

NOISE IMPACT ANALYSIS

**CHALLENGER ELEMENTARY SCHOOL SPORTS
COMPLEX PROJECT**

CITY OF VICTORVILLE

Lead Agency:

Victor Elementary School District
12219 2nd Avenue
Victorville, CA 92395

Prepared by:

Vista Environmental
1021 Didrickson Way
Laguna Beach, CA 92651
949 510 5355
Greg Tonkovich, INCE

Project No. 25011

April 4, 2025

TABLE OF CONTENTS

1.0	Introduction	1
	1.1 Purpose of Analysis and Study Objectives	1
	1.2 Site Location and Study Area	1
	1.3 Proposed Project Description	1
	1.4 Executive Summary.....	4
	1.5 Mitigation Measures for the Proposed Project	4
2.0	Noise Fundamentals	7
	2.1 Noise Descriptors	7
	2.2 Tone Noise	7
	2.3 Noise Propagation.....	7
	2.4 Ground Absorption	8
3.0	Ground-Borne Vibration Fundamentals	9
	3.1 Vibration Descriptors	9
	3.2 Vibration Perception	9
	3.3 Vibration Propagation.....	9
4.0	Regulatory Setting	10
	4.1 Federal Regulations	10
	4.2 State Regulations	11
	4.3 Local Regulations – City of Victorville	12
5.0	Existing Noise Conditions.....	15
	5.1 Noise Measurement Equipment.....	15
	5.2 Noise Measurement Results	15
6.0	Modeling Parameters and Assumptions.....	17
	6.1 Construction Noise.....	17
	6.2 Operations-Related Noise	18
	6.3 Vibration	18
7.0	Impact Analysis	20
	7.1 CEQA Thresholds of Significance.....	20
	7.2 Generation of Noise Levels in Excess of Standards	20
	7.3 Generation of Excessive Groundborne Vibration	23
	7.4 Aircraft Noise	23
8.0	References.....	25

TABLE OF CONTENTS CONTINUED

APPENDICES

Appendix A – Field Noise Measurements Photo Index	
Appendix B – Field Noise Measurements Printouts	
Appendix C – RCNM Model Construction Noise Calculations Printouts	
Appendix D – Operational Reference Noise Measurement Printouts	

LIST OF FIGURES

Figure 1 – Project Location Map	5
Figure 2 – Proposed Site Plan	6
Figure 3 – Field Noise Monitoring Locations	16

LIST OF TABLES

Table A – Proposed School Uses of Facility.....	3
Table B – Proposed Community Uses of Facility.....	3
Table C – FTA Construction Noise Criteria	10
Table D – Victorville Land Use Compatibility Standards	12
Table E – Existing (Ambient) Noise Measurement Results	15
Table F – Construction Equipment Noise Emissions and Usage Factors	17
Table G – Vibration Source Levels for Construction Equipment.....	19
Table H – Construction Noise Levels at the Nearest Sensitive Receptors	21
Table I – Operational Sports Complex Noise Levels at the Nearby Homes	22

ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Victorville
cmu	concrete masonry unit
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
VdB	Vibration velocity level in decibels

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise and vibration impacts associated with the proposed Challenger Elementary School Sports Complex project (proposed project). The following is provided in this report:

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

1.2 Site Location and Study Area

Challenger School of Sports and Fitness (School) serves students in TK through sixth grade on two parcels that total 16.75 acres. The School is located in the central portion of the City of Victorville (City) at 14777 Hopland Street and is bounded by Hopland Street and single-family homes to the north, Cahuenga Road, vacant land and single-family homes to the east, and vacant land to the south and west. The project site consists of the southern 8.2 acres of the School. The project study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest offsite sensitive receptors to the project site are single-family homes on the east side of Carmelia Drive that are as near as 360 feet east of the project site. There are also single-family homes on the north side of Hopland Street that are as near as 600 feet north of the project site.

1.3 Proposed Project Description

The Victor Elementary School District (District) proposes a new sports complex at the School. The new facility would include a multi-use sports field and track, concessions and restroom building, and parking on the southern portion of the School. Overall, the proposed project will disturb approximately 8.2 acres, of which 4.2 acres will be paved. Construction of the proposed project is anticipated to start March 2026 and will take approximately 12 months to complete. The proposed site plan is shown in Figure 2.

Track and Field

The new track and field would be oriented north-south and constructed along the western perimeter of the Project site. A natural turf field with an 8-lane, rubberized running track would be installed. The field would be marked for a 180-foot by 360-foot football field and a 192-foot by 360-foot soccer field. A new high jump facility would be installed on the west side of the field. Long/triple jump, shotput, and pole vault facilities would be installed on the two ends of the field, within the track.

Bleachers. Home and visitor aluminum bleachers would be installed to provide seating for 2,000 spectators. The visitor bleachers would be on the west side of the track and include seating for 1,000 spectators. The home bleachers east of the track and field would also include 1,000 seats.

Scoreboard. A light-emitting diode (LED) scoreboard would be installed north of the track, behind the goal post.

Light Poles. The new facility would include nighttime field lighting. A total of six poles would be installed to light the track and field and surrounding walkways. Three poles would be installed behind the west end, middle, and east end of the home and visitor bleachers. The poles on the east and west ends of the bleachers would be 80 feet in height, and the poles in the middle would be 90 feet in height. Light fixtures would be mounted at various heights on the six poles to provide the minimum field lighting levels compliant with standards from the California Interscholastic Federation, as well as security and safety lighting along walkways. The fixtures on the top of the poles would be directed downward toward the fields and walkways. The fixtures in the middle of the poles would provide upward lighting to optimize visibility of the ball in the air. All fixtures would be hooded and shielded with louvers to minimize spill light, glare, and sky glow. The poles would also be mounted with speakers, cameras, and wireless access points.

Replacement Turf Field. The track and field would be constructed over existing turf field. New replacement turf would be installed south of the remaining eastern half of the field, along the parking lot.

New Concession/Restroom Building

A new approximately 1,400-square-foot field house would be constructed southeast of the track and field, south of the home bleachers. The building would include visitor and home team rooms, each with lockers and unisex restroom; men's, women's, and gender-neutral restroom facilities; and custodial, electrical, and storage rooms and spaces.

Restroom Building

A second 480-square-foot restroom building would be constructed in northwest of the track and field, north of the visitor bleachers. This facility would include men's, women's, and gender-neutral restroom facilities.

Parking Lot

A surface lot with 232 stalls would be constructed south of the proposed improvements. Access would be from a new driveway at the Cahuenga Road and Gloria Lane intersection.

Landscaping

New landscaping would be installed in the parking lot and perimeter of the field with a goal to provide 20 percent shading over new hardscape and new landscape areas, pursuant to the California Green Building Code.

Utilities/Service Systems

New utility systems, including electricity, potable and irrigation water, and sewer, would be installed to support the proposed facilities. They would be connected to existing utility lines and systems on the campus. A new storm drain system of pipes, inlets, and catch basins would be installed below the development footprint, including below and around the track and field, varsity baseball field, tennis court

facilities, new buildings, and areas with hardscape. Stormwater would be directed to underground retention chambers. The system would include a filtration system to pre-treat stormwater before it is slowly released into an existing drywell located on the campus, near the cul-de-sac of Emperor Avenue, and enters the City's stormwater system.

Offsite Improvements

The offsite improvements would consist of a couple parkway drains at outfalls for stormwater, which would consist of a nominal disturbance area. No curb cuts or other street improvements are anticipated.

Proposed Operations

The proposed sports complex would be used for Challenger's physical education program during normal school hours. After school, as shown in Table A, it would be used by the school's existing sports programs, including football, soccer, and track.

