



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	10-Nov-13	11-Nov-13			
Rig Bit Number	1	3			
Bit Size (in)	8.75	8.75			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	796.94	5,942.91			
Log End Depth (TVD, ft)	5,942.91	6,710.57			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	10-Nov-13 00:30	10-Nov-13 03:30			
Drill/Wipe End Date and Time	10-Nov-13 16:45	11-Nov-13 16:00			
Min Inc (deg) @ Depth (TVD, ft)	.09 @ 5,791.93	3.88 @ 5,969.86			
Max Inc (deg) @ Depth (TVD, ft)	16.42 @ 2,958.87	80.29 @ 6,703.01			
Bit TFA(in2) / Bit Type	.91 / PDC	1.24 / PDC			
Flow Rate (gpm)	547.97	572.22			
Max AV (fpm) / CV (fpm) @ MWD	412.0 / 245.0	412.7 / 245.0			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.70 / 26.00	10.00 / 37.00			
Filtrate CL (ppm)	2,200.00	2,000.00			
pH / Fluid Loss (mptm)	9.00 / 42	9.50 / 13			
PV (cP) / YP (lbf2)	1 / 4.00	11 / 11.00			
% Solids / % Sand	2.20 / 0.20	10.5 / 0.20			
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:95			
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA			
Max Tool Temp (deg F) / S	148 / PCM	125.50 / PCM			

Max Tool Temp (degF) / Source	146 / PCM	165.58 / PCM			
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA			
Lead MWD Engineer	Gary Eifert	Gary Eifert			
Customer Representative	Matt Settles	Matt Settles			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341340	11341340			
Insert Serial Number	11400840	11400840			
Date and Time Initialized	09-Nov-13 13:19	01-Jan-70 00:00			
Date and Time Read	12-Nov-13 00:41	12-Nov-13 00:49			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	54.00			
Software Version	6.21	6.21			
Sub Serial Number	11341340	11341340			
Sonde Serial Number	11902117	11902117			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	250.84	21.80			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.55	47.55			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341340	11341340			
Insert/Sonde Serial Number	11579845	11579845			

REMARKS

1. All depths are true vertical bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.

2. No depth corrections have been made for pipe stretch or compression.

3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.

4. All data presented is recorded data unless otherwise specified.

5. The following smoothing parameters have been applied to the data:

PGRC (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

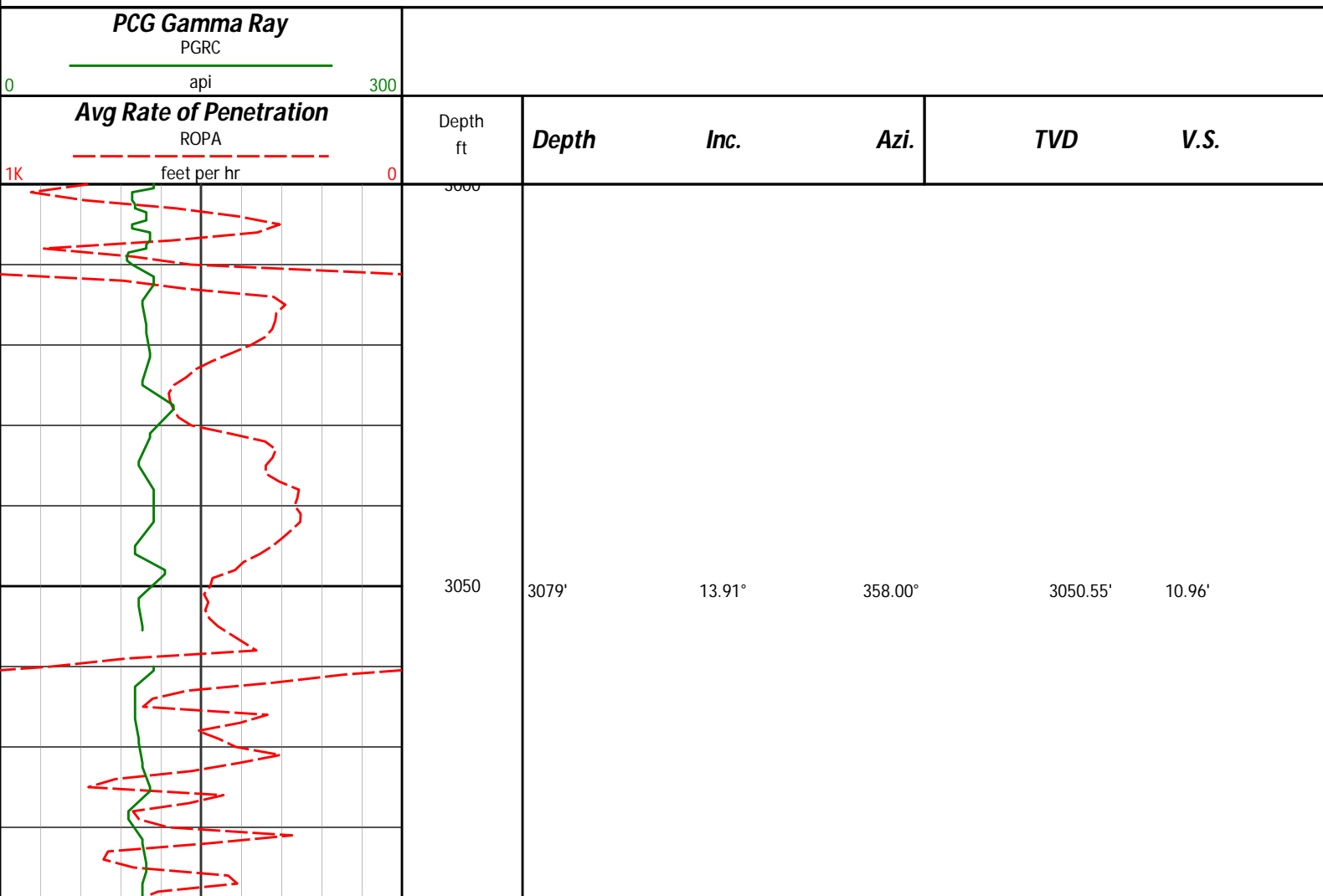
ROPA (Average Rate of Penetration)
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill: 3.0 ft

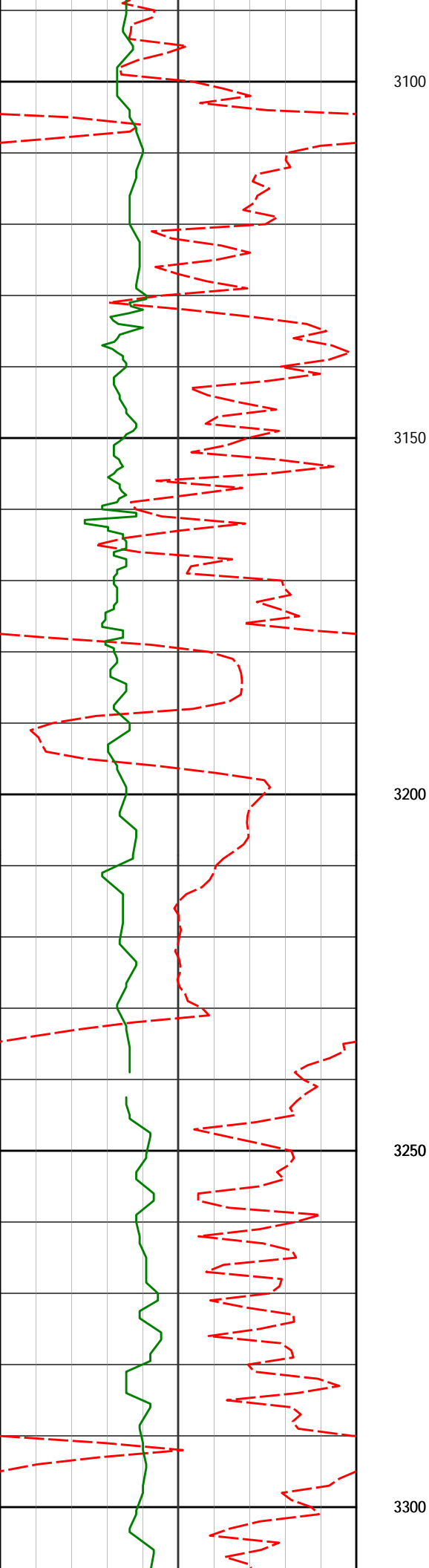
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HALLIBURTONSperry Drilling Services**TVD Detail Log 1:240**

