Appendix H

Redlands Avenue East Industrial Project Noise Impact Analysis

Ganddini Group

August 27, 2021

REDLANDS AVENUE WEST INDUSTRIAL PROJECT NOISE IMPACT ANALYSIS

City of Perris

August 27, 2021

Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

REDLANDS AVENUE WEST INDUSTRIAL PROJECT NOISE IMPACT ANALYSIS

City of Perris

August 27, 2021

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Project No. 19370

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EXECUTIVE SUMMARY

The purpose of this report is to provide an assessment of the noise impacts associated with development and operation of the proposed Redlands Avenue West Industrial project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state and local policies, including those of the City of Perris.

Although this is a technical report, effort has been made to write the report clearly and concisely. A list of acronyms and glossary are provided in Appendix A and Appendix B of this report to assist the reader with technical terms related to noise analysis.

Project Location

The approximately 20.26-acre project site is located west of Redlands Avenue, approximately 1,000 feet south of Rider Street and north of Placentia Avenue, within the Perris Valley Commerce Center Specific Plan Area in the City of Perris, California. The site is currently vacant.

Project Description

The proposed project involves construction of a 330,447 square foot warehouse building with an additional 4,000 square foot mezzanine totaling 334,447 square feet of gross floor area. Three access driveways are proposed to provide access to the site via Redlands Avenue. The north and south project driveways will primarily serve truck traffic and the center driveway will serve passenger cars. A 14-foot block wall is proposed as part of the project along the western project property line and portions of the northern and southern property lines. The proposed project is anticipated to be constructed and fully operational by year 2023.

Construction Impacts

Modeled maximum construction noise levels ranged between 52.3 to 66.4 dBA L_{max} at the nearest residential property lines to the project site.

The project will be subject to Section 7.34.060 of the City of Perris Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM or on legal holidays, with the exception of Columbus Day and Washington's Birthday, or on Sundays and prohibits construction activity from exceeding 80 dBA Lmax in residential zones within the City.

Construction activities associated with the proposed project would take place within the allowable hours identified in Section 7.34.060 of the City of Perris Municipal Code and would not exceed the City's standard of 80 dBA L_{max} in residential zones. Impacts related to construction noise would be less than significant. Recommended measures to further minimize construction noise are presented in Section 7 of this report.

Noise Impacts to Off-Site Receptors Due to Project Generated Trips

Existing and Existing Plus project noise levels along acoustically significant area roadways were modeled utilizing FHWA Traffic Noise Prediction Model FHWA-RD-77-108 methodology in order to quantify the proposed project's contribution to increases in ambient noise levels.

Project generated vehicle traffic is anticipated to increase ambient noise levels by 0.13 to 2.58 dBA CNEL. Project generated increases in ambient noise levels would be less than 3 dBA CNEL and would be considered less than significant.

Noise Impacts to Off-Site Receptors Due to On-Site Operational Noise

Project operational noise is expected to range between 36 and 44 dBA CNEL and reach up to 66 dBA Lmax at nearby receptors. Project operation would not exceed the City's General Plan land use compatibility criteria of 60 dBA CNEL at adjacent residential land uses nor would it cause interior noise levels at nearby residential land uses to exceed the State of California interior noise level standard of 45 dBA CNEL. Per SoundPLAN noise modeling results, the maximum anticipated noise event associated with project operation may reach up to 66 dBA L_{max} at the property line of the nearest sensitive receptor and would not exceed the City daytime maximum noise level standard of 80 dBA but could exceed the City's nighttime maximum noise level standard of 60 dBA. Project operational noise would be less than significant with mitigation.

Operational Noise Mitigation Measure

1. Truck brake venting on the project site shall be prohibited between the hours of 10:PM and 7:00 AM.

Groundborne Vibration Impacts

Construction equipment is anticipated to be located at a distance of at least 26 feet or more from any receptor. Although groundborne vibration may be noticeable at the residential uses to the west of the project site, it would be short-term, would not cause homes to shake or rattle, nor would it exceed the vibration damage threshold of 0.25 PPV in/sec. Temporary vibration levels associated with project construction would be less than significant. Therefore, impacts associated with construction activities would be less than significant. No mitigation is required.

Recommended Construction Noise Reduction Measures

In addition to adherence to the City of Perris Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

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

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

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

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

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

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

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

1. INTRODUCTION

This section describes the purpose of this noise impact analysis, project location, proposed development, and study area. Figure 1 shows the project location map and Figure 2 illustrates the project site plan.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise impacts resulting from development of the proposed Redlands Avenue West Industrial project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state and local policies, including those of the City of Perris.

Although this is a technical report, effort has been made to write the report clearly and concisely. A list of acronyms and glossary are provided in Appendix A and Appendix B of this report to assist the reader with technical terms related to noise analysis.

PROJECT LOCATION

The approximately 20.26-acre project site is located west of Redlands Avenue, approximately 1,000 feet south of Rider Street and north of Placentia Avenue, within the Perris Valley Commerce Center Specific Plan Area in the City of Perris, California. The site is currently vacant. A vicinity map showing the project location is provided on Figure 1.

PROJECT DESCRIPTION

The proposed project involves construction of a 330,447 square foot warehouse building with an additional 4,000 square foot mezzanine totaling 334,447 square feet of gross floor area. Three access driveways are proposed to provide access to the site via Redlands Avenue. The north and south project driveways will primarily serve truck traffic and the center driveway will serve passenger cars. A 14-foot block wall is proposed as part of the project along the western project property line and portions of the northern and southern property lines. The proposed project is anticipated to be constructed and fully operational by year 2023. Figure 2 illustrates the project site plan.

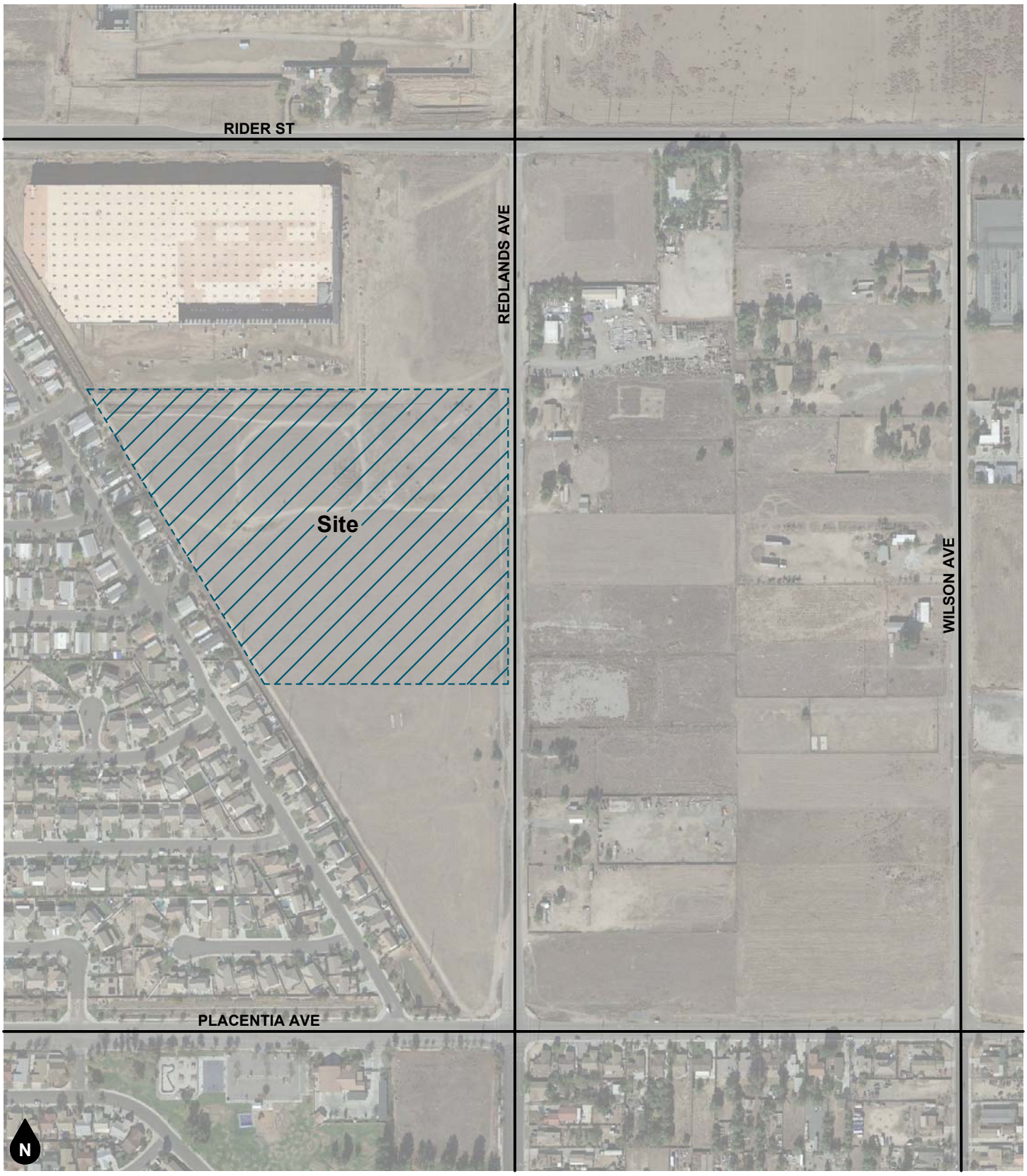


Figure 1
Project Location Map

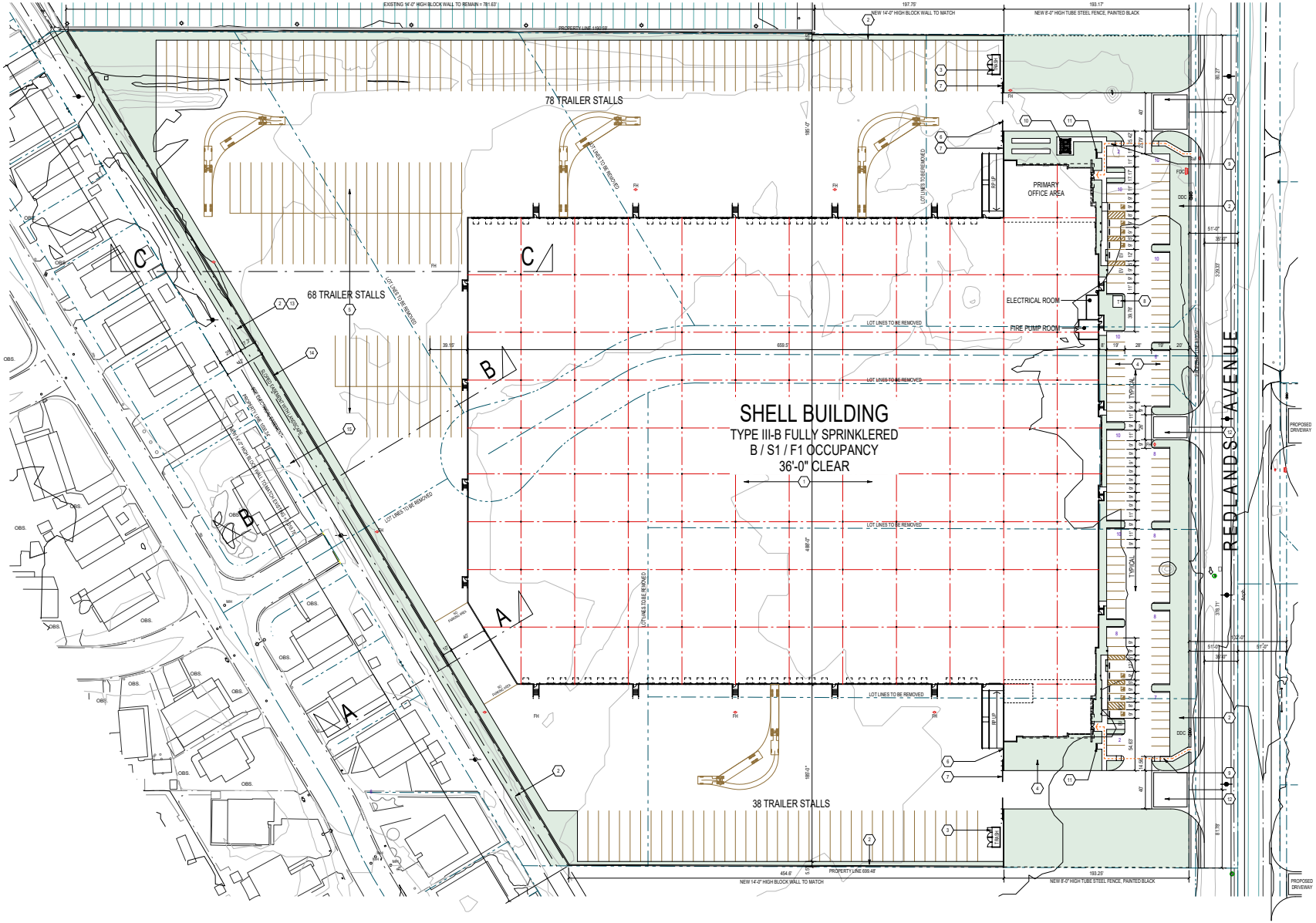


Figure 2
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

NOISE FUNDAMENTALS

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

Commonly used noise terms are presented in Appendix B. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dB(A) or dBA.

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

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease. Figure 3 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, or the equivalent noise level for that period of time. For example, $L_{eq(3\text{-}hr)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (DNL). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours. DNL is a very similar 24-hour average measure that weights only the nighttime hours.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation's Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013).

VIBRATION FUNDAMENTALS

The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. 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.

Compression waves, or P-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. Shear waves, or S-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 energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal in inches per second. The RMS of a signal is the average of the squared amplitude of the signal in vibration decibels (VdB), ref one micro-inch per second. The Federal Railroad Administration uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel.

PPV is appropriate for evaluating the potential of building damage and VdB is commonly used to evaluate human response. Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval. Figure 4 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in the figure, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually substantial unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.

