HALLIBURTON | Sperry Drilling

PCGK - Pressure Case Gamma
PCDC - Pressure Case Directional

Powered by INSITE™

1 : 240 / 1 : 600

Country	: USA
Field	: Wattenberg
Location	: Lat: 40° 42' 43.44" North Long: 103° 57' 35.21" West
Well	: Remora LC34-745
Company	: Noble Energy
Rig	: H&P 273

Company : **Noble Energy**
Rig : **H&P 273**
Well : **Remora LC34-745**
Field : **Wattenberg**
Country : **USA**
API Number : **05-123-40599**

LOCATION
Latitude : **40° 42' 43.44" North**
Longitude : **103° 57' 35.21" West**
UTM Easting = **3,426,970.998 usft**
UTM Northing = **1,505,957.644 usft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level**
Elevation : **4816.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

TVD LOG

Elev. KB **N/A**
DF **4840.00 ft**
GL **4816.00 ft**
WD **N/A**

Depth Logged : **618.00 ft** To **6,029.32 ft**
Date Logged : **01-Feb-16** To **04-Feb-16**
Total Depth MD : **6,454.00 ft** TVD : **6,029.32 ft**
Spud Date : **01-Feb-16**

Unit No. : **11703727**
Job No. : **CA-XX-0902986605**

Plot Type : **Final**
Plot Date : **04-Feb-16**

Run No.	Borehole Record (TVD) Size	From	To
2	8.750 in	618.00 ft	4,875.84 ft
3	8.750 in	4,875.84 ft	6,029.32 ft

Run No.	Borehole Record (TVD) Size	From	To

Casing Record (TVD) Size	Weight	From	To
13.500 in	36.00 lbpf	SURFACE	618.00 ft

WELL INFORMATION

MWD Run Number	100	200																											
Date run completed	02-Feb-16	03-Feb-16																											
Rig Bit Number	2	3																											
Bit Size (in)	8.750	8.750																											
Tool Nominal OD (in)	6.560	6.750																											
Log Start Depth (MD, ft)	618.00	4,928.00																											
Log End Depth (MD, ft)	4,928.00	6,454.00																											
Drill or Wipe	Drill	Drill																											
Drill/Wipe Start Date and Time	01-Feb-16 06:00	02-Feb-16 04:00																											
Drill/Wipe End Date and Time	01-Feb-16 21:15	03-Feb-16 03:30																											
Min Inc (deg) @ Depth (MD, ft)	0.17 @ 618.00	9.00 @ 4,928.00																											
Max Inc (deg) @ Depth (MD, ft)	11.00 @ 3,604.00	83.45 @ 6,399.00																											
Bit TFA(in2) / Bit Type	0.98 / PDC	0.98 / PDC																											
Flow Rate (gpm)	595.63	562.29																											
Max AV (fpm) / CV (fpm) @ MWD	300.0 / 0.0	130.0 / 0.0																											
Fluid Type	Native/Spud Mud	Native/Spud Mud																											
Density (ppg) / Viscosity (spqt)	8.70 / 30.00	10.17 / 45.00																											
Filtrate CL (ppm)	1,600.00	1,700.00																											
pH / Fluid Loss (mptm)	9.10 / 38	8.50 / 7																											
PV (cP) / YP (lhf2)	5 / 4.00	12 / 11.00																											
% Solids / % Sand	3.00 / 0.25	11.10 / 0.15																											
% 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 (degF) / Source	137.50 / PCM	162.80 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 137.50	N/A @ 162.80			
Lead MWD Engineer	Adam Sampson	Brandon McNair			
Customer Representative	Justin Fields	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	12686428	12686428			
Insert Serial Number	11227541	11227541			
Date and Time Initialized	30-Jan-16 09:55	30-Jan-16 09:53			
Date and Time Read	03-Feb-16 10:28	03-Feb-16 10:28			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	63.00	55.00			
Software Version	6.33	6.33			
Sub Serial Number	12686428	12686428			
Sonde Serial Number	11297563	11297563			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	66.20	252.80			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	51.03	42.60			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	12686428	12686428			
Insert/Sonde Serial Number	12071507	12071507			

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.

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

3. All data presented is recorded (memory data) unless otherwise stated.
- ROPA: Average Rate of Penetration is real time data.
- PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.

4. The following smoothing parameters have been applied to the data:
- All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
- Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
- Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.

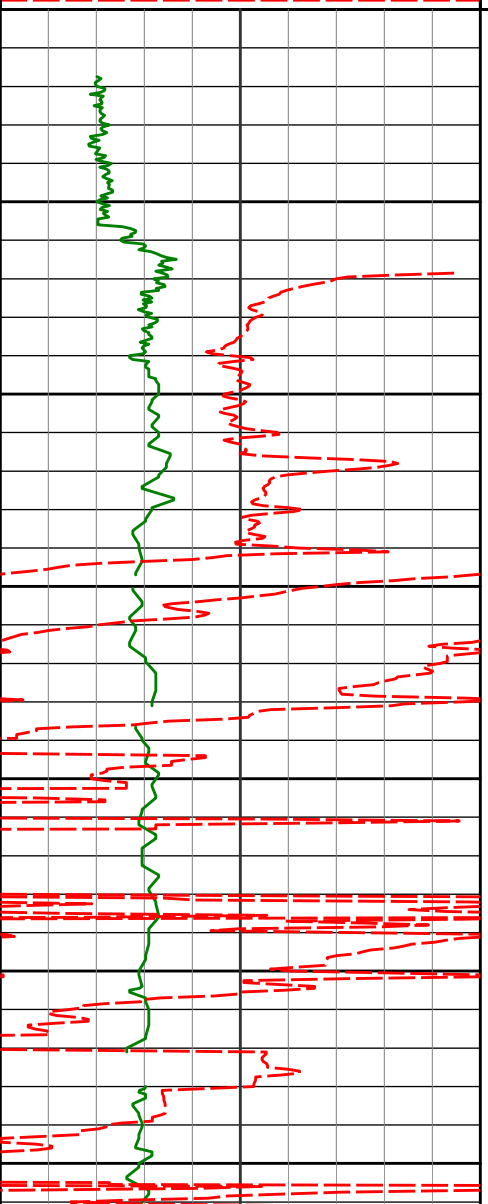
5. INSITE version 8.3.0.

WARRANTY

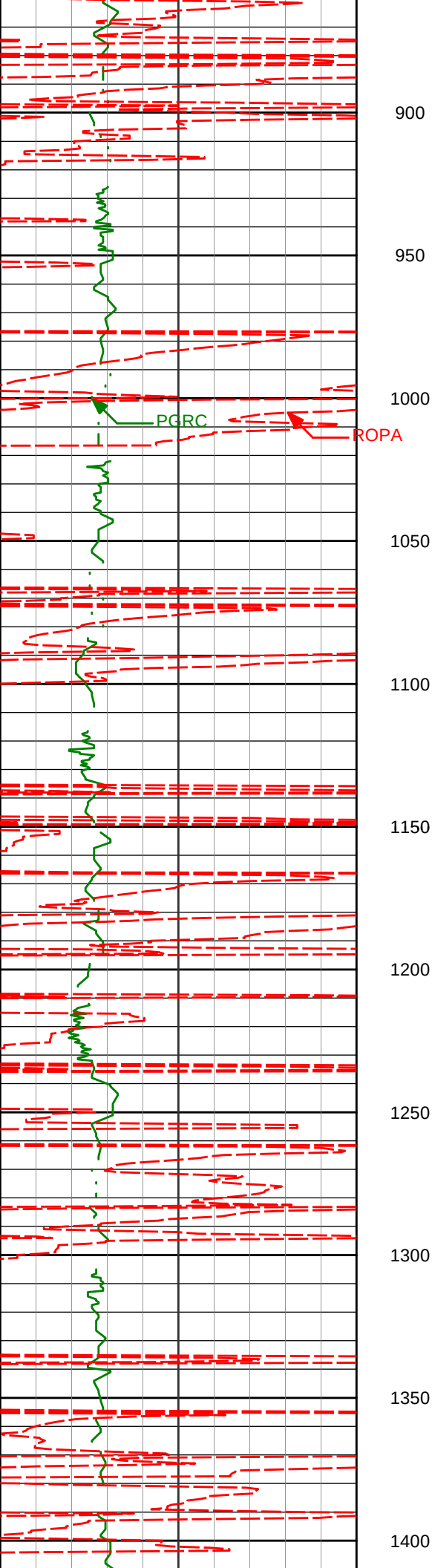
TVD Detail 1:600 Scale

PCG Gamma Ray BCorr
PGRC
0 api 300

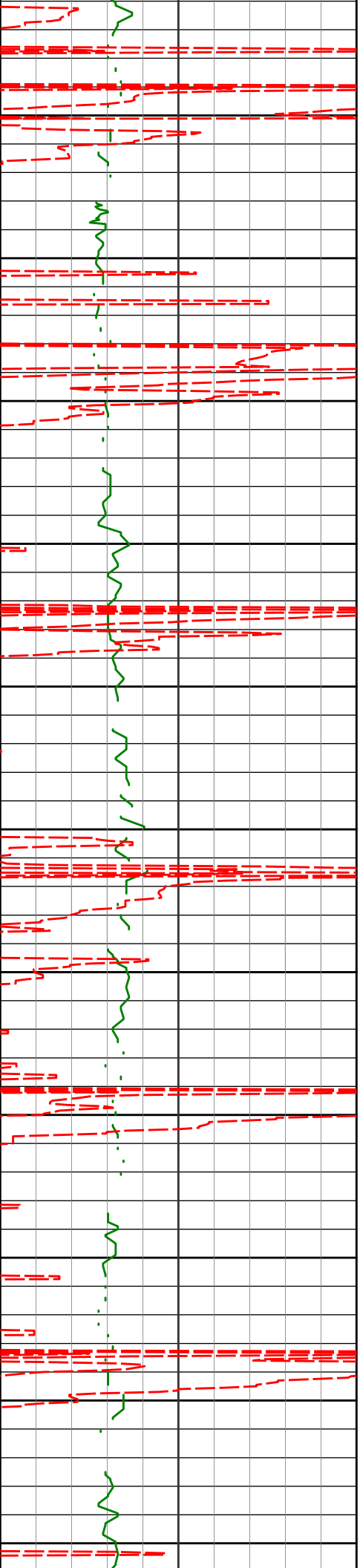
Avg Rate of Penetration
ROPA
500 feet per hr 0



