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P.A. Penardi & Associates

Box 133035
223 Teakwood Dr.
Big Bear Lake, CA 92315-8914
Voice & FAX: (909) 585-2685
paulpenardi@charter.net

November 25, 2016

Arrowhead Pine Rose Cabins
PO Box 31
Twin Peaks, CA 92391
Attn.: David DuFour

Subject: Assessment of Environmental Noise Impacts From Wedding Receptions at Arrowhead Pine Rose Cabins Resort.

Dear Mr. DuFour,

As you requested, and prompted by some complaints received from homeowners in the vicinity of the Arrowhead Pine Rose Cabins of noise from activities associated with outdoor wedding receptions, sound level measurements were made during weddings held in May 2014; in October and November 2015, and in July, October, and November 2016. In all, activities from 10 weddings were observed at the larger Hidden Creek venue as well as a wedding rehearsal dinner and a private party for employees held at the smaller Cedar Creek venue. The number of guests at the weddings varied from about 40 to 143. Cedar Creek celebrants at the rehearsal dinner were about 60, and those at the private party numbered about 50. As will be seen in later discussion, the environmental noise impacts were relatively independent of the number of wedding guests

The sound level measurements were made near the properties where complaints of noise had been initiated by homeowners. To appease the complainants, the resort had put in place certain remedial measures in the attempt to reduce the sound levels generated during the wedding receptions as perceived on the surrounding residential properties. These efforts included:

- in-house monitoring of the sound levels at the resort property lines
- the employment of their own DJ and the installation of a new audio system for the playing of recorded music (no live bands) so as to maintain a sound level consistency between weddings
- orientation of the audio system loudspeakers in such a manner as to focus the music on the dance floor and away from the surrounding residential neighborhoods
- maintaining a limit on the sound levels on the dance floor, and

- installation of an audio compressor/limiter to control momentary audio peaks.

Additional measures put in place include the construction of log and earth berms as sound barriers at the top of slope overlooking the Hidden Creek wedding venue. Recent noise mitigation measures involved the installation of 7-foot high noise barriers, fabricated from straw bales, placed at strategic locations at tops of slope along the west and south sections of the property (further discussion regarding these barriers can be found later in this report). These sound level mitigating measures serve to limit the audio levels at the resort property lines in the effort to assure compliance with the County of San Bernardino 2007 Development Code, Section 83.01.080, Noise (see attachment).

As indicated previously, the sound level measurements were made primarily at locations where complaints had been received from homeowners of sound levels generated from activities associated with the wedding receptions. The measurements were concentrated mostly at the south property line across from Lot 195, and at the west property line across from Lots 175 and 176 whose owners had generated most of the complaints. The measurements were made with Bruel & Kjaer Type 1 Precision Sound Level Meters that were calibrated before each use. In all cases, for the 12 events observed, the sound levels at these "worst case" property lines were in conformance with the County of San Bernardino noise ordinance for the daytime hours of 7 a.m.-10 p.m. by being less than 55 dB(A) Leq (the applicable county noise standards are attached; Leq = Equivalent Continuous Sound Level). Typical sound levels measured at the subject locations during the loudest activities on the Hidden Creek venue were in the range of 45-50 dB(A) Leq with the sound barriers in place. The ambient noise level in the absence of any sounds coming from the wedding venue was typically 35-40 dB(A) without any vehicular traffic on nearby roadways. Appendix I, attached, lists the results and details of the noise level measurements made on site in 2014, 2015, and 2016. A list of representative environmental noise levels is also attached for reference.

