

1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	03-Jan-15	06-Jan-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	683.00	6,950.00			
Log End Depth (MD, ft)	6,950.00	11,564.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	01-Jan-15 15:45	05-Jan-15 02:31			
Drill/Wipe End Date and Time	03-Jan-15 06:18	06-Jan-15 09:32			
Min Inc (deg) @ Depth (MD, ft)	0.14 @ 2,122.00	84.54 @ 7,037.00			
Max Inc (deg) @ Depth (MD, ft)	79.00 @ 6,892.00	93.14 @ 8,366.00			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.98 / PDC			
Flow Rate (gpm)	599.08	308.36			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	8.60 / 30.00	9.25 / 35.00			
Filtrate CL (ppm)	1,500.00	1,600.00			
pH / Fluid Loss (mptm)	11.30 / 0	9.10 / 9			
PV (cP) / YP (lhf2)	3 / 5.00	6 / 10.00			
% Solids / % Sand	1.70 / 0.75	4.70 / 0.25			
% 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 (in F) / S	125.50 / PDM	222.00 / PDM			

Max Tool Temp (degF) / Source	165.58 / PCM	226.08 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Sheets	Paul Sheets			
Customer Representative	Clifford Kester	Clifford Kester			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404272	12301676			
Insert Serial Number	11680745	11680745			
Date and Time Initialized	31-Dec-14 17:26	04-Jan-15 10:35			
Date and Time Read	03-Jan-15 14:25	06-Jan-15 19:00			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	55.73	56.45			
Software Version	6.21	6.21			
Sub Serial Number	11404272	12301676			
Sonde Serial Number	11297577	11297577			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	30.00	110.16			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	50.63	51.35			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404272	12301676			
Insert/Sonde Serial Number	11293301	11293301			

REMARKS

1. All depths are calibrated to 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.
4. The following smoothing parameters have been applied to the data.
-All 2" (1:600) logs - 1ft. interval, 3 ft. coercion distance.
-All 5" (1:240) logs - .5ft interval, .6 ft. coercion distance.
5. INSITE version 8.1.10
6. Gamma presented inside casing/cement from 6900' MD to 6945' MD.

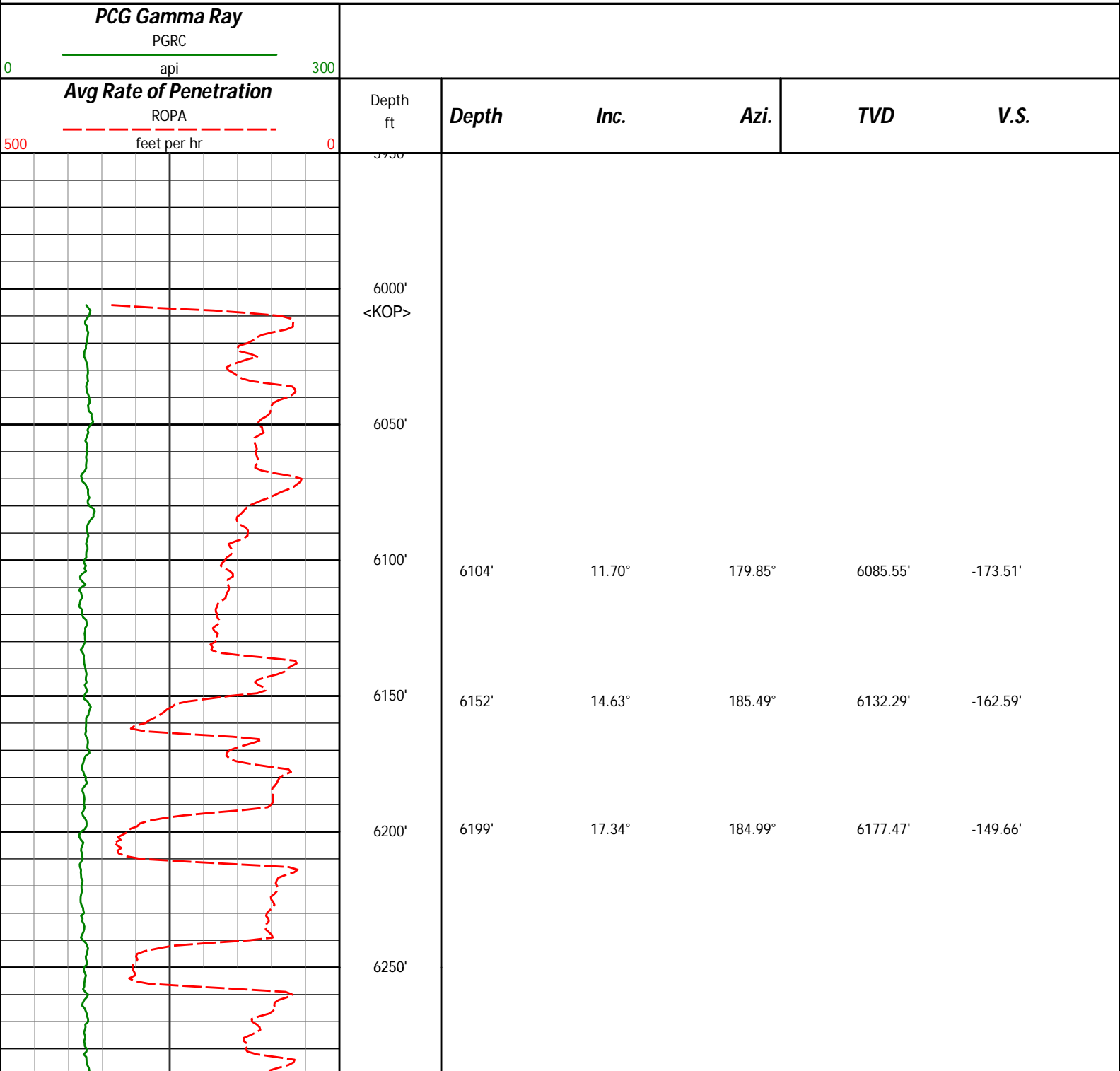
WARRANTY

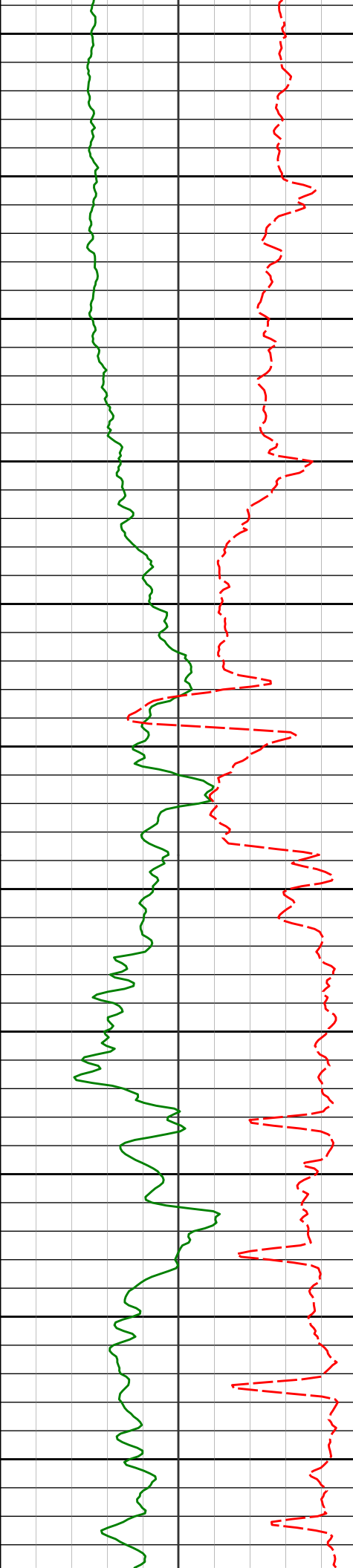
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DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, 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.

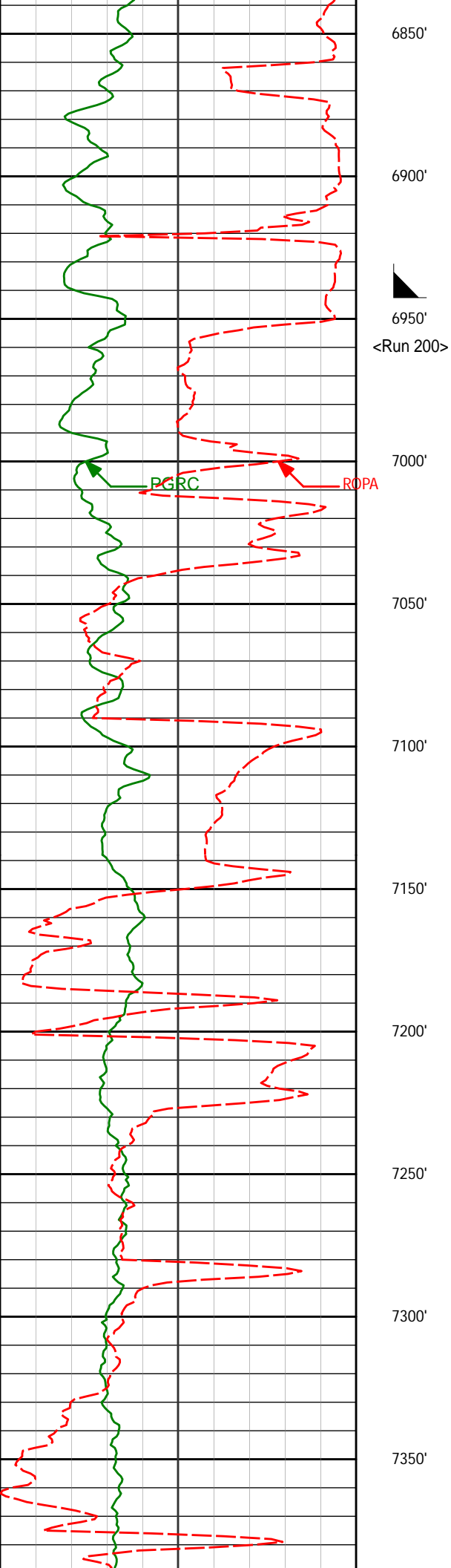
HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:600

Noble Energy, Inc
Crow Creek AA01-785
H&P 315
T6N R63W

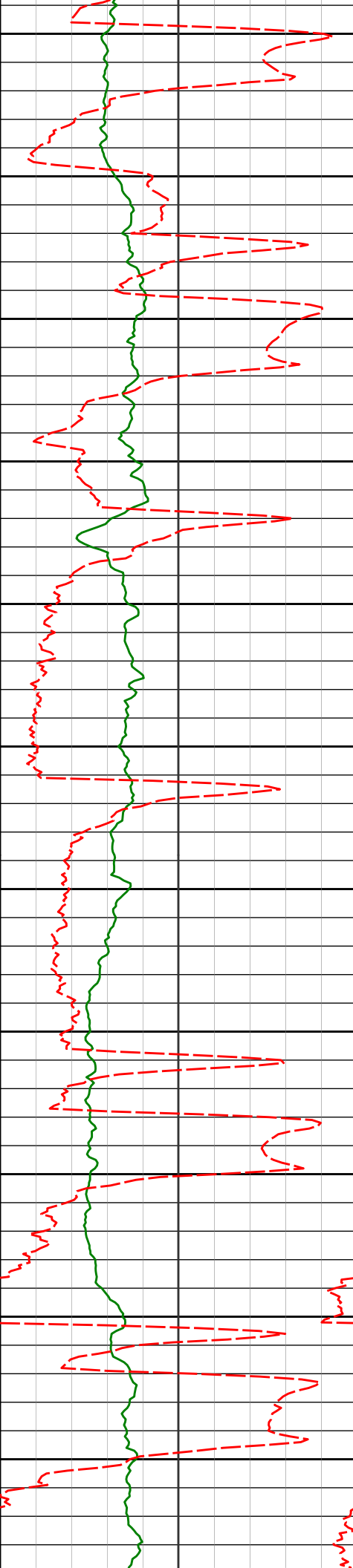




6300'	6294'	23.97°	183.50°	6266.31'	-116.19'
6350'					
6400'	6389'	32.99°	183.79°	6349.73'	-70.95'
6450'					
6500'	6484'	42.98°	180.39°	6424.52'	-12.57'
6550'	6532'	47.01°	180.60°	6458.45'	21.34'
6600'	6579'	51.83°	179.35°	6489.02'	56.99'
6650'	6627'	56.19°	178.76°	6517.22'	95.76'
6700'	6673'	60.70°	180.33°	6541.29'	134.90'
6750'	6721'	64.25°	181.41°	6563.46'	177.45'
6800'	6768'	68.79°	181.40°	6582.18'	220.54'
	6816'	72.05°	182.24°	6598.27'	265.76'