Noble Energy
NCLP PC AA04-65HN
H&P 343
T6N-R63W





3174'

13.41°

356.96°

3142.86'

11.17'

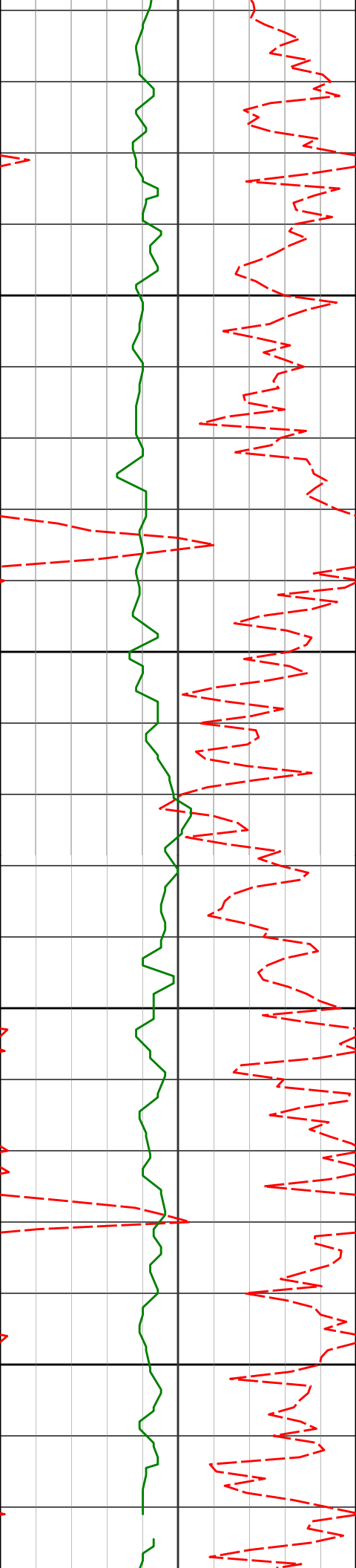
3268'

9.43°

358.56°

3234.99'

11.38'



3363'

8.54°

1.11°

3328.82'

12.11'

3350

3400

3458'

7.22°

1.52°

3422.92'

13.09'

3450

3500

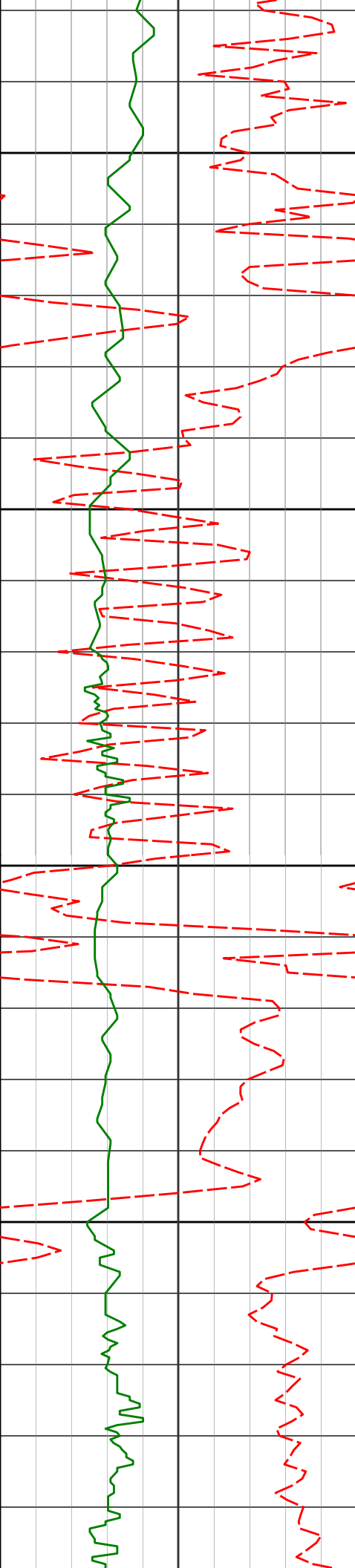
3553'

6.46°

10.45°

3517.25'

14.81'



3550

3600

3650

3700

3648'

7.29°

7.96°

3611.56'

17.20'

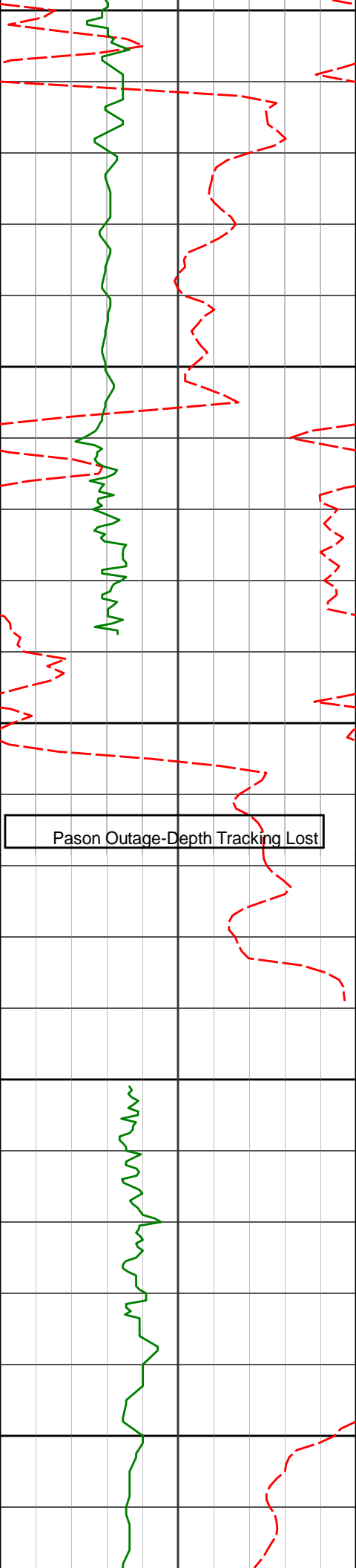
3742'

6.55°

1.55°

3704.88'

18.77'



3750

3800

3850

3900

3950

3837'

4.78°

350.88°

3799.41'

18.78'

3932'

