



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	05-May-13	07-May-13			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	1,081.00	6,937.00			
Log End Depth (MD, ft)	6,937.00	7,856.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	04-May-13 05:45	06-May-13 02:00			
Drill/Wipe End Date and Time	05-May-13 12:20	07-May-13 00:45			
Min Inc (deg) @ Depth (MD, ft)	.32 @ 5,144.00	1.52 @ 6,955.00			
Max Inc (deg) @ Depth (MD, ft)	6.59 @ 4,284.00	85.31 @ 7,809.00			
Bit TFA(in2) / Bit Type	1.09 / PDC	.98 /			
Flow Rate (gpm)	590.79	537.67			
Max AV (fpm) / CV (fpm) @ MWD	500.5 / 76.3	466.1 / 376.3			
Fluid Type	Native/Spud Mud	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.40 / 30.00	9.75 / 42.00			
Filtrate CL (ppm)	1,400.00	1,200.00			
pH / Fluid Loss (mptm)	8.00 / 20	8.50 / 3			
PV (cP) / YP (Ihf2)	1 / 2.00	19 / 13.00			
% Solids / % Sand	0.40 / N/A	8.10 / N/A			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (deg F) / S	100.00 / 0.00	100.00 / 0.00			

Max Tool Temp (degF) / Source	163.20 / PCM	180.09 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 163.20	N/A @ 180.09			
Lead MWD Engineer	Evan LeBlanc	Evan LeBlanc			
Customer Representative	Jason Laub	Jason Laub			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341336	11341336			
Insert Serial Number	11227484	11227484			
Date and Time Initialized	02-May-13 23:14	05-May-13 15:07			
Date and Time Read	05-May-13 21:38	07-May-13 09:31			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	51.30	46.06			
Software Version	6.21	6.21			
Sub Serial Number	11341336	11341336			
Sonde Serial Number	10993273	10993273			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	252.54	181.07			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	56.25	51.01			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341336	11341336			
Insert/Sonde Serial Number	11680968	11680968			

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rotary table.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. All main log data was logged while drilling
5. Environmental parameters used to process Gamma Ray are as follows:
☐ Hole Size: 8.75"
☐ Mud Density: 8.4 to 10.1 ppg
6. The following smoothing parameters have been applied to the data:
☐ ROP: 0.5 ft interval, 1.2 ft coercion distance
☐ All other curves: 0.5 ft interval, 0.6 ft coercion distance

INSITE v7.4.10 Build 39

WARRANTY

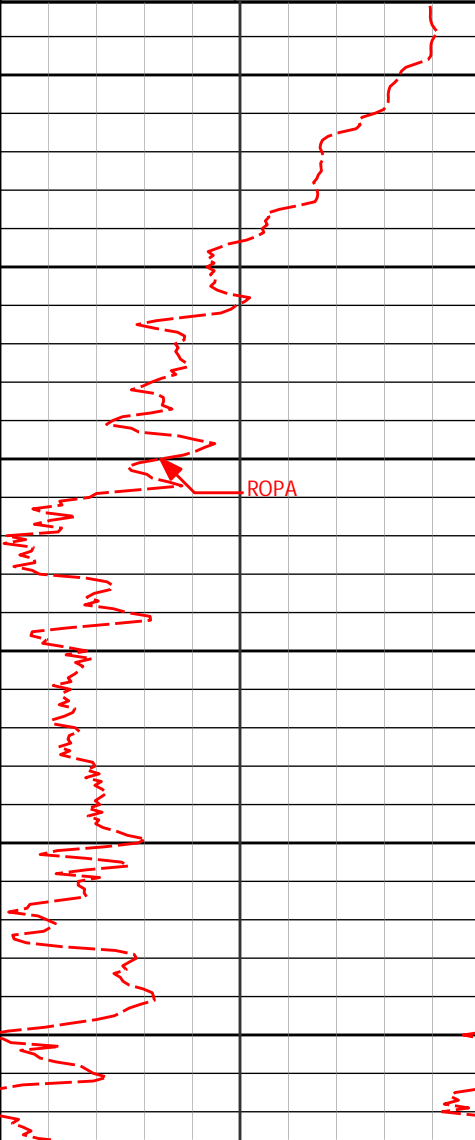
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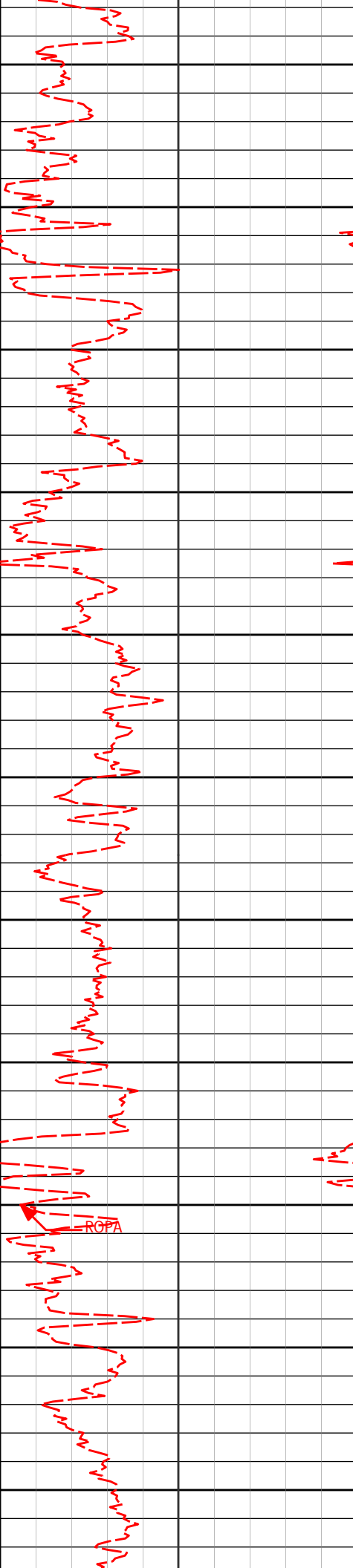
HALLIBURTON

Sperry Drilling Services

TVD Main Log 1:600

Anadarko Petroleum Corp.
Gobbler 2C-23HZ
Ensign 132
2N-66W

PCG Gamma Ray PGRC 0300 api						
Avg Rate of Penetration ROPA 1K0 feet per hr		Depth ft	Depth	Inc.	Azi.	TVDV.S.
		1100				
		1150				
		1200				
		1250	1250'	0.46°	212.75°	1249.96'1.10'
		1300				
		1350				



1400

1450

1500

1550

1600

1650

1700

1750

1800

1850

1900

1526'

0.36°

183.19°

1525.95'

-0.70'

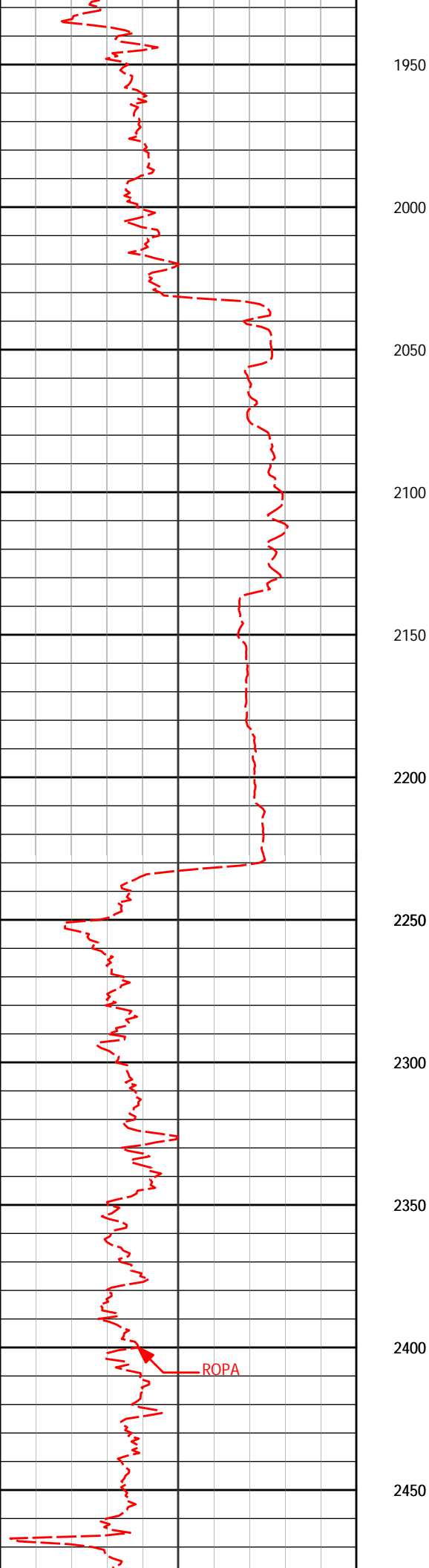
1802'

0.33°

200.38°

1801.95'

-2.32'



2086'

0.77°

265.44°

2085.93'

-3.25'

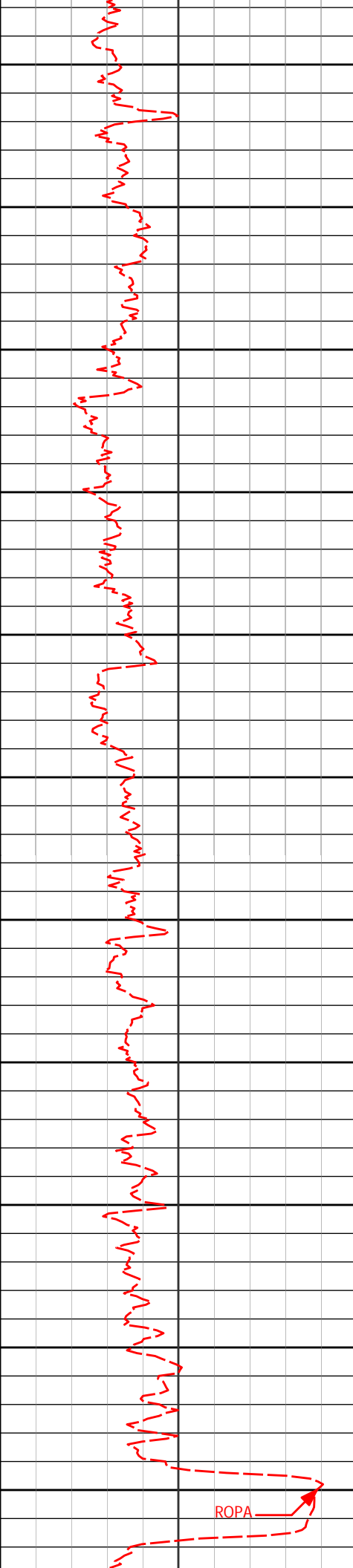
2373'

0.44°

331.46°

2372.92'

-2.44'



2500

2550

2600

2650

2700

2750

2800

2850

2900

2950

3000

2660'

0.41°

352.54°

2659.91'

-0.46'

2946'

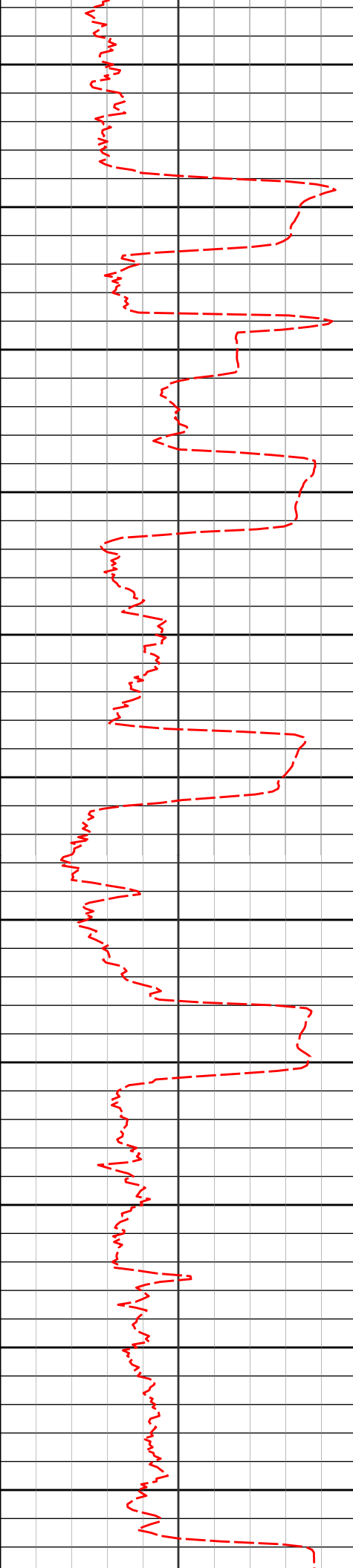
0.45°

196.97°

2945.91'

