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## Noise Assessment

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***SHADYBROOK WINERY  
USE PERMIT MODIFICATION  
ENVIRONMENTAL NOISE ASSESSMENT***

***Napa County, California***

**August 19, 2019**

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## INTRODUCTION

This environmental noise assessment evaluates the potential for increased noise as a result of the proposed use permit modification of the Shadybrook Winery located at 10 Rapp Lane in the Coombsville area of unincorporated Napa County in terms of the regulatory criteria established by the Noise Policy of the Napa County General Plan. This report includes a summary of applicable noise regulations, the results of a noise monitoring survey conducted for the project, and an assessment of noise impacts and the need for noise mitigation measures to meet the applicable County standards at adjacent noise sensitive land uses. Persons not familiar with environmental noise analysis are referred to Appendix A for additional discussion.

## PROJECT DESCRIPTION

The Shadybrook Winery is in current operation and is requesting to modify its current use permit as follows:

1. An increase in production from 30,000 gallons per year to 70,000 gallons of wine per year,
2. An increase in on-site employment from 2 to 9 full-time and 1 to 2 part-time positions,
3. An increase in visitors from 21 to 50 per day.
4. A reconfiguration of the existing parking and landscaping.
5. An increase of winery production area in a portion of an existing barn.
6. An increase in approved events from 8 events per year with 30 visitors and 1 wine auction event per year with 30 visitors to 6 events per year with 30 visitors, 6 events per year with 50 visitors, and 6 events per year with 100 visitors.

The Winery is situated between Rapp and Chateau Lanes in in the Coombsville area east of the City of Napa in un-

incorporated Napa County. The winery is bordered on the north and east by another winery and the Napa Valley Country Club, and to the west, south and southeast by rural residential uses and by another winery. Figure 1 shows the site boundaries and vicinity

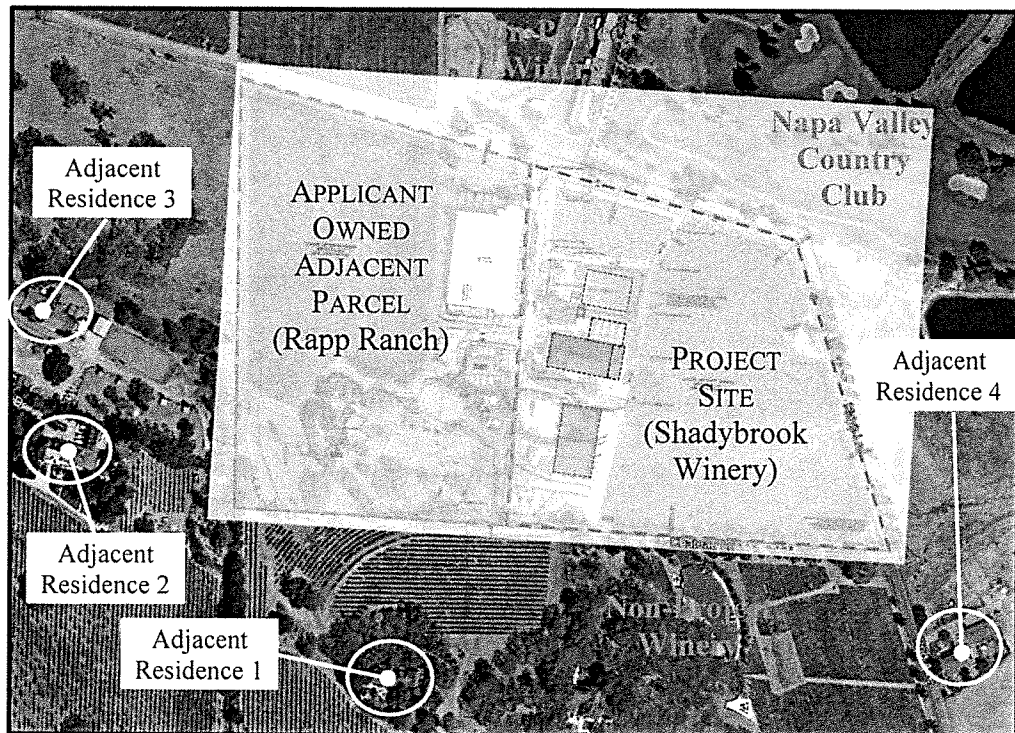


Figure 1: Project Site and Vicinity

## NAPA COUNTY NOISE REGULATIONS

The Anthem Winery lies east of the Napa City Limits and is contained entirely within Napa County 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<sub>50</sub> 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<sub>25</sub> 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<sub>08</sub> noise metric]; or
- d. The noise standard plus fifteen dB for a cumulative period of more than one minute in any hour [equivalent to the L<sub>02</sub> noise metric];
- e. The noise standard plus twenty dB or the maximum measured ambient level, for any period of time [equivalent to the L<sub>max</sub> noise metric].

**Table 8.16.070: EXTERIOR NOISE LIMITS**  
(Levels not to be exceeded more than 30 minutes in any hour)

Receiving Land Use Category	Time Period	Noise Level (dBA) Noise Zone Classification		
		Rural	Suburban	Urban
Residential: Single and double	10 p.m. to 7 a.m.	45	45	50
	7 a.m. to 10 p.m.	50	55	60
Residential: multiple and country	10 p.m. to 7 a.m.	45	50	55
	7 a.m. to 10 p.m.	50	55	60
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**

Hourly Noise Metric	Rural Residential		Commercial	
	Daytime Level	Nighttime Level	Daytime Level	Nighttime Level
L <sub>50</sub> (30 Min.)	50 dBA	45 dBA	65 dBA	60 dBA
L <sub>25</sub> (15 Min.)	55 dBA	50 dBA	70 dBA	65 dBA
L <sub>08</sub> (5 Min.)	60 dBA	55 dBA	75 dBA	70 dBA
L <sub>02</sub> (1 Min.)	65 dBA	60 dBA	80 dBA	75 dBA
L <sub>max</sub>	70 dBA	65 dBA	85 dBA	80 dBA

