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# Noise Study

Vida Valiente Winery Use Permit Application #P20-00079-UP
Planning Commission Hearing Date December 6, 2023

# *VIDA VALIENTE WINERY*
# *NOISE AND VIBRATION ASSESSMENT*

## *407 Crystal Springs Road*
## *Napa County, California*

**March 1, 2022**

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## Introduction

This report summarizes the assessment of noise and vibration impacts attributable to the proposed Vida Valiente Winery project with respect to the regulatory criteria established by the Napa County General Plan and Napa County Noise Ordinance. The report first describes the project and then summarizes existing noise levels in the project vicinity. The applicable regulatory criteria used in the assessment are described, followed by evaluations of project-generated noise levels. A brief discussion of the fundamentals of environmental noise and groundborne vibration is presented in Appendix A for those unfamiliar with acoustical terms or concepts. Appendix B contains figures that display the long-term noise data collected to establish existing noise levels at receptors in the project vicinity.

## Project Description

The proposed project is a new 40,000-gallon per year winery on a 16.93-acre parcel located at 407 Crystal Springs Road. The property is accessed from Crystal Springs Road, which intersects with both the Silverado Trail and Howell Mountain Road. Land uses in proximity to the subject parcel include a number of rural residential homes, vineyards, and both large and small family wineries.

The winery is stepped into the hillside on its northern side and consists of the three building elements: a production winery located at the west side of the winery development; an accessory/hospitality area at the east side; and a hospitality section bridging the two. The production area is linked to the production wine cave and the accessory structure is linked to the cave, as well. The mid-section hospitality area is linked to the two "anchor" structures by an outdoor walkway, and consists of an elliptical glass pavilion. A circular portion of the winery access road fronts the structures.

The winery includes two outdoor work areas/crush pads, for a total of 2,963 square feet (sf) of covered outdoor area. The winery includes a 2,305 sf uncovered outdoor terrace that can accommodate some of the outdoor venue tastings or events.

The wine cave is a total of 13,056 sf with a small accessory space defined for in-cave tastings and marketing events.

## Existing Noise Environment

Illingworth & Rodkin, Inc. (I&R) quantified the existing noise environment in the project vicinity through a noise monitoring survey between Friday, December 3, 2021 and Wednesday, December 8, 2021. One long-term noise measurement (LT-1) was made to quantify the daily trend in noise levels in the project vicinity, and three short-term noise measurement (ST-1, ST-2, and ST-3) were made to quantify ambient noise levels and categorize sources of noise at locations representative residential receptors in the project vicinity. Noise measurements were made using Larson-Davis Laboratories precision Type 1 sound level meters fitted with ½-inch pre-polarized condenser microphones and windscreens. The sound level meters were calibrated before and after installation with an LDL acoustical calibrator. Weather conditions were generally good for the purposes of noise monitoring.

Figure 1 is aerial image showing the noise monitoring locations selected during the noise survey and the nearest residential receptor locations analyzed for potential noise impacts.

Long-term noise measurement LT-1 was made along the north boundary of the site, roughly 65 feet south of Crystal Springs Road. Noise levels measured at this location were primarily the result of intermittent, local traffic and were representative of the noise environment experienced at nearby residences in the project vicinity. Appendix B contains graphical summaries of the noise data collected at Site LT-1. A review of these data indicates that hourly equivalent noise levels ($L_{eq}$) ranged from 29 to 50 dBA $L_{eq}$ during the proposed hours of operation (6:00 am to 6:00 pm). The calculated day-night average noise level ranged from 40 to 45 dBA $L_{dn}$.

Short-term noise measurement ST-1 quantified ambient noise levels at the westernmost property line of the project site on the morning of December 3, 2021 in the vicinity of the residential properties located northwest of the project site (R1 and R2). Noise sources documented at this location included intermittent vehicle traffic along Crystal Springs Road (50 to 60 dBA) and sounds of nature. The average equivalent noise level ranged from 40 to 43 dBA $L_{eq(10\text{-}min)}$.

Short-term noise measurement ST-2 was conducted near Crystal Springs Road, east of the proposed winery. This location was chosen to represent the noise environment at nearby residences (R4 and R5). Noise sources documented at this location included intermitted traffic (56 to 66 dBA) and wildlife (38 to 48 dBA). The average equivalent noise level was 55 dBA $L_{eq(10\text{-}min)}$ during an interval when five vehicles passed the measurement site and 42 dBA $L_{eq(10\text{-}min)}$ during an interval without vehicle passby.

Short-term noise measurement ST-3 quantified ambient noise levels at the easternmost property line of the project site. This site was selected to establish typical daytime noise levels at R6, which represents the nearest residential property to the southeast. Similar to the prior measurements, noise sources documented at this location included intermittent vehicle traffic along Crystal Springs Road (42 to 48 dBA), distant construction (38 to 44 dBA) and sounds of nature. The average equivalent noise level ranged from 39 to 41 dBA $L_{eq(10\text{-}min)}$.

**FIGURE 1 Aerial Image Showing Project Site, Noise Monitoring Locations, and Nearby Noise-Sensitive Receptors**


Source: Google Earth, December 2021.

## Regulatory Criteria

*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-37:** The County shall seek to limit excessive noise impacts of recreational uses—including motorboats, shooting ranges, motorcycles, and other noise-producing equipment— through the enforcement of applicable laws (such as requirements for mufflers) and limits on the location and/or extent of such uses.
>
> **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.

**Policy CC-49:** Consistent with the County's Noise Ordinance, ensure that reasonable measures are taken such that temporary and intermittent noise associated with construction and other activities does not become intolerable to those in the area. Construction hours shall be limited per the requirements of the Noise Ordinance. Maximum acceptable noise limits at the sensitive receptor are defined in Policies CC-35, CC-36, and CC-37.

*Napa County Noise Ordinance*

The Napa County Noise Ordinance Sections 8.16.060 and 8.17.070 provide maximum permissible dwelling interior sound levels and maximum permissible exterior levels, respectively.

**Section 8.16.060 Interior Noise Standards**

A. Maximum Permissible Dwelling Interior Sound Levels. The interior noise standards for residential dwelling units generated by noise sources outside the dwelling unit, as presented in Table 8.16.060 shall apply, unless otherwise specifically indicated, within all such dwelling units.

**TABLE 8.16.060 Interior Noise Limits**

| Noise Zone | Type of Land Use | Time Interval | Allowable Interior Noise Level (dBA) |
|---|---|---|---|
| All | Residential | 10:00 p.m. – 7:00 a.m. | 55 dBA |
| | | 7:00 a.m. – 10:00 p.m. | 60 dBA |

B. No person shall operate or cause to be operated within a dwelling unit any source of sound or allow the creation of any noise, which causes the noise level, when measured inside a neighboring receiving dwelling unit, to exceed:

1. The noise standard as specified in Table 8.16.060 above for a cumulative period of more than five minutes in any hour; or

2. The noise standard plus five dB for a cumulative period of more than one minute in any hour; or

3. The noise standard plus ten dB or the maximum measured ambient, for any period of time.

**Section 8.16.070 Exterior Noise Limits**

A. Maximum Permissible Sound Levels by Receiving Land Use.

1. The noise standard for the various categories of land use identified by the noise control officer, as presented in Tables 8.16.060 and 8.16.070 shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

2. 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).

