OSTERGAARD ACOUSTICAL ASSOCIATES
1460 US Highway 9 North Suite 209
Woodbridge, NJ 07095
Voice 973-731-7002
Fax 973-731-6680
acousticalconsultant.com

VIA EMAIL ONLY

17 June 2021

Mr. & Mrs. E. Martin Davidoff
9 Ashton Lane
Hightstown, NJ 08520

Re: Acoustical Findings from Frog Noise Measurements
OAA File 4429A

Dear Mr. Davidoff:

As agreed, Mr. Daniel Young of Ostergaard Acoustical Associates visited your home on the evening of 7 June 2021 to make calibrated measurements of frog noise on your patio as well as on your neighbor's patio at 25 Barton Drive. Measurements were made with a Bruel & Kjaer random-incidence condenser microphone 4189, used in conjunction with a preamplifier, Bruel & Kjaer Model ZC 0032, and a precision sound level meter and octave band analyzer, Bruel & Kjaer Model 2250. A windscreen was used on the microphone to reduce wind noise. The entire system was calibrated before and after the measurements by means of a sound pressure level calibrator with calibration traceable to the National Institute of Standards and Technology.

APPLICABLE NOISE REGULATIONS

Noise in Hightstown is regulated by the New Jersey Noise Regulation, found at N.J.A.C 7:29, as well as Hightstown Ordinances 2020-13 and 2020-14. The New Jersey regulation limits sound received at commercial and residential property lines to 65 dB(A) during the daytime hours of 0700-to-2200. During the nighttime hours of 2200-to-0700, the limit at receiving commercial property lines remains at 65 dB(A), while the limit at receiving residential property lines drops to 50 dB(A). Octave frequency band limits are associated with the 50 and 65 dB(A) limits and are shown in Table I below. The New Jersey noise regulation regulates sound *emitted from* industrial and commercial properties, and does not regulate residential-to-residential noise transmission. Specific exemptions to regulated noise are given in the New Jersey noise regulation, such as emergency generators operating during power failures, church bells sounding as part of religious services, unamplified human voices, etc. Animal noises are not exempt from regulation.

Hightstown Ordinance 2020-13 provides qualitative restrictions for noise.

Hightstown Ordinance 2020-14 restricts animal noise. ¶5-1.3.f states *Disturbing the Peace. No person shall keep any animal, including but not limited to any bird or dog, which causes frequent or long continued noise, or shall disturb the comfort or repose of any persons in the vicinity. For*

purposes of this subsection, a dog barking, or other pet making a disturbing noise, continually for ten (10) minutes or intermittently for thirty (30) minutes, and plainly audible at a distance of fifty (50) feet from the building, structure or vehicle in which or land on which it is located, shall be evidence of a violation of this section.

Below we present data that demonstrates measured frog sound levels exceed regulatory limits given in the New Jersey Noise Regulation. Determination of whether the sound emissions from the frogs are regulated, and whether they are the responsibility of your homeowner's association, is a question for legal professionals, not acoustical consultants.

Table I — New Jersey Noise Regulation limits *from* industrial/commercial sources *to* commercial/residential receivers, dB re 20 μPa.

		Octave Band Center Frequency (Hz)									
Receiver Type	**Time**	**31.5**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A***
Commercial	All times	96	82	74	67	63	60	57	55	53	65
Residential	0700-to-2200 hours	96	82	74	67	63	60	57	55	53	65
Residential	2200-to-0700 hours	86	71	61	53	48	45	42	40	38	50

* A denotes the A-weighted sound level

FINDINGS

We measured frog sound for two 10-minute periods at 9 Ashton Lane and one 10-minute period at 25 Barton Drive. We also carried out an additional 2-minute measurement at 9 Ashton Lane. Significant frog noise was present throughout all 4 measurement periods. Other audible noise included aircraft as well as traffic on Wyckoff Mills Road and Cranbury Station Road. Frog noise comprised low-frequency croaking noises in the 250 Hz octave band as well as raspy mid- and high-frequency noises in the 1,000 and 2,000 Hz octave bands. An example spectrum of maximum frog noise compared with New Jersey nighttime residential receiver limits is shown below in Figure 1.

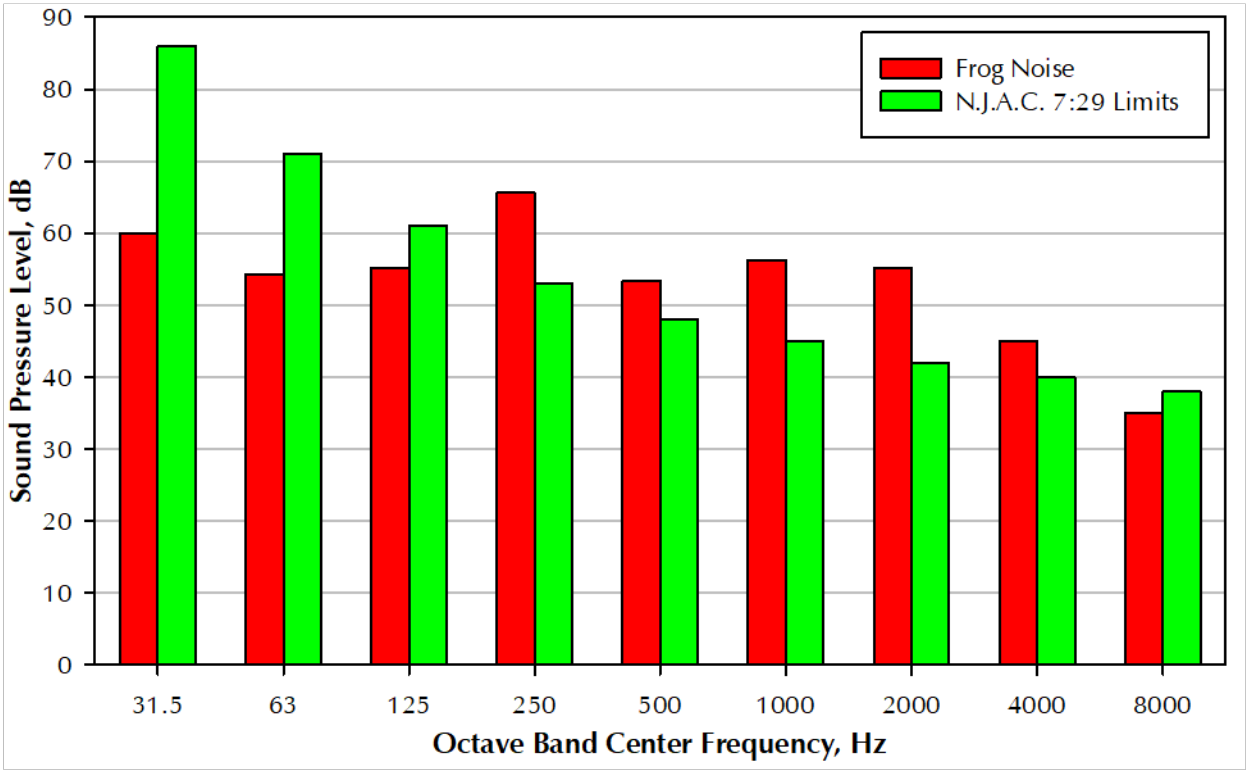

Figure 1 — Comparison of maximum frog noise spectrum to N.J.A.C. 7:29 limits for residential receivers during nighttime (2200-to-0700) hours.

Figures 2 through 17 show measurement time histories of data acquired once per second. Time histories of A-weighted (i.e. broadband) sound levels are shown, as well as time histories in the 250, 1,000, and 2,000 Hz octave bands. The respective New Jersey nighttime residential receiver limit is shown in each figure via a horizontal line. Figures 2 through 17 are annotated to call out locations in the time history that are clearly due to frog noise. Other instances where the plotted sound levels exceed the respective New Jersey limit are not clearly determinable as isolated frog noise; these occasions are either frog noise combined with local traffic noise, or instances of noise from aircraft.

