

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

1 : 600 / 1 : 240

Country		: USA		<div>Company : Noble Energy</div> <div>Rig : H&P 273</div> <div>Well : Rohn State LD10-62HN</div> <div>Field : Wattenberg</div> <div>Country : USA</div> <div>API Number : 05-123-37624</div>			
Field		: Wattenberg					
Location		: Lat: 40° 45' 38.88" North Long: 103° 51' 39.85" West					
Well		: Rohn State LD10-62HN					
Company		: Noble Energy					
Rig		: H&P 273		<div>Other Services</div> <div>Directional Drilling</div>			
LOCATION							
		Latitude : 40° 45' 38.88" North Longitude : 103° 51' 39.85" West					
		UTM Easting = 3,454,003.710 ft UTM Northing = 1,524,200.440 ft					
Permanent Datum : Ground Level				Elevation : 4719.00 ft		Elev. KB N/A	
Log Measured From : Drill Floor				24.00 ft Above Permanent Datum		DF 4743.00 ft	
Drilling Measured From : Drill Floor				MD LOG		GL 4719.00 ft	
						WD N/A	
Depth Logged : 1,213.00 ft To 10,130.00 ft				Unit No. : 11703717		Job No. :CA-XX-0901742658	
Date Logged : 23-Oct-14 To 26-Oct-14				Plot Type : Final			
Total Depth MD : 10,130.00 ft TVD : 5,605.59 ft				Plot Date : 26-Oct-14			
Spud Date : 22-Oct-14							
Run No.		Borehole Record (MD)		Run No.		Borehole Record (MD)	
	Size	From	To		Size	From	To
2	8.750 in	1,213.00 ft	5,990.00 ft				
3	6.125 in	5,990.00 ft	10,130.00 ft				

Max Tool Temp (degF) / Source	163.20 / PCM	213.40 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Justin Fields	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404267	12463937			
Insert Serial Number	11400845	11400845			
Date and Time Initialized	22-Oct-14 20:36	24-Oct-14 17:43			
Date and Time Read	24-Oct-14 07:07	26-Oct-14 15:37			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	52.48	62.90			
Software Version	6.21	6.21			
Sub Serial Number	11404267	12463937			
Sonde Serial Number	11062073	11062073			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	82.82	269.47			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	47.38	57.80			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404267	12463937			
Insert/Sonde Serial Number	11579773	11579773			

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 5943 ft. MD to 5990 ft. MD.

WARRANTY

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HALLIBURTON

Sperry Drilling Services

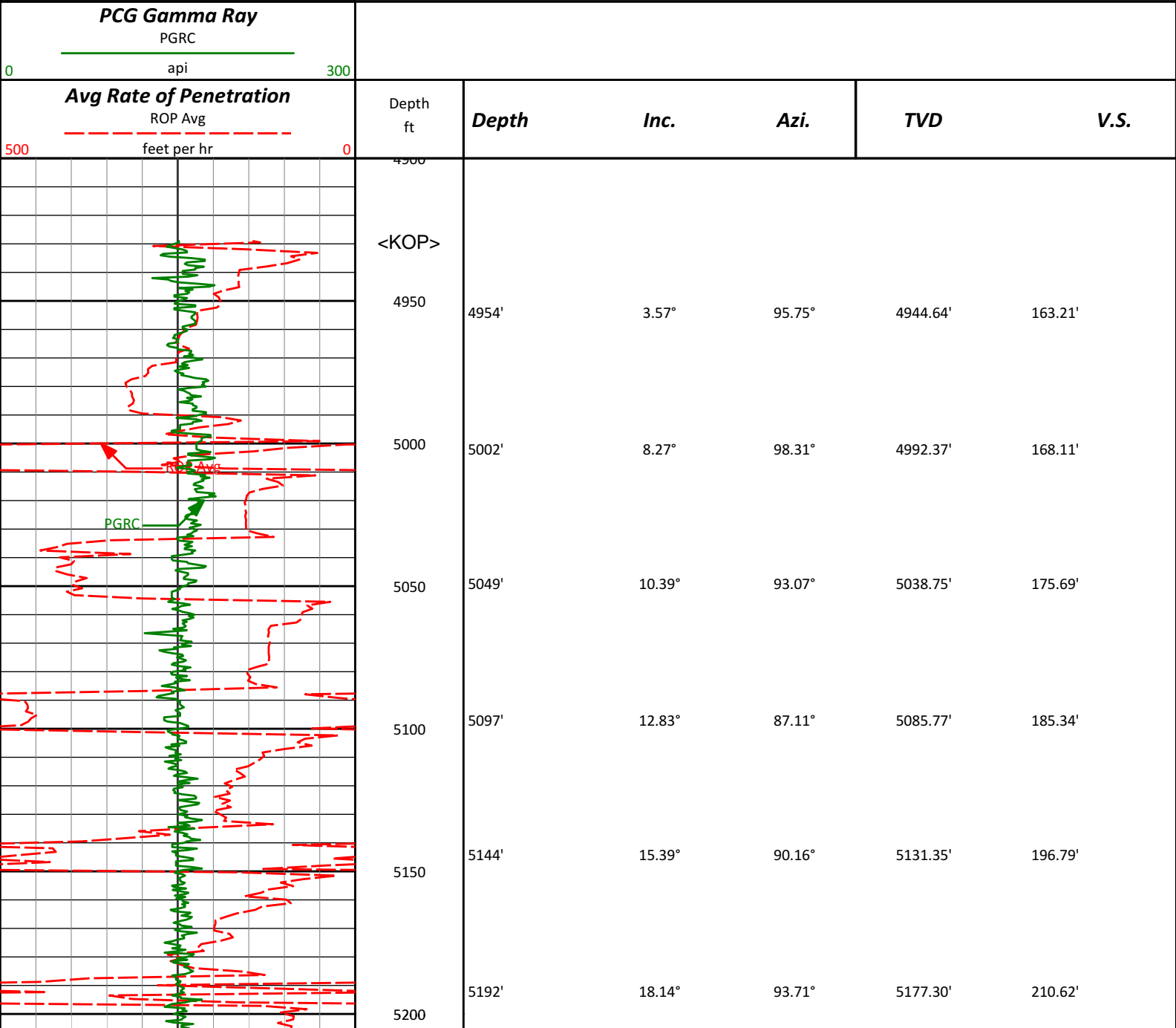
MD Main Log 1:600

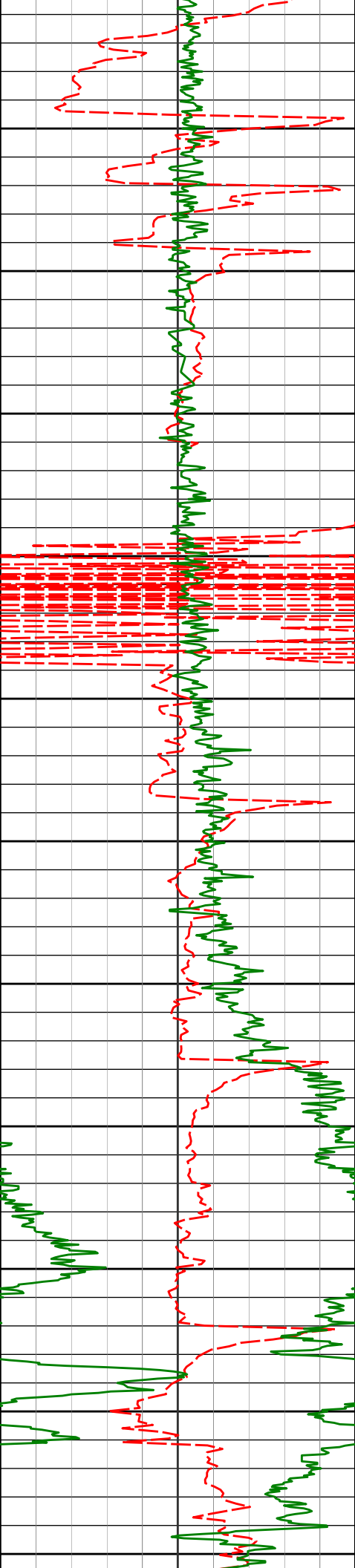
Noble Energy, Inc

Rohn State LD10-62HN

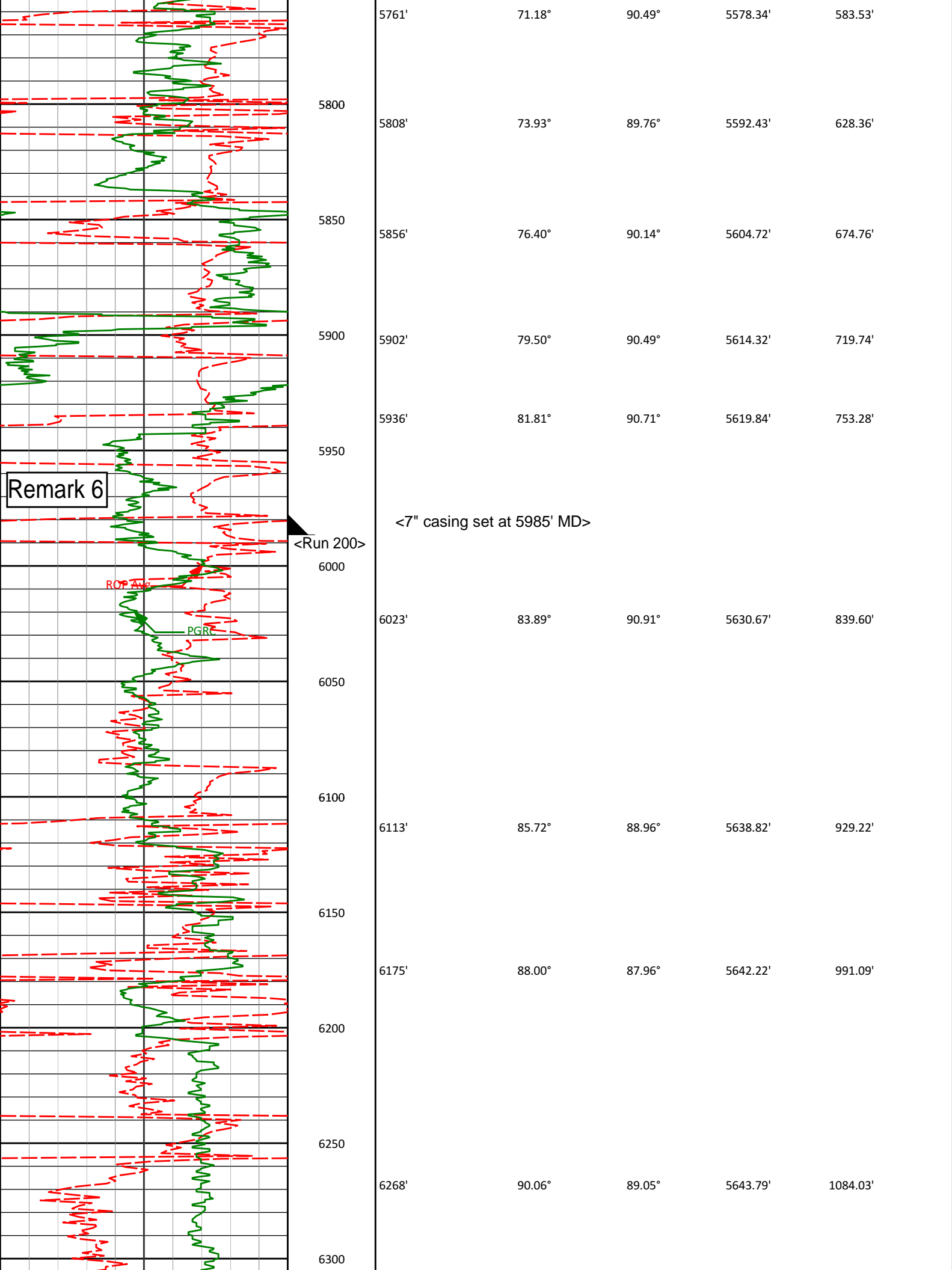
H&P 273

T9N R58W





5239'	21.72°	94.98°	5221.48'	226.60'
5250				
5287'	25.20°	95.94°	5265.50'	245.62'
5300				
5333'	29.27°	95.73°	5306.40'	266.57'
5350				
5381'	33.50°	96.58°	5347.36'	291.42'
5400				
5428'	38.00°	95.71°	5385.50'	318.73'
5450				
5476'	42.18°	96.47°	5422.21'	349.47'
5500				
5523'	46.25°	95.44°	5455.89'	382.07'
5550				
5571'	51.16°	95.16°	5487.56'	417.98'
5600				
5618'	55.97°	94.03°	5515.46'	455.67'
5650				
5666'	61.54°	93.17°	5540.35'	496.63'
5700				
5713'	66.39°	92.26°	5560.97'	538.80'
5750				



