

Company	:	Extraction Oil & Gas
Rig	:	Patterson 901
Well	:	NORTHWEST A S20-25-10N
Field	:	Wattenberg
Country	:	USA
API Number	:	05-014-20790-00

Country	: USA
Field	: Wattenberg
Location	: Lat: 39° 58' 59.37" North Long: 105° 0' 46.51" West
Well	: NORTHWEST A S20-25-10N
Company	: Extraction Oil & Gas
Rig	: Patterson 901
LOCATION	<div> <div> Company : Extraction Oil & Gas Rig : Patterson 901 Well : NORTHWEST A S20-25-10N Field : Wattenberg Country : USA API Number : 05-014-20790-00 </div> <div> Latitude : 39° 58' 59.37" North Longitude : 105° 0' 46.51" West UTM Easting = 3,136,490.785 usft UTM Northing = 1,237,086.583 usft </div> <div> Other Services Directional Drilling </div> </div>

[illegible]

WELL INFORMATION

MWD Run Number	100	200		
Date run completed	21-Dec-19	23-Dec-19		
Rig Bit Number	2	3		
Bit Size (in)	8.750	8.500		
Tool Nominal OD (in)	6.750	6.750		
Log Start Depth (MD, ft)	1,630.00	13,979.00		
Log End Depth (MD, ft)	13,979.00	21,955.00		
Drill or Wipe	Drill	Drill		
Drill/Wipe Start Date and Time	19-Dec-19 16:45	21-Dec-19 19:00		
Drill/Wipe End Date and Time	21-Dec-19 04:45	23-Dec-19 10:45		
Min Inc (deg) @ Depth (MD, ft)	0.51 @ 8,790.00	89.13 @ 16,442.00		
Max Inc (deg) @ Depth (MD, ft)	92.15 @ 12,976.00	90.74 @ 13,966.00		
Bit TFA(in2) / Bit Type	0.74 / PDC	0.74 / PDC		
Flow Rate (gpm)	650.00	630.00		
Max AV (fpm) / CV (fpm) @ MWD	513.0 / 308.0	578.0 / 378.0		
Fluid Type	Mineral Oil Bas	Mineral Oil Bas		
Density (ppg) / Viscosity (spqt)	9.60 / 45.00	10.10 / 53.00		
Filtrate CL (ppm)	43,500.00	42,000.00		
pH / API Filtrate (mptm)	N/A / 17	N/A / 16		
PV (cP) / YP (lhf2)	18 / 8.00	22 / 11.00		
% Solids / % Sand	11 / .25	13 / .25		
% Oil / Oil:Water Ratio	68 / 77:23	66.5 / 76:24		
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	235.00 / EMT	273.00 / iCruise			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	William Melenka	William Melenka			
Customer Representative	Manny Parras	Manny Parras			
SENSOR INFORMATION					
Downhole Processor Information					
Tool Type	EMT-DTU	EMT-DTU			
Software Version	4.48	8.12A			
Sub Serial Number	DR21632	DR8671			
Insert Serial Number	11296217	11214431			
Date and Time Initialized	N/A	N/A			
Date and Time Read	N/A	N/A			
ECMB SW Version	N/A	N/A			
Directional Sensor Information					
Tool Type	PCDC	iCruise DM			
Distance From Bit (ft)	49.07	17			
Software Version	6.43	3.7			
Sub Serial Number	DR21632	20170918			
Sonde Serial Number	11902024	13012189			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	180.39	N/A			
Gamma Ray Sensor Information					
Tool Type	PCG	iCruise GM			
Distance From Bit (ft)	52.67	12			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	3.06			
Sub Serial Number	DR21632	N/A			
Insert/Sonde Serial Number	11579760	N/A			
Rotary Steerable Information					
Tool Type		iCruise			
Distance From Bit (ft)		6.65			
Software Version		3.44			
Sub Serial Number		13012189			
REMARKS					
<p>1. All depths are measured bit depths, referenced to the Driller's pipe tally and are measured from the drill floor, unless otherwise specified.</p> <p>2. No depth corrections have been made for pipe stretch or compression.</p> <p>3. All data presented is recorded data unless otherwise specified.</p> <p>4. Environmental parameters used to process gamma ray are as follows: Hole Size: 8.75 - 8.50 in. Mud weight: 9.6 - 10.1 ppg</p> <p>5. The following smoothing parameters have been applied to the data:</p> <p>Main Log 1:240 (5"): ROPA: 0.5 ft interval, 1.2 ft coercion distance, 3.0 ft gap fill PGRC: 0.5 ft interval, 0.6 ft coercion distance, 3.0 ft gap fill</p>					

GMRC: 0.5 ft interval, 0.6 ft coercion distance, 3.0 ft gap fill

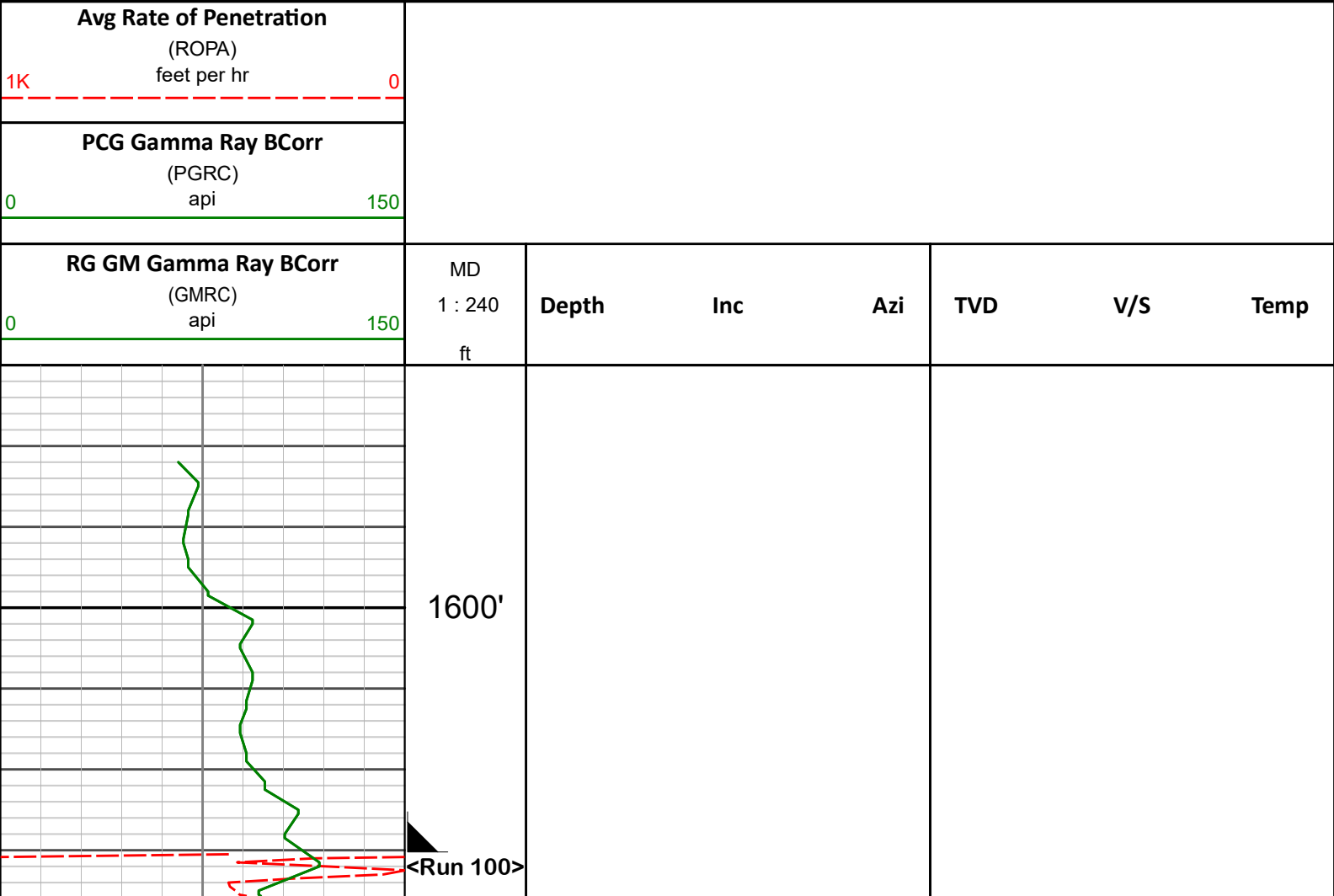
6. Gaps in ROP and Gamma data due to depth tracking issues.

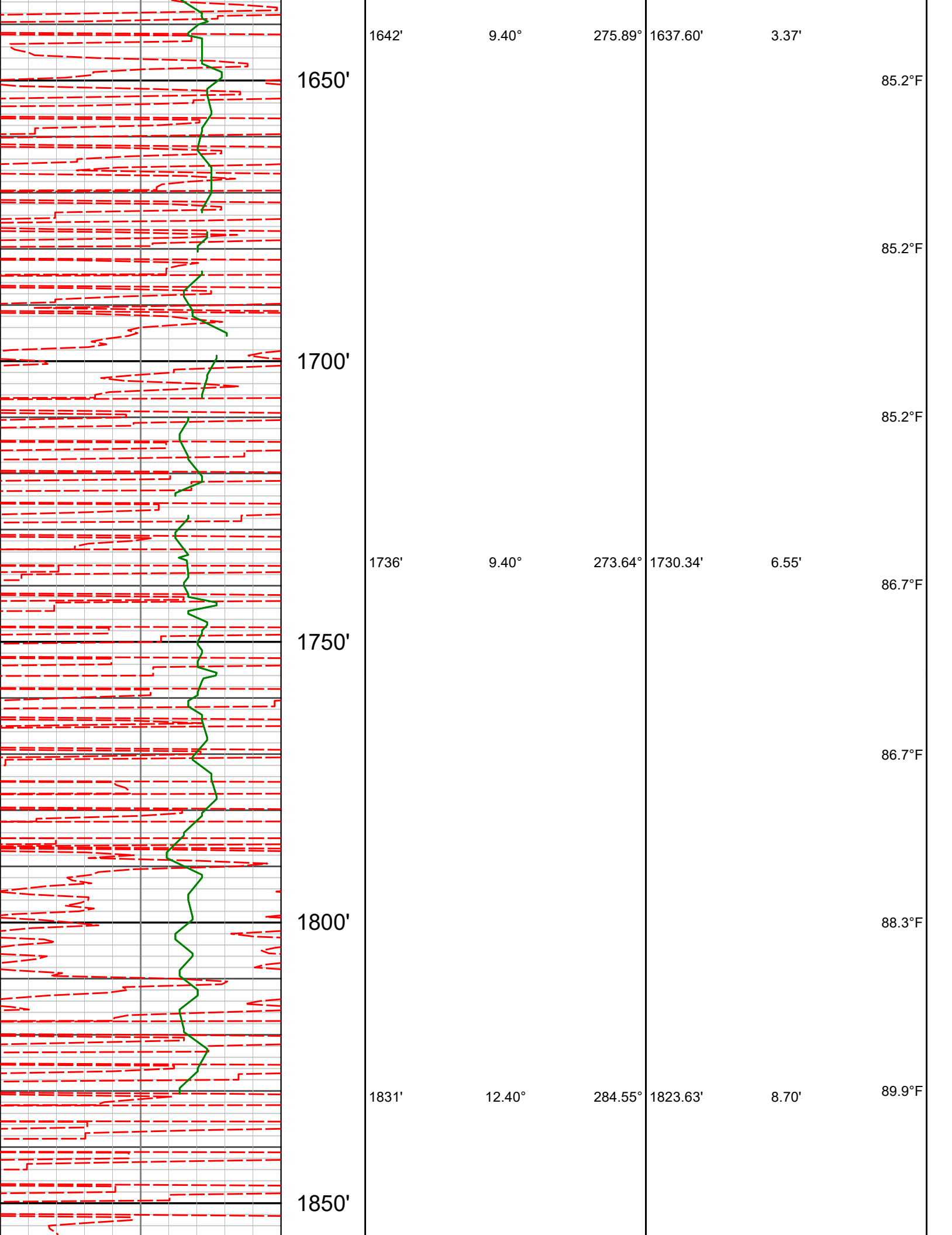
WARRANTY

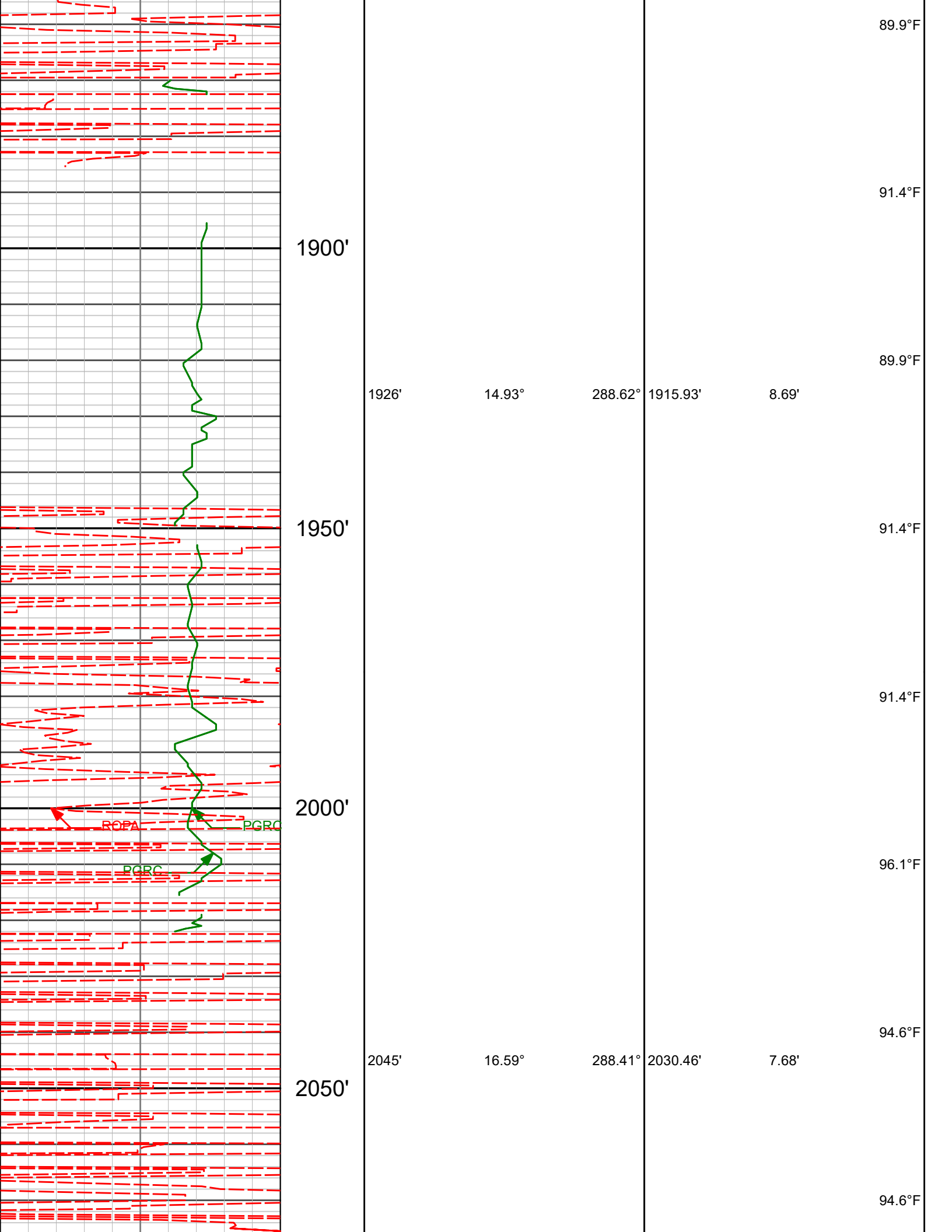
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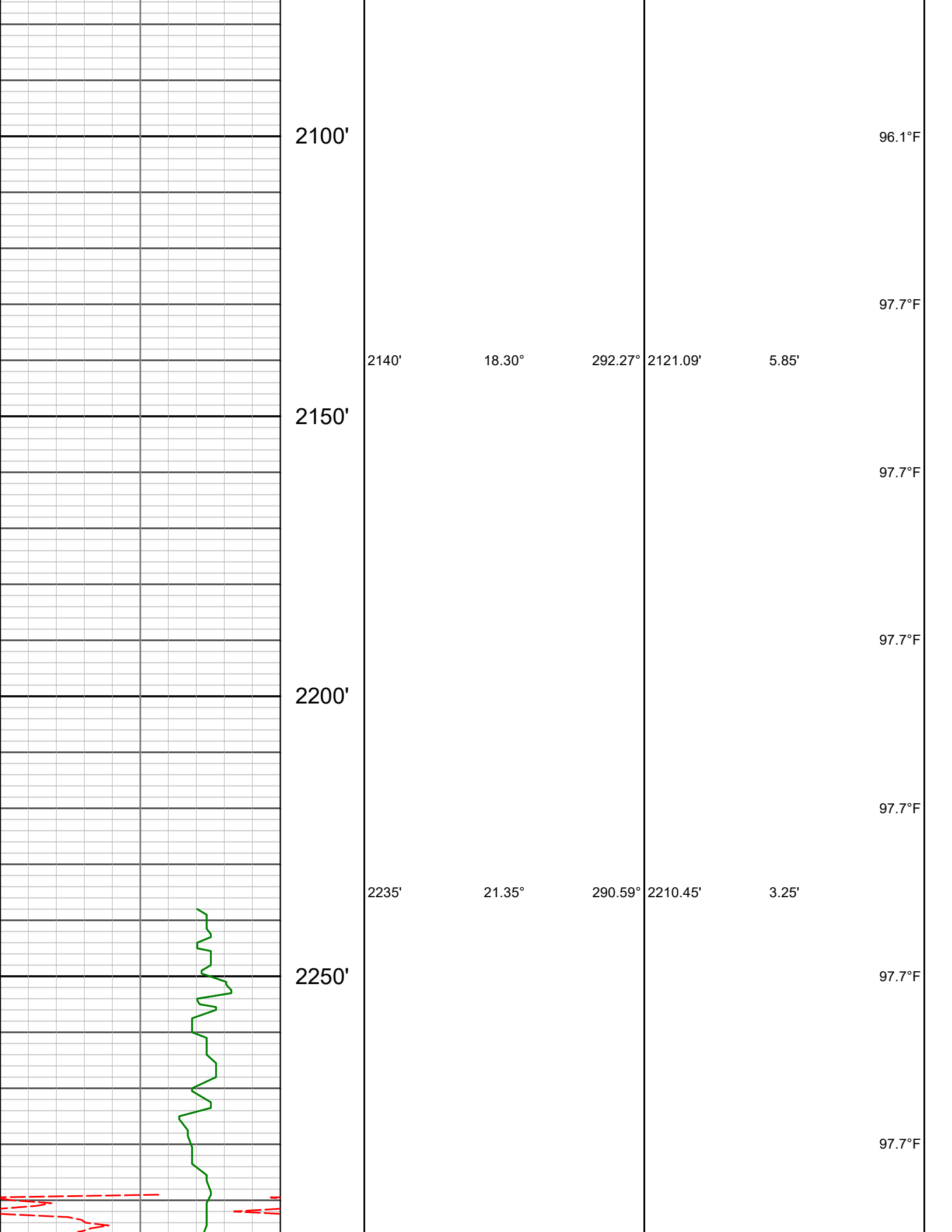
HALLIBURTON

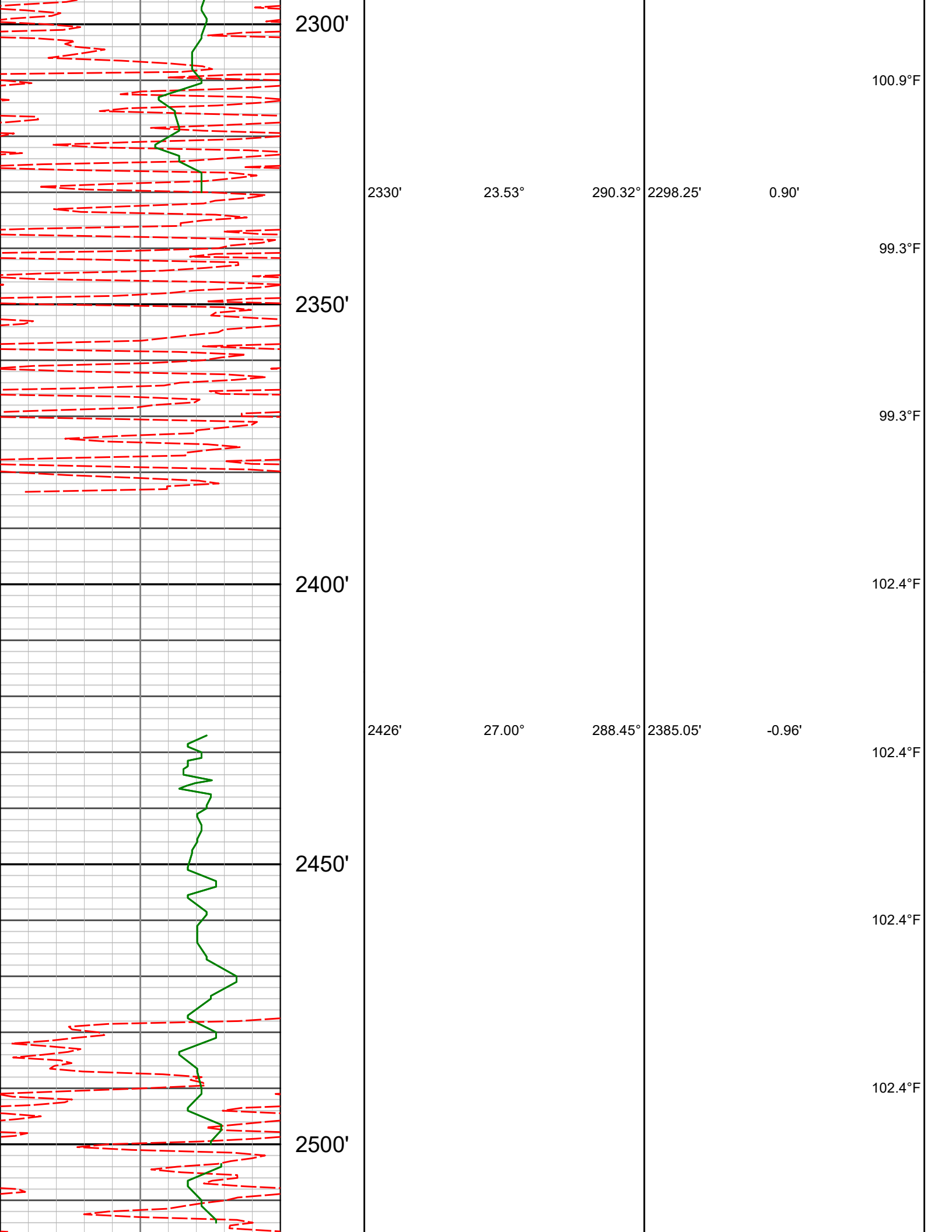
5" MD Log (1:240)

