

Vertex DM
Vertex GM



1 : 240

Country : USA	Field : Wattenberg	Location : Lat: 40° 2' 22.04" North Long: 104° 52' 11.98" West	Well : Wagner 27C-10HZ	Company : Anadarko Petroleum Corp.	Rig : PD 464	Company : Anadarko Petroleum Corp. Rig : PD 464 Well : Wagner 27C-10HZ Field : Wattenberg Country : USA API Number : 05-123-43474	
LOCATION						Latitude : 40° 2' 22.04" North Longitude : 104° 52' 11.98" West	Other Services Directional Drilling Battery Powered Surveys
						UTM Easting = 1,676,803.888 usft UTM Northing = 14,541,127.444 usft	
Permanent Datum : Ground Level						Elevation : 4971.00 ft	Elev. KB N/A
Log Measured From : Drill Floor						21.00 ft Above Permanent Datum	DF 4992.00 ft
Drilling Measured From : Drill Floor						MD LOG	GL 4971.00 ft
							WD N/A
Depth Logged : 1,903.00 ft To 15,076.00 ft						Unit No. : N/A	Job No. : CA-XX-0904337678
Date Logged : 26-Aug-17 To 30-Oct-17							
Total Depth MD : 15,076.00 ft TVD : 7,583.09 ft						Plot Type : Final	
Spud Date : 18-Aug-17						Plot Date : 29-Dec-17	
Run No.	Borehole Record (MD)			Run No.	Borehole Record (MD)		
	Size	From	To		Size	From	To
1	8.500 in	1,903.00 ft	5,871.00 ft				
3	6.125 in	5,871.00 ft	7,570.00 ft				
4	6.125 in	7,570.00 ft	7,749.00 ft				
5	6.125 in	7,749.00 ft	15,076.00 ft				
	Casing Record (MD)						
	Size	Weight	From	To			
	9.625 in	36.00 lbpf	SURFACE	1,893.00 ft			
	7.000 in	26.00 lbpf	SURFACE	5,860.00 ft			
	4.500 in	11.60 lbpf	5,660.00 ft	15,071.00 ft			

WELL INFORMATION

[illegible]

Max Tool Temp (degF) / Source					
Rm @ Max Tool Temp (degF)					
Lead MWD Engineer					
Customer Representative					

SENSOR INFORMATION

Downhole Processor Information

Tool Type					
Software Version					
Sub Serial Number					
Insert Serial Number					
Date and Time Initialized					
Date and Time Read					
ECMB SW Version					

Directional Sensor Information

Tool Type					
Distance From Bit (ft)					
Software Version					
Sub Serial Number					
Sonde Serial Number					
Sensor ID Number					
Toolface Offset (deg)					

Gamma Ray Sensor Information

Tool Type					
Distance From Bit (ft)					
Recorded Sample Period (sec)					
Software Version					
Sub Serial Number					
Insert/Sonde Serial Number					

REMARKS

1. All depths are calibrated to the driller's 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 realtime data unless otherwise stated.
4. Environmental parameters used to process gamma ray are as follows
Hole Size : 8.5" and 6.125"
5. The following smoothing parameters have been applied to the data:

Vertex GM (Gamma Ray BCorr):
Interval Resolution: 0.5ft
Interval Distance: 0.6ft
Gap Fill: 3.0ft

ROPA (Average Rate of Penetration):
Interval Resolution:0.5ft
Interval Distance:1.2ft
Gap Fill:3.0ft
6. Surveys from 1917-14994 corrected by Sperry Survey Management
7. INSITE version 8.5

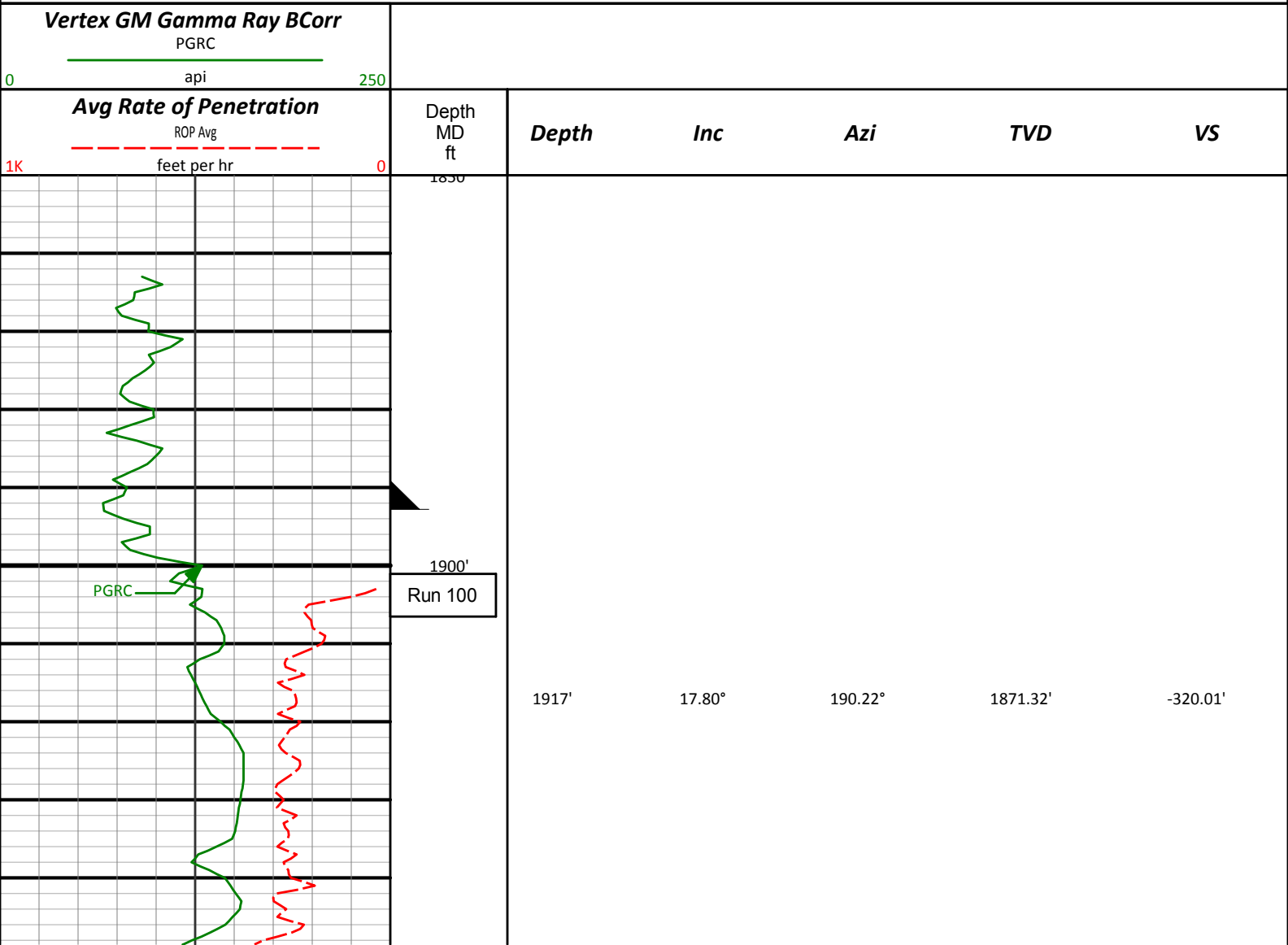
WARRANTY

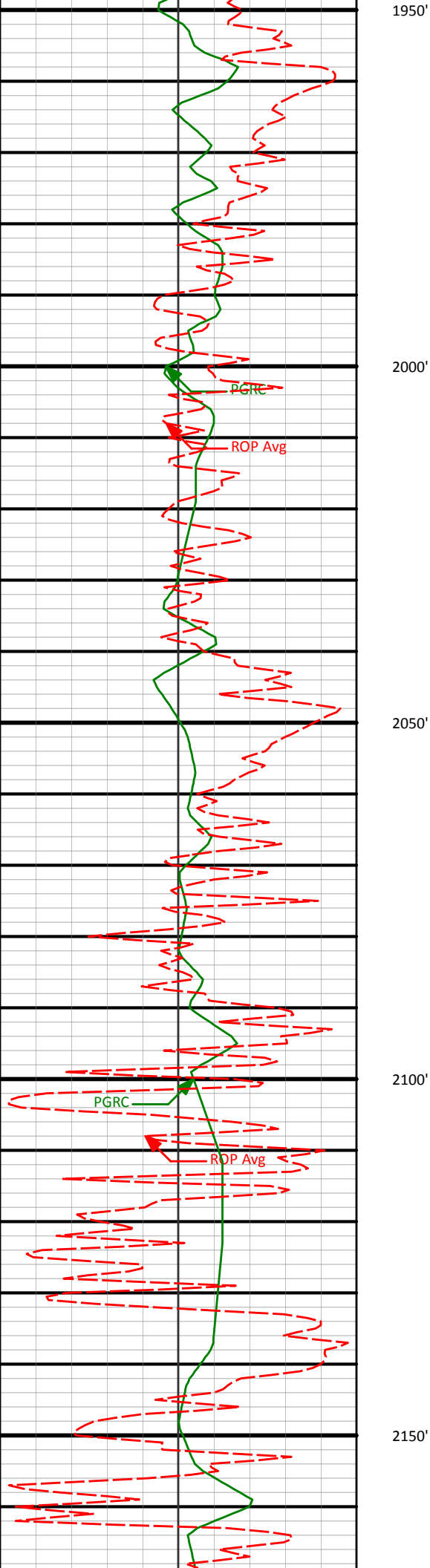
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Sperry Drilling Services

MD Detail Log 1:240

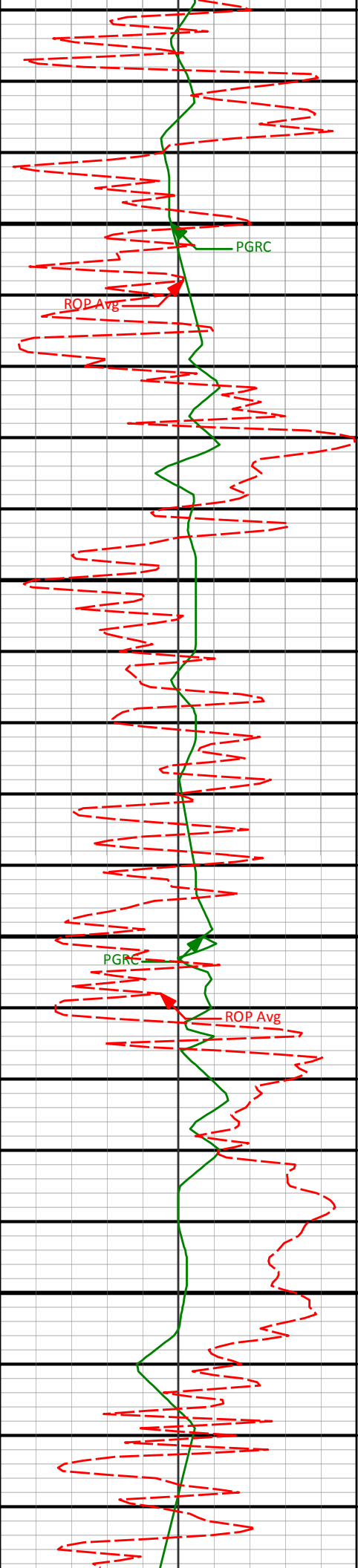
Anadarko Petroleum Corp.
Wagner 27C-10HZ
CA-XX-0904337678





2006'	17.23°	190.61°	1956.19'	-346.39'
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2096'	16.35°	189.83°	2042.35'	-372.01'
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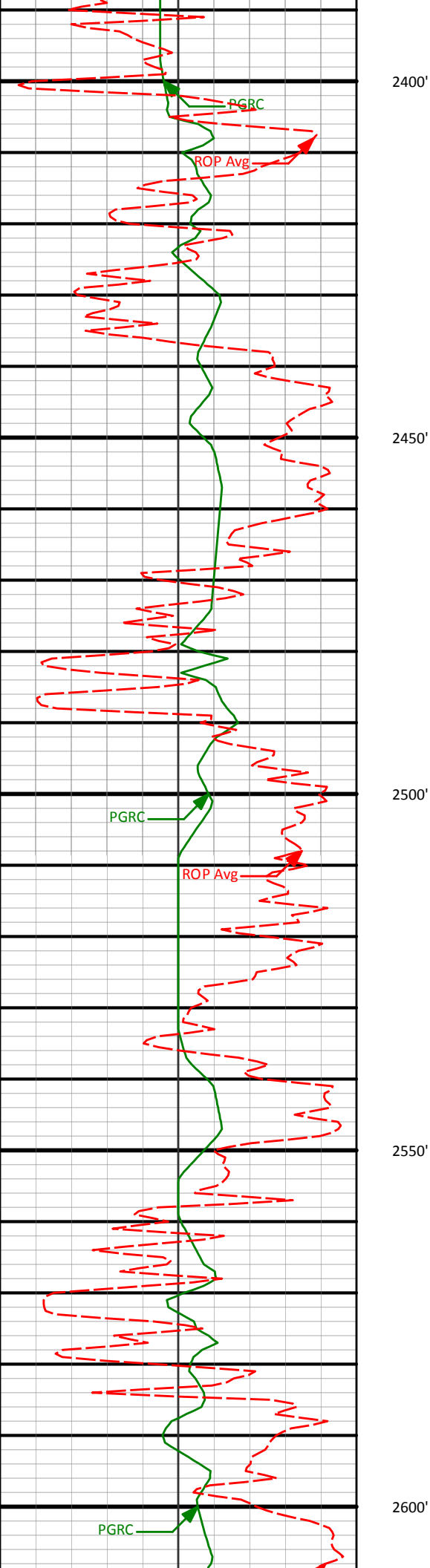
2200'

2250'

2300'

2350'

2186'	15.74°	190.07°	2128.85'	-396.55'
2275'	15.60°	189.21°	2214.54'	-420.27'
2365'	13.49°	196.21°	2301.66'	-442.34'



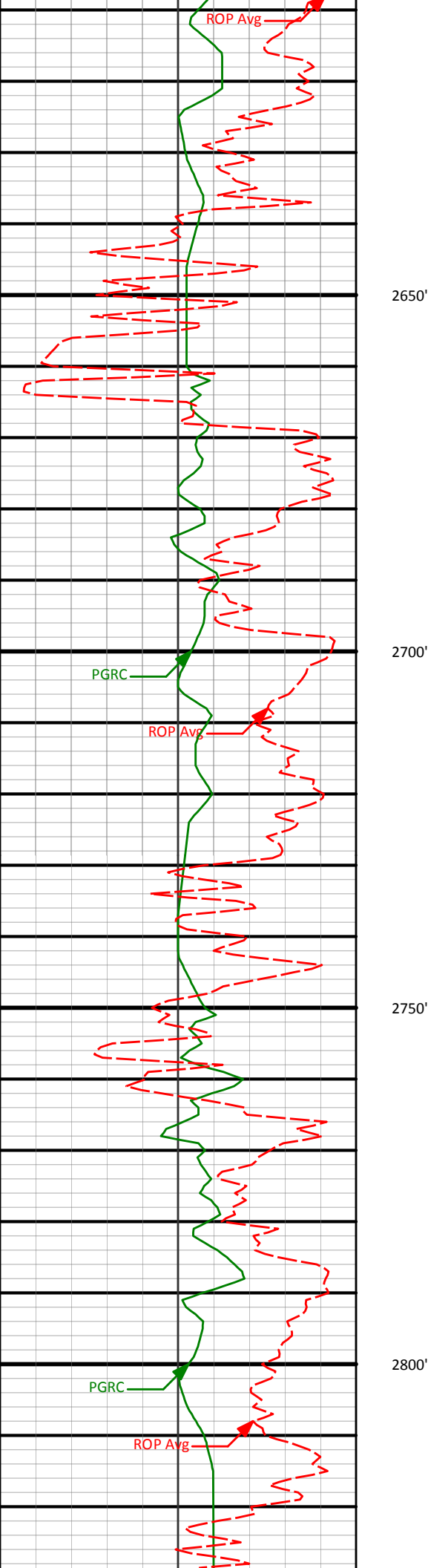
2545'

10.55°

200.34°

2477.70'

-478.05'



2634'	8.31°	204.54°	2565.49'	-491.58'
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2650'

2700'

2724'	5.71°	206.52°	2654.81'	-501.54'
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2750'

2800'

2814'	2.86°	227.35°	2744.55'	-507.10'
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2850'

2900'

2950'

3000'

PGRC

ROP Avg

PGRC

ROP Avg

2904'

3.56°

276.87°

2834.43'

-508.32'

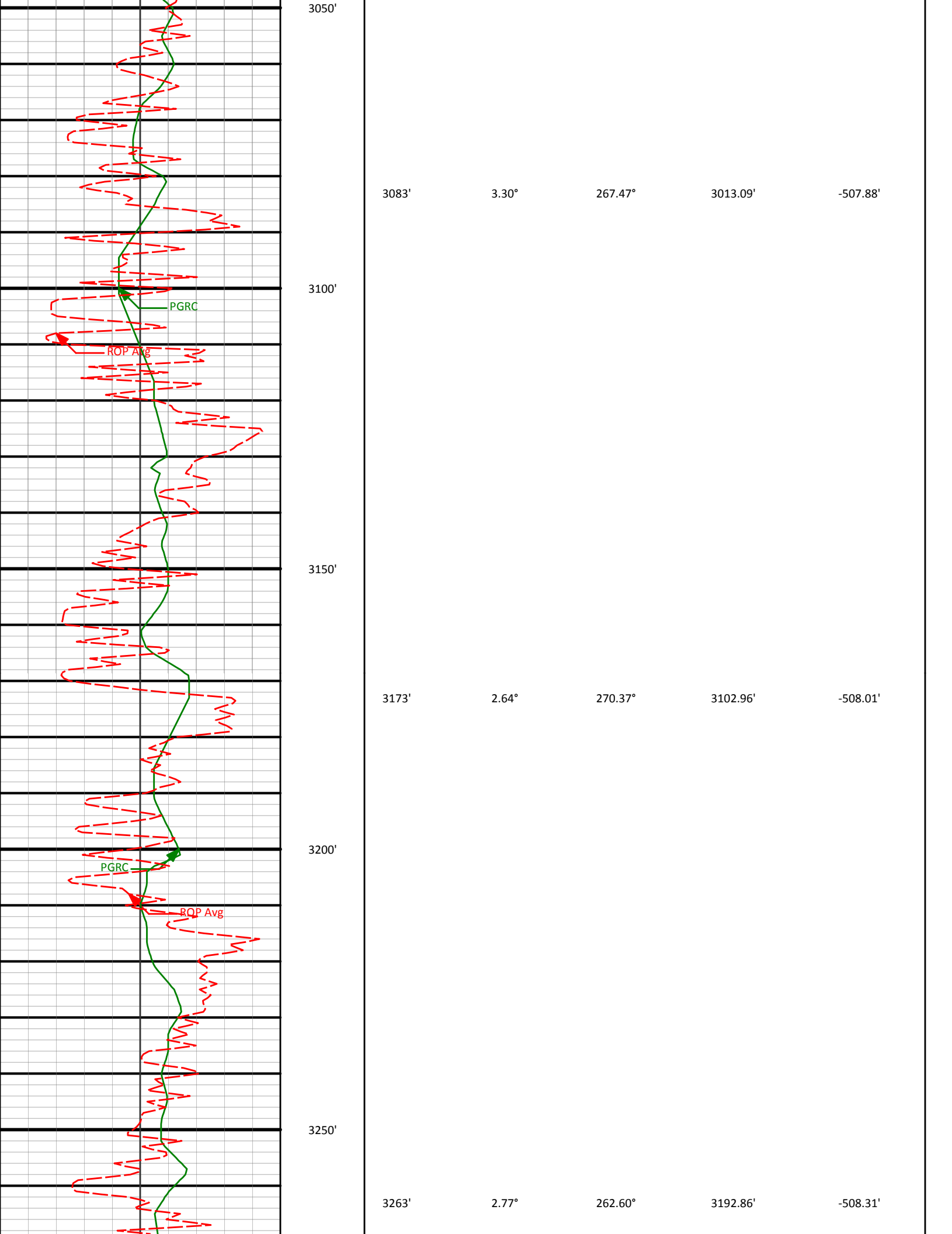
2994'

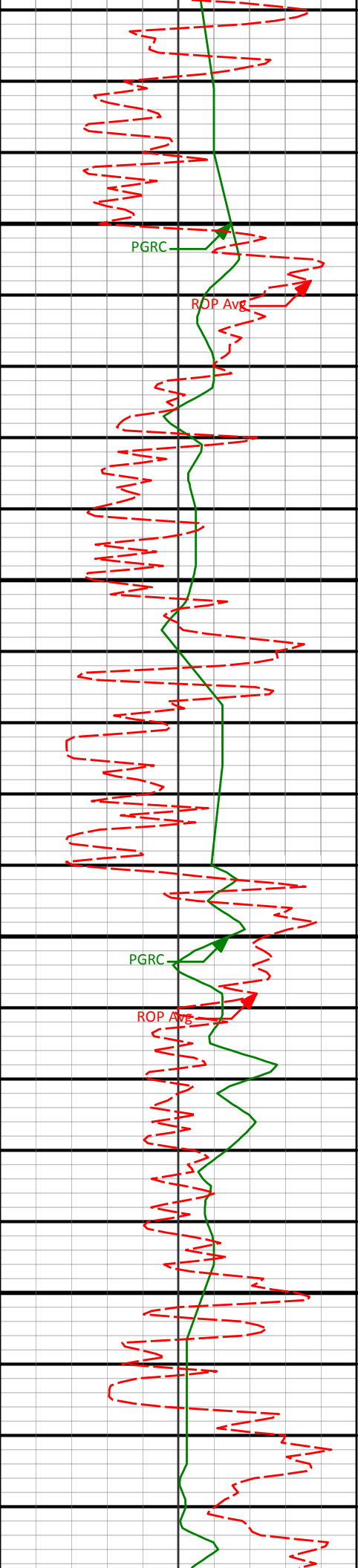
3.65°

273.08°

2924.25'

-507.88'





3300'

PGRC

ROP Avg

3350'

3353'

2.68°

266.16°

3282.76'

-508.77'

3400'

PGRC

ROP Avg

3442'