Remark 6

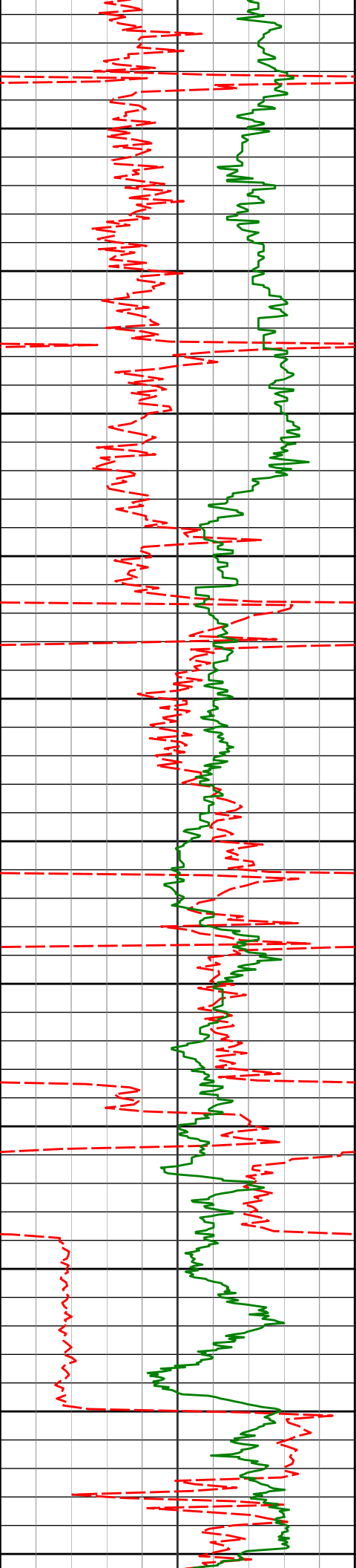
ROP Avg

PGR

<Run 200>

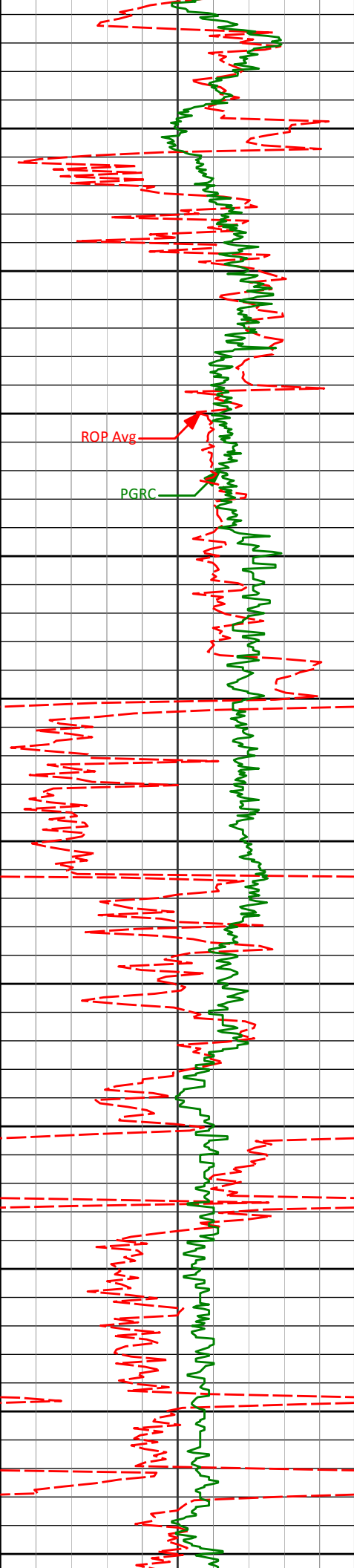
<7" casing set at 5985' MD>

5761'	71.18°	90.49°	5578.34'	583.53'
5800				
5808'	73.93°	89.76°	5592.43'	628.36'
5850				
5856'	76.40°	90.14°	5604.72'	674.76'
5900				
5902'	79.50°	90.49°	5614.32'	719.74'
5936'	81.81°	90.71°	5619.84'	753.28'
5950				
6000				
6023'	83.89°	90.91°	5630.67'	839.60'
6050				
6100				
6113'	85.72°	88.96°	5638.82'	929.22'
6150				
6175'	88.00°	87.96°	5642.22'	991.09'
6200				
6250				
6268'	90.06°	89.05°	5643.79'	1084.03'
6300				



6350
6400
6450
6500
6550
6600
6650
6700
6750
6800
6850

6360'	90.03°	88.48°	5643.72'	1176.00'
6452'	89.82°	88.10°	5643.84'	1267.95'
6547'	89.23°	87.52°	5644.63'	1362.86'
6642'	92.53°	88.66°	5643.18'	1457.77'
6737'	93.27°	87.67°	5638.38'	1552.59'
6831'	92.53°	90.37°	5633.63'	1646.44'



6900

6926'

91.14°

90.39°

5630.59'

1741.39'

6950

7000

7021'

90.37°

89.46°

5629.34'

1836.38'

7050

7100

7116'

91.42°

91.51°

5627.86'

1931.36'

7150

7200

7211'

91.82°

91.72°

5625.18'

2026.29'

7250

7300

7306'

91.14°

91.37°

5622.72'

2121.23'

7350

7400

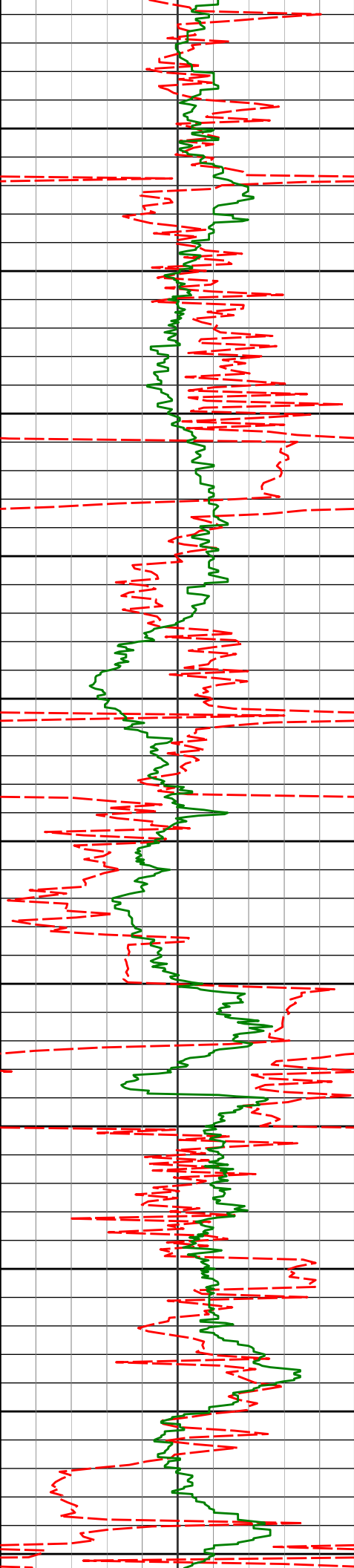
7401'

89.11°

89.60°

5622.52'

2216.22'



7450

7500

7550

7600

7650

7700

7750

7800

7850

7900

7950

7496'

88.64°

88.82°

5624.39'

2311.19'

7591'

90.15°

88.87°

5625.38'

2406.15'

7686'

89.60°

88.95°

5625.59'

2501.13'

7780'

89.66°

91.06°

5626.19'

2595.12'

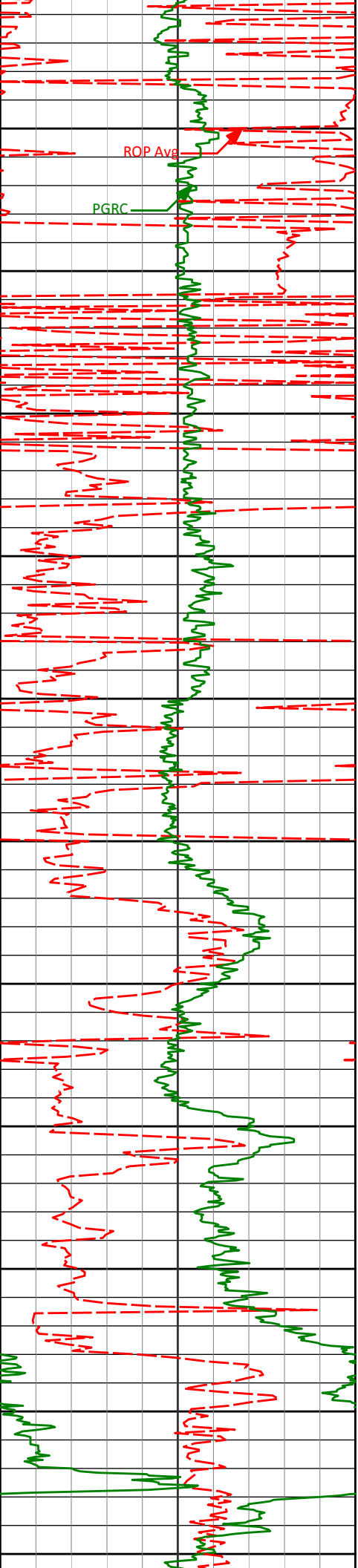
7875'

90.18°

90.98°

5626.32'

2690.11'



7970' 89.48° 90.55° 5626.60' 2785.11'

8000

ROP Avg

PGRC

8050

8065' 90.99° 91.30° 5626.22' 2880.09'

8100

8150

8160' 91.32° 91.57° 5624.30' 2975.05'

