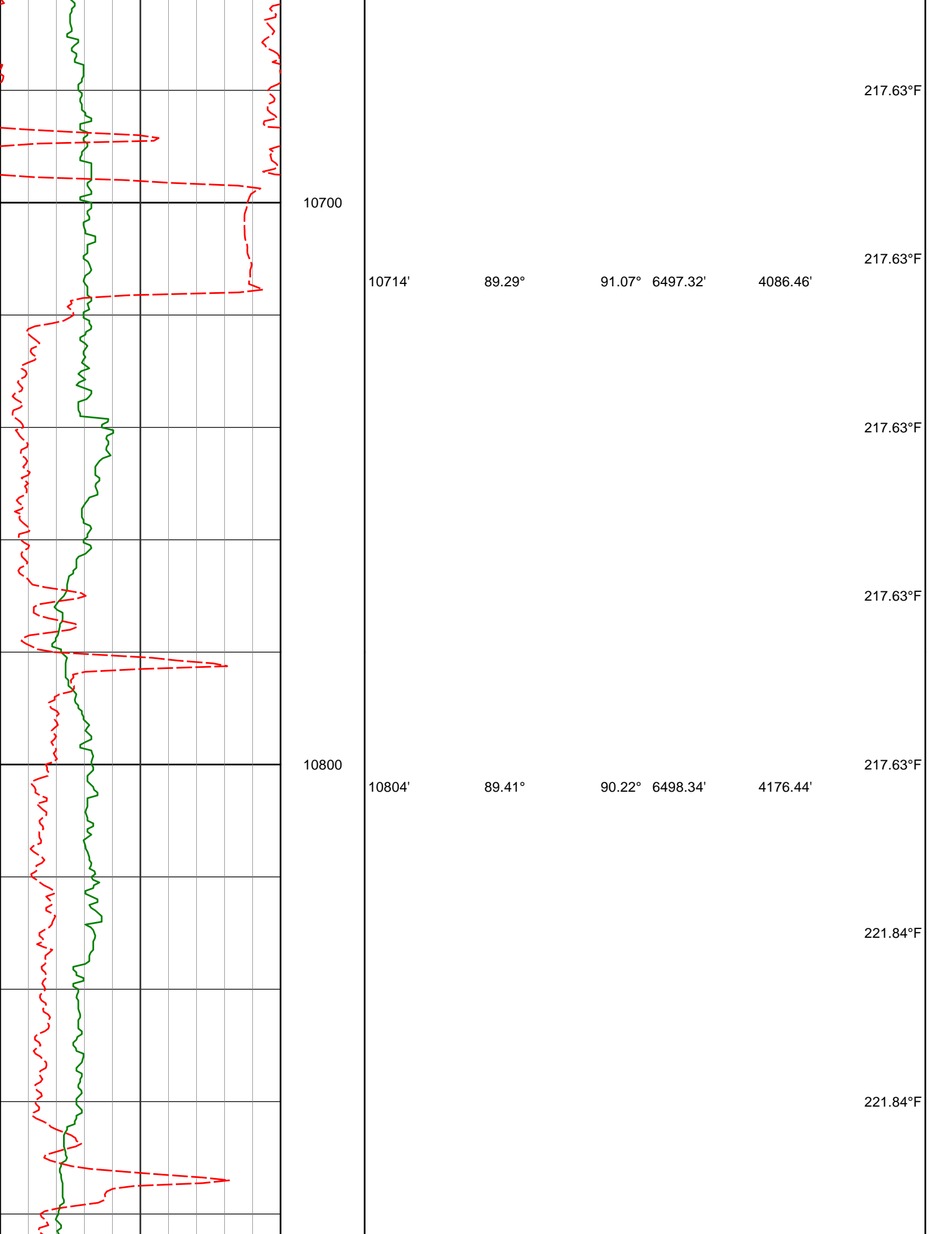
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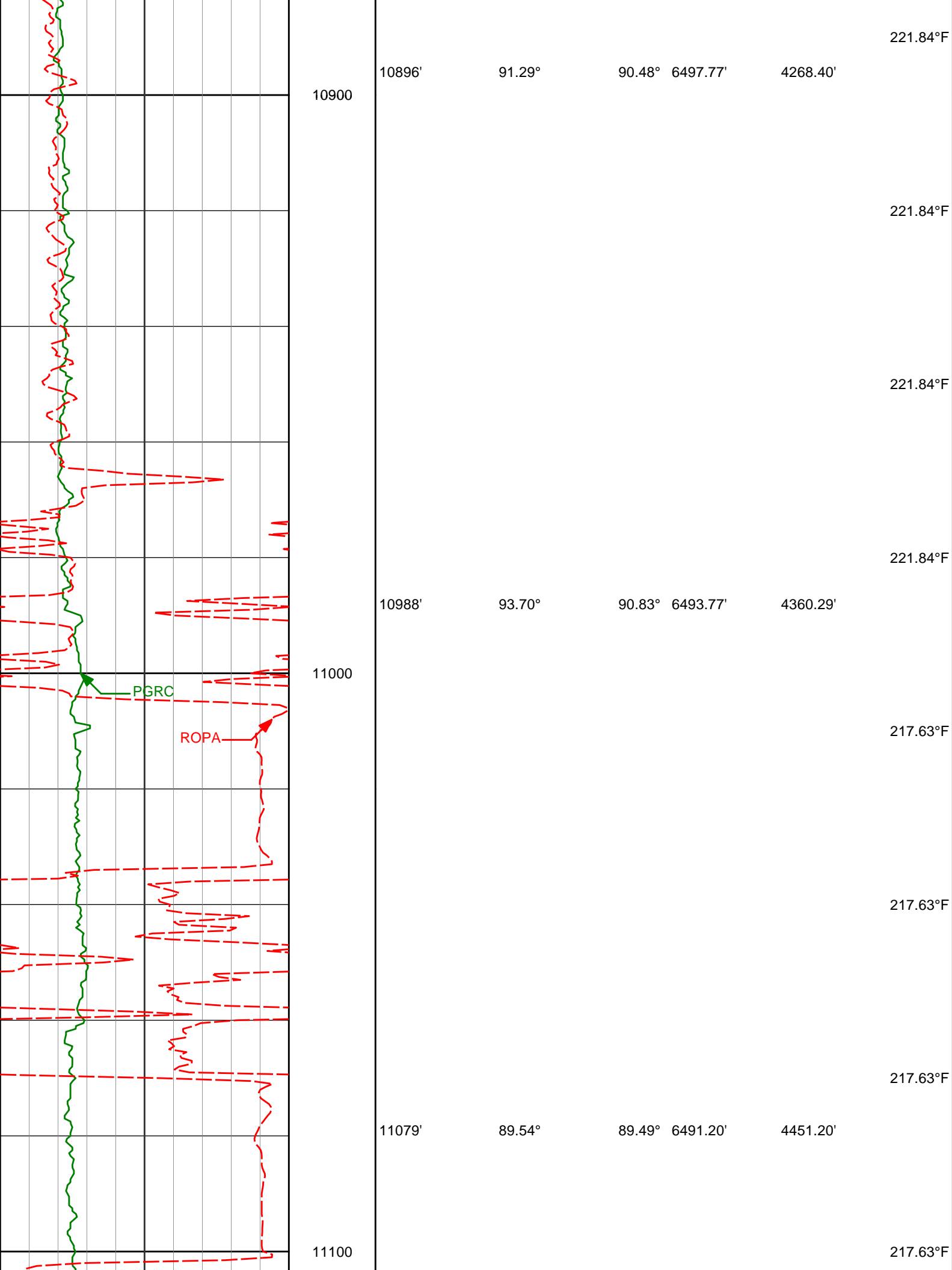
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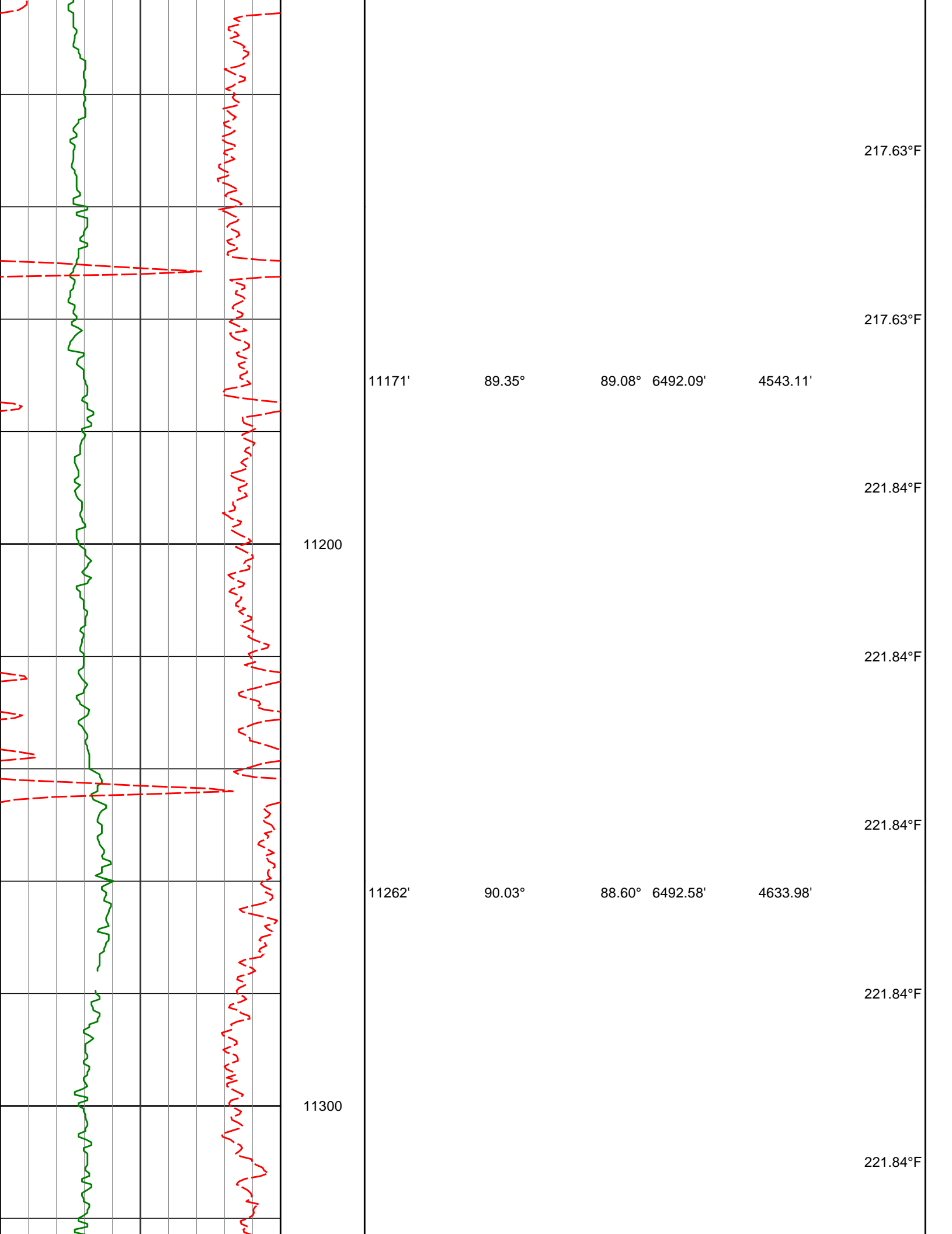
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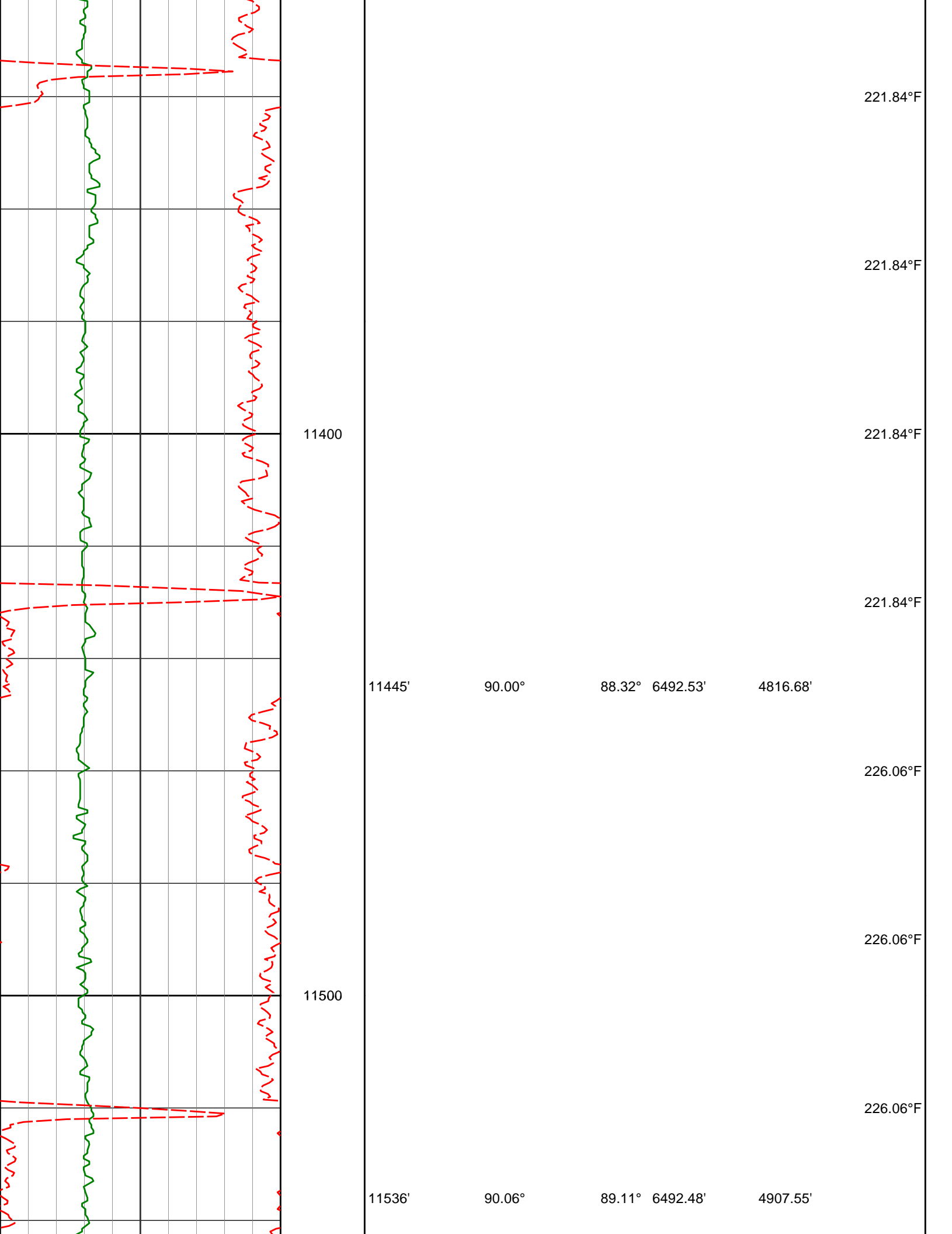


