

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

1 : 600 / 1 : 240

Country : USA			
Field : Wattenberg			
Location : Lat: 40° 45' 39.28" North Long: 103° 51' 39.85" West			
Well : Rohn State LD10-63-1HN			
Company : Noble Energy			
Rig : H&P 273			
LOCATION			
Latitude : 40° 45' 39.28" North Longitude : 103° 51' 39.85" West			
UTM Easting = 3,454,002.970 ft UTM Northing = 1,524,240.510 ft			
Company : Noble Energy Rig : H&P 273 Well : Rohn State LD10-63-1HN Field : Wattenberg Country : USA API Number : 05-123-37623			
Other Services Directional Drilling			
Permanent Datum : Ground Level Log Measured From : Drill Floor Drilling Measured From : Drill Floor			
Elevation : 4719.00 ft 24.00 ft Above Permanent Datum			
MD LOG			
Elev. KB N/A DF 4743.00 ft GL 4719.00 ft WD N/A			
Depth Logged : 1,220.00 ft To 10,118.00 ft Date Logged : 16-Oct-14 To 20-Oct-14 Total Depth MD : 10,118.00 ft TVD : 5,648.35 ft Spud Date : 15-Oct-14			
Unit No. : 11703717 Plot Type : Final Plot Date : 20-Oct-14			
Job No. : CA-XX-0901744857			
Run No.			
Size			
From			
To			
8.750 in			
1,220.00 ft			
4,880.00 ft			
8.750 in			
4,880.00 ft			
6,018.00 ft			
6.125 in			
6,018.00 ft			
10,118.00 ft			
Run No.			
Size			
From			
To			
7.000 in			
26.00 lppf			
SURFACE			
6,013.00 ft			

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	16-Oct-14	18-Oct-14	20-Oct-14		
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)	1,220.00	4,880.00	6,018.00		
Log End Depth (MD, ft)	4,880.00	6,018.00	10,118.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	16-Oct-14 04:30	16-Oct-14 23:10	19-Oct-14 06:00		
Drill/Wipe End Date and Time	16-Oct-14 14:10	16-Oct-14 23:10	20-Oct-14 08:45		
Min Inc (deg) @ Depth (MD, ft)	0.19 @ 4,009.00	0.56 @ 4,907.00	85.90 @ 6,179.00		
Max Inc (deg) @ Depth (MD, ft)	8.36 @ 2,491.00	81.87 @ 5,963.00	92.99 @ 7,310.00		
Bit TFA(in2) / Bit Type	0.74 / PDC	0.86 / PDC	0.75 / PDC		
Flow Rate (gpm)	593.61	541.52	295.00		
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)	9.13 / 45.00	10.60 / 41.00	10.72 / 37.00		
Filtrate CL (ppm)	150.00	150.00	200.00		
pH / Fluid Loss (mptm)	8.90 / 6	8.90 / 7	8.90 / 7		
PV (cP) / YP (lhf2)	12 / 12.00	14 / 11.00	13 / 11.00		
% Solids / % Sand	7.10 / 0.05	10.80 / 1.00	11.10 / 0.15		
% 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	145.90 / PCM	156.13 / PCM	213.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Juan Pablo Centeno	Juan Pablo Centeno	Juan Pablo Centeno		
Customer Representative	Dave Nielsen	Dave Nielsen	Dave Nielsen		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11404267	11404267	12463937		
Insert Serial Number	11400845	11400845	11400992		
Date and Time Initialized	13-Oct-14 10:21	13-Oct-14 10:21	18-Oct-14 08:08		
Date and Time Read	18-Oct-14 08:15	18-Oct-14 08:21	20-Oct-14 17:47		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	53.91	53.01	62.45		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11404267	11404267	12463937		
Sonde Serial Number	11062073	11062073	11478016		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	58.84	336.67	39.21		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	48.81	47.91	57.35		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11404267	11404267	12463937		
Insert/Sonde Serial Number	11579773	11579773	11293259		

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 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
 - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 8.0.20
6. Gamma presented inside casing/cement from 5970 ft. MD to 6018 ft. MD.

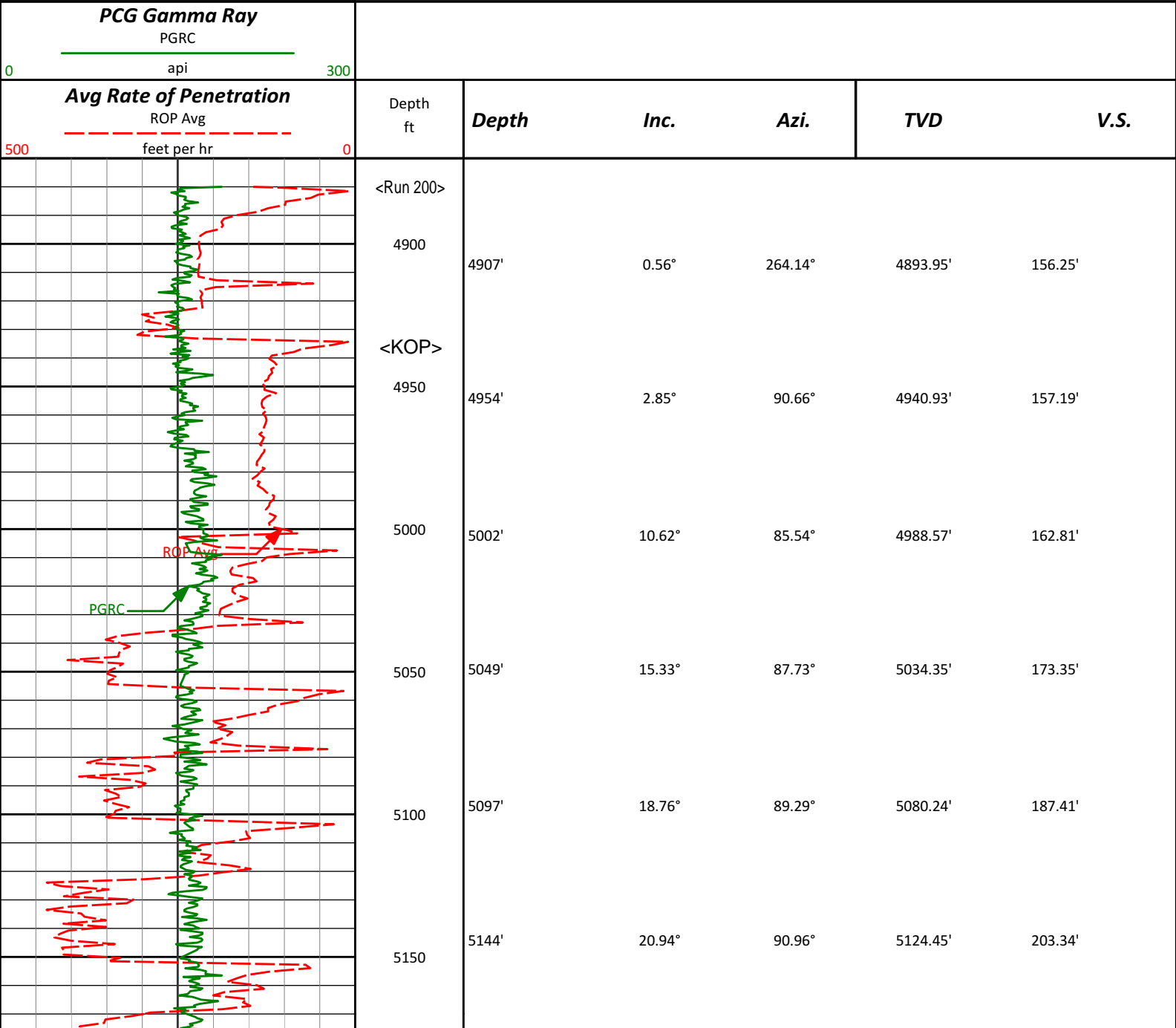
WARRANTY

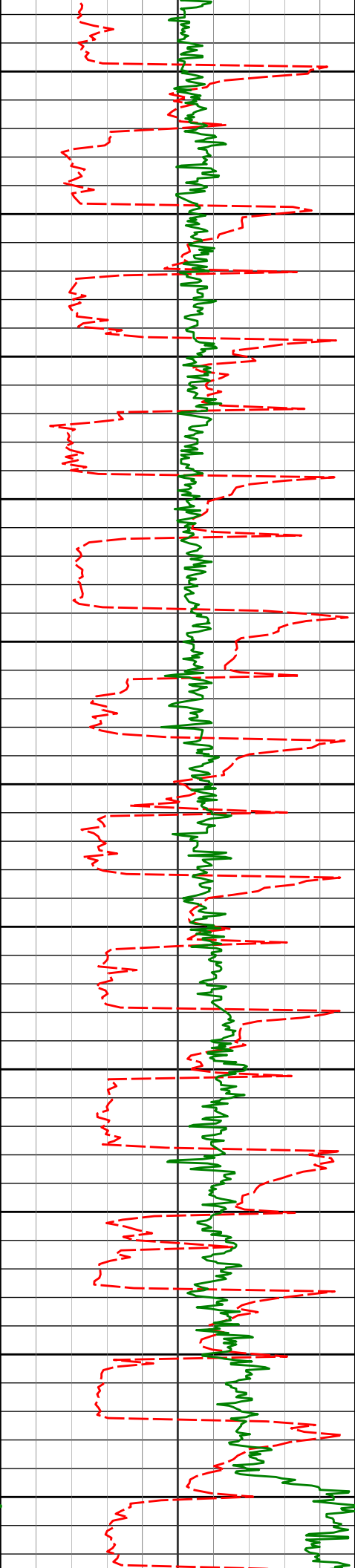
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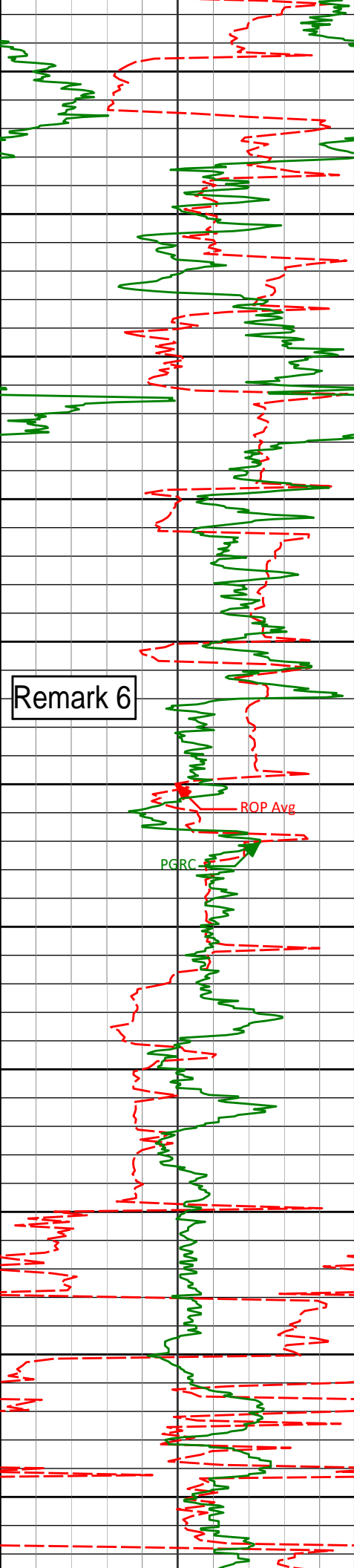
MD Main Log 1:600

