NOISE AND VIBRATION IMPACT ANALYSIS

LAKE ELSINORE IMPERIAL GAS STATION PROJECT

LAKE ELSINORE, CALIFORNIA

LSA

November 2021

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LAKE ELSINORE, CALIFORNIA

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LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily traffic
ALUC	Airport Land Use Commission
City	City of Lake Elsinore
CNEL	Community Noise Equivalent Level
dB	decibels
dBA	A-weighted decibels
FHWA	Federal Highway Administration
ft	foot/feet
FTA	Federal Transit Administration
FTA Manual	FTA's *Transit Noise and Vibration Impact Assessment Manual* (2018)
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum instantaneous noise level
L_V	velocity in decibels
PPV	peak particle velocity
project	Lake Elsinore Imperial Gas Station Project
RMS	root-mean-square (velocity)
STC	Sound Transmission Class
sf	square foot/feet
VdB	vibration velocity decibels

NOISE AND VIBRATION IMPACT ANALYSIS

INTRODUCTION

This noise and vibration impact analysis has been prepared to evaluate the potential noise and vibration impacts from, and identify reduction measures associated with, the Lake Elsinore Imperial Gas Station Project (project) at 31800 Mission Trail, Lake Elsinore, California. This report is intended to satisfy City of Lake Elsinore (City) requirements for a project-specific noise and vibration impact analysis by examining the short-term and long-term noise and vibration impacts on sensitive uses adjacent to the project site and evaluating reduction measures required by the proposed project.

PROJECT LOCATION

As shown in Figure 1, the project site is in Lake Elsinore at 31800 Mission Trail, Riverside County, California, 92530 between Mission Trail and Casino Drive. The project site is currently vacant. The proposed project is a gasoline service station and associated 3,000-square-foot (sf) convenience store with a self-service car wash area.

PROJECT DESCRIPTION

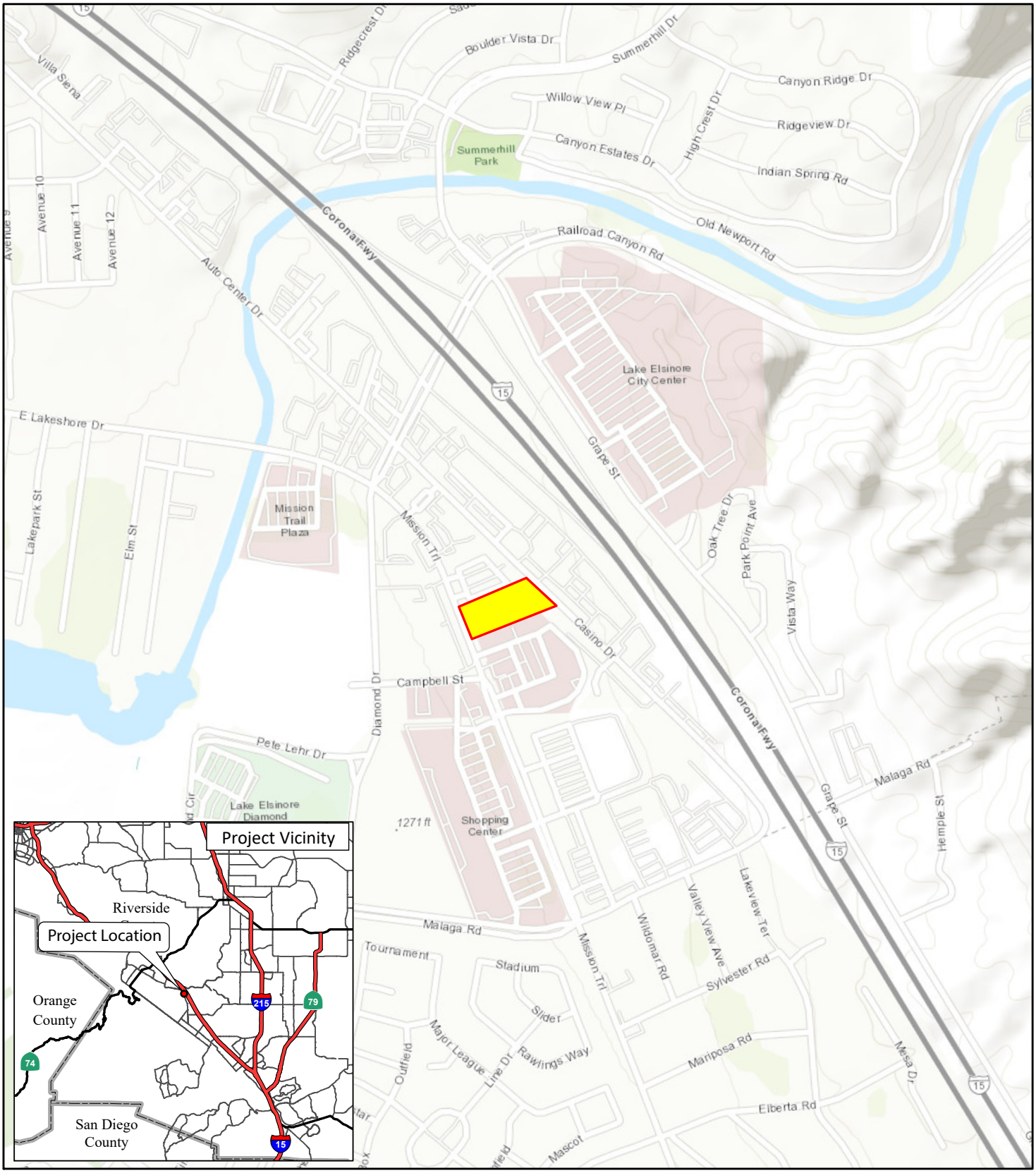
The project would construct a gas station with 18 fueling positions, a convenience store, and a self-service car wash area. The convenience store would be 3,000 sf and the car wash area would be 4,400 sf. The total lot area is 1.8 acres (79,041 sf). The project would also include a 6 foot (ft) high block wall on top of the retaining wall along the southeastern property line and 47 parking spaces, which includes two American with Disabilities Act-accessible stalls. The convenience store and gas station would operate 24 hours a day and the car wash would operate from 7:00 a.m. to 10:00 p.m. daily. Figure 2 depicts the project's conceptual site plan.

CHARACTERISTICS OF SOUND

Sound is increasing in the environment and can affect quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations (or cycles per second) of a wave, resulting in the tone's range from high to low. Loudness is the strength of a sound, describes a noisy or quiet environment, and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity is the average rate of sound energy transmitted through a unit area perpendicular to the direction in which the sound waves are traveling. This characteristic of sound can be precisely measured with instruments.

In the analysis of a project, the noise environment of the project area is defined in terms of sound intensity and its effect on adjacent sensitive land uses.



LSA

LEGEND

Project Site

FIGURE 1

N

0 400 800

FEET

SOURCE: ArcGIS Online Topographic Map (2021)

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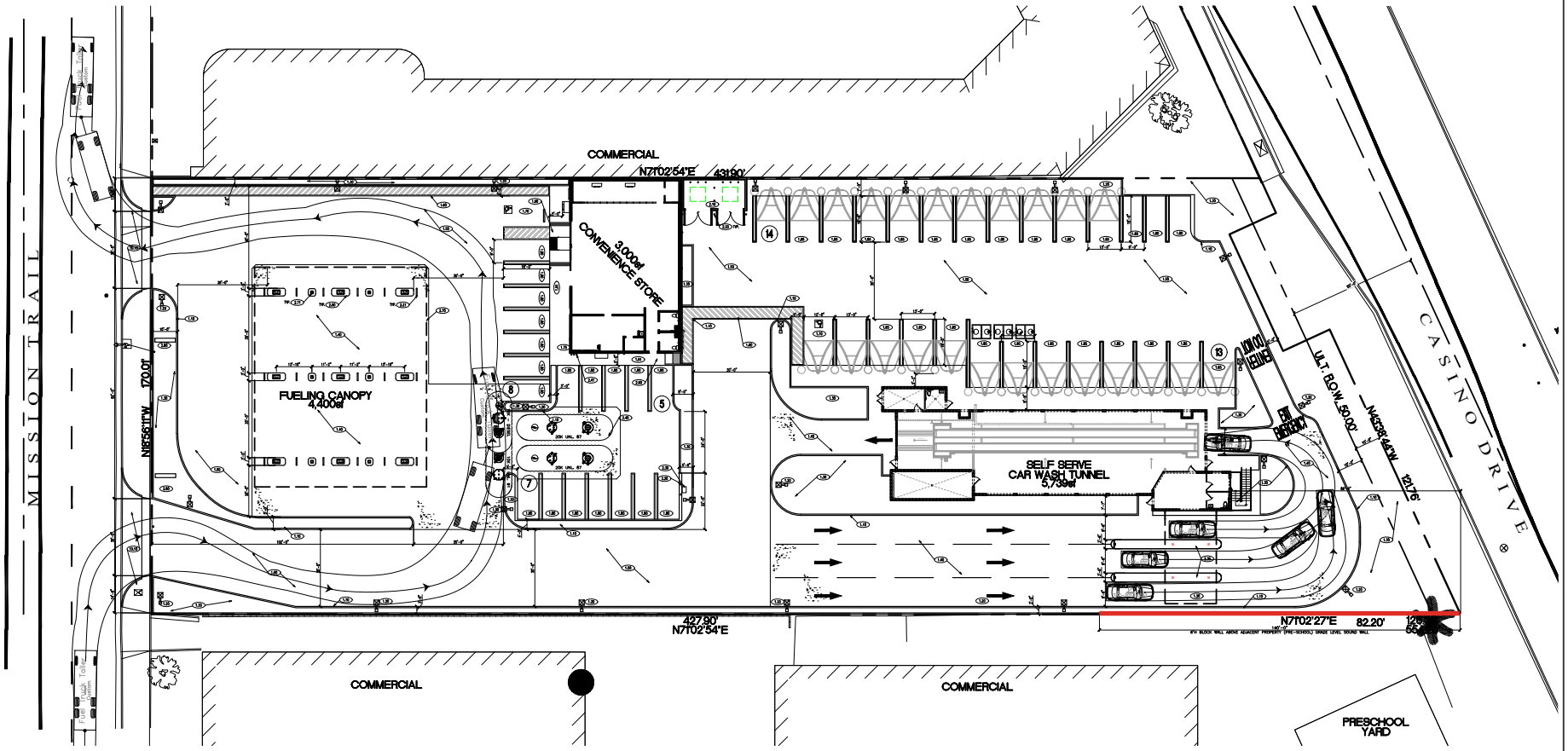
Lake Elsinore Imperial Gas Station

Project Location



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6 Ft High Block Wall

FIGURE 2

N

0 10 20

FEET

SOURCE: CJC Design, Inc

Lake Elsinore Imperial Gas Station

Site Plan

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Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Decibels, unlike the linear scale (e.g., inches or pounds), is a scale based on powers of 10.

