3.5-1 Noise Impact Analysis

41 Corporate Park, Suite 300
Irvine, CA 92606

Prepared by:

Bill Lawson, PE, INCE

Prepared for:

SUNBELT COMMUNITIES
27127 Calle Arroyo, Suite 1910
San Juan Capistrano, CA 92675

OAK CREEK (T.T.M. 36388)
NOISE IMPACT ANALYSIS
CITY OF WILDOMAR, CALIFORNIA

May 31, 2012

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OAK CREEK (T.T.M. 36388)
EIR NOISE IMPACT ANALYSIS
CITY OF WILDOMAR, CALIFORNIA

1.0 EXECUTIVE SUMMARY

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Oak Creek (T.T.M. 36388) Specific Plan. The project is generally located between the Farm Road and Sunset Avenue and on either side of Bundy Canyon Road in the City of Wildomar. The City of Wildomar planning case PA 11-0261 for TTM No. 36388 proposes to amend Specific Plan No. 116 (Amendment 4) to allow 275 single-family detached dwelling units and a 3.5 acre neighborhood commercial center. It should also be noted that a specific development proposal for the retail component is not proposed as part of this Project.

The purpose of this noise assessment is to evaluate the potential noise impacts associated with the development of the proposed project and to recommend noise mitigation measures to minimize the potential project impacts.

1.1 Off-Site Traffic Noise Analysis

To assess the off-site noise levels impact associated with development of the proposed development, noise level contour boundaries for the 55, 60, 65 and 70 dBA CNEL noise levels were developed for each of the alternatives included in the Oak Creek (T.T.M. 36388) Traffic Impact Analysis. For noise impacts to be considered significant, the project traffic volumes must create a noise level increase of greater than 3 dBA on the study area roadway segments AND the resulting noise level MUST exceed the City of Wildomar 65 dBA CNEL exterior noise level standard.

For the Opening Year 2015 and Horizon Year 2035 scenarios, potential traffic noise level impacts will range from 0.0 to 2.0 dBA CNEL, therefore, the Project's incremental off-site traffic noise level contributions will be considered "barely perceptible" (less than 3.0 dBA CNEL) and therefore, no off-site traffic mitigation is required.

1.2 On-Site Traffic Noise Impact Analysis

The results of this analysis indicate the future unmitigated exterior noise levels for the lots analyzed will range from 72.8 to 75.0 dBA CNEL. Based on the calculated noise level impacts presented, future traffic related noise level impact are expected to exceed the City of Wildomar exterior noise level standard of 65 dBA CNEL.

To reduce expected traffic noise impacts in order to meet the City of Wildomar 65 dBA CNEL exterior and 45 dBA CNEL interior noise standard, the project shall provide the noise mitigation measures presented on Exhibit 1-A and listed below:

Exterior Noise Mitigation

- Provide a 6.5-foot high noise barrier for lots 33-50 adjacent to Bundy Canyon Road.
- Provide a 6.0-foot high barrier lots 89-96, 131-144, 150-164 and 198-222 adjacent to Bundy Canyon Road.

