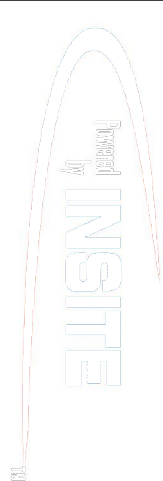


**PCDC - Pressure Case Directional**  
**PCGK - Pressure Case Gamma**

**1 : 240**

Country		: USA					
Field		: Wattenburg					
Location		: Lat: 40° 30' 37.37" North Long: 104° 27' 3.10" West					
Well		: NCLP AA06-62-1HNA					
Company		: Noble Energy					
Rig		: H&P 322					
LOCATION		Latitude : 40° 30' 37.37" North Longitude : 104° 27' 3.10" West					
		UTM Easting = 3,291,713.793 ft UTM Northing = 1,430,497.690 ft					
		Other Services Directional Drilling					
Permanent Datum		: Ground Level		Elevation : 4708.00 ft		Elev. KB N/A	
Log Measured From		: Drill Floor		24.00 ft Above Permanent Datum		DF 4732.00 ft GL 4708.00 ft WD N/A	
Drilling Measured From		: Drill Floor		MD LOG			
Depth Logged		: 846.00 ft To 14,455.00 ft		Unit No. : 11210425		Job No. : CA-XX-0901287551	
Date Logged		: 20-Jun-14 To 27-Jun-14		Plot Type : Final			
Total Depth MD		: 14,455.00 ft TVD : 6,677.74 ft		Plot Date : 30-Jun-14			
Spud Date		: 20-Jun-14					
Run No.		Borehole Record (MD)		Run No.		Borehole Record (MD)	
		Size From To				Size From To	
0100		8.750 in 846.00 ft 5991.00 ft					
0200		8.750 in 5991.00 ft 7004.00 ft					
0300		6.125 in 7004.00 ft 14455.00 ft					

Max Tool Temp (degF) / Source	154.30 / PCM	167.00 / PCM	230.30 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Garry Igunbor	Garry Igunbor	Garry Igunbor		
Customer Representative	Jeremy Stolz	Jeremy Stolz	Jeremy Stolz		

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11342299	11342299	12177825		
Insert Serial Number	11145513	11145513	11145513		
Date and Time Initialized	19-Jun-14 17:33	19-Jun-14 17:33	23-Jun-14 16:10		
Date and Time Read	23-Jun-14 14:08	23-Jun-14 14:07	27-Jun-14 23:06		
ECMB SW Version	N/A	N/A	N/A		

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	59.00	58.00	62.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11342299	11342299	12177825		
Sonde Serial Number	11638605	11638605	11638605		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	251.94	347.31	278.93		

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	51.53	50.68	54.65		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11342299	11342299	12177825		
Insert/Sonde Serial Number	11680902	11680902	11680902		

## 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"

PGXR (Gamma Ray):  
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

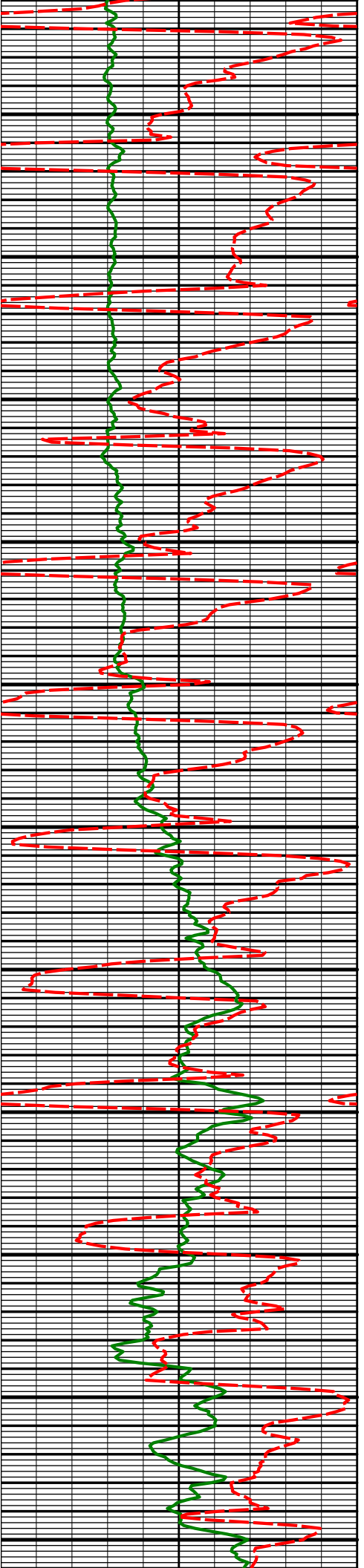
## WARRANTY

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.

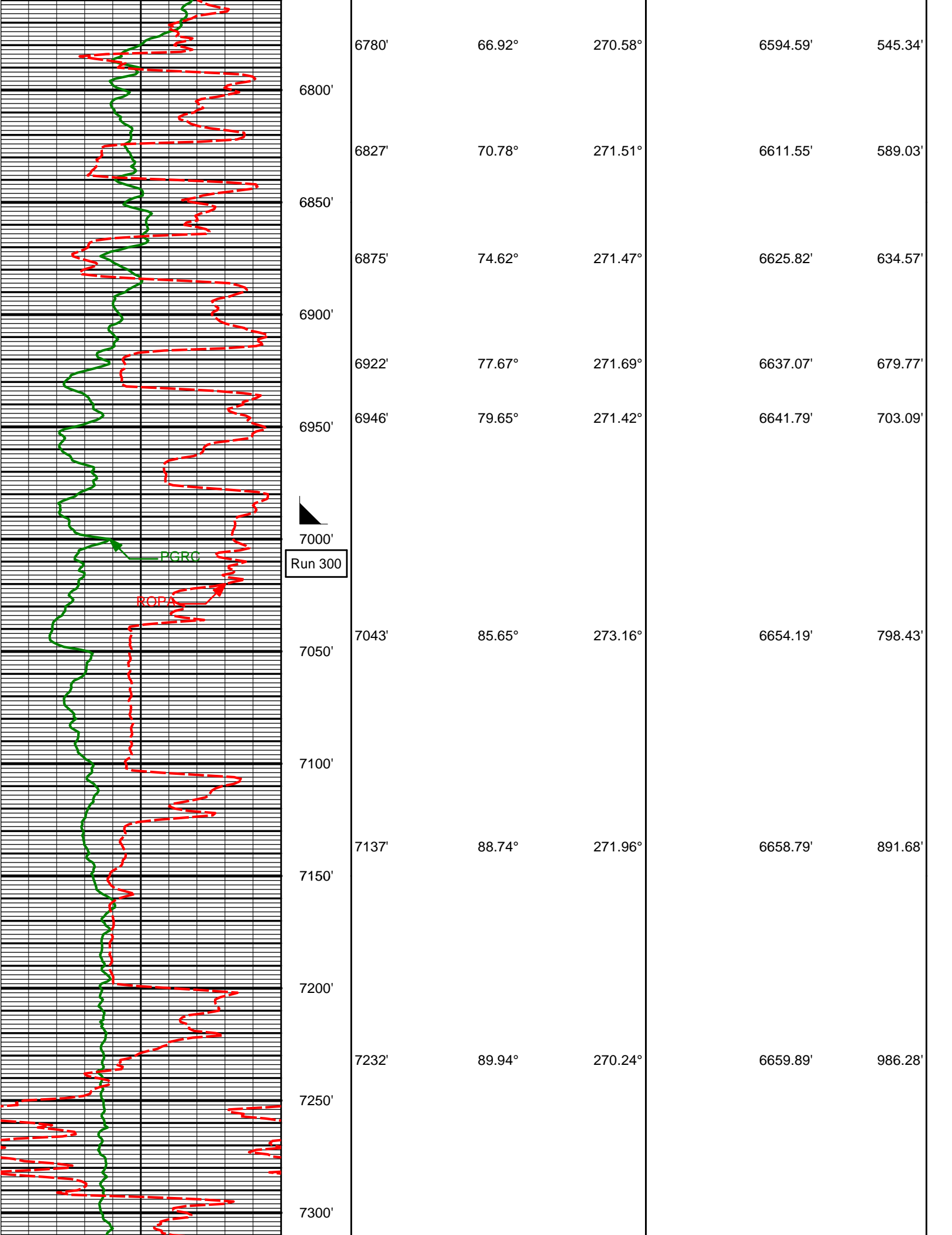
# HALLIBURTON

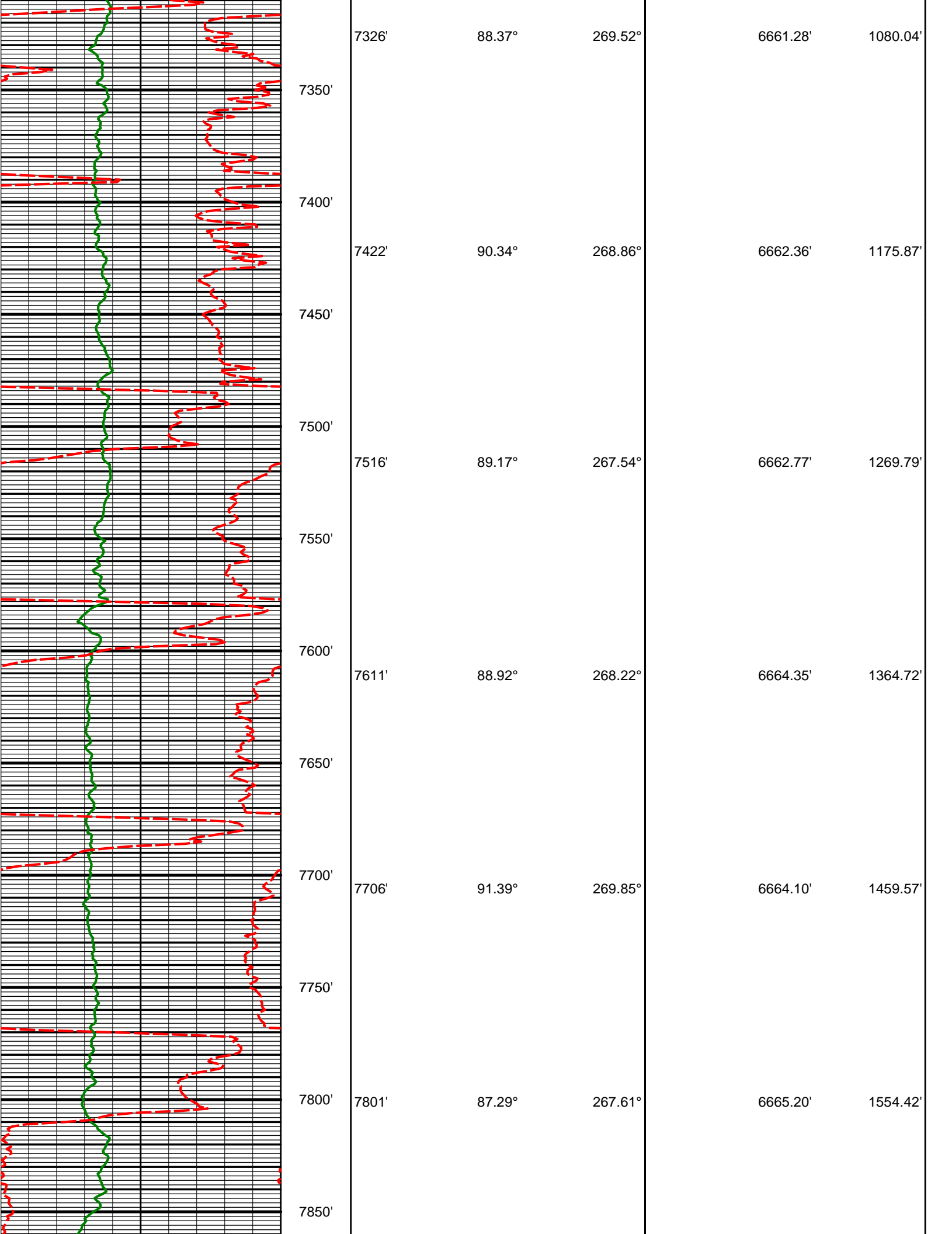
## MD Detail Log 1:600

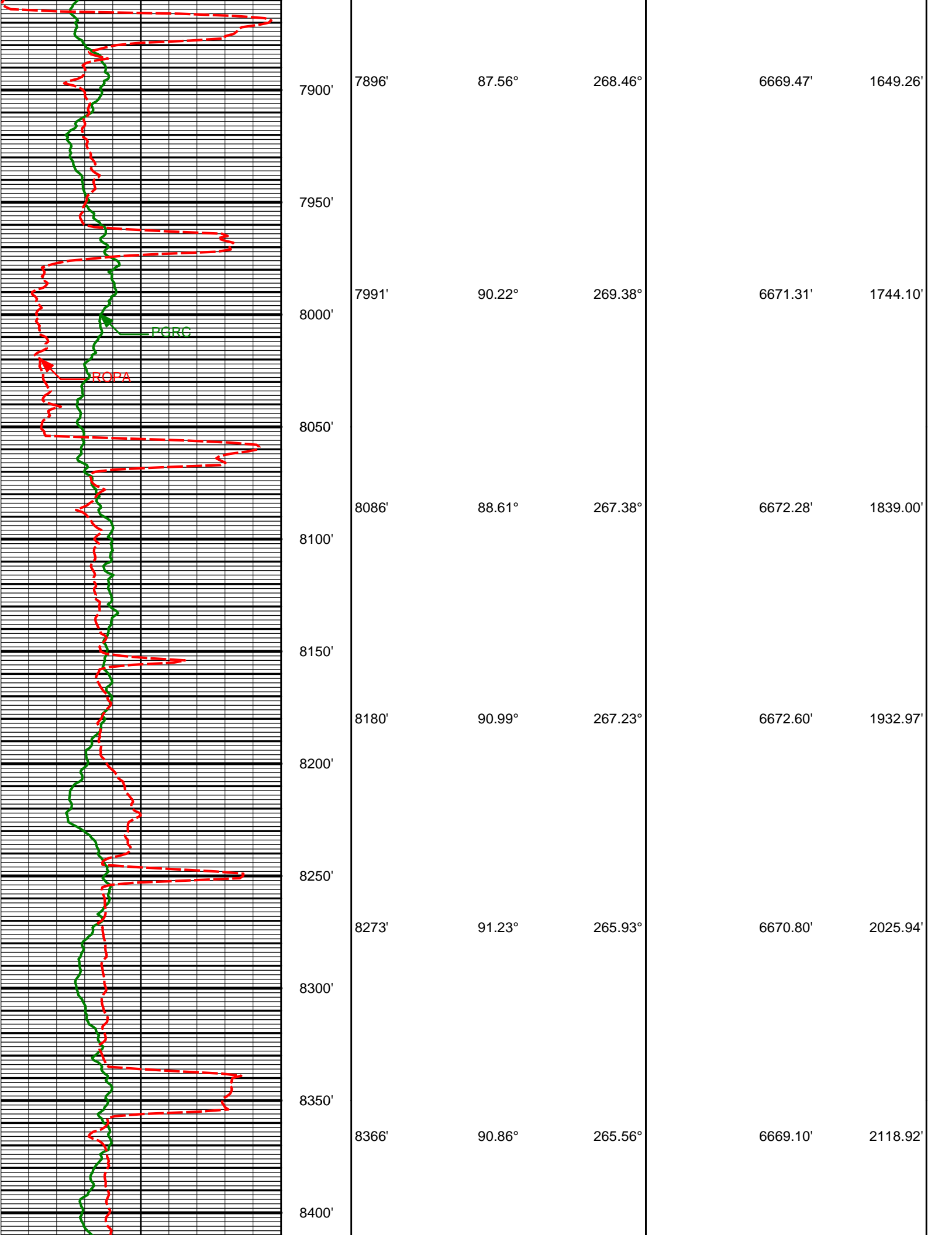
Gamma Ray (PGXC) (Api)						
0300						
Avg Rate of Penetration feet per hr	Feet					
6000		Depth	Inc	Azm	TVD	Vsec
	5950'					
	6000'					
	6022'	0.56°	292.10°	5987.33'	168.84'	
	6050'					
	6069'	3.40°	262.27°	6034.29'	170.44'	
	6100'					
	6116'	8.17°	267.43°	6081.04'	175.17'	
	6150'					
	6163'	11.23°	266.78°	6127.36'	183.09'	
	6200'					
	6211'	14.92°	265.50°	6174.10'	189.89'	

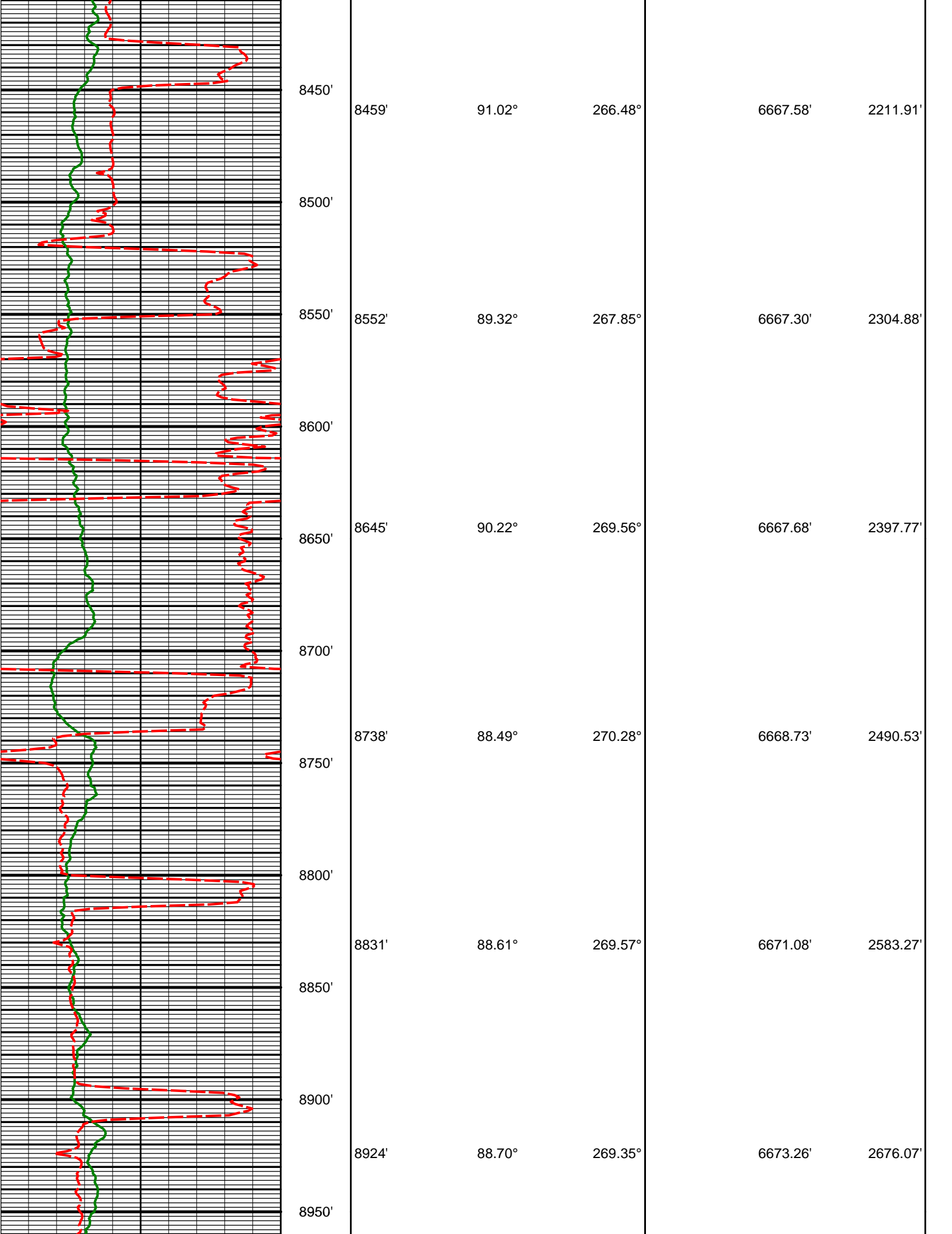


6211'	6211'	14.86°	265.59°	6174.12'	193.92'
6250'	6258'	18.12°	271.38°	6219.18'	207.21'
6300'	6305'	21.85°	278.53°	6263.35'	223.00'
6350'	6352'	26.33°	275.55°	6306.25'	241.77'
6400'	6400'	31.35°	270.26°	6348.29'	264.68'
6450'	6447'	35.80°	270.50°	6387.44'	290.54'
6500'	6495'	40.27°	269.80°	6425.24'	319.98'
6550'	6542'	44.39°	269.92°	6459.98'	351.49'
6600'	6590'	49.44°	269.79°	6492.75'	386.37'
6650'	6637'	53.62°	269.00°	6521.99'	423.01'
6700'	6685'	56.43°	269.12°	6549.50'	462.20'
6750'	6732'	61.51°	269.70°	6573.72'	502.29'

