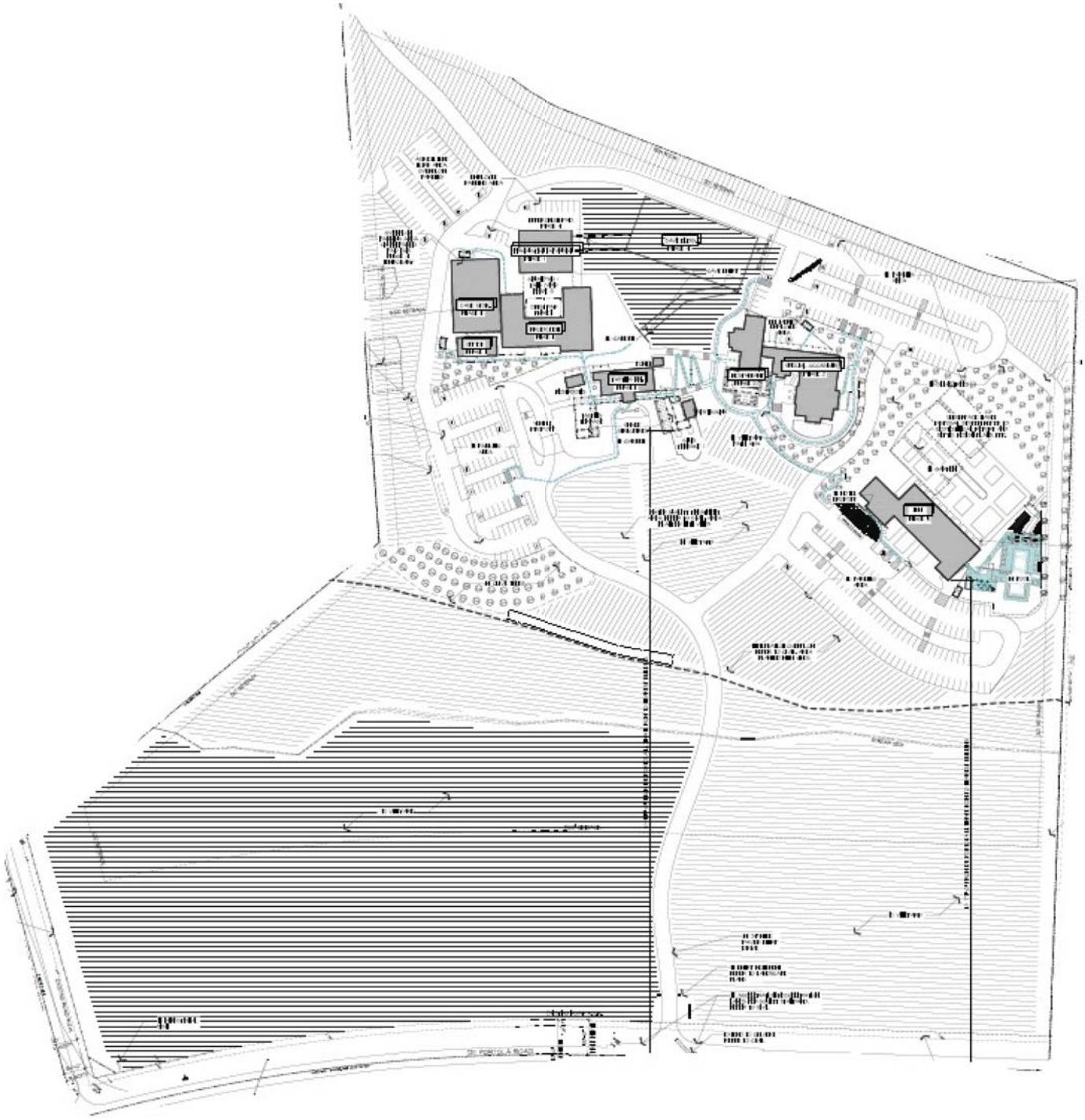
# MONARCH WINERY
# NOISE IMPACT STUDY
# COUNTY OF RIVERSIDE



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# NOISE IMPACT STUDY
# County of Riverside, California

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# 1.0 Introduction

## 1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Monarch Winery (project) and provide recommendations, if necessary, to minimize any project noise impacts. The assessment was conducted within the context of the California Environmental Quality Act (CEQA) and utilizes the noise standards set forth by the Federal, State, and local agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the existing noise environment
- Analysis of the project's noise/land use compatibility
- Analysis of the project's operational noise impact to adjacent receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

## 1.2 Site Location

The proposed project is located at the north corner of De Portola Road and Monte De Oro Road, in the unincorporated County of Riverside. The project site is bounded by agricultural land to the north, De Portola Road to the south, Monte De Oro Road to the southwest, a winery to the east and residential uses to the west. The project site is located approximately 1,500 feet above sea level and the topography is slopes downward from north to south.

The 44.6 acre project site is currently vacant and is zoned for WC-W (Wine Country-Winery) in the Riverside County Zoning Ordinance and is located within the Temecula Wine Country Community Plan and the Southwest Area Plan of the Riverside County General Plan.

Existing land uses surrounding the proposed project site include; Residential Agricultural (R-A) uses to the north and south, Wine County-Winery to the east and Rural Residential uses to the west.

The project site location map is provided in Exhibit A.

## 1.3 Project Description

The project would consist of constructing and operating a new winery with production buildings, tasting room, restaurant and a 10-room inn (hotel) on a 44.6 acres. Approximately 33 acres of the site will be used for agricultural production (vineyards and olive trees). The site plan used for this analysis, provided by WALTER R. ALLEN, AIA, is illustrated in Exhibit B.

Project operational activities are analyzed for long-term noise impacts associated with the day to day operation of the winery; including parking lot noise, truck delivery and loading activities, and mechanical HVAC equipment.

This noise analysis does not consider impacts from outdoor live events, as no such events are currently proposed for this project. Also, noise from any agricultural operations are exempted from the provisions of the Riverside County Noise Ordinance on land designated for Agricultural in the General Plan, provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile.

## 1.4 Summary of Analysis Results

Table 1 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. The project is not expected to result in 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.

**Table 1**
**CEQA Noise Impact Criteria**

| Noise Impact Criteria | Potentially Significant | Potentially Significant Unless Mitigated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| *Would the project result in?* | | | | |
| 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? | | X | | |
| b) Generation of excessive groundborne vibration or groundborne noise levels? | | | X | |
| 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, would the project expose people residing or working in the project area to excessive noise levels? | | | | X |

## 1.5 Recommended Mitigations Measures (MM)

The following recommended mitigation measures are provided to reduce potential project impacts identified in the CEQA Noise Impact Criteria Checklist to be less than significant.

**MM-1** All HVAC equipment should be fully shielded or enclosed from line of sight of any adjacent property or outdoor habitable area on the site.

**MM-2** No truck loading, deliveries or outdoor production related activities should take place during nighttime hours from 10 p.m. to 7 a.m.

**MM-3** Prior to organizing any large outdoor events or amplified music outside the project shall conduct a detailed noise study in accordance with Ordinance No. 847 to be approved by the County of Riverside.

## 1.6 Recommended Project Design Features (DF)

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the site design and construction management plan.

**DF-1** Construction-related noise activities shall comply with the requirements set forth in the County of Riverside Municipal Code Noise Ordinance 847.

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September;

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

**DF-2** During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

**DF-3** Locate staging area, generators and stationary construction equipment as far from the north and east property line, as reasonably feasible.

**DF-4** The pool deck area will be shielded from the adjacent property to the east due to the grade separation and the proposed retaining wall along the fire access road. To help ensure noise levels remain below the County standards, a minimum eight (8) foot high noise barrier shielding should be maintained along the east side of the pool deck area to shield adjacent sensitive receptor from noise associated with pool activities. This can be achieved through a combination of masonry brick and transparent glass.

The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking. Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch thick tongue and groove wood of sufficient weight per square foot;
- Transparent glass (3/8 inch thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

# 2.0 Fundamentals of Noise and Vibration

This section of the report provides basic information about noise and vibration and presents some of the terms used in the report.

## 2.1 Sound, Noise, and Acoustics

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

## 2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

## 2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal ($\mu$Pa). One $\mu$Pa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or $L_p$) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated as dB.

## 2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

## 2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

## 2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

### *A-Weighted Sound Level*

The sound pressure level in decibels as measured on a sound level meter using the A-weighted 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 response of the human ear. A numerical method of rating human judgment of loudness.

### *Ambient Noise Level*

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

*Community Noise Equivalent Level (CNEL)*

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

*Decibel (dB)*

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

*dB(A)*

A-weighted sound level (see definition above).

*Equivalent Sound Level (LEQ)*

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

*Habitable Room*

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

*L(n)*

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

*Noise*

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

*Outdoor Living Area*

Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

*Percent Noise Levels*

See L(n).

*Sound Level (Noise Level)*

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

*Sound Level Meter*

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

*Single Event Noise Exposure Level (SENEL)*

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

## 2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. The sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

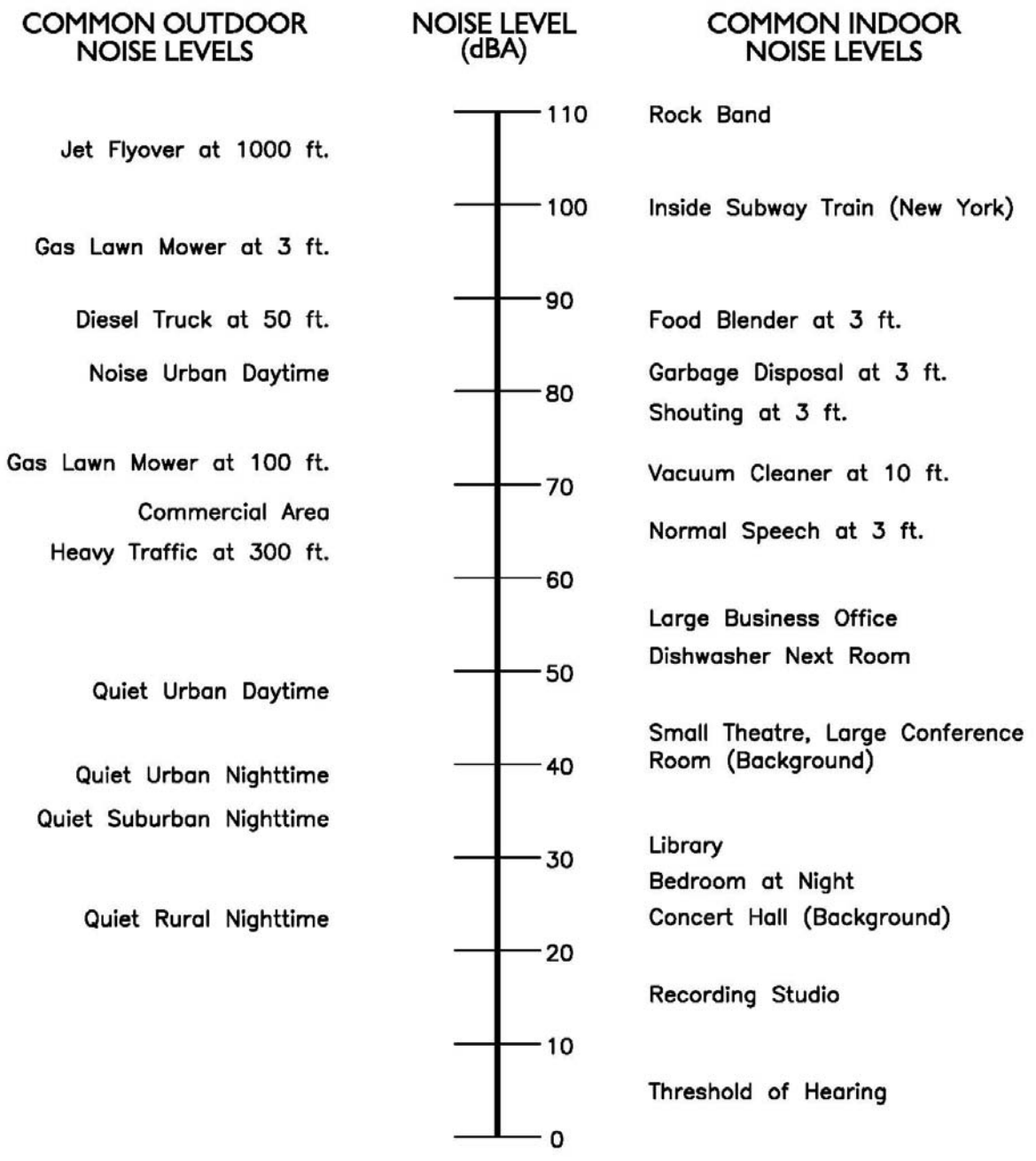
As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

## Figure 1

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



## 2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

*PPV*

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

*RMS*

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

*VdB*

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

## 2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

## 2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

## 2.11 Construction Related Vibration Level Prediction

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Induced Vibration Guidance Manual in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

**Table 2**
**Vibration Annoyance Potential Criteria**

| Human Response | PPV (in/sec) | |
|---|---|---|
| | Transient Sources | Continuous/Frequent Intermittent Sources |
| Barely perceptible | 0.04 | 0.01 |
| Distinctly perceptible | 0.25 | 0.04 |
| Strongly perceptible | 0.90 | 0.10 |
| Severe | 2.00 | 0.40 |

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

**Table 3**
**Vibration Damage Potential Threshold Criteria**

| Structure and Condition | PPV (in/sec) | |
|---|---|---|
| | Transient Sources | Continuous/Frequent Intermittent Sources |
| Extremely fragile historic buildings ruin ancient monuments | 0.12 | 0.08 |
| Fragile buildings | 0.20 | 0.10 |
| Historic and some old buildings | 0.50 | 0.25 |
| Older residential structures | 0.50 | 0.30 |
| New residential structures | 1.00 | 0.50 |
| Modern industrial/commercial buildings | 2.00 | 0.50 |

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

**Table 4**
**Suggested "n" Values Based on Soil Classes**

| Soil Class | Description of Soil Material | Suggested Value of "n" |
|---|---|---|
| I | Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand. | 1.4 |
| II | Most sands, sandy clays, silty clays, gravel, silts, weathered rock. | 1.3 |
| III | Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock. | 1.1 |
| IV | Hard, component rock: bedrock, freshly exposed hard rock. | 1.0 |

# 3.0 Regulatory Setting

The proposed project is located in the County of Riverside and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

## 3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

## 3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

## 3.3 County of Riverside Noise Standards

### 3.3.1 Riverside County General Plan Noise Element

The County of Riverside describes the adopted polices for noise/land use compatibility in the General Plan Noise Element. Noise compatibility is reviewed to determine the project's compatible with the surrounding land uses. The County's Noise Element is provided in Appendix A.