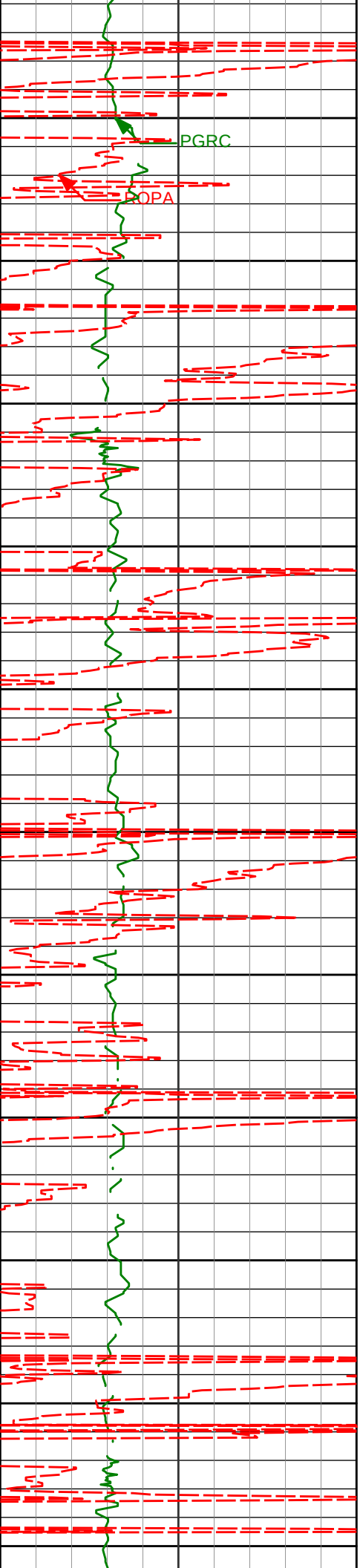
Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
						66.07
600						68.04
	618'	0.17°	159.97°	618.00'	0.81'	
	632'	0.22°	159.78°	632.00'	0.85'	70.02
650						70.02
						70.02
700						
	726'	0.28°	158.86°	726.00'	1.21'	56.35
750						56.35
						56.35
800						56.35
						56.35
850						



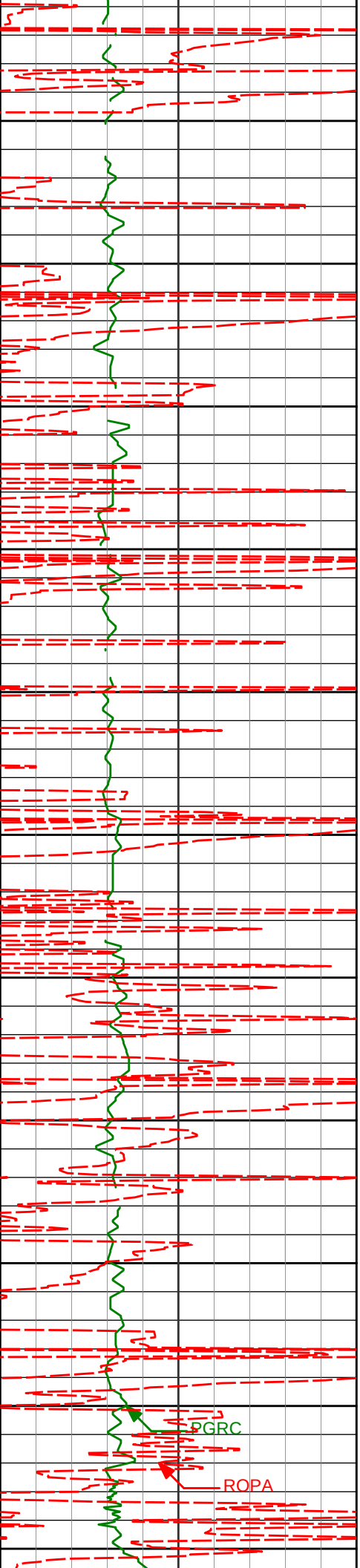
					56.35
915'	0.31°	155.88°	915.00'	2.05'	56.35
					72.00
					56.35
					56.35
1009'	2.87°	309.91°	1008.96'	1.07'	72.00
					56.35
					56.35
1103'	5.11°	307.43°	1102.73'	-2.10'	56.35
					56.35
					58.28
1195'	6.37°	311.12°	1194.26'	-6.71'	72.00
					73.98
					58.28
1287'	7.95°	309.75°	1285.54'	-12.61'	58.28
					75.97
					75.97
1379'	10.66°	302.82°	1376.33'	-19.21'	75.97



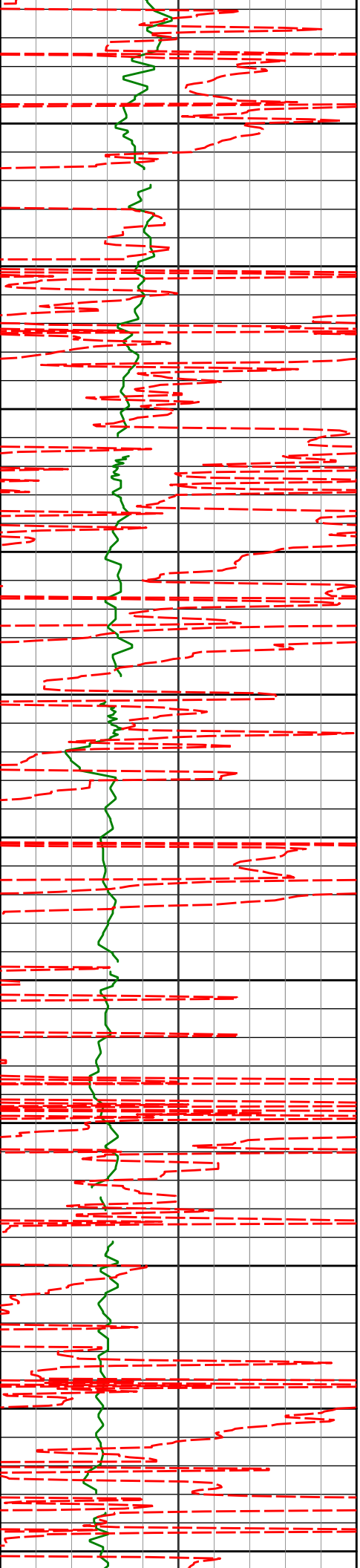
					56.35
					56.35
1470'	10.54°	304.06°	1465.77'	-26.04'	77.99
					77.99
					77.99
1562'	10.36°	301.97°	1556.25'	-32.73'	54.45
					54.45
					54.45
1653'	10.06°	302.14°	1645.81'	-38.95'	80.01
					52.54
					52.54
1745'	10.09°	291.76°	1736.39'	-43.79'	50.63
					50.63
					50.63
1836'	9.60°	290.45°	1826.05'	-46.95'	48.72
					48.72
					48.72
1927'	9.34°	290.78°	1915.82'	-49.87'	82.02
					46.85



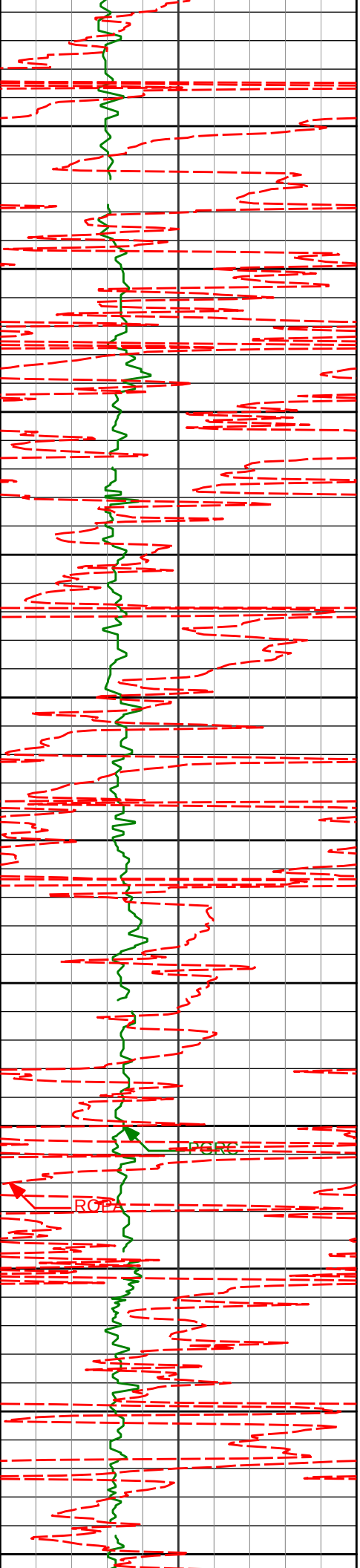
2019'	8.70°	290.32°	2006.68'	-52.66'	46.85
					84.06
					46.85
					46.85
2110'	8.43°	290.00°	2096.66'	-55.20'	84.06
					86.09
					44.96
2202'	10.61°	297.50°	2187.39'	-59.08'	44.96
					44.96
					43.09
2293'	9.77°	297.87°	2276.96'	-64.13'	43.09
					86.09
					86.09
2385'	9.42°	298.30°	2367.67'	-69.05'	86.09
					41.22
					41.22
2477'	8.80°	298.46°	2458.51'	-73.79'	90.19
					90.19



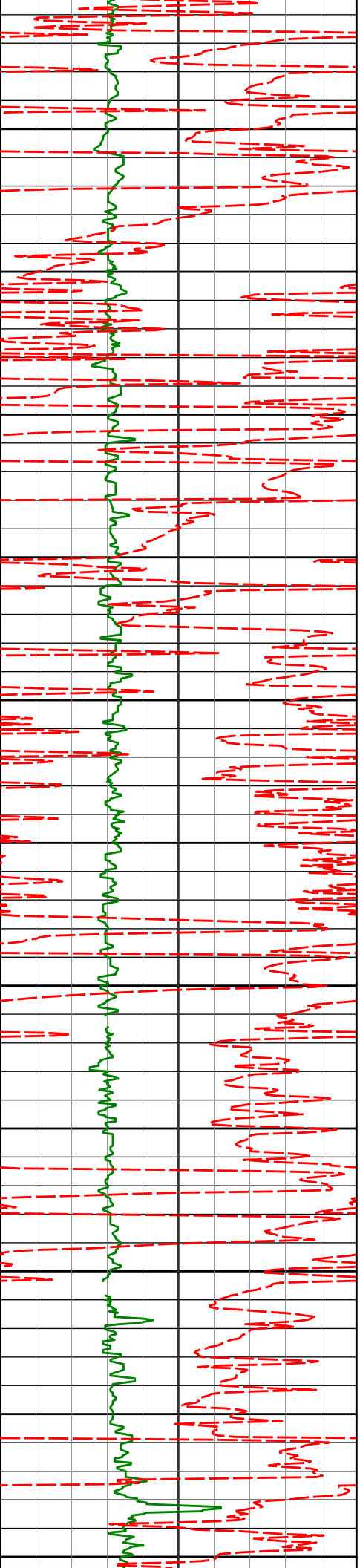
					90.19
2568'	9.89°	295.37°	2548.30'	-78.22'	90.19
					90.19
					90.19
2660'	9.80°	295.76°	2638.94'	-82.61'	41.22
					41.22
					41.22
2752'	9.66°	296.22°	2729.62'	-87.05'	41.22
					41.22
					41.22
2846'	9.51°	296.97°	2822.31'	-91.68'	94.33
					94.33
					39.36
2941'	8.92°	296.82°	2916.08'	-96.26'	39.36
					96.42
					96.42
3036'	7.96°	295.97°	3010.05'	-100.35'	39.36
					100.62



