

# **Appendix J**

## **Amanda Estates**

### **Noise Technical Report**

Atkins 2014a

# **Amanda Estates Development Project Noise Technical Report**

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## 1.0 Summary

This report assesses potential noise and vibration impacts associated with implementation of the Amanda Estates Development Project, herein referred to as the project. The project consists of an approximately 11-acre property, located within the City of Escondido west of Interstate 15 (I-15), north of Hamilton Lane, and bounded by Amanda Lane to the South. This report examines the impacts of the project on noise-sensitive uses in the area and identifies mitigation measures where feasible to address significant noise impacts.

Operation of the project would not expose noise sensitive receptors to excessive noise due to increased roadway noise levels. The increase in traffic noise associated with the proposed project would not result in a significant direct or cumulative impact. Short-term noise and groundborne vibration increases from construction equipment would have the potential to violate the City's Noise Ordinance and General Plan vibration standards. Mitigation measures Noi-1 and Noi-2 would reduce construction related impacts to a less than significant impact.

## 2.0 Project Description

The proposed Amanda Estates Development is currently located within the unincorporated area immediately south of the City of Escondido in northern San Diego County, California. Figure 1 (Project Site and Noise Measurement Locations) illustrates the project's location and surrounding uses. The project site is within the City's Sphere of Influence (SOI) and the proposed discretionary actions would include annexation to the City as part of the proposed project. The existing gross site area is 11.3 acres. The project site consists of a square-shaped property bounded on the north by Hamilton Lane, on the south by Amanda Lane, and existing residential development on the remaining sides. The project site is located west of Interstate 15 and is accessed from Gamble Lane.

The project would construct 21 new single-family detached residences with private drives on the project site. The proposed site plan is provided in Figure 2 (Proposed Site Plan). The site is designated for Estate II residential land uses in the City of Escondido General Plan (2012), which allows for up to two dwelling units per acre (du/ac). The gross density of the project site would be 1.9 du/ac. The project would include site access and circulation improvements, including an extension of Amanda Lane. All of the single-family homes would have driveway access directly to Amanda Lane. Access to the site would be provided from a single entry on Amanda Lane via Gamble Lane.

Project construction would include demolition of existing on-site structures, grading and site preparation, site utilities construction, roadway improvements, and building construction and coating. Standard construction equipment would be required, including loaders, dozers, scrapers, water trucks, excavators, backhoes, rollers, and dump trucks. No blasting would be required for project construction. Excavation/trenching within Gamble Lane would be accomplished with heavy trenching equipment, and the use of rock breakers, rock saws, or other non-blasting methods. Construction would occur during daytime hours (7:00 a.m. to 6:00 p.m. Monday through Friday, 9:00 a.m. to 5:00 p.m. on Saturday), in accordance with the Escondido Municipal Code. Construction would require site preparation and vegetation removal, grading, trenching for utilities, paving, building construction, and applying architectural coating.

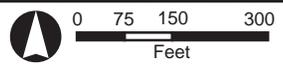


- Project Site Boundary
- Noise Measurement Location
- # Noise Measurement Results



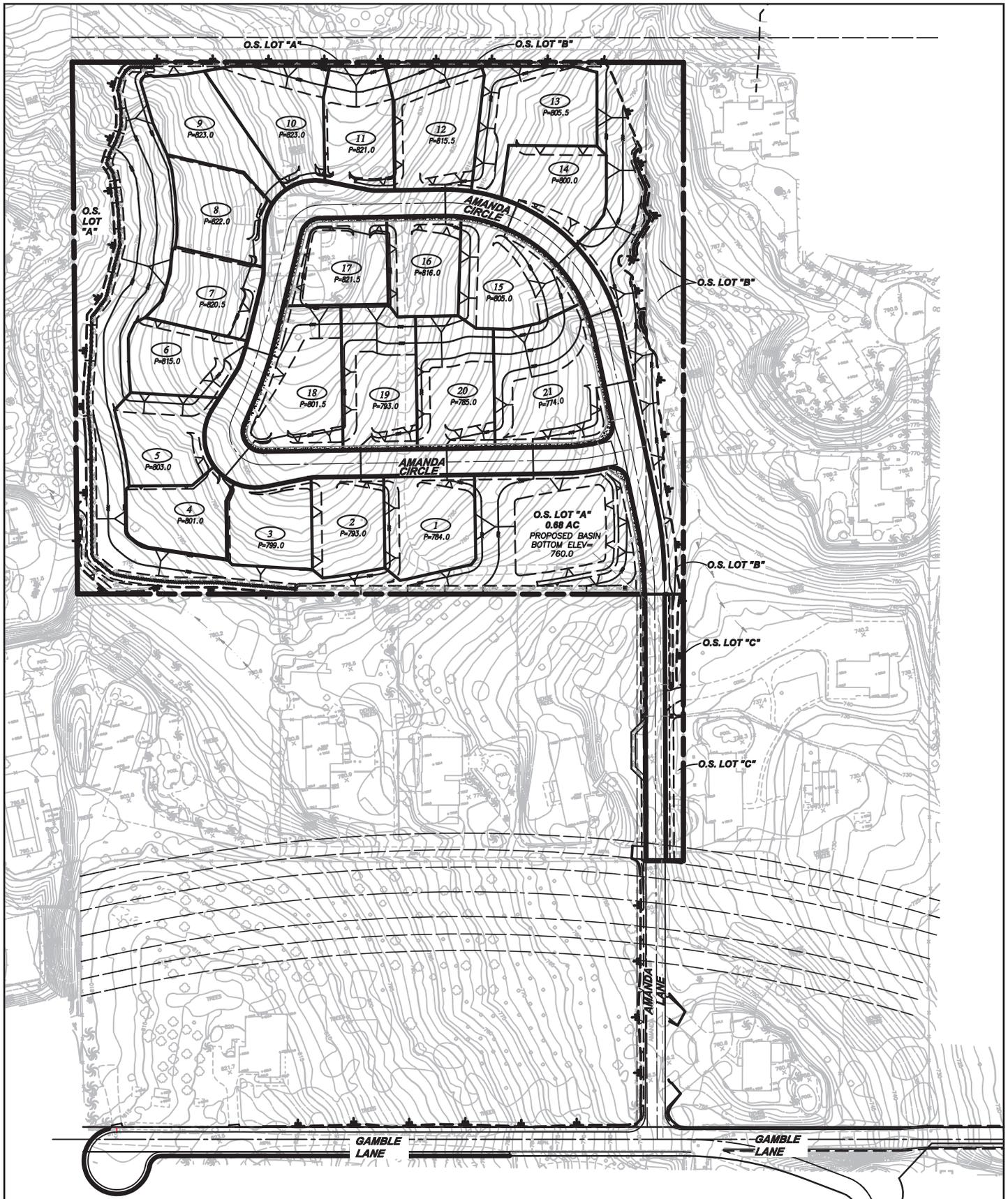
**FIGURE 1**  
**Project Site and Noise Measurement Locations**

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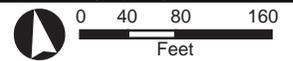


Source: GoogleMap Pro 2014

Amanda Estates Development Project IS/MND



**FIGURE 2**  
**Proposed Site Plan**



Source: Hunsaker & Associates 2014



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### 3.0 Environmental Setting

#### 3.1 Noise Basics

##### 3.1.1 Quantification of Noise

Noise is commonly defined as unwanted sound. Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB). Sound pressures in the environment have a wide range of values and the sound pressure level was developed as a convenience in describing this range as a logarithm of the sound pressure. The sound pressure level is the logarithm of the ratio of the unknown sound pressure to a reference quantity of the same kind. To account for the pitch of sounds and the corresponding sensitivity of human hearing to them, the raw sound pressure level is adjusted with an A-weighting scheme based on frequency that is stated in units of decibels (dBA). Typical A-weighted noise levels are listed in Table 1.

**Table 1 Typical A-Weighted Noise Levels**

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
		Bedroom at night
Quiet rural nighttime	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 1998.

A given level of noise may be more or less tolerable depending on the sound level, duration of exposure, character of the noise sources, the time of day during which the noise is experienced, and the activity affected by the noise. For example, noise that occurs at night tends to be more disturbing than that which occurs during the day because sleep may be disturbed. Additionally, rest at night is a critical requirement in the recovery from exposure to high noise levels during the day. In consideration of these factors, different measures of noise exposure have been developed to quantify the extent of the effects anticipated from these activities. For example, some indices consider the 24-hour noise environment of a location by using a weighted average to estimate its habitability on a long term basis. Other measures consider portions of the day and evaluate the nearby activities affected by it as well as the noise sources. The most commonly used indices for measuring community noise levels are described below:

**Leq**, the Equivalent Energy Level, is the average acoustical or sound energy content of noise, measured during a prescribed period, such as 1 minute, 15 minutes, 1 hour, or 8 hours. It is the decibel sound level that contains an equal amount of energy as a fluctuating sound level over a given period of time.

**CNEL**, Community Noise Equivalent Level, is the average equivalent A-weighted sound level over a 24-hour period. This measurement applies weights to noise levels during evening and nighttime hours to compensate for the increased disturbance response of people at those times. CNEL is the equivalent sound level for a 24-hour period with a +5 dBA weighting applied to all sound occurring between 7:00 p.m. and 10:00 p.m. and a +10 dBA weighting applied to all sound occurring between 10:00 p.m. and 7:00 a.m.

**Ldn**, the day-night average noise level, is similar to the CNEL. It is a 24-hour average Leq with a +10 dBA weighting applied to noise during the hours of 10:00 p.m. to 7:00 a.m. Ldn and CNEL are typically within one dBA of each other and, for most intents and purposes, are interchangeable.

**L<sub>50</sub>**, the 50<sup>th</sup> percentile-exceeded sound level is the sound level exceeded 50 percent of a prescribed period.

**L<sub>min</sub>**, the minimum sound level is the lowest instantaneous sound level measured during a prescribed period.

**L<sub>max</sub>**, the maximum sound level is the highest instantaneous sound level measured during a prescribed period.

The decibel level of a sound decreases (or attenuates) exponentially as the distance from the source of that sound increases. For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source. Sound that originates from a linear, or "line" source such as a heavily traveled traffic corridor, attenuates by approximately 3 dBA per doubling of distance, provided that the surrounding site conditions lack ground effects or obstacles that either scatter or reflect noise. Noise from roadways in environments with major ground effects due to vegetation and loose soils may either absorb or scatter the sound yielding attenuation rates as high as 4.5 dBA for each doubling of distance. Other contributing factors that affect sound reception include meteorological conditions and the presence of manmade obstacles such as buildings and sound barriers. Barriers between a noise source and a receiver can substantially reduce noise levels at the receiver. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dBA of noise reduction. Taller barriers provide increased noise reduction (Caltrans 2008).