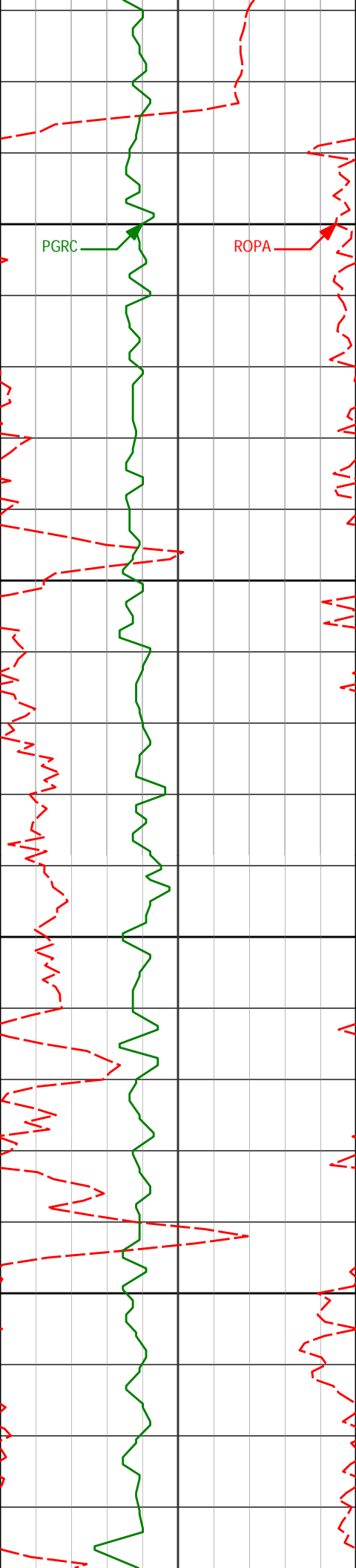
3.48°

331.38°

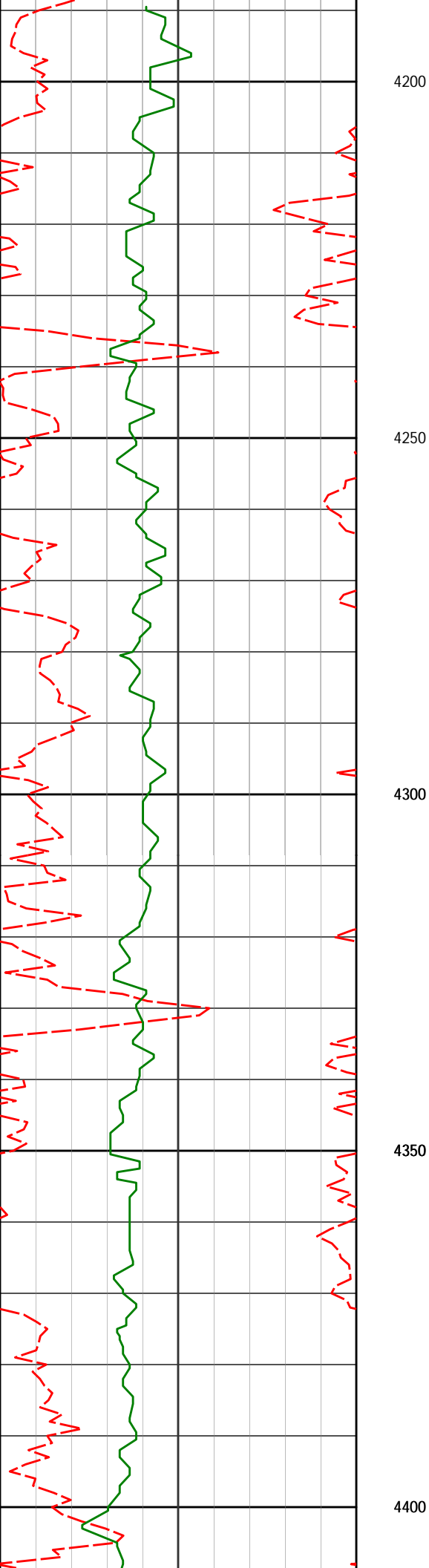
3894.17'

17.11'

Pason Outage-Depth Tracking Lost

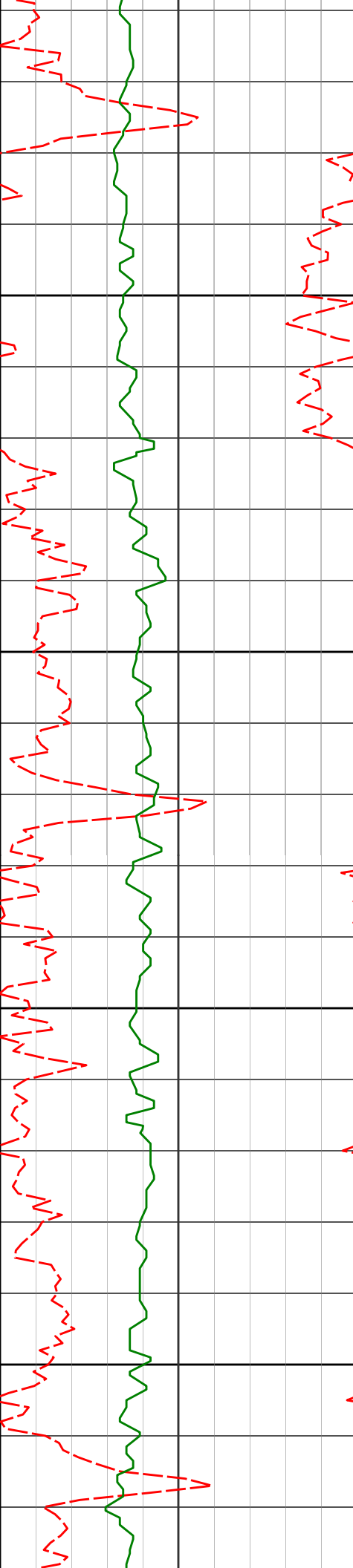


4028'	1.55°	248.58°	3990.09'	14.62'
4000				
4050				
4123'	1.25°	244.02°	4085.07'	12.45'
4100				
4150				
4217'	1.25°	228.26°	4179.04'	10.71'



4312'	1.11°	227.71°	4274.02'	9.18'
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4407'	0.57°	195.52°	4369.01'	8.32'
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4450

4502'

0.55°

187.60°

4464.01'

8.09'

4500

4550

4597'

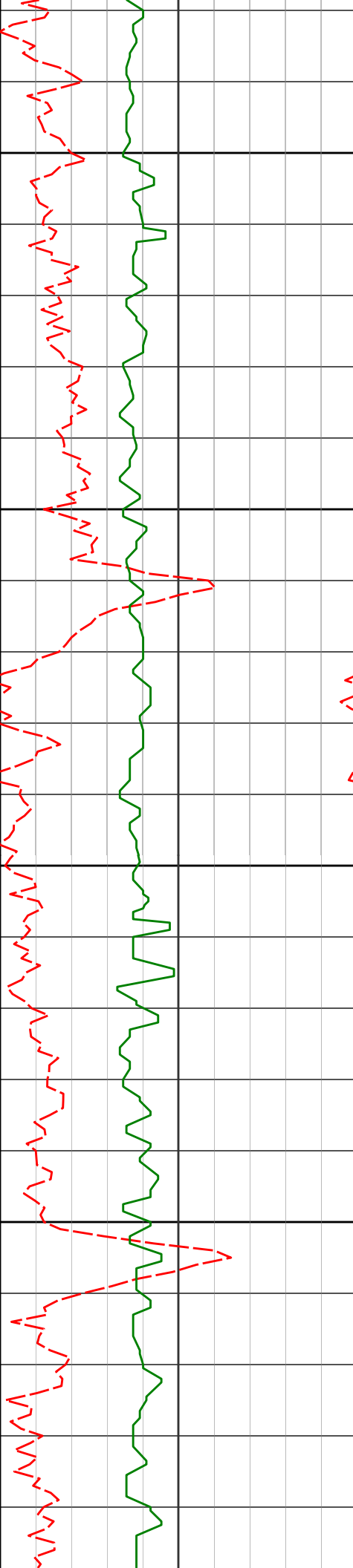
0.59°

204.48°

4559.00'

7.78'

4600



4650

4692'

0.83°

206.45°

4654.00'

7.21'

4700

4750

4787'

1.17°

201.93°

4748.98'

6.47'

4800

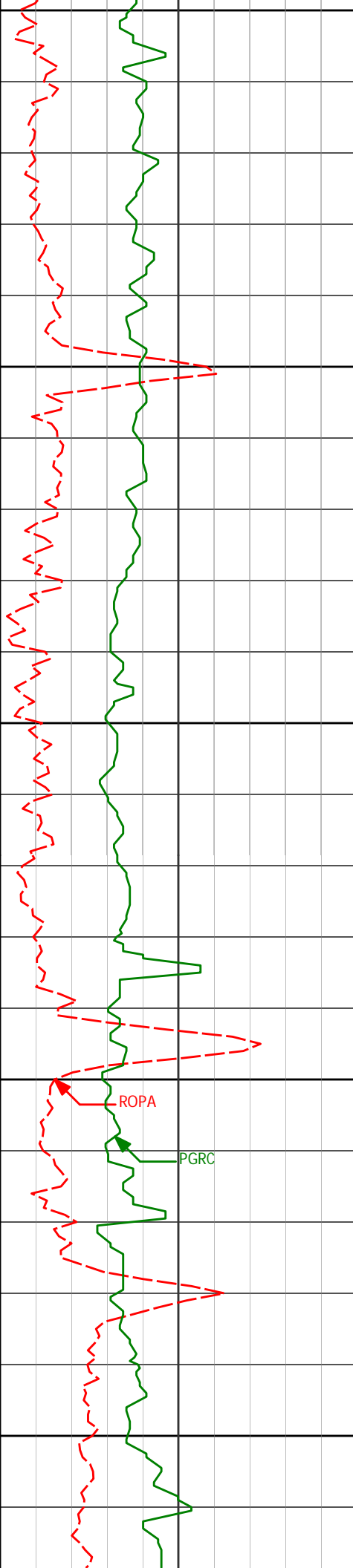
4881'