Noble Energy, Inc
Rohn State LD10-63-1HN
H&P 273
T9N R58W





5200	5192'	22.92°	89.83°	5168.97'	221.23'
5250	5239'	25.87°	90.76°	5211.77'	240.61'
5300	5287'	29.23°	91.48°	5254.32'	262.74'
5350	5334'	32.54°	91.01°	5294.65'	286.79'
5400	5382'	35.44°	90.21°	5334.45'	313.56'
5450	5429'	38.77°	90.71°	5371.93'	341.86'
5500	5477'	42.80°	90.46°	5408.26'	373.14'
5550	5523'	46.64°	90.18°	5440.94'	405.44'
5600	5571'	49.76°	89.22°	5472.93'	441.18'
5650	5618'	52.45°	88.91°	5502.44'	477.73'
5700	5666'	56.77°	89.28°	5530.23'	516.82'
	5713'	61.33°	89.97°	5554.39'	557.07'



5750

5761'

65.71°

89.55°

5575.79'

599.97'

5800

5808'

68.27°

88.28°

5594.16'

643.20'

5850

5856'

70.49°

87.38°

5611.06'

688.12'

5900

5903'

74.67°

87.01°

5625.13'

732.95'

5950

5963'

81.87°

87.51°

5637.32'

791.66'

6000

<7" casing set at 6013' MD>

<Run 300>

6050

6086'

85.96°

88.03°

5650.36'

913.92'

6100

6150

6179'

85.90°

88.15°

5656.97'

1006.67'

6200

6250

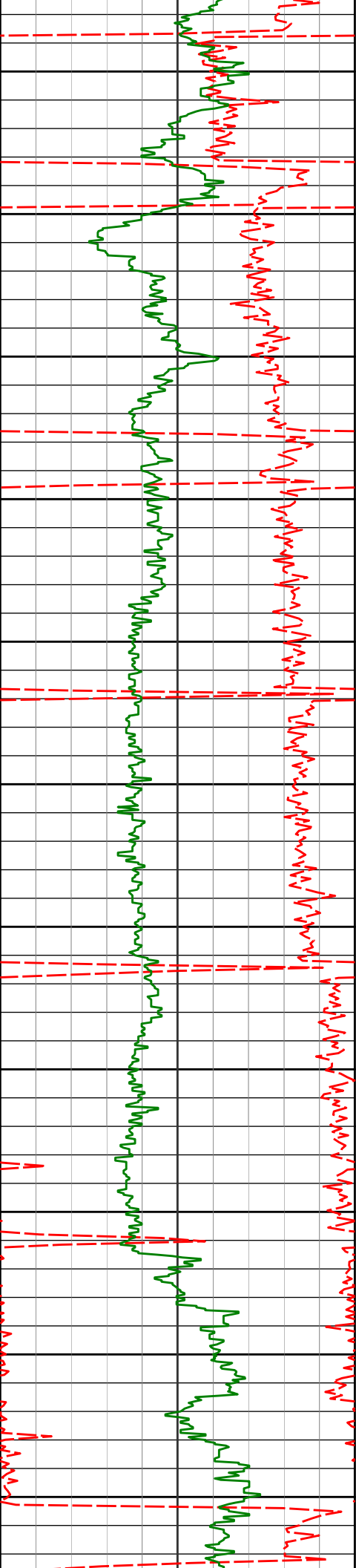
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87.44°

89.23°

5662.37'

1099.46'



6300

6350

6400

6450

6500

6550

6600

6650

6700

6750

6800

6364'

89.48°

90.35°

5664.85'

1191.30'

6457'

91.08°

88.92°

5664.40'

1284.18'

6552'

90.83°

87.89°

5662.81'

1379.14'

6647'

90.68°

87.19°

5661.56'

1474.12'

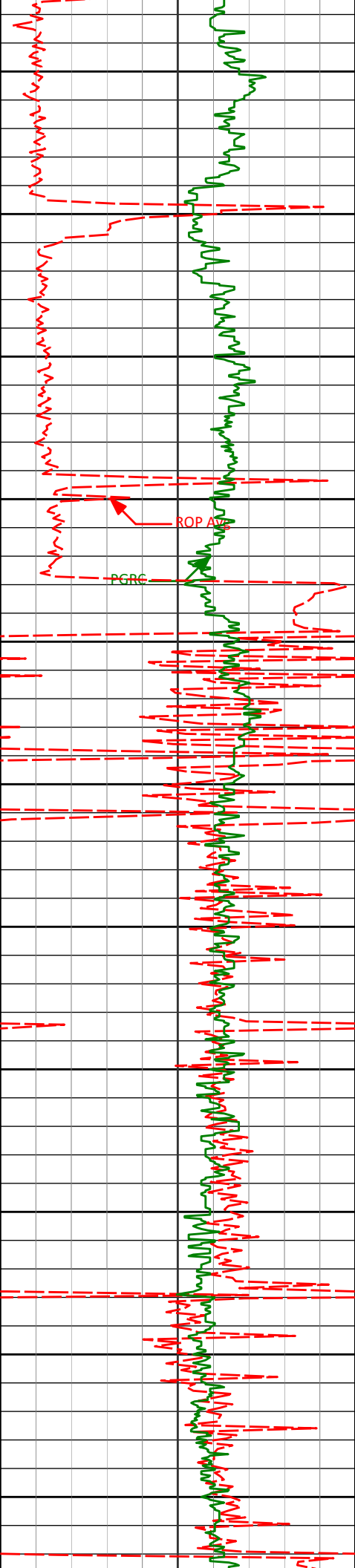
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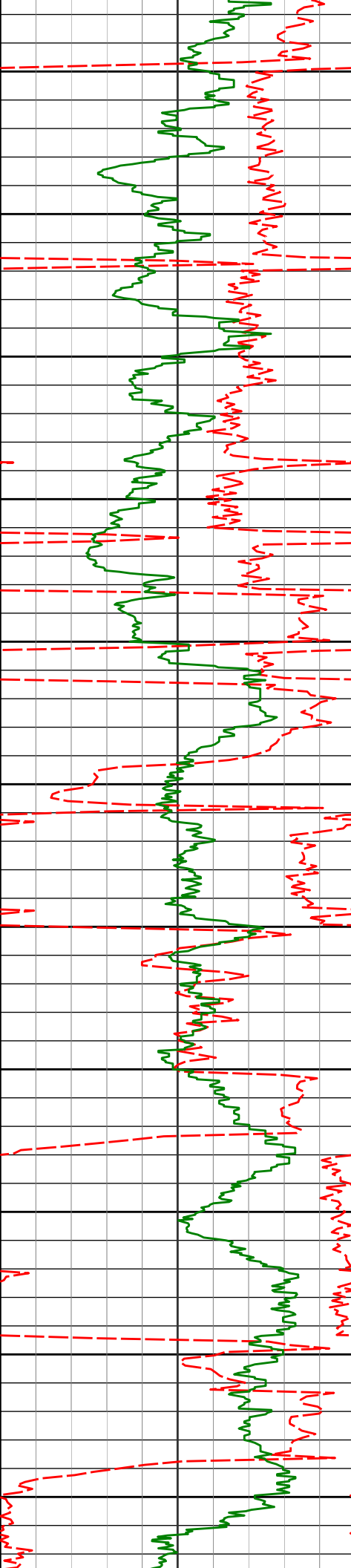
87.80°

5659.03'

1568.08'



6836'	90.43°	87.96°	5656.68'	1663.03'
6850				
6900				
6931'	90.12°	87.87°	5656.22'	1758.01'
6950				
7000				
7026'	90.55°	88.48°	5655.66'	1852.98'
7050				
7100				
7120'	91.45°	88.99°	5654.01'	1946.92'
7150				
7200				
7215'	90.80°	87.78°	5652.15'	2041.87'
7250				
7300				
7310'	92.99°	88.71°	5649.00'	2136.78'
7350				



7400

7450

7500

7550

7600

7650

7700

7750

7800

7850

7900

7405'

7500'

7595'

7690'

7785'

7880'

89.63°

88.58°

88.52°

88.12°

89.26°

89.88°

88.65°

88.42°

89.23°

89.29°

90.61°

90.65°

5646.83'

5648.32'

5650.72'

5653.50'

5655.68'

5656.39'

2231.69'

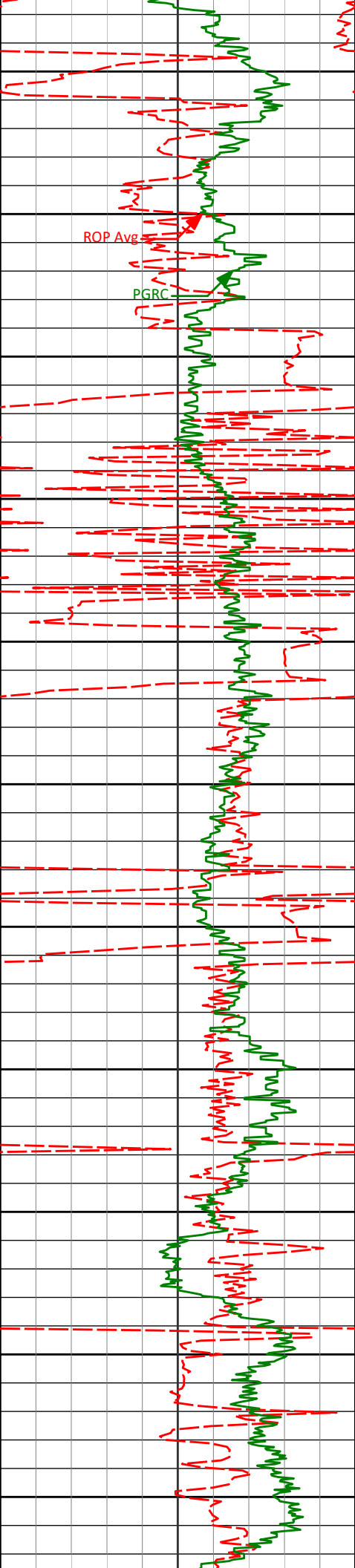
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2421.55'

2516.43'

2611.26'

2706.06'



7950

7975'

89.41°

90.34°

5656.98'

2800.86'

8000

8050

8070'

91.82°

90.47°

5655.96'

2895.67'

8100

8150

8165'

91.73°

88.71°

5653.02'

2990.51'

8200

8250

8260'

90.00°

87.10°

5651.59'

3085.48'

8300

8350

8354'

90.00°

86.46°

5651.59'

3179.48'

8400

8450

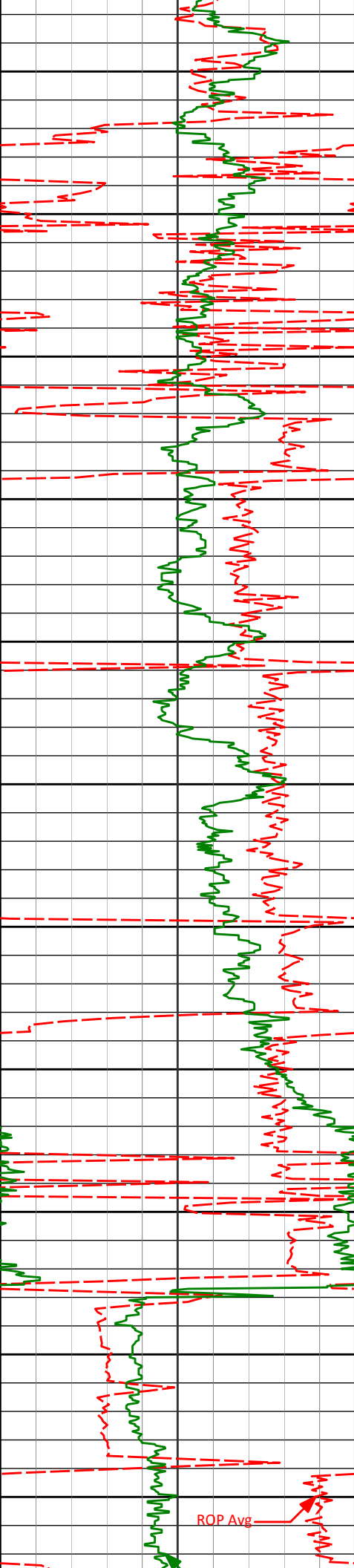
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86.46°