### 3.1.2 Noise Effects

Noise has a significant effect on the quality of life. An individual's reaction to a particular noise depends on many factors such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 5 dBA change in community noise levels is clearly noticeable, and a 3 dBA change is the smallest increment that is perceivable by most receivers. Generally, 1 to 2 dBA changes are not detectable. Although the reaction to noise may vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: sleep disturbance, permanent hearing loss, human performance and behavior, social interaction or communication, extra-auditory health effects, and general annoyance.

## 3.2 Environmental Vibration Basics

Vibration is defined as any oscillatory motion induced in a structure or mechanical device as a direct result of some type of input excitation. Vibration consists of waves transmitted through solid material. There are several types of wave motion in solids, unlike in air, including compressional, shear, torsional, and bending. The solid medium can be excited by forces, moments, or pressure fields. This leads to the terminology of "structure-borne/ground-borne" vibration.

Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building there is usually a ground-to-foundation coupling loss, but the vibration can also be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows or items on shelves or the motion of building surfaces. The vibration of building surfaces can also be radiated as sound and heard as a low-frequency rumbling noise, known as groundborne noise.

Ambient and source vibration are expressed in terms of the peak particle velocity (PPV) in inches per second (in/sec) that correlates best with human perception. The particle velocity is the velocity of the soil particles resulting from a disturbance. Consistent with Federal Transit Administration (FTA) notation, vibration levels in this study are referred to using decibel notation, expressed as VdB, which acts to compress the range of numbers required to describe vibration.

## 3.3 Regulatory Framework

### 3.3.1 Federal

#### Federal Aviation Administration Standards

Enforced by the Federal Aviation Administration (FAA), Code of Federal Regulations (CFR) Title 14, Part 150 prescribes the procedures, standards and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. Title 14 also identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. The FAA has

determined that interior sound levels up to 45 dBA Ldn (or CNEL) are acceptable within residential buildings. The FAA also considers residential land uses to be compatible with exterior noise levels at or less than 65 dBA Ldn (or CNEL).

### **Federal Highway Administration Standards**

CFR Title 23, Part 772 sets procedures for the abatement of highway traffic noise and construction noise. Title 23 is implemented by the Department of Transportation Federal Highway Administration (FHWA). The purpose of this regulation is to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. All highway projects which are developed in conformance with this regulation shall be deemed to be in conformance with the Department of Transportation FHWA Noise Standards. Title 23 establishes 67 dBA as the worst-case hourly average noise level standard for impacts of federal highway projects to land uses including residences, recreational uses, hotels, hospitals, and libraries [23 CFR Chapter 1, Part 772, Section 772.19].

### **Federal Transit Administration Standards and Federal Railroad Administration Standards**

Although the FTA standards are intended for federally funded mass transit projects, the impact assessment procedures and criteria included in the FTA Transit Noise and Vibration Impact Assessment Manual (May 2006) are routinely used for projects proposed by local jurisdictions. The FTA and Federal Railroad Administration have published guidelines for assessing the impacts of groundborne vibration associated with rail projects, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for conventional sensitive structures from groundborne vibration is 0.2 inches/second PPV.

## **3.3.2 State**

### **California Noise Control Act of 1973**

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, finds that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

## **3.3.3 Local**

### **City of Escondido General Plan**

The General Plan Community Protection Element establishes noise and land use compatibility standards and outlines goals and policies to achieve these standards. New projects in the City are required to meet the Noise Compatibility Guidelines listed in Table 2 to determine the compatibility of land uses when evaluating proposed development projects (Noise Policy 5.1). A land use located in an area identified as “normally acceptable” indicates that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can conduct outdoor activities with minimal noise interference. Land uses that fall into the “conditionally acceptable” noise environment should prepare

an acoustical study that considers the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source has the potential to interfere with sleep, speech, or other activities characteristic of the land use. For land uses where the exterior noise level falls within the “conditionally unacceptable” range, new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made with noise insulation features included in the design. For land uses where the exterior noise levels fall within the “clearly unacceptable” range, new construction generally should not be undertaken.

General Plan Noise Policy 5.2 establishes a CNEL of 60 dB or less as a goal where outdoor use is a major consideration (back yards and single family housing developments, and recreation areas in multifamily housing developments); however, it recognizes that such levels may not necessarily be achievable in all residential areas. Noise Policy 5.4 requires noise attenuation when interior noise in a new noise sensitive land uses (NSLU) may exceed 45 dBA CNEL.

**Table 2 City of Escondido Noise Compatibility Guidelines**

Land Use Category	Exterior Noise Level (CNEL)					
	55	60	65	70	75	80
Residential – Single family, Duplex, Mobile Home						
Residential – Multi-family, Residential Mixed Use						
Transient Lodging, Motels, Hotels				X		
Schools, Libraries, Churches, Hospitals, Nursing Homes						
Auditoriums, Concert Halls, Amphitheaters				X	X	X
Sports Arena, Outdoor Spectator Sports					X	X
Playgrounds, Parks				X		
Golf Courses, Riding Stables, Water Recreation, Cemeteries						
Office Buildings, Business Commercial, Professional						
Industrial, Manufacturing, Utilities, Agriculture						

-  NORMALLY ACCEPTABLE - Specified land use is satisfactory, based upon the assumption that buildings involved are of normal conventional construction, without any special noise insulation requirements.
-  CONDITIONALLY ACCEPTABLE - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
-  NORMALLY UNACCEPTABLE - New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with noise insulation features included in the design.
-  CLEARLY UNACCEPTABLE - New construction or development clearly should not be undertaken.

Source: City of Escondido 2012

The Community Protection Element also establishes standards for permanent increases in ambient noise level at NSLU. The standards for allowable increases in ambient noise level are listed in Table 3. Noise Policy 5.3 requires noise attenuation for increases in noise level that exceed those shown in Table 3. The City's recommended noise attenuation strategies are provided in Table 4.

**Table 3 Incremental Noise Impact Standards**

Residences and Buildings Where People Normally Sleep <sup>(1)</sup>		Institutional Land Uses with Primarily Daytime and Evening Uses <sup>(2)</sup>	
Existing $L_{dn}$	Allowable Noise Increment	Existing Peak Hour $L_{eq}$	Allowable Noise Increment
45	8	45	12
50	5	50	9
55	3	55	6
60	2	60	5
65	1	65	3
70	1	70	3
75	0	75	1
80	0	80	0

Noise levels are measured at the property line of the noise-sensitive use.

<sup>(1)</sup> This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.

<sup>(2)</sup> This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material.

Source: City of Escondido 2012

**Table 4 Noise Reduction Strategies**

Category	Strategies
Site Planning Responsive to Topography	<ul style="list-style-type: none"> <li>a. Increase distances between noise sources and receivers</li> <li>b. Place non-noise-sensitive uses such as utility areas, parking lots, and maintenance facilities between the source and the receiver</li> <li>c. Use non-noise-sensitive structures such as garages to shield noise-sensitive areas</li> <li>d. Orient buildings to shield outdoor spaces from a noise source</li> </ul>
Architecture Responsive to Noise Sensitive Spaces	<ul style="list-style-type: none"> <li>a. Orient bedrooms away from noise sources</li> <li>b. Limit openings and penetrations on portions of buildings impacted by noise</li> </ul>
Barriers Responsive to Reduce Noise Levels	<ul style="list-style-type: none"> <li>a. Ensure that line of sight is interrupted between noise source and the receptor when constructing noise walls</li> <li>b. Apply noise insulation to walls, roofs, doors windows and other penetrations</li> </ul>

Source: City of Escondido 2012

Noise Policy 5.5 requires construction projects and new development to ensure acceptable vibration levels at nearby vibration-sensitive uses based on FTA criteria. The Community Protection Element establishes the criteria shown in Table 5 as the acceptable vibration levels, consistent with the vibration criteria established by the FTA in the Transit Noise Impact and Vibration Assessment (2006).

**Table 5 General Plan Update Groundborne Vibration Impact Criteria**

Land Use Category	Impact Levels (Vdb)		
	Frequent Events <sup>(1)</sup>	Occasional Events <sup>(2)</sup>	Infrequent Events <sup>(3)</sup>
Category 1: Buildings where vibration would interfere with interior operations	65	65	65
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Vibration levels are measured in or near the vibration-sensitive use.

<sup>(1)</sup> "Frequent Events" is defined as more than 70 vibration events of the same source per day.

<sup>(2)</sup> "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

<sup>(3)</sup> "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.

Source: City of Escondido 2012

### City of Escondido Municipal Code Chapter 17, Article 12, Noise Abatement and Control (Noise Ordinance)

The Noise Ordinance establishes prohibitions for disturbing, excessive or offensive noise, and provisions such as sound level limits for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet for its citizens. Table 6, City of Escondido Exterior Sound Limit Levels, shows the allowable noise levels at any point on or beyond the boundaries of the property on which the sound is produced, and corresponding times of day for each zoning designation. The noise standards apply to each property or portion of property substantially used for a particular type of land use reasonably similar to the land use types shown in Table 6. Where two or more dissimilar land uses occur on a single property, the more restrictive noise limits apply. Environmental noise is measured by the Leq for the hours as specified in Table 6. If the noise is continuous, the Leq for any hour will be represented by any lesser time period within that hour. If the noise is intermittent, the Leq for any hour may be represented by a time period typical of the operating cycle, but the measurement period must be 15 minutes or longer. If the measured ambient level exceeds the permissible noise level, the measured ambient noise level becomes the allowable noise exposure standard. Noise restrictions are listed in Sections 17-230 through 17-241 of the Noise Ordinance, such as specific regulations pertaining to motor vehicles and burglar alarms. Additional sections of the Noise Ordinance applicable to this analysis are listed below.

**Table 6 City of Escondido Exterior Sound Limit Levels**

Zone	Time	Applicable Limit One-hour Average Sound Level (A-weighted Decibels)
Residential zones	7:00 a.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
Multi-residential zones	7:00 a.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial zones	7:00 a.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	55
Light industrial/Industrial park zones	Anytime	70
General Industrial zones	Anytime	75

Source: City of Escondido Municipal Code Section 17-229, Sound Level Limits

**Section 17-234 (Construction Equipment)**

Except for emergency work, the following applies to all construction equipment operating in the City:

- a) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site, except on Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. and on Saturdays between the hours of 9:00 a.m. and 5:00 p.m., and provided that the operation of such construction equipment complies with the requirements of subsection (c) of this section.
- b) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site on Sundays and on days designated by the President, Governor or City Council as public holidays.
- c) No construction equipment or combination of equipment, regardless of age or date of acquisition, shall be operated so as to cause noise in excess of a one-hour average sound level limit of 75 dB at any time, unless a variance has been obtained in advance from the City Manager.