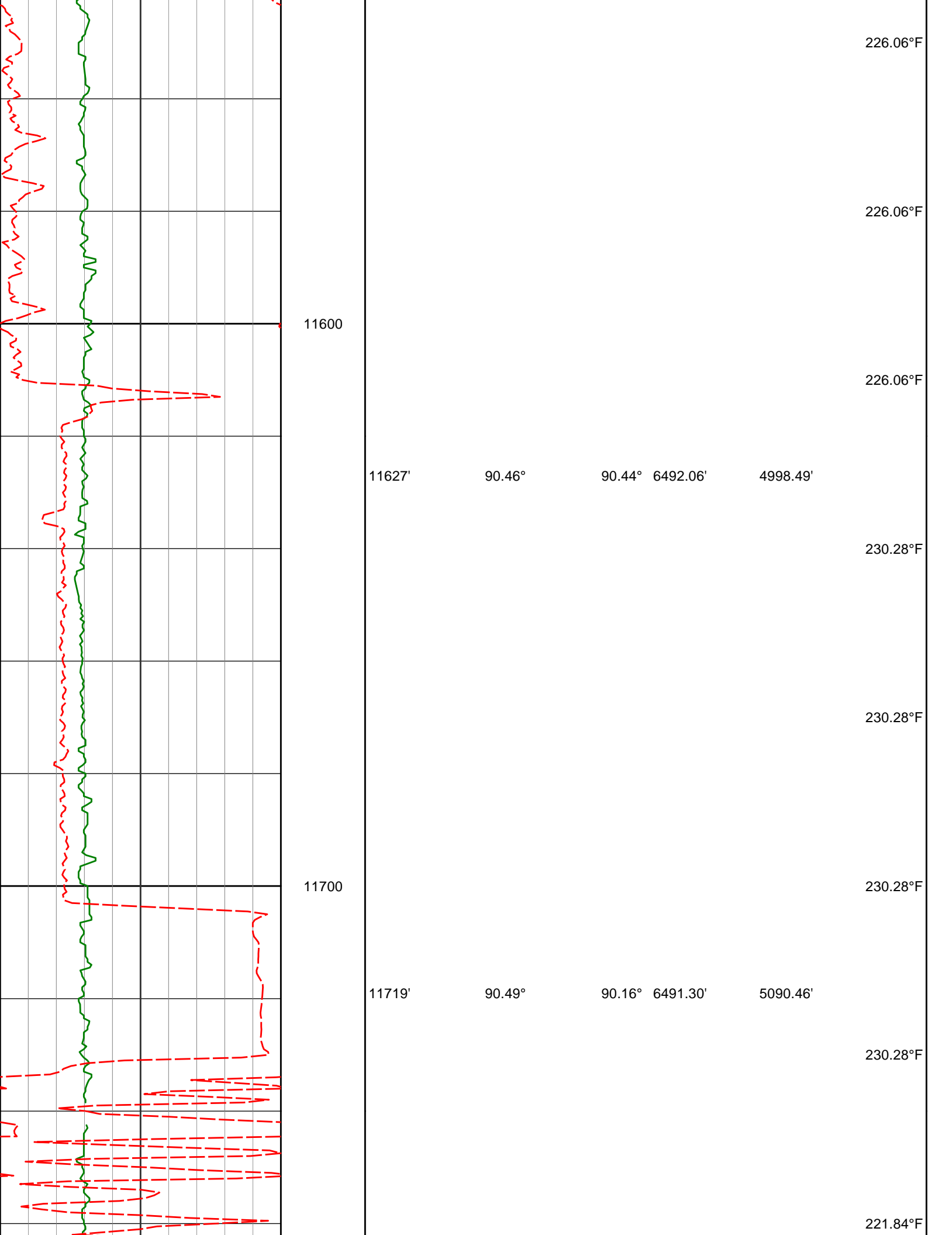


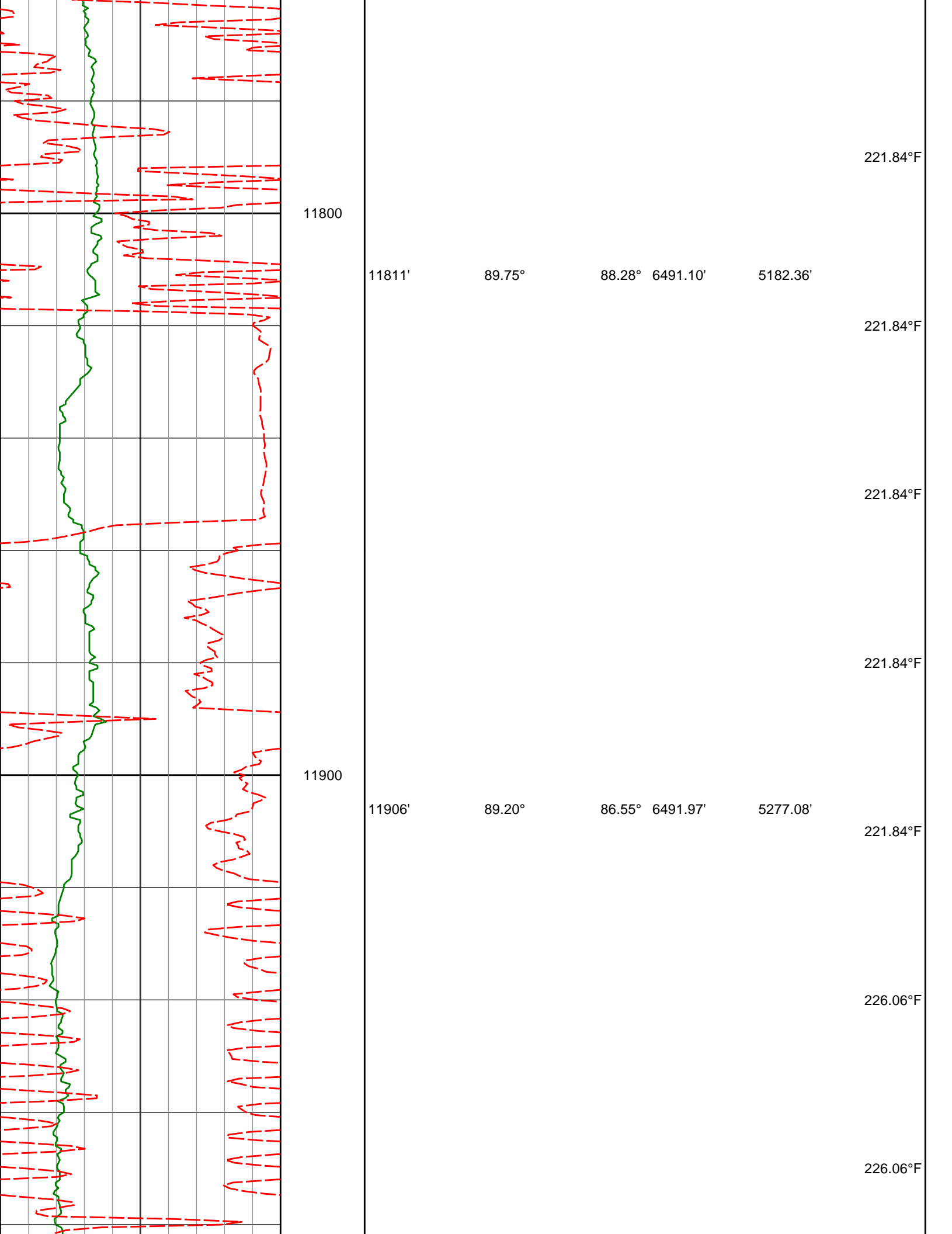


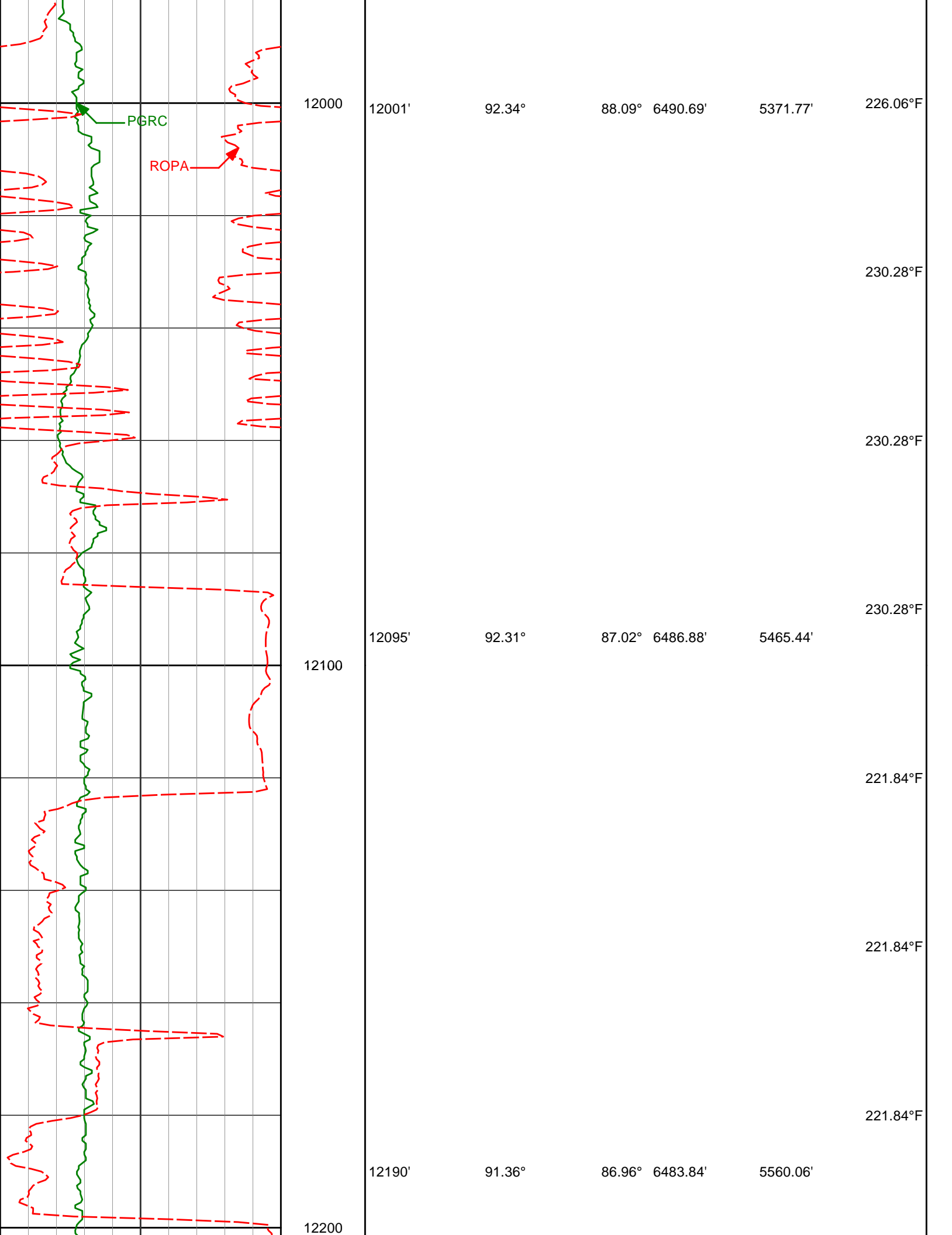


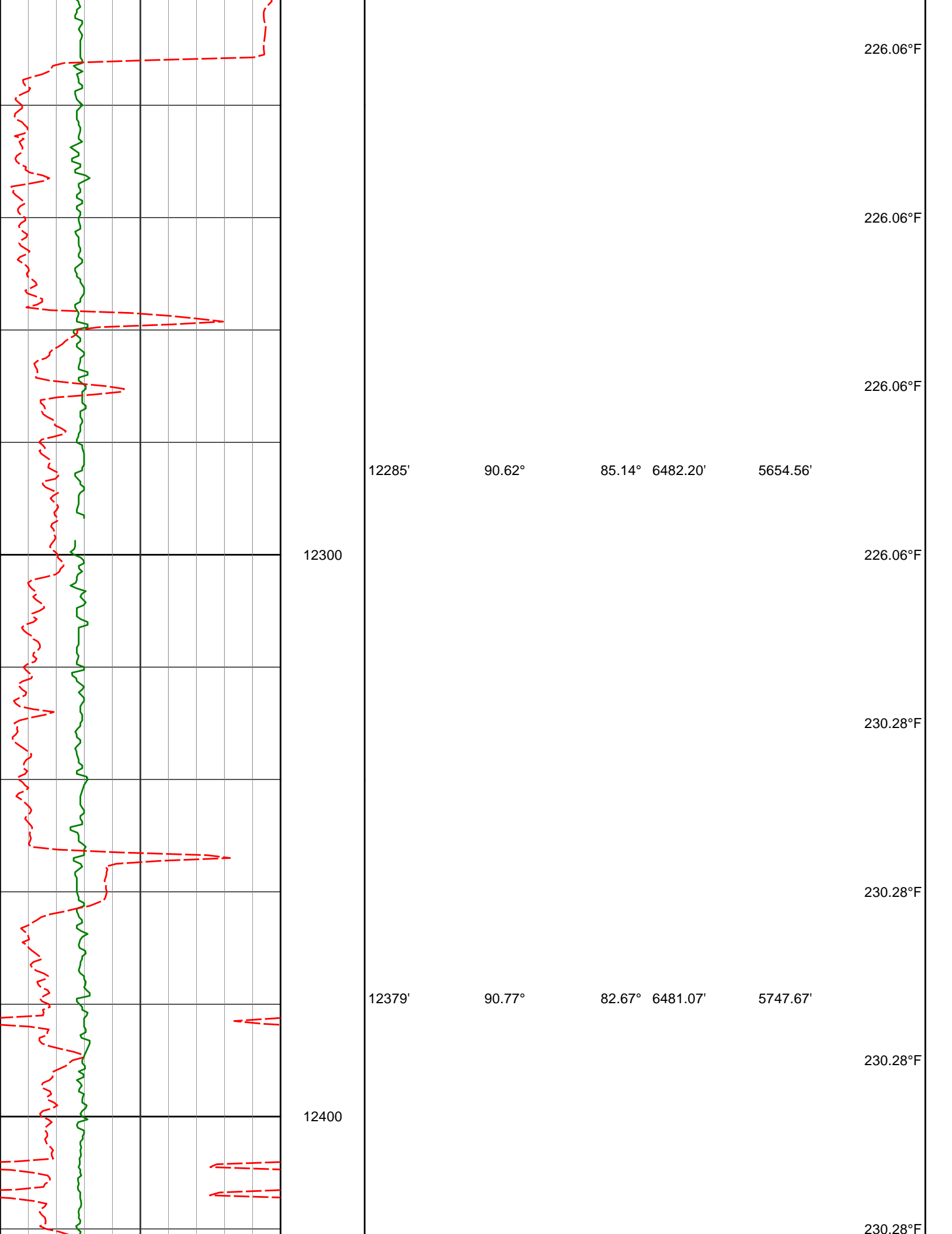


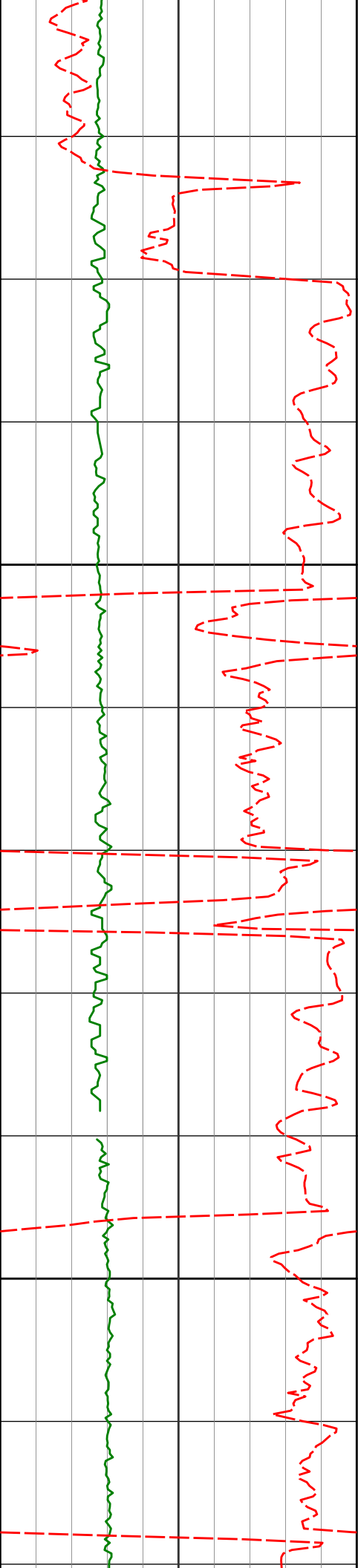












12500

12600

12474'

90.49°

81.63°

6480.02'

5841.32'

12569'

90.22°

83.62°

6479.44'

5935.11'