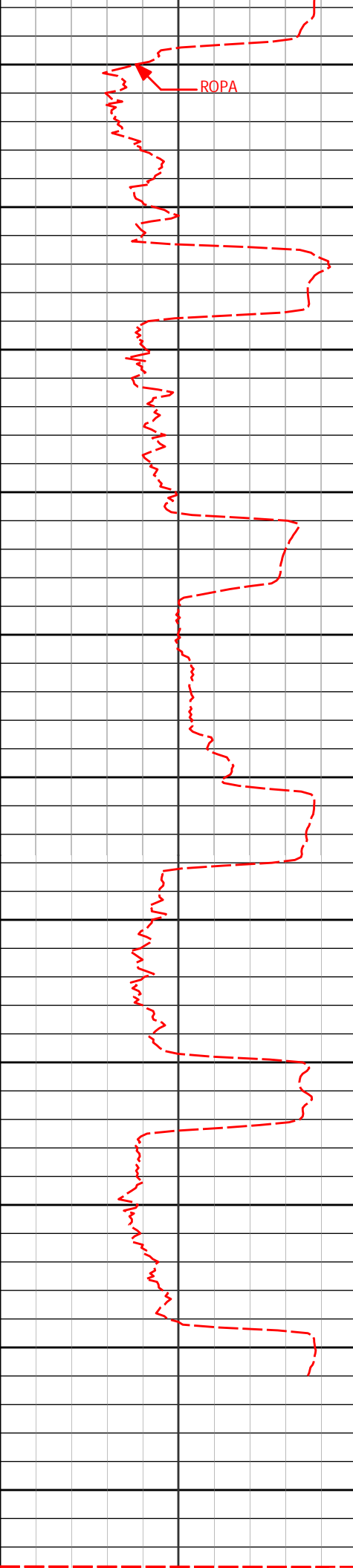
-0.52'

ROPA

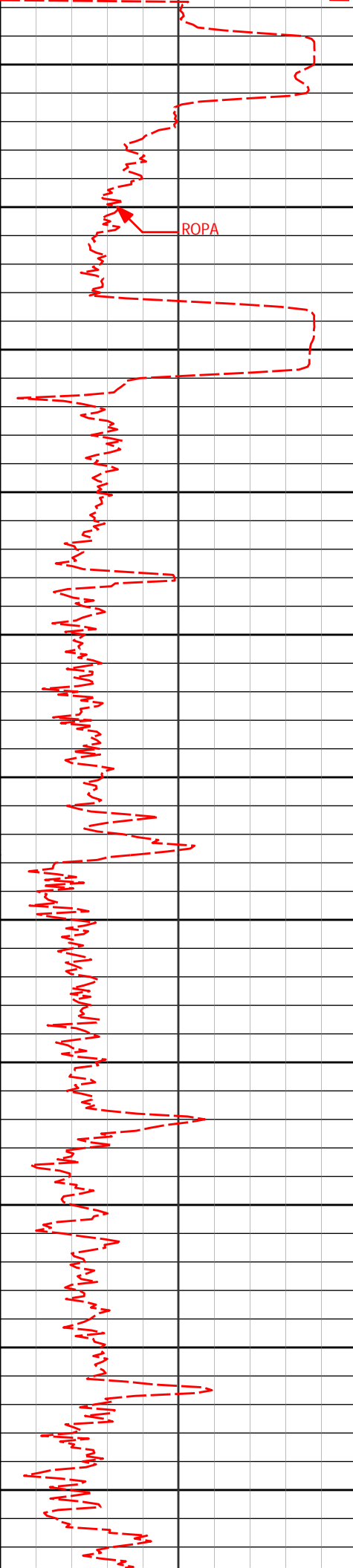


3050
3100
3150
3200
3250
3300
3350
3400
3450
3500
3550

3041'	1.64°	165.58°	3040.89'	-2.20'
3137'	2.98°	173.45°	3136.81'	-6.00'
3233'	4.39°	169.26°	3232.61'	-12.09'
3330'	5.17°	170.19°	3329.27'	-20.03'
3425'	6.55°	174.44°	3423.78'	-29.64'
3520'	5.35°	177.91°	3518.26'	-39.45'



3600	3615'	5.17°	168.85°	3612.86'	-48.07'
3650					
3700	3710'	5.12°	169.35°	3707.48'	-56.43'
3750					
3800	3806'	5.17°	162.03°	3803.10'	-64.74'
3850					
3900	3901'	5.75°	173.20°	3897.67'	-73.53'
3950					
4000	3996'	5.39°	169.86°	3992.22'	-82.64'
4050					
4100	4092'	5.80°	164.32°	4087.76'	-91.74'



4150

4188'

5.53°

159.28°

4183.29'

-100.72'

4200

ROPA

4250

4284'

6.59°

162.12°

4278.76'

-110.27'

4300

4350

4379'

6.56°

165.51°

4373.13'

-120.69'

4400

4450

4475'

5.65°

162.29°

4468.59'

-130.49'

4500

4550

4570'

4.28°

168.10°

4563.23'

-138.40'

4600

4650

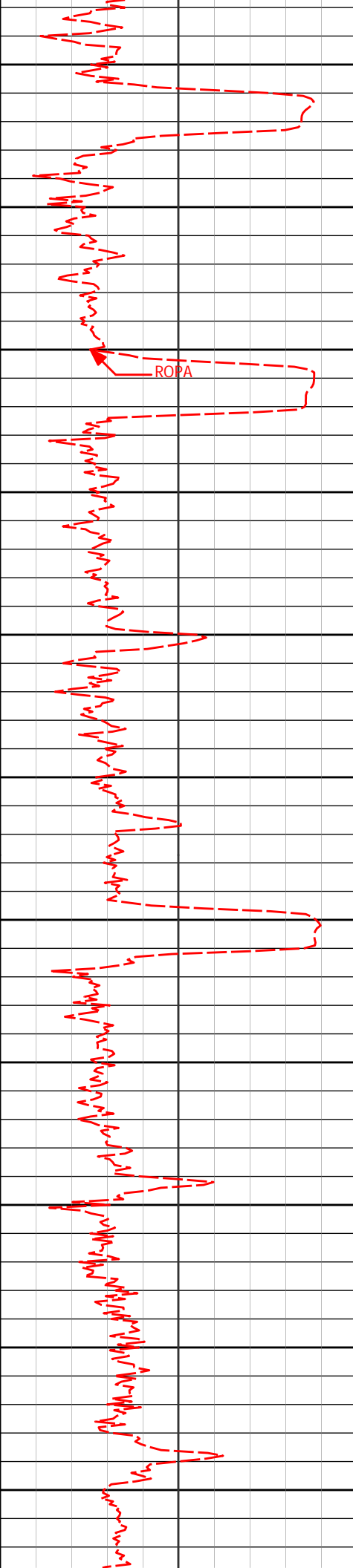
4666'

4.01°

174.57°

4658.98'

-145.24'



4700

4750

4800

4850

4900

4950

5000

5050

5100

5150

5200

4762'

2.80°

178.06°

4754.81'

-150.93'

4857'

1.63°

182.35°

4849.73'

-154.59'

4953'

1.30°

201.03°

4945.70'

-156.98'

5048'

0.71°

226.85°

5040.69'

-158.39'

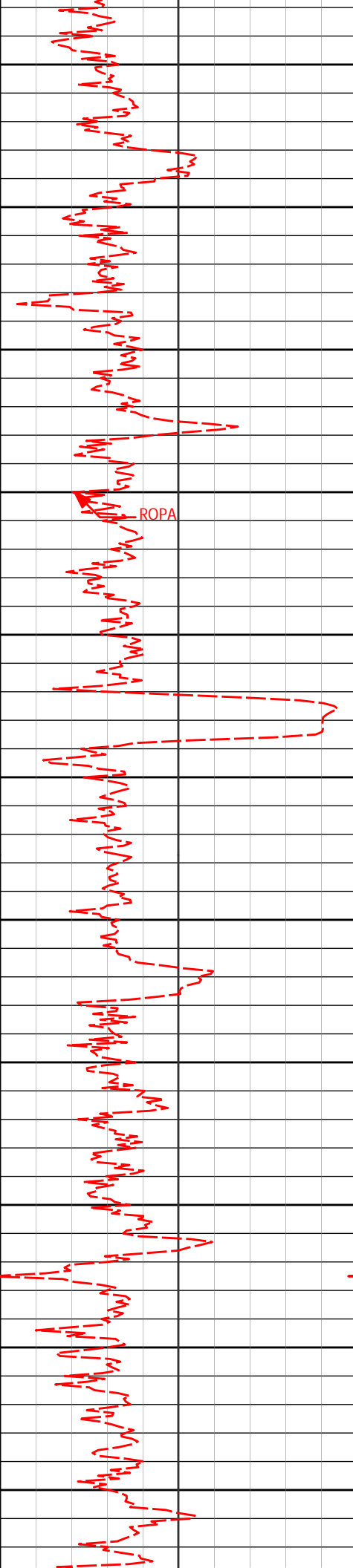
5144'

0.32°

305.72°

5136.68'

-158.64'



5250

5300

5350

5400

5450

5500

5550

5600

5650

5700

5750

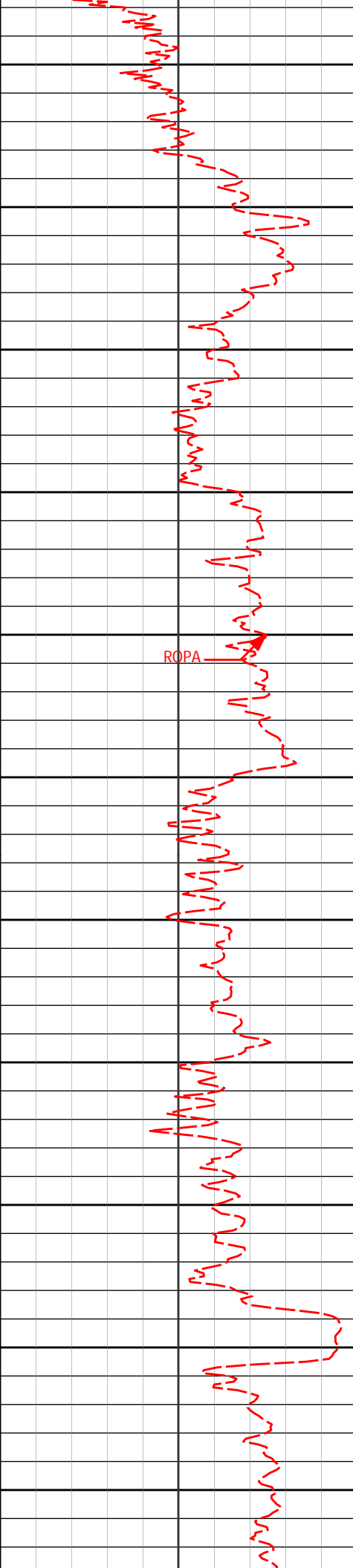
5428'

1.14°

336.80°

5420.66'

-155.59'



5800

5811'

0.97°

328.02°

5803.60'

-149.36'

5850

5900

5950

6000

ROPA

6050

6100

6150

6193'

1.23°

3.71°

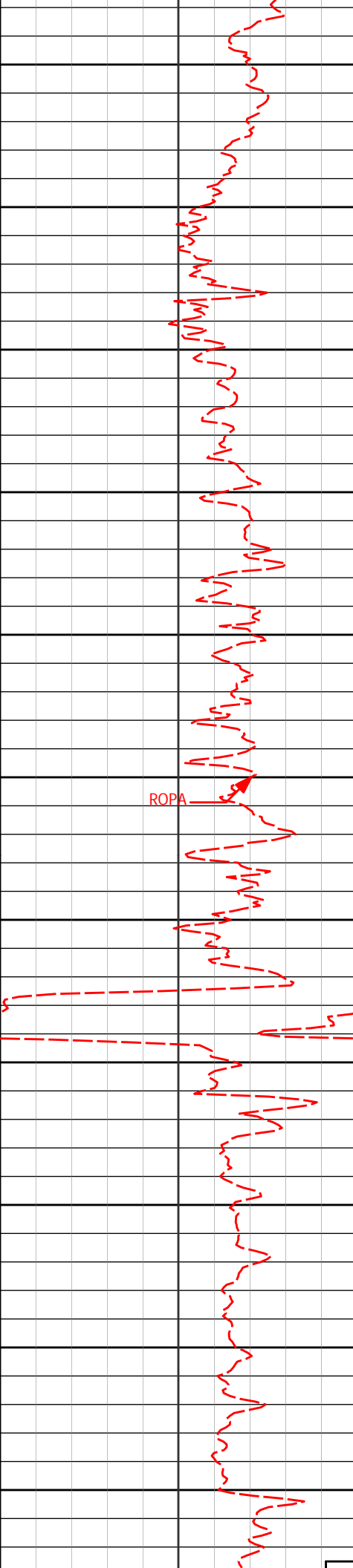
6185.53'

