3.11 Noise

This section of the Draft EIR (DEIR) discusses the existing noise setting, identifies potential noise impacts associated with implementation of the proposed project, and recommends mitigation measures to address potential impacts. Specifically, this section analyzes potential noise impacts due to development of the proposed project relative to the existing ambient noise environment and applicable noise criteria. Noise mitigation measures are recommended where the predicted noise levels would exceed applicable noise standards. This section was based on the noise and groundborne vibration impact assessment for the proposed project performed by Ambient Air Quality & Noise Consulting (2011) and attached as **Appendix 3.11-A**.

3.11.1 SETTING

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency. Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA. Common community noise sources and associated noise levels, in dBA, are depicted in **Figure 3.11-1**.

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates at a rate between 3.0 to 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. For mobile transportation sources, such as highways, hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance from the source. Noise generated by stationary sources typically attenuates at a rate of approximately 6.0 to 7.5 dBA per doubling of distance from the source.

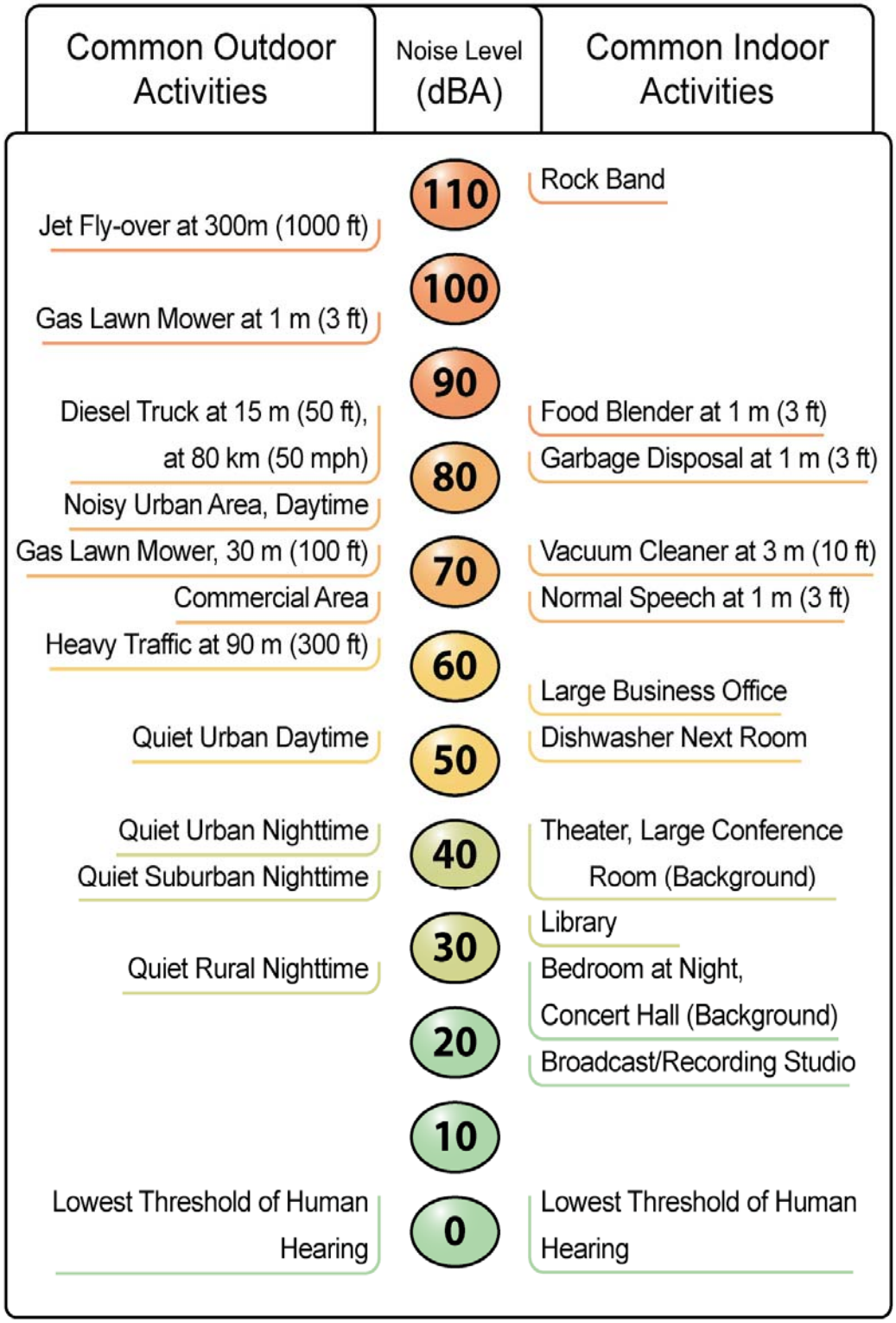
Sound levels can be reduced by placing barriers between the noise source and the receiver. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise, but are less effective than solid barriers.

Noise Descriptors

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are used. The three most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.). Another descriptor that is commonly discussed is the single-event noise exposure level (SENEL), also referred to as the sound exposure level (SEL). The SENEL/SEL describes a receiver's cumulative noise exposure from a single noise event, which is defined as an acoustical event of short duration, such as a backup beeper, the sound of an airplane traveling overhead, or a train whistle. Noise analyses may also depend on measurements of L_{max}, the maximum instantaneous noise level during a specific period of time, and L_{min}, the minimum instantaneous noise level during a specific period. Common noise level descriptors are summarized in **Table 3.11-1**.

TABLE 3.11-1
COMMON ACOUSTICAL DESCRIPTORS

Descriptor	Definition
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the Ldn described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated L_{dn}.
Single Event Level (SEL)	The level of sound accumulated over a given time interval or event. Technically, the sound exposure level is the level of the time-integrated mean square A-weighted sound for a stated time interval or event, with a reference time of one second.



Source: Caltrans, 2011

Figure 3.11-1
Common Noise Levels

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Sound Propagation and Attenuation

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels (dB) for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 dB per doubling of distance from the source.

Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in minimum 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dB exterior-to-interior noise reductions for building facades with windows open and approximately 20–25 dB with windows closed. With compliance with current Title 24 energy efficiency standards, which require increased building insulation and inclusion of an interior air ventilation system to allow windows on noise-impacted facades to remain closed, exterior-to-interior noise reductions typically average approximately 25 dB. The absorptive characteristics of interior rooms, such as carpeted floors, draperies, and furniture, can result in further reductions in interior noise.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of

actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference;
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10 dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

A limitation of using a single noise-level increase value to evaluate noise impacts, as discussed above, is that it fails to account for pre-development noise conditions. With this in mind, the Federal Interagency Committee on Noise (FICON) developed guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. The FICON recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL, L_{dn}). FICON-recommended noise evaluation criteria are summarized in **Table 3.11-2**.

TABLE 3.11-2
FEDERAL INTERAGENCY COMMITTEE ON NOISE
RECOMMENDED CRITERIA FOR EVALUATION OF INCREASES IN AMBIENT NOISE LEVELS

Ambient Noise Level Without Project	Increase Required for Significant Impact
<60 dB	5.0 dB, or greater
60–65 dB	3.0 dB, or greater
>65 dB	1.5 dB, or greater

Source: FICON 2000

As depicted in **Table 3.11-2**, an increase in the traffic noise level of 5.0, or greater, would typically be considered to result in increased levels of annoyance where existing ambient noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB, or greater. Increases of 1.5 dB, or greater, could result in increased levels of annoyance in areas where the ambient noise level exceeds 65 dB. The rationale for the FICON-recommended criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant increases in annoyance (FICON 2000).

Effects of Noise on Human Activities

The extent to which environmental noise is deemed to result in increased levels of annoyance, activity interference, and sleep disruption varies greatly from individual to individual depending on various factors, including the loudness or suddenness of the noise, the information value of the noise (e.g., aircraft overflights, child crying, fire alarm), and an individual's sleep state and sleep habits. Over time, adaptation to noise events and increased levels of noise may also occur. In terms of land use compatibility, environmental noise is often evaluated in terms of the potential for noise events to result in increased levels of annoyance, sleep disruption, or interference with speech communication, activities, and learning. Noise-related effects on human activities are discussed in more detail below.