Table A – Proposed School Uses of Facility

Season	Facility Users	Hours
August – June	School Physical Education	7 AM – 3 PM
June – August	Football, Soccer, Track	3 PM – 9 PM
August – March	Football, Soccer, Track	4 PM – 8 PM
October – June	Football, Soccer, Track	4 PM – 8 PM

Source: District

When the facility is not used by the school, it would be available for other District-sponsored events, such as the Junior Olympics, which is held annually over a two-day period; District-wide/multi-site events/competitions for any of the District's 18 schools; and potential student sports and employee events.

Similar to existing conditions with all District facilities, when the proposed facility is not used by the School or District, it would be available for use by the Victorville community, pursuant to the Civic Center Act and District policies. The public may rent the proposed sports complex for a fee through the District's facility use agreement. For purposes of the analysis, it is assumed existing community users in the High Desert, as listed in Table B, could rent the facility.

Table B – Proposed Community Uses of Facility

Season	Facility Users			Hours
	Main User	Off Season	Others	
August – December	Football Club	Soccer Club	Track Club	5 PM – 9 PM
January – June	Soccer Club	Football Club	Track Club	5 PM – 9 PM
June – August	Summer Sports Camps			9 AM – 3 PM
June – August	Football, Soccer, Baseball, Softball and/or Track			3 PM – 9 PM

Source: SVA Architects

Although the Project would result in an overall increase of 1,000 spectator seats, because the Project would not introduce new athletic programs or operations at the facility (which already hosts local and regional games, tournaments, and competitions), it would not result in an increase in the frequency of events. The number of spectators attending events at the track and field would be the same.

1.4 Executive Summary

Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City and State of California (State).

City of Victorville Noise Regulations

The following lists the noise regulations from the City of Victorville Development Code that are applicable, but not limited to the proposed project.

- Section 16-6-12-050 Noise control standards
- Section 16-6.12.060(9) Construction noise exemption

State of California Noise Regulations

The following lists the State of California noise regulations that are applicable, but not limited to the proposed project.

- California Vehicle Code Section 27200-27207 – On Road Vehicle Noise Limits
- California Vehicle Code Section 38365-38350 – Off-Road Vehicle Noise Limits

Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

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

Less than significant impact.

Generation of excessive groundborne vibration or groundborne noise levels?

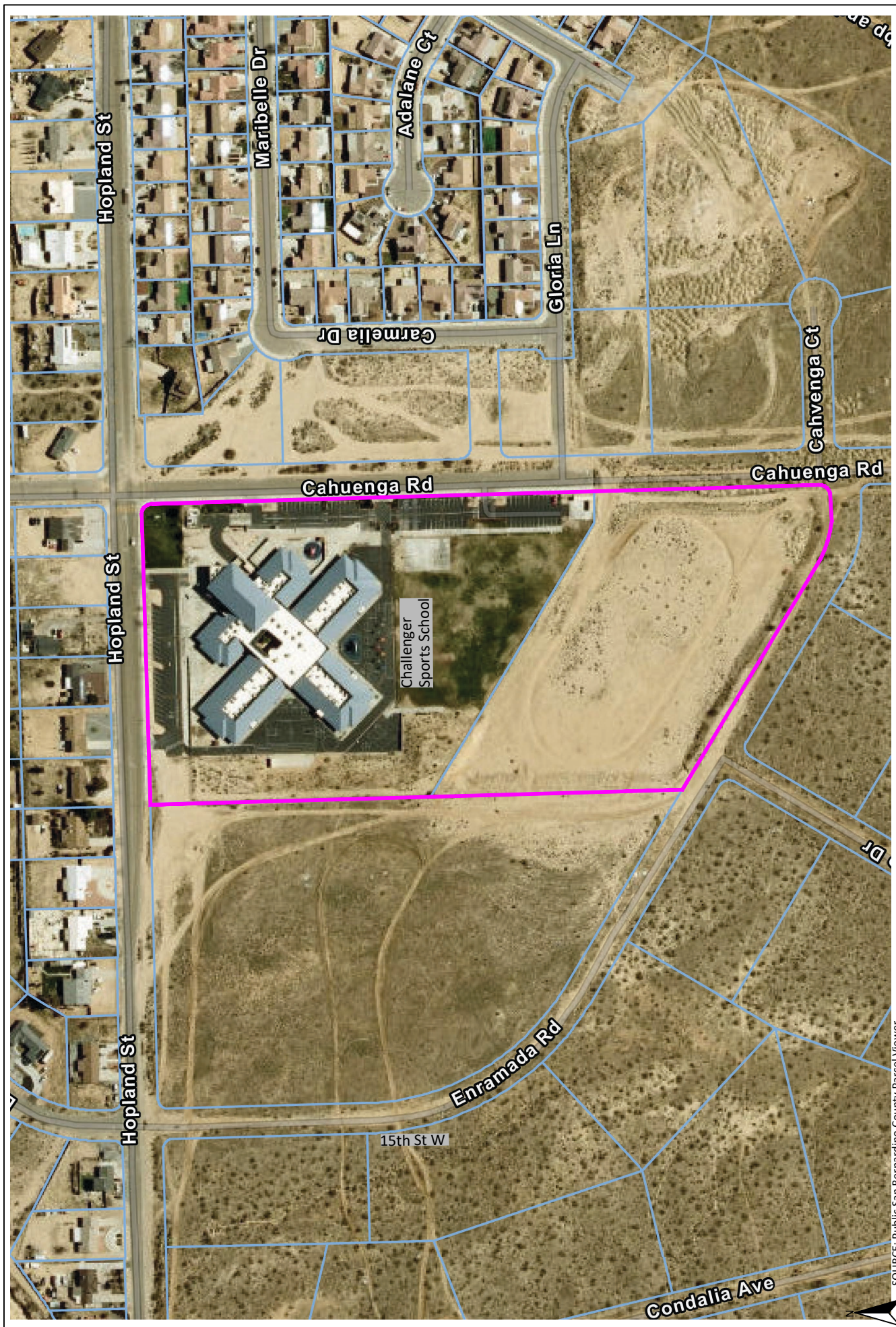
Less than significant impact.

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

Less than significant impact.