The temperature and relative humidity on the test days were such that there was no significant noise attenuation due to environmental factors, i.e. the noise levels measured can be considered to be representative of worst case conditions. Also there was little or no wind on the test days. It is important to note that the county noise criteria involves a noise level integrated over some designated time period (Leq). For the subject wedding receptions, the Leq should perhaps be taken over the time period of the event from about 4:30 p.m. at the entrance of the bridal party to 10 p.m. at the conclusion of the reception. Since the announcements and the music are not continuous over this time period, there is frequent "down time" which would affect the Leq making it *lower* than it otherwise would be if the measurements were made just when the dance music was most constantly playing during the time period of about 8:30 – 10 p.m., as was done during the field measurements. In other words, the Leqs reported can be considered to be worst case noise levels which are in compliance with the applicable county noise level limit of 55 dB(A) for the daytime time period of 7 a.m. to 10 p.m. It should be noted that an attempt was made to integrate the noise levels from a wedding over a 4:30 – 10 p.m. period, but interference from people walking around the site and talking, and vehicular traffic on interior streets and exterior roadways made the task difficult, so the effort was terminated. For completion, it should be noted that vocal outbursts (cheers) and applause are typical during the weddings resulting in momentary peaks up to

60 dB(A) or so, but they are infrequent and short in duration such that they have no effect on the measured Leq.

As part of the environmental noise impact studies, some noise measurements were made on site using a "pink noise" source input to the house audio system. This produced an almost constant broadband noise level that is ideal for diagnostic purposes, as opposed to using recorded music which typically varies in level and tonal quality. The purpose was to quantify the noise levels at certain locations on the Hidden Creek area of the property, particularly at the south and west property lines, proximity to which complaints had been received from homeowners. In addition, a top of hill location overlooking the dance floor of the Hidden Creek venue was selected as a reference point for both the pink noise studies and the noise measurements of the actual wedding activities. The reason for the latter was that it would have been awkward to actually intrude upon a wedding event and perform noise measurements on the dance floor. With knowledge that venue staff were holding the maximum sound level on the dance floor to about 85 dB(A), as well as our holding the pink noise level there to 85 dB(A) during our testing, it allowed for the determination of noise level *differences* between different selected points on the property. The main reason for this effort was to assess a reduction in noise levels that might be obtained by installing temporary noise barriers at select locations on the site. Since time was short with regard to the installation of barriers using typical construction materials, as an interim measure it was decided to use straw bales stacked in a row to a height of about seven feet along the south edge of top of slope between the wedding venue and the south property line across from Lot 195 (see a Strawberry Flat Property Owners Association map attached). Using the pink noise source during the pre and post straw bale barrier installation for testing showed that an improvement of less than 2 dB resulted, which is not significant. The reason being that the elevated terrain (plus distance) between the Hidden Creek wedding venue and the south property line produces the major reduction in noise levels from the dance floor (about 40 dB) such that the addition of another seven feet in height to the top of slope had little effect.

Since complaints had been also received from residents located near the west property line, the straw bale barrier effort was duplicated along top of slope near the west property line. Since the terrain noise shielding is not as great in this area, as opposed to the southerly end of the site, using an actual wedding as the noise source, the straw bales resulted in an approximate 9 dB further reduction in noise levels, as opposed to the non-barrier condition. This is significant with the change in noise levels from weddings being subjectively perceived as an almost halving from the previous condition. The result is that with the straw bale barrier in place, the community noise levels from wedding receptions can be expected to be about the same at the west property line as those at the south property line, i.e. 45-50 dB(A) Leq in the worst cases, which is in conformance with the applicable San Bernardino Development Code. The residential properties west of the site, however, are more distant from the west property line than those south of the site are from the south property line. As a result, in addition to being lower in elevation than the west property line, noise levels can be expected to be lower than 45-50 dB(A) Leq on those lots.

Although the acoustical analysis has shown that the wedding venues are in compliance with the applicable county noise code, further sound level remedial measures are being considered


which include the installation of permanent sound barriers having more noise attenuating properties at key points on the property to further reduce sound levels intruding onto the adjoining residential properties.

With regard to noise levels from the smaller Cedar Creek venue, no weddings were scheduled there during our field investigations. As indicated previously, the facility was booked for two small parties. A private party for the employees of the resort was held as an appreciation gesture for their good work. There were about 50 people in attendance for dining and dancing. A DJ played some recorded music on the dance floor at the location of Lot 191 where the sound level was measured to be about 80 dB(A). Noise measurements were made at several locations in the vicinity of Cedar Creek with the details shown in the listing in Appendix I. The results showed compliance with the county noise criteria by noise levels being less than 55 dB(A). Noise levels on the subject Lot 195 were measured as a maximum of 50 dB(A) from yells, while the ambient noise level in the absence of any noise generation from Cedar Creek was observed to be about 45 dB(A).