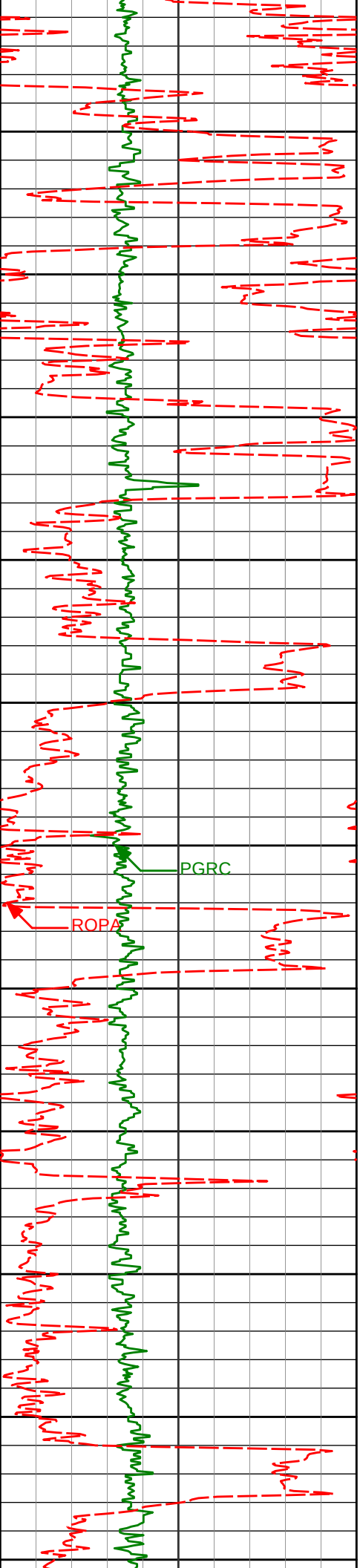
					98.51
					98.51
3130'	9.14°	289.25°	3103.01'	-103.49'	
					41.22
					41.22
					41.22
3225'	8.25°	289.06°	3196.91'	-105.93'	
					102.72
					102.72
					102.72
3320'	9.81°	295.67°	3290.74'	-109.34'	
					104.83
					104.83
					104.83
3414'	10.72°	296.34°	3383.23'	-114.14'	
					104.83
					104.83
					41.22
3509'	10.98°	295.73°	3476.54'	-119.26'	
					104.83
					39.36
					39.36
3604'	11.00°	296.11°	3569.79'	-124.41'	
					109.09
					39.36



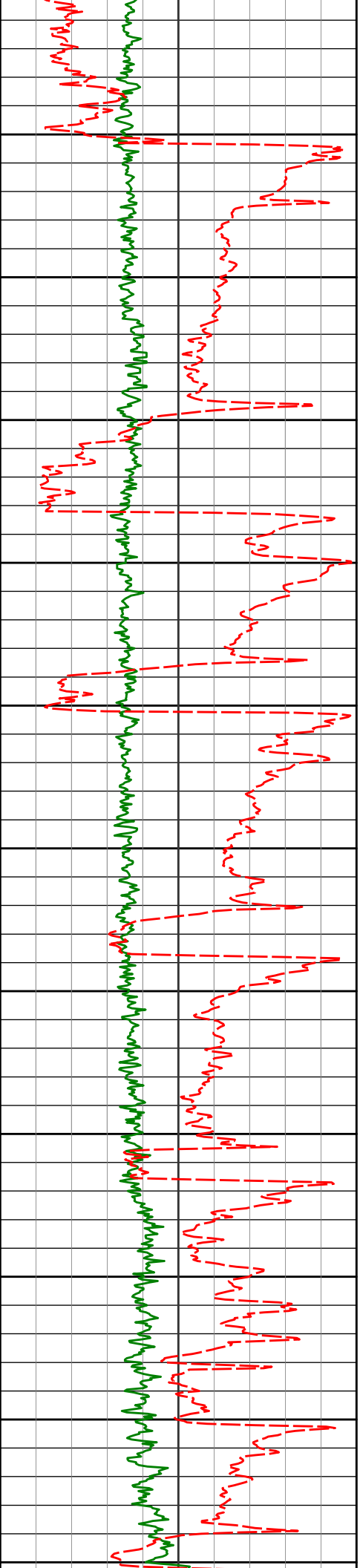
					39.36
					39.36
					39.36
					39.36
3793'	10.53°	296.09°	3755.47'	-134.57'	39.36
					39.36
					37.51
3887'	10.33°	296.92°	3847.92'	-139.58'	43.09
					43.09
					113.40
3982'	9.16°	297.46°	3941.54'	-144.49'	35.67
					41.22
					113.40
					113.40
4077'	8.09°	298.67°	4035.47'	-149.05'	111.24
					35.67
					111.24
4172'	8.62°	294.95°	4129.46'	-153.16'	39.36



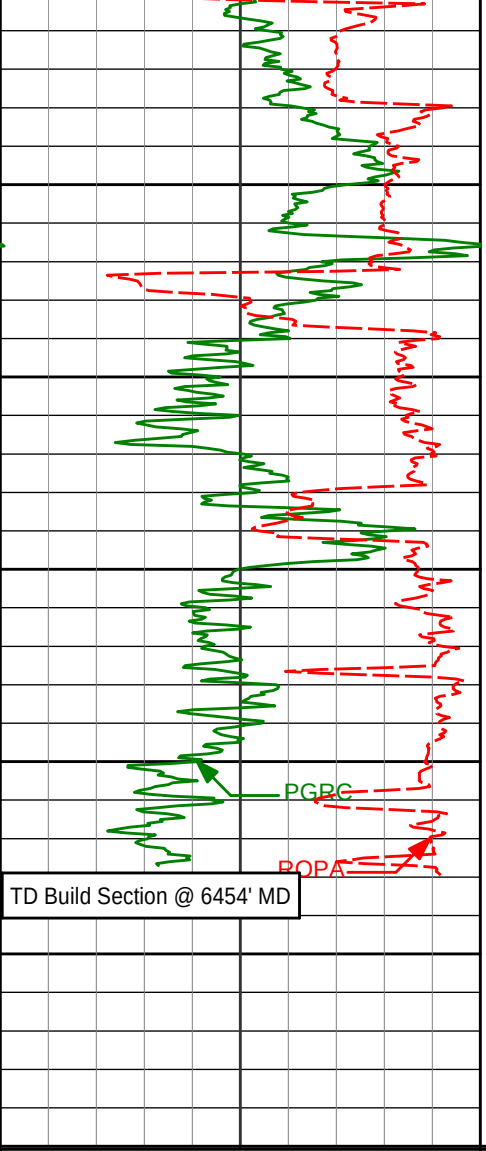
					111.24
					32.00
4266'	8.64°	296.25°	4222.40'	-157.10'	
					113.40
					115.56
					41.22
4360'	9.66°	293.45°	4315.20'	-161.07'	
					41.22
					30.18
					119.91
4455'	8.65°	289.04°	4408.99'	-164.21'	
					122.11
					122.11
					122.11
4550'	9.48°	281.51°	4502.81'	-165.70'	
					124.30
					124.30
					24.75
4644'	9.98°	285.56°	4595.45'	-166.86'	
					124.30
					126.52
					128.73
4739'	9.09°	286.94°	4689.14'	-168.73'	
					128.73



					128.73
					130.96
					133.20
4834'	8.84°	291.01°	4782.98'	-171.19'	
					135.45
					135.45
					111.24
4928'	9.00°	295.50°	4875.84'	-174.69'	
					111.24
					111.24
					113.40
5022'	10.39°	298.56°	4968.50'	-179.52'	
					117.73
					119.91
					119.91
5117'	12.48°	294.58°	5061.61'	-185.02'	
					119.91
					122.11
					124.30
5211'	10.97°	290.99°	5153.65'	-189.48'	
					126.52
					126.52
					128.73
5305'	11.85°	296.09°	5245.79'	-194.06'	
					128.73



					128.73
					130.96
5399'	15.50°	270.78°	5337.19'	-194.95'	130.96
					130.96
					133.20
5494'	21.00°	252.87°	5427.45'	-185.45'	133.20
					137.70
					139.96
5588'	24.99°	230.87°	5514.13'	-163.01'	142.25
					142.25
					142.25
5682'	28.43°	208.52°	5598.30'	-126.89'	144.54
					144.54
					144.54
5777'	31.48°	186.03°	5680.86'	-80.61'	146.84
					144.54
5871'	37.09°	178.47°	5758.53'	-28.22'	146.84
					142.25



Depth	Inc	Azi	TVD	V.S.	Temp
					139.96
5965'	42.20°	178.21°	5830.89'	30.63'	
					144.54
					144.54
6059'	51.55°	181.40°	5895.09'	98.21'	
					149.14
					146.84
6153'	58.93°	183.59°	5948.65'	174.83'	
					156.13
6248'	69.27°	184.85°	5990.09'	259.82'	
					156.13
6342'	78.20°	181.68°	6016.39'	349.44'	
6399'	83.45°	178.78°	6025.48'	404.97'	

