Noise and Vibration Impact Assessment for the Tumbleweed Sanctuary CUP Project

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Town of Yucca Valley, California

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Trips
APN	Assessor's Parcel Number
Caltrans	California Department of Transportation
CNEL	Community Noise Equivalent Level
County	San Bernardino County
CUP	Conditional Use Permit
dB	Decibel
dBA	Decibel is A-weighted
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}	Measure of ambient noise
L_{max}	The maximum A-weighted noise level during the measurement period
L_{min}	The minimum A-weighted noise level during the measurement period
In/sec	Inches per second
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
PPV	Peak particle velocity
Project	Tumbleweed Sanctuary CUP Project
RCNM	Roadway Construction Noise Model
RMS	Root mean square
RR	Rural Residential
STC	Sound Transmission Class
Town	Town of Yucca Valley
USEPA	United States Environmental Protection Agency
VdB	Vibration Decibel Level

1.0 INTRODUCTION

This report documents the results of a Noise and Vibration Impact Assessment completed for the Tumbleweed Sanctuary Conditional Use Permit (CUP) Project (Project), which proposes the construction of parking lot with 50 parking stalls to accommodate guest parking, landscaping around the parking lot area, as well as a continuation of event operations in the Town of Yucca Valley (Town) in San Bernardino County (County). This report was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the Town of Yucca Valley General Plan Noise Element and Municipal Code. The purpose of this report is to evaluate Project-generated noise and to determine the level of impact the Project would have on the environment.

1.1 Project Location

The Project Site is located at 57889 Pueblo Trail, Yucca Valley, CA 92284, on Assessor Parcel Numbers (APN) 058801601, 058802121, 058802128, and 058802129 (see Figure 1-1, Project Location). The Project Site is approximately 5.51 acres in size and most of the site includes an existing event venue and gardens that are going to remain. The CUP is intended to formalize the site as an event space. The land uses within the vicinity of the Project Site include residential uses to the north, east, and west. A vacant lot borders the Project Site's southern boundary. There is an assisted living facility located to the west of the Project Site. Regional access to the Project Site is provided via State Route (SR) 62 which is located approximately 0.75 mile to the northwest of the Project Site. Local access to the Project Site is provided via Pueblo Trail.

1.2 Project Description

The Project Site has a land use designation of Rural Residential (RR-0.5) under the Town of Yucca Valley General Plan (Town of Yucca Valley 2014). A CUP is required for certain land uses which may be subject to special conditions to ensure compatibility with surrounding land uses and to minimize or eliminate impacts on surrounding properties. A CUP is required for the Proposed Project to establish the site as an event space.

The Proposed Project Site includes an existing event venue, gardens, and 14-stall parking lot, each of which would remain on site. The CUP is intended to formalize the site as an event space. Events such as weddings, corporate meetings, health and wellness retreats, and other community and cultural events are proposed to be hosted at the Project Site. The predominate sources of onsite noise would include indoor amplified sound within the indoor event space, non-amplified acoustic music within the outdoor event space, charter bus operations, and associated parking lot noise. Events would host no more than 100 guests and conclude by 10:00 p.m. Clean up would take place between 10:00 p.m. to 10:30 p.m. and all guests and vendors must vacate the property by 10:30 p.m. Outdoor sound is proposed to be monitored by Tumbleweed Sanctuary, Garden and Labyrinth staff at all times.

Anticipated construction includes a new paved parking lot on the adjacent undeveloped parcel to the north, which would include 50 parking stalls (APN 058801601). This parcel would be cleared of vegetation, graded, paved and native landscape would be installed.

Location: W:\Projects\2024\2024-204 Tumbleweed Sanctuary CUP\Baseline Noise Survey\Baseline Noise Map.aprx - Portrait Template (agne - 10/22/2024)

Map Date: 10/22/2024
Sources: Esri 2024

Figure 1-1. Project Location

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Tumbleweed Sanctuary CUP Project 2024-204

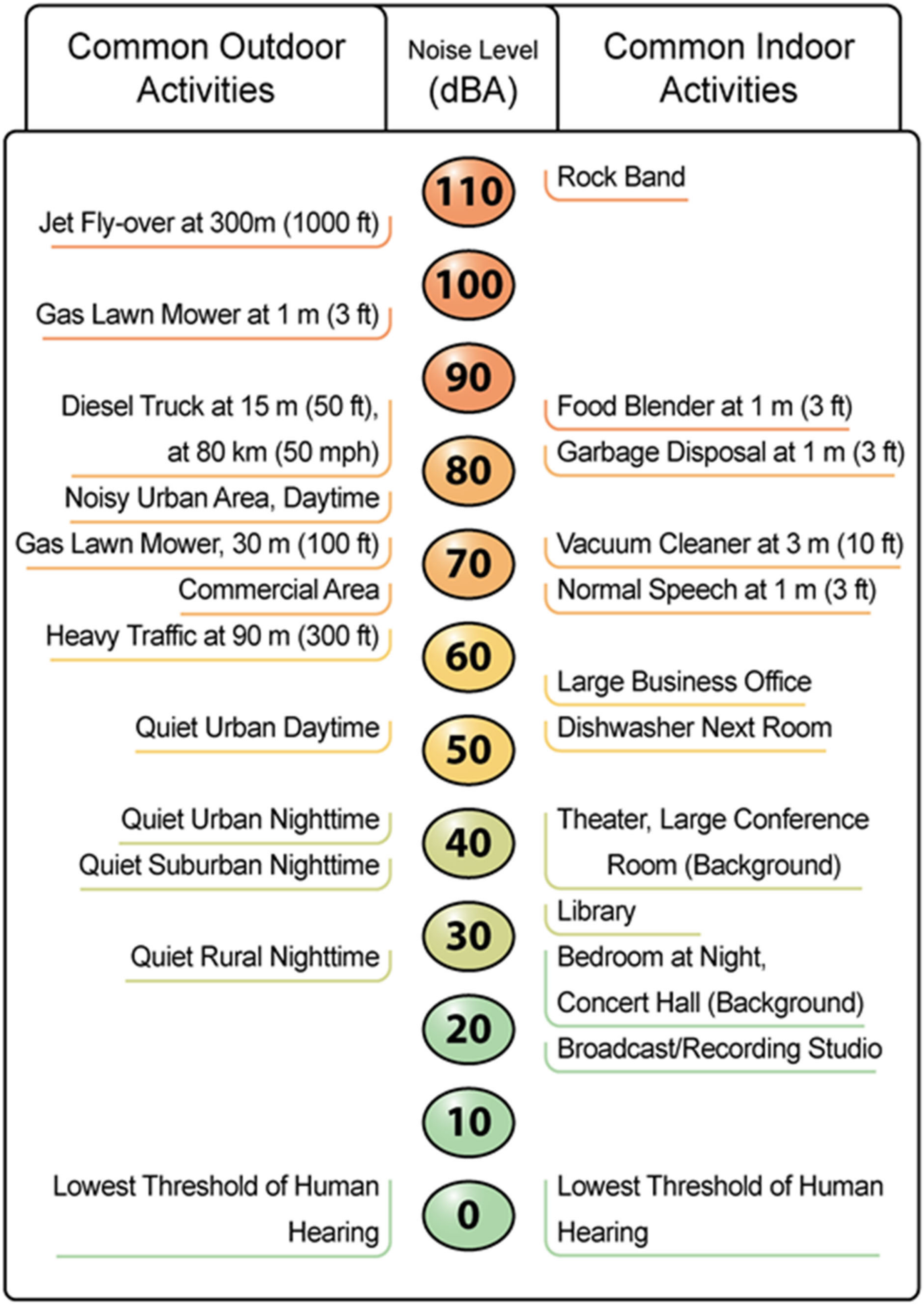
2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). 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 three dB). Under the decibel scale, three sources of equal loudness together would produce an increase of five dB.

Typical noise levels associated with common noise sources are depicted in Figure 2-1.



Source: California Department of Transportation (Caltrans) 2020

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Figure 2-1. Common Noise Levels

2.1.2 Sound Propagation and Attenuation

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. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source (Federal Highway Administration [FHWA] 2017). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (FHWA 2017). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. 2021). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the “line of sight” between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (California Department of Transportation [Caltrans] 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typical residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. (STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations). In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/community noise equivalent level (in L_{dn}/CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise Level (L_{eq})** is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA "weighting" added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.

- **Community Noise Equivalent Level (CNEL)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 pm to 10:00 pm and a 10-dBA weighting added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the evening and nighttime, respectively.

Table 2-1 provides a list of other common acoustical descriptors.

Table 2-1. Common Acoustical Descriptors	
Descriptor	**Definition**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels is measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

The A-weighted decibel sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about ±1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about ±1 to 2 dBA.

2.1.4 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.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL or L_{dn} is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in A-weighted noise levels (dBA), the following relationships should be noted in understanding this analysis:

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

2.1.5 Effects of Noise on People

2.1.5.1 Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

2.1.5.2 Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes of annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation between noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources.

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage. For human response, however, an average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to an average vibration amplitude, not a peak amplitude). Because the average particle velocity over time is zero, the RMS amplitude is typically used to assess human response. The RMS value is the average of the amplitude squared over time, typically a 1- sec. period (FTA 2018).

Table 2-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 2-2 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earthmoving which requires the use of heavy-duty earth moving equipment.

Table 2-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Decibel Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Threshold at which there is a risk of architectural damage to extremely fragile historic buildings, ruins, ancient monuments
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Threshold at which there is a risk of architectural damage to fragile buildings. Virtually no risk of architectural damage to normal buildings
0.25	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to historic and some old buildings
0.3	96	Vibrations may begin to feel severe to people in buildings	Threshold at which there is a risk of architectural damage to older residential structures
0.5	103	Vibrations considered unpleasant by people subjected to continuous vibrations	Threshold at which there is a risk of architectural damage to new residential structures and Modern industrial/commercial buildings

Source: Caltrans 2020b

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise Sensitive Land Uses

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 hospitals, historic sites, cemeteries, and certain recreation areas are 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 Town of Yucca Valley's Municipal Code Section 9.34.080 lists noise sensitive land uses as residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses. The nearest sensitive receptors to the Project Site include residences to the east and west of the proposed parking lot as well as residences directly adjacent to the east and west of the event site. All residences are approximately 190 feet distant at the nearest to either the center of the proposed parking lot or the center of the event hosting site. Additionally, Angelic Mansions Assisted Living is located to the southwest of the Project Site more than 600 feet distant.

3.1.1 Existing Ambient Noise Environment

The Town of Yucca Valley's low density and predominantly two-lane roads with relatively calm traffic allows its residents and visitors to experience lower noise levels than in cities located in more urbanized areas (Town of Yucca Valley 2014). According to the Town of Yucca Valley General Plan Noise Element, the most prevalent noise source in Yucca Valley is motor vehicles on SR 62 and SR 247 because they carry the highest volumes of traffic compared to other roadways in Town (Town of Yucca Valley 2014). The Town also experiences intermittent noise generated by local industrial, commercial, and aviation activities as well as periodic training exercises conducted at Marine Corps Air Ground Combat Center. Other noise within the town is associated with commercial and neighborhood land uses, which may experience noise from mechanical equipment, playgrounds, leaf blowers, and construction equipment. Within the Project Area, primary existing noise sources include traffic along Pueblo Trail and typical residential noises like dogs barking, radios, and landscaping equipment. As shown in Table 3-1 below, the ambient recorded noise levels range from 36.4 dBA to 45.3 dBA L_{eq} on and in the vicinity of the Project Site.

