NOISE AND VIBRATION IMPACT ANALYSIS

COLTON TROPICA WAREHOUSES PROJECT

CITY OF COLTON

SAN BERNARDINO COUNTY, CALIFORNIA

LSA

June 2018

NOISE AND VIBRATION IMPACT ANALYSIS

COLTON TROPICA WAREHOUSES PROJECT

CITY OF COLTON

SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

City of Colton
659 La Cadena Drive
Colton, California 92324

Prepared by:

LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

Project No. CLT1701

LSA

June 2018

TABLE OF CONTENTS

APPENDICES

FIGURES AND TABLES

FIGURES

TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

AMSL	Above Mean Sea Level
APN	Assessor's Parcel Number
CEQA	California Environmental Quality Act
City	City of Colton
CNEL	Community Noise Equivalent Level
dB	decibels
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
I-	Interstate
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum instantaneous noise level
LSA	LSA Associates, Inc.
L_V	velocity in decibels
PPV	peak particle velocity
RIR	Flabob Airport
RMS	root-mean-square (velocity)
SBD	San Bernardino International Airport
VdB	vibration velocity decibels

INTRODUCTION

This noise and vibration impact analysis has been prepared to evaluate the potential noise and vibration impacts and mitigation measures associated with the proposed Colton Tropica Warehouses Project located in the City of Colton (City), San Bernardino County, California. This report is intended to satisfy the City's requirement for a project-specific noise and vibration impact analysis by examining the impacts of the proposed project on noise-sensitive uses in the project area and evaluating the mitigation measures incorporated as part of the project design.

The proposed Colton Tropica Warehouses Project and associated discretionary actions collectively are the "project" assessed in this noise impact analysis. Unless otherwise noted, the terms "Colton Tropica Warehouses Project" and "project" are used interchangeably. The project would construct three warehouse buildings to be developed on approximately 22.2 acres located just west of La Cadena Drive and south of the Santa Ana River. Figure 1 depicts the regional and project location.

PROJECT LOCATION

The project site is west of La Cadena Drive and south of the Santa Ana River; it is abutted by single-family residential uses to the south and a mix of single-family residential uses and vacant undeveloped land to the west, north, and east. Refer to Figure 2. The project site consists of four parcels: Assessor's Parcel Numbers (APNs) 0163-361-14, 0163-361-15, 0275-192-06, and 0275-192-07. The site is approximately 1.6 miles south of Interstate 10 (I-10) and Interstate 215 (I-215) is approximately 0.8 mile west of the project site.

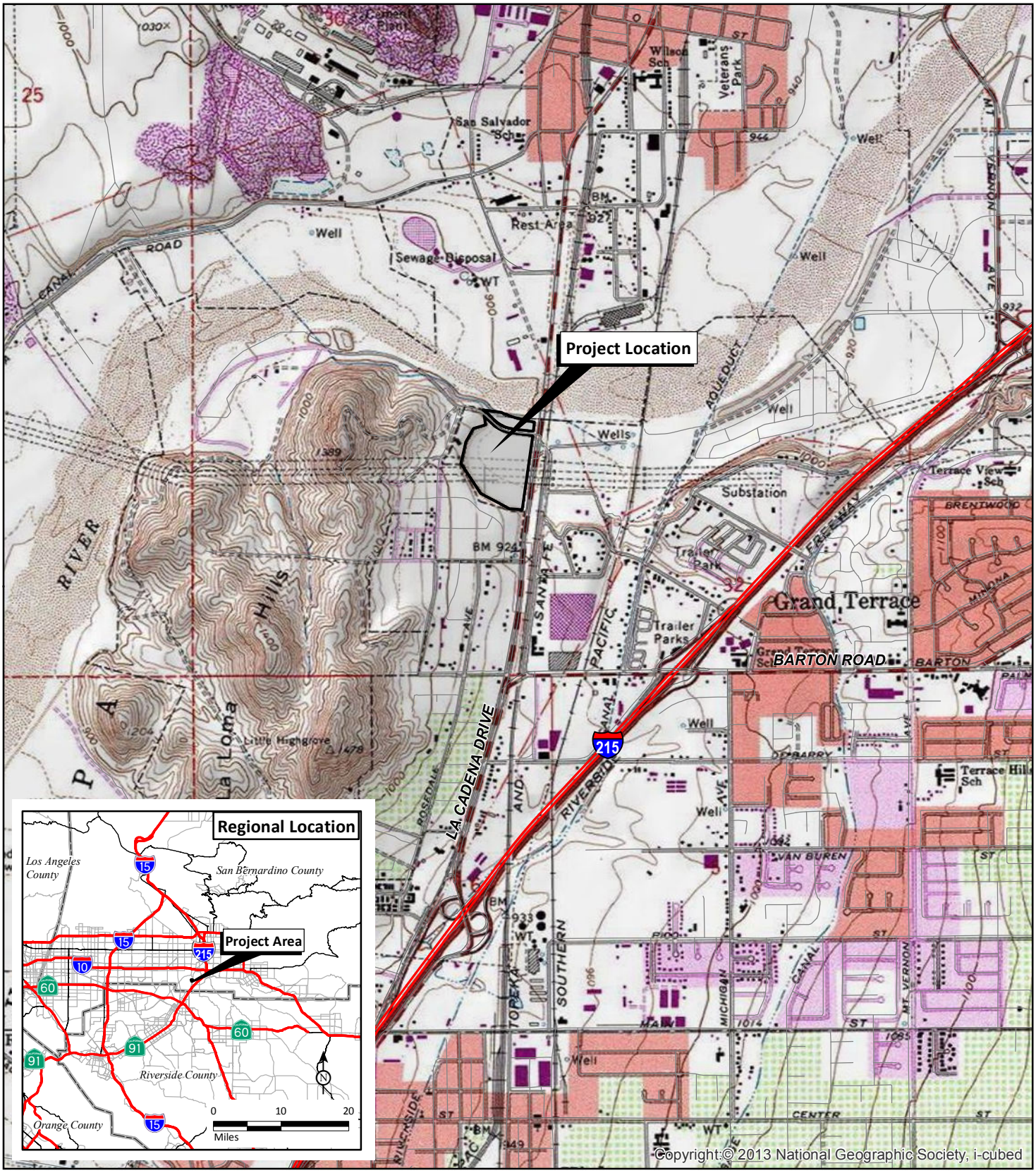
Project Site and Surrounding Area Existing Setting

Two high voltage electrical easements currently run through the project site in an eastern to western direction. One electrical easement is located along the central portion of the site, while the other runs through the southern central portion of the site. There is a 60 to 70 foot elevation difference between the homes south of the proposed project and project site, with the residents at the higher elevation. The project site is relatively flat, gradually slopes down to the northwest, and is currently vacant and undeveloped. Refer to Figure 2.

- North: Santa Ana River Trail, Santa Ana River, Copart (salvaged vehicle lot).
- East: La Cadena Drive, BNSF Railway, undeveloped land.
- South: Berm, single-family residences.
- West: Berm, undeveloped land.