Table 5 shows the normally acceptable community noise exposure levels (CNEL) for land uses proposed on the project site.

**Table 5**
**Riverside County Noise/Land Use Compatibility Standards**

| Project Land Use Categories | Normally Acceptable Noise Level (CNEL) |
|---|---|
| Residential, Transient Lodging-Motels, Hotels | 65 dBA |
| Commercial | 70 dBA |
| Industrial, Manufacturing, Agriculture | 75 dBA |

### 3.3.2 Riverside County Noise Ordinance

The Riverside County Board of Supervisors has adopted Ordinance No. 847 to establish countywide standards regulating noise. Per Ordinance No. 847, no person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table (2) below.

It should be noted that Ordinance No. 847 is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act.

Table 6 shows the sound level standards established in the Riverside County Ordinance No. 847, as they pertain to land uses surrounding the project site. The County's Noise Ordinance No. 847 is provided in Appendix A.

**Table 6**
**Riverside County Ordinance No. 847 Sound Level Standards**

| Land Use | Maximum Decibel Level (Lmax) | |
|---|---|---|
| | 7 am—10 pm | 10 pm—7 am |
| Rural Community (Estate Density, Very Low Density and Low Density Residential) | 55 dBA | 45 dBA |
| Rural (Rural Residential, Rural Mountainous and Rural Desert Residential) | 45 dBA | 45 dBA |
| Agricultural | 45 dBA | 45 dBA |
| Community Development (Commercial Tourist, Retail Commercial) | 65 dBA | 55 dBA |

Ordinance No. 847 also requires that no person shall install, use or operate sound amplifying equipment, or perform, or allow to be performed, live music unless such activities comply with the following requirements:

- Sound amplifying equipment or live music is prohibited between the hours of 10:00 p.m. and 8:00 a.m.

- Sound emanating from sound amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than two hundred (200) feet from the equipment or music.

### 3.3.3 Riverside County Department of Environmental Health Noise Standards

The Riverside County Department of Environmental Health has provided further guidelines for determining noise impacts for development review projects, as described in the Department of Environmental Health Requirements for Determining and Mitigating, Non-Transportation Noise Source Impacts to Residential Properties (Appendix A).

The Riverside County Department of Environmental Health noise standards are consistent with the policies described in the 2015 General Plan and are frequently cited by the County as the preferred thresholds of significance for CEQA analysis purposes.

The noise standards for stationary noise sources are shown in Table 7.

**Table 7**
**Riverside County Stationary Source Noise Standards[1]**

| Noise Source | 10-Minute Noise Equivalent Level (Leq) | |
|---|---|---|
| | 7 am—10 pm | 10 pm—7 am |
| Facility-Related Stationary Noise Sources | 65 dBA | 45 dBA |

[1] Noise sources covered by this standard include, but are not limited to: industrial facilities, mining activities, loading dock activities, loud speakers operation, sporting events, musical performances, well pumps, equipment, vehicles operated off the public roadways, or any noise producing activities associated with a permanent fixed base of operation (hereafter referred to as the "facility"). Temporary construction activities are not covered by the standard. Noise levels must not exceed the 10-minute noise equivalent level standards as projected to any portion of any surrounding property containing a "habitable dwelling, hospital, school, library or nursing home

### 3.3.4 Construction Noise Regulation

County of Riverside Ordinance No. 847 indicates that construction noise is exempt from the noise ordinance, provided any of the following are satisfied:

- Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling
- Private construction projects located one-quarter (1/4) of a mile from an inhabited dwelling, provided that:
    - Construction does not occur between the hours of 6:00 PM and 6:00 AM during the months of June through September; and
    - Construction does not occur between the hours of 6:00 PM and 7:00 AM during the months of October through May.

# 4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

## 4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

A Larson Davis 712 Type 2 sound level meter was used to conduct short-term (10-minute) noise measurements data at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for all short-term noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Results of the short-term noise measurements were recorded on field data sheets

- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

## 4.2 Stationary Noise Modeling

On-site stationary noise sources were analyzed using SoundPLAN™ noise modeling software. SoundPLAN™ is a standards-based program that incorporates more than twenty national and international noise modeling guidelines. The following noise prediction standards were used during the performance of this project:

- TNM 3.0 (TNM 2.5)
- FTA/FRA - HSGT: 2005 (FTA/FRA – HSGT;2005)
- RMR 2002 (EU-Interim) (RMR 2002)
- ISO 9613-2: 1996
- Nord2000

Projected noise levels from SoundPLAN™ are based on the following key parameters:

- Developing three-dimensional noise models of the project,
- Predicting the project noise levels at the selected community locations and
- Comparing the predicted noise with the existing community ambient noise levels at the receptor locations.

The sides of the buildings, walls, etc. were modeled as reflective surfaces and also as diffractive bodies. The noise sources can be added as point source (example: HVAC units) or area source (example: parking lot. Most of the ground within the project site and adjacent areas are covered with paved surfaces and modeled as a hard site (Ground Factor=0). The Effective Flow Resistivity for paved area is SoundPLAN default.

The main sources of potential on-site stationary noise impacts to adjacent land uses would include noise from HVAC equipment, and parking lot noise, including truck loading and deliveries.

### 4.2.1 Parking Lot Noise

Parking lot noise would occur from vehicles and trucks entering and exiting the site, idling, exhaust, loading and delivery activities, doors slamming, tires screeching, people talking, and the occasional horn honking. Parking lot noise would occur throughout the site and is assessed by using referenced noise levels in the SoundPLAN model. Parking lot noise is based on the type of vehicle and number of movements per hour. Referenced noise levels for parking lot activities are based on the SoundPLAN™ standard *Parkplatzlärmstudie 2007*. Key inputs for parking lot noise include size of area source, number of movements per hour, type of vehicles, and number of parking spaces within each lot.

### 4.2.2 HVAC Equipment Noise

To estimate noise level impacts from on-site HVAC noise sources, reference noise levels are utilized. Referenced noise levels represent similar noise sources operating under similar conditions as would be found on the project site. Table 8 indicates the referenced noise levels for on-site stationary noise sources. The noise measurement data indicates the distance the microphone was placed from the noise source and the statistical data.

**Table 8**
**HVAC Referenced Noise Levels[1]**

| Source[1] | Distance from Source (feet) | Noise Levels (dBA) | |
|---|---|---|---|
| | | $L_{eq}$ | $L_{max}$ |
| HVAC Equipment | 6.0 | 88.5 | 88.5 |

[1] Referenced noise levels measured by RK over a 1-minute period.

To estimate the future noise levels during typical operational conditions, referenced noise levels are input into SoundPLAN and projected to the nearest sensitive receptor locations. Adjusted noise levels are based on the distance of the receptor location relative to the noise source, local topography and physical barriers including buildings and sound walls. The noise levels assume that the stationary sources are operating continuously during both daytime and nighttime hours, when in reality will likely operate only intermittently throughout daily operations.

# 5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding areas has been established based on noise measurement data collected by RK. Noise measurement data indicates that traffic noise propagating from the adjacent roadways, as well as activities from the surrounding properties are the main sources of ambient noise at the project site and surrounding area.

## 5.1 Short-Term (10-Minute) Noise Measurement Results

Using a Larson Davis 712 Type 2 integrating-averaging sound level meter, two (2) 10-minute noise measurements were recorded at the surrounding property lines. Short term noise measurements are conducted during normal daytime hours and considered samples of typical ambient conditions. The Leq, Lmin, Lmax, L2, L8, L25, and L50, statistical data were reported over the 10-minute period. The information was utilized to define the noise characteristics for the project.

The following details and observations are provided for the short-term noise measurements. The results of the short-term (ST) measurements are presented in Table 9.

**Table 9**
**Short-Term Noise Measurement Results[1]**

| Site No. | Time Started | Leq | Lmin | Lmax | $L_2$ | $L_8$ | $L_{25}$ | $L_{50}$ |
|---|---|---|---|---|---|---|---|---|
| ST-1 | 5:56 PM | 49.0 | 38.3 | 58.6 | 54.9 | 52.6 | 49.8 | 47.6 |
| ST-2 | 6:15 PM | 47.4 | 36.4 | 65.6 | 53.9 | 50.2 | 47.4 | 44.6 |

[1] Noise measurements conducted for 10-minute intervals during normal daytime conditions.

ST-1 Measurement taken at approximately 10ft from the northern wall adjacent to the residential P/L to the north and 10ft from the eastern P/L. Ambient noise includes traffic noise from North Grand Avenue.

ST-2 Measurement taken at approximately 10ft from the northern wall adjacent to the residential P/L to the north and 10ft from the eastern P/L. Ambient noise includes traffic noise from North Grand Avenue.

Exhibit C shows the noise measurement locations. Appendix B includes photos, field sheets, and measured noise data.

# 6.0 Project Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project and impacts caused by changes to the ambient environment. The main sources of noise generated by the project would include on-site operational activities from vehicular traffic noise and HVAC equipment. Noise level impacts are compared to the County of Riverside noise standards and mitigation measures are provided, as needed, to reduce the project's noise impact.

Noise from any agricultural operations are exempted from the provisions of the Riverside County Noise Ordinance on land designated for Agricultural in the General Plan, provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile.

Existing ambient noise levels currently exceed the Riverisde County Noise Ordinance No. 847 noise standards of 45 dBA (Lmax) for rural residential and agricultural land uses. Therefore, the project should not significantly increase ambient noise levels above existing conditions.

## 6.1 Stationary Source Noise Impacts

On-site stationary noise impacts are assessed at all adjacent property lines surrounding the project site. Existing land uses surrounding the project site include; Residential Agricultural (R-A) uses to the north and south, Wine County-Winery to the east and Rural Residential uses to the west.

The results of the noise impact analysis are shown in the Tables 10 and 11 and are graphically illustrated on Exhibit D.

The noise analysis considers all project noise sources operating simultaneously during daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) hours at the nearest adjacent property lines. The result is worst case assessment of future noise levels, as not all noise sources would typically be in use at the same time.

Noise levels generated by the project are not expected to exceed the County's daytime or nighttime noise standards at the adjacent property lines. The noise standard for all surrounding land uses is established to be 65 dBA Leq (General Plan Standard) and 45 dBA Lmax (Ordinance No. 847 Standard) from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10 p.m. to 7 a.m.

A significant noise impact is considered to occur when the project causes a 3 dBA or more increase in noise levels above ambient without project conditions. 3dBA is typically considered the threshold for the human ear to perceive a noise level change.

The change in existing noise levels as a result of the project would be range from approximately 0.1 dBA to 1.3 dBA during daytime hours and 0.1 to 2.0 dBA during nighttime hours. Existing nighttime noise levels are estimated by reducing daytime noise levels by 5dBA.

This noise analysis does not consider impacts from outdoor live events, as no such events are currently proposed for this project. Thus, outdoor gathering noise would include normal conversational noise, dining noise and noise from pool deck area; the pool area will be shielded from the line of sight from the adjacent sensitive receptor to the east with noise barrier wall in height varying 8 feet to 12 feet. The variation in height is a result of the slope along the access road to the east. Therefore, the project's outdoor gathering is not expected to cause significant noise impacts at an adjacent property line.

Several recommended mitigation measures are provided to help reduce the potential project noise impacts to the surrounding sensitive land uses and community.

## 6.2 Roadway Noise Levels

The project is not expected to cause a substantial increase in ambient noise levels in the vicinity of the site as a result of increased traffic volume along adjacent roadways.

Typically, it takes a doubling of traffic volume along a roadway to cause a significant increase in ambient noise levels of more than 3 dBA. Based on the TIA, the project will not double the amount of traffic volumes on either De Portola Roadway or Monte de Oro either directly or cumulatively and therefore no further analysis is recommended.

## 6.3 Recommended Mitigation Measures

The following recommended mitigation measures are provided to help reduce the potential project noise impacts to the surrounding sensitive land uses and community.

**MM-1** All HVAC equipment should be fully shielded or enclosed from line of sight of any adjacent property or outdoor habitable area on the site.

**MM-2** No truck loading, deliveries or outdoor production related activities should take place during nighttime hours from 10 p.m. to 7 a.m.

**MM-3** Prior to organizing any large outdoor events or amplified music outside the project shall conduct a detailed noise study in accordance with Ordinance No. 847 to be approved by the County of Riverside.

## 6.4 Recommended Project Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the site design and construction management plan.

**DF-1** Construction-related noise activities shall comply with the requirements set forth in the County of Riverside Municipal Code Noise Ordinance 847.

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September;

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

**DF-2** During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

**DF-3** Locate staging area, generators and stationary construction equipment as far from the north and east property line, as reasonably feasible.

**DF-4** The pool deck area will be shielded from the adjacent property to the east due to the grade separation and the proposed retaining wall along the fire access road. To help ensure noise levels remain below the County standards, a minimum eight (8) foot high noise barrier shielding should be maintained along the east side of the pool deck area to shield adjacent sensitive receptor from noise associated with pool activities. This can be achieved through a combination of masonry brick and transparent glass.