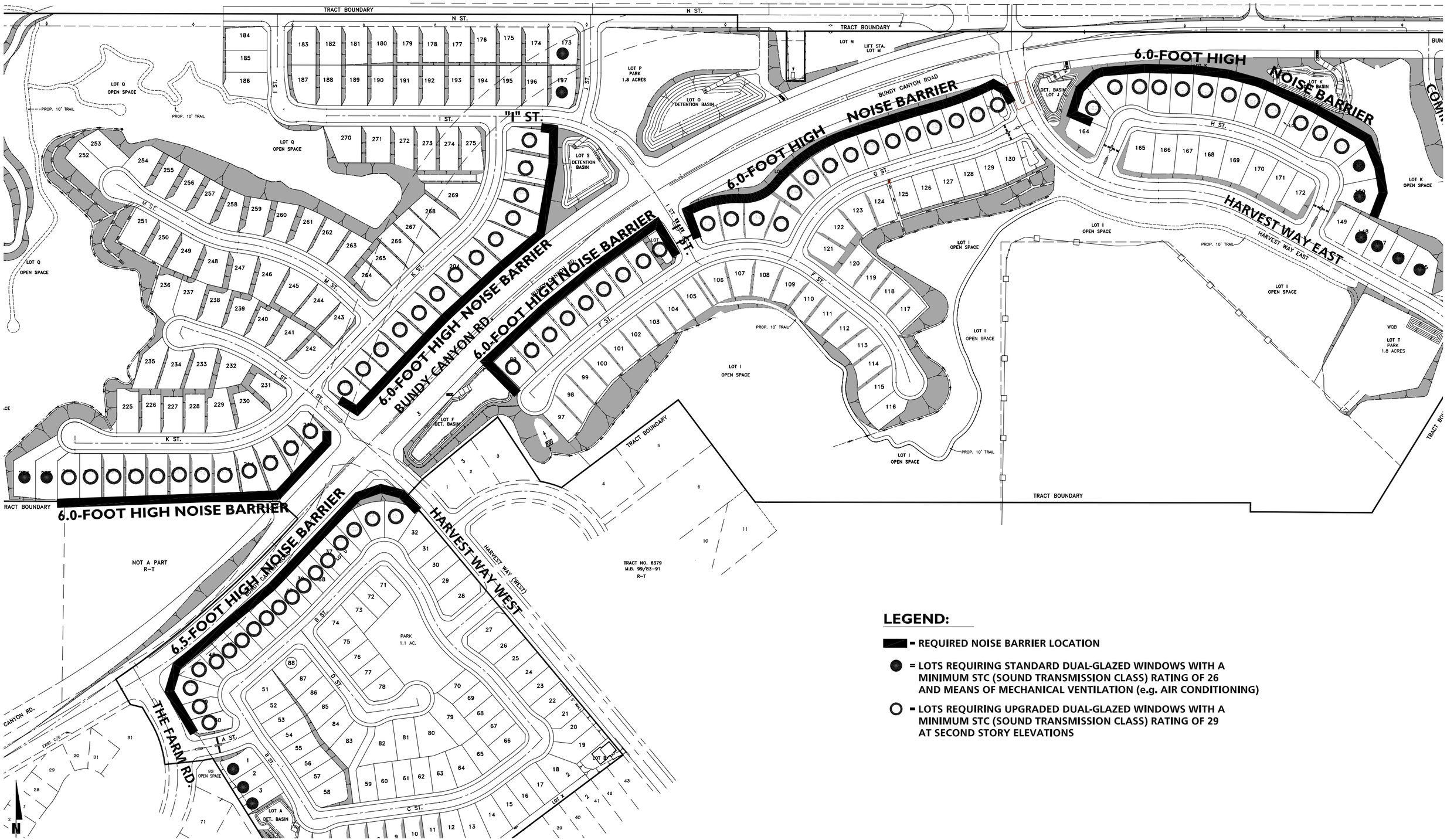
Interior Noise Mitigation

- Provide a "window closed" condition, requiring a means of mechanical ventilation and standard dual glazed windows with a minimum Sound Transmission Class (STC) rating of 26 at first floor elevations with upgraded dual glazed windows with a minimum Sound Transmission Class (STC) rating of 29 at second floor elevations for lots 33-50, 89-96, 131-144, 152-164 and 198-222.
- Provide a "window closed" condition, requiring a means of mechanical ventilation and standard dual glazed windows with a minimum Sound Transmission Class (STC) rating of 26 at first and second floor elevations for lots 1-3, 223-224, 145-151, 173, and 197.
- All window and door assemblies used throughout the project shall be free of cut outs and openings and shall be well fitted and well weather-stripped.