3. If the measured ambient noise level differs from that permissible within any of the first four noise limit categories above, the allowable noise exposure standard shall be the ambient noise level.

4. If the measurement location is on a boundary between two different zones, the sound level limit applicable to the quieter noise zone shall apply.

5. Wherever possible, the ambient noise level shall be measured at the same location along the property line utilized in subsection (A)(2) with the alleged offending noise

source inoperative. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period sufficient to measure the ambient noise level, the ambient noise level may be determined by traveling away from the noise source to a point where a steady-state decibel reading is achieved. If this test is not possible, the noise level measured while the source is in operation shall be compared directly to the noise level standards.

B. Correction for Character of Sound. 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.

**TABLE 8.16.070 Exterior Noise Limits (Levels not to be exceeded more than 30 minutes in any hour)**

| | | Noise Level (dBA) Noise Zone Classification[1] | | |
|---|---|---|---|---|
| **Receiving Land Use Category** | **Time Period** | **Rural** | **Suburban** | **Urban** |
| Residential Single and Double | 10:00 p.m. – 7:00 a.m. | 45 dBA | 45 dBA | 50 dBA |
| | 7:00 a.m. – 10:00 p.m. | 50 dBA | 55 dBA | 60 dBA |
| Residential Multiple and Country | 10:00 p.m. – 7:00 a.m. | 45 dBA | 50 dBA | 55 dBA |
| | 7:00 a.m. – 10:00 p.m. | 50 dBA | 55 dBA | 60 dBA |
| Commercial | 10:00 p.m. – 7:00 a.m. | 60 dBA | | |
| | 7:00 a.m. – 10:00 p.m. | 65 dBA | | |
| Industrial, including wineries | Anytime | 75 dBA | | |

[1] The classification of different areas of the county in terms of environmental noise zones shall be determined by the NCO, based upon assessment of county noise survey data. Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction within the zone.

**Section 8.16.080 Specific Types of Noise Prohibited**

A. Noise Disturbance Prohibited. No person shall unnecessarily make, continue or cause to be made or continued any noise disturbance.

B. Specific Prohibitions. The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:

2. Construction or Demolition.

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of seven p.m. and seven a.m., such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the appropriate authority. This subsection

shall not apply to the use of domestic power tools, as specified in subsection (B)(3) of this section.

b. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule:

**TABLE 8.16.080 Noise Limits for Construction Activities**

| | Residential | Commercial | Industrial |
|---|---|---|---|
| Daily: 7:00 a.m. to 7:00 p.m. | 75 dBA | 80 dBA | 85 dBA |
| Daily 7:00 p.m. to 7:00 a.m. | 60 dBA | 65 dBA | 70 dBA |

3. Domestic Power Tools – Machinery.

   a. Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, or similar tool between ten p.m. and seven a.m. so as to create a noise disturbance across a residential or commercial real property line;

   b. Any motor, machinery or pump, such as swimming pool equipment, etc., shall be sufficiently enclosed or muffled and maintained so as not to create a noise disturbance in accordance with subsection (A) of Section 8.16.060 or subsection (A) of 8.16.070.

4. Loading and Unloading. Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of ten p.m. and six a.m. in such a manner as to cause a noise disturbance across a residential real property line or at any time to violate the provisions of subsection (A) of Section 8.16.060 or subsection (A) of Section 8.16.070.

5. Loudspeakers, Amplified Sound. Using or operating for any purpose any loudspeaker, loudspeaker system or similar device, such that the sound therefrom creates a noise disturbance, or at any time violates the provisions of subsection (A) of Section 8.16.060 or subsection (A) of Section 8.16.070, except for any activity for which a variance has been issued by the NCO.

6. Powered Motor Vehicles. Operating or permitting the operation of powered model vehicles so as to create a noise disturbance across a residential or commercial real property line or at any time to violate the provisions of subsection (A) of Section 8.16.060 or subsection (A) of Section 8.16.070.

7. Radios, Television Sets, Musical Instruments and Similar Devices. Operating, playing or permitting the operation or playing of any radio, television set, phonograph, drum, musical instrument, or similar device which produces or reproduces sound in such a manner as to create a noise disturbance, or at any time to violate the provisions of

subsection (A) of Section 8.16.060 or subsection (A) of Section 8.16.070, except for activities for which a variance has been issued by the NCO.

**Section 8.16.090 Exemptions to Noise Regulations**

D. Exemptions from Exterior Noise Standards. The provisions of Table 8.16.070 shall not apply to activities covered by the following sections:

1. Street sales;
2. Animals;
3. Construction/demolition;
4. Domestic power tools, machinery;
5. Tampering.

**Noise Impact Analysis**

Land uses that surround the project site are predominantly agricultural (wineries and vineyards) but also include rural residences. The residential use areas of these nearby agricultural properties are considered the most sensitive to noise.

The construction of the project would increase noise levels in the site vicinity over a temporary basis. Permanent noise producing activities associated with the project include vehicles accessing the winery, production equipment and activities, and marketing events. Each of these noise producing activities are described and evaluated below:

Temporary Construction Activities

The project would result in a temporary increase in noise levels during construction of the winery and cave over an approximate 18 month period. All construction activities would be conducted in compliance with the Napa County Noise Ordinance (Napa County Code Chapter 8.16). As such, construction activities would be limited to daylight hours (between 7 am-7 pm on weekdays), and would be implemented using properly muffled vehicles and equipment with backup alarms adjusted to the lowest allowable levels.

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), if the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Construction activities would include demolition, cave boring, excavation, site preparation, grading, building construction, paving, and architectural coating. During each stage of construction, there would be a different mix of equipment operating, and noise levels would vary

by stage and vary within stages, based on the amount of equipment in operation and the location at which the equipment is operating. The hauling of excavated materials and construction materials would generate truck trips on local roadways as well.

Construction activities can generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. Typical hourly average construction-generated noise levels would be expected to range from 77 to 89 dBA $L_{eq}$ measured at a distance of 50 feet from the center of the site during busy construction periods when all pertinent equipment is present at the site (Table 1, Column 3). When the minimum required equipment is present at the site, noise levels are typically about 71 to 83 dBA $L_{eq}$ at a distance of 50 feet from the center of the site. Maximum instantaneous noise levels produced by individual pieces of construction equipment proposed by the project would typically range from about 70 to 90 dBA $L_{max}$ at 50 feet (Table 2). Construction noise levels attenuate at a rate of about 6 dBA per doubling of distance between the noise source and receptor.

Table 3 summarizes the anticipated range of construction noise levels at receptors in the project vicinity. The calculations assumed that the center of the proposed construction area would be approximately 600 to 700 feet from nearest residences to the northwest (R1 and R2), northeast (R3 and R4), east (R5), and southeast (R6). Average noise levels produced by construction activities would typically range from 48 to 67 dBA $L_{eq}$, and maximum instantaneous noise levels would be expected to range from 47 to 68 dBA $L_{max}$. Based on the results of the above calculations, noise levels produced by project construction activities would not exceed 75 dBA at residential areas in the project vicinity.