5850 5900 5950 6000 6050

Avg Rate of Penetration
ROPA
500 feet per hr 0

Depth
TVD
ft

PCG Gamma Ray BCorr
PGRC
0 api 300

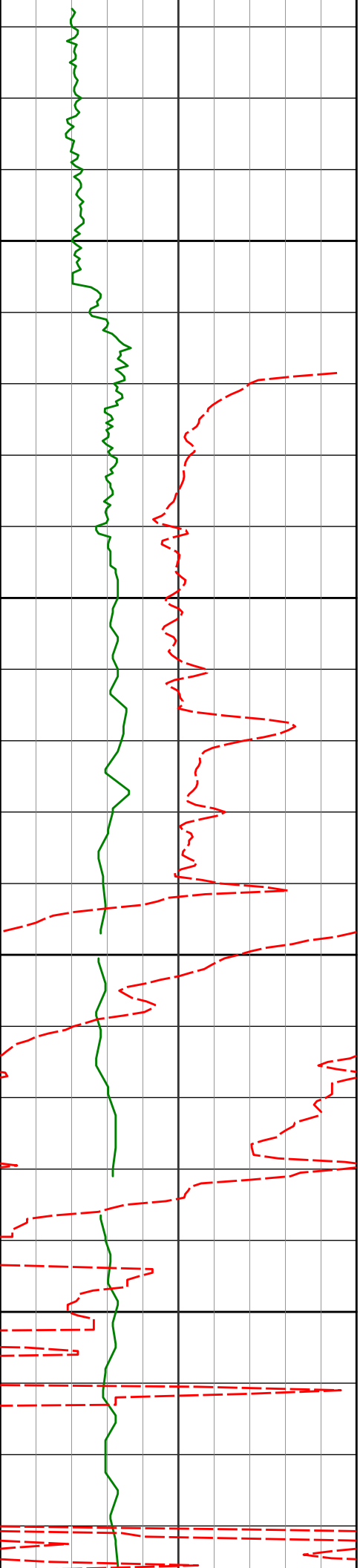
TVD Detail 1:240 Scale

PCG Gamma Ray BCorr
PGRC
0 api 300

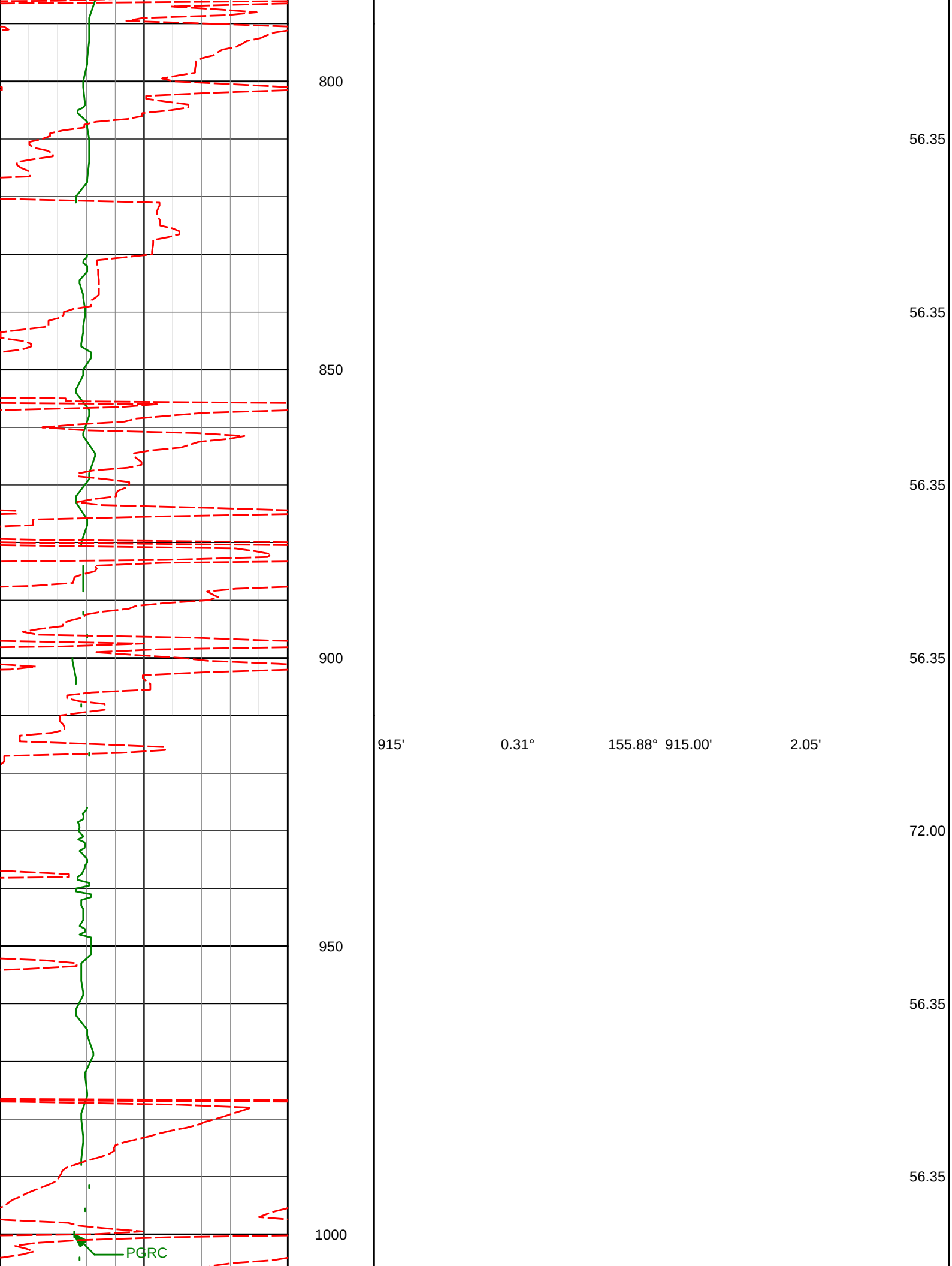
Avg Rate of Penetration
ROPA
500 feet per hr 0

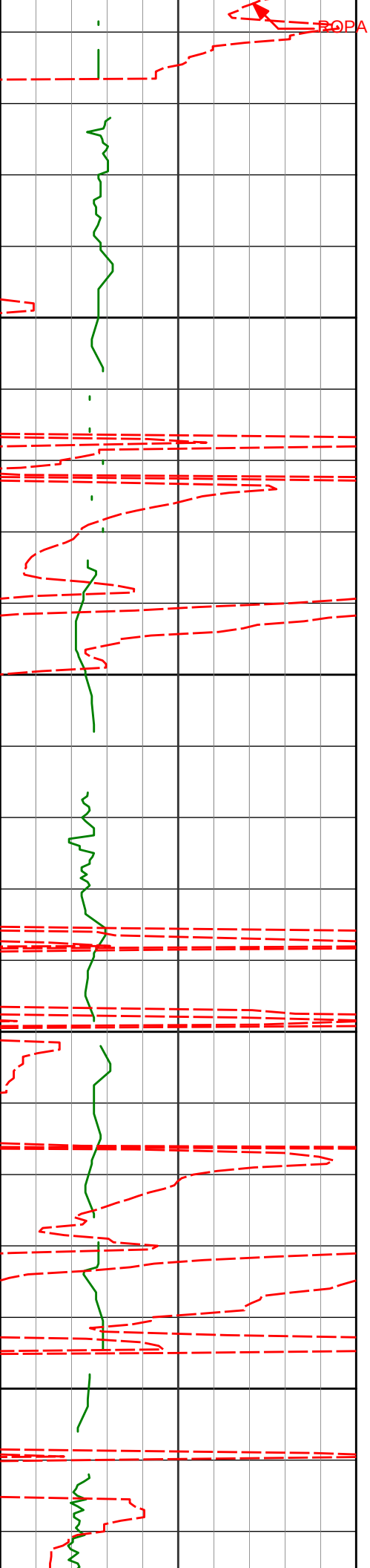
Depth
TVD
ft

Depth Inc Azi TVD V.S. Temp

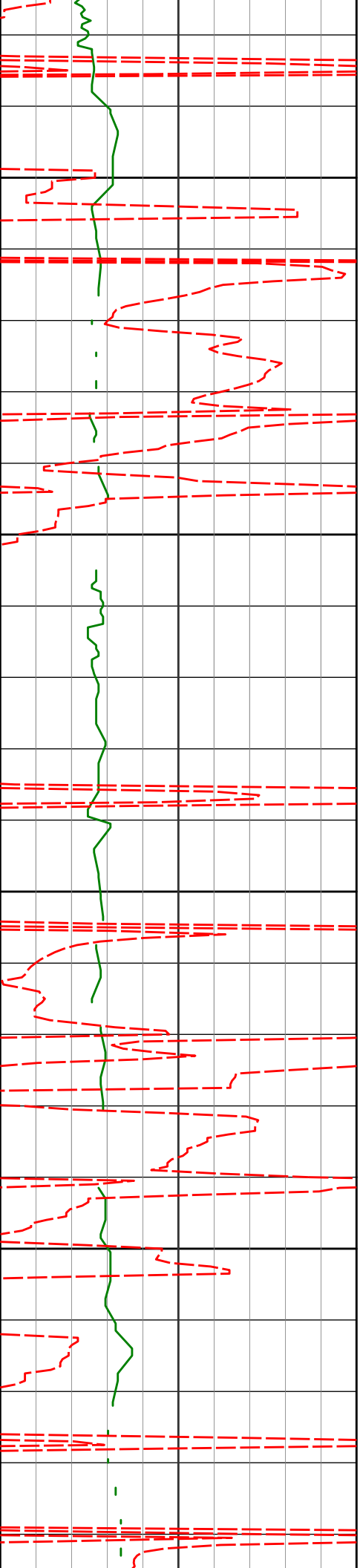


					66.07
					68.04
618'	0.17°	159.97°	618.00'	0.81'	
632'	0.22°	159.78°	632.00'	0.85'	70.02
					70.02
					70.02
726'	0.28°	158.86°	726.00'	1.21'	56.35
					56.35
					56.35


800
850
900
950
1000
PGRC
56.35
56.35
56.35
56.35
915'
0.31°
155.88°
915.00'
2.05'
72.00
56.35
56.35

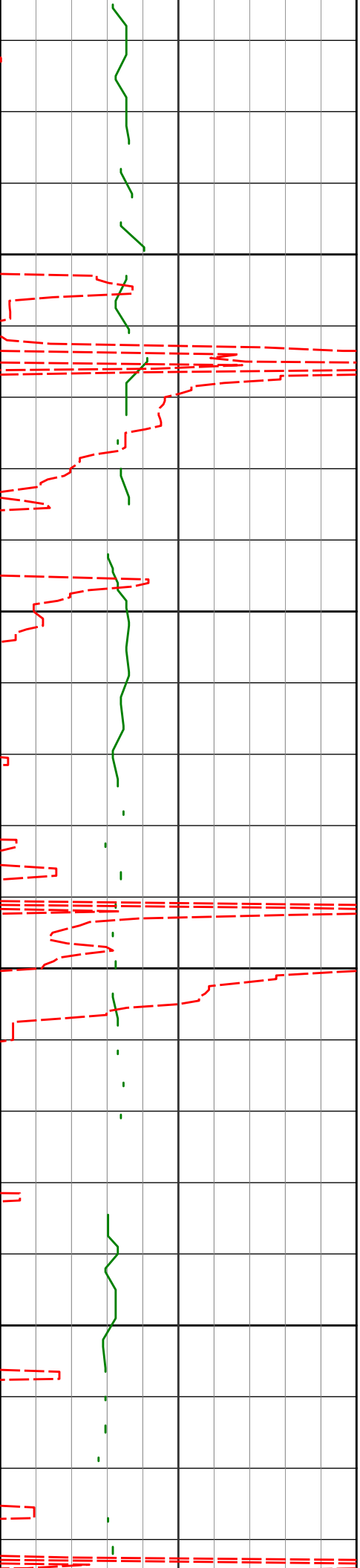


1009'	2.87°	309.91°	1008.96'	1.07'	
					72.00
					56.35
					56.35
1103'	5.11°	307.43°	1102.73'	-2.10'	
					56.35
					56.35
					58.28
1195'	6.37°	311.12°	1194.26'	-6.71'	
					72.00

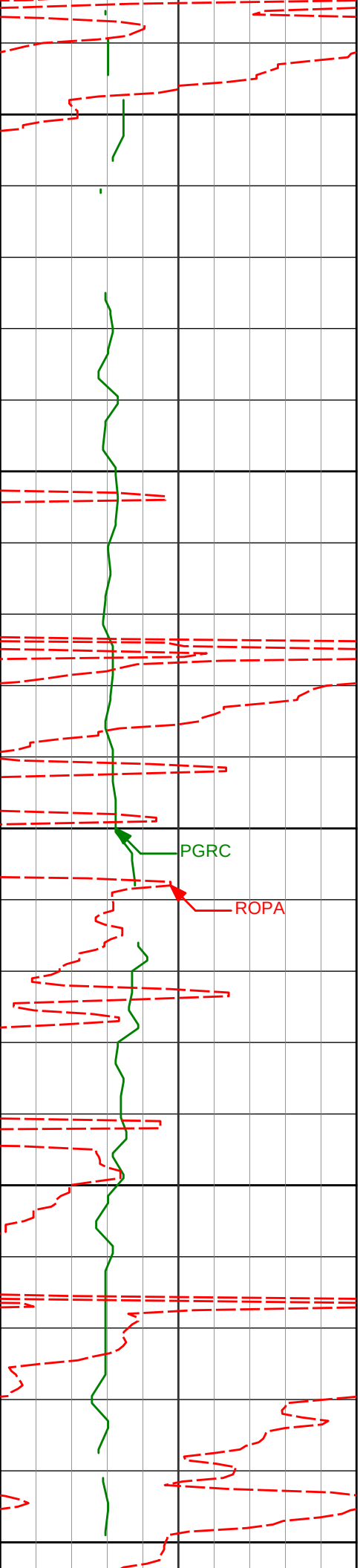


					73.98
					58.28
1287'	7.95°	309.75°	1285.54'	-12.61'	
					58.28
					75.97
					75.97
1379'	10.66°	302.82°	1376.33'	-19.21'	
					75.97
					56.35
					56.35