5651.10'

3274.48'



8500

8544'

90.96°

86.11°

5649.82'

3369.46'

8550

8600

8639'

90.31°

86.61°

5648.77'

3464.45'

8650

8700

8733'

91.11°

85.95°

5647.61'

3558.44'

8750

8800

8828'

88.77°

87.56°

5647.71'

3653.43'

8850

8900

8923'

88.58°

90.09°

5649.91'

3748.34'

8950

9000

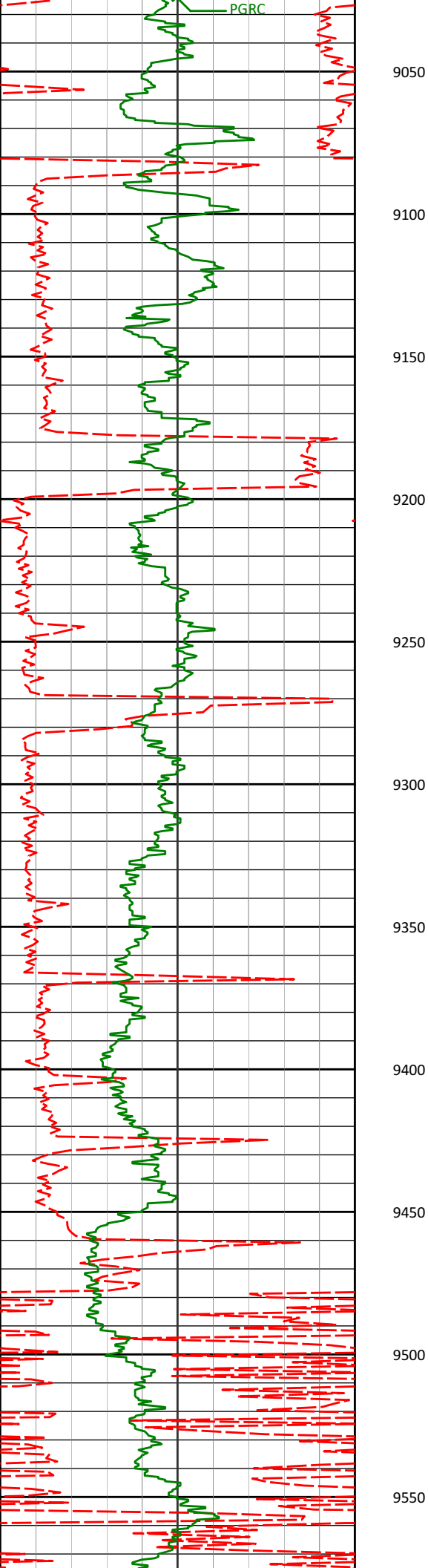
9018'

89.69°

90.19°

5651.34'

3843.17'



9112'

90.65°

89.35°

5651.06'

3937.05'

9207'

88.24°

88.08°

5651.98'

4031.99'

9302'

88.61°

87.23°

5654.59'

4126.94'

9397'

89.01°

86.50°

5656.56'

4221.92'

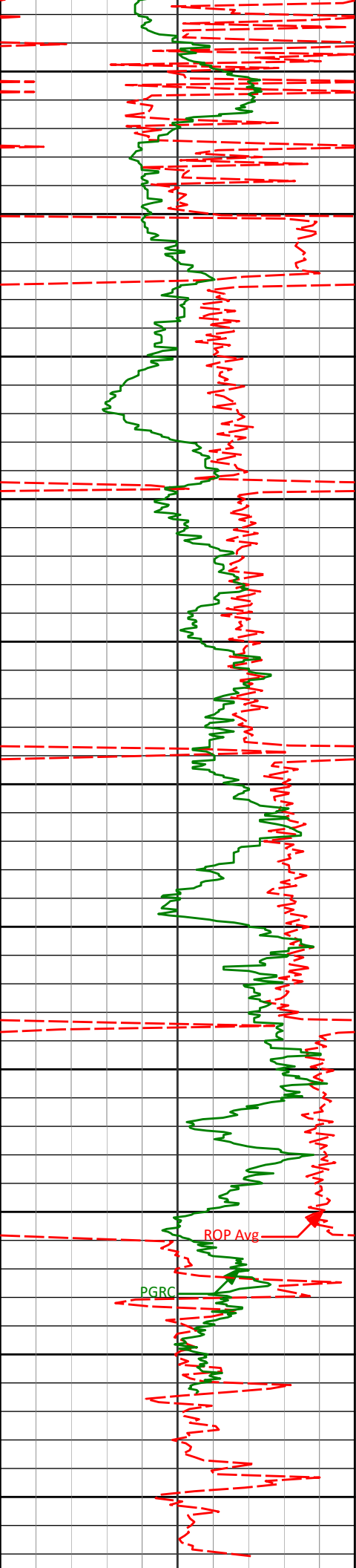
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86.40°

5657.61'

4316.91'



9600

9650

9700

9750

9800

9850

9900

9950

10000

10050

10100

9586'

90.06°

86.45°

5657.78'

4410.91'

9681'

89.94°

88.63°

5657.78'

4505.90'

9776'

90.52°

88.56°

5657.40'

4600.85'

9871'

91.14°

88.22°

5656.02'

4695.81'

9965'

91.70°

87.69°

5653.69'

4789.76'

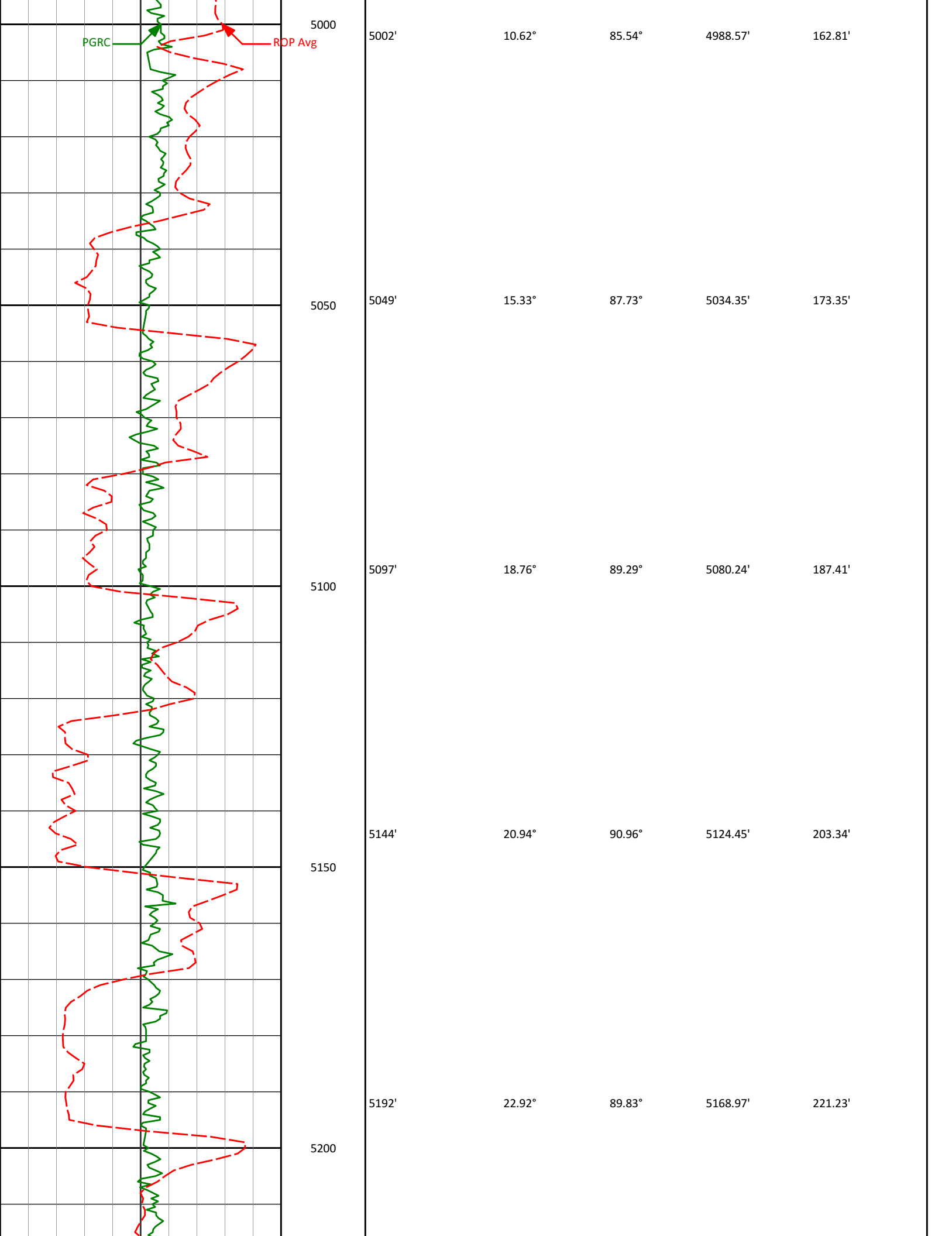
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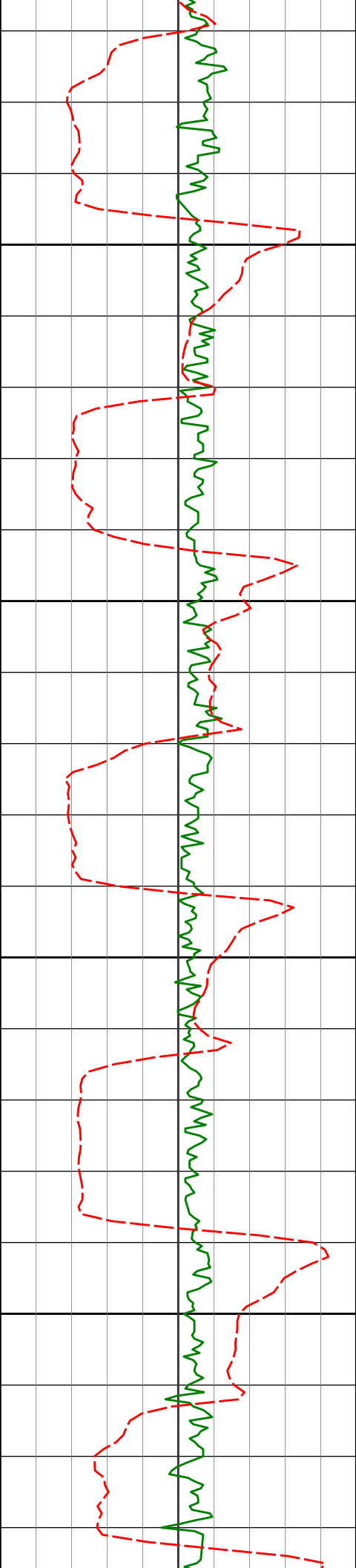
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5650.72'

