



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	09-Feb-15	10-Feb-15	12-Feb-15		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	916.00	6,469.00	6,976.00		
Log End Depth (MD, ft)	6,469.00	6,976.00	11,235.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	09-Feb-15 01:25	10-Feb-15 02:45	11-Feb-15 14:00		
Drill/Wipe End Date and Time	09-Feb-15 18:00	10-Feb-15 10:05	12-Feb-15 13:00		
Min Inc (deg) @ Depth (MD, ft)	0.40 @ 1,007.00	33.10 @ 6,457.00	85.68 @ 7,015.00		
Max Inc (deg) @ Depth (MD, ft)	29.98 @ 6,411.00	77.67 @ 6,922.00	92.71 @ 9,383.00		
Bit TFA(in2) / Bit Type	1.21 / PDC	1.21 / PDC	0.75 / PDC		
Flow Rate (gpm)	600.00	550.00	298.47		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	9.95 / 40.00	10.30 / 40.00	9.85 / 39.00		
Filtrate CL (ppm)	1,400.00	140.00	130.00		
pH / Fluid Loss (mptm)	9.00 / 0	9.00 / 6	8.90 / 6		
PV (cP) / YP (lhf2)	11 / 9.00	11 / 9.00	11 / 8.00		
% Solids / % Sand	9.50 / 0.30	3.7 / 0.30	7.60 / 0.30		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		

Max Tool Temp (degF) / Source	154.34 / PCM	158.56 / PCM	230.30 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Dave Nielsen	Justin Fields	Justin Fields		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11107081	11107081	12310748		
Insert Serial Number	11680742	11680742	11619995		
Date and Time Initialized	08-Feb-15 13:06	08-Feb-14 13:06	10-Feb-15 21:01		
Date and Time Read	10-Feb-15 14:26	10-Feb-15 14:38	12-Feb-15 21:20		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	56.46	52.10	63.39		
Software Version	6.33	6.33	6.33		
Sub Serial Number	11107081	11107081	12310748		
Sonde Serial Number	11477956	11477956	11638559		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	238.40	95.90	10.80		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	46.34	41.98	58.66		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11107081	11107081	12310748		
Insert/Sonde Serial Number	11121362	11121362	11293411		

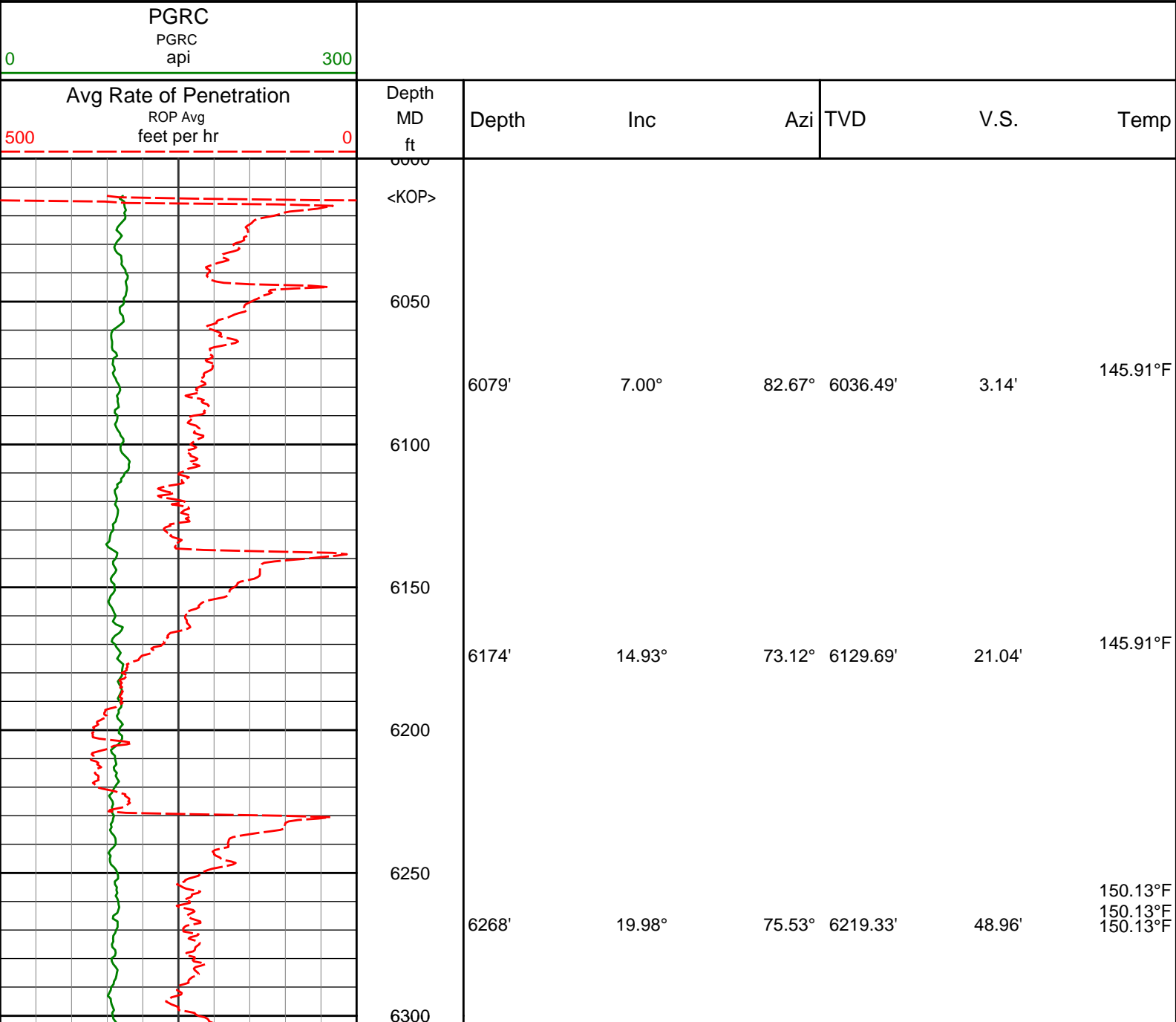
REMARKS

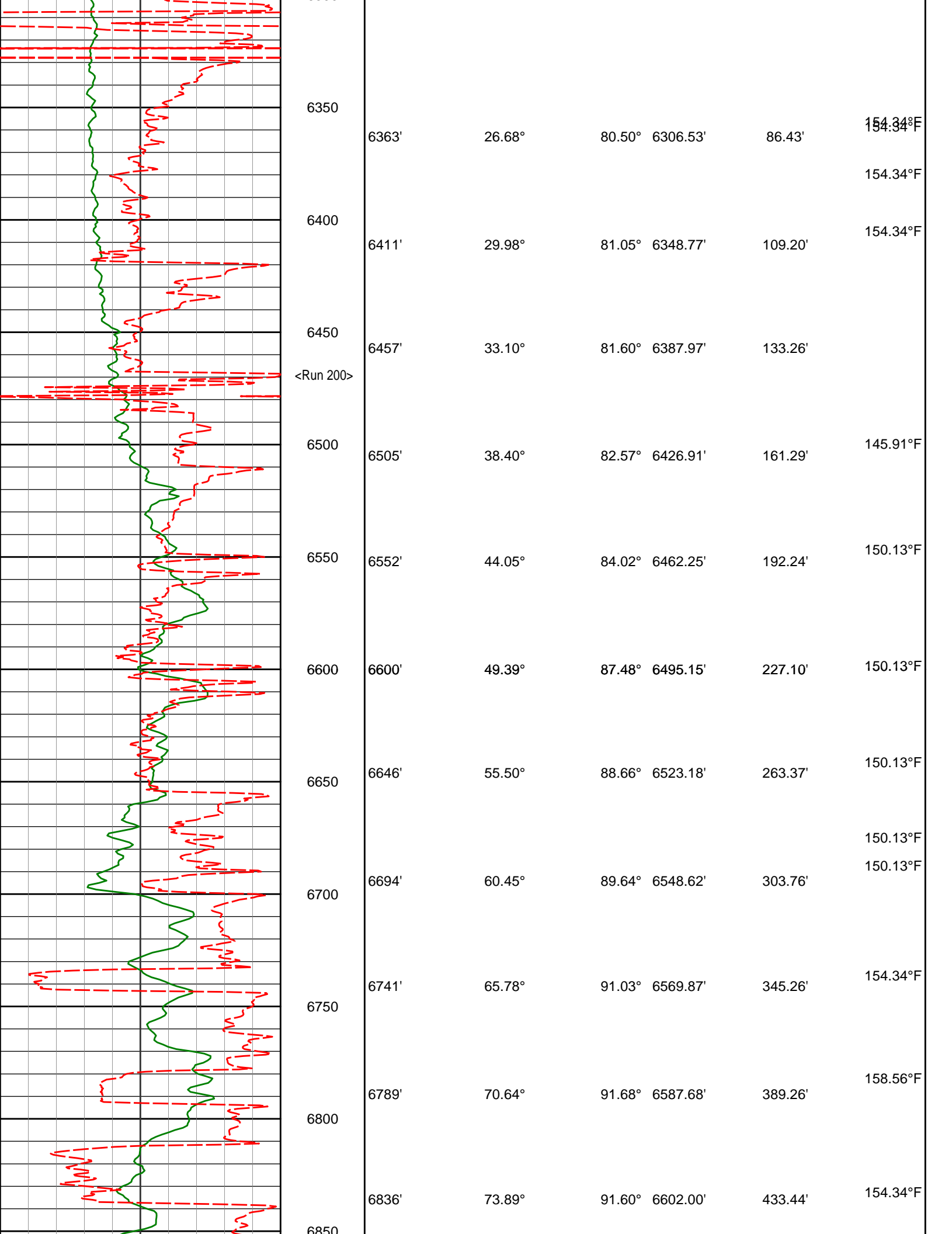
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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 8.1.10
6. Gamma presented inside casing/cement from 6934 ft. MD to 6976 ft. MD.