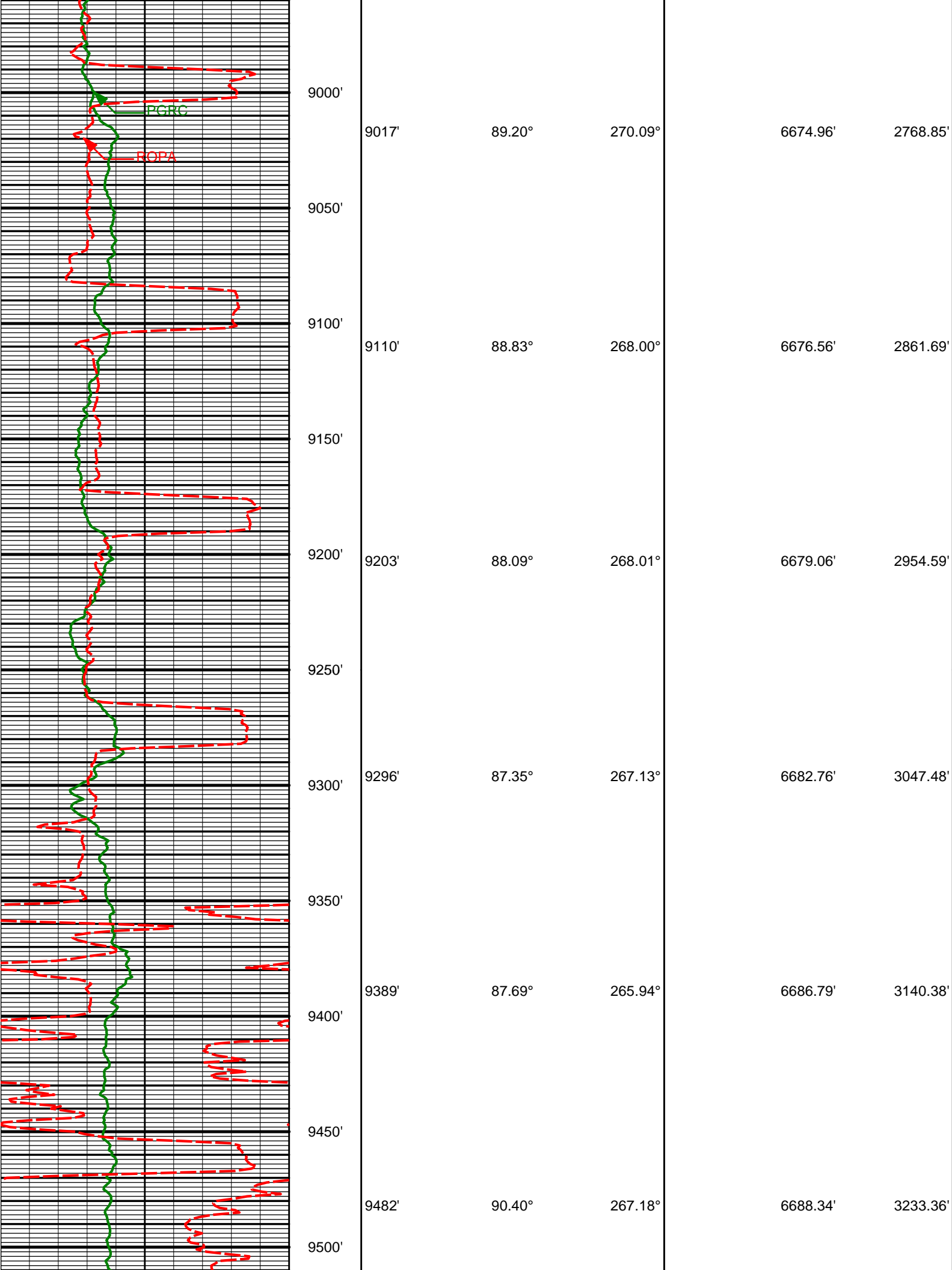


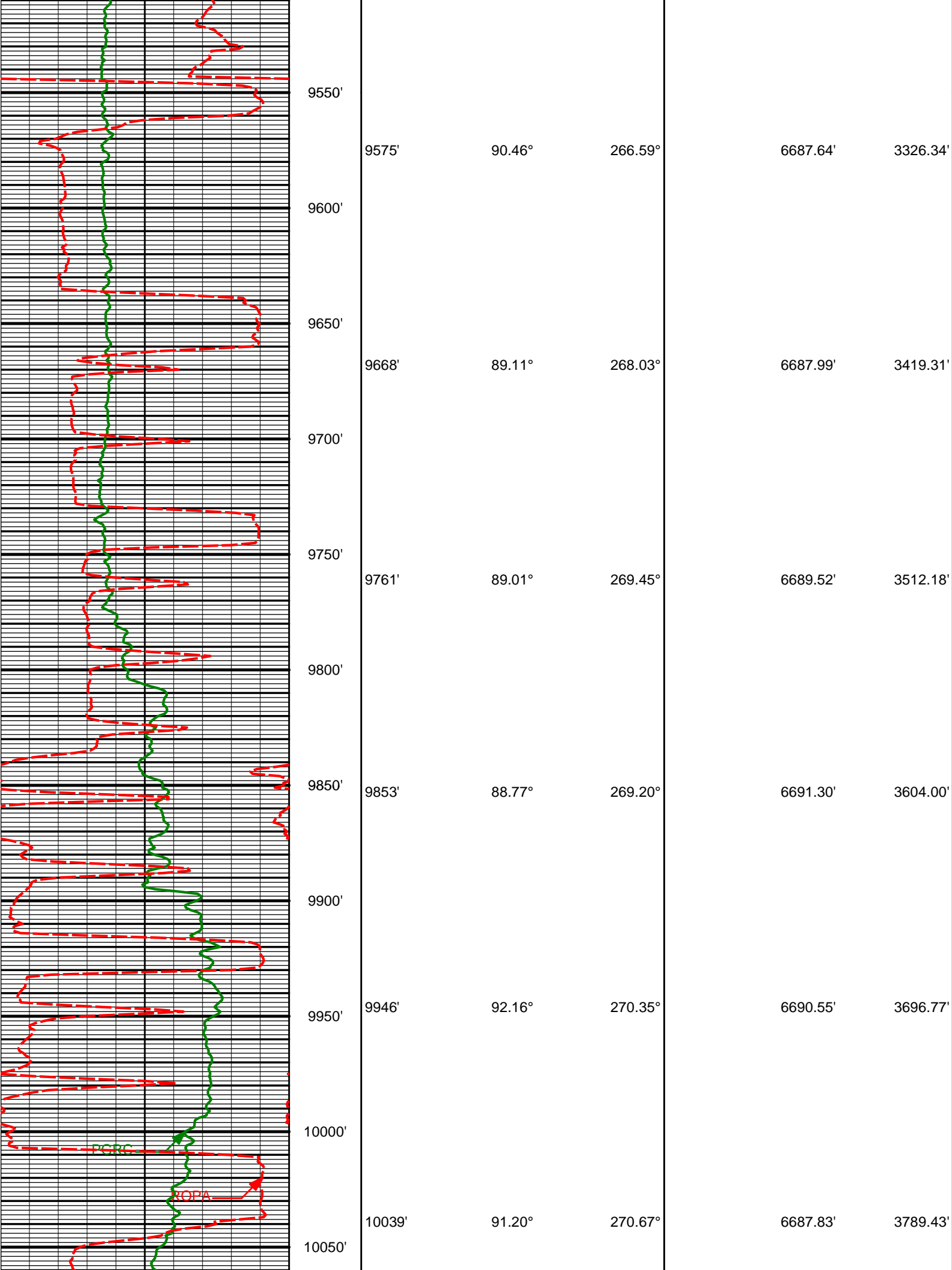


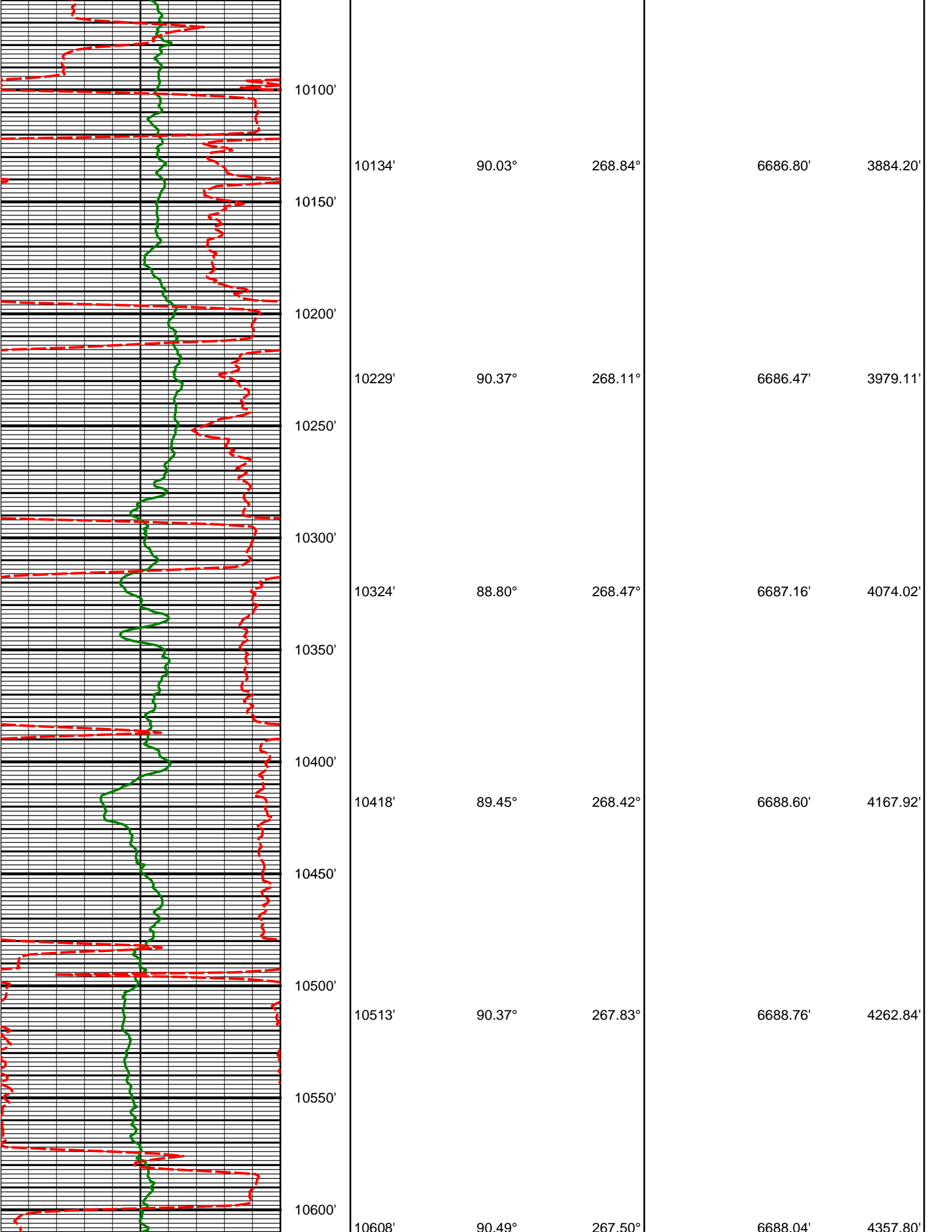


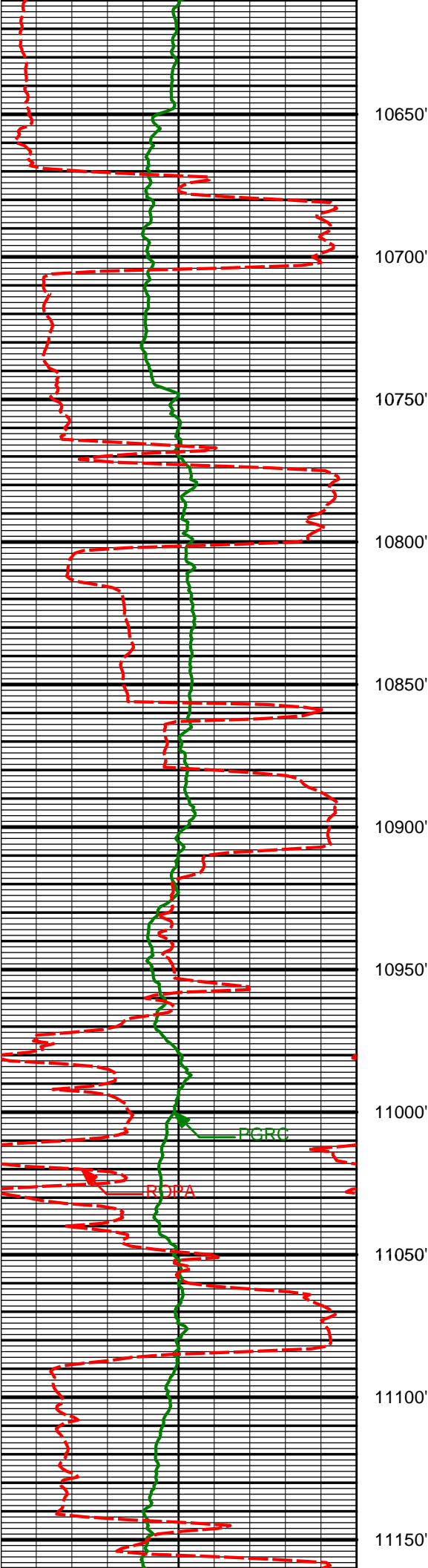




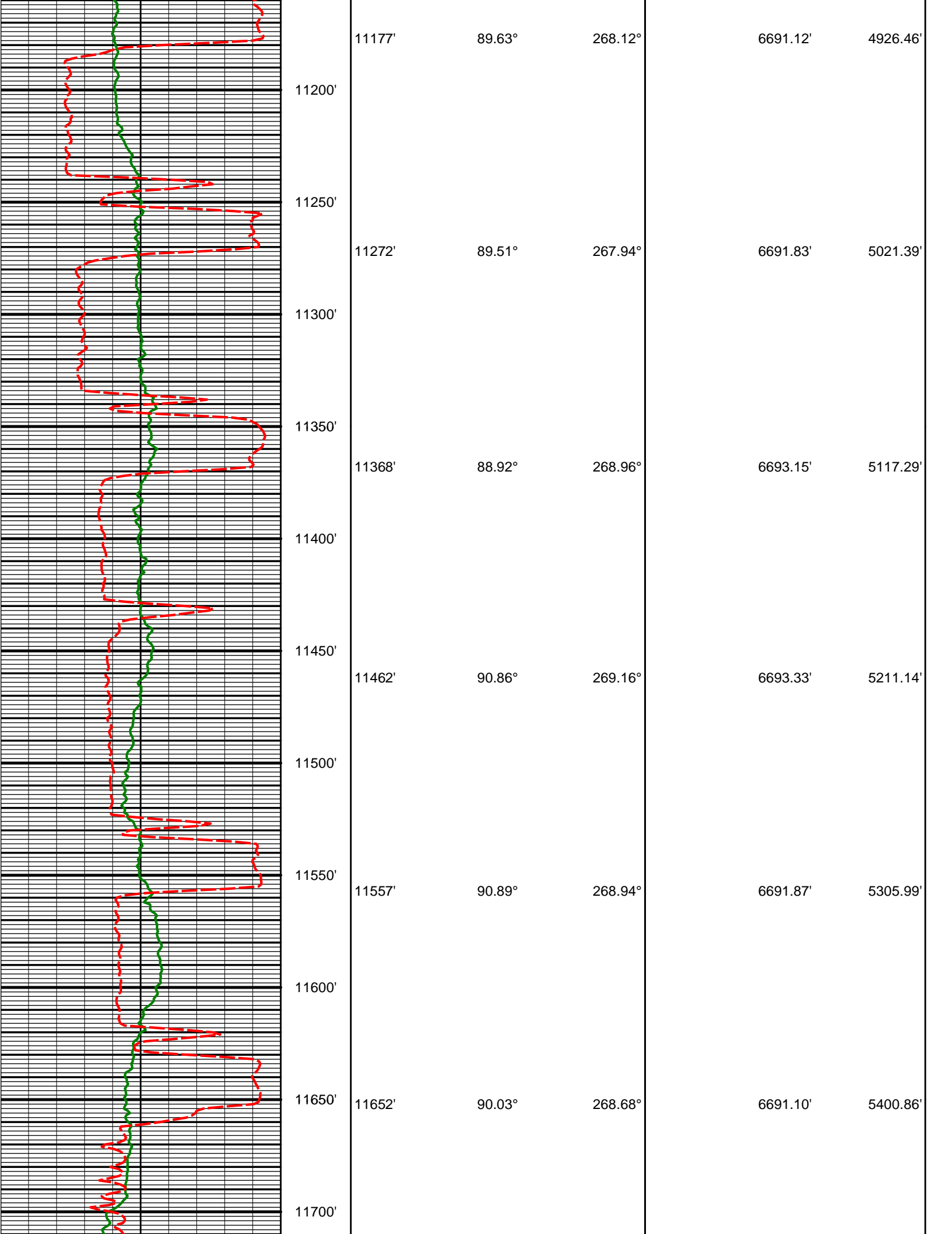


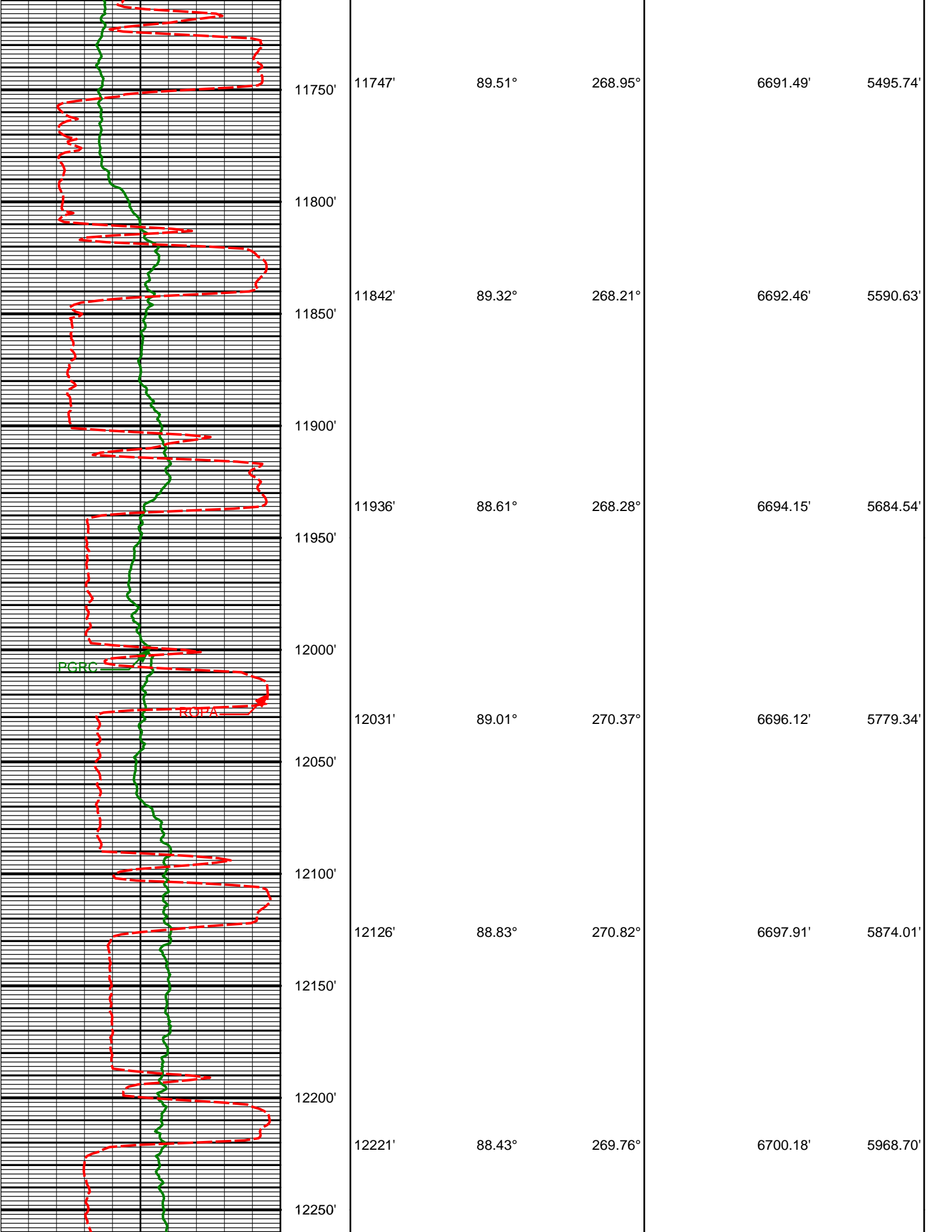


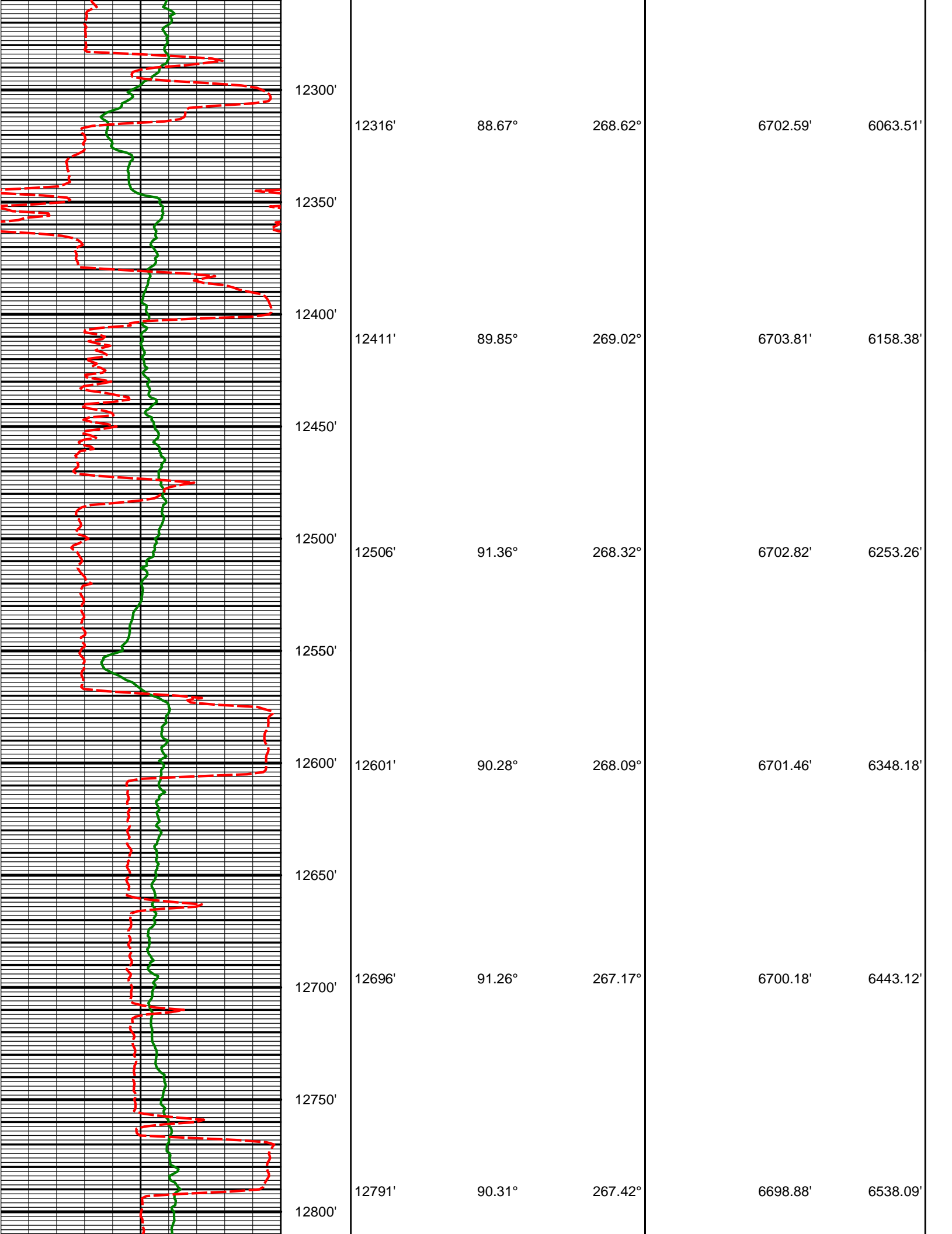


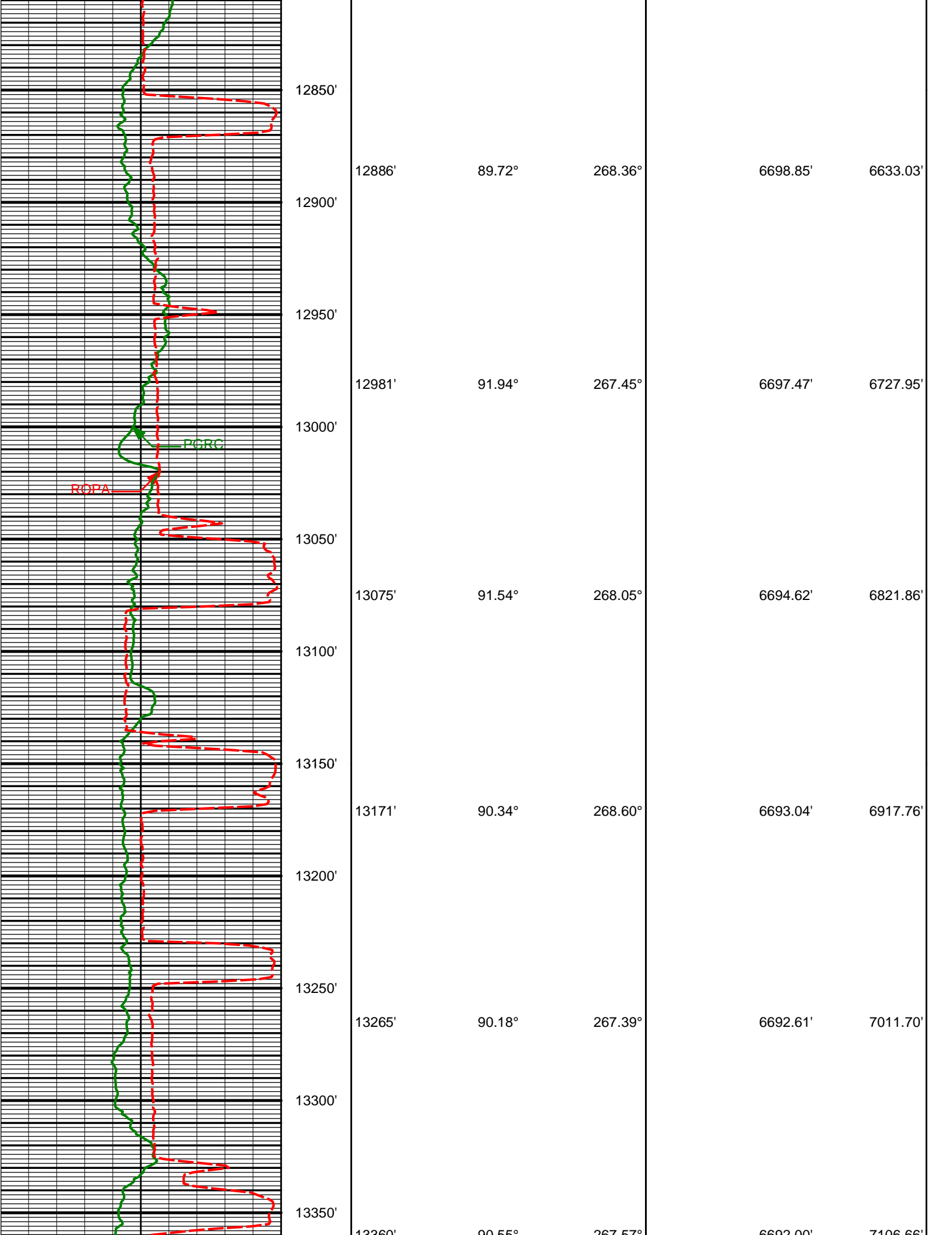


10703'	90.31°	267.58°	6687.38'	4452.75'	
10798'	90.12°	268.33°	6687.02'	4547.69'	
10892'	88.61°	267.68°	6688.06'	4641.62'	
10988'	88.92°	266.66°	6690.12'	4737.58'	
11083'	90.12°	268.24°	6690.91'	4832.53'	

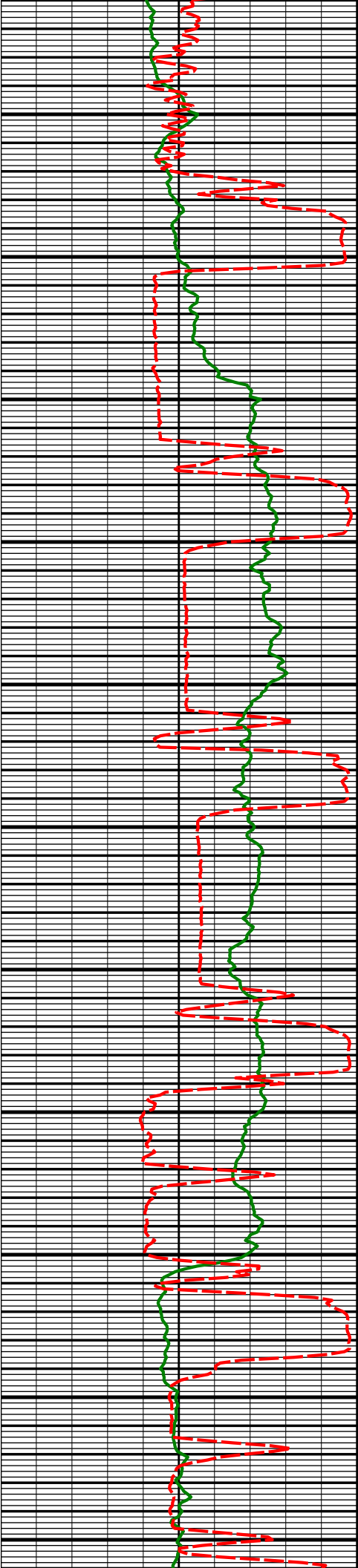




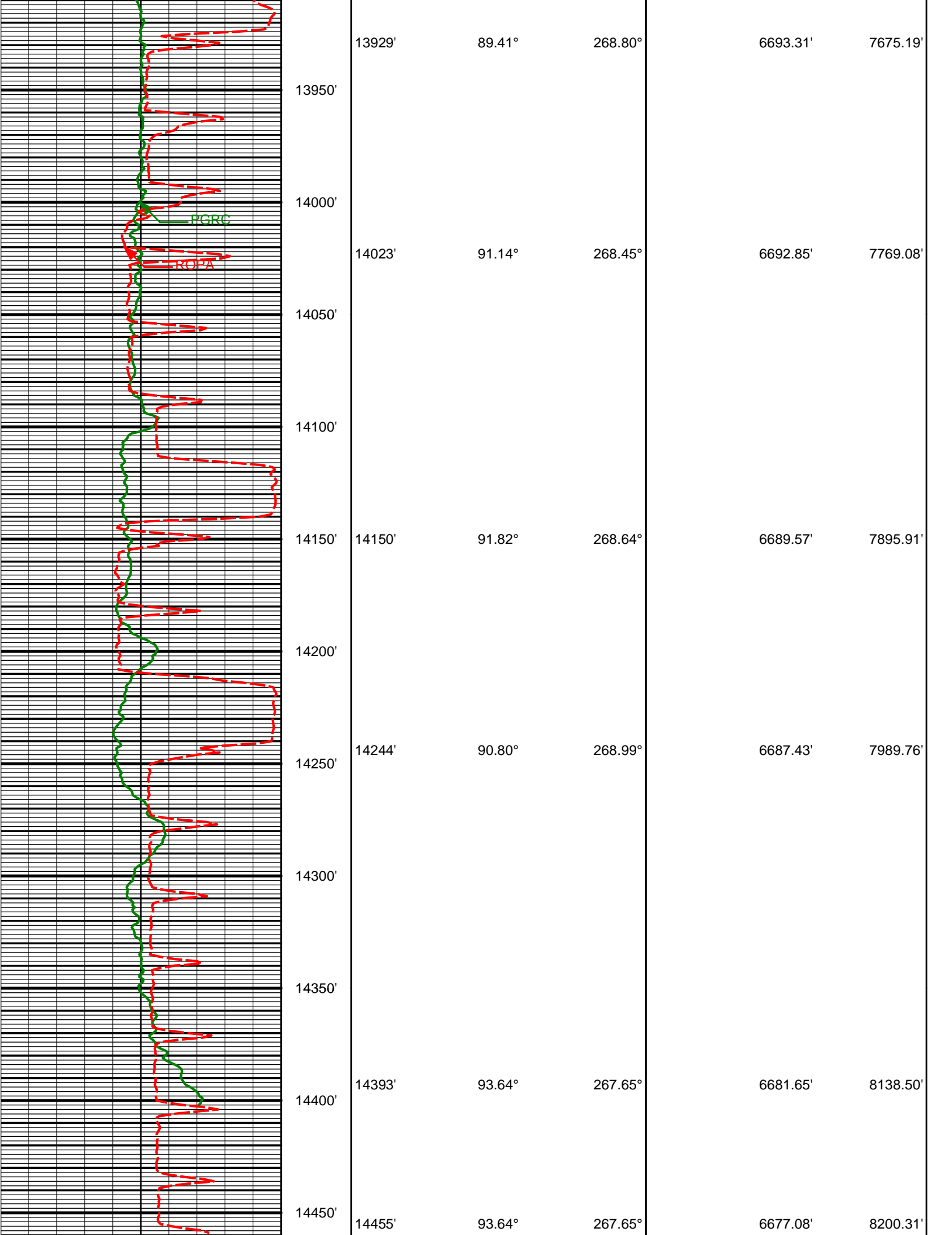








	13300'	90.33°	267.37°	6692.00'	7100.00'
	13400'				
	13450'				
	13455'	90.49°	267.32°	6691.13'	7201.62'