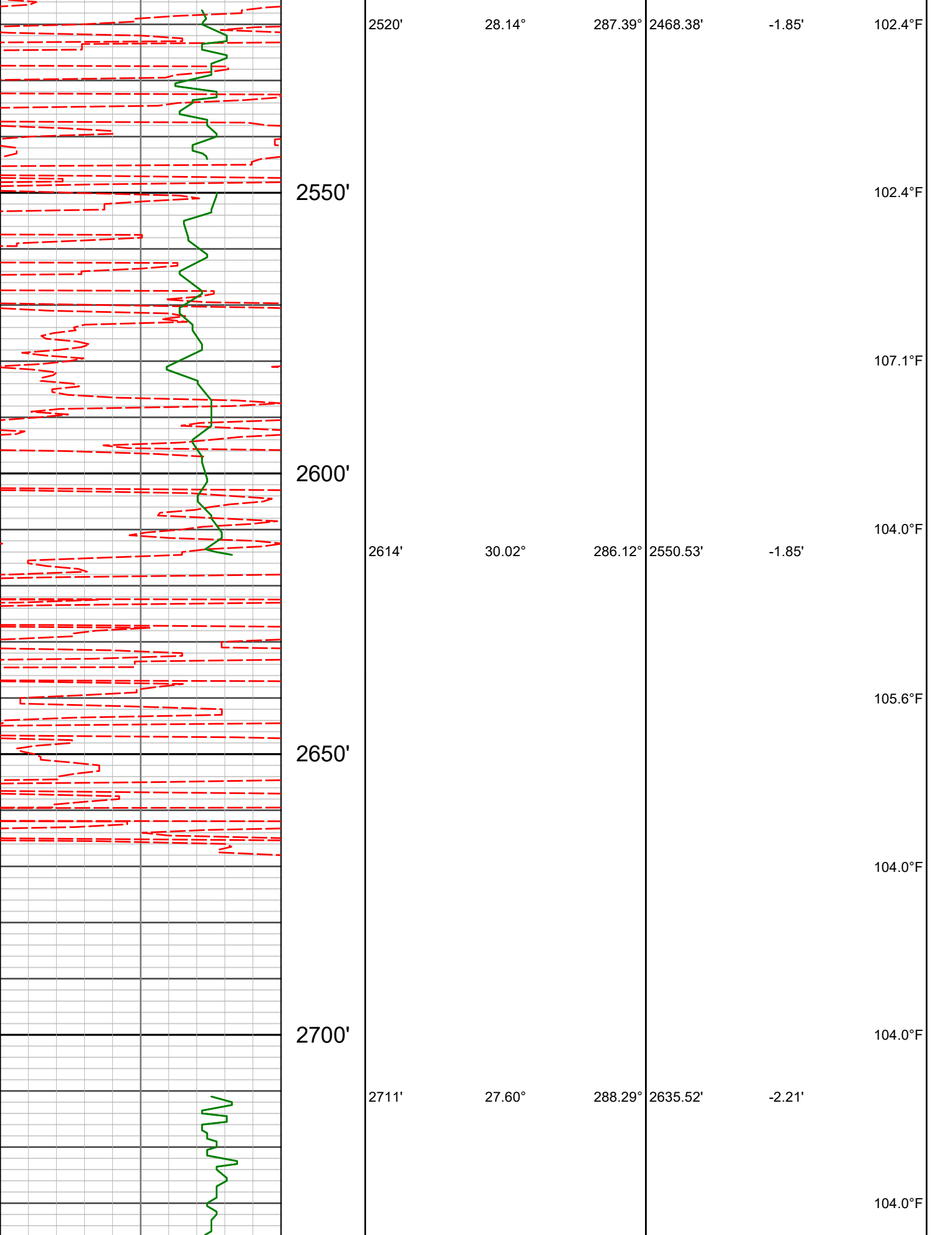


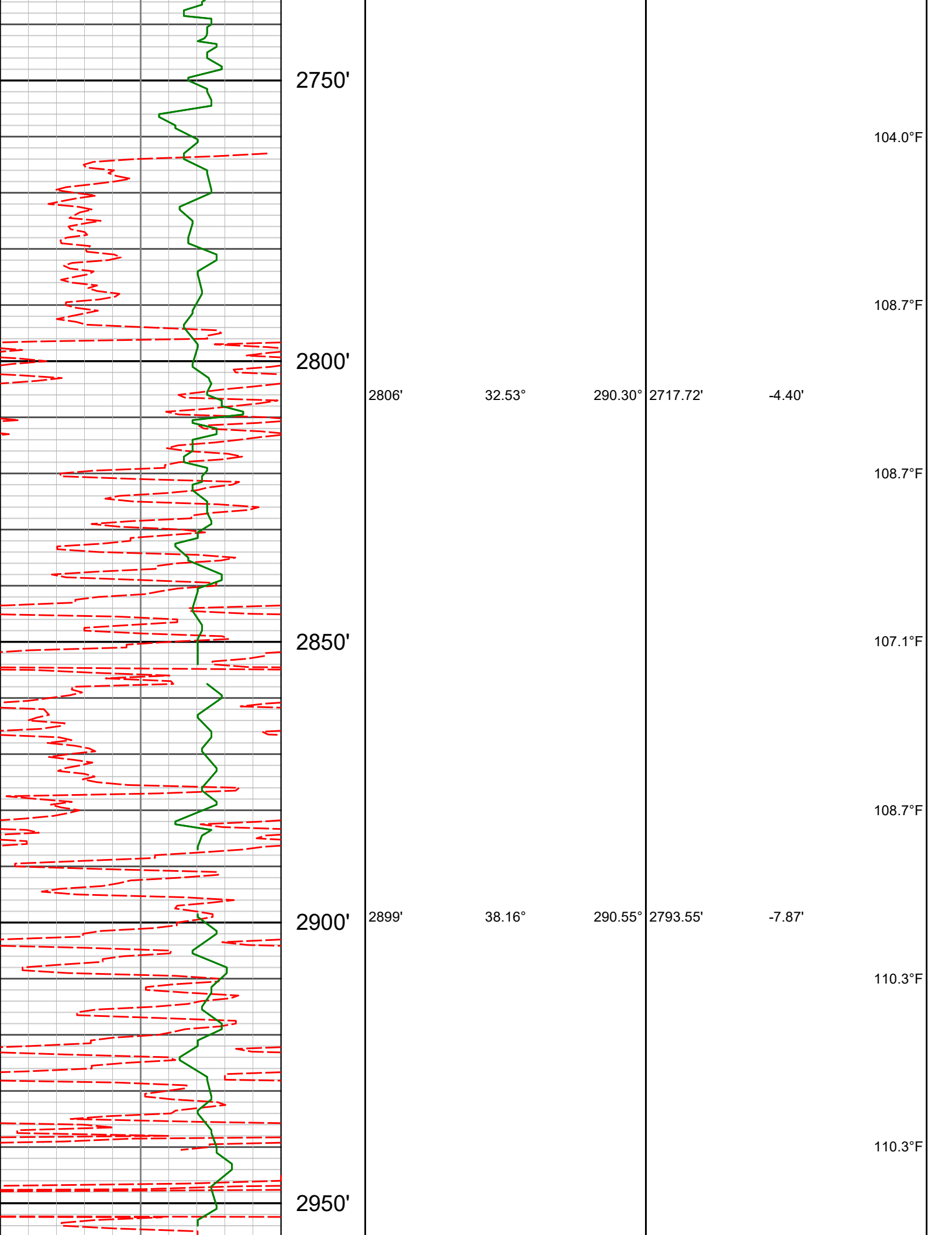


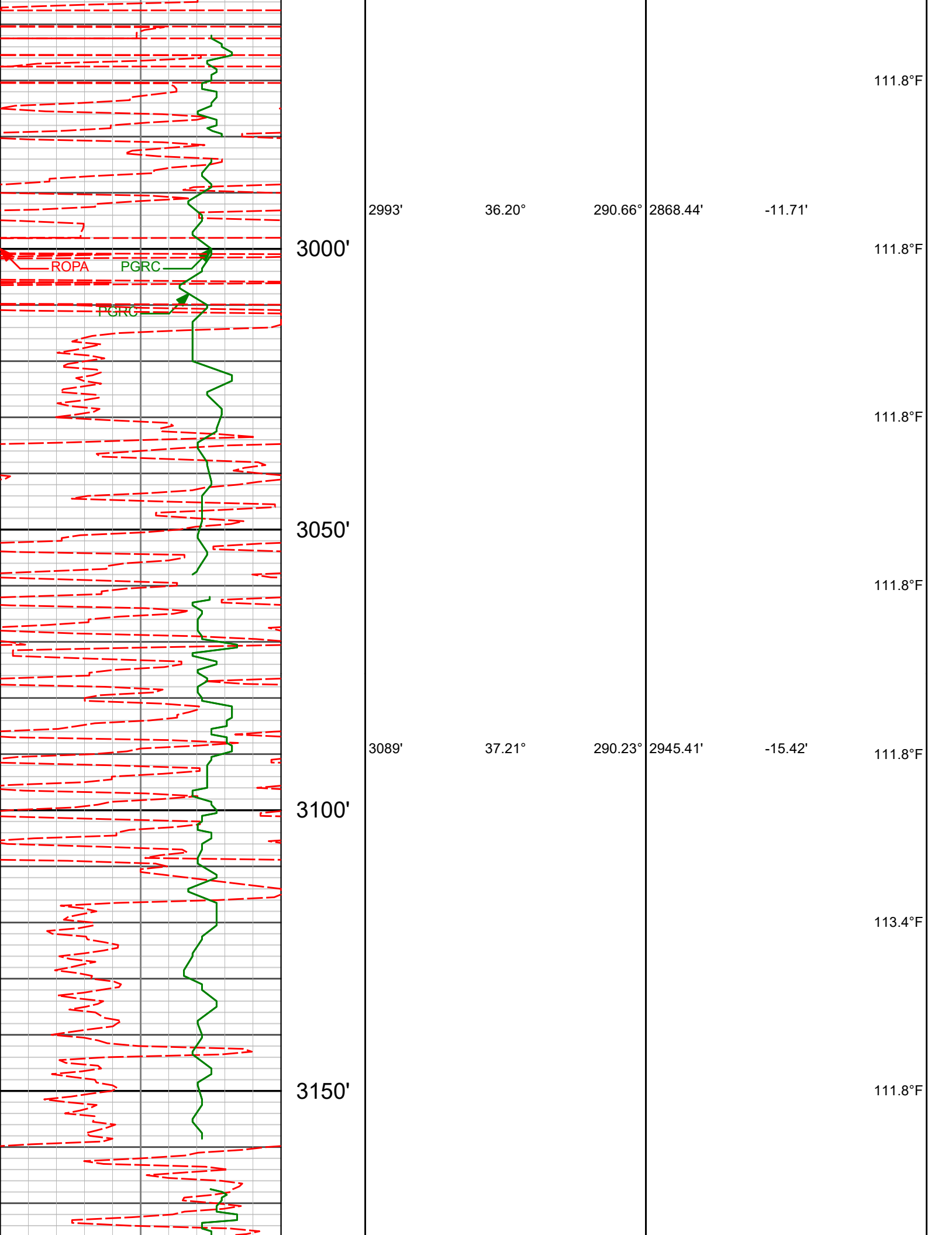


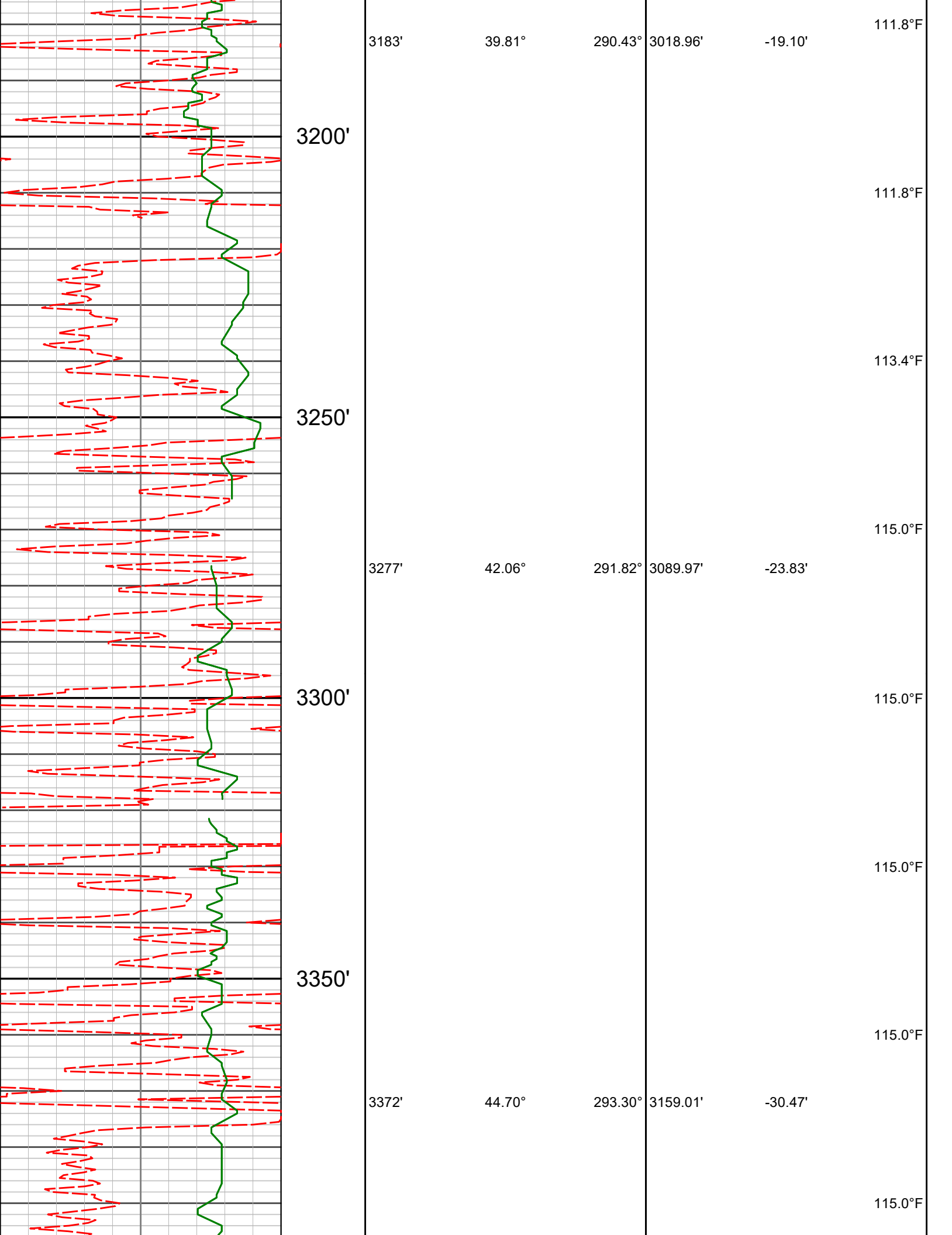


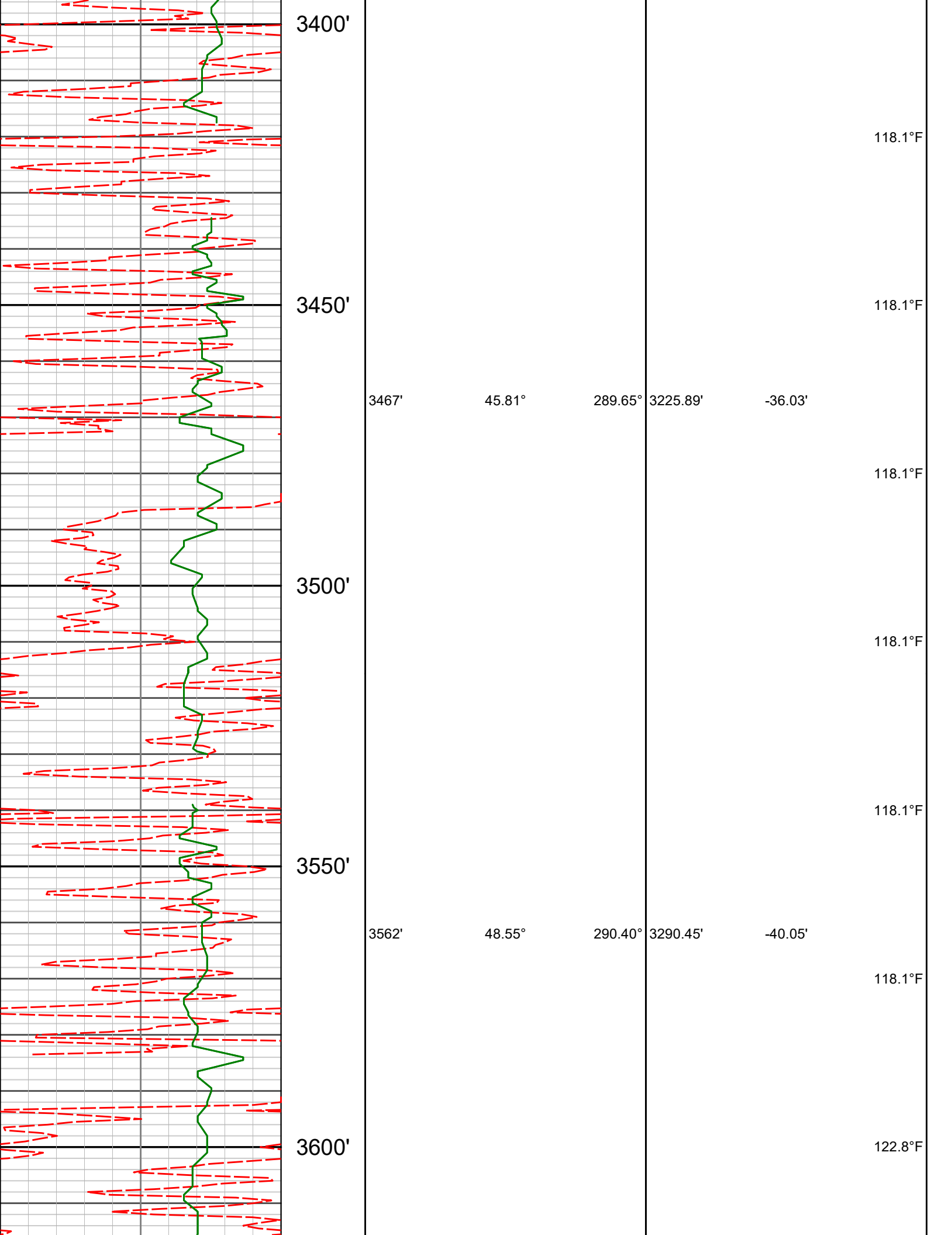


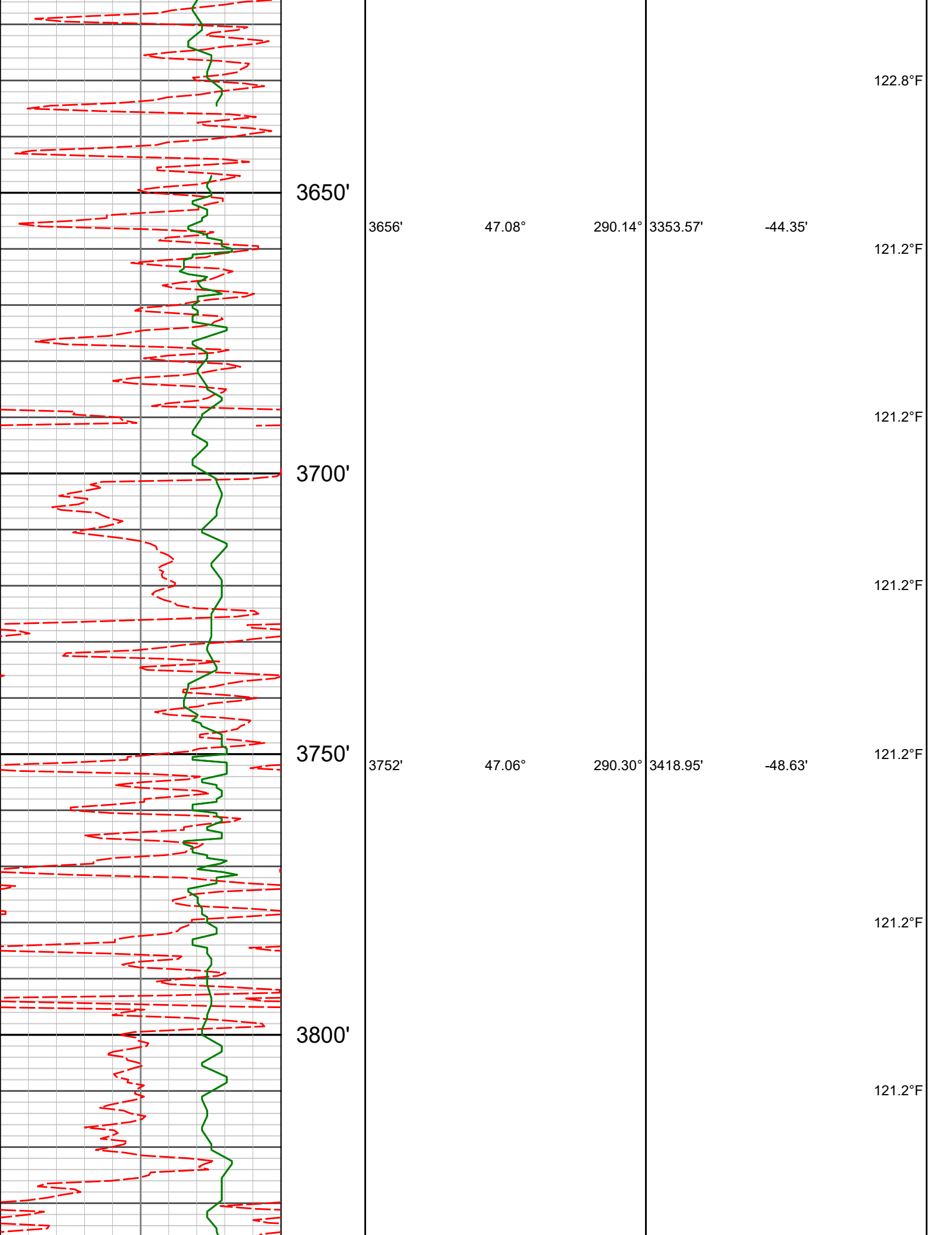


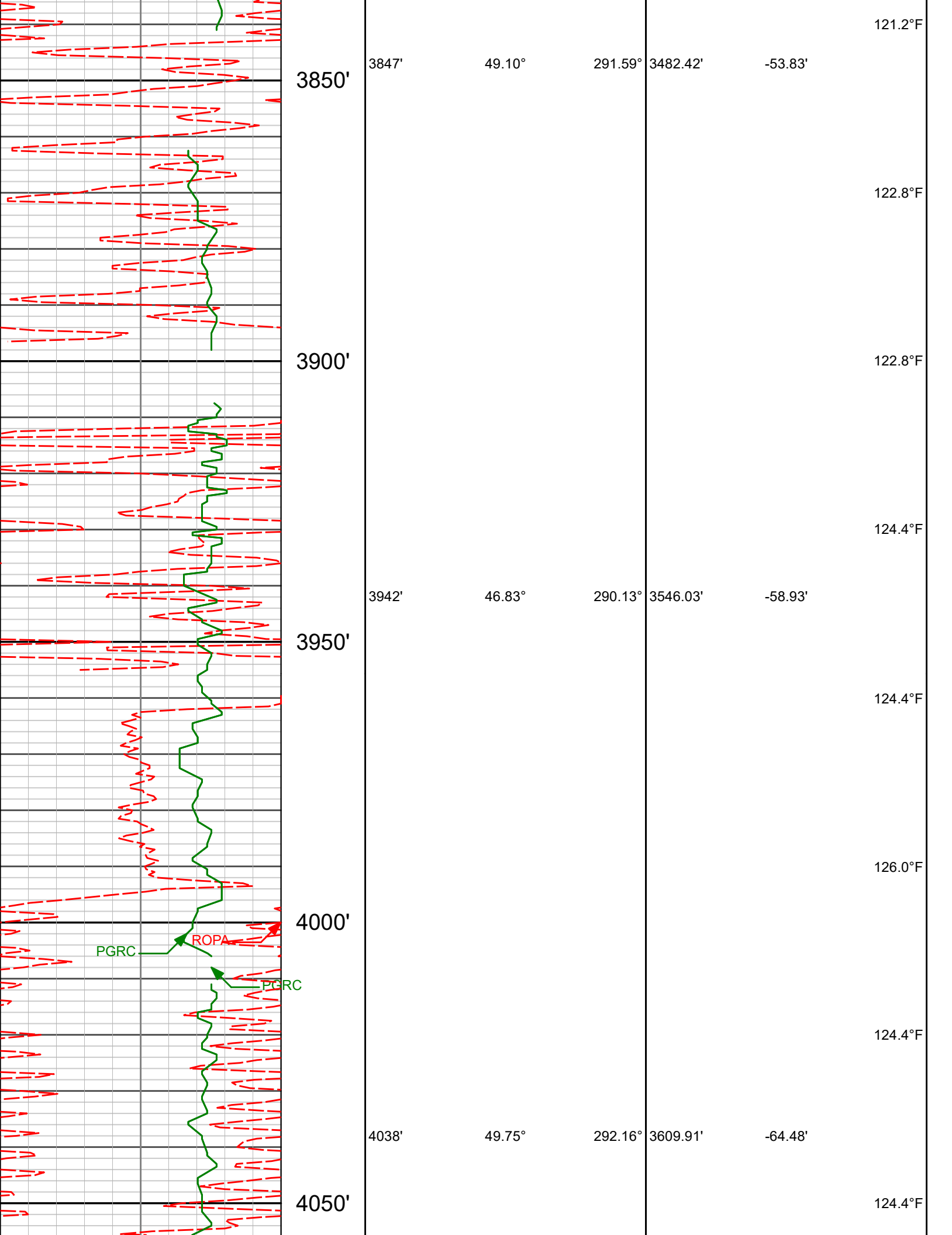


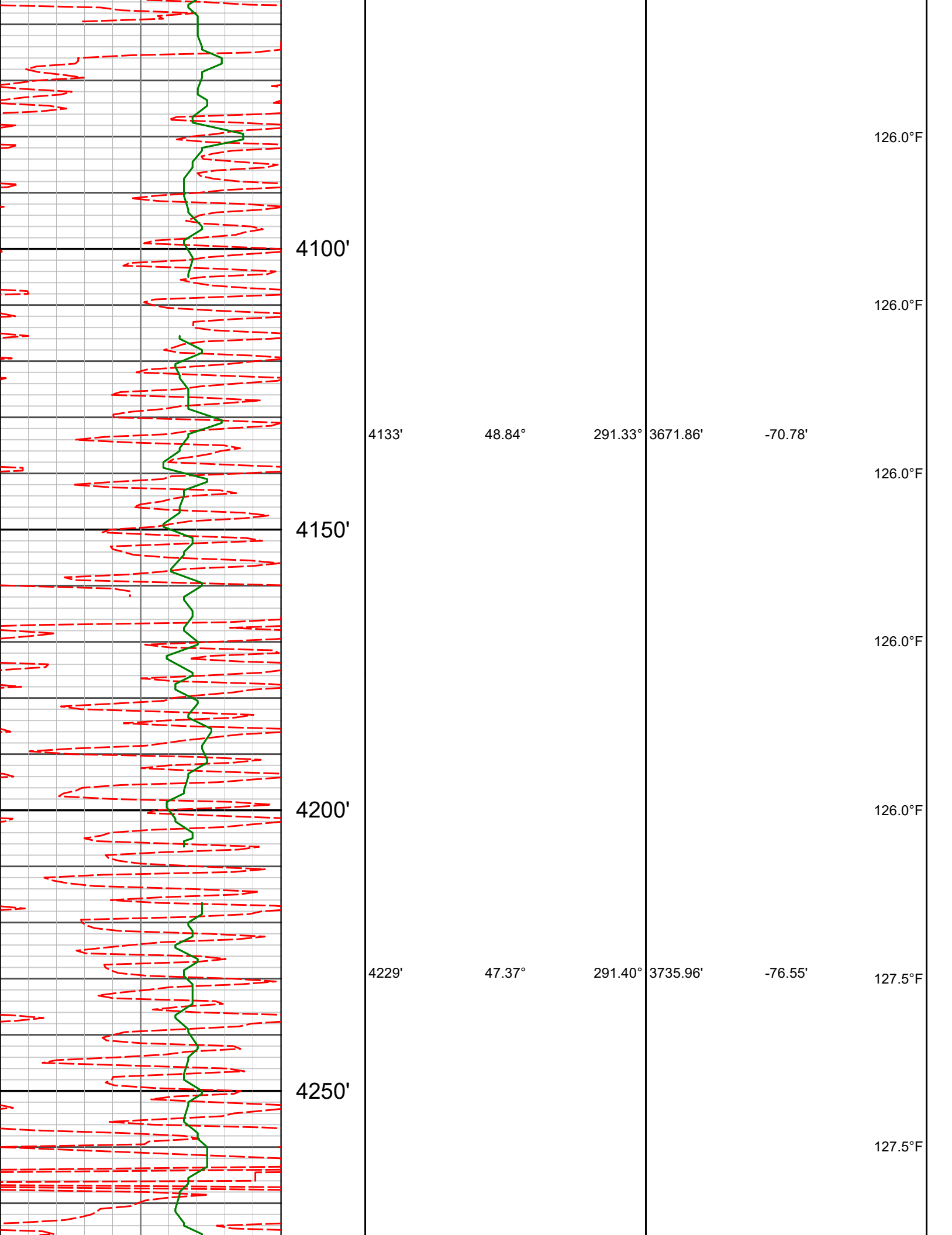


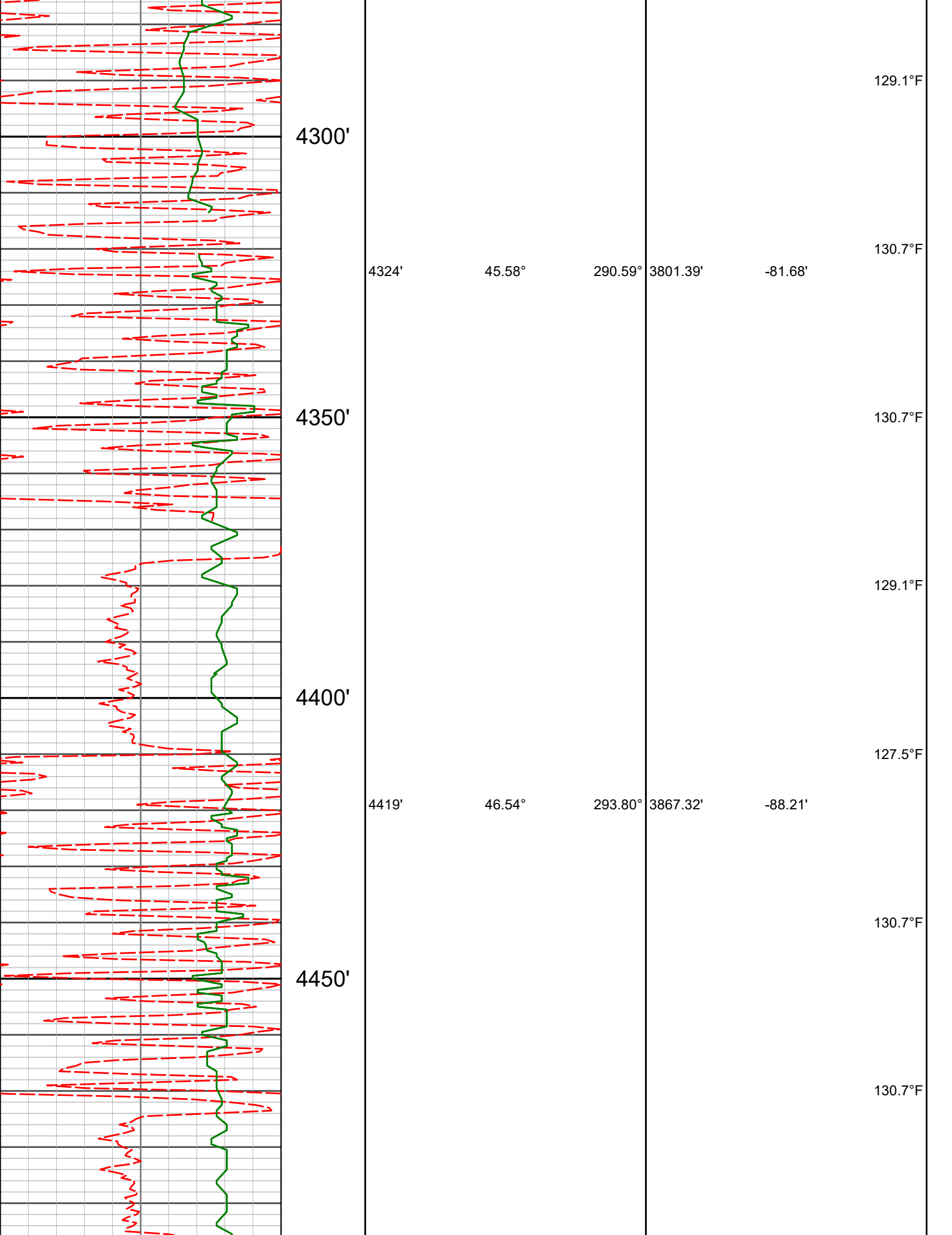


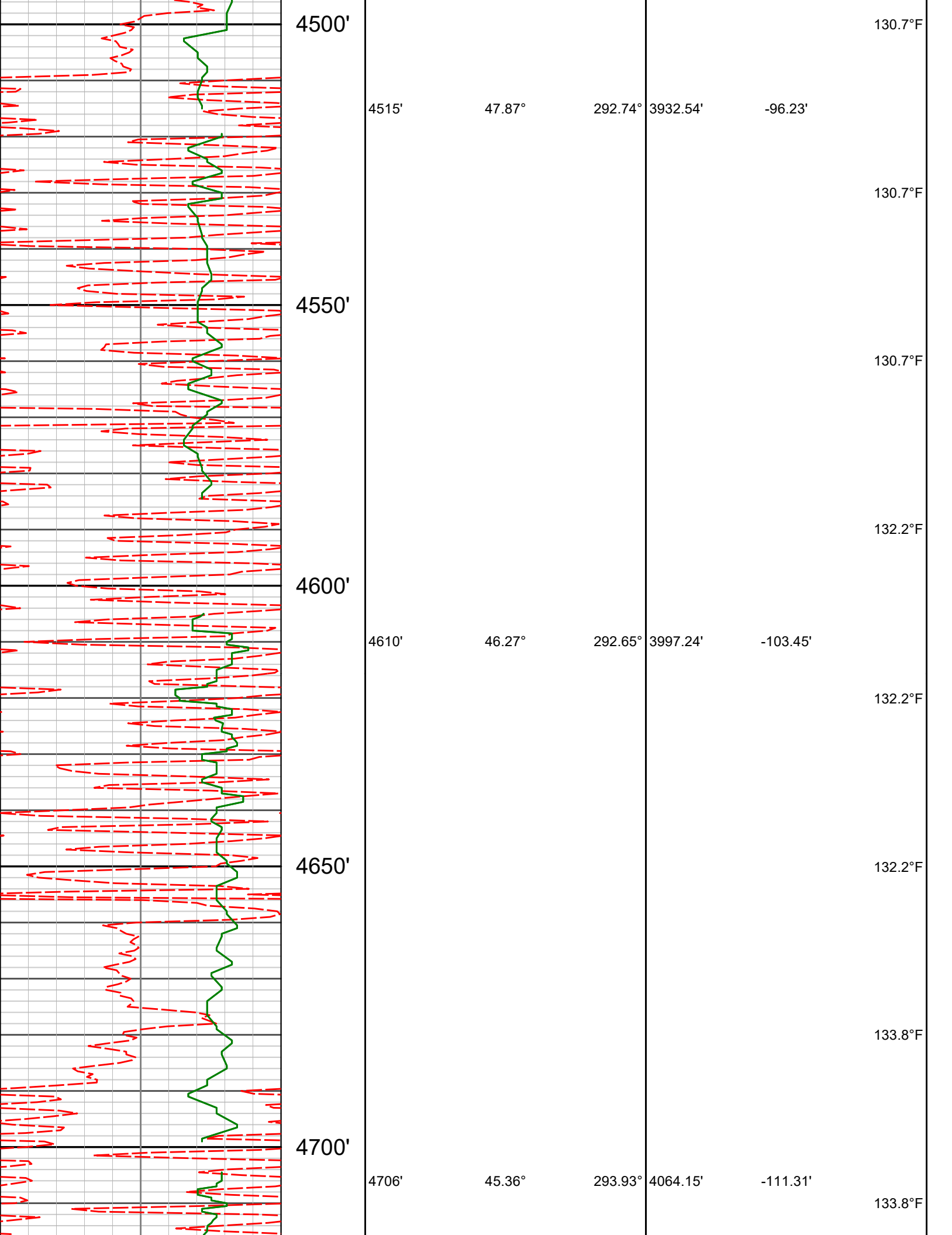


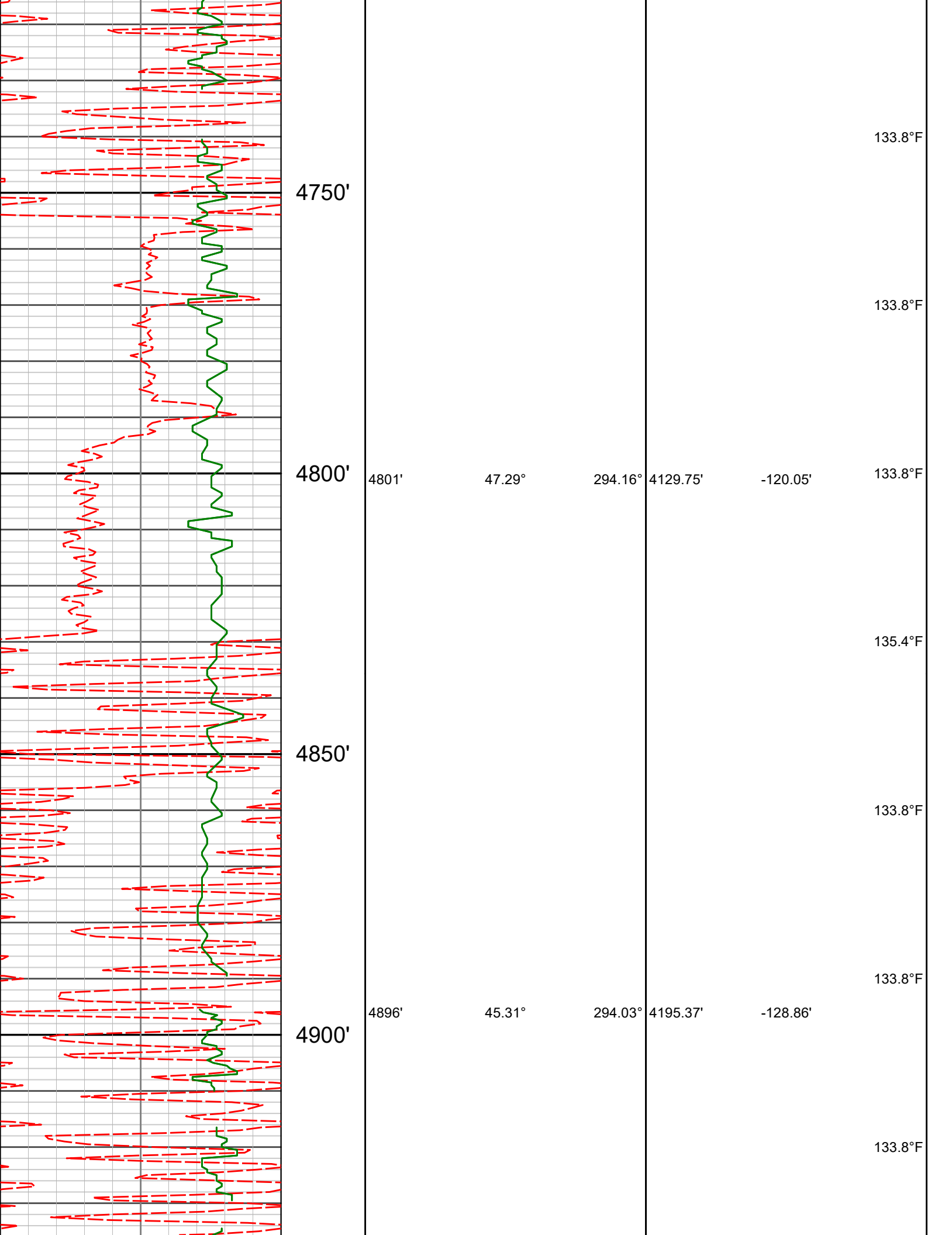


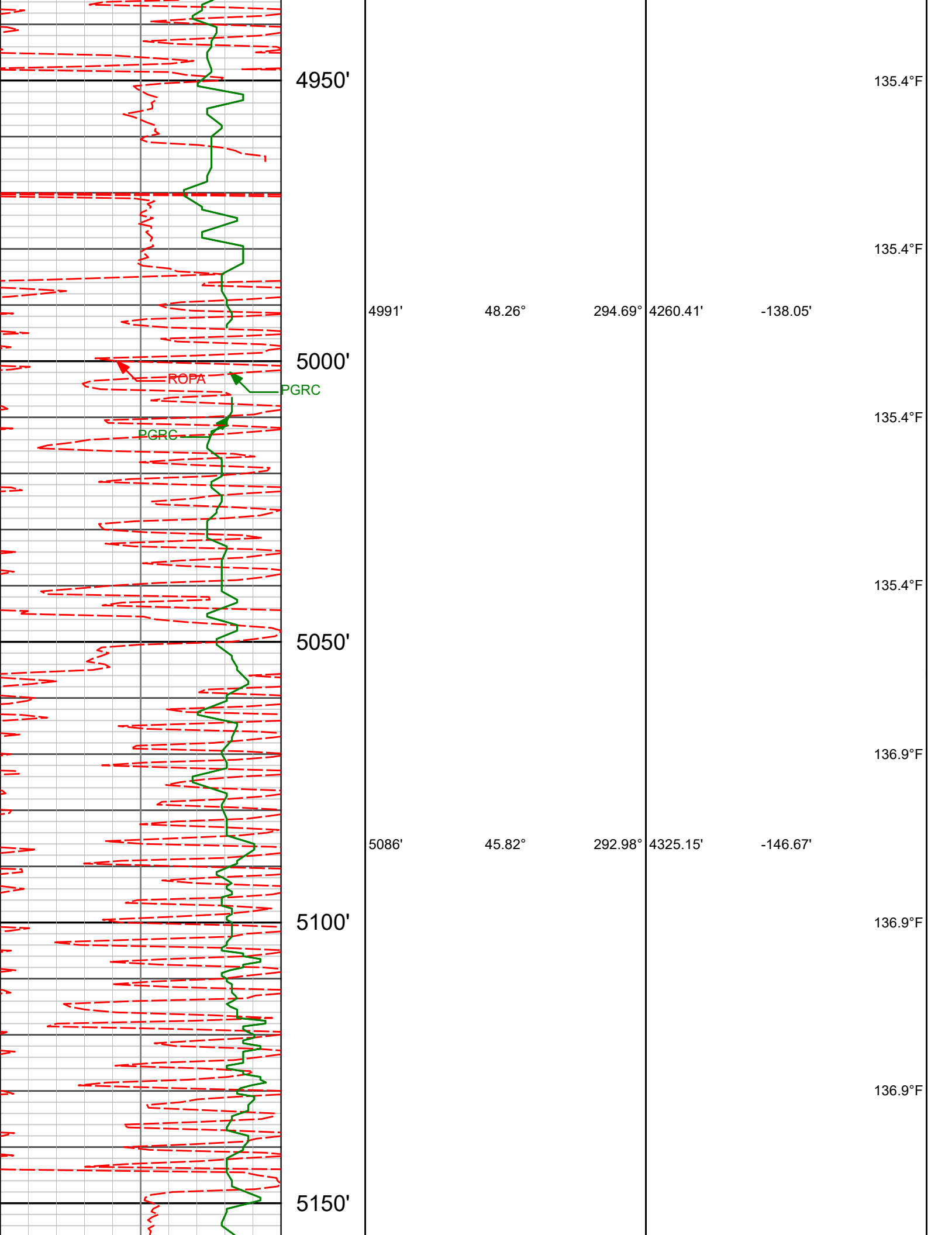


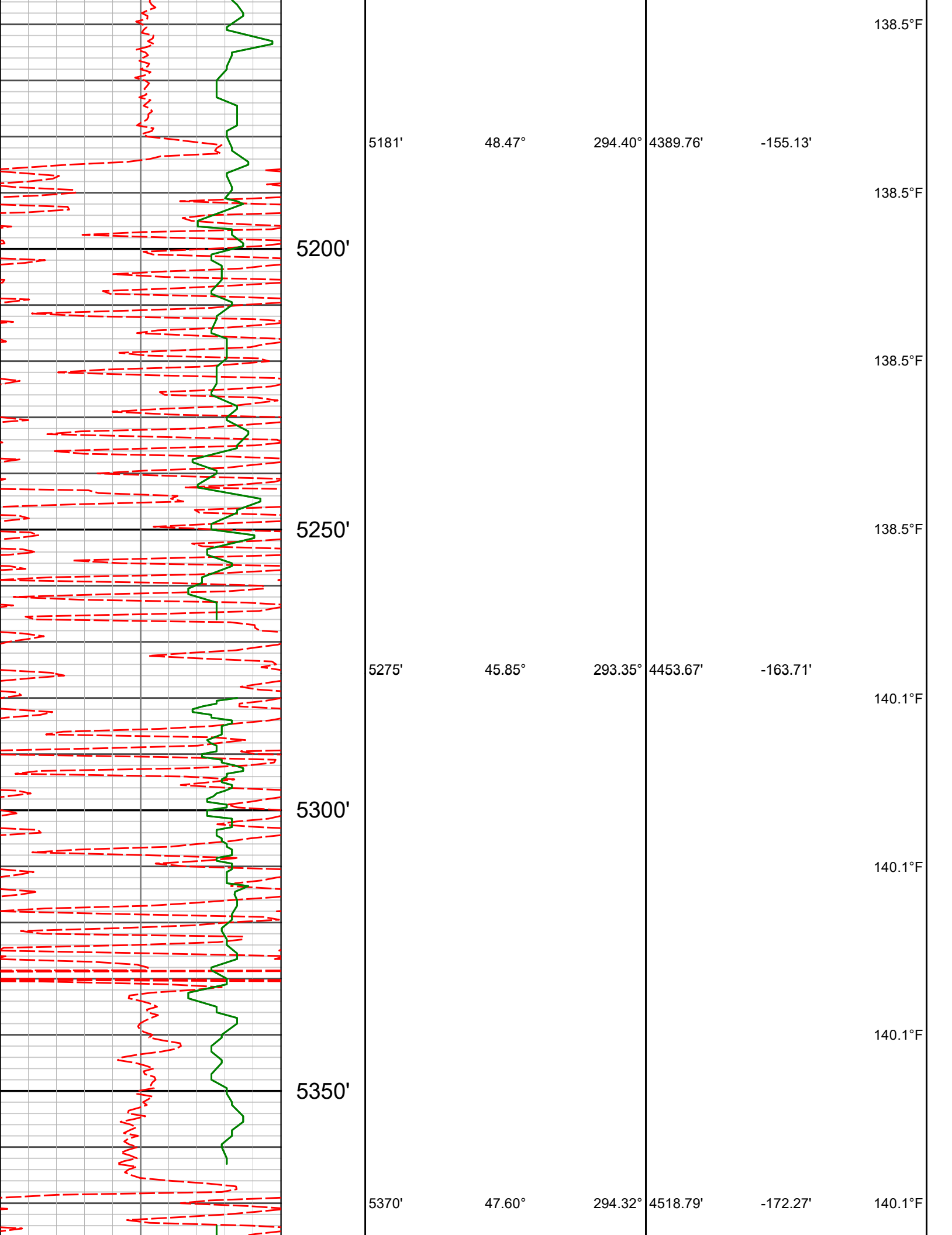


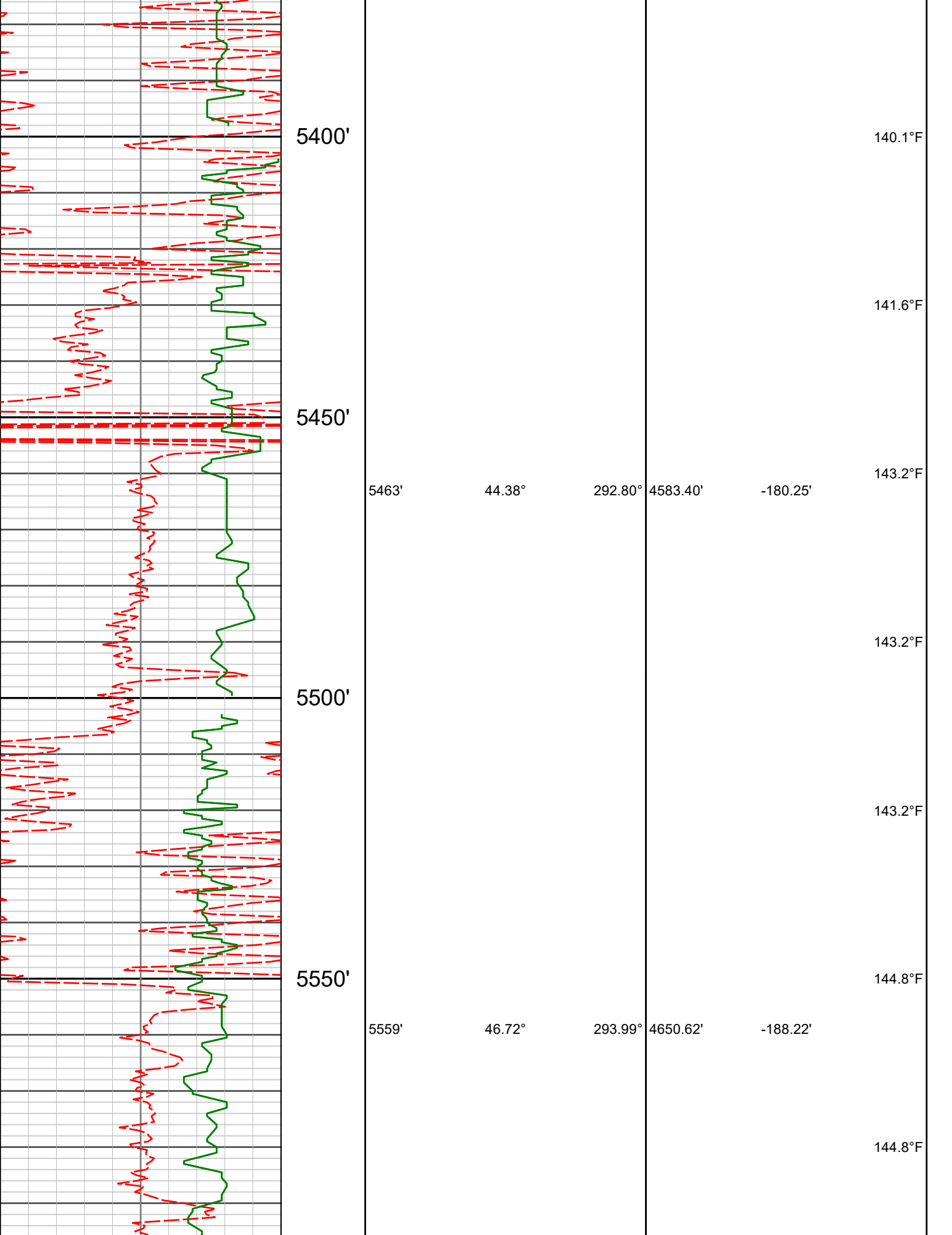


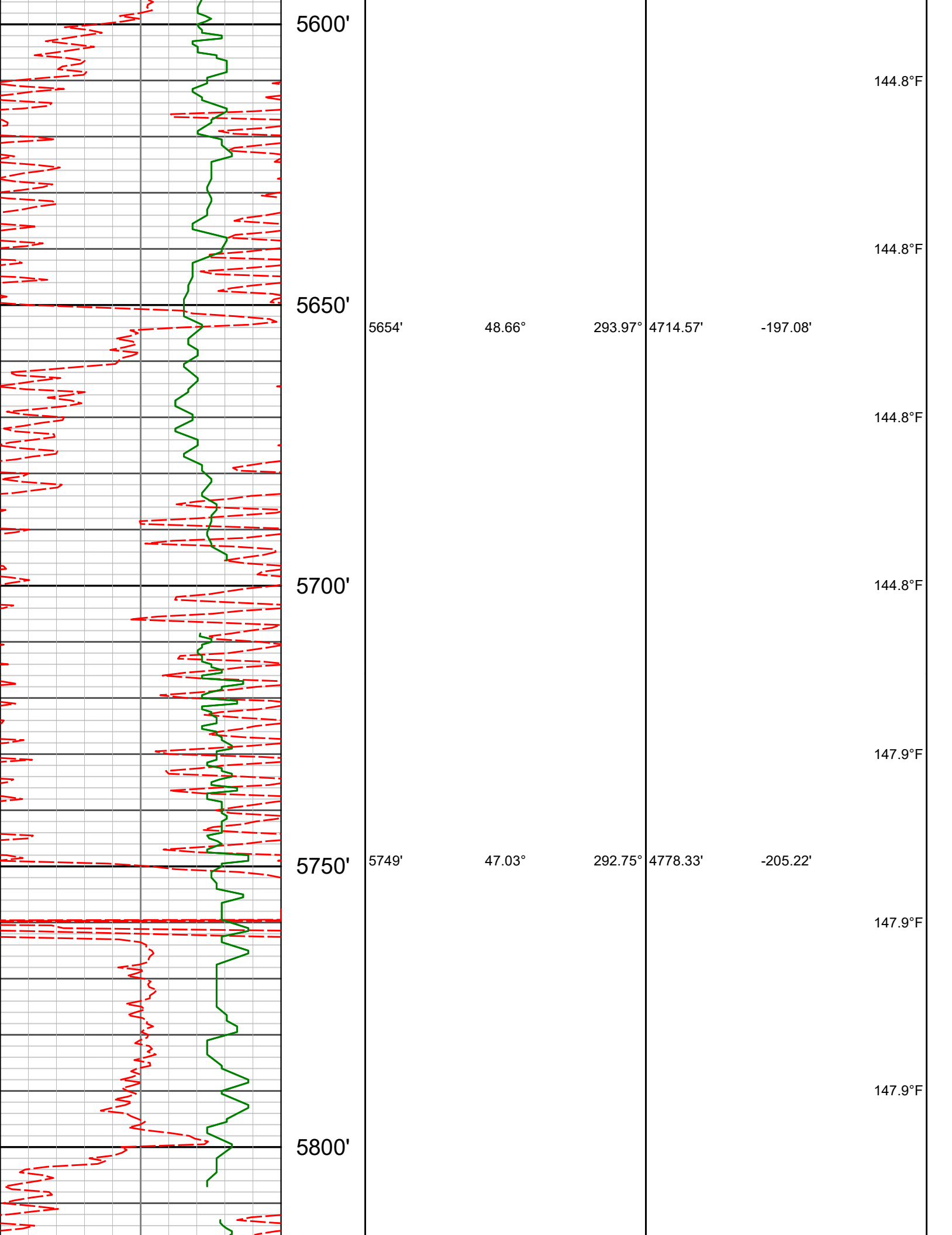


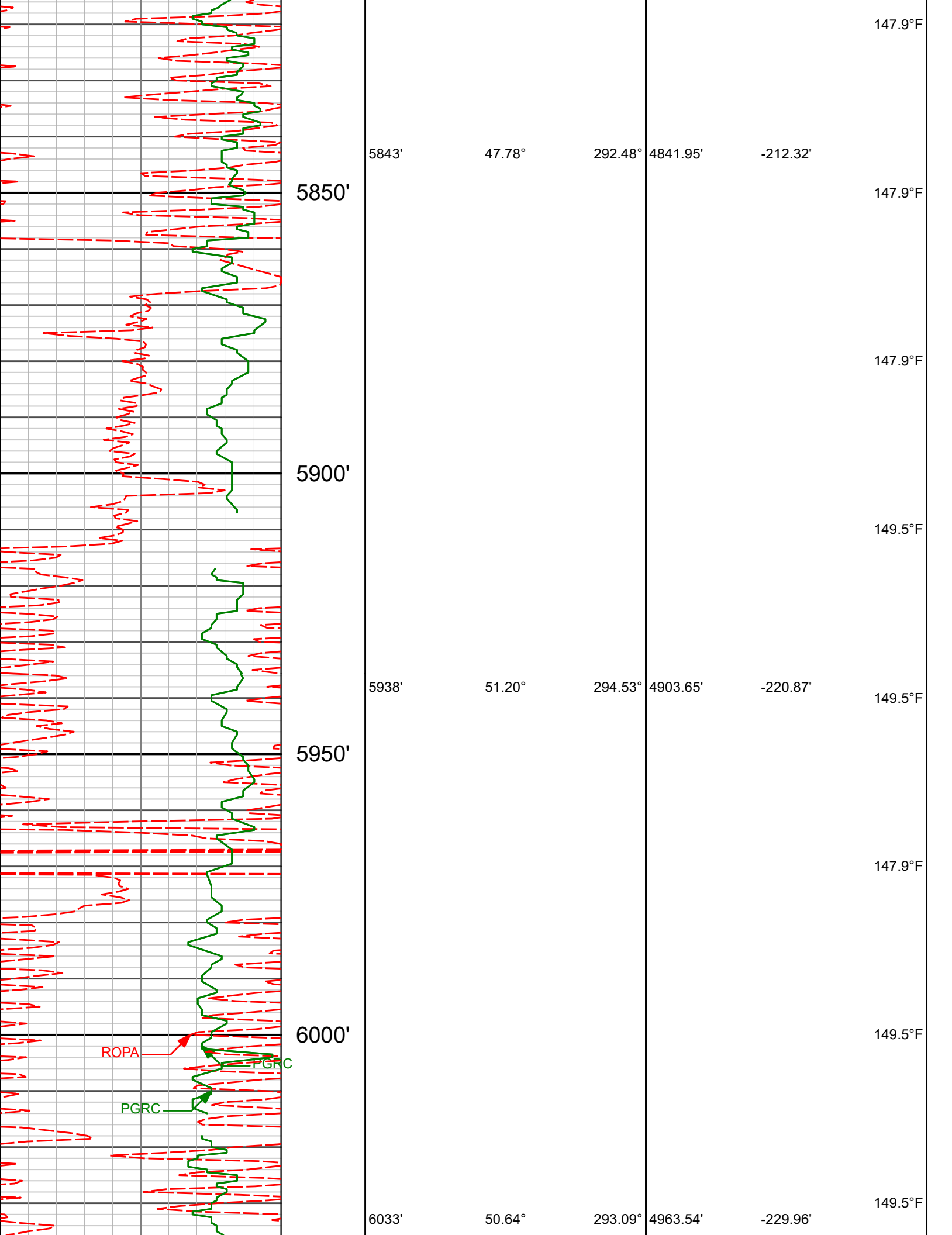


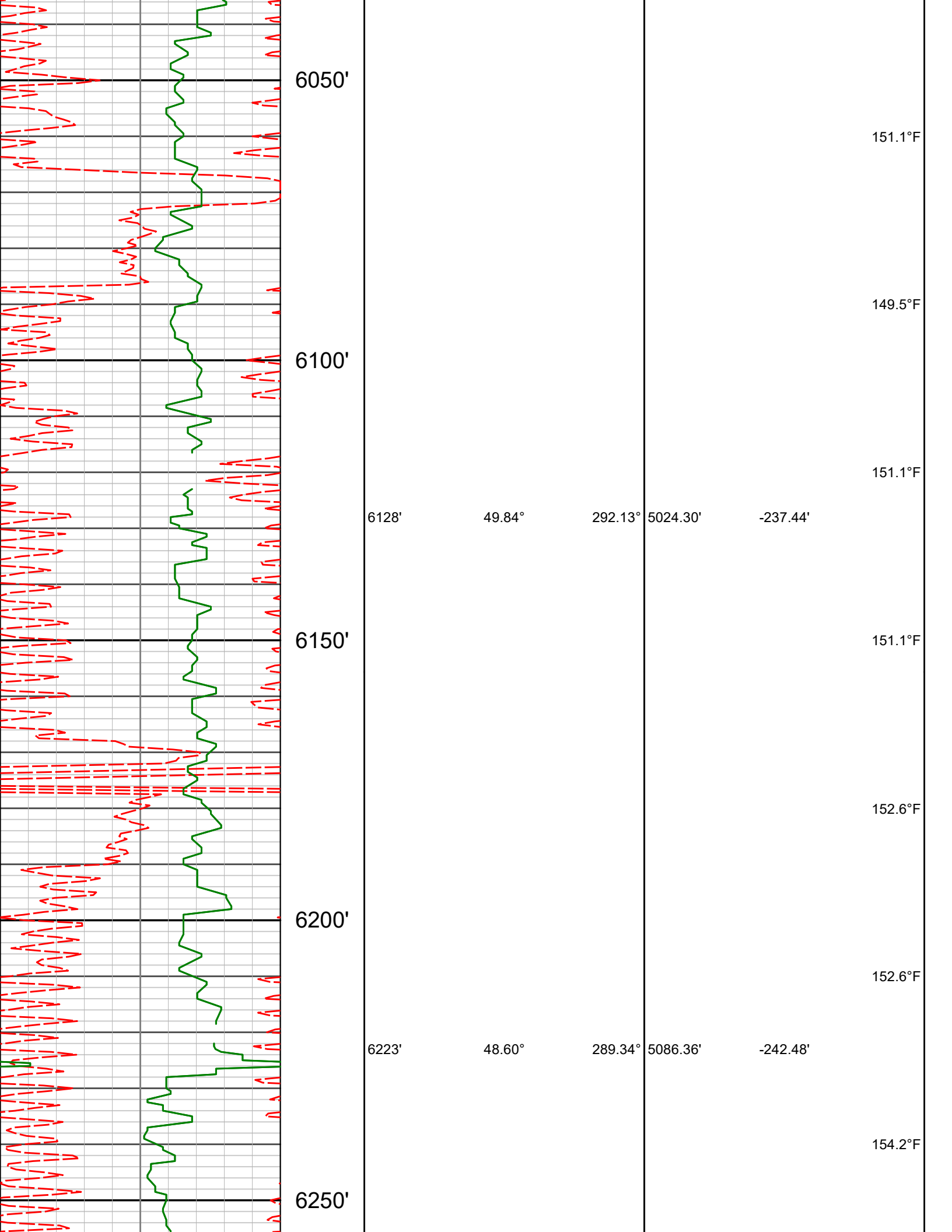


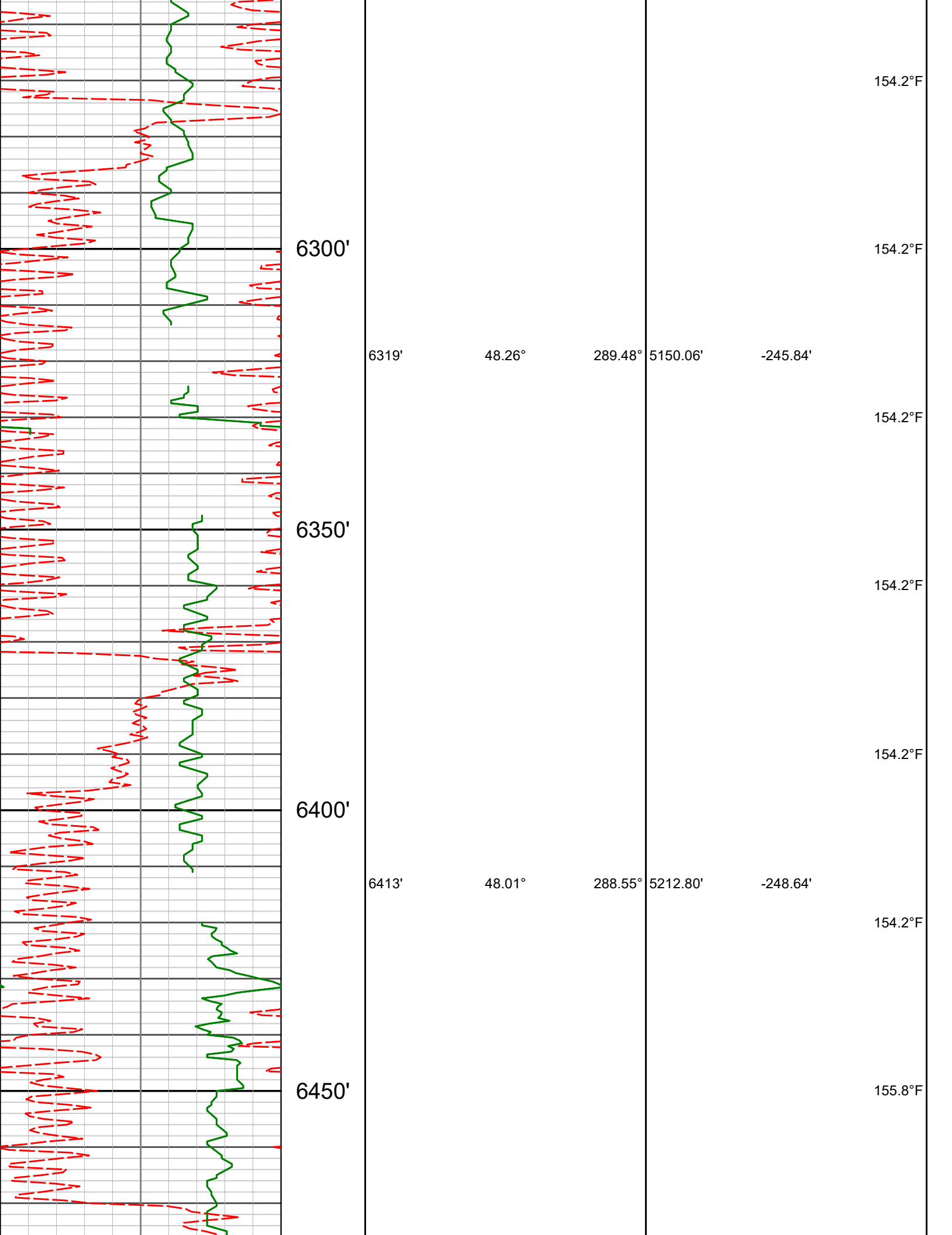


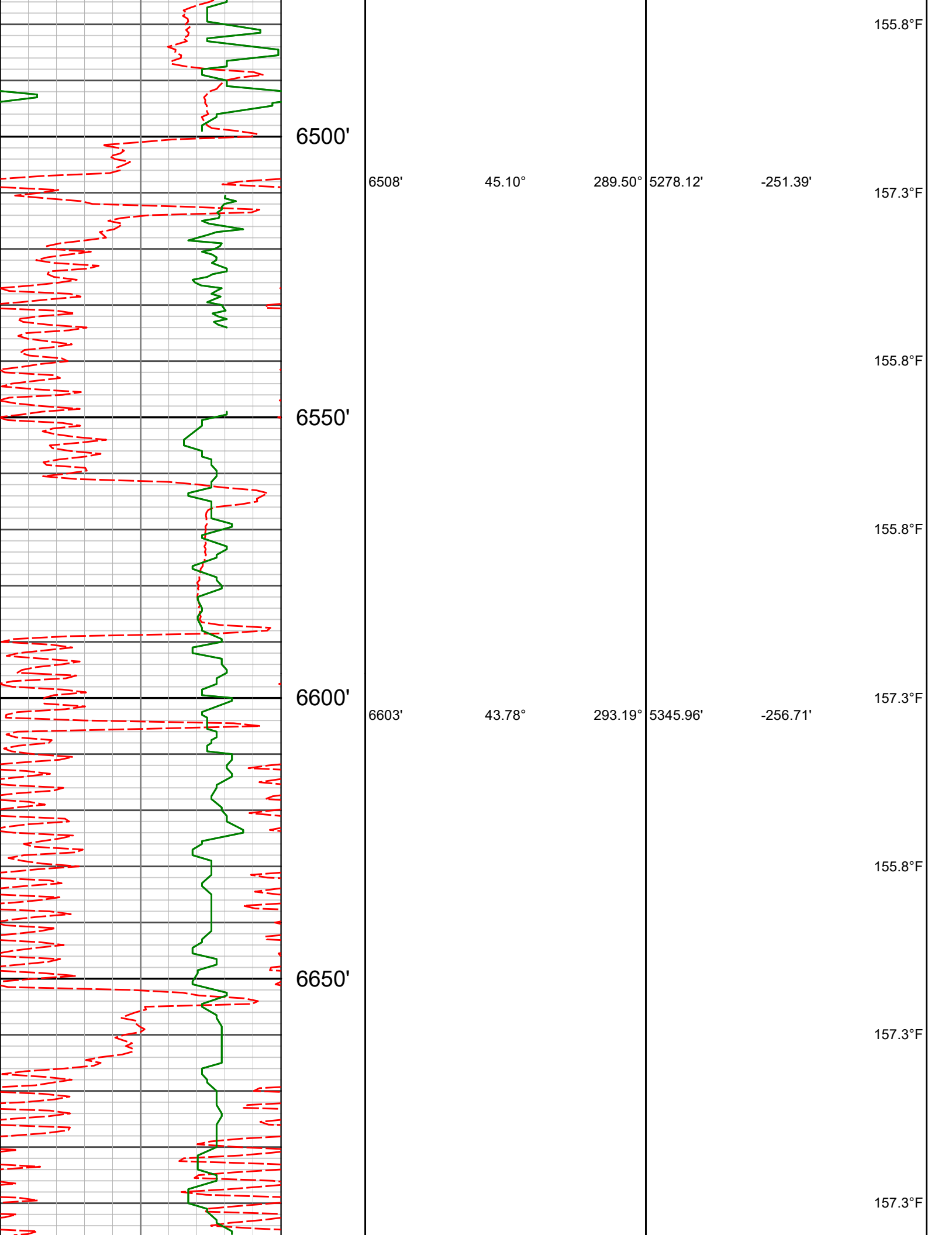


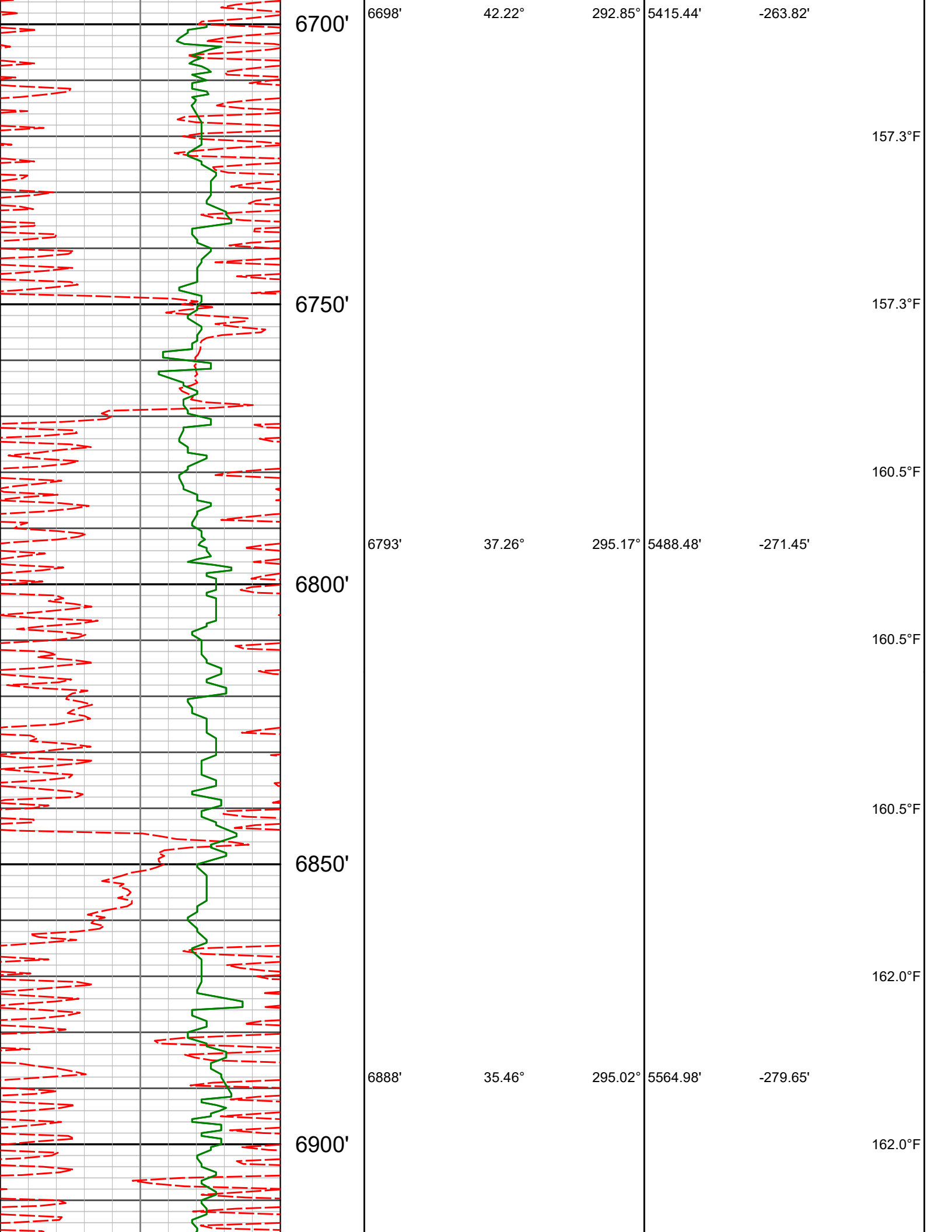


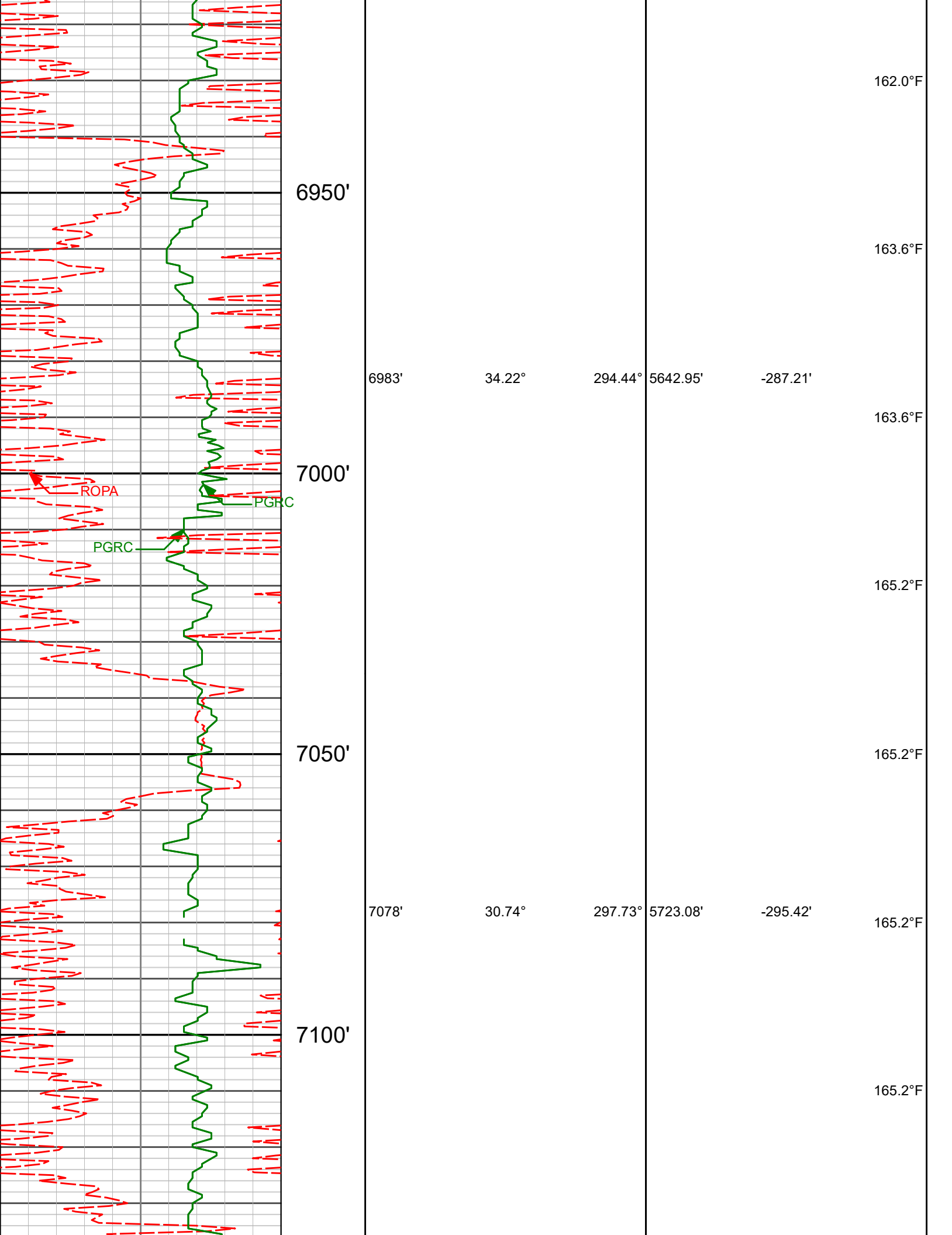


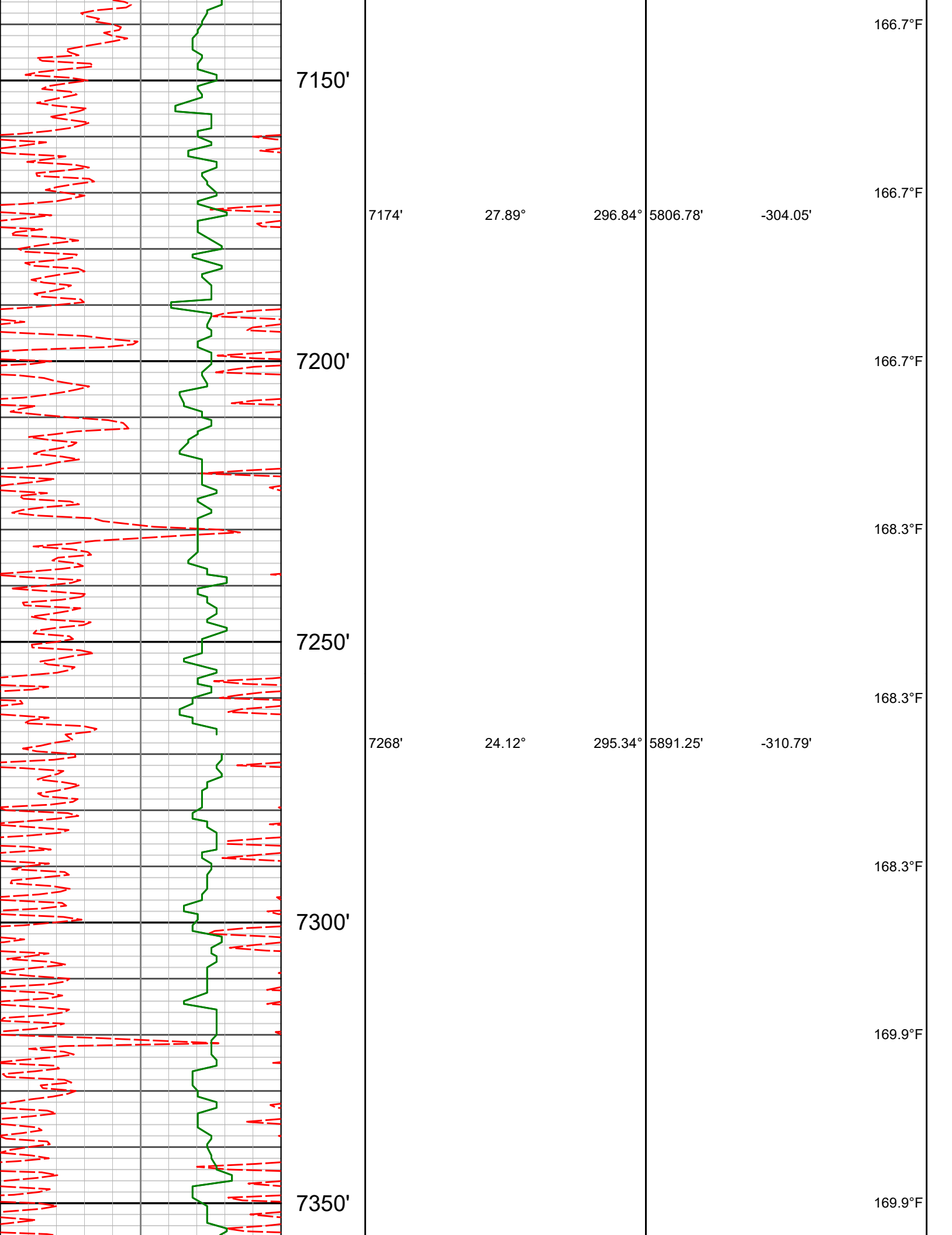