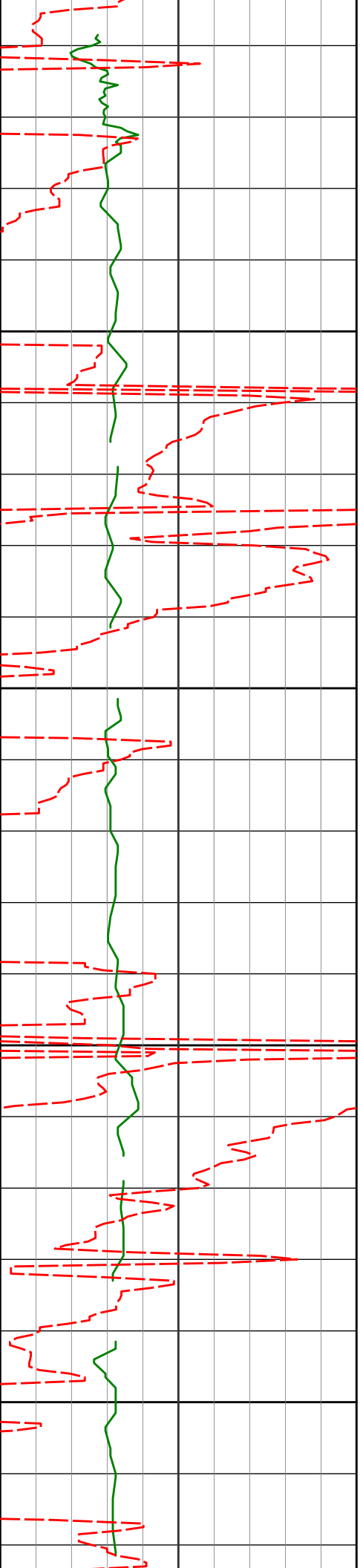
1470'	10.54°	304.06°	1465.77'	-26.04'	77.99
					77.99
					77.99
1562'	10.36°	301.97°	1556.25'	-32.73'	54.45
					54.45
					54.45
1653'	10.06°	302.14°	1645.81'	-38.95'	80.01



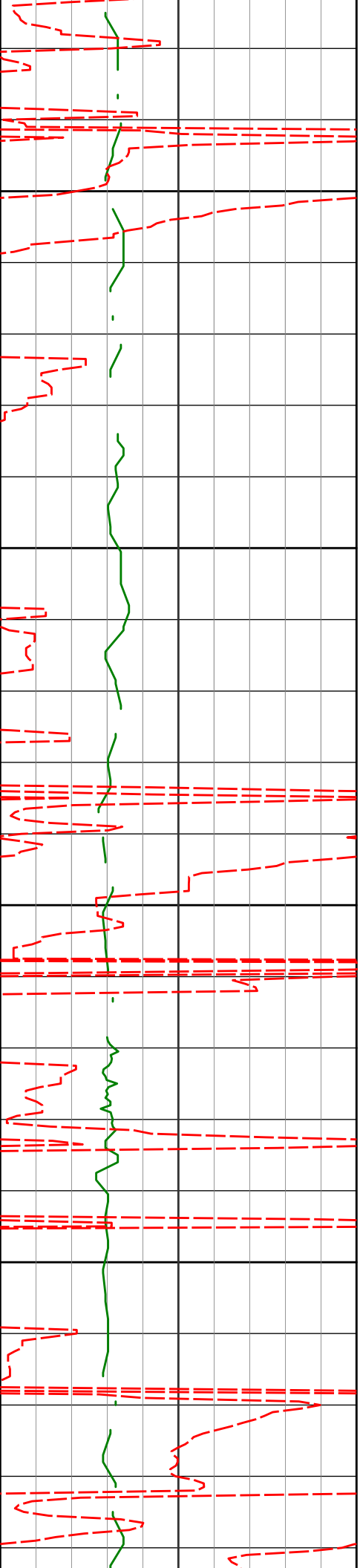
					52.54
					52.54
1745'	10.09°	291.76°	1736.39'	-43.79'	
					50.63
					50.63
					50.63
1836'	9.60°	290.45°	1826.05'	-46.95'	
					48.72
					48.72



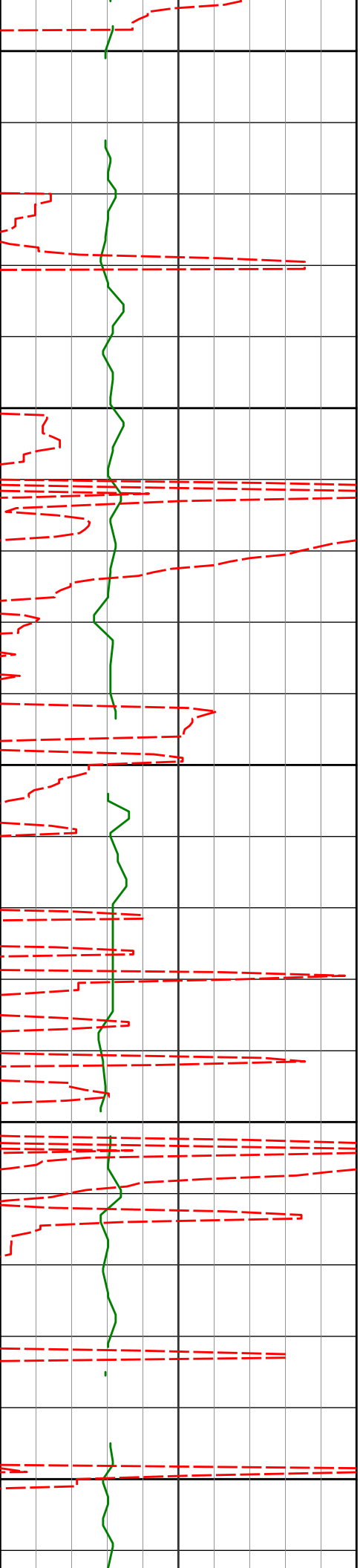
					48.72
1927'	9.34°	290.78°	1915.82'	-49.87'	82.02
					46.85
					46.85
2019'	8.70°	290.32°	2006.68'	-52.66'	84.06
					46.85
					46.85
2110'	8.43°	290.00°	2096.66'	-55.20'	84.06



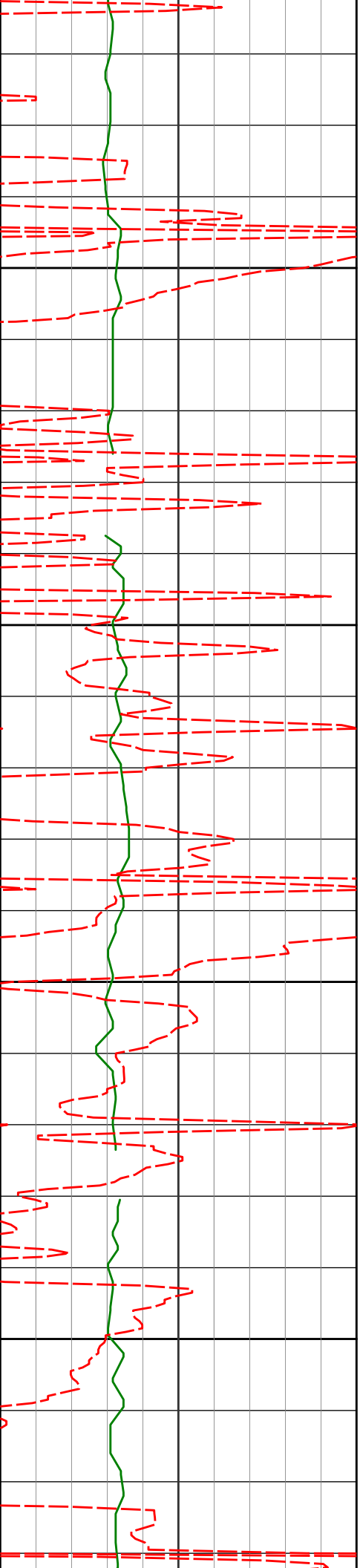
					86.09
					44.96
2202'	10.61°	297.50°	2187.39'	-59.08'	44.96
					44.96
					43.09
2293'	9.77°	297.87°	2276.96'	-64.13'	43.09
					86.09



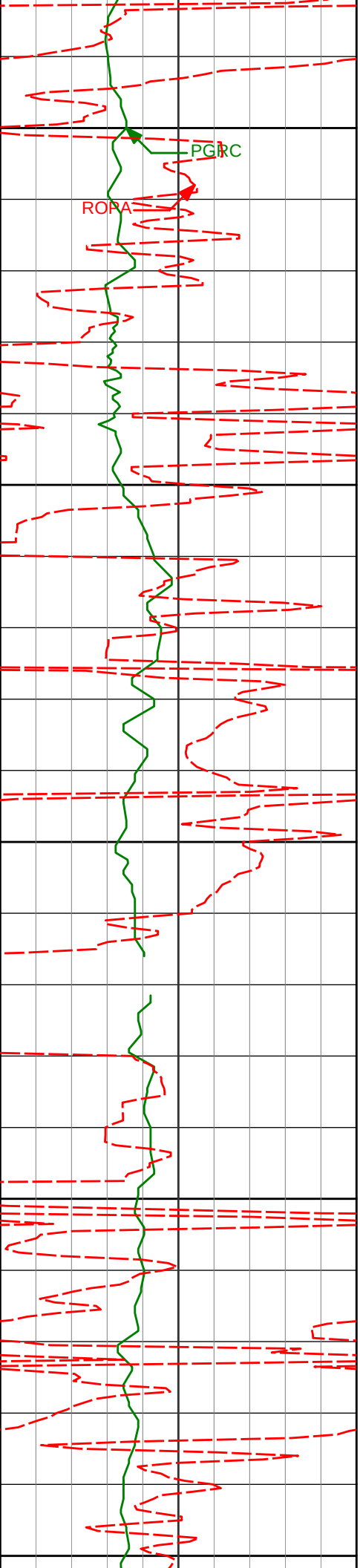
					86.09
2385'	9.42°	298.30°	2367.67'	-69.05'	86.09
					41.22
					41.22
2477'	8.80°	298.46°	2458.51'	-73.79'	90.19
					90.19
					90.19



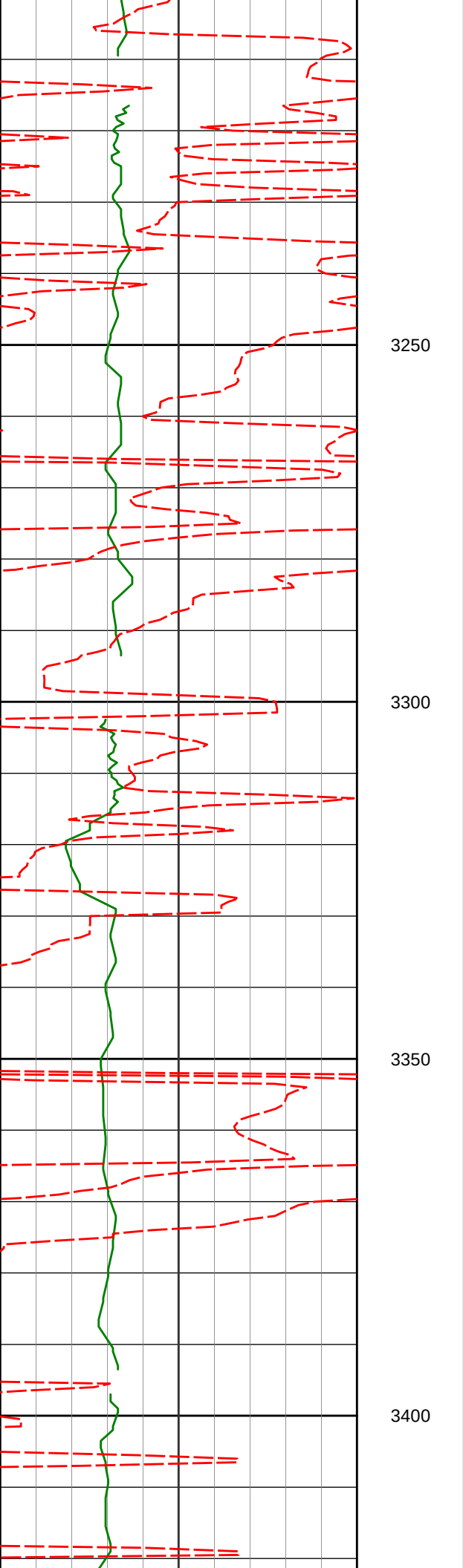
2568'	9.89°	295.37°	2548.30'	-78.22'	90.19
					90.19
					90.19
2660'	9.80°	295.76°	2638.94'	-82.61'	41.22
					41.22
					41.22
2752'	9.66°	296.22°	2729.62'	-87.05'	41.22
					41.22