	13500'				
	13550'				
	13549'	89.97°	267.96°	6690.75'	7295.58'
	13600'				
	13644'	89.85°	268.12°	6690.91'	7390.51'
	13650'				
	13700'				
	13739'	89.60°	268.62°	6691.37'	7485.42'
	13750'				
	13800'				
	13834'	89.32°	268.58°	6692.26'	7580.31'
	13850'				
	13900'				



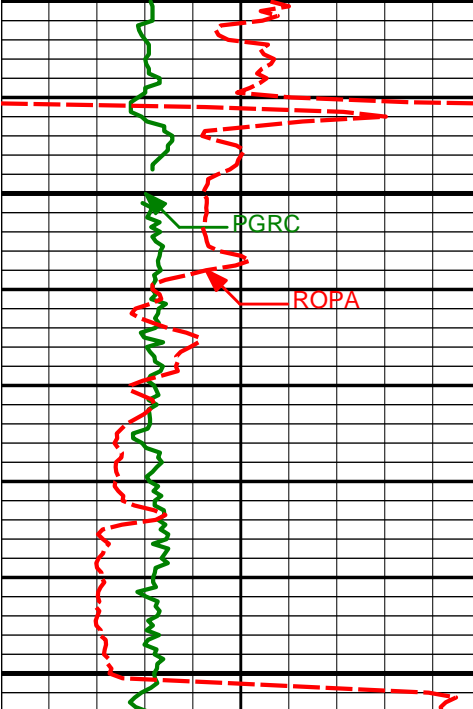
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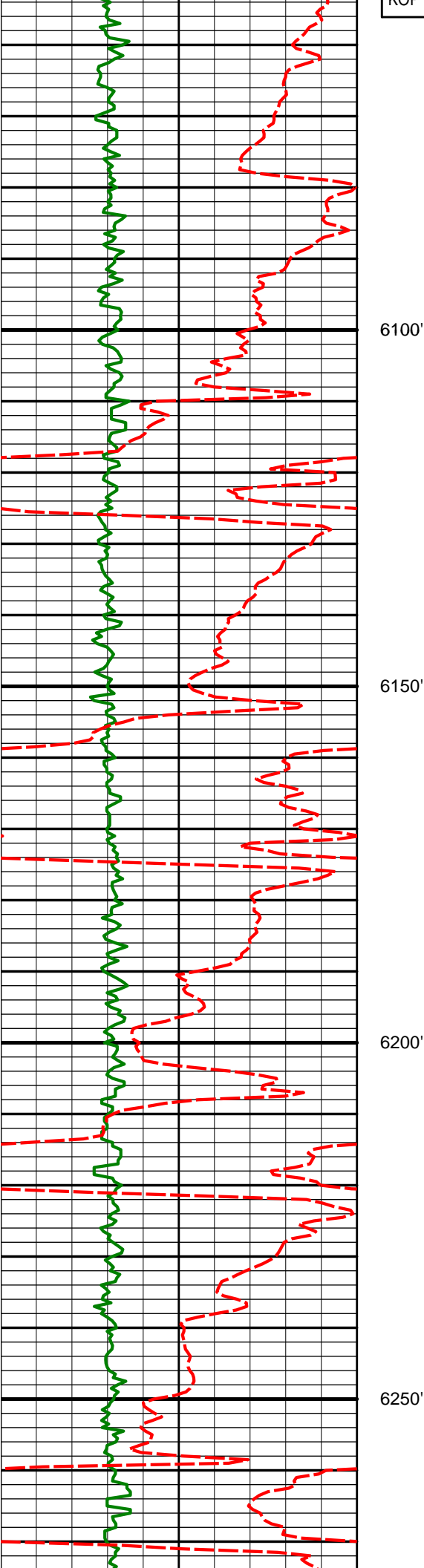
Avg Rate of Penetration feet per hr		Feet			
600	0		Depth	Inc	Azm
Gamma Ray (PGXC) (Api)					TVD
0	300				Vsec

HALLIBURTON

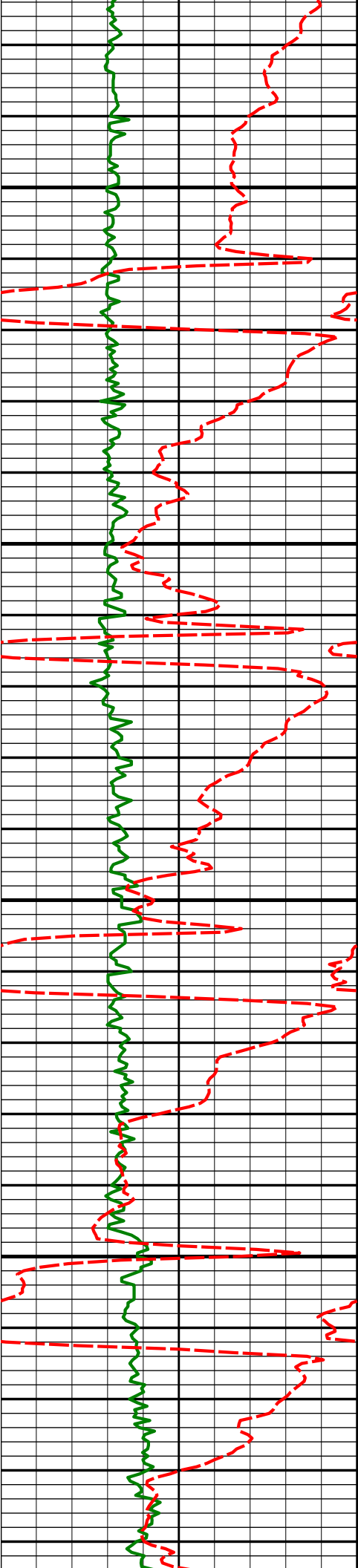
MD Detail Log 1:240

Gamma Ray (PGXC) (Api)					
0	300				
Avg Rate of Penetration feet per hr		Feet			
600	0		Depth	Inc	Azm
					TVD
					Vsec

