



1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	08-Aug-15	11-Aug-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)	1,125.00	6,292.00			
Log End Depth (MD, ft)	6,292.00	10,579.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	07-Aug-15 04:00	09-Aug-15 02:30			
Drill/Wipe End Date and Time	08-Aug-15 02:30	11-Aug-15 00:45			
Min Inc (deg) @ Depth (MD, ft)	0.48 @ 1,290.00	86.39 @ 10,512.00			
Max Inc (deg) @ Depth (MD, ft)	81.68 @ 6,236.00	91.51 @ 9,177.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.64 / PDC			
Flow Rate (gpm)	593.72	296.31			
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)	9.20 / 41.00	10.63 / 42.00			
Filtrate CL (ppm)	1,500.00	1,200.00			
pH / Fluid Loss (mptm)	9.50 / 11	9.00 / 8			
PV (cP) / YP (lhf2)	12 / 11.00	16 / 12.00			
% Solids / % Sand	2.20 / 0.20	3.80 / 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	172.78 / PCM	213.40 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Adam Sampson	Adam Sampson			
Customer Representative	Dave Neilsen	Dave Neilsen			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404289	12310755			
Insert Serial Number	11680799	11145577			
Date and Time Initialized	06-Aug-15 20:12	08-Aug-15 08:02			
Date and Time Read	08-Aug-15 07:04	11-Aug-15 10:09			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	67.00			
Software Version	6.21	6.33			
Sub Serial Number	11404289	12310755			
Sonde Serial Number	11145703	11062074			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	311.20	275.21			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	44.11	55.23			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404289	12310755			
Insert/Sonde Serial Number	11680952	11292594			

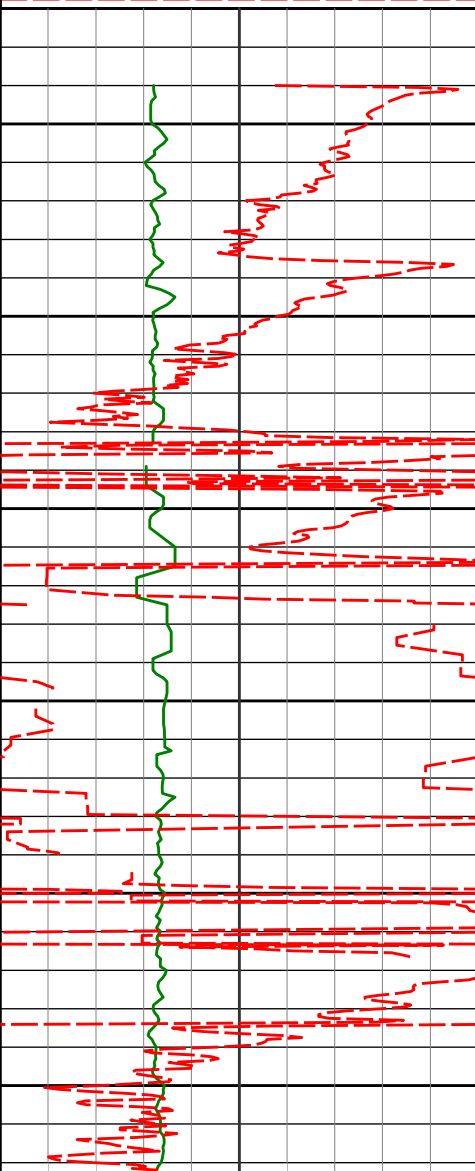
REMARKS

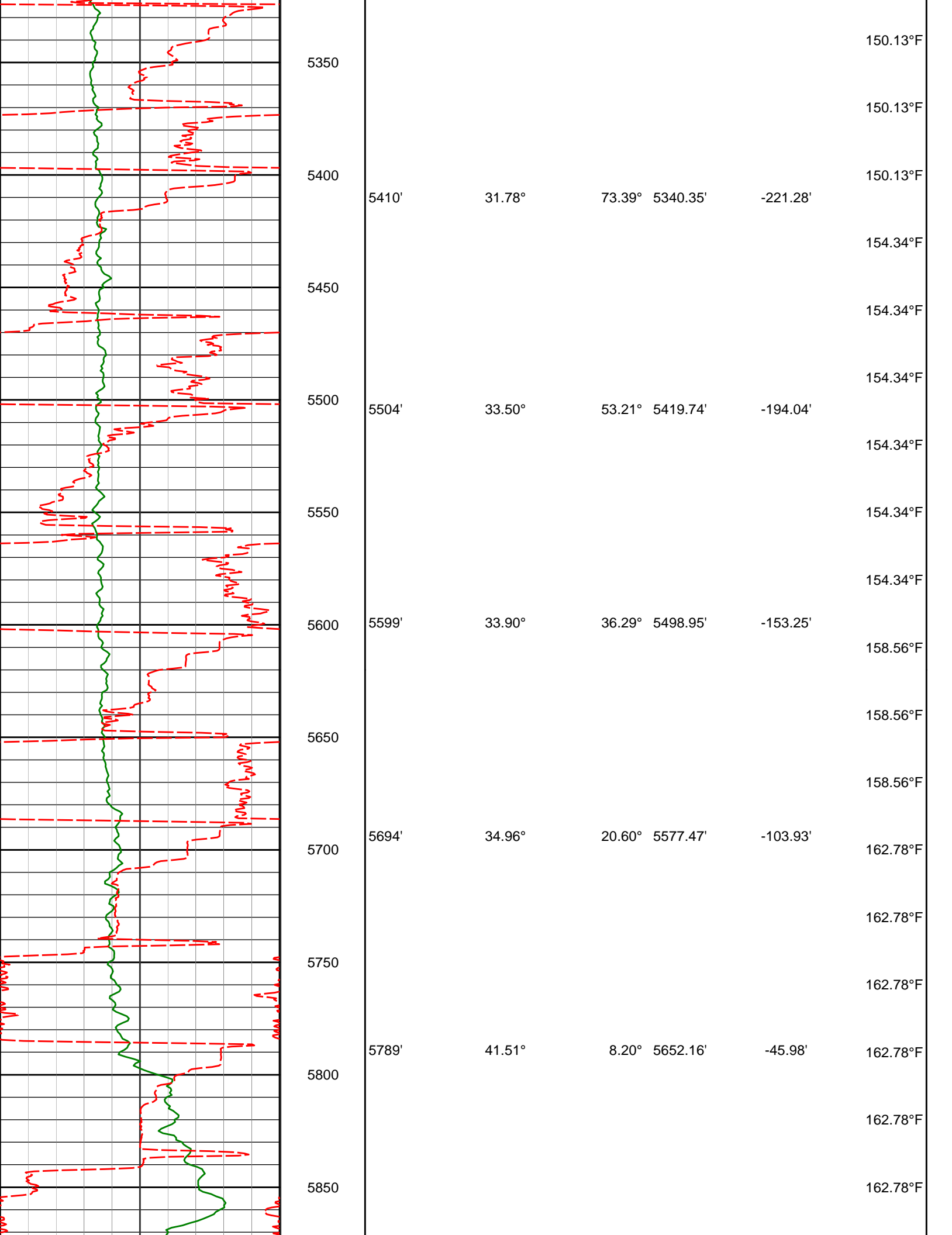
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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
6. Gamma presented inside casing/cement from 6248 ft. MD to 6292 ft. MD.

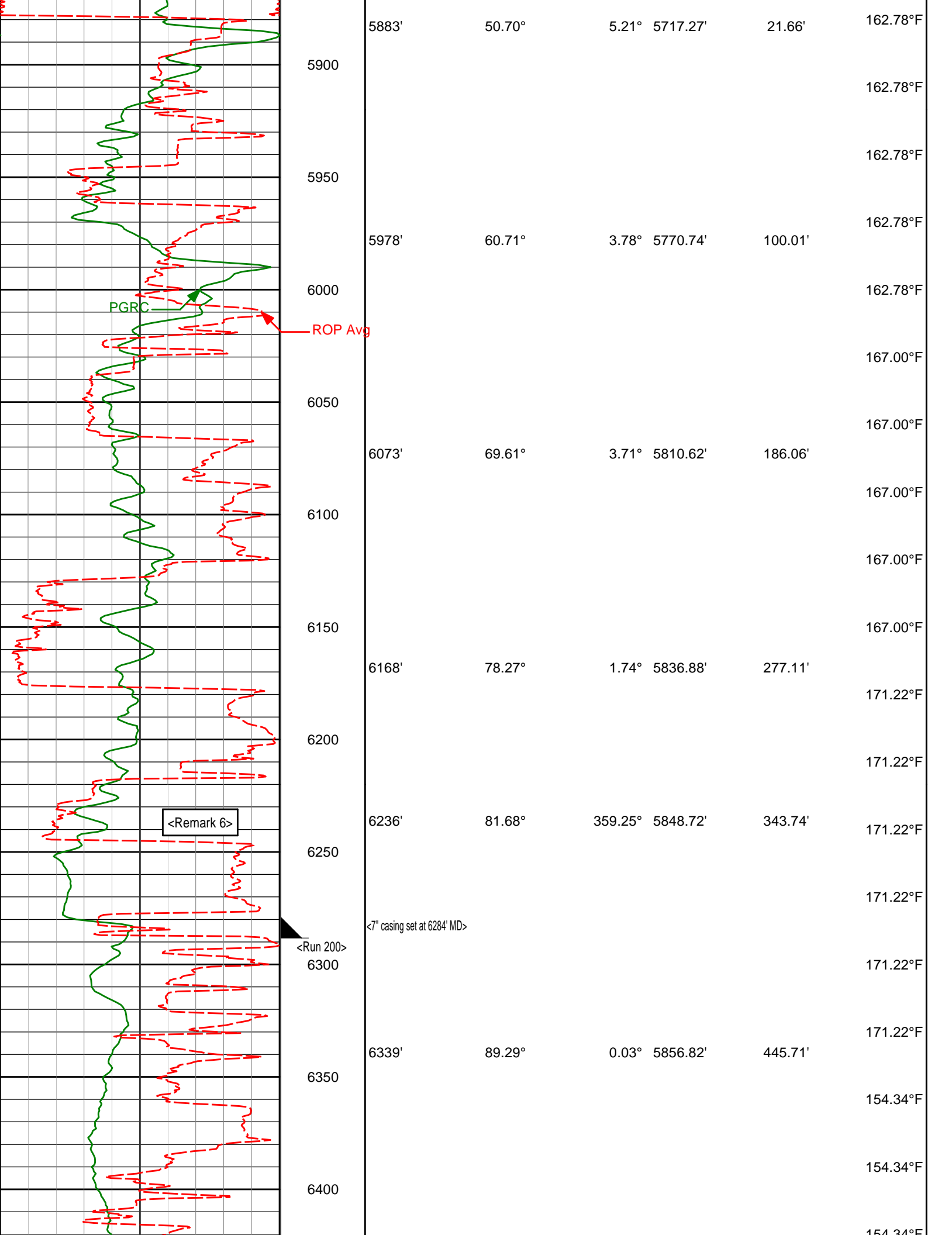
WARRANTY

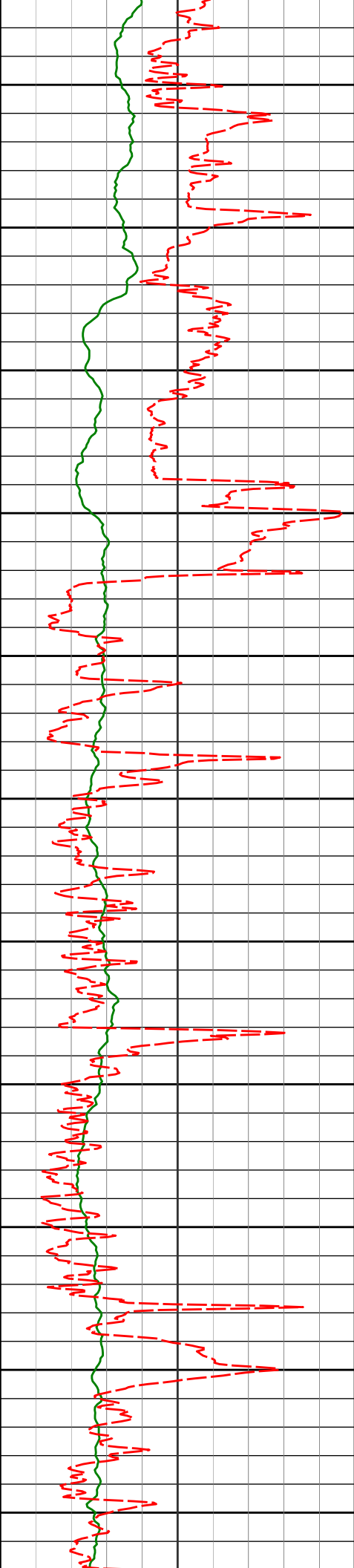
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

MD Detail 1:600 Scale

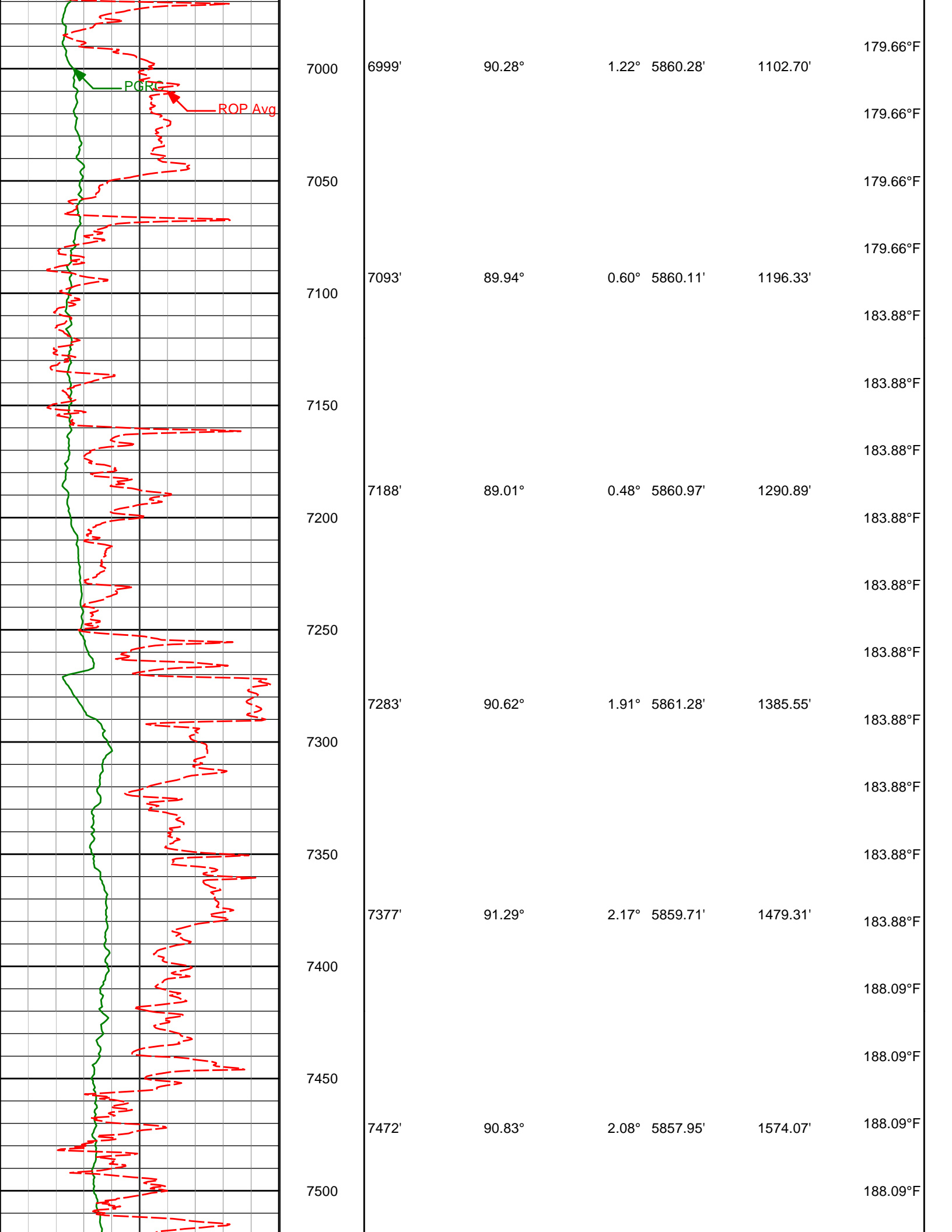
Gamma Ray Cor PGRC api								
0300								
Avg Rate of Penetration ROP Avg feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
5000								
		<KOP>	5031'	13.30°	146.10°	4995.83'	-226.87'	141.69°F
		5050						145.91°F
		5100						145.91°F
		5126'	5126'	23.55°	101.96°	5086.24'	-237.28'	145.91°F
		5150						145.91°F
		5200						145.91°F
		5220'	5220'	25.26°	91.66°	5171.88'	-237.70'	150.13°F
		5250						150.13°F
		5300						150.13°F
		5315'	5315'	26.58°	88.96°	5257.32'	-233.55'	150.13°F

