

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	11-Oct-14	13-Oct-14			
Rig Bit Number	0100	0200			
Bit Size (in)	13.500	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	80.00	1,615.00			
Log End Depth (MD, ft)	1,615.00	6,100.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	10-Oct-14 06:06	11-Oct-14 22:10			
Drill/Wipe End Date and Time	10-Oct-14 23:36	13-Oct-14 02:30			
Min Inc (deg) @ Depth (MD, ft)	0.59 @ 725.00	1.38 @ 4,935.00			
Max Inc (deg) @ Depth (MD, ft)	8.21 @ 1,559.00	85.80 @ 6,052.00			
Bit TFA(in2) / Bit Type	1.53 / PDC	0.88 / PDC			
Flow Rate (gpm)	765.60	508.52			
Max AV (fpm) / CV (fpm) @ MWD	NA / NA	NA / NA			
Fluid Type	Native	Polymer			
Density (ppg) / Viscosity (spqt)	8.50 / 27.00	10.00 / 60.00			
Filtrate CL (ppm)	NA	2,000.00			
pH / Fluid Loss (mptm)	8.00 / 0	9.00 / 0			
PV (cP) / YP (lbf2)	NA / NA	15 / 14.00			
% Solids / % Sand	2 / 0.25	10.00 / 0.25			
% Oil / Oil:Water Ratio	NA / NA	NA / NA			
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA			
Max Tool Temp (degF) @ Depth (MD, ft)	124.00 / PDC	170.07 / PDC			

Max Tool Temp (degF) / Source	124.30 / PCM	170.37 / PCM			
Rm @ Max Tool Temp (degF)	NA @ 124.30	NA @ 170.37			
Lead MWD Engineer	Scott Trowbridge	Scott Trowbridge			
Customer Representative	Kennith Wilkerson	Kennith Wilkerson			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404299	11404299			
Insert Serial Number	11400994	11227504			
Date and Time Initialized	09-Oct-14 20:50	11-Oct-14 15:44			
Date and Time Read	11-Oct-14 03:40	13-Oct-14 14:02			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	53.53	45.70			
Software Version	6.21	6.21			
Sub Serial Number	11404299	11404299			
Sonde Serial Number	11638567	11297622			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	49.66	274.29			

Gamma Ray Sensor Information

Tool Type		PCG			
Distance From Bit (ft)		50.65			
Recorded Sample Period (sec)		10			
Software Version		8.15			
Sub Serial Number		11404299			
Insert/Sonde Serial Number		11681029			

REMARKS

1. All depths are true vertical bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.

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

3. Critical annular velocities are calculated using the "Power Law" for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.

4. All data is stored data unless otherwise specified.

5. The following smoothing parameters have been applied to the data:

PCG Gamma Ray BCorr (PGRC)
Interval Resolution: .5
Interval Distance: .6
Gap Fill: 3

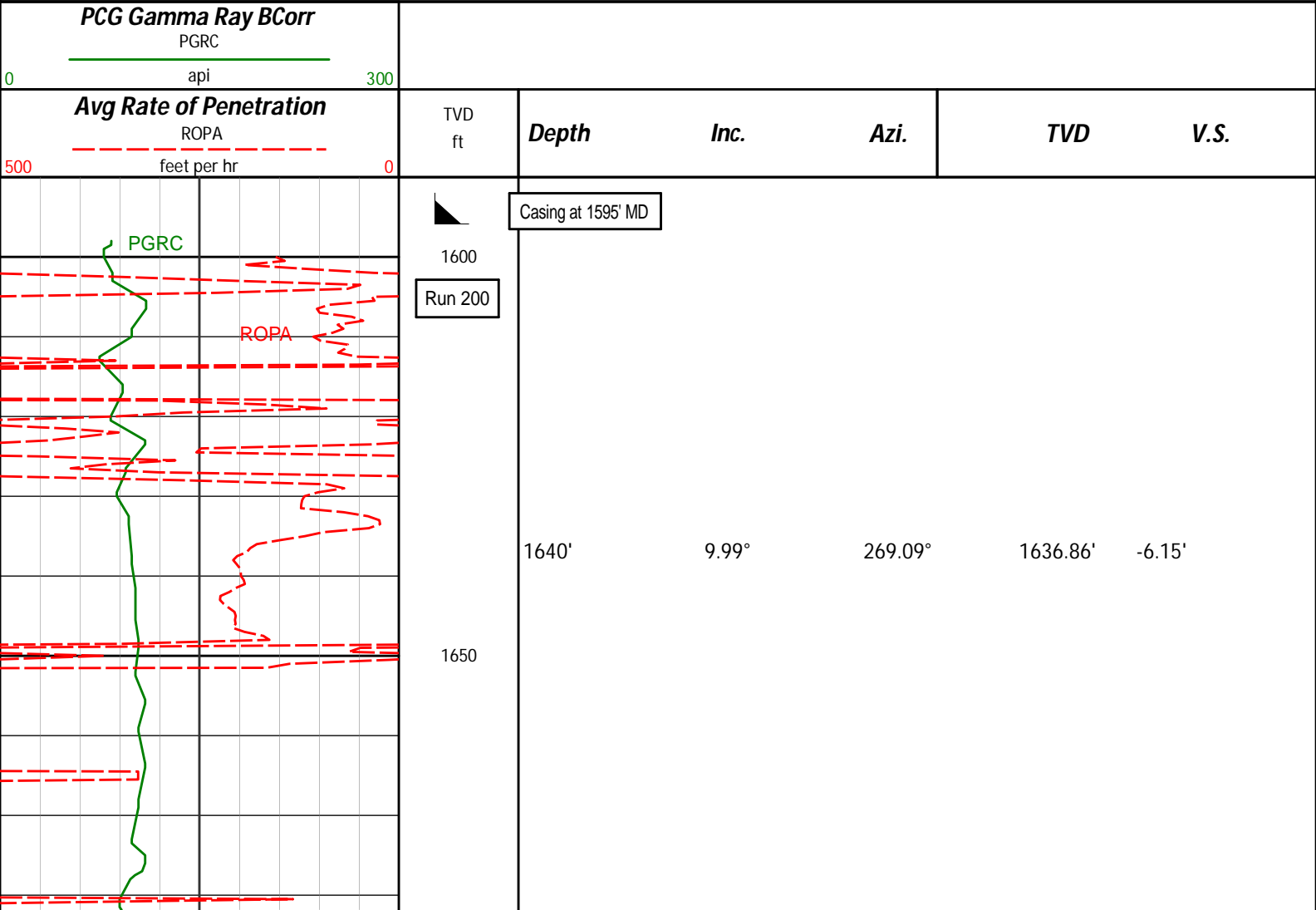
Average Rate of Penetration (ROPA)
Interval Resolution: .5
Interval Distance: 1.2
Gap Fill: 3

