BELL WINE CELLARS
6200 WASHINGTON STREET
YOUNTVILLE, CALIFORNIA

August 3, 2015

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these proposed modifications, this report assesses the increased visitation, events, and noise from increased production. All proposed interior changes are enclosed within the existing structure and other than accommodating additional visitors, these changes will not affect the exterior noise produced by the winery.

This report first provides a summary of the applicable regulatory criteria used in the assessment. This is followed by a presentation and discussion of the existing noise levels on the winery property. The expected changes in winery-generated noise levels are then discussed, followed by their assessment relative to the County regulations. An Appendix provides a brief discussion of the fundamentals of environmental noise, definitions of noise metrics, and typical noise levels.

Napa County Noise Regulations

The Bell Wine Cellars lies south of the Yountville City Limits and is contained entirely within Napa County, as does the surrounding properties, and as a result, the County regulations apply. Section 8.16.070 of the Napa County Noise Ordinance regulates exterior noise levels within the unincorporated area of the county due to operational related noise as follows:

No person shall operate, or cause to be operated, any source of sound at any location within the unincorporated area of the county, or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level, when measured on any other property, either incorporated or unincorporated, to exceed:

a. The noise standard for that land use as specified in Table 8.16.070 for a cumulative period of more than thirty minutes in any hour [equivalent to the L_{50} noise metric]; or
b. The noise standard plus five dB for a cumulative period of more than fifteen minutes in any hour [equivalent to the L_{25} noise metric]; or
c. The noise standard plus ten dB for a cumulative period of more than five minutes in any hour [equivalent to the L_{08} noise metric]; or

Commercial	10 p.m. to 7 a.m.	60		
	7 a.m. to 10 p.m.	65		
Industrial, including wineries	10 p.m. to 7 a.m.	75		
	7 a.m. to 10 p.m.	45		

Based on the exterior noise limits shown in Table 8.16.070 and the cumulative hourly noise levels described above for rural residential and commercial uses are as shown in Table 1, below:

Table 1: County Noise Ordinance Standards

	Rural Residential		Commercial	
Hourly Noise Metric	**Daytime Level**	**Nighttime Level**	**Daytime Level**	**Nighttime Level**
L_{50} (30 Min.)	50 dBA	45 dBA	65 dBA	60 dBA
L_{25} (15 Min.)	55 dBA	50 dBA	70 dBA	65 dBA
L_{08} (5 Min.)	60 dBA	55 dBA	75 dBA	70 dBA
L_{02} (1 Min.)	65 dBA	60 dBA	80 dBA	75 dBA
L_{max}	70 dBA	65 dBA	85 dBA	80 dBA

If the measured ambient noise level differs from that permissible within any of the first four noise limit categories above (L_{50}, L_{25}, L_{08}, L_{02}), the allowable noise exposure standard shall be the ambient noise level.

Another provision is included to correct the allowable noise standard for the character of the sound as follows,

> *"In the event the alleged offensive noise, as judged by the noise control officer, contains a steady, audible tone such as a whine, screech or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech, the standard limits set forth in Tables 8.16.060 and 8.16.070 shall be reduced by five dB, but not lower than forty-five."*

