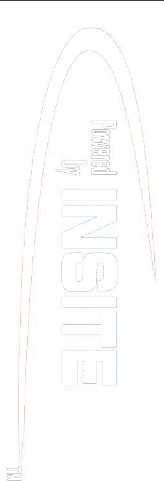


PCDC - Pressure Case Directional

PCGK - Pressure Case Gamma



Country : USA			
Field : Wattenburg			
Location : Lat: 40° 13' 17.72" North Long: 104° 56' 23.06" West			
Well : Sekich State 39C-17HZ			
Company : Anadarko			
Rig : Xtreme 22			
LOCATION		Company : Anadarko Rig : Xtreme 22 Well : Sekich State 39C-17HZ Field : Wattenburg Country : USA API Number : 05123391640000	
Latitude : 40° 13' 17.72" North Longitude : 104° 56' 23.06" West		Other Services Directional Drilling	
UTM Easting = 3,156,448.119 ft UTM Northing = 1,324,061.175 ft			
Permanent Datum : Ground Level		Elev. KB N/A	
Log Measured From : Drill Floor		16.00 ft Above Permanent Datum DF 4889.00 ft GL 4873.00 ft WD N/A	
Drilling Measured From : Drill Floor		MD LOG	
Depth Logged : 1,248.00 ft To 16,720.00 ft		Unit No. : 11610117	
Date Logged : 06-Apr-14 To 29-Apr-14		Job No. : CA-XX-0901221881	
Total Depth MD : 16,720.00 ft TVD: 7,191.50 ft		Plot Type : Final	
Spud Date : 06-Apr-14		Plot Date : 29-Apr-14	
Run No.	Borehole Record (MD)		Run No.
	Size	To	
0100	8.750 in	1248.00 ft	7591.00 ft
0200	6.125 in	7591.00 ft	13530.00 ft
0400	6.125 in	13530.00 ft	15728.00 ft
0500	6.125 in	15728.00 ft	16720.00 ft
		Casing Record (MD)	
		Size	Weight
		9.625 in	36.00 lbpf
		7.000 in	24.00 lbpf
		SURFACE	
		SURFACE	
		1,238.00 ft	
		7,581.00 ft	

WELL INFORMATION					
MWD Run Number	100	200	300	400	500
Date run completed	09-Apr-14	17-Apr-14	18-Apr-14	23-Apr-14	29-Apr-14
Rig Bit Number	0100	0200	0300	0400	0500
Bit Size (in)	8.750	6.125	6.125	6.125	6.125
Tool Nominal OD (in)	6.840	4.820	4.750	4.750	4.750
Log Start Depth (TVD, ft)	1,247.98	7,183.40	7,197.43	7,197.43	7,191.52
Log End Depth (TVD, ft)	7,183.40	7,197.43	7,197.43	7,191.52	7,191.50
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	06-Apr-14 07:35	11-Apr-14 00:40	17-Apr-14 18:33	19-Apr-14 10:34	26-Apr-14 10:10
Drill/Wipe End Date and Time	08-Apr-14 14:40	16-Apr-14 08:50	17-Apr-14 18:33	22-Apr-14 08:30	27-Apr-14 18:00
Min Inc (deg) @ Depth (TVD, ft)	0.03 @ 1,315.98	87.72 @ 7,183.82	89.82 @ 7,197.30	88.58 @ 7,192.03	88.52 @ 7,192.54
Max Inc (deg) @ Depth (TVD, ft)	83.97 @ 7,178.89	91.85 @ 7,191.43	89.82 @ 7,197.30	92.07 @ 7,193.93	91.29 @ 7,195.98
Bit TFA(in2) / Bit Type	2.23 / N/A	1.86 / PDC	1.86 / PDC	1.86 / PDC	1.86 / PDC
Flow Rate (gpm)	630.20	274.48	275.00	277.36	275.09
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	397.7 / 0.0	N/A / N/A	N/A / N/A	N/A / N/A
Fluid Type	Native/Spud Mud	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas
Density (ppg) / Viscosity (spqt)	9.15 / 56.00	9.60 / 63.00	9.70 / 81.00	9.60 / 63.00	9.70 / 68.00
Filtrate CL (ppm)	120.00	259,945.00	260,803.00	274,187.00	267,875.00
pH / Fluid Loss (mptm)	8.80 / 3	9.10 / 0	N/A / 2.0	N/A / 4.2	N/A / 3.9
PV (cP) / YP (lhf2)	20 / 18.00	23 / 18.00	22 / 9.00	24 / 10.00	21 / 7.00
% Solids / % Sand	3.30 / 0.10	10.50 / 0.10	13.00 / 0.00	14.00 / 0.10	13.00 / 0.1
% Oil / Oil:Water Ratio	N/A / N/A	63.00 / 71:29	N/A / 72:28	63.50 / 74:26	66.00 / 75:25
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	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	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A

Max Tool Temp (degF) / Source	172.78 / PCM	221.80 / PCM	200.05 / PCM	412.20 / PCM	247.78 / PCM
Rm @ Max Tool Temp (degF)	N/A @ 172.78	N/A @ 221.80	N/A @ 200.05	N/A @ 238.7	N/A @ 247.78
Lead MWD Engineer	Clay Wass	Clay Wass	Caleb Jones	Caleb Jones	Caleb Jones
Customer Representative	Jack Sanders	Jack Sanders	Jack Sanders	Jack Sanders	Jack Sanders

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	PCM
Software Version	5.76	5.76	5.76	5.76	5.76
Sub Serial Number	11342293	12310747	12310747	120159883	12310754
Insert Serial Number	11400958	10997273	11400958	10997273	11400958
Date and Time Initialized	05-Apr-14 14:20	10-Apr-14 00:05	17-Apr-14 00:19	18-Apr-14 00:06	24-Apr-14 13:21
Date and Time Read	09-Apr-14 20:28	17-Apr-14 08:50	18-Apr-14 09:20	23-Apr-14 16:10	29-Apr-14 06:36
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	75.10	65.12	66.21	64.70	63.99
Software Version	6.21	6.21	6.21	6.21	6.21
Sub Serial Number	11342293	12310747	12310747	120159883	12310754
Sonde Serial Number	11638501	11638521	11638501	11638521	11638501
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	132.66	246.69	62.83	179.62	86.85

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	PCG
Distance From Bit (ft)	65.08	55.01	56.10	54.58	54.73
Recorded Sample Period (sec)	10	15	15	10	10
Software Version	8.15	8.15	8.15	8.15	8.15
Sub Serial Number	11342293	12310747	12310747	120159883	12310754
Insert/Sonde Serial Number	11681025	11579788	11681025	11579788	11681025

REMARKS

1. Depths are True Vertical Depths, referenced to Driller's pipe tally, and measure from the rig floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the Power Law model for water based fluids and the Bingham Plastic model for oil based fluids.
4. All data presented is recorded 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

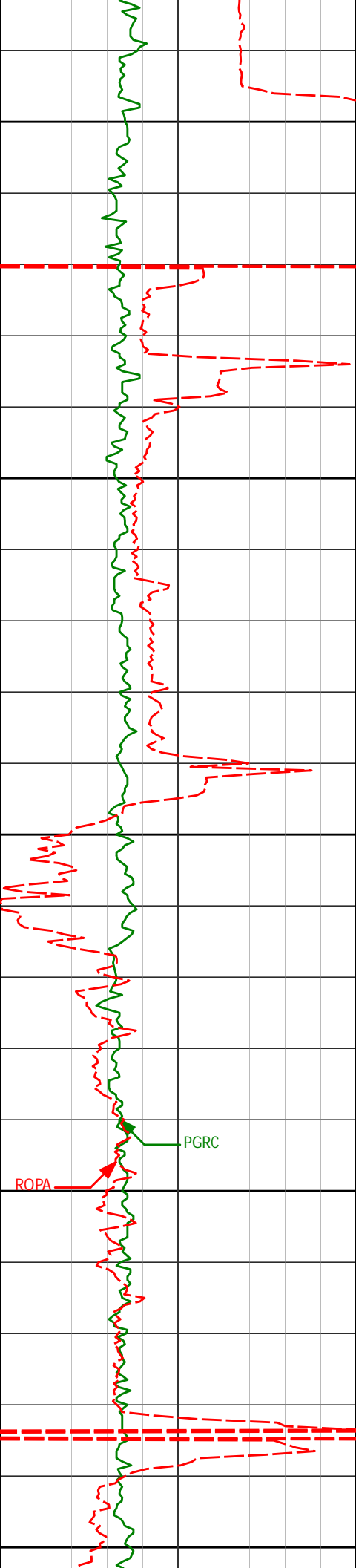
WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Anadarko PO
Sekich State 39C-17HZ
Xtreme 22
Sec. 18-T3N-R67W

<div>PCG Gamma Ray</div> <div>PGRC</div> <div>0300</div> <div>api</div>																	
<div>Avg Rate of Penetration</div> <div>ROPA</div> <div>5000</div> <div>feet per hr</div>												Depth ft	Depth	Inc.	Azi.	TVD	V.S.
												1200					
												1250					



1300

1350

1400

1450

1500

1316'

0.03°

259.69°

1315.98'

1.40'

1411'

0.28°

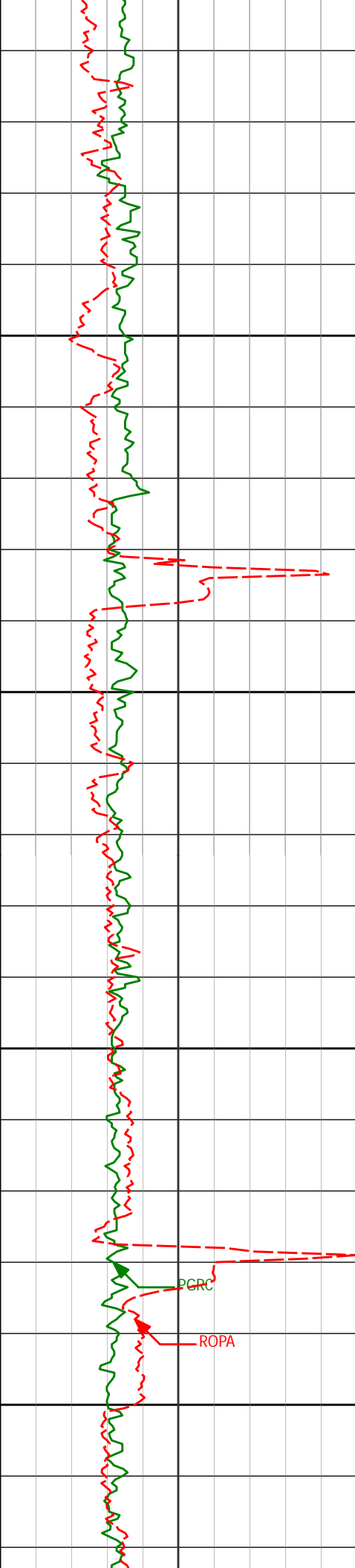
306.07°

1410.98'

1.18'

PGRC

ROPA



1550

1600

1650

1700

1506'

0.31°

315.99°

1505.98'

0.82'

1601'

0.14°

263.38°

1600.97'

0.52'

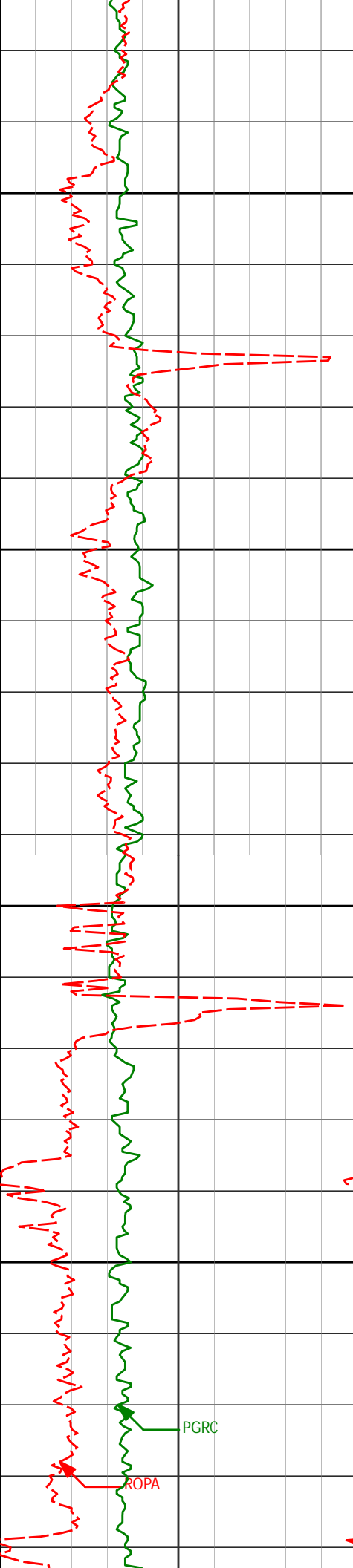
1694'

0.31°

50.26°

1693.97'

0.60'



1750

1800

1850

1900

1785'

0.26°

14.79°

1784.97'

0.84'

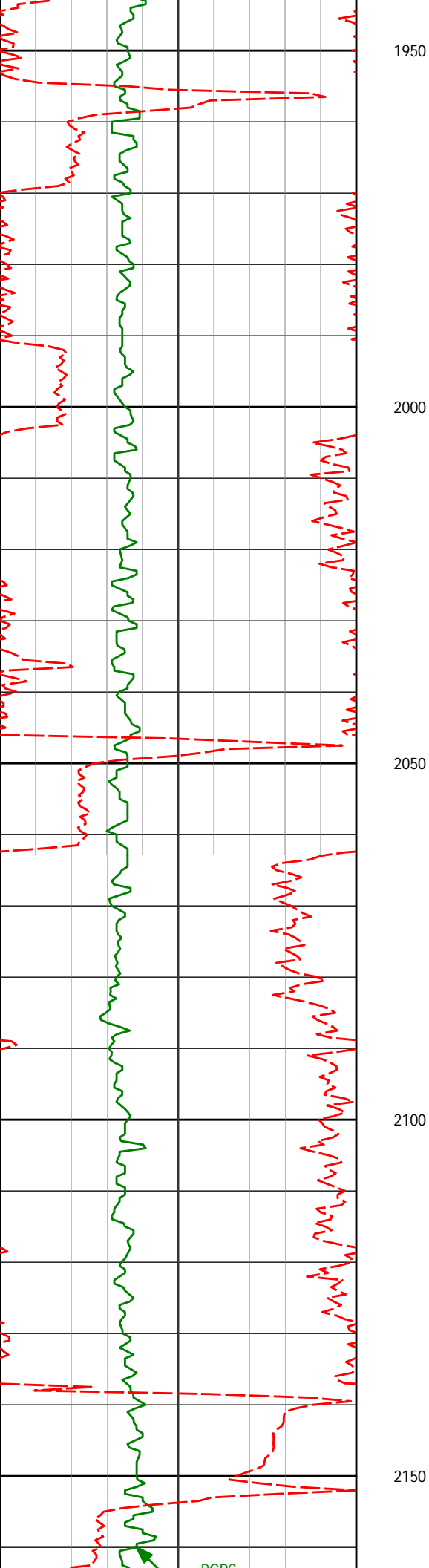
1875'

0.30°

348.50°

1874.97'

0.84'



1966'

0.60°

357.72°

1965.97'

0.77'

2149'

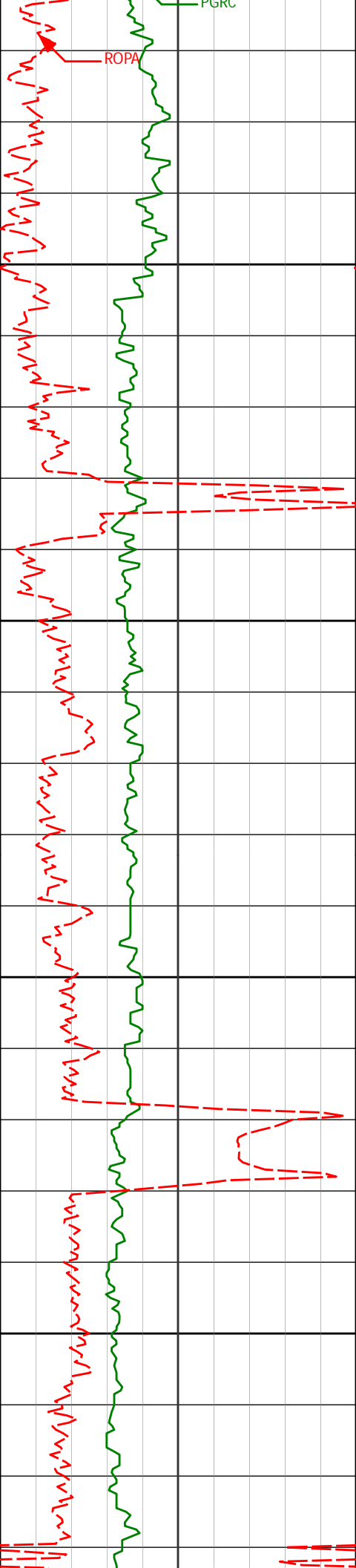
0.79°

188.09°

2148.96'

0.56'

BCRS



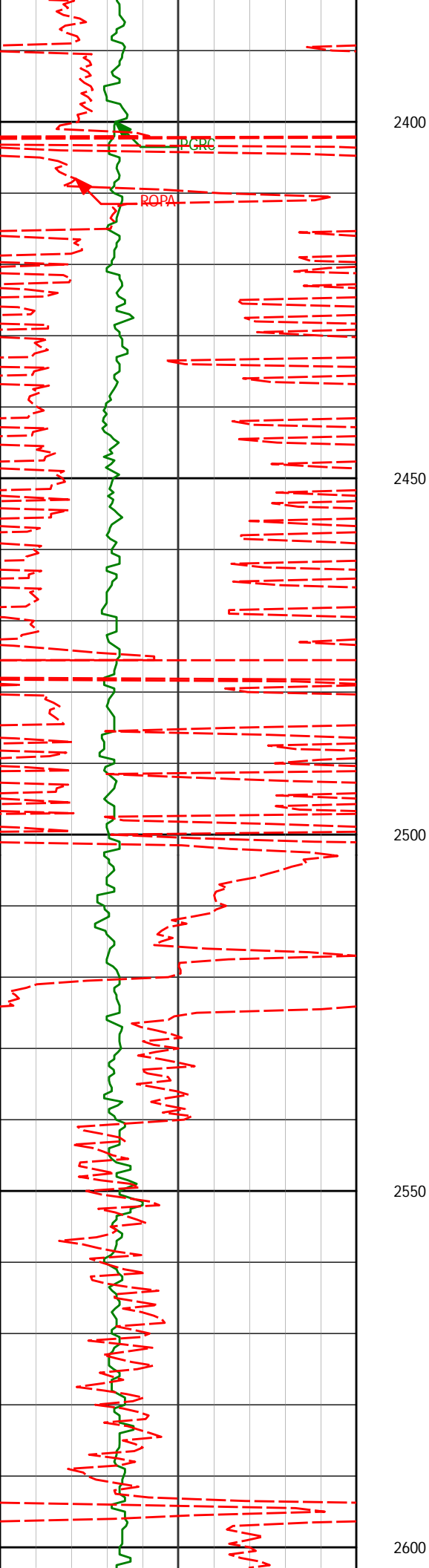
2332'

1.08°

130.96°

2331.94'

1.70'



