HALLIBURTON | Sperry Drilling

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Country : USA
Field : Wattenberg
Location : Lat: 40° 46' 57.61" North Long: 103° 51' 41.29" West
Well : Rohn State LD03-66-1HN
Company : Noble Energy
Rig : H&P 273

Company : **Noble Energy**
Rig : **H&P 273**
Well : **Rohn State LD03-66-1HN**
Field : **Wattenberg**
Country : **USA**
API Number : **0512337458**

LOCATION
Latitude : **40° 46' 57.61" North**
Longitude : **103° 51' 41.29" West**
UTM Easting = **3,453,745.700 ft**
UTM Northing = **1,532,165.010 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level**
Elevation : **4705.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4729.00 ft**
GL **4705.00 ft**
WD **N/A**

Depth Logged : **1,220.00 ft** To **10,179.00 ft**
Date Logged : **26-Aug-14** To **29-Aug-14**
Total Depth MD : **10,179.00 ft** TVD : **5,634.93 ft**
Spud Date : **25-Aug-14**

Unit No. : **11703717**
Job No. : **CA-XX-0901584425**
Plot Type : **Final**
Plot Date : **31-Aug-14**

Run No.	Borehole Record (MD) Size	From	To
2	8.750 in	1,220.00 ft	4,992.00 ft
3	8.750 in	4,992.00 ft	6,049.00 ft
4	6.125 in	6,049.00 ft	10,179.00 ft

Run No.	Borehole Record (MD) Size	From	To

Casing Record (MD)

Size	Weight	From	To
7.000 in	26.00 lbpf	SURFACE	6,039.00 ft

WELL INFORMATION

MWD Run Number	100	200	300
Date run completed	26-Aug-14	27-Aug-14	29-Aug-14
Rig Bit Number	2	3	4
Bit Size (in)	8.750	8.750	6.125
Tool Nominal OD (in)	6.750	6.750	4.750
Log Start Depth (MD, ft)	1,220.00	4,992.00	6,049.00
Log End Depth (MD, ft)	4,992.00	6,049.00	10,179.00
Drill or Wipe	Drill	Drill	Drill
Drill/Wipe Start Date and Time	26-Aug-14 05:42	26-Aug-14 21:00	28-Aug-14 10:00
Drill/Wipe End Date and Time	26-Aug-14 14:50	27-Aug-14 08:10	29-Aug-14 14:30
Min Inc (deg) @ Depth (MD, ft)	0.61 @ 1,551.00	0.72 @ 5,003.00	87.26 @ 6,270.00
Max Inc (deg) @ Depth (MD, ft)	14.36 @ 3,158.00	83.46 @ 5,994.00	93.79 @ 10,115.00
Bit TFA(in2) / Bit Type	0.74 / PDC	0.86 / PDC	0.75 / PDC
Flow Rate (gpm)	585.17	595.00	294.29
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel
Density (ppg) / Viscosity (spqt)	9.00 / 28.00	10.30 / 35.00	10.30 / 37.00
Filtrate CL (ppm)	200.00	200.00	200.00
pH / Fluid Loss (mptm)	7.80 / 0	7.90 / 0	9.10 / 0
PV (cP) / YP (lhf2)	1 / 1.00	10 / 8.00	10 / 9.00
% Solids / % Sand	2 / .1	10.2 / .1	9.5 / .1
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A
Rm @ Measured Temp (degF)	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
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A

Max Tool Temp (degF) / Source	145.90 / PCM	167.00 / PCM	209.20 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Dave Nielsen	Justin Fields	Justin Fields		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11404261	11404261	12429151		
Insert Serial Number	11400908	11400908	11227486		
Date and Time Initialized	25-Aug-14 22:04	25-Aug-14 22:04	28-Aug-14 04:06		
Date and Time Read	27-Aug-14 12:33	27-Aug-14 12:59	29-Aug-14 22:58		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	53.77	53.30	62.17		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11404261	11404261	12429151		
Sonde Serial Number	11638501	11638501	10859920		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	293.63	22.41	262.76		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	48.67	48.20	57.07		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11404261	11404261	12429151		
Insert/Sonde Serial Number	11120589	11120589	11681001		

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 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
- All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.

5. INSITE version 8.0.20

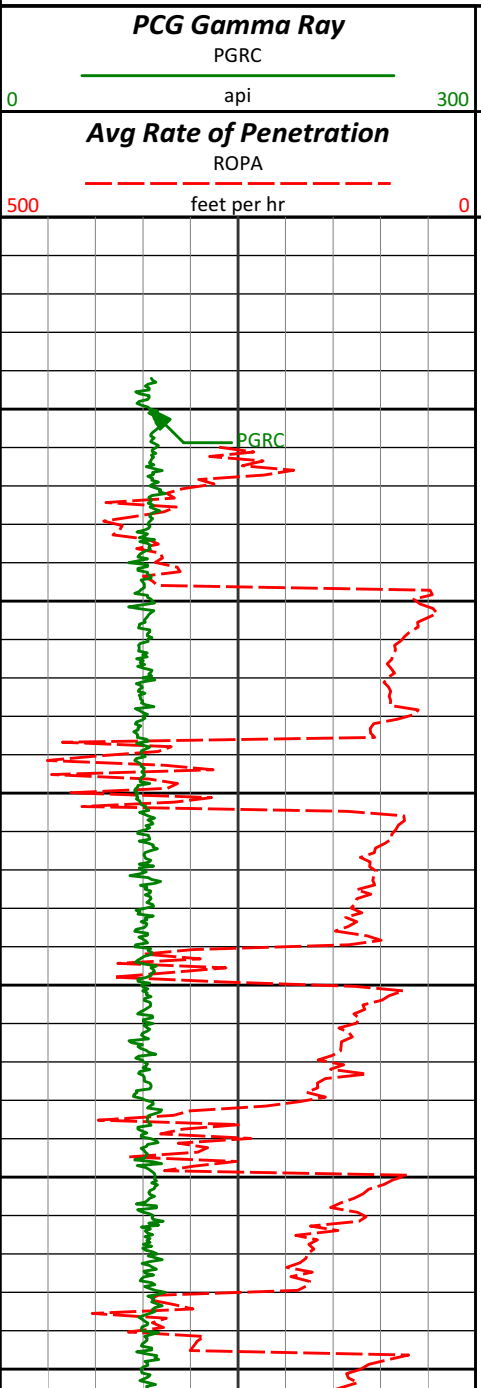
6. Gamma presented inside casing/cement from 6001 ft. MD to 6049 ft. MD.

WARRANTY

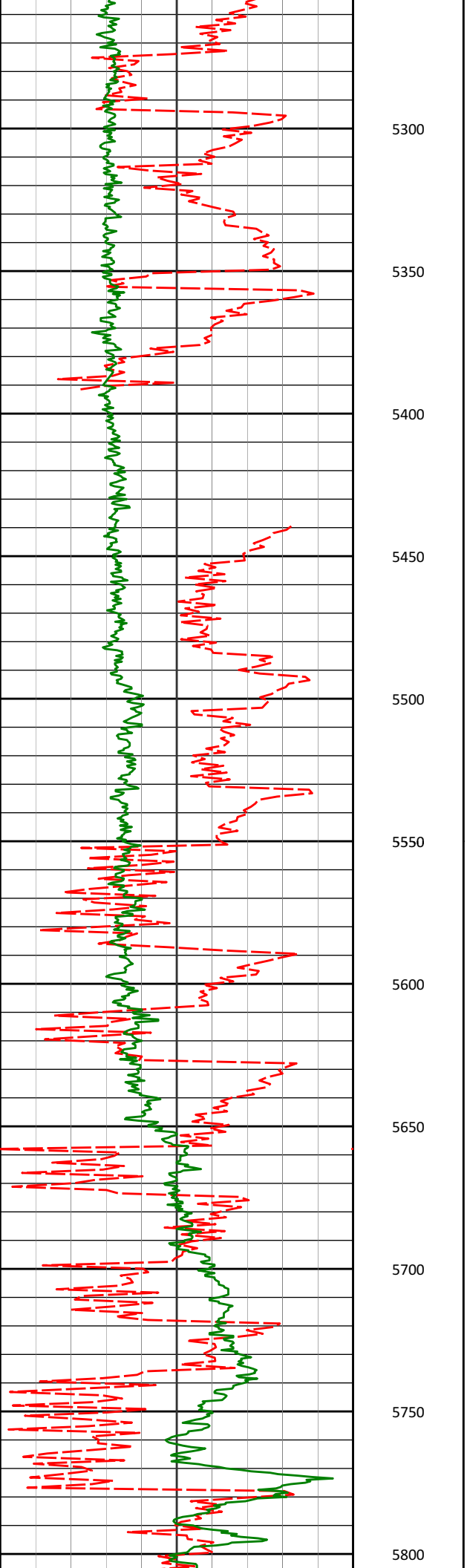
HALLIBURTON
Sperry Drilling Services

MD Main Log 1:600

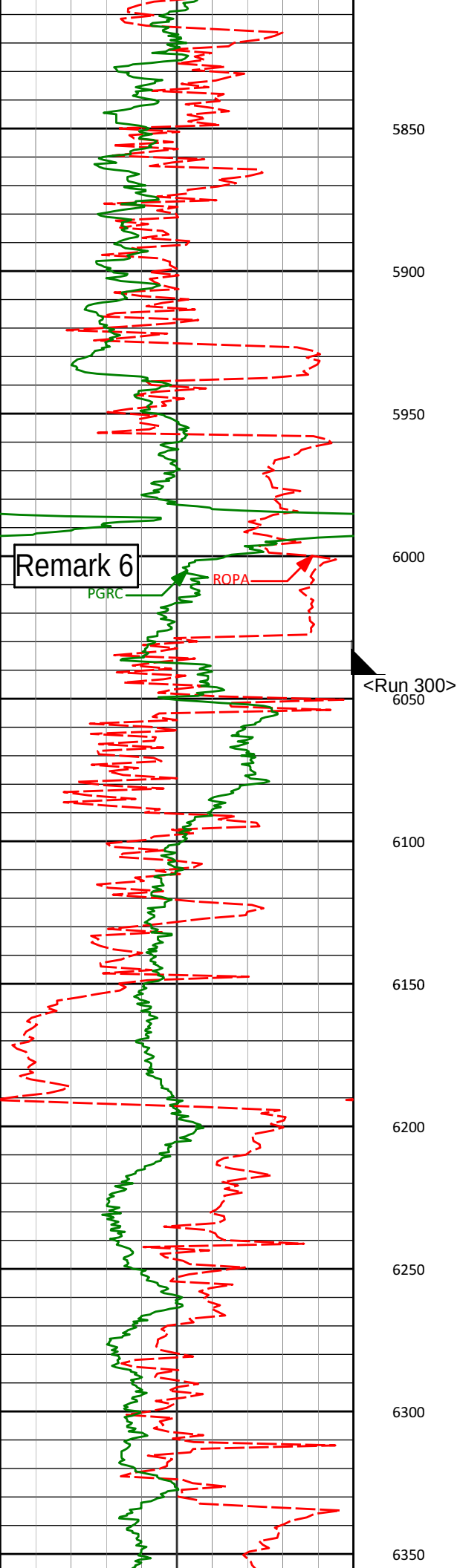
Noble Energy, Inc
Rohn State LD03-66-1HN
H&P 273
T9N R58W