Existing Noise Environment

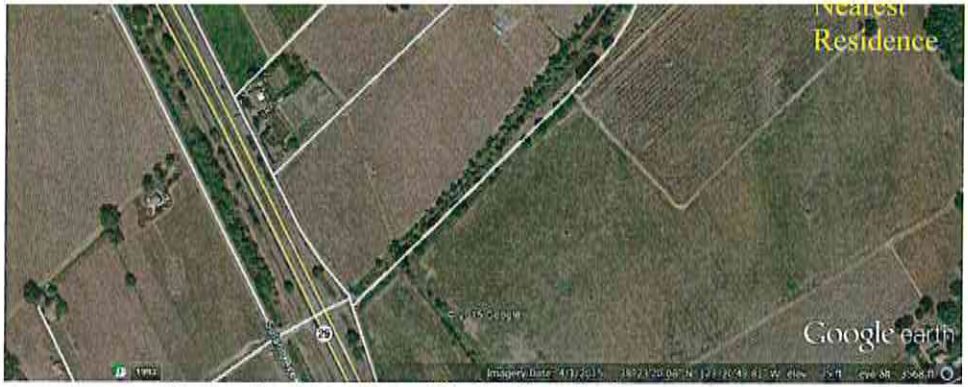


Figure 1: Location of Bell Wine Cellars and vicinity

Figure 3: Location of long-term noise monitoring stations LT-1 and LT- 2

The monitoring equipment was installed in a tree near the existing parking lot. The second location, LT-2, was selected at the southern corner of the property to be away from winery operations to better document the ambient conditions not as influenced by the winery as is LT-1. At each location, noise levels were measured on a 24-hour basis with a Larson-Davis (LD) precision Type 1 sound level meter (SLM) fitted with a ½-inch pre-polarized condenser microphone and windscreen. The meters were calibrated before and after installation with a 114 dB, 1,000 Hertz Larson Davis acoustical calibrator. These unattended measurements were conducted over periods starting in the morning of Friday, July 10th to the late morning of Monday, July 13th.

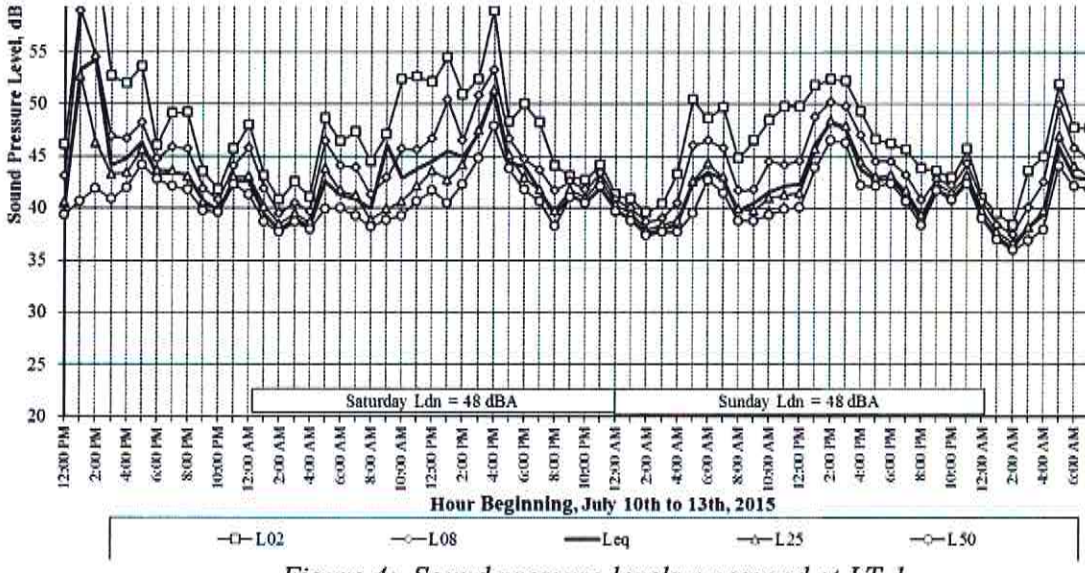


Figure 4: Sound pressure levels measured at LT-1

Table 1: Noise levels measured from 10:00am to 4:00pm at LT-1

Date	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}	L_{90}
10-Jul	47.4	65.2	55.1	50.0	45.3	41.0	39.1
11-Jul	45.7	64.1	53.4	48.4	44.6	42.5	40.4
12-Jul	44.6	63.6	50.5	47.0	44.3	42.6	40.8
Avg	45.9	64.3	53.0	48.5	44.7	42.0	40.1

pm. On the 11th, 52 people visited via 16 vehicles between 10:00 am and 4:00 pm, and on the 12th, 33 visitors via 8 vehicles. The average, maximum, and minimum levels during the daytime

	Range	*48/38*	*53/39*	*59/41*	*64/43*	*76/47*
Nighttime	Limit	45	50	55	60	65
	Measured	**40**	**41**	**42**	**44**	**50**
	Range	*44/36*	*47/37*	*50/38*	*52/38*	*58/42*

