AGUA MANSA HIGH-CUBE
NOISE IMPACT STUDY
County of San Bernardino, California

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Table of Contents

List of Attachments

Exhibits

Tables

Appendices

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

This noise assessment was prepared to evaluate whether the potential noise impacts associated with the project would cause a significant impact to the nearest sensitive receivers. The assessment was conducted and compared to the noise standards set-forth by the Federal, State and Local agencies. Consistent with the California Environmental Quality Act (CEQA) and CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- A description of the local noise guidelines and standards
- An exterior/interior analysis of traffic noise impacts to the project study area
- An exterior analysis of stationary noise impacts to the project study area
- Construction noise analysis

1.2 Site Location and Study Area

The project site is located north of El Rivino Road and west of Agua Mansa Road in an unincorporated area of the County of San Bernardino, California. The project site is bounded by El Rivino Road to the south, Agua Mansa Road to the east, existing industrial land use to the north (high-cube warehouse) and existing residential to the west as illustrated in Exhibit A. The project vicinity is characterized by a mix of developed properties. Developed properties in the vicinity include residential properties to the south and west, and industrial properties to the north. The project site is relatively flat, located approximately 940 feet above sea level and is vacant.

1.3 Proposed Project Description

The Agua Mansa High-Cube Warehouse project proposes to amend the zoning for the site area from Residential to Industrial. The site is within the Agua Mansa Specific Plan, which was adopted by the County in July, 1986.

The project consists of two (2) warehouse buildings on approximately 29.1 acres. Building #1 has approximately 1,248,564 square feet of high-cube warehouse space. Building #2 has approximately 31,818 square feet of high-cube warehouse space. The proposed project site plan used for this analysis, provided by HPA Architecture., is illustrated in Exhibit B.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. Noise is defined as sound that is loud, unpleasant, unexpected, or unwanted.
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2.2 Frequency and Hertz

A continuous sound is described by its frequency (pitch) and its amplitude (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The amplitude of a sound determines it loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measure in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or Lp) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels abbreviated dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns other are random. Some noise levels are constant while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. The following indicates the most commonly used noise descriptors and gives a brief definition.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly L50, L90 and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound..."

2.7 Traffic Noise Prediction

Noise levels associated with traffic depends on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2–3 axle) and heavy truck percentage (4 axle and greater), and sound propagation. The greater the volume of traffic, higher speeds and truck percentages equate to a louder volume in noise. A doubling of the Average Daily Traffic (ADT) along a roadway will increase noise levels by approximately 3 dB; reasons for this are discussed in the sections above.

Outdoor Living Area

Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally

used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

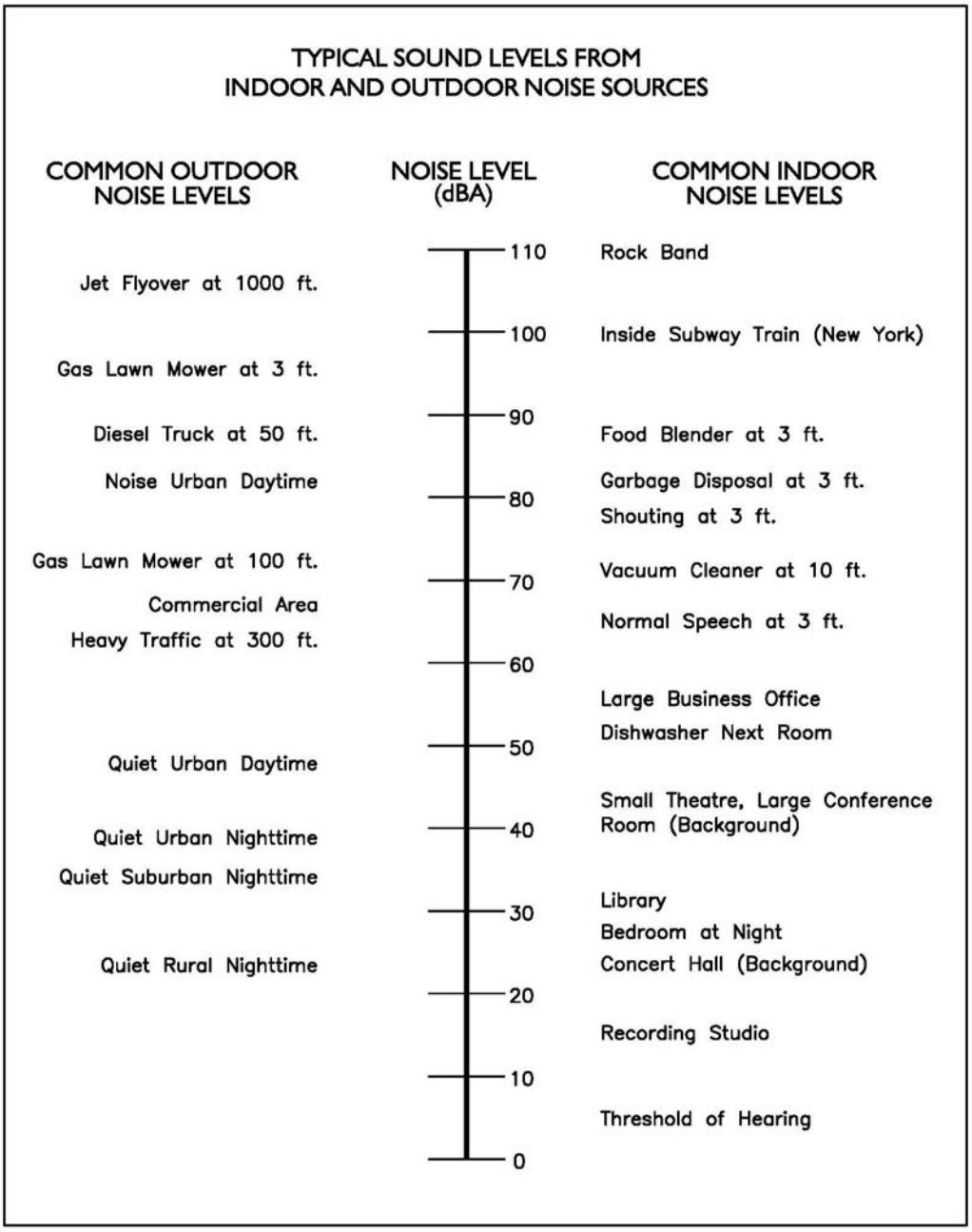
2.8 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at a rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 7.5 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity and turbulence can further impact have far sound can travel.

This noise assessment was prepared to evaluate whether the potential noise impacts associated with the project would cause a significant impact to the nearest sensitive receptor.



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3.0 Ground-Bourne Vibration Fundamentals

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

3.1 Vibration Descriptors

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as root mean squared (RMS) can be used to denote vibration amplitude

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

3.3 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves

carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

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

3.4 Construction Related Vibration Level Prediction

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Induced Vibration Guidance Manual in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

Guideline Vibration Annoyance Potential Criteria		
Human Response	**Maximum PPV (in/sec)**	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

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

The Caltrans Transportation and Construction Induced Vibration Guidance Manual provide general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Guideline Vibration Damage Potential Threshold Criteria		
Structure and Condition	**Maximum PPV (in/sec)**	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Suggested "n" Values Based on Soil Classes		
Soil Class	**Description of Soil Material**	**Suggested Value of "n"**
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: dense compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

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4.0 Regulatory Setting

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The proposed project is located in the County of San Bernardino and noise regulations are addressed through the efforts of various federal, state and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

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

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) originally was tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The federal government advocates that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

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

4.2 State Regulations

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

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

4.3 County of San Bernardino Noise Regulations

The County of San Bernardino outlines their noise regulations and standards within the Noise Element from the General Plan and Municipal Code (Appendix A). For purposes of this analysis, the County's General Plan and Noise Ordinance (Section 83.01.080) is used to evaluate the roadway noise and stationary noise impacts to and from the proposed project. The Noise Element outlines Goals and Polices (Goal N.1, page VII-4 of the Noise Element). In addition, Section 83.01.30 outlines the applicable noise standards for the proposed project. This assessment will compare the project noise levels to the residential noise limits since the proposed project is located directly adjacent to existing residential land uses. The project impacts were compared to the County's residential noise standards.

Traffic Noise Regulation

The County specifies outdoor and indoor noise limits for industrial and residential uses, places of worship, educational facilities, hospitals, hotels/motels, commercial and other land uses. Table 83-3 (Section 83.01.080) outlines the County's exterior standard for residential land uses. Residential land uses are normally acceptable at 60 dBA CNEL and up to 65 dBA CNEL, provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and the interior noise level does not exceed 45 dBA (CNEL) with windows and doors closed. The following table outlines the County's noise standards for adjacent mobile noise sources:

Table 83-3: Noise Standards for Adjacent Mobile Noise Sources

Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior (1)***	***Exterior (2)***
Residential	Single and multi-family, duplex, mobile homes	45	60 (3)
Commercial	Hotel, motel, transient housing	45	60 (3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

(1) The indoor environmental shall exclude bathrooms, kitchens, toilets, closets and corridors.
(2) The outdoor environment shall be limited to:
- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds
(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.
CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

Stationary Noise Regulation

Section 83.01.080(C) from the Municipal Code discusses the noise standards for stationary noise source and states the following:

(1) Table 83-2 from the noise ordinance describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2: Noise Standards for Stationary Noise Sources		
Affected Land Uses (Receiving Noise)	***7AM - 10PM (Leq)***	***10:00PM - 7AM (Leq)***
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)
Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time varying signal over a given sample period, typically one, eight, or 24 hours.		
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitive range of the human ear.		
Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.		

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.
(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.
(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.
(E) The noise standard plus 20 dB(A) for any period of time.

Vibration Regulation

Vibration sources are regulated within San Bernardino County under Section 83.01.090 of the County Code, which sets the vibration limit at that which cannot be felt without the aid of instruments at or beyond the property line, and that which does not produce a particle velocity greater than or equal to 0.2 inches per second at the property line. Construction vibration is exempt from this limit between the hours of 7:00 a.m. and 7:00 p.m., except Sundays and federal holidays and motor vehicles are exempt when not under the control of the subject use (County 2007).

Construction Noise Regulation

Construction noise sources are regulated within San Bernardino County under Section 83.01.090 (G) of the County Code, which states that temporary construction, maintenance, repair, or demolition activities between 7AM to 7PM, except Sundays and Federal Holidays are exempt.
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5.0 Study Method and Procedure

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To determine the existing noise level environment, RK conducted four (4) short-term noise measurements at the project study area. The following describes the measurement procedures, measurements locations, results, noise modeling methods and assumptions to determine the existing and future noise level impact.

5.1 Measurement Procedure and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance to the County of San Bernardino and CalTrans technical noise specifications. All measurements equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA). The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed 5-feet above the ground for all measurements
- Sound level meters were calibrated (Larson Davis CAL 200) before and after each measurement
- Following the calibration of equipment, a wind screen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Results of the long-term noise measurements were recorded on field data sheets
- During any short-term noise measurements any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

5.1.1 Noise Measurements

Noise measurements were conducted June 5, 2014 using a Larson Davis 700 type II sound level meter. The Leq, Lmin, Lmax, L2, L8, L25 and L50 were recorded over a 10-minute interval. The information was utilized to define the noise characteristics for the project.

5.1.2 Noise Measurement Locations

The noise monitoring locations for the Agua Mansa High-Cube Warehouse site were selected based on the proximity to the location to adjacent sensitive receptors. Short-term noise monitoring location (ST-1) is located along the project site's southeastern property line (near existing residence) and represents ambient noise levels in the vicinity of the measurement location. ST-2 is located at the center of the existing project site and represents noise levels within the vicinity of the measurement location. ST-3 is located along the project site's western property line (near existing residences) and represents ambient noise levels within the vicinity. ST-4 is located along the project site's southern property line (near existing residences) and represents ambient noise levels within the vicinity. Appendix B includes photos, field sheets and measured noise data.

5.1.3 Noise Measurement Timing and Climate

The short-term noise measurements were recorded during daytime hours between 12PM – 1PM on June 5, 2014. Noise measurements were conducted in 10-minute intervals during the indicated time schedule.

The climate data was noted during the measurements and is indicated in the field sheets within Appendix B.

5.2 Traffic Noise Modeling

Traffic noise from vehicular traffic was projected using a version of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the key input parameters. Traffic data, traffic volumes, and percentages were obtained using the Traffic Impact Study (prepared by RK Engineering Group, Inc.) and vehicle mix data from the San Bernardino County General Plan (Noise Element, Technical Study). The referenced traffic data utilized for the study is indicated in Appendix C.

The following outlines the key adjustments made to the computer model for the roadway inputs:

- Roadway classification – (e.g. freeway, major arterial, arterial, secondary, collector, etc),
- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic (ADT) Volumes, Travel Speeds, Percentages of automobiles, medium trucks, and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period

Tables 1 and 2 show the roadway parameters, vehicle distribution, and scenarios utilized for this study.

The following outlines key adjustments to the computer model for the project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

RK estimated the traffic noise levels at 100 feet from the centerline of the analyzed roadway and the roadway noise contours. The noise model assumes a flat topography condition (which is a worst-case scenario). The project noise calculation worksheet outputs are provided in Appendix D.

5.3 Stationary Noise Modeling

The stationary noise was projected using a computer program that replicates the FHWA Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the reference energy noise level. For each stationary source, the referenced noise level was applied to the model. The model outputs the projected noise level based on the following key parameters:

- Measured referenced noise level – (e.g. how loud a source is at a specific distance)
- Vertical and horizontal distances (sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (noise barrier distance from sound source and receptor).
- Typical noise source spectra
- Topography

Table 3 indicates the measured referenced and adjusted noise level measurements conducted by RK. The noise measurement data indicates the distance the microphone was placed from the noise source and the statistical data. Measurements were taken over a 10-minute interval.

To estimate the future noise levels during typical conditions, RK adjusted the reference noise levels. Reference noise levels were projected to the nearest property lines where sensitive receptors exist. Table 3 indicates the adjusted noise level measurements.

The adjusted noise levels are based on the distance of the receptor location relative to the noise source, local topography and the project design features including parapet shielding walls for the equipment. Noise calculation worksheets are located in Appendix E.

The noise levels assume that the stationary sources are operating continuously when in reality all noise sources will operate intermittently throughout the daily operation.

The stationary noise analysis uses a version of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Key parameters and equations from the model require the following input characteristics: Relative source-barrier-receiver horizontal separations, relative source-barrier-receiver vertical separations, typical noise source spectra, and barrier transmission loss. Key inputs also include noise attributed from the typical stationary noise sources (i.e., loading/unloading noise along with specific distances), also known as reference noise level measurements.

6.0 Existing Noise Environment

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Ambient noise measurements were conducted at various locations at the project site. Four (4) short term ambient measurements were conducted at or near the site to evaluate the existing noise conditions. Exhibit C shows the measurement locations. Noise measurement data indicates that traffic noise propagating from the Agua Mansa Road and El Rivino Road are the primary sources of noise impacting the project site and the existing residential land use.

6.1 Short-Term Noise Measurement Results

The results of the short-term noise data are presented in Table 4. The noise data indicates the daytime (7AM – 10PM) ambient noise level. RK reduced the daytime noise measurements by 5 dBA to establish the nighttime ambient noise levels. The noise measurement data indicates that the average noise level near the site area ranges from 43.7 to 51.0 dBA Leq. The maximum measured noise level near the existing residential units was 70.0 dBA Lmax.

Short-term noise data indicates the existing ambient noise level is below the City's daytime standard and nighttime standard. The measured noise levels and field notes indicate that the local residential traffic noise levels are the main source of noise impacting the site and the adjacent residential community.

The City's noise code states that noise propagating from an adjacent land use must not exceed the City's daytime standard and nighttime standard. Therefore the project must not further demonstrate an impact above the existing ambient noise conditions.

6.2 Modeled Existing Traffic Noise Levels

The noise contours of the nearby existing roadways were calculated using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) in order to provide a baseline of the existing traffic noise levels. The distances to the 55, 60, 65, 70 dBA CNEL noise contours were calculated. In addition, the noise level at 100 feet from the centerline was calculated and representative of the nearest homes along the study area roadways. The existing traffic (without project) noise levels along the roadways are presented in Table 5.

The calculated existing noise contours in Table 5 demonstrate that the noise level at 100 feet from the centerline for the analyzed roadways, range from 43.0 to 65.1 dBA CNEL. The existing traffic noise level condition at 100 feet from the centerline of El Rivino Road, the roadway closest to the proposed project and adjacent residential units, is 57.9 dBA CNEL. The existing traffic noise conditions at 100 feet from the centerline El Rivino is below the City's 65 dBA CNEL residential standard. The impact is less than significant.

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7.0 Future Noise Environment Impacts and Mitigation

7.1 Future Exterior Noise

Each future noise source related to the project was analyzed and compared to the CEQA guidelines. The sections below analyze the exterior noise levels and provide mitigation measures that would reduce noise levels. This assessment evaluates the potential noise impacts from the proposed Agua Mansa High-Cube Warehouse project to the surrounding land uses and compares the results to the City's Noise Standards.

7.1.1 Traffic Source Noise

The potential off-site noise impacts caused by the increase in vehicular traffic from the operation of the proposed project on the nearby roadways were calculated for the following scenarios and conditions:

Existing Year with Project Condition: This scenario refers to existing year traffic noise conditions with (plus) project generated traffic noise and is demonstrated in Table 6. Table 7 compares the existing without project to the existing with project condition and shows the change in noise level as a result of the proposed project.

Year 2035 without Project Condition: This scenario refers to the 2035 traffic noise conditions consisting of future traffic generated by ambient growth and known development projects in the project study areas, without the proposed project generated traffic noise and is demonstrated in Table 8.