-142.53'

6200

6250

6300



6350

6400

6450

6500

6550

6600

6650

6700

6750

6800

6850

6573'

0.69°

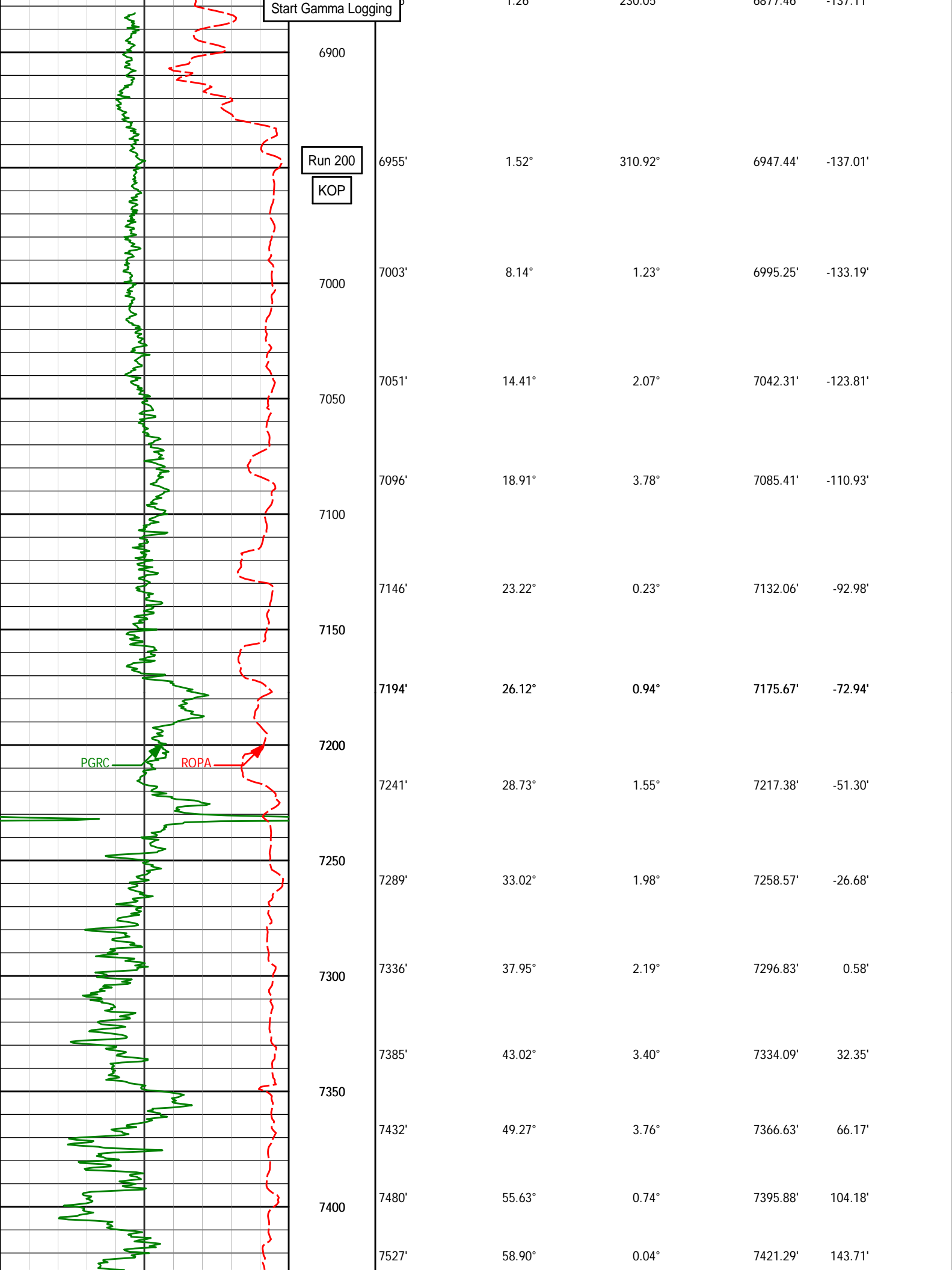
31.45°

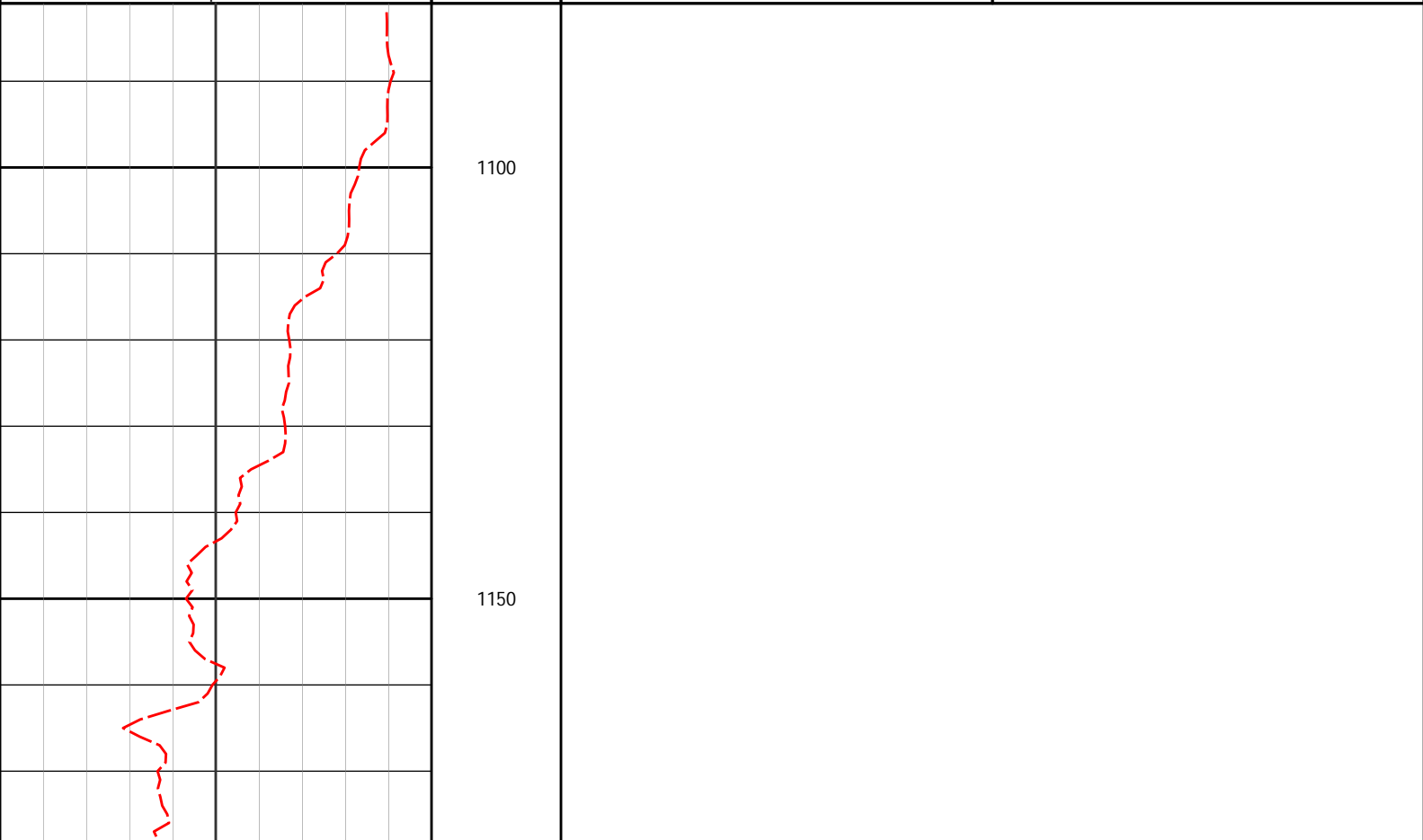
6565.48'

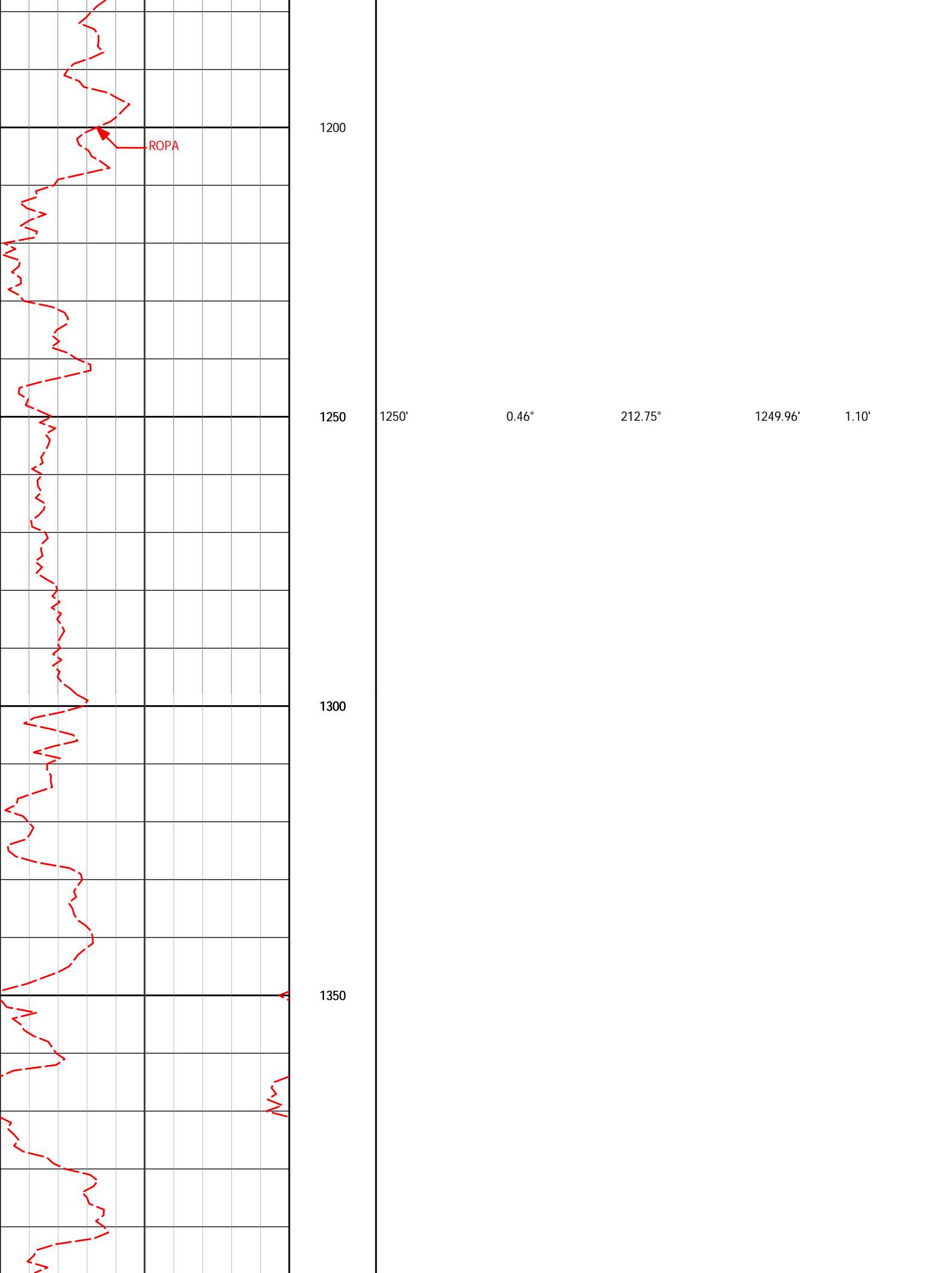
-136.50'