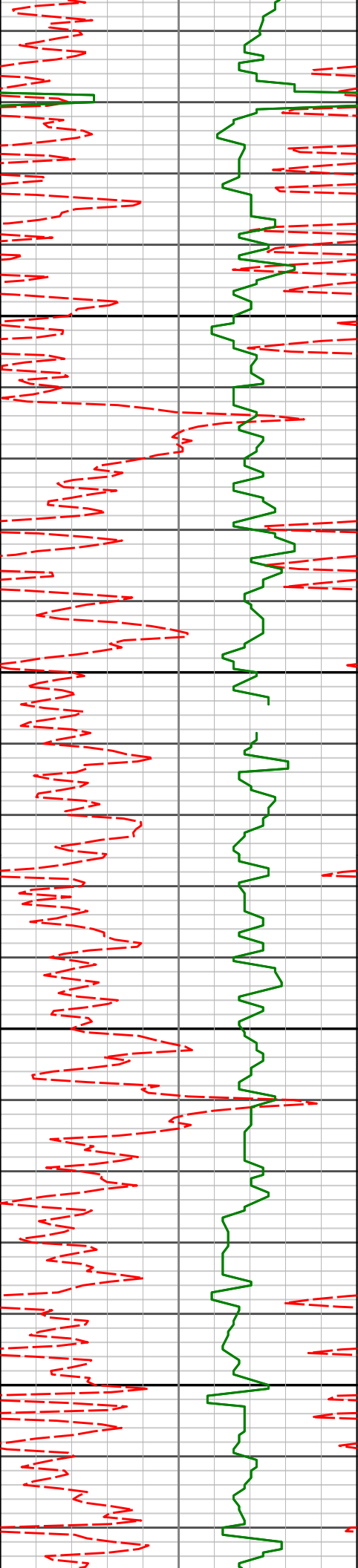












7400'

7450'

7500'

7550'

7364'

21.08°

294.06°

5979.86'

-315.93'

169.9°F

169.9°F

171.5°F

7459'

18.96°

293.28°

6069.12'

-319.87'

171.5°F

171.5°F

173.0°F

7554'

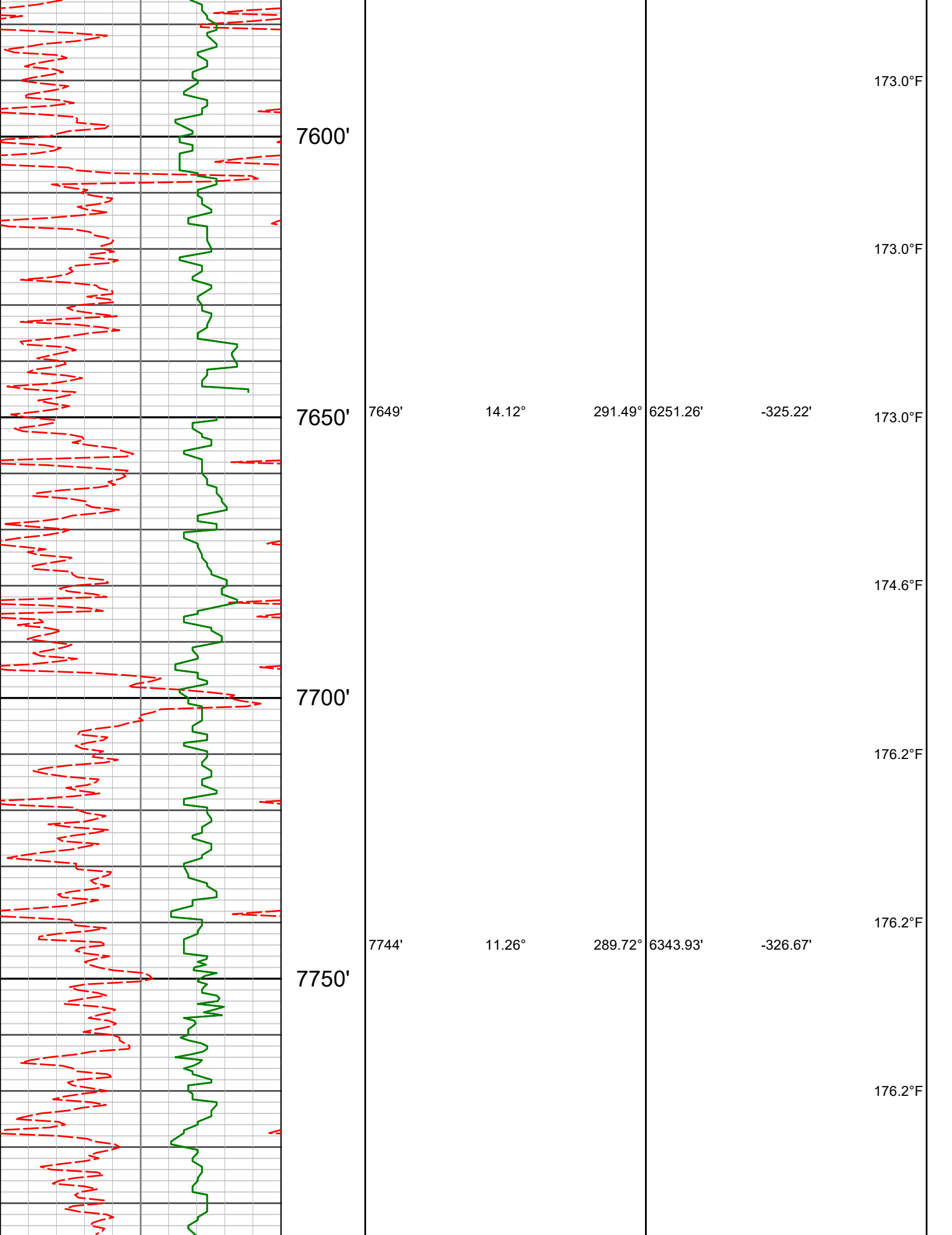
16.43°

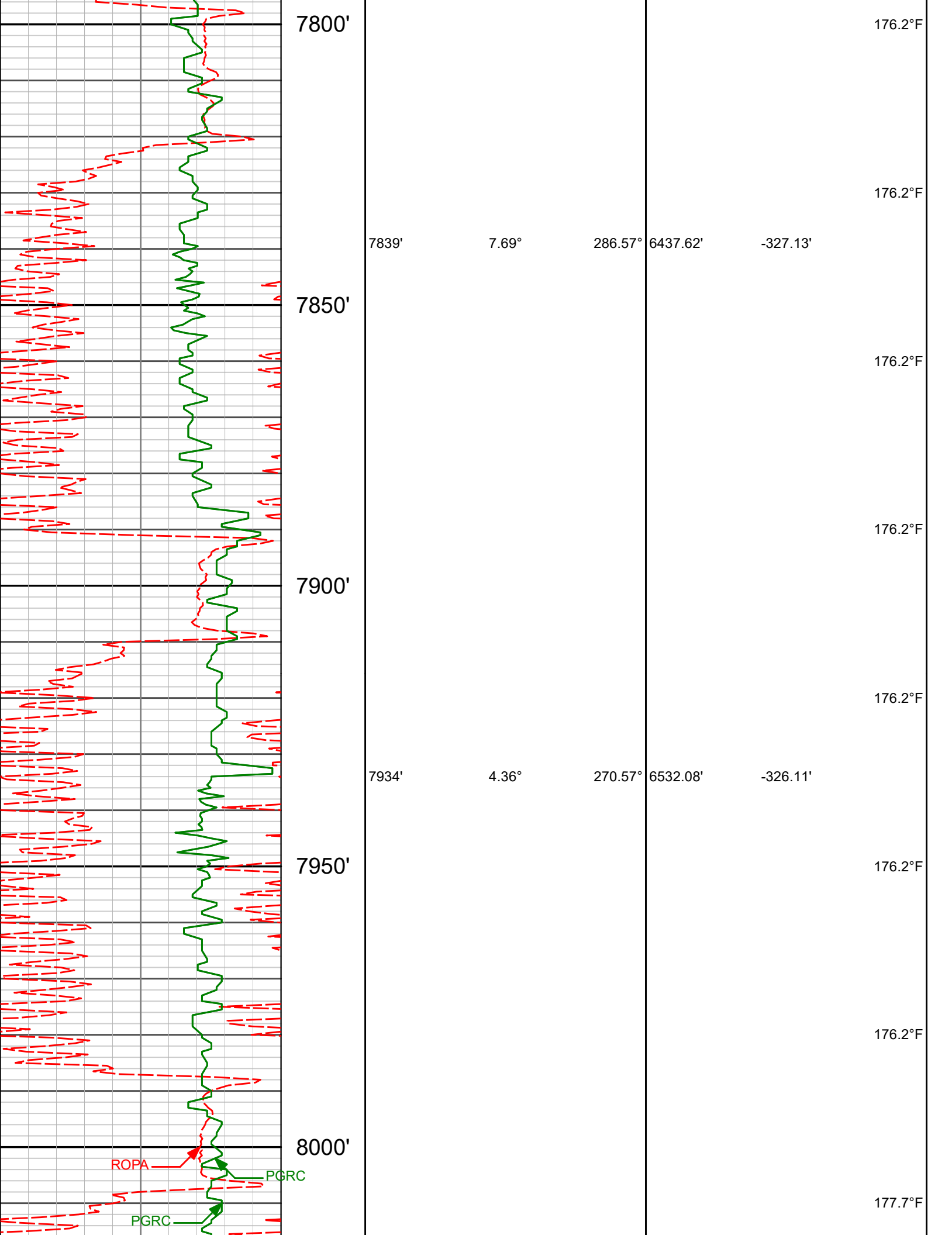
292.34°

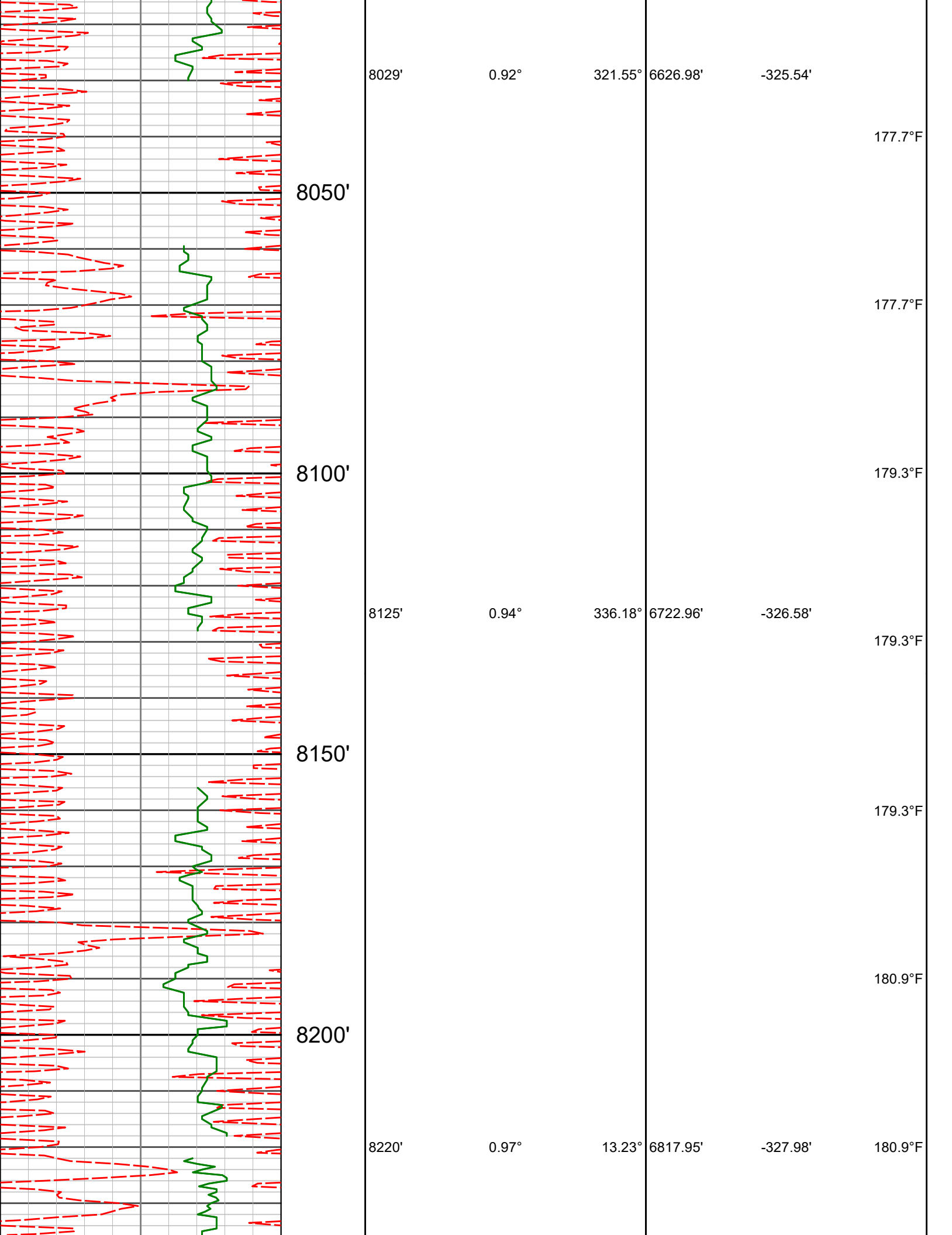
6159.62'

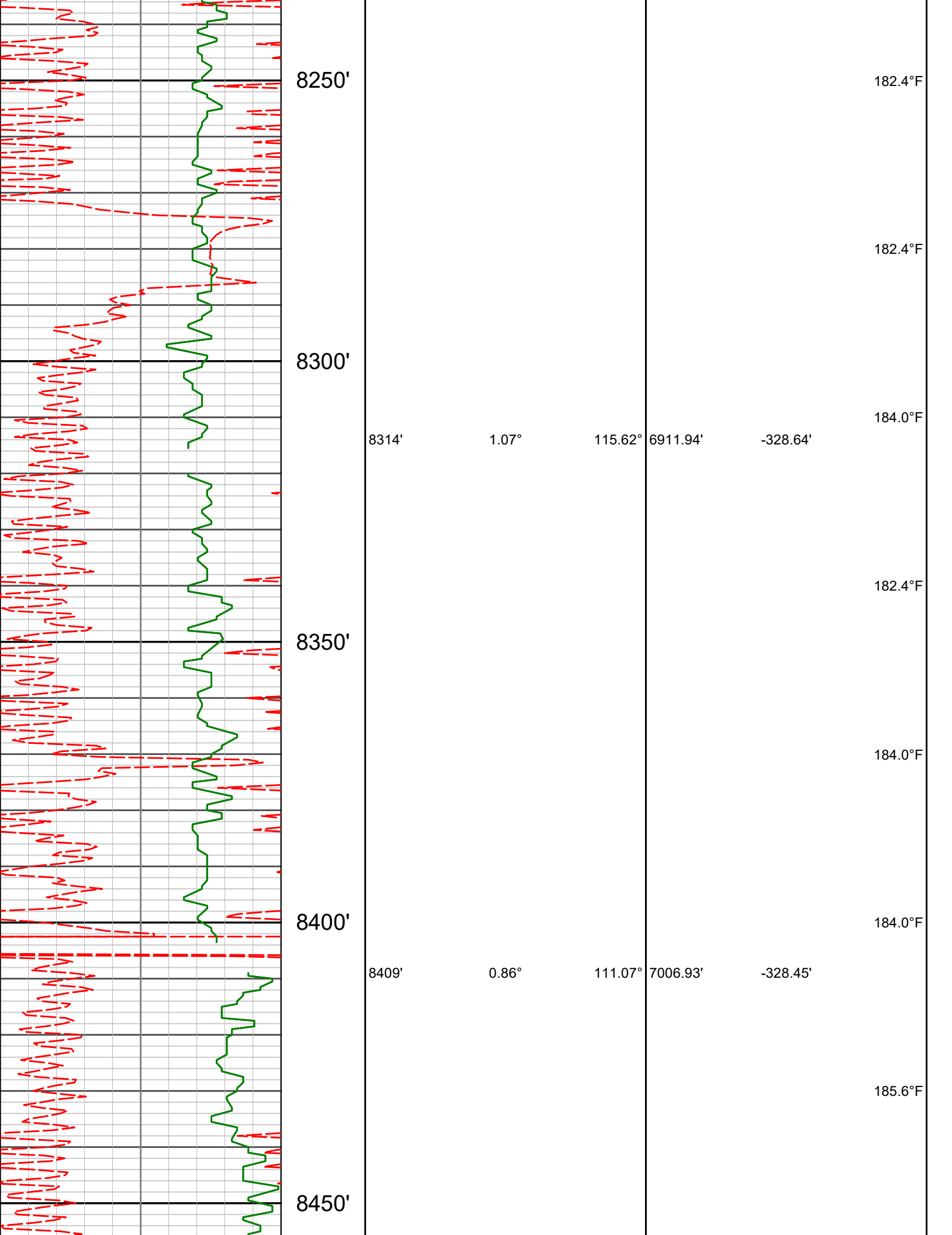
-322.95'

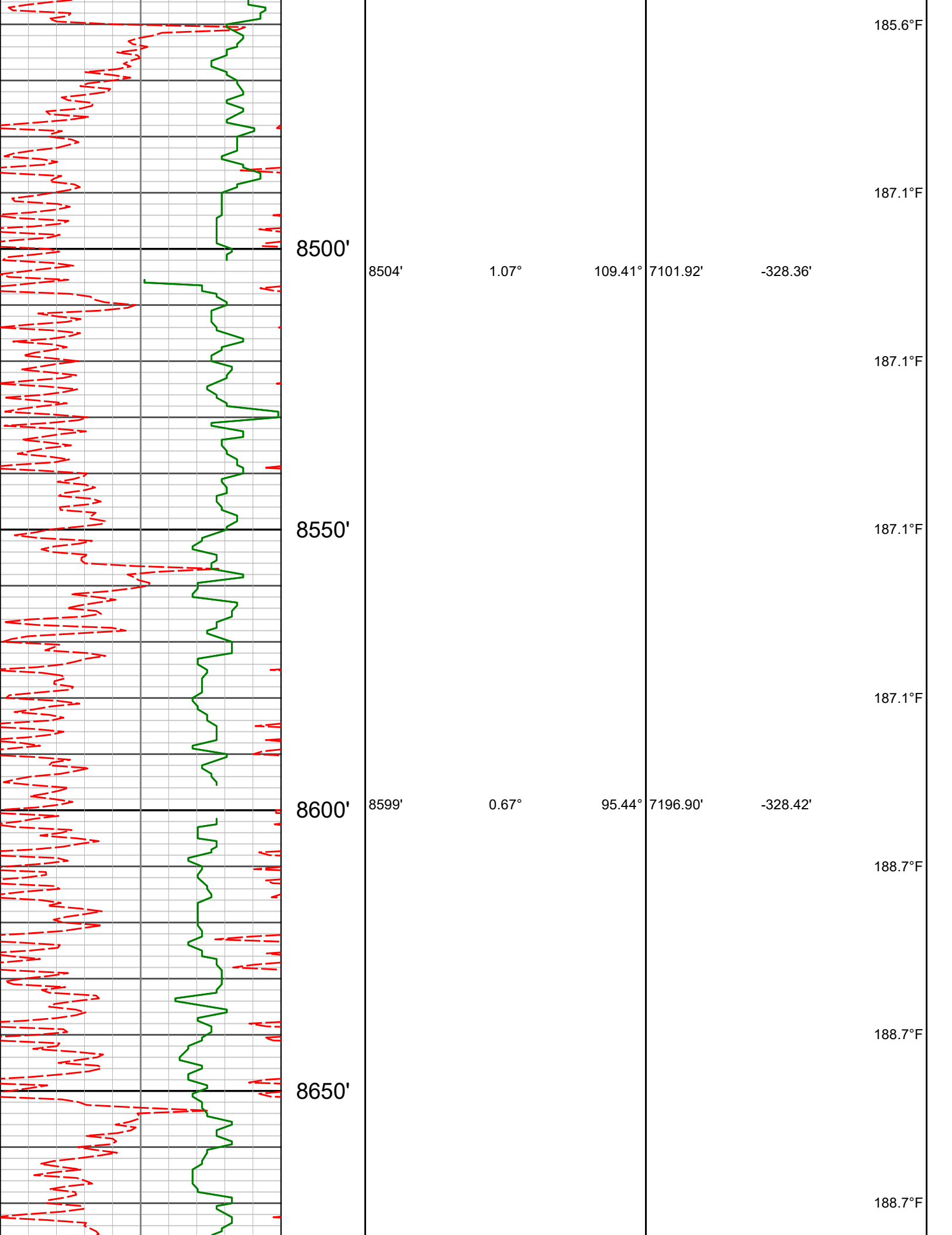
173.0°F

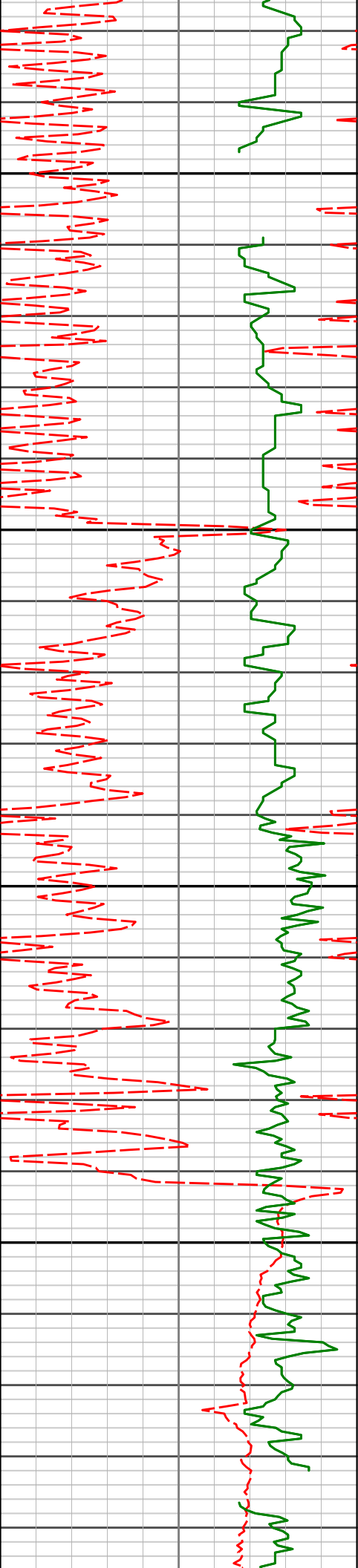




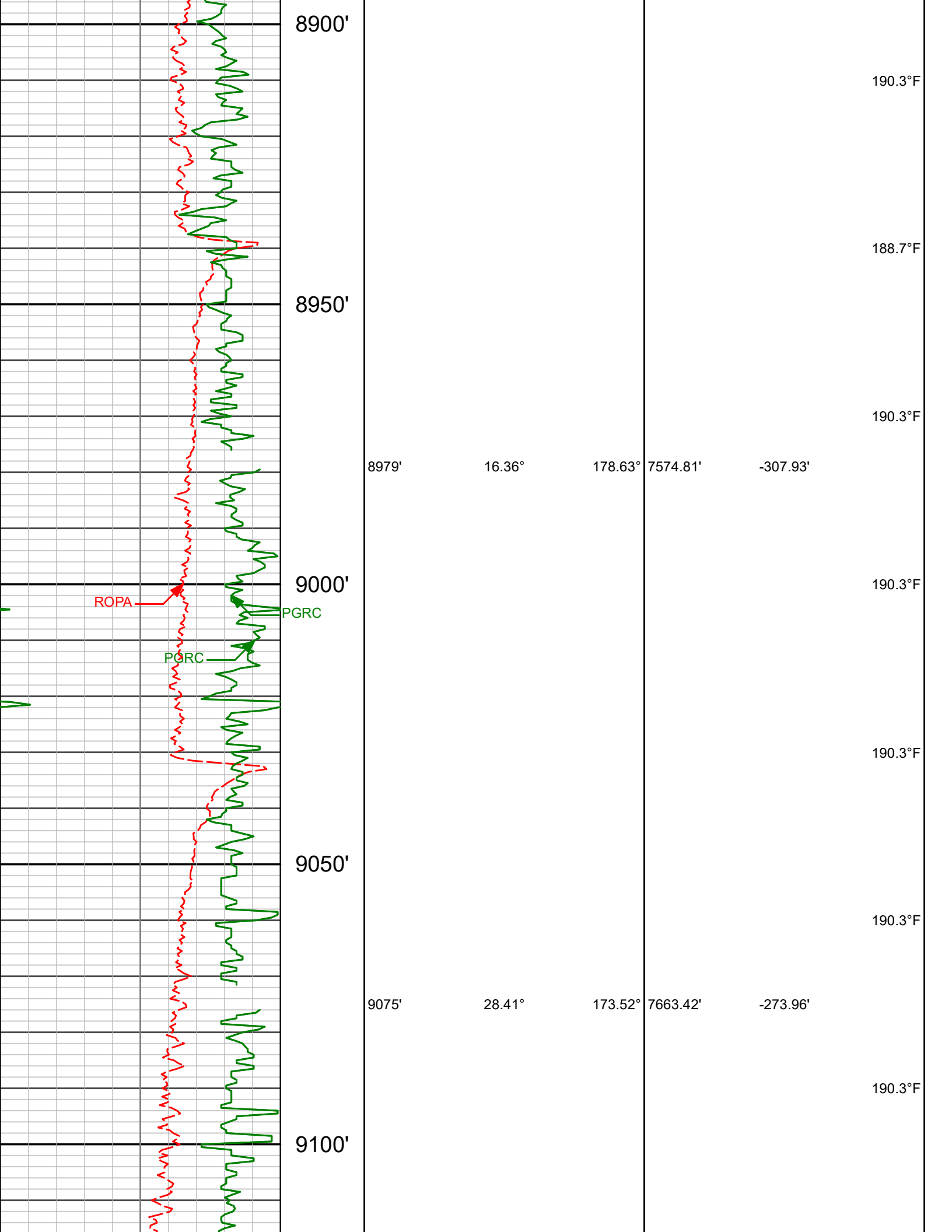


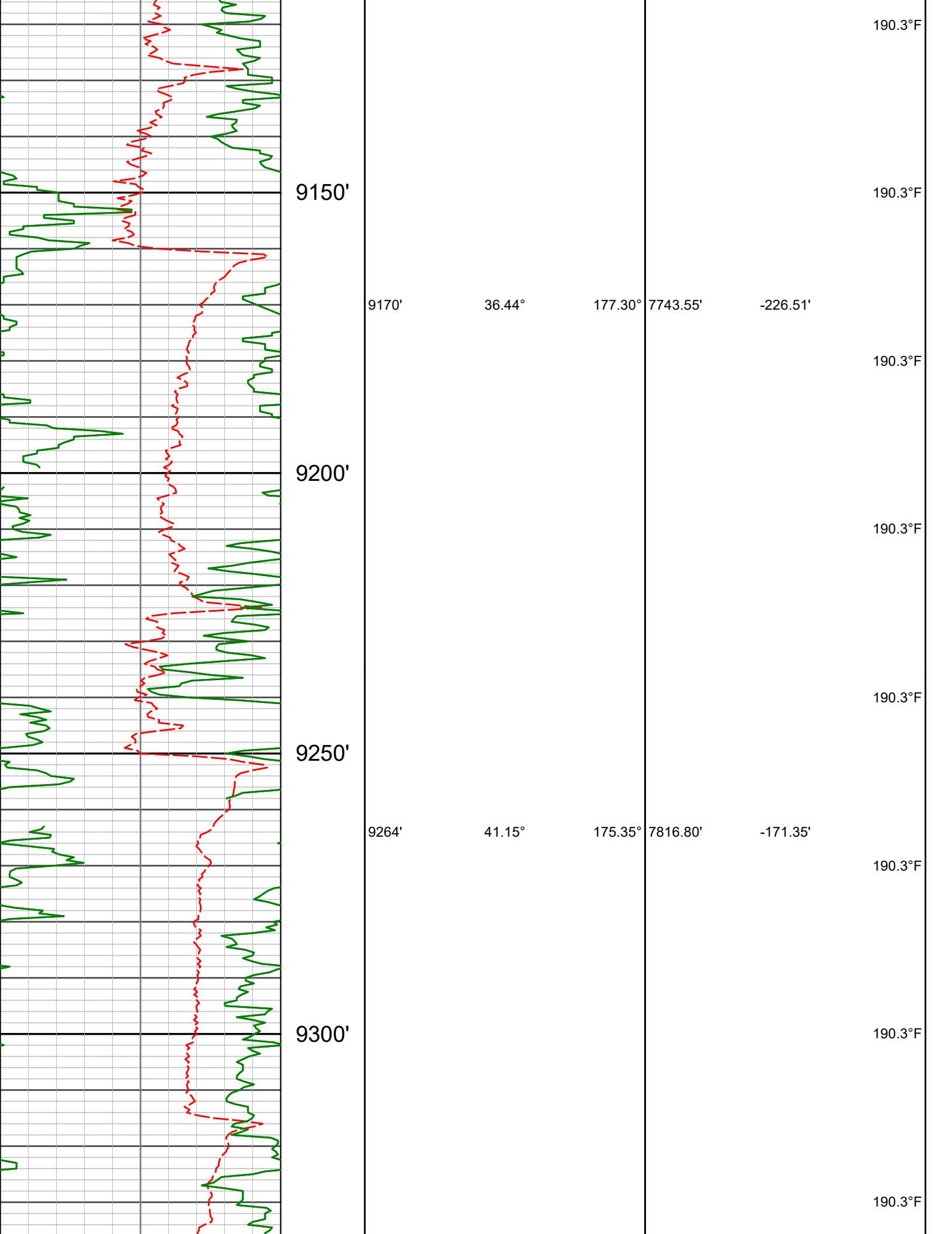


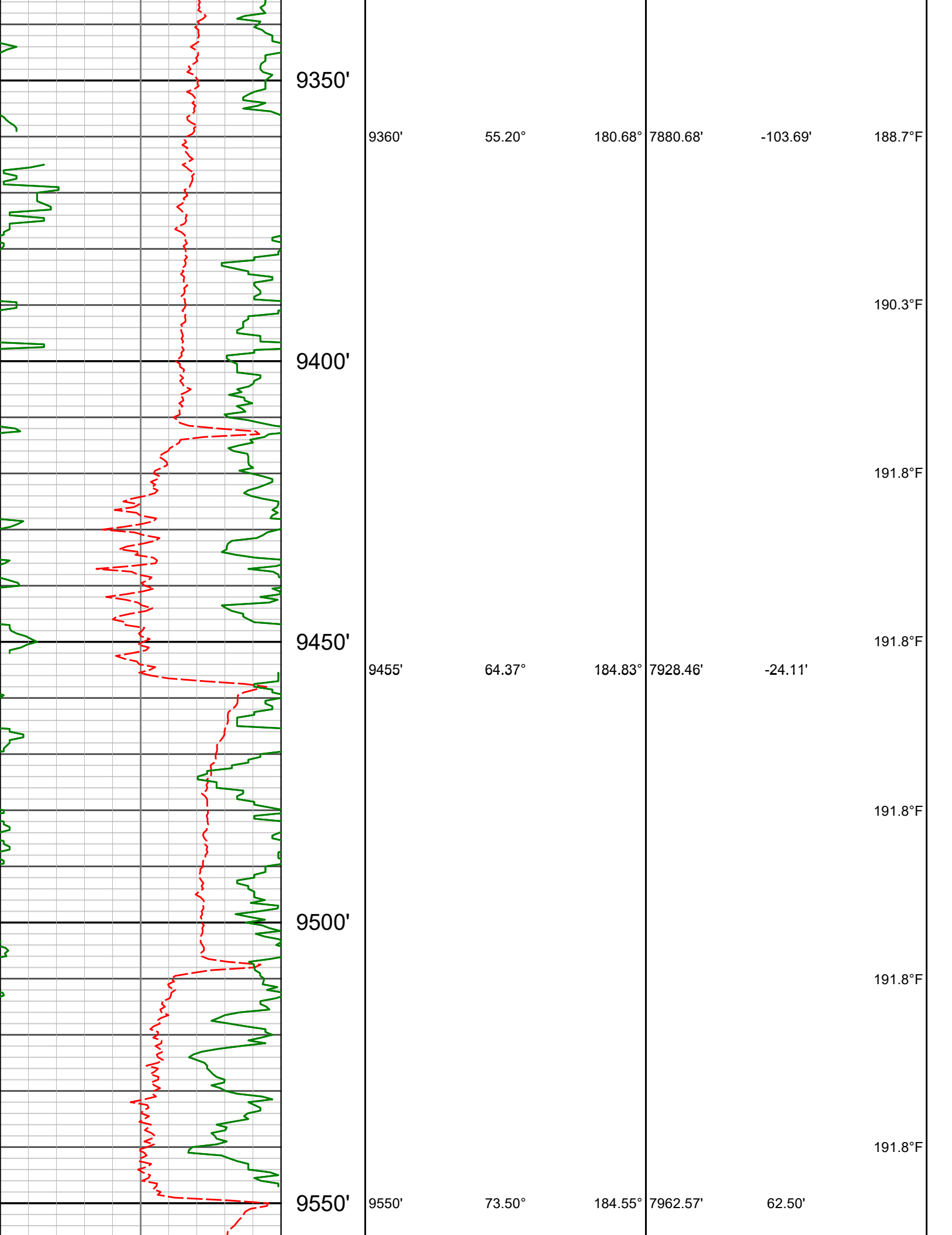


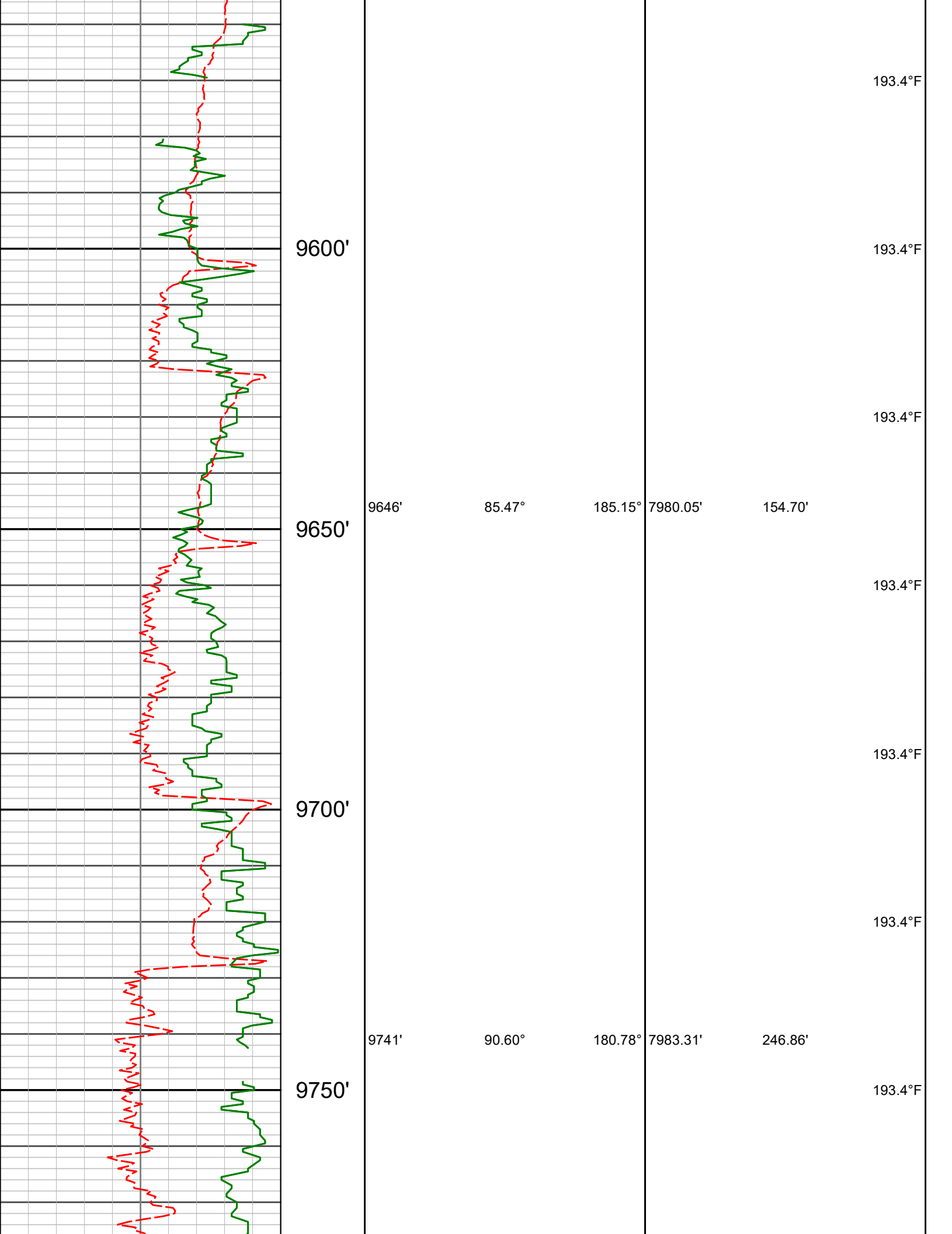


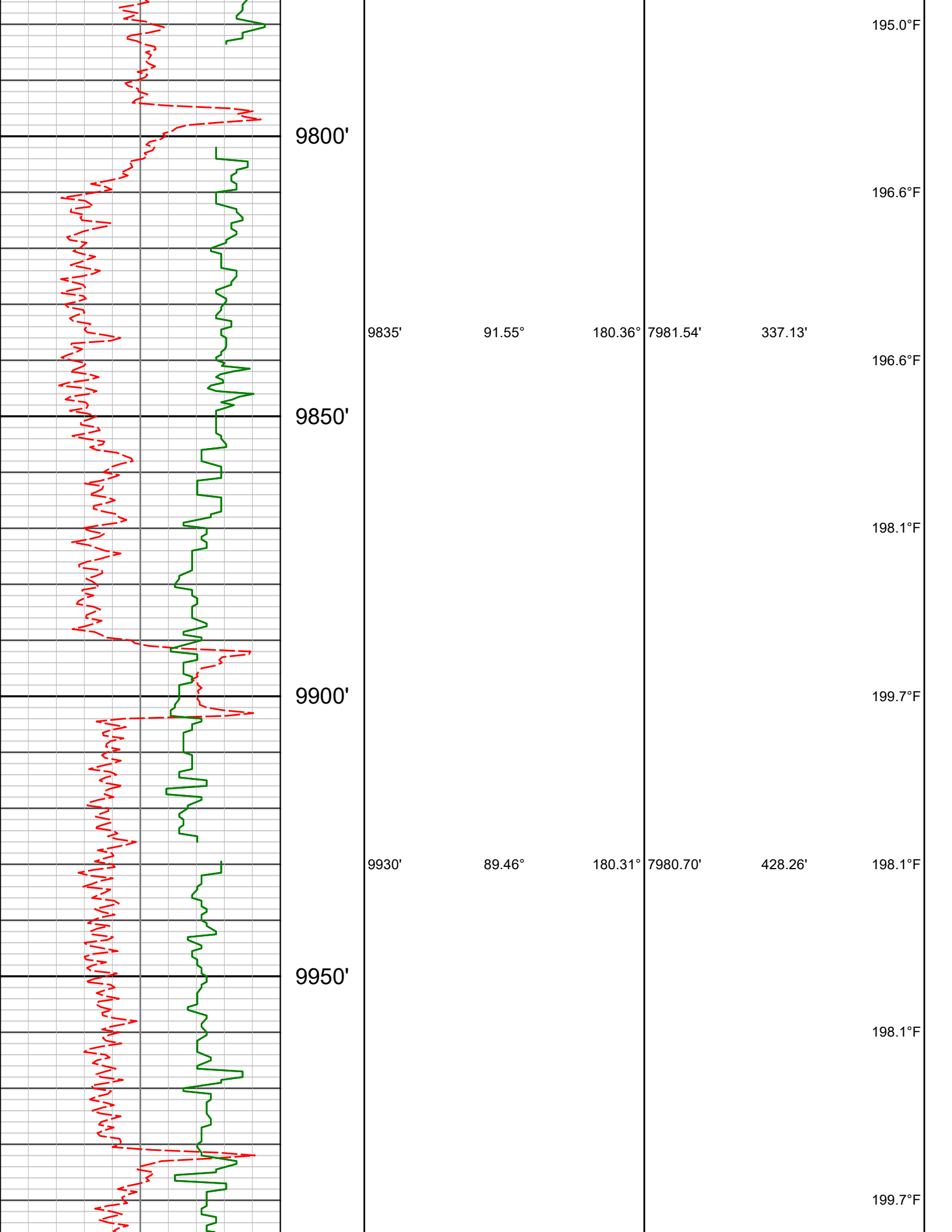
8694'	0.80°	75.69°	7291.90'	-328.87'	190.3°F
8700'					190.3°F
8750'					190.3°F
8790'	0.51°	62.68°	7387.89'	-329.52'	190.3°F
8800'					191.8°F
8850'					191.8°F
8885'	6.02°	175.68°	7482.72'	-325.16'	191.8°F