The other event held at Cedar Creek was a wedding rehearsal dinner where about 60 people were counted as being in attendance at any one time. This was mostly a quiet affair until some testimonials were given when sound levels at the south side of Lot 195 were observed to be about 52 dB(A), maximum, resulting from cheers, laughter, and applause. An Leq level would be much lower than this and easily in conformance with the county noise criteria. Additional noise control measures are ongoing at the Cedar Creek venue including administrative efforts to direct patrons away from the north side of the venue and the installation of noise barrier fencing along the north side of the site to reduce potential environmental noise levels from future weddings.

I trust that this information will satisfy your requirements. Please contact me if there are any questions or if further information is needed.

Yours truly,



Paul A. Penardi
Acoustical Consultant
Member, Acoustical Society of America

Attachments

RESULTS OF NOISE MEASUREMENTS MADE AT ARROWHEAD PINE ROSE CABINS RESORT

1. 5/3/14: Wedding at Hidden Creek; 40 guests. At south property line: 48 dB(A). At top of hill: 65 dB(A). At stream along south side of dance floor: 75 dB(A)
2. 10/26/15: Wedding at Hidden Creek; 91 guests. At south property line: Ambient = 42 dB(A). Top of hill: Ambient = 50-52 (waterscape sounds). At south property line: 50 dB(A) during 1st dance; 48 dB(A) during dinner music; 46 dB(A) music. At west property line: 48 dB(A). At top of hill: 55 dB(A). Lot 176: 30-35 dBA) (ambient and music); Lot 178: 40-43 dB(A); Lot 180: 35-37 dB(A), ambient; wedding activity sounds not audible.
3. 11/7/15: Wedding at Hidden Creek; 124 guests. At south property line: 48 dB(A), 42 dB(A), ambient; 53 dB(A) max (yells). At approximate west property line: 48 dB(A).
4. 11/12/15: Wedding at Hidden Creek; 75 guests. At south property line: yells up to 60 dB(A). At top of hill: (1st and 2nd dance) 55 dB(A); announcement: 60 dB(A) max. At south property line: 45 dB(A) max.
5. 11/16/15: Private Party at Cedar Creek; 50 guests. 80 dB(A), music on dance floor (Lot 191). At south property line of Hidden Creek area across from Lot 195: yells, 50 dB(A); ambient, 45 dB(A); Lot 142 (no measurements-barely hear music); Lot 145: ambient, 45 dB(A); 50 dB(A) (max).
6. 7/16/16: Wedding at Hidden Creek; 118 guests. At south property line across from Lot 195: ambient, 38-40 dB(A); 52 dB(A) with music
7. 10/4/16: Pink noise tests at Hidden Creek; With 85 dB(A) on dance floor: 62-63 dB(A), top of hill; 45-46 dB(A) at south property line across from Lot 195.
8. 10/7/16: Wedding at Hidden Creek; 143 guests. At south property line: 49.5 dB(A) Leq after 9 pm-noise mostly constant from music and dance floor activities; shouts 58-63 dB(A). Lowest ambient without wedding: 38 dB(A).
9. 10/8/16: Wedding at Hidden Creek; 142 guests (straw bales noise barrier installed along south side of top of hill); At south property line across from Lot 195: 48.1 Leq long term at 9 pm; only 1.4 dB(A) increase in noise reduction from barrier re: previous condition, but reduced speech intelligibility (some lyrics not understandable).