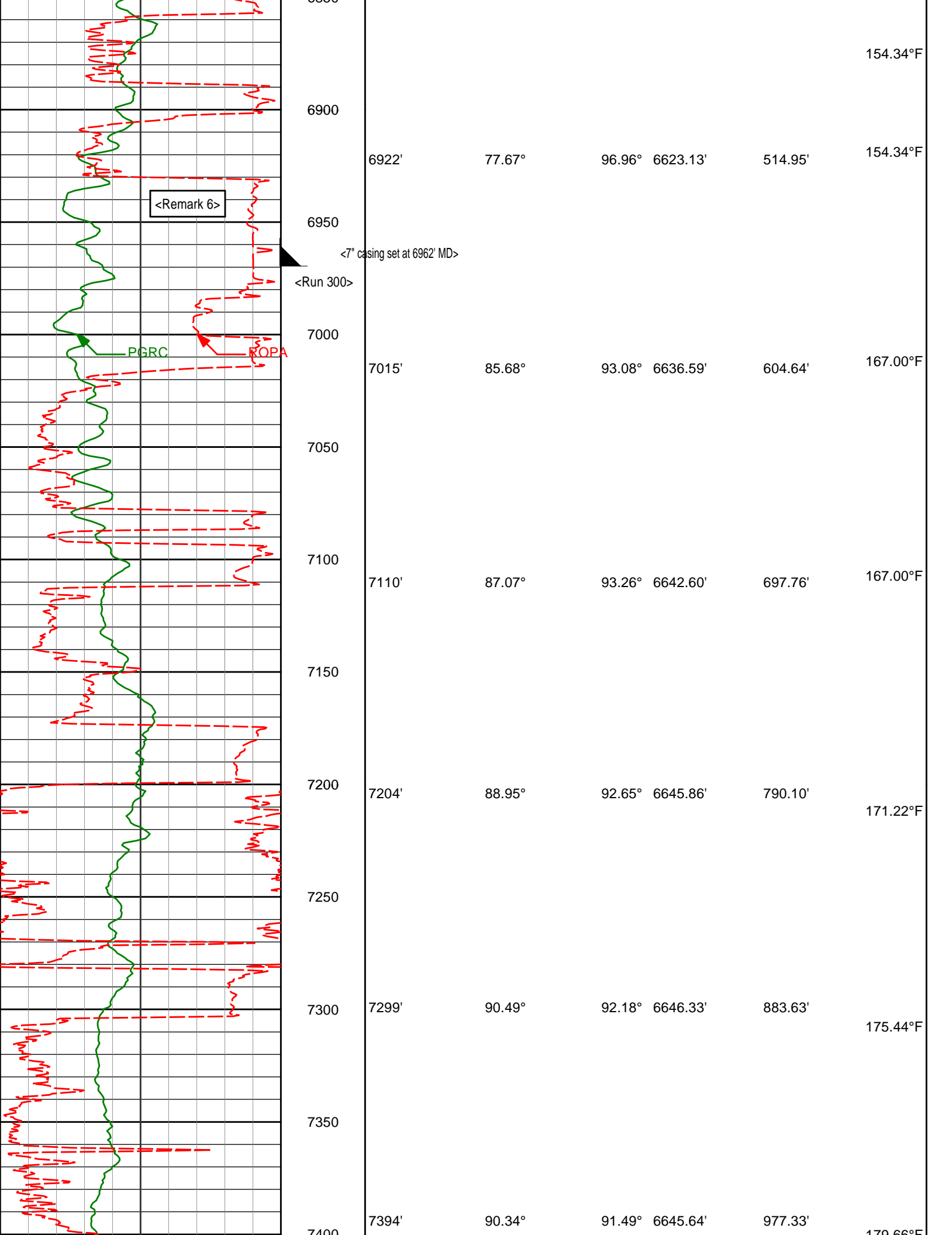
WARRANTY

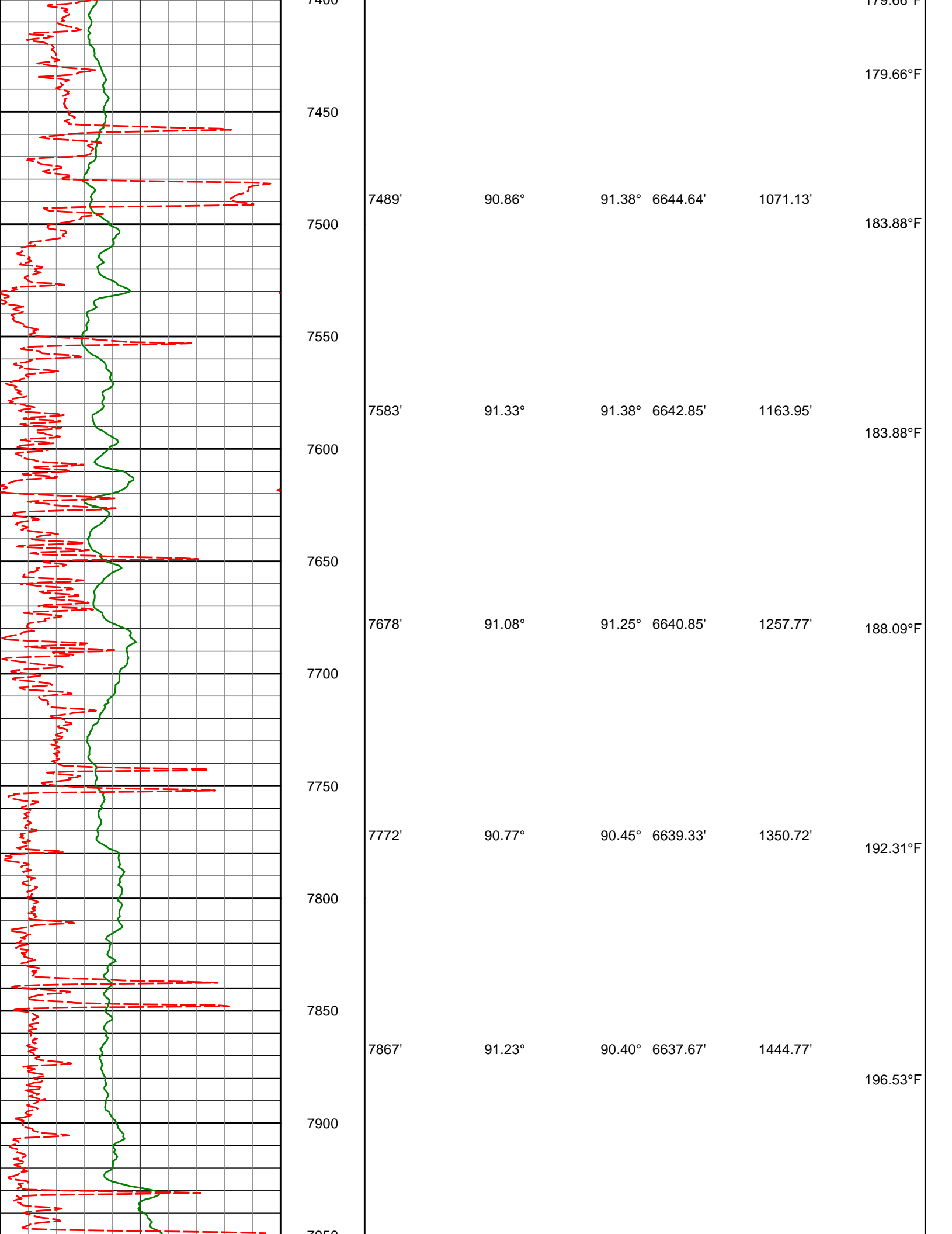
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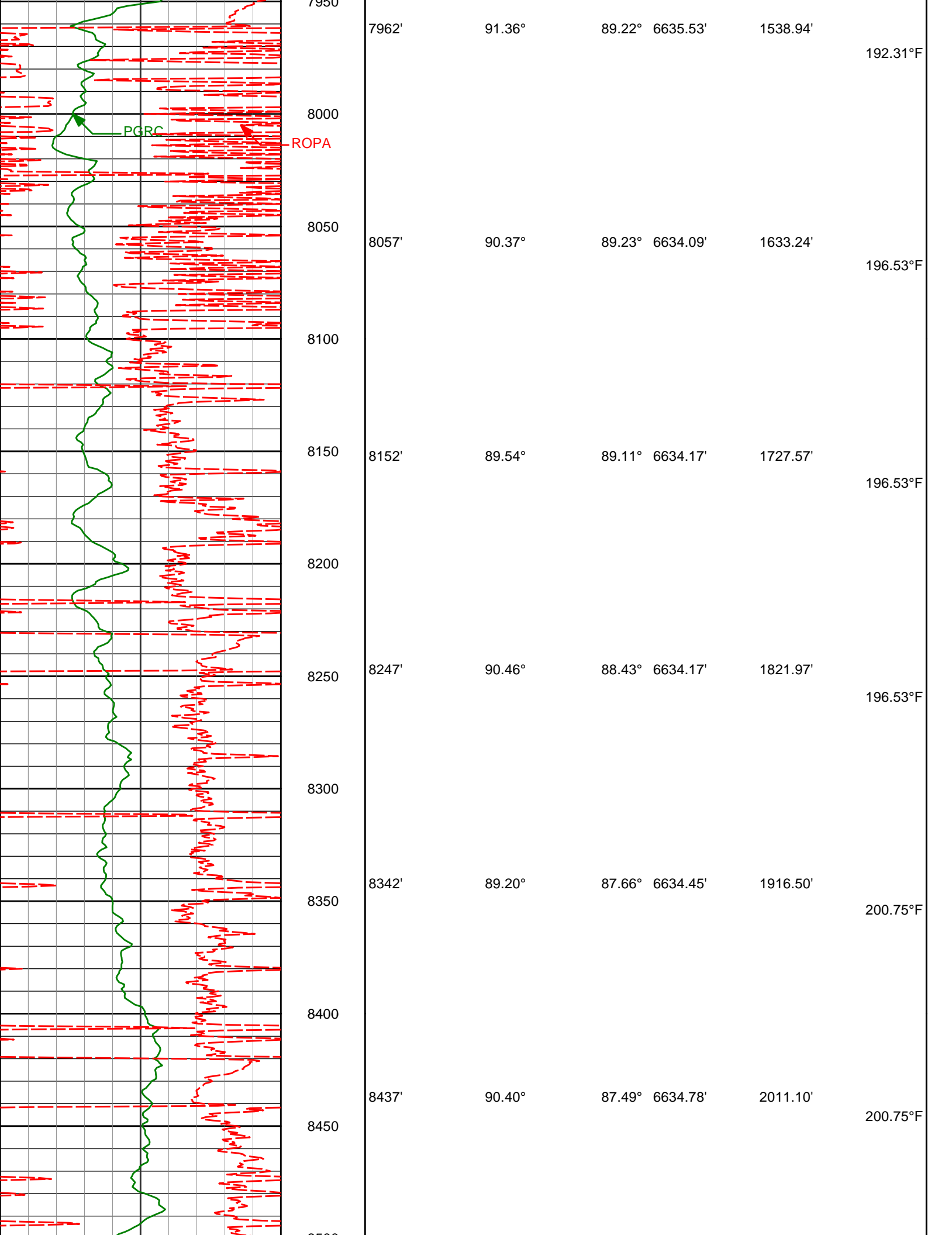
MD Detail 1:600 Scale