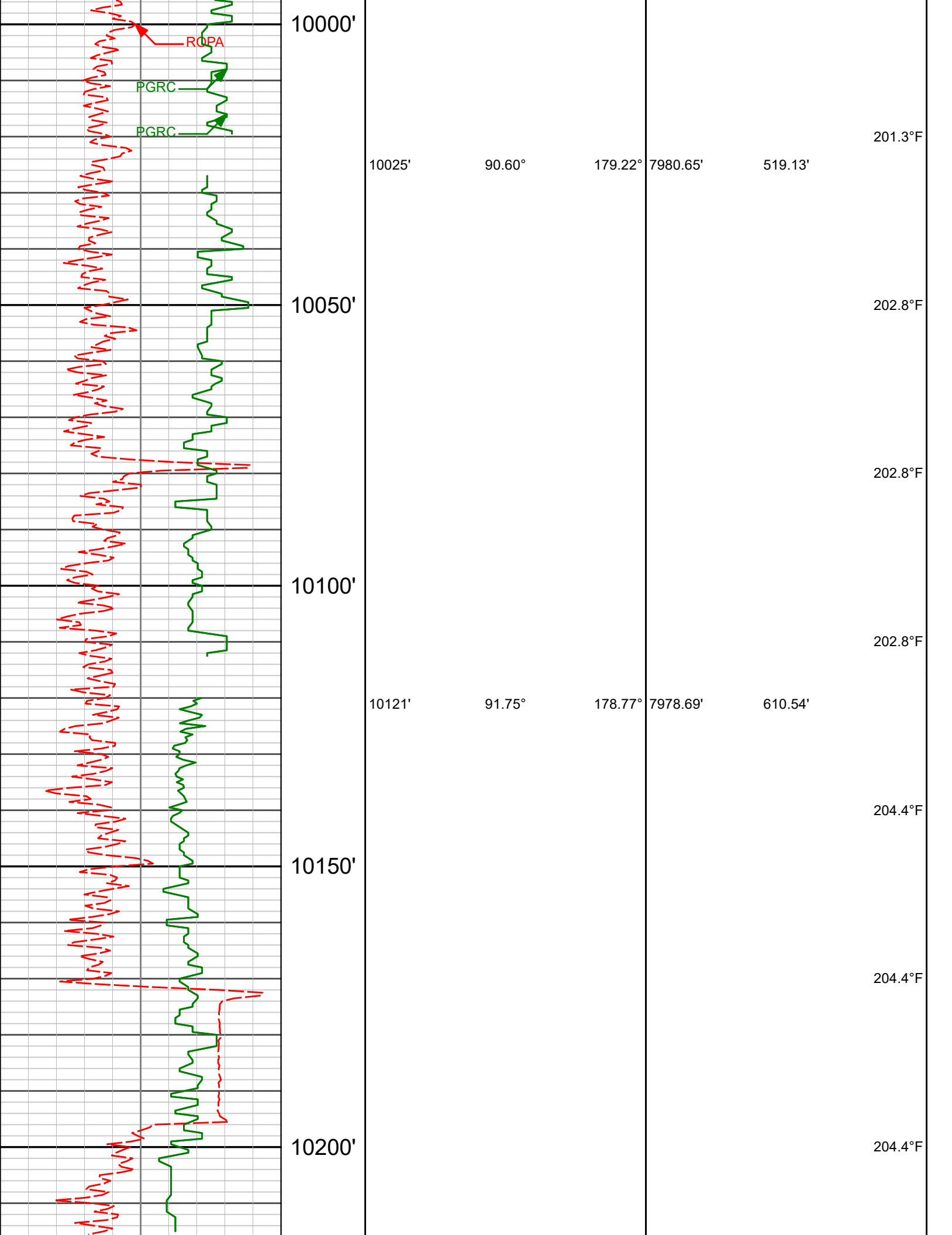


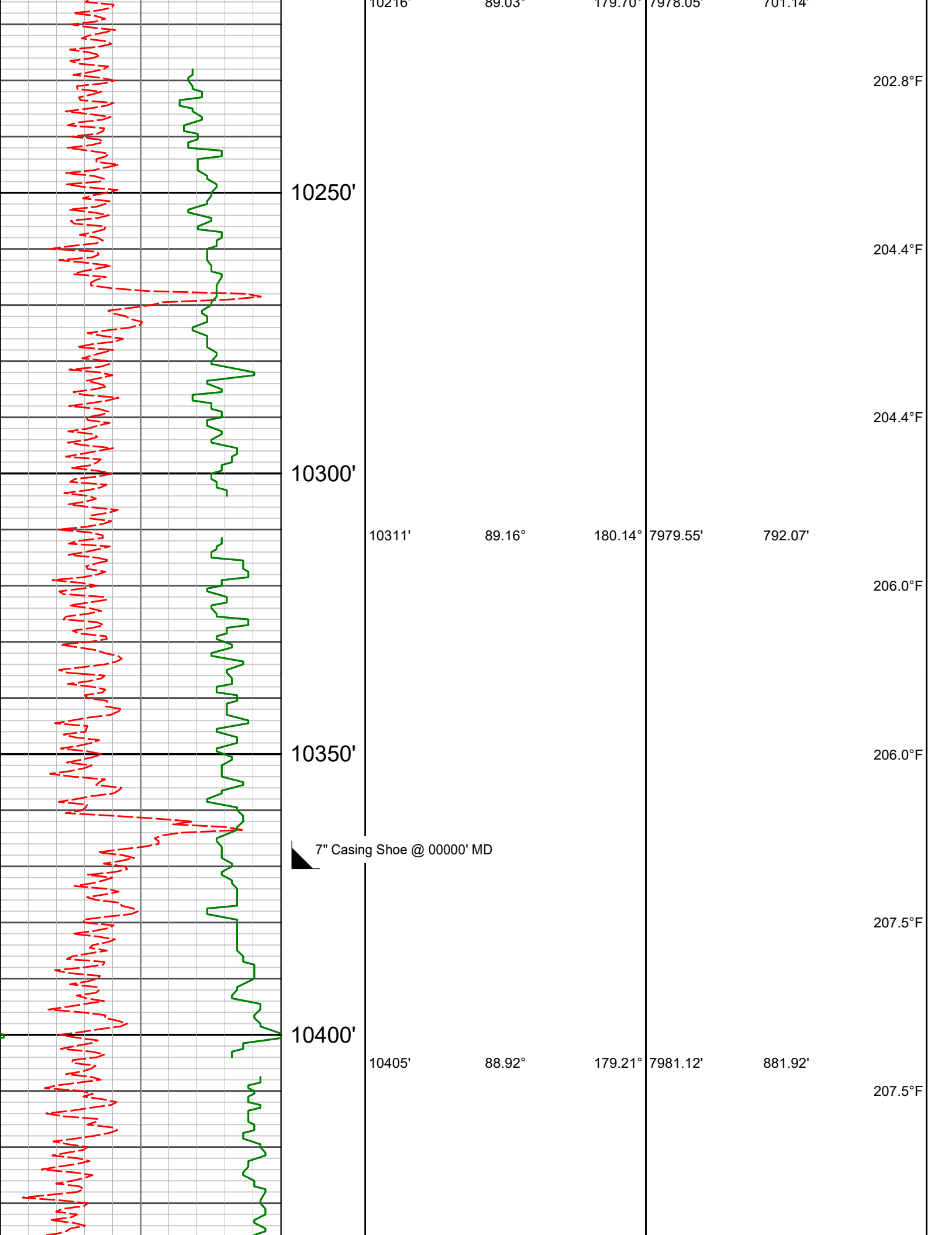


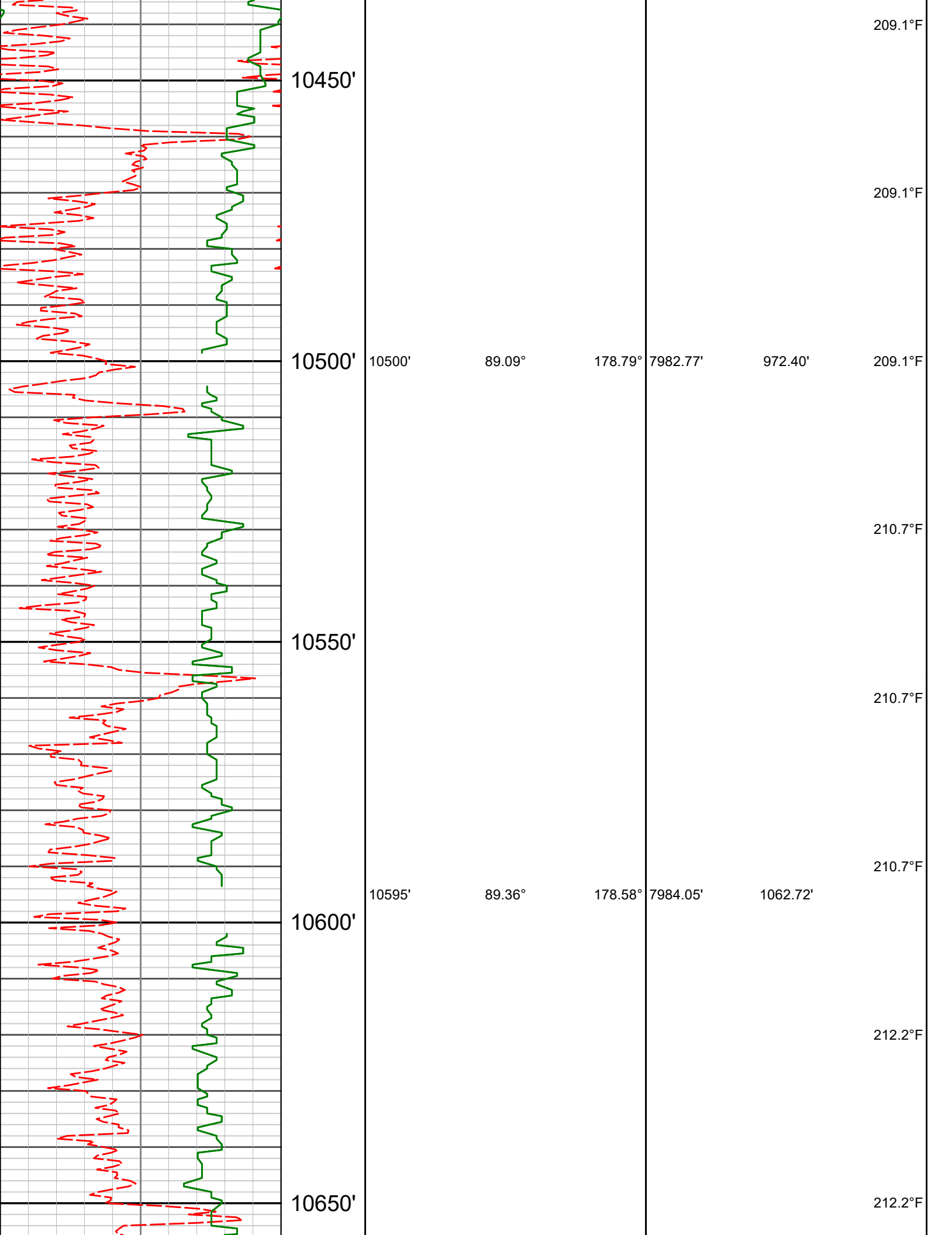


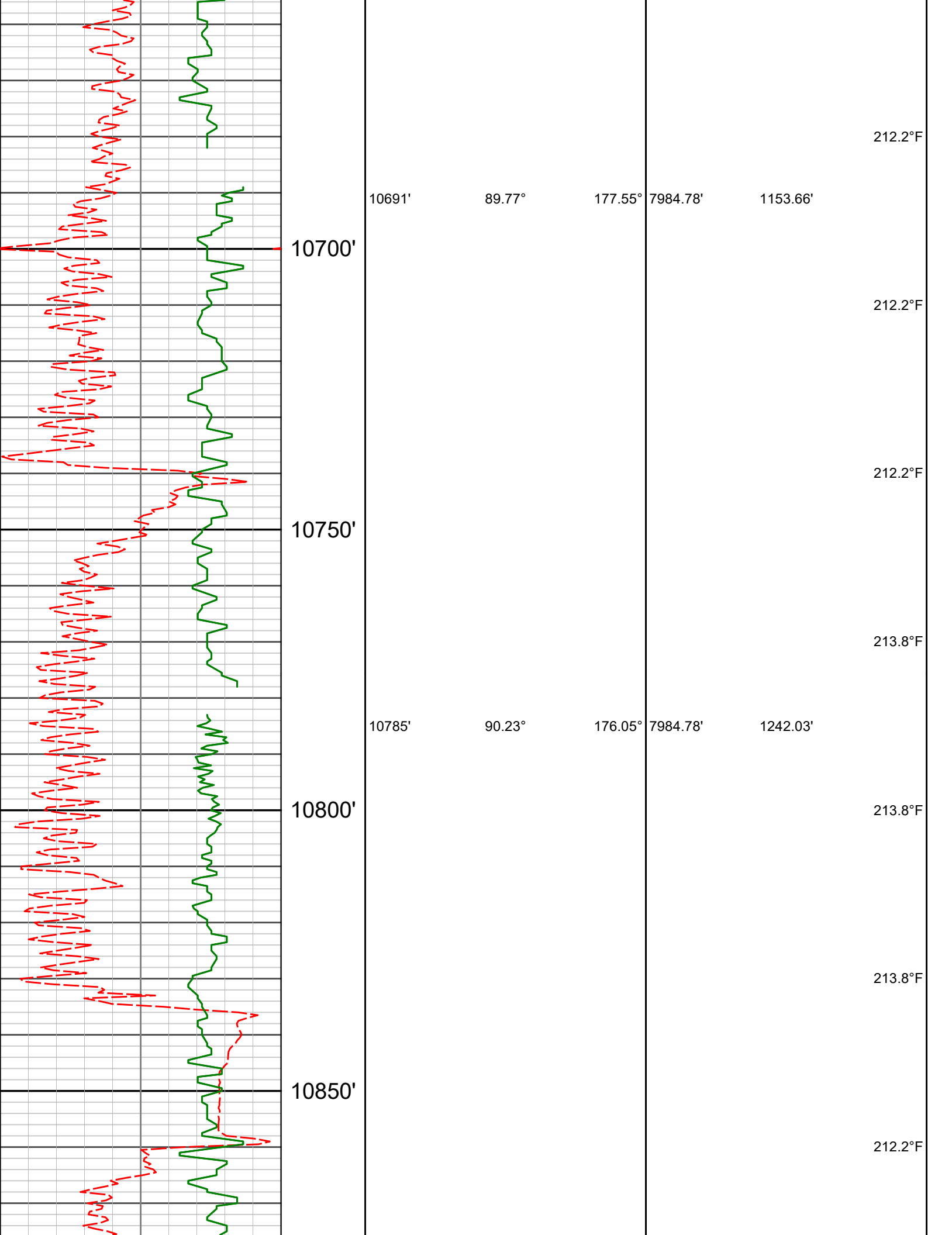


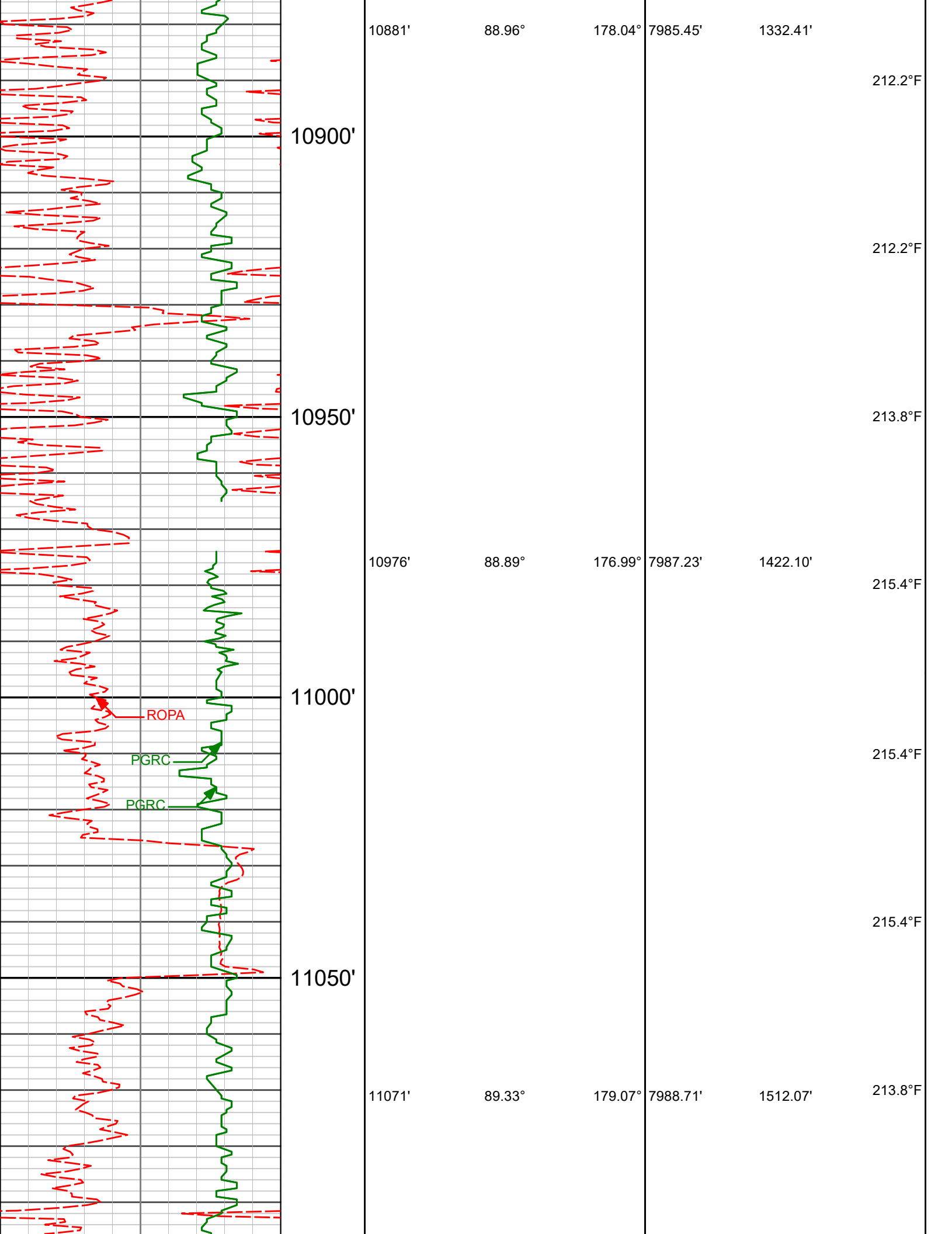


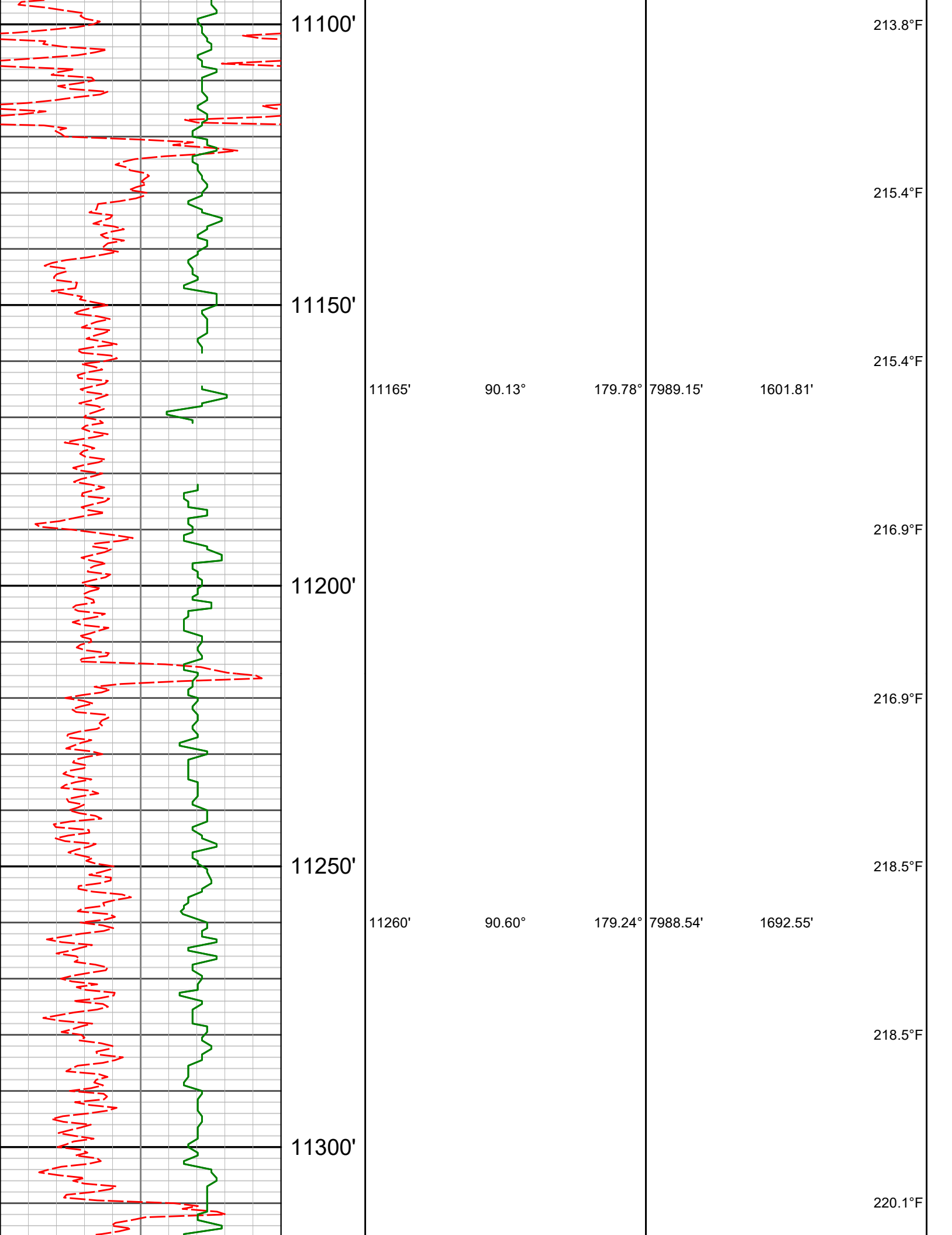


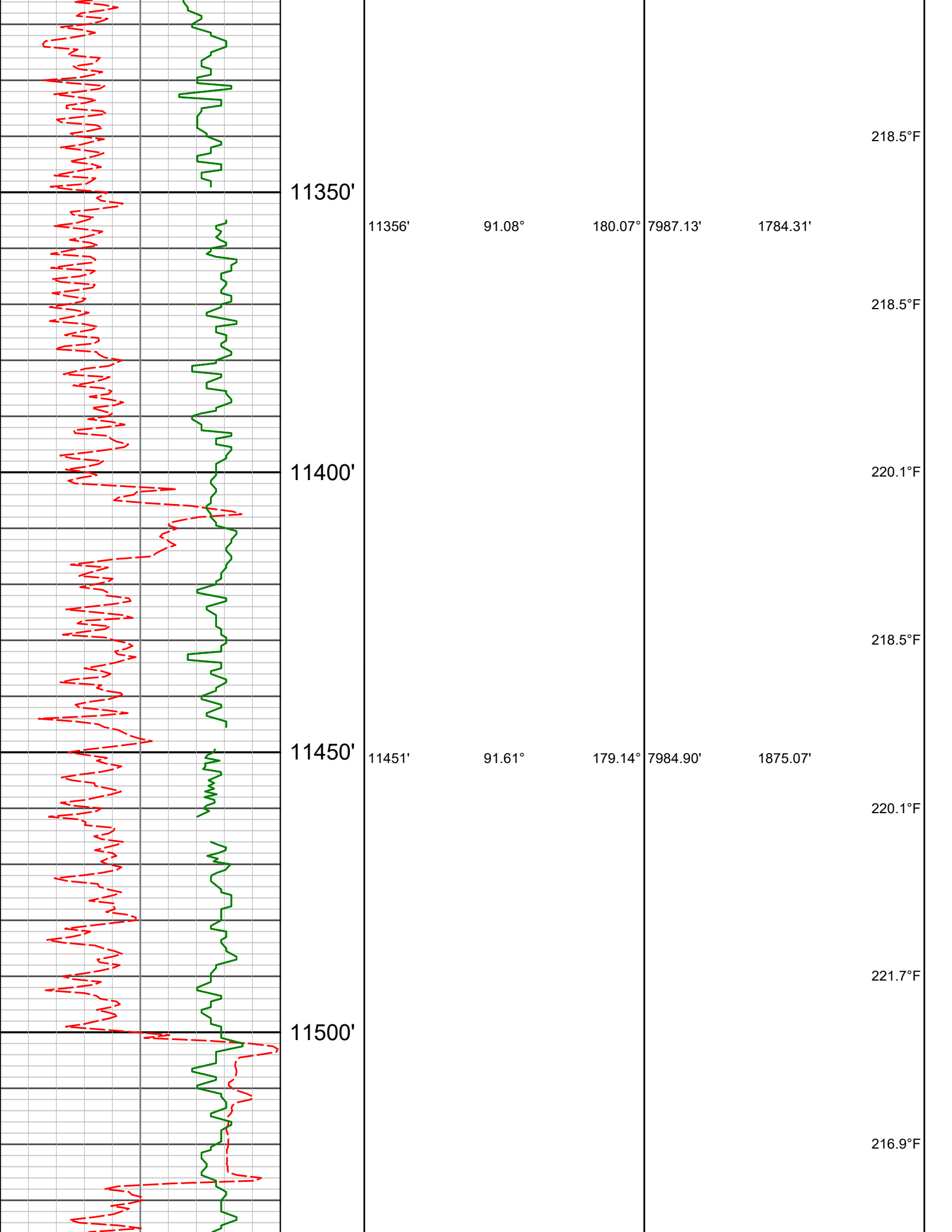


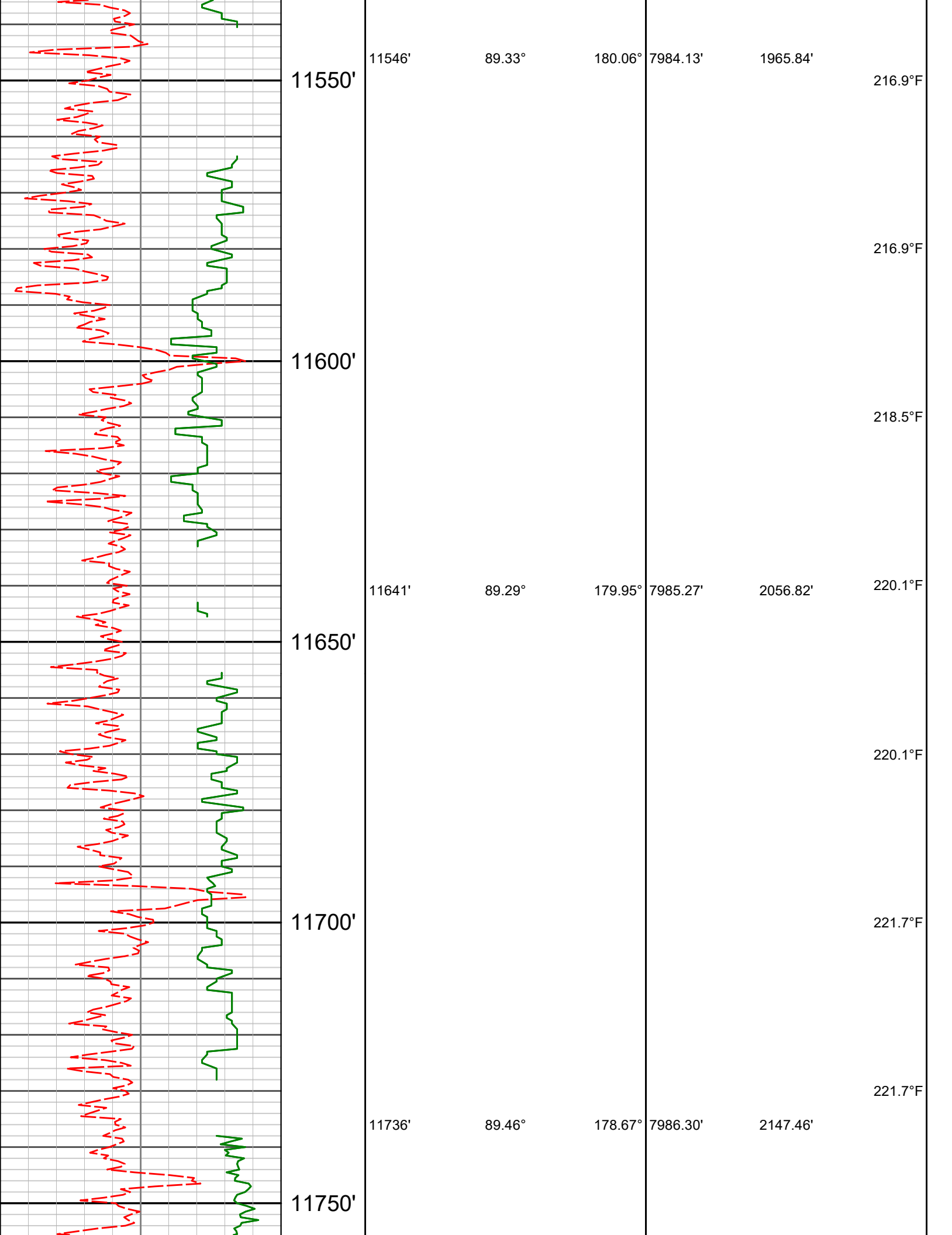


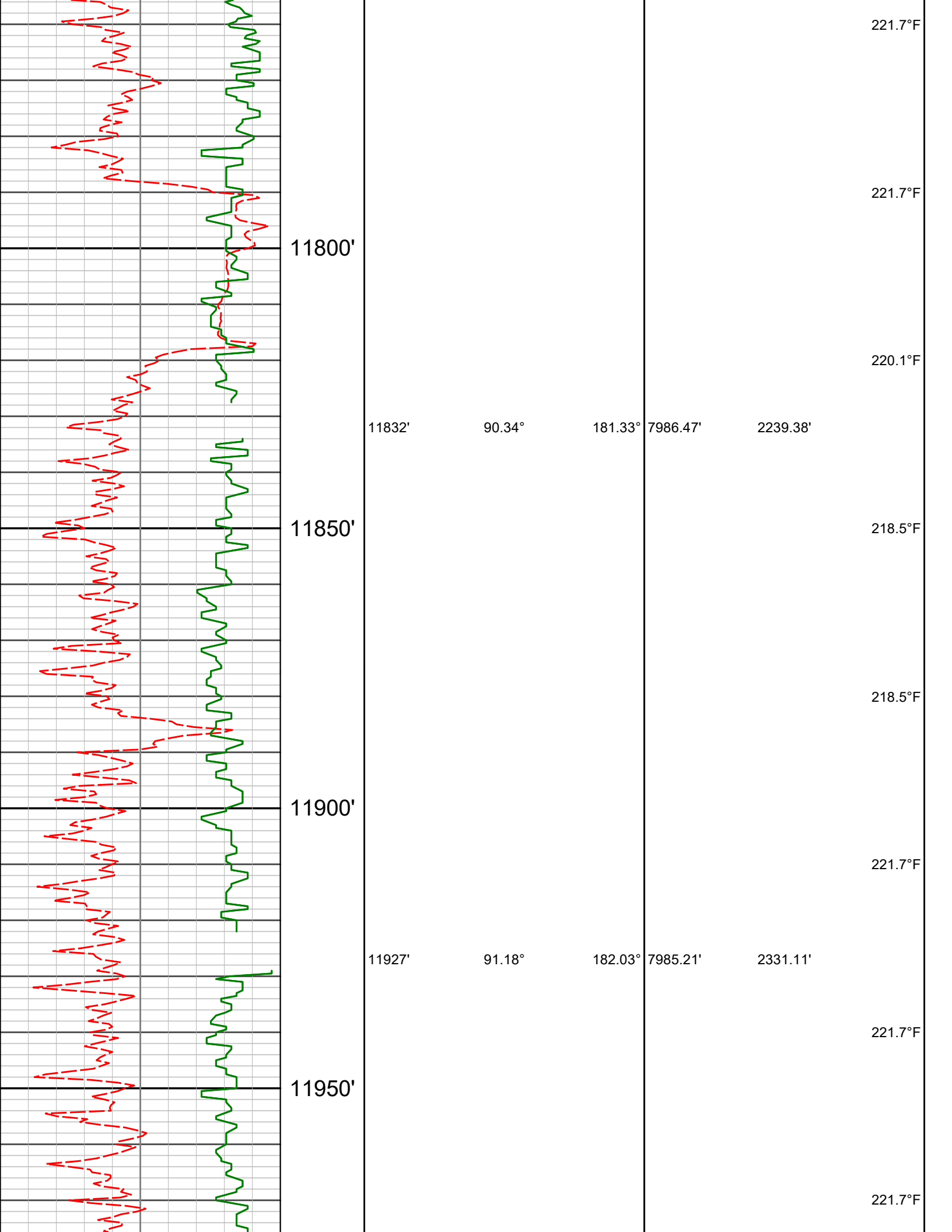


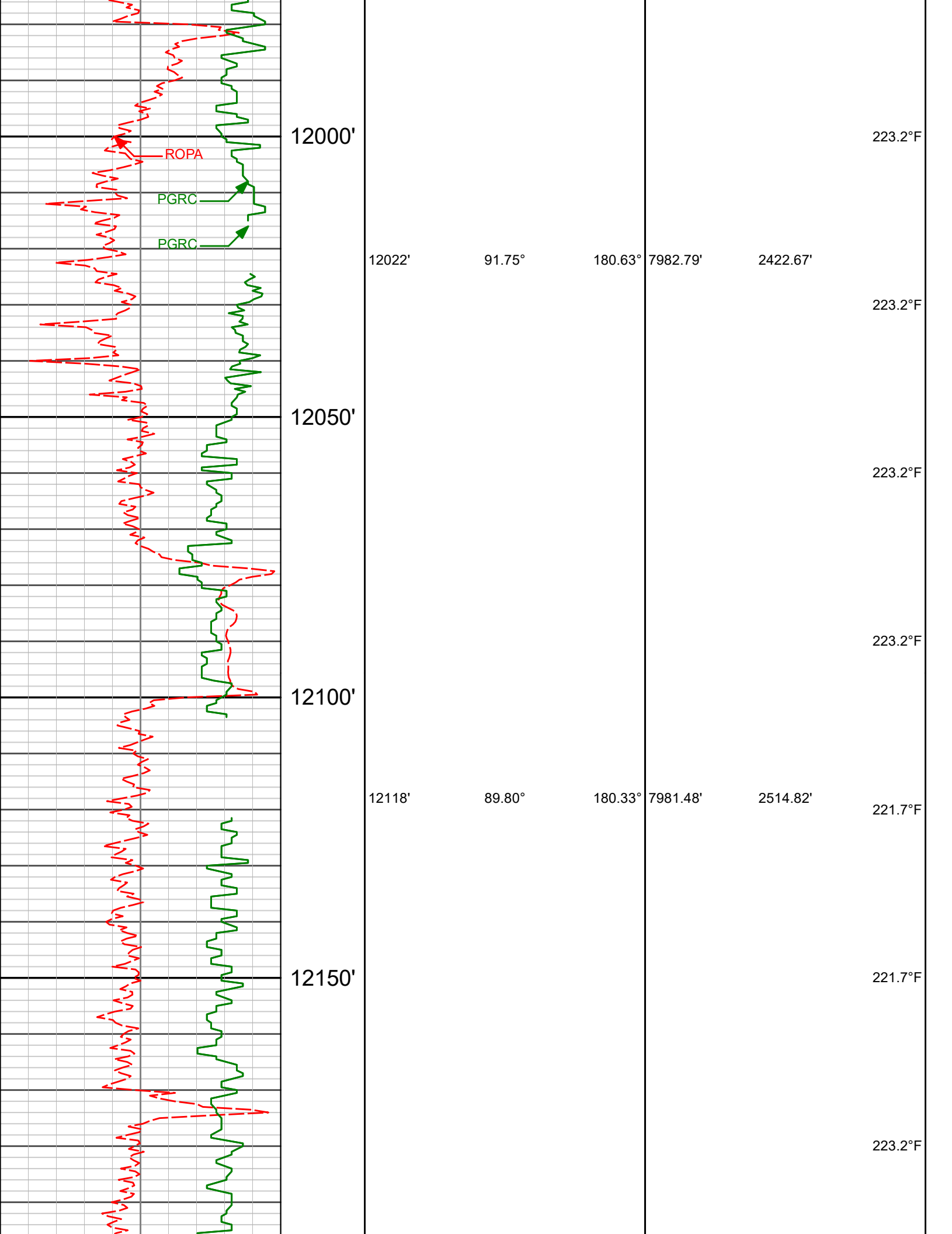


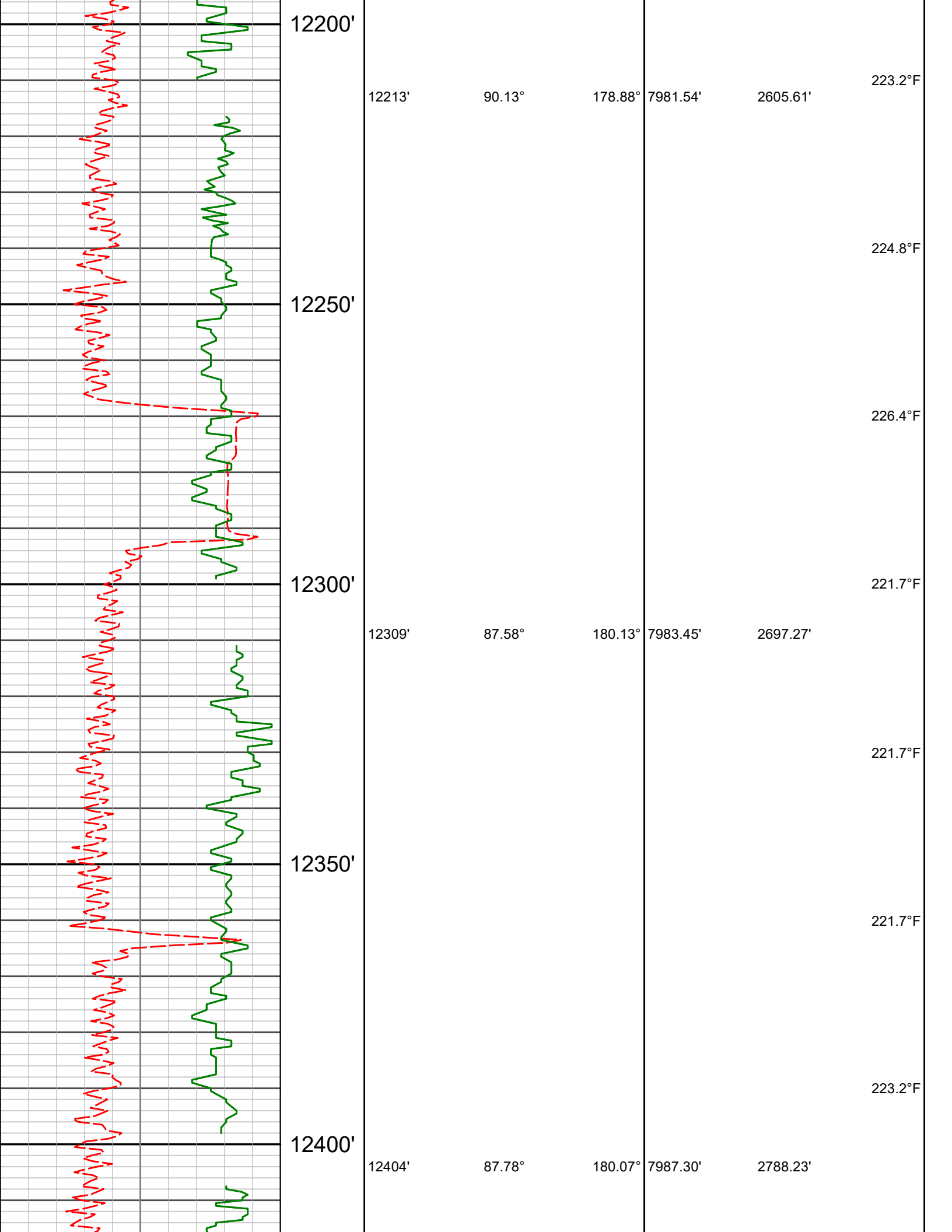


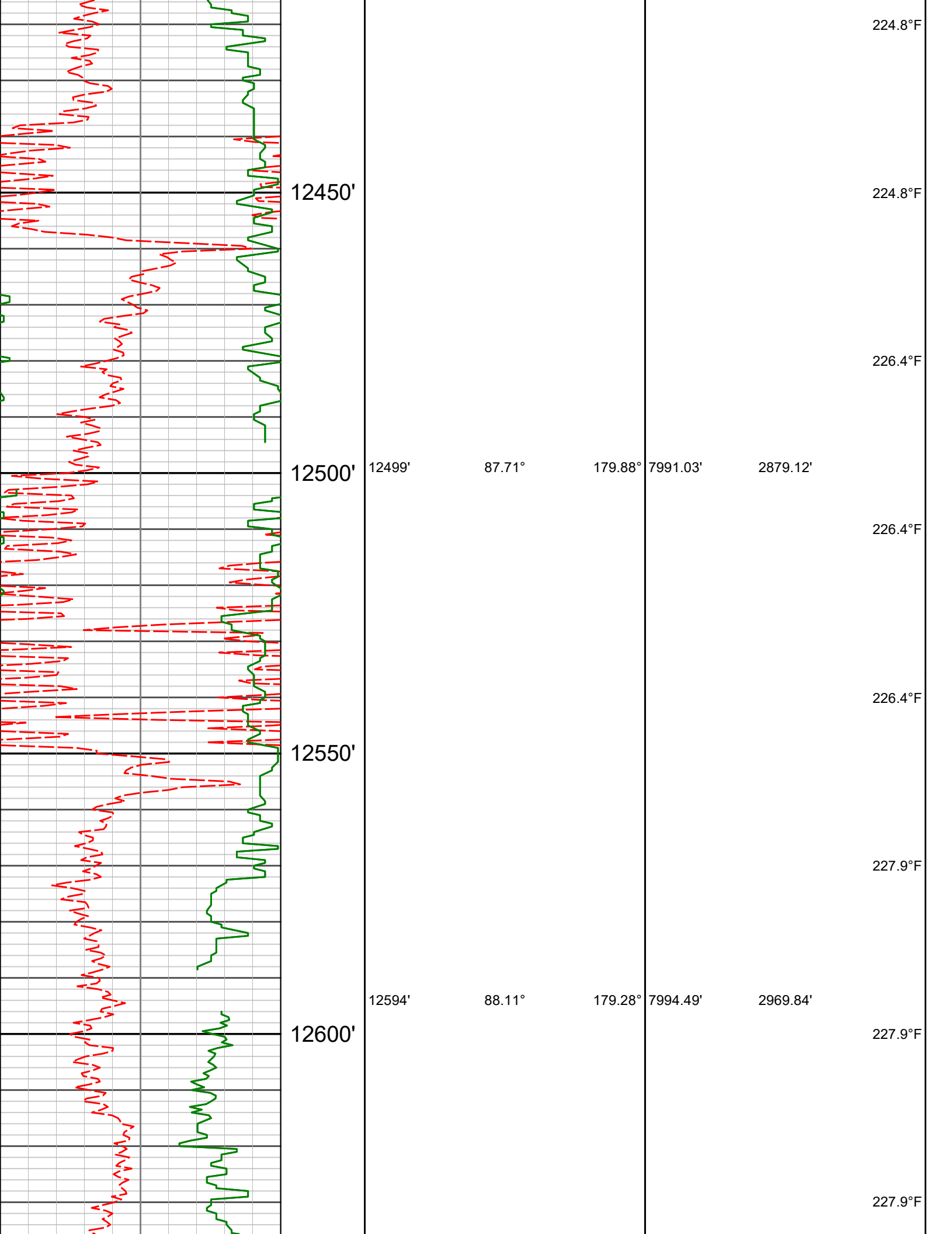


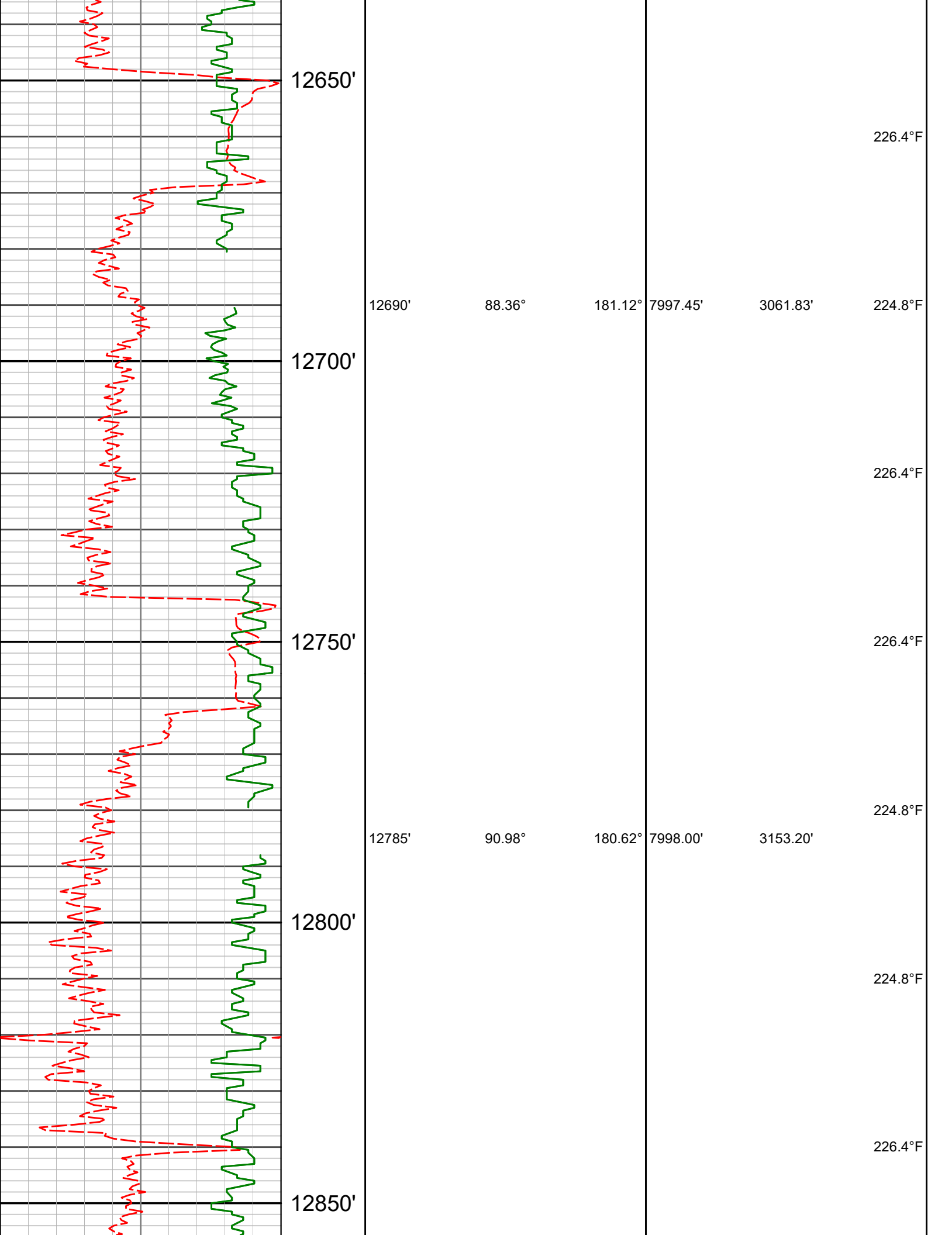


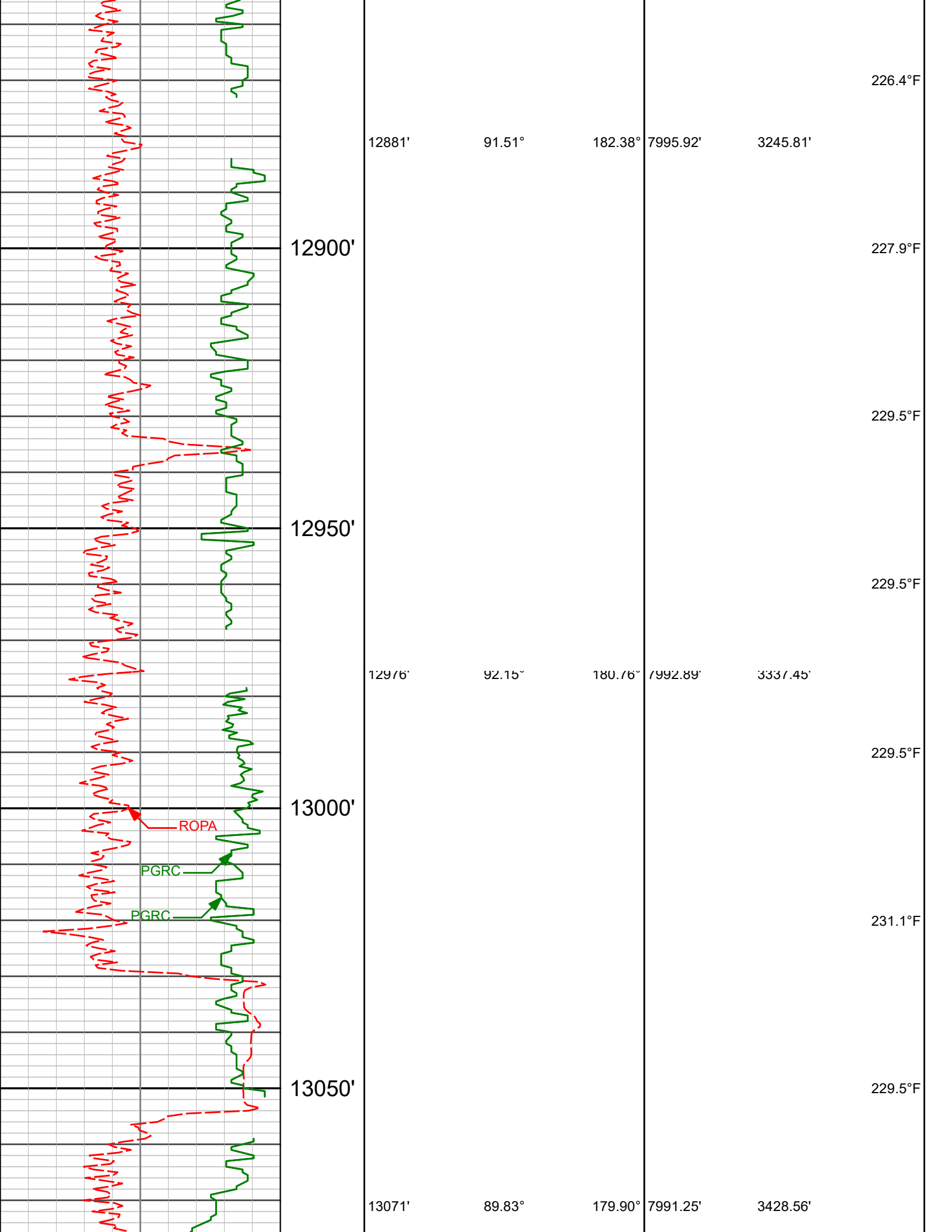


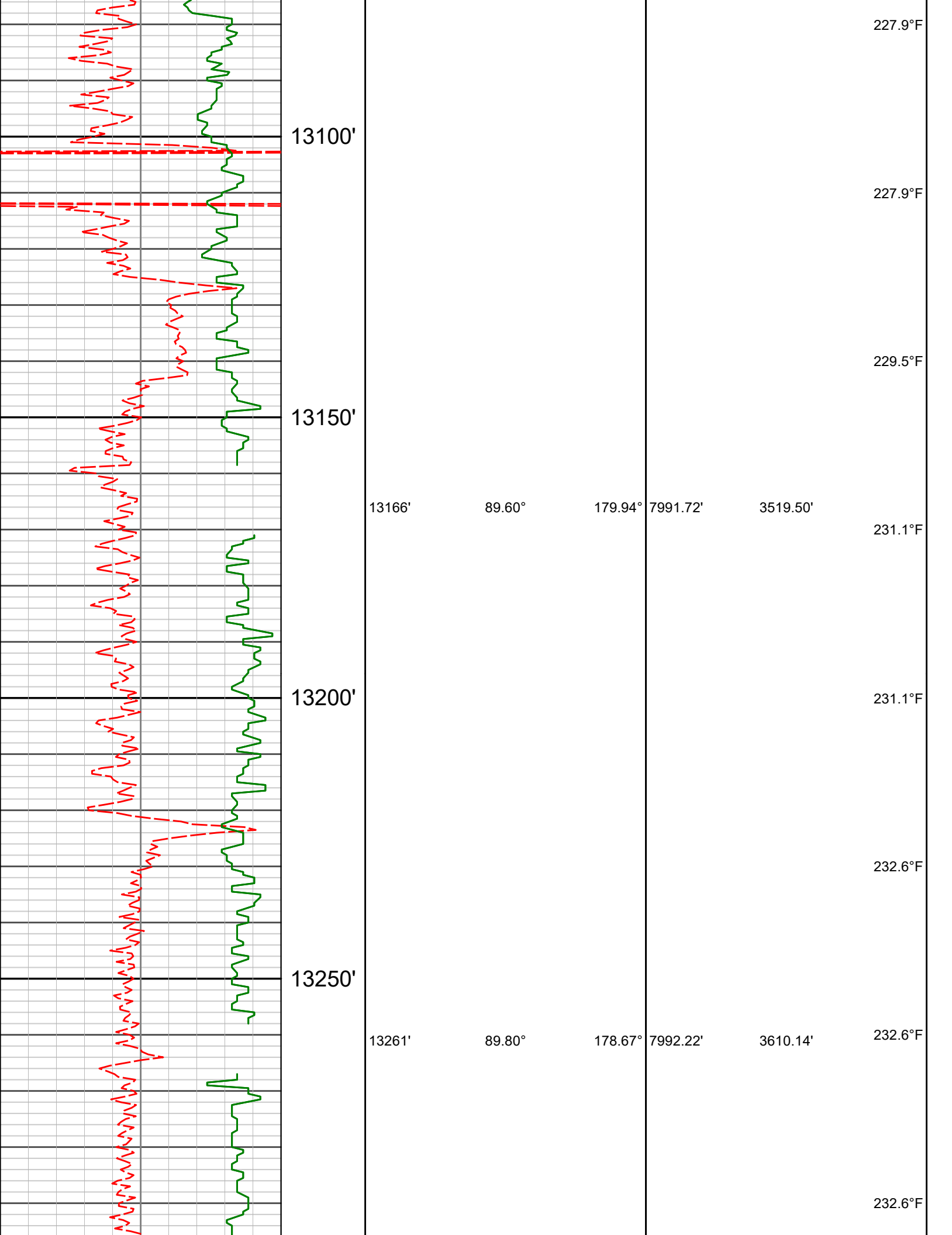


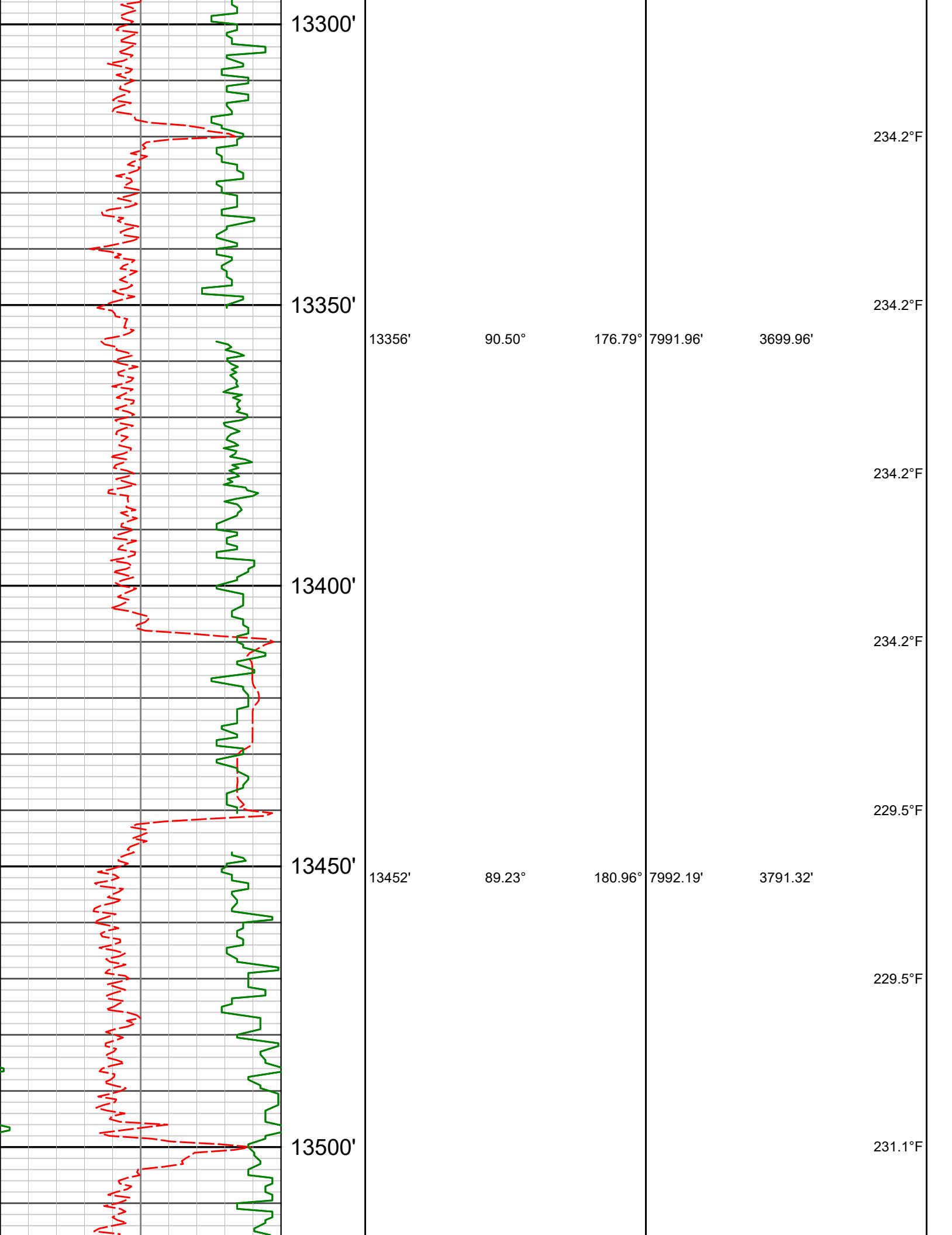


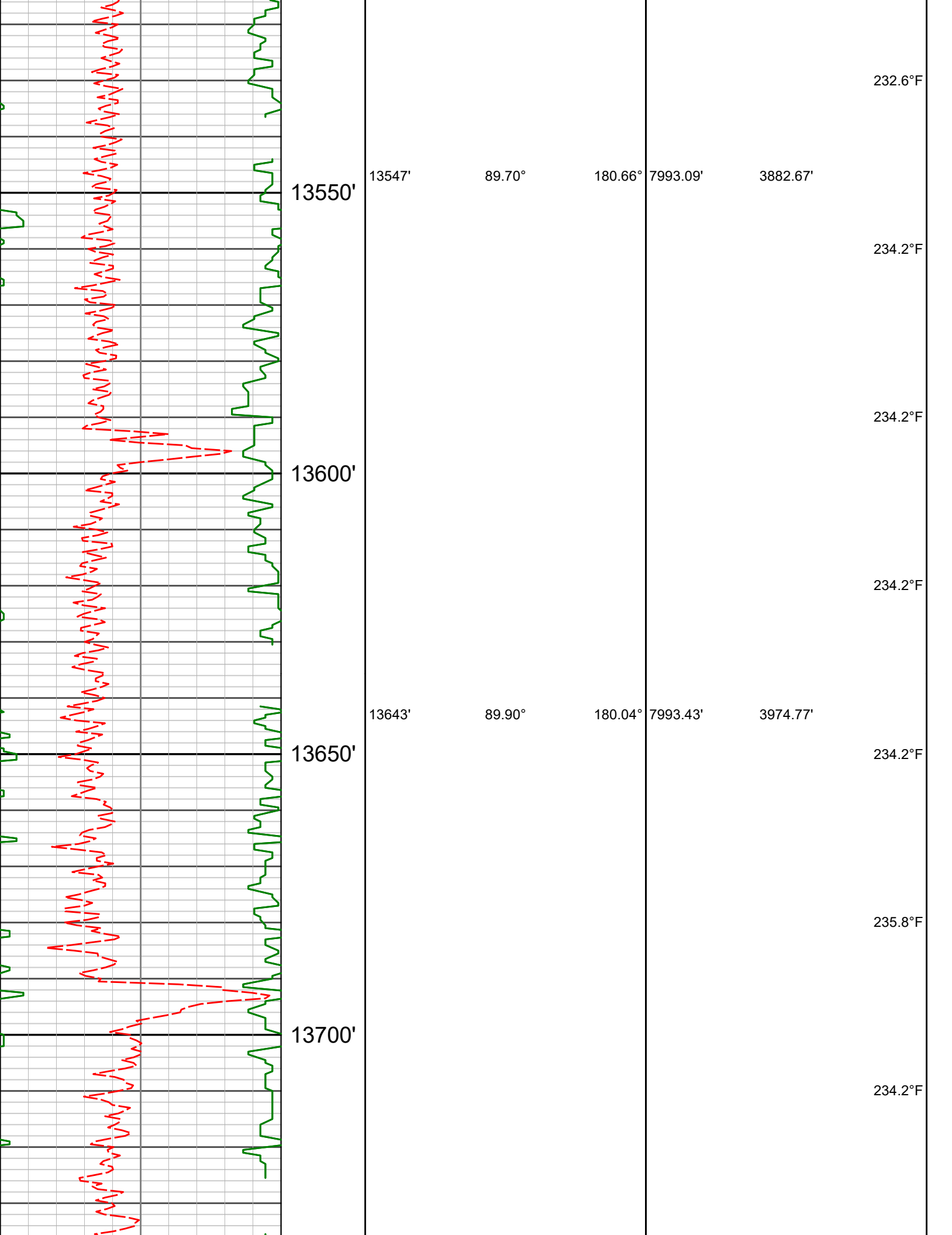


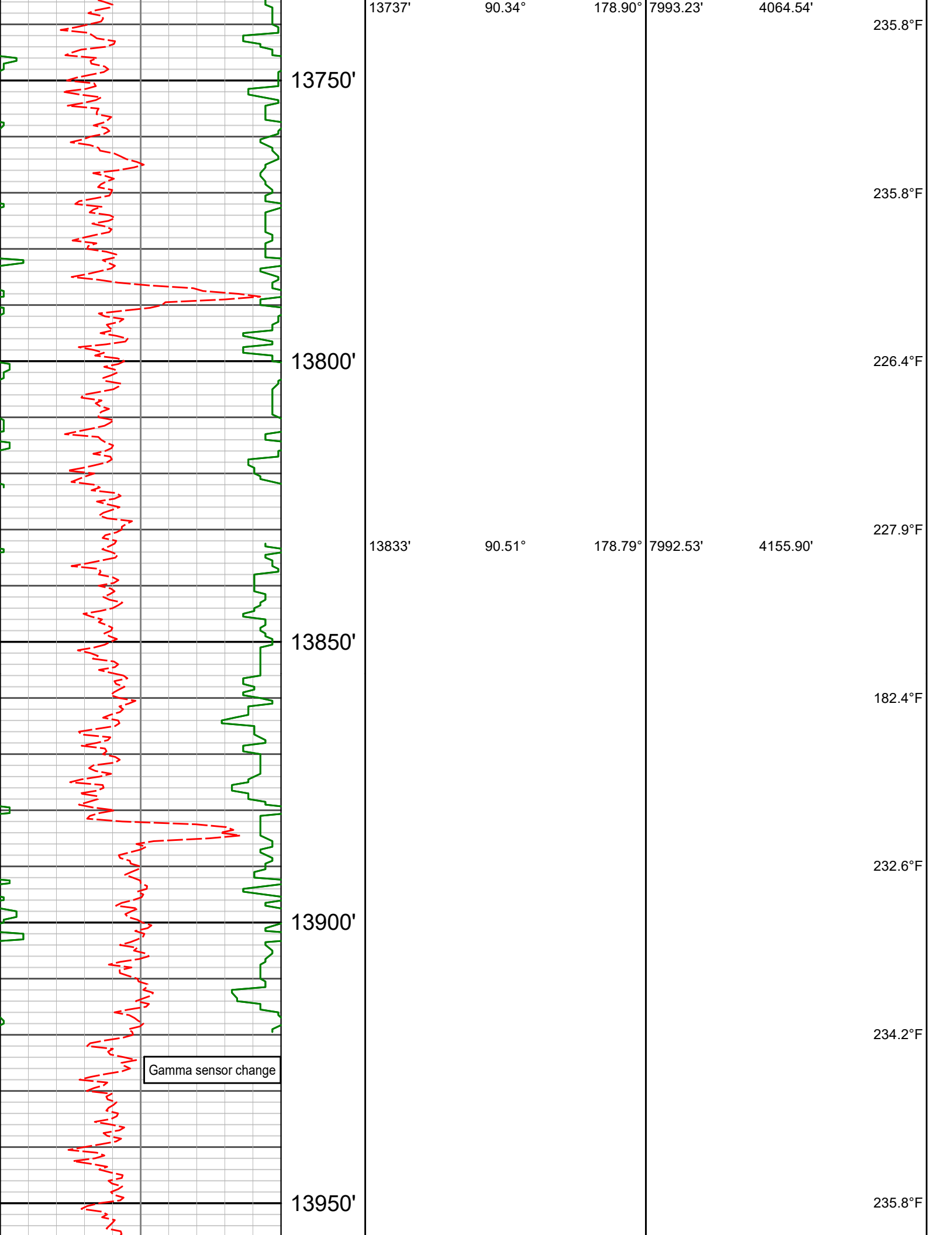


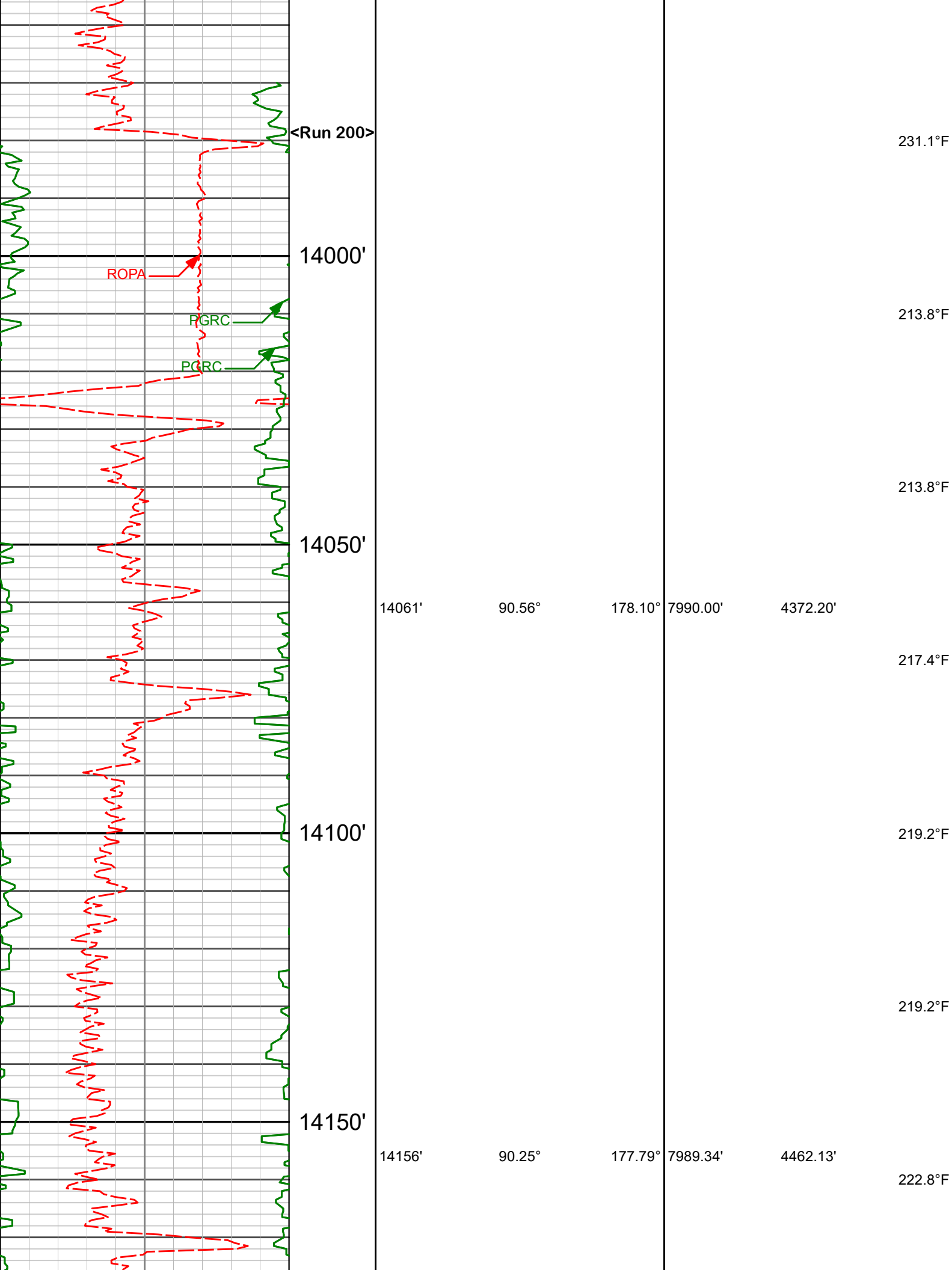


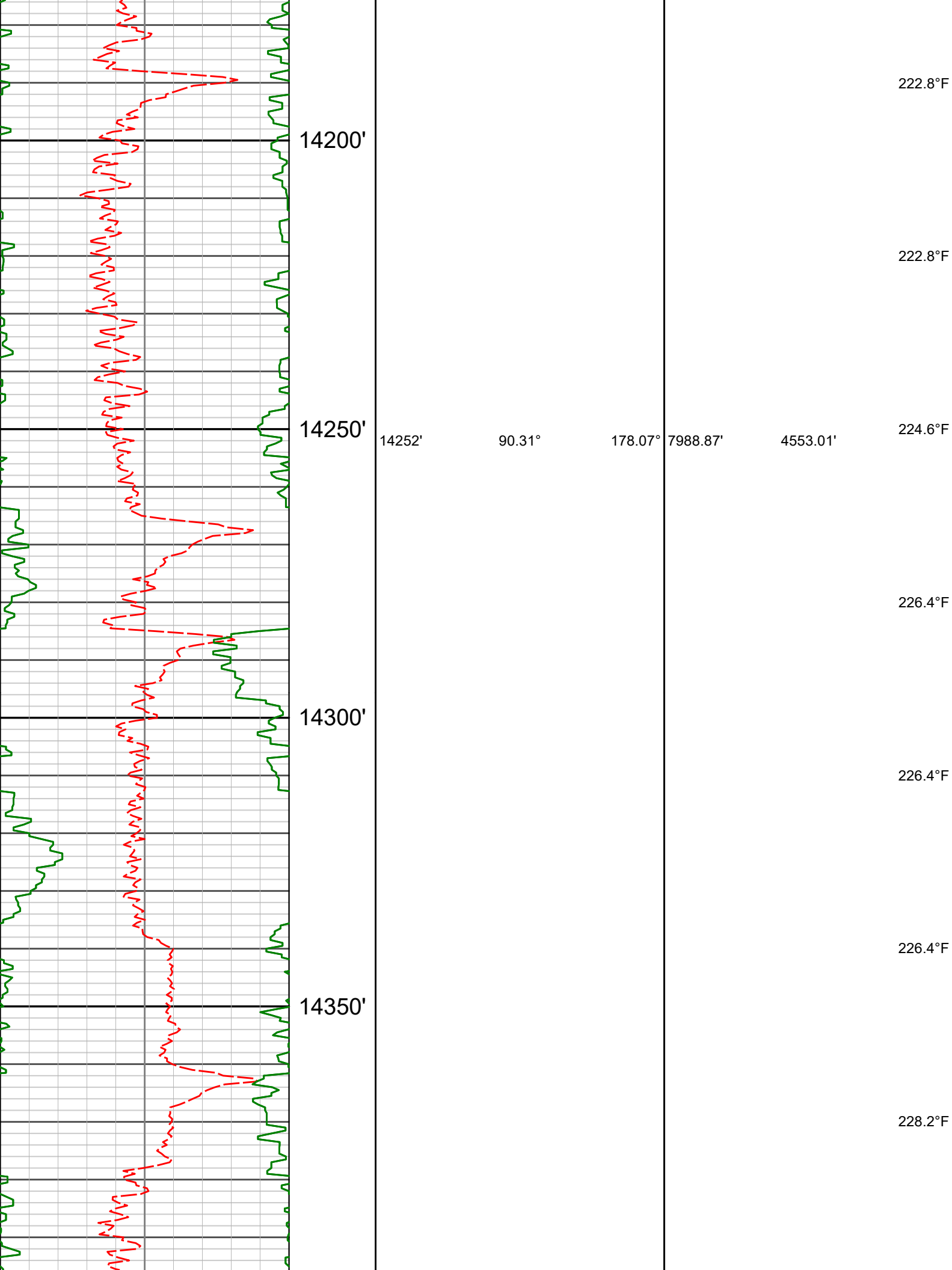


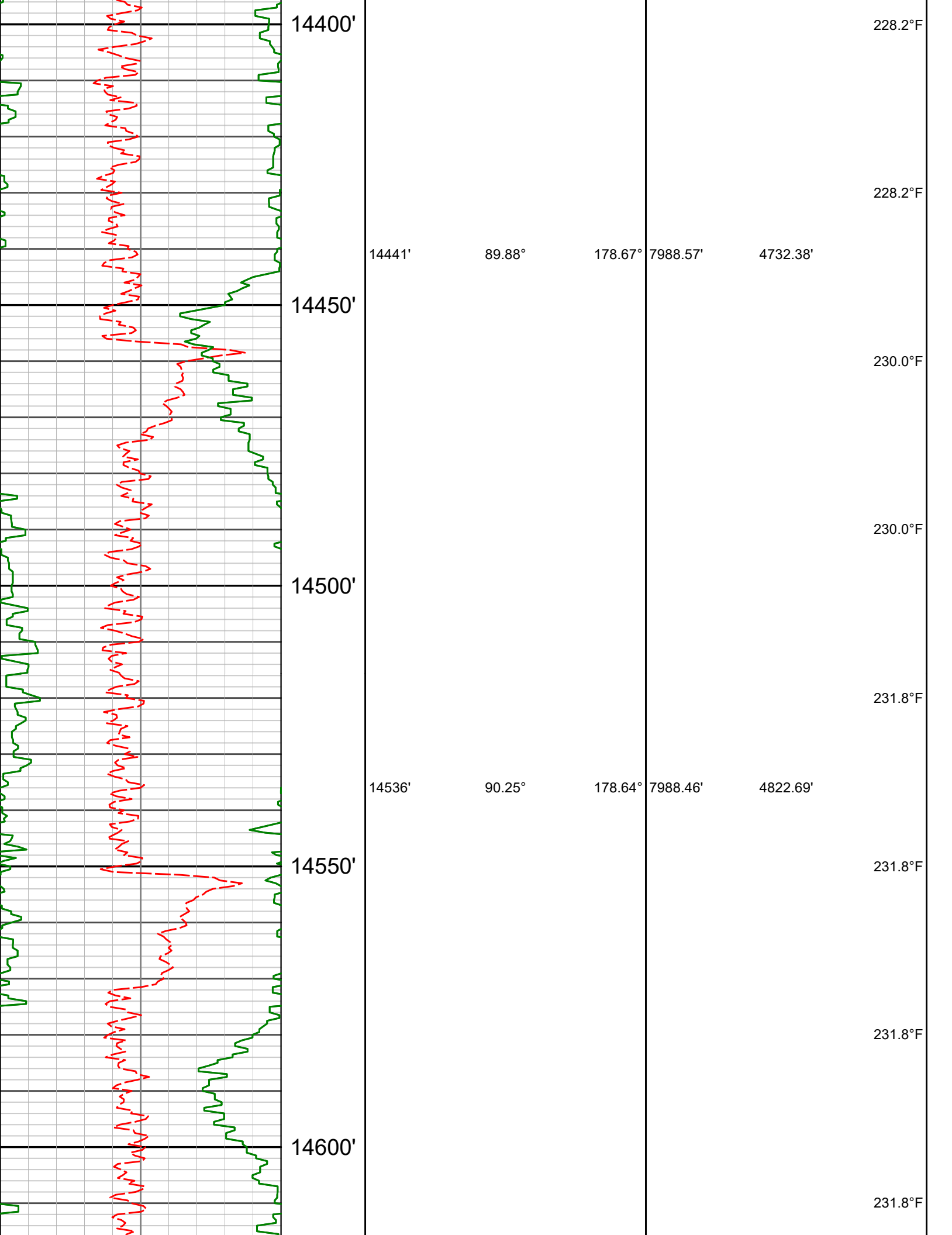


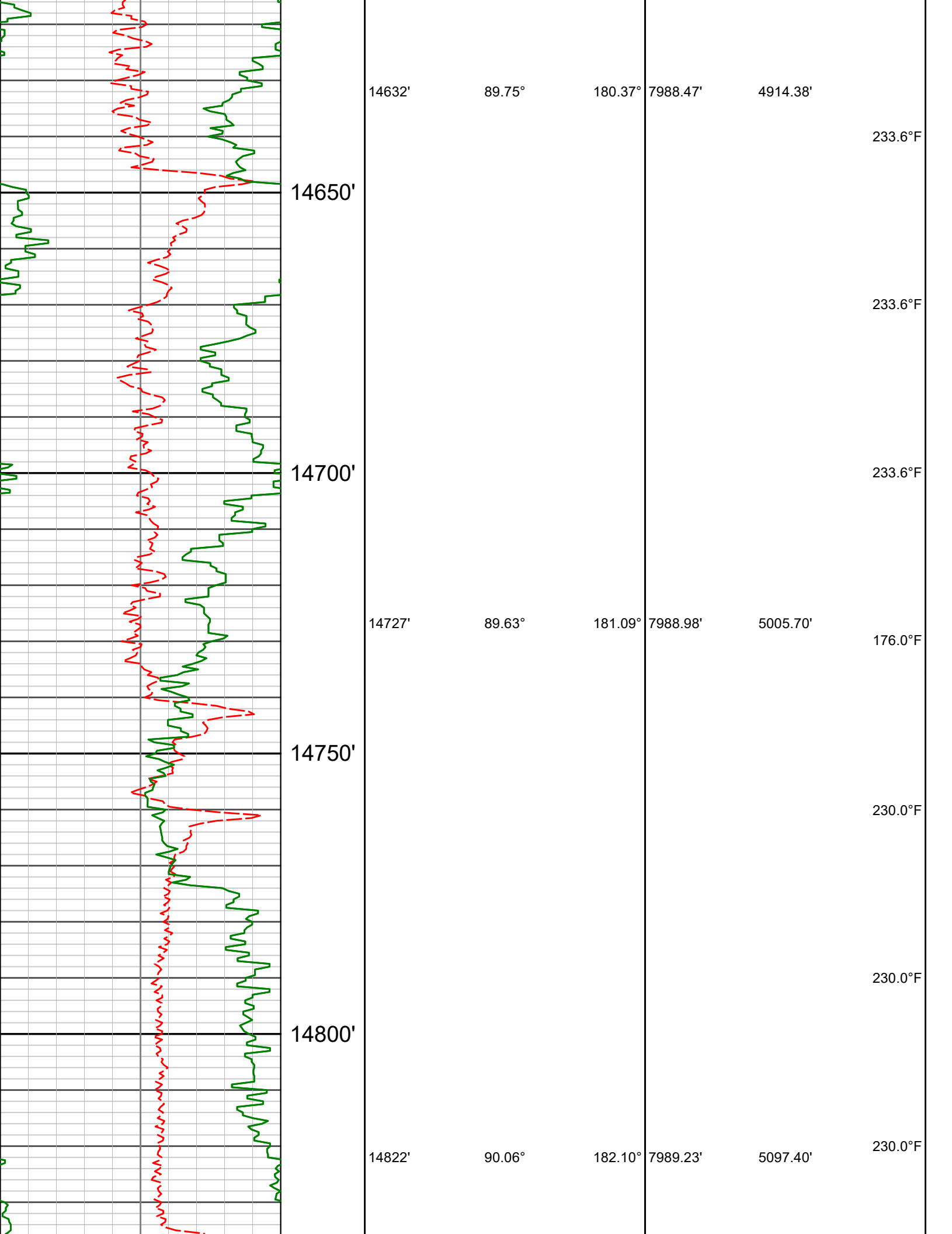


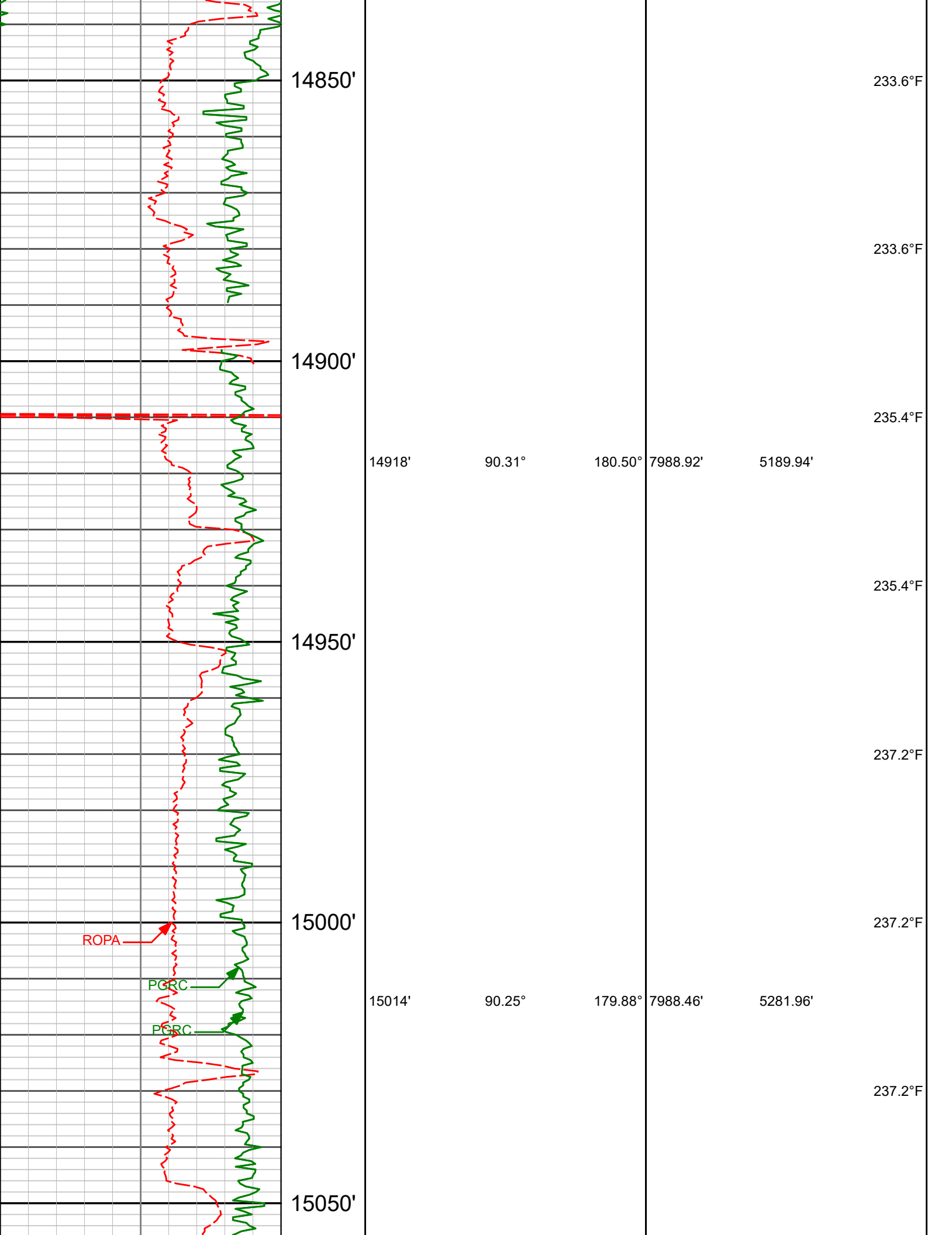


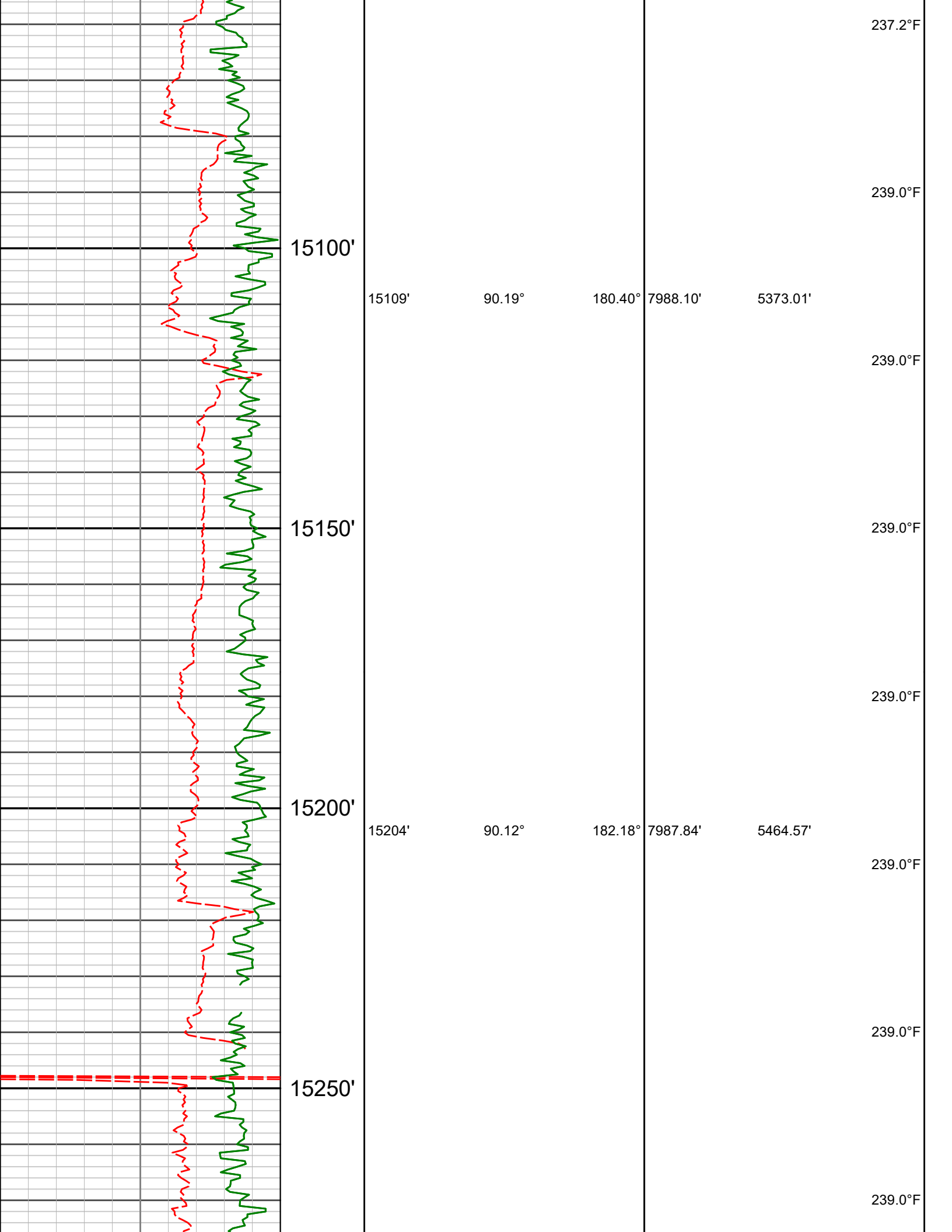


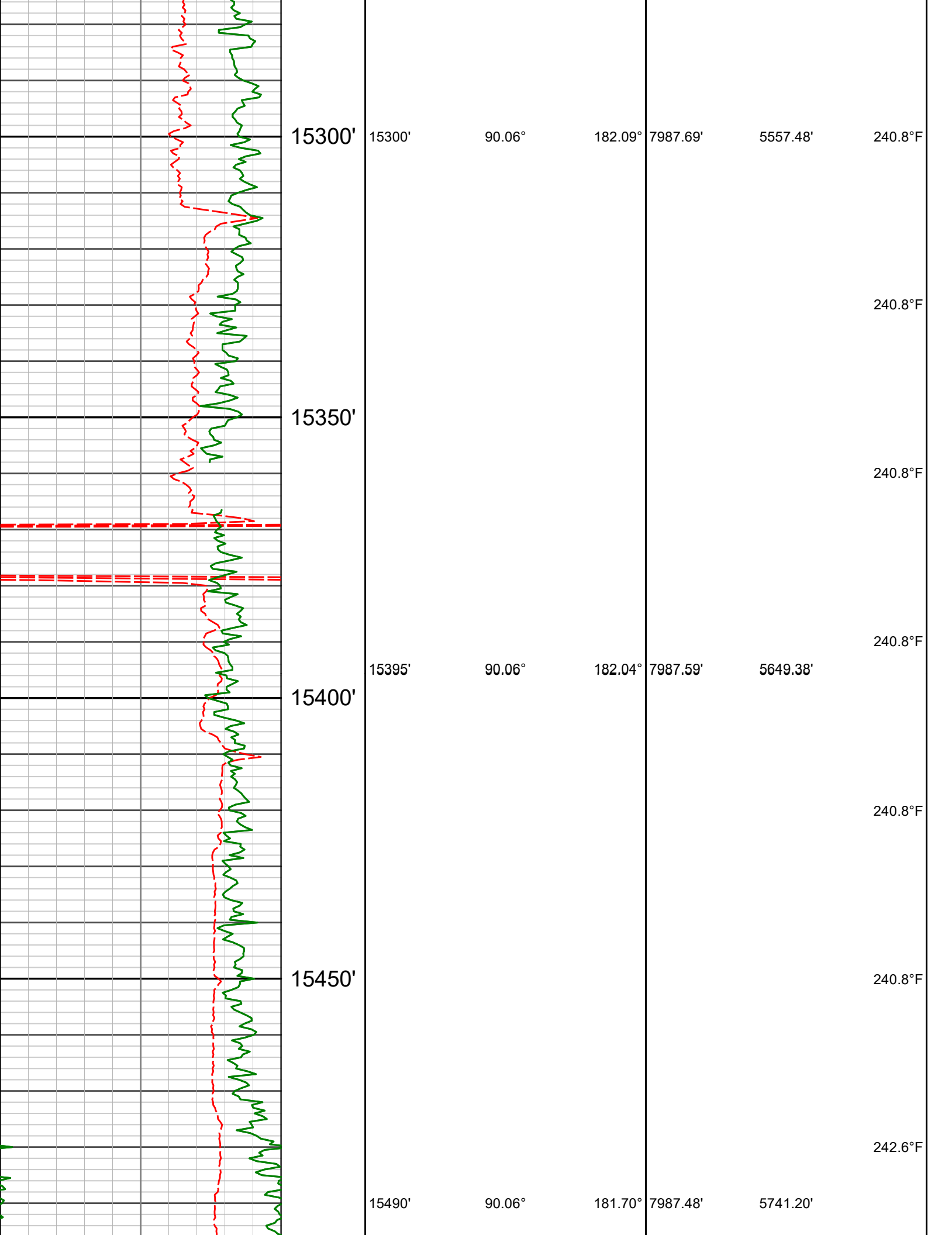


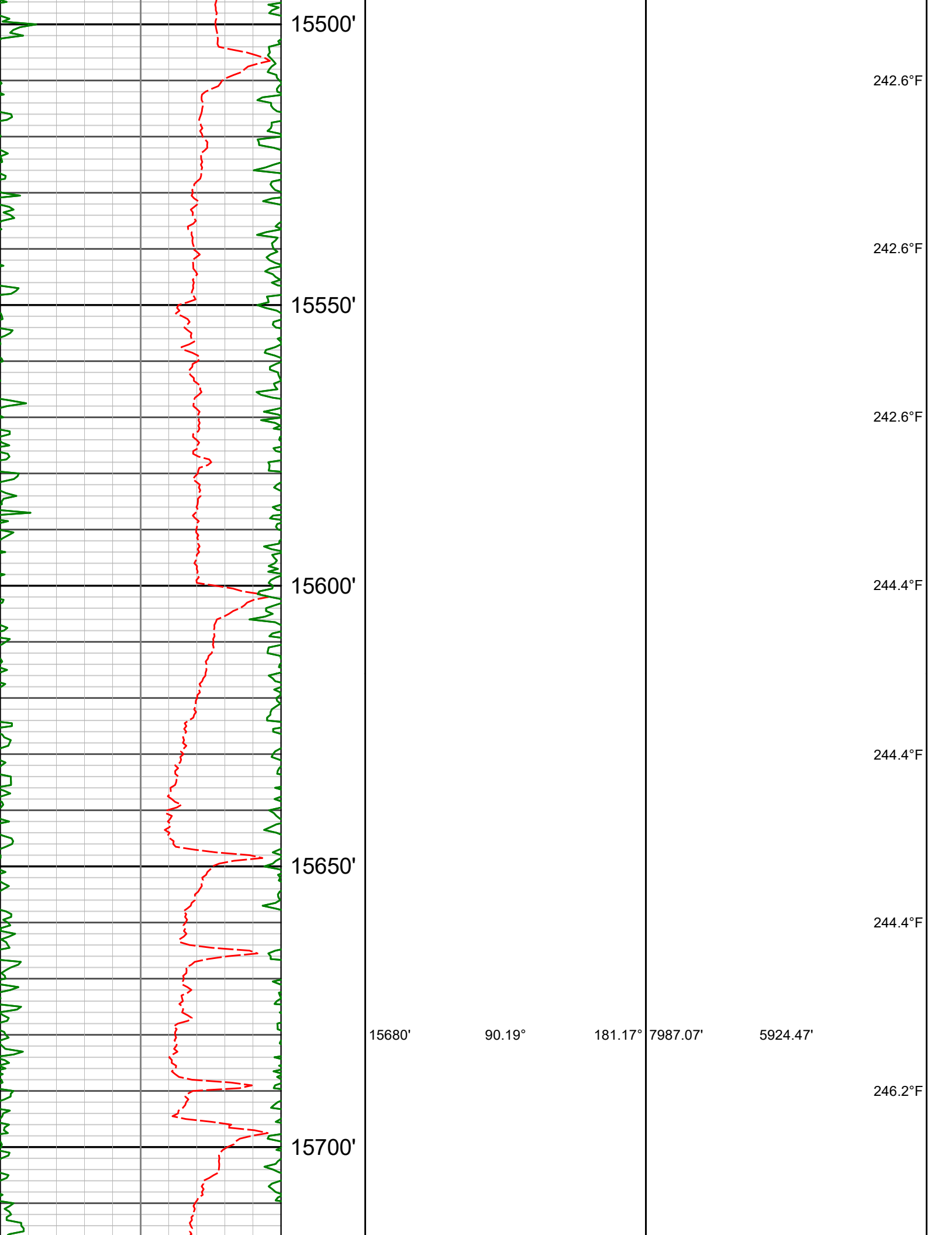


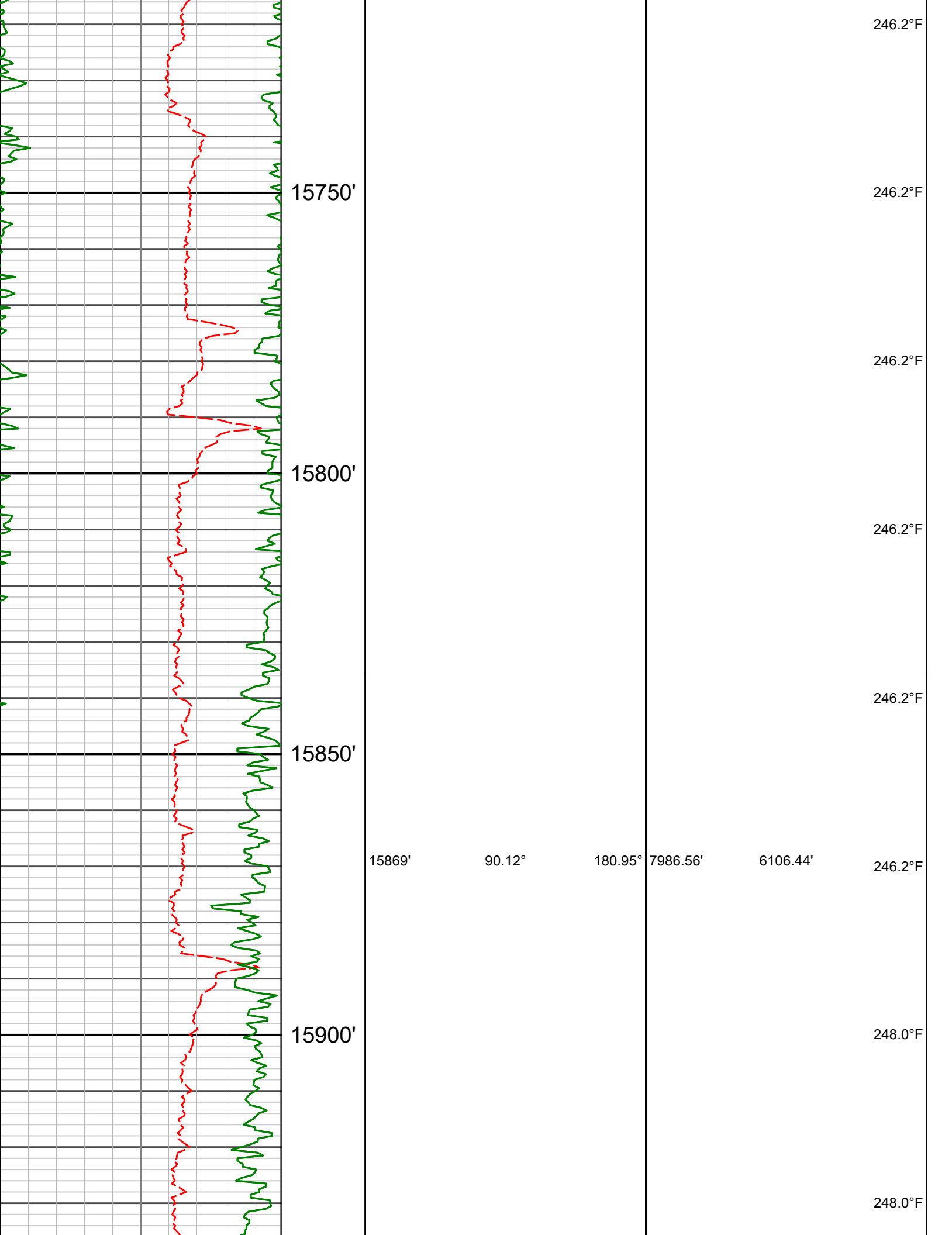


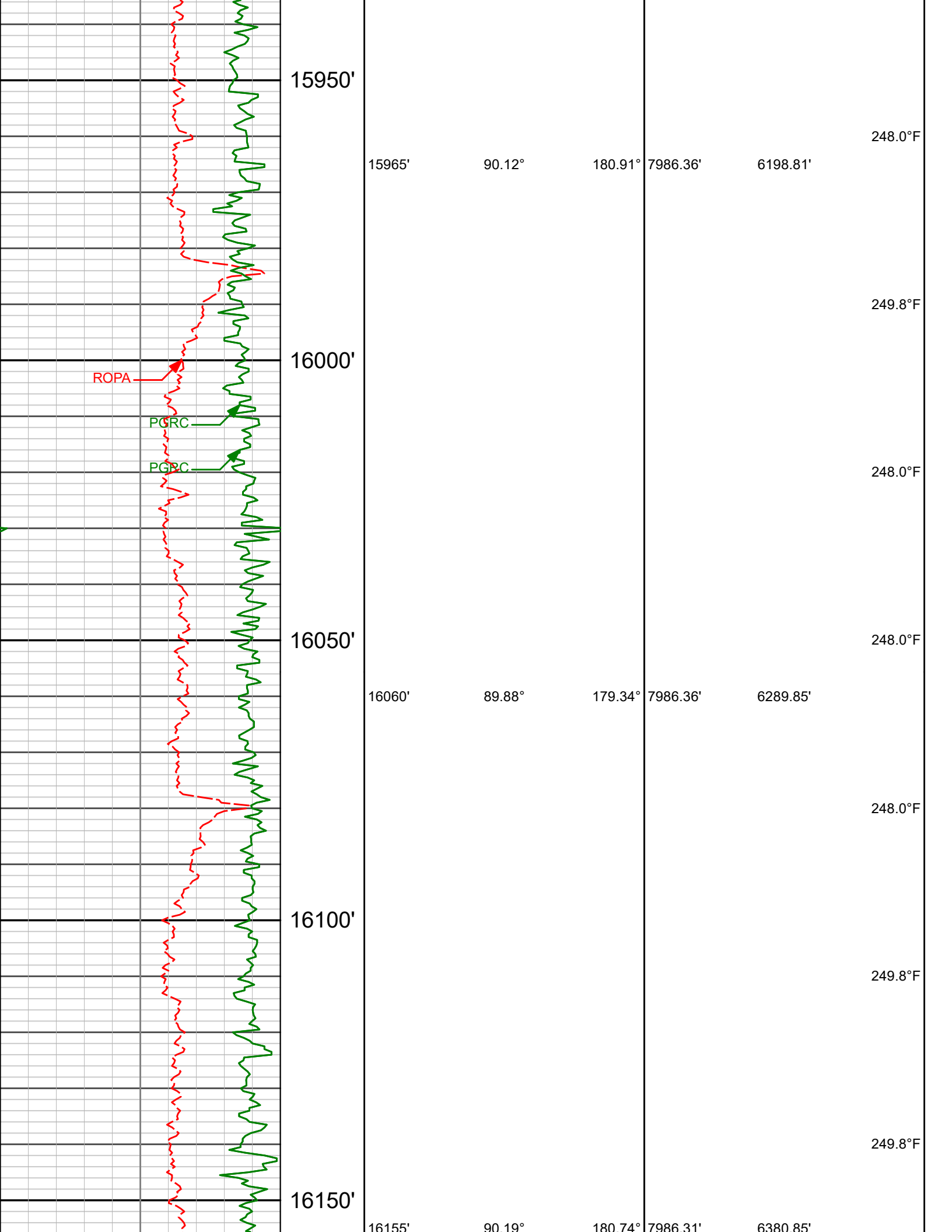


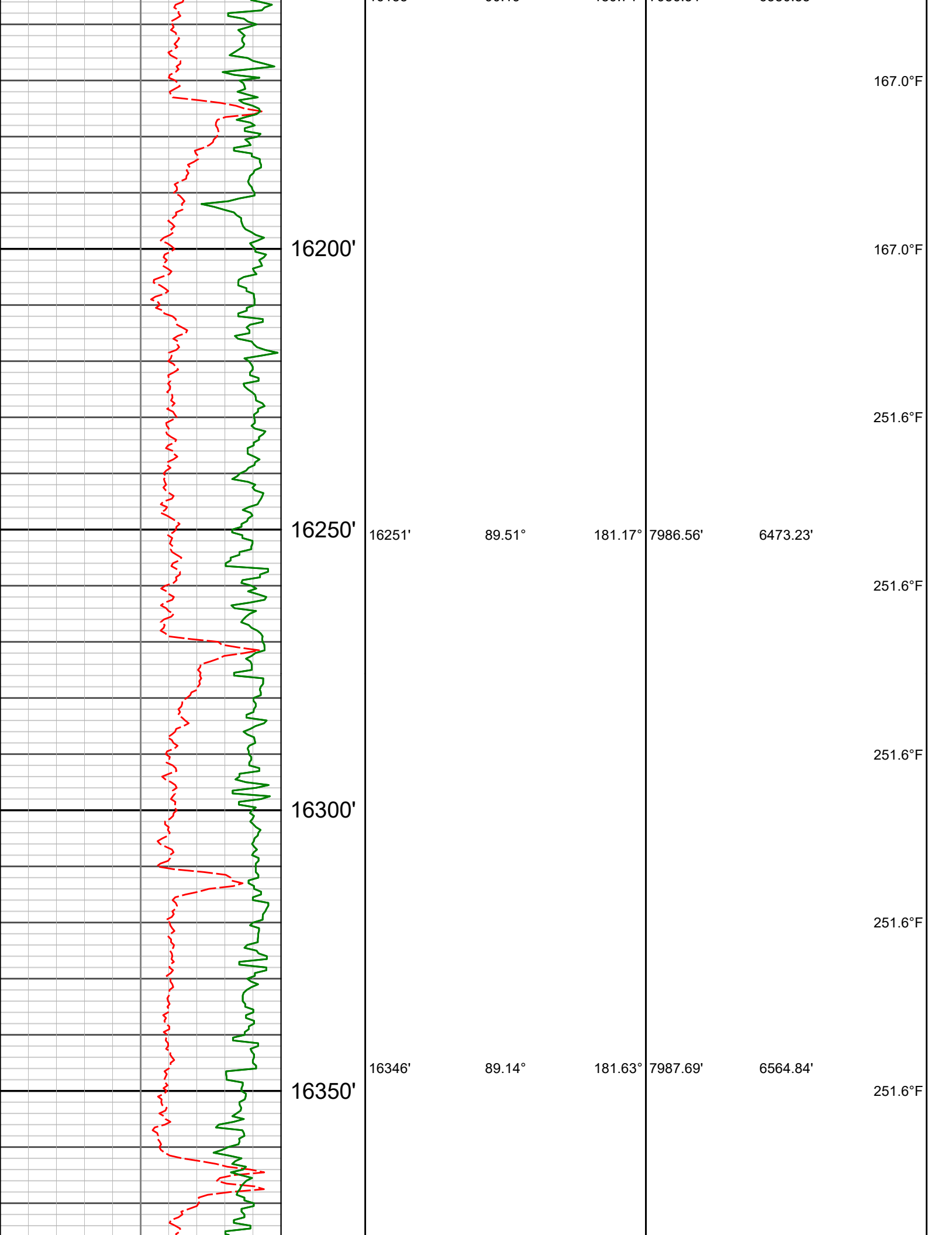


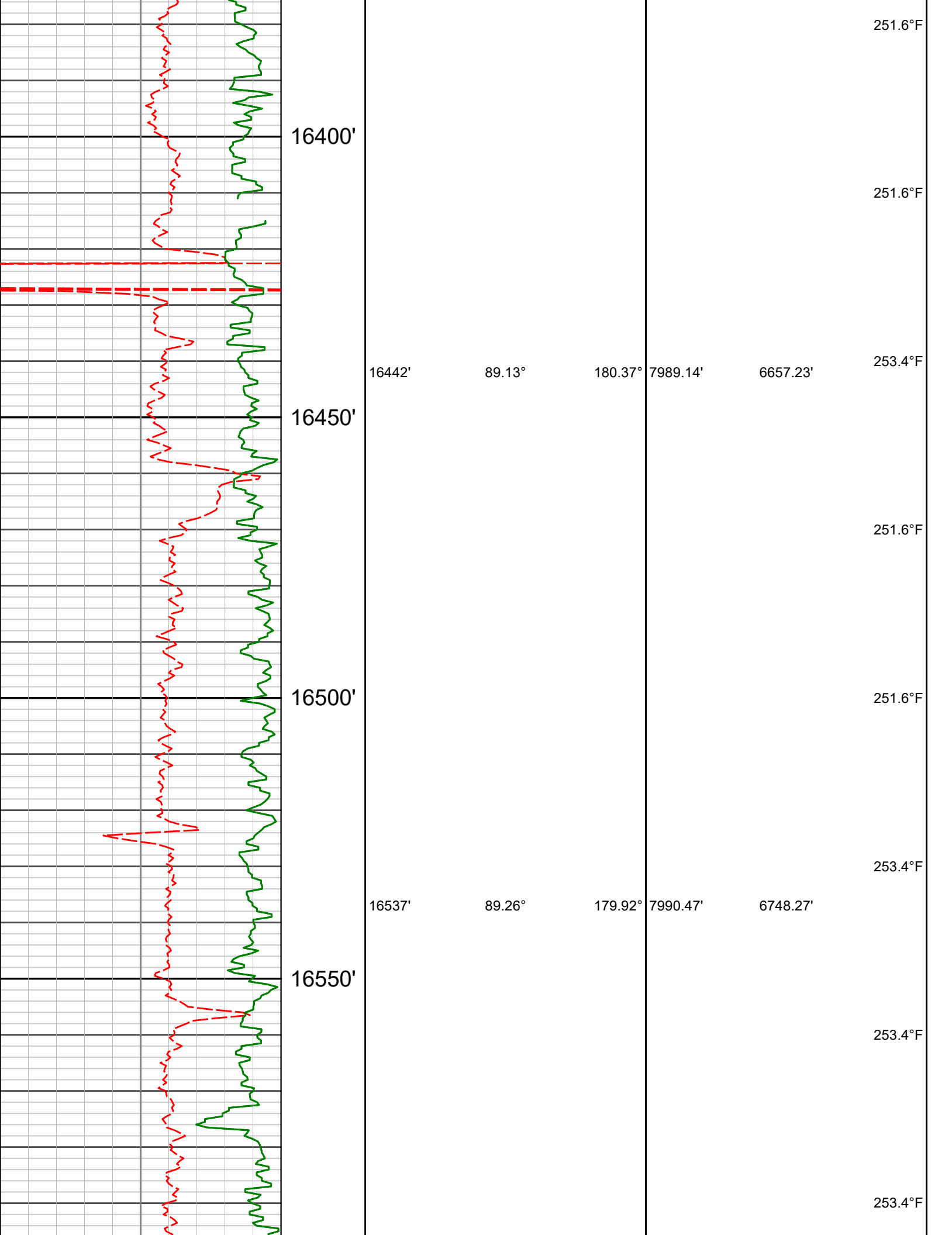


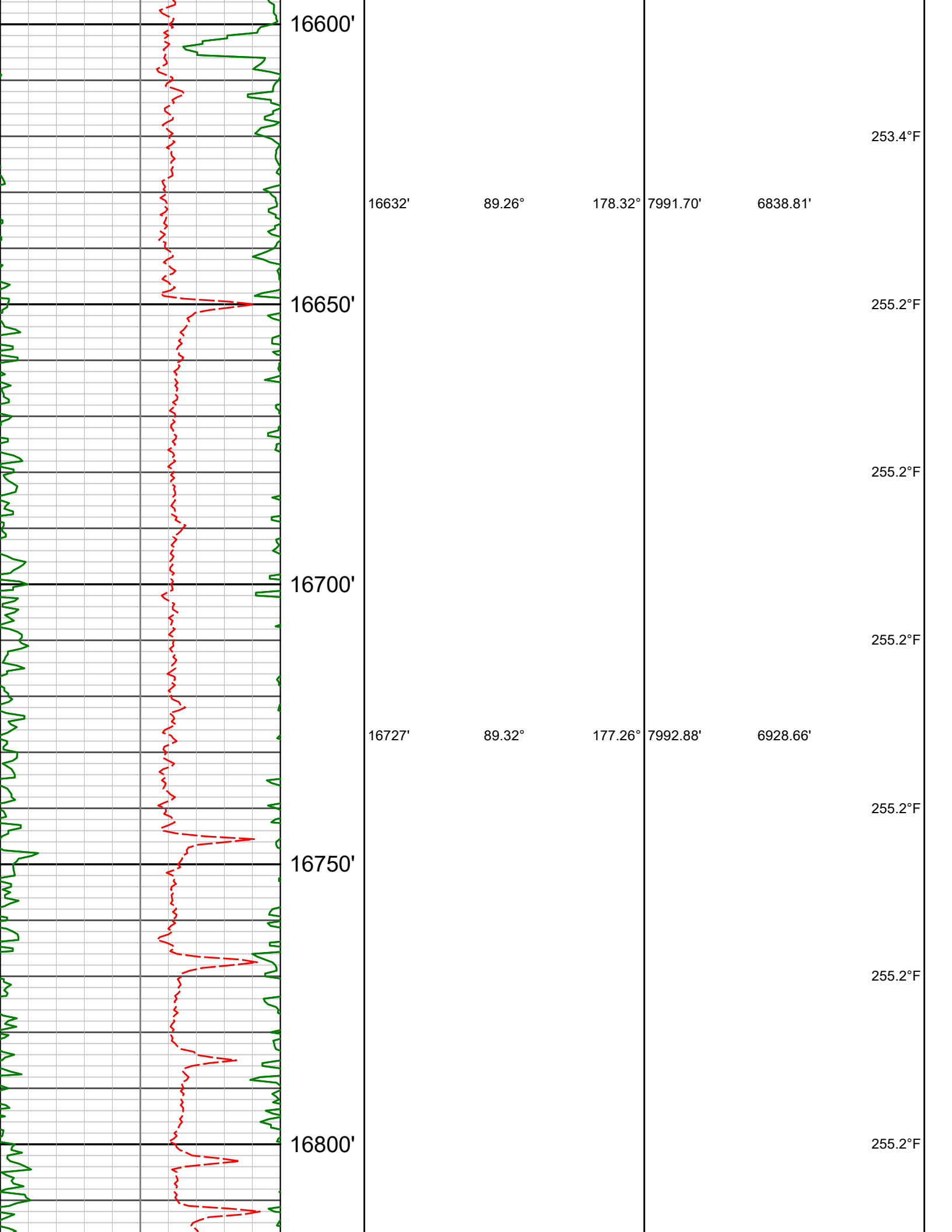


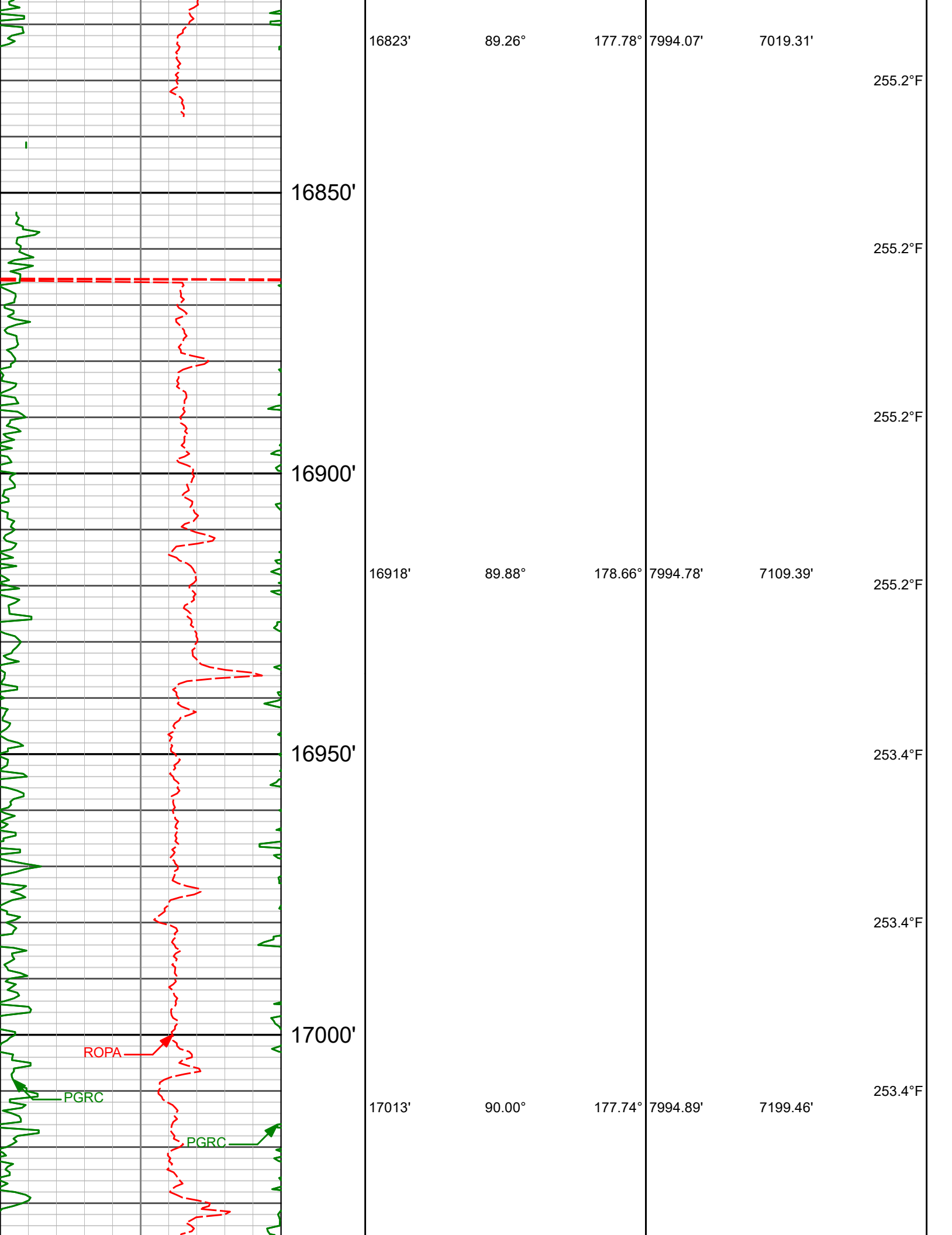


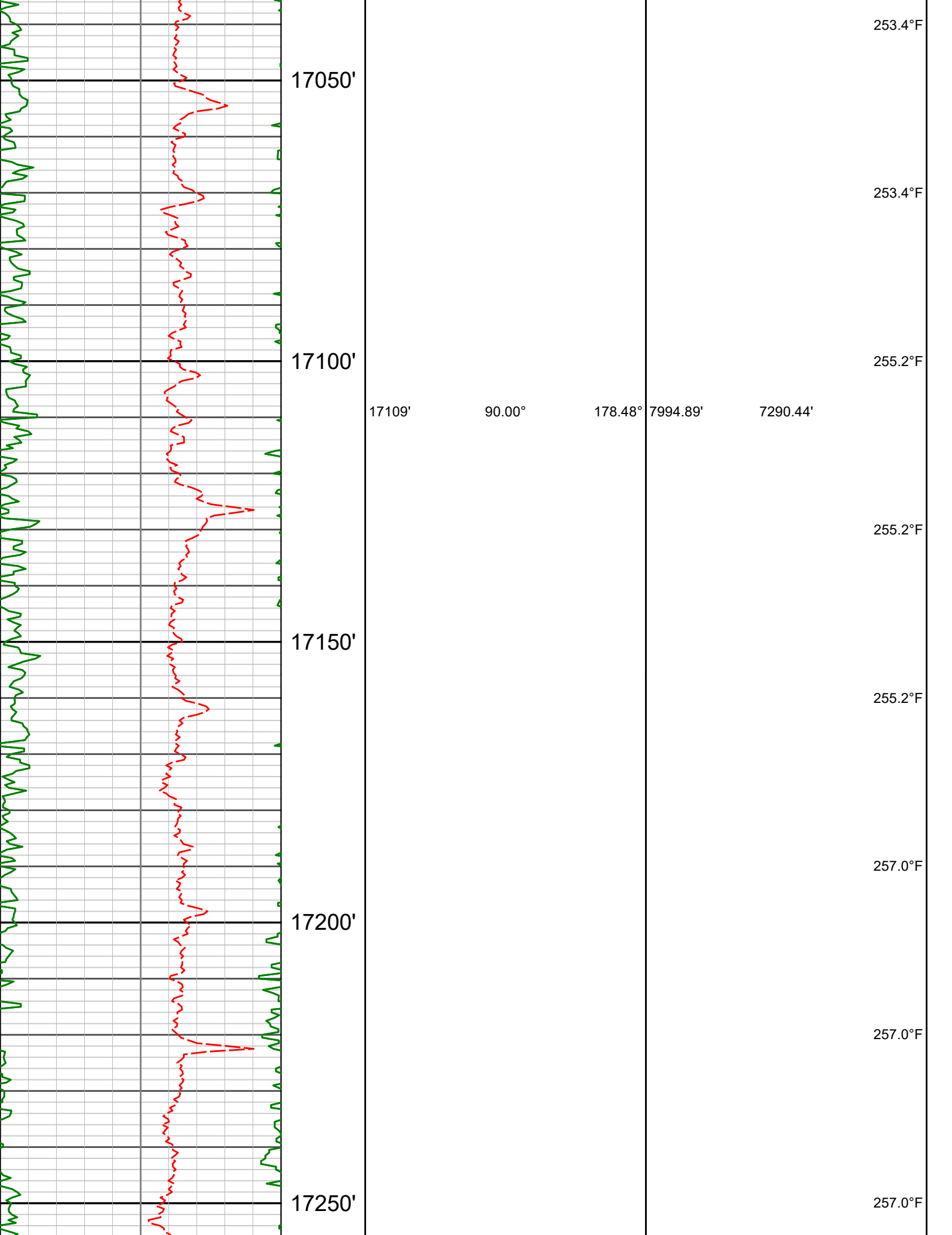


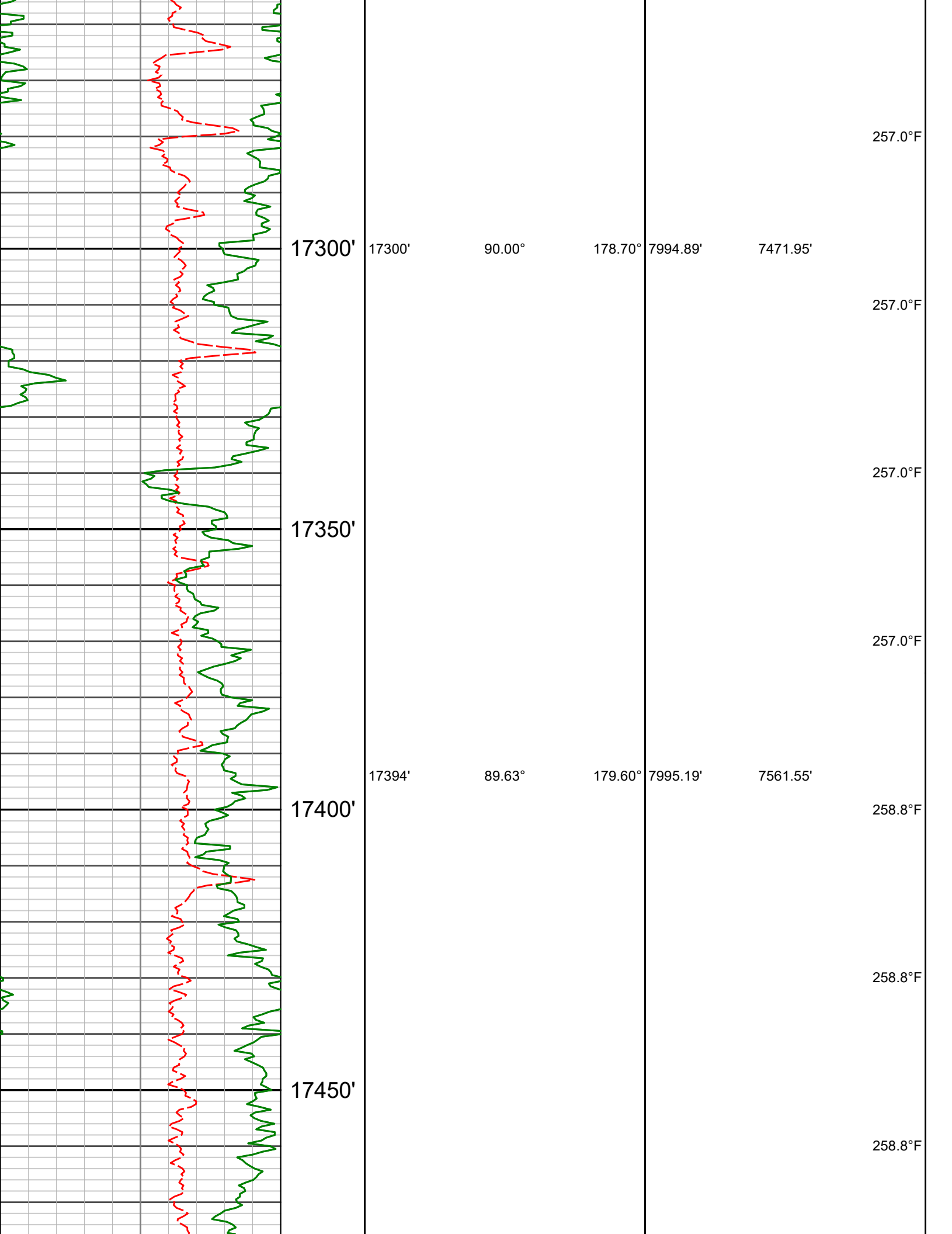


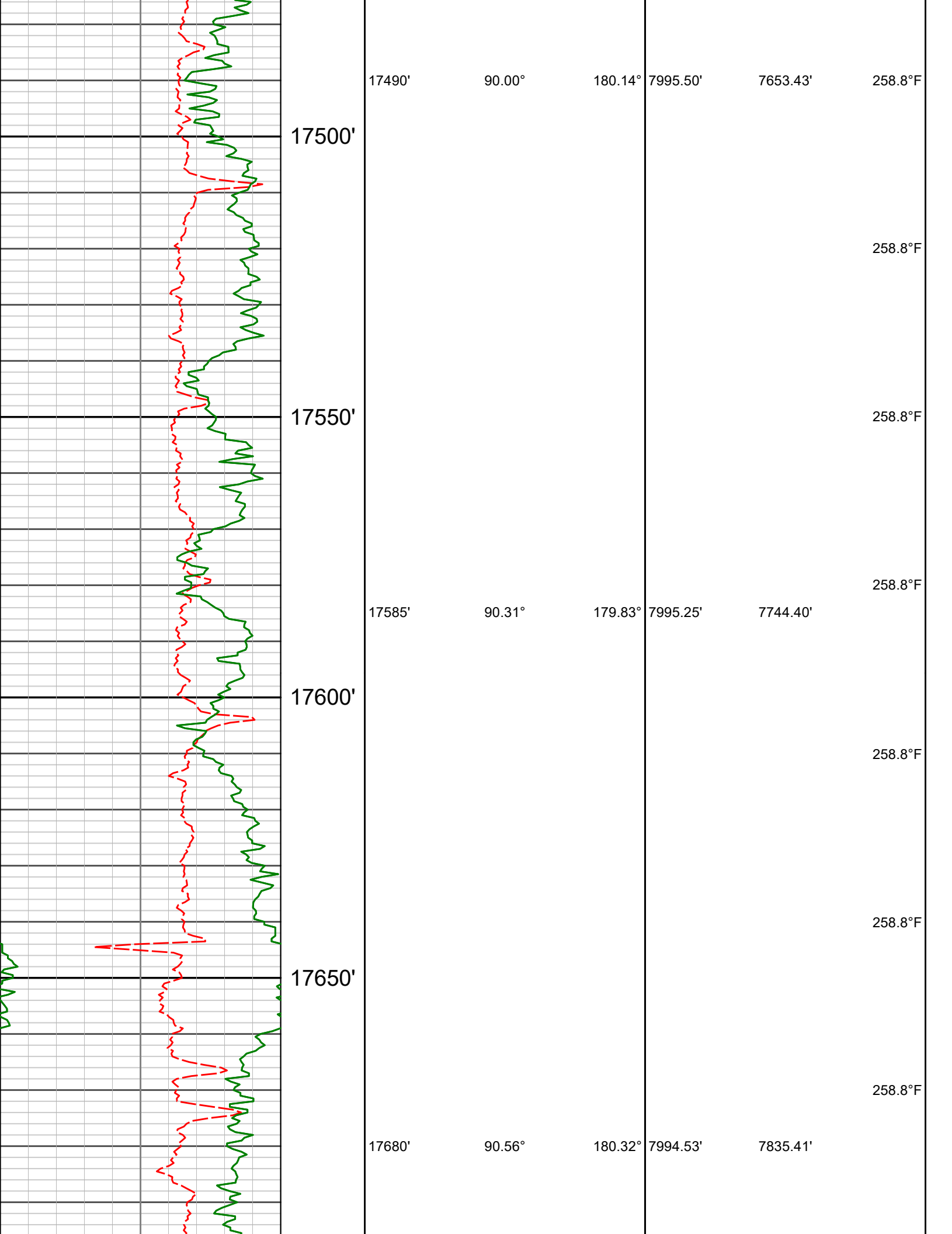


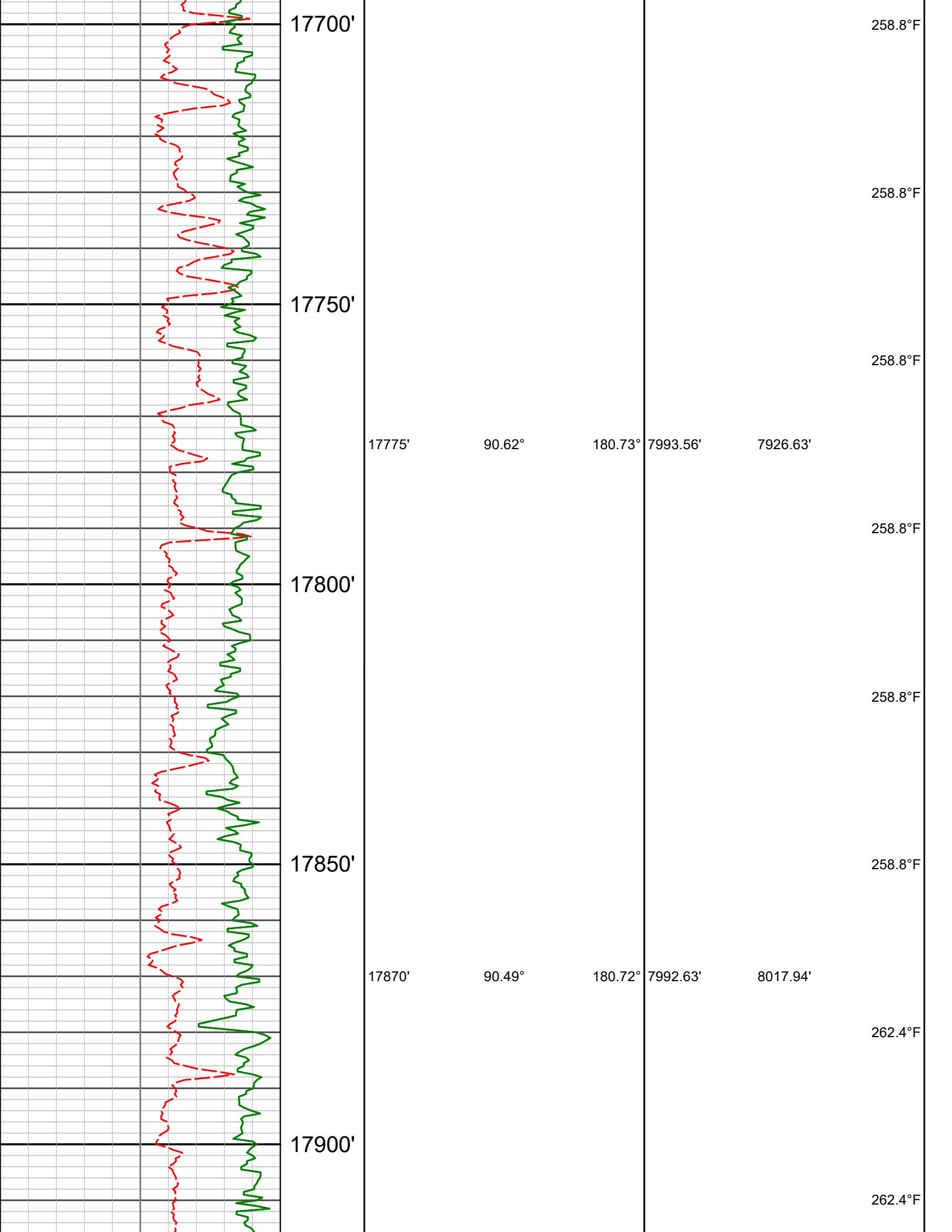


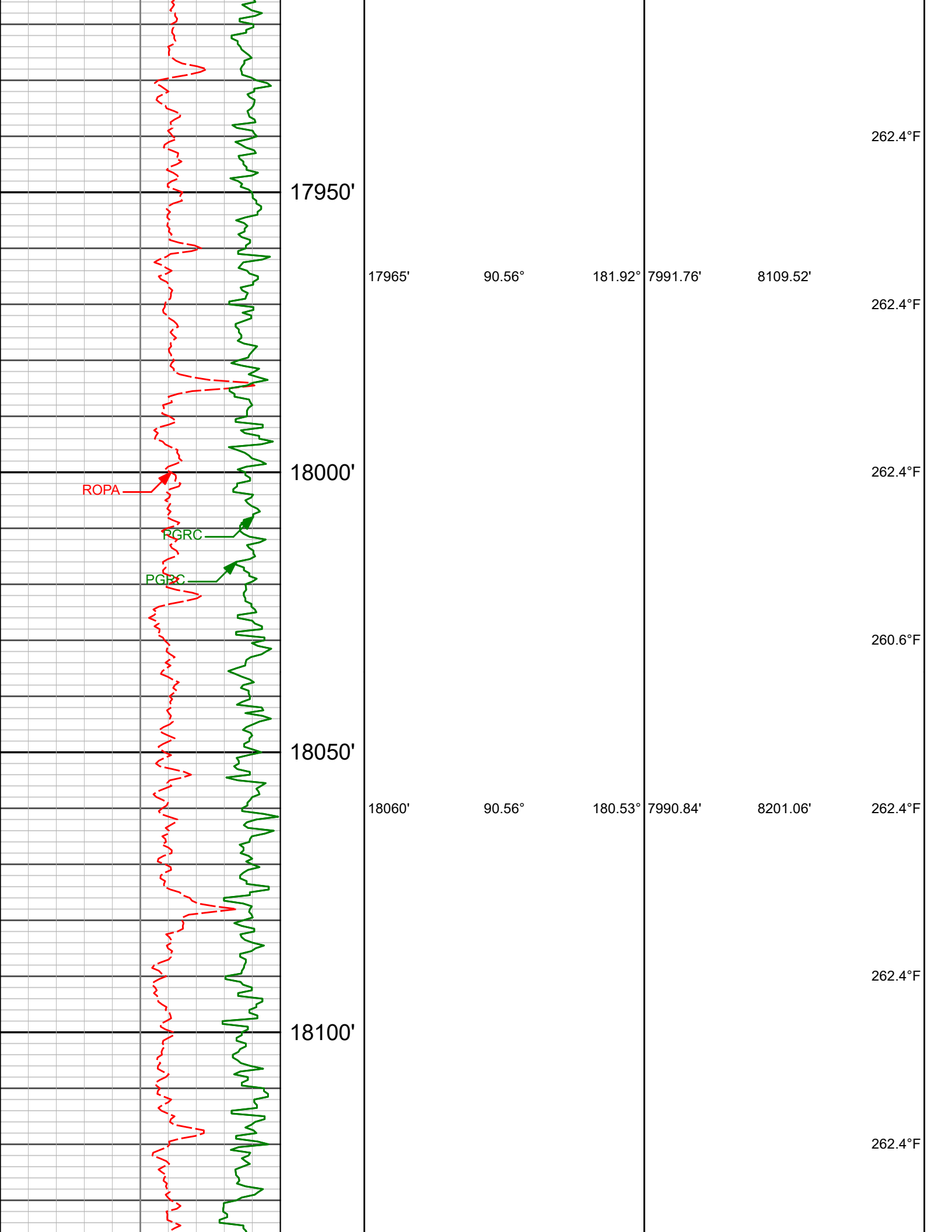


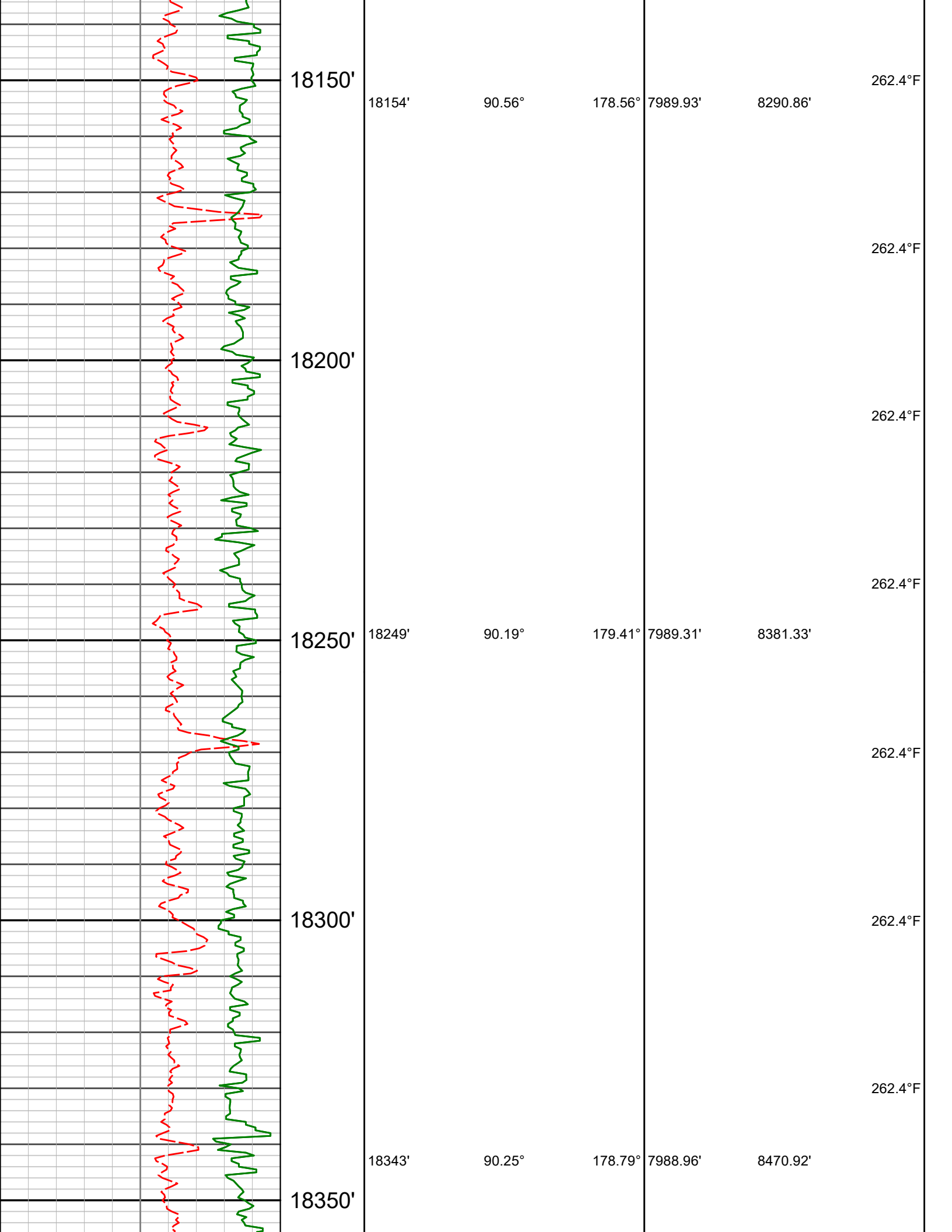


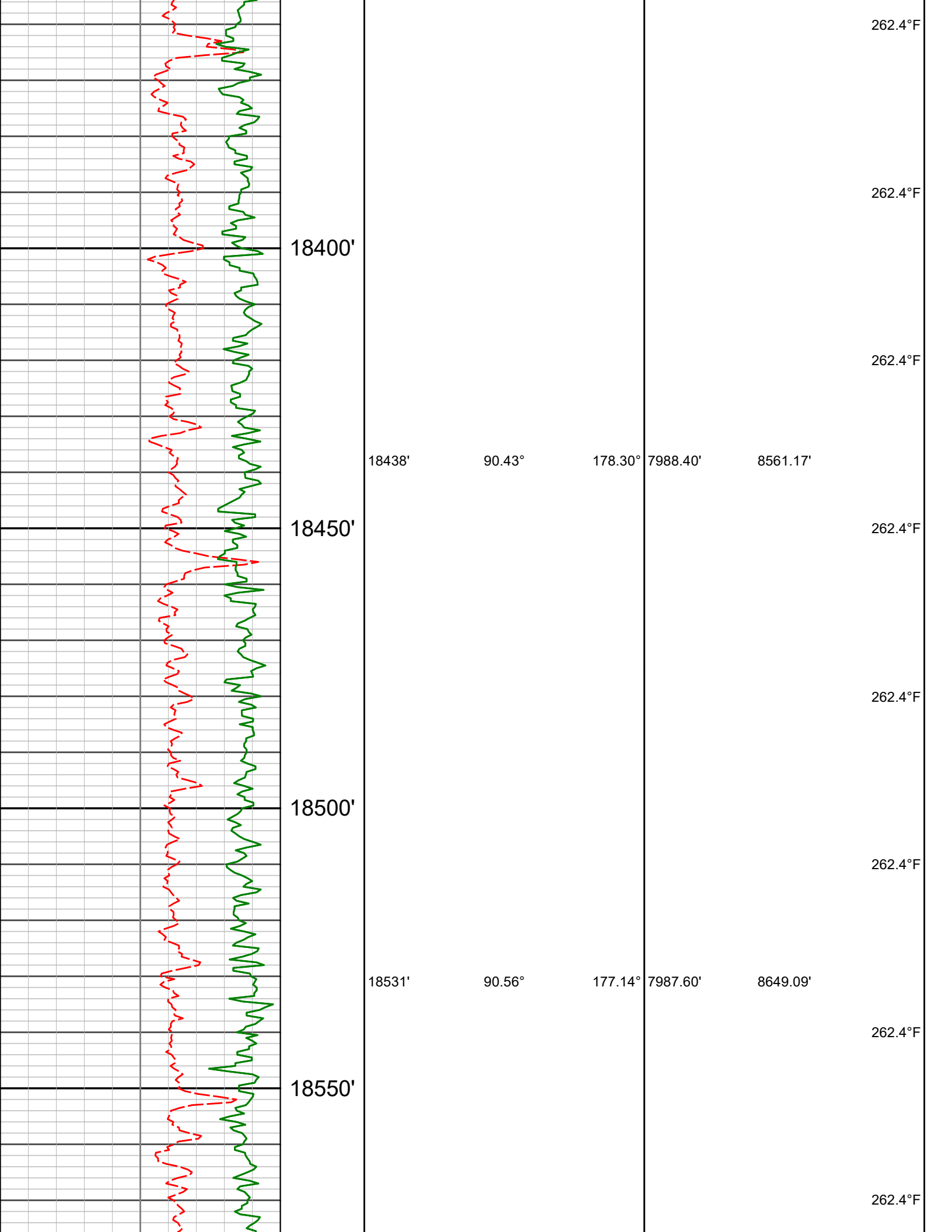


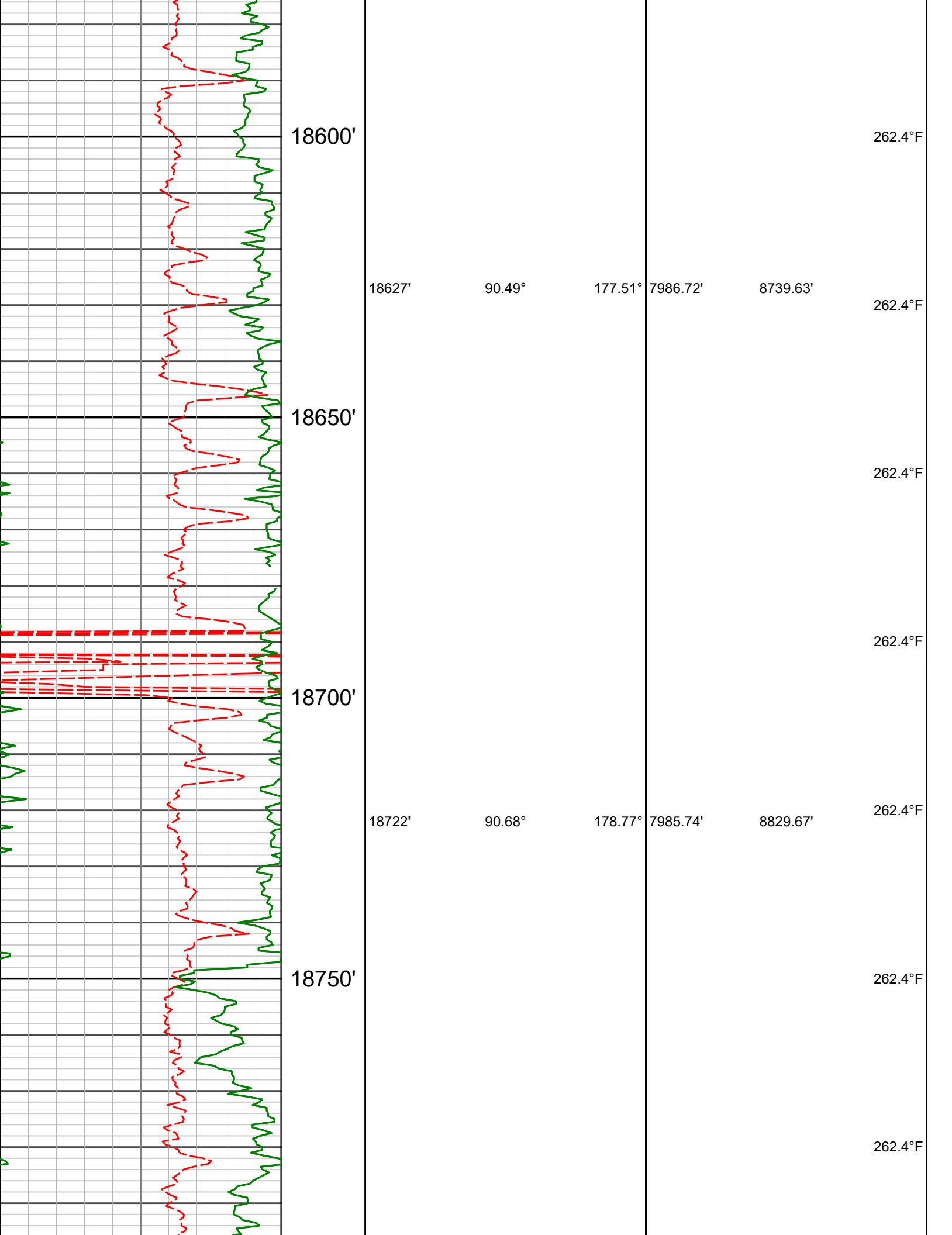


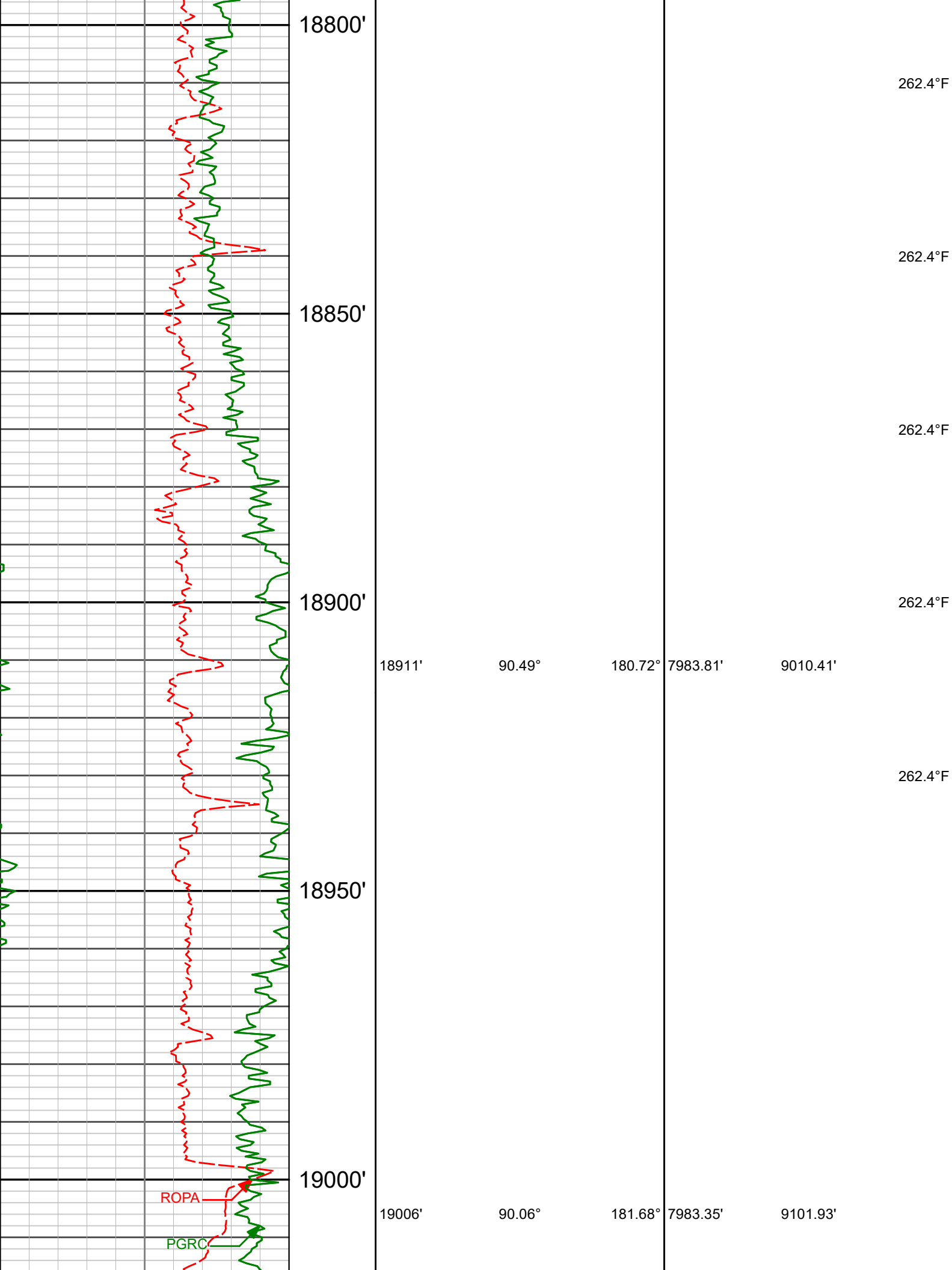


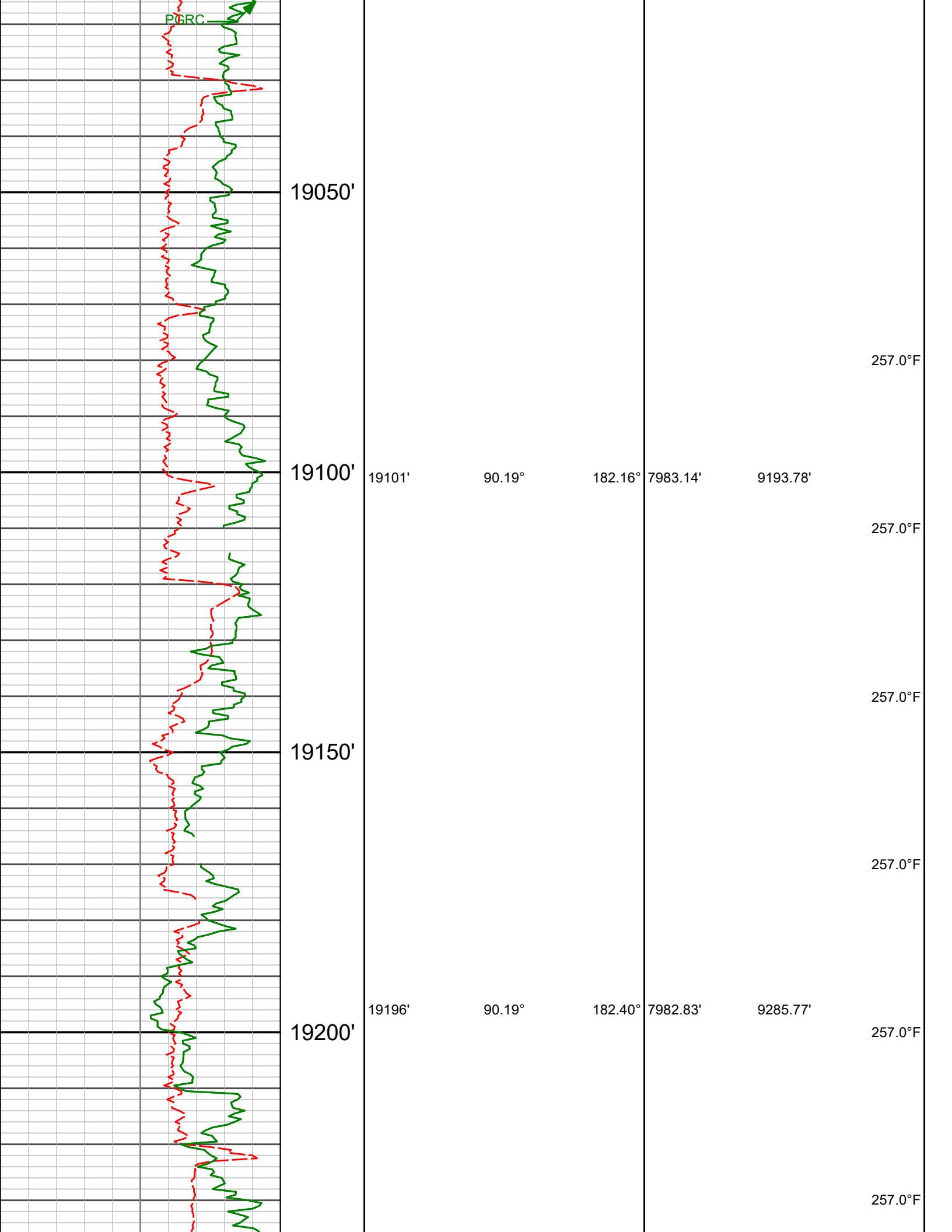


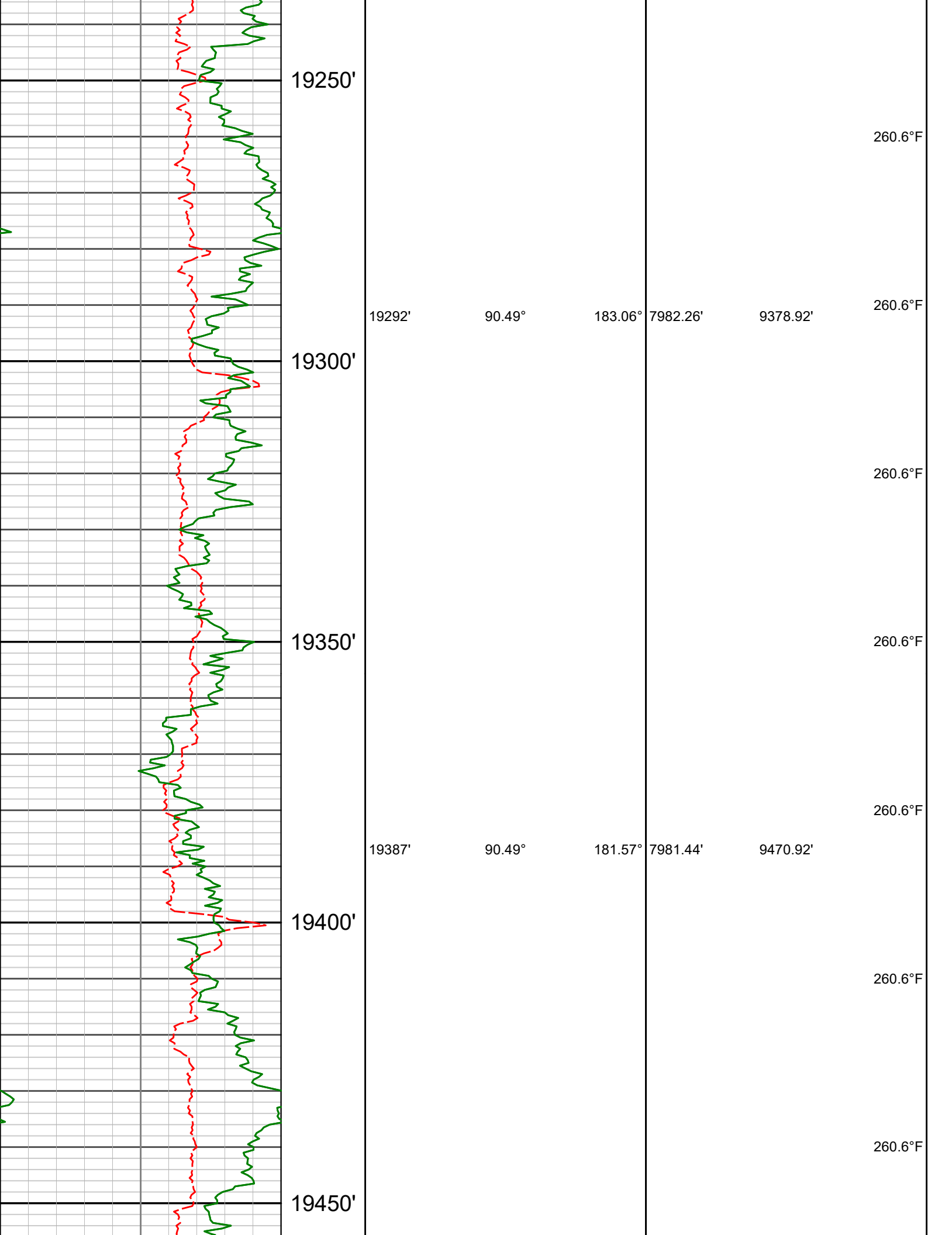


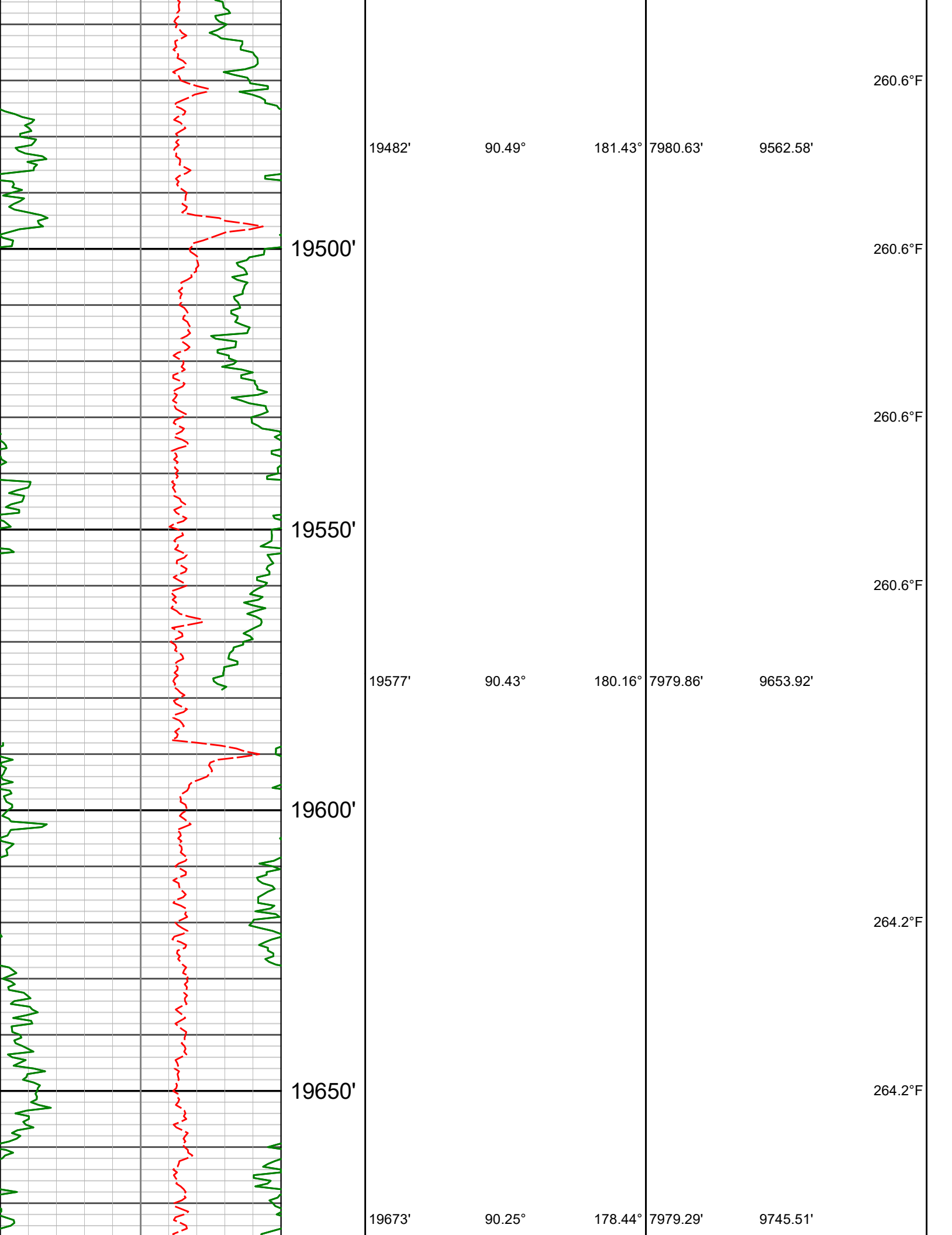


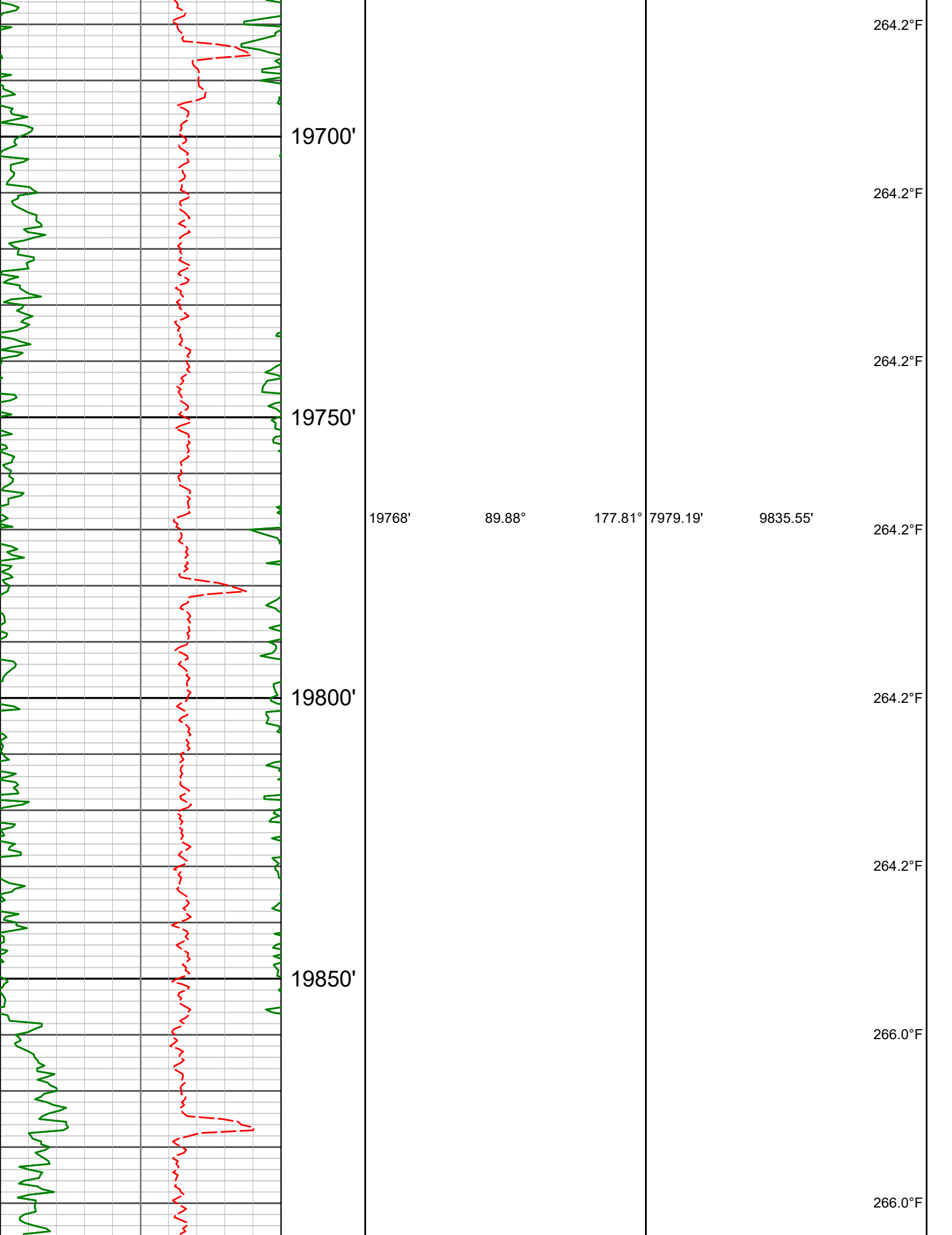


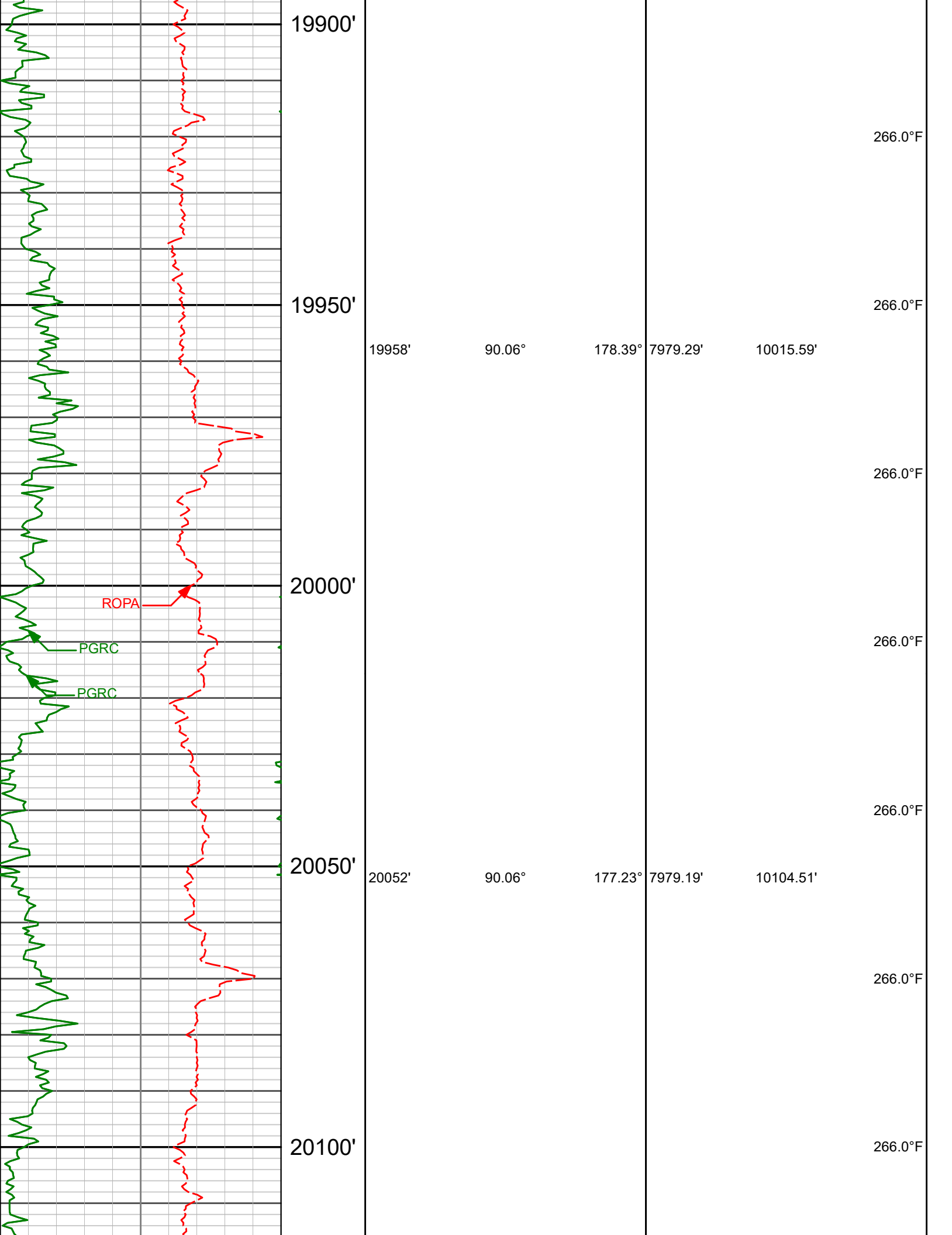


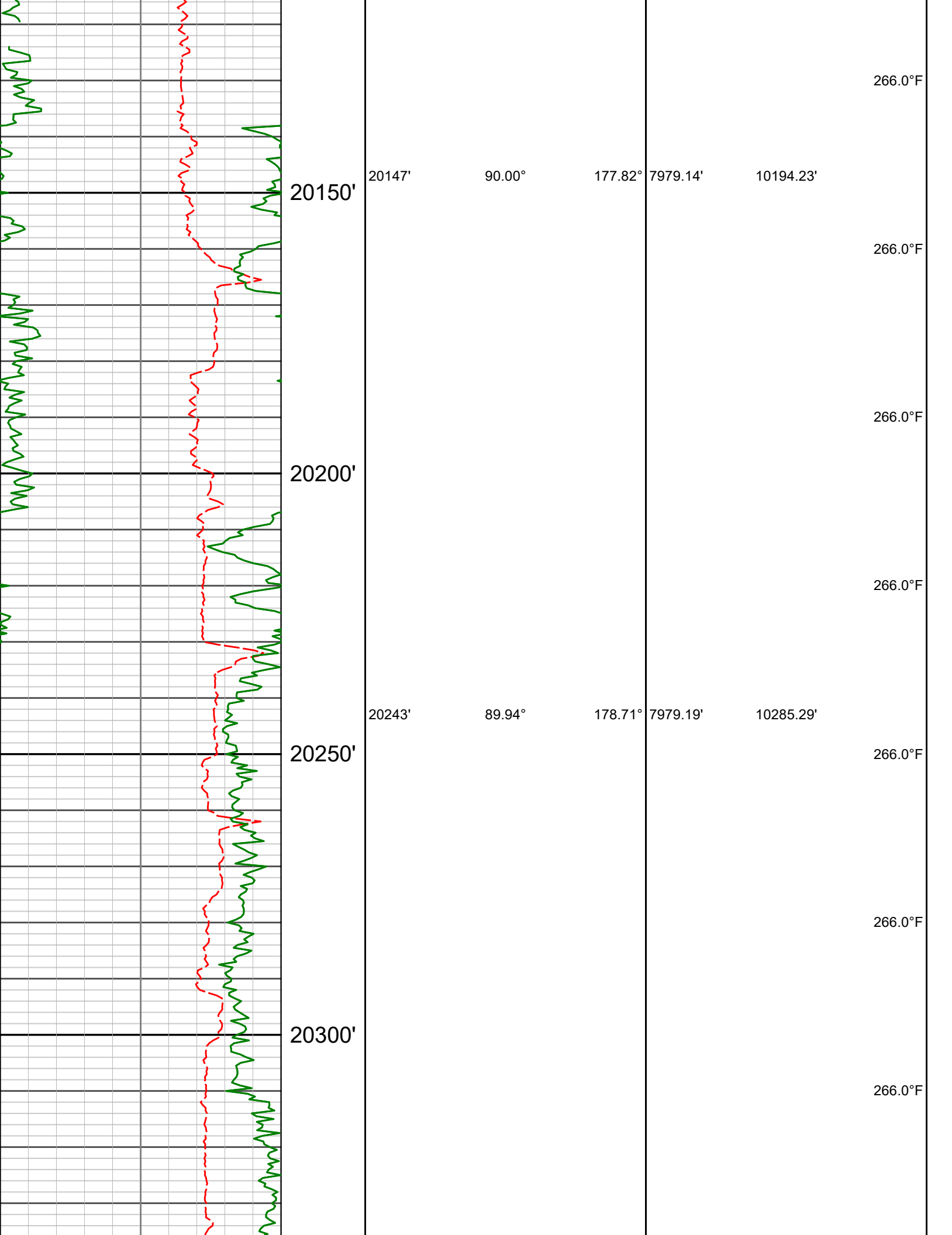


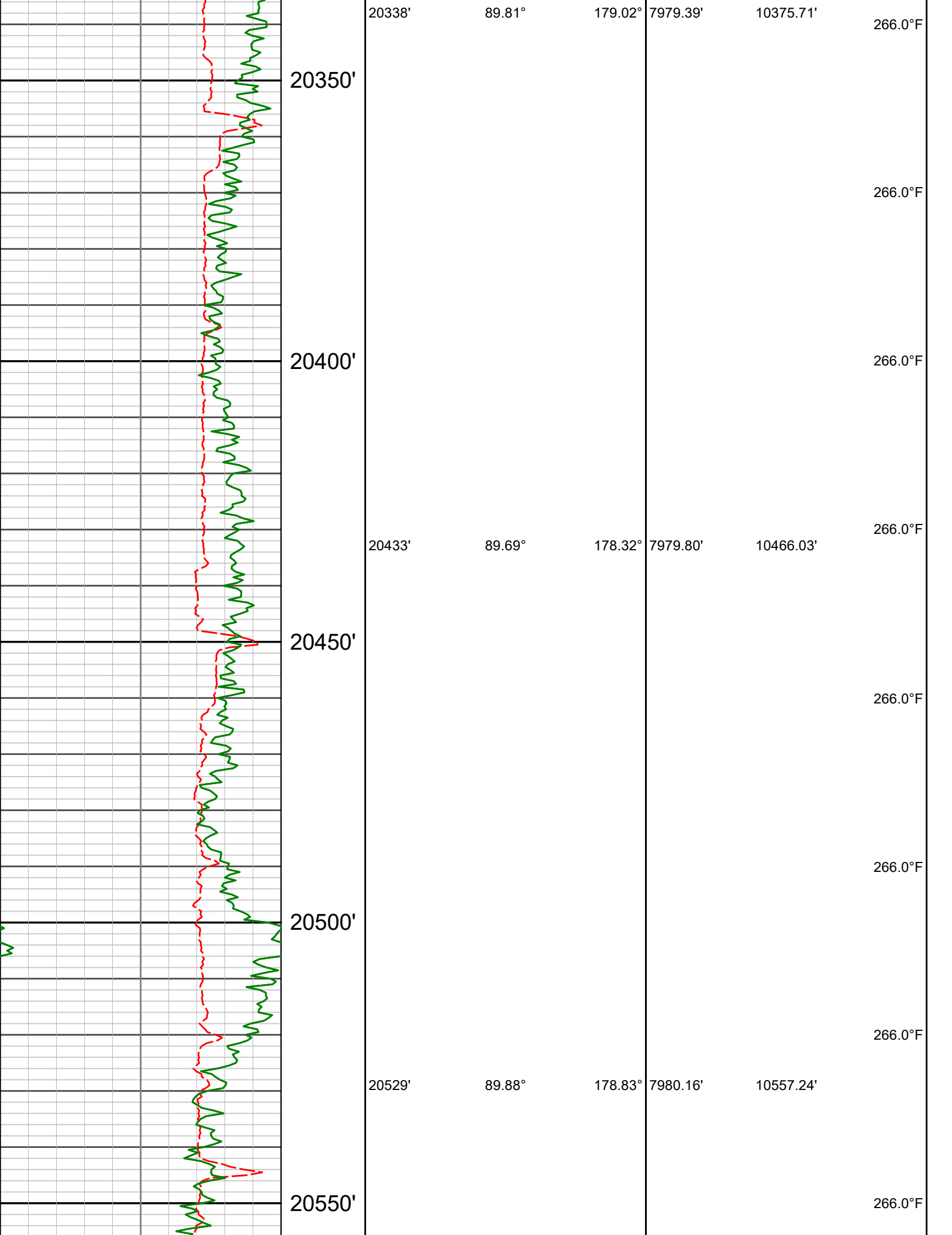


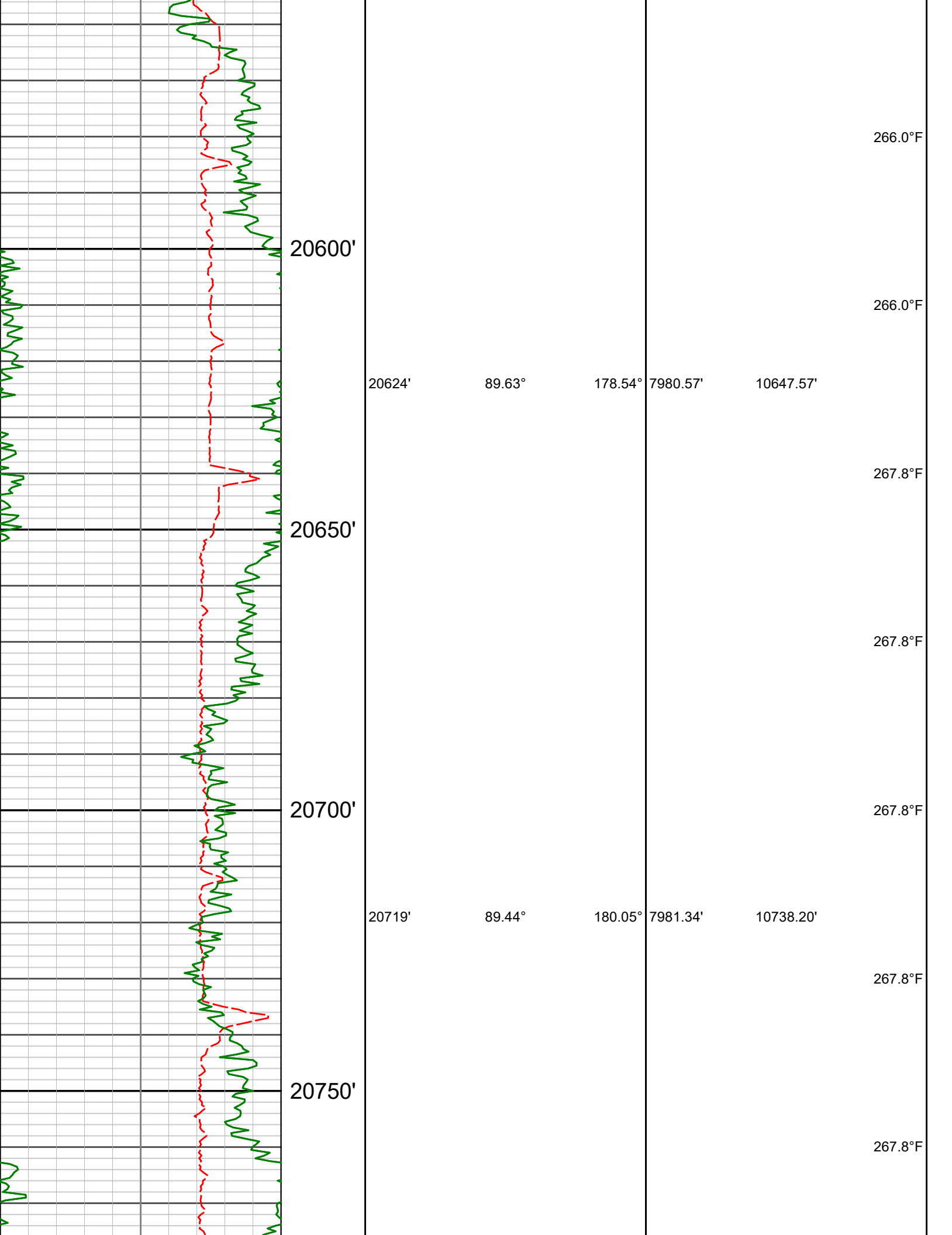


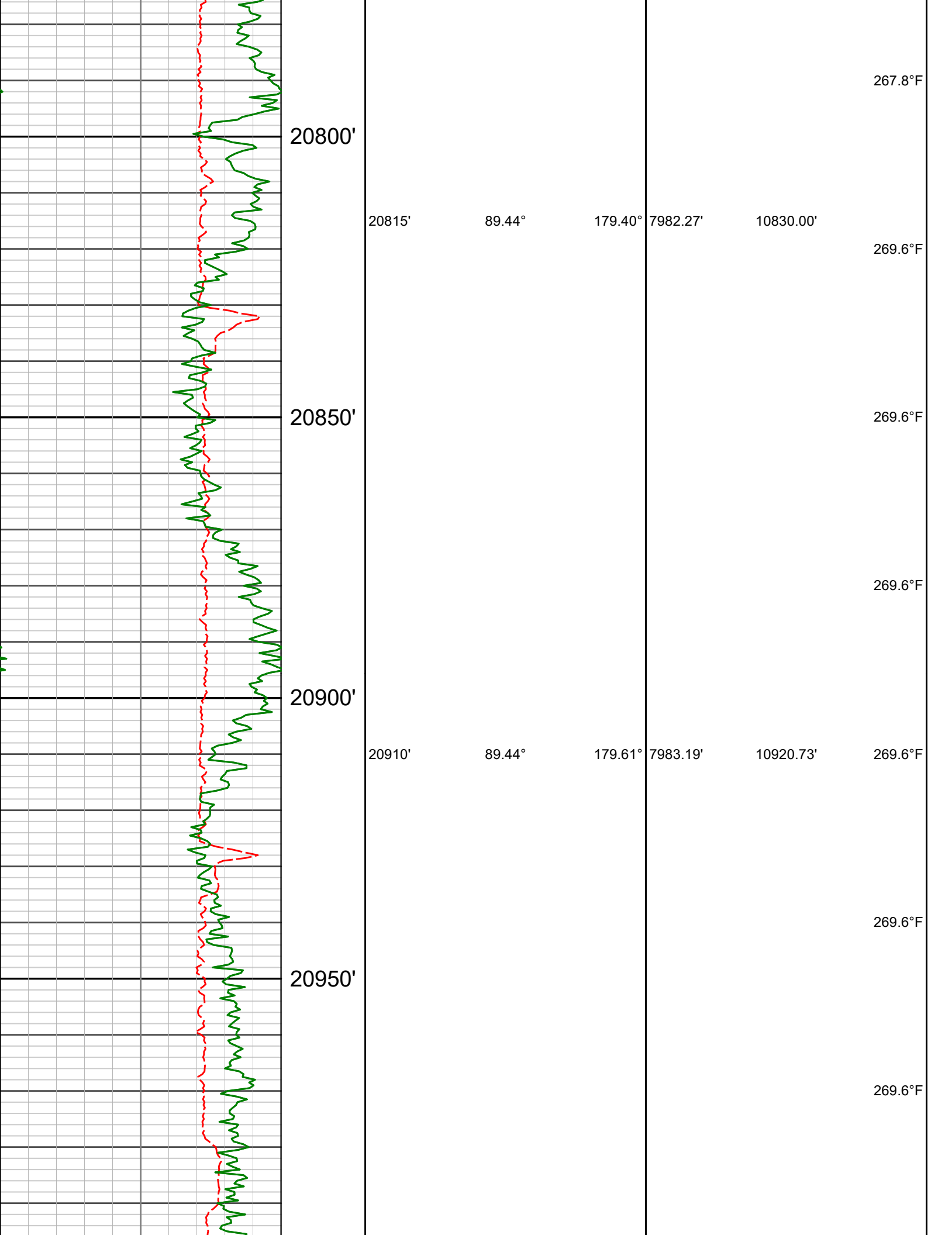


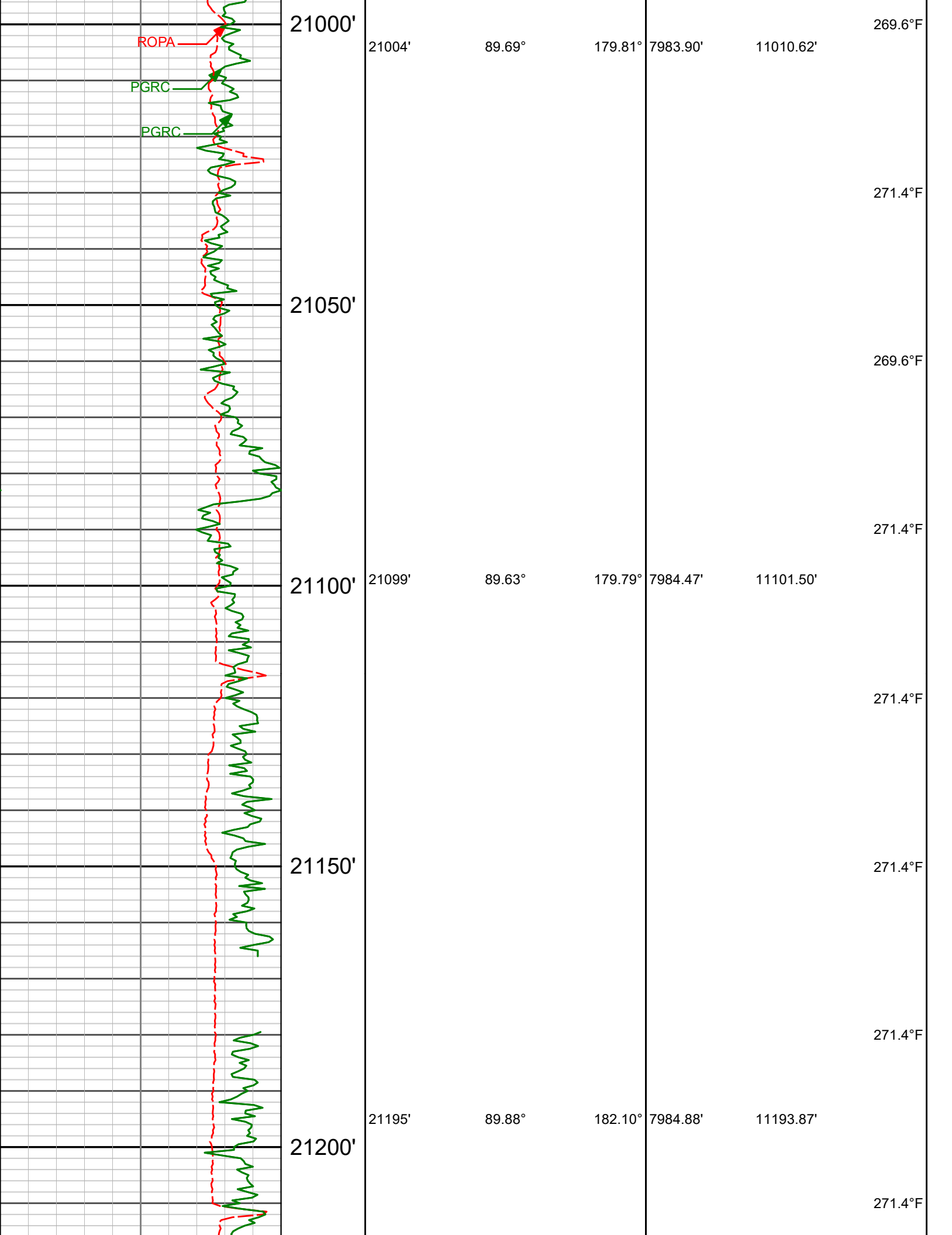


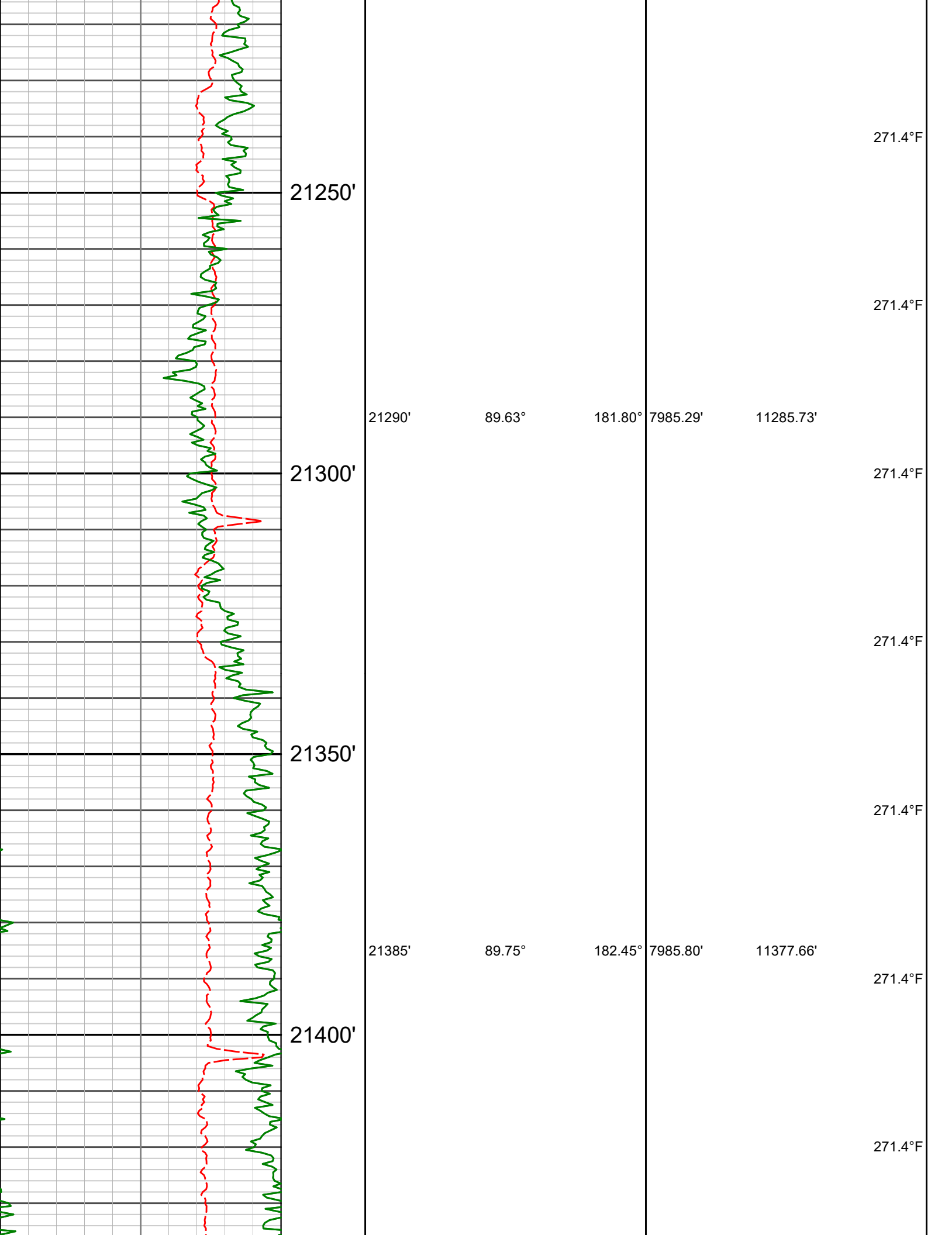


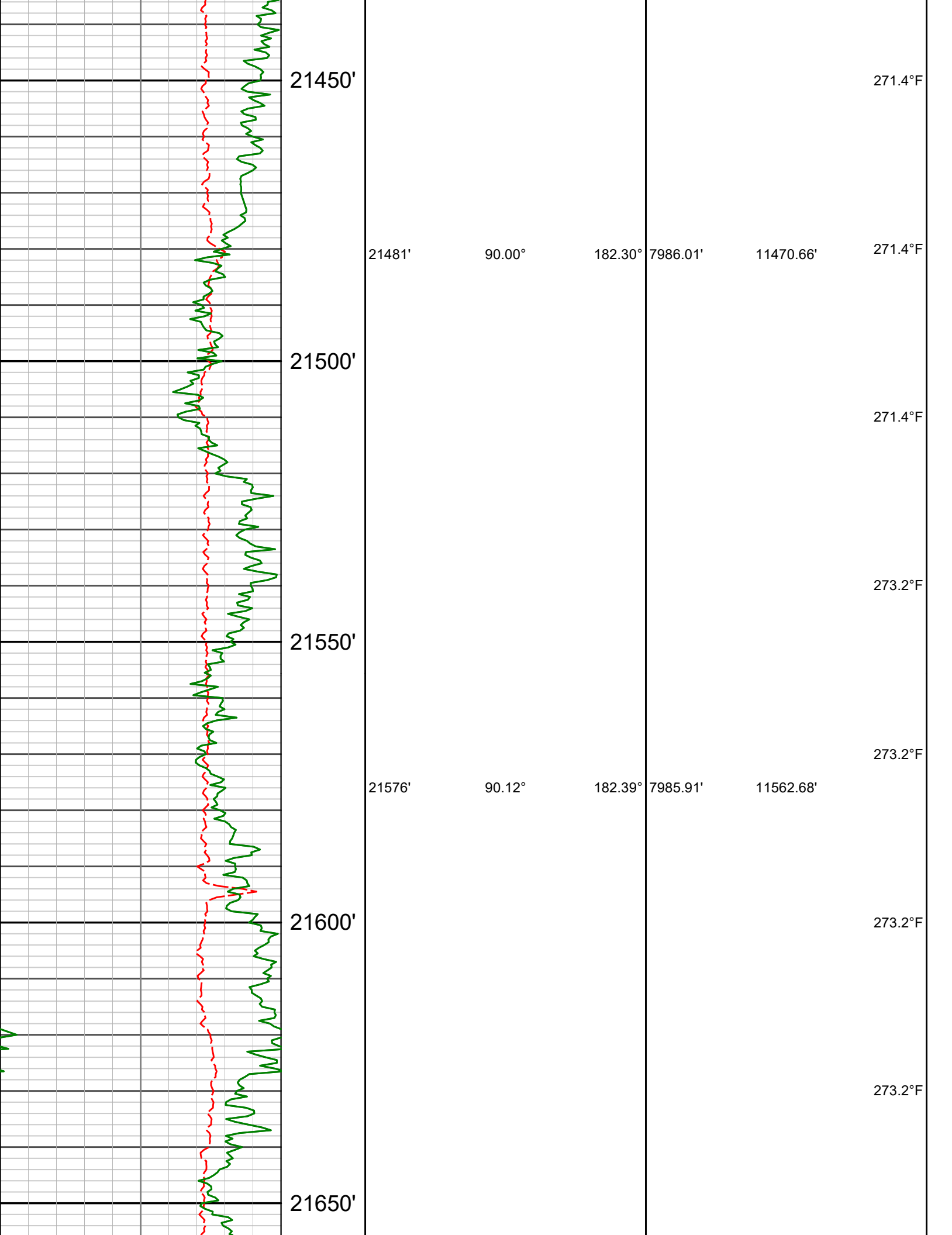


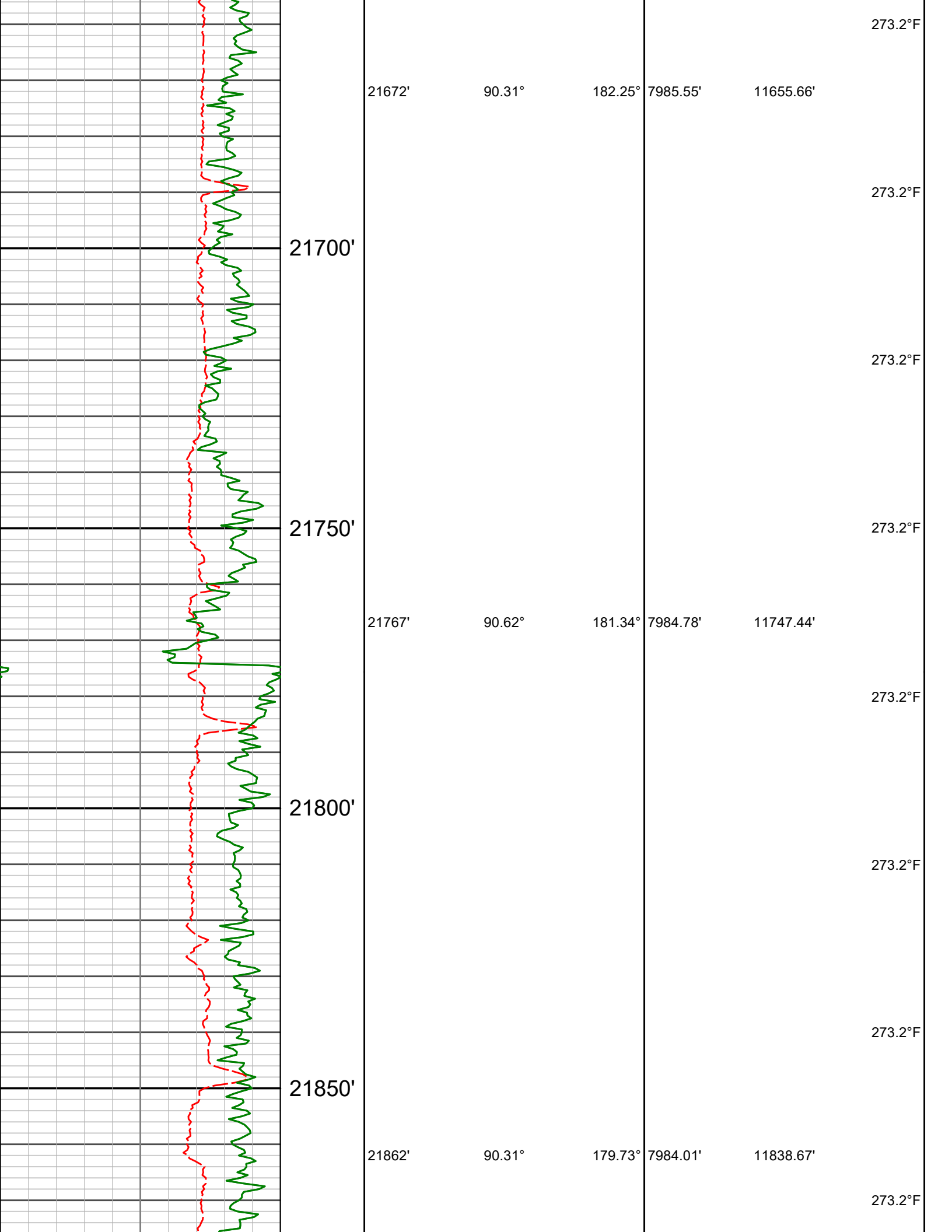


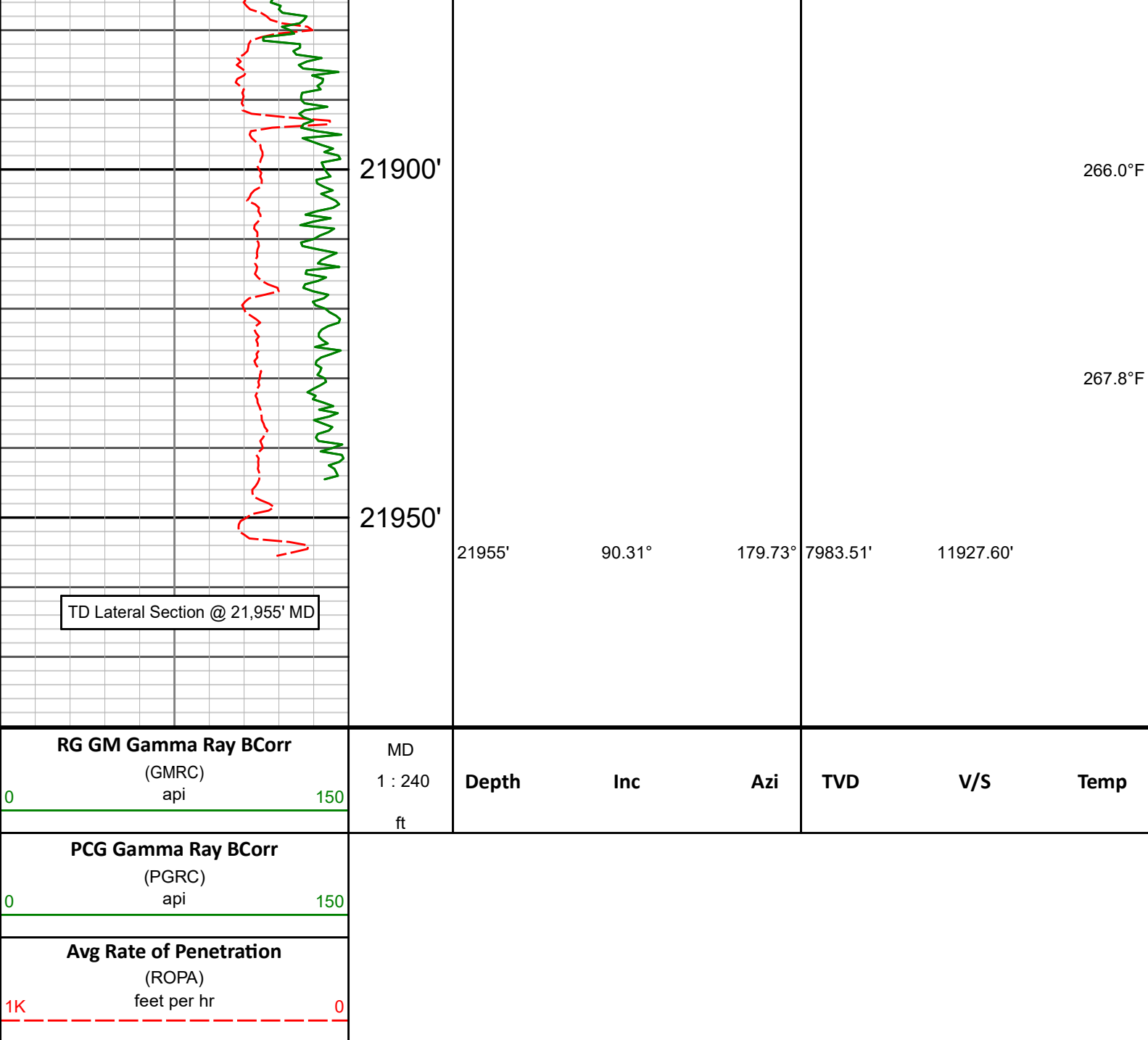












HALLIBURTON

DIRECTIONAL SURVEY REPORT

Extraction Oil Gas
NORTHWEST A S20-25-10N
Wattenberg
Broomfield Colorado
USA
CA-XX-0906084560
Third party Gyro surveys from 131' to 1,558' MD
First Sperry MWD survey @ 1,642' MD

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
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NORTHWEST A S20-25-10N

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
131.00	1.15	175.22	130.99	1.31 S	0.11 E	1.22	0.88
223.00	1.50	181.61	222.97	3.43 S	0.15 E	3.24	0.41
314.00	0.62	231.28	313.95	4.93 S	0.26 W	4.80	1.31
403.00	0.80	235.90	402.94	5.58 S	1.16 W	5.68	0.21
492.00	0.93	317.51	491.94	5.40 S	2.16 W	5.79	1.28
582.00	1.28	311.13	581.92	4.20 S	3.41 W	5.00	0.41
672.00	1.28	315.62	671.90	2.82 S	4.87 W	4.10	0.11
761.00	1.24	332.41	760.88	1.25 S	6.01 W	2.93	0.42
851.00	1.33	329.37	850.85	0.51 N	6.99 W	1.53	0.13
940.00	1.33	328.31	939.83	2.28 N	8.06 W	0.14	0.03
1029.00	1.33	326.11	1028.81	4.01 N	9.18 W	-1.20	0.06
1118.00	2.21	302.88	1117.76	5.80 N	11.20 W	-2.33	1.26
1208.00	4.24	289.75	1207.62	7.87 N	15.79 W	-2.99	2.39