PROJECT DESCRIPTION

The project would consist of the development of 266,030 square feet of industrial warehouse uses, with three warehouse buildings: Building 1 would be 190,100 square feet; Building 2 would be 45,160 square feet; and Building 3 would be 30,770 square feet, as shown in Figure 2. The project also would have a total of 203 auto parking spaces with 114 auto parking stalls at Building 1, 48 auto parking stalls at Building 2, and 41 auto parking stalls at Building 3. Additionally, the project would



LSA

FIGURE 1

N

0 1000 2000
FEET

Colton Tropica Warehouses Project

Regional and Project Location

SOURCE: USGS 7.5' Quad: San Bernardino South (1980), CA; ESRI Streetmap, 2013.

I:\CLT1701\Reports\IS_MND\fig1_RegLoc.mxd (4/11/2017)

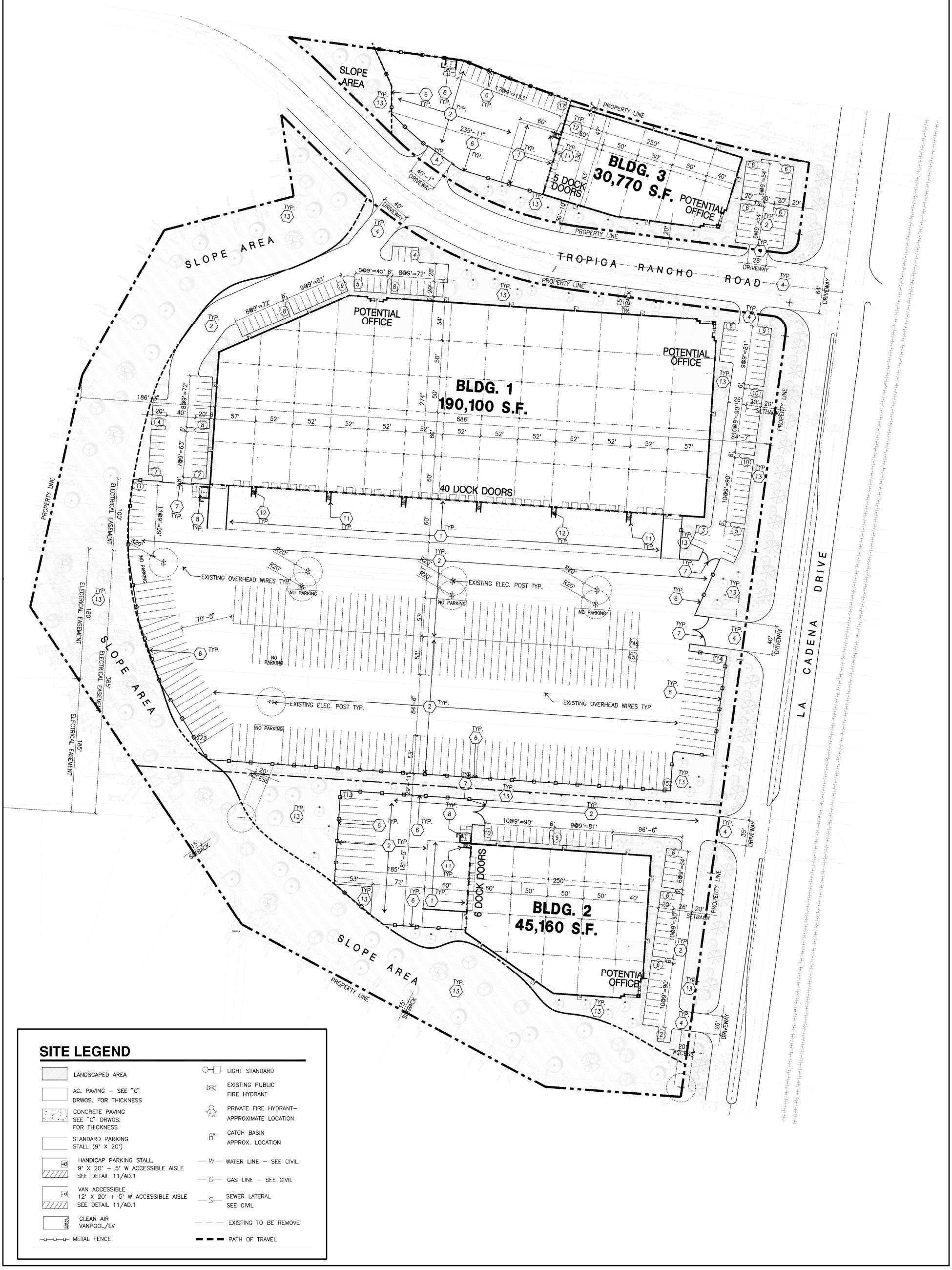


FIGURE 2

LSA

0 60 120
FEET

SOURCE: HPA, Architects, 4/18/2017.

I:\CLT1701\Reports\IS_MND\fig4_SitePlan.mxd (8/11/2017)

Colton Tropica Warehouses Project

Site Plan

provide a total of 212 trailer parking stalls consisting of 199 trailer parking stalls at Building 1 and 13 trailer parking stalls at Building 2.

La Cadena Drive and Tropica Rancho Road will provide project access points, which will also be used for emergency vehicle access. Access to Building 1 would be provided from two locations on La Cadena Drive and two locations on Tropica Rancho Road. Building 2 would have one access point on La Cadena Drive. Access to Building 3 would be provided by two locations on Tropica Rancho Road.

The project site ranges from an elevation of 907 feet above mean sea level (AMSL) to the southeast and an elevation of 900 feet AMSL to the northwest, creating an existing downward slope of approximately 0.6 percent to the northwest.

METHODOLOGY

Evaluation of noise and vibration impacts associated with the project includes the following:

- Determination of the short-term construction noise and vibration impacts on off-site noise-sensitive uses;
- Determination of the long-term noise and vibration impacts, including off-site vehicular traffic and on-site stationary noise sources, on the proposed on existing off-site noise-sensitive uses; and
- Determination of the required mitigation measures to reduce long-term noise and vibration impacts, if any, from all sources.

CHARACTERISTICS OF SOUND

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

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

MEASUREMENT OF SOUND

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds) decibels are measured on a logarithmic scale representing points on a sharply rising curve.

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

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

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the

predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours), and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The City uses the CNEL noise scale for long-term noise impact assessment.

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

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

PHYSIOLOGICAL EFFECTS OF NOISE

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

Table A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of measurement that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter deemphasizes the very low- and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted, unless reported otherwise.)
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 PM to 10:00 PM and after the addition of 10 dBA to sound levels occurring in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 PM and 7:00 AM.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

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

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	—
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	—

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA (2015).