Year 2035 with Project Condition: This scenario refers to the 2035 traffic noise conditions consisting of future traffic generated by ambient growth and known development projects in the project study areas, with (plus) the proposed project generated traffic noise and is demonstrated in Table 9. Table 10 compares the noise level contours for the without and with project 2035 project condition and shows the change in noise level as a result of the proposed project.

Proposed Project Off-Site Traffic Noise Impact

Tables 7 and 10 show that the largest increase in noise levels is along El Rivino Road between Kiningham Drive to Hall Avenue, where an increase of up to 0.5 dBA is predicted for the Existing With Project scenario. A noise level increase of 3 dBA or more is perceptible to the human ear and would be considered significant. However, the 65 dBA CNEL noise level contour along these roadway segments would remain confined within the roadway right-of-way.

The existing sensitive residential uses along these roadway segments are located at least 60 feet from the centerline and would not be exposed to traffic noise levels exceeding 65 dBA CNEL and would be below the City's exterior 65 dBA CNEL for noise sensitive land uses.

All other roadways in the project area would have a traffic noise increase of 0.4 dBA or less. Therefore, no mitigation measures on off-site noise-sensitive land uses are required.

Proposed Project On-Site Traffic Noise Impact

Tables 6, and 7 through 10 show the Existing Plus Project and Year 2035 scenarios traffic noise levels. Traffic noise levels would continue to be moderate along most roadway segments. As shown in Table 9, the 70, 65, 60, and 55 dBA CNEL impact zones extend up to 65, 140, 302, 652 ft, respectively, from the centerline of Agua Mansa Road centerline in the project vicinity. The project site is more than 600 ft. from the Agua Mansa centerline and is located near the 55 dBA CNEL impact zone.

7.1.2 Stationary Source Noise

The stationary noise impacts associated with the proposed project would include loading/unloading activities from the loading dock area and condenser unit noise from the rooftop HVAC units. The project must not exceed the County's stationary daytime and nighttime noise standard. Tables 11, 12, and 13 indicate the daytime and nighttime stationary noise levels associated with operations at the site, respectively. The noise level projections include a 8-foot screening wall along the project site's west, south, and south eastern property lines. To ensure adequate screening from truck operations during nighttime hours, the project will require a minimum 8-foot tall screening wall along the west, south, and south eastern property lines.

Truck Delivery Loading/Unloading Noise

During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. Loading/unloading activities would occur on the north side of the project site. Driveways and access to the site would occur at Agua Mansa Road (away from El Rivino Road and Hall Avenue where existing sensitive receptors exist).

Residences to the west of the project site are approximately 600 feet from the loading/unloading area. These closet residencies would experience truck noise levels of approximately 35.7 dBA Lmax with the incorporation of a 8 foot tall wall along the project site's eastern property line.

These noise levels generated by truck operations would not exceed the County's daytime or nighttime noise standards, respectively. When combining the existing ambient noise level to the stationary noise level the project would increase the existing ambient noise levels by a maximum of 0.7 dBA during the daytime and 1.8 dBA during the nighttime as indicated in Tables 11, 12, and 13. As previously stated it takes a change of 3 dBA or more for the ear to hear a discernible difference. A change of 10 dBA will sound twice as loud to the

ear. The noise levels are below the County's stationary noise standard. The project would not have a significant impact with the incorporation of the 8-foot screen wall.

Condenser Unit Noise

The proposed project would have rooftop heating, ventilation, and air conditioning (HVAC) or condenser equipment. HVAC equipment will be located approximately 160 to 600 feet from the nearest residencies. With the effects of distance divergence, noise generated by HVAC equipment would be reduced to 35.0 dBA Lmax at the closest residences. The noise levels generated by HVAC equipment would be below the City's daytime/nighttime exterior. Therefore, no significant noise impacts would occur to off-site noise sensitive land uses from rooftop HVAC equipment. No mitigation measures are required.

7.2 Future Interior Noise

Based on the data provided in the Environmental Protection Agency's (EPA) Protective Noise Levels (EPA 550/9-79-100, Nov 1979), standard homes in Southern California provide at least 12 dBA of noise exterior to interior noise attenuation with windows open and 20 dBA with windows closed.

Therefore, residences would need to be exposed to exterior noise levels exceeding 65 dBA CNEL (45 dBA + 20 dBA = 65 dBA) to potentially exceed the interior noise standard of 45 dBA CNEL with windows closed. With the windows open, residences would need to be exposed to a worst-case noise level of 57 dBA CNEL (45 dBA + 12 dBA = 57 dBA) to exceed the interior noise standard of 45 dBA CNEL with windows open. Based on the discussion above, the closest residences (located approximately 160 feet away) would not be exposed to noise levels exceeding 65 dBA CNEL with windows closed. Traffic noise levels along El Rivino Road are anticipated to reach a maximum level of 62.5 dBA CNEL. Therefore, no significant interior noise impacts would occur to noise-sensitive land uses located adjacent to the project site. No mitigation measures are required.

7.3 Summary of Mitigation Requirements

The mitigation measures for the project are indicated in Exhibit D. In order to comply with the County of San Bernardino's Noise Element and Municipal Code the project must incorporate the following recommendations into the project design.

Traffic Noise Reduction Measures

No mitigation measures are required

Stationary Noise Reduction Measures

- At minimum a 8 foot high wall is required along the west, south, and southeastern property line. The height of the wall must be 8 feet above the pad elevation. The wall must extend along the length of the eastern property line, as indicate in Exhibit D.

8.0 Construction Noise Impacts

The degree of construction noise may vary for different areas of the project site and also vary depending on the construction activities. Noise levels associated with the construction will vary with the different phases of construction.

8.1 Construction Noise

The Environmental Protection Agency (EPA) has compiled data regarding the noise generated characteristics of typical construction activities. The data is presented in Table 14. These noise levels would diminish rapidly with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 86 dBA measured 50 feet from the noise source would reduce to 80 dBA at 100 feet. At 200 feet from the noise source the noise level would reduce to 74 dBA. At 400 feet the noise source would reduce by another 6 dBA to 68 dBA. Contractors are required to comply with the County of San Bernardino's Noise Ordinance during as construction described in Appendix A.

The County has an exemption for noise created during construction. Also, construction is limited to certain hours during the day. The project will not have a significant impact to the adjacent land uses, based on the City's noise ordinance.

8.2 Construction Vibration

The effects of vibration on structures have been the subject of extensive research. The Federal Transit Administration has compiled data regarding the vibration levels for various construction equipment and activities and is detailed in Table 15. Much of the work orientated in the mining industry, where vibration from blasting is critical. The Transportation and Construction Induced Vibration Guidance Manuel for the California Department of Transportation has various recommended vibration thresholds for various types of projects and land uses. According to the Konan Vibration Criteria for Historic and Sensitive Buildings the criteria for transient vibration sources should not exceed 0.3 peak particle velocity (PPV) *(Section 6 – Structures, Table 11)*. 0.035 inches per second is barely perceptive.

Construction activities can produce vibration that may be felt by adjacent land uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary source vibration during construction may be from a bull dozer. A small dozer has a vibration impact of 0.003 inches per second PPV at 25 feet. The distance of the construction equipment will be further than 25 feet from any existing building. It is anticipated that no significant vibration impact will occur to any adjacent buildings due to the distance of construction equipment from buildings.

The project is not anticipated to have a vibration impact and is considered not significant.

Construction Noise Reduction Measures

A number of noise reduction measures are recommended to further minimize noise impacts.

1. Construction cannot take place between the hours of 7:00 PM and 7:00 AM on weekdays, or at any time on Sunday or a federal holiday.

2. Stationary construction noise sources such as generators or pumps should be located at least 300 feet from sensitive land uses, as feasible.

3. Construction staging areas should be located as far from noise sensitive land uses as feasible.

4. During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices.

5. Idling equipment shall be turned off when not in use.

6. Equipment shall be maintained so that vehicles and their loads are secured from rattling and banging.

Recommendations are provided in Exhibit D.

9.0 References

State of California General Plan Guidelines: 1998. Governor's Office of Planning and Research

County of San Bernardino. 2007 County of San Bernardino 2007 General Plan Noise Element. August 2014.

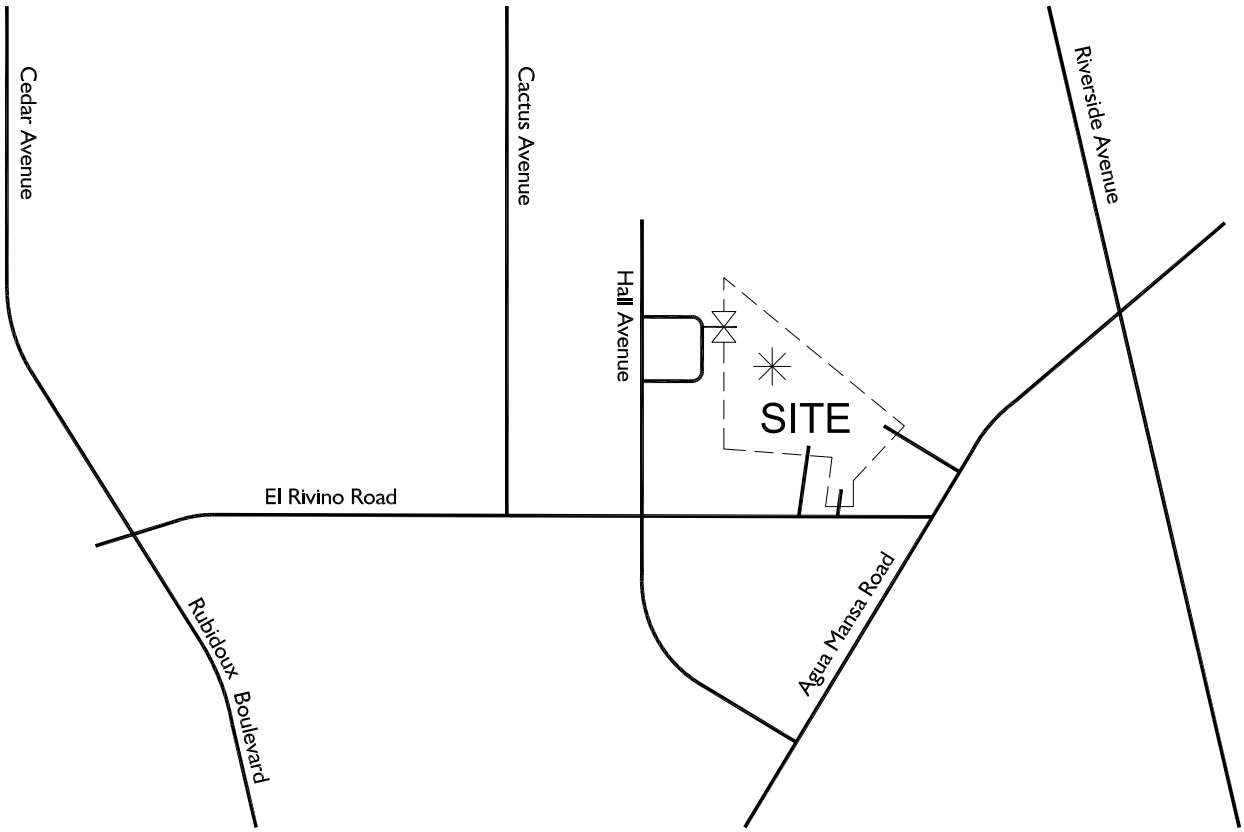
County of San Bernardino. 2014 County of San Bernardino Municipal Code, Noise Ordinance. August 2014.

Federal Highway Administration, Highway Traffic Noise Prediction Model, FHWA RD-77-108, 1978

RK Engineering Group, *Traffic Analysis*, August 2014

Exhibits

Exhibit A
Location Map



Legend:

⋈ = Emergency Access Only

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Exhibit B
Site Plan

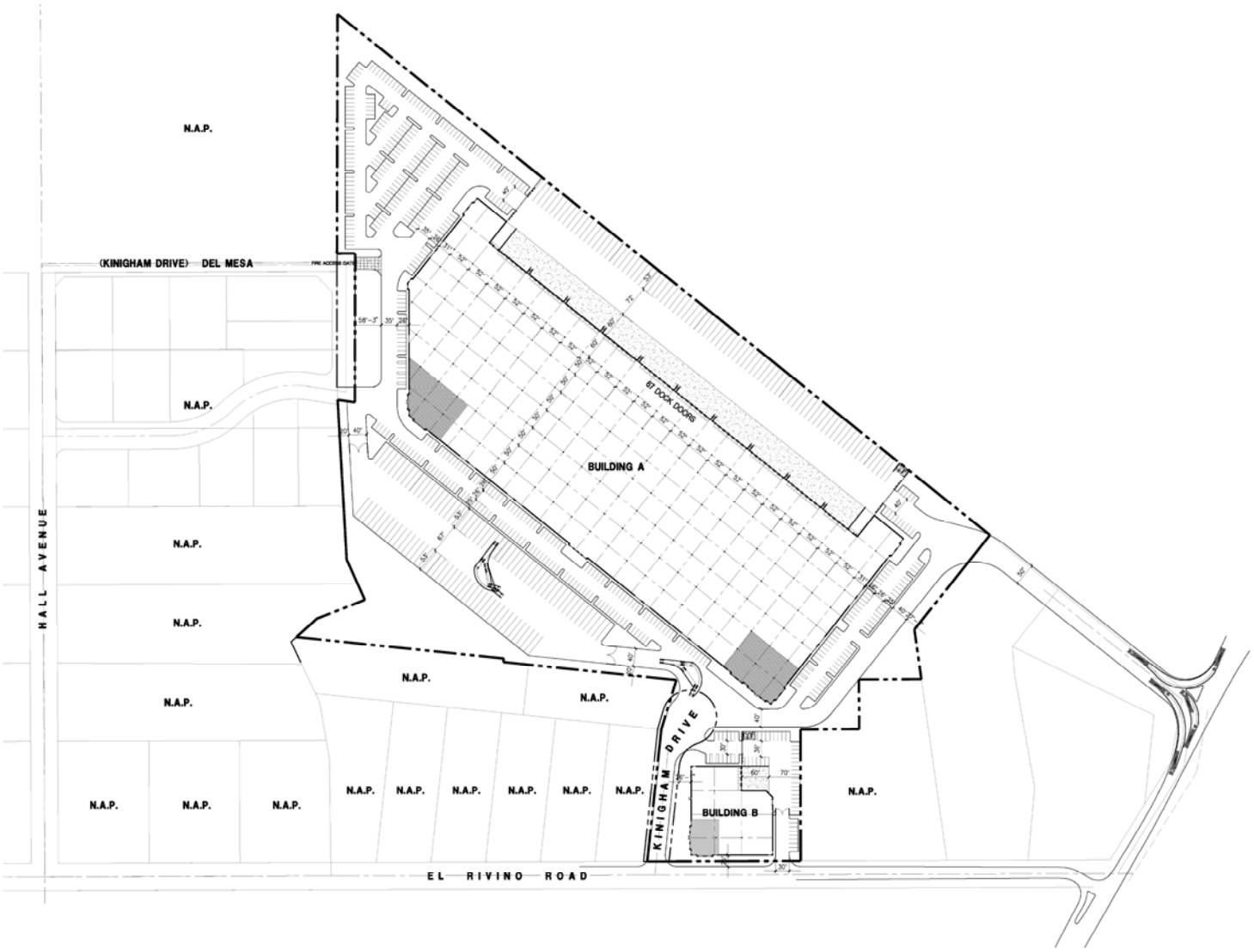

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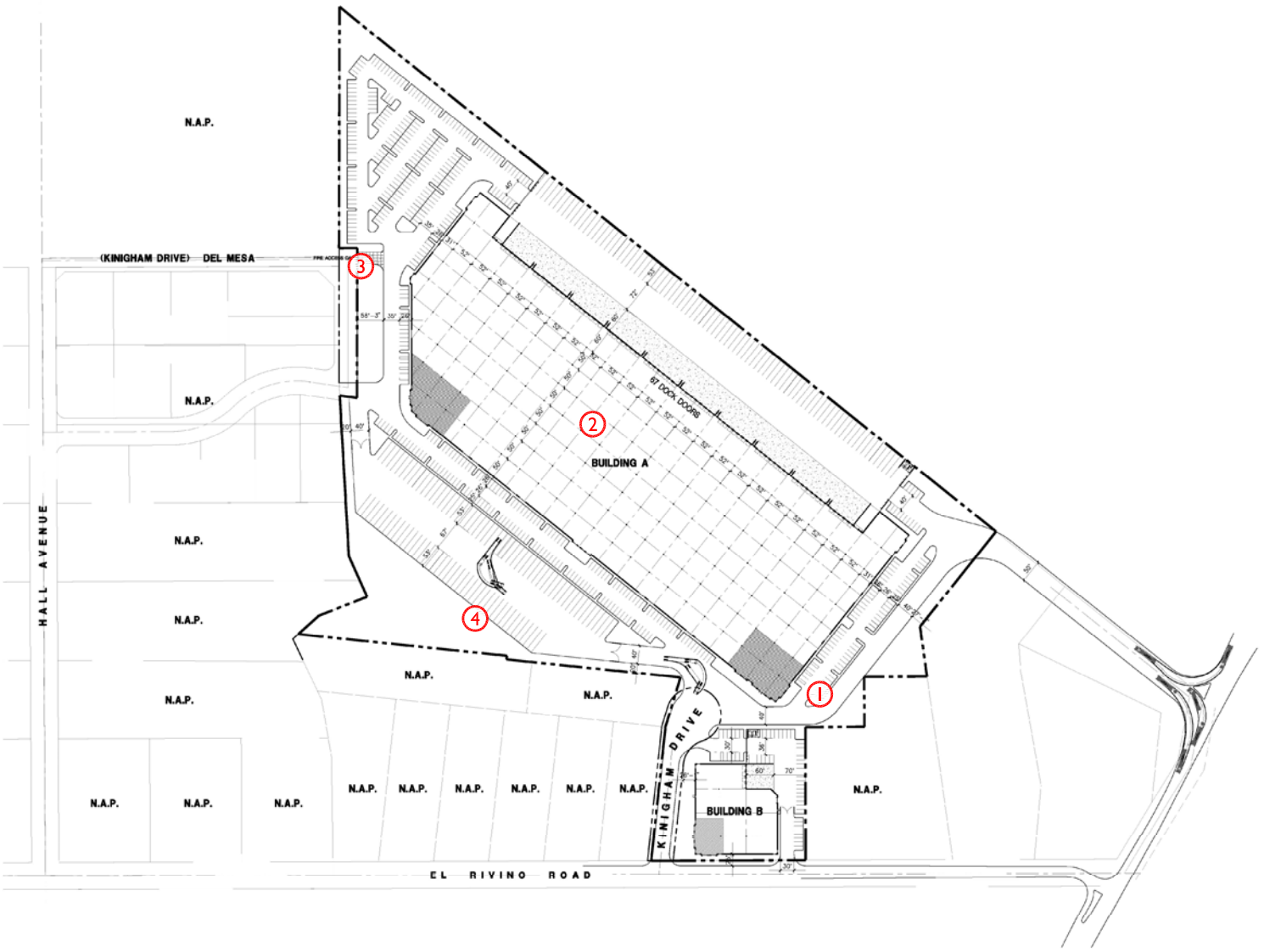
Exhibit C