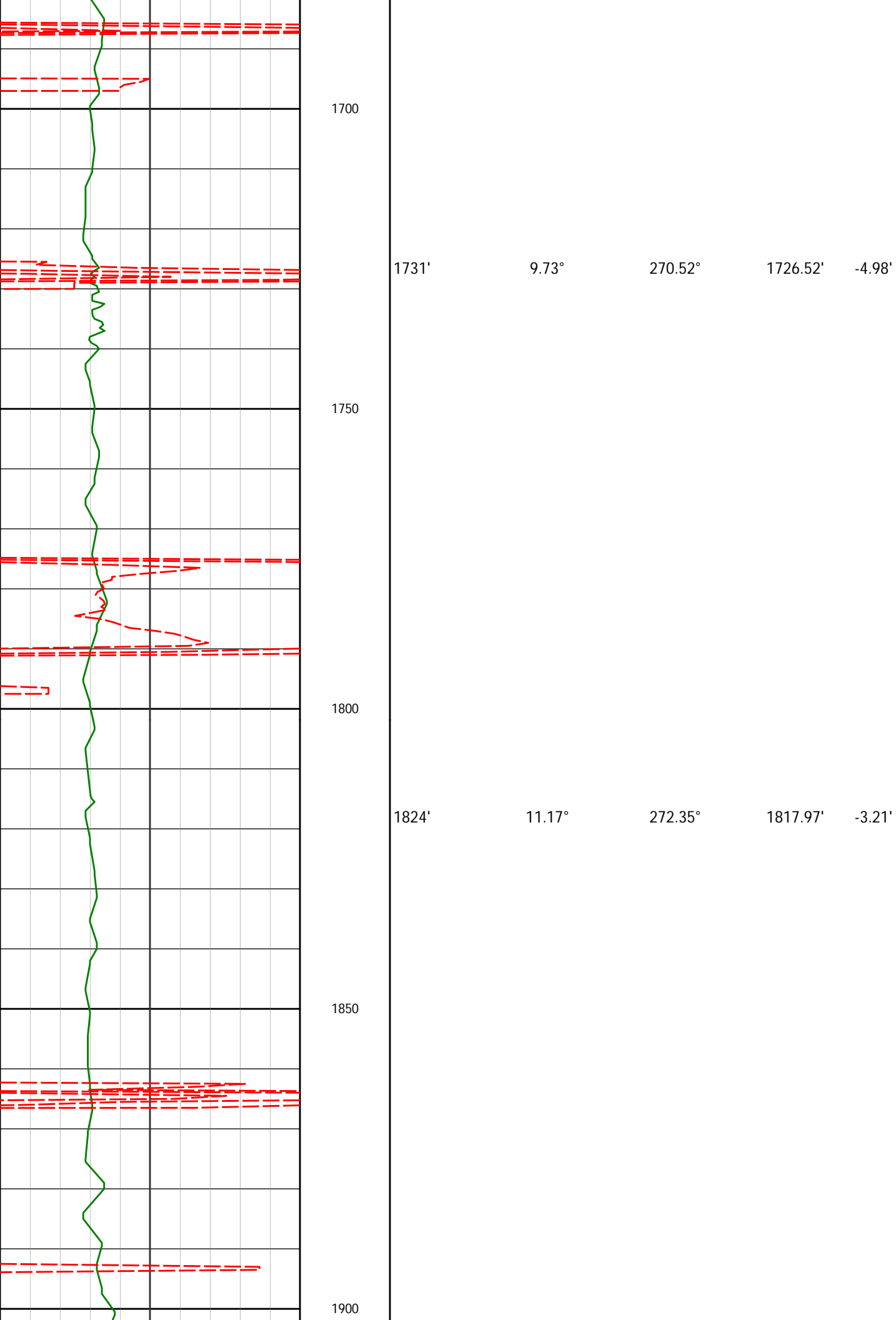
WARRANTY

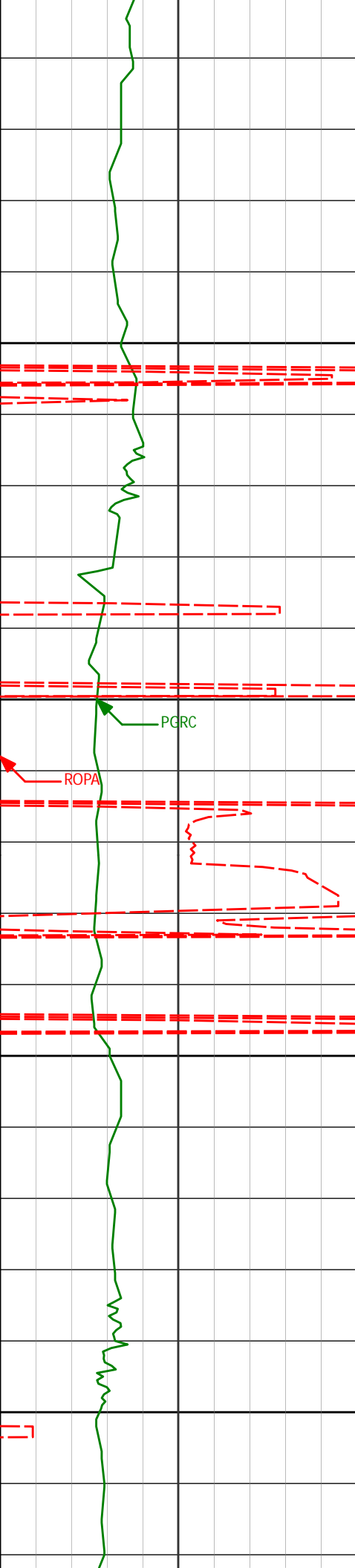
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HALLIBURTON
Sperry Drilling Services
TVD Main Log 1:240

Whiting Oil and Gas
Razor #27J-2209A
Frontier 26
Sec. 27-T10N-R58W







1915'

10.13°

268.08°

1907.40'

-1.79'

1950

2000

2006'

9.14°

263.78°

1997.12'

-1.64'

2050

2098'

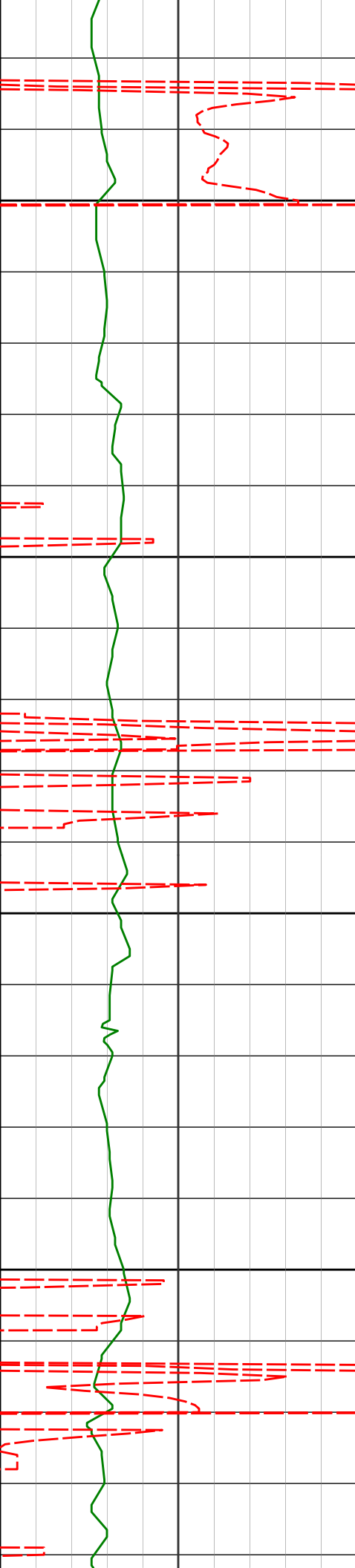
10.87°

268.55°

2087.72'