**TABLE 1 Typical Ranges of Construction Noise Levels at 50 Feet, $L_{eq}$ (dBA)**

| | **Domestic Housing** | | **Office Building, Hotel, Hospital, School, Public Works** | | **Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station** | | **Public Works Roads & Highways, Sewers, and Trenches** | |
|---|---|---|---|---|---|---|---|---|
| | **I** | **II** | **I** | **II** | **I** | **II** | **I** | **II** |
| Ground Clearing | 83 | 83 | 84 | 84 | 84 | 83 | 84 | 84 |
| Excavation | 88 | 75 | 89 | 79 | 89 | 71 | 88 | 78 |
| Foundations | 81 | 81 | 78 | 78 | 77 | 77 | 88 | 88 |
| Erection | 81 | 65 | 87 | 75 | 84 | 72 | 79 | 78 |
| Finishing | 88 | 72 | 89 | 75 | 89 | 74 | 84 | 84 |

**I** - All pertinent equipment present at site.
**II** - Minimum required equipment present at site.

Source: US E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

**TABLE 2 Construction Equipment 50-Foot Noise Emission Limits**

| Equipment Category | $L_{max}$ Level (dBA)[1,2] | Impact/Continuous |
|---|---|---|
| Arc Welder | 73 | Continuous |
| Auger Drill Rig | 85 | Continuous |
| Backhoe | 80 | Continuous |
| Bar Bender | 80 | Continuous |
| Boring Jack Power Unit | 80 | Continuous |
| Chain Saw | 85 | Continuous |
| Compressor[3] | 70 | Continuous |
| Compressor (other) | 80 | Continuous |
| Concrete Mixer | 85 | Continuous |
| Concrete Pump | 82 | Continuous |
| Concrete Saw | 90 | Continuous |
| Concrete Vibrator | 80 | Continuous |
| Crane | 85 | Continuous |
| Dozer | 85 | Continuous |
| Excavator | 85 | Continuous |
| Front End Loader | 80 | Continuous |
| Generator | 82 | Continuous |
| Generator (25 KVA or less) | 70 | Continuous |
| Gradall | 85 | Continuous |
| Grader | 85 | Continuous |
| Grinder Saw | 85 | Continuous |
| Horizontal Boring Hydro Jack | 80 | Continuous |
| Hydra Break Ram | 90 | Impact |
| Impact Pile Driver | 105 | Impact |
| Insitu Soil Sampling Rig | 84 | Continuous |
| Jackhammer | 85 | Impact |
| Mounted Impact Hammer (hoe ram) | 90 | Impact |
| Paver | 85 | Continuous |
| Pneumatic Tools | 85 | Continuous |
| Pumps | 77 | Continuous |
| Rock Drill | 85 | Continuous |
| Scraper | 85 | Continuous |
| Slurry Trenching Machine | 82 | Continuous |
| Soil Mix Drill Rig | 80 | Continuous |
| Street Sweeper | 80 | Continuous |
| Tractor | 84 | Continuous |
| Truck (dump, delivery) | 84 | Continuous |
| Vacuum Excavator Truck (vac-truck) | 85 | Continuous |
| Vibratory Compactor | 80 | Continuous |
| Vibratory Pile Driver | 95 | Continuous |
| All other equipment with engines larger than 5 HP | 85 | Continuous |

Notes:

[1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3] Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

**TABLE 3 Calculated Range of Construction Noise Levels at Nearest Receptors**

| Receptors | Distance (feet) | Attenuation with Distance from Noise Source (dBA) | Maximum Noise Level Range (dBA, $L_{eq}$) | Average Noise Level Range (dBA, $L_{eq}$) |
|---|---|---|---|---|
| R1 – Northwest<br>R4 – Northeast<br>R5 – East<br>R6 – Southeast | 700 | 23 | 47-67 | 48-66 |
| R2 – Northwest<br>R3 – Northeast | 600 | 22 | 48-68 | 49-67 |

Vehicle Traffic and Parking Lot Activities

The project site is located on the west side of Crystal Springs Road about a mile north of Sanitarium Road. Two Winery Driveway connections will be provided to Crystal Springs Road, one near the middle and one near the south end of the project frontage. The North (Main) Driveway will provide two-way traffic flow while the South Driveway will only provide outbound flow for trucks.

The project's traffic impact study, prepared by Crane Transportation Group and dated September 7, 2021, analyzed the potential traffic impacts of the project during the PM peak hour on six intersections: the Silverado Trail intersections with Crystal Springs Road and Deer Park Road, the Sanitarium Road intersections with Deer Park Road and Crystal Springs Road, and the Crystal Springs Road intersections with North Fork Crystal Springs Road and the proposed Winery Main Driveway. According to the study, the proposed project's daily traffic volumes and peak hour trips have been calculated to be 48 vehicle trips with 10 trips (2-Way Trips) occurring during the PM peak period on Friday, and 37 vehicle trips with 7 trips (2-Way Trips) occurring during the PM peak period on Saturday. Traffic noise levels were calculated at a distance of 50 feet from the centerline of Crystal Springs Road to represent the residential outdoor use area at R6 using the Federal Highway Administration's Traffic Noise Model (TNM). The calculated hourly average noise level attributable to project generated traffic is 42 dBA $L_{eq}$ at 50 feet assuming an average travel speed of 25 mph along Crystal Springs Road.

Project generated traffic noise levels occurring during the PM peak period on a Friday or Saturday during harvest would fall within the range of existing ambient daytime noise levels in the area, which typically ranged from 31 to 50 dBA $L_{eq}$ (as measured at LT-1), and from 39 to 43 dBA $L_{eq}$ (as measured at ST-1, ST-2, and ST-3). The relatively low traffic volumes associated with the project on a daily basis, or on occasion during marketing events, would not substantially increase ambient hourly average or daily average noise levels in the area given the infrequency of vehicle trips to and from the project site. Similarly, this relatively low volume of vehicle traffic would not substantially contribute to ambient traffic noise levels along roadways with higher volumes of traffic such as Sanitarium Road, Deer Park Road, or Silverado Trail.

A total of 11 parking spaces will be provided for guests and employees. Parking lot noise levels would be produced by vehicle circulation, engine starts, and door slams, which typically produce noise levels that range from 53 dBA to 63 dBA $L_{max}$ at 50 feet. Maximum instantaneous noise levels generated by medium trucks (box type and delivery) would be expected to range from 60 to 65 dBA $L_{max}$ when traveling at constant speeds to 65 to 70 dBA $L_{max}$ when stopping/starting and

maneuvering at a distance of 50 feet. Such noise levels would be about 19 dBA less at a distance of 425 feet, which represents the minimum separation distance from the small parking lot to the nearest residential receptor (R2) to the northwest. Maximum instantaneous noise levels due to on-site parking activities would range from 34 to 44 dBA $L_{max}$ at the nearest residence northwest of the parking lot and would be well below the daytime maximum instantaneous noise limit of 70 dBA $L_{max}$ and typical ambient maximum instantaneous noise levels in the area (51 to 57 dBA $L_{max}$ as measured at ST-1, ST-2, and ST-3). Parking lot noise levels would be less at other receptors in the project vicinity due to increased distance from the noise source.