0.71°

227.06°

4842.97'

5.61'



4850

4900

4950

5000

5050

4976'

0.34°

207.82°

4937.97'

5.02'

ROPA

PGRC

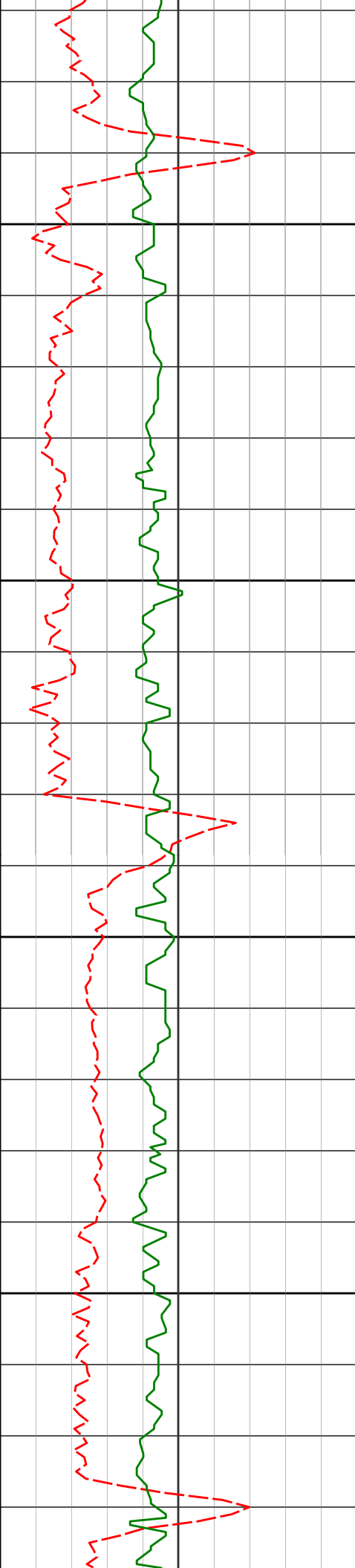
5071'

0.34°

220.49°

5032.96'

4.68'



5100

5150

5200

5250

5166'

0.36°

252.62°

5127.96'

4.20'

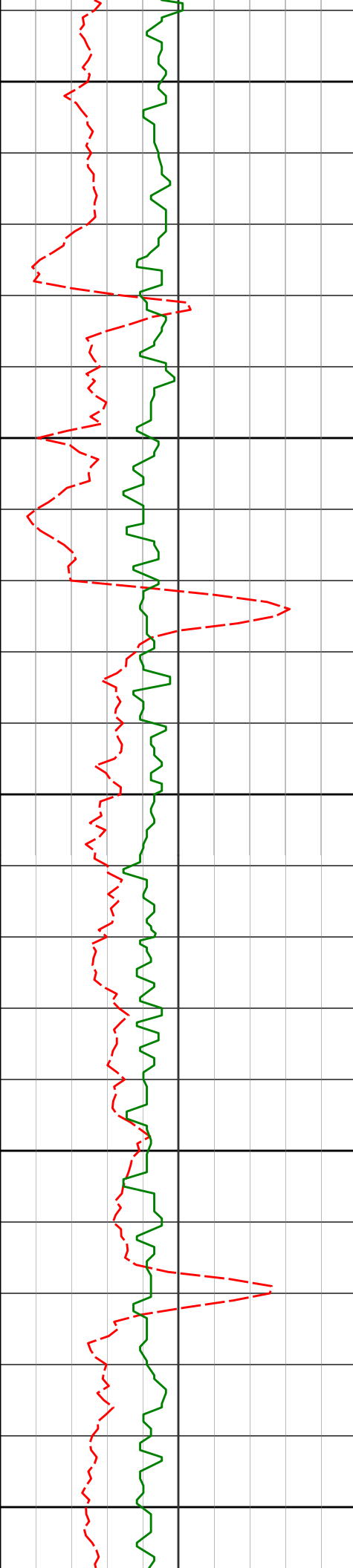
5261'

1.00°

222.12°

5222.96'

3.32'



5300

5350

5400

5450

5500

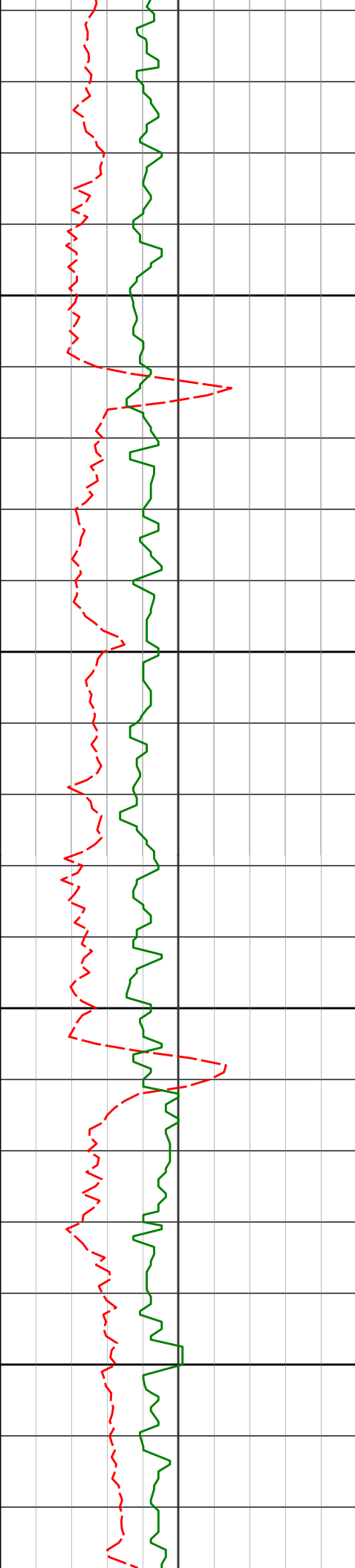
5450'

0.72°

196.83°

5411.94'

1.75'



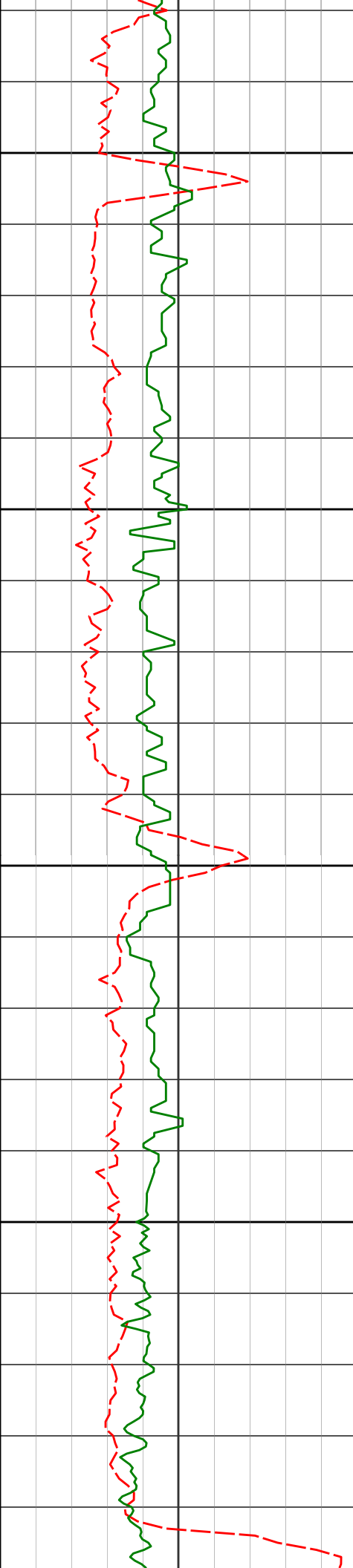
5550

5600

5650

5700

5640'	0.26°	137.28°	5601.93'	1.62'
5735'	0.19°	243.40°	5696.93'	1.61'