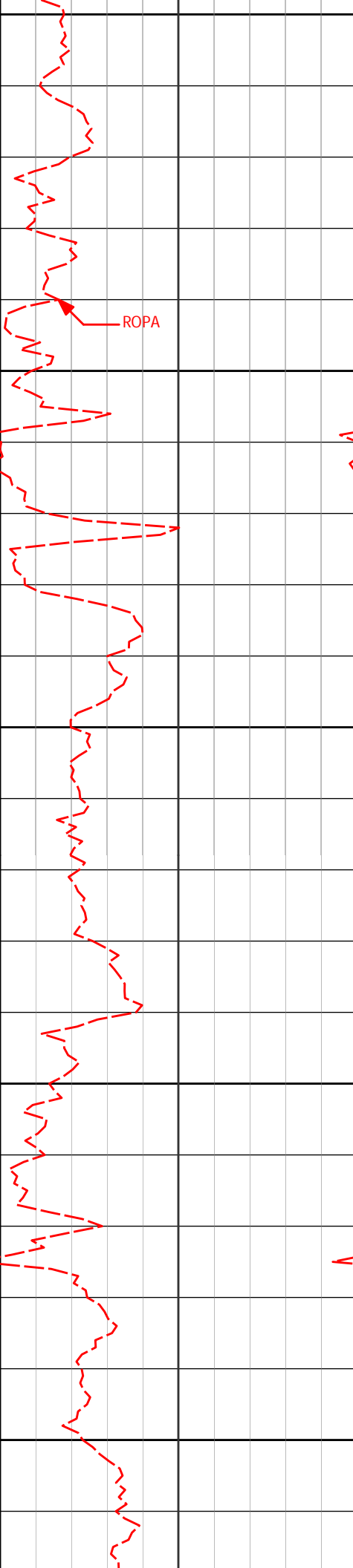
ROPA











1400

1450

1500

1550

1600

ROPA

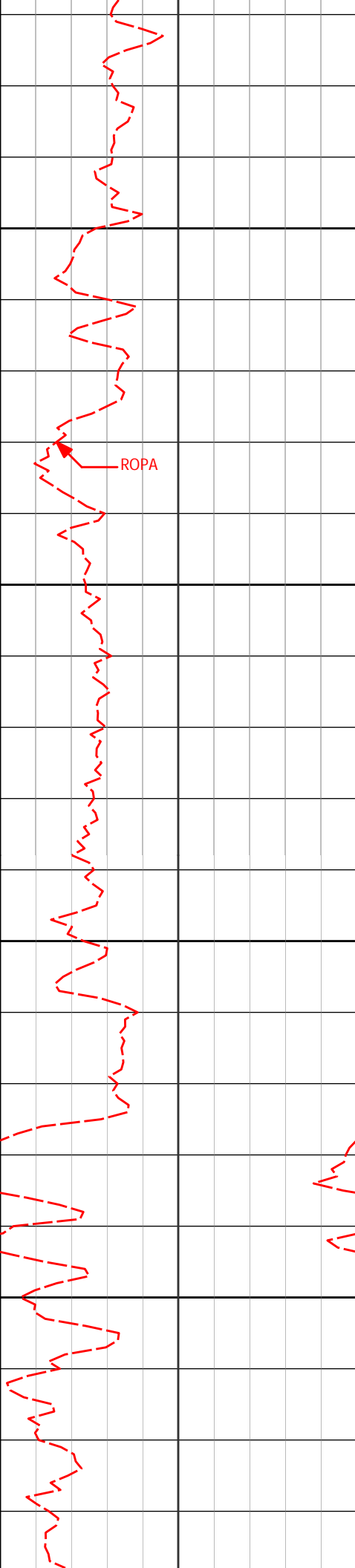
1526'

0.36°

183.19°

1525.95'

-0.70'



1650

1700

1750

1800

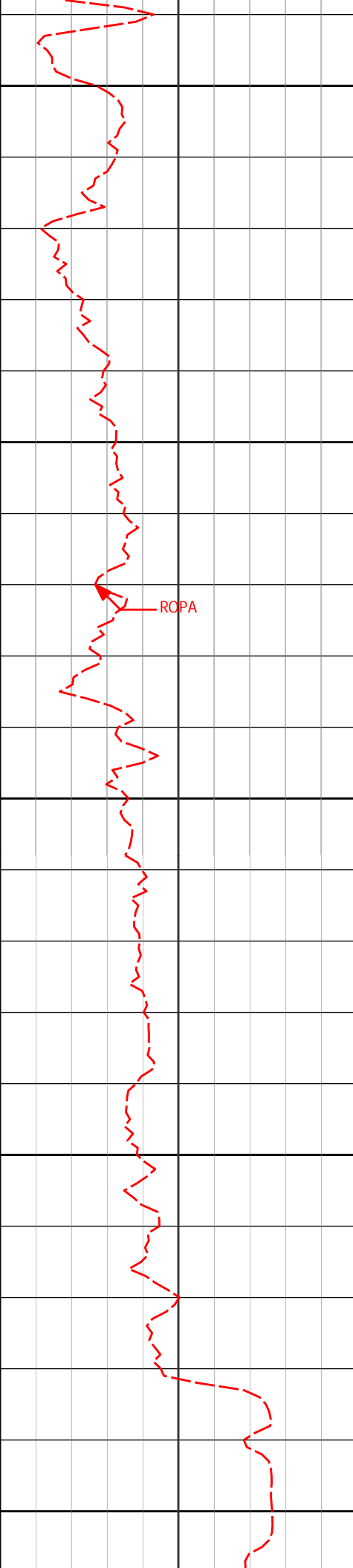
1802'

0.33°

200.38°

1801.95'

-2.32'



1850

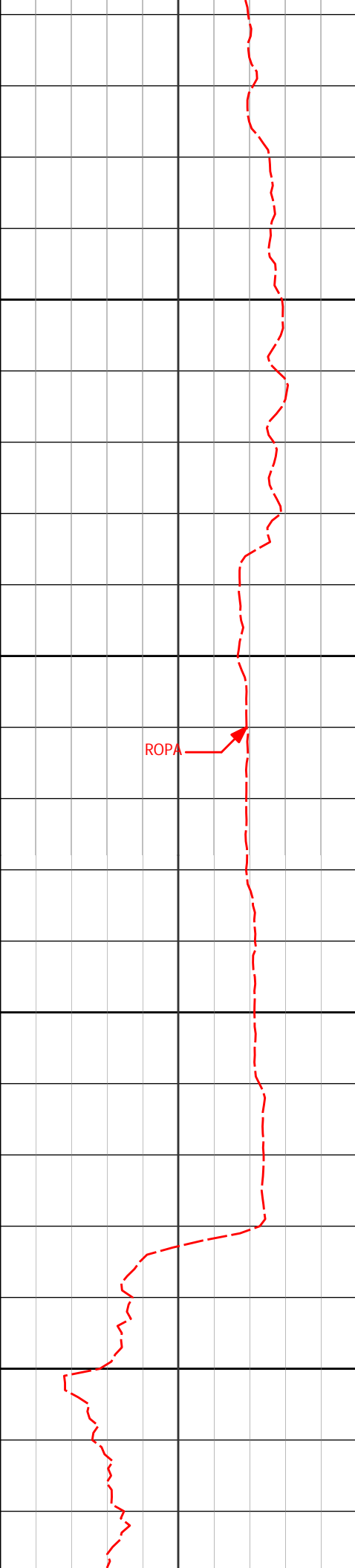
1900

1950

2000

2050

ROPA



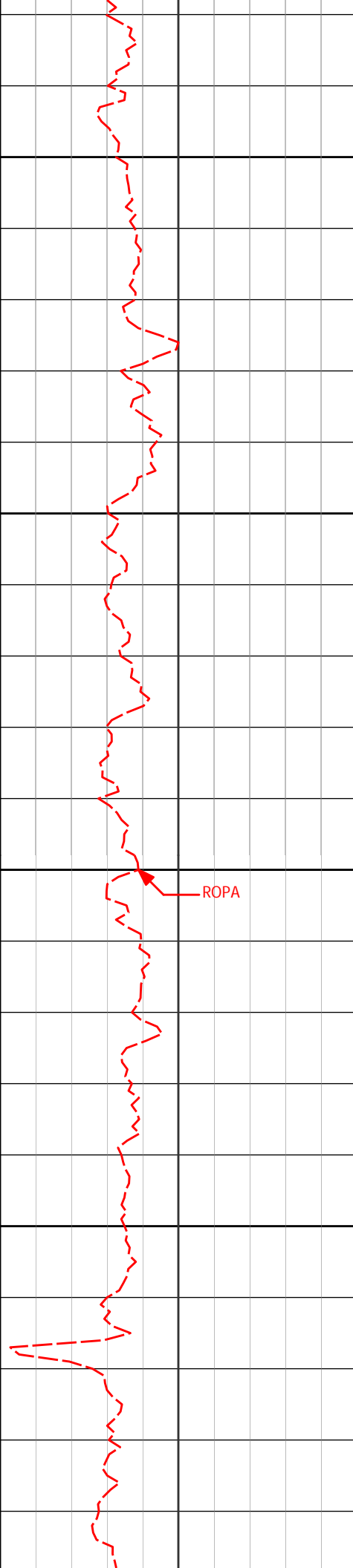
2086'

0.77°

265.44°

2085.93'

-3.25'



2300

2350

2400

2450

ROPA

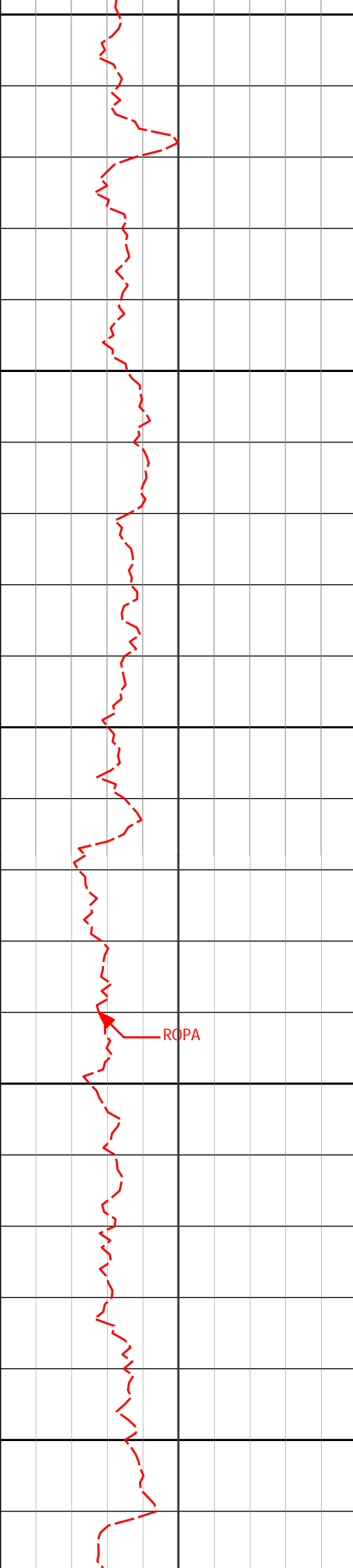
2373'

0.44°

331.46°

2372.92'

-2.44'