Speech Communication

For most noise-sensitive land uses, an interior noise level of 45 dB L_{eq} is typically identified for the protection of speech communication in order to provide for 100-percent intelligibility of speech sounds. Assuming an average 20 dB reduction in sound level between outdoors and indoors (which is an average amount of sound attenuation that assumes windows are closed), this interior noise level would equates to an exterior noise level of 65 dBA L_{eq}. For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (USEPA 1974). Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA. Within more noise-sensitive interior environments, such as educational facilities and places of worship, an average-hourly background noise level of 45 dBA L_{eq} is typically recommended (Caltrans 2002a).

Annoyance and Sleep Disruption

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978, Schultz's research findings provided support for L_{dn} as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percentage of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed (Caltrans 2002a).

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance (Caltrans 2002a).

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against long-term sleep interference (USEPA 1974). In California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single-family dwellings). Use of the 45 dBA CNEL threshold is further supported by recommendations provided in the State of California Office of Planning and Research's General Plan Guidelines, which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity" (OPR 2003).

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train passbys, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of other noise metrics, such as the L_{eq} or L_{max} descriptor, are sometime used as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact (Caltrans 2002a).

AFFECTED ENVIRONMENT

Noise-Sensitive Receptors

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The project site encompasses approximately 215 acres located at the east terminus of Rincon Way, one-half mile east of State Route (SR) 49. A majority of the project site is currently undeveloped, with the exception of an existing on-site residential dwelling, which is located within the southwestern portion of the project site. Nearby noise-sensitive land uses consist predominantly of rural residential land uses generally located at varying distances to the west, north, and east of the project site. Land located to the south of the project site, across the Bear River, consists of undeveloped land. Nearby residential land uses are depicted in **Figure 3.11-2**.

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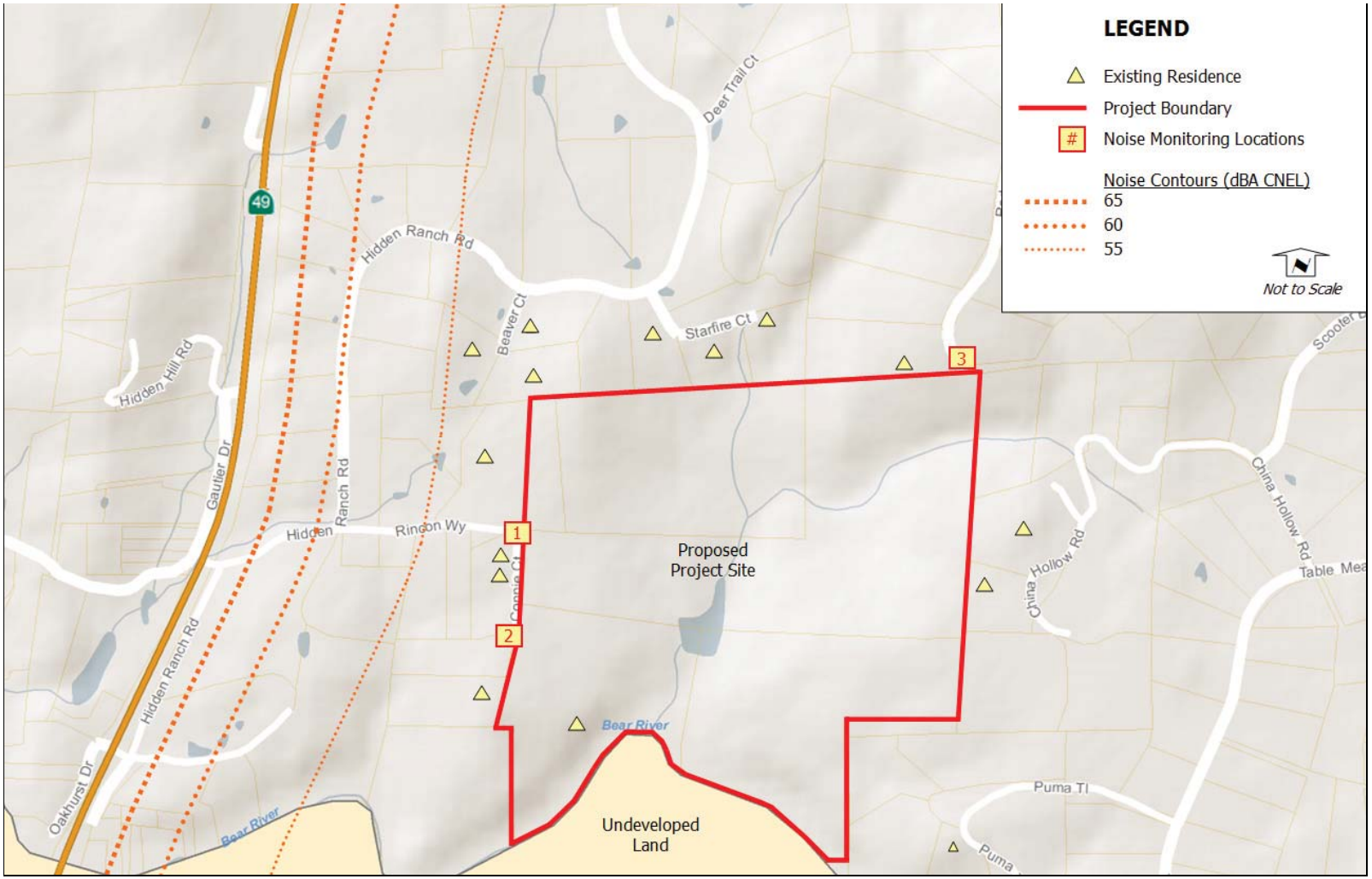

Ambient noise measurement locations correspond to those depicted in ***Table 3****. Depicts residential dwellings within approximately 500 feet of the project boundary. Predicted noise contours do not take into account shielding from intervening terrain or structures. Site boundary, residence, noise contour, and monitoring locations are approximate.*
Image Source: Nevada County 2011

Source: AMBIENT Air Quality & Noise Consulting, 2011

Figure 3.11-2

Existing Noise Environment & Nearby Noise-Sensitive Receptors

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Ambient Noise Environment

The noise environment in the project area is defined primarily by vehicular traffic on SR 49. To a lesser extent, occasional aircraft overflights, activities at nearby residential land uses (e.g., landscape maintenance), and vehicle traffic on local roadways, including Rincon Way, also contribute to ambient noise levels in the project area.

To document existing ambient noise levels in the project area, short-term ambient noise measurements were conducted on June 23, 2011. Noise measurements were conducted using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter positioned at a height of approximately 5 feet above ground level. The meter was calibrated before use and is certified to be in compliance with ANSI specifications. Measured ambient noise levels in the proposed project area are summarized in **Table 3.11-3**. Based on the measurements conducted, ambient noise levels range from approximately 43 to 46 dBA L_{eq}. Maximum intermittent noise levels ranged from approximately 55 dBA L_{max} to 60 dBA L_{max}.

TABLE 3.11-3
SUMMARY OF MEASURED AMBIENT NOISE LEVELS

Location		Monitoring Period	Noise Levels (dBA)	
			L_{eq}	L_{max}
1	10450 Rincon Way	10:00 a.m. – 10:10 a.m.	44.4	62.9
		1:00 p.m. – 1:10 p.m.	45.6	64.3
2	10450 Rincon Way	10:20 a.m. – 10:30 a.m.	43.7	57.8
		1:20 p.m. – 1:30 p.m.	44.2	60.7
3	24912 Connie Court	11:20 a.m. – 11:33 a.m.	43.2	57.4
		1:55 p.m. – 2:10 p.m.	42.8	58.4

Source: Ambient 2011
Ambient noise measurements were conducted on June 23, 2011, using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter placed at a height of approximately 5 feet above ground level. Measurement locations correspond to those depicted in ***Figure 3.11-2.***

Existing Traffic Noise Levels

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to determine noise levels associated with existing vehicle traffic on SR 49 and Rincon Way. The FHWA model used California vehicle reference noise emission factors (CALVENO) for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. Traffic data used in the modeling effort was obtained from the traffic analysis prepared for this project and the California Department of Transportation (Flecker 2011).

Table 3.11-4 depicts predicted existing average-daily traffic noise levels (in CNEL/L_{dn}) at a distance of 50 feet from the near travel-lane centerline for major roadways within the project area, as well as distances to the predicted 65, 60, and 55 dBA CNEL/L_{dn} traffic noise contours. The extent by which nearby land uses are affected by existing traffic noise depends on multiple factors, including their respective proximity to the roadways, shielding provided by intervening terrain and structures, and their individual sensitivity to noise. Predicted existing traffic noise contours for the modeled roadway segments are depicted in **Figure 3.11-2**. The project site is not located within the projected 55 dBA CNEL noise contour of SR 49 or Rincon Way.