5750

5830'

0.09°

317.62°

5791.93'

1.42'

5800

5850

5925'

0.37°

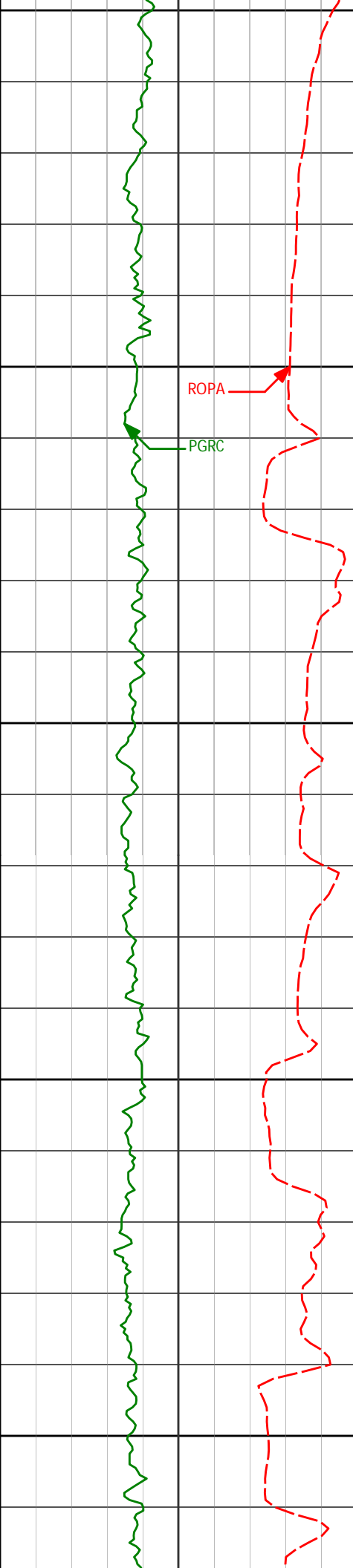
330.98°

5886.93'

1.24'

5900

Run 200



5950

6008'

3.88°

78.81°

5969.86'

3.90'

6000

6056'

8.58°

85.56°

6017.57'

9.09'

6050

6103'

12.05°

88.05°

6063.80'

17.50'

6100

6151'

15.56°

88.40°

6110.41'

28.95'

6150

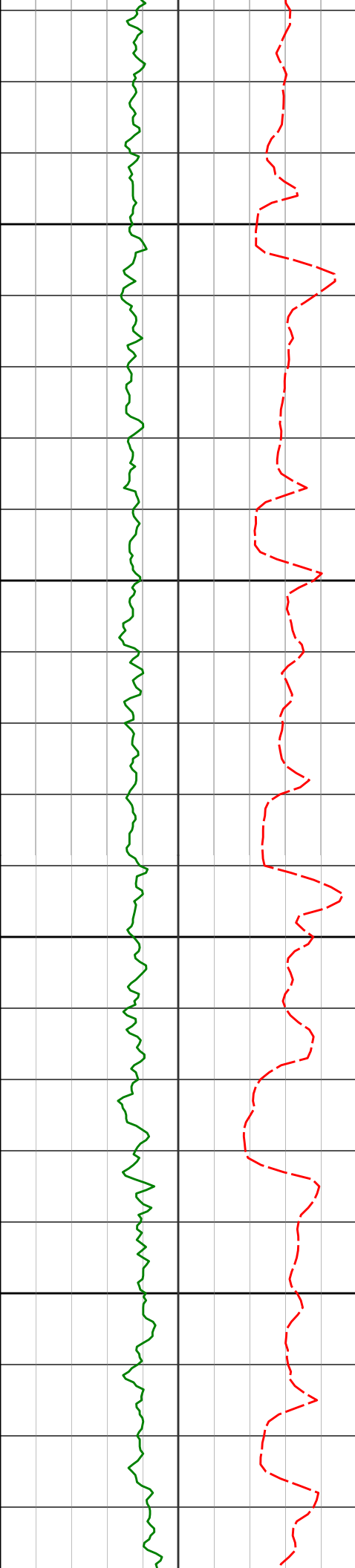
6197'

17.48°

83.13°

6154.51'

42.01'



6200

6245'

20.14°

83.09°

6199.94'

57.45'

6250

6292'

22.61°

88.37°

6243.71'

74.56'

6300

6340'

24.86°

92.52°

6287.65'

93.83'

6350

6387'

26.23°

90.54°

6330.06'

114.03'

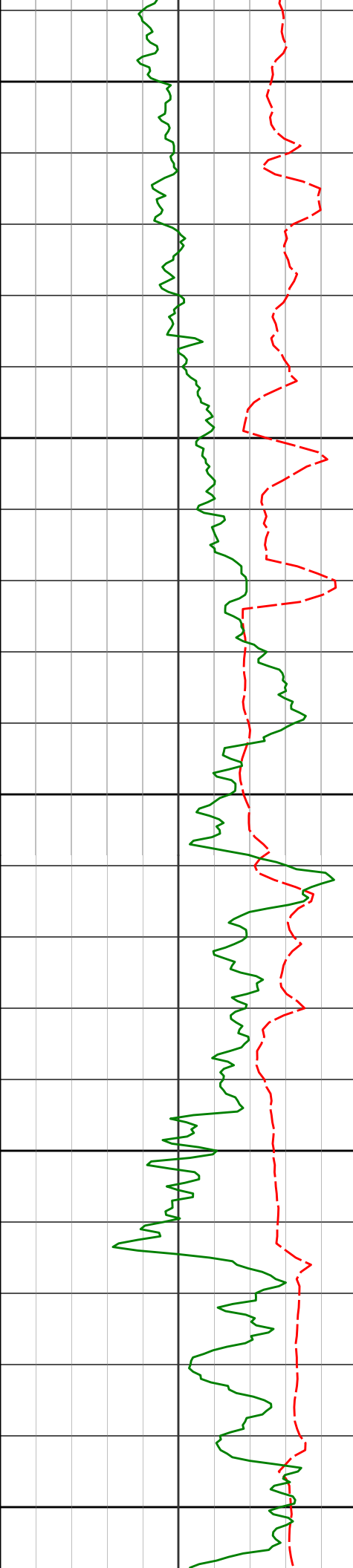
6435'

30.26°

88.50°

6372.33'

136.72'



6400

6482'

36.63°

85.88°

6411.53'

162.61'

6450

6576'

49.61°

88.10°

6480.00'

226.71'

6500

6671'

57.31°

88.47°

6536.52'

302.96'

6550

6719'

57.62°

87.88°

6562.34'

343.42'

6766'