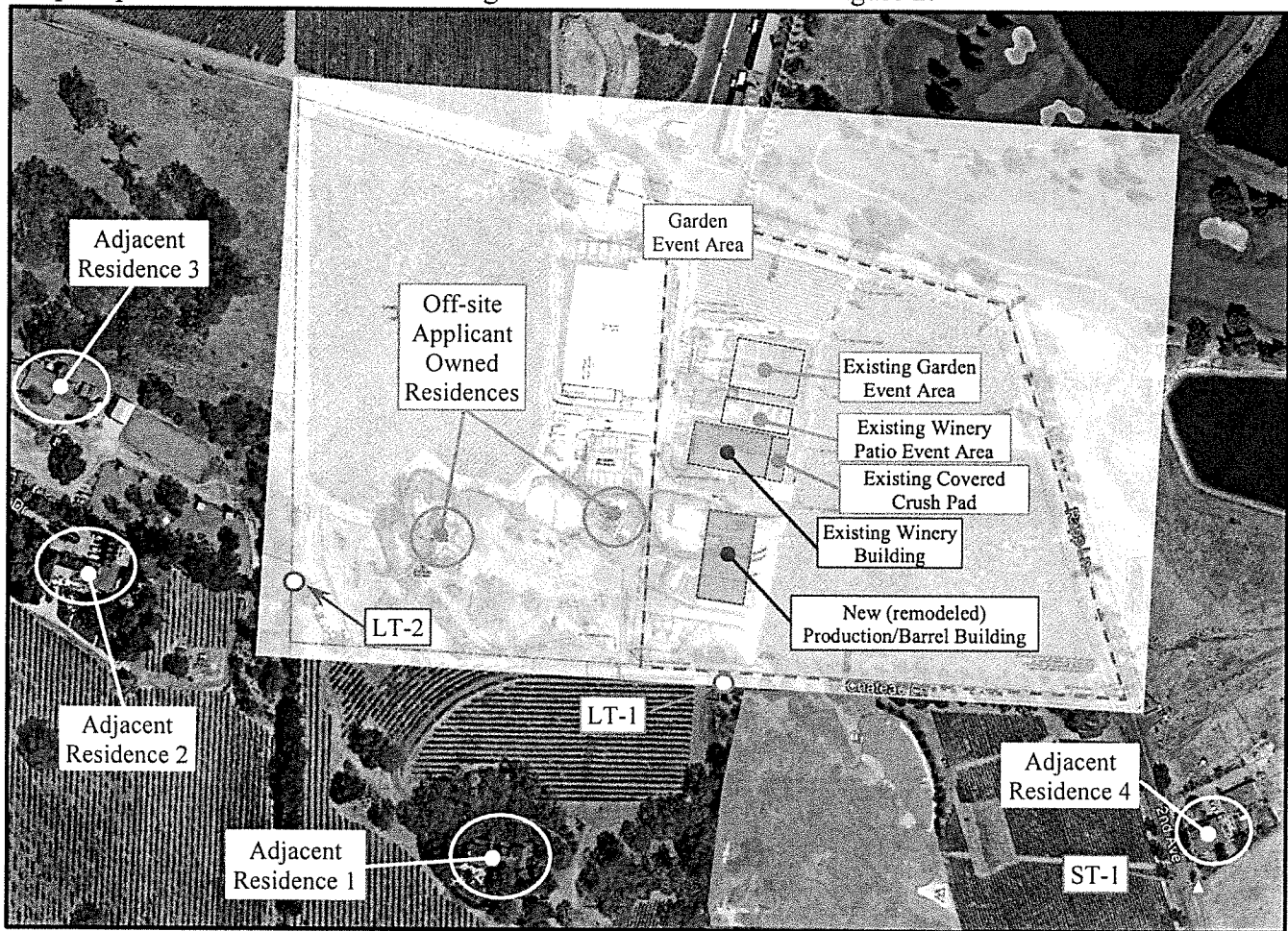
If the measured ambient noise level differs from that permissible within any of the first four noise categories (L<sub>50</sub>, L<sub>25</sub>, L<sub>08</sub>, L<sub>02</sub>), the allowable noise exposure standard shall be the ambient noise level.

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

To quantify the existing noise levels near the property lines of the closest noise sensitive (residential) uses, an ambient noise monitoring survey consisting of two long-term and one short term noise measurements was conducted between 1p m on Wednesday, August 7<sup>th</sup> and 11am on Monday, August 12<sup>th</sup>, 2019. The noise measurements were made using Larson-Davis Laboratories (LDL) precision Type 1 model meters fitted with a ½-inch pre-polarized condenser microphones and windscreens. The meters were calibrated before and after installation with an LDL acoustical calibrator. During the measurement period the weather was clear with no precipitation. The noise monitoring locations are identified in Figure 2.