For example, 10 decibels (dB) is 10 times more intense than 0 dB, 20 dB is 100 times more intense than 0 dB, and 30 dB is 1,000 times more intense than 0 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 0 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels generate from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source noise in a relatively flat environment with absorptive vegetation decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-weighted average noise over a sample period. However, the predominant rating scales for human communities in California are L_{eq} and the Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the relaxation hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance, when assessing the annoyance factor, include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise. Another noise scale often used together with L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level; half the time the noise level exceeds this level and half the time it is less. The L_{90} noise level represents the noise level

exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts, which refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions and thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. Sound levels from 160 to 165 dBA will potentially result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

Table A lists definitions of acoustical terms, and Table B shows common sound levels and their noise sources.

FUNDAMENTALS OF VIBRATION

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. The motion may be discernible outdoors, but without the effects associated with the shaking of a building, there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items on shelves or wall hangings, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less, which is an order of magnitude below the damage threshold for normal buildings.

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of noise level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very-low-frequency 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. (All sound levels in this report are A-weighted unless reported otherwise.)
L_2, L_8, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Sound Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Average Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter during a designated time interval using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Handbook of Acoustical Measurement and Noise Control* (Harris 1991).

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near-Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA (2004).

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 ft from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (Federal Transit Administration's [FTA] *Transit Noise and Vibration Impact Assessment Manual* [FTA Manual] [2018]). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, both construction of the project and freight train operations could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than ground-borne noise. Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes (e.g., blasting and pile driving) to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2018). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS velocity is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. The vibration velocity level in decibels is defined as the following:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where L_v is the vibration velocity in decibels (VdB), V is the RMS velocity amplitude, and V_{ref} is the reference velocity amplitude, or 1×10^{-6} inches/second (in/sec) used in the United States.

REGULATORY SETTING

Federal Regulations

Federal Transit Administration

Vibration standards included in the FTA Manual (2018) are used in this analysis for ground-borne vibration impacts on human annoyance. Table C provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building.

The criteria for environmental impacts from ground-borne vibration and noise are based on the maximum levels for a single event. Table D lists the potential vibration building damage criteria associated with construction activities, as suggested in the FTA Manual (2018). FTA guidelines show that a vibration level of up to 102 VdB (equivalent to 0.5 in/sec in PPV [FTA 2018]) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For nonengineered timber and masonry buildings, the construction building vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table C: Interpretation of Vibration Criteria for Detailed Analysis

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Vibration that is distinctly felt. Appropriate for workshops and similar areas not as sensitive to vibration.
Office	84	Vibration that can be felt. Appropriate for office and similar areas not as sensitive to vibration.
Residential Day	78	Vibration that is barely felt. Adequate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night and Operating Rooms	72	Vibration is not felt, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power optical microscopes (100X) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 Hz.
FTA = United States Federal Transit Administration
Hz = hertz
L_V = velocity in decibels
Max = maximum
VdB = vibration velocity decibels

Table D: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_V (VdB)[1]
Reinforced concrete, steel, or timber (no plaster)	0.50	102
Engineered concrete and masonry (no plaster)	0.30	98
Nonengineered-timber and masonry buildings	0.20	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] RMS vibration velocity in decibels (VdB) is 1 µin/sec.
µin/sec = microinches per second
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

Local Regulations

City of Lake Elsinore

Municipal Code. Section 17.176.060 of the City's Municipal Code establishes exterior noise standards (shown in Table E) to address unlawful creation of noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which noise causes the noise level, when measured at any location on any other property.

Section 17.176.080(f) of the City's Municipal Code prohibits noise from operating or causing the operation of any tools of equipment used in construction, drilling, repair, alteration, or demolition work that creates a noise disturbance across a residential or commercial real property line between the hours of 7:00 p.m. and 7:00 a.m. on weekdays or at any time on weekends or holidays, except for public service utilities, or by variance issued by the City. Also, where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at the affected properties will not exceed the noise standards shown in Table F. In addition, all mobile or stationary internal combustion engine powered equipment or machinery shall be equipped with suitable exhaust and air intake silencers in proper working order.

Table E: Exterior Noise Limits

Affected Land Use (Receiving Noise)	Time Period	Noise Level (dBA)				
		L_{50}	L_{25}	L_8	L_2	L_{max}
Single-Family Residential	10:00 p.m. to 7:00 a.m.	40	45	50	55	60
	7:00 a.m. to 10:00 p.m.	50	55	60	65	70
Multiple Dwelling Residential	10:00 p.m. to 7:00 a.m.	45	50	55	60	65
	7:00 a.m. to 10:00 p.m.	50	55	60	65	70
Limited Commercial and Office	10:00 p.m. to 7:00 a.m.	55	60	65	70	75
	7:00 a.m. to 10:00 p.m.	60	65	70	75	80
General Commercial	10:00 p.m. to 7:00 a.m.	60	65	70	75	80
	7:00 a.m. to 10:00 p.m.	65	70	75	80	85
Light Industrial	Anytime	70	75	80	85	90
Heavy Industrial	Anytime	70	75	80	85	90

Source: Lake Elsinore Municipal Code, Chapter 17.176 Noise Control (2021).
Note: No person shall operate, or cause to be operated, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other property, either incorporated or unincorporated, to exceed:

L_2 = The noise standard plus 15 dBA for a cumulative period of more than 1 minute in any hour.
L_8 = The noise standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour.
L_{25} = The noise standard plus 5 dBA for a cumulative period of more than 15 minutes in any hour.
L_{50} = The noise standard for a cumulative period of more than 30 minutes in any hour.
L_{max} = The noise standard plus 20 dBA or the maximum measured ambient noise level for any period of time.

dBA = A-weighted decibel

Table F: Construction Noise Standards

Allowable Work (Dates and Times)	At Residential Properties						At Business Properties	
	Single-Family		Multifamily		Semi-Residential/ Commercial		Mobile Equipment[1]	Stationary Equipment[2]
	Mobile Equipment[1]	Stationary Equipment[2]	Mobile Equipment[1]	Stationary Equipment[2]	Mobile Equipment[1]	Stationary Equipment[2]		
Daily,[3] 7:00 a.m.–7:00 p.m.	75 dBA	60 dBA	80 dBA	65 dBA	85 dBA	70 dBA	–	–
Daily,[4] 7:00 p.m.–7:00 a.m.	60 dBA	50 dBA	64 dBA	55 dBA	70 dBA	60 dBA	–	–
Daily, Anytime	–	–	–	–	–	–	85 dBA	75 dBA

Source: City of Lake Elsinore Municipal Code.
Note: Maximum noise levels were interpreted to be the equivalent continuous sound level (L_{eq}). The hours between 7:00 a.m. and 7:00 p.m. are referred to as daytime hours and the hours between 7:00 p.m. and 7:00 a.m. are referred to as nighttime hours.

1 Represents maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment.
2 Represents maximum noise levels for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment.
3 Daily except for Sundays and legal holidays.
4 Daily and all day on Sundays and legal holidays.

dBA = A-weighted decibels

Section 17.176.080(f) of the City's Municipal Code prohibits operating or permitting the operation of any device that creates a vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way.

EXISTING SETTING

Overview of the Existing Noise Environment

Transportation facilities and commercial operations are the primary existing noise sources in the project area. Traffic noise in the project area includes Mission Trail, Casino Drive, Interstate 15 (I-15), and other local roadways. Operational activities from commercial uses to the north, east, south, and west contribute to the noise environment in the project area.

Sensitive Land Uses in the Project Vicinity

Adjacent land uses surrounding the project site include a preschool and commercial uses. The preschool is immediately southeast among the commercial uses. Commercial uses are immediately to the north and south as well as east across Casino Drive and west across Mission Trail. In addition, a hotel is within the project vicinity to the southeast.

Ambient Noise Measurements

Short-Term Noise Measurements

Three short-term (20-minute) noise level measurements were conducted on September 29, 2021, using a Larson Davis Model 831 Type 1 sound level meter. Table G shows the results of the short-term noise level measurements along with a description of the measurement location and noise sources that occurred during the measurement. As shown in Table G, the measured average noise levels range from 54.5 to 68.1 dBA L_{eq} and the maximum instantaneous noise levels range from 71.2 to 84.3 dBA L_{max} in the project vicinity. Figure 3 shows the short-term monitoring locations.