8200

8250

8300

8350

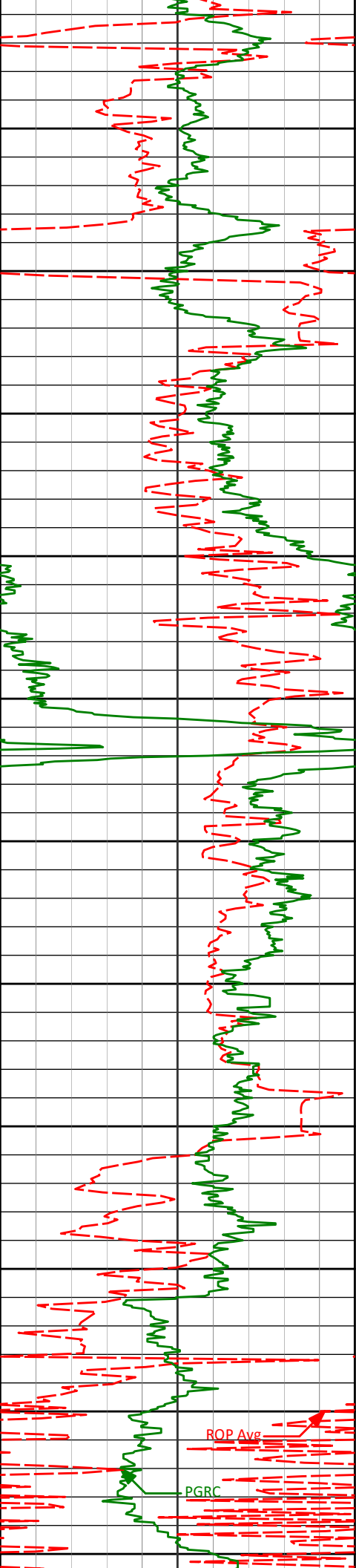
8350' 90.74° 90.90° 5620.88' 3164.99'

8400

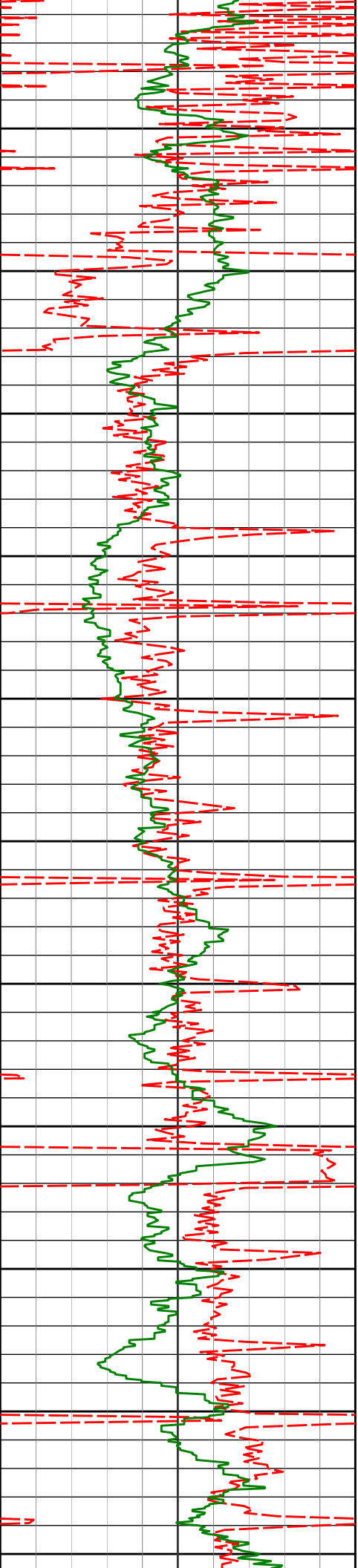
8450

8445' 91.17° 90.30° 5619.30' 3259.97'

8500



8539'	91.76°	90.07°	5616.90'	3353.94'
8550				
8600				
8634'	89.26°	89.33°	5616.05'	3448.93'
8650				
8700				
8729'	89.60°	89.32°	5617.00'	3543.91'
8750				
8800				
8823'	89.97°	89.14°	5617.35'	3637.90'
8850				
8900				
8918'	87.57°	89.09°	5619.40'	3732.85'
8950				
9000				
9013'	87.66°	88.21°	5623.36'	3827.73'
9050				



9100

9108'

88.37°

89.05°

5626.65'

3922.64'

9150

9200

9203'

88.74°

89.08°

5629.05'

4017.59'

9250

9300

9298'

88.74°

88.42°

5631.14'

4112.53'

9350

9400

9393'

88.74°

88.18°

5633.24'

4207.46'

9450

9500

9487'

90.99°

88.50°

5633.47'

4301.40'

9550

9600

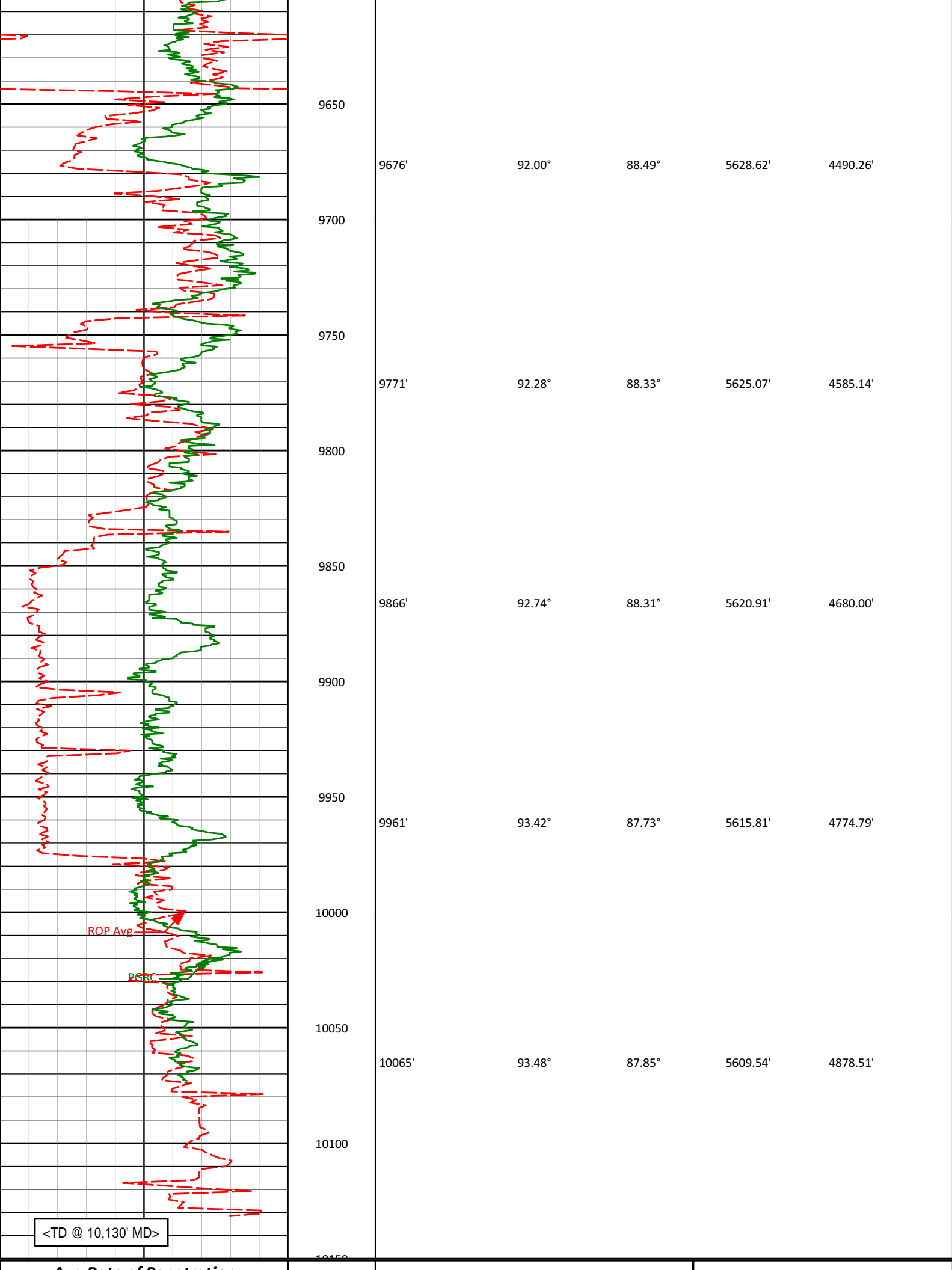
9582'

91.45°

88.56°

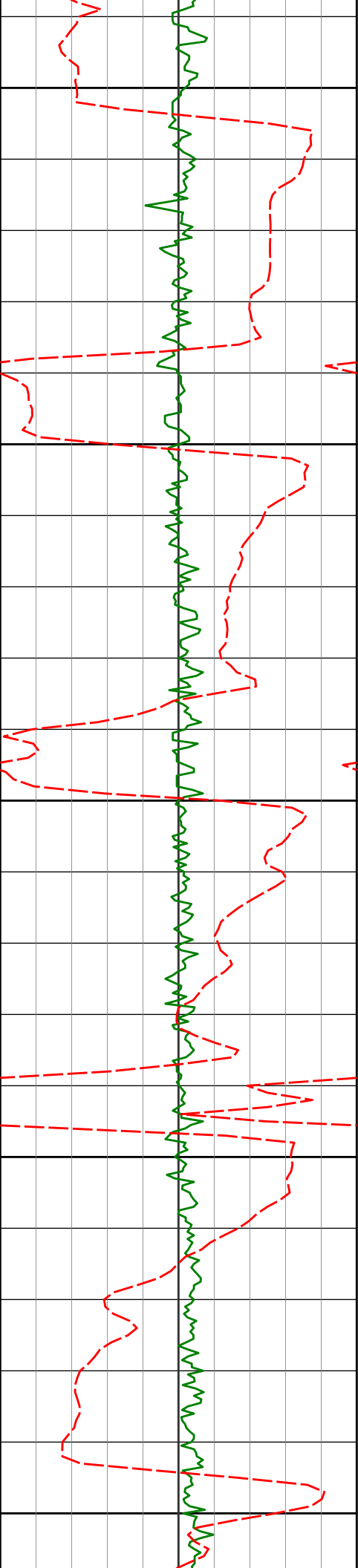
5631.45'

4396.34'



<TD @ 10,130' MD>

<div>Avg Rate of Penetration</div> <div>ROP Avg</div> <div>feet per hr</div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
05000		0					
<div>PCG Gamma Ray</div> <div>PGRC</div> <div>api</div>							
0300							
<div>HALLIBURTON</div> <div>Sperry Drilling Services</div> <div>MD Detail Log 1:240</div> <div>Noble Energy, Inc. Rohn State LD10-62HN H&P 273 T9N R58W</div>							
<div>PCG Gamma Ray</div> <div>PGRC</div> <div>api</div>							
0300							
<div>Avg Rate of Penetration</div> <div>ROP Avg</div> <div>feet per hr</div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
05000		0					
		<KOP>					
		4950	4954'	3.57°	95.75°	4944.64'	163.21'
		5000	5002'	8.27°	98.31°	4992.37'	168.11'



5050

5100

5150

5200

5250

5049'

5097'

5144'

5192'

5239'

10.39°

12.83°

15.39°

18.14°

21.72°

93.07°

87.11°

90.16°

93.71°

94.98°

5038.75'

5085.77'

5131.35'

5177.30'

5221.48'

