

**Company : NOBLE ENERGY INC**  
**Well : WELLS RANCH AE19-626**  
**Field : WATTENBERG**

**Date : 17-Dec-2014**  
**Time : 14:51**



A Schlumberger Company

GAMMA-RAY

2" = 100'

FEET TVD

COMPANY : NOBLE ENERGY INC  
WELL : WELLS RANCH AE19-626  
FIELD : WATTENBERG  
COUNTY : WELD  
STATE : CO  
COUNTRY : USA  
API No. : 05-123-39634

COMPANY : NOBLE ENERGY INC  
WELL : WELLS RANCH AE19-626  
FIELD : WATTENBERG  
COUNTY : WELD  
STATE : CO  
COUNTRY : USA  
API WELL No. : 05-123-39634

WELL LOCATION  
LAT:40°28'9"N LON:104°21'21"  
X:3318318' Y:1415853'  
SEC:24 TWP:6N 63W RANGE:

OTHER SERVICES

DIRECTIONAL  
ROP

DEPTH REF. : ROTARY TABLE  
ELEVATION : 4816.00 ft (ROTARY TABLE - MEAN SEA LEVEL)  
ALTITUDE : 4786.00 ft (GROUND LEVEL - MEAN SEA LEVEL)

BOREHOLE RECORD

DEVIATION RECORD

HOLE SIZE in	FROM ft	TO ft	INCLINATION deg	FROM ft	TO ft
13 1/2	0	733	00 +/-2	0	1600
8 3/4	733	6937	11 +/-2	1600	6000
6 1/8	6937	11482	11-90	6000	7078
			90 +/-5	7078	11842

CASING RECORD

CASING SIZE in	FROM ft	TO ft	DRILLING Co.: H&P RIG : 330 LMD UNIT No.: N/A SPUD DATE : 10-DEC-14 DISTRICT : COO LMD START DATE : 11-DEC-14 LMD END DATE : 16-DEC-14 TOTAL DEPTH : ft
9 5/8	0	723	
7	723	6946	

RUN DATA

RUN NUMBER	1	2			
START DATE	11-DEC-14	14-DEC-14			
START TIME	6:45	09:30			
END DATE	13-DEC-14	16-DEC-14			
END TIME	02:00	23:30			
DEPTH IN ft	653	6937			
DEPTH OUT ft	6937	11482			
LOG TOP ft	653	6900			
LOG BOTTOM ft	6897	11800			
HOLE SIZE in	8 3/4	6 1/8			
MUD DATA @ ft	1584	10637			
MUD TYPE	WATER BASED	WATER BASED			
DENSITY lb/gal	8.40	9.50			
VISCOSITY s/qt	26	35			
pH	10.2	9.8			
FLUID LOSS cm3/30		7.5			
SALINITY ppm	1900	2300			
Rm ohmm @ deg F	@	@			
Rmf ohmm @ deg F	@	@			

MAX REC TEMP deg F	80					
Rm @ MAX TEMP ohmm						
LWD ENGINEER #1	N.COOPER	N. COOPER				
LWD ENGINEER #2	D.LIPCOVSKI	T. BRIGGS				
LWD ENGINEER #3						

REMARKS

NOBLE ENERGY INC. AFE# 200468

PATHFINDER JOB #: 14CC00717

ALL LOGGING DATA IS TRANSMITTED ONLY UNLESS STATED OTHERWISE.

ALL REFERENCES TO LOG TOP, LOG BOTTOM, OR LOGGING TOOL DEPTH REFER TO GAMMA-RAY SENSOR UNLESS STATED OTHERWISE.

ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH.

THIRD PARTY DEPTH TRACKING SERVICES ARE PROVIDED BY PASON.

RUN #1: 6 3/4" HDS1-R/GAMMA LOGGING RUN.

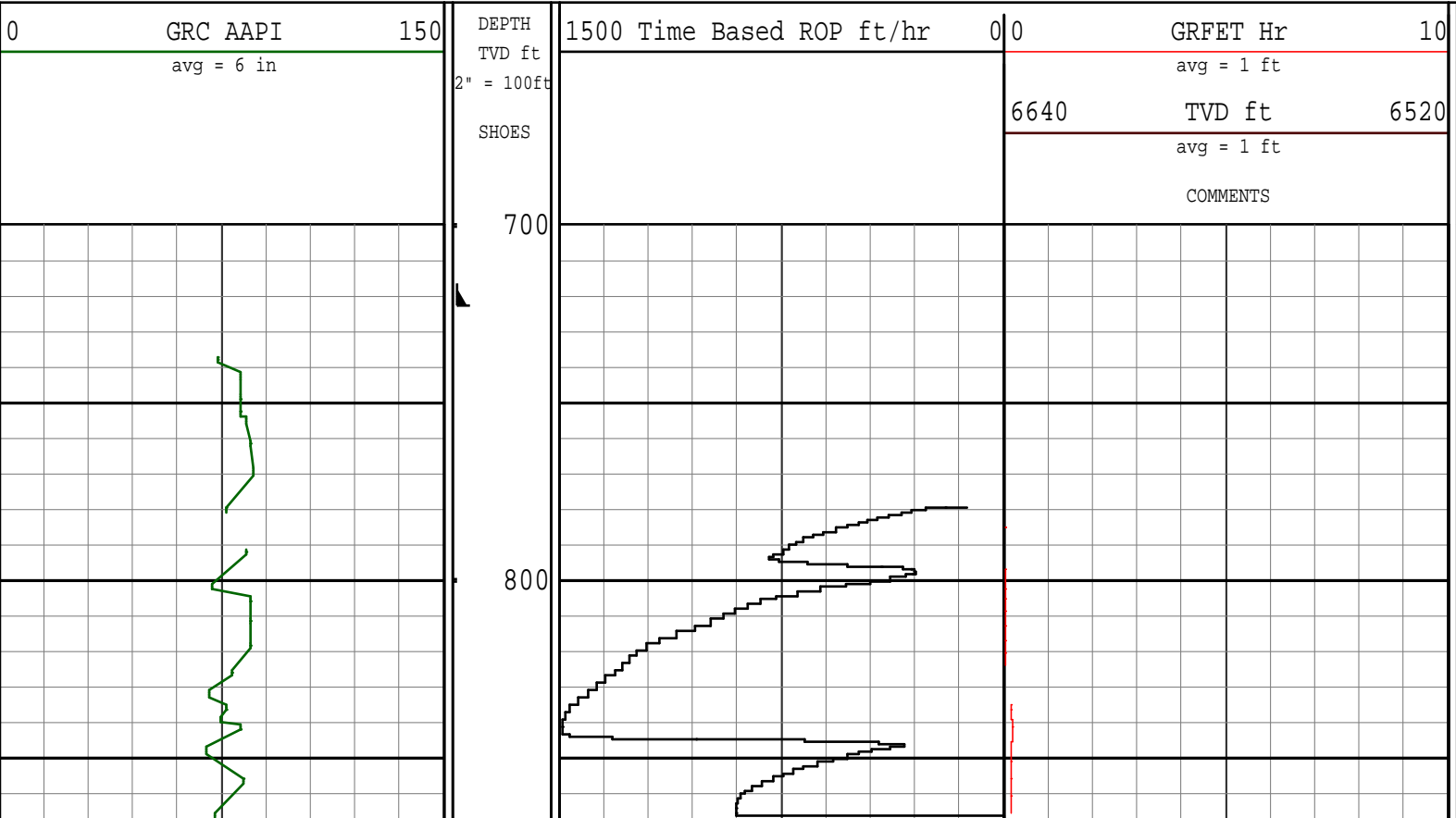
RUN #2: 4 3/4" HDS-1R/GAMMA LOGGING RUN.