Table G: Short-Term Ambient Noise Level Measurements

Monitor No.	Location	Start Time	Noise Level (dBA)			Noise Source(s)
			L_{eq}	L_{max}	L_{min}	
ST-1	31895 Mission Trail, 35 ft west of the edge of the outer lane of Mission Trail	10:30 a.m.	68.1	84.3	50.5	Traffic on Mission Trail
ST-2	At southeast corner of project site, near playground area for 31910 Mission Trail. Approximately 10 ft north of the fence and 20 ft west of the end of the fence.	11:27 a.m.	54.5	71.2	46.0	Traffic on Casino Drive and Mission Trail, and faint traffic on I-15
ST-3	31760 Casino Drive Unit 100, 3 ft southwest of closest palm tree to Casino Drive. Approximately 73 ft northeast of curb of Casino Drive.	12:01 p.m.	61.0	75.2	51.0	Traffic on Casino Drive and I-15, and very light parking lot activity (including a few cars driving through parking lot and car doors slamming)

Source: Compiled by LSA (2021).
Note: Short-term (20-minute) noise level measurements were conducted on September 29, 2021.
dBA = A-weighted decibels
ft = foot/feet
I-15 = Interstate 15
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum instantaneous noise level

LSA

LEGEND

- Project Site Boundary
- LT-1 - Long-Term Noise Monitoring Location
- ST-1 - Short-Term Noise Monitoring Location

FIGURE 3

N

0 50 100

FEET

SOURCE: Google Earth 2021

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Lake Elsinore Imperial Gas Station

Noise Monitoring Locations

Long-Term Noise Measurements

Three long-term (24-hour) noise level measurements were conducted from September 28 to September 29, 2021, using Larson Davis Spark 706RC Dosimeters. Tables H, I, and J show the hourly L_{eq}, L_{max}, and L_{min} results from the long-term noise level measurements. Table K summarizes the daytime and nighttime L_{eq} and L_{max} noise levels from the short-term and long-term noise level measurements as well as the calculated CNEL levels. The 24-hour noise levels at the short-term noise level measurement locations were calculated based on the noise level profile at the long-term noise level measurements. As shown in Table K, daytime noise levels range between 54.5 and 73.3 dBA L_{eq} and between 69.5 and 80.8 dBA L_{max}. The calculated CNEL levels range between 62.2 and 72.8 dBA CNEL. Figure 3 shows the long-term monitoring locations.

Existing Aircraft Noise

The closest public airports to the project site are the Perris Valley Airport and French Valley Airport, which are 8.3 miles northeast and 11.0 miles southeast, respectively, of the project site. Based on the Riverside County Airport Land Use Commission's (ALUC) Riverside County Airport Land Use Compatibility Plan (ALUC 2004), the project site is outside the 55 dBA CNEL noise contour of both airports. Also, Skylark airport is a private airstrip approximately 1.5 miles south of the project. Although this private airstrip is within 2 miles of the project, the airport runway consists of gravel and sand, which generally does not permit optimal conditions for frequent and convenient airport operations (City of Lake Elsinore 2011).

Existing Traffic Noise

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) (FHWA 1977) was used to evaluate traffic-related noise conditions along roadways in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resulting noise levels are weighted and summed over 24-hour periods to determine the L_{dn} values. The existing (2021) average daily traffic (ADT) volumes were derived from the project's Traffic Impact Analysis Report (STE 2021). The standard vehicle mix for Southern California roadways was used for roadways in the project vicinity. Table L lists the existing traffic noise levels on roadways in the project vicinity. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A.

As shown in Table L, traffic noise along Lakeshore Drive and Mission Trail is moderate, with the 70 dBA L_{dn} noise contour confined to the roadway right-of-way and the 65 and 60 dBA L_{dn} noise contour extending up to 108 and 227 ft, respectively, from the roadway centerline. Traffic noise along Diamond Drive is also moderate, with the 70 dBA L_{dn} noise contour confined to the roadway right-of-way and the 65 and 60 dBA L_{dn} noise contour extending up to 72 and 138 ft, respectively, from the roadway centerline.

Table H: Long-Term (24-Hour) Noise Level Measurement Results at LT-1

	Hour	Date	Noise Level (dBA)		
			L_{eq}	L_{max}	L_{min}
1	7:00 AM	9/28/21	59.7	75.2	52.8
2	8:00 AM	9/28/21	59.0	72.3	51.1
3	9:00 AM	9/28/21	59.0	78.9	50.3
4	10:00 AM	9/28/21	61.0	76.4	52.5
5	11:00 AM	9/28/21	58.5	73.1	49.5
6	12:00 PM	9/28/21	58.5	75.6	48.8
7	1:00 PM	9/28/21	59.0	73.3	48.0
8	2:00 PM	9/28/21	61.4	77.0	52.3
9	3:00 PM	9/28/21	60.8	77.8	49.8
10	4:00 PM	9/28/21	59.9	79.4	50.9
11	5:00 PM	9/28/21	60.7	79.2	49.6
12	6:00 PM	9/28/21	58.9	75.4	48.4
13	7:00 PM	9/28/21	58.5	77.9	48.5
14	8:00 PM	9/28/21	57.5	77.0	48.4
15	9:00 PM	9/28/21	57.0	78.8	48.9
16	10:00 PM	9/28/21	56.0	77.7	46.0
17	11:00 PM	9/28/21	53.5	72.6	41.6
18	12:00 AM	9/29/21	52.2	74.3	40.5
19	1:00 AM	9/29/21	51.1	71.8	39.7
20	2:00 AM	9/29/21	48.8	65.7	40.2
21	3:00 AM	9/29/21	50.1	66.6	40.4
22	4:00 AM	9/29/21	53.6	72.5	44.9
23	5:00 AM	9/29/21	55.4	71.5	48.5
24	6:00 AM	9/29/21	57.8	71.1	49.9

Source: Compiled by LSA (2021).
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels
L_{max} = maximum instantaneous noise level
L_{min} = minimum instantaneous noise level

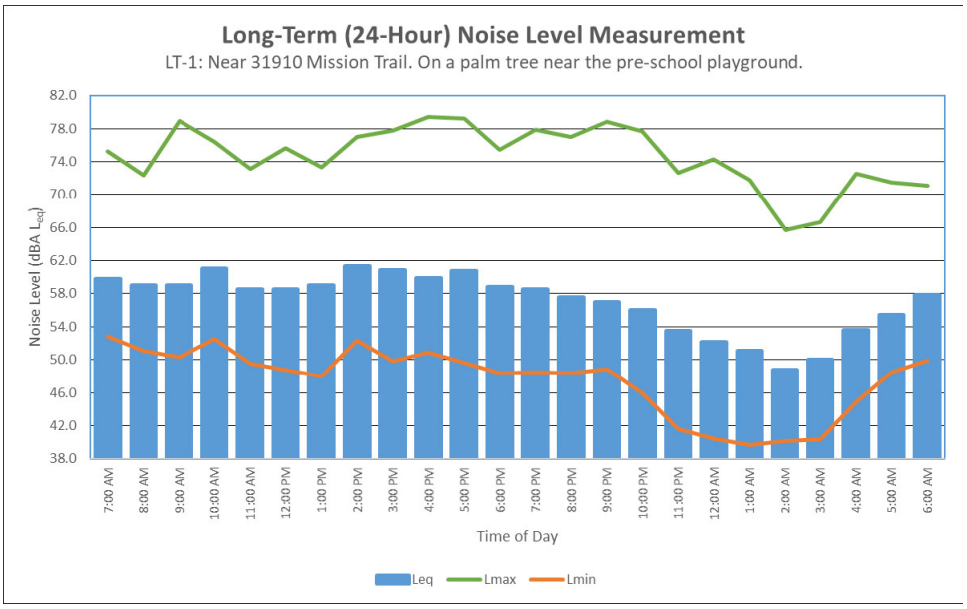

Table I: Long-Term (24-Hour) Noise Level Measurement Results at LT-2

	Hour	Date	Noise Level (dBA)		
			L_{eq}	L_{max}	L_{min}
1	7:00 AM	9/28/21	60.9	70.6	55.7
2	8:00 AM	9/28/21	60.0	73.7	54.3
3	9:00 AM	9/28/21	59.2	71.6	52.9
4	10:00 AM	9/28/21	60.1	74.7	52.8
5	11:00 AM	9/28/21	57.7	70.8	52.0
6	12:00 PM	9/28/21	58.7	73.4	52.4
7	1:00 PM	9/28/21	58.6	71.9	51.5
8	2:00 PM	9/28/21	61.1	77.0	53.8
9	3:00 PM	9/28/21	58.2	72.2	50.8
10	4:00 PM	9/28/21	59.1	76.0	51.0
11	5:00 PM	9/28/21	60.2	77.3	51.6
12	6:00 PM	9/28/21	59.3	76.0	48.6
13	7:00 PM	9/28/21	59.8	78.7	52.7
14	8:00 PM	9/28/21	59.5	73.0	52.4
15	9:00 PM	9/28/21	60.5	78.0	52.2
16	10:00 PM	9/28/21	59.3	72.9	47.9
17	11:00 PM	9/28/21	53.5	64.4	45.7
18	12:00 AM	9/29/21	54.5	68.6	44.8
19	1:00 AM	9/29/21	51.3	66.9	42.3
20	2:00 AM	9/29/21	52.2	66.7	44.2
21	3:00 AM	9/29/21	52.3	72.4	44.3
22	4:00 AM	9/29/21	55.5	72.7	47.6
23	5:00 AM	9/29/21	57.2	65.9	50.2
24	6:00 AM	9/29/21	58.4	67.4	53.4

Source: Compiled by LSA (2021).
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels
L_{max} = maximum instantaneous noise level
L_{min} = minimum instantaneous noise level