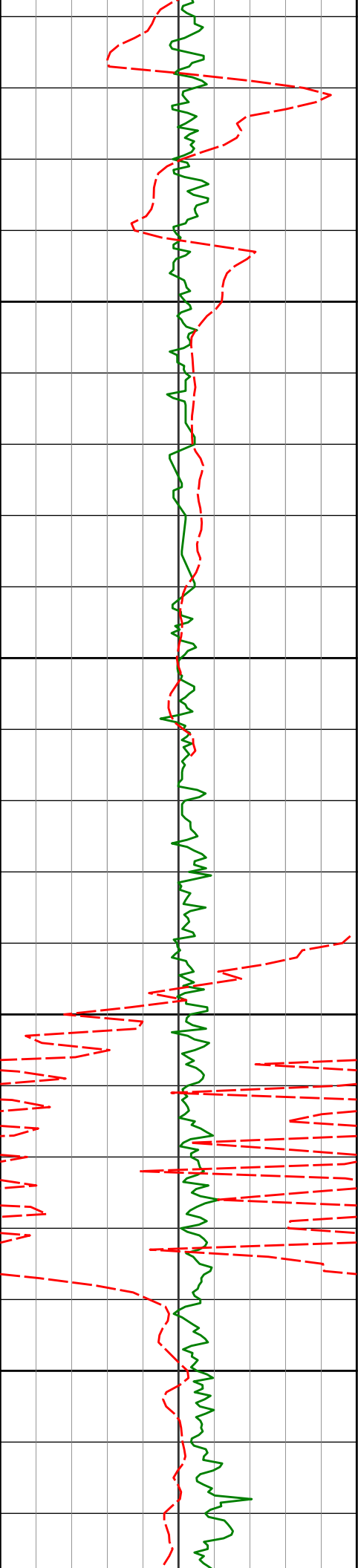
175.69'

185.34'

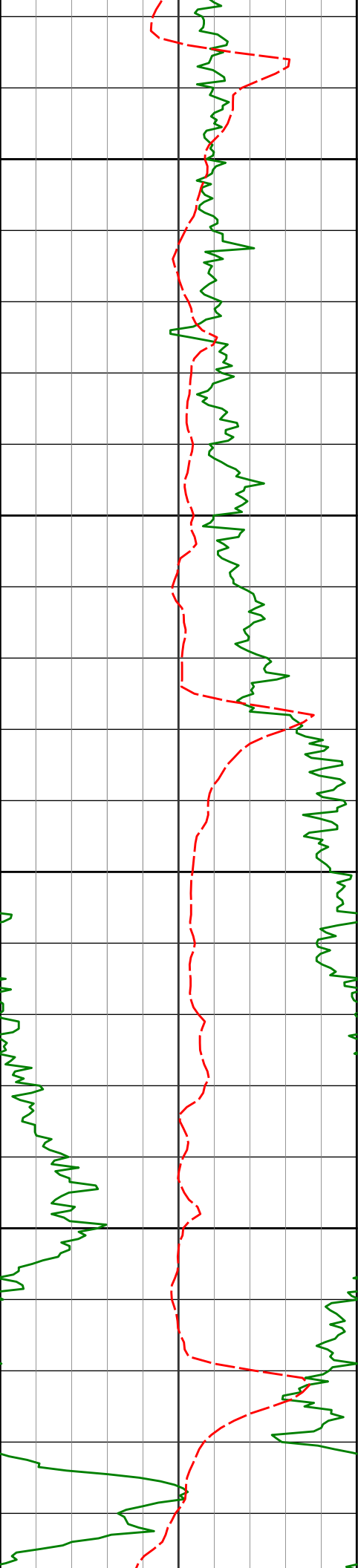
196.79'

210.62'

226.60'



5287'	25.20°	95.94°	5265.50'	245.62'
5333'	29.27°	95.73°	5306.40'	266.57'
5381'	33.50°	96.58°	5347.36'	291.42'
5428'	38.00°	95.71°	5385.50'	318.73'
5476'	42.18°	96.47°	5422.21'	349.47'



5500

5523'

46.25°

95.44°

5455.89'

382.07'

5550

5571'

51.16°

95.16°

5487.56'

417.98'

5600

5618'

55.97°

94.03°

5515.46'

455.67'

5650

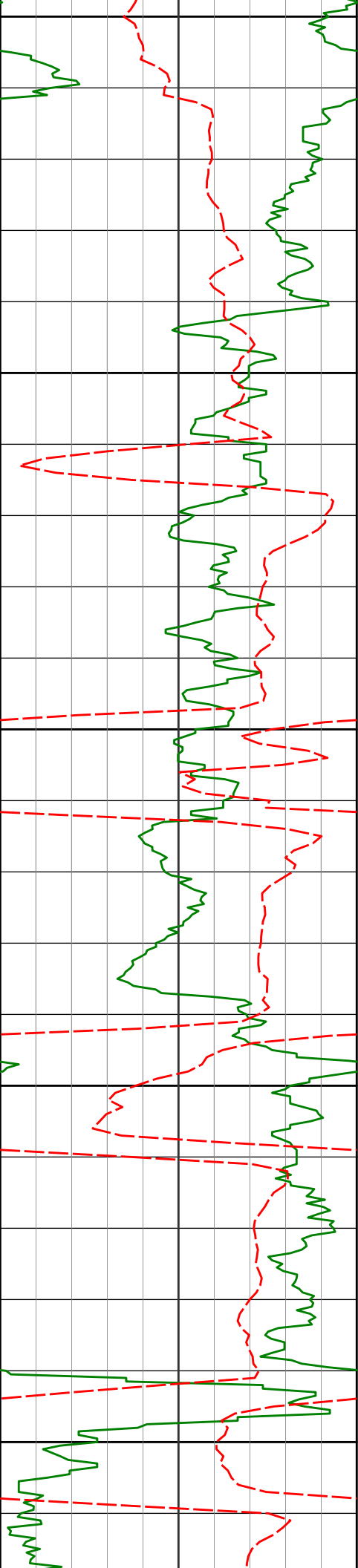
5666'

61.54°

93.17°

5540.35'

496.63'



5700

5713'

66.39°

92.26°

5560.97'

538.80'

5750

5761'

71.18°

90.49°

5578.34'

583.53'

5800

5808'

73.93°

89.76°

5592.43'

628.36'

5850

5856'

76.40°

90.14°

5604.72'

674.76'

5900

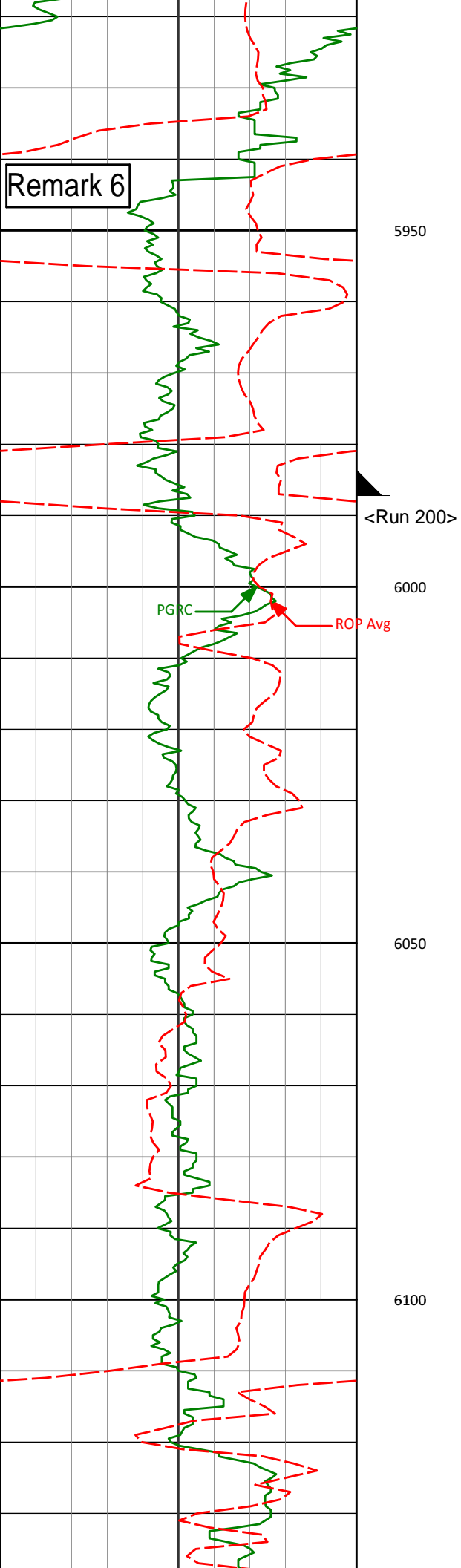
5902'

79.50°

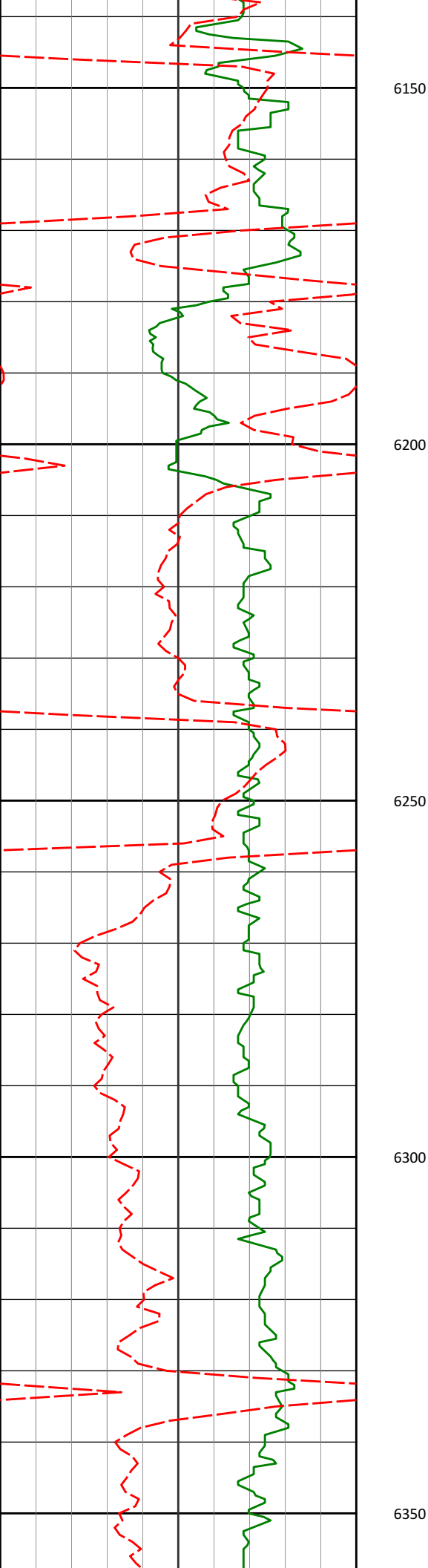
90.49°

5614.32'

719.74'



5936'	81.81°	90.71°	5619.84'	753.28'
<7" casing set at 5985' MD>				
<Run 200>				
6023'	83.89°	90.91°	5630.67'	839.60'
6113'	85.72°	88.96°	5638.82'	929.22'



6175'

88.00°

87.96°

5642.22'

991.09'

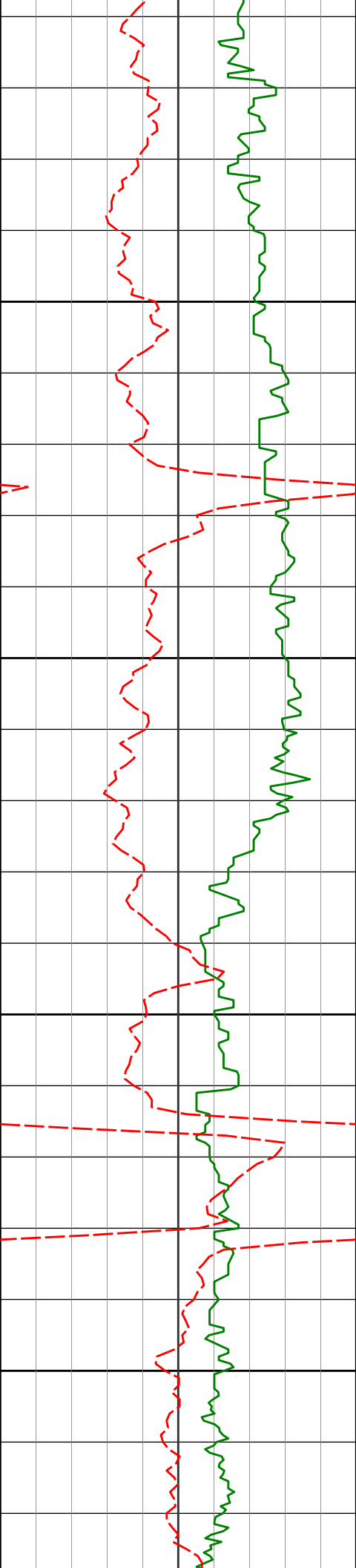
6268'