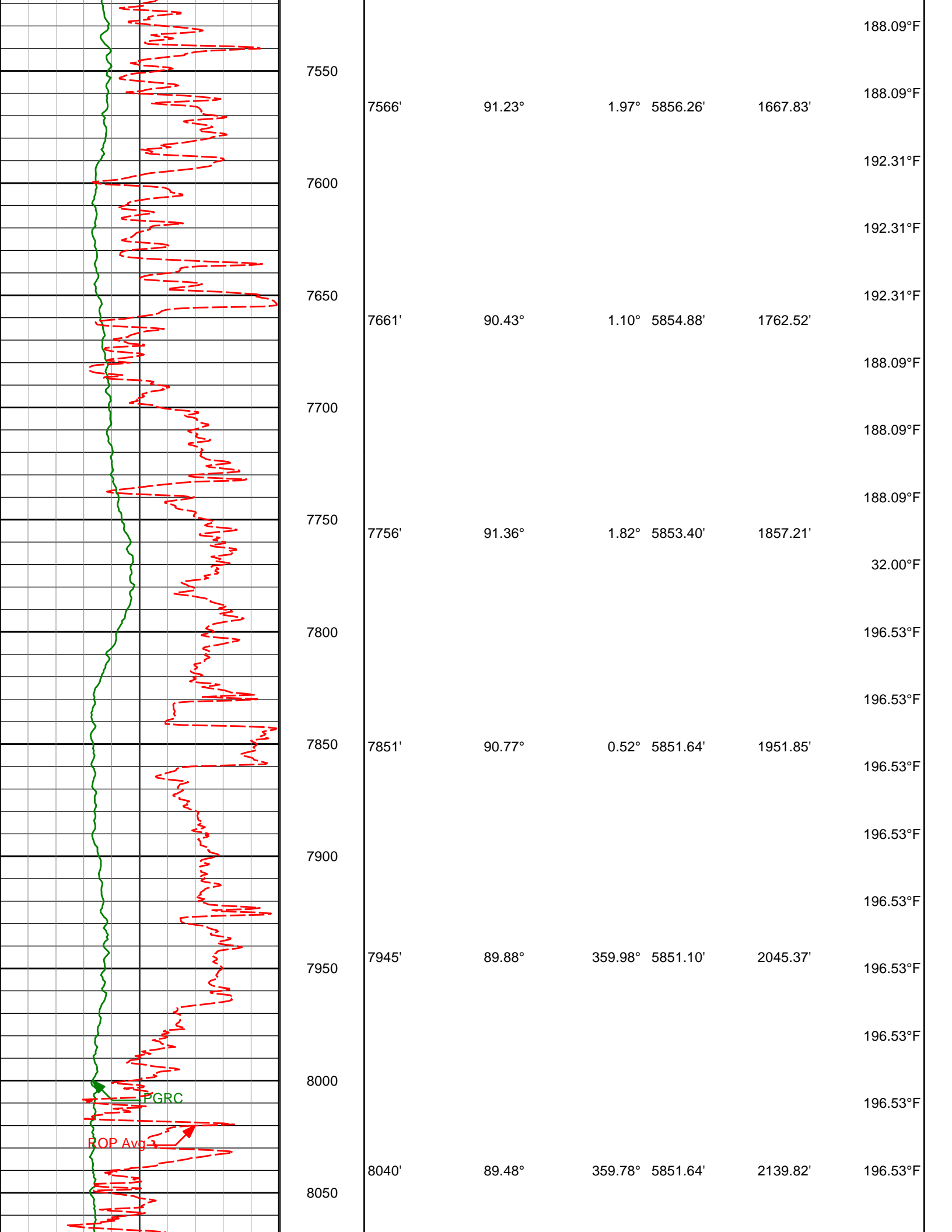


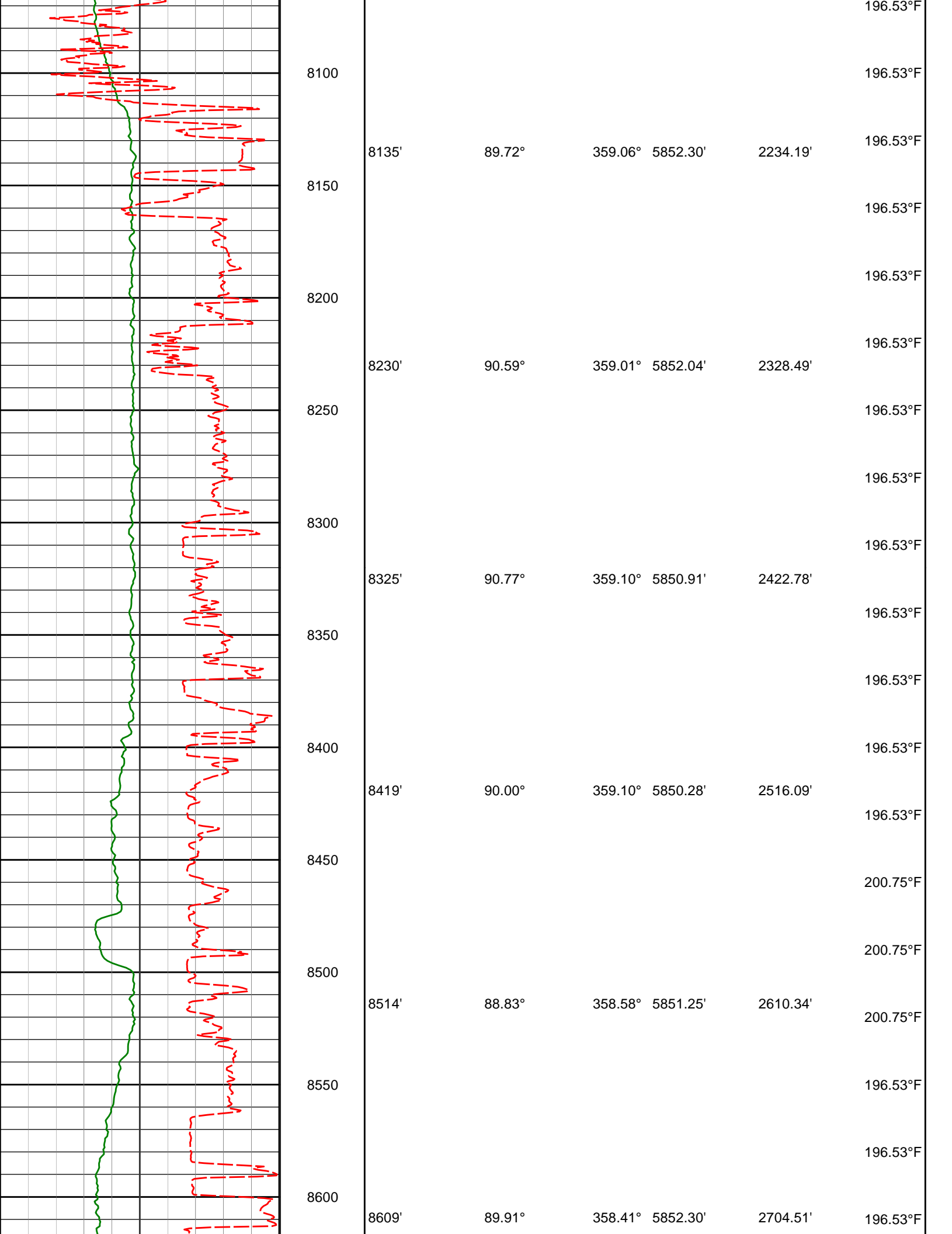


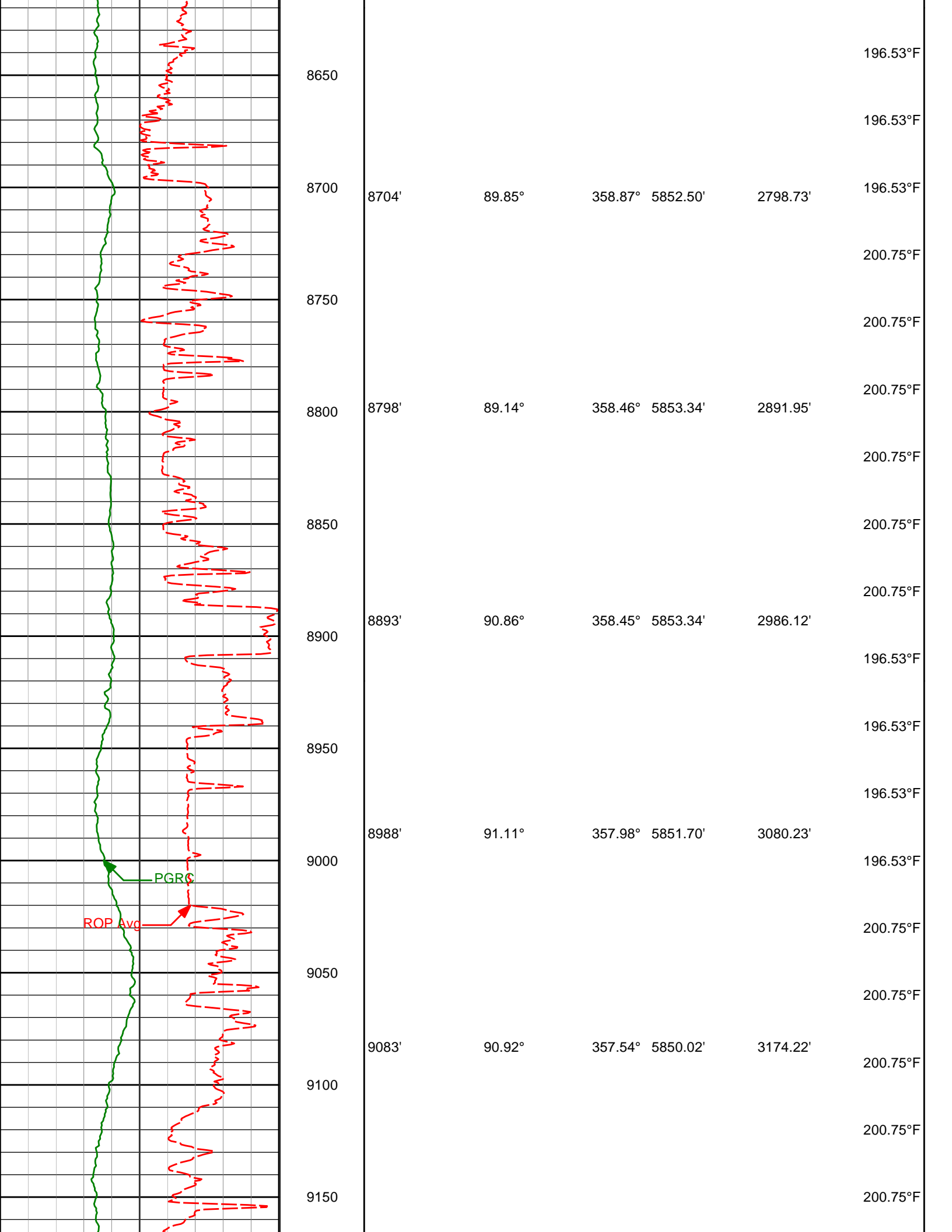


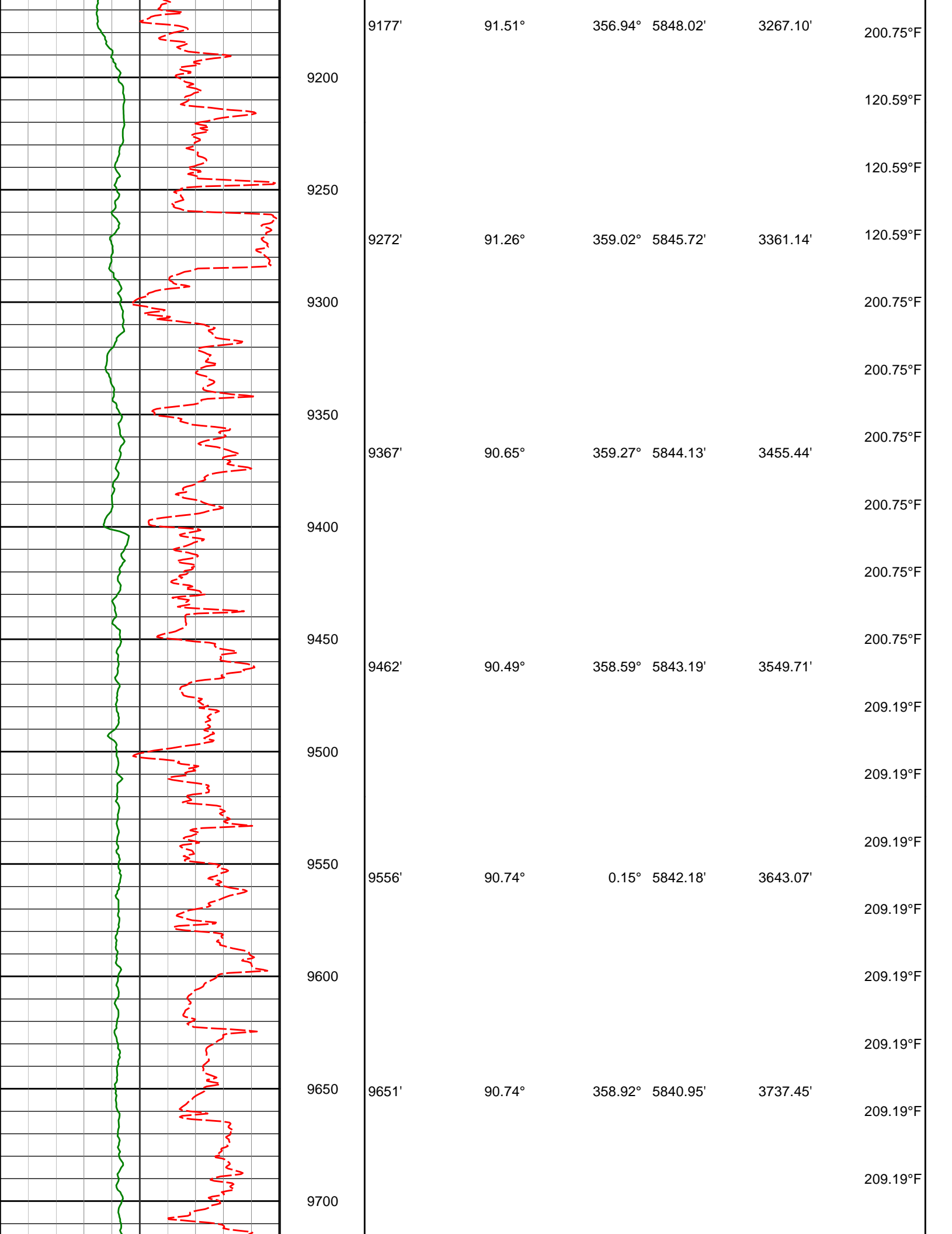
	6431'	89.08°	359.99°	5858.13'	537.20'	154.34°F
6450						162.78°F
						162.78°F
6500						162.78°F
	6525'	88.00°	0.25°	5860.53'	630.67'	162.78°F
6550						162.78°F
						162.78°F
6600						162.78°F
	6619'	89.88°	0.45°	5862.27'	724.18'	162.78°F
6650						167.00°F
						167.00°F
6700						167.00°F
						167.00°F
6750						171.22°F
						171.22°F
6800	6809'	90.52°	1.38°	5861.61'	913.43'	171.22°F
						175.44°F
6850						175.44°F
						175.44°F
6900	6904'	90.40°	0.77°	5860.84'	1008.07'	175.44°F
						179.66°F
6950						179.66°F
						179.66°F