230.28°F

226.06°F

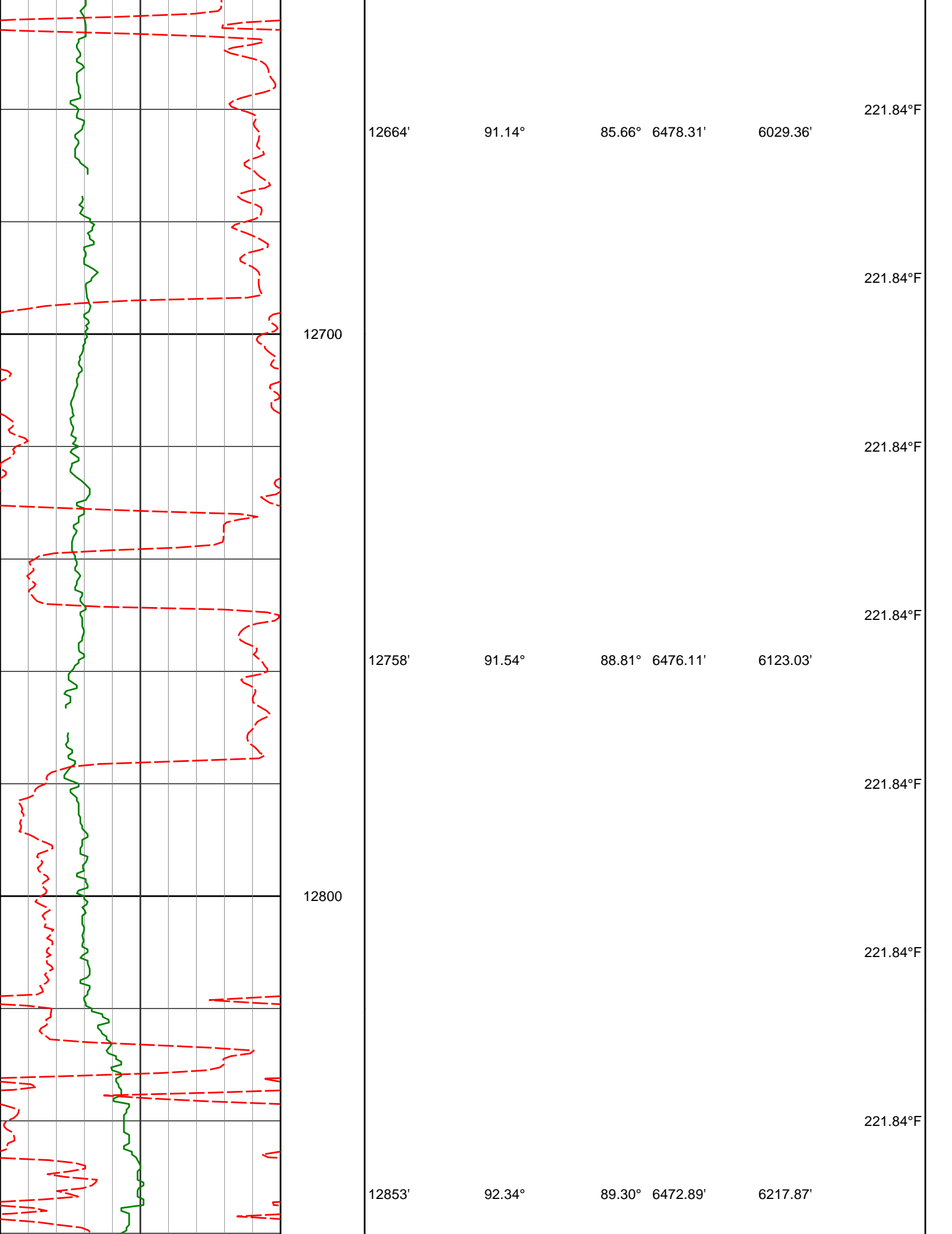
226.06°F

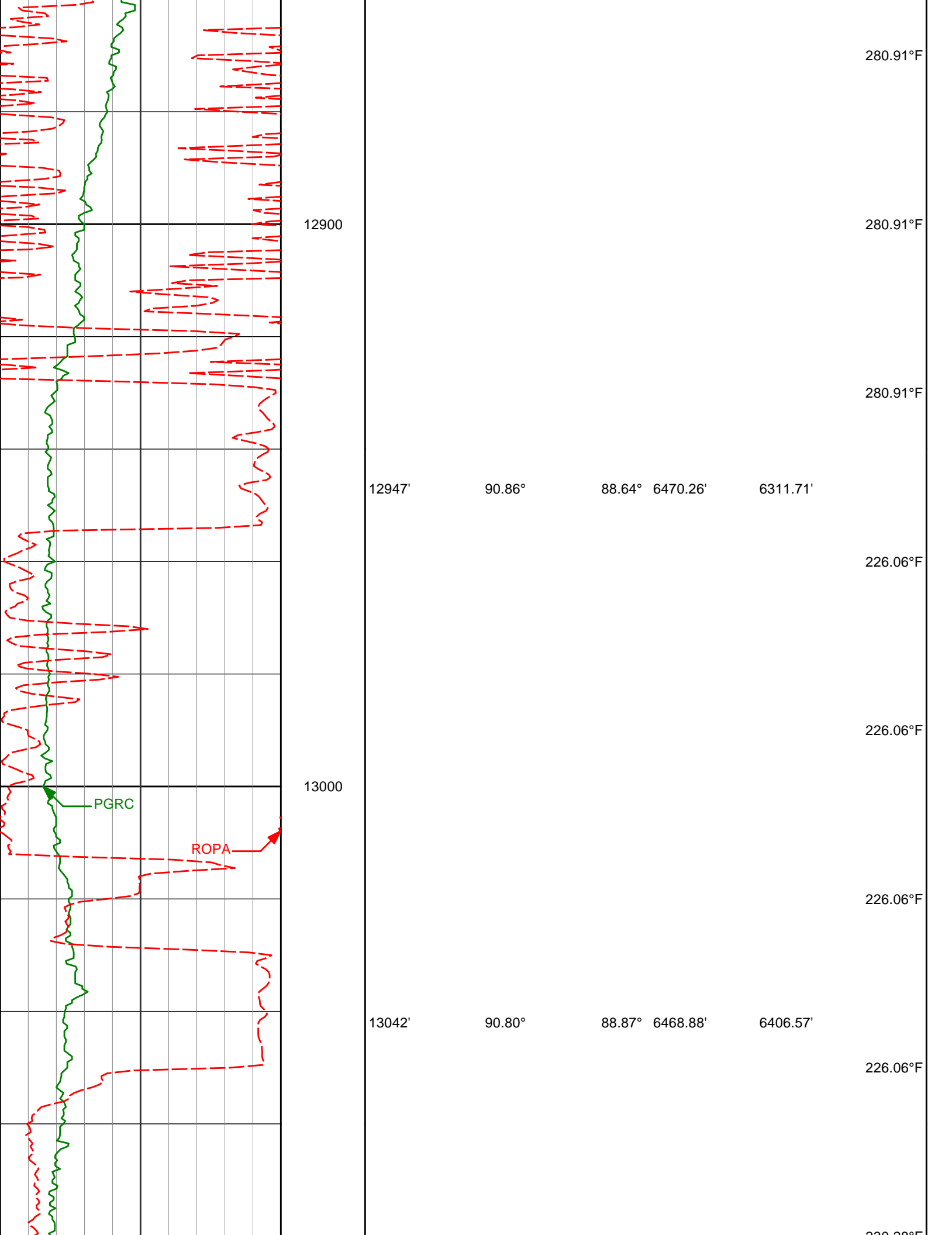
226.06°F

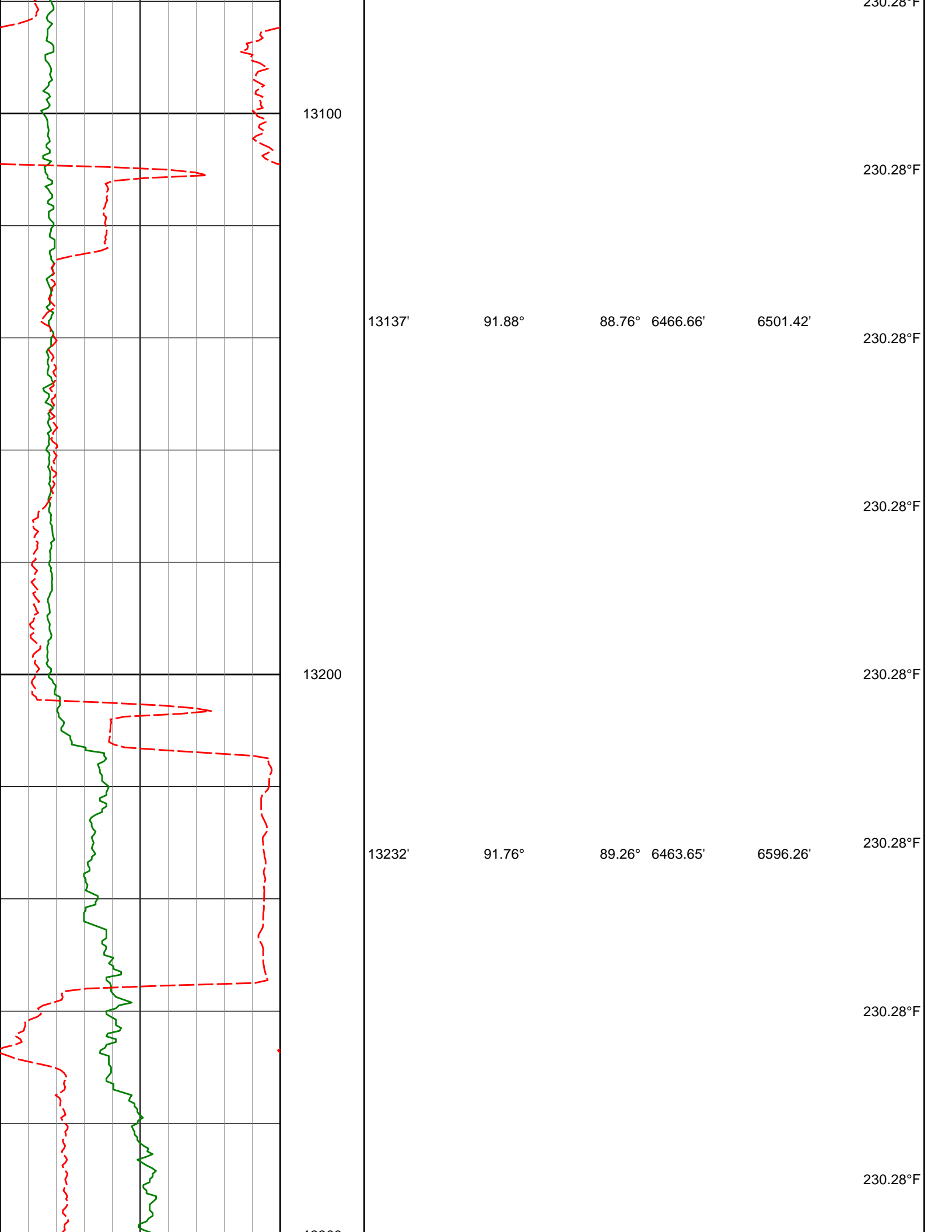
226.06°F

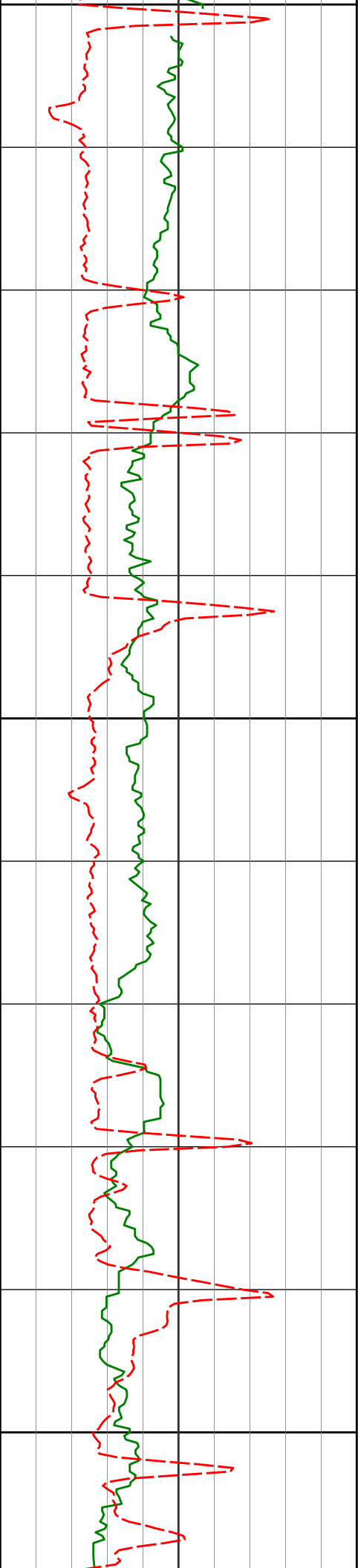