FUNDAMENTALS OF VIBRATION

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

Typical sources of groundborne vibration are construction activities (e.g., blasting, pile driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both groundborne vibration and noise from these sources are usually localized to areas within approximately 100 feet from the vibration source, although there are examples of groundborne vibration causing interference out to distances greater than 200 feet (FTA 2006). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that groundborne vibration from street traffic will not exceed the impact criteria; however, both construction of a project and freight train operations on railroad tracks could result in groundborne vibration that may be perceptible and annoying.

Groundborne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than groundborne noise. Groundborne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced groundborne vibration to cause even cosmetic building damage, it is not uncommon for heavy duty construction processes (e.g., blasting and pile driving) to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2006). Groundborne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS is best for characterizing human response to building vibration, and PPV is used to characterize potential for

damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

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

Where L_v is the VdB, "V" is the RMS velocity amplitude, and "V_{ref}" is the reference velocity amplitude, or 1×10^{-6} inches/second (in/sec) used in the United States. Table C illustrates human response to various vibration levels, as described in the *Transit Noise and Vibration Impact Assessment* (FTA 2006).

Table C: Human Response to Different Levels of Groundborne Noise and Vibration

Vibration Velocity Level	Noise Level		Human Response
	Low-Frequency[1]	Mid-Frequency[2]	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible; mid-frequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying. Low-frequency noise acceptable for sleeping areas, mid-frequency noise annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise annoying for sleeping areas, mid-frequency noise annoying even for infrequent events with institutional land uses such as schools and churches.

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] Approximate noise level when vibration spectrum peak is near 30 Hz.
[2] Approximate noise level when vibration spectrum peak is near 60 Hz.

dBA = A-weighted decibels
FTA = Federal Transit Administration
Hz = Hertz
VdB = vibration velocity decibels

Factors that influence groundborne vibration and noise include the following:

- *Vibration Source.* Vehicle suspension, wheel types and condition, railroad track/roadway surface, railroad track support system, speed, transit structure, and depth of vibration source.
- *Vibration Path.* Soil type, rock layers, soil layering, depth to water table, and frost depth.
- *Vibration Receiver.* Foundation type, building construction, and acoustical absorption.

Among the factors listed above, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock.

Experience with groundborne vibration indicates: (1) vibration propagation is more efficient in stiff, clay soils than in loose, sandy soils; and (2) shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at large distances from a railroad track. Factors including layering of the soil and the depth to the water table can have

significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

REGULATORY SETTING

FEDERAL REGULATIONS

Vibration standards included in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (FTA 2006) are used in this analysis for groundborne vibration impacts on human annoyance, as shown in Table D. The criteria presented in Table D account for variation in project types, as well as the frequency of events, which differ widely among projects. It is intuitive that when there will be fewer events per day, it should take higher vibration levels to evoke the same community response. The frequency of events is accounted for in the criteria by distinguishing between projects with frequent and infrequent events, in which the term "occasional events" is defined as between 30 and 70 events per day.

The criteria for environmental impact from groundborne vibration and noise are based on the maximum levels for a single event. Table E lists the potential vibration building damage criteria associated with construction activities, as suggested in the *Transit Noise and Vibration Impact Assessment* (FTA 2006).

FTA guidelines show that a vibration level of up to 102 VdB (equivalent to 0.5 in/sec in PPV) (FTA 2006) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a nonengineered timber and masonry building, the construction building vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table D: Groundborne Vibration and Groundborne Noise Impact Criteria for General Assessment

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 µin/sec)			Groundborne Noise Impact Levels (dB re 20 µPa)		
	Frequent[1] Events	Occasional[2] Events	Infrequent[3] Events	Frequent[1] Events	Occasional[2] Events	Infrequent[3] Events
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] Frequent events are defined as more than 70 events per day.
[2] Occasional events are defined as between 30 and 70 events per day.
[3] Infrequent events are defined as fewer than 30 events per day.
[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
[5] Vibration-sensitive equipment is not sensitive to groundborne noise.

µin/sec = microinches per second
µPa = micropascals
dB = decibels
dBA = A-weighted decibels
FTA = Federal Transit Administration
HVAC = heating, ventilation, and air conditioning
VdB = vibration velocity decibels

Table E: Construction Vibration Damage Criteria

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

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] RMS vibration velocity in decibels (VdB) re 1 µin/sec.

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

STATE REGULATIONS

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the *State Noise Insulation Standard*, these regulations require buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

The State has also established land use compatibility guidelines for determining acceptable noise levels for specified land uses. The City has adopted and modified the State's land use compatibility guidelines, as discussed below.

LOCAL REGULATIONS

City of Colton General Plan

The Noise Element of the General Plan (1987) contains noise standards for mobile noise sources. These standards address the impacts of noise from adjacent roadways and airports. The Noise Element identifies the noise standards related to commercial property, indicating a CNEL value of up to 75 dBA CNEL is considered normally acceptable; while noise levels of up to 80 dBA are conditionally acceptable.

Municipal Code

The City Noise Standards for stationary sources are provided in Section 18.42.040, Noise, of the City of Colton Municipal Code.

The Municipal Code States that the maximum sound level radiated by any use of facility, when measured at the boundary line of the property on which the sound is generated, shall not be obnoxious by reason of its intensity, pitch or dynamic characteristics as determined by the City, and shall not exceed 65 dBA.

The Municipal Code also states that all activities shall be operated so as not to generate ground vibration by equipment other than motor vehicles, trains, or by temporary construction or demolition, which is perceptible without instruments by the average person at or beyond any lot line of the lot containing the activities.

The City's Municipal Code does not include restrictions on construction activities.

THRESHOLDS OF SIGNIFICANCE

The *California Environmental Quality Act (CEQA) Guidelines* (ACEC 2015) do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." A noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. Based on this information, the following generally acceptable standards would apply to the operation activities of the proposed project:

For long-term operational off-site transportation impacts:

A significant increase of existing ambient noise levels affecting existing sensitive land uses which would require the adoption of practical and feasible mitigation is deemed to occur where a project will cause:

- The ambient noise level is less than 65 dBA CNEL and the project increases noise levels by 5 dBA or more; or
- The ambient noise level is greater than 65 dBA CNEL and the project increases noise levels by 3 dB or more.

For non-transportation-related stationary source impacts, including operations:

- As part of the City's Noise Ordinance, limits on the level a stationary noise source may impact a residential area are defined. The project would normally have a significant noise impact if it would exceed the noise level performance standard of 65 dBA.

For construction-related noise impacts:

- If construction activities do not comply with the stated construction hours in the City's Municipal Code.

For construction-related vibration impacts:

- If vibration levels exceed the FTA impact criteria listed above and in Tables D and E.

EXISTING SETTING

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

The existing noise environment includes traffic noise, mostly on La Cadena Drive and Tropica Rancho Road in the project vicinity. Noise from motor vehicles is generated by engine vibrations, interaction between tires and the road, and exhaust systems. Tropica Rancho Road, La Cadena Drive, and other local streets comprise the dominant source of traffic noise contributing to ambient levels in the project vicinity. Occasional train operations on the railroad tracks to the east of La Cadena Drive also contribute to the ambient noise.