6850'				
6863'	76.09°	181.35°	6611.16'	310.94'
6892'	79.00°	181.03°	6617.41'	339.25'
6900'				
6950'				
<Run 200>				
7000'				
7037'	84.54°	180.90°	6638.17'	482.66'
7050'				
7100'				
7131'	90.62°	181.06°	6642.14'	576.51'
7150'				
7200'				
7226'	91.05°	177.70°	6640.76'	671.36'
7250'				
7300'				
7321'	91.08°	176.74°	6639.00'	765.97'
7350'				



7400'

7416'

7450'

7500'

7511'

7550'

7600'

7606'

7650'

7700'

7701'

7750'

7796'

7800'

7850'

7891'

7900'

7416'

7511'

7606'

7701'

7796'

7891'

90.31°

90.06°

90.68°

89.38°

89.82°

89.51°

176.54°

178.06°

177.83°

176.89°

177.18°

180.64°

6637.85'

6637.54'

6636.93'

6636.88'

6637.54'

6638.11'

860.50'

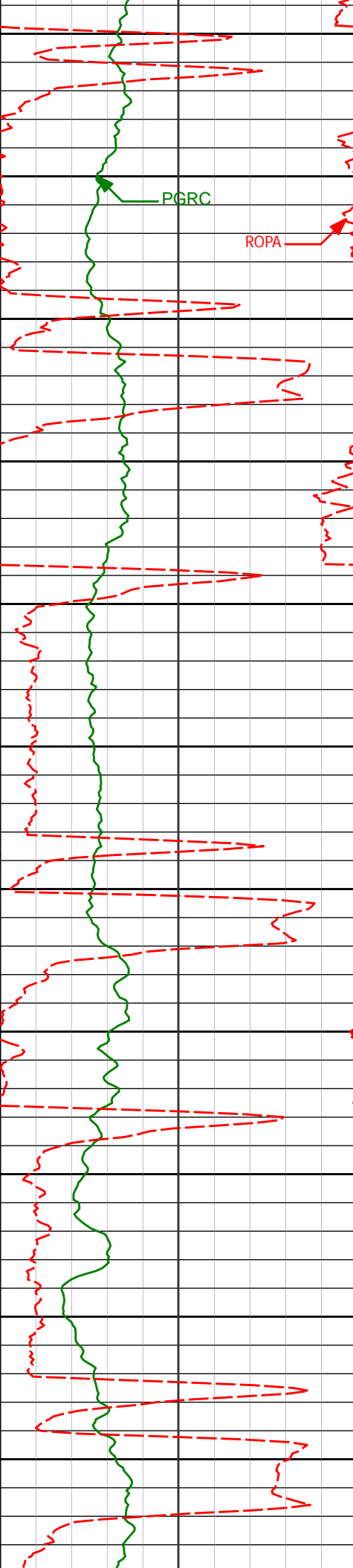
955.13'

1049.85'

1144.49'

1239.09'

1333.90'



7950'

7986'

8000'

8050'

8100'

8150'

8200'

8250'

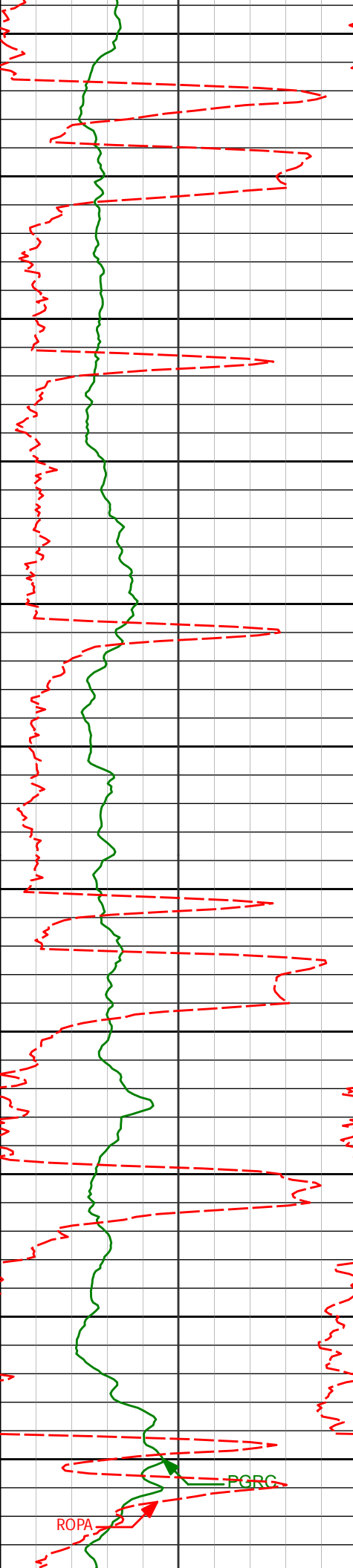
8300'

8350'

8400'

8450'

7986'	89.11°	180.32°	6639.25'	1428.85'
8081'	90.43°	180.34°	6639.63'	1523.79'
8176'	89.78°	179.68°	6639.45'	1618.71'
8271'	92.22°	179.91°	6637.79'	1713.60'
8366'	93.14°	179.45°	6633.35'	1808.39'
8461'	91.45°	180.09°	6629.54'	1903.22'



8500'

8550'

8600'

8650'

8700'

8750'

8800'

8850'

8900'

8950'

9000'

8555'

89.72°

180.36°

6628.58'

1997.15'

8650'

90.12°

179.96°

6628.71'

2092.08'

8745'

90.92°

179.51°

6627.84'

2186.98'

8840'

90.00°

181.31°

6627.08'

2281.92'

8935'

88.80°

181.27°

6628.07'

2376.90'

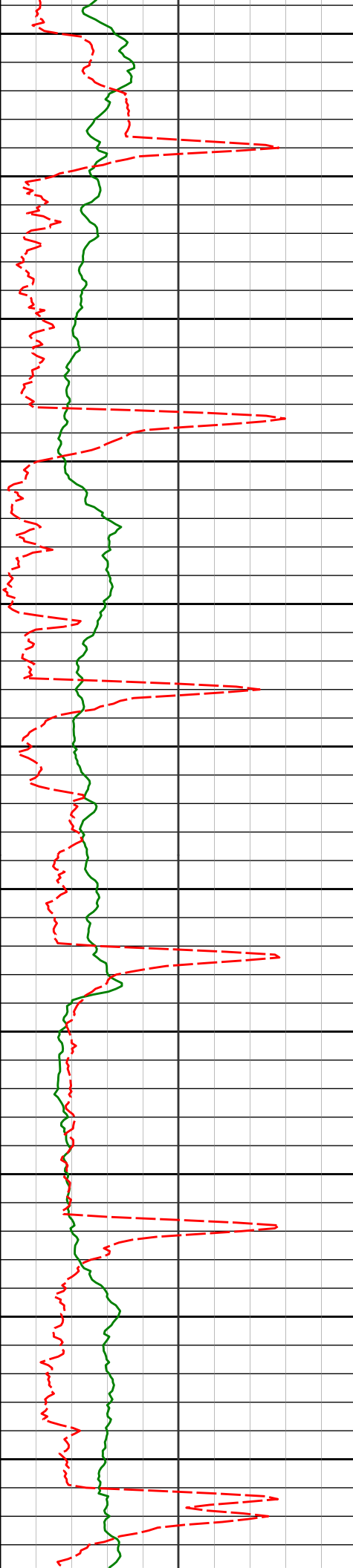
9030'

88.89°

181.01°

6629.99'

2471.86'



9050'

9100'

9150'

9200'

9250'

9300'

9350'

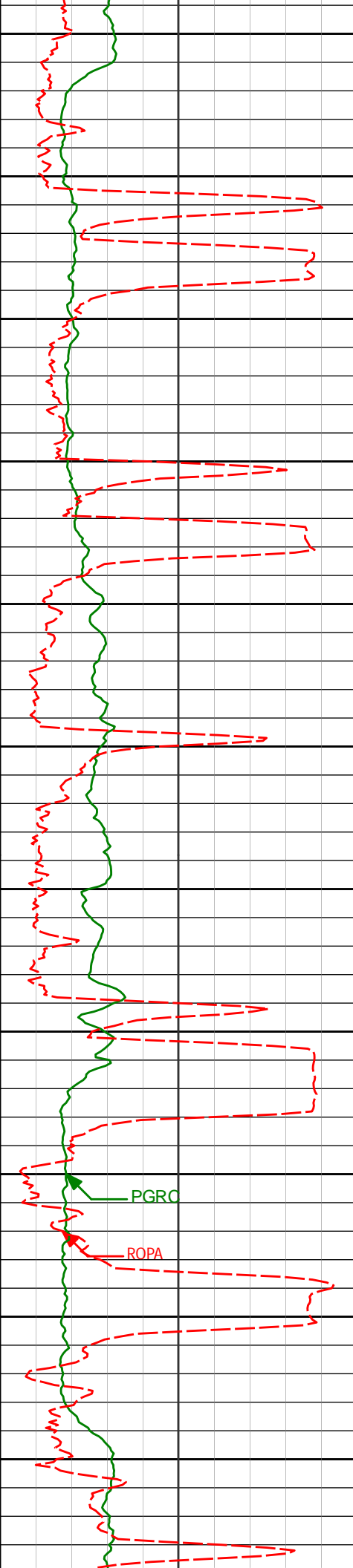
9400'

9450'

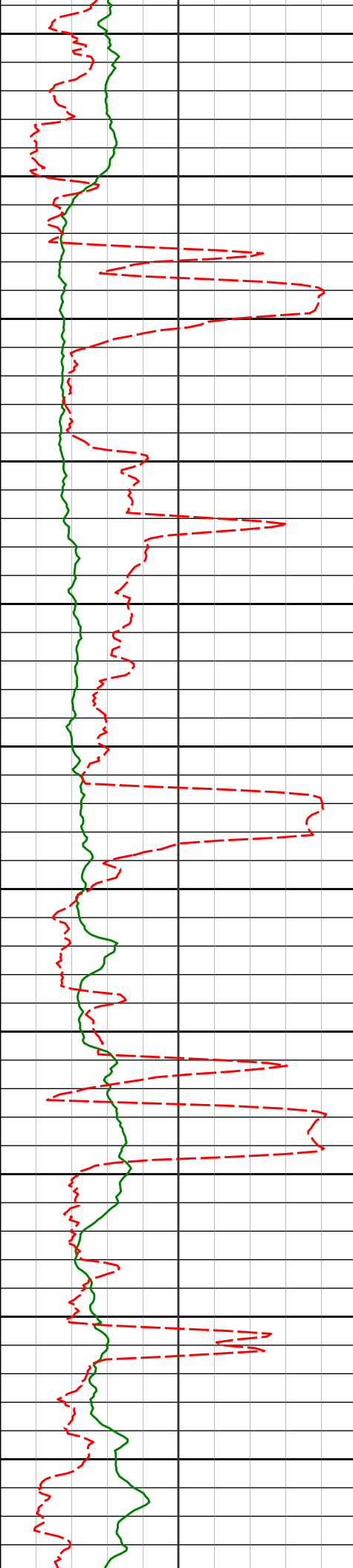
9500'

9550'

9125'	88.89°	180.62°	6631.82'	2566.81'
9220'	90.18°	180.71°	6632.59'	2661.76'
9315'	89.69°	180.53°	6632.69'	2756.72'
9409'	89.82°	180.27°	6633.10'	2850.67'
9504'	89.57°	179.67°	6633.61'	2945.59'



9600'	9599'	91.66°	180.36°	6632.59'	3040.50'
9650'					
9700'	9694'	90.95°	179.87°	6630.42'	3135.41'
9750'					
9800'	9789'	90.46°	178.14°	6629.24'	3230.24'
9850'					
9900'	9884'	89.32°	175.27°	6629.42'	3324.77'
9950'					
10000'	9978'	88.83°	177.78°	6630.94'	3418.27'
10050'					
10100'	10073'	90.18°	180.10°	6631.75'	3513.09'



10150'

10168'

91.66°

180.90°

6630.22'

3608.03'

10200'

10250'

10263'

89.97°

180.04°

6628.87'

3702.97'

10300'

10350'

10358'

90.18°

179.70°

6628.74'

3797.88'