Noise Monitoring Locations



Legend:

(1) = Short-Term (10-Minute) Noise Measurement Location

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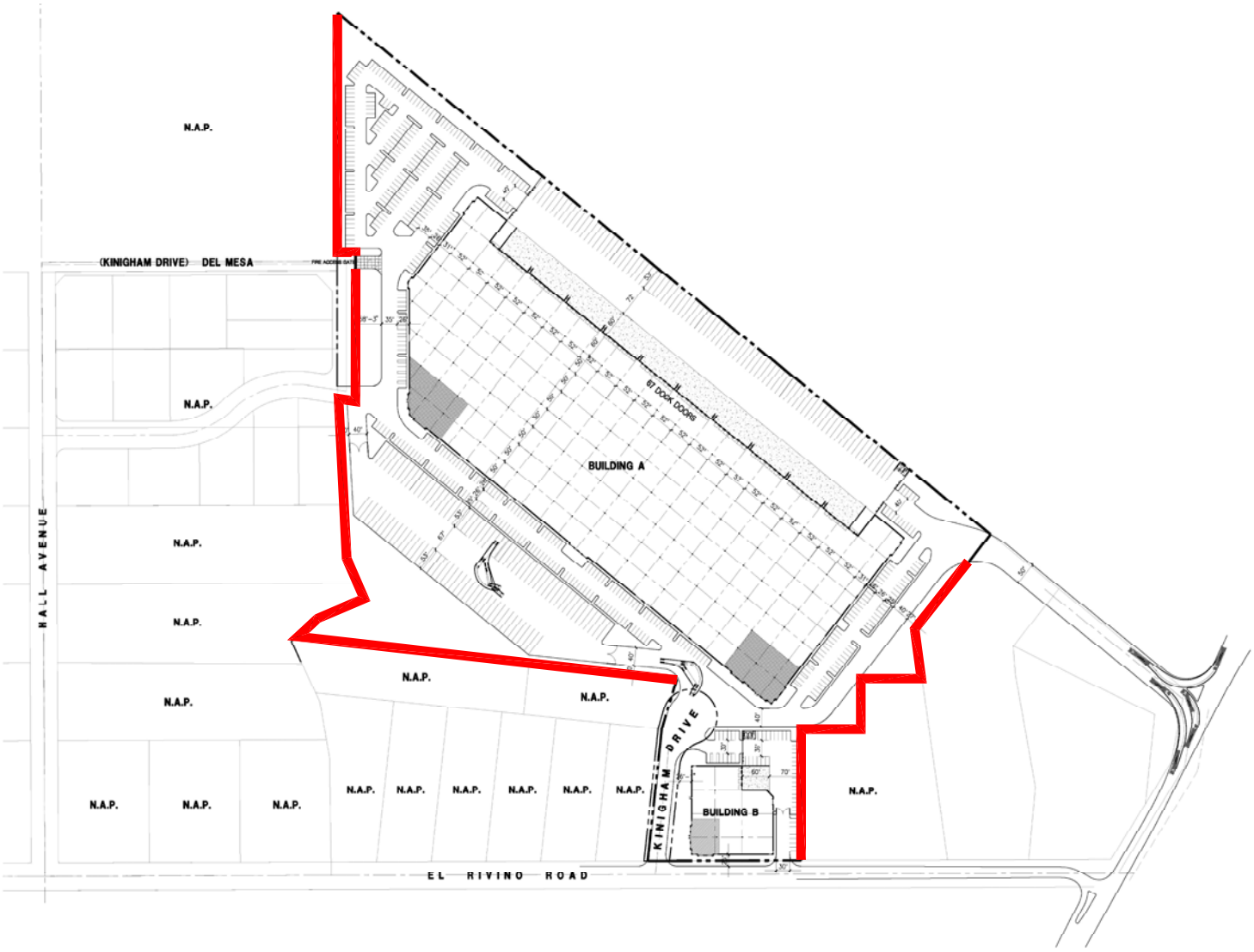
Exhibit D
Recommendations



Construction Recommendations:

1. Construction cannot take place between 7:00 PM and 7:00 AM on weekdays, or any time on Sunday or a federal holiday.
2. Stationary construction noise sources such as generators or pumps should be located at least 300 feet from sensitive land uses, as feasible.
3. Construction staging areas should be located as far from noise sensitive land uses as feasible.
4. During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices.
5. Idling equipment shall be turned off when not in use.
6. Equipment shall be maintained so that vehicles and their loads are secured from rattling and banging.

Legend:

= Recommended 8' Noise Barrier (for illustrative purposes only)

N

Tables

TABLE 1

Arterial Highway Hourly Traffic Flow Distribution

Agua Mansa Road and El Rivino Vehicle Distribution (Truck Mix) [1]

Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.5	12.9	9.6	91.20
Medium Trucks	84.8	4.9	10.3	4.40
Heavy Trucks	86.5	2.7	10.8	4.40

Hall Avenue Vehicle Distribution (Truck Mix) [2]

Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.5	12.9	9.6	97.42
Medium Trucks	84.8	4.9	10.3	1.84
Heavy Trucks	86.5	2.7	10.8	0.07

[1] Vehicle percentages utilized are typical for this type of area in San Bernardino County.

[2] Vehicle percentages are typical for southern California roadway.

TABLE 2

Project Average Daily Traffic Volumes and Traffic Speeds

Roadway	Segment	Average Daily Traffic[1]					Posted Travel Speeds
		Project	Existing	Existing Plus Project	Forecast Year 2035 without Project	Forecast Year 2035 with Project	
Agua Mansa Road	E/O of Riverside Avenue	70	9,900	9,970	20,100	20,170	40
	Riverside Avenue to El Rivino Road	558	14,000	14,558	23,700	24,258	40
	El Rivino Road to Hall Avenue	304	12,200	12,504	19,600	19,904	45
El Rivino Road	Agua Mansa Road to Kiningham Drive	34	2,700	2,734	4,400	4,434	45
	Kiningham Drive to Hall Avenue	276	2,356	2,632	4,200	4,476	45
	Hall Avenue to Cactus Avenue	276	3,200	3,476	6,500	6,776	45
	Cactus Avenue to Cedar Avenue	242	3,200	3,442	4,500	4,742	45
Hall Avenue	Kiningham Drive to El Rivino Road	0	500	500	700	700	25
	El Rivino Road to Agua Mansa Road	0	900	900	4,800	4,800	25

1. ADTs were obtained from the traffic impact study prepared by RK Engineering Group (Appendix C).

TABLE 3

Reference Stationary Noise Level Measurements

Source[1]	Referenced Measured Noise Levels (dBA)						
	Distance from Reference Source (feet)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Truck Loading/Unloading[2]	6.0	74.1	91.8	86.3	75.8	69.3	66.3
Condenser Unit	3.0	82.5	82.5	82.5	82.5	82.5	82.5

Adjusted Stationary Noise Level Measurements

Source	Southeastern Property Line - Adjusted Noise Levels (dBA)[3]						
	Distance from Reference Source (feet)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Truck Loading/Unloading	600	18.0	35.7	30.2	19.7	13.2	10.2
Condenser Unit	160	35.0	35.0	35.0	35.0	35.0	35.0

Adjusted Stationary Noise Level Measurements

Source	South Property Line - Adjusted Noise Levels (dBA)[3]						
	Distance from Reference Source (feet)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Truck Loading/Unloading	740	16.2	33.9	28.4	17.9	11.4	8.4
Condenser Unit	475	25.2	25.2	25.2	25.2	25.2	25.2

Adjusted Stationary Noise Level Measurements

Source	West Property Line - Adjusted Noise Levels (dBA)[3]						
	Distance from Reference Source (feet)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Truck Loading/Unloading	800	15.5	33.2	27.7	17.2	10.7	7.7
Condenser Unit	600	23.2	23.2	23.2	23.2	23.2	23.2

[1] RK conducted stationary noise measurements for the sources above (2010).

[2] Assumes approximately 6 trucks operating simultaneously.

[3] Adjusted noise levels (dBA) were calculated based on the distance of the stationary noise sources to the various property lines (existing residences) and assume an 8 foot wall along the project subject property lines. Refer to Appendix E for noise calculations.

TABLE 4

Noise Level Measurements[1,2]

	Site No.	Time Started[3]	Leq	L_{max}	L_{min}	L_2	L_8	L_{25}	L_{50}	Comments
Daytime	1	12:10 PM	46.9	69.7	40.2	49.9	46.2	44.1	42.9	Measurement taken along southereastern property line. Ambient noise = local traffic
	2	12:25 PM	51.0	70.0	39.6	59.6	53.9	48.0	44.7	Measurement taken at center of project site. Ambient noise = local traffic
	3	12:50 PM	47.4	70.0	39.6	53.1	47.9	44.0	42.3	Measurement taken along western property line. Ambient noise = local traffic.
	4	1:05 PM	43.7	60.8	39.7	50.2	46.2	43.1	42.0	Measurement taken along southern property line. Ambient noise = local traffic.
Nighttime	1	12:10 AM	41.9	64.7	35.2	44.9	41.2	39.1	37.9	Measurement taken along southereastern property line. Ambient noise = local traffic
	2	12:25 AM	46.0	65.0	34.6	54.6	48.9	43.0	39.7	Measurement taken at center of project site. Ambient noise = local traffic
	3	12:50 AM	42.4	65.0	34.6	48.1	42.9	39.0	37.3	Measurement taken along western property line. Ambient noise = local traffic.
	4	1:05 AM	38.7	55.8	34.7	45.2	41.2	38.1	37.0	Measurement taken along southern property line. Ambient noise = local traffic.

[1] Noise measurements were taken for ten minutes.

[2] Noise measurements were taken on June 5, 2014.

[3] Nighttime noise levels were estimated by reducing the daytime levels by 5 dB.

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TABLE 5

Existing (Without Project) Exterior Noise Levels Along Roadways (dBA CNEL)[1]

Roadway[2]	Segment	CNEL at 100 Ft (dBA)	Distance to Contour (Ft)[3]			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Agua Mansa Rd	E/O of Riverside Avenue	63.3	36	77	166	358
	Riverside Avenue to El Rivino Road	64.8	45	97	209	451
	El Rivino Road to Hall Avenue	65.1	47	101	218	470
El Rivino Road	Agua Mansa Road to Kiningham Drive	58.5	17	37	80	172
	Kiningham Drive to Hall Avenue	57.9	16	34	73	157
	Hall Avenue to Cactus Avenue	59.3	19	42	89	193
	Cactus Avenue to Cedar Avenue	59.3	19	42	89	193
Hall Avenue	Kiningham Drive to El Rivino Road	43.0	2	3	7	16
	El Rivino Road to Agua Mansa Road	45.5	2	5	11	23

[1] Exterior noise levels calculated at 5 feet above ground level.

[2] Noise levels calculated from centerline of subject roadway.

[3] Refer to Appendix D for projected noise level calculations.

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TABLE 6

Existing (With Project) Exterior Noise Levels Along Roadways (dBA CNEL)[1]

Roadway[2]	Segment	CNEL at 100 Ft (dBA)	Distance to Contour (Ft)[3]			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Agua Mansa Rd	E/O of Riverside Avenue	63.3	36	78	167	360
	Riverside Avenue to El Rivino Road	65.0	46	100	215	463
	El Rivino Road to Hall Avenue	65.2	48	103	222	478
El Rivino Road	Agua Mansa Road to Kiningham Drive	58.6	17	37	81	173
	Kiningham Drive to Hall Avenue	58.4	17	36	79	169
	Hall Avenue to Cactus Avenue	59.6	20	44	94	204
	Cactus Avenue to Cedar Avenue	59.6	20	44	94	202
Hall Avenue	Kiningham Drive to El Rivino Road	43.0	2	3	7	16
	El Rivino Road to Agua Mansa Road	45.5	2	5	11	23

[1] Exterior noise levels calculated at 5 feet above ground level.

[2] Noise levels calculated from centerline of subject roadway.

[3] Refer to Appendix D for projected noise level calculations.

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TABLE 7

Change in Existing Noise Levels as a Result of Project (dBA CNEL)

Roadway	Segment	CNEL at 100 Feet dBA			
		Existing Without Project	Existing With Project	Change in Noise Level	Potential Significant Impact[1]
Agua Mansa Rd	E/O of Riverside Avenue	63.3	63.3	0.0	NO
	Riverside Avenue to El Rivino Road	64.8	65.0	0.2	NO
	El Rivino Road to Hall Avenue	65.1	65.2	0.1	NO
El Rivino Road	Agua Mansa Road to Kiningham Drive	58.5	58.6	0.1	NO
	Kiningham Drive to Hall Avenue	57.9	58.4	0.5	NO
	Hall Avenue to Cactus Avenue	59.3	59.6	0.4	NO
	Cactus Avenue to Cedar Avenue	59.3	59.6	0.3	NO
Hall Avenue	Kiningham Drive to El Rivino Road	43.0	43.0	0.0	NO
	El Rivino Road to Agua Mansa Road	45.5	45.5	0.0	NO

[1] It takes a change of 3 dBA or more to hear a noticiable change in noise level. The projected noise levels at 100' are theoretical and do not take into consideration the effect of topography, noise barriers, structures or other factors which will reduce the actual noise level in the outdoor living areas. These factors can reduce the actual noise levels by 5-10+ dBA from what is shown in the projected noise levels at 100'. Therefore, the levels that are shown are for comparative purposes only to show the difference in projected noise levels without and with the project.

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TABLE 8

Forecast (2035) Without Project Exterior Noise Levels Along Roadways (dBA CNEL)[1]

Roadway[2]	Segment	CNEL at 100 Ft (dBA)	Distance to Contour (Ft)[3]			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Agua Mansa Rd	E/O of Riverside Avenue	66.4	57	124	267	574
	Riverside Avenue to El Rivino Road	67.1	64	138	297	641
	El Rivino Road to Hall Avenue	67.1	64	139	299	645
El Rivino Road	Agua Mansa Road to Kiningham Drive	60.7	24	51	111	238
	Kiningham Drive to Hall Avenue	60.5	23	50	107	231
	Hall Avenue to Cactus Avenue	62.3	31	67	143	309
	Cactus Avenue to Cedar Avenue	60.8	24	52	112	242
Hall Avenue	Kiningham Drive to El Rivino Road	44.4	2	4	9	20
	El Rivino Road to Agua Mansa Road	52.8	7	15	33	71

[1] Exterior noise levels calculated at 5 feet above ground level.

[2] Noise levels calculated from centerline of subject roadway.

[3] Refer to Appendix D for projected noise level calculations.

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TABLE 9

Forecast (2035) With Project Exterior Noise Levels Along Roadways (dBA CNEL)[1]

Roadway[2]	Segment	CNEL at 100 Ft (dBA)	Distance to Contour (Ft)[3]			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Agua Mansa Rd	E/O of Riverside Avenue	66.4	58	124	267	576
	Riverside Avenue to El Rivino Road	67.2	65	140	302	651
	El Rivino Road to Hall Avenue	67.2	65	140	302	652
El Rivino Road	Agua Mansa Road to Kiningham Drive	60.7	24	52	111	239
	Kiningham Drive to Hall Avenue	60.7	24	52	112	241
	Hall Avenue to Cactus Avenue	62.5	32	68	147	318
	Cactus Avenue to Cedar Avenue	61.0	25	54	116	250
Hall Avenue	Kiningham Drive to El Rivino Road	44.4	2	4	9	20
	El Rivino Road to Agua Mansa Road	52.8	7	15	33	71

[1] Exterior noise levels calculated at 5 feet above ground level.

[2] Noise levels calculated from centerline of subject roadway.

[3] Refer to Appendix D for projected noise level calculations.

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TABLE 10

Change in 2035 Noise Levels as a Result of Project (dBA CNEL)

Roadway	Segment	CNEL at 100 Feet dBA			
		Year 2035 Without Project	Year 2035 With Project	Change in Noise Level	Potential Significant Impact[1]
Agua Mansa Rd	E/O of Riverside Avenue	66.4	66.4	0.0	NO
	Riverside Avenue to El Rivino Road	67.1	67.2	0.1	NO
	El Rivino Road to Hall Avenue	67.1	67.2	0.1	NO
El Rivino Road	Agua Mansa Road to Kiningham Drive	60.7	60.7	0.0	NO
	Kiningham Drive to Hall Avenue	60.5	60.7	0.3	NO
	Hall Avenue to Cactus Avenue	62.3	62.5	0.2	NO
	Cactus Avenue to Cedar Avenue	60.8	61.0	0.2	NO
Hall Avenue	Kiningham Drive to El Rivino Road	44.4	44.4	0.0	NO
	El Rivino Road to Agua Mansa Road	52.8	52.8	0.0	NO

[1] It takes a change of 3 dBA or more to hear a noticiable change in noise level. The projected noise levels at 100' are theoretical and do not take into consideration the effect of topography, noise barriers, structures or other factors which will reduce the actual noise level in the outdoor living areas. These factors can reduce the actual noise levels by 5-10+ dBA from what is shown in the projected noise levels at 100'. Therefore, the levels that are shown are for comparative purposes only to show the difference in projected noise levels without and with the project.

