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May 3, 2016

Ms. Donna B. Oldford
Plans4Wine
2620 Pinot Way
St. Helena, California 94574

Via email: **DBOldford@aol.com**

Subject: **Mountain Peak Winery, Napa County, CA – Environmental Noise Assessment**

Dear Ms. Oldford:

The Mountain Peak Winery project proposes to construct a new 100,000-gallon per year production winery at 3265 Soda Canyon Road in unincorporated Napa County, California. The winery production activities, fermentation, and barrel storage would be housed within the wine caves, which would be located mostly underground. A covered crush pad would be located adjacent to the wine caves in an outdoor work area of 6,412 square feet. The accessory winery uses, such as wine tastings, hospitality uses, and winery administrative offices, would be located within an at-grade structure on the northern part of the site. Tours and tastings would be by appointment only and include up to a maximum of 82 persons daily and 320 persons weekly. Special events would include up to six food and wine pairings per month with 12 to 24 attendees, up to four wine club/release events per year with a maximum attendance of 75 guests, and up to two larger auction-related events per year with a maximum attendance of 125 guests. Amplification would not be used for any of these events.

This study provides a brief discussion of the fundamentals of environmental noise, definitions of noise metrics, and typical noise levels. A summary of the applicable regulatory criteria used in the assessment is reviewed, as well as a presentation and discussion of the existing noise levels on the project site. The expected changes in the noise environment due to winery-related noise are discussed, followed by their assessment relative to the County regulations.

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by 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 which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which 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 (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 *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 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The *Day/Night Average Sound Level* (L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
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. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
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.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
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.
Day/Night Noise Level, L_{dn} or DNL	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 p.m. and 7:00 a.m.
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 p.m.to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
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.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

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 Ldn. Typically, the highest steady

traffic noise level during the daytime is about equal to the Ldn 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. 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 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.

Regulatory Background

The proposed project would be subject to noise-related regulations, plans, and policies established within documents prepared by Napa County. These documents are implemented during the environmental review process to limit noise exposure at existing and proposed noise sensitive land uses. Applicable planning documents include the Napa County General Plan and Napa County Noise Ordinance.

2008 Napa County General Plan. The Community Character Element of the 2008 Napa County General Plan sets forth goals and policies to protect people from exposure to excessive noise. Goals and policies contained in this document that are relevant to this project are as follows:

Goal CC-7: Accept those sounds which are part of the County's agricultural character while protecting the people of Napa County from exposure to excessive noise.

Goal CC-8: Place compatible land uses where high noise levels already exist and minimize noise impacts by place new noise-generating uses in appropriate areas.

Policy CC-35: The noises associated with agriculture, including agricultural processing, are considered an acceptable and necessary part of the community character of Napa County, and are not considered to be undesirable provided that normal and reasonable measures are taken to avoid significantly impacting adjacent uses.

Policy CC-36: Residential and other noise-sensitive activities shall not be located where noise levels exceed the standards contained in this Element without provision of noise attenuation features that result in noise levels meeting the current standards of the County for exterior and interior noise exposure.

Policy CC-38: The following are the County's standards for maximum exterior noise levels for various types of land uses established in the County's Noise Ordinance. Additional standards are provided in the Noise Ordinance for construction activities (i.e., intermittent or temporary noise).

EXTERIOR NOISE LEVEL STANDARDS
(LEVELS NOT TO BE EXCEEDED MORE THAN 30 MINUTES IN ANY HOUR)

Land Use Type	Time Period	Noise Level (dBA) by Noise Zone Classification		
		Rural	Suburban	Urban
Single-Family Homes and Duplexes	10 p.m. to 7 a.m.	45	45	50
	7 a.m. to 10 p.m.	50	55	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10 p.m. to 7 a.m.	45	50	55
	7 a.m. to 10 p.m.	50	55	60
Office and Retail	10 p.m. to 7 a.m.	60		
	7 a.m. to 10 p.m.	65		
Industrial and Wineries	Anytime	75		

a) For the purposes of implementing this policy, standards for residential uses shall be measured at the housing unit in areas subject to noise levels in excess of the desired levels shown above.

b) Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction at the industrial use.

c) Where projected noise levels for a given location are not included in this Element, site-specific noise modeling may need to be conducted in order to apply the County's Noise policies.

d) For further information, see the County Noise Ordinance.

