

Company : NOBLE ENERGY INC
Well : WELLS RANCH AE19-631
Field : WATTENBERG

Date : 26-Dec-2014
Time : 12:32



GAMMA-RAY

2" = 100'
FEET TVD

COMPANY : NOBLE ENERGY INC WELL : WELLS RANCH AE19-631 FIELD : WATTENBERG COUNTY : WELD STATE : CO COUNTRY : USA API No.: 05-123-39634										COMPANY : NOBLE ENERGY INC WELL : WELLS RANCH AE19-631 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"W X:3318317' Y:1415889' NAD83 SEC: 20 TWP: 6N RANGE: 62W										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																													
8 3/4		725		6903		0-2.98		372		6192																													
6 1/8		6903		12066		2.98-79		6192		6903																													
						+/- 5		6903		12066																													
CASING RECORD																																							
CASING SIZE in		FROM ft		TO ft																																			
9 5/8		0		725																																			
7		0		6893																																			
DRILLING CO.: H&P RIG : 330										LMD UNIT No.: TRAILER DISTRICT : CCO SPUD DATE : 18-DEC-14 LMD START DATE : 19-DEC-14 LMD END DATE : 26-DEC-14 TOTAL DEPTH : 12066 ft										DEPTH : 667 ft DEPTH : 12066 ft																			

RUN DATA						
RUN NUMBER	1	2	3	4		
START DATE	18-DEC-14	20-DEC-14	21-DEC-14	23-DEC-14		
START TIME	08:15	16:30	11.50	19:45		
END DATE	20-DEC14	21-DEC-14	22-DEC-14	25-DEC-14		
END TIME	14:40	08:50	17:30	1:30		
DEPTH IN ft	725	6252	6630	6903		
DEPTH OUT ft	6252	6630	6903	12066		
LOG TOP ft	685	6212	6589	6862		
LOG BOTTOM ft	6212	6589	6862	12022		
HOLE SIZE in	8 3/4	8 3/4	8 3/4	6 1/8		
MUD DATA @ ft	6252	6630	6903	9800		
MUD TYPE	WATER BASED	WATER BASED	WATER BASED	WATER BASED		
DENSITY lb/gal	10.50	10.60	10.60	9.20		
VISCOSITY s/qt	46	41	41	95		
pH	8.2	8.4	8.6	9.0		
FLUID LOSS cm3/30	0.0					
SALINITY ppm	2400	2300	2200	2000		
Rm ohmm @ deg F	@	@	@	@		
Rmf ohmm @ deg F	@	@	@	@		

MAX REC TEMP deg F	202	202	176	216		
Rm @ MAX TEMP ohmm						
LWD ENGINEER #1	N.COOPER	N. COOPER	N. COOPER	M. WILSON		
LWD ENGINEER #2	T.BRIGGS	T. BRIGGS	T. BRIGGS	T. BRIGGS		
LWD ENGINEER #3						

REMARKS

NOBLE ENERGY
PATHFINDER 14CC00718

ALL LOGGING DATA IS TRANSMITTED ONLY UNLESS STATED OTHERWISE.
ALL REFERENCES TO LOG TOP, LOG BOTTOM, OR LOGGING TOOL DEPTH REFER TO
THE GAMMA-RAY SENSOR UNLESS STATED OTHERWISE
ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH

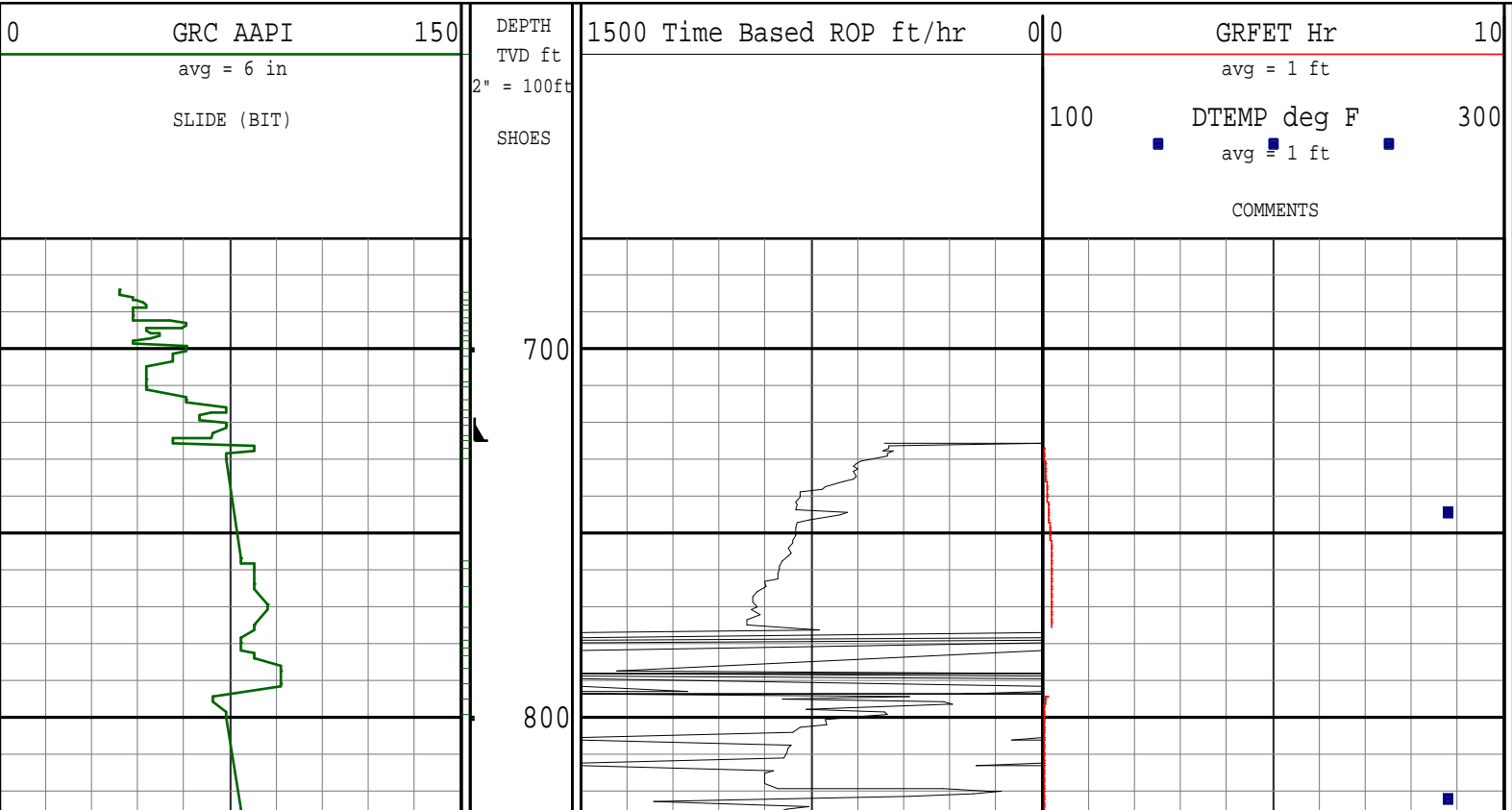
THIRD PARTY DEPTH TRACKING PROVIDED BY PASON SERVICES.

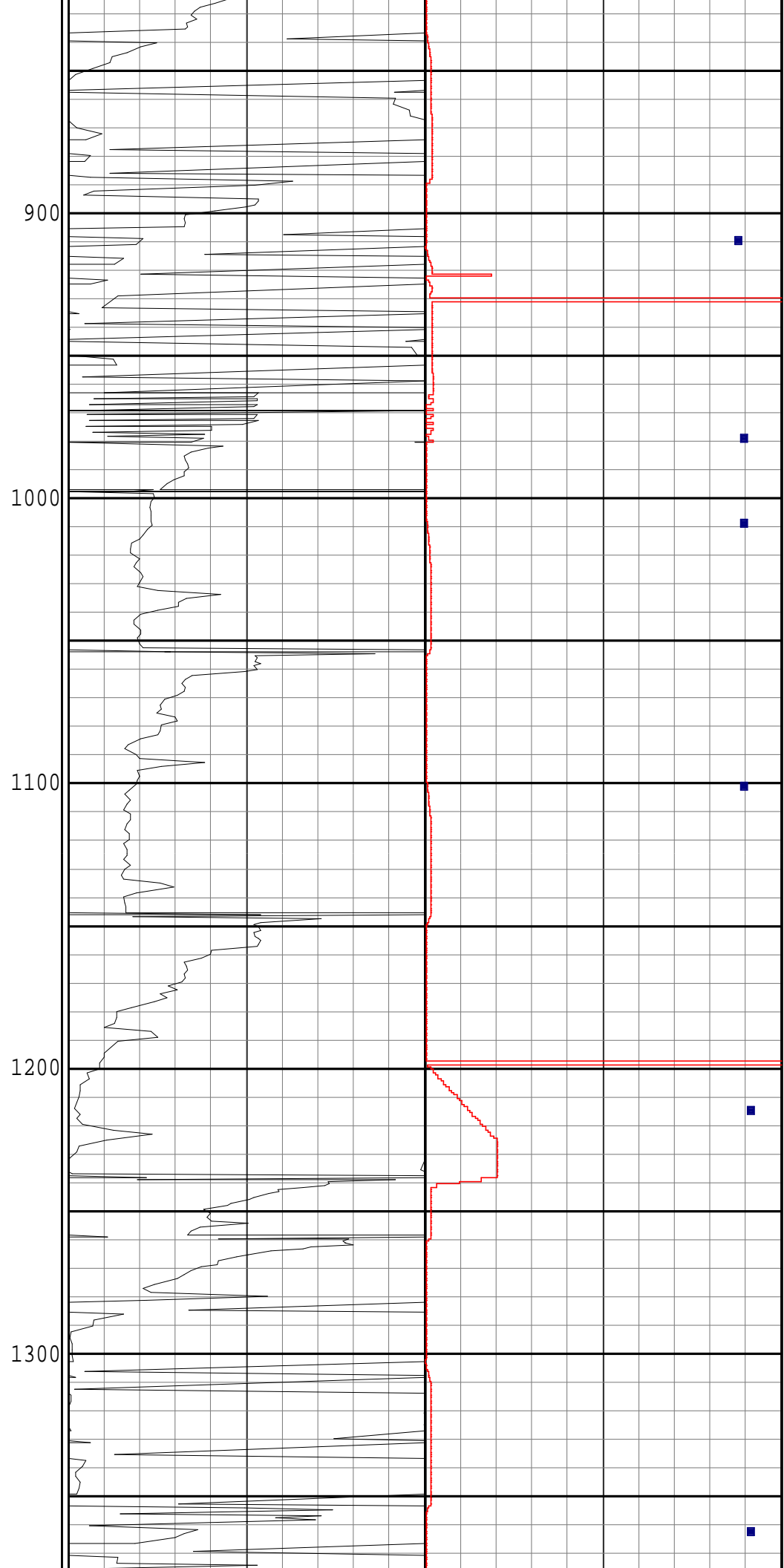
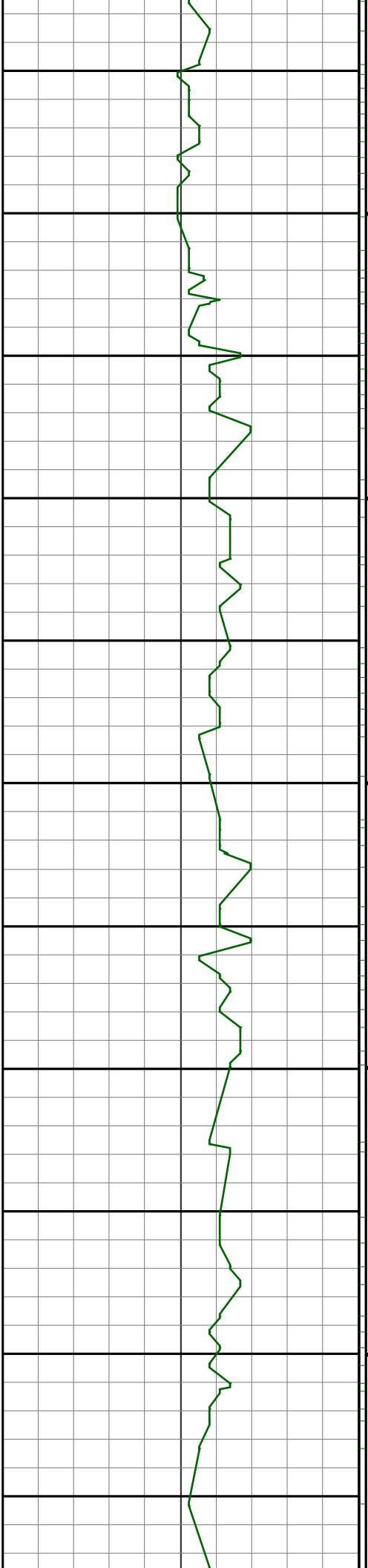
RUN #1: 6 3/4 HDS-1R/GAMMA LOGGING RUN.
RUN #2: 6 3/4 HDS-1R/GAMMA LOGGING RUN.
RUN #3: 6 3/4 HDS-1R/GAMMA LOGGING RUN.
RUN #4: 4 3/4 HDS-1R/GAMMA LOGGING RUN.