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TABLE 11
Projected Exterior Noise Levels at
Southeastern Property Line (dBA)[1,2]

	Source	Adjusted Noise Levels (dBA)						
		Distance from Reference Source (feet)	L_{eq}	L_{max} (max)	L_2 (1 min)	L_8 (5 min)	L_{25} (15 min)	L_{50} (30 min)
Daytime (7:00 AM - 10:00 PM)	Truck Loading/Unloading[3]	600	18.0	35.7	30.2	19.7	13.2	10.2
	Condenser Unit[3]	160	35.0	35.0	35.0	35.0	35.0	35.0
	Existing Ambient Measurement[4]	- -	46.9	69.7	49.9	46.2	44.1	42.9
	Total Combined Exterior Noise Impact[5]	- -	47.2	69.7	50.1	46.5	44.6	43.6
	County of San Bernardino Not-to Exceed Noise Criteria	- -	55.0	75.0	70.0	65.0	60.0	55.0
	Noise Level Exceeds Standard (?)	- -	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
	Change in Noise Level as a Result of Project	- -	0.3	0.0	0.2	0.3	0.5	0.7

	Source	Adjusted Noise Levels (dBA)						
		Distance from Reference Source (feet)	L_{eq}	L_{max} (max)	L_2 (1 min)	L_8 (5 min)	L_{25} (15 min)	L_{50} (30 min)
Nighttime (10:00 PM - 7:00 AM)	Truck Loading/Unloading[3]	600	18.0	35.7	30.2	19.7	13.2	10.2
	Condenser Unit[3]	160	35.0	35.0	35.0	35.0	35.0	35.0
	Existing Ambient Measurement[4]	- -	41.9	64.7	44.9	41.2	39.1	37.9
	Total Combined Exterior Noise Impact[5]	- -	42.7	64.7	45.5	42.2	40.5	39.7
	County of San Bernardino Not-to Exceed Noise Criteria	- -	45.0	65.0	60.0	55.0	50.0	45.0
	Noise Level Exceeds Standard (?)	- -	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
	Change in Noise Level as a Result of Project	- -	0.8	0.0	0.6	1.0	1.4	1.8

[1] Exterior noise levels calculated 10 feet in from property line.

[2] Noise level calculations represent projected exterior

[3] See Table 3 for adjusted noise level

[4] Ambient measurement taken from Table 4

[5] See Appendix E for dBA calculations

TABLE 12
Projected Exterior Noise Levels at
Southern Property Line (dBA)[1,2]

	Source	Adjusted Noise Levels (dBA)						
		Distance from Reference Source (feet)	L_{eq}	L_{max} (max)	L_2 (1 min)	L_8 (5 min)	L_{25} (15 min)	L_{50} (30 min)
Daytime (7:00 AM - 10:00 PM)	Truck Loading/Unloading[3]	740	16.2	33.9	28.4	17.9	11.4	8.4
	Condenser Unit[3]	475	25.2	25.2	25.2	25.2	25.2	25.2
	Existing Ambient Measurement[4]	- -	43.7	60.8	50.2	46.2	43.1	42.0
	Total Combined Exterior Noise Impact[5]	- -	43.8	60.8	50.2	46.2	43.2	42.1
	County of San Bernardino Not-to Exceed Noise Criteria	- -	55.0	75.0	70.0	65.0	60.0	55.0
	Noise Level Exceeds Standard (?)	- -	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
	Change in Noise Level as a Result of Project	- -	0.1	0.0	0.0	0.0	0.1	0.1

	Source	Adjusted Noise Levels (dBA)						
		Distance from Reference Source (feet)	L_{eq}	L_{max} (max)	L_2 (1 min)	L_8 (5 min)	L_{25} (15 min)	L_{50} (30 min)
Nighttime (10:00 PM - 7:00 AM)	Truck Loading/Unloading[3]	740	16.2	33.9	28.4	17.9	11.4	8.4
	Condenser Unit[3]	475	25.2	25.2	25.2	25.2	25.2	25.2
	Existing Ambient Measurement[4]	- -	38.7	55.8	45.2	41.2	38.1	37.0
	Total Combined Exterior Noise Impact[5]	- -	38.9	55.8	45.3	41.3	38.3	37.3
	County of San Bernardino Not-to Exceed Noise Criteria	- -	45.0	65.0	60.0	55.0	50.0	45.0
	Noise Level Exceeds Standard (?)	- -	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
	Change in Noise Level as a Result of Project	- -	0.2	0.0	0.1	0.1	0.2	0.3

[1] Exterior noise levels calculated 10 feet in from property line.

[2] Noise level calculations represent projected exterior

[3] See Table 3 for adjusted noise level

[4] Ambient measurement taken from Table 4

[5] See Appendix E for dBA calculations

TABLE 13
Projected Exterior Noise Levels at
Western Property Line (dBA)[1,2]

	Source	Adjusted Noise Levels (dBA)						
		Distance from Reference Source (feet)	L_{eq}	L_{max} (max)	L_2 (1 min)	L_8 (5 min)	L_{25} (15 min)	L_{50} (30 min)
Daytime (7:00 AM - 10:00 PM)	Truck Loading/Unloading[3]	800	15.5	33.2	27.7	17.2	10.7	7.7
	Condenser Unit[3]	600	23.2	23.2	23.2	23.2	23.2	23.2
	Existing Ambient Measurement[4]	- -	47.4	70	53.1	47.9	44.0	42.3
	Total Combined Exterior Noise Impact[5]	- -	47.4	70.0	53.1	47.9	44.0	42.4
	County of San Bernardino Not-to Exceed Noise Criteria	- -	55.0	75.0	70.0	65.0	60.0	55.0
	Noise Level Exceeds Standard (?)	- -	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
	Change in Noise Level as a Result of Project	- -	0.0	0.0	0.0	0.0	0.0	0.1

	Source	Adjusted Noise Levels (dBA)						
		Distance from Reference Source (feet)	L_{eq}	L_{max} (max)	L_2 (1 min)	L_8 (5 min)	L_{25} (15 min)	L_{50} (30 min)
Nighttime (10:00 PM - 7:00 AM)	Truck Loading/Unloading[3]	800	15.5	33.2	27.7	17.2	10.7	7.7
	Condenser Unit[3]	600	23.2	23.2	23.2	23.2	23.2	23.2
	Existing Ambient Measurement[4]	- -	42.4	65.0	48.1	42.9	39.0	37.3
	Total Combined Exterior Noise Impact[5]	- -	42.5	65.0	48.2	43.0	39.1	37.5
	County of San Bernardino Not-to Exceed Noise Criteria	- -	45.0	65.0	60.0	55.0	50.0	45.0
	Noise Level Exceeds Standard (?)	- -	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
	Change in Noise Level as a Result of Project	- -	0.1	0.0	0.1	0.1	0.1	0.2

[1] Exterior noise levels calculated 10 feet in from property line.

[2] Noise level calculations represent projected exterior

[3] See Table 3 for adjusted noise level

[4] Ambient measurement taken from Table 4

[5] See Appendix E for dBA calculations

TABLE 14
Typical Construction Noise Levels[1]

EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86

IMPACT EQUIPMENT

Type	Noise Levels (dBA) at 50 Feet
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105

OTHER

Type	Noise Levels (dBA) at 50 Feet
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

Table 15
Vibration Source Levels for Construction Equipment[1]

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

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JN:0995-2014-07

Appendices

Appendix A

County of San Bernardino
Noise Element
&
Noise Ordinance

VII. NOISE ELEMENT

Noise has long been accepted as a byproduct of urbanization and is considered a potential environmental hazard. Excessive and/or sustained noise can contribute to both temporary and permanent hearing loss, and may be associated with increased fatigue, stress, annoyance, anxiety, and other psychological reactions in humans. For the various elements of the society to coexist, noise levels need to be controlled and minimized to limit exposure to residential communities and noise-sensitive land uses. The control of noise, therefore, is an essential component in creating a safe, compatible, and productive environment.

A. PURPOSE OF THE NOISE ELEMENT

The purpose of the Noise Element is to limit the exposure of the community to excessive noise levels. Local governments must "analyze and quantify" noise levels and the extent of noise exposure through actual measurement or the use of noise modeling. Technical data relating to mobile and point sources must be collected and synthesized into a set of noise control policies and programs that "minimizes the exposure of community residents to excessive noise." Noise-level contours must be mapped, and the conclusions of the element used as a basis for land use decisions. The Noise Element must be used to guide decisions concerning land use and the location of new roads and transit facilities because these are common sources of excessive noise levels. The Noise Background Report provides much of these technical data, and includes generalized estimates of distances to noise contours for typical traffic volumes on County roadways.

The most common sources of environmental noise in San Bernardino County are associated with roads, airports, railroad operations, and industrial activities. The facilities are used to transport residents, consumer products and provide basic infrastructure for the community by creating jobs and economic stability. In many areas of the County, noise-sensitive land uses such as residences, schools, churches and parks exist in proximity to these major noise sources.

1. RELATIONSHIP TO OTHER ELEMENTS OF THE GENERAL PLAN

The Noise Element is closely related to the Circulation and Land Use Elements. Transit thoroughfares, such as freeways, arterial highways, and railways, generate the majority of noise within the County and influence the type and intensity of development within a given area. Likewise, land uses sensitive to noise are to be considered when determining land use patterns and planned mitigation measures related to noise impacts. The location and amount of such noise generators and

receptors are also important considerations in the Open Space Element, which addresses such issues as public parks and open space buffers.

2. INPUT FROM PUBLIC PARTICIPATION PROGRAM

As part of the County's General Plan Update process, community meetings were held at several locations within the County to gather informative data and input from residents. Questions were posed to the attendees regarding the growth and development in their community, to inquire about their concerns and about what could be done to address their concerns. Noise was mentioned in several of the community meetings as being an issue of concern. Additionally, concern was expressed by citizens and staff regarding the efficacy of the noise complaint process and enforcement of noise regulations.

3. SUMMARY OF EXISTING CONDITIONS

The Noise Background Report describes the existing noise environment in the subareas of San Bernardino County. It also reviews the roles of the state and federal governments in regulating noise from specific sources. The County regulates noise from sources that are not pre-empted by state or federal jurisdiction. Such sources include project construction activities; stationary sources, such as fans, pumps, compressors or other mechanical equipment; or mobile sources operating on private property. Section 83.01.080 of the County's Development Code sets forth performance standards for affected (receiving) land uses from stationary and mobile sources, during daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) periods. Exemptions from these standards include motor vehicles not under the control of the industrial use, emergency equipment, vehicles and devices, and temporary construction and repair or demolition activities taking place between the hours of 7 AM and 7 PM Monday through Saturday, excluding federal holidays.

4. SOURCES OF NOISE IN SAN BERNARDINO COUNTY

The County has promulgated and implemented noise policies and requirements for land development and construction projects by requiring these projects to provide specific noise analyses and implement any necessary measures to reduce noise to an acceptable level.

Circulation and transportation systems (roadways, airports and railroads) are the most significant noise-producing activities within the County, and subject some areas to unacceptable levels. Point sources, such as industrial, mining and recreational sites, also produce noise levels of concern. Some key problem areas

are wrecking yards, rock crushing, racetracks, snow and water ski areas, outdoor concerts, shooting facilities, and similar recreation facilities. Additional problems are off-road vehicles, snowmobiles, and the operation of specialized equipment.

Traffic Noise: The level of noise associated with roadways will vary with total traffic volume, vehicular speed, the relative numbers of trucks and cars in the traffic volumes, the roadway cross-section and geometric design, and the local topography. Typically, the greater the vehicle speed and truck percentage, the greater the level of noise emission from the transportation facility. Refer to the Noise Background Report for more information on traffic noise in San Bernardino County.

Rail Noise*:* Railroad activity, including heavy rail locomotives and railcars, also constitutes a major but less widespread element of the noise environment in the County. The passage of trains results in considerable noise impacts on adjacent lands, although the elevated noise levels are periodic and of relatively short duration. Railroad tracks within the County are used for passenger transportation and delivery of freight. Refer to the Noise Background Report for more information on rail noise in San Bernardino County.

Aircraft Noise: Aircraft noise generates occasional, but intrusive noise levels for the occupants of property adjacent to airports and/or under the flight patterns of aircraft using airports. The federal and state governments regulate aircraft noise. Refer to the Noise Background Report for more information on aircraft noise in San Bernardino County.

Industrial Noise: Industrial noise sources exist but do not materially affect noise-sensitive land uses within the unincorporated areas of the County. Refer to the Noise Background Report for more information on industrial noise in San Bernardino County.

5. CONCLUSION

The unincorporated portions of the County represent the full range of community noise environments from very quiet rural to moderately noisy suburban to noisy urban. Noise patterns in the County are generally consistent with published data regarding the intensity of development/type of land use and the expected levels of environmental noise.

B. COUNTYWIDE GOALS AND POLICIES OF THE NOISE ELEMENT

GOAL N 1.	**The County will abate and avoid excessive noise exposures through noise mitigation measures incorporated into the design of new noise-generating and new noise-sensitive land uses, while protecting areas within the County where the present noise environment is within acceptable limits.**

POLICIES

N 1.1 Designate areas within San Bernardino County as "noise impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Chapter 83.01 of the Development Code.

N 1.2 Ensure that new development of residential or other noise-sensitive land uses is not permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the standards of Noise-sensitive land uses include residential uses, schools, hospitals, nursing homes, places of worship and libraries.

N 1.3 When industrial, commercial, or other land uses, including locally regulated noise sources, are proposed for areas containing noise-sensitive land uses, noise levels generated by the proposed use will not exceed the performance standards of Table N-2 within outdoor activity areas. If outdoor activity areas have not yet been determined, noise levels shall not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for residential or other noise-sensitive land uses.

Programs

1. Require an acoustical analysis prior to approval of proposed development of new residential or other noise-sensitive land uses in a noise-impacted area or a new noise generating use in an area that could affect existing noise-sensitive land uses. The appropriate time for requiring an acoustical analysis is during the environmental review process so that noise mitigation may be an integral part of the project design. The acoustical analysis shall:

    a. Be the responsibility of the applicant.

b. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.

c. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions;

d. Include estimated noise levels in terms of the descriptors shown in Figures II-8 and II-9 of the Noise Background Report for existing and projected future (20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.

e. Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.

f. Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, acoustical information to support a statement of overriding considerations for the project must be provided.

2. Develop and employ procedures to ensure that requirements imposed pursuant to the finding of an acoustical analysis are implemented as part of the project review and building permit processes.

N 1.4 Enforce the state noise insulation standards (California Administrative Code, Title 24) and Chapter 35 of the California Building Code (CBC)6.

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[6] Title 24 requires that an acoustical analysis be prepared for all new developments of multi-family dwellings, condominiums, hotels, and motels proposed for areas within the 60 dB Ldn (or CNEL) contour of a major noise source for the purpose of documenting that an acceptable interior noise level of 45 dB Ldn (or CNEL) or below will be achieved with the windows and doors closed. UBC Chapter 35 requires that common wall and floor/ceiling assemblies within multi-family dwellings comply with minimum standards for the transmission of airborne sound and structure-borne impact noise.

N 1.5 Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.

N 1.6 Enforce the hourly noise-level performance standards for stationary and other locally regulated sources, such as industrial, recreational, and construction activities as well as mechanical and electrical equipment.

Programs

1. Develop and implement a noise ordinance that will:

    a. Be consistent with this element of the General Plan.

    b. Include the development standards provided in this element in the Development Code.

N 1.7 Prevent incompatible land uses, by reason of excessive noise levels, from occurring in the future.

Programs

1. Examine the existing and projected future noise environment when considering amendments to the circulation system.

2. Periodically review and update the Noise Element to ensure that noise exposure information and specific policies are consistent with changing conditions within the County and with noise control regulations enacted after the adoption of this element.

3. Provide sufficient noise exposure information so that existing and potential noise impacts will be identified and addressed in the project review processes.

4. Compile and publish a list of standardized noise mitigation measures.

GOAL N 2.	**The County will strive to preserve and maintain the quiet environment of mountain, desert and other rural areas.**

POLICIES

N 2.1 The County will require appropriate and feasible on-site noise attenuating measures that may include noise walls, enclosure of noise-generating equipment, site planning to locate noise sources away from sensitive receptors, and other comparable features.

N 2.2 The County will continue to work aggressively with federal agencies, including the branches of the military, the U.S. Forest Service, BLM, and other agencies to identify and work cooperatively to reduce potential conflicts arising from noise generated on federal lands and facilities affecting nearby land uses in unincorporated County areas.

C. VALLEY REGION GOALS AND POLICIES OF THE NOISE ELEMENT

NONE SPECIFIC TO THE VALLEY REGION.

D. MOUNTAIN REGION GOALS AND POLICIES OF THE NOISE ELEMENT

GOAL M/N 1.	**The County will strive to preserve and maintain the quiet environment of the Mountain Region.**

POLICIES

M/N 1.1 Encourage and support strict enforcement of vehicle code regulations to reduce vehicular noise in the mountain communities.

M/N 1.2 Encourage responsible agencies to post signs near forest access roads which explain the acceptable vehicular noise levels for vehicles using those roads.

E. DESERT REGION GOALS AND POLICIES OF THE NOISE ELEMENT

NONE SPECIFIC TO THE DESERT REGION.

Print

San Bernardino County, CA Code of Ordinances

DIVISION 3: COUNTYWIDE DEVELOPMENT STANDARDS

CHAPTER 83.01: GENERAL PERFORMANCE STANDARDS

Section

§ 83.01.010 Purpose.