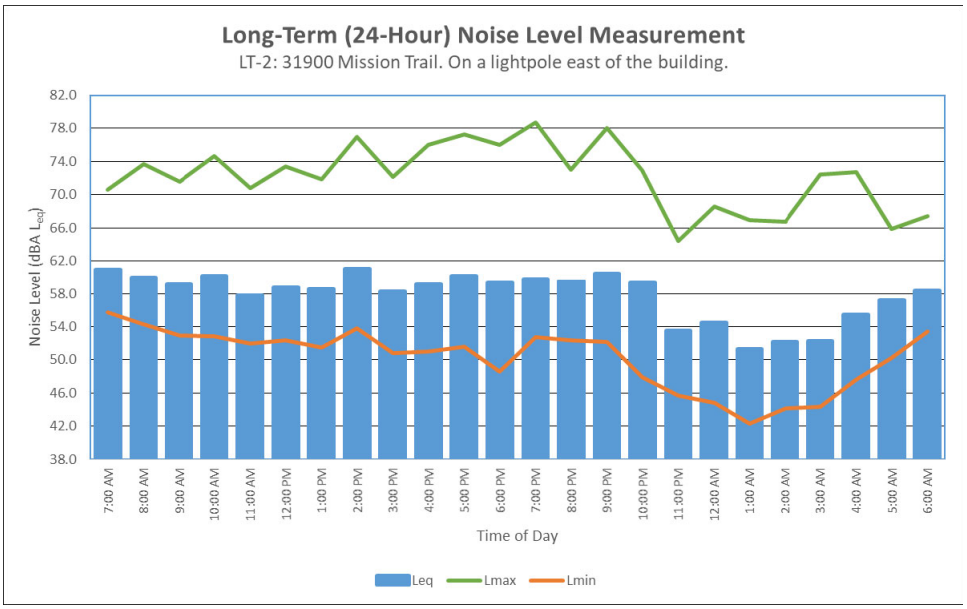

Table J: Long-Term (24-Hour) Noise Level Measurement Results at LT-3

	Hour	Date	Noise Level (dBA)		
			L_{eq}	L_{max}	L_{min}
1	7:00 AM	9/28/21	60.7	78.8	51.7
2	8:00 AM	9/28/21	59.6	74.8	51.3
3	9:00 AM	9/28/21	58.3	74.5	49.6
4	10:00 AM	9/28/21	59.8	78.4	48.9
5	11:00 AM	9/28/21	57.7	71.0	48.4
6	12:00 PM	9/28/21	59.3	77.8	49.1
7	1:00 PM	9/28/21	58.9	80.0	49.3
8	2:00 PM	9/28/21	58.3	74.7	50.5
9	3:00 PM	9/28/21	58.8	73.7	50.1
10	4:00 PM	9/28/21	60.5	80.8	48.8
11	5:00 PM	9/28/21	62.9	80.3	50.5
12	6:00 PM	9/28/21	60.6	78.6	47.6
13	7:00 PM	9/28/21	58.7	77.6	49.6
14	8:00 PM	9/28/21	57.5	69.5	48.5
15	9:00 PM	9/28/21	57.1	72.0	47.8
16	10:00 PM	9/28/21	56.2	74.6	44.6
17	11:00 PM	9/28/21	52.0	64.6	42.8
18	12:00 AM	9/29/21	51.3	65.5	42.1
19	1:00 AM	9/29/21	49.9	67.4	41.3
20	2:00 AM	9/29/21	49.1	65.5	41.2
21	3:00 AM	9/29/21	51.7	72.9	41.7
22	4:00 AM	9/29/21	55.0	70.8	43.4
23	5:00 AM	9/29/21	56.7	69.1	46.7
24	6:00 AM	9/29/21	57.9	70.6	48.5

Source: Compiled by LSA (2021).
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels
L_{max} = maximum instantaneous noise level
L_{min} = minimum instantaneous noise level

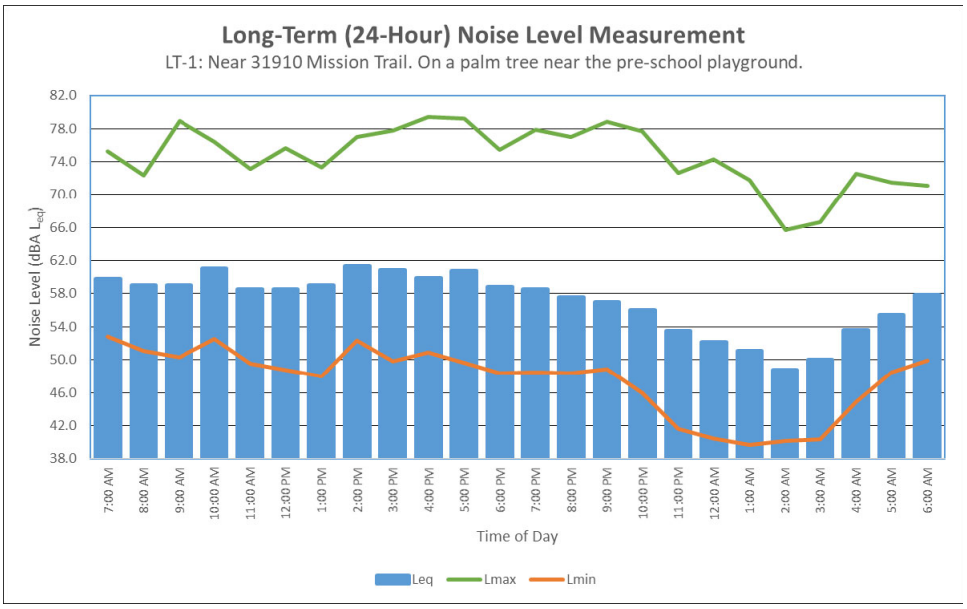

Table K: Long-Term Ambient Noise Monitoring Results

Monitoring No.	Location	Noise Level (dBA)					Noise Source
		L_{eq}		L_{max}		CNEL	
		Daytime	Nighttime	Daytime	Nighttime		
LT-1	Near southeast corner of project site, on a palm tree east of playground area for 31910 Mission Trail	57.0-61.4	48.8-57.8	72.3-79.4	65.7-77.7	62.2	Traffic on Casino Drive and Mission Trail, and faint traffic on I-15
LT-2	31900 Mission Trail, east of the building, on a light pole	57.7-61.1	51.3-59.3	70.6-78.7	64.4-72.9	63.5	Traffic on Mission Trail, faint traffic on Casino Drive, and parking lot activity
LT-3	31762 Casino Drive, on a light pole in front of Unit K	57.1-62.9	49.1-57.9	69.5-80.8	64.6-74.6	62.4	Traffic on Mission Trail and parking lot activity
ST-1[1]	31895 Mission Trail, 35 ft west of the edge of the outer lane of Mission Trail	67.5-73.3	59.5-68.3	--[2]	--	72.8	Traffic on Mission Trail
ST-2[3]	At southeast corner of project site, near playground area for 31910 Mission Trail. Approximately 10 ft north of fence and 20 ft west of the end of the fence.	54.5-58.9	46.2-55.3	--[2]	--	59.7	Traffic on Casino Drive and Mission Trail, and faint traffic on I-15
ST-3[3]	31760 Casino Drive Unit 100, 3 ft southwest of closest palm tree to Casino Drive. Approximately 73 ft northeast of curb of Casino Drive.	59.5-63.9	51.2-60.3	--[2]	--	64.7	Traffic on Casino Drive and I-15, and very light parking lot activity (including a few cars driving through parking lot and car doors slamming)

Source: Compiled by LSA (2021).
Note: The long-term (24-hour) noise level measurements were conducted from September 28, 2021, through September 29, 2021.
[1] The noise levels at ST-1 were calculated based on the noise level profile at LT-3.
[2] Refer to Table G for the maximum noise levels.
[3] The noise levels at ST-2 and ST-3 were calculated based on the noise level profile at LT-1.
CNEL = Community Noise Equivalent Level ft = feet L_{eq} = equivalent continuous sound level
dBA = A-weighted decibels I-15 = Interstate 15 L_{max} = maximum instantaneous noise level

Table L: Existing (2021)Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 dBA L_{dn} (ft)	Centerline to 65 dBA L_{dn} (ft)	Centerline to 60 dBA L_{dn} (ft)	L_{dn} (dBA) 50 ft from Centerline of Outermost Lane
Lakeshore Drive west of Diamond Drive	11,240	< 50	< 50	109	62.8
Mission Trail between Diamond Drive and Project Driveway	8,810	< 50	68	139	64.4
Mission Trail between Project Driveway and Malaga Road	8,810	< 50	68	139	64.4
Mission Trail south of Malaga Road	14,370	< 50	108	227	67.4
Diamond Drive north of Auto Center Drive/Casino Drive	15,700	< 50	72	138	63.5
Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail	13,680	< 50	68	127	62.8
Diamond Drive south of Malaga Road	2,960	< 50	< 50	< 50	56.7
Malaga Road between Diamond Drive and Mission Trail	1,730	< 50	< 50	< 50	54.4

Source: Compiled by LSA (2021).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic ft = foot/feet
dBA = A-weighted decibels L_{dn} = day-night average noise level

IMPACTS

Short-Term Construction Noise Impacts

Two types of short-term noise impacts could occur during construction on the project site. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on roads leading to the site. The pieces of heavy equipment for construction activities will be moved on site, will remain for the duration of each construction phase, and will not add to the daily traffic volume in the project vicinity. Although there would be a relatively high single-event noise exposure potential causing intermittent noise nuisance (passing trucks at 50 ft would generate up to a maximum of 84 dBA), the effect on longer-term (hourly or daily) ambient noise levels would be small because the hourly/daily construction-related vehicle trips are small compared to existing hourly/daily traffic volume on Mission Trail, Diamond Drive, and Lakeshore Drive. The building construction phase would generate the most trips out of all of the construction phases, at 45 trips per hour and 90 trips per day based on the California Emissions Estimator Model (Version 2020.4.0). Roadways that would be used to access the project site would include Mission Trail, Diamond Drive, and Lakeshore Drive. Based on Table L, Mission Trail, Diamond Drive, and Lakeshore Drive have estimated existing hourly/daily traffic volumes of 881/8,810, 1,368/13,680, and 1,124/11,240, respectively, near the project site. Based on the information above, construction-related traffic would increase noise levels by up to 0.2 dBA. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, no short-term, construction-related noise impacts associated with worker commute and equipment transport to the project site would occur, and no noise reduction measures are required.

The second type of short-term noise impact is related to noise generated from construction activities. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. The project anticipates demolition, site preparation, and grading; building construction; paving; and architectural coating phases of construction. These various sequential phases change the character of the noise generated on a project site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table M lists the maximum noise levels (L_{max}) recommended for noise impact assessments for typical construction equipment included in the FHWA Highway Construction Noise Handbook (FHWA 2006), based on a distance of 50 ft between the equipment and a noise receptor.

