2.7 Noise

This section examines potential noise and vibration impacts resulting from construction and operation of the proposed project. The information used in this analysis is general in nature and is derived from the most readily available information in applicable resource and planning documents.

2.7.1 Existing Conditions

This section provides the existing ambient noise environment, including the sources of noise, in the County of San Diego (County) in relation to noise-sensitive land uses. Ambient noise data and baseline information reviewed for this section include the Noise Technical Report for the County of San Diego General Plan Update (PBS&J 2009), General Plan Update (2011), County of San Diego General Plan, Noise Element Background Report (County of San Diego 2011), and Guidelines for Determining Significance: Noise (County of San Diego 2009a). The following describes the characteristic of noise within the County.

Ambient Noise Setting

The County of San Diego is characterized as a primarily rural environment with low-density development that contributes significantly to the perceived quality of life and the peace and tranquility that exist within the County (County of San Diego 2011). However, higher density communities also exist in the County, including Valle de Oro Community Planning Area (CPA), Spring Valley CPA, and Sweetwater CPA, which have a louder ambient noise environment. Major sources of noise include transportation- and non-transportation-related activities. Non-transportation noise sources include industrial processing; mechanical equipment; pump stations; and heating, ventilating, and air conditioning (HVAC) equipment. Some non-transportation sources are not stationary but are typically assessed as point or area sources due to the limited area in which they operate, such as truck deliveries, agricultural field machinery, and mining equipment (County of San Diego 2011).

Characteristics of Noise and Vibration

Noise is typically defined as unwanted sound. Sounds are perceived based on their loudness (i.e., volume or sound pressure level) or pitch (i.e., tonal or frequency content). The standard unit of measure for sound pressure levels is the decibel (dB). The standard unit used to describe the tonal or frequency content is the hertz (Hz). Typical frequency ranges consist of 20 hertz (Hz) to 20,000 Hz for audible noise, 100 Hz to 3,000 Hz for normal speech, 20 to 200 Hz for low frequency, and less than 20 Hz for infrasound. Table 2.7-1 shows the sound pressure level, in decibels, of the corresponding frequency of infrasound and low frequency sound necessary for the sound to be heard by the average person. Customarily, the young, non-pathological ear can

perceive sounds ranging from 20 Hz to 20,000 Hz. Infrasound, at certain frequencies and at high levels, can be audible to some people.

To account for the pitch of sounds and the corresponding sensitivity of human hearing to them, the raw sound pressure level is adjusted with an A-weighting scheme based on frequency that is stated in units of decibels (dBA). Table 2.7-2 depicts typical A-weighted sound levels for various noise sources. A-weighting is acceptable if there is largely middle and high frequency noise present, but if the noise is unusually high at low frequencies, or contains prominent low frequency tones, the A-weighting may not give a valid measure. Human hearing causes sounds dominated by low-frequency components to seem louder than broadband sounds that have the same A-weighted level. Therefore, other weighting schemes are used.

A given level of noise would be more or less tolerable depending on the sound level, duration of exposure, character of the noise sources, time of day during which the noise is experienced, and activity affected by the noise. For example, noise that occurs at night tends to be more disturbing than that which occurs during the day because sleep has the potential to be disturbed. Additionally, rest at night is a critical requirement in the recovery from exposure to high noise levels during the day. In consideration of these factors, different measures of noise exposure have been developed to quantify the extent of the effects anticipated from these activities. For example, some indices consider the 24-hour noise environment of a location by using a weighted average to estimate its habitability on a long-term basis. Other measures consider portions of the day and evaluate the nearby activities affected by it as well as the noise sources. The most commonly used indices for measuring community noise levels are the Equivalent Energy Level (Leq), and the Community Noise Equivalent Level (CNEL).

The decibel level of a sound decreases (or attenuates) exponentially as the distance from the source of that sound increases. For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source. Sound that originates from a linear (or “line”) source, such as a heavily traveled traffic corridor, attenuates by approximately 3 dBA per doubling of distance, provided that the surrounding site conditions lack ground effects or obstacles that either scatter or reflect noise.

Equine Facilities Noise

Ambient noise associated with equine facilities generally include vehicular traffic on proximate roadway segments, delivery vehicles and maintenance activities associated with ongoing facility operations, and direct noise from individual horses and other animals on site.

Noise Effects

Noise has a significant effect on the quality of life. An individual's reaction to a particular noise depends on many factors, such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is perceivable, while 1 to 2 dBA changes generally are not perceived. Although the reaction to noise would vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: sleep disturbance, permanent hearing loss, human performance and behavior, social interaction of communication, extra-auditory health effects, and general annoyance.

Noise-Sensitive Land Uses

Noise-sensitive land uses include areas where an excessive amount of noise would interfere with normal activities. Primary noise-sensitive land uses include residential uses, public and private educational facilities, hospitals, convalescent homes, hotels/motels, daycare facilities, and passive recreational parks. Sleep disturbance is the most critical concern for a noise-sensitive land use on a 24-hour basis or longer compared to activities that are occupied only a portion of a day.

Groundborne Vibration

Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hz. The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high frequency of about 200 Hz. Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Ambient and source vibration are often expressed in terms of the peak particle velocity (PPV) or root mean square (RMS) velocity in inches per second that correlates best with human perception. The Federal Transit Administration (FTA) estimates that the threshold of perception is approximately 0.0001 inches/second RMS, and the level at which continuous vibrations begin to annoy people is approximately 0.001 inches/second RMS (FTA 2006).

Vibration-Sensitive Land Uses

Groundborne vibration can disrupt vibration-sensitive land uses by causing movement of buildings, rattling of windows and items inside buildings, rumbling sounds, and even property damage. Vibration-sensitive land uses include buildings where vibration would interfere with operations within the building, such as vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration depends on the specific equipment that would be affected by the vibration. Residential uses are also sensitive to excessive levels of vibration of either a regular or an intermittent nature. According to the Transit Noise and Vibration Impact Assessment (FTA 2006), background vibration level in residential areas is typically 0.00003 inches/second RMS, which is lower than 0.0001 inches/second RMS, the threshold of perception for humans. There are several sources of groundborne vibration in the unincorporated County, including construction, railroad operations, and extractive mining operations (see Table 2.7-3).