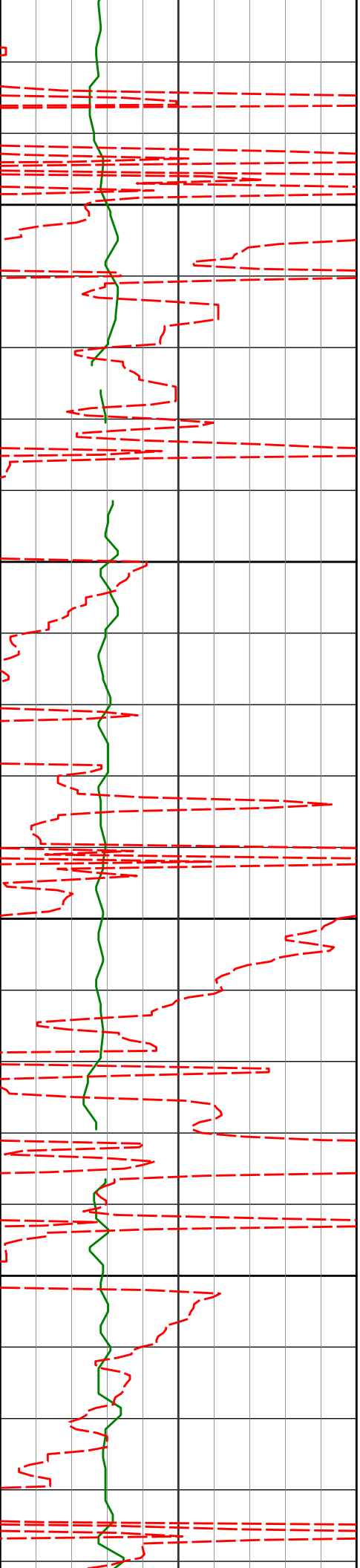
					41.22
2846'	9.51°	296.97°	2822.31'	-91.68'	94.33
					94.33
					39.36
2941'	8.92°	296.82°	2916.08'	-96.26'	39.36
					96.42
					96.42



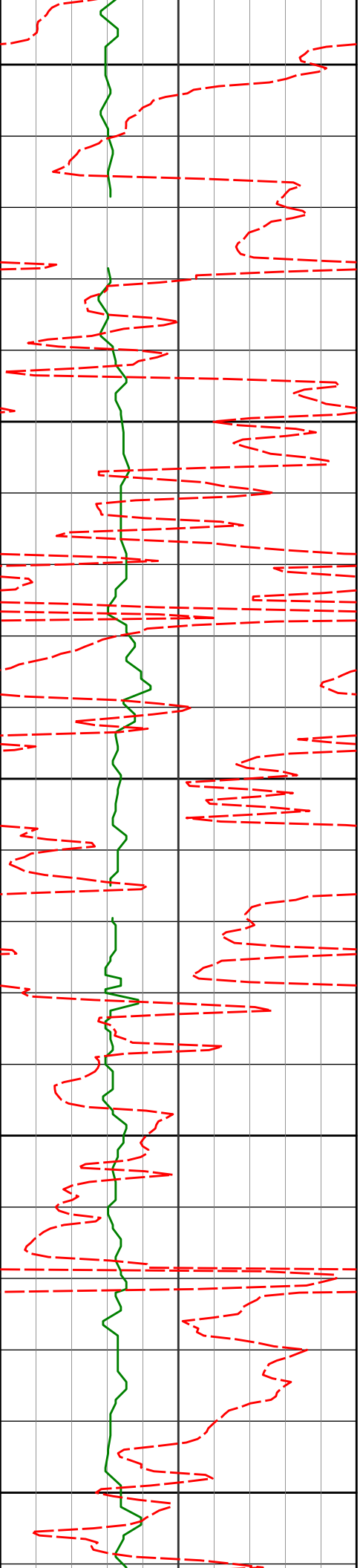
					39.36
3036'	7.96°	295.97°	3010.05'	-100.35'	
					100.62
					98.51
					98.51
3130'	9.14°	289.25°	3103.01'	-103.49'	
					41.22
					41.22
					41.22
3225'	8.25°	289.06°	3196.91'	-105.93'	



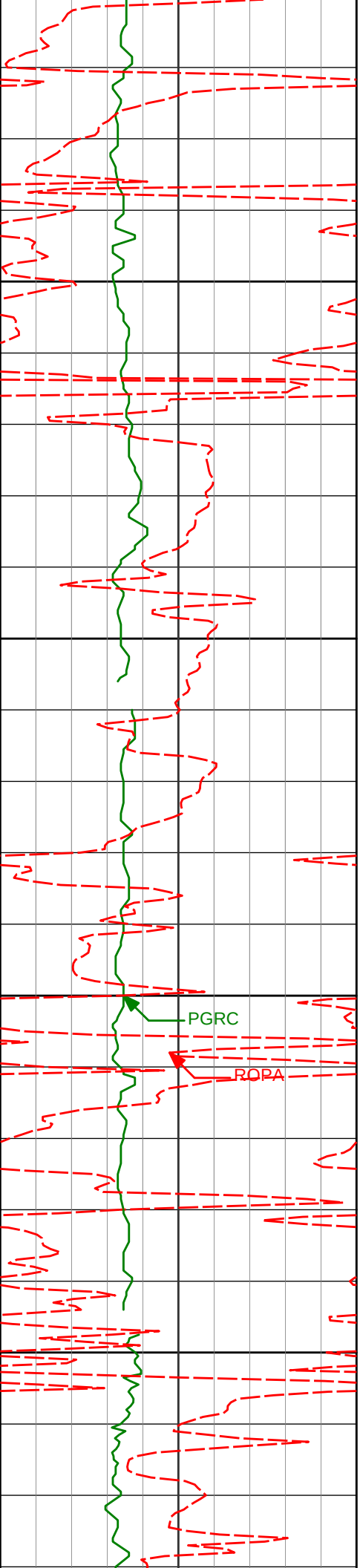
				102.72
				102.72
				102.72
3320'	9.81°	295.67°	3290.74'	-109.34'
				104.83
				104.83
				104.83
3414'	10.72°	296.34°	3383.23'	-114.14'
				104.83
				104.83



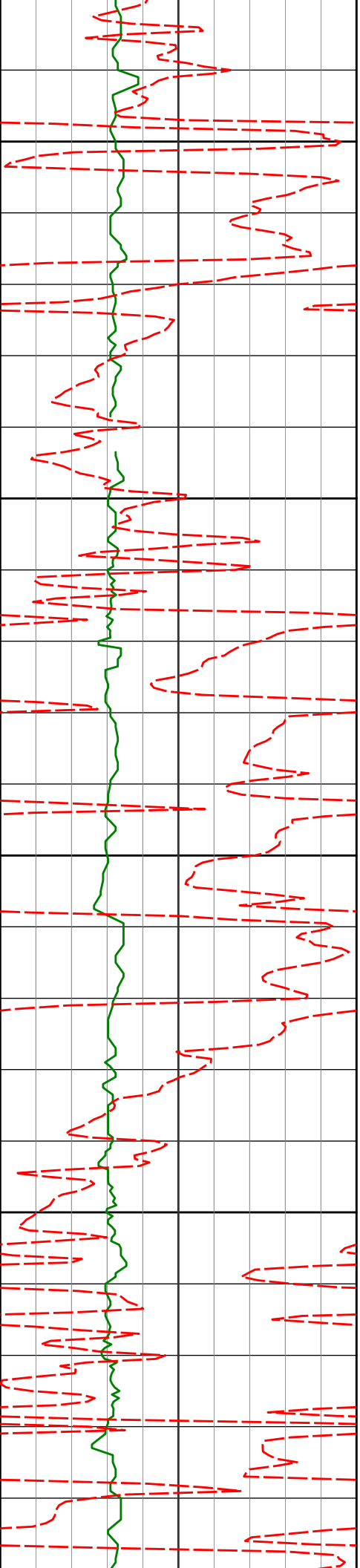
					41.22
3509'	10.98°	295.73°	3476.54'	-119.26'	104.83
					39.36
					39.36
3604'	11.00°	296.11°	3569.79'	-124.41'	109.09
					39.36
					39.36



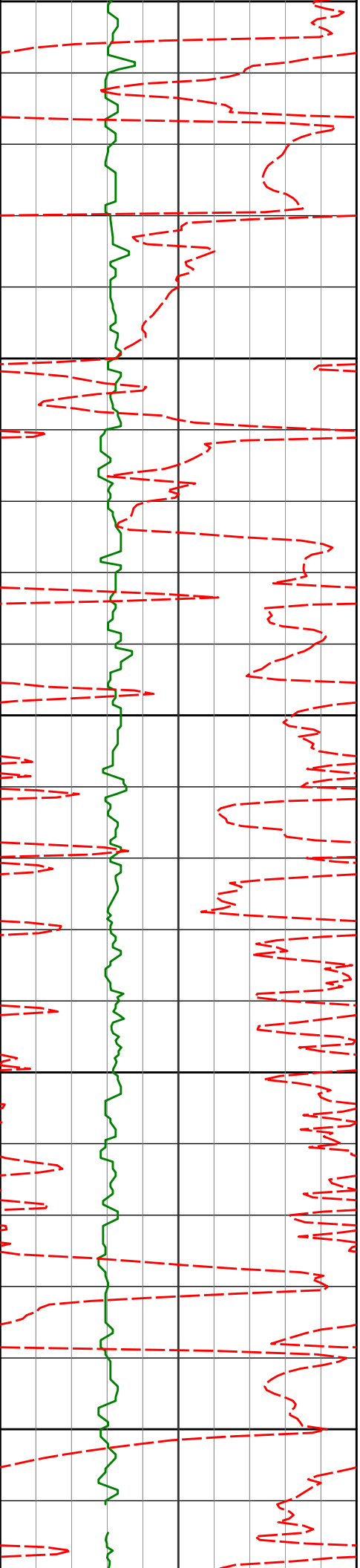
					39.36
					39.36
					39.36
3793'	10.53°	296.09°	3755.47'	-134.57'	39.36
					39.36
					37.51
3887'	10.33°	296.92°	3847.92'	-139.58'	43.09