SENSITIVE LAND USES IN THE PROJECT VICINITY

Certain land uses are considered more sensitive to noise than others. Examples of these include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. The closest sensitive receptors would be single-family residences to the west and southwest along the electricity easement corridor. Existing residences are located to the southeast on the east side of La Cadena Drive and the railroad tracks.

EXISTING AIRCRAFT NOISE

Airport related noise levels are primarily associated with aircraft engine noise made while aircraft are taking off, landing, or running their engines while still on the ground. The closest airports include Flabob Airport (RIR), approximately 5.5 miles southwest of the project site, and San Bernardino International Airport (SBD), approximately 6.2 miles northeast of the project site. Aircraft noise is rarely audible at the project site and no portion of the project site lies within the 65 dBA CNEL noise contours of the airports.

EXISTING TRAFFIC NOISE

The guidelines included in the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (1977; FHWA RD-77-108) were used to evaluate highway traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24 hour periods to determine the CNEL values. The standard vehicle mix for Southern California roadways was used for traffic on these roadway segments. Traffic volumes were used to assess the existing traffic noise impacts. Table F provides the traffic noise levels for the Existing without Project scenario. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. Appendix A provides the specific assumptions used in developing these noise levels and model printouts. Table F shows that traffic noise levels range from 41.2 dBA CNEL to 69.5 dBA CNEL.

Table F: Existing Traffic Noise Levels Without Project

Roadway	#	Roadway Segment	ADT	Centerline to 70 dBA CNEL (ft)	Centerline to 65 dBA CNEL (ft)	Centerline to 60 dBA CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Rancho Ave	1	West of La Cadena Dr	10,900	< 50	81	170	66.2
La Cadena Dr	2	North of Rancho Ave	9,300	< 50	88	183	66.2
	3	Rancho Ave to Tropica Rancho Rd	19,700	69	141	301	69.5
	4	Tropica Rancho Rd to Litton Ave	19,300	68	139	296	69.4
	5	Litton Ave to Barton Rd	19,900	69	142	303	69.5
	6	South of Barton Ave	18,900	67	137	292	69.3
Tropica Rancho Rd	7	West of La Cadena Dr	50	< 50	< 50	< 50	41.2
Litton Ave	8	West of La Cadena Dr	1,500	< 50	< 50	< 50	52.5
Barton Ave	9	East of La Cadena Dr	7,700	< 50	< 50	89	63.1

Source: Compiled by LSA (June 2017).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet

AMBIENT NOISE MEASUREMENTS

To assess existing noise levels, LSA conducted three short-term noise measurements in the vicinity of the project site on August 29, 2018. The short-term noise measurements captured traffic noise from La Cadena Drive and Tropica Ranch Road. Table G summarizes noise measurement data collected and Figure 3 shows locations. Noise measurement sheets are provided in Appendix A.

Table G: Short-Term Noise Level Measurements

Location Number	Location Description	Time	Measured Average Noise Level (dBA L_{eq})	Measured Maximum Noise Level (dBA L_{max})	Measured Minimum Noise Level (dBA L_{min})
ST-1	Southeast of project site. East of existing homes at top of slope.	10:23 a.m.	66.3	77.7	39.0
ST-2	Behind the yard of 293 Loma Verde Drive west of the project site.	11:28 a.m.	42.6	64.0	35.8
ST-3	Southwest of the intersection of La Cadena Drive and Tropica Ranch Road.	9:24 a.m.	62.3	74.3	38.8

Source: Compiled by LSA Associates, Inc. (March 2018).
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level
L_{max} = maximum measured sound level
L_{min} = minimum measured sound level

LSA

LEGEND

- Project Site

- Noise Monitoring Location

N

0 175 350

FEET

SOURCE: Google Earth, 2017

I:\CLT1701\G\Noise_Monitor_Locs.cdr (6/18/2018)

FIGURE 3

Colton Tropica Warehouse

Noise Monitoring Locations

PROJECT IMPACTS

In order to determine if there are significant project-related noise and vibration impacts on the environment, the following information was evaluated:

- Short-term construction noise levels at off-site noise sensitive uses versus the allowable levels provided in the City's General Plan and Municipal Code Ordinance requirements;
- Project-induced long-term noise levels at off-site noise sensitive uses versus the levels outlined in the City's pertinent noise standards; and
- Where necessary, the required reduction measures were determined to reduce project-related noise and vibration impacts to nearby sensitive receptors from all sources.

SHORT-TERM CONSTRUCTION NOISE IMPACTS

Two types of short-term noise impacts would occur during project construction. The first type would be from construction crew commutes and the transport of construction equipment and materials to the project site and would incrementally raise noise levels on access roads leading to the site. The pieces of heavy equipment for grading and construction activities will be moved on site, will remain for the duration of each construction phase, and will not add to the daily traffic volume in the project vicinity. La Cadena Drive would be used to access the project site. Although there would be high single-event noise exposure potential at a maximum level of 75 dBA L_{max} from trucks passing at 50 feet, the effect on longer-term (hourly or daily) ambient noise levels would be small compared to existing hourly and daily traffic volumes. Because construction-related vehicle trips would not approach the hourly and daily traffic volumes decribed above, traffic noise would not increase by 3 dBA. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment.

Therefore, short-term, construction-related impacts associated with worker commutes and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during demolition, site preparation, grading, building construction, architectural coating, and paving on the project site. Construction is undertaken in discrete steps, each of which has its own mix of equipment, and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated on the project site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table H lists the maximum noise levels recommended for noise impact assessments for typical construction equipment based on a distance of 50 feet between the equipment and a noise receptor. Typical operating cycles for these types of construction equipment may involve 1 to 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings.

Table H: Typical Maximum Construction Equipment Noise Levels (Lmax)

Type of Equipment	Acoustical Usage Factor	Suggested Maximum Sound Levels for Analysis (dBA L_{max} at 50 ft)
Air Compressor	40	80
Backhoe	40	80
Cement Mixer	50	80
Concrete/Industrial Saw	20	90
Crane	16	85
Excavator	40	85
Forklift	40	85
Generator	50	82
Grader	40	85
Loader	40	80
Pile Driver	20	101
Paver	50	85
Roller	20	85
Rubber Tire Dozer	40	85
Scraper	40	85
Tractor	40	84
Truck	40	84
Welder	40	73

Source: Federal Highway Administration, *Highway Construction Noise Handbook* (2006).
dBA = A-weighted decibel ft = feet L_{max} = maximum noise level

In addition to the reference maximum noise level, the usage factor provided in Table H is utilized to calculate the hourly noise level impact for each piece of equipment based on the following equation:

$$L_{eq}(equip) = E.L. + 10\log(U.F.) - 20\log\left(\frac{D}{50}\right)$$

where: $L_{eq}(equip)$ = L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period

E.L. = noise emission level of the particular piece of equipment at a reference distance of 50 feet

U.F. = usage factor that accounts for the fraction of time that the equipment is in use over the specified period of time

D = distance from the receiver to the piece of equipment

Each piece of construction equipment operates as an individual point source. Utilizing the following equation, a composite noise level can be calculated when multiple sources of noise operate simultaneously:

$$Leq\ (composite) = 10 * \log_{10}\left(\sum_{1}^{n} 10^{\frac{Ln}{10}}\right)$$

The composite noise level of the two loudest pieces of equipment, the forklift and tractor, during construction, as required by the FTA criteria, would be 82 dBA L_{eq} at a distance of 50 feet from the construction area.

