Noise Impact Analysis
Royston Bed and Breakfast
Oak Glen, San Bernardino County, California

Prepared for:

Kirsten Royston
38433 Potato Canyon Road
Oak Glen, CA 92399

(909) 662-5124

Prepared by:

KW Air Quality and Noise LLC
7404 Kingsley Way
Riverside, CA 92504
951.212.3277

Contact: Katie Wilson, CEO/Air Quality/Noise Specialist

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LIST OF ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
dBA/DD	A-weighted decibel per each doubling of distance
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FTA	Federal Transit Administration
Hz	Hertz
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
L_V	Vibration Level
ONAC	Federal Office of Noise Abatement Control
ONC	California Department of Health Services Office of Noise Control
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
RMS	root mean square
SEL	Single Event Level
sq ft	square feet
UMTA	Urban Mass Transit Administration
VdB	L_V at 1 microinch per second

SECTION 1: INTRODUCTION

1.1 - Purpose of Analysis and Study Objectives

This Noise Impact Study has been prepared by KW Air Quality and Noise LLC (KWAQN) to determine the offsite and onsite noise impacts associated with the proposed Royston Bed and Breakfast development project. The following is provided in this report:

- A description of the study area and the proposed project.
- Information regarding the fundamentals of noise.
- Information regarding the fundamentals of vibration.
- A description of the local noise guidelines and standards.
- An evaluation of the current noise environment.
- An analysis of the potential short-term construction-related noise and vibration impacts from the proposed project.
- An analysis of long-term operations-related noise and vibration impacts from the proposed project.

1.2 - Project Location and Study Area

The project site is located south of Potato Canyon Road and west of Oak Glen Road.. The project site currently is currently occupied by an existing residential use. The project is bounded to the west by a residential use, to the north by Potato Canyon Road, and east by a vacant lot, and to the south by open space (see Exhibit 1).

1.3 - Project Description

The project site is to be developed with a five room bed and breakfast with a special event space in an existing 4,751 square foot (SF) home with five bedrooms and 4.5 bathrooms. Per the County requirements, three will be a maximum of 20 people hosted at one time the Bed and Breakfast house. As an additional use to the Bed and Breakfast, the site will host a limited number of events. Per Andres Aguirre of the State Water Resources Control Board, the site will never host more than 25 guests per year for more than 50 days out of the year. The maximum guest count on any given day during one of those 50 event days, shall never exceed 200 people. The events will be broken down per year as follows:

- 13 events with 200 guests hosted on weekend days with limited amplified music and a curfew of 10pm (Inland empire [I.E.] Community events and private events)

- 15 seasonal agritourism based events to take place on weekends during apple picking season with limited amplified music and a curfew of 7pm (I.E. U-Pick apple, pumpkin patch, fall festival, farmers markets, etc.)

- 22 smaller daytime & afternoon events with limited to no amplified music, 100 people, and a curfew of 9pm (I.E. family reunion, corporate retreat, team building events, movie nights, rehearsal dinners etc.)

When the home is rented out for Bed and Breakfast, guests will have 24-hour access to the house and parking. During events, all gates will be left open to allow for proper traffic flow into and out of the property. On those limited event days, the project will abide by all noise curfew requirements, and ensure that events end in a timely manner, with time for guests to leave the premise in order to create as little noise disturbance to the neighbors as possible.

The proposed site plan is shown in Exhibit 2.