	Run 200					
	6000'					
	6022'	0.56°	292.10°	5987.33'	168.84'	
6050'						
KOP						



ROI				
6069'	3.40°	262.27°	6034.29'	170.44'
6100'				
6116'	8.17°	267.43°	6081.04'	175.17'
6150'				
6163'	11.23°	266.78°	6127.36'	183.09'
6200'				
6211'	14.86°	265.59°	6174.12'	193.92'
6250'				
6258'	18.12°	271.38°	6219.18'	207.21'



6300'

6305'

21.85°

278.53°

6263.35'

223.00'

6350'

6352'

26.33°

275.55°

6306.25'

241.77'

6400'

6400'

31.35°

270.26°

6348.29'

264.68'

6450'

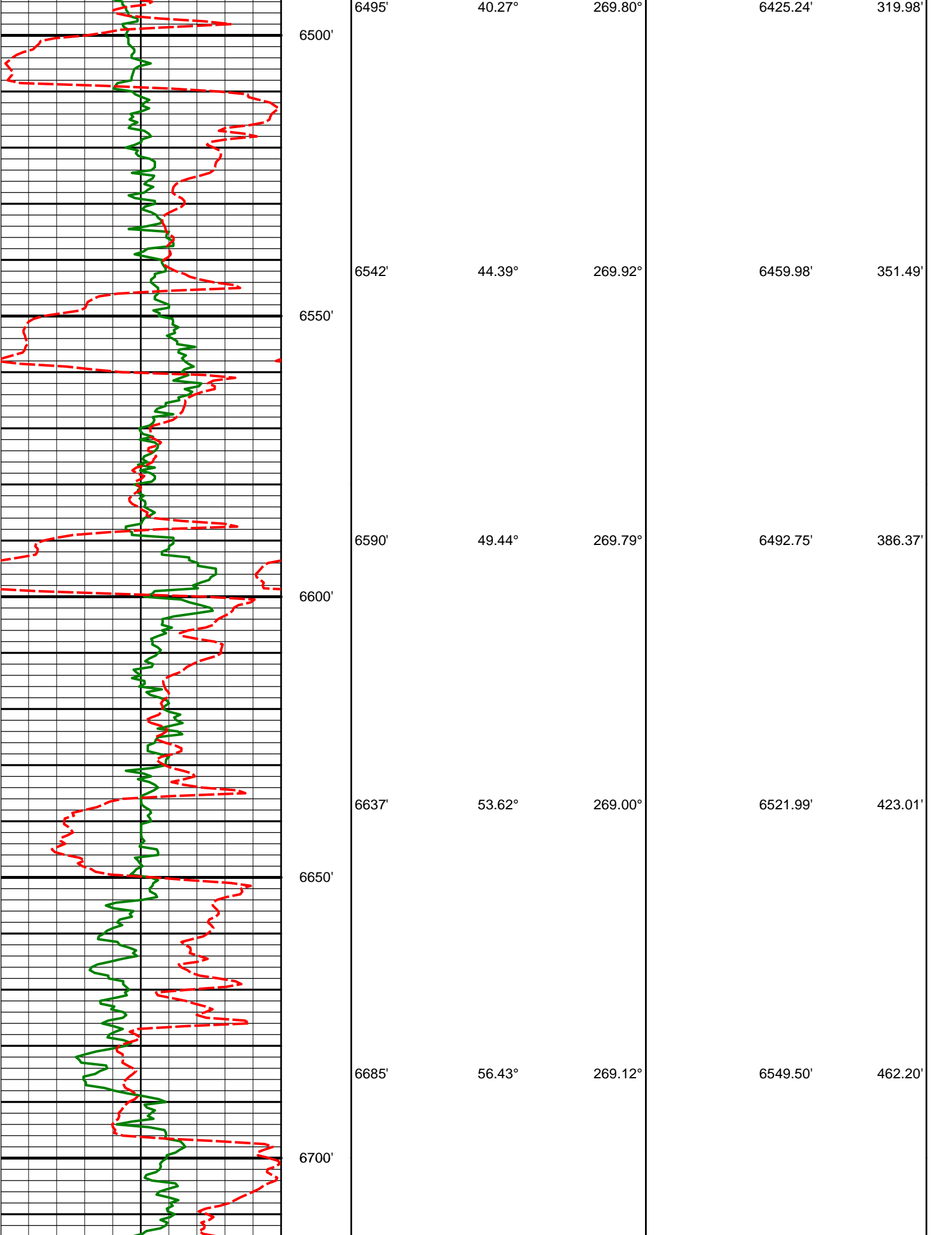
6447'

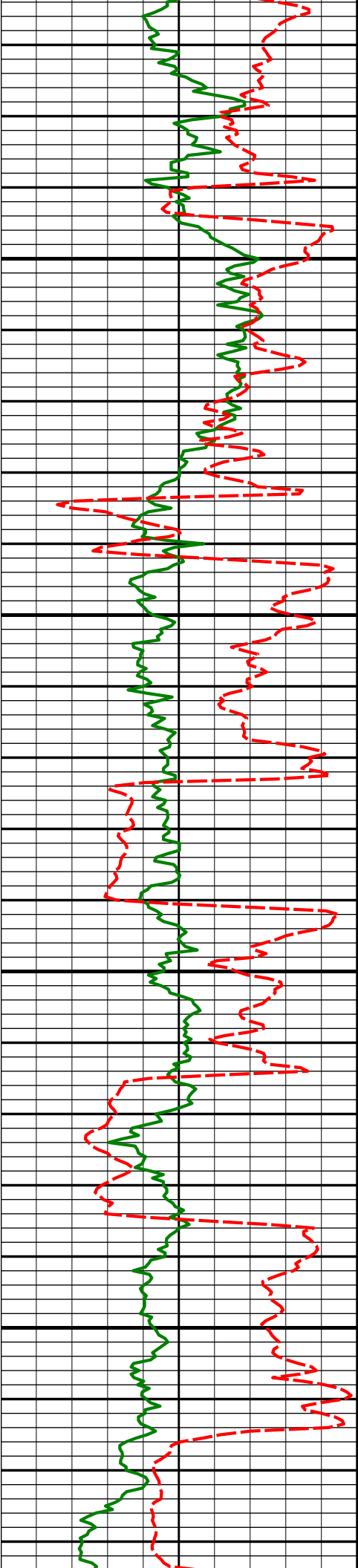
35.80°

270.50°

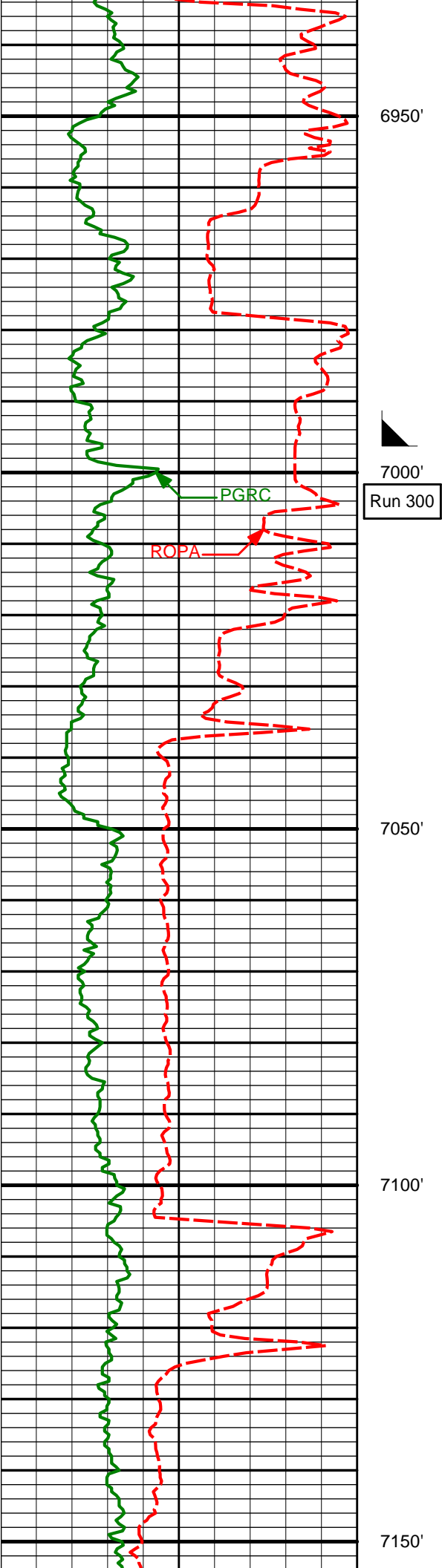
6387.44'

290.54'



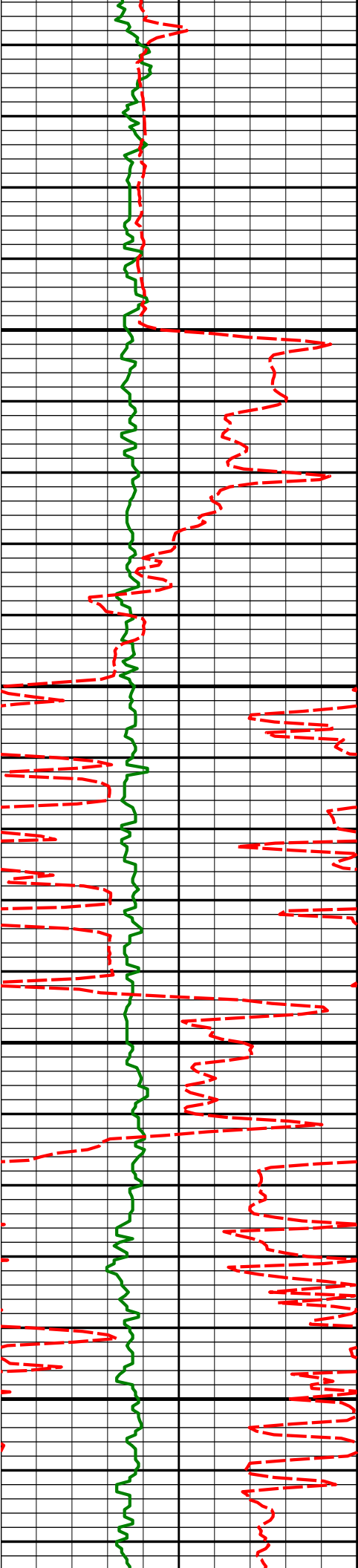


6732'	61.51°	269.70°	6573.72'	502.29'
6750'				
6780'	66.92°	270.58°	6594.59'	545.34'
6800'				
6827'	70.78°	271.51°	6611.55'	589.03'
6850'				
6875'	74.62°	271.47°	6625.82'	634.57'
6900'				
6922'	77.67°	271.69°	6637.07'	679.77'



6946'	79.65°	271.42°	6641.79'	703.09'
7043'	85.65°	273.16°	6654.19'	798.43'
7137'	88.74°	271.96°	6658.79'	891.68'





7200'

7232'

89.94°

270.24°

6659.89'

986.28'

7250'

7300'

7326'

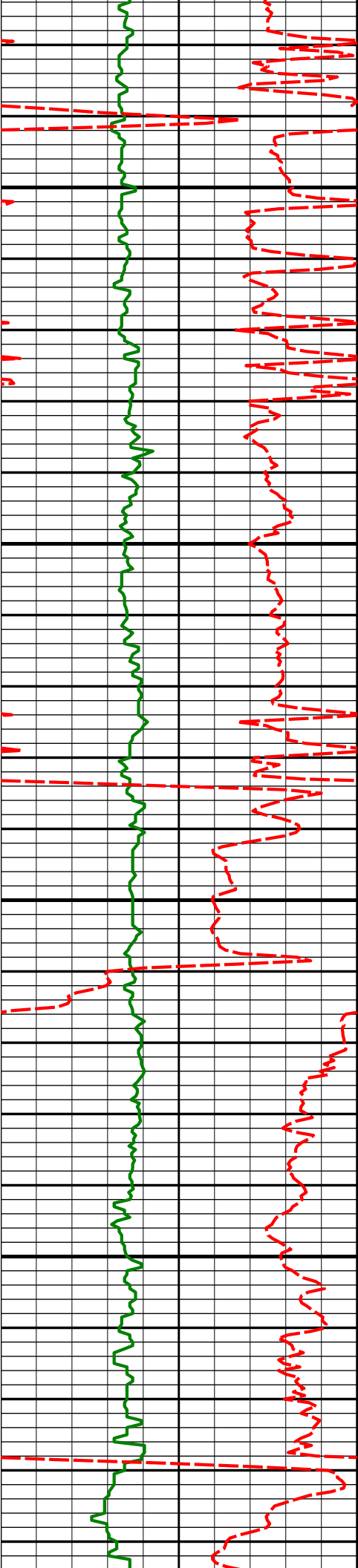
88.37°

269.52°

6661.28'

1080.04'

7350'



7400'

7422'

90.34°

268.86°

6662.36'

1175.87'

7450'

7500'

7516'

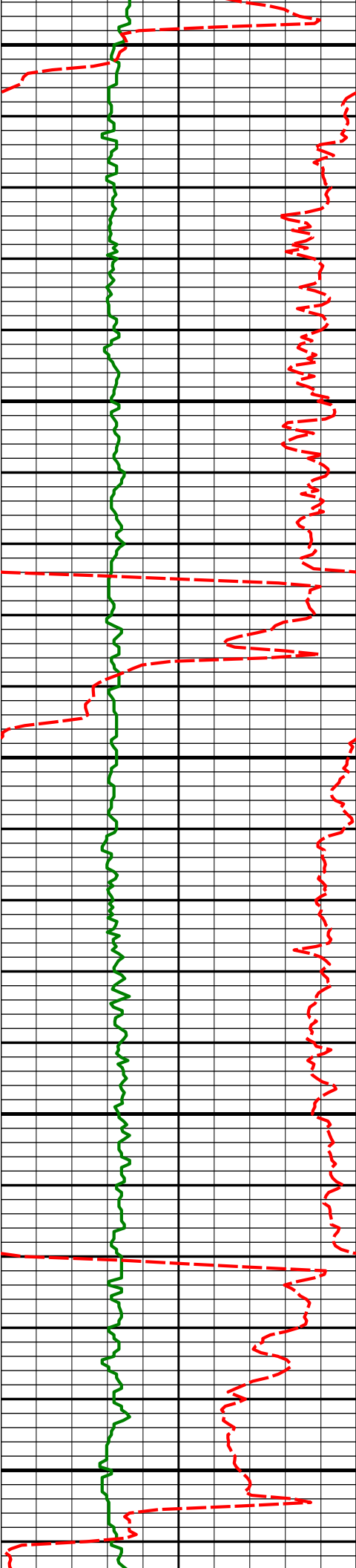
89.17°

267.54°

6662.77'

1269.79'

7550'



7600'

7611'

88.92°

268.22°

6664.35'

1364.72'

7650'

7700'

7706'

91.39°

269.85°

6664.10'

1459.57'

7750'

7800'

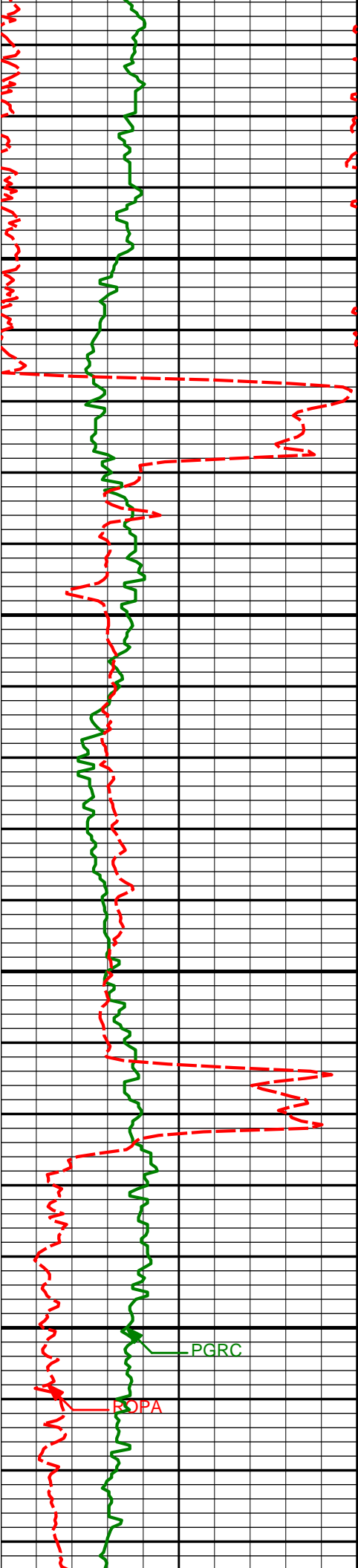
7801'

87.29°

267.61°

6665.20'

1554.42'



7850'

7900'

7950'

8000'

7896'

87.56°

268.46°

6669.47'

1649.26'

7991'

90.22°

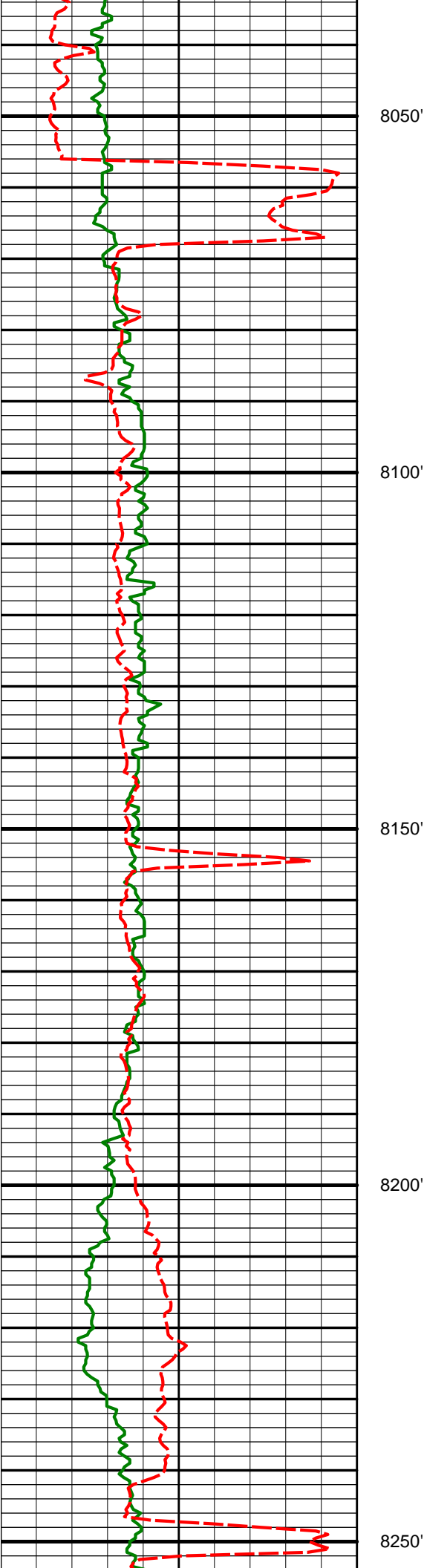
269.38°

6671.31'

1744.10'

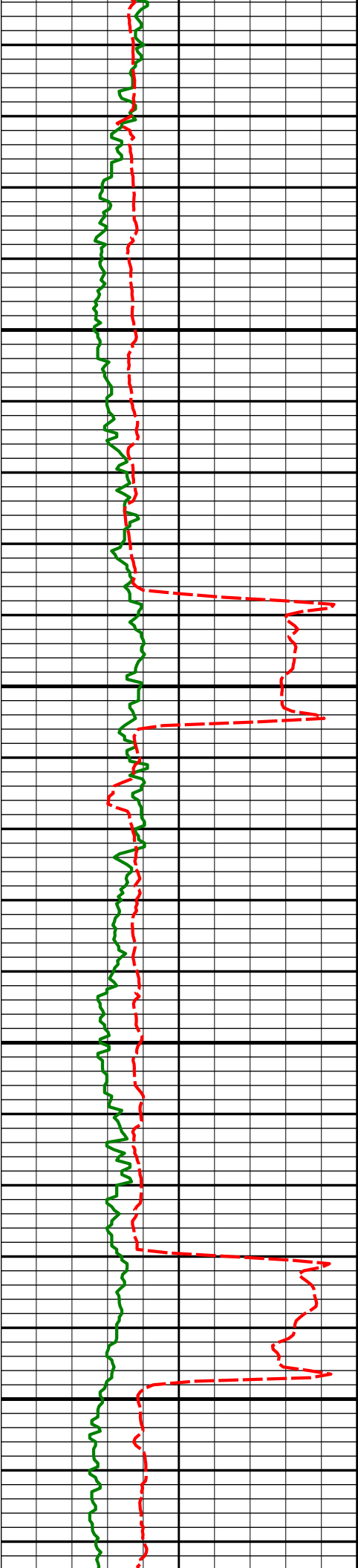
PGRC

POPA



8086'	88.61°	267.38°	6672.28'	1839.00'
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8180'	90.99°	267.23°	6672.60'	1932.97'
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8273'