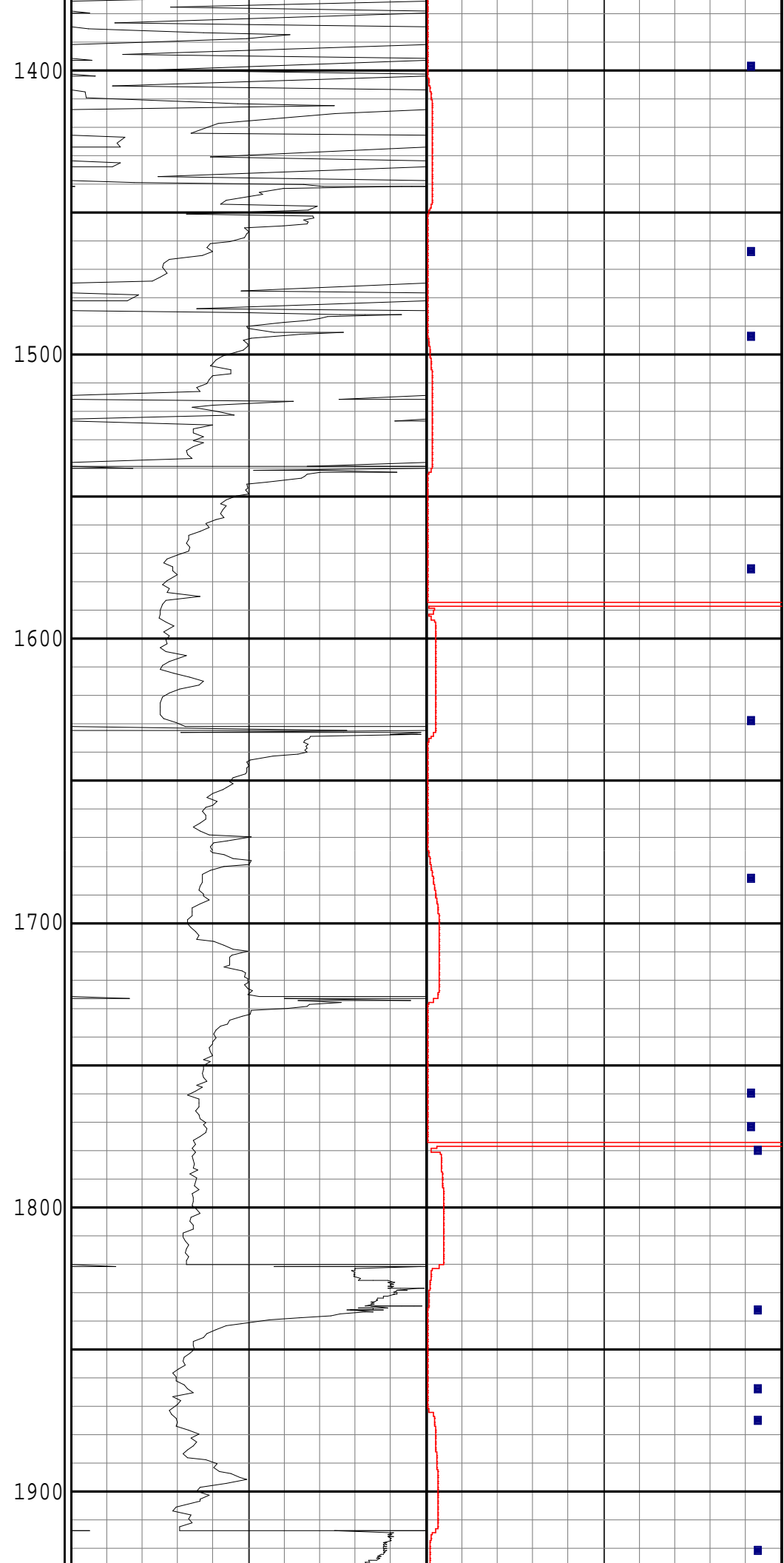
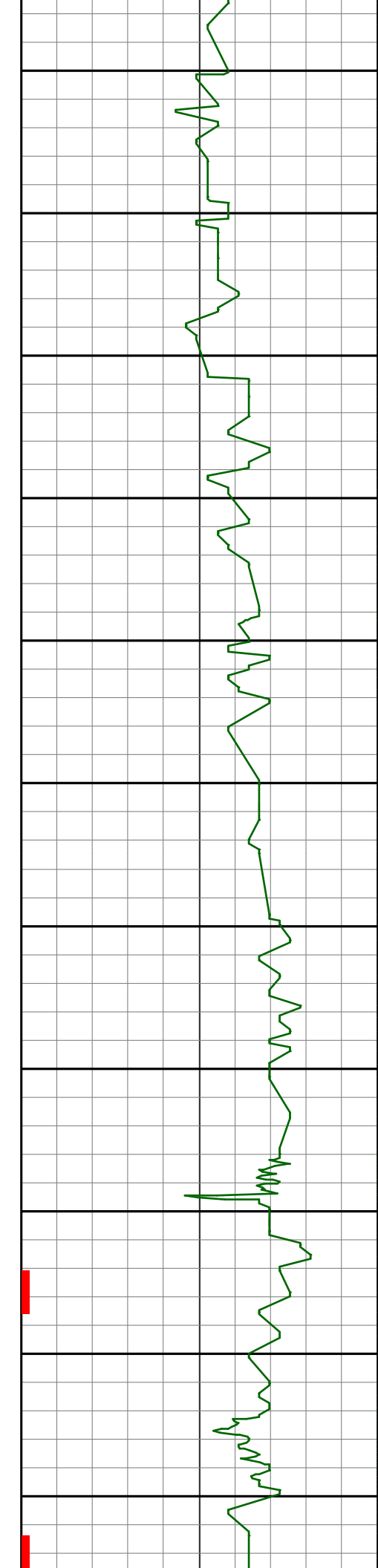
NOTICE - All interpretations are opinions based on inferences from electrical or other measurements and we do not guarantee the accuracy or correctness of any interpretations. We shall not, except in the case of gross or willful negligence on our part, be liable or responsible for loss, costs, damages 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.