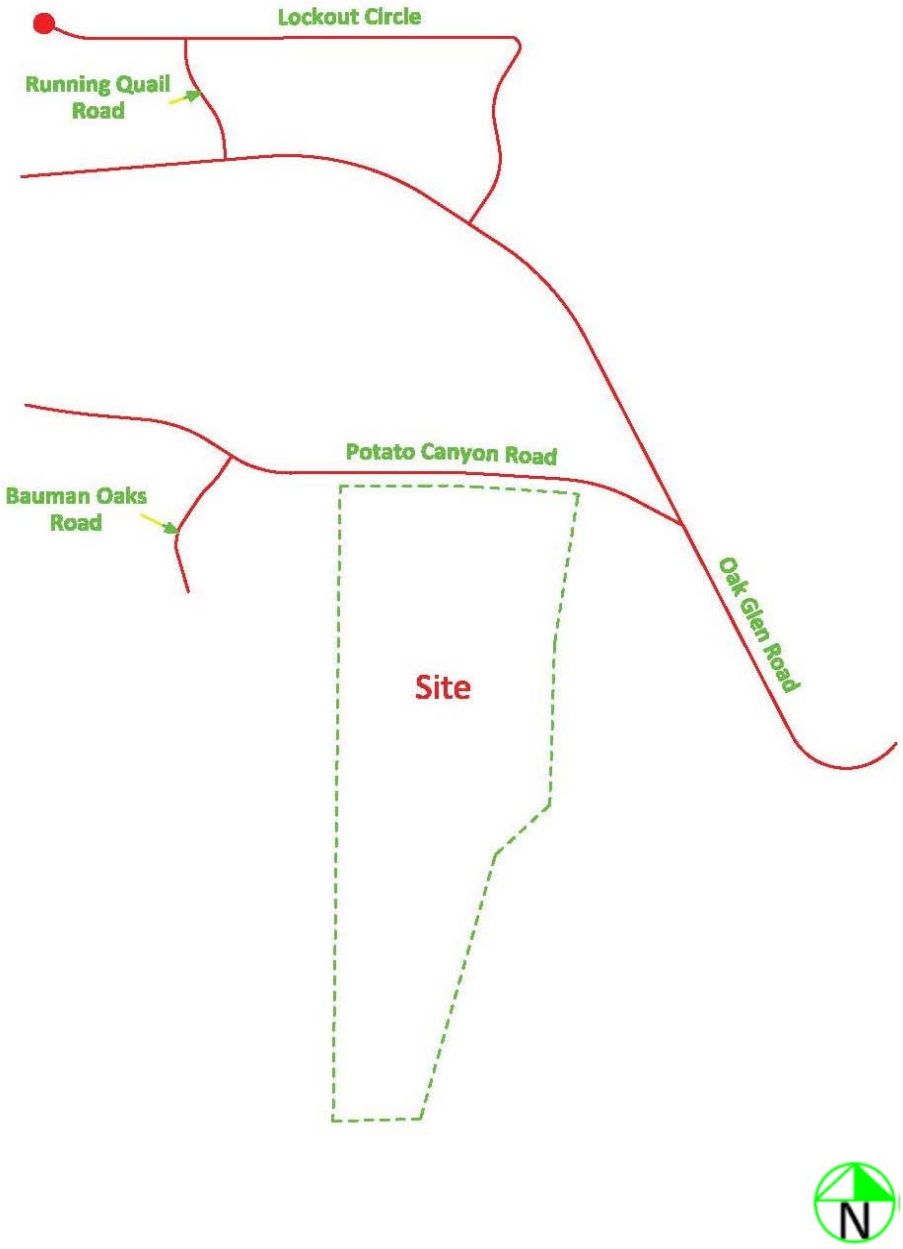


Exhibit 1
Project Location Map

Royston Bed and Breakfast
Noise Impact Analysis

Source: Kunzman Associates, 2020

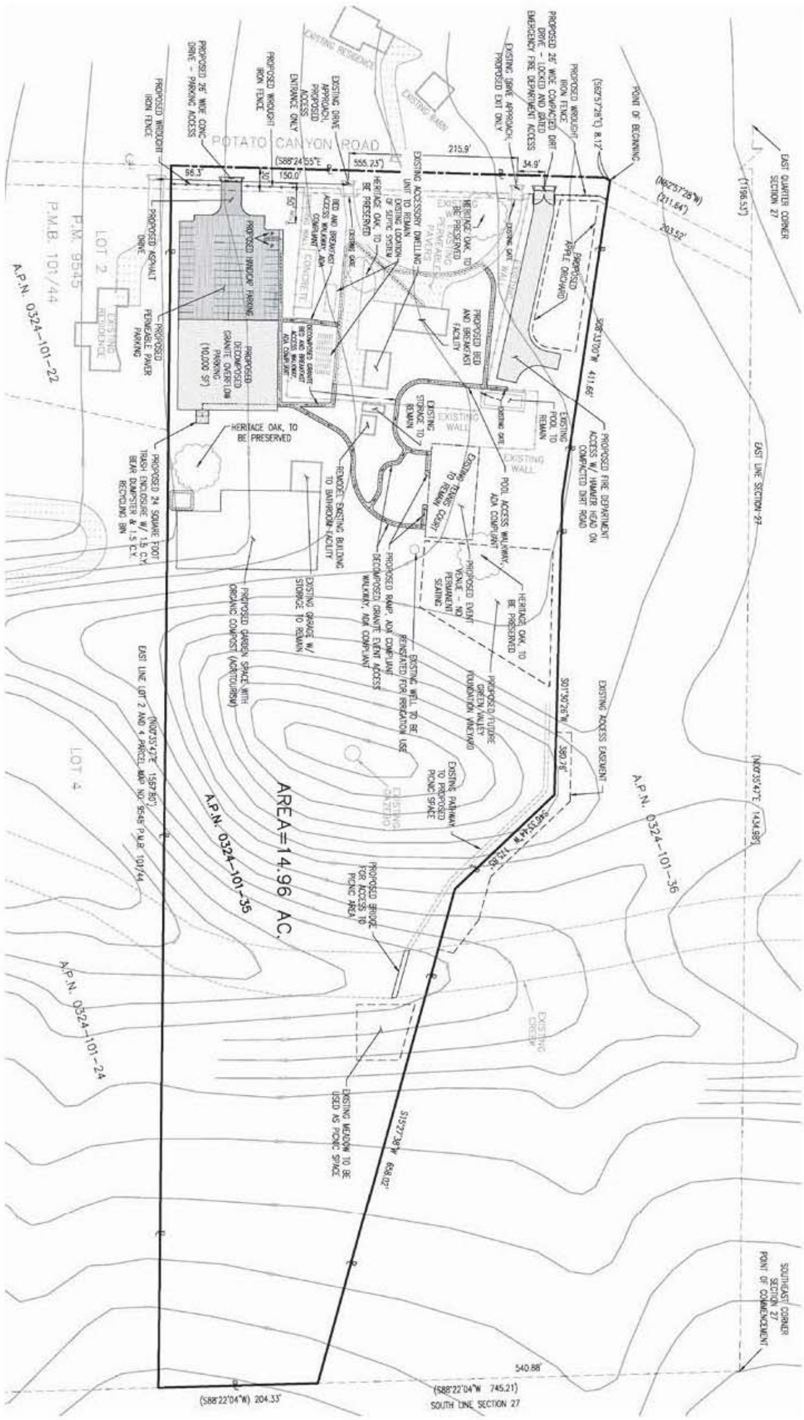


Exhibit 2
Site Plan

Royston Bed and Breakfast

Noise Impact Analysis

SECTION 2: NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

2.1 - Noise Descriptors

Noise equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour L_{eq} is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Sound Level (L_{dn}) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the L_{dn}, except that it has another addition of 4.77 dB to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these times because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound is perceived to be louder in the evening and nighttime hours and is weighted accordingly. Many cities rely on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

Another noise descriptor that is used primarily for the assessment of aircraft noise impacts is the Sound Exposure Level, which is also called the Single Event Level (SEL). The SEL descriptor represents the acoustic energy of a single event (i.e., an aircraft overflight) normalized to one-second event duration. This is useful for comparing the acoustical energy of different events involving different durations of the noise sources. The SEL is based on an integration of the noise during the period when the noise first rises within 10 dBA of its maximum value and last falls below 10 dBA of its maximum value. The SEL is often 10 dBA greater, or more, than the L_{MAX} since the SEL logarithmetically adds the L_{eq} for each second of the duration of the noise.

2.2 - Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown the humans are more perceptible to changes in noise levels of a pure tone (Caltrans 1998). For a noise source to contain a "pure tone," there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to "stand out" against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contagious one-third octave bands by: 5 dB for center frequencies of 500 Hertz (Hz) and above; by 8 dB for center frequencies between 160 and 400 Hz; and by 15 dB for center frequencies of 125 Hz or less (Department of Health Services 1977).

2.3 - Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 - Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. To be conservative, hard-site conditions were used in this analysis.

2.5 - Traffic Noise Prediction

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of

traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the FHWA community noise assessment criteria, this change is "barely perceptible," for reference a doubling of perceived noise levels would require an increase of approximately 10 dBA. However, the 1992 findings of Federal Interagency Committee on Noise (FICON), which assessed changes in ambient noise levels resulting from aircraft operations, found that noise increases as low as 1.5 dB can cause annoyance, when the existing noise levels are already greater than 65 dB. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

2.6 - Noise Barrier Attenuation

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. For a noise barrier to work, it must be high enough and long enough to block the view of a road. A noise barrier is most effective when placed close to the noise source or receiver. A noise barrier can achieve a 5-dBA noise level reduction when it is tall enough to break the line-of-sight. When the noise barrier is a berm instead of a wall, the noise attenuation can be increased by another 3 dBA.

SECTION 3: GROUNDBORNE VIBRATION FUNDAMENTALS

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

3.1 - Vibration Descriptors

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (RMS) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as L_V and is based on the RMS velocity amplitude. A commonly used abbreviation is VdB, which in this text, is when vibration level (L_V) is based on the reference quantity of 1 microinch per second.

3.2 - Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Offsite sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration.

3.3 - Vibration Propagation

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform median, while groundborne vibrations travel through the earth, which may contain significant geological differences. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

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

3.4 - Construction-Related Vibration Level Prediction

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table 1 gives approximate vibration levels for particular construction activities. The data in Table 1 provides a reasonable estimate for a wide range of soil conditions.

Table 1: Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (L_V) at 25 feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.		

SECTION 4: REGULATORY SETTING

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

4.1 - Federal Regulations

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

- Promulgating noise emission standards for interstate commerce.
- Assisting state and local abatement efforts.
- Promoting noise education and research.

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the County is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 - State Regulations

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide

each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it any special acoustical is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project. The City of Indio has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see Table 2). Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable and clearly unacceptable. The County of San Bernardino has adopted their own version of the State Land Use Compatibility Guidelines (see Tables 2 and 3).

4.2.1 - California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

Would the project result in:

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

Substantial increases in ambient noise levels are usually associated with project construction noise (temporary) and project operational noise (permanent).

Project Construction Noise: Construction noise sources are regulated within Section 83.01.080(g)(3) of the County of San Bernardino's Development Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM, except Sundays and Federal holidays.

Although construction activity may be exempt from the noise standards in the County's Development Code, CEQA requires that potential noise impacts still be evaluated for significance.

The County of San Bernardino has not adopted a numerical threshold that identifies what a substantial increase would be. For purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria will be used to establish significance thresholds. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA Leq averaged over an 8-hour period (Leq (8-hr); and the nighttime noise threshold is 70 dBA Leq (8-hr). For commercial uses, the daytime and nighttime noise threshold is 85 dBA Leq (8-hr). In compliance with the County's Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Project Operational Noise (permanent): The proposed project has the potential to generate on-site and off-site noise. For on-site generated noise, the County's stationary noise source standards (see Table 2) apply.

For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable mobile noise source standard for the affected sensitive receptors set forth in the County's Development Code (Table 3); or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

b) Generate excessive groundborne vibration or groundborne noise levels?

A peak particle velocity (PPV) of 0.20 is the threshold at which there is a risk to "architectural" damage to normal dwellings. It is also the level at which groundborne vibration can become annoying. Impacts would be significant if construction activities result in groundborne vibration of 0.20 PPV or higher at a sensitive receptor.

4.2.2 - California Department of Transportation (Caltrans)

The California Department of Transportation has published one of the seminal works for the analysis of ground-borne noise and vibration relating to transportation- and construction-induced vibrations and although the project is not subject to these regulations, it serves as useful tools to evaluate vibration impacts. These guidelines recommend that a standard of 0.2 inches per section (in/sec) PPV not be exceeded for the protection of normal residential buildings (California Department of Transportation, 2013). This is the appropriate threshold for construction related ground-borne vibration impacts.

4.3 - Local Regulations

The County of San Bernardino establish the following applicable goals policies related to noise and vibration.

4.3.1 - County of San Bernardino General Plan

The County of San Bernardino General Plan Noise Element provides goals, policies and implementation measures that are intended to achieve and maintain land use compatibility with environmental noise levels and to ensure that County residents will be protected from excessive noise intrusion, both now and in the future. Goals and Policies applicable to the proposed project are presented below:

Goal N-1 The County will abate and avoid excessive noise exposures through noise mitigation measures incorporated into the design of new noise generating and new noise sensitive land uses, while protecting areas within the County where the present noise environment is within acceptable limits.