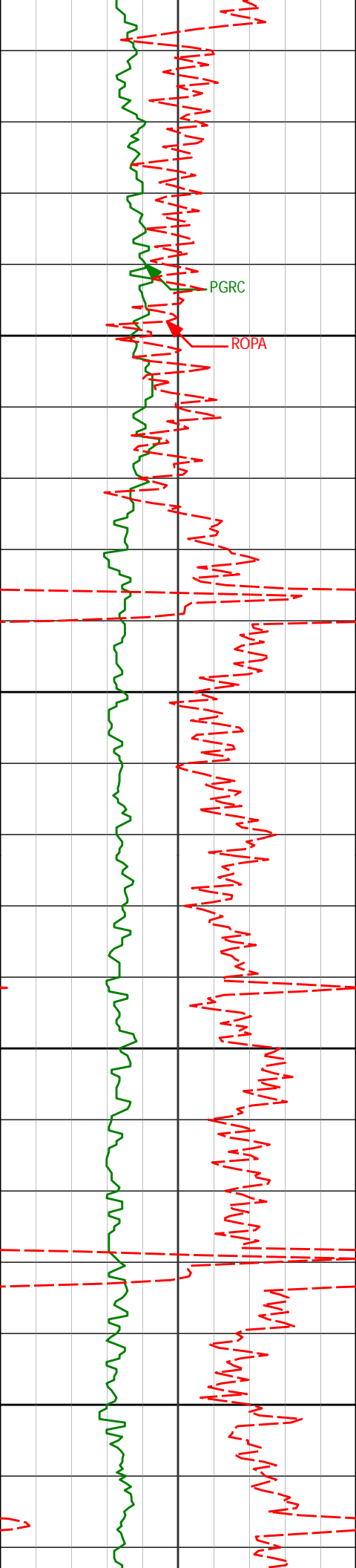
2515'

0.39°

302.93°

2514.94'

2.48'



2650

2700

2750

2800

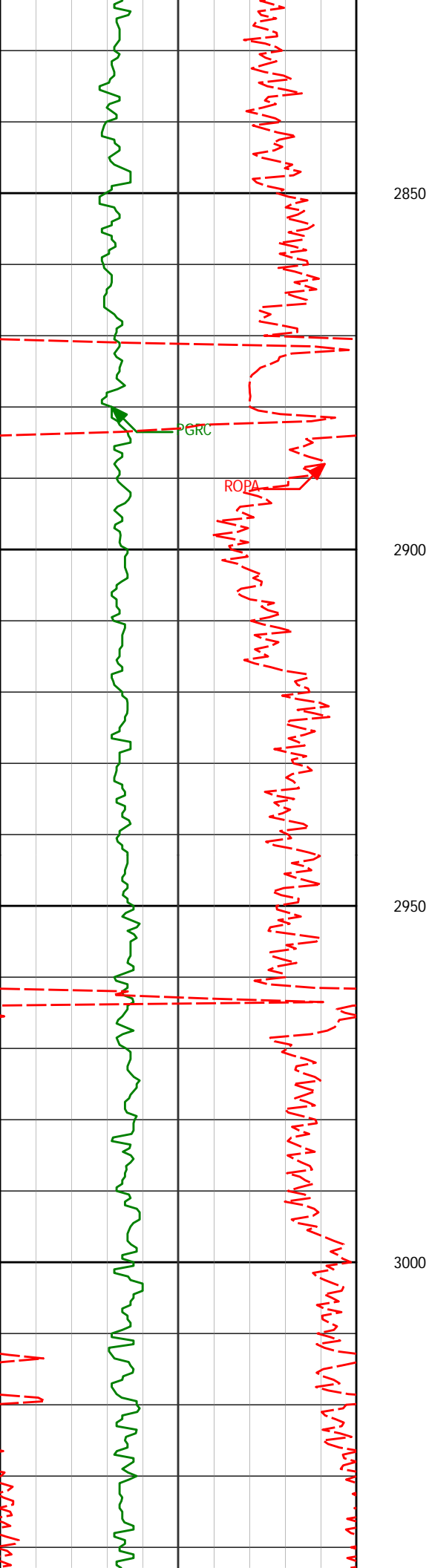
2698'

1.07°

296.74°

2697.92'

0.43'



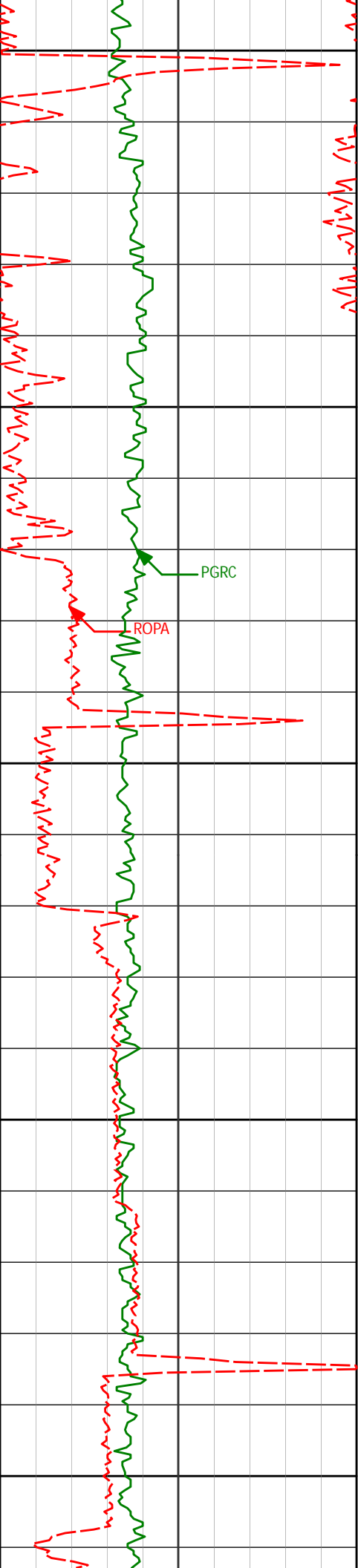
2882'

0.32°

246.25°

2881.91'

-1.58'



3050

3064'

0.34°

181.68°

3063.90'

-2.06'

3100

3150

3200

3241'

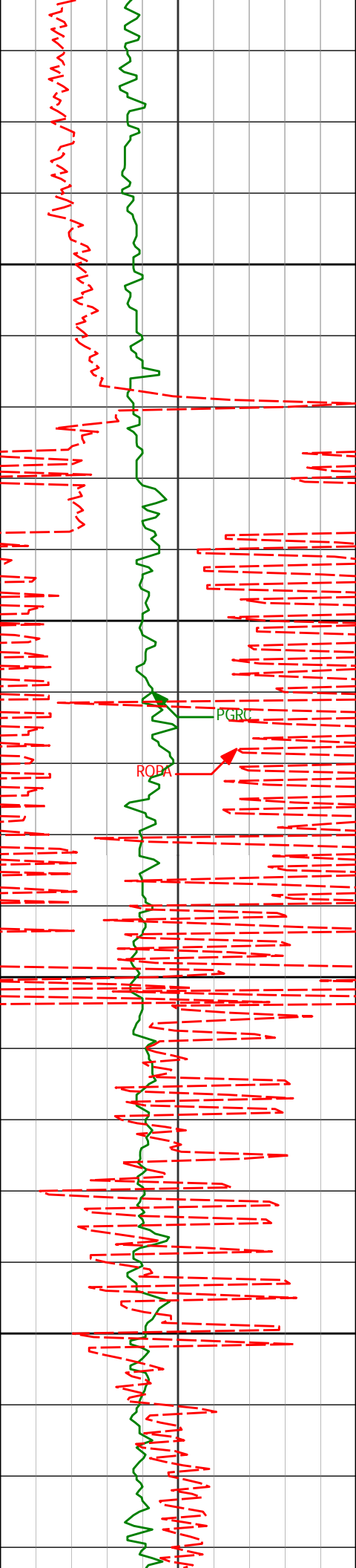
0.61°

144.30°

3240.90'

-1.52'

3250



3300

3350

3400

3450

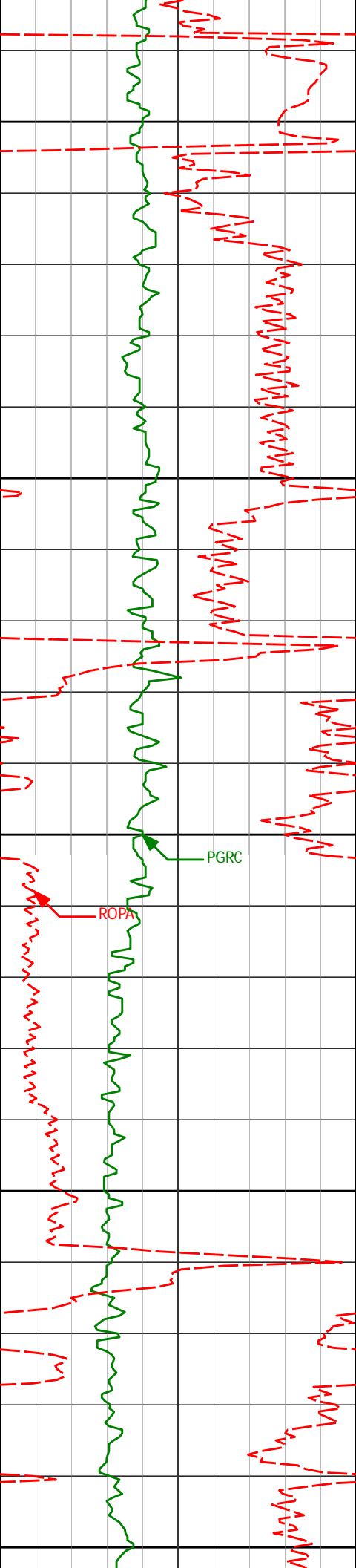
3412'

0.93°

133.70°

3411.88'

0.02'



3500

3550

3584'

0.46°

24.08°

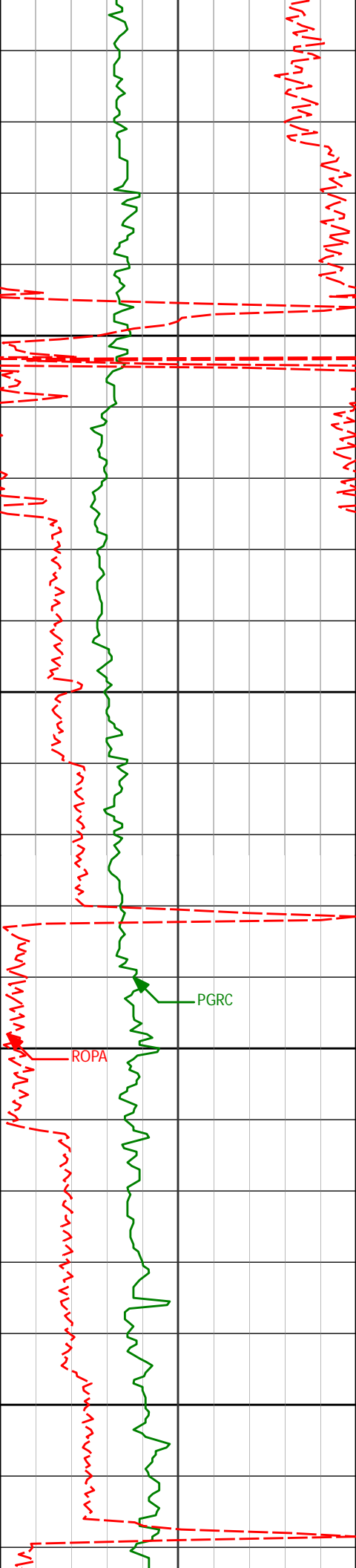
3583.87'

1.32'

3600

3650

3700



3750

3755'

0.39°

22.62°

3754.87'

1.82'

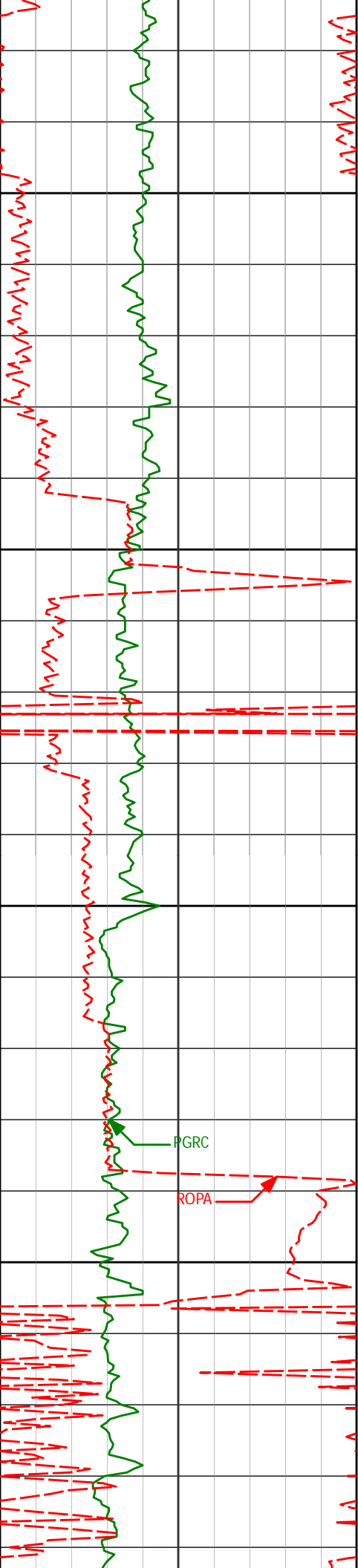
3800

PGRC

ROPA

3850

3900



3927'

0.69°

37.91°

3926.86'

2.67'

3950

4000

4050

PGRC

ROPA

4100

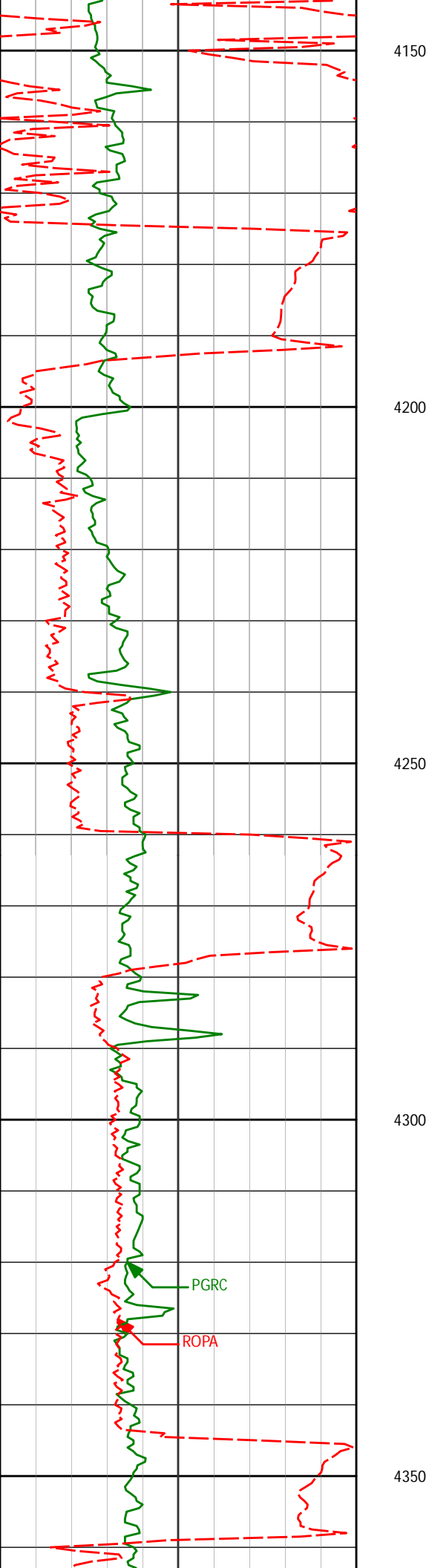
4098'

1.13°

24.15°

4097.84'

3.98'



4269'

5.48°

354.86°

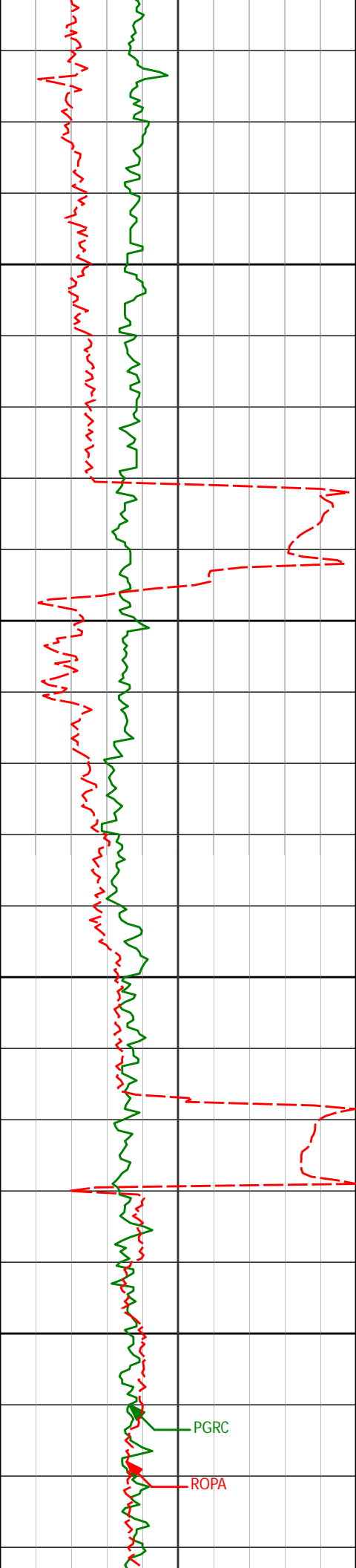
4268.52'

3.89'

PGRC

ROPA

4350



4400

4450

4500

4550

4441'

8.94°

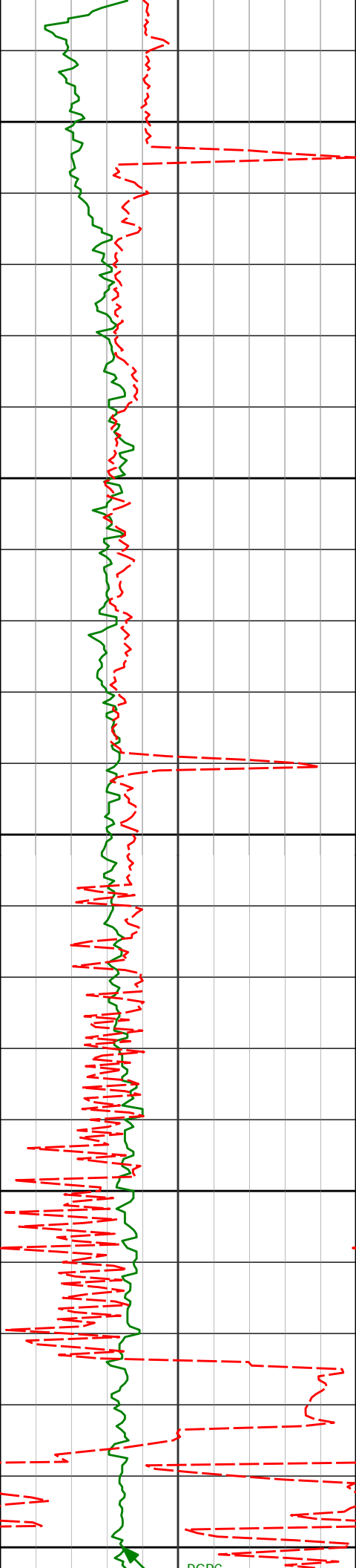
354.41°

4439.13'

1.74'

PGRC

ROPA



4600

4612'

11.17°

352.36°

4607.50'

-1.90'