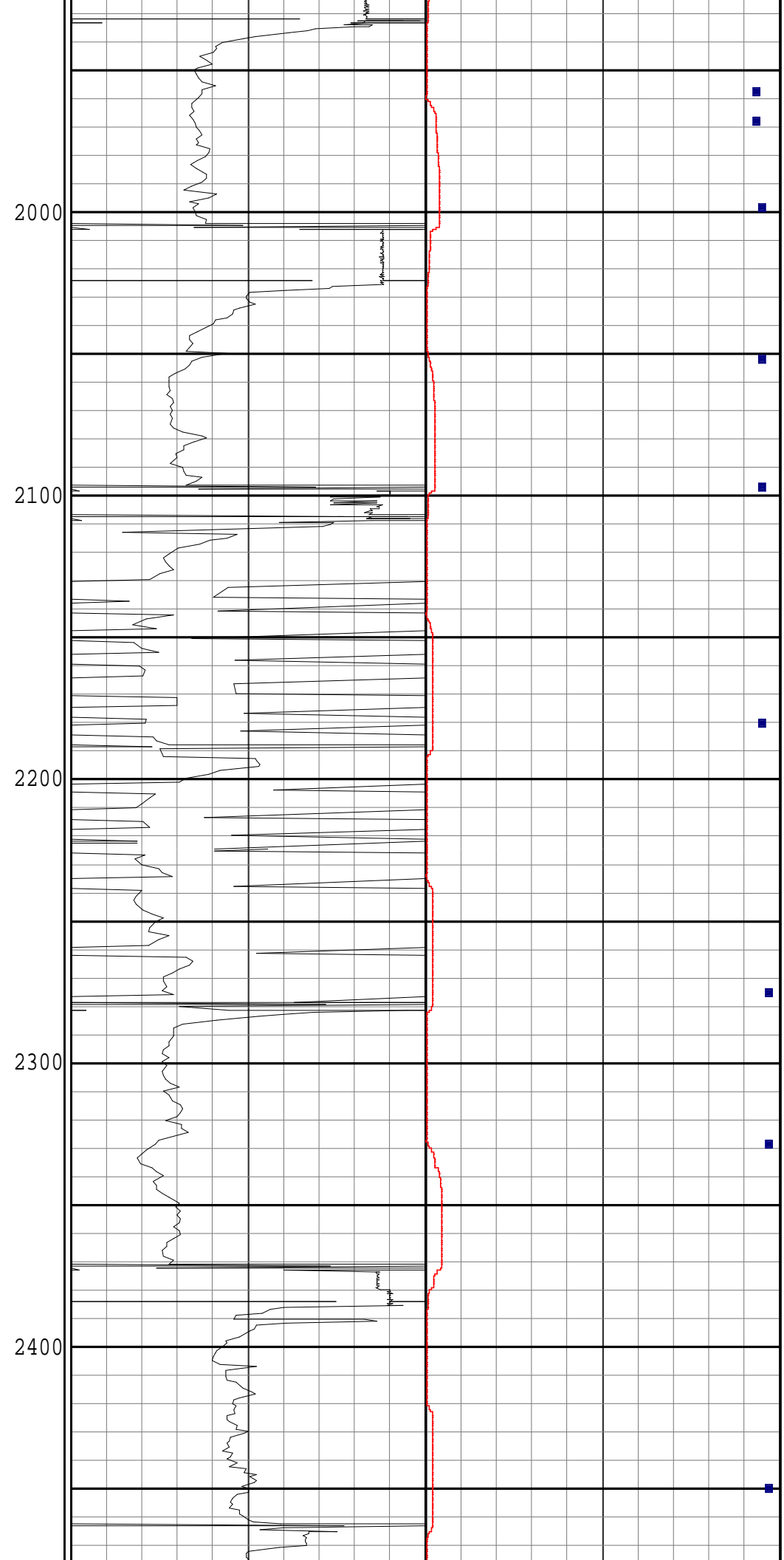
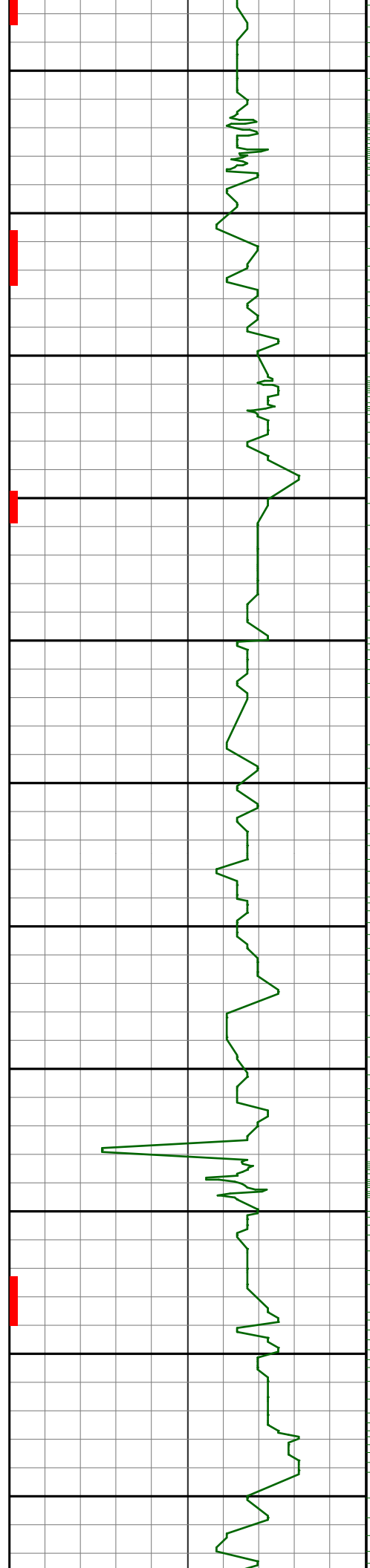
PATHFINDER - A Schlumberger Company

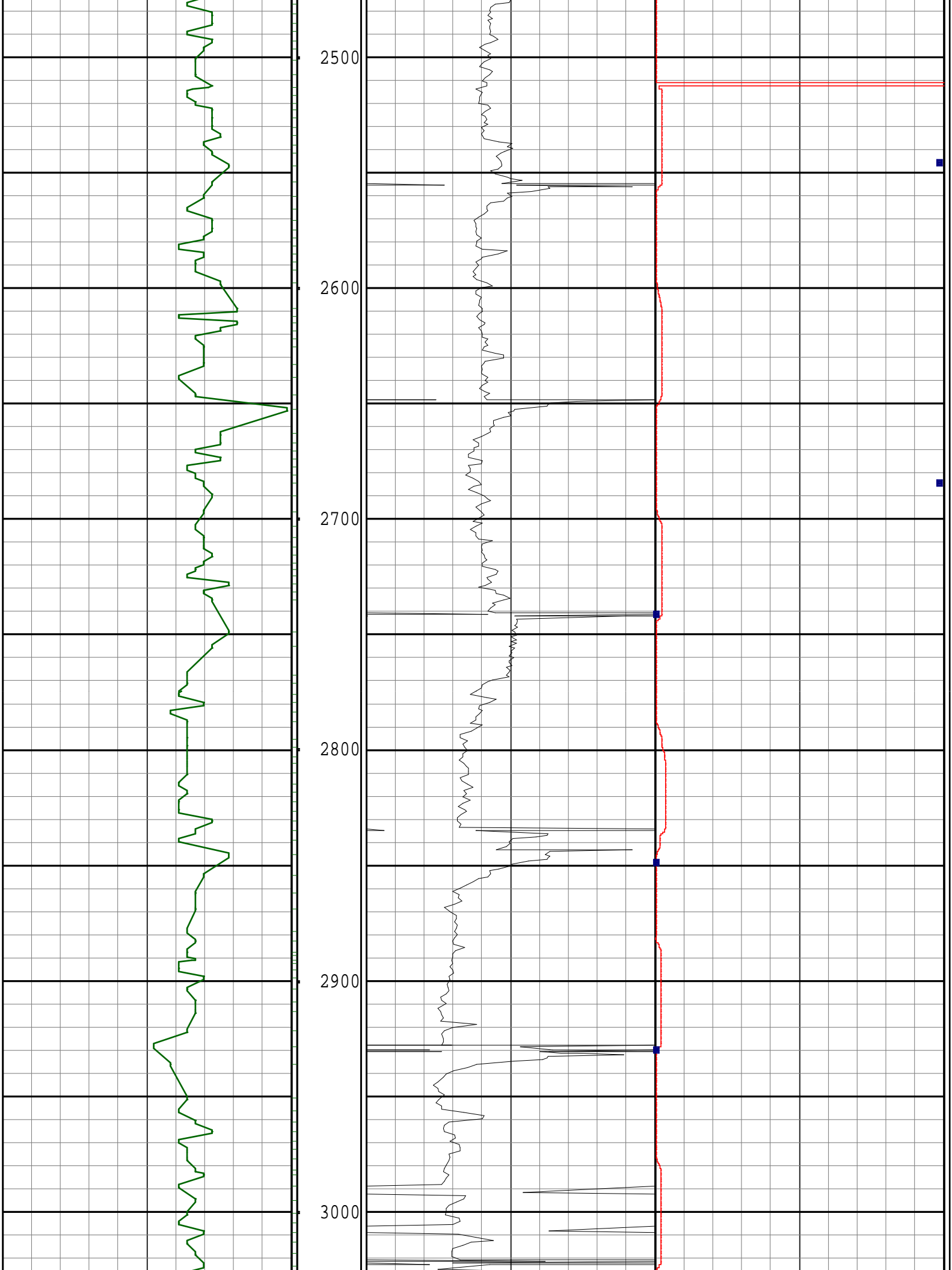
Version No : RX5 V6.05B Release 20Jun2014
Plot Time : 26-Dec-2014 12:30

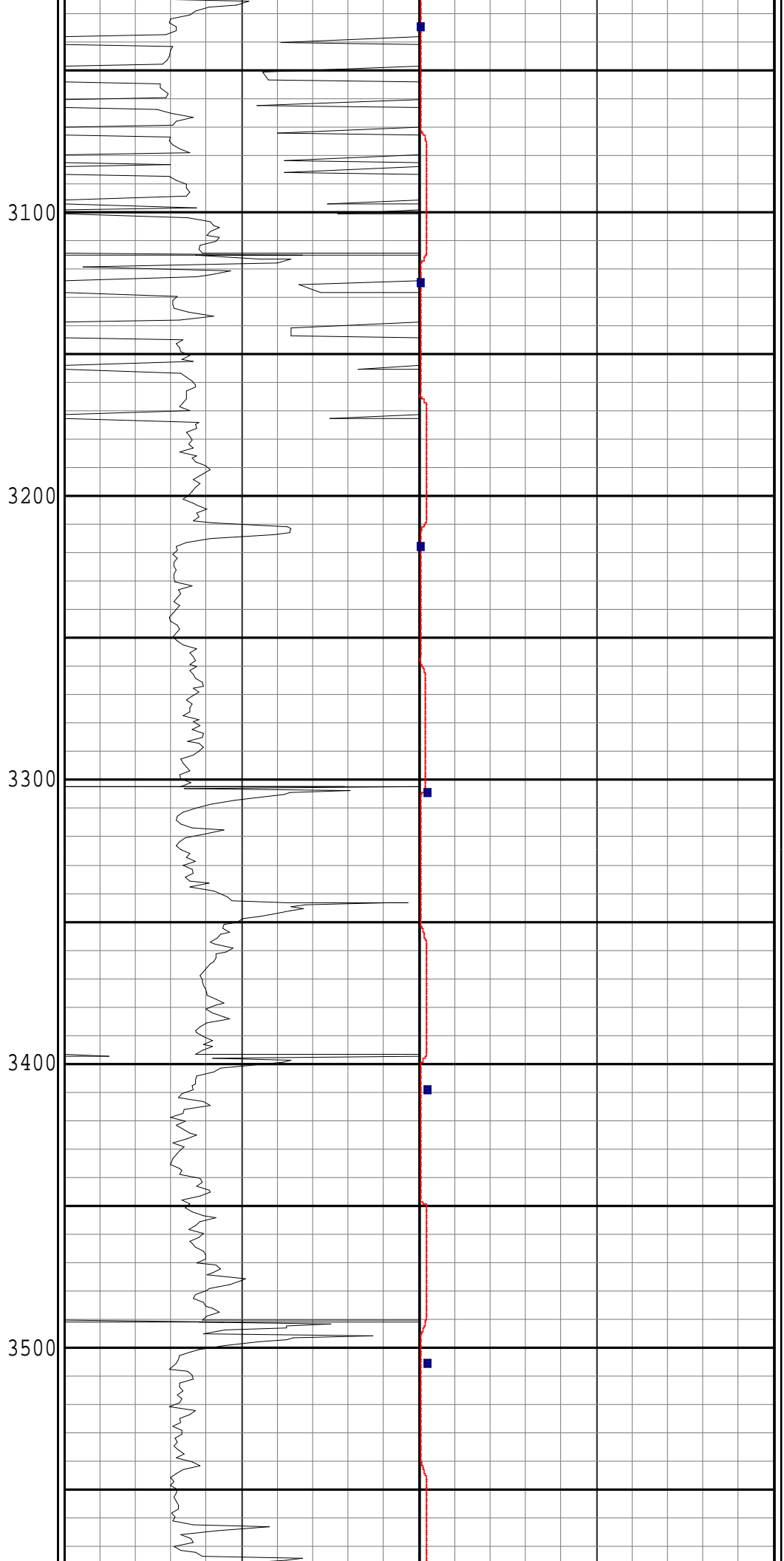
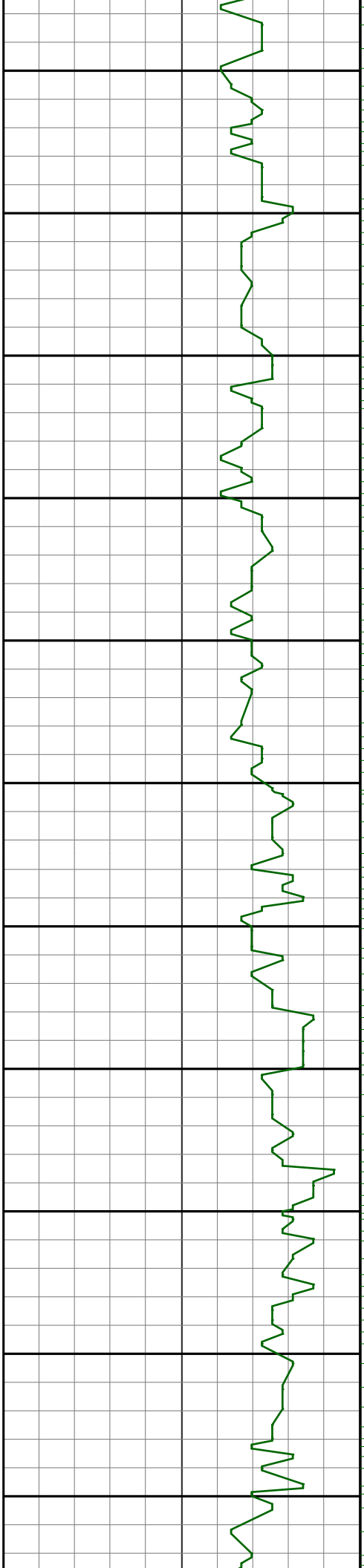