The purpose of this Chapter is to establish uniform performance standards for development within the County that promotes compatibility with surrounding areas and land uses.

Performance standards are designed to mitigate the environmental impacts of existing and proposed land uses within a community. Environmental impacts include air quality, glare, heat, noise, runoff control, and waste disposal. These general performance standards are intended to protect the health and safety of businesses, nearby residents, and workers and to prevent damaging effects to surrounding properties.

(Ord. 4011, passed - -2007)

§ 83.01.020 Applicability.

ground, or in a structure.

(Ord. 4011, passed - -2007)

§ 83.01.080 Noise.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § SI4 1979, Type 1 or Type 2);

(3) Using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2

Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	***7:00 a.m. - 10:00 p.m. Leq***	***10:00 p.m. - 7:00 a.m. Leq***
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.
Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3			
Noise Standards for Adjacent Mobile Noise Sources			
Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior*** (1)	***Exterior*** (2)

Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65
Notes:			
(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.			
(2) The outdoor environment shall be limited to: · Hospital/office building patios · Hotel and motel recreation areas · Mobile home parks · Multi-family private patios or balconies · Park picnic areas · Private yard of single-family dwellings · School playgrounds			
(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.			
CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.			

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4	
Noise Standards for Other Structures	
Typical Uses	***12-Hour Equivalent Sound Level (Interior) in dBA Ldn***
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

§ 83.01.090 Vibration.

(a) *Vibration Standard.* No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line.

(b) *Vibration Measurement.* Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) *Exempt Vibrations.* The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

(2) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(Ord. 4011, passed - -2007)

§ 83.01.100 Waste Disposal.

(a) *Liquid Waste Disposal and Runoff Control.* No liquids of any kind shall be discharged into a public or private sewage or drainage system, watercourse, body of water, or into the ground, except in compliance with applicable regulations of the County Code, Title 23 (Waters) of the California Code of Regulations, the California Water Code, and related Federal regulations.

(b) *Hazardous Waste.* Refer to Chapter 84.11 (Hazardous Waste Facilities) for regulations relative to hazardous waste facilities.

(c) *Solid Waste Disposal.* Refer to Chapter 84.24 (Solid Waste/Recyclable Materials Storage) for regulations relative to solid waste disposal.

(Ord. 4011, passed - -2007)

§ 83.01.110 External Commercial or Industrial Activity on Private Property.

There shall be no unpermitted external or industrial activity on properties subject to the County's jurisdiction between the hours of 9:00 p.m. and 7:00 a.m. that shall at any time impair the quiet enjoyment of neighboring property owners or residents or in any manner disturb the public peace.

(Ord. 4525, passed - -2014)

Appendix B

Photographs and
Field Measurements

Field Sheet

Project: Agua Mansa Warehouse Noise Study **Engineer:** Mario Gutierrez **Date:** 6/5/2014
JN: 0095-2014-07

Measurement Address: Agua Mansa Rd. **City:** San Bernardino County **Site No.:** 1-4

Sound Level Meter:
LD-712
Serial # A0520

Calibrator:
LD-250 250
Serial # 1322

Calibration Record:

	Input, dB/	Reading, dB/	Offset, dB/	Time
Before	114.0/	114.0/	26.9/	12:00 PM
After	114.0/	114.0/	26.3/	1:20 AM
Before	/	/	/	
After	/	/	/	

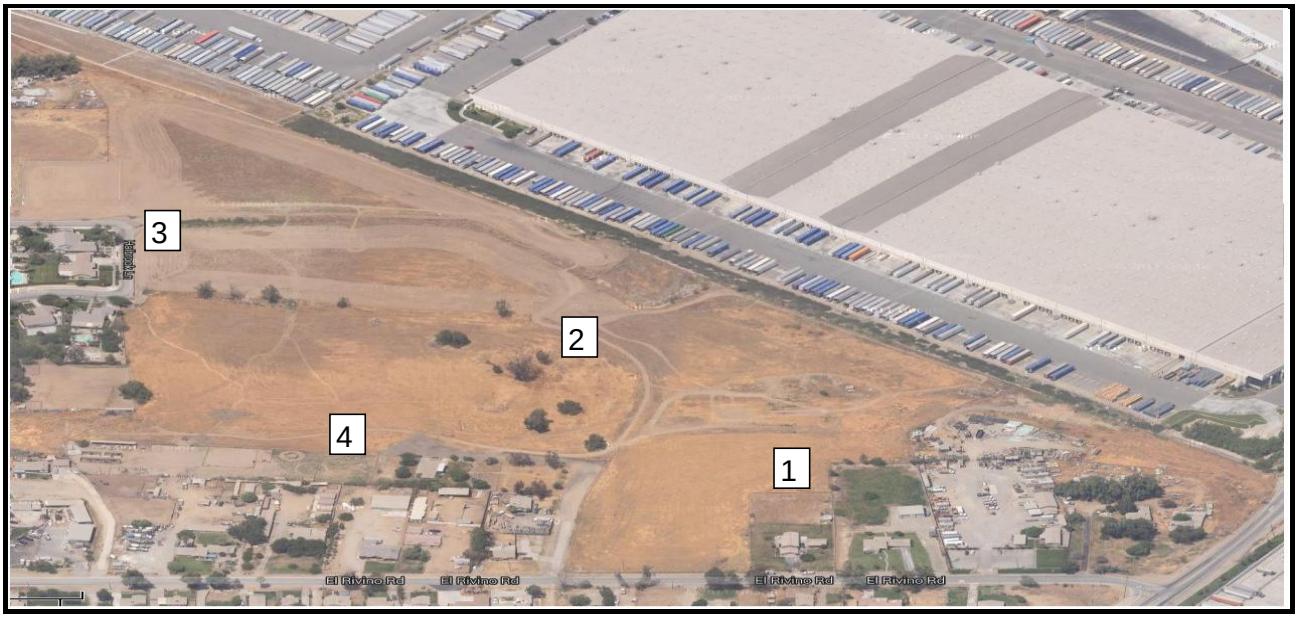
Notes:
Temp: 79
Windspeed: --
Direction: --
Skies: Clear
Camera:
Photo Nos.

Meter Settings:
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___10____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term
Short-term X

		Start Time	Stop Time	Leq	Lmin	Lmax	L2	L8	L25	L50
Locations	1	12:10 PM	12:20 PM	46.9	40.2	69.7	49.9	46.2	44.1	42.9
		Comments: Noise Meter was placed along the south eastern property line.								
	2	12:25 PM	12:35 PM	51	39.6	70.0	59.6	53.9	48.0	44.7
		Comments: Noise Meter was placed at the center of the project site.								
	3	12:50 PM	1:00 AM	47.4	39.6	70.0	53.1	47.9	44.0	42.3
		Comments: Noise Meter was placed along the western peroperty line.								
	4	1:05 AM	1:15 AM	43.7	39.7	60.8	50.2	46.2	43.1	42.0
		Comments: Noise Meter was placed along the south western property line.								
	5									



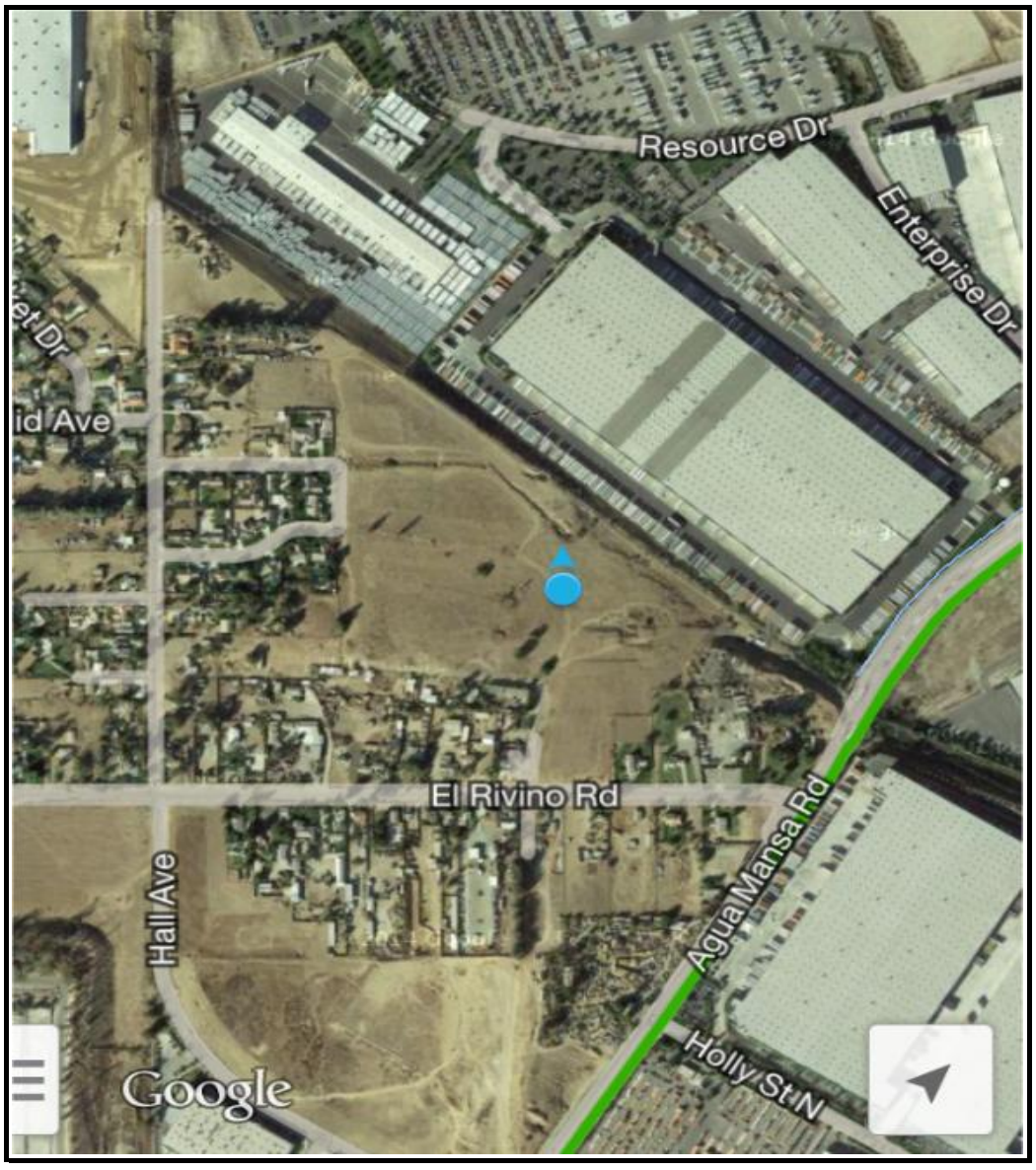
RK engineering group, inc.

Field Sheet - ST1 Location Photos

Project: Agua Mansa Warehouse Noise Study	**Engineer:** Mario Gutierrez	**Date:**	6/5/2014
		JN:	0995-2014-07
Measurement Address:	**City:** County of San Bernardino	**Site No.:**	1
Noise Meter was placed along the south eastern property line.			

RK engineering group, inc.

Field Sheet - ST2 Location Photos			
Project: Agua Mansa Warehouse Noise Study	**Engineer:** Mario Gutierrez	**Date:**	6/5/2014
		JN:	0995-2014-07
Measurement Address:	**City:** County of San Bernardino	**Site No.:**	2
Noise Meter was placed along the south eastern property line.			



RK engineering group, inc.

Field Sheet - ST3 Location Photos		
Project: Agua Mansa Warehouse Noise Study **Engineer:** Mario Gutierrez	**Date:**	6/5/2014
	JN:	0995-2014-07
Measurement Address: **City:** County of San Bernardino	**Site No.:**	3
Noise Meter was placed along the south eastern property line.		

Field Sheet - ST4 Location Photos

Project: Agua Mansa Warehouse Noise Study **Engineer:** Mario Gutierrez	**Date:**	6/5/2014
	JN:	0995-2014-07
Measurement Address: **City:** County of San Bernardino	**Site No.:**	4
Noise Meter was placed along the south eastern property line.		

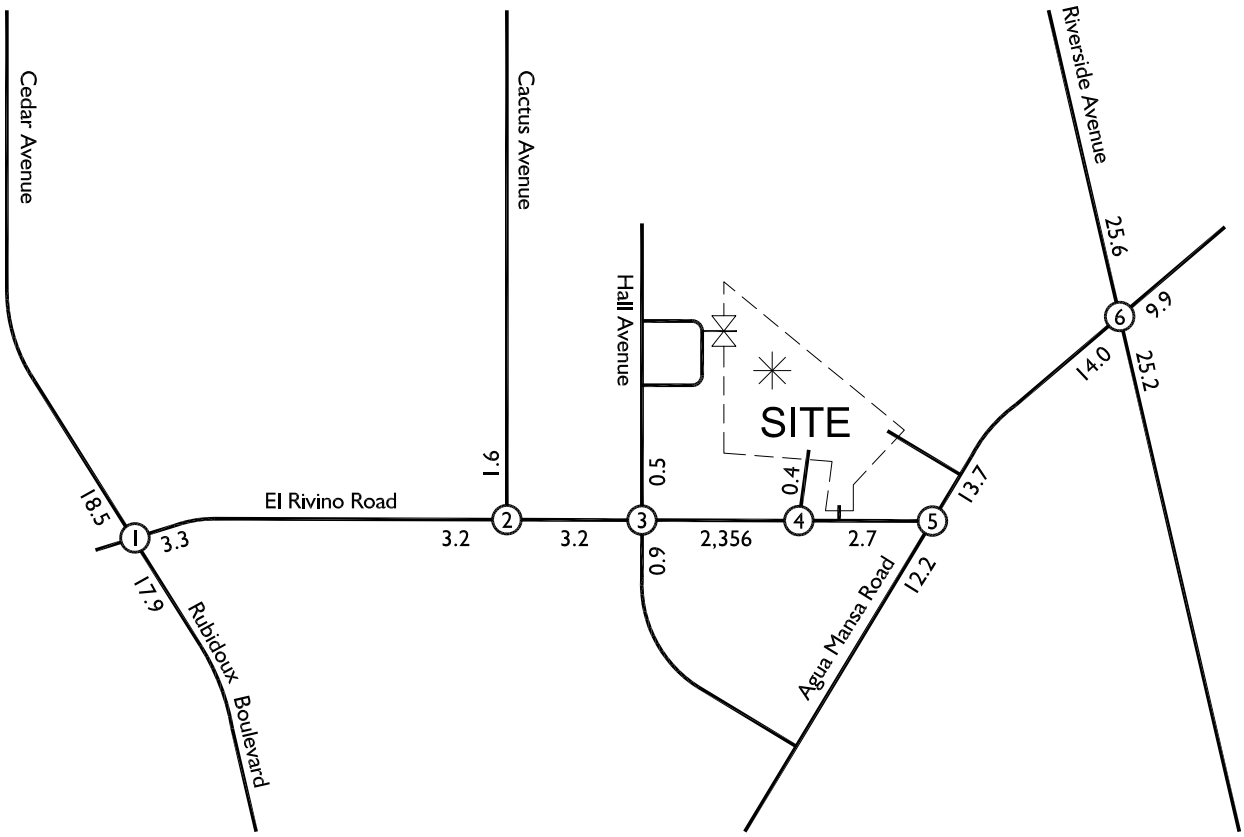
RK engineering group, inc.