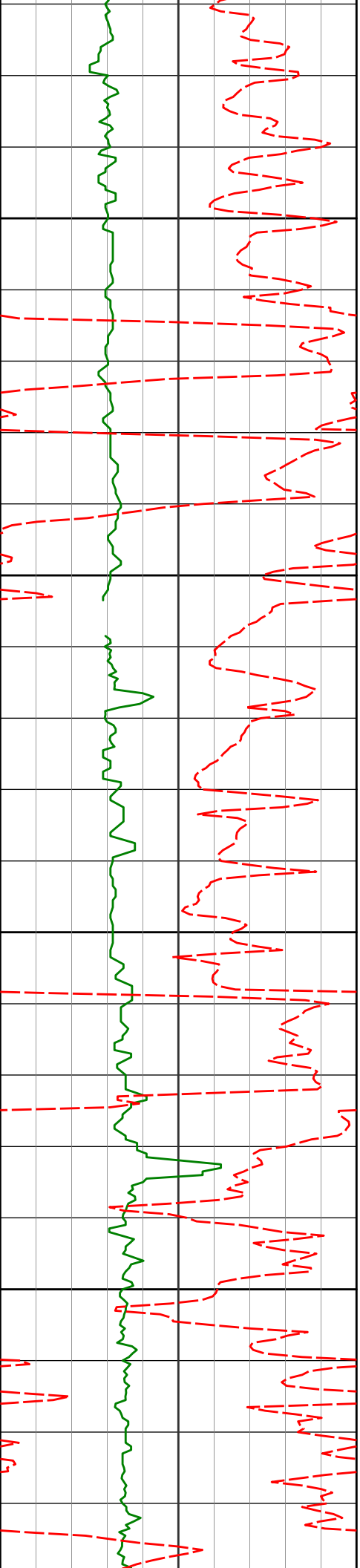
3900						43.09
						113.40
						35.67
	3982'	9.16°	297.46°	3941.54'	-144.49'	
3950						
						41.22
						113.40
4000						
						113.40
	4077'	8.09°	298.67°	4035.47'	-149.05'	
4050						111.24
						35.67



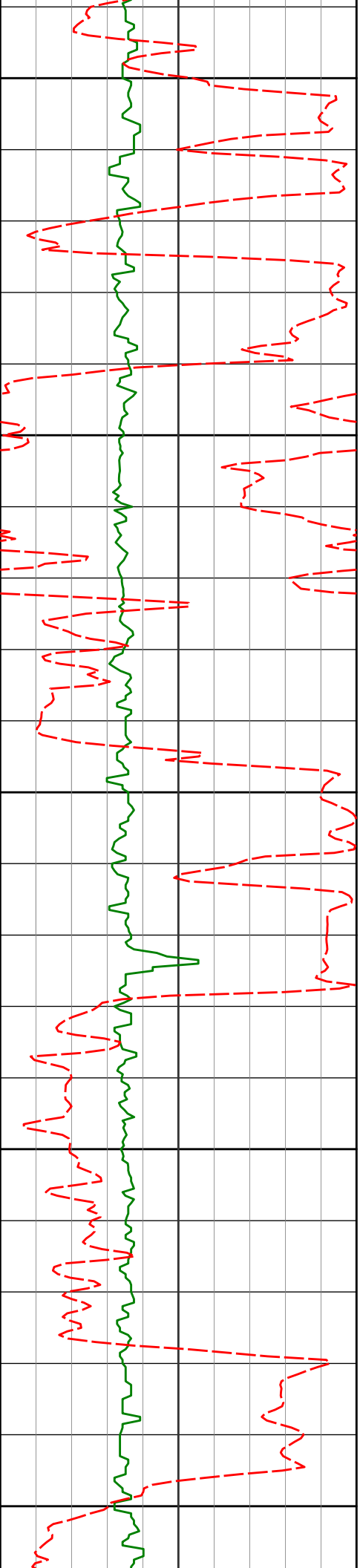
					111.24
4172'	8.62°	294.95°	4129.46'	-153.16'	
					39.36
					111.24
					32.00
4266'	8.64°	296.25°	4222.40'	-157.10'	
					113.40
					115.56
					41.22



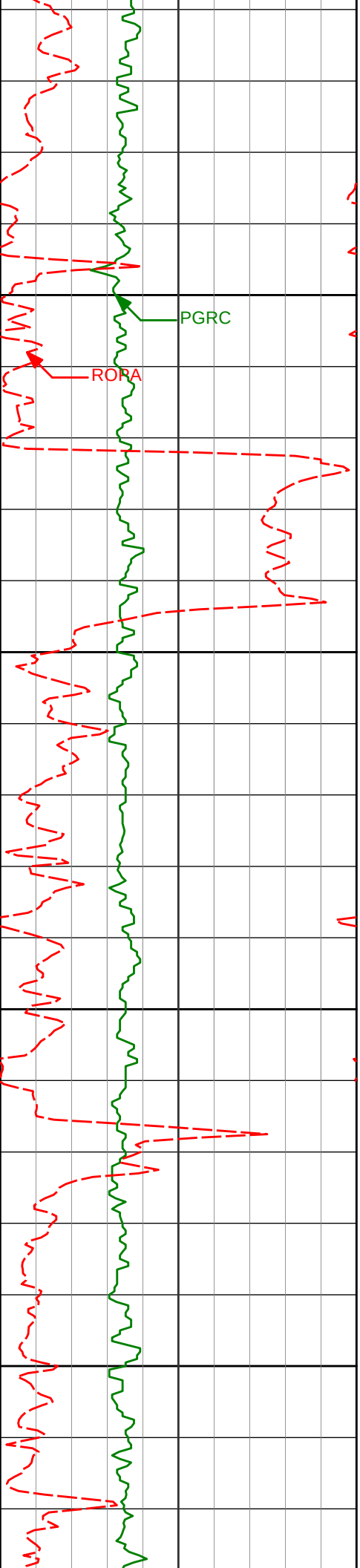
4360'	9.66°	293.45°	4315.20'	-161.07'	41.22
					30.18
					119.91
4455'	8.65°	289.04°	4408.99'	-164.21'	122.11
					122.11
					122.11
4550'	9.48°	281.51°	4502.81'	-165.70'	124.30



					124.30
					24.75
					124.30
4644'	9.98°	285.56°	4595.45'	-166.86'	
					126.52
					128.73
					128.73
4739'	9.09°	286.94°	4689.14'	-168.73'	
					128.73

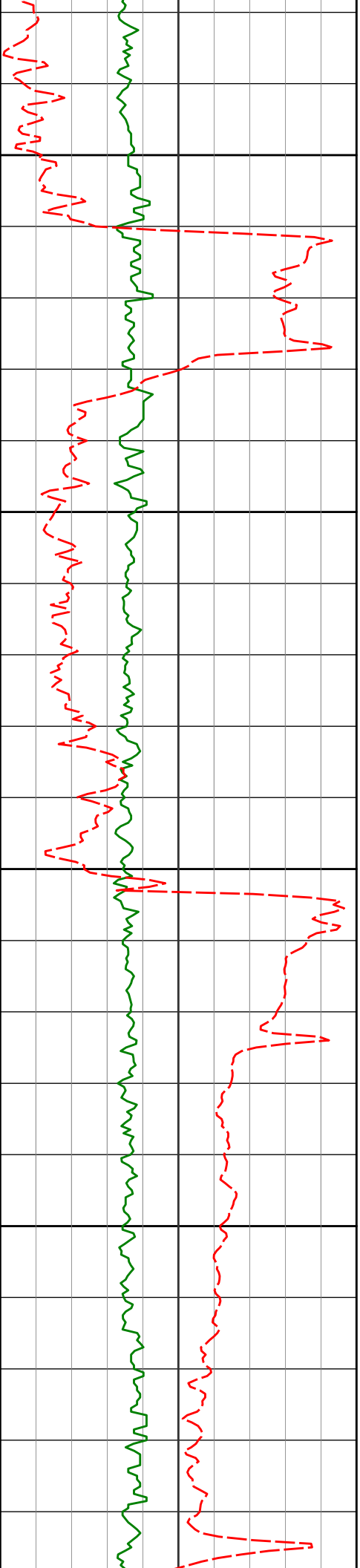


					130.96
					133.20
4834'	8.84°	291.01°	4782.98'	-171.19'	
					135.45
					135.45
					111.24
4928'	9.00°	295.50°	4875.84'	-174.69'	
					111.24
					111.24
					113.40

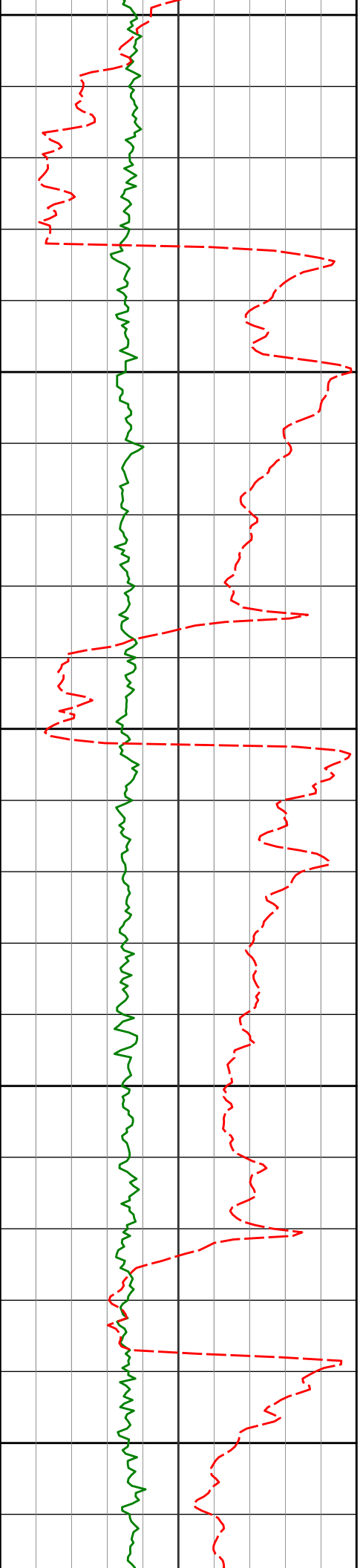


	5022'	10.39°	298.56°	4968.50'	-179.52'
5000					
	5117'	12.48°	294.58°	5061.61'	-185.02'
5050					
5100					
	5211'	10.97°	290.99°	5153.65'	-189.48'
5150					

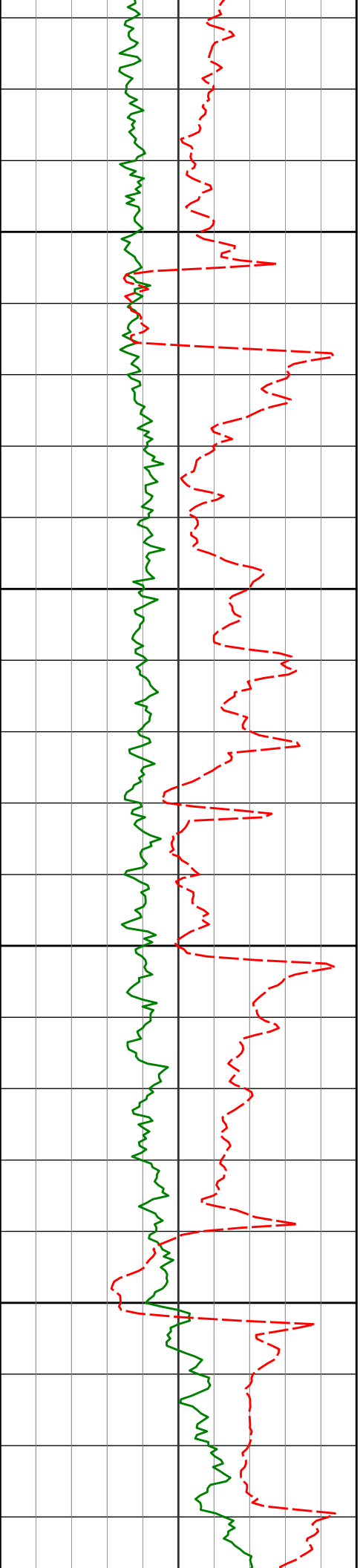
117.73
119.91
119.91
119.91
122.11
124.30
126.52