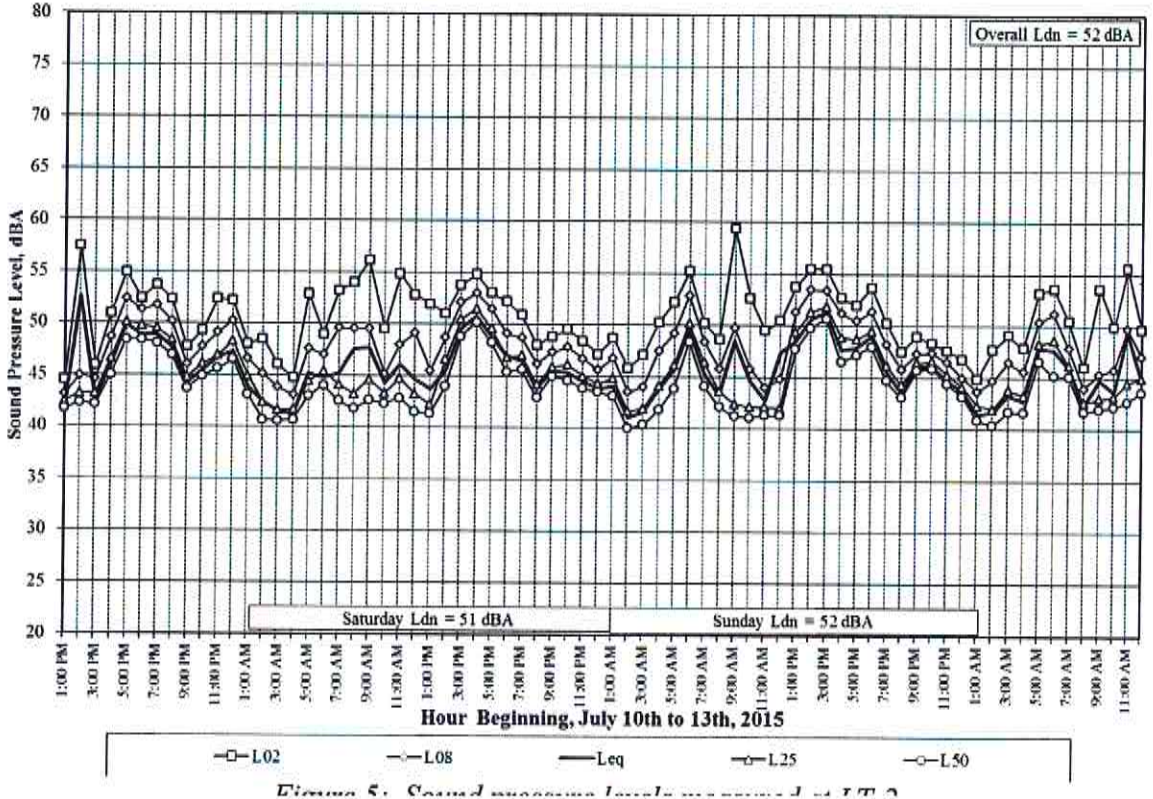