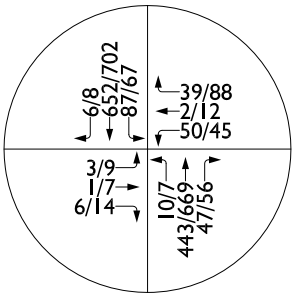
Appendix C

Traffic Data

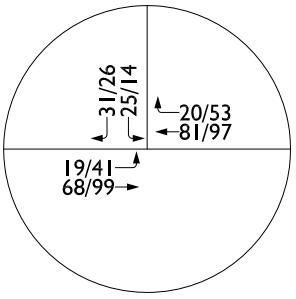
Exhibit D

Existing Traffic Volumes

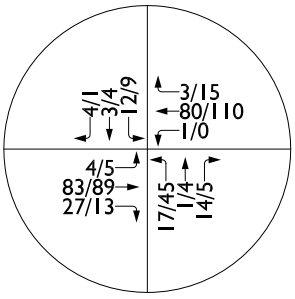




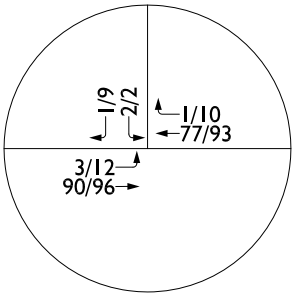
1. Cedar Avenue (NS) & El Ravino Road (EW)



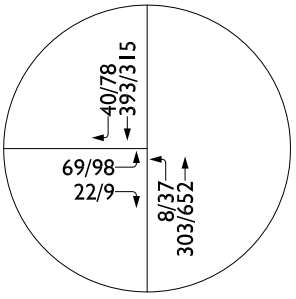
2. Cactus Avenue (NS) & El Ravino Road (EW)



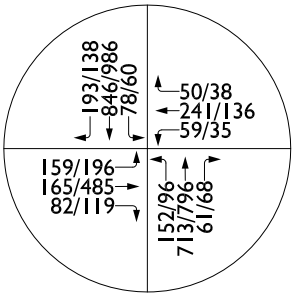
3. Hall Avenue (NS) & El Ravino Road (EW)



4. Kiningham Drive (NS) & El Ravino Road (EW)



5. Agua Mansa Road (NS) & El Ravino Road (EW)



6. Riverside Avenue (NS) & Agua Mansa Road (EW)

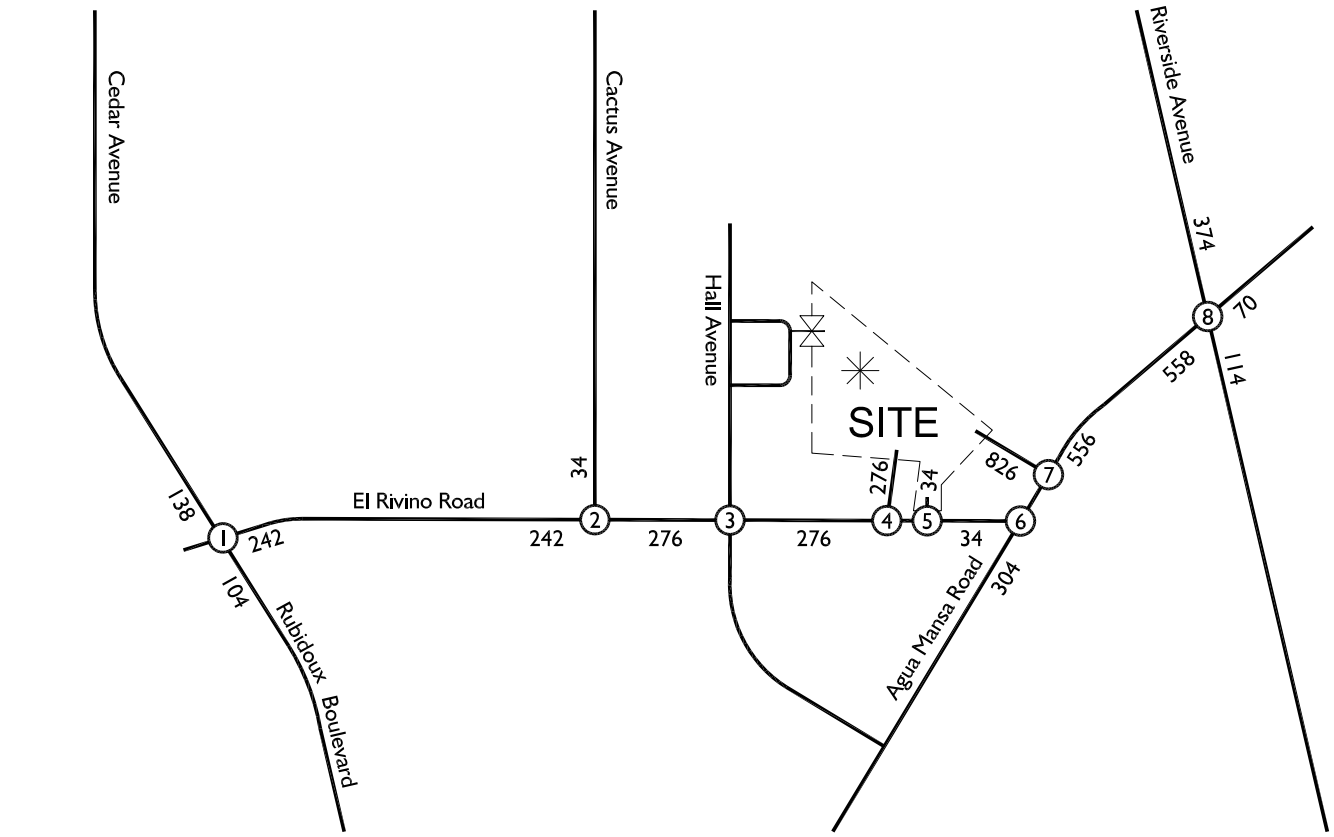
Legend:

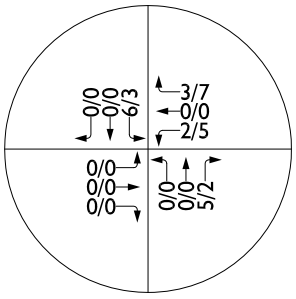
10/20 = AM/PM Peak Hour Volumes
10.0 = Average Daily Traffic (1000's)
2,356 = Measured Average Daily Traffic Counted June 12, 2014

N

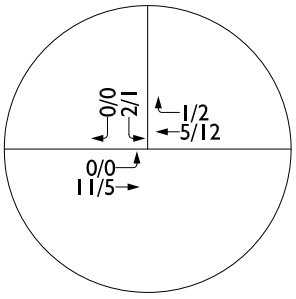
Exhibit H

Project Traffic Volumes

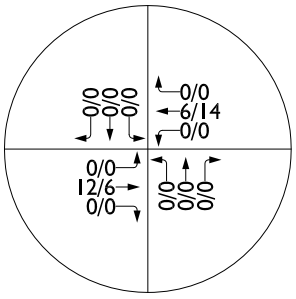




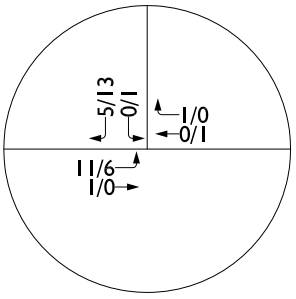
1. Cedar Avenue (NS) & El Ravino Road (EW)



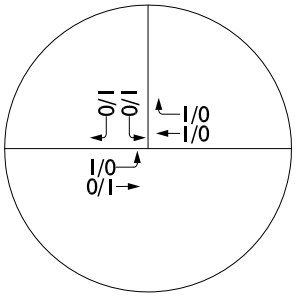
2. Cactus Avenue (NS) & El Ravino Road (EW)



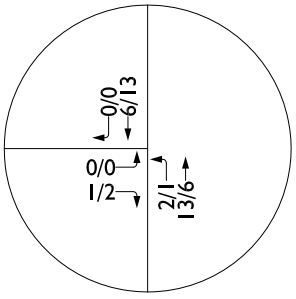
3. Hall Avenue (NS) & El Ravino Road (EW)



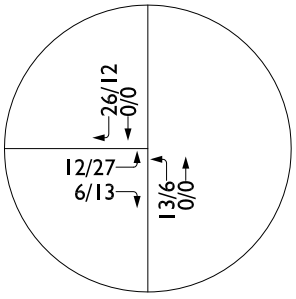
4. Kiningham Drive (NS) & El Ravino Road (EW)



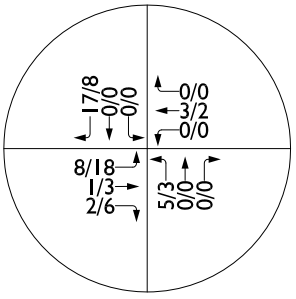
5. Project Access 1 (NS) & El Ravino Road (EW)



6. Agua Mansa Road (NS) & El Ravino Road (EW)



7. Agua Mansa Road (NS) & Project Access 2 (EW)



8. Riverside Avenue (NS) & Agua Mansa Road (EW)

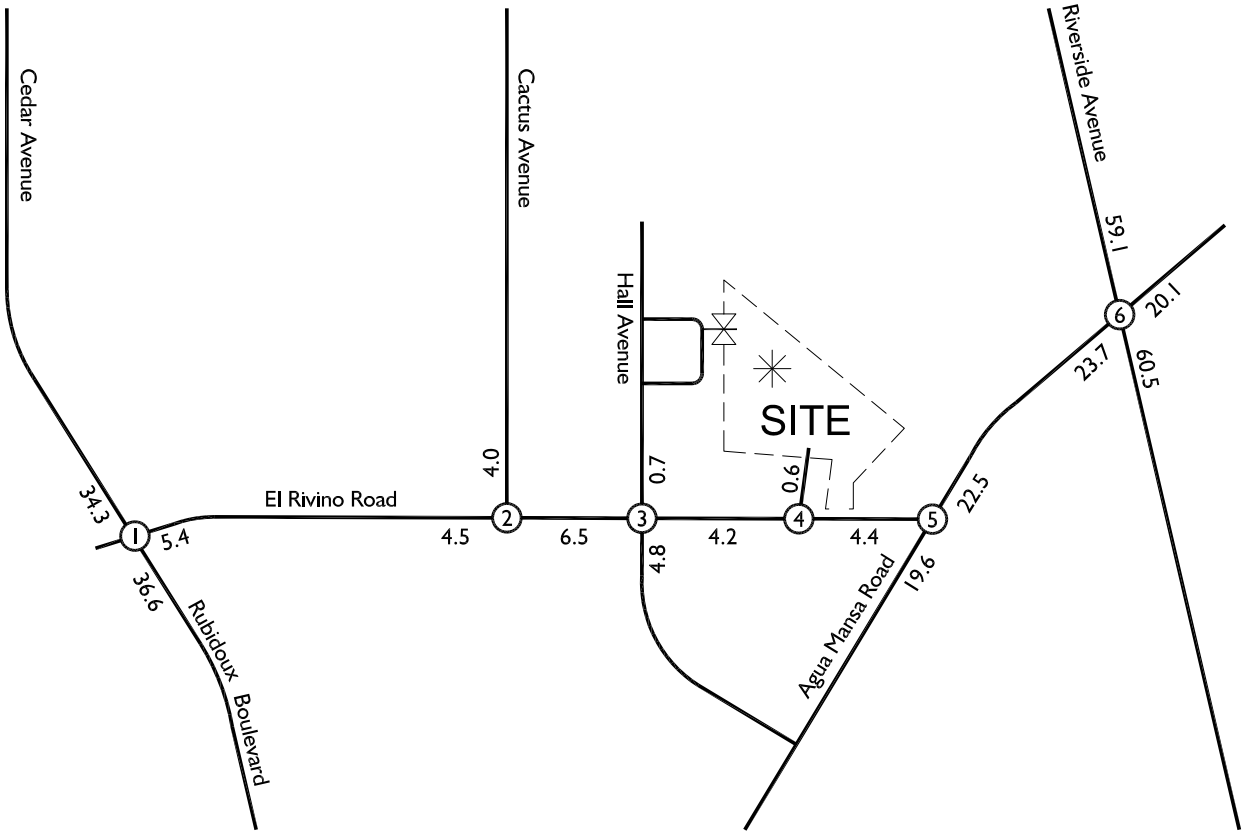
Legend:

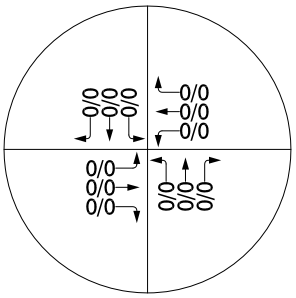
10/20 = AM/PM Peak Hour Volumes
100 = Average Daily Traffic

N

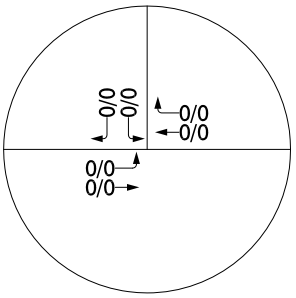
Exhibit O

Buildout Year (2035) With Cumulatives and Without Project Traffic Volumes

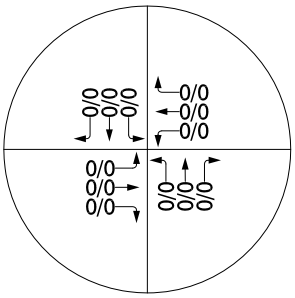




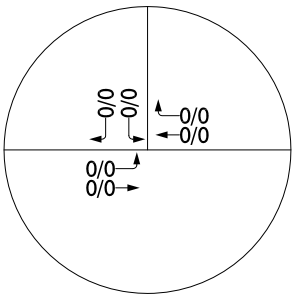
1. Cedar Avenue (NS) & El Ravino Road (EW)



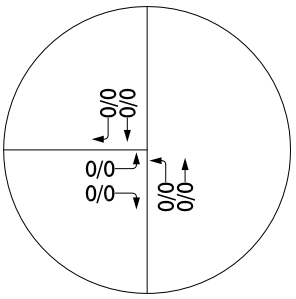
2. Cactus Avenue (NS) & El Ravino Road (EW)



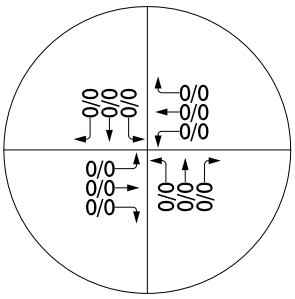
3. Hall Avenue (NS) & El Ravino Road (EW)



4. Kiningham Drive (NS) & El Ravino Road (EW)



5. Agua Mansa Road (NS) & El Ravino Road (EW)



6. Riverside Avenue (NS) & Agua Mansa Road (EW)

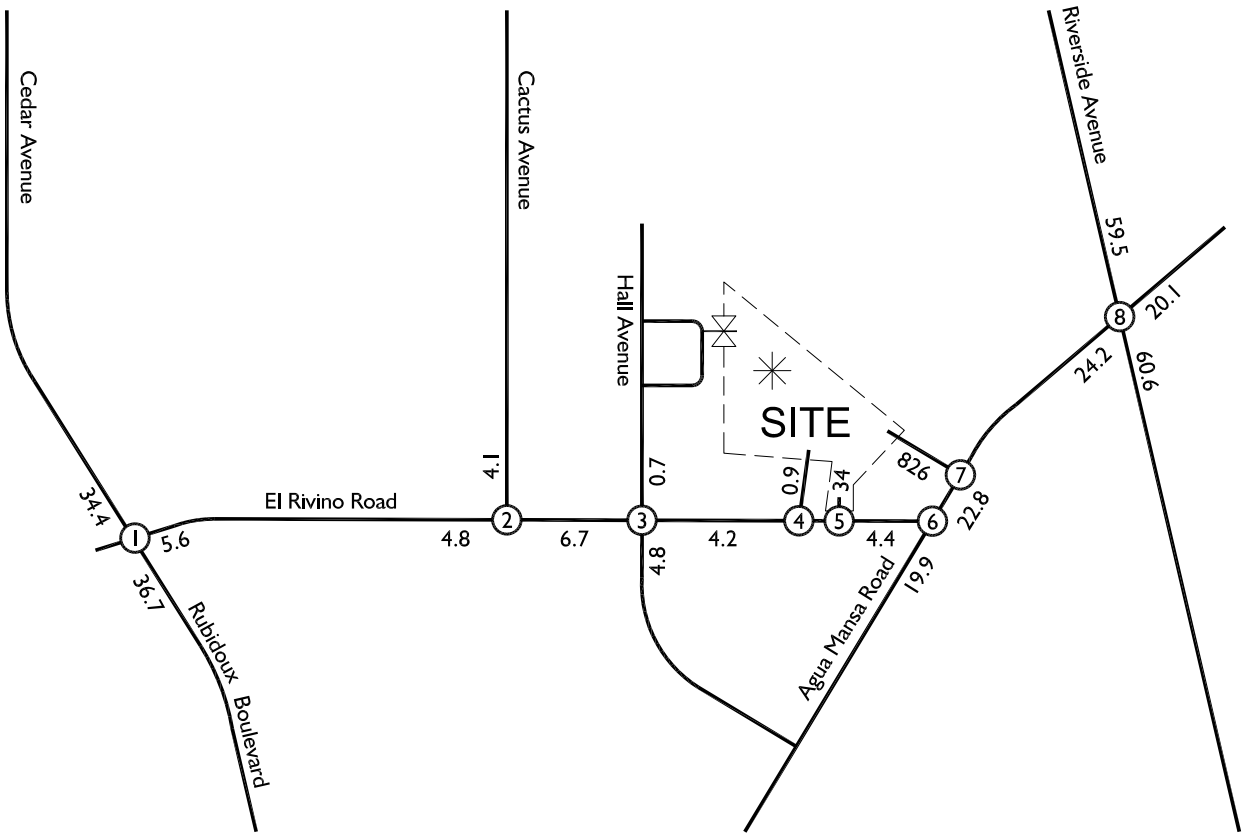
Legend:

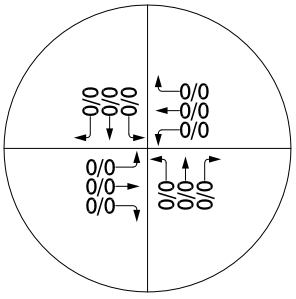
10/20 = AM/PM Peak Hour Volumes
10.0 = Average Daily Traffic (1000's)

N

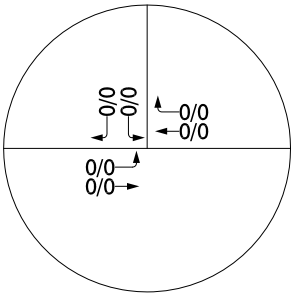
Exhibit P

Buildout Year (2035) With Cumulatives and With Project Traffic Volumes

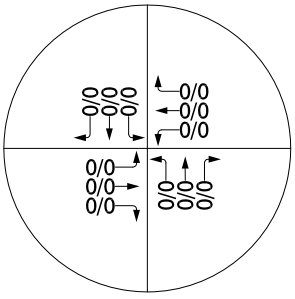




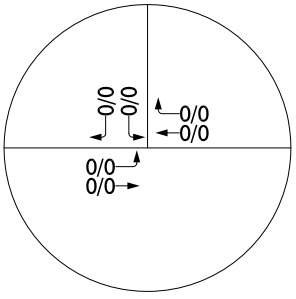
1. Cedar Avenue (NS) & El Ravino Road (EW)



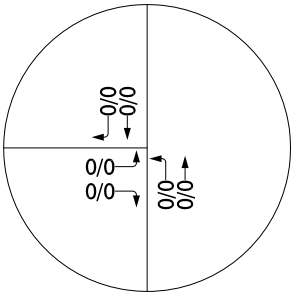
2. Cactus Avenue (NS) & El Ravino Road (EW)



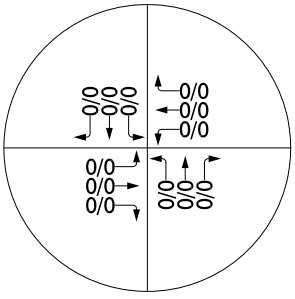
3. Hall Avenue (NS) & El Ravino Road (EW)



4. Kiningham Drive (NS) & El Ravino Road (EW)



5. Agua Mansa Road (NS) & El Ravino Road (EW)



6. Riverside Avenue (NS) & Agua Mansa Road (EW)

Legend:

10/20 = AM/PM Peak Hour Volumes
10.0 = Average Daily Traffic (1000's)

N

Appendix D

Traffic Noise
Calculation Worksheets

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT E/O of Riverside Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	9,900
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	990

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	59.9	58.0	56.2	50.2	58.8	59.4
MEDIUM TRUCKS	55.7	54.2	47.8	46.3	54.7	55.0
HEAVY TRUCKS	60.5	59.1	50.1	51.3	59.7	59.8
VEHICULAR NOISE	63.9	62.3	57.7	54.5	63.0	**63.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**36**	**77**	**166**	**358**
LDN	**34**	**73**	**158**	**340**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT Riverside Avenue to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	14,000
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,400

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	61.4	59.5	57.7	51.7	60.3	60.9
MEDIUM TRUCKS	57.2	55.7	49.3	47.8	56.2	56.5
HEAVY TRUCKS	62.0	60.6	51.6	52.8	61.2	61.3
VEHICULAR NOISE	65.4	63.8	59.2	56.0	64.5	**64.8**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**45**	**97**	**209**	**451**
LDN	**43**	**92**	**199**	**429**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT El Rivino Road to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	12,200
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,220

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	62.2	60.3	58.5	52.5	61.1	61.7
MEDIUM TRUCKS	57.3	55.8	49.4	47.9	56.4	56.6
HEAVY TRUCKS	61.8	60.4	51.4	52.6	61.0	61.1
VEHICULAR NOISE	65.7	64.1	59.7	56.2	64.7	**65.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**47**	**101**	**218**	**470**
LDN	**45**	**96**	**207**	**445**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Agua Mansa Road to Kiningham Drive
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	2,700
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	270

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	55.6	53.7	52.0	45.9	54.5	55.2
MEDIUM TRUCKS	50.8	49.3	42.9	41.3	49.8	50.0
HEAVY TRUCKS	55.3	53.9	44.8	46.1	54.4	54.6
VEHICULAR NOISE	59.2	57.5	53.2	49.7	58.2	**58.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**17**	**37**	**80**	**172**
LDN	**16**	**35**	**76**	**163**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Kiningham Drive to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	2,356
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	236

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	55.1	53.2	51.4	45.3	54.0	54.6
MEDIUM TRUCKS	50.2	48.7	42.3	40.8	49.2	49.4
HEAVY TRUCKS	54.7	53.3	44.2	45.5	53.8	54.0
VEHICULAR NOISE	58.6	56.9	52.6	49.1	57.6	**57.9**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**16**	**34**	**73**	**157**
LDN	**15**	**32**	**69**	**149**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Hall Avenue to Cactus Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	3,200
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	320

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.4	54.5	52.7	46.7	55.3	55.9
MEDIUM TRUCKS	51.5	50.0	43.6	42.1	50.5	50.8
HEAVY TRUCKS	56.0	54.6	45.6	46.8	55.2	55.3
VEHICULAR NOISE	59.9	58.3	53.9	50.4	58.9	**59.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**19**	**42**	**89**	**193**
LDN	**18**	**39**	**85**	**182**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Cactus Avenue to Cedar Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	3,200
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	320

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.4	54.5	52.7	46.7	55.3	55.9
MEDIUM TRUCKS	51.5	50.0	43.6	42.1	50.5	50.8
HEAVY TRUCKS	56.0	54.6	45.6	46.8	55.2	55.3
VEHICULAR NOISE	59.9	58.3	53.9	50.4	58.9	**59.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**19**	**42**	**89**	**193**
LDN	**18**	**39**	**85**	**182**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT El Rivino Road to Agua Mansa Road
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	900
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	90

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	43.8	41.9	40.1	34.0	42.7	43.3
MEDIUM TRUCKS	38.2	36.7	30.3	28.8	37.2	37.5
HEAVY TRUCKS	40.1	38.7	29.7	30.9	39.3	39.4
VEHICULAR NOISE	46.1	44.4	40.9	36.6	45.1	**45.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**2**	**5**	**11**	**23**
LDN	**2**	**5**	**10**	**22**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT Kiningham Drive to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	500
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	50

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	41.2	39.3	37.6	31.5	40.1	40.7
MEDIUM TRUCKS	35.6	34.1	27.8	26.2	34.7	34.9
HEAVY TRUCKS	37.6	36.2	27.1	28.4	36.7	36.9
VEHICULAR NOISE	43.5	41.8	38.3	34.0	42.5	**43.0**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**2**	**3**	**7**	**16**
LDN	**1**	**3**	**7**	**15**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT E/O of Riverside Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	20,170
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,017

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.0	61.1	59.3	53.3	61.9	62.5
MEDIUM TRUCKS	58.8	57.3	50.9	49.4	57.8	58.1
HEAVY TRUCKS	63.6	62.2	53.2	54.4	62.8	62.9
VEHICULAR NOISE	67.0	65.4	60.7	57.6	66.1	**66.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**58**	**124**	**267**	**576**
LDN	**55**	**118**	**254**	**547**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT El Rivino Road to Agua Mansa Road
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,800
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	480

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	51.0	49.1	47.4	41.3	49.9	50.5
MEDIUM TRUCKS	45.5	43.9	37.6	36.0	44.5	44.7
HEAVY TRUCKS	47.4	46.0	37.0	38.2	46.6	46.7
VEHICULAR NOISE	53.4	51.7	48.2	43.8	52.4	**52.8**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**7**	**15**	**33**	**71**
LDN	**7**	**14**	**31**	**67**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT Kiningham Drive to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	700
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	70

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	42.7	40.8	39.0	33.0	41.6	42.2
MEDIUM TRUCKS	37.1	35.6	29.2	27.7	36.1	36.4
HEAVY TRUCKS	39.0	37.6	28.6	29.8	38.2	38.3
VEHICULAR NOISE	45.0	43.3	39.8	35.5	44.0	**44.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**2**	**4**	**9**	**20**
LDN	**2**	**4**	**9**	**18**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Cactus Avenue to Cedar Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,742
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	474

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	58.1	56.2	54.4	48.4	57.0	57.6
MEDIUM TRUCKS	53.2	51.7	45.3	43.8	52.3	52.5
HEAVY TRUCKS	57.7	56.3	47.3	48.5	56.9	57.0
VEHICULAR NOISE	61.6	60.0	55.6	52.1	60.6	**61.0**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**25**	**54**	**116**	**250**
LDN	**24**	**51**	**110**	**237**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Hall Avenue to Cactus Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	6,776
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	678

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	59.6	57.7	56.0	49.9	58.5	59.1
MEDIUM TRUCKS	54.8	53.2	46.9	45.3	53.8	54.0
HEAVY TRUCKS	59.3	57.9	48.8	50.1	58.4	58.5
VEHICULAR NOISE	63.2	61.5	57.2	53.7	62.2	**62.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**32**	**68**	**147**	**318**
LDN	**30**	**65**	**140**	**301**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Kiningham Drive to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,476
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	448

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	57.8	55.9	54.2	48.1	56.7	57.3
MEDIUM TRUCKS	53.0	51.4	45.1	43.5	52.0	52.2
HEAVY TRUCKS	57.5	56.1	47.0	48.3	56.6	56.7
VEHICULAR NOISE	61.4	59.7	55.4	51.9	60.4	**60.7**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**24**	**52**	**112**	**241**
LDN	**23**	**49**	**106**	**228**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Agua Mansa Road to Kiningham Drive
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,434
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	443

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	57.8	55.9	54.1	48.1	56.7	57.3
MEDIUM TRUCKS	52.9	51.4	45.0	43.5	52.0	52.2
HEAVY TRUCKS	57.4	56.0	47.0	48.2	56.6	56.7
VEHICULAR NOISE	61.3	59.7	55.3	51.8	60.3	**60.7**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**24**	**52**	**111**	**239**
LDN	**23**	**49**	**105**	**227**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT El Rivino Road to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	19,904
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,990

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	64.3	62.4	60.7	54.6	63.2	63.8
MEDIUM TRUCKS	59.4	57.9	51.6	50.0	58.5	58.7
HEAVY TRUCKS	64.0	62.5	53.5	54.7	63.1	63.2
VEHICULAR NOISE	67.8	66.2	61.8	58.4	66.9	**67.2**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**65**	**140**	**302**	**652**
LDN	**62**	**133**	**286**	**617**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT Riverside Avenue to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	24,258
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,426

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.8	61.9	60.1	54.1	62.7	63.3
MEDIUM TRUCKS	59.6	58.1	51.7	50.2	58.6	58.9
HEAVY TRUCKS	64.4	63.0	54.0	55.2	63.6	63.7
VEHICULAR NOISE	67.8	66.2	61.5	58.4	66.9	**67.2**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**65**	**140**	**302**	**651**
LDN	**62**	**133**	**287**	**619**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT E/O of Riverside Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	20,100
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,010

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.0	61.1	59.3	53.2	61.9	62.5
MEDIUM TRUCKS	58.8	57.3	50.9	49.4	57.8	58.0
HEAVY TRUCKS	63.6	62.2	53.2	54.4	62.8	62.9
VEHICULAR NOISE	67.0	65.4	60.7	57.6	66.1	**66.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**57**	**124**	**267**	**574**
LDN	**55**	**118**	**253**	**546**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT El Rivino Road to Agua Mansa Road
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,800
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	480

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	51.0	49.1	47.4	41.3	49.9	50.5
MEDIUM TRUCKS	45.5	43.9	37.6	36.0	44.5	44.7
HEAVY TRUCKS	47.4	46.0	37.0	38.2	46.6	46.7
VEHICULAR NOISE	53.4	51.7	48.2	43.8	52.4	**52.8**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**7**	**15**	**33**	**71**
LDN	**7**	**14**	**31**	**67**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT Kiningham Drive to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	700
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	70

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	42.7	40.8	39.0	33.0	41.6	42.2
MEDIUM TRUCKS	37.1	35.6	29.2	27.7	36.1	36.4
HEAVY TRUCKS	39.0	37.6	28.6	29.8	38.2	38.3
VEHICULAR NOISE	45.0	43.3	39.8	35.5	44.0	**44.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**2**	**4**	**9**	**20**
LDN	**2**	**4**	**9**	**18**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Cactus Avenue to Cedar Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,500
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	450

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	57.9	56.0	54.2	48.1	56.8	57.4
MEDIUM TRUCKS	53.0	51.5	45.1	43.6	52.0	52.3
HEAVY TRUCKS	57.5	56.1	47.0	48.3	56.6	56.8
VEHICULAR NOISE	61.4	59.7	55.4	51.9	60.4	**60.8**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**24**	**52**	**112**	**242**
LDN	**23**	**49**	**106**	**229**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Hall Avenue to Cactus Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	6,500
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	650

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	59.5	57.6	55.8	49.7	58.4	59.0
MEDIUM TRUCKS	54.6	53.1	46.7	45.2	53.6	53.9
HEAVY TRUCKS	59.1	57.7	48.6	49.9	58.2	58.4
VEHICULAR NOISE	63.0	61.3	57.0	53.5	62.0	**62.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**31**	**67**	**143**	**309**
LDN	**29**	**63**	**136**	**293**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Kiningham Drive to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,200
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	420

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	57.6	55.7	53.9	47.8	56.5	57.1
MEDIUM TRUCKS	52.7	51.2	44.8	43.3	51.7	52.0
HEAVY TRUCKS	57.2	55.8	46.7	48.0	56.3	56.5
VEHICULAR NOISE	61.1	59.4	55.1	51.6	60.1	**60.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**23**	**50**	**107**	**231**
LDN	**22**	**47**	**102**	**219**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Agua Mansa Road to Kiningham Drive
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,400
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	440

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	57.8	55.9	54.1	48.0	56.7	57.3
MEDIUM TRUCKS	52.9	51.4	45.0	43.5	51.9	52.2
HEAVY TRUCKS	57.4	56.0	46.9	48.2	56.5	56.7
VEHICULAR NOISE	61.3	59.6	55.3	51.8	60.3	**60.7**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**24**	**51**	**111**	**238**
LDN	**23**	**49**	**105**	**226**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT El Rivino Road to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	19,600
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,960

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	64.3	62.4	60.6	54.5	63.2	63.8
MEDIUM TRUCKS	59.4	57.9	51.5	50.0	58.4	58.6
HEAVY TRUCKS	63.9	62.5	53.4	54.7	63.0	63.2
VEHICULAR NOISE	67.8	66.1	61.8	58.3	66.8	**67.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**64**	**139**	**299**	**645**
LDN	**61**	**132**	**283**	**611**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT Riverside Avenue to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Year 2035 Conditions - W/O Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	23,700
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,370

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.7	61.8	60.0	54.0	62.6	63.2
MEDIUM TRUCKS	59.5	58.0	51.6	50.1	58.5	58.8
HEAVY TRUCKS	64.3	62.9	53.9	55.1	63.5	63.6
VEHICULAR NOISE	67.7	66.1	61.4	58.3	66.8	**67.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**64**	**138**	**297**	**641**
LDN	**61**	**131**	**283**	**609**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT E/O of Riverside Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	9,970
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	997

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	59.9	58.0	56.3	50.2	58.8	59.4
MEDIUM TRUCKS	55.7	54.2	47.9	46.3	54.8	55.0
HEAVY TRUCKS	60.6	59.1	50.1	51.4	59.7	59.8
VEHICULAR NOISE	64.0	62.4	57.7	54.5	63.0	**63.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**36**	**78**	**167**	**360**
LDN	**34**	**74**	**159**	**342**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT El Rivino Road to Agua Mansa Road
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	900
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	90

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	43.8	41.9	40.1	34.0	42.7	43.3
MEDIUM TRUCKS	38.2	36.7	30.3	28.8	37.2	37.5
HEAVY TRUCKS	40.1	38.7	29.7	30.9	39.3	39.4
VEHICULAR NOISE	46.1	44.4	40.9	36.6	45.1	**45.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**2**	**5**	**11**	**23**
LDN	**2**	**5**	**10**	**22**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Hall Avenue
SEGMENT Kiningham Drive to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	500
SPEED =	25
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	50

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.974
MEDIUM TRUCKS	0.848	0.049	0.103	0.018
HEAVY TRUCKS	0.865	0.027	0.108	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.9	- -
MEDIUM TRUCKS=	4.00	99.8	- -
HEAVY TRUCKS =	8.01	99.9	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	41.2	39.3	37.6	31.5	40.1	40.7
MEDIUM TRUCKS	35.6	34.1	27.8	26.2	34.7	34.9
HEAVY TRUCKS	37.6	36.2	27.1	28.4	36.7	36.9
VEHICULAR NOISE	43.5	41.8	38.3	34.0	42.5	**43.0**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**2**	**3**	**7**	**16**
LDN	**1**	**3**	**7**	**15**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Cactus Avenue to Cedar Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	3,442
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	344

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.7	54.8	53.0	47.0	55.6	56.2
MEDIUM TRUCKS	51.8	50.3	43.9	42.4	50.9	51.1
HEAVY TRUCKS	56.3	54.9	45.9	47.1	55.5	55.6
VEHICULAR NOISE	60.2	58.6	54.2	50.7	59.2	**59.6**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**20**	**44**	**94**	**202**
LDN	**19**	**41**	**89**	**192**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Hall Avenue to Cactus Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	3,476
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	348

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.7	54.8	53.1	47.0	55.6	56.2
MEDIUM TRUCKS	51.9	50.4	44.0	42.4	50.9	51.1
HEAVY TRUCKS	56.4	55.0	45.9	47.2	55.5	55.6
VEHICULAR NOISE	60.3	58.6	54.3	50.8	59.3	**59.6**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**20**	**44**	**94**	**204**
LDN	**19**	**42**	**89**	**193**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Kiningham Drive to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	2,632
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	263

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	55.5	53.6	51.9	45.8	54.4	55.0
MEDIUM TRUCKS	50.7	49.1	42.8	41.2	49.7	49.9
HEAVY TRUCKS	55.2	53.7	44.7	46.0	54.3	54.4
VEHICULAR NOISE	59.0	57.4	53.1	49.6	58.1	**58.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**17**	**36**	**79**	**169**
LDN	**16**	**35**	**74**	**160**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY El Rivino Road
SEGMENT Agua Mansa Road to Kiningham Drive
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	2,734
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	273

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	55.7	53.8	52.0	46.0	54.6	55.2
MEDIUM TRUCKS	50.8	49.3	42.9	41.4	49.9	50.1
HEAVY TRUCKS	55.3	53.9	44.9	46.1	54.5	54.6
VEHICULAR NOISE	59.2	57.6	53.2	49.7	58.2	**58.6**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**17**	**37**	**81**	**173**
LDN	**16**	**35**	**76**	**164**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT El Rivino Road to Hall Avenue
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	12,504
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	24
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,250

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	99.3	- -
MEDIUM TRUCKS=	4.00	99.3	- -
HEAVY TRUCKS =	8.01	99.3	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	62.3	60.4	58.6	52.6	61.2	61.8
MEDIUM TRUCKS	57.4	55.9	49.5	48.0	56.5	56.7
HEAVY TRUCKS	61.9	60.5	51.5	52.7	61.1	61.2
VEHICULAR NOISE	65.8	64.2	59.8	56.3	64.8	**65.2**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**48**	**103**	**222**	**478**
LDN	**45**	**98**	**210**	**453**

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Agua Mansa High-Cube Warehouse Noise Impact Study, County of San Bernardino
ROADWAY Agua Mansa Road
SEGMENT Riverside Avenue to El Rivino Road
LOCATION: County of San Bernardino SCENARIO: Existing Conditions - W/ Project

JOB #: 0995-2014-07
DATE: 19-Aug-14
ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	14,558
SPEED =	40
PK HR % =	10
NEAR LANE/FAR LANE DIST =	40
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,456

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL	0	FT
AMBIENT =	0	
BARRIER =	0	(0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.912
MEDIUM TRUCKS	0.848	0.049	0.103	0.044
HEAVY TRUCKS	0.865	0.027	0.108	0.044