91.23°

265.93°

6670.80'

2025.94'

8300'

8350'

8366'

90.86°

265.56°

6669.10'

2118.92'

8400'

8450'

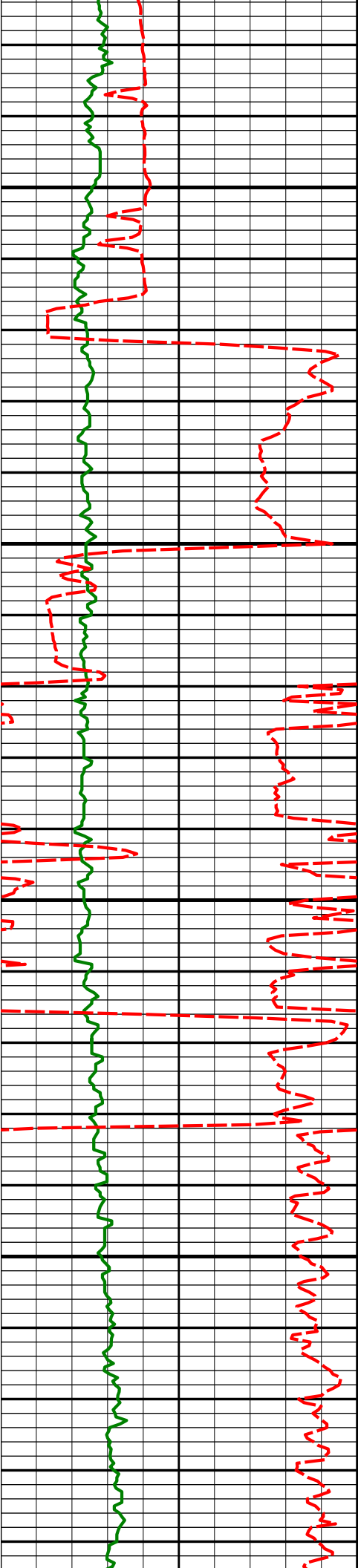
8459'

91.02°

266.48°

6667.58'

2211.91'



8500'

8550'

8600'

8650'

8552'

89.32°

267.85°

6667.30'

2304.88'

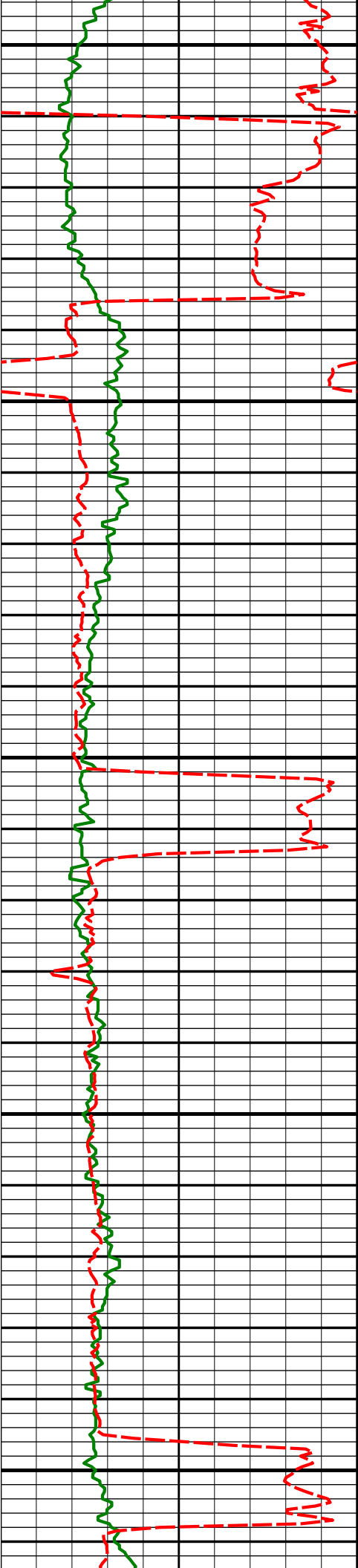
8645'

90.22°

269.56°

6667.68'

2397.77'



8700'

8738'

88.49°

270.28°

6668.73'

2490.53'

8750'

8800'

8831'

88.61°

269.57°

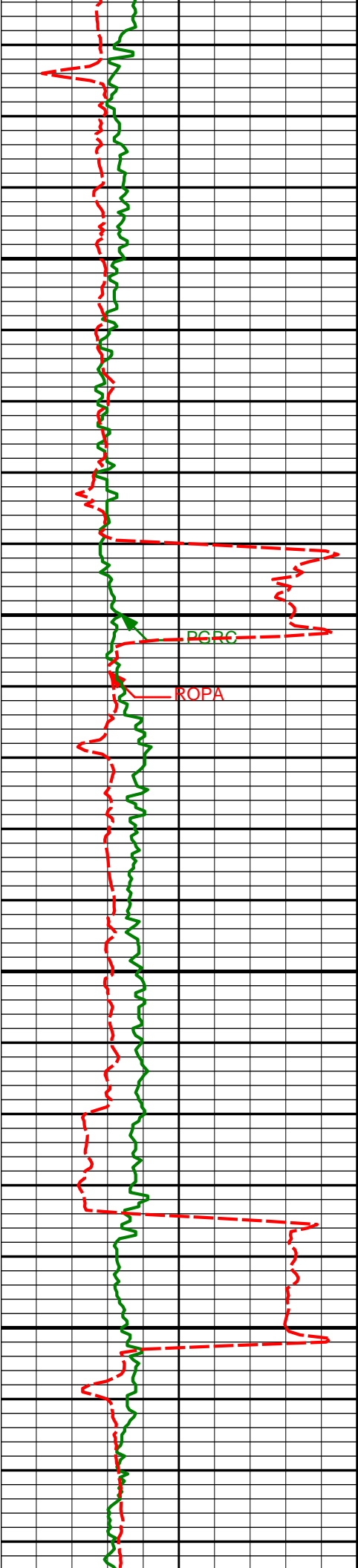
6671.08'

2583.27'

8850'

8900'





8924'

88.70°

269.35°

6673.26'

2676.07'

8950'

9000'

PGRC

ROPA

9017'

89.20°

270.09°

6674.96'

2768.85'

9050'

9100'

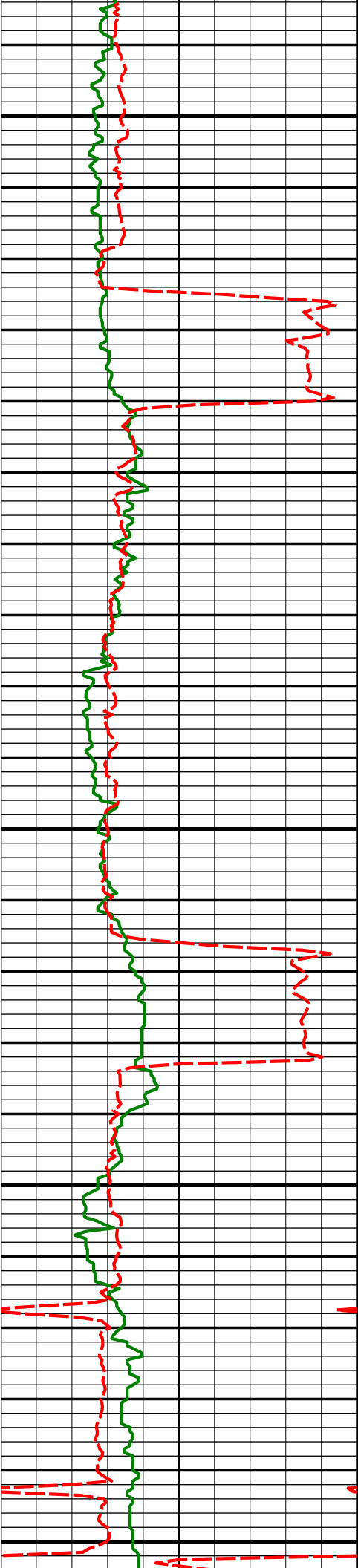
9110'

88.83°

268.00°

6676.56'

2861.69'



9150'

9200'

9250'

9300'

9350'

9203'

88.09°

268.01°

6679.06'

2954.59'

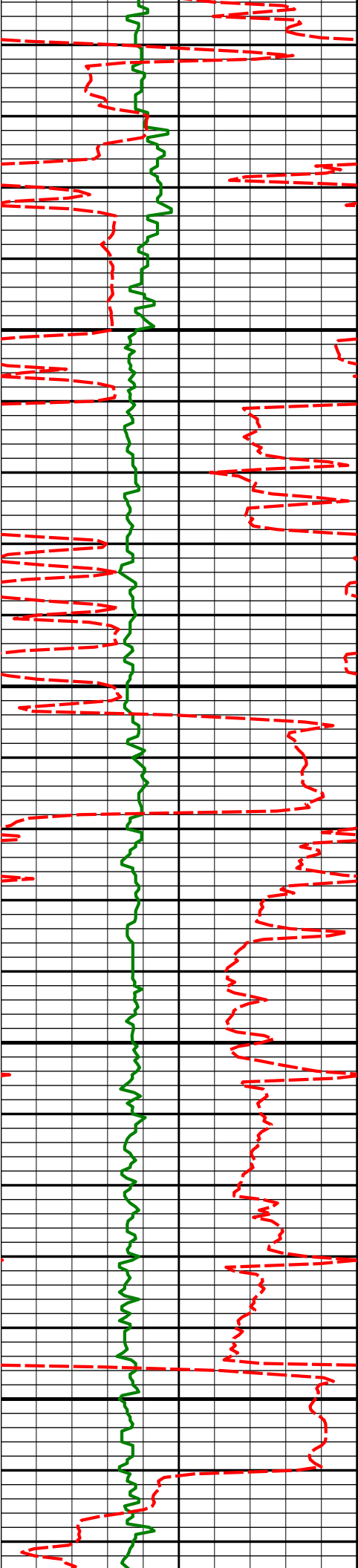
9296'

87.35°

267.13°

6682.76'

3047.48'



9389'

87.69°

265.94°

6686.79'

3140.38'

9400'

9450'

9482'

90.40°

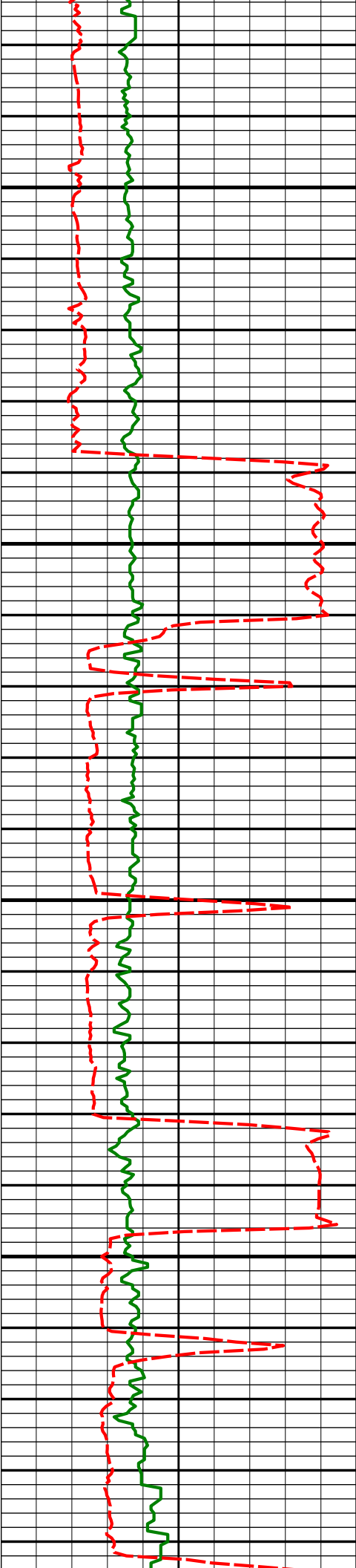
267.18°

6688.34'

3233.36'

9500'

9550'



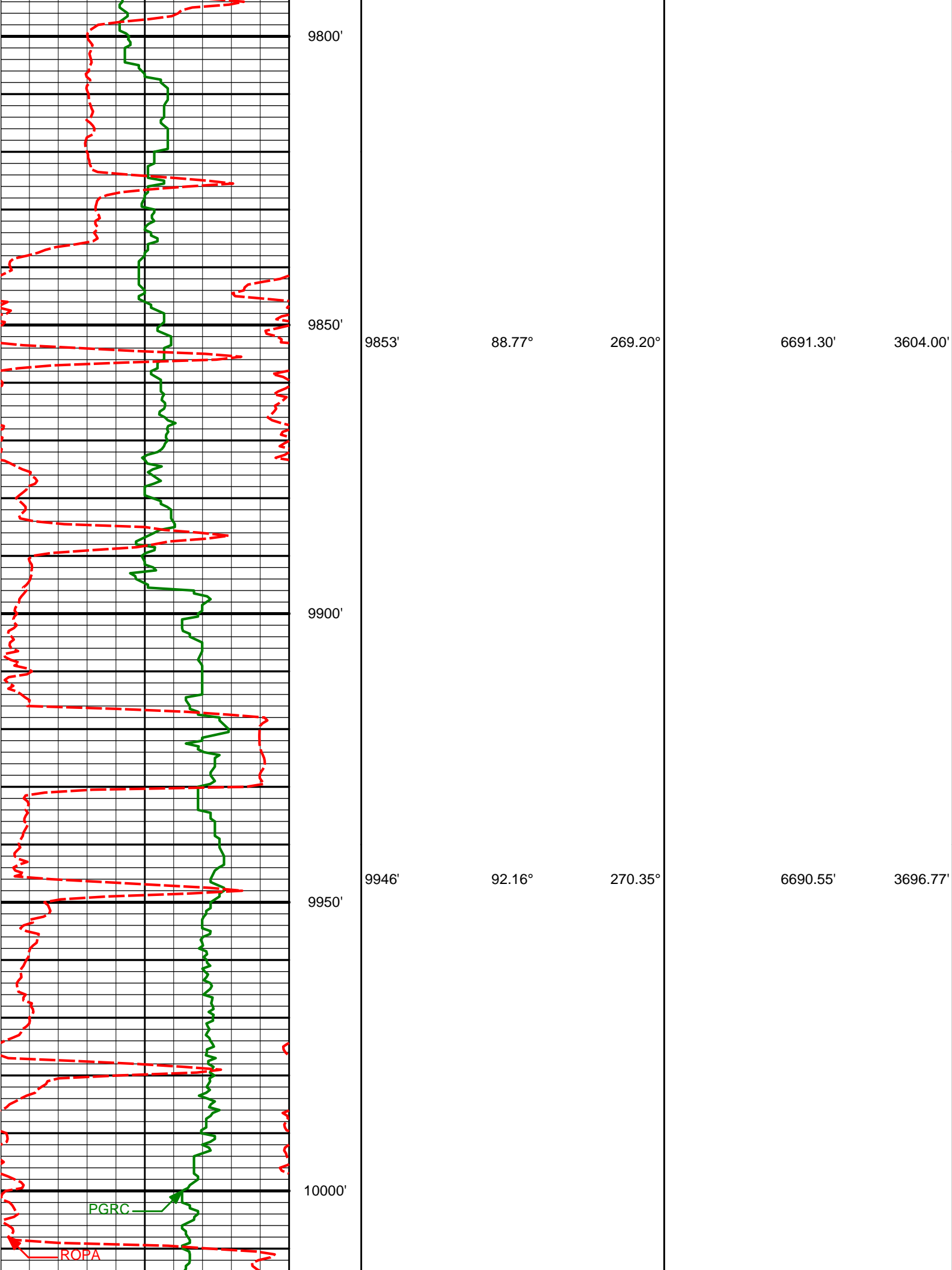
9600'

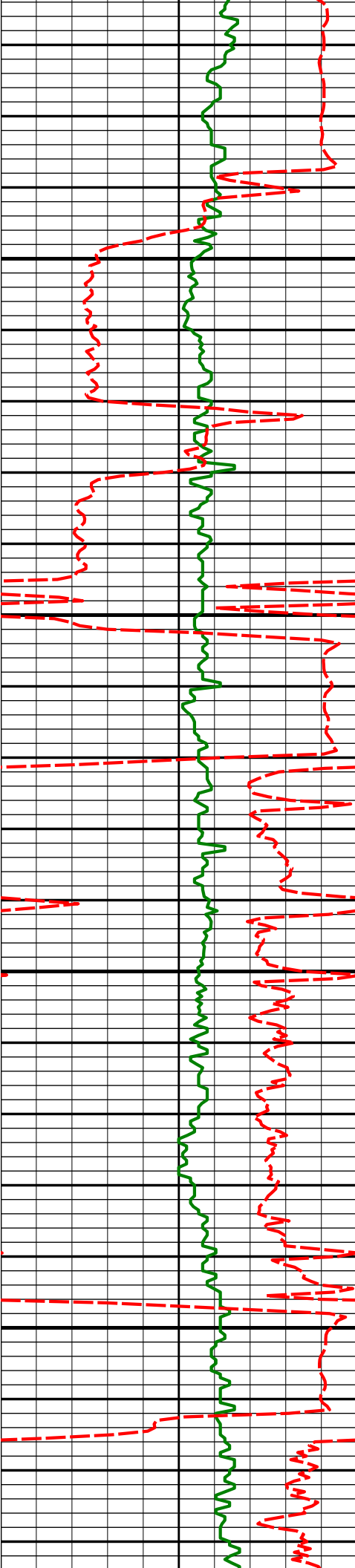
9650'

9700'

9750'

9575'	90.46°	266.59°	6687.64'	3326.34'
9668'	89.11°	268.03°	6687.99'	3419.31'
9761'	89.01°	269.45°	6689.52'	3512.18'





10039'

10050'

10100'

10150'

10200'

10039'

91.20°

270.67°

6687.83'

3789.43'

10134'

90.03°

268.84°

6686.80'

3884.20'

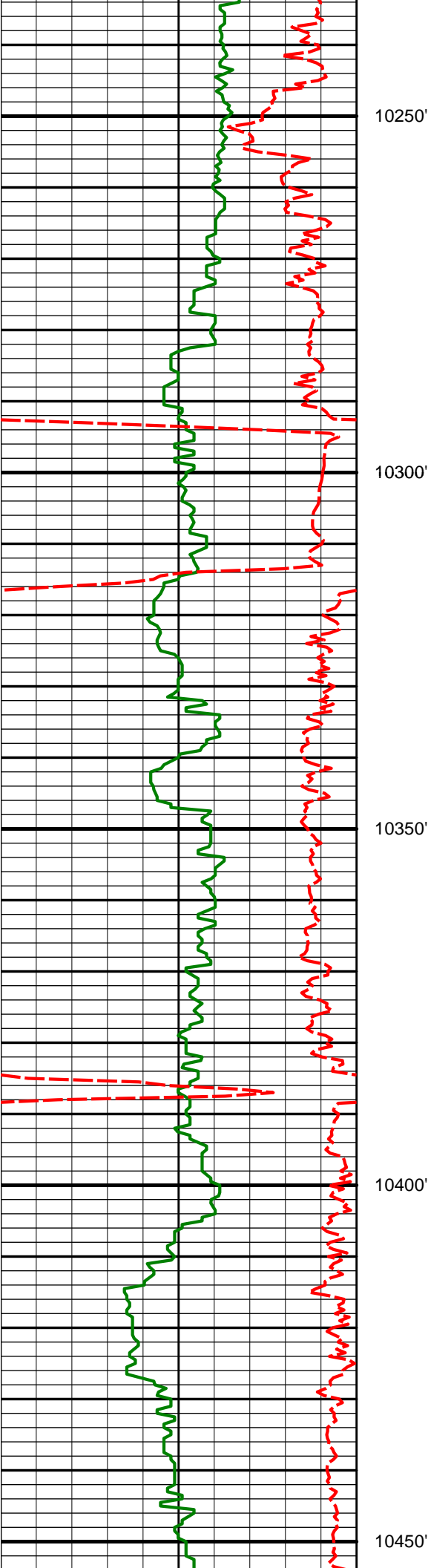
10229'