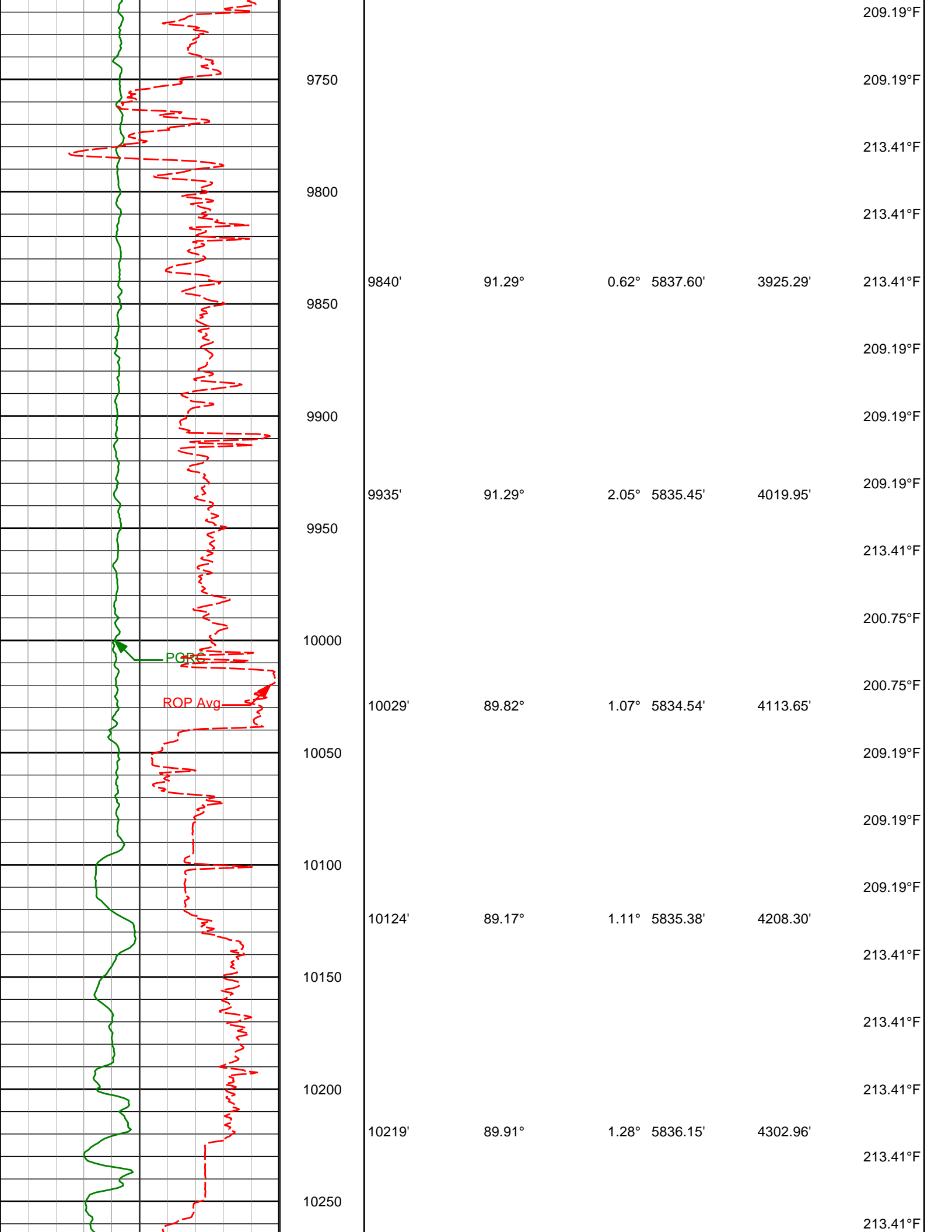


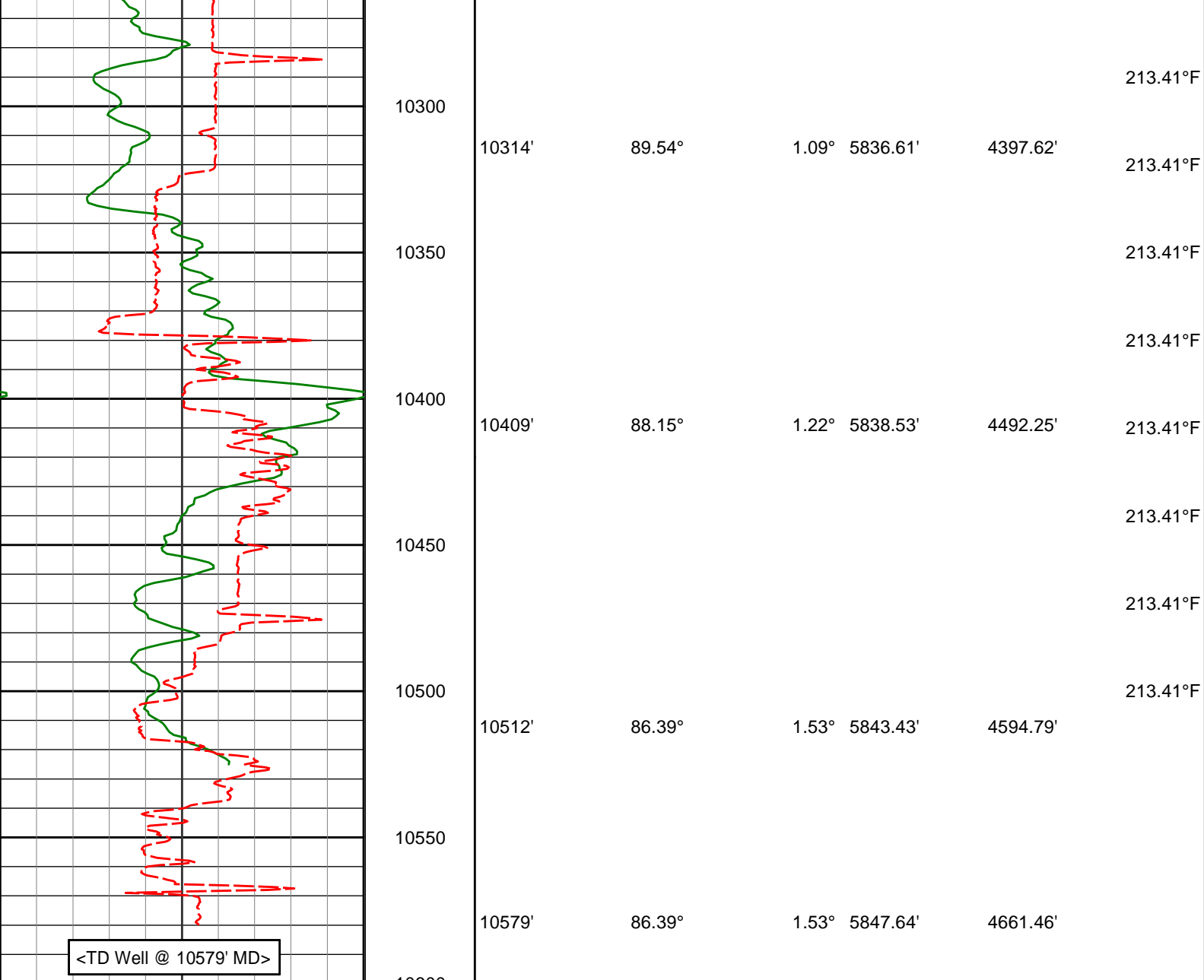










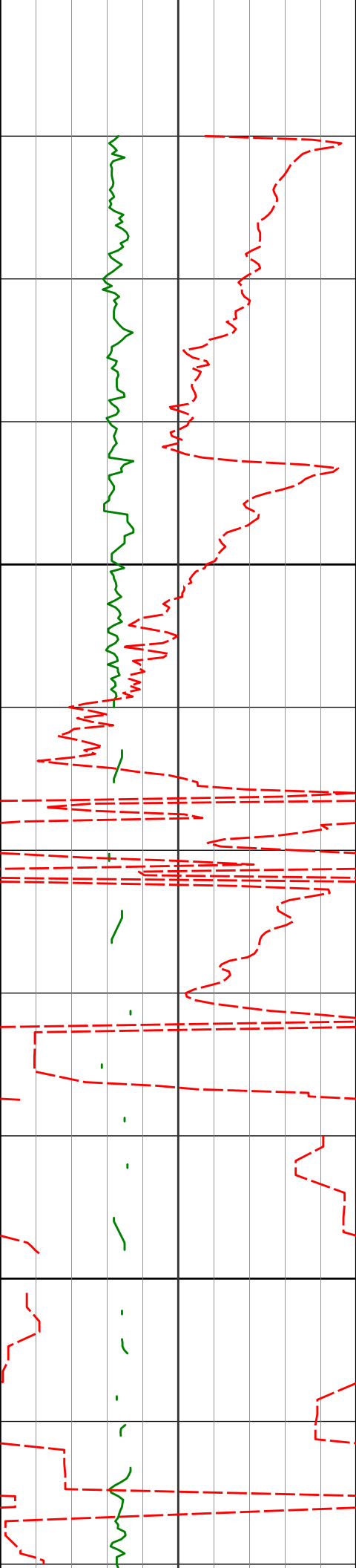


<TD Well @ 10579' MD>

Avg Rate of Penetration ROP Avg feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500		0						
Gamma Ray Cor PGRC api								
0		300						

MD Detail 1:240 Scale

Gamma CG Cor PGRC api								
0		300						
Avg Rate of Penetration ROP Avg feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500		0						



<KOP>

5100

5200

5031'

13.30°

146.10°

4995.83'

-226.87'

5126'

23.55°

101.96°

5086.24'

-237.28'

5220'

25.26°

91.66°

5171.88'

-237.70'