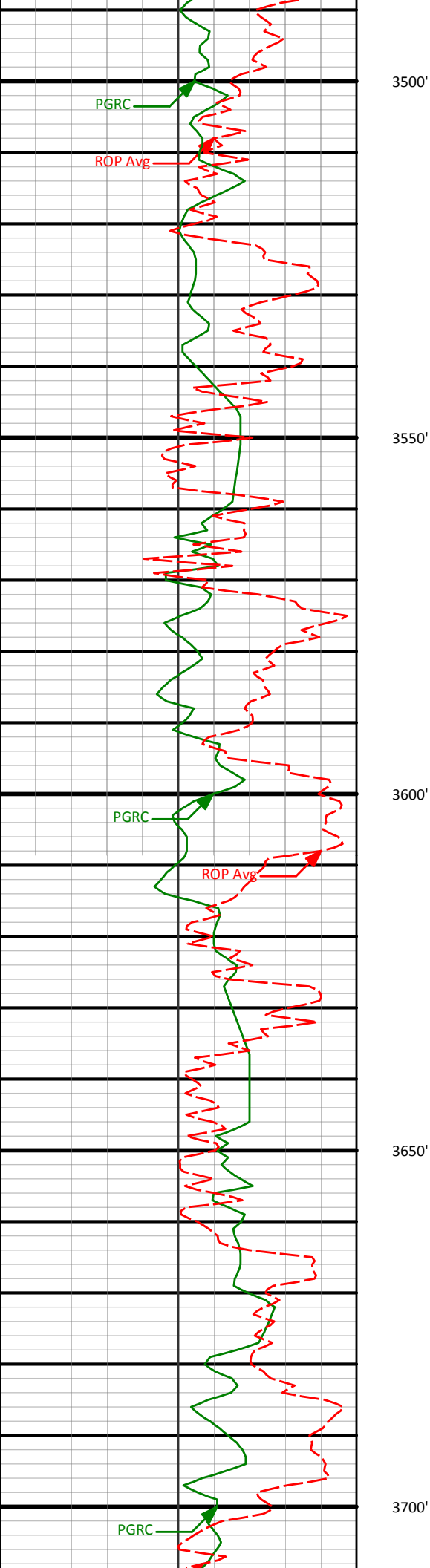
2.11°

270.16°

3371.68'

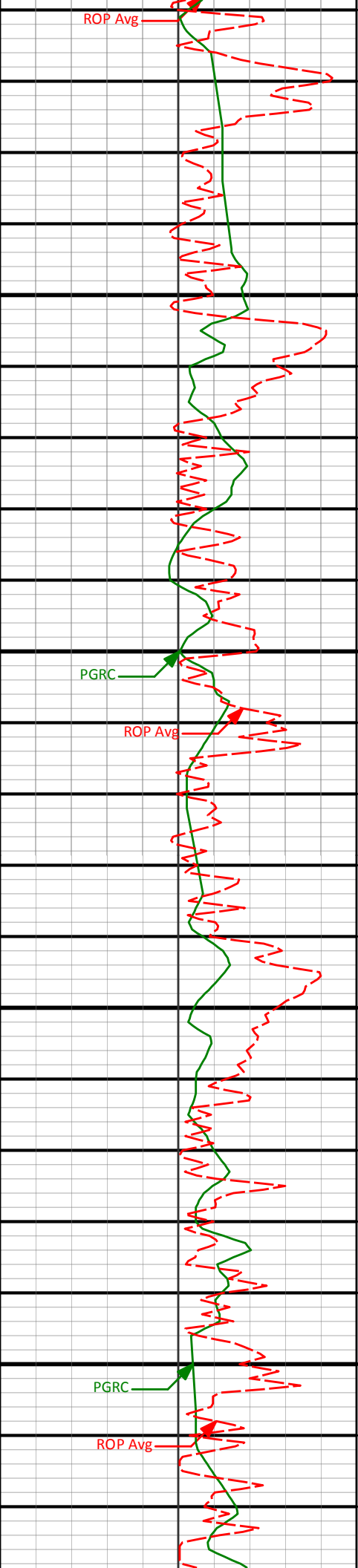
-508.93'

3450'



3532'	2.20°	269.54°	3461.62'	-508.97'
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3622'	2.24°	269.87°	3551.55'	-509.01'
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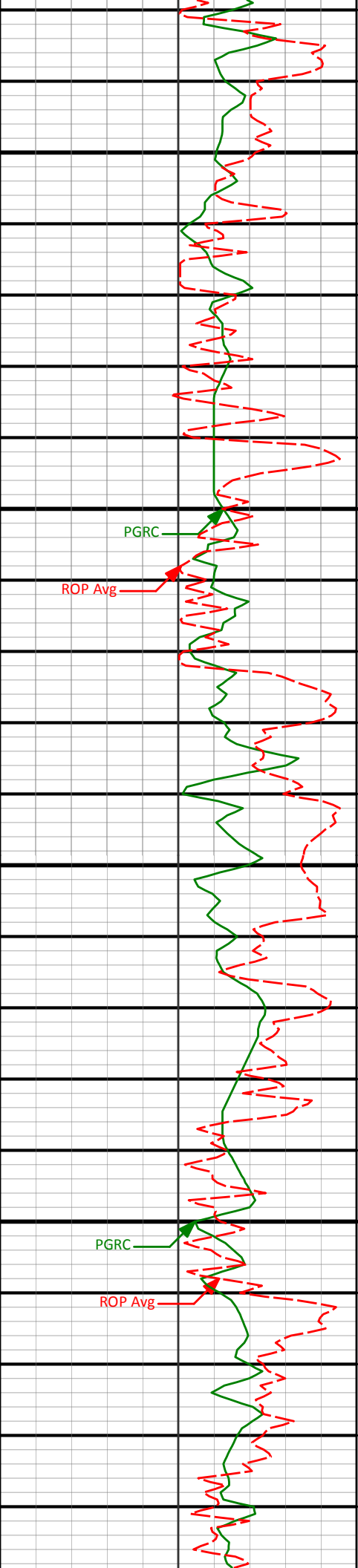
3750'

3800'

3850'

3900'

3712'	3.30°	244.54°	3641.45'	-510.16'
3802'	3.60°	249.62°	3731.29'	-512.30'
3891'	3.30°	252.77°	3820.13'	-514.07'



3950'

3981'

3.21°

254.56°

3909.98'

-515.54'

4000'

PGRC

ROP Avg

4050'

4071'

2.15°

278.64°

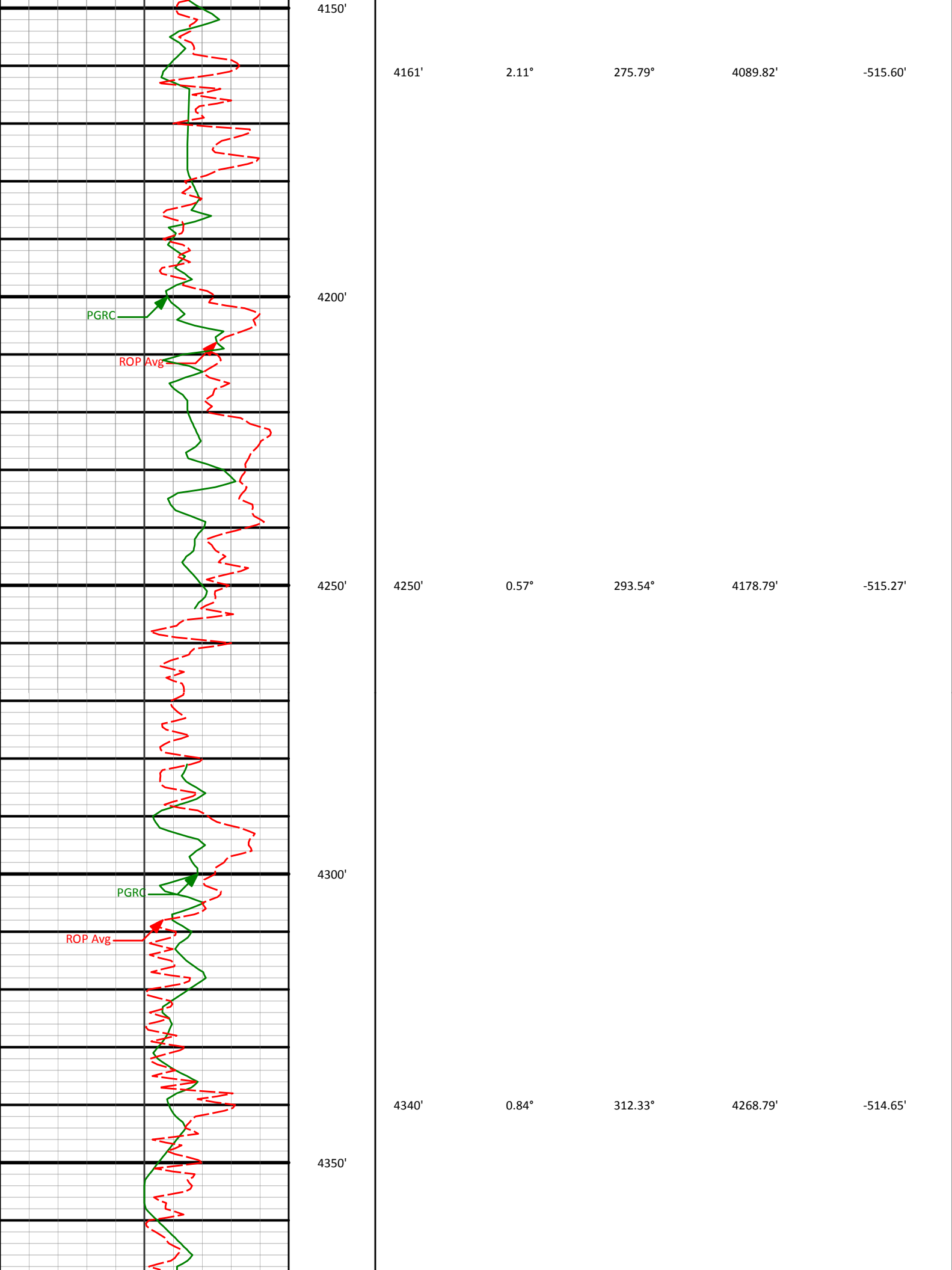
3999.88'

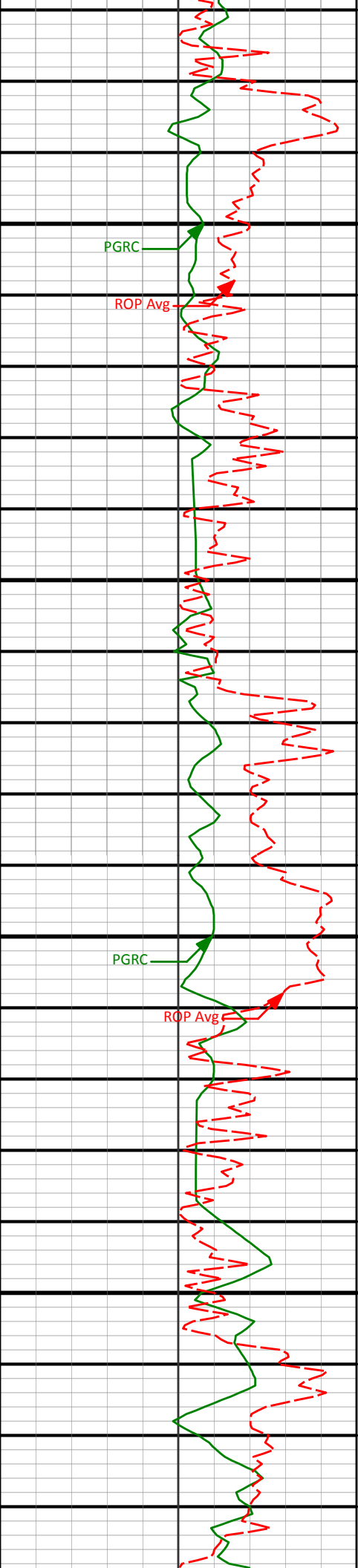
-515.99'

4100'

PGRC

ROP Avg





4400'

PGRC

ROP Avg

4430'

0.92°

298.63°

4358.78'

-513.87'

4450'

4500'

PGRC

ROP Avg

4520'

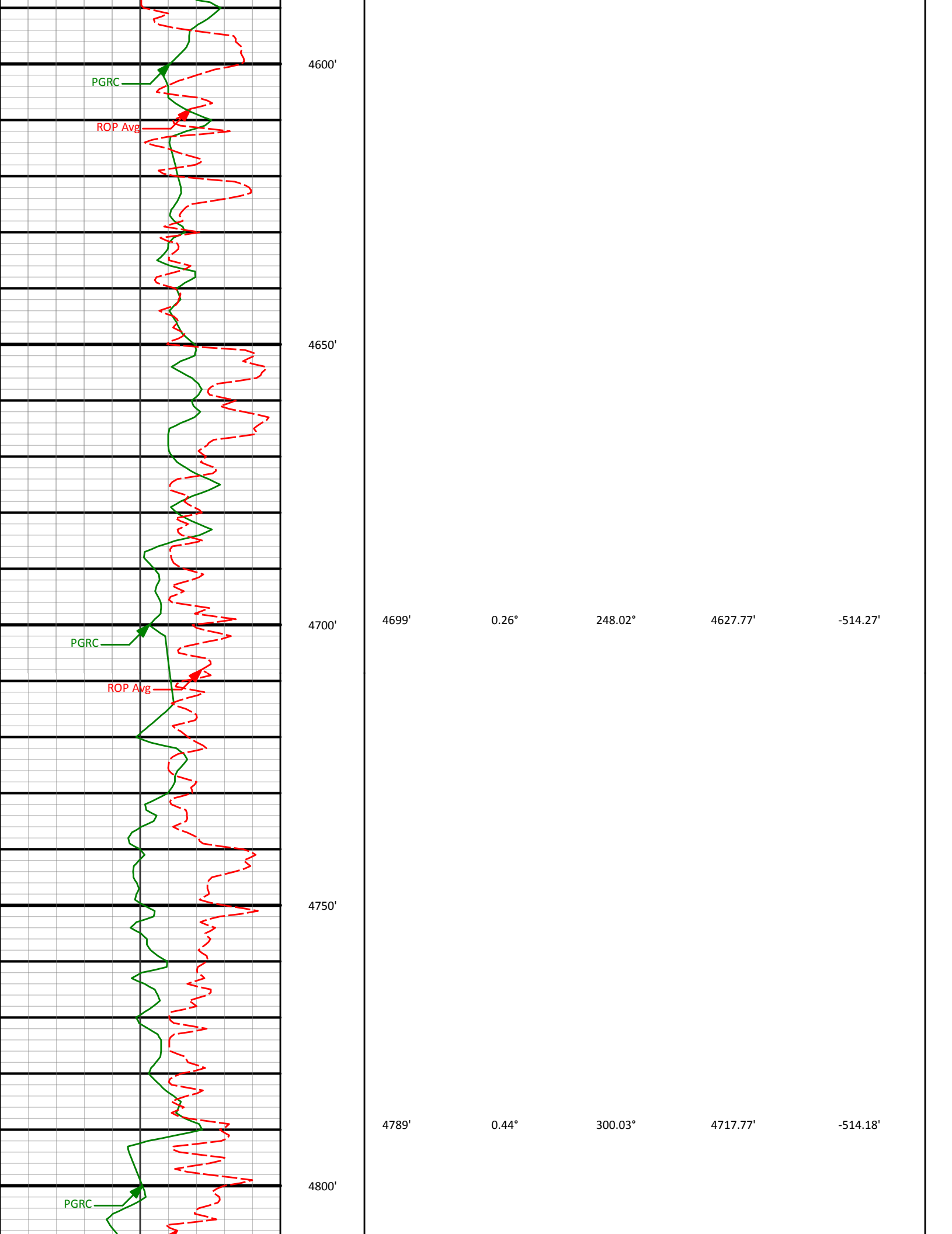
0.40°

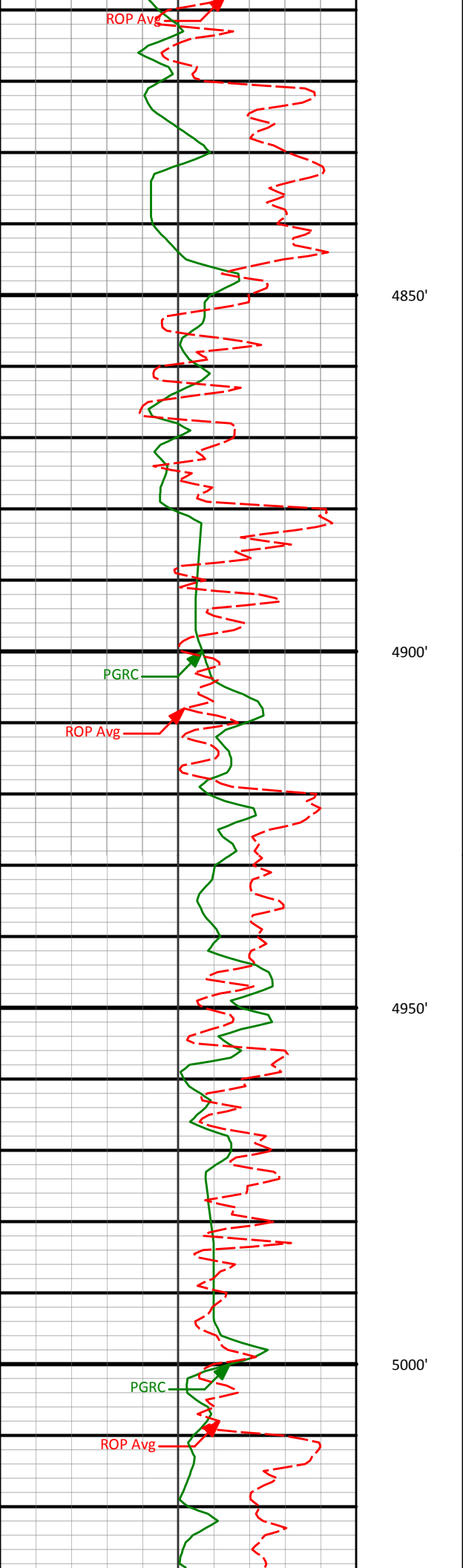
231.83°

4448.77'

-513.73'

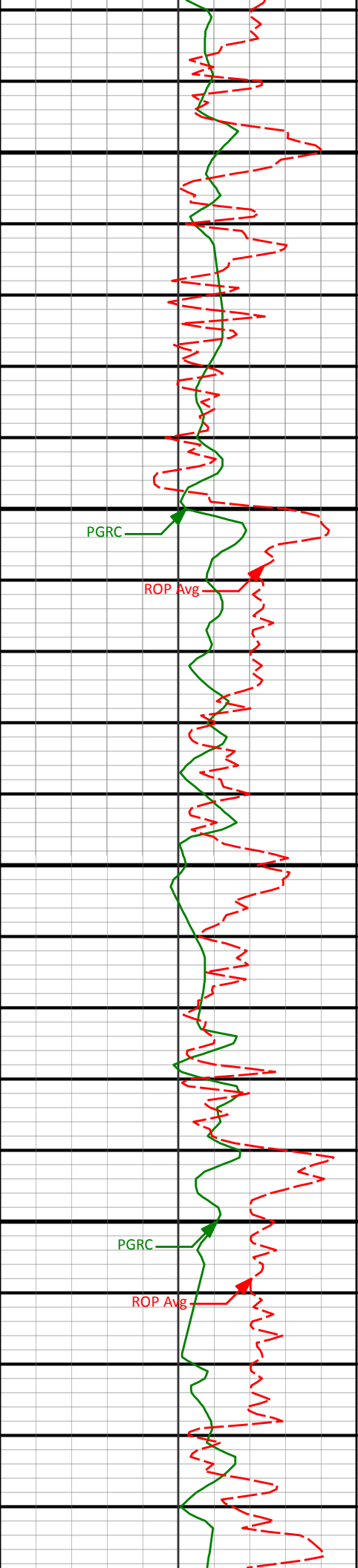
4550'





4879'	0.57°	288.10°	4807.76'	-513.87'
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4968'	0.53°	299.67°	4896.76'	-513.54'
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5050'

5058'

0.79°

301.78°

4986.75'

-513.01'

5100'

PGRC

ROP Avg

5150'

5148'

1.01°

288.34°

5076.74'

-512.44'

5200'

PGRC

ROP Avg

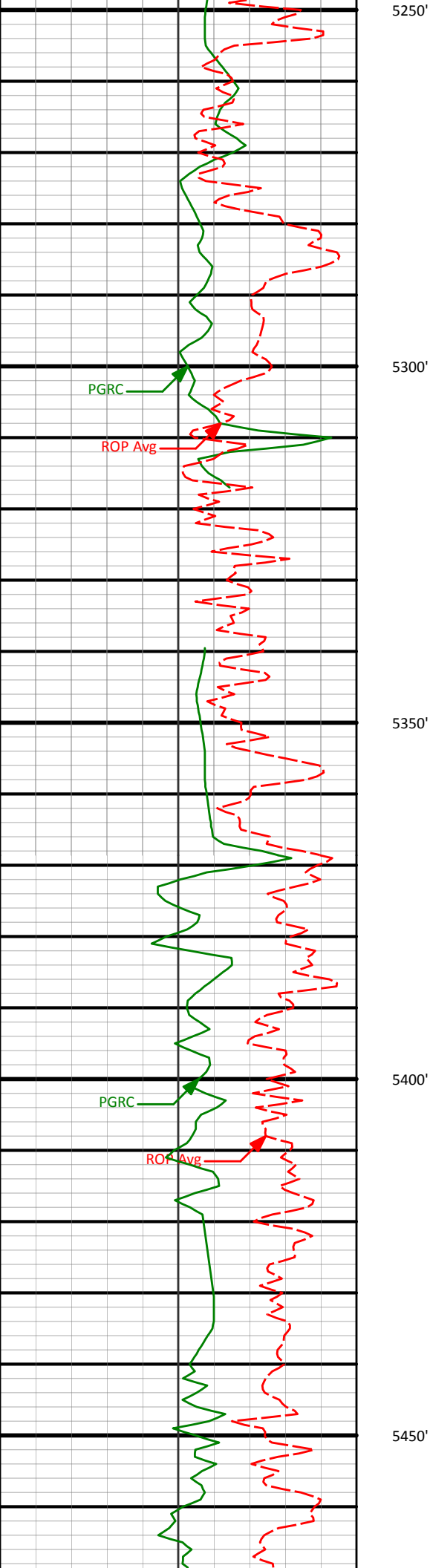
5238'

1.19°

286.65°

5166.73'

-511.94'