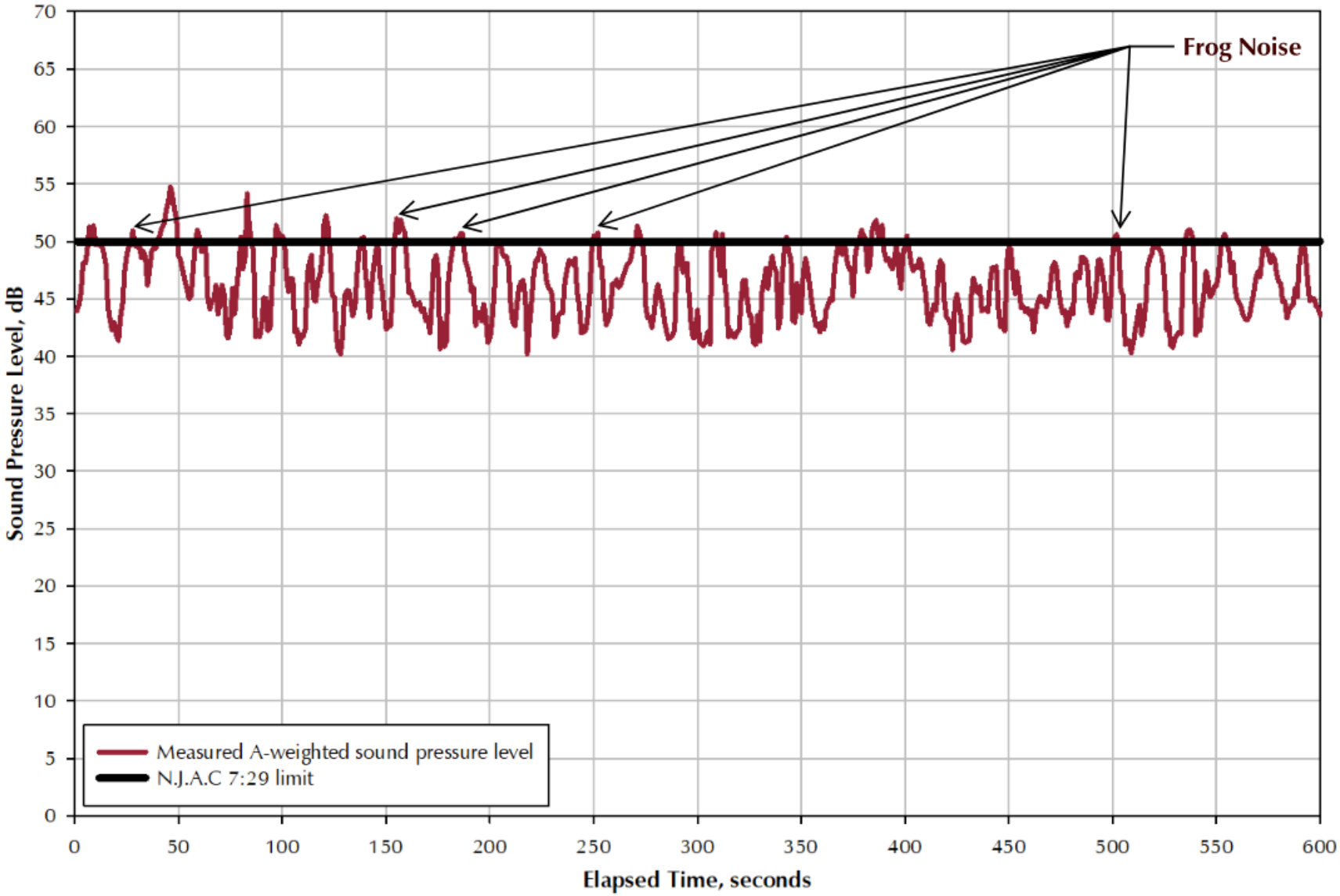

Figure 2 — A-weighted sound level time history for first measurement at 9 Ashton Lane (2154-to-2204 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

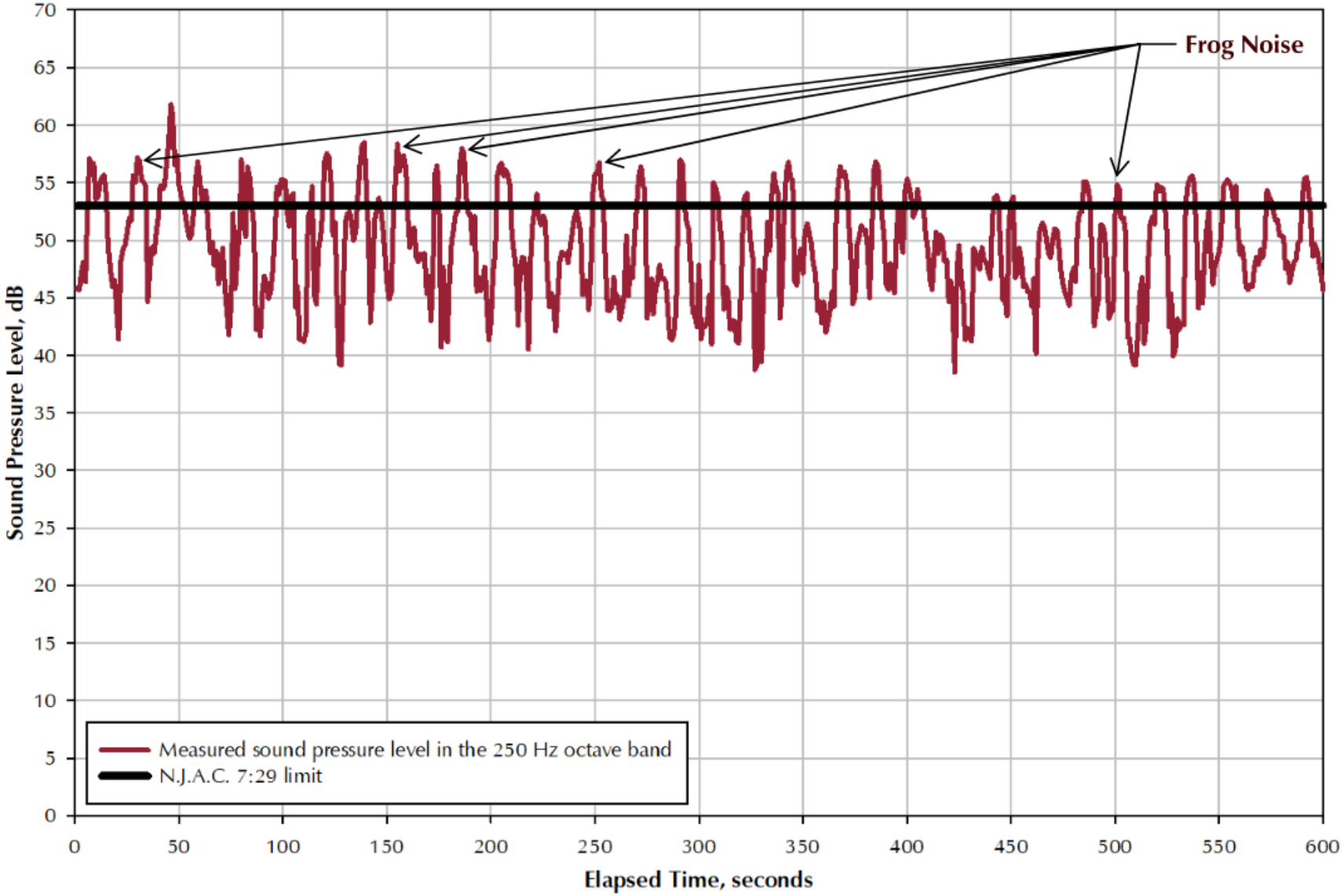

Figure 3 — Time history in 250 Hz octave band for first measurement at 9 Ashton Lane (2154-to-2204 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