10400'

10450'

10453'

89.88°

180.67°

6628.69'

3892.82'

10500'

10550'

10548'

89.88°

182.02°

6628.89'

3987.80'

10600'

10650'

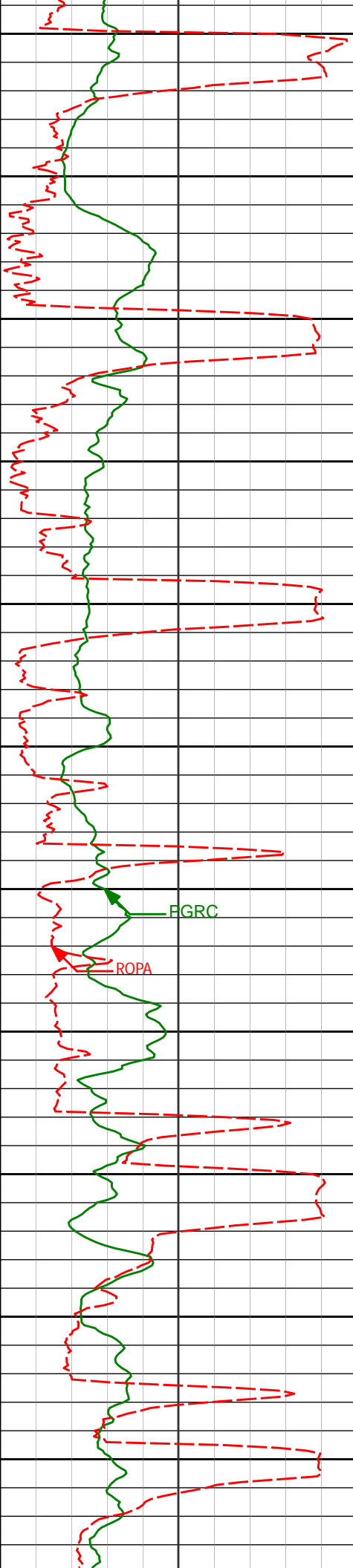
10643'

90.49°

182.24°

6628.59'

4082.80'



10700'

10750'

10800'

10850'

10900'

10950'

11000'

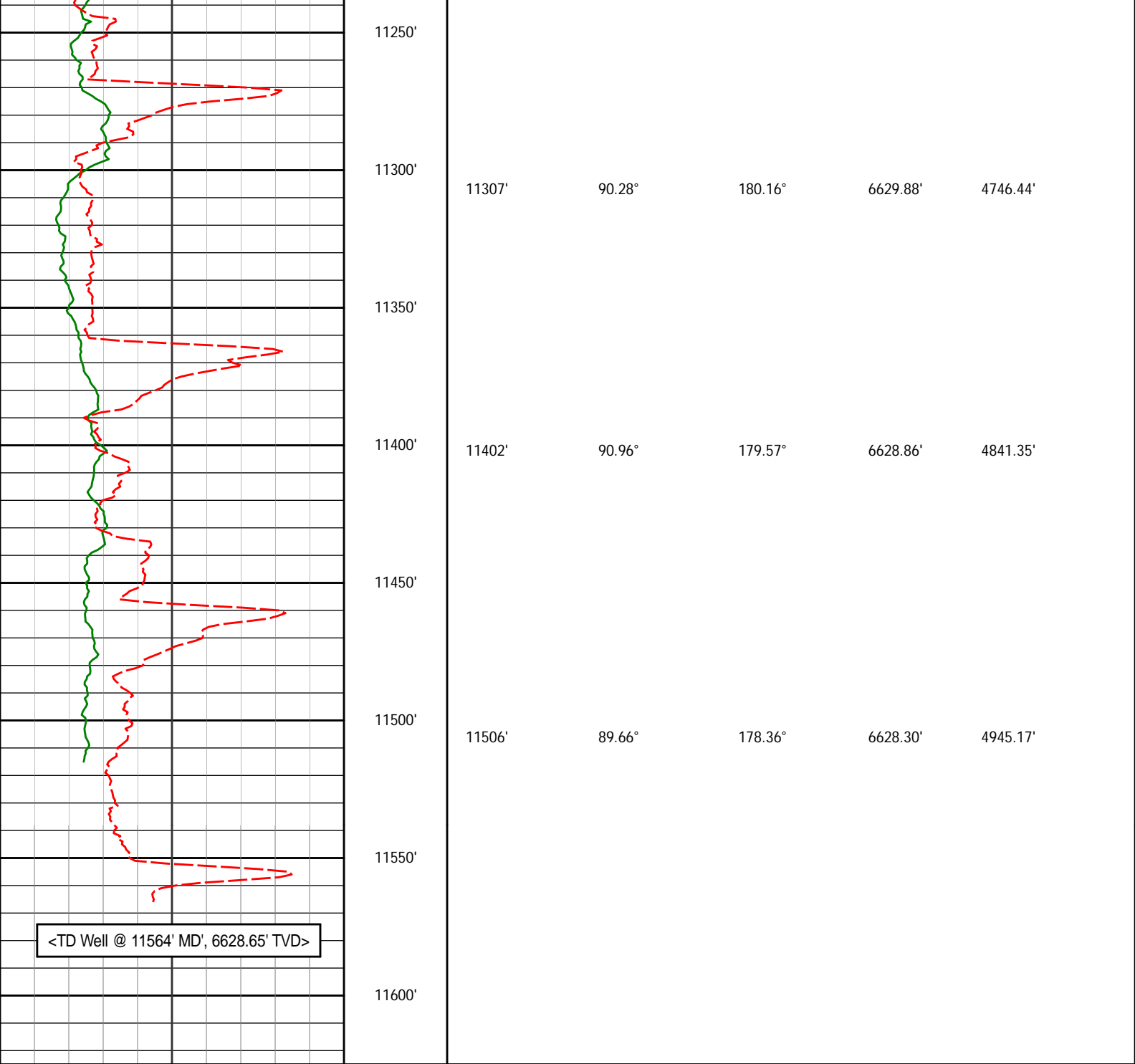
11050'

11100'

11150'

11200'

10738'	89.82°	180.56°	6628.33'	4177.78'
10833'	90.40°	180.58°	6628.15'	4272.74'
10927'	88.86°	180.13°	6628.76'	4366.68'
11022'	90.09°	179.66°	6629.63'	4461.59'
11117'	90.06°	181.15°	6629.50'	4556.53'
11212'	89.60°	180.47°	6629.78'	4651.50'



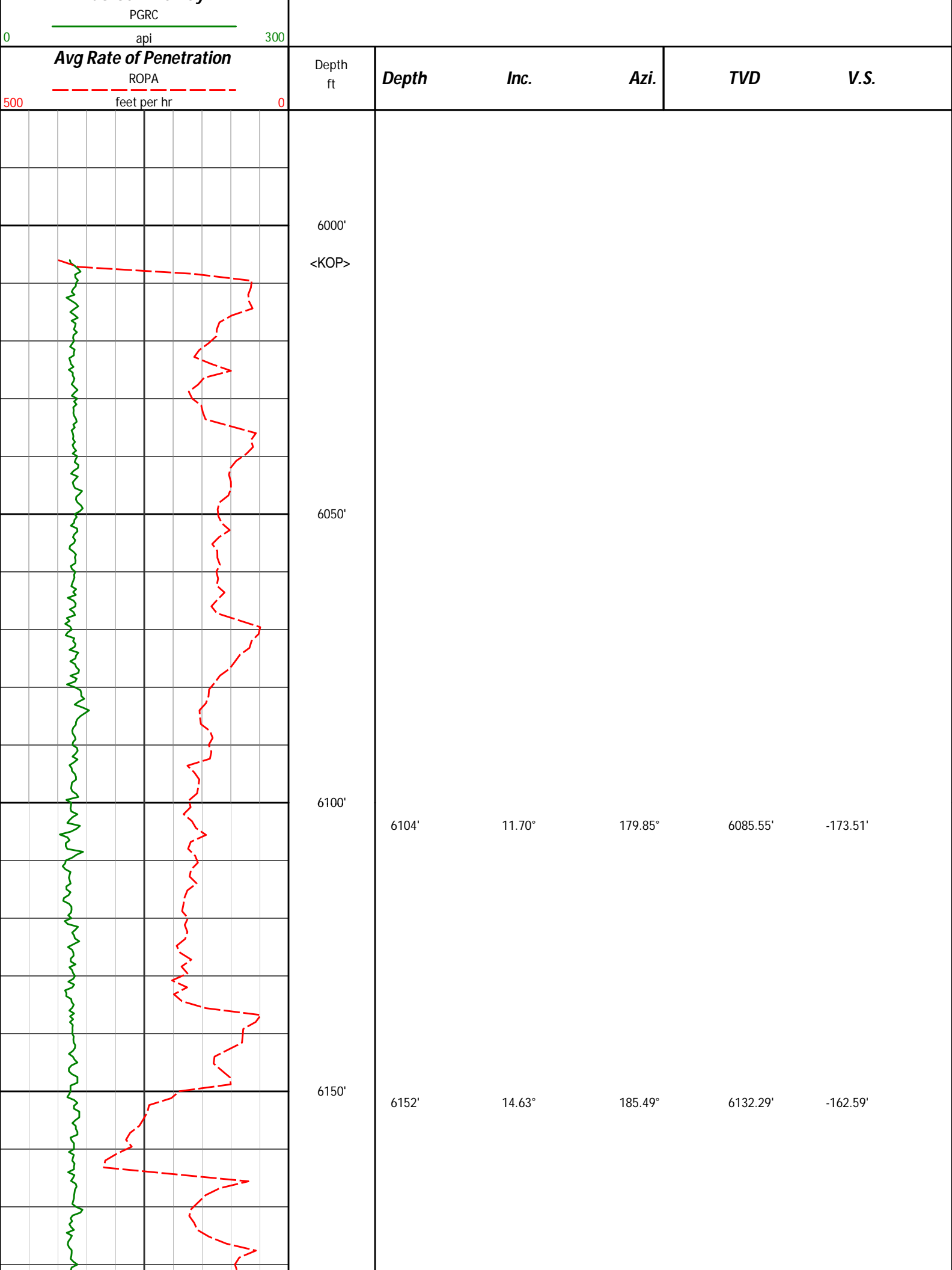
Avg Rate of Penetration		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
500	ROP feet per hr						

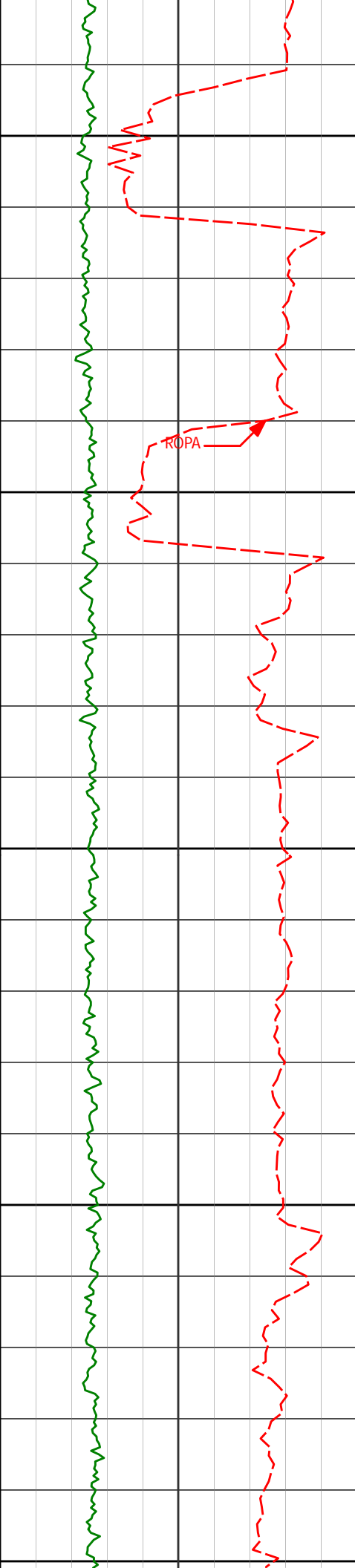
PCG Gamma Ray							
0	PGRC api	300					

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Noble Energy, Inc
Crow Creek AA01-785
H&P 315
T2N R64W

PCG Gamma Ray							
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6200'

6199'

17.34°

184.99°

6177.47'

-149.66'

6250'

6294'

23.97°

183.50°

6266.31'

-116.19'

6300'

6350'

6389'