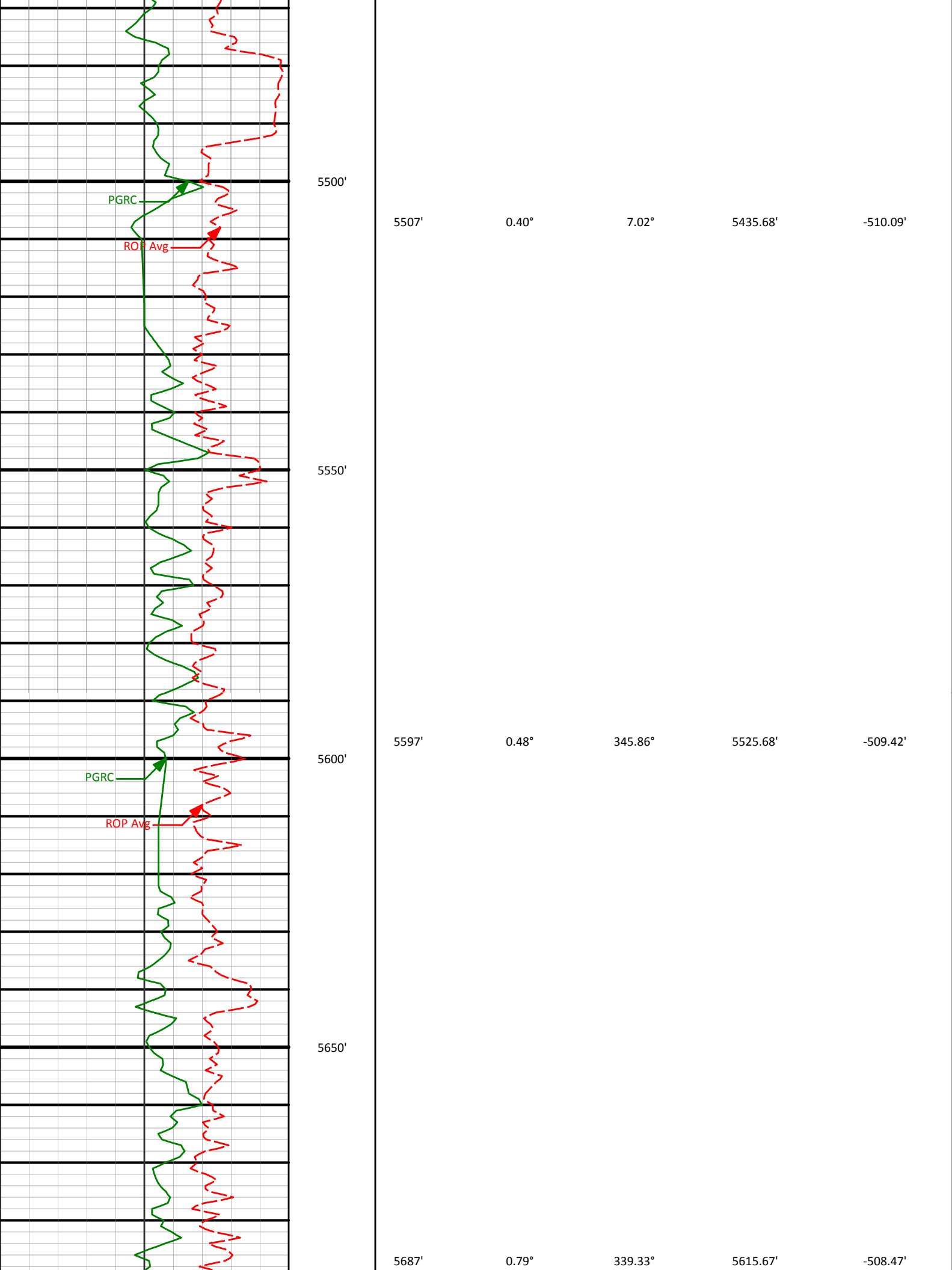
5417'

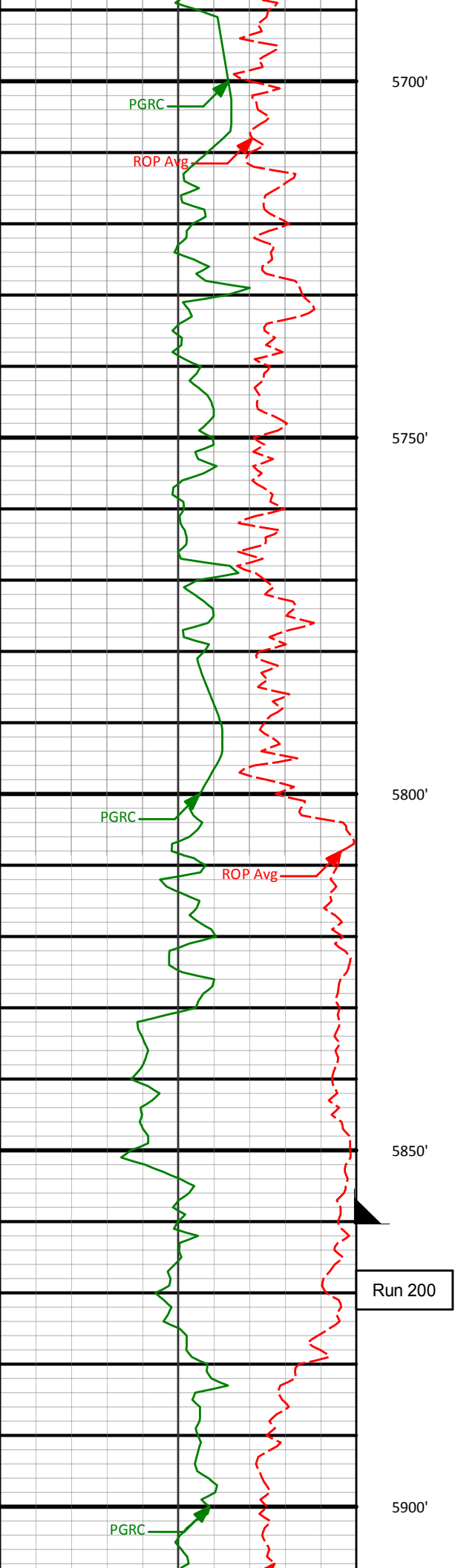
1.19°

291.70°

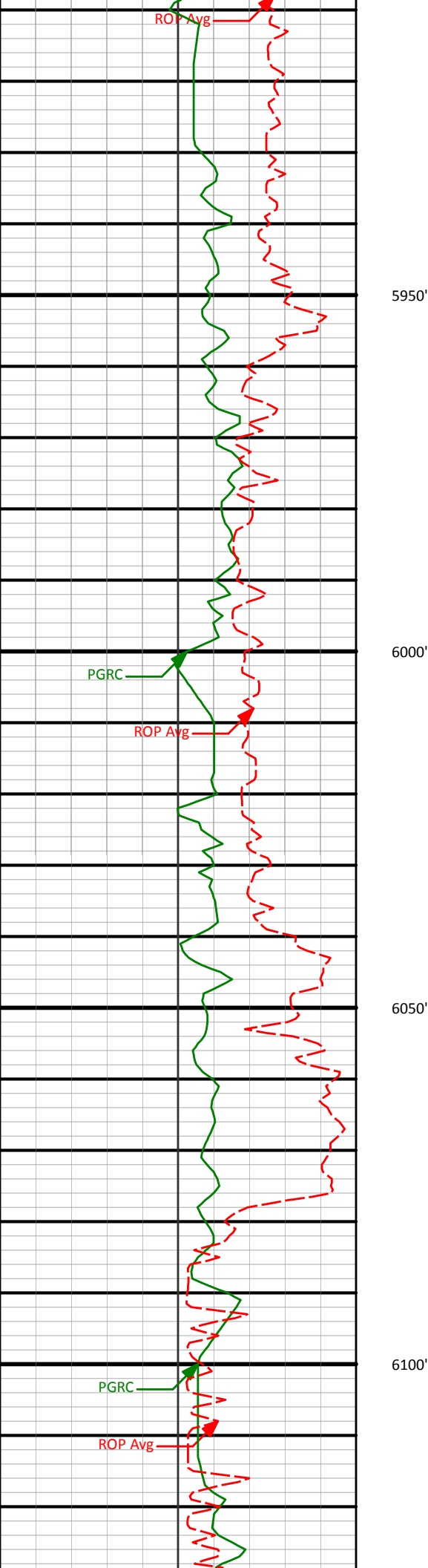
5345.69'

-510.75'

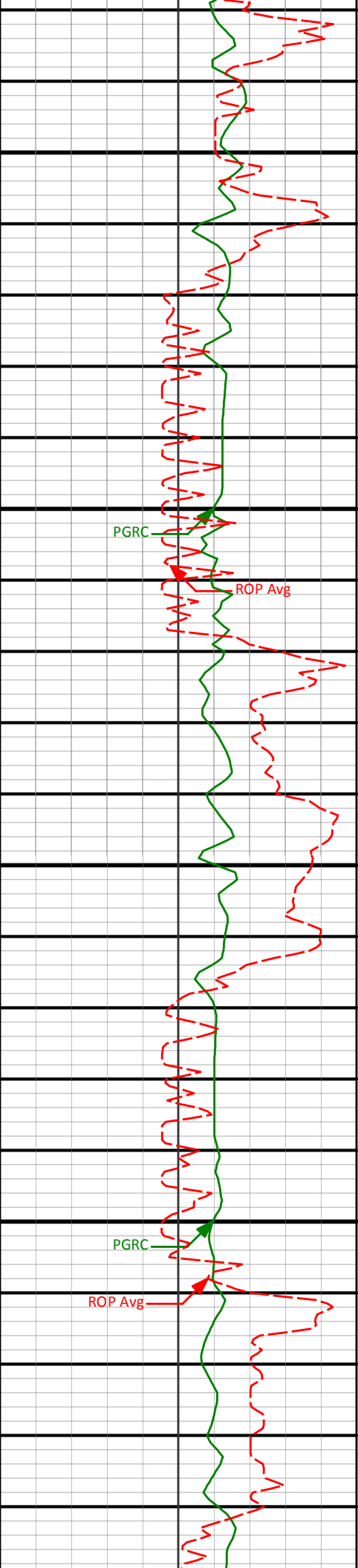




5700'				
5750'				
5777'	0.84°	339.92°	5705.66'	-507.28'
5800'				
5826'	0.70°	327.77°	5754.66'	-506.69'
5850'				
Run 200				
5900'				
5908'	0.70°	22.20°	5836.65'	-505.80'



5998'	0.80°	16.33°	5926.65'	-504.69'
6088'	0.92°	21.64°	6016.63'	-503.41'



6150'

6177'

0.97°

37.06°

6105.62'

-502.14'

6200'

PGRC

ROP Avg

6250'

6267'

1.01°

189.85°

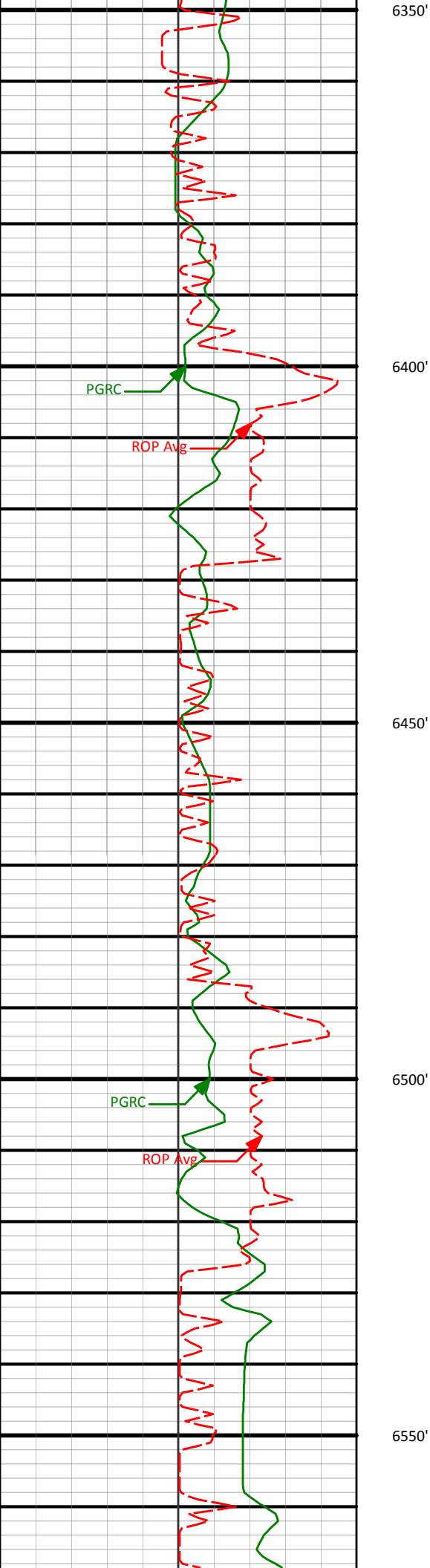
6195.62'

-502.31'

6300'

PGRC

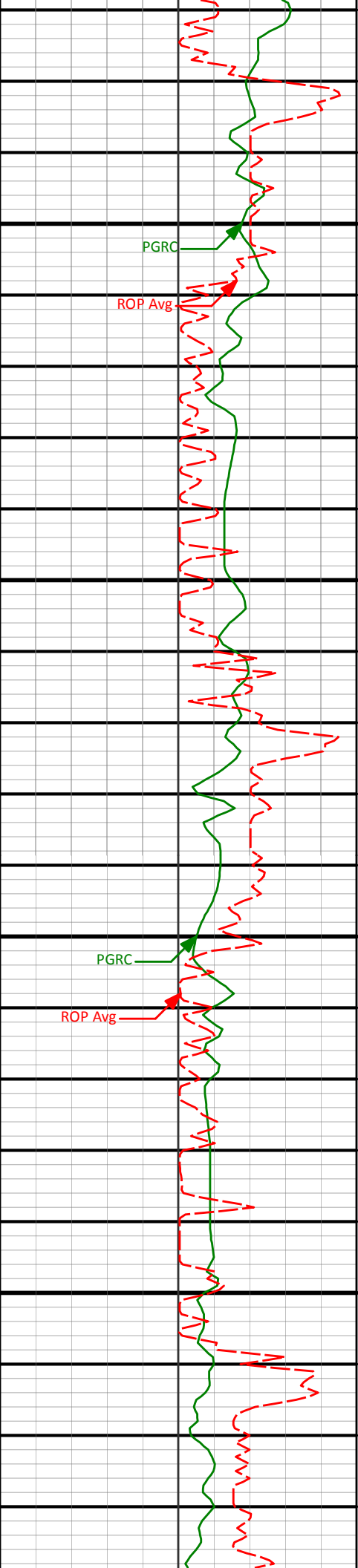
ROP Avg



6357'	0.53°	187.28°	6285.61'	-503.51'
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6447'	0.18°	288.60°	6375.61'	-503.87'
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6537'	0.13°	283.08°	6465.61'	-503.81'
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6600'

PGRC

ROP Avg

6626'

0.22°

137.31°

6554.61'

-503.91'

6650'

6700'

PGRC

ROP Avg

6716'

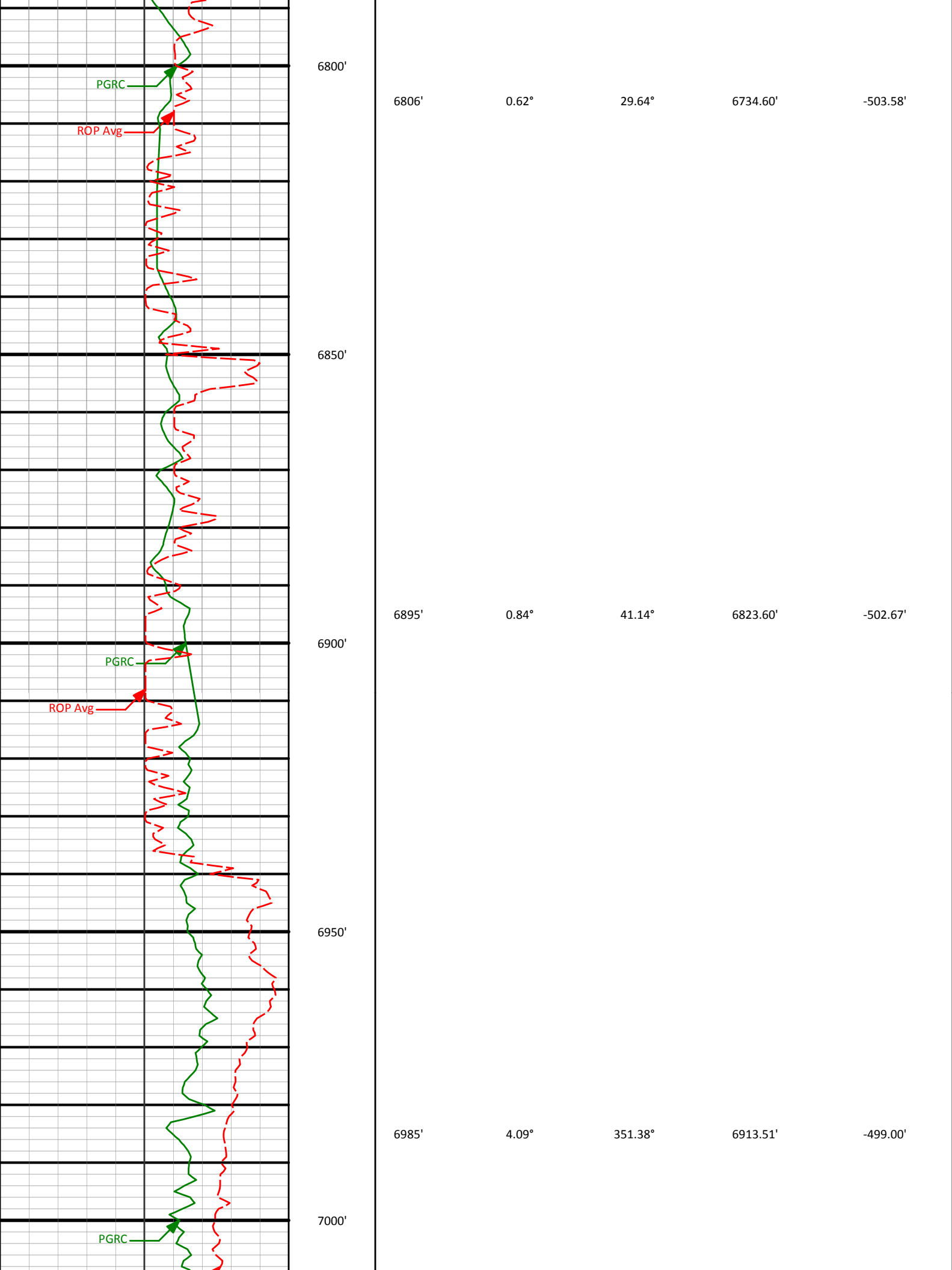
0.26°

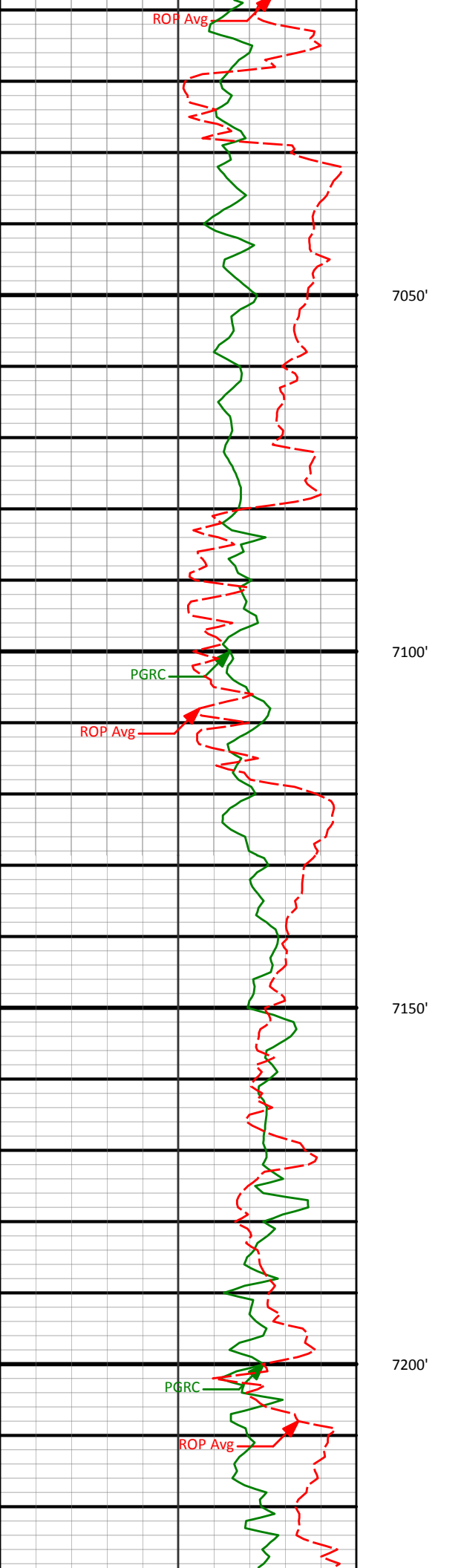
86.60°

6644.61'

-504.02'

6750'





7075'

10.33°

354.79°

7002.75'

-487.79'

7100'

7150'

7165'