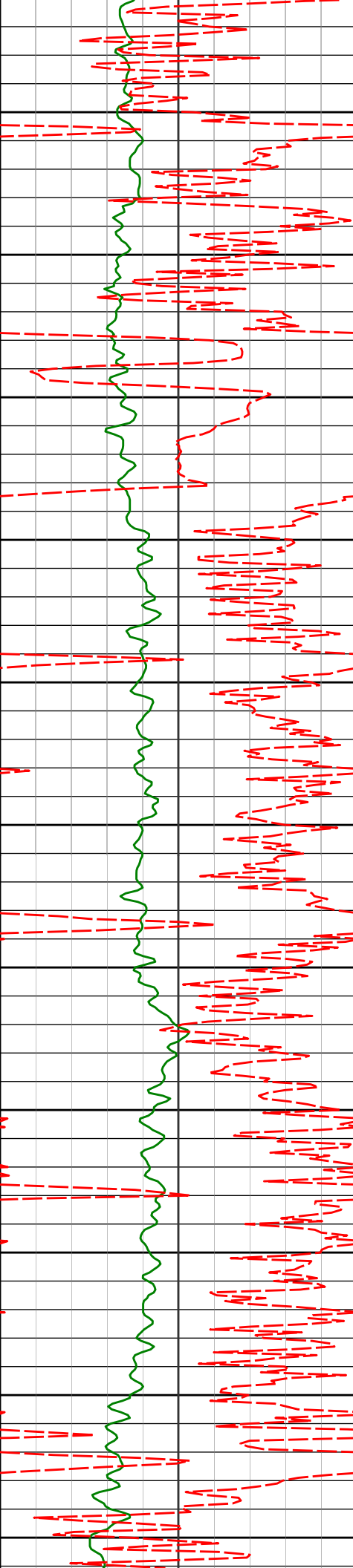
58.00°

87.50°

6587.38'

383.19'

6600



3100

3150

3200

3250

3300

3350

3400

3450

3500

3550

3600

3174'

13.41°

356.96°

3142.86'

11.17'

3268'

9.43°

358.56°

3234.99'

11.38'

3363'

8.54°

1.11°

3328.82'

12.11'

3458'

7.22°

1.52°

3422.92'

13.09'

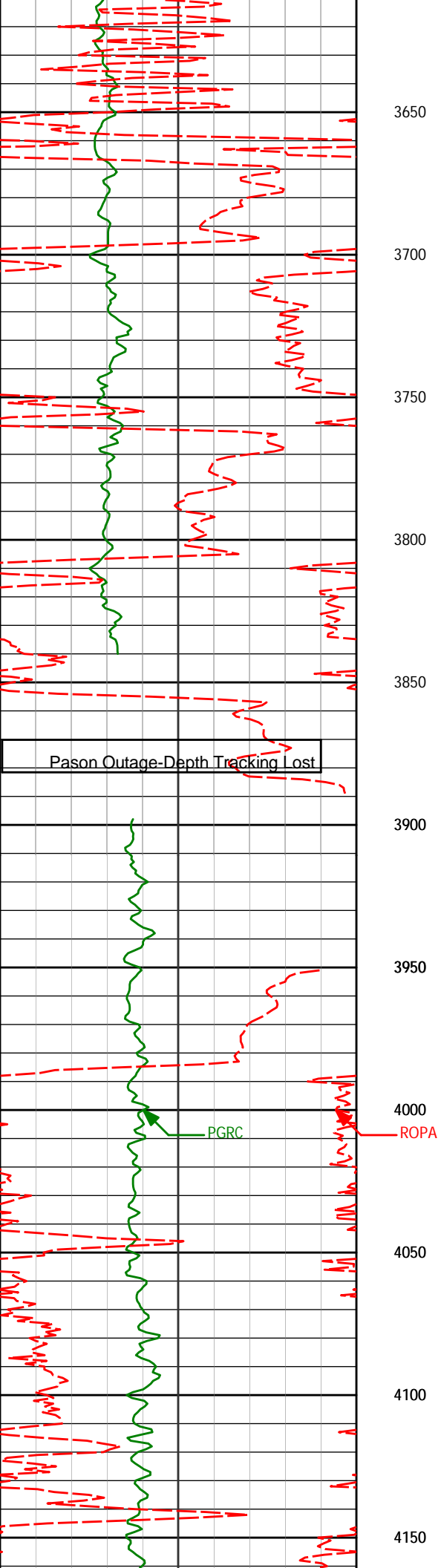
3553'

6.46°

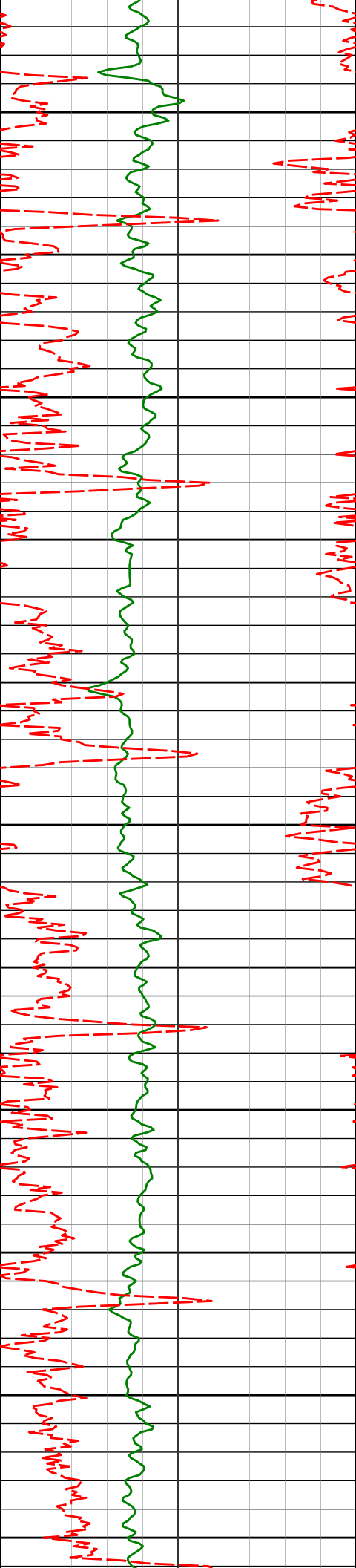
10.45°

3517.25'

14.81'



3648	7.29°	7.96°	3611.56'	17.20'
3742'	6.55°	1.55°	3704.88'	18.77'
3837'	4.78°	350.88°	3799.41'	18.78'
3932'	3.48°	331.38°	3894.17'	17.11'
4028'	1.55°	248.58°	3990.09'	14.62'
4123'	1.25°	244.02°	4085.07'	12.45'



4200

4250

4300

4350

4400

4450

4500

4550

4600

4650

4700

4217'

1.25°

228.26°

4179.04'

10.71'

4312'

1.11°

227.71°

4274.02'

9.18'

4407'

0.57°

195.52°

4369.01'

8.32'

4502'

0.55°

187.60°

4464.01'

8.09'

4597'

0.59°

204.48°

4559.00'

7.78'

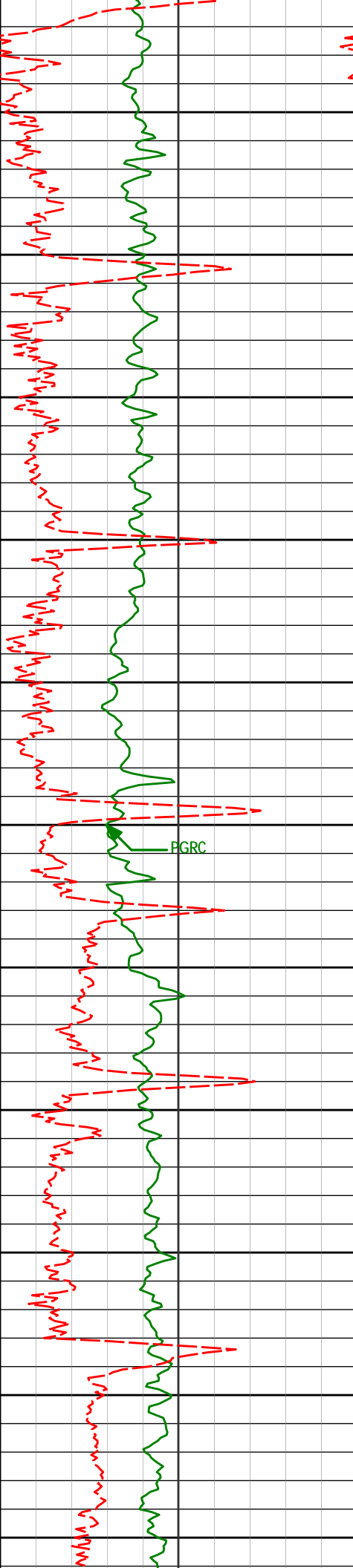
4692'