2500

2550

2600

2650

2700

ROPA

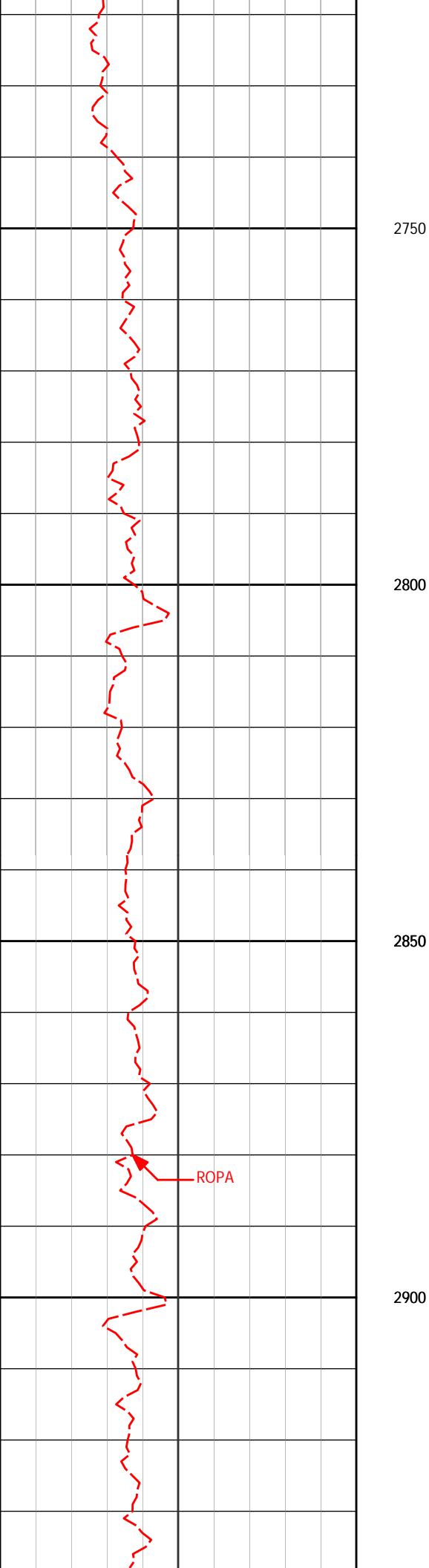
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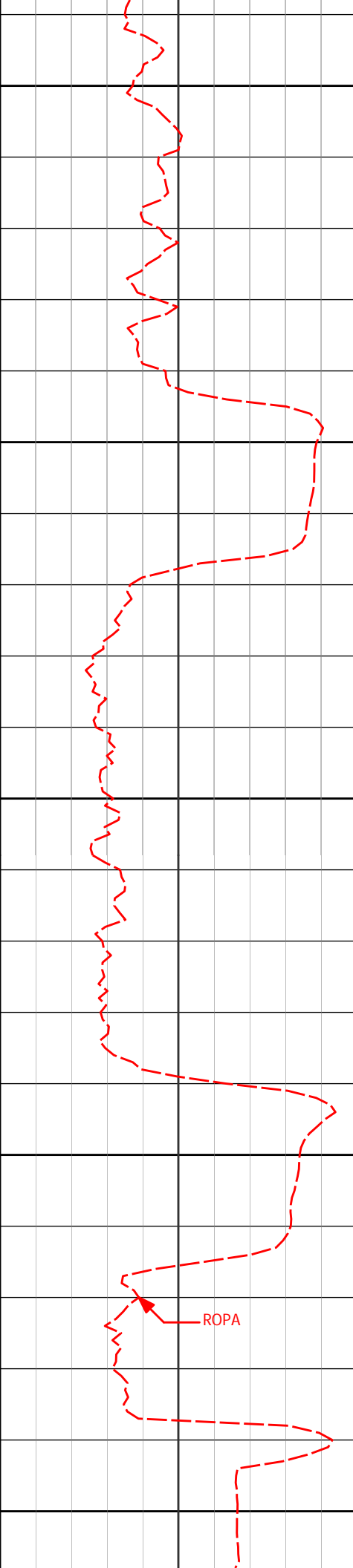
0.41°

352.54°

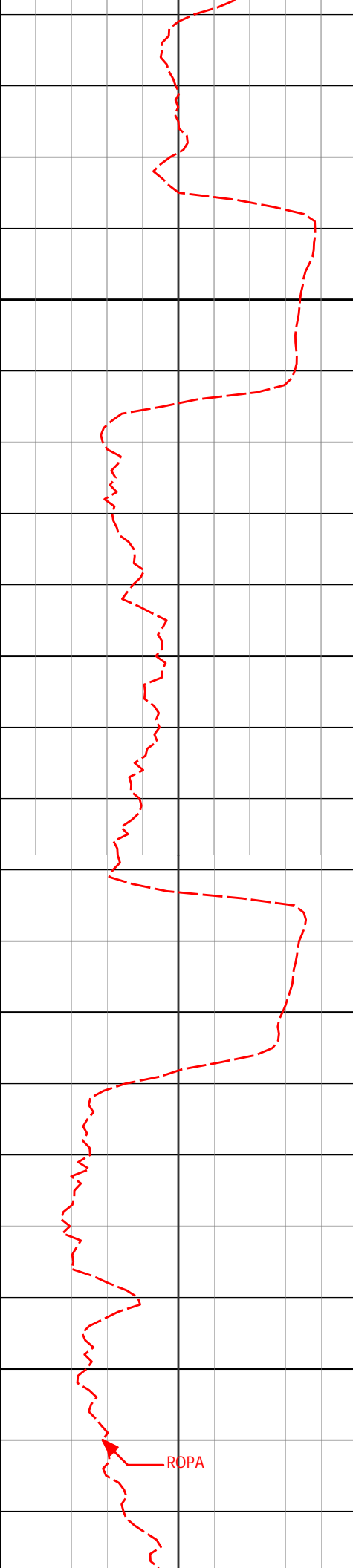
2659.91'

-0.46'





2946'	0.45°	196.97°	2945.91'	-0.52'
2950				
3000				
3041'	1.64°	165.58°	3040.89'	-2.20'
3050				
3100				
3137'	2.98°	173.45°	3136.81'	-6.00'
3150				



3200

3250

3300

3350

3233'

4.39°

169.26°

3232.61'

-12.09'

3330'

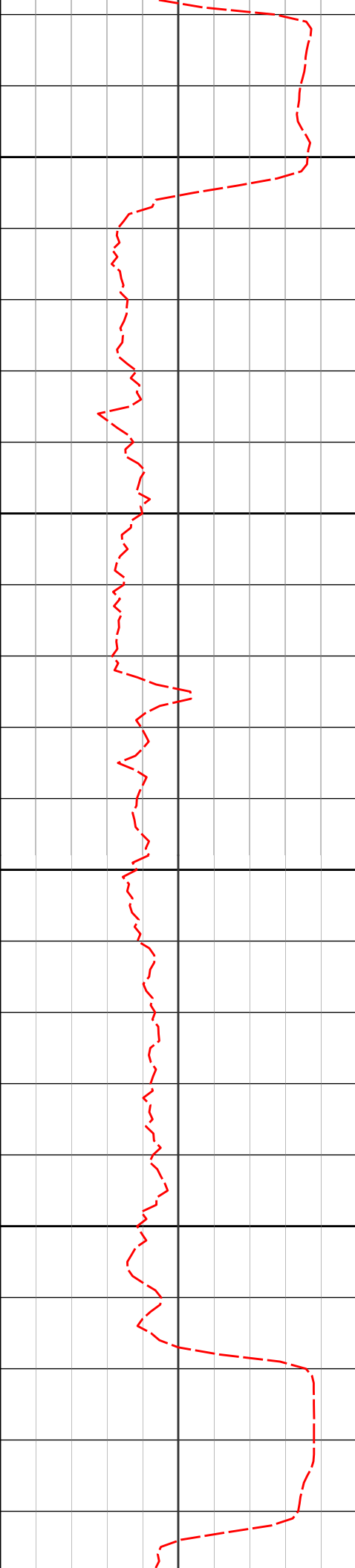
5.17°

170.19°

3329.27'

-20.03'

ROPA



3400

3425'

6.55°

174.44°

3423.78'

-29.64'

3450

3500

3520'

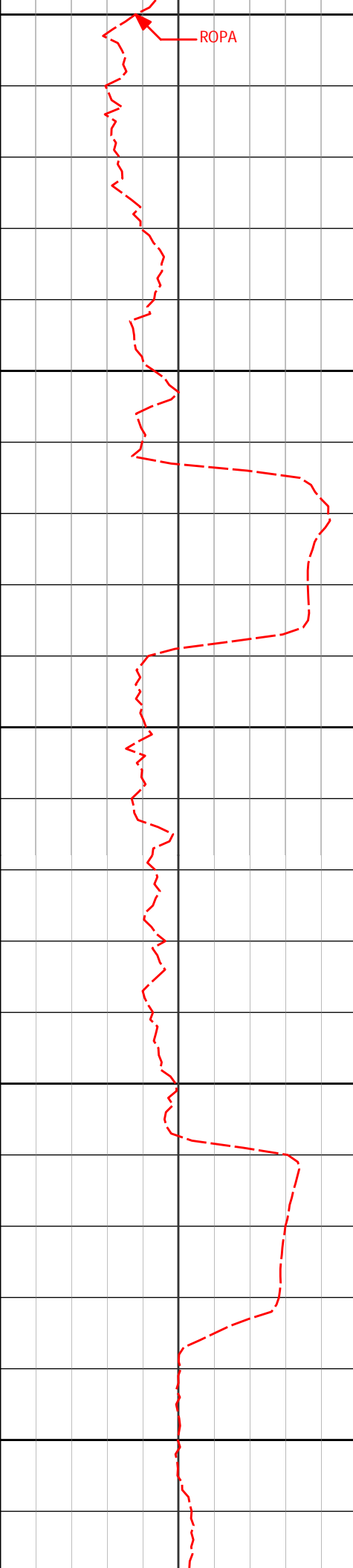
5.35°

177.91°

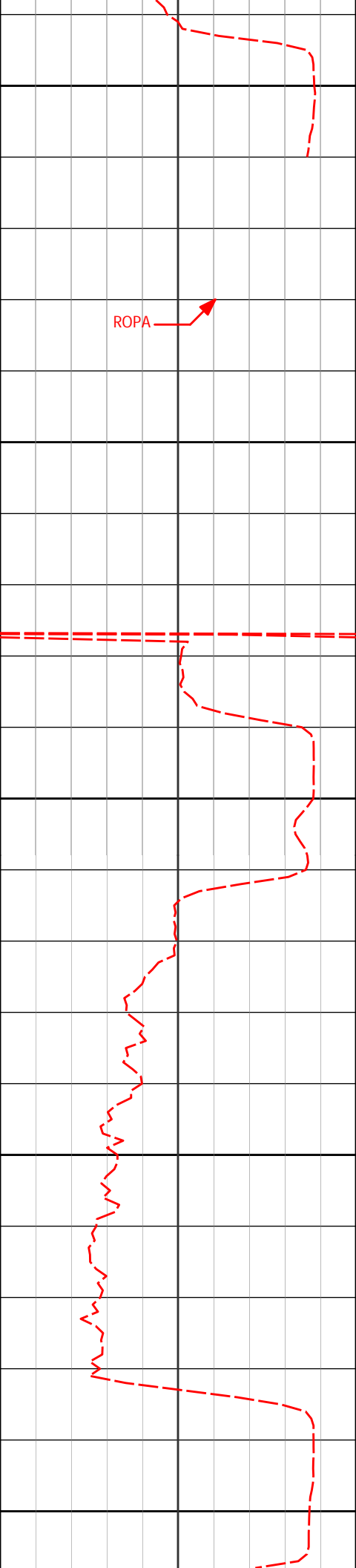
3518.26'

-39.45'

3550



Station	Latitude	Longitude	Distance (m)	Angle (°)
3615'	5.17°	168.85°	3612.86'	-48.07'
3710'	5.12°	169.35°	3707.48'	-56.43'
3806'	5.17°	162.03°	3803.10'	-64.74'



4050

4100

4150

4200

4250

4092'

5.80°

164.32°

4087.76'

-91.74'

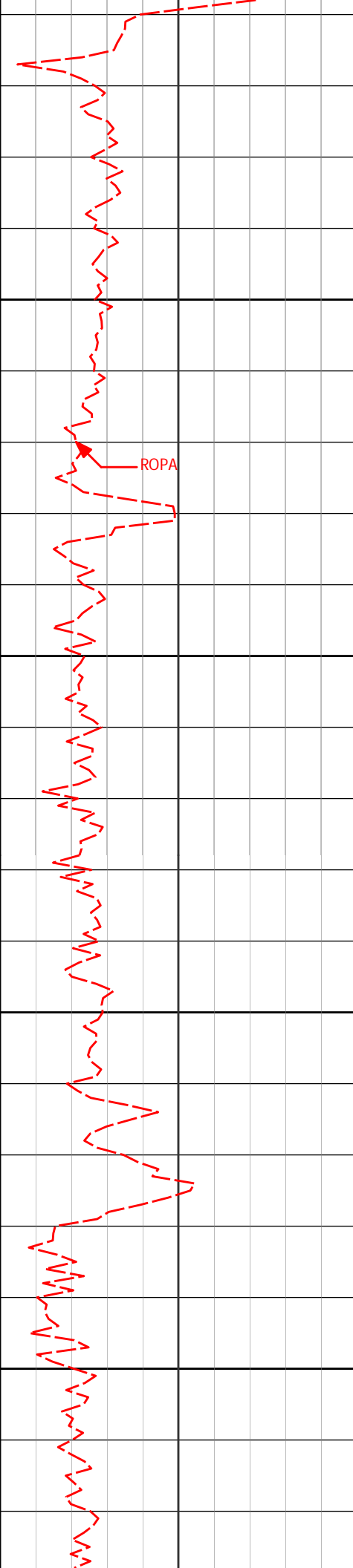
4188'