TABLE 3.11-4
EXISTING TRAFFIC NOISE LEVELS

Segment	Existing ADT	CNEL/L_{dn} at 50 Feet from Near-Travel-Lane Centerline	Distance (feet) to Noise Level Contours (dBA CNEL/L_{dn}) from Roadway Centerline		
			65	60	55
SR 49	28,000	74.38	296	636	1,369
Rincon Way	459	43.41	Within Roadway Right-of-Way		

Source: Ambient 2011
*Refer to **Appendix 3.11-A** for modeling assumptions and results.*

3.11.2 REGULATORY FRAMEWORK

STATE

California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land use compatibility criteria. The General Plan Guidelines (2003), published by the Governor's Office of Planning and Research, also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

California Building Code

Title 24 of the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family residences. The standards state that the interior noise level attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room. Proposed residential structures to be located where the CNEL exceeds 60 dBA shall require an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard. Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with these standards.

LOCAL

Nevada County General Plan and Noise Ordinance

The Noise Element of the Nevada County General Plan (1996) establishes maximum allowable exterior noise levels for various land use categories in terms of the average-hourly (L_{eq}) and maximum intermittent (L_{max}) noise descriptors. Maximum allowable noise standards are identified for daytime (7 a.m. – 7 p.m.), evening (7 p.m. – 10 p.m.), and nighttime (10 p.m. – 7 a.m.) periods. The County's noise standards, which are typically applied to non-transportation noise sources, are summarized in **Table 3.11-5**. These noise standards are also identified in the Nevada

County Land Use Development Code, Chapter 11, Zoning Regulations, Section L-II, 4.1.7, Noise, (2010). Construction activities are exempt from the County's noise standards.

For transportation noise sources, the County has historically used the average-daily noise descriptor (i.e., CNEL or L_{dn}) for determination of land use compatibility. The County's General Plan Noise Element identifies noise criteria to be used for determination of land use compatibility within exterior noise environments, as summarized in **Figure 3.11-3**.

In addition to the identification of noise standards, the County's General Plan also identifies goals, objectives, and policies to reduce noise-related impacts and land use compatibility conflicts. Applicable goals and policies relative to the proposed project site within the noise element are listed in a table in **Appendix 3.0-A**. This table also summarizes how the proposed project complies with these applicable General Plan goals and policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), the Nevada County Board of Supervisors makes the ultimate determination of consistency with the General Plan.

TABLE 3.11-5
COUNTY OF NEVADA EXTERIOR NOISE LIMITS

Land Use Category	Zoning District	Time Period	Noise Level, dBA	
			L_{eq}	L_{max}
Rural	A1, TPZ, AE, OS, FR, IDR	7 am-7 pm	55	75
		7 pm-10 pm	50	65
		10 pm-7 am	40	55
Residential and Public	RA, R1, R2, R3, P	7 am-7 pm	55	75
		7 pm-10 pm	50	65
		10 pm-7 am	45	60
Commercial and Recreation	C1, C2, C3, CH, CS, OP, REC	7 am-7 pm	70	90
		7 pm-7 am	65	75
Business Park	BP	7 am-7 pm	65	85
		7 pm-7 am	60	70
Industrial	M1, M2	Any time	80	90

Notes:

- *Compliance with the above standards shall be determined by measuring the noise level based on the mean average of not less than three (3) 20-minute measurements for any given time period. Additional noise measurements may be necessary to ensure that the ambient noise level is adequately determined.*
- *Where two different zoning districts abut, the standard applicable to the lower or more restrictive district plus 5 dBA shall apply.*
- *The above standards shall be measured only on property containing a noise-sensitive land use as defined in General Plan Policy 9.8 and may be measured anywhere on the property containing said land use.*
- *If the measured ambient level exceeds that permitted, the allowable noise exposure standard shall be set at 5 dBA above the ambient.*
- *Because of the unique nature of sound, the County reserves the right to provide for a more restrictive standard than shown in the Exterior Noise Limits table contained in this policy. The maximum adjustment shall be limited to be not less than the current ambient noise levels and shall not exceed the standards of this policy or as they may be further adjusted by General Plan Policy 9.1b. Imposition of a noise level adjustment shall only be considered if one or more of the following conditions are found to exist:*
  - *a. Unique characteristics of the noise source:*
    - *The noise contains a very high or low frequency, is of a pure tone (a steady, audible tone such as a whine, screech, or hum), or contains a wide divergence in frequency spectra between the noise source and ambient level.*
    - *The noise is impulsive in nature (such as hammering, riveting, or explosions), or contains music or speech.*
    - *The noise source is of a long duration.*
  - *b. Unique characteristics of the noise receptor when the ambient noise level is determined to be 5 dBA or more below the Policy 9.1 standard for those projects requiring a General Plan amendment, rezoning, and/or conditional use permit. In such instances, the new standard shall not exceed 10 dBA above the ambient or General Plan Policy 9.1standard, whichever is more restrictive.*
- *The above standards shall not apply to those activities associated with the actual construction of a project or to those projects associated with the provision of emergency services or functions.*

Source: Nevada County 1996, 2010

Groundborne Vibration

There are no federal, state, or local regulatory standards for groundborne vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, the California Department of Transportation (Caltrans) has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in **Table 3.11-6** and **Table 3.11-7**, respectively. The criteria differentiate between transient and continuous/frequent sources. Transient sources of groundborne vibration include intermittent events, such as blasting, whereas continuous and frequent events would include the operations of equipment, including construction equipment, and vehicle traffic on roadways (Caltrans 2002b, 2004).

The groundborne vibration criteria recommended by Caltrans for evaluation of potential structural damage is based on building classifications, which take into account the age and condition of the building. For residential structures and newer buildings, Caltrans considers a minimum peak-particle velocity (ppv) threshold of 0.5 inches per second (in/sec) for transient sources and 0.3 in/sec for continuous/frequent sources to be sufficient to protect against building damage. In general, a level of 0.3 in/sec ppv correspond to vibration levels generated by a heavily-loaded freight train at a distance of roughly 10 feet from the tracks. With the exception of fragile buildings, ruins, and ancient monuments, continuous groundborne vibration levels below approximately 0.2 in/sec ppv are unlikely to cause structural damage. In terms of human annoyance, continuous vibrations in excess of 0.04 in/sec ppv and transient sources in excess of 0.25 in/sec ppv are identified by Caltrans as being "distinctly perceptible." Within buildings, short periods of ground vibration in excess of 0.2 in/sec ppv are generally considered to result in increased levels of annoyance (Caltrans 2002b, 2004).

TABLE 3.11-6
DAMAGE POTENTIAL TO BUILDINGS AT VARIOUS GROUNDBORNE VIBRATION LEVELS

Structure and Condition	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely Fragile Historic Buildings, Ruins, Ancient Monuments	0.12	0.08
Fragile Buildings	0.2	0.1
Historic and Some Old Buildings	0.5	0.25
Older Residential Structures	0.5	0.3
New Residential Structures	1.0	0.5
Modern Industrial/Commercial Buildings	2.0	0.5

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.

Source: Caltrans 2002b, 2004

Land Use Category	Community Noise Exposure (L_{dn} or CNEL, dBA) 50 55 60 65 70 75	Interpretation
Residential –Low Density Single Family, Duplex, Mobile Homes		**Clearly Acceptable** The activities associated with the specified land use may be carried out with essentially no interference from the noise exposure.
Residential – Multiple Family		
Transient Lodging – Motels, Hotels		**Normally Acceptable** Noise should be considered in proposed land use projects, but under most circumstances conventional construction without and special noise insulation requirements, is satisfactory.
Schools, Libraries, Churches, Hospitals, Nursing Homes		
Auditoriums, Concert Halls, Amphitheaters		**Conditionally Acceptable** New construction or development should be undertaken only after a detailed analysis of noise reduction requirements and needed noise insulation features included in the design. Conventional construction with closed windows and conditioning will normally suffice.
Sports Arena, Outdoor Spectator Sports		
Playgrounds, Neighborhood Parks		**Normally Unacceptable** New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Golf Courses, Riding Stables, Water Recreation, Cemeteries		
Office Buildings, Commercial Retail		
Industrial, Manufacturing, Utilities, Agriculture		**Clearly Unacceptable** New construction or development should generally not be undertaken

Source: Nevada County General Plan 1996

Source: AMBIENT Air Quality & Noise Consulting, 2011

Figure 3.11-3

Nevada County Land Use Compatibility Noise Criteria

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TABLE 3.11-7
ANNOYANCE POTENTIAL TO PEOPLE AT VARIOUS GROUNDBORNE VIBRATION LEVELS

Human Response	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.10
Severe	2.0	0.4

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.