The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project

site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking. Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch thick tongue and groove wood of sufficient weight per square foot;
- Transparent glass (3/8 inch thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

**TABLE 10**

**Monarch Winery**
**Daytime Noise Impact Analysis (dBA)**

| Receptor | Location | Daytime Exterior Noise Level dBA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Project Noise Contribution (Leq) | Ordinace No. 847 Noise Level Criteria (Lmax) | General Plan Noise Level Criteria (Leq) | Noise Level Exceeds Standard (?) | Existing Ambient Measurement (Leq)[1] | Combined Noise Level Existing Plus Project (Leq) | Change in Noise Level as a Result of Project (dBA) | Significant Imapact (?) |
| Receiver at PL-1 | West | 32.3 | 45.0 | 65.0 | No | 49.0 | 49.1 | 0.1 | No |
| Receiver at PL-2 | | 33.4 | | | No | | 49.1 | 0.1 | No |
| Receiver at PL-3 | | 39.5 | | | No | | 49.5 | 0.5 | No |
| Receiver at PL-4 | | 32.5 | | | No | | 49.1 | 0.1 | No |
| Receiver at PL-5 | | 28.7 | | | No | | 49.0 | 0.0 | No |
| Receiver at PL-6 | South | 29.5 | 45.0 | 65.0 | No | 49.0 | 49.0 | 0.0 | No |
| Receiver at PL-7 | | 31.9 | | | No | | 49.1 | 0.1 | No |
| Receiver at PL-8 | | 33.4 | | | No | | 49.1 | 0.1 | No |
| Receiver at PL-9 | East | 43.0 | 45.0 | 65.0 | No | 47.4 | 48.7 | 1.3 | No |
| Receiver at PL-10 | | 40.1 | | | No | | 48.1 | 0.7 | No |
| Receiver at PL-11 | | 37.5 | | | No | | 47.8 | 0.4 | No |
| Receiver at PL-12 | North | 36.8 | 45.0 | 65.0 | No | 47.4 | 47.8 | 0.4 | No |
| Receiver at PL-13 | | 41.9 | | | No | | 48.5 | 1.1 | No |

*BE:sl:RK15227.1*
*JN:2815-2019-1*

**TABLE 11**

**Monarch Winery**
**Nighttime Noise Impact Analysis (dBA)**

| Receptor | Location | Nighttime Exterior Noise Level dBA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Project Noise Contribution (Leq) | Ordinace No. 847 Noise Level Criteria (Lmax) | General Plan Noise Level Criteria (Leq) | Noise Level Exceeds Standard (?) | Existing Ambient Measurement (Leq)[1] | Combined Noise Level Existing Plus Project (Leq) | Change in Noise Level as a Result of Project (dBA) | Significant Imapact (?) |
| Receiver at PL-1 | West | 30.8 | 45.0 | 45.0 | No | 44.0 | 44.2 | 0.2 | No |
| Receiver at PL-2 | | 31.0 | | | No | | 44.2 | 0.2 | No |
| Receiver at PL-3 | | 34.9 | | | No | | 44.5 | 0.5 | No |
| Receiver at PL-4 | | 29.0 | | | No | | 44.1 | 0.1 | No |
| Receiver at PL-5 | | 27.2 | | | No | | 44.1 | 0.1 | No |
| Receiver at PL-6 | South | 28.4 | 45.0 | 45.0 | No | 44.0 | 44.1 | 0.1 | No |
| Receiver at PL-7 | | 30.9 | | | No | | 44.2 | 0.2 | No |
| Receiver at PL-8 | | 32.7 | | | No | | 44.3 | 0.3 | No |
| Receiver at PL-9 | East | 39.9 | 45.0 | 45.0 | No | 42.4 | 44.3 | 1.9 | No |
| Receiver at PL-10 | | 37.8 | | | No | | 43.7 | 1.3 | No |
| Receiver at PL-11 | | 35.6 | | | No | | 43.2 | 0.8 | No |
| Receiver at PL-12 | North | 36.2 | 45.0 | 45.0 | No | 42.4 | 43.3 | 0.9 | No |
| Receiver at PL-13 | | 40.0 | | | No | | 44.4 | 2.0 | No |

[1] Nighttime noise levels estimated by reducing daytime levels by 5 dBA.

*BE:sl:RK15227.1*
*JN:2815-2019-1*

# 7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding adjacent land uses.

## 7.1 Construction Noise

Table 12 shows typical construction noise levels for different types of equipment. This data was compiled by the Environmental Protection Agency (EPA).

**Table 12**
**Typical Construction Noise Levels[1]**

| Type | Noise Levels (dBA) at 50 Feet |
|---|---|
| Earth Moving | |
| Compactors (Rollers) | 73 - 76 |
| Front Loaders | 73 - 84 |
| Backhoes | 73 - 92 |
| Tractors | 75 - 95 |
| Scrapers, Graders | 78 - 92 |
| Pavers | 85 - 87 |
| Trucks | 81 - 94 |
| Materials Handling | |
| Concrete Mixers | 72 - 87 |
| Concrete Pumps | 81 - 83 |
| Cranes (Movable) | 72 - 86 |
| Cranes (Derrick) | 85 - 87 |
| Stationary | |
| Pumps | 68 - 71 |
| Generators | 71 - 83 |
| Compressors | 75 - 86 |
| Impact Equipment | |
| Pneumatic Wrenches | 82 - 87 |
| Jack Hammers, Rock Drills | 80 - 99 |
| Pile Drivers (Peak) | 95-105 |
| Other | |
| Vibrators | 68 - 82 |
| Saws | 71 - 82 |

[1] Reference: Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, December 31, 1971, U.S. Environmental Protection Agency (USEPA)

The degree of construction noise will vary for different areas of the project site and also vary depending on the construction activities.

During the construction period, the contractors would be required to comply County of Riverside Ordinance No. 847 which indicates that construction noise is exempt from the noise ordinance, provided any of the following are satisfied:

- Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling

- Private construction projects located one-quarter (1/4) of a mile from an inhabited dwelling, provided that:

    - Construction does not occur between the hours of 6:00 PM and 6:00 AM during the months of June through September; and

    - Construction does not occur between the hours of 6:00 PM and 7:00 AM during the months of October through May.

## 7.2 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structure. For this project, the nearest sensitive receptors are residential homes located approximately fifty (50) feet west of the site. For purposes of assessing structural impacts from vibration, the nearest sensitive receptors are considered "new residential structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be from bulldozer activity during site preparation and grading, loading trucks during excavation, and vibratory rollers during paving. Vibratory rollers would only be used on the paved surface areas of the site, approximately 250 feet from the nearest structures.

The construction vibration assessment utilizes the referenced vibration levels from Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006 and methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual.

Table 13 shows the referenced vibration levels.

**Table 13**
**Typical Construction Vibration Levels[1]**

| Equipment | Peak Particle Velocity (PPV) (inches/second) at 25 feet | Approximate Vibration Level (LV) at 25 feet |
|---|---|---|
| Piledriver (impact) | 1.518 (upper range) | 112 |
| | 0.644 (typical) | 104 |
| Piledriver (sonic) | 0.734 upper range | 105 |
| | 0.170 typical | 93 |
| Clam shovel drop (slurry wall) | 0.202 | 94 |
| Hydromill | 0.008 in soil | 66 |
| (slurry wall) | 0.017 in rock | 75 |
| Vibratory Roller | 0.210 | 94 |
| Hoe Ram | 0.089 | 87 |
| Large bulldozer | 0.089 | 87 |
| Caisson drill | 0.089 | 87 |
| Loaded trucks | 0.076 | 86 |
| Jackhammer | 0.035 | 79 |
| Small bulldozer | 0.003 | 58 |

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

Table 14 shows the project's construction-related vibration analysis at the residential structures to the north.

**Table 14**
**Construction Vibration Impact Analysis**

| Construction Activity | Distance to Nearest Structure (ft) | Duration | Calculated Vibration Level - PPV (in/sec) | Damage Potential Level | Annoyance Criteria Level |
|---|---|---|---|---|---|
| Caisson Drilling | 250 ft. | Continuous/Frequent | 0.017 | No Impact | Distinctly Perceptible |
| Large Bulldozer | 50 ft. | Continuous/Frequent | 0.042 | No Impact | Distinctly Perceptible |
| Loaded Trucks | 50 ft. | Continuous/Frequent | 0.035 | No Impact | Distinctly Perceptible |

The estimated vibration noise levels at the nearest sensitive receptors are compared to the Caltrans Vibration Manual thresholds. The worst case vibratory impact from the site is estimated to be 0.042 PPV (in/sec) at the residential structures to the west. The annoyance potential of vibration from construction activities would be "distinctly perceptible" and no

potential damage is expected to residential structures and modern commercial/industrial buildings in the nearby vicinity.

Construction vibration calculation worksheets are shown in Appendix C.

## 7.3 Construction Project Design Features

**DF-1** Construction-related noise activities shall comply with the requirements set forth in the County of Riverside Municipal Code Noise Ordinance 847.

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September;

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

**DF-2** During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

**DF-3** Locate staging area, generators and stationary construction equipment as far from the north and east property line, as reasonably feasible.