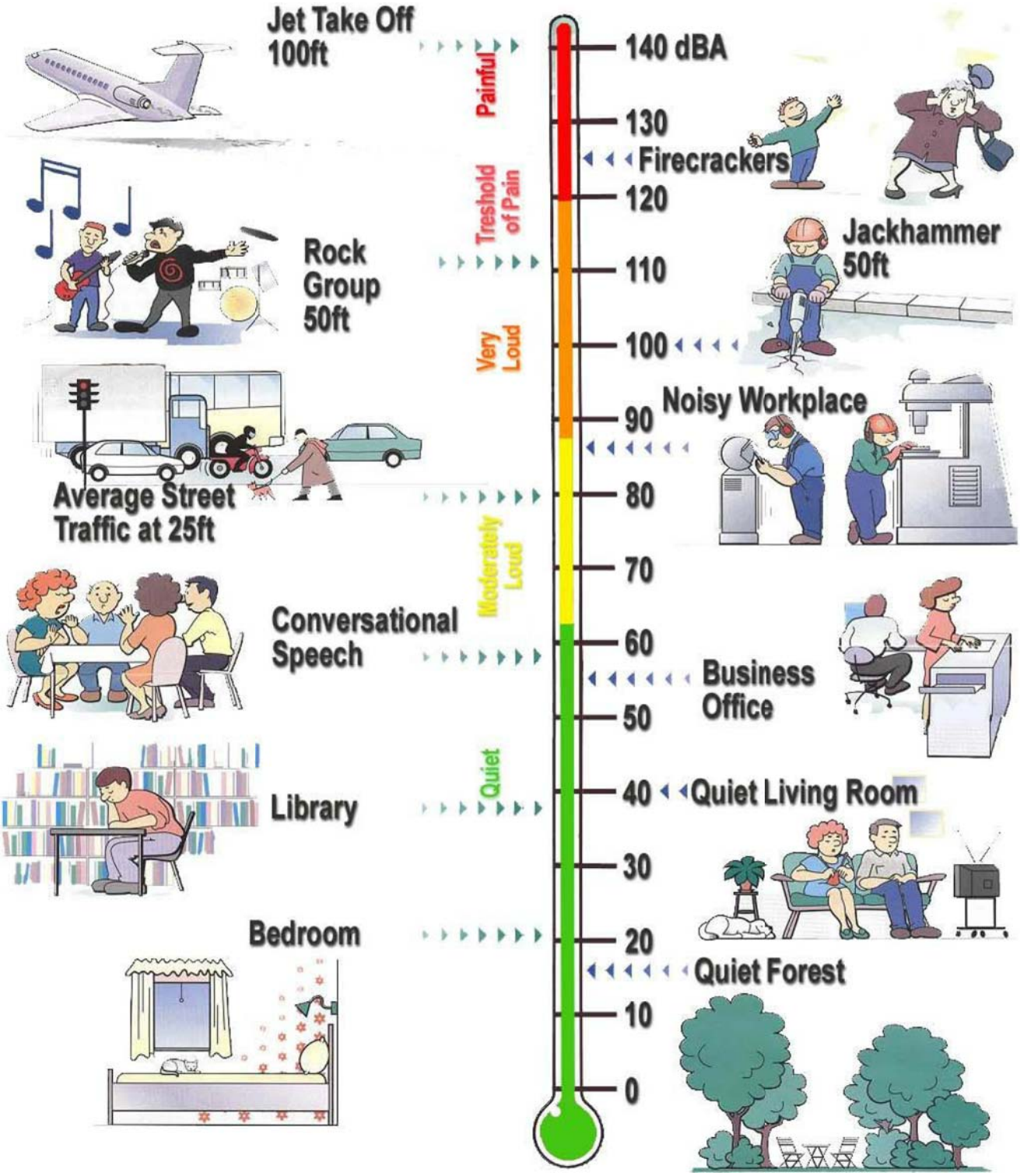
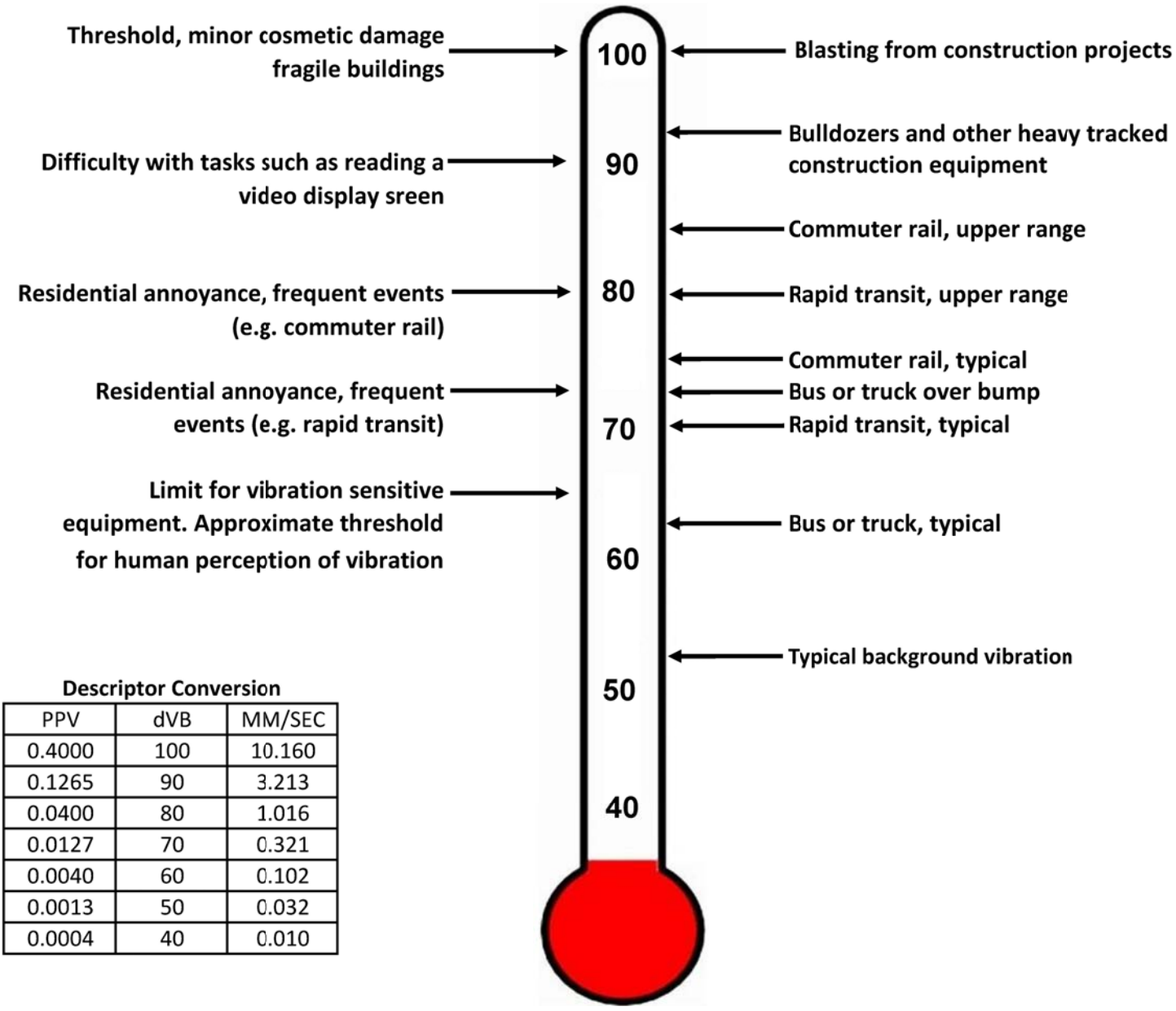


Figure 3
Weighted Sound Levels and Human Response

Source: Bruel & Kjaer 2001



Descriptor Conversion

PPV	dVB	MM/SEC
0.4000	100	10.160
0.1265	90	3.213
0.0400	80	1.016
0.0127	70	0.321
0.0040	60	0.102
0.0013	50	0.032
0.0004	40	0.010

Source: FRA, 2012. Federal Railroad Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment. Office of Railroad Policy Development, Washington, D.C. DOT/FRA/ORD-12/15. September.

Figure 4
Typical Levels of Groundborne Vibration

3. EXISTING NOISE ENVIRONMENT

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered by industrial and vacant land uses to the north, vacant land to the south, residential uses to the west, and Redlands Avenue to the east.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas. Existing sensitive land uses that may be affected by project noise include single-family residential and mobile home park uses adjacent to the project site to the west, and single-family residential uses located approximately 335 feet to the southeast, 1,055 feet southeast, 500 feet northeast, 697 feet east, and 780 feet north. Per a site visit on July 15, 2021 (Appendix C), the single-family residential uses located directly east of the project site, along the eastern side of Redlands Avenue, have been demolished.

AMBIENT NOISE MEASUREMENTS

Our noise measurement methodology is consistent with the methodology presented in both the Caltrans Technical Noise Supplement (TENS 2018) as well as the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018), "It is not necessary or recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for "clusters" of sites based on measurements or estimates at representative locations in the community."

An American National Standards Institute (ANSI Section SI.4 2014, Class 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. In order to document existing ambient noise levels in the project area, four (4) 15-minute daytime noise measurements were taken between 12:55 PM and 3:20 PM on July 15, 2021, and two (2) 15-minute daytime noise measurements were taken between 1:06 PM and 1:57 PM on July 19, 2021. In addition, two (2) long-term 24-hour noise measurement were also taken from July 15, 2021, to July 16, 2021, and July 19, 2021, to July 20, 2021. Field worksheets and noise measurement output data are included in Appendix C. As shown on Figure 5, existing ambient noise measurements were taken at the following locations:

- STNM1: Noise measurement was taken near the residential uses located adjacent to the west of the project site (2977 and 2997 Lake View Drive, Perris).
- STNM2: Noise measurement was taken near the residential uses located approximately 1,072 feet to the southeast of the project site along the southern side of Placentia Avenue (431 Placentia Avenue, Perris).
- STNM3: Noise measurement was taken near the residential use located approximately 335 feet to the southeast of the project site (2865 Redlands Avenue, Perris).
- STNM4: Noise measurement was taken near the residential land uses located approximately 695 feet to the east of the project site along Wilson Avenue (2980 and 3040 Wilson Avenue, Perris).
- STNM5: Noise measurement was taken to the east of the project site near recently demolished residential uses (3085 Redlands Avenue, Perris).
- STNM6: Noise measurement was taken near the residential land uses located to the north of the project site along Rider Street (336 E Rider Street, Perris).
- LTNM1: Noise measurement was taken near the center of the project site.
- LTNM2: Noise measurement was taken to the southeast of the project site near the existing residential land use to the southeast (2865 Redlands Avenue, Perris).

Table 1 provides a summary of the short-term ambient noise data. Table 2 and Table 3 provide hourly interval ambient noise data from the long-term noise measurements. Measured short-term ambient noise levels ranged between 49.6 and 68.3 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 41 to 61.2 dBA L_{eq} (LTNM1) and 47.7 to 60.9 dBA L_{eq} (LTNM2). The dominant noise source in the project vicinity was vehicle traffic associated with Lake View Drive, Redlands Avenue, Riders Street, Placentia Avenue, Wilson Avenue, and other surrounding roadways.

Table 1
Short-Term Noise Measurement Summary (dBA)

Daytime Measurements[1,2]								
Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
STNM1	12:55 PM	49.6	68.2	38.7	59.6	51.7	46.5	44.1
STNM2	1:46 PM	64.9	83.8	42.9	74.9	68.4	59.3	52.1
STNM3	2:23 PM	67.9	87.1	41.0	76.5	73.0	67.3	53.9
STNM4	3:05 PM	61.8	77.0	42.2	71.6	67.7	59.1	51.3
STNM5	1:06 PM	67.3	79.6	41.2	75.7	73.5	67.2	55.9
STNM6	1:42 PM	68.3	84.7	48.2	77.5	72.9	67.6	60.9

Notes:

(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.

(2) STNM1 through STNM4 were performed on July 15, 2021 and STNM5 through STNM6 were performed on July 19, 2021.

Table 2
Long-Term Noise Measurement Summary (LTNM1) (dBA)

24-Hour Ambient Noise[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	6:00 PM	53.7	90.2	32.8	55.0	51.0	47.7	44.4
1	6:00 PM	59.7	87.9	42.6	56.3	51.7	49.6	48.0
2	7:00 PM	49.6	67.6	42.1	54.9	51.9	49.8	48.2
3	8:00 PM	60.4	90.2	40.3	55.5	51.2	48.5	46.8
4	9:00 PM	47.9	66.4	39.2	53.2	49.7	47.0	45.0
5	10:00 PM	55.7	77.4	38.8	64.7	52.2	47.1	44.5
6	11:00 PM	45.0	59.4	33.9	53.1	48.9	45.1	41.3
7	12:00 AM	42.3	58.3	32.8	51.0	46.9	40.8	37.9
8	1:00 AM	41.0	55.7	34.2	49.7	44.2	39.7	37.8
9	2:00 AM	41.3	55.3	33.5	49.7	45.1	40.0	37.7
10	3:00 AM	43.9	64.5	33.1	51.3	47.5	42.8	39.6
11	4:00 AM	47.0	59.7	38.2	54.0	50.7	47.4	44.5
12	5:00 AM	48.5	67.3	39.1	54.2	51.7	49.1	47.2
13	6:00 AM	47.4	61.6	38.0	54.2	51.5	48.1	45.1
14	7:00 AM	43.0	57.9	36.2	49.2	46.2	43.3	41.2
15	8:00 AM	51.2	73.9	35.9	58.2	47.6	42.7	40.4
16	9:00 AM	53.5	75.3	35.7	60.0	49.0	43.5	41.1
17	10:00 AM	44.3	63.3	35.6	51.3	46.4	42.4	39.9
18	11:00 AM	48.1	68.8	36.2	55.3	48.1	43.2	40.8
19	12:00 PM	48.3	70.2	36.3	57.0	48.9	45.2	43.2
20	1:00 PM	45.8	57.7	39.4	51.0	48.9	46.5	44.7
21	2:00 PM	47.7	58.5	41.1	53.1	50.8	48.3	46.4
22	3:00 PM	49.8	63.2	42.0	56.4	52.9	50.1	48.0
23	4:00 PM	61.2	85.9	42.5	67.5	55.9	52.5	50.3
24	5:00 PM	58.5	86.1	41.1	55.0	52.1	49.9	48.2

Notes:

(1) See Figure 5 for noise measurement locations. Noise measurement was performed over a 24-hour duration.

(2) Noise measurement performed from July 15, 2021 to July 16, 2021.

Table 3
Long-Term Noise Measurement Summary (LTNM2) (dBA)

24-Hour Ambient Noise[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	4:00 PM	55.7	89.0	35.6	62.9	57.4	53.1	48.5
1	4:00 PM	54.5	66.3	42.8	60.4	58.3	55.6	52.8
2	5:00 PM	55.6	70.5	43.9	61.6	59.1	56.4	53.7
3	6:00 PM	54.2	68.4	43.4	60.8	58.4	55.1	51.9
4	7:00 PM	53.7	70.1	41.9	60.8	57.9	54.1	50.4
5	8:00 PM	60.8	89.0	39.8	61.8	57.4	53.4	48.8
6	9:00 PM	58.7	78.9	38.3	68.7	58.8	52.8	46.9
7	10:00 PM	51.5	66.8	38.7	59.5	56.4	51.6	45.4
8	11:00 PM	47.7	64.2	37.1	56.5	53.0	46.3	42.1
9	12:00 AM	52.7	67.6	35.8	63.0	58.8	48.8	40.5
10	1:00 AM	53.9	83.1	37.1	63.5	56.9	44.4	40.3
11	2:00 AM	55.5	75.9	37.1	66.1	56.8	45.9	41.9
12	3:00 AM	60.1	77.6	39.1	70.3	66.1	55.5	45.8
13	4:00 AM	53.1	74.6	41.2	60.5	56.6	52.4	48.3
14	5:00 AM	53.3	67.8	44.0	59.4	57.1	54.1	51.2
15	6:00 AM	53.4	74.2	44.2	59.6	56.9	53.3	50.2
16	7:00 AM	50.2	65.7	36.6	57.5	55.0	50.9	45.9
17	8:00 AM	53.8	72.8	35.7	61.4	55.4	51.5	45.1
18	9:00 AM	52.1	73.6	35.6	59.2	53.7	49.5	43.8
19	10:00 AM	54.1	77.9	36.6	61.2	55.0	50.6	45.7
20	11:00 AM	51.3	71.0	39.1	58.2	55.1	51.4	46.7
21	12:00 PM	60.9	78.7	41.7	73.1	60.3	53.9	49.9
22	1:00 PM	56.0	77.9	41.9	61.8	56.9	53.3	49.7
23	2:00 PM	54.9	74.2	42.1	62.1	57.1	53.7	50.4
24	3:00 PM	55.0	75.6	40.7	61.1	57.5	54.3	50.8

Notes:

(1) See Figure 5 for noise measurement locations. Noise measurement was performed over a 24-hour duration.

(2) Noise measurement performed from July 19, 2021 to July 20, 2021.

Legend

⊕ NM 1 Noise Measurement Location

ST NM Short-Term Noise Measurement

LT NM Long-Term Noise Measurement

Figure 5
Noise Measurement Location Map

4. REGULATORY SETTING

FEDERAL REGULATION

Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In addition, the Levels of Environmental Noise identified five (5) dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA Ldn (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

STATE REGULATIONS

State of California General Plan Guidelines 2017

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project. The City of Perris has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see Table 4).

California Environmental Quality Act

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

Would the project result in?

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

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

Project Construction Noise: Construction noise sources are regulated within the City of Perris under Section 7.34.060 of the City's Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM. Construction activities are not permitted on a legal holiday, with the exception of Columbus Day and Washington's Birthday, or on Sundays. Section 7.34.060 also prohibits construction activity from exceeding 80 dBA L_{max} in residential zones within the City.

Project Operational Noise (permanent): The proposed project has the potential to generate on-site and off-site noise. For on-site generated noise, the Noise Element of the City of Perris General Plan identifies noise levels of up to 60 CNEL at existing sensitive receptors as the exterior noise standard. The State of California Building Code requires interior noise levels for multi-family residential land uses to not exceed 45 dBA CNEL. In addition, Section 7.34.040 of the Noise Ordinance prohibits the generation of amplified sound (music and/or human voice) beyond the property line of the property from which the sound emanates that exceeds 80 dBA L_{max} from 7:01 AM to 10:00 PM or 60 dBA L_{max} from 10:01 PM to 7:00 AM at the property line of any residential neighborhood.