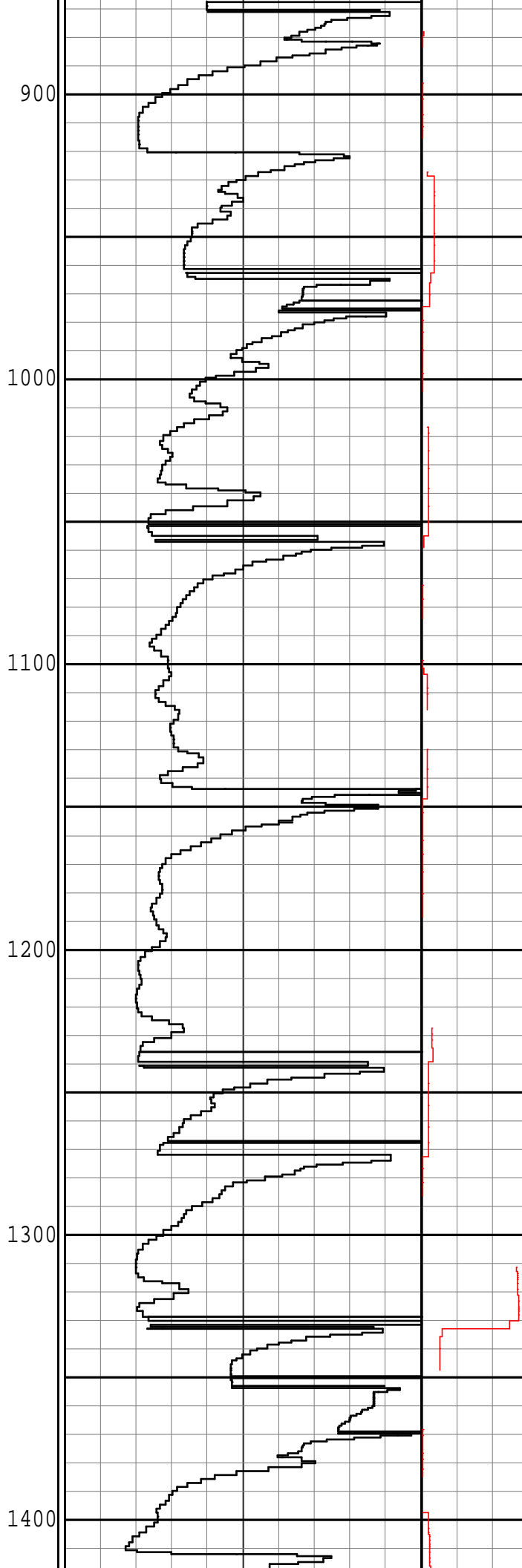
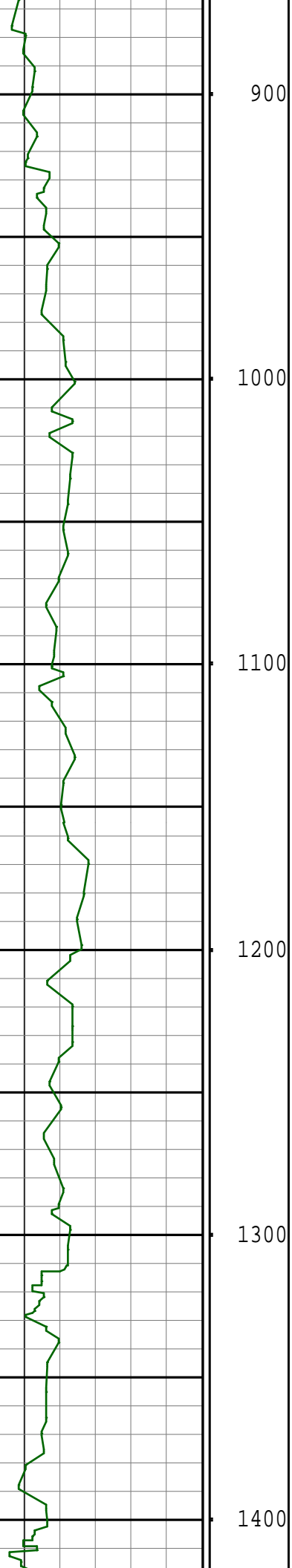
NOTICE - All interpretations are opinions based on inferences from electrical or other measurements and we do not guarantee the accuracy or correctness of any interpretations. We shall not, except in the case of gross or willful negligence on our part, be liable or responsible for loss, costs, damages or expenses incurred or sustained by anyone as a result of any interpretations made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

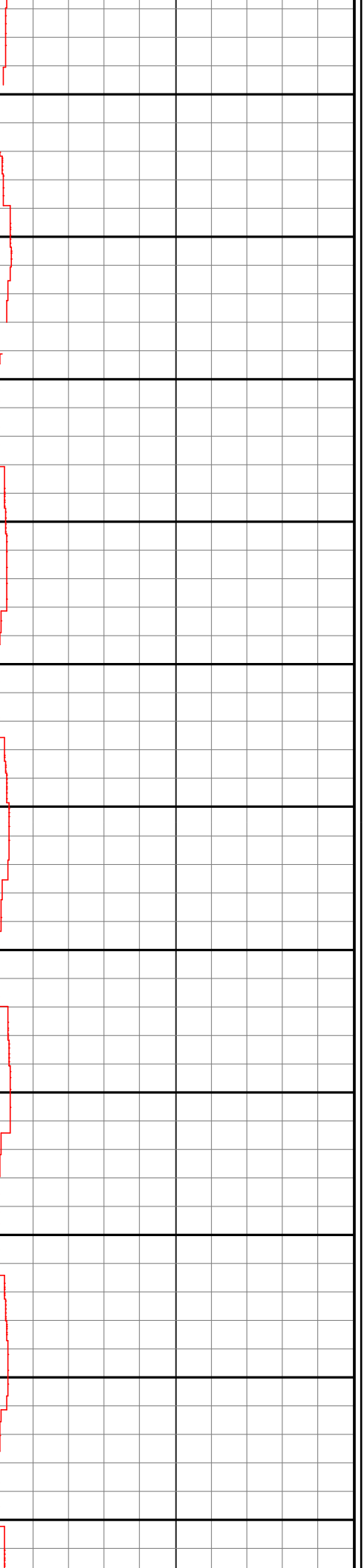
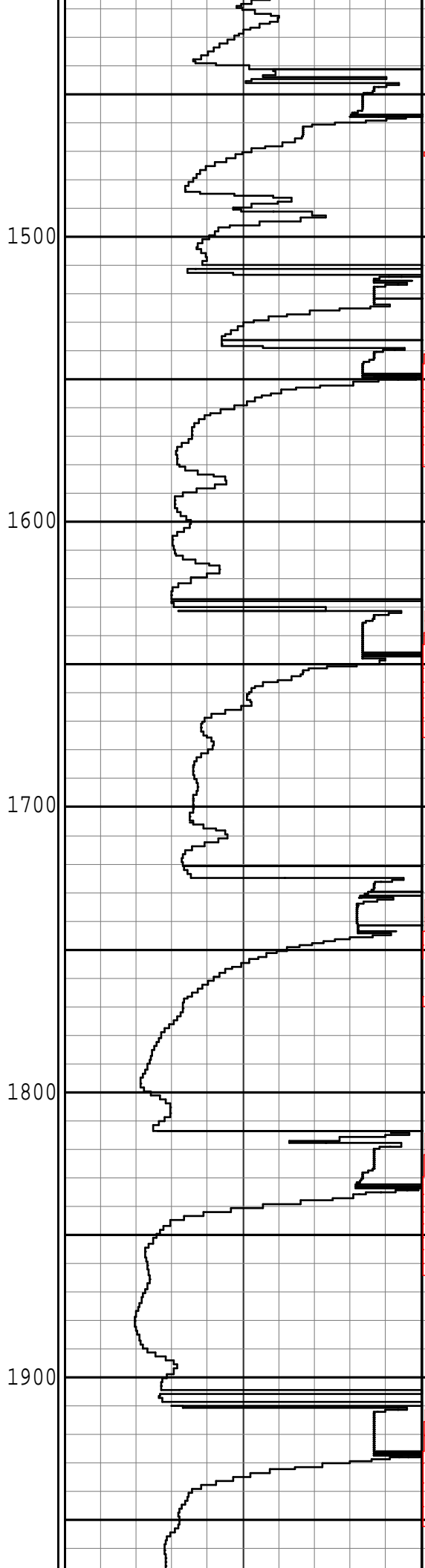
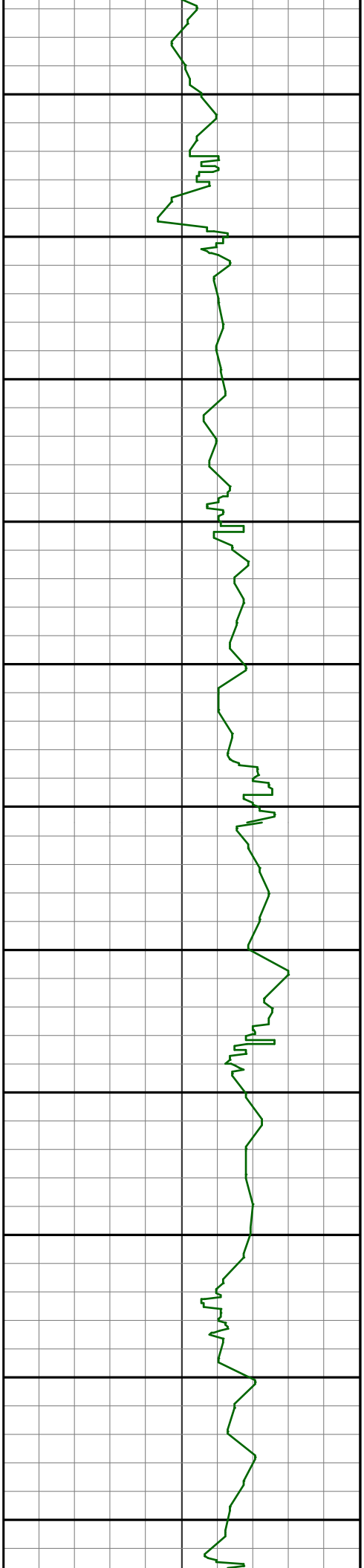
PATHFINDER - A Schlumberger Company