Policy N 1.2: Ensure that new development of residential or other noise-sensitive land uses is not permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the standards of noise-sensitive land uses include residential uses, schools, hospitals, nursing homes, places of worship and libraries.

Policy N 1.3: When industrial, commercial, or other land uses, including locally regulated noise sources, are proposed for areas containing noise sensitive land uses, noise levels generated by the proposed use will not exceed the performance standards of Table N-2 within outdoor activity areas. If outdoor activity areas have not yet been determined, noise levels shall not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for residential or other noise-sensitive land uses.

Policy N 1.4: Enforce the state noise insulation standards (California Administrative Code, Title 24) and Chapter 35 of the California Building Code (CBC) 6.

Policy N 1.5: Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.

Policy N 1.7 Prevent incompatible land uses, by reason of excessive noise levels, from occurring in the future.

Goal N-2 The County will strive to preserve and maintain the quiet environment of mountain, desert and other rural areas.

Policy 2.1: The County will require appropriate and feasible on-site noise attenuating measures that may include noise walls, enclosure of noise generating equipment, site planning to locate noise sources away from sensitive receptors, and other comparable features.

4.3.2 - County of San Bernardino Development Code

Section 83.01.080 of the County of San Bernardino Development Code establishes noise criteria not to be exceeded at the property line of adjacent land uses. These criteria would apply to on-site operational noise generated by the project. Nearby residential land uses may be affected by project-generated operational noise. Sections of the code applicable to the proposed project are presented below.

Noise Standards for Stationary Noise Sources

Table 3, Noise Standards for Stationary Noise Sources, describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties. Stationary noise sources associated with the proposed project may impact nearby residential land uses. As shown in Table 2, the base exterior noise level standards for residential land uses are 55 dBA L_{eq} during daytime hours and 45 dBA during nighttime hours; and the base noise level criteria for park land uses is 65 dBA (anytime). As described in Table 2, other criteria apply depending on the duration of the noise event. For example, the maximum event noise level standard for impacts to the adjacent residential land uses is 75 dBA L_{eq} during daytime hours and 65 dBA during nighttime hours. Typically, if the 30-minute L_{eq} is not exceeded the other shorter criteria, with the exception of the L_{max} would be likely to be exceeded.

Noise Standards for Adjacent Mobile Noise Sources

The County of San Bernardino Development Code also sets forth interior and exterior noise level standards for transportation noise impacts to the proposed project (see Table 3). The noise level criteria of 45 dBA CNEL for interior noise and the 65 dBA CNEL apply to the nearby residential buildings.

Noise Standards for Construction Noise

Temporary construction, maintenance, repair, and demolition activities between 7:00 AM and 7:00 PM, except Sundays and Federal holidays are exempt from Section 83.01.080(g)(3) the San Bernardino Development Code.

This Development Code Standard seems to be contradictory to the General Plan Policy N1.6 above. Therefore, to be conservative, it is assumed that construction noise is exempt only between the hours presented above under Ordinance 83.01.080(g)(3).

Ground Vibration

Section 83.01.090(a) of the County of San Bernardino Development Code prohibits the creation of ground vibration that can be felt without the aid of instruments at or beyond the lot-line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot-line. Per Section 83.01.090(c), construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays. It is anticipated that project construction will occur within the exempt hours, therefore this threshold will not apply. The project does not proposed any non-construction related sources of ground-borne vibration.

Table 2
County of San Bernardino Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7:00 AM to 10:00 PM dBA L_{eq}	10:00 PM to 7:00 AM dBA L_{eq}
Residential	55	45
Professional Services	55	55
Other Commercial	60	60
Industrial	70	70

Noise limit categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporat unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subsection B (Noise-impacted areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

If the measured ambient level exceeds any of the first four noise limit categories, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

Notes:

(1) Source: County of San Bernardino Development Code, Development Code Table 83-2.

Table 3
County of San Bernardino Noise Standards for Mobile Noise Sources

Land Use		L_{dn} (or CNEL) dB(A)	
Category	Type	Interior[1]	Exterior[2]
Residential	Single and multi-family, duplex, mobile homes	45	60[3]
Commercial	Hotel, motel, transient housing	45	60[3]
	Commercial retail, bank, restaurant	50	n/a
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	n/a
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	n/a	65

Notes:

Source: County of San Bernardino Development Code, Development Code Table 83-3.

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

Hospital/office building patios
Hotel and motel recreation areas
Mobile home parks
Multi-family private patios or balconies
Park picnic areas
Private yard of single-family dwellings
School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

SECTION 5: EXISTING NOISE CONDITIONS

To determine the existing noise level environment, short-term noise measurements were taken in the project study area at three locations in the project vicinity. The following describes the measurement procedures, measurement locations, and the noise measurement results.

5.1 - Measurement Procedure and Criteria

To ascertain the existing noise at and adjacent to the project site, field monitoring was conducted on November 9, 2020. The field survey noted that noise within the proposed project area is generally characterized by traffic noise. The nearest airport is Redlands Municipal Airport, which is located approximately 10.6 miles northwest of the project site. The project site falls well outside the 65 dBA noise contour, and is not considered as a source that contributes to the ambient noise levels on the project site.

5.1.1 - Noise Measurement Equipment

Noise monitoring was performed using an American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter. The sound level meter was programmed in "slow" mode to record the sound pressure level at one second intervals for in A-weighted form. The sound level meter and microphone were mounted approximately five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before monitoring using Larson Davis Cal 250. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

5.1.2 - Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise measurements of the current noise sources impacting the vicinity of the project site and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The sites are shown in Exhibit 3 on the following page. Appendix A includes a photographic index of the study area and noise level measurement locations.

Exhibit 3
Noise Monitoring Locations

Royston Bed and Breakfast

Noise Impact Analysis

5.1.3 - Noise Measurement Timing and Climate

The noise measurements were recorded between 11:55 AM and 12:57 PM on November 9, 2020. At the start of the noise monitoring, the sky had approximately 40% cloud cover and there were calm wind conditions (5-10 mph).

5.2 - Noise Measurement and Analysis Results

The noise measurements were taken at three (3) locations at the project site. The results of the noise level measurements are provided below in Table 4. The dominant noise source in the area was traffic, with secondary noise from birds and the occasional overhead aircraft.

Table 4: Existing Noise Level Measurements

Site Location	Description	L_{eq}	L_{MAX}	L_{MIN}
NM 1	On the northern portion of the property, adjacent to the residential receptor west of the project site	48.7	61.2	40.4
NM 2	On the southern portion of the property, adjacent to the residential receptor west of the project site at 38387 Potato Canyon Road	50.5	62.9	42.3
NM 3	At the southern boundary of the residential receptor north of the project site at 38454 Potato Canyon Road, north of Potato Canyon Road.	41.6	50.5	37.0

5.2.1 - Traffic Noise Modeling Results

The Noise impacts related to vehicular traffic were modeled using a version of the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108), as modified for CNEL and the "Calveno" energy curves. Site-specific information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, noise source and receiver heights, and the percentages of automobiles, medium trucks, and heavy trucks that the traffic is made up of throughout the day, amongst other variables.

The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface). All modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Any reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Existing and Existing Plus Project average daily traffic (ADT) were obtained from Robert Kunzman,, the traffic engineer for the project, and are provided in Appendix C .

Roadway parameters utilized to model future traffic noise levels to the Project include location, traffic volume, speed and vehicle mix (autos, medium trucks, and heavy trucks) . The various scenarios that are described above were modeled to determine project-specific increases in noise levels at an arbitrary distance of 50 feet from roadway centerline. The uniform distance allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies. Therefore, the change in a noise level between scenarios is the focus of this portion of the analysis, rather than the resulting independent noise level for any one segment. FHWA calculation spreadsheets are included in Appendix C.

The calculated noise levels in Table 5 shows that the existing traffic noise in the area is as high as 62.9 dBA at a distance of 50 feet from the centerline.

Table 5
Project Traffic Noise Contributions to Existing Scenario

Road Segments	Existing		Existing Plus Project			Is the Increase Significant ?
	ADT	dB CNEL	ADT	Total	Project-Specific Increase	
Oak Glen Road						
w/o Potato Canyon Road	3,275	62.9	3,511	63.2	0.3	**No**
e/o Potato Canyon Road	3,275	62.9	3,433	63.1	0.2	**No**

*The uniform distance of 50 feet from centerline allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies

SECTION 6: NOISE AND VIBRATION ANALYSES

Consistent with the California Environmental Quality Act (CEQA) and the CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- 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.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

According to the CEQA checklist, to determine whether impacts to noise resources are significant environmental effects, the following thresholds are analyzed and evaluated:

- Exceedance of noise standards for construction and operational noise
- Groundborne vibration.
- Operational noise.
- Short-term construction noise.
- Airport noise.