# Exhibits

Exhibit A

# Location Map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# Exhibit B
# Site Plan

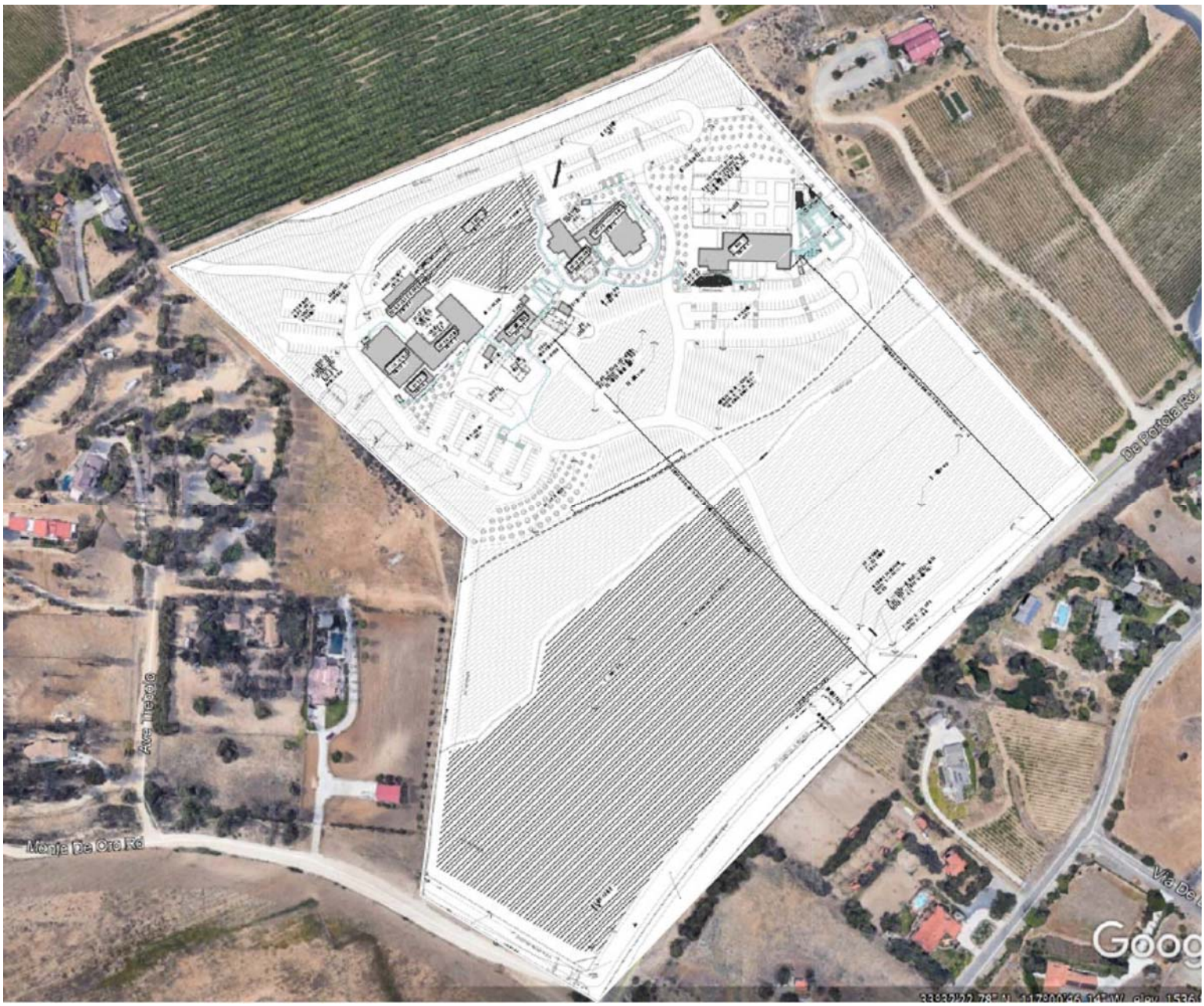


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Exhibit C

# Noise Monitoring Locations


**Legend:**

① = Short Term (10-min) Noise Monitoring Location

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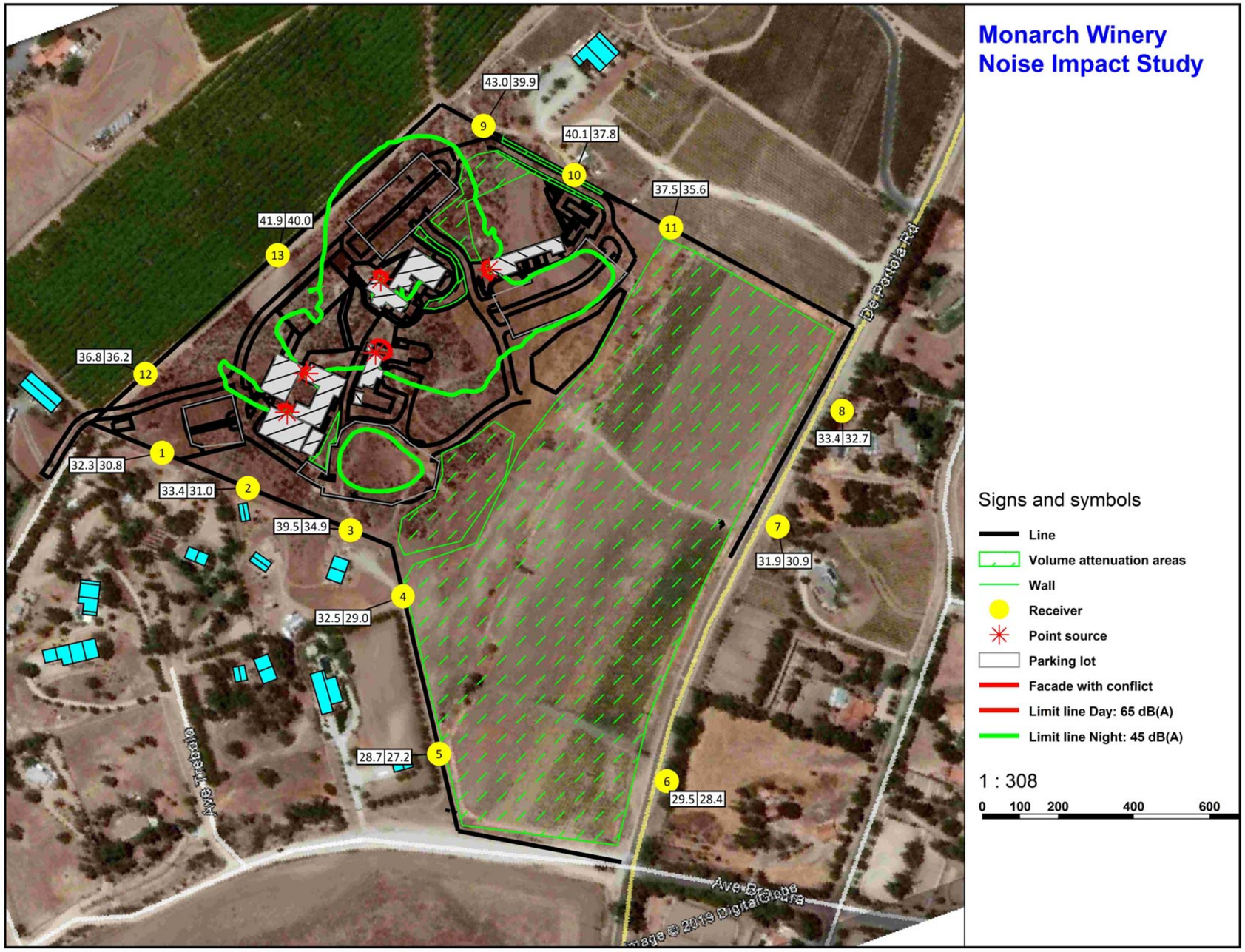
# SoundPLAN Project Noise Level Results

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# Appendices

# Appendix A

County of Riverside
General Plan Noise Element and
Municipal Code Noise Control

# Chapter 7
# Noise Element

## Definitions

★

The level of sound that impacts a property varies greatly during the day. As an example, the sound near an airport may be relatively quiet when no airplane is taking off or landing, but will be extremely loud as a plane takes off. In order to deal with these variations, several noise indices have been developed, which measure how loud each sound is, how long it lasts, and how often the sound occurs. The indices express all the sound occurring during the day as a single average level, which if it occurred all day would convey the same sound energy to the site.

Following is a list of commonly used terms and abbreviations that may be found within this element or when discussing the topic of noise. This is an abbreviated glossary to be reviewed prior to reading the element. It is important to become familiar with the definitions listed in order to better understand the importance of the Noise Element within the County of Riverside General Plan. Since the disbanding of the State of California Office of Noise Control in the mid-1990, the State of California Office of Planning and Research General Plan Guidelines can offer further information on other noise-related resources.

**Ambient Noise:** The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

**CNEL (Community Noise Equivalent Level):** The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

**dB (Decibel):** The unit of measure that denotes the ratio between two quantities that are proportional to power; the number of decibels corresponding to the ratio of the two amounts of power is based on a logarithmic scale.

**dBA (A-weighted decibel):** The A-weighted decibel scale discriminates upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale is based on a reference pressure level of 20 micropascals.

**Intrusive Noise:** 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 noise level.

**$L_{10}$:** The A-weighted sound level exceeded 10% of the sample time. Similarly, $L_{50}$, $L_{90}$, etc.

**Sound** refers to anything that is or may be perceived by the ear.

**Noise** is defined as "unwanted sound" because of its potential to disrupt sleep, rest, work, communication, and recreation, to interfere with speech communication, to produce physiological or psychological damage, and to damage hearing.

**$L_{eq}$ (Equivalent energy level):** The average acoustic energy content of noise during the time it lasts. The $L_{eq}$ of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure, no matter what time of day they occur. The County of Riverside uses a 10-minute $L_{eq}$ measurement.

**$L_{dn}$ (Day-Night Average Level):** The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. Note: CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour.

**Micropascal**: The international unit for pressure, similar to pounds per square inch. 20 micropascals is the human hearing threshold. The scale ranges from zero for the average least perceptible sound to about 130 for the average pain level

**Noise Contours:** Lines drawn around a noise source indicating equal levels of noise exposure. CNEL and Ldn are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

## Introduction

**Tinnitus**: The perception of ringing, hissing, or other sound in the ears or head when no external sound is present. For some people, tinnitus is just a nuisance. For others, it is a life-altering condition. In the United States, an estimated 12 million people have tinnitus to a distressing degree.

Before the alarm clock sounds, the lawn mower next door begins to roar. Then, while listening to the morning news on the radio, an airplane flies overhead and deadens all sound in the neighborhood. Once outside, the neighbor's stereo can be heard a block away. And during the morning commute, car horns, rumbling mufflers, and whirring motorcycles serenade motorists on the highway. Even in the most rural areas of Riverside County, the eternal battle between the efficiency of technology, and the noise it can create cannot be avoided.

As modern transportation systems continue to develop and human dependence upon machines continues to increase, the general level of noise in our day to day living environment rises. In Riverside County, residential areas near airports, freeways, and railroads are being adversely affected by annoying or hazardous noise levels. Other activities such as construction, operation of household power tools and appliances, and industry, also contribute to increasing background noise.

### Addressing Noise Issues

The Noise Element is a mandatory component of the General Plan pursuant to the California Planning and Zoning Law, Section 65302(f). The element must recognize the guidelines adopted by the Office of Planning and

Research pursuant to Section 46050.1 of the Health and Safety Code. It also can be utilized as a tool for compliance with the State of California's noise insulation standards.

The General Plan Noise Element provides a systematic approach to identifying and appraising noise problems in the community; quantifying existing and projected noise levels; addressing excessive noise exposure; and community planning for the regulation of noise. This element includes policies, standards, criteria, programs, diagrams, a reference to action items, and maps related to protecting public health and welfare from noise.

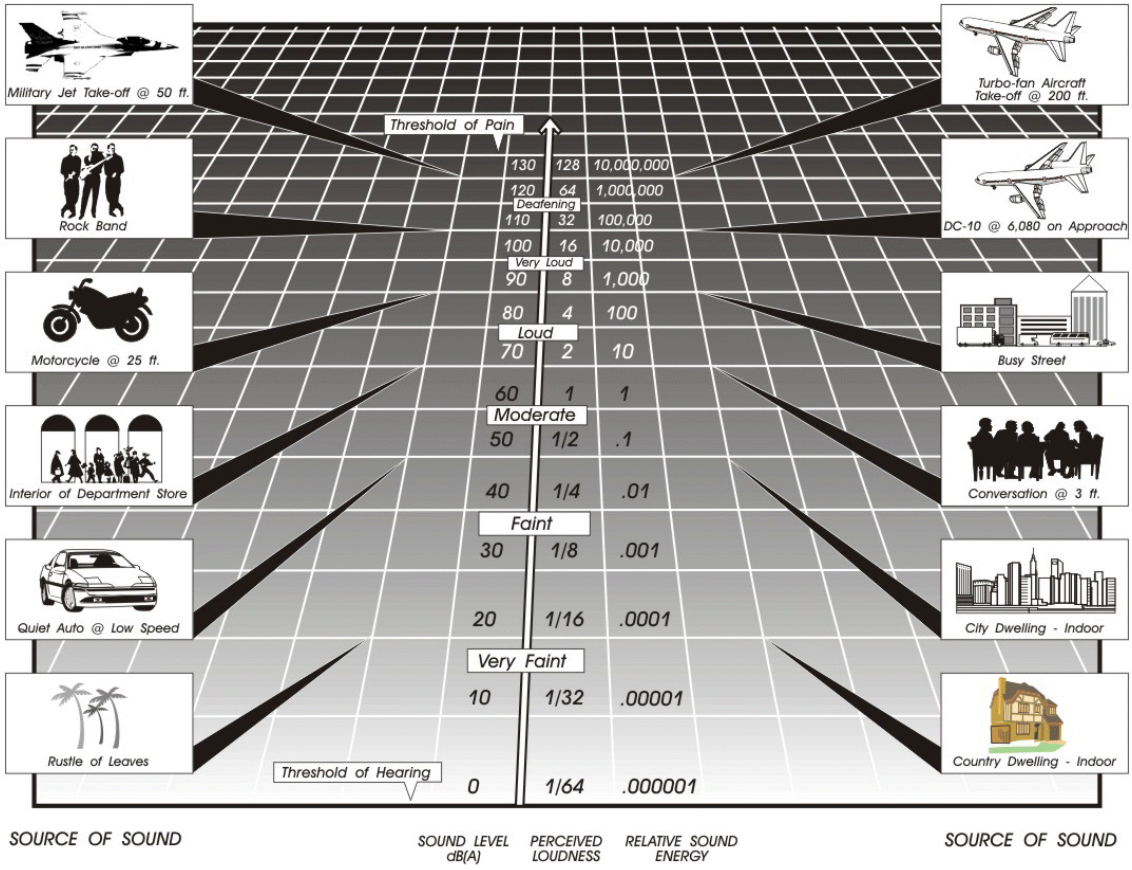
## Setting

Riverside County is a continuously evolving group of communities that relies heavily upon the modern technological conveniences of American society to thrive and succeed as a pleasant and desirable place to live and work. Without such necessities as air-conditioning, heating, generators, and cars, living in an urban, suburban, rural, desert, or mountainous environment becomes difficult, if not impossible. Fortunately, these amenities are available to the residents of Riverside County and are used every day, often all day long. Unfortunately, these technological advances can come at a high price to residents' and visitors' ears.

The philosophical view commonly held by Riverside County staff and residents is that noise, which may be perceived by some to be annoying, may not be noticed at all by others. It is also important to note that people who move into an area where a noise source already exists (such as near an existing highway) are often more tolerant of that noise source than when a new noise generator locates itself in an established area that may be noise-sensitive (such as a stadium that is constructed near an established community).

Noise within Riverside County is generated by numerous sources found near places where people live and work. These sources are of particular concern when the noise they generate reaches levels above the prevailing background noise. There are many different types of noise, including mobile, stationary, and construction-related, that affect noise-sensitive receptors such as residences, schools, and hospitals. Figure N-1, Common Noise Sources and Noise Levels, illustrates some noise producers that can be found within Riverside County, as well as their corresponding noise measurement. The following sections contain policies that address the issues of noise producers and their effects on noise-sensitive land uses.

**Figure N- 1 Common Noise Sources and Noise Levels**




## Noise Sensitive Land Uses

A series of land uses have been deemed sensitive by the State of California. These land uses require a serene environment as part of the overall facility or residential experience. Many of these facilities depend on low levels of sound to promote the wellbeing of the occupants. These uses include, but are not necessarily limited to; schools, hospitals, rest homes, long term care facilities, mental care facilities, residential uses, places of worship, libraries, and passive recreation areas. Activities conducted in proximity to these facilities must consider the noise output, and ensure that they don't create unacceptable noise levels that may unduly affect the noise-sensitive uses. The following policies address issues related to noise-sensitive land uses.

### Noise Compatibility

The Noise Element of the General Plan is closely related to the Land Use Element because of the effects that noise has on sensitive land uses. Noise-producing land uses must be compatible with adjacent land uses in order for the Land Use Plan to be successful. Land uses that emit noise are measured in A-weighted decibels (dBA) or Community Noise Equivalent Level (CNEL). If existing land uses emit noise above a certain level, they are not

compatible with one another, and therefore noise attenuation devices must be used to mitigate the noise to acceptable levels indoors and outdoors. In cases of new development, the placement of noise-sensitive land uses is integral to a successful community. Table N-1, Land Use Compatibility for Community Noise Exposure, reveals the noise acceptability levels for different land uses. Areas around airports may have different or more restrictive noise standards than those cited in Table N-1 (See Policy N 1.3 below).The following policies protect noise-sensitive land uses from noise emitted by outside sources, and prevent new projects from generating adverse noise levels on adjacent properties.

**Policies:**

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used. (AI 107)

N 1.2 Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors or within the projected noise contours of any adjacent airports. (AI 107)

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- Schools.
- Hospitals.
- Rest Homes.
- Long Term Care Facilities.
- Mental Care Facilities.
- Residential Uses.
- Libraries.
- Passive Recreation Uses.
- Places of Worship.