4650

4700

4750

4783'

11.58°

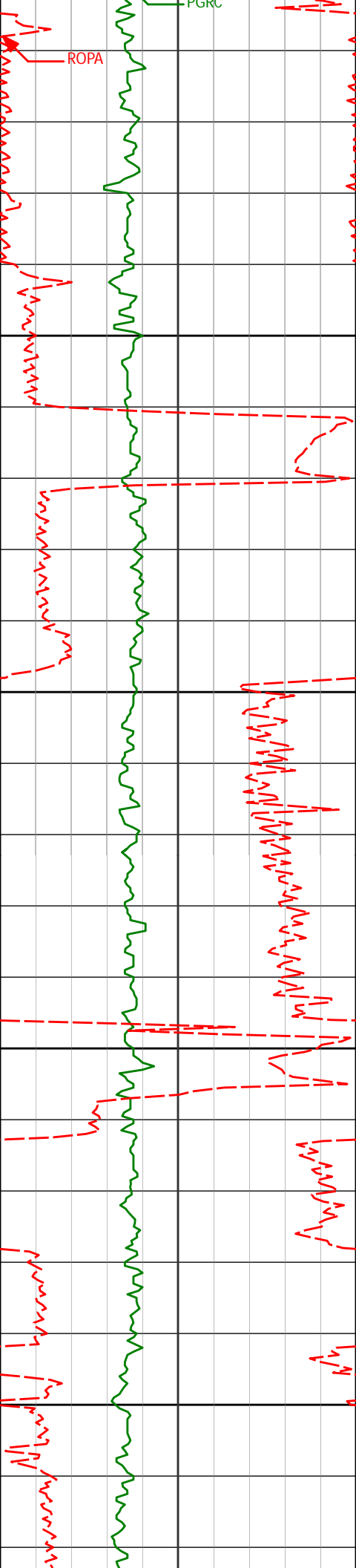
355.16°

4775.14'

-5.72'

4800

BCD6



4850

4900

4950

5000

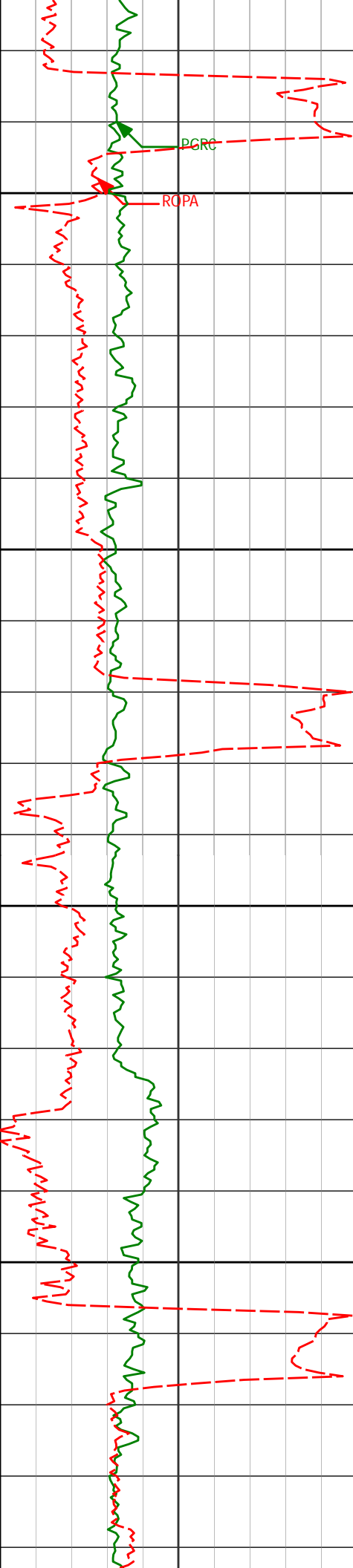
4955'

9.28°

358.91°

4944.29'

-7.60'



PGRC

ROPA

5050

5100

5150

5200

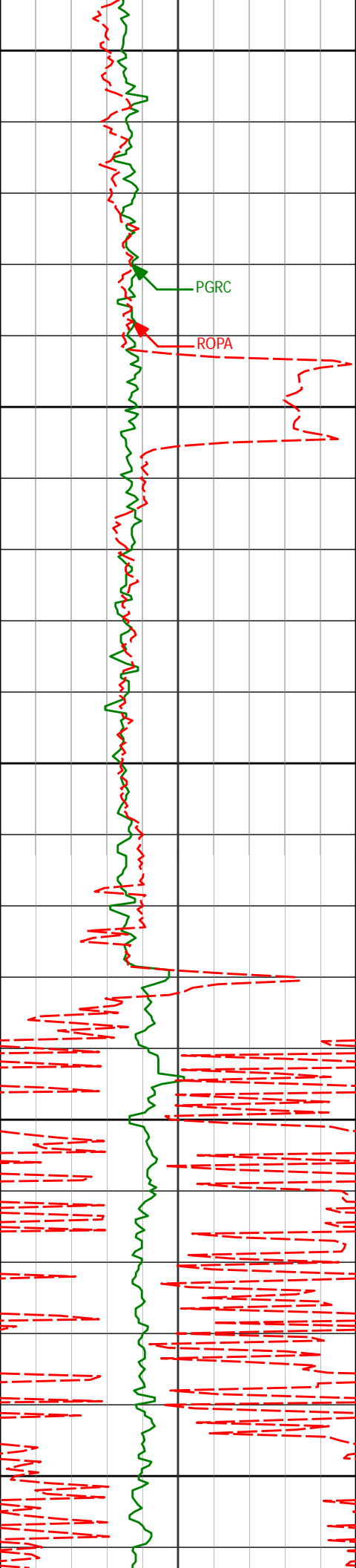
5126'

9.84°

1.18°

5112.91'

-7.71'



5250

5300

5350

5400

5450

PGRC

ROPA

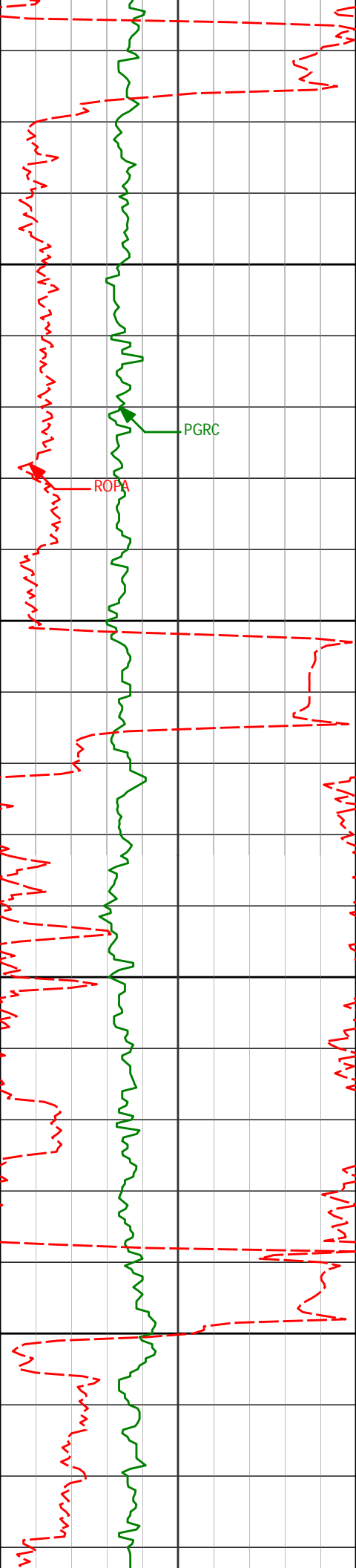
5298'

10.83°

357.48°

5282.12'

-8.27'



5469'

9.72°

356.21°

5450.38'

-10.09'

5500

PGRC

ROP

5550

5600

5641'

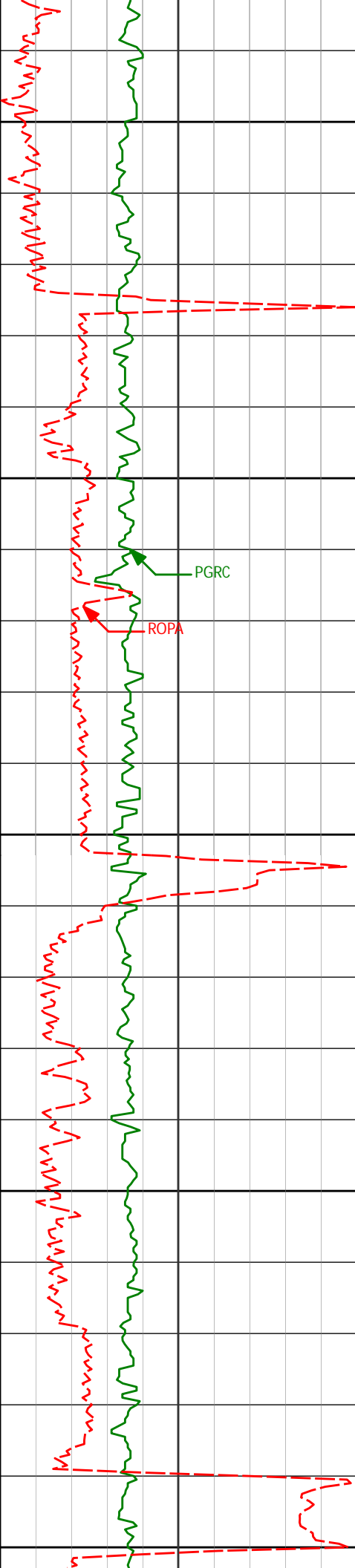
9.33°

3.86°

5620.01'

-10.25'

5650



5700

5750

5800

5850

5900

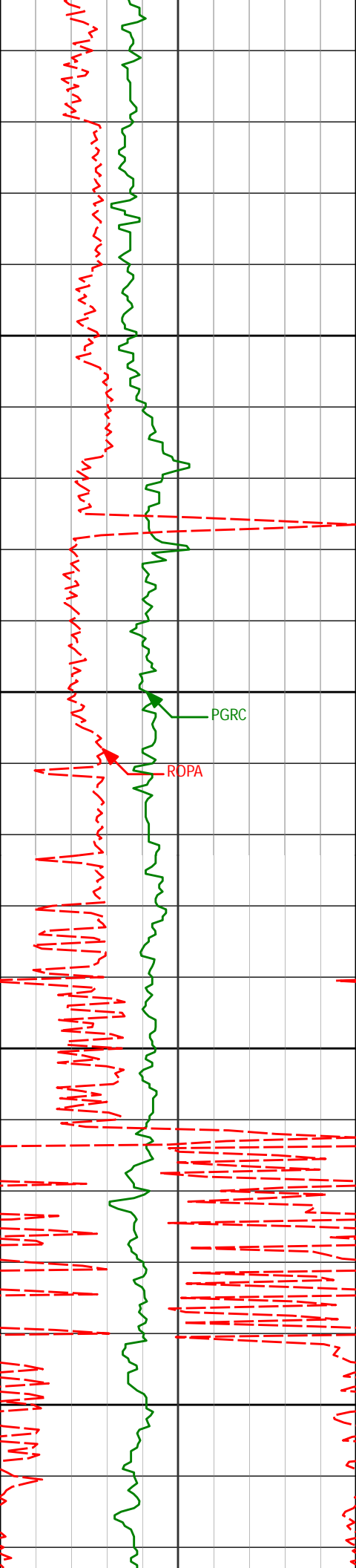
5812'

7.28°

1.81°

5789.21'

-9.10'



5950

6000

6050

6100

5983'

6.67°

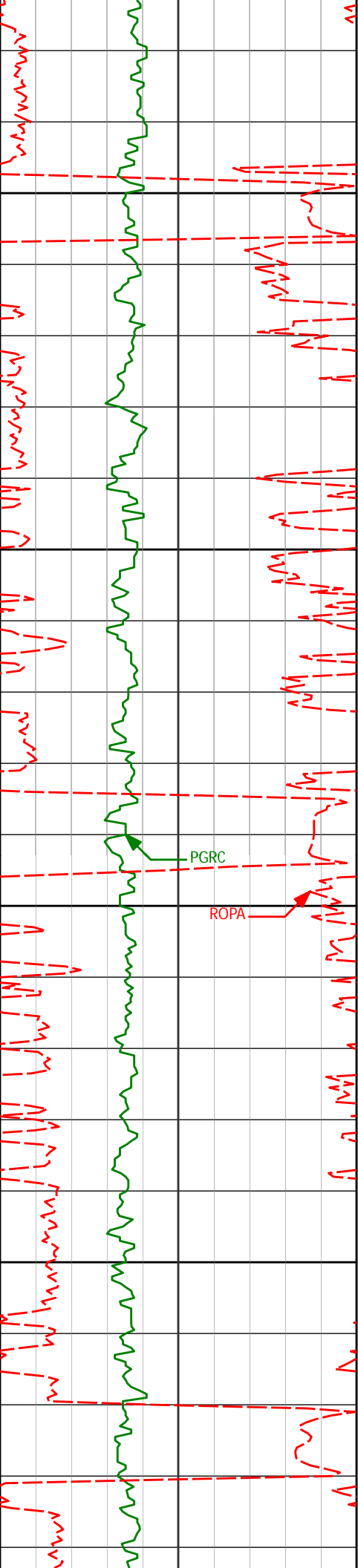
351.63°

5958.95'

-10.31'

PGRC

ROPA



6150

6154'

4.56°

354.55°

6129.12'

-12.48'

6200

6250

6300

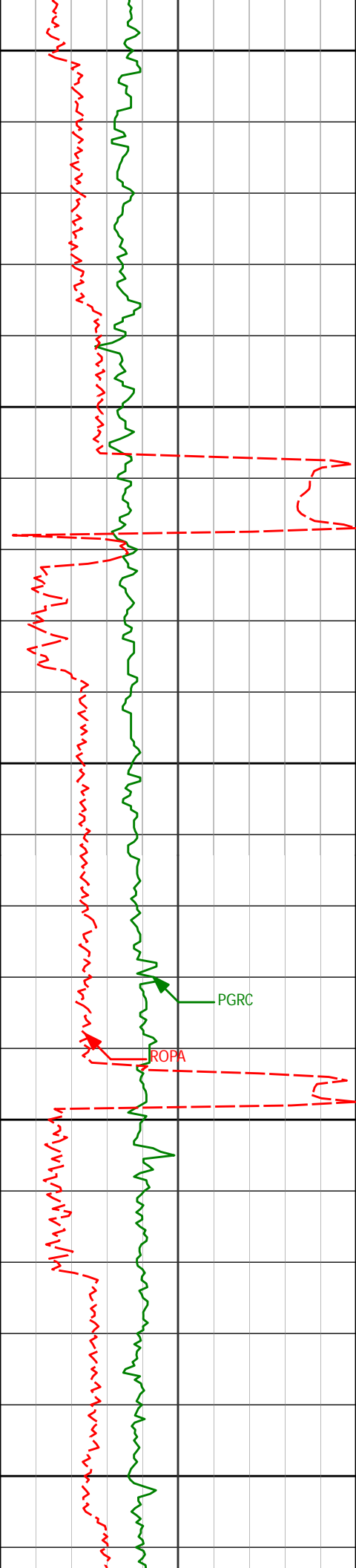
6326'

1.88°

340.24°

6300.84'

-14.13'



6350

6400

6450

6500

6550

PGRC

ROPA

6497'

0.83°

181.24°

6471.81'

-15.12'

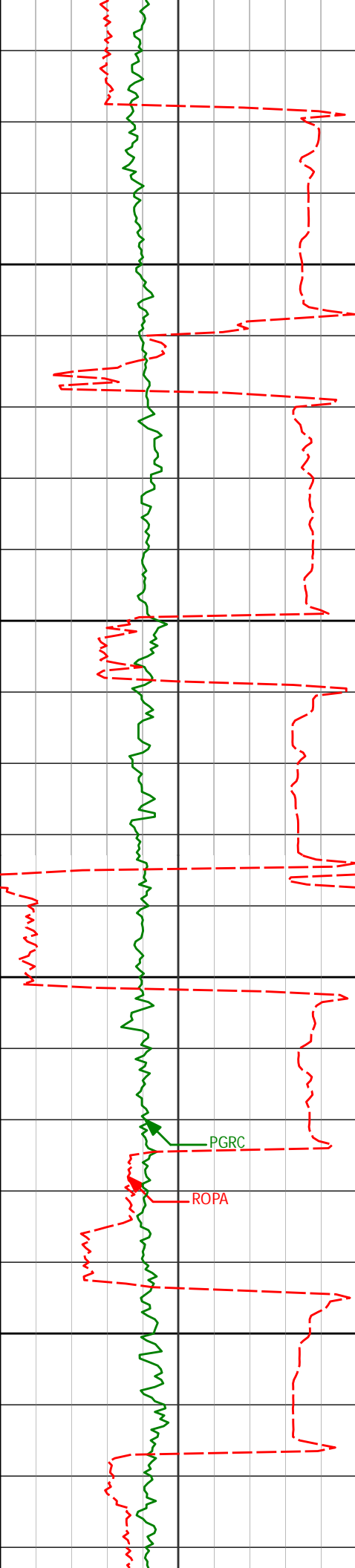
6539'

1.12°

188.51°

6513.81'

-15.18'



6600

6650

6700

6750

6582'

2.16°

121.96°

6556.79'

-14.55'

6625'

7.41°

105.70°

6599.63'

-11.19'

6668'

12.71°

100.76°

6641.95'

-3.86'

6711'

16.45°

99.91°

6683.56'

6.80'

6754'

20.09°

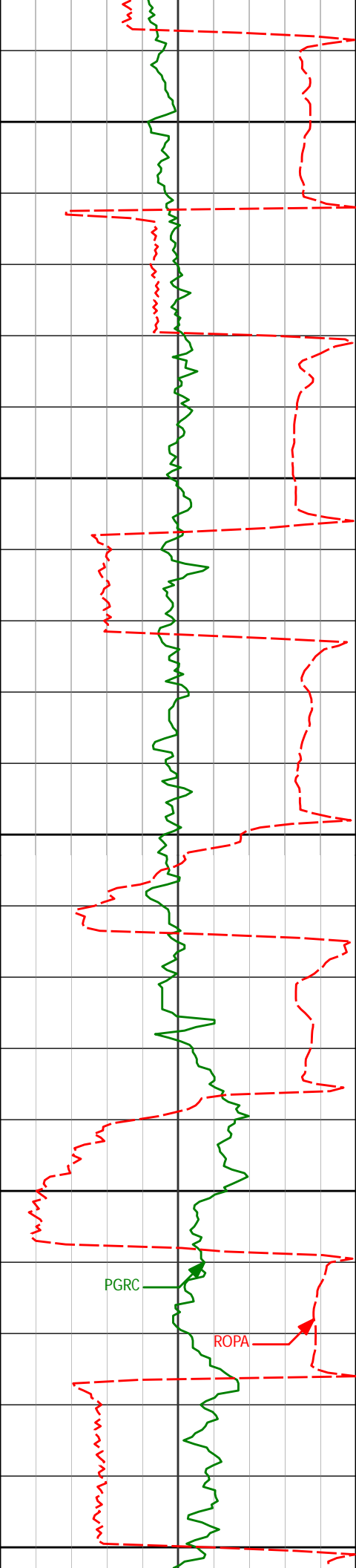
100.97°

6724.39'

20.07'