3.1.2 Existing Ambient Noise Measurements

In order to quantify existing ambient noise levels in the Project Area, ECORP Consulting, Inc. conducted four short-term noise measurements (15-minutes) on the morning of October 14th, 2024. The 15-minute measurements were taken between 11:51 a.m. and 12:08 p.m. These short-term noise measurements are representative of typical existing noise exposure within and immediately adjacent to the Project Site during the daytime (see Attachment A for a visual representation of the measurement locations). The average noise levels at each location are listed in Table 3-1.

Table 3-1. Existing Ambient Noise Measurements					
Location Number	**Location**	**L_{eq} dBA**	**L_{min} dBA**	**L_{max} dBA**	**Time**
1	Northwest Corner of Project Site, South of Pueblo Trail	**36.4**	32.1	59.6	11:01 a.m. – 11:16 a.m.
2	Northeast Corner of Pueblo Trail and Chula Vista Avenue	**45.3**	31.4	74.2	11:18 a.m. - 11:34 a.m.
3	Eastern Edge of Project Site, 215 feet South of Pueblo Trail	**38.8**	32.7	63.4	11:35 a.m. – 11:50 a.m.
4	South of Project Site, 350 feet South of Pueblo Trail	**38.1**	33.6	64.7	11:51 a.m. – 12:08 p.m.

Source: Measurements were taken by ECORP with a Larson Davis Spartan 821 sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. Prior to the measurements, the Spartan 821 sound level meter was calibrated according to manufacturer specifications with a Larson Davis CAL200 Class I Calibrator. See Attachment A for noise measurement outputs.

Notes: L_{eq} is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. L_{min} is the minimum noise level during the measurement period and L_{max} is the maximum noise level during the measurement period.

As shown in Table 3-1, the ambient recorded noise levels range from 36.4 dBA to 45.3 dBA L_{eq} over the course of the four short-term noise measurements taken in the Project vicinity in October of 2024. The most common noise in the Project vicinity is produced by automotive vehicles on the local surrounding roadways such as Pueblo Trail and people talking in neighboring backyards.

As a result of implementation of the Land Use and Circulation Elements of the Town's General Plan, the noise environment is expected to increase slightly in the future. However, the implementation of the policies in the Town's Noise Element and compliance with the Town's noise standards will mitigate the impacts of future commercial and industrial area build out to acceptable levels (Town of Yucca Valley 2014). According to the Town of Yucca Valley Noise Element, the most elevated and frequent noise source expected to affect the community in the future is vehicular traffic along SR 62 and SR 247. The Proposed Project Site is located approximately 0.75 mile from SR 62 at the nearest and approximately one mile from SR 247 at the nearest. According to Figure N-1 in the Town's Noise Element, the Proposed Project Site is located outside of the 60-65 dBA CNEL traffic noise contours.

3.1.3 Existing Roadway Noise Levels

The Town's General Plan Draft EIR (2013) included existing traffic noise levels for roadway segments around Yucca Valley, including a roadway segment along Pueblo Trail between Hanford Avenue and Balsa Avenue. The existing traffic noise level for this portion of Pueblo Trail is 52.7 dBA CNEL. While this segment of Pueblo Trail is approximately 0.33 mile to the east of the Proposed Project Site, the existing land use patterns along Pueblo Trail between Hanford Avenue and Balsa Avenue are generally the same as the segment of Pueblo Trail fronting the Project Site and therefore is considered representative. As previously described, CNEL is a

24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 pm to 10:00 pm and a 10-dBA weighting added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the evening and nighttime, respectively.

It should be noted that the noise level provided in the Town's Draft EIR may differ from measured levels in Table 3-1 because the measurements represent noise levels at different locations around the Project Area and are also reported in different noise metrics (e.g., noise measurements are the L_{eq} values and traffic noise levels are reported in CNEL).

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an eight-hour work shift (29 Code of Regulations 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.1.2 National Institute of Occupational Safety and Health

A division of the U.S. Department of Health and Human Services, the National Institute for Occupational Safety and Health (NIOSH) has established a construction-related noise level threshold as identified in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998. NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than 8 hours per day; for every 3-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than 4 hours per day, 92 dBA for more than 1 hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. The intention of these thresholds is to protect people from hearing losses resulting from occupational noise exposure.

4.1.3 Federal Interagency Committee on Noise (FICON)

The FICON thresholds of significance assist in the evaluation of increased traffic noise. The 2000 FICON findings provide guidance as to the significance of changes in ambient noise levels due to transportation noise sources. FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the project creates a readily perceptible 5 dBA CNEL or greater noise level increase, or
- If the existing noise levels range from 60 to 65 dBA CNEL and the project creates a barely perceptible 3 dBA CNEL or greater noise level increase, or
- If the existing noise levels already exceed 65 dBA CNEL and the project creates a community noise level increase of greater than 1.5 dBA CNEL.

4.2 State

4.2.1 State of 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 State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), 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.

4.2.2 State Office of Planning and Research Noise Element Guidelines

The State OPR *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a Land Use Compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.2.3 California Department of Transportation

In 2020, the California Department of Transportation (Caltrans) published the Transportation and Construction Vibration Manual (Caltrans 2020b). The manual provides general guidance on vibration issues associated with the construction and operation of projects concerning human perception and structural damage. Table 2-2 above presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

4.3 Local

4.3.1 Town of Yucca Valley General Plan Noise Element

The Noise Element of the General Plan provides policy direction for minimizing excessive noise within the community and aims to protect residents, neighborhoods, schools, and noise-sensitive land uses from health impacts. By identifying noise-sensitive land uses and establishing noise level compatibility guidelines for land uses, noise considerations will influence the general distribution, location, and intensity of future land uses. The result is that effective land use planning and mitigation can alleviate the majority of noise problems. The following goals and policies have been identified to be applicable to the Proposed Project:

Goal N1: A noise environment where excessive noise from stationary, transportation-related, and temporary sources of noise are appropriately managed.

Policy N 1-1: Separate excessive noise-generating uses from residential uses and other sensitive receptors through building design and noise-minimizing buffers such as landscaping, berms, and setbacks.

Policy N 1-3: Require daytime only truck deliveries to commercial and industrial uses adjacent to residential uses and other sensitive receptors unless there is no feasible alternative.

***Policy N 1*-4:** Encourage the use of alternative transportation such as busing, bicycling, and walking to reduce peak traffic volumes and therefore transportation-related sources of noise.

***Policy N 1*-9:** Encourage the use of landscaping, berms, setbacks and architectures rather than conventional walls to reduce motor vehicle noise in an aesthetically pleasing manner.

***Policy N 1*-13:** Enforce Town noise standards and monitor compliance with noise standards.

***Policy N 1*-15:** Require the design and construction of industrial and commercial development to minimize excessive offsite noise impacts to surrounding properties.

***Policy N 1*-18:** Enforce standards on the hours of operation for nonemergency construction.

***Policy 1*-19:** Enforce limits on the hours of refuse collection, street and parking lot sweeping, and other property maintenance operations.

***Policy 1*-20:** Encourage special events to be planned to minimize the potential effects of noise on adjacent properties to the degree feasible.

The Noise Element contains compatibility noise standards for a variety of land uses, shown in Table 4-1 below.

Table 4-1. Town of Yucca Valley Land Use Compatibility Standards

Land Use Categories	Average CNEL or L_{dn}, dB			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density Single Family, Duplex, Mobile Homes	50-60	60-70	70-75	>75
Residential – Multiple Family	50-65	65-70	70-75	>75
Transient Lodging – Motels, Hotels	50-65	65-70	70-80	>80
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-65	65-70	70-80	>80
Auditoriums, Concert Halls, Amphitheaters	NA	NA	50-70	>70
Sports Arena, Outdoor Spectator Sports	NA	NA	50-75	>75
Playgrounds, Neighborhood Parks	50-70	NA	70-75	>75
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-75	NA	75-80	>80
Office Buildings, Businesses, Commercial and Professional	50-70	70-75	>75	NA
Industrial, Manufacturing, Utilities, Agriculture	50-75	75-80	NA	> 80

Source: Town of Yucca Valley General Plan Noise Element 2014.
Notes:
Normally Acceptable: Specified land use is satisfactory, based on the assumption that any buildings are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in design.
Clearly Unacceptable: New construction or development should generally not be undertaken.

4.3.2 Town of Yucca Valley Municipal Code

The Town of Yucca Valley's regulations with respect to noise are included in Section 9.34.080 of the Municipal Code. The Noise Regulations provide noise standards and restrictions within Yucca Valley. Section 9.34.080 outlines regulations for exterior noise at residential properties, limiting noises to 55 dBA during daytime hours (7:00 a.m. – 10:00 p.m.) and 45 dBA during nighttime hours (10:00 p.m. – 7:00 a.m.).

Furthermore, when measured at the residential property, it is unlawful for noise from stationary noise sources to exceed:

- The noise standard for a cumulative period of more than 30 minutes in any hour (L_{50})
- The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour (L_{25})
- The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour (L_8)
- The noise standards plus 15 dB(A) for a cumulative period of more than one minute in any hour (L_2)
- The noise standard plus 20 dB(A) for any period of time (L_{max}).

Section 9.34.080 enumerates noise standards for exterior and interior noise levels at residential properties generated by mobile noise sources, limiting interior noise from mobile sources to a L_{dn} of 45 dBA and limiting exterior noise from mobile sources to a L_{dn} of 60 dBA. Section 9.34.080 notes that exterior noise levels generated by mobile sources of up to 65 dBA (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 dBA (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.

It is further specified that if the ambient noise exceeds the noise standards, the standard shall be increased to reflect the ambient noise level.

The Municipal Code Section 9.34.080 exempts temporary construction noise from Town noise standards, provided that the activities do not occur between the hours of 10:00 p.m. to 7:00 a.m., Monday through Saturday or any time on Sundays or federal holidays. Additionally, Municipal Code Section 9.34.090 limits ground vibrations to 0.2 inches per second (in/sec) PPV at or beyond the property boundary of the land use. Temporary construction maintenance or demolition activities between the hours of 7:00 a.m. and 10:00 p.m. are exempt from the vibration standard set in Section 9.34.090.

5.0 Impact Assessment

5.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act Guidelines Appendix G thresholds of significance. The Project would result in a significant noise-related impact if it would result in the:

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

2) Generation of excessive groundborne vibration or groundborne noise levels.

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

For the purposes of this analysis, Project construction noise is compared to the regulation-exempted hours of construction established by the Town as well as the NIOSH standard of 85 dBA. The Town's Municipal Code states that no ground vibration shall be allowed 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 0.2 in/sec measured at or beyond the lot line. The increase in transportation-related noise is compared against the FICON recommendation for evaluating the impact of increased traffic noise. The FICON thresholds of significance guide the evaluation of increased traffic noise based on changes in ambient noise levels from transportation sources. According to FICON, if the existing ambient noise levels at noise-sensitive areas are below 60 dBA CNEL, a project that increases noise by 5 dBA CNEL or more is considered significant. For existing noise levels between 60 and 65 dBA CNEL, a project with a 3 dBA CNEL increase is significant. If existing noise levels exceed 65 dBA CNEL, a project causing an increase of more than 1.5 dBA CNEL is deemed significant. Onsite noise generated as a result of Project operations is compared to the Town's exterior residential noise standards described in the Municipal Code Section 9.34.080. As previously described in Section 4.3.2 of this report, the Town Municipal Code specifies that in the event that the ambient noise exceeds the noise standards, the standard shall be increased to reflect the ambient noise level.