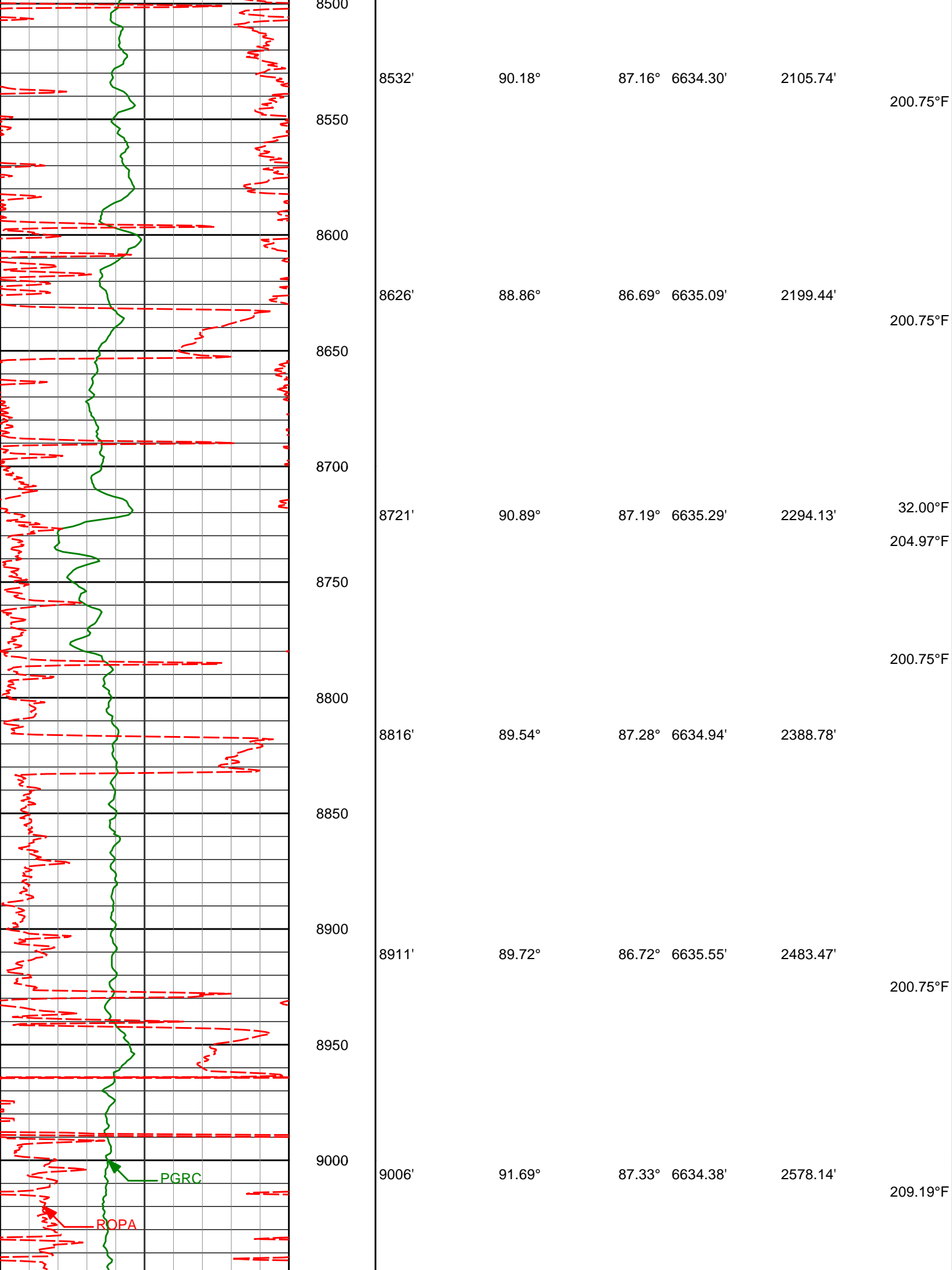


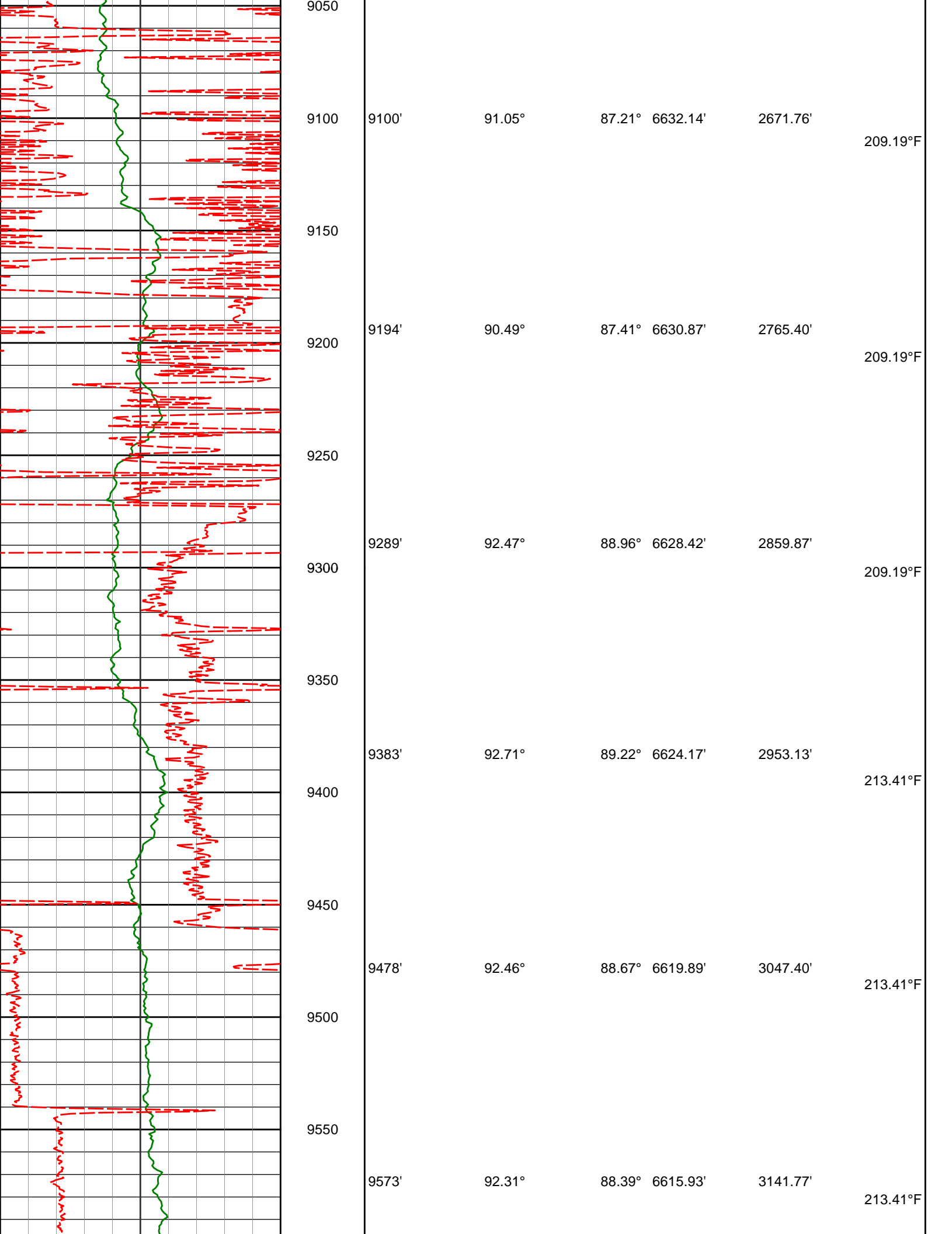


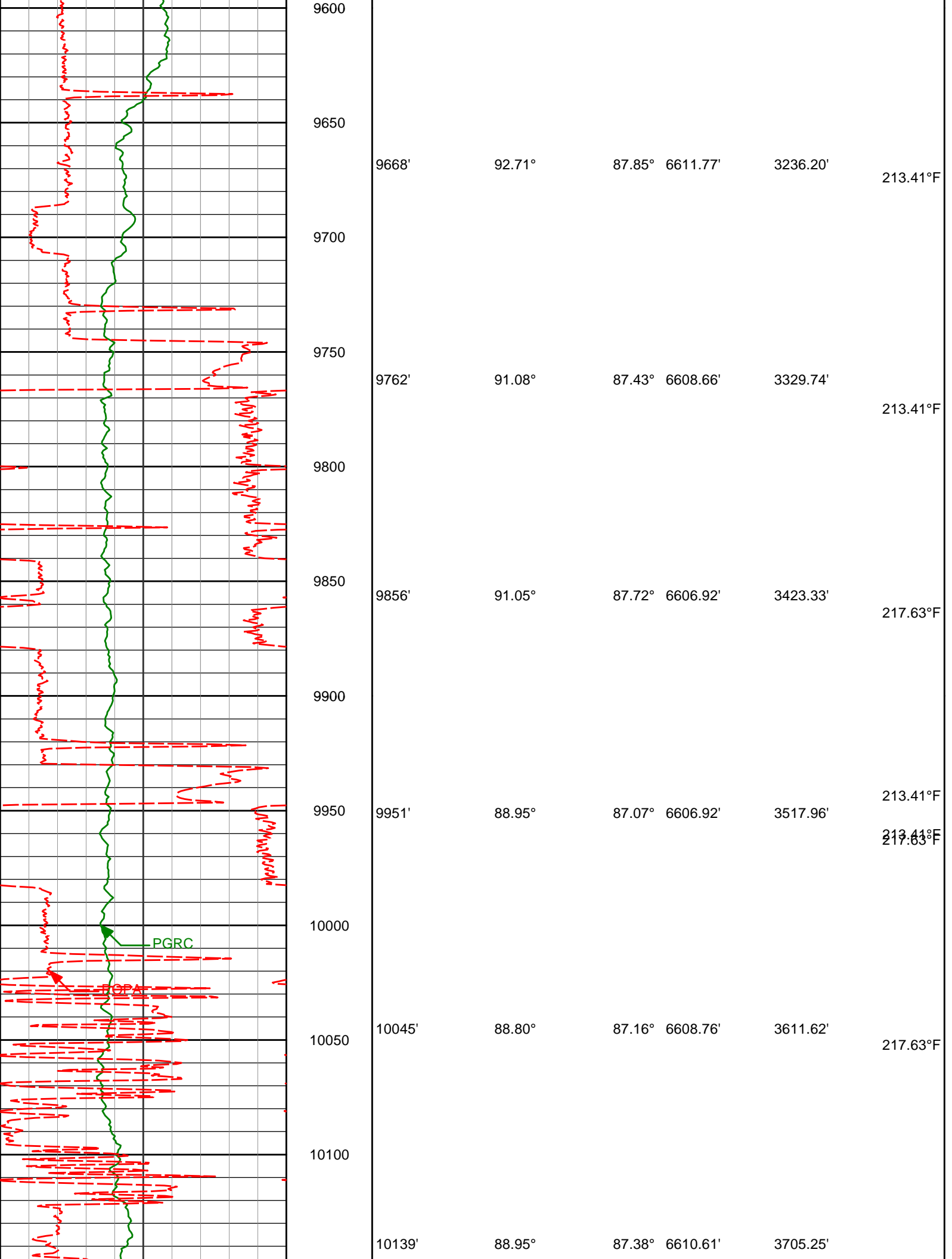


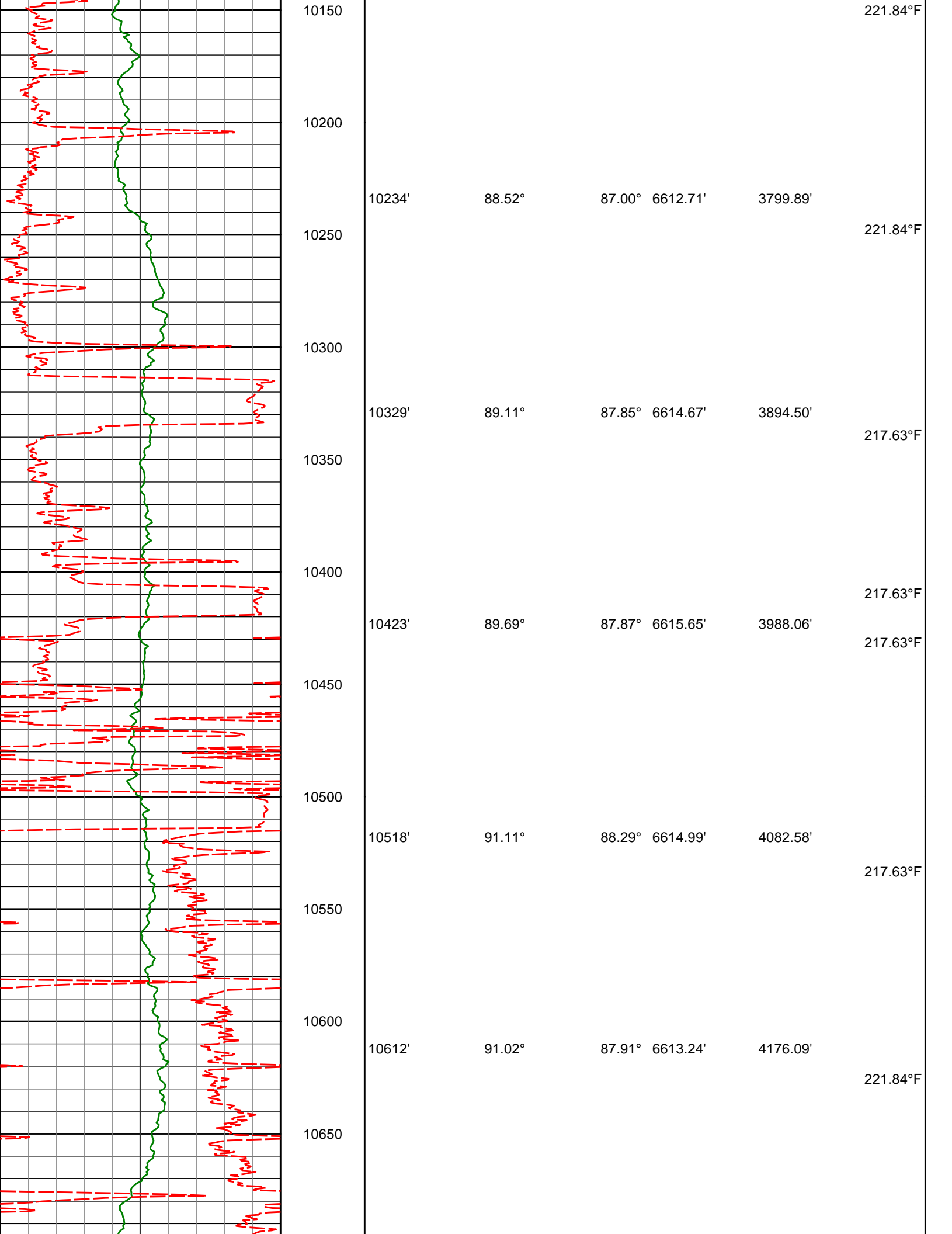


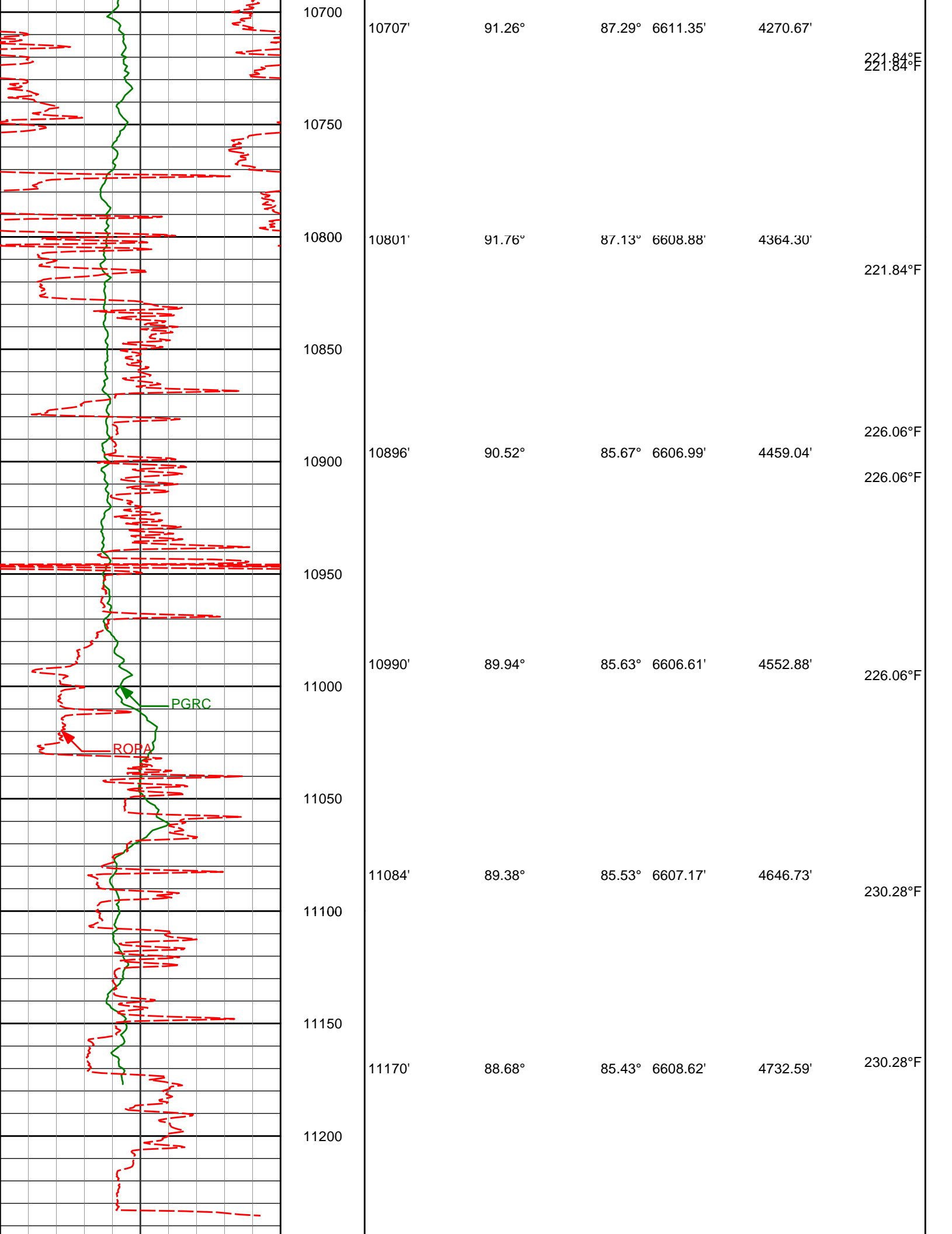


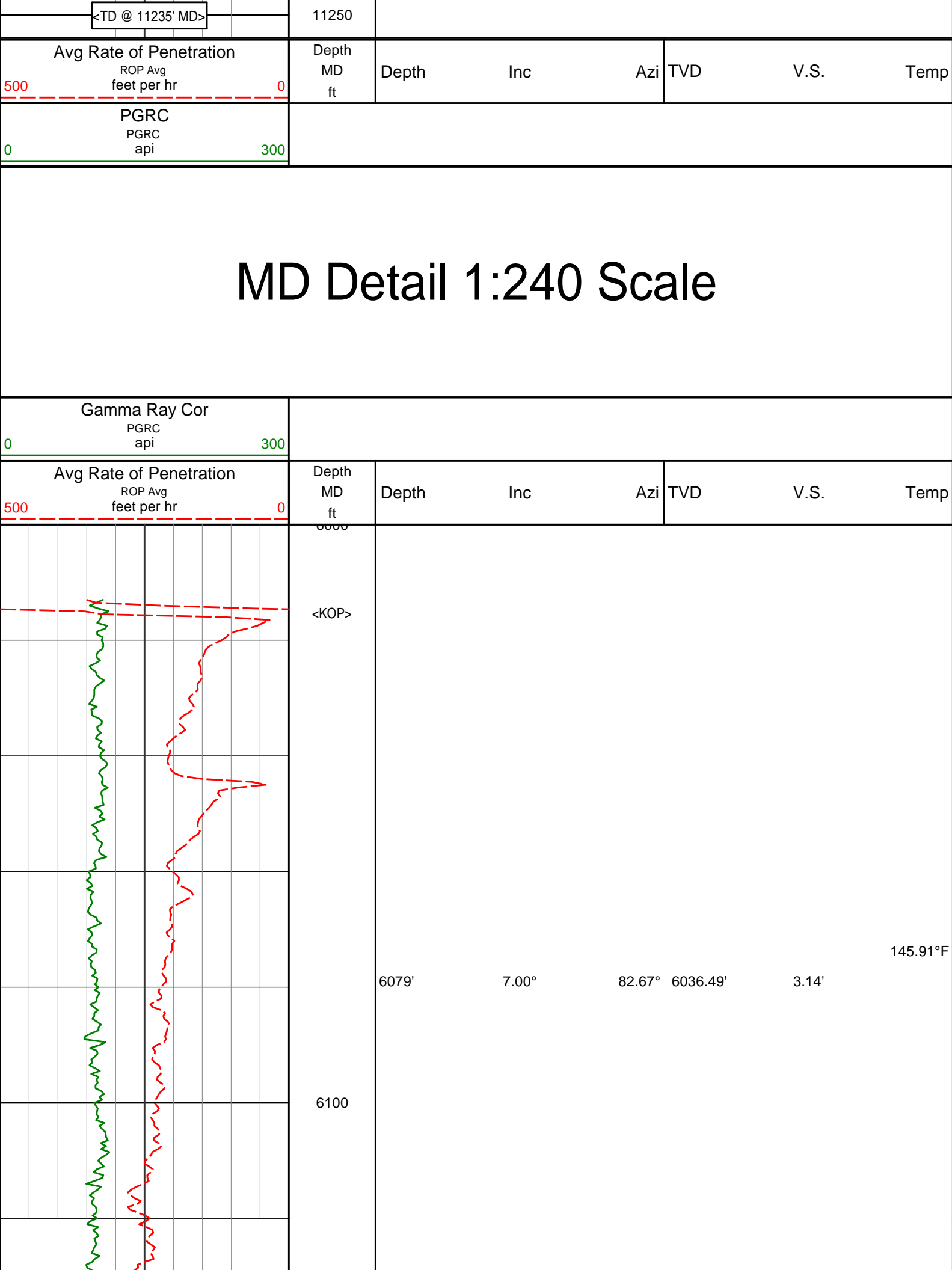


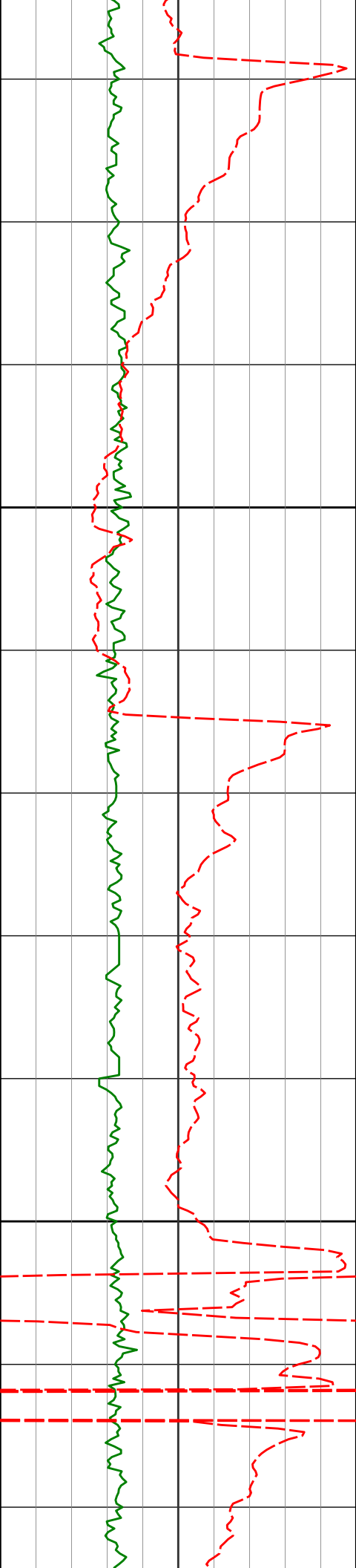












6200

6300

6174'

14.93°

73.12°

6129.69'

21.04'

145.91°F

6268'

19.98°

75.53°

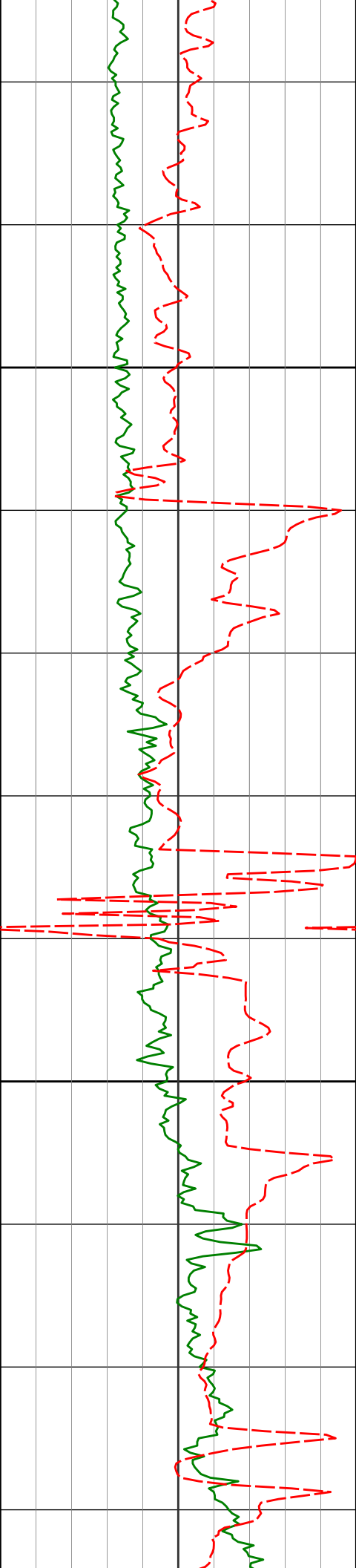
6219.33'

48.96'

150.13°F

150.13°F

150.13°F



6400

<Run 200>

6500

6363'

26.68°

80.50°