4878.70'





5250

5300

5350

5400

5239'

25.87°

90.76°

5211.77'

240.61'

5287'

29.23°

91.48°

5254.32'

262.74'

5334'

32.54°

91.01°

5294.65'

286.79'

5382'

35.44°

90.21°

5334.45'

313.56'

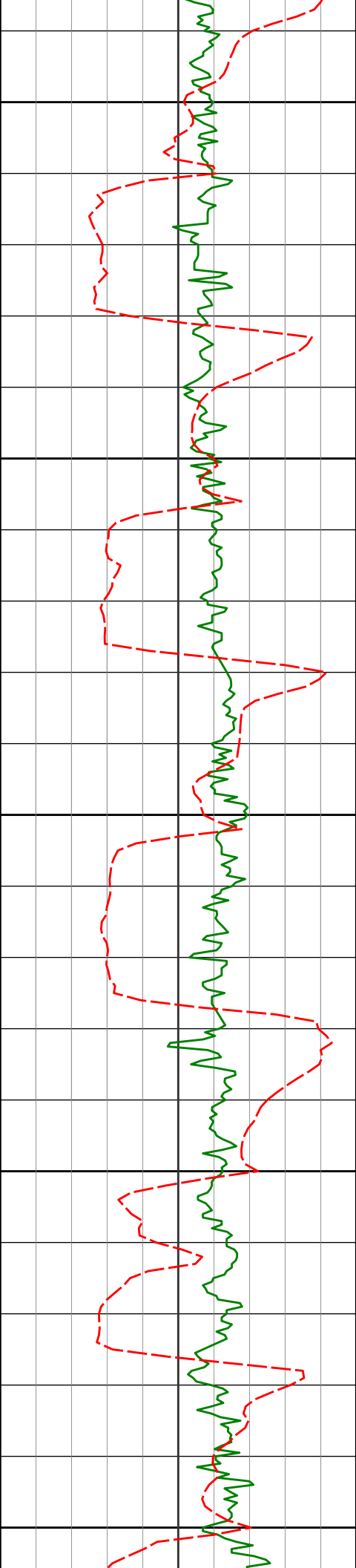
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90.71°

5371.93'

341.86'



5450

5477'

42.80°

90.46°

5408.26'

373.14'

5500

5523'

46.64°

90.18°

5440.94'

405.44'

5550

5571'

49.76°

89.22°

5472.93'

441.18'

5600

5618'

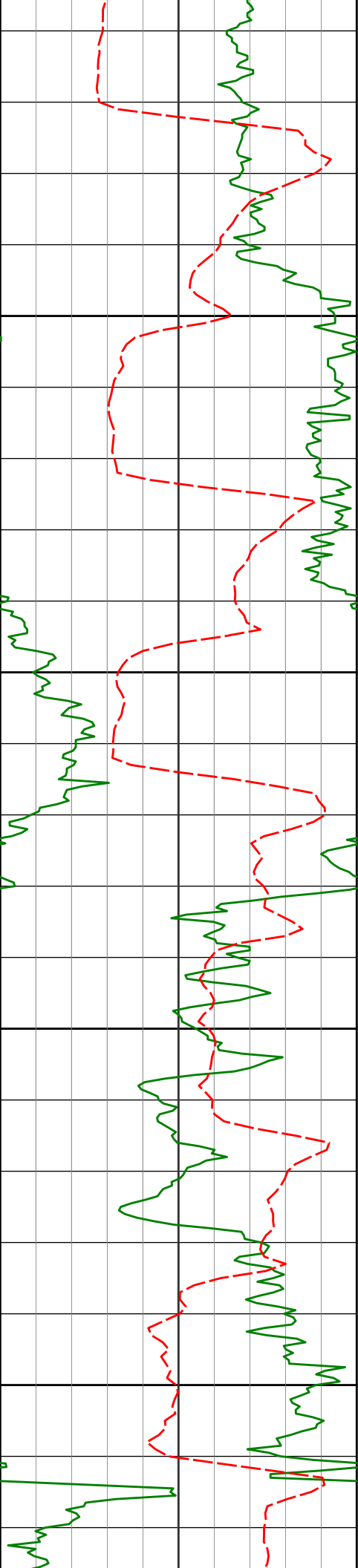
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88.91°

5502.44'

477.73'

5650



5700

5750

5800

5850

5666'

56.77°

89.28°

5530.23'

516.82'

5713'

61.33°

89.97°

5554.39'

557.07'

5761'

65.71°

89.55°

5575.79'

599.97'

5808'

68.27°

88.28°

5594.16'

643.20'

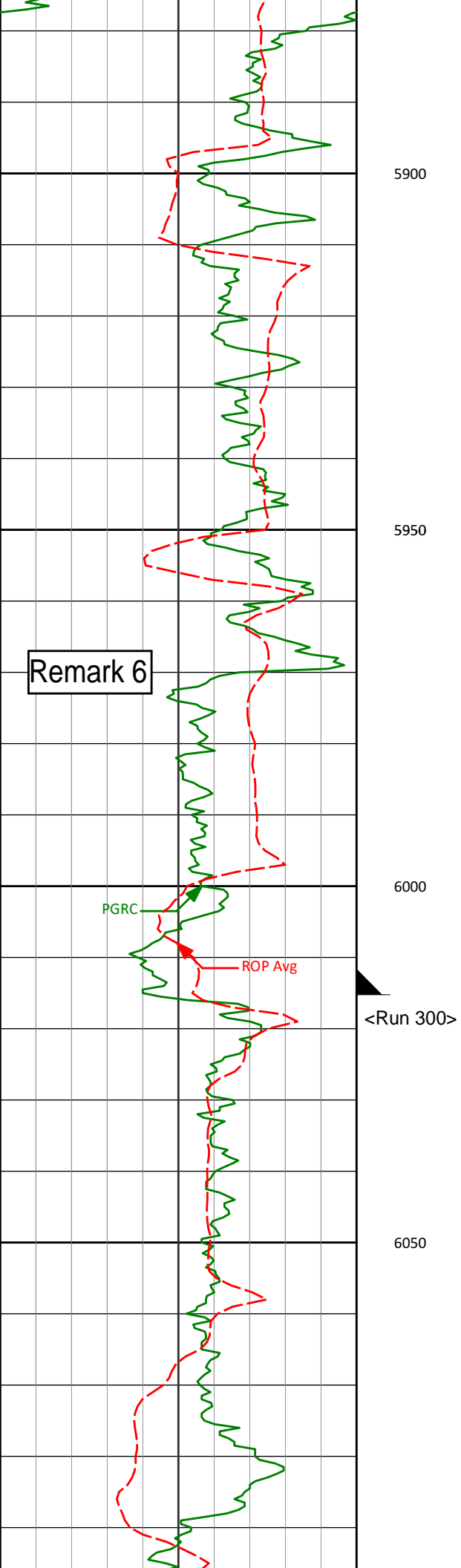
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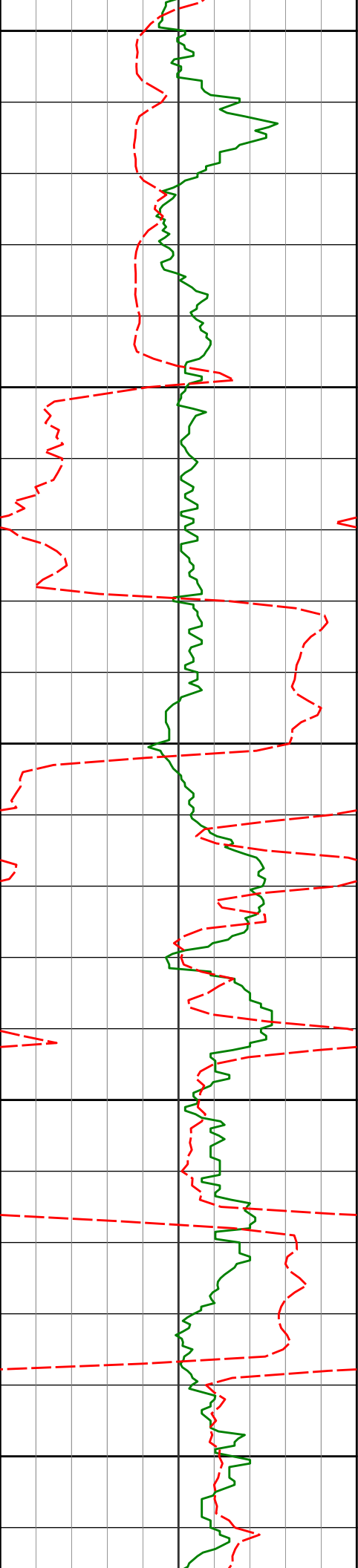
87.38°

5611.06'

688.12'



5900				
5903'	74.67°	87.01°	5625.13'	732.95'
5950				
5963'	81.87°	87.51°	5637.32'	791.66'
6000				
6050				
6086'	85.96°	88.03°	5650.36'	913.92'



6100

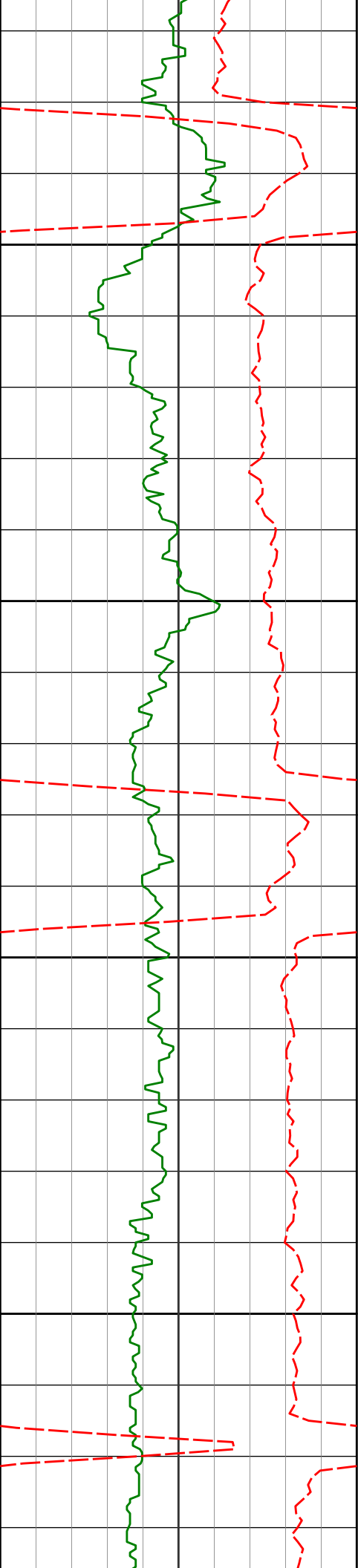
6150

6200

6250

6300

6179'	85.90°	88.15°	5656.97'	1006.67'
6272'	87.44°	89.23°	5662.37'	1099.46'



6350

6364'

89.48°

90.35°

5664.85'

1191.30'

6400

6450

6457'