1297.00	5.79	287.90	1296.27	10.36 N	23.16 W	-3.25	1.75
1386.00	7.64	282.79	1384.66	13.05 N	33.20 W	-2.94	2.18
1475.00	9.06	277.41	1472.72	15.26 N	45.92 W	-1.40	1.82
1558.00	9.01	276.05	1554.69	16.79 N	58.86 W	0.86	0.26
1642.00	9.40	275.89	1637.60	18.19 N	72.23 W	3.37	0.47
1736.00	9.40	273.64	1730.34	19.46 N	87.52 W	6.55	0.39
1831.00	12.40	284.55	1823.63	22.52 N	105.14 W	8.70	3.82
1926.00	14.93	288.62	1915.93	28.99 N	126.61 W	8.69	2.84
2045.00	16.59	288.41	2030.46	39.25 N	157.26 W	7.68	1.40
2140.00	18.30	292.27	2121.09	49.18 N	183.94 W	5.85	2.17
2235.00	21.35	290.59	2210.45	60.92 N	213.93 W	3.25	3.27
2330.00	23.53	290.32	2298.25	73.58 N	247.91 W	0.90	2.30
2426.00	27.00	288.45	2385.05	87.14 N	286.56 W	-0.96	3.71
2520.00	28.14	287.39	2468.38	100.51 N	327.96 W	-1.85	1.31
2614.00	30.02	286.12	2550.53	113.67 N	371.71 W	-1.85	2.10
2711.00	27.60	288.29	2635.52	127.46 N	416.36 W	-2.21	2.72
2806.00	32.53	290.30	2717.72	143.23 N	461.24 W	-4.40	5.29
2899.00	38.16	290.55	2793.55	162.01 N	511.63 W	-7.87	6.06
2993.00	36.20	290.66	2868.44	182.00 N	564.80 W	-11.71	2.09
3089.00	37.21	290.23	2945.41	202.03 N	618.56 W	-15.42	1.09
3183.00	39.81	290.43	3018.96	222.37 N	673.43 W	-19.10	2.77
3277.00	42.06	291.82	3089.97	244.57 N	730.87 W	-23.83	2.58
3372.00	44.70	293.30	3159.01	269.62 N	791.11 W	-30.47	2.98
3467.00	45.81	289.65	3225.89	294.29 N	853.89 W	-36.03	2.96
3562.00	48.55	290.40	3290.45	318.16 N	919.35 W	-40.05	2.94
3656.00	47.08	290.14	3353.57	342.30 N	984.69 W	-44.35	1.58
3752.00	47.06	290.30	3418.95	366.59 N	1050.65 W	-48.63	0.13
3847.00	49.10	291.59	3482.42	391.87 N	1116.66 W	-53.83	2.37
3942.00	46.83	290.13	3546.03	417.01 N	1182.57 W	-58.93	2.65
4038.00	49.75	292.16	3609.91	442.88 N	1249.39 W	-64.48	3.43
4133.00	48.84	291.33	3671.86	469.56 N	1316.28 W	-70.78	1.16
4229.00	47.37	291.40	3735.96	495.60 N	1382.83 W	-76.55	1.54
4324.00	45.58	290.59	3801.39	520.28 N	1447.13 W	-81.68	1.98
4419.00	46.54	293.80	3867.32	546.13 N	1510.44 W	-88.21	2.64
4515.00	47.87	292.74	3932.54	573.95 N	1575.15 W	-96.23	1.60
4610.00	46.27	292.65	3997.24	600.79 N	1639.32 W	-103.45	1.68
4706.00	45.36	293.93	4064.15	628.00 N	1702.56 W	-111.31	1.34
4801.00	47.29	294.16	4129.75	655.99 N	1765.31 W	-120.05	2.04
4896.00	45.31	294.03	4195.37	684.03 N	1828.01 W	-128.86	2.09
4991.00	48.26	294.69	4260.41	712.59 N	1891.07 W	-138.05	3.14
5086.00	45.82	292.98	4325.15	740.70 N	1954.65 W	-146.67	2.89

NORTHWEST A S20-25-10N

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
5181.00	48.47	294.40	4389.76	768.69 N	2018.41 W	-155.13	2.99
5275.00	45.85	293.35	4453.67	796.60 N	2081.42 W	-163.71	2.90
5370.00	47.60	294.32	4518.79	824.56 N	2144.68 W	-172.27	1.98
5463.00	44.38	292.80	4583.40	851.31 N	2205.97 W	-180.25	3.65
5559.00	46.72	293.99	4650.62	878.53 N	2268.86 W	-188.22	2.59
5654.00	48.66	293.97	4714.57	907.08 N	2333.05 W	-197.08	2.04
5749.00	47.03	292.75	4778.33	935.01 N	2397.69 W	-205.22	1.95
5843.00	47.78	292.48	4841.95	961.62 N	2461.57 W	-212.32	0.82
5938.00	51.20	294.53	4903.65	990.46 N	2527.77 W	-220.87	3.96
6033.00	50.64	293.09	4963.54	1020.23 N	2595.24 W	-229.96	1.32
6128.00	49.84	292.13	5024.30	1048.30 N	2662.65 W	-237.44	1.15
6223.00	48.60	289.34	5086.36	1073.78 N	2729.91 W	-242.48	2.58
6319.00	48.26	289.48	5150.06	1097.65 N	2797.64 W	-245.84	0.37
6413.00	48.01	288.55	5212.80	1120.46 N	2863.82 W	-248.64	0.78
6508.00	45.10	289.50	5278.12	1142.93 N	2929.02 W	-251.39	3.15