221.84°F

221.84°F









13300

13326'

89.63°

89.26° 6462.51'

6690.16'

230.28°F

13400

13421'

88.03°

88.85° 6464.45'

6785.03'

230.28°F

13500

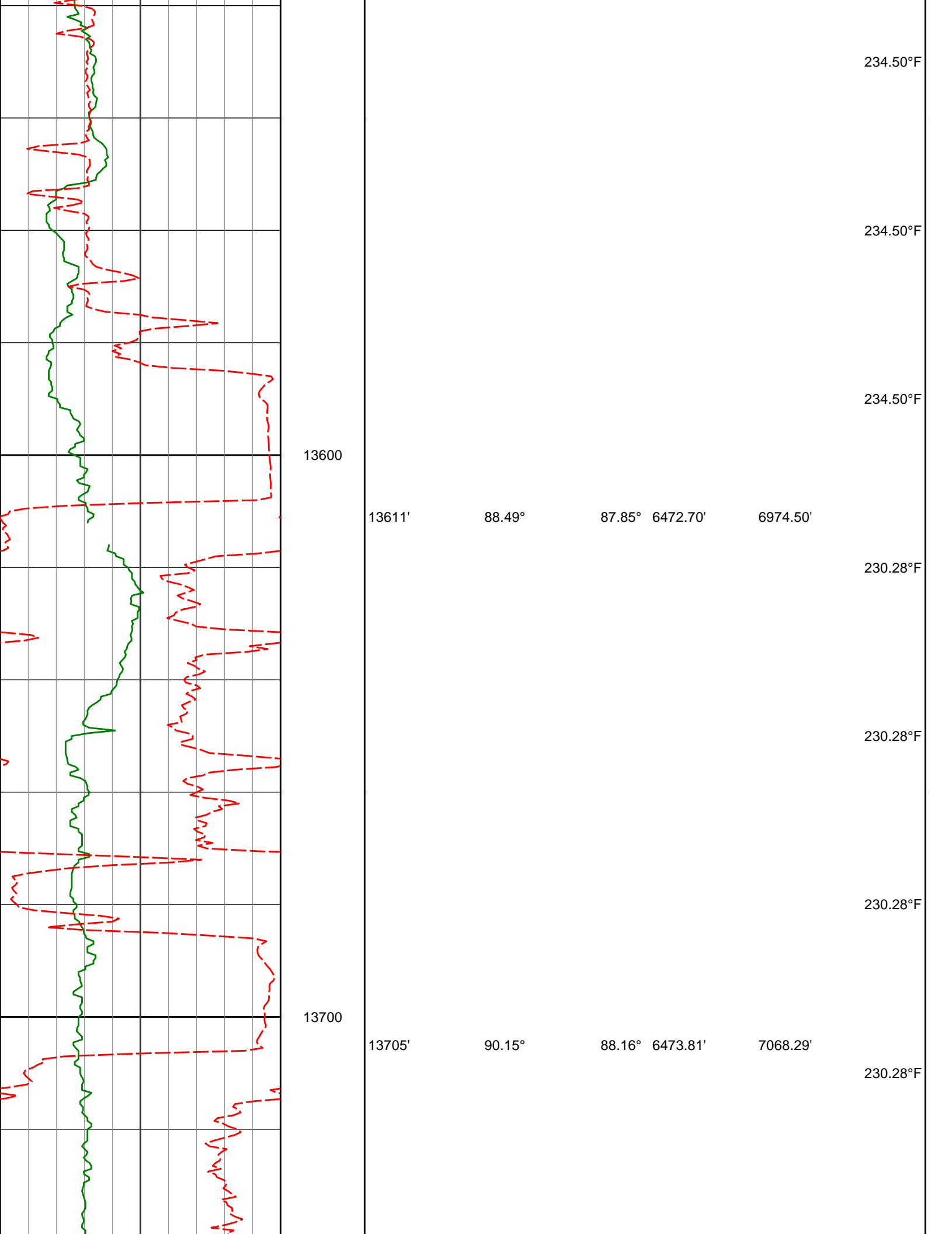
13516'