Project construction would consist of both mobile and stationary equipment. Mobile construction equipment during the noisiest construction phase for the proposed project is expected to require the use of graders, bulldozers, and water trucks/pickup trucks simultaneously. Noise associated with the use of each type of mobile construction equipment is estimated to be between 55 and 85 dBA L_{max} at a distance of 50 ft from the active construction area. As shown in Table M, the maximum noise level generated by each grader is assumed to be approximately 85 dBA L_{max} at 50 ft. Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks/pickup trucks is approximately 55 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound sources with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, the

Table M: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor[1]	Maximum Noise Level (L_{max}) at 50 ft[2]
Backhoe	40	80
Compactor (ground)	20	80
Compressor	40	80
Crane	16	85
Dozer	40	85
Dump Truck	40	84
Excavator	40	85
Flatbed Truck	40	84
Forklift	20	85
Front-End Loader	40	80
Grader	40	85
Impact Pile Driver	20	95
Jackhammer	20	85
Pickup Truck	40	55
Pneumatic Tools	50	85
Pump	50	77
Rock Drill	20	85
Roller	20	85
Scraper	40	85
Tractor	40	84
Welder	40	73

Source: *FHWA Highway Construction Noise Handbook,* Table 9.1 (FHWA 2006).
Note: The noise levels reported in this table are rounded to the nearest whole number.
[1] Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.
[2] Maximum noise levels were developed based on Spec 721.560 from the CA/T program to be consistent with the City of Boston, Massachusetts, Noise Code for the "Big Dig" project.
CA/T = Central Artery/Tunnel
FHWA = Federal Highway Administration
ft = foot/feet
L_{max} = maximum instantaneous noise level

worst-case combined noise level during this phase of construction would be 88 dBA L_{max} at a distance of 50 ft from the active construction area. Based on a usage factor of 40 percent, the worst-case combined noise level during this phase of construction would be 84 dBA L_{eq} at a distance of 50 ft from the active construction area.

Stationary construction equipment for the proposed project is expected to require the use of pneumatic tools, air compressors, welder/torches, and generators. As shown in Table M, the maximum noise level generated by a pneumatic tool, air compressor, welder/torch, and generator are assumed to be approximately 85, 80, 73, and 82 dBA L_{max}, respectively, at a distance of 50 ft. Based on the corresponding usage factor for each piece of stationary construction equipment shown in Table M, noise generated from these pieces of equipment would be 82, 76, 69, and 79 dBA L_{eq}, respectively, at a distance of 50 ft.

Table N shows the mobile construction noise levels at the closest business properties (commercial properties) as well as the hotel (semiresidential/commercial) and preschool within the project area from the active construction area. As shown in Table N, mobile construction noise levels would not exceed the City's mobile construction noise standard of 85 dBA L_{eq} for commercial properties, hotel, and preschool, except for the commercial properties immediately north and south of the project site. Although mobile construction noise levels would exceed the City's mobile construction noise standard of 85 dBA, no impacts would occur because there are no outdoor active uses areas associated with the commercial properties.

Similarly, Table O shows the stationary construction noise levels at the closest business properties (commercial properties) as well as the hotel (semiresidential/commercial) and preschool within the project area from the active construction area. As shown in Table O, stationary construction noise levels would not exceed the City's stationary construction noise standard of 70 dBA L_{eq} for the hotel. Also, stationary construction noise levels would not exceed the City's stationary construction noise standard of 75 dBA L_{eq} for commercial properties and the preschool, except for the commercial properties immediately north and south of the project site. Although stationary construction noise levels would exceed the City's stationary construction noise standard of 75 dBA, no impacts would occur because there are no outdoor active uses areas associated with the commercial properties.

Daytime ambient noise levels in the project vicinity range between 54.5 and 73.3 dBA L_{eq} and between 69.5 and 80.8 dBA L_{max} based on the short-term and long-term noise level measurements shown in Table K. Although noise generated by project construction activities would be higher than the ambient noise levels and may result in a temporary increase in the ambient noise levels, construction noise would stop once project construction is completed. The project would comply with the mobile and stationary construction noise standards specified in the City's Municipal Code, and the best construction practices listed below would minimize construction noise:

- The construction contractor shall limit construction activities to between the hours of 7:00 a.m. and 7:00 p.m. on weekdays. No construction would take place outside of these hours, anytime on weekends, or holidays.
- The construction contractor shall erect a minimum 14-foot high temporary construction barrier to shield the playground associated with the preschool from mobile construction equipment and a minimum 8 ft high portable temporary construction barrier immediately to the southeast for all on-site stationary construction equipment. The barrier shall be continuous with no gaps or holes and may be any material that has a minimum Sound Transmission Class (STC) rating of 28.
- The construction contractor shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site whenever feasible.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and the noise-sensitive receptors nearest the project site during all project construction whenever feasible.

Therefore, no noise impacts from construction activities would occur, and no noise reduction measures are required.

Table N: Mobile Construction Noise Levels

Land Use	Direction	Reference Noise Level at 50 ft (dBA L_{max}/L_{eq})	Distance from Active Construction Area to the Property (ft)	Distance Attenuation (ft)	Shielding (dBA)	Noise Level (dBA L_{max}/L_{eq})	Mobile Construction Noise Standard (dBA L_{eq})	Exceeds Daytime Noise Standard?
Commercial	North	88/84	25	-6.0	0.0	94.0/90.0	85	Yes[1]
Commercial	Northeast	88/84	130	8.3	0.0	79.7/75.7	85	No
Preschool	Southeast	88/84	25	-6.0	10.0[2]	84.0/80.0	85	No
Hotel	Southeast	88/84	505	20.1	10.0[3]	57.9/53.9	85	No
Commercial	South	88/84	25	-6.0	0.0	94.0/90.0	85	Yes[1]
Commercial	West	88/84	130	8.3	0.0	79.7/75.7	85	No

Source: Compiled by LSA (2021).

[1] Although mobile construction noise levels would exceed the City of Lake Elsinore's mobile construction noise standard of 85 dBA, no impacts would occur because there are no outdoor active uses areas associated with the commercial property.

[2] Best construction practices would include a 14 ft high temporary construction barrier that would provide a minimum noise reduction of 10 dBA.

[3] Existing intervening building structures would provide a minimum noise reduction of 10 dBA.

dBA = A-weighted decibels L_{eq} = equivalent continuous sound level
ft = feet L_{max} = maximum instantaneous noise level

Table O: Stationary Construction Noise Levels

Land Use	Direction	Reference Noise Level at 50 ft (dBA L_{max}/L_{eq})	Distance from Active Construction Area to the Property (ft)	Distance Attenuation (ft)	Shielding (dBA)	Noise Level (dBA L_{max}/L_{eq})	Stationary Construction Noise Standard (dBA L_{eq})	Exceeds Daytime Noise Standard?
Commercial	North	85/82	25	-6.0	0.0	91.0/88.0	75	Yes[1]
Commercial	Northeast	85/82	130	8.3	0.0	76.7/73.7	75	No
Preschool	Southeast	85/82	25	-6.0	10.0[2]	76.0/73.0	75	No
Hotel	Southeast	85/82	505	20.1	10.0[3]	54.9/51.9	70	No
Commercial	South	85/82	25	-6.0	0.0	91.0/88.0	75	Yes[1]
Commercial	West	85/82	130	8.3	0.0	76.7/73.7	75	No

Source: Compiled by LSA (2021).

[1] Although stationary construction noise levels would exceed the City of Lake Elsinore's stationary construction noise standard of 75 dBA, no impacts would occur because there are no outdoor active uses areas associated with the commercial property.

[2] Best construction practices would include a 14 ft high temporary construction barrier for mobile construction equipment and an 8 ft high portable temporary construction barrier for stationary construction equipment, which would provide a minimum noise reduction of 15 dBA.

[3] Existing intervening building structures would provide a minimum noise reduction of 10 dBA.

dBA = A-weighted decibels L_{eq} = equivalent continuous sound level
ft = feet L_{max} = maximum instantaneous noise level

Short-Term Construction Vibration Impacts

This construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and assesses the potential for building damage using vibration levels in PPV (in/sec). Vibration levels calculated in RMS velocity are best for characterizing human response to building vibration, whereas vibration levels in PPV are best for characterizing damage potential. As previously shown in Table D, the FTA guidelines indicate that a vibration level up to 0.5 PPV (in/sec) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage (FTA 2018). For a nonengineered timber and masonry building, the construction vibration damage criterion is 0.2 PPV (in/sec). For a fragile building, the construction vibration damage criterion is 0.12 PPV (in/sec).

Table P shows the reference vibration levels at a distance of 25 ft for each type of standard construction equipment from the FTA Manual (2018). Outdoor site preparation for the proposed project is expected to require the use of a small (rubber tire) bulldozer and loaded trucks, which would generate ground-borne vibration of up to 58 VdB (0.003 PPV [in/sec]) and 86 VdB (0.076 PPV [in/sec]) when measured at 25 ft, respectively. Pile drivers, vibratory rollers, large bulldozers, and other heavy-tracked construction equipment would not be used during construction of the proposed project.

The greatest vibration levels are anticipated during the site preparation and grading phase. All other phases are expected to result in lower vibration levels. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts normally occur within the buildings. An exception to this would be the location of loaded trucks. Loaded trucks would be limited to the adjacent roadways or certain areas on the project site and would not operate at the project construction boundary.

Table P: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 Ft	
	PPV (in/sec)	L_V (VdB)[1]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks[2]	**0.076**	**86**
Jackhammer	0.035	79
Small Bulldozer[2]	**0.003**	**58**

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] RMS vibration velocity in decibels (VdB) is 1 µin/sec.
[2] Equipment shown in bold is expected to be used on site.