Once composite noise levels are calculated, reference noise levels can then be adjusted for distance using the following equation:

$$Leq\ (at\ distance\ X) = Leq\ (at\ 50\ feet) - 20 * \log_{10}\left(\frac{X}{50}\right)$$

In general, this equation shows that doubling the distance would decrease noise levels by 6 dBA while halving the distance would increase noise levels by 6 dBA. It is expected that noise levels for the residences to the south, approximately 220 feet away, would approach 69 dBA L_{eq}, which is potentially higher than existing noise levels experienced.

Implementation of **Mitigation Measure NOI-1** would be required to reduce potential construction noise impacts by limiting construction hours and requiring the construction contractor to implement noise-reducing measures during construction. Construction-related short-term noise levels would be higher than existing ambient noise levels in the project area today, but would no longer occur once project construction is completed. No construction noise impacts would occur with implementation of **Mitigation Measure NOI-1**.

SHORT-TERM CONSTRUCTION VIBRATION IMPACTS

This construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and will assess the potential for building damages using vibration levels in PPV (in/sec) because vibration levels calculated in RMS are best for characterizing human response to building vibration while vibration levels in PPV are best used to characterize potential for damage. As shown in previously referenced Table E, the FTA guidelines indicate that a vibration level up to 102 VdB (equivalent to 0.5 in/sec in PPV) (FTA 2006) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table I shows the PPV and VdB values at 25 feet from the construction vibration source and demonstrates that bulldozers and other heavy-tracked construction equipment (except for pile drivers and vibratory rollers) generate approximately 87 VdB of groundborne vibration when measured at 25 feet, based on the Transit Noise and Vibration Impact Assessment (FTA 2006). This level of groundborne vibration levels would result in potential annoyance to residences and workers located adjacent to the project site, but would not cause any damage to the buildings. Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residences and commercial/office buildings in the project vicinity). Outdoor site preparation for the project is expected to use a bulldozer and loaded truck. The

greatest levels of vibration are anticipated to occur during the site preparation phase. All other phases are expected to result in lower vibration levels. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below.

$$L_vdB\ (D) = L_vdB\ (25\ feet) - 30\ Log\ (D/25)$$

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Table I: Vibration Source Amplitudes for Construction Equipment

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

Sources: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] RMS vibration velocity in decibels (VdB) is 1 µin/sec.
[2] Equipment shown in **bold** is expected to be used on site.

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

For typical construction activity, the equipment with the highest vibration generation potential is the large bulldozer, which would generate 87 VdB at 25 feet. The closest residential structure from the project site is approximately 220 feet from the project construction boundary. Based on the information in Table I, the closest residences from the project site would experience vibration levels of up to 59 VdB (0.003 PPV [in/sec]). This range of vibration levels from construction equipment or activity would be below the FTA 94 VdB (0.2 in/sec PPV) threshold and would not exceed the 80 VdB threshold for residences due to infrequent events. No significant construction vibration impacts would occur; therefore, no mitigation measures are required.

LONG-TERM NOISE IMPACTS

The following sections present the potential long-term operational impacts associated with the proposed project as compared to the applicable City standards.

Long-Term Aircraft Noise Impacts

The project would provide industrial warehouse space within the City, and would not contribute to any measurable long-term aircraft activity. The project is outside of the 65 dBA CNEL noise contour from both RIR and SBD. Therefore, no noise impacts from aircraft noise would occur and no mitigation measures are required.

Long-term Off-Site Traffic Noise Impacts

LSA used guidelines included in the FHWA Highway Traffic Noise Prediction Model (1977; FHWA RD-77-108) to evaluate highway traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24 hour periods to determine the CNEL values. The standard vehicle mix for Southern California roadways was used for traffic on these roadway segments. Traffic volumes in the project's traffic study (RAJU, June 2017) were used to assess the existing and future traffic noise impacts. Previously referenced Table F provides the traffic noise levels for the Existing without Project scenario. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. Appendix A provides the specific assumptions used in developing these noise levels and model printouts.

Table J shows the existing and future with and without project traffic noise levels along with the project-related traffic noise increase. As discussed above, these noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn.

Table L shows that project-related traffic would have very small (0.1 dBA or less) noise level increases along most roadway segments in the project vicinity. One segment, Tropica Rancho Road west of La Cadena Drive, is expected to experience noise level increases approaching 9 dBA; however, there are no noise-sensitive uses along this road segment and the overall noise level would be less than 51 dBA CNEL. These roadway segments would have less than perceptible traffic noise level increases under the with project scenarios or would remain below the off-site transportation standard established by the City.

Long-Term Stationary Noise Impacts

In order to calculate the noise levels expected to result from long-term project stationary source activities during project operations, SoundPLAN software was used. SoundPLAN is a noise modeling program that allows 3-D calculations to be made taking into account topography, ground attenuation, and shielding from structures and walls. Within the model, the noise library allows for the input of many noise sources and calculates the composite noise levels experienced at identified receptors. The results from any calculation can be presented both in both tabular and graphic formats.

Delivery trucks, truck loading and unloading activities, heating, ventilation, and air conditioning (HVAC) equipment, and parking lot activities associated with the proposed project would potentially

Table J: Existing and Future Traffic Noise Levels Without and With Project

Roadway Segment	2017 Existing Traffic Conditions					2019 Traffic Conditions					2040 Traffic Conditions				
	Without Project		With Project			Without Project		With Project			Without Project		With Project		
	ADT	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions	ADT	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions	ADT	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Rancho Avenue - West of La Cadena Drive	10,900	66.2	11,000	66.2	0.0	12,800	66.9	12,900	66.9	0.0	15,900	67.8	16,000	67.9	0.1
La Cadena Drive - North of Rancho Avenue	9,300	66.2	9,500	66.3	0.1	10,800	66.9	11,000	66.9	0.0	13,000	67.7	13,200	67.7	0.0
La Cadena Drive - Rancho Avenue to Tropica Rancho Road	19,700	69.5	20,000	69.5	0.0	22,900	70.1	23,200	70.2	0.1	28,000	71.0	28,300	71.0	0.0
La Cadena Drive - Tropica Rancho Road to Litton Avenue	19,300	69.4	19,800	69.5	0.1	22,500	70.1	23,000	70.1	0.0	27,100	70.9	27,600	70.9	0.0
La Cadena Drive - Litton Avenue to Barton Road	19,900	69.5	20,400	69.6	0.1	23,500	70.2	24,000	70.3	0.1	27,000	70.8	27,500	70.9	0.1
La Cadena Drive - South of Barton Avenue	18,900	69.3	19,100	69.3	0.0	23,800	70.3	24,000	70.3	0.0	27,100	70.9	27,300	70.9	0.0
Tropica Rancho Road - West of La Cadena Drive	50	41.2	400	50.2	9.0	50	41.2	400	50.2	9.0	100	44.2	450	50.7	6.5
Litton Avenue - West of La Cadena Drive	1,500	52.5	1,500	52.5	0.0	2,400	54.5	2,400	54.5	0.0	2,200	54.1	2,200	54.1	0.0
Barton Avenue - East of La Cadena Drive	7,700	63.1	8,000	63.2	0.1	11,000	64.6	11,300	64.7	0.1	11,600	64.8	11,900	64.9	0.1

Source: LSA (August 2017).
Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

affect the existing off-site sensitive land uses. Noise impacts associated with the long-term operation of the project must comply with the standards presented in the City's Noise Ordinance, described above.