0.83°

206.45°

4654.00'

7.21'



4750

4787'

1.17°

201.93°

4748.98'

6.47'

4800

4850

4881'

0.71°

227.06°

4842.97'

5.61'

4900

4950

4976'

0.34°

207.82°

4937.97'

5.02'

5000

EGRC

5050

5071'

0.34°

220.49°

5032.96'

4.68'

5100

5150

5166'

0.36°

252.62°

5127.96'

4.20'

5200

5250

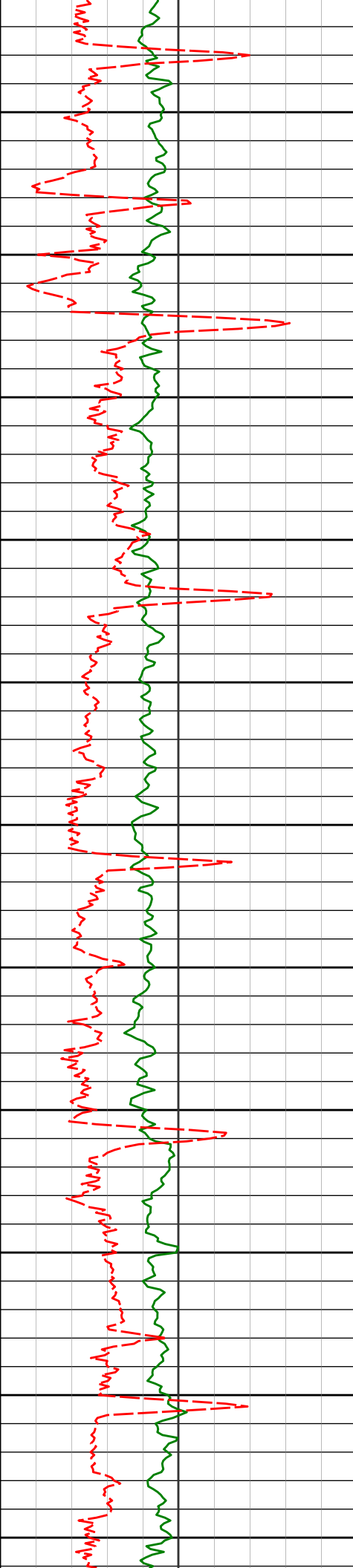
5261'

1.00°

222.12°

5222.96'

3.32'



5300

5350

5400

5450

5500

5550

5600

5650

5700

5750

5800

5450'

0.72°

196.83°

5411.94'

1.75'

5640'

0.26°

137.28°

5601.93'

1.62'

5735'

0.19°

243.40°

5696.93'

1.61'

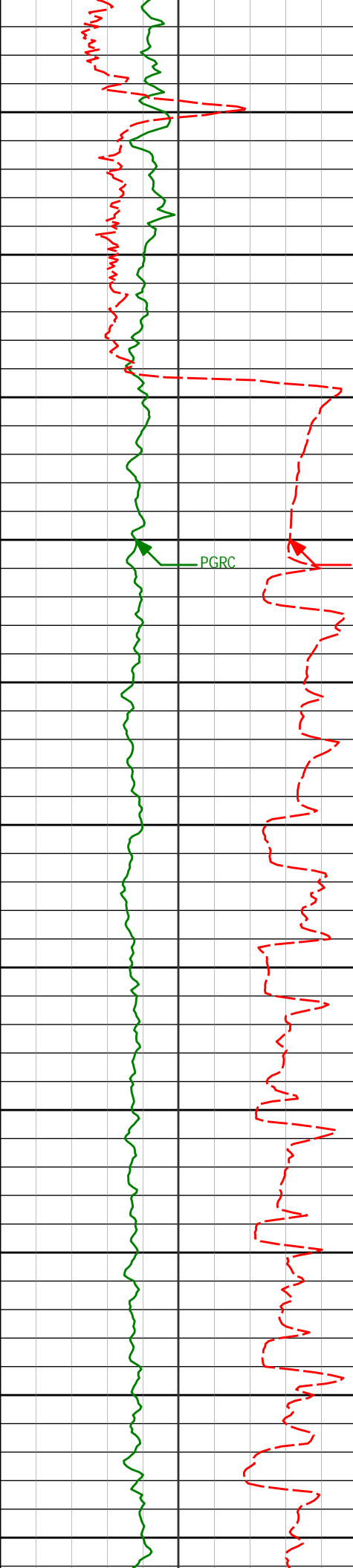
5830'

0.09°

317.62°

5791.93'

1.42'