Production Activities

Winery and seasonal production operations would generally occur between the hours of 6:00 am and 6:00 pm, with the exception of infrequent bottling activities, which would occur during the day time period between the hours of 7:00 am and 6:00 pm. Winery operations produce the following type and range of noise levels at nearby receptors:

*Mechanical Equipment*

Mechanical equipment associated with the project would generally be located within small rooms (111 to 384 sf) in the winery, hospitality, and tasting buildings. Other equipment of note will include an electric fire pump and other water processing equipment within the cave. Air compressors and chillers necessary to cool fermentation tanks will also be located inside a mechanical part of the cave. A generator is planned outside the building at a location to be determined, but operations would be infrequent or during emergencies.

Mechanical equipment (e.g., refrigeration equipment required for production) are conservatively assumed to operate under constant conditions day and night. Though the model, type, and capacities of the mechanical equipment for the winery are not specified, field measurements of such equipment show that sound levels can reach 60 dBA $L_{50}$ at 50 feet. Considering that the mechanical equipment would be located a minimum of 480 feet from the nearest residential outdoor use areas, the sound pressure level resulting from full-load operation is calculated to be 40 dBA $L_{50}$ or less, which would not exceed the 50 dBA $L_{50}$ daytime noise limit or 45 dBA $L_{50}$ nighttime noise limit established by Napa County. Other receptors in the project vicinity would be further from the mechanical equipment, and therefore, exposed to lower levels of noise.

*Maintenance and Forklift Operations*

Maintenance and forklift operations would 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, $L_{25}$ noise levels from these operations may reach 67 dBA at 50 feet.

Considering that maintenance and forklift operations would be located a minimum of 480 feet from the nearest residential outdoor use area (R2), the sound pressure level resulting from these activities is calculated to be 47 dBA $L_{25}$ or less, which would not exceed the 55 dBA $L_{25}$ daytime noise limit or the 50 dBA $L_{25}$ nighttime noise limit. Other receptors in the project vicinity would

be further from the maintenance and forklift operations, and therefore, exposed to lower levels of noise.

*Seasonal Crush Activities*

Crush activities typically occur for a period of about six to eight weeks per year; however, such activities would not occur on a daily basis during this timeframe. Crush related activities are expected to primarily occur at indoor crush pads within the winery building and at the covered outdoor work area on the northwest end of the building. Grapes would be harvested from vineyards on and off-site for processing. Trucks would access the covered work area on the northwest end of the winery building via the new driveway, and grape bins would be unloaded with a forklift and moved indoors. All grapes would be crushed and pressed indoors and the juice would be pumped into fermentation tanks located within the production caves.

The majority of the noise sources associated with crush activities would primarily 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, producing average noise levels of 64 dBA $L_{50}$ and discrete maximum noise events of 70 to 80 dBA $L_{max}$ at 50 feet from the center of operations assuming unshielded conditions.

Such activities would occur at least 480 feet from the closest portion of the residential outdoor use area of R2, and other receptors in the project vicinity would be further from the bottling truck and partially or fully shielded by the intervening winery building. At the closest residential outdoor use area, crush noise levels are calculated to be 44 dBA $L_{50}$ or less, and would not exceed the 50 dBA $L_{50}$ daytime noise limit or 45 dBA $L_{50}$ nighttime noise limit. Noise levels produced by discrete maximum noise events would range from 50 to 70 dBA $L_{max}$ at 480 feet (R2) assuming unshielded conditions, which would be less than or equal to the 70 dBA $L_{max}$ daytime noise limit and potentially exceed the 65 dBA $L_{max}$ nighttime noise limit. Other receptors in the project vicinity would be further from the crushing activities and partially or fully shielded by the intervening winery building, and therefore, exposed to lower level of noise.

**Mitigation Measure 1**

- Prohibit crush activities that produce the highest noise levels (e.g., truck circulation and grape bin power washing) during the 6:00 am hour.

*Bottling Activities*

Bottling would occur during the daytime only on a few days in May or June and again in January. A mobile bottling truck would be utilized and at the covered outdoor work area. The bottling truck would back in as close to the main winery production door as possible, and the entire bottling process happens inside the truck. Bottling produces noise levels that are fairly continuous over an hourly basis, and based on sound level measurements of mobile (truck based) and fixed bottling lines at other wineries, bottling operations would be expected to produce sound levels of approximately 67 dBA $L_{50}$ at 50 feet. Bottling would occur approximately 480 feet from the closest portion of the residential outdoor use area of R2. At the closest residential outdoor use area, bottling noise levels are calculated to be 47 dBA $L_{50}$ or less, and would not exceed the 50 dBA $L_{50}$

noise limit. Other receptors in the project vicinity would be further from the bottling truck and partially or fully shielded by the intervening winery building, thus resulting in lower sound levels.

Tastings and Marketing Events

Wineries typically conduct daily, by-appointment only tours and tastings and promotional events exclusively oriented to the promotion of wine. These may include events such as special tastings, food and wine pairing events, wine release and wine club events, and auction-related wine promotion events. The project proposes a maximum of 28 persons per day for private tours/tastings, or a maximum of 120 persons in any given week. Evening marketing events will commence no earlier than 6:00 pm and will be concluded, including cleanup, by 10:00 pm. As is standard for wineries in Napa County, there will be no outdoor amplified music associated with winery marketing events. The winery applicant proposes the following:

- Wine and Food Pairings: A maximum of two (2) per month, with a maximum of 24 persons attending any single event.

- Wine Release/Wine Club Events: A maximum of three (3) events per year, with up to 60 persons attending any single event.

- Larger Auction-related Events: One event per year with up to 125 persons attending.

Table 4 lists typical noise levels generated by small to moderate sized winery events at a distance of 50 feet from the source. The cumulative duration of noise from these fairly continuous sounds attributable to marketing events would be more than 30 minutes in any hour, therefore, the $L_{50}$ would be the applicable regulatory threshold, and the maximum source noise level would be 67 dBA $L_{50}$ at a distance of 50 feet assuming free-field conditions.

**TABLE 4 Typical Noise Source Levels for Events (A-Weighted $L_{50}$ Levels)**

| Event or Activity | Typical Noise Level at 50 feet |
|---|---|
| Raised Conversation | 64 dBA |
| Winetasting/Dinner with Background Music | 57 dBA |

A credible worst-case analysis assumed that events would occur outdoors at the tasting room terrace. Outdoor amplified music is prohibited, so the primary noise source associated with the event would be raised conversations. The acoustic center of the noise produced by marketing events outdoors on the tasting room terrace would be 580 feet from the residence R4, 480 feet from the residence R5, and 440 feet from the residence R6. Receptors R1 to R3 would be shielded by the intervening tasting room building and located approximately 700 feet or more from the tasting room terrace. The predicted noise level from marketing events would be 43 to 45 dBA $L_{50}$ at the nearest, unshielded residential areas of R4, R5, and R6, which would not exceed the daytime noise level threshold of 45 dBA $L_{50}$ (corrected for the character of sound). Noise levels produced by wine and food pairing events or daily tastings would reach 36 to 38 dBA $L_{50}$ at the nearest residences (R4, R5, and R6) and would also remain below the daytime noise level threshold of 45 dBA $L_{50}$. There would be no prohibitions on events held inside the building, or within the wine cave, provided that doors and windows remain closed.