141.69°F

145.91°F

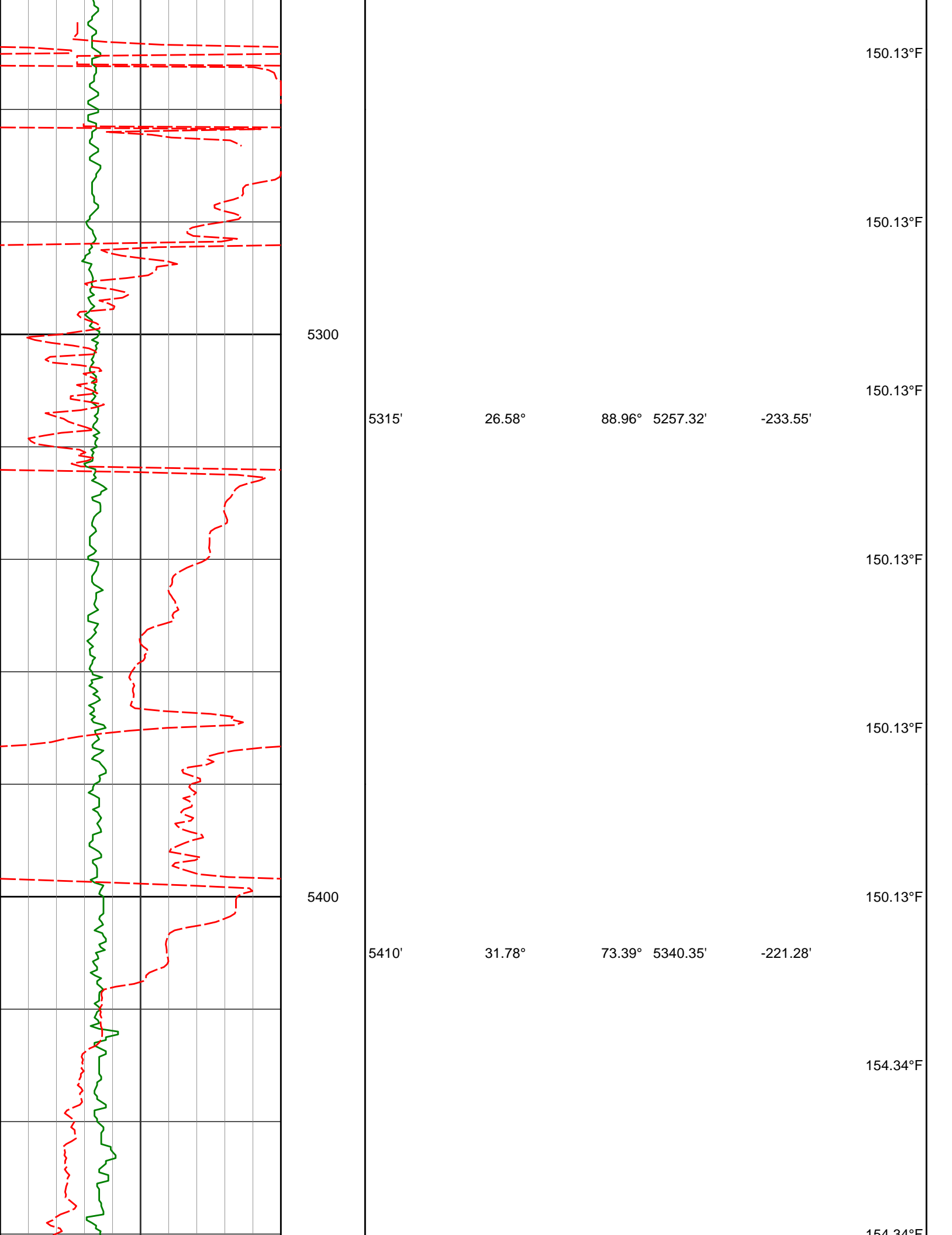
145.91°F

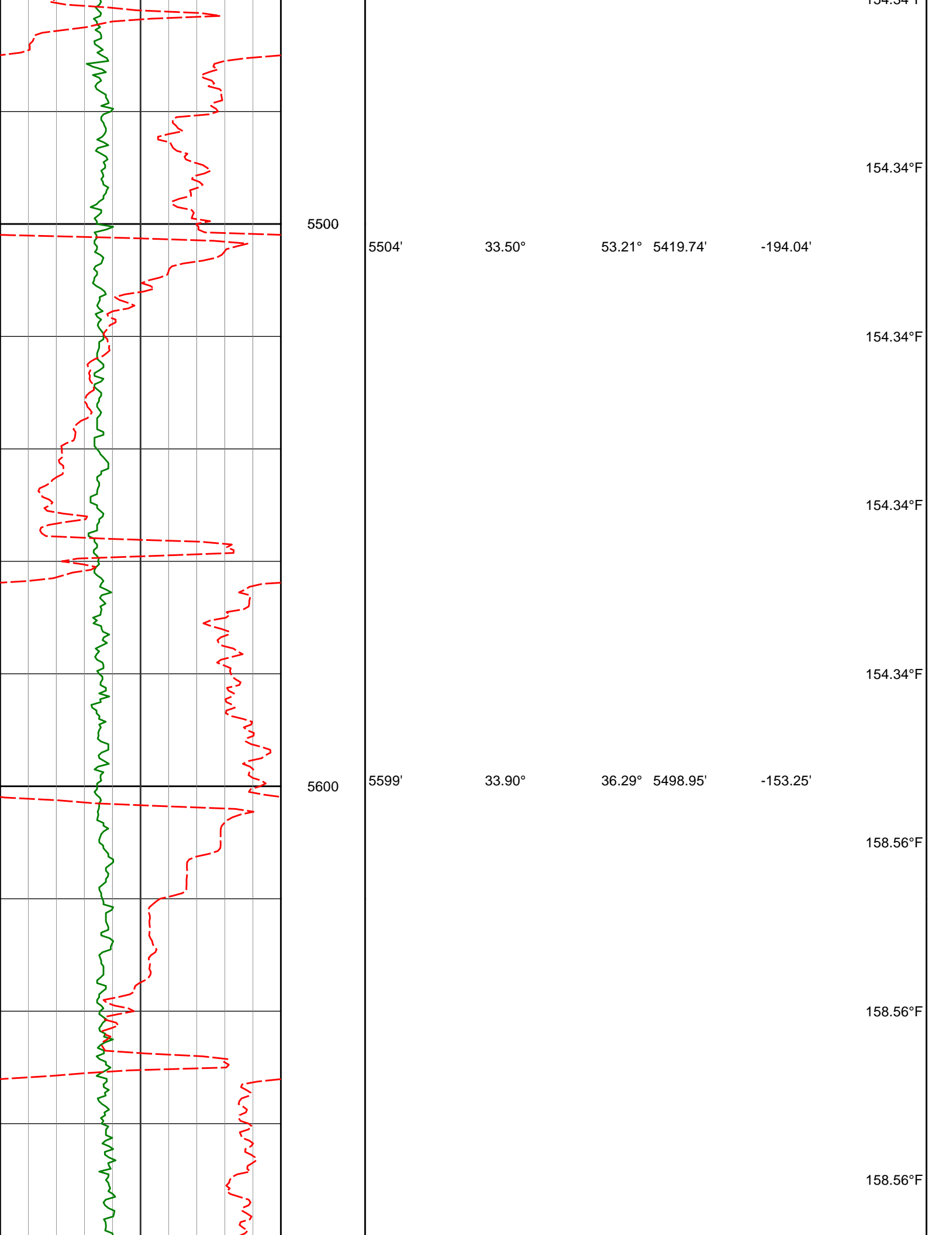
145.91°F

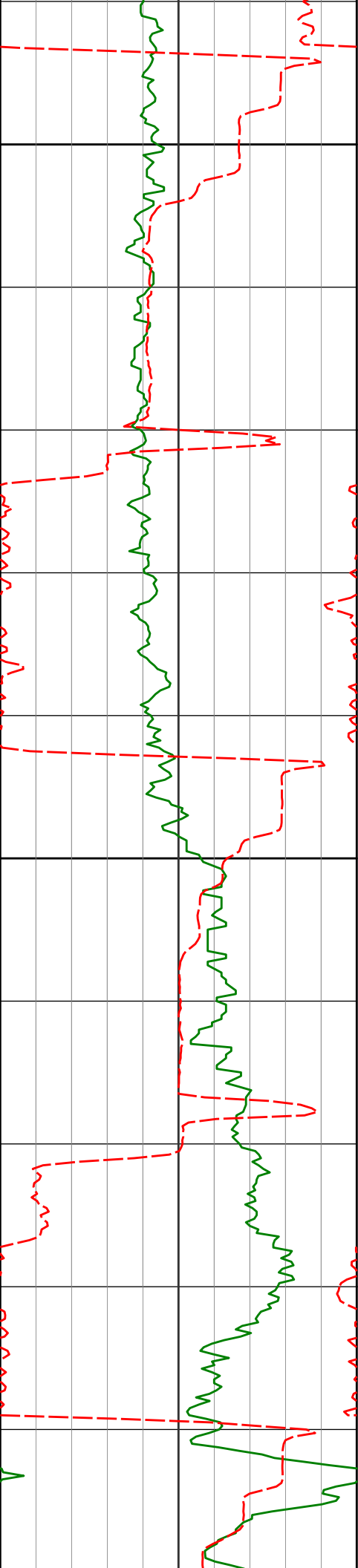
145.91°F

145.91°F

150.13°F







5700

5800

5883

5694'

34.96°

20.60°

5577.47'

-103.93'

162.78°F

162.78°F

162.78°F

5789'

41.51°

8.20°

5652.16'

-45.98'

162.78°F

162.78°F

162.78°F

5883'

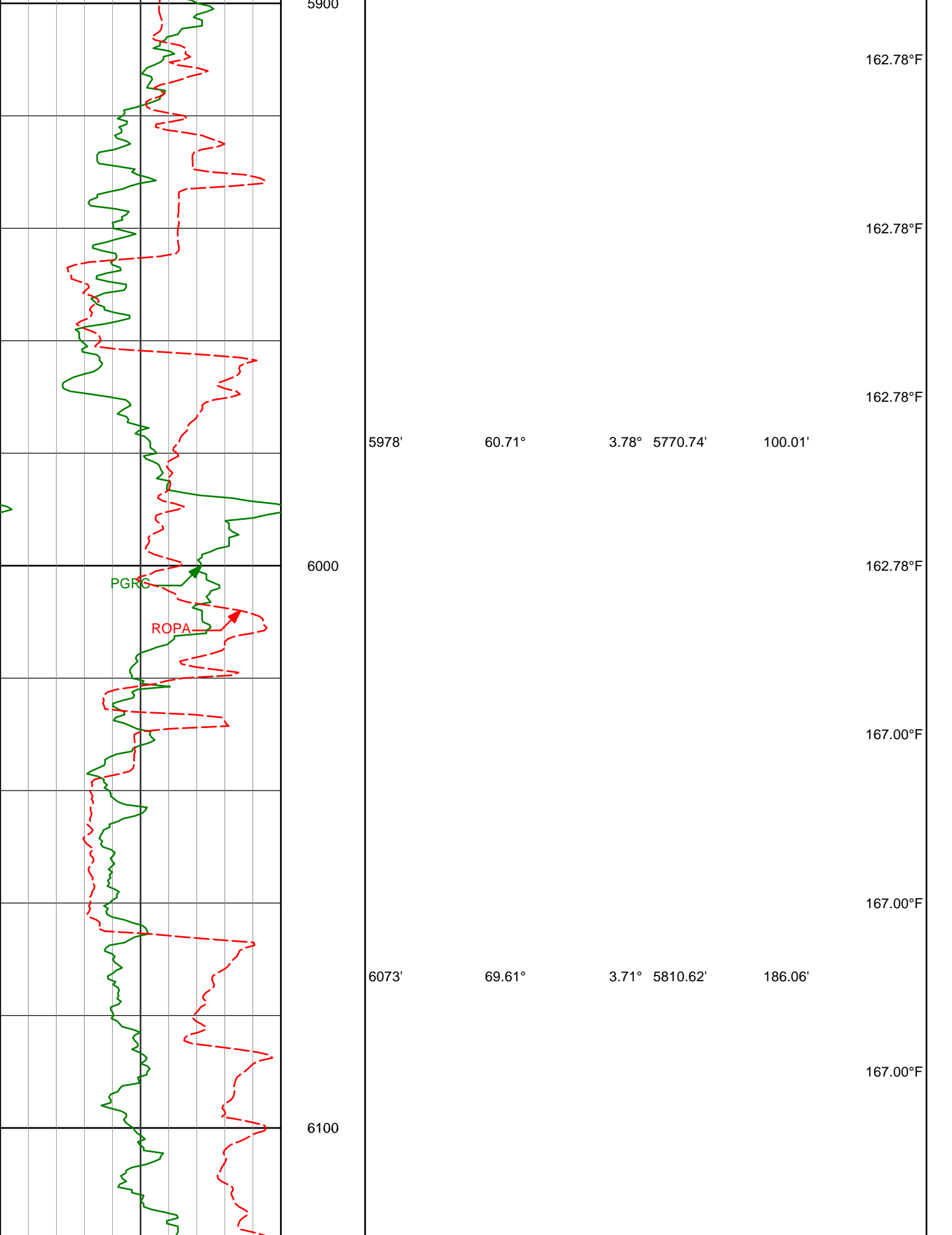
50.70°

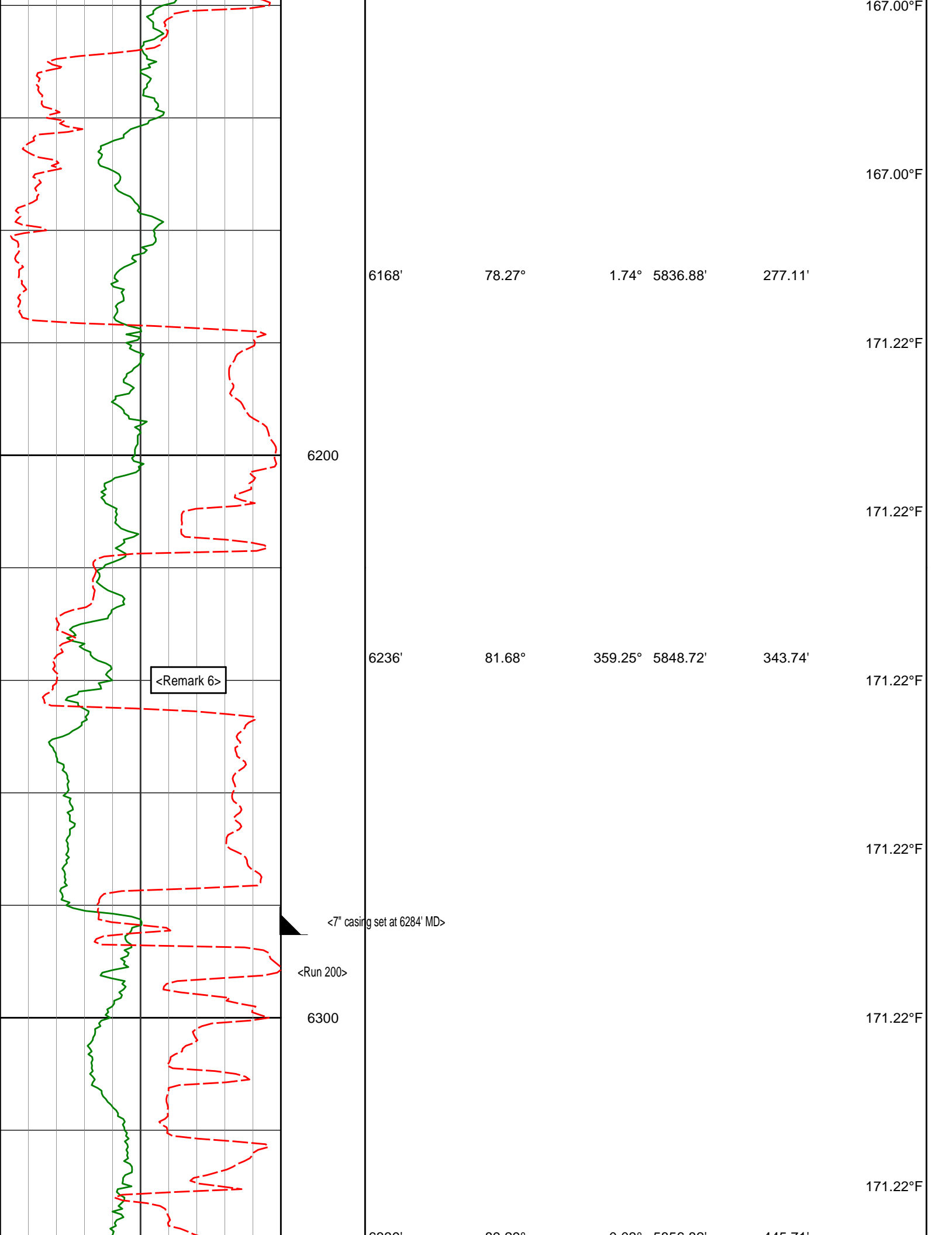
5.21°

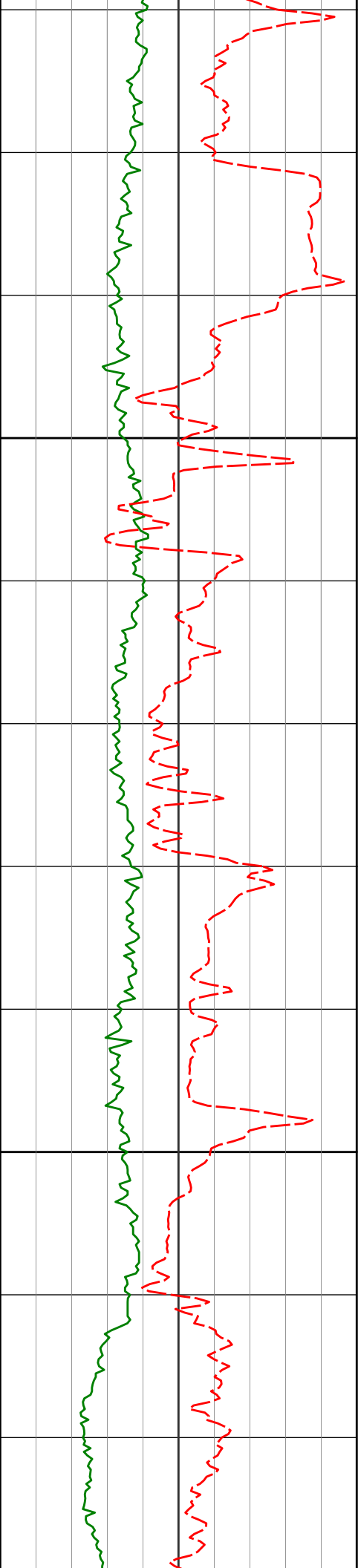
5717.27'

21.66'