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	98.0	- -
MEDIUM TRUCKS=	4.00	98.0	- -
HEAVY TRUCKS =	8.01	98.0	0.0

NOISE OUTPUT DATA

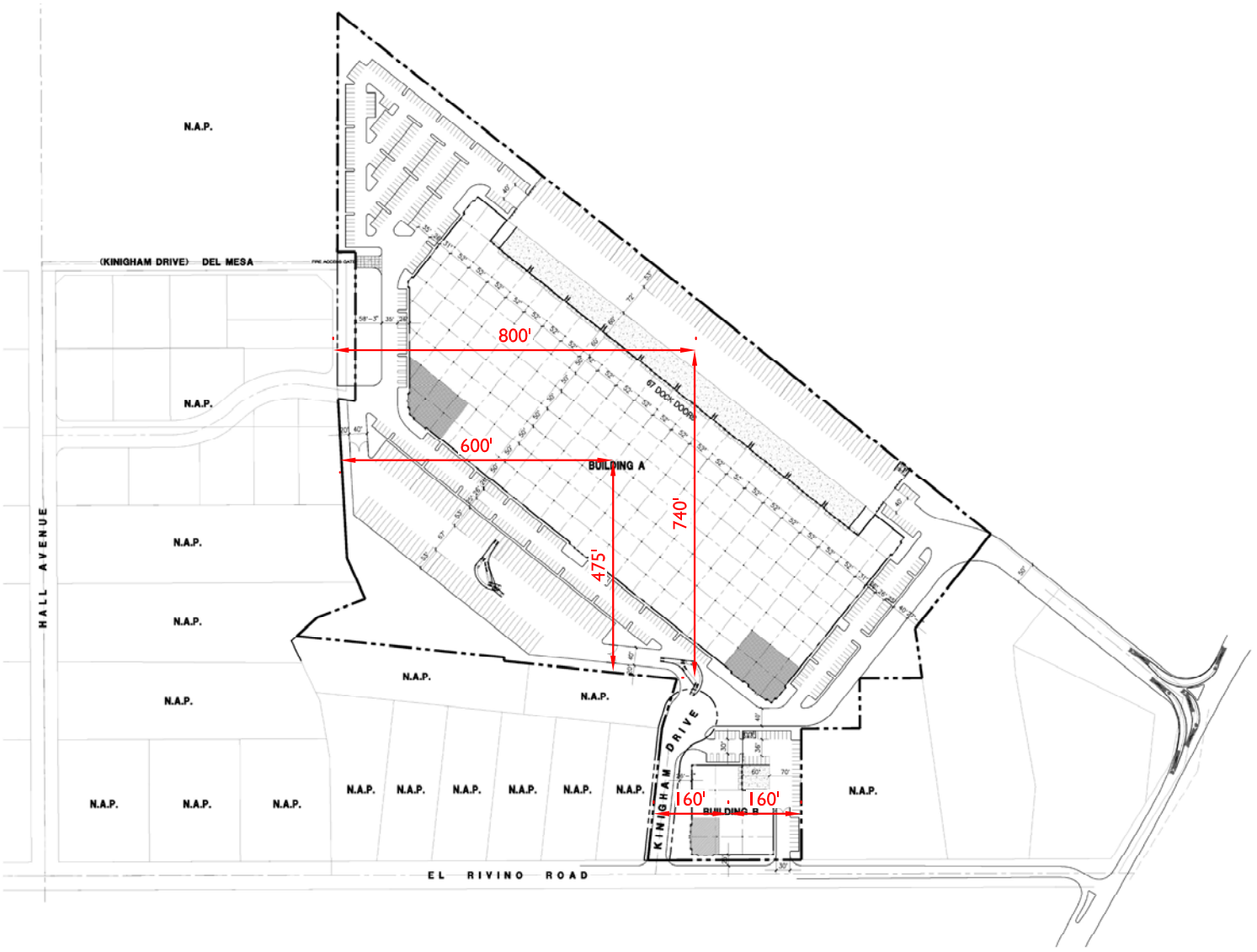
NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	61.6	59.7	57.9	51.8	60.5	61.1
MEDIUM TRUCKS	57.4	55.9	49.5	48.0	56.4	56.6
HEAVY TRUCKS	62.2	60.8	51.8	53.0	61.4	61.5
VEHICULAR NOISE	65.6	64.0	59.3	56.2	64.7	**65.0**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	**46**	**100**	**215**	**463**
LDN	**44**	**95**	**204**	**440**

Appendix E

Stationary Noise
Calculation Worksheets


N.A.P.
(KINIGHAM DRIVE) DEL MESA
800'
600'
BUILDING A
740'
475'
67 DOCK DOORS
HALL AVENUE
N.A.P.
KINGHAM DRIVE
160'
160'
BUILDING B
EL RIVINO ROAD

N

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY	JOB #:	0995-2014-07
SOURCE:	TRUCK LOADING/UNLOADING NOISE (6 TRUCKS OPERATING)	DATE:	19-Aug-14
LOCATION:	SOUTHEASTERN PROPERTY LINE	BY:	M. DICKERSON

NOISE INPUT DATA

OBS DIST=	600.0			
DT WALL=	30.0			
DT W/OB=	570.0			
HTH WALL=	25.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	8.0		BARRIER+	
OBS EL =	5.0		TOPO SHIELDING =	-16.10
NOISE EL =	0.0		NOISE HTH EL=	8.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6	74.1	91.8	86.3	75.8	69.3	66.3
PROJ LEVEL	600	34.1	51.8	46.3	35.8	29.3	26.3
SHIELDING	600	-16.1	-16.1	-16.1	-16.1	-16.1	-16.1
ADJ LEVEL	600	***18.0***	***35.7***	***30.2***	***19.7***	***13.2***	***10.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -40

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY	JOB #:	0995-2014-07
SOURCE:	TRUCK LOADING/UNLOADING NOISE (6 TRUCKS OPERATING)	DATE:	19-Aug-14
LOCATION:	SOUTH PROPERTY LINE	BY:	M. DICKERSON

NOISE INPUT DATA

OBS DIST=	740.0			
DT WALL=	30.0			
DT W/OB=	710.0			
HTH WALL=	25.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	8.0		BARRIER+	
OBS EL =	5.0		TOPO SHIELDING =	-16.10
NOISE EL =	0.0		NOISE HTH EL=	8.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6	74.1	91.8	86.3	75.8	69.3	66.3
PROJ LEVEL	740	32.3	50.0	44.5	34.0	27.5	24.5
SHIELDING	740	-16.1	-16.1	-16.1	-16.1	-16.1	-16.1
ADJ LEVEL	740	***16.2***	***33.9***	***28.4***	***17.9***	***11.4***	***8.4***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -41.8216094

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY	JOB #:	0995-2014-07
SOURCE:	TRUCK LOADING/UNLOADING NOISE (6 TRUCKS OPERATING)	DATE:	19-Aug-14
LOCATION:	WEST PROPERTY LINE	BY:	M. DICKERSON

NOISE INPUT DATA

OBS DIST=	800.0			
DT WALL=	30.0			
DT W/OB=	770.0			
HTH WALL=	25.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	8.0		BARRIER+	
OBS EL =	5.0		TOPO SHIELDING =	-16.10
NOISE EL =	0.0		NOISE HTH EL=	8.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6	74.1	91.8	86.3	75.8	69.3	66.3
PROJ LEVEL	800	31.6	49.3	43.8	33.3	26.8	23.8
SHIELDING	800	-16.1	-16.1	-16.1	-16.1	-16.1	-16.1
ADJ LEVEL	800	***15.5***	***33.2***	***27.7***	***17.2***	***10.7***	***7.7***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -42.4987747

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY	JOB #:	0995-2014-07
SOURCE:	HVAC EQUIPMENT	DATE:	19-Aug-14
LOCATION:	SOUTHEASTERN PROPERTY LINE	BY:	M. DICKERSON

NOISE INPUT DATA

OBS DIST=	160.0			
DT WALL=	160.0			
DT W/OB=	0.0			
HTH WALL=	8.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	24.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-13.00
NOISE EL =	0.0		NOISE HTH EL=	24.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	82.5	82.5	82.5	82.5	82.5	82.5
PROJ LEVEL	160	48.0	48.0	48.0	48.0	48.0	48.0
SHIELDING	160	-13.0	-13.0	-13.0	-13.0	-13.0	-13.0
ADJ LEVEL	160	***35.0***	***35.0***	***35.0***	***35.0***	***35.0***	***35.0***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -34.5399746

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY	JOB #:	0995-2014-07
SOURCE:	HVAC EQUIPMENT	DATE:	19-Aug-14
LOCATION:	SOUTH PROPERTY LINE	BY:	M. DICKERSON

NOISE INPUT DATA

OBS DIST=	475.0			
DT WALL=	475.0			
DT W/OB=	0.0			
HTH WALL=	8.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	24.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-13.30
NOISE EL =	0.0		NOISE HTH EL=	24.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	82.5	82.5	82.5	82.5	82.5	82.5
PROJ LEVEL	475	38.5	38.5	38.5	38.5	38.5	38.5
SHIELDING	475	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3
ADJ LEVEL	475	***25.2***	***25.2***	***25.2***	***25.2***	***25.2***	***25.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -43.9914471

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY	JOB #:	0995-2014-07
SOURCE:	HVAC EQUIPMENT	DATE:	19-Aug-14
LOCATION:	WEST PROPERTY LINE	BY:	M. DICKERSON

NOISE INPUT DATA

OBS DIST=	600.0			
DT WALL=	600.0			
DT W/OB=	0.0			
HTH WALL=	8.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	24.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-13.30
NOISE EL =	0.0		NOISE HTH EL=	24.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	82.5	82.5	82.5	82.5	82.5	82.5
PROJ LEVEL	600	36.5	36.5	36.5	36.5	36.5	36.5
SHIELDING	600	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3
ADJ LEVEL	600	***23.2***	***23.2***	***23.2***	***23.2***	***23.2***	***23.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -46.0205999

dBA NOISE ADDER

PROJECT: AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY JOB #: 0995-2014-07

LOCATION: SOUTHEASTERN PROPERTY LINE DATE: 08/19/14

SCENARIO: 6 TRUCKS OPERATING SIMULTANEOUSLY BY: M.DICKERSON

NOISE LEVEL MEASUREMENTS (dBA)

SOURCE	LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
TRUCK LOADING/UNLOADING	18.0	35.7	N/A	30.2	19.7	13.2	10.2
CONDENSER UNIT	35.0	35.0	N/A	35.0	35.0	35.0	35.0
AMBIENT MEASUREMENT	46.9	69.7	N/A	49.9	46.2	44.1	42.9
TOTAL	47.2	69.7	#VALUE!	50.1	46.5	44.6	43.6

dBA NOISE ADDER

LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
=10^(LEQ/10)	=10^(L(MAX)/10)	.0^(L(MIN)/1	=10^(L(2)/10)	=10^(L(8)/10)	=10^(L(25)/10)	10^(L(50)/10)
-	-	-	-	-	-	-
63	3,715	#VALUE!	1,047	93	21	10
3,162	3,162	#VALUE!	3,162	3,162	3,162	3,162
48,978	9,332,543	#VALUE!	97,724	41,687	25,704	19,498
52,203	9,339,421	#VALUE!	101,933	44,943	28,887	22,671

dBA NOISE ADDER

PROJECT: AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY JOB #: 0995-2014-07

LOCATION: SOUTHEASTERN PROPERTY LINE DATE: 08/19/14

SCENARIO: 6 TRUCKS OPERATING SIMULTANEOUSLY BY: M.DICKERSON

NOISE LEVEL MEASUREMENTS (dBA)

SOURCE	LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
TRUCK LOADING/UNLOADING	18.0	35.7	N/A	30.2	19.7	13.2	10.2
CONDENSER UNIT	35.0	35.0	N/A	35.0	35.0	35.0	35.0
AMBIENT MEASUREMENT	41.9	64.7	N/A	44.9	41.2	39.1	37.9
TOTAL	42.7	64.7	#VALUE!	45.5	42.2	40.5	39.7

dBA NOISE ADDER

LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
=10^(LEQ/10)	=10^(L(MAX)/10)	.0^(L(MIN)/1	=10^(L(2)/10)	=10^(L(8)/10)	=10^(L(25)/10)	10^(L(50)/10)
-	-	-	-	-	-	-
63	3,715	#VALUE!	1,047	93	21	10
3,162	3,162	#VALUE!	3,162	3,162	3,162	3,162
15,488	2,951,209	#VALUE!	30,903	13,183	8,128	6,166
18,714	2,958,087	#VALUE!	35,112	16,438	11,311	9,339

dBA NOISE ADDER

PROJECT: AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY JOB #: 0995-2014-07

LOCATION: SOUTH PROPERTY LINE DATE: 08/19/14

SCENARIO: 6 TRUCKS OPERATING SIMULTANEOUSLY BY: M.DICKERSON

NOISE LEVEL MEASUREMENTS (dBA)

SOURCE	LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
TRUCK LOADING/UNLOADING	16.2	33.9	N/A	28.4	17.9	11.4	8.4
CONDENSER UNIT	25.2	25.2	N/A	25.2	25.2	25.2	25.2
AMBIENT MEASUREMENT	43.7	60.8	N/A	50.2	46.2	43.1	42.0
TOTAL	43.8	60.8	#VALUE!	50.2	46.2	43.2	42.1

dBA NOISE ADDER

LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
=10^(LEQ/10)	=10^(L(MAX)/10)	.0^(L(MIN)/1	=10^(L(2)/10)	=10^(L(8)/10)	=10^(L(25)/10)	10^(L(50)/10)
-	-	-	-	-	-	-
42	2,455	#VALUE!	692	62	14	7
331	331	#VALUE!	331	331	331	331
23,442	1,202,264	#VALUE!	104,713	41,687	20,417	15,849
23,815	1,205,050	#VALUE!	105,736	42,080	20,762	16,187

dBA NOISE ADDER

PROJECT: AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY JOB #: 0995-2014-07

LOCATION: SOUTH PROPERTY LINE DATE: 08/19/14

SCENARIO: 6 TRUCKS OPERATING SIMULTANEOUSLY BY: M.DICKERSON

NOISE LEVEL MEASUREMENTS (dBA)

SOURCE	LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
TRUCK LOADING/UNLOADING	16.2	33.9	N/A	28.4	17.9	11.4	8.4
CONDENSER UNIT	25.2	25.2	N/A	25.2	25.2	25.2	25.2
AMBIENT MEASUREMENT	38.7	55.8	N/A	45.2	41.2	38.1	37.0
TOTAL	38.9	55.8	#VALUE!	45.3	41.3	38.3	37.3

dBA NOISE ADDER

LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
=10^(LEQ/10)	=10^(L(MAX)/10)	.0^(L(MIN)/1	=10^(L(2)/10)	=10^(L(8)/10)	=10^(L(25)/10)	10^(L(50)/10)
-	-	-	-	-	-	-
42	2,455	#VALUE!	692	62	14	7
331	331	#VALUE!	331	331	331	331
7,413	380,189	#VALUE!	33,113	13,183	6,457	5,012
7,786	382,975	#VALUE!	34,136	13,575	6,801	5,350

dBA NOISE ADDER

PROJECT: AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY JOB #: 0995-2014-07

LOCATION: WEST PROPERTY LINE DATE: 08/19/14

SCENARIO: 6 TRUCKS OPERATING SIMULTANEOUSLY BY: M.DICKERSON

NOISE LEVEL MEASUREMENTS (dBA)

SOURCE	LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
TRUCK LOADING/UNLOADING	15.5	33.2	N/A	27.7	17.2	10.7	7.7
CONDENSER UNIT	23.2	23.2	N/A	23.2	23.2	23.2	23.2
AMBIENT MEASUREMENT	47.4	70.0	N/A	53.1	47.9	44.0	42.3
TOTAL	47.4	70.0	#VALUE!	53.1	47.9	44.0	42.4

dBA NOISE ADDER

LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
=10^(LEQ/10)	=10^(L(MAX)/10)	.0^(L(MIN)/1	=10^(L(2)/10)	=10^(L(8)/10)	=10^(L(25)/10)	10^(L(50)/10)
-	-	-	-	-	-	-
35	2,089	#VALUE!	589	52	12	6
209	209	#VALUE!	209	209	209	209
54,954	10,000,000	#VALUE!	204,174	61,660	25,119	16,982
55,198	10,002,298	#VALUE!	204,972	61,921	25,340	17,197

dBA NOISE ADDER

PROJECT: AGUA MANSA HIGH-CUBE WAREHOUSE NOISE IMPACT STUDY JOB #: 0995-2014-07

LOCATION: WEST PROPERTY LINE DATE: 08/19/14

SCENARIO: 6 TRUCKS OPERATING SIMULTANEOUSLY BY: M.DICKERSON

NOISE LEVEL MEASUREMENTS (dBA)

SOURCE	LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
TRUCK LOADING/UNLOADING	15.5	33.2	N/A	27.7	17.2	10.7	7.7
CONDENSER UNIT	23.2	23.2	N/A	23.2	23.2	23.2	23.2
AMBIENT MEASUREMENT	42.4	65.0	N/A	48.1	42.9	39.0	37.3
TOTAL	42.5	65.0	#VALUE!	48.2	43.0	39.1	37.5

dBA NOISE ADDER

LEQ	L(MAX)	L(MIN)	L(2)	L(8)	L(25)	L(50)
=10^(LEQ/10)	=10^(L(MAX)/10)	.0^(L(MIN)/1	=10^(L(2)/10)	=10^(L(8)/10)	=10^(L(25)/10)	10^(L(50)/10)
-	-	-	-	-	-	-
35	2,089	#VALUE!	589	52	12	6
209	209	#VALUE!	209	209	209	209
17,378	3,162,278	#VALUE!	64,565	19,498	7,943	5,370
17,622	3,164,576	#VALUE!	65,363	19,760	8,164	5,585