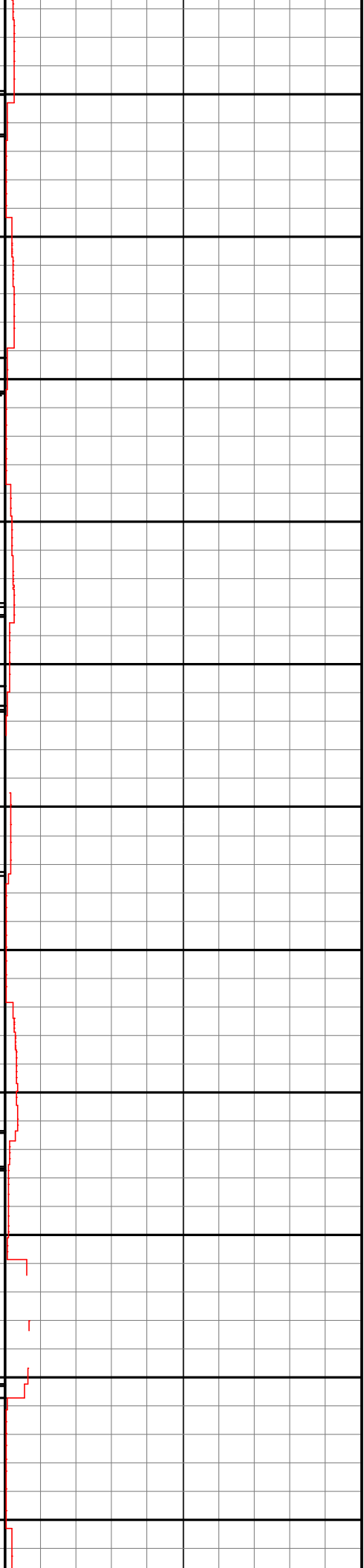
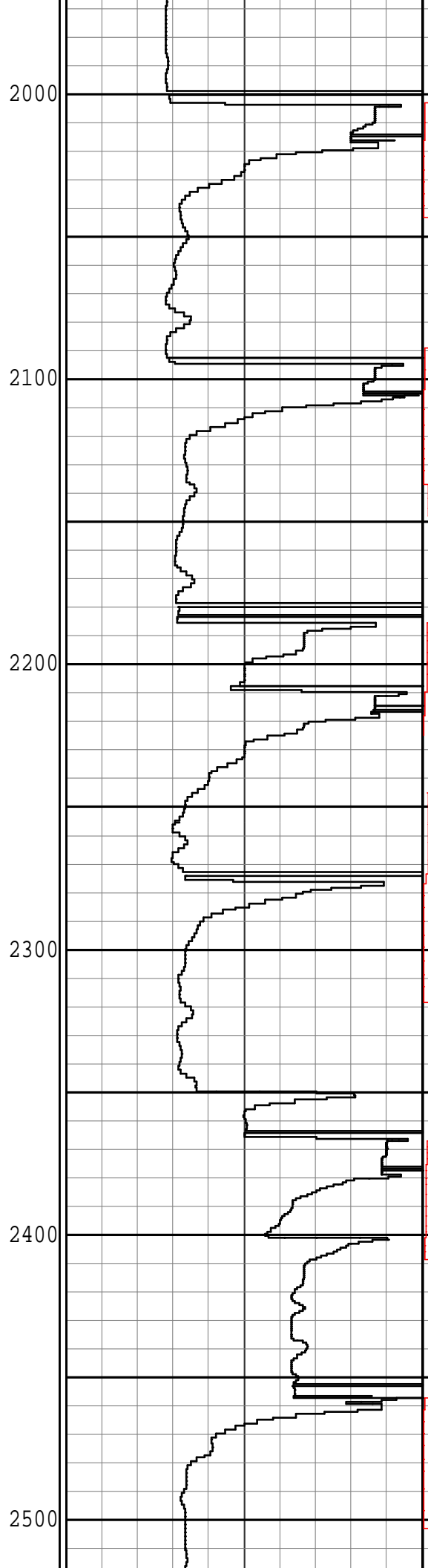
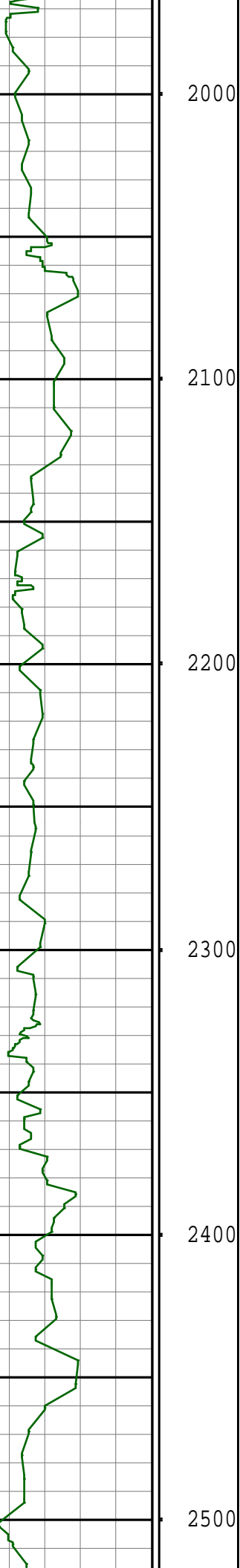
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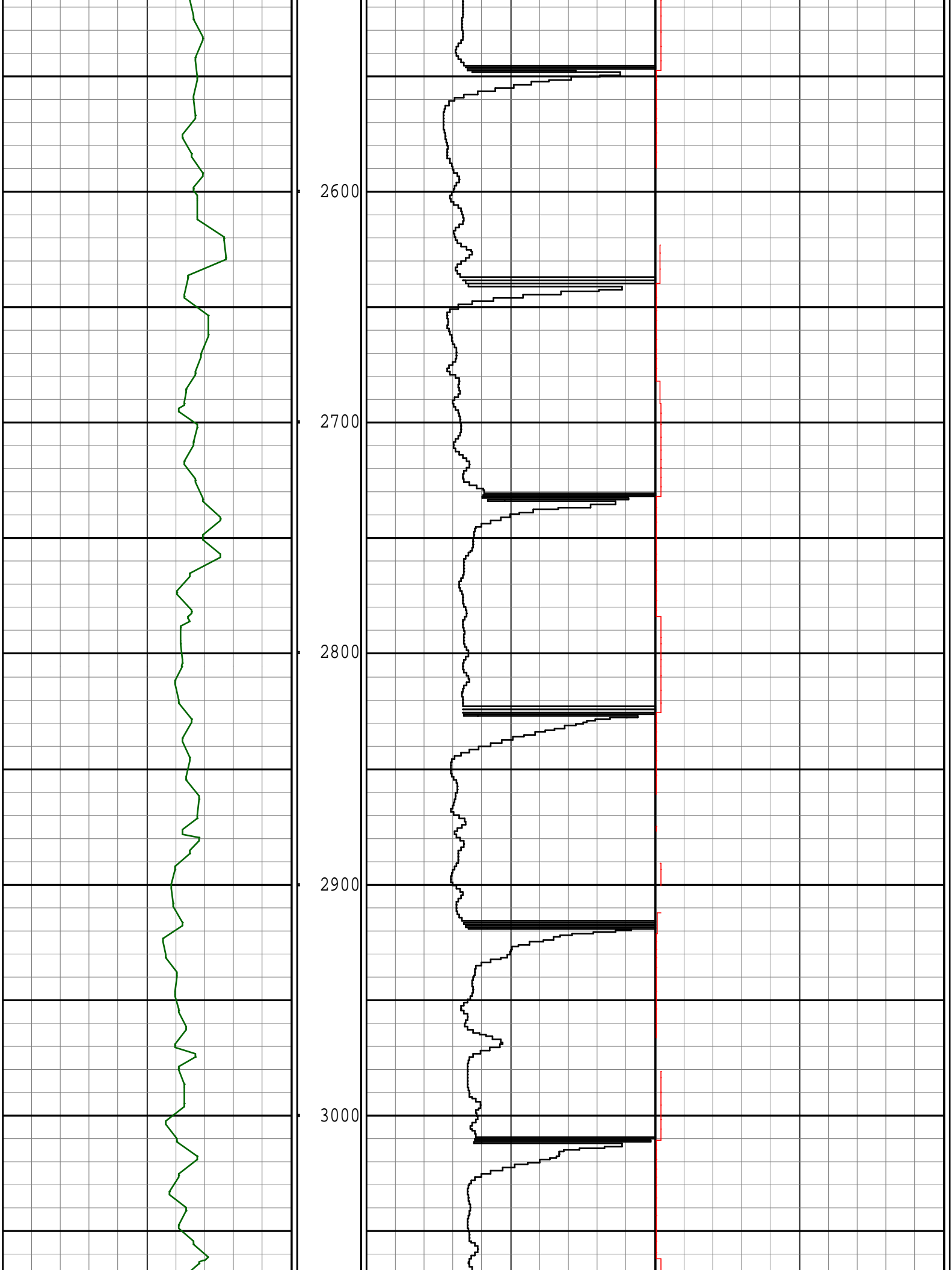
Plot Time : 17-Dec-2014 14:47