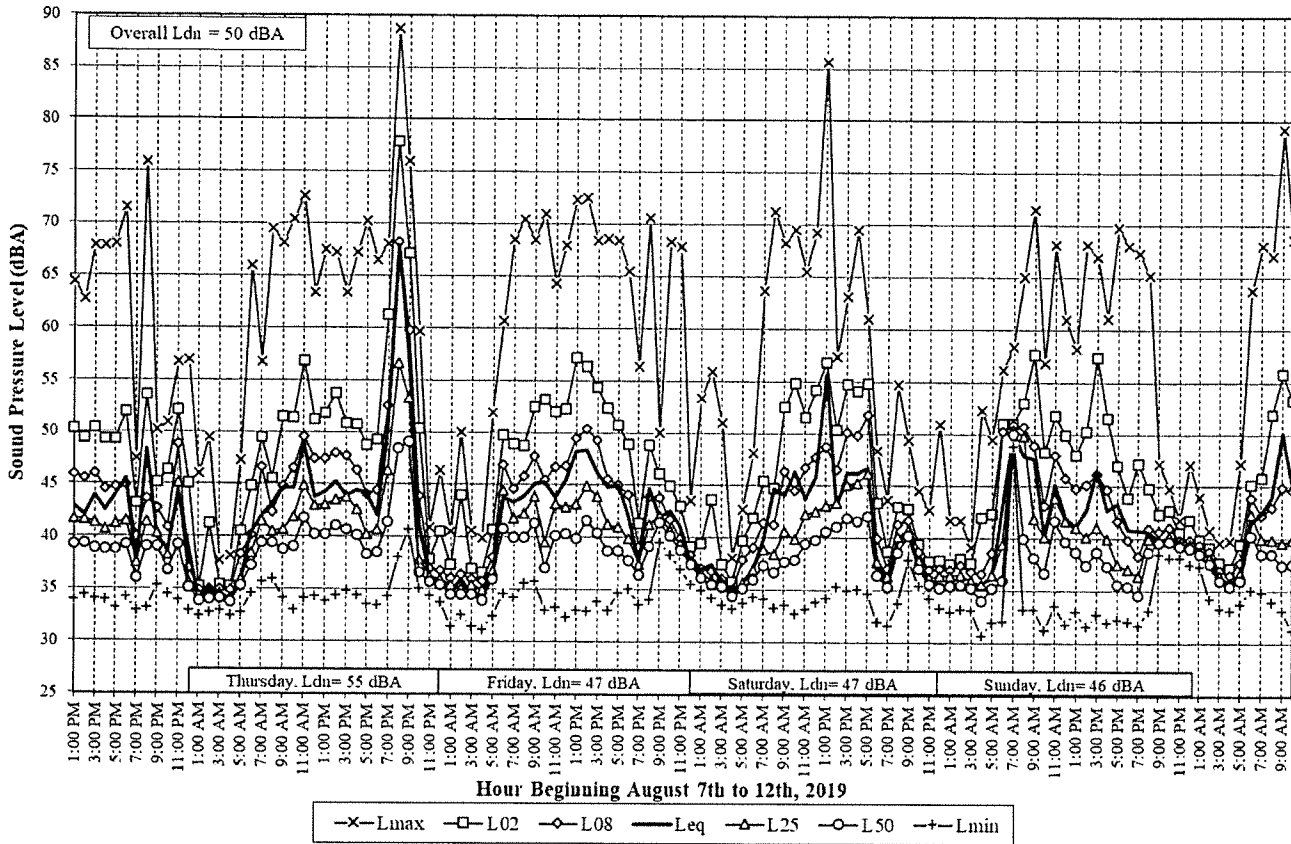


**Figure 2: Site, Noise Measurement Locations and Adjacent Residences**

The first long-term sound level measurement (LT-1) was made on the property line shared with the closest residence to the south of the Winery (Residence 1) as shown in Figure 2. The monitoring equipment was installed in tree on the south side of Chateau Lane opposite the Shadybrook Winery site. The monitor was about 130 feet from the closest project site equipment (water storage tanks) and about 200 feet from offsite mechanical equipment associated with the Covert Estate Winery to the south. Noise emissions from both of these equipment installations contributed to the ambient noise environment at LT-1. Other noise levels measured at this site

were primarily produced by occasional vehicles on Chateau Lane, more distant traffic on Rapp Lane, wind in trees, sounds from the adjacent residential and winery uses, bird chirps, insects, and other noise associated with wooded agricultural areas. The hourly trend in noise levels at this location, including the energy equivalent noise level ( $L_{eq}$ ), maximum ( $L_{max}$ ), minimum ( $L_{min}$ ), and the noise levels exceeded 2, 8, 25, and 50 percent of the time (indicated as  $L_2$ ,  $L_8$ ,  $L_{25}$ , and  $L_{50}$ ) are shown on Chart 1.

**Chart 1: Measured Noise Levels at LT-1**



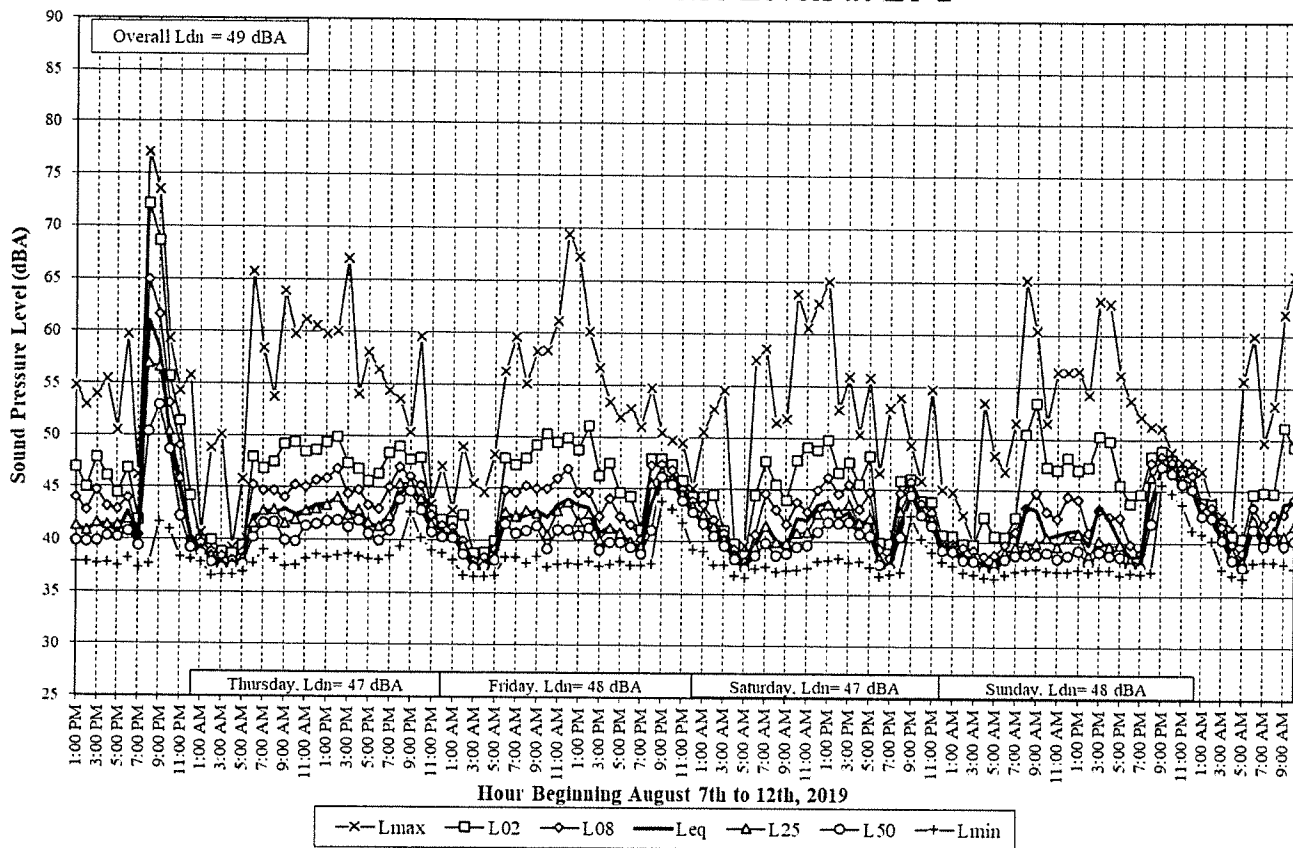
The average weekday noise levels ranged from 37 to 68 dBA  $L_{eq}$  during the day, and 34 to 44 dBA  $L_{eq}$  at night, and average weekend noise levels ranged from 36 to 56 dBA  $L_{eq}$  during the day and 34 to 43 dBA  $L_{eq}$  at night. The calculated average day/night noise level ( $L_{dn}$ ) at this location was 52 dBA on weekdays and 47 dBA on the weekend. The overall  $L_{dn}$  at this location was found to be 50 dBA. The average, maximum, minimum levels measured for the daytime and nighttime periods for the entire LT-1 measurement along with the corresponding Napa County Noise Standard Limits are shown in Table 2.