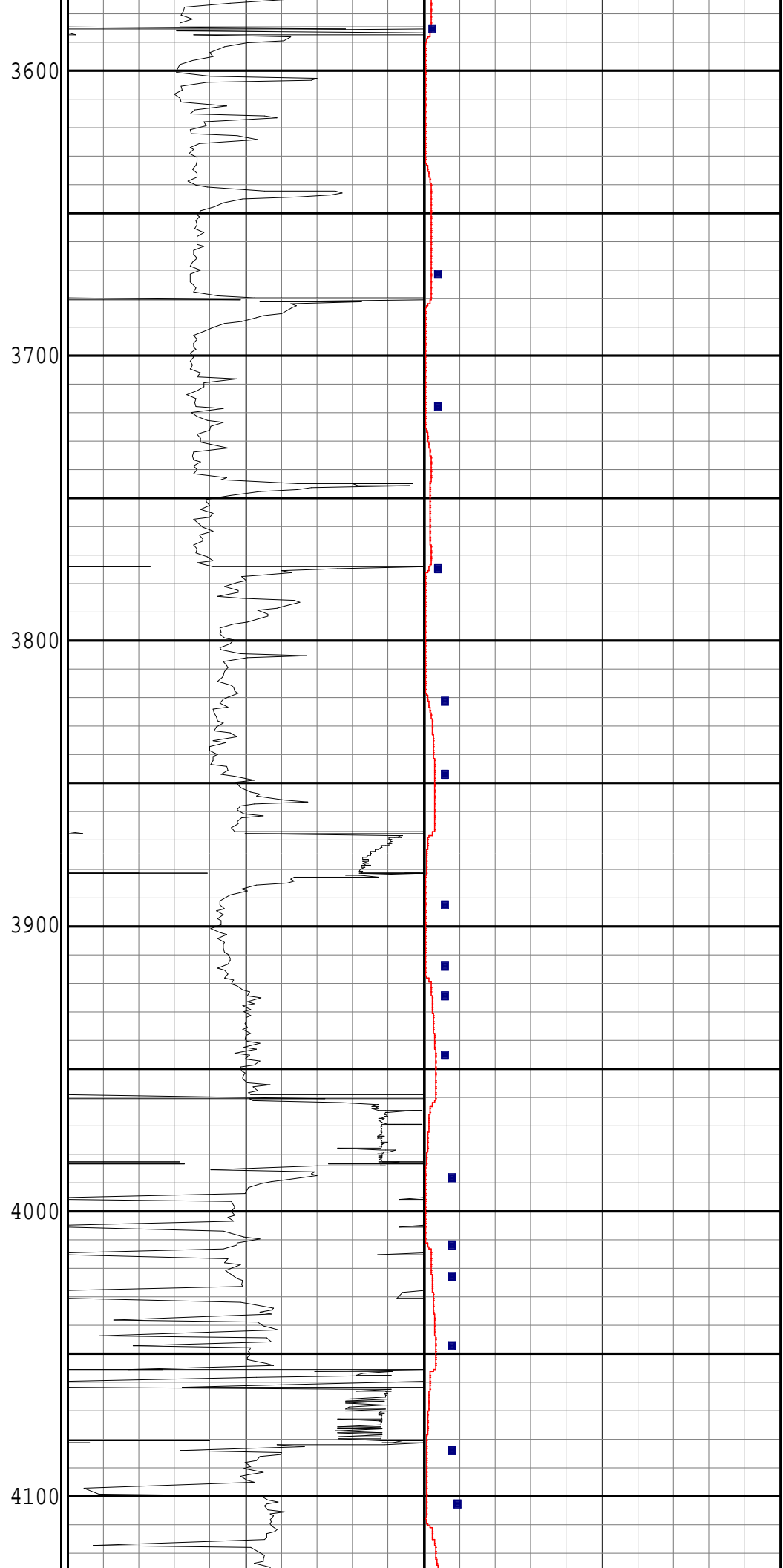
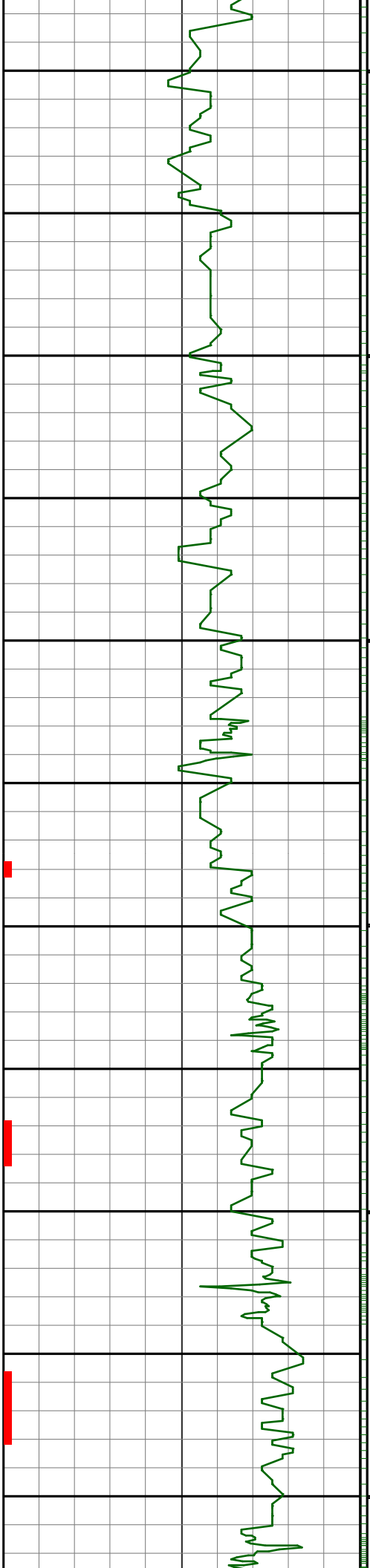