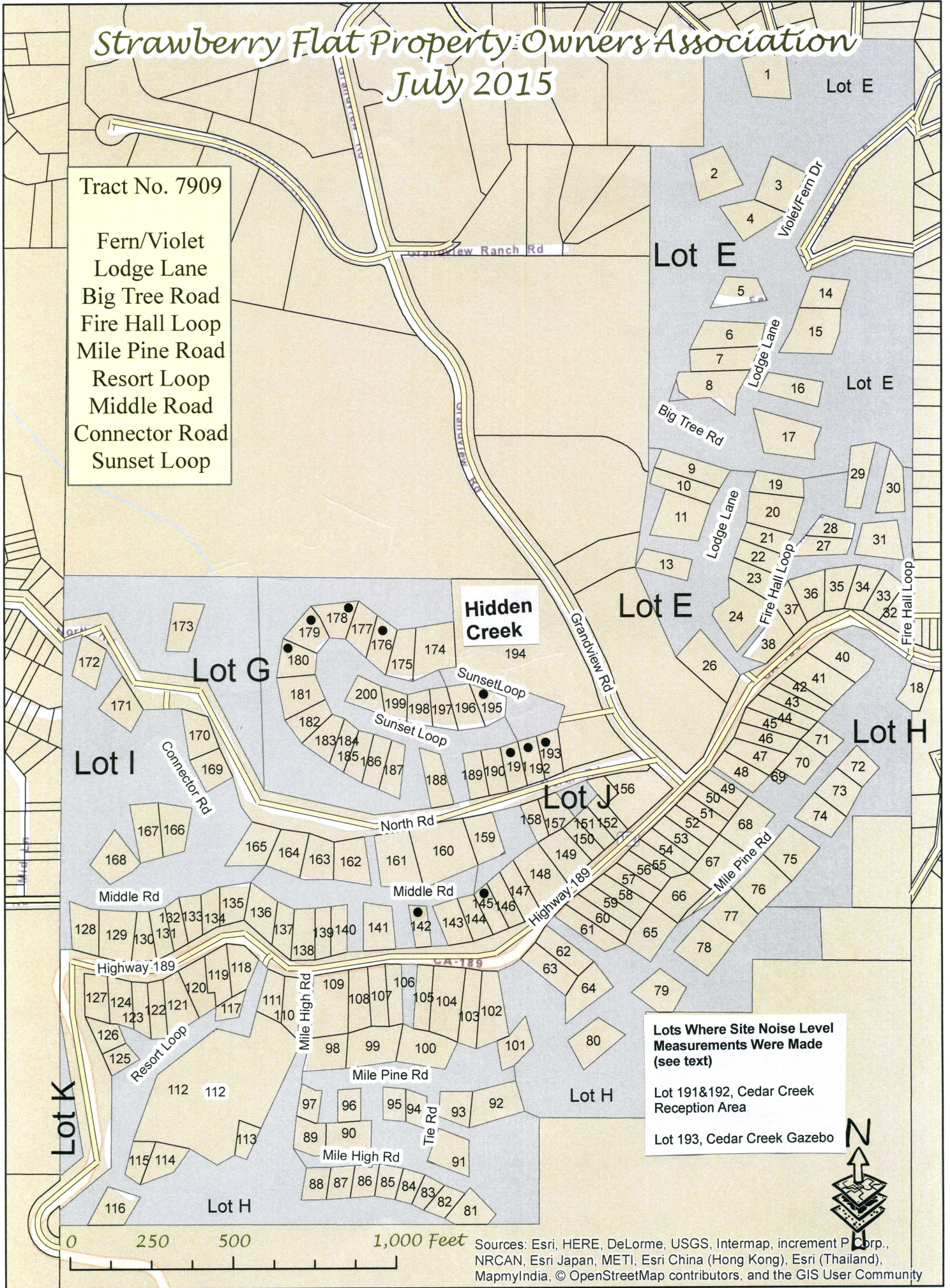
10. 10/18/2016: Pink noise tests at Hidden Creek (straw bales noise barrier installed along south side of top of hill). With 83 dB(A) on dance floor: 61 dB(A) at top of hill; 42 dB(A) at south property line across from Lot 195.
11. 10/29/16: Wedding at Hidden Creek; 100 guests (straw bales noise barrier along south side of top of hill extended further to west). At south property line across from Lot 195: rowdy music, 49.4 dB(A). At west property line: rowdy music, 52.9 dB(A).
12. 11/3/16: Wedding at Hidden Creek; 125 guests. Straw bales noise barrier installed along west side of venue; At top of hill: 61 dB(A). At south property line across from Lot 195: 45 dB(A). At west property line: approx. 46 dB(A).
13. 11/4/16: Wedding Rehearsal Dinner at Cedar Creek; 60 guests. At south property line: ambient, 41 dB(A) from 6:45-7 pm. At property line across from catering (south side of Lot 195): inside Cedar Creek area at other side of pond, 57 dB(A); At pool entrance off Hwy 189, 37 dB(A), ambient-can't hear patrons (7:45 pm). At property line across from catering (south side of Lot 195), 44 dB(A); 52 dB(A) max from cheers, laughter and applause (8:20 pm). Temporary barriers in place along north side of venue. Administrative controls in place to direct patrons away from the north and toward the east for entry and egress.