Ambient Noise Setting

The County is characterized as a primarily rural environment with low-density development that contributes significantly to the perceived quality of life and the peace and tranquility that exist within the County. However, several higher-density communities, including the Valle de Oro CPA, Spring Valley CPA, and Sweetwater CPA, also exist, which have a louder ambient noise environment.

Non-transportation-related noise generators are commonly called “stationary,” “fixed,” “area,” or “point” sources of noise. Industrial processing; mechanical equipment; pump stations; and heating, ventilating, and air conditioning (HVAC) equipment are examples of fixed-location, non-transportation noise sources within the County. Some non-transportation sources are not stationary but are typically assessed as point or area sources due to the limited area in which they operate, such as truck deliveries, agricultural field machinery, and mining equipment.

Temporary and/or Nuisance Noise

Temporary construction activities are disturbing to residents but are difficult to attenuate and control. Noise complaints occur more frequently in densely developed areas of the unincorporated County, such as the Spring Valley CPA and Valle de Oro CPA, as well as areas that are heavily agricultural, such as the Fallbrook CPA and Valley Center CPA.

Community Noise Survey

During February and March 2008, PBS&J conducted noise measurements with the purpose of establishing baselines for transportation and non-transportation noise generators throughout the County. Locations were monitored using a Larson–Davis American National Standards Institute

(ANSI) Type II integrating sound level meter to establish existing ambient noise levels. Noise meter locations varied for each measurement according to site accessibility. A total of 44 short-term (15-minute) measurements were conducted to provide a basis for understanding the overall existing noise environment of the County. A 15-minute sample is considered a "snapshot" of the baseline noise environment at a given time; however, the sound level would vary depending on time, day, or season.

The results of the community noise survey show that the locations with the highest noise levels (between 70 dBA and 74 dBA Leq) were roadways (including Interstate 8 (I-8), boulevards, and a prime arterial), a Sprinter pass-by area in North County Metro Subregion, a shooting range in Valle de Oro CPA, the Ramona Landfill, and construction in Spring Valley CPA. The locations with the lowest noise levels (between 43 dBA and 50 dBA) were a resort in Borrego Springs, residential developments in San Dieguito CPA and Lakeside CPA, and noise-sensitive biological resources in Lakeside CPA, all of which were subject to limited traffic noise. Other land use designations in this range were a recreational park in Julian CPA, a school in Pala/Pauma Valley Subregion with school bells and children at recess, and agricultural use in Pala/Pauma Valley Subregion using tractors and forklifts.

Noise Contours

Noise level contours are used as a guide for minimizing the exposure of community residents to noise. Noise contours represent lines of equal noise exposure. Contours are used to provide a general visualization of sound levels and should not be considered as absolute lines of demarcation. Noise contours for roadway noise sources in the County were developed for existing conditions (2007) and the General Plan Update conditions (2030) and are expressed as CNEL values.

2.7.2 Regulatory Setting

Federal Regulations

Federal Aviation Administration Standards

Enforced by the Federal Aviation Administration (FAA), Title 14, Part 150 of the Code of Federal Regulations prescribes the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. Title 14 also identifies land uses that are normally compatible with various levels of exposure to noise by individuals. It provides technical assistance to airport operators, in conjunction with other local, state, and federal authorities, to prepare and execute appropriate noise compatibility planning and implementation programs. The FAA establishes a CNEL of 65 dBA as the noise standard associated with aircraft noise.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has indicated that residential noise exposure of 55 to 65 dBA is acceptable when analyzing land use compatibility (EPA 1981); however, these guidelines are not regulatory. With regard to noise exposure and workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 CFR 1910.95). OSHA specifies that sustained noise over 85 dBA (8-hour time-weighted average) can be a threat to workers' hearing, and if worker exposure exceeds this amount, the employer shall develop and implement a monitoring plan (29 CFR 1910.95(d)(1)).

U.S. Office of Surface Mining Reclamation and Enforcement

The U.S. Office of Surface Mining Reclamation and Enforcement (OSM) has established guidelines related to blasting for surface mining activities. The OSM guidelines requires the operator to distribute a blasting schedule, post blasting signs, and control access within the blasting area. OSM has established air blast and ground vibration limits at the location of any dwelling, public building, school, church, or community building outside the permit area. The standard PPV damage threshold for residential structures is 2.0 inches per second. This requirement is based on the findings and recommendations of several reports made by the former U.S. Bureau of Mines.

State Regulations

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, finds that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

California Airport Noise Standards (21 CCR 5000 et seq.)

The 1990 California Airport Noise Standards are designed to cause the airport proprietor, aircraft operator, local governments, pilots, and the California Department of Transportation's (Caltrans) Division of Aeronautics to work cooperatively to diminish noise. The regulations accomplish these ends by controlling and reducing noise in the communities in the vicinity of airports. The

level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dBA. The limitations on airport noise in residential communities are established as follows:

a. The criterion CNEL is 65 dBA for proposed new airports and for active military airports being converted to civilian use.
b. The criterion CNEL for existing civilian airports is 65 dBA.

California Airport Land Use Planning Handbook

The California Airport Land Use Planning Handbook provides guidance for the assessment of noise compatibility of land uses near airports. Guidance is based on existing federal and state regulations and policies. The handbook states that 65 dBA is the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses and recommends an annual CNEL standard of 60 dBA to be used for new residential development; however, this standard has been set with respect to relatively noisy urban areas and may be too high of a noise level to be appropriate as a standard for land use compatibility planning. The level of noise deemed acceptable in one community is not necessarily the same in another. A noise level above 60 dBA CNEL may be considered incompatible with some residential uses. According to the handbook, noise compatibility standards typically place primary emphasis on residential areas because residential development is one of the most noise-sensitive land uses and usually covers the greatest proportion of urban land. Three CNELs are commonly used as the limit for acceptable residential noise exposure: CNEL 65, 60, or 55 dBA. The handbook also includes normalization factors as a method for adjusting aircraft noise levels used for determining and predicting community reactions. Because the acceptable residential noise level standard may vary between communities, noise compatibility issues are addressed in the Airport Land Use Compatibility Plans (ALUCPs) prepared for individual airports.