µin/sec = microinches per second
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

The formula for vibration transmission is provided below:

$$L_vdB\ (D) = L_vdB\ (25\ ft) - 30\ Log\ (D/25)$$
$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Table Q lists the projected vibration levels from various construction equipment expected to be used on the project site to the closest buildings in the project vicinity. As shown in Table Q, the closest structure is a commercial building north of the project construction boundary, approximately 5 ft away, and would experience vibration levels of up to 79 VdB (0.034 PPV [in/sec]). This vibration level would not have the potential to result in building damage because the building was observed to be constructed equivalent to non-engineered timber and masonry and the vibration level would not exceed the FTA vibration damage threshold of 0.2 PPV (in/sec). In addition, this vibration level would not result in community annoyance because vibration levels would not exceed the FTA community annoyance threshold of 84 VdB for commercial uses because they are not as sensitive to vibration or the FTA community annoyance threshold of 78 VdB for the hotel and preschool because they would have similar vibration sensitivity as daytime residences. Therefore, no construction vibration impacts would occur. No vibration reduction measures are required.

Table Q: Construction Vibration Levels

Land Use	Direction	Equipment/Activity	Reference Vibration Level (VdB) at 25 ft	Reference Vibration Level (PPV [in/sec]) at 25 ft	Distance (ft)	Maximum Vibration Level (VdB)	Maximum Vibration Level (PPV [in/sec])
Commercial	North	Small bulldozers	58	0.003	5	79	0.034
		Loaded trucks	86	0.076	50[1]	77	0.027
Commercial	Northeast	Small bulldozers	58	0.003	165	33	0.000
		Loaded trucks	86	0.076	165	61	0.004
Preschool	Southeast	Small bulldozers	58	0.003	25	58	0.003
		Loaded trucks	86	0.076	50[1]	77	0.027
Hotel	Southeast	Small bulldozers	58	0.003	525	18	0.000
		Loaded trucks	86	0.076	525	46	0.001
Commercial	South	Small bulldozers	58	0.003	10	70	0.012
		Loaded trucks	86	0.076	50[1]	77	0.027
Commercial	West	Small bulldozers	58	0.003	125	37	0.000
		Loaded trucks	86	0.076	125	65	0.007

Source: Compiled by LSA (2021).
Note: The FTA-recommended building damage threshold is 94 VdB (0.2 PPV [in/sec]) for building structures constructed of non-engineered timber and masonry.
[1] Loaded trucks would be limited to the adjacent roadways or certain areas on the project site and would not operate at the project construction boundary
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inches per second
PPV = peak particle velocity
VdB = vibration velocity decibels

Long-Term Aircraft Noise Impacts

As discussed above, the closest public airports to the project site are the Perris Valley Airport and French Valley Airport, which are 8.3 miles northeast and 11.0 miles southeast, respectively, of the project site. Based on the ALUC Riverside County Airport Land Use Compatibility Plan (ALUC 2004),

the project site is outside the 55 dBA CNEL noise contour of both airports. Also, Skylark airport is a private airstrip approximately 1.5 miles south of the project. Although this private airstrip is within 2 miles of the project, the airport runway consists of gravel and sand, which generally does not permit optimal conditions for frequent and convenient airport operations (City of Lake Elsinore 2011). Therefore, the proposed project would not expose people working in the project area to excessive noise levels.

Long-Term Traffic Noise Impacts

The FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions along roadways in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resulting noise levels are weighted and summed over 24-hour periods to determine the L_{dn} values. The Existing (2021) and opening year (2023) without and with project ADT volumes were derived from the project's Traffic Impact Analysis Report (STE 2021). The standard vehicle mix for Southern California roadways was used for traffic on these roadway segments. Tables R and S list the traffic noise levels for the Existing (2021) and 2023 without and with project scenarios, respectively. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A.

Tables R and S show that the project-related traffic would increase noise by up to 1.1 dBA. This noise level increase is below 3 dBA and would not be perceptible to the human ear in an outdoor environment. Therefore, no off-site traffic noise impacts would occur, and no noise reduction measures are required.

Long-Term Stationary Source Noise Impacts

Operation of the proposed project would include carwash operations; fueling activities; parking lot activities; heating, ventilation, and air conditioning (HVAC) equipment; and truck delivery activities that would result in stationary noise impacts as described below. The convenience store and gas station would operate 24 hours a day and the car wash would operate from 7:00 a.m. to 10:00 p.m. daily. The following provides a detailed noise analysis and discussion of each stationary noise source. SoundPLAN was used to calculate noise levels at receptors adjacent to the project site because the project would be substantially lower in elevation than the adjacent land uses, particularly on the eastern side of the project. SoundPLAN printouts are provided in Appendix B.

Table R: Existing (2021) Traffic Noise Levels Without and With Project

Roadway Segment	Without Project Traffic Conditions					With Project Traffic Conditions					
	ADT	Centerline to 70 dBA L_{dn} (ft)	Centerline to 65 dBA L_{dn} (ft)	Centerline to 60 dBA L_{dn} (ft)	L_{dn} (dBA) 50 ft from Centerline of Outermost Lane	ADT	Centerline to 70 dBA L_{dn} (ft)	Centerline to 65 dBA L_{dn} (ft)	Centerline to 60 dBA L_{dn} (ft)	L_{dn} (dBA) 50 ft from Centerline of Outermost Lane	Increase from Baseline Conditions
Lakeshore Drive west of Diamond Drive	11,240	< 50	< 50	109	62.8	11,660	< 50	56	112	62.9	0.1
Mission Trail between Diamond Drive and Project Driveway	8,810	< 50	68	139	64.4	11,190	< 50	78	162	65.4	1.0
Mission Trail between Project Driveway and Malaga Road	8,810	< 50	68	139	64.4	11,170	< 50	78	162	65.4	1.0
Mission Trail south of Malaga Road	14,370	< 50	108	227	67.4	14,890	< 50	111	233	67.5	0.1
Diamond Drive north of Auto Center Drive/ Casino Drive	15,700	< 50	72	138	63.5	16,020	< 50	72	140	63.6	0.1
Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/ Mission Trail	13,680	< 50	68	127	62.8	14,740	< 50	70	133	63.1	0.3
Diamond Drive south of Malaga Road	2,960	< 50	< 50	< 50	56.7	2,960	< 50	< 50	< 50	56.7	0.0
Malaga Road between Diamond Drive and Mission Trail	1,730	< 50	< 50	< 50	54.4	2,250	< 50	< 50	< 50	55.5	1.1

Source: Compiled by LSA (2021).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet
L_{dn} = day-night average noise level

Table S: Opening Year (2023) Traffic Noise Levels Without and With Project

Roadway Segment	Without Project Traffic Conditions					With Project Traffic Conditions					
	ADT	Centerline to 70 dBA L_{dn} (ft)	Centerline to 65 dBA L_{dn} (ft)	Centerline to 60 dBA L_{dn} (ft)	L_{dn} (dBA) 50 ft from Centerline of Outermost Lane	ADT	Centerline to 70 dBA L_{dn} (ft)	Centerline to 65 dBA L_{dn} (ft)	Centerline to 60 dBA L_{dn} (ft)	L_{dn} (dBA) 50 ft from Centerline of Outermost Lane	Increase from Baseline Conditions
Lakeshore Drive west of Diamond Drive	13,410	< 50	61	122	63.5	13,830	< 50	62	125	63.7	0.2
Mission Trail between Diamond Drive and Project Driveway	8,250	< 50	65	133	64.1	10,630	< 50	76	157	65.2	1.1
Mission Trail between Project Driveway and Malaga Road	8,250	< 50	65	133	64.1	10,610	< 50	76	156	65.2	1.1
Mission Trail south of Malaga Road	16,070	59	116	244	67.9	16,590	60	118	250	68.0	0.1
Diamond Drive north of Auto Center Drive/ Casino Drive	24,800	< 50	91	184	65.5	25,120	< 50	92	186	65.5	0.0
Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/ Mission Trail	15,320	< 50	72	136	63.3	16,380	< 50	74	142	63.6	0.3
Diamond Drive south of Malaga Road	250	< 50	< 50	< 50	46.0	250	< 50	< 50	< 50	46.0	0.0
Malaga Road between Diamond Drive and Mission Trail	2,600	< 50	< 50	< 50	56.1	3,120	< 50	< 50	< 50	56.9	0.8

Source: Compiled by LSA (2021).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet
L_{dn} = day-night average noise level

Car Wash Operations

The proposed project would include a car wash and a total of 24 vacuum stalls on the eastern portion of the project site. Noise levels generated from the car wash tunnel at the exit would be 87.3 dBA at a distance of 20 ft based on reference noise level measurements for eight 15-horsepower Peco dryers, which are the same dryers proposed for the project. At a distance of 50 ft, noise levels from the Peco dryers would be 79.3 dBA L_{eq}. Noise levels from the car wash entrance would 72.8 dBA at a distance of 50 ft because of reference noise level measurements conducted by LSA at a similar car wash. Also, noise levels generated from each vacuum station were estimated to be 40.7 dBA at a distance of 50 ft based on reference noise level measurements conducted 16061 Beach Boulevard in Huntington Beach with 19 vacuum stations with an average noise level of 53.5 dBA at a distance of 50 ft.

Fueling Activities

Fueling activities would include engine start-up noise, car door slams, back-up alarms, and tire squeals, which would generate noise levels of approximately 70 dBA L_{max} at 50 ft. It is assumed that fueling activities would generate the maximum noise level for a cumulative period of 15 minutes in any hour, which would be 64.0 dBA L_{eq} at 50 ft.

Parking Activities

The proposed project would include 20 parking spaces near convenience store on the project site. Noise generated from parking lot activities would include noise generated by vehicles traveling at slow speeds, engine start-up noise, car door slams, car horns, car alarms, and tire squeals. Representative parking activities would generate approximately 60 to 70 dBA L_{max} at 50 ft. It is assumed that parking activities for automobiles would generate the maximum noise level for a cumulative period of 10 minutes in any hour, which would be 62.2 dBA L_{eq} at 50 ft.