According to the State of California Office of Planning and Research General Plan Guidelines, an acoustical study may be required in cases where these noise-sensitive land uses are located in an area of 60 CNEL or greater. Any land use that is exposed to levels higher than 65 CNEL will require noise attenuation measures.

Areas around airports may have different noise standards than those cited above. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix L-1 and summarized in the Policy Area section of the affected Area Plan. (AI 105)

The General Plan policy and implementation item reference system:

**LU 1.3**: Identifies which element contains the Policy, in this case the Land Use Element, and the sequential number.

**AI 1 and AI 4**: Reference to the relevant Action Items contained in the Implementation Program found in Appendix K.

Please contact the Office of Industrial Hygiene for more information on acoustical specialists

N 1.4 Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys. (AI 106, 109)

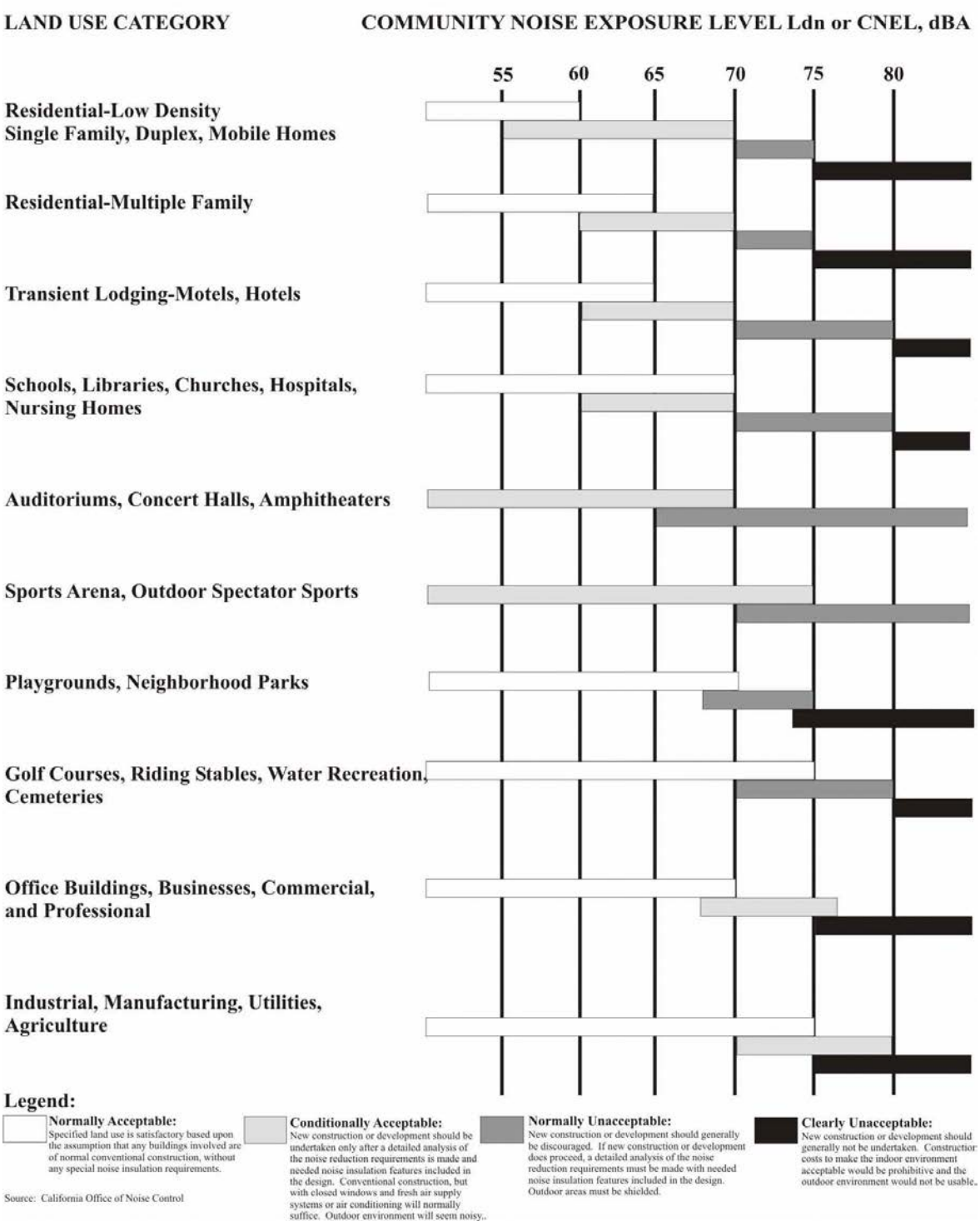
N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County. (AI 105, 106, 108)

N 1.6 Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise-sensitive uses. (AI 107)

N 1.7 Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem. (AI 106, 107)

N 1.8 Limit the maximum permitted noise levels that cross property lines and impact adjacent land uses, except when dealing with noise emissions from wind turbines. Please see the Wind Energy Conversion Systems section for more information. (AI 108)

**Table N-1**
**Land Use Compatibility for Community Noise Exposure**



### Noise Mitigation Strategies

Many land uses emit noise above state-mandated acceptable levels. The noise emitted from a land use must be mitigated to acceptable levels indoors and outdoors in order for other, more noise-sensitive land uses to locate in proximity to these noise producers. There are a number of ways to mitigate noise and the following policies suggest some possible solutions to noise problems.

**Policies:**

N 2.1 Create a County Noise Inventory to identify major noise generators and noise-sensitive land uses, and to establish appropriate noise mitigation strategies. (AI 105)

N 2.2 Require a qualified acoustical specialist to prepare acoustical studies for proposed noise-sensitive projects within noise impacted areas to mitigate existing noise. (AI 105, 107)

N 2.3 Mitigate exterior and interior noises to the levels listed in Table N-2 below to the extent feasible, for stationary sources: (AI 105)

**Table N-2:**
**Stationary Source Land Use Noise Standards[1]**

| Land Use | Interior Standards | Exterior Standards |
|---|---|---|
| *Residential* | | |
| 10:00 p.m. to 7:00 a.m. | 40 $L_{eq}$ (10 minute) | 45 $L_{eq}$ (10 minute) |
| 7:00 a.m. to 10:00 p.m. | 55 $L_{eq}$ (10 minute) | 65 $L_{eq}$ (10 minute) |

1 These are only preferred standards; final decision will be made by the Riverside County Planning Department and Office of Public Health.

## Noise Producers

### Location of Noise Producers

> *"Good neighbors keep their noise to themselves."*

The communities of Riverside County need a variety of land uses in order to thrive and succeed. These land uses may provide jobs, clean water, ensure safety, ship goods, and ease transportation woes. But they may also emit high levels of noise throughout the day. These noise-producing land uses can complement a community when the noise they emit is properly mitigated. The following policies suggest a series of surveys and analyses to correctly identify the proper noise mitigating procedures in order to promote the continued success of the communities of Riverside County.

#### *Agriculture*

One of the major economic thrusts of Riverside County is the agricultural industry. The Riverside County Right-to-Farm Ordinance conserves, protects, and encourages the development, improvement, and continued viability of agricultural land and industries for the long-term production of food and other agricultural products, and for the economic well-being of Riverside County's residents. The Right-to-Farm Ordinance also attempts to balance the rights of farmers to produce food and other agricultural products with the rights of non-farmers who own,

occupy, or use land within or adjacent to agricultural areas. The Riverside County Right-to-Farm Ordinance also works to reduce the burden of Riverside County's agricultural resources by limiting the circumstances under which agricultural operations may be deemed a nuisance. Policies within this section address the potential noise issues that may be raised in regards to agricultural production.

**Policies:**

N 3.1 Protect Riverside County's agricultural resources from noise complaints that may result from routine farming practices, through the enforcement of the Riverside County Right-to-Farm Ordinance. (AI 105, 107)

N 3.2 Require acoustical studies and subsequent approval by the Planning Department and the Office of Industrial Hygiene, to help determine effective noise mitigation strategies in noise-producing areas. (AI 105)

N 3.3 Ensure compatibility between industrial development and adjacent land uses. To achieve compatibility, industrial development projects may be required to include noise mitigation measures to avoid or minimize project impacts on adjacent uses. (AI 107)

N 3.4 Identify point-source noise producers such as manufacturing plants, truck transfer stations, and commercial development by conducting a survey of individual sites. (AI 106)

N 3.5 Require that a noise analysis be conducted by an acoustical specialist for all proposed projects that are noise producers. Include recommendations for design mitigation if the project is to be located either within proximity of a noise-sensitive land use, or land designated for noise-sensitive land uses. (AI 109)

N 3.6 Discourage projects that are incapable of successfully mitigating excessive noise. (AI 107)

N 3.7 Encourage noise-tolerant land uses such as commercial or industrial, to locate in areas already committed to land uses that are noise-producing. (AI 107)

## Stationary Noise

A stationary noise producer is any entity in a fixed location that emits noise. Stationary noise producers are common in many noise-sensitive areas. Motors, appliances, air conditioners, lawn and garden equipment, power tools, and generators are often found in residential neighborhoods, as well as on or near the properties of schools, hospitals, and parks. These structures are often a permanent fixture and are required for the particular land use. Industrial and manufacturing facilities are also stationary noise producers that may affect sensitive land uses. Furthermore, while noise generated by the use of motor vehicles over public roads is preempted from local regulation, the County of Riverside considers the use of these vehicles to be a stationary noise source when operated on private property such as at a truck terminal or warehousing facility. The emitted noise from the producer can be mitigated to acceptable levels either at the source or on the adjacent property through the use of proper planning, setbacks, blockwalls, acoustic-rated windows, dense landscaping, or by changing the location of the noise producer. The following policies identify mechanisms to measure and mitigate the noise emitted from stationary noise producers.

## Community Noise Inventory

There are a series of noise producers within Riverside County that bear special recognition. These uses may be important parts of the economic health of Riverside County, but they still emit noise from time to time. Some of the special noise producers within Riverside County include, but are not limited to the Riverside Raceway, surface mining, truck transfer stations in the Mira Loma area, manufacturing facilities, and natural gas transmission pipelines.

Three high pressure natural gas transmission pipelines are located in the community of Cabazon (within the Pass Area Plan), and a series of valve stations are placed along the pipeline throughout the community. The pipelines supply a major portion of the non-transportation energy supply for Southern California. The depressurization of mainline valves at the valve stations for emergency or maintenance reasons can result in noise levels exceeding 140 dB $L_{eq}$ at a distance of 50 feet from the source for more than an hour at a time. The pipelines are not located in heavily populated areas; however, should higher-intensity uses be approved in the area in the future, possible relocation of one or more pipelines or valves may be necessary.

**Policies:**

N 4.1 Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels: (AI 105)

a. 45 dBA-10-minute $L_{eq}$ between 10:00 p.m. and 7:00 a.m.

b. 65 dBA-10-minute $L_{eq}$ between 7:00 a.m. and 10:00 p.m.

N 4.2 Develop measures to control non-transportation noise impacts. (AI 105)

N 4.3 Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented. (AI 105, 106, 109)

N 4.4 Require that detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources. (AI 105)

A **pure tone** is a single frequency tone with no harmonic content (e.g. hum).

N 4.5 Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business licenses or prior to the approval and/or issuance of new conditional use permits for said facilities. (AI 105, 107)

N 4.6 Establish acceptable standards for residential noise sources such as, but not limited to, leaf blowers, mobile vendors, mobile stereos and stationary noise sources such as home appliances, air conditioners, and swimming pool equipment. (AI 105)

N 4.7 Evaluate noise producers for the possibility of pure-tone producing noises. Mitigate any pure tones that may be emitted from a noise source. (AI 106, 107)

N 4.8 Require that the parking structures, terminals, and loading docks of commercial or industrial land uses be designed to minimize the potential noise impacts of vehicles on the site as well as on adjacent land uses. (AI 106, 107)

### *Wind Energy Conversion Systems (WECS)*

Wind energy is a unique resource found only in a portion of Riverside County. Wind Energy Conversion Systems (WECS) are used to harness the energy found in strong gusts of wind. In order to fully capitalize on this special commodity, a large number of wind turbines have been placed in a portion of the Coachella Valley and San Gorgonio Pass within Riverside County. There are some residential areas spread throughout Riverside County that may also capitalize on wind-generated power. Though there is minimal residential development in the immediate areas where these windmills are located, the potential for noise and ground-borne vibration in neighboring developed areas may occur. The Wind Implementation Monitoring Program, designed and implemented by Riverside County, guides the policy direction for this area.

**Policies:**

N 5.1 Enforce the Wind Implementation Monitoring Program (WIMP).

N 5.2 Encourage the replacement of outdated technology with more efficient technology with less noise impacts. (AI 105)

## Mobile Noise

Mobile noise sources may be one of the most annoying noise producers in a community because they are louder than background noises and more intense than many acceptable stationary noise sources. Though the noise emitted from mobile sources is temporary, it is often more disturbing because of its abruptness, especially single noise-producing events such as vehicle backfires. Common mobile noise sources include on-road vehicles, aircraft, and trains. The policies in this section identify common mobile noise sources, and suggest mitigation techniques to reduce the annoyance and burden of mobile noise sources on noise-sensitive receptors.

Please see the **Circulation Element** for further policies regarding transportation and noise related issues.