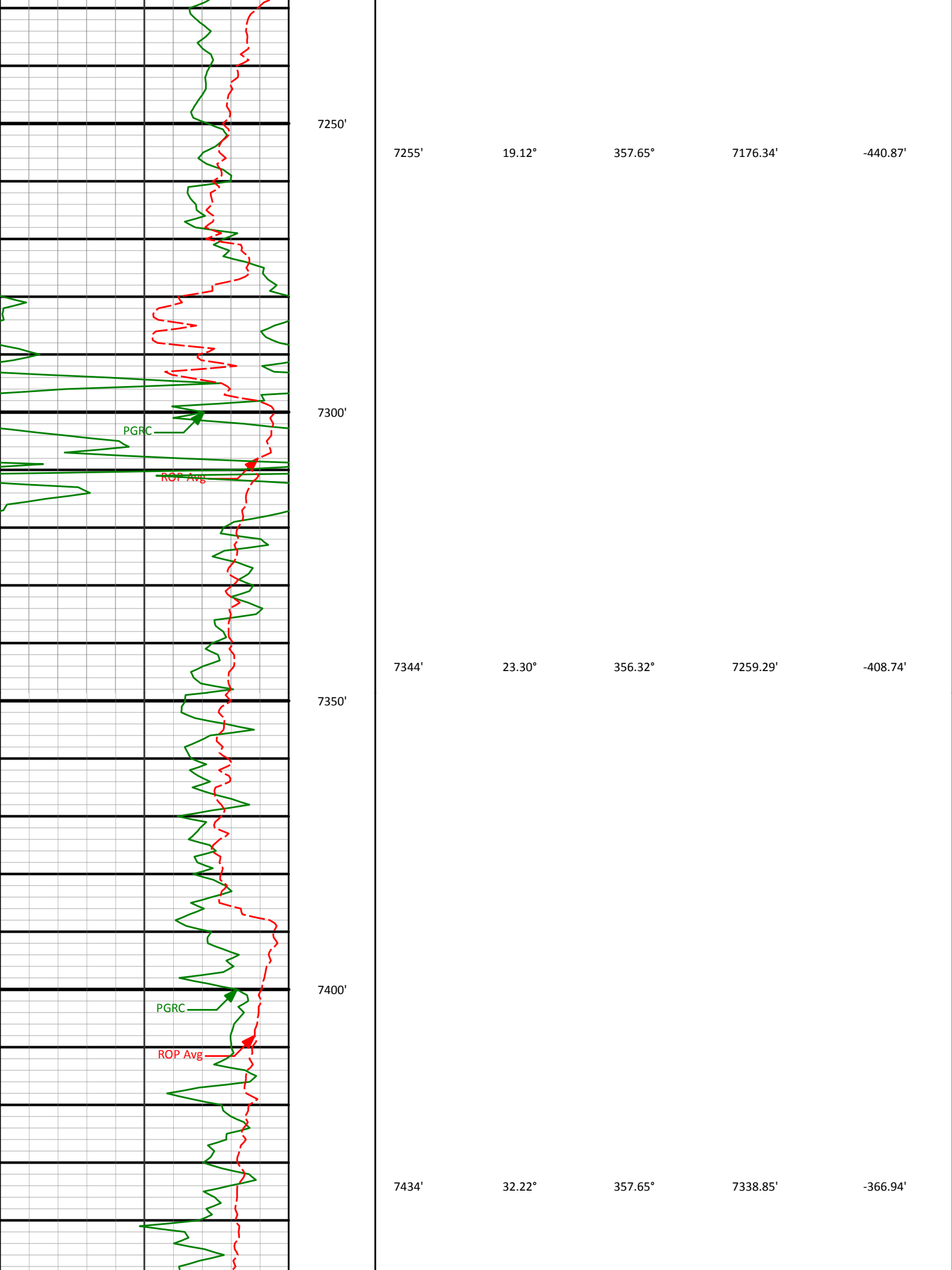
15.56°

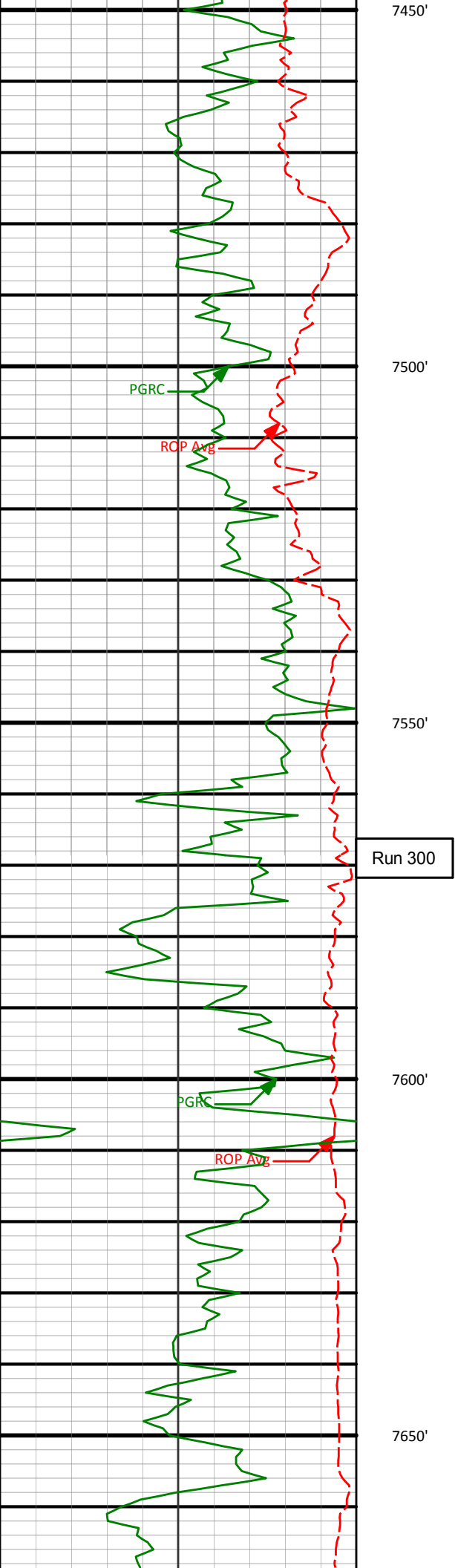
0.74°

7090.44'

-467.67'

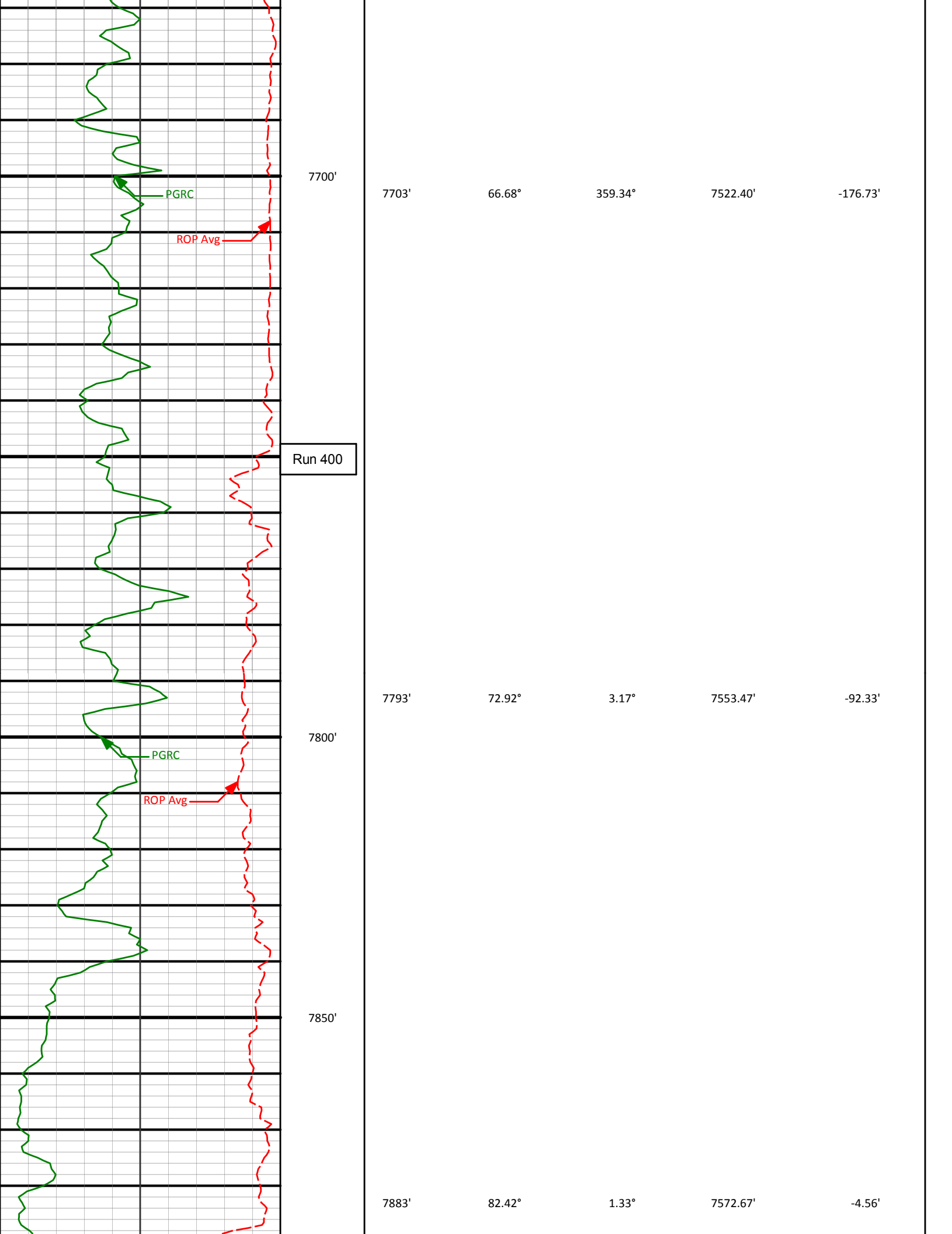
7200'

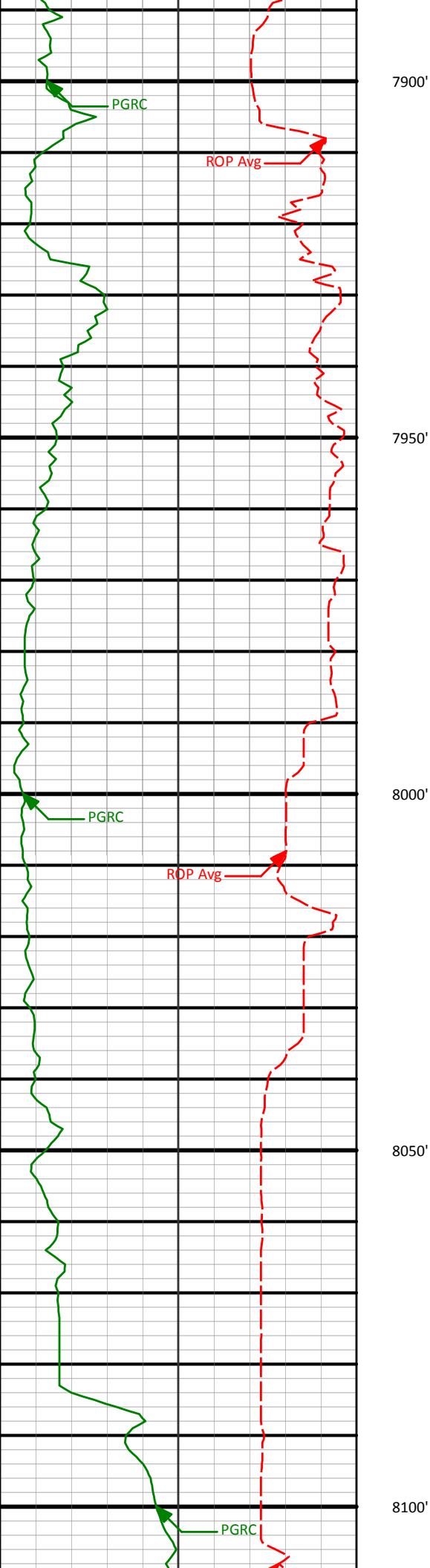




7524' 37.98° 356.21° 7412.45' -315.31'

7614' 51.03° 355.75° 7476.50' -252.55'





7973'

87.96°

0.60°

7580.22'

85.09'

8000'

8050'

8067'

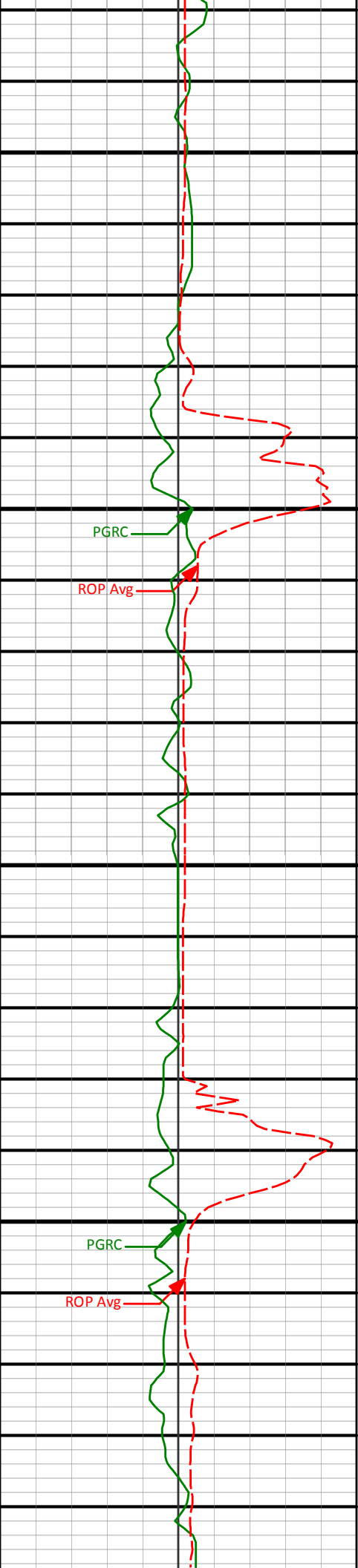
89.76°

0.38°

7582.09'

179.07'

8100'



8350'

8400'

8450'

8500'

PGRC

ROP Avg

PGRC

ROP Avg

8444'

89.49°

358.96°

7585.98'

556.00'

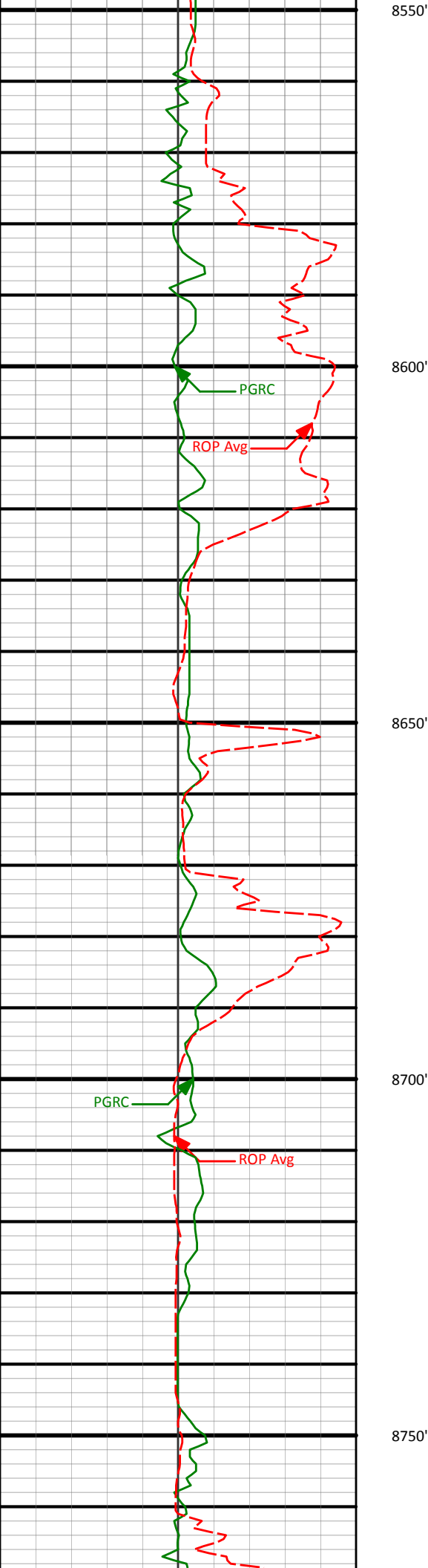
8538'

89.85°

358.75°

7586.52'

649.96'



8632'

90.64°

0.71°

7586.12'

743.95'

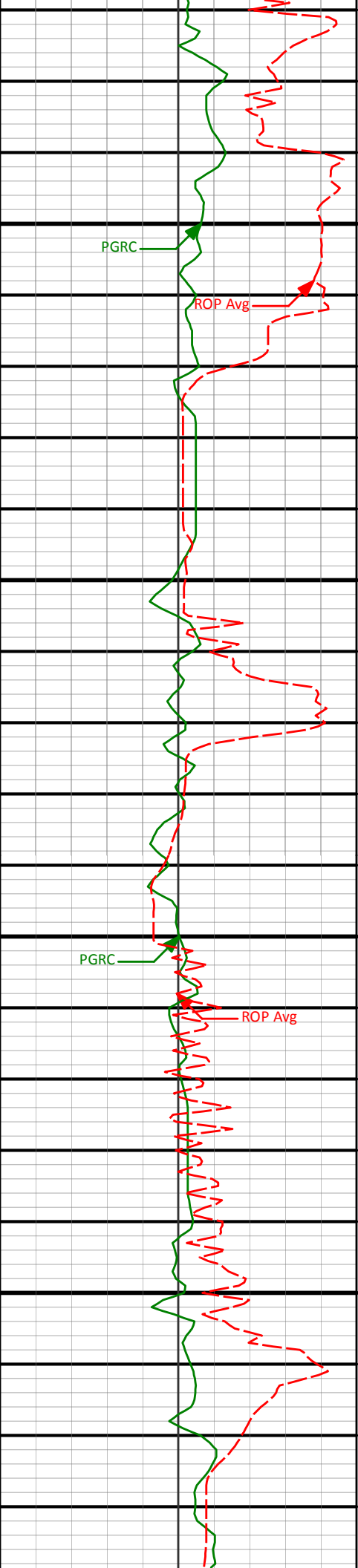
8727'

90.64°

0.22°

7585.06'

838.95'



8800'

8821'

90.15°

2.17°

7584.41'

932.93'

8850'

8900'

8915'

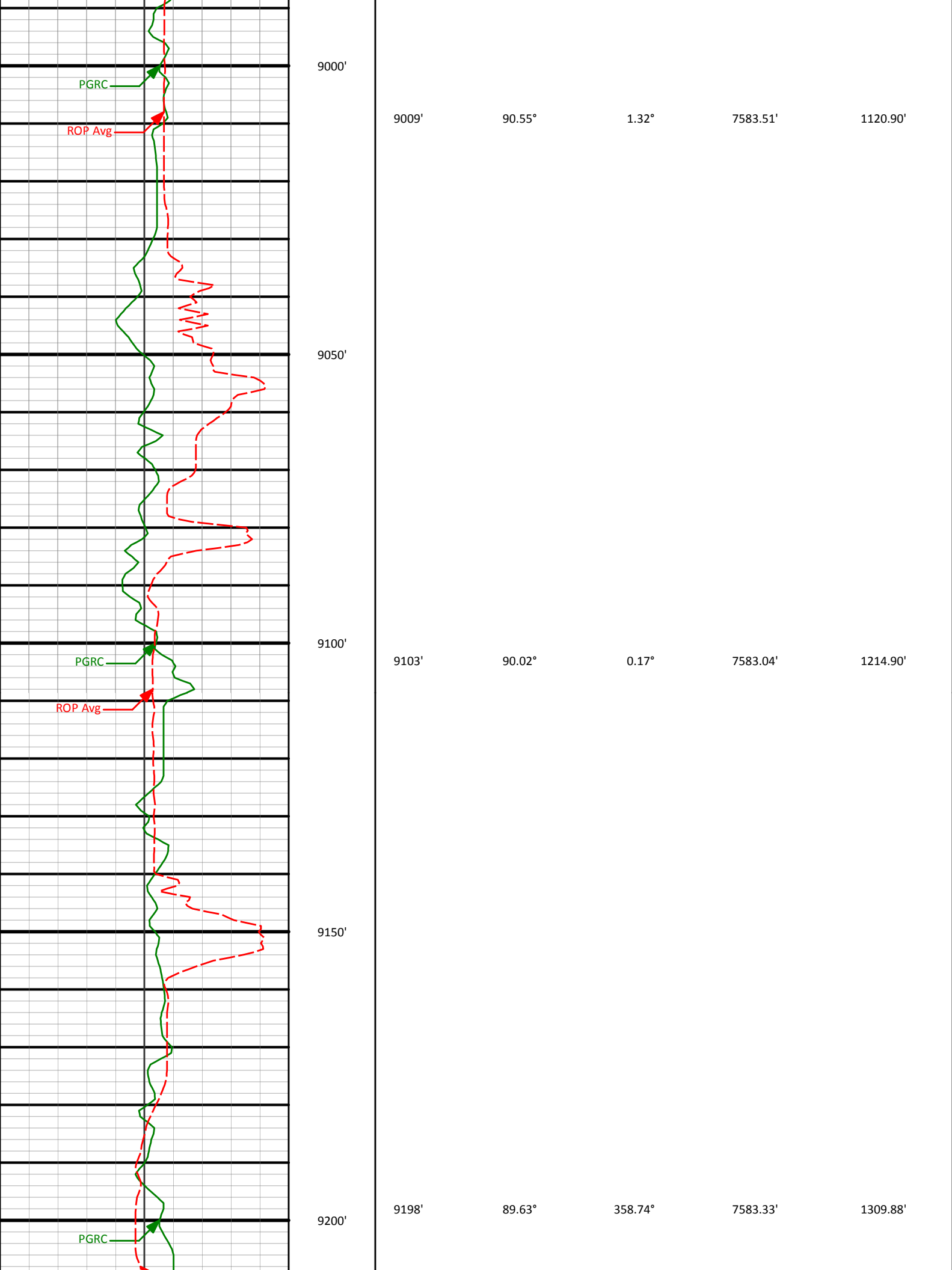
90.20°

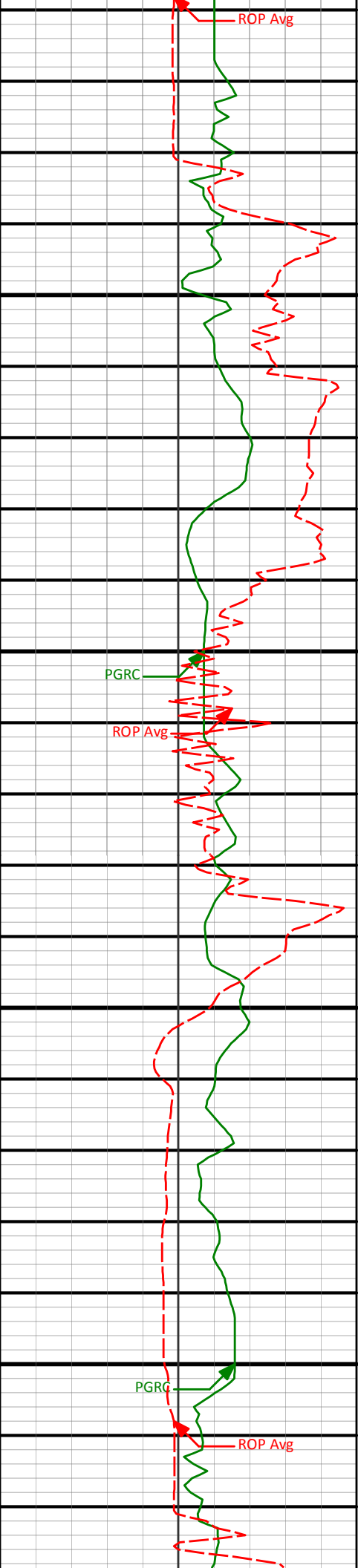
0.85°

7584.12'

1026.91'