For off-site project generated noise, increases in ambient noise could occur along affected roadways due to project generated vehicle traffic. The proposed project site is located within the Perris Valley Commerce Center Specific Plan (PVCCSP) planning area of the City of Perris. The PVCCSP was adopted by the City of Perris on January 12, 2012 (Ordinance No. 1284). Environmental impacts resulting from implementation of allowed development under the PVCCSP have been evaluated in the Perris Valley Commerce Center Specific Plan Final Environmental Impact Report (PVCCSP EIR) (State Clearinghouse No. 2009081086), which was certified by the City of Perris in January 2012. The PVCCSP EIR is a program EIR and project-specific evaluations in later-tier environmental documents for individual development projects within the Specific Plan area was anticipated.

Pursuant to the PVCCSP EIR, project roadway noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development.

When the resulting noise levels at noise-sensitive land uses (e.g., residential, etc.):

1. are less than 60 dBA CNEL and the project creates a 5 dBA CNEL or greater Project-related level increase: or

2. exceed 60 dBA CNEL and the project creates a 3 dBA CNEL or greater project-related noise level increase.

b) Generate excessive groundborne vibration or groundborne noise levels?

As shown in Table 5, the threshold at which there is a risk to "architectural" damage to historic and some older buildings is a peak particle velocity (PPV) of 0.25 in/sec, at older residential structures a PPV of 0.3 in/sec, and at new residential structures a PPV of 0.5 in/sec. Table 6 shows that, in regards to vibrational annoyance, groundborne vibration becomes distinctly perceptible at a PPV of 0.04 in/sec, strongly perceptible at a PPV of 0.1 in/sec, and severe at a PPV of 0.4 in/sec. Impacts would be significant if construction activities result in groundborne vibration of 0.25 in/sec PPV or higher at a sensitive receptor. Impacts related to annoyance would be considered significant if the groundborne vibration exceeded 0.4 in/sec., occurs outside of the allowed hours for construction activities per City Code 7.34.060 or affects the operation of sensitive equipment.

California Department of Transportation (Caltrans)

The California Department of Transportation has published one of the seminal works for the analysis of ground-borne noise and vibration relating to transportation- and construction-induced vibrations and although the project is not subject to these regulations, it serves as useful tools to evaluate vibration impacts. These guidelines recommend that a standard of 0.25 inches per second (in/sec) PPV not be exceeded for the protection of historic and some old buildings (California Department of Transportation, 2020).

LOCAL REGULATIONS

City of Perris General Plan

Applicable policies and standards governing environmental noise in the City of Perris are set forth in the General Plan Noise Element. Those applicable to the proposed project are presented below:

Goals, Policies, and Implementation Measures

The City of Perris utilizes the following General Plan Noise Element goal, policies, and implementation measures to assess evaluate the project's suitability in light of noise impacts.

Goal-1: Land Use Siting: Future land uses compatible with projected noise environments.

Policy I.A:
The State of California Noise/Land Use Compatibility Criteria shall be used in determining land use compatibility for new development.

Implementation Measures
I.A.1 All new development proposals will be evaluated with respect to the State Noise/Land Use Compatibility Criteria. Placement of noise sensitive uses will be discouraged within any area exposed to exterior noise levels that fall into the "Normally Unacceptable" range and prohibited within areas exposed to "Clearly Unacceptable" noise ranges.

Goal-V: Stationary Source Noise Future non-residential land uses compatible with noise sensitive land uses.

Policy V.A:
New large scale commercial or industrial facilities located within 160 feet of sensitive land uses shall mitigate noise impacts to attain an acceptable level as required by the State of California Noise/Land Use Compatibility Criteria.

Implementation Measures
V.A.1 An acoustical impact analysis shall be prepared for new industrial and large-scale commercial facilities to be constructed within 160 feet of the property line of any existing noise sensitive land use. This analysis

shall document the nature of the commercial or industrial facility as well as all interior or exterior facility operations that would generate exterior noise. The analysis shall document the placement of any existing or proposed noise-sensitive land uses situated within the 160-foot distance. The analysis shall determine the potential noise levels that could be received at these sensitive land uses and specify specific measures to be employed by the large scale commercial or industrial facility to ensure that these levels do not exceed 60 dBA CNEL at the property line of the adjoining sensitive land use. No development permits or approval of land use applications shall be issued until the acoustic analysis is received and approved by the City of Perris Staff.

City of Perris Municipal Code

Chapter 7.34 of the City's Municipal Code establishes base ambient noise levels and establishes maximum noise level limits for stationary noise sources.

7.34.040 Sound Amplification

No person shall amplify sound using sound amplifying equipment contrary to any of the following:

1. The only amplified sound permitted shall be either music or the human voice, or both.

2. The volume of amplified sound shall not exceed the noise levels set forth in this subsection when measured outdoors at or beyond the property line of the property from which the sound emanates.

Time Period	Maximum Noise Level
10:01 PM – 7:00 AM	50 dBA
7:01 AM – 10:00 PM	80 dBA

7.34.050 General Prohibition

(a) It unlawful for any person to willfully make, cause or suffer, or permit to be made or caused, any loud excessive or offensive noises or sounds which unreasonably disturb the peace and quiet of any residential neighborhood or which are physically annoying to persons of ordinary sensitivity or which are so harsh, prolonged or unnatural or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of the city, or any section thereof. The standards for dBA noise level in section 7.34.040 shall apply to this section. To the extent that the noise created causes the noise level at the property line to exceed the ambient noise level by more than 1.0 decibels, it shall be presumed that the noise being created also is in violation of this section.

(b) The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include, but not be limited to, the following:

(1) The level of the noise;
(2) Whether the nature of the noise is usual or unusual;
(3) Whether the origin of the noise is natural or unnatural;
(4) The level of the ambient noise;
(5) The proximity of the noise to sleeping facilities;
(6) The nature and zoning of the area from which the noise emanates and the area where it is received;
(7) The time of day or night the noise occurs;
(8) The duration of the noise; and
(9) Whether the noise is recurrent, intermittent or constant.

7.34.060 Hours of Construction

It is unlawful for any person between the hours of 7:00 PM of any day and 7:00 AM of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect,

construct, demolish, excavate, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. Construction activity shall not exceed 80 dBA L_{max} in residential zones in the City of Perris.

7.34.070 Refuse vehicles and parking lot sweepers

No person shall operate or permit to be operated a refuse compacting, processing or collection vehicle or parking lot sweeper between the hours of 7:00 PM to 7:00 AM in any residential area unless a permit has been applied for and granted by the city.

7.34.080 Disturbing, excessive, offensive noises; declaration of certain acts constituting.

The following activities, among others, are declared to cause loud, disturbing, excessive or offensive noises in violation of this section and are unlawful, namely:

(7) Leaf blowers
   a. The term "leaf blower" means any portable, hand-held or backpack, engine-powered device with a nozzle that creates a direct able airstream which is capable of and intended for moving leaves and light materials.
   b. No person shall operate a leaf blower in any residential zoned area between the hours of 7:00 PM and 8:00 AM on weekdays and 5:00 PM and 9:00 AM on weekends or on legal holidays.
   c. No person may operate any leaf blower at a sound level in excess of 80 decibels measured at a distance of 50 feet or greater from the point of noise origin.

Leaf blowers shall be equipped with functional mufflers and an approved sound limiting device required to ensure that the leaf blower is not capable of generating a sound level exceeding any limit prescribed in this section.

19.51.080 Noise

Chapter 19.51 of the City's Municipal Code establishes noise levels and regulations for land uses within the March ARB/IP Airport Overlay Zone (MAOZ).

Airport Related Noise. Noise compatibility standards are intended to prevent the establishment of noise-sensitive land uses in portions of the airport environ that are exposed to significant levels of aircraft noise. Where permitted within the Airport Overlay Zone (AOZ), the following noise-sensitive land uses shall comply with applicable noise exposure criteria:

1) All new residences, schools, libraries, museums, hotels and motels, hospitals and nursing homes, places of worship, and other noise-sensitive uses must have sound attenuation features incorporated into the structures sufficient to reduce interior noise levels from exterior aviation-related sources to no more than CNEL 40 dB. This requirement is intended to reduce the disruptiveness of loud individual aircraft noise events upon uses in this zone and represents a higher standard than the CNEL 45 dB standard set by state and local regulations and the Riverside County ALUC policy.

2) Office space must have sound attenuation features sufficient to reduce the exterior aviation-related noise level to no more than CNEL 45 dB. To ensure compliance with these criteria, an acoustical study shall be required to be completed for any development proposed to be situated where the aviation-related noise exposure is more than 20 dB above the interior standard (e.g., within the CNEL 60 dB contour where the interior standard is CNEL 40 dB).

3) Standard building construction is presumed to provide adequate sound attenuation where the difference between the exterior noise exposure and the interior standard is 20 dB or less.

Table 4
City of Perris Land Use Compatibility Guidelines for Noise

Land Use Category	Community Noise Equivalent Level (CNEL)						
	55	60	65	70	75	80	85
Residential: Low Density Single Family, Duplex, Mobile Homes							
Residential: Multi-Family							
Commercial: Hotels/Motels, Transient Lodging							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheatres, Meeting Halls							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional, and Mixed-Use Developments							
Industrial, Manufacturing Utilities, Agriculture							

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

Notes:
Source: California Governor's Office of Planning and Research, State of California General Plan Guidelines, Appendix C: Guidelines for the Preparation and Content of Noise Elements of the General Plan, February 1976 and City of Perris General Plan, 2005.

Table 5
Guideline Vibration Damage Potential Threshold Criteria

Structure Condition	Maximum PPV (in/sec)	
	Transient Sources[1]	Continuous/Frequent Intermittent Sources[1]
Extremely fragile historic buildings, ruins, anceint monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 19, April 2020.

(1) Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 6
Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 20, April 2020.

(1) Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

This section discusses the analysis methodologies used to assess noise impacts.

CONSTRUCTION NOISE MODELING

Construction noise associated with the proposed project was calculated at the sensitive receptor locations, utilizing methodology presented in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site. Distances to receptors were based on the acoustical center of the project site. The equipment used to calculate the construction noise levels for each phase were based on the assumptions provided in the CalEEMod modeling in the Air Quality, Global Climate Change, HRA, and Energy Impact Analysis prepared for the proposed project (Ganddini Group, Inc., 2021). For construction noise purposes, the distance measured from the project site to sensitive receptors was assumed to be the acoustical center of the project site to the property line of residential properties with existing residential buildings. Construction noise worksheets are provided in Appendix D.

FEDERAL HIGHWAY ADMINISTRATION (FHWA) TRAFFIC NOISE PREDICTION MODEL

Increases in ambient noise levels associated with project generated vehicular traffic were modeled utilizing a computer program that replicates the FHWA Traffic Noise Prediction Model FHWA-RD-77-108. The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emissions Levels.[1] Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification (i.e., collector, secondary, major or arterial), the roadway active width (i.e., distance between the center of the outermost travel lanes on each side of the roadway), travel speed, truck mix (i.e., percentage of automobiles, medium trucks, and heavy trucks in the traffic volume), roadway grade and site conditions (hard or soft ground surface relating to the absorption of the ground, pavement, or landscaping). Research conducted by Caltrans identifies that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model.[2] Therefore, surfaces adjacent to all modeled roadways were assumed to have a "soft site". Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Existing and Existing Plus Project average daily trips and project vehicle mix were obtained from the project's traffic study (Ganddini Group 2021). Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions. FHWA spreadsheets are included in Appendix E.

SOUNDPLAN NOISE MODEL

The SoundPLAN acoustical modeling software was utilized to model worst-case stationary noise impacts associated with project operation at adjacent sensitive uses (e.g., residences). SoundPLAN is capable of evaluating stationary noise sources (e.g., parking lots, drive-thru menus, carwash equipment, vacuums, etc.) and much more. The SoundPLAN software utilizes algorithms (based on the inverse square law) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations. In addition to the information provided below, noise modeling input and outputs assumptions are provided in Appendix F.

[1] California Department of Transportation Environmental Program, Office of Environmental Engineering. Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction. September 1995. TAN 95-03.

[2] California Department of Transportation. Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report. June 1995. FHWA/CA/TL-95/23.

The CNEL as well as the expected maximum noise level associated with project operation was modeled utilizing representative sound levels in the SoundPLAN model. Modeled noise sources include vehicle movement/parking lot noise, loading and unloading areas, and HVAC equipment. All noise sources were modeled to be in full operation during daytime and evening hours.

Parking Lot Noise

Parking lot noise was calculated using SoundPLAN methodology. Specifically, the traffic volume of the parking lot is entered with the number of moves per parking, the hour and the number of parking bays. The user defines whether the parking lots are for automobiles, motorcycles, or trucks, and the emission level of a parking lot is automatically adjusted accordingly. The values for the number of parking moves for each time slice is the number of parking moves per reference unit (most often per parking bay), averaged for the hour[3].

SoundPLAN utilizes parking lot noise emission levels from the 6th revised edition of the parking lot study "Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus Stations as well as of Multi-Story Car Parks and Underground Car Parks" published by the Bavarian Landesamt für Umwelt provides calculation methods to determine the emissions of parking lots.

The parking lot emission table documents the reference level (Lw, ref) from the parking lot study.

Lw, ref = Lw0 + KPA + KI + KD + KStrO + 10 log(B) [dB(A)]

With the following parameters:

Lw0 = Basic sound power, sound power level of one motion / per hour on P+R areas = 63 dB(A)
KPA = Surcharge parking lot type
KI = Surcharge for impulse character
KD = Surcharge for the traffic passaging and searching for parking bays in the driving lanes 2,5 * lg (f * B - 9)
f = Parking bays per unit of the reference value
B = Reference value
KStrO = Surcharge for the road surface

A maximum noise event associated with the maximum noise level for loading/unloading and the release of air brakes (110 L_w)[4] was utilized to model maximum noise levels at nearby sensitive receptors. Horns, car alarms, trash trucks and trailers being hitched and unhitched would cause loud, but less loud noise events in the parking and truck loading/unloading areas.

Loading/Unloading

The proposed loading area was modeled using a sound reference level for loading/unloading of pallet/ramp with a sound power level of 92 dB per meter.

Mechanical Equipment (HVAC Units) Noise

A noise reference level of 67.7 dBA at 3 feet (sound power level of 78.7 dB) was utilized to represent rooftop 5 Ton Carrier HVAC units[5]. A rooftop HVAC plan is not available at the time of this analysis so the exact location and number of units per building were estimated. A total of 22 rooftop units were modeled on the proposed rooftops. The noise source height for each HVAC unit was assumed at 1 meter above the roof top. Roof top is assumed to be approximately 42 feet above grade.

[3] SoundPLAN Essential 4.0 Manual. SoundPLAN International, LLC. May 2016.
[4] SoundPLAN Noise Model Library Version 8.2. February 10, 2020.
[5] MD Acoustics, LLC Noise Measurement Data for RTU –Carrier 50TFQ0006 and car alarm.

6. IMPACT ANALYSIS

This impact discussion analyzes the potential for noise and/or groundborne vibration impacts to cause the exposure of a person to, or generation of, noise levels in excess of established City of Perris standards related to construction, operation, and transportation noise related impacts to, or from, the proposed project.

IMPACTS RELATED TO CONSTRUCTION NOISE

The existing residential uses located to the west, southeast, and north of the project site may be affected by short-term noise impacts associated with construction noise.[6] Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work.

The construction phases for the proposed project are anticipated to include grading, building construction, paving and architectural coating. A summary of noise level data for a variety of construction equipment compiled by the U.S. Department of Transportation is presented in Table 7. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings.

Construction noise associated with the proposed project was calculated utilizing methodology presented in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site. Distances to receptors were based on the acoustical center of the proposed construction activity. Construction noise levels were calculated for each phase. Anticipated noise levels during each construction phase are presented in Table 8. Worksheets for each phase are included as Appendix D.

Modeled maximum construction noise levels ranged between 52.3 to 66.4 dBA L_{max} at the nearest residential property lines to the project site. Section 7.34.060 of the City's municipal code prohibits construction activity from exceeding 80 dBA L_{max} in residential zones within the City. Project construction noise will not exceed the City's construction noise threshold of 80 dBA L_{max} at nearby residential uses.