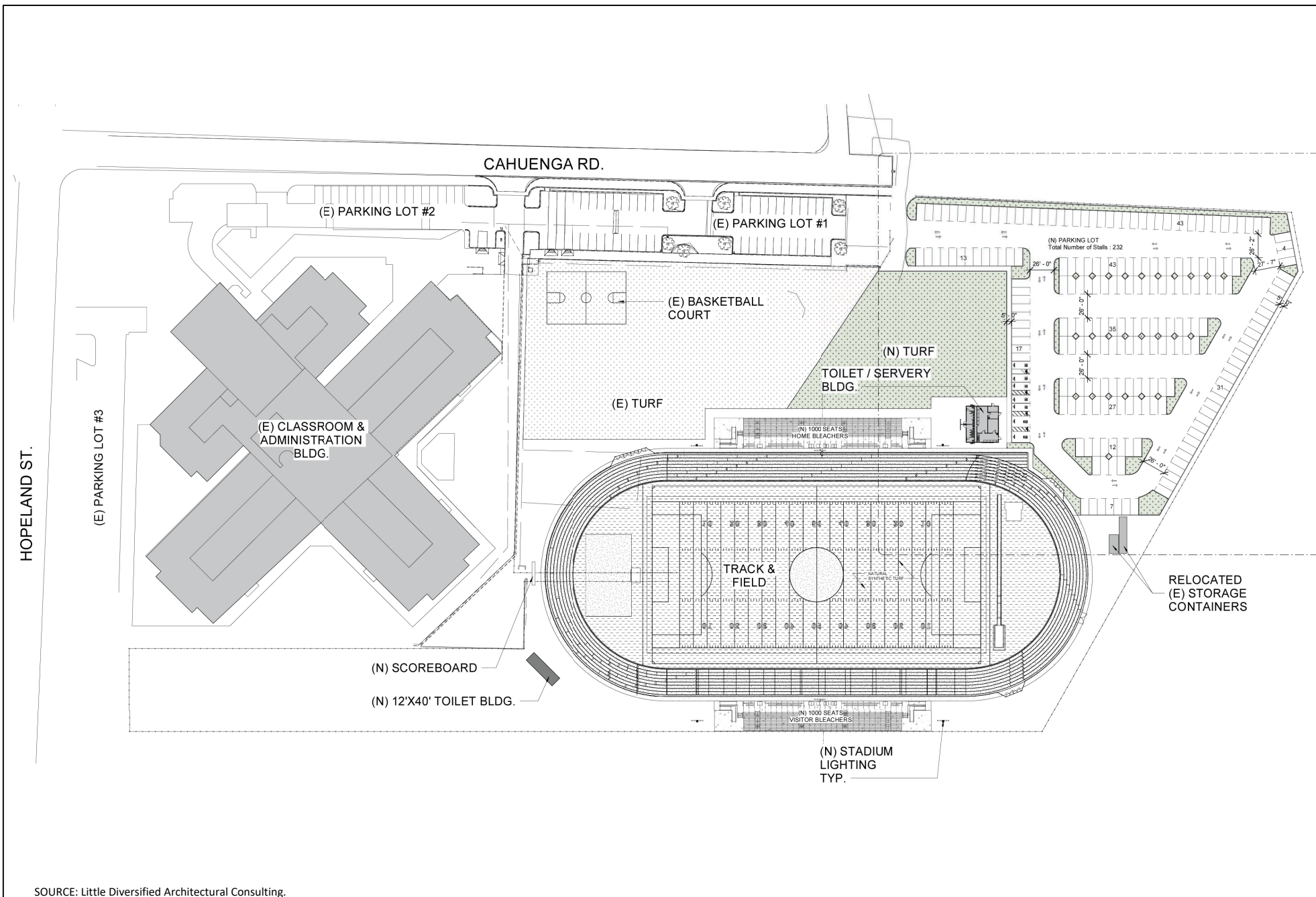
1.5 Mitigation Measures for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4 above were adequate to limit all noise and vibration impacts to less than significant levels. No mitigation measures are required for the proposed project with respect to noise and vibration impacts.



SOURCE: Public San Bernardino County Parcel Viewer.

Figure 1
Project Location Map



SOURCE: Little Diversified Architectural Consulting.

2.0 NOISE FUNDAMENTALS

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

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The worst-hour traffic Leq is the noise metric used by California Department of Transportation (Caltrans) for analyzing traffic noise impacts.

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

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in level of noise as the distance from the source increases. The manner in which the noise level reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features.

Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD) between source and receiver. Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

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

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

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

3.1 *Vibration Descriptors*

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is “VdB”, which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 *Vibration Perception*

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

3.3 *Vibration Propagation*

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

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

4.0 REGULATORY SETTING

The project site is located in the City of Victorville. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

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

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

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

Although the proposed project is not under the jurisdiction of the FTA, the *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual), prepared by the FTA, September 2018, is the only guidance document from a government agency that provides guidance on construction noise and recommends developing construction noise criteria on a project-specific basis that utilizes local noise ordinances if possible. However, local noise ordinances usually relates to nuisance and hours of allowed activity and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the noise impacts of a construction project. Project construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land uses. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings for a detailed construction noise assessment are provided below in Table C.

Table C – FTA Construction Noise Criteria

Land Use	Day (dBA Leq _(8-hour))	Night (dBA Leq _(8-hour))	30-day Average (dBA Ldn)
Residential	80	70	75
Commercial	85	85	80 ⁽¹⁾
Industrial	90	90	85 ⁽¹⁾

Notes:

⁽¹⁾ Use a 24-hour Leq (24 hour) instead of Ldn (30 day).
Source: Federal Transit Administration, 2018.

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

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the “Land Use Compatibility for Community Noise Environments Matrix,” which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

The *Transportation- and Construction Vibration Guidance Manual*, prepared by Caltrans, April 2020, provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations – City of Victorville

The *City of Victorville General Plan 2030* (General Plan), approved September 24, 2008, and City of Victorville Development Code (Development Code) version October 11, 2021, establishes the following applicable policies related to noise and vibration.

General Plan

The following applicable goals and policies to the proposed project are from the Noise Element of the General Plan.

Goal #1: NOISE SENSITIVITY

IDENTIFY SIGNIFICANT NOISE SOURCES THAT COULD ADVERSELY AFFECT COMMUNITY.

Policy 1.1.1 Implement Table N-3 (see Table D) regarding placement of new land uses.

Table D – Victorville Land Use Compatibility Standards

	Community Noise Equivalent Level (CNEL)						
	55	60	65	70	75	80	80+
Residential – Low Density, Single Family, Duplex, Multi-family, Mobile Home	1		2		3		4
Schools, Libraries, Churches, Hospitals, Nursing Homes	1		2		3		4

Legend:

1 Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal convention construction, without any special noise insulation requirements.

2 Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice.

3 Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

4 Clearly Unacceptable: New construction or development should generally not be undertaken.

Source: Section 9.100.210(B) of the Municipal Code.

Implementation Measures

- 1.1.1.1** Continue to assess projects through the subdivision, site plan, conditional use permit, and other development review processes and incorporate conditions of approval which ensure noise compatibility where appropriate.
- 1.1.1.3** Require a noise study to be performed and appropriate noise attenuation to be incorporated prior to approving any multifamily or mixed-use residential development in an area with a CNEL of 65 dB or greater.

Policy 1.2.1 Include noise mitigation measures in the design and use of new roadway projects.

Implementation Measures

- 1.2.1.1** Continue to use special paving materials that will buffer roadway noise.
- 1.2.1.2** Incorporate adequate setbacks in roadway design to maximize the distance from sensitive land uses.
- 1.2.1.3** Restrict new truck routes to roadways that are located away from sensitive land uses.

Goal #2: NOISE CONTROL

MANAGE THE AFFECTS OF NOISE EMISSIONS TO HELP ENSURE REDUCTION OF ADVERSE AFFECTS ON THE COMMUNITY.

Policy 2.1.1 Continue to implement acceptable standards for noise for various land uses throughout the City.

Implementation Measures

- 2.1.1.3** Discourage location of new educational facilities in areas with noise levels greater than 65 dB CNEL.
- 2.1.1.5** Continue to restrict noise and require mitigation measures for any noise-emitting construction equipment or activity.

City of Victorville Development Code

The City of Victorville Development Code establishes the following applicable standards related to noise and vibration.

16-6.12.040 – Base ambient noise levels

All ambient noise measurements shall commence in decibels within the respective zones and times as follows:

Zone	Time	Sound Level Decibels
All Residential Zones	10:00 pm to 7:00 am	55 dB(A)
	7:00 am to 10:00 pm	65 dB(A)

If the ambient noise level exceeds the applicable limit as noted in the above table, the ambient noise level shall be the standard.

16-6.12.050 – Noise levels prohibited

Noise levels shall not exceed the ambient noise levels in Section 13.01.040 (same as Section 16-6.12.040) by the following dB(A) levels for the cumulative period of time specified:

- (1) Less than 5 dB(A) for a cumulative period of more than thirty minutes in any hour;
- (2) Less than 10 dB(A) for a cumulative period of more than fifteen minutes in any hour;
- (3) Less than 15 dB(A) for a cumulative period of more than five minutes in any hour;
- (4) Less than 20 dB(A) for a cumulative period of more than one minute in any hour;
- (5) 20 dB(A) or more for any period of time.