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
	4956'	0.99°	143.76°	4912.04'	221.48'
<Run 200> 5000	5003'	0.72°	145.53°	4959.03'	221.93'
<KOP> 5050	5051'	2.34°	101.79°	5007.02'	223.09'
5100	5098'	7.22°	96.19°	5053.84'	227.00'
5150	5146'	13.46°	100.86°	5101.04'	235.57'
5200	5193'	18.39°	102.20°	5146.22'	248.35'
5250	5240'	23.65°	95.85°	5190.08'	265.14'



5287'	27.26°	88.34°	5232.53'	285.28'
5335'	30.07°	88.31°	5274.64'	308.17'
5382'	33.86°	88.18°	5314.50'	332.91'
5430'	37.13°	89.66°	5353.58'	360.65'
5477'	39.11°	92.04°	5390.56'	389.60'
5525'	42.80°	92.35°	5426.80'	421.04'
5572'	45.74°	90.94°	5460.45'	453.81'
5619'	49.93°	88.62°	5492.00'	488.52'
5666'	55.86°	88.36°	5520.34'	525.79'
5714'	61.90°	89.91°	5545.14'	566.69'
5761'	63.91°	91.38°	5566.54'	608.45'

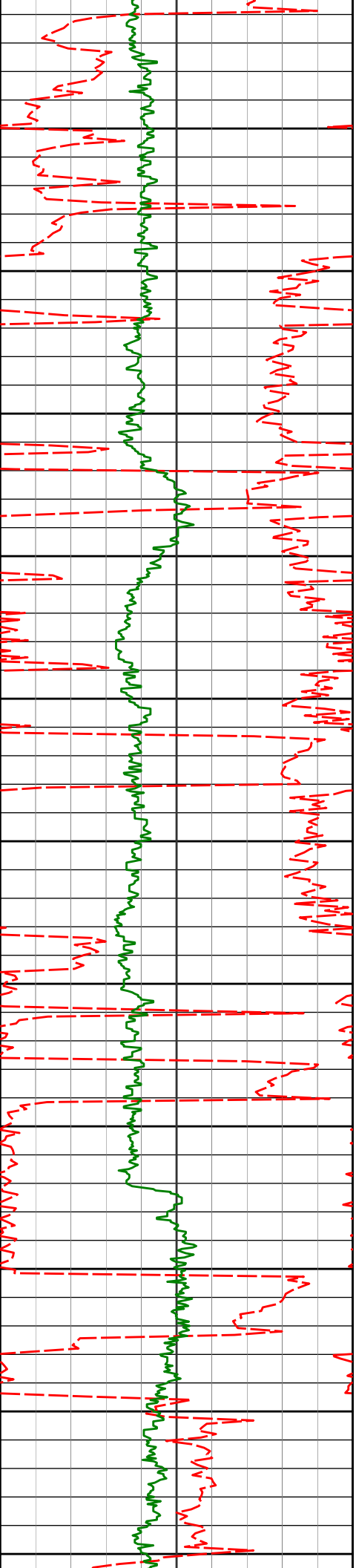


5809'	69.25°	89.07°	5585.62'	652.37'
5856'	74.31°	87.61°	5600.31'	696.75'
5904'	75.73°	86.25°	5612.72'	742.72'
5951'	77.64°	88.31°	5623.54'	788.10'
5994'	83.46°	90.18°	5630.60'	830.34'

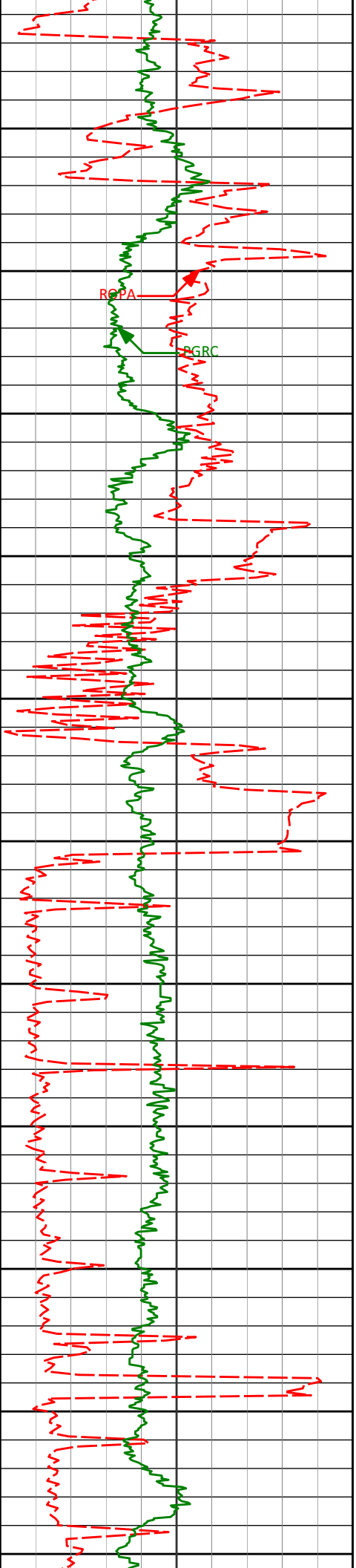
<7" casing set at 6039' MD>

<Run 300>

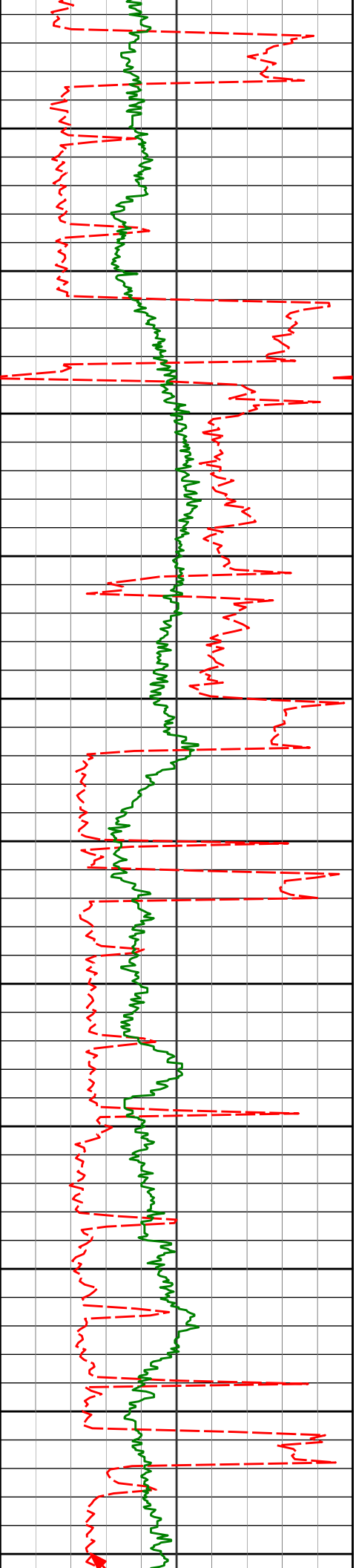
6085'	87.38°	89.60°	5637.87'	920.80'
6177'	87.87°	90.87°	5641.68'	1012.48'
6270'	87.26°	90.20°	5645.63'	1105.19'



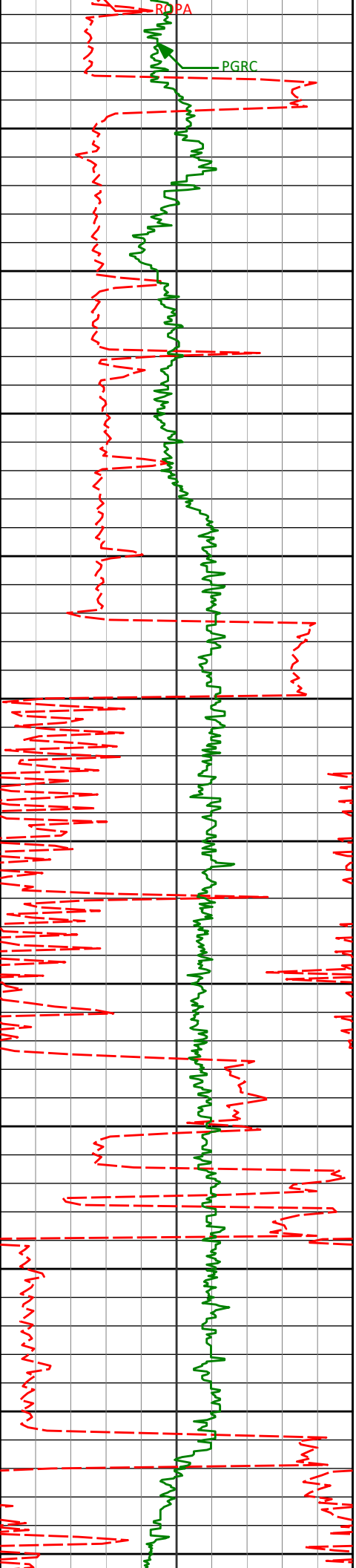
6363'	89.82°	89.94°	5648.01'	1197.90'
6455'	91.88°	89.75°	5646.65'	1289.60'
6550'	91.51°	88.75°	5643.84'	1384.18'
6645'	90.55°	88.69°	5642.13'	1478.71'
6739'	90.40°	88.34°	5641.34'	1572.23'
6834'	88.86°	88.00°	5641.96'	1666.67'



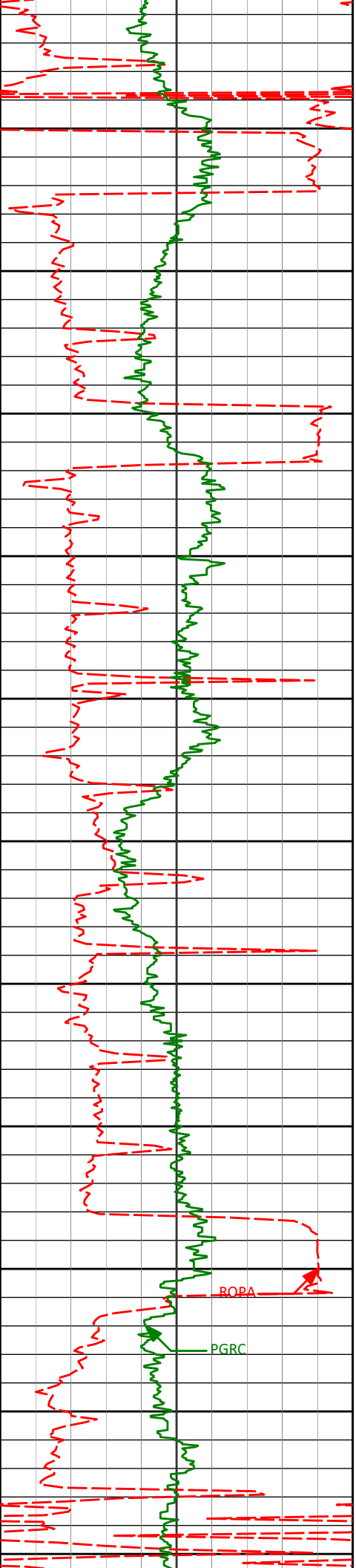
6929'	88.27°	87.82°	5644.33'	1761.05'
7024'	88.52°	87.20°	5646.99'	1855.34'
7119'	87.78°	88.96°	5650.06'	1949.72'
7213'	90.65°	90.24°	5651.35'	2043.38'
7308'	91.91°	90.72°	5649.23'	2138.14'
7403'	92.90°	90.07°	5645.24'	2232.83'