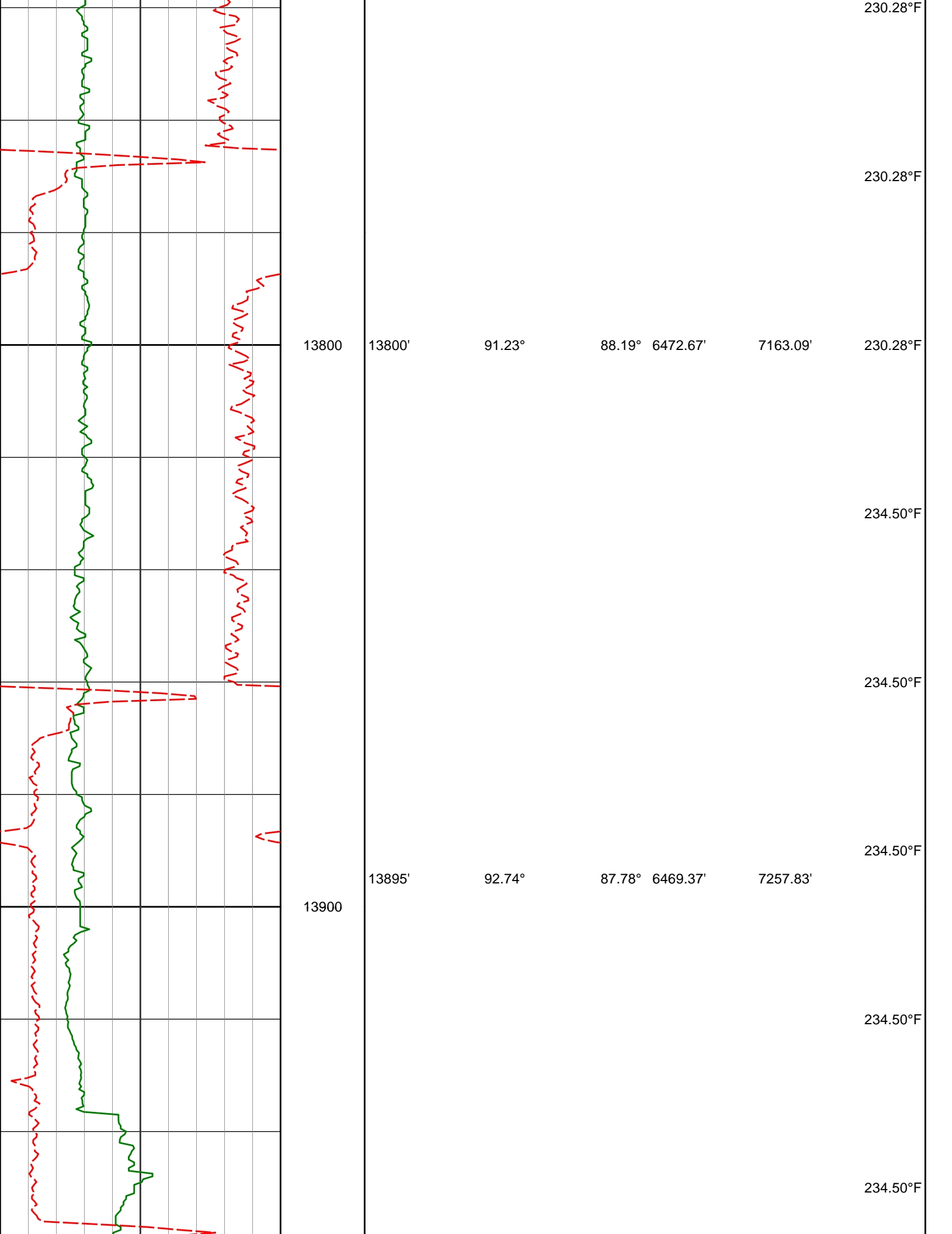
86.76°

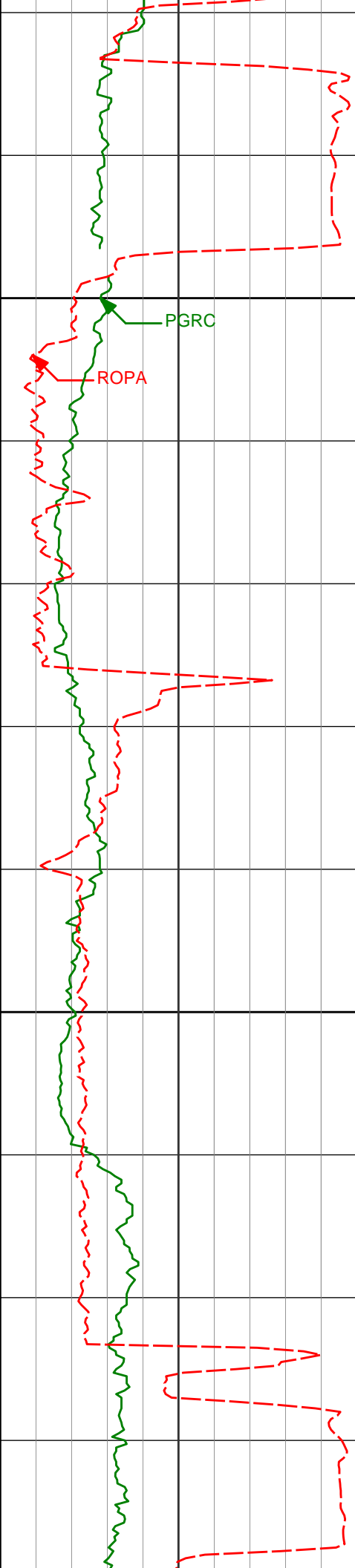
88.36° 6468.77'

6879.78'

230.28°F







14000

14100

13990'

14085'

92.44°

92.90°

87.89°

87.11°

6465.08'

6460.66'

7352.51'

7447.14'

234.50°F

234.50°F

234.50°F

234.50°F

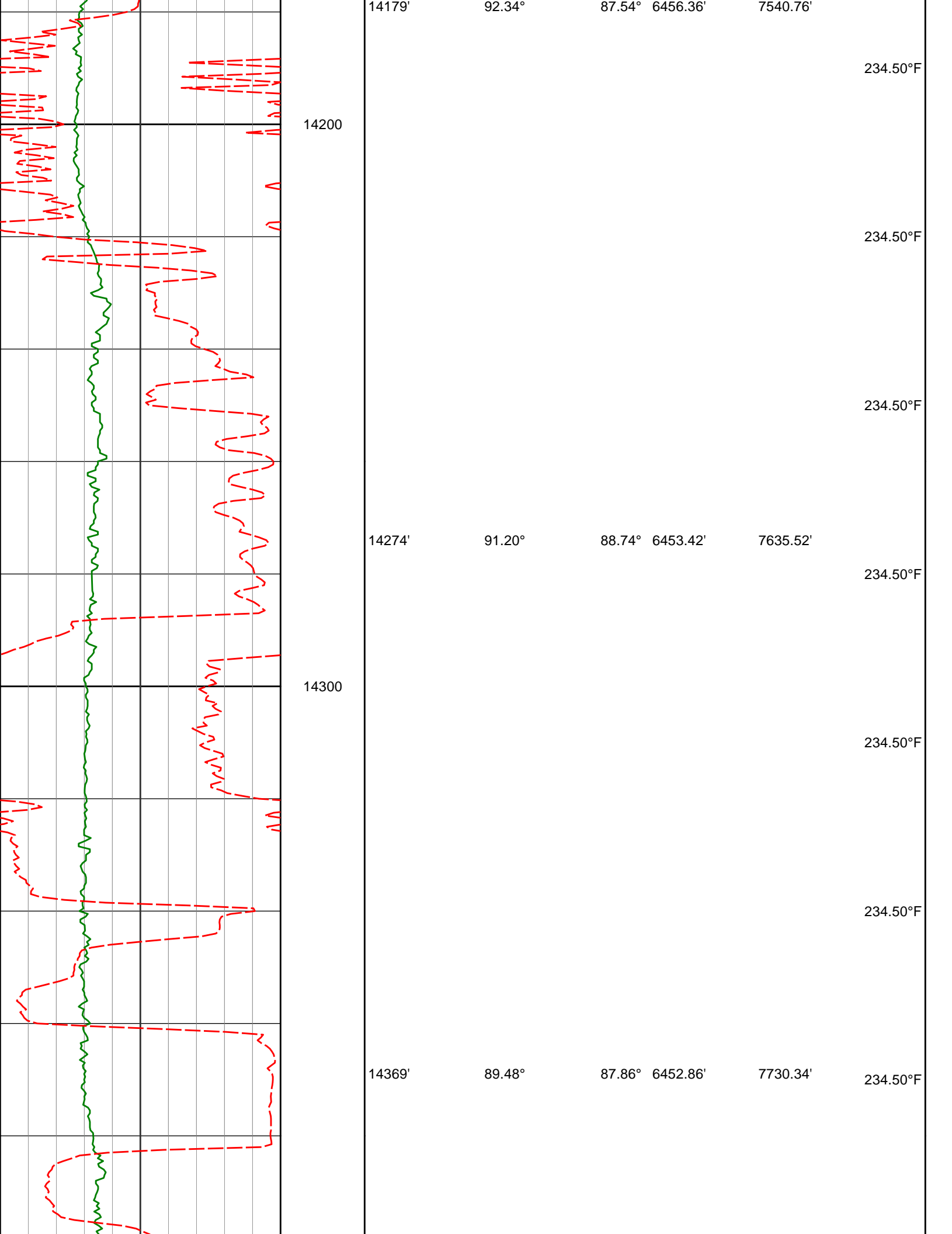
234.50°F

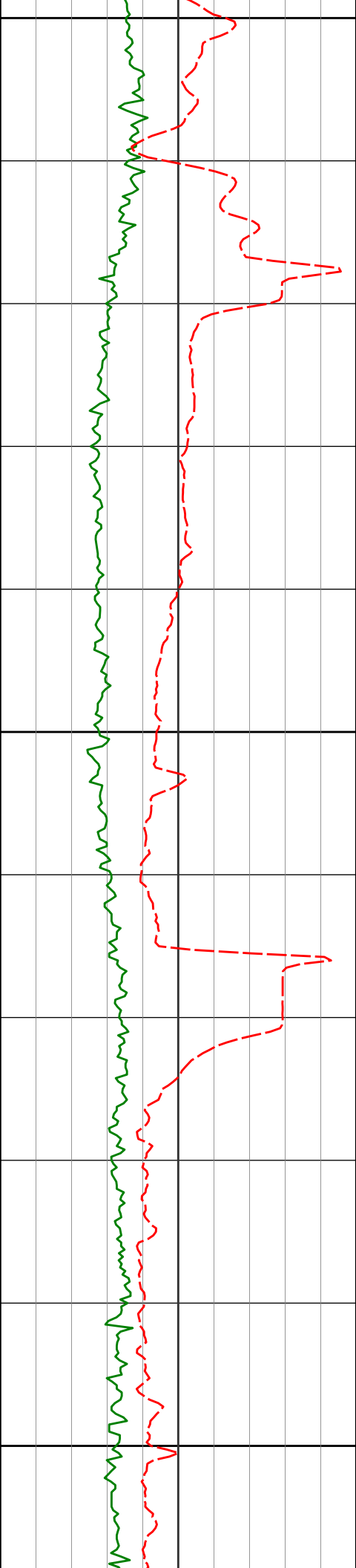
234.50°F

234.50°F

PGRC

ROPA





14400

14463'

14500

14558'

14600

89.60°

88.32° 6453.61'

7824.14'

89.69°

87.89° 6454.20'

7918.94'