**CEQA Initial Study Checklist Questions**

The California Environmental Quality Act (CEQA) includes qualitative guidelines for determining the significance of environmental noise impacts. The CEQA Initial Study checklist questions are addressed below:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

*The project would not result in a substantial temporary increase in noise levels during construction of the winery and its infrastructure. All construction activities would be conducted in compliance with the Napa County Noise Ordinance (Napa County Code Chapter 8.16) and would not exceed the 75 dBA construction noise limit at affected residential properties.* ***Less-than-Significant Impact.***

*The project would not result in a substantial permanent increase in noise levels during operation of the winery with the implementation of Mitigation Measure 1. Noise levels produced by vehicles accessing the winery, production equipment and activities, and marketing events would comply with the Napa County noise limits.* ***Less-than-Significant Impact with Mitigation.***

(b) Generation of excessive groundborne vibration or groundborne noise levels?

*Construction would occur more than 200 feet from the nearest residences and pile driving is not proposed as a method of construction. At a distance of 200 feet, groundborne vibration from construction is anticipated to generate vibration levels no greater than 0.02 in/sec PPV. These vibration levels would be well below the conservative 0.3 in/sec PPV vibration limit recommended by the California Department of Transportation for buildings that are found to be structurally sound but where structural damage is a major concern. In addition, such low levels of vibration would not be perceptible by persons at rest.* ***No Impact****.*

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels?

*The winery is neither within the boundaries of an airport land use compatibility planning area nor within two miles of any public or private airport or airstrip. The proposed project would not expose people to excessive noise levels associated with air traffic.* ***No Impact****.*

**Summary of Results**

In summary, the project would not result in a substantial temporary increase in noise levels or produce excessive groundborne vibration levels during construction. Project operations were found to comply with the applicable Napa County noise limits, and no substantial permanent increase in noise levels was identified. The winery is located in a compatible noise environment

and the proposed project would not expose people to excessive noise levels associated with air traffic.

# Appendix A – Noise and Vibration Fundamentals

**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 A1.

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 A2. 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 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) 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.

## 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 noises 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. Typical structural attenuation is 12 to 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 to 62 dBA $L_{dn}$ with open windows and 65 to 70 dBA $L_{dn}$ with standard construction if the windows are closed.

*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 50 dBA $L_{dn}$. At a $L_{dn}$ of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the $L_{dn}$ increases to 70 dBA, the percentage of the population highly annoyed increases to about 25 to 30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a $L_{dn}$ of 60 to 70 dBA. Between a $L_{dn}$ of 70 to 80 dBA, each decibel increase, increases by about 3 percent, the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the $L_{dn}$ is 60 dBA, approximately 30 to 35 percent of the population is believed to be highly annoyed.

**TABLE A1 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 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 measured in the night between 10:00 pm and 7:00 am. |
| 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 A2 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.

**Fundamentals of Groundborne Vibration**

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table A3 displays the reactions of people and the effects on buildings that continuous vibration levels produce. The guidelines in Table A3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table A3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table A3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

**TABLE A3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels**

| Velocity Level, PPV (in/sec) | Human Reaction | Effect on Buildings |
|---|---|---|
| 0.01 | Barely perceptible | No effect |
| 0.04 | Distinctly perceptible | Vibration unlikely to cause damage of any type to any structure |
| 0.08 | Distinctly perceptible to strongly perceptible | Recommended upper level of the vibration to which ruins and ancient monuments should be subjected |
| 0.1 | Strongly perceptible | Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings |
| 0.25 | Strongly perceptible to severe | Threshold at which there is a risk of damage to historic and some old buildings. |
| 0.3 | Strongly perceptible to severe | Threshold at which there is a risk of damage to older residential structures |
| 0.5 | Severe - Vibrations considered unpleasant | Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures |

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

# Appendix B – Long-Term Noise Data

**Noise Levels at LT-1**
**~ 65' Southwest of the Centerline of Crystal Springs Road**
**Friday, December 3, 2020**

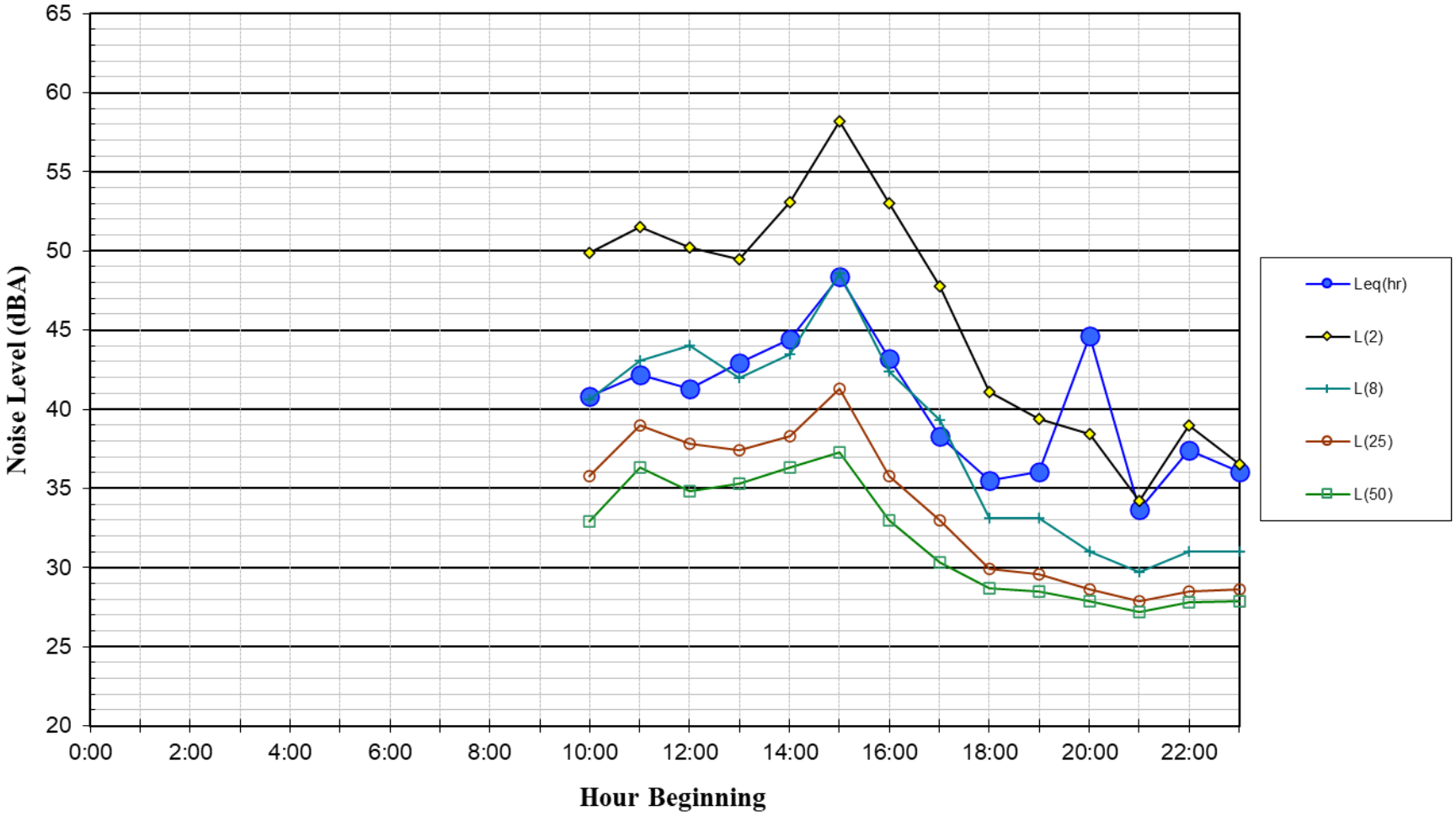
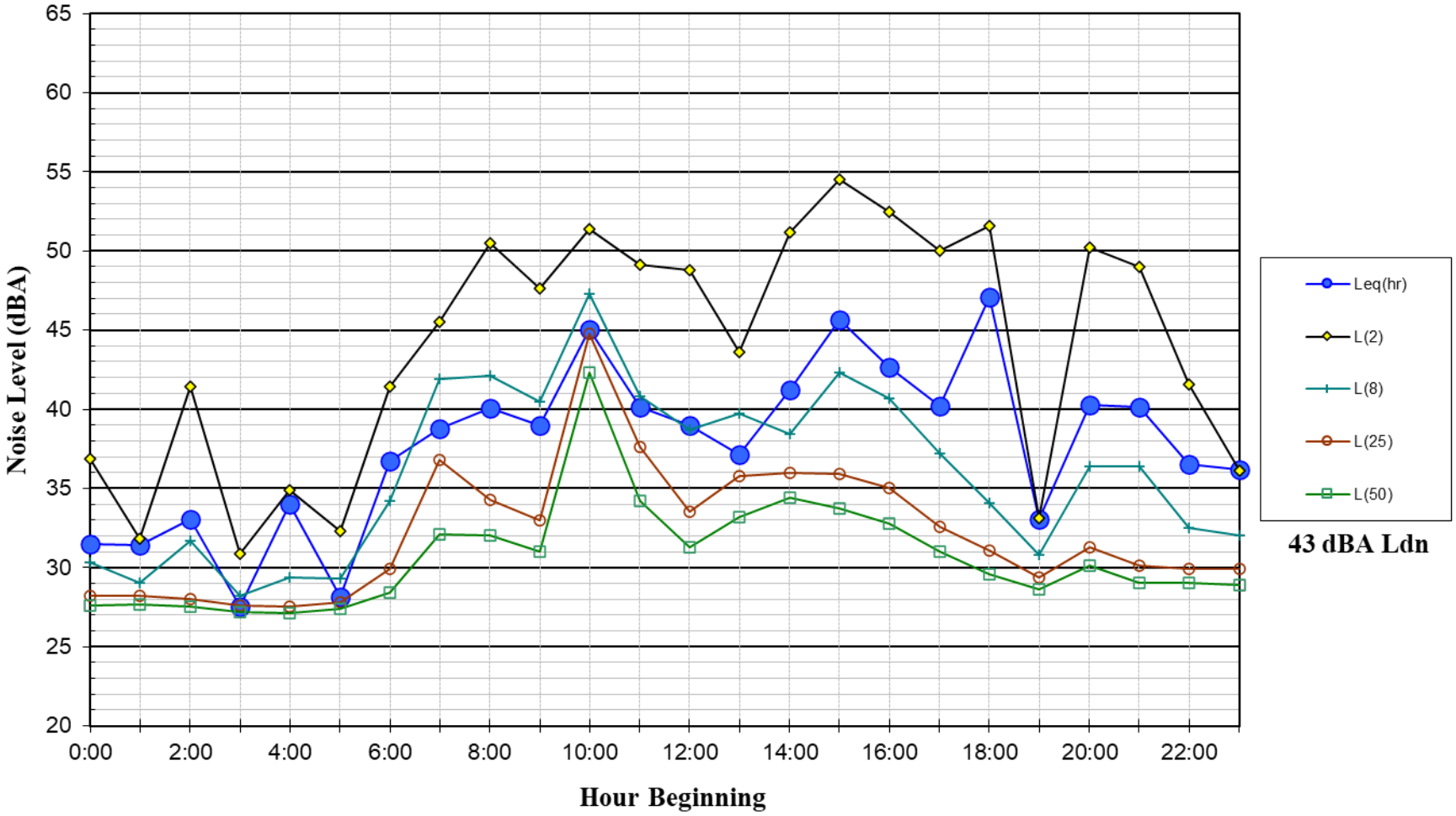