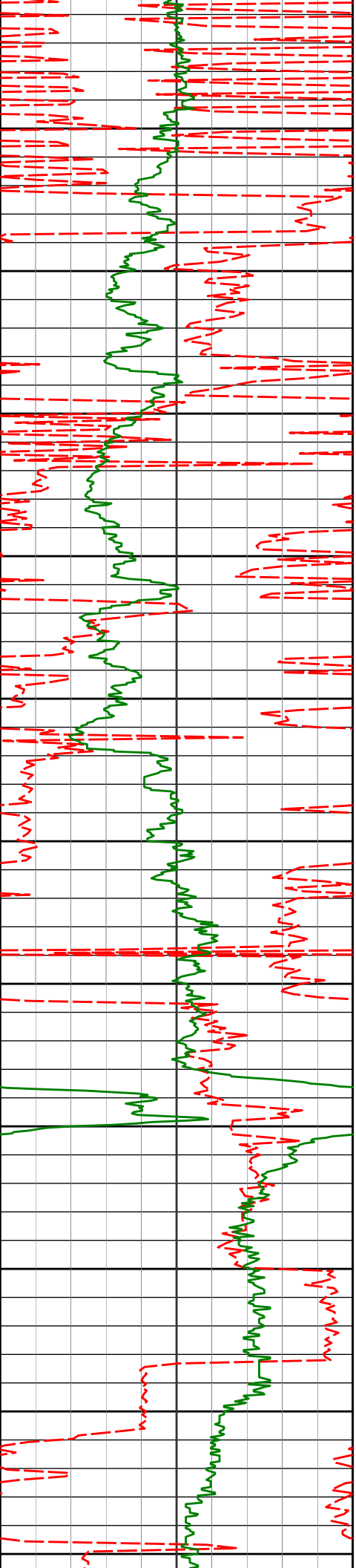
7498'	92.22°	89.64°	5641.00'	2327.45'
7592'	90.77°	89.79°	5638.55'	2421.11'
7687'	91.11°	90.06°	5636.99'	2515.81'
7781'	87.81°	89.14°	5637.87'	2609.48'
7876'	88.00°	89.17°	5641.35'	2704.02'
7971'	90.06°	89.34°	5642.96'	2798.63'



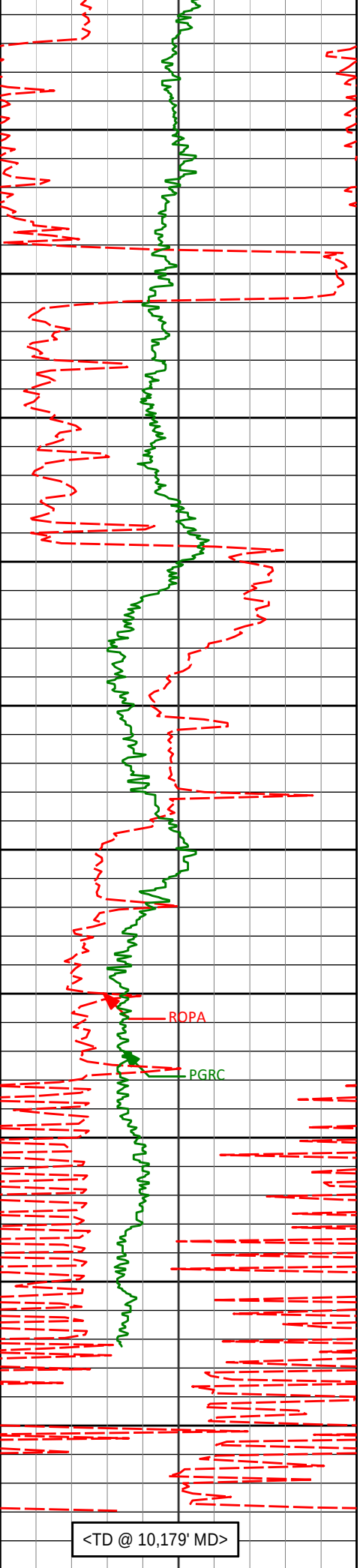
8065'	89.38°	88.79°	5643.42'	2892.24'
8160'	89.78°	88.04°	5644.11'	2986.73'
8255'	89.72°	91.05°	5644.52'	3081.38'
8350'	90.86°	91.25°	5644.04'	3176.24'
8445'	90.99°	89.72°	5642.50'	3271.01'
8540'	90.77°	88.99°	5641.04'	3365.64'



8635'	89.88°	89.68°	5640.50'	3460.27'
8730'	88.86°	90.01°	5641.55'	3554.98'
8825'	89.97°	90.62°	5642.52'	3649.74'
8920'	91.36°	90.74°	5641.43'	3744.53'
9015'	89.45°	89.09°	5640.76'	3839.24'



9109'	89.82°	89.49°	5641.37'	3932.88'
9203'	88.89°	88.46°	5642.43'	4026.46'
9298'	89.32°	88.31°	5643.91'	4120.93'
9393'	88.18°	88.24°	5645.98'	4215.38'
9488'	87.90°	87.71°	5649.23'	4309.74'
9583'	90.25°	89.43°	5650.76'	4404.24'



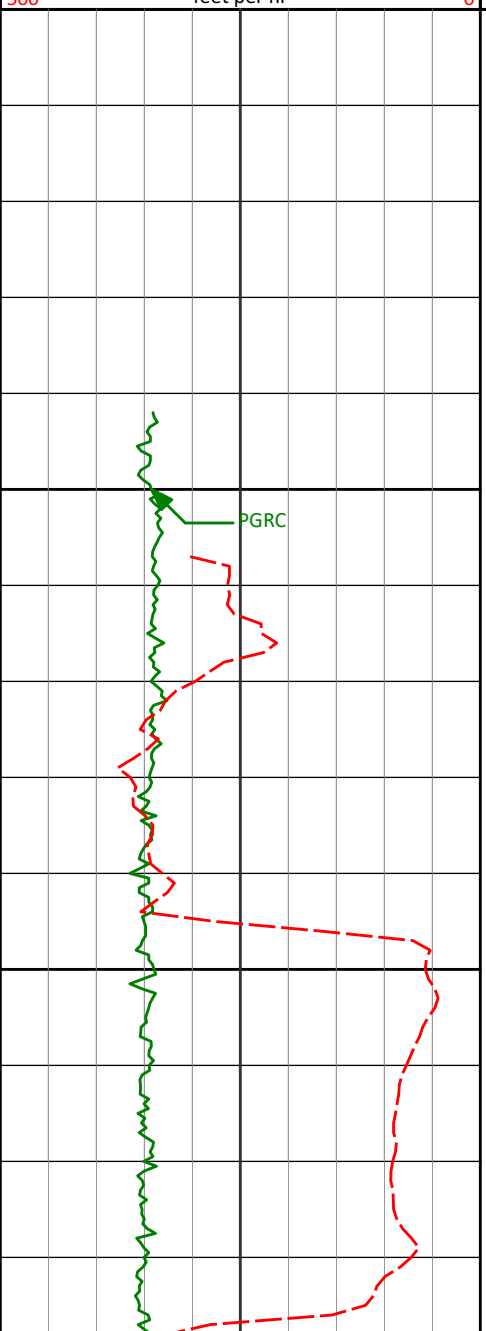
9678'	91.51°	89.72°	5649.30'	4498.90'
9772'	90.43°	88.71°	5647.71'	4592.51'
9867'	90.71°	88.46°	5646.76'	4687.02'
9962'	90.99°	88.28°	5645.36'	4781.50'
10057'	92.59°	88.26°	5642.39'	4875.92'
10115'	93.79°	88.99°	5639.16'	4933.54'

Avg Rate of Penetration
ROPA
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Noble Energy, Inc
Rohn State LD03-66-1HN
H&P 273
T9N R58W



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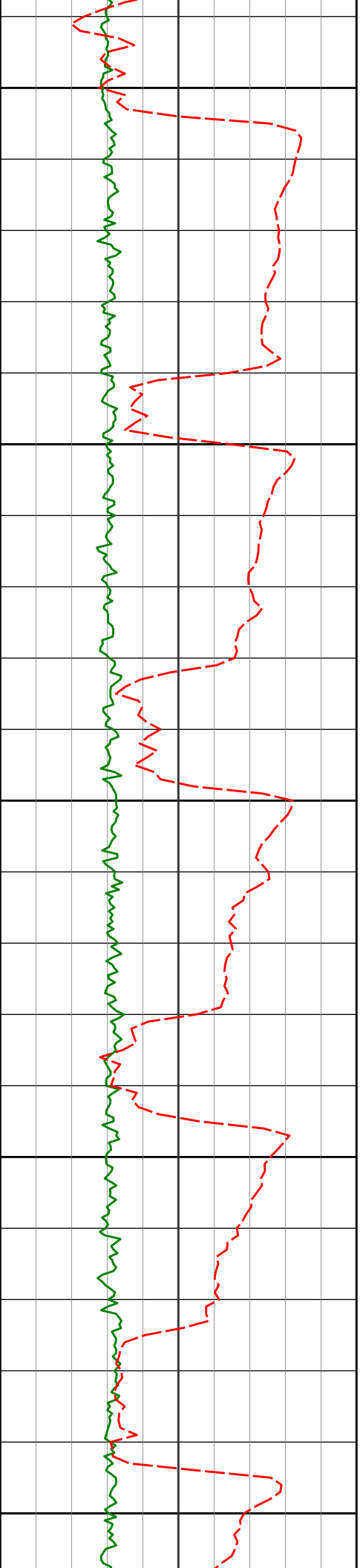
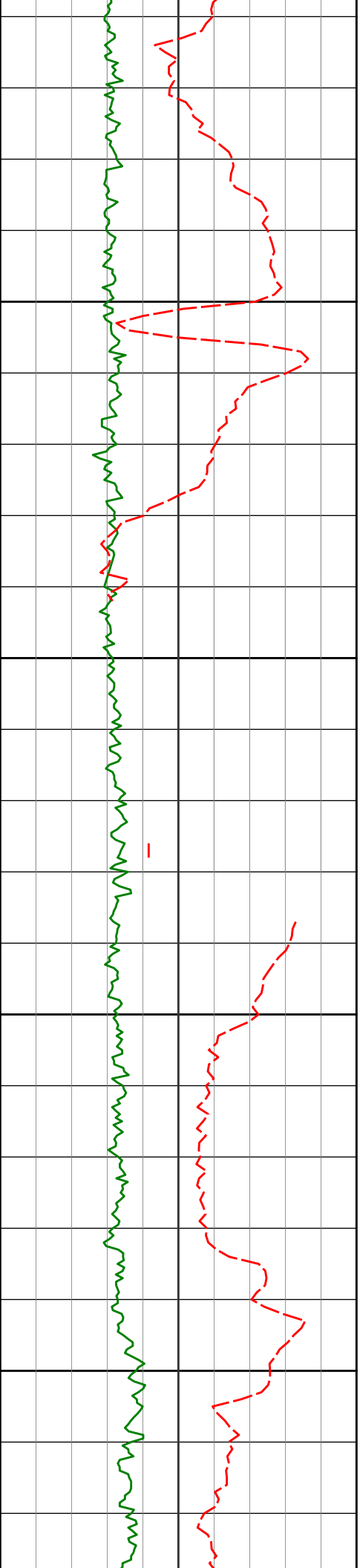
	4956'	0.99°	143.76°	4912.04'	221.48'
<Run 200>					
5000	5003'	0.72°	145.53°	4959.03'	221.93'
<KOP>					
5050	5051'	2.34°	101.79°	5007.02'	223.09'