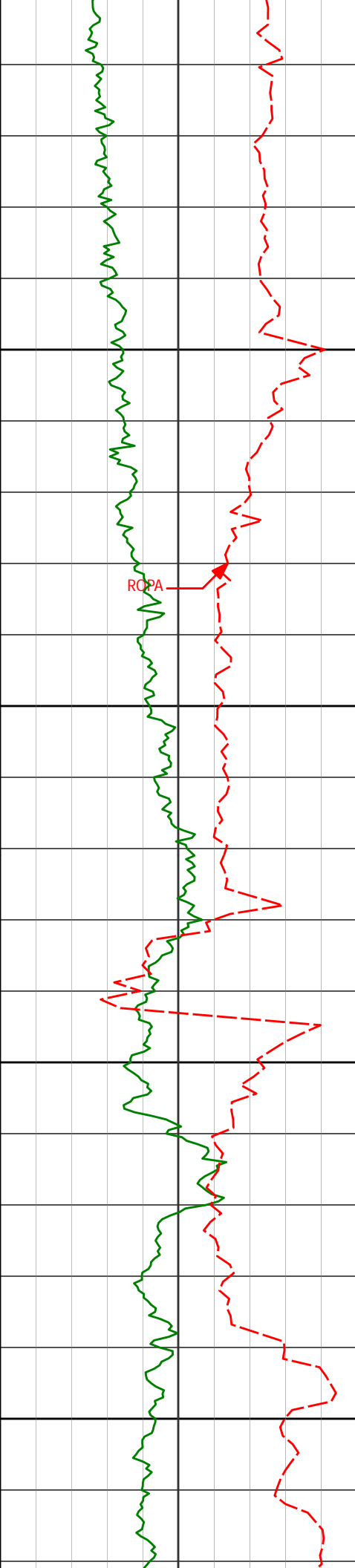
32.99°

183.79°

6349.73'

-70.95'

6400'



6450'

ROPA

6484'

42.98°

180.39°

6424.52'

-12.57'

6500'

6532'

47.01°

180.60°

6458.45'

21.34'

6550'

6579'

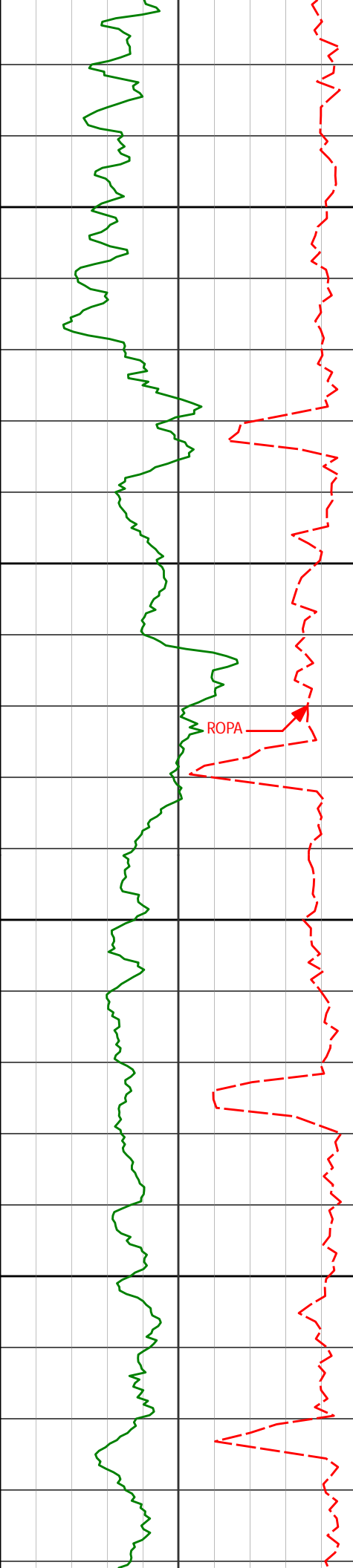
51.83°

179.35°

6489.02'

56.99'

6600'



6650'

6700'

6750'

6800'

6627'

56.19°

178.76°

6517.22'

95.76'

6673'

60.70°

180.33°

6541.29'

134.90'

6721'

64.25°

181.41°

6563.46'

177.45'

6768'

68.79°

181.40°

6582.18'

220.54'

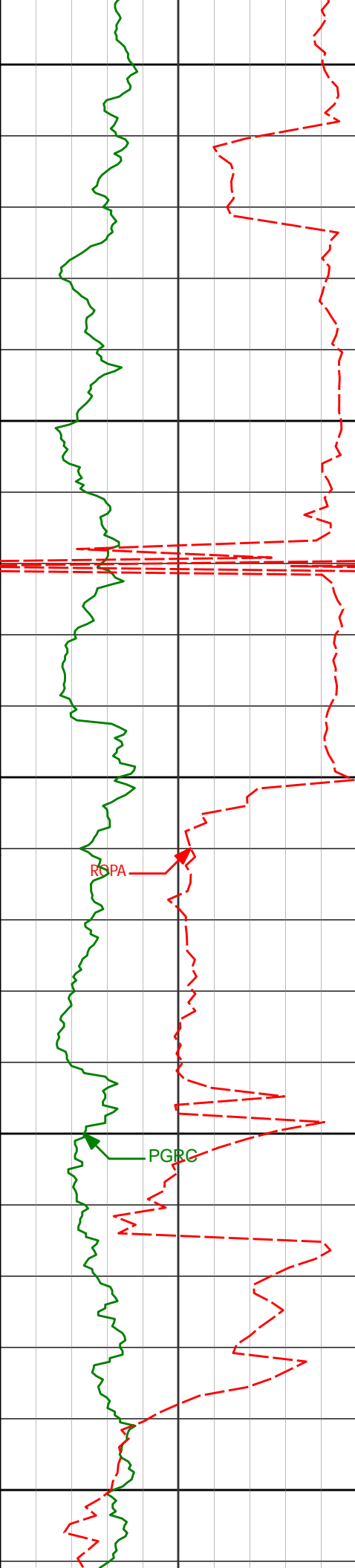
6816'

72.05°

182.24°

6598.27'

265.76'



6850'

6863'

76.09°

181.35°

6611.16'

310.94'

6892'

79.00°

181.03°

6617.41'

339.25'

6900'

6950'

<Run 200>

<7" casing set at 6945' MD>

ROPA

PGRC

7000'

7037'

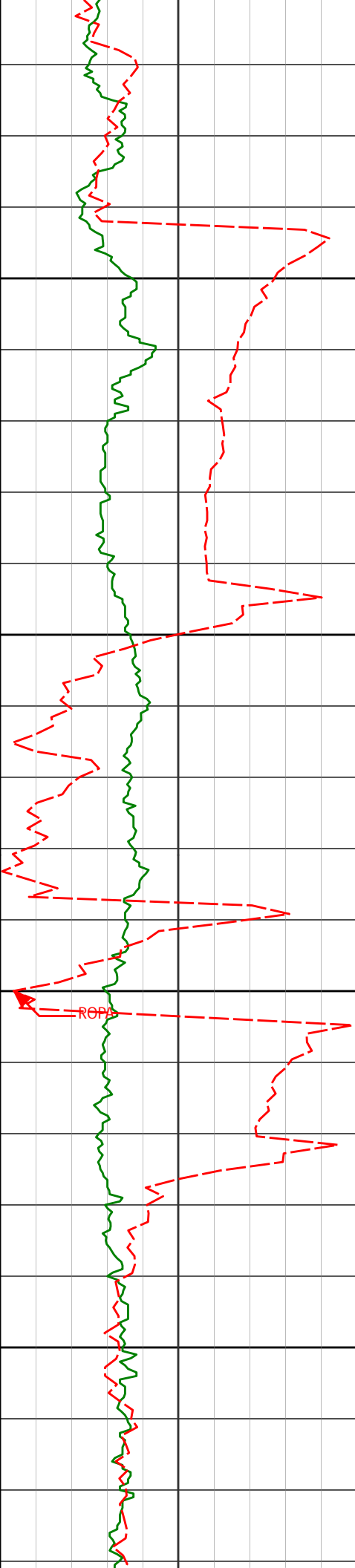
84.54°

180.90°

6638.17'

482.66'

7050'



7100'

7131'

90.62°

181.06°

6642.14'

576.51'

7150'

7200'

7226'

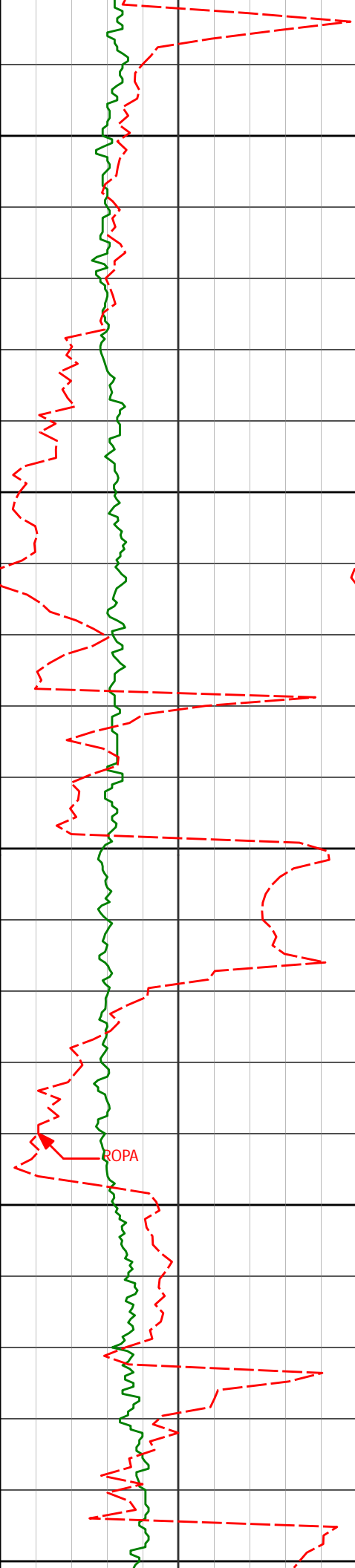
91.05°

177.70°

6640.76'

671.36'

7250'



7300'

7321'

91.08°

176.74°

6639.00'

765.97'

7350'

7400'

7416'

90.31°

176.54°

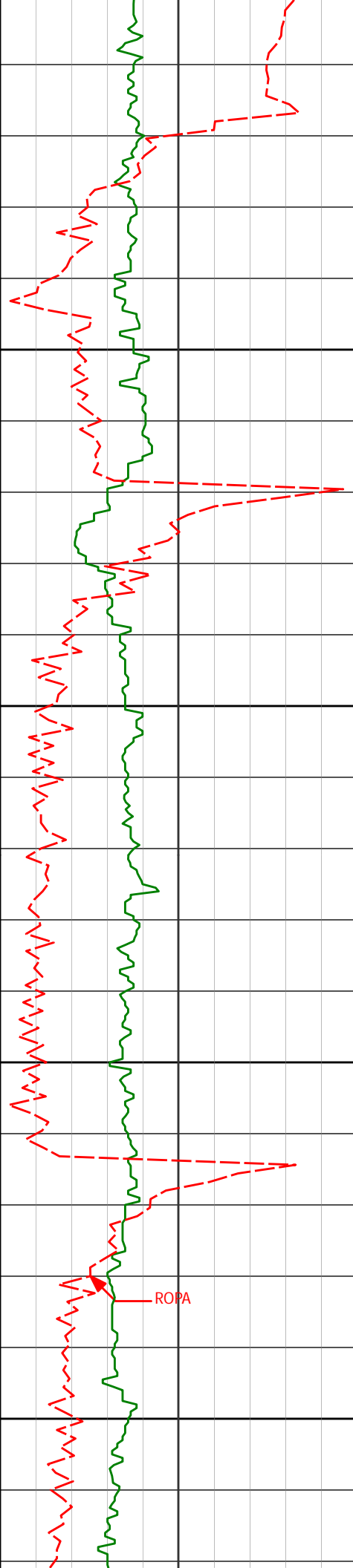
6637.85'

860.50'

7450'

7500'

ROPA



7550'

7600'

7650'

7700'

7511'

90.06°

178.06°

6637.54'

955.13'

7606'

90.68°

177.83°

6636.93'

1049.85'

