



1 : 240

Country : USA							
Field : Wattenberg							
Location : Lat: 40° 39' 20.21" North Long: 104° 14' 18.16" West							
Well : Sievers LE17-62HN							
Company : Noble Energy							
Rig : H&P 322							
LOCATION		Other Services					
Latitude : 40° 39' 20.21" North Longitude : 104° 14' 18.16" West UTM Easting = 3350038.147 ft UTM Northing = 1484172.776 ft		Directional Drilling					
Permanent Datum : Ground Level		Elev. KB N/A					
Log Measured From : Drill Floor		24.00 ft Above Permanent Datum DF 5056.00 ft					
Drilling Measured From : Drill Floor		MD LOG GL 5032.00 ft WD N/A					
Depth Logged : 844.00 ft To 10,960.00 ft		Unit No. : 11210425 Job No. : CA-XX-0900206163					
Date Logged : 23-Mar-13 To 29-Mar-13							
Total Depth MD : 10,960.00 ft TVD: 6,673.51 ft		Plot Type : Final					
Spud Date : 22-Mar-13		Plot Date : 29-Mar-13					
Run No.	Borehole Record (MD)		Run No.	Borehole Record (MD)			
	Size	From		To	Size	From	To
	2	8.750 in		844.00 ft	5,930.00 ft		
	3	8.750 in		5,930.00 ft	7,057.00 ft		
	4	6.125 in		7,057.00 ft	10,960.00 ft		
			Size	Casing Record (MD)			
				Weight	From	To	
				9.625 in	36.00 lbpf	SURFACE	833.00 ft
				7.000 in	26.00 lbpf	SURFACE	7,047.00 ft

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	24-Mar-13	25-Mar-13	29-Mar-13		
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)	844.00	5,930.00	7,057.00		
Log End Depth (MD, ft)	5,930.00	7,057.00	10,960.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	23-Mar-13 06:45	24-Mar-13 11:30	25-Mar-13 16:00		
Drill/Wipe End Date and Time	23-Mar-13 23:00	25-Mar-13 01:00	28-Mar-13 20:30		
Min Inc (deg) @ Depth (MD, ft)	.65 @ 1,196.00	.56 @ 5,930.00	84.84 @ 7,143.00		
Max Inc (deg) @ Depth (MD, ft)	13.63 @ 2,614.00	82.08 @ 7,002.00	92.99 @ 10,895.00		
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC	.46 / PDC		
Flow Rate (gpm)	552.00	516.00	271.00		
Max AV (fpm) / CV (fpm) @ MWD	409.5 / 409.5	405.9 / 405.9	442.9 / 442.9		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.80 / 28.00	9.35 / 39.00	10.00 / 37.00		
Filtrate CL (ppm)	1,400.00	1,200.00	900.00		
pH / Fluid Loss (mptm)	8.50 / N/A	10.40 / N/A	10.00 / N/A		
PV (cP) / YP (lbf2)	3 / 2.00	16 / 8.00	14 / 10.00		
% Solids / % Sand	3.2 / 0.30	8.7 / 0.30	0.75 / 8.1		
% 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		
Min Tool Temp (deg F) / S	444.78 / PDM	454.89 / PDM	345.51 / PDM		

Max Tool Temp (degF) / Source	141.70 / PCM	154.20 / PCM	215.51 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Robert Ley	Robert Ley	Robert Ley		
Customer Representative	Charles Collver	Charles Collver	Charles Collver		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11303513	11303513	11675324		
Insert Serial Number	11227512	11227512	11227512		
Date and Time Initialized	22-Mar-13 14:08	01-Jan-70 00:00	25-Mar-13 13:43		
Date and Time Read	25-Mar-13 08:00	25-Mar-13 07:53	29-Mar-13 10:01		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	57.00	55.00	65.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11303513	11303513	11675324		
Sonde Serial Number	11833053	11833053	11833053		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	172.82	103.93	24.30		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.42	48.30	58.07		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11303513	11303513	11675324		
Insert/Sonde Serial Number	11579843	11579843	11681003		

REMARKS

1. All depths are measured depths and are calibrated to the driller' pipe tally and are measured from the 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.
4. The Following smoothing parameters have been applied to the data"

PGRC (Gamma Ray Corrected):

Interval Resolution: 0.5 feet
Coercion Distance: 0.6 feet
Gap Fill: 3.0 feet

ROPA (Rate of Penetration):

Interval Resolution: 0.5 feet
Coercion Distance: 1.2 feet
Gap Fill: 3.0 feet

Insite Version 7.3.40 build 25

5. Gamma Data from the depths of (6762 - 6776) and ROP Data from the depths of (6811-6825) are missing due to a power outage on the rig.