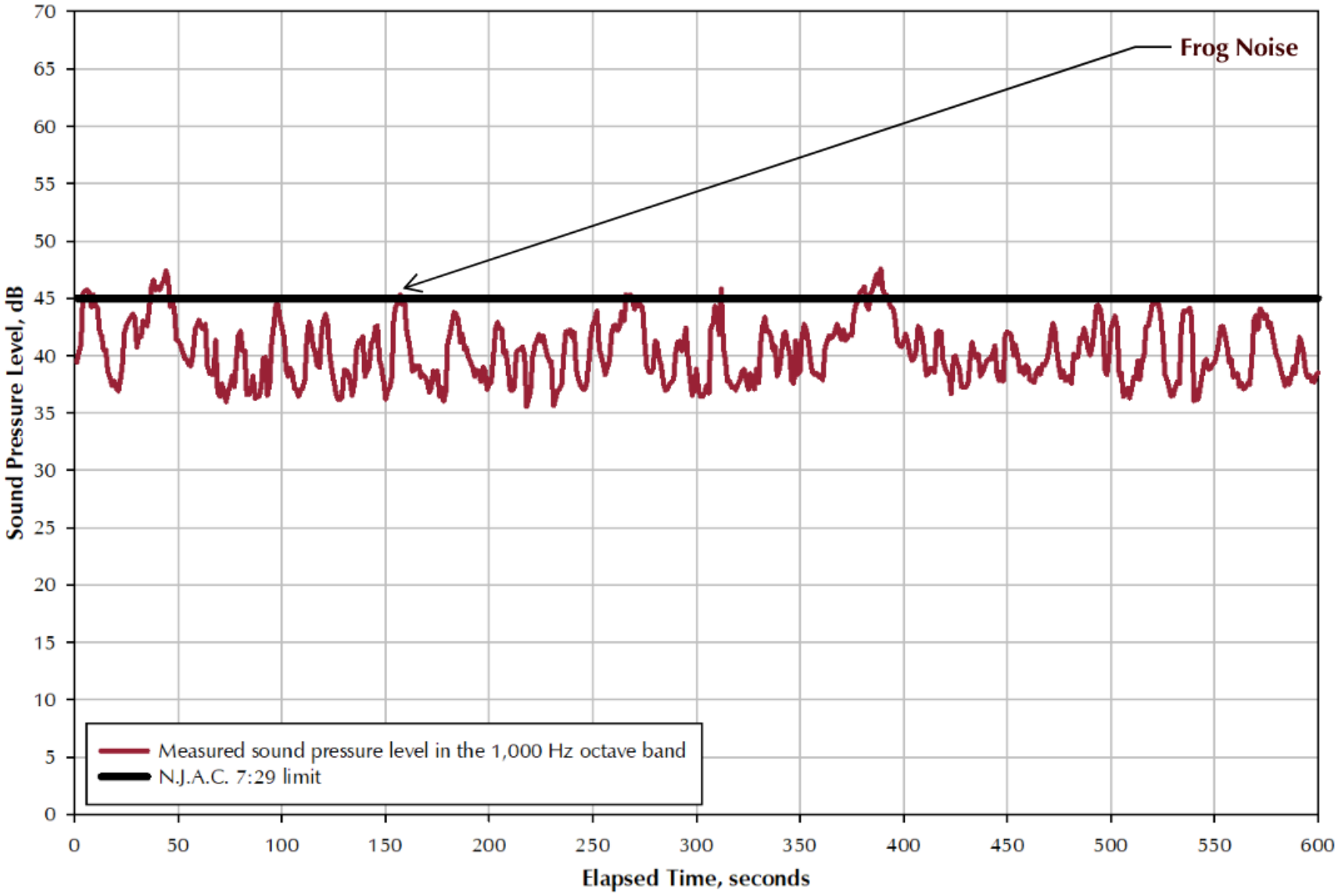

Figure 4 — Time history in 1,000 Hz octave band for first measurement at 9 Ashton Lane (2154-to-2204 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

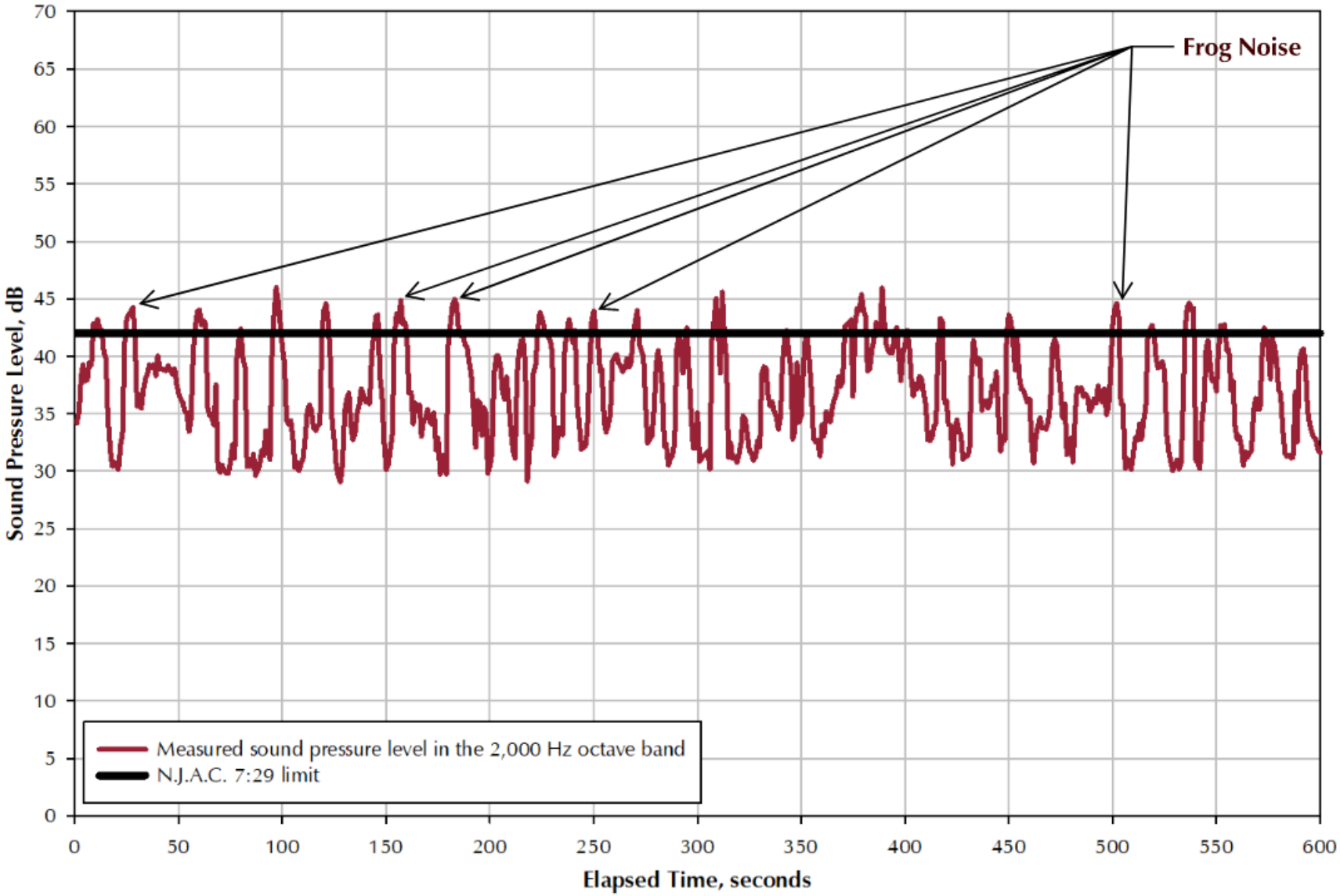

Figure 5 — Time history in 2,000 Hz octave band for first measurement at 9 Ashton Lane (2154-to-2204 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

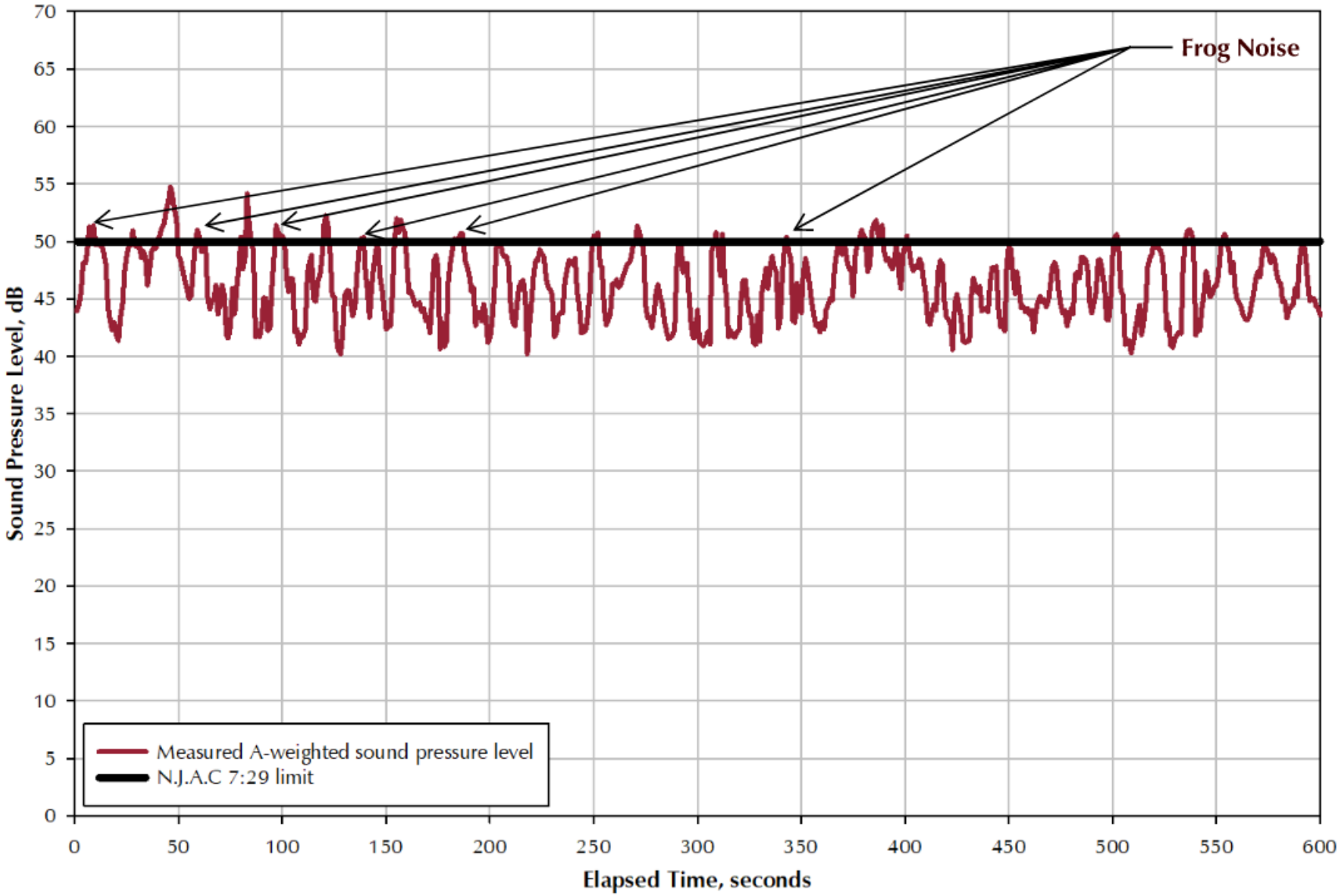

Figure 6 — A-weighted sound level time history for second measurement at 9 Ashton Lane (2235-to-2245 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