5.2 Methodology

This analysis of the existing and future noise environments is based on empirical observations and noise prediction modeling. Predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Noise Model (RCNM) (FHWA 2006). Groundborne vibration levels associated with construction-related activities for the Project have been evaluated utilizing typical groundborne vibration levels associated with construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures and typically applied criteria for structural damage and human annoyance.

Onsite stationary source noise levels associated with the Project have been calculated with the SoundPLAN 3D noise model, which predicts noise propagation from a noise source based on the location, noise level, and frequency spectra of the noise sources as well as the geometry and reflective properties of the local terrain, buildings and barriers, as well as FTA sound exposure references. There are four SoundPLAN modeling scenarios developed to demonstrate typical sound levels throughout the duration of a wedding: a Ceremony hosted at Site A, a Ceremony hosted at Site B, an Outdoor Reception Dinner, and an Indoor Reception with Amplified Music. A wedding was selected as the activity to model in this Report because the Tumbleweed Sanctuary's Proposal states weddings are the most frequent event hosted during their peak season with up to 100 guests and indoor amplified music. The SoundPLAN modeling scenarios account for typical noise producing activity on the Project Site from the anticipated events such as crowd noise and live music (i.e., people talking, stereo music, etc.). SoundPLAN allows computer simulations of noise situations and creates noise contour maps using reference noise levels, topography, point and area noise sources, and intervening structures. Parking lot activity noise was calculated using the FTA's reference sound exposure level for park & ride lots at 50 feet (FTA 2018). Onsite stationary source modeling methodology is discussed in further detail below.

5.3 Impact Analysis

5.3.1 Would the Project Result in Short-Term Construction-Generated Noise in Excess of Town Standards?

Onsite Construction Noise

Construction noise associated with the Proposed Project would be temporary and would vary depending on the specific nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., site preparation, excavation, paving). Noise generated by construction equipment, including earth movers, pile drivers, and portable generators, can reach high levels. 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. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site. The individual pieces on construction equipment proposed for each phase of the Project are listed in Table 5-1. This information was derived from the California Emissions Estimator Model (CalEEMod). CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters. The construction equipment information derived from CalEEMod is coupled with the FHWA Roadway Noise Construction Model to calculate construction noise from the Proposed Project.

Table 5-1. Project Construction Equipment	
Construction Equipment	**Pieces of Construction Equipment**
Site Preparation	
Graders	1
Tractors/Loaders/Backhoes	1
Grading	
Grader	1
Rubber Tired Dozers	1
Tractors/Loaders/Backhoes	1
Paving	
Cement and Mortar Mixers	4
Pavers	1
Rollers	1
Tractors/Loaders/Backhoes	1
Painting	
Air Compressors	1

Source: Construction equipment used during construction derived from the California Emissions Estimator Model (CalEEMod). CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters.

The Town does not promulgate a numeric threshold pertaining to the noise associated with construction. This is due to the fact that construction noise is temporary, short term, intermittent in nature, and would cease on completion of the Project. However, as previously mentioned, the Municipal Code Section 9.34.080 exempts construction noise, provided that the activities do not occur between the hours of 7:00 p.m. to 7:00 a.m., Monday through Saturday or any time on Sundays or federal holidays. In order to remain compliant with the Town's regulations, the Proposed Project would be required to follow these construction guidelines (as identified in Table 5-2 below, Project construction noise would exceed the Town's noise limit of 55 dBA at the nearest noise-sensitive receptor if occurring outside of the noise standard exempted hours).

Recent case law as held that the use of an absolute noise threshold for evaluating all ambient noise impacts violated CEQA because it did not provide a "complete picture" of the noise impacts that may result from implementation of the ordinance. As such, the Proposed Project's construction noise is estimated and then added to the average daily ambient noise level in the Project Area as determined by the baseline noise survey conducted by ECORP Consulting (see Table 3-1). As previously described, the dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Furthermore, when combining two separate sources where one of the noise sources is 10 dB (or more) greater than the other noise source, the noise contribution of the quieter source is completely obscured by the louder source.

The nearest sensitive receptors to the Project Site include residences to the east and west of the proposed parking lot as well as residences directly adjacent to the east and west of the event site. Additionally, Angelic Mansions Assisted Living is located to the southwest of the Project Site more than 600 feet distant. To estimate the worst-case onsite construction noise levels that may occur at the nearest noise-sensitive receptors and in order to evaluate the potential health-related effects (physical damage to the ear) from construction noise, the construction equipment noise levels were calculated using the Federal Highway Administration's Roadway Noise Construction Model and compared against the construction-related noise level threshold established in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998 by NIOSH. A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than 8 hours per day; for every 3-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than 4 hours per day, 92 dBA for more than 1 hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. For the purposes of this analysis, the lowest, more conservative threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receptors.

It is acknowledged that the majority of construction equipment is not situated at any one location during construction activities, but rather spread throughout the Project Site and at various distances from sensitive receptors. Therefore, this analysis employs FTA guidance for calculating construction noise, which recommends measuring construction noise produced by all construction equipment simultaneously from the center of the Project Site (FTA 2018), which in this case is approximately 190 feet from the closest residences bordering the proposed parking lot and the closest residences bordering event site. The anticipated short-term construction noise levels generated for the necessary equipment for each phase of construction are presented in Table 5-2.

Table 5-2. Construction Average (dBA) Noise Levels at Nearest Receptors				
Construction Phase	**Average Ambient Noise Level* (dBA L_{eq})**	**Existing Ambient Noise + Exterior Construction Noise Levels (dBA L_{eq})**	**Construction Noise Standard (dBA L_{eq})**	**Exceeds Standards?**
Site Preparation	39.7	72.0	*85*	**No**
Grading		73.0	*85*	**No**
Paving		72.0	*85*	**No**
Painting		62.1	*85*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment B for Model Data Outputs.

Notes: *Average ambient noise levels of the Project Area were estimated using the average L_{eq} of the four short term noise measurement taken on October 14th, 2024, and identified in Table 3-1.

Construction equipment used and construction schedule information provided by the Project proponent. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the Project Site (FTA 2018), which is 190 feet from the nearest sensitive receptor.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 5-2, the Project's contribution of construction noise combined with the ambient noise environment would not exceed the 85 dBA NIOSH construction noise threshold during any phase of construction at the nearby noise-sensitive receptors. It is noted that construction noise was modeled on a worst-case basis and is considered in addition to ambient noise levels currently experienced in the Project Area. It is very unlikely that all pieces of construction equipment would be operating at the same time for the various phases of Project construction as well as at the point closest to residences.

Offsite Construction Worker Trips

Project construction would result in additional traffic on adjacent roadways over the period that construction occurs. According to Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013), a doubling of traffic on a roadway is required to result in an increase of 3 dB (outside of the laboratory, a 3-dBA change is considered a just-perceivable difference). According to the California Emissions Estimator Model, which is used to predict the number of construction-related automotive trips, the Project would generate up to 18 daily construction trips during a single construction phase. The Project Site would be accessible via Chula Vista Avenue and Pueblo Trail during construction. There are approximately 17 single family homes along Pueblo Trail Road within 0.35 mile east and west of the Project Site. According to the Institute of Transportation Engineers' 10th Edition Trip Generation Manual (2017), single family homes generate an average of 9.44 daily trips, and therefore these 17 residences could be expected to contribute approximately 161 daily trips along Pueblo Trail adjacent to the Project Site (9.44 x 17 = 161). The contribution of an additional 18 daily trips during a single construction phase for the Project would not result in a doubling of traffic on adjacent roadways, and therefore its contribution to existing traffic noise would not be perceptible. Traffic noise calculations prepared by ECORP using the Federal

Highway Noise Prediction Model (FHWA-RD-77-108) shows the addition of 18 daily construction trips would result in less than 0.5 dBA increase, verifying this conclusion. Therefore, the temporary incremental increase in traffic due to construction trips would not be perceptible. Additionally, it is noted that construction is temporary, and these trips would cease upon completion of the Project.

5.3.2 Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in Excess of Town Standards During Operations?

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. The Town of Yucca Valley's Municipal Code Section 9.34.080 lists noise sensitive land uses as residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses. The nearest sensitive receptors to the Project Site include residences to the east and west of the proposed parking lot as well as residences directly adjacent to the east and west of the event site. The nearest residence to the Proposed Project's new parking lot is approximately 85 feet from the lot boundary. The nearest residence to the event venue's existing parking lot is approximately 90 feet from the lot boundary. The nearest residence to the outdoor ceremony sites is approximately 82 feet to the west of Ceremony Site A.

Operational Offsite Traffic Noise

The Town of Yucca Valley published the Town's General Plan Draft EIR documents in 2013. The General Plan Draft EIR included existing traffic noise levels for roadway segments around Yucca Valley, including a roadway segment along Pueblo Trail between Hanford Avenue and Balsa Avenue. The existing traffic noise level for this portion of Pueblo Trail is 52.7 dBA CNEL. While this segment of Pueblo Trail is approximately 0.33 mile to the east of the Proposed Project Site, the existing land use patterns along Pueblo Trail between Hanford Avenue and Balsa Avenue are generally the same as the segment of Pueblo Trail fronting the Project Site and therefore is considered representative.

Due to the unavailability of existing average daily trips (ADT) data for Pueblo Trail, the Institute of Transportation Engineers' 10^{th} Edition Trip Generation Manual (2017) and aerial imagery of the Project Area is used to estimate this value. According to the Institute of Transportation Engineers' 10^{th} Edition Trip Generation Manual (2017), single family homes generate an average of 9.44 daily trips. There are approximately 17 single family homes along Pueblo Trail Road within 0.35 mile east and west of the Project Site and therefore these 17 residences could be expected to contribute approximately 161 daily trips along Pueblo Trail adjacent to the Project Site (9.44 x 17 = 161). This is a conservative estimate as the actual amount of traffic is likely higher, and thus currently louder under existing conditions, as the estimate does not include through-trips from other surrounding users or collector streets. As previously described, according to Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013), a doubling of traffic on a roadway is required to result in an increase of 3 dB (outside of the laboratory, a 3-dBA change is considered a just-perceivable difference). According to Project traffic data provided by Translutions, Inc. (2024), the Project can be expected to contribute an additional 99 daily trips at the maximum. Thus, the Proposed Project would not result in a doubling of traffic on vicinity roadways, and therefore its contribution to existing traffic noise would not be perceptible. Traffic noise calculations prepared by ECORP using the

Federal Highway Noise Prediction Model (FHWA-RD-77-108) shows the addition of 99 daily trips would result in an imperceivable increase of 2.1 dBA increase, verifying this conclusion.

Furthermore, as stated in Section 5.1, *Thresholds of Significance*, according to FICON, if the existing ambient noise levels at noise-sensitive areas are below 60 dBA CNEL, a project that increases noise by 5 dBA CNEL or more is considered significant. The existing traffic noise level generated on Pueblo Trail is approximately 52.7 dBA CNEL and therefore an increase of 2.1 dBA CNEL as a result of Project traffic would not surpass this standard.