Each of these thresholds is analyzed below.

6.1 - Exceedance of Noise Standards

This impact discussion analyzes the potential for project construction noise to cause an exposure of persons to or generation of noise levels in excess of established County of San Bernardino noise standards or applicable standards of other agencies. Noise levels in the project area would be influenced by construction activities.

6.1.1 - Construction Noise

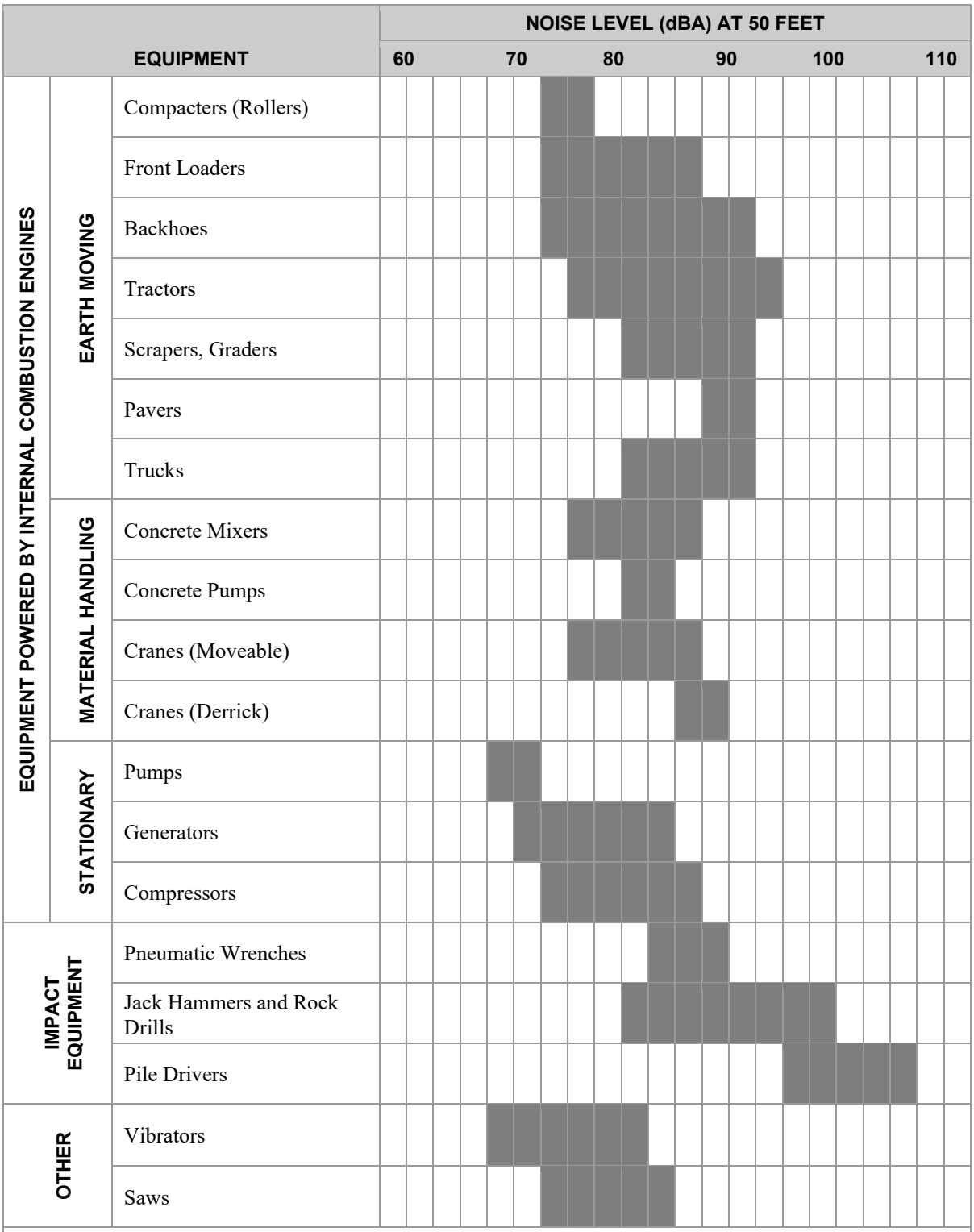
As stated previously, construction noise sources are regulated within Section 83.01.080(g)(3) of the County of San Bernardino's Development Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM, except Sundays and Federal holidays.
Although construction activity may be exempt from the noise standards in the County's Development Code, CEQA requires that potential noise impacts still be evaluated for significance.
The County of San Bernardino has not adopted a numerical threshold that identifies what a substantial increase would be. For purposes of this analysis, the Federal Transit Administration (FTA) Transit

Noise and Vibration Impact Assessment (2006) criteria will be used to establish significance thresholds. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA Leq averaged over an 8-hour period (Leq (8-hr); and the nighttime noise threshold is 70 dBA Leq (8-hr). For commercial uses, the daytime and nighttime noise threshold is 85 dBA Leq (8-hr). In compliance with the County's Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas. The closest receptors to the project site include: the residential uses located to the west and north of the project site.

Short-term noise impacts could occur during construction activities from either the noise impacts created from the transport of workers and movement of construction materials to and from the project site, or from the noise generated onsite during the minor parking area improvements and driveway paving activities.

Exhibit 4: Typical Construction Equipment Noise Levels



Source: United States Environmental Protection Agency, 1971, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," NTID 300-1.

Construction noise levels will vary significantly based upon the size and topographical features of the active construction zone, duration of the work day, and types of equipment employed, as indicated in Exhibit 4. A typical construction day with an eight-hour duration will generate 84 dBA CNEL at a distance of 50 feet from the noise source, on average. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Although there would be a relatively high single-event noise exposure potential, resulting in potential short-term intermittent annoyances, the effect in long-term ambient noise levels would be small when averaged over longer time. As shown by the ambient noise level measurements in Table 4: Existing Noise Level Measurements, receptors in the project vicinity are already exposed to a maximum noise level of 85.0 dBA.

The proposed installation of permeable paver parking and asphalt driveway would occur adjacent to Potato Canyon Road and would use mostly hand tools; therefore, daytime construction noise levels should not exceed 80 dBA L_{eq} for an 8-hour period at residential uses and 85 dBA L_{eq} Therefore, project construction is not anticipated to exceed the FTA thresholds for residential uses. Furthermore, with compliance with the County's Development Code Standards for Construction Noise, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Impacts related to construction noise will be further minimized with adherence to the best management practice measures (BMPs) presented below.

In addition to adherence to the County of San Bernardino Development Code which limits the construction hours of operation, the following BMPs are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

2. The contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. Equipment shall be shut off and not left to idle when not in use.

4. The contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

5. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

6. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

7. Limit the use of heavy equipment or vibratory rollers and soil compressors along the project boundaries to the greatest degree possible. It is acknowledged that some soil compression may be necessary along the project boundaries.

8. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded and noise shall be directed away from sensitive receptors.

9. For the duration of construction activities, the construction manager shall serve as the contact person should noise levels become disruptive to local residents. A sign should be posted at the project site with the contact phone number.

With use of BMPs (as applicable) construction-related noise impacts are considered to be less than significant.

6.2 - Groundborne Vibration

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the project area would be influenced by construction activities and from the ongoing operations of the proposed project.

The California Department of Transportation (Caltrans) Transportation and Construction Vibration Manual identifies various vibration damage criteria for different building classes. This evaluation uses the Caltrans architectural damage criterion for continuous vibrations at residential structures of 0.3 inch-per-second PPV. Further, as the nearest sensitive receptors to project construction are residents, the criterion for human annoyance of 0.2 inch-per-second PPV is utilized. The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural.

6.2.1 - Construction Vibration

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The highest degree of groundborne vibration would be generated during the paving construction phase due to the operation of a vibratory roller. Based on the Federal Transit Administration (FTA) data, vibration velocities from vibratory roller operations are estimated to be approximately 0.1980 inch-per-second PPV at 26 feet from the source of activity.[2] As such, structures located greater than 26 feet from vibratory roller operations would not experience groundborne vibration above the Caltrans significance thresholds (i.e. 0.3 inch-per-second PPV for structures and 0.2 inch-per-second PPV for human annoyance). As the nearest existing structures are located at least 50 feet from any location within the project boundary and vibratory roller is not anticipated to be used on-site (only a plate compactor will likely be used during installation of the pavers) significance thresholds would not be exceeded. Therefore, impacts would be less than significant in this regard.