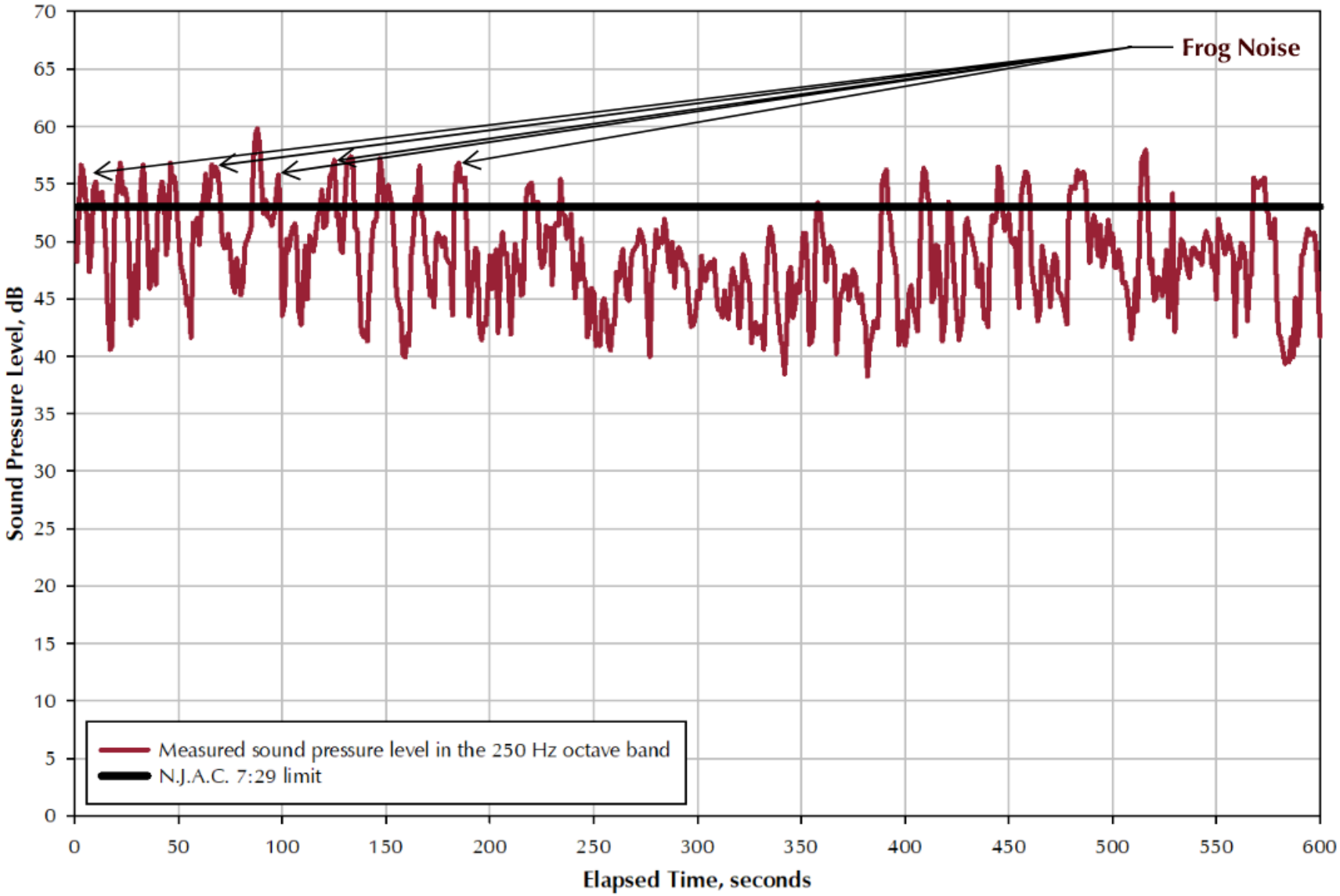

Figure 7 — Time history in 250 Hz octave band for second measurement at 9 Ashton Lane (2235-to-2245 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

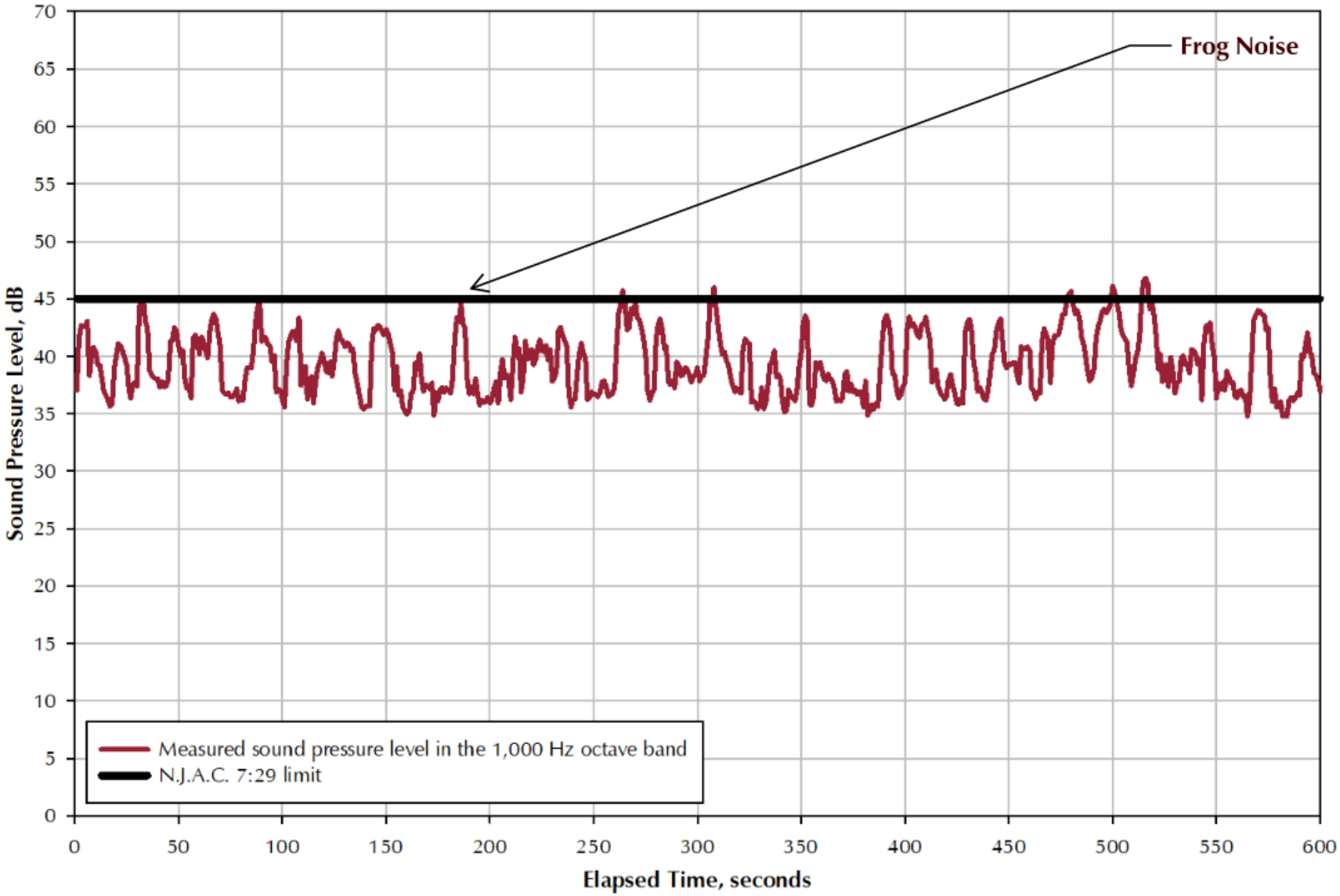

Figure 8 — Time history in 1,000 Hz octave band for second measurement at 9 Ashton Lane (2235-to-2245 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