5098'	7.22°	96.19°	5053.84'	227.00'
5146'	13.46°	100.86°	5101.04'	235.57'
5193'	18.39°	102.20°	5146.22'	248.35'
5240'	23.65°	95.85°	5190.08'	265.14'
5287'	27.26°	88.34°	5232.53'	285.28'



5335'	30.07°	88.31°	5274.64'	308.17'
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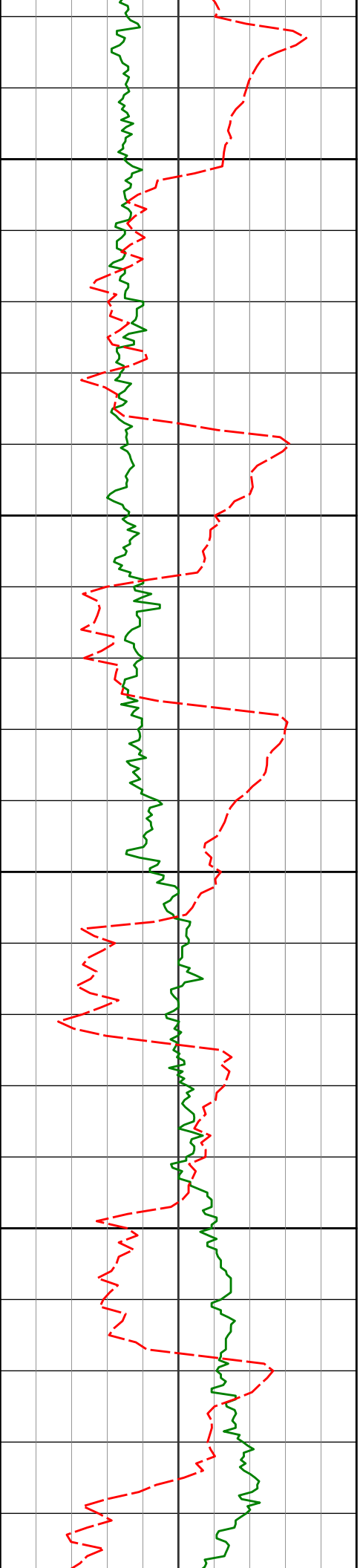
5430'	37.13°	89.66°	5353.58'	360.65'
5477'	39.11°	92.04°	5390.56'	389.60'
5525'	42.80°	92.35°	5426.80'	421.04'



5572'	45.74°	90.94°	5460.45'	453.81'
5619'	49.93°	88.62°	5492.00'	488.52'
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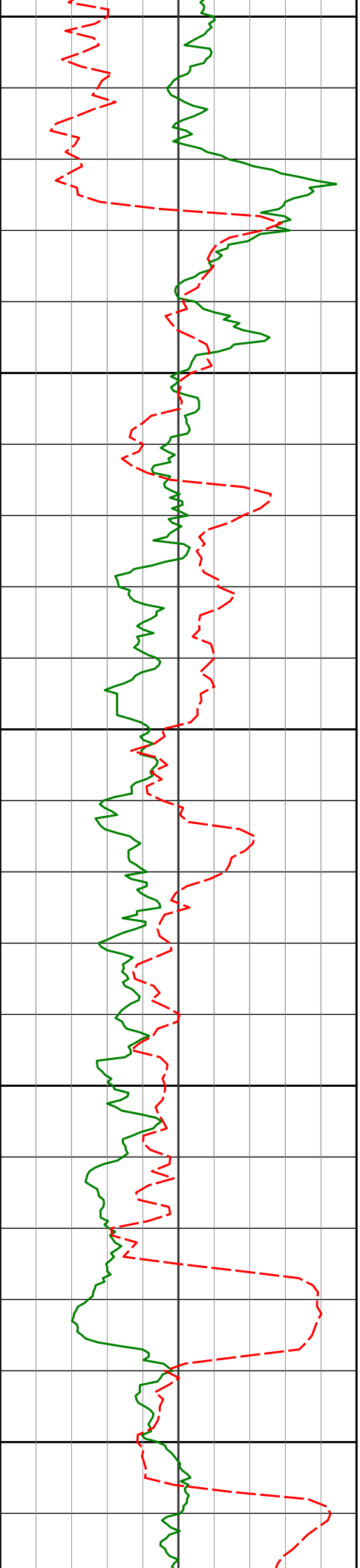
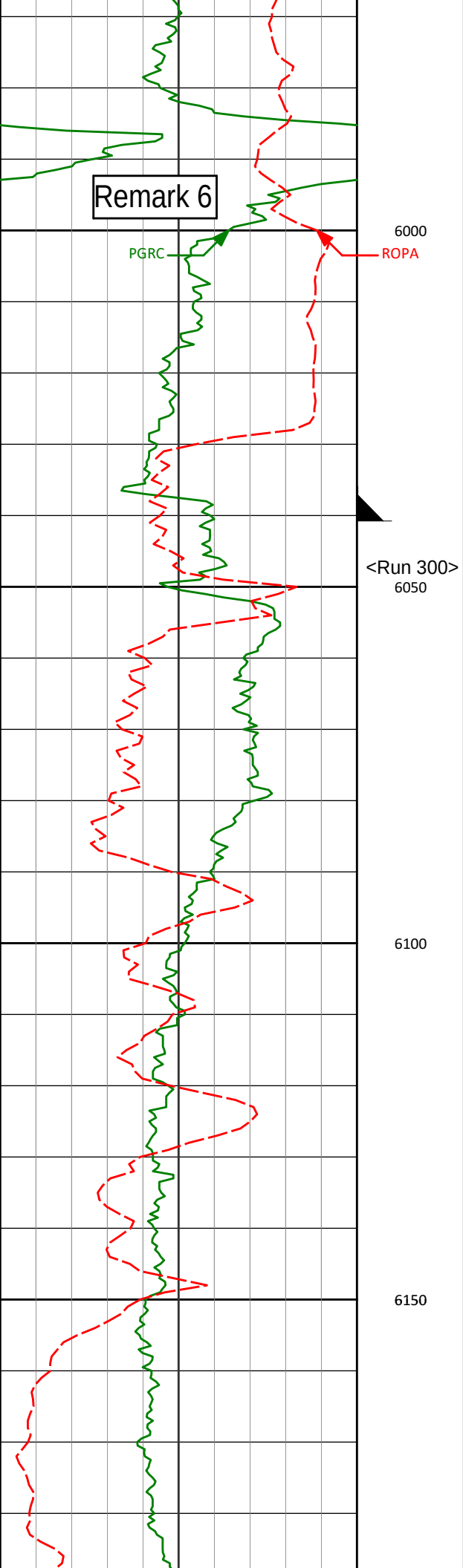
5714'	61.90°	89.91°	5545.14'	566.69'



5761'	63.91°	91.38°	5566.54'	608.45'
5809'	69.25°	89.07°	5585.62'	652.37'
5856'	74.31°	87.61°	5600.31'	696.75'
5904'	75.73°	86.25°	5612.72'	742.72'
5951'	77.64°	88.31°	5623.54'	788.10'

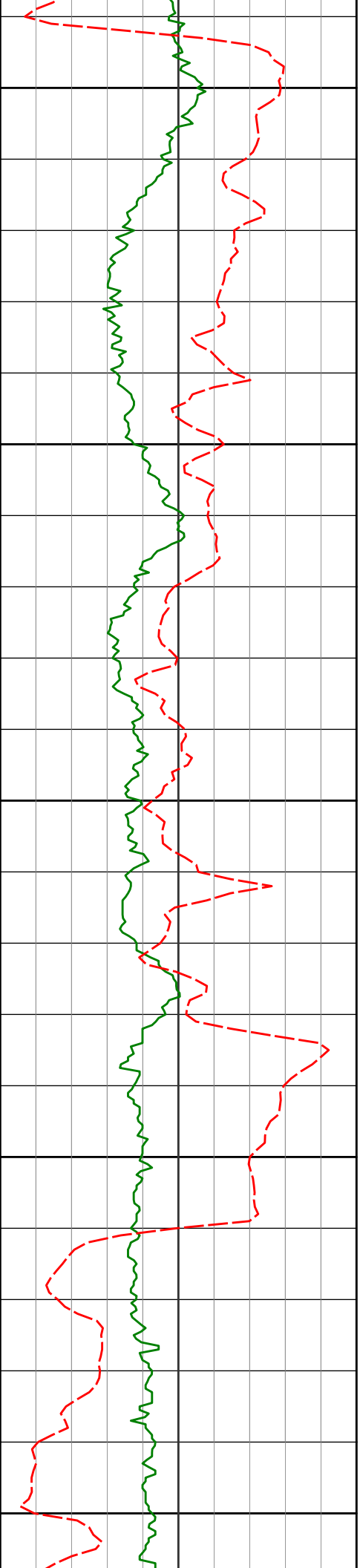


5994'	83.46°	90.18°	5630.60'	830.34'