**Table 2: Comparison of LT-1 Noise Measurements Results and Napa County Standards**

Type of Level		Noise Level, dBA				
		$L_{50}$	$L_{25}$	$L_8$	$L_2$	$L_{max}$
Daytime Levels	County Noise Standard	50	55	60	65	70
	Average Level Measured	39	42	46	51	66
	Range (Max/Min)	35/50	36/57	37/68	39/78	44/89
Nighttime Levels	County Noise Standard	45	50	55	60	65
	Average Level Measured	36	37	39	41	48
	Range (Max/Min)	34/41	34/45	35/50	35/52	38/68

The second long-term sound level measurement (LT-2) was made at the property line of the closest non-applicant owned residential properties to the west setback of the residential property lines west of 4<sup>th</sup> Avenue on the property line of the residence closest to the new entry road from Dry Creek Road (Residences 2 and 3) as shown in Figure 2. The monitoring equipment was installed on the property line fence at a height of 5 feet above grade. Noise levels measured at this site were primarily produced distant traffic and winery noise sources along with sounds produced by insects and other noise associated woodland areas and bird chirps. The hourly trend in noise levels at this location, including the energy equivalent noise level ( $L_{eq}$ ), maximum ( $L_{max}$ ), minimum ( $L_{min}$ ), and the noise levels exceeded 2, 8, 25, and 50 percent of the time (indicated as  $L_2$ ,  $L_8$ ,  $L_{25}$ , and  $L_{50}$ ) are shown on Chart 2.

**Chart 2: Measured Noise Levels at LT-2**



The average weekday noise levels ranged from 39 to 61 dBA  $L_{eq}$  during the day, and 37 to 50 dBA  $L_{eq}$  at night, and average weekend noise levels ranged from 38 to 47 dBA  $L_{eq}$  during the day and 37 to 47 dBA  $L_{eq}$  at night. The calculated average day/night noise level ( $L_{dn}$ ) at this location was 50 dBA on weekdays and 48 dBA on the weekend. The overall  $L_{dn}$  at this location was found to be 49 dBA. The average, maximum, minimum levels for the daytime and nighttime levels for the entire LT-2 measurement period are shown in Table 3, along with the Napa County Noise Standards.

**Table 3: Comparison of LT-2 noise measurements results and Napa County Standards**

Type of Level		Noise Level, dBA				
		L <sub>50</sub>	L <sub>25</sub>	L <sub>8</sub>	L <sub>2</sub>	L <sub>max</sub>
Daytime Levels	County Noise Standard	50	55	60	65	70
	Average Level Measured	<b>41</b>	<b>42</b>	<b>44</b>	<b>48</b>	<b>57</b>
	Range (Max/Min)	38/53	38/57	39/65	40/72	46/77
Nighttime Levels	County Noise Standard	45	50	55	60	65
	Average Level Measured	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>49</b>
	Range (Max/Min)	37/49	38/51	38/53	39/56	39/66

A short-term, 20-minute duration, noise measurement (ST-1 in Figure 2) was made on the property line of the closest residence to the southeast of the Winery along Rapp Lane (Residence 4) as shown in Figure 2. The average day-night noise level (L<sub>dn</sub>) at the short-term measurement location was estimated at this site by correlating the short-term measurement data to the data gathered during the corresponding time period at the long-term sites. Noise levels measured at the short-term measurement location was produced primarily by roadway traffic on Rapp Lane. The measurement results and estimated L<sub>dn</sub> levels at these locations are shown in Table 4, following.

**Table 4: Summary of Short-Term Noise Measurement Data, dBA**

Noise Measurement Location	L <sub>50</sub>	L <sub>25</sub>	L <sub>08</sub>	L <sub>02</sub>	L <sub>max</sub>	L <sub>dn</sub>
ST-1: Near Property line of Residence 4 to project site.	40	43	53	69	85	<b>68</b>

Note: L<sub>dn</sub> is approximated by correlation to the corresponding measurement period at the long-term sites.

**PROJECT SPECIFIC NOISE LEVEL CRITERIA**

Based on the results of the noise measurement data the existing levels at the property lines shared with the nearest non-applicant owned Residences 1, 2, or 3 do not exceed the Napa County Noise Limits for L<sub>max</sub>, L<sub>2</sub>, L<sub>8</sub>, L<sub>25</sub>, and L<sub>50</sub> for either the daytime or nighttime. The average measured levels at this location ranged from 4 dB to 19 dB below the County noise limits.

However, the difference in the noise levels measured at short term location to those at the long-term positions indicates that the daytime and nighttime L<sub>max</sub> and L<sub>2</sub> levels at the residential properties adjacent to Rapp Lane exceed the Napa County Noise Limits by 8 to 12 dBA.

For assessment purposes, the Napa County Noise Ordinance allows the individual L<sub>N</sub> limit to be raised to the ambient level, however, from these data, this is only appropriate for daytime and nighttime L<sub>2</sub> and L<sub>max</sub> levels at the property line of Residence 4. Further, for music or speech, the limits are to be lowered by 5 dB. Thus, for assessing the non-vehicular event noise, the noise limits should be lower by the 5 dB. Considering this, the project specific noise criteria are given in Table 5 for adjacent residences for event noise and vehicular related noise.