Compliance with Section 7.34.060 of the City's Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM Monday through Saturday, and construction activities on legal holidays, with the exception of Columbus Day and Washington's Birthday, will avoid construction noise impacts during sensitive nighttime hours.

Impacts related to construction noise would be less than significant. Recommended measures to further minimize construction noise are presented in Section 7 of this report.

NOISE IMPACTS TO OFF-SITE RECEPTORS DUE TO PROJECT GENERATED TRIPS

During operation, the proposed project is expected to generate approximately 605 average daily trips with 51 trips during the AM peak-hour and 51 trips during the PM peak-hour. A project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. Traffic noise levels were calculated at the right of way from the centerline of the analyzed roadway. The modeling is theoretical

[6] The construction analysis conducted for this project originally evaluated project construction noise levels at residential receptors to the east (along western side of Wilson Avenue) and northeast (along southern side of Rider Street); however, as shown in Google Earth imagery, since then these existing residential uses have been demolished. As the area is designated and zoned for Light Industrial in the Perris Valley Commerce Center Specific Plan (PVCCSP), it can be assumed that the potential new development on these parcels would not be that of residential use/sensitive receptors. Therefore, the evaluation of construction impacts at these receptor locations have now been removed from the analysis.

and does not take into account any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the levels are shown for comparative purposes only to show the difference in with and without project conditions. Roadway input parameters including average daily traffic volumes (ADTs), speeds, and vehicle distribution data is shown in Table 9. The potential off-site noise impacts caused by an increase of traffic from operation of the proposed project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions and is demonstrated in Table 9.

Existing Year (With Project): This scenario refers to existing year plus project traffic noise conditions and is demonstrated in Table 9.

As shown in Table 10, modeled Existing traffic noise levels range between 66-73 dBA CNEL at the right-of-way of each modeled roadway segment: and the modeled Existing Plus Project traffic noise levels range between 67-73 dBA CNEL at the right-of-way of each modeled roadway segment.

Pursuant to the PVCCSP EIR, project roadway noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development.

When the resulting noise levels at noise-sensitive land uses (e.g., residential, etc.):

1. are less than 60 dBA CNEL and the project creates a 5 dBA CNEL or greater Project-related level increase: or

2. exceed 60 dBA CNEL and the project creates a 3 dBA CNEL or greater project-related noise level increase.

Project generated vehicle traffic is anticipated to increase ambient noise levels by 0.13 to 2.58 dBA CNEL. Project generated increases in ambient noise levels would be less than 3 dBA CNEL and would be considered less than significant.

NOISE IMPACTS TO OFF-SITE RECEPTORS DUE TO ON-SITE OPERATIONAL NOISE

Existing sensitive land uses that may be affected by project noise include single-family residential and mobile home park uses adjacent to the project site to the west, and single-family residential uses located approximately 335 feet to the southeast, 1,055 feet southeast, 500 feet northeast, 697 feet east, and 780 feet north. Per a site visit on July 15, 2021 (Appendix C), the single-family residential uses located directly east of the project site, along the eastern side of Redlands Avenue, have been demolished.

Noise standards that apply to operational noise as discussed in Section 4 of this report are as follows:

- Exterior noise levels of up to 60 CNEL at residential land uses are considered "normally acceptable" The proposed project may result in a significant impact if it causes noise levels at residential land uses to exceed 60 dBA CNEL.

- The State of California Building Code requires interior noise levels for multi-family residential land uses to not exceed 45 dBA CNEL. The project may result in a significant impact if it causes interior noise levels at residential land uses to exceed 45 dBA CNEL.

- Amplified sound (music and/or human voice) beyond the property line of the property from which the sound emanates that exceeds 80 dBA L_{max} from 7:01 AM to 10:00 PM or 60 dBA L_{max} from 10:01

PM to 7:00 AM at the property line of any residential neighborhood is prohibited. The project may result in a significant impact if it results in maximum noise events that exceed 80 dBA.

The SoundPLAN noise model was utilized to calculate the community noise equivalent noise level (CNEL) associated with project operational noise as well as the expected maximum noise level at the nearest sensitive receptors. The modeling effort was very conservative as it was assumed that peak hour operation would occur every hour of the 24-hour period. A 14-foot block wall along the western project property line and portions of the northern and southern property lines, as shown in Figures 6 through 9, is proposed as part of the project. A description of each noise source and model parameters are discussed in Section 5 of this report.

Operational Noise Levels - CNEL

As shown on Figures 6 and 7 and in Table 11, project operation is expected to range between 36 and 44 dBA CNEL at the property line of nearby receptors. Project operation would not exceed the City's General Plan land use compatibility criteria of 60 dBA CNEL at adjacent residential land uses.[7] Residential construction typically provides an exterior to interior noise reduction of 20 dB with a windows-closed condition. Project operation is not expected to exceed the State of California interior noise level standard of 45 dBA CNEL (State of California 2019) at nearby residences. This impact would be less than significant. No mitigation is required.

Operational Noise Levels - Lmax

As discussed previously, Section 7.34.040 of the City's Noise Ordinance prohibits the generation of amplified sound (music and/or human voice) beyond the property line of the property from which the sound emanates that exceeds 80 dBA L_{max} from 7:01 AM to 10:00 PM or 60 dBA L_{max} from 10:01 PM to 7:00 AM at the property line of the property from which the sound emanates. Section 7.34.050 applies these noise standards to any noise in a residential neighborhood. A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near a sensitive receptor. As shown in Figures 8 and 9 and in Table 12, maximum operational noise levels may reach up to 66 dBA L_{max} at the nearest sensitive receptor. Operation of the proposed project would not result in activities that would cause maximum noise events that exceed the daytime noise standard of 80 dBA L_{max} but may exceed the nighttime noise standard of 60 dBA L_{max}. This impact would be less than significant with mitigation. A measure prohibiting the venting of brakes between the hours of 7:00 AM and 10:00 PM has been added as a mitigation measure in Section 8 of this report.

GROUNDBORNE VIBRATION IMPACTS

There are several types of construction equipment that can cause vibration levels high enough to annoy persons in the vicinity and/or result in architectural or structural damage to nearby structures and improvements. For example, as shown in Table 13, a vibratory roller could generate up to 0.21 PPV at a distance of 25 feet; and operation of a large bulldozer (0.089 PPV) at a distance of 25 feet (two of the most vibratory pieces of construction equipment). Groundborne vibration at sensitive receptors associated with this equipment would drop off as the equipment moves away. For example, as the vibratory roller moves further than 100 feet from the sensitive receptors, the vibration associated with it would drop below 0.0026 PPV. It should be noted that these vibration levels are reference levels and may vary slightly depending upon soil type and specific usage of each piece of equipment.

Annoyance to Persons

The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary

[7] When combined with measured ambient noise levels the operational noise level at Receptor R5, as shown in Figures 6 and 7 and Table 11, exceeds 60 dBA CNEL. However, this is due to the existing measured ambient noise level being above 60 dBA CNEL,. Project operational noise levels are below 60 dBA CNEL. Furthermore, the residential use in this location has recently been demolished.

perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping, or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential. (California Department of Transportation, 2020).

As shown in Table 6, in regard to annoyance, vibration becomes severe to people in buildings at a PPV of 0.4 in/sec. Impacts related to annoyance would be considered significant if the groundborne vibration exceeded 0.4 in/sec., occurs outside of the allowed hours for construction activities per City Code 7.34.060 or affects the operation of sensitive equipment.

At 26 feet, which is the distance to the closest off-site buildings, structures (i.e., dwelling units, sheds etc.) associated with the residential uses to the west, use of a vibratory roller would be expected to generate a PPV of 0.198 in/sec and a bulldozer would be expected to generate a PPV of 0.084 in/sec. Construction activities would not cause severe vibration related annoyance at the closest sensitive receptors. Operation of equipment sensitive to low levels of groundborne vibration is unlikely in residential areas. Further, the construction activities are anticipated to comply with the allowed hours for operation outlined in City Code 7.34.060. Impacts from vibration related annoyance would be less than significant. Vibration worksheets are provided in Appendix G.

Architectural Damage

Vibration generated by construction activity generally has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile. (California Department of Transportation, 2020)

Table 5 identifies a PPV level of 0.25 in/sec as the threshold at which there is a risk to "architectural" damage to historic and some old buildings. Groundborne vibration associated with the proposed project would not exceed 0.198 PPV in/sec at the nearest sensitive receptor. Temporary vibration levels associated with project construction would be less than significant. No mitigation is required. Vibration worksheets are provided in Appendix G.

IMPACT TO PROJECT FROM AIRPORTS

The closest airport to the project site is the March Air Reserve Base/Inland Port Airport located approximately 2.7 miles to the northwest of the project site. Per the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (ALUCP) (2014), the project site is located within Compatibility Zone B2 (High Noise Zone). Exhibit S-17 of the Safety Element of the City's General Plan shows that the project site is also located within the airport's 65 dBA CNEL noise contour. However, Figure 4-2 of the more recent Final Air Installations Compatible Use Zones Study for March Air Reserve Base (Air Force Reserve Command) (AICUZ 2018) shows that the project site is located within the airport's 60 dBA CNEL noise contour. The 2018 AICUZ noise contour map is provided on Figure 10.

Per the 2018 AICUZ the Air Force provides planning contours–noise contours based on reasonable projections of future missions and operations. AICUZ studies using planning contours provide a description of the long-term (5-10 year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by State, tribal, regional and local planning bodies."

The proposed project is a 334,447 square foot warehouse building. Neither the City of Perris Municipal Code nor the March Air Reserve Base Inland Port ALCUP establish airport noise criteria for industrial or warehouse land uses. Furthermore, as shown in Table MA-2, Basic Compatibility Criteria, of the March Air Reserve Base Inland Port ALCUP, industrial uses are considered allowed uses within Zone B2.

The total square footage proposed by the project includes approximately 8,000 square feet of associated office use. Section 19.51.080 of the City's Municipal Code includes a requirement of 45 dBA CNEL for office space. Section 19.51.080 of the City's Code further states that standard building construction is presumed to provide adequate sound attenuation where the difference between the exterior noise exposure and the interior noise standard is 20 dB or less. Per the Final AICUZ (2018), the project site is located within the 60 dBA CNEL noise contour. Therefore, with standard building construction, the associated office use would not be anticipated to have noise levels exceeding 45 dBA CNEL.

The project would not expose people residing or working in the project area to excessive noise levels associated with airports. This impact would be less than significant. No mitigation is required.

Table 7 (1 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-N/A-	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-N/A-	0
Blasting	Yes	-N/A-	94	-N/A-	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-N/A-	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Forklift[2,3]	No	50	n/a	61	n/a
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-N/A-	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-N/A-	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	50	85	77	9
Paving Equipment	No	50	85	77	9
Pneumatic Tools	No	50	85	85	90

Table 7 (2 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-N/A-	0
Tractor	No	40	84	-N/A-	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

Notes:

(1) Source: FHWA Roadway Construction Noise Model User's Guide January 2006.

(2) Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014 http://www.noisetesting.info/blog/carl-strautins/page-3/

(3) Data provided Leq as measured at the operator. Sound Level at 50 feet is calculated using Inverse Square Law.

Table 8
Construction Noise Levels (L_{max})

Phase	Receptor Location	Closest Measured Ambient Noise Location[2]	Existing Measured Noise Levels (dBA, Lmax)[1]	Construction Noise Levels (dBA Lmax)	Combined Existing Measured Ambient and Modeled Construction Noise Levels (dBA, Lmax)	Increase In Ambient Noise Levels Due to Construction	Exceeds Daytime 80 dBA Lmax Standard (Y/N)
Grading	Residential property line adjacent to west	STNM1	68.2	66.4	70.4	2.2	No
	Residential property line to southeast (along Redlands Avenue)	STNM3	87.1	59.6	87.1	0.0	No
	Residential property line to north (along northern side of Rider Street)	STNM6	84.7	57.3	84.7	0.0	No
Building Construction	Residential property line adjacent to west	STNM1	68.2	65.4	70.0	1.8	No
	Residential property line to southeast (along Redlands Avenue)	STNM3	87.1	58.6	87.1	0.0	No
	Residential property line to north (along northern side of Rider Street)	STNM6	84.7	56.3	84.7	0.0	No
Paving	Residential property line adjacent to west	STNM1	68.2	66.4	70.4	2.2	No
	Residential property line to southeast (along Redlands Avenue)	STNM3	87.1	59.6	87.1	0.0	No
	Residential property line to north (along northern side of Rider Street)	STNM6	84.7	57.3	84.7	0.0	No
Architectural Coating	Residential property line adjacent to west	STNM1	68.2	61.4	69.0	0.8	No
	Residential property line to southeast (along Redlands Avenue)	STNM3	87.1	54.6	87.1	0.0	No
	Residential property line to north (along northern side of Rider Street)	STNM6	84.7	52.3	84.7	0.0	No

Notes:
(1) Construction noise worksheets are provided in Appendix D.
(2) Nearest noise measurement as shown in Figure 5 and Table 1.

Table 9
Project Average Daily Traffic Volumes and Roadway Parameters

Roadway	Segment	Average Daily Traffic Volume[1]		Posted Travel Speeds (MPH)	Site Conditions
		Existing	Existing Plus Project		
Rider Street	West of Redlands Avenue	9,200	9,300	45	Soft
Placentia Avenue	West of Redlands Avenue	3,500	3,600	45	Soft
Redlands Avenue	North of Rider Street	1700	2200	40	Soft
	South of Rider Street	3300	4000	40	Soft
	North of Placentia Avenue	3300	3500	40	Soft
	South of Placentia Avenue	4800	4900	40	Soft

Vehicle Distribution (Heavy Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.54	14.02	10.43
Medium Trucks	48.00	2.00	50.00
Heavy Trucks	48.00	2.00	50.00

Notes:

(1) Existing and project average daily traffic volumes and project vehicle mix obtained from the Redlands Avenue West Industrial Project Traffic Impact Analysis, Ganddini Group Inc. (August 2021).

(2) Existing vehicle percentages are based on the Riverside County Industrial Hygiene Letter for Traffic Noise 2009.

Table 10
Change in Existing Noise Levels Along Roadways as a Result of Project (dBA CNEL)

Roadway	Segment	Distance from roadway centerline to right-of-way (feet)[2]	Modeled Noise Levels (dBA CNEL)[1]				
			Existing Without Project at right-of-way	Existing Plus Project at right-of-way	Change in Noise Level	Exceeds Standards[3]	Increase of 3 dB or More?
Rider Street	West of Redlands Avenue	47	72.81	72.94	0.13	Yes	No
Placentia Avenue	West of Redlands Avenue	64	66.54	66.88	0.34	Yes	No
Redlands Avenue	North of Rider Street	47	65.48	68.06	2.58	Yes	No
	South of Rider Street	47	68.36	70.36	2.00	Yes	No
	North of Placentia Avenue	47	68.36	69.03	0.67	Yes	No
	South of Placentia Avenue	47	69.99	70.23	0.24	Yes	No

Notes:

(1) Exterior noise levels calculated 5 feet above pad elevation, perpendicular to subject roadway.

(2) Right of way per the City of Perris General Plan Circulation Element.

(3) Per the City of Perris normally acceptable standard for single-family detached residential dwelling units (see Table 4).

Table 11
Project Operational Noise Levels (dBA, CNEL)

Receptor Location[1]	Closest Measured Ambient Noise Location[2]	Existing Measured Noise Levels (dBA, CNEL)	Operational Noise Levels (dBA, CNEL)	Combined Existing Measured Ambient and Modeled Operational Noise Levels (dBA, CNEL)	Increase In Ambient Noise Levels Due to Project Operation	Exceeds Daytime 60 dBA CNEL Standard (Y/N)
R1 (Residential property line adjacent to west)	STNM1	49.6	41	50.2	0.6	No
R2 (Residential property line adjacent to west)	STNM1	49.6	42	50.3	0.7	No
R3 (Residential property line adjacent to west)	STNM1	49.6	44	50.7	1.1	No
R4 (Residential property line adjacent to west)	STNM1	49.6	41	50.2	0.6	No
R5 (Property line of recently demolished residential uses to east)	STNM5	67.3	44	67.3	0.0	Yes

Notes:
(1) Reciever locations shown on Figure 6.
(2) Estimated using short-term noise measurements Figure 5 and Table 1.