6.2.2 - Operational Vibration

As the proposed project consists of a proposed bed and breakfast use, the project does not include any sources of operational vibration; no impacts are anticipated.

[2] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

6.3 - Operational Noise

This impact discussion analyzes the potential for a substantial permanent increase in ambient noise levels in the project vicinity associated with operation of the proposed project, including impacts related to offsite vehicular noise and exposure of neighboring land uses to onsite noise.

Onsite Operational Noise

Analysis of on-site operational noise is typically not conducted for residential projects as they usually do not include stationary noise sources that could result in substantial increases in ambient noise levels resulting in violation of established standards. However, the project proposes the conversion of the existing residential use to a Bed and Breakfast that will also host a limited number of events which could generated noise that may disturb adjacent sensitive receptors. As stated previously, the site will never host more than 25 guests per year for more than 50 days out of the year. The maximum guest count on any given day during one of those 50 event days, shall never exceed 200 people. The events will be broken down per year as follows:

- 13 events with 200 guests hosted on weekend days with limited amplified music and a curfew of 10pm (I.E Community events and private events)

- 15 seasonal agritourism based events to take place on weekends during apple picking season with limited amplified music and a curfew of 7pm (I.E. U-Pick apple, pumpkin patch, fall festival, farmers markets, etc.)

- 22 smaller daytime & afternoon events with limited to no amplified music, 100 people, and a curfew of 9pm (I.E. family reunion, corporate retreat, team building events, movie nights, rehearsal dinners etc.)

The owner stated that when the home is rented out for Bed and Breakfast, guests will have 24-hour access to the house and parking. During events, all gates will be left open to allow for proper traffic flow into and out of the property. On those limited event days the guests will abide by all noise curfew requirements, and ensure that events end in a timely manner, with time for guests to leave the premise in order to create as little noise disturbance to our neighbors as possible.

As shown on the site plan (Figure 3), the proposed event venue will be located on the existing tennis court, in the middle of the site, south of the swimming pool area. The event venue is located approximately 350 feet to the southeast of the boundary of the residential use located at 38387 Potato Canyon Road (close to the noise measurement location NM1), approximately 325 feet east of the residential use located at the end of the cul-de-sac on Bauman Oaks Road (close to the noise measurement location NM2) and approximately 370 feet south of the boundary of the closest

residential use located at 38454 Potato Canyon Road (closest to the noise measurement location NM3).

In order to calculate the potential noise impacts from the on-site events, amplified music was anticipated to be between 80 to 90 dB at a distance of 5 feet from the source[3]. Therefore, at a distance of 325 feet, using 90 dB and a noise drop-off rate of 6 dBA per each doubling of the distance (dBA/DD), the noise level at the façade of the closest residential receptor (on Bauman Oaks Road) directly west of the event venue area would be approximately 53.74 dB, which would not exceed the County's residential daytime noise standard for stationary noise sources of 55 dBA_{leq}. As the other receptor locations to the northwest and north are further away from the source, the noise levels at those receptor locations would be even lower and would also not exceed 55 dBA. Although music would be audible at the closest receptor locations, the noise levels would not be considered significant. Furthermore, as stated above, the amplified music would be discontinued at 10 PM; therefore, the noise levels associated with amplified music would not exceed the County's residential nighttime noise standard for stationary noise sources of 45 dBA_{leq} either.

Another source of on-site noise would be from parking activities in the improved paved parking area, located approximately 25 feet from the boundary (55 feet from the façade) of the residential use located at 38387 Potato Canyon Road. The proposed parking areas have the potential to generate noise due to cars entering and exiting, engines accelerating, braking, car alarms, and other general activities associated with people using the parking areas (i.e., talking, opening/closing doors, etc.). Noise levels within the parking areas would fluctuate with the amount of automobile and human activity. Activity levels would be highest during events, when the largest number of people would enter and exit. However, these events would occur at low exiting and entering speeds, which would not generate high noise levels. During these times, the noise levels can range from 44 to 63 dB Leq[4]. At a distance of 25 feet, the noise levels would be reduced down to approximately 30.02 to 49.02 dB. This type of noise would not be constant, rather occur at instantaneous peaks. As shown in Table 3, the average ambient noise levels is 46.9 dB Leq and the maximum ambient noise level is 59.2 dB at this location (NM1). Therefore, parking lot activity is anticipated to be similar to existing noise levels in the area and would not exceed the County's residential daytime noise standard for stationary noise sources of 55 dBA_{leq} at closest receptor locations.

Noise associated with the use of the outdoor spaces would consist primarily of people talking. This would result in noise levels of approximately 60-70 dBA at three feet[3]. At an average distance of approximately 55 feet from the parking area and open space area adjacent to the receptors at 38387 Potato Canyon Road and Bauman Oaks Road, the noise levels from conversation would be reduced to 34.74-44.74 dB, which would not exceed either the daytime standard of 55 dBA or the nighttime

[3] Source: http://www.djspacebar.com/Site_Popups/decibels.html
[4] Source: Gordon Bricken & Associates, 1996. Estimates are based on actual noise measurements taken at various parking lots.

standard of 45 dBA. Although conversations maybe audible, the noise levels generated would not be considered significant.

Off-Site Operational Noise

Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways. As stated previously, the noise impacts related to vehicular traffic were modeled using a version of the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108), as modified for CNEL and the "Calveno" energy curves. The Opening Year (2022) without Project and Opening Year (2022) with Project average daily traffic (ADT) were obtained from the traffic engineer for the project, Robert Kunzman. FHWA calculation spreadsheets are included in Appendix C.

The calculated noise levels in Table 5 show that the project would contribute a maximum of 0.3 dBA to existing noise levels along Oak Glen Road west of Potato Canyon Road. Table 6 also shows that at project buildout, in 2022, there would be a marginal increase in noise of 0.3 dBA along the same road segment, due to the increase of project-related traffic on roadways in the project vicinity. As the project-related increase in traffic noise does not exceed 3 dBA, the project would not contribute to a substantial permanent increase in ambient noise levels in the project vicinity.

Table 6
Project Traffic Noise Contributions to Buildout (2022) Scenario

Road Segments	Opening Year (2022) without Project		Opening Year (2022) with Project			Is the Increase Significant ?
	ADT	dB CNEL	ADT	Total	Project-Specific Increase	
Oak Glen Road						
w/o Potato Canyon Road	3,425	63.0	3,661	63.3	0.3	**No**
e/o Potato Canyon Road	3,425	63.0	3,583	63.2	0.2	**No**

*The uniform distance of 50 feet from centerline allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies

6.4 - Airport Noise

This impact discussion analyzes the potential for nearby airports or private airstrips to expose people residing or working in the project area to excessive noise levels.

The nearest airport is Redlands Municipal Airport, located approximately 10.6 miles northwest of the project site. The project site falls well outside the 65 dBA noise contour[5] and is not considered as a source that contributes to the ambient noise levels on the project site. Impacts are considered to be less than significant.

[5] Source: http://ci.redlands.ca.us/clerk/agenda/staffreports/160621L3-attG.pdf

SECTION 7: REFERENCES

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Appendix A:
Study Area Photographic Index

KWAQN

7404 Kingsley Way,
Riverside, CA

10-Minute Noise Measurement Datasheet

Project: Royston Bed & Breakfast, Yucaipa Project
Site Address/Location: 38433 Potato Canyon Road, Yucaipa, CA
Date: 11/9/2020
Field Tech/Engineer: Ian Edward Gallagher
General Location: 38433 Potato Canyon Road,Yucaipa, CA
Sound Meter: Larson Davis Sound Track LxT1 **SN:** 3099
Settings: A-weighted, slow, 1-min, 10-minute interval
Meteorological Con.: 44 deg F, 5 to 10 mph wind, 43% humidity, about 40% cloud. Light dusting (<5%) of melting snow on ground.
Site ID: NM-1 2 & 3

Site Observations: Main noise sources are from vehicular traffic traveling along Potato Canyon Rd, Oak Glen Rd & other surrounding roads . Low density residential area with much vegetation and trees. Other noise sources include engine noise from low altitude & distant aircraft both fixed wing propeller and jet. Constant bird song from birds in trees and open grassy areas. Glen runs E-W with mountains to the N & S.