All land use jurisdictions in the County have ordinances that regulate activities in order to reduce noise impacts. As stated previously, any noise generated by the construction, operation, and maintenance of projects under the proposed Zoning Ordinance Amendment would be required to comply with the standards and regulations governing noise limits within the applicable jurisdiction.

Local Regulations

Airport Land Use Compatibility Plans

ALUCPs are plans that guide property owners and local jurisdictions in determining what types of proposed new land uses are appropriate around airports. They are intended to protect the safety of people, property, and aircraft on the ground and in the air in the vicinity of an airport.

ALUCPs are based on a defined area around an airport known as the Airport Influence Area. ALUCPs include policies that address noise compatibility issues associated with airports and their respective Airport Influence Areas.

County of San Diego General Plan Update, Noise Element

The General Plan Update Noise Element establishes noise and land use compatibility standards and outlines goals and policies to achieve these standards. The County's General Plan Noise Element characterizes the noise environment in the County and provides the context for the County's noise/land use compatibility guidelines and standards. The Noise Element also describes the County's goals for achieving the standards and introduces policies designed to implement the goals. Under implementation of the General Plan Update, the County would use the Noise Compatibility Guidelines to determine the compatibility of land uses when evaluating proposed development projects. The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments.

A land use located in an area identified as "acceptable" indicates that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can carry out outdoor activities with minimal noise interference. Land uses that fall into the "conditionally acceptable" noise environment should have an acoustical study that considers the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source has the potential to interfere with sleep, speech, or other activities characteristic of the land use. For land uses indicated as "conditionally acceptable," structures must be able to attenuate the exterior noise to the indoor noise level as indicated in the Noise Standards. For land uses where the exterior noise levels fall within the "unacceptable" range, new construction generally should not be undertaken.

San Diego County Code of Regulatory Ordinances Title 3, Division 6, Chapter 4, Sections 36.401–36.435, Noise Ordinance

The Noise Ordinance establishes prohibitions for disturbing, excessive, or offensive noise as well as provisions such as sound level limits for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet for its citizens. Planned compliance with sound level limits and other specific parts of the ordinance allows presumption that the noise is not disturbing, excessive, or offensive. Limits are specified depending on the zoning placed on a property (e.g., varying densities and intensities of residential, industrial, and commercial zones). Where two adjacent properties have different zones, the sound level limit at a location on a boundary between two properties is the arithmetic mean of the respective limits for the two zones, except for extractive industries. The 1-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 dBA at the property line regardless

of the zone in which the extractive industry is located. It is unlawful for any person to cause or allow the creation of any noise that exceeds the applicable limits of the Noise Ordinance at any point on or beyond the boundaries of the property on which the sound is produced.

Section 36.404 of the County Noise Ordinance contains sound level limits specific to receiving land uses. Sound level limits are in terms of a 1-hour average sound level. The allowable noise limits depend upon the County's zoning district and time of day. The proposed project would be located in any zone within the County. Tables 2.7-4 and 2.7-5 list the sound level limits for the County. Section 36.408 of the County Noise Ordinance sets limits on the time of day and days of the week that construction can occur, as well as setting noise limits for construction activities. In summary, the ordinance prohibits operating construction equipment on the following days and times:

- Mondays through Saturdays except between the hours of 7:00 a.m. and 7:00 p.m.
- Sundays and days appointed by the president, governor, or board of supervisors for a public fast, Thanksgiving, or other holiday.

In addition, the code requires that between the hours of 7:00 a.m. and 7:00 p.m., no equipment shall be operated so as to cause an 8-hour average construction noise level in excess of 75 dBA when measured at the boundary line of the property where the noise source is located, or on any occupied property where the noise is being received.

2.7.3 Analysis of Project Effects and Determination of Significance

The proposed project consists of an amendment to the Zoning Ordinance related to equine uses in unincorporated portions of the County over which the County has land use jurisdiction; see Section 1.4, Project Components, and Appendix A for further details. The following impact analysis below has been separated into Tier One/Tier Two and Tier Three/Tier Four equine facilities to reflect the distinction in the level of review required for the establishment of each use (non-discretionary versus discretionary).

2.7.3.1 Excessive Noise Levels

Guidelines for the Determination of Significance

The following significance guideline from Appendix G of the California Environmental Quality Act (CEQA) Guidelines applies to direct and indirect impact analysis, as well as the cumulative impact analysis.

A significant impact would result if:

- The project would result in the exposure of persons to or generation of noise levels in excess of standards established by the County's General Plan, County's Noise Ordinance, County's Noise Compatibility Guidelines, or County's Zoning Ordinance.

Analysis

Noise levels are regulated by the County General Plan Noise Element and Noise Ordinance. The Noise Element designates permissible noise levels (dBA) for various land-use zones and regulates vehicle noise levels associated with development. The Noise Ordinance also regulates noise levels associated with on-site operation and construction, and includes permissible noise levels.

Tier One and Tier Two

The following analyzes potential noise impacts associated with Tier One and Tier Two facilities.

Construction

Construction of Tier One and Tier Two projects would involve erection of structures that would be associated with equine facilities including horse stables, animal enclosures, and pastures, as well as related infrastructure including parking lots, driveways, fences, and buildings. Construction noise can vary substantially from day to day, depending on the level of activity and the specific type of operation. Therefore, such noise levels can be approximately analyzed only with a corresponding uncertainty in precise ambient noise impacts.

It is not anticipated that blasting would be required to support the construction of any Tier One and Tier Two facilities. Construction activities would be temporary and would not include equipment associated with the generation of excessive noise and in many cases, heavy construction equipment would not be required for the construction of Tier One and Tier Two facilities and infrastructure. Additionally, Section 36.408 of the County's Noise Ordinance sets limits on hours of operation for construction equipment, and Section 36.409 of the County's Noise Ordinance sets sound level limits on construction equipment. In summary, the ordinance prohibits operating construction equipment on the following days and times:

- Mondays through Saturdays except between the hours of 7:00 a.m. and 7:00 p.m.
- Sundays or a holiday (January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the president as a special national holiday or the governor of the state as a special state holiday). A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence provided compliance with Section 36.409 and 36.410 of the County's Noise Ordinance.