ROPA

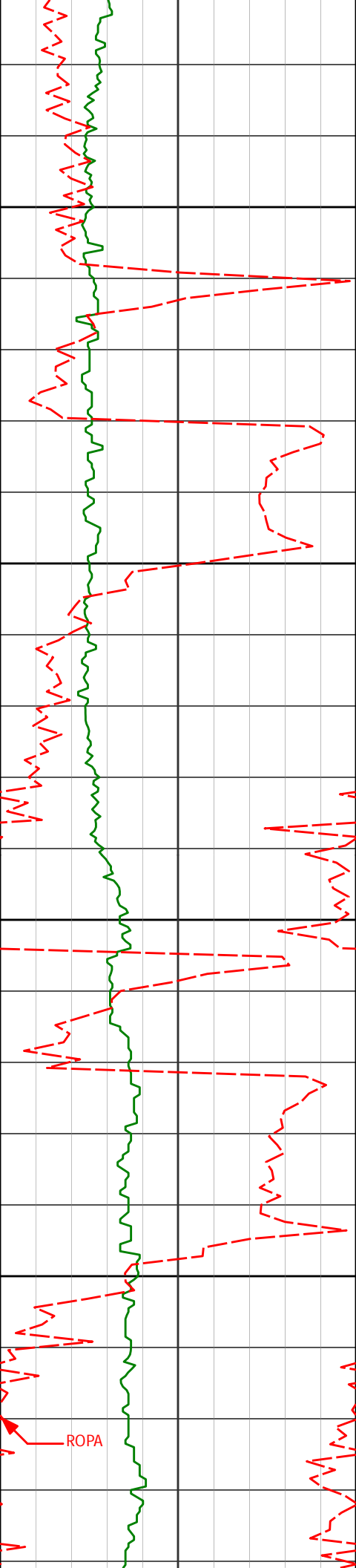
7701'

89.38°

176.89°

6636.88'

1144.49'



7750'

7796'

89.82°

177.18°

6637.54'

1239.09'

7800'

7850'

7891'

89.51°

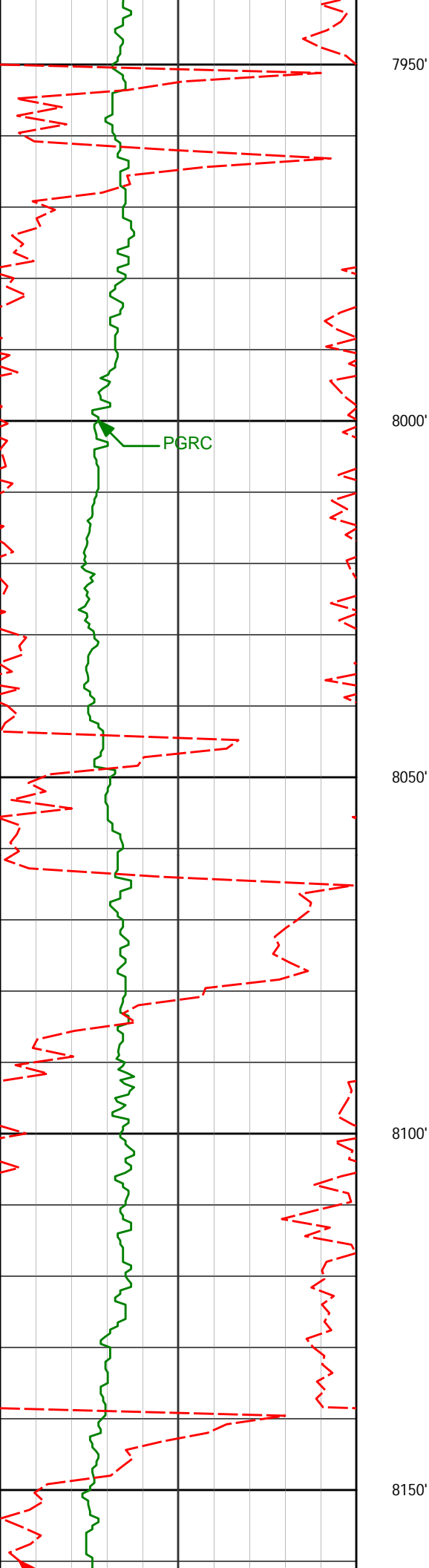
180.64°

6638.11'

1333.90'

7900'

ROPA



7950'

7986'

89.11°

180.32°

6639.25'

1428.85'

8000'

PGRC

8050'

8081'

90.43°

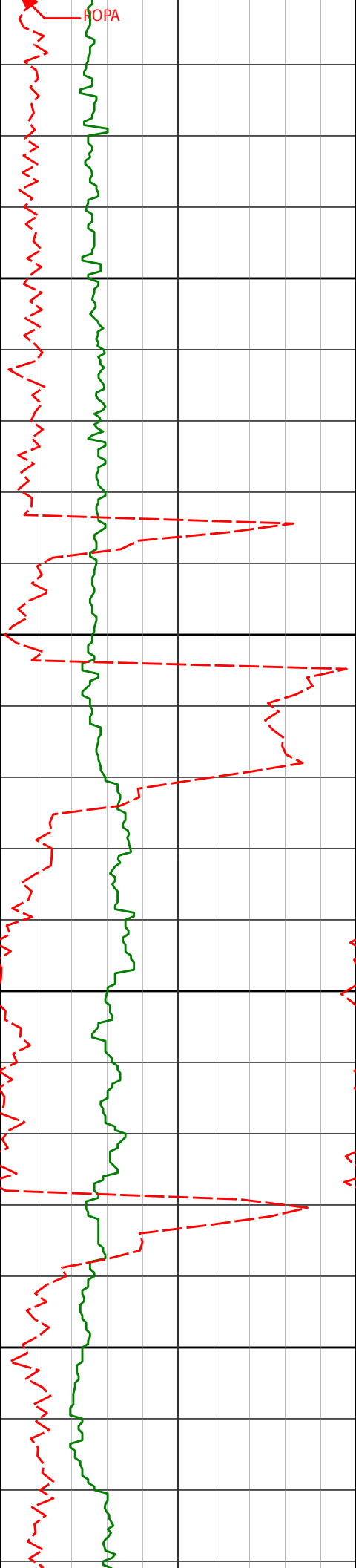
180.34°

6639.63'

1523.79'

8100'

8150'



8200'

8250'

8300'

8350'

8176'

89.78°

179.68°

6639.45'

1618.71'

8271'

92.22°

179.91°

6637.79'

1713.60'

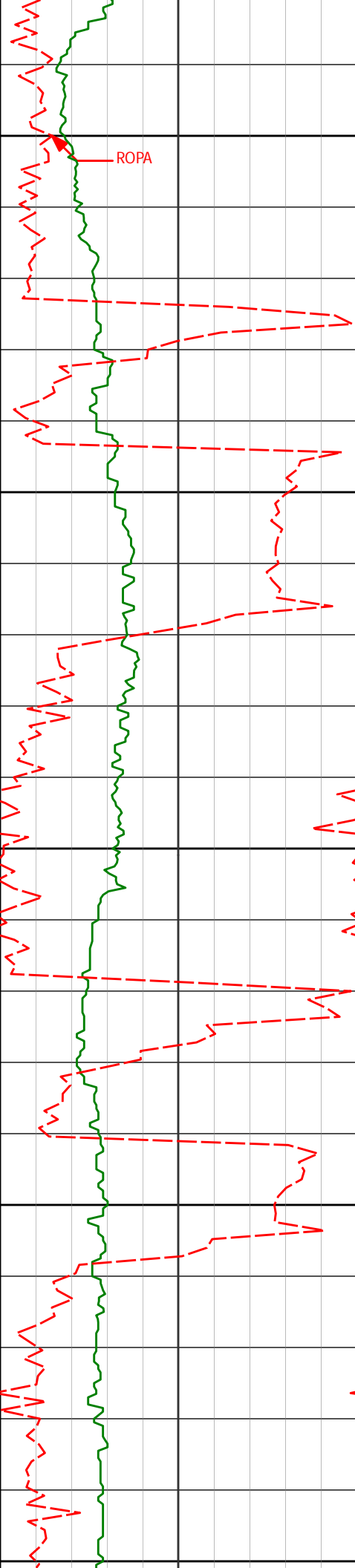
8366'

93.14°

179.45°

6633.35'

1808.39'



8400'

8450'

8500'

8550'

8600'

8461'

91.45°

180.09°

6629.54'

1903.22'

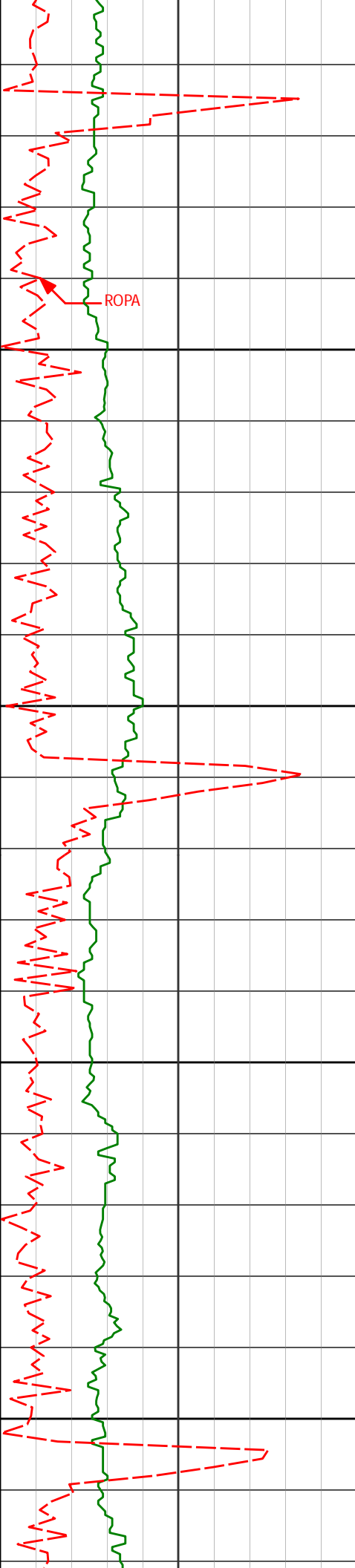
8555'

89.72°

180.36°

6628.58'

1997.15'



8650'

8650'

90.12°

179.96°

6628.71'

2092.08'

8700'

8750'

8800'

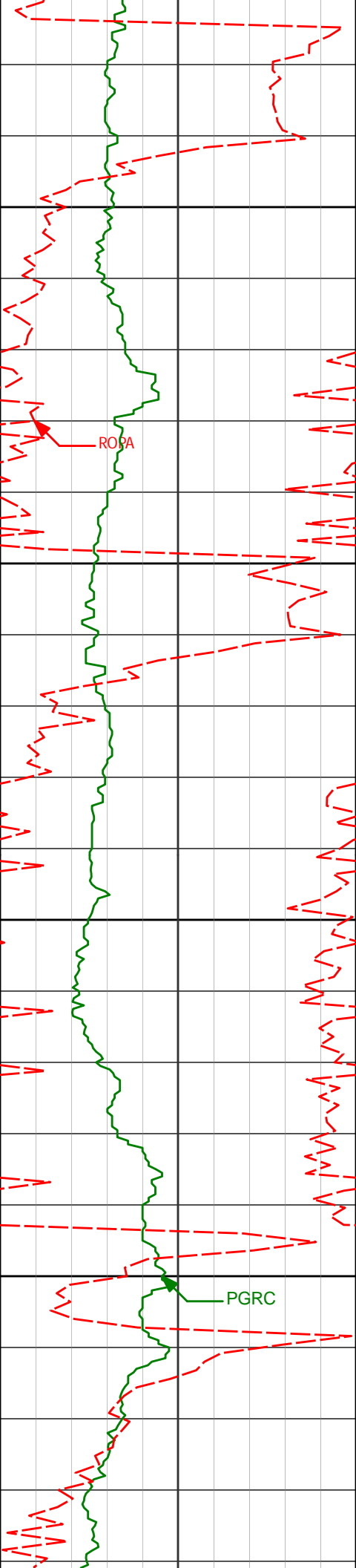
8745'

90.92°

179.51°

6627.84'

2186.98'



8850'

8900'

8950'

9000'

8840'

90.00°

181.31°

6627.08'

2281.92'

8935'

88.80°

181.27°

6628.07'

2376.90'