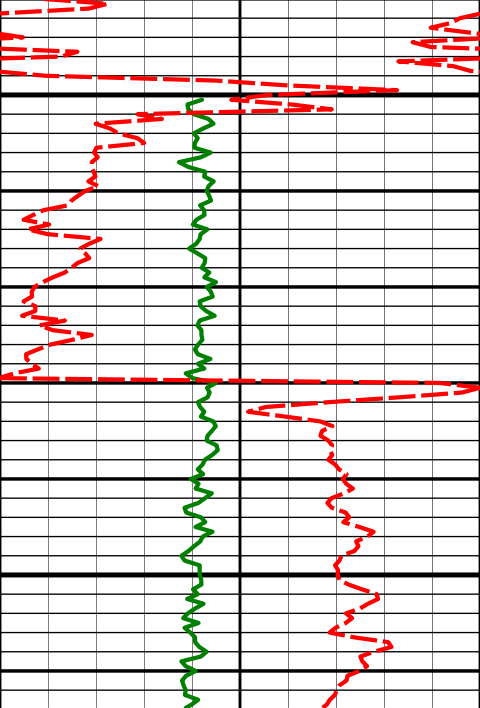
6. Survey at TD is projected to the bit

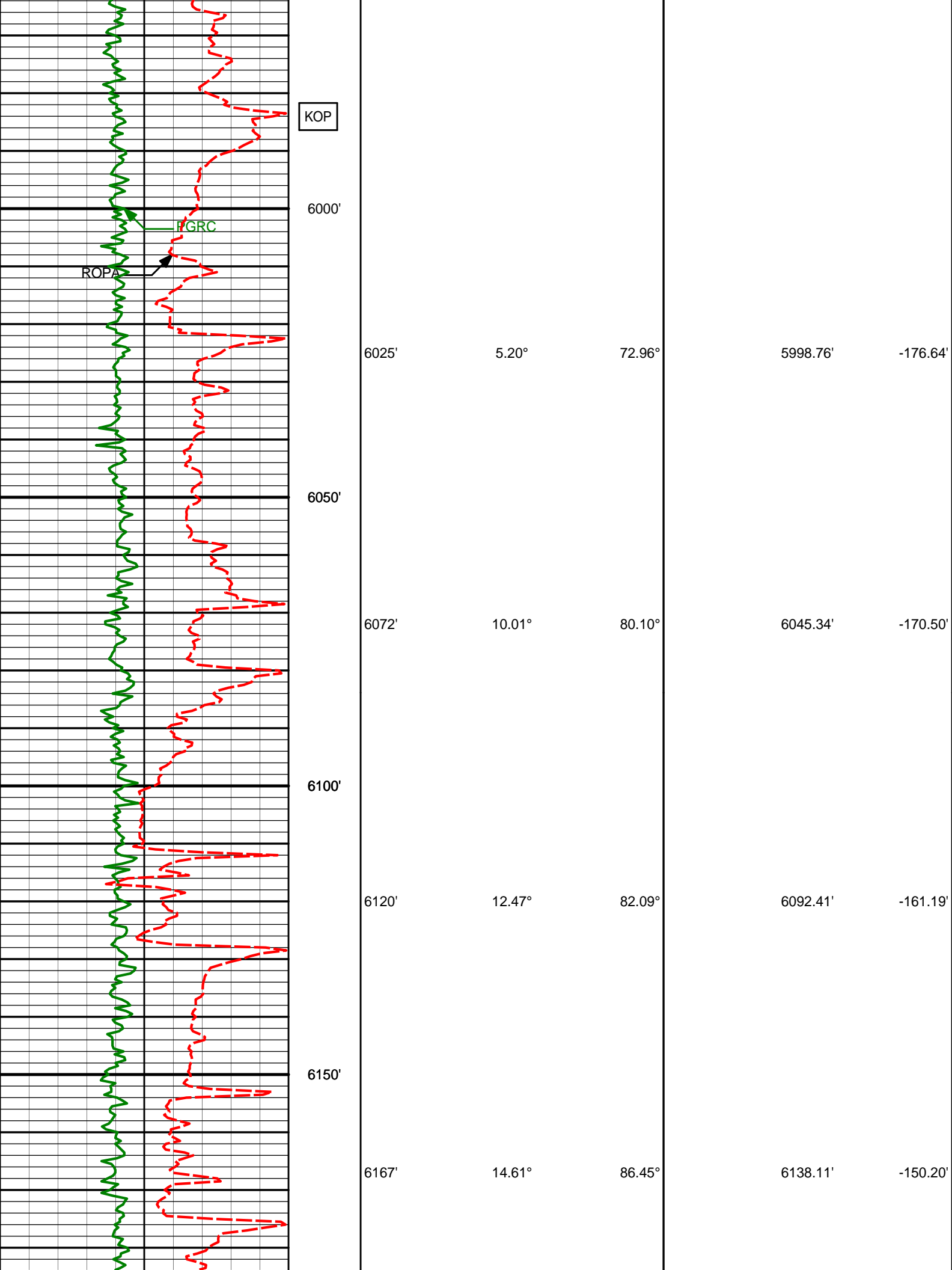
WARRANTY

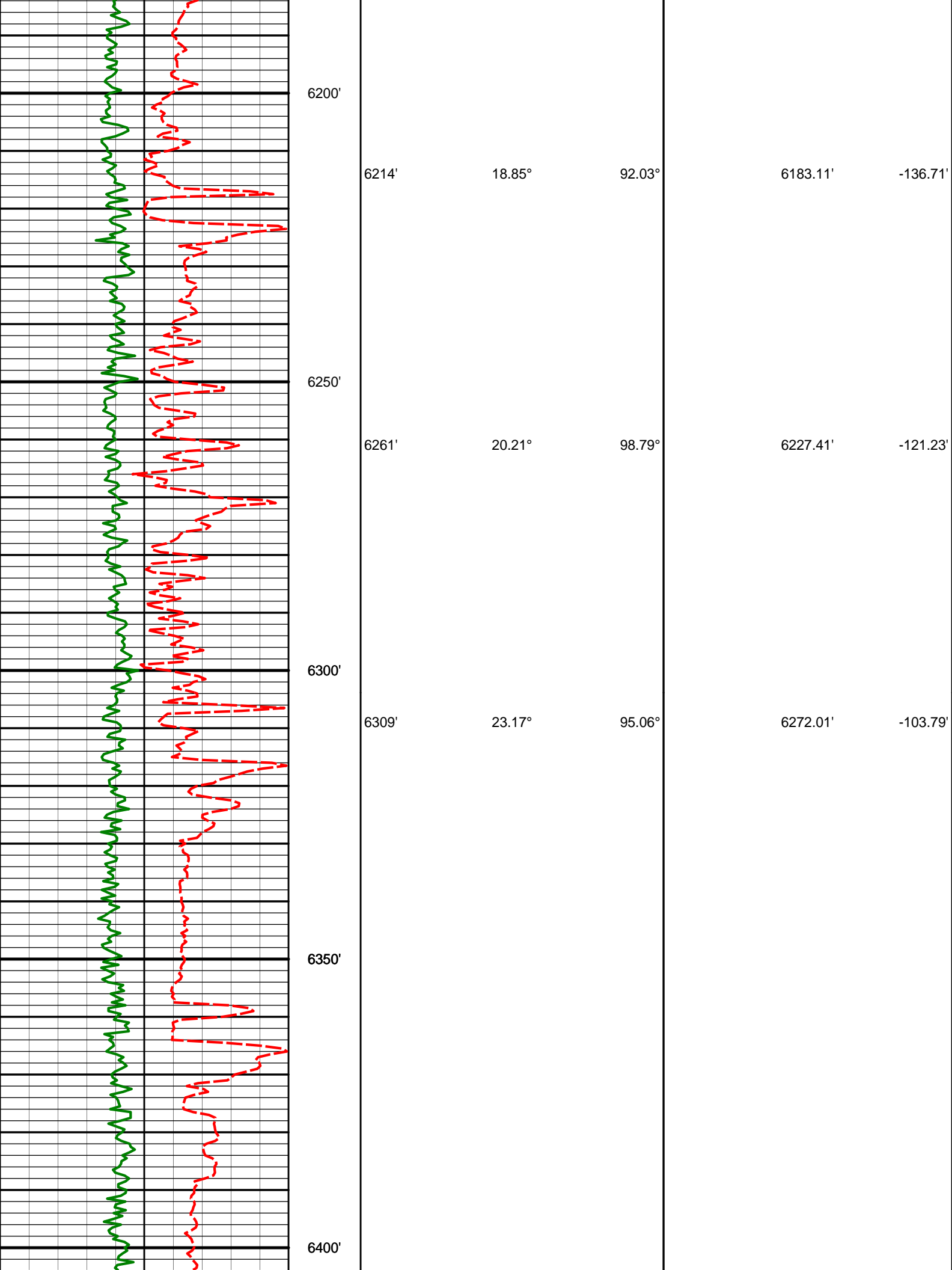
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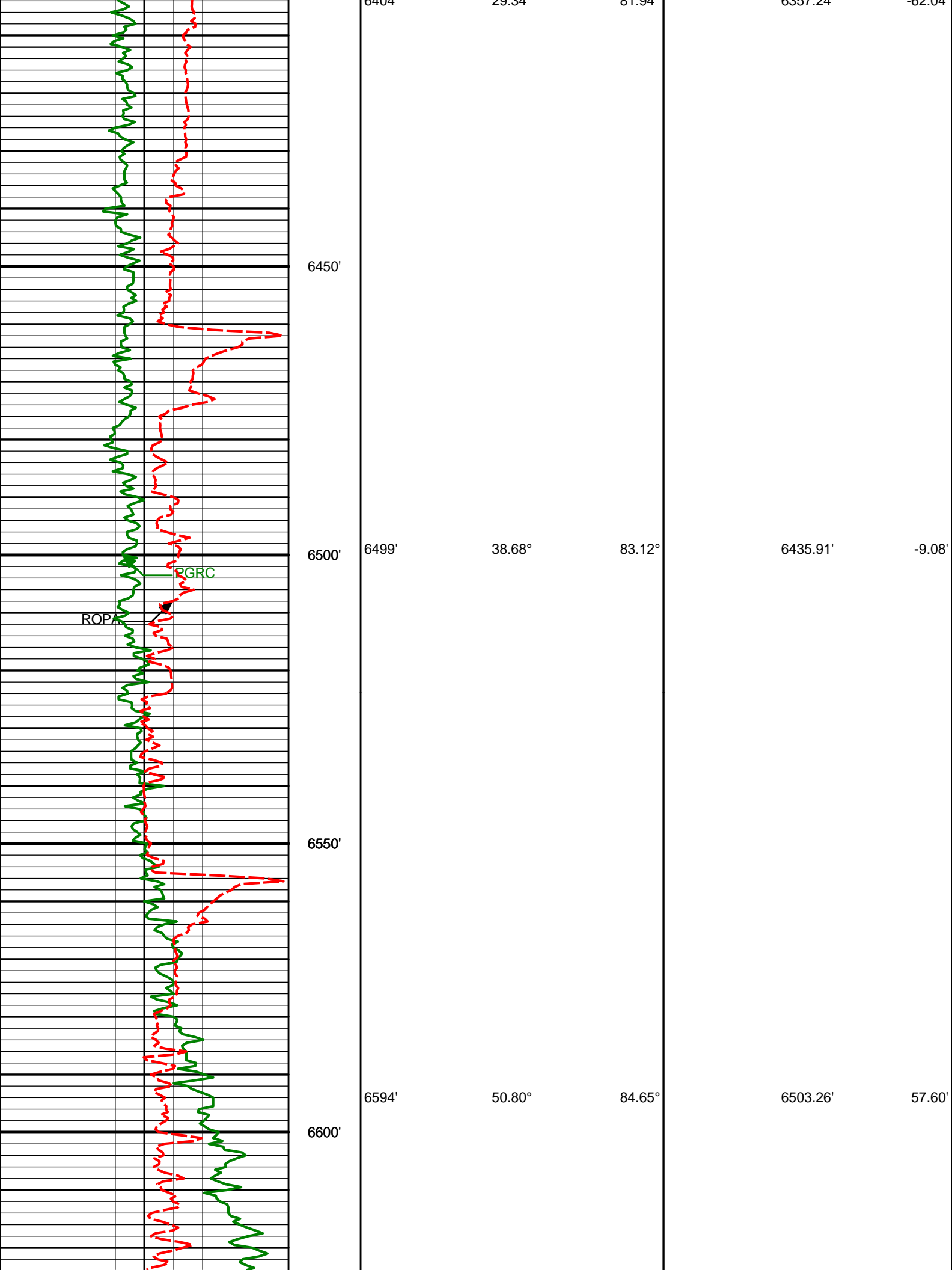
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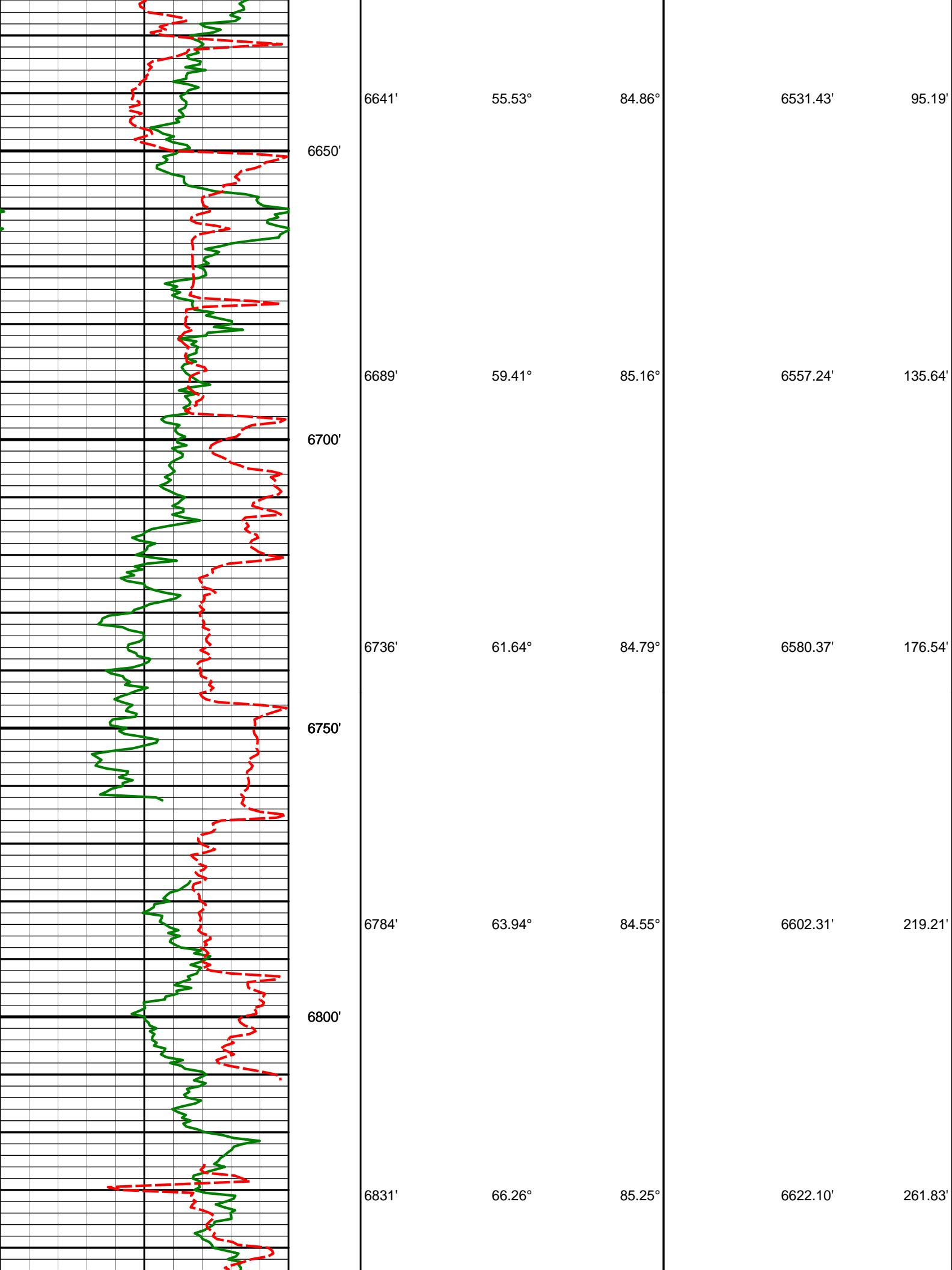
MD Detail Log 1:240

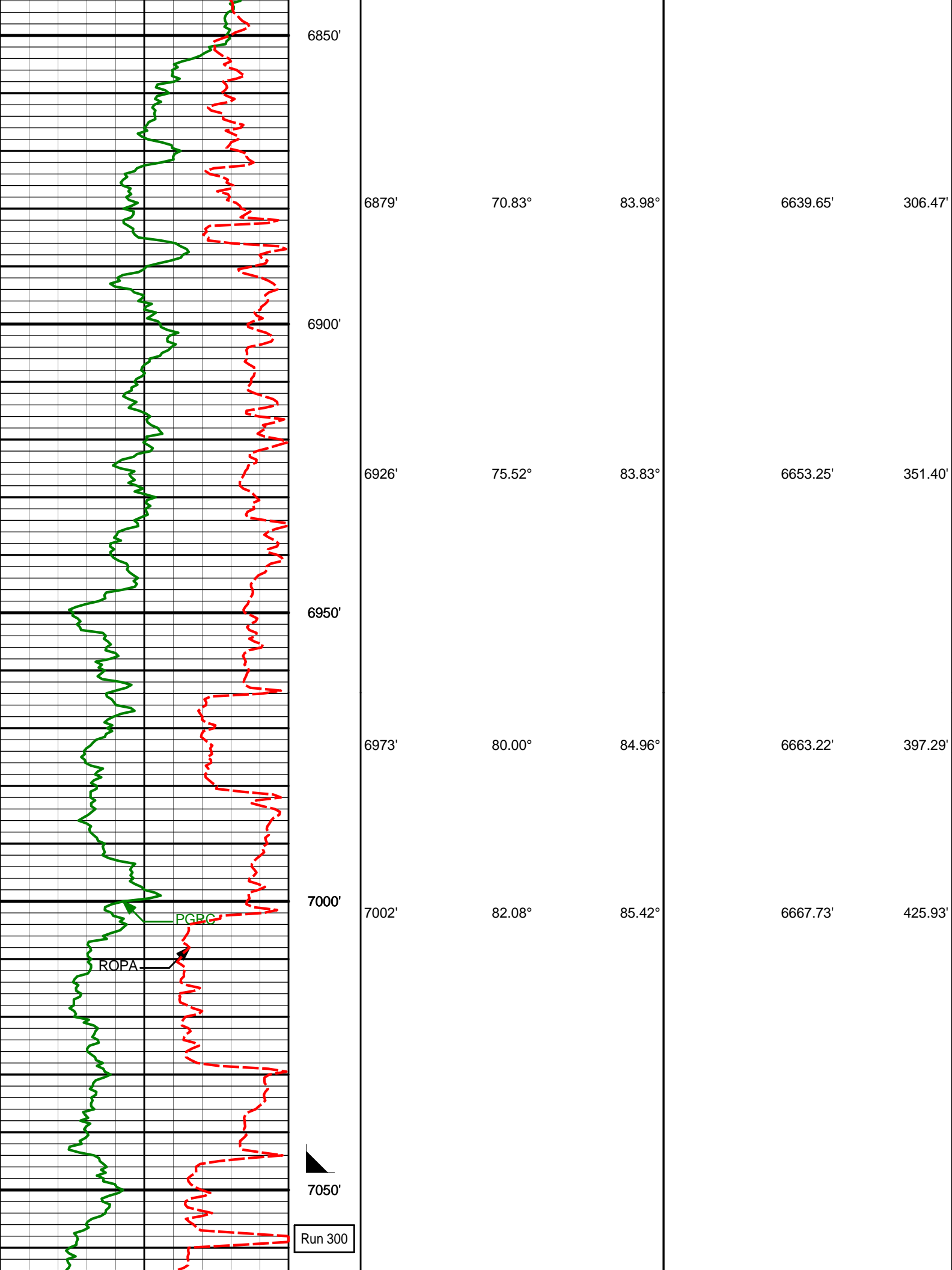
Gamma Ray (PGRC) (Api)					
0300					
Avg Rate of Penetration feet per hr	Feet				
6000					
	Depth	Inc	Azm	TVD	Vsec
	5900'				
	Run 200	5930'	0.56°	153.36°	5903.90' -181.01'
	5950'				