**Policies:**

N 6.1 Consider noise reduction as a factor in the purchase of County maintenance equipment and their use by County contractors and permittees. (AI 108)

N 6.2 Investigate the feasibility of retrofitting current County-owned vehicles and mechanical equipment to comply with noise performance standards consistent with the best available noise reduction technology. (AI 108)

N 6.3 Require commercial or industrial truck delivery hours be limited when adjacent to noise-sensitive land uses unless there is no feasible alternative or there are overriding transportation benefits. (AI 105, 107)

N 6.4 Restrict the use of motorized trail bikes, mini-bikes, and other off-road vehicles in areas of the county except where designated for that purpose. Enforce strict operating hours for these vehicles in order to minimize noise impacts on sensitive land uses adjacent to public trails and parks. (AI 105, 108)

## Transportation

The most common mobile noise sources in Riverside County are transportation-related. Motor vehicle noise is of concern because it is characterized by a high number of individual events, which often create a higher sustained noise level in proximity to areas sensitive to noise exposure. Rail and aircraft operations, though less frequent, may generate extremely high noise levels that can be disruptive to daily activities. Though mass transit has not yet been developed within Riverside County, it is important to consider the noise that may be generated from transit service.

### Airports

With the dynamic growth in aviation, aircraft noise will remain a challenging environmental problem and one that will affect an increasing number of people as air traffic routes and procedures change in the future. Aircraft noise appears to produce the greatest community anti-noise response, although the duration of the noise from a single airplane is much less, for example, than that from a freight train. There is great economic benefit to gain from airports of any size, although living in proximity to an airport will necessarily result in exposure to aircraft noise.

There are fourteen public use or military airports that are located within or have a direct effect on Riverside County. The land under the flight paths of each airport was monitored to determine the amount of noise emitted by common aircraft taking-off and landing at any given airport. Noise contours were created based on the measurements from the monitoring program. The CNEL noise contour(s) for the following airports have been depicted in the applicable Area Plan's Airport Influence Area section:

- Banning Municipal Airport
- Bermuda Dunes Airport
- Blythe Airport
- Chino Airport

The following airports are located within or have a direct effect on Riverside County. Please see Appendix L-1 for a map with each airport=s noise contours. Also see the area plans and airport land use plans for more specific airport-related policies:

- Banning Municipal Airport
- Bermuda Dunes Airport
- Blythe Airport
- Chino Airport
- Corona Municipal Airport
- Chiriaco Summit Airport
- Jacqueline Cochran Regional Airport
- Flabob Airport
- French Valley Airport
- Hemet-Ryan Airport
- March Joint Air Reserve Base/March Inland Port
- Palm Springs International Airport
- Perris Valley Airport
- Riverside Municipal Airport
- Skylark Airport

- Chiriaco Summit Airport
- Corona Municipal Airport
- Jacqueline Cochran Regional Airport
- Flabob Airport
- French Valley Airport
- Hemet-Ryan Airport
- March Joint Air Reserve Base
- Riverside Municipal Airport

Airport Land Use Compatibility Plans have been created for most airports within Riverside County, and they should be referenced for further information regarding airports. Helicopters and heliports are also potential sources of noise, but due to the relatively low frequency and short duration of their operation in most circumstances, these operations do not significantly affect average noise levels within Riverside County. The following general policies address the noise that comes from airports and the aircraft they service.

**Policies:**

N 7.1 New land use development within Airport Influence Areas shall comply with airport land use noise compatibility criteria contained in the corresponding airport land use compatibility plan for the area. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix I-1and summarized in the Policy Area section of the affected Area Plan.

N 7.2 Adhere to applicable noise compatibility criteria when making decisions regarding land uses adjacent to airports. Refer to the Airports section of the Land Use Element (Page LU-32) and the Airport Influence Area sections of the corresponding Area Plans.

N 7.3 Prohibit new residential land uses, except construction of a single-family dwelling on a legal residential lot of record, within the current 60 dB CNEL contours of any currently operating public-use, or military airports. The applicable noise contours are as defined by the Riverside County Airport Land Use Commission and depicted in Appendix I-1, as well as in the applicable Area Plan's Airport Influence Area section.

N 7.4 Check each development proposal to determine if it is located within an airport noise impact area as depicted in the applicable Area Plan's Policy Area section regarding Airport Influence Areas. Development proposals within a noise impact area shall comply with applicable airport land use noise compatibility criteria.

### Chocolate Mountain Aerial Gunnery Range

A portion of the Chocolate Mountain Aerial Gunnery Range (CMAGR) is located in Riverside County, between the Eastern Coachella Valley Area Plan and East County Desert Areas. The CMAGR has served as a military

aerial bombing and gunnery training range since the 1940s. It is a centerpiece in a much larger training complex, known as the Bob Stump Training Range Complex, that incorporates adjacent and nearby special use airspaces and ranges located in southeast California and southwest Arizona. This complex supports full-spectrum combat operations so that Marines can realistically train as they will fight. The CMAGR's desert mountain terrain is ideal for air-to-ground attack and air-to-air combat training. Tactical military exercises involve live explosives and large force-on-force aviation training. Noise emitting from training exercises may extend past the CMAGR boundaries.

**Policies:**

N 8.1 Prohibit residential development, except construction of a single-family dwelling on a legal residential lot of record, within the current 60 dB CNEL contours of the Chocolate Mountain Aerial Gunnery Range.

### Vehicular

Please see the **Circulation Element** for more in-depth information regarding Level of Service Standards, Average Daily Trips, and other information related to vehicular circulation.

Roadway traffic is one of the most pervasive sources of noise within Riverside County. Traffic noise varies in how it affects land uses depending upon the type of roadway, and the distance of the land use from that roadway. Some variables that affect the amount of noise emitted from a road are speed of traffic, flow of traffic, and type of traffic (e.g. tractor trailers versus cars). Another variable affecting the overall measure of noise is a perceived increase in sensitivity to vehicular noise at night. Appendix I-1 contains tables and figures that illustrate existing and forecasted noise from roadways throughout Riverside County. The existing noise measurements were obtained by measuring noise at different points adjacent to the roadway. The future noise contours along freeways and major highways, also located in Appendix I-1, were created from the results of traffic modeling to project the noise of major roadways in the future. The following policies address the issues of roadway traffic noise, and suggest methods to reduce the noise impact of roads on adjacent and nearby land uses.

**Policies:**

N 9.1 Enforce all noise sections of the State Motor Vehicle Code.

N 9.2 Ensure the inclusion of noise mitigation measures in the design of new roadway projects in the county. (AI 105)

N 9.3 Require development that generates increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses to provide for appropriate mitigation measures. (AI 106)

N 9.4 Require that the loading and shipping facilities of commercial and industrial land uses, which abut residential parcels be located and designed to minimize the potential noise impacts upon residential parcels. (AI 105)

N 9.5 Employ noise mitigation practices when designing all future streets and highways, and when improvements occur along existing highway segments. These mitigation measures will

emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas. (AI 105)

N 9.6 Require that all future exterior noise forecasts use Level of Service C, and be based on designed road capacity or 20-year projection of development (whichever is less) for future noise forecasts. (AI 106)

N 9.7 Require that field noise monitoring be performed prior to siting to any sensitive land uses along arterial roadways. Noise level measurements should be of at least 10 minutes in duration and should include simultaneous vehicle counts so that more accurate vehicle ratios may be used in modeling ambient noise levels. (AI 106)

> *"Calling noise a nuisance is like calling smog an inconvenience. Noise must be considered a hazard to the health of people everywhere."*
>
> *-The Surgeon General*

### Mass Transit

Currently, the County of Riverside does not participate in or provide any rail transit services though public transportation is becoming a more desirable option for many travelers and commuters in Riverside County. Transit can be an alternative to driving a car through congested Riverside County freeways. Currently, the noise generated by public transportation within Riverside County affects only a very small percentage of the total residential population. As years pass, and the need for public transportation increases, there will be a greater number of residents affected by the noise that buses, transit oases shuttles, light rail, and trains will produce. The following policies address the issues of noise related to public transit.

Please see the **Circulation Element** for additional policies related to transit development and rail systems.

**Policies:**

N 10.1 Encourage local and regional public transit providers to ensure that the equipment they operate and purchase is state-of-the-art and does not generate excessive noise impacts on the community. (AI 108)

N 10.2 Encourage the use of quieter electric-powered vehicles. (AI 108)

N 10.3 Encourage the development and use of alternative transportation modes including bicycle paths and pedestrian walkways to minimize vehicular noise within sensitive receptor areas.

N 10.4 Actively participate in the development of noise abatement plans for freeways and rapid transit. (AI 108)

An at-grade railroad crossing is one where the street and the rail line form an intersection, and physically cross one-another.

### Rail

The rail system within Riverside County criss-crosses its way through communities, industrial areas, rural areas, and urban centers. Trains carry passengers, freight, and cargo to local and regional destinations day and night. Rail transportation may become more popular in the future if a mass public transportation system is implemented within Riverside County. Currently, daily train traffic produces noise that may disrupt activities in proximity to railroad tracks. For instance, trains are required to sound their horns at all at-grade crossings, and they may also be required to slow their speed through residential areas. These types of noise disturbances can interfere with activities conducted on noise-sensitive land uses. Exhibits showing existing railroad noise contours can be found in Appendix I-1. These exhibits provide purely illustrative contours along rail lines throughout Riverside County. The following policies suggest actions that could minimize the impacts of train noise on noise-sensitive land uses.

**Policies:**

N 11.1 Check all proposed projects for possible location within railroad noise contours using typical noise contour diagrams. (AI 106, 109)

N 11.2 Minimize the noise effect of rail transit (freight and passenger) on residential uses and other sensitive land uses through the land use planning process. (AI 106, 109)

N 11.3 Locate light rail and fixed rail routes and design rail stations in areas that are accessible to both residential and commercial areas, but also minimize noise impacts on surrounding residential and sensitive land uses. (AI 106, 109)

N 11.4 Install noise mitigation features where rail operations impact existing adjacent residential or other noise-sensitive uses. (AI 108)

N 11.5 Restrict the development of new sensitive land uses to beyond the 65 decibel CNEL contour along railroad rights-of-way. (AI 106, 109)

## Building and Design

One of the most effective means of reducing noise in a sensitive area is to construct and design buildings in such a way that the noise is deflected in such a way that it does not affect the occupants. If the building has already been constructed, then landscaping and design techniques can be used to tastefully absorb the noise emitted from mobile or stationary sources. These building and design techniques should serve two purposes; to mitigate noise to acceptable indoor and outdoor levels, and to enhance the community character rather than detract from its surroundings. The following policies have been included in the Noise Element to ensure that the character of each community within Riverside County is preserved while minimizing noise to acceptable levels.

### Natural Barriers and Landscaping

**Policies:**

N 12.1 Utilize natural barriers such as hills, berms, boulders, and dense vegetation to assist in noise reduction. (AI 108)

N 12.2 Utilize dense landscaping to effectively reduce noise. However, when there is a long initial period where the immaturity of new landscaping makes this approach only marginally effective, utilize a large number of highly dense species planted in a fairly mature state, at close intervals, in conjunction with earthen berms, setbacks, or block walls. (AI 108)

### Temporary Construction

**Policies:**

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices. (AI 105, 108)

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas. (AI 105, 108)

N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

a. Temporary noise attenuation fences;

b. Preferential location of equipment; and

c. Use of current noise suppression technology and equipment. (AI 107)

N 13.4 Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. (AI 105, 108)

### Building and Design Techniques

**Policies:**

N 14.1 Enforce the California Building Standards that sets standards for building construction to mitigate interior noise levels to the tolerable 45 CNEL limit. These standards are utilized in conjunction with the Uniform Building Code by the County's Building Department to ensure that noise protection is provided to the public. Some design features may include extra-dense insulation, double-paned windows, and dense construction materials.

N 14.2 Continue to develop effective strategies and mitigation measures for the abatement of noise hazards reflecting effective site design approaches and state-of-the-art building technologies. (AI 108)

N 14.3 Incorporate acoustic site planning into the design of new development, particularly large scale, mixed-use, or master-planned development, through measures which may include:

- Separation of noise-sensitive buildings from noise-generating sources.
- Use of natural topography and intervening structure to shield noise-sensitive land uses.
- Adequate sound proofing within the receiving structure. (AI 106)

★

Non-habitable areas within a home include:

- kitchens
- bathrooms
- hallways
- garages
- closets
- utility rooms
- laundry rooms

N 14.4 Consider and, when necessary, to lower noise to acceptable limits, require noise barriers and landscaped berms. (AI 108)

N 14.5 Consider the issue of adjacent residential land uses when designing and configuring all new, non-residential development. Design and configure on-site ingress and egress points that divert traffic away from nearby noise-sensitive land uses to the greatest degree practicable. (AI 106, 107)

N 14.6 Prevent the transmission of excessive and unacceptable noise levels between individual tenants and businesses in commercial structures and between individual dwelling units in multi-family residential structures. (AI 105, 108)

N 14.7 Assist the efforts of local homeowners living in high noise areas to noise attenuate their homes through funding assistance and retrofitting program development, as feasible. (AI 105, 108)

N 14.8 Review all development applications for consistency with the standards and policies of the Noise Element of the General Plan.

N 14.9 Mitigate 600 square feet of exterior space to 65 dB CNEL when new development is proposed on residential parcels of 1 acre or greater.

## Mixed Use

**Policies:**

N 15.1 Minimize the potential adverse noise impacts associated with the development of mixed-use structures where residential units are located above or adjacent to commercial uses. (AI 106, 107, 108)

N 15.2 Require that commercial and residential mixed-use structures minimize the transfer or transmission of noise and vibration from the commercial land use to the residential land use. (AI 105)

N 15.3 Minimize the generation of excessive noise level impacts from entertainment and restaurant/bar establishments into adjacent residential or noise-sensitive uses. (AI 105, 107)

## Vibration

Another community annoyance related to noise is vibration. As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized by displacement, velocity, and/or acceleration. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration.

Vibration can be felt outdoors, but the perceived intensity of vibration impacts are much greater indoors, due to the shaking of the structure. Some of the most common sources of vibration come from trains and/or transit vehicles, construction equipment, airplanes, and large vehicles. Several land uses are especially sensitive to vibration, and therefore have a lower vibration threshold. These uses include, but are not limited to, concert halls, hospitals, libraries, vibration-sensitive research operations, residential areas, schools, and offices.