Policy CC-48: Where proposed commercial or industrial land uses are likely to produce noise levels exceeding the standards contained in this Element at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

Napa County Noise Ordinance. The Napa County Noise Ordinance Section 8.16.070 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

d. The noise standard plus fifteen dB for a cumulative period of more than one minute in any hour [equivalent to the L_{02} noise metric];

e. The noise standard plus twenty dB or the maximum measured ambient level, for any period of time [equivalent to the L_{max} 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 3, below:

Table 3: 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

The Mountain Peak Winery project site is located almost at the top of Soda Canyon road, which extends eastward from the Silverado Trail just north of the City of Napa, California. The existing site consists of a residence surrounded by agricultural land. Single-family rural residences, vineyard property, some grazing lands, and a school are located along Soda Canyon Road in the

vicinity of the project site. The nearest single-family residences are approximately 375 to 400 feet to the east.

A noise monitoring survey was performed in the area of the project site beginning on Thursday July 30, 2015 and concluding on Monday August 3, 2015. The monitoring survey included two long-term noise measurements, as shown in Figure 1. The noise environment at the site and in the surrounding areas results primarily from vehicular traffic along Soda Canyon Road. Occasional aircraft associated with nearby airports also affects the noise environment.

The monitoring equipment used for both long-term measurements was installed in trees approximately 10 to 12 feet above the ground. The first long-term noise measurement LT-1 was made along at the rear of the existing parking lot on the project site. The distance from LT-1 to the centerline of Soda Canyon Road was approximately 365 feet. LT-2 was located near the entrance of the project site, approximately 25 feet north of the centerline of Soda Canyon Road. 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 sound level meters were calibrated before and after installation with a 114 dB, 1,000 Hertz Larson Davis acoustical calibrator.

The hourly L_{eq}, L_2, L_8, L_{25}, and L_{50} noise levels measured at LT-1 are shown in Figure 2, along with the L_{dn} values for the 24-hour periods from Thursday, July 30, 2015 through Monday, August 3, 2015. Hourly average noise levels at LT-1 typically ranged from 34 to 66 dBA L_{eq} during the day, and from 30 to 46 dBA L_{eq} at night. The day-night average noise level was 50 dBA L_{dn} at LT-1 on Friday, while each weekend day-night average noise level was 42 dBA L_{dn}. From 8:00 a.m. to 12:00 p.m. on Friday, LT-1 showed noise levels significantly higher than typical levels measured during the rest of the survey. These elevated levels were due to gardening and landscape work. The average, maximum, and minimum levels during the daytime and nighttime for the entire LT-1 measurement period are shown in Table 4, as compared with the Napa County Noise Standards.

The corresponding measurements from LT-2 are shown in Figure 3. The levels at LT-2 were typically higher than those at LT-1, presumably due to the proximity of Soda Canyon Road. Hourly average noise levels at LT-2 typically ranged from 47 to 65 dBA L_{eq} during the day, and from 37 to 61 dBA L_{eq} at night. The day-night average noise level for Friday July 31, 2015, which was the full 24-hour weekday included in the measurement period, was 62 dBA L_{dn}, and on Saturday and Sunday, the day-night average noise level was 57 and 54 dBA L_{dn}, respectively. The average, maximum, and minimum levels during the daytime and nighttime for the entire LT-2 measurement period are shown in Table 5, as compared with the Napa County Noise Standards. From the measurements, the only average ambient noise level that currently exceeds the threshold would be L_{max} at LT-2.