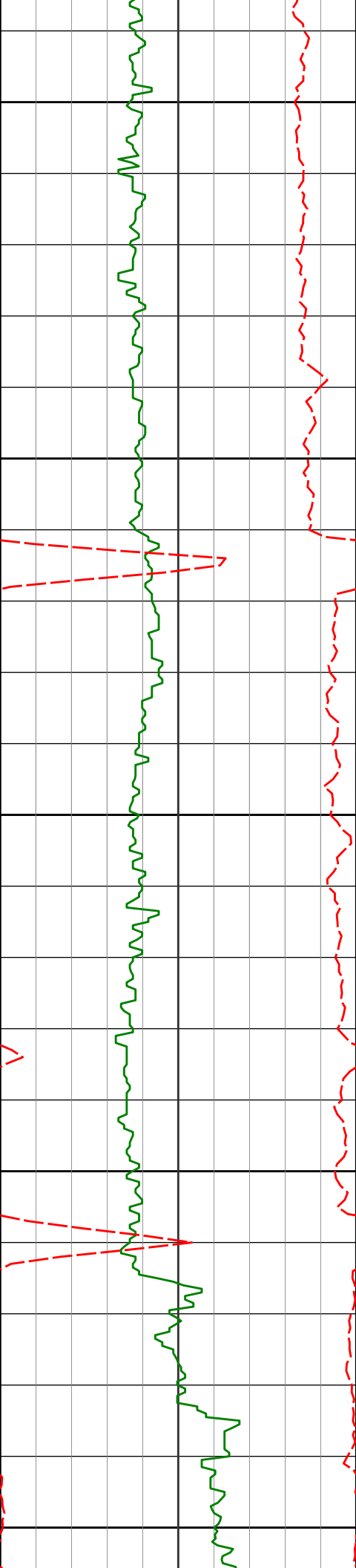
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88.92°

5664.40'

1284.18'

6500



6550

6552'

90.83°

87.89°

5662.81'

1379.14'

6600

6650

6647'

90.68°

87.19°

5661.56'

1474.12'

6700

6750

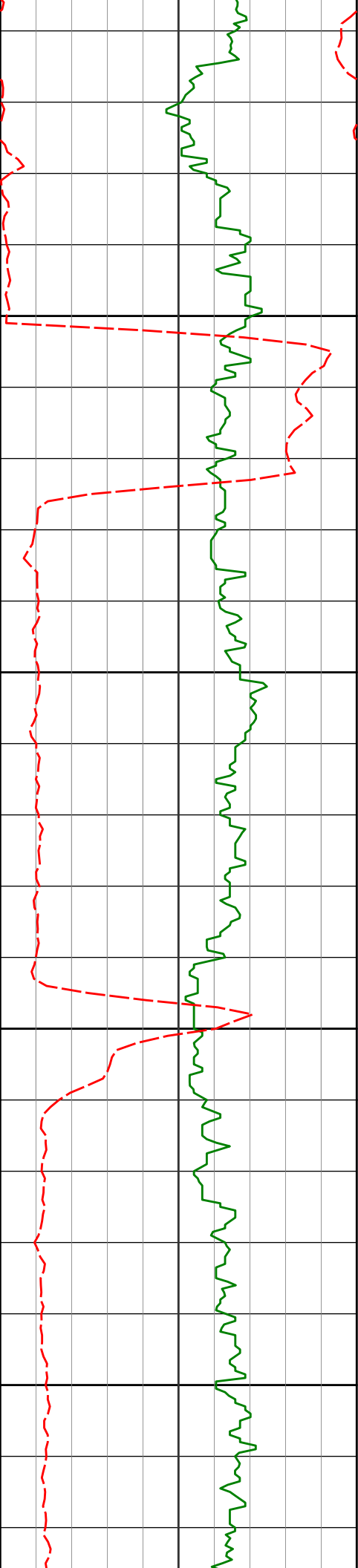
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87.80°

5659.03'

1568.08'



6800

6850

6900

6950

6836'

90.43°

87.96°

5656.68'

1663.03'

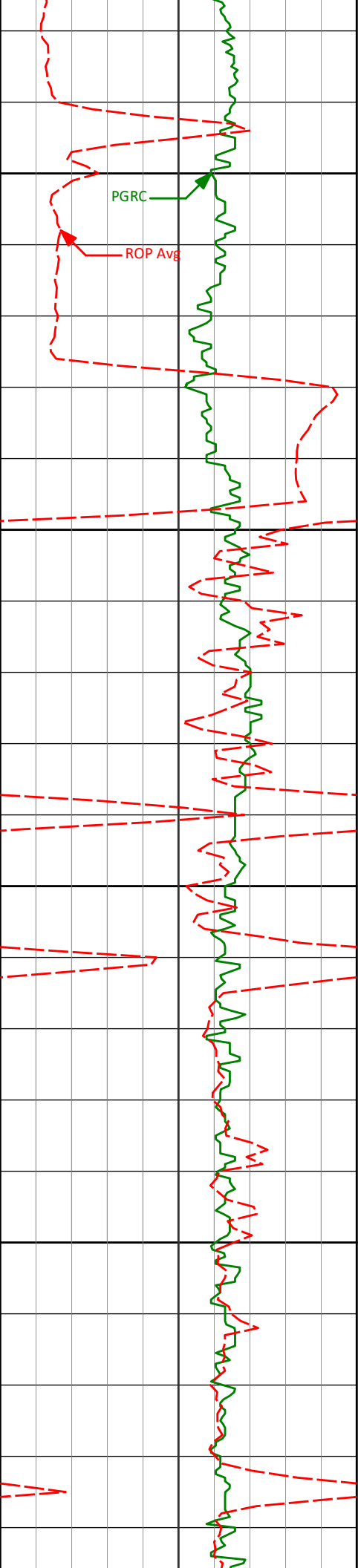
6931'

90.12°

87.87°

5656.22'

1758.01'



7000

PGRC

ROP Avg

7026'

90.55°

88.48°

5655.66'

1852.98'

7050

7100

7120'

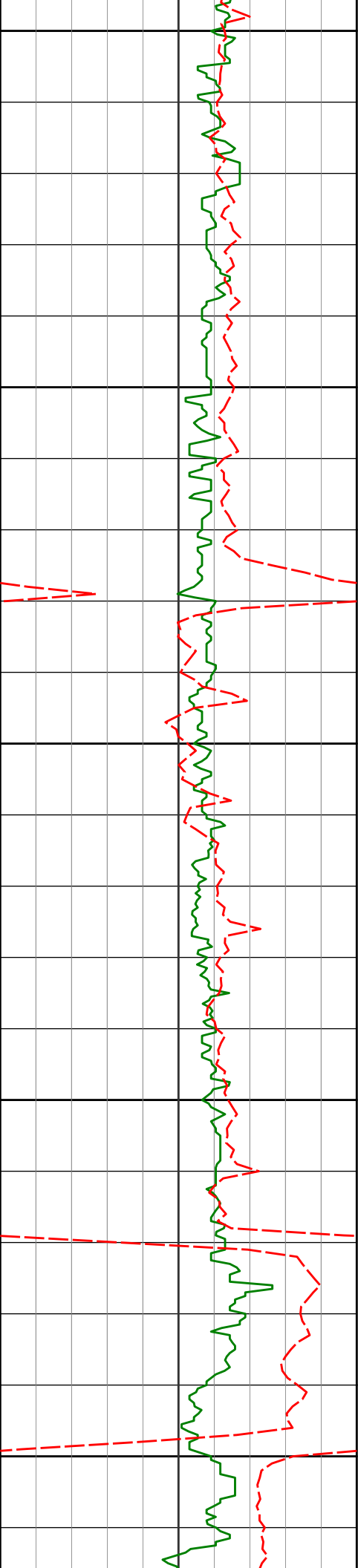
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5654.01'

1946.92'

7150



7200

7215'

90.80°

87.78°

5652.15'

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7250

7300

7310'

92.99°

88.71°

5649.00'

2136.78'

7350

7400

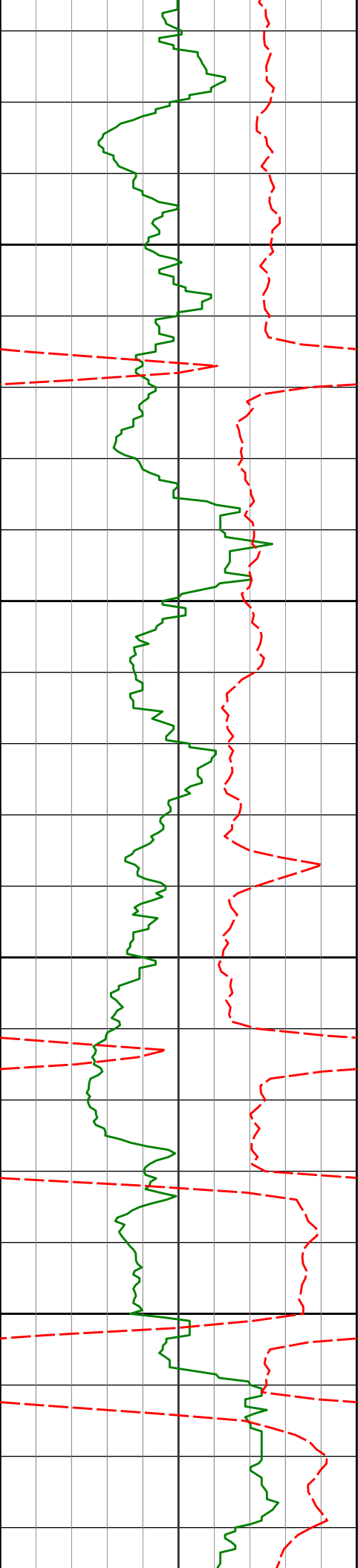
7405'

89.63°

88.65°

5646.83'

2231.69'



7450

7500

7550

7600

7500'

7595'

88.58°

88.52°

88.42°

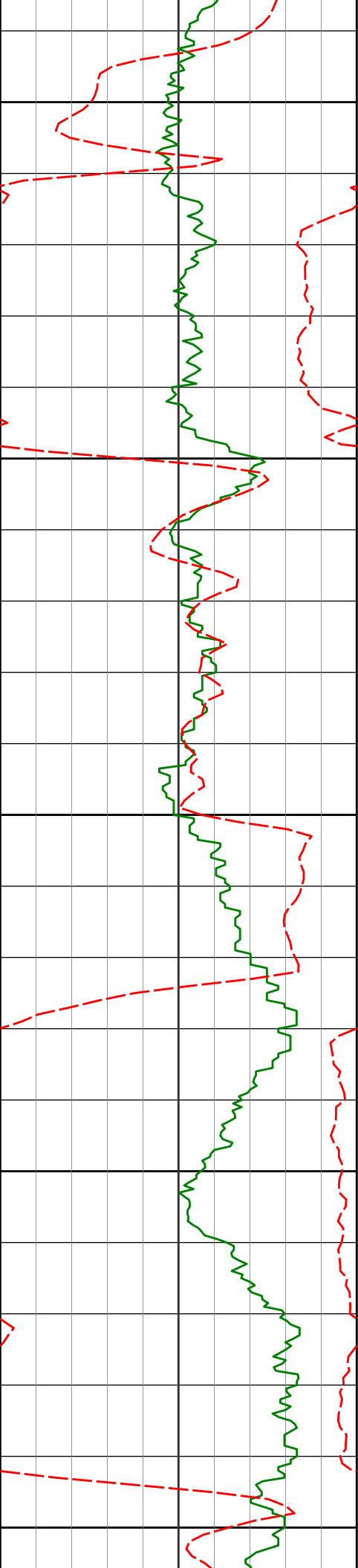
89.23°

5648.32'

5650.72'

2326.64'

2421.55'



7650

7690'

88.12°

89.29°

5653.50'

2516.43'

7700

7750

7785'