**Section 17-237 (Landscape Equipment)**

It shall be unlawful for any person, including the City of Escondido, to use any motorized landscape equipment, including but not limited to power blowers and vacuums, which causes a disturbing, excessive or offensive noise as defined under Section 17-227(k) of the Noise Ordinance. Disturbing, excessive or offensive noise refers to any sound or noise exceeding the noise standards established in the Noise Ordinance (Table 6, City of Escondido Exterior Sound Limit Levels).

**Section 17-238 (Grading)**

- a) It shall be unlawful for any person, including the City of Escondido, to do any authorized grading at any construction site, except on Mondays through Fridays between the hours of 7:00 a.m. and 6:00 p.m. and, provided a variance has been obtained in advance from the City Manager, on Saturdays from 10:00 a.m. to 5:00 p.m.
- b) For the purpose of this section, “grading” shall include, but not be limited to, compacting, drilling, rock crushing or splitting, bulldozing, clearing, dredging, digging, filling and blasting.
- c) In addition, any equipment used for grading shall not be operated so as to cause noise in excess of a one-hour sound level limit of 75 dB at any time when measured at or within the property lines of any property which is developed and used in whole or in part for residential purposes, unless a variance has been obtained in advance from the City Manager.

**Section 17-240**

Section 17-240 includes additional general noise regulations. This section states that it is unlawful for any person to make, continue or cause to be made or continued, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. Noises declared to be disturbing, excessive and offensive include stereo equipment, animal noise, and loading and unloading of vehicles that disturbs neighboring receptors. This section also establishes the following requirements for pile driving activities: No person shall operate between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, or on Saturdays, Sundays or any legal holidays, any pile driver, pneumatic hammer, derrick, or other similar appliance, the use of which is attended by loud or unusual noise, unless a variance has been obtained in advance from the City Manager. Section 17-242 of the Noise Ordinance

exempts agricultural operations from the standards in Table 6, City of Escondido Exterior Sound Limit Levels, provided that agricultural operations meet equipment standards and limit their hours of operation.

### **City of Escondido Municipal Code Chapter 33, Article 47, Environmental Quality Regulations**

The Environmental Quality Regulations (EQRs) implement CEQA and the CEQA Guidelines (guidelines) by applying the provisions and procedures contained in CEQA to development projects proposed within the City of Escondido. Section 33-924(a)(2) pertains to noise impacts, specifically noise impacts related to the widening of Mobility and Infrastructure Element streets. According to this section, the following incremental noise increases are generally not considered significant:

- a) Short or long-term increases, regardless of the extent, that do not result in noise increases in excess of General Plan standards.
- b) Short or long-term increases that result in a 3 dBA or less incremental increase in noise beyond the General Plan's noise standards.

## **3.4 Existing Noise Environment**

Existing noise sources that affect the project site are described below.

### **3.4.1 Operational Noise Sources**

The 11-acre project site is currently undeveloped, with the exception of one single-family residence in the center of the site. The site was previously used for agricultural purposes. The project site is surrounded by single-family residential development and open space on all sides. Two private tennis courts are located approximately 200 feet northeast of the project site in the Candlelight Hills community. Residences are not sources of substantial operational noise. Occasional nuisance noise may result from these uses, such as loud music or car alarms. Intermittent noise may also result from use of the tennis courts. Access to the courts is available only to residents in the Candlelight Hill community. The courts are open from 7:00 a.m. to 10:00 p.m. daily (Candlelight Hills HOA 2013). Beyond the residential development west of the site is the Del Lago Academy high school located approximately 350 feet from the project site at 1740 Scenic Trails Way. The school facility located closest to the project site is an athletic field, which may result in noise from games such as whistles and cheering.

### **3.4.2 Existing Noise Levels**

An ambient sound level survey was conducted on August 7, 2013, to quantify the noise environment on the project site and in the surrounding area. A Larson Davis 820 ANSI (American National Standards Institute) Type I Integrating Sound Level Meter calibrated with a Larson Davis CAL200 calibrator was used to record ambient sound levels. Daytime weather conditions during the measurements were calm with a warm temperature and clear skies. A total of two short-term and one long-term measurements were taken. The monitoring locations are shown on Figure 1. The short-term measurements were taken during the daytime (12:00 p.m. to 1:30 p.m.) and were 20 minutes in duration. Location 1 was selected to measure noise on the site near existing residential development. Location 2 was selected to be approximately equidistant from surrounding development to characterize the overall noise environment of the site. Table 7 summarizes the measured short-term Leq and noise sources for the monitoring locations.

**Table 7 Ambient Sound Level Measurements (dBA)**

Site	Location	Daytime Noise Sources	Date/Time	Leq	L <sub>50</sub>	L <sub>max</sub>	L <sub>min</sub>
1	Southwest corner of project site	Landscape equipment, distant I-15 traffic	8-7-13 / 12:56 p.m.	50.5	38.1	71.9	34.5
2	Middle of project site, southeast of existing residence	Distant I-15 traffic	8-7-13 / 1:22 p.m.	42.9	40.2	60.3	37.9

Source: Atkins, August 7, 2013. Ambient measurements were 20 minutes in duration.

One long-term measurement was taken over a 24-hour period, from 3:00 p.m. on August 7, 2013 to 3:00 p.m. on August 28, 2013 to characterize ambient traffic noise on the project site. As shown in Figure 1, this measurement site is located on the northern boundary of the project site. The 24-hour noise measurement resulted in a CNEL of 54 dBA.

The results of the ambient noise survey reflect daytime noise levels are generally 51 dBA or below in the main portion of the site. The primary noise sources were landscape equipment and traffic. Ambient 24-hour noise levels on the site on a typical weekday are 54 dBA CNEL. Based on the Escondido noise compatibility guidelines, noise levels on the project site are compatible with residential land use.

### 3.4.3 Transportation Noise Sources

#### Aviation

The nearest airport to the project site is McClellan-Palomar Airport, located approximately 12 miles west of the project site in the City of Carlsbad. The airport serves approximately 225,000 annual operations. The project site is not located within the 60 dBA CNEL noise contour of the McClellan-Palomar Airport (SDCRAA 2004).

#### Roadways

Amanda Lane currently provides access the project site and runs adjacent to a portion of the southern boundary of the project site. The remaining site boundary is adjacent to open space or residential lots. Gamble Lane is the closest roadway located to the south of the project site, Eucalyptus Avenue is located to the east, Greenwood Place is located to the west, and restricted access residential streets in the Candlelight Hills community are located to the north. I-15 runs northwest to southeast approximately 0.5 mile from the project site. Table 8 shows the existing noise levels generated by the roadways that provide access to the project site. The City of Escondido considers roadway noise levels up to 60 dBA CNEL to be normally compatible with noise sensitive land uses such as residences, and noise levels up to 70 dBA to be conditionally compatible with residences with the implementation of additional noise attenuations. Traffic noise on residential roadways is assessed using standard noise modeling equations adapted from the FHWA noise prediction model and the traffic impact analysis prepared for the project (LLG 2013). The estimates are conservative because the model does not take into account buildings or topography that would provide noise attenuation. As shown in Table 8, none of the roadway segments currently generate noise levels at 50 feet from the roadway centerline that exceed 60 dBA CNEL. Fifty feet from the centerline is the standard reference distance for noise levels (FTA 2006). Development is generally not closer than 50 feet from the centerline due to roadway width, shoulders, bicycle and pedestrian amenities, or building setbacks (FTA 2006). The other roadways in the vicinity of the project site are residential streets that serve a limited number of residences. These roadways would experience fewer trips than Gamble Lane and Citracado Parkway and would not generate noise levels in excess of 60 dBA CNEL.

**Table 8 Existing Roadway Noise Levels**

Roadway	Segment	Existing Average Daily Trips	Noise Level at 50 feet from Roadway Centerline (dBA CNEL)
Gamble Lane	Amanda Lane to Bernardo Avenue	450	48
	Bernardo Avenue to I-15 SB Off-Ramp	5,480	59
Citracado Parkway	East of I-15 Ramps	3,940	57

Source: LLG 2013 (traffic data); FHWA 2004a (noise level estimates). See appendix for noise model assumptions and output.

According to Figure 4.12-1 of the Escondido General Plan, Downtown Specific Plan, and Climate Action Plan Final EIR (Existing Noise Contours), the project site is not within the 60 dBA CNEL noise contour of I-15. This is consistent with the 24-hour noise measurement taken on site, which measured a CNEL of 54 dBA. I-15 does not generate a noise level in excess of 60 dBA CNEL on the project site.

### Railroads

The project site is not serviced by a railroad line. The closest rail line is the SPRINTER light rail line. The line runs east-west along Mission Road in Escondido. The rail line currently terminates in Escondido near the intersection of West Valley Parkway and Centre City Parkway, approximately 1.5 miles northeast of the project site. According to noise technical report prepared for the City of Escondido General Plan Update (Atkins 2011), the 60 dBA CNEL noise contour for the SPRINTER is 50 feet from the track alignment.

### 3.4.4 Noise Sensitive Land Uses

NSLU are land uses that may be subject to stress and/or interference from excessive noise. The Escondido General Plan identifies the following as NSLU: residences, residential care facilities, schools, transient lodging, hospitals, health care facilities, libraries, museums, cultural facilities, golf course, passive recreational sites, and places of worship. Industrial and commercial land uses are generally not considered sensitive to noise. The term “noise receptor” is often used to represent a specific location where individuals would be exposed to noise, such as a specific residence. The nearest NSLU to the project site are the residences surrounding the project site on all sides, and Del Lago Academy high school, located approximately 350 feet west of the project site at 1740 Scenic Trails Way.

### 3.4.5 Vibration Sensitive Land Uses

Land uses in which groundborne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations are considered “vibration-sensitive” (FTA 2006). The degree of sensitivity depends on the specific equipment that would be affected by the groundborne vibration. The land uses surrounding the project site are not vibration sensitive. Regardless, excessive levels of groundborne vibration of either a regular or an intermittent nature can result in annoyance to residential uses.