**Table 5: Project Specific Noise Criteria for Specific Types of Noise**

<b>Adjacent Residences 1, 2, and 3</b>				
<b>Hourly Noise Metric</b>	<b>Maximum Exterior Noise Level Standards, dBA</b>			
	<b>Event Noise (music or speech)</b>		<b>Operations, Equipment &amp; Vehicular Noise</b>	
	<b>Daytime</b>	<b>Nighttime</b>	<b>Daytime</b>	<b>Nighttime</b>
L <sub>50</sub> (30 Min.)	45	40	50	45
L <sub>25</sub> (15 Min.)	50	45	55	50
L <sub>08</sub> (5 Min.)	55	50	60	55
L <sub>02</sub> (1 Min.)	60	55	65	60
L <sub>max</sub>	65	60	70	65
<b>Adjacent Residence 4 (east of Rapp Lane)</b>				
<b>Hourly Noise Metric</b>	<b>Maximum Exterior Noise Level Standards, dBA</b>			
	<b>Event Noise (music or speech)</b>		<b>Operations, Equipment &amp; Vehicular Noise</b>	
	<b>Daytime</b>	<b>Nighttime</b>	<b>Daytime</b>	<b>Nighttime</b>
L <sub>50</sub> (30 Min.)	45	40	50	45
L <sub>25</sub> (15 Min.)	50	45	55	50
L <sub>08</sub> (5 Min.)	55	50	60	55
L <sub>02</sub> (1 Min.)	<b>65</b>	55	<b>70</b>	60
L <sub>max</sub>	<b>81</b>	<b>65</b>	<b>86</b>	<b>70</b>

Notes: **Bolded** entries indicate criteria which has been raised to measured ambient levels

## **NOISE ASSESSMENT**

Estimating the expected noise produced by, and impacts from, the proposed modification of the Shadybrook Winery use permit at adjacent noise sensitive uses requires three elements; the first is an assessment of what increases in noise producing operations are likely to occur, the second is typical noise source levels for those operations, and the third is to determine the temporal nature of the operations.

### **I. Identification of Noise Producing operations/uses**

There are a number of operations associated with wine production and events at the facility that will produce noise. These include:

1. Project Traffic,
2. Winery operations and seasonal production activities,
3. Maintenance and forklift operations, and
4. Marketing Event noise.

### **II. Typical Noise Source Levels**

To estimate the noise levels associated with project operations, some attention must be given to the temporal nature of the noise produced. Below each of the major winery related noise producing operations outlined above are discussed:

Project Traffic would produce the following type and range of traffic noise levels:

- Automobile and light vehicle traffic accessing the tasting room would occur during the daytime hours and noise produced is expected to include the sounds of vehicles traveling on the access road maneuvering in parking areas, engine starts, door slams. Automobile and other light vehicle traveling at 25 to 35 mph typically produce sound levels of between 59 to 65 dBA at 50 feet. Parking lot activities such as engine starts, door slams and low speed vehicle movements typically produce maximum sounds levels ranging from 53 dBA to 63 dBA at 50 feet.

- Truck traffic on the project site will continue to access the winery via Rapp Lane. Noise levels generated by truck traffic are dependent on the size and speed of trucks, typical noise levels generated by heavy duty (semi-tractor trailer type) trucks would be expected to range from 70 to 75 dBA when traveling at constant speeds to 75 to 80 dBA when stopping/starting and maneuvering at a distance of 50 feet. Typical maximum noise levels generated by medium (box type and delivery) trucks would be expected to range from 60 to 65 dBA when traveling at constant speeds to 65 to 70 dBA when stopping/starting and maneuvering at a distance of 50 feet.

Winery and seasonal production operations typically produce the following type and range of noise levels<sup>1</sup>:

- Refrigeration equipment, as a maximum condition, is assumed operate under constant conditions day and night. Though the model, type and capacities of the existing or any additional cooling compressors are not known, field measurements of such equipment shows that sound from such equipment can produce levels of between 50 dBA to 65 dBA at 50 feet, with average ( $L_{eq}$ ) noise levels of 60 dBA at 50 feet.
- Air compressors, used for various processes in the facility, typically cycle on and off based on the need for compressed air. Though the model, type and capacities of existing or any additional cooling compressors for the facility are not specified, from field measurements of cooling compressors at other wineries, we expect this equipment to produce average ( $L_{eq}$ ) sound levels of 62 dBA at 50 feet.
- Bottling would be constant on an hourly basis although it is likely to occur for only a few weeks each year. Based on sound level measurements of mobile (truck based) and fixed bottling lines at other wineries, we would expect bottling operations to produce average ( $L_{eq}$ ) sound levels of between 65 and 70 dBA at 50 feet.
- Crush activities typically occur for about two weeks each year. The majority of the noise sources associated with the crush include the operation of hoppers, presses, destemmers, separators, crushers, air compressors, forklifts, conveyors, etc. Average noise levels resulting from the crush are typically constant on an hourly basis. Individual pieces of crush-specific equipment such as the separators and destemmers are relatively quiet with sound levels of around 50 dBA  $L_{eq}$  at about 50 feet, however the composite crush activities at a small sized winery, such as the proposed 70,000 Gallon (29,500 case) capacity facility, typically generate noise levels of about 63 dBA  $L_{eq}$ , at a distance of 50 feet from the center of operations. During the crush, discrete maximum noise events, such as the setting of empty bins, may reach 70 to 80 dBA  $L_{max}$  at 50 feet from the center of operations.

Maintenance and forklift operations typically produce intermittent noise depending on the exact nature of the operation. These would likely occur at a much less than a daily rate although operations may span several hours once initiated. Backup alarms (or beepers), which are repetitive and irritating by design, will also produce noise during these activities, and as with forklift operations themselves are expected to be intermittent by nature. Based on experience with other winery operations, we estimate that noise levels from these operations may reach levels of 66 to 67 dBA at 50 feet.

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<sup>1</sup> The Use permit modification requests an increase in production from 30,000 gallons per year (~12,500 cases) to 70,000 gallons (~29,500 cases) of wine per year.

### Marketing Event Noise

The Use permit modification requests an increase in approved events from 8 events per year with 30 visitors and 1 wine auction event per year with 30 visitors to 6 events per year with 30 visitors, 6 events per year with 50 visitors, and 6 events per year with 100 visitors. Considering these proposed event sizes, that events are expected to have background music, and that amplified and non-amplified music performances may occur at events, Table 6 lists typical average noise levels at distances of 50 feet from the source generated by the types of events which may occur at the project.

**Table 6: Typical Noise Source Levels for Events (A-Weighted  $L_{eq}$  Levels)**

Event or Activity	Typical Noise Level @ 50 ft.
Amplified Music Performances	72 dBA <sup>1</sup>
Amplified Speech	70 dBA
Non-amplified (acoustic) Music Performances	67 dBA <sup>1</sup>
30 Guests in Raised Conversation with Background Music	56 dBA
50 Guests in Raised Conversation with Background Music	58 dBA
100 Guests in Raised Conversation with Background Music	61 dBA

<sup>1</sup> Based on the results of measurements conducted at wineries and other event venues, I&R has found that Music performances are louder than multiple (100 person) guests with background music. In general, we have found that when music is only used as a background for dinner, tasting, and similar events it is played at a lower level to encourage conversation. Conversely, where Music performances are a focal point of an event, they typically produce higher sound levels than simple background music.