Operational Onsite Noise

The Project is proposing the construction of a 50-space parking lot on the northern parcel (APN #058801601) and the continuation of operation at the 105,798 square foot Tumbleweed Sanctuary event space (APN #058802121) which is used for hosting indoor and outdoor events. The facility hosts a variety of events such as weddings, retreats, health and wellness center events, community events, conferences, and cultural events and can accommodate up to 100 people. It is important to note that the contracts required to host an event at Tumbleweed Sanctuary include stipulations related to noise during operations. Amplified music would be restricted to insulated indoor spaces and is controlled by the Tumbleweed Sanctuary staff. The Tumbleweed Sanctuary staff monitors noise levels throughout all events using a decibel meter. Music at all events hosted at the Project Site stops promptly at 10:00 p.m. and all event attendees must be off the premises by 10:30 p.m. Tumbleweed Sanctuary staff also provide at least two phone numbers to neighboring residents during weddings and communicate to these neighbors about the event calendar.

On-site noise associated with the Proposed Project has been calculated using the SoundPLAN 3D noise model and the FTA's reference noise levels and guidelines for parking lot noise (FTA 2018). The SoundPLAN 3D noise model generates computer simulations of noise situations based on the Project Site's features. Four scenarios were modeled in SoundPLAN to demonstrate typical sound levels throughout the duration of a wedding: a ceremony hosted at Site A, a ceremony hosted at Site B, an outdoor reception dinner, and an indoor reception with amplified music. A wedding is selected as the activity to model in this Report as the Project applicant indicates weddings are the most frequent event hosted during their peak season with up to 100 guests and indoor amplified music. The modeling scenarios account for typical noise producing activity on the Project Site such as crowd noise and indoor amplified music. Noise associated with parking was evaluated using the FTA's reference sound exposure level (L_{eq}) for park & ride lots at 50 feet. Details of the modeling methodology and results are summarized as follows:

Scenario 1, ceremony hosted at Site A: To model the propagation of noise from a ceremony at Site A with the SoundPLAN model, a raised voice level was used to represent an individual speaking loud enough to be heard in the back row of guests, approximately 55 feet away. During the ceremony, it's assumed only one person is speaking at a time. For speech intelligibility, the speaker's sound level needs to be 10–15 dB above the ambient noise. Ambient noise measurements taken by ECORP on October 14, 2024, showed a maximum L_{eq} of 45 dBA over 16 minutes. This equates to the sound level at the back row needing to reach 60 dBA, requiring the speaker's noise level to be approximately 85 dBA at its source.

Scenario 2, ceremony hosted at Site B: The same methodology utilized in Scenario 1 is applied to Scenario 2. The distance to the back row of guests from the speaker is approximately 40 feet. Therefore, the speaker's noise level would be approximately 82 dBA at the source in order to reach 60 dBA at the back row.

Scenario 3, outdoor reception dinner: To model the propagation of noise from an outdoor reception dinner with 100 guests, 50 evenly spaced noise sources representing conversations between two people were modeled. Each source was assigned a noise level of 60 dBA to ensure speech intelligibility.

Scenario 4, indoor reception with amplified music: As described in the Project Description, amplified music would be restricted to an enclosed indoor venue. A reference noise level from the SoundPLAN library was used to represent a live band with speakers. According to the U.S. Environmental Protection Agency (USEPA), indoor sound levels are typically reduced by 25 dBA due to the attenuation provided by a building's exterior shell (U.S. EPA,1974). Thus, to estimate exterior noise levels at nearby sensitive receptors, the reference noise level inputted into the SoundPLAN model was reduced by 25 dB, as the music would remain indoors.

Parking Lot Noise Scenario: Parking lot activity noise was calculated using the FTA's reference sound exposure level for park & ride lots at 50 feet (FTA 2018).

The Town has established exterior daytime (7:00 a.m. to 10:00 p.m.) residential noise standard of 55 dBA (Town of Yucca Valley 2014). Because all events would conclude by 10:00 p.m. modeled noise levels are only compared to the daytime noise standard. Table 5-3 shows the predicted Project noise levels at 17 noise-sensitive locations in the Project vicinity during daytime activity, which includes the nearby residences surrounding the Project Site in all directions, as predicted by SoundPLAN. Additionally, a noise contour graphic for each scenario (see Figure 5-1, Figure 5-2, Figure 5-3, and Figure 5-4) has been prepared to provide a visual depiction of the predicted noise levels in the Project vicinity from Project operations.

Table 5-3. Modeled Operational Noise Levels at Sensitive Receptors (dBA L_{eq})

#	Receptor Location	Scenario 1 Ceremony at Site A	Scenario 2 Ceremony at Site B	Scenario 3 Outdoor Reception Dinner	Scenario 4 Indoor Reception with Amplified Music	Daytime Exterior Noise Standards	Exceeds Daytime Standard?
1	7459 Bonita Trail	37.7	37.2	29.8	23.3	*55*	**No**
2	7472 Chula Vista Ave.	35.8	31.0	26.4	22.6	*55*	**No**
3	7473 Chula Vista Ave.	35.0	30.6	26.5	22.8	*55*	**No**
4	7497 Chula Vista Ave.	38.8	34.1	31.5	28.7	*55*	**No**
5	7509 Bonita Trail	39.9	34.9	28.7	23.8	*55*	**No**
6	7515 Hilton Ave.	36.0	33.1	30.4	26.2	*55*	**No**
7	7535 Hilton Ave.	35.9	32.6	30.4	26.1	*55*	**No**
8	7536 Hilton Ave.	39.2	37.5	**36.4**	**31.3**	*55*	**No**
9	7541 Bonita Trail	42.5	40.5	32.3	26.1	*55*	**No**
10	7556 Hilton Ave.	37.7	37.0	34.9	28.6	*55*	**No**
11	7576 Hilton Ave.	35.9	35.3	31.9	25.4	*55*	**No**
12	7585 Warren Vista Ave.	33.7	31.9	25.2	19.0	*55*	**No**
13	7606 Hilton Ave.	34.2	33.5	29.4	23.1	*55*	**No**
14	57791 Coronado St.	31.9	30.5	24.5	18.5	*55*	**No**
15	57825 Pueblo Trail	**51.7**	**43.1**	35.4	30.2	*55*	**No**
16	57890 Pueblo Trail	45.0	37.3	31.8	27.9	*55*	**No**
17	57932 Pueblo Trail	36.3	32.5	29.9	26.6	*55*	**No**

Source: SoundPLAN v 9.0. Refer to Attachment D for Model Data Outputs.
Notes: **Bolded** values represent the highest noise levels.

As shown in Table 5-3, Project operational noise would not exceed the Town's 55 dBA exterior noise standard for daytime at any receptor location.

To assess the noise levels associated with the Proposed Project's parking lot activity during operations, the FTA's reference sound exposure level (L_{eq}) for park & ride lots at 50 feet is utilized (FTA 2018). Table 5-4 shows the predicted noise levels at the closest noise-sensitive locations in the vicinity of both the existing parking lot and the Proposed Project's new parking lot. Since events will conclude by 10:00 p.m., but guests have until 10:30 p.m. to fully exit the premises, parking lot noise is compared to both daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) exterior noise standards.

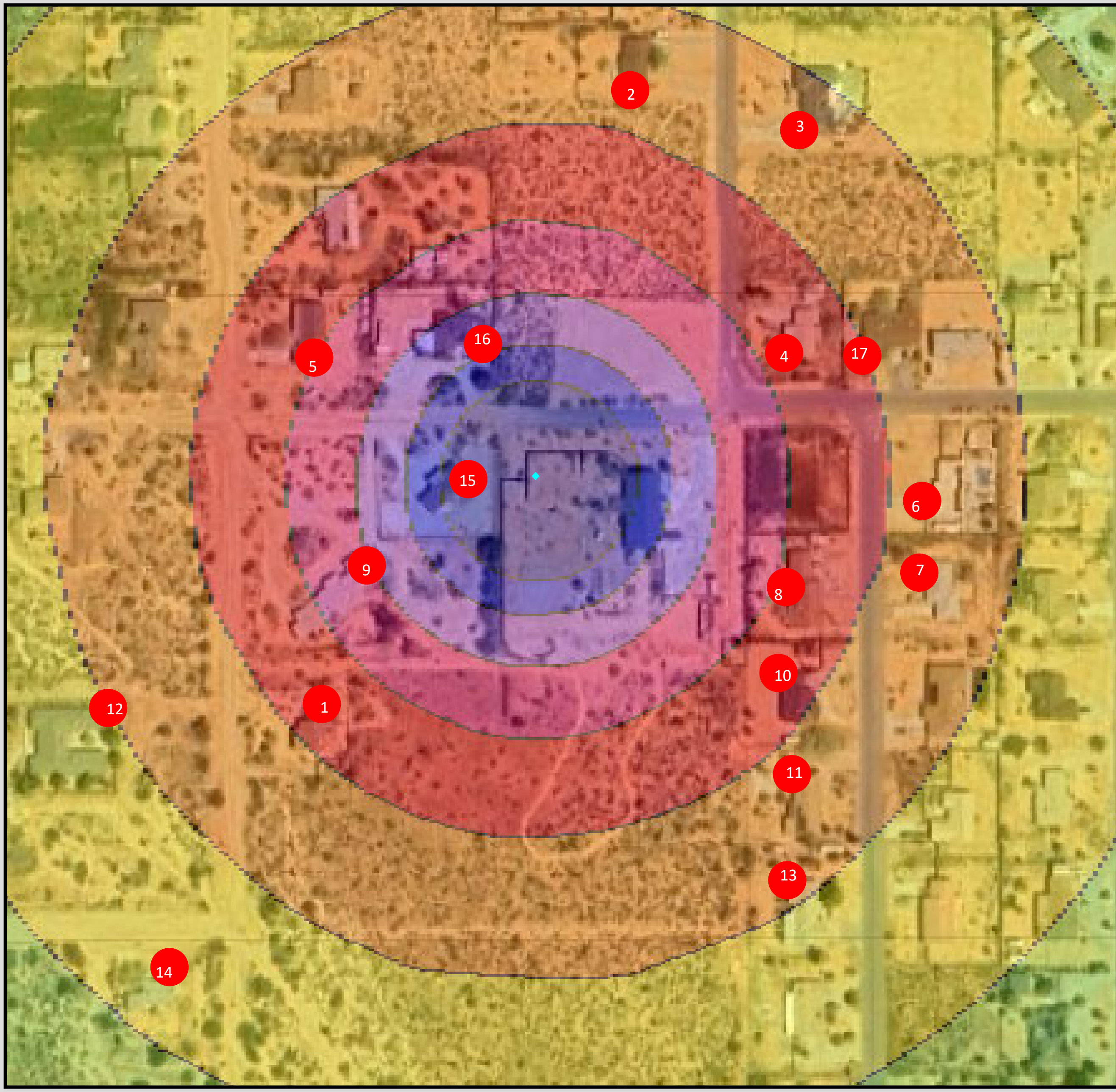
Table 5-4. Calculated Noise Level for Parking Lot Noise, (dBA L_{eq})

#	Location	Distance to Parking Lot (Either new or existing)	Parking Lot Noise[1]	Daytime/Nighttime Exterior Noise Standards	Exceed Daytime or Nighttime Exterior Standard?
1	57890 Pueblo Trail	92 feet	43.8	*55/45*	**No**
2	7497 Chula Vista Ave.	85 feet	44.5	*55/45*	**No**
3	7536 Hilton Ave.	90 feet	38.8	*55/45*	**No**

Source: [1]FTA Reference Sound Exposure Level for Park & Ride Lot at 50 feet attenuated to distances of residences from either the existing parking lot or the Proposed parking lot (2018).

As shown in Table 5-4, Project operational noise from parking lot activities would not exceed the Town's daytime or nighttime exterior noise standards of 55 dBA and 45 dBA, respectively, the surrounding receptor locations.