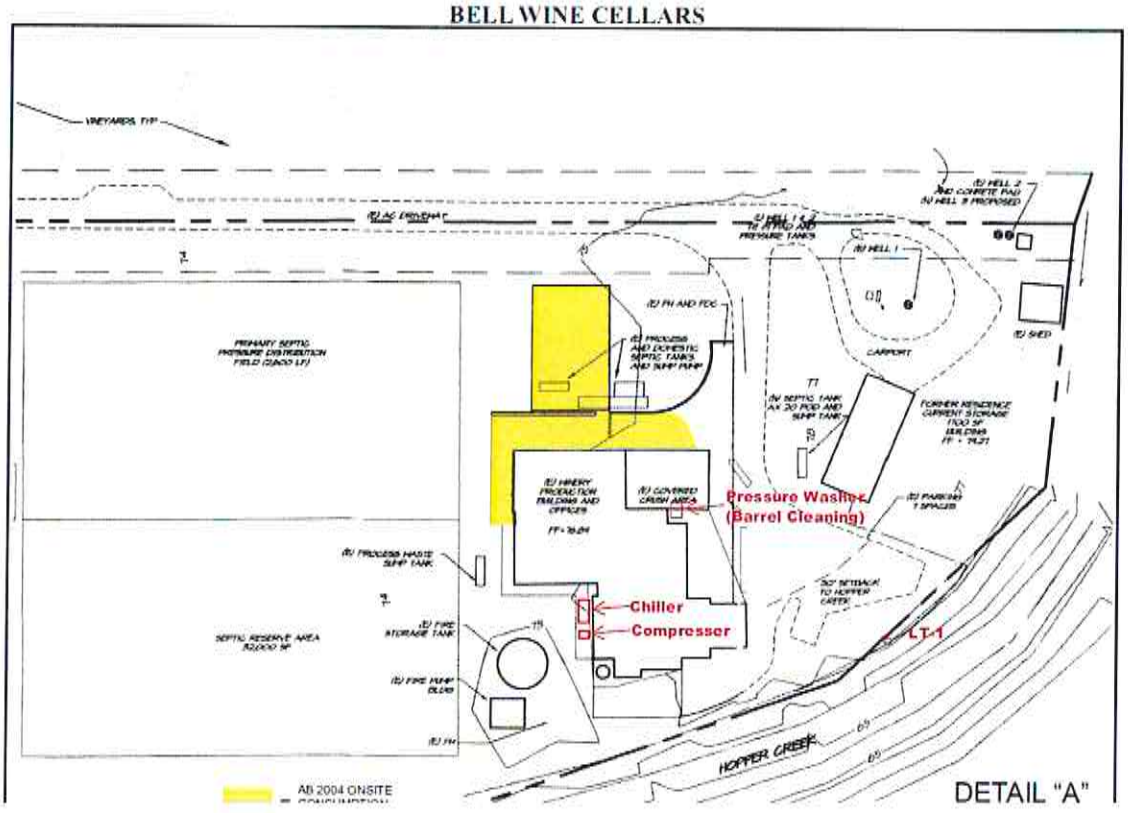