16-6.12.060 – Noise source exemptions

The following activities shall be exempted from the provisions of this chapter:

- (2) The provisions of this regulation shall not preclude the construction, operation, maintenance and repairs of equipment, apparatus or facilities of park and recreation projects, public works projects or essential public works services and facilities, including those utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.
- (3) Activities conducted on the grounds of any elementary, intermediate or secondary school or college.
- (5) Activities conducted in public parks and public playgrounds, provided said events are conducted pursuant to a permit as required by this code.
- (7) Traffic on any roadway or railroad right-of-way.
- (9) Construction activities on private properties that are determined by the Building Official to be essential to the completion of the project.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise levels, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the proposed project area is generally characterized by vehicle traffic on the nearby roads. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurement Equipment

The noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in “slow” mode to record noise levels in “A” weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4-2014 standard).

Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise levels at the nearest residential uses located on the east and north sides of the project site. Descriptions of the noise monitoring sites are provided below in Table E and are shown in Figure 3. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 3:31 p.m. and 4:04 p.m. on Monday, March 10, 2025. During the noise measurements, the sky was partly cloudy, the temperature was 71 degrees Fahrenheit, the humidity was 21 percent, barometric pressure was 26.89 inches of mercury, and the wind was blowing at an average rate of five miles per hour.

5.2 Noise Measurement Results

The results of the noise level measurements are presented in Table E and the noise monitoring data printouts are included in Appendix B.

Table E – Existing (Ambient) Noise Measurement Results

Site No.	Description	Primary Noise Sources	Start Time of Measurement	Measured Noise Level	
				dBA Leq	dBA Lmax
1	Located east of the project site, in front of home at 14912 Gloria Lane, approximately 35 feet north of Gloria Lane centerline and 35 feet east of Carmelia Drive centerlines.	Vehicles on Gloria Lane	3:31 p.m.	50.6	69.0
2	Located north of the project site, in front of home at 14790 Hopland Street, approximately 30 feet north of Hopland Street centerline.	Vehicles on Hopland Street	3:49 p.m.	61.0	78.1

Notes: Noise measurements taken with a Larson-Davis Model 831 Type 1 precision sound level meter on Monday, March 10, 2025.

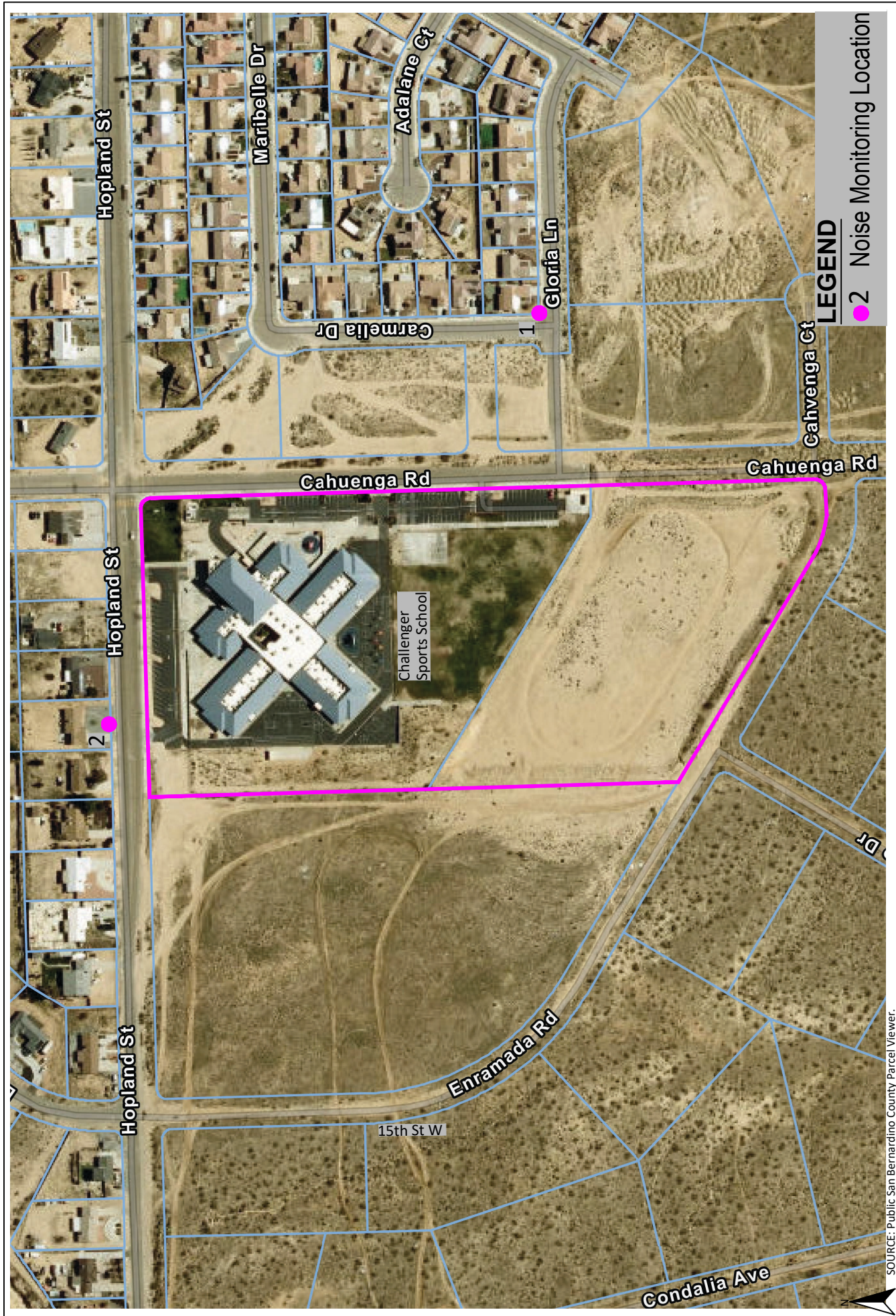


Figure 3
Field Noise Monitoring Locations

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table F below provides a list of the construction equipment anticipated to be used for each phase of construction that was obtained from the *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Challenger Elementary School Sports Complex Project* (Air Quality Analysis), prepared by Vista Environmental, March 28, 2025.

Table F – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor ¹ (percent)	Spec 721.560 Lmax at 50 feet ² (dBA, slow ³)	Actual Measured Lmax at 50 feet ⁴ (dBA, slow ³)
Site Preparation				
Rubber Tired Dozers	3	40	85	82
Backhoe	1	40	80	78
Front End Loader	1	40	80	79
Tractors	2	40	84	N/A
Grading				
Grader	1	40	85	83
Excavators	1	40	85	81
Rubber Tired Dozer	1	40	85	82
Backhoe	1	40	80	78
Front End Loader	1	40	80	79
Tractor	1	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	3	40	85	83
Generator	1	50	82	81
Backhoe	1	40	80	78
Front End Loader	1	40	80	79
Tractor	1	40	84	N/A
Welder	1	40	73	74
Paving				
Pavers	2	50	85	77
Paving Equipment	2	50	85	77
Rollers	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:

¹ Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.

² Spec 721.560 is the equipment noise level utilized by the RCNM program.

³ The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.

⁴ Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.

Source: Federal Highway Administration, 2006.

Table F shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed Table F and through use of the RCNM. For each phase of construction, all construction equipment was analyzed based on being placed in the middle of the area being disturbed, which is based on the analysis methodology detailed in FTA Manual for a General Assessment. However, in order to provide a conservative analysis, all equipment was analyzed, instead of just the two noisiest pieces of equipment as detailed in the FTA Manual. The RCNM model printouts are provided in Appendix C.

6.2 Operations-Related Noise

In order to determine the noise impacts created from the proposed sports complex, a reference noise measurement was taken of a football game at Justin-Siena High School. The use of a High School football game that included cheerleaders, a band and a PA system for the reference noise measurement provides for a worst-case analysis of the proposed sports complex at an elementary school.