Based upon a review of the project plans and experience with other wineries, events may to occur inside the Winery Building and outside at the Patio or Garden areas identified in Figure 2.

### **III. Propagation of sound**

The final step in estimating the project noise levels is assessing the propagation of sound to the sensitive receptors. To do this, it is necessary to assume some rate of sound attenuation between the operations and receiver locations. The most dominant physical effect is due to the spreading out of sound waves with distance. Depending on ground absorption conditions noise from traffic noise sources can be considered to attenuate at 3 to 4.5 dB per doubling of distance from the source while noise from fixed project source can be considered to attenuate at a rate of 6 to 7.5 dB per doubling of distance from the source. Considering the vineyard and other vegetative over much of the site, distance attenuation rates of 4.5 dB per distance doubling for traffic noise sources and 7.5 dB per distance doubling for fixed noise sources are used in this analysis. Other effects can modify these fall-off rates such as partial shielding from buildings or topography, atmospheric attenuation of sound, and meteorological effects. These effects almost always reduce the noise in addition to that due to sound divergence. As most of these effects will vary with time due to changing environmental conditions, it is most conservative to assume only attenuation due to divergence for outdoor activities, minimum terrain or building shielding factors (6 dBA) where intervening terrain or structures break the line of sight from source to receiver, and conservative (minimal) rate of structural attenuation (12 dBA) when operations are conducted within buildings, realizing that the actual noise level will be at or, most likely, below those predicted using these assumptions at any one time.

The closest noise sensitive uses to the Winery are the non-applicant owned residences to the west, south and east of the site identified as Residences 1, 2, 3 and 4 in Figure 2.

## IMPACT ASSESSMENT

### **Impact 1: increased Vehicular Noise on Winery Access Roads.**

#### Automobile parking and traffic

Autos and passenger vehicles would continue to use the existing driveway from Rapp Lane and the parking areas north and west of the winery building. A review of the project site plan and information from Google Earth indicates that;

- The property line of Residence 1 is to the south opposite Chateau Lane at approximately 390 feet from site driveways and 350 feet from the winery parking areas,
- The property lines of Residences 2 and 3 are west of the Applicant owned Rapp Ranch Equestrian Center respectively at approximately 650 and 620 feet from site driveways and 690 and 650 feet from the winery parking areas, and that
- The property line of Residence 4 is to the south east opposite Rapp Lane at approximately 1040 feet from site driveways and 1000 feet from the winery parking areas.

Given the expected visitor and employee use information provided with the Use Permit Application, these activities are expected to occur for more than 5 but less than 15 minutes out of an hour on a typical day and fall in the L<sub>08</sub> daytime category of 60 dBA (see Table 1). However, during events, on busy weekends, or during harvest season such activities may occur more frequently and occur for more than 15 but less than 30 minutes out of an hour and fall in the project specific L<sub>25</sub> daytime category of 55 dBA, as shown in Table 5. Considering these activity durations and the distances, Table 7 summarizes the assessment of automobile noise the driveway and in the parking lots at the closest non-applicant owned residences.

**Table 7: Driveway and Parking Lot Automobile Noise Levels**

	Noise Levels, dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>08</sub> Noise Limit	60	60	60	60
<b>Noise levels due to Autos on Winery Access Roads at Residence</b>	<b>46</b>	<b>37</b>	<b>38</b>	<b>34</b>
<i>Driveway Noise Exceeds Daytime L<sub>08</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
Daytime L <sub>25</sub> Noise Limit	65	65	65	65
<b>Noise levels due to Autos in parking areas at Residence</b>	<b>41</b>	<b>35</b>	<b>35</b>	<b>30</b>
<i>Parking Noise Exceeds Daytime L<sub>25</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Based on this finding, noise associated with auto traffic at the winery would comply with the project specific noise standards at all adjacent residences.

#### Truck Traffic

Trucks entering the Winery site currently enter the site on Rapp Lane and travel on a one-way path on the site. This practice would continue under the future Winery expansion. A review of the project site plan and information from Google Earth indicates that trucks traveling on this drive path drive would come as close as approximately 300, 650, 620, and 840 feet from the property lines of non-applicant occupied adjacent Residences 1, 2, 3 and 4 as identified in Figure 2. Based on these distances, the maximum noise levels generated by medium and heavy-duty trucks traveling at constant speeds on the winery driveways would, respectively, be 46 & 56

dBa at Residence 1, 37 & 47 dBA at Residence 2, 38 & 48 dBA at Residence 3, and 34 & 44 dBA at Residence 4.

Further review of the project site plan and information from Google Earth indicates that trucks maneuvering in the winery shipping/receiving area would be as close as approximately 300, 790, 810, and 880 feet from the property line of adjacent Residences 1, 2, 3 and 4 as identified in Figure 2. Based on these distances, the maximum noise levels generated by medium and heavy-duty trucks maneuvering in the winery shipping/receiving area would, respectively, be 51 & 61 dBA at Residence 1, 40 & 50 dBA at Residences 2 and 3, and 39 & 49 dBA at Residence 4.

Given the expected truck trip information provided with the Use Permit Application, we expect that the winery will have one to two truck trips per day during non-harvest season, with an expected increase in truck trips to 5 to 6 truck trips per day during harvest season. Based on this usage, maximum noise levels due to on-site Truck traffic is expected to occur for more than 1 but less than 5 minutes out of an hour during the highest use (harvest season) periods and fall in the project specific L<sub>02</sub> daytime category of 65 dBA (Residences 1,2, &3) and 70 dBA (Residence 4) as shown in Table 5.

Considering this activity duration and sound levels, Table 8 summarizes the assessment of truck traffic noise at the closest non-applicant owned residences.

**Table 8: On-site Truck Noise Levels**

		Noise Levels dBA			
		Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>02</sub> Noise Limit		65	65	65	70
<b>Medium Trucks</b>	<b>On site access drives</b>	46	37	38	34
	<b>In shipping/receiving area</b>	51	40	40	39
<b>Heavy Trucks</b>	<b>On site access drives</b>	56	47	48	44
	<b>In shipping/receiving area</b>	61	50	50	49
<i>Truck Noise Exceeds Daytime L<sub>02</sub> Limit?</i>		<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Based on this finding, noise associated with truck use at the winery would comply with the project specific noise standards at all adjacent residences.