PGRC

ROPA



6800

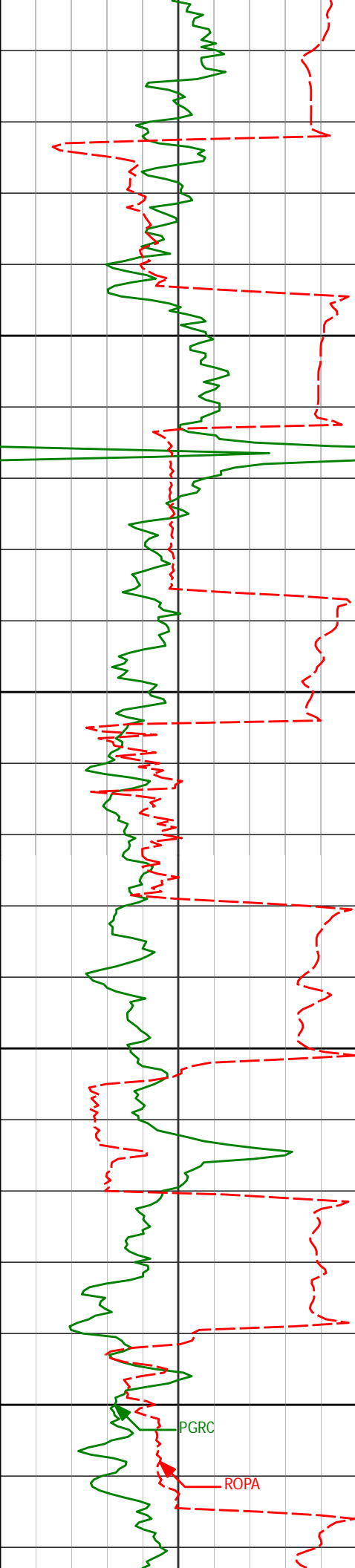
6850

6900

6950

7000

6796'	23.47°	100.98°	6763.38'	35.38'
6839'	27.57°	100.18°	6802.18'	53.60'
6882'	31.53°	99.30°	6839.58'	74.52'
6925'	34.66°	96.98°	6875.60'	97.77'
6967'	37.68°	94.97°	6909.50'	122.44'

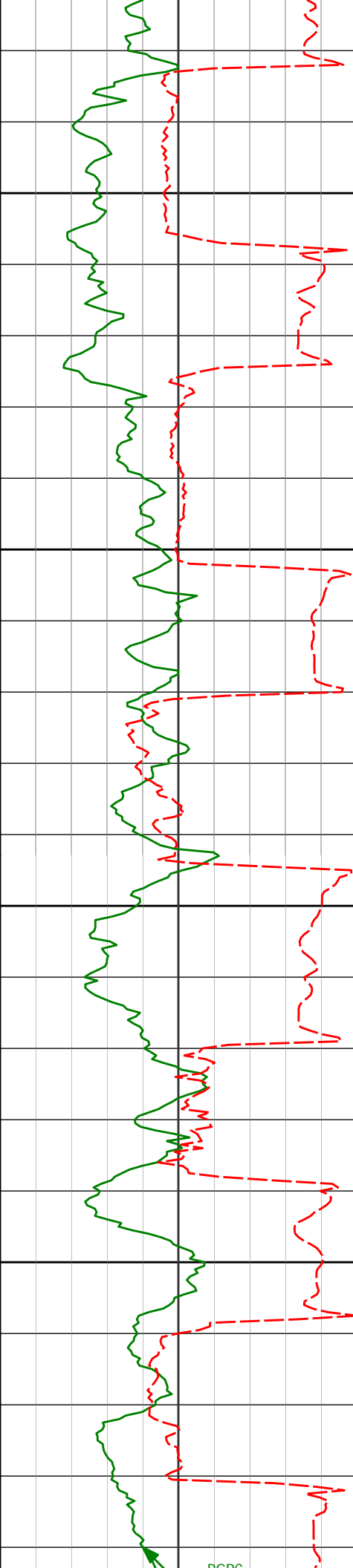


7010'	40.74°	92.91°	6942.82'	149.56'
7050				
7053'	44.55°	90.90°	6974.44'	178.67'
7096'	47.91°	89.83°	7004.19'	209.72'
7100				
7139'	51.41°	89.01°	7032.02'	242.48'
7150				
7182'	55.20°	88.49°	7057.71'	276.94'

7200

PGRC

ROPA



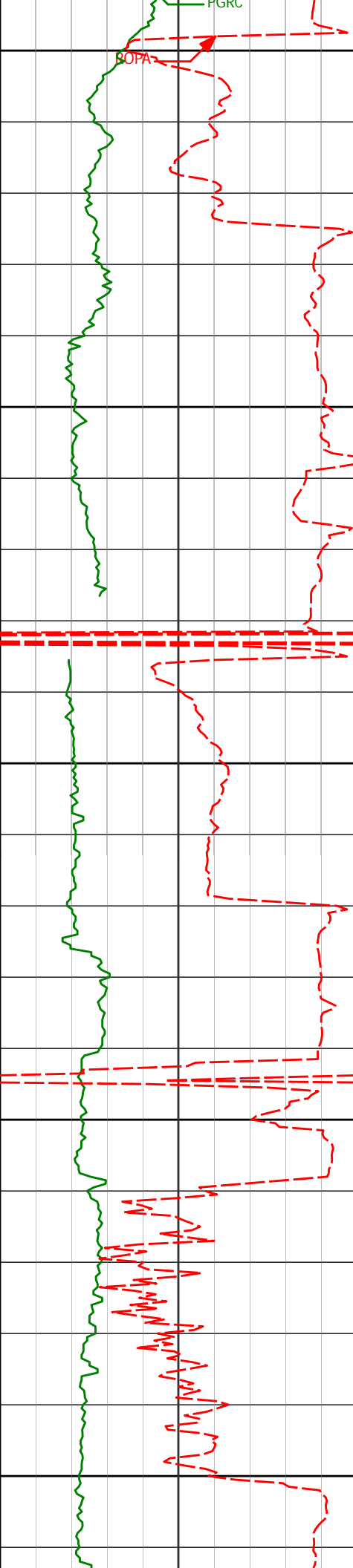
7250

7300

7350

7400

7224'	58.47°	87.54°	7080.68'	312.07'
7267'	61.53°	87.08°	7102.18'	349.25'
7310'	64.74°	88.05°	7121.61'	387.56'
7353'	68.22°	89.39°	7138.76'	426.97'
7396'	71.95°	89.65°	7153.41'	467.38'
7439'	75.61°	88.68°	7165.42'	508.66'



7450

7482'

80.53°

87.64°

7174.30'

550.69'

7500

7516'

83.97°

86.38°

7178.89'

584.31'

7550

Gamma in casing until 7580'

Run 200

7600

7626'

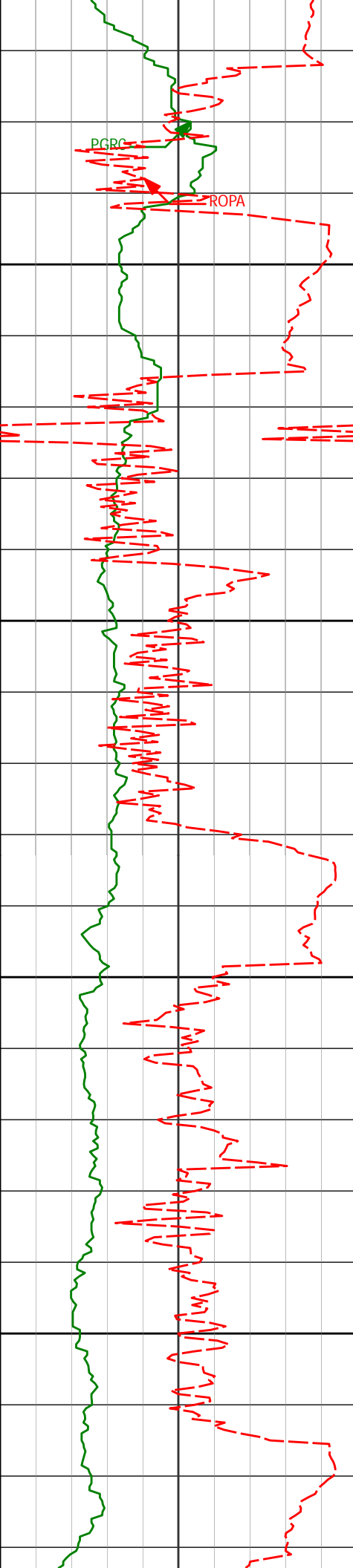
91.54°

84.56°

7183.19'

693.76'

7650



7700

7750

7800

7850

7673'

89.41°

85.70°

7182.81'

740.56'

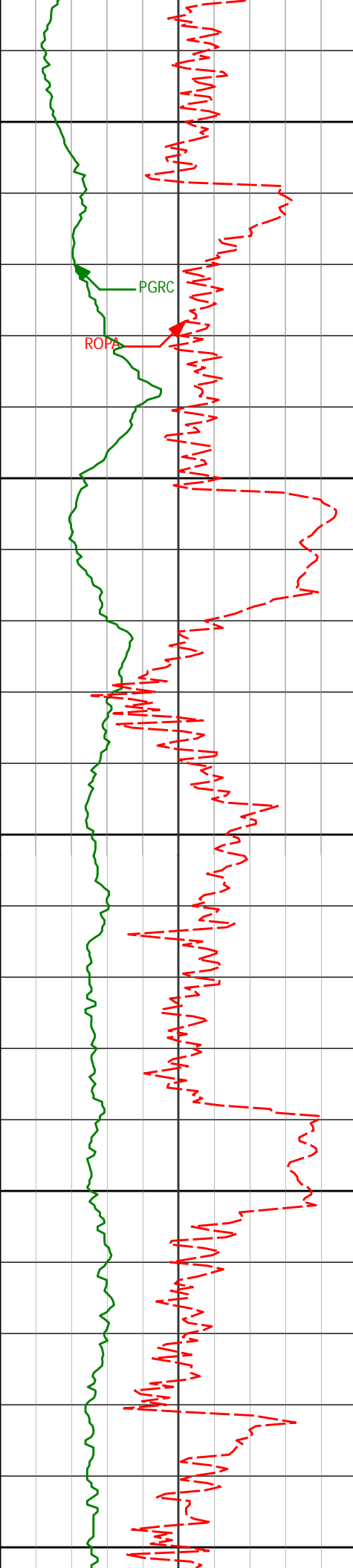
7712'

87.78°

87.27°

7183.76'

779.46'



7900

7950

8000

8050

8100

7663

69.63

69.33

7167.30

950.31

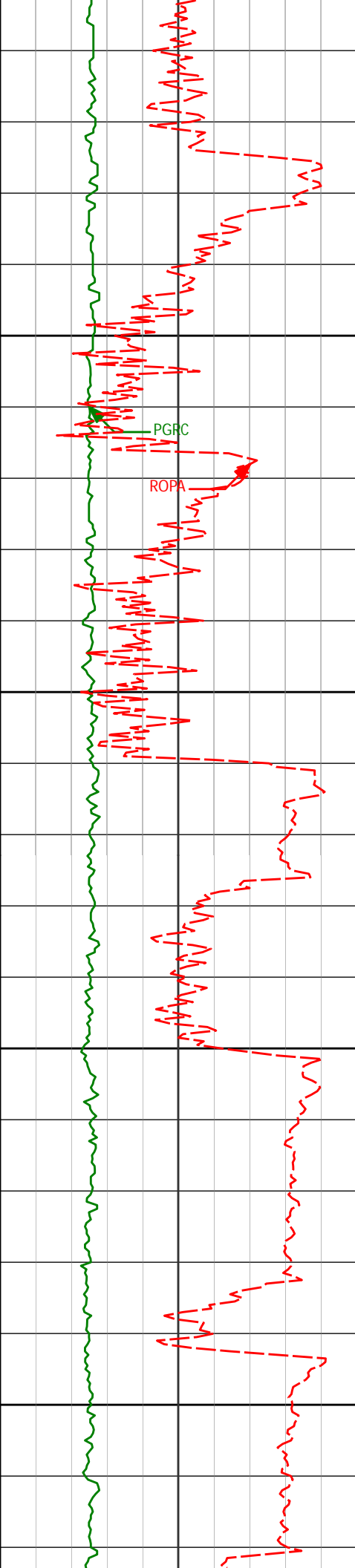
8055'

91.63°

92.21°

7185.08'

1122.26'



8150

8200

8250

8300

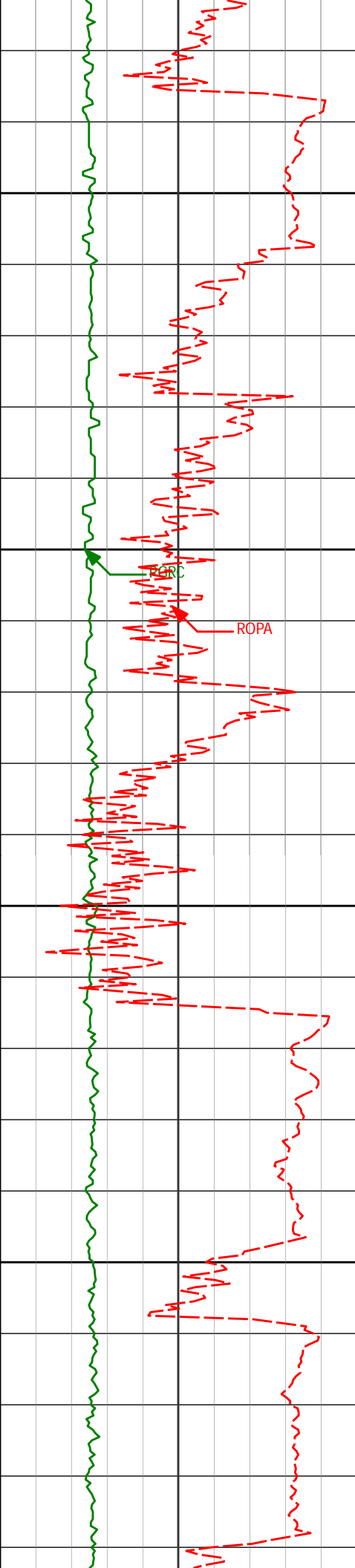
8226'

89.88°

84.78°

7182.82'

1293.04'



8350

8400

8450

8500

8397'

90.37°

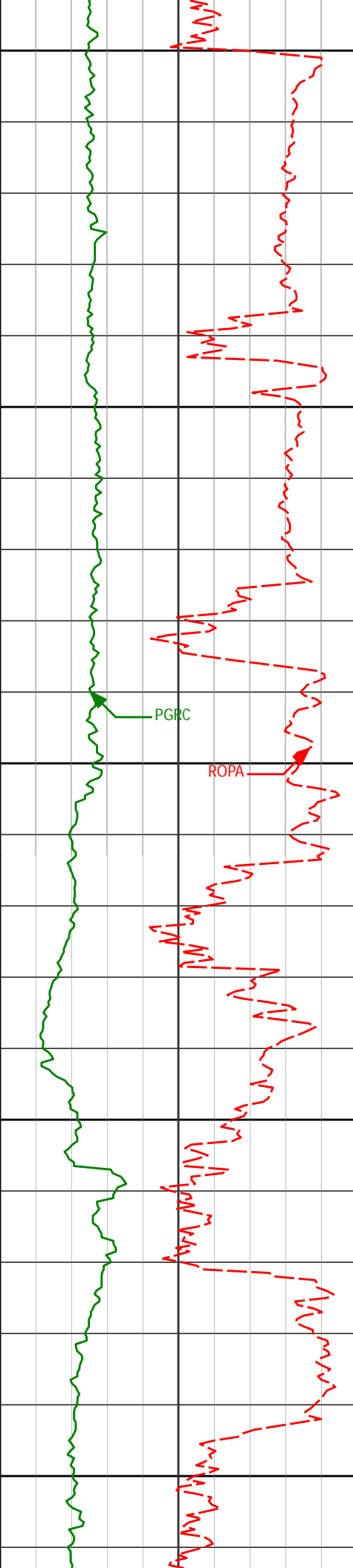
88.07°

7182.45'

1463.63'

BS

ROPA



8550

8569'

91.08°

95.90°

7180.27'

1635.40'

8600

8650

8700

8750

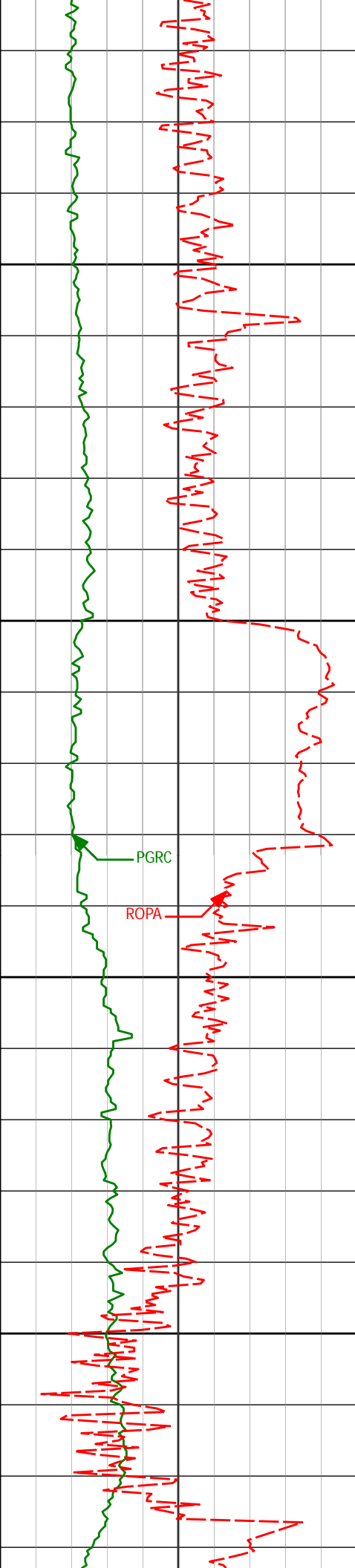
8740'

90.18°

102.26°

7178.39'

1804.29'



8800

8850

8900

8950

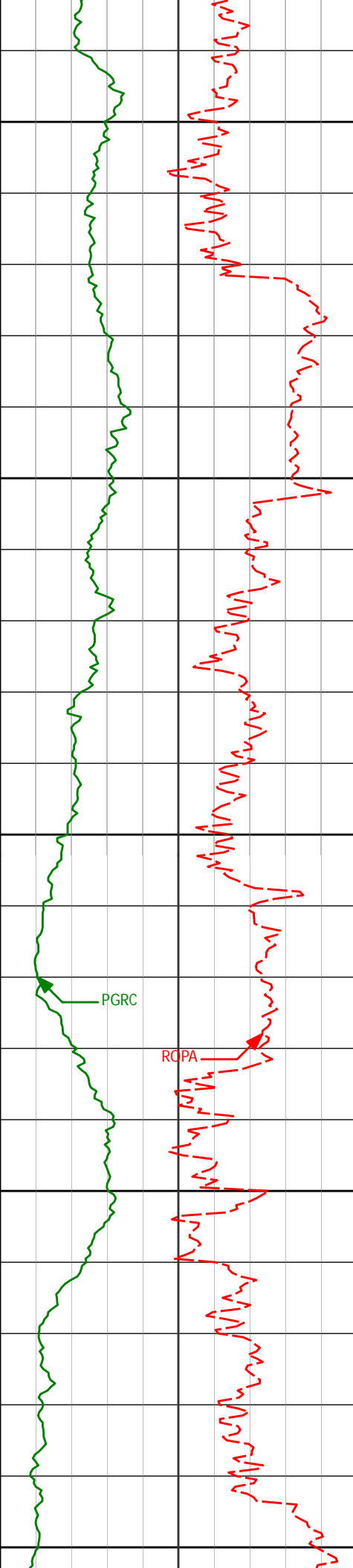
8912'