89.26°

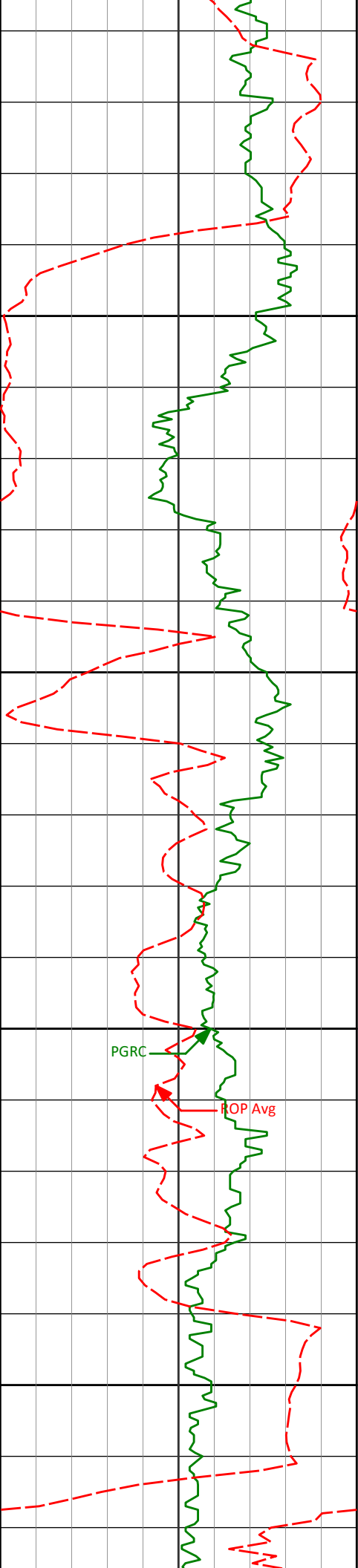
90.61°

5655.68'

2611.26'

7800

7850



7880'

89.88°

90.65°

5656.39'

2706.06'

7900

7950

7975'

89.41°

90.34°

5656.98'

2800.86'

8000

PGRC

ROP Avg

8050

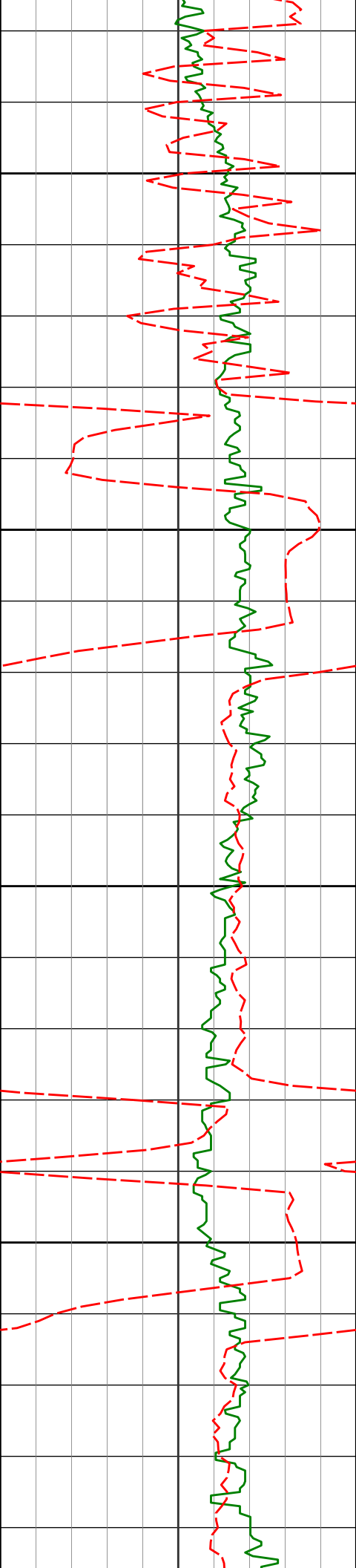
8070'

91.82°

90.47°

5655.96'

2895.67'



8100

8150

8200

8250

8165'

91.73°

88.71°

5653.02'

2990.51'

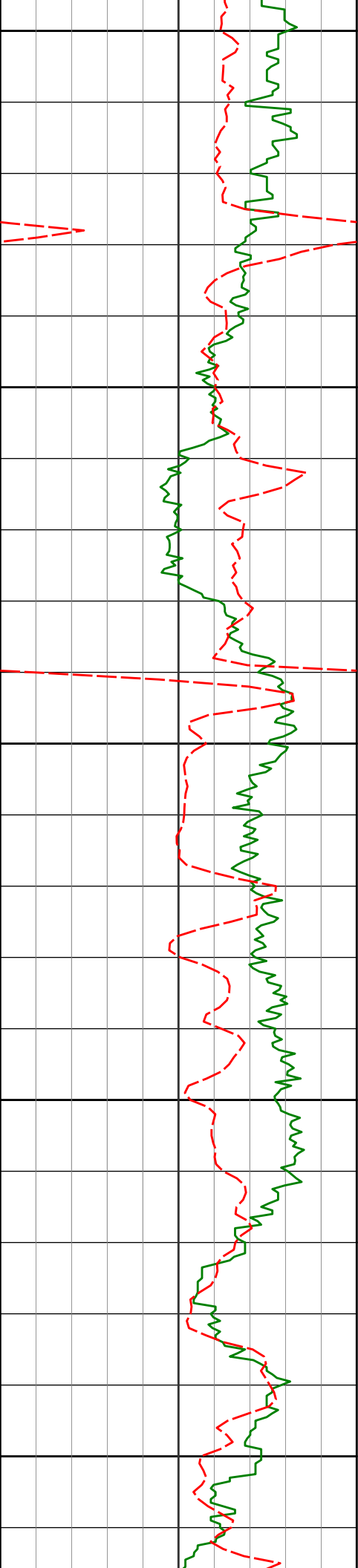
8260'

90.00°

87.10°

5651.59'

3085.48'



8300

8350

8400

8450

8500

8354'

90.00°

86.46°

5651.59'

3179.48'

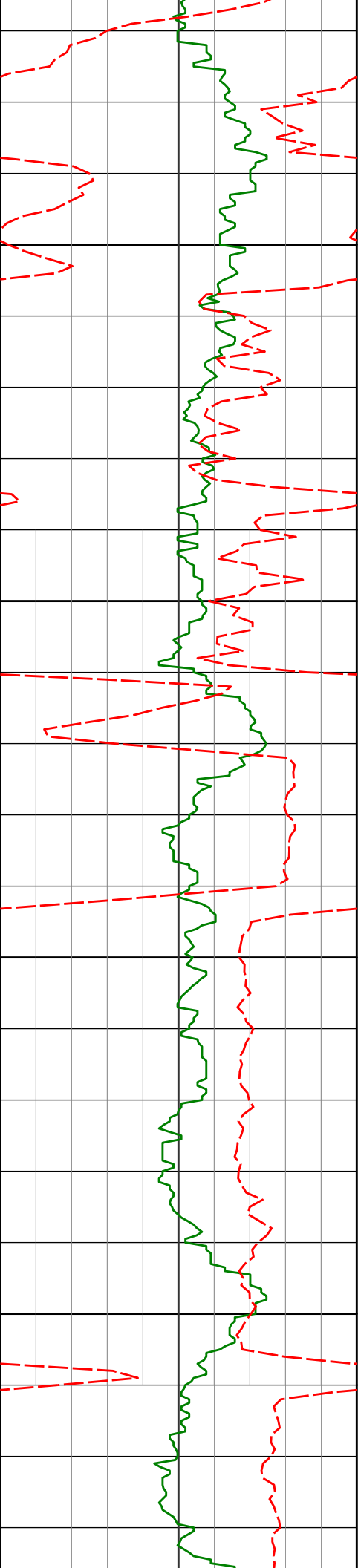
8449'

90.59°

86.46°

5651.10'

3274.48'



8544'

90.96°

86.11°

5649.82'

3369.46'

8550

8600

8639'

90.31°

86.61°

5648.77'

3464.45'

8650

8700

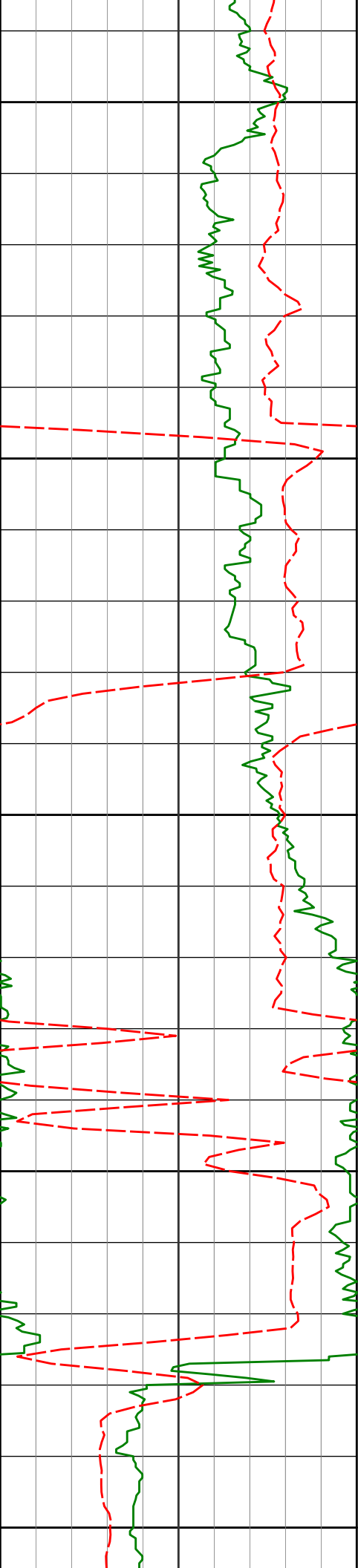
8733'

91.11°

85.95°

5647.61'

3558.44'



8750

8800

8850

8900

8950

8828'

88.77°

87.56°

5647.71'

3653.43'

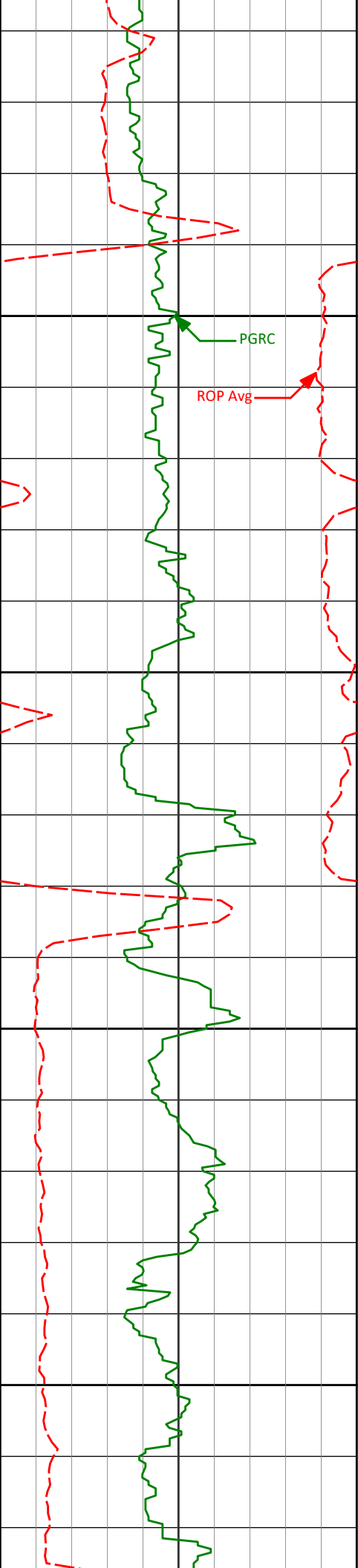
8923'