90.06°

89.05°

5643.79'

1084.03'



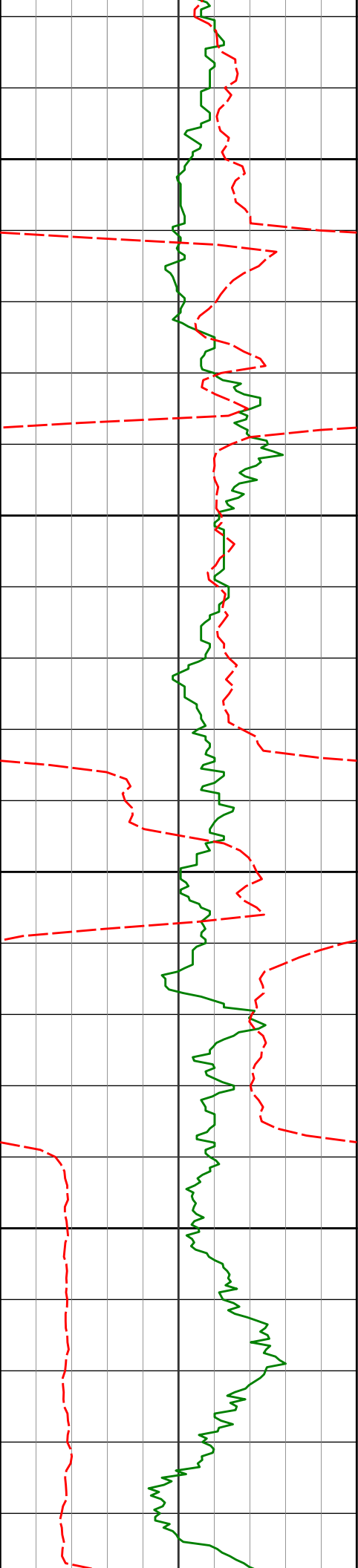
6400

6450

6500

6550

6360'	90.03°	88.48°	5643.72'	1176.00'
6452'	89.82°	88.10°	5643.84'	1267.95'
6547'	89.23°	87.52°	5644.63'	1362.86'



6600

6642'

92.53°

88.66°

5643.18'

1457.77'

6650

6700

6737'

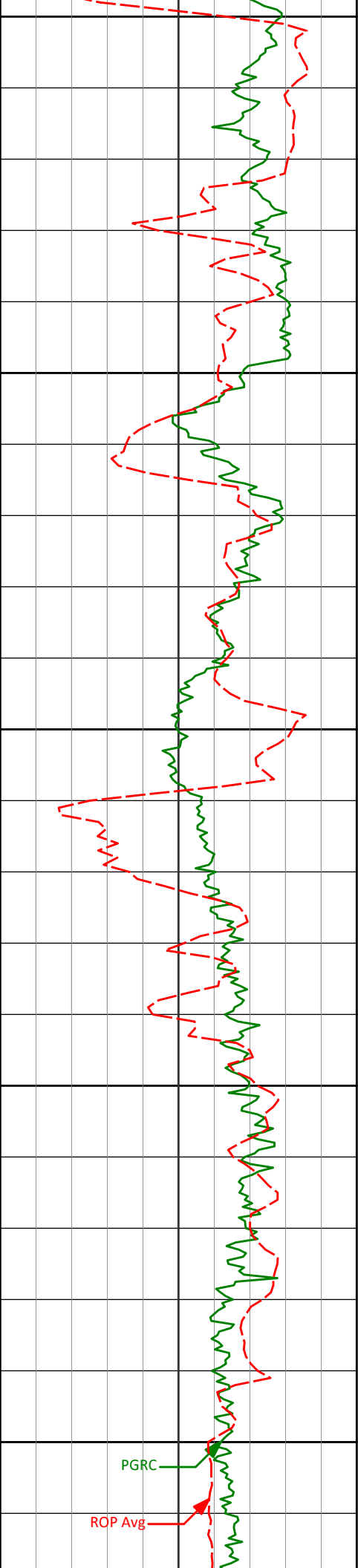
93.27°

87.67°

5638.38'

1552.59'

6750



6800

6831'

92.53°

90.37°

5633.63'

1646.44'

6850

6900

6926'

91.14°

90.39°

5630.59'

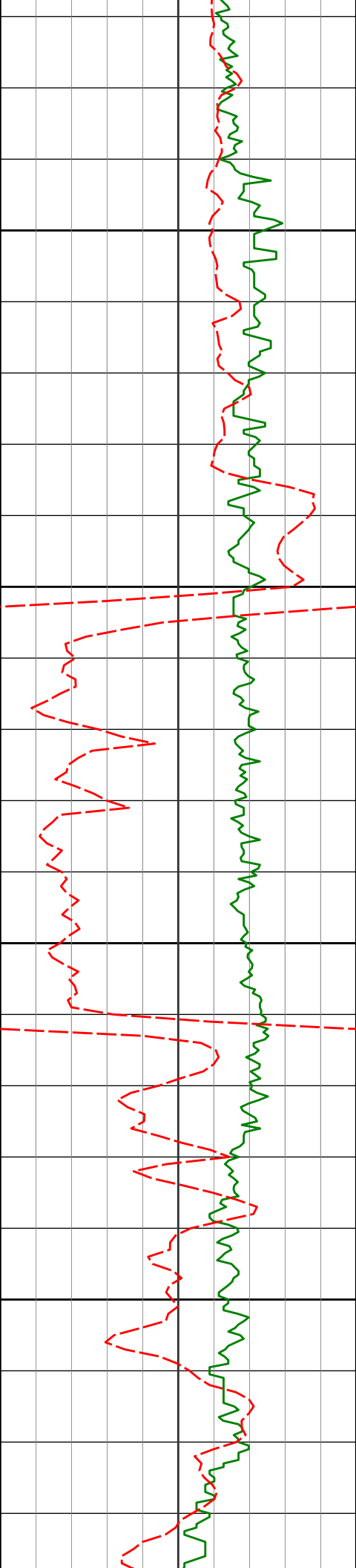
1741.39'

6950

7000

PGRC

ROP Avg



7021'

90.37°

89.46°

5629.34'

1836.38'

7050

7100

7116'

91.42°

91.51°

5627.86'

1931.36'

7150

7200

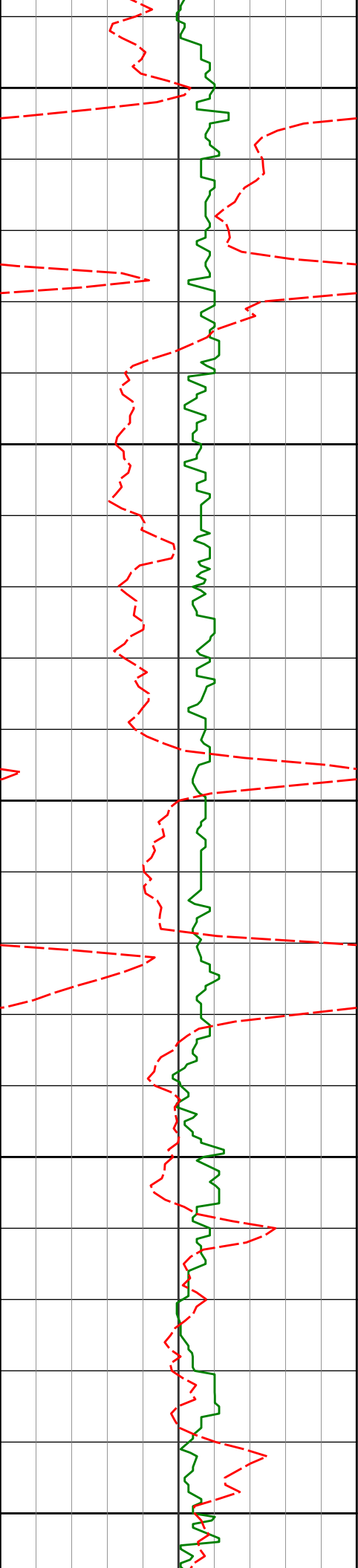
7211'

91.82°

91.72°

5625.18'

2026.29'



7250

7300

7350

7400

7450

7306'

91.14°

91.37°

5622.72'

2121.23'

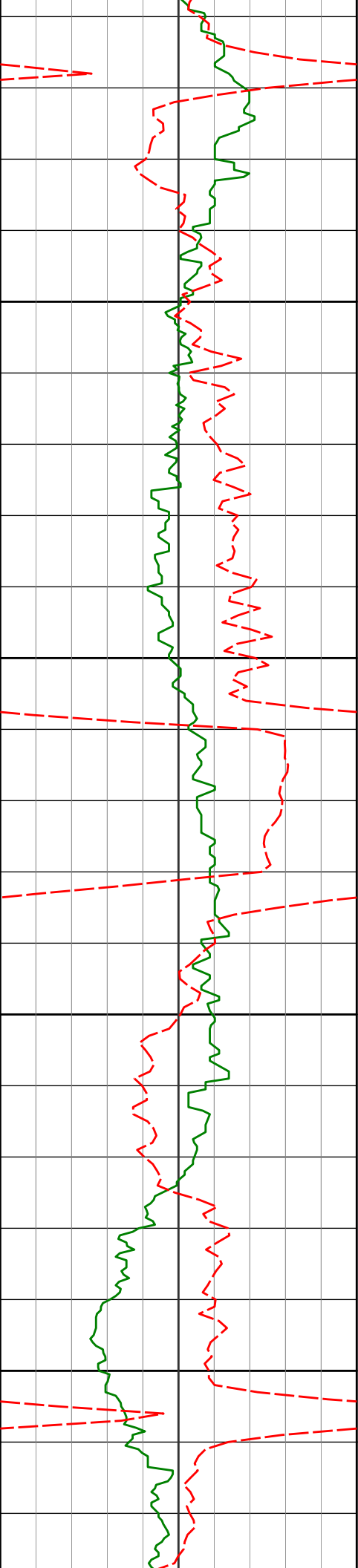
7401'

89.11°

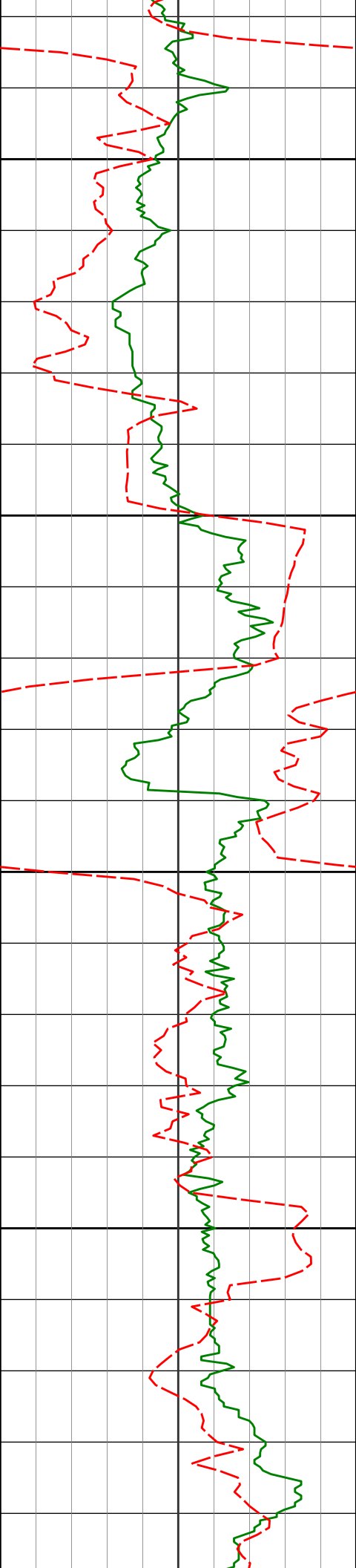
89.60°

5622.52'