-1.38'

2100



2150

2189'

12.62°

267.85°

2176.81'

-0.51'

2200

2250

2281'

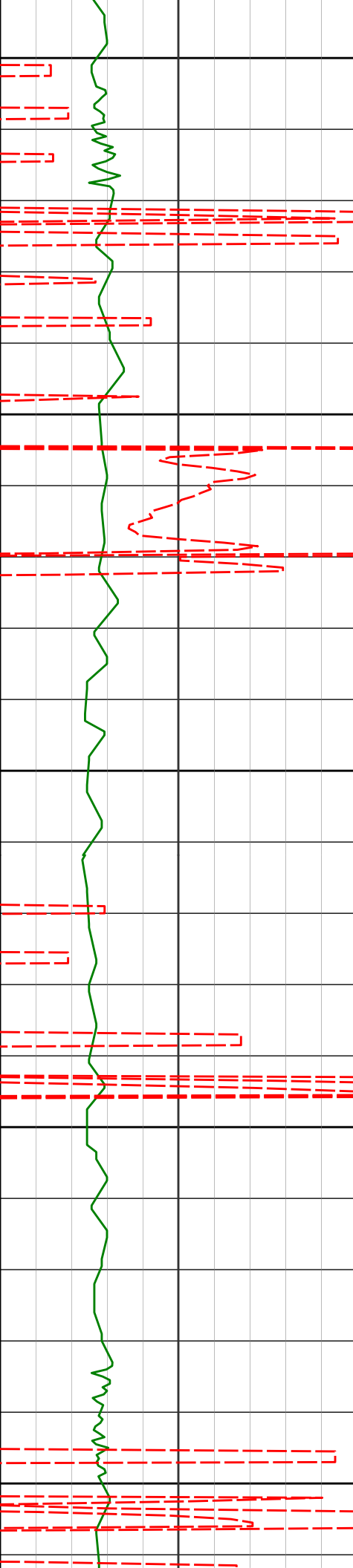
11.51°

267.22°

2266.78'

0.19'

2300



2350

2373'	10.75°	267.44°	2357.05'	0.76'
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2400

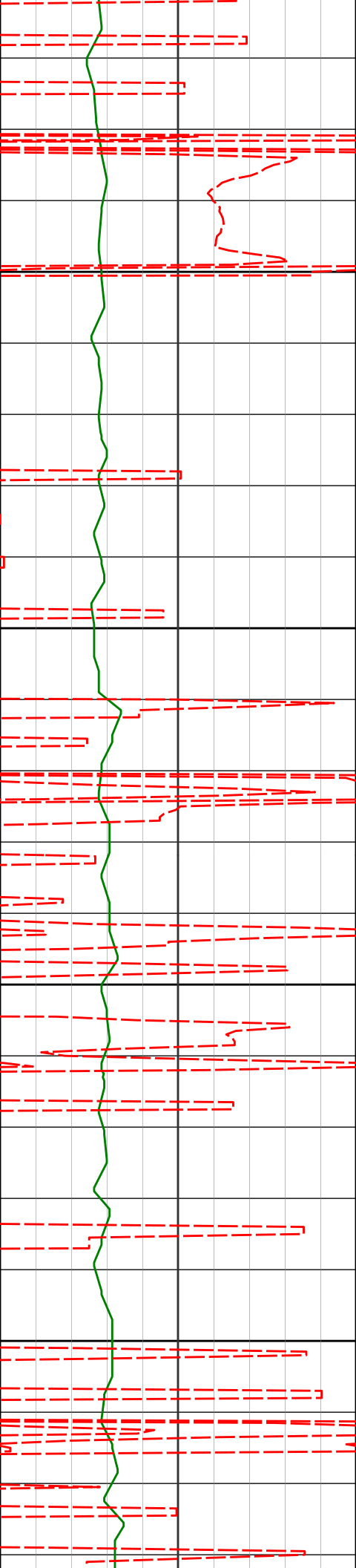
2450

2464'	10.74°	255.00°	2446.46'	-0.49'
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2500

2555'	10.60°	254.76°	2535.89'	-3.58'
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2550



2600

2650

2700

2750

2647'

12.61°

258.00°

2626.00'

-6.46'

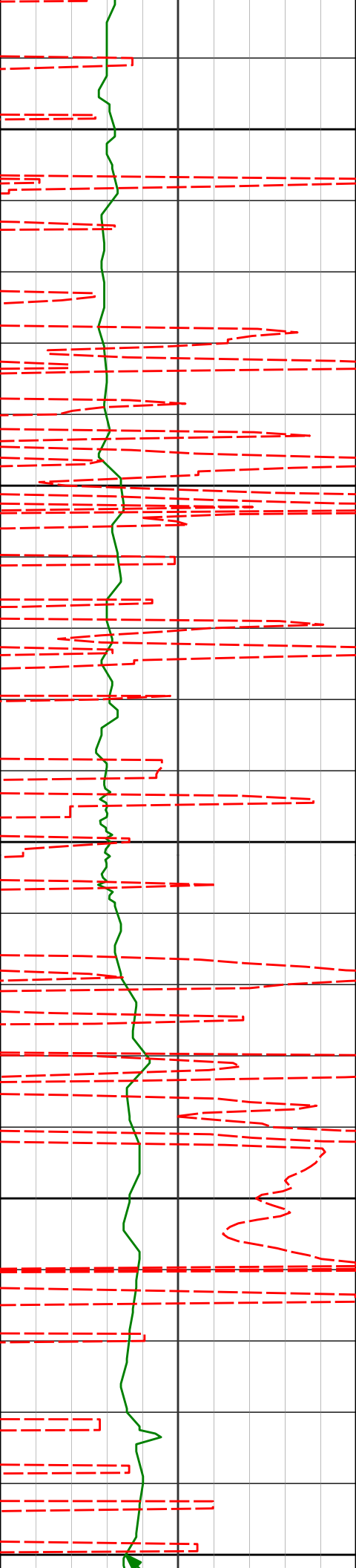
2738'

12.01°

257.30°

2714.91'

-9.10'



2800

2829'

11.51°

255.54°

2804.00'

-12.01'

2850

2900

2921'

10.67°

255.65°

2894.28'

-15.05'

2950

3013'