FIGURE 1 Noise Measurement Locations

FIGURE 2 Daily Trend in Noise Levels at LT-1, from Thursday, July 30 through Monday, August 3, 2015

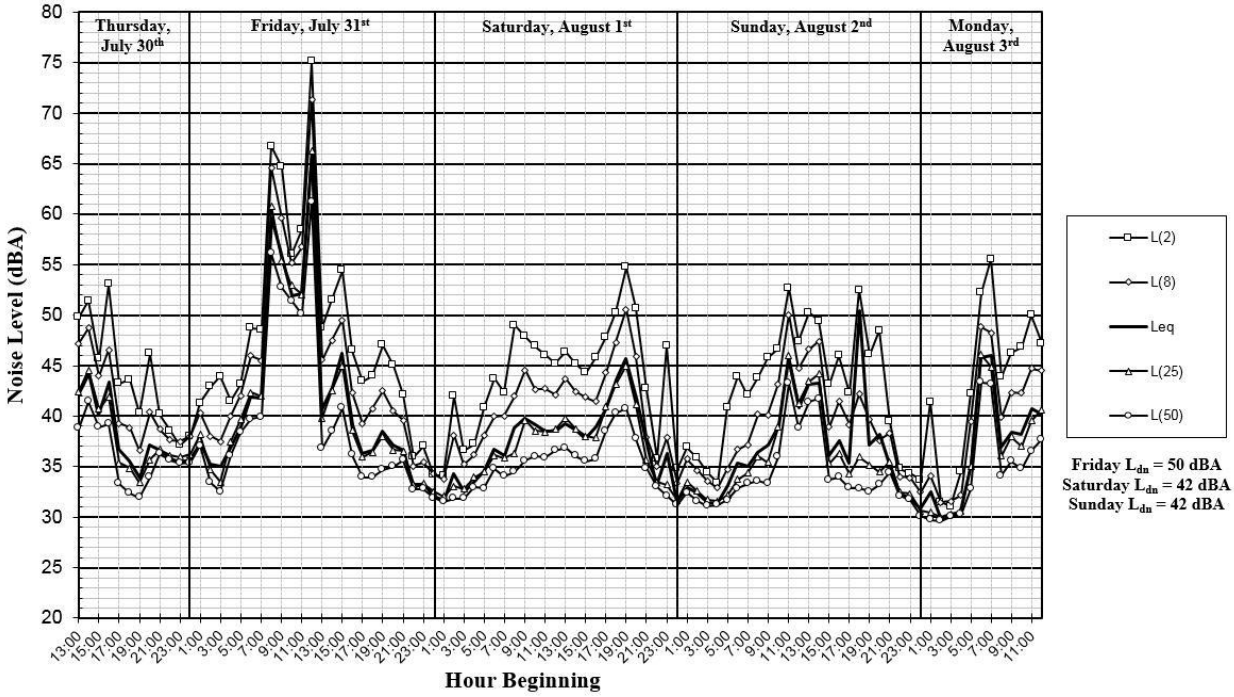

FIGURE 3 Daily Trend in Noise Levels at LT-2, from Thursday, July 30 through Monday, August 3, 2015