The noise measurement was taken approximately 70 feet from the football field and recorded a noise level of 63.3 dBA Leq and the reference noise measurement printout is provided in Appendix D. The noise levels at the nearby homes were calculated based on standard geometric spreading of noise. According to the *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, prepared by Caltrans, September 2013, sound level attenuates or drops off at a rate of 6 dB per doubling the distance between source and receptor and was calculated based on the following equation:

$$dBA_2 = dBA_1 + 10\log_{10}[(D_1/D_2)]^2 = dBA_1 + 20\log_{10}(D_1/D_2)$$

where:

dBA₁ = noise level at distance D₁

dBA₂ = noise level at distance D₂

6.3 Vibration

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

The construction-related vibration impacts have been calculated through the vibration levels shown below in Table G and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table F.

Table G – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L _v) at 25 feet
Pile driver (impact)	Upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, 2018.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

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

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. The following section calculates the potential noise emissions associated with the temporary construction activities and long-term operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

Construction activities for the proposed project are anticipated to start around March 2026 and would take approximately one year to complete. Construction activities for the proposed project are anticipated to include site preparation and grading of approximately 8.2 acres, building construction of the sports complex, paving of the parking lot and hardscape areas, and application of architectural coatings.

Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are single-family homes on the east side of Carmelia Drive that are as near as 360 feet east of the project site. There are also single-family homes on the north side of Hopland Street that are as near as 600 feet north of the project site.

Section 16-6.12.060(9) of the City's Development Code exempts construction noise from the City noise standards provided that the Building Official determines the construction activities are essential to completion of the project. However, the City construction noise standards do not provide any limits to the noise levels that may be created from construction activities and even with adherence to the City standards, the resultant construction noise levels may result in a significant substantial temporary noise increase to the nearby residents.

In order to determine if the proposed construction activities would create a significant substantial temporary noise increase, the FTA construction noise criteria thresholds detailed above in Section 4.1 have been utilized, which shows that a significant construction noise impact would occur if construction noise exceeds 80 dBA during the daytime at any of the nearby homes.

Construction noise impacts to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table F that shows the anticipated construction equipment per phase. The results are shown below in Table H and the RCNM printouts are provided in Appendix C.

Table H – Construction Noise Levels at the Nearest Sensitive Receptors

Construction Phase	Construction Noise Level (dBA Leq) at:	
	Nearest Homes to the East ¹	Nearest Homes to the North ²
Site Preparation	64	62
Grading	64	61
Building Construction	65	62
Paving	60	57
Painting	52	49
FTA Construction Noise Threshold⁴	80	80
Exceed Thresholds?	No	No

¹ The nearest homes to the east are located as near as 640 feet from the center of the area to be disturbed.

² The nearest homes to the north are located as near as 870 feet from the center of the area to be disturbed.

⁴ The FTA Construction noise thresholds are detailed above in Table C.

Source: RCNM, Federal Highway Administration, 2006

Table H shows that the greatest noise impacts would occur during the building construction phase, with a noise level as high as 65 dBA Leq at the nearest homes to the east. Table H also shows that none of the construction phases would exceed the FTA noise standard of 80 dB at the nearby homes. Therefore, construction-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would construction activities create a substantial temporary increase in ambient noise levels from construction of the proposed project. Impacts would be less than significant.

Operational-Related Noise

The proposed project would consist of the development of a sports complex. Potential noise impacts associated with the operations of the proposed project would be from project-generated vehicular traffic on the nearby roadways as well from onsite noise impacts from operation of the sport complex. The roadway noise impacts and onsite noise impacts have been analyzed separately below.

Roadway Vehicular Noise Impact to Nearby Homes

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project's potential offsite noise impacts have been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

Since the General Plan does not quantify what is a significant roadway noise increase, the roadway noise threshold utilized in the *Draft Program Environmental Impact Report City of Victorville General Plan 2030* (General Plan DPEIR), August 14, 2008, has been utilized, which details that a potentially significant road noise impact is one that would cause noise levels to increase over 65 CNEL or if over 65 CNEL, to increase

by 3 dB or more when adjacent to noise sensitive uses. Since the roadway noise calculations show that currently all analyzed nearby sensitive receptors currently exceed 65 CNEL, this analysis has utilized a significant road noise increase would occur when the traffic noise increases by 3 dBA CNEL.

The *Challenger School of Sports and Fitness – Trip Generation & VMT Screening Assessment* (Traffic Analysis), prepared by Michael Baker International, December 9, 2024, found that the proposed project would generate 93 daily trips. The nearest analyzed road segment to the project site in the DPEIR is Hopland Street between El Evado Road and Llanada Avenue that had 800 daily trips in 2005 and is anticipated to have 7,300 daily trips in 2035.

In order for project-generated vehicular traffic to increase the noise level of Hopland Street in the vicinity of the project site, by 3 dB, the roadway traffic would have to double. Since the proposed project would only result in a maximum of a 12 percent increase in traffic volumes on Hopland Street, when compared to year 2005 conditions, the project-related roadway noise increase is anticipated to be negligible and well below the 3 dBA road noise. Operational roadway noise impacts would be less than significant.

Onsite Noise Impacts to Nearby Sensitive Receptors

As detailed above in Section 6.2, operation of the project may create onsite noise impacts to the nearby homes from the operation of the sports complex. Sections 16-6.12.040 and 16-6.12.050 of the Municipal Code limit the noise levels at the nearby homes to 65 dBA between 7:00 a.m. and 10:00 p.m. and 55 dBA between 10:00 p.m. and 7:00 a.m.. Section 16-6.12.060(3) of the Municipal Code exempts activities conducted on the grounds of any elementary school from the above City noise standards. However, in order to provide a conservative analysis, the City noise standards have been utilized to determine if the project would create a significant noise impact. The noise levels at the nearby homes to the east and north were calculated based on the methodology detailed above in Section 6.2 and Table I shows the calculated noise levels at the nearby homes.

Table I – Operational Sports Complex Noise Levels at the Nearby Homes

Noise Source	Calculated Noise Levels (dBA Leq) at ¹ :	
	Homes to East ²	Homes to North ³
Sports Complex	45	43
City of Victorville Noise Standards (Day/Night)⁴	65/55	65/55
Exceed City Noise Standard? (Day/Night)	No/No	No/No

Notes:

¹ Noise levels calculated based on a reference noise level of 62 dB at one meter, a standard geometric spreading of noise, which results in a 6.0 dB drop in noise when distance is doubled, and accounts for existing and proposed walls and grade difference.

² The distance from the sports complex to the nearest homes to the east is 550 feet.

³ The distance from the sports complex to the nearest homes to the north is 750 feet.

⁴ Obtained from Sections 16-6-12-040 and 16-6.12-050 of the Municipal Code.

Table I shows that operation of the proposed Sports Complex would create a noise level as high as 45 dBA at the homes to the east and 43 dBA at the homes to the north. The operational sports complex noise levels at the nearby homes would be below the City's residential daytime standard of 65 dBA and nighttime noise standard of 55 dBA. Therefore, the operation of the proposed project would not create a substantial increase in ambient noise levels that are in excess of applicable noise standards. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

Construction activities for the proposed project are anticipated to start around March 2026 and would take approximately one year to complete. Construction activities for the proposed project are anticipated to include site preparation and grading of approximately 8.2 acres, building construction of the sports complex, paving of the parking lot and hardscape areas, and application of architectural coatings.

Vibration impacts from construction activities associated with the proposed project would typically be created from the operation of heavy off-road equipment. The nearest sensitive receptors to the project site are single-family homes located on the east side of Carmelia Drive that are as near as 360 feet east of the project site.

Since neither the Municipal nor the General Plan provide a quantifiable vibration threshold for temporary construction activities, guidance from the *Transportation and Construction-Induced Vibration Guidance Manual*, prepared by Caltrans, April 2020, has been utilized, which defines the threshold of perception from transient sources such as off-road construction equipment at 0.25 inch per second peak particle velocity (PPV).