89.23°

98.82°

7179.27'

1973.52'



9000

9050

9100

9150

9200

9083'

87.72°

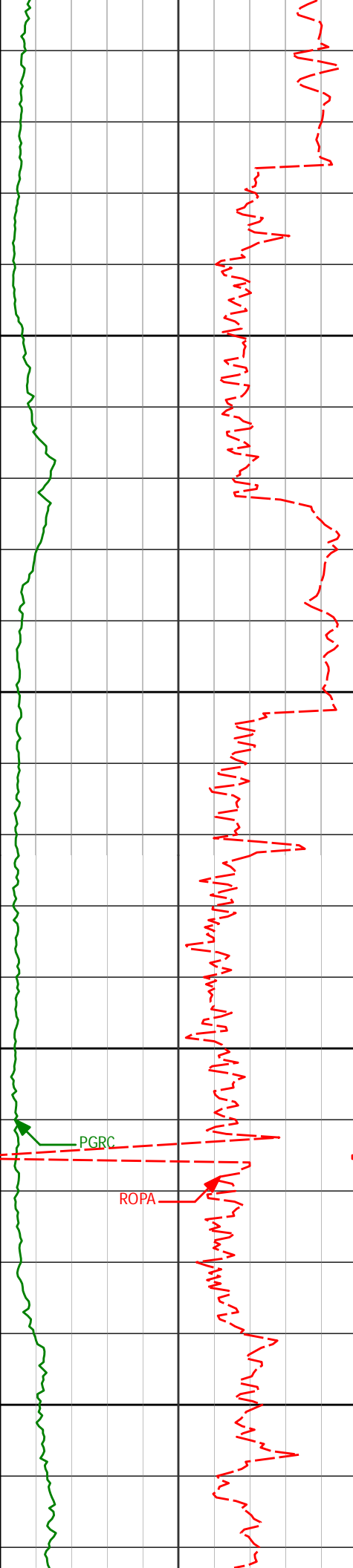
95.29°

7183.82'

2143.24'

PGRC

RCPA



9250

9254'

87.75°

98.40°

7190.58'

2312.97'

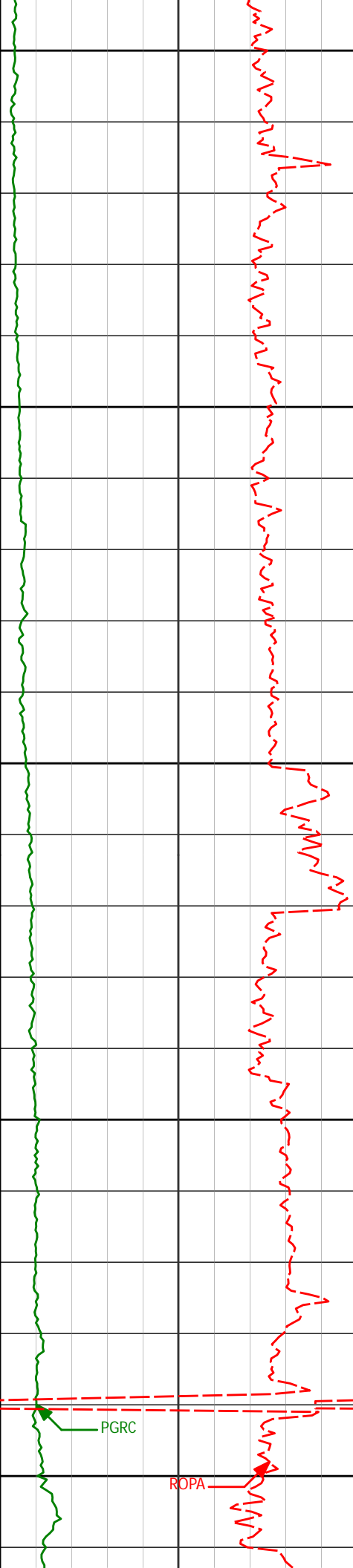
9300

9350

9400

PGRC

ROPA



9650

9700

9750

9800

9850

9768'

91.02°

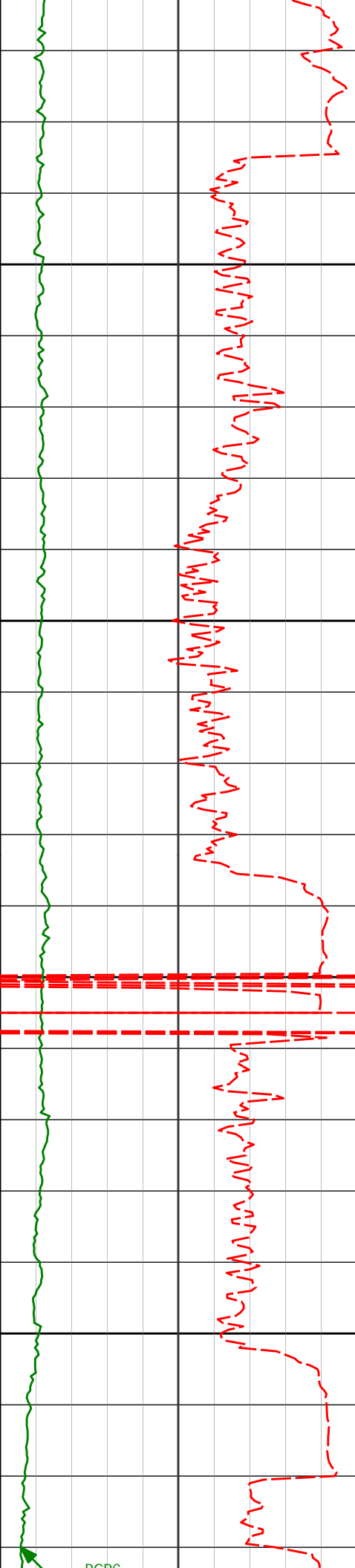
101.43°

7187.15'

2818.81'

PGRC

ROPA



9900

9950

10000

10050

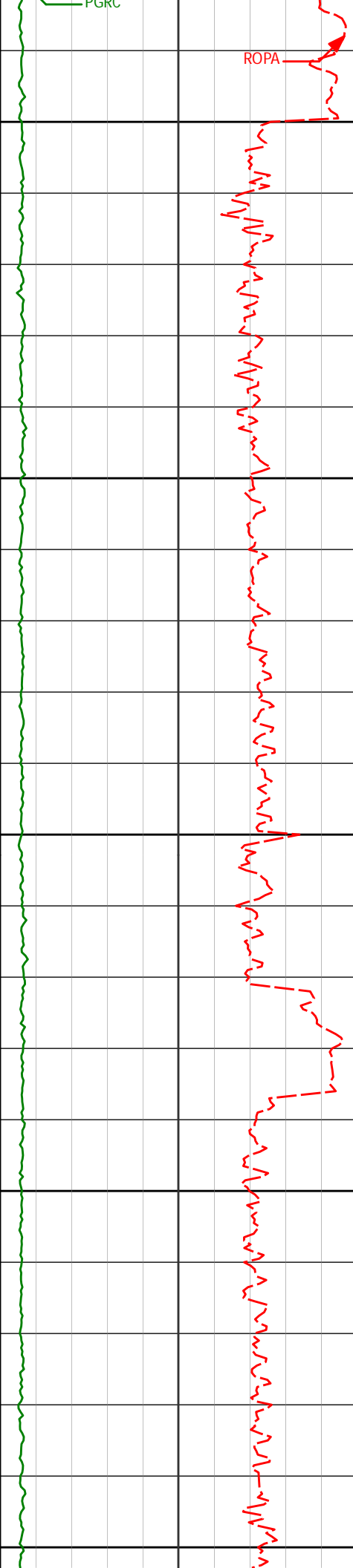
9951'

90.74°

102.90°

7184.34'

2997.87'



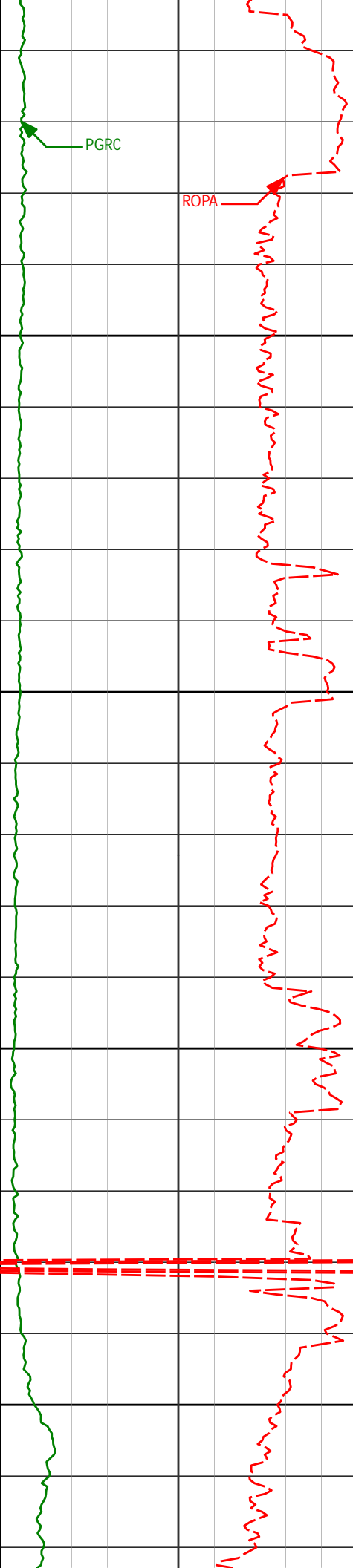
10133'

90.93°

98.11°

7181.69'

3176.91'



10350

10400

10450

10500

10316'

90.49°

96.83°

7179.42'

3358.46'

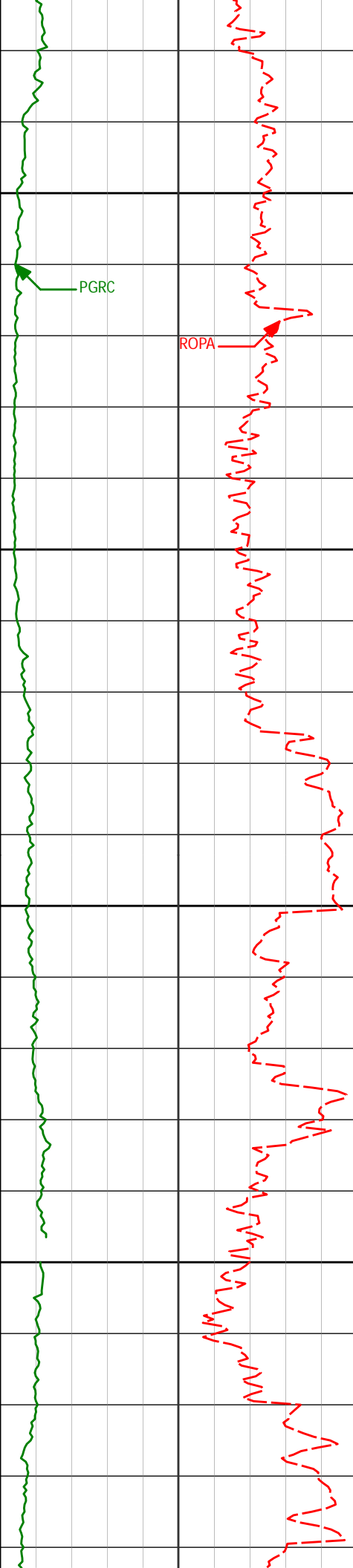
10499'

88.06°

94.96°

7181.73'

3540.55'



10550

PGRC

ROPA

10600

10650

10700

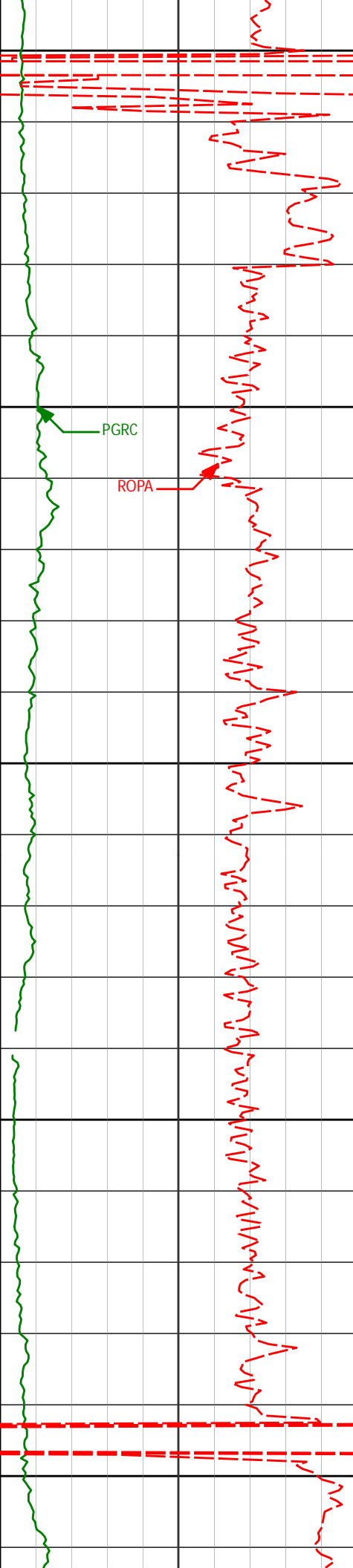
10682'

89.26°

92.22°

7186.01'

3723.17'



10750

10800

10850

10900

10950

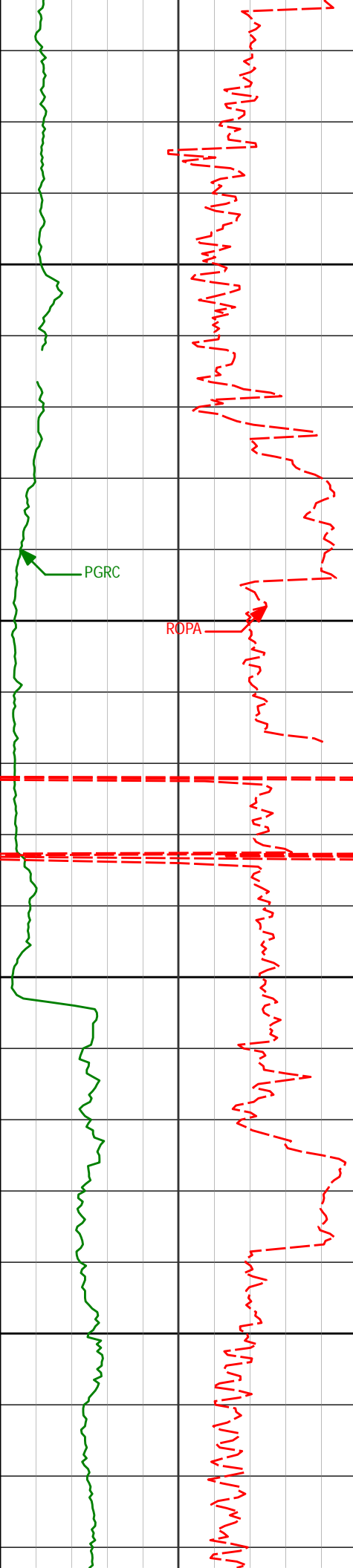
10865'

89.81°

88.70°

7187.50'

3906.14'



11000

11050

11100

11150

PGRC

ROPA

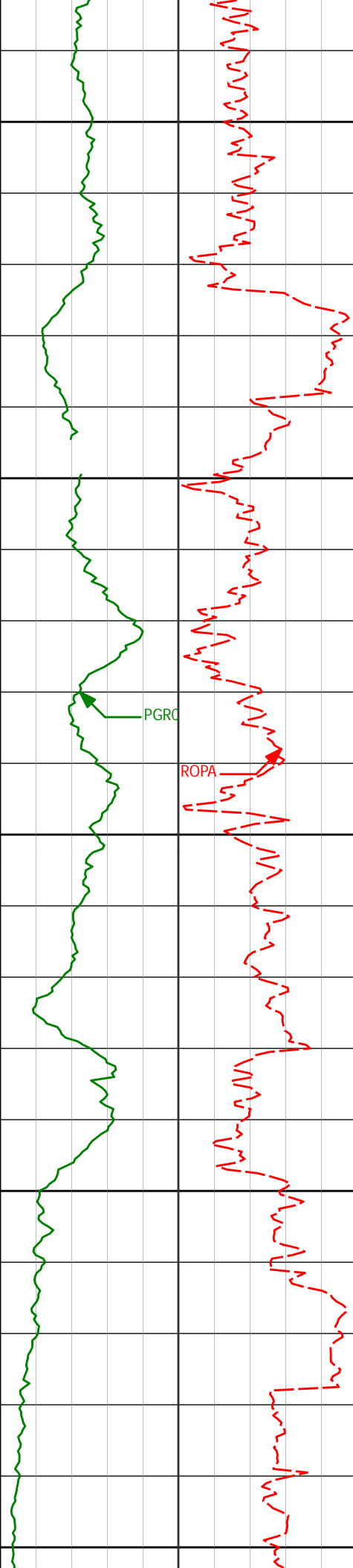
11049'

90.99°

84.40°

7186.21'

4089.69'



11200

11231'

89.04°

84.16°

7186.17'

4270.69'

11250

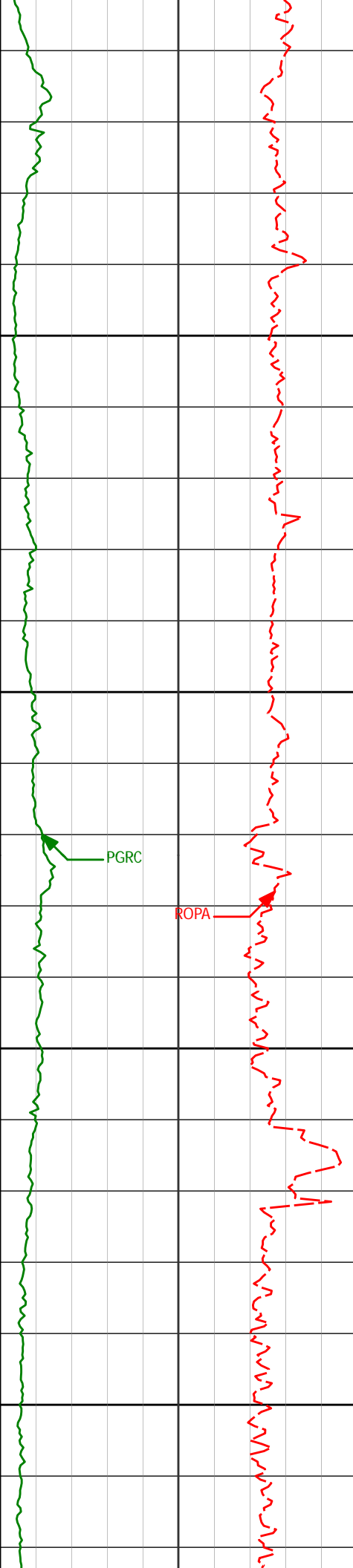
11300

11350

11400

PGRC

ROPA



11450

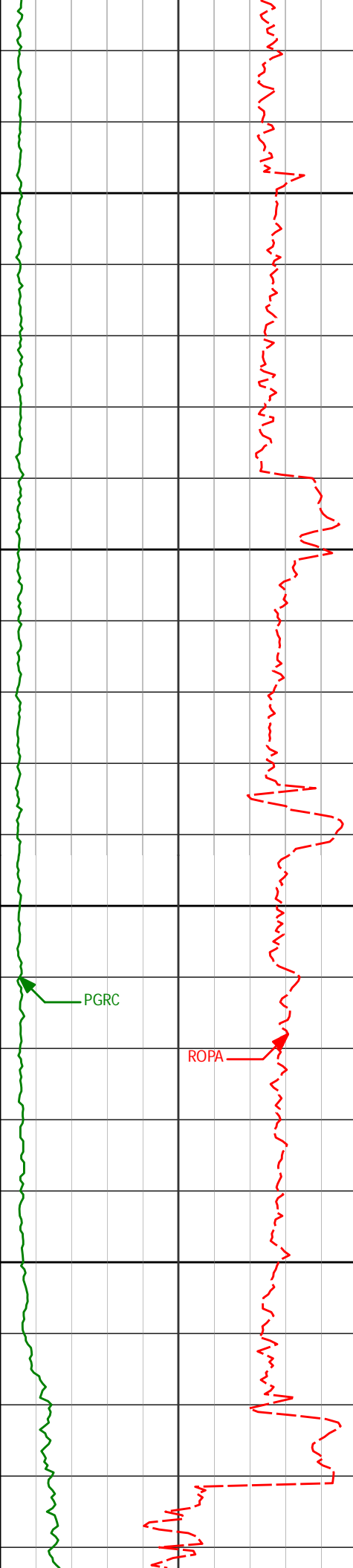
11500

11550

11600

11408'	90.25°	85.55°	7187.26'	4446.88'
--------	--------	--------	----------	----------