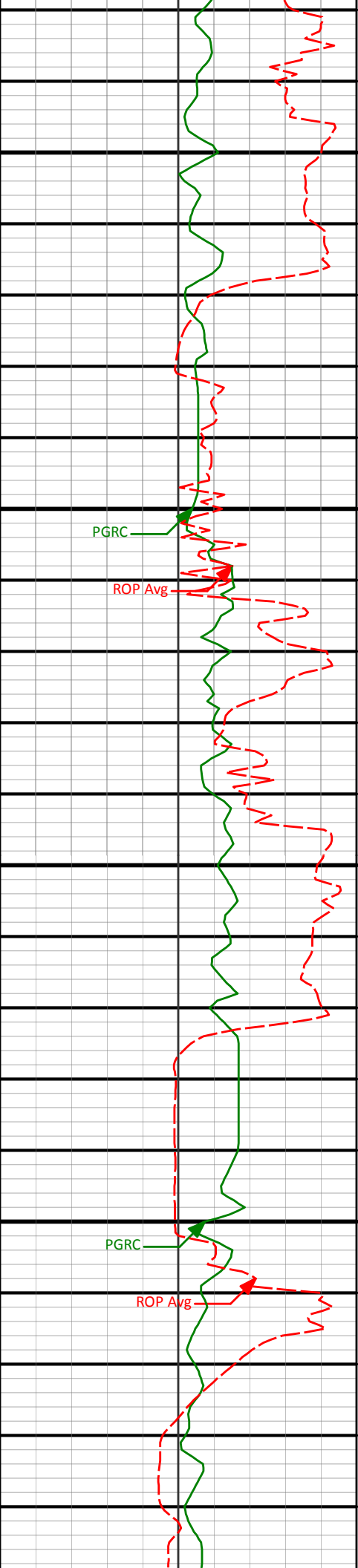
8950'





Run 200

9250'				
9292'	91.03°	0.41°	7582.79'	1403.86'
9300'				
9350'				
9386'	90.55°	358.92°	7581.49'	1497.84'
9400'				



9450'

9500'

9550'

9600'

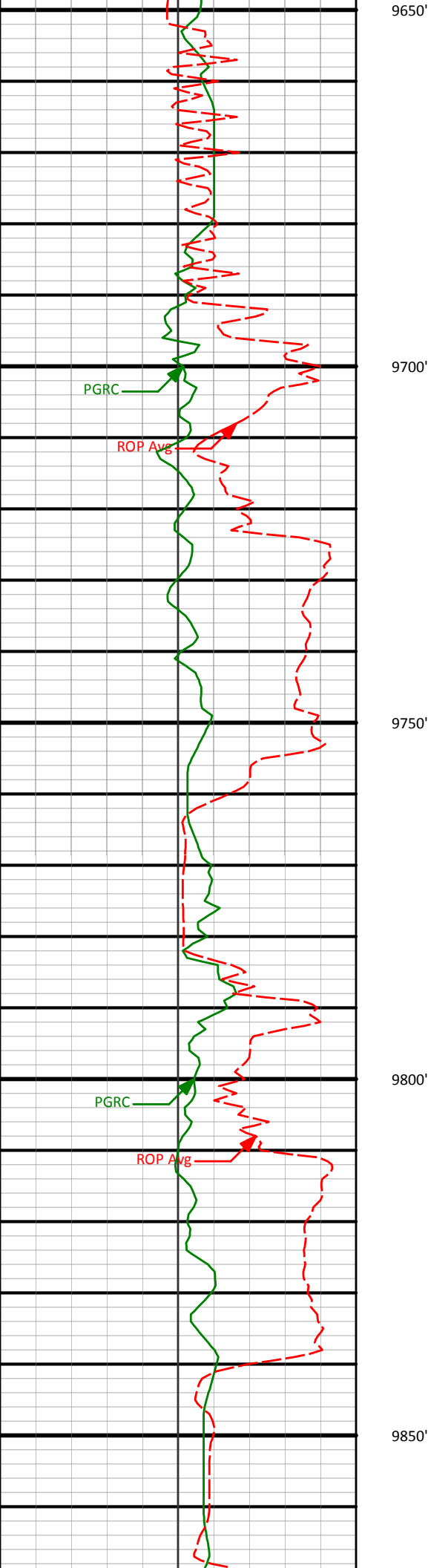
9566'

90.07°

1.02°

7580.52'

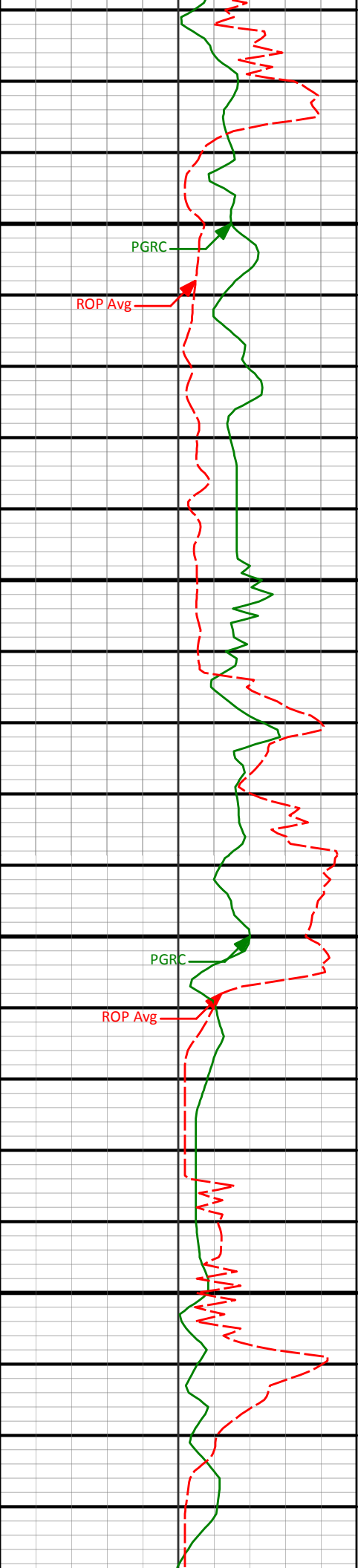
1677.82'



9655'	89.89°	0.25°	7580.55'	1766.82'
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9745'	89.19°	1.41°	7581.27'	1856.82'
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9835'	90.15°	2.87°	7581.79'	1946.77'
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9900'

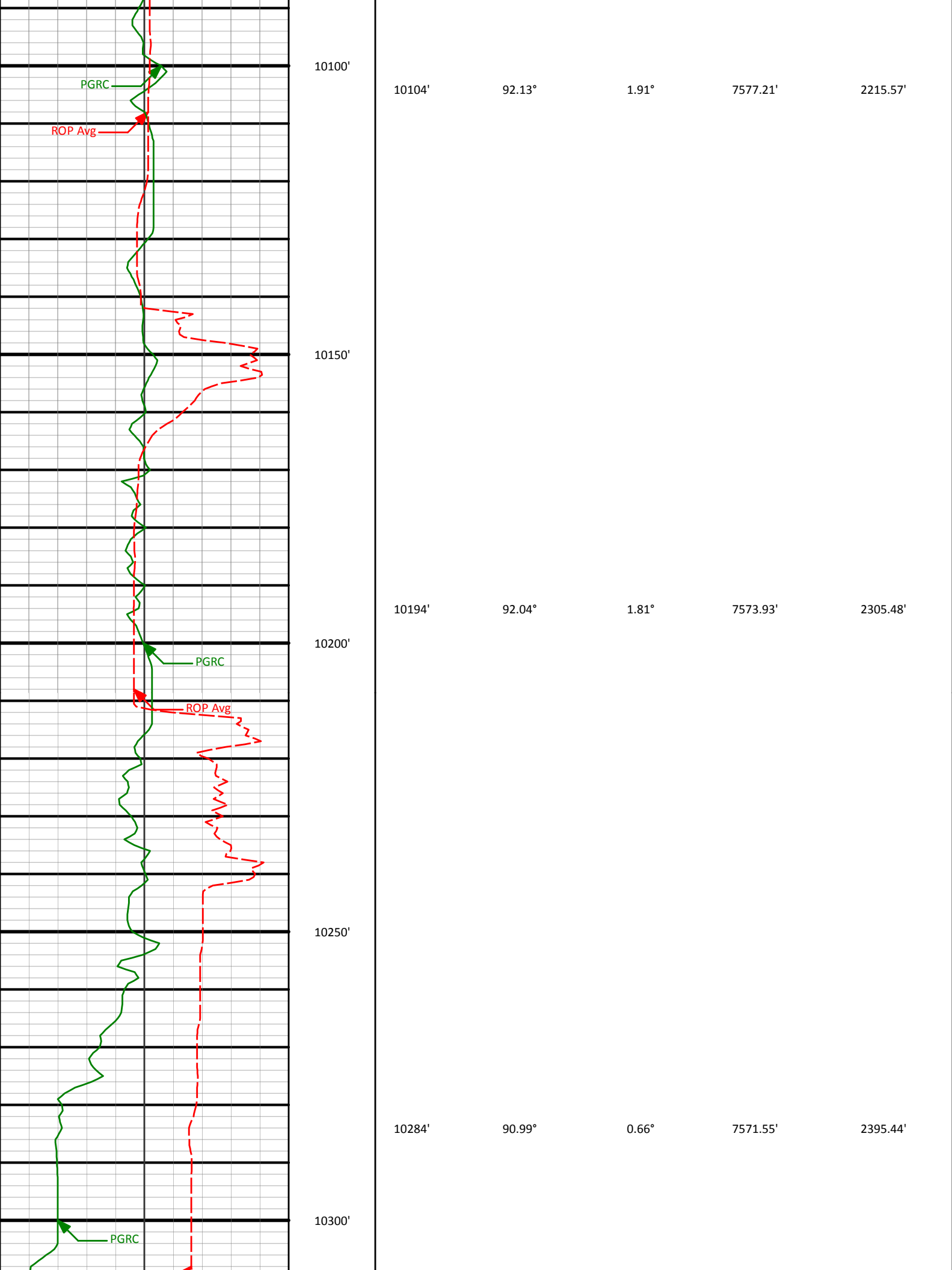
9950'

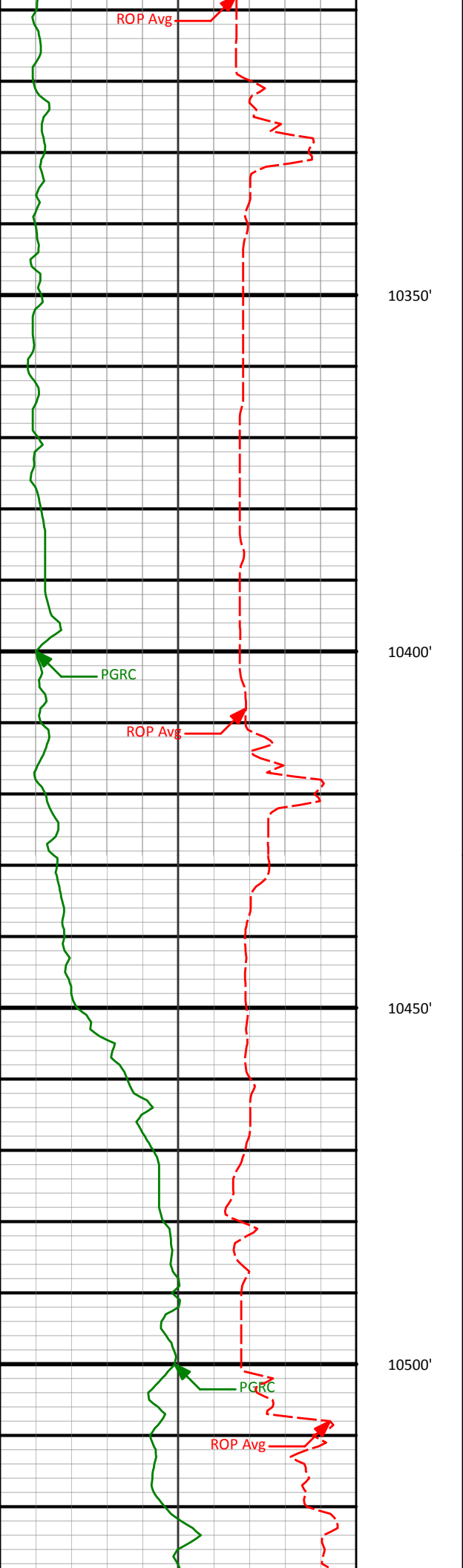
10000'

10050'

9925'	90.11°	1.99°	7581.59'	2036.72'
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10015'	91.69°	2.45°	7580.17'	2126.66'
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10374'

90.42°

0.17°

7570.45'

2485.43'

10350'

10400'

10450'

10463'

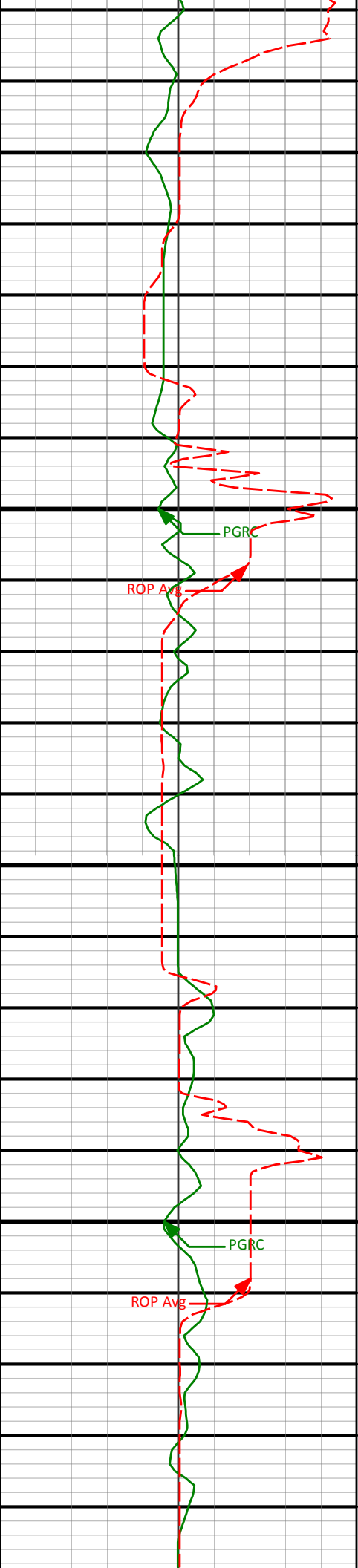
89.32°

359.52°

7570.65'

2574.42'

10500'



10550'

10553'

89.80°

358.71°

7571.34'

2664.39'

10600'

PGRC

ROP Avg

10650'

10643'

89.98°

358.16°

7571.51'

2754.34'

10700'

PGRC

ROP Avg

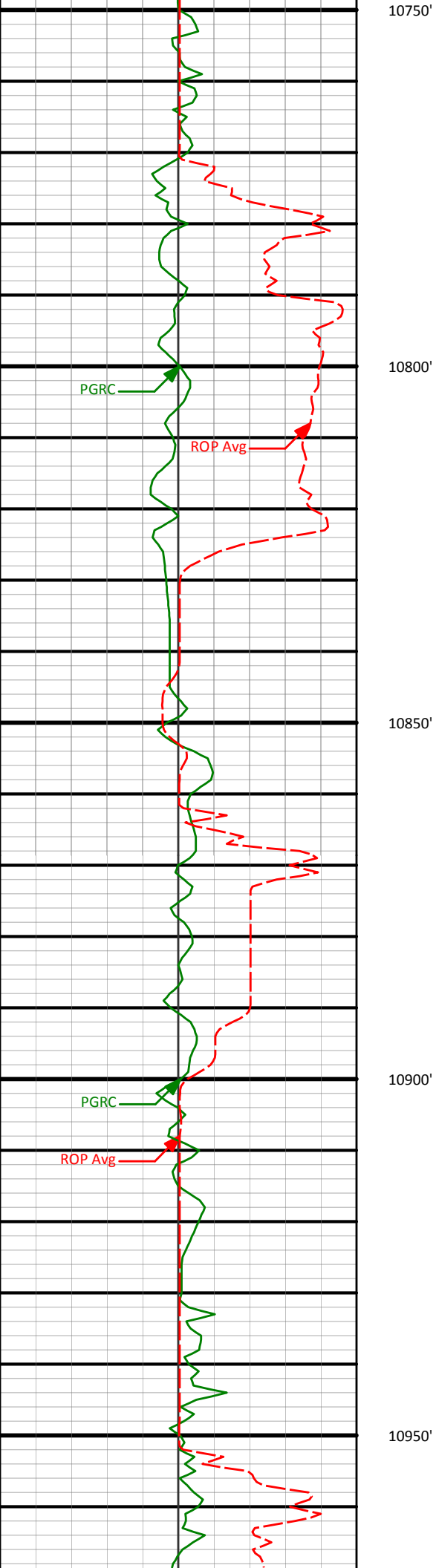
10733'

89.89°

357.49°

7571.61'

2844.24'



10822'

91.21°

359.32°

7570.76'

2933.18'

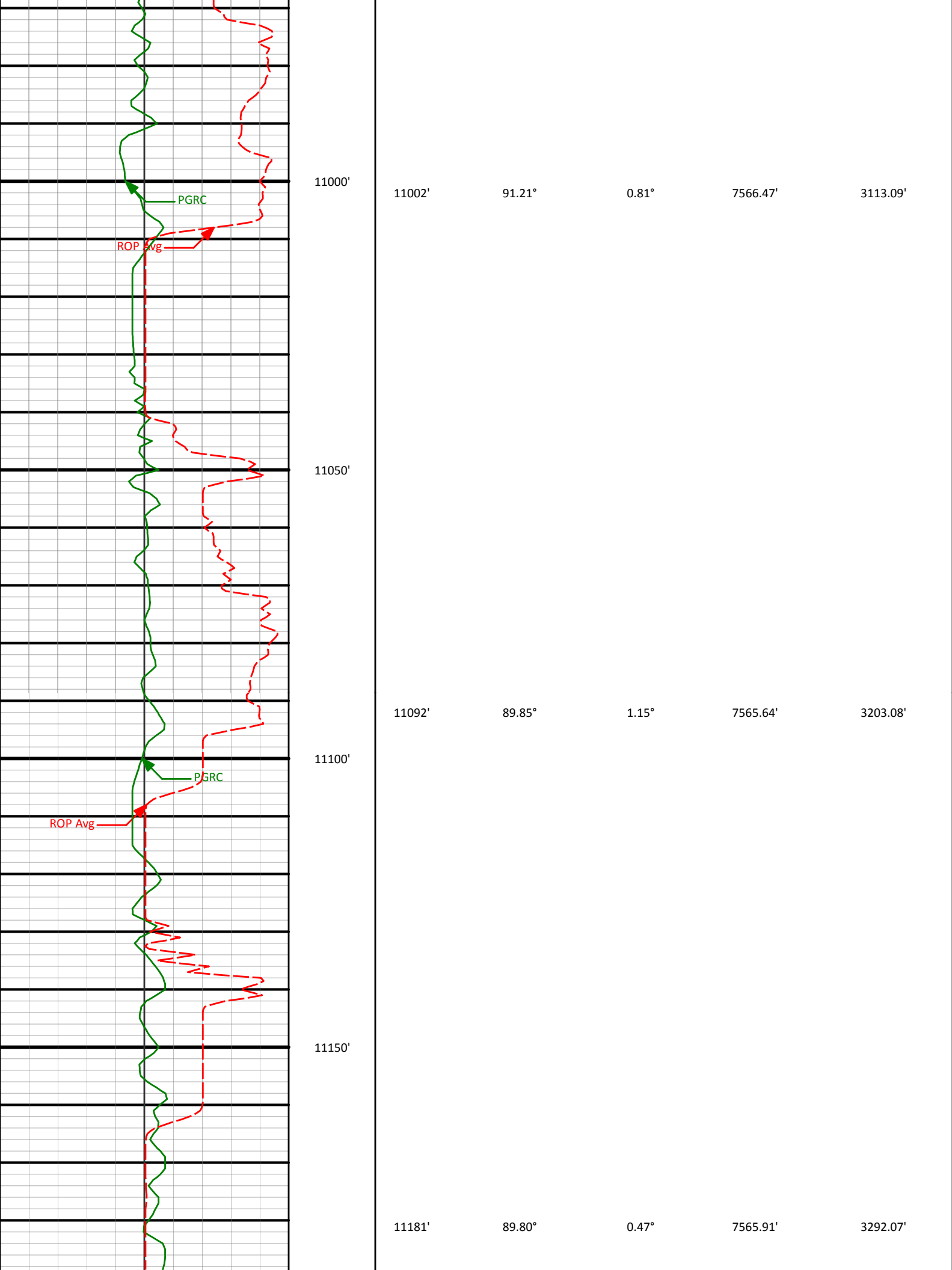
10912'

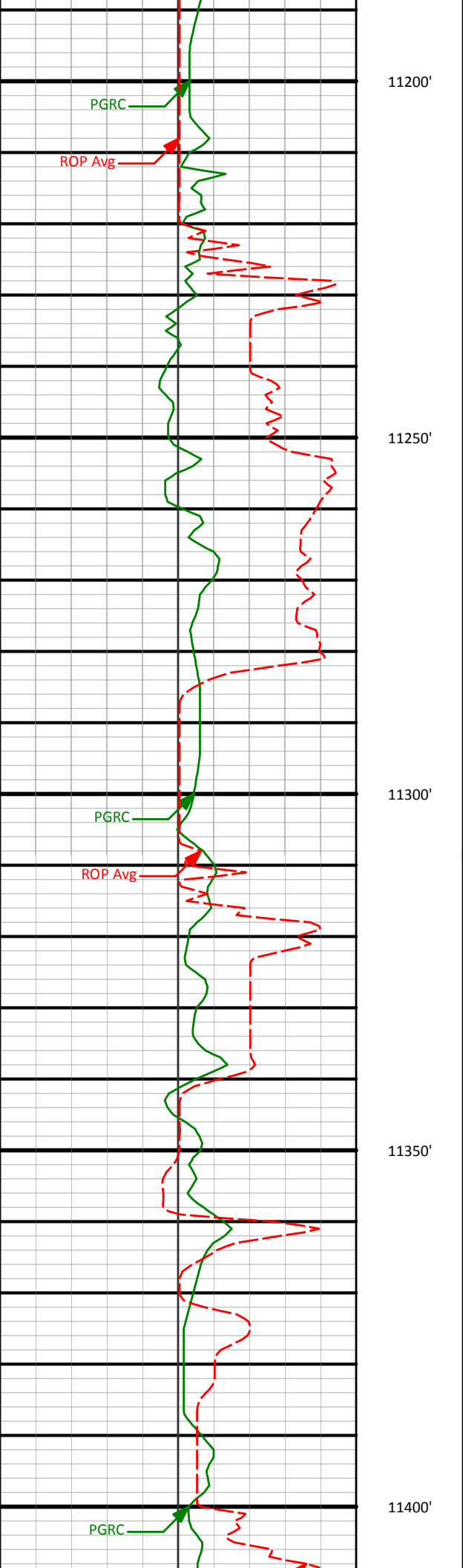
91.52°

358.69°

7568.62'