The code also requires that between the hours of 7:00 a.m. and 7:00 p.m. no equipment shall be operated so as to cause an 8-hour average construction noise level in excess of 75 dBA when measured at the boundary line of the property where the noise source is located, or on any occupied property where the noise is being received. In addition, these facilities are anticipated to require minimal material deliveries during construction. As a result, construction noise for Tier One and Tier Two facilities would meet County Noise Ordinance and General Plan Noise Element requirements. Construction impacts associated with Tier One and Tier Two facilities would result in **less-than-significant** noise levels.

Operational

Upon completion of construction activities, noise levels at Tier One and Tier Two facilities would be minimal and intermittent. As described in Section 2.7.1, operational noise from a typical equine facility would consist of vehicular traffic on proximate roadway segments, delivery vehicles and maintenance activities associated with ongoing facility operations, and direct noise from individual animals on site.

Maintenance of Tier One and Tier Two facilities is often conducted by the owner/operator of the facility with the assistance of maintenance staff. Smaller stables might have one staff member, whereas larger facilities might have up to three or four. Based on data collected by County Staff, which includes facility site visits and interviews of 20 stable operators, the owner/operator of equine facilities usually staff about two full-time employees for general maintenance work. Maintenance activities may include vegetation clearance as needed, equine feeding, regular facility cleaning and maintenance, and waste disposal. These activities would not result in a large number of vehicle trips to the future project sites or generate substantial noise. Tier Two facilities are only anticipated to generate 20 to 30 average daily trips (ADTs) (see Table 2.9-6b). Additionally, all Tier One and Tier Two facilities would be required to comply with the County Noise Ordinance. Therefore, noise impacts from operation and maintenance activities would be **less than significant**.

Tier Three and Tier Four

On-site noise generating sources for Tier Three and Tier Four facilities could include operation and maintenance activities such as landscaping and facility maintenance equipment, horse training and exercising activities, and direct noise from individual animals on site. Additional temporary noise sources could occur during on-site events including but not limited to, riding classes, horse training, animal sales and auctioning, equine shows, and competitions which would draw additional personnel and spectators to the site, and may require the use of a microphone or loud speaker amplification system. As stated in the proposed Zoning Ordinance Amendment, limitations on location and duration of larger events would be imposed to ensure noise sources would not persist over an extended period of time.

Under the proposed Zoning Ordinance Amendment, temporary gathering of additional people and horses that are not a part of the regular operations of a horse stable, for a horse event, show, or competition is considered a Community Outdoor Entertainment Event and may be allowed in compliance with Section 6106 of the Zoning Ordinance, which addresses Circus, Carnival, or other Outdoor Entertainment Events. Section 6106 of the Zoning Ordinance states that Outdoor Entertainment Events must obtain a license pursuant to the Uniform Licensing Procedure of the County Code. Outdoor Entertainment Events may be permitted in any zone; however, zones RS, RD, RM, and RV require a Major Use Permit (MUP). License approval for Outdoor Entertainment Events would also be dependent on duration of the event. An Administrative Permit or MUP for a Horse Stable may specify an extended period of operation or Horse Events per year. Additionally, community events pursuant to Title 2, Division 1, Chapter 2 of the County Code would be conducted under the authority of the Department of Environmental Health which would regulate noise sources and associated noise levels from such events. Moreover, restrictions, density ranges, and setbacks for animal enclosures are established in the proposed Zoning Ordinance Amendment depending on a property's animal designator, which would reduce on-site noise generation during facility operations.

As previously discussed, all future Tier Three and Tier Four projects would be subject to discretionary review. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts relative to excessive noise levels. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, propose mitigation measures to minimize potentially significant environmental effects, and possibly identify alternatives that would reduce or avoid the significant impacts.

Additionally, Tier Three and Tier Four facilities would be required to comply with the County's Noise Compatibility Guidelines, General Plan Noise Element noise standards, and Noise Ordinance. Compliance with these regulations would be ensured through ongoing compliance review. The regulations establish A-weighted sound level limits for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet. While on-site generated noise would be regulated by and required to comply with the Noise Ordinance, off-site noise generated from vehicular traffic and delivery trucks could potentially result in significant noise impacts. Potential off-site noise sources, such as these, cannot be analyzed at this time as they are dependent on a variety of factors that are specific to a project and its location. Ultimately, there is no guarantee on a project-specific level that mitigation measures would reduce off-site generating noise impacts to a level below significant. Therefore the proposed project would result in **potentially significant impacts** (**N-1**).

2.7.3.2 Excessive Groundborne Vibration

Guidelines for Determination of Significance

The following significance guideline from Appendix G of the CEQA Guidelines applies to direct and indirect impact analysis, as well as the cumulative impact analysis. Table 2.7-6 shows the County Guidelines for Determining the Significance of Groundborne Vibration and Noise Impacts.

A significant impact would result if:

- The project would result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Analysis

Potential sources of groundborne vibration include construction, railroads, and extractive mining operations. The proposed Zoning Ordinance Amendment applies to a large portion of the unincorporated County (approximately 356,898 acres); therefore, it includes sites that may be impacted with potential excessive groundborne vibration or groundborne noise levels.

Tier One and Tier Two

The levels of vibration generated during construction activities would depend on a number of factors, including the amount of vibration-generating activity (grading/excavation) required for the project and the nearest vibration-sensitive receptor. Construction of Tier One and Tier Two projects would involve erection of structures that would be associated with equine facilities including horse stables, animal enclosures and pastures as well as related infrastructure including parking lots, driveways, fences, and buildings. Construction noise can vary substantially from day to day, depending on the level of activity and the specific type of operation. It is not anticipated that blasting would be required to support the construction of any Tier One or Tier Two facilities. Future grading operations would be minimal and in many cases would not be required. Vibration is subjective, and could become a nuisance to the public at continuous vibration levels near the level of perception (or at approximately a peak particle velocity of .01 inch/second). Future Tier One or Tier Two facilities are not expected to require blasting or major grading activities requiring the operation of heavy earth-moving equipment. Therefore, the construction of future Tier One and Tier Two facilities would not generate substantial groundborne vibration or groundborne noise, and potential impacts would be **less than significant**.