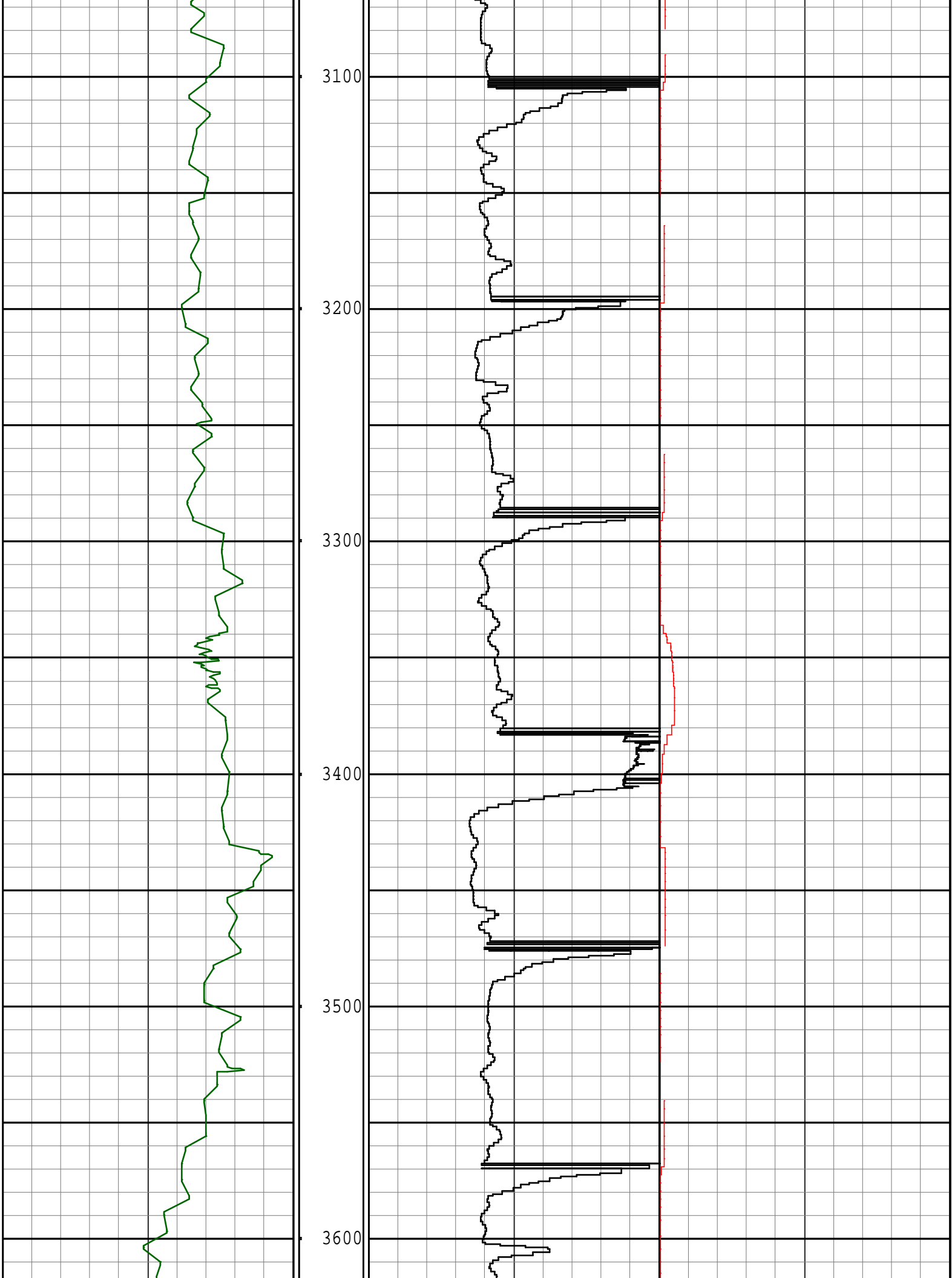




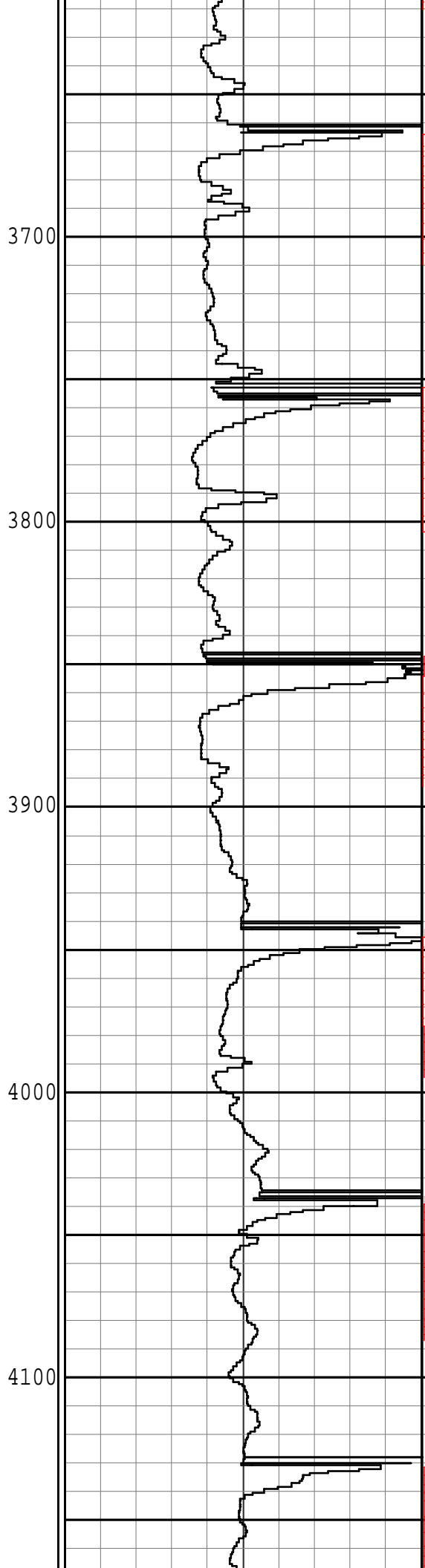
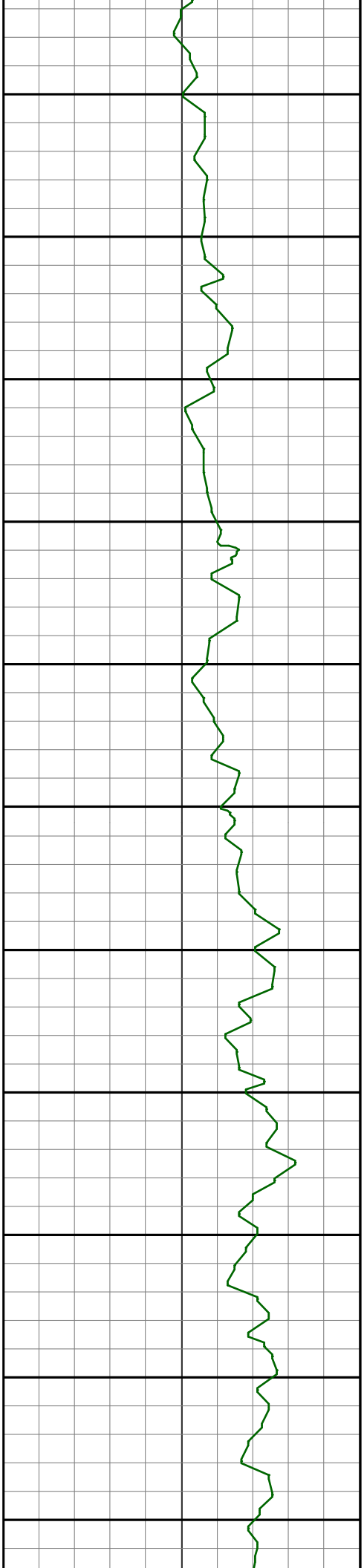