Source: Caltrans 2002b, 2004

3.11.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Criteria for determining the significance of noise impacts were developed based on information contained in the California Environmental Quality Act Guidelines (State CEQA Guidelines). According to those guidelines, a project may have a significant effect on the environment if it would cause the following conditions:

1) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

2) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

3) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

4) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

5) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels within 2 miles of a public airport or public use airport.

6) For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

The project site is not in the vicinity of a public or private airport; the closest airport to the project site is the Auburn Municipal Airport, located over 4 miles to the south. The project site is not located within 2 miles of a public airport or private airstrip, nor would implementation of the proposed project affect airport operations or result in increased exposure of noise-sensitive receptors to aircraft noise. For these reasons, exposure to aircraft noise levels (Standards of

Significance 5 and 6) would be considered less than significant and has not been discussed further in this report.

Temporary noise impacts associated with the proposed project would be associated with construction-related activities. Permanent increases in noise levels would occur associated with on-site operational activities as well as related to potential increases in traffic noise levels along area roadways. Potential increases in groundborne vibration levels would be primarily associated with short-term construction-related activities. For purposes of this analysis and where applicable, the Nevada County noise standards were used for evaluation of project-related noise impacts. Thresholds of significance used in this analysis are discussed below.

Construction Noise

As previously discussed and noted in **Table 3.11-5**, construction activities are exempt from the County's noise standards. In the absence of applicable County noise standards, construction noise impacts would be considered significant if the proposed project would result in increased levels of nuisance during the more noise-sensitive evening and nighttime hours. For residential land uses, noise-generating construction activities that would result in an increase in ambient noise levels between the hours of 7:00 p.m. and 7:00 a.m. would be considered to result in a potentially significant impact. In addition, sustained construction-generated noise levels that would exceed the commonly applied interior noise threshold for speech communication (i.e., 60 dBA L_{eq}) within nearby existing residential dwellings would also be considered to have a potentially significant impact. Assuming an average exterior-to-interior noise reduction of 20 dB for typical residential construction, an interior noise level threshold of 60 dBA L_{eq} would equate to an exterior noise threshold of 80 dBA L_{eq}, which is consistent with the exterior threshold often recommended for construction activities by other governmental agencies, such as the Federal Transit Administration (FTA 2006).

Operational Non-Transportation Noise

Operational non-transportation noise impacts would be considered significant if the proposed project would result in non-transportation noise levels that would exceed applicable County noise standards at nearby noise-sensitive land uses. County noise standards are identified in **Table 3.11-5.**

Operational Transportation Noise

Operational transportation noise impacts would be considered significant if the proposed project would result in a substantial increase in ambient noise levels that would exceed the County noise standards for land use compatibility (**Figure 3.11-3**). For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 5.0, or greater, where the noise levels, without project implementation, are less than the County's normally acceptable noise standard of 60 dBA CNEL/L_{dn}; 3 dBA, or greater, where the noise level, without project implementation, ranges from 60 to 65 dBA CNEL/L_{dn}; and 1.5 dB, or greater, where the noise level, without project implementation, exceeds 65 dBA CNEL/L_{dn} (**Table 3.11-2**). The rationale for these noise criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause a substantial increase in annoyance. Substantial increase in noise levels that would also exceed applicable noise standards at primarily affected noise-sensitive land uses would be considered to have a significant impact.

Exposure to Groundborne Vibration

Groundborne vibration levels would be considered significant if predicted construction or long-term operational groundborne vibration levels attributable to the proposed project would exceed normally applied groundborne vibration criteria (**Tables 3.11-6** and **3.11-7**) at nearby existing structures.

Land Use Compatibility

The compatibility of proposed land uses were evaluated in comparison to the County's General Plan noise standards for land use compatibility (**Figure 3.11-3**), based on projected future cumulative noise conditions. Accordingly, convalescent care facilities and residential dwellings are considered normally acceptable within exterior noise environments up to 60 dBA CNEL/L_{dn}. The proposed project would be considered to have a potentially significant impact if projected future noise levels at the project site would exceed 60 dBA CNEL/L_{dn}.

METHODOLOGY

A combination of existing literature, noise level measurements, and application of accepted noise prediction and sound propagation algorithms was used for the prediction of short-term construction and long-term non-transportation and transportation source noise levels as well as for the evaluation of groundborne vibration impacts.

Construction Noise

Predicted noise levels at nearby noise-sensitive land uses were calculated utilizing typical noise levels and usage rates associated with construction equipment, derived from the U.S. Department of Transportation, Federal Highway Administration's Roadway Construction Noise Model (version 1.1). Construction noise levels were predicted assuming an average noise attenuation rate of 6 dB per doubling of distance from the source.

Operational Non-Transportation Noise

Predicted noise levels associated with non-transportation noise sources were calculated based on representative data obtained from existing literature as well as noise measurement data obtained from similar uses. Operational noise levels were calculated at the nearest on-site noise-sensitive receptors and at the property line of the nearest off-site residential land use assuming an average noise-attenuation rate of 6 dB per doubling of distance from the source. To be conservative, no shielding due to intervening terrain or non-source structures was included in the calculation. It is important to note that the County's noise standards are applied only on properties containing a noise-sensitive land use, such as residential dwellings, and may be applied anywhere on the property or at the property boundary. To be conservative, predicted noise levels at existing off-site receptors were calculated based on the distance from the source center to the nearest receptor property line. Modeling assumptions and calculations are included in **Appendix 3.11-A**.

Operational Traffic Noise and Land Use Compatibility

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise emission factors and traffic data obtained from the traffic analysis prepared for this project. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors,

and roadway widths. Predicted noise levels were calculated at a distance of 50 feet from the near-travel-lane centerline as well as distances to the predicted noise contours. Increases in traffic noise levels attributable to the proposed project were determined based on a comparison of predicted noise levels, with and without project implementation. The compatibility of proposed land uses was evaluated based on projected future on-site transportation noise levels with project implementation. Predicted on-site noise levels were compared with the County's corresponding noise criteria for determination of land use compatibility (**Figure 3.11-3**). Modeling assumptions and calculations are included in **Appendix 3.11-A**.

Groundborne Vibration

No major existing sources of groundborne vibration have been identified in the proposed project area. Groundborne vibration impacts would be primarily associated with short-term construction activities. Groundborne vibration levels associated with construction-related activities were evaluated utilizing typical groundborne vibration levels rates associated with construction equipment, obtained from the U.S. Department of Transportation, Federal Transit Administration's *Transit Noise and Vibration Impact Assessment Guidelines* (2006). Groundborne vibration impacts related to structural damage and human annoyance were evaluated taking into account the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance (**Tables 3.11-6** and **3.11-7**).

PROJECT IMPACTS AND MITIGATION MEASURES

Construction Noise (Standards of Significance 1, 2, and 4)

Impact 3.11.1 Construction activities could result in a substantial temporary increase in ambient noise levels at nearby noise-sensitive land uses, which may result in increased levels of annoyance, activity interference, and sleep disruption. This impact is considered **potentially significant.**

Construction noise associated with future development would be limited to periods of construction and would vary depending on the nature of the construction activities being performed. Noise generated during construction is typically associated with the operation of off-road equipment, including excavation equipment, material handlers, and portable generators. **Table 3.11-8** lists typical uncontrolled noise levels generated by individual pieces of representative construction equipment likely to be used during construction. Noise levels associated with individual construction equipment can reach levels of up to approximately 90 dBA L_{max} (FTA 2006). Noise from localized point sources, such as construction sites, typically decreases by approximately 6 dBA with each doubling of distance from source to receptor. Given this noise attenuation rate and typical construction equipment noise levels and usage rates, combined noise levels associated with construction activities can reach levels of up to approximately 84 dBA L_{eq} at 50 feet (USEPA 1971). Depending on the location and type of construction activities conducted, construction-generated noise levels at the nearest existing offsite residential land uses, which are located west of the project site, could reach levels of up to approximately 72 dBA L_{eq}, when construction activities occur near the western boundary of the project site.