6306.53'

86.43'

6411'

29.98°

81.05°

6348.77'

109.20'

6457'

33.10°

81.60°

6387.97'

133.26'

6505'

38.40°

82.57°

6426.91'

161.29'

6552'

44.05°

84.02°

6462.25'

192.24'

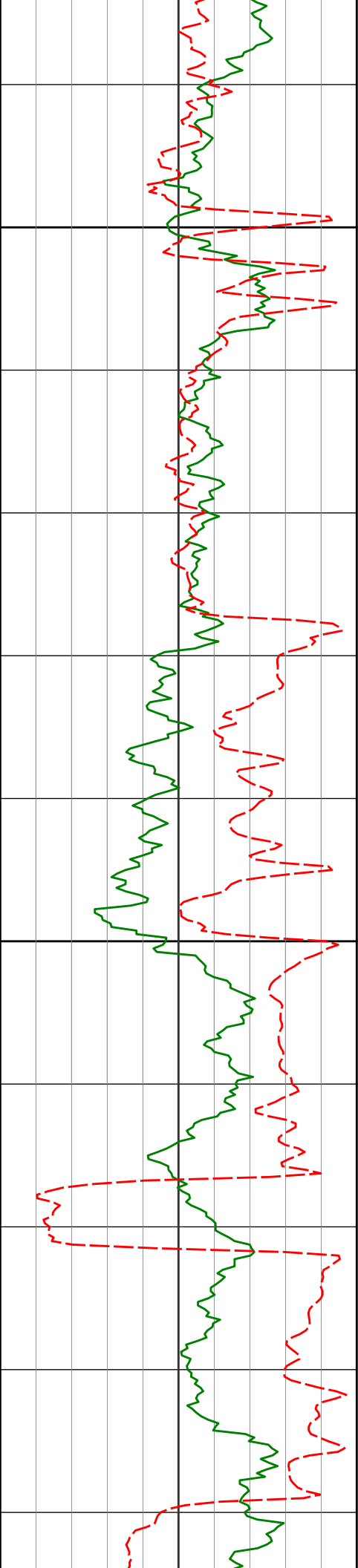
154.34°F
154.34°F

154.34°F

154.34°F

145.91°F

150.13°F



6600

6600'

49.39°

87.48°

6495.15'

227.10'

150.13°F

6646'

55.50°

88.66°

6523.18'

263.37'

150.13°F

6700

6694'

60.45°

89.64°

6548.62'

303.76'

150.13°F

6741'

65.78°

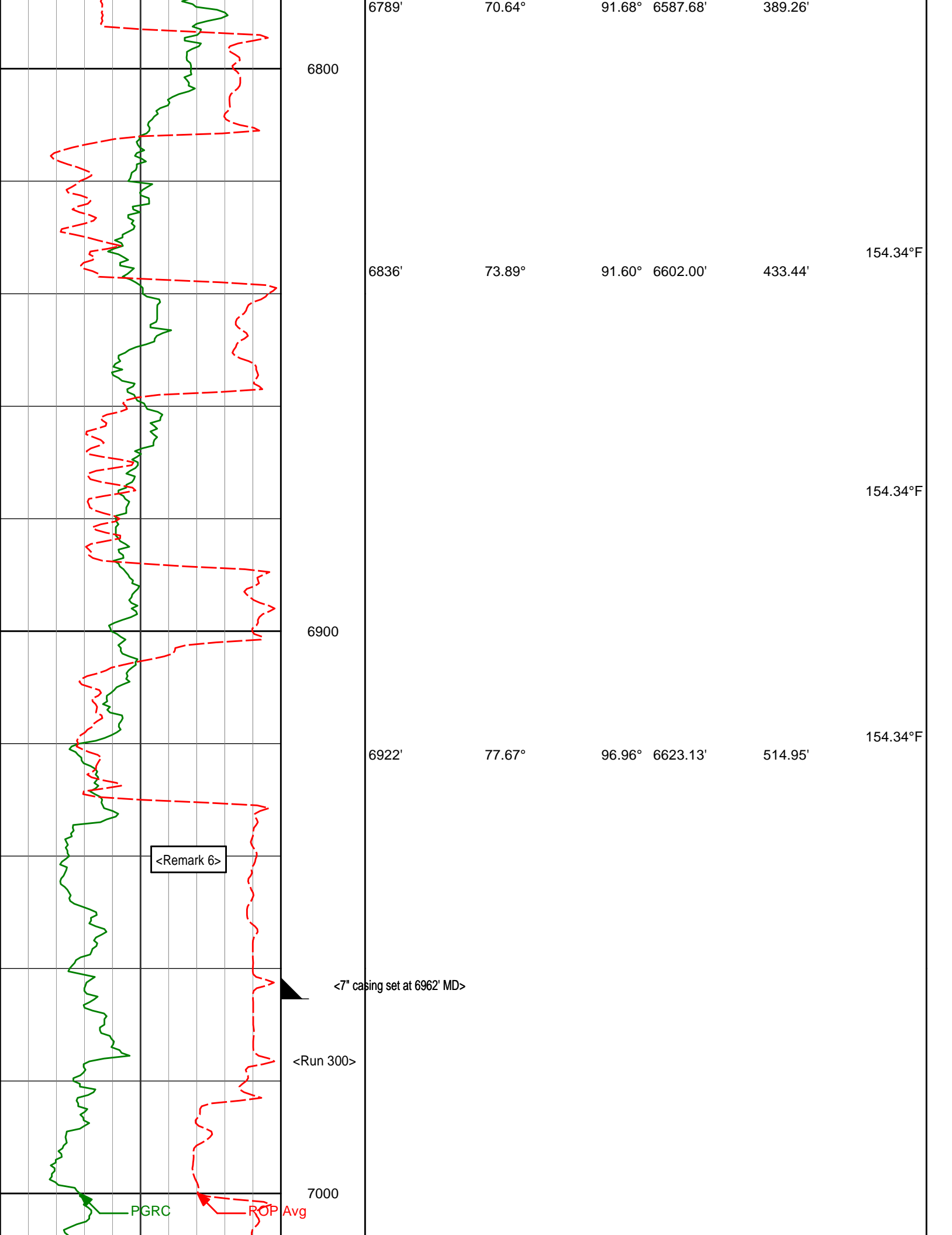
91.03°

6569.87'