2216.22'



7496'	88.64°	88.82°	5624.39'	2311.19'
7500				
7550				
7591'	90.15°	88.87°	5625.38'	2406.15'
7600				
7650				



7686'

89.60°

88.95°

5625.59'

2501.13'

7700

7750

7780'

89.66°

91.06°

5626.19'

2595.12'

7800

7850

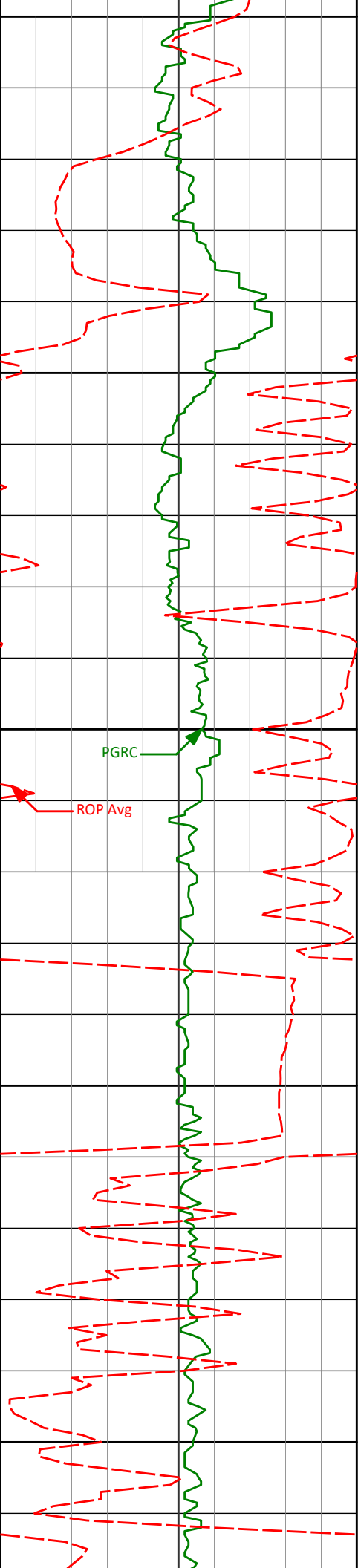
7875'

90.18°

90.98°

5626.32'

2690.11'



7900

7950

7970'

8000

8050

8100

89.48°

90.55°

5626.60'

2785.11'

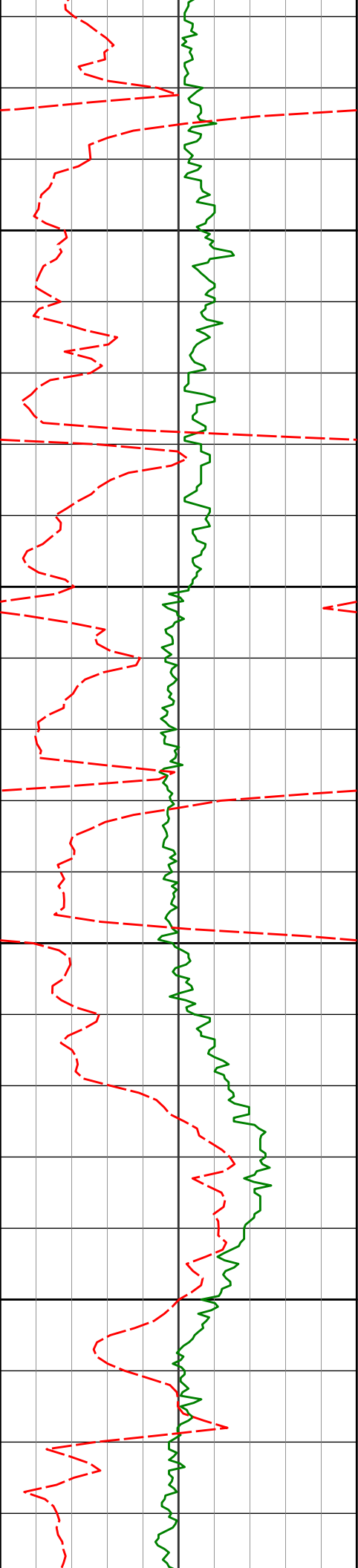
8065'

90.99°

91.30°

5626.22'

2880.09'



8150

8160'

91.32°

91.57°

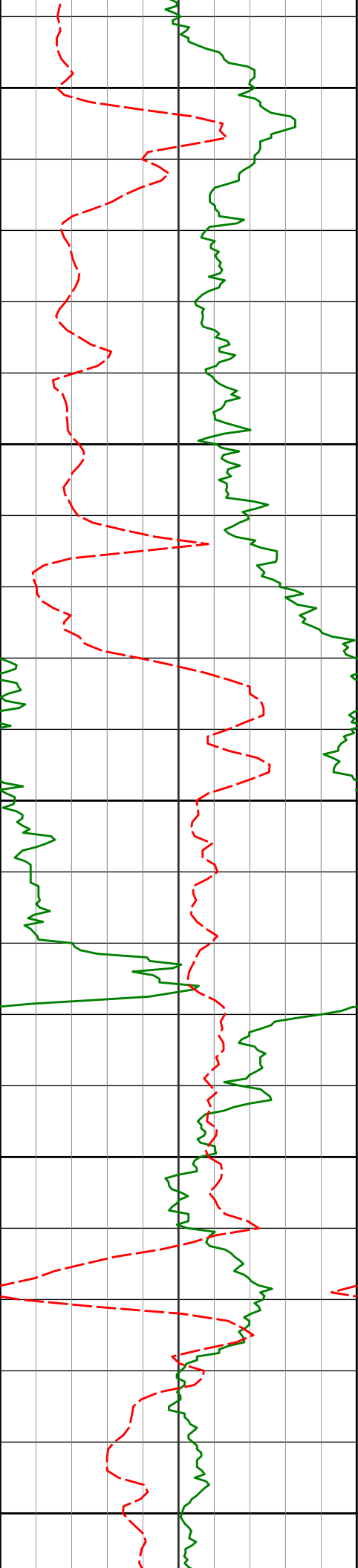
5624.30'

2975.05'

8200

8250

8300



8350

8350'

90.74°

90.90°

5620.88'

3164.99'

8400

8450

8445'

91.17°

90.30°

5619.30'

3259.97'

8500

8550

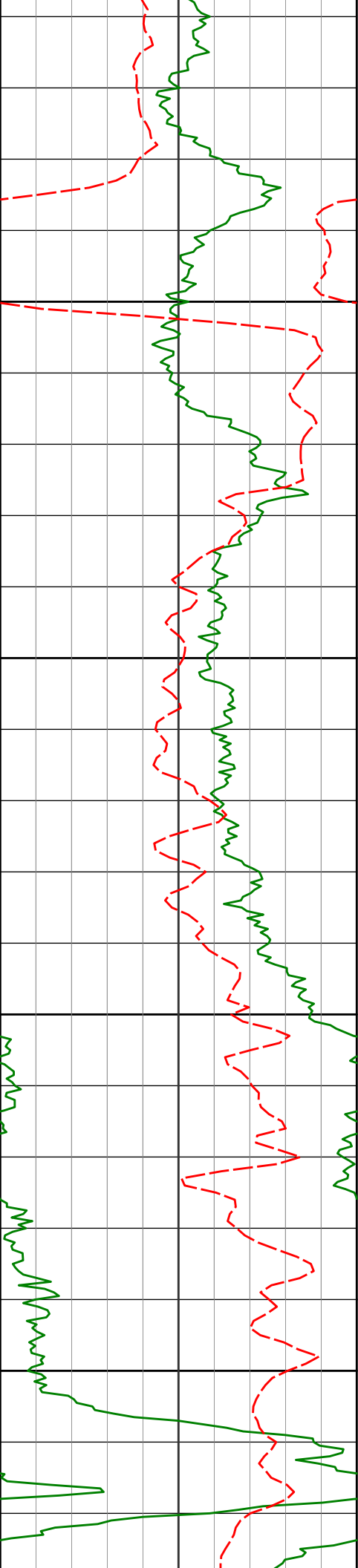
8539'

91.76°

90.07°

5616.90'

3353.94'



8600

8634'

89.26°

89.33°

5616.05'

3448.93'

8650

8700

8729'

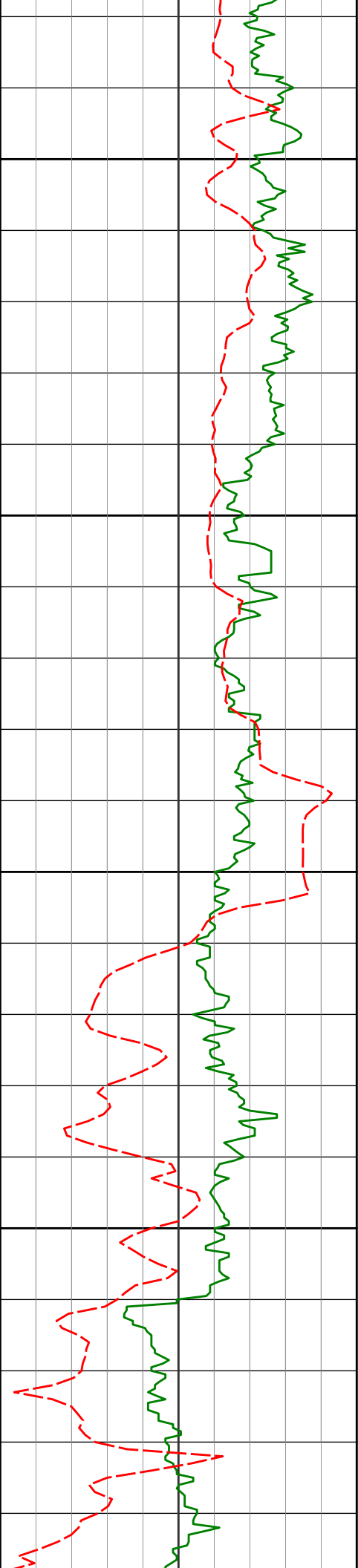
89.60°

89.32°

5617.00'

3543.91'

8750



8800

8823'

89.97°

89.14°

5617.35'

3637.90'

8850

8900

8918'