3023.12'





11271'

88.79°

2.30°

7567.02'

3382.05'

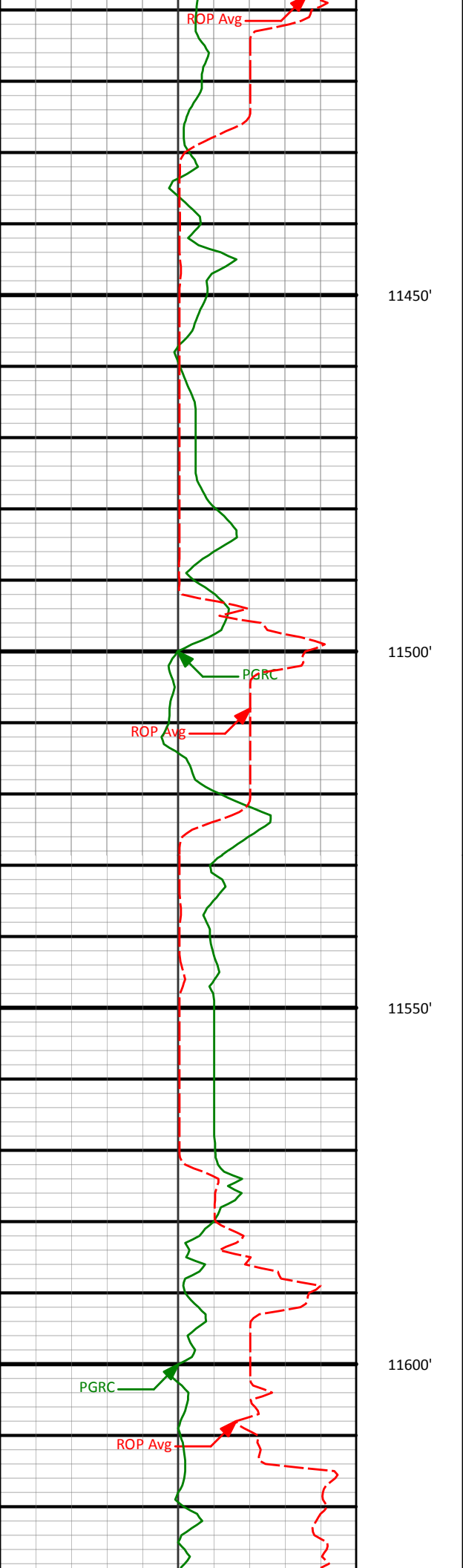
11361'

88.53°

2.23°

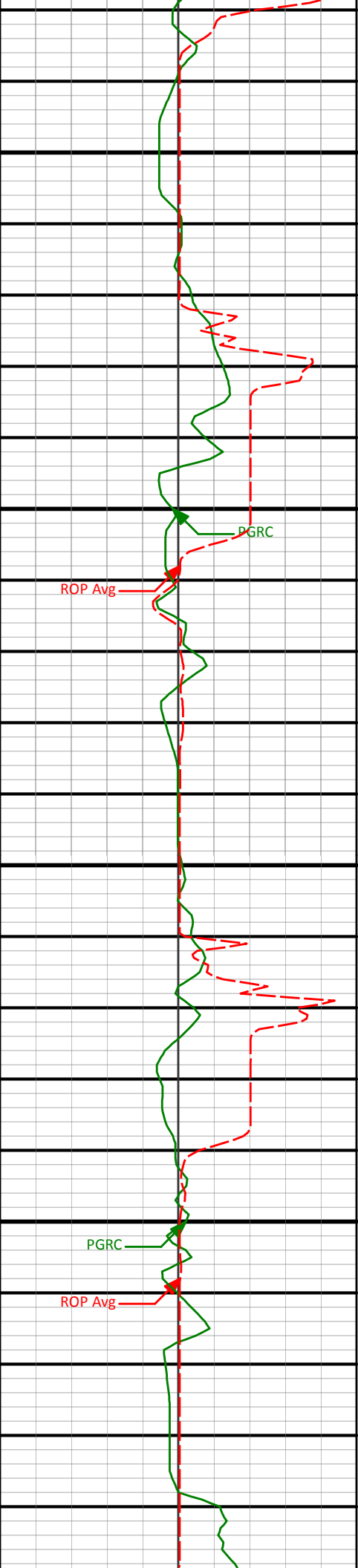
7569.12'

3471.98'

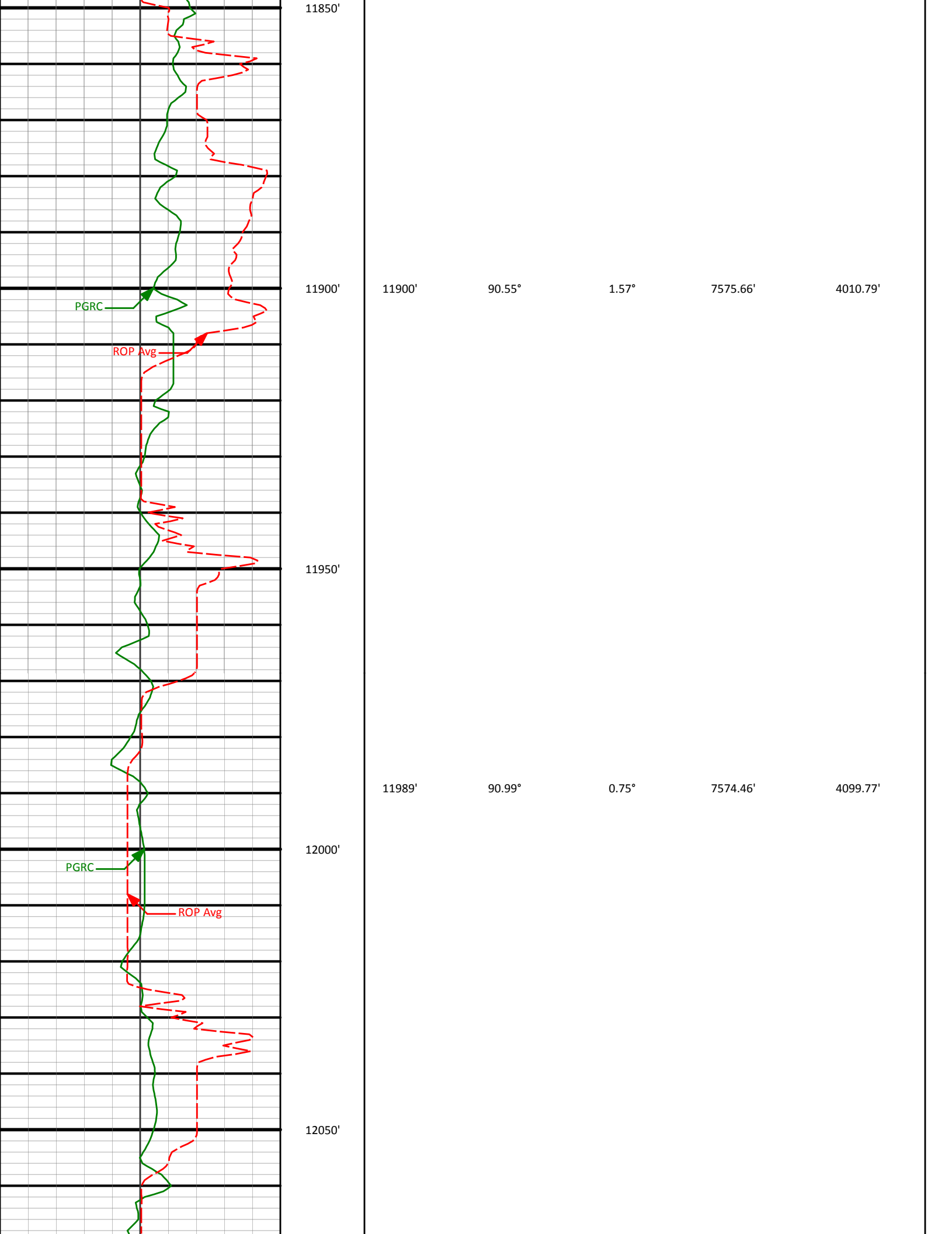


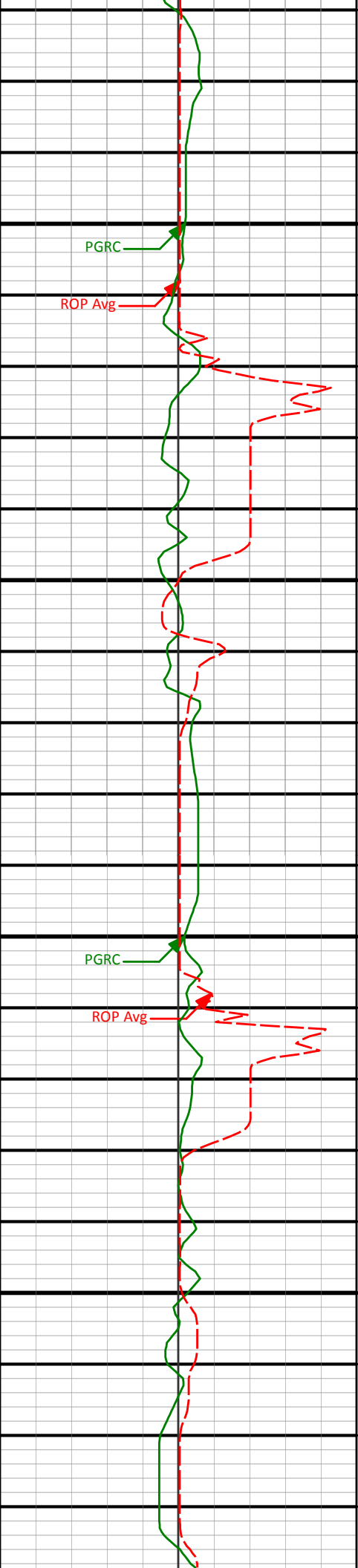
11451' 88.88° 2.40° 7571.16' 3561.91'

11541' 88.53° 1.58° 7573.19' 3651.85'



	11630'	89.54°	1.69°	7574.69'	3740.82'
11650'					
11700'					
	11720'	89.76°	1.30°	7575.24'	3830.80'
11750'					
11800'					
	11810'	89.58°	0.33°	7575.76'	3920.80'





12100'

12150'

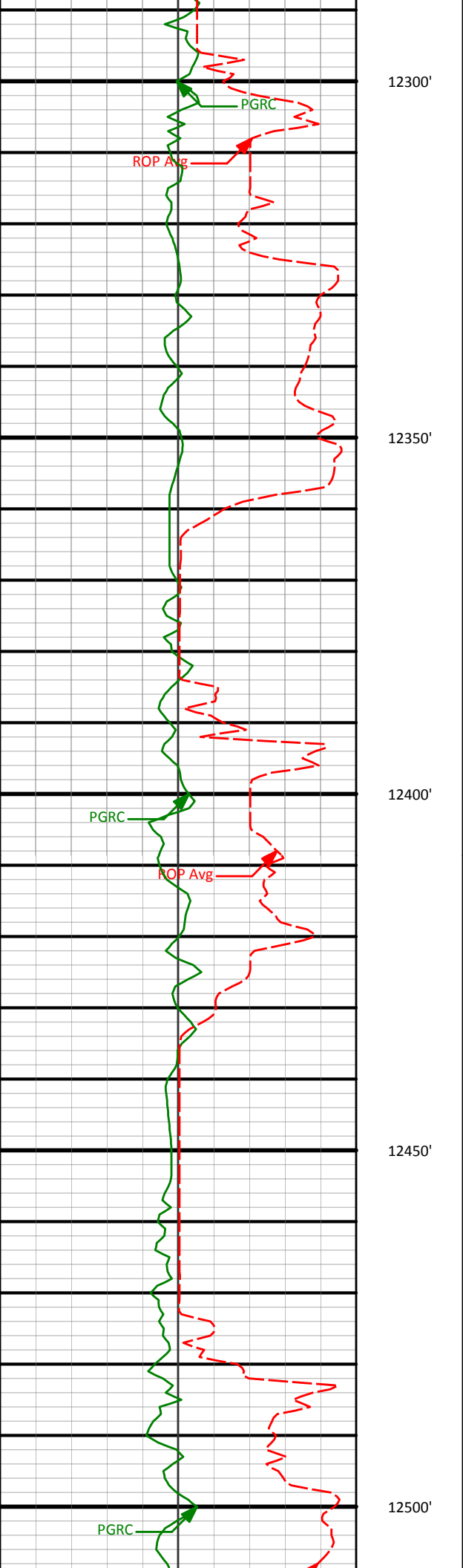
12200'

12250'

12079'	90.55°	359.52°	7573.25'	4189.76'
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12169'	90.37°	358.67°	7572.53'	4279.73'
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12259'	90.55°	358.24°	7571.81'	4369.68'
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12348'

90.15°

359.40°

7571.26'

4458.64'

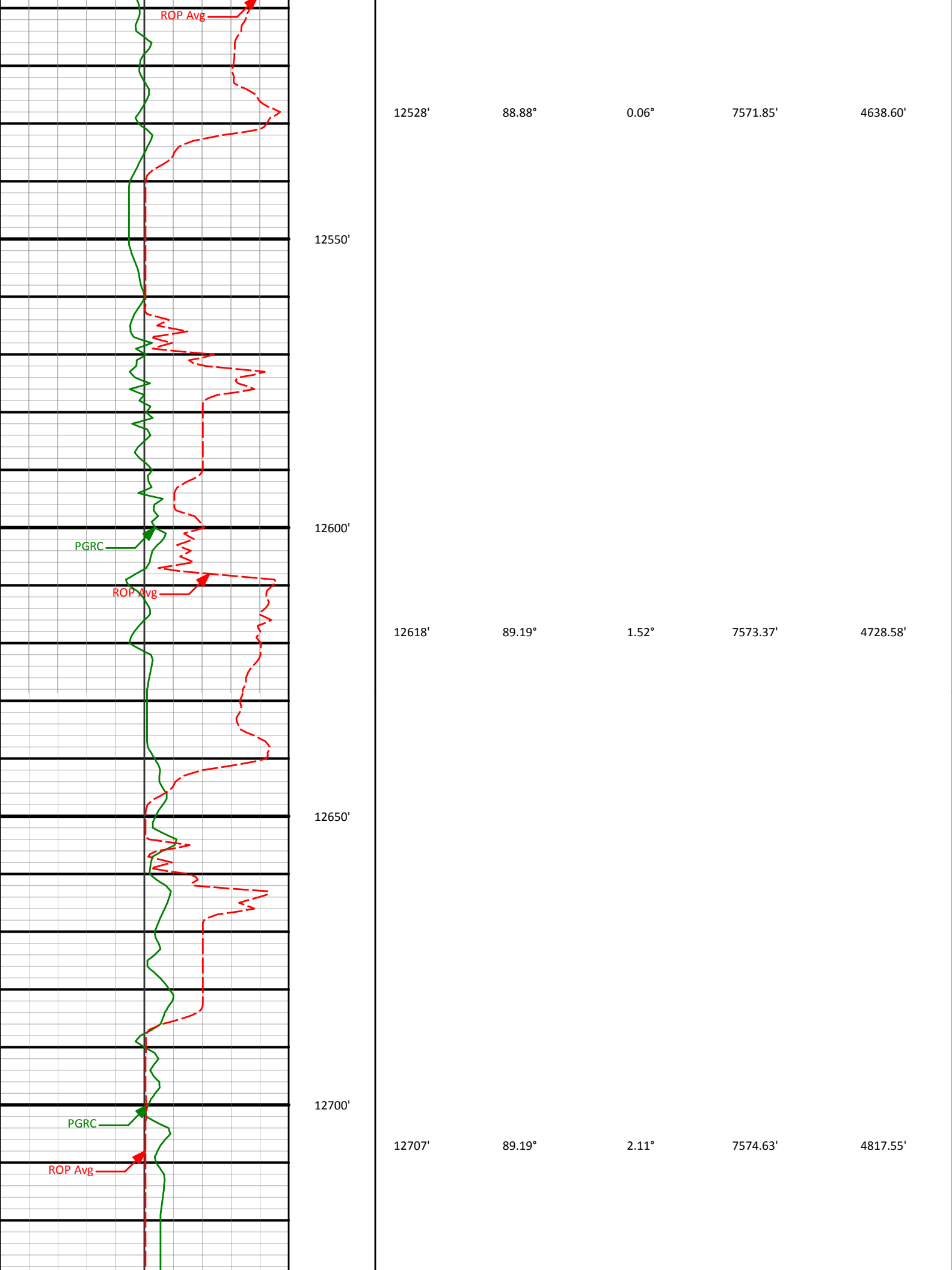
12438'

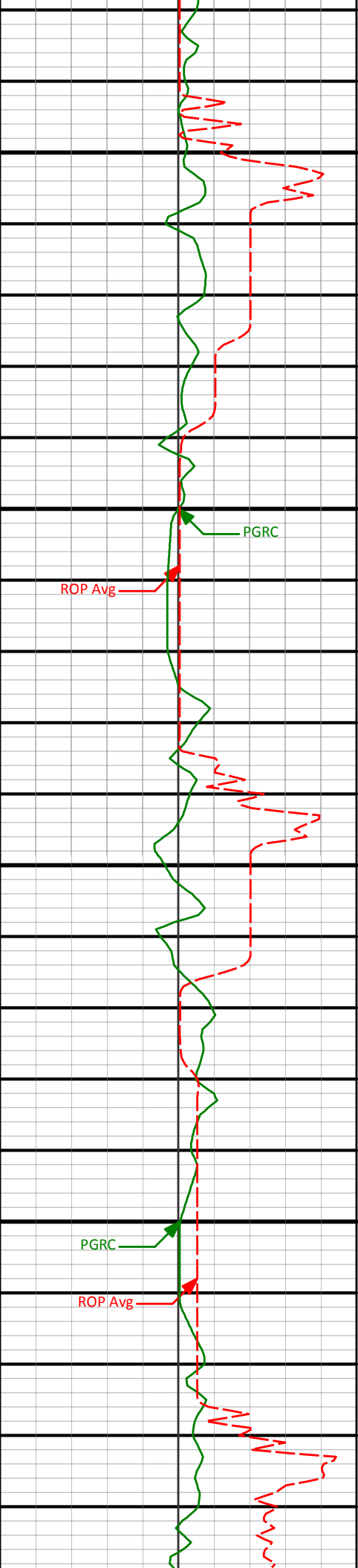
90.11°

359.05°

7571.06'

4548.62'





12750'

12800'

12850'

12900'

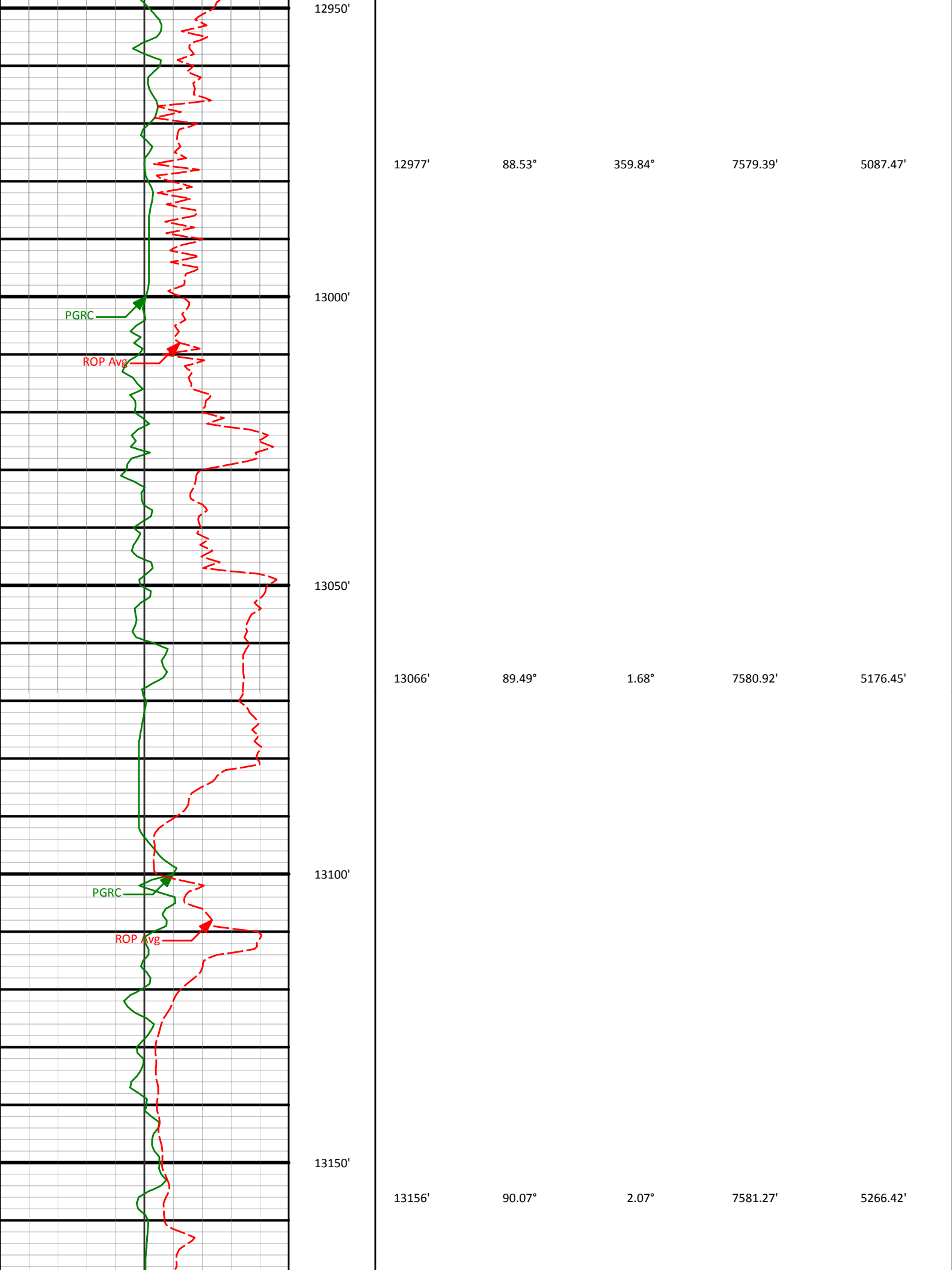
12887'