Table 12
Project Operational Noise Levels (dBA, Lmax)

Receptor Location[1]	Closest Measured Ambient Noise Location[2]	Existing Measured Noise Levels (dBA, Lmax)	Operational Noise Levels (dBA, Lmax)	Increase In Ambient Noise Levels Due to Project Operation
R1 (Residential property line adjacent to west)	STNM1	49.6	52	0.0
R2 (Residential property line adjacent to west)	STNM1	49.6	60	10.4
R3 (Residential property line adjacent to west)	STNM1	49.6	66	16.4
R4 (Residential property line adjacent to west)	STNM1	49.6	59	0.0
R5 (Property line of recently demolished residential uses to east)	STNM5	67.3	34	0.0

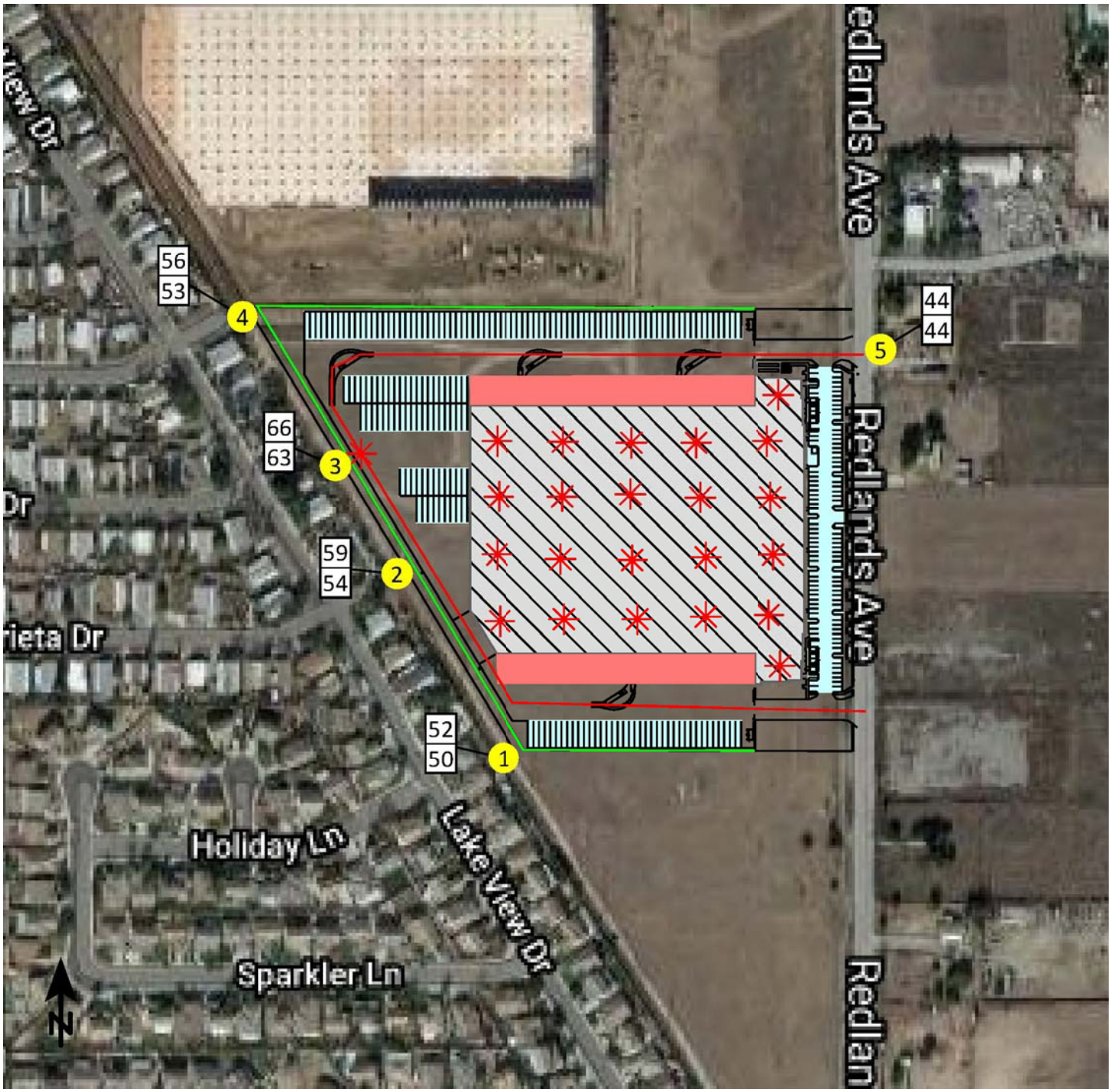
Notes:
(1) Reciever locations shown on Figure 8.
(1) Nearest noise measurement as shown in Figure 5 and Table 1.

Table 13
Construction Equipment Vibration Source Levels

Equipment		PPV at 25 ft, in/sec	Approximate Lv* at 25 ft
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
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Loaded Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment Manual, 2018.

*RMS velocity in decibels, VdB re 1 micro-in/sec



Signs and symbols

- Planned 14 FT CMU Wall
- Receiver
- Point source (HVAC)
- Truck Aisle
- Loading Area
- Parking lot
- Level tables (1st FL/2nd FL)

Figure 6
Operational Noise Levels (CNEL)

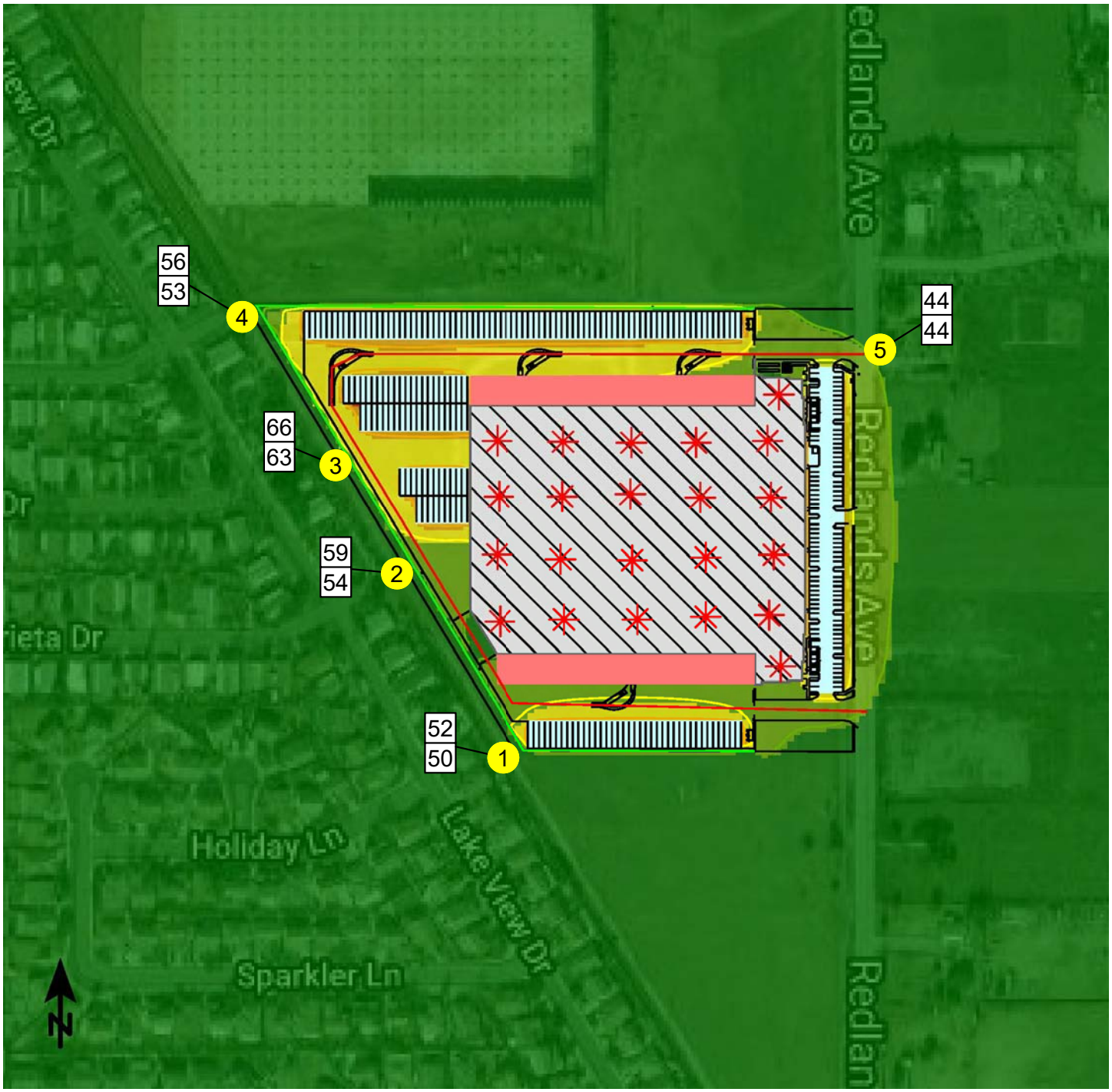


Figure 7
Operational Noise Level Contours (CNEL)

Figure 8
Operational Noise Levels (Lmax)

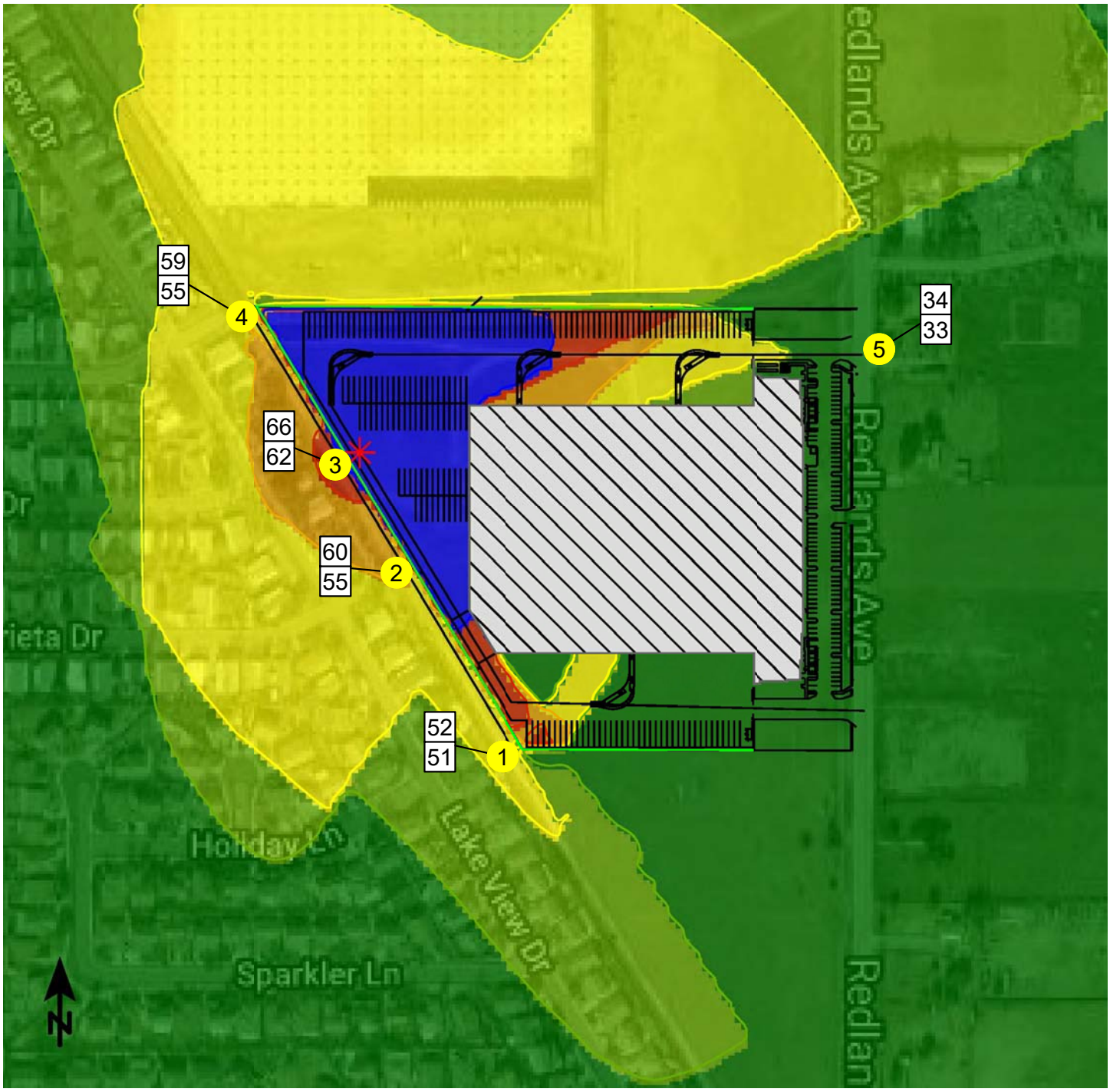
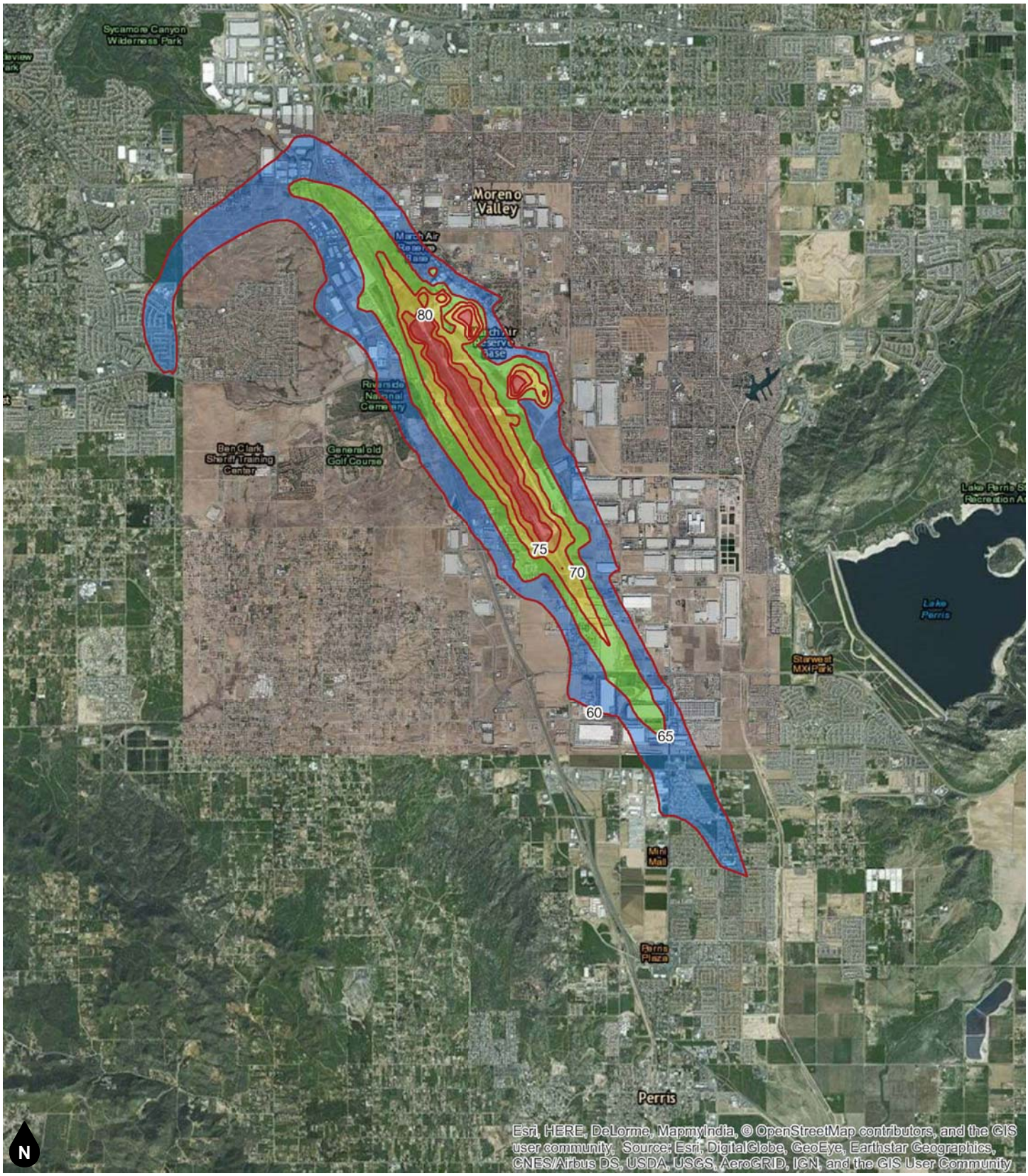


Figure 9
Operational Noise Contours (Lmax)



Legend

March ARB 2018 Noise Contours

Noise Contour Levels (CNEL)

60dB 65dB 70dB 75dB 80dB

Figure 10
March ARB 2018 AICUZ Noise Contours

7. MEASURES TO REDUCE IMPACTS

RECOMMENDED CONSTRUCTION NOISE REDUCTION MEASURES

In addition to adherence to the City of Perris Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

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

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

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

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

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

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

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

OPERATIONAL NOISE MITIGATION MEASURES

Operational Noise Mitigation Measure

1. Truck brake venting on the project site shall be prohibited between the hours of 10:PM and 7:00 AM.

8. REFERENCES

Air Force Reserve Command
2018 Final Air Installations Compatible Use Zones Study March Air Reserve Base Riverside, California.