Figure 5-1
Modeled Operational Noise Levels: Ceremony Site A Situation



Signs and symbols

- Noise Receptors
- Noise Source

Noise Level Scale in dB(A) Leq

<=	25
25 -	28
28 -	31
31 -	34
34 -	37
37 -	40
40 -	43
43 -	46
46 -	49
>	49

N

Scale 1:198

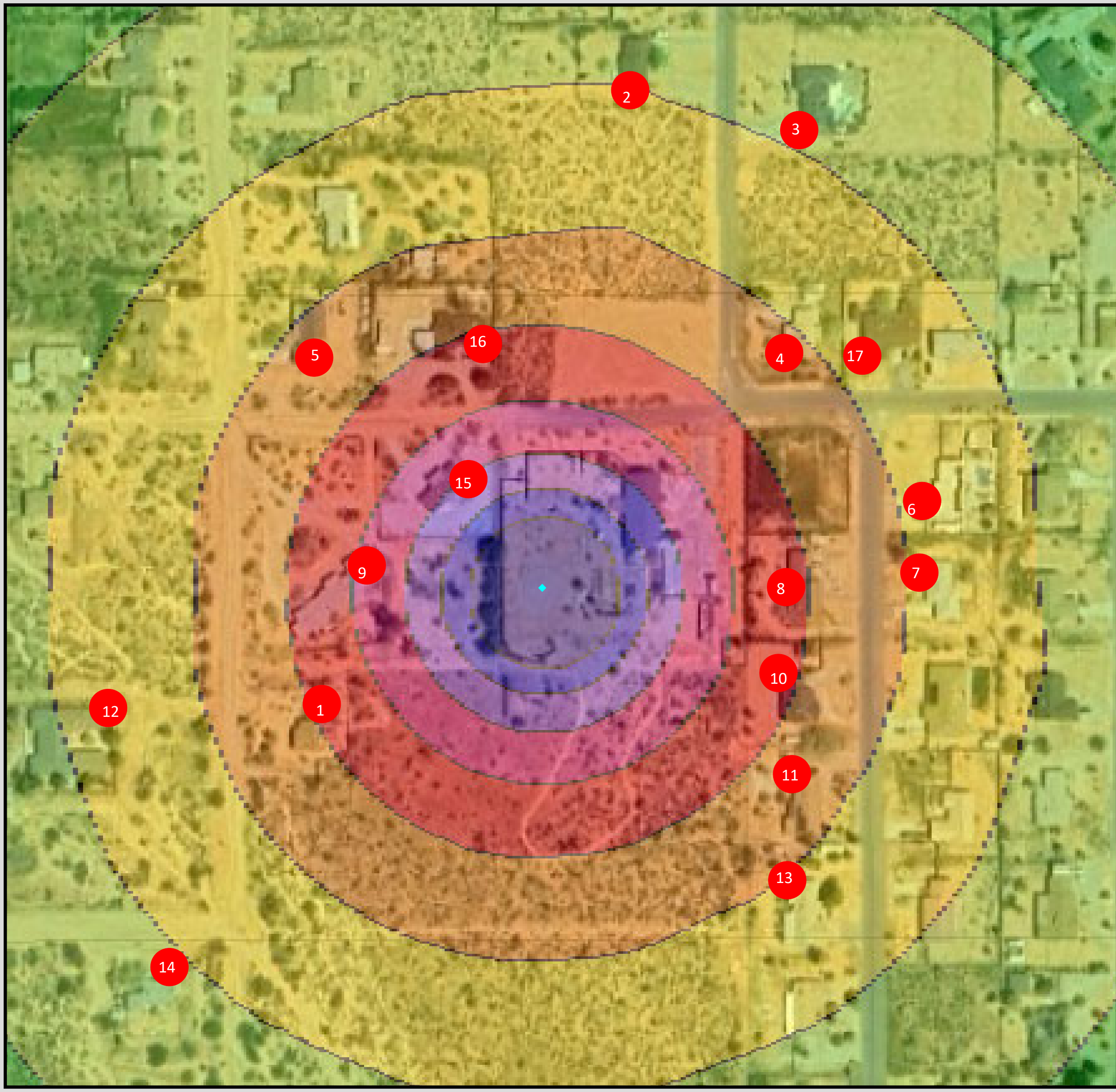
0 40 80 160 240 320 feet

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Sound PLAN

Map Date: 10/30/2024
2024-204: Tumbleweed Sanctuary Project

Figure 5-2
Modeled Operational Noise Levels: Ceremony Site B Situation



Signs and symbols
- Noise Receptors
- Noise Source

Noise Level
Scale in dB(A)
Leq

<=	25
25 -	28
28 -	31
31 -	34
34 -	37
37 -	40
40 -	43
43 -	46
46 -	49
>	49

N

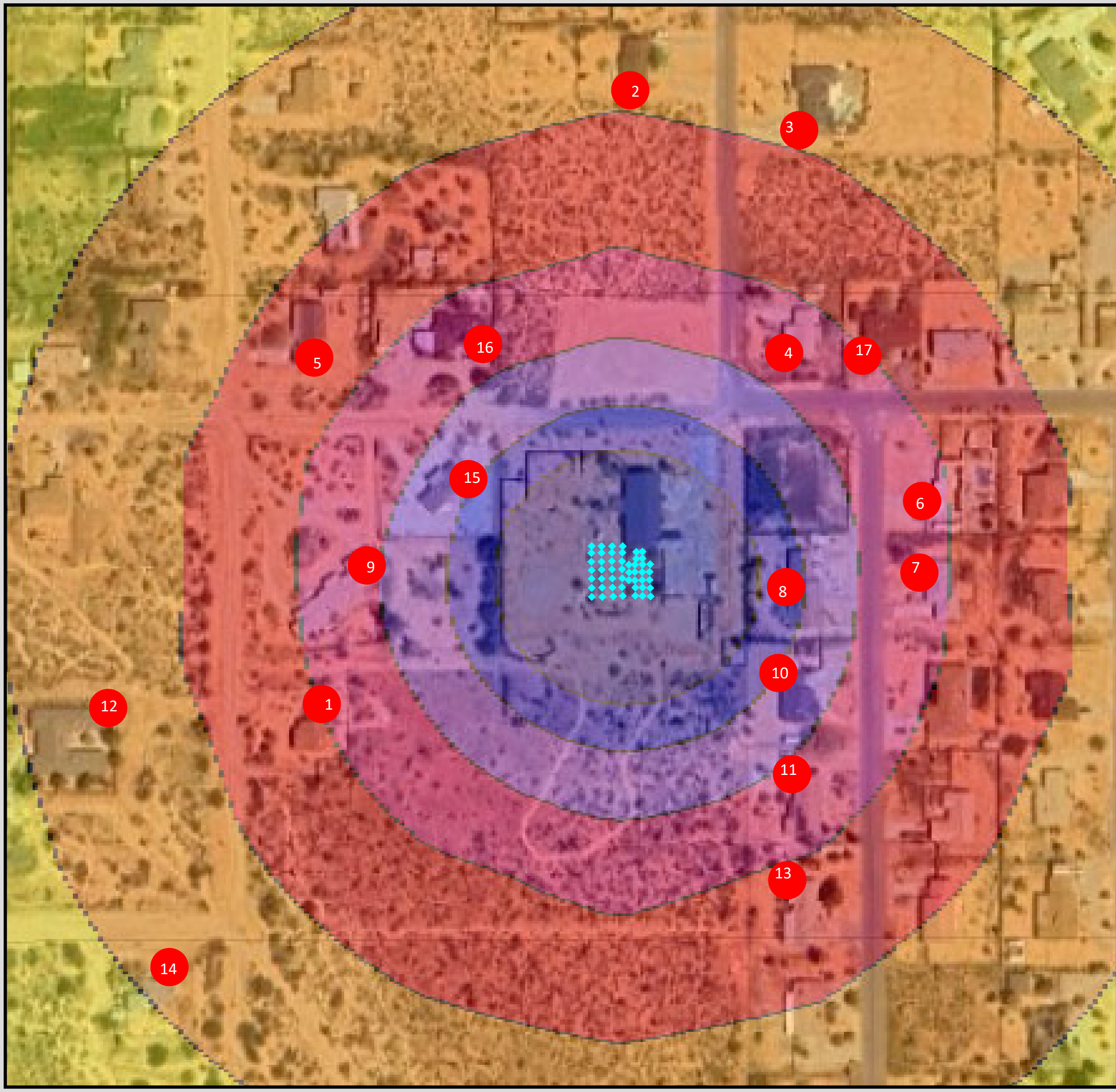
Scale 1:198
0 40 80 160 240 320 feet

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

SoundPLAN

Map Date: 10/30/2024
2024-204: Tumbleweed Sanctuary Project

Figure 5-3
Modeled Operational Noise Levels: Outdoor Reception Situation



Signs and symbols

- Noise Receptors
- Noise Source

Noise Level Scale in dB(A) Leq

<=		15
15	-	18
18	-	21
21	-	24
24	-	27
27	-	30
30	-	33
33	-	36
36	-	39
>		39

N

Scale 1:198

0 40 80 160 240 320 feet

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Sound PLAN

Map Date: 10/30/2024
2024-204: Tumbleweed Sanctuary Project

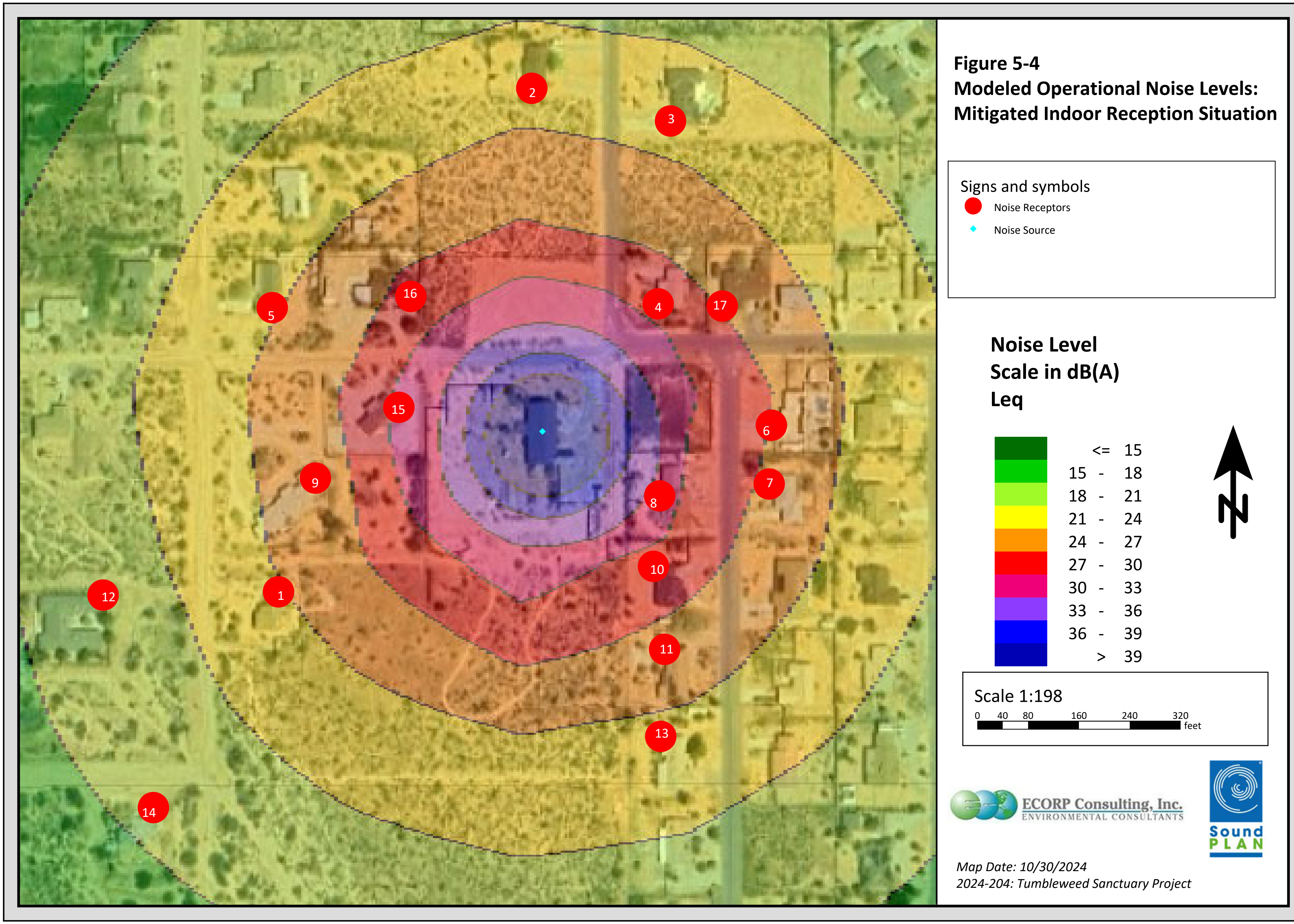


Figure 5-4
Modeled Operational Noise Levels: Mitigated Indoor Reception Situation

5.3.3 Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Construction on the Project Site's northern parking lot would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as bulldozers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. Pile drivers are not anticipated to be used during Project construction. Pile drivers are required in building construction when the foundation needs to transfer loads to deeper, more stable soil layers, which is typically only necessary for the construction of multi-story structures. Groundborne vibration levels associated with construction equipment are summarized in Table 5-5.

Table 5-5. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Large Bulldozer	0.089
Loaded Haul Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source: FTA 2018

The Town's Municipal Code Section 9.34.090 limits ground vibrations to 0.2 in/sec PPV at or beyond the property boundary of a land use. However, the Town exempts temporary construction vibration from maintenance and/or demolition activities between the hours of 7:00 a.m. and 10:00 p.m. Though the Municipal Code exempts construction vibration during these hours, for the purposes of this analysis this threshold is use to analyze vibration damage impacts at the nearest residential buildings. The Town's vibration threshold of 0.2 in/sec PPV aligns with the FTA's vibration standard of 0.2 in/sec PPV for non-engineered timber and masonry buildings (applicable to the surrounding residential homes).

The nearest structures of concern to the construction site are residences approximately 85 feet distant from the edge of the Proposed Project's new parking lot.

Based on the representative vibration levels presented for various construction equipment types in Table 5-5 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential Project construction vibration levels. The FTA provides the following equation:

$$[PPVequip = PPVref \times (25/D)^{1.5}]$$

Table 5-6 presents the expected Project related vibration levels at a distance of 85 feet.

Table 5-6. Construction Vibration Levels at 85 Feet

Receiver PPV Levels (in/sec)[1]				Max Vibration	Town Threshold	Exceeds Thresholds?
Large Bulldozer, Caisson Drilling, & Hoe Ram	**Loaded Trucks**	**Jackhammer**	**Vibratory Roller**			
0.014	0.012	0.006	0.034	**0.034**	*0.2*	**No**

Notes: [1]Based on the Vibration Source Levels of Construction Equipment included on Table 5-4 (FTA 2018). Distance to the nearest structure of concern is approximately 85 feet measured from the Project Site.

As shown in Table 5-6, vibration as a result of onsite construction activities on the Project Site would not exceed the 0.2 PPV Town vibration threshold at the nearest structures.

5.3.4 Would the Project Expose Structures to Substantial Groundborne Vibration During Operations?

Project operations would not generate substantial on-going operational vibration from mobile or stationary sources (e.g. rail traffic, industrial machinery). Therefore, the Project would result in negligible groundborne vibration impacts during operations.