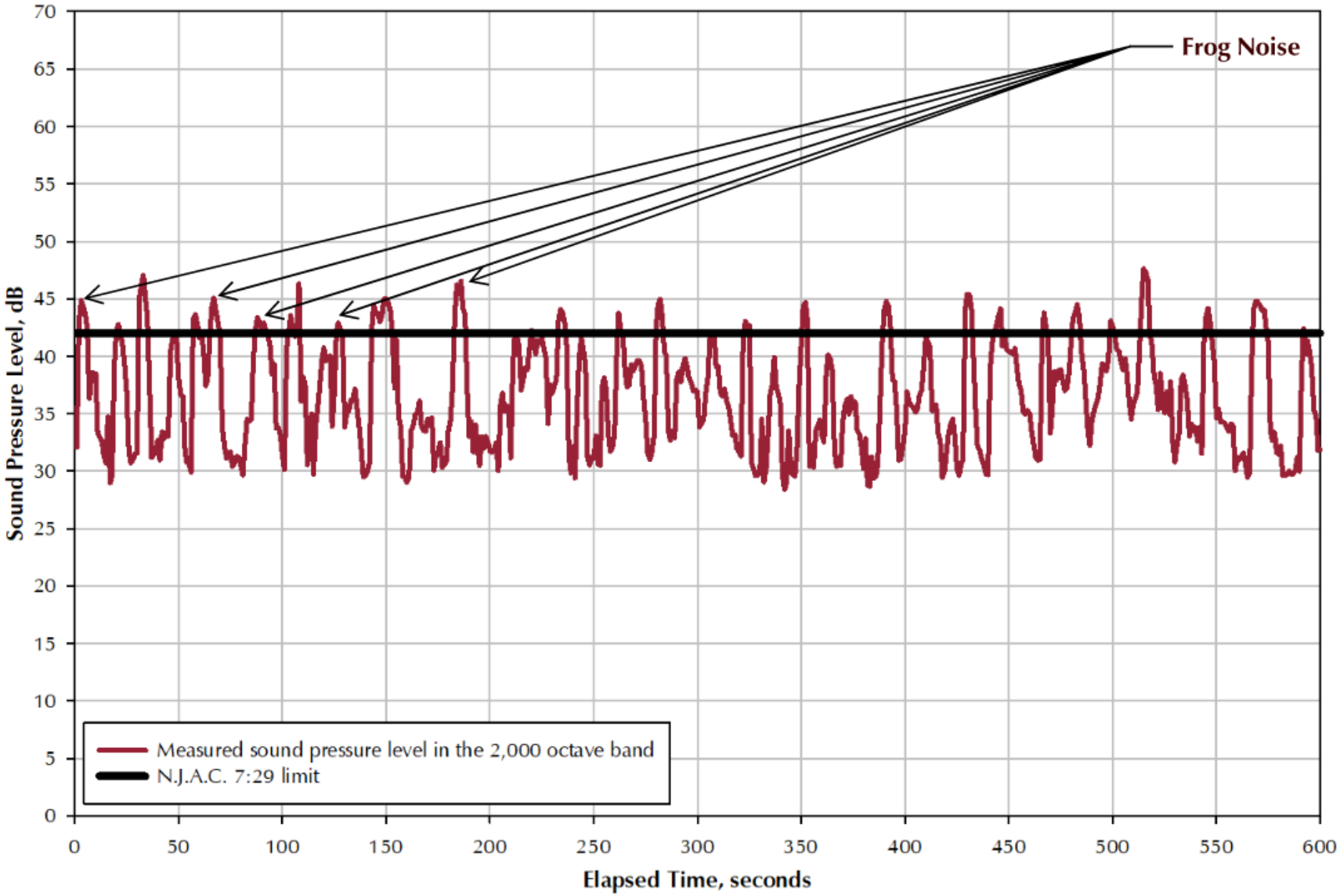

Figure 9 — Time history in 2,000 Hz octave band for second measurement at 9 Ashton Lane (2235-to-2245 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

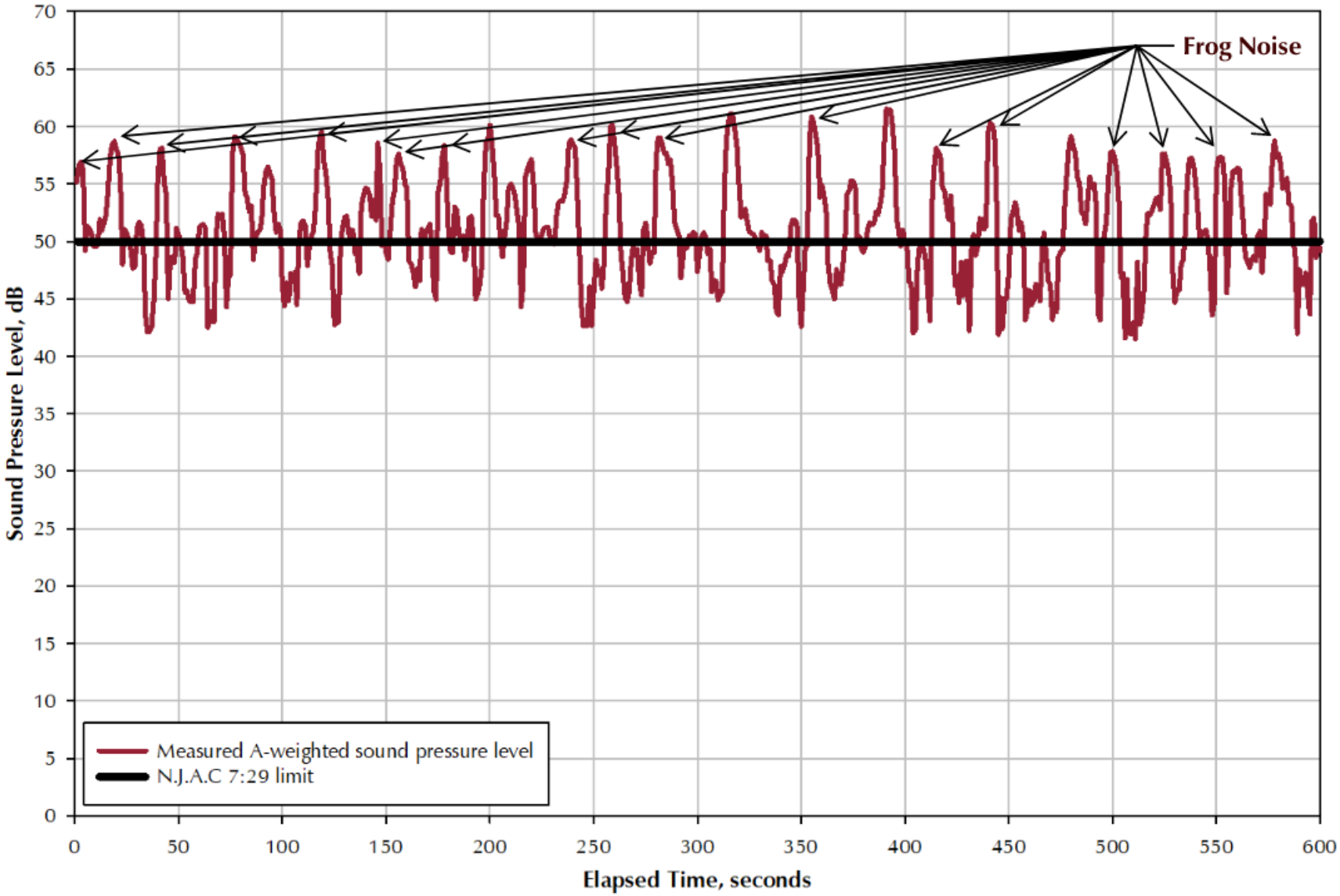

Figure 10 — A-weighted sound level time history for measurement at 25 Barton Drive (2219-to-2229 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