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

California, State of, Building Code
2019 Chapter 12, Section 1206.4 Allowable Interior Noise Levels

Environmental Protection Agency
1974 "Information on Levels of Environmental Noise Requisite to Protect Public Health And Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March 1974.

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2018 Transit Noise and Vibration Impact Assessment Manual. Typical Construction Equipment Vibration Emissions.

Ganddini Group, Inc.
2021 Redlands Avenue West Industrial Project Traffic Impact Analysis. August 4.

Office of Planning and Research
2017 State of California General Plan Guidelines

Perris, City of
2005 City of Perris General Plan. August 30.
2020 City of Perris Municipal Code.

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

Carl Stautins
2014 Warehouse & Forklift Noise Exposure – Noise Testing. November 4, 2014

APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheets
Appendix D Construction Noise Modeling
Appendix E FHWA Worksheets
Appendix F SoundPLAN Input and Output
Appendix G Vibration Worksheets

APPENDIX A

LIST OF ACRONYMS

Term	Definition
ADT	Average Daily Traffic
ANSI	American National Standard Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
D/E/N	Day / Evening / Night
dB	Decibel
dBA or dB(A)	Decibel "A-Weighted"
dBA/DD	Decibel per Double Distance
dBA L_{eq}	Average Noise Level over a Period of Time
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
L_{02},L_{08},L_{50},L_{90}	A-weighted Noise Levels at 2 percent, 8 percent, 50 percent, and 90 percent, respectively, of the time period
DNL	Day-Night Average Noise Level
$L_{eq(x)}$	Equivalent Noise Level for '"x" period of time
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Level of Noise (measured using a sound level meter)
L_{min}	Minimum Level of Noise (measured using a sound level meter)
LOS C	Level of Service C
OPR	California Governor's Office of Planning and Research
PPV	Peak Particle Velocities
RCNM	Road Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root Mean Square

APPENDIX B

GLOSSARY

Term	Definition
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
CNEL	Community Noise Equivalent Level. CNEL is a weighted 24-hour noise level that is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours.
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
DNL, Ldn	Day Night Level. The DNL, or Ldn is a weighted 24-hour noise level that is obtained by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the nighttime hours.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
L_{02}, L_{08}, L_{50}, L_{90}	The 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, respectively.
L_{max}, L_{min}	Lmax is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. Lmin is the minimum level.
Offensive/ Offending/Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.

APPENDIX C

NOISE MEASUREMENT FIELD WORKSHEETS

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 15, 2021

Project #: 19370 & 19371

Noise Measurement #: STNM1 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 2997 Lake View Drive, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located just west of 19370 with residential, mobile homes, surrounding Punta Prieta Drive to south and intersection of Punta Prieta Drive & Lake View Drive to west/southwest.

Weather: Clear skies, sunshine, hot. **Settings:** SLOW FAST

Temperature: 92 deg F **Wind:** 7 mph **Humidity:** 23% **Terrain:** Flat

Start Time: 12:55 PM **End Time:** 1:10 PM **Run Time:**

Leq: 49.6 dB
Lmax 68.2 dB
L2 59.6 dB
L8 51.7 dB
L25 46.5 dB
L50 44.1 dB

Primary Noise Source: Traffic noise from the 18 vehicles passing microphone traveling along Lake View Drive. Traffic ambiance from Redlands Ave, Rider St & other surrounding roads.

Secondary Noise Sources: Leaves rustling in gentle 7 mph breeze, bird song. Overhead aircraft from air reserve base to the NW. Residential ambiance, trash truck drives by on Lake View ~1PM.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM1 looking SW down Punta Prieta Drive which intersects with Lake View Drive. Residences 2997 Lake View Drive, Perris on the right and 2977 Lake view Drive, Perris, on the left.

STNM1 looking NW from Punta Prieta Drive across front/side garden of residence 2997 Lake View Drive, Perris.

Summary					
File Name on Meter	LxT_Data.093.s				
File Name on PC	LxT_0001152-20210715 125508-LxT_Data.093.ldbin				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM1 33°49'35.85"N 117°13'14.12"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Note	Ganddini Projects 19370 & 19371, City of Perris				
Measurement					
Start	2021-07-15 12:55:08				
Stop	2021-07-15 13:10:08				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre-Calibration	2021-07-15 12:53:06				
Post-Calibration	None				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamplifier	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	143.9 dB				
Results					
LA_{eq}	49.6				
LAE	79.1				
EA	9.062 µPa²h				
EA8	289.979 µPa²h				
EA40	1.450 mPa²h				
$LZ_{peak\ (max)}$	2021-07-15 13:07:22	97.5 dB			
LAS_{max}	2021-07-15 13:00:55	68.2 dB			
LAS_{min}	2021-07-15 12:57:06	38.7 dB			
SEA	-99.9 dB				
LAFTM5	56.5 dB		**Statistics**		
Corrected dBA	49.7 dBA		**LA2.00**	59.6 dB	
LC_{eq}	61.3 dB		**LA8.00**	51.7 dB	
LA_{eq}	49.6 dB		**LA25.00**	46.5 dB	
LC_{eq} - LA_{eq}	11.7 dB		**LA50.00**	44.1 dB	
LAI_{eq}	53.8 dB		**LA66.60**	42.5 dB	
LA_{eq}	49.6 dB		**LA90.00**	40.6 dB	
LAI_{eq} - LA_{eq}	4.2 dB				
Overload Count	0				

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 15, 2021

Project #: 19370 & 19371

Noise Measurement #: STNM2 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 431 Placentia Avenue, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located just south of 19370/19371 with single-family residential to south and Placentia Ave to north.

Weather: Clear skies, sunshine, hot. **Settings:** SLOW FAST

Temperature: 93 deg F **Wind:** 7 mph **Humidity:** 22% **Terrain:** Flat

Start Time: 1:46 PM **End Time:** 2:01 PM **Run Time:**

Leq: 64.9 dB

Lmax 83.8 dB

L2 74.9 dB

L8 68.4 dB

L25 59.3 dB

L50 52.1 dB

Primary Noise Source: Traffic noise from the 46 vehicles passing microphone traveling along Placentia Ave. Traffic ambiance from Redlands Ave, Rider St & other surrounding roads.

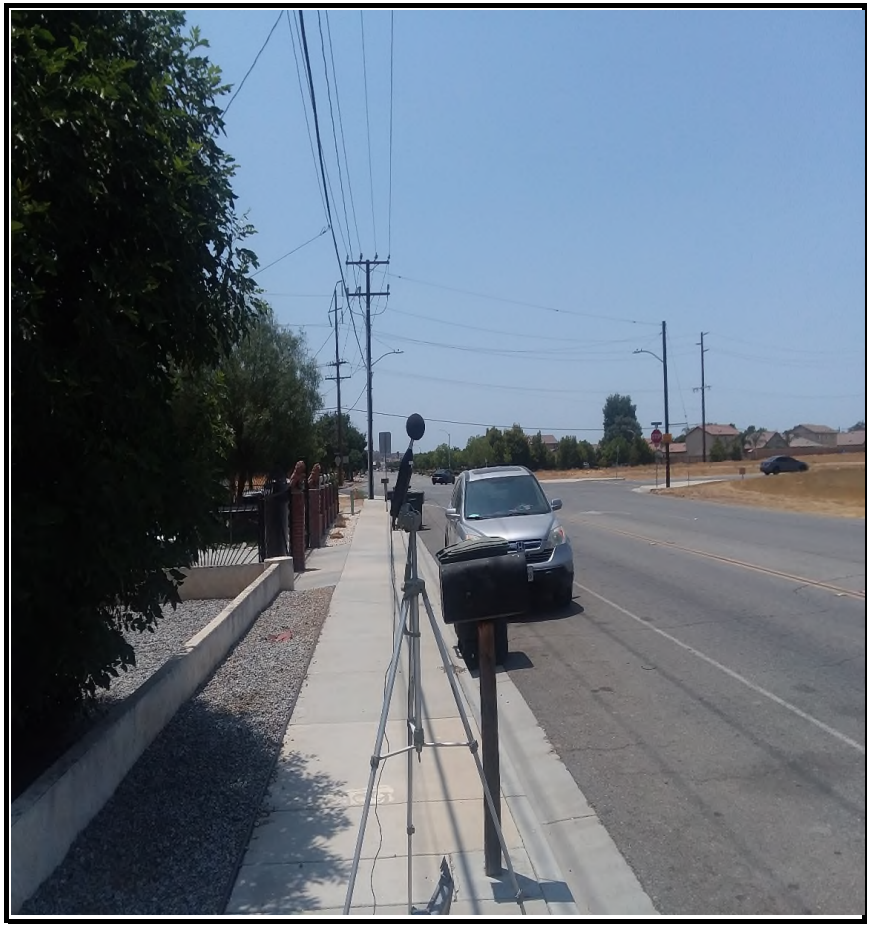
Secondary Noise Sources: Leaves rustling in gentle 7 mph breeze, bird song. Overhead aircraft, from air reserve base to the NW. Residential ambiance.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM2 looking E down Placentia Avenue, residence 431 Placentia Avenue, Perris immediately on the right.



STNM2 looking NW up Placentia Avenue intersecting with Redlands Avenue.

Summary	
File Name on Meter	LxT_Data.094.s
File Name on PC	LxT_0001152-20210715 134647-LxT_Data.094.ldbin
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edaward Gallagher
Location	STNM2 33°49'22.38"N 117°12'59.84"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Projects 19370 & 19371, City of Perris

Measurement	
Start	2021-07-15 13:46:47
Stop	2021-07-15 14:01:47
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2021-07-15 13:37:28
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	143.9 dB

Results					
LA_{eq}	64.9				
LAE	94.4				
EA	305.571	µPa²h			
EA8	9.778	mPa²h			
EA40	48.891	mPa²h			
$LZ_{peak\ (max)}$	2021-07-15 14:00:12	110.9	dB		
LAS_{max}	2021-07-15 13:53:39	83.8	dB		
LAS_{min}	2021-07-15 13:49:46	42.9	dB		
SEA	-99.9	dB			
LAFTM5	70.4	dB	Statistics		
Corrected dBA	65.9	dBA	**LA2.00**	74.9	dB
LC_{eq}	74.2	dB	**LA8.00**	68.4	dB
LA_{eq}	64.9	dB	**LA25.00**	59.3	dB
LC_{eq} - LA_{eq}	9.4	dB	**LA50.00**	52.1	dB
LAI_{eq}	67.0	dB	**LA66.60**	49.2	dB
LA_{eq}	64.9	dB	**LA90.00**	46.1	dB
LAI_{eq} - LA_{eq}	2.2	dB			
Overload Count	0				

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 15, 2021

Project #: 19370 & 19371

Noise Measurement #: STNM3 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 2865 Redlands Avenue, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located just south of 19371 with single-family residential to east and Redlands Ave to west.

Weather: Clear skies, sunshine, hot. **Settings:** SLOW FAST

Temperature: 94 deg F **Wind:** 7 mph **Humidity:** 21% **Terrain:** Flat

Start Time: 2:23 PM **End Time:** 2:38 PM **Run Time:**

Leq:	67.9	dB	**Primary Noise Source:** Traffic noise from the 70 vehicles passing microphone traveling along Redlands
Lmax	87.1	dB	Ave. Traffic ambiance from Placentia Ave, Rider St & other surrounding roads.
L2	76.5	dB	**Secondary Noise Sources:** Leaves rustling in gentle 7 mph breeze, bird song. Overhead aircraft, from air reservd
L8	73.0	dB	base to the NW.
L25	67.3	dB	
L50	53.9	dB	

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM3 looking S down Redlands Avenue towatds Placentia Avenue intersection. Residence 2865 Redlands Ave, Perris on the immrdiate left.

STNM3 looking E across front yard of residence 2865 Redlands Avenue, Perris.

Summary					
File Name on Meter	LxT_Data.095.s				
File Name on PC	LxT_0001152-20210715 142341-LxT_Data.095.ldbin				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM3 33°49'29.37"N 117°13'2.05"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Note	Ganddini Projects 19370 & 19371, City of Perris				
Measurement					
Start	2021-07-15 14:23:41				
Stop	2021-07-15 14:38:41				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre-Calibration	2021-07-15 14:21:22				
Post-Calibration	None				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamplifier	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	144.0 dB				
Results					
LA_{eq}	67.9				
LAE	97.4				
EA	617.272 µPa²h				
EA8	19.753 mPa²h				
EA40	98.764 mPa²h				
$LZ_{peak\ (max)}$	2021-07-15 14:31:25	108.8 dB			
LAS_{max}	2021-07-15 14:23:53	87.1 dB			
LAS_{min}	2021-07-15 14:27:56	41.0 dB			
SEA	-99.9 dB				
LAFTM5	74.6 dB		Statistics		
Corrected dBA	68.2 dBA		**LA2.00**	76.5 dB	
LC_{eq}	74.0 dB		**LA8.00**	73.0 dB	
LA_{eq}	67.9 dB		**LA25.00**	67.3 dB	
LC_{eq} - LA_{eq}	6.1 dB		**LA50.00**	53.9 dB	
LAI_{eq}	71.0 dB		**LA66.60**	47.7 dB	
LA_{eq}	67.9 dB		**LA90.00**	44.1 dB	
LAI_{eq} - LA_{eq}	3.1 dB				
Overload Count	0				

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 15, 2021

Project #: 19370 & 19371

Noise Measurement #: STNM4 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 2980 Wilson Avenue, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located east of 19371 with single-family residential to west w/ 19371 further west and Wilson Ave to east.

Weather: Clear skies, sunshine, hot. **Settings:** SLOW FAST

Temperature: 94 deg F **Wind:** 7 mph **Humidity:** 21% **Terrain:** Flat

Start Time: 3:05 PM **End Time:** 3:20 PM **Run Time:**

Leq: 61.8 dB
Lmax 77 dB
L2 71.6 dB
L8 67.7 dB
L25 59.1 dB
L50 51.3 dB

Primary Noise Source: Traffic noise from the 44 vehicles passing microphone on Wilson Ave. Traffic ambiance from Placentia Ave, Rider St, Redlands Ave & other surrounding roads.

Secondary Noise Sources: Leaves rustling in gentle 7 mph breeze, bird song. Overhead aircraft, from air reserve base to the NW.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM4 looking SW towards residence 2980 Wilson Avenue, Perris

STNM4 looking NE up Wilson Avenue towards Rider Street intersection. Residence 3040 Wilson Avenue, Perris on the left.