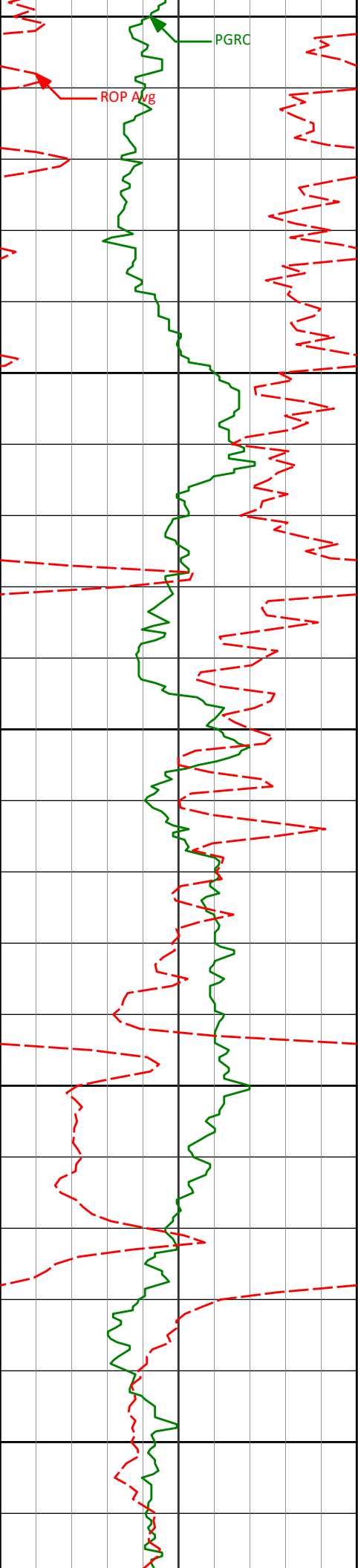
87.57°

89.09°

5619.40'

3732.85'

8950



9000

9013'

87.66°

88.21°

5623.36'

3827.73'

9050

9100

9108'

88.37°

89.05°

5626.65'

3922.64'

9150

9200

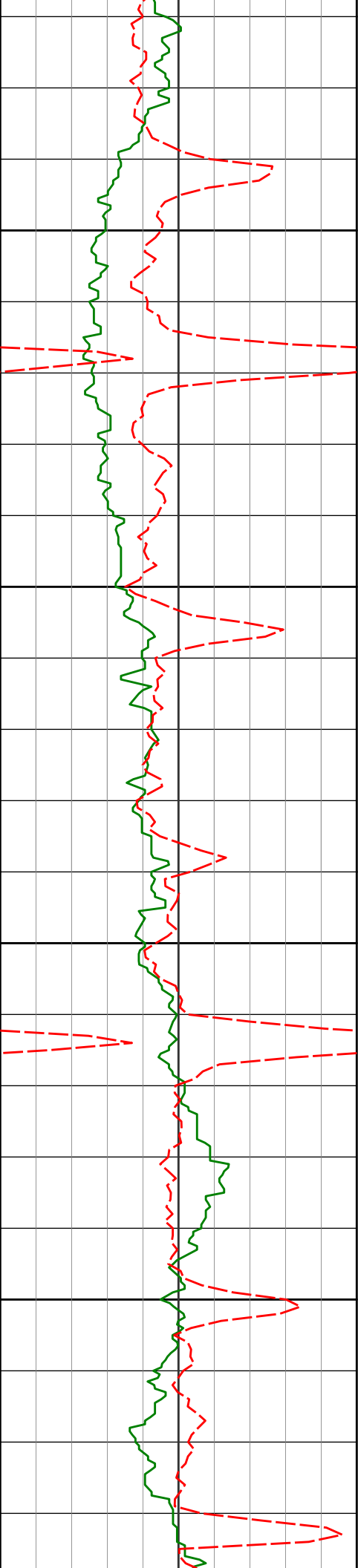
9203'

88.74°

89.08°

5629.05'

4017.59'



9250

9300

9350

9400

9298'

88.74°

88.42°

5631.14'

4112.53'

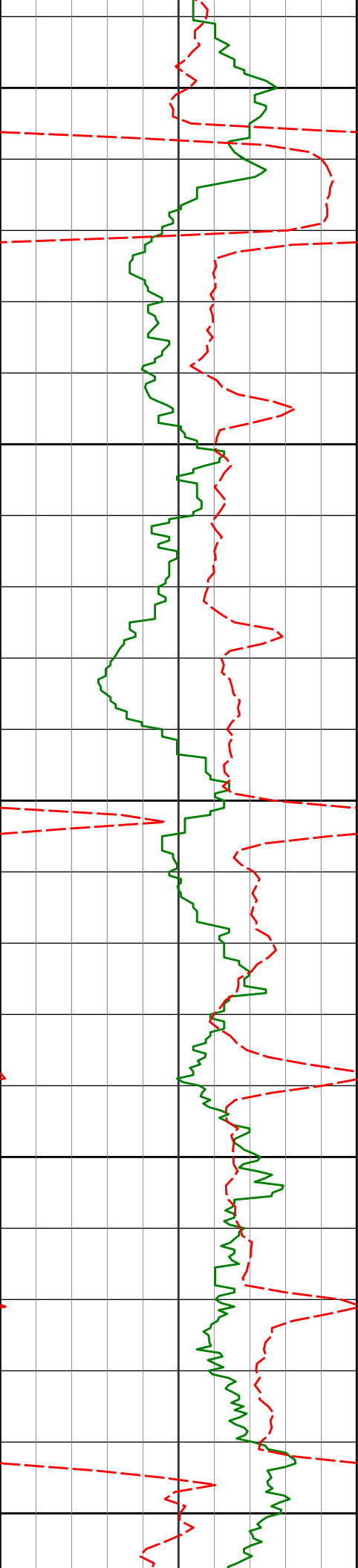
9393'

88.74°

88.18°

5633.24'

4207.46'



9450

9487'

90.99°

88.50°

5633.47'

4301.40'

9500

9550

9582'

91.45°

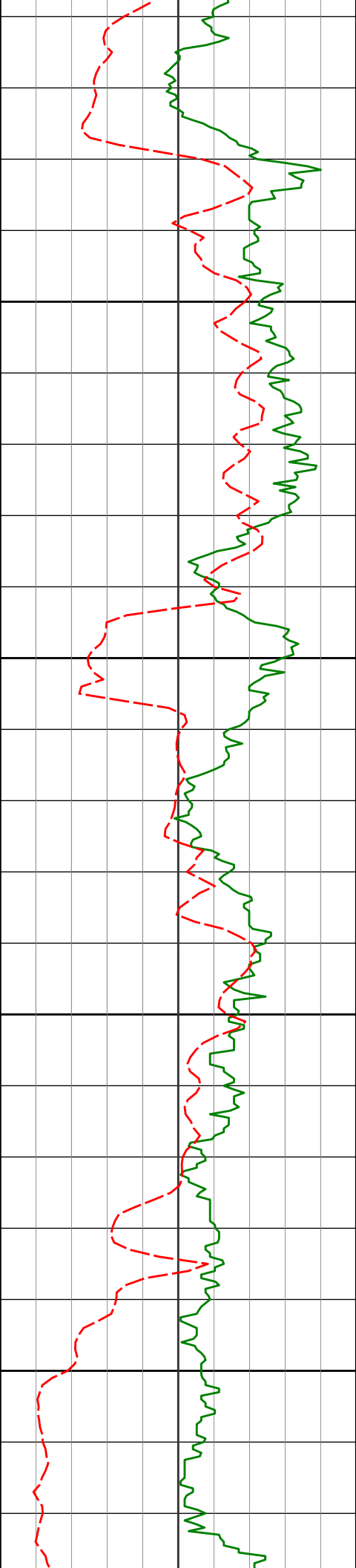
88.56°

5631.45'

4396.34'

9600

9650



9676'

92.00°

88.49°

5628.62'

4490.26'

9700

9750

9771'

92.28°

88.33°

5625.07'

4585.14'

9800

9850

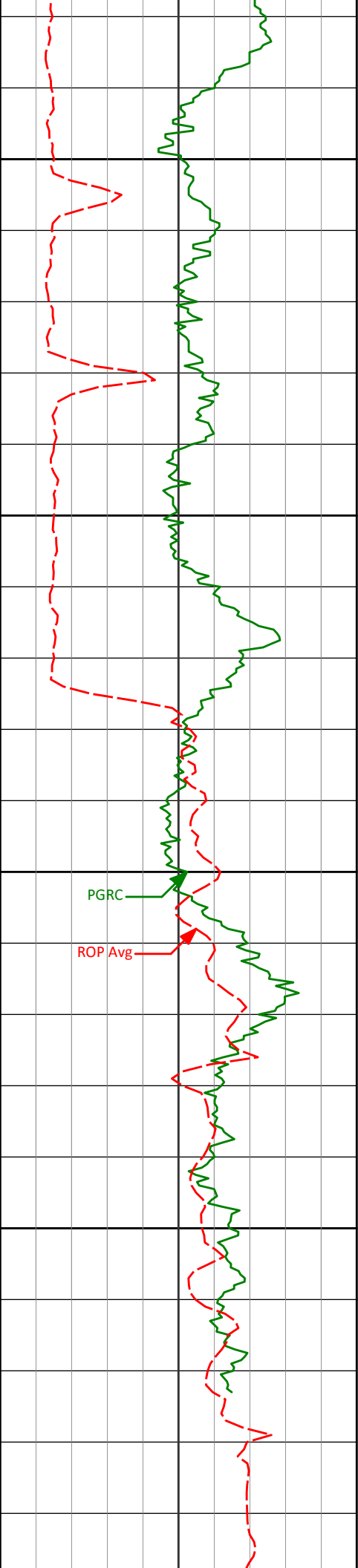
9866'

92.74°

88.31°

5620.91'

4680.00'



9900

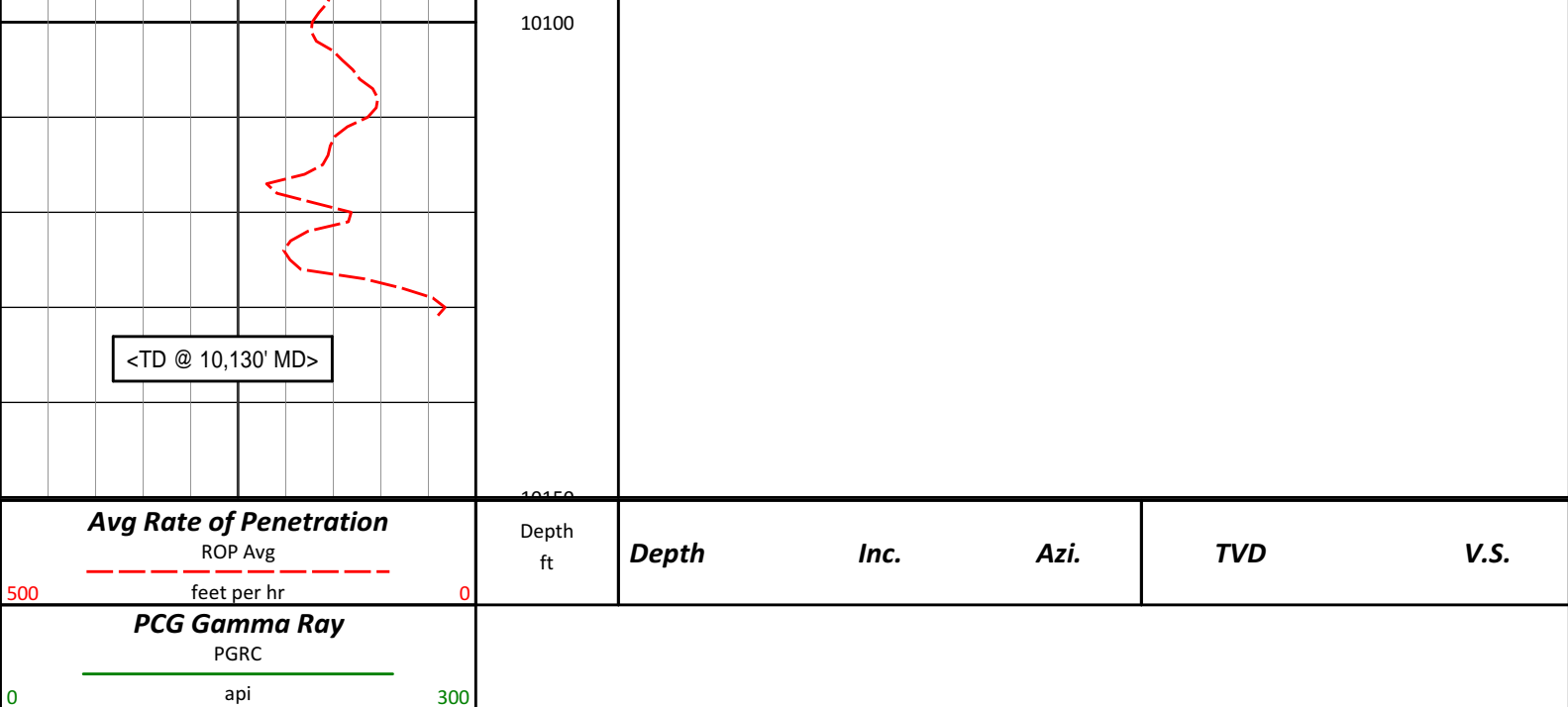
9950

10000

10050

9961'	93.42°	87.73°	5615.81'	4774.79'
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10065'	93.48°	87.85°	5609.54'	4878.51'
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HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Rohn State LD10-62HN
Wattenberg
Weld Colorado
USA
CA-XX-0901742658