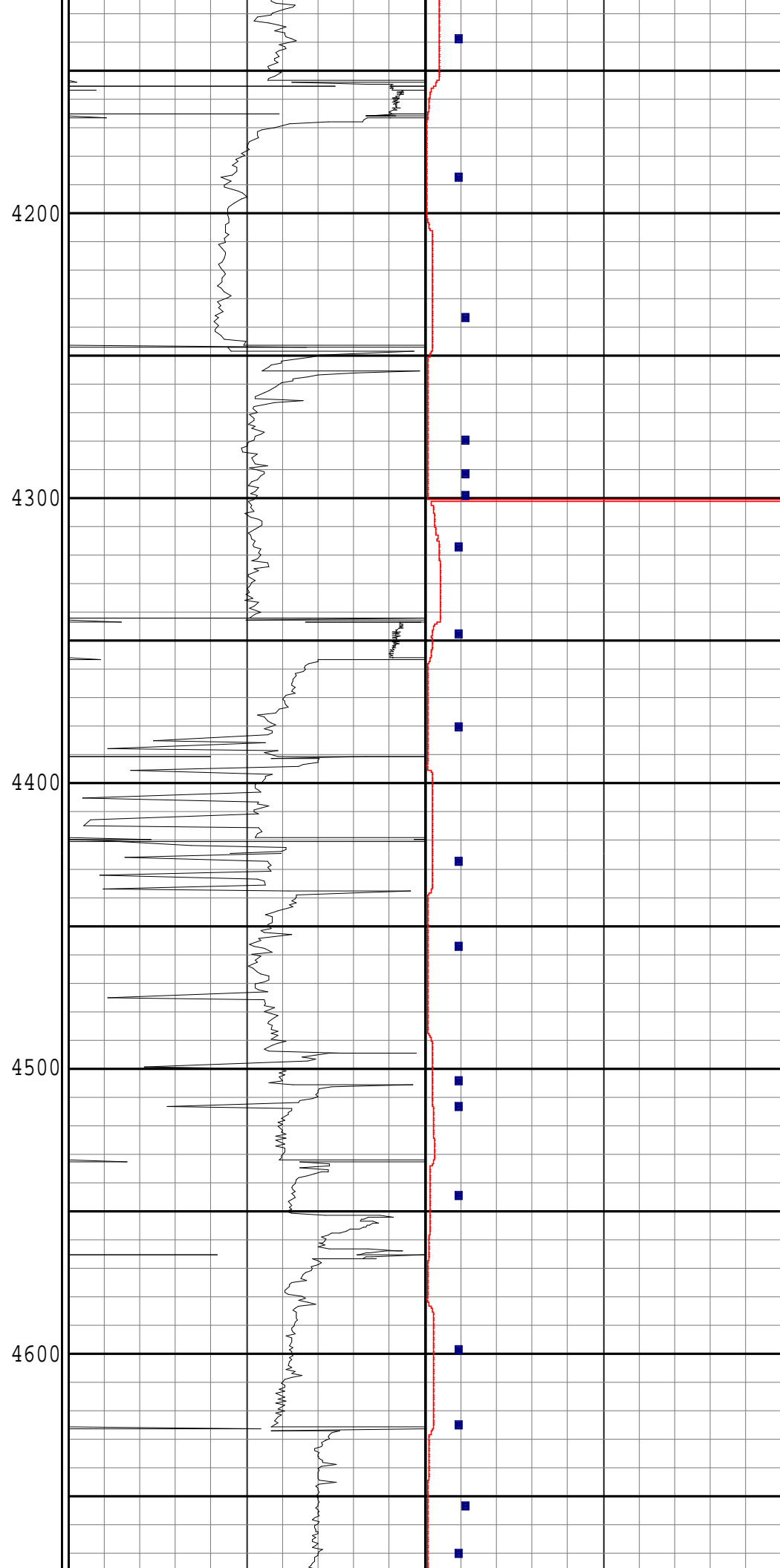
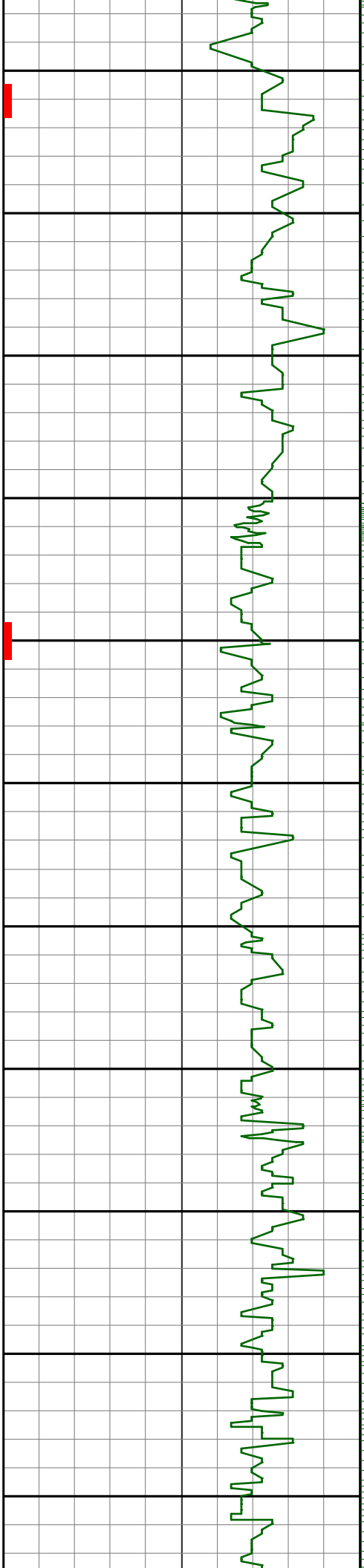