**Figure 2**

**Noise Levels at LT-1**
**~ 65' Southwest of the Centerline of Crystal Springs Road**
**Saturday, December 4, 2020**




**43 dBA Ldn**

**Figure 3**

**Noise Levels at LT-1**
**~ 65' Southwest of the Centerline of Crystal Springs Road**
**Sunday, December 5, 2020**

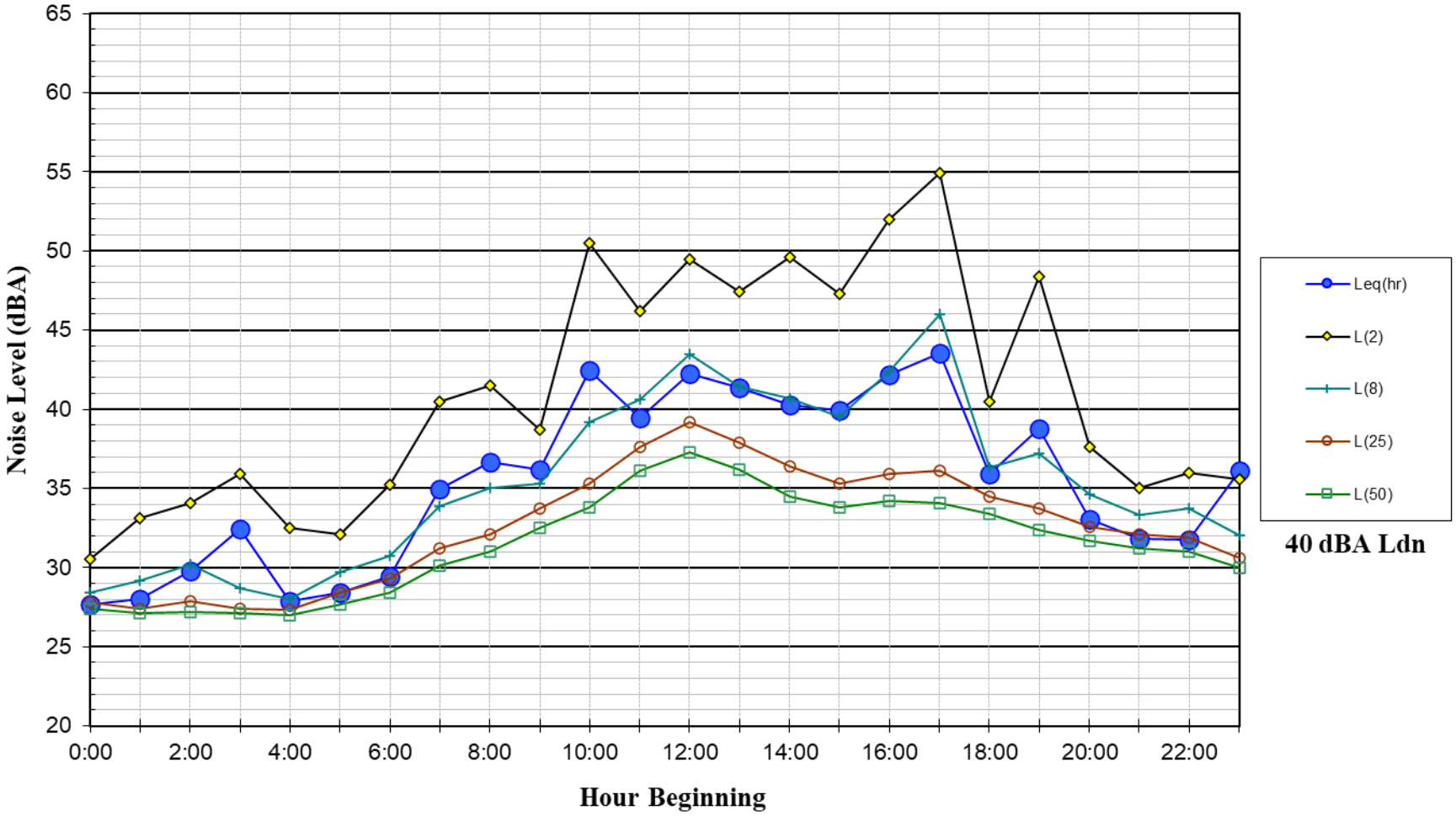
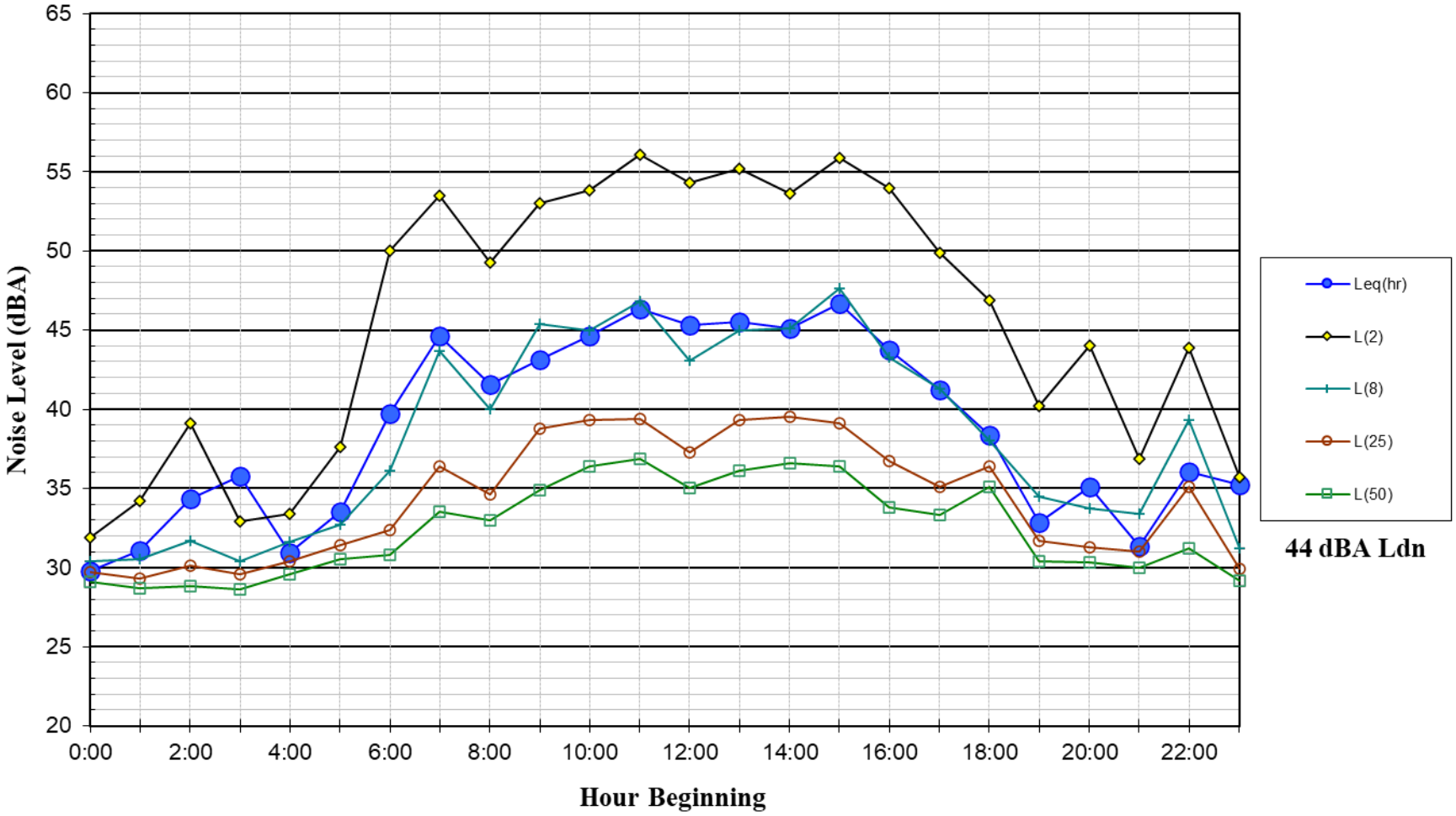