Table N-3, Human Reaction to Typical Vibration Levels, presents the human reaction to various levels of peak particle velocity. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies. However, due to their suspension systems, city buses often generate frequencies around 30 Hz at high vehicle speeds. It is more uncommon, but possible, to measure traffic frequencies above 30 Hz.

**Amplitude**-the distance that a vibrating particle travels from a fixed point.

**Frequency**-the number of wave cycles that occur in 1 second.

**Hertz (Hz)**-the unit by which frequency is measured.

**Displacement**-a measure of the distance that a vibrated particle travels from its original position.

**Velocity**-the rate of speed at which particles move in inches per second or millimeters per second.

**Acceleration**-the rate of change in velocity with respect to time.

**Table N-3:**
**Human Reaction to Typical Vibration Levels**

| Vibration Level Peak Particle Velocity (inches/second) | Human Reaction |
|---|---|
| 0.0059-0.0188 | Threshold of perception, possibility of intrusion |
| 0.0787 | Vibrations readily perceptible |
| 0.0984 | Continuous vibration begins to annoy people |
| 0.1968 | Vibrations annoying to people in buildings |
| 0.3937-0.5905 | Vibrations considered unpleasant when continuously subjected and unacceptable by some walking on bridges |

Source: Caltrans, 1992

**Policies:**

N 16.1 Restrict the placement of sensitive land uses in proximity to vibration-producing land uses. (AI 105)

N 16.2 Consider the following land uses sensitive to vibration:

- Hospitals;
- Residential areas;
- Concert halls;
- Libraries;
- Sensitive research operations;
- Schools; and
- Offices

N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

## Noise Information Management

Current and projected noise data and maps for Riverside County require constant updating and review in order for the information to remain correct as well as accurate. Currently, there is no central noise information database available for Riverside County staff or residents to reference when noise inquiries arise. This information is necessary and should be easily accessible when reviewing potential development plans, building a new home, siting an industrial area, evaluating circulation routes, or conducting other advanced planning activities. The following policies guide the County of Riverside to create a database, or central location, where up-to-date information can be accessed by Riverside County Staff or residents.

### Mapping

**Policies:**

Please see **Table N-1** for more information in order to determine a noise threshold necessary for creating a noise database.

N 17.1 Identify, quantify, and map noise producers and provide noise contour diagrams as is practical. (AI 109)

N 17.2 Identify and map noise-sensitive land uses throughout the county. (AI 109)

N 17.3 Identify and map point-source noise producers such as surface mines, wind turbines, manufacturing plants, truck transfer stations, active recreational facilities, and amphitheaters. (AI 109)

### Noise Data Management

**Policies:**

N 18.1 Maintain baseline information, on an ongoing basis, regarding ambient and stationary noise sources. (AI 105)

N 18.2 Monitor and update available data regarding the community's existing and projected ambient stationary noise levels.

N 18.3 Assure that areas subject to noise hazards are identified, quantified, and mapped in a form that is available to decision makers. (AI 109)

N 18.4 Develop and maintain a detailed, comprehensive noise data base. (AI 106)

N 18.5 Develop and update county noise inventories using the following steps.

a. Identify noise sources and noise-sensitive land uses

b. Continue to identify various agency responsibilities, review noise complaint files, and conduct noise surveys and monitoring, as needed.

N 18.6 Identify those areas of the county affected by high noise levels. (AI 106, 107, 109)

N 18.7 Evaluate current land uses to identify potential noise conflict areas. (AI 106, 107, 109)

N 18.8 Gather activity operations' data of noise sources; prepare analytical noise exposure models to develop existing and projected noise contours around major noise sources down to 50 CNEL. (AI 109)

N 18.9 Encourage greater involvement of other County departments in the identification, measurement, and reduction of noise hazards throughout the county, including: Building and Safety Department, Aviation Department, and the Department of Public Health-Office of Industrial Hygiene.

### Public Noise Information

**Policies:**

N 19.1 Provide information to the public regarding the health effects of high noise levels and means of mitigating such levels. (AI 109)

N 19.2 Cooperate with industry to develop public information programs on noise abatement. (AI 108)

N 19.3 Condition that prospective purchasers or end users of property be notified of overflight, sight, and sound of routine aircraft operations by all effective means, including:

a. requiring new residential subdivisions that are located within the 60 CNEL contour or are subject to overflight, sight, and sound of aircraft from any airport, to have such information included in the State of California Final Subdivision Public Report.

b. requiring that Declaration and Notification of Aircraft Noise and Environmental Impacts be recorded and made available to prospective purchasers or end users of property located within the 60 CNEL noise contour for any airport or air station or is subject to routine aircraft overflight. (AI 109)

N 19.4 Promote increased awareness concerning the effects of noise and suggest methods by which the public can be of assistance in reducing noise.

N 19.5 Require new developments that have the potential to generate significant noise impacts to inform impacted users on the effects of these impacts during the environmental review process. (AI 106, 107)

# Appendix B

Field Data and Photos

# Field Sheet

**Project:** Monarch Winery Noise Impact Study **Engineer:** D. Shivaiah **Date:** 3/29/2019
**JN:** 2815-2019-01

**Measurement Address:** De Portola Road and Monte De oro **City:** Temecula **Site No.:** 1

**Sound Level Meter:**
LD-712
Serial # A0520

**Calibrator:**
LD-250 250
Serial # 1322

**Calibration Record:**

| | Input, dB/ | Reading, dB/ | Offset, dB/ | Time |
|---|---|---|---|---|
| Before | | | | |
| After | | | | |
| Before | 94.0 | 94.0 | 0.0 | 7:30 AM |
| After | / | / | / | |

**Notes:**
Temp: 57
Windspeed: 1 MPH
Direction: ENE
Skies: Clear
Camera:
Photo Nos.

**Meter Settings:**
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___10____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ $L_N$ PERCENTILE VALUES

**Notes:**

Measurement Type:
Long-term ____
Short-term X

| Locations | | Start Time | Stop Time | Leq | Lmin | Lmax | L2 | L8 | L25 | L50 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 5:56 PM | 6:06 PM | 49.0 | 38.3 | 58.6 | 54.9 | 52.6 | 49.8 | 47.6 |
| | | Measurement was taken at the eastern P/L near Frangipani Estate Winery. Ambient Noise Include traffic noise from De Portola Road. | | | | | | | | |
| | 2 | 6:15 PM | 6:25 PM | 47.4 | 36.4 | 65.6 | 53.9 | 50.2 | 47.4 | 44.6 |
| | | Measurement was taken at the western P/L of the Project Site. Ambient Noise Include traffic noise from De Portola Road and Monte De Oro Road. | | | | | | | | |
| | 3 | | | | | | | | | |
| | | | | | | | | | | |
| | 4 | | | | | | | | | |
| | | | | | | | | | | |
| | 5 | | | | | | | | | |
| | | | | | | | | | | |


RK engineering group, inc.

# Field Sheet - ST1 Location Photos

| | | | |
|---|---|---|---|
| **Project:** Monarch Winery Noise Impact Study | **Engineer:** D. Shivaiah | **Date:** | 3/29/2019 |
| | | **JN:** | 2815-2019-01 |
| **Measurement Address:** De Portola Road and Monte De oro | **City:** Temecula | **Site No.:** | 1 |

RK engineering group, inc.

# Field Sheet - ST2 Location Photos

| | | | |
|---|---|---|---|
| **Project:** Monarch Winery Noise Impact Study | **Engineer:** D. Shivaiah | **Date:** | 3/29/2019 |
| | | **JN:** | 2815-2019-01 |
| **Measurement Address:** De Portola Road and Monte De oro | **City:** Temecula | **Site No.:** | 2 |

RK engineering group, inc.

# Appendix C

SoundPLAN Noise Calculation Worksheets

# Monarch Winery Noise Impact Study
## Receiver list

| No. | Receiver name | Building side | Floor | Limit | | Level w/o NP | | Level w NP | | Difference | | Conflict | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Day | Night | Day | Night | Day | Night | Day | Night | Day | Night |
| | | | | dB(A) | | dB(A) | | dB(A) | | dB | | dB | |
| 1 | Reciever at PL-1 | - | GF | - | - | 34.4 | 33.6 | 32.3 | 30.8 | -2.1 | -2.7 | - | - |
| 2 | Reciever at PL-2 | - | GF | - | - | 33.2 | 30.6 | 33.4 | 31.0 | 0.2 | 0.4 | - | - |
| 3 | Reciever at PL-3 | - | GF | - | - | 40.1 | 36.5 | 39.5 | 34.9 | -0.6 | -1.6 | - | - |
| 4 | Reciever at PL-4 | - | GF | - | - | 33.7 | 31.4 | 32.5 | 29.0 | -1.3 | -2.4 | - | - |
| 5 | Reciever at PL-5 | - | GF | - | - | 29.3 | 28.1 | 28.7 | 27.2 | -0.7 | -0.9 | - | - |
| 6 | Reciever at PL-6 | - | GF | - | - | 30.1 | 29.2 | 29.5 | 28.4 | -0.6 | -0.7 | - | - |
| 7 | Reciever at PL-7 | - | GF | - | - | 32.1 | 31.2 | 31.9 | 30.9 | -0.2 | -0.3 | - | - |
| 8 | Reciever at PL-8 | - | GF | - | - | 34.2 | 33.6 | 33.4 | 32.7 | -0.8 | -0.9 | - | - |
| 9 | Reciever at PL-9 | - | GF | - | - | 44.3 | 42.3 | 43.0 | 39.9 | -1.4 | -2.5 | - | - |
| 10 | Reciever at PL-10 | - | GF | - | - | 41.0 | 39.3 | 40.1 | 37.8 | -1.0 | -1.6 | - | - |
| 11 | Reciever at PL-11 | - | GF | - | - | 37.7 | 36.0 | 37.5 | 35.6 | -0.3 | -0.4 | - | - |
| 12 | Reciever at PL-12 | - | GF | - | - | 40.3 | 40.1 | 36.8 | 36.2 | -3.6 | -3.9 | - | - |
| 13 | Reciever at PL-13 | - | GF | - | - | 43.8 | 42.7 | 41.9 | 40.0 | -1.9 | -2.7 | - | - |

# Monarch Winery Noise Impact Study
## Contribution levels of the receivers

| Source name | Traffic lane | Level w/o NP | | Level w NP | |
|---|---|---|---|---|---|
| | | Day | Night | Day | Night |
| | | dB(A) | | dB(A) | |
| Reciever at PL-1 | GF | 34.4 | 33.6 | 32.3 | 30.8 |
| Hotel Parking Lot1 | - | 15.1 | 9.3 | 15.1 | 9.3 |
| HVAC-1 | - | 32.2 | 32.2 | 28.0 | 28.0 |
| HVAC-2 | - | 23.8 | 23.8 | 22.3 | 22.3 |
| HVAC-3 | - | 16.0 | 16.0 | 16.0 | 16.0 |
| HVAC-4 | - | 17.7 | 17.7 | 21.1 | 21.1 |
| HVAC-5 | - | 19.5 | 19.5 | 17.1 | 17.1 |
| Overflow Parking1 | - | 22.6 | 12.2 | 22.6 | 12.2 |
| Restuarant Parking Lot1 | - | 23.9 | 20.1 | 23.9 | 20.1 |
| Tasting Room Parking Lot1 | - | 23.7 | 17.9 | 23.7 | 17.9 |
| Reciever at PL-2 | GF | 33.2 | 30.6 | 33.4 | 31.0 |
| Hotel Parking Lot1 | - | 13.7 | 8.0 | 13.7 | 8.0 |
| HVAC-1 | - | 24.0 | 24.0 | 26.7 | 26.7 |
| HVAC-2 | - | 26.0 | 26.0 | 24.0 | 24.0 |
| HVAC-3 | - | 16.8 | 16.8 | 16.8 | 16.8 |
| HVAC-4 | - | 16.9 | 16.9 | 20.0 | 20.0 |
| HVAC-5 | - | 18.3 | 18.3 | 17.4 | 17.4 |
| Overflow Parking1 | - | 18.1 | 7.7 | 18.1 | 7.7 |
| Restuarant Parking Lot1 | - | 18.8 | 15.0 | 18.8 | 15.0 |
| Tasting Room Parking Lot1 | - | 30.4 | 24.6 | 30.4 | 24.6 |
| Reciever at PL-3 | GF | 40.1 | 36.5 | 39.5 | 34.9 |
| Hotel Parking Lot1 | - | 21.8 | 16.1 | 21.8 | 16.1 |
| HVAC-1 | - | 20.3 | 20.3 | 24.0 | 24.0 |
| HVAC-2 | - | 23.7 | 23.7 | 23.3 | 23.3 |
| HVAC-3 | - | 19.5 | 19.5 | 19.5 | 19.5 |
| HVAC-4 | - | 18.4 | 18.4 | 21.4 | 21.4 |
| HVAC-5 | - | 32.8 | 32.8 | 25.4 | 25.4 |
| Overflow Parking1 | - | 9.4 | -1.0 | 9.4 | -1.0 |
| Restuarant Parking Lot1 | - | 21.9 | 18.1 | 21.9 | 18.1 |
| Tasting Room Parking Lot1 | - | 38.8 | 33.0 | 38.8 | 33.0 |
| Reciever at PL-4 | GF | 33.7 | 31.4 | 32.5 | 29.0 |
| Hotel Parking Lot1 | - | 17.1 | 11.4 | 17.1 | 11.4 |
| HVAC-1 | - | 15.3 | 15.3 | 15.3 | 15.3 |
| HVAC-2 | - | 21.4 | 21.4 | 19.7 | 19.7 |
| HVAC-3 | - | 18.2 | 18.2 | 18.2 | 18.2 |
| HVAC-4 | - | 16.7 | 16.7 | 19.3 | 19.3 |
| HVAC-5 | - | 28.6 | 28.6 | 21.5 | 21.5 |
| Overflow Parking1 | - | 5.6 | -4.8 | 5.6 | -4.8 |
| Restuarant Parking Lot1 | - | 19.6 | 15.8 | 19.6 | 15.8 |
| Tasting Room Parking Lot1 | - | 30.8 | 25.0 | 30.8 | 25.0 |
| Reciever at PL-5 | GF | 29.3 | 28.1 | 28.7 | 27.2 |
| Hotel Parking Lot1 | - | 16.0 | 10.2 | 16.0 | 10.2 |
| HVAC-1 | - | 12.2 | 12.2 | 15.7 | 15.7 |
| HVAC-2 | - | 20.0 | 20.0 | 16.3 | 16.3 |
| HVAC-3 | - | 13.9 | 13.9 | 13.9 | 13.9 |
| HVAC-4 | - | 13.7 | 13.7 | 16.4 | 16.4 |
| HVAC-5 | - | 25.8 | 25.8 | 24.4 | 24.4 |
| Overflow Parking1 | - | 2.0 | -8.4 | 2.0 | -8.4 |
| Restuarant Parking Lot1 | - | 19.0 | 15.2 | 19.1 | 15.2 |
| Tasting Room Parking Lot1 | - | 22.8 | 17.0 | 22.8 | 17.0 |
| Reciever at PL-6 | GF | 30.1 | 29.2 | 29.5 | 28.4 |
| Hotel Parking Lot1 | - | 19.0 | 13.2 | 19.0 | 13.2 |
| HVAC-1 | - | 12.8 | 12.8 | 11.2 | 11.2 |
| HVAC-2 | - | 15.9 | 15.9 | 13.5 | 13.5 |
| HVAC-3 | - | 15.6 | 15.6 | 15.6 | 15.6 |
| HVAC-4 | - | 23.6 | 23.6 | 18.7 | 18.7 |
| HVAC-5 | - | 26.0 | 26.0 | 26.6 | 26.6 |
| Overflow Parking1 | - | -0.9 | -11.3 | -0.9 | -11.3 |
| Restuarant Parking Lot1 | - | 20.8 | 16.9 | 20.8 | 16.9 |
| Tasting Room Parking Lot1 | - | 20.1 | 14.3 | 20.1 | 14.3 |