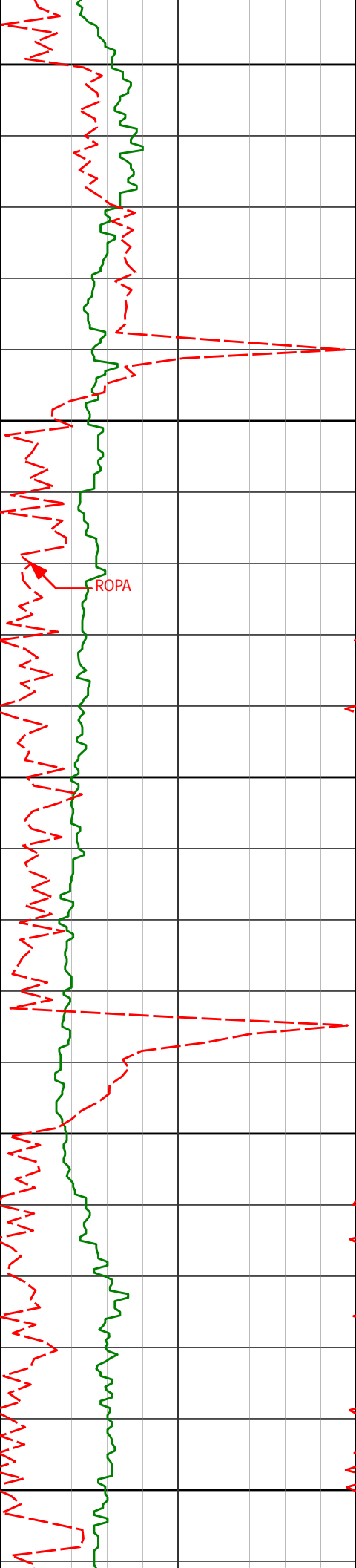
9030'

88.89°

181.01°

6629.99'

2471.86'



9050'

9100'

9125'

88.89°

180.62°

6631.82'

2566.81'

9150'

9200'

9220'

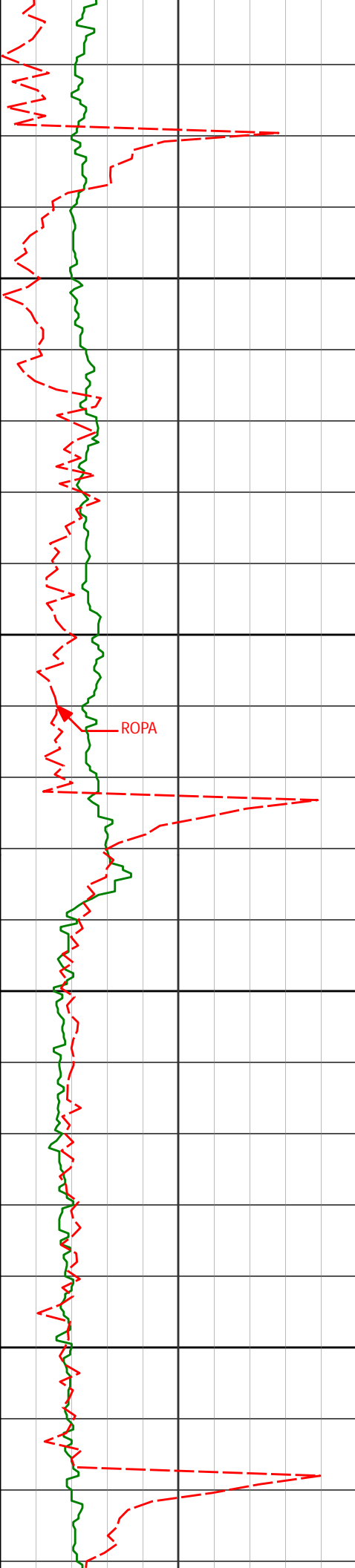
90.18°

180.71°

6632.59'

2661.76'

9250'



9300'

9315'

89.69°

180.53°

6632.69'

2756.72'

9350'

ROPA

9400'

9409'

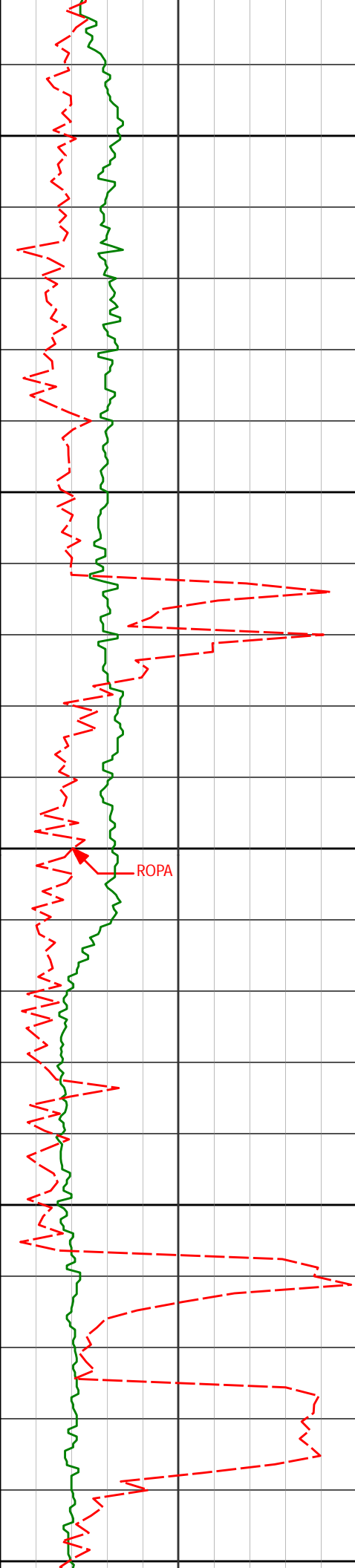
89.82°

180.27°

6633.10'

2850.67'

9450'



9500'

9504'

89.57°

179.67°

6633.61'

2945.59'

9550'

9600'

9599'

91.66°

180.36°

6632.59'

3040.50'

ROPA

9650'

9694'

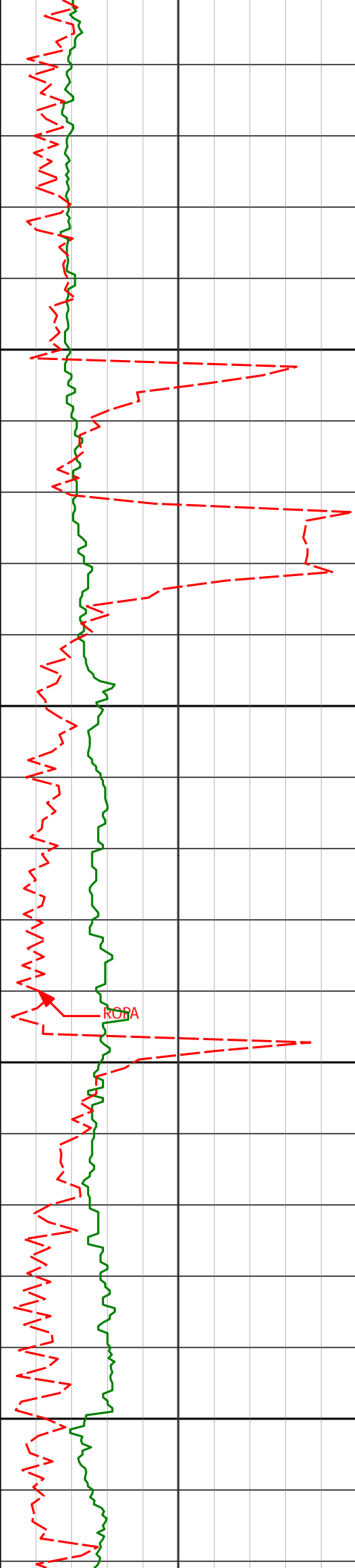
90.95°

179.87°

6630.42'

3135.41'

9700'



9750'

9789'

90.46°

178.14°

6629.24'

3230.24'

9800'

9850'

9884'

89.32°

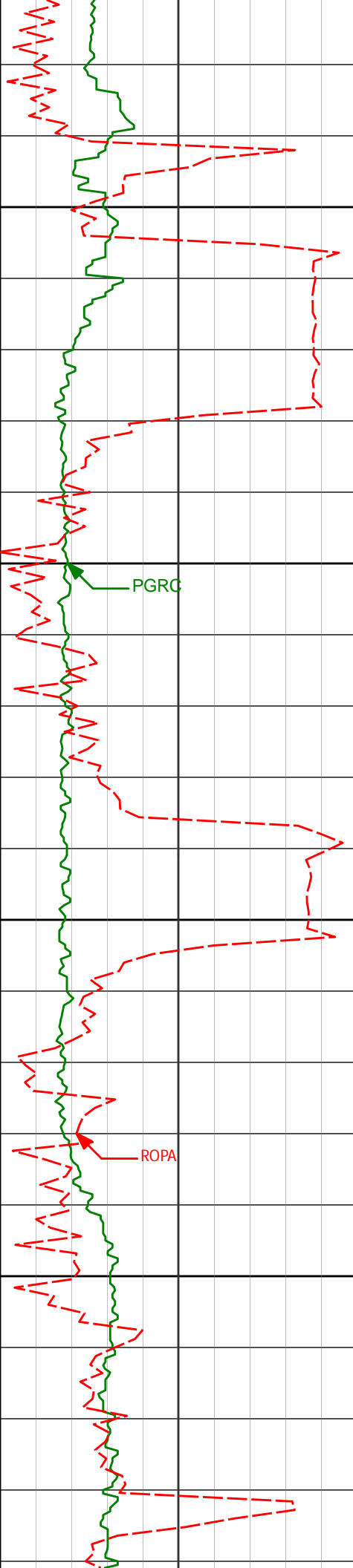
175.27°

6629.42'

3324.77'

9900'

ROSA



9950'

9978'

88.83°

177.78°

6630.94'

3418.27'

10000'

PGRC

10050'

10073'

90.18°

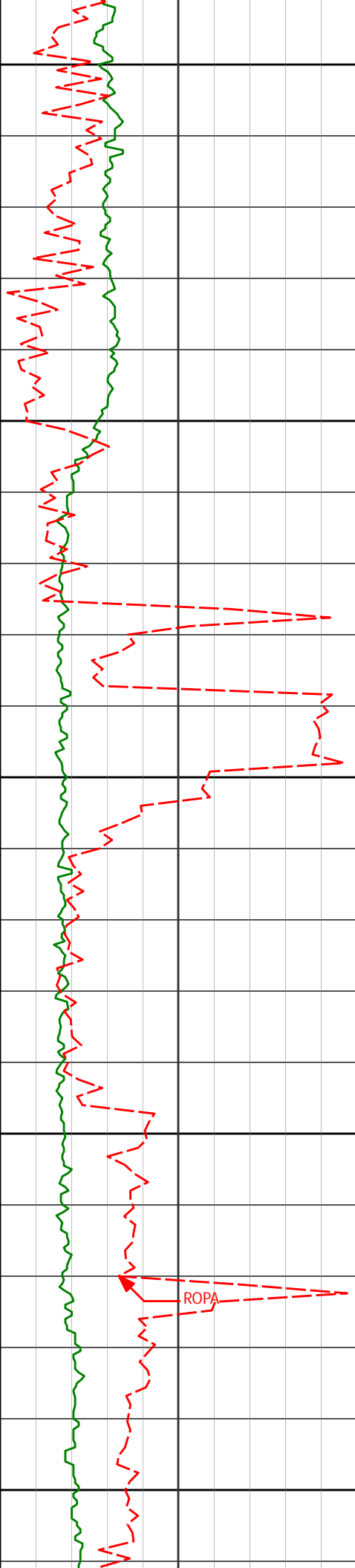
180.10°

6631.75'

3513.09'

ROPA

10100'



10150'

10168'

91.66°

180.90°

6630.22'

3608.03'

10200'

10250'

10263'

89.97°

180.04°

6628.87'

3702.97'

10300'

10350'

10358'