Summary	
File Name on Meter	LxT_Data.096.s
File Name on PC	LxT_0001152-20210715 150510-LxT_
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM4 33°49'35.51"N 117°12'47.21"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Projects 19370 & 19371, City of Perris

Measurement	
Start	2021-07-15 15:05:10
Stop	2021-07-15 15:20:10
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2021-07-15 15:02:50
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	144.0 dB

Results			Statistics	
LA_{eq}	61.8			
LAE	91.3			
EA	150.870	µPa²h		
EA8	4.828	mPa²h		
EA40	24.139	mPa²h		
$LZ_{peak\ (max)}$	2021-07-15 15:14:43	104.0 dB		
LAS_{max}	2021-07-15 15:11:22	77.0 dB		
LAS_{min}	2021-07-15 15:05:36	42.2 dB		
SEA	-99.9	dB		
LAFTM5	67.1	dB		
Corrected dBA	65.5	dBA	**LA2.00**	71.6 dB
LC_{eq}	69.6	dB	**LA8.00**	67.7 dB
LA_{eq}	61.8	dB	**LA25.00**	59.1 dB
LC_{eq} - LA_{eq}	7.8	dB	**LA50.00**	51.3 dB
LAI_{eq}	64.2	dB	**LA66.60**	48.5 dB
LA_{eq}	61.8	dB	**LA90.00**	45.6 dB
LAI_{eq} - LA_{eq}	2.4	dB		
Overload Count	0			

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 19, 2021

Project #: 19370 & 19371

Noise Measurement #: STNM5 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 3085 Redlands Avenue, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located east of 19370 & north of 19371 on the eastern side of Redlands Ave. Redlands Ave to west, demolished residential use to east, & commercial to northeast.

Weather: Almost clear skies, white cloud near horizon, sunshine, hot. **Settings:** SLOW FAST

Temperature: 95 deg F **Wind:** 10 mph **Humidity:** 27% **Terrain:** Flat

Start Time: 1:06 PM **End Time:** 1:21 PM **Run Time:**

Leq: 67.3 dB

Lmax 79.6 dB

L2 75.7 dB

L8 73.5 dB

L25 67.2 dB

L50 55.9 dB

Primary Noise Source: Traffic noise from the 70 vehicles passing microphone on Redlands Ave. Traffic ambiance from Placentia Ave, Rider St, Wilson Ave & other surrounding roads.

Secondary Noise Sources: Leaves rustling in gentle 10 mph breeze, bird song. Overhead aircraft, from air reserve base to the NW.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/19/2021		

Noise Measurement
Field Data

PHOTOS:

STNM5 looking N up Redlands Avenue towards Rider Street intersection.
What is left of residence 3085 Redlands Avenue, Perris on the right (home recently demolished).

STNM5 looking S down Redlands Avenue towards Placentia Avenue intersection.
Entry way to what was once residence 3085 Redlands Ave on the left.

Summary					
File Name on Meter	LxT_Data.098.s				
File Name on PC	LxT_0001152-20210719 130658-LxT_Data.098.ldbin				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM5 33°49'40.56"N 117°13'2.22"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Note	Ganddini Projects 19370 & 19371, City of Perris				
Measurement					
Start	2021-07-19 13:06:58				
Stop	2021-07-19 13:21:58				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre-Calibration	2021-07-19 13:03:54				
Post-Calibration	None				
Calibration Deviation	---				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamplifier	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	143.8 dB				
Results					
LA_{eq}	67.3				
LAE	96.8				
EA	533.152 µPa²h				
EA8	17.061 mPa²h				
EA40	85.304 mPa²h				
$LZ_{peak\ (max)}$	2021-07-19 13:15:29	108.5 dB			
LAS_{max}	2021-07-19 13:08:49	79.6 dB			
LAS_{min}	2021-07-19 13:19:09	41.2 dB			
SEA	-99.9 dB				
LAFTM5	73.3 dB		**Statistics**		
Corrected dBA	71.0 dBA		**LA2.00**	75.7 dB	
LC_{eq}	72.0 dB		**LA8.00**	73.5 dB	
LA_{eq}	67.3 dB		**LA25.00**	67.2 dB	
LC_{eq} - LA_{eq}	4.7 dB		**LA50.00**	55.9 dB	
LAI_{eq}	69.8 dB		**LA66.60**	49.7 dB	
LA_{eq}	67.3 dB		**LA90.00**	45.1 dB	
LAI_{eq} - LA_{eq}	2.5 dB				
Overload Count	0				

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 19, 2021

Project #: 19370 & 19371

Noise Measurement #: STNM6 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 336 East Rider Street, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Rider Street to south with industrial further south and single-family residential use to north.

Weather: Almost clear skies, white cloud near horizon, sunshine, hot. **Settings:** SLOW FAST

Temperature: 96 deg F **Wind:** 10 mph **Humidity:** 27% **Terrain:** Flat

Start Time: 1:42 PM **End Time:** 1:57 PM **Run Time:**

Leq: 68.3 dB

Lmax 84.7 dB

L2 77.5 dB

L8 72.9 dB

L25 67.6 dB

L50 60.9 dB

Primary Noise Source: Traffic noise from the 236 vehicles passing microphone on Rider Street. Traffic ambiance from Placentia Ave, Redlands Ave, Wilson Ave & other surrounding roads.

Secondary Noise Sources: Leaves rustling in gentle 10 mph breeze, bird song. Overhead aircraft, from air reserve base to the NW.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/19/2021		

Noise Measurement
Field Data

PHOTOS:

STNM6 looking SW across Rider Street towards building 251 E Rider Street, Perris.

STNM6 looking NE across front yard & driveway of residence 336 E Rider Street, Perris.

Summary					
File Name on Meter	LxT_Data.099.s				
File Name on PC	LxT_0001152-20210719 134200-LxT_Data.099.ldbin				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM6 33°49'48.99"N 117°13'7.87"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Note	Ganddini Projects 19370 & 19371, City of Perris				
Measurement					
Start	2021-07-19 13:42:00				
Stop	2021-07-19 13:57:00				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre-Calibration	2021-07-19 13:39:41				
Post-Calibration	None				
Calibration Deviation	---				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamplifier	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	143.9 dB				
Results					
LA_{eq}	68.3				
LAE	97.8				
EA	677.126 µPa²h				
EA8	21.668 mPa²h				
EA40	108.340 mPa²h				
$LZ_{peak\ (max)}$	2021-07-19 13:49:08	108.5 dB			
LAS_{max}	2021-07-19 13:49:08	84.7 dB			
LAS_{min}	2021-07-19 13:53:59	48.2 dB			
SEA	-99.9 dB				
LAFTM5	74.3 dB		Statistics		
Corrected dBA	68.4 dBA		**LA2.00**	77.5 dB	
LC_{eq}	75.0 dB		**LA8.00**	72.9 dB	
LA_{eq}	68.3 dB		**LA25.00**	67.6 dB	
LC_{eq} - LA_{eq}	6.7 dB		**LA50.00**	60.9 dB	
LAI_{eq}	70.8 dB		**LA66.60**	58.0 dB	
LA_{eq}	68.3 dB		**LA90.00**	53.8 dB	
LAI_{eq} - LA_{eq}	2.5 dB				
Overload Count	0				

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 15, 2021

Project #: 19370 & 19371

Noise Measurement #: LTNM1 Run Time: 24 hours (24 x 1 hours) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 3055 Redlands Avenue, Perris, California 92571. Lat/Long: 33°49'39.01"N 117°13'6.18"W

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located in northern portion of 19370 w/ vacant site surrounding, Redlands Ave to east, industrial to north, residential to east and west, & commercial to northeast.

Weather: Clear skies, hot. Sunset/rise: 8:03PM/5:52AM **Settings:** SLOW FAST

Temperature: 63-94 deg F **Wind:** 0-11 mph **Humidity:** 20-40% **Terrain:** Flat

Start Time: 6:00 PM **End Time:** 6:00 PM **Run Time:**

Leq: 53.7 dB

Lmax 90.2 dB

L2 55.0 dB

L8 51.0 dB

L25 47.7 dB

L50 44.4 dB

Primary Noise Source: Traffic ambiance from vehicles traveling along Redlands Ave, Rider St, Placentia Ave and other surrounding roads.

Secondary Noise Sources: Leaves rustling in gentle breeze, bird song by day, crickets by night. Overhead aircraft, air reserve base to the NW of LTNM1.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/15/2021		

Noise Measurement
Field Data

PHOTOS:

LTNM1 looking NE past microphone in tree towards Redlands Avenue & Rider Street intersection.

LTNM1, looking down from above, showing location of microphone relative to surrounding area.

Summary	
File Name on Meter	LxT_Data.097.s
File Name on PC	LxT_0001152-20210715 180000-LxT_
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	LTNM1 33°49'39.01"N 117°13'6.18"W
Job Description	24 hour noise measurement (24 x 1 hours)
Note	Gandinni Project 19370 & 19371, City of Perris

Measurement	
Start	2021-07-15 18:00:00
Stop	2021-07-16 18:00:00
Duration	24:00:00.0
Run Time	24:00:00.0
Pause	00:00:00.0
Pre-Calibration	2021-07-15 16:50:36
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	144.0 dB

Results			
L_{Aeq}	53.7		
LAE	103.0		
EA	2.234	mPa²h	
EA8	744.828	µPa²h	
EA40	3.724	mPa²h	
$L_{Apeak\ (max)}$	2021-07-15 18:37:19	105.7	dB
L_{ASmax}	2021-07-15 20:25:32	90.2	dB
L_{ASmin}	2021-07-16 00:01:17	32.8	dB
SEA	-99.9	dB	
LAFTM5	58.1	dB	
L_{Ceq}	63.5	dB	
L_{Aeq}	53.7	dB	
L_{Ceq} - L_{Aeq}	9.8	dB	
L_{AIeq}	56.0	dB	
L_{Aeq}	53.7	dB	
L_{AIeq} - L_{Aeq}	2.3	dB	
Overload Count	0		

Statistics		
LA2.00	55.0	dB
LA8.00	51.0	dB
LA25.00	47.7	dB
LA50.00	44.4	dB
LA90.00	37.8	dB
LA99.00	35.1	dB

Noise Measurement
Field Data

Project Name: Redlands Avenue West & East Industrial Projects, City of Perris. **Date:** July 19-20, 2021

Project #: 19370 & 19371

Noise Measurement #: LTNM2 Run Time: 24 hours (24 x 1 hours) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 2865 Redlands Avenue, Perris, California 92571

Site Description (Type of Existing Land Use and any other notable features): Project site: Open land w/ shrubs & trees. Redlands Ave running N-S dividing project 19370 & 19371. Noise Measurement Site: Located at SW corner of 19371 with vacant project site land to north and east, Redlands Ave to west, and a residnetial use to south.

Weather: <5% cloud, sunshine by day, hot. Sunset/rise: 7:58PM/5:52AM **Settings:** SLOW FAST

Temperature: 67-99 deg F **Wind:** 0-13 mph **Humidity:** 20-40% **Terrain:** Flat

Start Time: 4:00 PM **End Time:** 4:00 PM **Run Time:**

Leq: 55.7 dB **Primary Noise Source:** Traffic noise from vehicles passing microphone traveling along Redlands Ave.

Lmax 89 dB Traffic ambiance from Placentia Ave, Rider St & other surrounding roads.

L2 62.9 dB **Secondary Noise Sources:** Leaves rustling in gentle breeze, bird song by day. Overhead aircraft, from air reserve

L8 57.4 dB base to the NW. Residential ambiance.

L25 53.1 dB

L50 48.5 dB

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	7/19/2021		

Noise Measurement
Field Data

PHOTOS:

LTNM2 looking WNW towards Redlands Avenue. Microphone about 5.5 feet above ground.

LTNM2, looking from above, showing location of microphone in relation to Redlands Avenue (road on the left) & residence 2865 Redlands Avenue, Perris.

Summary					
File Name on Meter	LxT_Data.100.s				
File Name on PC	LxT_0001152-20210719 160000-LxT_Data.100.ldbin				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	LTNM2 33°49'30.17"N 117°13'0.52"W				
Job Description	24 hour noise measurement (24 x 1 hours)				
Note	Ganddini Projects 19370 & 19371, City of Perris				
Measurement					
Start	2021-07-19 16:00:00				
Stop	2021-07-20 16:00:00				
Duration	24:00:00.0				
Run Time	24:00:00.0				
Pause	00:00:00.0				
Pre-Calibration	2021-07-19 14:56:56				
Post-Calibration	None				
Calibration Deviation	---				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	A Weighting				
Detector	Slow				
Preamplifier	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Normal				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	A Weighting				
OBA Max Spectrum	Bin Max				
Overload	144.0 dB				
Results					
LAeq	55.7				
LAE	105.1				
EA	3.556 mPa²h				
EA8	1.185 mPa²h				
EA40	5.927 mPa²h				
LApeak (max)	2021-07-19 20:41:20	102.4 dB			
LASmax	2021-07-19 20:41:20	89.0 dB			
LASmin	2021-07-20 09:22:09	35.6 dB			
SEA	-99.9 dB				
LAFTM5	61.2 dB		Statistics		
LCeq	64.1 dB		**LA2.00**	62.9 dB	
LAeq	55.7 dB		**LA8.00**	57.4 dB	
LCeq - LAeq	8.4 dB		**LA25.00**	53.1 dB	
LAleq	59.6 dB		**LA50.00**	48.5 dB	
LAeq	55.7 dB		**LA90.00**	40.3 dB	
LAleq - LAeq	3.9 dB		**LA99.00**	37.6 dB	
Overload Count	0				

Record #	Date	Time	Run Duration	Run Time	Pause	LAeq	LASmin	LASmin Time	LASmax	LASmax Time	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS99.00
1	2021-07-19	16:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.5	42.8	16:28:48	66.3	16:03:54	60.4	58.3	55.6	52.8	48.1	45.2
2	2021-07-19	17:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.6	43.9	17:30:20	70.5	17:35:52	61.6	59.1	56.4	53.7	48.9	46.1
3	2021-07-19	18:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.2	43.4	18:36:22	68.4	18:51:13	60.8	58.4	55.1	51.9	46.7	44.6
4	2021-07-19	19:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.7	41.9	19:28:53	70.1	19:45:20	60.8	57.9	54.1	50.4	45.6	43.4
5	2021-07-19	20:00:00	01:00:00.0	01:00:00.0	00:00:00.0	60.8	39.8	20:47:10	89.0	20:41:20	61.8	57.4	53.4	48.8	43.4	40.8
6	2021-07-19	21:00:00	01:00:00.0	01:00:00.0	00:00:00.0	58.7	38.3	21:54:55	78.9	21:31:13	68.7	58.8	52.8	46.9	40.9	39.4
7	2021-07-19	22:00:00	01:00:00.0	01:00:00.0	00:00:00.0	51.5	38.7	22:54:19	66.8	22:43:48	59.5	56.4	51.6	45.4	40.4	39.4
8	2021-07-19	23:00:00	01:00:00.0	01:00:00.0	00:00:00.0	47.7	37.1	23:59:38	64.2	23:58:23	56.5	53.0	46.3	42.1	39.4	38.1
9	2021-07-20	00:00:00	01:00:00.0	01:00:00.0	00:00:00.0	52.7	35.8	00:15:17	67.6	00:54:30	63.0	58.8	48.8	40.5	37.6	36.6
10	2021-07-20	01:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.9	37.1	01:44:32	83.1	01:26:22	63.5	56.9	44.4	40.3	38.4	37.6
11	2021-07-20	02:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.5	37.1	02:34:51	75.9	02:57:19	66.1	56.8	45.9	41.9	39.4	37.9
12	2021-07-20	03:00:00	01:00:00.0	01:00:00.0	00:00:00.0	60.1	39.1	03:00:56	77.6	03:14:06	70.3	66.1	55.5	45.8	41.8	40.2
13	2021-07-20	04:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.1	41.2	04:03:06	74.6	04:37:26	60.5	56.6	52.4	48.3	43.9	42.2
14	2021-07-20	05:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.3	44.0	05:35:19	67.8	05:48:33	59.4	57.1	54.1	51.2	46.8	45.2
15	2021-07-20	06:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.4	44.2	06:28:19	74.2	06:16:29	59.6	56.9	53.3	50.2	46.5	44.9
16	2021-07-20	07:00:00	01:00:00.0	01:00:00.0	00:00:00.0	50.2	36.6	07:40:41	65.7	07:05:45	57.5	55.0	50.9	45.9	40.0	37.9
17	2021-07-20	08:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.8	35.7	08:32:16	72.8	08:45:34	61.4	55.4	51.5	45.1	38.7	36.9
18	2021-07-20	09:00:00	01:00:00.0	01:00:00.0	00:00:00.0	52.1	35.6	09:22:09	73.6	09:18:49	59.2	53.7	49.5	43.8	37.7	36.2
19	2021-07-20	10:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.1	36.6	10:06:48	77.9	10:28:59	61.2	55.0	50.6	45.7	39.9	37.7
20	2021-07-20	11:00:00	01:00:00.0	01:00:00.0	00:00:00.0	51.3	39.1	11:22:07	71.0	11:59:42	58.2	55.1	51.4	46.7	41.9	39.8
21	2021-07-20	12:00:00	01:00:00.0	01:00:00.0	00:00:00.0	60.9	41.7	12:44:32	78.7	12:14:06	73.1	60.3	53.9	49.9	44.9	42.9
22	2021-07-20	13:00:00	01:00:00.0	01:00:00.0	00:00:00.0	56.0	41.9	13:57:20	77.9	13:47:02	61.8	56.9	53.3	49.7	45.1	42.8
23	2021-07-20	14:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.9	42.1	14:28:02	74.2	14:16:15	62.1	57.1	53.7	50.4	45.3	43.0
24	2021-07-20	15:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.0	40.7	15:06:24	75.6	15:56:09	61.1	57.5	54.3	50.8	45.5	42.8