345.26'

154.34°F

158.56°F





7100

7200

7015'

7110'

7204'

85.68°

87.07°

88.95°

93.08° 6636.59'

93.26° 6642.60'

92.65° 6645.86'

604.64'

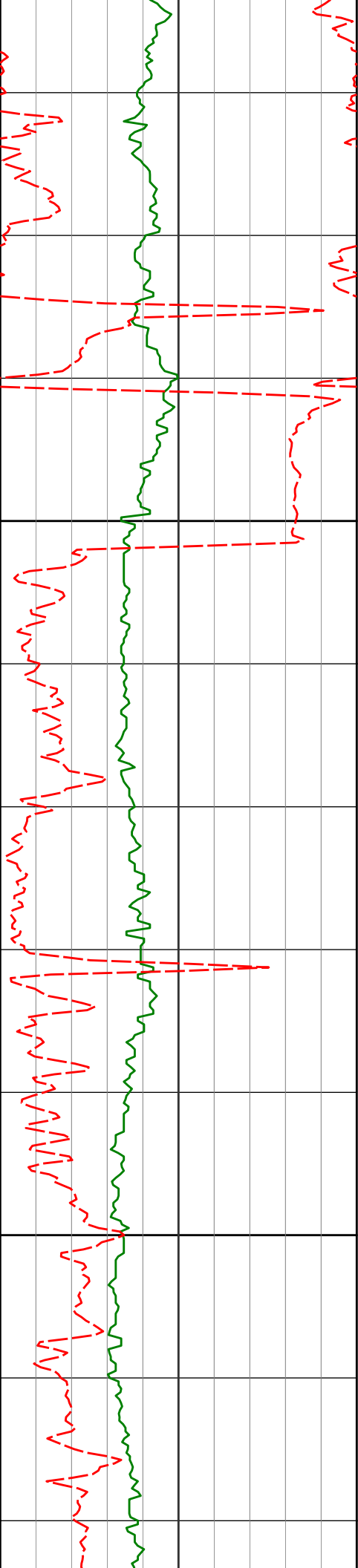
697.76'

790.10'

167.00°F

167.00°F

171.22°F



7300

7299'

90.49°

92.18° 6646.33'

883.63'

175.44°F

7400

7394'

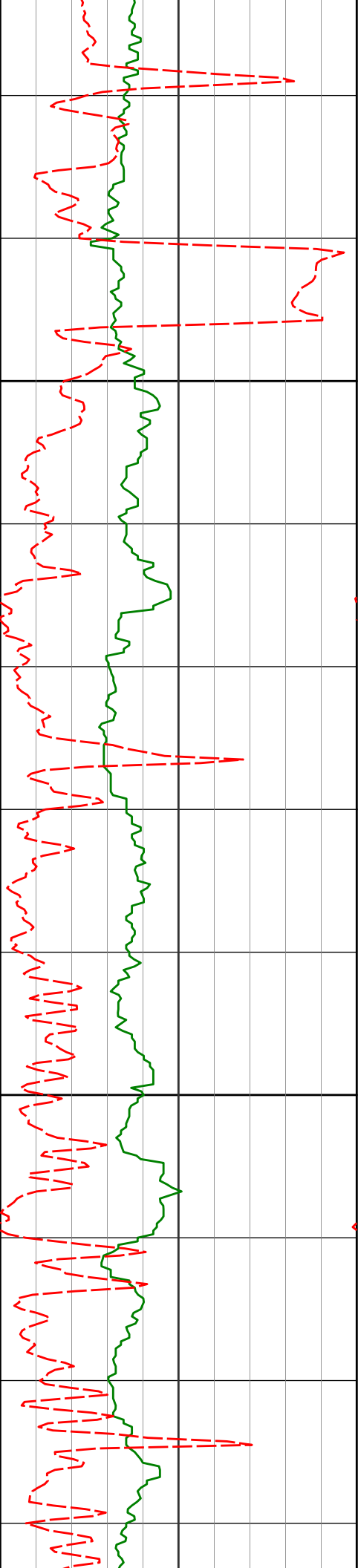
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91.49° 6645.64'

977.33'

179.66°F

179.66°F



7500

7489'

90.86°

91.38° 6644.64'

1071.13'

183.88°F

7600

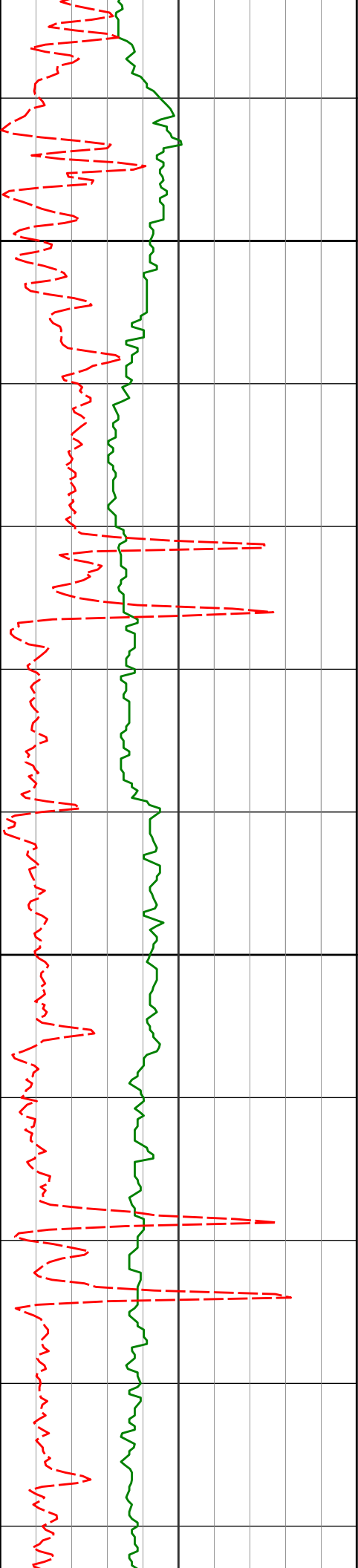
7583'

91.33°

91.38° 6642.85'

1163.95'

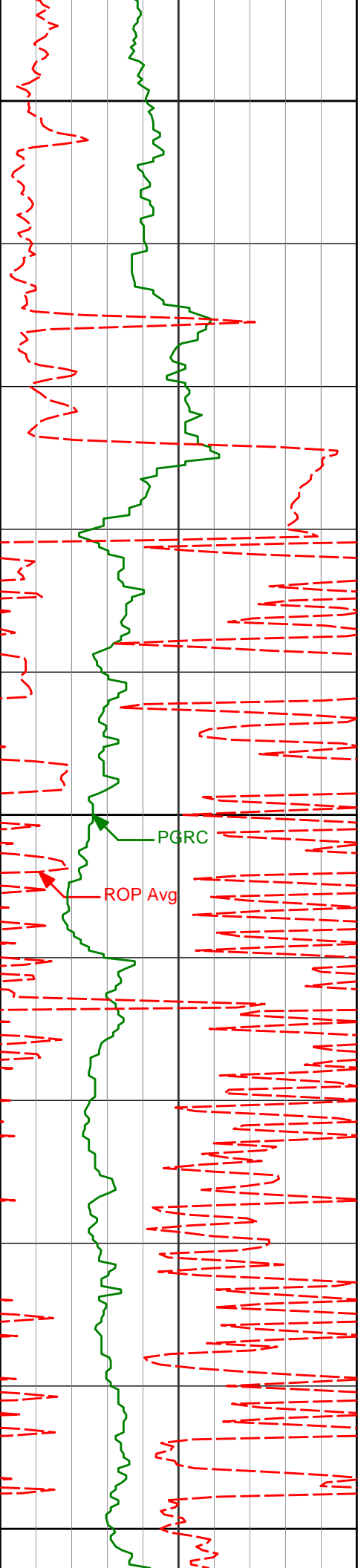
183.88°F



7700

7800

7678'	91.08°	91.25°	6640.85'	1257.77'	188.09°F
7772'	90.77°	90.45°	6639.33'	1350.72'	192.31°F
7867'	91.23°	90.40°	6637.67'	1444.77'	196.53°F



7900

7962'

91.36°

89.22° 6635.53'

1538.94'

192.31°F

8000

PGRC

ROP Avg

8057'

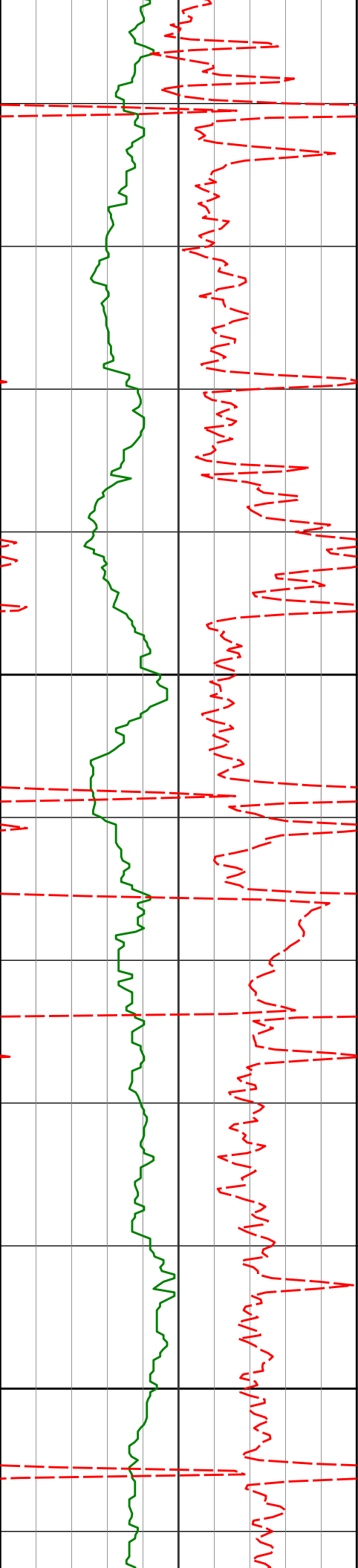
90.37°

89.23° 6634.09'

1633.24'

196.53°F

8100



8152'

89.54°

89.11° 6634.17'

1727.57'

196.53°F

8200

8247'

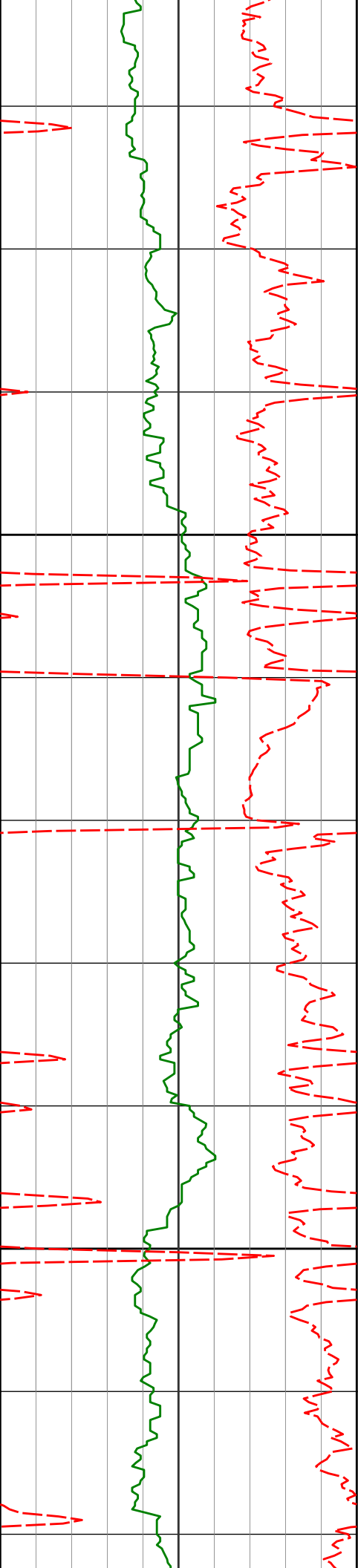
90.46°

88.43° 6634.17'

1821.97'

196.53°F

8300



8342'

89.20°

87.66° 6634.45'

1916.50'

200.75°F

8400

8437'

90.40°

87.49° 6634.78'

2011.10'