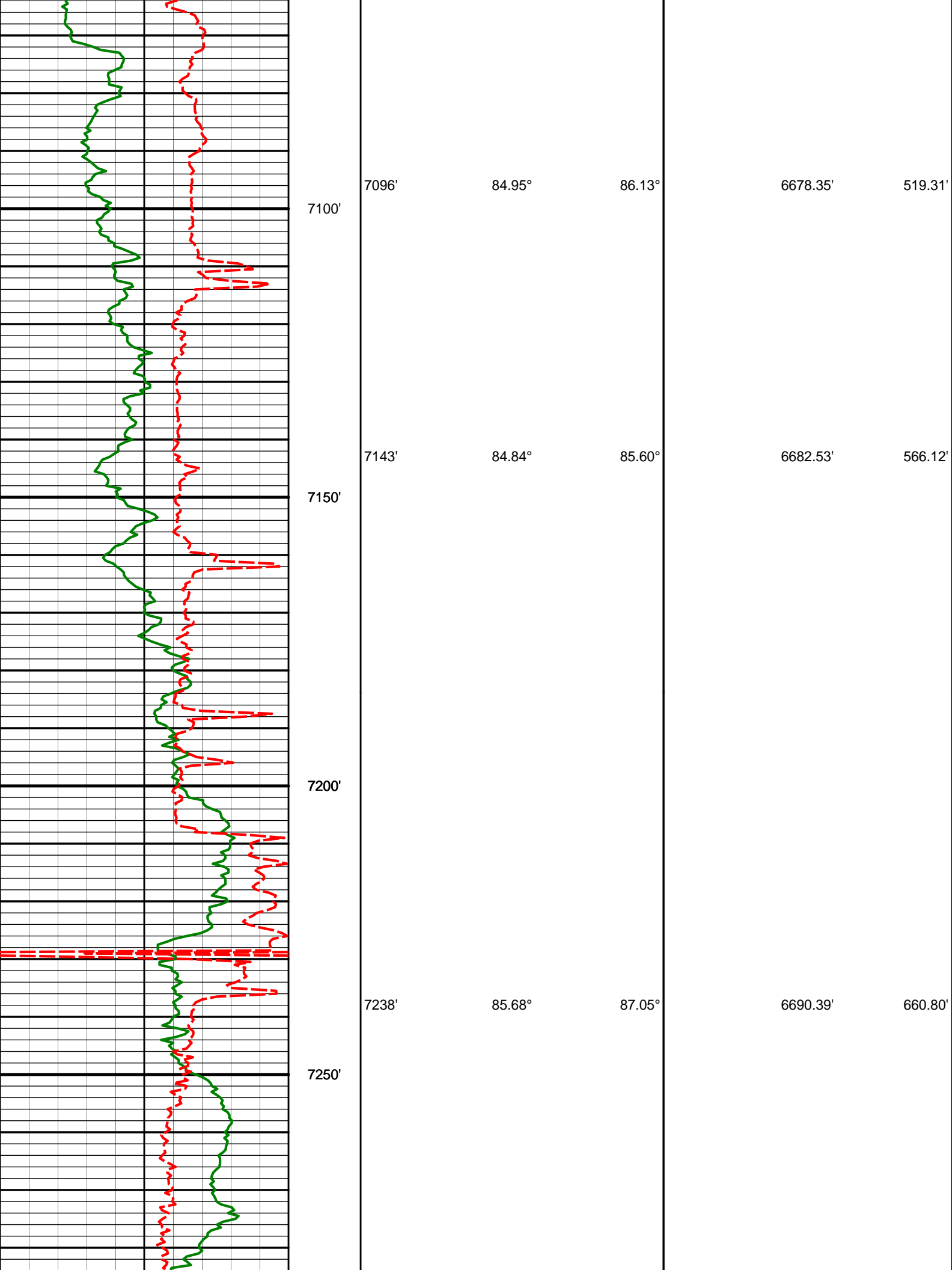


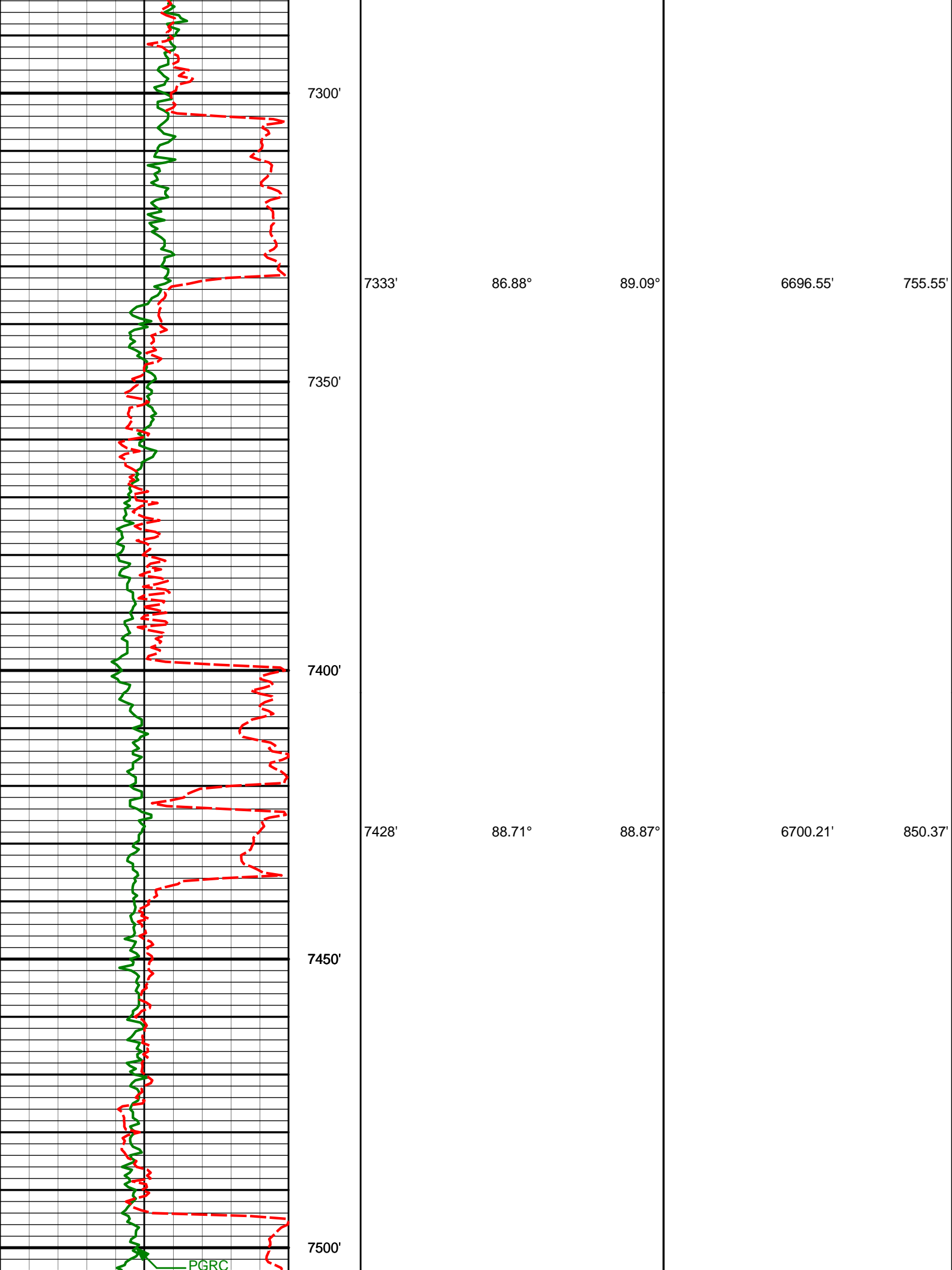


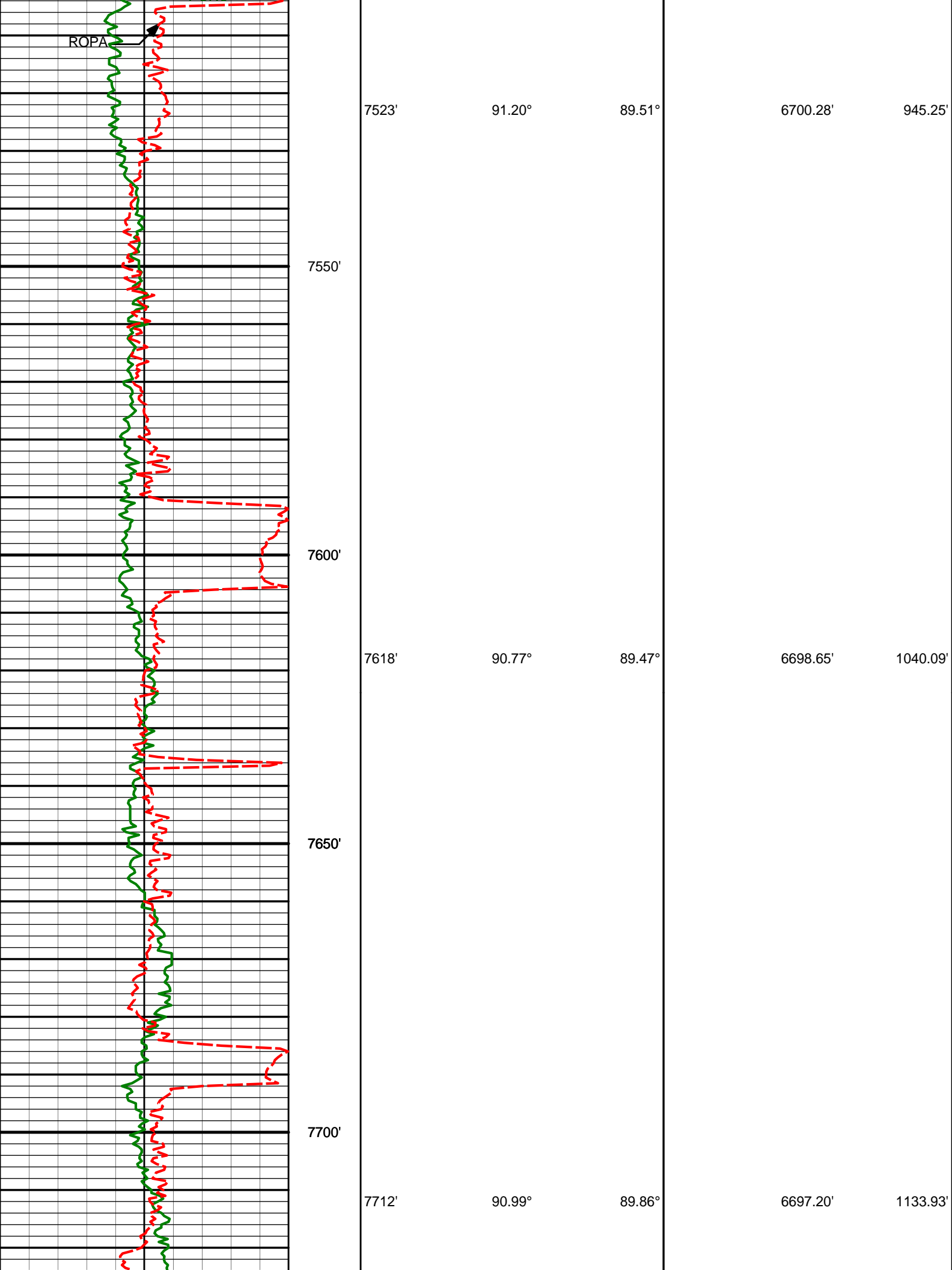


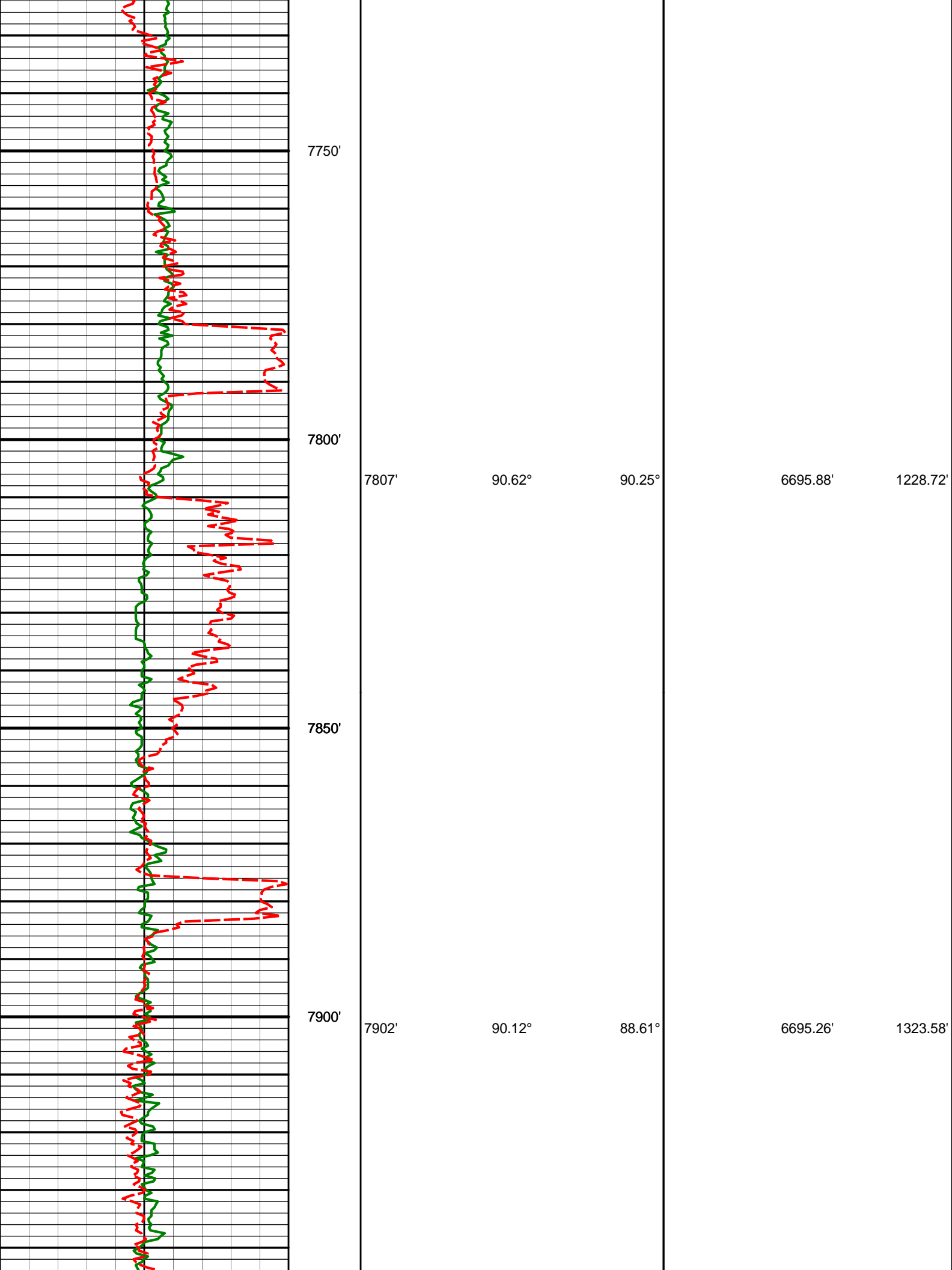