Strawberry Flat Property Owners Association

July 2015

Tract No. 7909

Fern/Violet
Lodge Lane
Big Tree Road
Fire Hall Loop
Mile Pine Road
Resort Loop
Middle Road
Connector Road
Sunset Loop



**Hidden
Creek**

**Lots Where Site Noise Level
Measurements Were Made
(see text)**

- Lot 191&192, Cedar Creek Reception Area
- Lot 193, Cedar Creek Gazebo

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

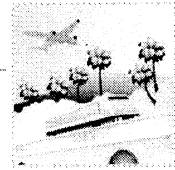
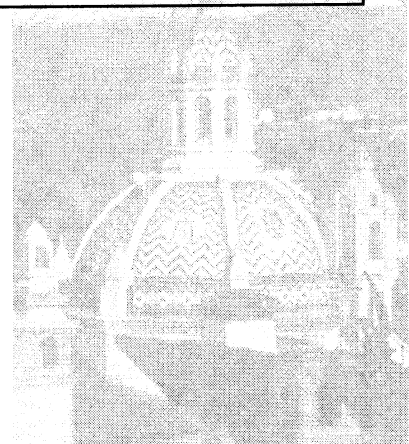


TABLE N-2
REPRESENTATIVE ENVIRONMENTAL NOISE LEVELS

Common Outdoor Activities	Noise Levels (dbA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 1000 feet	105	
	100	
Gas Lawnmower at 3 feet	95	
	90	
	85	Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	80	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime	75	
Gas Lawnmower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area	65	Normal Speech at 3 feet
Heavy Traffic at 300 feet	60	
	55	Large Business Office
Quiet Urban Area during Daytime	50	Dishwasher in Next Room
	45	
Quiet Urban Area during Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime	35	
	30	Library
Quiet Rural Area during Nighttime	25	Bedroom at Night, Concert Hall (background)
	20	
	15	Broadcast/Recording Studio
	10	
	5	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation, Technical Noise Supplement, 1998.



Affected Land Uses (Receiving Noise)	7 am-10 pm Leq	10 pm-7 am Leq
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically 1, 8 or 24 hours.

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10 pm to 7 am). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

- (2) **Noise limit categories.** No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:
- (A) The noise standard for the receiving land use as specified in Subsection B (Noise-impacted areas), above, for a cumulative period of more than 30 minutes in any hour.
 - (B) The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour.
 - (C) The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour.
 - (D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.
 - (E) The noise standard plus 20 dB(A) for any period of time.
- (d) **Noise standards for adjacent mobile noise sources.** Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

REFERENCE LIST

1. Pearsons, Karl S., et. al., Handbook of Noise Ratings, NTIS, U.S. Department of Commerce Document #N74-23275, prepared by Bolt, Beranek, and Newman for NASA, April 1974.
2. Beranek, Leo L., Noise and Vibration Control, Revised Edition, Institute of Noise Control Engineering, Washington, D.C., 1988.
3. Harris, Cyril M., Handbook of Acoustical Measurements and Noise Control, 3rd Edition, Acoustical Society of America, Woodbury, New York, 1998.
4. County of San Bernardino 2007 Development Code, Section 83.01.080, Noise; Adopted March 13, 2007, Effective April 12, 2007, Amended February 28, 2008.
5. Strawberry Flat Property Owners Association, Tract 7909 Map, July 2015.
6. City of Riverside General Plan 2025, Noise Element, Adopted November 2007.