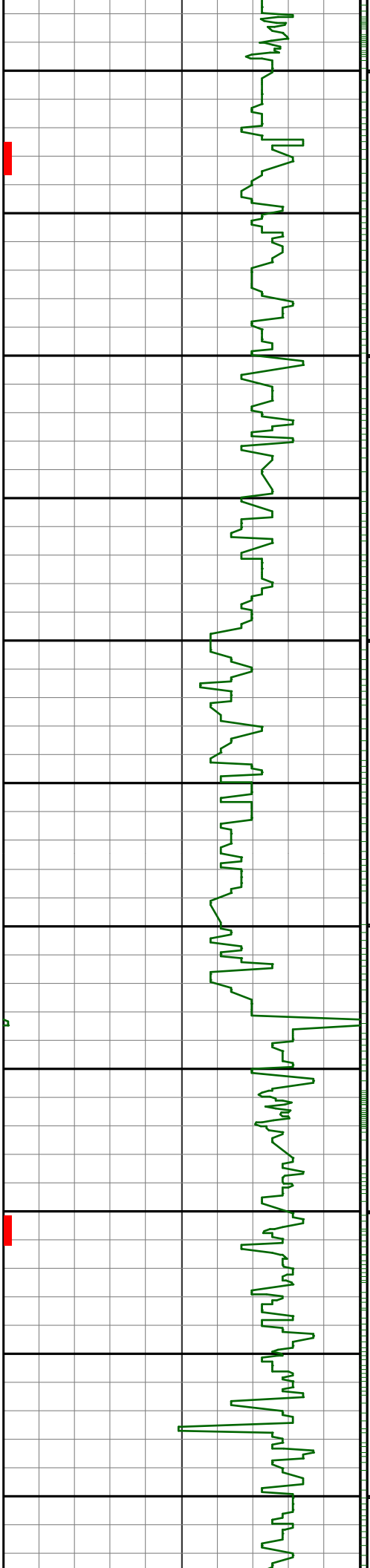




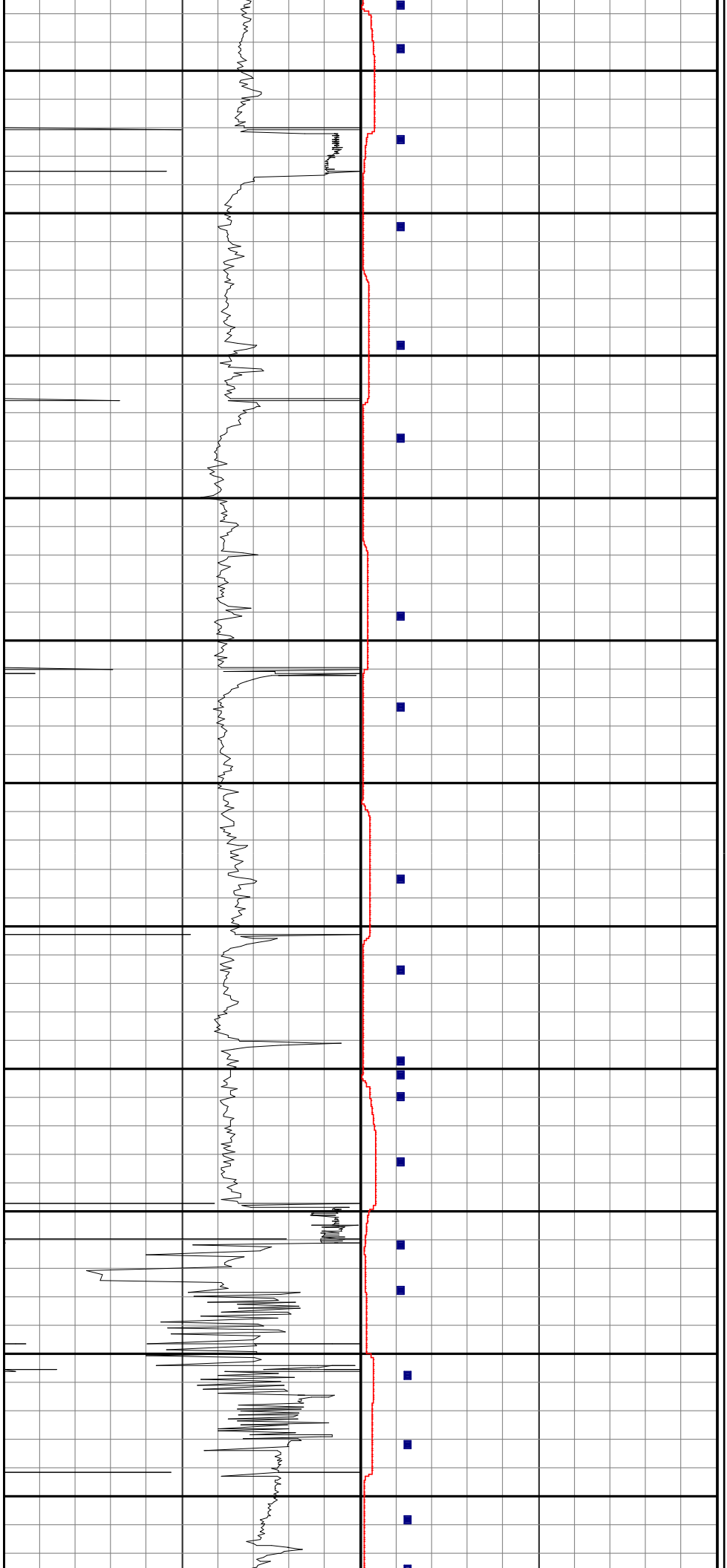


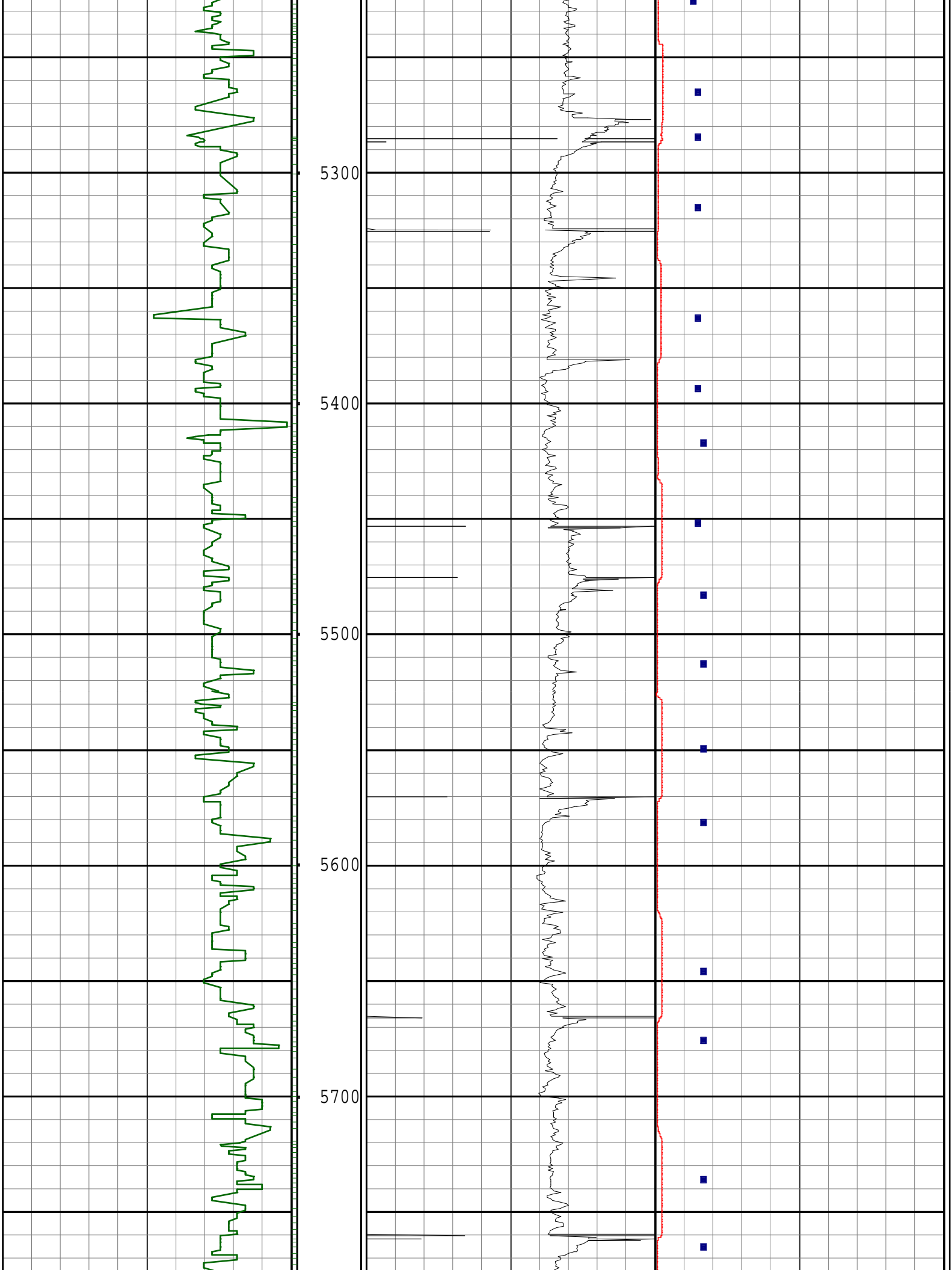


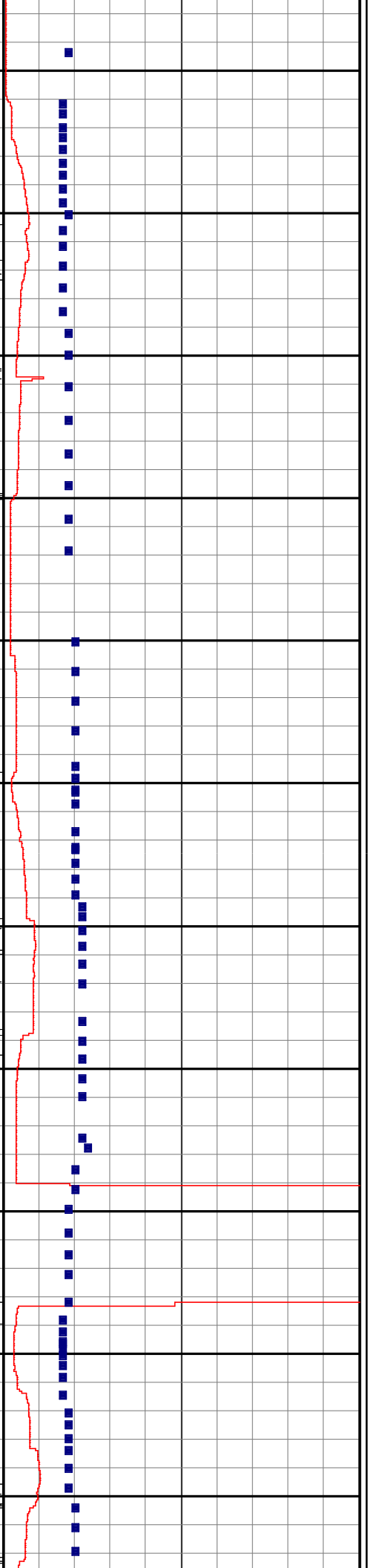
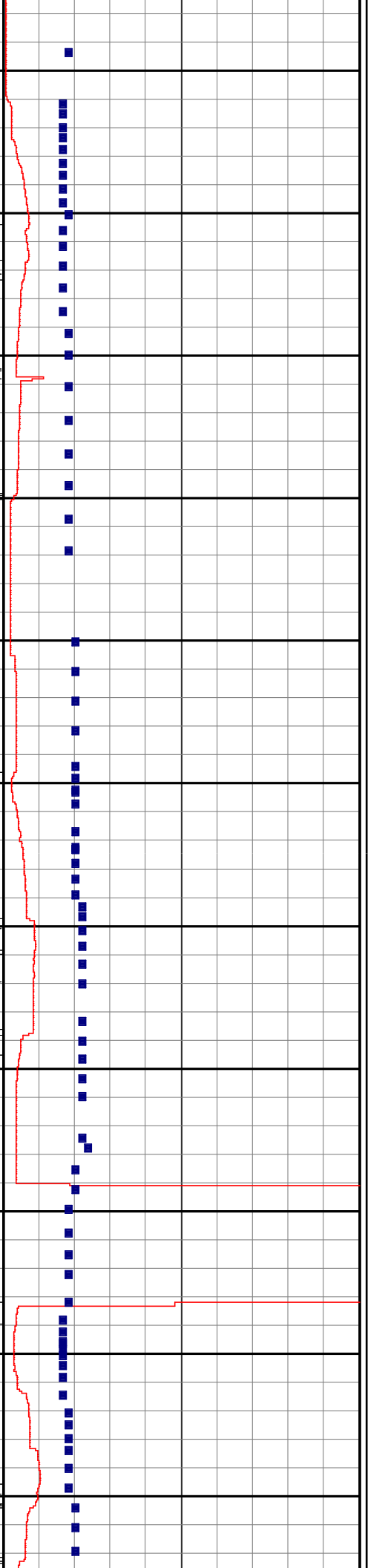
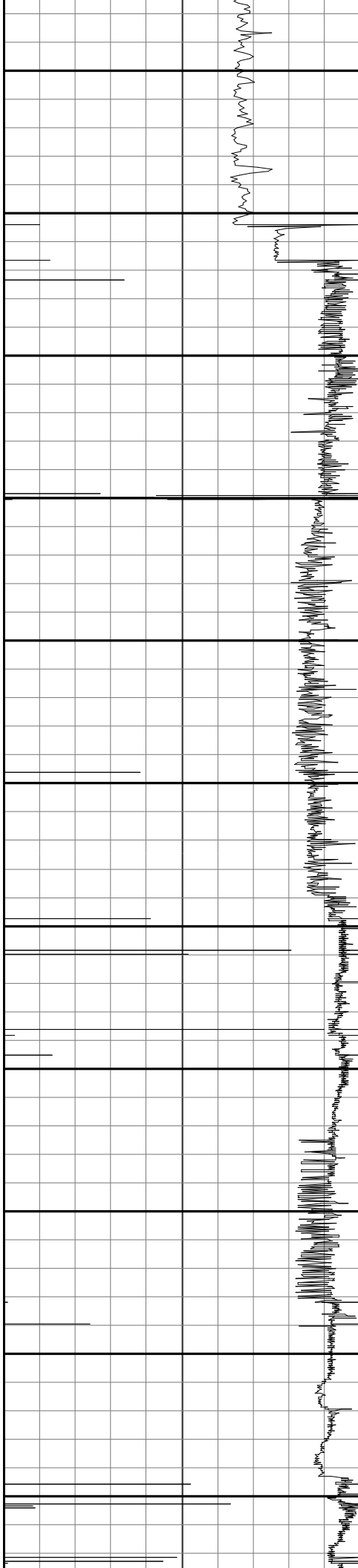
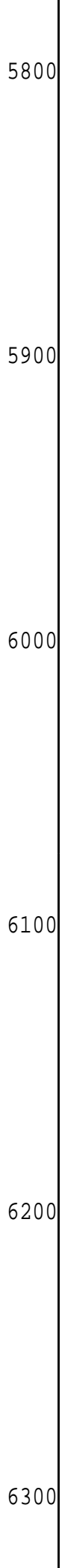
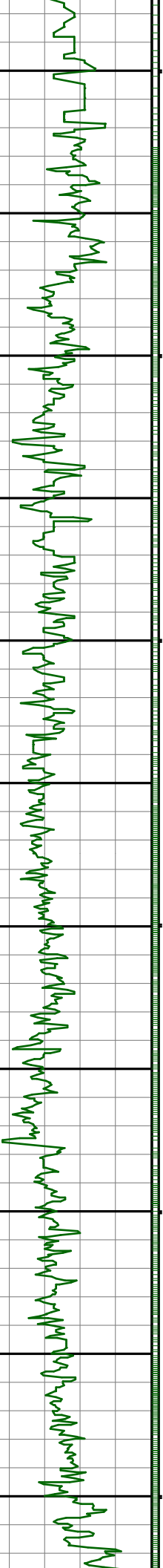