**Figure 4**

**Noise Levels at LT-1**
**~ 65' Southwest of the Centerline of Crystal Springs Road**
**Monday, December 6, 2020**




**44 dBA Ldn**

**Figure 5**

**Noise Levels at LT-1**
**~ 65' Southwest of the Centerline of Crystal Springs Road**
**Tuesday, December 7, 2020**

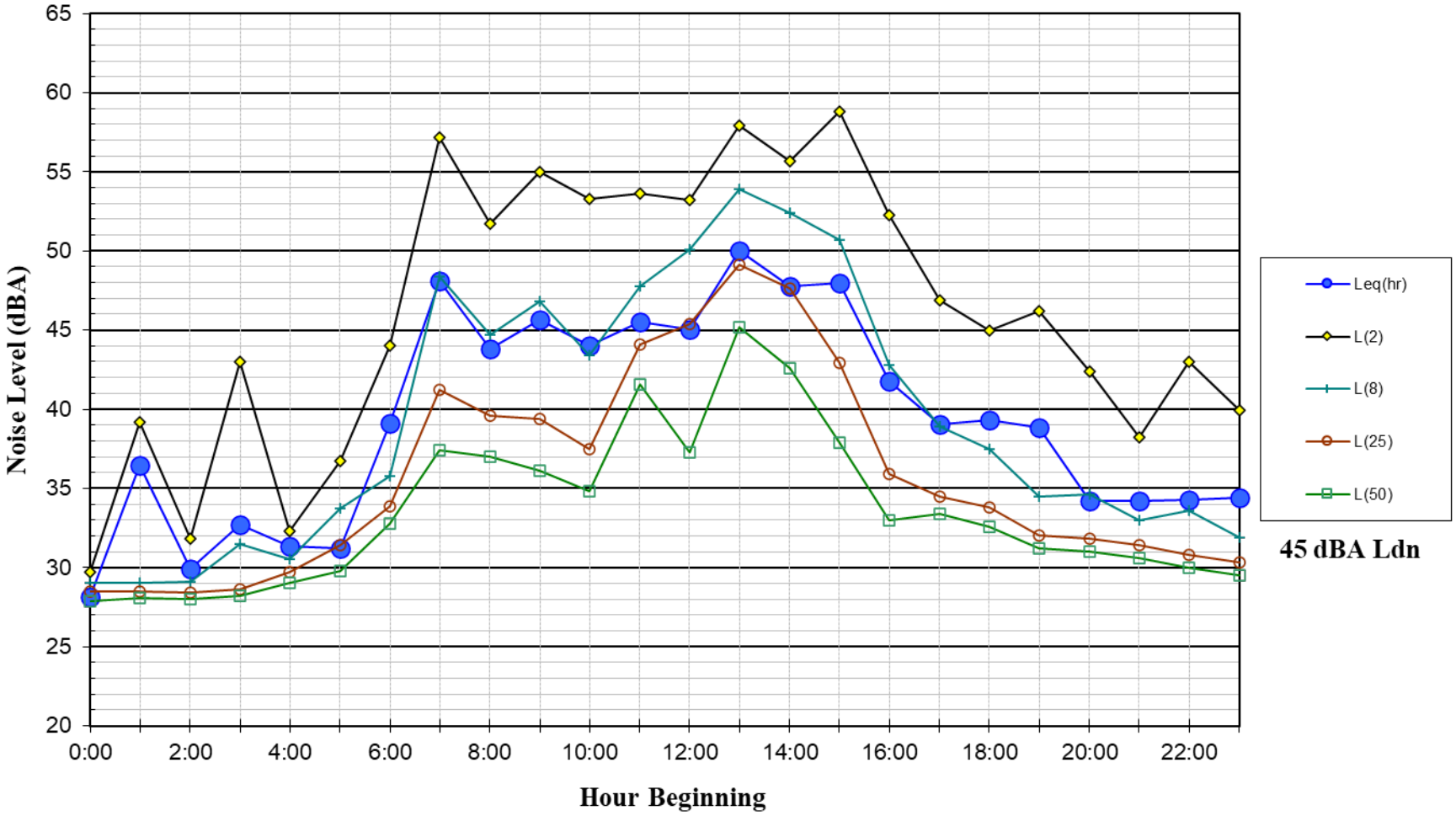



**Figure 6**

**Noise Levels at LT-1**
**~ 65' Southwest of the Centerline of Crystal Springs Road**
**Wednesday, December 8, 2020**

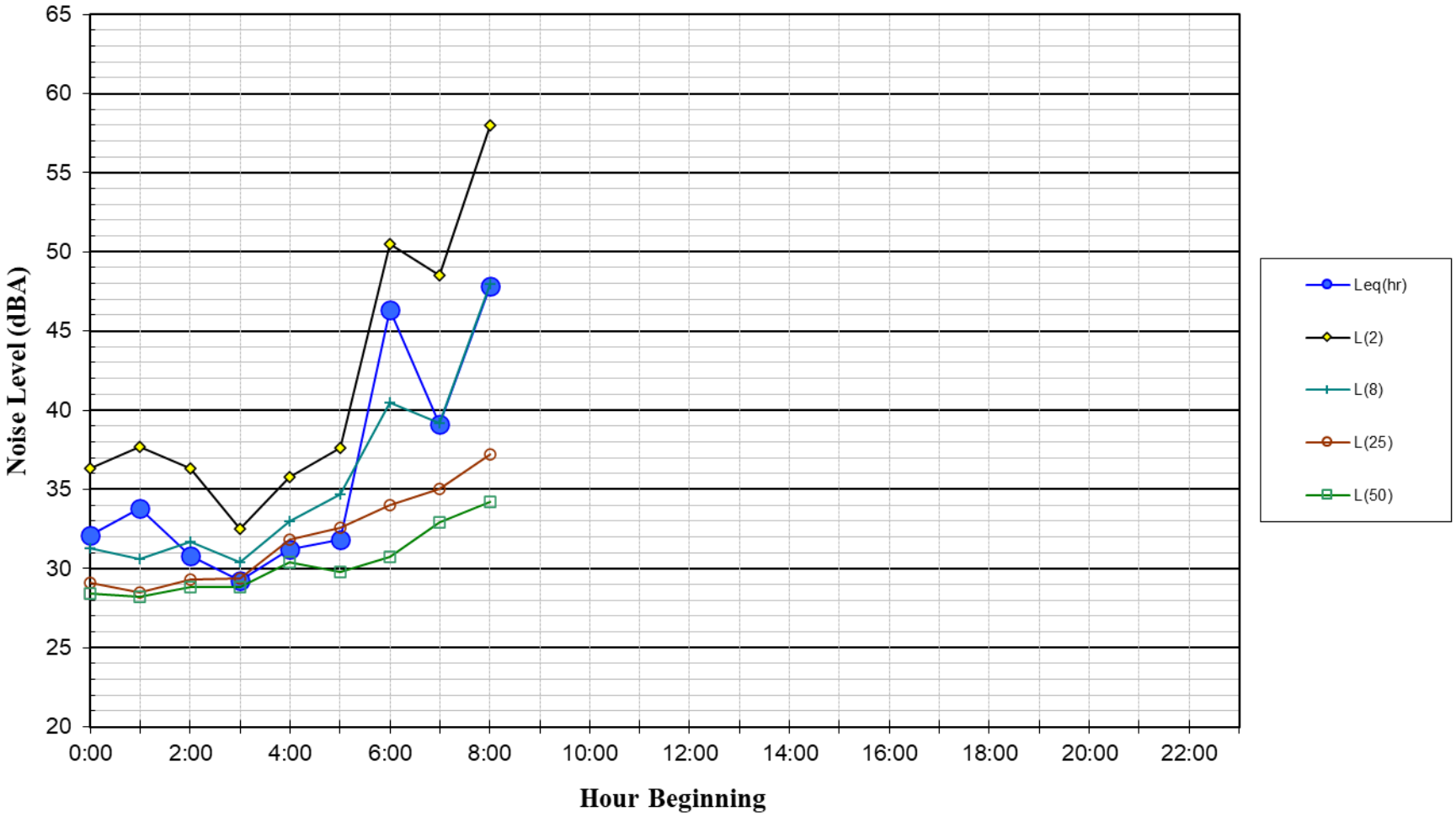



**Figure 7**