The primary source of vibration during construction would be from the operation of a bulldozer. From Table G above a large bulldozer would create a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest offsite homes (360 feet to the east) would be 0.005 inch per second PPV. The vibration level at the nearest offsite homes would be well below the 0.25 inch per second PPV threshold detailed above. Impacts would be less than significant.

Operations-Related Vibration Impacts

The proposed project would consist of the development of a sports complex. The on-going operation of the proposed project would not include the operation of any known vibration sources other than typical onsite vehicle operations for a residential development. Therefore, a less than significant vibration impact is anticipated from operation of the proposed project.

Level of Significance

Less than significant impact.

7.4 Aircraft Noise

The proposed project may expose people residing in the project area to excessive noise levels from aircraft. The nearest airport is Southern California Logistics Airport that is located as near as 3.7 miles northwest of the project site. The project site is located outside of the 60 dBA CNEL noise contours of this airport. Therefore, the proposed homes would not be exposed to excessive aircraft noise. Impacts would be less than significant.

Level of Significance

Less than significant impact.

8.0 REFERENCES

California Department of Transportation, *2016 Annual Average Daily Truck Traffic on the California State Highway System*, 2018.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation- and Construction Vibration Guidance Manual*, April 2020.

City of Victorville, *A Codification of the General Ordinances of the City of Victorville, California*, January 14, 2025.

City of Victorville, *City of Victorville General Plan 2030*, October 21, 2008.

City of Victorville, *Draft Program Environmental Impact Report City of Victorville General Plan 2030*, August 14, 2008.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Michael Baker International, *Challenger School of Sports and Fitness – Trip Generation & VMT Screening Assessment*, December 9, 2024.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide*, January, 2006.

U.S. Department of Transportation, *Highway Traffic Noise: Analysis and Abatement Guidance*, December, 2011.

Vista Environmental, *Air Quality, Energy and Greenhouse Gas Emissions Impact Analysis Challenger Elementary School Sports Complex Project*, March 28, 2025.

APPENDIX A

Field Noise Measurements Photo Index



Noise Measurement Site 1 - looking north



Noise Measurement Site 1 - looking northeast



Noise Measurement Site 1 - looking east



Noise Measurement Site 1 - looking southeast



Noise Measurement Site 1 - looking south



Noise Measurement Site 1 - looking southwest



Noise Measurement Site 1 - looking west



Noise Measurement Site 1 - looking northwest



Noise Measurement Site 2 - looking north



Noise Measurement Site 2 - looking northeast



Noise Measurement Site 2 - looking east



Noise Measurement Site 2 - looking southeast



Noise Measurement Site 2 - looking south



Noise Measurement Site 2 - looking southwest



Noise Measurement Site 2 - looking west



Noise Measurement Site 2 - looking northwest

APPENDIX B

Field Noise Measurements Printouts

Measurement Report

Report Summary

Meter's File Name	831_Data.003.s	Computer's File Name	831_0002509-20250310 153116-831_Data.003.ldbin
Meter	831 0002509	Firmware	2.403
User	GT	Location	East Side of Project
Job Description	Challenger ES Sports Complex		
Note	Northeast Corner of Intersection of Gloria Ln & Carmelia Dr. In front of home at 14912 Gloria Ln.		

Measurement

Start Time	2025-03-10 15:31:16	Duration	0:15:00.0	
End Time	2025-03-10 15:46:16	Run Time	0:15:00.0	Pause Time 0:00:00.0
Pre-Calibration	2025-03-10 15:30:04	Post-Calibration	None	Calibration Deviation ---

Results

Overall Metrics					
LA _{eq}	50.6 dB				
LAE	80.1 dB	SEA	--- dB		
EA	11.5 μPa²h				
LZ _{peak}	111.7 dB		2025-03-10 15:31:22		
LAS _{max}	69.0 dB		2025-03-10 15:35:59		
LAS _{min}	39.1 dB		2025-03-10 15:34:53		
LA _{eq}	50.6 dB				
LC _{eq}	72.0 dB	LC _{eq} - LA _{eq}	21.4 dB		
LAL _{eq}	54.2 dB	LAL _{eq} - LA _{eq}	3.6 dB		
Exceedances		Count	Duration		
LAS > 65.0 dB		2	0:00:08.1		
LAS > 85.0 dB		0	0:00:00.0		
LZpk > 135.0 dB		0	0:00:00.0		
LZpk > 137.0 dB		0	0:00:00.0		
LZpk > 140.0 dB		0	0:00:00.0		
Community Noise		LDN	LDay	LNight	
		50.6 dB	50.6 dB	--- dB	
		LDEN	LDay	LEve	LNight
		50.6 dB	50.6 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	50.6 dB		72.0 dB		89.1 dB	
L _S (max)	69.0 dB	2025-03-10 15:35:59	84.5 dB	2025-03-10 15:31:23	101.0 dB	2025-03-10 15:31:24
L _F (max)	71.2 dB	2025-03-10 15:35:58	90.4 dB	2025-03-10 15:46:07	105.4 dB	2025-03-10 15:31:22
L _I (max)	72.6 dB	2025-03-10 15:35:58	93.9 dB	2025-03-10 15:37:43	109.0 dB	2025-03-10 15:31:22
L _S (min)	39.1 dB	2025-03-10 15:34:53	57.5 dB	2025-03-10 15:36:18	71.6 dB	2025-03-10 15:36:18
L _F (min)	38.1 dB	2025-03-10 15:34:51	54.8 dB	2025-03-10 15:44:30	61.2 dB	2025-03-10 15:36:16
L _I (min)	38.9 dB	2025-03-10 15:34:51	58.8 dB	2025-03-10 15:36:18	78.0 dB	2025-03-10 15:35:58
L _{Peak} (max)	87.9 dB	2025-03-10 15:35:58	101.8 dB	2025-03-10 15:37:43	111.7 dB	2025-03-10 15:31:22

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	55.4 dB
LAS 10.0	51.4 dB
LAS 33.3	45.7 dB
LAS 50.0	44.1 dB
LAS 66.6	43.3 dB
LAS 90.0	42.1 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.004.s	Computer's File Name	831_0002509-20250310 154928-831_Data.004.ldbin
Meter	831 0002509	Firmware	2.403
User	GT	Location	North of Project
Job Description	Challenger ES Sports Complex		
Note	North Side of Hopland St. In front of home at 14790 Hopland St.		

Measurement

Start Time	2025-03-10 15:49:28	Duration	0:15:00.0		
End Time	2025-03-10 16:04:28	Run Time	0:15:00.0	Pause Time	0:00:00.0
Pre-Calibration	2025-03-10 15:30:00	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics					
L _{Aeq}	61.0 dB				
L _{AE}	90.5 dB	SEA	---	dB	
EA	125.9 µPa²h				
L _{Zpeak}	106.0 dB		2025-03-10 15:55:20		
L _{ASmax}	78.1 dB		2025-03-10 15:50:11		
L _{ASmin}	39.6 dB		2025-03-10 16:00:48		
L _{Aeq}	61.0 dB				
L _{Ceq}	70.1 dB	L _{Ceq} - L _{Aeq}	9.1 dB		
L _{AIeq}	63.5 dB	L _{AIeq} - L _{Aeq}	2.5 dB		
Exceedances		Count	Duration		
LAS > 65.0 dB		21	0:01:45.10		
LAS > 85.0 dB		0	0:00:00.0		
LZpk > 135.0 dB		0	0:00:00.0		
LZpk > 137.0 dB		0	0:00:00.0		
LZpk > 140.0 dB		0	0:00:00.0		
Community Noise		LDN	LDay	LNight	
		61.0 dB	61.0 dB	---	dB
		LDEN	LDay	LEve	LNight
		61.0 dB	61.0 dB	---	dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	61.0 dB		70.1 dB		83.4 dB	
L _S (max)	78.1 dB	2025-03-10 15:50:11	86.6 dB	2025-03-10 16:02:53	95.4 dB	2025-03-10 15:55:20
L _F (max)	81.1 dB	2025-03-10 15:50:11	89.8 dB	2025-03-10 16:02:53	101.4 dB	2025-03-10 15:55:20
L _I (max)	81.7 dB	2025-03-10 15:50:11	90.9 dB	2025-03-10 16:02:53	104.0 dB	2025-03-10 15:55:20
L _S (min)	39.6 dB	2025-03-10 16:00:48	56.3 dB	2025-03-10 16:00:25	65.0 dB	2025-03-10 16:00:47
L _F (min)	38.7 dB	2025-03-10 16:00:47	54.1 dB	2025-03-10 16:02:01	60.9 dB	2025-03-10 16:00:43
L _I (min)	39.5 dB	2025-03-10 16:00:47	56.8 dB	2025-03-10 16:00:25	66.8 dB	2025-03-10 16:00:45
L _{Peak} (max)	91.9 dB	2025-03-10 15:50:11	98.9 dB	2025-03-10 16:02:53	106.0 dB	2025-03-10 15:55:20