88.58°

90.09°

5649.91'

3748.34'



9000

9018'

89.69°

90.19°

5651.34'

3843.17'

9050

9100

9112'

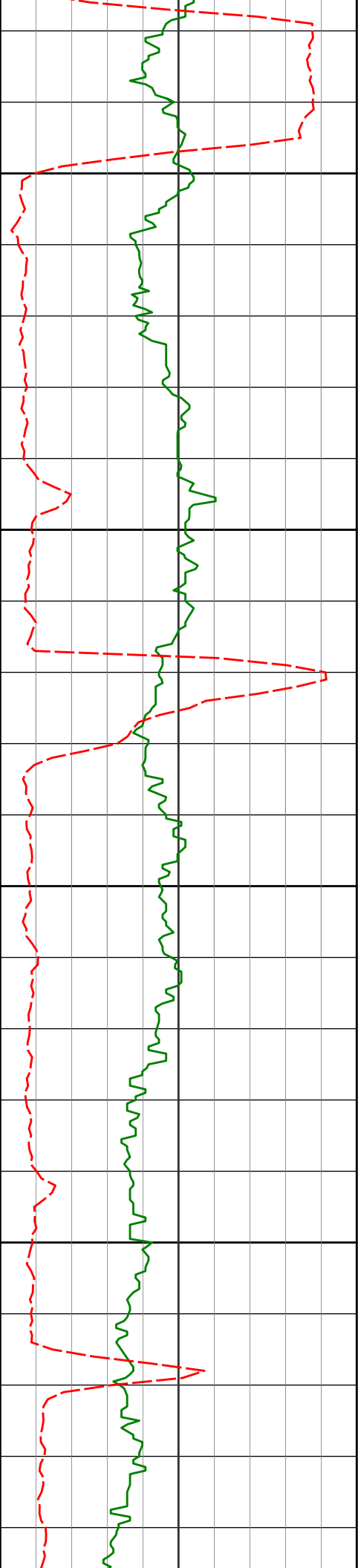
90.65°

89.35°

5651.06'

3937.05'

9150



9200

9207'

88.24°

88.08°

5651.98'

4031.99'

9250

9300

9302'

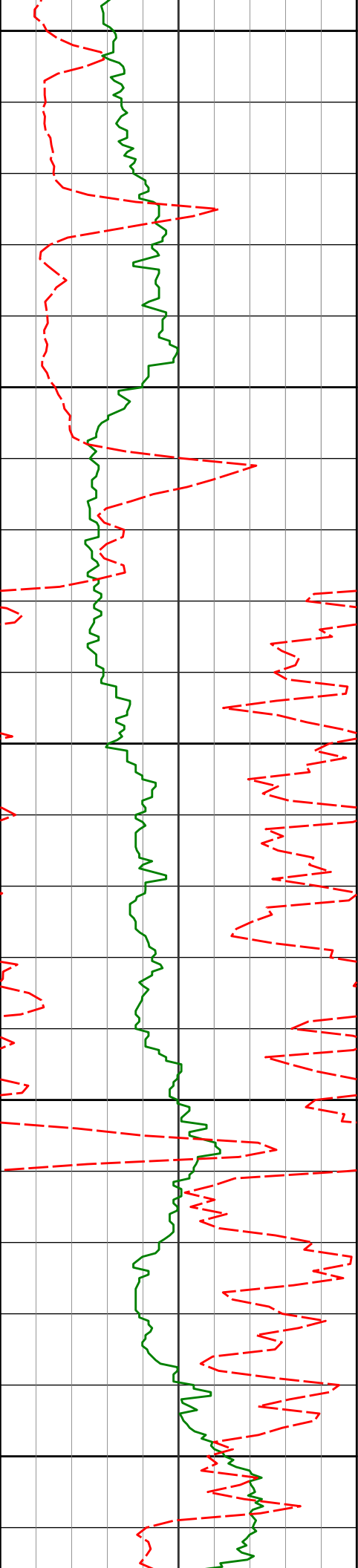
88.61°

87.23°

5654.59'

4126.94'

9350



9400

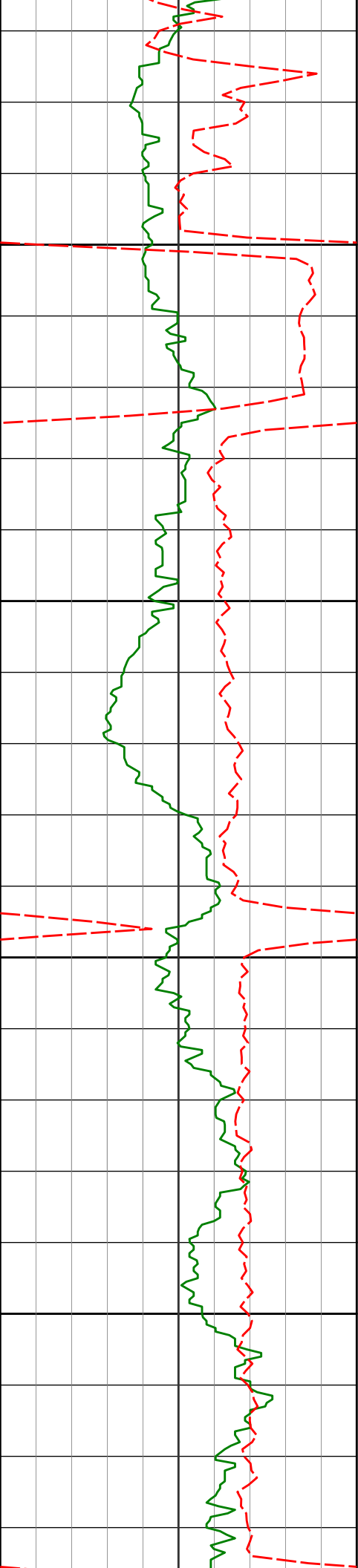
9450

9500

9550

9600

9397'	89.01°	86.50°	5656.56'	4221.92'
9492'	89.72°	86.40°	5657.61'	4316.91'
9586'	90.06°	86.45°	5657.78'	4410.91'



9650

9681'

89.94°

88.63°

5657.78'

4505.90'

9700

9750

9776'

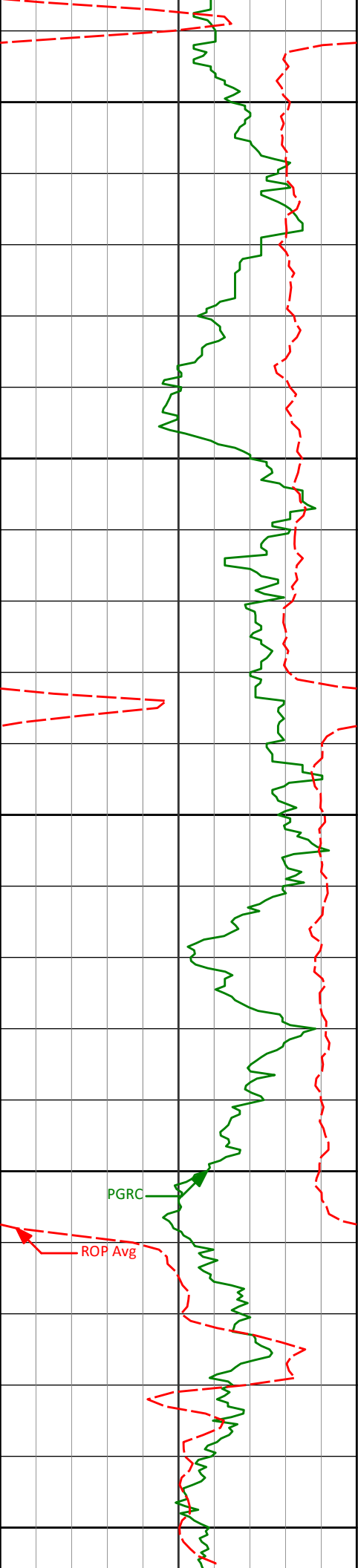
90.52°

88.56°

5657.40'

4600.85'

9800



9850

9871'

91.14°

88.22°

5656.02'

4695.81'

9900

9950

9965'

91.70°

87.69°

5653.69'

4789.76'

10000

10050

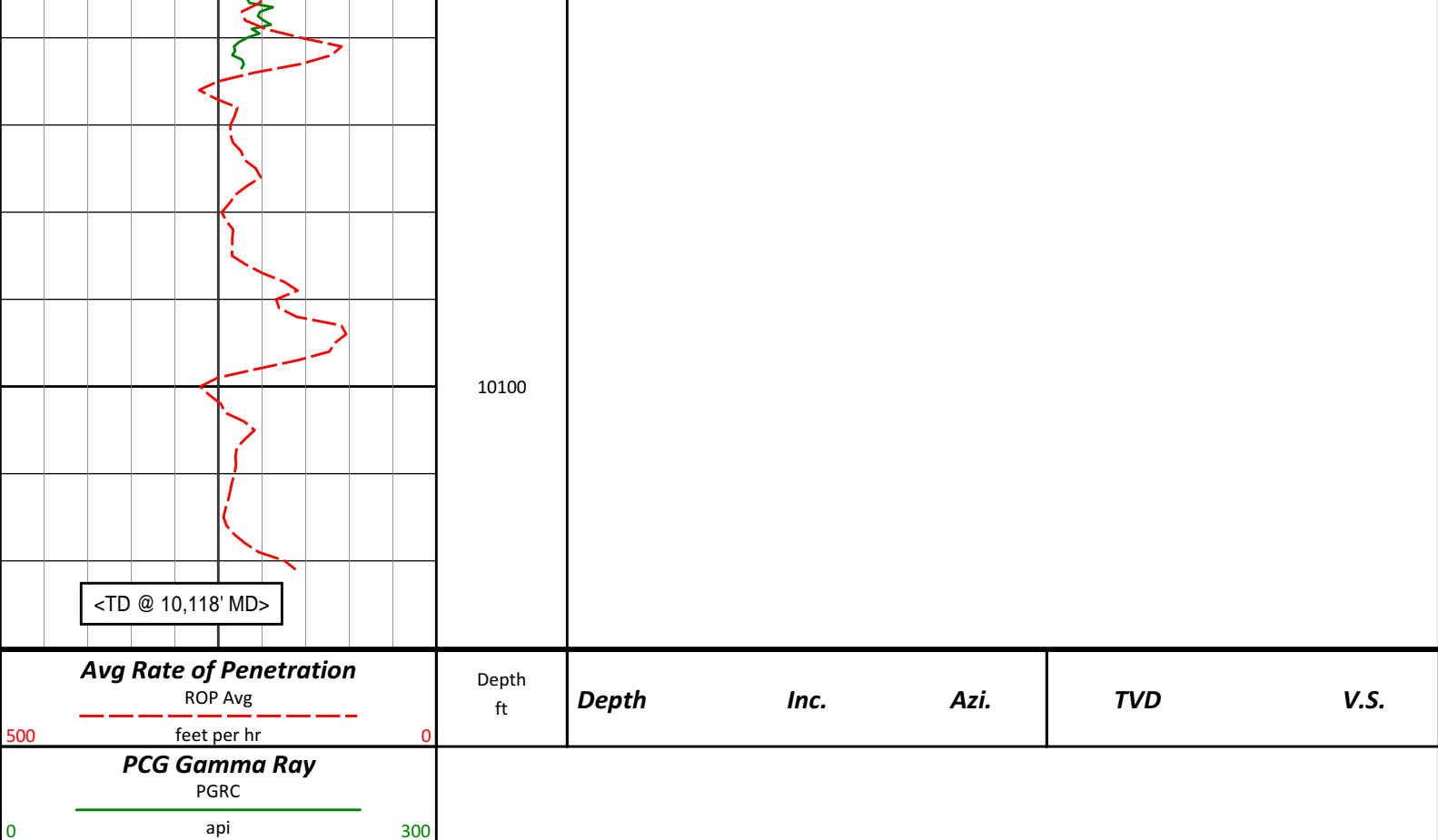
10054'