200.75°F

8500

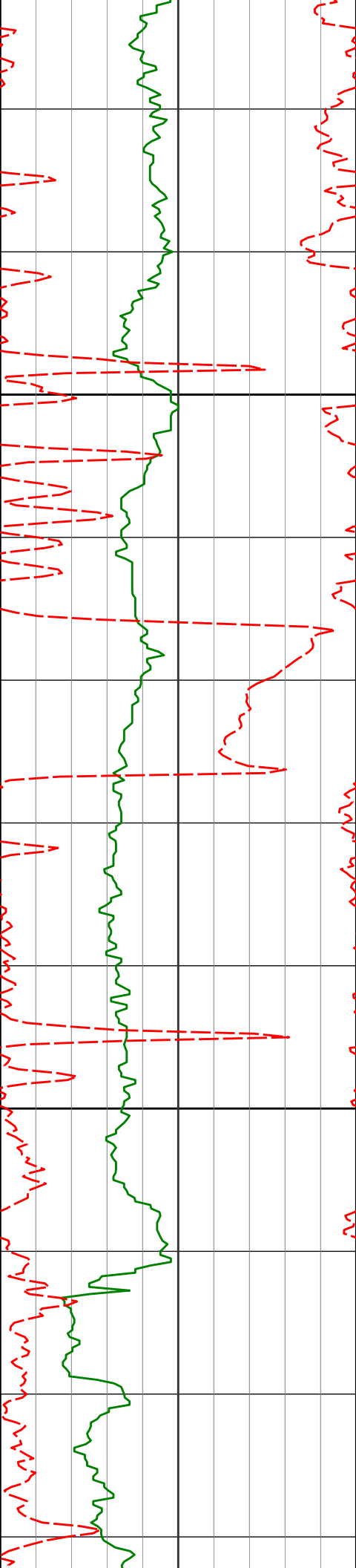
8532'

90.18°

87.16° 6634.30'

2105.74'

200.75°F



8600

8626'

88.86°

86.69°

6635.09'

2199.44'

200.75°F

8700

8721'

90.89°

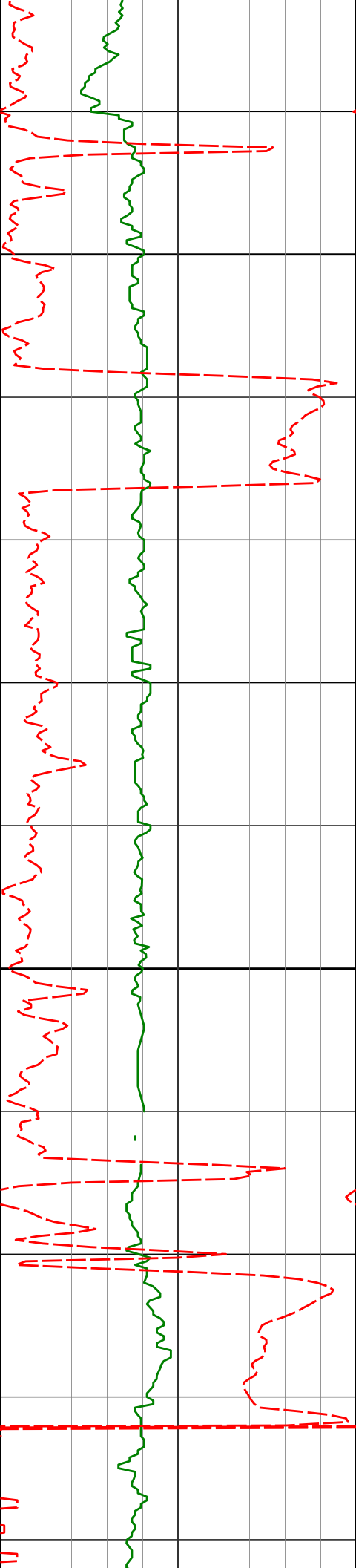
87.19°

6635.29'

2294.13'

32.00°F

204.97°F



8800

8900

8816'

8911'

89.54°

89.72°

87.28° 6634.94'

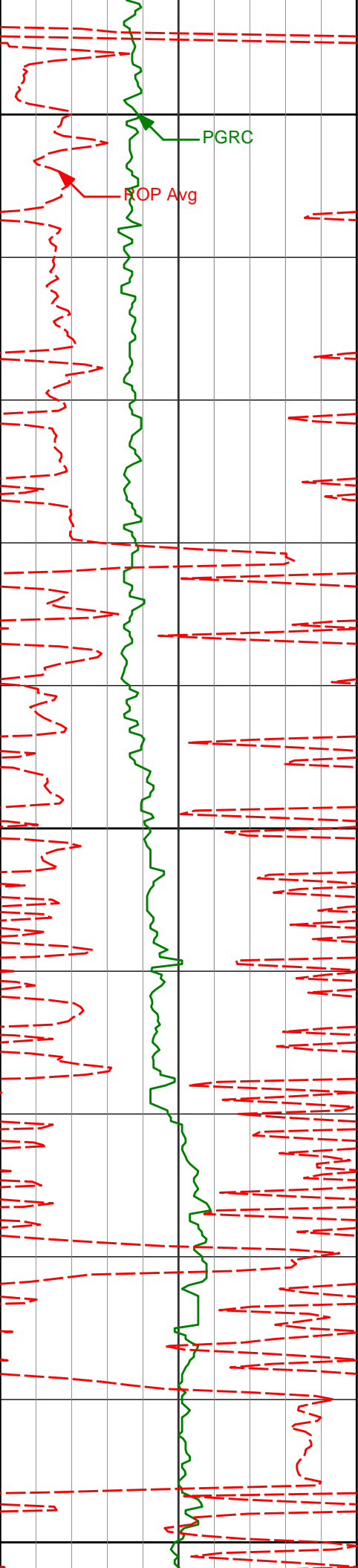
86.72° 6635.55'

2388.78'

2483.47'

200.75°F

200.75°F



9000

9006'

91.69°

87.33°

6634.38'

2578.14'

209.19°F

9100

9100'

91.05°

87.21°

6632.14'

2671.76'

209.19°F

9200

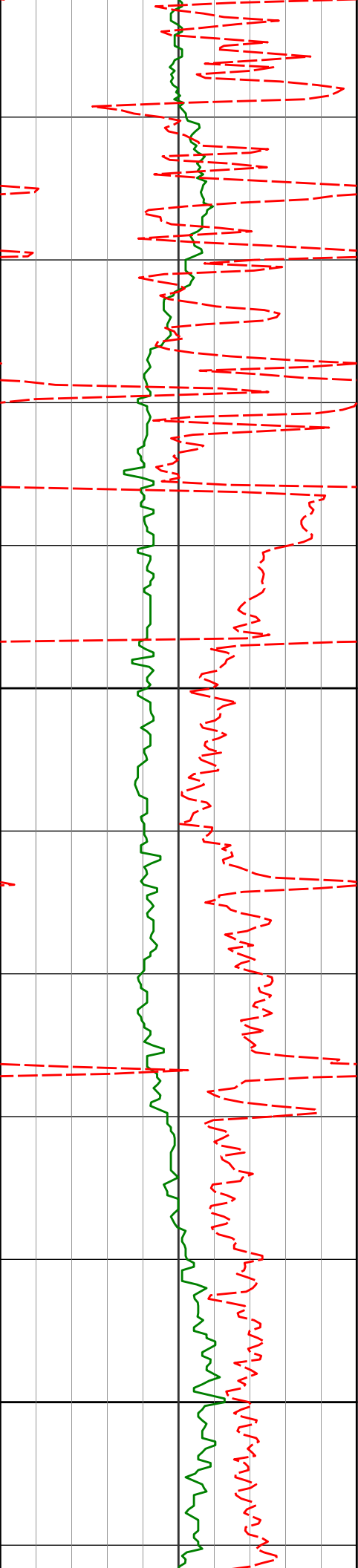
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90.49°

87.41°

6630.87'

2765.40'



9300

9400

9289'

9383'

92.47°

92.71°

88.96°

89.22°

6628.42'

6624.17'

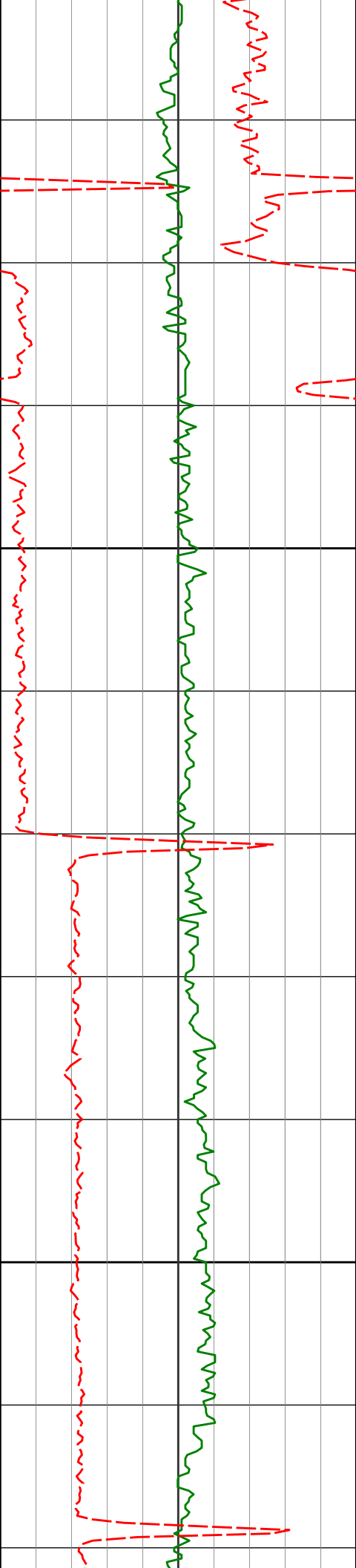
2859.87'

2953.13'

209.19°F

209.19°F

213.41°F



9500

9600

9478'

92.46°

88.67°

6619.89'

3047.40'

213.41°F

9573'

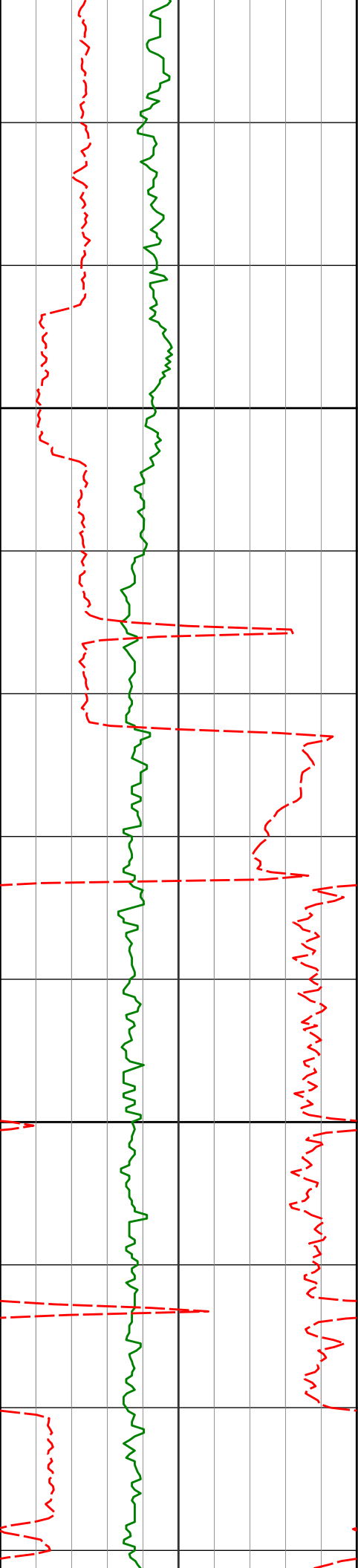
92.31°

88.39°

6615.93'

3141.77'

213.41°F



9700

9800

9668'

9762'

9856'

92.71°

91.08°

91.05°

87.85°

87.43°

87.72°

6611.77'

6608.66'

6606.92'