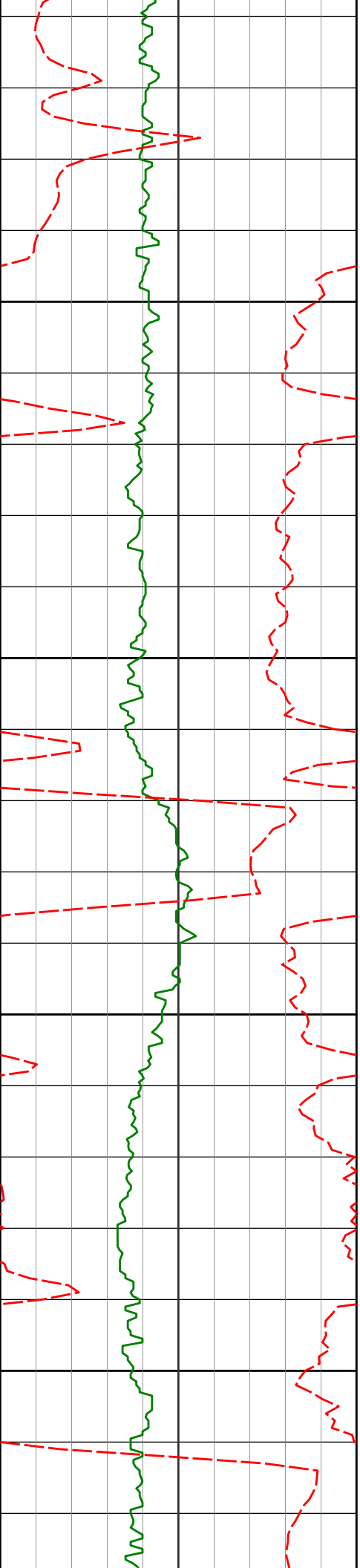
<7" casing set at 6039' MD>

<Run 300>

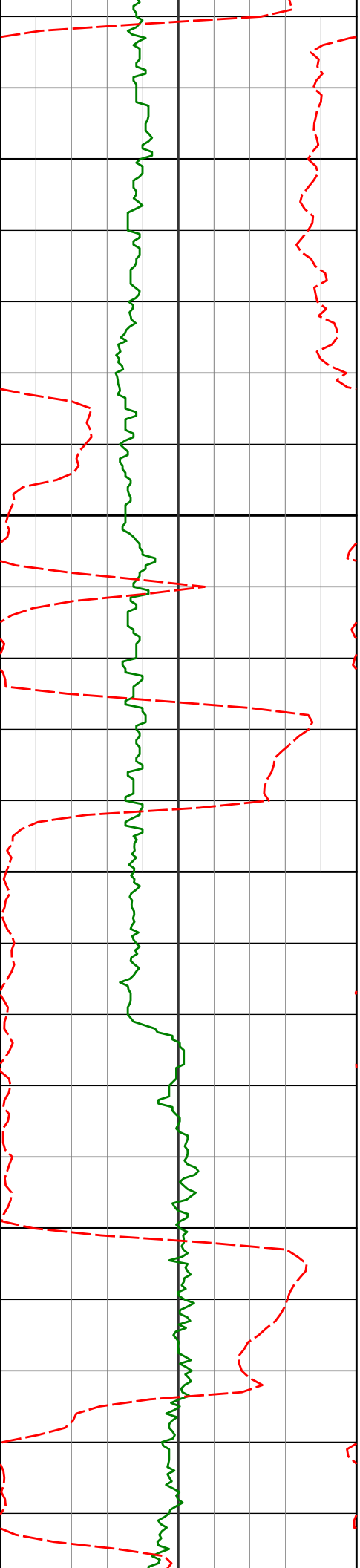
6085'	87.38°	89.60°	5637.87'	920.80'
6177'	87.87°	90.87°	5641.68'	1012.48'



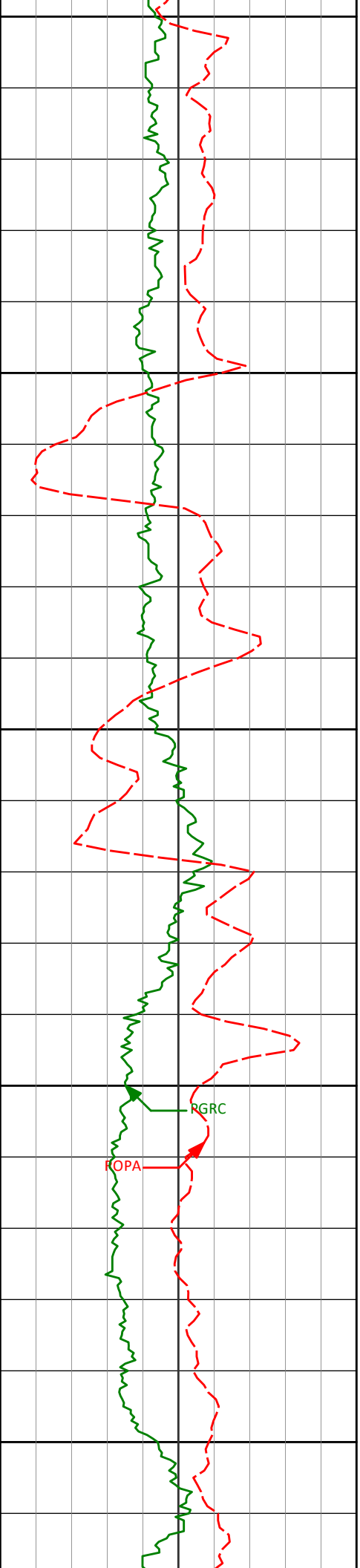
6270'	87.26°	90.20°	5645.63'	1105.19'
6363'	89.82°	89.94°	5648.01'	1197.90'



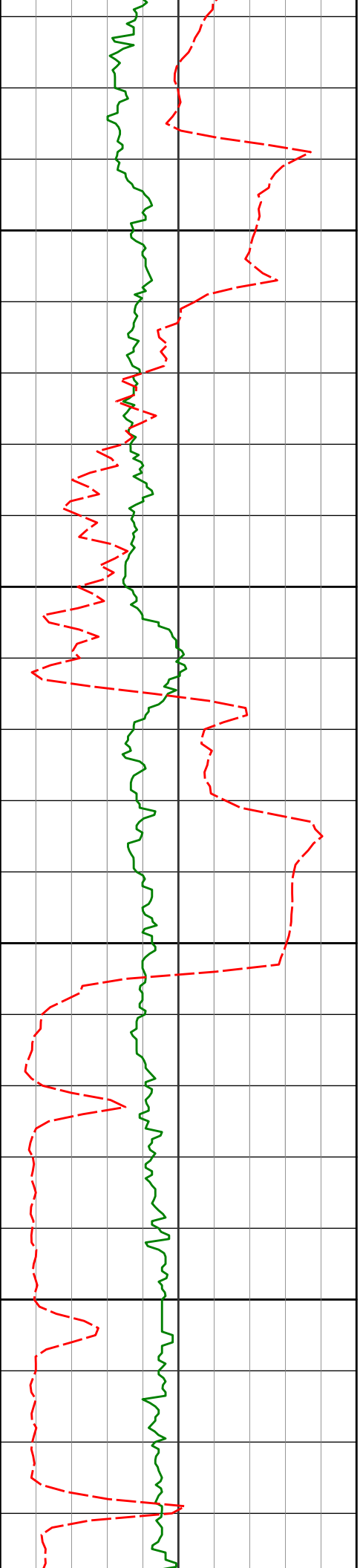
6455'	91.88°	89.75°	5646.65'	1289.60'
6550'	91.51°	88.75°	5643.84'	1384.18'



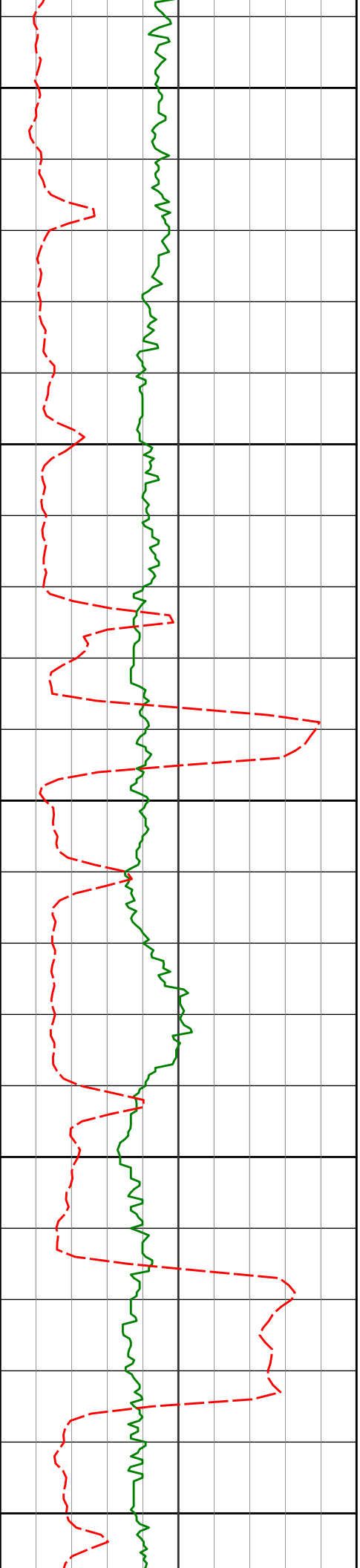
6645'	90.55°	88.69°	5642.13'	1478.71'
6739'	90.40°	88.34°	5641.34'	1572.23'
6834'	88.86°	88.00°	5641.96'	1666.67'



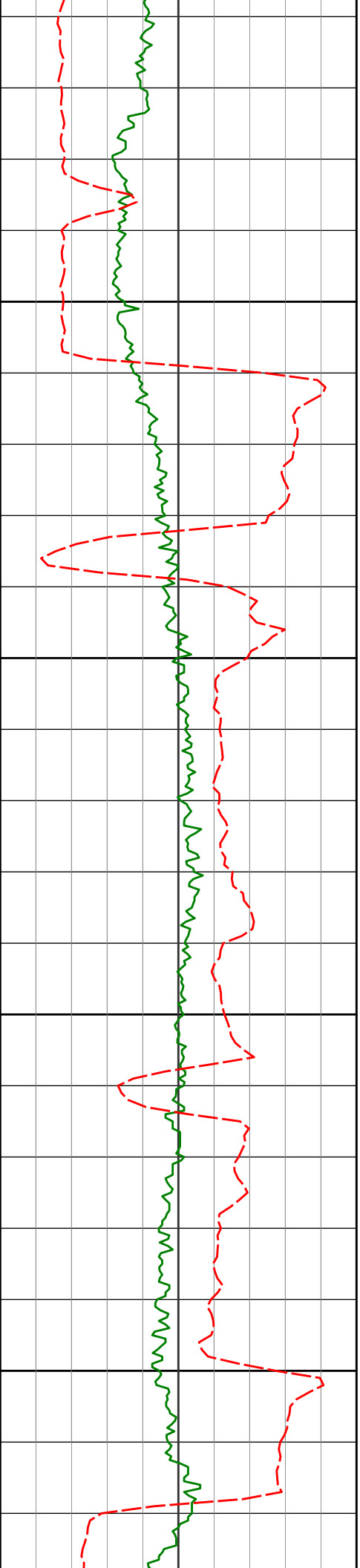
6929'	88.27°	87.82°	5644.33'	1761.05'
7024'	88.52°	87.20°	5646.99'	1855.34'