6603.00	43.78	293.19	5345.96	1167.11 N	2990.96 W	-256.71	3.06
6698.00	42.22	292.85	5415.44	1192.45 N	3050.58 W	-263.82	1.66
6793.00	37.26	295.17	5488.48	1217.09 N	3106.06 W	-271.45	5.45
6888.00	35.46	295.02	5564.98	1240.99 N	3157.06 W	-279.65	1.89
6983.00	34.22	294.44	5642.95	1263.69 N	3206.35 W	-287.21	1.36
7078.00	30.74	297.73	5723.08	1286.05 N	3252.17 W	-295.42	4.11
7174.00	27.89	296.84	5806.78	1307.61 N	3293.94 W	-304.05	3.00
7268.00	24.12	295.34	5891.25	1325.76 N	3330.93 W	-310.79	4.07
7364.00	21.08	294.06	5979.86	1341.20 N	3364.43 W	-315.93	3.21
7459.00	18.96	293.28	6069.12	1354.27 N	3394.20 W	-319.87	2.25
7554.00	16.43	292.34	6159.62	1365.48 N	3420.81 W	-322.95	2.68
7649.00	14.12	291.49	6251.26	1374.83 N	3444.02 W	-325.22	2.43
7744.00	11.26	289.72	6343.93	1382.21 N	3463.54 W	-326.67	3.04
7839.00	7.69	286.57	6437.62	1387.15 N	3478.37 W	-327.13	3.80
7934.00	4.36	270.57	6532.08	1389.00 N	3488.07 W	-326.11	3.89
8029.00	0.92	321.55	6626.98	1389.64 N	3492.16 W	-325.54	4.05
8125.00	0.94	336.18	6722.96	1390.96 N	3492.96 W	-326.58	0.25
8220.00	0.97	13.23	6817.95	1392.46 N	3493.09 W	-327.98	0.64
8314.00	1.07	115.62	6911.94	1392.86 N	3492.12 W	-328.64	1.69
8409.00	0.86	111.07	7006.93	1392.22 N	3490.66 W	-328.45	0.23
8504.00	1.07	109.41	7101.92	1391.67 N	3489.16 W	-328.36	0.22
8599.00	0.67	95.44	7196.90	1391.33 N	3487.77 W	-328.42	0.48
8694.00	0.80	75.69	7291.90	1391.44 N	3486.58 W	-328.87	0.30
8790.00	0.51	62.68	7387.89	1391.80 N	3485.55 W	-329.52	0.33
8885.00	6.02	175.68	7482.72	1387.02 N	3484.79 W	-325.16	6.57
8979.00	16.36	178.63	7574.81	1368.82 N	3484.11 W	-307.93	11.02
9075.00	28.41	173.52	7663.42	1332.48 N	3481.19 W	-273.96	12.70
9170.00	36.44	177.30	7743.55	1281.76 N	3477.30 W	-226.51	8.72
9264.00	41.15	175.35	7816.80	1223.01 N	3473.48 W	-171.35	5.18
9360.00	55.20	180.68	7880.68	1151.73 N	3471.37 W	-103.69	15.19
9455.00	64.37	184.83	7928.46	1069.85 N	3475.44 W	-24.11	10.36
9550.00	73.50	184.55	7962.57	981.59 N	3482.67 W	62.50	9.62
9646.00	85.47	185.15	7980.05	887.71 N	3490.65 W	154.70	12.48
9741.00	90.60	180.78	7983.31	792.95 N	3495.55 W	246.86	7.10
9835.00	91.55	180.36	7981.54	698.97 N	3496.49 W	337.13	1.10
9930.00	89.46	180.31	7980.70	603.98 N	3497.05 W	428.26	2.20
10025.00	90.60	179.22	7980.65	508.99 N	3496.66 W	519.13	1.66
10121.00	91.75	178.77	7978.69	413.02 N	3494.98 W	610.54	1.28
10216.00	89.03	179.70	7978.05	318.04 N	3493.71 W	701.14	3.03
10311.00	89.16	180.14	7979.55	223.06 N	3493.58 W	792.07	0.49

NORTHWEST A S20-25-10N

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
10405.00	88.92	179.21	7981.12	129.07 N	3493.06 W	881.92	1.02
10500.00	89.09	178.79	7982.77	34.10 N	3491.41 W	972.40	0.48
10595.00	89.36	178.58	7984.05	60.86 S	3489.23 W	1062.72	0.37
10691.00	89.77	177.55	7984.78	156.81 S	3485.99 W	1153.66	1.15
10785.00	90.23	176.05	7984.78	250.66 S	3480.75 W	1242.03	1.68
10881.00	88.96	178.04	7985.45	346.52 S	3475.79 W	1332.41	2.46
10976.00	88.89	176.99	7987.23	441.41 S	3471.67 W	1422.10	1.11
11071.00	89.33	179.07	7988.71	536.34 S	3468.40 W	1512.07	2.24
11165.00	90.13	179.78	7989.15	630.33 S	3467.45 W	1601.81	1.14
11260.00	90.60	179.24	7988.54	725.33 S	3466.64 W	1692.55	0.75
11356.00	91.08	180.07	7987.13	821.31 S	3466.06 W	1784.31	0.99
11451.00	91.61	179.14	7984.90	916.28 S	3465.41 W	1875.07	1.12
11546.00	89.33	180.06	7984.13	1011.27 S	3464.75 W	1965.84	2.59
11641.00	89.29	179.95	7985.27	1106.26 S	3464.76 W	2056.82	0.12
11736.00	89.46	178.67	7986.30	1201.25 S	3463.62 W	2147.46	1.36