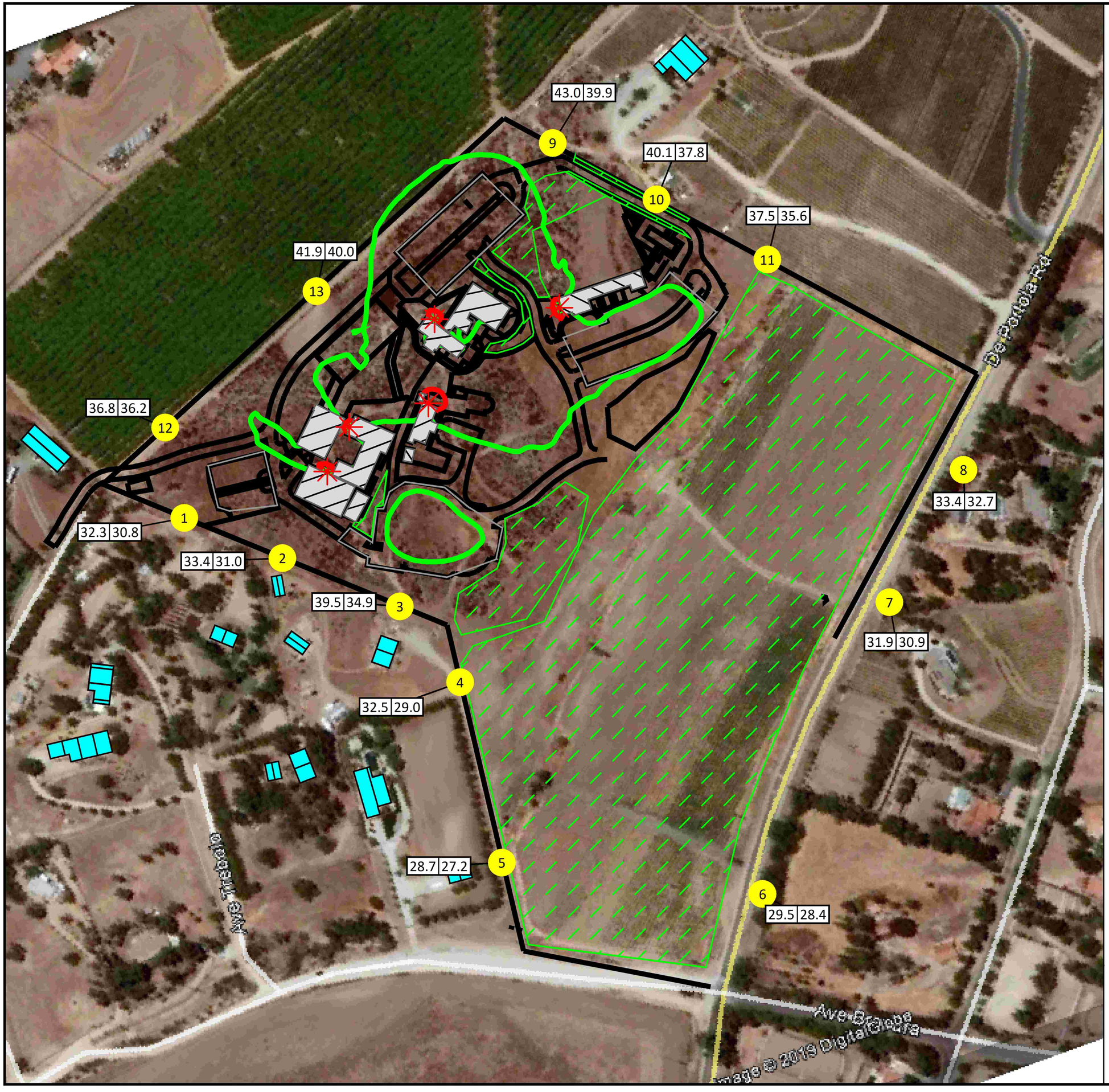
# Monarch Winery Noise Impact Study
## Contribution levels of the receivers

| Source name | | Traffic lane | Level w/o NP Day | Level w/o NP Night | Level w NP Day | Level w NP Night |
|---|---|---|---|---|---|---|
| | | | dB(A) | | dB(A) | |
| Reciever at PL-7 | GF | | 32.1 | 31.2 | 31.9 | 30.9 |
| Hotel Parking Lot1 | | - | 19.7 | 13.9 | 19.7 | 13.9 |
| HVAC-1 | | - | 16.0 | 16.0 | 16.8 | 16.8 |
| HVAC-2 | | - | 16.3 | 16.3 | 14.1 | 14.1 |
| HVAC-3 | | - | 27.2 | 27.2 | 27.2 | 27.2 |
| HVAC-4 | | - | 26.6 | 26.6 | 23.1 | 23.1 |
| HVAC-5 | | - | 20.0 | 20.0 | 24.3 | 24.3 |
| Overflow Parking1 | | - | -3.8 | -14.2 | -3.8 | -14.2 |
| Restuarant Parking Lot1 | | - | 23.9 | 20.1 | 24.0 | 20.1 |
| Tasting Room Parking Lot1 | | - | 20.7 | 14.9 | 20.7 | 14.9 |
| Reciever at PL-8 | GF | | 34.2 | 33.6 | 33.4 | 32.7 |
| Hotel Parking Lot1 | | - | 19.4 | 13.6 | 19.4 | 13.6 |
| HVAC-1 | | - | 13.0 | 13.0 | 12.6 | 12.6 |
| HVAC-2 | | - | 16.5 | 16.5 | 13.7 | 13.7 |
| HVAC-3 | | - | 31.3 | 31.3 | 31.3 | 31.3 |
| HVAC-4 | | - | 28.3 | 28.3 | 24.0 | 24.0 |
| HVAC-5 | | - | 15.0 | 15.0 | 16.6 | 16.6 |
| Overflow Parking1 | | - | -5.6 | -16.0 | -5.6 | -16.0 |
| Restuarant Parking Lot1 | | - | 25.0 | 21.2 | 25.0 | 21.2 |
| Tasting Room Parking Lot1 | | - | 19.4 | 13.6 | 19.4 | 13.6 |
| Reciever at PL-9 | GF | | 44.3 | 42.3 | 43.0 | 39.9 |
| Hotel Parking Lot1 | | - | 26.6 | 20.8 | 26.6 | 20.8 |
| HVAC-1 | | - | 23.9 | 23.9 | 21.0 | 21.0 |
| HVAC-2 | | - | 15.6 | 15.6 | 15.6 | 15.6 |
| HVAC-3 | | - | 20.7 | 20.7 | 20.7 | 20.7 |
| HVAC-4 | | - | 38.2 | 38.2 | 32.4 | 32.4 |
| HVAC-5 | | - | 35.0 | 35.0 | 28.7 | 28.7 |
| Overflow Parking1 | | - | -2.3 | -12.7 | -2.3 | -12.7 |
| Restuarant Parking Lot1 | | - | 42.2 | 38.3 | 42.2 | 38.3 |
| Tasting Room Parking Lot1 | | - | 19.2 | 13.4 | 19.2 | 13.4 |
| Reciever at PL-10 | GF | | 41.0 | 39.3 | 40.1 | 37.8 |
| Hotel Parking Lot1 | | - | 33.3 | 27.5 | 33.3 | 27.5 |
| HVAC-1 | | - | 24.7 | 24.7 | 23.1 | 23.1 |
| HVAC-2 | | - | 11.9 | 11.9 | 15.8 | 15.8 |
| HVAC-3 | | - | 32.9 | 32.9 | 32.9 | 32.9 |
| HVAC-4 | | - | 35.3 | 35.3 | 26.2 | 26.2 |
| HVAC-5 | | - | 27.3 | 27.3 | 29.8 | 29.8 |
| Overflow Parking1 | | - | -6.6 | -17.1 | -6.6 | -17.1 |
| Restuarant Parking Lot1 | | - | 36.3 | 32.5 | 36.3 | 32.5 |
| Tasting Room Parking Lot1 | | - | 20.9 | 15.1 | 20.9 | 15.1 |
| Reciever at PL-11 | GF | | 37.7 | 36.0 | 37.5 | 35.6 |
| Hotel Parking Lot1 | | - | 32.5 | 26.7 | 32.5 | 26.7 |
| HVAC-1 | | - | 15.8 | 15.8 | 16.9 | 16.9 |
| HVAC-2 | | - | 10.6 | 10.6 | 14.6 | 14.6 |
| HVAC-3 | | - | 33.9 | 33.9 | 33.9 | 33.9 |
| HVAC-4 | | - | 27.3 | 27.3 | 20.8 | 20.8 |
| HVAC-5 | | - | 18.5 | 18.5 | 20.9 | 20.9 |
| Overflow Parking1 | | - | -5.8 | -16.2 | -5.8 | -16.2 |
| Restuarant Parking Lot1 | | - | 29.9 | 26.0 | 29.9 | 26.0 |
| Tasting Room Parking Lot1 | | - | 20.2 | 14.4 | 20.2 | 14.4 |
| Reciever at PL-12 | GF | | 40.3 | 40.1 | 36.8 | 36.2 |
| Hotel Parking Lot1 | | - | 18.0 | 12.2 | 18.0 | 12.2 |
| HVAC-1 | | - | 39.7 | 39.7 | 35.2 | 35.2 |
| HVAC-2 | | - | 25.6 | 25.6 | 23.8 | 23.8 |
| HVAC-3 | | - | 18.1 | 18.1 | 18.1 | 18.1 |
| HVAC-4 | | - | 20.1 | 20.1 | 24.6 | 24.6 |
| HVAC-5 | | - | 15.9 | 15.9 | 15.7 | 15.7 |
| Overflow Parking1 | | - | 20.0 | 9.6 | 20.0 | 9.6 |
| Restuarant Parking Lot1 | | - | 26.8 | 23.0 | 26.8 | 23.0 |
| Tasting Room Parking Lot1 | | - | 22.0 | 16.2 | 22.0 | 16.2 |

# Monarch Winery Noise Impact Study
## Contribution levels of the receivers

| Source name | Traffic lane | Level w/o NP | | Level w NP | |
|---|---|---|---|---|---|
| | | Day | Night | Day | Night |
| | | dB(A) | | dB(A) | |
| Reciever at PL-13 GF | | 43.8 | 42.7 | 41.9 | 40.0 |
| Hotel Parking Lot1 | - | 18.9 | 13.2 | 18.8 | 13.1 |
| HVAC-1 | - | 30.9 | 30.9 | 27.8 | 27.8 |
| HVAC-2 | - | 39.8 | 39.8 | 30.9 | 30.9 |
| HVAC-3 | - | 28.9 | 28.9 | 28.9 | 28.9 |
| HVAC-4 | - | 34.3 | 34.3 | 35.3 | 35.3 |
| HVAC-5 | - | 25.8 | 25.8 | 21.6 | 21.6 |
| Overflow Parking1 | - | 9.0 | -1.5 | 9.0 | -1.5 |
| Restuarant Parking Lot1 | - | 39.5 | 35.7 | 39.5 | 35.7 |
| Tasting Room Parking Lot1 | - | 22.7 | 16.9 | 22.7 | 16.9 |

# Monarch Winery
# Noise Impact Study




## Signs and symbols

- Line
- Volume attenuation areas
- Wall
- Receiver
- Point source
- Parking lot
- Facade with conflict
- Limit line Day: 65 dB(A)
- Limit line Night: 45 dB(A)

1 : 308

0 100 200 400 600