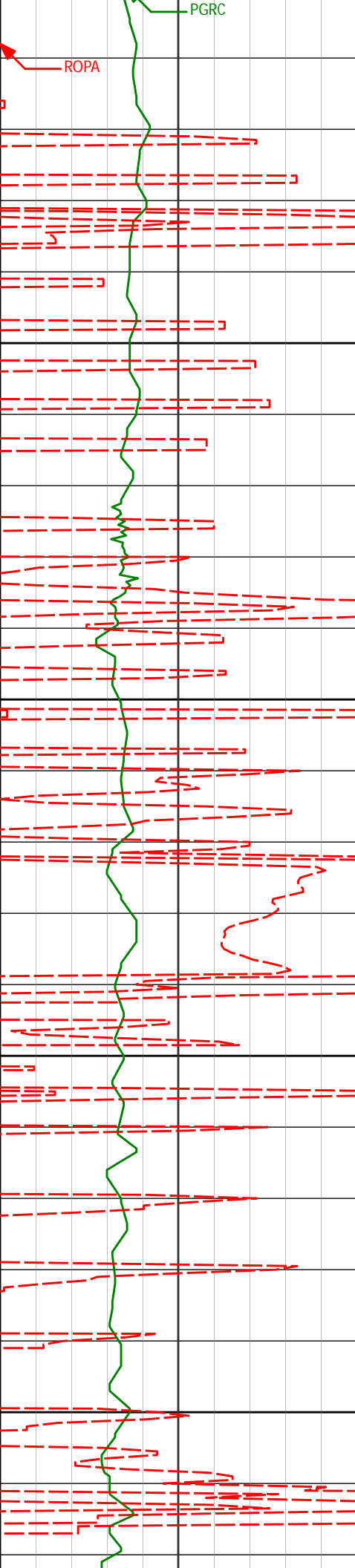
11.36°

260.01°

2984.59'

-17.36'

3000



3050

3104'

9.68°

260.62°

3074.06'

-18.86'

3100

3150

3195'

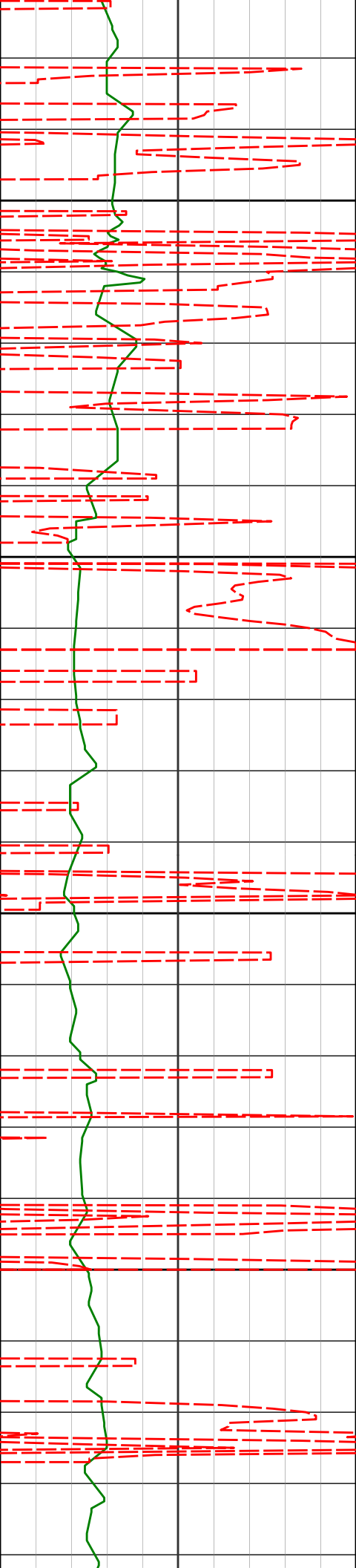
11.52°

262.45°

3163.50'

-19.99'

3200



3250

3288'

11.57°

261.71°

3254.62'

-21.09'

3300

3379'

12.66°

261.67°

3343.59'

-22.35'

3350

3400

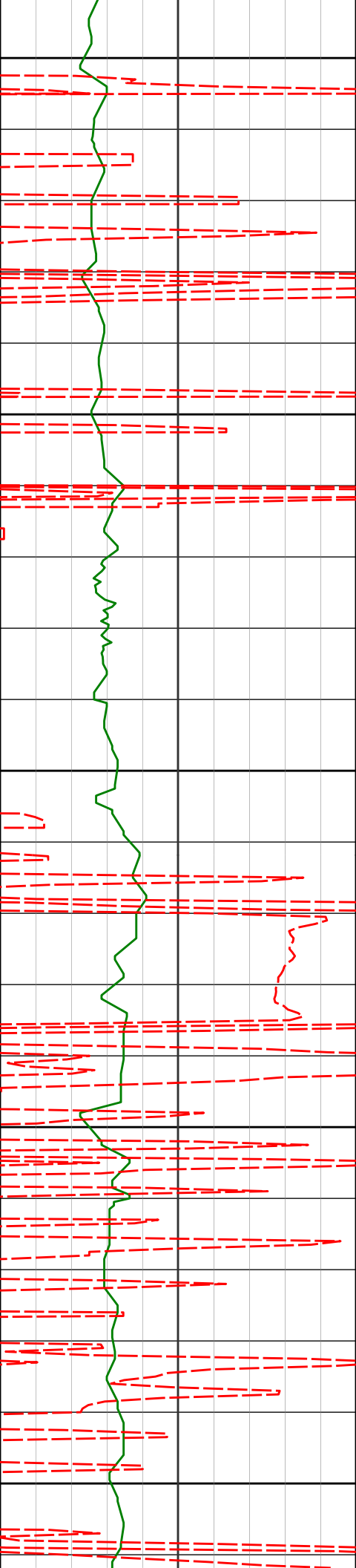
3471'

12.84°

259.21°

3433.32'

-24.13'



3450

3500

3550

3600

3650

3562'

13.58°

258.49°

3521.91'

-26.53'

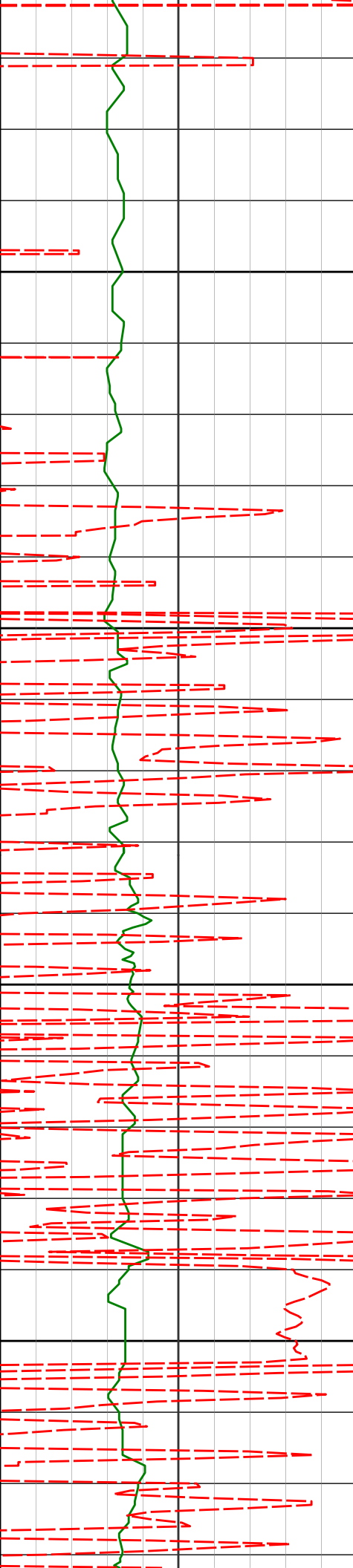
3653'