90.37°

268.11°

6686.47'

3979.11'



10250'

10300'

10350'

10400'

10450'

10324'

88.80°

268.47°

6687.16'

4074.02'

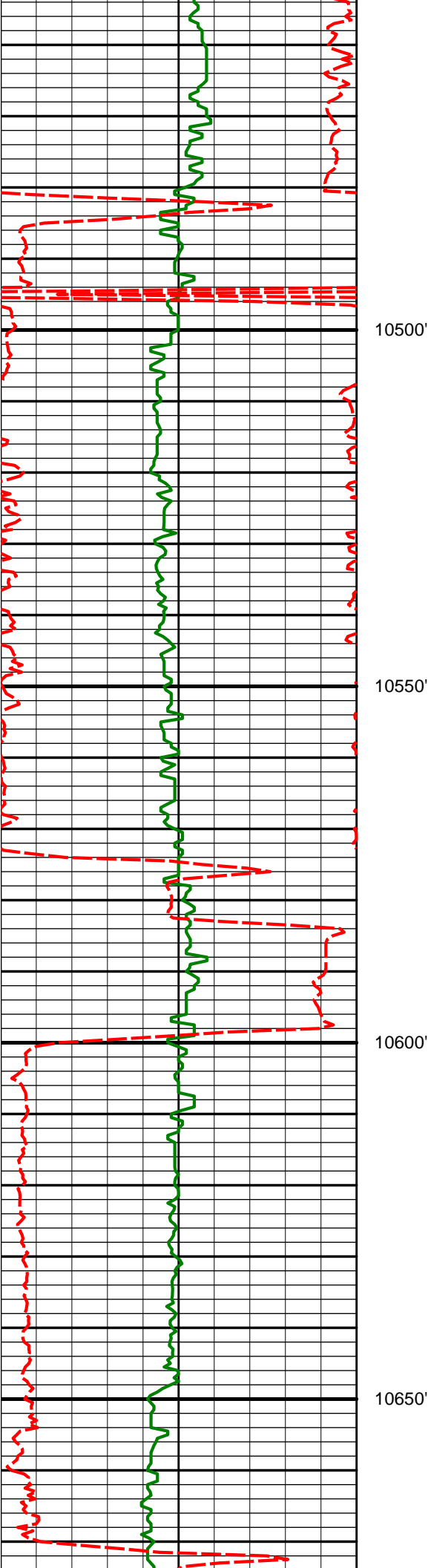
10418'

89.45°

268.42°

6688.60'

4167.92'



10513'

90.37°

267.83°

6688.76'

4262.84'

10500'

10550'

10600'

10608'

90.49°

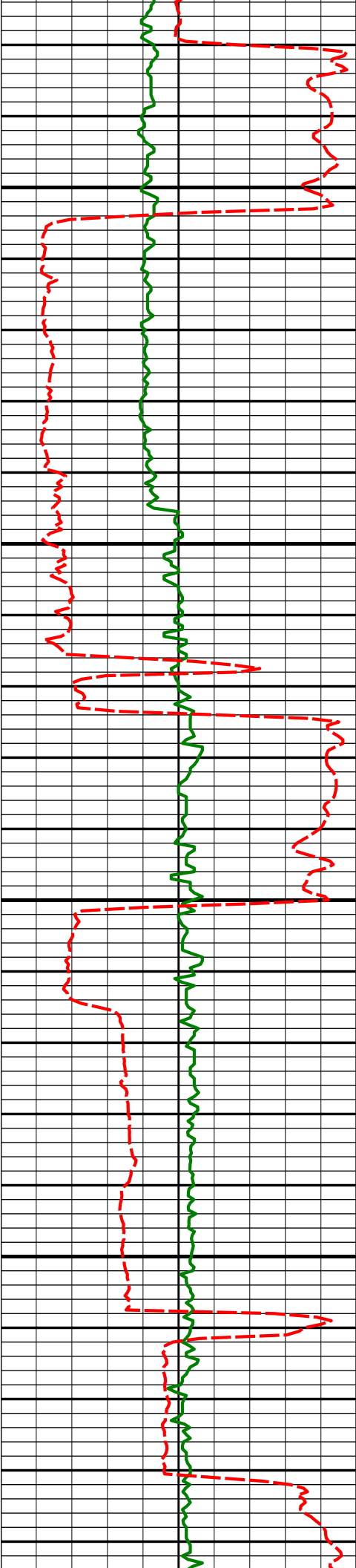
267.50°

6688.04'

4357.80'

10650'





10700'

10703'

90.31°

267.58°

6687.38'

4452.75'

10750'

10800'

10798'

90.12°

268.33°

6687.02'

4547.69'

10850'

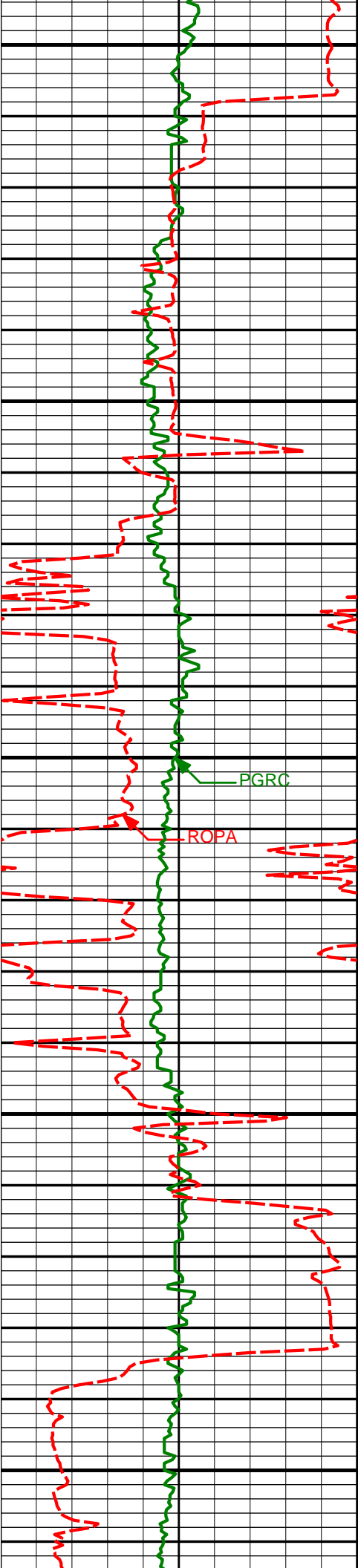
10892'

88.61°

267.68°

6688.06'

4641.62'



10900'

10950'

10988'

11000'

11050'

11083'

11100'

88.92°

266.66°

6690.12'

4737.58'

PGRC

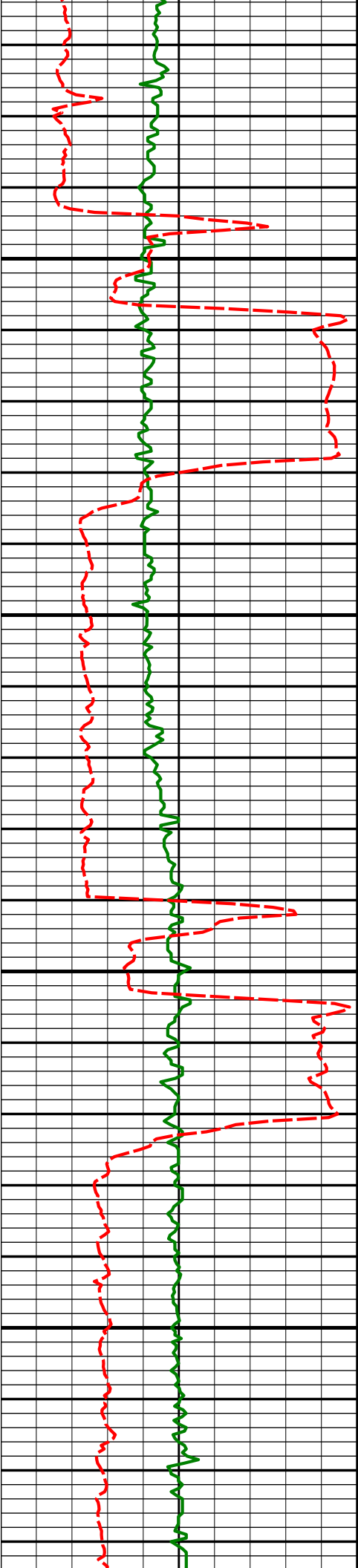
ROPA

90.12°

268.24°

6690.91'

4832.53'



11150'

11177'

89.63°

268.12°

6691.12'

4926.46'

11200'

11250'

11272'

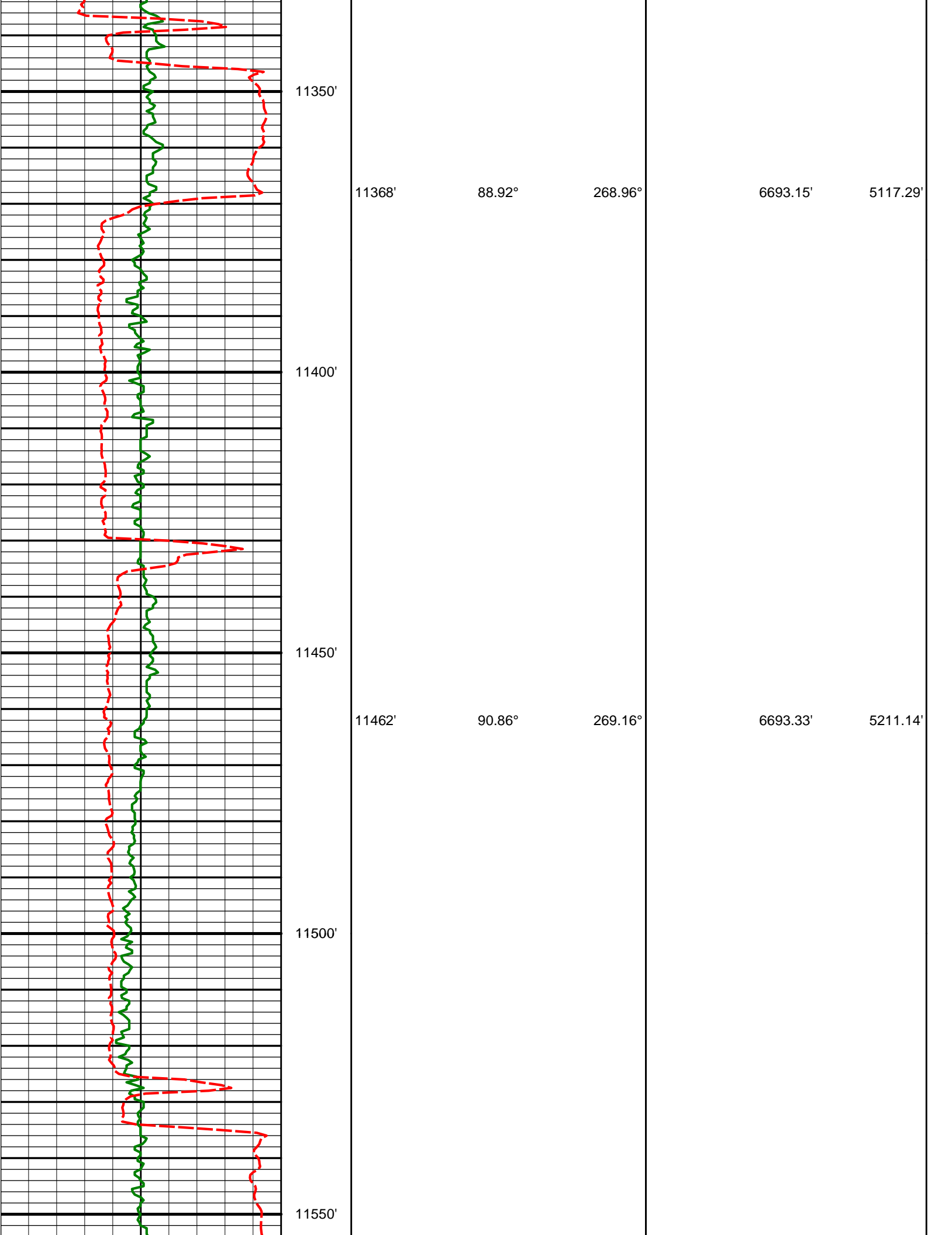
89.51°

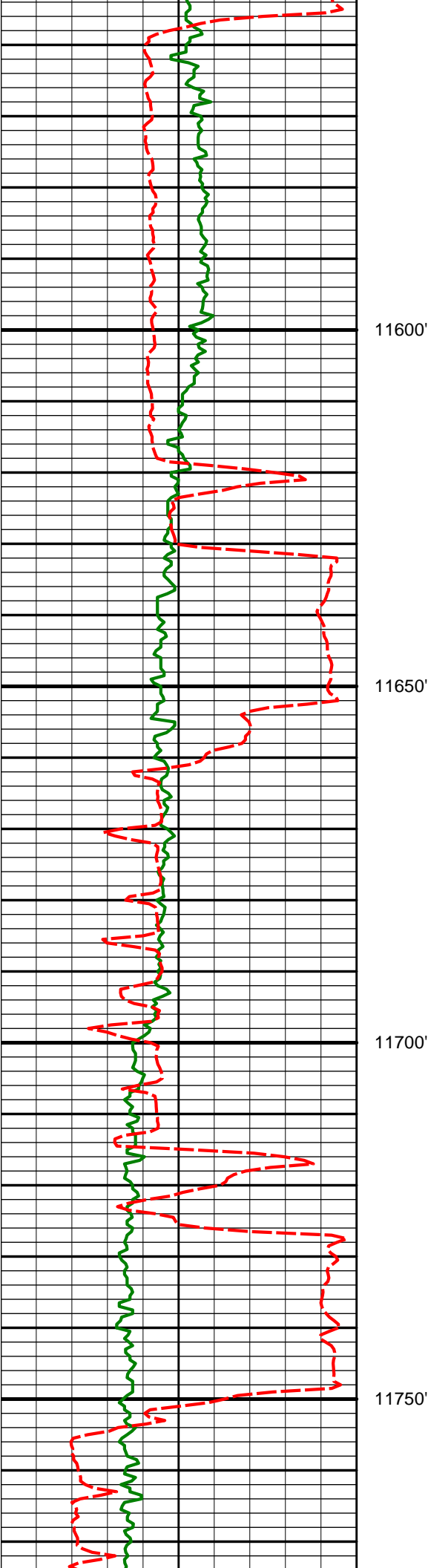
267.94°

6691.83'

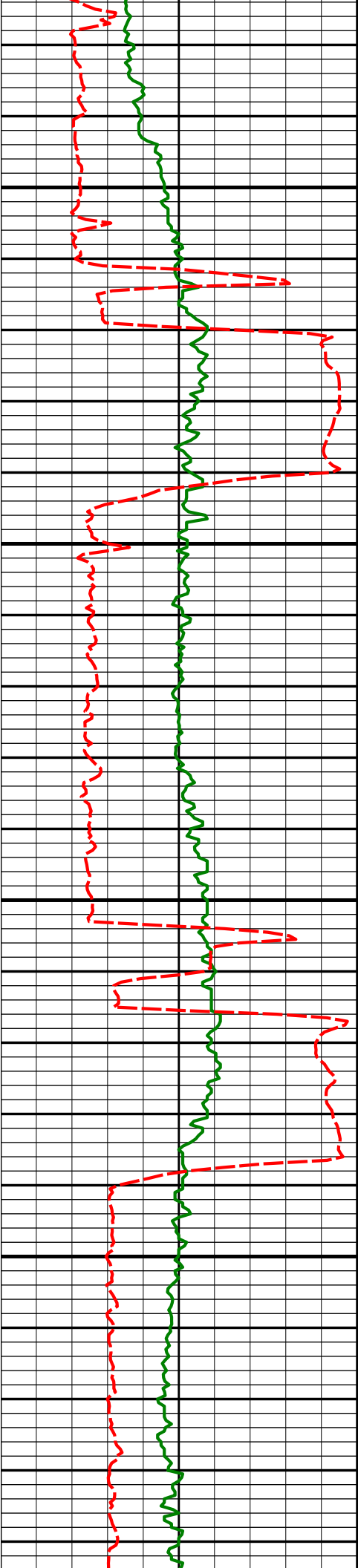
5021.39'

11300'





11557'	90.89°	268.94°	6691.87'	5305.99'
11652'	90.03°	268.68°	6691.10'	5400.86'
		</		



11800'

11842'

89.32°

268.21°

6692.46'

5590.63'

11850'

11900'

11936'

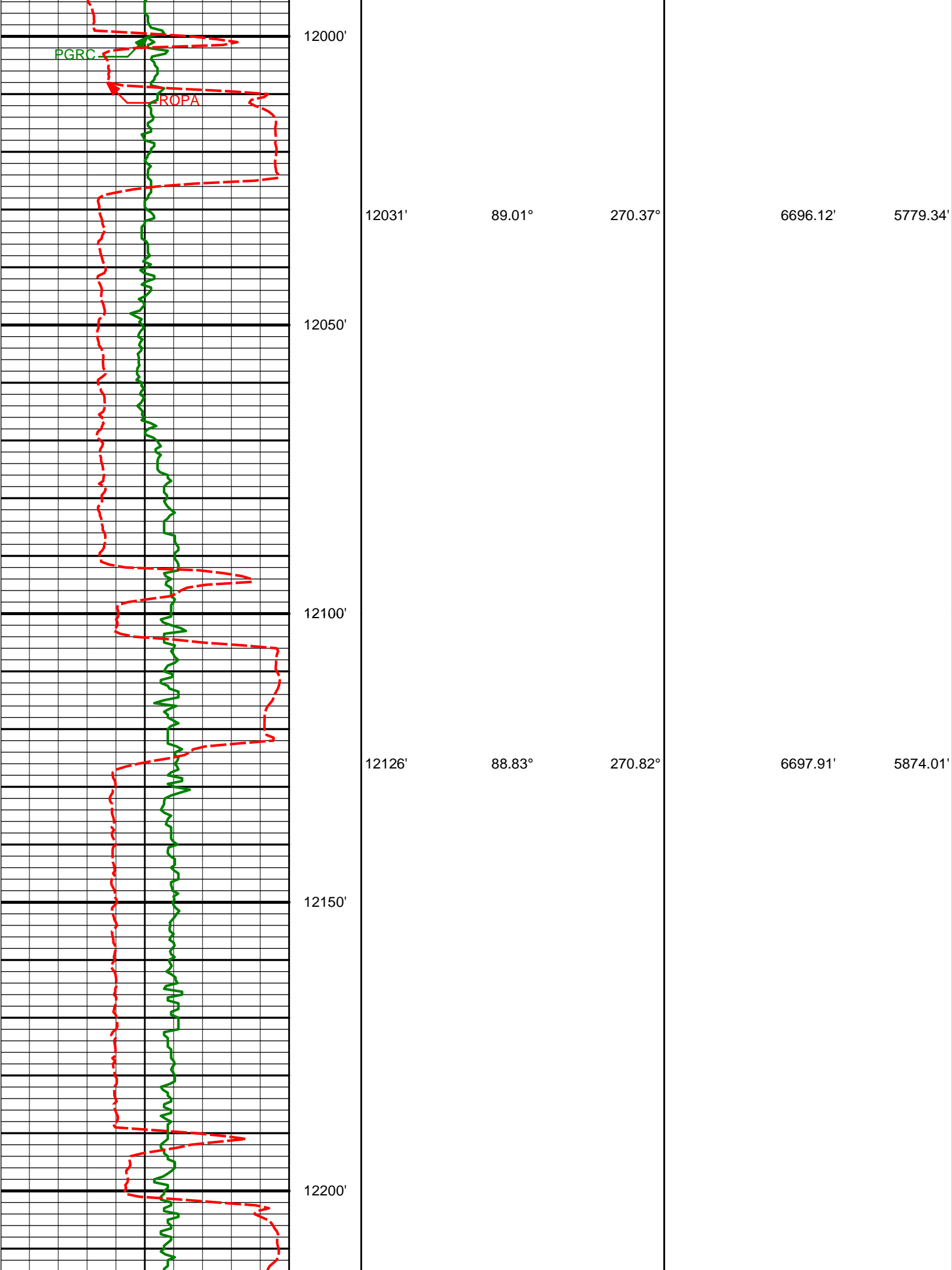
88.61°

268.28°

6694.15'

5684.54'

11950'





12221'

88.43°

269.76°

6700.18'

5968.70'

12250'

12300'

12316'

88.67°

268.62°

6702.59'