5.53°

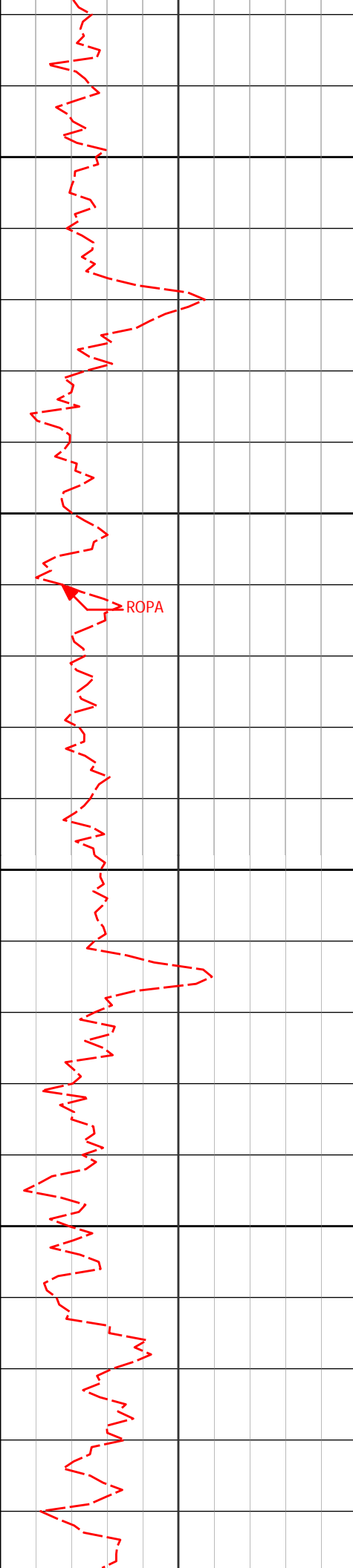
159.28°

4183.29'

-100.72'



Point	Latitude	Longitude	Altitude	Distance	Angle
1	4284'	6.59°	162.12°	4278.76'	-110.27'
2	4379'	6.56°	165.51°	4373.13'	-120.69'
3	4475'	5.65°	162.29°	4468.59'	-130.49'



4500

4550

4600

4650

4570'

4.28°

168.10°

4563.23'

-138.40'

4666'

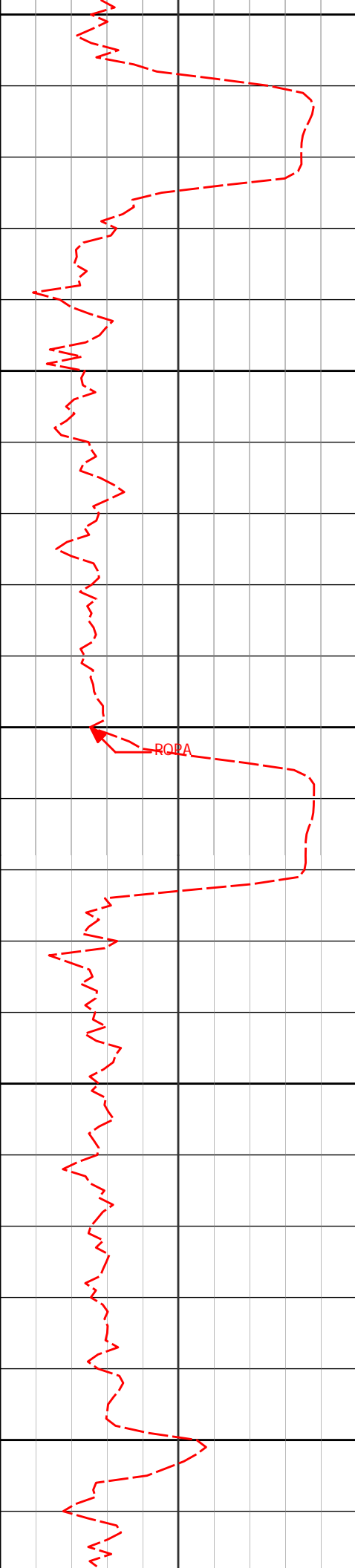
4.01°

174.57°

4658.98'

-145.24'

ROPA



4700

4750

4800

4850

4900

4762'

2.80°

178.06°

4754.81'

-150.93'

RQ2A

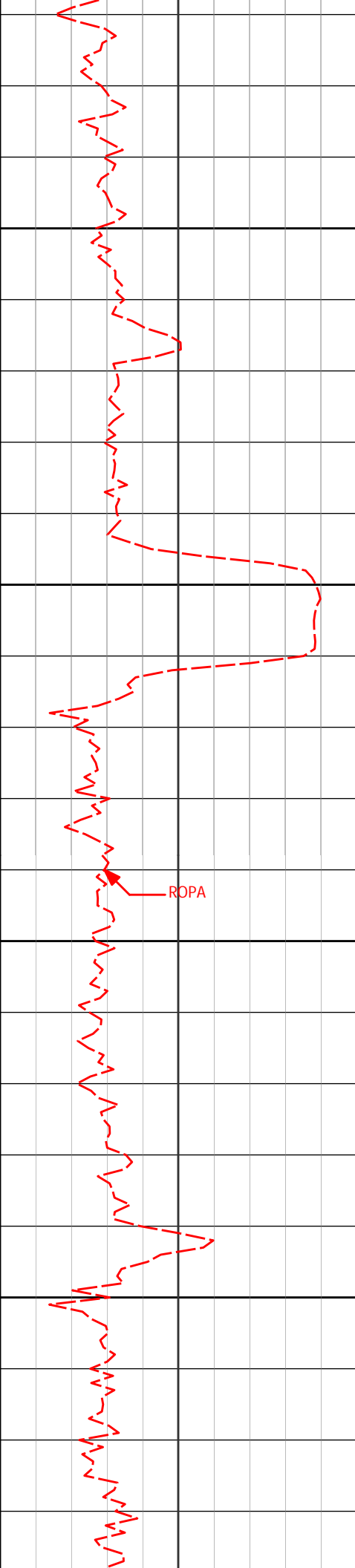
4857'

1.63°

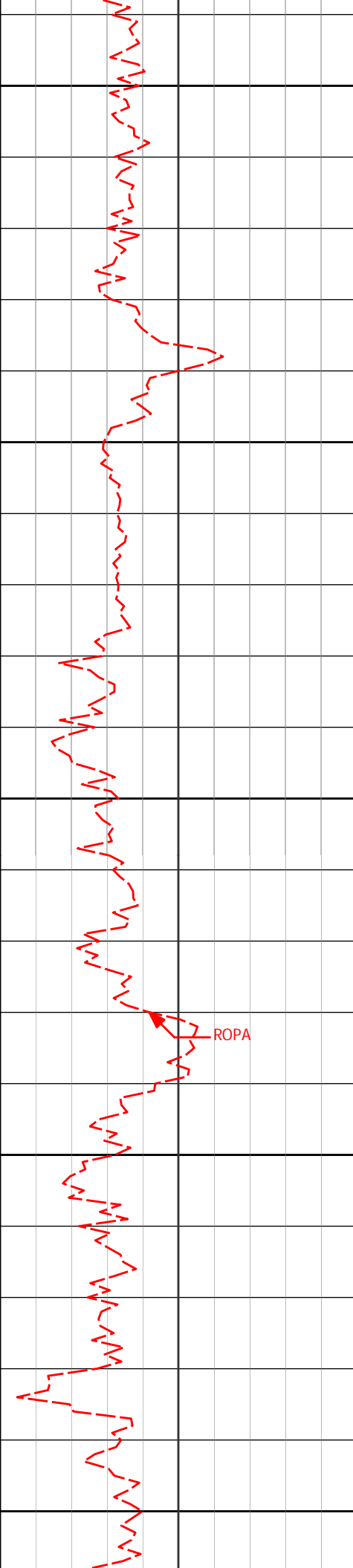
182.35°

4849.73'

-154.59'



4953'	1.30°	201.03°	4945.70'	-156.98'
4950				
5000				
5048'	0.71°	226.85°	5040.69'	-158.39'
5050				
5100				
5144'	0.32°	305.72°	5136.68'	-158.64'



5150

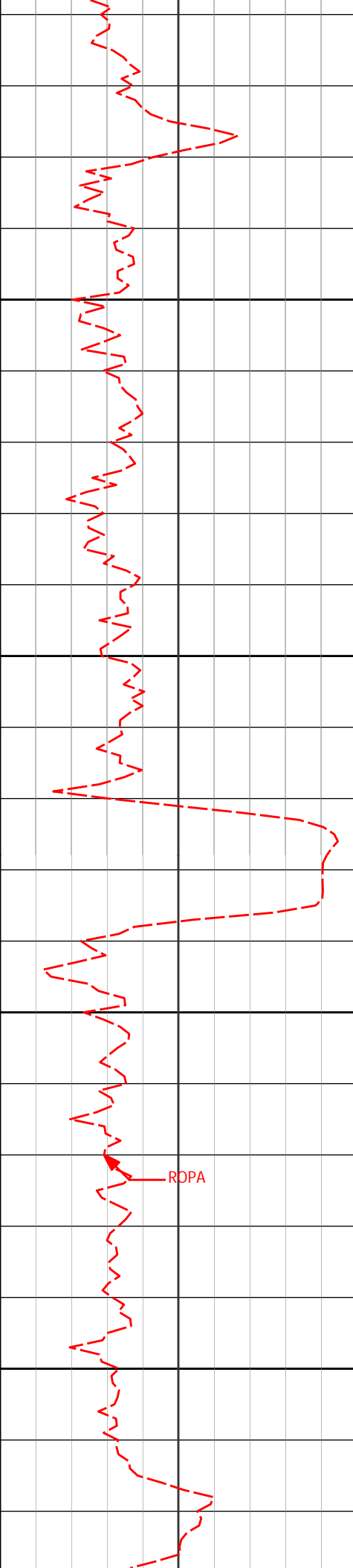
5200

5250

5300

5350

ROPA



5400

5428'

1.14°

336.80°

5420.66'

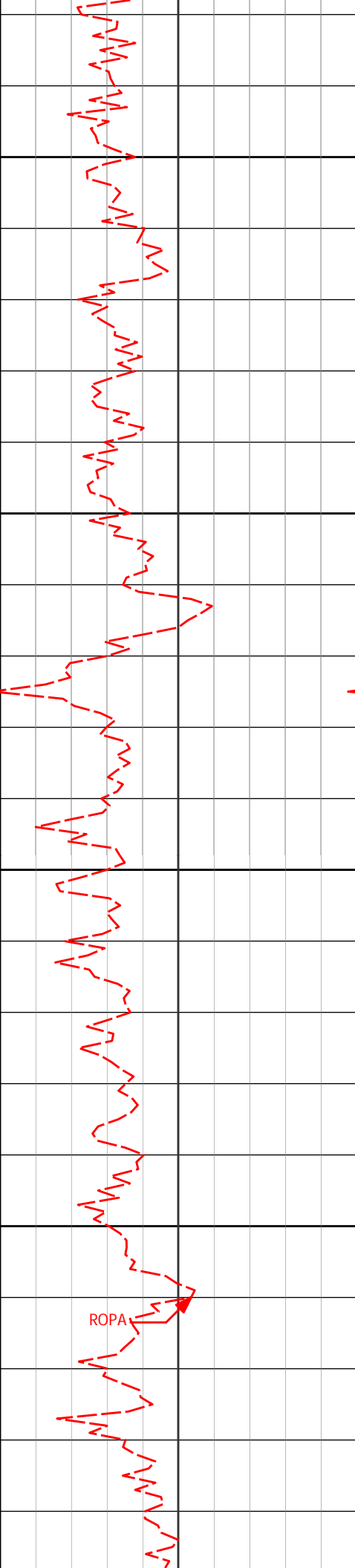
-155.59'