## **4.0 Methodology and Significance Criteria**

### **4.1 Methodology**

#### **4.1.1 Excessive Noise Levels**

Impacts related to potential exposure of NSLU to excessive noise levels as a result of the operation of the project are assessed based on a comparison of existing surrounding land uses to the noise levels potentially generated by the proposed land uses. Estimated noise levels are based on a variety of sources, including noise technical reports for similar facilities. Noise levels at a particular receptor from a stationary noise source are based on an attenuation rate of 6 dBA for every doubling of distance. Roadways would experience a decrease of approximately 3 dBA for every doubling of distance from the roadway.

Impacts related to traffic noise were modeled using standard noise modeling equations adapted from the FHWA noise prediction model. Traffic volumes for surface streets were obtained from the traffic impact analysis prepared for the project by Linscott, Law and Greenspan (LLG 2013). Traffic volumes on I-15 were obtained from Caltrans (2012).

#### **4.1.2 Groundborne Vibration**

Groundborne vibration impacts are assessed based on the vibration impact criteria listed in the City of Escondido General Plan (see Table 5) and typical vibration source levels provided by the FTA (2006).

#### **4.1.3 Permanent Increase in Ambient Noise**

The potential for implementation of the project to permanently increase ambient noise levels as a result of increased traffic noise is assessed using standard noise modeling equations adapted from the FHWA noise prediction model and the traffic impact analysis. Other potential sources of operational noise from the project are addressed under Issue 1, Excessive Noise Levels (Section 5.1.1). The traffic volumes are based on the project-specific traffic study prepared by LLG (LLG 2013).

#### **4.1.4 Temporary Increase in Ambient Noise**

Impacts related to temporary increases in ambient noise levels from construction of the proposed project access road and police facility are assessed using estimates of sound levels from typical construction equipment provided by the FHWA in the Roadway Construction Noise Model (FHWA 2008), assuming an attenuation rate of 6 dBA per doubling of distance from the source.

#### **4.1.5 Aircraft Noise**

Impacts related to aircraft noise are assessed based on the Airport Land Use Compatibility Plan (ALUCP) for McClellan-Palomar Airport (SDCRAA 2004).

### **4.2 Significance Criteria**

Based on Appendix G of the CEQA Guidelines, implementation of the project would result in a significant adverse impact if it would:

- **Threshold 1:** Expose persons to or generate noise levels in excess of standards established in the Escondido General Plan or noise ordinance, or applicable standards of other agencies.
- **Threshold 2:** Expose persons to or generation of excessive groundborne vibration or groundborne noise levels, which is defined as groundborne vibration in excess of FTA criteria, listed in Table 5. In accordance with the City's Noise Ordinance, construction only would occur during the daytime and would not disturb sleep; however, residences may be occupied during daytime construction and construction may result in a nuisance to daily activities. Therefore, an impact would occur if construction would generate vibration levels greater than 80 vibration decibels (VdB) at the nearest residence.
- **Threshold 3:** Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial permanent increase in traffic noise would occur if the project would cause an increase in roadway noise in excess of the City's incremental increase in noise standards, listed in Table 3.
- **Threshold 4:** Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Construction activity would be considered significant if it violates the limits established in the Escondido Noise Ordinance, which establishes a one-hour average sound level standard of 75 dBA. In addition, construction activity is limited to 7:00 a.m. and 6:00 p.m. Monday through Friday and on Saturdays between the hours of 9:00 a.m. and 5:00 p.m. (10:00 a.m. to 5:00 p.m. for grading).
- **Threshold 5:** For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or private airstrip, expose people residing or working in the project area to excessive noise.

## 5.0 Impact Analysis and Mitigation Measures

### 5.1 Impact Analysis

#### 5.1.1 Issue 1: Excessive Noise Levels

##### Impact Analysis

The implementation of the proposed project would have the potential to generate noise levels in excess of established standards by increasing human activity throughout the project site. This section addresses the potential for sensitive receptors to be exposed to excessive noise levels from the proposed residences, followed by a discussion of the potential for the proposed residences to be exposed to excessive noise levels from the surrounding area. The potential for a permanent increase in noise levels that would occur as a result of increased traffic on roadways is addressed in Section 5.1.3, Issue 3: Substantial Permanent Increase in Noise Levels.

##### Impacts to Off-Site Uses

A total of 21 single-family residences would be developed throughout the project site. Noise generated from residential uses is generally described as nuisance noise. Nuisance noise is defined as intermittent or temporary neighborhood noise from sources such as amplified music, and barking dogs that may be disturbing to other residents. Section 17-240 of the Escondido Municipal Code prohibits nuisance noise at any time which causes discomfort or annoyance to reasonable persons of normal sensitivity. Compliance with the noise ordinance would limit exposure to excessive nuisance noise. The Escondido Police Department enforces the nuisance noise provisions of the noise ordinance. Additionally, nuisance noises would be different from each other in kind, duration, and location, so that the overall effects would be separate and in most cases would not affect the receptors at the same time. Instances of nuisance noise would be addressed on an individual case basis by the Escondido Police Department. Additionally, nuisance noise from the proposed project would be similar to existing nuisance noise from the existing residential development surrounding the site. Therefore, nuisance noise from the proposed residences would not result in significant impact.

##### Impacts to On-Site Uses

CEQA is intended to protect the existing environment from impacts that would result from the proposed project. CEQA does not consider impacts of the existing environment on a proposed land use to be significant<sup>1</sup>. However, the City of Escondido has established noise compatibility standards for siting of new development, as shown in Table 2. A significant land use compatibility impact would occur if the proposed project would expose new residences to noise levels in excess of the noise compatibility standards. Therefore, this potential noise-related land use impact is addressed in this analysis.

##### Roadways

Future cumulative traffic noise levels on the residential roadways that surround the project site are shown in Table 9. The project's contribution to the future increase in noise level is addressed in Section 5.1.3. As shown in Table 9, the roadways providing access to the project site and surrounding residences would not generate noise levels in excess of 60 dBA at 50 feet from the roadway centerline. As previously discussed, the other roadways in the project vicinity are residential streets that serve limited

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<sup>1</sup> *South Orange County Wastewater Authority v. City of Dana Point* (2011) 196 Cal.App.4<sup>th</sup> 1604

residents and would not generate noise levels in excess of 60 dBA. Additionally, due to distance, noise levels from I-15 currently do not exceed 60 dBA on the project site. The project site is within the 60 dBA CNEL noise contour for I-15 for Year 2035 identified in the City's General Plan (see General Plan Figure VI-17, Noise Contours [2035]). However, the General Plan contours are conservative and do not take into account topographic features or barriers. The project site is separated from I-15 by varied topography and structures; therefore, future noise levels on the project site would be expected to be lower than predicted by the contour. Therefore, impacts from roadway noise on the project site would be less than significant.

**Table 9 On-Site Future Roadway Noise Levels**

Roadway	Segment	Future + Project Average Daily Trips	Noise Level at 50 feet from Roadway Centerline (dBA CNEL)
Gamble Lane	Amanda Lane to Bernardo Avenue	700	50
	Bernardo Avenue to I-15 SB Off-Ramp	5,740	59
Citracado Parkway	East of I-15 Ramps	3,990	57

Source: LLG 2013 (traffic data); FHWA 2004a (noise level estimates). See appendix for noise model assumptions and output.

### ***Surrounding Land Uses***

In addition to roadways, the project site is surrounded by residential development. Residential uses are not sources of substantial operational noise and would not expose the proposed residences to excessive noise levels. Occasional nuisance noise may result from residences, such as loud music or car alarms. Nuisance noise does not generate excessive noise levels, as described above related to impacts resulting from the proposed land uses, and would not result in noise levels incompatible with the proposed land use. Use of the tennis courts located to the northwest of the project site would potentially generate nuisance noise during games. However, the two courts are accessible only to Candlelight Hills residents and are in use intermittently. Additionally, use of the courts is limited to 7:00 a.m. to 10:00 p.m. Due to limits on use and distance (200 feet from the project site), the private tennis courts would not result in excessive noise levels on the project site. Additionally, similar to residences, nuisance noise from the courts is prohibited by the City's Noise Ordinance. It is likely that nuisance noise from the courts would disturb adjacent Candlelight Hills residents and result in code enforcement prior to generation of noise levels that would disturb residences of the project site.

The outdoor sports field at Del Lago Academy does not include stadium seating, an announcement system, or other features that would result in substantial noise levels during events. Noise levels would be expected to be similar to community park or athletic center multi-purpose fields, which may accommodate several games at once and include noise from spectators, players, and referees. Athletic fields are estimated to generate noise levels up to 60 dBA at 100 feet (ICF 2013). Due to distance, noise levels from the Del Lago Academy athletic field would be reduced to 49 dBA or below at the project site. Therefore, impacts from surrounding land uses would be less than significant.

### **Mitigation Measures**

Implementation of the proposed project would not result in exposure of sensitive receptors to excessive noise levels. No mitigation is necessary.

## Significance After Mitigation

Impacts related to excessive noise levels would be less than significant without mitigation.

## Cumulative Impacts

Noise is a localized phenomenon and is progressively reduced as the distance from the source increases; specifically, noise levels from stationary noise sources decrease by approximately 6 dB for every doubling of distance. Therefore, the geographic limit that would be considered for the noise cumulative analysis would include only those projects in close proximity to the project site.

There are no approved, planned, or foreseeable projects in the area of the project site that would introduce new stationary source noise to the area. The cumulative projects identified in the traffic impact analysis (LLG 2013) are residential projects, which typically do not include stationary noise sources and do not generate excessive noise levels. A car wash, oil change, and restaurant facility are also included in the cumulative projects, but are located on the other side of I-15 from the project site and would not contribute to the noise environment in the proximity of the project site. The proposed project would not generate excessive noise levels. Therefore, the project, in combination with other cumulative projects, would not generate excessive noise levels. A significant cumulative impact would not occur.

### 5.1.2 Issue 2: Groundborne Vibration

#### Impact Analysis

Based on Appendix G of the CEQA Guidelines, the City of Escondido Noise Ordinance and other existing City policies and regulations, the project would result in a significant impact if it would result in the exposure of vibration-sensitive uses to groundborne vibration, or if new vibration-sensitive land uses would be located in the vicinity of groundborne vibration-inducing land uses such as railroads or mining operations.