11579'	90.15°	85.99°	7186.67'	4617.35'
--------	--------	--------	----------	----------



11650

11700

11750

11800

11750'

89.88°

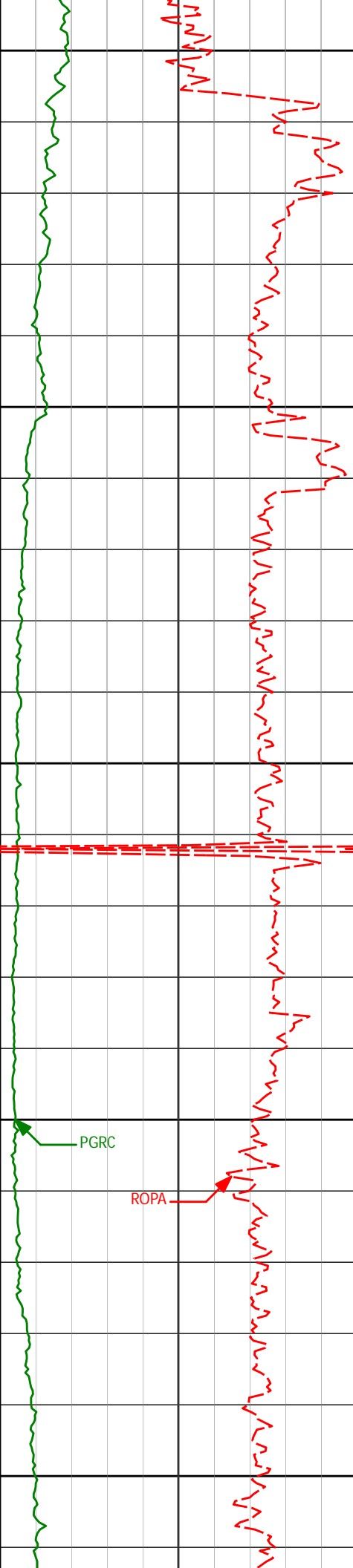
85.63°

7186.62'

4787.82'

PGRC

ROPA



11850

11900

11921'

88.83°

84.22°

7188.55'

4958.06'

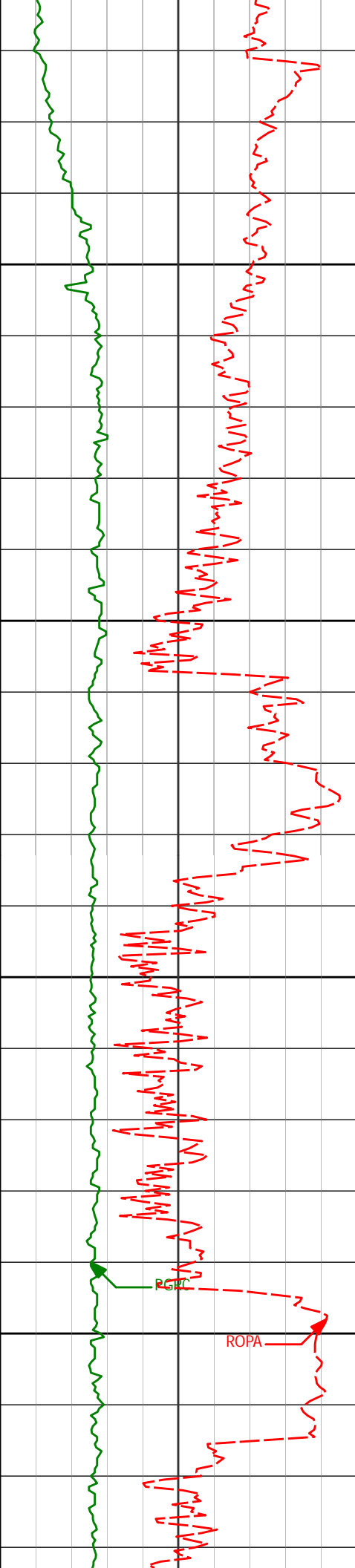
11950

12000

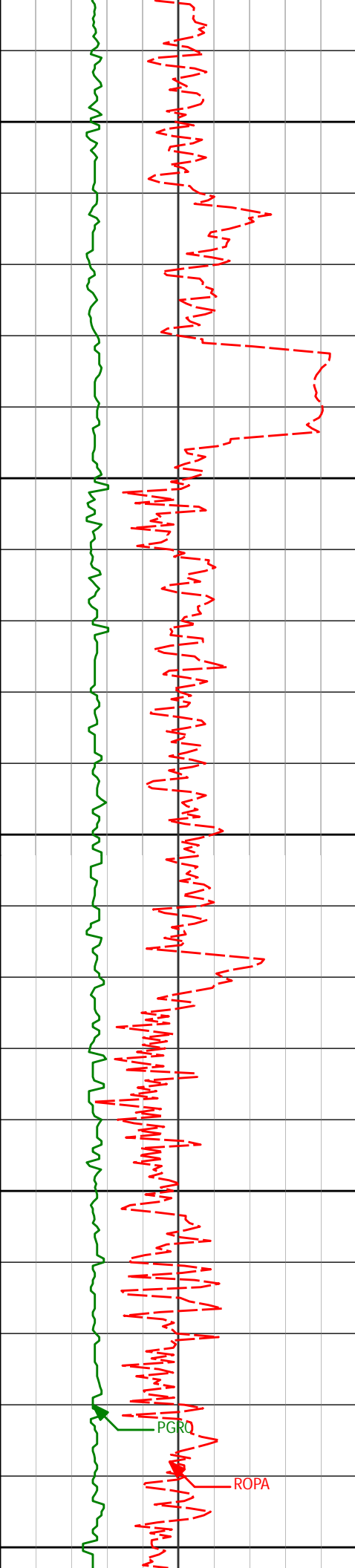
PGRC

ROPA

12050



12092'	89.23°	83.39°	7191.44'	5127.94'
12100				
12150				
12200				
12250				
12264'	89.66°	84.10°	7193.11'	5298.80'



12300

12350

12400

12450

12500

12436'

90.86°

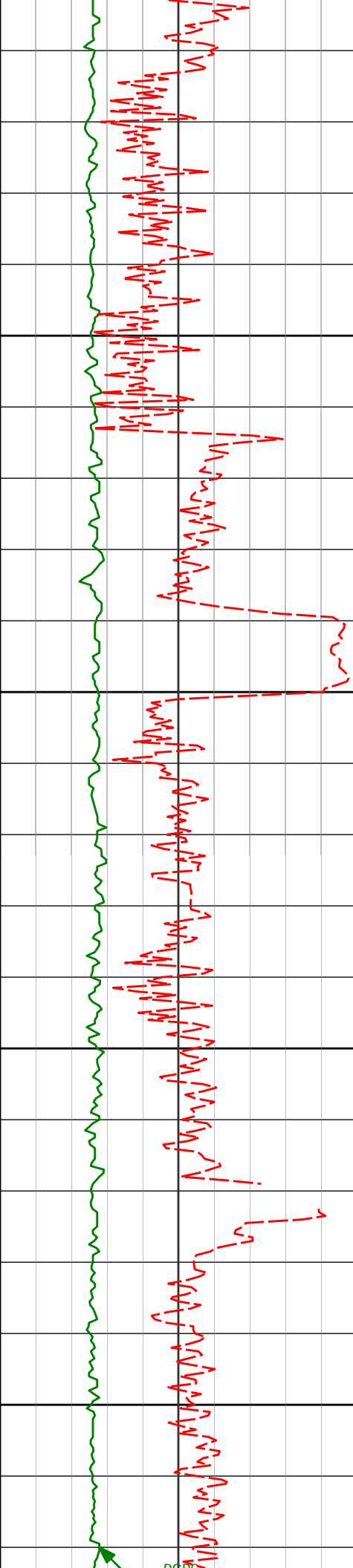
84.52°

7192.33'

5469.86'

PGRO

ROPA



12550

12600

12650

12700

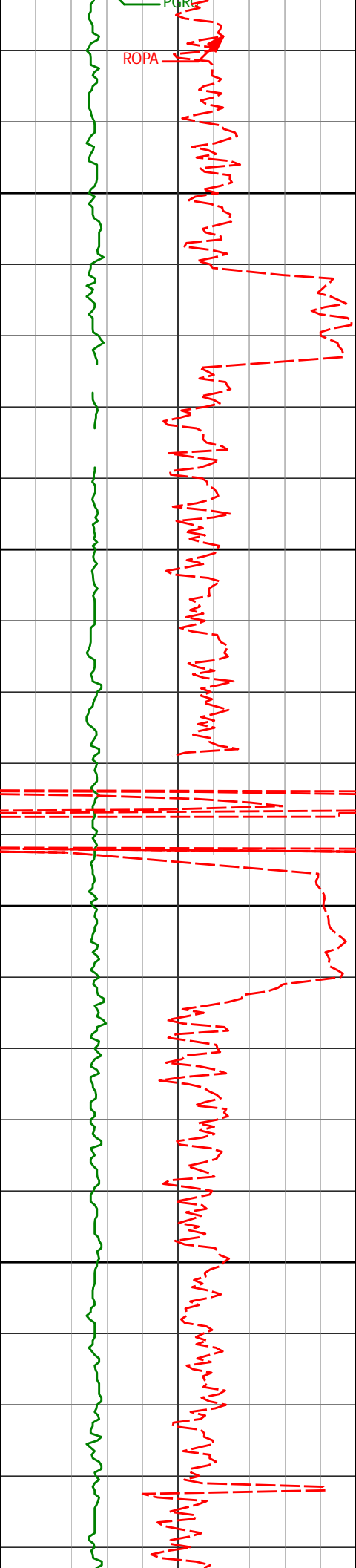
12607'

89.94°

84.92°

7191.13'

5640.05'



12750

12778'

89.14°

86.55°

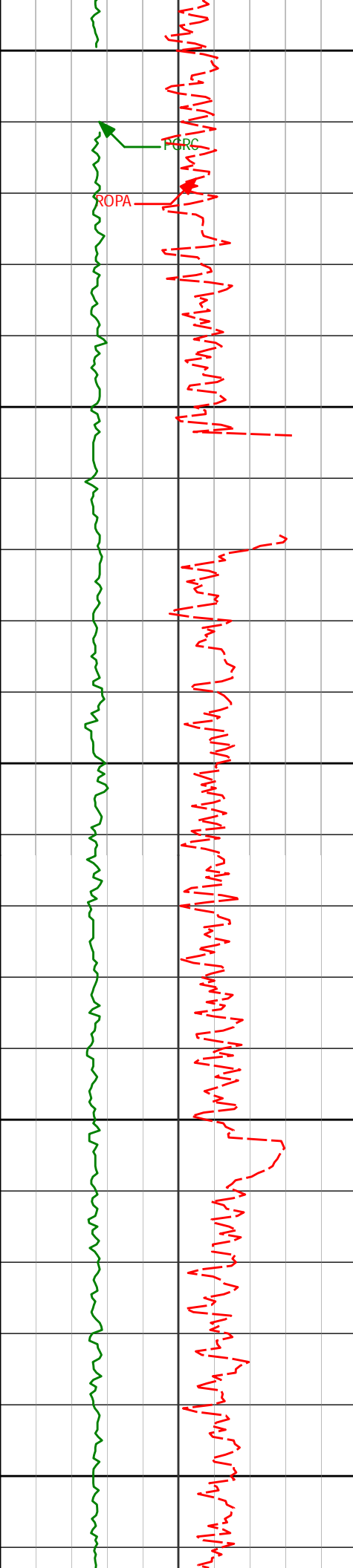
7192.51'

5810.50'

12800

12850

12900



12950

12950'

90.09°

86.50°

7193.66'

5982.12'

13000

13050

13100

13121'

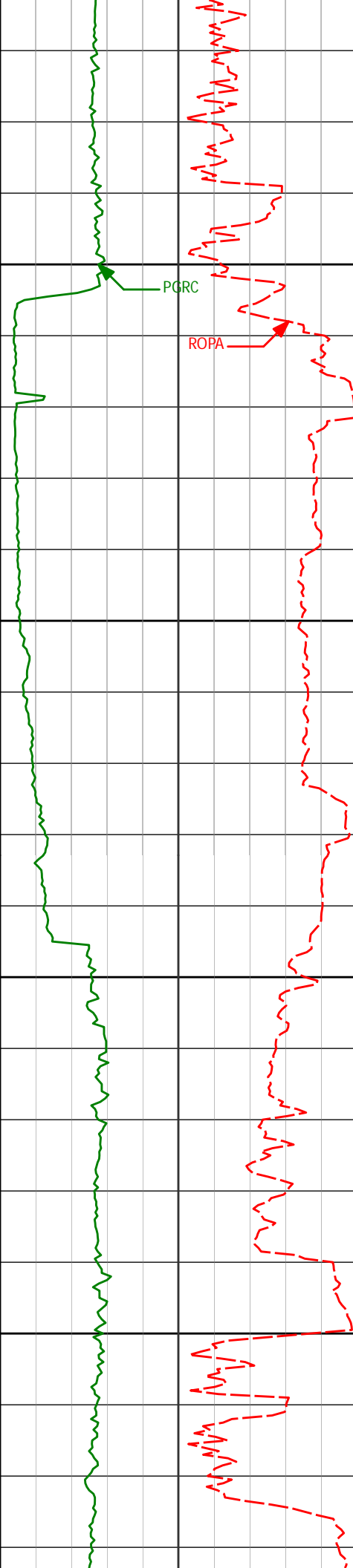
90.40°

84.80°

7192.93'

6152.55'

13150



13200

13250

13300

13350

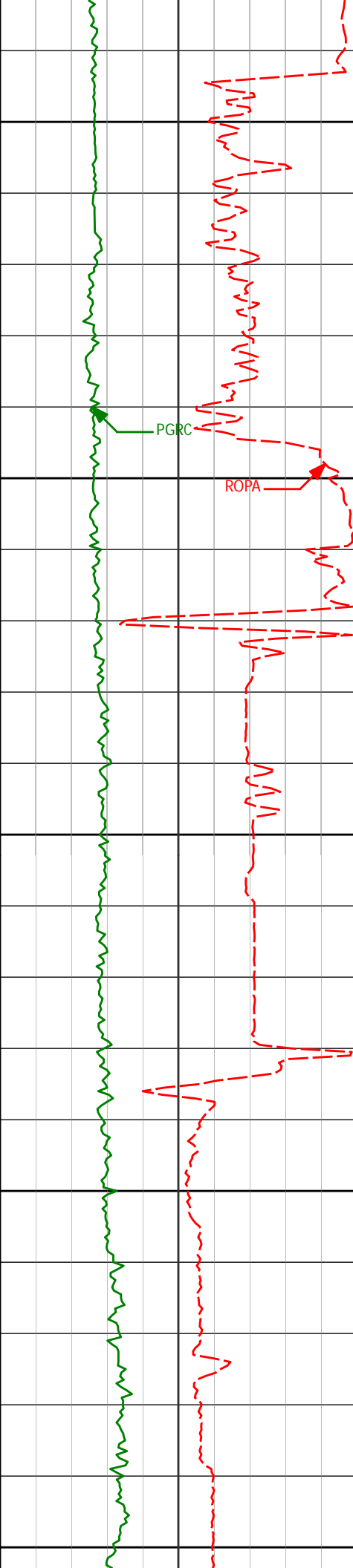
13292'

88.43°

83.86°

7194.68'

6322.61'



13400

13450

13500

13550

13600

PGRC

ROPA

Run 400

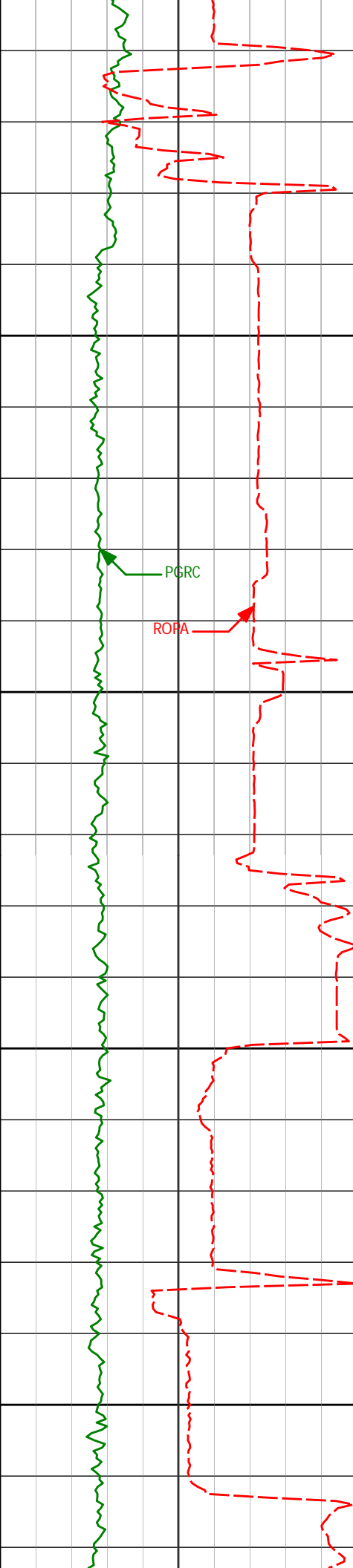
13464'

89.82°

83.69°

7197.30'

6493.47'



13650

13700

13750

13800

13628'

90.18°

83.31°

7197.30'

6656.32'