5450

5500

5550

ROPA



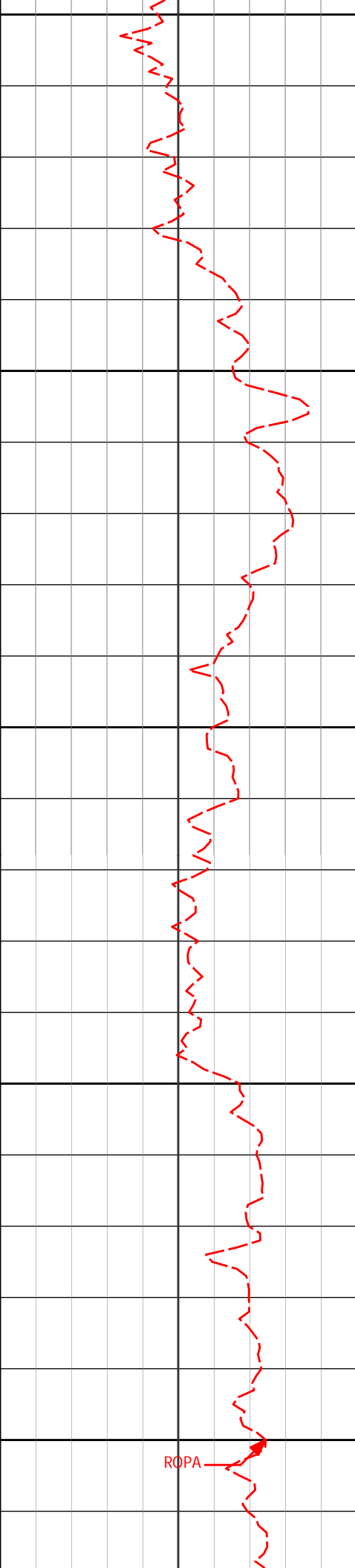
5600

5650

5700

5750

ROPA



5800

5811'

0.97°

328.02°

5803.60'

-149.36'

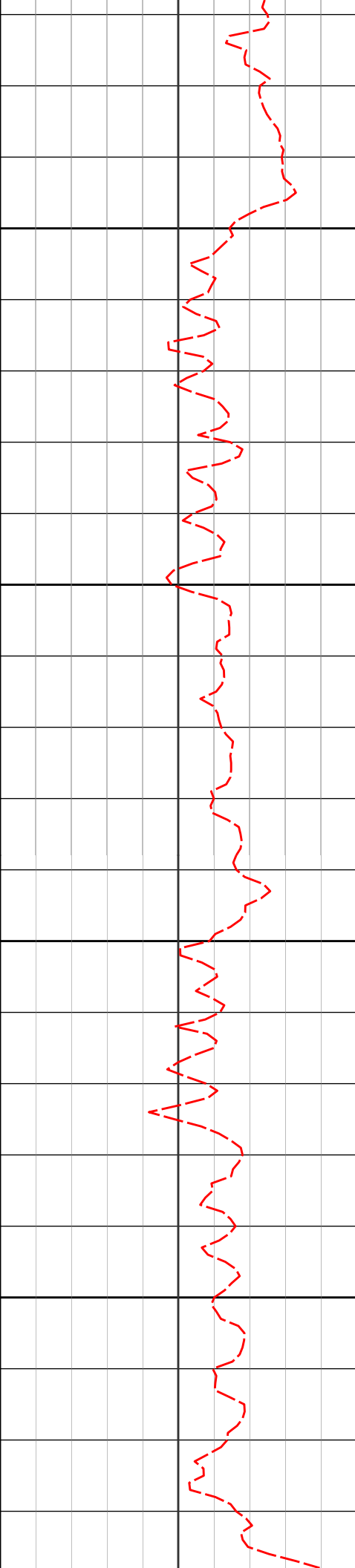
5850

5900

5950

6000

ROPA



6050

6100

6150

6200

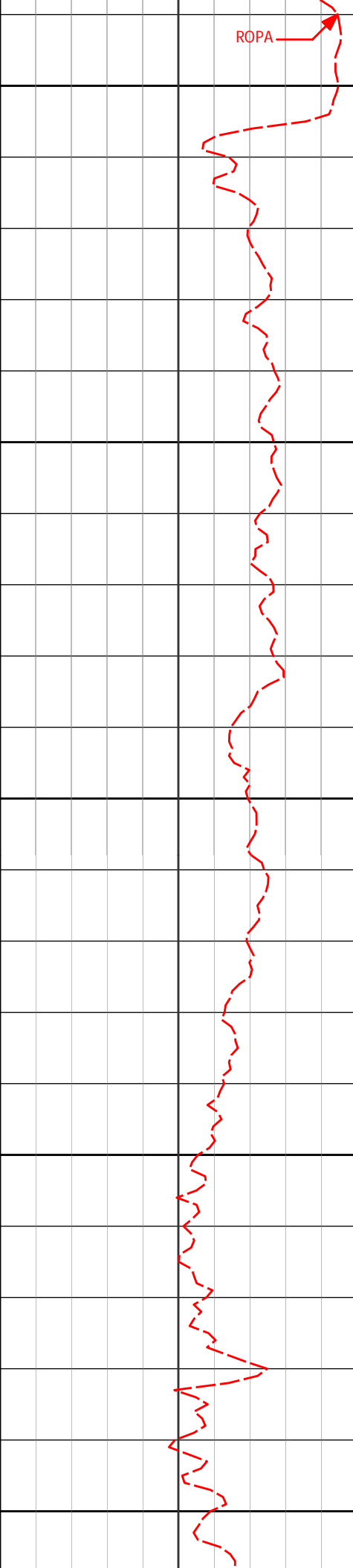
6193'

1.23°

3.71°

6185.53'

-142.53'



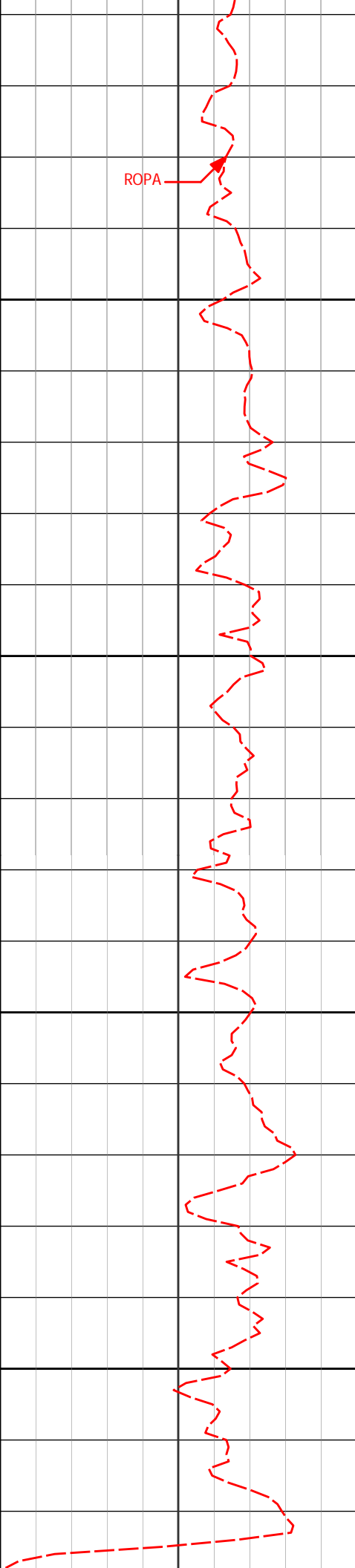
6250

6300

6350

6400

6450



6500

6550

6600

6650

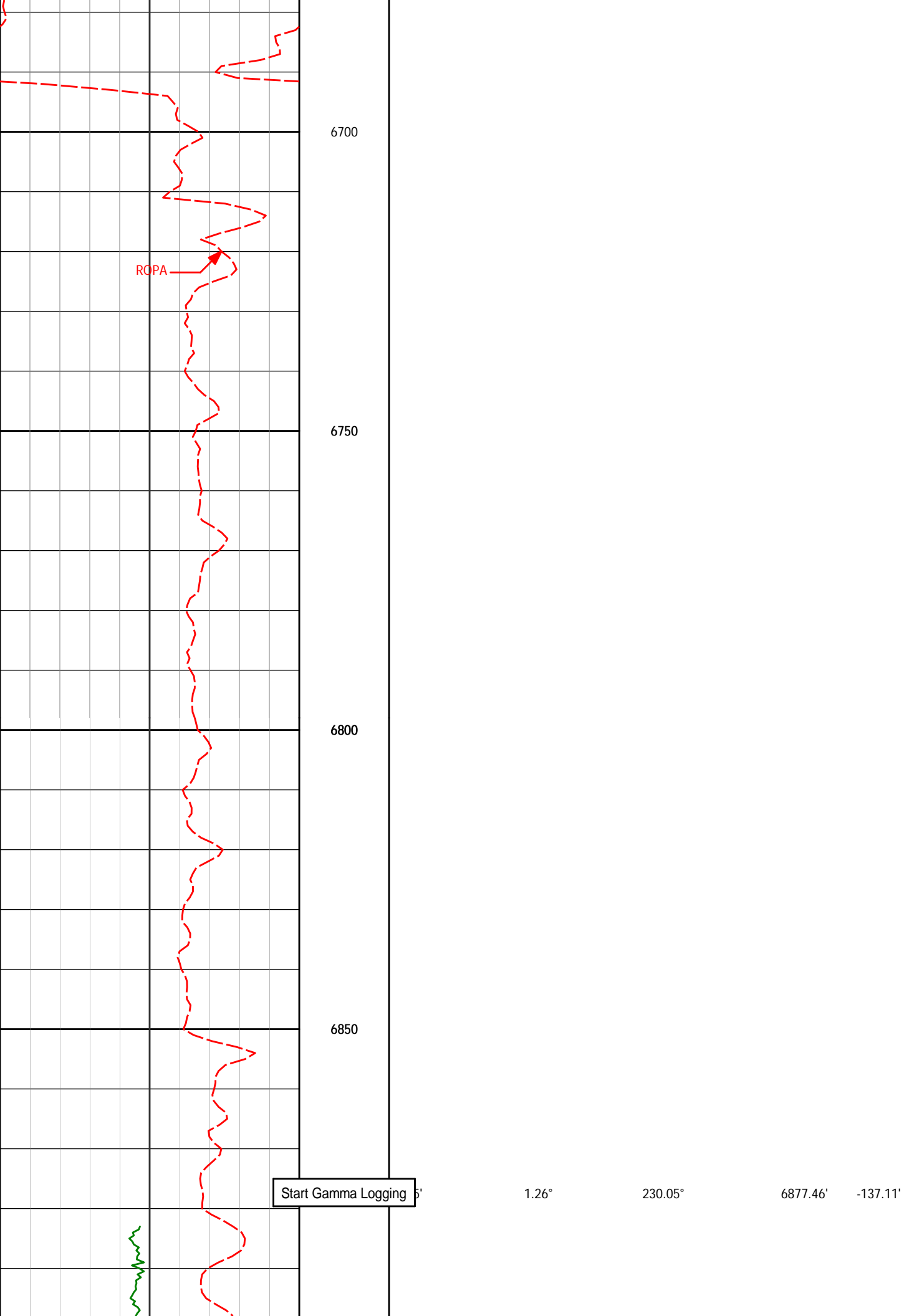
6573'

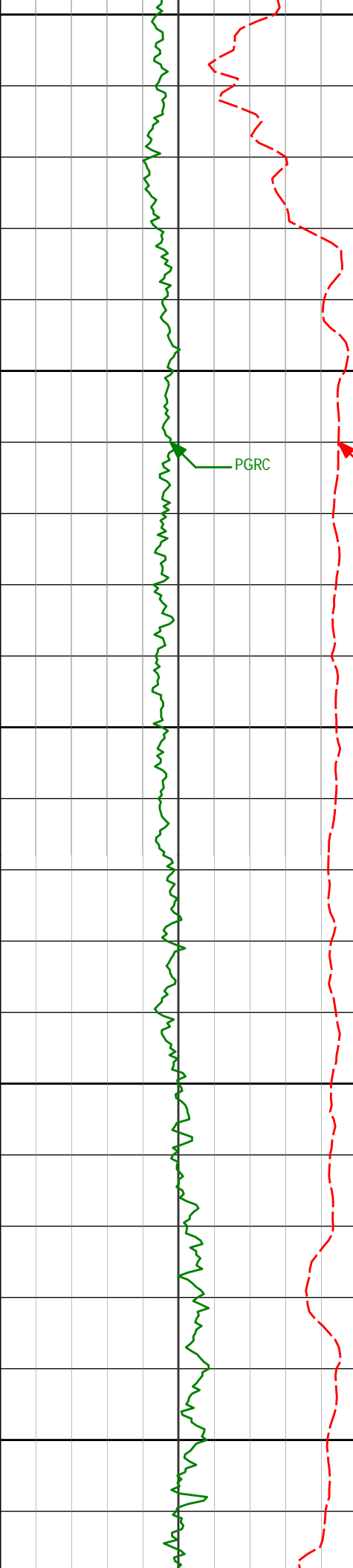
0.69°

31.45°

6565.48'