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	68.9 dB
LAS 10.0	64.9 dB
LAS 33.3	50.6 dB
LAS 50.0	47.6 dB
LAS 66.6	45.5 dB
LAS 90.0	42.0 dB

APPENDIX C

RCNM Model Construction Noise Calculation Printouts

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)			Equipment Spec	Actual	Receptor Distance (feet)	Estimated Shielding (dBA)
		Daytime	Evening	Night				
Homes to East	Residential	50.6	50.6	50.6				
Description		Impact		Usage(%)	Lmax (dBA)	Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
		Device						
Dozer		No		40		81.7	640	0
Dozer		No		40		81.7	640	0
Dozer		No		40		81.7	640	0
Backhoe		No		40		77.6	640	0
Front End Loader		No		40		79.1	640	0
Tractor		No		40	84		640	0
Tractor		No		40	84		640	0

Results

Equipment	Calculated (dBA)		Day	Noise Limits (dBA)		
	*Lmax	Leq		Leq	Evening	Leq
Dozer	59.5	55.5	N/A	N/A	N/A	N/A
Dozer	59.5	55.5	N/A	N/A	N/A	N/A
Dozer	59.5	55.5	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A
Front End Loader	57.0	53.0	N/A	N/A	N/A	N/A
Tractor	61.9	57.9	N/A	N/A	N/A	N/A
Tractor	61.9	57.9	N/A	N/A	N/A	N/A
Total	62	64	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Site Preparation

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)			Equipment Spec	Actual	Receptor Distance (feet)	Estimated Shielding (dBA)
		Daytime	Evening	Night				
Homes to North	Residential	61.0	61.0	61				
Description		Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)			
Dozer		No	40		81.7	870	0	
Dozer		No	40		81.7	870	0	
Dozer		No	40		81.7	870	0	
Backhoe		No	40		77.6	870	0	
Front End Loader		No	40		79.1	870	0	
Tractor		No	40	84		870	0	
Tractor		No	40	84		870	0	

Results

Equipment	Calculated (dBA)		Day	Noise Limits (dBA)		
	*Lmax	Leq		Evening		
Dozer	56.9	52.9	Lmax	Leq	Lmax	Leq
Dozer	56.9	52.9	N/A	N/A	N/A	N/A
Dozer	56.9	52.9	N/A	N/A	N/A	N/A
Backhoe	52.7	48.8	N/A	N/A	N/A	N/A
Front End Loader	54.3	50.3	N/A	N/A	N/A	N/A
Tractor	59.2	55.2	N/A	N/A	N/A	N/A
Tractor	59.2	55.2	N/A	N/A	N/A	N/A
Total	59	62	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Homes to East	Residential	50.6	50.6	50.6

Description	Impact Device	Usage(%)	Equipment Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Excavator	No	40		80.7	640	0
Grader	No	40	85		640	0
Dozer	No	40		81.7	640	0
Backhoe	No	40		77.6	640	0
Front End Loader	No	40		79.1	640	0
Tractor	No	40	84		640	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)			
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq
Excavator	58.6	54.6	N/A	N/A	N/A	N/A
Grader	62.9	58.9	N/A	N/A	N/A	N/A
Dozer	59.5	55.5	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A
Front End Loader	57.0	53.0	N/A	N/A	N/A	N/A
Tractor	61.9	57.9	N/A	N/A	N/A	N/A
Total	63	64	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Grading

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Homes to North	Residential	61.0	61.0	61.0

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Excavator	No	40		80.7	870	0
Grader	No	40	85		870	0
Dozer	No	40		81.7	870	0
Backhoe	No	40		77.6	870	0
Front End Loader	No	40		79.1	870	0
Tractor	No	40	84		870	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)			
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq
Excavator	55.9	52	N/A	N/A	N/A	N/A
Grader	60.2	56.2	N/A	N/A	N/A	N/A
Dozer	56.9	52.9	N/A	N/A	N/A	N/A
Backhoe	52.7	48.8	N/A	N/A	N/A	N/A
Front End Loader	54.3	50.3	N/A	N/A	N/A	N/A
Tractor	59.2	55.2	N/A	N/A	N/A	N/A
Total	60	61	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Homes to East	Residential	50.6	50.6	50.6

Description	Impact Device	Usage(%)	Equipment Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Crane	No	16		80.6	640	0
Gradall	No	40		83.4	640	0
Gradall	No	40		83.4	640	0
Gradall	No	40		83.4	640	0
Generator	No	50		80.6	640	0
Backhoe	No	40		77.6	640	0
Front End Loader	No	40		79.1	640	0
Tractor	No	40	84		640	0
Welder / Torch	No	40		74	640	0

Equipment	Calculated (dBA)		Results			
	*Lmax	Leq	Day Lmax	Leq	Noise Limits (dBA) Evening Lmax	Leq
Crane	58.4	50.4	N/A	N/A	N/A	N/A
Gradall	61.3	57.3	N/A	N/A	N/A	N/A
Gradall	61.3	57.3	N/A	N/A	N/A	N/A
Gradall	61.3	57.3	N/A	N/A	N/A	N/A
Generator	58.5	55.5	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A
Front End Loader	57.0	53.0	N/A	N/A	N/A	N/A
Tractor	61.9	57.9	N/A	N/A	N/A	N/A
Welder / Torch	51.9	47.9	N/A	N/A	N/A	N/A
Total	62	65	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Building Construction

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Homes to North	Residential	61.0	61.0	61

Description	Impact Device	Usage(%)	Equipment Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Crane	No	16		80.6	870	0
Gradall	No	40		83.4	870	0
Gradall	No	40		83.4	870	0
Gradall	No	40		83.4	870	0
Generator	No	50		80.6	870	0
Backhoe	No	40		77.6	870	0
Front End Loader	No	40		79.1	870	0
Tractor	No	40	84		870	0
Welder / Torch	No	40		74	870	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)			
	*Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
Crane	55.7	47.8	N/A	N/A	N/A	N/A
Gradall	58.6	54.6	N/A	N/A	N/A	N/A
Gradall	58.6	54.6	N/A	N/A	N/A	N/A
Gradall	58.6	54.6	N/A	N/A	N/A	N/A
Generator	55.8	52.8	N/A	N/A	N/A	N/A
Backhoe	52.7	48.8	N/A	N/A	N/A	N/A
Front End Loader	54.3	50.3	N/A	N/A	N/A	N/A
Tractor	59.2	55.2	N/A	N/A	N/A	N/A
Welder / Torch	49.2	45.2	N/A	N/A	N/A	N/A
Total	59	62	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Homes to East	Residential	50.6	50.6	50.6