162.78°F



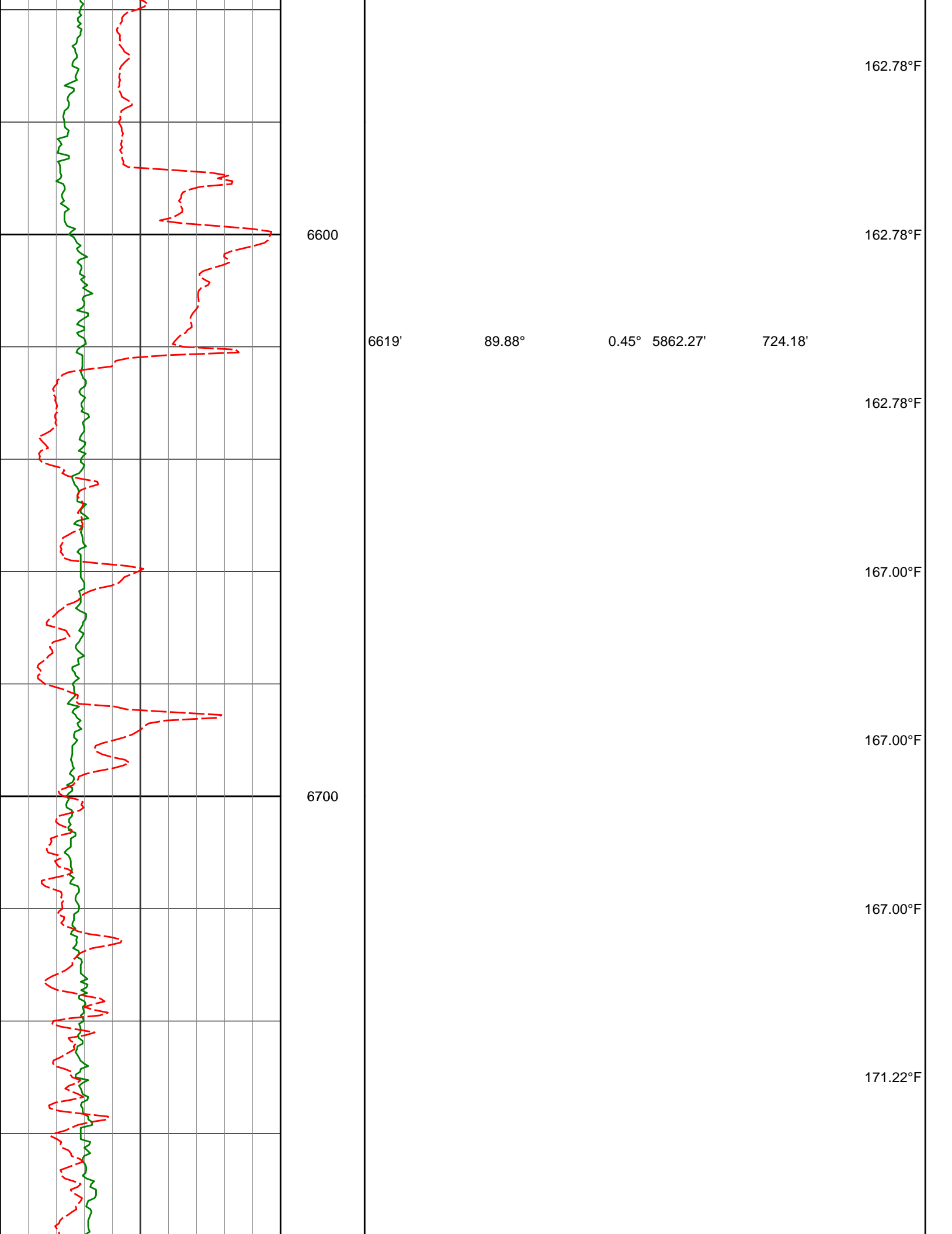


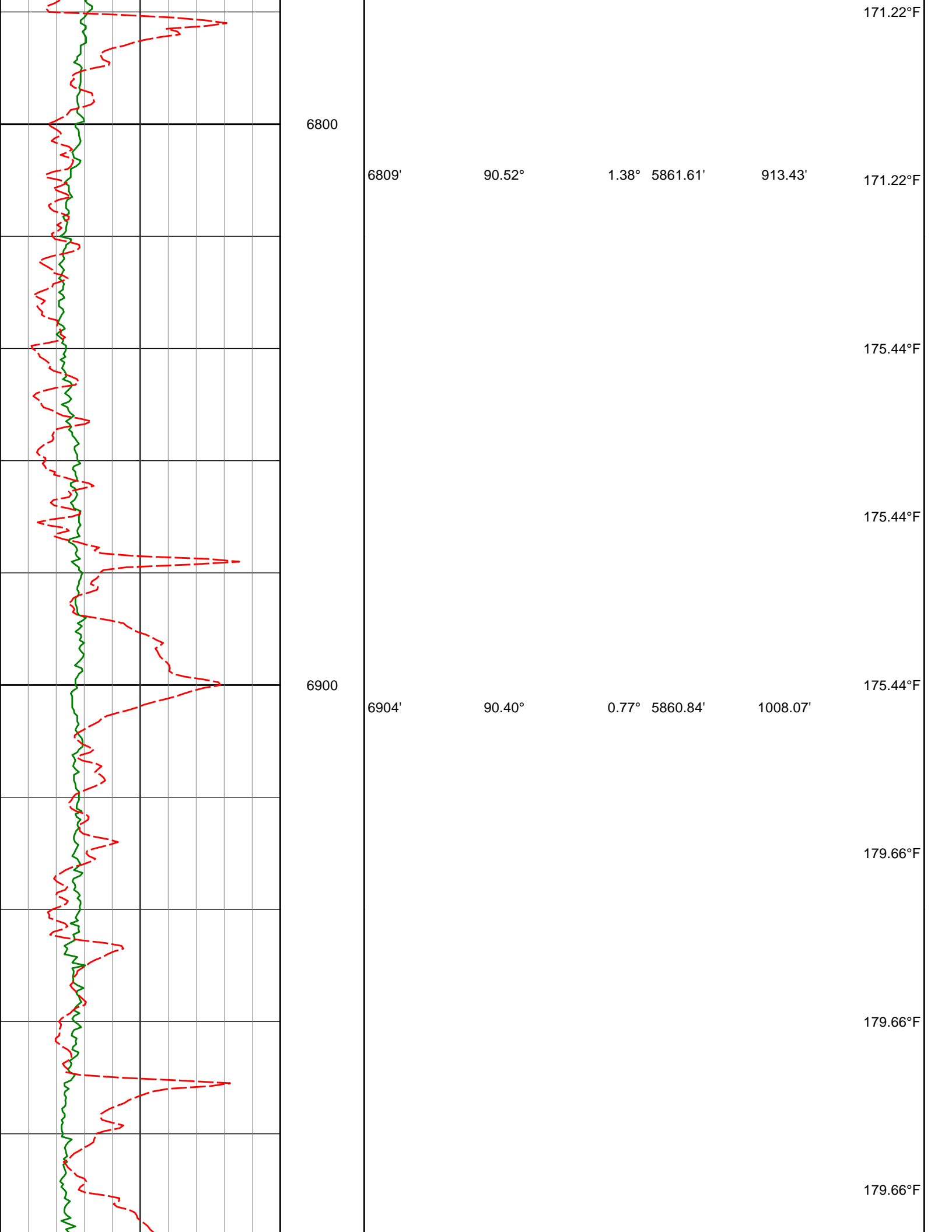


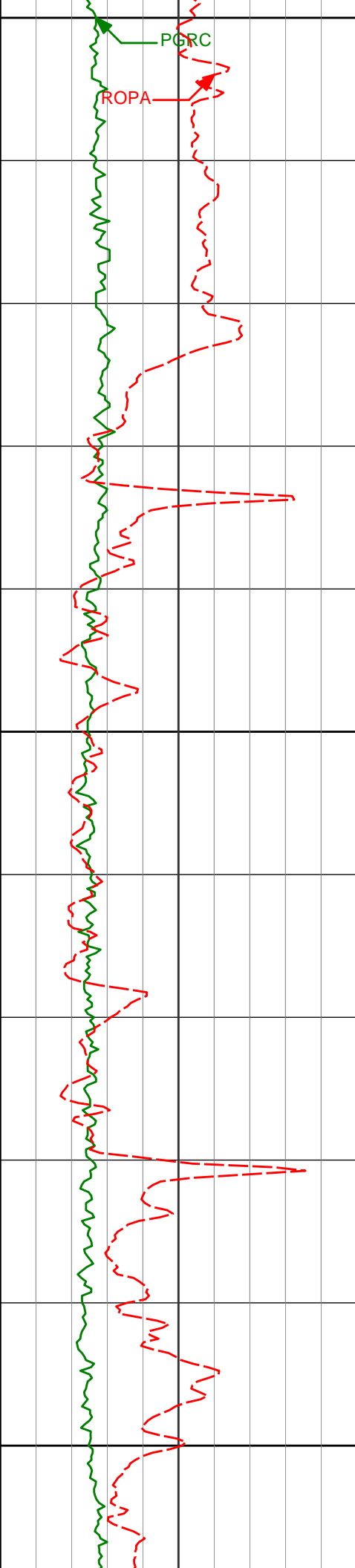
6400

6500

6339	89.29°	0.03°	5856.82'	445.71'	
					154.34°F
					154.34°F
					154.34°F
6431'	89.08°	359.99°	5858.13'	537.20'	
					162.78°F
					162.78°F
					162.78°F
6525'	88.00°	0.25°	5860.53'	630.67'	
					162.78°F







7000

7100

7200

6999'

7093'

7188'

90.28°

89.94°

89.01°

1.22° 5860.28'

0.60° 5860.11'

0.48° 5860.97'

1102.70'

1196.33'

1290.89'

179.66°F

179.66°F

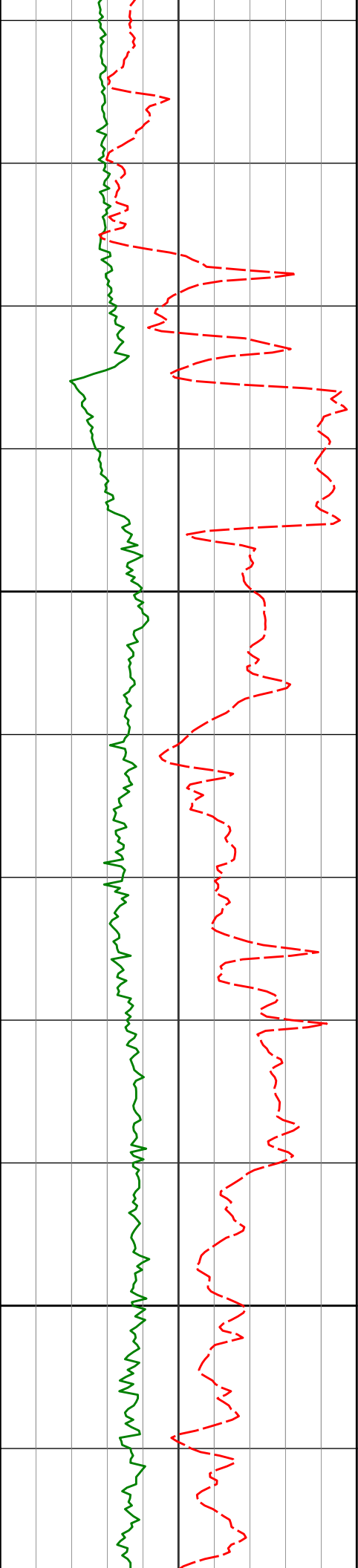
179.66°F

183.88°F

183.88°F

183.88°F

183.88°F



7300

7400

7283'

7377'

90.62°

91.29°

1.91° 5861.28'

2.17° 5859.71'

1385.55'

1479.31'

183.88°F

183.88°F

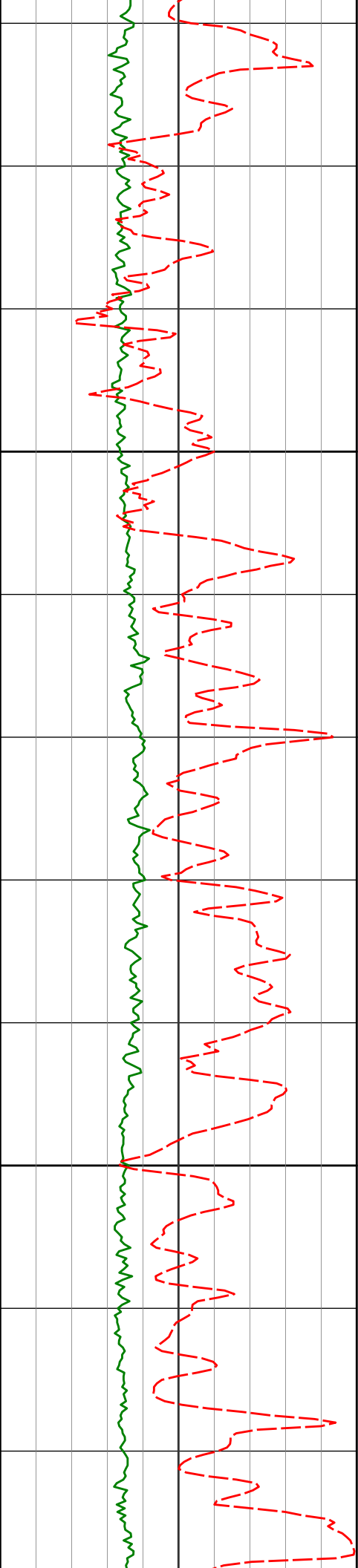
183.88°F

183.88°F

183.88°F

183.88°F

188.09°F



7500

7600

7472'

90.83°

2.08°

5857.95'

1574.07'

7566'

91.23°

1.97°

5856.26'

1667.83'

188.09°F

188.09°F

188.09°F

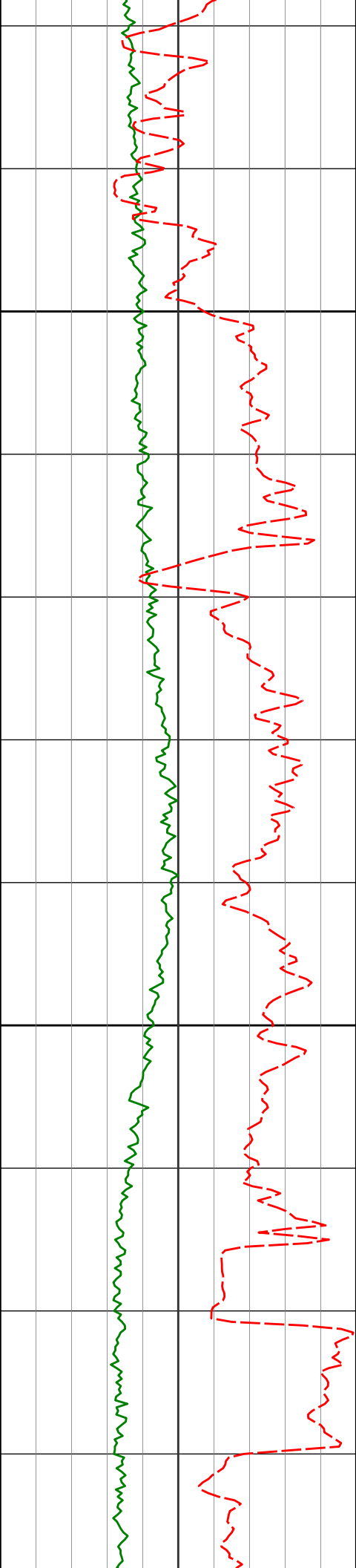
188.09°F

188.09°F

192.31°F

192.31°F

192.31°F



7700

7800

7661'

7756'

7851'

90.43°

91.36°

90.77°

1.10°

1.82°

0.52°

5854.88'

5853.40'

5851.64'

1762.52'

1857.21'

1951.85'

188.09°F

188.09°F

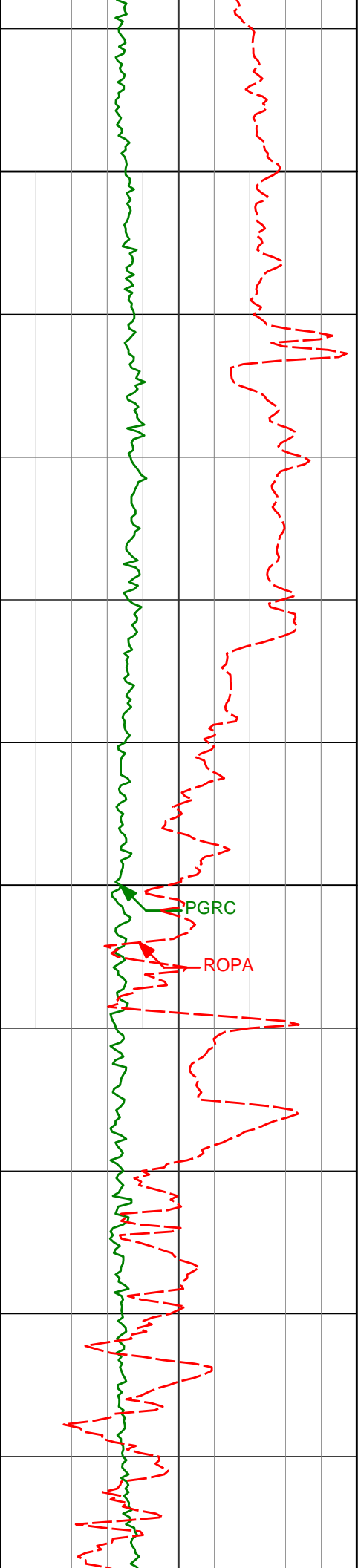
188.09°F

32.00°F

196.53°F

196.53°F

196.53°F



7900

8000

7945'

8040'

89.88°

89.48°

359.98°

359.78°

5851.10'

5851.64'

2045.37'

2139.82'