234.50°F

234.50°F

234.50°F

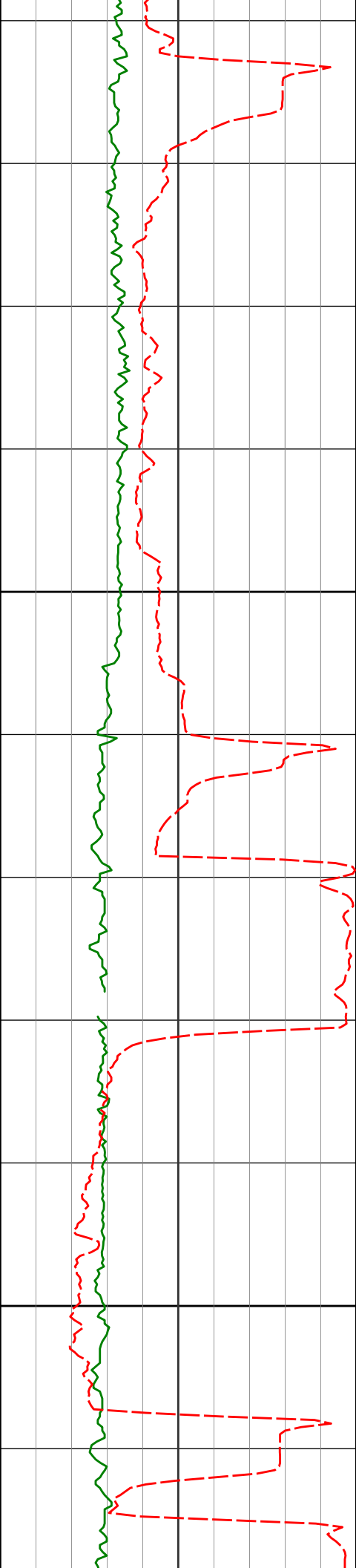
238.72°F

238.72°F

238.72°F

238.72°F

238.72°F



14700

14800

14653'

91.02°

87.58°

6453.61'

8013.70'

14748'

91.05°

87.74°

6451.90'

8108.44'

238.72°F

238.72°F

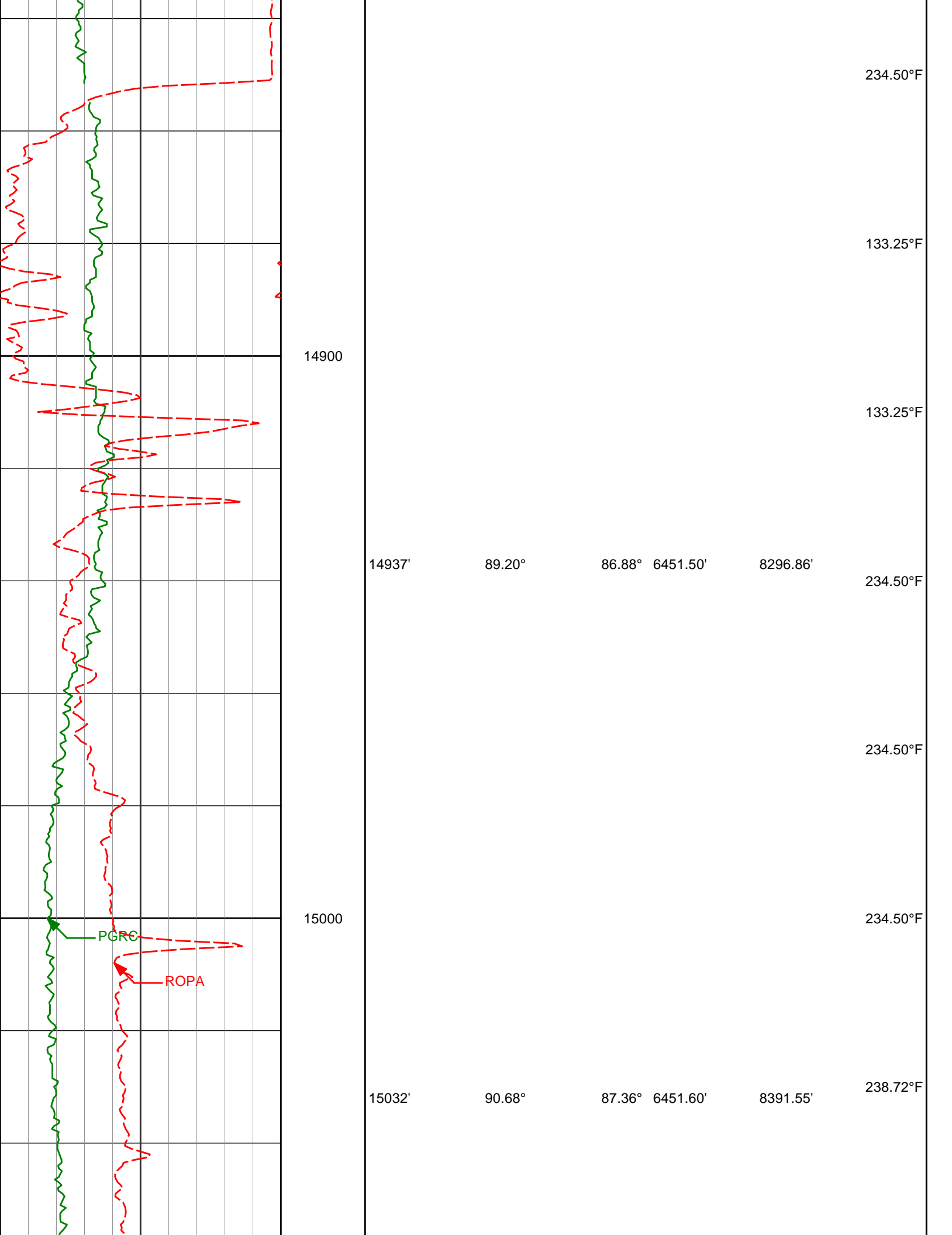
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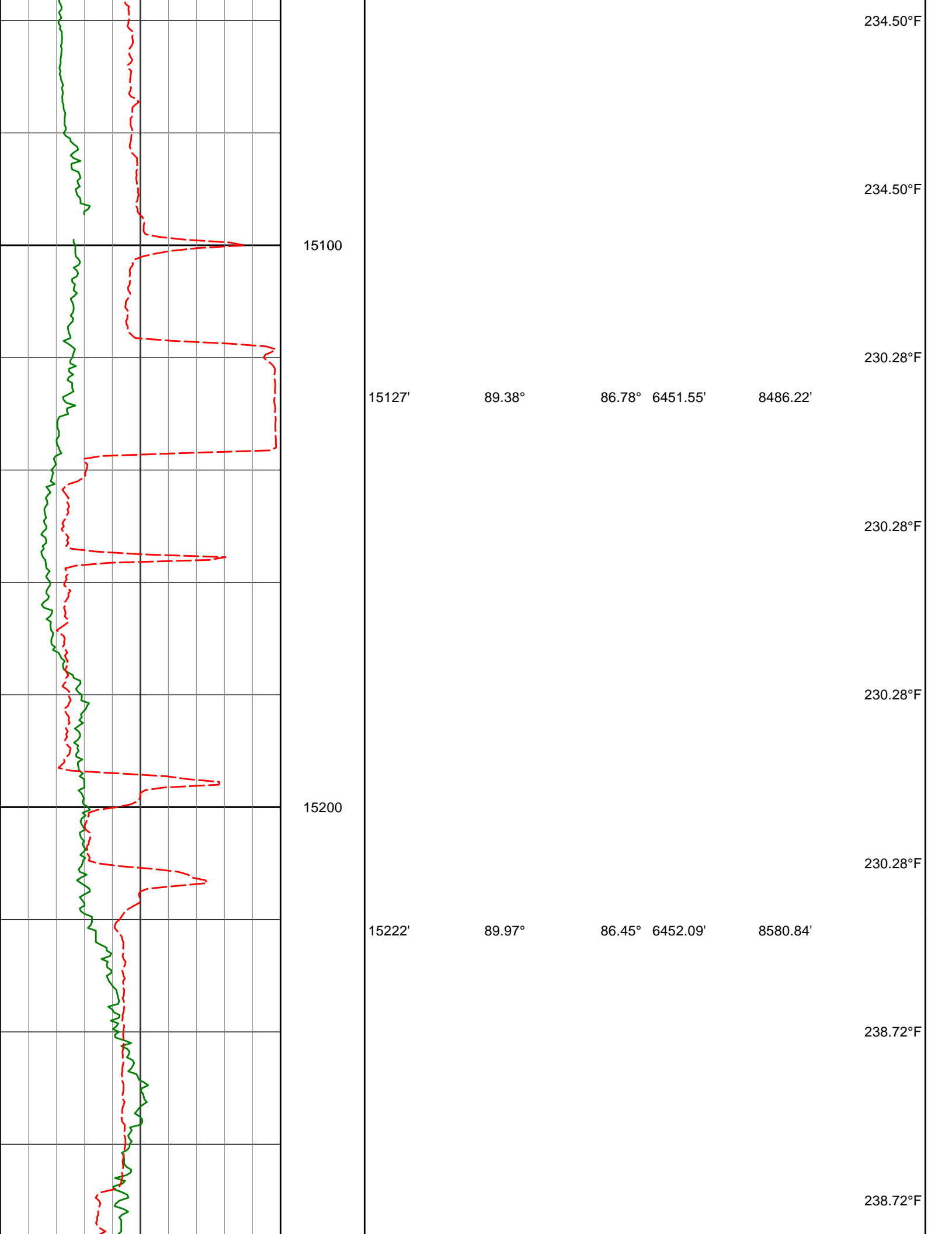
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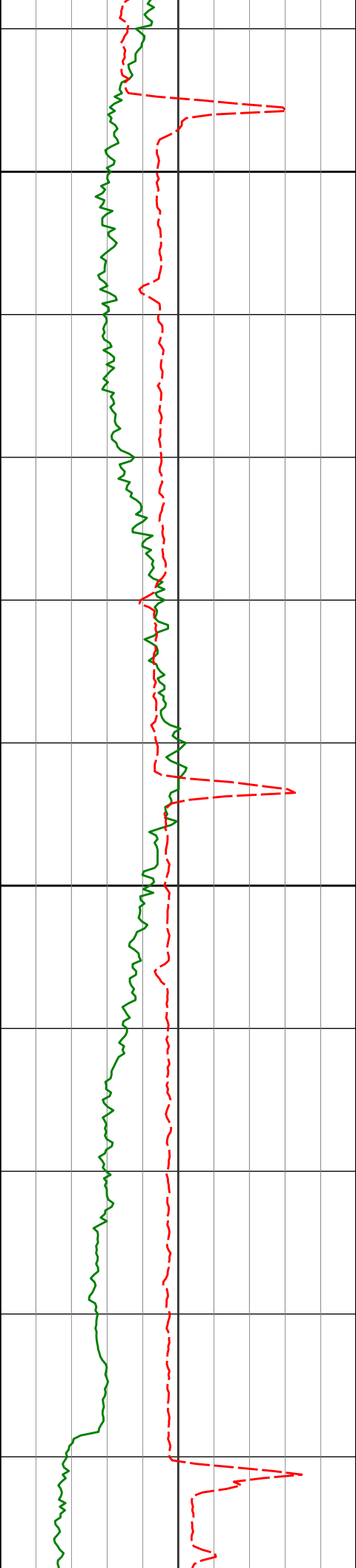
234.50°F

234.50°F

234.50°F







15300

15316'

90.83°

86.54°

6451.43'

8674.44'

15400

15411'

91.42°

86.37°

6449.57'

8769.01'