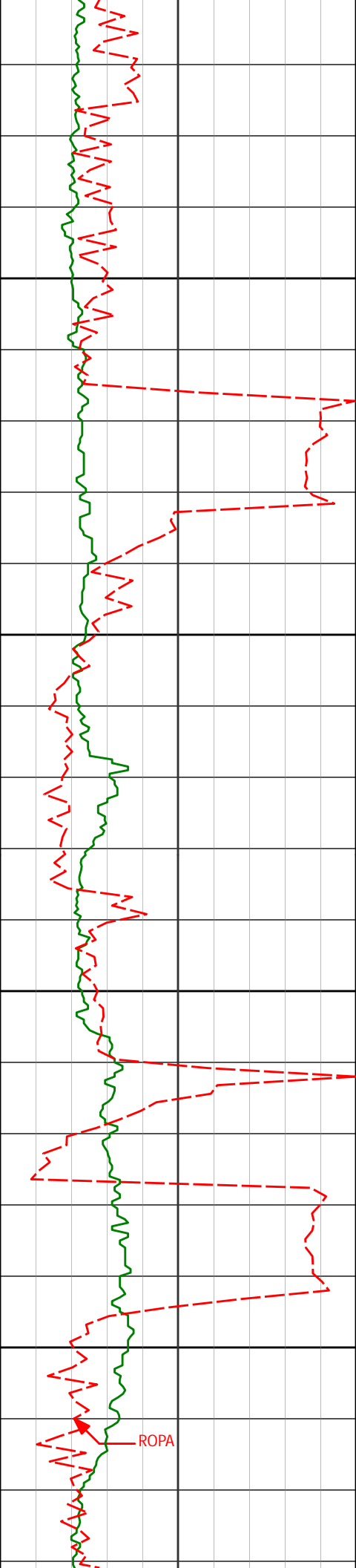
90.18°

179.70°

6628.74'

3797.88'

ROPA



10400'

10450'

10500'

10550'

10453'

89.88°

180.67°

6628.69'

3892.82'

10548'

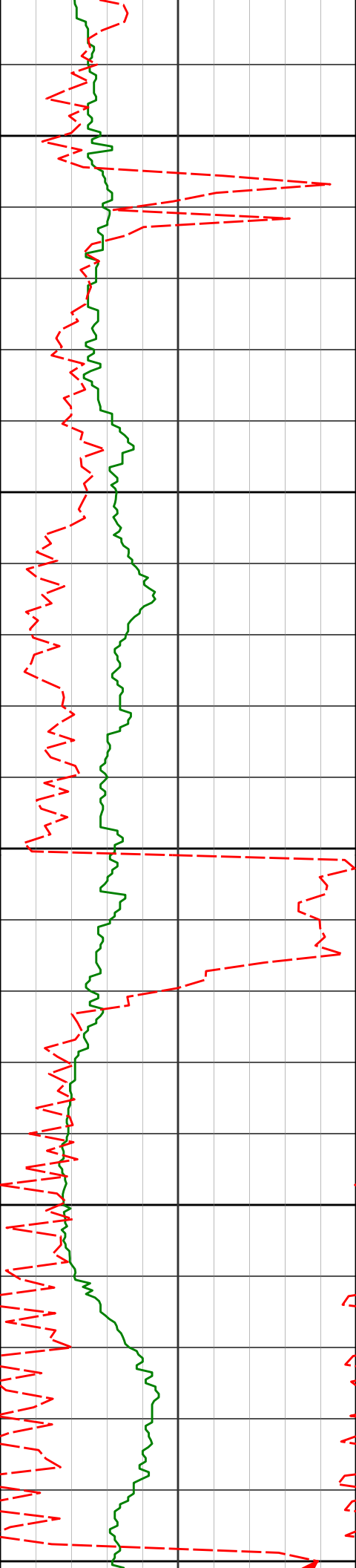
89.88°

182.02°

6628.89'

3987.80'

ROPA



10600'

10643'

90.49°

182.24°

6628.59'

4082.80'

10650'

10700'

10738'

89.82°

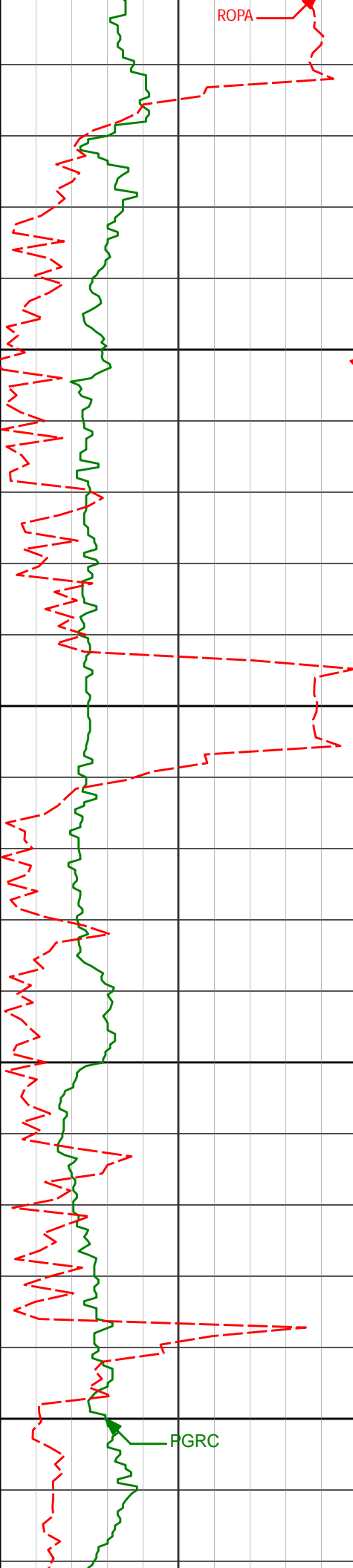
180.56°

6628.33'

4177.78'

10750'

10800'



10850'

10900'

10950'

11000'

10833'

90.40°

180.58°

6628.15'

4272.74'

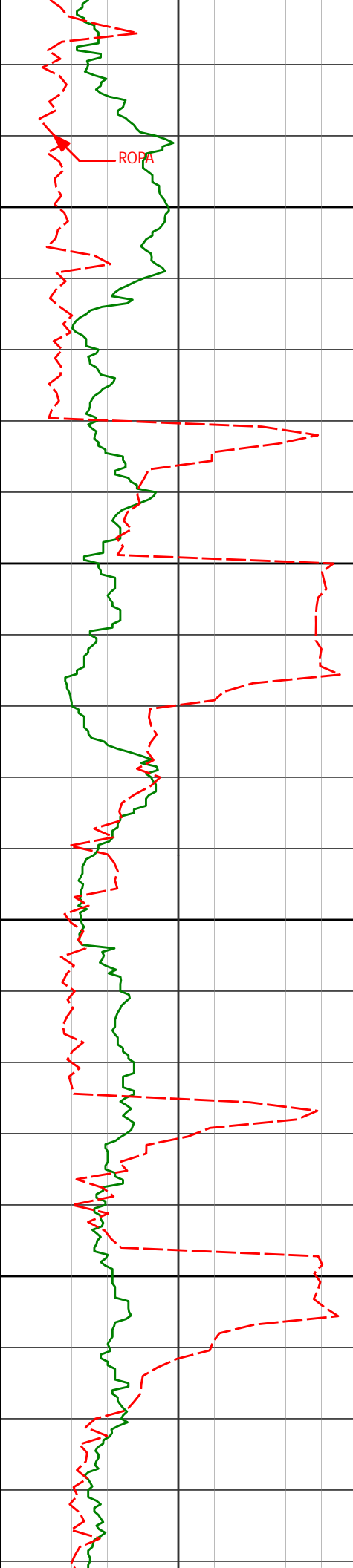
10927'

88.86°

180.13°

6628.76'

4366.68'



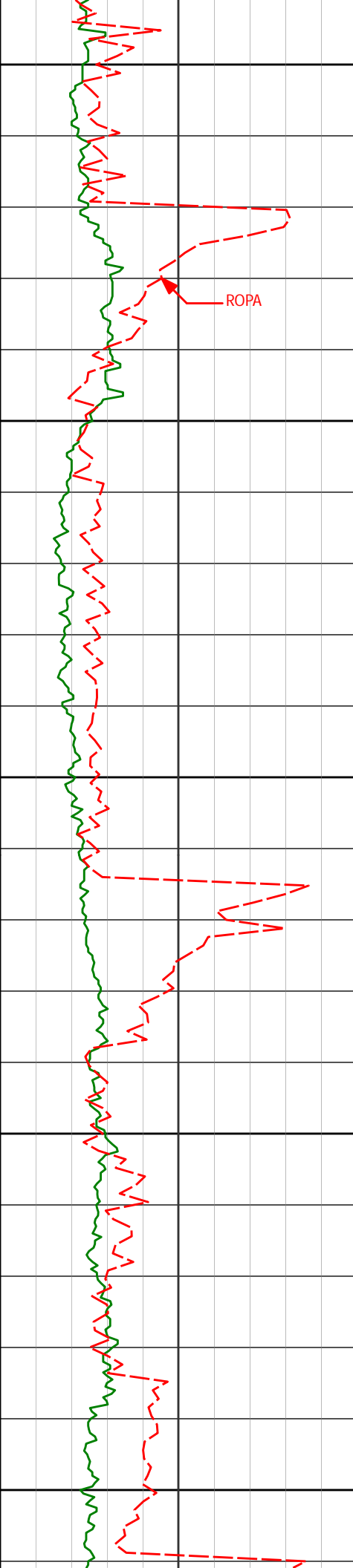
11050'

11100'

11150'

11200'

11022'	90.09°	179.66°	6629.63'	4461.59'
11117'	90.06°	181.15°	6629.50'	4556.53'
11212'	89.60°	180.47°	6629.78'	4651.50'



11250'

11300'

11350'

11400'

11450'

ROPA

11307'

90.28°

180.16°

6629.88'

4746.44'

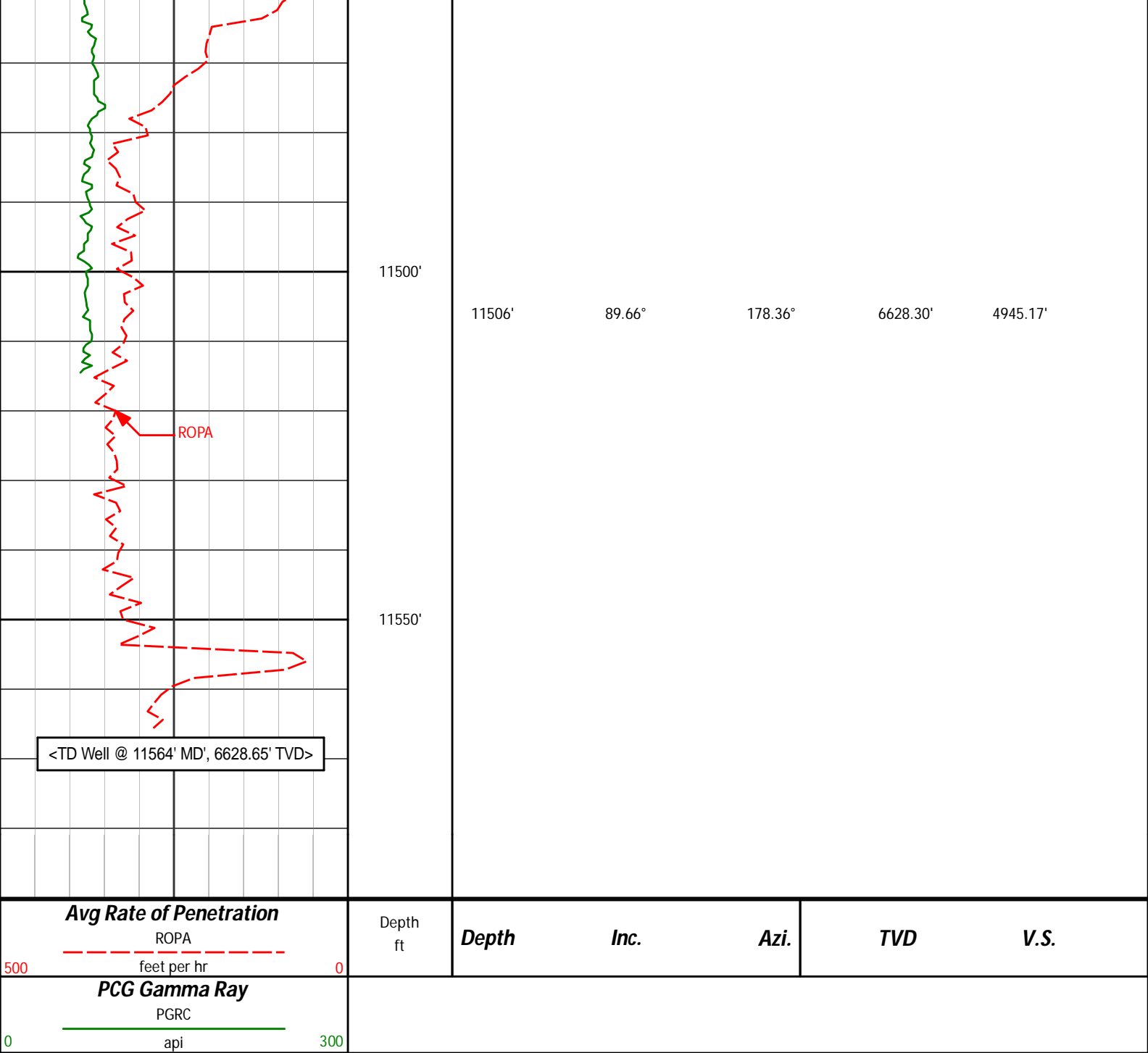
11402'