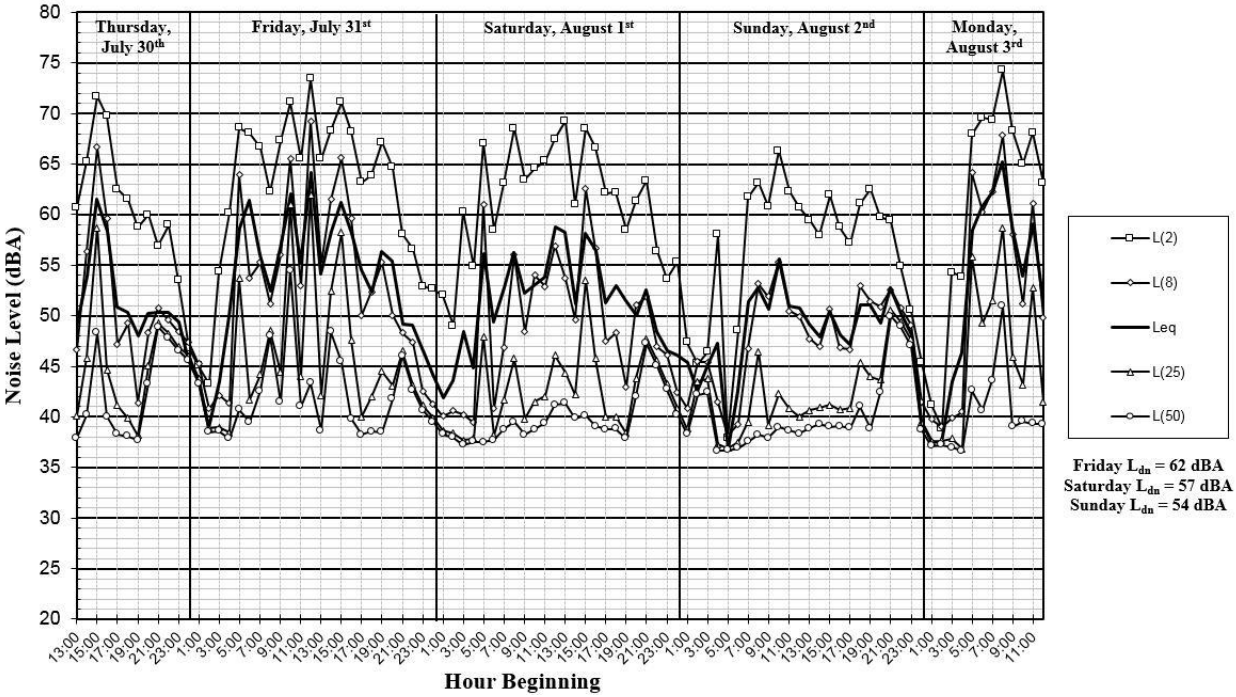

TABLE 4 Comparison of LT-1 ambient noise measurements and Napa County Limits

Type of Level		Noise Level, dBA				
		L_{50}	**L_{25}**	**L_8**	**L_2**	**L_{max}**
Daytime	Limit	50	55	60	65	70
	Measured	**38**	**40**	**44**	**48**	**55**
	Range	*32-61*	*33-66*	*37-71*	*39-75*	*42-79*
Nighttime	Limit	45	50	55	60	65
	Measured	**33**	**34**	**37**	**39**	**43**
	Range	*30-43*	*30-46*	*31-49*	*31-52*	*34-60*

TABLE 5 Comparison of LT-2 ambient noise measurements and Napa County Limits

Type of Level		Noise Level, dBA				
		L_{50}	**L_{25}**	**L_8**	**L_2**	**L_{max}**
Daytime	Limit	50	55	60	65	70
	Measured	**41**	**45**	**53**	**64**	**73**
	Range	*38-54*	*38-62*	*41-69*	*57-74*	*66-85*
Nighttime	Limit	45	50	55	60	65
	Measured	**40**	**42**	**45**	**54**	**63**
	Range	*37-49*	*37-56*	*38-64*	*38-70*	*39-84*

Surrounding Residential Land Uses

The nearest residences with direct line-of-sight to the winery are labeled in Figure 1 as Residence 1, Residence 2, and Residence 3. In addition to being a single-family residence, Residence 1 also includes some vineyard production activities. Residences 2 and 3 are located opposite Soda Canyon Road from the winery entrance driveways. While there are other residences along Soda Canyon Road near the project site, Residences 2 and 3 are the closest to the roadway and to the project site and would experience the greatest impact from the proposed project. Since the property lines for each of these residences are unclear, and each property is heavily congested with either trees or agriculture, all noise level estimations for the residences were made near the open outdoor use areas surrounding each residence. The existing noise environment at all three residences is dominated by traffic noise along Soda Canyon Road. Ambient noise levels at each of the residences were calculated based on the levels measured at LT-2 and the respective distances from the centerline of the roadway to each residence, which are 510 feet for Residence 1, 85 feet for Residence 2, and 215 feet for Residence 3. The calculated noise levels are summarized in Table 6.