5.3.5 Would the Project Expose People Residing or Working in the Project Area to Excessive Airport Noise?

The Project Site is located approximately one mile southwest of the Yucca Valley Airport. According to the Yucca Valley Airport Comprehensive Land Use Plan, the Project Site is outside the 60 dBA CNEL noise contour (San Bernardino County 1992). Therefore, the Proposed Project would not expose those visiting or working on the Project Site to excessive airport noise.

6.0 REFERENCES

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LIST OF ATTACHMENTS

ATTACHMENT A

Baseline (Existing) Noise Measurements – Project Site and Vicinity

Site Number: 1			
Recorded By: Lindsay Buck			
Job Number: 2024-204			
Date: 10/14/24			
Time: 11:01 a.m. – 11:16 a.m.			
Location: NW Corner of Project Site, South of Pueblo Trail			
Source of Peak Noise: Vehicles along Pueblo Trail			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
36.4	32.1	59.6	76.6

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**Spartan 821**	**30100**	**05/22/2024**	
	Microphone	**Larson Davis**	**377B02**	**352537**	**04/12/2024**	
	Preamp	**Larson Davis**	**PRM821**	**001679**	**04/26/2024**	
	Calibrator	**Larson Davis**	**CAL200**	**226638**	**05/20/2024**	

Weather Data			
Est.	**Duration:** 15 minutes	**Sky:** Clear	
	Note: dBA Offset = 0.11	**Sensor Height (ft):** 3.5	
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3	78	29.97

Photo of Measurement Location

LARSON DAVIS A PCB DIVISION

Spartan 821 Summary: 2024-10-15 08:38:37

User:

Location:

Job Description:

Notes: Could not parse section, making sure you have the latest G4 installed may resolve this issue.

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:670CFA24:00000700	

Overall Measurement

Start Date & Time	2024-10-14 11:01:56		
Stop Date & Time	2024-10-14 11:16:56		
Run Time	00:15:00		
Pre-Calibration			
Date/Time	2024-10-14 11:00:30		
Calibrator Level	94.0 dB		
Meter Sensitivity	-26.00 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
LAIeq	41.3 dB		
	A	**C**	**Z**
Lweq	36.4	53.7	72.7
Lwpk	76.6 dB	78.6 dB	94.1 dB
	2024-10-14 11:14:39	2024-10-14 11:08:12	2024-10-14 11:15:56
LwSmin	30.8 dB	46.5 dB	52.8 dB
	2024-10-14 11:14:12	2024-10-14 11:15:34	2024-10-14 11:06:04
LwSmax	49.4 dB	65.6 dB	85.2 dB
	2024-10-14 11:15:47	2024-10-14 11:08:12	2024-10-14 11:15:57
LwFmin	30.3 dB	44.5 dB	50.4 dB
	2024-10-14 11:14:12	2024-10-14 11:15:34	2024-10-14 11:06:03
LwFmax	55.9 dB	71.1 dB	90.4 dB
	2024-10-14 11:15:47	2024-10-14 11:08:12	2024-10-14 11:15:56
LwImin	32.1 dB	48.8 dB	56.1 dB
	2024-10-14 11:14:12	2024-10-14 11:15:35	2024-10-14 11:06:05
LwImax	59.6 dB	74.2 dB	92.9 dB
	2024-10-14 11:15:47	2024-10-14 11:08:12	2024-10-14 11:15:56
w = frequency weighting (A, C or Z)			
Overload Count	0		
Overload Duration	00:00:00		
	A	**C**	**Z**
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 2.0	43.0 dB
LAS 8.0	39.5 dB
LAS 25.0	36.3 dB
LAS 50.0	34.7 dB
LAS 90.0	32.6 dB
LAS 90.0	32.6 dB

Virtual Dosimeters

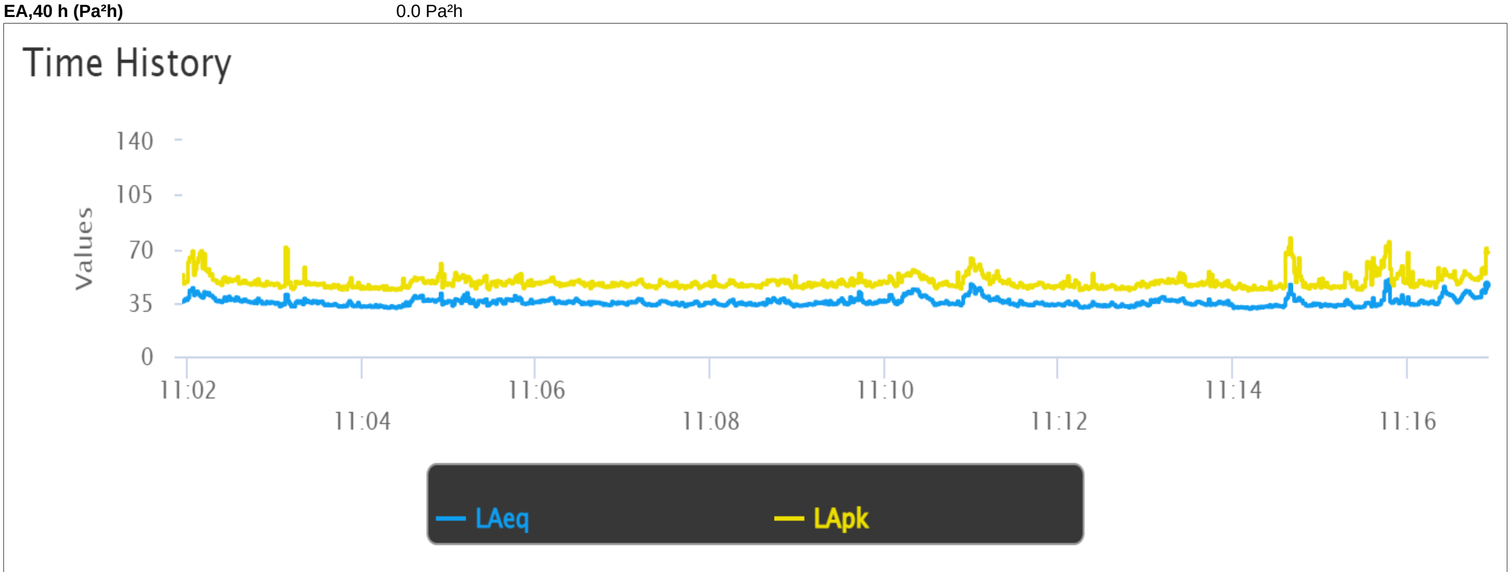
	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	21.4 dB	21.4 dB	21.4 dB	21.4 dB
Projected LEP'd/Lex,8h	36.4 dB	36.4 dB	36.4 dB	36.4 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

Exceedances

	Count	Duration
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	66.0 dB
EA (Pa²s)	0.0 Pa²s
EA,8 h (Pa²s)	0.1 Pa²s
EA,40 h (Pa²s)	0.3 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h



Powered by Larson Davis

Site Number: 2			
Recorded By: Lindsay Buck			
Job Number: 2024-204			
Date: 10/14/24			
Time: 11:18 a.m. – 11:34 a.m.			
Location: NE Corner of Pueblo Trail and Chula Vista Avenue			
Source of Peak Noise: Vehicles along Pueblo Trail			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
45.3	31.4	74.2	83.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**Spartan 821**	**30100**	**05/22/2024**	
	Microphone	**Larson Davis**	**377B02**	**352537**	**04/12/2024**	
	Preamp	**Larson Davis**	**PRM821**	**001679**	**04/26/2024**	
	Calibrator	**Larson Davis**	**CAL200**	**226638**	**05/20/2024**	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.11		**Sensor Height (ft):** 3.5
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3	79	29.96

Photo of Measurement Location

Spartan 821 Summary: 2024-10-15 08:39:08

User:

Location:

Job Description:

Notes: Could not parse section, making sure you have the latest G4 installed may resolve this issue.