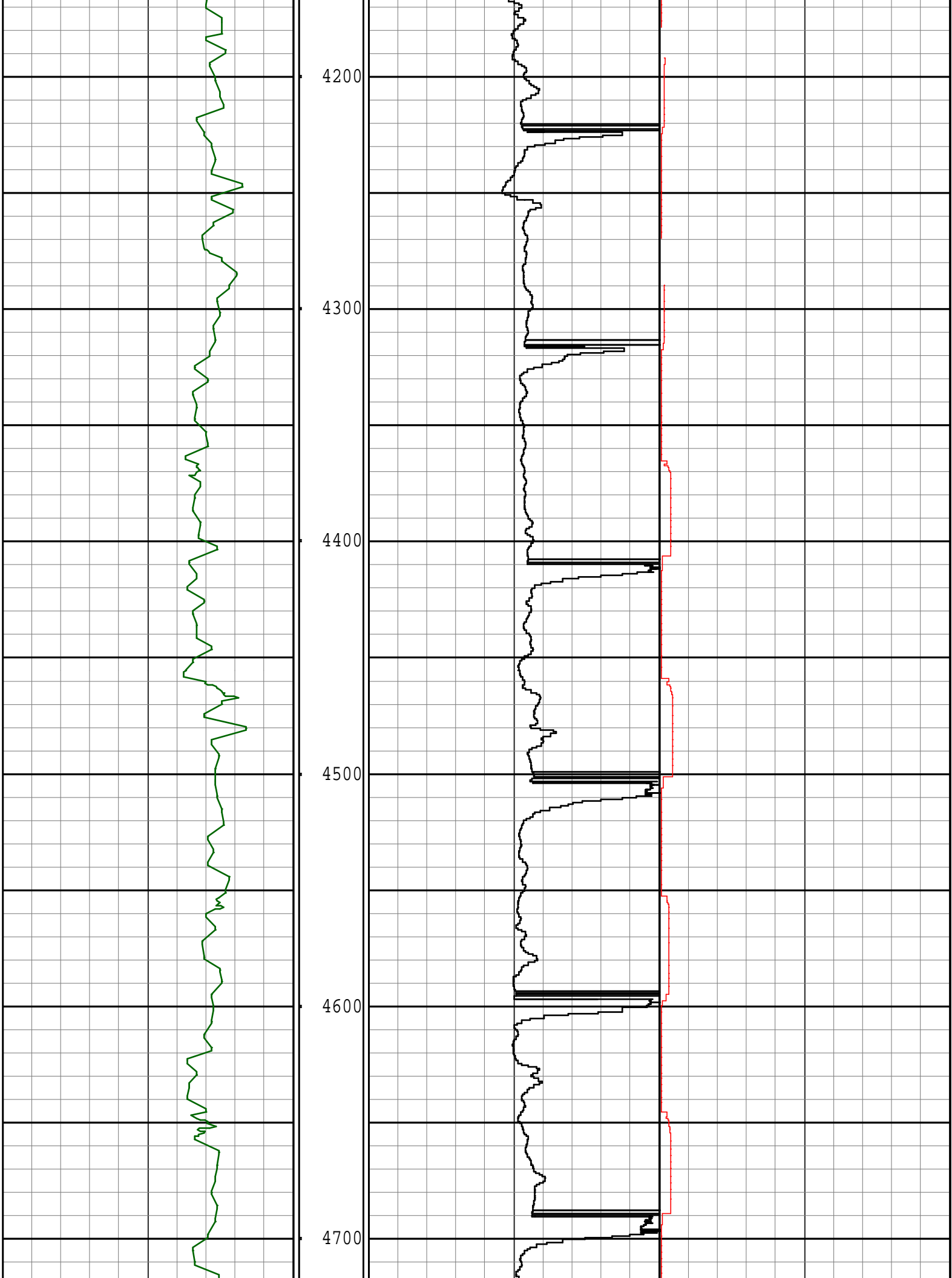


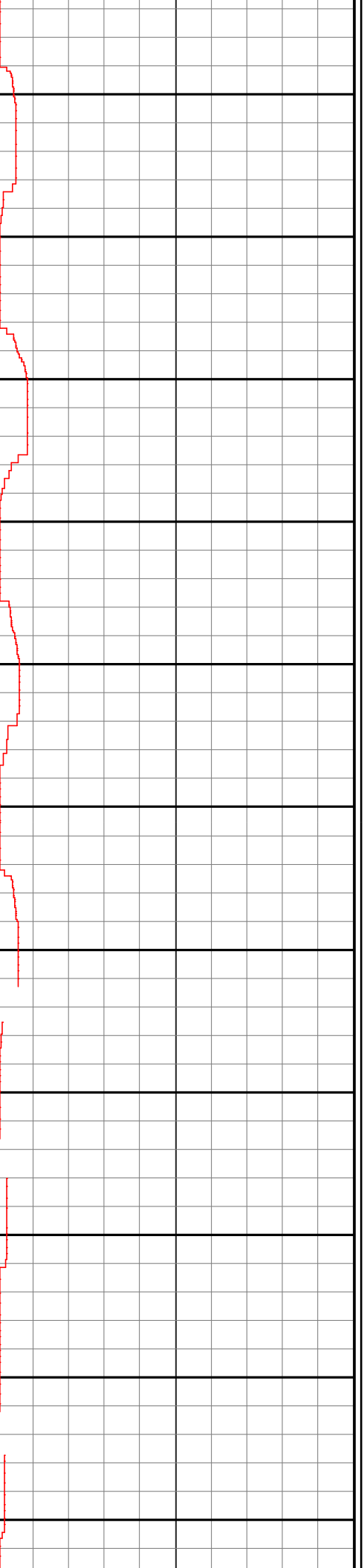
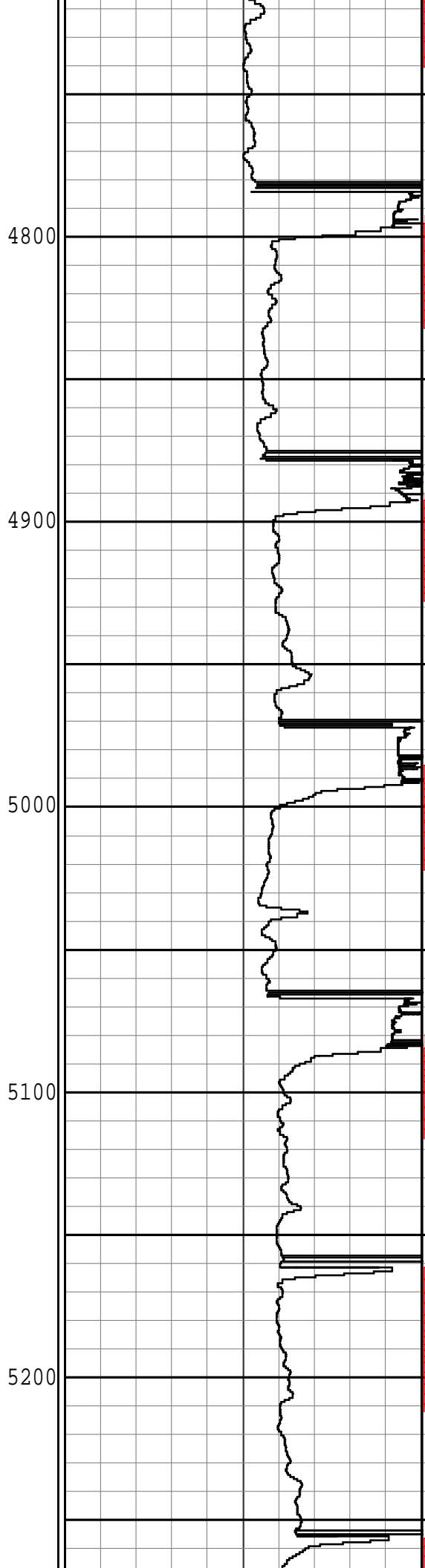
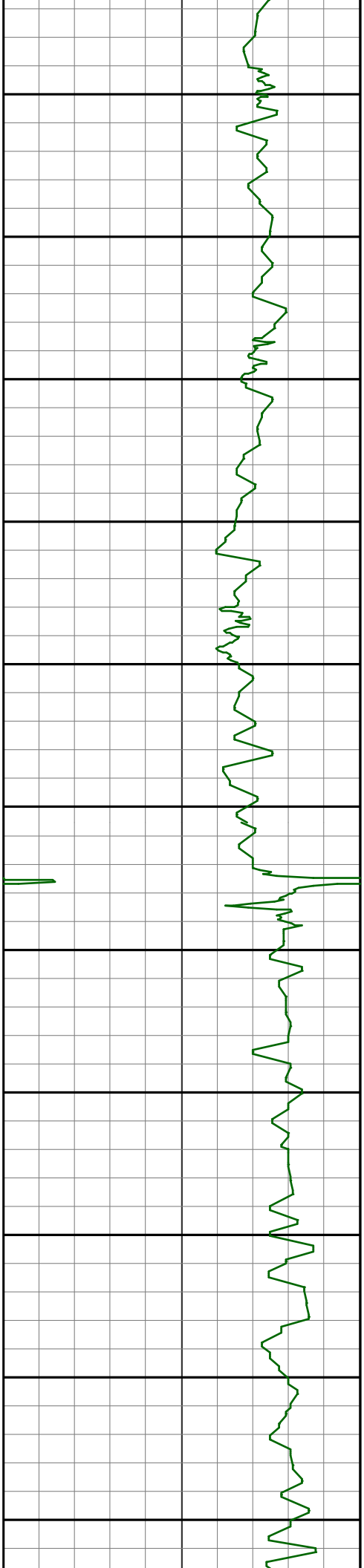