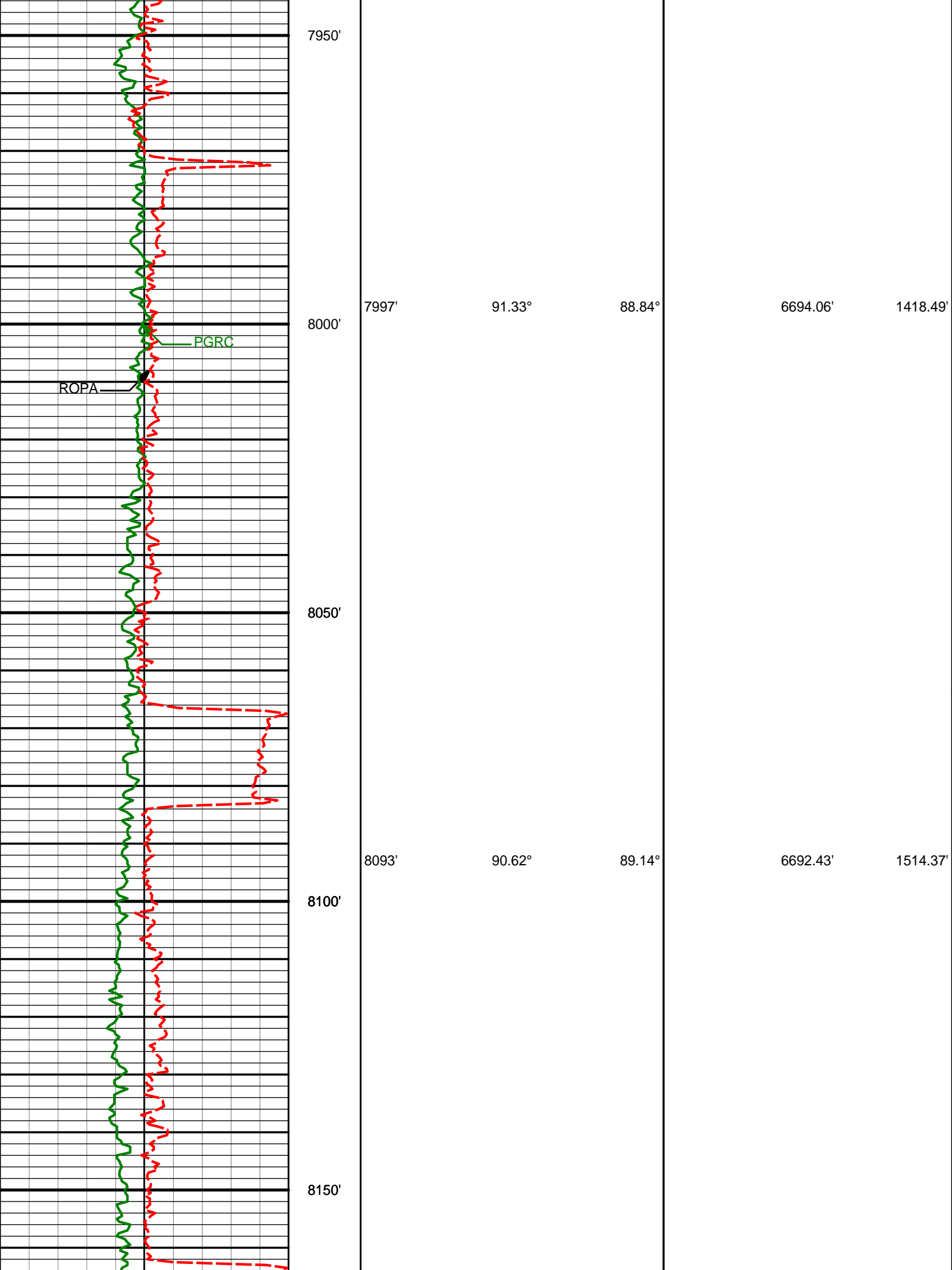


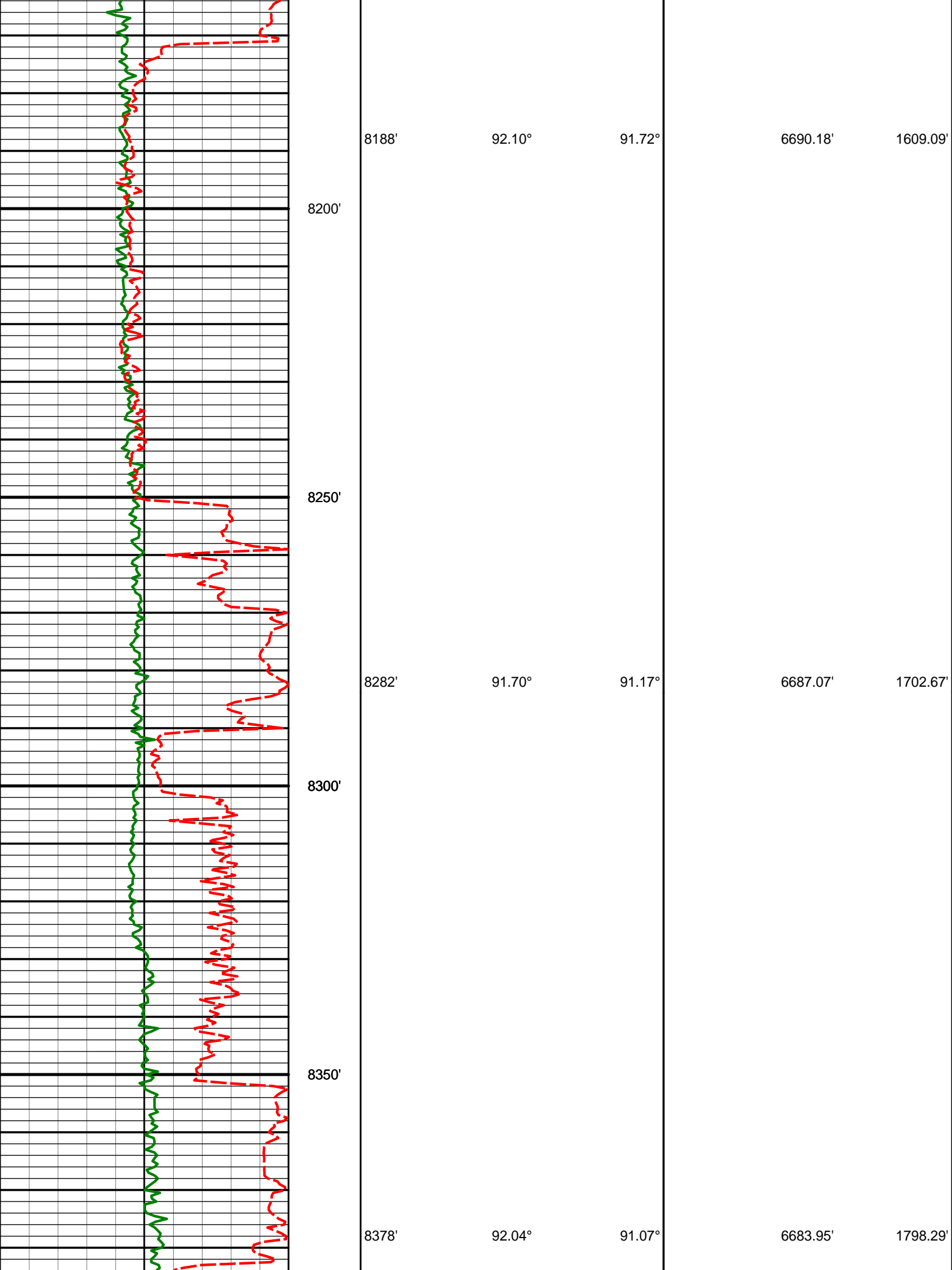


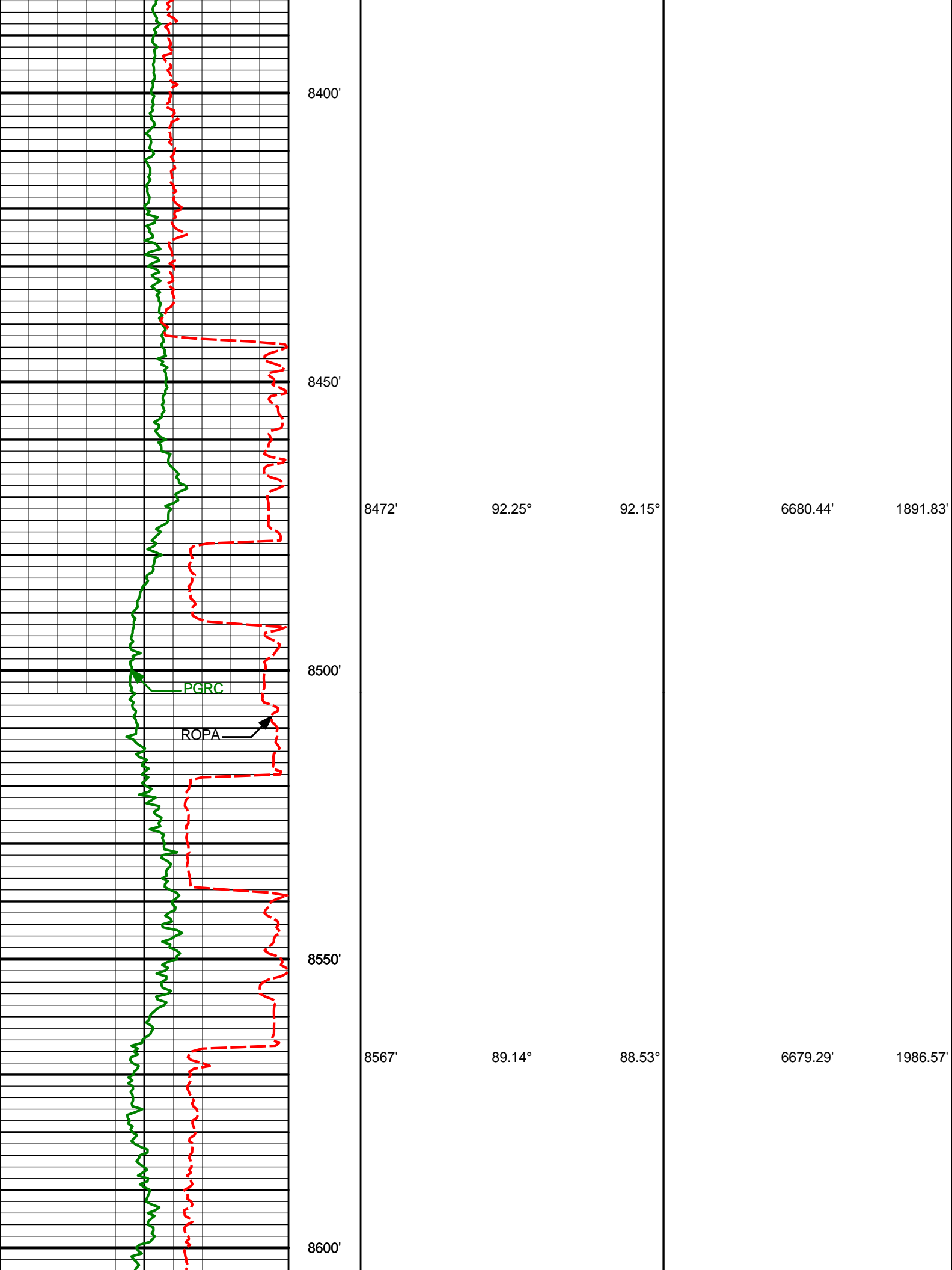


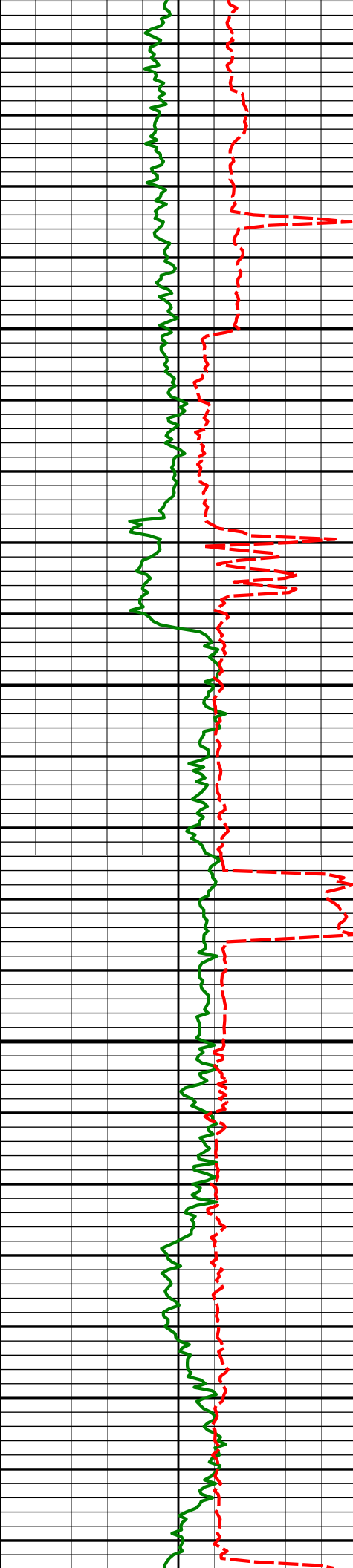












8650'

8662'

89.60°

88.26°