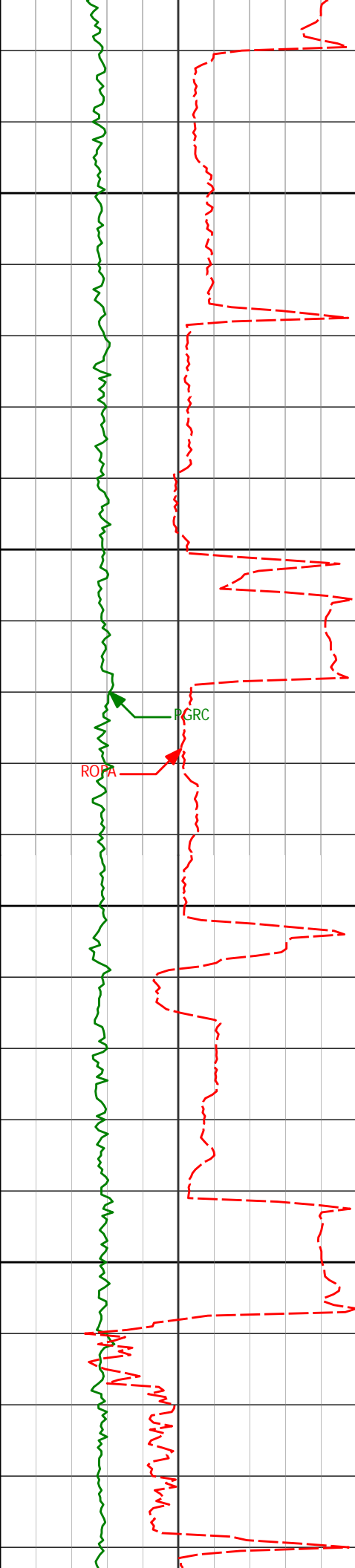
13800'

92.07°

84.61°

7193.93'

6827.23'



13850

13900

13950

14000

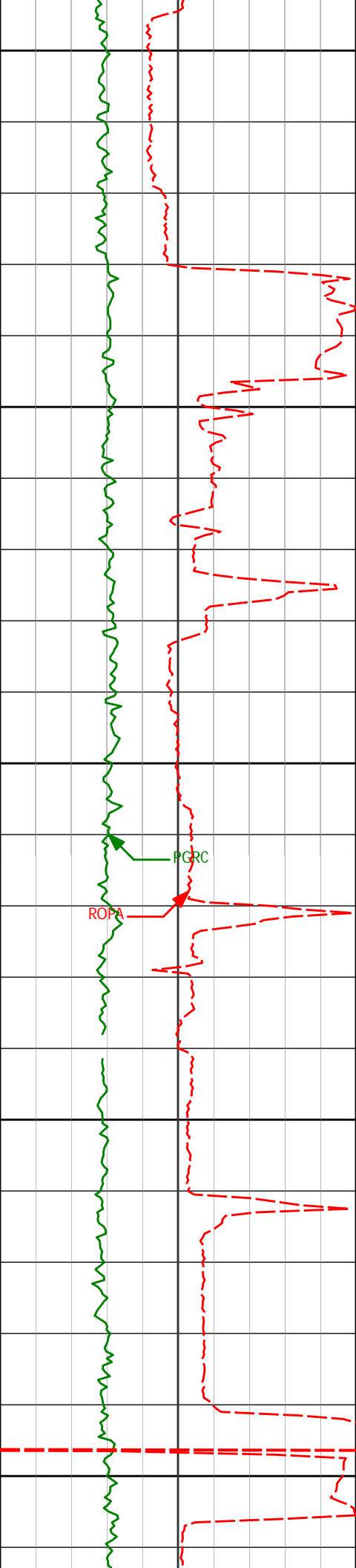
13971'

90.65°

85.90°

7189.87'

6997.51'



14050

14100

14150

14200

14250

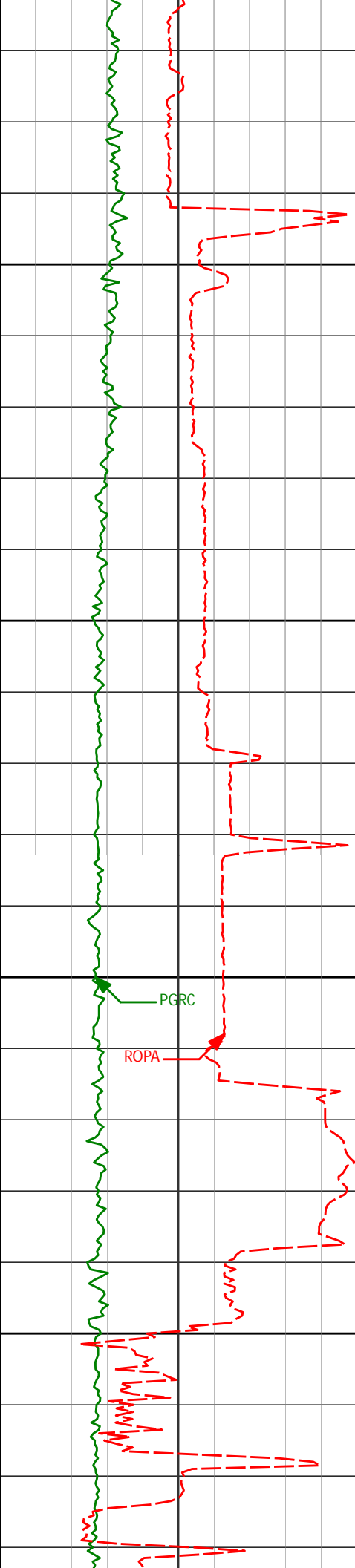
14143'

89.72°

88.56°

7189.31'

7169.25'



14300

14350

14400

14450

14314'

89.94°

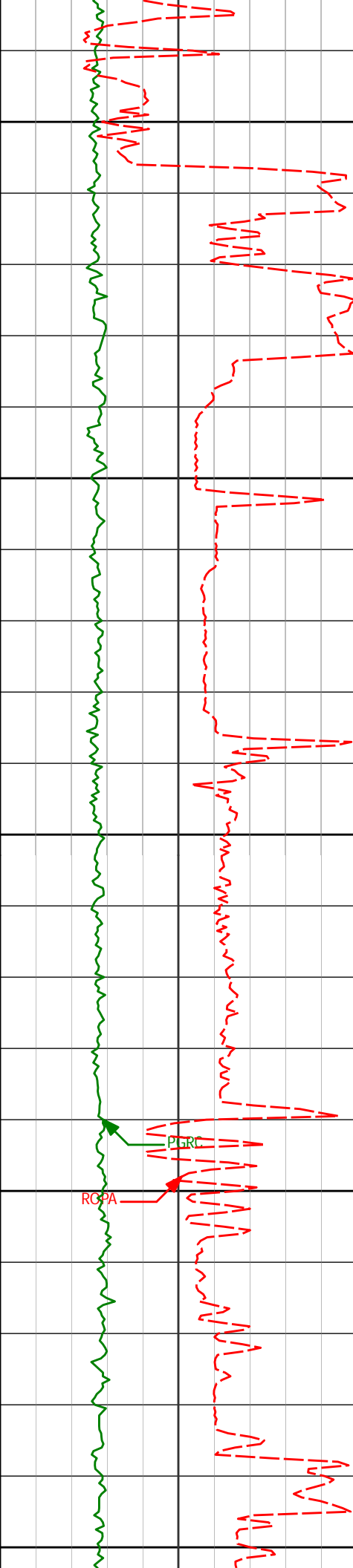
89.11°

7189.82'

7340.19'

PGRC

ROPA



14500

14550

14600

14650

14700

14485'

88.58°

90.05°

7192.03'

7511.16'

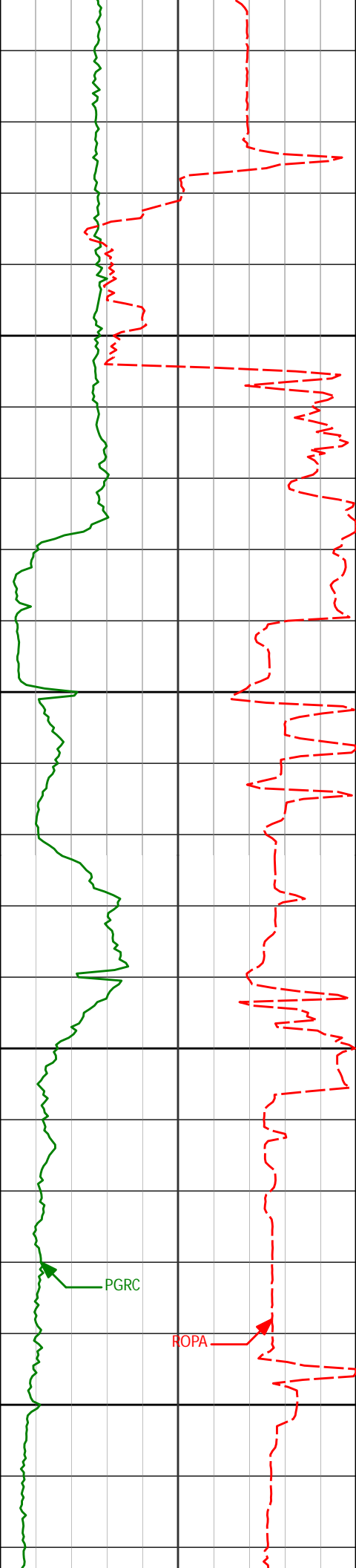
14657'

89.57°

88.18°

7194.81'

7683.09'



14750

14800

14828'

14850

14900

90.77°

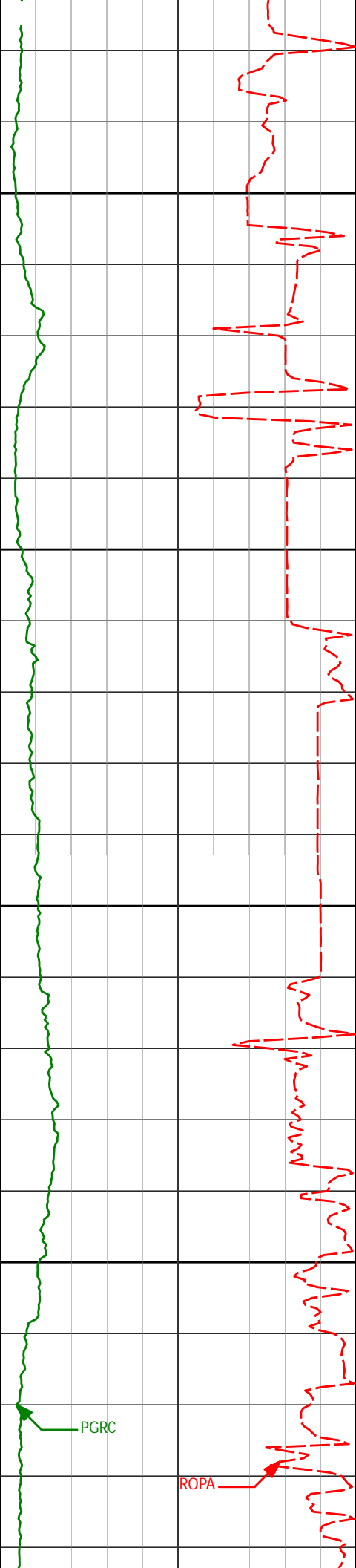
88.75°

7194.30'

7854.00'

PGRC

ROPA



14950

15000

15050

15100

15000'

90.99°

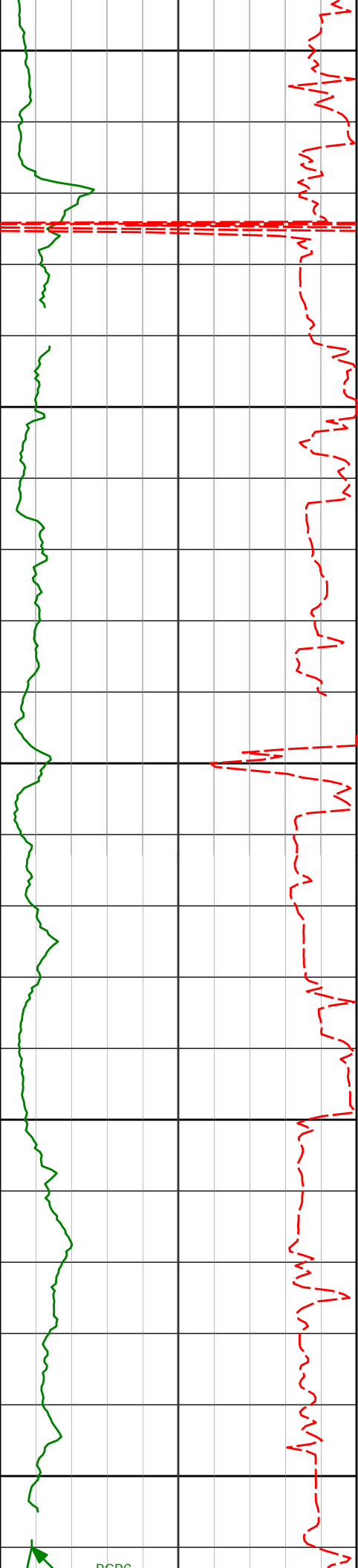
90.32°

7191.66'

8025.96'

PGRC

ROPA



15150

15171'

90.12°

93.17°

7190.00'

8196.88'

15200

15250

15300

15342'

89.08°

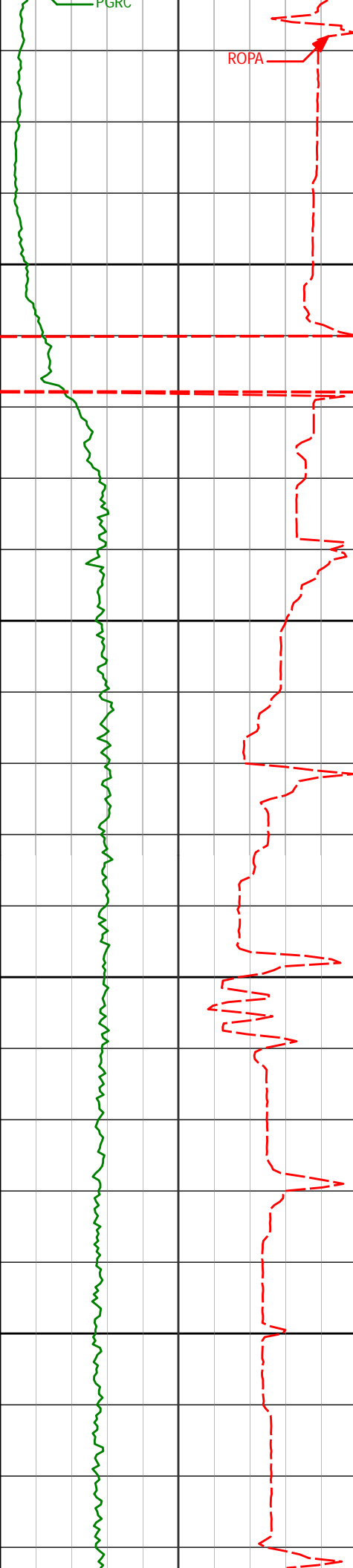
92.38°

7191.19'

8367.71'

15350

DCRS



15400

15450

15500

15550

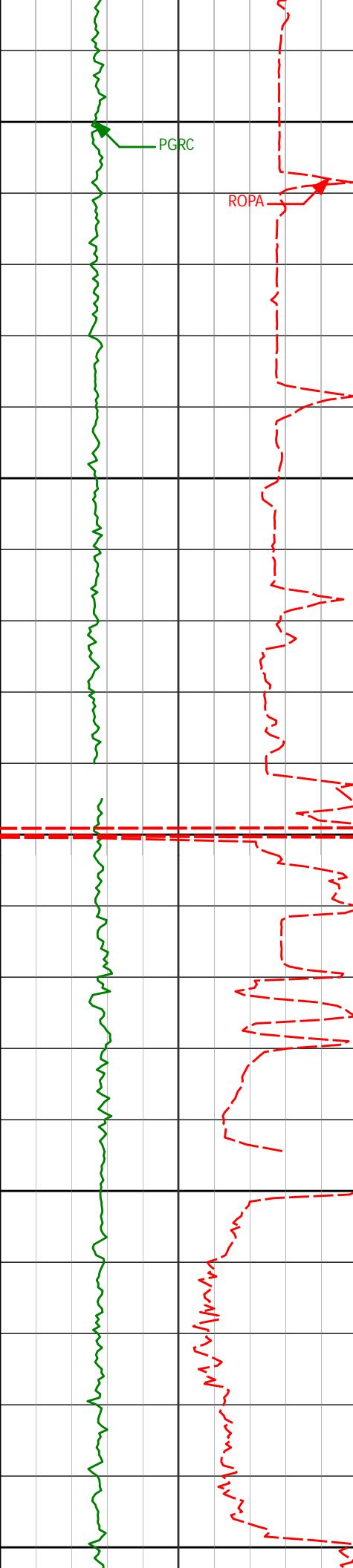
15513'

89.48°

92.05°

7193.34'

8538.60'



PGRC

ROPA

Run 500

15600

15650

15700

15750

15800

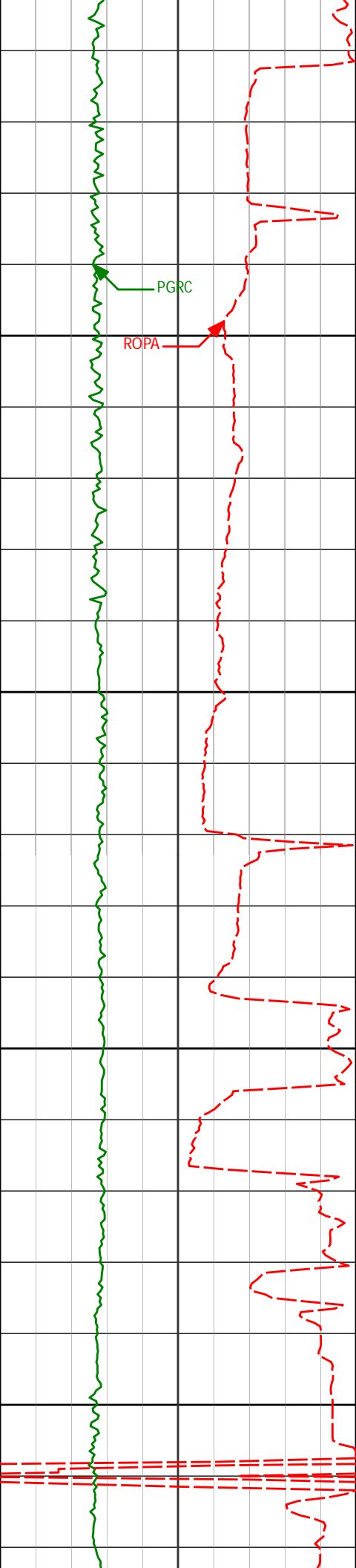
15683'

91.27°

90.13°

7192.23'

8708.56'



15850

15900

15950

16000

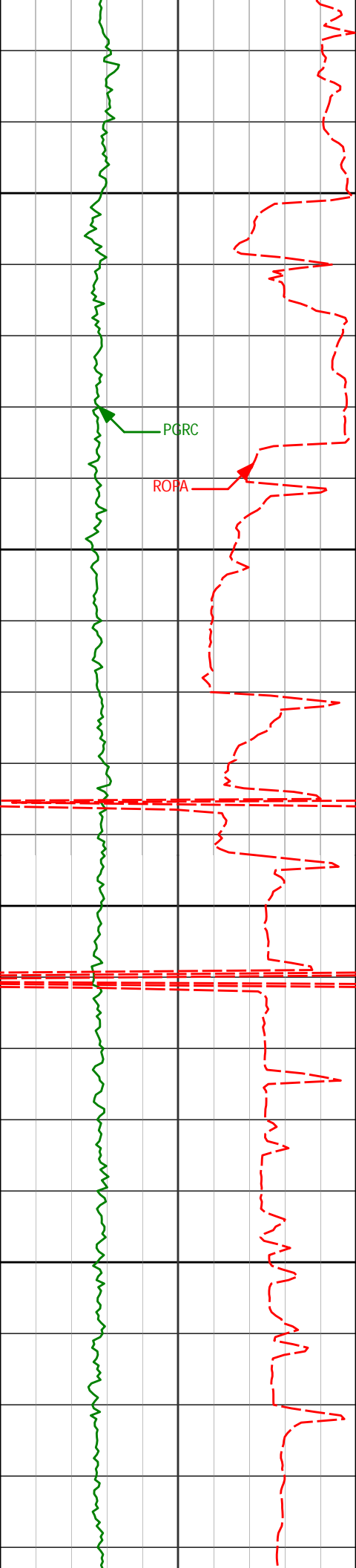
15854'