Tier Three and Tier Four

All future Tier Three and Tier Four facilities would be subject to discretionary review and required to obtain an Administrative or Major Use Permit, respectively. As part of the County's discretionary review process, these facilities would be evaluated under CEQA and would be required to implement measures to minimize impacts to groundborne vibration and groundborne noise levels. As part of the CEQA process, the County would require projects with the potential to result in vibration impacts to conduct a Noise Impact Analysis report to determine if impacts would be significant. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, propose mitigation measures to minimize potentially significant environmental effects, and possibly identify alternatives that would reduce or avoid the significant impacts identified for the proposed project. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and required to implement the maximum feasible mitigation measures. Future development of Tier Three and Tier Four facilities would be anticipated to meet the limits stated in Tables 2.7-3 and 2.7-6. The Zoning Ordinance establishes vibration limits that must be adhered to for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet. Therefore, impacts would be **less than significant**.

2.7.3.3 Permanent Increase in Ambient Noise Levels

Guidelines for Determination of Significance

The following significance guideline from Appendix G of the CEQA Guidelines applies to direct and indirect impact analysis, as well as the cumulative impact analysis.

A significant impact would result if:

- The project would cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the proposed project.

Analysis

Tier One and Tier Two

Vehicle Traffic Noise

Operational vehicular traffic would consist of approximately 20 to 30 ADT (see Table 2.9-6b) and consist of trips by employees and visitors and occasional delivery trips. Due to the small number of vehicles and equipment likely to be required for maintenance at future project sites, as

discussed in Section 2.7.3.1, increases in ambient noise levels due to operational traffic would be **less than significant**.

On-Site Generated Noise

As discussed in Section 2.7.1, ambient noise associated with equine facilities generally include vehicular traffic on proximate roadway segments, delivery vehicles and maintenance activities associated with ongoing facility operations, and direct noise from individual horses and other animals on site. The ordinance would require, as part of the zoning verification permit process, that the applicant submit information with regard to the noise levels of the proposed equine facility at the proposed location and at the nearest property lines. The implementation of the minimum setbacks under the Zoning Ordinance Amendment and minimal operational and maintenance activities would ensure that any increase of ambient noise from the development of Tier One and Tier Two facilities would be **less than significant.**

Tier Three and Tier Four

On-site noise generating sources for Tier Three and Tier Four facilities are described in Section 2.7.3.1. Additionally, as previously discussed in Section 2.7.3.1, all future Tier Three and Tier Four projects would be subject to discretionary review. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts relative to excessive noise levels. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, propose mitigation measures to minimize potentially significant environmental effects, and possibly identify alternatives that would reduce or avoid the significant impacts.

Additionally, Tier Three and Tier Four facilities would be required to comply with the County's Noise Compatibility Guidelines, General Plan Noise Element noise standards, and Noise Ordinance. Compliance with these regulations would be ensured through ongoing compliance review. The regulations establish A-weighted sound level limits for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet. While on-site generated noise would be regulated by and required to comply with the Noise Ordinance, off-site noise generated from vehicular traffic and delivery trucks could potentially result in significant noise impacts. Although there is not enough information currently available, as they are dependent on a variety of factors that are specific to a project and its location, it is possible that these larger facilities could cause a substantial increase in ambient noise levels from both on-site and off-site sources. Therefore the proposed project would result in **potentially significant impacts** (**N-2**).

2.7.3.4 Temporary or Periodic Increase in Ambient Noise Levels

Guidelines for Determination of Significance

The following significance guideline from Appendix G of the CEQA Guidelines applies to direct and indirect impact analysis, as well as the cumulative impact analysis. A significant impact would result if:

- The project would cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed project.

Analysis

Construction activities including, but not limited to, site grading, truck/construction equipment movement, engine noise, and rock excavation would have the potential to result in the exposure of on- or off-site areas to noise in excess of the standards listed in the County Code Sections 36.408 and 36.409. Typical construction equipment noise levels are provided in Table 2.7-7.

Tier One and Tier Two

Construction activities would generate a small amount of temporary traffic on project area roadways. Construction traffic would consist of equipment delivery and additional vehicles if the property owner is unable to construct portions of the project themselves. Some smaller facilities, such as storage structures, would not require construction vehicles at the project site since these facilities can typically be installed by the property owner. Only facilities requiring substantial earth-moving activities or those requiring the delivery of larger-scale equipment would require heavy, drivable equipment. Due to the brief construction time period associated with the installation of Tier One and Tier Two facilities and because traffic generated by the construction of Tier One and Tier Two facilities would be relatively minor, temporary and periodic noise impacts would be **less than significant**.

Tier Three and Tier Four

Temporary noise generating sources for Tier Three and Tier Four facilities include construction activities and events, as described in Section 2.7.3.1. As previously discussed in Section 2.7.3.1, all future Tier Three and Tier Four projects would be subject to discretionary review. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts relative to excessive noise levels. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, propose mitigation measures to

minimize potentially significant environmental effects, and possibly identify alternatives that would reduce or avoid the significant impacts.

Additionally, Tier Three and Tier Four facilities would be required to comply with the County's Noise Compatibility Guidelines, General Plan Noise Element noise standards, and Noise Ordinance. Compliance with these regulations would be ensured through ongoing compliance review. The regulations establish A-weighted sound level limits for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet. While on-site generated noise would be regulated by and required to comply with the Noise Ordinance, off-site noise generated from vehicular traffic and construction trucks could potentially result in significant temporary or periodic noise impacts. Potential off-site noise sources, such as these, cannot be analyzed at this time as they are dependent on a variety of factors that are specific to a project and its location; therefore, it is possible that these larger projects could contribute to a temporary or periodic increase in ambient noise levels. Ultimately, there is no guarantee on a project-specific level that mitigation measures would reduce off-site generating noise impacts to a level below significant. Therefore the proposed project would result in **potentially significant impacts (N-3).**

2.7.3.5 Excessive Noise Exposure from a Public or Private Airport

Guidelines for Determination of Significance

The following significance guideline from Appendix G of the CEQA Guidelines applies to direct and indirect impact analysis, as well as the cumulative impact analysis.