Description	Impact Device	Usage(%)	Equipment Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Paver	No	50		77.2	640	0
Paver	No	50		77.2	640	0
Paver	No	50		77.2	640	0
Paver	No	50		77.2	640	0
Roller	No	20		80	640	0
Roller	No	20		80	640	0

Equipment	Calculated (dBA)		Results			
			Day	Noise Limits (dBA)		
	*Lmax	Leq		Lmax	Leq	Lmax
Paver	55.1	52.1	N/A	N/A	N/A	N/A
Paver	55.1	52.1	N/A	N/A	N/A	N/A
Paver	55.1	52.1	N/A	N/A	N/A	N/A
Paver	55.1	52.1	N/A	N/A	N/A	N/A
Roller	57.9	50.9	N/A	N/A	N/A	N/A
Roller	57.9	50.9	N/A	N/A	N/A	N/A
Total	58	60	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Paving

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Homes to North	Residential	61.0	61.0	61.0

Description	Impact	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	870	0
Paver	No	50		77.2	870	0
Paver	No	50		77.2	870	0
Paver	No	50		77.2	870	0
Roller	No	20		80	870	0
Roller	No	20		80	870	0

Equipment	Calculated (dBA)		Results			
	*Lmax	Leq	Noise Limits (dBA)			
			Day Lmax	Day Leq	Evening Lmax	Evening Leq
Paver	52.4	49	N/A	N/A	N/A	N/A
Paver	52.4	49.4	N/A	N/A	N/A	N/A
Paver	52.4	49.4	N/A	N/A	N/A	N/A
Paver	52.4	49.4	N/A	N/A	N/A	N/A
Roller	55.2	48.2	N/A	N/A	N/A	N/A
Roller	55.2	48.2	N/A	N/A	N/A	N/A
Total	55	57	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/4/2025

Case Description: Challenger School Sports Complex - Painting

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)					
		Daytime	Evening	Night			
Homes to East	Residential	50.6	50.6	50.6			
Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)		No	40		77.7	640	0
Equipment		Calculated (dBA)		Results Day Lmax	Noise Limits (dBA)		
		*Lmax	Leq		Leq	Evening Lmax	Leq
Compressor (air)		55.5	51.5	N/A	N/A	N/A	N/A
Total		56	52	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)					
		Daytime	Evening	Night			
Homes to North	Residential	61.0	61.0	61.0			
Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)		No	40		77.7	870	0
Equipment		Calculated (dBA)		Results Day Lmax	Noise Limits (dBA)		
		*Lmax	Leq		Leq	Evening Lmax	Leq
Compressor (air)		52.9	48.9	N/A	N/A	N/A	N/A
Total		53	49	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

Operational Reference Noise Measurement Printouts

Serial Number	02509											
Model	831											
Firmware Version	2.000											
Filename	831_Data.009											
User	GT											
Job Description												
Location	Justin-Siena High School											
Measurement Description												
Start Time	Friday, 2011 October 21 19:25:33											
Stop Time	Friday, 2011 October 21 19:45:34											
Duration	00:20:00.7											
Run Time	00:20:00.7											
Pause	00:00:00.0											
Pre Calibration	Friday, 2011 October 21 19:18:27											
Post Calibration	None											
Calibration Deviation	---											
Note												
Approximately 70 feet from football field during football game												
61F, 83% humid, 30.09 in Hg, 4 mph wind, clear sky												
Overall Data												
LAeq											63.3	dB
LASmax	2011 Oct 21 19:29:35										77.0	dB
LZpeak (max)	2011 Oct 21 19:26:10										96.1	dB
LASmin	2011 Oct 21 19:31:02										51.6	dB
LCeq											67.4	dB
LAeq											63.3	dB
LCeq - LAeq											4.1	dB
LA1eq											67.9	dB
LAeq											63.3	dB
LA1eq - LAeq											4.6	dB
Ldn											63.3	dB
LDay 07:00-23:00											63.3	dB
LNight 23:00-07:00											---	dB
Lden											---	dB
LDay 07:00-19:00											---	dB
LEvening 19:00-23:00											63.3	dB
LNight 23:00-07:00											---	dB
LAE											94.1	dB
# Overloads											0	
Overload Duration											0.0	s
# OBA Overloads											0	
OBA Overload Duration											0.0	s
Statistics												
LAS5.00											68.2	dBA
LAS10.00											66.3	dBA
LAS33.30											62.4	dBA
LAS50.00											60.5	dBA
LAS66.60											58.8	dBA
LAS90.00											56.1	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)											65 / 292.3	s
LAS > 85.0 dB (Exceedence Counts / Duration)											0 / 0.0	s
LZpeak > 135.0 dB (Exceedence Counts / Duration)											0 / 0.0	s
LZpeak > 137.0 dB (Exceedence Counts / Duration)											0 / 0.0	s
LZpeak > 140.0 dB (Exceedence Counts / Duration)											0 / 0.0	s
Settings												
RMS Weight											A Weighting	
Peak Weight											Z Weighting	
Detector												
Preamp											PRM831	
Integration Method											Linear	
OBA Range											Low	
OBA Bandwidth											1/1 and 1/3	
OBA Freq. Weighting											Z Weighting	
OBA Max Spectrum											Bin Max	
											+0	dB
Under Range Limit											26.2	dB
Under Range Peak											77.9	dB
Noise Floor											17.1	dB
Overload											143.5	dB
1/1 Spectra												
Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	52.4	54.8	61.0	62.1	60.2	53.6	58.9	59.5	55.9	53.8	35.9	22.7
LZSmax	71.3	74.0	71.9	76.8	71.3	70.7	73.8	74.2	72.4	69.9	58.3	42.3
LZSmin	41.4	45.7	53.2	53.0	46.3	46.2	47.0	48.1	44.5	37.8	22.3	13.1

Table 1: Frequency and Power Spectral Density (PSD) Data													
Frequency (Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	PSD (dBm/Hz)	
LZSmin	46.7	45.2	49.9	49.1	49.1	51.4	55.4	56.6	56.8	57.0	57.3	57.7	
	69.9	65.4	68.1	66.6	66.7	72.9	69.3	66.4	70.1	74.4	75.1	71.5	
	33.1	34.4	35.5	37.8	39.4	41.7	43.4	42.3	43.3	47.4	47.3	48.2	
Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k	
	56.5	55.9	53.4	50.8	47.3	47.0	48.2	53.5	56.8	56.8	53.7	52.5	
	69.6	70.6	63.2	64.2	65.0	68.3	65.4	69.7	73.3	71.6	72.3	71.8	
LZSmin	48.6	47.9	45.1	42.4	39.8	37.9	38.2	42.1	42.3	42.0	42.0	41.1	
	Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
		52.6	50.7	49.9	49.6	51.4	37.7	34.1	29.8	25.4	20.6	16.4	12.6
71.9		68.7	70.6	69.3	69.1	58.3	57.0	51.9	41.8	40.6	36.5	33.9	
LZSmin	40.4	39.4	36.1	34.9	31.1	26.6	19.4	15.3	11.5	8.3	8.2	8.4	

	07 Dec 2010 00:05:22	
PRM831	21 Oct 2011 19:18:27	-25.9
PRM831	21 Oct 2011 11:49:55	-25.1
PRM831	20 Oct 2011 18:13:39	-24.9
PRM831	20 Oct 2011 15:24:54	-25.2
PRM831	16 Sep 2011 05:30:45	-26.0
PRM831	15 Sep 2011 20:04:18	-26.6
PRM831	26 Jul 2011 15:57:55	-25.7
PRM831	06 Jun 2011 10:37:42	-24.9
PRM831	07 Dec 2010 13:27:12	-25.8
PRM831	07 Dec 2010 08:57:27	-26.3
PRM831	07 Dec 2010 11:06:22	-26.4