6680.33'

2081.50'

8700'

8750'

8757'

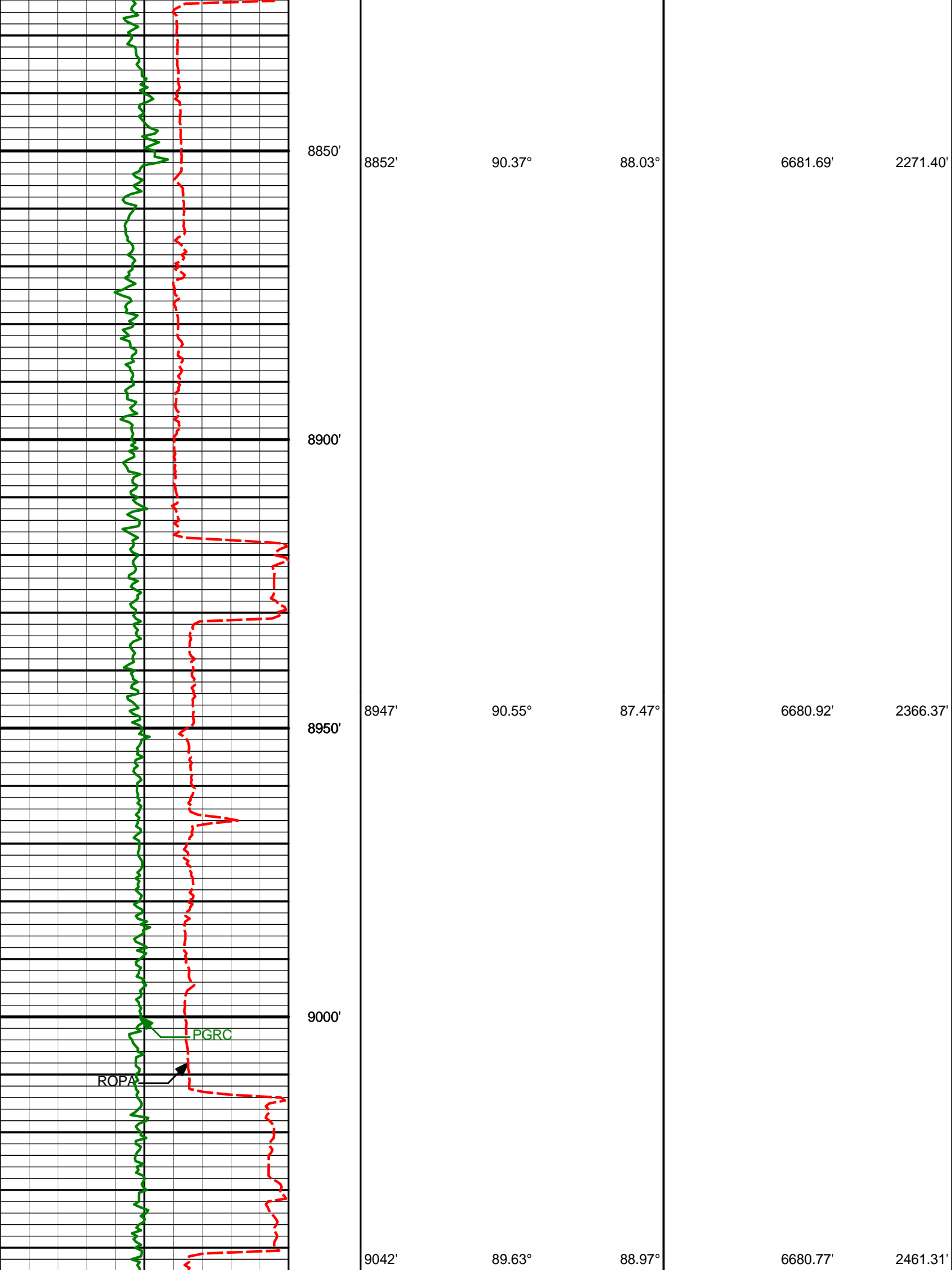
89.20°

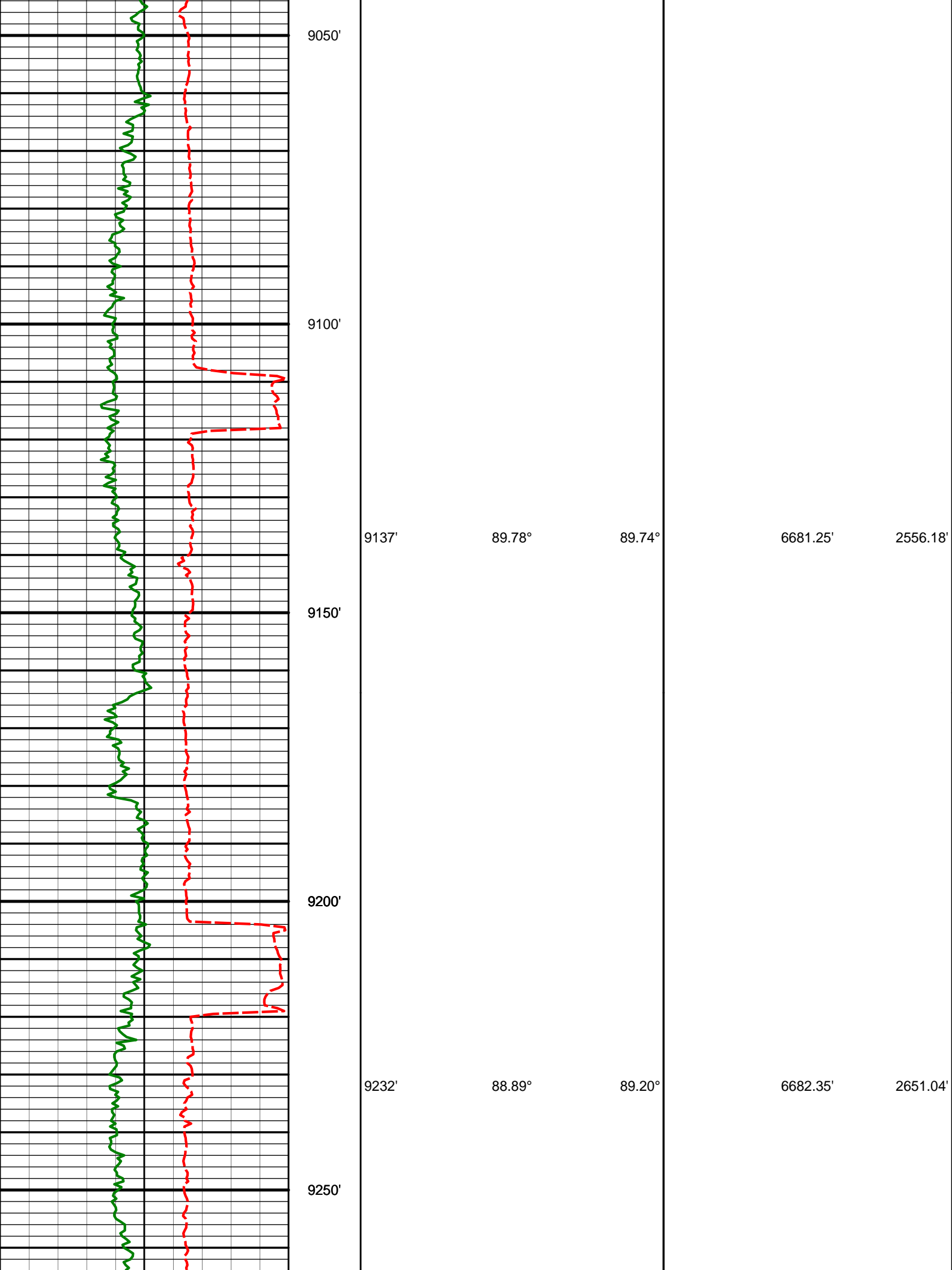
88.13°

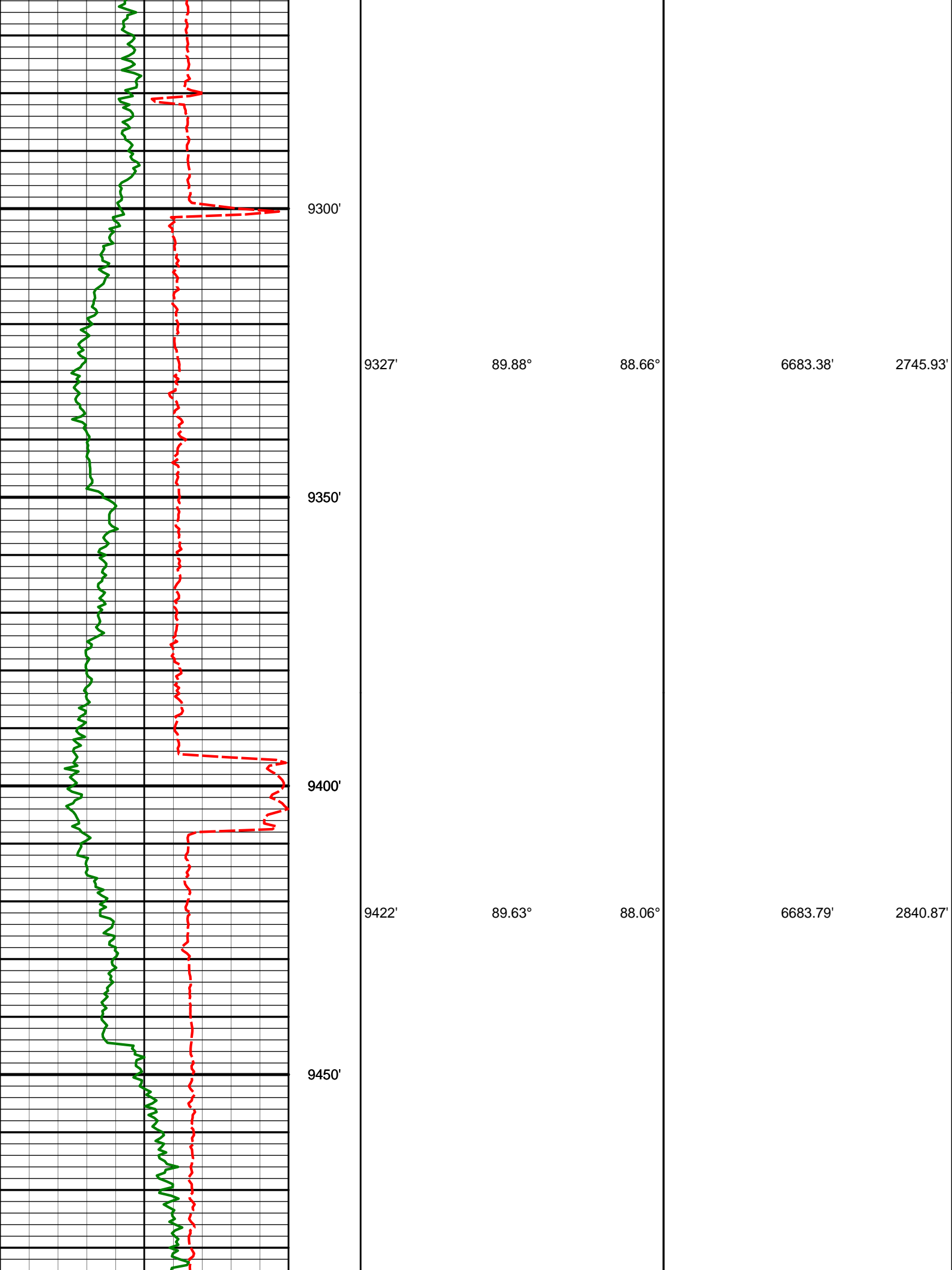
6681.33'