The main concerns associated with groundborne vibration from this type of project are annoyance and damage; however, vibration-sensitive instruments and operations can be disrupted at much lower levels than would typically affect other uses. In extreme cases, the vibration can cause damage to buildings, particularly those that are old or otherwise fragile. There are no existing sources of groundborne vibration surrounding the project site and the proposed residences would not be exposed to excessive groundborne vibration. Therefore, this analysis focuses on the potential for the project to generate vibration at surrounding land uses. Groundborne vibration occurring as part of the project would result from construction equipment. Following construction, the proposed residences would not generate groundborne vibration.

Escondido utilizes the FTA groundborne vibration impact criteria, provided in Table 5 to determine whether vibration impacts would be significant. Consistent with the methodology of the Noise Technical Report prepared for the Escondido General Plan Update EIR (Atkins 2011), construction vibration is subject to the infrequent event criteria. The project site is surrounded by residences where people normally sleep (Land Use Category 2). In accordance with the City's Noise Ordinance, construction would only occur during the daytime and would not disturb sleep; however, residences may be occupied during daytime construction and construction may result in a nuisance to daily activities. Therefore, an impact would occur if construction would generate vibration levels greater than 80 VdB at the nearest residential receptor.

Typical vibration levels for the construction equipment required for the proposed project are provided in Table 10. As shown in Table 10, vibration levels from all construction equipment would be reduced to 80 VdB or below beyond 75 feet from the project site. The nearest residences are located approximately 40 feet from the onsite and offsite construction areas. At this distance, heavy duty construction equipment including large bulldozers and vibratory rollers would have the potential to exceed vibration significance criteria. Impacts related to large bulldozer use would be reduced to less than significant beyond 45 feet from the construction area. Several other residences are located within 75 feet of the construction area. Therefore, night time construction activities that would occur within 45 feet of existing homes, or use of a vibratory roller within 75 feet of existing homes, would exceed the vibration impact criteria that could affect nearby residents' sleep patterns, which would result in a significant impact.

**Table 10 Vibration Source Levels for Construction Equipment**

Construction Equipment	Approximate VdB at 25 feet	Approximate VdB at 40 feet <sup>(1)</sup>	Approximate VdB at 75 feet <sup>(1)</sup>
Large Bulldozer	87	81	73
Loaded Trucks	86	80	72
Jackhammer	79	73	65
Small Bulldozer	58	52	44
Vibratory Roller	94	88	80

<sup>(1)</sup> Based on the formula  $VdB = VdB(25 \text{ feet}) - 30\log(d/25)$  provided by the FTA (2006)

Source: FTA 2006.

## Mitigation Measures

Implementation of mitigation measure Noi-1 would minimize temporary groundborne vibration impacts from construction activities at adjacent residential uses that are in close proximity to the project site. The following mitigation measure is consistent with the groundborne vibration impact analysis contained in the City of Escondido's General Plan Update, the Downtown Specific Plan Update, and Climate Action Plan Final Environmental Impact Report, which indicates that construction-related groundborne vibration impacts to adjacent residents are less than significant through compliance with the City of Escondido Noise Ordinance.

**Noi-1 Construction Activities Limitation.** Construction activities associated with the project that occur within 75 feet of an existing residence shall only take place during the day as required by the Noise Ordinance. Sections 17-234, 17-238, and 17-240 of the City of Escondido Noise Ordinance limit operation of construction equipment to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. Grading activities on Saturday may not begin until 10:00 a.m. and must end by 5:00 p.m. Construction is prohibited on Sundays. Therefore, construction activities would not occur during nighttime hours.

## Significance After Mitigation

Implementation of mitigation measure Noi-1 would reduce groundborne vibration impacts to a less significant level by limiting construction activities to daytime hours in compliance with the City's Noise Ordinance.

## Cumulative Impacts

Similar to noise effects, vibration is a localized phenomenon and is progressively reduced as the distance from the source increases. Therefore, the area of projects that would be considered for the vibration cumulative analysis would be only those projects close to the project site. There are no approved, planned or foreseeable projects adjacent to the project site that would generate similar vibration. The closest cumulative projects to the site are the proposed residential developments at the intersection of Felicita Road and Monticello Drive, approximately 4,500 feet east of the project site. Therefore, vibration generated by construction on the project site and other sites would not combine to generate cumulative vibration impacts. Once constructed, the proposed land use would not generate a significant source of vibration during normal operation. Therefore, a significant cumulative vibration impact would not occur.

### 5.1.3 Issue 3: Substantial Permanent Increase in Ambient Noise Levels

#### Impact Analysis

This section addresses the potential for implementation of the proposed project to permanently increase ambient noise levels as a result of increased traffic noise. The potential for other noise sources associated with project implementation to result in noise levels that would expose NSLU to excessive noise levels is addressed in Section 5.1.1, Issue 1: Excessive Noise Levels.

The potential for the project to permanently increase traffic noise is addressed under the following scenarios: existing plus project, and future (includes cumulative projects). Traffic volumes for each roadway are included in the appendix. Noise levels for area roadways were calculated using standard noise modeling equations adapted from the FHWA noise prediction model. The modeling calculations take into account the posted vehicle speed, average daily traffic volume, and the estimated vehicle mix. The estimates are conservative because the model does not take into account buildings or topography that would provide noise attenuation. Noise levels at distances further from the source than the specific receptor would be lower due to attenuation provided by increased distance from the noise source. Generally, noise from heavily traveled roadways would experience a decrease of approximately 3 dBA for every doubling of distance from the roadway.

#### Existing + Project Scenario

Existing and Existing + Project traffic noise levels are provided in Table 11. The Existing + Project scenario is conservative for estimating the project's contribution to area traffic noise because additional growth in the city would occur prior to completion of project construction, which would lessen than project's incremental contribution to ambient traffic noise. As shown in Table 11, implementation of the proposed project would not exceed the applicable incremental noise impact standard on any roadway. Therefore, the project would not result in a potentially significant traffic noise impact under the Existing + Project scenario.

**Table 11 Existing + Project Roadway Noise Levels**

Roadway	Segment	Existing Noise Level (dBA CNEL) <sup>(1)</sup>	Existing + Project Noise Level (dBA CNEL) <sup>(1)</sup>	Increase in Noise Level	Allowable Increase <sup>(2)</sup>	Significant Impact?
Gamble Lane	Amanda Lane to Bernardo Avenue	48	50	+2	+5	No
	Bernardo Avenue to I-15 SB Off-Ramp	59	59	0	+2	No
Citracado Parkway	East of I-15 Ramps	57	57	0	+2	No

<sup>(1)</sup> All noise levels at 50 feet from the roadway centerline.

<sup>(2)</sup> See Table 3. Allowable noise increment for residences.

Source: LLG 2013 (traffic data); FHWA 2004a (noise level estimates). See appendix for noise model assumptions and output.

### Future Scenario

The Future scenario includes buildout of the project as well as the six cumulative projects anticipated in the project area. Future increases in traffic, with and without the project, are provided in Table 12. As shown in Table 12, traffic noise levels are not anticipated to increase compared to existing noise levels. This is due to the rural residential character of the area surrounding the site. The roadways serve limited traffic associated with these residences and substantial growth is not anticipated. Implementation of the proposed project would not exceed the applicable incremental noise impact standard on any roadway. Therefore, the project would not result in a potentially significant traffic noise impact under the Future scenario.

**Table 12 Future Traffic Noise Levels**

Roadway	Segment	Future Noise Level (dBA CNEL) <sup>(1)</sup>	Future Noise Level (dBA CNEL) <sup>(1)</sup>	Increase in Noise Level	Allowable Increase <sup>(2)</sup>	Significant Impact?
Gamble Lane	Amanda Lane to Bernardo Avenue	48	50	+2	+5	No
	Bernardo Avenue to I-15 SB Off-Ramp	59	59	0	+2	No
Citracado Parkway	East of I-15 Ramps	57	57	0	+2	No

<sup>(1)</sup> All noise levels at 50 feet from the roadway centerline.

<sup>(2)</sup> See Table 3. Allowable noise increment for residences.

Source: LLG 2013 (traffic data); FHWA 2004a (noise level estimates). See appendix for noise model assumptions and output.

### Mitigation Measures

Implementation of the project would not result in a significant increase in traffic noise levels in the project area. No mitigation is required.

### Significance After Mitigation

Impacts related to permanent increases in ambient noise levels would be less than significant without mitigation.

## Cumulative Impacts

Buildout of the proposed project, along with future cumulative growth in Escondido, would result in increases in traffic that would cumulatively increase traffic noise. The cumulative analysis compares future noise levels to existing noise levels to determine if a significant cumulative increase in noise level would occur. A significant cumulative impact would occur if cumulative projects would cause a roadway to exceed the incremental noise impact standard applicable to the existing noise level. The potential noise impacts that would result from cumulative projects and cumulative growth are included in the Future scenario. Table 13 compares Future traffic noise levels to existing conditions. As shown in Table 13, the proposed project would not contribute an increase in noise level on any roadway segment that would exceed the incremental noise impact standard. Therefore, a significant cumulative impact would not occur.

**Table 13 Cumulative Traffic Noise Impacts**

Roadway	Segment	Existing	Future + Project	Increase in Noise Level	Allowable Increase	Significant Cumulative Impact?	Increase Attributable to Project <sup>(1)</sup>	Cumulatively Considerable Contribution?
Gamble Lane	Amanda Lane to Bernardo Avenue	48	50	+2	+5	No	+2	No
	Bernardo Avenue to I-15 SB Off-Ramp	59	59	0	+2	No	0	No
Citracado Parkway	East of I-15 Ramps	57	57	0	+2	No	0	No

<sup>(1)</sup> Based on the results in Table 12. The project's contribution to the cumulative noise impact is based on the increase in traffic noise attributable to the proposed project under the Future scenario. If the project's contribution is less than the allowable increase, the project's contribution is not cumulatively considerable.

Note: Noise levels are calculated at 50 feet from roadway centerline. Noise levels are based upon traffic data provided by LLG (2013). Traffic levels for each roadway are included in the appendix. Decibel levels are rounded to the nearest whole number. See appendix for data sheets.

### 5.1.4 Issue 4: Construction Noise

#### Impact Analysis

Construction of the proposed project would generate noise that could expose nearby NSLU to elevated noise levels that may disrupt communication and routine activities. The magnitude of the impact would depend on the type of construction activity, equipment, duration of the construction phase, distance between the noise source and receiver, and intervening structures. Sound levels from typical construction equipment range from 74 dBA to 85 dBA Leq at 50 feet from the source, as shown in Table 14 (FHWA 2008). Noise from construction equipment generally exhibits point source acoustical characteristics. Strictly speaking, a point source sound decays at a rate of 6 dBA per doubling of distance from the source. The rule applies to the propagation of sound waves with no ground interaction.