196.53°F

196.53°F

196.53°F

196.53°F

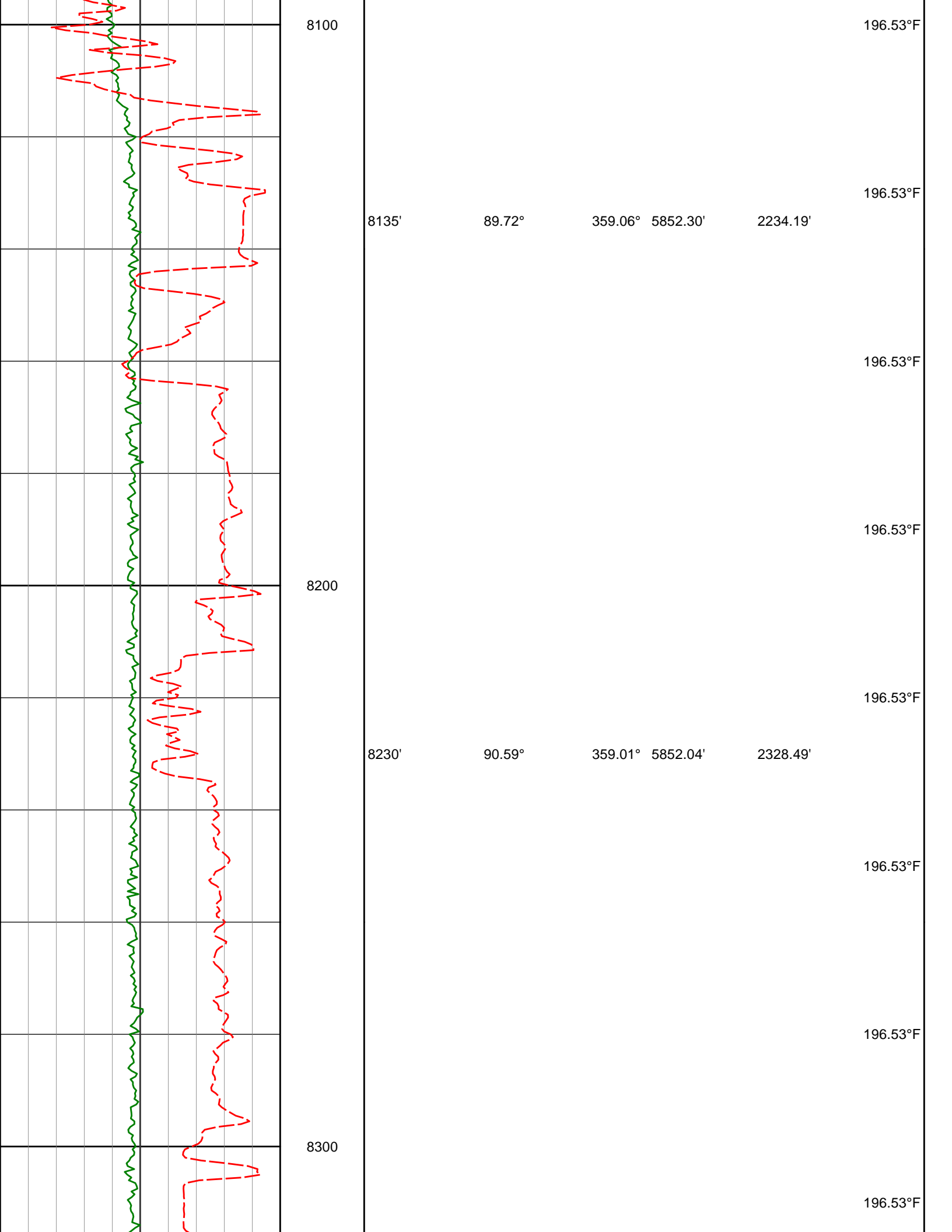
196.53°F

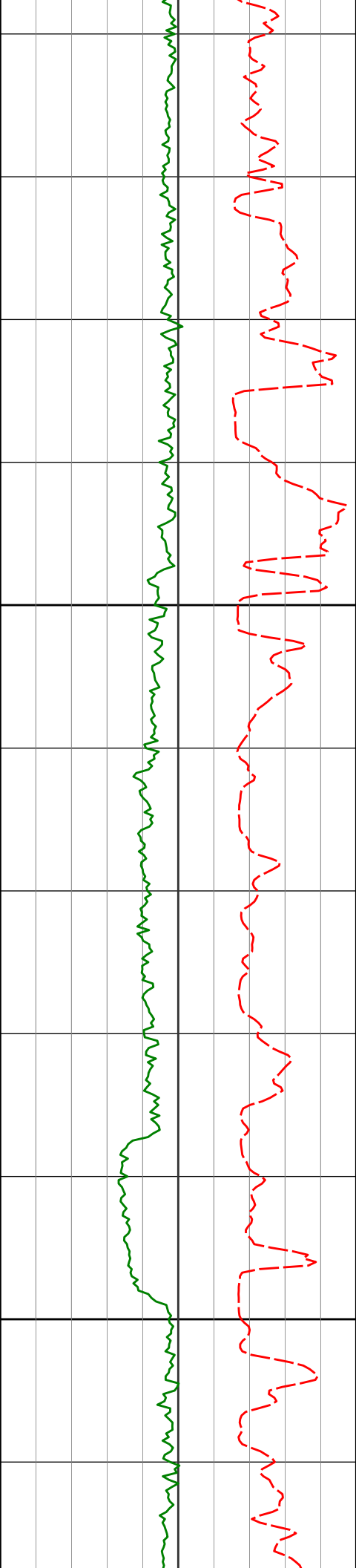
196.53°F

196.53°F

PGRC

ROPA





8400

8500

8325'

90.77°

359.10° 5850.91'

2422.78'

196.53°F

196.53°F

196.53°F

8419'

90.00°

359.10° 5850.28'

2516.09'

196.53°F

200.75°F

200.75°F

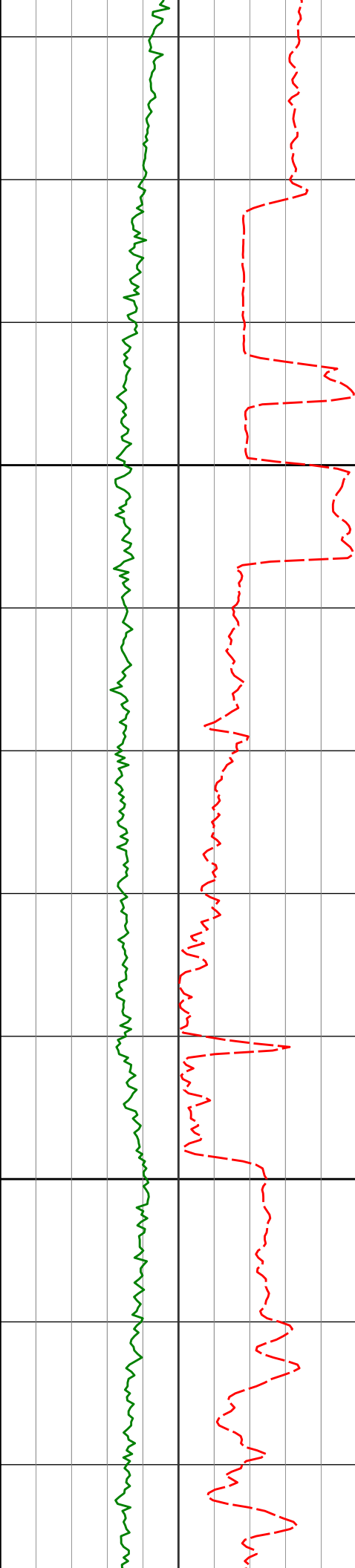
8514'

88.83°

358.58° 5851.25'

2610.34'

200.75°F



8600

8609'

89.91°

358.41°

5852.30'

2704.51'

196.53°F

196.53°F

196.53°F

196.53°F

196.53°F

8700

8704'

89.85°

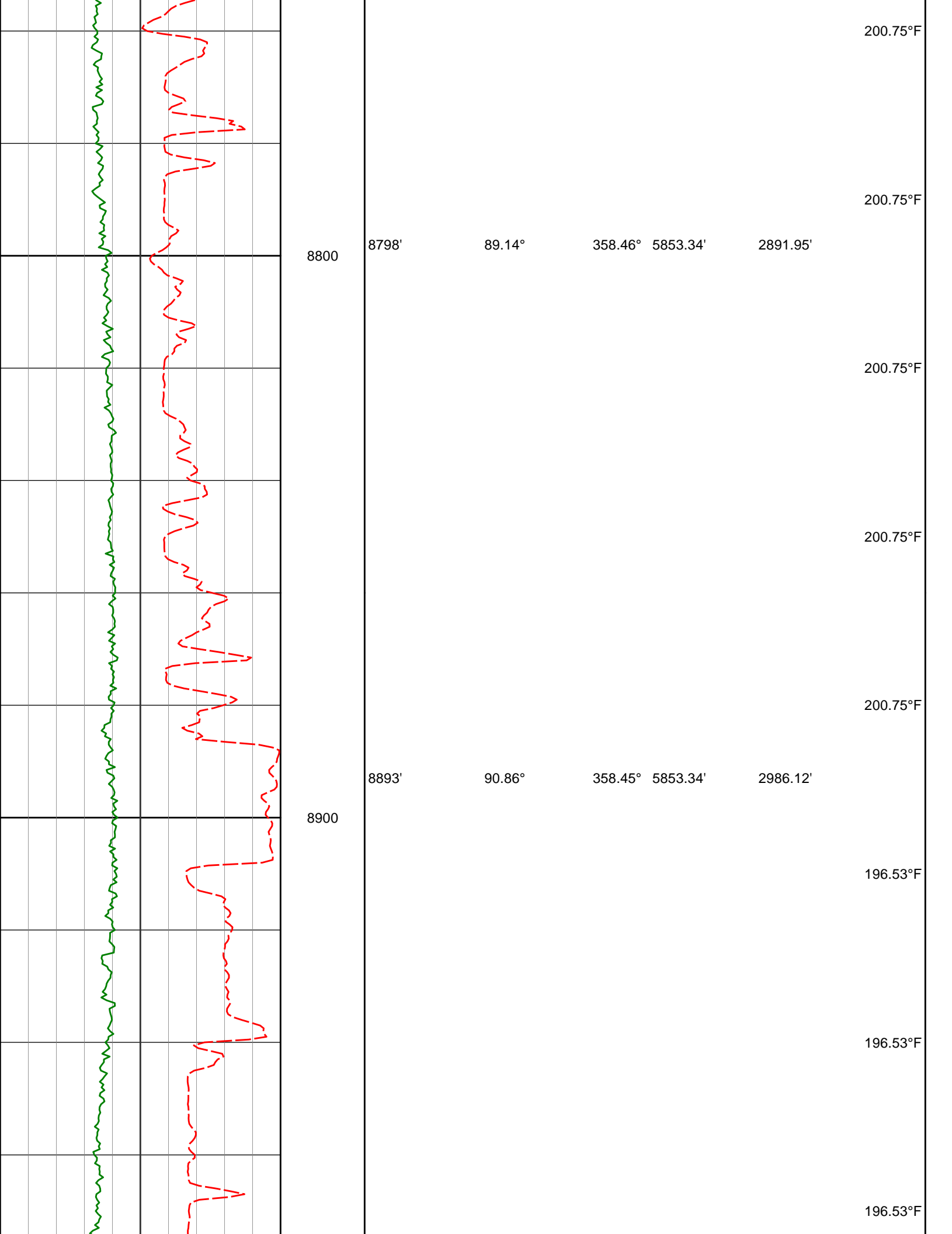
358.87°

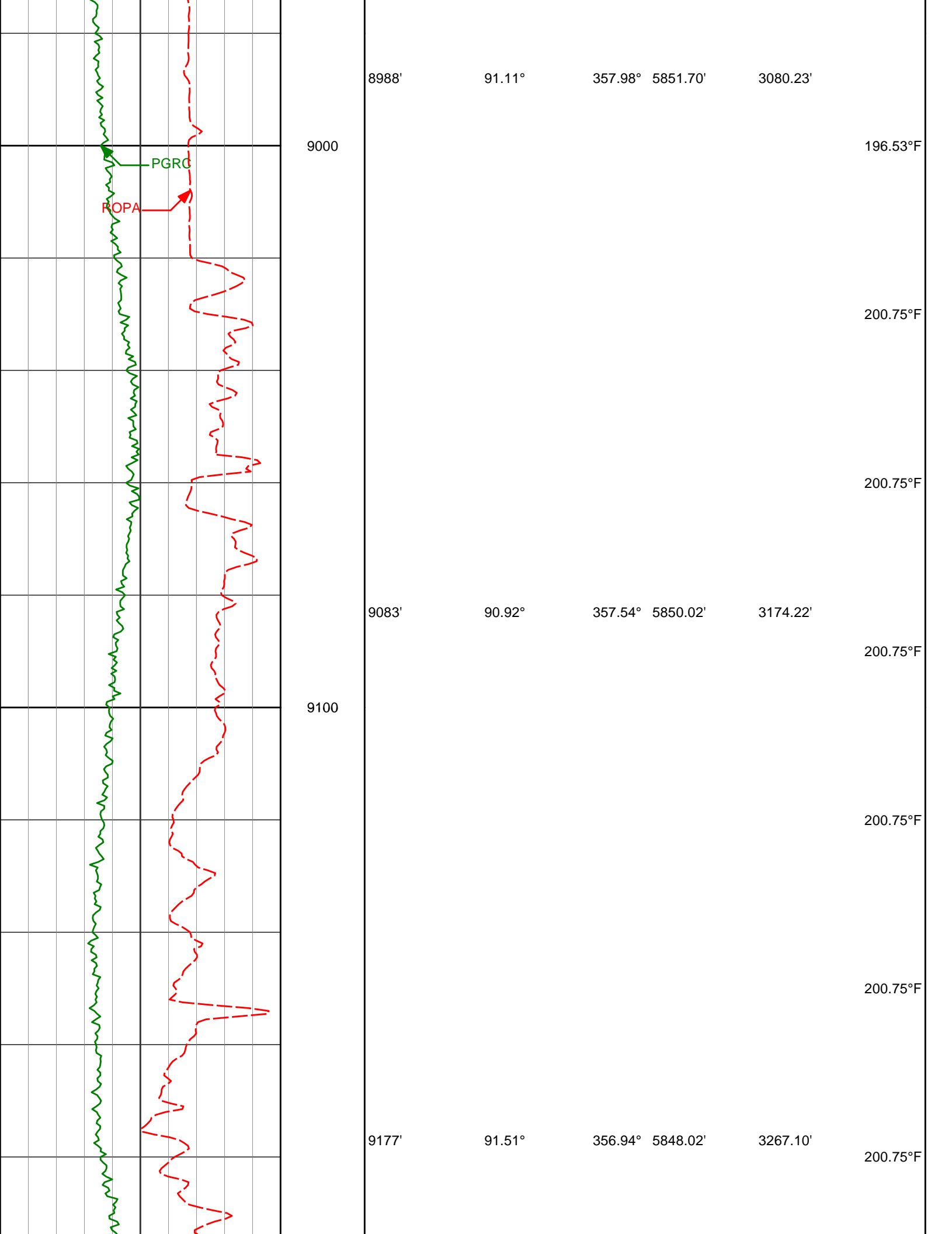
5852.50'

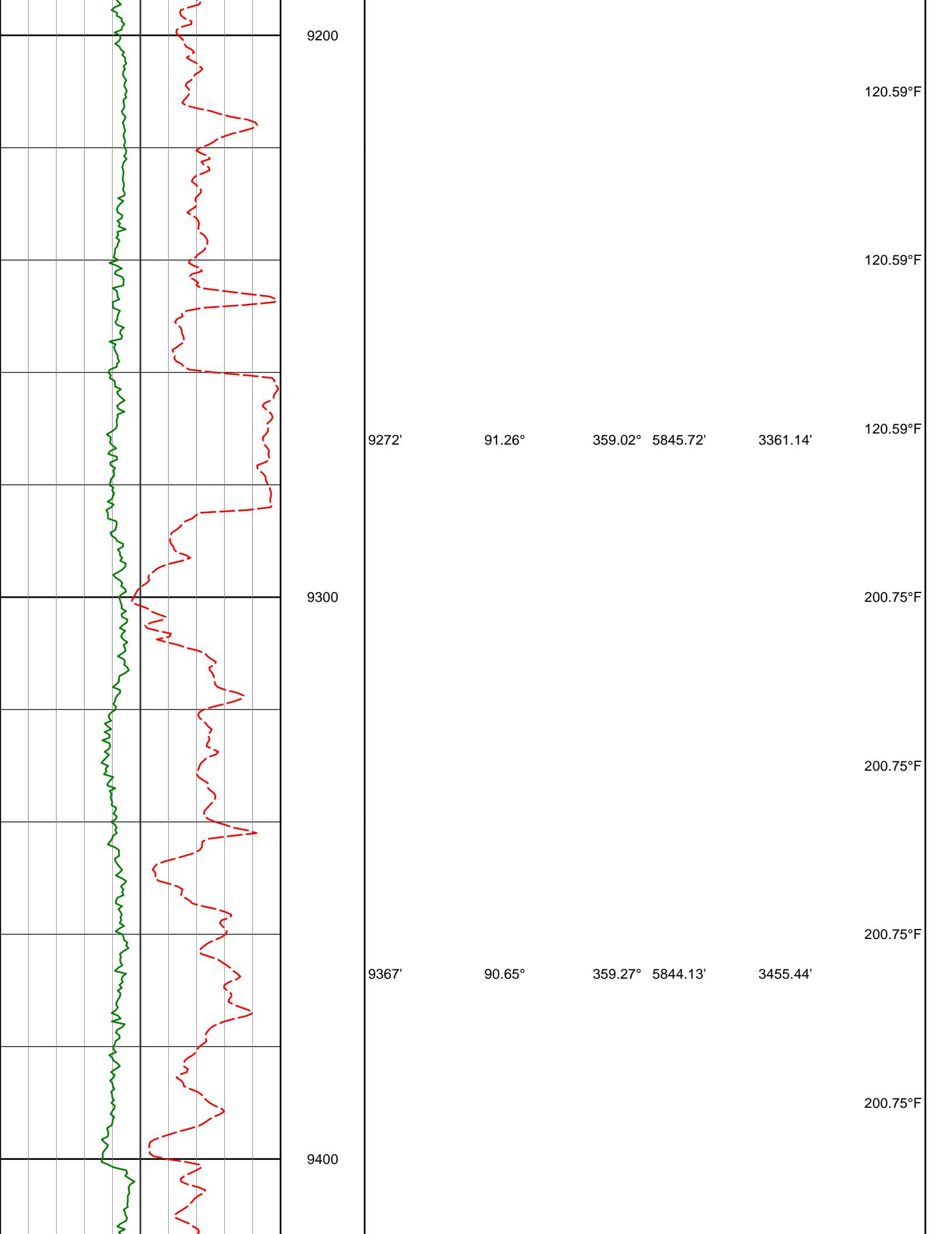
2798.73'