11832.00	90.34	181.33	7986.47	1297.24 S	3463.62 W	2239.38	2.92
11927.00	91.18	182.03	7985.21	1392.19 S	3466.40 W	2331.11	1.15
12022.00	91.75	180.63	7982.79	1487.13 S	3468.61 W	2422.67	1.60
12118.00	89.80	180.33	7981.48	1583.11 S	3469.41 W	2514.82	2.06
12213.00	90.13	178.88	7981.54	1678.11 S	3468.75 W	2605.61	1.57
12309.00	87.58	180.13	7983.45	1774.07 S	3467.93 W	2697.27	2.96
12404.00	87.78	180.07	7987.30	1869.00 S	3468.10 W	2788.23	0.22
12499.00	87.71	179.88	7991.03	1963.92 S	3468.05 W	2879.12	0.21
12594.00	88.11	179.28	7994.49	2058.86 S	3467.36 W	2969.84	0.76
12690.00	88.36	181.12	7997.45	2154.81 S	3467.70 W	3061.83	1.93
12785.00	90.98	180.62	7998.00	2249.78 S	3469.15 W	3153.20	2.81
12881.00	91.51	182.38	7995.92	2345.72 S	3471.67 W	3245.81	1.92
12976.00	92.15	180.76	7992.89	2440.64 S	3474.27 W	3337.45	1.84
13071.00	89.83	179.90	7991.25	2535.61 S	3474.81 W	3428.56	2.60
13166.00	89.60	179.94	7991.72	2630.61 S	3474.69 W	3519.50	0.25
13261.00	89.80	178.67	7992.22	2725.60 S	3473.53 W	3610.14	1.36
13356.00	90.50	176.79	7991.96	2820.52 S	3469.77 W	3699.96	2.11
13452.00	89.23	180.96	7992.19	2916.48 S	3467.90 W	3791.32	4.54
13547.00	89.70	180.66	7993.09	3011.47 S	3469.25 W	3882.67	0.59
13643.00	89.90	180.04	7993.43	3107.46 S	3469.84 W	3974.77	0.68
13737.00	90.34	178.90	7993.23	3201.46 S	3468.97 W	4064.54	1.31
13833.00	90.51	178.79	7992.53	3297.44 S	3467.03 W	4155.90	0.20
13966.00	90.74	178.11	7991.08	3430.38 S	3463.44 W	4282.18	0.54
14061.00	90.56	178.10	7990.00	3525.32 S	3460.29 W	4372.20	0.20
14156.00	90.25	177.79	7989.34	3620.26 S	3456.88 W	4462.13	0.46
14252.00	90.31	178.07	7988.87	3716.19 S	3453.41 W	4553.01	0.30
14441.00	89.88	178.67	7988.57	3905.11 S	3448.03 W	4732.38	0.39
14536.00	90.25	178.64	7988.46	4000.09 S	3445.80 W	4822.69	0.39
14632.00	89.75	180.37	7988.47	4096.08 S	3444.97 W	4914.38	1.88
14727.00	89.63	181.09	7988.98	4191.07 S	3446.18 W	5005.70	0.77
14822.00	90.06	182.10	7989.23	4286.03 S	3448.82 W	5097.40	1.15
14918.00	90.31	180.50	7988.92	4382.00 S	3450.99 W	5189.94	1.69
15014.00	90.25	179.88	7988.46	4478.00 S	3451.30 W	5281.96	0.65
15109.00	90.19	180.40	7988.10	4573.00 S	3451.53 W	5373.01	0.55
15204.00	90.12	182.18	7987.84	4667.97 S	3453.67 W	5464.57	1.88
15300.00	90.06	182.09	7987.69	4763.91 S	3457.25 W	5557.48	0.12
15395.00	90.06	182.04	7987.59	4858.84 S	3460.67 W	5649.38	0.05
15490.00	90.06	181.70	7987.48	4953.79 S	3463.77 W	5741.20	0.36
15680.00	90.19	181.17	7987.07	5143.73 S	3468.52 W	5924.47	0.29
15869.00	90.12	180.95	7986.56	5332.70 S	3472.01 W	6106.44	0.12

NORTHWEST A S20-25-10N

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
15965.00	90.12	180.91	7986.36	5428.69 S	3473.57 W	6198.81	0.04
16060.00	89.88	179.34	7986.36	5523.68 S	3473.78 W	6289.85	1.67
16155.00	90.19	180.74	7986.31	5618.68 S	3473.85 W	6380.85	1.51
16251.00	89.51	181.17	7986.56	5714.67 S	3475.45 W	6473.23	0.83
16346.00	89.14	181.63	7987.69	5809.63 S	3477.77 W	6564.84	0.63
16442.00	89.13	180.37	7989.14	5905.60 S	3479.44 W	6657.23	1.32
16537.00	89.26	179.92	7990.47	6000.59 S	3479.68 W	6748.27	0.48
16632.00	89.26	178.32	7991.70	6095.57 S	3478.23 W	6838.81	1.68
16727.00	89.32	177.26	7992.88	6190.49 S	3474.57 W	6928.66	1.13
16823.00	89.26	177.78	7994.07	6286.39 S	3470.41 W	7019.31	0.55
16918.00	89.88	178.66	7994.78	6381.34 S	3467.46 W	7109.39	1.13
17013.00	90.00	177.74	7994.89	6476.30 S	3464.48 W	7199.46	0.98
17109.00	90.00	178.48	7994.89	6572.24 S	3461.31 W	7290.44	0.78