TABLE 6 Calculated ambient noise levels at each nearby residence

Type of Level		Noise Level, dBA				
		L_{50}	L_{25}	L_8	L_2	L_{max}
Daytime	Limit	50	55	60	65	70
	Residence 1	28	32	40	51	60
	Residence 2	36	40	48	59	68
	Residence 3	32	36	44	55	64
Nighttime	Limit	45	50	55	60	65
	Residence 1	27	29	32	41	50
	Residence 2	35	37	40	49	58
	Residence 3	31	33	36	45	54

Future Operations at the Winery

The Mountain Peak Winery would produce 100,000 gallons of wine per year. The winery would be open seven days per week. Production operations would start at 6:00 a.m. and conclude at 6:00 p.m. Visitation hours are proposed from 10:00 a.m. until 6:00 p.m., with evening events from 6:00 p.m. to 10:00 p.m. The total number of employees expected would be 19 full-time, four part-time, and an additional four part-time during harvest season. Tours and tastings would be 'by appointment only' and limited to a maximum of 82 persons daily and 320 persons weekly. Special events would include up to six food and wine pairings per month with 12 to 24 attendees, up to four wine club/release events per year with a maximum attendance of 75 guests, and up to two larger auction-related events per year with a maximum attendance of 125 guests. There would be no outdoor amplified music in connection with the winery.

Noise generated by the project would include sources such as increased vehicle traffic, driveway and parking lot noise, seasonal production-related noise, and special events. Most of the operation of mechanical equipment for the proposed project would be located within the wine cave, and the nearby residences would be shielded from most operational noise. A discussion of each of these project-related noise sources is provided below.[1]

Project-Generated Traffic

A traffic noise study was conducted for the proposed Mountain Peak Winery project by *Crane Transportation Group*[2] in February of 2015. The study was conducted for typical daily activity, which would include employees and visitors for scheduled tours and tastings. Project trip generation was estimated between 8:00 and 9:00 a.m. (morning peak hour) and between 4:30 and 5:30 p.m. (evening peak hour) on Friday and between 4:00 and 5:00 p.m. (evening peak hour) on Saturday. According to the traffic study, the project-generated trips during the morning peak hour

[1] Note, the following noise assessment was originally conducted prior to the size reduction of the cave; however, the locations of each operation would remain the same, with respect to the distance from the nearby residences. Therefore, the results of the analysis would not change.

[2] Crane Transportation Group, Traffic Impact Report: Proposed Mountain Peak Winery Along Soda Canyon Road in the Napa Valley, February 2015.

on Friday, which would consist of employees only, would be 4 trips, while the Friday evening peak hour trips generated by the project would be 11. The trips generated on Saturday evening would be 10. The additional trips resulting from the project would increase traffic noise levels along Soda Canyon Road by approximately 1 dBA. Based on the average levels measured at LT-2, the noise levels at the nearby residences were estimated for existing plus project conditions. Since the noise level increase calculated from peak hour traffic volumes does not specify how many vehicles come at a time, a conservative worst-case approach was taken to calculate project-generated noise levels. The noise level increase of 1 dBA was applied to each of the metrics to represent worst-case scenario conditions. These results are summarized in Table 7. The traffic generated by the proposed would not increase noise at the nearby residences to levels exceeding the Napa County Limits.