-136.50'





Run 200

6950

KOP

PGRC

ROPA

6900

6955'

1.52°

310.92°

6947.44'

-137.01'

7000

7003'

8.14°

1.23°

6995.25'

-133.19'

7050

7051'

14.41°

2.07°

7042.31'

-123.81'

7100

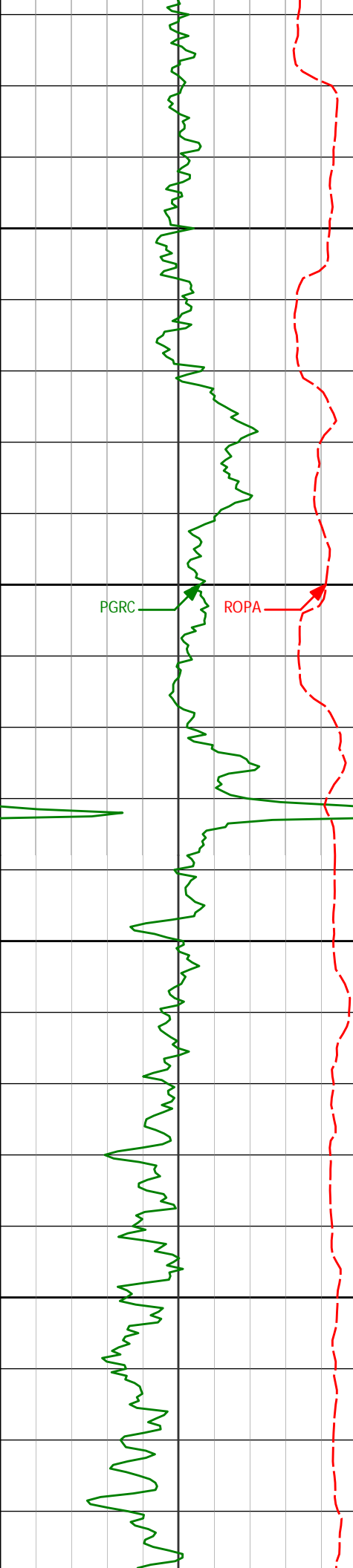
7096'

18.91°

3.78°

7085.41'

-110.93'



7150

7200

7250

7300

7146'

23.22°

0.23°

7132.06'

-92.98'

7194'

26.12°

0.94°

7175.67'

-72.94'

7241'

28.73°

1.55°

7217.38'

-51.30'

7289'

33.02°

1.98°

7258.57'

-26.68'

7336'

37.95°

2.19°

7296.83'

0.58'

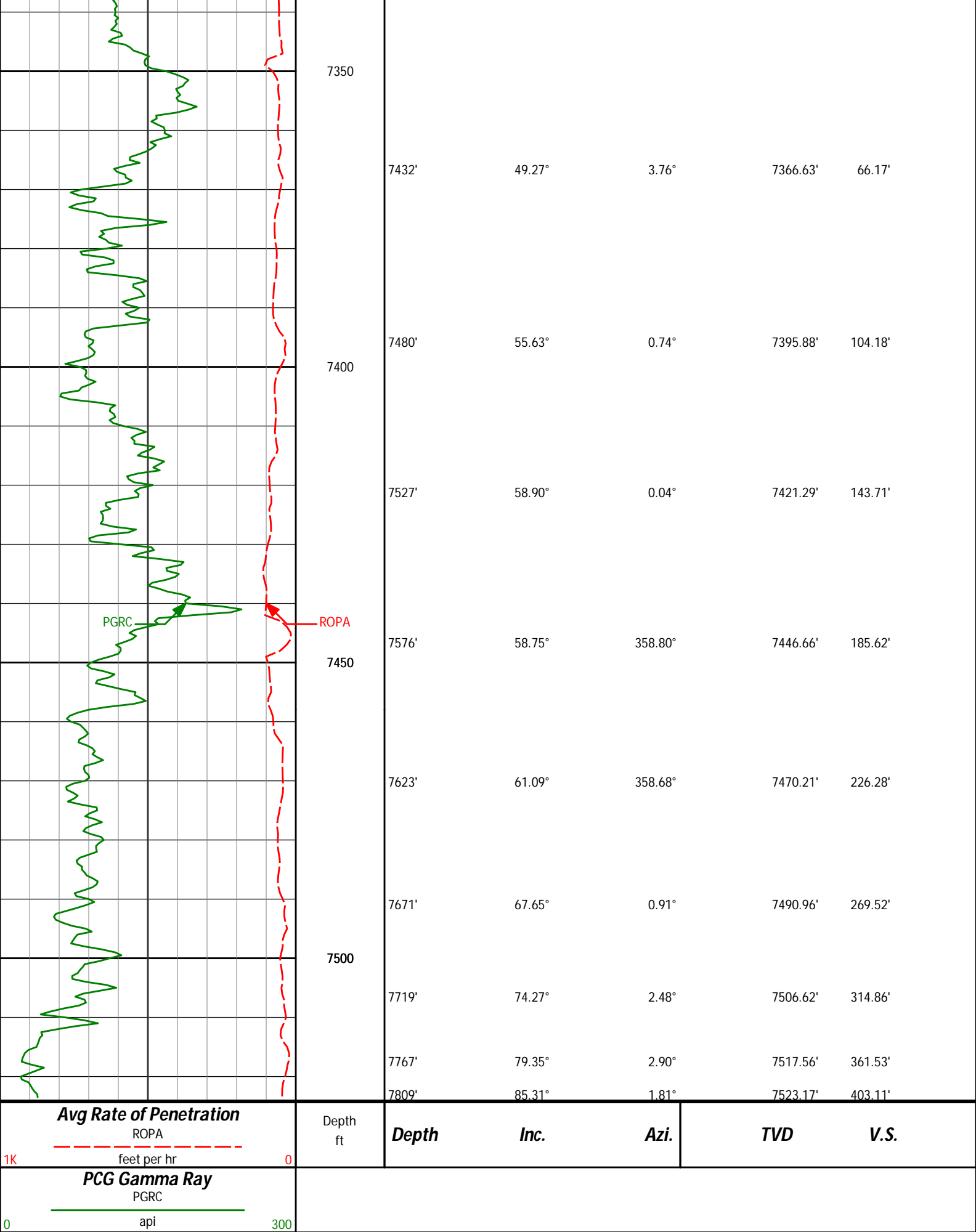
7385'

43.02°

3.40°

7334.09'

32.35'





HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum

Gobbler 2C-23-HZ

Wattenberg

Weld Colorado

USA

CA-XX-0900275968

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
991.00	0.02	278.40	990.96	1.93 N	7.20 E	1.97	TIE-IN
1250.00	0.46	212.75	1249.96	1.06 N	6.59 E	1.10	0.17
1526.00	0.36	183.19	1525.95	0.74 S	5.95 E	-0.70	0.08
1802.00	0.33	200.38	1801.95	2.35 S	5.62 E	-2.32	0.04
2086.00	0.77	265.44	2085.93	3.26 S	3.43 E	-3.25	0.25
2373.00	0.44	331.46	2372.92	2.45 S	0.98 E	-2.44	0.25
2660.00	0.41	352.54	2659.91	0.46 S	0.32 E	-0.46	0.06
2946.00	0.45	196.97	2945.91	0.52 S	0.14 W	-0.52	0.29
3041.00	1.64	165.58	3040.89	2.20 S	0.09 E	-2.20	1.34
3137.00	2.98	173.45	3136.81	6.01 S	0.72 E	-6.00	1.43
3233.00	4.39	169.26	3232.61	12.10 S	1.69 E	-12.09	1.49
3330.00	5.17	170.19	3329.27	20.05 S	3.13 E	-20.03	0.81
3425.00	6.55	174.44	3423.78	29.66 S	4.38 E	-29.64	1.52
3520.00	5.35	177.91	3518.26	39.48 S	5.07 E	-39.45	1.32
3615.00	5.17	168.85	3612.86	48.11 S	6.06 E	-48.07	0.89
3710.00	5.12	169.35	3707.48	56.47 S	7.67 E	-56.43	0.07
3806.00	5.17	162.03	3803.10	64.80 S	9.79 E	-64.74	0.69
3901.00	5.75	173.20	3897.67	73.59 S	11.68 E	-73.53	1.27
3996.00	5.39	169.86	3992.22	82.71 S	13.03 E	-82.64	0.51
4092.00	5.80	164.32	4087.76	91.82 S	15.13 E	-91.74	0.71
4188.00	5.53	159.28	4183.29	100.82 S	18.08 E	-100.72	0.59
4284.00	6.59	162.12	4278.76	110.38 S	21.41 E	-110.27	1.15
4379.00	6.56	165.51	4373.13	120.83 S	24.44 E	-120.69	0.41
4475.00	5.65	162.29	4468.59	130.64 S	27.25 E	-130.49	1.01
4570.00	4.28	168.10	4563.23	138.56 S	29.40 E	-138.40	1.53
4666.00	4.01	174.57	4658.98	145.41 S	30.46 E	-145.24	0.56
4762.00	2.80	178.06	4754.81	151.09 S	30.86 E	-150.93	1.28
4857.00	1.63	182.35	4849.73	154.76 S	30.88 E	-154.59	1.24
4953.00	1.30	201.03	4945.70	157.14 S	30.43 E	-156.98	0.60
5048.00	0.71	226.85	5040.69	158.55 S	29.62 E	-158.39	0.77
5144.00	0.32	305.72	5136.68	158.80 S	28.96 E	-158.64	0.75
5428.00	1.14	336.80	5420.66	155.74 S	27.21 E	-155.59	0.31
5811.00	0.97	328.02	5803.60	149.49 S	23.99 E	-149.36	0.06
6193.00	1.23	3.71	6185.53	142.66 S	22.54 E	-142.53	0.19
6573.00	0.69	31.45	6565.48	136.64 S	24.00 E	-136.50	0.18
6885.00	1.26	230.05	6877.46	137.24 S	22.35 E	-137.11	0.62
6955.00	1.52	310.92	6947.44	137.12 S	21.06 E	-137.01	2.59
7003.00	8.14	1.23	6995.25	133.30 S	20.65 E	-133.19	15.13
7051.00	14.41	2.07	7042.31	123.93 S	20.94 E	-123.81	13.07
7096.00	18.91	3.78	7085.41	111.05 S	21.62 E	-110.93	10.06
7146.00	23.22	0.23	7132.06	93.10 S	22.20 E	-92.98	8.99
7194.00	26.12	0.94	7175.67	73.07 S	22.41 E	-72.94	6.07
7241.00	28.73	1.55	7217.38	51.43 S	22.88 E	-51.30	5.59
7289.00	33.02	1.98	7258.57	26.81 S	23.65 E	-26.68	8.95
7336.00	37.95	2.19	7296.83	0.44 N	24.64 E	0.58	10.49
7385.00	43.02	3.40	7334.09	32.21 N	26.21 E	32.35	10.47
7432.00	49.27	3.76	7366.63	66.02 N	28.33 E	66.17	13.31
7480.00	55.63	0.74	7395.88	104.02 N	29.78 E	104.18	14.16
7527.00	58.90	0.04	7421.29	143.54 N	30.05 E	143.71	7.07
7576.00	58.75	358.80	7446.66	185.47 N	29.62 E	185.62	2.19
7623.00	61.09	358.68	7470.21	226.12 N	28.73 E	226.28	4.98
7671.00	67.65	0.91	7490.96	269.37 N	28.60 E	269.52	14.29
7719.00	74.27	2.48	7506.62	314.70 N	29.95 E	314.86	14.13
7767.00	79.35	2.90	7517.56	361.37 N	32.14 E	361.53	10.62
7809.00	85.31	1.81	7523.17	402.94 N	33.85 E	403.11	14.42

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 0.31 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.63 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7809.00 FEET
IS 404.36 FEET ALONG 4.80 DEGREES (TRUE)

Date Printed:10 May 2013