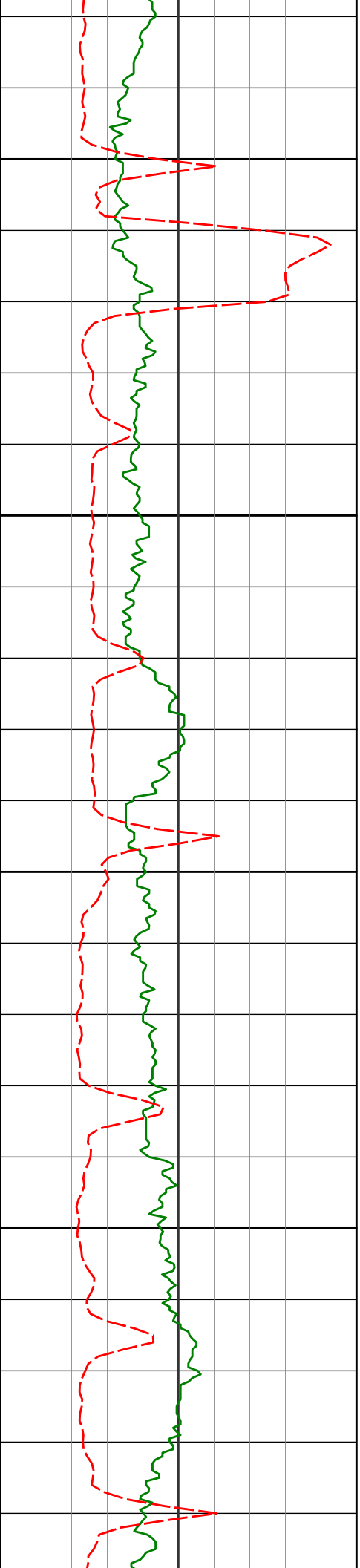
7119'	87.78°	88.96°	5650.06'	1949.72'
7213'	90.65°	90.24°	5651.35'	2043.38'



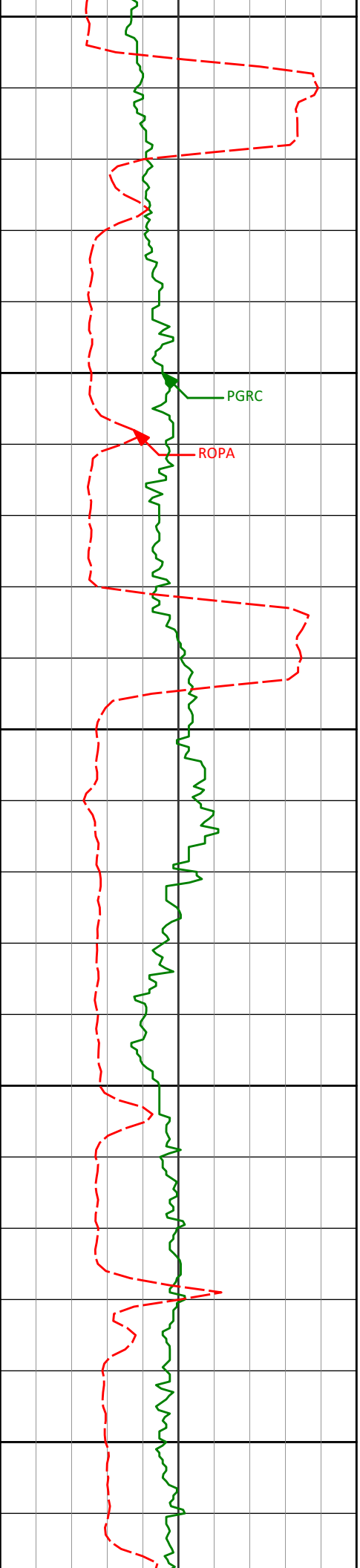
7308'	91.91°	90.72°	5649.23'	2138.14'
7403'	92.90°	90.07°	5645.24'	2232.83'
7498'	92.22°	89.64°	5641.00'	2327.45'



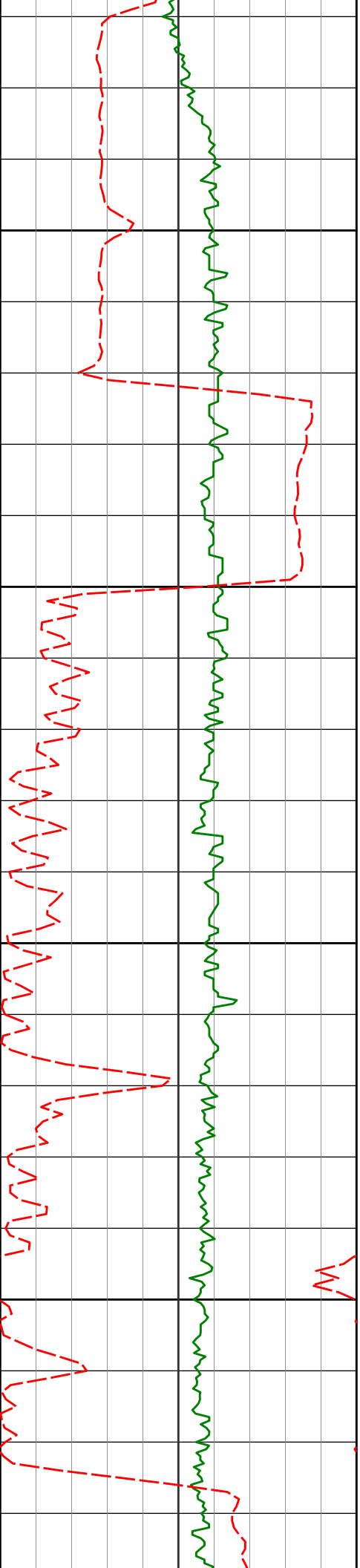
7592'	90.77°	89.79°	5638.55'	2421.11'
7687'	91.11°	90.06°	5636.99'	2515.81'



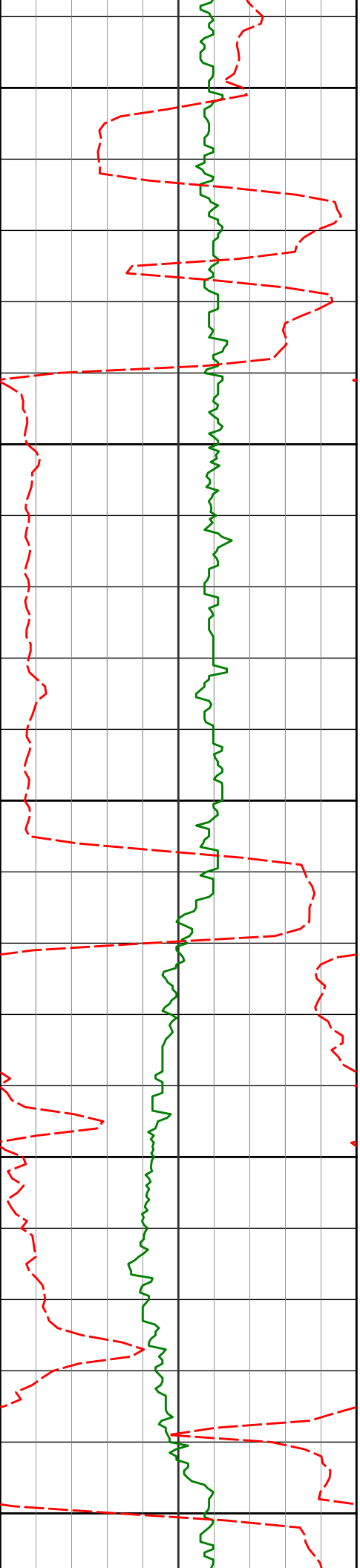
7781'	87.81°	89.14°	5637.87'	2609.48'
7876'	88.00°	89.17°	5641.35'	2704.02'



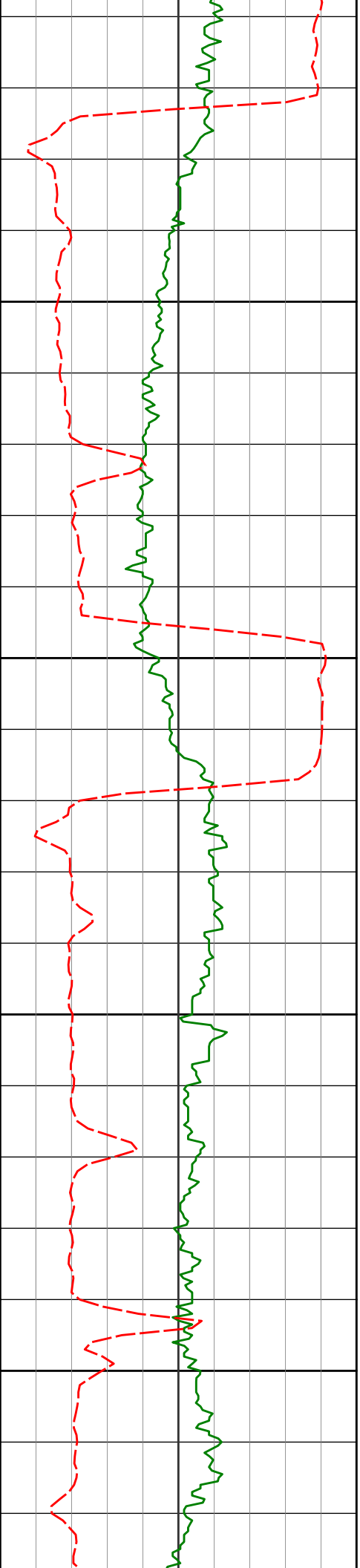
7971'	90.06°	89.34°	5642.96'	2798.63'
8065'	89.38°	88.79°	5643.42'	2892.24'
8160'	89.78°	88.04°	5644.11'	2986.73'



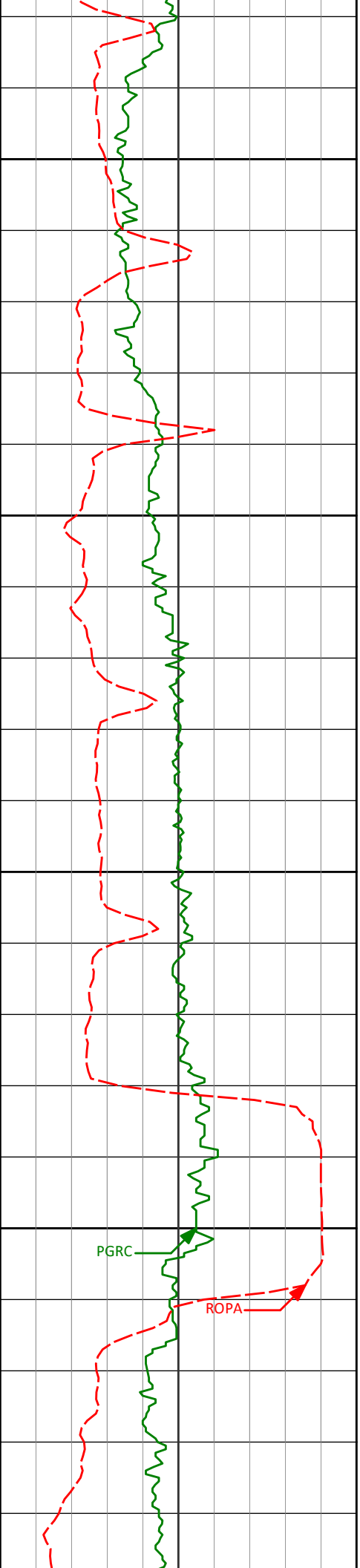
8255'	89.72°	91.05°	5644.52'	3081.38'	
8350'	90.86°	91.25°	5644.04'	3176.24'	