TABLE 7 Estimated noise levels due to existing plus project-generated traffic for tours and tastings

		Noise Level, dBA			
		L_{50}	L_{25}	L_8	L_2
Daytime	Limit	50	55	60	65
	Residence 1	29	33	41	52
	Residence 2	37	41	49	60
	Residence 3	33	37	45	56
Nighttime	Limit	45	50	55	60
	Residence 1	28	30	33	42
	Residence 2	36	38	41	50
	Residence 3	32	34	37	46

While traffic volumes due to special events were not included in the traffic study, trips generated from these events can be estimated assuming an average of 2.5 people per vehicle. Under this assumption, approximately 10, 30, and 50 trips would be generated for each of the food and wine pairings, the wine club, and the larger auction-related events, respectively. These trip generations would result in noise level increases of 1, 2, and 3 dBA L_{dn}, respectively. Table 8 summarizes the expected noise levels due to project-generated traffic for each of the special events. The noise levels estimated at the nearby residences during special events would not exceed the County's standards.

TABLE 8 Estimated noise levels due to project-generated traffic for special events

		Noise Level, dBA			
		L_{50}	L_{25}	L_8	L_2
Food and Wine Pairing Events					
Daytime	Limit	50	55	60	65
	Residence 1	29	33	41	52
	Residence 2	37	41	49	60
	Residence 3	33	37	45	56
Nighttime	Limit	45	50	55	60
	Residence 1	28	30	33	42
	Residence 2	36	38	41	50
	Residence 3	32	34	37	46
Wine Club/Release Events					
Daytime	Limit	50	55	60	65
	Residence 1	30	34	42	53
	Residence 2	38	42	50	61
	Residence 3	34	38	46	57
Nighttime	Limit	45	50	55	60
	Residence 1	29	31	34	43
	Residence 2	37	39	42	51
	Residence 3	33	35	38	47
Larger Auction-Related Events					
Daytime	Limit	50	55	60	65
	Residence 1	31	35	43	54
	Residence 2	39	43	51	62
	Residence 3	35	39	47	58
Nighttime	Limit	45	50	55	60
	Residence 1	30	32	35	44
	Residence 2	38	40	43	52
	Residence 3	34	36	39	48

Driveway and Parking Lot Noise

Noise sources associated with the driveway and parking lot would include the sounds of vehicles accessing the parking area, engine starts, door slams, and voices. For the proposed project, parking for employees is located in proximity to the accessory use structures, which totals 28 spots, and near the existing viticulture structure, which is an additional 10 spots. For special events, parking would be along vineyard roads, as well as valet parking and/or shuttle bus service for off-site parking. Typically, the sound of a passing car at 15 mph, engine starts, and door slams range from 53 to 63 dBA at 50 feet. Based on the expected visitor and employee use, these activities are expected to occur for less than five minutes in an hour on a typical day, which corresponds to the L_8 threshold. Additionally, typical maximum noise levels from sources such as door slams, engine starts, idling of diesel powered vehicles, motorcycles, shouting, radios, etc. would occasionally generate noise levels in excess of 65 dBA L_{max} at 50 feet.

The distance from the employee parking lot to the nearby residences ranges from 530 to 670 feet. At these distances, the noise levels would be below 40 dBA, which would meet the L_8 daytime threshold of 60 dBA on typical days, and the maximum noise levels from intermittent parking lot noise would be below 45 dBA L_{max}, which would meet the 70 dBA L_{max} threshold. During special events, additional parking on the driveways would reduce the distance to each residence to between 300 and 440 feet. At these distances, the noise levels would be below 45 dBA, and the maximum instantaneous noise levels would be below 50 dBA L_{max}. Compared to the 60 dBA L_8 and the 70 dBA L_{max} daytime thresholds, respectively, the parking lot noise from the proposed project would not exceed the limits established in the Napa County Noise Ordinance.