APPENDIX D

CONSTRUCTION NOISE MODELING

Receptor - Residential to West

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Grading									
Excavator	2	85	425	40	0.8	-18.6	-1.0	66.4	65.4
Grader	1	85	425	40	0.40	-18.6	-4.0	66.4	62.4
Rubber Tired Dozers	1	85	425	40	0.40	-18.6	-4.0	66.4	62.4
Scrapers	2	85	425	40	0.80	-18.6	-1.0	66.4	65.4
Tractors/Loaders/Backhoes	2	84	425	40	0.80	-18.6	-1.0	65.4	64.4
							Log Sum		71.2
Building Construction									
Cranes	2	83	425	16	0.32	-18.6	-4.9	64.4	59.5
Forklifts [2]	4	48	425	40	1.60	-18.6	2.0	29.4	31.5
Generator Set	2	81	425	50	1.00	-18.6	0.0	62.4	62.4
Welders	2	74	425	40	0.80	-18.6	-1.0	55.4	54.4
Tractors/Loaders/Backhoes	4	84	425	40	1.60	-18.6	2.0	65.4	67.5
							Log Sum		69.3
Paving									
Pavers	2	77	425	50	1.00	-18.6	0.0	58.4	58.4
Paving Equipment	2	85	425	20	0.40	-18.6	-4.0	66.4	62.4
Rollers	2	80	425	20	0.40	-18.6	-4.0	61.4	57.4
							Log Sum		64.8
Architectural Coating									
Air Compressors	1	80	425	40	0.40	-18.6	-4.0	61.4	57.4
							Log Sum		57.4

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construciton Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (structure).

Receptor - Residential to Southeast

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Grading									
Excavator	2	85	936	40	0.8	-25.4	-1.0	59.6	58.6
Grader	1	85	936	40	0.40	-25.4	-4.0	59.6	55.6
Rubber Tired Dozers	1	85	936	40	0.40	-25.4	-4.0	59.6	55.6
Scrapers	2	85	936	40	0.80	-25.4	-1.0	59.6	58.6
Tractors/Loaders/Backhoes	2	84	936	40	0.80	-25.4	-1.0	58.6	57.6
							Log Sum		64.4
Building Construction									
Cranes	2	83	936	16	0.32	-25.4	-4.9	57.6	52.6
Forklifts [2]	4	48	936	40	1.60	-25.4	2.0	22.6	24.6
Generator Set	2	81	936	50	1.00	-25.4	0.0	55.6	55.6
Welders	2	74	936	40	0.80	-25.4	-1.0	48.6	47.6
Tractors/Loaders/Backhoes	4	84	936	40	1.60	-25.4	2.0	58.6	60.6
							Log Sum		62.4
Paving									
Pavers	2	77	936	50	1.00	-25.4	0.0	51.6	51.6
Paving Equipment	2	85	936	20	0.40	-25.4	-4.0	59.6	55.6
Rollers	2	80	936	20	0.40	-25.4	-4.0	54.6	50.6
							Log Sum		57.9
Architectural Coating									
Air Compressors	1	80	936	40	0.40	-25.4	-4.0	54.6	50.6
							Log Sum		50.6

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construciton Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (structure).

Receptor - Residential to North

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Grading									
Excavator	2	85	1216	40	0.8	-27.7	-1.0	57.3	56.3
Grader	1	85	1216	40	0.40	-27.7	-4.0	57.3	53.3
Rubber Tired Dozers	1	85	1216	40	0.40	-27.7	-4.0	57.3	53.3
Scrapers	2	85	1216	40	0.80	-27.7	-1.0	57.3	56.3
Tractors/Loaders/Backhoes	2	84	1216	40	0.80	-27.7	-1.0	56.3	55.3
							Log Sum		62.1
Building Construction									
Cranes	2	83	1216	16	0.32	-27.7	-4.9	55.3	50.3
Forklifts [2]	4	48	1216	40	1.60	-27.7	2.0	20.3	22.3
Generator Set	2	81	1216	50	1.00	-27.7	0.0	53.3	53.3
Welders	2	74	1216	40	0.80	-27.7	-1.0	46.3	45.3
Tractors/Loaders/Backhoes	4	84	1216	40	1.60	-27.7	2.0	56.3	58.3
							Log Sum		60.1
Paving									
Pavers	2	77	1216	50	1.00	-27.7	0.0	49.3	49.3
Paving Equipment	2	85	1216	20	0.40	-27.7	-4.0	57.3	53.3
Rollers	2	80	1216	20	0.40	-27.7	-4.0	52.3	48.3
							Log Sum		55.6
Architectural Coating									
Air Compressors	1	80	1216	40	0.40	-27.7	-4.0	52.3	48.3
							Log Sum		48.3

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construciton Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (structure).

APPENDIX E

FHWA WORKSHEETS

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Rider Street**

Segment: **West of Redlands Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	9200.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	532.83	11.04	18.40	395.60	1.84	3.07	98.13	15.33	25.56	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	20.43	3.59	5.81	19.13	-4.19	-1.97	13.08	5.02	7.24		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	72.81
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.52
LEQ	64.97	56.41	63.15	63.68	48.63	55.37	57.62	57.84	64.58	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.52		EVENING LEQ	64.39		NIGHT LEQ	66.08		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.81**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Rider Street**

Segment: **West of Redlands Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	9300.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	537.43	11.44	19.08	399.01	1.91	3.18	98.98	15.89	26.50	% A	91.80
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.08
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.13
ADJUSTMENTS											
Flow	20.47	3.75	5.97	19.17	-4.04	-1.81	13.12	5.17	7.39		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	72.94
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.61
LEQ	65.01	56.57	63.31	63.72	48.79	55.53	57.66	57.99	64.73	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.61		EVENING LEQ	64.45		NIGHT LEQ	66.22		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.94**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Placentia Avenue**

Segment: **West of Redlands Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	3500.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	40.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	202.71	4.20	7.00	150.50	0.70	1.17	37.33	5.83	9.72	% A	92
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	5
ADJUSTMENTS											
Flow	16.74	-0.09	2.12	15.45	-7.88	-5.66	9.39	1.33	3.55		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	66.54
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	60.95
LEQ	57.96	50.08	57.14	56.67	42.30	49.36	50.61	51.50	58.57	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	60.95		EVENING LEQ	57.54		NIGHT LEQ	59.89		Use hour?	no
										GRADE dB	0.00
		CNEL	**66.54**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Placentia Avenue**

Segment: **West of Redlands Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	3600.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	40.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	207.30	4.60	7.68	153.91	0.77	1.28	38.18	6.39	10.67	% A	91.47
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.19
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	5.33
ADJUSTMENTS											
Flow	16.84	0.30	2.53	15.55	-7.48	-5.25	9.49	1.73	3.95		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	66.88
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	61.20
LEQ	58.06	50.47	57.54	56.76	42.69	49.76	50.71	51.90	58.97	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	61.20		EVENING LEQ	57.69		NIGHT LEQ	60.26		Use hour?	no
										GRADE dB	0.00
		CNEL	**66.88**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **North of Rider Street**

	DAYTIME			EVENING			NIGHTTIME			ADT	1700.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	98.46	2.04	3.40	73.10	0.34	0.57	18.13	2.83	4.72	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	13.09	-3.74	-1.52	11.80	-11.52	-9.30	5.75	-2.31	-0.10		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	65.48
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	60.18
LEQ	57.64	49.08	55.82	56.34	41.30	48.04	50.29	50.51	57.24	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	60.18		EVENING LEQ	57.06		NIGHT LEQ	58.75		Use hour?	no
										GRADE dB	0.00
		CNEL	**65.48**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **North of Rider Street**

	DAYTIME			EVENING			NIGHTTIME			ADT	2200.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	121.44	4.04	6.80	90.16	0.67	1.13	22.37	5.61	9.44	% A	87.68
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	4.59
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	7.73
ADJUSTMENTS											
Flow	14.01	-0.77	1.49	12.71	-8.56	-6.29	6.66	0.65	2.91		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.06
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	62.15
LEQ	58.55	52.05	58.83	57.26	44.27	51.05	51.20	53.47	60.25	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	62.15		EVENING LEQ	58.36		NIGHT LEQ	61.51		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.06**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **South of Rider Street**

	DAYTIME			EVENING			NIGHTTIME			ADT	3300.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	191.13	3.96	6.60	141.90	0.66	1.10	35.20	5.50	9.17	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	15.98	-0.86	1.36	14.68	-8.64	-6.42	8.63	0.57	2.78		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.36
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	63.06
LEQ	60.52	51.96	58.70	59.23	44.18	50.92	53.17	53.39	60.12	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	63.06		EVENING LEQ	59.94		NIGHT LEQ	61.63		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.36**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **South of Rider Street**

	DAYTIME			EVENING			NIGHTTIME			ADT	4000.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	223.29	6.76	11.36	165.78	1.13	1.89	41.12	9.39	15.78	% A	88.68
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	4.23
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	7.10
ADJUSTMENTS											
Flow	16.65	1.46	3.72	15.36	-6.32	-4.07	9.30	2.89	5.14		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	70.36
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	64.56
LEQ	61.19	54.28	61.06	59.90	46.50	53.27	53.85	55.71	62.48	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	64.56		EVENING LEQ	60.92		NIGHT LEQ	63.78		Use hour?	no
										GRADE dB	0.00
		CNEL	**70.36**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **North of Placentia Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	3300.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	191.13	3.96	6.60	141.90	0.66	1.10	35.20	5.50	9.17	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	15.98	-0.86	1.36	14.68	-8.64	-6.42	8.63	0.57	2.78		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.36
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	63.06
LEQ	60.52	51.96	58.70	59.23	44.18	50.92	53.17	53.39	60.12	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	63.06		EVENING LEQ	59.94		NIGHT LEQ	61.63		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.36**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **North of Placentia Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	3500.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	200.32	4.76	7.96	148.72	0.79	1.33	36.89	6.61	11.06	% A	90.91
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.40
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.69
ADJUSTMENTS											
Flow	16.18	-0.06	2.17	14.89	-7.84	-5.61	8.83	1.36	3.60		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	69.03
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	63.55
LEQ	60.72	52.76	59.51	59.43	44.98	51.73	53.37	54.19	60.94	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	63.55		EVENING LEQ	60.24		NIGHT LEQ	62.36		Use hour?	no
										GRADE dB	0.00
		CNEL	**69.03**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **South of Placentia Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	4800.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	278.00	5.76	9.60	206.40	0.96	1.60	51.20	8.00	13.33	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	17.60	0.77	2.98	16.31	-7.02	-4.80	10.25	2.19	4.41		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	69.99
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	64.69
LEQ	62.15	53.59	60.33	60.85	45.81	52.54	54.80	55.01	61.75	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	64.69		EVENING LEQ	61.57		NIGHT LEQ	63.26		Use hour?	no
										GRADE dB	0.00
		CNEL	**69.99**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19370 Redlands Avenue West Industrial Project**

Road: **Redlands Avenue**

Segment: **South of Placentia Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	4900.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	47.00
INPUT PARAMETERS											
Vehicles per hour	282.60	6.16	10.28	209.81	1.03	1.71	52.05	8.56	14.28	% A	91.61
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.14
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.24
ADJUSTMENTS											
Flow	17.67	1.06	3.28	16.38	-6.72	-4.50	10.33	2.48	4.71		
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	70.23
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	64.86
LEQ	62.22	53.88	60.62	60.92	46.10	52.84	54.87	55.31	62.05	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	64.86		EVENING LEQ	61.67		NIGHT LEQ	63.52		Use hour?	no
										GRADE dB	0.00
		CNEL	**70.23**								

APPENDIX F

SOUNDPLAN INPUT AND OUTPUT

Noise emissions of parking lot traffic

Name	Parking lot type	Size	Movements per hour			Road surface	Separated method	Lw,ref
			Day	Evening	Night			dB(A)
1	Rest stop (Trucks)	78 Parking bays	0.020	0.020	0.020	Asphaltic driving lanes	no	100.5
2	Rest stop (Trucks)	41 Parking bays	0.020	0.020	0.020	Asphaltic driving lanes	no	96.9
3	Rest stop (Trucks)	21 Parking bays	0.020	0.020	0.020	Asphaltic driving lanes	no	92.9
4	Rest stop (Trucks)	38 Parking bays	0.020	0.020	0.020	Asphaltic driving lanes	no	96.5
5	Visitors and staff	38 Parking bays	0.400	0.400	0.400	Asphaltic driving lanes	no	82.5

Receiver list

No.	Receiver name	Building side	Floor	Limit Lden dB(A)	Level w/o NP Lden dB(A)	Level w NP Lden dB(A)	Difference Lden dB	Conflict Lden dB
1	1	-	1.Fl	-	45.3	36.9	-8.4	-
			2.Fl	-	45.5	40.7	-4.8	-
2	2	-	1.Fl	-	45.0	37.7	-7.3	-
			2.Fl	-	45.2	41.9	-3.3	-
3	3	-	1.Fl	-	47.3	38.3	-9.0	-
			2.Fl	-	47.4	43.7	-3.7	-
4	4	-	1.Fl	-	44.0	36.4	-7.6	-
			2.Fl	-	43.9	40.7	-3.1	-
5	5	-	1.Fl	-	43.7	43.9	0.2	-
			2.Fl	-	43.9	44.1	0.1	-

Noise emissions of industry sources

Source name	Reference	Level		Frequency spectrum [dB(A)]								Corrections		
				63	125	250	500	1	2	4	8	Cwall	CI	CT
			dB(A)	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	dB	dB	dB
Truck venting brakes	Lw/unit	Day	110.0	77.0	87.0	94.0	100.0	103.0	104.0	104.0	102.0	-	-	-

Receiver list

No.	Receiver name	Building side	Floor	Limit Lden dB(A)	Level w/o NP Lden dB(A)	Level w NP Lden dB(A)	Difference Lden dB	Conflict Lden dB
1	1	-	1.Fl	-	57.6	51.2	-6.4	-
			2.Fl	-	57.2	52.4	-4.8	-
2	2	-	1.Fl	-	68.0	55.4	-12.7	-
			2.Fl	-	68.1	60.4	-7.7	-
3	3	-	1.Fl	-	80.2	62.2	-17.9	-
			2.Fl	-	80.1	65.5	-14.6	-
4	4	-	1.Fl	-	64.9	54.9	-10.1	-
			2.Fl	-	64.7	59.4	-5.3	-
5	5	-	1.Fl	-	31.7	33.3	1.6	-
			2.Fl	-	32.3	34.0	1.7	-

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS

Project:	19370 Redlands Avenue West Industrial Project	Date:	7/21/21
Source:	Large Dozer		
Scenario:	Unmitigated		
Location:	Residential to West		
Address:			

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	26.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.084	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19370 Redlands Avenue West Industrial Project		Date: 7/21/21
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to West		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	26.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.198	IN/SEC	OUTPUT IN BLUE

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