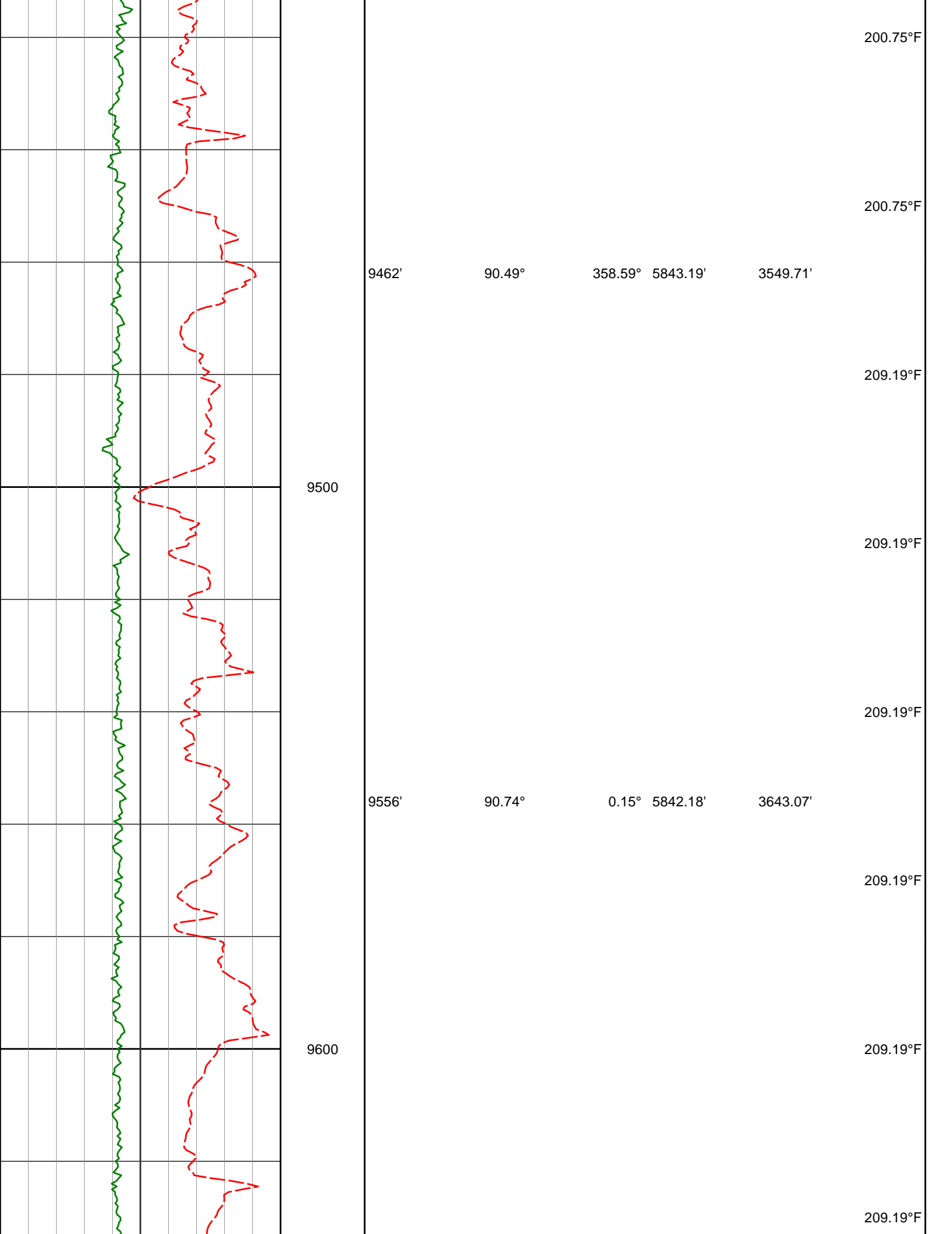
196.53°F

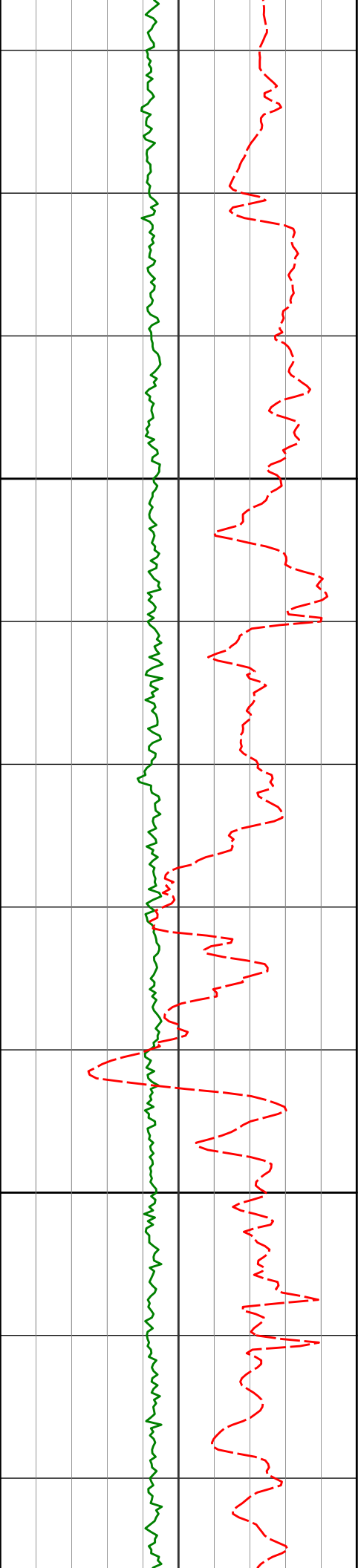
200.75°F











9700

9800

9651'

90.74°

358.92°

5840.95'

3737.45'

9840'

91.29°

0.62°

5837.60'

3925.29'