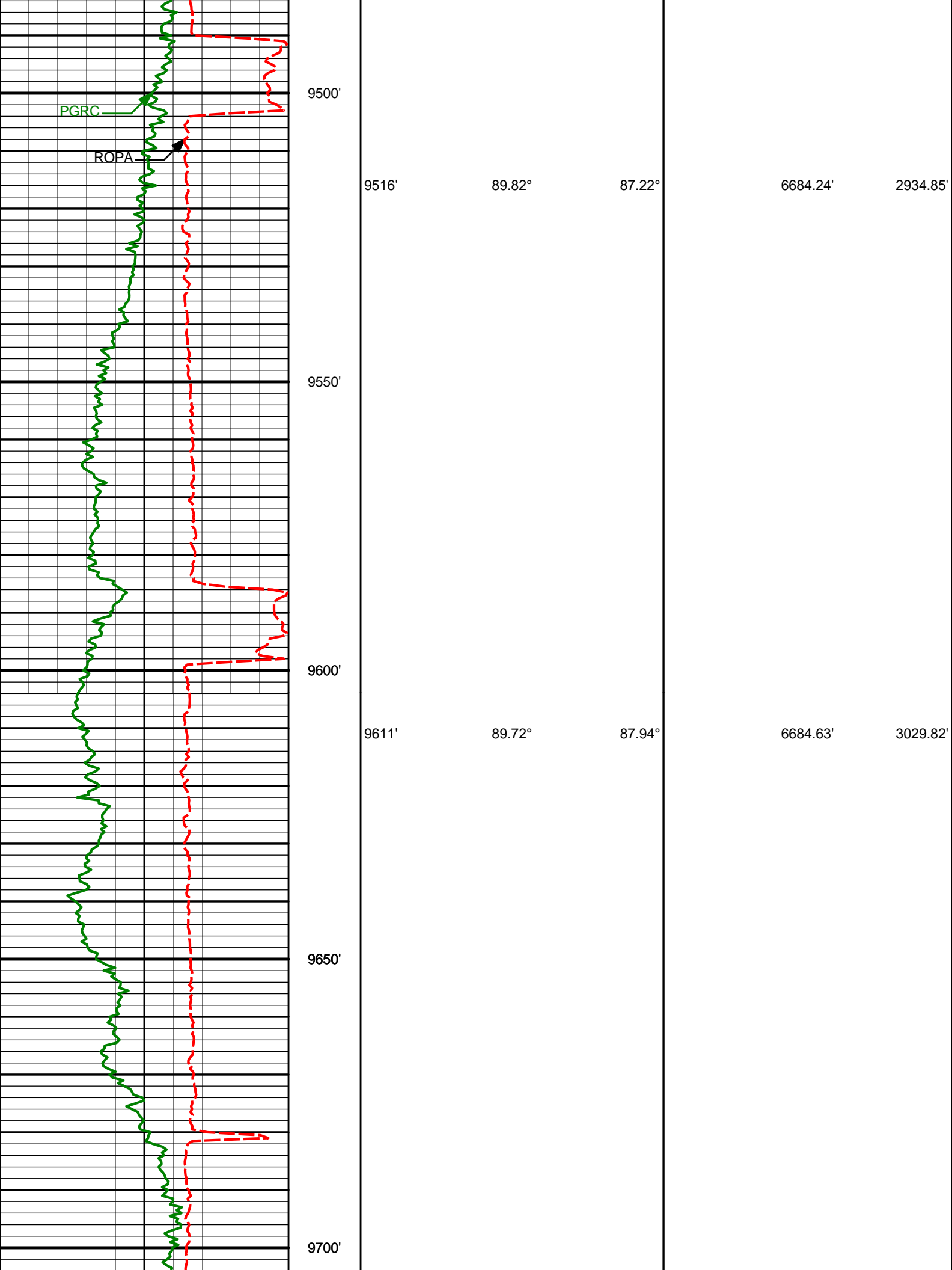
2176.45'

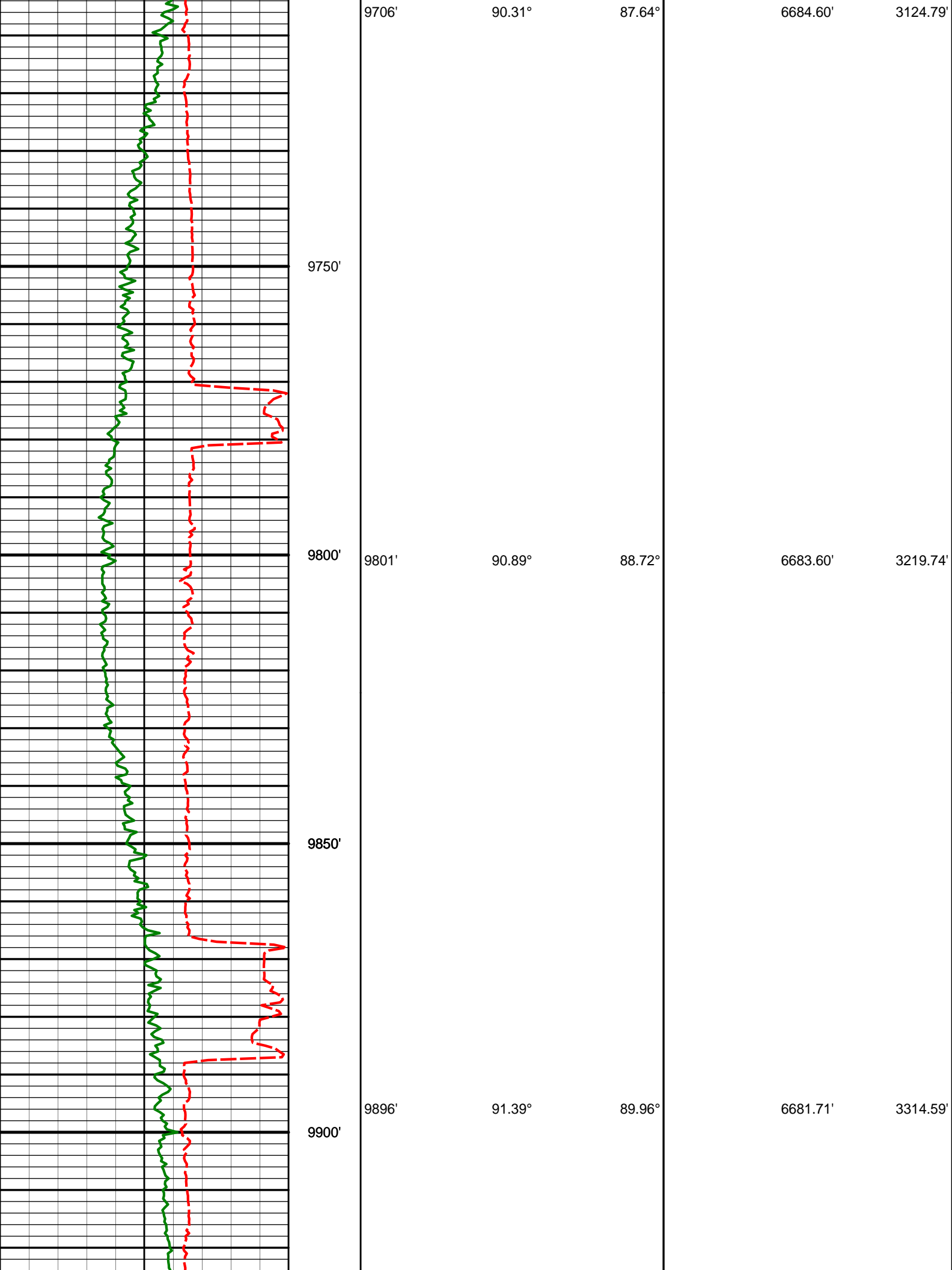
8800'