10.98°

261.73°

3610.83'

-28.39'



3700

3745'

10.75°

259.10°

3701.18'

-29.92'

3750

3800

3850

3836'

9.60°

256.26°

3790.74'

-32.07'

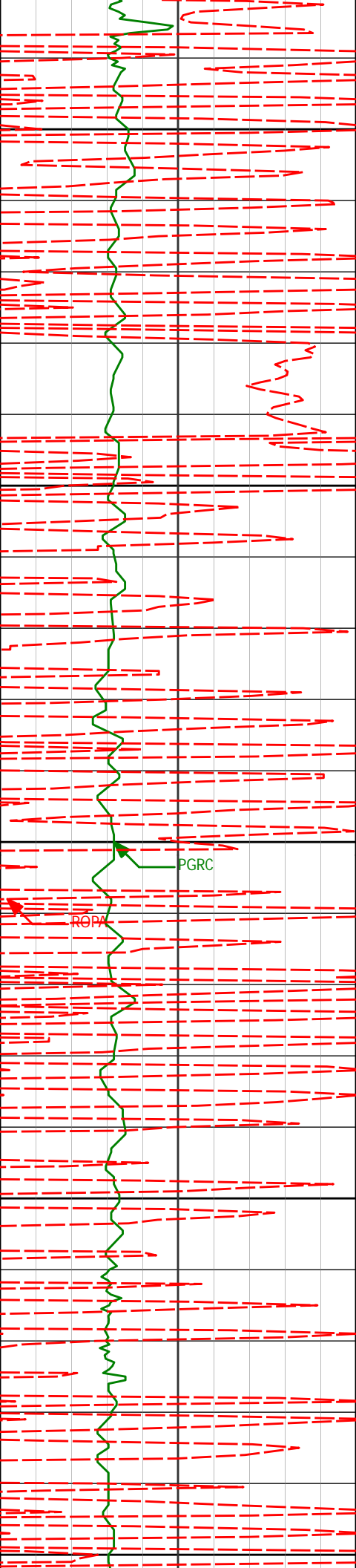
3928'

10.58°

259.89°

3881.32'

-34.12'



3900

3950

4000

4050

4100

4019'

11.49°

265.03°

3970.64'

-35.00'

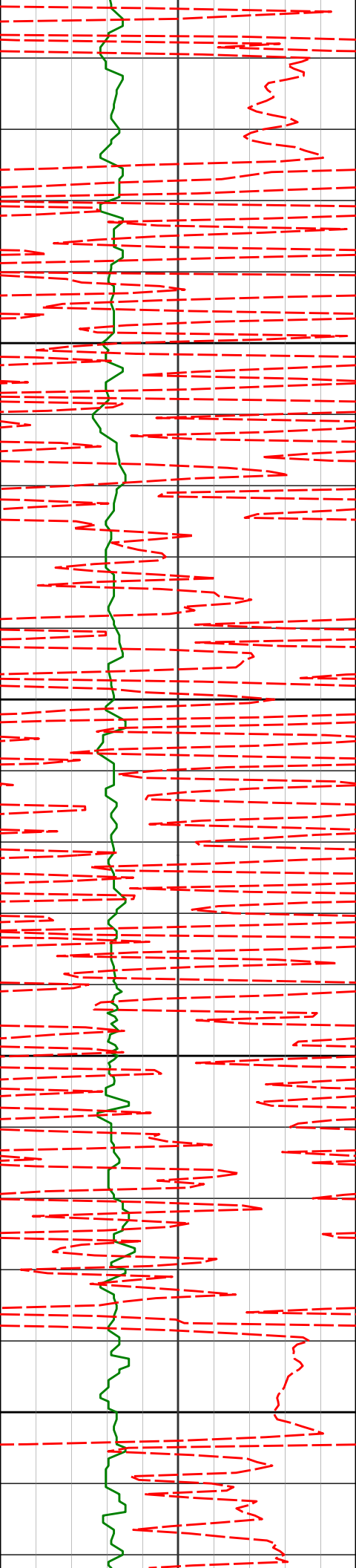
4111'

10.29°

264.89°

4060.98'

-35.16'



4150

4202'

11.69°

261.65°

4150.31'

-35.85'

4200

4293'

10.66°

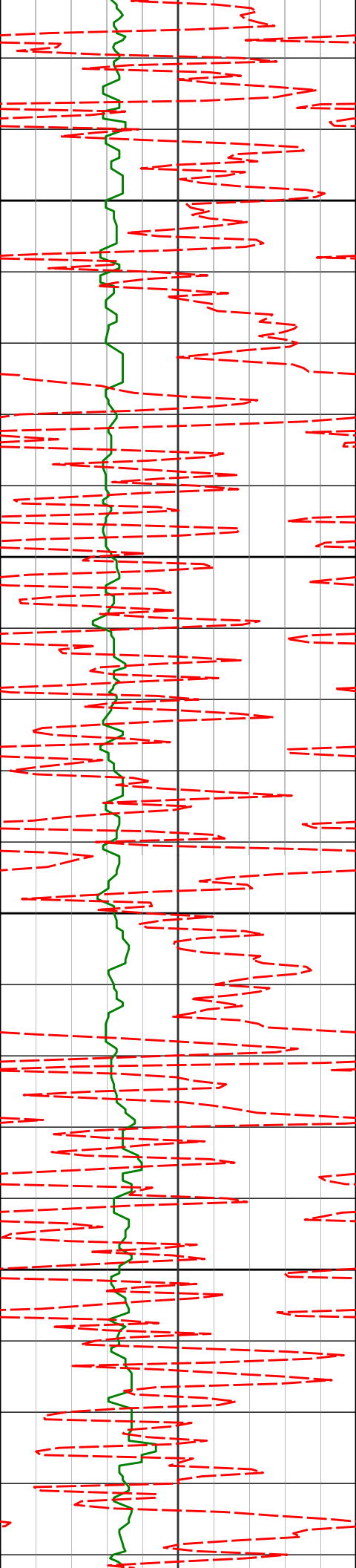
261.91°

4239.58'

-36.99'

4250

4300



4384'

10.63°

266.70°

4329.02'

-37.33'

4350

4400

4477'

9.03°

262.71°

4420.65'

-37.50'