6063.51'

12350'

12400'

12411'

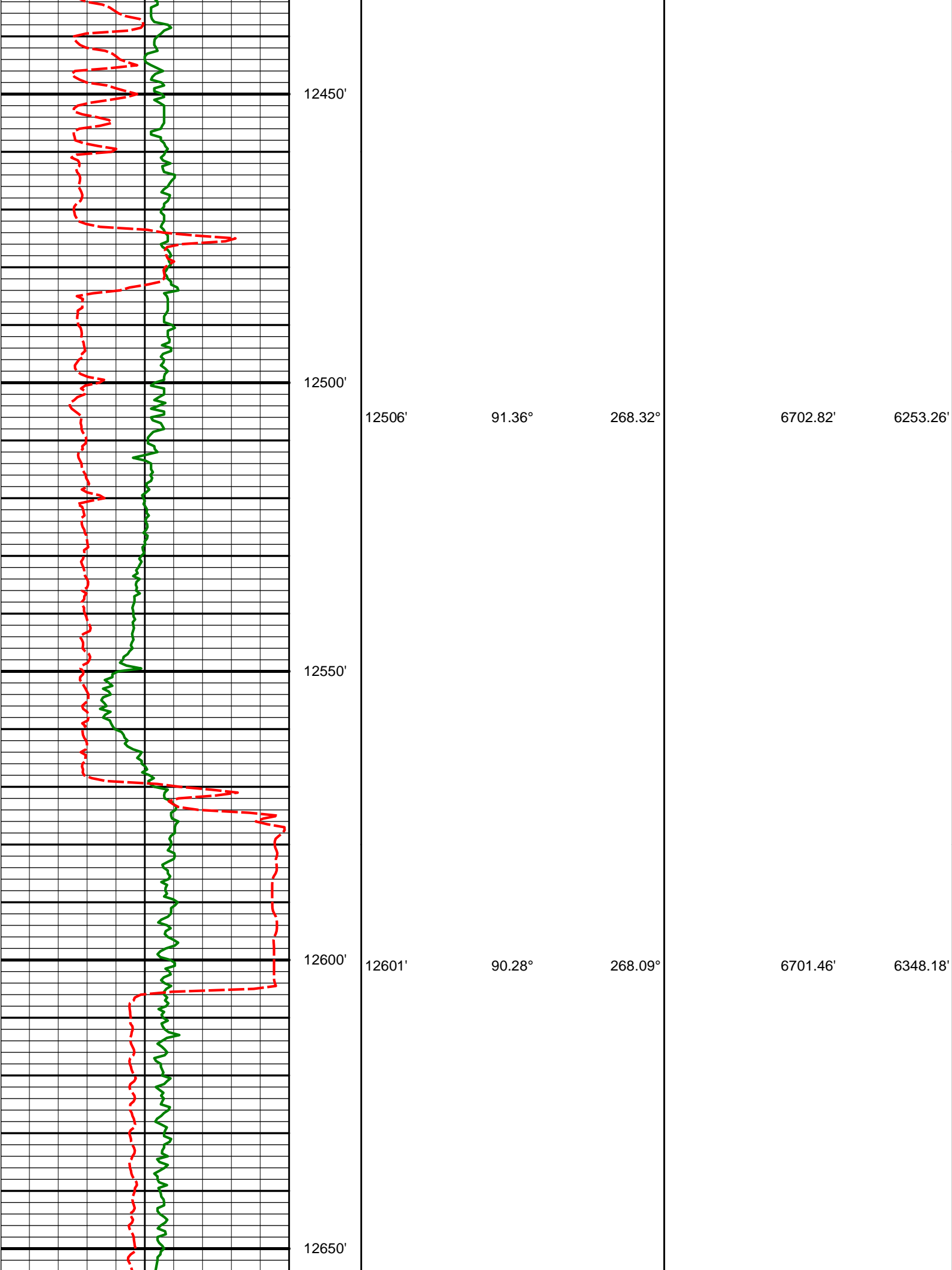
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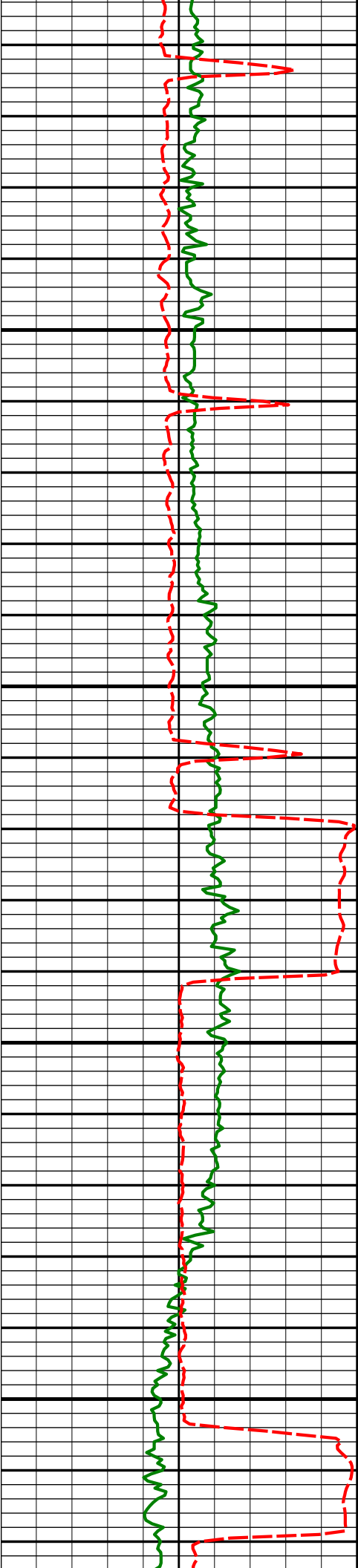
269.02°

6703.81'

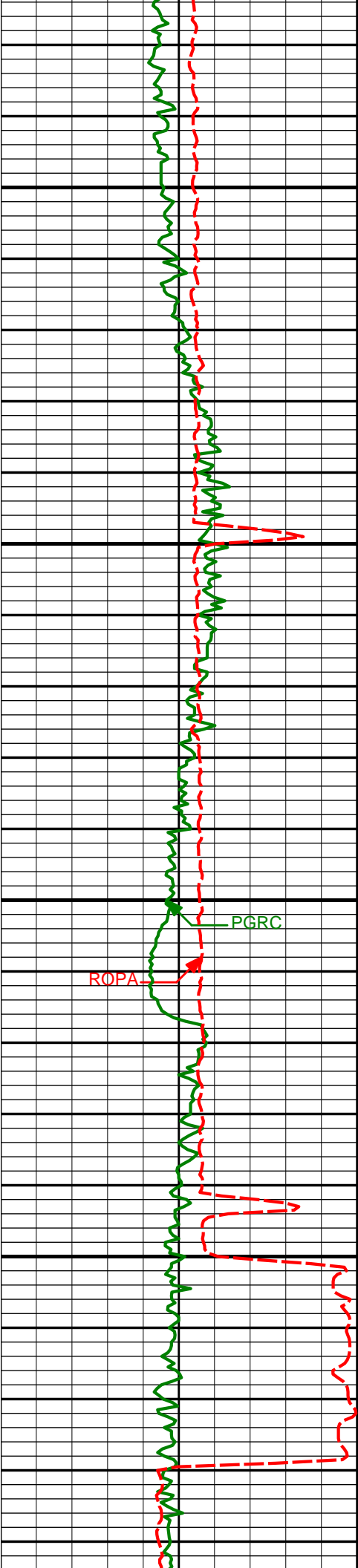
6158.38'







12696'	91.26°	267.17°	6700.18'	6443.12'
12700'				
12750'				
12791'	90.31°	267.42°	6698.88'	6538.09'
12800'				
12850'				



12886'

89.72°

268.36°

6698.85'

6633.03'

12900'

12950'

12981'

91.94°

267.45°

6697.47'

6727.95'

13000'

PGRC

ROPA

13050'

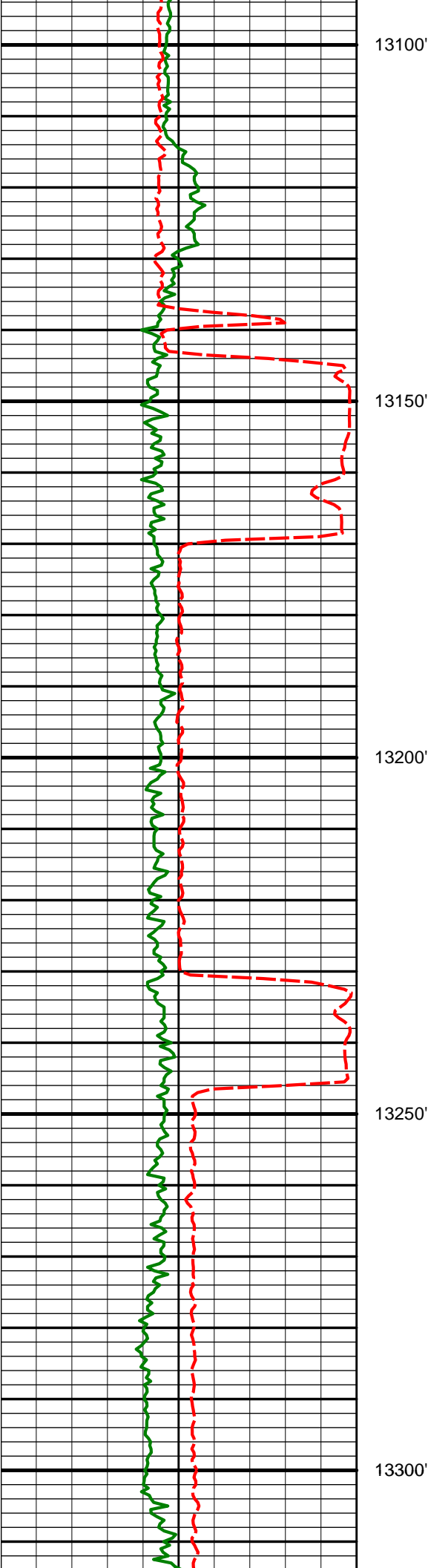
13075'

91.54°

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6821.86'



13171'

90.34°

268.60°

6693.04'

6917.76'

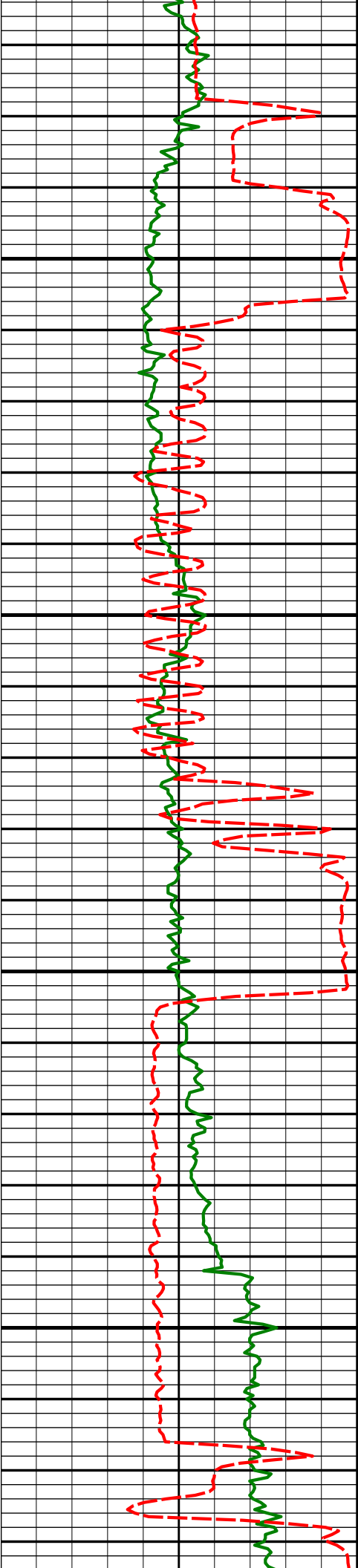
13265'

90.18°

267.39°

6692.61'

7011.70'



13350'

13360'

90.55°

267.57°

6692.00'

7106.66'

13400'

13450'

13455'

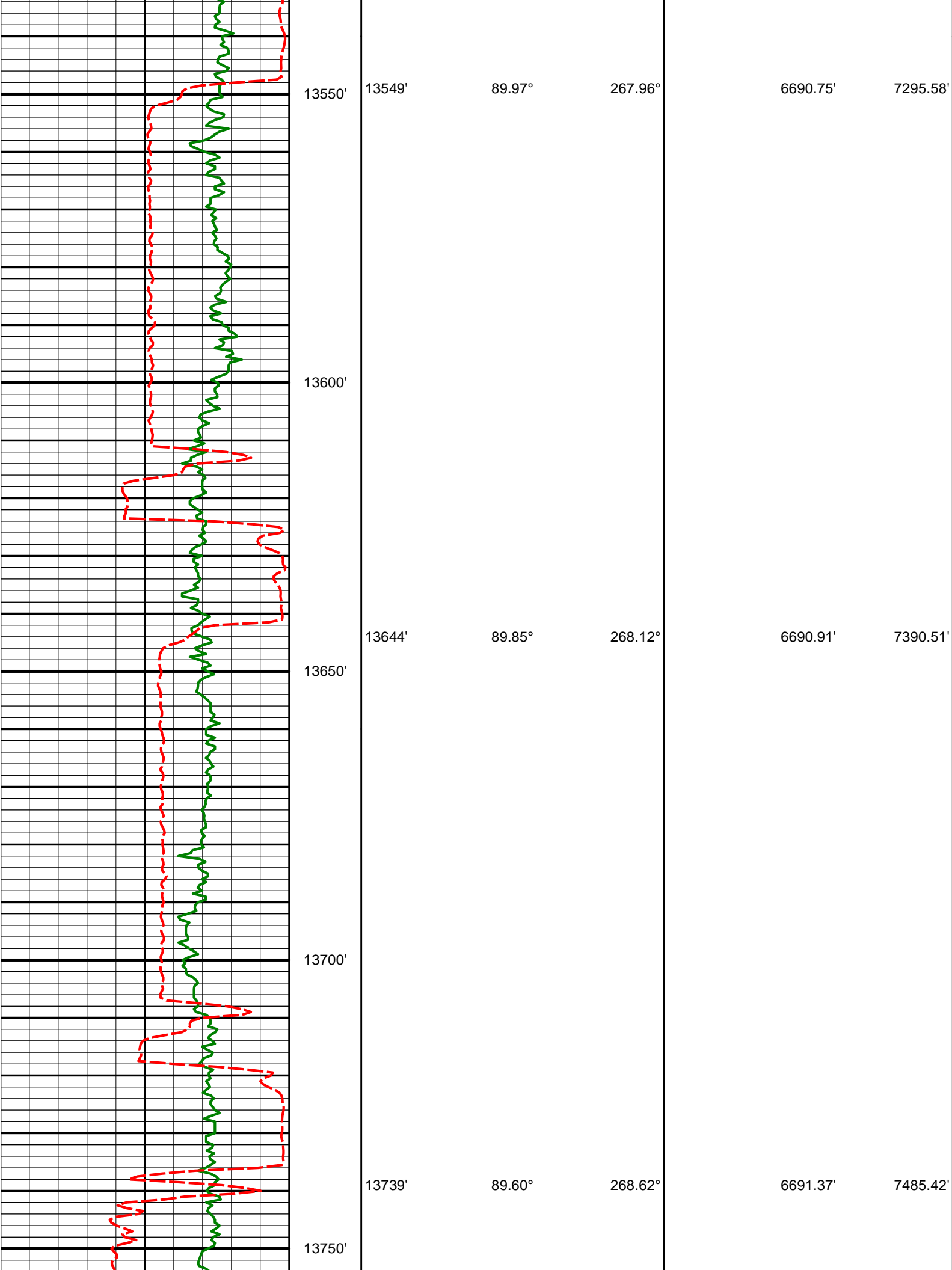
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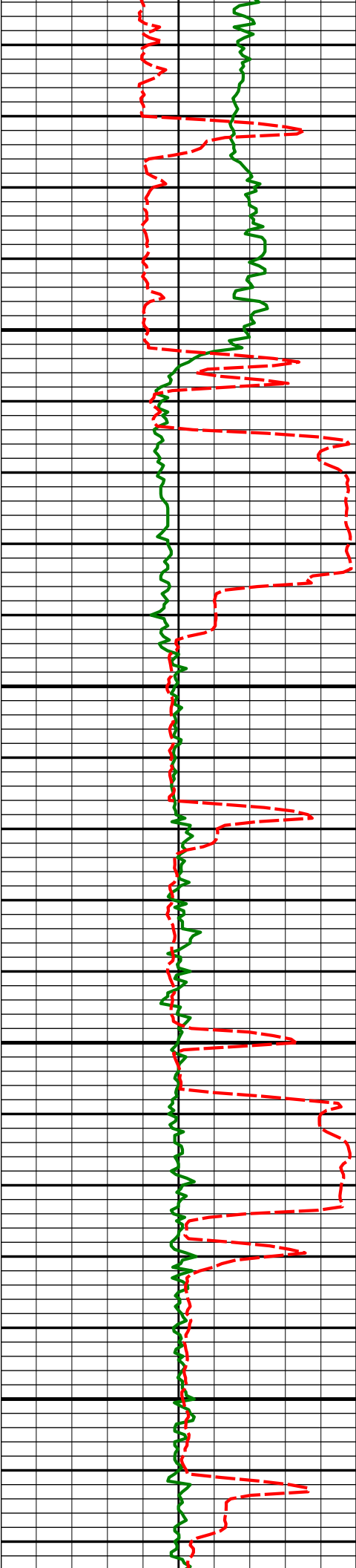
267.32°

6691.13'

7201.62'

13500'





13800'

13834'

89.32°

268.58°

6692.26'

7580.31'

13850'

13900'

13929'

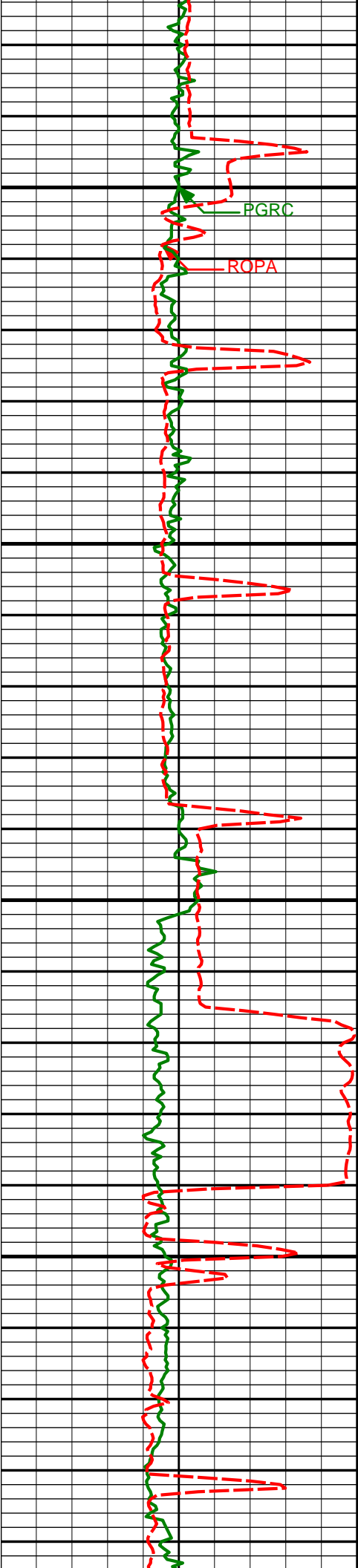
89.41°

268.80°

6693.31'

7675.19'

13950'



14000'

14050'

14100'

14150'

14023'

14150'

91.14°

91.82°

268.45°

268.64°

6692.85'

6689.57'