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:670CFE21:00000709	

Overall Measurement

Start Date & Time	2024-10-14 11:18:57		
Stop Date & Time	2024-10-14 11:34:40		
Run Time	00:15:43		
Pre-Calibration			
Date/Time	2024-10-14 11:00:30		
Calibrator Level	94.0 dB		
Meter Sensitivity	-26.00 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
LAIeq	50.5 dB		
	A	**C**	**Z**
Lweq	45.3	55.8	74.4
Lwpk	83.5 dB	85.5 dB	94.6 dB
	2024-10-14 11:32:17	2024-10-14 11:32:17	2024-10-14 11:21:57
LwSmin	30.1 dB	46.1 dB	52.0 dB
	2024-10-14 11:20:46	2024-10-14 11:22:36	2024-10-14 11:29:24
LwSmax	69.6 dB	72.2 dB	87.0 dB
	2024-10-14 11:32:18	2024-10-14 11:32:18	2024-10-14 11:26:51
LwFmin	29.5 dB	43.3 dB	49.6 dB
	2024-10-14 11:20:43	2024-10-14 11:22:36	2024-10-14 11:21:07
LwFmax	71.8 dB	74.6 dB	91.6 dB
	2024-10-14 11:32:17	2024-10-14 11:32:17	2024-10-14 11:26:51
LwImin	31.4 dB	48.8 dB	56.0 dB
	2024-10-14 11:20:46	2024-10-14 11:22:48	2024-10-14 11:29:24
LwImax	74.2 dB	76.0 dB	93.2 dB
	2024-10-14 11:18:57	2024-10-14 11:18:57	2024-10-14 11:26:51

w = frequency weighting (A, C or Z)

Overload Count	0		
Overload Duration	00:00:00		
	A	**C**	**Z**
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 2.0	48.5 dB
LAS 8.0	41.9 dB
LAS 25.0	38.3 dB
LAS 50.0	36.0 dB
LAS 90.0	32.6 dB
LAS 90.0	32.6 dB

Virtual Dosimeters

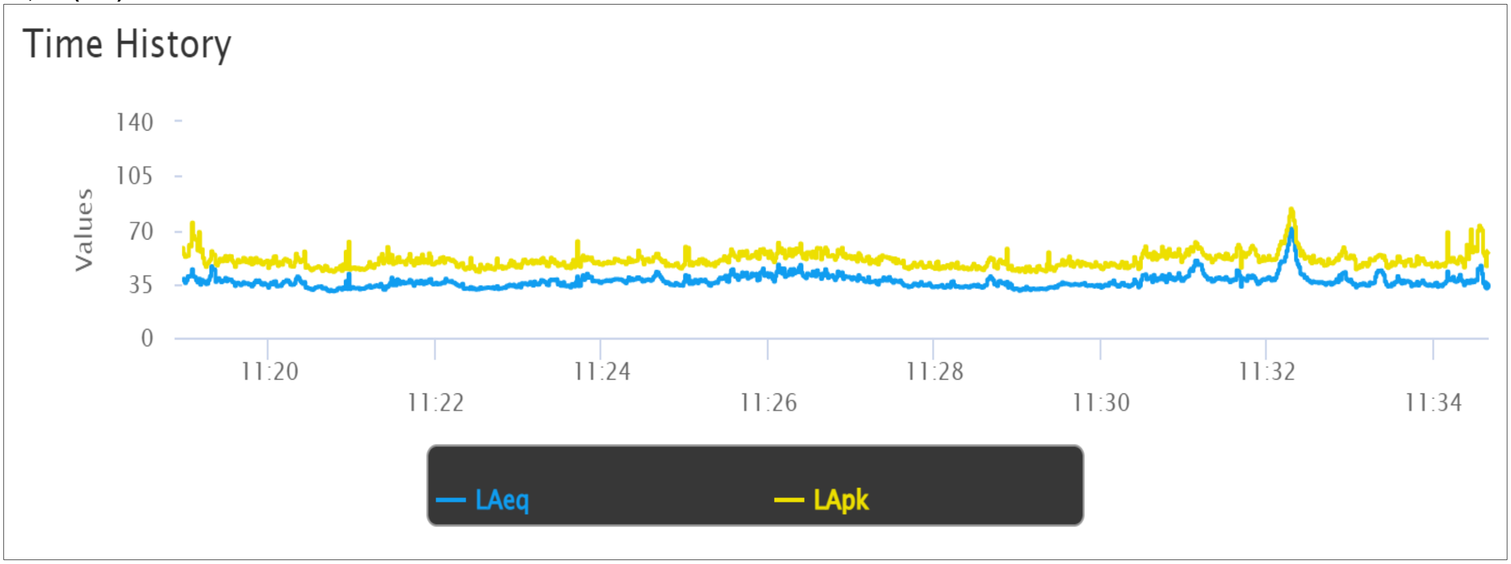
	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	30.5 dB	30.5 dB	30.5 dB	30.5 dB
Projected LEP'd/Lex,8h	45.3 dB	45.3 dB	45.3 dB	45.3 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

Exceedances

	Count	**Duration**
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	75.1 dB
EA (Pa²s)	0.0 Pa²s
EA,8 h (Pa²s)	0.4 Pa²s
EA,40 h (Pa²s)	2.0 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h



Site Number: 3			
Recorded By: Lindsay Buck			
Job Number: 2024-204			
Date: 10/14/24			
Time: 11:35 a.m. – 11:50 a.m.			
Location: Eastern edge of Project Site, 215 feet south of Pueblo Trail			
Source of Peak Noise: Vehicles along Pueblo Trail			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
38.8	32.7	63.4	82.6

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**Spartan 821**	**30100**	**05/22/2024**	
	Microphone	**Larson Davis**	**377B02**	**352537**	**04/12/2024**	
	Preamp	**Larson Davis**	**PRM821**	**001679**	**04/26/2024**	
	Calibrator	**Larson Davis**	**CAL200**	**226638**	**05/20/2024**	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.11		**Sensor Height (ft):** 3.5
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3	81	29.96

Photo of Measurement Location

LARSON DAVIS
A PCB DIVISION

Spartan 821 Summary: 2024-10-15 08:39:26

User:

Location:

Job Description:

Notes: Could not parse section, making sure you have the latest G4 installed may resolve this issue.

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:670D020A:00000710	

Overall Measurement

Start Date & Time	2024-10-14 11:35:38		
Stop Date & Time	2024-10-14 11:50:38		
Run Time	00:15:00		
Pre-Calibration			
Date/Time	2024-10-14 11:00:30		
Calibrator Level	94.0 dB		
Meter Sensitivity	-26.00 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
LAIeq	45.2 dB		
	A	**C**	**Z**
Lweq	38.8	51.6	64.2
Lwpk	82.6 dB	85.0 dB	91.1 dB
	2024-10-14 11:50:13	2024-10-14 11:50:13	2024-10-14 11:49:51
LwSmin	31.8 dB	48.0 dB	52.0 dB
	2024-10-14 11:38:10	2024-10-14 11:42:00	2024-10-14 11:38:30
LwSmax	51.4 dB	62.1 dB	81.9 dB
	2024-10-14 11:50:13	2024-10-14 11:48:35	2024-10-14 11:49:51
LwFmin	31.0 dB	46.0 dB	48.4 dB
	2024-10-14 11:37:58	2024-10-14 11:38:30	2024-10-14 11:38:30
LwFmax	59.2 dB	64.2 dB	87.4 dB
	2024-10-14 11:50:13	2024-10-14 11:50:13	2024-10-14 11:49:51
LwImin	32.7 dB	50.2 dB	54.8 dB
	2024-10-14 11:38:10	2024-10-14 11:44:05	2024-10-14 11:38:25
LwImax	63.4 dB	68.5 dB	89.8 dB
	2024-10-14 11:50:13	2024-10-14 11:50:13	2024-10-14 11:49:51
w = frequency weighting (A, C or Z)			
Overload Count	0		
Overload Duration	00:00:00		
	A	**C**	**Z**
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 2.0	44.9 dB
LAS 8.0	42.9 dB
LAS 25.0	39.8 dB
LAS 50.0	36.0 dB
LAS 90.0	33.2 dB
LAS 90.0	33.2 dB

Virtual Dosimeters

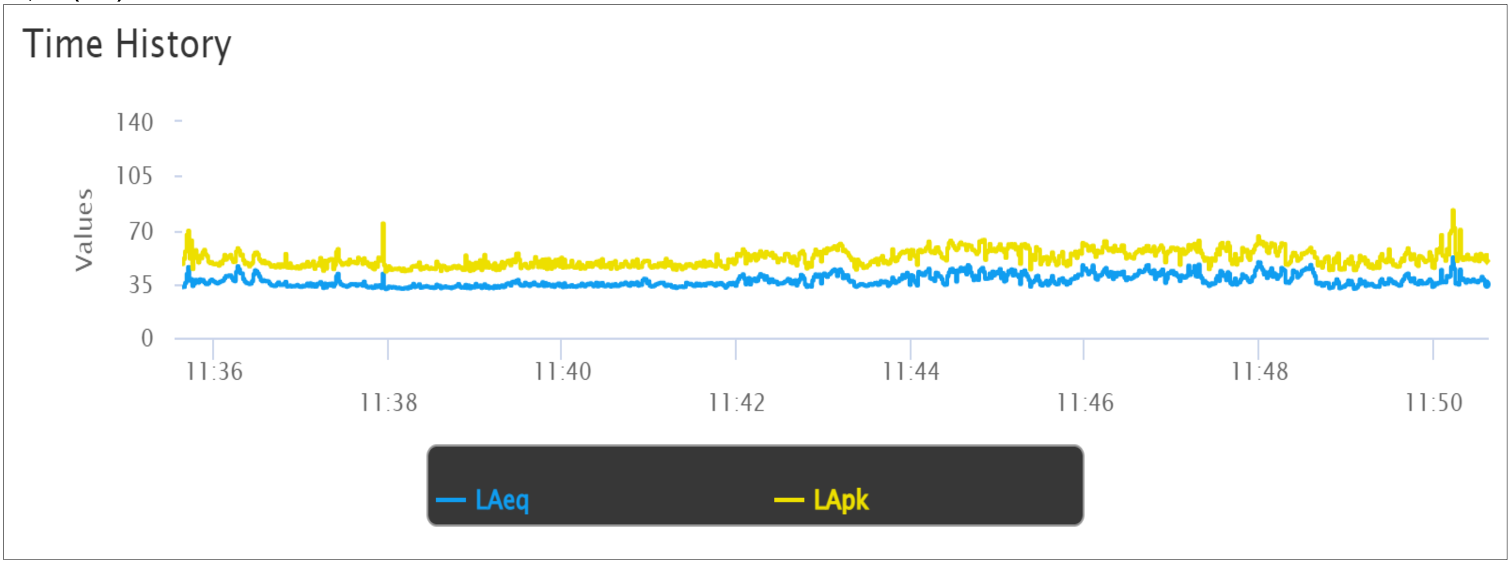
	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	23.7 dB	23.7 dB	23.7 dB	23.7 dB
Projected LEP'd/Lex,8h	38.8 dB	38.8 dB	38.8 dB	38.8 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

Exceedances

	Count	Duration
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	68.3 dB
EA (Pa²s)	0.0 Pa²s
EA,8 h (Pa²s)	0.1 Pa²s
EA,40 h (Pa²s)	0.4 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h



Site Number: 4			
Recorded By: Lindsay Buck			
Job Number: 2024-204			
Date: 10/14/24			
Time: 11:51 a.m. – 12:08 p.m.			
Location: South of Project Site, 350 feet south of Pueblo Trail			
Source of Peak Noise: Neighbors in backyards, vehicles on Pueblo Trail			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
38.1	33.6	64.7	79.3

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**Spartan 821**	**30100**	**05/22/2024**	
	Microphone	**Larson Davis**	**377B02**	**352537**	**04/12/2024**	
	Preamp	**Larson Davis**	**PRM821**	**001679**	**04/26/2024**	
	Calibrator	**Larson Davis**	**CAL200**	**226638**	**05/20/2024**	

Weather Data			
Est.	**Duration:** 16 minutes		**Sky:** Clear
	Note: dBA Offset = 0.11		**Sensor Height (ft):** 3.5
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3	83	29.96

<u>Photo of Measurement Location</u>

LARSON DAVIS
A PCB DIVISION

Spartan 821 Summary: 2024-10-15 08:39:43

User:

Location:

Job Description:

Notes: Could not parse section, making sure you have the latest G4 installed may resolve this issue.