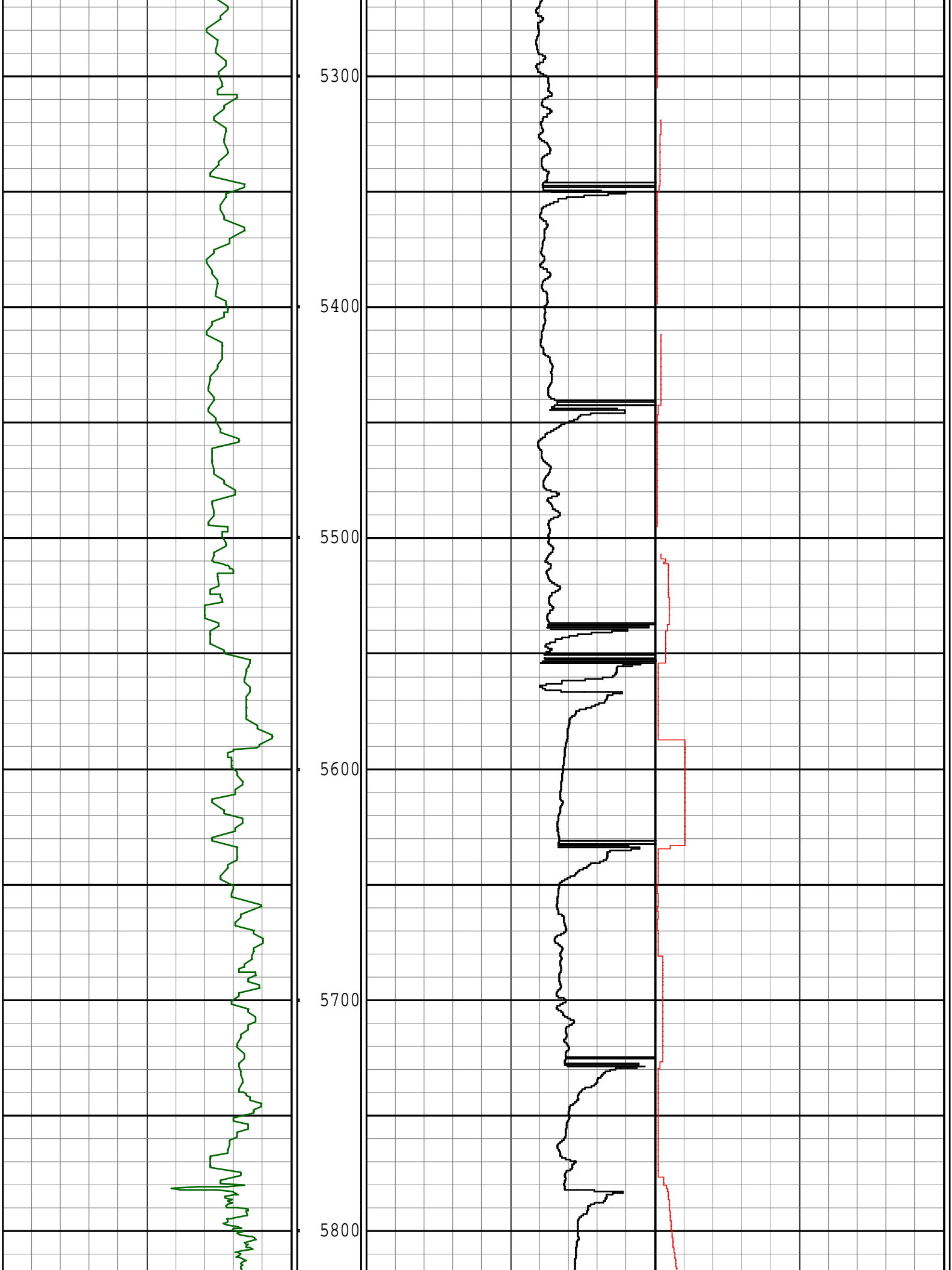


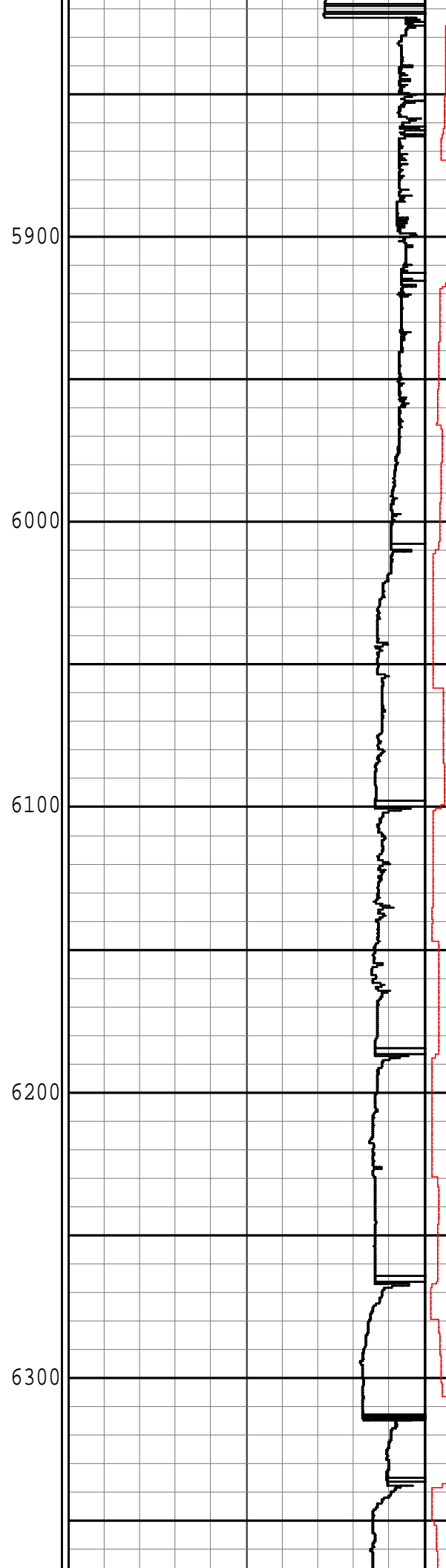
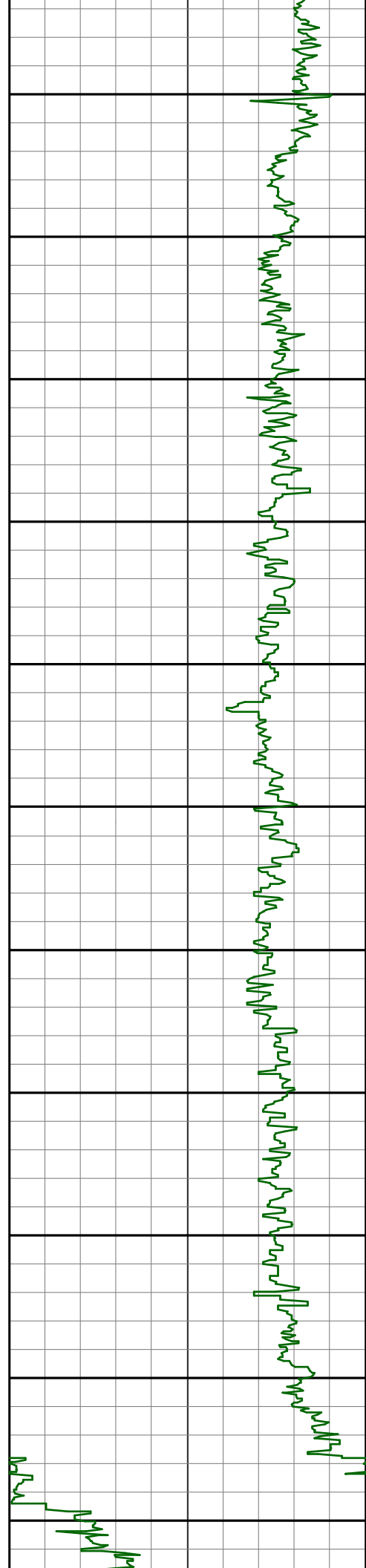