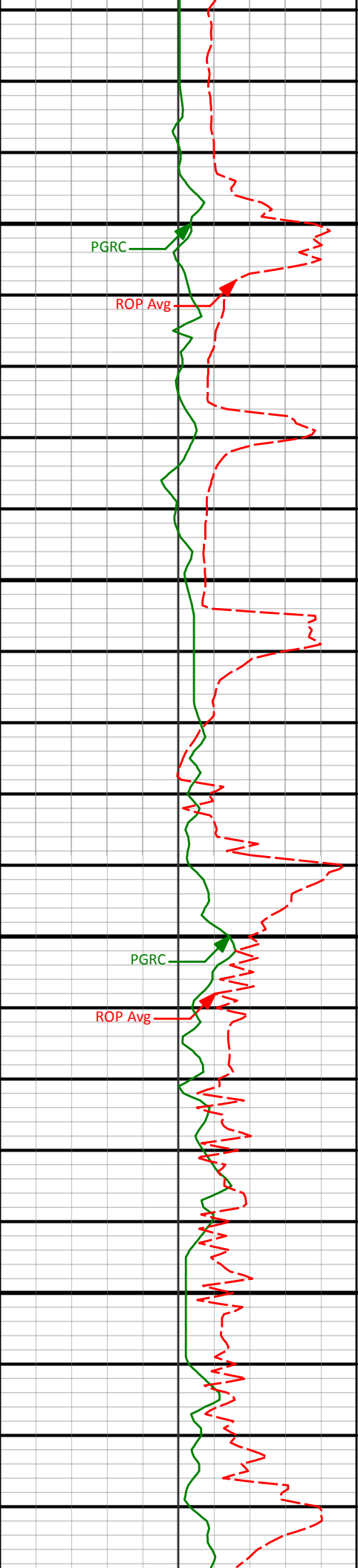
89.01°

0.86°

7577.45'

4997.49'





13200'

PGRC

ROP Avg

13250'

13300'

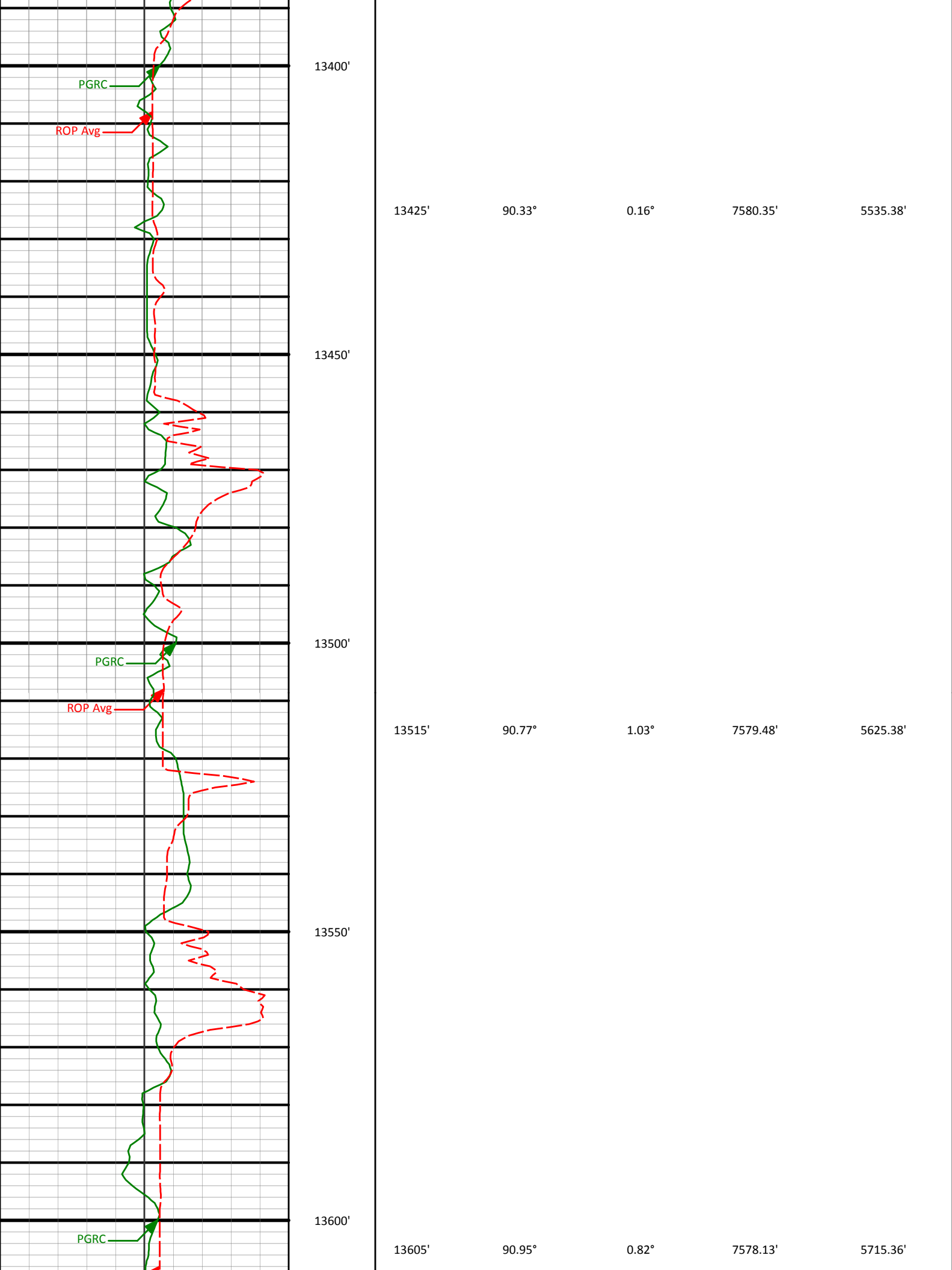
PGRC

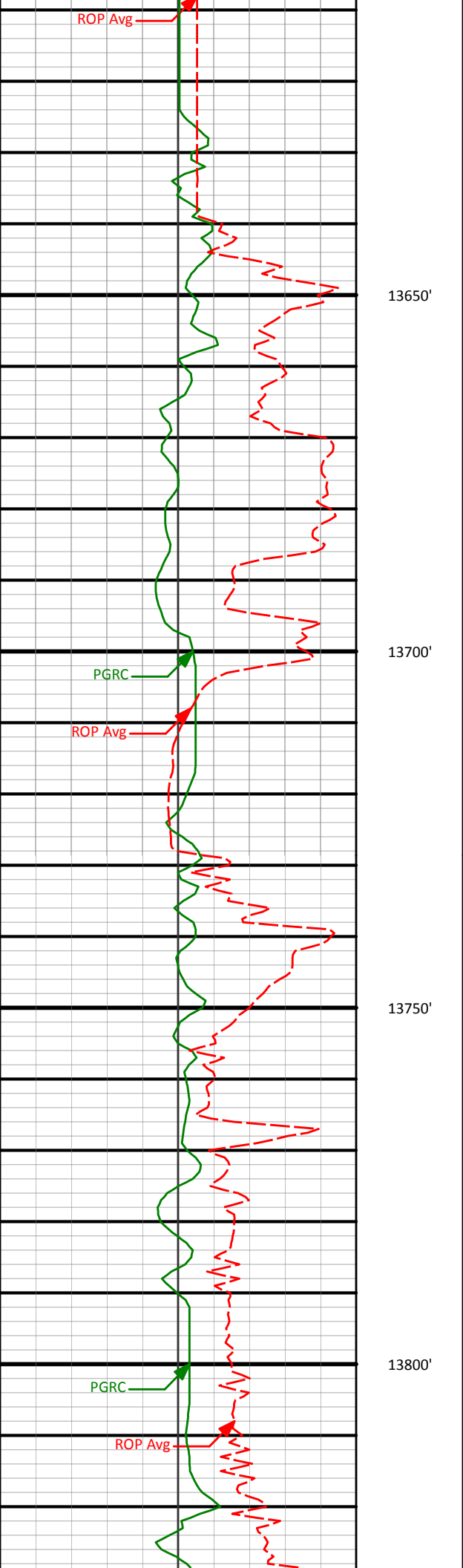
ROP Avg

13350'

13246'	90.15°	1.63°	7581.10'	5356.39'
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13336'	90.24°	0.69°	7580.79'	5446.39'
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13650'

13700'

13750'

13800'

13695'

89.63°

0.01°

7577.68'

5805.36'

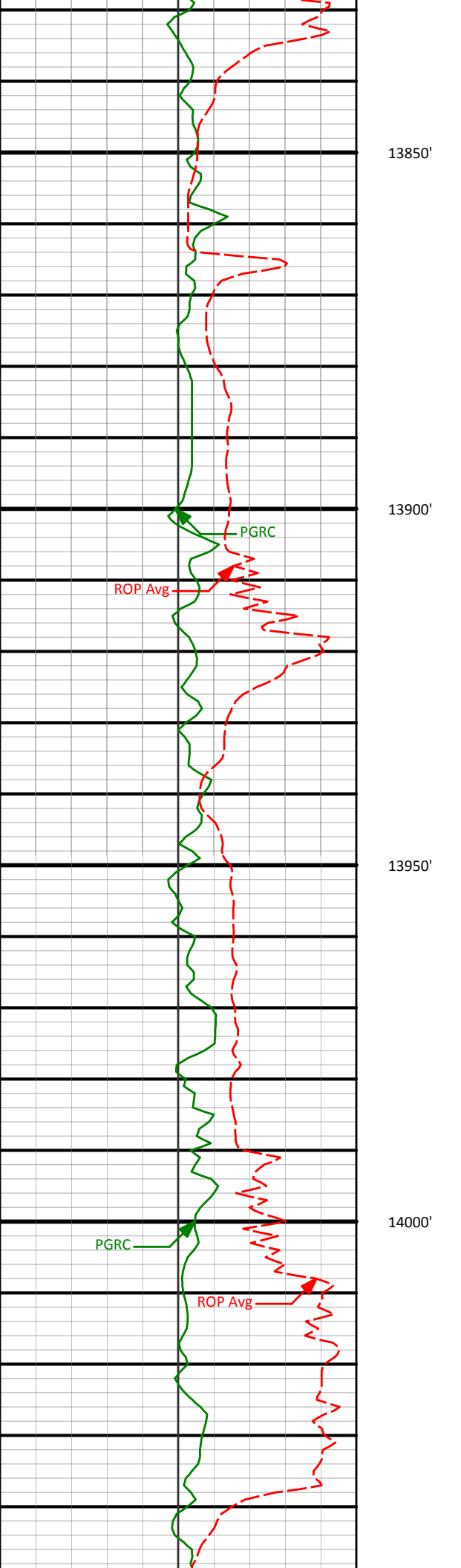
13784'

89.54°

359.75°

7578.32'

5894.35'



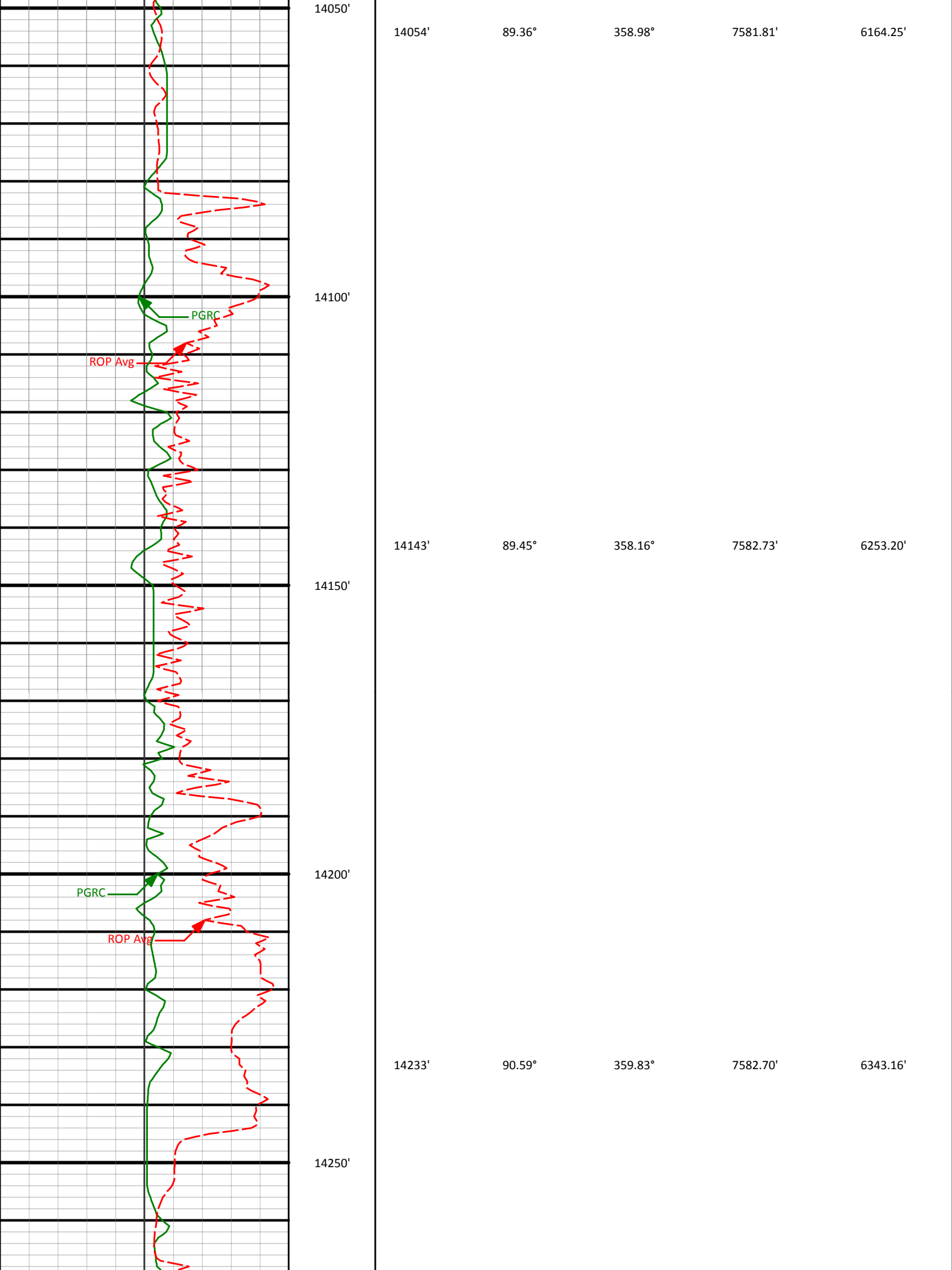
13874'

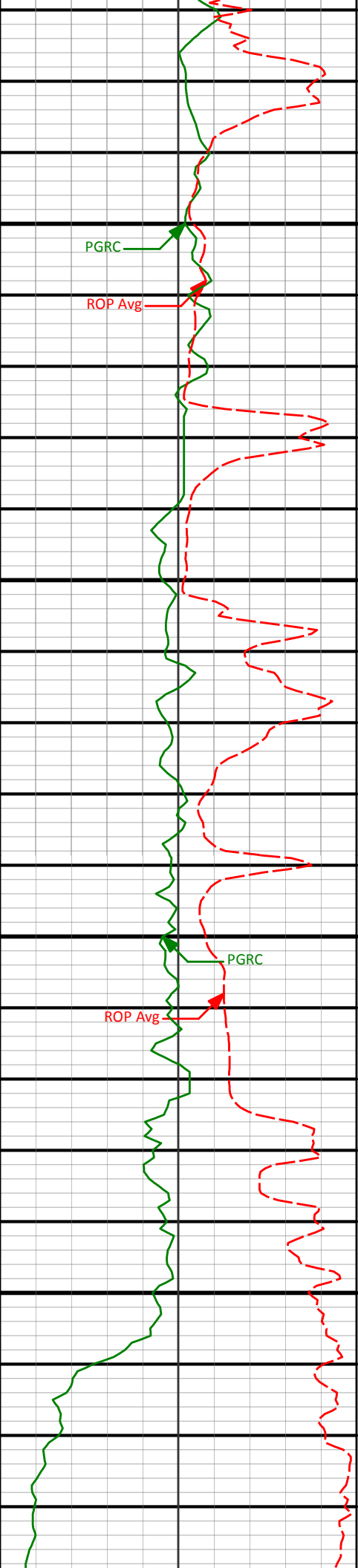
89.10°

358.87°

7579.39'

5984.33'





14300'

PGRC

ROP Avg

14323'

90.73°

0.05°

7581.66'

6433.15'

14350'

14400'

PGRC

ROP Avg

14413'

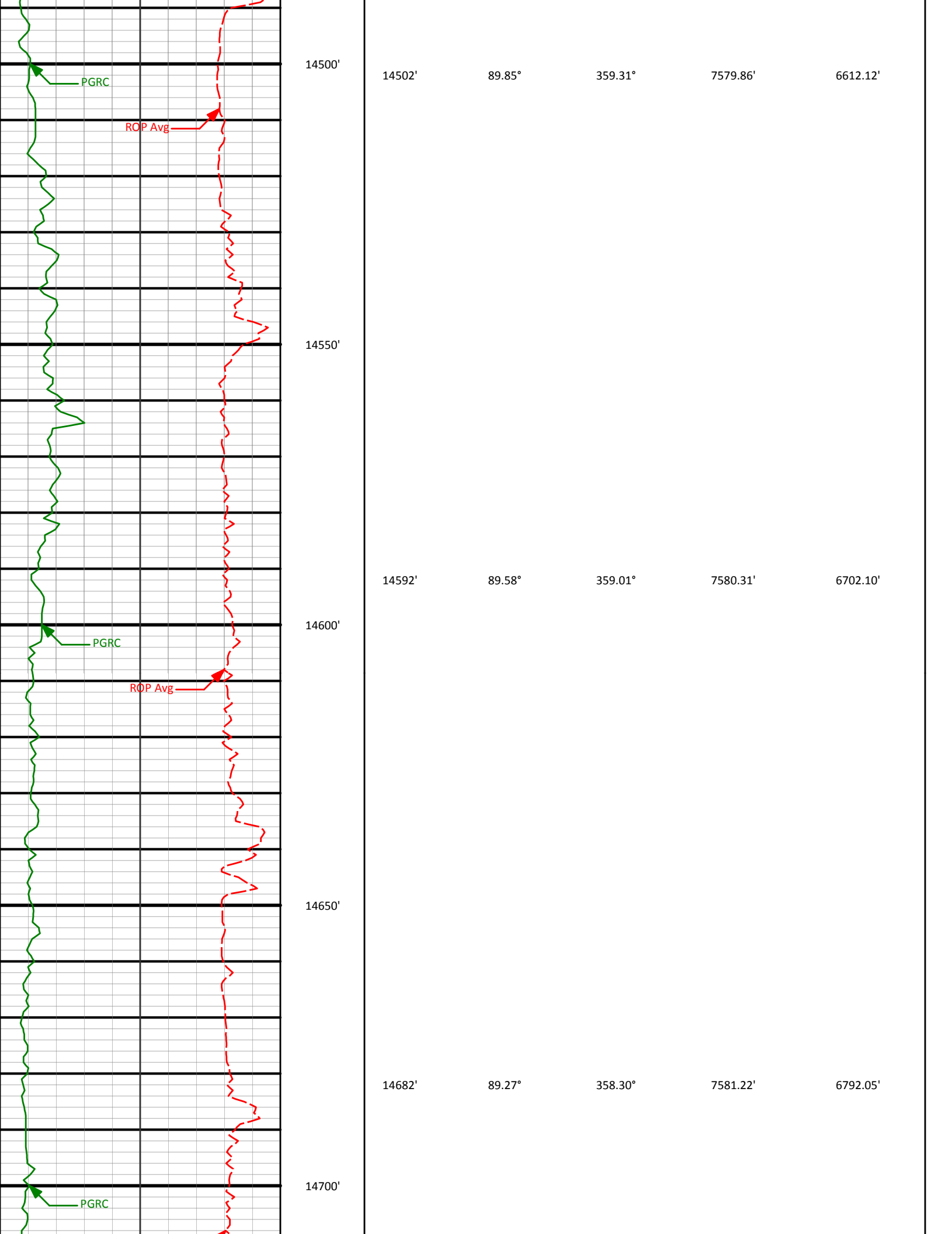
90.86°

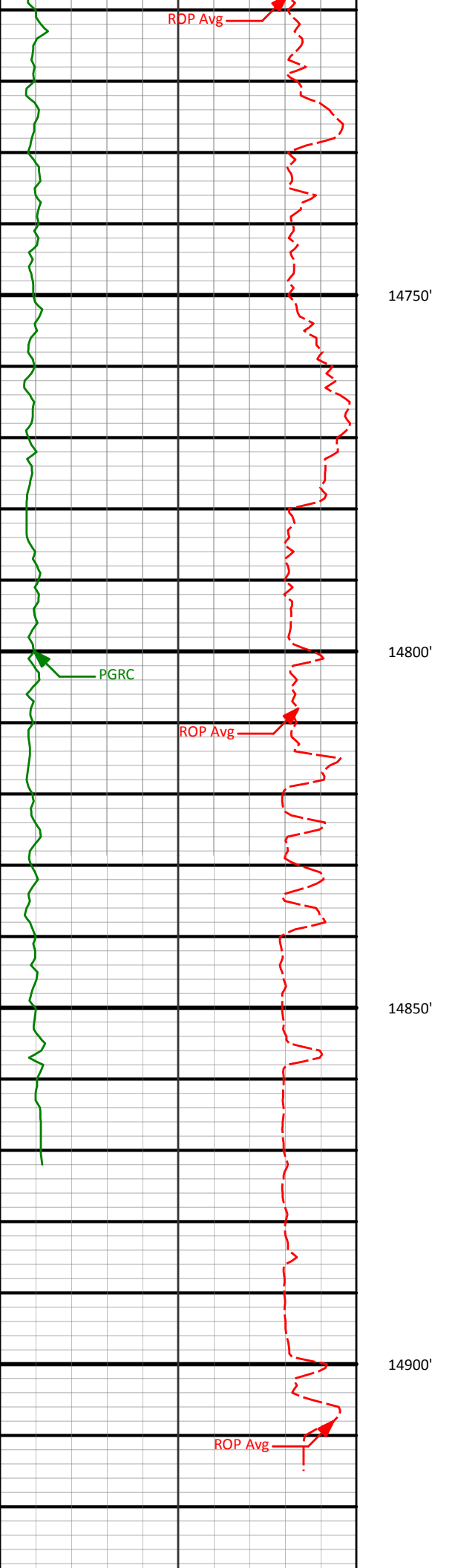
359.46°

7580.42'

6523.14'

14450'





14772'

89.98°

358.36°

7581.80'

6881.98'