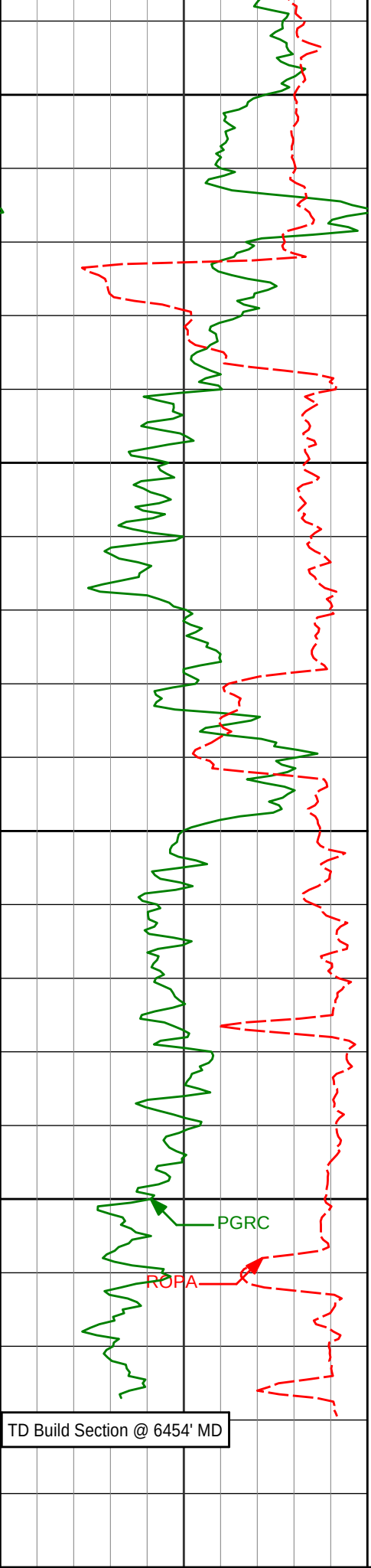
					126.52
					128.73
5305'	11.85°	296.09°	5245.79'	-194.06'	
					128.73
					128.73
					130.96
5399'	15.50°	270.78°	5337.19'	-194.95'	
					130.96
					130.96



					133.20
5494'	21.00°	252.87°	5427.45'	-185.45'	133.20
					137.70
					139.96
5588'	24.99°	230.87°	5514.13'	-163.01'	142.25
					142.25
					142.25
5682'	28.43°	208.52°	5598.30'	-126.89'	144.54

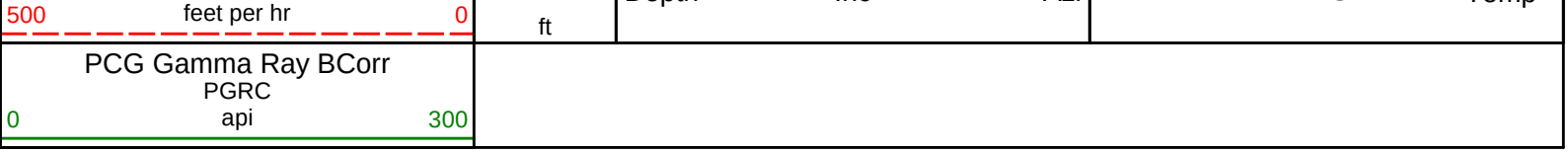


					144.54
					144.54
5777'	31.48°	186.03°	5680.86'	-80.61'	
					146.84
					144.54
5871'	37.09°	178.47°	5758.53'	-28.22'	
					146.84
					142.25
					139.96
5965'	42.20°	178.21°	5830.89'	30.63'	



Depth TVD	Depth	Inc	Azi	TVD	V.S.	Temp
5850						144.54
						144.54
	6059'	51.55°	181.40°	5895.09'	98.21'	
5900						
						149.14
						146.84
5950	6153'	58.93°	183.59°	5948.65'	174.83'	
						156.13
	6248'	69.27°	184.85°	5990.09'	259.82'	
6000						156.13
	6342'	78.20°	181.68°	6016.39'	349.44'	
	6399'	83.45°	178.78°	6025.48'	404.97'	
6050						

Avg Rate of Penetration
ROPA



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Remora LC34-745
Wattenberg
Weld Colorado
USA
CA-XX-0902986605

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
250.00	0.07	159.97	250.00	0.14 S	0.05 E	0.13	0.03
500.00	0.14	159.97	500.00	0.57 S	0.21 E	0.53	0.03
618.00	0.17	159.97	618.00	0.87 S	0.32 E	0.81	0.03
632.00	0.22	159.78	632.00	0.92 S	0.34 E	0.85	0.39
726.00	0.28	158.86	726.00	1.31 S	0.48 E	1.21	0.06
915.00	0.31	155.88	915.00	2.22 S	0.86 E	2.05	0.02
1009.00	2.87	309.91	1008.96	0.94 S	0.84 W	1.07	3.36
1103.00	5.11	307.43	1102.73	3.11 N	5.97 W	-2.10	2.38
1195.00	6.37	311.12	1194.26	8.96 N	13.07 W	-6.71	1.43
1287.00	7.95	309.75	1285.54	16.39 N	21.81 W	-12.61	1.72
1379.00	10.66	302.82	1376.33	25.07 N	33.85 W	-19.21	3.19
1470.00	10.54	304.06	1465.77	34.29 N	47.82 W	-26.04	0.29
1562.00	10.36	301.97	1556.25	43.38 N	61.81 W	-32.73	0.45
1653.00	10.06	302.14	1645.81	51.95 N	75.49 W	-38.95	0.33
1745.00	10.09	291.76	1736.39	59.21 N	89.78 W	-43.79	1.97
1836.00	9.60	290.45	1826.05	64.81 N	104.29 W	-46.95	0.60
1927.00	9.34	290.78	1915.82	70.08 N	118.30 W	-49.87	0.29
2019.00	8.70	290.32	2006.68	75.15 N	131.80 W	-52.66	0.70
2110.00	8.43	290.00	2096.66	79.82 N	144.52 W	-55.20	0.30
2202.00	10.61	297.50	2187.39	86.04 N	158.37 W	-59.08	2.72
2293.00	9.77	297.87	2276.96	93.52 N	172.63 W	-64.13	0.92
2385.00	9.42	298.30	2367.67	100.74 N	186.17 W	-69.05	0.39
2477.00	8.80	298.46	2458.51	107.66 N	198.99 W	-73.79	0.67
2568.00	9.89	295.37	2548.30	114.33 N	212.17 W	-78.22	1.32
2660.00	9.80	295.76	2638.94	121.12 N	226.36 W	-82.61	0.13
2752.00	9.66	296.22	2729.62	127.93 N	240.33 W	-87.05	0.17
2846.00	9.51	296.97	2822.31	134.94 N	254.33 W	-91.68	0.21
2941.00	8.92	296.82	2916.08	141.82 N	267.90 W	-96.26	0.63
3036.00	7.96	295.97	3010.05	148.02 N	280.39 W	-100.35	1.02
3130.00	9.14	289.25	3103.01	153.34 N	293.29 W	-103.49	1.65
3225.00	8.25	289.06	3196.91	158.05 N	306.85 W	-105.93	0.94
3320.00	9.81	295.67	3290.74	163.78 N	320.58 W	-109.34	1.97
3414.00	10.72	296.34	3383.23	171.13 N	335.63 W	-114.14	0.98
3509.00	10.98	295.73	3476.54	178.97 N	351.69 W	-119.26	0.30
3604.00	11.00	296.11	3569.79	186.88 N	367.98 W	-124.41	0.08
3793.00	10.53	296.09	3755.47	202.41 N	399.68 W	-134.57	0.25
3887.00	10.33	296.92	3847.92	210.01 N	414.91 W	-139.58	0.27
3982.00	9.16	297.46	3941.54	217.35 N	429.21 W	-144.49	1.23
4077.00	8.09	298.67	4035.47	224.04 N	441.79 W	-149.05	1.15
4172.00	8.62	294.95	4129.46	230.25 N	454.11 W	-153.16	0.80
4266.00	8.64	296.25	4222.40	236.35 N	466.83 W	-157.10	0.21
4360.00	9.66	293.45	4315.20	242.61 N	480.40 W	-161.07	1.18
4455.00	8.65	289.04	4408.99	248.11 N	494.46 W	-164.21	1.30
4550.00	9.48	281.51	4502.81	252.00 N	508.88 W	-165.70	1.53
4644.00	9.98	285.56	4595.45	255.73 N	524.31 W	-166.86	0.90
4739.00	9.09	286.94	4689.14	260.13 N	539.42 W	-168.73	0.97
4834.00	8.84	291.01	4782.98	264.93 N	553.42 W	-171.19	0.72
4928.00	9.00	295.50	4875.84	270.69 N	566.80 W	-174.69	0.76

5022.00	10.39	298.56	4968.50	277.91 N	580.88 W	-179.52	1.57
5117.00	12.48	294.58	5061.61	286.27 N	597.74 W	-185.02	2.35
5211.00	10.97	290.99	5153.65	293.69 N	615.32 W	-189.48	1.78
5305.00	11.85	296.09	5245.79	301.14 N	632.34 W	-194.06	1.43
5399.00	15.50	270.78	5337.19	305.56 N	653.59 W	-194.95	7.36
5494.00	21.00	252.87	5427.45	300.72 N	682.59 W	-185.45	8.21
5588.00	24.99	230.87	5514.13	283.19 N	714.16 W	-163.01	10.01
5682.00	28.43	208.52	5598.30	250.91 N	740.31 W	-126.89	11.22
5777.00	31.48	186.03	5680.86	206.22 N	753.76 W	-80.61	12.18
5871.00	37.09	178.47	5758.53	153.41 N	755.58 W	-28.22	7.48
5965.00	42.20	178.21	5830.89	93.49 N	753.84 W	30.63	5.44
6059.00	51.55	181.40	5895.09	24.97 N	753.75 W	98.21	10.25
6153.00	58.93	183.59	5948.65	52.12 S	757.17 W	174.83	8.08
6248.00	69.27	184.85	5990.09	137.22 S	763.49 W	259.82	10.95
6342.00	78.20	181.68	6016.39	227.22 S	768.58 W	349.44	10.04
6399.00	83.45	178.78	6025.48	283.46 S	768.79 W	404.97	10.49

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 189.38 DEGREES (GRID)
A TOTAL CORRECTION OF 7.03 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6399.00 FEET
IS 819.38 FEET ALONG 249.76 DEGREES (GRID)

Date Printed:04 February 2016