2784.00	11.26	190.22	2766.95	2766.95	81.20	187.20 S	58.95 W	196.26	197.48	0.16	101.02
2878.00	11.43	190.31	2859.11	2859.11	86.67	205.39 S	62.24 W	214.61	196.86	0.18	101.02
2973.00	11.70	189.72	2952.18	2952.18	92.23	224.15 S	65.55 W	233.54	196.30	0.31	101.02
3068.00	11.78	189.47	3045.20	3045.20	97.74	243.21 S	68.77 W	252.74	195.79	0.10	104.64
3162.00	11.34	189.51	3137.29	3137.29	103.07	261.78 S	71.88 W	271.47	195.35	0.47	104.64
3257.00	11.26	188.09	3230.45	3230.45	108.13	280.18 S	74.73 W	289.97	194.93	0.31	108.25
3352.00	10.73	186.67	3323.70	3323.70	112.62	298.15 S	77.06 W	307.94	194.49	0.63	108.25
3447.00	9.50	199.71	3417.24	3417.24	118.23	314.31 S	80.73 W	324.52	194.41	2.73	111.87
3542.00	9.23	198.49	3510.97	3510.97	125.02	328.92 S	85.79 W	339.92	194.62	0.35	111.87
3637.00	9.50	198.03	3604.70	3604.70	131.60	343.60 S	90.64 W	355.35	194.78	0.30	115.48
3732.00	10.02	198.41	3698.33	3698.33	138.46	358.90 S	95.67 W	371.43	194.93	0.55	115.48
3827.00	10.82	198.07	3791.76	3791.76	145.77	375.21 S	101.05 W	388.58	195.07	0.85	115.48
3922.00	11.34	196.14	3884.99	3884.99	153.21	392.66 S	106.41 W	406.83	195.16	0.67	115.48
4017.00	11.52	195.67	3978.11	3978.11	160.52	410.77 S	111.57 W	425.65	195.20	0.21	119.09
4112.00	11.43	195.66	4071.21	4071.21	167.79	428.97 S	116.67 W	444.55	195.22	0.09	119.09
4206.00	10.99	194.72	4163.41	4163.41	174.69	446.60 S	121.46 W	462.82	195.21	0.51	122.71
4301.00	10.11	195.49	4256.81	4256.81	181.22	463.39 S	125.99 W	480.22	195.21	0.94	122.71
4395.00	9.50	197.73	4349.43	4349.43	187.61	478.73 S	130.56 W	496.22	195.25	0.76	122.71
4490.00	8.71	197.41	4443.24	4443.24	193.85	493.07 S	135.10 W	511.24	195.32	0.83	122.71
4584.00	7.47	194.14	4536.30	4536.30	198.99	505.78 S	138.72 W	524.46	195.34	1.41	126.32
4678.00	6.68	190.29	4629.58	4629.58	202.81	517.09 S	141.19 W	536.02	195.27	0.98	126.32
4773.00	5.63	190.08	4724.03	4724.03	205.81	527.11 S	142.99 W	546.16	195.18	1.11	126.32
4867.00	4.13	191.73	4817.69	4817.69	208.25	534.97 S	144.49 W	554.13	195.11	1.60	129.94
4961.00	2.81	193.16	4911.52	4911.52	210.12	540.52 S	145.70 W	559.82	195.09	1.41	115.48
5055.00	1.93	193.92	5005.44	5005.44	211.48	544.30 S	146.60 W	563.70	195.07	0.94	126.32
5149.00	0.53	220.34	5099.41	5099.41	212.37	546.17 S	147.27 W	565.68	195.09	1.57	129.94
5244.00	0.70	246.68	5194.41	5194.41	213.25	546.74 S	148.08 W	566.44	195.16	0.34	133.55
5338.00	0.62	232.49	5288.40	5288.40	214.23	547.27 S	149.02 W	567.20	195.23	0.19	137.17
5433.00	0.62	232.67	5383.40	5383.40	215.12	547.90 S	149.83 W	568.02	195.29	0.00	140.78
5528.00	0.70	228.23	5478.39	5478.39	216.04	548.60 S	150.67 W	568.91	195.36	0.10	140.78
5622.00	0.26	186.93	5572.39	5572.39	216.56	549.19 S	151.13 W	569.61	195.39	0.57	148.01
5717.00	0.35	261.72	5667.38	5667.38	216.90	549.45 S	151.44 W	569.94	195.41	0.40	144.39
5811.00	0.53	272.58	5761.38	5761.38	217.62	549.47 S	152.16 W	570.15	195.48	0.21	148.01
5906.00	3.52	276.39	5856.31	5856.31	220.89	549.12 S	155.50 W	570.72	195.81	3.15	148.01
6001.00	9.67	275.80	5950.64	5950.64	231.52	547.99 S	166.34 W	572.68	196.89	6.47	148.01
6095.00	15.48	266.51	6042.35	6042.35	251.76	547.96 S	186.74 W	578.90	198.82	6.53	151.62
6190.00	22.77	265.54	6132.05	6132.05	282.82	550.16 S	217.76 W	591.69	201.59	7.68	151.62
6285.00	30.16	271.96	6217.05	6217.05	324.83	550.78 S	260.01 W	609.06	205.27	8.33	155.24
6379.00	40.01	275.88	6293.89	6293.89	377.76	546.86 S	313.81 W	630.50	209.85	10.75	151.62
6474.00	52.41	274.79	6359.50	6359.50	444.65	540.57 S	381.96 W	661.90	215.24	13.08	155.24
6569.00	58.92	273.00	6413.06	6413.06	521.65	535.29 S	460.18 W	705.90	220.69	7.03	158.85
6663.00	64.46	269.89	6457.63	6457.63	603.48	533.26 S	542.87 W	760.97	225.51	6.57	162.46
6758.00	70.00	267.11	6494.39	6494.39	690.64	535.60 S	630.39 W	827.19	229.65	6.42	162.46
6853.00	78.26	265.70	6520.35	6520.35	781.78	541.34 S	721.50 W	902.01	233.12	8.81	166.08
6874.00	80.90	265.10	6524.14	6524.14	802.42	543.00 S	742.09 W	919.53	233.81	12.88	166.08