Figure 5: Sound pressure levels measured at LT-2

Nighttime	**Measured**	**43**	**45**	**47**	**49**	**55**
	Max/Min	*48/40*	*50/42*	*53/43*	*55/45*	*67/47*

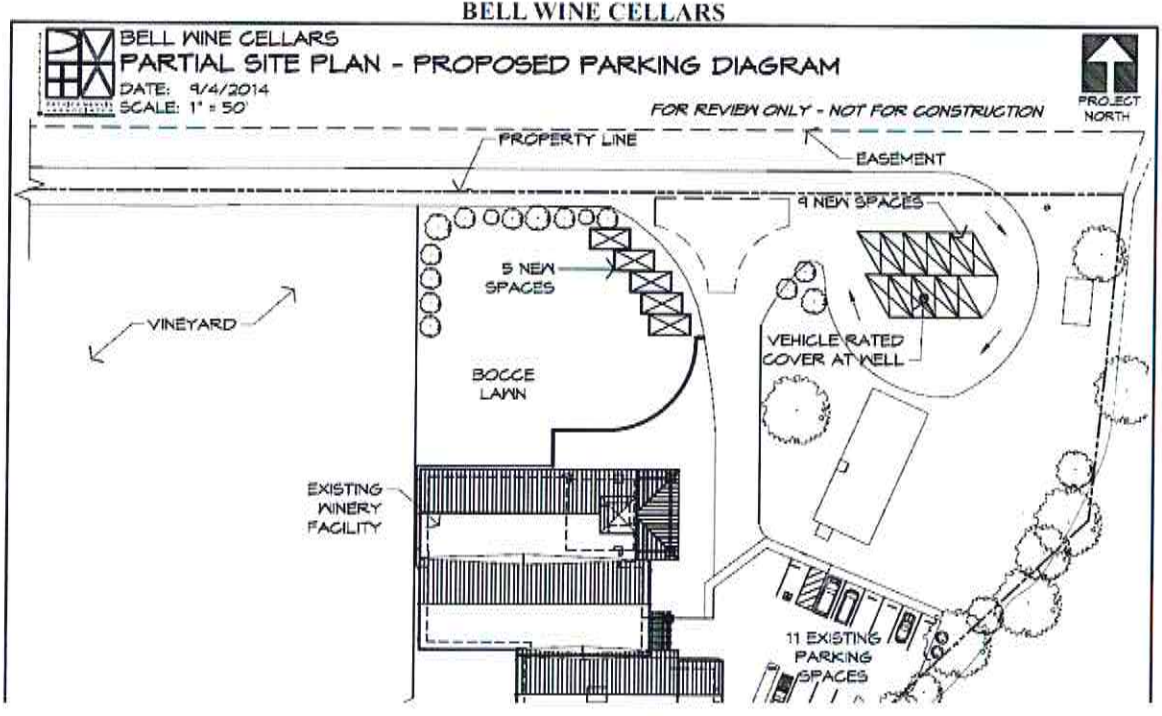


13-Jul-15	12:37:55	Pressure Washer @ 10 feet	73.7	73.7	73.7	**73.2**	73.7	73.4	72.8

Assessment of Proposed Modifications

Proposed Modifications

The proposed physical modifications to the exterior of the winery are shown in Figure 7. These consist of the addition of two parking areas on the north corner of the property, five on the left side of the entrance and nine in the center of the circular drive on the right of the entrance.



winery to 100 maximum visitors per day (420 maximum per week) from the current maximum of 76 visitors per week and modifying the Marketing Event Program to include events with a maximum of 200 guests with the potential of unamplified music from the current maximum of 60 guests without music. If these events are held outdoors, they will take place in the patio area surrounding the west corner of the barrel storage building and/or on the lawn area to the northwest of the storage building, as they do under the current permit. These areas are shielded by the winery buildings relative to the property line to the east of the winery and the closest residence. The larger events can have several possible effects on exterior noise. First, the maximum number of vehicles entering the winery property could increase. Assuming an average of 2½ people per vehicle, the vehicle number could increase from 24 to 80. Second, sounds generated by the greater number of attendees could increase group conversational sounds. And finally, the unamplified music would also produce sounds.

Project-Specific Criteria

From the LT data presented in Tables 2 and 3, it is shown that the existing levels do not exceed the Napa County Noise Limits for L_2, L_8, L_{25}, and L_{50} for either the daytime or nighttime. For LT-1, the average measured levels range from 8 dB below the limit to 15 dB below, and the maximum levels over the 2½-day period are also below the limit. For LT-2, the averages range from 5 to 13 dB below the limits. In one hour of one day (on July 12th), the maximum L_{50} level exceeded the limit by 1 dB (see Figure 6). For assessment purposes, the Noise Ordinance allows the individual L_N limit to be raised to the ambient level; however, from these data, this is not appropriate. Further, for music or speech, the limits are to be lowered by 5 dB. For assessing the non-vehicular event noise, the limits should according be lower by the 5 dB. The proposed modification to the Use Permit does not result in any new activities in the nighttime hours defined in the ordinance, and as a result, this is not considered in the assessment. The project-specific noise criteria are given in Table 5 for event noise and vehicular related noise.

Table 5: Project specific noise criteria for specific types of noise

	Daytime Noise Level Limit, dBA

levels for the existing parking lot are shown in Table 6, along with the Noise Criteria. These estimated levels remain well below the limits, as shown in the table.