Site Topo: Ruralscape, vegetation/ trees, residential,asphalt paving.
Ground Type: Vegetative/soil conditions, reflective, refractive, some absorption.

NM locations, lat , long :

NM1 Meter: 34° 3'12.27"N 116°58'1.11"W
NM2 Meter: 34° 3'9.60"N 116°58'1.18"W
NM3 Meter: 34° 3'14.49"N 116°57'57.84"W

Figure 1: Monitoring Locations

Figure 2: NM1 Photo

NM1 looking NNE out across open grassy area along dirt pathway towards Potato Canyon Road (70 yards).

KWAQN

7404 Kingsley Way,
Riverside, CA

10-Minute Noise Measurement Datasheet - Cont.

Project: Royston Bed & Breakfast, Yucaipa Project
Site Address/Location: 38433 Potato Canyon Road, Yucaipa, CA
Site ID: NM-1 2 & 3

Figure 3: NM2 Photo

NM2 looking W down Baumann Oaks Road, Yucaipa

Figure 4: NM3 Photo

NM3 looking N from Potato Canyon Road into front yard of residence 38454 Potato Canyon Road Yucaipa

Appendix B:
Field Noise Measurement Print-outs

KWAQN

7404 Kingsley Way,
Riverside, CA

10-Minute Noise Measurement Datasheet - Cont.

Project: Royston Bed & Breakfast, Yucaipa Project
Site Address/Location: 38433 Potato Canyon Road, Yucaipa, CA
Site ID: NM-1 2 & 3

Table 1: Noise Measurement Summary

Location	Start	Stop	Leq/ dB	Lmax/ dB	Lmin/ dB	L2/ dB	L8/ dB	L25/ dB	L50/ dB	L90/ dB
NM 1	11:55 AM	12:05 PM	46.9	59.2	31.0	56.7	51.2	46.1	40.7	35.1
NM 2	12:21 PM	12:31 PM	37.4	57.9	32.2	42.7	40.5	38.2	36.4	33.8
NM 3	12:47 PM	12:57 PM	66.6	85.0	34.7	76.2	71.6	62.3	49.1	38.0

NM1 KW Royston Bed & Breakfast, 38433 Potato Canyon Road, Yucaipa Project.

Record #	Record Type	Date	Time	LAeq	LZpeak	LASmax	LCeq-LAeq	LAIeq-LAeq	OVLD	Marker
1	Calibration Change	11/9/2020	11:53:43 AM							
2	Calibration Change	11/9/2020	11:53:57 AM							
3	Run	11/9/2020	11:55:27 AM							
4		11/9/2020	11:55:27 AM	39.2	68.2	39.6	15.0	1.4	No	
5		11/9/2020	11:55:30 AM	42.0	70.3	44.4	13.2	0.9	No	
6		11/9/2020	11:55:40 AM	40.7	69.4	46.5	12.7	4.7	No	
7		11/9/2020	11:55:50 AM	42.0	76.0	49.0	11.7	14.5	No	
8		11/9/2020	11:56:00 AM	45.7	76.3	50.8	13.1	1.1	No	
9		11/9/2020	11:56:10 AM	52.7	78.9	55.9	12.2	1.2	No	
10		11/9/2020	11:56:20 AM	41.9	71.2	46.0	14.3	0.2	No	
11		11/9/2020	11:56:30 AM	40.6	70.2	42.8	13.8	1.6	No	
12		11/9/2020	11:56:40 AM	45.2	71.3	46.5	12.2	1.6	No	
13		11/9/2020	11:56:50 AM	51.1	76.8	53.4	12.1	0.9	No	
14		11/9/2020	11:57:00 AM	54.1	80.6	57.0	11.1	3.7	No	
15		11/9/2020	11:57:10 AM	56.7	80.0	58.7	9.5	0.6	No	
16		11/9/2020	11:57:20 AM	57.4	82.0	59.2	13.8	1.4	No	
17		11/9/2020	11:57:30 AM	53.7	80.4	57.0	15.6	1.6	No	
18		11/9/2020	11:57:40 AM	47.8	75.3	50.2	12.9	4.4	No	
19		11/9/2020	11:57:50 AM	46.8	74.9	48.7	13.3	0.4	No	
20		11/9/2020	11:58:00 AM	43.1	72.0	48.4	12.1	1.0	No	
21		11/9/2020	11:58:10 AM	47.0	72.4	49.9	9.6	0.6	No	
22		11/9/2020	11:58:20 AM	47.1	73.5	50.2	12.2	0.7	No	
23		11/9/2020	11:58:30 AM	38.7	69.6	46.2	14.3	2.1	No	
24		11/9/2020	11:58:40 AM	37.2	71.3	40.5	15.7	6.4	No	
25		11/9/2020	11:58:50 AM	37.5	73.8	39.9	18.6	0.3	No	
26		11/9/2020	11:59:00 AM	44.6	73.4	47.0	13.2	1.9	No	
27		11/9/2020	11:59:10 AM	45.6	74.4	49.0	12.0	2.5	No	
28		11/9/2020	11:59:20 AM	36.1	69.6	42.5	17.3	1.1	No	
29		11/9/2020	11:59:30 AM	36.8	70.5	38.6	16.5	0.9	No	
30		11/9/2020	11:59:40 AM	38.8	73.6	41.0	18.4	0.6	No	
31		11/9/2020	11:59:50 AM	42.3	71.9	44.2	15.3	0.1	No	
32		11/9/2020	12:00:00 PM	39.0	69.0	41.5	14.1	0.5	No	
33		11/9/2020	12:00:10 PM	45.1	72.8	48.0	9.8	0.7	No	
34		11/9/2020	12:00:20 PM	37.2	68.6	41.0	15.4	6.2	No	
35		11/9/2020	12:00:30 PM	44.4	71.3	47.5	11.8	0.1	No	
36		11/9/2020	12:00:40 PM	49.5	74.4	51.7	9.8	0.0	No	
37		11/9/2020	12:00:50 PM	49.0	75.8	51.2	12.9	0.3	No	
38		11/9/2020	12:01:00 PM	43.1	75.1	49.7	14.6	1.0	No	
39		11/9/2020	12:01:10 PM	37.6	68.0	40.4	14.1	6.0	No	
40		11/9/2020	12:01:20 PM	37.1	78.4	39.9	16.6	0.4	No	
41		11/9/2020	12:01:30 PM	34.9	68.4	37.1	15.7	0.0	No	
42		11/9/2020	12:01:40 PM	31.9	69.7	32.9	20.4	3.2	No	
43		11/9/2020	12:01:50 PM	33.4	69.0	35.3	19.3	-0.1	No	
44		11/9/2020	12:02:00 PM	35.6	68.2	38.2	17.2	0.7	No	
45		11/9/2020	12:02:10 PM	37.5	69.6	39.2	17.2	4.6	No	
46		11/9/2020	12:02:20 PM	38.4	68.6	39.6	15.5	0.1	No	
47		11/9/2020	12:02:30 PM	41.0	75.2	41.4	13.4	0.3	No	
48		11/9/2020	12:02:40 PM	42.0	72.7	45.3	12.3	1.1	No	
49		11/9/2020	12:02:50 PM	48.5	73.8	51.6	8.8	1.5	No	
50		11/9/2020	12:03:00 PM	47.2	77.7	50.6	9.2	0.2	No	
51		11/9/2020	12:03:10 PM	47.2	73.6	50.0	11.7	2.2	No	
52		11/9/2020	12:03:20 PM	41.3	70.4	48.0	13.8	0.7	No	
53		11/9/2020	12:03:30 PM	46.5	80.1	49.9	10.3	4.1	No	
54		11/9/2020	12:03:40 PM	37.2	69.8	46.5	17.9	0.9	No	
55		11/9/2020	12:03:50 PM	36.2	70.0	37.5	18.8	2.8	No	
56		11/9/2020	12:04:00 PM	35.2	69.1	37.2	18.9	0.9	No	
57		11/9/2020	12:04:10 PM	37.3	67.9	38.8	15.5	0.8	No	
58		11/9/2020	12:04:20 PM	35.4	69.6	38.5	18.9	3.4	No	
59		11/9/2020	12:04:30 PM	36.8	70.5	39.6	19.4	0.1	No	
60		11/9/2020	12:04:40 PM	43.2	77.4	47.3	18.8	1.4	No	
61		11/9/2020	12:04:50 PM	37.0	71.4	40.0	18.7	3.4	No	
62		11/9/2020	12:05:00 PM	39.8	71.0	44.6	13.3	-0.7	No	
63		11/9/2020	12:05:10 PM	35.8	69.6	44.9	16.5	1.2	No	
64		11/9/2020	12:05:20 PM	37.3	69.6	39.2	15.9	1.5	No	
65	Stop	11/9/2020	12:05:27 PM							

NM2 KW Royston Bed & Breakfast, 38433 Potato Canyon Road, Yucaipa Project.