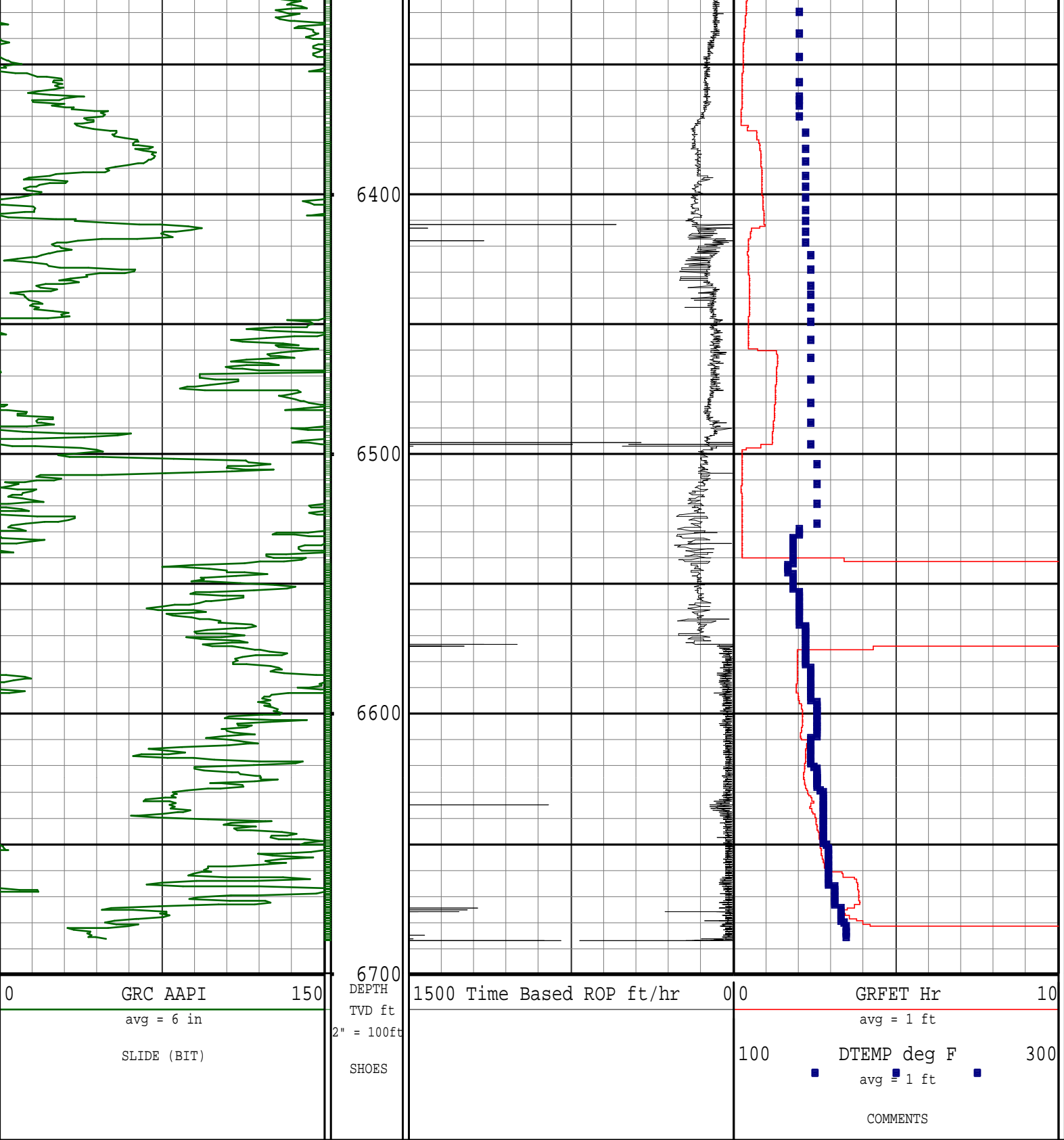


4700
4800
4900
5000
5100
5200









Survey Report

Vertical Section Plane: 265.94°	Total Correction: 7.39° East to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: WELLS RANCH AE19-631
RT: 30' ROTARY TABLE TO GROUND LEVEL	FIELD: WATTENBERG

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (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)
TIED - IN TO SURFACE											
0.00	0.00	209.74	0.00		-0.00	0.00 N	0.00 E	0.00	0.00		
372.00	0.80	257.80	371.99	372.00	2.57	0.55 S	2.54 W	2.60	257.80	0.21	

THE FOLLOWING ARE PATHFINDER MWD SURVEYS											
811.00	0.35	6.10	810.97	439.00	5.37	0.14 N	5.39 W	5.39	271.45	0.22	75.72
903.00	0.44	6.90	902.97	92.00	5.25	0.77 N	5.32 W	5.37	278.20	0.10	79.34
996.00	0.44	20.03	995.97	93.00	5.04	1.46 N	5.15 W	5.36	285.78	0.11	79.34
1088.00	0.35	31.78	1087.97	92.00	4.73	2.03 N	4.88 W	5.29	292.54	0.13	79.34
1181.00	0.35	4.72	1180.96	93.00	4.52	2.55 N	4.71 W	5.36	298.44	0.18	82.95
1202.00	0.44	27.10	1201.96	21.00	4.47	2.69 N	4.67 W	5.39	299.92	0.84	79.34
1295.00	0.44	338.29	1294.96	93.00	4.39	3.34 N	4.64 W	5.72	305.73	0.39	82.95
1389.00	0.26	346.21	1388.96	94.00	4.54	3.88 N	4.82 W	6.19	308.81	0.20	82.95
1481.00	0.44	340.71	1480.96	92.00	4.66	4.42 N	4.99 W	6.66	311.51	0.20	82.95
1572.00	0.26	327.54	1571.96	91.00	4.85	4.92 N	5.22 W	7.17	313.33	0.21	82.95
1665.00	0.53	320.38	1664.95	93.00	5.21	5.43 N	5.60 W	7.80	314.09	0.30	82.95
1758.00	0.44	323.66	1757.95	93.00	5.65	6.05 N	6.09 W	8.58	314.80	0.10	82.95
1852.00	1.23	190.45	1851.94	94.00	6.09	5.35 N	6.49 W	8.41	309.50	1.66	86.57
1943.00	3.43	216.52	1942.86	91.00	8.11	2.20 N	8.28 W	8.57	284.86	2.62	90.18
2036.00	5.80	205.30	2035.56	93.00	12.22	4.29 S	11.95 W	12.69	250.26	2.72	90.18
2129.00	7.39	209.09	2127.94	93.00	17.80	13.76 S	16.86 W	21.77	230.78	1.77	90.18
2222.00	7.74	209.22	2220.13	93.00	24.50	24.45 S	22.83 W	33.45	223.03	0.38	93.80
2316.00	7.47	207.30	2313.30	94.00	31.16	35.41 S	28.72 W	45.59	219.05	0.39	93.80
2409.00	8.97	212.20	2405.35	93.00	38.59	46.92 S	35.36 W	58.75	217.00	1.78	93.80
2501.00	8.79	210.06	2496.25	92.00	46.78	59.07 S	42.70 W	72.89	215.86	0.41	97.41
2596.00	9.06	210.02	2590.09	95.00	55.04	71.83 S	50.08 W	87.56	214.88	0.28	97.41
2691.00	8.88	209.20	2683.93	95.00	63.25	84.71 S	57.40 W	102.32	214.12	0.23	97.41
2786.00	8.44	208.27	2777.85	95.00	71.00	97.25 S	64.28 W	116.57	213.46	0.49	101.02
2880.00	8.27	208.76	2870.85	94.00	78.36	109.25 S	70.80 W	130.18	212.95	0.20	101.02
2975.00	8.35	208.62	2964.85	95.00	85.78	121.29 S	77.39 W	143.88	212.54	0.09	101.02
3070.00	8.44	208.61	3058.84	95.00	93.27	133.47 S	84.03 W	157.72	212.19	0.09	101.02
3164.00	8.18	206.08	3151.85	94.00	100.35	145.53 S	90.28 W	171.26	211.81	0.48	101.02
3259.00	7.83	204.17	3245.92	95.00	106.81	157.51 S	95.90 W	184.40	211.33	0.46	104.64
3354.00	6.77	200.42	3340.15	95.00	112.19	168.66 S	100.50 W	196.33	210.79	1.22	104.64
3449.00	6.33	202.92	3434.53	95.00	116.88	178.73 S	104.49 W	207.03	210.31	0.55	104.64
3544.00	6.16	202.31	3528.97	95.00	121.52	188.27 S	108.47 W	217.28	209.95	0.19	104.64
3639.00	6.24	198.50	3623.41	95.00	125.77	197.88 S	112.04 W	227.40	209.52	0.44	108.25
3734.00	6.60	197.15	3717.82	95.00	129.73	207.99 S	115.29 W	237.81	209.00	0.41	108.25
3829.00	7.12	197.57	3812.14	95.00	133.87	218.82 S	118.68 W	248.93	208.47	0.55	111.87
3924.00	6.33	198.98	3906.48	95.00	138.09	229.39 S	122.16 W	259.89	208.04	0.85	111.87
4018.00	4.40	202.76	4000.07	94.00	141.75	237.61 S	125.24 W	268.60	207.79	2.09	115.48
4113.00	2.02	213.98	4094.91	95.00	144.42	242.36 S	127.58 W	273.89	207.76	2.58	119.09
4208.00	1.76	198.57	4189.86	95.00	146.02	245.13 S	128.98 W	277.00	207.75	0.60	119.09
4302.00	1.32	197.47	4283.83	94.00	146.97	247.54 S	129.77 W	279.49	207.67	0.47	122.71
4397.00	0.18	31.67	4378.82	95.00	147.28	248.45 S	130.02 W	280.42	207.62	1.57	119.09
4492.00	0.35	49.58	4473.82	95.00	146.96	248.14 S	129.72 W	280.00	207.60	0.20	119.09
4586.00	0.44	62.16	4567.82	94.00	146.40	247.78 S	129.18 W	279.43	207.54	0.13	119.09
4680.00	0.44	71.03	4661.81	94.00	145.72	247.50 S	128.52 W	278.88	207.44	0.07	119.09
4774.00	0.44	250.58	4755.81	94.00	145.72	247.50 S	128.52 W	278.88	207.44	0.94	122.71
4868.00	0.44	227.90	4849.81	94.00	146.35	247.86 S	129.13 W	279.48	207.52	0.18	122.71
4962.00	0.44	221.54	4943.81	94.00	146.90	248.37 S	129.64 W	280.17	207.56	0.05	122.71
5057.00	0.44	214.55	5038.80	95.00	147.38	248.95 S	130.08 W	280.88	207.59	0.06	126.32
5151.00	0.79	278.63	5132.80	94.00	148.24	249.15 S	130.93 W	281.45	207.72	0.76	122.71
5246.00	0.53	321.40	5227.79	95.00	149.13	248.70 S	131.85 W	281.49	207.93	0.57	126.32
5340.00	0.09	318.95	5321.79	94.00	149.42	248.31 S	132.17 W	281.29	208.03	0.47	129.94
5435.00	0.26	204.06	5416.79	95.00	149.57	248.45 S	132.31 W	281.48	208.04	0.32	133.55
5529.00	0.53	178.59	5510.79	94.00	149.69	249.08 S	132.38 W	282.07	207.99	0.34	133.55
5624.00	0.44	215.05	5605.79	95.00	149.94	249.82 S	132.58 W	282.82	207.96	0.33	133.55
5719.00	0.44	166.17	5700.78	95.00	150.11	250.47 S	132.71 W	283.45	207.92	0.38	133.55
5813.00	0.18	304.60	5794.78	94.00	150.16	250.74 S	132.74 W	283.71	207.90	0.63	137.17
5908.00	1.23	274.62	5889.78	95.00	151.28	250.57 S	133.88 W	284.09	208.12	1.14	137.17
6002.00	3.52	258.22	5983.69	94.00	155.14	251.08 S	137.71 W	286.36	208.74	2.52	140.78
6097.00	4.75	266.89	6078.44	95.00	161.96	251.89 S	144.49 W	290.39	209.84	1.45	140.78
6192.00	7.56	263.92	6172.88	95.00	172.14	252.76 S	154.64 W	296.31	211.46	2.98	144.39
6286.00	10.46	265.91	6265.71	94.00	186.86	254.03 S	169.30 W	305.27	213.68	3.10	133.55
6380.00	18.29	284.36	6356.75	94.00	209.43	250.97 S	192.15 W	316.08	217.44	9.55	140.78
6474.00	26.29	285.50	6443.65	94.00	243.10	241.73 S	226.55 W	331.30	223.14	8.52	148.01
6569.00	33.94	280.97	6525.78	95.00	288.61	231.05 S	272.94 W	357.60	229.75	8.39	151.62
6664.00	46.25	281.78	6598.31	95.00	347.46	218.95 S	332.79 W	398.36	236.66	12.97	151.62
6759.00	62.87	278.88	6653.21	95.00	422.20	205.32 S	408.69 W	457.37	243.33	17.67	158.85
6842.00	79.76	276.28	6679.71	83.00	498.94	195.08 S	486.35 W	524.02	248.14	20.56	166.08
6933.00	90.92	274.66	6687.09	91.00	588.25	186.45 S	576.49 W	605.90	252.08	12.39	169.69