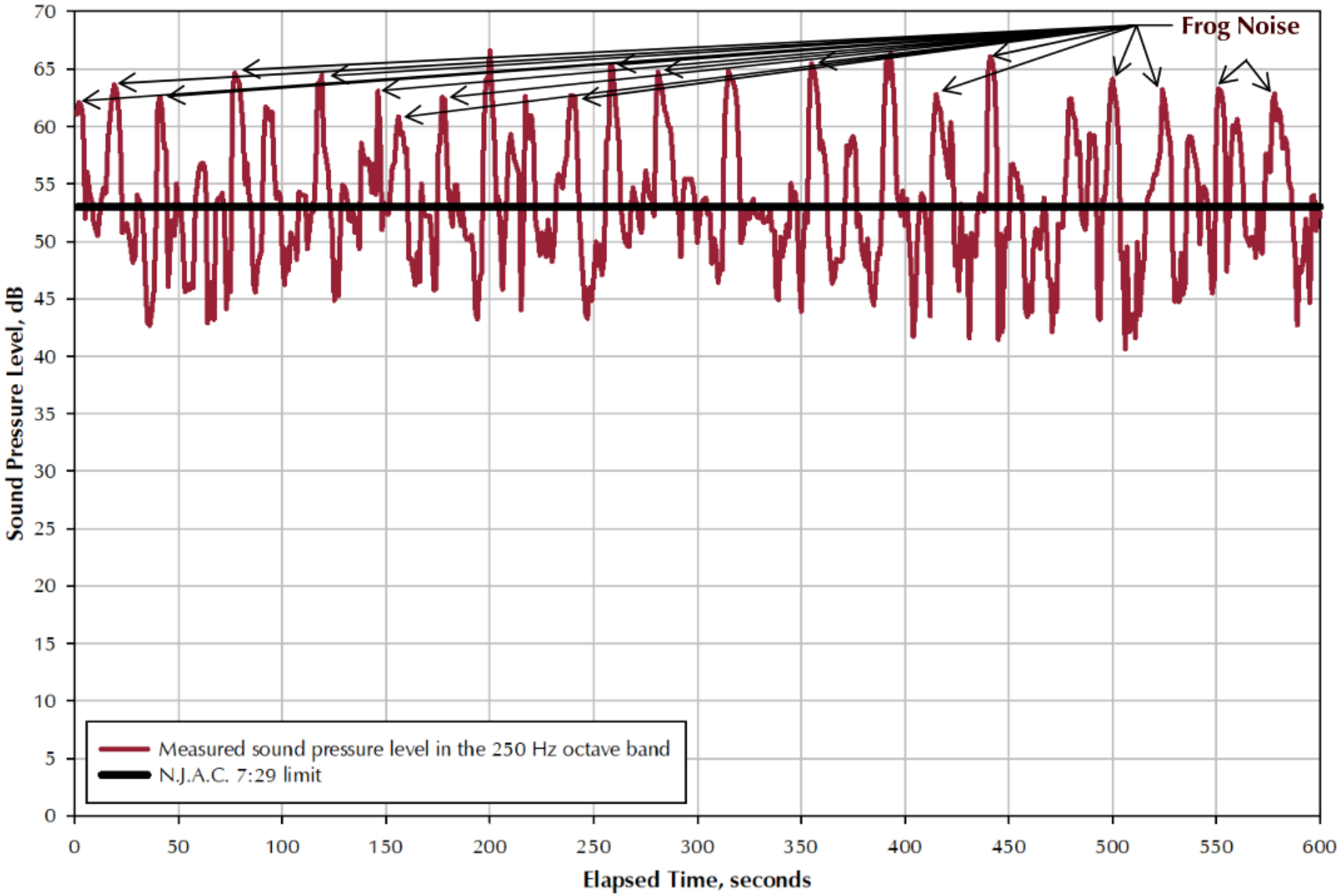

Figure 11— Time history in 250 Hz octave band for measurement at 25 Barton Drive (2219-to-2229 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

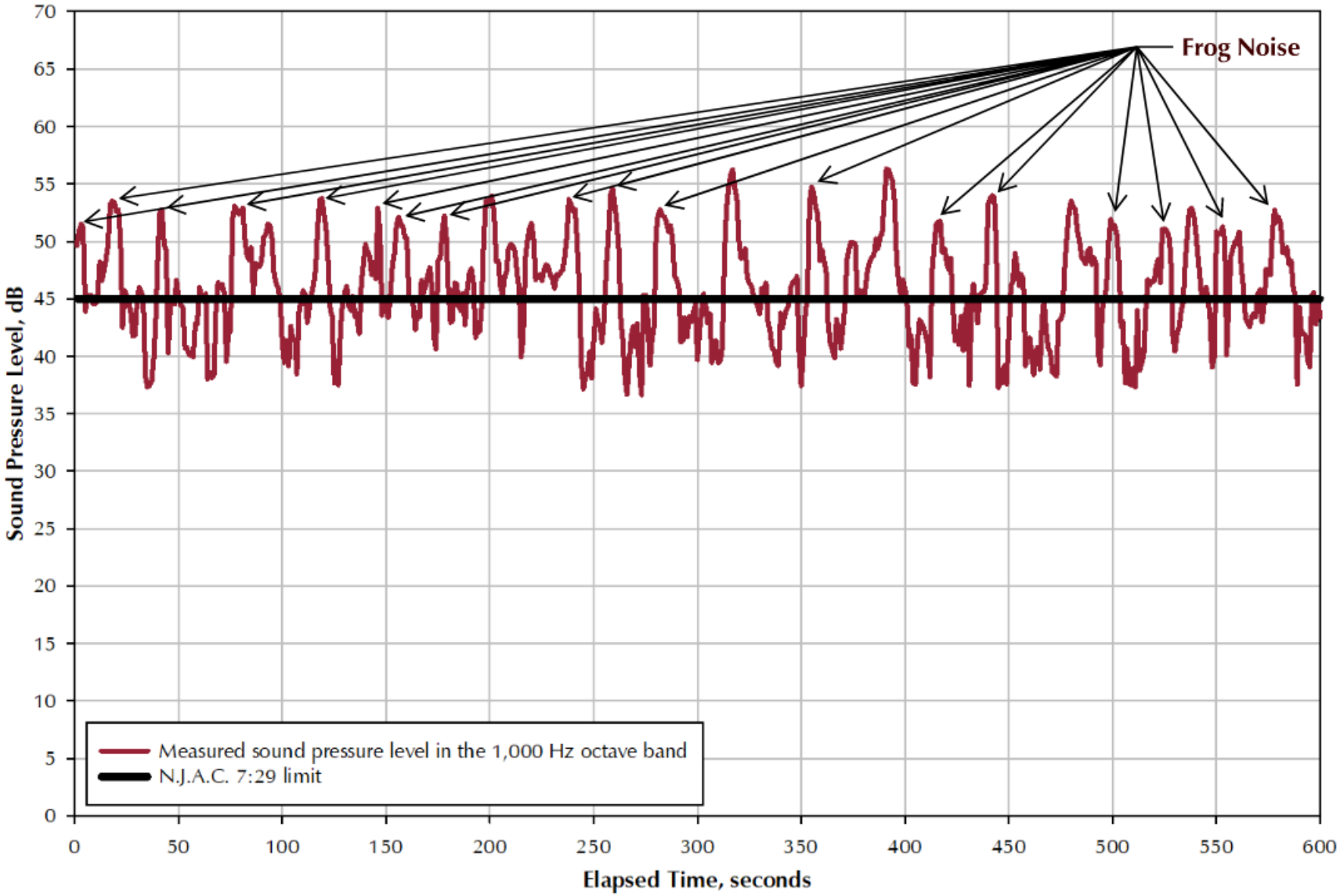

Figure 12 — Time history in 1,000 Hz octave band for measurement at 25 Barton Drive (2219-to-2229 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