Survey Report											
Vertical Section Plane: 263.04°						Total Correction: 7.60° East to Grid					
Calculation Method: Minimum Curvature						Survey Reference: Wellhead					
North Aligned to: Grid North						Well: WELLS RANCH AE19-626					
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Sub Sea TVD (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
6964.00	85.91	264.37	6534.48	6534.48	891.75	551.21 S	831.09 W	997.26	236.45	5.63	148.01
7025.00	85.65	263.36	6538.96	6538.96	952.58	557.71 S	891.57 W	1051.63	237.97	1.71	148.01
7118.00	86.09	264.53	6545.66	6545.66	1045.33	567.49 S	983.81 W	1135.75	240.02	1.34	151.62
7210.00	88.29	266.28	6550.17	6550.17	1137.13	574.85 S	1075.39 W	1219.40	241.87	3.05	155.24
7303.00	89.52	268.13	6551.95	6551.95	1229.86	579.38 S	1168.26 W	1304.04	243.62	2.39	158.85
7397.00	90.66	269.21	6551.80	6551.80	1323.40	581.57 S	1262.23 W	1389.77	245.26	1.67	162.46
7489.00	92.68	269.36	6549.12	6549.12	1414.81	582.71 S	1354.18 W	1474.23	246.72	2.20	166.08
7582.00	91.63	268.78	6545.63	6545.63	1507.23	584.22 S	1447.10 W	1560.58	248.02	1.29	166.08
7677.00	91.19	268.93	6543.29	6543.29	1601.71	586.12 S	1542.05 W	1649.69	249.19	0.49	169.69
7772.00	88.55	268.67	6543.50	6543.50	1696.23	588.11 S	1637.02 W	1739.46	250.24	2.79	166.08
7867.00	89.25	268.30	6545.33	6545.33	1790.78	590.62 S	1731.97 W	1829.91	251.17	0.83	169.69
7961.00	89.34	268.56	6546.48	6546.48	1884.36	593.20 S	1825.93 W	1919.87	252.00	0.29	169.69
8056.00	89.87	269.38	6547.14	6547.14	1978.84	594.90 S	1920.91 W	2010.92	252.79	1.03	169.69
8150.00	89.69	269.63	6547.50	6547.50	2072.25	595.71 S	2014.91 W	2101.13	253.53	0.33	169.69
8245.00	88.99	269.41	6548.59	6548.59	2166.63	596.51 S	2109.90 W	2192.60	254.21	0.77	169.69
8340.00	88.02	268.95	6551.07	6551.07	2261.05	597.87 S	2204.85 W	2284.48	254.83	1.13	173.31
8434.00	88.99	268.57	6553.52	6553.52	2354.55	599.90 S	2298.80 W	2375.79	255.37	1.11	176.92
8529.00	87.85	268.78	6556.14	6556.14	2449.06	602.10 S	2393.74 W	2468.30	255.88	1.22	176.92
8623.00	88.29	268.62	6559.31	6559.31	2542.54	604.23 S	2487.66 W	2559.99	256.35	0.50	180.54
8718.00	88.99	267.86	6561.56	6561.56	2637.13	607.15 S	2582.58 W	2652.99	256.77	1.09	180.54
8812.00	89.78	267.69	6562.57	6562.57	2730.80	610.80 S	2676.51 W	2745.32	257.14	0.86	184.15
8906.00	88.90	268.09	6563.66	6563.66	2824.45	614.26 S	2770.44 W	2837.72	257.50	1.03	184.15
9001.00	89.87	266.75	6564.68	6564.68	2919.17	618.53 S	2865.33 W	2931.33	257.82	1.74	184.15
9095.00	90.92	266.43	6564.03	6564.03	3012.98	624.12 S	2959.16 W	3024.26	258.09	1.17	187.76
9190.00	90.04	268.58	6563.23	6563.23	3107.69	628.26 S	3054.06 W	3118.01	258.38	2.44	187.76
9284.00	88.64	268.88	6564.31	6564.31	3201.21	630.34 S	3148.03 W	3210.52	258.68	1.52	187.76
9379.00	88.20	267.96	6566.93	6566.93	3295.76	632.96 S	3242.96 W	3304.15	258.96	1.07	191.38
9473.00	89.25	266.97	6569.03	6569.03	3389.45	637.12 S	3336.84 W	3397.12	259.19	1.54	194.99
9567.00	90.31	266.82	6569.39	6569.39	3483.24	642.21 S	3430.70 W	3490.29	259.40	1.14	194.99
9662.00	88.96	268.06	6569.16	6569.16	3577.96	646.45 S	3525.60 W	3584.38	259.61	1.36	198.61

9802.00	87.32	268.11	6575.50	6575.50	3765.01	651.69 S	3713.40 W	3770.15	260.05	0.75	202.22
9756.00	87.32	268.11	6575.50	6575.50	3765.01	651.69 S	3713.40 W	3770.15	260.05	0.75	202.22
9850.00	87.67	268.11	6575.50	6575.50	3765.01	651.69 S	3713.40 W	3770.15	260.05	0.75	202.22
9944.00	87.41	267.18	6579.54	6579.54	3858.62	655.55 S	3807.24 W	3863.26	260.23	1.03	202.22
10038.00	88.29	269.32	6583.06	6583.06	3952.16	658.42 S	3901.12 W	3956.29	260.42	2.46	198.61
10132.00	89.08	268.90	6585.22	6585.22	4045.60	659.88 S	3995.08 W	4049.21	260.62	0.95	202.22
10226.00	89.43	268.13	6586.44	6586.44	4139.17	662.31 S	4089.04 W	4142.33	260.80	0.90	205.83
10321.00	88.46	266.47	6588.19	6588.19	4233.88	666.79 S	4183.92 W	4236.72	260.94	2.02	202.22
10416.00	90.57	270.84	6589.00	6589.00	4328.40	669.01 S	4278.86 W	4330.84	261.11	5.11	198.61
10510.00	92.42	270.50	6586.54	6586.54	4421.53	667.92 S	4372.82 W	4423.53	261.32	2.00	202.22
10604.00	93.83	268.40	6581.42	6581.42	4514.79	668.82 S	4466.66 W	4516.46	261.48	2.69	194.99
10698.00	92.24	267.46	6576.44	6576.44	4608.32	672.21 S	4560.47 W	4609.74	261.62	1.96	198.61
10793.00	89.96	268.22	6574.62	6574.62	4702.96	675.79 S	4655.37 W	4704.17	261.74	2.53	202.22
10887.00	88.72	267.39	6575.70	6575.70	4796.62	679.39 S	4749.30 W	4797.64	261.86	1.59	205.83
10982.00	89.08	266.45	6577.53	6577.53	4891.39	684.49 S	4844.14 W	4892.26	261.96	1.06	209.45
11076.00	89.16	268.63	6578.97	6578.97	4985.08	688.52 S	4938.04 W	4985.81	262.06	2.32	209.45
11171.00	89.43	268.53	6580.14	6580.14	5079.63	690.88 S	5033.00 W	5080.20	262.18	0.30	209.45
11265.00	89.96	267.94	6580.64	6580.64	5173.24	693.77 S	5126.95 W	5173.68	262.29	0.84	213.06
11360.00	90.40	269.71	6580.34	6580.34	5267.75	695.72 S	5221.93 W	5268.07	262.41	1.92	213.06
11455.00	88.02	271.15	6581.65	6581.65	5361.95	695.01 S	5316.91 W	5362.14	262.55	2.93	213.06
11549.00	88.55	271.00	6584.46	6584.46	5454.98	693.25 S	5410.85 W	5455.08	262.70	0.59	216.68
11644.00	88.99	271.50	6586.50	6586.50	5548.99	691.17 S	5505.80 W	5549.02	262.84	0.70	216.68
11739.00	89.87	271.40	6587.45	6587.45	5642.96	688.77 S	5600.77 W	5642.96	262.99	0.93	220.29
11779.00	90.40	271.48	6587.35	6587.35	5682.53	687.76 S	5640.76 W	5682.53	263.05	1.34	220.29
PROJECTED TO BIT											
11842.00	90.04	271.48	6587.11	6587.11	5744.85	686.14 S	5703.73 W	5744.86	263.14	0.57	

BOTTOM HOLE ASSEMBLY RECORD

RUN #1		ft	RUN #2		ft				
8 3/4 PDC BIT		0.70	6 1/8 PDC BIT		0.57				
1.75° MUD MOTOR		26.18	1.75° FX MOTOR		26.79				
FLOAT SUB		3.22	FLOAT SUB		3.50				
MULESHOE SUB		2.58	SUB MULESHOE		2.97				
HDS1-R (DIR/GR)		29.50	NM DRILL COLLAR		31.11				
NM FLEX COLLAR		31.10	NM DRILL COLLAR		30.97				
NM FLEX COLLAR		31.04	FLOAT SUB		3.49				
FILTER SUB		3.00	NM DRILL COLLAR		30.97				
X/O		2.80	FILTER SUB		3.05				
HWDP		1392.51	X/O SUB		1.15				
DP		31.00	HWDP		31.10				
			STAB DRILL		8.52				
			DRILL PIPE		2179.05				
			AGITATOR		11.55				
			SHOCK SUB		11.14				
			DRILL PIPE		3875.91				
			HWDP		1392.57				
=====			=====						
TOTAL BHA LENGTH		1553.63	TOTAL BHA LENGTH		7644.41				
SENSOR OFFSETS:			SENSOR OFFSETS:						
=====			=====						
DIRECTIONAL		60.28	DIRECTIONAL		64.00				
GAMMA-RAY		42.98	GAMMA-RAY		43.00				

GAMMA-RAY



A Schlumberger Company

2" = 100'

FEET TVD