4450

4500

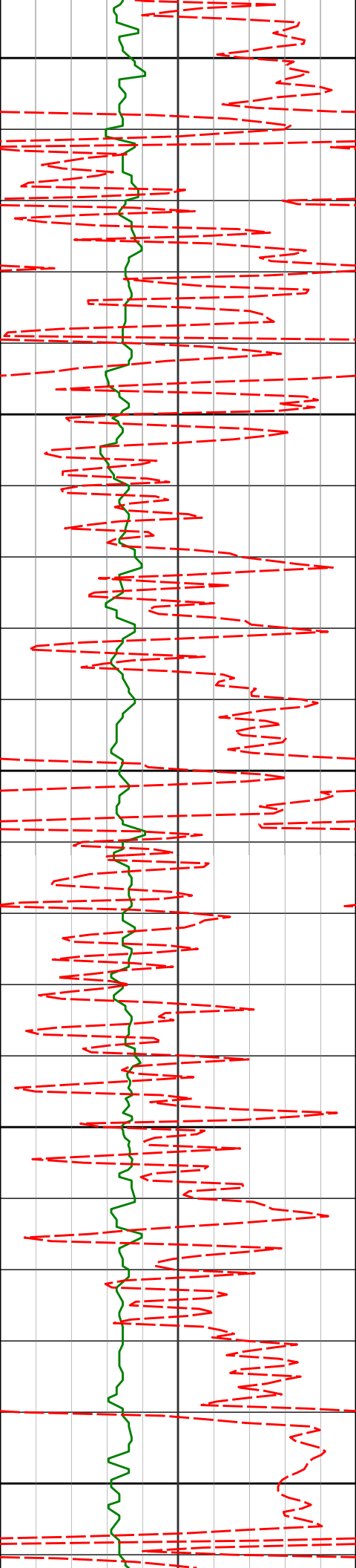
4567'

8.23°

260.70°

4509.63'

-38.38'



4550

4600

4650

4700

4750

4659'

6.93°

258.20°

4600.83'

-39.63'

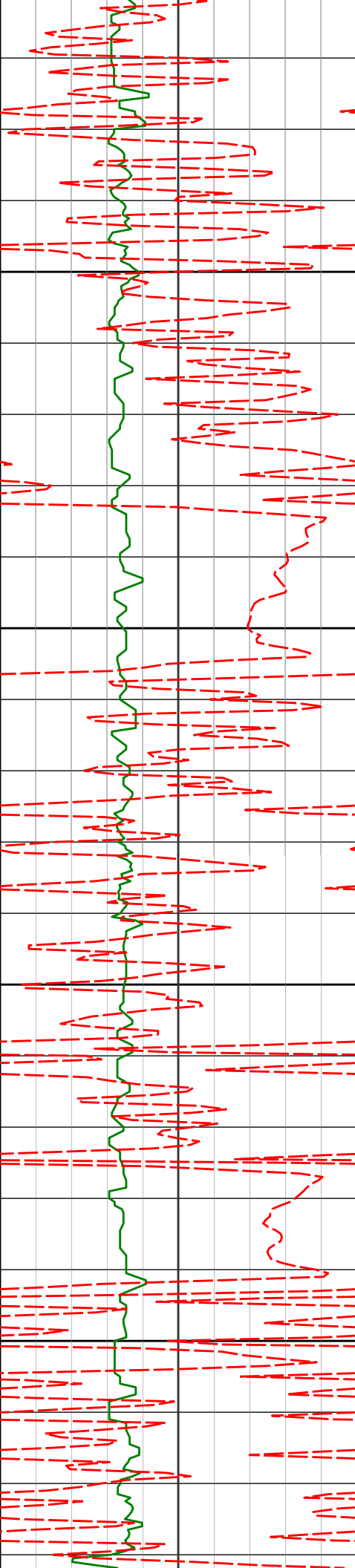
4751'

5.40°

256.75°

4692.29'

-40.99'



4843'

3.15°

260.21°

4784.03'

-41.87'

4800

4850

4935'

1.38°

329.06°

4875.97'

-41.11'

4900

4950

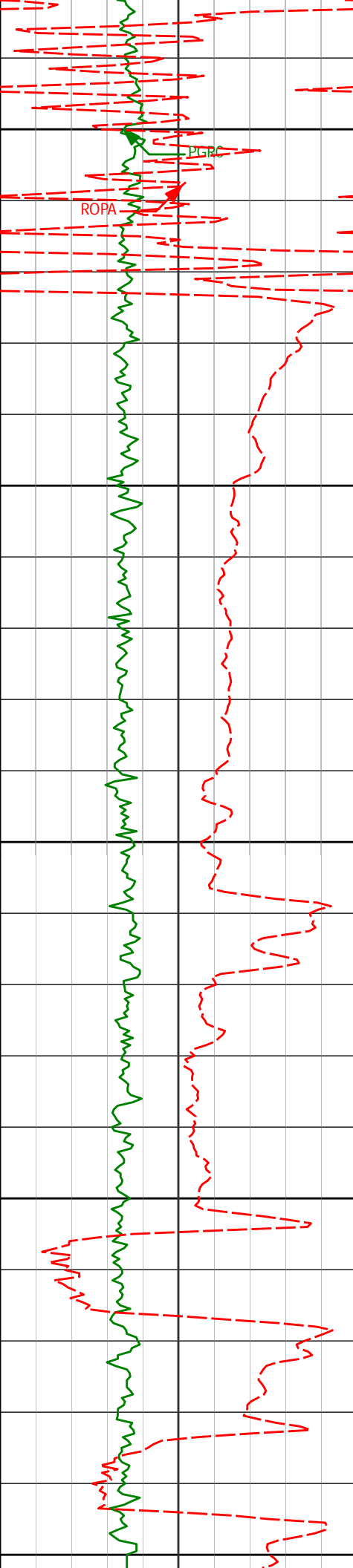
5026'

1.62°

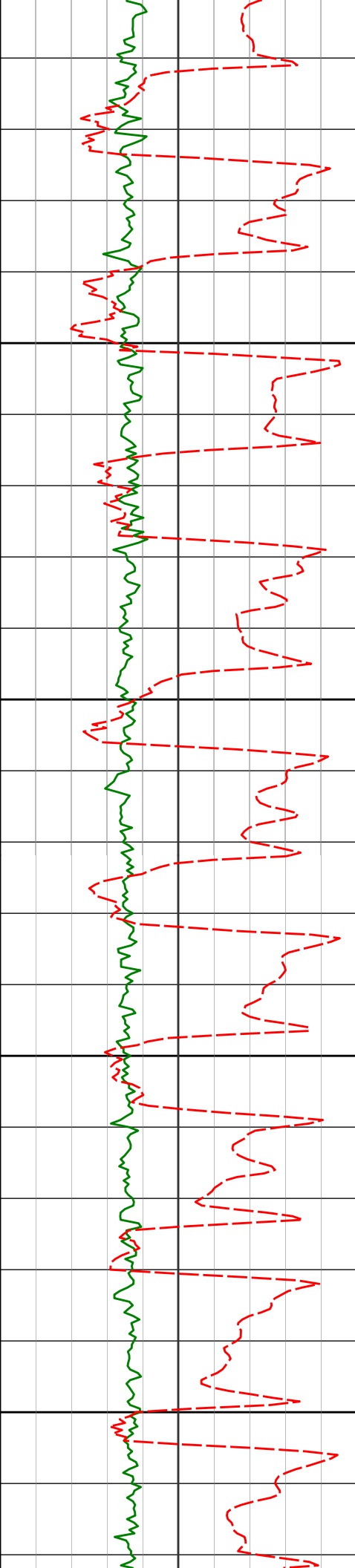
42.53°

4966.95'