285.13°F

285.13°F

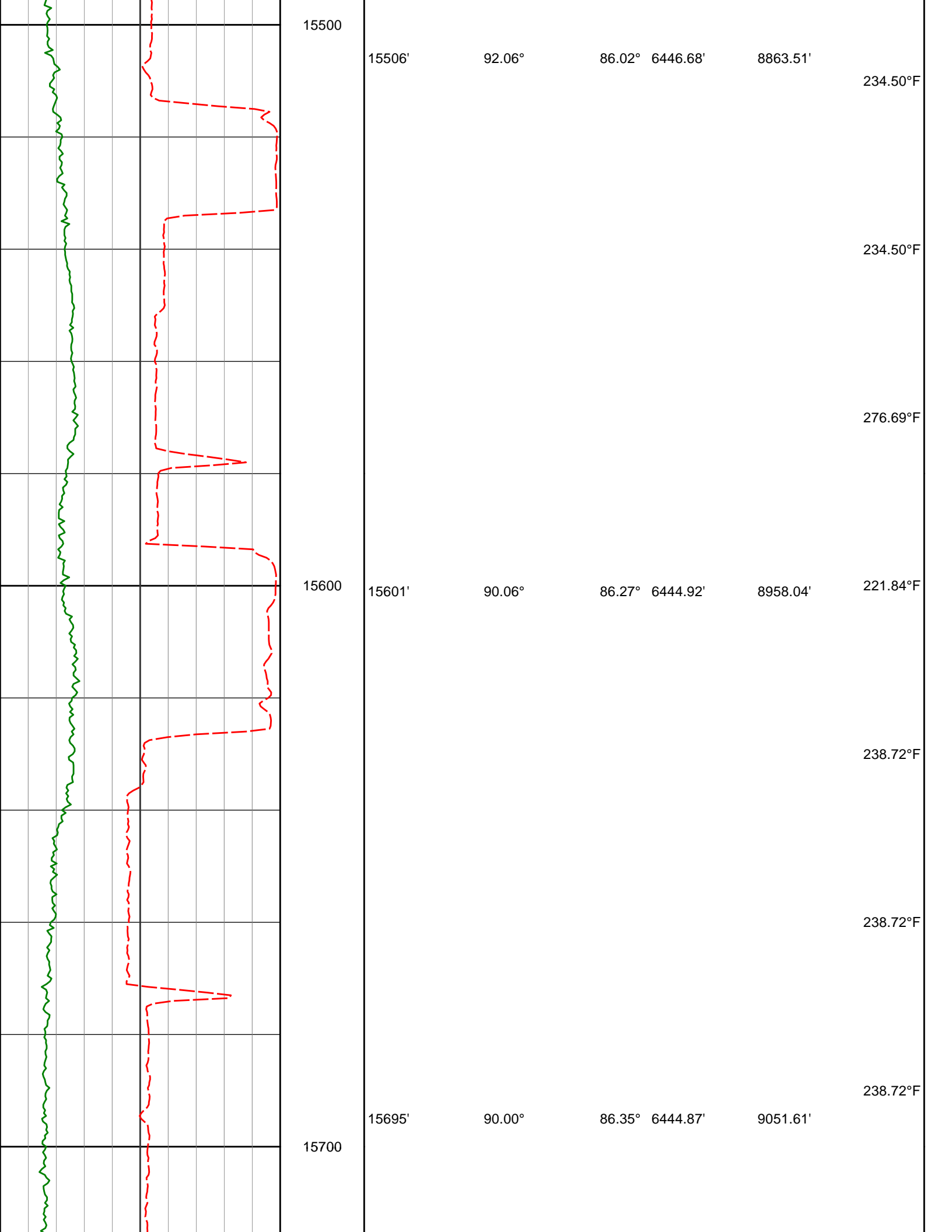
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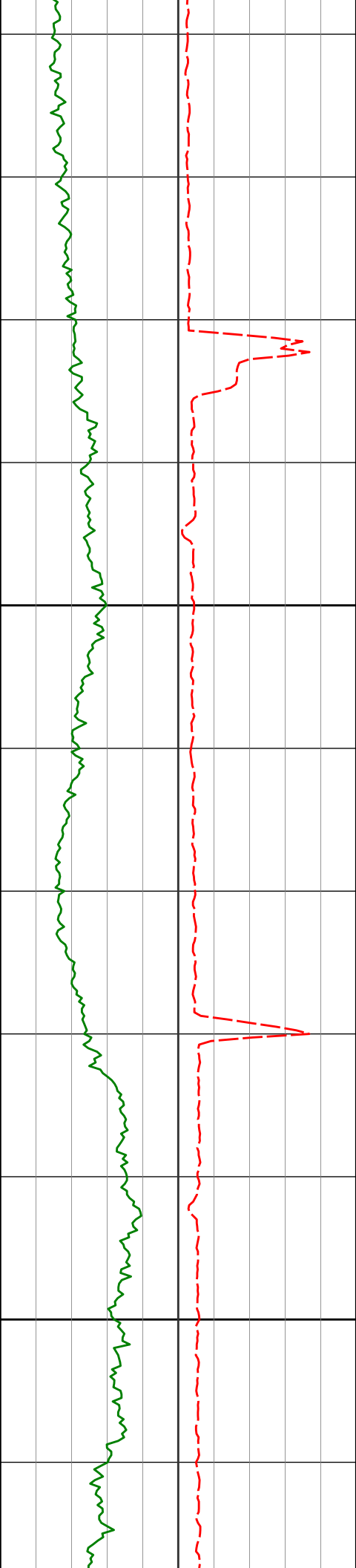
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238.72°F

238.72°F

234.50°F





15800

15900

15790'

91.66°

86.74° 6443.49'

9146.20'

15925'

92.90°

85.88° 6438.11'

9280.48'

238.72°F

238.72°F

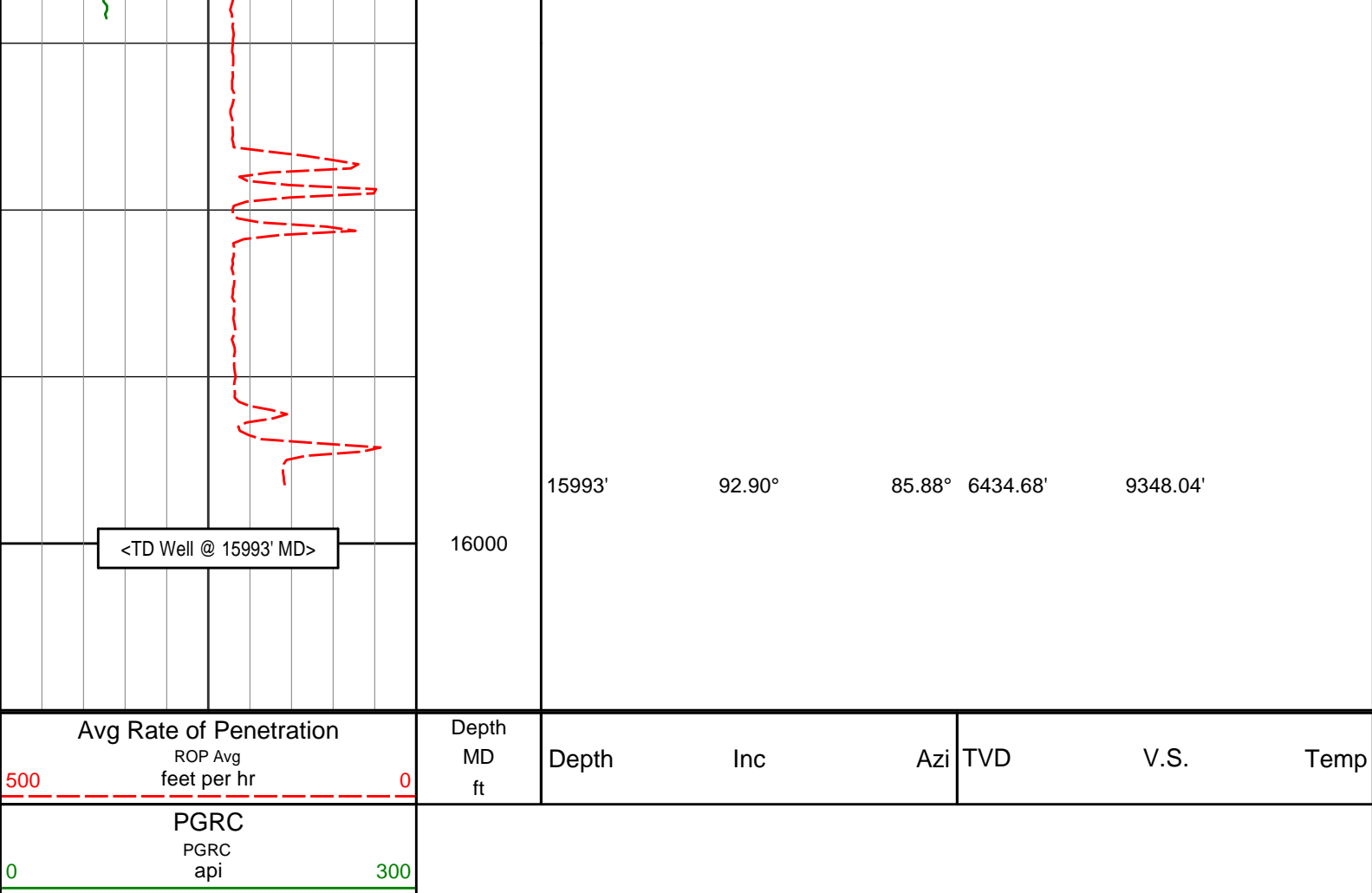
238.72°F

238.72°F

238.72°F

238.72°F

238.72°F



DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AF05-690
Wattenberg
Weld Colorado
USA
CA-XX-0902715776

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
300.00	0.15	82.12	300.00	0.05 N	0.39 E	0.39	0.05
637.00	0.32	82.12	637.00	0.24 N	1.76 E	1.75	0.05
683.00	0.34	82.12	683.00	0.28 N	2.02 E	2.01	0.04
816.00	0.57	91.32	815.99	0.32 N	3.07 E	3.06	0.18
910.00	0.48	90.57	909.99	0.30 N	3.93 E	3.92	0.09
1004.00	0.37	91.01	1003.99	0.29 N	4.63 E	4.62	0.12
1190.00	0.25	135.17	1189.98	0.00 S	5.52 E	5.52	0.14
1281.00	0.31	132.46	1280.98	0.31 S	5.84 E	5.85	0.07
1372.00	0.44	129.16	1371.98	0.70 S	6.29 E	6.31	0.15
1464.00	0.28	151.86	1463.98	1.12 S	6.67 E	6.71	0.24
1555.00	0.33	132.81	1554.98	1.49 S	6.97 E	7.01	0.13
1647.00	0.31	134.36	1646.97	1.85 S	7.35 E	7.40	0.02
1738.00	0.34	167.05	1737.97	2.29 S	7.59 E	7.65	0.21
1921.00	0.25	198.90	1920.97	3.20 S	7.58 E	7.68	0.10
2195.00	0.37	242.70	2194.97	4.16 S	6.60 E	6.73	0.09
2287.00	0.50	185.98	2286.97	4.70 S	6.30 E	6.44	0.47
2470.00	0.55	151.82	2469.96	6.26 S	6.63 E	6.82	0.17
2561.00	0.82	172.34	2560.95	7.29 S	6.92 E	7.14	0.40
2653.00	1.00	176.00	2652.94	8.75 S	7.06 E	7.33	0.20
2745.00	2.54	211.48	2744.90	11.29 S	6.05 E	6.40	1.98
2839.00	3.43	218.84	2838.77	15.25 S	3.20 E	3.67	1.02