Based on the predicted exterior noise level discussed above and assuming an average exterior-to-interior noise reduction of 20 dB, predicted interior noise levels of the nearest existing off-site residential land uses could reach approximately 52 dBA L_{eq} for short periods of time, which would not be projected to exceed the commonly applied interior speech communication noise

threshold of 60 dBA L_{eq}. However, with regard to residential land uses, noise levels associated with construction activities occurring during the more noise-sensitive evening and nighttime hours (i.e., 7 p.m. to 7 a.m.) are of increased concern. Because exterior ambient noise levels typically decrease during the nighttime hours as community activities (e.g., commercial activities, vehicle traffic) decrease, construction activities performed during these more noise-sensitive periods of the day could result in increased annoyance and potential sleep disruption for occupants of nearby residential dwellings. It is important to note that construction noise levels are highly variable and would last only as long as construction activities occur. Nonetheless, noise-generating construction activities associated with future development would be considered to have a **potentially significant** impact.

TABLE 3.11-8
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level (dBA) at 50 feet from Source	
	L_{max}	L_{eq}
Air Compressor	80	76
Backhoe/Front End Loader	80	76
Compactor (Ground)	80	73
Concrete Mixer Truck	85	81
Concrete Mixer (Vibratory)	80	73
Concrete Pump Truck	82	75
Concrete Saw	90	83
Crane	85	77
Dozer/Grader/Excavator/Scraper	85	81
Drill Rig Truck	84	77
Generator	82	79
Gradall	85	81
Hydraulic Break Ram	90	80
Jack Hammer	85	78
Impact Hammer/Hoe Ram (Mounted)	90	83
Pavement Scarifier/Roller	85	78
Paver	85	82
Pneumatic Tools	85	82
Pumps	77	74
Truck (Dump/Flat Bed)	84	80

Source: Ambient 2011

Mitigation Measures

MM 3.11.1 The following mitigation measures shall be implemented and specified on all construction contracts:

a) Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 7:00 p.m. Construction activities shall be prohibited on Sundays and state and federal holidays.

b) Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and shrouds, in accordance with manufacturers' recommendations.

c) Construction equipment staging areas shall be centrally located on the project site or located at the farthest distance possible from nearby residential land uses.

d) All motorized construction equipment and vehicles shall be turned off when not in use.

e) At a prominent location legible from a public road at or near the construction area(s) a phone number and contact information shall be provided of a site supervisor or manager with authority to deal with noise complaints. The sign shall be present for the duration of construction.

Timing/Implementation: *Prior to and during construction*

Enforcement/Monitoring: *Nevada County Planning Department*

Implementation of the above mitigation measures would limit construction activities to the less noise-sensitive periods of the day. Use of manufacturer-recommended noise control devices, such as exhaust mufflers and engine shrouds, can reduce individual equipment noise levels by approximately 10 dBA. Providing contact information for construction activities will also ensure that the neighborhood has access to the supervisor or manager while the noise generating activity is occurring. It is important to note that even with the mitigation measures construction noise will be audible in the surrounding neighborhood. However, with implementation of the above mitigation measures, noise-generating construction activities would be considered **less than significant**.

Increase in Traffic Noise (Standards of Significance 1 and 3)

Impact 3.11.2 Operation of the proposed project would not result in a significant increase in traffic noise levels at nearby noise-sensitive receptors. This impact would be considered **less than significant.**

Operation of the proposed project would result in increased traffic volumes on some area roadways. The increase in traffic volumes resulting from implementation of the proposed project would, therefore, contribute to predicted increases in traffic noise levels. The FHWA Highway Traffic Noise Prediction Model (FHWA RD77-108), utilizing CALVENO noise emission factors, was used to predict traffic noise levels along primarily affected roadway segments with and without implementation of the proposed project. Based on information obtained from the traffic analysis

prepared for this project, primarily affected roadways would include Rincon Way and nearby segments of SR 49. The proposed project's contribution to traffic noise levels along these roadways was determined by comparing the predicted noise levels with and without project-generated traffic. Predicted traffic noise levels, with and without development of the proposed project, are summarized in **Table 3.11-9**.

TABLE 3.11-9
PREDICTED INCREASES IN TRAFFIC NOISE LEVELS
EXISTING CONDITIONS

Roadway	CNEL/L_{dn} at 50 Feet from Near-Travel-Lane Centerline[1]		Predicted Noise Level Increase	Substantial Noise Level Increase?[2]
	Without Project	With Project		
SR 49	74.38	74.46	0.08	No
Rincon Way	43.41	48.34	4.93	No

Source: Ambient 2011
Notes:
Traffic noise levels were calculated using the FHWA roadway noise prediction model.
Substantial increases defined as an increase of 5.0, or greater, where noise levels are less than the County's normally acceptable minimum noise level of 60 dBA CNEL/L_{dn}; 3 dBA, or greater, where noise levels range from 60 to 65 dBA CNEL; and 1.5 dB, or greater, where the noise level exceeds 65 dBA CNE,L without the proposed project.

As depicted in **Table 3.11-9**, the proposed project would result in predicted increases in traffic noise levels of approximately 0.08 dBA along nearby segments of SR 49 and approximately 4.93 dBA along Rincon Way. The proposed project would not result in a substantial increase in traffic noise levels along primarily affected area roadways. As a result, increases in traffic noise levels attributable to the proposed project would be considered **less than significant**.

Mitigation Measures

None required.

Exposure to Non-Transportation Source Noise (Standards of Significance 1, 2, 3, and 4)

Impact 3.11.3 Operation and occupancy of the proposed project may result in non-transportation noise levels that could exceed applicable noise standards at nearby noise-sensitive land uses. This impact would be considered **potentially significant.**

Operation of the proposed project, including occupancy of the residential units, would include on-site activities and the operation of stationary equipment that would result in increases in ambient noise levels that could exceed applicable County noise standards at nearby on- and off-site noise-sensitive receptors. Predicted average-hourly and maximum intermittent noise levels at the nearest on- and off-site receptors associated with major on-site noise sources are summarized in **Table 3.11-10** and **Table 3.11-11**, respectively, and discussed in greater detail below.

Sewer Lift Stations

The project proposes to construct an on-site sewer lift station (and possibly an intermediate lift station). The proposed station would be located along the emergency access road, approximately 120 feet south of the project site's northern property line, and the second

optional station would be located south of the proposed farm fields, approximately 1,080 feet south of the northern property line, if needed. The proposed pump stations are anticipated to include an emergency power generator, control panel, exhaust fans, and booster pump. The booster pump would be located below grade in an underground vault. The remaining equipment would be located above ground and housed in an enclosed structure. Based on data obtained from similar pump stations, operational noise levels associated with pump station equipment can reach combined levels of up to approximately 78 dBA L_{eq} at 50 feet from the structure, depending on the equipment installed and structural design.

Detailed equipment specifications have not yet been identified for the proposed pump stations. Noise levels were predicted based on typical noise levels derived from representative equipment and manufacturer specifications data. Depending on building design, average interior-to-exterior noise reductions typically range from approximately 10 to 25 dBA. Combined equipment noise levels were calculated at the property line of the nearest residential land use, assuming a minimum sound transmission loss of approximately 10 dBA for the pump station building. Modeling was conducted assuming that all equipment, including the emergency generator, would be operating simultaneously. As indicated in **Table 3.11-10** and **Table 3.11-11** and depending on the hour of day, predicted operational noise levels at the nearest on- and off-site receptors for both of the proposed pump stations would exceed the County's applicable average-hourly and maximum intermittent noise standards. Actual noise levels would vary depending on final building design, construction materials and techniques, and the equipment installed. Noise generated by the proposed on-site pump stations would be considered **potentially significant**.

On-Site Agricultural Activities

The proposed project includes approximately 4 acres of agricultural uses located to the northeast of the Village Center to accommodate gardening activities for project-site residents. Agricultural uses would include raised-bed community gardens, row crops, and an orchard. As described above, two community barns would be located adjacent to the agricultural uses in order to provide for equipment and storage. Noise generated by agricultural activities would be primarily associated with the intermittent and seasonal use of small tractors and related farm equipment. Noise levels associated with the operation of farm tractors can reach levels of approximately 92 dBA at 5 feet (Ambient 2011). Predicted average-hourly and maximum intermittent noise levels at the nearest on- and off-site receptors associated with on-site agricultural activities are summarized in **Table 3.11-10** and **Table 3.11-11**, respectively. Depending on the hour of day, average-hourly and maximum intermittent operational noise levels for on-site agricultural activities could potentially exceed applicable County noise standards at the nearest on- and off-site receptors. As a result, noise impacts associated with on-site agricultural activities would be considered **potentially significant**.