209.19°F

209.19°F

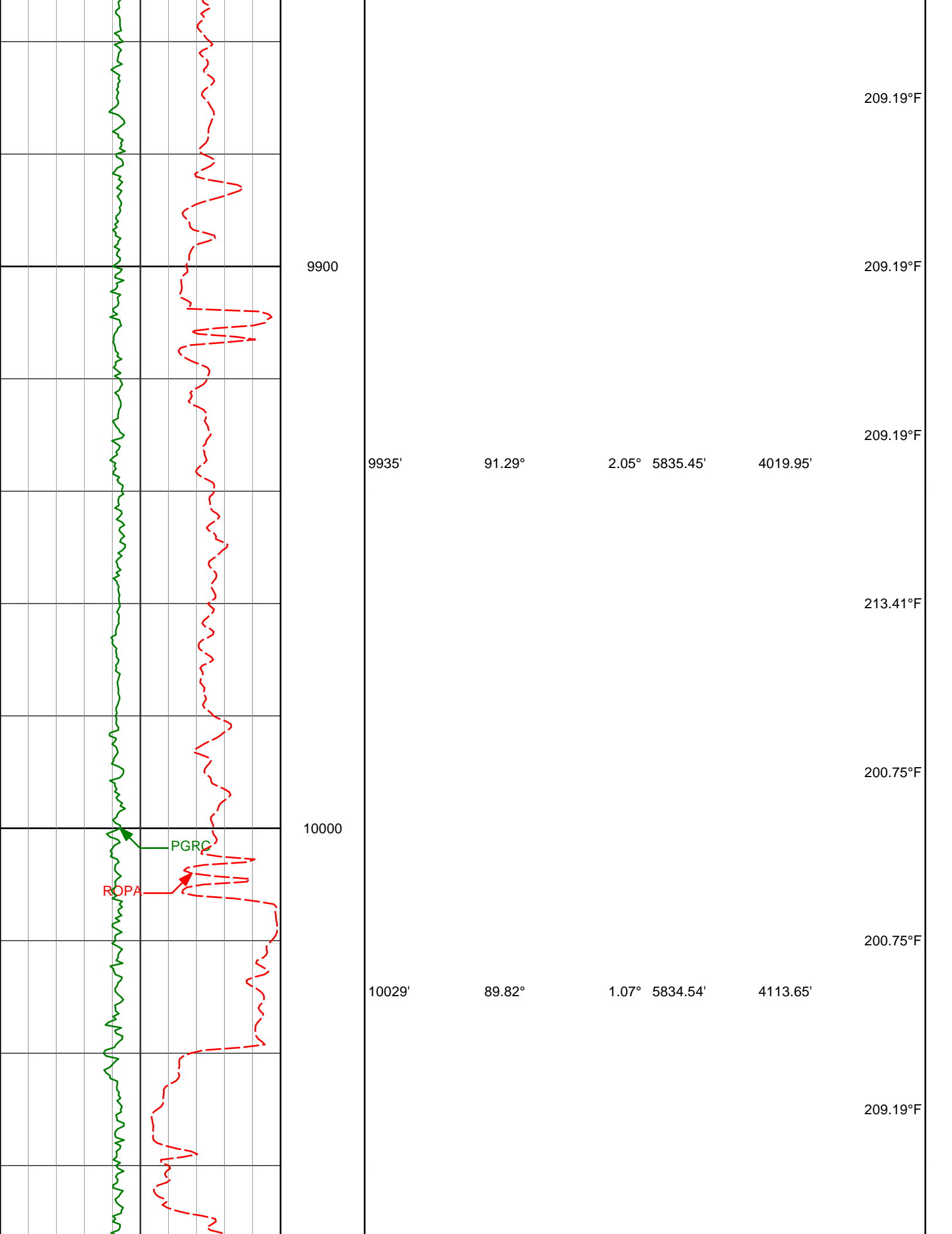
209.19°F

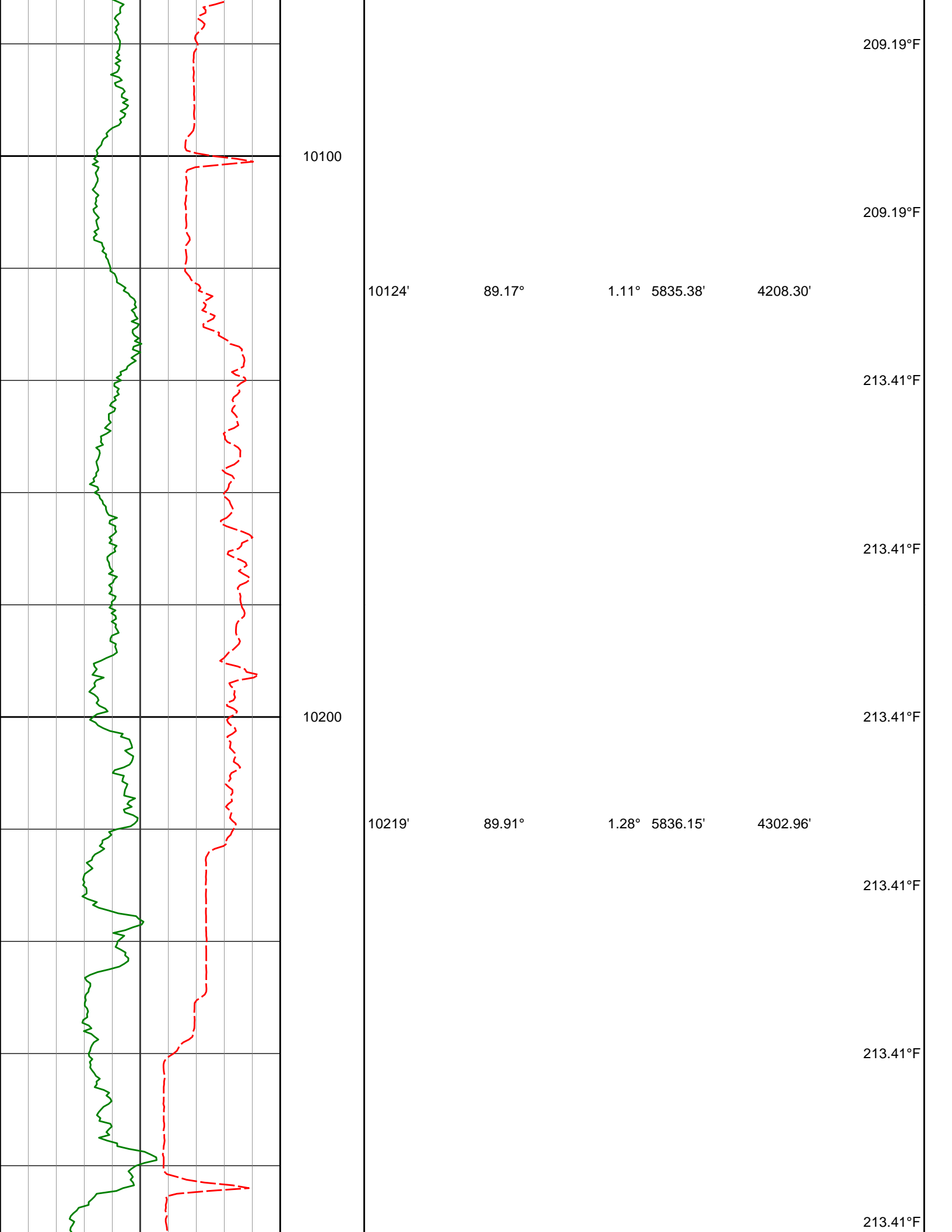
209.19°F

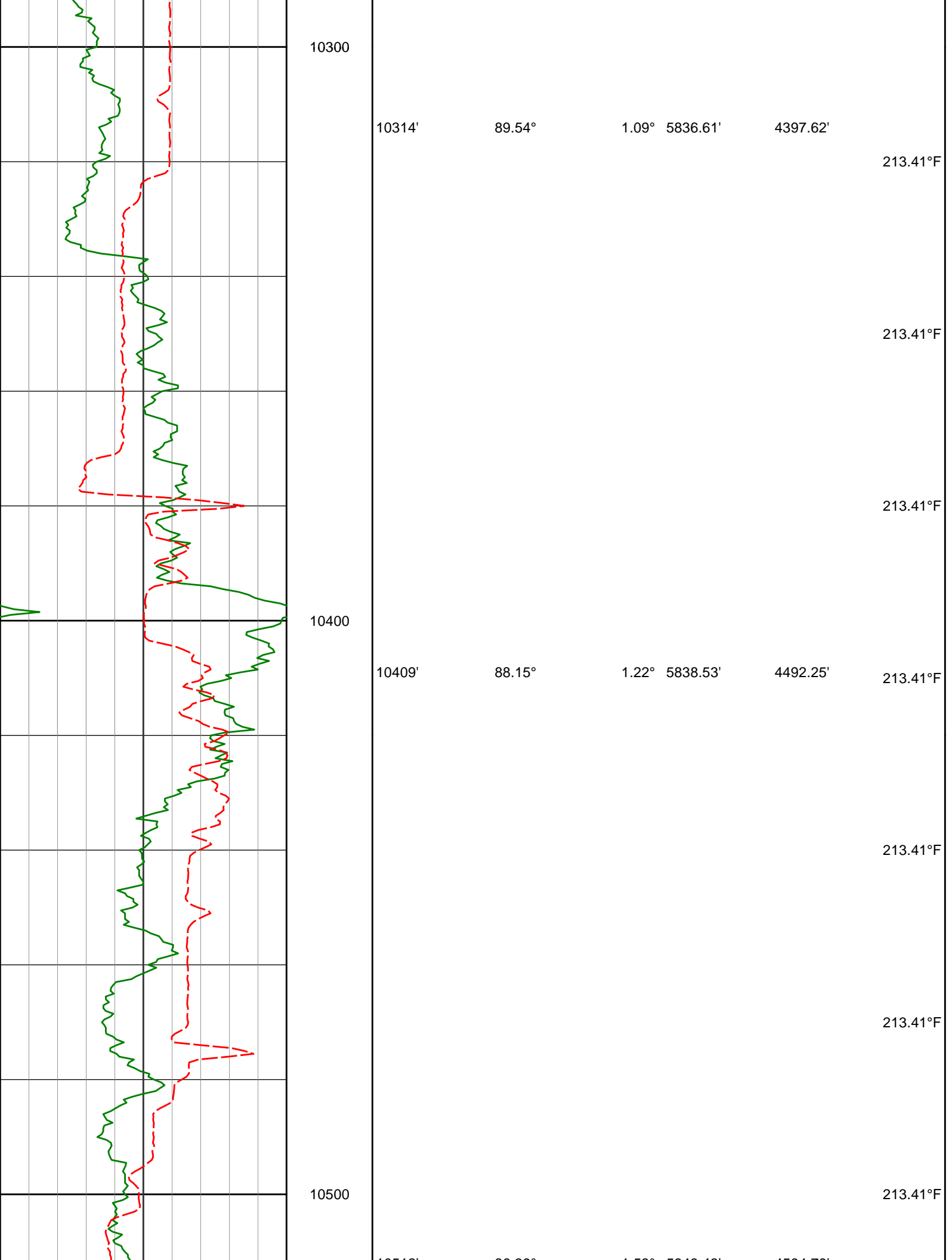
213.41°F

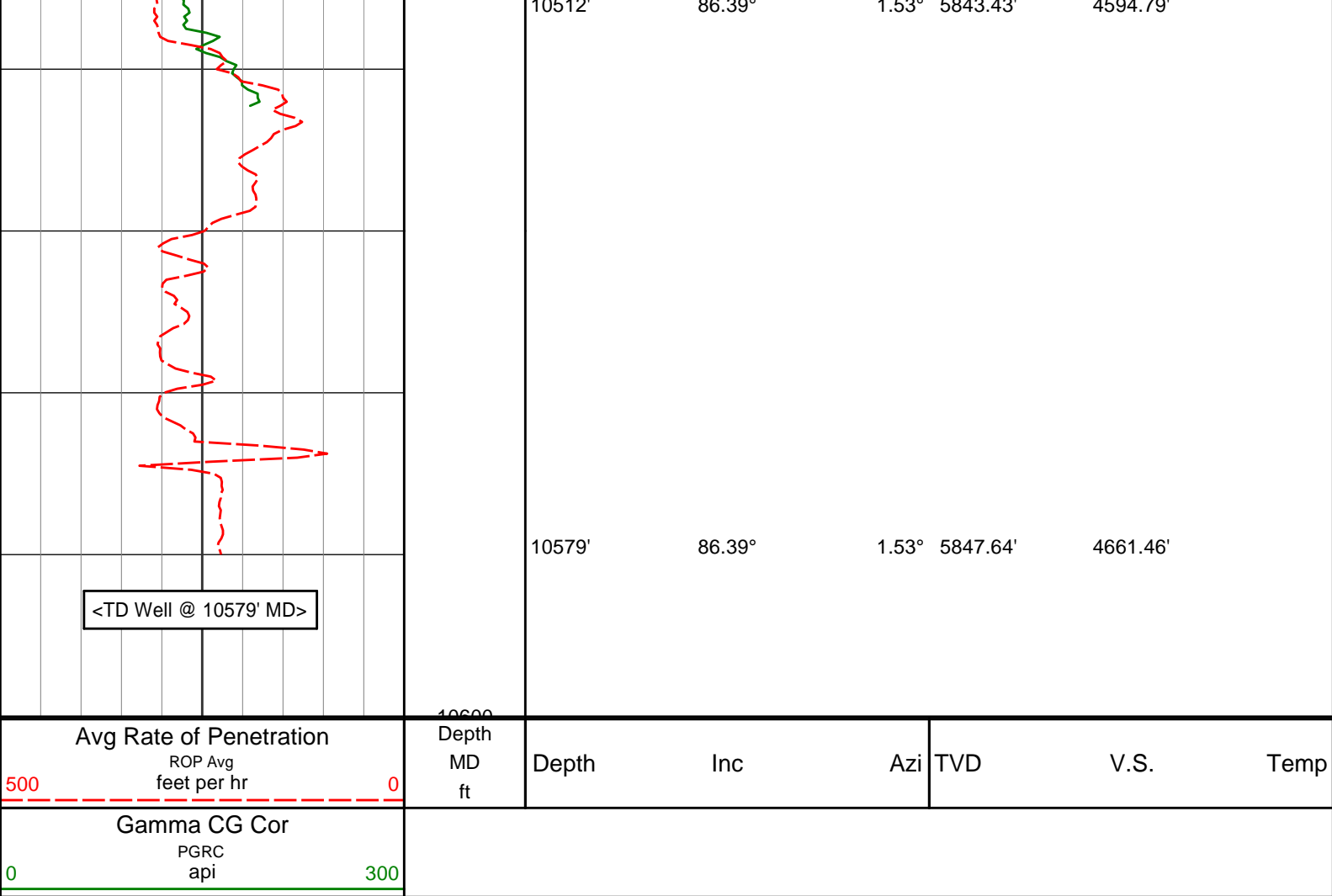
213.41°F

213.41°F









DIRECTIONAL SURVEY REPORT

**Noble Energy
Brecken LD28-727
Wattenberg
Weld Colorado
USA
CA-XX-0902606363**

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
86.75	0.30	26.05	86.75	0.20 N	0.10 E	0.21	0.34
178.00	0.22	292.18	178.00	0.48 N	0.04 E	0.48	0.42
269.25	0.30	344.52	269.25	0.78 N	0.18 W	0.75	0.26
360.50	0.18	283.58	360.50	1.04 N	0.39 W	1.00	0.29
451.75	0.18	238.77	451.75	1.00 N	0.65 W	0.93	0.15
543.00	0.09	223.80	543.00	0.87 N	0.82 W	0.78	0.10
634.25	0.12	77.58	634.25	0.84 N	0.78 W	0.75	0.22
725.50	0.14	175.56	725.50	0.75 N	0.68 W	0.67	0.22
816.75	0.16	166.49	816.75	0.51 N	0.64 W	0.44	0.03
908.00	0.22	157.03	908.00	0.23 N	0.55 W	0.17	0.08
999.25	0.24	151.51	999.24	0.11 S	0.38 W	-0.15	0.03
1090.50	0.14	213.86	1090.49	0.37 S	0.35 W	-0.40	0.24
1290.00	0.48	348.95	1289.99	0.26 N	0.65 W	0.19	0.29
1381.00	0.75	1.53	1380.99	1.22 N	0.70 W	1.14	0.32
1472.00	0.81	6.36	1471.98	2.45 N	0.62 W	2.38	0.10
1564.00	0.65	24.74	1563.97	3.58 N	0.32 W	3.52	0.30
1655.00	0.71	17.54	1654.97	4.58 N	0.06 E	4.56	0.11
1747.00	0.87	2.27	1746.96	5.82 N	0.26 E	5.82	0.28
1838.00	1.04	1.18	1837.94	7.33 N	0.31 E	7.32	0.19

1930.00	1.05	357.86	1929.93	9.00 N	0.29 E	8.98	0.07
2021.00	1.27	1.10	2020.91	10.84 N	0.28 E	10.81	0.26
2113.00	1.16	10.10	2112.89	12.77 N	0.46 E	12.75	0.24
2205.00	1.10	9.92	2204.87	14.56 N	0.78 E	14.56	0.06
2297.00	1.14	1.14	2296.85	16.35 N	0.95 E	16.36	0.19
2389.00	1.30	358.24	2388.83	18.30 N	0.93 E	18.30	0.19
2480.00	1.30	349.12	2479.81	20.35 N	0.71 E	20.31	0.23
2572.00	1.42	344.43	2571.78	22.47 N	0.20 E	22.37	0.18
2663.00	1.31	340.43	2662.76	24.54 N	0.45 W	24.36	0.16
2758.00	1.38	340.52	2757.73	26.64 N	1.19 W	26.37	0.07
2853.00	1.32	333.86	2852.71	28.70 N	2.05 W	28.32	0.18
2948.00	1.12	328.40	2947.68	30.46 N	3.02 W	29.98	0.24
3042.00	1.55	137.65	3041.68	30.31 N	2.64 W	29.86	2.82
3137.00	4.69	140.54	3136.52	26.36 N	0.69 E	26.29	3.31
3232.00	6.41	147.07	3231.07	18.91 N	6.04 E	19.44	1.93
3326.00	8.43	148.43	3324.28	8.63 N	12.50 E	9.90	2.15
3421.00	8.42	148.55	3418.26	3.23 S	19.77 E	-1.14	0.02
3516.00	11.57	139.98	3511.81	16.46 S	29.53 E	-13.27	3.66
3611.00	11.70	140.82	3604.86	31.22 S	41.74 E	-26.67	0.22
3705.00	11.39	142.46	3696.96	45.97 S	53.41 E	-40.11	0.48
3800.00	10.04	143.22	3790.30	60.04 S	64.09 E	-52.98	1.43
3895.00	10.95	140.60	3883.71	73.64 S	74.77 E	-65.39	1.08
3989.00	13.12	137.12	3975.64	88.36 S	87.70 E	-78.67	2.43
4084.00	12.58	137.14	4068.26	103.84 S	102.07 E	-92.56	0.57
4179.00	11.78	135.57	4161.12	118.34 S	115.90 E	-105.54	0.91
4273.00	11.07	134.48	4253.26	131.52 S	129.05 E	-117.26	0.78
4368.00	11.10	138.04	4346.49	144.71 S	141.68 E	-129.06	0.72
4463.00	10.14	139.09	4439.86	157.83 S	153.26 E	-140.89	1.03
4557.00	10.92	143.49	4532.28	171.24 S	163.98 E	-153.10	1.19
4652.00	12.70	145.05	4625.26	187.03 S	175.31 E	-167.62	1.91
4747.00	11.66	143.04	4718.13	203.26 S	187.07 E	-182.52	1.18
4842.00	12.38	143.23	4811.04	219.09 S	198.94 E	-197.02	0.77
4936.00	11.36	145.07	4903.03	234.76 S	210.27 E	-211.41	1.16
5031.00	13.30	146.10	4995.83	251.51 S	221.73 E	-226.87	2.05
5126.00	23.55	101.96	5086.24	264.60 S	246.56 E	-237.28	17.53
5220.00	25.26	91.66	5171.88	269.07 S	285.00 E	-237.70	4.87
5315.00	26.58	88.96	5257.32	269.27 S	326.52 E	-233.55	1.87
5410.00	31.78	73.39	5340.35	261.72 S	371.84 E	-221.28	9.65
5504.00	33.50	53.21	5419.74	239.03 S	416.47 E	-194.04	11.68
5599.00	33.90	36.29	5498.95	201.90 S	453.23 E	-153.25	9.86
5694.00	34.96	20.60	5577.47	154.97 S	478.54 E	-103.93	9.38
5789.00	41.51	8.20	5652.16	98.19 S	492.64 E	-45.98	10.60
5883.00	50.70	5.21	5717.27	30.99 S	500.40 E	21.66	10.04
5978.00	60.71	3.78	5770.74	47.15 N	506.48 E	100.01	10.61
6073.00	69.61	3.71	5810.62	133.09 N	512.11 E	186.06	9.37
6168.00	78.27	1.74	5836.88	224.19 N	516.40 E	277.11	9.33
6236.00	81.68	359.25	5848.72	291.13 N	516.97 E	343.74	6.18
6339.00	89.29	0.03	5856.82	393.73 N	516.33 E	445.71	7.42
6431.00	89.08	359.99	5858.13	485.72 N	516.34 E	537.20	0.24
6525.00	88.00	0.25	5860.53	579.69 N	516.53 E	630.67	1.18
6619.00	89.88	0.45	5862.27	673.67 N	517.10 E	724.18	2.01
6809.00	90.52	1.38	5861.61	863.64 N	520.13 E	913.43	0.60
6904.00	90.40	0.77	5860.84	958.62 N	521.92 E	1008.07	0.66
6999.00	90.28	1.22	5860.28	1053.60 N	523.57 E	1102.70	0.49
7093.00	89.94	0.60	5860.11	1147.59 N	525.06 E	1196.33	0.75
7188.00	89.01	0.48	5860.97	1242.58 N	525.96 E	1290.89	0.98
7283.00	90.62	1.91	5861.28	1337.55 N	527.94 E	1385.55	2.26
7377.00	91.29	2.17	5859.71	1431.48 N	531.29 E	1479.31	0.77
7472.00	90.83	2.08	5857.95	1526.40 N	534.81 E	1574.07	0.49
7566.00	91.23	1.97	5856.26	1620.32 N	538.14 E	1667.83	0.44
7661.00	90.43	1.10	5854.88	1715.28 N	540.68 E	1762.52	1.25
7756.00	91.36	1.82	5853.40	1810.23 N	543.10 E	1857.21	1.23
7851.00	90.77	0.52	5851.64	1905.20 N	545.04 E	1951.85	1.51
7945.00	89.88	359.98	5851.10	1999.19 N	545.45 E	2045.37	1.10
8040.00	89.48	359.78	5851.64	2094.19 N	545.24 E	2139.82	0.48
8135.00	89.72	359.06	5852.30	2189.18 N	544.28 E	2234.19	0.80
8230.00	90.59	359.01	5852.04	2284.17 N	542.68 E	2328.49	0.91
8325.00	90.77	359.10	5850.91	2379.15 N	541.11 E	2422.78	0.21
8419.00	90.00	359.10	5850.28	2473.13 N	539.64 E	2516.09	0.82
8514.00	88.83	358.58	5851.25	2568.11 N	537.72 E	2610.34	1.35
8609.00	89.91	358.41	5852.30	2663.07 N	535.23 E	2704.51	1.15
8704.00	89.85	358.87	5852.50	2758.04 N	532.08 E	2798.73	0.48

8704.00	89.85	358.87	5852.30	2758.04 N	532.98 E	2798.73	0.48
8798.00	89.14	358.46	5853.34	2852.01 N	530.80 E	2891.95	0.87
8893.00	90.86	358.45	5853.34	2946.97 N	528.23 E	2986.12	1.82
8988.00	91.11	357.98	5851.70	3041.91 N	525.27 E	3080.23	0.56
9083.00	90.92	357.54	5850.02	3136.82 N	521.56 E	3174.22	0.50
9177.00	91.51	356.94	5848.02	3230.69 N	517.04 E	3267.10	0.89
9272.00	91.26	359.02	5845.72	3325.60 N	513.69 E	3361.14	2.20
9367.00	90.65	359.27	5844.13	3420.58 N	512.27 E	3455.44	0.70
9462.00	90.49	358.59	5843.19	3515.56 N	510.50 E	3549.71	0.74
9556.00	90.74	0.15	5842.18	3609.54 N	509.47 E	3643.07	1.68
9651.00	90.74	358.92	5840.95	3704.53 N	508.70 E	3737.45	1.29
9840.00	91.29	0.62	5837.60	3893.49 N	507.95 E	3925.29	0.95
9935.00	91.29	2.05	5835.45	3988.44 N	510.16 E	4019.95	1.50
10029.00	89.82	1.07	5834.54	4082.39 N	512.72 E	4113.65	1.89
10124.00	89.17	1.11	5835.38	4177.37 N	514.52 E	4208.30	0.68
10219.00	89.91	1.28	5836.15	4272.35 N	516.50 E	4302.96	0.80
10314.00	89.54	1.09	5836.61	4367.33 N	518.47 E	4397.62	0.44
10409.00	88.15	1.22	5838.53	4462.29 N	520.38 E	4492.25	1.46
10512.00	86.39	1.53	5843.43	4565.14 N	522.85 E	4594.79	1.73
10579.00	86.39	1.53	5847.64	4631.98 N	524.64 E	4661.46	0.01

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 6.02 DEGREES (GRID)
A TOTAL CORRECTION OF 6.96 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10579.00 FEET
IS 4661.60 FEET ALONG 6.46 DEGREES (GRID)**

Tied into gyro survey @ 1090.5 ft provided by Noble Energy.

Last survey is a projection from 10512 ft MD to TD at 10579 ft MD.