**Mitigation 1: None required.**

**Impact 2: Mechanical Equipment Noise**

The winery operations currently, and will continue to, use noise-generating mechanical equipment such as air-cooled condensing units, pumps, and compressors as well as less significant sources of noise, such as air-conditioning systems and exhaust fans. The project drawings do not indicate the location of this mechanical equipment. Some of the equipment will likely be placed in mechanical rooms within the new Production & Barrel Building or the existing Winery Building, however some equipment, such as cooling compressors, will likely need to be located outside of the structures due to air flow considerations. Equipment may also be placed on the building rooftop. Considering these possibilities, and distance information obtained via Goggle Earth, the equipment outside of the Winery or Production & Barrel Building may be as close as approximately 150, 690, 670, and 760 feet from the property line of adjacent Residences 1, 2, 3 and 4 as identified in Figure 2. Thus, under the worst-case condition with the equipment located outside and unshielded by the building structures, constant L<sub>50</sub> noise levels from mechanical equipment could produce respective L<sub>50</sub> levels of 50, 34, 34, and 31 dBA at the non-applicant occupied adjacent Residences 1, 2, 3 and 4 as identified in Figure 2. Table 9,

below, presents and summarizes the assessment of this worst-case mechanical equipment noise versus the project specific L<sub>50</sub> daytime criterion of 50 dBA at the outdoor use areas of the closest noise sensitive uses.

**Table 9: Mechanical Equipment Noise Levels**

	Noise Levels dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>50</sub> Noise Limit	50	50	50	50
<b>Mechanical Equipment Noise Levels at Residence</b>	<b>50</b>	<b>34</b>	<b>34</b>	<b>32</b>
<i>Mechanical Noise Exceeds L<sub>50</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Considering the findings shown in Table 9, noise levels associated with worst-case winery mechanical equipment would not exceed the project specific noise standards at the closest noise sensitive uses.

**Mitigation 2: None required.**

**Impact 3: Crush Related Noise**

Under the modified use permit annual crush related activities would continue to take place in the covered crush pad adjacent to the existing winery building. Crush activities occurring in these areas may receive some noise shielding from building structures, however to conduct a conservative impact assessment no attenuation between crush activities and adjacent residences was considered. Based on a review of project plans and distance information obtained via Goggle Earth, crush activities may be as close as approximately 350 feet from the Residence 1, 820 feet from the Residence 2, and 800 feet from the Residences 3 and 4 property lines. As discussed previously noise from crush activities are largely made up of relatively constant noise, with occasional discrete maximum noise events, such as the setting of empty bins. Noise from crush activities would therefore fall in the Project Specific noise criteria of 50 dBA L<sub>50</sub> and 70 dBA L<sub>max</sub> (Residences 1,2, &3) and 86 dBA L<sub>max</sub> (Residence 4) as shown in Table 5.

Table 10, below, presents and summarizes the assessment of crush noise against these L<sub>50</sub> and L<sub>max</sub> noise criteria noise standard and maximum noise events, such as the setting of empty bins.

**Table 10: Crush Noise Levels**

	Noise Levels dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>50</sub> Noise Limit	50	50	50	50
<b>L<sub>50</sub> Crush Noise Levels at Residence</b>	<b>42</b>	<b>33</b>	<b>33</b>	<b>33</b>
<i>Crush Noise Exceeds Daytime L<sub>50</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
Daytime L <sub>max</sub> Noise Limit	70	70	70	86
<b>L<sub>max</sub> Crush Noise Levels at Residence</b>	<b>59</b>	<b>50</b>	<b>50</b>	<b>50</b>
<i>Crush Noise Exceeds Daytime L<sub>max</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Considering the findings shown in Table 10, noise levels associated with annual crush activities would not exceed the project specific noise standards at the property lines of the closest non-applicant owned noise sensitive uses.

**Mitigation 3: None required.**

#### Impact 4: Bottling Noise

The project description or drawings do not indicate whether bottling occurs within buildings or in the crush area or shipping/receiving area between the Winery and Production Buildings. However, in keeping with the practice of many similar sized wineries this report assumes that, under worst case conditions, bottling will be done with a mobile bottling truck in the closest areas to the adjacent residences of either the crush pad or the shipping/receiving area. Based on this consideration, and distance information obtained via Goggle Earth, bottling noise is therefore analyzed at respective distances of approximately 300, 790, 800, and 800 feet from the property lines of Residences 1, 2, 3 and 4. As discussed previously noise from bottling is relatively constant noise and would therefore fall in the Project Specific Noise Criteria of 50 dBA L<sub>50</sub> at the adjacent residential uses.

Table 11, below, presents and summarizes the assessment of indoor bottling noise against the L<sub>50</sub> project specific noise criterion.

**Table 11: Bottling Noise Levels**

	Noise Levels, dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>50</sub> Noise Limit	50	50	50	50
<b>Bottling Noise Levels at Residence</b>	<b>48</b>	<b>40</b>	<b>40</b>	<b>40</b>
<i>Bottling Noise Exceeds L<sub>50</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Considering the findings shown in Table 12, noise levels associated with bottling activities would not exceed the project specific noise standards at the closest noise sensitive uses.

**Mitigation 4: None required.**

#### Impact 5: Maintenance and Forklift Operations

Forklift and maintenance operations are expected to take place in the covered crush/receiving areas and within the winery and production/barrel buildings. Such activities within buildings would receive significant noise shielding from the building and are not analyzed here. Outdoor forklift and maintenance operations are considered a worst-case condition and are analyzed. Such outdoor operations could therefore occur as close as approximately 300, 790, 800, and 800 feet from the property lines of Residences 1, 2, 3 and 4. Based on experience with other winery operations, during high activity periods these activities would be expected to occur for more than 15 but less than 30 minutes out of an hour and fall in the Project Specific Noise Criteria of 55 dBA L<sub>25</sub> at the adjacent residential uses. However, considering that forklift backup alarms are repetitive and irritating by design, this activity noise has been penalized by 5 dBA and is judged against a more stringent noise criteria of 50 dBA at the adjacent residential uses.

Table 12, following, presents and summarizes the assessment of forklift and maintenance activity against this 5-dBA reduced L<sub>25</sub> project specific noise criterion.