Truck Traffic Noise

The majority of truck traffic on the project site is expected to primarily access the winery along the western boundary and conduct loading and unloading in the vicinity of the crush pad. Noise levels generated by truck traffic are dependent on the size and speed of trucks; typically, maximum noise levels generated by heavy-duty (i.e., semi-tractor trailer type) trucks would range from 70 dBA when traveling at constant speeds to 75 dBA when stopping/starting and maneuvering at a distance of 50 feet (15 meters). Medium (box type and delivery) trucks would typically have maximum levels ranging from 60 dBA when traveling at constant speeds to 65 dBA when stopping/starting and maneuvering at a distance of 50 feet. Truck operations are expected to occur during daytime hours only and on a basis of one to five minutes per hour, or less, since it is unlikely that more than one heavy truck would arrive and depart during any given hour. Thus, truck operations would fall in the L_2 and L_8 thresholds for one to five minutes of operations per hour. These limits are 65 and 60 dBA, respectively.

Residence 1 would be approximately 860 feet from the driveway and approximately 760 feet from the loading area. Residences 2 and 3 would be approximately 430 and 285 feet, respectively, from the driveway and approximately 530 and 520 feet, respectively, from the loading area. At these distances, noise levels expected at the nearby residences due to heavy-duty trucks traveling at constant speeds along the driveway would range from 51 to 59 dBA, while maneuvering in the loading area would cause levels ranging from 51 to 55 dBA at the nearby residences. Expected noise levels due to medium-duty trucks would range from 41 to 49 dBA while traveling at constant speeds and from 41 to 45 dBA during maneuvering. The expected noise levels would not exceed the County's L_2 threshold of 65 dBA or the County's L_8 threshold of 60 dBA at the nearby residences.

Project Mechanical Equipment

The project would include noise-generating mechanical equipment, such as an air-cooled condensing unit (portable chiller), and less significant sources of noise, such as an air-conditioning system or exhaust fans. The condensing unit would provide cooling during the fermentation process and to the barrel storage area. This unit would maintain the desired temperature and could operate over extended periods of time during the day or night. Since the fermentation process and storage area would be located within the wine cave for the proposed project, the nearby residences

would be well shielded from any project mechanical equipment. Therefore, this would not affect the ambient noise environment at the nearby residences.

Ventilation for the wine cave would be expected as part of the proposed project. The noise levels from the ventilation system would depend on the fans being used, the location of the fans within the ducts, the distance from the underground fans to the outlet portal, and the distance from the outlet portal to the nearby residences. While details regarding the type of fans and the location within the underground ventilation pipes were not provided at the time of this study, the location of the outlet portals would be on the north side of the cave. Fan noise levels could be as high as 77 to 85 dBA at 5 feet. Without knowing the location of the fans within the ventilation ducts, the noise levels at the outlet portals were calculated under worst-case scenario conditions, which assume the location to be 5 feet from the outlet portals. Under maximum conditions, it can be assumed that operation would be constant during the day and night, which would compare to the L_{50} standard. The distance from the nearest outlet portal to the nearby residences would range from 500 to 630 feet. At these distances, the noise levels would range from 43 to 45 dBA L_{50}. This meets the County's daytime L_{50} limit of 50 dBA and the nighttime limit of 45 dBA. Equipment noise levels would be even lower if the equipment is located in a more shielded location within the wine cave.

Seasonal Production-Related Noise

Production-related noise would occur during the crush season (mid-September to the end of October) and during bottling season (end of March through early September). Grapes would be harvested from the vineyard or transported from other nearby vineyards. For the proposed project, approximately 92% of the grapes would be grown on site, while the remaining 8% would be transported to the site using seven to eight trucks. For the grapes that are not processed on site, they would be transported to off-site facilities in Napa using 84 trucks. The crush pad would be located on the north side of the wine cave, adjacent to the employee parking lot. Typical noise levels generated during grape crushing activities would be about 63 dBA L_{eq} at 50 feet, assuming unshielded conditions. During the crush, discrete maximum noise events, such as the setting of empty bins, may reach 70 to 80 dBA L_{max} or L_2 at 50 feet from the center of operations. Noise levels generated by bottling activities would be 65 to 70 dBA L_{eq} at 50 feet, assuming unshielded conditions.