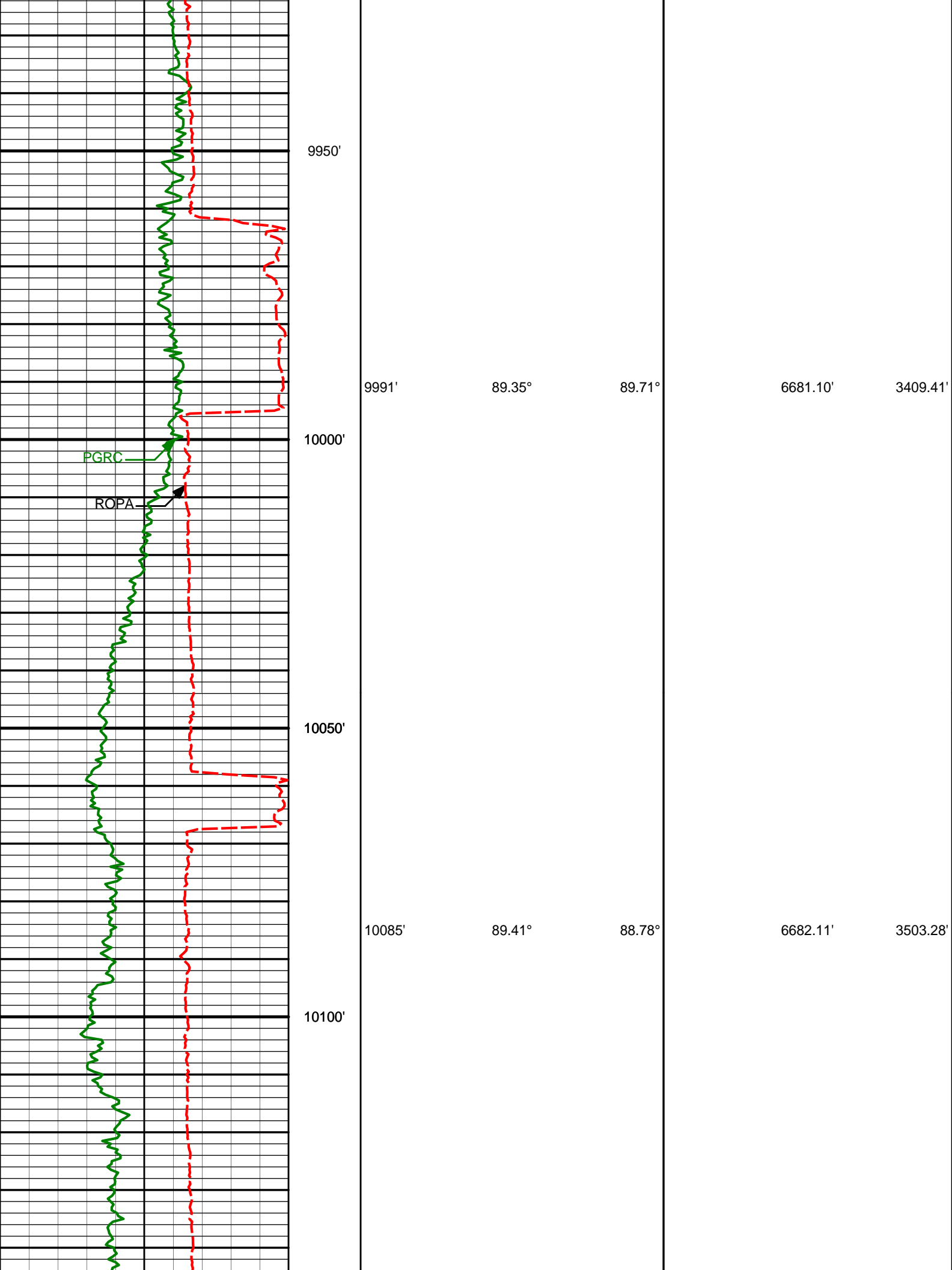


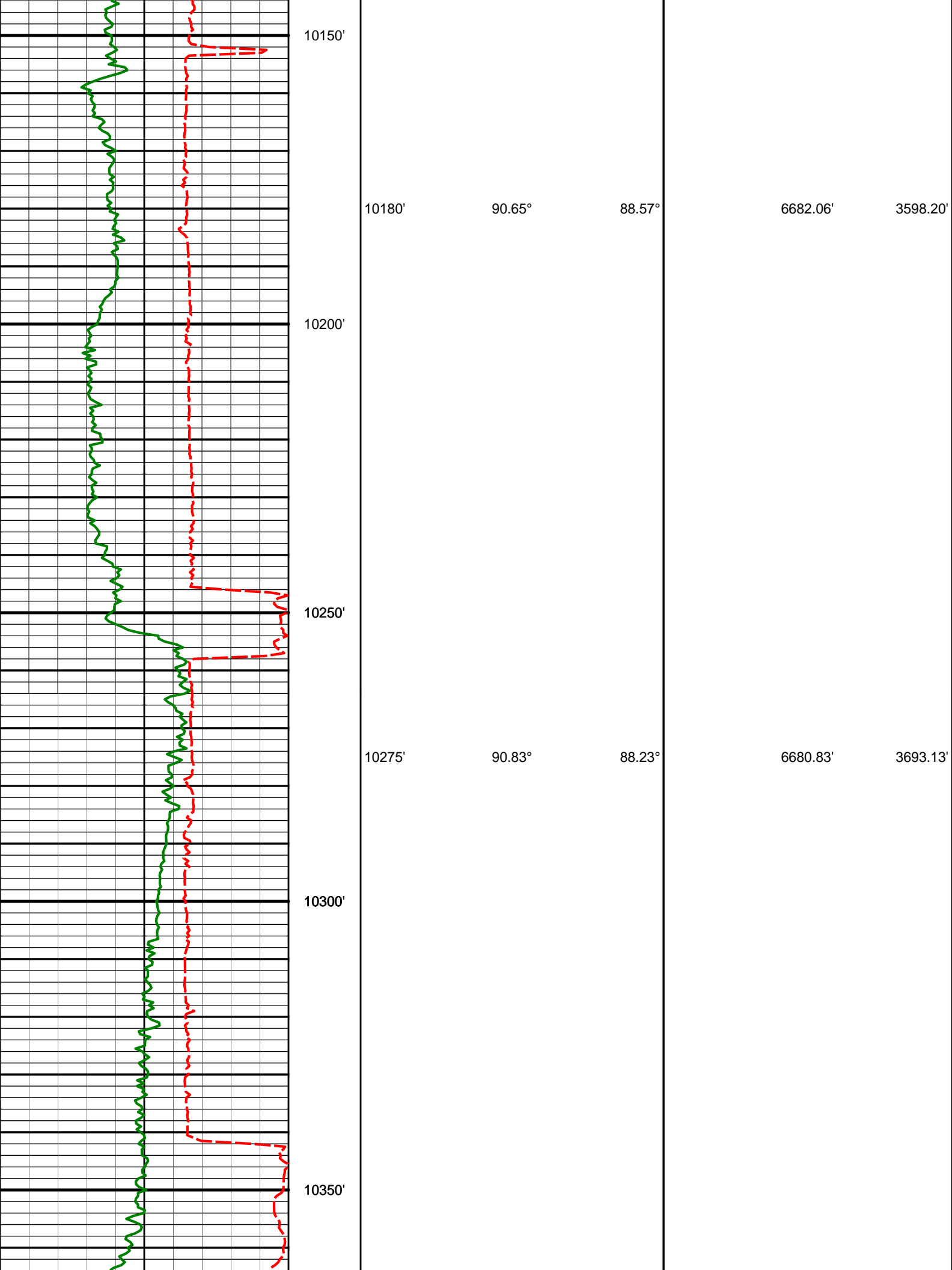


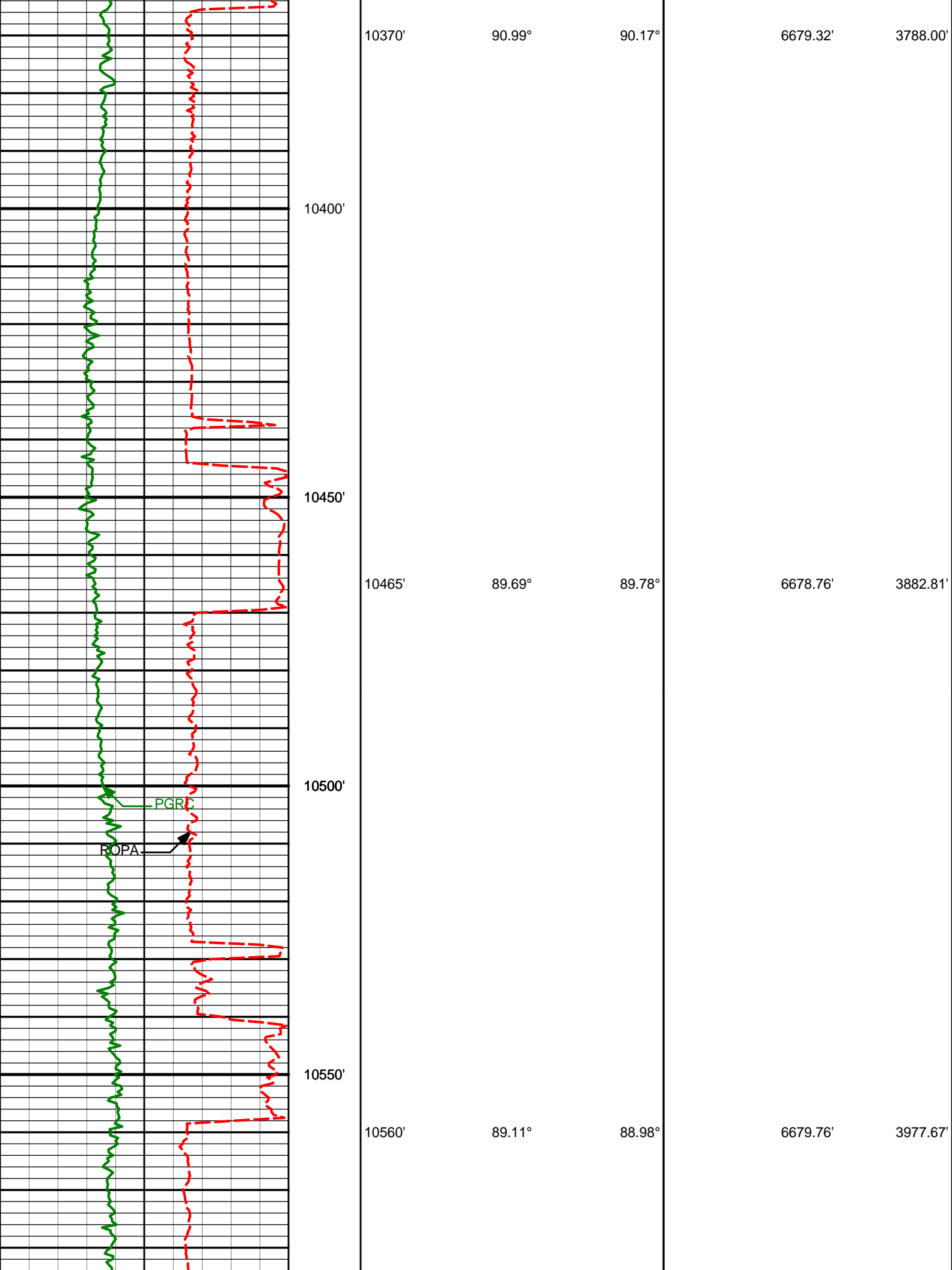


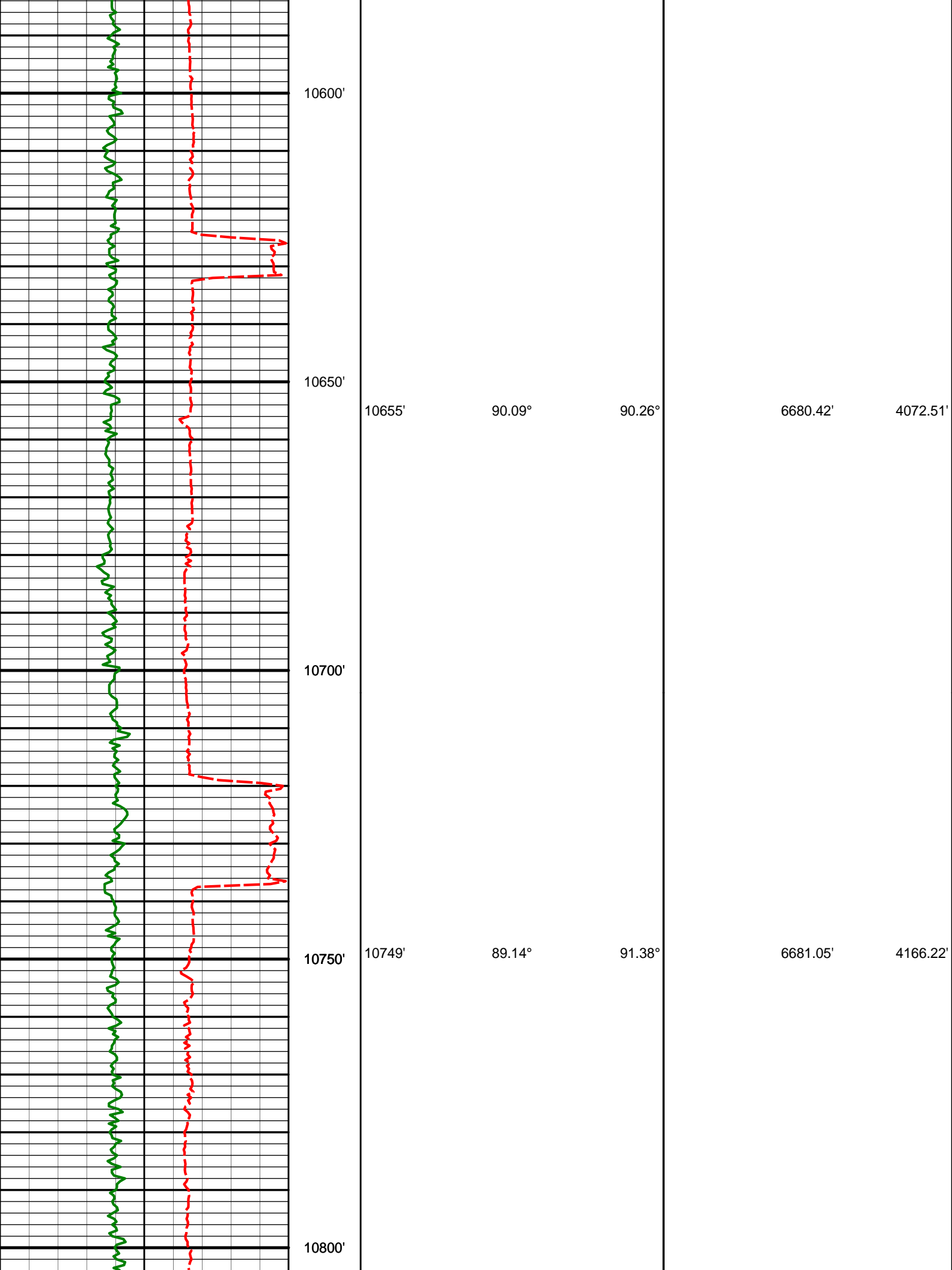


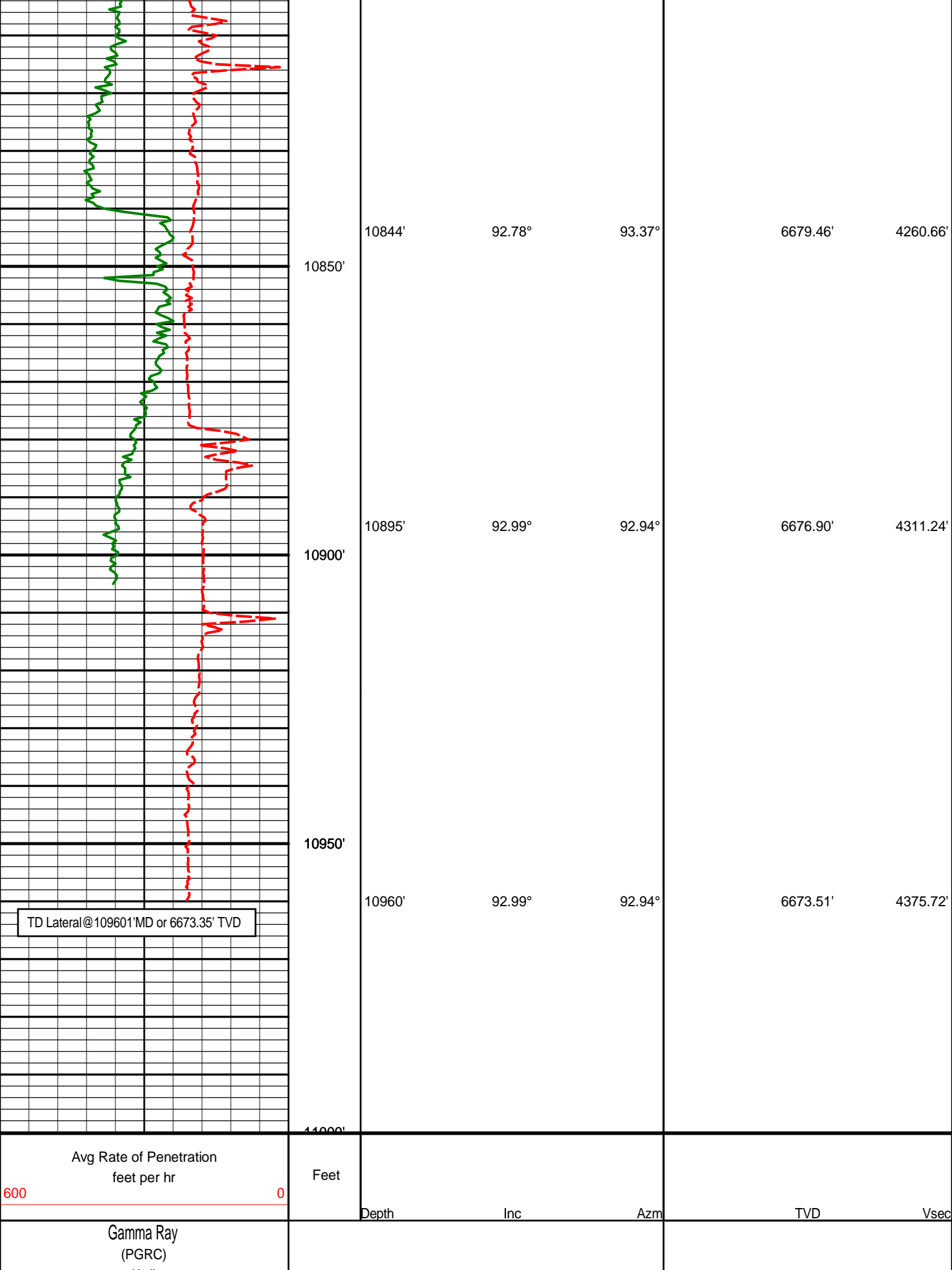














HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Sievers LE17-62HN
Wattenberg
Weld Colorado
USA
CA-XX-0900206163

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
844.00	0.00	0.00	844.00	0.00 N	0.00 E	0.00	TIE-IN
1010.00	0.66	345.51	1010.00	0.93 N	0.24 W	-0.18	0.40
1103.00	0.68	319.46	1102.99	1.87 N	0.73 W	-0.61	0.33
1196.00	0.65	315.05	1195.98	2.66 N	1.46 W	-1.29	0.06
1289.00	0.99	328.09	1288.97	3.72 N	2.26 W	-2.02	0.41
1382.00	1.29	326.22	1381.96	5.27 N	3.27 W	-2.93	0.33
1475.00	1.25	335.48	1474.93	7.07 N	4.27 W	-3.82	0.23
1665.00	1.26	341.70	1664.89	10.93 N	5.79 W	-5.08	0.07
1760.00	3.77	333.98	1759.79	14.72 N	7.48 W	-6.53	2.66
1854.00	6.10	321.71	1853.44	21.42 N	11.93 W	-10.55	2.71
1949.00	7.94	315.11	1947.72	30.03 N	19.69 W	-17.75	2.11
2044.00	10.83	314.72	2041.44	40.96 N	30.67 W	-28.01	3.04
2139.00	11.69	315.96	2134.61	54.16 N	43.70 W	-40.17	0.94
2234.00	13.43	316.18	2227.34	69.03 N	58.03 W	-53.53	1.84
2329.00	11.20	313.09	2320.14	83.30 N	72.40 W	-66.97	2.44
2424.00	12.23	319.72	2413.17	97.28 N	85.65 W	-79.30	1.78
2519.00	12.45	314.45	2505.98	112.13 N	99.47 W	-92.15	1.21
2614.00	13.63	314.14	2598.52	127.10 N	114.81 W	-106.51	1.25
2709.00	12.76	312.17	2691.02	141.94 N	130.62 W	-121.35	1.03
2804.00	11.58	307.42	2783.88	154.78 N	145.97 W	-135.85	1.63
2899.00	11.24	307.40	2877.01	166.19 N	160.89 W	-150.02	0.36
2994.00	8.30	312.15	2970.62	176.42 N	173.33 W	-161.78	3.20
3089.00	6.80	316.16	3064.79	185.07 N	182.31 W	-170.19	1.67
3184.00	5.00	312.65	3159.29	191.94 N	189.25 W	-176.69	1.93
3279.00	3.43	309.30	3254.03	196.54 N	194.50 W	-181.63	1.68
3374.00	2.62	289.02	3348.90	199.05 N	198.74 W	-185.71	1.40
3469.00	0.84	22.42	3443.86	200.40 N	200.53 W	-187.40	2.94
3753.00	1.82	125.39	3727.81	199.71 N	196.05 W	-182.98	0.76
4038.00	2.22	121.39	4012.63	194.21 N	187.65 W	-174.94	0.15
4133.00	1.28	140.59	4107.58	192.43 N	185.40 W	-172.81	1.15
4418.00	1.71	166.02	4392.49	185.84 N	182.34 W	-170.18	0.27
4702.00	1.95	175.96	4676.35	176.90 N	180.98 W	-169.38	0.14
4987.00	3.27	213.42	4961.06	165.27 N	185.12 W	-174.25	0.73
5082.00	0.68	240.99	5056.00	162.73 N	187.11 W	-176.40	2.83
5366.00	1.35	203.78	5339.96	158.84 N	189.94 W	-179.48	0.32
5556.00	0.68	197.82	5529.92	155.71 N	191.19 W	-180.92	0.36
5841.00	0.70	164.50	5814.90	152.42 N	191.24 W	-181.18	0.14
5873.00	0.75	174.57	5846.90	152.02 N	191.17 W	-181.13	0.42
5930.00	0.56	153.36	5903.90	151.41 N	191.01 W	-181.01	0.53
6025.00	5.20	72.96	5998.76	152.26 N	186.68 W	-176.64	5.41
6072.00	10.01	80.10	6045.34	153.58 N	180.62 W	-170.50	10.42
6120.00	12.47	82.09	6092.41	155.01 N	171.37 W	-161.19	5.17
6167.00	14.61	86.45	6138.11	156.08 N	160.43 W	-150.20	5.04
6214.00	18.85	92.03	6183.11	156.18 N	146.92 W	-136.71	9.65
6261.00	20.21	98.79	6227.41	154.67 N	131.31 W	-121.23	5.60
6309.00	23.17	95.06	6272.01	152.57 N	113.71 W	-103.79	6.80
6404.00	29.34	81.94	6357.24	154.19 N	71.98 W	-62.04	8.88
6499.00	38.68	83.12	6435.91	161.02 N	19.34 W	-9.08	9.86
6594.00	50.80	84.65	6503.26	168.04 N	47.03 E	57.60	12.80
6641.00	55.53	84.86	6531.43	171.47 N	84.48 E	95.19	10.07