**Table 14 Typical Noise Levels for Construction Equipment**

Construction Equipment	Typical Noise Level at 50 feet (dBA)
Air Compressor	77.7
Backhoe	77.6
Concrete Mixer Truck	78.8
Crane	80.6
Dozer	81.7
Dump Truck	76.5
Excavator	80.7
Generator	80.6
Grader	85.0
Loader	79.1
Paver	77.2
Roller	80.0
Scraper	83.6
Tractor	84.0
Welder	74.0

Source: FHWA 2008

**On-site Construction**

Standard equipment, including front-end loaders, backhoes, rollers, and dozers, would be used for construction of the proposed project. Noise levels from construction activities on the project site were determined based on the construction equipment list provided by the applicant and typical equipment noise levels determined by the Roadway Construction Noise Model (RCNM) (FHWA 2008). The six noisiest pieces of construction equipment (loader, dozer, scraper, roller, backhoe, and excavator) that could be required for the project were assumed to operate simultaneously in the same location. Based on this worst-case assumption, construction of the project would have the potential to generate hourly average noise levels up to 84 dBA at 50 feet from the construction site. This estimate is conservative because construction equipment would be spread out over several acres and would not be operating all at once.

The City of Escondido Noise Ordinance limits construction activities to Mondays through Fridays between the hours of 7:00 a.m. and 6:00 p.m. The proposed project would comply with these restrictions. No evening or nighttime construction would be necessary. The noise ordinance also prohibits noise levels from construction from exceeding a one hour average sound level limit of 75 dB at any time when measured at or within the property lines of any property which is developed and used in whole or in part for residential purposes. The worst-case construction equipment scenario would have the potential to exceed the 75 dBA  $L_{eq}$  threshold up to 140 feet from the project site. Residences are located within 140 feet of the project site on all sides. Therefore, a potentially significant impact would occur during on-site construction.

**Off-site Construction**

The proposed project would include roadway improvements to Gamble Lane as well as the portion of existing Amanda Lane that is off site. Due to the limited right-of-way of these roadways, it is assumed that a maximum of two pieces of construction equipment would operate simultaneously during construction of the off-site roadway improvements. No blasting would be required. Excavation/trenching within Gamble Lane would be accomplished with heavy trenching equipment, and the use of rock breakers, rock saws, or other non-blasting methods. Assuming simultaneous operation of the two

noisiest pieces of construction equipment required for the off-site improvements (grader and saw), the RCNM model estimates that off-site construction would have the potential to generate hourly average noise levels up to 85 dBA at 50 feet from the construction site. The worst-case construction equipment scenario would have the potential to exceed the hourly 75 dBA  $L_{eq}$  threshold up to 150 feet from the project site. Residential properties are located adjacent to Gamble Lane and Amanda Lane. Therefore, a potentially significant impact would occur during off-site construction.

## Mitigation Measures

Implementation of the best management practices listed in mitigation measure Noi-2 and the additional construction best management practices listed in mitigation measure Noi-1 would minimize noise from construction activities and ensure that noise levels would not exceed an hourly average noise level of 75 dBA at an adjacent residence.

**Noi-2** Prior to grading activities, the construction contractor shall implement and monitor the noise reduction measures described below to ensure that construction noise levels would not exceed an hourly average noise level of 75 dBA at any residential property line. Noise reduction measures are required for all off-site construction and on-site construction within 150 feet of an off-site residential lot. Any one or a combination of measures can be used as necessary. Typical measures that may be implemented include the following, as necessary, to achieve compliance with the City's noise ordinance:

1. Use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) for construction equipment and trucks;
2. Use "quiet" gasoline-powered compressors or other electric-powered compressors, and use electric rather than gasoline or diesel powered forklifts for small lifting;
3. Locate stationary noise sources, such as temporary generators, as far from nearby receptors as possible;
4. Muffle and enclose stationary noise sources within temporary sheds or incorporate insulation barriers;
5. Limit simultaneous operation of construction equipment or limit construction time within an hour to reduce hourly average noise level; and/or
6. For on-site construction, install temporary noise barriers of a sufficient height and thickness around the perimeter of the project site to minimize construction noise to 75 dBA as measured at the applicable property lines of the adjacent uses. It is anticipated that a plywood barrier, 8 feet in height and 1 inch thick would be sufficient (FWHA 2006, City of New York 2013).

To ensure compliance with City noise ordinance, noise monitoring shall be conducted on the first day of typical on-site and off-site construction. A one-hour noise measurement shall be conducted in accordance with Section 17-228 of the City's noise ordinance at 50 feet from the most intensive construction activity. If it is determined that construction would have the potential to exceed the hourly construction noise level limit at any residential property, additional noise control measures shall be implemented as necessary and an additional noise measurement will be conducted to confirm compliance.

## Significance After Mitigation

Implementation of mitigation measures Noi-1 and Noi-2 would reduce construction noise impacts to a less than significant level.

## Cumulative Impacts

Construction noise impacts are localized in nature because they are limited to the construction site where construction equipment is operating. As discussed above, sound levels from project construction would be up to 75 dBA approximately 140 feet from the construction site (FHWA 2008). There are no approved, planned, or foreseeable projects in the vicinity that would generate similar construction noise levels. The closest cumulative project to the site would be located at the intersection of Felicita Road and Monticello Drive, approximately 4,500 feet east of the project site. Additionally, cumulative projects and the proposed project would be subject to the Escondido construction noise ordinance, which limits construction noise to 75 dBA at the nearest residence. Mitigation measure Noi-2 would ensure proposed project compliance with the noise level limit. Compliance with the Escondido noise ordinance would reduce impacts to a less than significant level. Therefore, a significant cumulative impact would not occur.

### 5.1.5 Issue 5: Aircraft Noise

#### Impact Analysis

The nearest airport to the project site is McClellan-Palomar Airport, located approximately 12 miles west of the project site. The project site is not located within the 60 dBA CNEL noise contour of the McClellan-Palomar Airport (SDCRAA 2004). Therefore, the project would not be exposed to excessive noise from the airfield. It is not foreseeable that additional aviation uses would be introduced in the immediate vicinity of the project site because it is currently developed with residential land uses. In addition, the implementation of the project would not result in a significant impact on future air traffic operations. Therefore, NSLU would not be exposed to excessive noise levels from aviation noise as a result of the project.

#### Mitigation Measures

Implementation of the project would not result in significant impacts from aircraft noise. No mitigation is required.

#### Significance After Mitigation

Impacts related to aircraft noise would be less than significant without mitigation.

#### Cumulative Impacts

No additional aviation uses are planned to be introduced in the immediate vicinity of the project site. In addition, the project does not propose any new air traffic. No NSLU would be exposed to excessive noise levels from aviation as a result of the project. Therefore, a cumulative impact related to aviation would not occur.

## 6.0 Conclusion

Operation of the project would not expose sensitive noise receptors to excessive noise levels. The increase in traffic noise associated with the proposed project would not result in a significant direct or cumulative impact. Short-term noise and groundborne vibration increases from construction equipment would have the potential to violate the City's Noise Ordinance and General Plan vibration standards. Mitigation measures Noi-1 and Noi-2 would reduce impacts to a less than significant impact.

## 7.0 References

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# **Appendix**

## **Noise Data**

Interval data

Translated: 08-Aug-2013 17:13:40  
 Translated File: C:\Users\22242\Desktop\General AQ and Noise\820 SLM Utility\AmandaLane.SLMDL  
 SLM: 820A1664

Firmware Rev.: 1.634 13Mar2002  
 Software: SImUtility v2.01  
 L-D Model 820

You may enter three lines of  
 personalized instrument name.  
 Untitled

Rec #	Date	Time	Duration	Leq	Lmax	Lmin	SEL	Peak	UwpPeak	L(5.00)	L(10.00)	L(33.00)	L(50.00)	L(67.00)	L(90.00)	Overloads
1	7-Aug-13	14:13:36	46:24.0	45.81	66.42	37.14	80.27	97.05	96.61	50.75	44.71	40.7	39.75	39.07	38.13	0
2	7-Aug-13	15:00:00	00:00.0	50.97	77.28	34.78	86.55	93.5	101.69	50.6	47.03	40.51	38.79	37.87	36.77	0
3	7-Aug-13	16:00:00	00:00.0	45.25	62.01	34.5	80.82	81	92.61	50.68	48.55	43.15	39.67	37.29	35.71	0
4	7-Aug-13	17:00:00	00:00.0	44.89	64.98	33.76	80.46	81.92	97.06	46.86	42.33	37.56	36.5	35.78	34.94	0
5	7-Aug-13	18:00:00	00:00.0	52.76	75.28	32.38	88.34	93.62	98.96	50.84	43.89	36.86	35.57	34.77	33.72	0
6	7-Aug-13	19:00:00	00:00.0	56.28	78	32.04	91.85	92.96	102.86	51.81	44.71	36.28	34.92	34.02	33.15	0
7	7-Aug-13	20:00:00	00:00.0	53.39	76.67	33.22	88.96	92.77	99.32	51.18	46.23	42.42	41.07	37.86	34.89	0
8	7-Aug-13	21:00:00	00:00.0	43.21	57.27	35.61	78.78	73.69	99.32	47.57	43.75	41.78	40.92	39.81	37.77	0
9	7-Aug-13	22:00:00	00:00.0	41.95	52.14	36.01	77.53	73.49	80.57	44.32	43.64	42.13	41.04	40.21	38.77	0
10	7-Aug-13	23:00:00	00:00.0	37.25	44.42	32.42	72.83	60.35	83.07	39.78	39.31	37.53	36.75	36.21	35.1	0
11	8-Aug-13	0:00:00	00:00.0	37.64	45.4	31.77	73.21	59.56	80.57	39.74	39.05	38	37.52	37.04	35.44	0
12	8-Aug-13	1:00:00	00:00.0	36.84	49.75	28.24	72.42	60.67	0	40.88	39.5	36.67	35.57	34.16	31.85	0
13	8-Aug-13	2:00:00	00:00.0	54.14	78.47	28.47	89.71	91.78	91.86	42.73	40.96	37.76	35.82	33.78	30.68	0
14	8-Aug-13	3:00:00	00:00.0	28.84	37.1	23.6	64.42	54.53	0	32.67	31.26	28.78	27.92	27.16	25.31	0
15	8-Aug-13	4:00:00	00:00.0	30.77	52.24	23.99	66.35	65.67	0	30.63	29.65	28.03	27.12	26.46	25.45	0
16	8-Aug-13	5:00:00	00:00.0	32.3	47.64	26.26	67.88	58.07	0	35.42	33.78	31.97	31.05	29.9	28.36	0
17	8-Aug-13	6:00:00	00:00.0	37.05	52.02	29.27	72.63	72.57	89.09	42.22	39.56	36.29	35.2	33.58	30.82	0
18	8-Aug-13	7:00:00	00:00.0	40.35	59.67	32.54	75.92	74.96	0	44.1	41.73	38.14	37.17	36.39	35.18	0
19	8-Aug-13	8:00:00	00:00.0	44.23	75.46	33.42	79.81	110.48	119.77	42.91	40.8	38.53	37.63	36.71	35.17	0
20	8-Aug-13	9:00:00	00:00.0	41.97	61.85	35.96	77.55	91.75	107.54	45.54	43.8	41.17	40.44	39.73	38.06	0
21	8-Aug-13	10:00:00	00:00.0	41.36	54.44	35.78	76.93	70.97	87.91	44.95	43.55	40.83	39.85	39.01	37.68	0
22	8-Aug-13	11:00:00	00:00.0	42.16	59.71	35.78	77.74	72.96	87.91	46.14	43.55	39.46	38.53	37.87	37.1	0
23	8-Aug-13	12:00:00	00:00.0	46.1	68.22	35.85	81.67	85.21	97.06	44.36	41.83	39	38.38	37.8	37.1	0
24	8-Aug-13	13:00:00	00:00.0	45.86	66.65	35.68	81.44	78	96.61	51.46	43.68	38.37	37.67	37.21	36.39	0
25	8-Aug-13	14:00:00	00:00.0	40.75	55.11	35.86	76.32	71.58	96.16	46.31	41.81	38.53	37.85	37.44	36.7	0
26	8-Aug-13	15:00:00	53:13.5	45.32	68.5	36.1	80.37	94.71	115.99	48.13	44.64	39.97	39.11	38.53	37.58	0

SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99

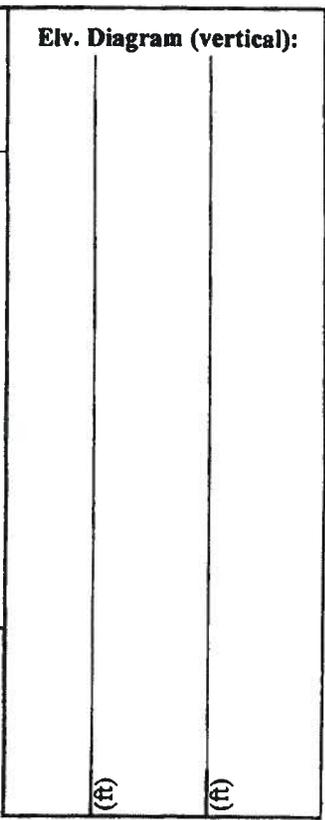
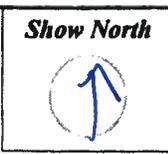
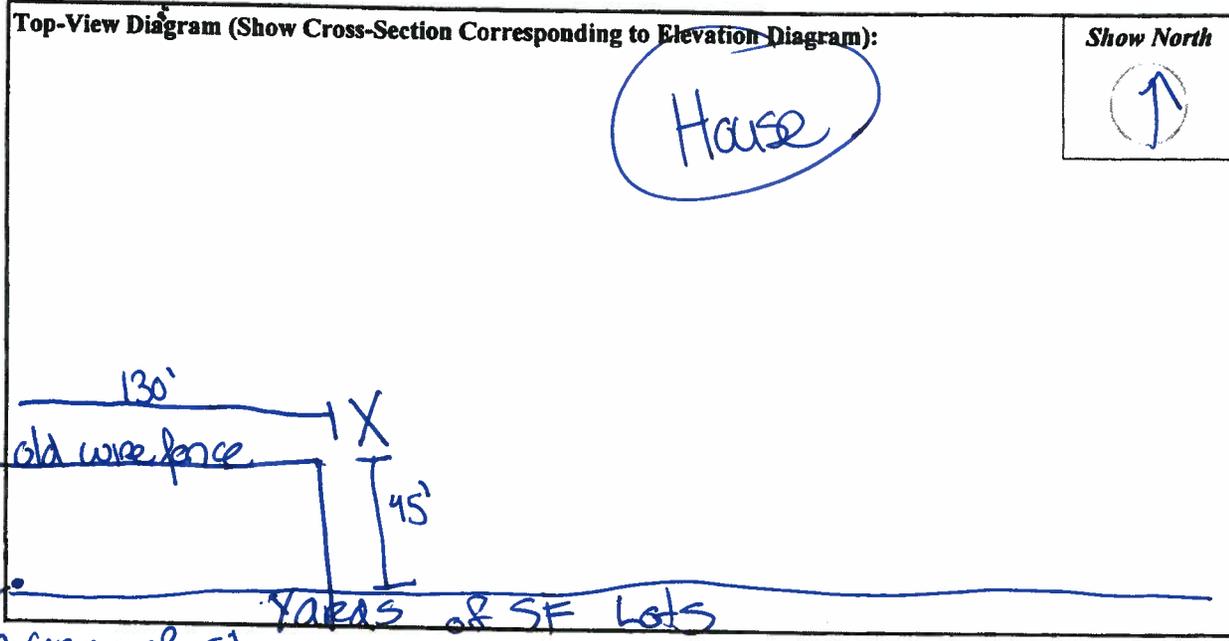
Location # 1

Project: <u>Amanda Estates</u>	Date: <u>8/7/13</u>	Eqpt: <u>LD8-20</u>	Photos:
Temp: Hot <u>Warm</u> Mild Cool Cold	Wind (mph): <u>&lt;2.5</u> 2.5-5 5-10 ≥10	(dir): N E S W Δ	Cloud Cover: <u>Clear</u> Pt. Cld. Clouds Fog
Location Desc.: <u>SW corner</u>	Noise Source(s): <u>lawnmower, distant 1-5</u>		
Rep. Info:	Ground Effects: <u>dirt</u>		
Barrier Effects: <u>none</u>			

Meas. Int.:				
Roadway:				
Segment:				
Spd: Post: Trav.:				
Volumes				Dir.
Auto	MT	HT		
			NB/EB	
			SB/WB	

Meas. Int.:				
Roadway:				
Segment:				
Spd: Post: Trav.:				
Volumes				Dir.
Auto	MT	HT		
			NB/EB	
			SB/WB	

Cal. Δ @Int1	Cal. √	Offset
Yes No Int #:		<u>+1</u>



General Comments:

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Description	Int. #	Start (h:m(:s))	Duration ((h:)m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info			
														Description	Lmax	Begin	End
<u>Location 1</u>	<u>1</u>	<u>12:56</u>	<u>20:00</u>	<u>81.3</u>	<u>50.5</u>	<u>34.5</u>	<u>71.9</u>		<u>48.1</u>	<u>38.1</u>	<u>35.7</u>						

SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99

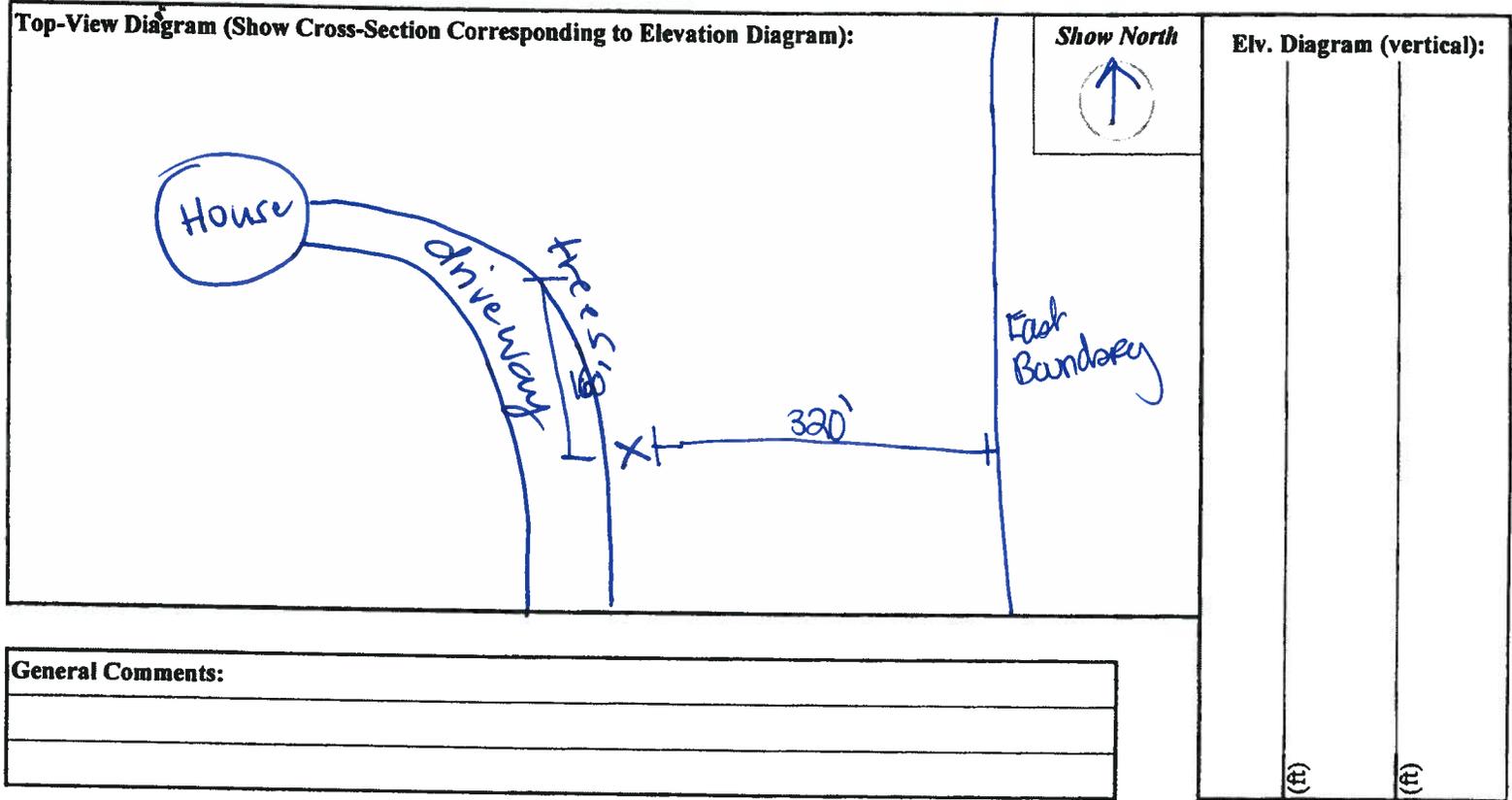
Location # 2

Project: <u>Amanda Estatus</u>	Date: <u>8/7/13</u>	Eqpt: <u>LD820</u>	Photos:
Temp: Hot <u>Warm</u> Mild Cool Cold	Wind (mph): $\leq 2.5$ <u>2.5-5</u> 5-10 $\geq 10$ (dir): N E S W $\Delta$	Cloud Cover: <u>Clear</u>	Pt. Cld. Clouds Fog
Location Desc.: <u>Middle of site</u>	Noise Source(s): <u>distant 1-85</u>		
Rep. Info:	Ground Effects: <u>dirt</u>		
Barrier Effects: <u>none</u>			