90.96°

179.57°

6628.86'

4841.35'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy Inc.
Crow Creek AA01-785
Wattenberg
Weld Colorado
USA
CA-XX-0901833889

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
283.00	0.60	26.18	282.99	1.33 N	0.65 E	-1.36	0.21
652.00	0.20	70.98	651.99	3.27 N	2.12 E	-3.36	0.13
726.00	0.16	298.04	725.99	3.36 N	2.15 E	-3.45	0.44
914.00	0.30	308.54	913.98	3.79 N	1.53 E	-3.85	0.08

1100.00	0.96	303.39	1099.97	4.96 N	0.16 W	-4.95	0.36
1192.00	0.89	331.54	1191.96	6.01 N	1.14 W	-5.96	0.50
1284.00	0.95	333.32	1283.95	7.32 N	1.83 W	-7.24	0.07
1376.00	0.86	346.14	1375.94	8.67 N	2.33 W	-8.57	0.24
1469.00	1.08	260.84	1468.93	9.20 N	3.36 W	-9.06	1.42
1563.00	1.14	238.07	1562.91	8.57 N	5.03 W	-8.36	0.47
1653.00	1.65	185.59	1652.89	6.81 N	5.91 W	-6.56	1.46
1746.00	1.57	175.73	1745.85	4.21 N	5.95 W	-3.96	0.31
1840.00	1.80	189.14	1839.81	1.47 N	6.09 W	-1.22	0.48
1933.00	0.19	228.91	1932.79	0.08 S	6.44 W	0.34	1.78
2027.00	0.28	265.44	2026.79	0.20 S	6.79 W	0.48	0.18
2122.00	0.14	268.62	2121.79	0.22 S	7.14 W	0.51	0.15
2217.00	0.45	293.42	2216.79	0.08 S	7.60 W	0.38	0.35
2312.00	0.50	241.57	2311.79	0.13 S	8.31 W	0.46	0.44
2407.00	0.58	281.44	2406.78	0.23 S	9.15 W	0.60	0.39
2501.00	0.85	261.60	2500.78	0.24 S	10.30 W	0.65	0.38
2596.00	1.29	317.76	2595.76	0.45 N	11.71 W	0.02	1.14
2691.00	2.61	328.80	2690.71	3.09 N	13.55 W	-2.55	1.44
2786.00	3.61	330.24	2785.56	7.54 N	16.15 W	-6.88	1.06
2881.00	5.18	333.25	2880.28	13.97 N	19.57 W	-13.17	1.67
2976.00	7.08	334.16	2974.73	23.08 N	24.06 W	-22.09	2.00
3070.00	7.85	332.18	3067.94	33.97 N	29.58 W	-32.75	0.86
3165.00	7.62	332.00	3162.07	45.27 N	35.56 W	-43.80	0.24
3259.00	8.16	323.39	3255.18	56.14 N	42.47 W	-54.38	1.38
3354.00	7.66	322.12	3349.28	66.55 N	50.38 W	-64.46	0.56
3449.00	6.69	322.20	3443.53	75.92 N	57.66 W	-73.53	1.02
3543.00	7.52	314.29	3536.81	84.54 N	65.42 W	-81.84	1.37
3638.00	8.64	315.90	3630.87	94.01 N	74.84 W	-90.92	1.20
3733.00	9.67	315.83	3724.66	104.86 N	85.37 W	-101.33	1.09
3828.00	9.24	313.69	3818.36	115.86 N	96.45 W	-111.87	0.59
3923.00	8.48	309.74	3912.23	125.60 N	107.35 W	-121.17	1.03
4018.00	8.68	309.59	4006.17	134.65 N	118.25 W	-129.77	0.22
4113.00	7.41	315.12	4100.23	143.55 N	128.10 W	-138.27	1.56
4207.00	7.00	314.19	4193.49	151.84 N	136.48 W	-146.22	0.45
4302.00	6.06	314.59	4287.87	159.40 N	144.21 W	-153.45	0.98
4397.00	6.68	318.82	4382.29	167.08 N	151.42 W	-160.84	0.81
4492.00	6.05	320.07	4476.70	175.08 N	158.27 W	-168.55	0.67
4587.00	6.05	320.43	4571.17	182.78 N	164.68 W	-175.99	0.04
4681.00	5.92	321.68	4664.66	190.40 N	170.84 W	-183.36	0.20
4776.00	3.88	323.84	4759.31	196.85 N	175.78 W	-189.60	2.15
4871.00	3.35	320.65	4854.12	201.59 N	179.43 W	-194.19	0.60
4966.00	1.24	302.47	4949.04	204.28 N	182.06 W	-196.78	2.32
5061.00	1.23	293.16	5044.01	205.23 N	183.86 W	-197.66	0.21
5250.00	1.68	278.01	5232.95	206.42 N	188.46 W	-198.65	0.31
5345.00	1.63	285.85	5327.91	206.98 N	191.14 W	-199.11	0.24
5440.00	1.70	280.72	5422.87	207.61 N	193.82 W	-199.63	0.18
5535.00	1.39	203.04	5517.85	206.81 N	195.66 W	-198.76	2.06
5630.00	1.48	205.83	5612.82	204.65 N	196.65 W	-196.56	0.12
5724.00	1.43	211.14	5706.79	202.56 N	197.78 W	-194.42	0.15
5819.00	1.28	228.02	5801.76	200.83 N	199.18 W	-192.64	0.45
5914.00	1.29	227.49	5896.74	199.40 N	200.76 W	-191.14	0.02
5948.00	1.33	228.98	5930.73	198.88 N	201.35 W	-190.60	0.14
6104.00	11.70	179.85	6085.55	181.82 N	202.67 W	-173.51	6.97
6152.00	14.63	185.49	6132.29	170.92 N	203.24 W	-162.59	6.66
6199.00	17.34	184.99	6177.47	158.03 N	204.42 W	-149.66	5.76
6294.00	23.97	183.50	6266.31	124.63 N	206.83 W	-116.19	7.01
6389.00	32.99	183.79	6349.73	79.47 N	209.73 W	-70.95	9.49
6484.00	42.98	180.39	6424.52	21.12 N	211.67 W	-12.57	10.74
6532.00	47.01	180.60	6458.45	12.81 S	211.96 W	21.34	8.39
6579.00	51.83	179.35	6489.02	48.49 S	211.93 W	56.99	10.45
6627.00	56.19	178.76	6517.22	87.31 S	211.29 W	95.76	9.15
6673.00	60.70	180.33	6541.29	126.50 S	210.99 W	134.90	10.23
6721.00	64.25	181.41	6563.46	169.06 S	211.64 W	177.45	7.65
6768.00	68.79	181.40	6582.18	212.14 S	212.70 W	220.54	9.65
6816.00	72.05	182.24	6598.27	257.34 S	214.14 W	265.76	7.00
6863.00	76.09	181.35	6611.16	302.50 S	215.55 W	310.94	8.79
6892.00	79.00	181.03	6617.41	330.81 S	216.14 W	339.25	10.07
7037.00	84.54	180.90	6638.17	474.24 S	218.56 W	482.66	3.82
7131.00	90.62	181.06	6642.14	568.10 S	220.17 W	576.51	6.47
7226.00	91.05	177.70	6640.76	663.07 S	219.15 W	671.36	3.57
7321.00	91.08	176.74	6639.00	757.94 S	214.54 W	765.97	1.01
7416.00	90.31	176.54	6637.85	852.77 S	208.98 W	860.50	0.84
7511.00	90.06	178.06	6637.54	947.66 S	204.50 W	955.13	1.62
7606.00	90.68	177.83	6636.93	1042.59 S	201.09 W	1049.85	0.69
7701.00	89.38	176.89	6636.88	1137.49 S	196.71 W	1144.49	1.69

7796.00	89.82	177.18	6637.54	1232.36 S	191.79 W	1239.09	0.55
7891.00	89.51	180.64	6638.11	1327.33 S	189.98 W	1333.90	3.65
7986.00	89.11	180.32	6639.25	1422.32 S	190.78 W	1428.85	0.54
8081.00	90.43	180.34	6639.63	1517.31 S	191.33 W	1523.79	1.39
8176.00	89.78	179.68	6639.45	1612.31 S	191.34 W	1618.71	0.98
8271.00	92.22	179.91	6637.79	1707.29 S	191.00 W	1713.60	2.57
8366.00	93.14	179.45	6633.35	1802.18 S	190.48 W	1808.39	1.09
8461.00	91.45	180.09	6629.54	1897.10 S	190.09 W	1903.22	1.91
8555.00	89.72	180.36	6628.58	1991.09 S	190.46 W	1997.15	1.86
8650.00	90.12	179.96	6628.71	2086.09 S	190.73 W	2092.08	0.60
8745.00	90.92	179.51	6627.84	2181.08 S	190.29 W	2186.98	0.97
8840.00	90.00	181.31	6627.08	2276.07 S	190.97 W	2281.92	2.13
8935.00	88.80	181.27	6628.07	2371.04 S	193.12 W	2376.90	1.26
9030.00	88.89	181.01	6629.99	2466.00 S	195.01 W	2471.86	0.29
9125.00	88.89	180.62	6631.82	2560.98 S	196.36 W	2566.81	0.41
9220.00	90.18	180.71	6632.59	2655.96 S	197.47 W	2661.76	1.37
9315.00	89.69	180.53	6632.69	2750.96 S	198.49 W	2756.72	0.55
9409.00	89.82	180.27	6633.10	2844.96 S	199.15 W	2850.67	0.30
9504.00	89.57	179.67	6633.61	2939.95 S	199.10 W	2945.59	0.69
9599.00	91.66	180.36	6632.59	3034.94 S	199.13 W	3040.50	2.32
9694.00	90.95	179.87	6630.42	3129.92 S	199.31 W	3135.41	0.91
9789.00	90.46	178.14	6629.24	3224.89 S	197.66 W	3230.24	1.89
9884.00	89.32	175.27	6629.42	3319.72 S	192.19 W	3324.77	3.25
9978.00	88.83	177.78	6630.94	3413.53 S	186.49 W	3418.27	2.72
10073.00	90.18	180.10	6631.75	3508.50 S	184.73 W	3513.09	2.83
10168.00	91.66	180.90	6630.22	3603.48 S	185.56 W	3608.03	1.77
10263.00	89.97	180.04	6628.87	3698.46 S	186.33 W	3702.97	2.00
10358.00	90.18	179.70	6628.74	3793.46 S	186.12 W	3797.88	0.42
10453.00	89.88	180.67	6628.69	3888.46 S	186.43 W	3892.82	1.07
10548.00	89.88	182.02	6628.89	3983.43 S	188.66 W	3987.80	1.41
10643.00	90.49	182.24	6628.59	4078.37 S	192.19 W	4082.80	0.69
10738.00	89.82	180.56	6628.33	4173.33 S	194.51 W	4177.78	1.91
10833.00	90.40	180.58	6628.15	4268.33 S	195.45 W	4272.74	0.62
10927.00	88.86	180.13	6628.76	4362.32 S	196.03 W	4366.68	1.71
11022.00	90.09	179.66	6629.63	4457.32 S	195.86 W	4461.59	1.39
11117.00	90.06	181.15	6629.50	4552.31 S	196.53 W	4556.53	1.57
11212.00	89.60	180.47	6629.78	4647.30 S	197.87 W	4651.50	0.86
11307.00	90.28	180.16	6629.88	4742.30 S	198.40 W	4746.44	0.78
11402.00	90.96	179.57	6628.86	4837.29 S	198.18 W	4841.35	0.95
11506.00	89.66	178.36	6628.30	4941.27 S	196.31 W	4945.17	1.70
11564.00	89.66	178.36	6628.65	4999.24 S	194.65 W	5003.03	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 182.31 DEGREES (GRID)
A TOTAL CORRECTION OF 7.58 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11564.00 FEET
IS 5003.03 FEET ALONG 182.23 DEGREES (GRID)**

Surface surveys at 283' and 652' MD have had azimuth corrections to grid north, but were not taken by Halliburton.

Last survey is a projection from 11506' MD to bit at 11564' MD.