A significant impact would result if:

- The project is located within 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, that would expose people residing or working in the project area to excessive noise levels.
- The project is located within the vicinity of a private airstrip that would expose people residing or working in the project area to excessive noise levels.

Analysis

The proposed project would have a significant impact if it would expose people residing or working in the project area to excessive noise levels from a public airport or private airstrip. Six public airports are located in the unincorporated County. These include Agua Caliente Airstrip (Desert Subregion), Borrego Valley Airport (Desert Subregion), Fallbrook Community Airpark (Fallbrook CPA), Jacumba Airport (Mountain Empire Subregion), Ocotillo Airstrip (Desert Subregion), and Ramona Airport (Ramona CPA). Gillespie Field is located in the City of El Cajon.

The level of noise acceptable to new development in the vicinity of proposed new airports, active military airports being converted to civilian use, and existing civilian airports is established as an annual CNEL of 60 dBA. Noise-sensitive land uses should generally not be located within the 60 dBA annual CNEL noise contour of a public airport or within 2 miles of a private airstrip.

Tier One and Tier Two

The proposed project does not include the development of noise-sensitive land uses and would not expose people to excessive noise levels due to the proximity of a public or private airport. Therefore, there would be **no impact**.

Tier Three and Tier Four

The proposed project does not include the development of noise-sensitive land uses and would not expose people to excessive noise levels due to the proximity of a public or private airport. Therefore, there would be **no impact**.

2.7.4 Cumulative Impact Analysis

The geographic scope of cumulative impact analysis for noise is limited to areas surrounding noise-generating sources, such as roadways, agricultural, or industrial uses, because noise impacts are localized in nature. Geographic scope can be the entire area within which the resource has the potential to occur. For the purpose of this environmental impact report (EIR), the geographic scope for the cumulative analysis of noise impacts includes the San Diego region, which encompasses the entire County, including both incorporated and unincorporated areas, as well as surrounding counties, and tribal and public agency lands.

2.7.4.1 Noise Exposure

A cumulative noise impact would occur if construction and operation associated with cumulative regional land use projects, such as those identified in adjacent city and county general plans and regional transportation plans, would exceed the noise compatibility guidelines and standards of the Noise Element. For example, the 2030 San Diego Regional Transportation Plan Projects, such as the expansion of a portion of I-8, would increase traffic noise above the Noise Element standards. However, development and construction proposed under most cumulative projects would be subject to regulations that require compliance with noise standards, such as those contained in the State of California Code of Regulations and those required by the OSM. The exception to this would be projects proposed on tribal lands. Therefore, even though required regulations would minimize the cumulative impact of projects in San Diego County, development in or on tribal lands within the vicinity of existing noise-sensitive land uses would

not be required to comply with the same noise standards, and a potentially cumulatively considerable impact would occur.

Tier One and Tier Two

As described in Section 2.7.1, construction and operational noise for Tier One and Tier Two facilities would be below the thresholds established in the County's Noise Compatibility Guidelines and Noise Ordinance. Therefore, the development of Tier One and Tier Two facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

Tier Three and Tier Four

As discussed previously, development of future Tier Three and Tier Four facilities would be required to comply with the County's Noise Compatibility Guidelines, General Plan Noise Element Noise Standards, and Noise Ordinance prior to approval. Additionally, as part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts to ambient noise. However, as there is no guarantee on a project-specific level that mitigation measures will reduce impacts to a level below significant, the proposed project **would potentially contribute to a cumulatively considerable impact (N-4)**.

2.7.4.2 Excessive Groundborne Vibration

A cumulative groundborne vibration impact would occur if one or more cumulative projects would result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. However, there are no specific plans or time scales for individual construction projects. Therefore, it is not possible to determine exact vibration levels, locations, or time periods for construction. Potential vibration impacts from construction would need to be analyzed on a case-by-case basis. Therefore, cumulative projects have the potential to result in a cumulatively considerable impact if located in close proximity to one another and if construction of multiple cumulative projects were to occur at the same time. Therefore, a potentially cumulatively considerable impact may occur.

Tier One and Tier Two

As described in Section 2.7.3.1, future Tier One and Tier Two facilities are not expected to require blasting or major grading activities and, therefore, are not expected to require the operation of heavy earth-moving equipment that would result in vibration impacts. Therefore, the development of Tier One and Tier Two facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

Tier Three and Tier Four

As described in Section 2.7.3.1, all future Tier Three and Tier Four facilities would be required to comply with the County's Noise Compatibility Guidelines, General Plan Noise Element Noise Standards, and Noise Ordinance prior to approval and are anticipated to meet the vibration limits stated in Tables 2.7-3 and 2.7-6. Therefore, the development of Tier Three and Tier Four facilities under the proposed project **would not contribute to a cumulatively considerable impact** regarding groundborne vibration.

2.7.4.3 Permanent Increase in Ambient Noise Levels

A cumulative noise impact would occur if construction and development associated with cumulative regional land use projects, such as those identified in adjacent city and county general plans and regional transportation plans, when combined would result in a substantial permanent increase in ambient noise in the project vicinity above levels existing without the proposed projects. For example, the extension of State Route (SR) 905 from I-805 to the U.S.–Mexico international border and widening of SR-94 from SR-125 to Jamacha Road would result in a permanent increase in ambient noise due to an increase in roadway noise.

Tier One and Tier Two

As described in Section 2.7.3.3, the implementation of the minimum setbacks under the Zoning Ordinance Amendment and minimal operational and maintenance activities and traffic generation associated with these smaller facilities would ensure that ambient noise levels are not increased a substantial amount. Therefore, the development of Tier One and Tier Two facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

Tier Three and Tier Four

As described in Section 2.7.3.3, all future Tier Three and Tier Four facilities would be required to comply with the County's Noise Compatibility Guidelines, General Plan Noise Element Noise Standards, and Noise Ordinance prior to approval. Additionally, as part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts to ambient noise. However, these larger projects could potentially contribute to an increase in ambient noise levels as there is no guarantee on a project-specific level that mitigation measures will reduce impacts to a level below significant, the proposed project would potentially contribute to a cumulatively considerable impact (N-5).