6689.00	59.41	85.16	6557.24	174.99 N	124.79 E	135.64	8.10
6736.00	61.64	84.79	6580.37	178.57 N	165.54 E	176.54	4.80
6784.00	63.94	84.55	6602.31	182.54 N	208.04 E	219.21	4.81
6831.00	66.26	85.25	6622.10	186.33 N	250.50 E	261.83	5.13

6879.00	70.83	83.98	6639.65	190.53 N	294.96 E	306.47	9.82
6926.00	75.52	83.83	6653.25	195.30 N	339.69 E	351.40	9.99
6973.00	80.00	84.96	6663.22	199.78 N	385.38 E	397.29	9.81
7002.00	82.08	85.42	6667.73	202.19 N	413.93 E	425.93	7.36
7096.00	84.95	86.13	6678.35	209.07 N	507.06 E	519.31	3.14
7143.00	84.84	85.60	6682.53	212.44 N	553.75 E	566.12	1.14
7238.00	85.68	87.05	6690.39	218.50 N	648.23 E	660.80	1.75
7333.00	86.88	89.09	6696.55	221.69 N	742.97 E	755.55	2.49
7428.00	88.71	88.87	6700.21	223.37 N	837.88 E	850.37	1.94
7523.00	91.20	89.51	6700.28	224.71 N	932.86 E	945.25	2.71
7618.00	90.77	89.47	6698.65	225.56 N	1027.85 E	1040.09	0.46
7712.00	90.99	89.86	6697.20	226.11 N	1121.83 E	1133.93	0.47
7807.00	90.62	90.25	6695.88	226.02 N	1216.82 E	1228.72	0.57
7902.00	90.12	88.61	6695.26	226.97 N	1311.81 E	1323.58	1.81
7997.00	91.33	88.84	6694.06	229.08 N	1406.78 E	1418.49	1.29
8093.00	90.62	89.14	6692.43	230.78 N	1502.75 E	1514.37	0.80
8188.00	92.10	91.72	6690.18	230.07 N	1597.71 E	1609.09	3.13
8282.00	91.70	91.17	6687.07	227.69 N	1691.63 E	1702.67	0.72
8378.00	92.04	91.07	6683.95	225.82 N	1787.56 E	1798.29	0.37
8472.00	92.25	92.15	6680.44	223.18 N	1881.46 E	1891.83	1.17
8567.00	89.14	88.53	6679.29	222.62 N	1976.42 E	1986.57	5.02
8662.00	89.60	88.26	6680.33	225.28 N	2071.38 E	2081.50	0.57
8757.00	89.20	88.13	6681.33	228.27 N	2166.32 E	2176.45	0.44
8852.00	90.37	88.03	6681.69	231.45 N	2261.27 E	2271.40	1.24
8947.00	90.55	87.47	6680.92	235.18 N	2356.19 E	2366.37	0.62
9042.00	89.63	88.97	6680.77	238.14 N	2451.14 E	2461.31	1.86
9137.00	89.78	89.74	6681.25	239.21 N	2546.13 E	2556.18	0.83
9232.00	88.89	89.20	6682.35	240.09 N	2641.12 E	2651.04	1.10
9327.00	89.88	88.66	6683.38	241.86 N	2736.10 E	2745.93	1.18
9422.00	89.63	88.06	6683.79	244.57 N	2831.06 E	2840.87	0.69
9516.00	89.82	87.22	6684.24	248.44 N	2924.98 E	2934.85	0.91
9611.00	89.72	87.94	6684.63	252.44 N	3019.89 E	3029.82	0.76
9706.00	90.31	87.64	6684.60	256.10 N	3114.82 E	3124.79	0.69
9801.00	90.89	88.72	6683.60	259.11 N	3209.76 E	3219.74	1.29
9896.00	91.39	89.96	6681.71	260.21 N	3304.74 E	3314.59	1.40
9991.00	89.35	89.71	6681.10	260.48 N	3399.73 E	3409.41	2.16
10085.00	89.41	88.78	6682.11	261.72 N	3493.71 E	3503.28	0.99
10180.00	90.65	88.57	6682.06	263.92 N	3588.69 E	3598.20	1.32
10275.00	90.83	88.23	6680.83	266.57 N	3683.64 E	3693.13	0.40
10370.00	90.99	90.17	6679.32	267.89 N	3778.62 E	3788.00	2.05
10465.00	89.69	89.78	6678.76	267.93 N	3873.61 E	3882.81	1.42
10560.00	89.11	88.98	6679.76	268.96 N	3968.60 E	3977.67	1.04
10655.00	90.09	90.26	6680.42	269.59 N	4063.59 E	4072.51	1.70
10749.00	89.14	91.38	6681.05	268.24 N	4157.58 E	4166.22	1.57
10844.00	92.78	93.37	6679.46	264.30 N	4252.46 E	4260.66	4.37
10895.00	92.99	92.94	6676.90	261.49 N	4303.32 E	4311.24	0.94
10960.00	92.99	92.94	6673.51	258.16 N	4368.15 E	4375.72	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 86.36 DEGREES (GRID)
A TOTAL CORRECTION OF 7.60 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10960.00 FEET
IS 4375.77 FEET ALONG 86.62 DEGREES (GRID)**

Casing set at 7047 ft.