The proposed typical operations assumed in this analysis are conservative in nature (i.e., all operations are occurring simultaneously and operations occur 24 hours a day). A description of the sources and their respective sound levels, from reference materials as well as measurements gathered by LSA for other projects, included in the analysis follows:

- **Heating, Ventilation, and Air Conditioning Units:** HVAC units would be used in order to properly maintain a desired temperature inside the building. The sound-power level for this piece of equipment is 85.7 LwA.
- **Container Refrigeration Units:** The external refrigeration units on the semi-containers operate locally and are used to keep the interior temperatures at a fixed temperature. The sound-power level for this piece of equipment is 103.5 LwA.
- **Forklift:** The forklifts are used on site to load and unload trailers and move materials. The sound-power level for this piece of equipment is 92.3 LwA.
- **Semi-Truck Arrival and Departure:** Impacts associated with the arrival and departure of the semi-trucks with trailers include air brake release, back-up beepers, and engine noise. The sound-power level for this activity is 101.2 LwA.
- **Automobile Arrival and Departure:** Impacts associated with the arrival and departure of automobiles include doors opening and shutting as well as engine noise. The sound-power level for this activity is 98.1 LwA.

Per the specifics presented in the project description, it was assumed that a maximum of half of the loading docks would contain refrigerated containers. In addition to loading dock and truck activities, approximate locations of HVAC units were modeled and assumed to run continuously.

The results show that all points around the project site would experience noise level impacts that would be less than the City's standard of 65 dBA; thus, the project would not result in an exceedance of the City's noise standards at the existing nearby sensitive receptors. The results from the calculations are presented in graphic format in Appendix C.

During final design, prior to issuance of an operation permit, once the final equipment is chosen, the City of Colton Planning Department shall have an acoustical engineer verify that the operations of the proposed project and associated equipment is in compliance with both the noise ordinance requirements.

LAND USE COMPATIBILITY

The proposed project consists of industrial uses that have no sensitive areas related to noise; therefore, any exterior noise levels experienced due to traffic or train noise in the area would result in a less than significant impact.

Excessive Airport Noise

The proposed project is approximately 5.5 miles from the nearest airport. Aircraft noise is rarely audible at the project site. Furthermore, no portion of the project site lies within the 65 dBA CNEL noise contours of any public airport nor does any portion of the project site lie within 2 miles of any private airfield or heliport.

LONG-TERM VIBRATION IMPACTS

The streets surrounding the project area are paved, smooth, and unlikely to cause significant groundborne vibration. In addition, the rubber tires and suspension systems of buses and other on-road vehicles make it unusual for on-road vehicles to cause groundborne noise or vibration problems. It is, therefore, assumed that no such vehicular vibration impacts would occur during project operations and, therefore, no vibration impact analysis of on-road vehicles is necessary. Additionally, once constructed, the proposed project would not contain uses that would generate groundborne vibration.

MITIGATION MEASURES

SHORT-TERM CONSTRUCTION NOISE AND VIBRATION IMPACTS

NOI-1: Construction Noise. Prior to issuance of demolition permits, the City of Colton Planning Staff shall verify that all construction plans include notes stipulating the following:

- Construction activities are restricted to conform with the City of Riverside requirements to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays, and are prohibited on Sundays and federal holidays.
- Grading and construction contractors shall use equipment that generates lower vibration levels such as rubber-tired equipment rather than metal-tracked equipment.
- Construction haul truck and materials delivery traffic shall avoid residential areas whenever feasible.
- The construction contractor shall place noise and vibration-generating construction equipment and locate construction staging areas away from sensitive uses, whenever feasible.

LONG-TERM AIRCRAFT NOISE IMPACTS

No mitigation measures are required.

LONG-TERM TRAFFIC NOISE IMPACTS

No mitigation measures are required.

LONG-TERM STATIONARY NOISE IMPACTS

NOI-2: Operational Noise Impacts. Prior to issuance of an operation permit, once the final equipment is chosen and designed, the City of Colton Planning Department shall have an acoustical engineer verify that the operations of the proposed project and associated equipment is in compliance with both the noise ordinance requirements.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant noise impacts from short-term construction or long-term traffic will result after implementation of the mitigation measures listed above.

REFERENCES

City of Colton. 2103. *City of Colton General Plan.* Land Use Element. August.

_____. 1992. Municipal Code, Code of Ordinance. Website: https://www.municode.com/library/ca/colton/codes/code_of_ordinances?nodeId=TIT18ZO_CH18.42PEST_18.42.040NO.

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

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

Federal Transit Administration (FTA). 2006. Office of Planning and Environment. *Transit Noise and Vibration Impact Assessment*. FTA-VA-90-1003-06. August.

Harris, Cyril M., editor. 1991. *Handbook of Acoustical Measurements and Noise Control*, Third Edition.

Transtech Engineers, Inc. *Traffic Impact Analysis for the Proposed Tropica Warehouse Project Colton.* July 2017.

United States Environmental Protection Agency (EPA). 1978. *Protective Noise Levels, Condensed Version of EPA Levels Document*, EPA 550/9-79-100. November.