Survey Report											
Vertical Section Plane: 265.94°						Total Correction: 7.39° East to True					
Calculation Method: Minimum Curvature						Survey Reference: Wellhead					
North Aligned to: True North						Well: WELLS RANCH AE19-631					
RT: 30' ROTARY TABLE TO GROUND LEVEL						FIELD: WATTENBERG					
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (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)
7025.00	91.01	273.84	6685.54	92.00	679.27	179.64 S	668.23 W	691.95	254.95	0.90	169.69
7117.00	92.95	273.26	6682.36	92.00	770.40	173.94 S	759.99 W	779.64	257.11	2.20	169.69
7210.00	93.39	271.28	6677.22	93.00	862.69	170.27 S	852.77 W	869.60	258.71	2.18	173.31
7303.00	93.12	270.33	6671.94	93.00	955.20	168.96 S	945.61 W	960.59	259.87	1.06	176.92
7397.00	92.07	267.69	6667.68	94.00	1048.96	170.59 S	1039.49 W	1053.39	260.68	3.02	176.92
7490.00	93.21	267.35	6663.40	93.00	1141.82	174.60 S	1132.30 W	1145.69	261.23	1.28	166.08

7582.00	91.36	264.86	6659.73	92.00	1233.74	180.85 S	1224.01 W	1237.30	261.60	3.37	169.69
7676.00	89.69	265.70	6658.87	94.00	1327.72	188.58 S	1317.68 W	1331.11	261.86	1.99	173.31
7771.00	90.04	265.15	6659.09	95.00	1422.72	196.16 S	1412.38 W	1425.93	262.09	0.69	176.92
7866.00	89.52	265.06	6659.46	95.00	1517.71	204.27 S	1507.03 W	1520.81	262.28	0.56	180.54
7961.00	90.13	265.05	6659.75	95.00	1612.70	212.46 S	1601.67 W	1615.70	262.44	0.64	184.15
8055.00	89.96	265.84	6659.67	94.00	1706.69	219.92 S	1695.38 W	1709.58	262.61	0.86	180.54
8150.00	90.84	265.53	6659.01	95.00	1801.69	227.07 S	1790.10 W	1804.45	262.77	0.98	184.15
8245.00	89.34	267.42	6658.86	95.00	1896.68	232.91 S	1884.92 W	1899.25	262.96	2.54	184.15
8339.00	89.78	268.07	6659.58	94.00	1990.63	236.61 S	1978.84 W	1992.94	263.18	0.83	187.76
8434.00	90.84	268.64	6659.07	95.00	2085.54	239.34 S	2073.80 W	2087.56	263.42	1.27	187.76
8528.00	89.52	267.03	6658.77	94.00	2179.48	242.89 S	2167.73 W	2181.29	263.61	2.21	191.38
8622.00	89.25	266.71	6659.78	94.00	2273.46	248.02 S	2261.58 W	2275.14	263.74	0.45	194.99
8717.00	90.40	266.70	6660.07	95.00	2368.45	253.48 S	2356.42 W	2370.02	263.86	1.21	194.99
8812.00	87.49	266.24	6661.82	95.00	2463.42	259.33 S	2451.21 W	2464.89	263.96	3.10	194.99
8906.00	88.02	265.13	6665.51	94.00	2557.35	266.39 S	2544.87 W	2558.78	264.02	1.31	198.61
9000.00	89.60	268.29	6667.46	94.00	2651.30	271.79 S	2638.68 W	2652.64	264.12	3.76	198.61
9095.00	90.40	267.67	6667.46	95.00	2746.24	275.13 S	2733.62 W	2747.43	264.25	1.07	202.22
9189.00	90.13	269.36	6667.02	94.00	2840.14	277.57 S	2827.59 W	2841.18	264.39	1.82	202.22
9284.00	90.92	269.56	6666.15	95.00	2934.96	278.46 S	2922.58 W	2935.81	264.56	0.86	202.22
9378.00	89.87	267.68	6665.50	94.00	3028.85	280.73 S	3016.54 W	3029.58	264.68	2.29	202.22
9472.00	90.40	268.04	6665.28	94.00	3122.80	284.24 S	3110.48 W	3123.44	264.78	0.68	205.83
9566.00	89.60	266.76	6665.28	94.00	3216.76	288.50 S	3204.38 W	3217.34	264.86	1.60	202.22
9661.00	89.87	266.76	6665.72	95.00	3311.75	293.87 S	3299.23 W	3312.29	264.91	0.28	205.83
9755.00	90.48	266.64	6665.44	94.00	3405.74	299.28 S	3393.07 W	3406.24	264.96	0.66	209.45
9849.00	89.52	266.72	6665.44	94.00	3499.73	304.73 S	3486.91 W	3500.20	265.01	1.03	205.83
9943.00	90.31	266.40	6665.58	94.00	3593.73	310.37 S	3580.74 W	3594.16	265.05	0.91	209.45
10037.00	89.96	267.44	6665.35	94.00	3687.71	315.42 S	3674.60 W	3688.11	265.09	1.17	209.45
10132.00	90.66	266.98	6664.84	95.00	3782.69	320.04 S	3769.49 W	3783.05	265.15	0.88	209.45
10226.00	90.40	266.96	6663.97	94.00	3876.67	325.01 S	3863.35 W	3877.00	265.19	0.28	205.83
10320.00	90.13	266.38	6663.54	94.00	3970.66	330.47 S	3957.19 W	3970.97	265.23	0.68	209.45
10415.00	90.57	265.82	6662.96	95.00	4065.65	336.93 S	4051.97 W	4065.95	265.25	0.75	209.45
10509.00	88.46	265.69	6663.75	94.00	4159.65	343.89 S	4145.70 W	4159.94	265.26	2.25	209.45
10604.00	89.16	269.29	6665.72	95.00	4254.57	348.05 S	4240.57 W	4254.83	265.31	3.86	209.45
10698.00	88.72	268.65	6667.46	94.00	4348.43	349.74 S	4334.54 W	4348.63	265.39	0.83	213.06
10792.00	89.08	268.58	6669.27	94.00	4442.31	352.01 S	4428.50 W	4442.47	265.46	0.39	213.06
10887.00	89.60	268.51	6670.36	95.00	4537.20	354.42 S	4523.46 W	4537.32	265.52	0.55	216.68
10981.00	88.46	268.47	6671.95	94.00	4631.09	356.90 S	4617.41 W	4631.18	265.58	1.21	216.68
11076.00	89.96	269.96	6673.26	95.00	4725.92	358.20 S	4712.39 W	4725.98	265.65	2.22	216.68
11170.00	91.28	270.20	6672.25	94.00	4819.67	358.07 S	4806.38 W	4819.70	265.74	1.43	220.29
11265.00	89.87	269.52	6671.29	95.00	4914.44	358.30 S	4901.37 W	4914.45	265.82	1.65	216.68
11359.00	90.48	269.05	6671.01	94.00	5008.28	359.47 S	4995.36 W	5008.28	265.88	0.82	216.68
11454.00	89.96	267.92	6670.64	95.00	5103.18	361.98 S	5090.33 W	5103.18	265.93	1.31	216.68
11548.00	90.48	267.96	6670.28	94.00	5197.12	365.36 S	5184.27 W	5197.13	265.97	0.56	220.29
11644.00	90.22	267.58	6669.69	96.00	5293.07	369.10 S	5280.19 W	5293.08	266.00	0.48	216.68
11738.00	91.71	267.50	6668.11	94.00	5387.02	373.13 S	5374.09 W	5387.03	266.03	1.59	220.29
11833.00	90.31	266.96	6666.44	95.00	5481.98	377.72 S	5468.96 W	5481.99	266.05	1.58	220.29
11928.00	90.84	267.20	6665.48	95.00	5576.96	382.56 S	5563.83 W	5576.97	266.07	0.61	223.91
12003.00	90.22	267.58	6664.79	75.00	5651.93	385.98 S	5638.75 W	5651.95	266.08	0.97	223.91
PROJECTION TO BIT											
12066.00	90.22	267.58	6664.55	63.00	5714.90	388.64 S	5701.69 W	5714.92	266.10	0.00	

BOTTOM HOLE ASSEMBLY RECORD							
1 ft		2 ft		3 ft		4 ft	
8 3/4 PDC BIT	0.70	8 3/4 PDC BIT	0.65	8 3/4 INSERT BIT	0.80	6 1/8 PDC BIT	0.58
1.75° FX MOTOR	25.40	2.25° FX MOTOR	24.27	2.5° FX MOTOR	24.30	1.5° FX MOTOR	26.81
NM FLOAT SUB	3.22	NM FLOAT SUB	3.22	NM FLOAT SUB	3.22	NM FLOAT SUB	3.50
SUB MULESHOE	2.58	MULESHOE	2.58	MULESHOE	2.58	MULESHOE	2.97
HDS-1R (DIR/GR)	29.50	NM DC	29.50	NM DC	29.50	NM DC	31.11
NM FLEX DC	31.10	NM FLEX DC	31.10	NM FLEX DC	31.10	NM DC	30.97
NM FLEX DC	31.04	NM FLEX DC	31.04	NM FLEX DC	31.04	NM FLOAT SUB	3.49
FILTER SUB	2.83	FILTER SUB	2.83	FILTER SUB	2.83	NM DC	30.97
XOVER SUB	2.80	DRILL PIPE	1040.06	DRILL PIPE	1040.06	FILTER SUB	3.05
		X/O SUB	2.88	X/O SUB	2.88	X/O SUB	3.06
		HWDP	1392.51	HWDP	1392.51	HWDP	30.67
						REAMER	8.52
						DRILL PIPE	2179.05
HWDP	1392.51					SHOCK SUB	2376.47
						DRILL PIPE	3875.91
						HWDP	1392.91
=====		=====		=====		=====	

TOTAL BHA LENGTH	1521.68	TOTAL BHA LENGTH	2560.64	TOTAL BHA LENGTH	2560.82	TOTAL BHA LENGTH	7645.29
SENSOR OFFSETS:		SENSOR OFFSETS:		SENSOR OFFSETS:		SENSOR OFFSETS:	
=====		=====		=====		=====	
DIRECTIONAL	57.51	DIRECTIONAL	58.03	DIRECTIONAL	58.21	DIRECTIONAL	61.14
GAMMA-RAY	40.21	GAMMA-RAY	40.63	GAMMA-RAY	40.81	GAMMA-RAY	43.74



A Schlumberger Company

GAMMA-RAY

2" = 100'

FEET TVD