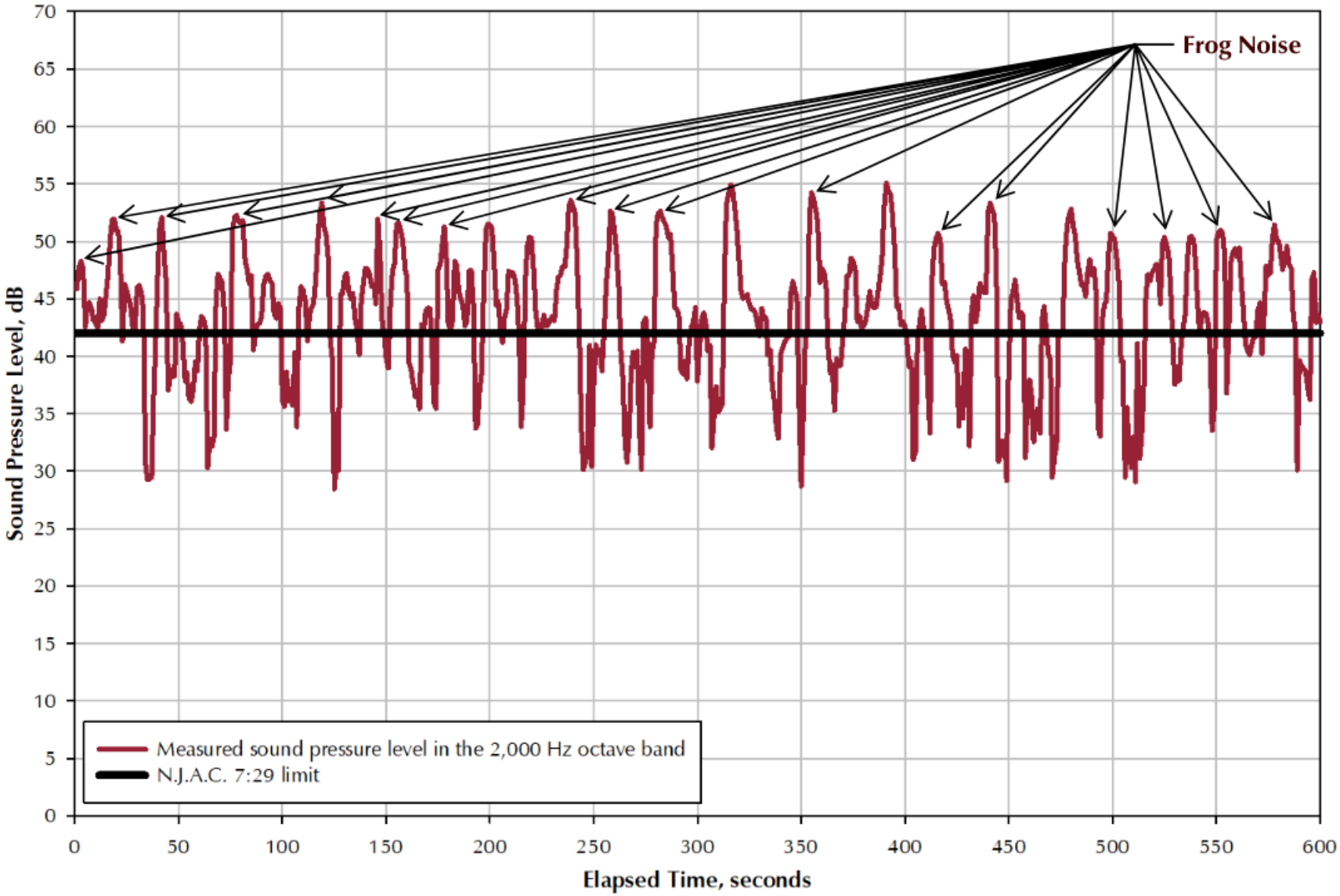

Figure 13 — Time history in 2,000 Hz octave band for measurement at 25 Barton Drive (2219-to-2229 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

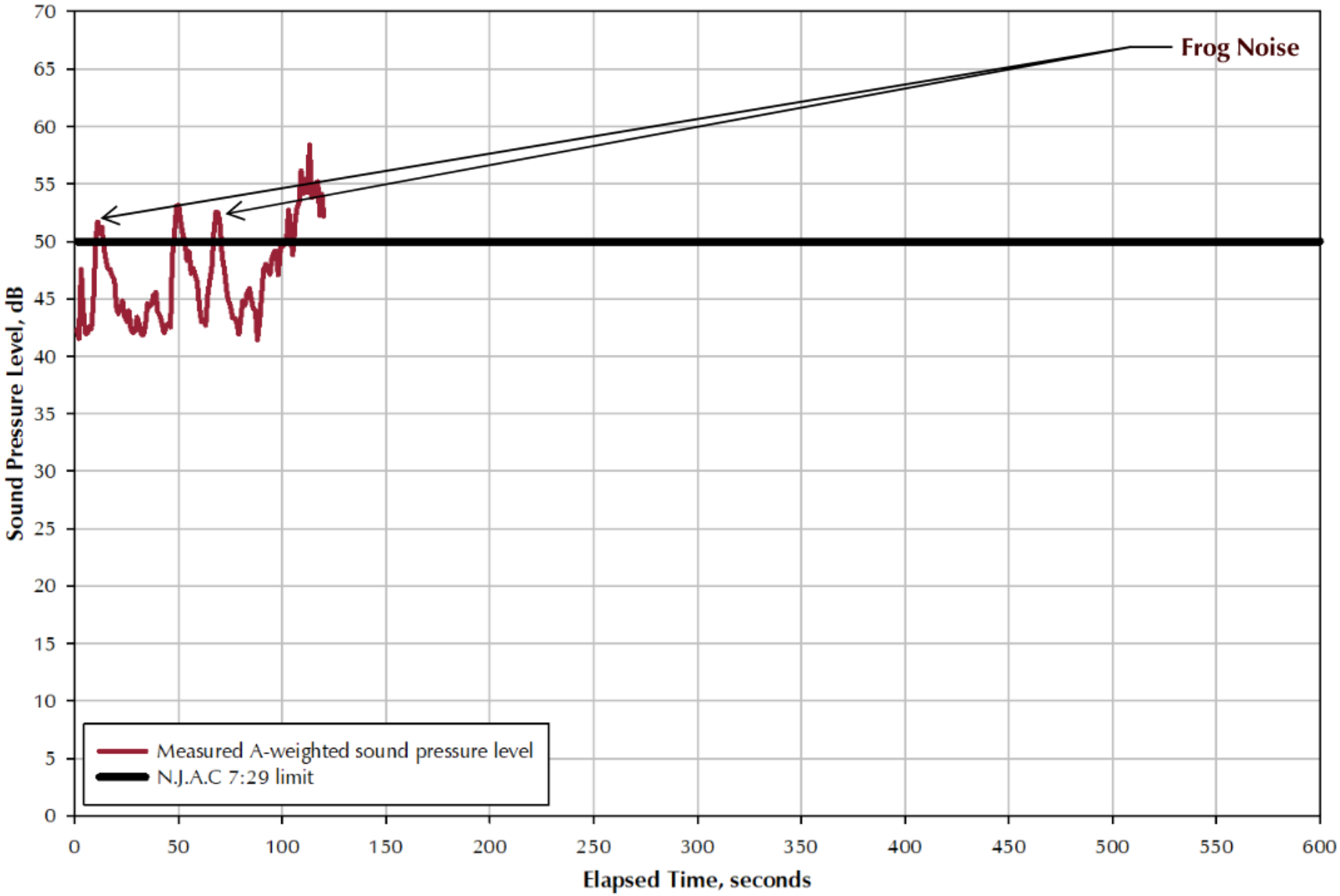

Figure 14 — A-weighted sound level time history for third measurement at 9 Ashton Lane (2255-to-2305 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

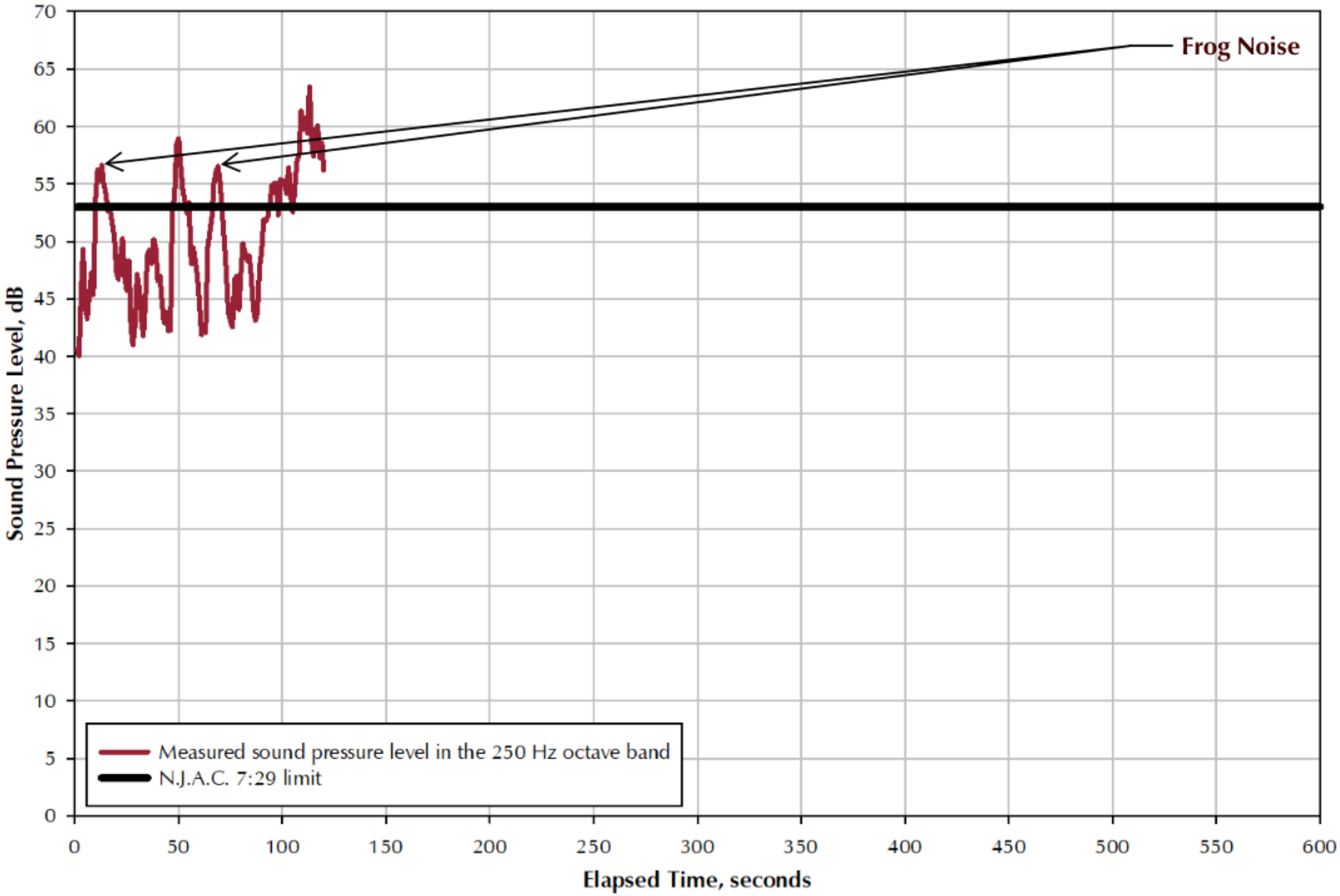

Figure 15 — Time history in 250 Hz octave band for third measurement at 9 Ashton Lane (2255-to-2305 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