2.7.4.4 Temporary or Periodic Increase in Ambient Noise Levels

A cumulative noise impact would occur if construction associated with one or more projects in close proximity to one another would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed projects. However, since there are no specific plans or time scales for individual projects, it is not possible to determine exact noise levels, locations, or time periods for construction. Additionally, projects would have to be constructed in close proximity to each other to result in a cumulative impact. Construction projects in incorporated jurisdictions would be subject to noise standards and limits for the jurisdiction in which they are proposed. Projects proposed on tribal lands would not be subject to County of San Diego noise regulations and standards; however, potential construction noise-related impacts in these areas would be temporary and limited to the area immediately surrounding the project. Similarly, a cumulative nuisance noise impact would occur if noise associated with one or more land uses in an area would result in combined noise levels that would temporarily increase ambient noise levels beyond the standards in the County Noise Ordinance. However, these events would be short-term and event-specific in nature. Therefore, a potentially cumulatively considerable impact associated with temporary increases in ambient noise levels is not anticipated to occur.

Tier One and Tier Two

As described in Section 2.7.3.4, due to the brief construction time period associated with the construction of Tier One and Tier Two facilities, and because traffic generated by the construction of these facilities would be relatively minor, temporary and periodic noise impacts would be less than significant. Therefore, the development of Tier One and Tier Two facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

Tier Three and Tier Four

Although these larger facilities would be subject to CEQA, there is no guarantee on a project-specific level that mitigation measures will reduce potential cumulative impacts to a level below significant, when considered in combination with other cumulative projects that may occur in the site vicinity; therefore, the proposed project **would potentially contribute to a cumulatively considerable impact (N-6)**.

2.7.4.5 Excessive Noise Exposure from a Public or Private Airport

A cumulative noise impact would occur if construction and operation associated with cumulative regional land use projects, such as those identified in adjacent city and county general plans and regional transportation plans, when combined would result in the exposure of people residing or working in the project area to excessive noise from a public or private airport. Development and construction proposed under most cumulative projects would be subject to regulations that

require compliance with noise standards, such as the 1990 California Airport Noise Standards and applicable ALUCPs. The exception to this would be projects proposed on tribal lands. It is possible that a new private airstrip would be proposed as part of a cumulative project on tribal land that would result in the exposure of noise-sensitive land uses to excessive noise. For example, a health clinic is proposed for the Ewiiaapaayp Reservation, as listed in Table 1-5b, Proposed Projects on Tribal Lands, and health clinics sometimes include helipads to transport patients. Therefore, even though required regulations would minimize the cumulative impact of projects in the United States, development on tribal lands within the vicinity of existing noise-sensitive land uses would not be required to comply with the same noise standards, and a potentially cumulatively considerable impact could occur.

Tier One and Tier Two

As described in Section 2.7.3.5, the proposed project does not include the development of noise-sensitive land uses and would not expose people to excessive noise levels due to the proximity of a public or private airport. Therefore, the development of Tier One and Tier Two facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

Tier Three and Tier Four

As described in Section 2.7.3.5, the proposed project does not include the development of noise-sensitive land uses and would not expose people to excessive noise levels due to the proximity of a public or private airport. Therefore, the development of Tier Three and Tier Four facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

2.7.5 Significance of Impacts Prior to Mitigation

The proposed project would result in potentially significant impacts related to noise levels in excess of County standards (**N-1** and **N-4**), substantial increase in ambient noise levels (**N-2** and **N-5**), and substantial temporary or periodic increases in ambient noise levels (**N-3** and **N-6**) as a result of Tier Three and Tier Four facility development. The proposed project would not result in potentially significant impacts associated with excessive groundborne vibration or excessive noise exposure from airports. Tier One and Tier Two facilities would not result in any significant noise impacts.

2.7.6 Mitigation Measures

2.7.6.1 Noise Exposure

The proposed project would amend current regulations related to Tier Three and Tier Four equine facilities that may directly or indirectly affect noise exposure (**N-1** and **N-4**). Appropriate feasible and enforceable mitigation measures could not be identified that would reduce potential impacts.

As it cannot be concluded at this stage that impacts related to excessive noise levels from Tier Three and Tier Four facilities would be avoided or mitigated, impacts would remain significant and unavoidable. Chapter 4, Project Alternatives, provides a discussion of alternatives to the proposed project that would result in some reduced impacts associated with noise exposure as compared to the proposed project.

2.7.6.2 Excessive Groundborne Vibration

The project will not result in any significant impacts due to excessive groundborne vibration and no mitigation measures are required.

2.7.6.3 Permanent Increase in Ambient Noise Levels

The proposed project would amend current regulations related to Tier Three and Tier Four projects that may directly or indirectly result in a substantial permanent increase in ambient noise levels (**N-2** and **N-5**). Appropriate feasible and enforceable mitigation measures could not be identified that would reduce potential impacts. Therefore, these impacts would remain significant and unavoidable. Chapter 4, Project Alternatives, provides a discussion of alternatives to the proposed project that would result in some reduced impacts associated with permanent increases in ambient noise levels as compared to the proposed project.

2.7.6.4 Temporary or Periodic Increase to Ambient Noise

The proposed project would amend current regulations related to Tier Three and Tier Four equine projects that may result in temporary or periodic increases in ambient noise levels (**N-3** and **N-6**). Mitigation measures described below have been identified that would reduce noise impacts during construction, but not below a significant level.

Mitigation Measures

M N-1: Prior to grading permit issuance, the County shall ensure that:

- All construction equipment, fixed or mobile, is equipped with properly operating and maintained mufflers.
- Construction noise reduction methods such as shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment, shall be used where feasible.

- During construction, stationary construction equipment shall be located such that emitted noise is directed away from or shielded from sensitive noise receivers.
- During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors.
- Construction shall only occur Mondays through Saturdays between the hours of 7:00 a.m. and 7:00 p.m. Construction shall not be allowed on Sundays or a holiday (January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the president as a special national holiday or the governor of the state as a special state holiday). A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence provided compliance with Section 36.409 and 36.410 of the County's Noise Ordinance.

2.7.6.5 Excessive Noise Exposure from a Public or Private Airport

The project will not result in any significant impacts to due to excessive noise exposure from a public or private airport and no mitigation measures are required.