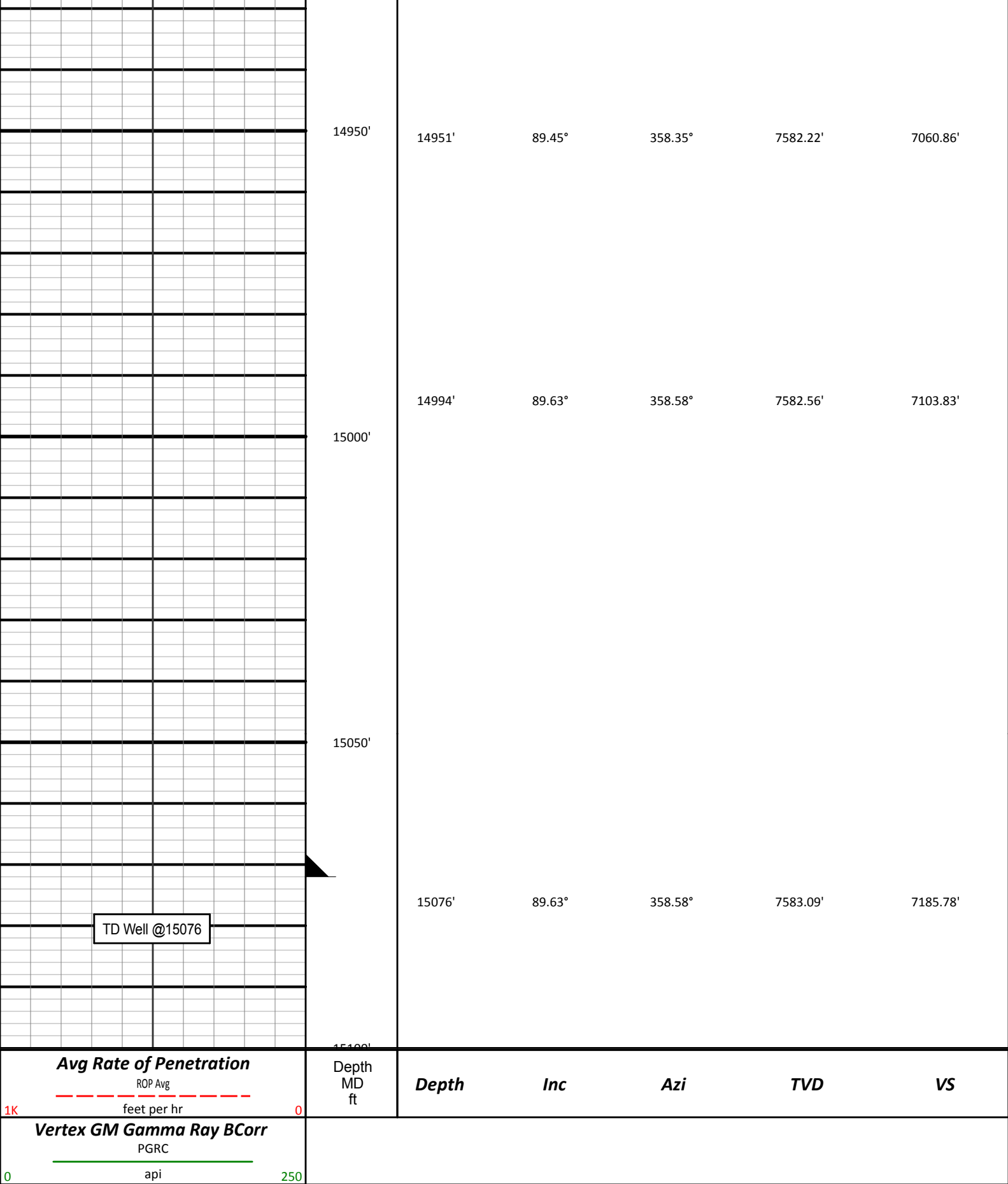
14862'

90.02°

358.21°

7581.80'

6971.92'



Avg Rate of Penetration

ROP Avg

feet per hr

1K 0

Vertex GM Gamma Ray BCorr

PGRC

api

0 250

Depth MD ft	Depth	Inc	Azi	TVD	VS

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.
Wagner 27C-10HZ
Wattenberg
Weld Colorado
USA

CA-XX-0904337678

Surveys from 133-1853 provided by 3rd party

First Sperry survey @1917

Survey corrections provided by Sperry Survey Management

Final Survey @15076

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
133.00	0.22	328.23	133.00	0.22 N	0.13 W	0.22	0.17
165.00	0.35	28.52	165.00	0.36 N	0.12 W	0.35	0.96
197.00	0.09	278.22	197.00	0.44 N	0.10 W	0.44	1.22
229.00	0.13	25.01	229.00	0.48 N	0.11 W	0.48	0.56
260.00	0.04	46.28	260.00	0.52 N	0.09 W	0.52	0.30
292.00	0.18	278.22	292.00	0.54 N	0.13 W	0.53	0.65
324.00	0.53	256.25	324.00	0.51 N	0.32 W	0.50	1.15
355.00	0.79	233.57	355.00	0.35 N	0.63 W	0.34	1.17
387.00	1.27	236.30	386.99	0.02 N	1.10 W	0.01	1.51
419.00	1.93	226.98	418.98	0.55 S	1.79 W	-0.56	2.21
451.00	2.07	232.60	450.96	1.26 S	2.65 W	-1.28	0.75
483.00	2.11	217.14	482.94	2.09 S	3.46 W	-2.11	1.76
514.00	2.24	207.12	513.92	3.08 S	4.08 W	-3.11	1.29
546.00	2.81	206.59	545.88	4.34 S	4.72 W	-4.37	1.78
577.00	3.30	196.66	576.84	5.87 S	5.31 W	-5.91	2.32
609.00	3.56	197.98	608.78	7.70 S	5.88 W	-7.74	0.85
640.00	4.48	191.38	639.71	9.80 S	6.42 W	-9.85	3.32
672.00	5.19	192.62	671.59	12.44 S	6.98 W	-12.49	2.24
704.00	5.54	190.94	703.45	15.37 S	7.59 W	-15.43	1.20
736.00	6.06	189.36	735.29	18.55 S	8.16 W	-18.61	1.70
767.00	6.33	186.99	766.11	21.86 S	8.63 W	-21.93	1.20
799.00	6.81	188.75	797.90	25.49 S	9.14 W	-25.56	1.63
830.00	7.65	188.75	828.65	29.34 S	9.73 W	-29.42	2.71
862.00	8.26	190.94	860.34	33.71 S	10.49 W	-33.79	2.13
894.00	8.66	195.34	891.99	38.29 S	11.57 W	-38.37	2.38
925.00	9.01	196.83	922.63	42.86 S	12.89 W	-42.96	1.35
957.00	9.67	196.39	954.20	47.84 S	14.37 W	-47.95	2.07
988.00	9.71	195.69	984.76	52.85 S	15.81 W	-52.97	0.40
1020.00	10.94	197.10	1016.24	58.35 S	17.43 W	-58.48	3.92
1052.00	11.56	197.36	1047.63	64.32 S	19.28 W	-64.46	1.94
1083.00	11.69	197.62	1077.99	70.27 S	21.16 W	-70.43	0.45
1115.00	12.57	196.04	1109.28	76.71 S	23.10 W	-76.88	2.94
1147.00	13.45	196.13	1140.45	83.63 S	25.10 W	-83.82	2.75
1178.00	14.63	196.83	1170.53	90.84 S	27.24 W	-91.05	3.85
1210.00	15.42	197.71	1201.43	98.76 S	29.70 W	-98.99	2.57
1242.00	15.34	195.51	1232.29	106.89 S	32.13 W	-107.14	1.84
1274.00	15.34	193.67	1263.15	115.09 S	34.26 W	-115.35	1.52
1305.00	16.04	194.72	1292.99	123.21 S	36.32 W	-123.49	2.44
1337.00	16.57	192.70	1323.71	131.94 S	38.44 W	-132.23	2.43
1368.00	17.36	191.12	1353.36	140.79 S	40.31 W	-141.10	2.95
1400.00	18.02	190.68	1383.84	150.34 S	42.14 W	-150.66	2.10
1432.00	18.85	191.74	1414.20	160.26 S	44.11 W	-160.60	2.80
1463.00	19.34	192.00	1443.50	170.19 S	46.20 W	-170.54	1.60
1495.00	20.08	191.21	1473.62	180.76 S	48.37 W	-181.13	2.46
1527.00	20.61	190.33	1503.62	191.69 S	50.45 W	-192.07	1.91
1558.00	20.79	188.75	1532.62	202.49 S	52.26 W	-202.89	1.89
1590.00	20.43	190.59	1562.58	213.60 S	54.15 W	-214.01	2.32
1622.00	20.65	190.77	1592.54	224.63 S	56.23 W	-225.06	0.72
1652.00	20.96	189.89	1620.58	235.11 S	58.14 W	-235.55	1.47

Wagner 27C-10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
1684.00	20.08	191.12	1650.55	246.14 S	60.19 W	-246.60	3.06
1716.00	19.51	190.42	1680.66	256.79 S	62.21 W	-257.26	1.93
1748.00	19.16	190.07	1710.86	267.21 S	64.10 W	-267.70	1.15
1780.00	18.68	189.27	1741.13	277.44 S	65.84 W	-277.94	1.70
1811.00	18.46	188.04	1770.52	287.20 S	67.33 W	-287.71	1.45
1853.00	17.97	191.03	1810.41	300.14 S	69.50 W	-300.67	2.51
1917.00	17.80	190.22	1871.32	319.46 S	73.12 W	-320.01	0.47
2006.00	17.23	190.61	1956.19	345.81 S	77.96 W	-346.39	0.65
2096.00	16.35	189.83	2042.35	371.39 S	82.58 W	-372.01	1.01
2186.00	15.74	190.07	2128.85	395.89 S	86.88 W	-396.55	0.68
2275.00	15.60	189.21	2214.54	419.59 S	90.90 W	-420.27	0.30
2365.00	13.49	196.21	2301.66	441.62 S	95.77 W	-442.34	3.05
2545.00	10.55	200.34	2477.70	477.24 S	107.36 W	-478.05	1.70
2634.00	8.31	204.54	2565.49	490.73 S	112.86 W	-491.58	2.63
2724.00	5.71	206.52	2654.81	500.65 S	117.57 W	-501.54	2.90
2814.00	2.86	227.35	2744.55	506.18 S	121.22 W	-507.10	3.56
2904.00	3.56	276.87	2834.43	507.37 S	125.64 W	-508.32	3.07
2994.00	3.65	273.08	2924.25	506.88 S	131.28 W	-507.88	0.28
3083.00	3.30	267.47	3013.09	506.84 S	136.67 W	-507.88	0.55
3173.00	2.64	270.37	3102.96	506.94 S	141.33 W	-508.01	0.75
3263.00	2.77	262.60	3192.86	507.21 S	145.56 W	-508.31	0.43
3353.00	2.68	266.16	3282.76	507.63 S	149.81 W	-508.77	0.21
3442.00	2.11	270.16	3371.68	507.77 S	153.53 W	-508.93	0.67
3532.00	2.20	269.54	3461.62	507.78 S	156.91 W	-508.97	0.10
3622.00	2.24	269.87	3551.55	507.79 S	160.40 W	-509.01	0.05
3712.00	3.30	244.54	3641.45	508.91 S	164.50 W	-510.16	1.77
3802.00	3.60	249.62	3731.29	511.01 S	169.48 W	-512.30	0.48
3891.00	3.30	252.77	3820.13	512.74 S	174.55 W	-514.07	0.40
3981.00	3.21	254.56	3909.98	514.18 S	179.45 W	-515.54	0.15
4071.00	2.15	278.64	3999.88	514.60 S	183.55 W	-515.99	1.69
4161.00	2.11	275.79	4089.82	514.18 S	186.87 W	-515.60	0.13
4250.00	0.57	293.54	4178.79	513.83 S	188.90 W	-515.27	1.77
4340.00	0.84	312.33	4268.79	513.21 S	189.80 W	-514.65	0.39
4430.00	0.92	298.63	4358.78	512.42 S	190.92 W	-513.87	0.25
4520.00	0.40	231.83	4448.77	512.27 S	191.80 W	-513.73	0.94
4699.00	0.26	248.02	4627.77	512.81 S	192.67 W	-514.27	0.09
4789.00	0.44	300.03	4717.77	512.71 S	193.16 W	-514.18	0.39
4879.00	0.57	288.10	4807.76	512.40 S	193.89 W	-513.87	0.19
4968.00	0.53	299.67	4896.76	512.06 S	194.66 W	-513.54	0.13
5058.00	0.79	301.78	4986.75	511.52 S	195.55 W	-513.01	0.29
5148.00	1.01	288.34	5076.74	510.95 S	196.83 W	-512.44	0.34
5238.00	1.19	286.65	5166.73	510.43 S	198.48 W	-511.94	0.20
5417.00	1.19	291.70	5345.69	509.21 S	201.99 W	-510.75	0.06
5507.00	0.40	7.02	5435.68	508.55 S	202.82 W	-510.09	1.28
5597.00	0.48	345.86	5525.68	507.87 S	202.87 W	-509.42	0.20
5687.00	0.79	339.33	5615.67	506.93 S	203.18 W	-508.47	0.35
5777.00	0.84	339.92	5705.66	505.73 S	203.63 W	-507.28	0.06
5826.00	0.70	327.77	5754.66	505.14 S	203.91 W	-506.69	0.44
5908.00	0.70	22.20	5836.65	504.25 S	203.99 W	-505.80	0.78
5998.00	0.80	16.33	5926.65	503.14 S	203.61 W	-504.69	0.14
6088.00	0.92	21.64	6016.63	501.86 S	203.16 W	-503.41	0.16
6177.00	0.97	37.06	6105.62	500.60 S	202.45 W	-502.14	0.29
6267.00	1.01	189.85	6195.62	500.77 S	202.12 W	-502.31	2.14
6357.00	0.53	187.28	6285.61	501.97 S	202.31 W	-503.51	0.53
6447.00	0.18	288.60	6375.61	502.33 S	202.50 W	-503.87	0.66
6537.00	0.13	283.08	6465.61	502.27 S	202.73 W	-503.81	0.06
6626.00	0.22	137.31	6554.61	502.37 S	202.71 W	-503.91	0.38
6716.00	0.26	86.60	6644.61	502.48 S	202.39 W	-504.02	0.23
6806.00	0.62	29.64	6734.60	502.05 S	201.95 W	-503.58	0.58
6895.00	0.84	41.14	6823.60	501.14 S	201.28 W	-502.67	0.30

Wagner 27C-10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
6985.00	4.09	351.38	6913.51	497.47 S	201.33 W	-499.00	4.01
7075.00	10.33	354.79	7002.75	486.25 S	202.54 W	-487.79	6.95
7165.00	15.56	0.74	7090.44	466.13 S	203.12 W	-467.67	5.99
7255.00	19.12	357.65	7176.34	439.32 S	203.57 W	-440.87	4.08
7344.00	23.30	356.32	7259.29	407.18 S	205.30 W	-408.74	4.73
7434.00	32.22	357.65	7338.85	365.36 S	207.43 W	-366.94	9.93
7524.00	37.98	356.21	7412.45	313.71 S	210.24 W	-315.31	6.47
7614.00	51.03	355.75	7476.50	250.91 S	214.69 W	-252.55	14.50
7703.00	66.68	359.34	7522.40	175.06 S	217.74 W	-176.73	17.92
7793.00	72.92	3.17	7553.47	90.68 S	215.84 W	-92.33	8.00
7883.00	82.42	1.33	7572.67	2.92 S	212.41 W	-4.56	10.74
7973.00	87.96	0.60	7580.22	86.71 N	210.91 W	85.09	6.21
8067.00	89.76	0.38	7582.09	180.68 N	210.10 W	179.07	1.93
8161.00	88.70	359.00	7583.35	274.67 N	210.61 W	273.05	1.85
8256.00	89.71	0.61	7584.67	369.66 N	210.93 W	368.03	2.00
8444.00	89.49	358.96	7585.98	557.64 N	211.64 W	556.00	0.89
8538.00	89.85	358.75	7586.52	651.62 N	213.52 W	649.96	0.44
8632.00	90.64	0.71	7586.12	745.62 N	213.96 W	743.95	2.25
8727.00	90.64	0.22	7585.06	840.61 N	213.19 W	838.95	0.52
8821.00	90.15	2.17	7584.41	934.58 N	211.23 W	932.93	2.14
8915.00	90.20	0.85	7584.12	1028.54 N	208.75 W	1026.91	1.41
9009.00	90.55	1.32	7583.51	1122.53 N	206.97 W	1120.90	0.62
9103.00	90.02	0.17	7583.04	1216.51 N	205.75 W	1214.90	1.35
9198.00	89.63	358.74	7583.33	1311.51 N	206.65 W	1309.88	1.56
9292.00	91.03	0.41	7582.79	1405.50 N	207.35 W	1403.86	2.32
9386.00	90.55	358.92	7581.49	1499.48 N	207.90 W	1497.84	1.67
9566.00	90.07	1.02	7580.52	1679.47 N	208.00 W	1677.82	1.20
9655.00	89.89	0.25	7580.55	1768.46 N	207.01 W	1766.82	0.89
9745.00	89.19	1.41	7581.27	1858.45 N	205.71 W	1856.82	1.51
9835.00	90.15	2.87	7581.79	1948.38 N	202.35 W	1946.77	1.94
9925.00	90.11	1.99	7581.59	2038.30 N	198.53 W	2036.72	0.98
10015.00	91.69	2.45	7580.17	2128.22 N	195.04 W	2126.66	1.83
10104.00	92.13	1.91	7577.21	2217.10 N	191.66 W	2215.57	0.78
10194.00	92.04	1.81	7573.93	2307.00 N	188.74 W	2305.48	0.15
10284.00	90.99	0.66	7571.55	2396.94 N	186.80 W	2395.44	1.73
10374.00	90.42	0.17	7570.45	2486.93 N	186.15 W	2485.43	0.84
10463.00	89.32	359.52	7570.65	2575.93 N	186.39 W	2574.42	1.44
10553.00	89.80	358.71	7571.34	2665.92 N	187.78 W	2664.39	1.05
10643.00	89.98	358.16	7571.51	2755.88 N	190.24 W	2754.34	0.64
10733.00	89.89	357.49	7571.61	2845.82 N	193.65 W	2844.24	0.75
10822.00	91.21	359.32	7570.76	2934.77 N	196.13 W	2933.18	2.54
10912.00	91.52	358.69	7568.62	3024.73 N	197.69 W	3023.12	0.78
11002.00	91.21	0.81	7566.47	3114.70 N	198.09 W	3113.09	2.38
11092.00	89.85	1.15	7565.64	3204.68 N	196.55 W	3203.08	1.56
11181.00	89.80	0.47	7565.91	3293.67 N	195.29 W	3292.07	0.77
11271.00	88.79	2.30	7567.02	3383.63 N	193.11 W	3382.05	2.32
11361.00	88.53	2.23	7569.12	3473.54 N	189.56 W	3471.98	0.30
11451.00	88.88	2.40	7571.16	3563.44 N	185.92 W	3561.91	0.43
11541.00	88.53	1.58	7573.19	3653.36 N	182.80 W	3651.85	0.99
11630.00	89.54	1.69	7574.69	3742.31 N	180.26 W	3740.82	1.14
11720.00	89.76	1.30	7575.24	3832.28 N	177.91 W	3830.80	0.50
11810.00	89.58	0.33	7575.76	3922.27 N	176.63 W	3920.80	1.10
11900.00	90.55	1.57	7575.66	4012.25 N	175.14 W	4010.79	1.75
11989.00	90.99	0.75	7574.46	4101.23 N	173.34 W	4099.77	1.05
12079.00	90.55	359.52	7573.25	4191.22 N	173.13 W	4189.76	1.45
12169.00	90.37	358.67	7572.53	4281.20 N	174.55 W	4279.73	0.97
12259.00	90.55	358.24	7571.81	4371.16 N	176.98 W	4369.68	0.52
12348.00	90.15	359.40	7571.26	4460.14 N	178.81 W	4458.64	1.38
12438.00	90.11	359.05	7571.06	4550.13 N	180.03 W	4548.62	0.39
12528.00	88.88	0.06	7571.85	4640.13 N	180.72 W	4638.60	1.77

Wagner 27C-10HZ

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
12618.00	89.19	1.52	7573.37	4730.10 N	179.48 W	4728.58	1.66
12707.00	89.19	2.11	7574.63	4819.05 N	176.67 W	4817.55	0.66
12887.00	89.01	0.86	7577.45	4998.96 N	172.00 W	4997.49	0.70
12977.00	88.53	359.84	7579.39	5088.94 N	171.45 W	5087.47	1.25
13066.00	89.49	1.68	7580.92	5177.91 N	170.27 W	5176.45	2.33
13156.00	90.07	2.07	7581.27	5267.86 N	167.33 W	5266.42	0.78
13246.00	90.15	1.63	7581.10	5357.81 N	164.42 W	5356.39	0.50
13336.00	90.24	0.69	7580.79	5447.79 N	162.60 W	5446.39	1.05
13425.00	90.33	0.16	7580.35	5536.79 N	161.94 W	5535.38	0.60
13515.00	90.77	1.03	7579.48	5626.78 N	161.00 W	5625.38	1.08
13605.00	90.95	0.82	7578.13	5716.76 N	159.55 W	5715.36	0.31
13695.00	89.63	0.01	7577.68	5806.75 N	158.90 W	5805.36	1.72
13784.00	89.54	359.75	7578.32	5895.75 N	159.09 W	5894.35	0.31
13874.00	89.10	358.87	7579.39	5985.74 N	160.17 W	5984.33	1.09
14054.00	89.36	358.98	7581.81	6165.69 N	163.55 W	6164.25	0.16
14143.00	89.45	358.16	7582.73	6254.65 N	165.77 W	6253.20	0.93
14233.00	90.59	359.83	7582.70	6344.64 N	167.35 W	6343.16	2.25
14323.00	90.73	0.05	7581.66	6434.63 N	167.44 W	6433.15	0.29
14413.00	90.86	359.46	7580.42	6524.62 N	167.83 W	6523.14	0.67
14502.00	89.85	359.31	7579.86	6613.61 N	168.78 W	6612.12	1.15
14592.00	89.58	359.01	7580.31	6703.60 N	170.10 W	6702.10	0.45
14682.00	89.27	358.30	7581.22	6793.57 N	172.21 W	6792.05	0.86
14772.00	89.98	358.36	7581.80	6883.53 N	174.84 W	6881.98	0.79
14862.00	90.02	358.21	7581.80	6973.49 N	177.53 W	6971.92	0.17
14951.00	89.45	358.35	7582.22	7062.45 N	180.20 W	7060.86	0.66
14994.00	89.63	358.58	7582.56	7105.43 N	181.35 W	7103.83	0.68
15076.00	89.63	358.58	7583.09	7187.40 N	183.38 W	7185.78	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 0.44 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.15 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 15076.00 FEET
IS 7189.74 FEET ALONG 358.54 DEGREES (TRUE)**