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:670D05C4:00000716	

Overall Measurement

Start Date & Time	2024-10-14 11:51:32		
Stop Date & Time	2024-10-14 12:08:14		
Run Time	00:16:42		
Pre-Calibration			
Date/Time	2024-10-14 11:00:30		
Calibrator Level	94.0 dB		
Meter Sensitivity	-26.00 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
LAIeq	43.7 dB		
	A	**C**	**Z**
Lweq	38.1	54.6	73.7
Lwpk	79.3 dB	80.2 dB	94.8 dB
	2024-10-14 12:07:09	2024-10-14 12:07:09	2024-10-14 11:59:53
LwSmin	32.7 dB	48.4 dB	54.3 dB
	2024-10-14 12:01:19	2024-10-14 12:03:14	2024-10-14 11:51:45
LwSmax	53.7 dB	66.0 dB	86.9 dB
	2024-10-14 12:07:09	2024-10-14 11:59:53	2024-10-14 11:59:42
LwFmin	31.8 dB	46.8 dB	51.4 dB
	2024-10-14 12:01:18	2024-10-14 12:05:12	2024-10-14 12:00:45
LwFmax	61.2 dB	71.0 dB	90.7 dB
	2024-10-14 12:07:09	2024-10-14 11:59:53	2024-10-14 11:59:53
LwImin	33.6 dB	51.1 dB	57.1 dB
	2024-10-14 12:04:53	2024-10-14 12:01:20	2024-10-14 11:57:47
LwImax	64.7 dB	73.2 dB	93.4 dB
	2024-10-14 12:07:09	2024-10-14 12:04:18	2024-10-14 11:59:53

w = frequency weighting (A, C or Z)

Overload Count	0		
Overload Duration	00:00:00		
	A	**C**	**Z**
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 2.0	42.9 dB
LAS 8.0	40.7 dB
LAS 25.0	38.5 dB
LAS 50.0	36.7 dB
LAS 90.0	33.6 dB
LAS 90.0	33.6 dB

Virtual Dosimeters

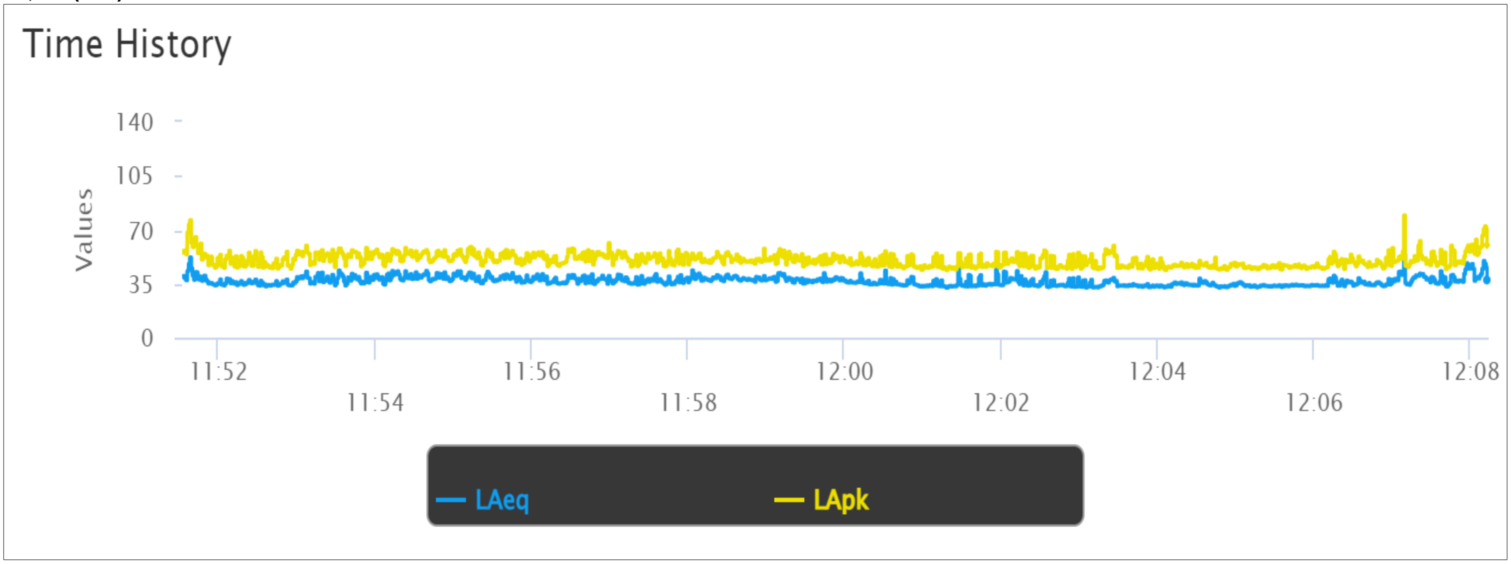
	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	23.5 dB	23.5 dB	23.5 dB	23.5 dB
Projected LEP'd/Lex,8h	38.1 dB	38.1 dB	38.1 dB	38.1 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

Exceedances

	Count	Duration
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	68.1 dB
EA (Pa²s)	0.0 Pa²s
EA,8 h (Pa²s)	0.1 Pa²s
EA,40 h (Pa²s)	0.4 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h



ATTACHMENT B

Federal Highway Administration Roadway Construction Noise Model Outputs – Project Construction

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/23/2024

Case Description: **Tumbleweed Sanctuary Phase 1: Site Preparation**

Description	**Affected Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		190	0
Tractor	No	40	84		190	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		73.4	69.4
Tractor		72.4	68.4
	Total	73.4	**72**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/23/2024
Case Description: **Tumbleweed Sanctuary Phase 2: Grading**

Description	**Affected Land Use**
Grading	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		190	0
Dozer	No	40		81.7	190	0
Tractor	No	40	84		190	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		73.4	69.4
Dozer		70.1	66.1
Tractor		72.4	68.4
	Total	73.4	**73**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/23/2024
Case Description: **Tumbleweed Sanctuary Phase 3: Paving**

Description	**Affected Land Use**
Paving	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Vibratory Concrete Mixer	No	20		80	190	0
Vibratory Concrete Mixer	No	20		80	190	0
Vibratory Concrete Mixer	No	20		80	190	0
Vibratory Concrete Mixer	No	20		80	190	0
Paver	No	50		77.2	190	0
Roller	No	20		80	190	0
Tractor	No	40	84		190	0

Results

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Vibratory Concrete Mixer	68.4	61.4
Vibratory Concrete Mixer	68.4	61.4
Vibratory Concrete Mixer	68.4	61.4
Vibratory Concrete Mixer	68.4	61.4
Paver	65.6	62.6
Roller	68.4	61.4
Tractor	72.4	68.4
Total	72.4	**72**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/23/2024
Case Description: **Tumbleweed Sanctuary Phase 4: Architectural Coating**

Description	**Affected Land Use**
Architectural Coating	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Compressor (air)	No	40		77.7	190	0

Results

Equipment		Calculated (dBA) ***Lmax**	**Leq**
Compressor (air)		66.1	62.1
	Total	66.1	**62.1**

*Calculated Lmax is the Loudest value.

ATTACHMENT C

SoundPLAN Onsite Noise Generation

SoundPLAN
Output Source Information

Number	Reciever Name	Floor	Level at Receiver (dBA) for Ceremony Site A (Scenario 1)[1]	Level at Receiver (dBA) for Ceremony Site B (Scenario 2)[1]	Level at Receiver (dBA) for Outdoor Reception Area (Scenario 3)[1]	Level at Receiver (dBA) for Indoor Reception Area with Amplified Music (Scenario 4)[2]
1	7459 Bonita Trail	Ground Floor	37.7	37.2	29.8	23.3
2	7472 Chula Vista Ave.	Ground Floor	35.8	31.0	26.4	22.6
3	7473 Chula Vista Ave.	Ground Floor	35.0	30.6	26.5	22.8
4	7497 Chula Vista Ave.	Ground Floor	38.8	34.1	31.5	28.7
5	7509 Bonita Trail	Ground Floor	39.9	34.9	28.7	23.8
6	7515 Hilton Ave.	Ground Floor	36.0	33.1	30.4	26.2
7	7535 Hilton Ave.	Ground Floor	35.9	32.6	30.4	26.1
8	7536 Hilton Ave.	Ground Floor	39.2	37.5	36.4	31.3
9	7541 Bonita Trail	Ground Floor	42.5	40.5	32.3	26.1
10	7556 Hilton Ave.	Ground Floor	37.7	37.0	34.9	28.6
11	7576 Hilton Ave.	Ground Floor	35.9	35.3	31.9	25.4
12	7585 Warren Vista Ave.	Ground Floor	33.7	31.9	25.2	19.0
13	7606 Hilton Ave.	Ground Floor	34.2	33.5	29.4	23.1
14	57791 Coronado St.	Ground Floor	31.9	30.5	24.5	18.5
15	57825 Pueblo Trail	Ground Floor	51.7	43.1	35.4	30.2
16	57890 Pueblo Trail	Ground Floor	45.0	37.3	31.8	27.9
17	57932 Pueblo Trail	Ground Floor	36.3	32.5	29.9	26.6

Number	Noise Source Information	Citation	Leq Level at Source (dBA)	Lw Level at Source (dBA)	Leq Level at Source (dBA)	Lw Level at Source (dBA)	Leq Level at Source (dBA)	Lw Level at Source (dBA)	Leq Level at Source (dBA)	Lw Level at Source (dBA)
1	3M Occupational Health & Environmental Safety Division for Speech Intelligibility	3M (ND)	84.7	92.8	82.0	90.1	60	68.1	NA	NA
2	SoundPLAN Refernce Noise Library	SoundPLAN (2024) and EPA (1974)	NA	NA	NA	NA	NA	NA	NA	105 - 25 = 80