Table 6: Estimated noise levels due to increased daily visitors and small events utilizing existing parking spaces

Daily Visitors & Small Events	Noise Level, dBA			
	L_{50}	L_{25}	L_8	L_2
Limit	*50*	*55*	*60*	*65*
Estimated Noise	**45**	**48**	**46**	**56**

For winery events where additional parking is needed either in the proposed new parking stalls or along the access road, the vehicle operations in the proposed parking spaces would be 220ft or more away from LT-1 and the eastern property line. Assuming the conventional 6 dB reduction in noise per doubling of distance, these levels would be about 13 dB lower at the property line than those in the existing parking lot at distance of 50ft. For these larger events, it may be expected that most of the vehicles would arrive in a single hour. With 200 attendees, approximately 67 vehicles would be expected. The existing lot could handle 11vehicles, leaving 56 for the more distant parking places. For the existing lot, 11 vehicles would be about double the number of entering vehicles in an hour, increasing the estimated levels another 3 dB beyond the daily visitors estimated in Table 6. For the 56 distant vehicles, the attenuation is greater (+13 dB), but the numbers are also greater. The increased numbers (56 versus 11) yield the estimated increase by about 7 dB. The estimated levels for the larger event are shown in Table 7, broken down by existing and future parking and combined level, along with the Noise Criteria. The combined levels remain 1 to 5 dB below the various L_N criteria.

Table 7: Estimated noise levels due events up to 200 attendees using the existing spaces and the new spacing and access road parking

	Noise Level, dBA

provide 10 to 15 dB of reduction, with an average of 12 dB. These attenuation values defined by distance and barrier effects are used to produce the estimated levels shown in Table 8. For unamplified music, I&R measurements show that L_{50} is typically about 67 dBA. Applying the same attenuations as for the conversing attendees, the L_{50} for the music is estimated to be 41 dBA. Combining the levels for the conversation and music is somewhat problematic as the two could be considered to be mutually exclusive; that is, people converse less when the music is played so that combining levels on an (energy) average basis is not appropriate. As a worst case, if the speech and music were combined, the resultant level would be 44 dBA.

Table 8: Estimated noise levels for event up to 200 people and unamplified music

Parking at Larger Events	Noise Level, dBA				
	L_{50}	L_{25}	L_8	L_2	L_{max}
Limit	*45*	*50*	*55*	*60*	*65*
Group Voices at 50ft	67	68	70	72	74
Reduction by Distance	13	13	13	13	13
Barrier Effect	12	12	12	12	12
Estimated Voice Levels at Property Line	**42**	**44**	**45**	**47**	**49**
With Unamplfied Music at Property Line	**44**	**46**	**47**	**49**	**51**

As discussed previously, the proposed increase in production could lead to more hours of operating production equipment per year, such as grape crushing and bottling. However, the noise levels produced by this equipment would not increase on an hourly basis upon which the County criteria are based.

Noise Assessment

The modifications to the Bell Cellars Winery Use Permit will not produce noise in excess of the Napa County Noise Level Limits at the nearest residential property line. Increases in production

from the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales that are used to describe noise in a particular location. *A decibel (dB)* is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1. There are several methods of characterizing sound. The most common in California is the *A-weighted sound level or dBA.* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2.

Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Day/Night Average Sound Level, Ldn,* is a measure of the cumulative

Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	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 in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Definitions Of Acoustical Terms | **Table 1**

	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Diesel Pile Driver (100')			
	100		Very Loud
	90	Boiler Room	
Freight Cars (50')		Printing Press Plant	
Pneumatic Drill (50')	80		
Freeway (100')		In Kitchen With Garbage	
Vacuum Cleaner (10')	70	Disposal Running	Moderately Loud
Conversational Speech (3')	60	Data Processing Center	
Light Traffic (100')	50	Department Store	
Large Transformer (200')			
	40	Private Business Office	Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA Ldn with open windows and 65-70 dBA Ldn if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Annoyance: Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The Ldn as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 55 dBA Ldn. At an Ldn of about 60 dBA, approximately 2 percent of the population is highly annoyed. When the Ldn increases to 70 dBA, the percentage of the population highly annoyed increases to about 12 percent of the population. There is, therefore, an increase of about 1 percent per dBA between an Ldn of 60-70 dBA. Between an Ldn of 70-80 dBA, each decibel increase increases by about 2 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the Ldn is 60 dBA, approximately 10 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 2 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 3 percent increase in the percentage of the population highly annoyed.