17300.00	90.00	178.70	7994.89	6763.19 S	3456.62 W	7471.95	0.11
17394.00	89.63	179.60	7995.19	6857.17 S	3455.22 W	7561.55	1.03
17490.00	90.00	180.14	7995.50	6953.17 S	3455.00 W	7653.43	0.69
17585.00	90.31	179.83	7995.25	7048.17 S	3454.98 W	7744.40	0.47
17680.00	90.56	180.32	7994.53	7143.17 S	3455.10 W	7835.41	0.58
17775.00	90.62	180.73	7993.56	7238.16 S	3455.97 W	7926.63	0.44
17870.00	90.49	180.72	7992.63	7333.15 S	3457.18 W	8017.94	0.13
17965.00	90.56	181.92	7991.76	7428.12 S	3459.37 W	8109.52	1.26
18060.00	90.56	180.53	7990.84	7523.09 S	3461.41 W	8201.06	1.46
18154.00	90.56	178.56	7989.93	7617.08 S	3460.66 W	8290.86	2.10
18249.00	90.19	179.41	7989.31	7712.06 S	3458.98 W	8381.33	0.98
18343.00	90.25	178.79	7988.96	7806.04 S	3457.51 W	8470.92	0.67
18438.00	90.43	178.30	7988.40	7901.01 S	3455.09 W	8561.17	0.55
18531.00	90.56	177.14	7987.60	7993.93 S	3451.39 W	8649.09	1.25
18627.00	90.49	177.51	7986.72	8089.82 S	3446.91 W	8739.63	0.40
18722.00	90.68	178.77	7985.74	8184.77 S	3443.83 W	8829.67	1.33
18911.00	90.49	180.72	7983.81	8373.75 S	3442.98 W	9010.41	1.04
19006.00	90.06	181.68	7983.35	8468.72 S	3444.96 W	9101.93	1.11
19101.00	90.19	182.16	7983.14	8563.67 S	3448.15 W	9193.78	0.53
19196.00	90.19	182.40	7982.83	8658.59 S	3451.92 W	9285.77	0.25
19292.00	90.49	183.06	7982.26	8754.48 S	3456.49 W	9378.92	0.76
19387.00	90.49	181.57	7981.44	8849.40 S	3460.33 W	9470.92	1.57
19482.00	90.49	181.43	7980.63	8944.36 S	3462.81 W	9562.58	0.14
19577.00	90.43	180.16	7979.86	9039.35 S	3464.13 W	9653.92	1.34
19673.00	90.25	178.44	7979.29	9135.34 S	3462.96 W	9745.51	1.80
19768.00	89.88	177.81	7979.19	9230.28 S	3459.86 W	9835.55	0.77
19958.00	90.06	178.39	7979.29	9420.18 S	3453.56 W	10015.59	0.32
20052.00	90.06	177.23	7979.19	9514.11 S	3449.98 W	10104.51	1.24
20147.00	90.00	177.82	7979.14	9609.02 S	3445.88 W	10194.23	0.63
20243.00	89.94	178.71	7979.19	9704.98 S	3442.98 W	10285.29	0.93
20338.00	89.81	179.02	7979.39	9799.96 S	3441.10 W	10375.71	0.35
20433.00	89.69	178.32	7979.80	9894.93 S	3438.90 W	10466.03	0.75
20529.00	89.88	178.83	7980.16	9990.90 S	3436.51 W	10557.24	0.57
20624.00	89.63	178.54	7980.57	10085.87 S	3434.33 W	10647.57	0.40
20719.00	89.44	180.05	7981.34	10180.86 S	3433.16 W	10738.20	1.60
20815.00	89.44	179.40	7982.27	10276.85 S	3432.70 W	10830.00	0.68
20910.00	89.44	179.61	7983.19	10371.85 S	3431.88 W	10920.73	0.23
21004.00	89.69	179.81	7983.90	10465.84 S	3431.41 W	11010.62	0.34
21099.00	89.63	179.79	7984.47	10560.84 S	3431.08 W	11101.50	0.07
21195.00	89.88	182.10	7984.88	10656.82 S	3432.66 W	11193.87	2.42
21290.00	89.63	181.80	7985.29	10751.76 S	3435.90 W	11285.73	0.41
21385.00	89.75	182.45	7985.80	10846.70 S	3439.42 W	11377.66	0.69

NORTHWEST A S20-25-10N

<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>
21481.00	90.00	182.30	7986.01	10942.61 S	3443.40 W	11470.66	0.30
21576.00	90.12	182.39	7985.91	11037.53 S	3447.28 W	11562.68	0.16
21672.00	90.31	182.25	7985.55	11133.45 S	3451.17 W	11655.66	0.24
21767.00	90.62	181.34	7984.78	11228.40 S	3454.14 W	11747.44	1.01
21862.00	90.31	179.73	7984.01	11323.39 S	3455.03 W	11838.67	1.73
21955.00	90.31	179.73	7983.51	11416.39 S	3454.60 W	11927.60	0.00

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 196.73 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.24 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 21955.00 FEET
IS 11927.62 FEET ALONG 196.84 DEGREES (TRUE)

Final survey is a projection to bit.