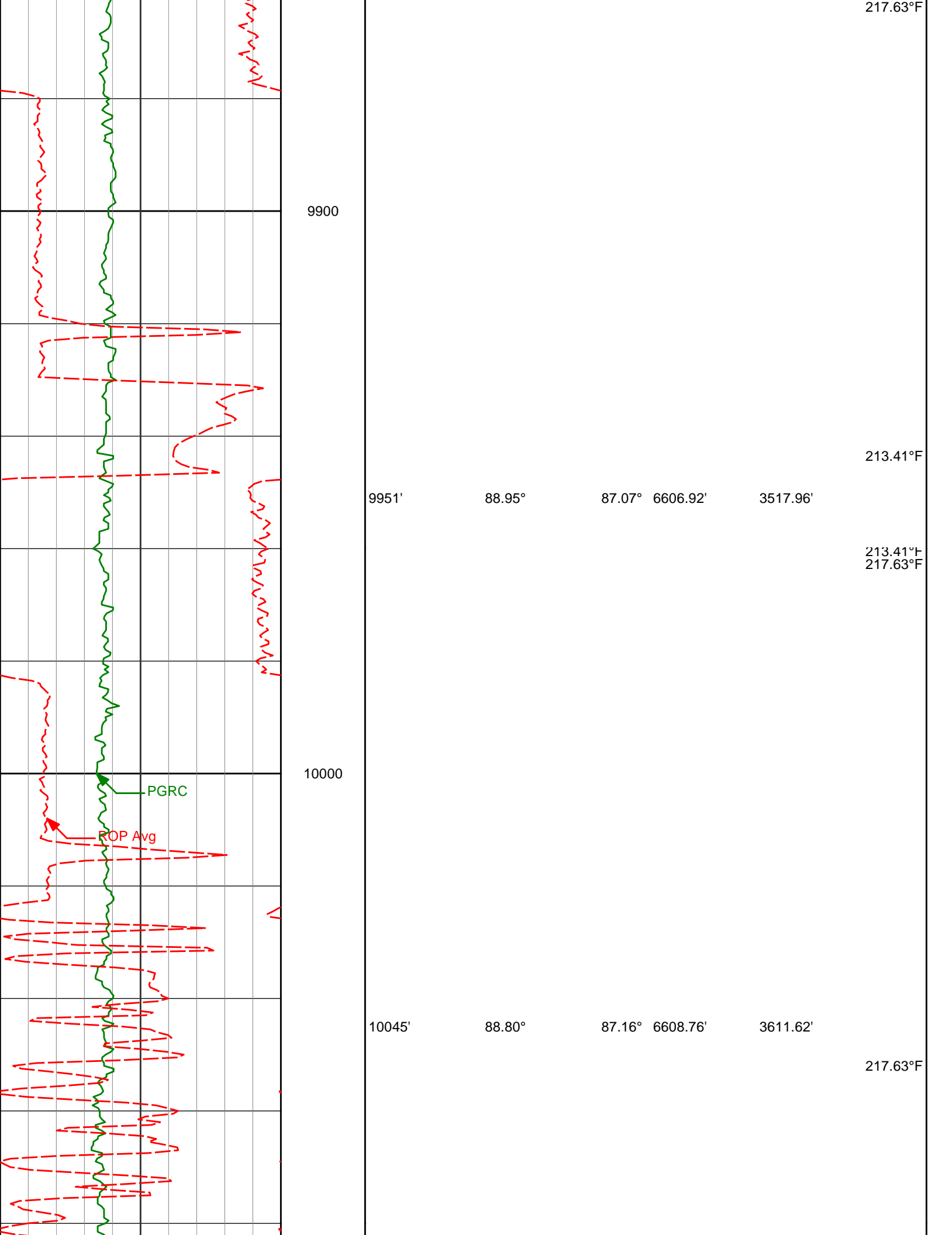
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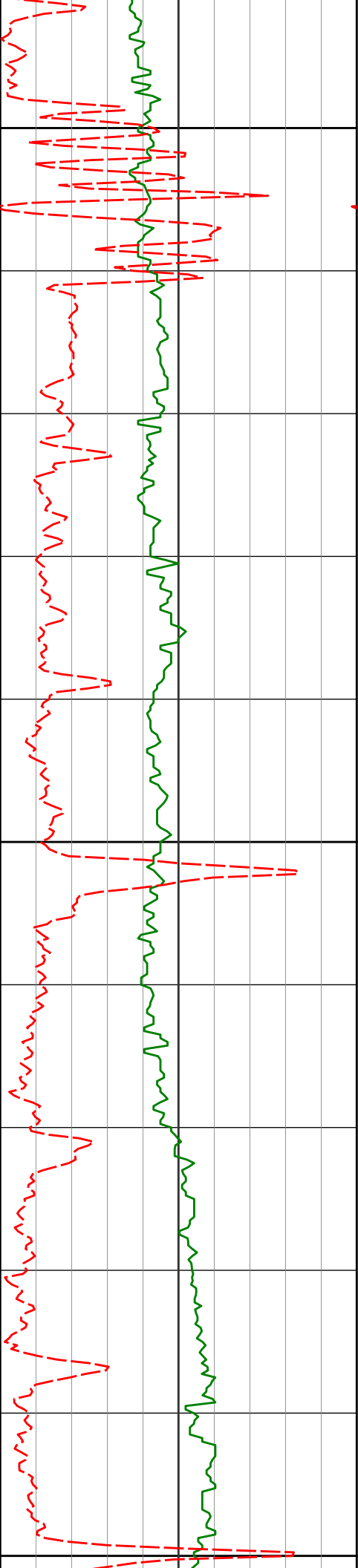
3329.74'

3423.33'

213.41°F

213.41°F





10100

10139'

88.95°

87.38° 6610.61'

3705.25'

221.84°F

10200

10234'

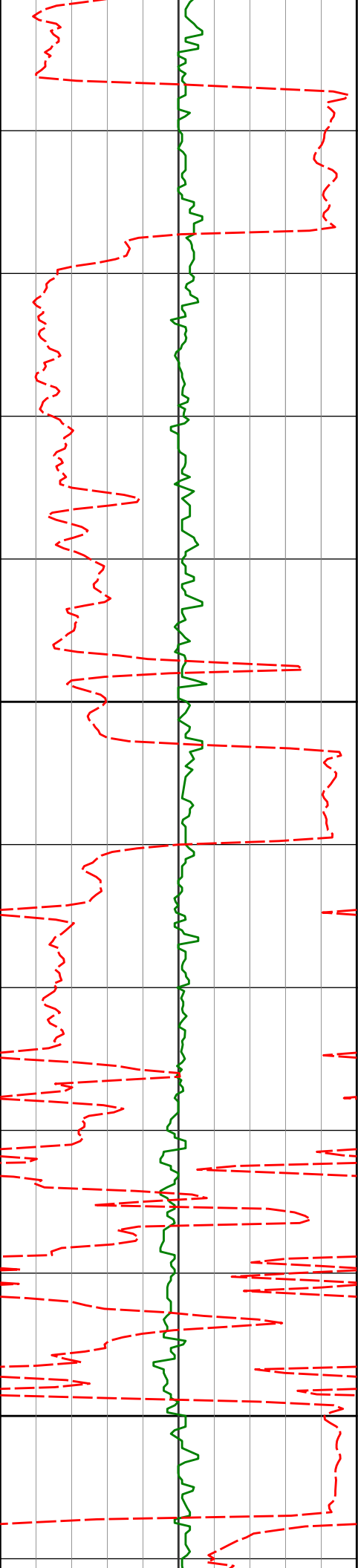
88.52°

87.00° 6612.71'

3799.89'

221.84°F

10300



10329'

89.11°

87.85° 6614.67'

3894.50'

217.63°F

10400

217.63°F

10423'

89.69°

87.87° 6615.65'

3988.06'

217.63°F

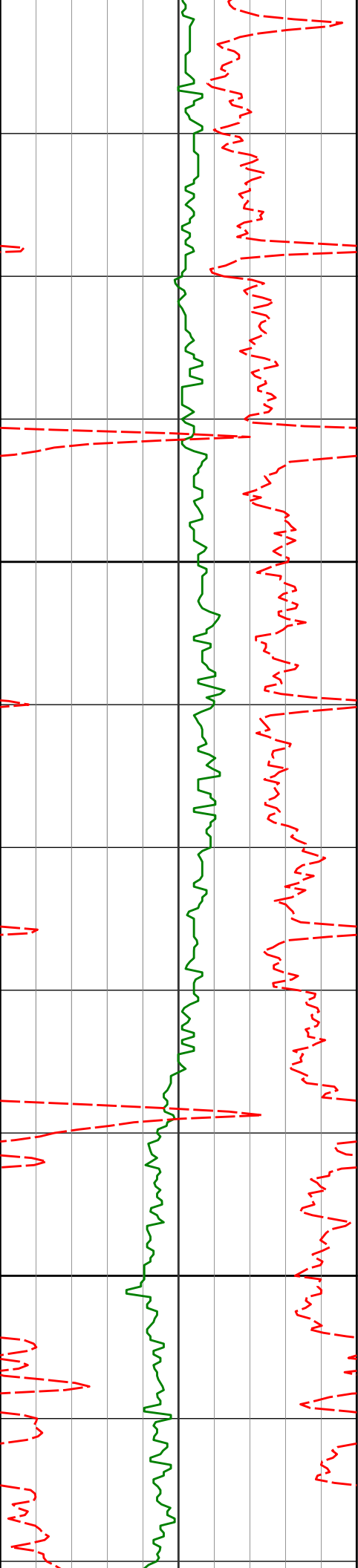
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10518'

91.11°

88.29° 6614.99'

4082.58'



10600

10612'

91.02°

87.91° 6613.24'

4176.09'

10700

10707'

91.26°

87.29° 6611.35'

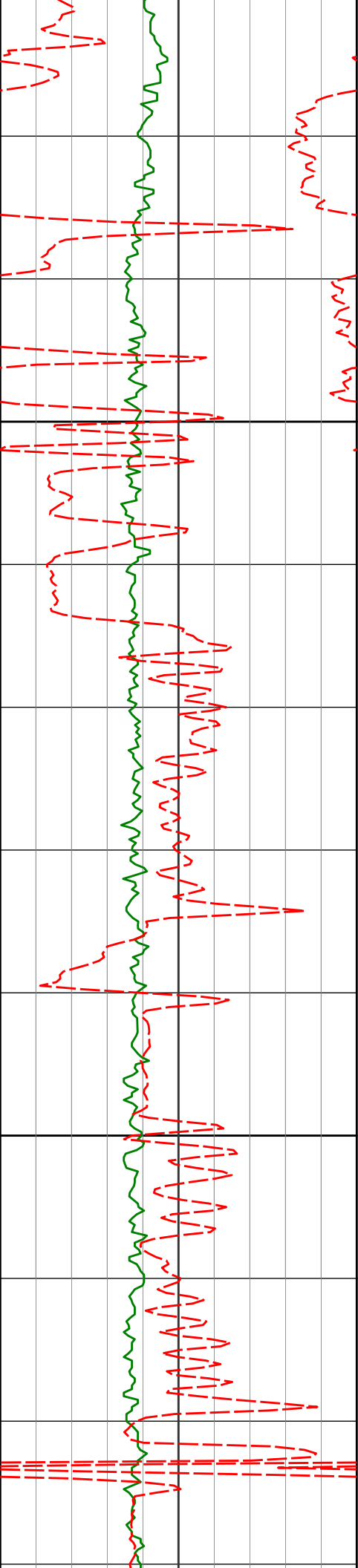
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221.84°F

221.84°F

221.84°F



10800

10801'

91.76°

87.13° 6608.88'

4364.30'

221.84°F

10900

10896'

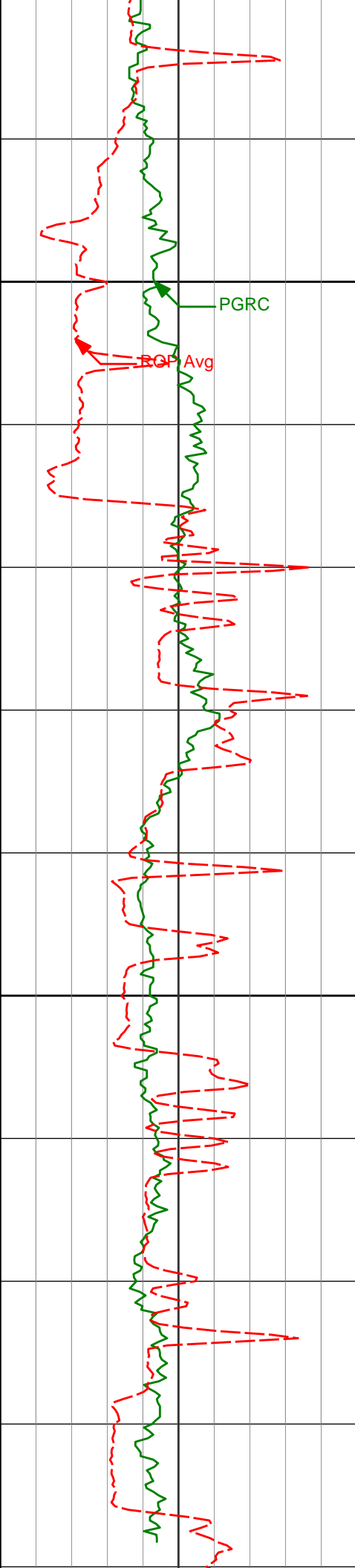
90.52°

85.67° 6606.99'

4459.04'

226.06°F

226.06°F



11000

10990'

89.94°

85.63°

6606.61'

4552.88'

226.06°F

PGRC

RGP Avg

11084'

89.38°

85.53°

6607.17'

4646.73'

230.28°F

11100

11170'