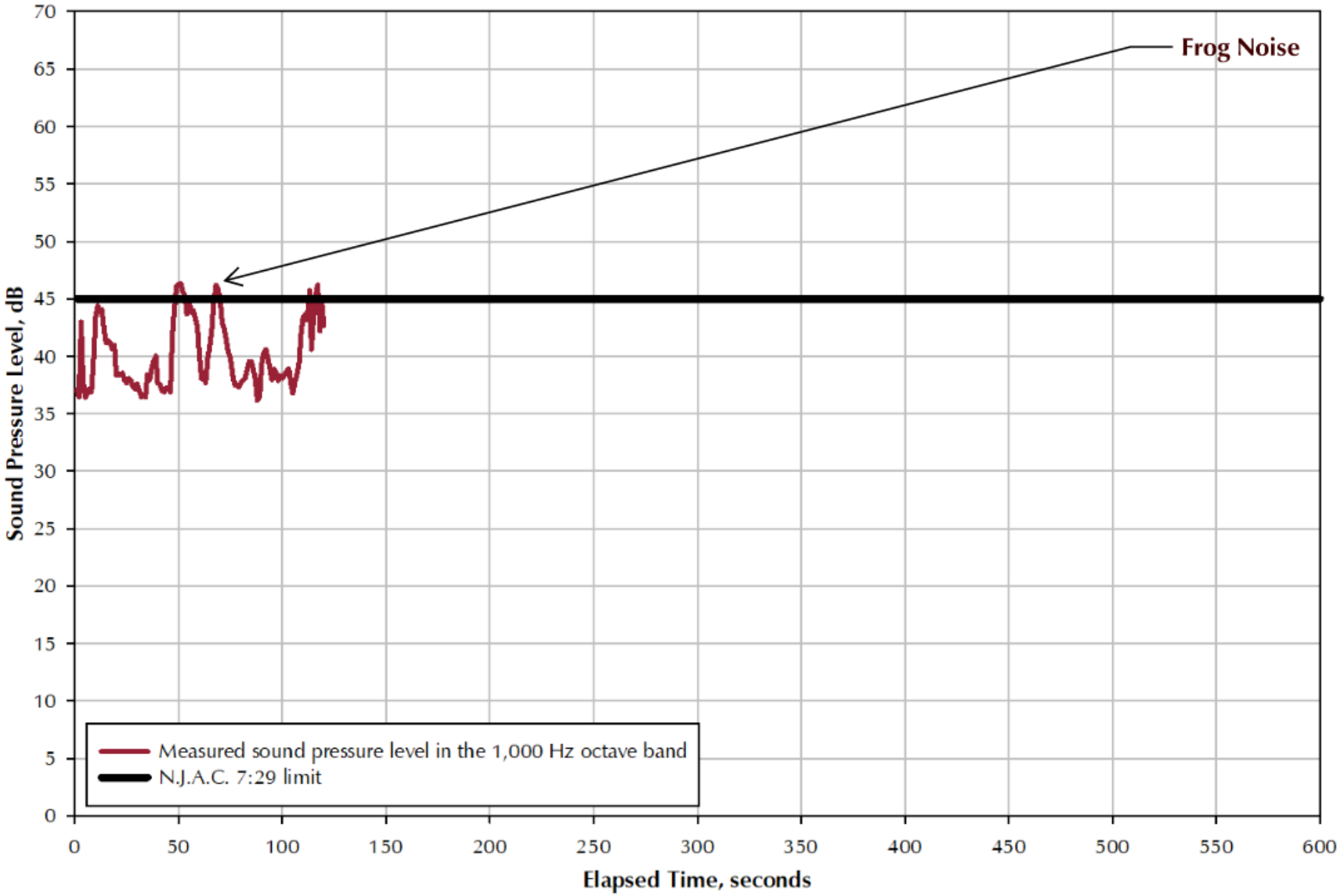

Figure 16 — Time history in 1,000 Hz octave band for third measurement at 9 Ashton Lane, (2255-to-2305 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

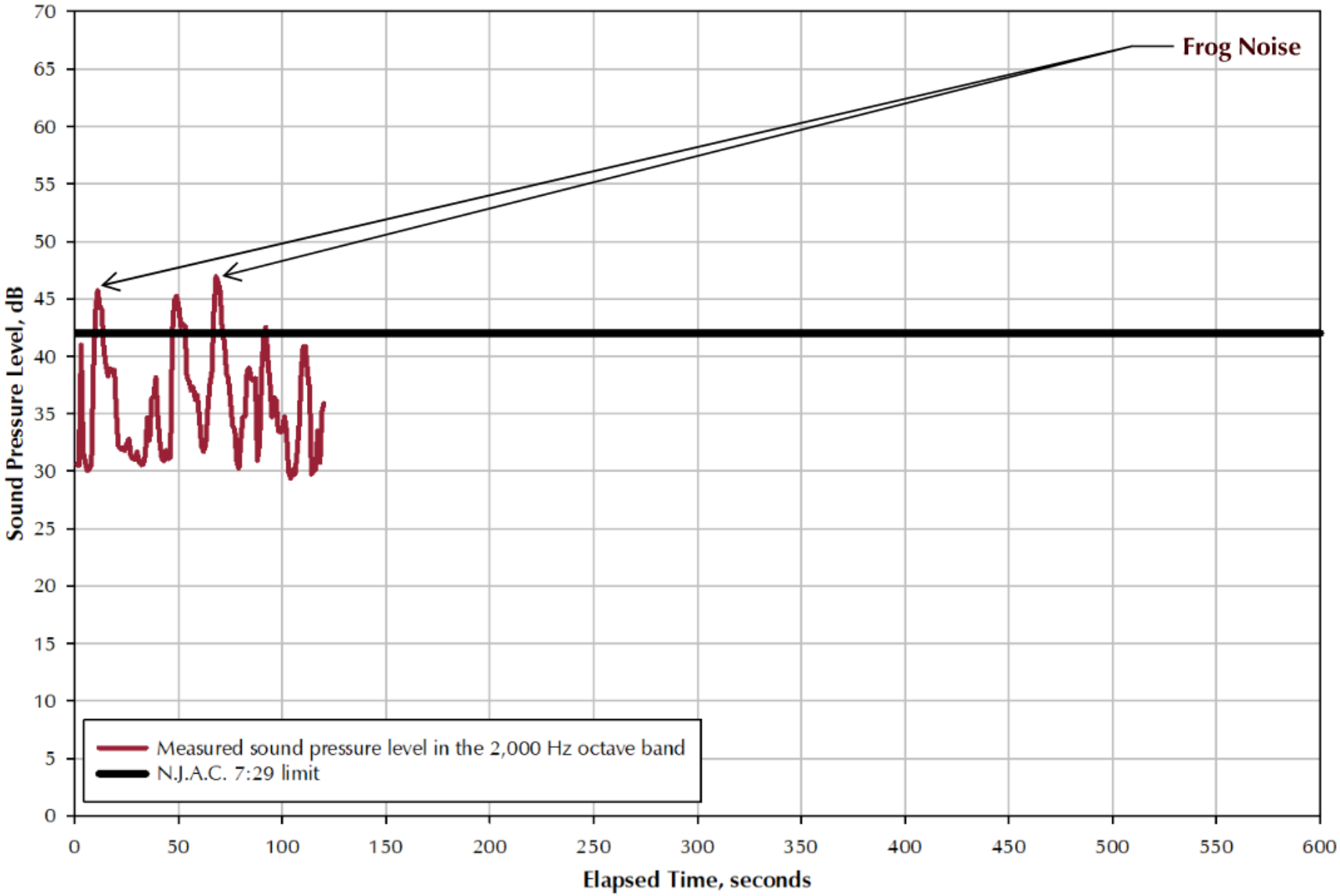

Figure 17 — Time history in 2,000 Hz octave band for third measurement at 9 Ashton Lane (2255-to-2305 hours), compared with N.J.A.C. 7:29 limit for residential receivers during nighttime (2200-to-0700) hours.

We trust that the above is helpful. Please do not hesitate to call or email with any questions.

Sincerely,

OSTERGAARD ACOUSTICAL ASSOCIATES

Joseph A. Keefe, Assoc. Principal
jkeefe@acousticalconsultant.com