APPENDIX A

FHWA HIGHWAY TRAFFIC NOISE MODEL PRINTOUTS

TABLE 2017 Existing Traffic Conditions-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Rancho Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10900 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.18

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	80.7	170.3	365.2

TABLE 2017 Existing Traffic Conditions-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - North of Rancho Avenue
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9300 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.22

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	87.7	183.3	392.1

TABLE 2017 Existing Traffic Conditions-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Rancho Avenue to Tropica Rancho Road
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19700 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
68.9	141.1	300.5	645.8

TABLE 2017 Existing Traffic Conditions-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Tropica Rancho Road to Litton Avenue
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19300 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
68.1	139.3	296.5	637.0

TABLE 2017 Existing Traffic Conditions-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Litton Avenue to Barton Road
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19900 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.52

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
69.3	142.1	302.6	650.1

TABLE 2017 Existing Traffic Conditions-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - South of Barton Avenue
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18900 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
67.2	137.4	292.4	628.2

TABLE 2017 Existing Traffic Conditions-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Tropica Rancho Road - West of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 50 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 41.18

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

TABLE 2017 Existing Traffic Conditions-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Litton Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1500 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 52.49

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

TABLE 2017 Existing Traffic Conditions-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Barton Avenue - East of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Existing Traffic Conditions

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7700 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.06

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	89.2	191.8

TABLE 2017 Exisiting Traffic Conditions plus Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Rancho Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11000 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.22

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL 70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	81.1	171.3	367.5

TABLE 2017 Exisiting Traffic Conditions plus Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - North of Rancho Avenue
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9500 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.31

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	88.8	185.8	397.6

TABLE 2017 Exisiting Traffic Conditions plus Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Rancho Avenue to Tropica Rancho Road
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 20000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.54

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
69.5	142.5	303.6	652.3

TABLE 2017 Exisiting Traffic Conditions plus Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Tropica Rancho Road to Litton Avenue
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19800 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.50

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
69.1	141.6	301.6	647.9

TABLE 2017 Exisiting Traffic Conditions plus Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Litton Avenue to Barton Road
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 20400 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.63

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
70.3	144.4	307.6	660.9

TABLE 2017 Exisiting Traffic Conditions plus Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - South of Barton Avenue
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19100 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.34

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
67.6	138.3	294.5	632.6

TABLE 2017 Exisiting Traffic Conditions plus Project-07

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Tropica Rancho Road - West of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 400 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.21

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

TABLE 2017 Exisiting Traffic Conditions plus Project-08

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Litton Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1500 SPEED (MPH): 25 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 52.49

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

TABLE 2017 Exisiting Traffic Conditions plus Project-09

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Barton Avenue - East of La Cadena Drive
NOTES: Tidewater Crossing - 2017 Exisiting Traffic Conditions plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8000 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.22

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	91.5	196.8

TABLE 2019 Traffic Without Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Rancho Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12800 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.88

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	89.3	189.4	406.4

TABLE 2019 Traffic Without Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - North of Rancho Avenue
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10800 SPEED (MPH): 50 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.87

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	96.2	202.1	433.0

TABLE 2019 Traffic Without Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Rancho Avenue to Tropica Rancho Road
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22900 SPEED (MPH): 50 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.13

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
75.3	155.6	332.1	713.8

TABLE 2019 Traffic Without Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Tropica Rancho Road to Litton Avenue
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22500 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.05

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
74.5	153.9	328.2	705.5

TABLE 2019 Traffic Without Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Litton Avenue to Barton Road
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23500 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.24

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
76.5	158.3	337.8	726.2

TABLE 2019 Traffic Without Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - South of Barton Avenue
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23800 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
77.1	159.6	340.7	732.4

TABLE 2019 Traffic Without Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Tropica Rancho Road - West of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 50 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 41.18

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

TABLE 2019 Traffic Without Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Litton Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2400 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.53

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	52.1

TABLE 2019 Traffic Without Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Barton Avenue - East of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11000 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	52.7	113.0	243.2

TABLE 2019 Traffic With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Rancho Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12900 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.92

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	89.8	190.3	408.6

TABLE 2019 Traffic With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - North of Rancho Avenue
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.94

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	97.3	204.6	438.3

TABLE 2019 Traffic With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Rancho Avenue to Tropica Rancho Road
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23200 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
75.9	156.9	335.0	720.0

TABLE 2019 Traffic With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Tropica Rancho Road to Litton Avenue
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.15

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	75.5	156.1	333.0	715.9

TABLE 2019 Traffic With Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Litton Avenue to Barton Road
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.33

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
77.5	160.5	342.6	736.5

TABLE 2019 Traffic With Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - South of Barton Avenue
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.33

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
77.5	160.5	342.6	736.5

TABLE 2019 Traffic With Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Tropica Rancho Road - West of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 400 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.21

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2019 Traffic With Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Litton Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2400 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.53

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	52.1

TABLE 2019 Traffic With Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Barton Avenue - East of La Cadena Drive
NOTES: Tidewater Crossing - 2019 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11300 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	53.7	115.1	247.6

TABLE 2040 Traffic Without Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Rancho Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15900 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.82

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	102.7	218.6	469.6

TABLE 2040 Traffic Without Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - North of Rancho Avenue
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.67

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	108.1	228.4	489.8

TABLE 2040 Traffic Without Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Rancho Avenue to Tropica Rancho Road
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.00

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
85.1	177.4	379.5	816.1

TABLE 2040 Traffic Without Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Tropica Rancho Road to Litton Avenue
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27100 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.86

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
83.4	173.7	371.3	798.5

TABLE 2040 Traffic Without Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Litton Avenue to Barton Road
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27000 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.84

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
83.2	173.3	370.4	796.6

TABLE 2040 Traffic Without Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - South of Barton Avenue
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27100 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.86

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
83.4	173.7	371.3	798.5

TABLE 2040 Traffic Without Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Tropica Rancho Road - West of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 100 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 44.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2040 Traffic Without Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Litton Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2200 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.15

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

TABLE 2040 Traffic Without Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Barton Avenue - East of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic Without Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11600 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.84

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	54.6	117.1	252.0

TABLE 2040 Traffic With Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Rancho Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

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

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	103.1	219.5	471.5

TABLE 2040 Traffic With Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - North of Rancho Avenue
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13200 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	109.2	230.7	494.8

TABLE 2040 Traffic With Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Rancho Avenue to Tropica Rancho Road
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28300 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.05

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
85.6	178.7	382.2	821.9

TABLE 2040 Traffic With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Tropica Rancho Road to Litton Avenue
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27600 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.94

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
84.3	175.8	375.9	808.3

TABLE 2040 Traffic With Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - Litton Avenue to Barton Road
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27500 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.92

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
84.1	175.4	375.0	806.4

TABLE 2040 Traffic With Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: La Cadena Drive - South of Barton Avenue
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27300 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

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

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.89

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
83.8	174.5	373.1	802.5

TABLE 2040 Traffic With Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Tropica Rancho Road - West of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 450 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.73

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2040 Traffic With Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Litton Avenue - West of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2200 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.15

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2040 Traffic With Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/15/2018
ROADWAY SEGMENT: Barton Avenue - East of La Cadena Drive
NOTES: Tidewater Crossing - 2040 Traffic With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11900 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.95

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	55.6	119.1	256.3

APPENDIX B

NOISE MONITORING DATA SHEETS

Noise Measurement Survey

Project Number: CLT1701
Project Name: Colton Tropica Warehouse
Test Personnel: Daniel Kaufman
Equipment: Larson Davis 824

Site Number: ST-1 Date: 8/29/2017
Time: From 10:23 AM To 10:44 AM

Site Location: Southeast of project site. East of homes near the top of the slope, 30 – 40 ft above roadway.

Primary Noise Sources: Traffic on La Cadena Drive

Comments: Homes are 5-10 ft higher. Filtered aircraft and passenger train.

Adjacent Roadways: La Cadena Drive.