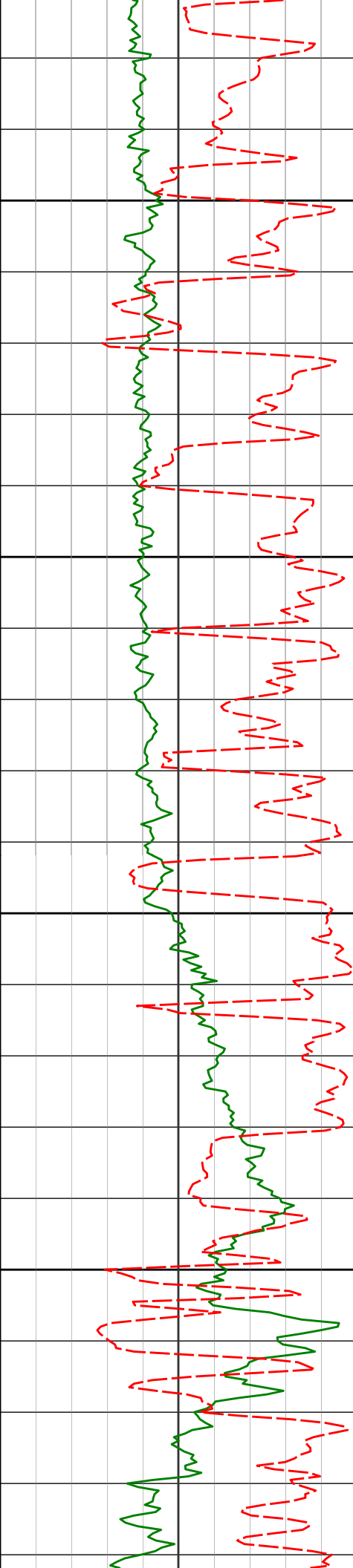
-39.25'



5000	5057'	1.69°	50.23°	4997.93'	-38.69'
	5088'	3.17°	25.27°	5028.90'	-37.69'
	KOP 5080' MD				
	5119'	6.71°	1.37°	5059.79'	-35.14'
	5149'	11.82°	354.58°	5089.39'	-30.32'
5100	5180'	16.08°	352.56°	5119.47'	-22.85'
	5210'	19.64°	354.07°	5148.02'	-13.66'
5150	5241'	21.73°	355.26°	5177.02'	-2.71'
5200					



5272'	23.80°	356.74°	5205.60'	9.28'
5302'	25.26°	357.79°	5232.89'	21.73'
5250				
5333'	26.53°	358.70°	5260.78'	35.25'
5363'	28.23°	358.55°	5287.42'	49.02'
5300				
5393'	29.78°	357.64°	5313.65'	63.56'
5424'	31.67°	356.19°	5340.30'	79.39'
5350				
5455'	33.94°	356.64°	5366.36'	96.18'
5486'	36.70°	357.47°	5391.65'	114.09'
5400				
5516'	40.02°	358.76°	5415.17'	132.69'



5450

5500

5550

5600

5547'	43.38°	359.51°	5438.31'	153.26'
5578'	46.19°	359.45°	5460.31'	175.05'
5609'	48.31°	359.45°	5481.35'	197.75'
5641'	51.27°	359.29°	5502.01'	222.13'
5673'	53.45°	359.03°	5521.55'	247.42'
5705'	56.16°	359.29°	5539.99'	273.51'
5736'	58.72°	359.72°	5556.67'	299.57'
5768'	61.25°	358.35°	5572.68'	327.22'
5799'	66.37°	358.81°	5586.36'	354.99'
5831'	71.71°	358.77°	5597.80'	384.81'
5863'	72.24°	359.21°	5607.70'	415.18'
5894'	73.02°	359.63°	5616.96'	444.70'
5926'	76.50°	359.98°	5625.37'	475.48'
5957'	79.21°	0.41°	5631.89'	505.68'
5989'	80.86°	0.56°	5637.43'	537.08'
6020'	82.92°	0.01°	5641.80'	567.66'

				5650		6020 6052'	82.72° 85.80°	0.01 359.99°	5641.80' 5644.94'	567.80' 599.40'	
TD Build @ 6100' MD											
<div><div>Avg Rate of Penetration</div><div>ROPA</div><div>-----</div><div>500feet per hr0</div></div>						TVD ft	Depth	Inc.	Azi.	TVD	V.S.
<div><div>PCG Gamma Ray BCorr</div><div>PGRC</div><div>-----</div><div>0api300</div></div>											

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DIRECTIONAL SURVEY REPORT

Whiting Oil and Gas
Razor 27J-2209A
Redtail
Weld Colorado
USA
CA-XX-0901619288
Surveys are Sag, IFR and MS corrected.