Automotive and Tractor Repair Barns

The proposed project includes the proposed construction of on-site automotive and tractor repair barns, to be located adjacent to and west of the proposed farm fields. Noise generated by automotive and tractor repair facilities is predominantly associated with the use of small hand-held pneumatic tools (power sanders, grinders, impact wrenches). Other equipment operations such as lifts, compressed air nozzles, air compressors, and welders would generate a lesser degree of noise impact. Operational noise levels can reach approximately 83 dBA L_{eq} at 50 feet, with intermittent noise events reaching levels of up to approximately 85 dBA L_{max} at 50 feet. As indicated in **Table 3.11-10** and **Table 3.11-11** and depending on the hour of day, average-hourly operational noise levels would exceed applicable County noise standards at the

nearest receptors. Noise generated during the more noise-sensitive nighttime hours would also be projected to exceed the County's average-hourly noise standards at the nearest off-site receptors. As a result, noise impacts associated with the automotive and tractor repair barns would be considered **potentially significant**.

Property Maintenance Activities

Noise-generating activities and noise sources commonly associated with property maintenance activities are typically associated with on-site landscape maintenance, including the operation of leaf blowers, lawn mowers, power sweepers, leaf blowers, and vacuum trucks, as well as occasional waste collection activities. These activities can result in varying noise levels of approximately 70 to 110 dBA L_{max} at 3 feet. Maintenance-related activities typically occur on an intermittent basis or over a large area, which reduces prolonged exposure at any one receptor. Nonetheless, as indicated in **Table 3.11-10** and **Table 3.11-11**, predicted noise levels at nearby on- and off-site receptors could potentially exceed the County's average-hourly and maximum intermittent noise standards. As a result, noise levels generated by on-site landscape maintenance and waste collection activities would be considered **potentially significant**.

Building Equipment

Noise-generating mechanical equipment associated with the proposed on-site structures would be anticipated to include air and water circulation systems (e.g., heating, ventilation, and air conditioning systems, and boilers). Noise generated by mechanical building equipment would occur on an intermittent basis, primarily during the day and evening hours and less frequently at night. In general, noise levels generated by such systems typically average between 55 and 85 dBA at 3 feet from the source (USEPA 1971). Mechanical equipment is typically shielded from direct public exposure and usually housed on rooftops, within equipment rooms, or within exterior enclosures. In addition to building mechanical equipment, equipment used for material loading and unloading activities at non-residential structures could also generate high noise levels. Noise levels commonly associated with material loading and unloading areas typically average approximately to 60 dBA L_{eq} at 50 feet.

Noise generated by building mechanical equipment intended to serve larger on-site structures, such as the proposed lodges and commercial use structures, would have the highest potential for noise-related impacts. Detailed equipment and building specifications have not yet been identified. Noise levels were therefore predicted based on typical noise levels derived from representative equipment and manufacturer specifications data. As depicted in **Table 3.11-10** and **Table 3.11-11** and depending on the hour of day, operational noise levels at the nearest on- and off-site receptors could potentially exceed the County's average-hourly noise standards. Predicted maximum intermittent noise levels would also be projected to exceed the County's nighttime noise standard. Actual noise levels would vary depending on final building design, construction materials and techniques, and the equipment installed. Noise generated by on-site building equipment, including equipment operation within outdoor material loading and unloading areas, would be considered **potentially significant**.

On-Site Recreational Uses

Noise generated by on-site recreational uses would be primarily associated with the proposed tennis courts, volleyball courts, bocce ball courts, pickle ball courts, and swimming pools. Recreational uses involving multiple participants would typically generate the highest noise levels. Activities resulting in impact noise events, such as tennis and pickleball courts, can also

generate relatively high noise levels that can result in increased levels of annoyance to occupants of nearby residential dwellings.

Predicted average-hourly and maximum intermittent noise levels associated with the proposed on-site recreational activities are summarized in **Table 3.11-10** and **Table 3.11-11**, respectively. As indicated, operational noise levels associated with the proposed tennis courts, volleyball courts, and bocce ball courts would not be projected to exceed the County's noise standards at the nearest on- or off-site receptors. However, operational noise levels associated with the proposed pickleball courts and the outdoor swimming pool, which are located adjacent to and north of Rincon Way, would be projected to exceed the County's average-hourly and maximum intermittent noise standards at nearby receptors, particularly during the more noise-sensitive evening and nighttime hours. As a result, noise generated by these proposed on-site recreational uses would be considered **potentially significant**.

On-site non-transportation noise sources, including the proposed sewer lift stations (one proposed and one optional), agricultural activities, automotive and tractor repair barns, property maintenance activities, building equipment, and recreational uses (i.e., pickleball courts and outdoor swimming pool) would result in predicted noise levels in excess of County noise standards. Due to decreases in ambient noise levels during the quieter nighttime hours, activities occurring during the more noise-sensitive nighttime hours (i.e., 10 p.m. to 7 a.m.) would have a higher potential for increased levels of annoyance and potential sleep disruption to occupants of nearby on- and off-site residential dwelling units. Noise impacts associated with these on-site sources would be considered to have a **potentially significant** impact.

TABLE 3.11-10
SUMMARY OF PREDICTED NON-TRANSPORTATION AVERAGE-HOURLY NOISE LEVELS AT OFF-SITE AND ON-SITE NOISE-SENSITIVE RECEPTORS

Source	Predicted Exterior Noise Levels at the Property Line of the Nearest Existing Off-Site Residence (dBA)[1]					Predicted Exterior Noise Levels at the Nearest Proposed On-Site Noise-Sensitive Receptor (dBA)[1,2]				
	Distance from Source to Receptor (feet)	Average Hourly (L_{eq})	Equals or Exceeds County Noise Standard?			Distance from Source to Receptor (feet)	Average Hourly (L_{eq})	Equals or Exceeds County Noise Standard?		
			Day (55 dB)	Evening (50 dB)	Night (40 dB)			Day (55 dB)	Evening (50 dB)	Night (40 dB)
Sewer Lift Station #1 (North)	120	**60**	**Yes**	**Yes**	**Yes**	1,300	**40**	No	No	**Yes**
Optional Sewer Lift Station #2 (South)	1,080	41	No	No	**Yes**	195	**56**	**Yes**	**Yes**	**Yes**
On-Site Agricultural Activities	480	**52**	No	**Yes**	**Yes**	270	**57**	**Yes**	**Yes**	**Yes**
Auto/Tractor Repair Barns	540	47	No	No	**Yes**	75	**64**	**Yes**	**Yes**	**Yes**
Property Maintenance	100	**66**	**Yes**	**Yes**	**Yes**	50	**72**	**Yes**	**Yes**	**Yes**
Building Equipment	165	**50**	No	**Yes**	**Yes**	50	**61**	**Yes**	**Yes**	**Yes**
Tennis Courts	150	32	No	No	No	120	33	No	No	No
Volleyball Courts	1,100	10	No	No	No	720	14	No	No	No
Bocce Ball Courts	180	24	No	No	No	75	31	No	No	No
Pickleball Courts	225	**46**	No	No	**Yes**	75	**56**	**Yes**	**Yes**	**Yes**
Outdoor Swimming Pool	270	37	No	No	No	30	**54**	No	**Yes**	**Yes**

Source: Ambient 2011
The County's noise standards are applied only on properties containing a noise-sensitive land use, such as residential dwellings, and may be applied anywhere on the property or at the property boundary. To be conservative, predicted noise levels at existing off-site receptors were calculated based on the distance from the source center to the nearest receptor property line, based on to the proposed site plan and aerial photo interpretation. Predicted noise levels do not include shielding from intervening terrain or non-source structures.
Predicted noise levels at on-site receptors are based on distance from source center to the nearest building structure. Predicted noise levels do not include shielding from intervening terrain or non-source structures.
*Predicted noise levels that exceed corresponding noise thresholds are depicted in **bold** font.*
*Refer to **Appendix 3.11-A** for modeling assumptions and results.*

TABLE 3.11-11
SUMMARY OF PREDICTED NON-TRANSPORTATION MAXIMUM INTERMITTENT NOISE LEVELS AT OFF-SITE AND ON-SITE NOISE-SENSITIVE RECEPTORS