5850

5900

5950

6000

6050

6100

6150

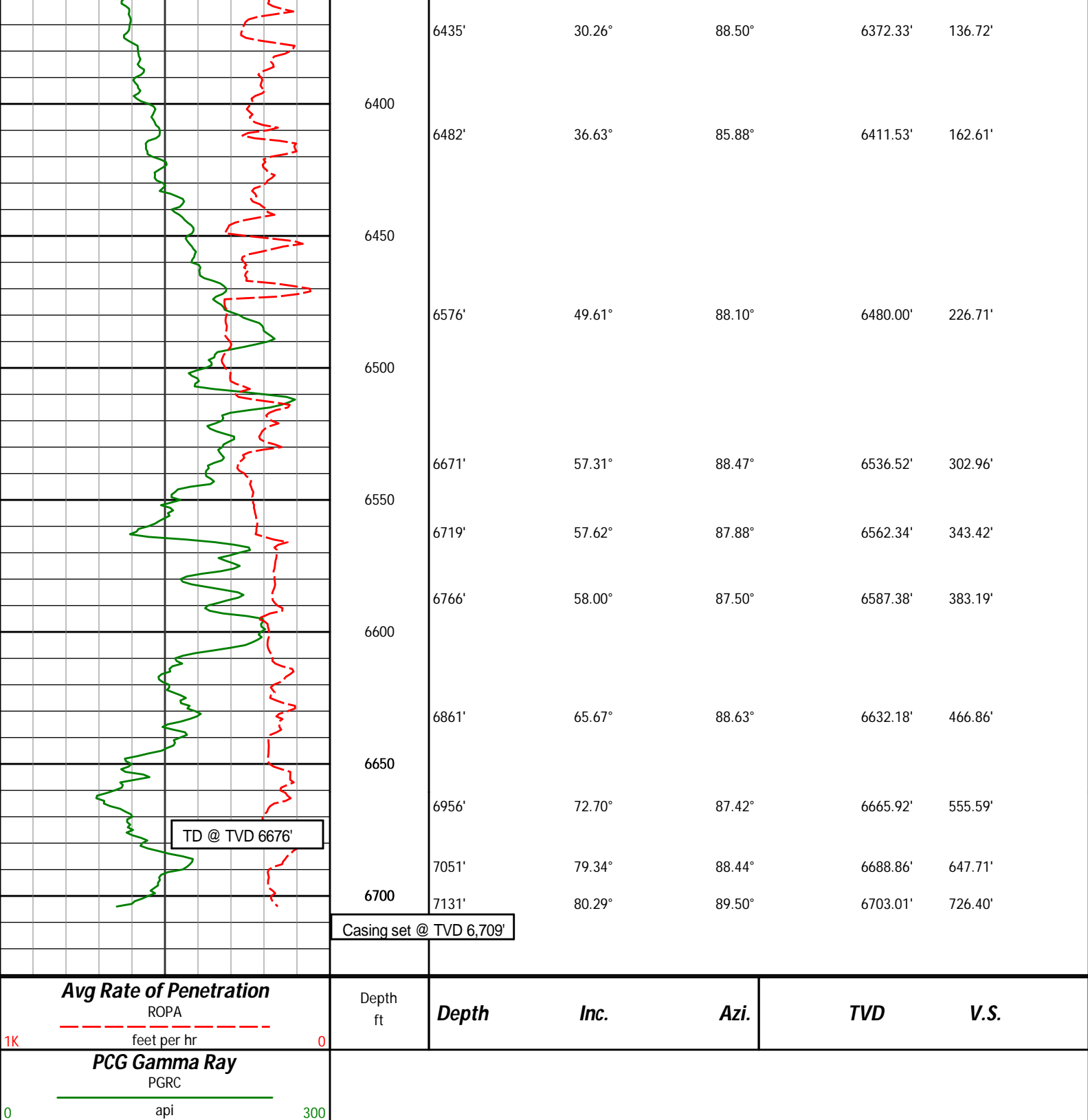
6200

6250

6300

6350

Run 200				
5925'	0.37°	330.98°	5886.93'	1.24'
6008'	3.88°	78.81°	5969.86'	3.90'
6056'	8.58°	85.56°	6017.57'	9.09'
6103'	12.05°	88.05°	6063.80'	17.50'
6151'	15.56°	88.40°	6110.41'	28.95'
6197'	17.48°	83.13°	6154.51'	42.01'
6245'	20.14°	83.09°	6199.94'	57.45'
6292'	22.61°	88.37°	6243.71'	74.56'
6340'	24.86°	92.52°	6287.65'	93.83'
6387'	26.23°	90.54°	6330.06'	114.03'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
NCLP PC AA04-65HN
Wattenberg
Weld Colorado
USA
CA-XX-0900859732

Measured Depth	Inclination	Direction	Vertical Depth	Latitude	Departure	Vertical Section	Dogleg
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0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
360.00	0.60	107.43	359.99	0.56 S	1.80 E	1.77	0.17
762.00	1.20	152.83	761.95	4.94 S	5.73 E	5.46	0.22
907.00	2.25	159.47	906.88	8.96 S	7.42 E	6.94	0.74
1001.00	1.87	101.41	1000.83	10.99 S	9.57 E	8.98	2.16
1094.00	2.00	12.78	1093.79	9.71 S	11.42 E	10.89	2.91
1186.00	2.12	351.74	1185.73	6.46 S	11.53 E	11.17	0.83
1279.00	2.08	349.84	1278.67	3.09 S	10.98 E	10.80	0.09
1374.00	2.36	355.03	1373.60	0.55 N	10.51 E	10.52	0.36
1469.00	2.33	351.89	1468.52	4.41 N	10.07 E	10.29	0.14
1564.00	2.72	357.44	1563.43	8.58 N	9.70 E	10.13	0.48
1659.00	2.70	355.61	1658.32	13.06 N	9.42 E	10.10	0.09
1754.00	2.94	355.47	1753.21	17.72 N	9.06 E	9.98	0.25
1848.00	2.62	353.96	1847.10	22.26 N	8.64 E	9.81	0.35
1943.00	2.64	351.55	1942.00	26.58 N	8.09 E	9.49	0.12
2038.00	5.09	355.53	2036.77	32.95 N	7.44 E	9.17	2.59
2133.00	6.51	347.47	2131.29	42.41 N	5.95 E	8.18	1.72
2228.00	8.81	351.22	2225.43	54.86 N	3.67 E	6.56	2.48
2322.00	11.23	357.12	2317.99	71.12 N	2.11 E	5.86	2.79
2417.00	14.07	357.14	2410.68	91.89 N	1.07 E	5.92	2.99
2606.00	13.76	357.06	2594.13	137.28 N	1.23 W	6.03	0.16
2700.00	13.33	355.75	2685.52	159.26 N	2.61 W	5.81	0.56
2794.00	15.86	1.50	2776.48	182.91 N	3.08 W	6.60	3.10
2889.00	16.41	0.36	2867.74	209.30 N	2.65 W	8.42	0.67
2984.00	16.42	0.28	2958.87	236.15 N	2.50 W	9.98	0.03
3079.00	13.91	358.00	3050.55	260.99 N	2.83 W	10.96	2.72
3174.00	13.41	356.96	3142.86	283.41 N	3.82 W	11.17	0.59
3268.00	9.43	358.56	3234.99	302.00 N	4.59 W	11.38	4.25
3363.00	8.54	1.11	3328.82	316.83 N	4.65 W	12.11	1.03
3458.00	7.22	1.52	3422.92	329.85 N	4.35 W	13.09	1.39
3553.00	6.46	10.45	3517.25	341.07 N	3.23 W	14.81	1.37
3648.00	7.29	7.96	3611.56	352.30 N	1.42 W	17.20	0.93
3742.00	6.55	1.55	3704.88	363.56 N	0.45 W	18.77	1.14
3837.00	4.78	350.88	3799.41	372.89 N	0.93 W	18.78	2.16
3932.00	3.48	331.38	3894.17	379.33 N	2.94 W	17.11	2.00
4028.00	1.55	248.58	3990.09	381.41 N	5.55 W	14.62	3.78
4123.00	1.25	244.02	4085.07	380.49 N	7.67 W	12.45	0.34
4217.00	1.25	228.26	4179.04	379.36 N	9.36 W	10.71	0.36
4312.00	1.11	227.71	4274.02	378.05 N	10.81 W	9.18	0.15
4407.00	0.57	195.52	4369.01	376.98 N	11.62 W	8.32	0.73
4502.00	0.55	187.60	4464.01	376.07 N	11.81 W	8.09	0.08
4597.00	0.59	204.48	4559.00	375.17 N	12.07 W	7.78	0.18
4692.00	0.83	206.45	4654.00	374.11 N	12.58 W	7.21	0.25
4787.00	1.17	201.93	4748.98	372.59 N	13.25 W	6.47	0.37
4881.00	0.71	227.06	4842.97	371.31 N	14.03 W	5.61	0.65
4976.00	0.34	207.82	4937.97	370.66 N	14.60 W	5.02	0.43
5071.00	0.34	220.49	5032.96	370.19 N	14.91 W	4.68	0.08
5166.00	0.36	252.62	5127.96	369.89 N	15.38 W	4.20	0.20
5261.00	1.00	222.12	5222.96	369.19 N	16.22 W	3.32	0.75
5450.00	0.72	196.83	5411.94	366.83 N	17.67 W	1.75	0.25
5640.00	0.26	137.28	5601.93	365.37 N	17.72 W	1.62	0.33
5735.00	0.19	243.40	5696.93	365.14 N	17.72 W	1.61	0.38
5830.00	0.09	317.62	5791.93	365.12 N	17.91 W	1.42	0.20
5925.00	0.37	330.98	5886.93	365.44 N	18.11 W	1.24	0.30
6008.00	3.88	78.81	5969.86	366.22 N	15.48 W	3.90	4.83
6056.00	8.58	85.56	6017.57	366.82 N	10.32 W	9.09	9.89
6103.00	12.05	88.05	6063.80	367.26 N	1.91 W	17.50	7.44
6151.00	15.56	88.40	6110.41	367.61 N	9.53 E	28.95	7.31
6197.00	17.48	83.13	6154.51	368.60 N	22.56 E	42.01	5.29
6245.00	20.14	83.09	6199.94	370.46 N	37.92 E	57.45	5.54
6292.00	22.61	88.37	6243.71	371.69 N	54.99 E	74.56	6.66
6340.00	24.86	92.52	6287.65	371.51 N	74.30 E	93.83	5.84
6387.00	26.23	90.54	6330.06	370.98 N	94.56 E	114.03	3.43
6435.00	30.26	88.50	6372.33	371.20 N	117.26 E	136.72	8.63
6482.00	36.63	85.88	6411.53	372.51 N	143.11 E	162.61	13.89
6576.00	49.61	88.10	6480.00	375.73 N	207.14 E	226.71	13.90
6671.00	57.31	88.47	6536.52	378.00 N	283.38 E	302.96	8.11

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 86.97 DEGREES (GRID)
A TOTAL CORRECTION OF 7.73 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6671.00 FEET
IS 472.43 FEET ALONG 36.86 DEGREES (GRID)

Surveys are tied into two non-Halliburton surveys at MD 360' and 762' taken while drilling the surface section.

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