Record #	Record Type	Date	Time	LAeq	LZpeak	LASmax	LCeq-LAeq	LAleq-LAeq	OVLD	Marker
1	Calibration Change	11/9/2020	12:21:11 PM							
2	Calibration Change	11/9/2020	12:21:33 PM							
3	Run	11/9/2020	12:21:50 PM							
4		11/9/2020	12:21:50 PM	37.9	70.7	57.9	16.7	8.1	No	
5		11/9/2020	12:22:00 PM	38.7	70.0	41.4	16.0	0.9	No	
6		11/9/2020	12:22:10 PM	40.9	72.5	42.3	14.6	1.5	No	
7		11/9/2020	12:22:20 PM	38.4	73.2	39.4	17.6	1.0	No	
8		11/9/2020	12:22:30 PM	44.0	77.1	47.0	16.4	1.3	No	
9		11/9/2020	12:22:40 PM	34.9	70.3	38.6	19.1	0.3	No	
10		11/9/2020	12:22:50 PM	38.7	71.4	40.0	17.8	0.3	No	
11		11/9/2020	12:23:00 PM	36.6	68.9	39.4	16.8	1.9	No	
12		11/9/2020	12:23:10 PM	36.3	70.5	40.0	17.7	2.5	No	
13		11/9/2020	12:23:20 PM	37.9	69.6	43.0	16.2	7.1	No	
14		11/9/2020	12:23:30 PM	34.2	68.7	36.9	19.4	3.5	No	
15		11/9/2020	12:23:40 PM	34.9	68.7	35.9	17.7	2.7	No	
16		11/9/2020	12:23:50 PM	33.5	67.5	34.3	18.6	1.3	No	
17		11/9/2020	12:24:00 PM	34.0	69.9	35.5	18.9	1.0	No	
18		11/9/2020	12:24:10 PM	32.8	69.6	33.5	19.4	0.4	No	
19		11/9/2020	12:24:20 PM	34.3	68.3	34.9	18.2	0.6	No	
20		11/9/2020	12:24:30 PM	35.6	69.5	36.6	16.5	0.6	No	
21		11/9/2020	12:24:40 PM	35.8	67.9	37.7	16.3	1.0	No	
22		11/9/2020	12:24:50 PM	35.8	68.9	38.2	17.4	0.9	No	
23		11/9/2020	12:25:00 PM	36.7	68.4	39.3	16.2	1.8	No	
24		11/9/2020	12:25:10 PM	38.0	69.4	39.2	16.4	0.1	No	
25		11/9/2020	12:25:20 PM	40.2	70.3	43.1	14.5	0.1	No	
26		11/9/2020	12:25:30 PM	33.9	69.0	37.9	19.1	1.1	No	
27		11/9/2020	12:25:40 PM	36.8	78.4	43.1	16.8	12.3	No	
28		11/9/2020	12:25:50 PM	36.3	69.2	37.8	18.2	4.0	No	
29		11/9/2020	12:26:00 PM	35.5	67.9	36.2	16.5	0.4	No	
30		11/9/2020	12:26:10 PM	38.4	68.6	39.8	14.2	2.6	No	
31		11/9/2020	12:26:20 PM	34.7	68.9	37.3	17.8	-0.7	No	
32		11/9/2020	12:26:30 PM	37.3	67.8	38.4	15.9	3.4	No	
33		11/9/2020	12:26:40 PM	36.3	68.0	38.3	16.2	1.0	No	
34		11/9/2020	12:26:50 PM	38.9	71.1	39.9	14.5	1.3	No	
35		11/9/2020	12:27:00 PM	37.0	69.0	38.7	16.1	0.5	No	
36		11/9/2020	12:27:10 PM	37.3	69.9	39.5	15.5	0.2	No	
37		11/9/2020	12:27:20 PM	34.3	70.9	35.3	18.3	0.7	No	
38		11/9/2020	12:27:30 PM	35.2	74.4	36.0	17.7	2.0	No	
39		11/9/2020	12:27:40 PM	36.8	69.6	38.0	15.5	0.2	No	
40		11/9/2020	12:27:50 PM	36.5	71.3	37.2	16.3	1.2	No	
41		11/9/2020	12:28:00 PM	39.8	71.3	41.5	14.3	0.2	No	
42		11/9/2020	12:28:10 PM	41.1	71.0	42.4	13.5	1.6	No	
43		11/9/2020	12:28:20 PM	38.1	70.7	40.1	16.4	1.0	No	
44		11/9/2020	12:28:30 PM	35.0	67.9	36.2	17.8	2.0	No	
45		11/9/2020	12:28:40 PM	34.6	69.1	35.4	18.0	-0.4	No	
46		11/9/2020	12:28:50 PM	33.1	69.1	34.2	19.4	0.5	No	
47		11/9/2020	12:29:00 PM	34.4	69.9	35.4	18.8	0.0	No	
48		11/9/2020	12:29:10 PM	39.3	71.4	43.0	14.3	7.0	No	
49		11/9/2020	12:29:20 PM	37.9	80.6	41.5	19.2	0.8	No	
50		11/9/2020	12:29:30 PM	39.2	74.6	42.0	17.6	1.1	No	
51		11/9/2020	12:29:40 PM	38.5	72.4	43.0	15.4	1.3	No	
52		11/9/2020	12:29:50 PM	36.5	72.6	38.3	17.1	1.0	No	
53		11/9/2020	12:30:00 PM	38.2	75.1	39.6	15.1	1.4	No	
54		11/9/2020	12:30:10 PM	40.0	70.8	42.8	13.7	0.3	No	
55		11/9/2020	12:30:20 PM	34.8	75.7	37.1	17.8	-0.1	No	
56		11/9/2020	12:30:30 PM	36.1	75.7	37.1	16.3	1.1	No	
57		11/9/2020	12:30:40 PM	34.8	74.0	36.2	17.4	0.4	No	
58		11/9/2020	12:30:50 PM	34.6	73.0	35.8	16.7	0.4	No	
59		11/9/2020	12:31:00 PM	36.6	70.3	37.8	14.5	6.9	No	
60		11/9/2020	12:31:10 PM	36.3	72.5	40.9	15.9	0.8	No	
61		11/9/2020	12:31:20 PM	37.5	74.3	40.7	14.8	2.7	No	
62		11/9/2020	12:31:30 PM	38.1	74.5	39.5	15.2	0.3	No	
63		11/9/2020	12:31:40 PM	39.2	71.5	40.9	13.3	0.1	No	
64		11/9/2020	12:31:50 PM	37.5	68.8	37.9	15.2	0.0	No	
65	Stop	11/9/2020	12:31:51 PM							

NM3 KW Royston Bed & Breakfast, 38433 Potato Canyon Road, Yucaipa Project.