File:	
L_{eq}	66.3
L_{max}	77.7
L_{min}	39.0
L_{peak}	99.7
L_2	73.4
L_8	70.8
L_{25}	67.6
L_{50}	63.5
L_{90}	46.7
L_{99}	41.1
SEL	97.1

Atmospheric Conditions	
Average Wind Velocity (mph)	0.9
Maximum Wind Velocity (mph)	4.2
Temperature (F)	111.8
Relative Humidity (%)	17.6

Diagram:

Location Photo:

Noise Measurement Survey

Project Number: CLT1701
Project Name: Colton Tropica Warehouse
Test Personnel: Daniel Kaufman
Equipment: Larson Davis 824

Site Number: ST-2 Date: 8/29/2017
Time: From 11:28 AM To 11:53 AM

Site Location: Northwest of the backyard of 293 Loma Verde Drive.

Primary Noise Sources: Traffic on La Cadena Drive.

Comments: Filtered aircraft and train.

Adjacent Roadways: Bostick Avenue, Loma Verde Drive.

File:	
L_{eq}	42.6
L_{max}	64.0
L_{min}	35.8
L_{peak}	84.8
L_2	49.5
L_8	44.4
L_{25}	41.2
L_{50}	39.2
L_{90}	37.2
L_{99}	36.4
SEL	73.4

Atmospheric Conditions	
Average Wind Velocity (mph)	1.8
Maximum Wind Velocity (mph)	5.7
Temperature (F)	109.4
Relative Humidity (%)	24.4

Diagram:

Location Photo:

Noise Measurement Survey

Project Number: CLT1701
Project Name: Colton Tropica Warehouse

Test Personnel: Daniel Kaufman
Equipment: Larson Davis 824

Site Number: ST-3 Date: 8/29/2017

Time: From 9:24 AM To 9:45 AM

Site Location: South of the intersection of La Cadena Drive and Tropica Ranch Road. Northeast portion of field

Primary Noise Sources: Traffic on La Cadena Drive.

Comments: Filtered aircraft.

Adjacent Roadways: La Cadena Drive, Tropica Ranch Road.

File:	
L_{eq}	62.3
L_{max}	74.3
L_{min}	38.8
L_{peak}	88.0
L_2	69.5
L_8	66.7
L_{25}	63.4
L_{50}	59.5
L_{90}	46.1
L_{99}	40.1
SEL	93.1

Atmospheric Conditions	
Average Wind Velocity (mph)	0.8
Maximum Wind Velocity (mph)	2.4
Temperature (F)	114.6
Relative Humidity (%)	18.1

Diagram:

Location Photo:

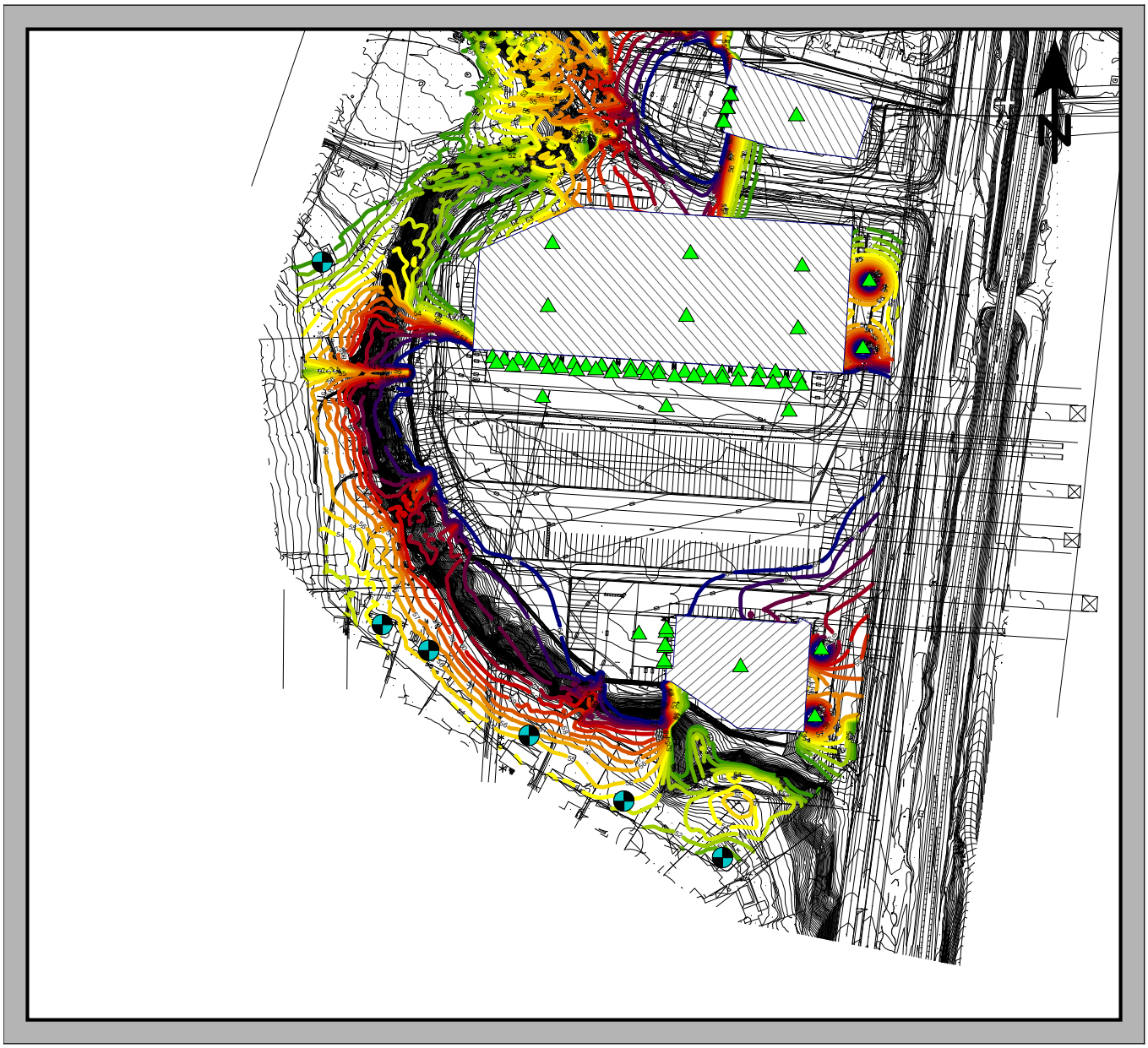
APPENDIX C

SOUNDPLAN MODEL OUTPUT – IN PROGRESS

Tropica Warehouse

Project No. CLT1701

GridNoiseMap - 50% Red, Leq



Signs and symbols

- Point source
- Main building
- Point receiver

Levels, Leq

in dB(A)

	< 50
	50 - 51
	51 - 52
	52 - 53
	53 - 54
	54 - 55
	55 - 56
	56 - 57
	57 - 58
	58 - 59
	59 - 60
	60 - 61
	61 - 62
	62 - 63
	63 - 64
	>= 64

Date: 6/15/2018

Project engineer: JT Stephens