2933.00	5.25	232.59	2932.50	20.06 S	1.98 W	-1.36	2.22
3027.00	7.94	237.96	3025.87	26.11 S	10.90 W	-10.08	2.93
3121.00	9.18	241.92	3118.82	33.09 S	23.01 W	-21.98	1.47
3216.00	7.84	241.45	3212.77	39.75 S	35.39 W	-34.15	1.42
3311.00	9.46	230.83	3306.69	47.77 S	47.13 W	-45.63	2.39
3406.00	8.91	228.56	3400.48	57.57 S	58.70 W	-56.89	0.69
3500.00	9.36	228.09	3493.28	67.50 S	69.85 W	-67.73	0.48
3595.00	9.92	228.82	3586.94	78.05 S	81.75 W	-79.30	0.60
3690.00	10.80	229.36	3680.39	89.23 S	94.66 W	-91.86	0.93
3785.00	11.20	228.33	3773.65	101.16 S	108.30 W	-105.13	0.47
3880.00	11.06	228.87	3866.86	113.29 S	122.06 W	-118.50	0.18
3974.00	10.36	228.62	3959.22	124.80 S	135.19 W	-131.27	0.74
4069.00	9.86	228.72	4052.75	135.81 S	147.71 W	-143.44	0.53
4164.00	8.81	224.57	4146.49	146.36 S	158.92 W	-154.33	1.31
4259.00	7.74	223.54	4240.50	156.18 S	168.43 W	-163.53	1.13
4353.00	9.81	219.43	4333.40	166.95 S	177.88 W	-172.64	2.30
4448.00	9.62	216.52	4427.04	179.58 S	187.75 W	-182.11	0.55
4543.00	8.02	215.28	4520.91	191.37 S	196.30 W	-190.29	1.70
4638.00	7.30	208.32	4615.06	202.10 S	202.99 W	-196.65	1.23
4732.00	7.76	216.26	4708.25	212.47 S	209.58 W	-202.91	1.21
4827.00	7.93	226.43	4802.37	222.16 S	218.12 W	-211.15	1.47
4922.00	8.24	229.30	4896.43	231.12 S	228.02 W	-220.78	0.54
5016.00	9.88	227.41	4989.25	240.97 S	239.07 W	-231.51	1.78
5111.00	8.09	222.43	5083.08	251.42 S	249.59 W	-241.70	2.05
5206.00	6.05	217.46	5177.36	260.33 S	257.14 W	-248.98	2.25
5300.00	7.27	224.41	5270.72	268.51 S	264.32 W	-255.90	1.56
5395.00	8.63	228.45	5364.81	277.54 S	273.86 W	-265.16	1.55
5490.00	9.69	232.79	5458.59	287.10 S	285.56 W	-276.56	1.33
5584.00	10.89	227.45	5551.08	297.89 S	298.41 W	-289.06	1.64
5679.00	9.17	224.40	5644.63	309.37 S	310.32 W	-300.62	1.90
5774.00	10.05	209.95	5738.31	321.96 S	319.75 W	-309.66	2.69
5868.00	22.27	180.01	5828.56	347.01 S	323.87 W	-313.00	15.34
5963.00	30.56	169.62	5913.61	388.86 S	319.51 W	-307.35	9.95
6058.00	32.22	153.65	5994.85	435.40 S	303.89 W	-290.30	8.91
6152.00	32.25	143.64	6074.41	478.08 S	277.88 W	-262.98	5.67
6247.00	37.70	129.60	6152.36	517.10 S	240.39 W	-224.30	10.20
6342.00	38.19	115.74	6227.41	548.43 S	191.46 W	-174.43	8.98
6436.00	43.47	106.70	6298.58	570.37 S	134.23 W	-116.55	8.42
6531.00	51.16	99.31	6362.99	585.78 S	66.27 W	-48.14	9.90
6626.00	57.66	95.18	6418.27	595.40 S	10.31 E	28.70	7.70
6720.00	65.29	91.79	6463.13	600.33 S	92.68 E	111.18	8.72
6815.00	73.65	87.51	6496.43	599.69 S	181.54 E	199.97	9.76
6910.00	79.96	86.67	6518.10	594.99 S	273.86 E	292.11	6.69
7045.00	87.72	91.95	6532.58	593.42 S	407.92 E	426.06	6.94
7140.00	89.88	91.49	6534.58	596.27 S	502.85 E	521.03	2.32
7234.00	90.68	90.14	6534.12	597.60 S	596.84 E	615.01	1.67
7329.00	92.87	90.52	6531.19	598.15 S	691.79 E	709.93	2.34
7423.00	92.77	89.24	6526.56	597.94 S	785.67 E	803.77	1.37
7518.00	92.03	88.97	6522.58	596.45 S	880.58 E	898.58	0.83
7613.00	89.94	88.27	6520.95	594.17 S	975.53 E	993.42	2.32
7707.00	90.71	88.79	6520.42	591.76 S	1069.50 E	1087.26	0.99
7802.00	90.18	86.94	6519.68	588.22 S	1164.42 E	1182.04	2.03
7896.00	90.65	87.30	6518.99	583.50 S	1258.30 E	1275.72	0.62
7991.00	91.17	86.86	6517.49	578.66 S	1353.16 E	1370.39	0.72
8086.00	91.05	86.58	6515.65	573.23 S	1447.99 E	1465.01	0.32
8180.00	91.20	86.60	6513.81	567.64 S	1541.81 E	1558.60	0.16
8275.00	91.26	86.75	6511.76	562.13 S	1636.63 E	1653.21	0.18
8370.00	90.18	85.71	6510.57	555.89 S	1731.41 E	1747.75	1.58
8464.00	90.55	86.06	6509.97	549.14 S	1825.16 E	1841.26	0.54
8558.00	90.74	87.36	6508.90	543.75 S	1919.00 E	1934.88	1.40
8653.00	91.17	88.76	6507.32	540.53 S	2013.93 E	2029.67	1.54
8747.00	91.05	89.18	6505.50	538.84 S	2107.90 E	2123.54	0.46
8842.00	89.29	89.06	6505.22	537.38 S	2202.88 E	2218.43	1.85
8936.00	88.77	89.02	6506.81	535.82 S	2296.86 E	2312.31	0.56
9030.00	89.11	88.66	6508.55	533.91 S	2390.82 E	2406.17	0.53
9125.00	90.06	88.36	6509.24	531.45 S	2485.78 E	2501.01	1.05
9219.00	91.17	87.94	6508.23	528.41 S	2579.73 E	2594.82	1.26
9314.00	88.77	87.20	6508.28	524.39 S	2674.64 E	2689.56	2.65
9408.00	88.18	87.47	6510.78	520.02 S	2768.50 E	2783.24	0.69
9502.00	88.09	87.01	6513.83	515.50 S	2862.34 E	2876.90	0.50
9597.00	89.72	87.25	6515.65	510.74 S	2957.20 E	2971.57	1.74

9692.00	91.29	87.67	6514.80	506.53 S	3052.10 E	3066.29	1.71
9786.00	92.96	87.17	6511.32	502.29 S	3145.94 E	3159.95	1.85
9881.00	91.85	87.28	6507.34	497.69 S	3240.74 E	3254.57	1.17
9975.00	90.71	88.14	6505.24	493.94 S	3334.64 E	3348.31	1.52
10070.00	89.17	89.15	6505.34	491.70 S	3429.61 E	3443.16	1.94
10164.00	90.22	89.47	6505.84	490.57 S	3523.60 E	3537.07	1.16
10256.00	90.55	89.15	6505.23	489.46 S	3615.59 E	3628.98	0.50
10347.00	89.85	88.46	6504.91	487.57 S	3706.57 E	3719.86	1.09
10439.00	91.33	88.58	6503.97	485.19 S	3798.53 E	3811.71	1.61
10530.00	92.16	89.64	6501.20	483.77 S	3889.48 E	3902.56	1.48
10622.00	91.69	90.95	6498.11	484.24 S	3981.42 E	3994.48	1.51
10714.00	89.29	91.07	6497.32	485.87 S	4073.40 E	4086.46	2.62
10804.00	89.41	90.22	6498.34	486.88 S	4163.38 E	4176.44	0.95
10896.00	91.29	90.48	6497.77	487.45 S	4255.38 E	4268.40	2.06
10988.00	93.70	90.83	6493.77	488.49 S	4347.28 E	4360.29	2.64
11079.00	89.54	89.49	6491.20	488.75 S	4438.22 E	4451.20	4.80
11171.00	89.35	89.08	6492.09	487.60 S	4530.21 E	4543.11	0.50
11262.00	90.03	88.60	6492.58	485.75 S	4621.19 E	4633.98	0.91
11445.00	90.00	88.32	6492.53	480.85 S	4804.12 E	4816.68	0.15
11536.00	90.06	89.11	6492.48	478.81 S	4895.10 E	4907.55	0.87
11627.00	90.46	90.44	6492.06	478.45 S	4986.09 E	4998.49	1.53
11719.00	90.49	90.16	6491.30	478.94 S	5078.09 E	5090.46	0.30
11811.00	89.75	88.28	6491.10	477.69 S	5170.07 E	5182.36	2.20
11906.00	89.20	86.55	6491.97	473.40 S	5264.97 E	5277.08	1.91
12001.00	92.34	88.09	6490.69	468.96 S	5359.84 E	5371.77	3.68
12095.00	92.31	87.02	6486.88	464.95 S	5453.68 E	5465.44	1.14
12190.00	91.36	86.96	6483.84	459.96 S	5548.50 E	5560.06	1.01
12285.00	90.62	85.14	6482.20	453.41 S	5643.25 E	5654.56	2.07
12379.00	90.77	82.67	6481.07	443.43 S	5736.71 E	5747.67	2.64
12474.00	90.49	81.63	6480.02	430.45 S	5830.81 E	5841.32	1.13
12569.00	90.22	83.62	6479.44	418.26 S	5925.02 E	5935.11	2.11
12664.00	91.14	85.66	6478.31	409.39 S	6019.59 E	6029.36	2.36
12758.00	91.54	88.81	6476.11	404.85 S	6113.44 E	6123.03	3.37
12853.00	92.34	89.30	6472.89	403.28 S	6208.37 E	6217.87	0.99
12947.00	90.86	88.64	6470.26	401.59 S	6302.32 E	6311.71	1.72
13042.00	90.80	88.87	6468.88	399.52 S	6397.28 E	6406.57	0.25
13137.00	91.88	88.76	6466.66	397.55 S	6492.24 E	6501.42	1.14
13232.00	91.76	89.26	6463.65	395.92 S	6587.17 E	6596.26	0.54
13326.00	89.63	89.26	6462.51	394.71 S	6681.15 E	6690.16	2.26
13421.00	88.03	88.85	6464.45	393.14 S	6776.12 E	6785.03	1.74
13516.00	86.76	88.36	6468.77	390.83 S	6870.99 E	6879.78	1.43
13611.00	88.49	87.85	6472.70	387.69 S	6965.85 E	6974.50	1.90
13705.00	90.15	88.16	6473.81	384.41 S	7059.79 E	7068.29	1.80
13800.00	91.23	88.19	6472.67	381.38 S	7154.73 E	7163.09	1.13
13895.00	92.74	87.78	6469.37	378.04 S	7249.61 E	7257.83	1.65
13990.00	92.44	87.89	6465.08	374.45 S	7344.44 E	7352.51	0.35
14085.00	92.90	87.11	6460.66	370.30 S	7439.25 E	7447.14	0.95
14179.00	92.34	87.54	6456.36	365.92 S	7533.05 E	7540.76	0.75
14274.00	91.20	88.74	6453.42	362.84 S	7627.95 E	7635.52	1.74
14369.00	89.48	87.86	6452.86	360.03 S	7722.90 E	7730.34	2.04
14463.00	89.60	88.32	6453.61	356.89 S	7816.85 E	7824.14	0.51
14558.00	89.69	87.89	6454.20	353.75 S	7911.79 E	7918.94	0.47
14653.00	91.02	87.58	6453.61	349.99 S	8006.71 E	8013.70	1.43
14748.00	91.05	87.74	6451.90	346.11 S	8101.62 E	8108.44	0.18
14937.00	89.20	86.88	6451.50	337.24 S	8290.40 E	8296.86	1.08
15032.00	90.68	87.36	6451.60	332.47 S	8385.28 E	8391.55	1.64
15127.00	89.38	86.78	6451.55	327.62 S	8480.15 E	8486.22	1.50
15222.00	89.97	86.45	6452.09	322.01 S	8574.98 E	8580.84	0.71
15316.00	90.83	86.54	6451.43	316.26 S	8668.80 E	8674.44	0.92
15411.00	91.42	86.37	6449.57	310.39 S	8763.60 E	8769.01	0.64
15506.00	92.06	86.02	6446.68	304.08 S	8858.35 E	8863.51	0.77
15601.00	90.06	86.27	6444.92	297.70 S	8953.11 E	8958.04	2.13
15695.00	90.00	86.35	6444.87	291.65 S	9046.92 E	9051.61	0.10
15790.00	91.66	86.74	6443.49	285.93 S	9141.73 E	9146.20	1.80
15925.00	92.90	85.88	6438.11	277.26 S	9276.34 E	9280.48	1.11
15993.00	92.90	85.88	6434.68	272.38 S	9344.08 E	9348.04	0.01

TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 91.77 DEGREES (GRID)
A TOTAL CORRECTION OF 7.57 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 15993.00 FEET
IS 9348.05 FEET ALONG 91.67 DEGREES (GRID)

Surveys at 300' and 637' are interpolated.

Final survey is a projection to bit @ TD.

Date Printed:11 September 2015