88.52°

88.73°

7192.54'

8879.52'



16050

16100

16150

16200

16026'

88.95°

89.48°

7196.34'

9051.44'

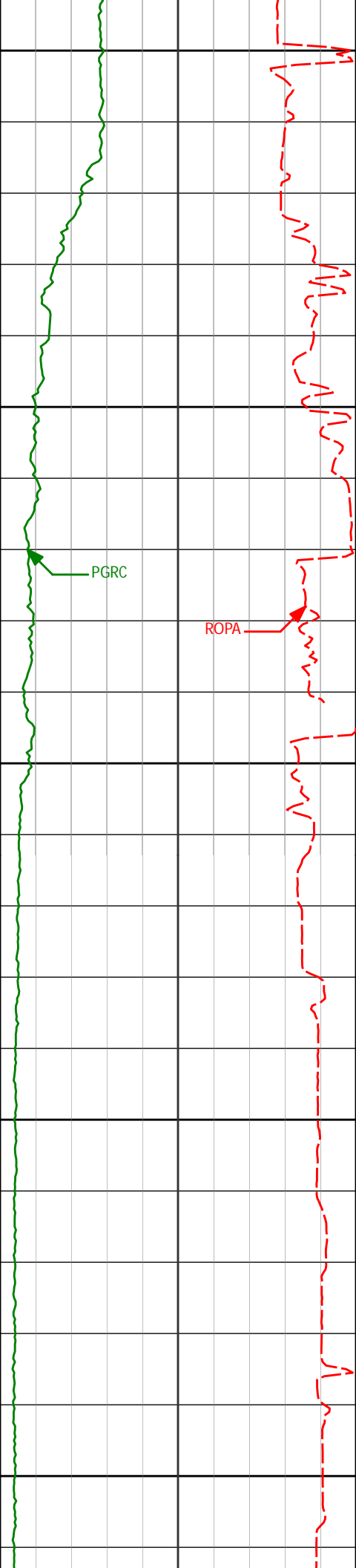
16197'

91.29°

90.53°

7195.98'

9222.43'



16250

16300

16350

16400

16450

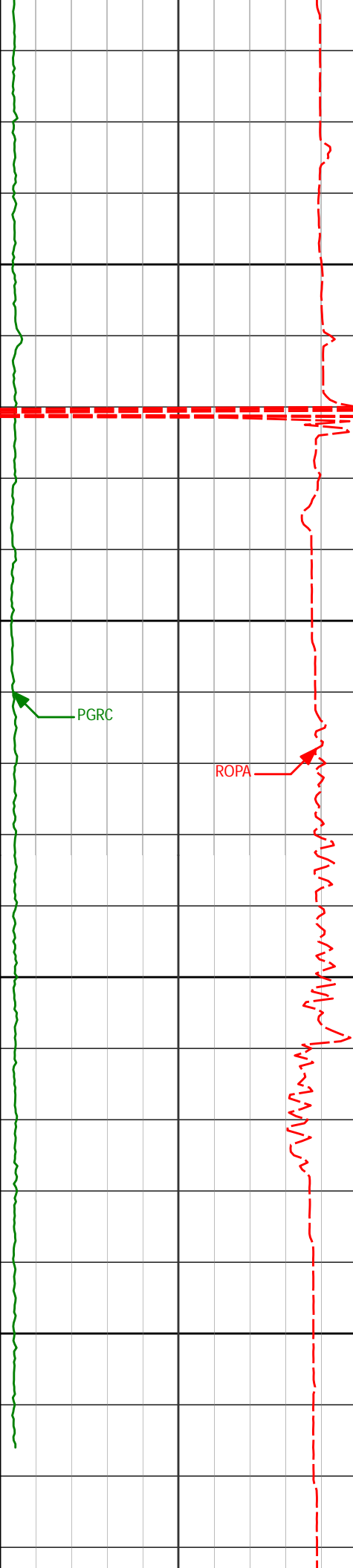
16368'

90.46°

90.70°

7193.37'

9393.40'



16500

16540'

90.37°

90.64°

7192.13'

9565.39'

16550

PGRC

ROPA

16600

16650

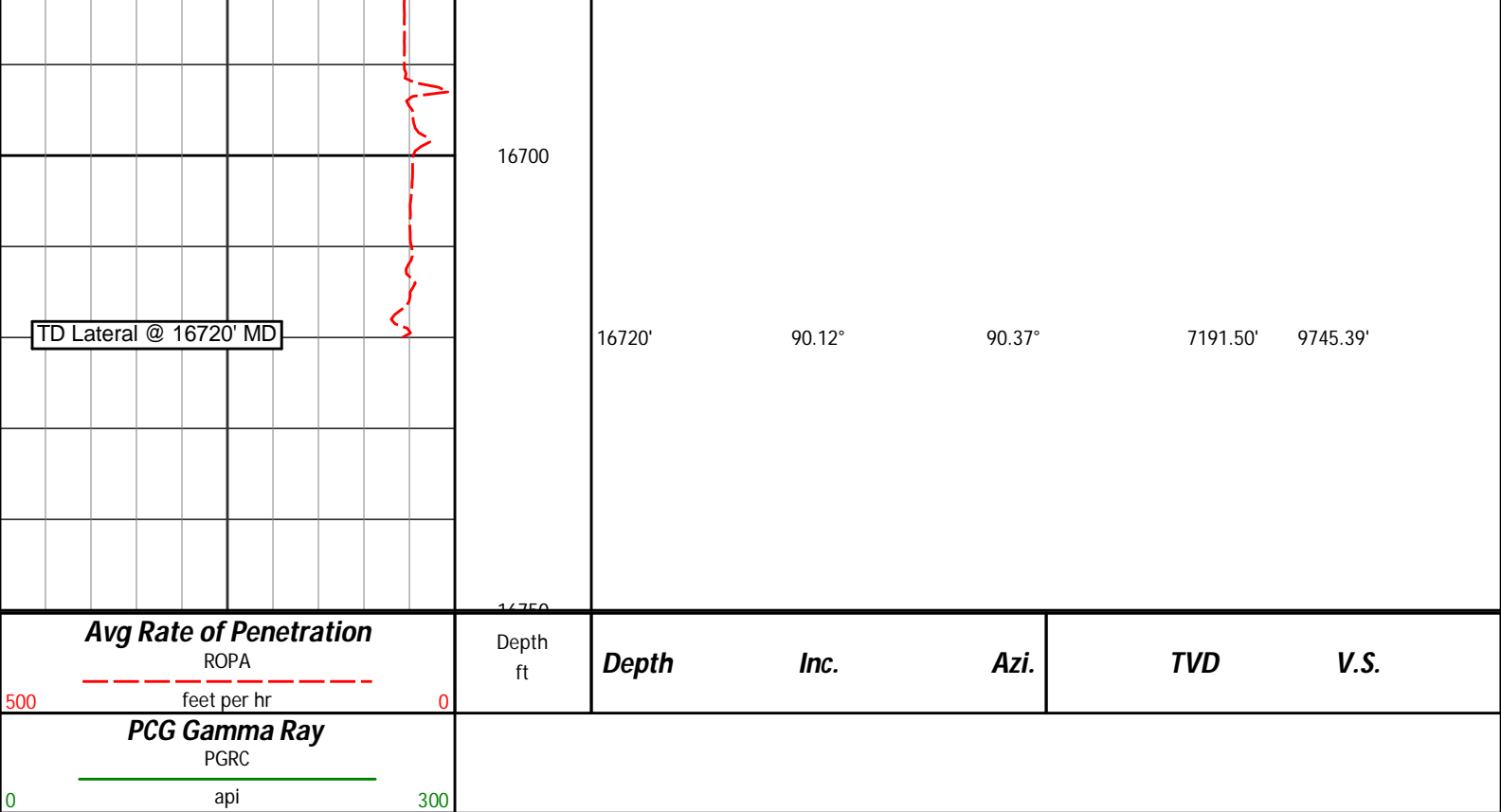
16654'

90.12°

90.37°

7191.64'

9679.39'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko
Sekich State 39C-17HZ
Wattenburg
Weld Colorado
USA
CA-XX-0901221881

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
1184.00	0.67	291.25	1183.98	1.89 N	2.16 E	2.15	TIE-IN
1316.00	0.03	259.69	1315.98	2.16 N	1.41 E	1.40	0.49
1411.00	0.28	306.07	1410.98	2.30 N	1.19 E	1.18	0.27
1506.00	0.31	315.99	1505.98	2.62 N	0.83 E	0.82	0.06
1601.00	0.14	263.38	1600.97	2.79 N	0.53 E	0.52	0.26
1694.00	0.31	50.26	1693.97	2.94 N	0.62 E	0.60	0.47
1785.00	0.26	14.79	1784.97	3.29 N	0.86 E	0.84	0.20
1875.00	0.30	348.50	1874.97	3.72 N	0.86 E	0.84	0.15
1966.00	0.60	357.72	1965.97	4.43 N	0.80 E	0.77	0.34
2149.00	0.79	188.09	2148.96	4.14 N	0.58 E	0.56	0.76
2332.00	1.08	130.96	2331.94	1.76 N	1.71 E	1.70	0.51
2515.00	0.39	302.93	2514.94	0.97 N	2.48 E	2.48	0.80
2698.00	1.07	296.74	2697.92	2.08 N	0.44 E	0.43	0.37
2882.00	0.32	246.25	2881.91	2.64 N	1.57 W	-1.58	0.49
3064.00	0.34	181.68	3063.90	1.90 N	2.05 W	-2.06	0.19
3241.00	0.61	144.30	3240.90	0.61 N	1.52 W	-1.52	0.22
3412.00	0.93	133.70	3411.88	1.09 S	0.02 E	0.02	0.20
3584.00	0.46	24.08	3583.87	1.43 S	1.31 E	1.32	0.68
3755.00	0.39	22.62	3754.87	0.26 S	1.81 E	1.82	0.04
3927.00	0.69	37.91	3926.86	1.10 N	2.68 E	2.67	0.19
4098.00	1.13	24.15	4097.84	3.45 N	4.00 E	3.98	0.29
4269.00	5.48	354.86	4268.52	13.12 N	3.96 E	3.89	2.65
4441.00	8.94	354.41	4439.13	34.61 N	1.92 E	1.74	2.01
4612.00	11.17	352.36	4607.50	64.25 N	1.58 W	-1.90	1.32
4783.00	11.58	355.16	4775.14	97.77 N	5.23 W	-5.72	0.40
4955.00	9.28	358.91	4944.29	128.84 N	6.95 W	7.60	1.29

4935.00	9.28	338.91	4944.29	128.84 N	6.93 W	-7.90	1.39
5126.00	9.84	1.18	5112.91	157.24 N	6.91 W	-7.71	0.39
5298.00	10.83	357.48	5282.12	188.08 N	7.32 W	-8.27	0.69
5469.00	9.72	356.21	5450.38	218.53 N	8.98 W	-10.09	0.66
5641.00	9.33	3.86	5620.01	246.93 N	9.00 W	-10.25	0.77
5812.00	7.28	1.81	5789.21	271.59 N	7.73 W	-9.10	1.21
5983.00	6.67	351.63	5958.95	292.25 N	8.83 W	-10.31	0.80
6154.00	4.56	354.55	6129.12	308.84 N	10.92 W	-12.48	1.24
6326.00	1.88	340.24	6300.84	318.30 N	12.52 W	-14.13	1.61
6497.00	0.83	181.24	6471.81	319.71 N	13.50 W	-15.12	1.56
6539.00	1.12	188.51	6513.81	319.00 N	13.57 W	-15.18	0.75
6582.00	2.16	121.96	6556.79	318.15 N	12.94 W	-14.55	4.65
6625.00	7.41	105.70	6599.63	316.97 N	9.58 W	-11.19	12.49
6668.00	12.71	100.76	6641.95	315.34 N	2.26 W	-3.86	12.48
6711.00	16.45	99.91	6683.56	313.41 N	8.39 E	6.80	8.71
6754.00	20.09	100.97	6724.39	310.95 N	21.64 E	20.07	8.50
6796.00	23.47	100.98	6763.38	307.98 N	36.94 E	35.38	8.05
6839.00	27.57	100.18	6802.18	304.59 N	55.15 E	53.60	9.57
6882.00	31.53	99.30	6839.58	301.02 N	76.04 E	74.52	9.26
6925.00	34.66	96.98	6875.60	297.71 N	99.28 E	97.77	7.85
6967.00	37.68	94.97	6909.50	295.15 N	123.93 E	122.44	7.72
7010.00	40.74	92.91	6942.82	293.30 N	151.05 E	149.56	7.73
7053.00	44.55	90.90	6974.44	292.35 N	180.15 E	178.67	9.41
7096.00	47.91	89.83	7004.19	292.16 N	211.20 E	209.72	8.02
7139.00	51.41	89.01	7032.02	292.50 N	243.97 E	242.48	8.27
7182.00	55.20	88.49	7057.71	293.25 N	278.43 E	276.94	8.87
7224.00	58.47	87.54	7080.68	294.47 N	313.56 E	312.07	8.01
7267.00	61.53	87.08	7102.18	296.22 N	350.75 E	349.25	7.18
7310.00	64.74	88.05	7121.61	297.85 N	389.07 E	387.56	7.73
7353.00	68.22	89.39	7138.76	298.72 N	428.48 E	426.97	8.58
7396.00	71.95	89.65	7153.41	299.06 N	468.90 E	467.38	8.69
7439.00	75.61	88.68	7165.42	299.67 N	510.18 E	508.66	8.78
7482.00	80.53	87.64	7174.30	301.02 N	552.22 E	550.69	11.68
7516.00	83.97	86.38	7178.89	302.78 N	585.85 E	584.31	10.76
7626.00	91.54	84.56	7183.19	311.46 N	695.34 E	693.76	7.08
7673.00	89.41	85.70	7182.81	315.45 N	742.17 E	740.56	5.14
7712.00	87.78	87.27	7183.76	317.84 N	781.08 E	779.46	5.80
7883.00	89.85	89.53	7187.30	322.61 N	951.96 E	950.31	1.79
8055.00	91.63	92.21	7185.08	320.00 N	1123.90 E	1122.26	1.87
8226.00	89.88	84.78	7182.82	324.49 N	1294.70 E	1293.04	4.46
8397.00	90.37	88.07	7182.45	335.15 N	1465.34 E	1463.63	1.95
8569.00	91.08	95.90	7180.27	329.20 N	1637.09 E	1635.40	4.57
8740.00	90.18	102.26	7178.39	302.23 N	1805.85 E	1804.29	3.76
8912.00	89.23	98.82	7179.27	270.77 N	1974.92 E	1973.52	2.07
9083.00	87.72	95.29	7183.82	249.78 N	2144.53 E	2143.24	2.24
9254.00	87.75	98.40	7190.58	229.42 N	2314.16 E	2312.97	1.82
9425.00	89.91	99.44	7194.07	202.91 N	2483.04 E	2481.98	1.40
9597.00	91.85	101.73	7191.43	171.32 N	2652.07 E	2651.17	1.74
9768.00	91.02	101.43	7187.15	137.01 N	2819.54 E	2818.81	0.52
9951.00	90.74	102.90	7184.34	98.45 N	2998.40 E	2997.87	0.82
10133.00	90.93	98.11	7181.69	65.28 N	3177.28 E	3176.91	2.63
10316.00	90.49	96.83	7179.42	41.49 N	3358.71 E	3358.46	0.74
10499.00	88.06	94.96	7181.73	22.70 N	3540.71 E	3540.55	1.68
10682.00	89.26	92.22	7186.01	11.25 N	3723.28 E	3723.17	1.63
10865.00	89.81	88.70	7187.50	9.78 N	3906.24 E	3906.14	1.95
11049.00	90.99	84.40	7186.21	20.85 N	4089.85 E	4089.69	2.42
11231.00	89.04	84.16	7186.17	38.98 N	4270.94 E	4270.69	1.08
11408.00	90.25	85.55	7187.26	54.86 N	4447.21 E	4446.88	1.04
11579.00	90.15	85.99	7186.67	67.47 N	4617.75 E	4617.35	0.26
11750.00	89.88	85.63	7186.62	79.96 N	4788.29 E	4787.82	0.26
11921.00	88.83	84.22	7188.55	95.09 N	4958.60 E	4958.06	1.03
12092.00	89.23	83.39	7191.44	113.54 N	5128.58 E	5127.94	0.54
12264.00	89.66	84.10	7193.11	132.28 N	5299.54 E	5298.80	0.48
12436.00	90.86	84.52	7192.33	149.33 N	5470.69 E	5469.86	0.74
12607.00	89.94	84.92	7191.13	165.07 N	5640.96 E	5640.05	0.59
12778.00	89.14	86.55	7192.51	177.78 N	5811.47 E	5810.50	1.06
12950.00	90.09	86.50	7193.66	188.21 N	5983.15 E	5982.12	0.55
13121.00	90.40	84.80	7192.93	201.18 N	6153.65 E	6152.55	1.01
13292.00	88.43	83.86	7194.68	218.07 N	6323.79 E	6322.61	1.28
13464.00	89.82	83.69	7197.30	236.72 N	6494.75 E	6493.47	0.81
13628.00	90.18	83.31	7197.30	255.28 N	6657.70 E	6656.32	0.32
13800.00	92.07	84.61	7193.93	273.38 N	6828.70 E	6827.23	1.33
13971.00	90.65	85.90	7189.87	287.52 N	6999.06 E	6997.51	1.12
14143.00	89.72	88.56	7189.31	295.83 N	7170.84 E	7169.25	1.64
14314.00	89.94	89.11	7189.82	299.30 N	7341.80 E	7340.19	0.35

14485.00	88.58	90.05	7192.03	300.56 N	7512.78 E	7511.16	0.97
14657.00	89.57	88.18	7194.81	303.21 N	7684.72 E	7683.09	1.23
14828.00	90.77	88.75	7194.30	307.80 N	7855.66 E	7854.00	0.78
15000.00	90.99	90.32	7191.66	309.19 N	8027.63 E	8025.96	0.92
15171.00	90.12	93.17	7190.00	303.98 N	8198.52 E	8196.88	1.74
15342.00	89.08	92.38	7191.19	295.71 N	8369.31 E	8367.71	0.76
15513.00	89.48	92.05	7193.34	289.10 N	8540.17 E	8538.60	0.30
15683.00	91.27	90.13	7192.23	285.86 N	8710.12 E	8708.56	1.54
15854.00	88.52	88.73	7192.54	287.56 N	8881.09 E	8879.52	1.80
16026.00	88.95	89.48	7196.34	290.25 N	9053.03 E	9051.44	0.50
16197.00	91.29	90.53	7195.98	290.24 N	9224.01 E	9222.43	1.50
16368.00	90.46	90.70	7193.37	288.40 N	9394.98 E	9393.40	0.50
16540.00	90.37	90.64	7192.13	286.39 N	9566.97 E	9565.39	0.06
16654.00	90.12	90.37	7191.64	285.38 N	9680.96 E	9679.39	0.32
16720.00	90.12	90.37	7191.50	284.96 N	9746.96 E	9745.39	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 90.29 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.61 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16720.00 FEET
IS 9751.12 FEET ALONG 88.33 DEGREES (TRUE)**

Directional surveys tied on to gyro surveys at 1184' MD. Final survey is a projection to bit.