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
175.00	0.60	124.76	175.00	0.52 S	0.75 E	-0.58	0.34
266.00	0.84	124.27	265.99	1.17 S	1.70 E	-1.30	0.26
357.00	0.97	128.19	356.98	2.02 S	2.85 E	-2.24	0.16
449.00	1.78	142.58	448.95	3.64 S	4.33 E	-3.97	0.95
541.00	0.92	165.11	540.93	5.49 S	5.39 E	-5.90	1.08
633.00	0.80	168.46	632.91	6.83 S	5.71 E	-7.26	0.14
725.00	0.59	173.46	724.91	7.93 S	5.89 E	-8.37	0.24
817.00	0.62	166.37	816.90	8.88 S	6.06 E	-9.33	0.09
909.00	0.63	161.35	908.90	9.85 S	6.34 E	-10.32	0.06
1001.00	1.13	256.83	1000.89	10.53 S	5.62 E	-10.94	1.46
1092.00	2.08	266.38	1091.85	10.84 S	3.10 E	-11.05	1.08
1184.00	2.73	280.35	1183.77	10.55 S	0.72 W	-10.46	0.95
1276.00	4.01	276.38	1275.61	9.80 S	6.08 W	-9.29	1.41
1368.00	5.40	274.55	1367.30	9.10 S	13.59 W	-8.00	1.52
1459.00	7.05	267.83	1457.76	8.97 S	23.44 W	-7.09	1.98
1550.00	8.04	266.69	1547.97	9.55 S	35.37 W	-6.73	1.10
1559.00	8.21	266.52	1556.88	9.63 S	36.64 W	-6.70	1.91
1640.00	9.99	269.09	1636.86	10.09 S	49.44 W	-6.15	2.25
1731.00	9.73	270.52	1726.52	10.15 S	65.02 W	-4.98	0.39
1824.00	11.17	272.35	1817.97	9.70 S	81.88 W	-3.21	1.59
1915.00	10.13	268.08	1907.40	9.61 S	98.69 W	-1.79	1.43
2006.00	9.14	263.78	1997.12	10.66 S	113.87 W	-1.64	1.34
2098.00	10.87	268.55	2087.72	11.67 S	129.81 W	-1.38	2.08
2189.00	12.62	267.85	2176.81	12.26 S	148.32 W	-0.51	1.93
2281.00	11.51	267.22	2266.78	13.09 S	167.53 W	0.19	1.21
2373.00	10.75	267.44	2357.05	13.91 S	185.27 W	0.76	0.83
2464.00	10.74	255.00	2446.46	16.49 S	201.94 W	-0.49	2.54
2555.00	10.60	254.76	2535.89	20.88 S	218.21 W	-3.58	0.16
2647.00	12.61	258.00	2626.00	25.20 S	236.20 W	-6.46	2.30
2738.00	12.01	257.30	2714.91	29.34 S	255.15 W	-9.10	0.68
2829.00	11.51	255.54	2804.00	33.69 S	273.18 W	-12.01	0.68
2921.00	10.67	255.65	2894.28	38.09 S	290.32 W	-15.05	0.91
3013.00	11.36	260.01	2984.59	41.78 S	307.49 W	-17.36	1.18
3104.00	9.68	260.62	3074.06	44.58 S	323.87 W	-18.86	1.85
3195.00	11.52	262.45	3163.50	47.02 S	340.43 W	-19.99	2.06
3288.00	11.57	261.71	3254.62	49.59 S	358.86 W	-21.09	0.17
3379.00	12.66	261.67	3343.59	52.35 S	377.76 W	-22.35	1.20
3471.00	12.84	259.21	3433.32	55.72 S	397.78 W	-24.13	0.62
3562.00	13.58	258.49	3521.91	59.74 S	418.18 W	-26.53	0.83
3653.00	10.98	261.73	3610.83	63.12 S	437.23 W	-28.39	2.95

3745.00	10.75	259.10	3701.18	66.01 S	454.32 W	-29.92	0.59
3836.00	9.60	256.26	3790.74	69.41 S	470.03 W	-32.07	1.38
3928.00	10.58	259.89	3881.32	72.72 S	485.80 W	-34.12	1.27
4019.00	11.49	265.03	3970.64	74.97 S	503.05 W	-35.00	1.47
4111.00	10.29	264.89	4060.98	76.50 S	520.36 W	-35.16	1.30
4202.00	11.69	261.65	4150.31	78.56 S	537.58 W	-35.85	1.68
4293.00	10.66	261.91	4239.58	81.08 S	555.04 W	-36.99	1.13
4384.00	10.63	266.70	4329.02	82.75 S	571.75 W	-37.33	0.97
4477.00	9.03	262.71	4420.65	84.17 S	587.55 W	-37.50	1.87
4567.00	8.23	260.70	4509.63	86.11 S	600.92 W	-38.38	0.95
4659.00	6.93	258.20	4600.83	88.31 S	612.85 W	-39.63	1.46
4751.00	5.40	256.75	4692.29	90.43 S	622.49 W	-40.99	1.67
4843.00	3.15	260.21	4784.03	91.86 S	629.20 W	-41.87	2.46
4935.00	1.38	329.06	4875.97	91.34 S	632.26 W	-41.11	3.20
5026.00	1.62	42.53	4966.95	89.45 S	631.96 W	-39.25	1.98
5057.00	1.69	50.23	4997.93	88.83 S	631.31 W	-38.69	0.75
5088.00	3.17	25.27	5028.90	87.76 S	630.59 W	-37.69	5.76
5119.00	6.71	1.37	5059.79	85.18 S	630.18 W	-35.14	12.97
5149.00	11.82	354.58	5089.39	80.36 S	630.43 W	-30.32	17.39
5180.00	16.08	352.56	5119.47	72.94 S	631.29 W	-22.85	13.83
5210.00	19.64	354.07	5148.02	63.80 S	632.34 W	-13.66	11.97
5241.00	21.73	355.26	5177.02	52.90 S	633.36 W	-2.71	6.88
5272.00	23.80	356.74	5205.60	40.94 S	634.19 W	9.28	6.93
5302.00	25.26	357.79	5232.89	28.50 S	634.78 W	21.73	5.08
5333.00	26.53	358.70	5260.78	14.97 S	635.19 W	35.25	4.29
5363.00	28.23	358.55	5287.42	1.17 S	635.52 W	49.02	5.67
5393.00	29.78	357.64	5313.65	13.36 N	636.01 W	63.56	5.37
5424.00	31.67	356.19	5340.30	29.18 N	636.87 W	79.39	6.55
5455.00	33.94	356.64	5366.36	45.94 N	637.91 W	96.18	7.36
5486.00	36.70	357.47	5391.65	63.84 N	638.83 W	114.09	9.04
5516.00	40.02	358.76	5415.17	82.44 N	639.44 W	132.69	11.38
5547.00	43.38	359.51	5438.31	103.06 N	639.74 W	153.26	10.96
5578.00	46.19	359.45	5460.31	124.89 N	639.94 W	175.05	9.07
5609.00	48.31	359.45	5481.35	147.65 N	640.16 W	197.75	6.84
5641.00	51.27	359.29	5502.01	172.09 N	640.43 W	222.13	9.26
5673.00	53.45	359.03	5521.55	197.42 N	640.80 W	247.42	6.84
5705.00	56.16	359.29	5539.99	223.57 N	641.18 W	273.51	8.49
5736.00	58.72	359.72	5556.67	249.69 N	641.41 W	299.57	8.34
5768.00	61.25	358.35	5572.68	277.39 N	641.88 W	327.22	8.73
5799.00	66.37	358.81	5586.36	305.19 N	642.57 W	354.99	16.57
5831.00	71.71	358.77	5597.80	335.06 N	643.20 W	384.81	16.69
5863.00	72.24	359.21	5607.70	365.48 N	643.73 W	415.18	2.11
5894.00	73.02	359.63	5616.96	395.07 N	644.03 W	444.70	2.83
5926.00	76.50	359.98	5625.37	425.94 N	644.14 W	475.48	10.93
5957.00	79.21	0.41	5631.89	456.24 N	644.03 W	505.68	8.85
5989.00	80.86	0.56	5637.43	487.75 N	643.77 W	537.08	5.18
6020.00	82.92	0.01	5641.80	518.44 N	643.61 W	567.66	6.87
6052.00	85.80	359.99	5644.94	550.28 N	643.61 W	599.40	9.00

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 355.47 DEGREES (TRUE)
A TOTAL CORRECTION OF 7.52 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6052.00 FEET
IS 846.79 FEET ALONG 310.53 DEGREES (TRUE)**

Tie onto surface at 0' MD