Heating, Ventilation, and Air Conditioning Noise

The proposed project would include a rooftop HVAC unit for the convenience store and the office near the entrance of car wash tunnel. The HVAC equipment could operate 24 hours per day. The HVAC units would each generate a noise level of 44.4 dBA L_{eq} at 50 ft.

Truck Delivery Activities

Truck delivery activities would take place on the west end of the project near the convenience store for the convenience store and gas station. Noise generated from truck delivery activities would include truck movement at slow speeds, engine start-up noise, truck door slams, back-up alarms, air brakes, idling, and unloading activities. These activities would result in a maximum noise similar to noise readings from truck delivery and truck-unloading activities for other projects, which would generate a noise level of 75 dBA L_{max} at 50 ft. It is assumed that truck delivery activities would generate the maximum noise level for a cumulative period of 5 minutes in any hour. Also, it is estimated that there would be a maximum of one delivery truck per hour, which would result in a cumulative period of 5 minutes in any hour. Based on the assumptions above, truck delivery activities would generate a noise level of 64.2 dBA L_{eq} at 50 ft.

Stationary Noise Impact Summary

Table T lists the individual stationary noise source from daytime project operations at each of the surrounding adjacent uses and shows the reference noise level at 50 ft, modeled noise level at the receptor, combined noise levels, the City's daytime noise standard for the corresponding land use, and the noise increase over the existing daytime ambient noise level. Similarly, Table U lists the individual stationary noise source from nighttime project operations (without car wash operations) at each of the surrounding adjacent uses and shows the reference noise level at 50 ft, modeled noise level at the receptor, combined noise levels, the City's nighttime noise standard for the corresponding land use, and the noise increase over the existing nighttime ambient noise level.

As shown in Tables T and U, noise level generated from project operations would reach up to 62.4 dBA L_{eq} and 53.2 dBA L_{eq} during daytime and nighttime hours, respectively, at the adjacent commercial use. Also, project operations would increase noise by up to 4.7 dBA and 1.4 dBA during daytime and nighttime hours. Although daytime project operations would have a perceptible noise increase above existing ambient noise levels, noise levels generated from project operations would not exceed the City's exterior daytime and nighttime 30-minute (L_{50}) noise standards of 65 and 60 dBA, respectively, for commercial uses.

The preschool southeast of the project site was evaluated based on whether project would substantially increase ambient noise levels because the City's Municipal Code has no exterior noise standards for schools. Tables T and U shows that project operations would increase ambient noise levels at the preschool by up to 0.9 dBA. This increase in noise would not be perceptible to the human ear in an outdoor environment. Therefore, no noise impacts from project operations would occur. No noise reduction measures are required.

Long-Term Ground-Borne Noise and Vibration from Vehicular Traffic

Once operational, the proposed project would not generate vibration. In addition, vibration levels generated from project-related traffic on the adjacent roadways (i.e., Mission Trail and Casino Drive) would be unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Therefore, no vibration impacts from project-related traffic on the adjacent roadways would occur, and no vibration reduction measures are required.

BEST CONSTRUCTION PRACTICES

The following best construction practices would minimize construction noise:

- The construction contractor shall limit construction activities to between the hours of 7:00 a.m. and 7:00 p.m. on weekdays. No construction would take place outside of these hours, anytime on weekends, or holidays.

- The construction contractor shall erect a minimum 14 ft high temporary construction barrier to shield the playground associated with the preschool from mobile construction equipment and a minimum 8 ft high portable temporary construction barrier immediately to the southeast for all on-site stationary construction equipment. The barrier shall be continuous with no gaps or holes and may be any material that has a minimum STC rating of 28.

Table T: Stationary Daytime Noise Levels

Land Use	Direction	Noise Source	Average Existing Daytime Ambient Noise Level[1] (dBA L_{eq})	Reference Noise Level at 50 ft (dBA L_{eq})	Modeled Noise Level at Receptor[3] (dBA L_{eq})	Combined Noise Level (dBA L_{eq})	Daytime Noise Standard (dBA)	Combined Noise Level With Ambient Noise Level (dBA L_{eq})	Noise Increase Over Existing Ambient Noise Level (dBA)
Preschool (R-1)	Southeast	Car Wash Tunnel (Entrance)	57.3[2]	72.8	47.9	50.9	--[4]	58.2	0.9
		Car Wash Tunnel (Exit)		79.3					
		Vacuums		40.7	32.3				
		Fueling Activities		64.0	41.3				
		HVAC		44.4	35.7				
		Parking Activities		62.2	43.0				
		Truck Delivery		64.2	43.4				
Commercial (R-2)	South	Car Wash Tunnel (Entrance)	59.5	72.8	62.1	62.5	65	64.3	4.8
		Car Wash Tunnel (Exit)		79.3					
		Vacuums		40.7	35.6				
		Fueling Activities		64.0	45.5				
		HVAC		44.4	28.4				
		Parking Activities		62.2	49.5				
		Truck Delivery		64.2	46.7				
Commercial (R-3)	West	Car Wash Tunnel (Entrance)	69.6	72.8	60.0	60.9	65	70.1	0.5
		Car Wash Tunnel (Exit)		79.3					
		Vacuums		40.7	29.7				
		Fueling Activities		64.0	50.5				
		HVAC		44.4	29.1				
		Parking Activities		62.2	44.4				
		Truck Delivery		64.2	49.0				
Commercial (R-4)	North	Car Wash Tunnel (Entrance)	59.2	72.8	47.5	47.9	65	59.5	0.3
		Car Wash Tunnel (Exit)		79.3					
		Vacuums		40.7	24.8				
		Fueling Activities		64.0	32.6				
		HVAC		44.4	23.2				
		Parking Activities		62.2	31.1				
		Truck Delivery		64.2	32.4				
Commercial (R-5)	East	Car Wash Tunnel (Entrance)	61.8	72.8	51.6	52.9	65	62.3	0.5
		Car Wash Tunnel (Exit)		79.3					
		Vacuums		40.7	37.8				
		Fueling Activities		64.0	39.4				
		HVAC		44.4	32.9				
		Parking Activities		62.2	40.9				
		Truck Delivery		64.2	43.3				

Source: Compiled by LSA (2021).

[1] The average existing daytime ambient noise level is from 7:00 am to 10:00 pm.

[2] The average existing daytime ambient noise level at the preschool is from 7:00 am to 6:00 pm.

[3] The modeled noise level at the receptor was calculated using SoundPLAN.

[4] The City of Lake Elsinore has no noise standards for schools; the preschool was evaluated based on whether the proposed project would substantially increase ambient noise levels.

dBA = A-weighted decibels ft = foot/feet HVAC = heating, ventilation, and air conditioning L_{eq} = equivalent continuous sound level

Table U: Stationary Nighttime Noise Levels

Land Use	Direction	Noise Source	Average Existing Nighttime Ambient Noise Level[1] (dBA L_{eq})	Reference Noise Level at 50 ft (dBA L_{eq})	Modeled Noise Level at Receptor[3] (dBA L_{eq})	Combined Noise Level (dBA L_{eq})	Nighttime Noise Standard (dBA)	Combined Noise Level With Ambient Noise Level (dBA L_{eq})	Noise Increase over Existing Ambient Noise Level (dBA)
Preschool	Southeast	Fueling Activities	55.3[2]	64.0	41.3	47.7	--[4]	56.0	0.7
		HVAC		44.4	35.7				
		Parking Activities		62.2	43.0				
		Truck Delivery		64.2	43.4				
Commercial	South	Fueling Activities	54.9	64.0	45.5	52.4	60	56.8	1.9
		HVAC		44.4	28.4				
		Parking Activities		62.2	49.5				
		Truck Delivery		64.2	46.7				
Commercial	West	Fueling Activities	63.7	64.0	50.5	53.4	60	64.1	0.4
		HVAC		44.4	29.1				
		Parking Activities		62.2	44.4				
		Truck Delivery		64.2	49.0				
Commercial	North	Fueling Activities	53.3	64.0	32.6	37.0	60	53.4	0.1
		HVAC		44.4	23.2				
		Parking Activities		62.2	31.1				
		Truck Delivery		64.2	32.4				
Commercial	East	Fueling Activities	55.6	64.0	39.4	46.5	60	56.1	0.5
		HVAC		44.4	32.9				
		Parking Activities		62.2	40.9				
		Truck Delivery		64.2	43.3				

Source: Compiled by LSA (2021).
[1] The average existing nighttime ambient noise level is from 10:00 pm to 7:00 am.
[2] The average existing nighttime ambient noise level at the preschool at 6:00 am.
[3] The modeled noise level at the receptor was calculated using SoundPLAN.
[4] The City of Lake Elsinore has no noise standards for schools; the preschool was evaluated based on whether the proposed project would substantially increase ambient noise levels.
dBA = A-weighted decibels
ft = foot/feet
HVAC = heating, ventilation, and air conditioning
L_{eq} = equivalent continuous sound level

- The construction contractor shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site whenever feasible.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and the noise-sensitive receptors nearest the project site during all project construction whenever feasible.

REDUCTION MEASURES

Short-Term Construction Noise Impacts

No noise reduction measures are required.

Short-Term Construction Vibration Impacts

No vibration reduction measures are required.

Long-Term Aircraft Noise Impacts

No noise reduction measures are required.

Long-Term Traffic Noise Impacts

No noise reduction measures are required.

Long-Term Stationary Noise Impacts

No noise reduction measures are required.

Long-Term Vibration Impacts

No vibration reduction measures are required.

REFERENCES

City of Lake Elsinore. 2011. General Plan, Section 3.0 Public Safety & Welfare. December 13. Website: http://www.lake-elsinore.org/city-hall/city-departments/community-development/planning/lake-elsinore-general-plan (accessed November 2021).

_____. 2021. Municipal Code. Chapter 17.176—Noise Control. Website: https://www.codepublishing.com/CA/LakeElsinore/ (accessed November 2021).