92.13°

87.62°

5650.72'

4878.70'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Rohn State LD10-63-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0901744857

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
375.00	0.30	236.98	375.00	0.54 S	0.82 W	-0.85	0.08
745.00	0.20	151.78	745.00	1.63 S	1.33 W	-1.42	0.09
1208.00	0.00	165.98	1207.99	2.34 S	0.95 W	-1.07	0.04
1269.00	0.26	140.07	1268.99	2.45 S	0.86 W	-0.99	0.43
1454.00	0.22	114.14	1453.99	2.92 S	0.27 W	-0.43	0.06
1547.00	1.92	56.16	1546.97	2.12 S	1.19 E	1.07	1.96
1639.00	4.11	45.23	1638.84	1.06 N	4.81 E	4.86	2.44
1732.00	5.55	42.06	1731.51	6.74 N	10.19 E	10.54	1.57
1827.00	5.90	49.29	1826.04	13.33 N	16.96 E	17.66	0.84
1922.00	8.16	49.73	1920.32	20.87 N	25.80 E	26.90	2.38
2017.00	7.87	49.47	2014.39	29.45 N	35.88 E	37.44	0.31
2112.00	7.16	48.90	2108.58	37.57 N	45.28 E	47.27	0.75
2301.00	7.46	49.29	2296.04	53.31 N	63.46 E	66.27	0.16
2491.00	8.36	46.28	2484.23	70.91 N	82.80 E	86.55	0.52
2586.00	8.33	45.49	2578.22	80.51 N	92.70 E	96.96	0.13
2681.00	7.87	43.34	2672.28	90.06 N	102.07 E	106.83	0.58
2776.00	7.52	40.38	2766.42	99.53 N	110.56 E	115.83	0.56
2870.00	7.23	37.76	2859.64	108.89 N	118.16 E	123.93	0.47
2965.00	6.78	46.71	2953.94	117.46 N	125.91 E	132.13	1.24
3060.00	6.17	42.28	3048.33	125.08 N	133.42 E	140.05	0.83
3155.00	6.19	40.53	3142.78	132.75 N	140.19 E	147.23	0.20
3252.00	4.72	42.24	3237.25	132.21 N	142.12 E	152.22	1.77

3250.00	4.70	48.64	3237.35	139.21 N	146.43 E	153.82	1.77
3345.00	2.75	45.09	3332.14	143.39 N	150.97 E	158.57	2.06
3440.00	0.96	33.54	3427.09	145.66 N	153.02 E	160.74	1.92
3535.00	1.32	26.66	3522.07	147.30 N	153.94 E	161.76	0.40
3629.00	1.25	22.28	3616.05	149.21 N	154.82 E	162.73	0.13
3724.00	0.59	8.67	3711.04	150.65 N	155.28 E	163.28	0.73
3819.00	0.34	344.03	3806.03	151.40 N	155.28 E	163.32	0.33
3914.00	0.22	238.01	3901.03	151.57 N	155.05 E	163.09	0.48
4009.00	0.19	141.85	3996.03	151.35 N	154.99 E	163.02	0.33
4104.00	0.28	159.81	4091.03	151.00 N	155.17 E	163.18	0.12
4199.00	0.29	124.65	4186.03	150.64 N	155.45 E	163.44	0.18
4293.00	0.39	136.07	4280.03	150.28 N	155.86 E	163.84	0.12
4388.00	0.57	177.42	4375.03	149.58 N	156.11 E	164.04	0.40
4483.00	1.20	242.60	4470.02	148.65 N	155.25 E	163.13	1.15
4578.00	1.34	255.57	4564.99	147.92 N	153.29 E	161.14	0.33
4673.00	1.07	259.90	4659.97	147.48 N	151.34 E	159.17	0.29
4767.00	0.89	279.04	4753.96	147.44 N	149.75 E	157.58	0.40
4824.00	0.55	266.49	4810.95	147.50 N	149.05 E	156.88	0.66
4859.00	0.33	252.00	4845.95	147.45 N	148.79 E	156.61	0.68
4907.00	0.56	264.14	4893.95	147.39 N	148.42 E	156.25	0.50
4954.00	2.85	90.66	4940.93	147.35 N	149.36 E	157.19	7.24
5002.00	10.62	85.54	4988.57	147.68 N	154.97 E	162.81	16.21
5049.00	15.33	87.73	5034.35	148.26 N	165.50 E	173.35	10.08
5097.00	18.76	89.29	5080.24	148.61 N	179.56 E	187.41	7.20
5144.00	20.94	90.96	5124.45	148.56 N	195.52 E	203.34	4.79
5192.00	22.92	89.83	5168.97	148.45 N	213.44 E	221.23	4.24
5239.00	25.87	90.76	5211.77	148.34 N	232.85 E	240.61	6.33
5287.00	29.23	91.48	5254.32	147.90 N	255.05 E	262.74	7.03
5334.00	32.54	91.01	5294.65	147.38 N	279.16 E	286.79	7.05
5382.00	35.44	90.21	5334.45	147.10 N	305.99 E	313.56	6.12
5429.00	38.77	90.71	5371.93	146.87 N	334.34 E	341.86	7.11
5477.00	42.80	90.46	5408.26	146.55 N	365.68 E	373.14	8.41
5523.00	46.64	90.18	5440.94	146.37 N	398.05 E	405.44	8.35
5571.00	49.76	89.22	5472.93	146.56 N	433.82 E	441.18	6.67
5618.00	52.45	88.91	5502.44	147.16 N	470.39 E	477.73	5.75
5666.00	56.77	89.28	5530.23	147.78 N	509.51 E	516.82	9.02
5713.00	61.33	89.97	5554.39	148.04 N	549.81 E	557.07	9.77
5761.00	65.71	89.55	5575.79	148.22 N	592.76 E	599.97	9.17
5808.00	68.27	88.28	5594.16	149.04 N	636.01 E	643.20	5.99
5856.00	70.49	87.38	5611.06	150.75 N	680.90 E	688.12	4.94
5903.00	74.67	87.01	5625.13	152.95 N	725.68 E	732.95	8.93
5963.00	81.87	87.51	5637.32	155.75 N	784.32 E	791.66	12.02
6086.00	85.96	88.03	5650.36	160.50 N	906.51 E	913.92	3.35
6179.00	85.90	88.15	5656.97	163.60 N	999.22 E	1006.67	0.14
6272.00	87.44	89.23	5662.37	165.72 N	1092.04 E	1099.46	2.03
6364.00	89.48	90.35	5664.85	166.06 N	1184.00 E	1191.30	2.52
6457.00	91.08	88.92	5664.40	166.66 N	1276.99 E	1284.18	2.31
6552.00	90.83	87.89	5662.81	169.30 N	1371.94 E	1379.14	1.11
6647.00	90.68	87.19	5661.56	173.38 N	1466.84 E	1474.12	0.76
6741.00	92.40	87.80	5659.03	177.48 N	1560.71 E	1568.08	1.95
6836.00	90.43	87.96	5656.68	181.00 N	1655.62 E	1663.03	2.08
6931.00	90.12	87.87	5656.22	184.46 N	1750.55 E	1758.01	0.34
7026.00	90.55	88.48	5655.66	187.49 N	1845.50 E	1852.98	0.79
7120.00	91.45	88.99	5654.01	189.56 N	1939.46 E	1946.92	1.10
7215.00	90.80	87.78	5652.15	192.24 N	2034.40 E	2041.87	1.45
7310.00	92.99	88.71	5649.00	195.14 N	2129.30 E	2136.78	2.50
7405.00	89.63	88.65	5646.83	197.33 N	2224.24 E	2231.69	3.54
7500.00	88.58	88.42	5648.32	199.76 N	2319.19 E	2326.64	1.13
7595.00	88.52	89.23	5650.72	201.70 N	2414.14 E	2421.55	0.85
7690.00	88.12	89.29	5653.50	202.92 N	2509.09 E	2516.43	0.43
7785.00	89.26	90.61	5655.68	203.00 N	2604.06 E	2611.26	1.83
7880.00	89.88	90.65	5656.39	201.96 N	2699.06 E	2706.06	0.65
7975.00	89.41	90.34	5656.98	201.14 N	2794.05 E	2800.86	0.58
8070.00	91.82	90.47	5655.96	200.46 N	2889.03 E	2895.67	2.54
8165.00	91.73	88.71	5653.02	201.14 N	2983.98 E	2990.51	1.86
8260.00	90.00	87.10	5651.59	204.62 N	3078.90 E	3085.48	2.48
8354.00	90.00	86.46	5651.59	209.90 N	3172.75 E	3179.48	0.68
8449.00	90.59	86.46	5651.10	215.76 N	3267.57 E	3274.48	0.62
8544.00	90.96	86.11	5649.82	221.92 N	3362.36 E	3369.46	0.53
8639.00	90.31	86.61	5648.77	227.95 N	3457.16 E	3464.45	0.86
8733.00	91.11	85.95	5647.61	234.04 N	3550.96 E	3558.44	1.10
8828.00	88.77	87.56	5647.71	239.42 N	3645.80 E	3653.43	2.99

8923.00	88.58	90.09	5649.91	241.37 N	3740.74 E	3748.34	2.67
9018.00	89.69	90.19	5651.34	241.14 N	3835.73 E	3843.17	1.17
9112.00	90.65	89.35	5651.06	241.51 N	3929.73 E	3937.05	1.35
9207.00	88.24	88.08	5651.98	243.64 N	4024.69 E	4031.99	2.86
9302.00	88.61	87.23	5654.59	247.52 N	4119.57 E	4126.94	0.98
9397.00	89.01	86.50	5656.56	252.71 N	4214.41 E	4221.92	0.87
9492.00	89.72	86.40	5657.61	258.59 N	4309.22 E	4316.91	0.76
9586.00	90.06	86.45	5657.78	264.45 N	4403.04 E	4410.91	0.37
9681.00	89.94	88.63	5657.78	268.53 N	4497.94 E	4505.90	2.30
9776.00	90.52	88.56	5657.40	270.86 N	4592.92 E	4600.85	0.62
9871.00	91.14	88.22	5656.02	273.53 N	4687.87 E	4695.81	0.74
9965.00	91.70	87.69	5653.69	276.88 N	4781.78 E	4789.76	0.82
10054.00	92.13	87.62	5650.72	280.52 N	4870.65 E	4878.70	0.49
10118.00	92.13	87.62	5648.35	283.18 N	4934.55 E	4942.65	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 86.87 DEGREES (GRID)
A TOTAL CORRECTION OF 6.98 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10118.00 FEET
IS 4942.67 FEET ALONG 86.72 DEGREES (GRID)

Surface surveys at 375 ft, 745 ft, and 1208 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 10054 ft MD to TD at 10118 ft MD.