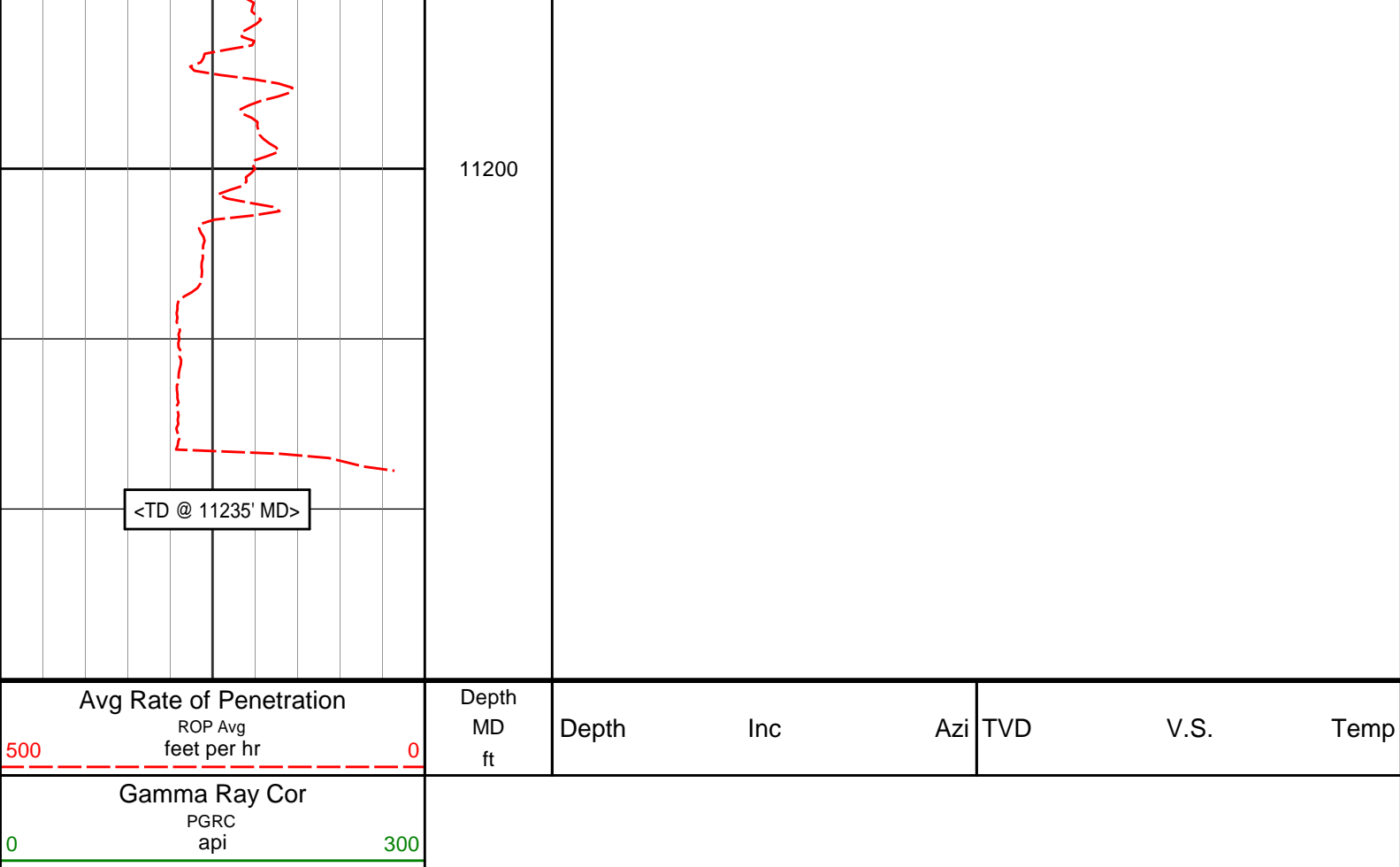
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85.43°

6608.62'

4732.59'

230.28°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Aggie State AA17-635
Wattenberg
Weld Colorado
USA
CA-XX-0902101511

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
364.00	0.60	192.44	363.99	1.86 S	0.41 W	-0.65	0.16
729.00	0.50	192.04	728.98	5.28 S	1.15 W	-1.85	0.03
1007.00	0.40	211.30	1006.97	7.30 S	1.91 W	-2.87	0.06
1100.00	0.49	196.17	1099.97	7.96 S	2.19 W	-3.23	0.16
1192.00	0.59	175.38	1191.96	8.81 S	2.26 W	-3.42	0.24
1470.00	0.65	195.13	1469.95	11.76 S	2.56 W	-4.10	0.08
1561.00	0.66	185.43	1560.94	12.78 S	2.74 W	-4.42	0.12
1653.00	0.56	184.70	1652.93	13.75 S	2.83 W	-4.64	0.11
1746.00	3.10	353.47	1745.90	11.71 S	3.15 W	-4.68	3.93
1838.00	5.44	346.85	1837.63	4.99 S	4.43 W	-5.05	2.60
1930.00	6.66	336.03	1929.12	4.13 N	7.59 W	-6.97	1.81
2022.00	7.99	342.94	2020.37	15.12 N	11.63 W	-9.52	1.73
2114.00	8.83	350.66	2111.38	28.20 N	14.65 W	-10.77	1.53
2207.00	7.88	348.31	2203.40	41.49 N	17.10 W	-11.43	1.09
2300.00	9.10	352.16	2295.38	55.02 N	19.40 W	-11.90	1.45
2392.00	7.43	345.84	2386.42	67.99 N	21.85 W	-12.60	2.06
2487.00	9.33	354.00	2480.40	81.61 N	24.15 W	-13.08	2.35
2581.00	8.13	352.44	2573.31	95.78 N	25.83 W	-12.85	1.30
2676.00	10.52	354.60	2667.05	111.07 N	27.53 W	-12.49	2.54

2866.00	10.85	351.07	2853.76	146.01 N	31.93 W	-12.21	0.39
2960.00	10.26	348.94	2946.17	162.96 N	34.91 W	-12.91	0.75
3054.00	10.14	347.98	3038.68	179.27 N	38.24 W	-14.04	0.22
3149.00	9.48	343.51	3132.30	194.95 N	42.21 W	-15.88	1.06
3243.00	6.99	341.85	3225.32	207.81 N	46.18 W	-18.11	2.66
3338.00	7.83	349.81	3319.53	219.68 N	49.13 W	-19.45	1.39
3433.00	7.56	359.69	3413.68	232.29 N	50.31 W	-18.94	1.42
3528.00	8.01	6.56	3507.80	245.12 N	49.59 W	-16.51	1.09
3622.00	9.79	8.54	3600.67	259.53 N	47.65 W	-12.68	1.92
3717.00	11.50	1.11	3694.03	276.99 N	46.27 W	-8.98	2.30
3812.00	12.71	350.27	3786.93	296.76 N	47.85 W	-7.92	2.71
3907.00	13.44	350.79	3879.47	317.96 N	51.39 W	-8.60	0.78
4001.00	12.75	351.38	3971.02	339.00 N	54.69 W	-9.07	0.75
4094.00	11.86	350.73	4061.89	358.58 N	57.77 W	-9.52	0.97
4189.00	10.49	349.85	4155.08	376.73 N	60.86 W	-10.17	1.45
4284.00	9.41	352.99	4248.65	392.95 N	63.33 W	-10.46	1.27
4378.00	8.20	348.06	4341.54	407.13 N	65.66 W	-10.88	1.52
4472.00	7.50	346.90	4434.66	419.67 N	68.44 W	-11.96	0.76
4566.00	6.54	347.22	4527.96	430.86 N	71.01 W	-13.02	1.02
4660.00	7.79	3.56	4621.23	442.44 N	71.80 W	-12.26	2.53
4755.00	6.68	1.95	4715.47	454.39 N	71.21 W	-10.09	1.19
4849.00	7.17	344.53	4808.80	465.51 N	72.59 W	-9.98	2.28
4944.00	5.76	348.55	4903.19	475.90 N	75.12 W	-11.10	1.56
5038.00	5.61	345.57	4996.73	484.97 N	77.20 W	-11.95	0.35
5132.00	4.66	346.88	5090.35	493.14 N	79.21 W	-12.86	1.02
5227.00	1.50	351.03	5185.20	498.13 N	80.28 W	-13.26	3.33
5321.00	2.11	8.65	5279.15	501.05 N	80.21 W	-12.80	0.87
5605.00	2.29	9.27	5562.95	511.82 N	78.51 W	-9.68	0.06
5700.00	1.63	89.30	5657.90	513.71 N	76.86 W	-7.79	2.71
5889.00	2.19	12.05	5846.83	517.28 N	73.41 W	-3.90	1.28
5984.00	2.03	3.20	5941.76	520.73 N	72.94 W	-2.97	0.38
6079.00	7.00	82.67	6036.49	523.15 N	67.10 W	3.14	7.29
6174.00	14.93	73.12	6129.69	527.45 N	49.62 W	21.04	8.54
6268.00	19.98	75.53	6219.33	534.99 N	22.46 W	48.96	5.43
6363.00	26.68	80.50	6306.53	542.57 N	14.33 E	86.43	7.34
6411.00	29.98	81.05	6348.77	546.22 N	36.82 E	109.20	6.90
6457.00	33.10	81.60	6387.97	549.84 N	60.60 E	133.26	6.81
6505.00	38.40	82.57	6426.91	553.68 N	88.37 E	161.29	11.10
6552.00	44.05	84.02	6462.25	557.28 N	119.12 E	192.24	12.19
6600.00	49.39	87.48	6495.15	559.82 N	153.95 E	227.10	12.30
6646.00	55.50	88.66	6523.18	561.03 N	190.38 E	263.37	13.44
6694.00	60.45	89.64	6548.62	561.63 N	231.05 E	303.76	10.46
6741.00	65.78	91.03	6569.87	561.37 N	272.96 E	345.26	11.64
6789.00	70.64	91.68	6587.68	560.31 N	317.50 E	389.26	10.20
6836.00	73.89	91.60	6602.00	559.03 N	362.24 E	433.44	6.92
6922.00	77.67	96.96	6623.13	552.78 N	445.32 E	514.95	7.47
7015.00	85.68	93.08	6636.59	544.77 N	536.90 E	604.64	9.55
7110.00	87.07	93.26	6642.60	539.52 N	631.56 E	697.76	1.48
7204.00	88.95	92.65	6645.86	534.68 N	725.38 E	790.10	2.10
7299.00	90.49	92.18	6646.33	530.68 N	820.29 E	883.63	1.69
7394.00	90.34	91.49	6645.64	527.64 N	915.24 E	977.33	0.74
7489.00	90.86	91.38	6644.64	525.26 N	1010.20 E	1071.13	0.56
7583.00	91.33	91.38	6642.85	523.00 N	1104.16 E	1163.95	0.50
7678.00	91.08	91.25	6640.85	520.82 N	1199.11 E	1257.77	0.30
7772.00	90.77	90.45	6639.33	519.42 N	1293.09 E	1350.72	0.91
7867.00	91.23	90.40	6637.67	518.72 N	1388.07 E	1444.77	0.49
7962.00	91.36	89.22	6635.53	519.03 N	1483.04 E	1538.94	1.25
8057.00	90.37	89.23	6634.09	520.32 N	1578.02 E	1633.24	1.04
8152.00	89.54	89.11	6634.17	521.69 N	1673.01 E	1727.57	0.88
8247.00	90.46	88.43	6634.17	523.73 N	1767.99 E	1821.97	1.20
8342.00	89.20	87.66	6634.45	526.97 N	1862.93 E	1916.50	1.55
8437.00	90.40	87.49	6634.78	530.99 N	1957.84 E	2011.10	1.28
8532.00	90.18	87.16	6634.30	535.43 N	2052.74 E	2105.74	0.42
8626.00	88.86	86.69	6635.09	540.47 N	2146.60 E	2199.44	1.49
8721.00	90.89	87.19	6635.29	545.54 N	2241.46 E	2294.13	2.20
8816.00	89.54	87.28	6634.94	550.12 N	2336.34 E	2388.78	1.42
8911.00	89.72	86.72	6635.55	555.09 N	2431.21 E	2483.47	0.62
9006.00	91.69	87.33	6634.38	560.02 N	2526.07 E	2578.14	2.17
9100.00	91.05	87.21	6632.14	564.50 N	2619.94 E	2671.76	0.69
9194.00	90.49	87.41	6630.87	568.91 N	2713.82 E	2765.40	0.63
9289.00	92.47	88.96	6628.42	571.92 N	2808.74 E	2859.87	2.65
9384.00	92.74	88.88	6624.15	573.44 N	2893.62 E	2954.12	2.88

9383.00	92.71	89.22	6624.17	573.41 N	2902.63 E	2953.13	0.38
9478.00	92.46	88.67	6619.89	575.16 N	2997.51 E	3047.40	0.64
9573.00	92.31	88.39	6615.93	577.59 N	3092.40 E	3141.77	0.33
9668.00	92.71	87.85	6611.77	580.71 N	3187.26 E	3236.20	0.71
9762.00	91.08	87.43	6608.66	584.57 N	3281.12 E	3329.74	1.79
9856.00	91.05	87.72	6606.92	588.55 N	3375.02 E	3423.33	0.31
9951.00	88.95	87.07	6606.92	592.87 N	3469.92 E	3517.96	2.31
10045.00	88.80	87.16	6608.76	597.60 N	3563.78 E	3611.62	0.19
10139.00	88.95	87.38	6610.61	602.08 N	3657.66 E	3705.25	0.28
10234.00	88.52	87.00	6612.71	606.73 N	3752.52 E	3799.89	0.60
10329.00	89.11	87.85	6614.67	611.00 N	3847.40 E	3894.50	1.09
10423.00	89.69	87.87	6615.65	614.51 N	3941.33 E	3988.06	0.62
10518.00	91.11	88.29	6614.99	617.69 N	4036.27 E	4082.58	1.56
10612.00	91.02	87.91	6613.24	620.81 N	4130.20 E	4176.09	0.42
10707.00	91.26	87.29	6611.35	624.78 N	4225.10 E	4270.67	0.70
10801.00	91.76	87.13	6608.88	629.36 N	4318.96 E	4364.30	0.56
10896.00	90.52	85.67	6606.99	635.32 N	4413.75 E	4459.04	2.02
10990.00	89.94	85.63	6606.61	642.45 N	4507.47 E	4552.88	0.62
11084.00	89.38	85.53	6607.17	649.70 N	4601.19 E	4646.73	0.61
11170.00	88.68	85.43	6608.62	656.47 N	4686.91 E	4732.59	0.82
11235.00	88.68	85.43	6610.12	661.65 N	4751.69 E	4797.48	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 82.35 DEGREES (GRID)
A TOTAL CORRECTION OF 7.44 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11235.00 FEET
IS 4797.53 FEET ALONG 82.07 DEGREES (GRID)**

Surface surveys at 364 ft and 729 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 11170 ft MD to TD at 11235 ft MD.