Crushing activities would be conducted at the outdoor, covered crush pad located on the north side of the wine cave. These activities would be conducted between 6:00 a.m. and 6:00 p.m. The distance from Residence 1, Residence 2, and Residence 3 to the crush pad would be 635, 520, and 550 feet, respectively. Assuming direct line-of-sight to the crush pad from each residence, noise levels resulting from crushing activities are estimated to range from 41 to 43 dBA L_{eq}. Such noise sources could occur for more than 30 minutes in any hour, which would correlate to the L_{50} criterion. The estimated noise levels due to crushing would be below the daytime noise level limits established by the County of 50 dBA L_{50}; however, they would exceed the average ambient noise levels shown in Table 6 during daytime hours. Intermittent maximum noise levels generated during crushing activities could be up to 60 dBA L_{max} at the nearby residences, which would be well below the County's maximum noise level limit of 70 dBA L_{max}.

Bottling would be conducted on site, most likely in the vicinity of the crush pad and truck loading zone. Bottling operations would be constant on an hourly basis during the bottling season, which would compare to the County's 50 dBA L_{50} limit during daytime hours. The distances to each nearby residence are assumed to be about the same as the crush pad distances. At these distances, noise levels due to bottling operations would range from 41 to 43 dBA L_{eq}, which meet the County's L_{50} limit.

Special Events

Special events would include up to six food and wine pairings per month with 12 to 24 attendees, up to four wine club/release events per year with a maximum attendance of 75 guests, and up to two larger auction-related events per year with a maximum attendance of 125 guests. These special events would not include weddings, concerts, or other sources of amplified sound. Special events would typically be held in the winery accessory structure located in northernmost section of the winery or in the wine cave. The main wine tasting and hospitality building would include an outdoor patio area on the ground floor and a covered terrace at the basement level. According to the site plan provided for the accessory building, these outdoor reception areas would be located on the north side of the building and would be partially shielded from the nearby residences by the proposed building and cave. The covered tasting patio located in the northernmost part of the building would have direct line-of-sight to Residence 1, with a distance of 540 feet. Residences 2 and 3 would have a direct line-of-sight to the uncovered tasting patio located on the western part of the building. The distance to these residences would range from 650 and 790 feet, respectively.

For small-to-moderate sized events, typical noise levels, as measured at a distance of 50 feet from the source, would be 67 dBA L_{50} for non-amplified (acoustic) music and 65 dBA L_{50} for raised conversation. 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 scenario, however, the speech and music would combine to be 69 dBA. Table 9 summarizes the estimated noise levels at each residence for the combination of non-amplified music and conversation occurring at events of up to 200 people. Since no event would occur beyond 10:00 p.m., the noise limits used for comparison are the County's daytime standards. The estimated noise levels are within the County's threshold for special events.

TABLE 9 Estimated noise levels for special events up to 200 people, assuming raised conversation and non-amplified music

Type of Level		Noise Level, dBA				
		L_{50}	**L_{25}**	**L_{8}**	**L_{2}**	**L_{max}**
Daytime	Limit	50	55	60	65	70
	Residence 1	48	49	51	53	55
	Residence 2	47	48	50	52	54
	Residence 3	45	46	48	50	52

Summary

Noise generated by the proposed project, which would include traffic noise, driveway and parking lot noise, mechanical equipment noise, seasonal production-related noise, and special events, would not cause levels to exceed Napa County's Noise Ordinance Standards at the nearby noise-sensitive residences. Therefore, no mitigation measures would be required for the proposed project.

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Please feel free to contact us with any questions on the analysis or if we can be of further assistance.

Sincerely,

Carrie J. Janello
Consultant
Illingworth & Rodkin, Inc.

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