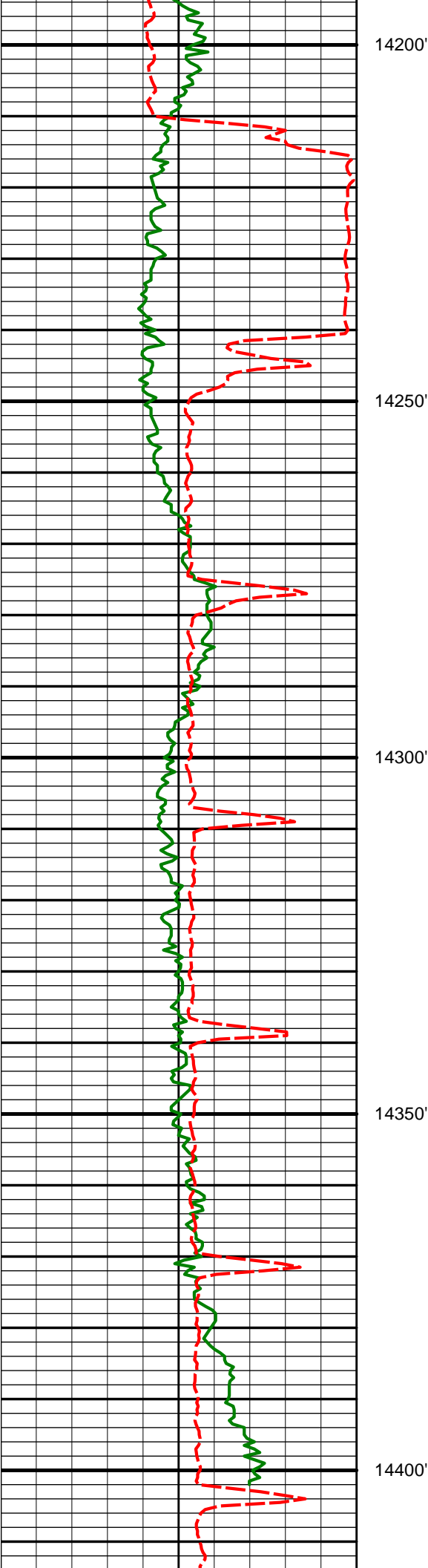
7769.08'

7895.91'

PGRC

ROPA





14244'

90.80°

268.99°

6687.43'

7989.76'

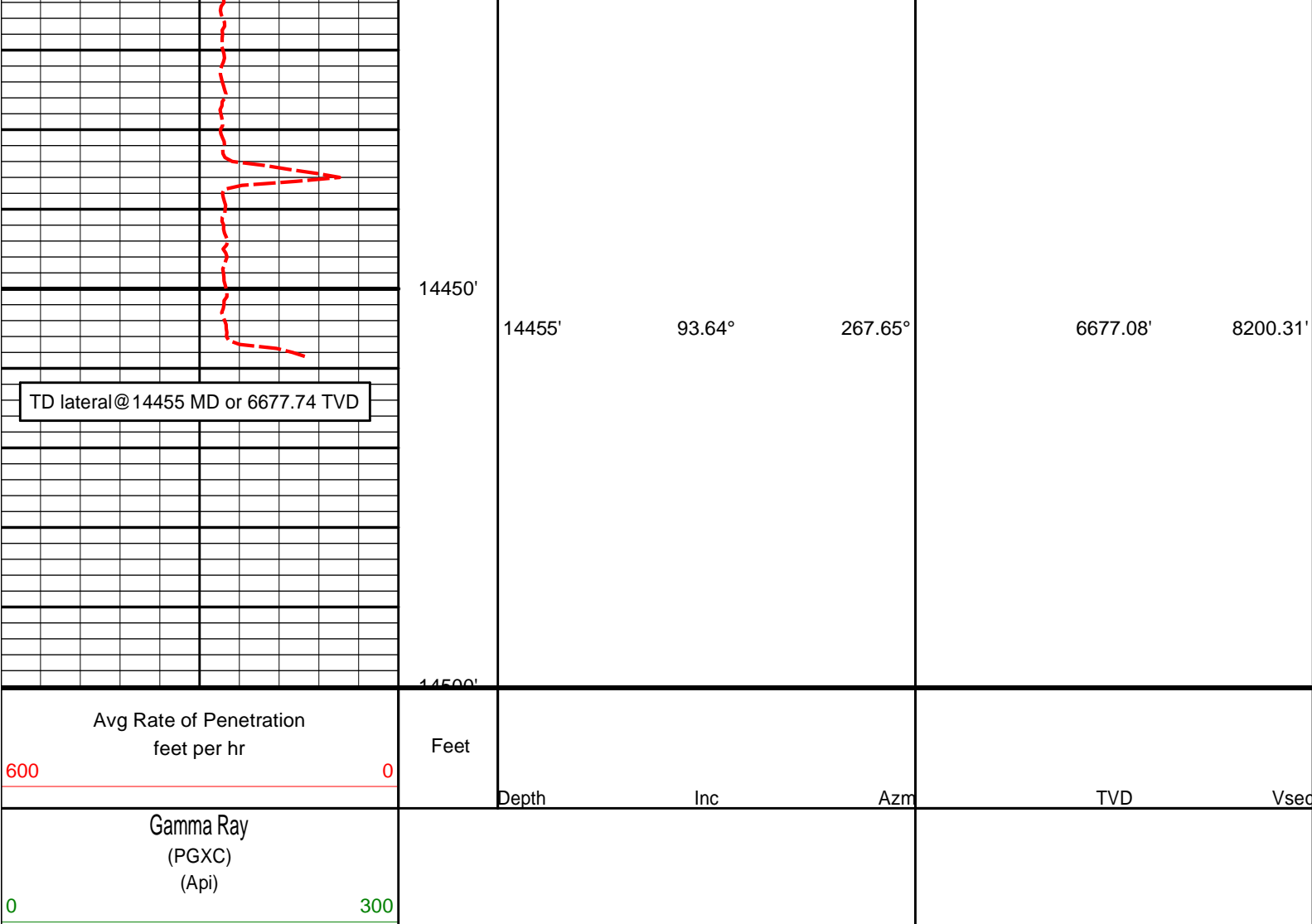
14393'

93.64°

267.65°

6681.65'

8138.50'



**DIRECTIONAL SURVEY REPORT**  
Noble Energy  
NCLP AA06-62-1HNA  
Wattenburg  
Weld Colorado  
USA  
CA-XX-0901287551

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
261.00	0.20	32.98	261.00	0.38 N	0.25 E	-0.27	0.08
515.00	0.10	107.88	515.00	0.69 N	0.70 E	-0.75	0.08
802.00	0.50	158.88	801.99	0.56 S	1.39 E	-1.35	0.15
921.00	0.70	166.88	920.99	1.75 S	1.74 E	-1.61	0.18
1014.00	0.84	147.46	1013.98	2.88 S	2.24 E	-2.03	0.32
1107.00	0.88	159.05	1106.97	4.12 S	2.86 E	-2.56	0.19
1200.00	0.67	145.61	1199.96	5.24 S	3.42 E	-3.05	0.30
1386.00	0.70	161.24	1385.95	7.21 S	4.40 E	-3.88	0.10
1574.00	0.55	154.84	1573.94	9.11 S	5.15 E	-4.50	0.09
1763.00	0.60	151.66	1762.93	10.81 S	6.01 E	-5.24	0.03
1857.00	0.33	164.63	1856.92	11.50 S	6.32 E	-5.49	0.31
2047.00	0.25	222.35	2046.92	12.33 S	6.18 E	-5.30	0.15
2142.00	2.35	250.26	2141.89	13.15 S	4.21 E	-3.27	2.24
2237.00	4.42	260.21	2236.72	14.43 S	1.23 W	2.24	2.26
2332.00	6.36	247.01	2331.30	17.10 S	9.69 W	10.86	2.41
2426.00	7.32	231.31	2424.64	22.88 S	19.15 W	20.71	2.23
2521.00	7.91	207.90	2518.82	32.44 S	26.94 W	29.15	3.30
2615.00	9.32	198.34	2611.77	45.39 S	32.36 W	35.47	2.13

	2710.00	9.36	201.42	2705.51	59.88 S	37.60 W	41.72	0.53
	2804.00	10.18	202.65	2798.14	74.66 S	43.59 W	48.73	0.90
	2899.00	11.02	200.71	2891.52	90.90 S	50.04 W	56.30	0.96
	2994.00	11.31	201.41	2984.72	108.07 S	56.65 W	64.10	0.34
	3088.00	10.79	201.32	3076.98	124.85 S	63.21 W	71.83	0.55
	3183.00	10.38	200.14	3170.36	141.17 S	69.39 W	79.14	0.49
	3278.00	9.27	198.35	3263.97	156.46 S	74.75 W	85.56	1.21
	3373.00	9.31	203.72	3357.72	170.76 S	80.25 W	92.05	0.91
	3468.00	10.21	206.11	3451.35	185.36 S	87.04 W	99.86	1.04
	3563.00	8.27	200.85	3545.11	199.31 S	93.18 W	106.96	2.23
	3658.00	9.92	200.36	3638.92	213.36 S	98.46 W	113.21	1.74
	3753.00	11.20	203.76	3732.31	229.48 S	105.03 W	120.89	1.50
	3847.00	11.80	207.23	3824.42	246.38 S	113.10 W	130.14	0.97
	3942.00	12.88	207.07	3917.22	264.45 S	122.37 W	140.65	1.14
	4037.00	11.39	205.31	4010.10	282.36 S	131.20 W	150.71	1.62
	4132.00	10.95	201.87	4103.30	299.21 S	138.57 W	159.25	0.84
	4227.00	10.04	199.37	4196.71	315.40 S	144.67 W	166.48	1.07
	4416.00	8.10	187.03	4383.35	344.16 S	151.77 W	175.58	1.45
	4511.00	6.72	176.13	4477.56	356.35 S	152.21 W	176.88	2.07
	4606.00	5.52	179.74	4572.02	366.46 S	151.82 W	177.20	1.33
	4700.00	3.92	192.22	4665.70	374.13 S	152.48 W	178.39	2.01
	4795.00	2.19	235.05	4760.57	378.34 S	154.65 W	180.86	2.90
	4890.00	0.37	175.38	4855.55	379.69 S	156.12 W	182.41	2.14
	4984.00	0.14	212.56	4949.55	380.09 S	156.15 W	182.48	0.29
	5079.00	1.89	105.33	5044.53	380.60 S	154.70 W	181.07	2.04
	5174.00	1.66	102.57	5139.48	381.31 S	151.85 W	178.27	0.26
	5363.00	1.70	94.11	5328.40	382.11 S	146.38 W	172.88	0.13
	5552.00	1.17	40.56	5517.35	380.84 S	142.33 W	168.74	0.73
	5647.00	0.34	41.81	5612.34	379.90 S	141.51 W	167.86	0.87
	5742.00	0.28	38.35	5707.34	379.50 S	141.18 W	167.50	0.07
	5837.00	0.16	6.21	5802.34	379.19 S	141.02 W	167.32	0.18
	5927.00	0.19	351.58	5892.34	378.92 S	141.03 W	167.31	0.06
	6022.00	0.56	292.10	5987.34	378.59 S	141.48 W	167.74	0.52
	6069.00	3.40	262.27	6034.31	378.69 S	143.08 W	169.34	6.23
	6116.00	8.17	267.43	6081.05	379.02 S	147.80 W	174.07	10.20
	6163.00	11.23	266.78	6127.38	379.43 S	155.71 W	181.99	6.51
	6211.00	14.86	265.59	6174.13	380.17 S	166.51 W	192.82	7.58
	6258.00	18.12	271.38	6219.19	380.46 S	179.83 W	206.13	7.76
	6305.00	21.85	278.53	6263.36	378.98 S	195.80 W	221.95	9.47
	6352.00	26.33	275.55	6306.26	376.67 S	214.83 W	240.77	9.87
	6400.00	31.35	270.26	6348.30	375.59 S	237.93 W	263.74	11.72
	6447.00	35.80	270.50	6387.45	375.41 S	263.92 W	289.65	9.47
	6495.00	40.27	269.80	6425.25	375.34 S	293.48 W	319.14	9.36
	6542.00	44.39	269.92	6459.98	375.42 S	325.13 W	350.71	8.77
	6590.00	49.44	269.79	6492.76	375.51 S	360.17 W	385.67	10.52
	6637.00	53.62	269.00	6521.99	375.91 S	396.96 W	422.39	8.99
	6685.00	56.43	269.12	6549.51	376.55 S	436.28 W	461.66	5.86
	6732.00	61.51	269.70	6573.73	376.96 S	476.54 W	501.85	10.86
	6780.00	66.92	270.58	6594.60	376.85 S	519.74 W	544.94	11.39
	6827.00	70.78	271.51	6611.55	376.04 S	563.56 W	588.59	8.42
	6875.00	74.62	271.47	6625.82	374.85 S	609.36 W	634.20	8.00
	6922.00	77.67	271.69	6637.08	373.59 S	654.97 W	679.61	6.51
	6946.00	79.65	271.42	6641.80	372.95 S	678.50 W	703.03	8.32
	7043.00	85.65	273.16	6654.20	369.10 S	774.57 W	798.60	6.44
	7137.00	88.74	271.96	6658.80	364.91 S	868.35 W	891.85	3.53
	7232.00	89.94	270.24	6659.90	363.09 S	963.33 W	986.46	2.21
	7326.00	88.37	269.52	6661.28	363.28 S	1057.31 W	1080.23	1.84
	7422.00	90.34	268.86	6662.36	364.64 S	1153.29 W	1176.07	2.16
	7516.00	89.17	267.54	6662.76	367.59 S	1247.24 W	1269.99	1.88
	7611.00	88.92	268.22	6664.35	371.11 S	1342.16 W	1364.92	0.76
	7706.00	91.39	269.85	6664.09	372.71 S	1437.14 W	1459.78	3.12
	7801.00	87.29	267.61	6665.19	374.81 S	1532.08 W	1554.63	4.92
	7896.00	87.56	268.46	6669.45	378.07 S	1626.93 W	1649.48	0.94
	7991.00	90.22	269.38	6671.29	379.86 S	1721.88 W	1744.32	2.96
	8086.00	88.61	267.38	6672.26	382.54 S	1816.83 W	1839.22	2.70
	8180.00	90.99	267.23	6672.59	386.96 S	1910.72 W	1933.19	2.54
	8273.00	91.23	265.93	6670.79	392.51 S	2003.54 W	2026.17	1.42
	8366.00	90.86	265.56	6669.09	399.41 S	2096.26 W	2119.15	0.56
	8459.00	91.02	266.48	6667.57	405.86 S	2189.03 W	2212.14	1.00
	8552.00	89.32	267.85	6667.29	410.46 S	2281.91 W	2305.11	2.35
	8645.00	90.22	269.56	6667.67	412.56 S	2374.88 W	2398.00	2.08

8738.00	88.49	270.28	6668.71	412.69 S	2467.87 W	2490.77	2.01
8831.00	88.61	269.57	6671.07	412.81 S	2560.84 W	2583.52	0.77
8924.00	88.70	269.35	6673.25	413.69 S	2653.81 W	2676.32	0.26
9017.00	89.20	270.09	6674.95	414.14 S	2746.79 W	2769.10	0.96
9110.00	88.83	268.00	6676.55	415.69 S	2839.76 W	2861.95	2.28
9203.00	88.09	268.01	6679.05	418.93 S	2932.67 W	2954.86	0.80
9296.00	87.35	267.13	6682.75	422.87 S	3025.51 W	3047.75	1.24
9389.00	87.69	265.94	6686.78	428.49 S	3118.25 W	3140.65	1.33
9482.00	90.40	267.18	6688.33	434.06 S	3211.06 W	3233.62	3.20
9575.00	90.46	266.59	6687.63	439.12 S	3303.92 W	3326.61	0.64
9668.00	89.11	268.03	6687.98	443.48 S	3396.81 W	3419.58	2.12
9761.00	89.01	269.45	6689.50	445.53 S	3489.77 W	3512.46	1.53
9853.00	88.77	269.20	6691.29	446.61 S	3581.75 W	3604.28	0.38
9946.00	92.16	270.35	6690.53	446.98 S	3674.73 W	3697.06	3.85
10039.00	91.20	270.67	6687.80	446.15 S	3767.69 W	3789.72	1.09
10134.00	90.03	268.84	6686.78	446.56 S	3862.67 W	3884.51	2.29
10229.00	90.37	268.11	6686.45	449.08 S	3957.64 W	3979.41	0.85
10324.00	88.80	268.47	6687.14	451.92 S	4052.59 W	4074.33	1.70
10418.00	89.45	268.42	6688.58	454.47 S	4146.54 W	4168.23	0.69
10513.00	90.37	267.83	6688.73	457.58 S	4241.49 W	4263.16	1.15
10608.00	90.49	267.50	6688.01	461.45 S	4336.41 W	4358.12	0.37
10703.00	90.31	267.58	6687.35	465.53 S	4431.32 W	4453.08	0.21
10798.00	90.12	268.33	6686.99	468.92 S	4526.26 W	4548.02	0.81
10892.00	88.61	267.68	6688.03	472.19 S	4620.19 W	4641.95	1.75
10988.00	88.92	266.66	6690.10	476.93 S	4716.05 W	4737.91	1.11
11083.00	90.12	268.24	6690.90	481.15 S	4810.95 W	4832.87	2.09
11177.00	89.63	268.12	6691.10	484.14 S	4904.90 W	4926.80	0.54
11272.00	89.51	267.94	6691.82	487.40 S	4999.84 W	5021.73	0.23
11368.00	88.92	268.96	6693.13	490.00 S	5095.80 W	5117.63	1.23
11462.00	90.86	269.16	6693.31	491.54 S	5189.78 W	5211.49	2.07
11557.00	90.89	268.94	6691.86	493.12 S	5284.76 W	5306.34	0.23
11652.00	90.03	268.68	6691.10	495.09 S	5379.73 W	5401.22	0.95
11747.00	89.51	268.95	6691.48	497.05 S	5474.71 W	5496.10	0.62
11842.00	89.32	268.21	6692.45	499.41 S	5569.67 W	5591.00	0.80
11936.00	88.61	268.28	6694.15	502.29 S	5663.61 W	5684.91	0.76
12031.00	89.01	270.37	6696.12	503.41 S	5758.58 W	5779.72	2.24
12126.00	88.83	270.82	6697.91	502.42 S	5853.56 W	5874.40	0.51
12221.00	88.43	269.76	6700.18	501.94 S	5948.53 W	5969.10	1.19
12316.00	88.67	268.62	6702.59	503.28 S	6043.49 W	6063.92	1.23
12411.00	89.85	269.02	6703.82	505.24 S	6138.46 W	6158.79	1.31
12506.00	91.36	268.32	6702.81	507.44 S	6233.42 W	6253.67	1.75
12601.00	90.28	268.09	6701.45	510.42 S	6328.37 W	6348.59	1.16
12696.00	91.26	267.17	6700.18	514.35 S	6423.27 W	6443.54	1.41
12791.00	90.31	267.42	6698.88	518.83 S	6518.16 W	6538.50	1.03
12886.00	89.72	268.36	6698.85	522.33 S	6613.09 W	6633.45	1.17
12981.00	91.94	267.45	6697.47	525.80 S	6708.01 W	6728.38	2.53
13075.00	91.54	268.05	6694.62	529.49 S	6801.90 W	6822.29	0.77
13171.00	90.34	268.60	6693.04	532.29 S	6897.84 W	6918.19	1.38
13265.00	90.18	267.39	6692.62	535.58 S	6991.78 W	7012.13	1.30
13360.00	90.55	267.57	6692.01	539.76 S	7086.69 W	7107.10	0.43
13455.00	90.49	267.32	6691.15	543.99 S	7181.59 W	7202.06	0.27
13549.00	89.97	267.96	6690.77	547.86 S	7275.51 W	7296.02	0.88
13644.00	89.85	268.12	6690.92	551.11 S	7370.45 W	7390.96	0.21
13739.00	89.60	268.62	6691.38	553.82 S	7465.41 W	7485.87	0.59
13834.00	89.32	268.58	6692.27	556.14 S	7560.38 W	7580.77	0.30
13929.00	89.41	268.80	6693.33	558.31 S	7655.35 W	7675.65	0.25
14023.00	91.14	268.45	6692.88	560.56 S	7749.31 W	7769.55	1.88
14150.00	91.82	268.64	6689.60	563.79 S	7876.23 W	7896.38	0.56
14244.00	90.80	268.99	6687.45	565.73 S	7970.18 W	7990.24	1.15
14393.00	93.64	267.65	6681.68	570.09 S	8118.99 W	8138.98	2.11
14455.00	93.64	267.65	6677.74	572.63 S	8180.81 W	8200.83	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 265.97 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.48 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 14455.00 FEET  
IS 8200.83 FEET ALONG 266.00 DEGREES (GRID)

Tie-In @ Surface

Surveys at 261 ft, 515ft and 802 ft were taken and provided by HP 322 while they were drilling the surface hole and have been converted from magnetic north to grid north.

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