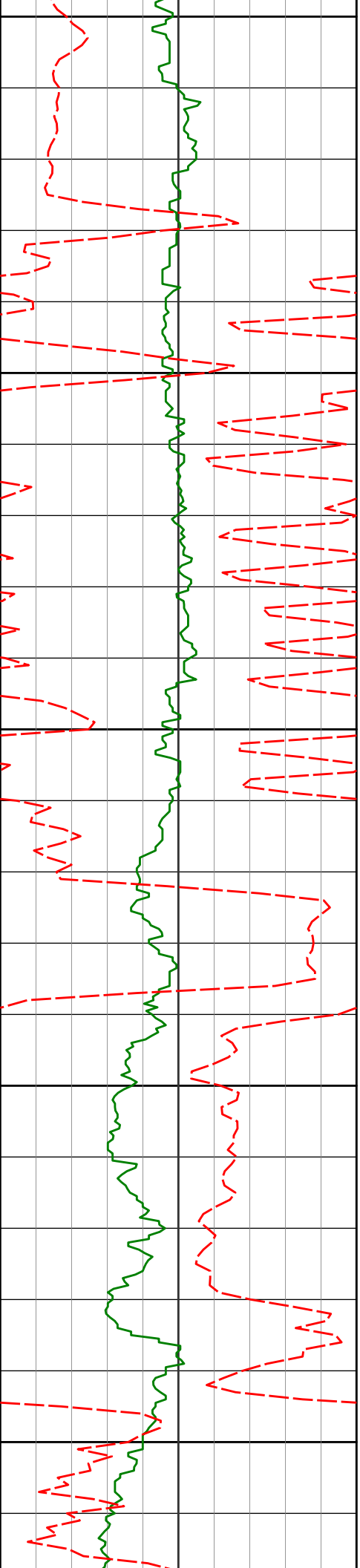
8445'	90.99°	89.72°	5642.50'	3271.01'
8540'	90.77°	88.99°	5641.04'	3365.64'



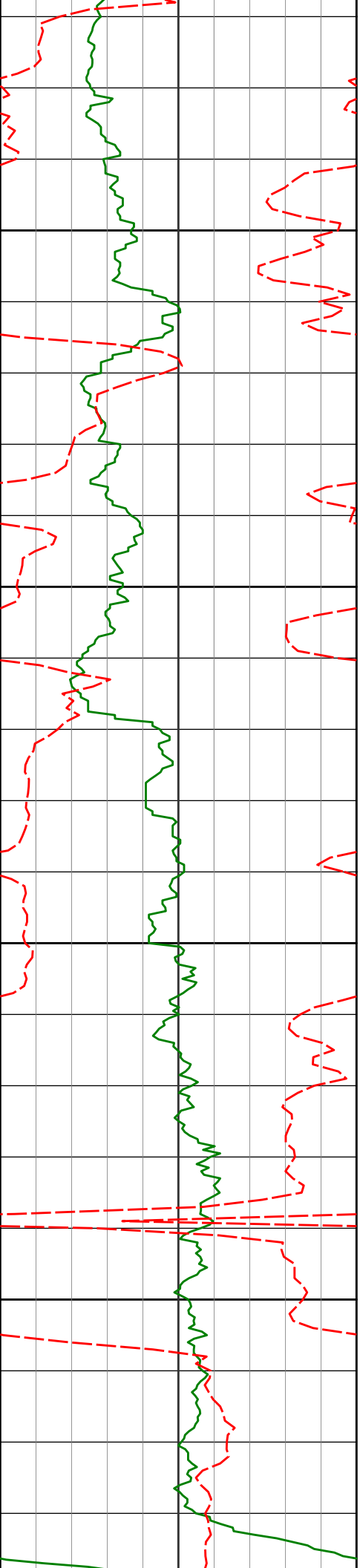
8635'	89.88°	89.68°	5640.50'	3460.27'
8730'	88.86°	90.01°	5641.55'	3554.98'
8825'	89.97°	90.62°	5642.52'	3649.74'



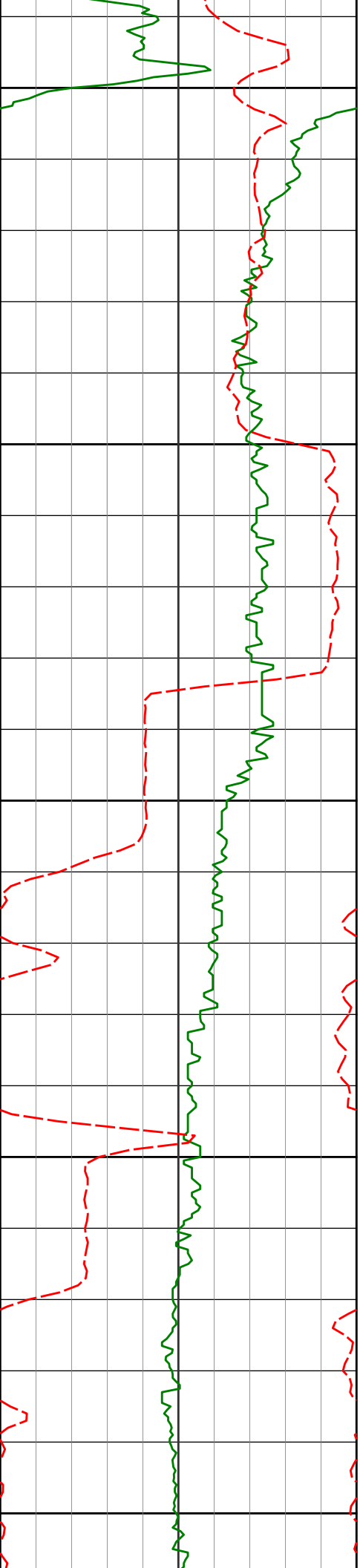
8920'	91.36°	90.74°	5641.43'	3744.53'
9015'	89.45°	89.09°	5640.76'	3839.24'



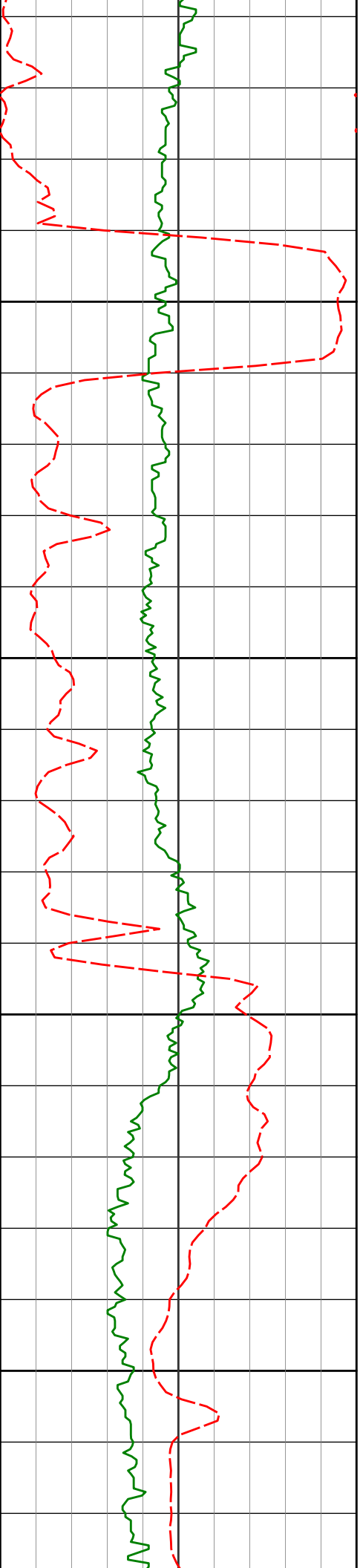
9109'	89.82°	89.49°	5641.37'	3932.88'
9203'	88.89°	88.46°	5642.43'	4026.46'



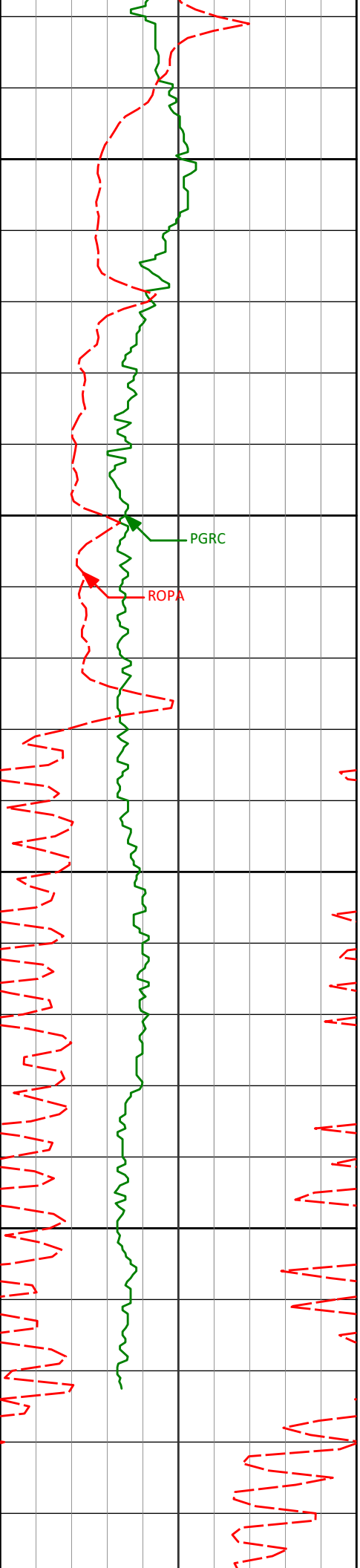
9298'	89.32°	88.31°	5643.91'	4120.93'
9393'	88.18°	88.24°	5645.98'	4215.38'



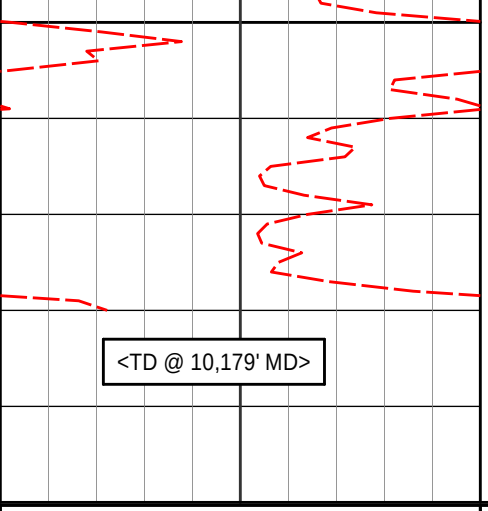
9488'	87.90°	87.71°	5649.23'	4309.74'
9583'	90.25°	89.43°	5650.76'	4404.24'
9678'	91.51°	89.72°	5649.30'	4498.90'



9772'	90.43°	88.71°	5647.71'	4592.51'
9867'	90.71°	88.46°	5646.76'	4687.02'



9962'	90.99°	88.28°	5645.36'	4781.50'
10057'	92.59°	88.26°	5642.39'	4875.92'
10115'	93.79°	88.99°	5639.16'	4933.54'