Source	Predicted Exterior Noise Levels at the Property Line of the Nearest Existing Residence (dBA)[1]					Predicted Exterior Noise Levels at the Nearest On-Site Noise-Sensitive Receptor (dBA)[1,2]				
	Distance from Source to Receptor (feet)	Maximum Noise Level (L_{max})	Equals or Exceeds County Noise Standard?			Distance from Source to Receptor (feet)	Maximum Noise Level (L_{max})	Equals or Exceeds County Noise Standard?		
			Day (75 dB)	Evening (65 dB)	Night (55 dB)			Day (75 dB)	Evening (65 dB)	Night (55 dB)
Sewer Lift Station #1 (North)	120	**62**	No	No	**Yes**	1,300	42	No	No	No
Sewer Lift Station #2 (South)	1,080	43	No	No	No	195	**58**	No	No	**Yes**
On-Site Agricultural Activities	480	**60**	No	No	**Yes**	270	**65**	No	**Yes**	**Yes**
Auto/Tractor Repair Barns	540	49	No	No	No	75	**66**	No	**Yes**	**Yes**
Property Maintenance	100	**80**	**Yes**	**Yes**	**Yes**	50	**86**	**Yes**	**Yes**	**Yes**
Building Mechanical Equipment	165	**55**	No	No	**Yes**	50	**65**	No	No	**Yes**
Tennis Courts	150	41	No	No	No	120	42	No	No	No
Volleyball Courts	1,100	24	No	No	No	720	27	No	No	No
Bocce Ball Courts	180	44	No	No	No	75	52	No	No	No
Pickleball Courts	225	53	No	No	No	75	**63**	No	No	**Yes**
Swimming Pool (Outdoor)	270	36	No	No	No	30	**55**	No	No	**Yes**

Source: Ambient 2011
The County's noise standards are applied only on properties containing a noise-sensitive land use, such as residential dwellings, and may be applied anywhere on the property or at the property boundary. To be conservative, predicted noise levels at existing off-site receptors were calculated based on the distance from the source center to the nearest receptor property line, based on to the proposed site plan and aerial photo interpretation. Predicted noise levels do not include shielding from intervening terrain or non-source structures.
Predicted noise levels at on-site receptors are based on distance from source center to the nearest building structure. Predicted noise levels do not include shielding from intervening terrain or non-source structures.
*Predicted noise levels that exceed corresponding noise thresholds are depicted in **bold** font.*
Refer to Appendix 3.11-A for modeling assumptions and results.

Mitigation Measures

MM 3.11.3 The following mitigation measures shall be implemented and specified on all construction contracts:

Sewer Lift Stations

a. The proposed sewer lift station, and optional station if needed, shall be designed so that operation noise levels at nearby noise-sensitive receptors would not exceed applicable Nevada County noise standards (refer to **Table 3.11-5**). Typical design measures may include, but are not limited to, selection of low-noise-generating equipment, incorporation of equipment shielding and enclosures, and use of sound-rated doors and vents.

On-Site Agricultural Activities

b. On-site agricultural activities using noise-generating equipment shall be limited to the daytime hours of 7 a.m. to 7 p.m.

Auto/Tractor Repair Barns

c. Use of the auto/tractor repair barns shall be subject to the following conditions:

   1. Noise-generating activities/equipment repair shall be conducted within the barn.

   2. All doors and windows shall be closed when noise-generating activities are conducted.

   3. Signage specifying the above conditions shall be posted at building entrances.

d. Stationary equipment (i.e., air compressors, generators, etc.) shall be designed and installed so that operational noise levels at nearby noise-sensitive land uses would not exceed applicable Nevada County noise standards of 55 dBA L_{eq} during the daytime hours of 7 a.m. to 7 p.m., in accordance with Nevada County noise standards (refer to **Table 3.11-5**). Typical design measures may include, but are not limited to, the selection of low-noise-generating equipment, incorporation of equipment shielding, and locating equipment indoors and/or within enclosures.

e. Main building entrances/overhead doors shall be shielded from direct line of sight of proposed on-site dwelling units located within 250 feet of the repair barns.

Property Maintenance

f. Landscape maintenance activities using noise-generating equipment shall be limited to the daytime hours of 7 a.m. to 7 p.m.

g. Building equipment and material loading/unloading areas shall be designed so that operation noise levels at nearby noise-sensitive receptors

would not exceed applicable Nevada County noise standards (refer to **Table 3.11-5**). Typical design measures may include, but are not limited to, selection of low-noise-generating equipment, incorporation of equipment shielding and enclosures, use of sound-rated doors and vents, and incorporation of sound barriers/building parapets to interrupt line of sight between the source and nearby receptors.

Building Mechanical Equipment

h. Building equipment shall be designed and installed so that operational noise levels at nearby noise-sensitive land uses would not exceed applicable Nevada County noise standards (refer to **Table 3.11-5**). Typical design measures may include, but are not limited to, selection of low-noise-generating equipment, incorporation of equipment shielding, and locating equipment indoors and/or within enclosures. Building parapets shall be incorporated, where necessary, to shield roof-mounted equipment from direct line of sight of nearby noise-sensitive receptors. No mitigation will be required if the project applicant provides a noise analysis of the final design demonstrating compliance with County noise standards.

Recreational Uses

i. Team use of recreational areas shall be prohibited during the more noise-sensitive nighttime hours of 10 p.m. to 7 a.m.

j. Pickleball courts shall be located no closer than 250 feet from existing adjacent residential properties or on-site residential units, or shielding (e.g., noise curtains/blankets or barriers) shall be installed at the court perimeter sufficient to shield noise-sensitive receptors located within 250 feet of the courts. Noise curtains or barriers shall be installed/constructed to a minimum height of 6 feet above ground level with no visible air gaps between construction materials or at the base of the structure. No mitigation will be required if the project applicant provides a noise analysis of the final design demonstrating compliance with County noise standards.

k. Swimming pool equipment (e.g., pumps, heaters, and blower units) shall be designed and installed so that equipment operational noise levels at nearby noise-sensitive land uses would not exceed applicable Nevada County noise standards (refer to **Table 3.11-5**). Typical design measures may include, but are not limited to, selection of low-noise-generating equipment, incorporation of equipment shielding, and locating equipment indoors and/or within enclosures.

Proposed Dwelling Units

l. Proposed on-site dwelling units shall be equipped with fresh air supply systems or air conditioning systems to allow windows to remain closed during inclement weather conditions so that acceptable interior noise levels can be maintained.

m. Outdoor activity areas or residential dwellings located within 175 feet of pickleball courts and the outdoor swimming pool, 350 feet of proposed on-site agricultural farming/orchard areas, and within 250 feet of the proposed auto/tractor repair barns shall be shielded from direct line of sight of these noise sources, to be measured at a height of 5 feet above ground level. These distances represent the area of potential impact within which noise levels from these sources are projected to potentially exceed the County's noise standards. No mitigation will be required if the project applicant provides a noise analysis of the final design demonstrating compliance with County noise standards.

n. On-site dwelling units located within 175 feet of pickleball courts and the outdoor swimming pool, 350 feet of proposed on-site agricultural farming/orchard areas, and within 250 feet of the proposed auto/tractor repair barns shall be provided written notification of potential exposure to nuisances noise associated with the operation of these nearby uses prior to purchase/occupancy. These distances represent the area of potential impact within which noise levels from these sources are projected to potentially exceed the County's noise standards. No mitigation will be required if the project applicant provides a noise analysis of the final design demonstrating compliance with County noise standards.

Timing/Implementation: *Prior to construction and during operation*

Enforcement/Monitoring: *Nevada County Planning Department*

With mitigation, major noise-generating sources, including the proposed sewer pump stations (one proposed and one optional), automotive and tractor repair barns, and building equipment, would be designed to ensure compliance with County noise standards. Additional measures have been included to reduce the potential for increased levels of annoyance and sleep disruption to nearby noise-sensitive receptors, including restrictions on the hours of operation for on-site recreational uses, maintenance activities, and agricultural activities. Proposed residential dwelling units would also be required to comply with California Title 24 noise insulation standards of 45 dBA CNEL for habitable rooms. Additional mitigation is included that would require the outdoor activity areas of primarily impacted on-site dwelling units to be shielded from direct line of sight of nearby noise sources and that advance notification be provided to occupants of these residences to inform them of potential exposure to nuisance noise from these nearby sources. This would include residential dwelling units located near the proposed pickleball courts, outdoor swimming pool, farm fields and orchards, and auto/tractor repair barns. With mitigation, operational noise levels would be reduced to a **less than significant** level.