2.7.7 Conclusion

Noise Exposure

Development of Tier One and Tier Two facilities pursuant to the proposed Zoning Ordinance Amendment would not result in a significant adverse effect due to exposing people to or generating noise levels in excess of standards established in the County's General Plan, County's Noise Ordinance, County's Noise Compatibility Guidelines, or County's Zoning Ordinance. Tier Three and Tier Four facilities developed under the proposed project would result in significant impacts relative to noise exposure (**N-1** and **N-4**). Feasible and enforceable mitigation measures that would reduce direct and cumulative impacts could not be identified. Therefore, impacts would remain **significant and unavoidable**.

Groundborne Vibration and Noise Impacts

The proposed project would not result in a significant adverse effect due to exposing people to or generating excessive groundborne vibration or groundborne noise levels.

Permanent Increase to Ambient Noise

Development of Tier One and Tier Two facilities pursuant to the proposed Zoning Ordinance Amendment would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the proposed project. Three and Tier Four facilities developed under the proposed project would result in significant impacts (**N-2** and **N-5**) relative to a permanent increase in ambient noise. Feasible and enforceable mitigation measures that would reduce direct and cumulative impacts could not be identified. Therefore, impacts would remain **significant and unavoidable**.

Temporary or Periodic Increase to Ambient Noise

Development of Tier One and Tier Two facilities pursuant to the proposed Zoning Ordinance Amendment would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed project. Tier Three and Tier Four facilities developed under the proposed project would result in significant impacts (**N-3** and **N-6**) relative to a temporary or periodic increase in ambient noise. Feasible and enforceable mitigation measures that would reduce direct and cumulative impacts have been identified; however, impacts would remain **significant and unavoidable** following mitigation.

Excessive Noise Exposure from a Public or Private Airport

The proposed project would not result in significant adverse effect to an airport land use plan, within 2 miles of a public airport or public use airport, or within the vicinity of a private airstrip that would expose people residing or working in the project area to excessive noise levels.

Table 2.7-1
Hearing Thresholds in the Infrasonic and Low Frequency Range

Frequency (Hz)	4	8	10	16	20	25	40	50	80	100	125	160	200
Sound pressure level (dB)	107	100	97	88	79	69	51	44	32	27	22	18	14

Note: Average hearing thresholds (for young healthy people) in the infrasound (4 Hz to 20 Hz) and low frequency region (10 Hz to 200 Hz).

Table 2.7-2
Typical A-Weighted Sound Levels Measured in the Environment and Industry

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

Source: Caltrans 2009, pp. 2–21

Table 2.7-3
Guideline for Determining the Significance of
Groundborne Vibration and Noise Impacts for Special Buildings

Type of Building or Room	Groundborne Vibration Impact Levels (inches/second RMS)		Groundborne Vibration Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	*Occasional or Infrequent Events*[2]	*Frequent Events*[1]	*Occasional or Infrequent Events*[2]
Concert Halls, TV Studios, and Recording Studios	0.0018	0.0018	25 dBA	25 dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theatres	0.0040	0.014	35 dBA	43 dBA

Source: FTA 2006
Notes: [1] "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
[2] "Occasional or Infrequent Events" are defined as fewer than 70 vibrations events per day. This combined category includes most commuter rail systems.

Table 2.7-4
San Diego County Noise Ordinance Sound Level Limits

Zone	Applicable Limit 1-Hour Average Sound Level (dB)		
	7 a.m. to 7 p.m.	*7 p.m. to 10 p.m.*	*10 p.m. to 7 a.m.*
(1) RS, RD, RR, RHM, A70, A72, S80, S81, S87, S90, S92, RV, and RU with a density of less than 11 dwelling units per acre	50	50	45
(2) RRO, RC, RM, C30, S86, V5 and RV and RU with a density of 11 or more dwelling units per acre	55	55	50
(3) S94, V4, all other commercial zones	60	60	55
(4) V1, V2	60	55	see below
V1	60	55	55
V2	60	55	50
V3	70	70	65
(5) M50, M52, and M54	70	70	70
(6) S82, M56, and M58	75	75	75
(7) S88 (see note 4 below)			

Source: County Of San Diego 2011b

Table 2.7-5
San Diego County Code Section 36.404 Sound Level Limits in Decibels (dBA)

Zone	Time	1-Hour Average Sound Level Limits (dBA)
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
(2) R-RO, R-C, R-M, S-86, V5 and R-V and R-U with a density of 11 or more dwelling units per acre	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
(3) S-94, V-4 and all other commercial zones	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
(4) V1, V2 V1, V2 V1 V2	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m. 10 p.m. to 7 a.m.	60 55 55 50
V3	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	70 65
(5) M-50, M-52, and M-54	Anytime	70
(6) S-82, M-56, and M-58	Anytime	75

Note: If the measured ambient level exceeds the applicable limit noted above, the allowable 1-hour average sound level shall be the ambient noise level, plus 3 dB. The ambient noise level shall be measured when the alleged noise violation source is not operating.
Source: County of San Diego 2009b, Table 36.404

Table 2.7-6
Guideline for Determining the Significance of Groundborne Vibration and Noise Impacts

Land Use Category	Groundborne Vibration Impact Levels (inches/second RMS)		Groundborne Vibration Impact Levels (dB re 20 microPascals)	
	Frequent Events[1]	*Occasional or Infrequent Events*[2]	*Frequent Events*[1]	*Occasional or Infrequent Events*[2]
Category 1: Buildings where low ambient vibration is essential for interior operations (research and manufacturing facilities with special vibration constraints)	0.0018[3]	0.0018[3]	N/A	N/A
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, and other sleeping facilities)	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, and quiet uses)	0.0056	0.014	40 dBA	48 dBA

Source: FTA 2006

Notes: [1] "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Occasional or Infrequent Events" are defined as fewer than 70 vibrations events per day. This combined category includes most commuter rail systems.

[3] This criterion limit is based on a level that is acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design on HVAC systems and stiffened floors.

Table 2.7-7
Typical Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Crane, Derrick	88
Dozer	85
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pile-drive (Impact)	101
Pump	76
Roller	74
Scraper	89
Truck	88

Source: County Of San Diego 2011b, p. 2.11-59