10150

10200

Avg Rate of Penetration ROPA 500 feet per hr 0	Depth ft	Depth	Inc.	Azi.	TVD	V.S.
PCG Gamma Ray PGRC 0 api 300						

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Rohn State LD03-66-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0901584425

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
350.00	0.20	31.59	350.00	0.52 N	0.32 E	0.28	0.06
750.00	0.00	193.99	750.00	1.12 N	0.69 E	0.60	0.05
1200.00	0.60	327.59	1199.99	3.10 N	0.58 W	-0.81	0.13
1273.00	0.73	288.10	1272.99	3.57 N	1.23 W	-1.49	0.64
1458.00	0.74	288.73	1457.97	4.32 N	3.48 W	-3.80	0.01
1551.00	0.61	281.62	1550.96	4.62 N	4.54 W	-4.88	0.16
1644.00	0.86	177.88	1643.96	4.02 N	5.00 W	-5.29	1.26
1737.00	1.80	149.49	1736.93	2.07 N	4.24 W	-4.38	1.20
1832.00	2.60	146.93	1831.86	1.02 S	2.30 W	-2.22	0.85
1926.00	4.36	151.45	1925.69	5.95 S	0.57 E	1.02	1.89
2021.00	6.09	152.96	2020.29	13.61 S	4.59 E	5.60	1.82
2116.00	8.08	151.10	2114.56	23.94 S	10.10 E	11.88	2.11
2210.00	9.60	150.29	2207.44	36.53 S	17.18 E	19.89	1.62
2305.00	11.20	151.49	2300.88	51.52 S	25.51 E	29.32	1.70
2400.00	11.76	153.22	2393.97	68.27 S	34.28 E	39.33	0.69
2494.00	13.04	152.21	2485.78	86.21 S	43.54 E	49.92	1.37
2589.00	13.07	153.24	2578.33	105.28 S	53.37 E	61.16	0.25
2684.00	11.95	152.30	2671.07	123.57 S	62.77 E	71.92	1.20
2779.00	13.19	156.20	2763.79	142.20 S	71.72 E	82.25	1.58
2873.00	11.41	156.23	2855.63	160.52 S	79.79 E	91.68	1.89
2968.00	11.85	161.22	2948.68	178.36 S	86.72 E	99.94	1.15
3063.00	13.57	163.71	3041.35	198.29 S	92.99 E	107.69	1.90
3158.00	14.36	163.37	3133.54	220.28 S	99.48 E	115.83	0.84
3253.00	13.37	160.34	3225.78	241.91 S	106.55 E	124.52	1.29
3347.00	13.85	160.01	3317.14	262.72 S	114.06 E	133.57	0.51
3442.00	13.60	157.54	3409.42	283.73 S	122.21 E	143.28	0.67
3537.00	14.06	156.47	3501.67	304.62 S	131.08 E	153.71	0.55
3632.00	11.63	157.46	3594.29	324.05 S	139.36 E	163.43	2.57
3727.00	10.29	155.60	3687.55	340.61 S	146.53 E	171.83	1.46

3822.00	8.25	152.91	3781.31	354.41 S	153.14 E	179.46	2.19
3916.00	7.77	151.49	3874.39	366.00 S	159.25 E	186.43	0.56
4010.00	6.80	149.35	3967.63	376.37 S	165.12 E	193.06	1.07
4105.00	5.79	146.09	4062.06	385.18 S	170.66 E	199.25	1.13
4200.00	4.48	144.18	4156.68	392.17 S	175.50 E	204.61	1.39
4295.00	3.38	141.76	4251.45	397.38 S	179.41 E	208.90	1.17
4389.00	2.47	138.31	4345.33	401.07 S	182.47 E	212.23	0.98
4484.00	1.97	150.42	4440.26	404.02 S	184.64 E	214.62	0.72
4579.00	2.29	156.67	4535.19	407.18 S	186.20 E	216.41	0.42
4674.00	2.24	157.14	4630.12	410.64 S	187.68 E	218.14	0.06
4769.00	1.18	155.62	4725.07	413.24 S	188.80 E	219.46	1.12
4863.00	1.14	148.67	4819.05	414.92 S	189.69 E	220.47	0.16
4936.00	0.89	143.39	4892.04	416.00 S	190.40 E	221.27	0.37
4956.00	0.99	143.76	4912.04	416.26 S	190.60 E	221.48	0.53
5003.00	0.72	145.53	4959.03	416.83 S	191.00 E	221.93	0.58
5051.00	2.34	101.79	5007.02	417.28 S	192.14 E	223.09	3.94
5098.00	7.22	96.19	5053.84	417.80 S	196.01 E	227.00	10.40
5146.00	13.46	100.86	5101.04	419.18 S	204.51 E	235.57	13.12
5193.00	18.39	102.20	5146.22	421.78 S	217.13 E	248.35	10.51
5240.00	23.65	95.85	5190.08	424.31 S	233.77 E	265.14	12.19
5287.00	27.26	88.34	5232.53	424.96 S	253.92 E	285.28	10.29
5335.00	30.07	88.31	5274.64	424.28 S	276.93 E	308.17	5.87
5382.00	33.86	88.18	5314.50	423.52 S	301.80 E	332.91	8.05
5430.00	37.13	89.66	5353.58	423.01 S	329.65 E	360.65	7.05
5477.00	39.11	92.04	5390.56	423.45 S	358.66 E	389.60	5.25
5525.00	42.80	92.35	5426.80	424.66 S	390.09 E	421.04	7.69
5572.00	45.74	90.94	5460.45	425.59 S	422.88 E	453.81	6.59
5619.00	49.93	88.62	5492.00	425.43 S	457.70 E	488.52	9.63
5666.00	55.86	88.36	5520.34	424.45 S	495.16 E	525.79	12.63
5714.00	61.90	89.91	5545.14	423.85 S	536.22 E	566.69	12.89
5761.00	63.91	91.60	5566.54	424.40 S	578.06 E	608.45	5.33
5809.00	69.25	89.26	5585.62	424.72 S	622.08 E	652.37	11.99
5856.00	74.31	87.29	5600.31	423.36 S	666.69 E	696.75	11.48
5904.00	75.73	86.37	5612.72	420.80 S	712.99 E	742.72	3.49
5951.00	77.64	88.08	5623.54	418.59 S	758.66 E	788.10	5.39
5994.00	83.46	90.80	5630.60	418.18 S	801.06 E	830.34	14.90
6085.00	87.38	89.60	5637.87	418.49 S	891.75 E	920.80	4.50
6177.00	87.87	90.87	5641.68	418.87 S	983.66 E	1012.48	1.49
6270.00	87.26	90.20	5645.63	419.74 S	1076.58 E	1105.19	0.98
6363.00	89.82	89.94	5648.01	419.85 S	1169.54 E	1197.90	2.77
6455.00	91.88	89.75	5646.65	419.60 S	1261.52 E	1289.60	2.25
6550.00	91.51	88.75	5643.84	418.36 S	1356.47 E	1384.18	1.13
6645.00	90.55	88.69	5642.13	416.24 S	1451.43 E	1478.71	1.01
6739.00	90.40	88.34	5641.34	413.81 S	1545.40 E	1572.23	0.41
6834.00	88.86	88.00	5641.96	410.77 S	1640.34 E	1666.67	1.66
6929.00	88.27	87.82	5644.33	407.31 S	1735.25 E	1761.05	0.64
7024.00	88.52	87.20	5646.99	403.18 S	1830.12 E	1855.34	0.71
7119.00	87.78	88.96	5650.06	400.00 S	1925.01 E	1949.72	2.02
7213.00	90.65	90.24	5651.35	399.35 S	2018.99 E	2043.38	3.34
7308.00	91.91	90.72	5649.23	400.15 S	2113.96 E	2138.14	1.43
7403.00	92.90	90.07	5645.24	400.81 S	2208.87 E	2232.83	1.25
7498.00	92.22	89.64	5641.00	400.57 S	2303.78 E	2327.45	0.85
7592.00	90.77	89.79	5638.55	400.10 S	2397.74 E	2421.11	1.55
7687.00	91.11	90.06	5636.99	399.98 S	2492.73 E	2515.81	0.45
7781.00	87.81	89.14	5637.87	399.33 S	2586.71 E	2609.48	3.64
7876.00	88.00	89.17	5641.35	397.92 S	2681.63 E	2704.02	0.20
7971.00	90.06	89.34	5642.96	396.69 S	2776.61 E	2798.63	2.18
8065.00	89.38	88.79	5643.42	395.16 S	2870.59 E	2892.24	0.93
8160.00	89.78	88.04	5644.11	392.54 S	2965.55 E	2986.73	0.90
8255.00	89.72	91.05	5644.52	391.79 S	3060.54 E	3081.38	3.17
8350.00	90.86	91.25	5644.04	393.70 S	3155.52 E	3176.24	1.22
8445.00	90.99	89.72	5642.50	394.51 S	3250.50 E	3271.01	1.62
8540.00	90.77	88.99	5641.04	393.44 S	3345.48 E	3365.64	0.80
8635.00	89.88	89.68	5640.50	392.34 S	3440.47 E	3460.27	1.19
8730.00	88.86	90.01	5641.55	392.08 S	3535.46 E	3554.98	1.13
8825.00	89.97	90.62	5642.52	392.61 S	3630.46 E	3649.74	1.33
8920.00	91.36	90.74	5641.43	393.74 S	3725.44 E	3744.53	1.47
9015.00	89.45	89.09	5640.76	393.60 S	3820.43 E	3839.24	2.66
9109.00	89.82	89.49	5641.37	392.43 S	3914.42 E	3932.88	0.58
9203.00	88.89	88.46	5642.43	390.75 S	4008.40 E	4026.46	1.47

9298.00	89.32	88.31	5643.91	388.07 S	4103.35 E	4120.93	0.48
9393.00	88.18	88.24	5645.98	385.20 S	4198.28 E	4215.38	1.20
9488.00	87.90	87.71	5649.23	381.84 S	4293.16 E	4309.74	0.63
9583.00	90.25	89.43	5650.76	379.47 S	4388.11 E	4404.24	3.06
9678.00	91.51	89.72	5649.30	378.77 S	4483.10 E	4498.90	1.37
9772.00	90.43	88.71	5647.71	377.48 S	4577.07 E	4592.51	1.58
9867.00	90.71	88.46	5646.76	375.13 S	4672.04 E	4687.02	0.39
9962.00	90.99	88.28	5645.36	372.43 S	4766.99 E	4781.50	0.35
10057.00	92.59	88.26	5642.39	369.56 S	4861.90 E	4875.92	1.69
10115.00	93.79	88.99	5639.16	368.17 S	4919.79 E	4933.54	2.42
10179.00	93.79	88.99	5634.93	367.05 S	4983.64 E	4997.13	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 94.33 DEGREES (GRID)
A TOTAL CORRECTION OF 6.99 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10179.00 FEET
IS 4997.14 FEET ALONG 94.21 DEGREES (GRID)

Surface surveys at 350 ft, 750 ft and 1200 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 10115 ft MD to TD at 10179 ft MD.

Date Printed:31 August 2014