Exposure to Groundborne Vibration (Standard of Significance 2)

Impact 3.11.4 Groundborne vibration levels associated with construction activities would not be projected to exceed applicable groundborne vibration criteria at nearby land uses. This impact would be **less than significant.**

Ground vibration spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. For most structures, a peak particle velocity (ppv) threshold of 0.5 inches per

second (in/sec) is sufficient to avoid structure damage, with the exception of fragile historic structures or ruins. For the protection of fragile, historic, and residential structures, the California Department of Transportation recommends a more conservative threshold of 0.2 inches per second ppv. This same threshold would represent the level at which vibrations would be potentially annoying to people in buildings (FTA 2006; Caltrans 2002b).

Operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Groundborne vibration levels associated with construction equipment are summarized in **Table 3.11-12.**

TABLE 3.11-12
REPRESENTATIVE CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Equipment	Peak Particle Velocity at 25 Feet (in/sec ppv)
Large Tractors	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Tractors	0.003

Source: Caltrans 2004; FTA 2006

Construction activities associated with the proposed project would not be anticipated to require the use of pile drivers. Based on the vibration levels presented in **Table 3.11-12**, ground vibration generated by typical off-road construction equipment, such as tractors, trucks, and tractors, would be less than 0.09 inches per second ppv at 25 feet and would not pose a significant risk to nearby structures or occupants. As a result, this impact would be considered **less than significant**.

Mitigation Measures

None required.

Compatibility of Proposed Land Uses with Projected Future Noise Levels (Standards of Significance 1 and 3)

Impact 3.11.5 Projected on-site noise levels at proposed on-site land uses would not exceed the County's normally acceptable noise exposure standards for land use compatibility. As a result, this impact is considered **less than significant.**

The compatibility of proposed land uses is evaluated based on a comparison of predicted future cumulative traffic noise levels at the site to the County's General Plan exterior noise standards (**Figure 3.11-3**). According to the County's General Plan noise standards for land use compatibility, residential land uses and convalescent care facilities are considered normally acceptable within exterior noise environments up to 60 dBA CNEL/L_{dn}.

As noted earlier in this report, noise levels within the project area are predominantly influenced by vehicle traffic noise emanating from State Route 49. To a lesser extent, noise generated by

vehicle traffic on Rincon Way would also contribute to the projected future noise environment. Predicted future cumulative transportation noise levels for these sources, with implementation of the proposed project, were calculated using the FHWA Highway Traffic Noise Prediction Model (FHWA RD77-108), based on CALVENO noise emission factors and traffic data obtained from the traffic analysis prepared for this project. Based on the modeling conducted, which includes all future traffic on SR 49 and not just traffic generated by the project, the projected future 60 dBA noise contour for State Route 49 would extend approximately 831 feet from the roadway centerline. The projected future 60 dBA noise contour for Rincon Way would not extend beyond the roadway right-of-way. The project site would not be located within the projected 60 dBA CNEL/L_{dn} contours of these roadways. Predicted future on-site noise levels would not be projected to exceed the County's normally acceptable noise standard of 60 dBA CNEL/L_{dn} at proposed onsite land uses. As a result, this impact would be considered **less than significant**.

Mitigation Measures

None required.

3.11.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

The geographic extent of the cumulative setting for noise consists of the project area and the surrounding areas within Nevada County. Cumulative development conditions would result in increased cumulative roadway noise levels and would also result in increased noise associated with future development. As noted earlier in this report, ambient noise levels in the project area are influenced primarily by traffic noise emanating from area roadways, particularly State Route 49 and Rincon Way. No major stationary sources of noise have been identified in the project area. The primary factor for cumulative noise impact analysis is therefore the consideration of future traffic noise levels.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Contribution to Cumulative Noise Levels

Impact 3.11.6 Implementation of the proposed project, including the proposed General Plan and Zoning Ordinance text amendments, would not result in a substantial contribution to cumulative noise levels. This impact would be considered **less than cumulatively considerable.**

Proposed CCRC Development

The project's contribution to the cumulative traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic. Predicted increases in future cumulative traffic noise levels along primarily affected roadways are depicted in **Table 3.11-13**.

TABLE 3.11-13
PREDICTED INCREASES IN TRAFFIC NOISE LEVELS
FUTURE CUMULATIVE CONDITIONS

Roadway	CNEL/L_{dn} at 50 Feet from Near-Travel-Lane Centerline[1]		Predicted Increase	Substantial Increase?[2]
	Without Project	With Project		
Highway 49	76.06	76.12	0.06	*No*
Rincon Way	44.52	48.73	4.21	*No*

Source: Ambient 2011
Traffic noise levels were calculated using the FHWA roadway noise prediction model.
Substantial increases defined as an increase of 5.0, or greater, where noise levels are less than the County's normally acceptable minimum noise level of 60 dBA CNEL/L_{dn}; 3 dBA, or greater, where noise levels range from 60 to 65 dBA CNEL; and 1.5 dB, or greater, where the noise level exceeds 65 dBA CNE,L without the proposed project.

As depicted, implementation of the proposed project would result in predicted increases of 0.06 dBA along nearby segments of State Route 49 and approximately to 4.21 dBA along Rincon Way. While the proposed project will increase traffic and associated noise along these two roadways, the increase does not represent a significant contribution to traffic noise levels and this impact is considered **less than cumulatively considerable**.

General Plan and Zoning Ordinance Text Amendments

As discussed in further detail in Section 4.0, Cumulative Impacts Summary, the proposed General Plan and Zoning Ordinance text amendments are policy actions that would not directly result in increased noise in the cumulative setting. Although CCRCs would be permitted in either a PD (Planned Development) or SDA (Special Development Area) land use designation with approval of a zone change after implementation of the proposed project, such rezoning applications would be subject to further CEQA analysis of project-specific impacts (proposed Zoning Ordinance amendment Section L.II 2.7.11(C)(4)), including noise impacts. At a programmatic level, the environmental impacts associated with development of all PD and SDA designated areas in the county were analyzed in the Nevada County General Plan Environmental Impact Report, Volume I, SCH #1995102136 (1995). Future site-specific CEQA analysis would result in project-specific mitigation to address impacts. Therefore, cumulative noise impacts associated with the proposed General Plan and Zoning Ordinance text amendments are considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

Ambient Air Quality & Noise Consulting. 2011. *Noise & Groundborne Vibration Impact Assessment for the Proposed Rincon del Rio, Nevada County, CA.*

California Building Standards Commission. 1998. *California Building Code, Volume 1, Appendix Chapter 12, Section 1208A*. http://www.bsc.ca.gov/default.htm.

Caltrans (California Department of Transportation). 2002a. *California Airport Land Use Planning Handbook.*

———. 2002b. *Transportation Related Earthborne Vibrations*.

———. 2004. *Transportation- and Construction-Induced Vibration Guidance Manual.*

———. 2011. "IS/EA Annotated Outline." Accessed February 8. http://www.dot.ca.gov/ser/vol1/sec4/ch31ea/chap31ea.htm.

FICON (Federal Interagency Committee on Noise). 2000. *Discussion of Methodologies of Measuring Noise Impact.*

Flecker, Jonathan. 2011. Transportation Engineer, KD Anderson Associates. E-mail correspondence to Kurt Legleiter, Ambient Air Quality & Noise Consulting. July 11.

FTA (United States Department of Transportation, Federal Transit Administration). 2006. *Transit Noise and Vibration Impact Assessment Guidelines*.

Nevada County. 1996. *Nevada County General Plan, Noise Element.* http://new.mynevadacounty.com/planning/index.cfm?ccs=783.

———. 2010. *Nevada County Land Use Development Code, Chapter 11, Zoning Regulations, Section L-II, 4.1.7, Noise*. https://public.nevcounty.net/County%20Counsel%20Public%20Library/County%20Codes/Land%20Use%20Code/Land%20Use%20Code%20Chap.%20II,%20Zoning%20Regulations.pdf.

———. 2011. "My Neighborhood Interactive GIS." Accessed July 26. http://gisweb01.nevcounty.net/public/flash/myneighborhood/index.html.

OPR (State of California, Office of Planning and Research). 2003. *General Plan Guidelines.*

USEPA (United States Environmental Protection Agency). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*.

———. 1974. *Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*.