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
380.00	0.20	293.17	380.00	0.26 N	0.61 W	-0.61	0.05
745.00	0.30	253.77	745.00	0.24 N	2.11 W	-2.11	0.05
1209.00	0.80	337.77	1208.98	2.90 N	4.50 W	-4.51	0.18
1283.00	0.36	55.39	1282.98	3.51 N	4.51 W	-4.52	1.09
1376.00	0.40	85.49	1375.97	3.71 N	3.94 W	-3.96	0.22
1469.00	0.56	47.38	1468.97	4.04 N	3.29 W	-3.30	0.37
1562.00	0.41	27.93	1561.97	4.64 N	2.79 W	-2.81	0.24
1747.00	0.29	218.33	1746.97	4.86 N	2.78 W	-2.79	0.38
1840.00	2.07	139.62	1839.94	3.39 N	1.84 W	-1.85	2.18
1933.00	3.23	112.73	1932.85	1.10 N	1.67 E	1.66	1.80
2026.00	5.82	110.02	2025.55	1.52 S	8.52 E	8.52	2.79
2119.00	7.63	111.40	2117.91	5.39 S	18.70 E	18.72	1.96
2212.00	8.24	102.66	2210.02	9.11 S	30.95 E	30.98	1.45
2305.00	7.81	101.49	2302.11	11.83 S	43.65 E	43.69	0.49
2398.00	7.20	98.49	2394.31	13.95 S	55.60 E	55.65	0.78
2582.00	8.18	96.60	2576.65	17.15 S	80.01 E	80.07	0.55
2677.00	7.76	97.01	2670.73	18.71 S	93.09 E	93.16	0.44
2772.00	7.10	97.05	2764.94	20.22 S	105.29 E	105.36	0.70
2867.00	5.92	91.83	2859.32	21.09 S	116.02 E	116.09	1.39
2962.00	5.31	88.60	2953.87	21.14 S	125.31 E	125.38	0.72
3057.00	5.08	83.43	3048.48	20.55 S	133.88 E	133.96	0.55
3152.00	4.83	84.05	3143.12	19.66 S	142.04 E	142.11	0.27
3246.00	3.17	61.70	3236.89	18.01 S	148.27 E	148.33	2.39
3436.00	0.87	44.49	3426.76	14.49 S	153.92 E	153.97	1.24
3531.00	0.92	45.60	3521.75	13.44 S	154.97 E	155.02	0.06
3721.00	0.07	18.00	3711.74	12.26 S	156.10 E	156.14	0.45
4005.00	0.55	111.28	3995.74	12.59 S	157.42 E	157.47	0.20
4100.00	0.55	117.36	4090.73	12.96 S	158.25 E	158.30	0.06
4290.00	0.39	84.90	4280.73	13.32 S	159.71 E	159.75	0.16

	4574.00	0.90	343.36	4564.72	11.11 S	160.05 E	160.08	0.37
	4669.00	0.51	26.22	4659.71	10.02 S	160.02 E	160.05	0.66
	4764.00	0.34	1.19	4754.71	9.36 S	160.21 E	160.24	0.26
	4859.00	0.35	2.09	4849.70	8.79 S	160.23 E	160.26	0.01
	4954.00	3.57	95.75	4944.64	8.79 S	163.18 E	163.21	3.80
	5002.00	8.27	98.31	4992.37	9.44 S	168.08 E	168.11	9.80
	5049.00	10.39	93.07	5038.75	10.16 S	175.66 E	175.69	4.86
	5097.00	12.83	87.11	5085.77	10.12 S	185.30 E	185.34	5.66
	5144.00	15.39	90.16	5131.35	9.88 S	196.75 E	196.79	5.68
	5192.00	18.14	93.71	5177.30	10.38 S	210.59 E	210.62	6.11
	5239.00	21.72	94.98	5221.48	11.61 S	226.56 E	226.60	7.67
	5287.00	25.20	95.94	5265.50	13.43 S	245.58 E	245.62	7.28
	5333.00	29.27	95.73	5306.40	15.57 S	266.52 E	266.57	8.86
	5381.00	33.50	96.58	5347.36	18.26 S	291.36 E	291.42	8.85
	5428.00	38.00	95.71	5385.50	21.18 S	318.66 E	318.73	9.64
	5476.00	42.18	96.47	5422.21	24.47 S	349.39 E	349.47	8.77
	5523.00	46.25	95.44	5455.89	27.86 S	381.98 E	382.07	8.79
	5571.00	51.16	95.16	5487.56	31.18 S	417.88 E	417.98	10.23
	5618.00	55.97	94.03	5515.46	34.20 S	455.56 E	455.67	10.43
	5666.00	61.54	93.17	5540.35	36.76 S	496.50 E	496.63	11.70
	5713.00	66.39	92.26	5560.97	38.76 S	538.67 E	538.80	10.46
	5761.00	71.18	90.49	5578.34	39.82 S	583.39 E	583.53	10.55
	5808.00	73.93	89.76	5592.43	39.91 S	628.22 E	628.36	6.04
	5856.00	76.40	90.14	5604.72	39.87 S	674.62 E	674.76	5.20
	5902.00	79.50	90.49	5614.32	40.12 S	719.60 E	719.74	6.78
	5936.00	81.81	90.71	5619.84	40.47 S	753.15 E	753.28	6.82
	6023.00	83.89	90.91	5630.67	41.70 S	839.46 E	839.60	2.41
	6113.00	85.72	88.96	5638.82	41.60 S	929.08 E	929.22	2.96
	6175.00	88.00	87.96	5642.22	39.93 S	990.96 E	991.09	4.02
	6268.00	90.06	89.05	5643.79	37.50 S	1083.91 E	1084.03	2.51
	6360.00	90.03	88.48	5643.72	35.51 S	1175.88 E	1176.00	0.62
	6452.00	89.82	88.10	5643.84	32.76 S	1267.84 E	1267.95	0.48
	6547.00	89.23	87.52	5644.63	29.13 S	1362.77 E	1362.86	0.86
	6642.00	92.53	88.66	5643.18	25.97 S	1457.69 E	1457.77	3.67
	6737.00	93.27	87.67	5638.38	22.93 S	1552.52 E	1552.59	1.30
	6831.00	92.53	90.37	5633.63	21.33 S	1646.38 E	1646.44	2.97
	6926.00	91.14	90.39	5630.59	21.96 S	1741.32 E	1741.39	1.46
	7021.00	90.37	89.46	5629.34	21.83 S	1836.31 E	1836.38	1.27
	7116.00	91.42	91.51	5627.86	22.63 S	1931.29 E	1931.36	2.42
	7211.00	91.82	91.72	5625.18	25.30 S	2026.22 E	2026.29	0.48
	7306.00	91.14	91.37	5622.72	27.86 S	2121.15 E	2121.23	0.80
	7401.00	89.11	89.60	5622.52	28.67 S	2216.14 E	2216.22	2.84
	7496.00	88.64	88.82	5624.39	27.35 S	2311.11 E	2311.19	0.96
	7591.00	90.15	88.87	5625.38	25.44 S	2406.08 E	2406.15	1.59
	7686.00	89.60	88.95	5625.59	23.63 S	2501.06 E	2501.13	0.59
	7780.00	89.66	91.06	5626.19	23.63 S	2595.06 E	2595.12	2.25
	7875.00	90.18	90.98	5626.32	25.32 S	2690.04 E	2690.11	0.56
	7970.00	89.48	90.55	5626.60	26.59 S	2785.03 E	2785.11	0.88
	8065.00	90.99	91.30	5626.22	28.12 S	2880.01 E	2880.09	1.78
	8160.00	91.32	91.57	5624.30	30.50 S	2974.96 E	2975.05	0.45
	8350.00	90.74	90.90	5620.88	34.59 S	3164.89 E	3164.99	0.47
	8445.00	91.17	90.30	5619.30	35.58 S	3259.87 E	3259.97	0.78
	8539.00	91.76	90.07	5616.90	35.89 S	3353.84 E	3353.94	0.67
	8634.00	89.26	89.33	5616.05	35.38 S	3448.82 E	3448.93	2.74
	8729.00	89.60	89.32	5617.00	34.26 S	3543.81 E	3543.91	0.36
	8823.00	89.97	89.14	5617.35	33.00 S	3637.80 E	3637.90	0.44
	8918.00	87.57	89.09	5619.40	31.53 S	3732.76 E	3732.85	2.53
	9013.00	87.66	88.21	5623.36	29.29 S	3827.65 E	3827.73	0.94
	9108.00	88.37	89.05	5626.65	27.02 S	3922.57 E	3922.64	1.16
	9203.00	88.74	89.08	5629.05	25.47 S	4017.52 E	4017.59	0.39
	9298.00	88.74	88.42	5631.14	23.39 S	4112.48 E	4112.53	0.69
	9393.00	88.74	88.18	5633.24	20.57 S	4207.41 E	4207.46	0.25
	9487.00	90.99	88.50	5633.47	17.84 S	4301.37 E	4301.40	2.42
	9582.00	91.45	88.56	5631.45	15.40 S	4396.31 E	4396.34	0.49
	9676.00	92.00	88.49	5628.62	12.98 S	4490.24 E	4490.26	0.59
	9771.00	92.28	88.33	5625.07	10.35 S	4585.14 E	4585.14	0.34
	9866.00	92.74	88.31	5620.91	7.57 S	4680.00 E	4680.00	0.48
	9961.00	93.42	87.73	5615.81	4.29 S	4774.81 E	4774.79	0.94
	10065.00	93.48	87.85	5609.54	0.29 S	4878.54 E	4878.51	0.13
	10130.00	93.48	87.85	5605.59	2.15 N	4943.38 E	4943.34	0.01

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 90.20 DEGREES (GRID)
A TOTAL CORRECTION OF 6.97 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10130.00 FEET
IS 4943.38 FEET ALONG 89.98 DEGREES (GRID)**

Surface surveys at 380 ft, 745 ft and 1209 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 10065 ft MD to TD at 10130 ft MD.

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