**Table 12: Forklift and Maintenance Activity Noise Levels**

	Noise Levels, dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>25</sub> Noise Limit (5 dB reduction applied for repetitive sound)	50	50	50	50
<b>Forklift and Maintenance Noise Levels at Residence</b>	<b>48</b>	<b>37</b>	<b>37</b>	<b>37</b>
<i>Forklift and Maintenance Exceeds modified L<sub>25</sub> Limit?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Considering the findings shown in Table 12, noise levels associated with Forklift and Maintenance Activity activities would not exceed the project specific noise standards at the closest noise sensitive uses.

**Mitigation 5: None required.**

**Impact 6: Marketing Event Noise at adjacent residential uses**

The Use permit modification requests 6 events per year with 30 visitors, 6 events per year with 50 visitors, and 6 events per year with 100 visitors. Marketing events would take place during the hours of 11 am to 10 pm. These events are expected to have background music and may also include amplified and non-amplified music performances. The events are expected to occur both inside and outside of the winery buildings. We understand that currently outside events are held on the winery patio area adjacent to the Winery Building and/or in the Garden Area north of the Patio. It is expected that future outside events would continue to occur in these areas. Indoor events at the winery are expected to occur either within the existing Winery Building. Indoor events would receive noise shielding from building structure estimated at 12 dBA (assuming open windows and/or doors). Outdoor events will also receive shielding from intervening terrain features and building structures. However, to conduct a conservative analysis of event noise impacts, only a minimum terrain or building shielding factor of 6 dBA is considered in this analysis.

Based on a review of the project site plan and distance information obtained via Goggle Earth;

- Outdoor events held in the Winery Patio area could be close as approximately 430, 760, 720 and 840 feet from the near property lines of Residences 1, 2, 3 and 4,
- Outdoor events held in the Garden area could be close as approximately 500, 810, 750 and 880 feet from the near property lines of Residences 1, 2, 3 and 4,
- Events held within the Winery Building could be close as approximately 350, 700, 670 and 840 feet from the near property lines of Residences 1, 2, 3 and 4, and

When underway, events typically produce noise from periods of 30 minutes or more per hour, and thus event noise is judged against the L<sub>50</sub> standard. Additionally, a 5-dBA penalty is applied to event noise, because event noise typically contains music or speech. Noise from events concluding by 10 pm is therefore judged against the Project Specific Event Noise Criteria of 45 dBA L<sub>50</sub> (see Table 5).

The following tables present and summarize the assessment of marketing event noise versus project specific criterion for outside events at the Winery Patio area (the closest outdoor event area to all adjacent residences) (Table 13a) and indoor events in the Winery Building (Table 13b).



**Table 13a: Winery Patio Outdoor Event Noise Levels**

	Noise Levels, dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>50</sub> Event Noise Limit	45	45	45	45
<b>Amplified Music Performance</b>	<b>43</b>	<b>36</b>	<b>37</b>	<b>35</b>
<b>Amplified Speech</b>	<b>41</b>	<b>34</b>	<b>35</b>	<b>33</b>
<b>Non-amplified Music Performance</b>	<b>38</b>	<b>31</b>	<b>32</b>	<b>30</b>
<b>100 Guests with Background Music</b>	<b>27</b>	<b>20</b>	<b>21</b>	<b>19</b>
<b>50 Guests with Background Music</b>	<b>29</b>	<b>22</b>	<b>23</b>	<b>21</b>
<b>30 Guests with Background Music</b>	<b>32</b>	<b>25</b>	<b>26</b>	<b>24</b>
<i>Noise level Exceeds L<sub>50</sub> Limit?</i>	<i>No (all)</i>	<i>No (all)</i>	<i>No (all)</i>	<i>No (all)</i>

**Table 13b: Winery Building Indoor Event Noise Levels**

	Noise Levels, dBA			
	Residence 1	Residence 2	Residence 3	Residence 4
Daytime L <sub>50</sub> Event Noise Limit	45	45	45	45
<b>Amplified Music Performance</b>	<b>39</b>	<b>31</b>	<b>32</b>	<b>29</b>
<b>Amplified Speech</b>	<b>37</b>	<b>29</b>	<b>30</b>	<b>27</b>
<b>Non-amplified Music Performance</b>	<b>34</b>	<b>26</b>	<b>27</b>	<b>24</b>
<b>100 Guests with Background Music</b>	<b>23</b>	<b>15</b>	<b>16</b>	<b>13</b>
<b>50 Guests with Background Music</b>	<b>25</b>	<b>17</b>	<b>18</b>	<b>15</b>
<b>30 Guests with Background Music</b>	<b>28</b>	<b>20</b>	<b>21</b>	<b>18</b>
<i>Noise level Exceeds L<sub>50</sub> Limit?</i>	<i>No (all)</i>	<i>No (all)</i>	<i>No (all)</i>	<i>No (all)</i>

Considering the findings shown in Table 13a and 13b, all marketing events will meet the Project Specific Noise Criteria at the closest noise sensitive uses.

**Mitigation 6: None required.**

## APPENDIX A: FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL ACOUSTICS

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound may be caused by either its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with 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. For lesser increases of sound from the same or similar sources, a 6 dB change is perceived to be a “noticeable” change and a 3 dB change to be just perceptible. 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,  $L_{dn}$ , is a measure of the cumulative noise exposure in a community, with a 10 dB penalty added to nighttime (10:00 pm - 7:00 am) noise levels. The Community Noise Equivalent Level, CNEL, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels.

### **Effects of Noise**

**Sleep and Speech Interference:** The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noise of sufficient intensity; above 35 dBA, and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA  $L_{dn}$ . Typically, the highest steady traffic noise level during the daytime

is about equal to the  $L_{dn}$  and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses.

TERM	DEFINITIONS
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
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.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels 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**

*ILLINGWORTH & RODKIN, INC./Acoustical Engineers*

Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an 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  $L_{dn}$  with open

windows and 65-70 dBA  $L_{dn}$  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 windows with special glass.

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	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 Printing Press Plant	
Freight Cars (50')	80		
Pneumatic Drill (50')	80		
Freeway (100')	70	In Kitchen With Garbage Disposal Running	Moderately Loud
Vacuum Cleaner (10')	70		
	60	Data Processing Center	
Light Traffic (100')	50	Department Store	
Large Transformer (200')	50		
	40	Private Business Office	Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

**Typical Sound Levels in the Environment & Industry**

**Table 2**

*ILLINGWORTH & RODKIN, INC./Acoustical Engineers*

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  $L_{dn}$  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.