Meas. Int.:			
Roadway:			
Segment:			
Spd: Post: Trav.:			
Volumes			
Auto	MT	HT	Dir.
			NB/EB
			SB/WB

Meas. Int.:			
Roadway:			
Segment:			
Spd: Post: Trav.:			
Volumes			
Auto	MT	HT	Dir.
			NB/EB
			SB/WB

Cal. $\Delta$ @Int1	Cal. $\checkmark$	Offset
Yes	No	Int #:



Description	Int. #	Start (h:m(:s))	Duration ((h):m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info			
														Description	Lmax	Begin	End
<u>Site 2</u>	<u>2</u>	<u>13:22</u>	<u>20:00</u>	<u>73.7</u>	<u>42.9</u>	<u>37.9</u>	<u>60.3</u>		<u>43.0</u>	<u>40.2</u>	<u>38.9</u>						

**SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99**

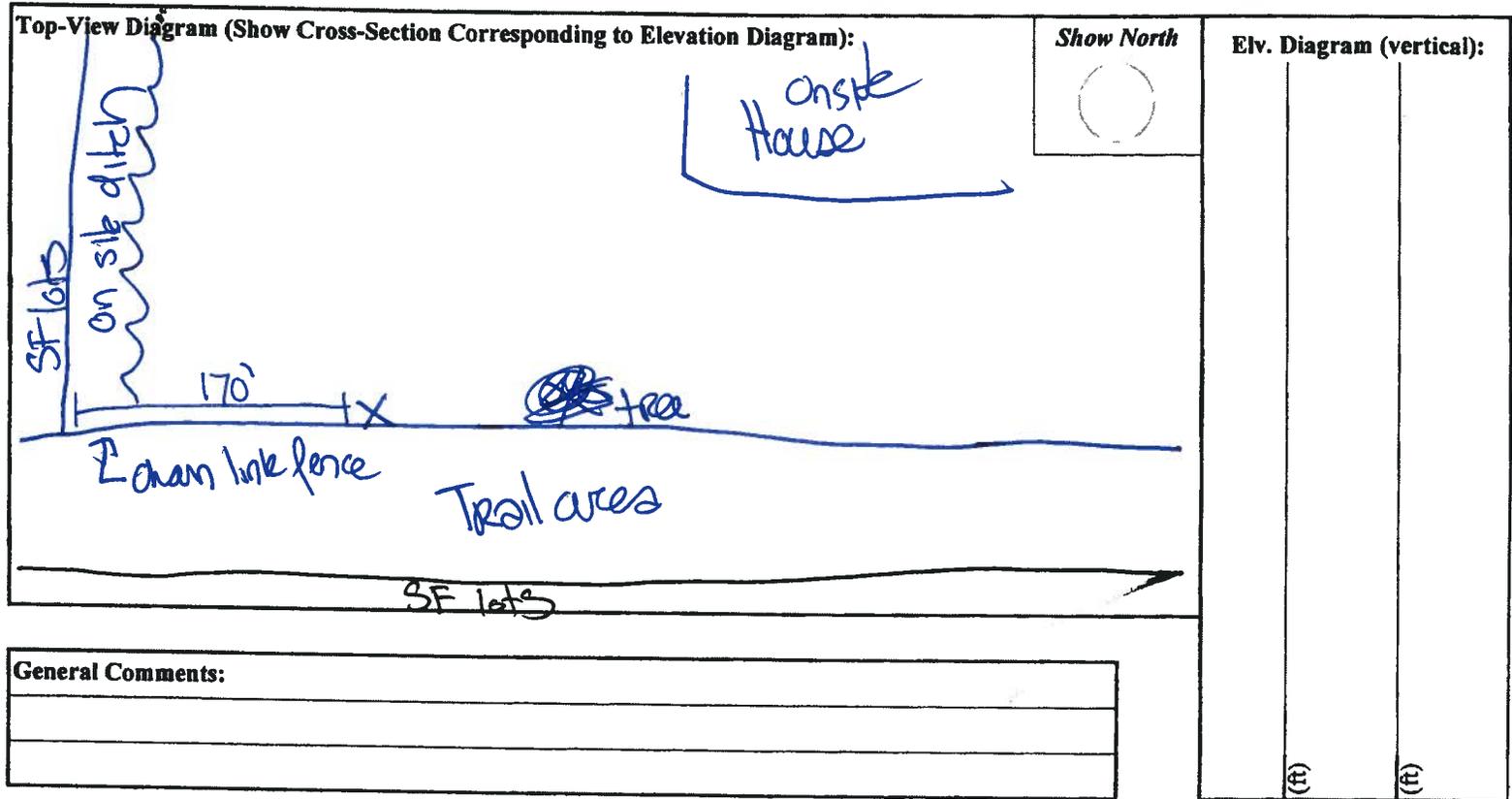
Location # 3

Project: <u>Amadala Lane</u>		Date: <u>8/7</u>	Eqpt: <u>LD826</u>		Photos:
Temp: Hot Warm Mild Cool Cold	Wind (mph): ≤2.5 <u>2.5-5</u> 5-10 ≥10		(dir): N E S W Δ		Cloud Cover: <u>Clear</u> Pt. Cld. Clouds Fog
Location Desc.: <u>Northern fence line, east of</u>			Noise Source(s):		
Rcp. Info:			Ground Effects:		
Barrier Effects:					

Meas. Int.:				
Roadway:				
Segment:				
Spd: Post: Trav.:				
Volumes				Dir.
Auto	MT	HT	NB/EB	
			SB/WB	

Meas. Int.:				
Roadway:				
Segment:				
Spd: Post: Trav.:				
Volumes				Dir.
Auto	MT	HT	NB/EB	
			SB/WB	

Cal. Δ @Intl	Cal. √	Offset
Yes No	Int #:	



Description	Int. #	Start (h:m(:s))	Duration ((h):m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info			
														Description	Lmax	Begin	End
<u>24-hour</u>	<u>1</u>	<u>3:00</u>															

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number:

Project Name: Amanda Estates Development

### Background Information

Model Description:

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.

Source of Traffic Volumes:

Linscott, Law, and Greenspan, July 2013 (Surface Streets)

Community Noise Descriptor

L<sub>dn</sub>: \_\_\_\_\_ CNEL: X

"-" = contour is located within the roadway right-of-way.  
Distance is from the centerline of the roadway segment to the receptor location.

Assumed 24-Hour Traffic Distribution:

	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix		Distance from Centerline of Roadway				
						Medium Trucks	Heavy Trucks	CNEL at 50 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
<b>Gamble Lane</b>												
Amanda Lane to Bernardo Avenue, existing	3	0	450	25	0.5	2.0%	1.0%	<b>48.0</b>	-	-	-	-
Amanda Lane to Bernardo Avenue, existing + project	3	0	700	25	0.5	2.0%	1.0%	<b>49.9</b>	-	-	-	-
Amanda Lane to Bernardo Avenue, future	3	0	450	25	0.5	2.0%	1.0%	<b>48.0</b>	-	-	-	-
Amanda Lane to Bernardo Avenue, future + project	3	0	700	25	0.5	2.0%	1.0%	<b>49.9</b>	-	-	-	-
<b>Gamble Lane</b>												
Bernardo Ave to I-15 SB Off-Ramp, existing	2	0	5,480	25	0.5	2.0%	1.0%	<b>58.7</b>	-	-	41	89
Bernardo Ave to I-15 SB Off-Ramp, existing + project	2	0	5,720	25	0.5	2.0%	1.0%	<b>58.9</b>	-	-	42	91
Bernardo Ave to I-15 SB Off-Ramp, future	2	0	5,500	25	0.5	2.0%	1.0%	<b>58.7</b>	-	-	41	89
Bernardo Ave to I-15 SB Off-Ramp, future + project	2	0	5,740	25	0.5	2.0%	1.0%	<b>58.9</b>	-	-	42	91
<b>Citracado Parkway</b>												
East of I-15 NB Ramps, existing	2	0	3,940	25	0.5	2.0%	1.0%	<b>57.3</b>	-	-	33	71
East of I-15 NB Ramps, existing + project	2	0	3,970	25	0.5	2.0%	1.0%	<b>57.3</b>	-	-	33	72
East of I-15 NB Ramps, future	2	0	3,960	25	0.5	2.0%	1.0%	<b>57.3</b>	-	-	33	71
East of I-15 NB Ramps, future + project	2	0	3,990	25	0.5	2.0%	1.0%	<b>57.4</b>	-	-	33	72

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 7/24/2013

Case Description: Amanda Lane

---- Receptor #1 ----

Description Receptor	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Front End Loader	No	40		79.1	50	0
Dozer	No	40		81.7	50	0
Scraper	No	40		83.6	50	0
Roller	No	20		80	50	0
Backhoe	No	40		77.6	50	0
Excavator	No	40		80.7	50	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	83.6	84.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

5 Gamble Construction.txt  
 Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 12/15/2014  
 Case Description: Amanda Off-site Construction

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Daytime	Baselines (dBA)	
			Evening	Night
Residences	Residential	65.0	65.0	65.0

Description	Impact Device	Usage (%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85.0		50.0	0.0
Concrete Saw	No	20		89.6	50.0	0.0

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

Night	Calculated (dBA)				Day Night		Evening		
	Day		Evening		Night		Evening		
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	N/A	N/A	85.0	81.0	N/A	N/A	N/A	N/A	N/A
Concrete Saw	N/A	N/A	89.6	82.6	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	89.6	84.9	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A