Federal Highway Administration (FHWA). 1977. Highway Traffic Noise Prediction Model, FHWA RD-77-108.

_____. 2006. *FHWA Highway Construction Noise Handbook*. Roadway Construction Noise Model, FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. NTIS No. PB2006-109012. August.

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual*. FTA Report No. 0123. September. Website: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf (accessed November 2021).

Harris, Cyril M., ed. 1991. *Handbook of Acoustical Measurements and Noise Control*. 3rd Edition. McGraw-Hill, Inc.

Riverside County Airport Land Use Commission (ALUC). 2004. Riverside County Airport Land Use Compatibility Plan. October 14. Website: http://www.rcaluc.org/Plans/New-Compatibility-Plan (accessed November 2021).

Sierra Transportation Engineers, Inc. (STE). 2021. *Traffic Impact Analysis Report for Imperial Stations 31800 Mission Trail, Lake Elsinore, California*. June 4.

APPENDIX A

FHWA HIGHWAY TRAFFIC NOISE MODEL PRINTOUTS

TABLE Existing No Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11240 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.75

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	109.4	231.2

TABLE Existing No Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8810 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	67.8	138.7	295.2

TABLE Existing No Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8810 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	67.8	138.7	295.2

TABLE Existing No Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14370 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	108.3	227.1	486.4

TABLE Existing No Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15700 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	71.6	138.0	289.3

TABLE Existing No Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13680 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	68.0	127.3	264.5

TABLE Existing No Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2960 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	98.5

TABLE Existing No Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1730 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	71.7

TABLE Existing With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11660 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.91

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	56.2	112.0	236.9

TABLE Existing With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11190 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.40

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	78.2	162.0	345.9

TABLE Existing With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11170 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn 70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	78.1	161.8	345.5

TABLE Existing With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14890 SPEED (MPH): 50 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	110.8	232.5	498.0

TABLE Existing With Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16020 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.57

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	72.3	139.8	293.1

TABLE Existing With Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14740 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.10

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	70.4	133.3	277.8

TABLE Existing With Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2960 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	98.5

TABLE Existing With Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2250 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn 70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	83.5

TABLE 2023 No Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13410 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	60.7	122.5	259.8

TABLE 2023 No Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8250 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	65.3	132.9	282.7

TABLE 2023 No Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8250 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	65.3	132.9	282.7

TABLE 2023 No Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16070 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.85

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
59.3	116.1	244.4	523.8

TABLE 2023 No Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24800 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	91.3	184.3	391.0

TABLE 2023 No Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15320 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.27

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	71.7	136.5	284.9

TABLE 2023 No Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 250 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.97

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	0.0

TABLE 2023 No Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2600 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	91.1

TABLE 2023 With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13830 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.65

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	61.8	124.9	265.1

TABLE 2023 With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10630 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	75.8	156.7	334.4

TABLE 2023 With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10610 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	75.7	156.5	333.9

TABLE 2023 With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16590 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
60.3	118.5	249.6	535.0

TABLE 2023 With Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25120 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	92.0	185.8	394.3

TABLE 2023 With Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16380 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	74.1	142.2	297.6

TABLE 2023 With Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 250 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.97

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	0.0

TABLE 2023 With Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3120 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.93

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	101.8

APPENDIX B

SOUNDPLAN PRINTOUTS

TABLE Existing No Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11240 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.75

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	109.4	231.2

TABLE Existing No Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8810 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	67.8	138.7	295.2

TABLE Existing No Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8810 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	67.8	138.7	295.2

TABLE Existing No Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14370 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	108.3	227.1	486.4

TABLE Existing No Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15700 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	71.6	138.0	289.3

TABLE Existing No Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13680 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	68.0	127.3	264.5

TABLE Existing No Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2960 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	98.5

TABLE Existing No Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1730 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	71.7

TABLE Existing With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11660 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.91

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	56.2	112.0	236.9

TABLE Existing With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11190 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.40

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	78.2	162.0	345.9

TABLE Existing With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11170 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn 70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	78.1	161.8	345.5

TABLE Existing With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14890 SPEED (MPH): 50 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	110.8	232.5	498.0

TABLE Existing With Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16020 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.57

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	72.3	139.8	293.1

TABLE Existing With Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14740 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.10

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	70.4	133.3	277.8

TABLE Existing With Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2960 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	98.5

TABLE Existing With Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - Existing With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2250 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn 70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	83.5

TABLE 2023 No Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13410 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	60.7	122.5	259.8

TABLE 2023 No Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8250 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	65.3	132.9	282.7

TABLE 2023 No Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8250 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	65.3	132.9	282.7

TABLE 2023 No Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16070 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.85

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
59.3	116.1	244.4	523.8

TABLE 2023 No Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24800 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	91.3	184.3	391.0

TABLE 2023 No Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15320 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.27

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	71.7	136.5	284.9

TABLE 2023 No Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 250 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.97

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	0.0

TABLE 2023 No Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2600 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	91.1

TABLE 2023 With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Lakeshore Drive west of Diamond Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13830 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.65

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	61.8	124.9	265.1

TABLE 2023 With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Diamond Drive and Project Driveway
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10630 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	75.8	156.7	334.4

TABLE 2023 With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail between Project Driveway and Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10610 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	75.7	156.5	333.9

TABLE 2023 With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Mission Trail south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16590 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
60.3	118.5	249.6	535.0

TABLE 2023 With Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive north of Auto Center Drive/Casino Drive
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25120 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 36 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	92.0	185.8	394.3

TABLE 2023 With Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive between Auto Center Drive/Casino Drive and Lakeshore Drive/Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16380 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 38 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	74.1	142.2	297.6

TABLE 2023 With Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Diamond Drive south of Malaga Road
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 250 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.97

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	0.0

TABLE 2023 With Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/28/2021
ROADWAY SEGMENT: Malaga Road between Diamond Drive and Mission Trail
NOTES: Lake Elsinore Imperial Gas Station Project - 2023 With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3120 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 28 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.93

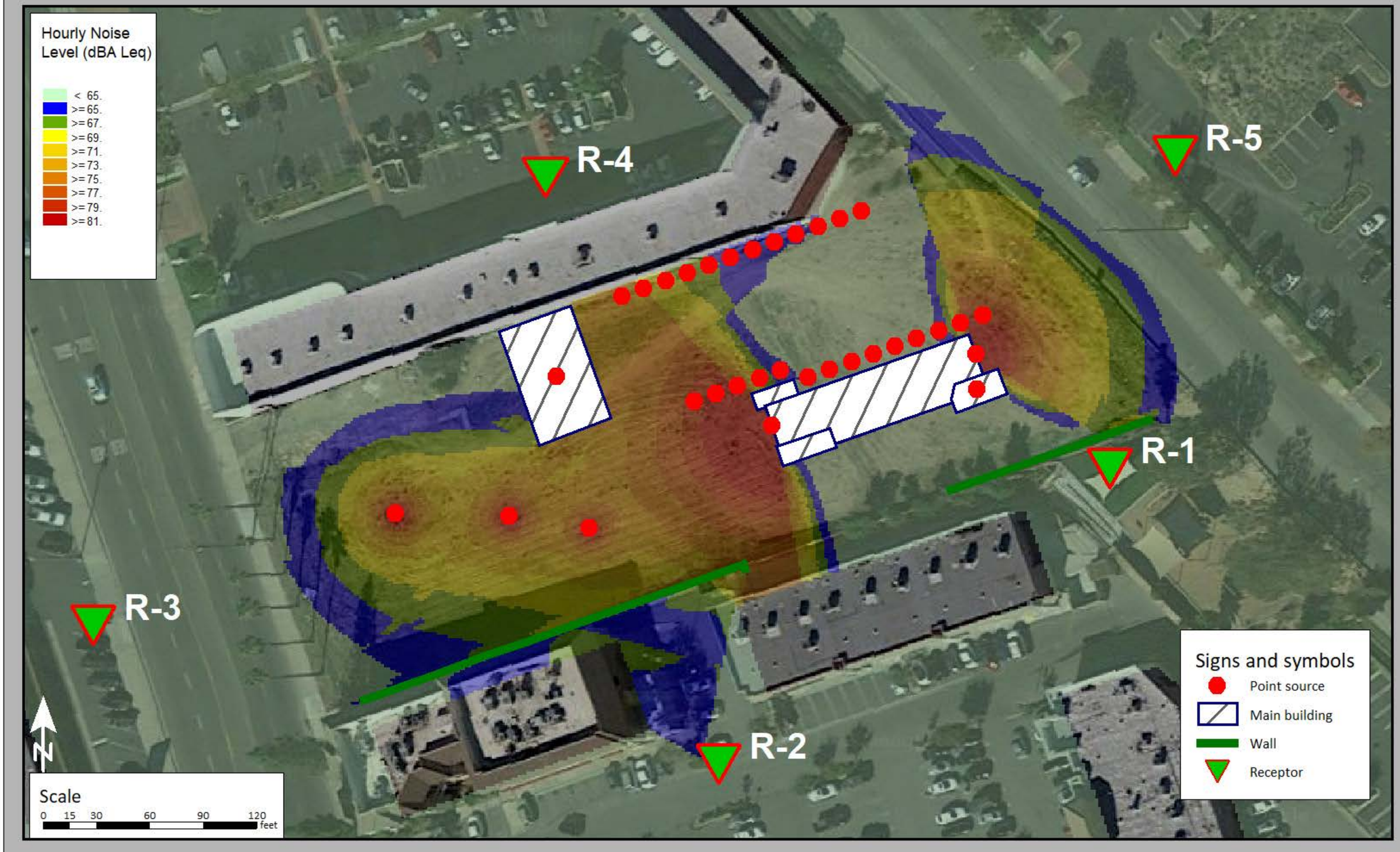
DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	0.0	101.8

Lake Elsinore Imperial Gas Station Project

Project No. CJD2104

Project Operational Noise Levels - Daytime



Lake Elsinore Imperial Gas Station Project

Project No. CJD2104

Project Operational Noise Levels - Nighttime