Record #	Record Type	Date	Time	LAeq	LZpeak	LASmax	LCeq-LAeq	LAleq-LAeq	OVLD	Marker
1	Calibration Change	11/9/2020	12:47:28 PM							
2	Calibration Change	11/9/2020	12:47:44 PM							
3	Run	11/9/2020	12:47:58 PM							
4		11/9/2020	12:47:58 PM	68.4	86.2	67.4	3.8	2.2	No	
5		11/9/2020	12:48:00 PM	57.9	82.3	67.3	4.3	9.1	No	
6		11/9/2020	12:48:10 PM	66.0	88.0	71.7	2.2	9.6	No	
7		11/9/2020	12:48:20 PM	71.4	98.4	78.2	2.5	8.0	No	
8		11/9/2020	12:48:30 PM	61.7	84.6	77.2	2.7	0.6	No	
9		11/9/2020	12:48:40 PM	70.9	101.0	76.8	11.2	2.6	No	
10		11/9/2020	12:48:50 PM	70.9	98.4	78.2	3.9	8.6	No	
11		11/9/2020	12:49:00 PM	44.2	77.6	52.2	13.8	3.1	No	
12		11/9/2020	12:49:10 PM	39.4	74.6	40.6	17.3	1.1	No	
13		11/9/2020	12:49:20 PM	39.0	71.4	41.4	17.1	3.1	No	
14		11/9/2020	12:49:30 PM	40.2	72.6	44.2	16.4	0.0	No	
15		11/9/2020	12:49:40 PM	67.8	91.2	74.0	2.5	8.3	No	
16		11/9/2020	12:49:50 PM	72.4	96.3	76.3	2.5	10.6	No	
17		11/9/2020	12:50:00 PM	56.5	78.0	71.8	4.2	10.7	No	
18		11/9/2020	12:50:10 PM	38.7	73.1	45.7	17.8	-0.4	No	
19		11/9/2020	12:50:20 PM	49.4	75.0	54.9	7.1	0.7	No	
20		11/9/2020	12:50:30 PM	67.3	88.9	72.6	2.5	5.4	No	
21		11/9/2020	12:50:40 PM	48.1	79.1	58.0	8.4	2.4	No	
22		11/9/2020	12:50:50 PM	61.1	85.4	67.9	1.3	-0.2	No	
23		11/9/2020	12:51:00 PM	68.2	90.2	74.4	1.8	8.4	No	
24		11/9/2020	12:51:10 PM	39.5	72.8	48.5	15.6	7.3	No	
25		11/9/2020	12:51:20 PM	41.3	72.9	44.2	17.3	2.4	No	
26		11/9/2020	12:51:30 PM	64.3	95.6	71.8	11.3	-0.2	No	
27		11/9/2020	12:51:40 PM	66.1	96.2	73.5	13.0	6.2	No	
28		11/9/2020	12:51:50 PM	39.6	78.5	46.4	19.9	2.1	No	
29		11/9/2020	12:52:00 PM	41.6	76.9	45.7	15.7	-0.2	No	
30		11/9/2020	12:52:10 PM	69.5	97.1	76.0	2.9	10.2	No	
31		11/9/2020	12:52:20 PM	54.5	80.3	69.8	5.3	6.0	No	
32		11/9/2020	12:52:30 PM	41.7	77.1	45.5	13.7	0.3	No	
33		11/9/2020	12:52:40 PM	68.8	90.9	74.9	2.6	6.3	No	
34		11/9/2020	12:52:50 PM	68.2	90.9	73.5	2.7	7.2	No	
35		11/9/2020	12:53:00 PM	44.4	79.6	55.9	11.5	1.0	No	
36		11/9/2020	12:53:10 PM	37.6	70.6	39.9	18.3	0.4	No	
37		11/9/2020	12:53:20 PM	38.9	72.0	41.3	17.3	4.7	No	
38		11/9/2020	12:53:30 PM	36.7	70.5	39.2	19.7	0.8	No	
39		11/9/2020	12:53:40 PM	37.8	71.5	39.0	18.3	2.2	No	
40		11/9/2020	12:53:50 PM	50.1	76.4	56.1	8.6	0.2	No	
41		11/9/2020	12:54:00 PM	65.2	90.2	70.4	5.0	-0.1	No	
42		11/9/2020	12:54:10 PM	65.6	88.6	71.4	3.8	4.8	No	
43		11/9/2020	12:54:20 PM	40.1	71.3	50.6	16.9	2.3	No	
44		11/9/2020	12:54:30 PM	42.7	75.3	44.9	17.0	0.9	No	
45		11/9/2020	12:54:40 PM	43.8	73.3	45.2	16.5	0.4	No	
46		11/9/2020	12:54:50 PM	65.4	89.3	72.9	3.1	0.9	No	
47		11/9/2020	12:55:00 PM	73.8	99.3	79.6	3.1	6.5	No	
48		11/9/2020	12:55:10 PM	56.7	79.7	59.2	8.3	0.5	No	
49		11/9/2020	12:55:20 PM	72.7	98.7	79.1	1.7	0.7	No	
50		11/9/2020	12:55:30 PM	70.9	95.6	77.3	2.0	5.8	No	
51		11/9/2020	12:55:40 PM	44.5	73.5	54.4	12.2	0.6	No	
52		11/9/2020	12:55:50 PM	36.9	72.0	38.0	18.2	1.3	No	
53		11/9/2020	12:56:00 PM	35.6	70.0	36.7	17.7	1.9	No	
54		11/9/2020	12:56:10 PM	39.5	70.9	42.9	17.3	9.2	No	
55		11/9/2020	12:56:20 PM	41.1	71.5	43.6	15.4	9.4	No	
56		11/9/2020	12:56:30 PM	46.4	74.1	49.4	12.9	6.6	No	
57		11/9/2020	12:56:40 PM	64.0	88.7	70.6	4.6	0.1	No	
58		11/9/2020	12:56:50 PM	78.8	102.5	85.0	2.6	4.9	No	
59		11/9/2020	12:57:00 PM	68.8	90.5	73.1	4.3	0.2	No	
60		11/9/2020	12:57:10 PM	64.8	92.0	70.5	10.4	0.6	No	
61		11/9/2020	12:57:20 PM	41.7	72.1	50.4	15.5	1.5	No	
62		11/9/2020	12:57:30 PM	46.4	72.9	51.9	11.1	0.9	No	
63		11/9/2020	12:57:40 PM	68.1	91.0	73.4	3.9	5.1	No	
64		11/9/2020	12:57:50 PM	50.1	75.6	61.9	7.5	1.7	No	
65	Stop	11/9/2020	12:57:58 PM							

Appendix C:
FHWA Model Analysis Calculations

NOISE CONTOUR WORKSHEET

(calculations based on the FHWA-RD-77-108 Highway Noise Prediction Model)

PROJECT INFORMATION

Project:	- -	**W.O. #:**	- -
City/County:	- -	**Date Entered:**	
Comments:	- -	**Entered By:**	- -

SITE INFORMATION

Planning Area(s):	- -	**Land Use(s):**	- -
Obs. Location:	(see below)	**Scenario:**	LOS 'C' Volumes

ROADWAY SEGMENT, VEHICULAR AND OBSERVER CHARACTERISTICS

Roadway:	"standard roadway"	**Roadway Class:**	- -
Segment:	- -	**Right of Way:**	- -
ADT:	10,000	**Travel Speed:**	40 MPH
Pad Elev. (opt.):	0.0 feet	**Obs. Height:**	5.0 feet
Roadway Elev.:	0.0 feet	**Roadway Grade:**	0.1%

	Required	Type	Height
Ext. Mitigation:	- -	- -	- -

	Left	Right	Total
Exposure:	90º	90º	180º

	Autos	Med Trucks	Heavy Trucks
Noise Height: (above roadway)	0.00 feet	2.30 feet	8.01 feet
Hard/Soft Site:	Hard	Hard	Hard

Veh. Distributio	Daytime	Evening	Nighttime	Daily
Automobiles	77.50%	12.90%	9.59%	97.42%
Medium Trucks	84.78%	4.89%	10.33%	1.84%
Heavy Trucks	86.49%	2.70%	10.81%	0.74%

Notes: Standard Road at 50 feet from the centerline

CALCULATED CNEL NOISE IMPACTS

Noise impact under various scenarios:

67.7
Exterior
Umitigated

Noise is a function of both speed and ADTs.
Since speed is assumed constant at 40 mph for this analysis, noise is a function of ADT only, and can be calculated by the following equation:

CNEL (dB) = 67.7 + 10 x log (ADT/10,000)

Table A
Project Traffic Noise Contributions

Road Segments	Existing		Existing Plus Project			Opening Year (2022) without Project		Opening Year (2022) with Project			Is the Increase Significant ?
	ADT	dB CNEL	ADT	Total	Project-Specific Increase	ADT	dB CNEL	ADT	Total	Project-Specific Increase	
Oak Glen Road											
w/o Potato Canyon Road	3,275	62.9	3,511	63.2	0.3	3,425	63.0	3,661	63.3	0.3	**No**
e/o Potato Canyon Road	3,275	62.9	3,433	63.1	0.2	3,425	63.0	3,583	63.2	0.2	**No**

*The uniform distance of 50 feet from centerline allows for direct comparisons of potential increases or decreases in noise levels based upon various traffic scenarios; however, at this distance, no specific noise standard necessarily applies

Information for Katie

Location	Existing	Project[1]	Existing Plus Project	Opening Year 2022		Year 2040		Year 2045		Year 2050	
				Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
Oak Glen Road - West of Potato Canyon Road	3,275	236	3,511	3,425	3,661	4,775	5,011	5,150	5,386	5,525	5,761
Oak Glen Road - East of Potato Canyon Road	3,275	158	3,433	3,425	3,583	4,775	4,933	5,150	5,308	5,525	5,683

[1]Maximum project daily traffic volume used.