A final noise study should be prepared prior to obtaining building permits for the project. This report would finalize the noise requirements based upon precise grading plans and

EXHIBIT 1-A

SUMMARY OF RECOMMENDATIONS



LEGEND:

- ▬ = REQUIRED NOISE BARRIER LOCATION
- ● = LOTS REQUIRING STANDARD DUAL-GLAZED WINDOWS WITH A MINIMUM STC (SOUND TRANSMISSION CLASS) RATING OF 26 AND MEANS OF MECHANICAL VENTILATION (e.g. AIR CONDITIONING)
- ○ = LOTS REQUIRING UPGRADED DUAL-GLAZED WINDOWS WITH A MINIMUM STC (SOUND TRANSMISSION CLASS) RATING OF 29 AT SECOND STORY ELEVATIONS

actual building design specifications. Preliminary interior noise requirements are presented in this report.

With the recommended interior noise mitigation measures provided in this study, the proposed residential project will meet the City of Wildomar 65 dBA CNEL exterior noise level standard for residential development.

1.3 On-Site Stationary Noise Impacts

Future uses within the commercial area of the Oak Creek (T.T.M 36388) development near the intersection of Bundy Canyon Road and Sunset Street has the potential to produce unacceptable operational noise levels. Typical noise impacts associated with the operation of the commercial center include truck maneuvering and unloading, air conditioning units, trash compactors and speakerphones. It is not possible to calculate the specific noise impacts at the specific plan level without final plans and the location of the potential noise sources. At the time that site plans or building permits are proposed for uses within the 3.5 acre commercial site, a site-specific noise analysis shall be completed to determine if the proposed uses would result in any significant noise impacts affecting nearby off-site sensitive receptors.

1.4 Construction Noise Impact Analysis

The proposed Oak Creek (T.T.M. 36388) development is surrounded by existing single-family homes at varying distances. To estimate the construction noise impacts, typical reference construction noise level sources were placed within the project site and then used to estimate the potential noise impacts on the neighboring noise sensitive land uses. Using a drop-off rate of 6 dBA per doubling of distance, noise levels at 100 feet are estimated at 83 dBA Leq, at 200 feet 77 dBA, and at 400 feet 71 dBA. This noise level impact represents a worst-case condition when grading equipment is operating near the project boundaries and adjacent to the noise sensitive residential areas adjacent to the project site. To reduce the noise impacts to the adjacent noise sensitive residential community, several noise mitigation measures are provided below.

To reduce the potential short-term noise impacts during construction activities for the proposed project, the following construction noise reduction measures are recommended to minimize noise level increases:

- The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal working hours, to be determined by City staff.

- During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

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

- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

- Homeowners shall be notified via postings on the construction site 24-hours before major construction-related noise impacts such as grading which may affect them.

The recommended construction noise impact mitigation measures recognize that construction noise is of short-term duration and will not present any long-term impacts on the project site or surrounding area.

2.0 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Oak Creek (T.T.M. 36388) project. This noise study briefly describes the proposed project, provides information regarding noise fundamentals, describes the local noise guidelines, provides the study methods and procedures for traffic noise analysis, and evaluates the future off-site and on-site exterior noise environment. Included in this study is an analysis of the potential off-site and on-site project-related noise impacts during construction activities and the predicted future noise environment that can be expected within the noise sensitive residential community.

2.1 Site Location and Study Area

The project site is generally located between the Farm Road and Sunset Avenue and on either side of Bundy Canyon Road in the City of Wildomar as shown on Exhibit 2-A.

2.2 Project Description and Phasing

The City of Wildomar planning case PA 11-0261 for TTM No. 36388 proposes to amend Specific Plan No. 116 (Amendment 4) to allow 275 single-family detached dwelling units and a 3.5 acre neighborhood commercial center. It should also be noted that a specific development proposal for the retail component is not proposed as part of this Project. A site plan of the proposed Oak Creek (T.T.M. 36388) development is shown on Exhibit 2-B.

EXHIBIT 2-A

LOCATION MAP

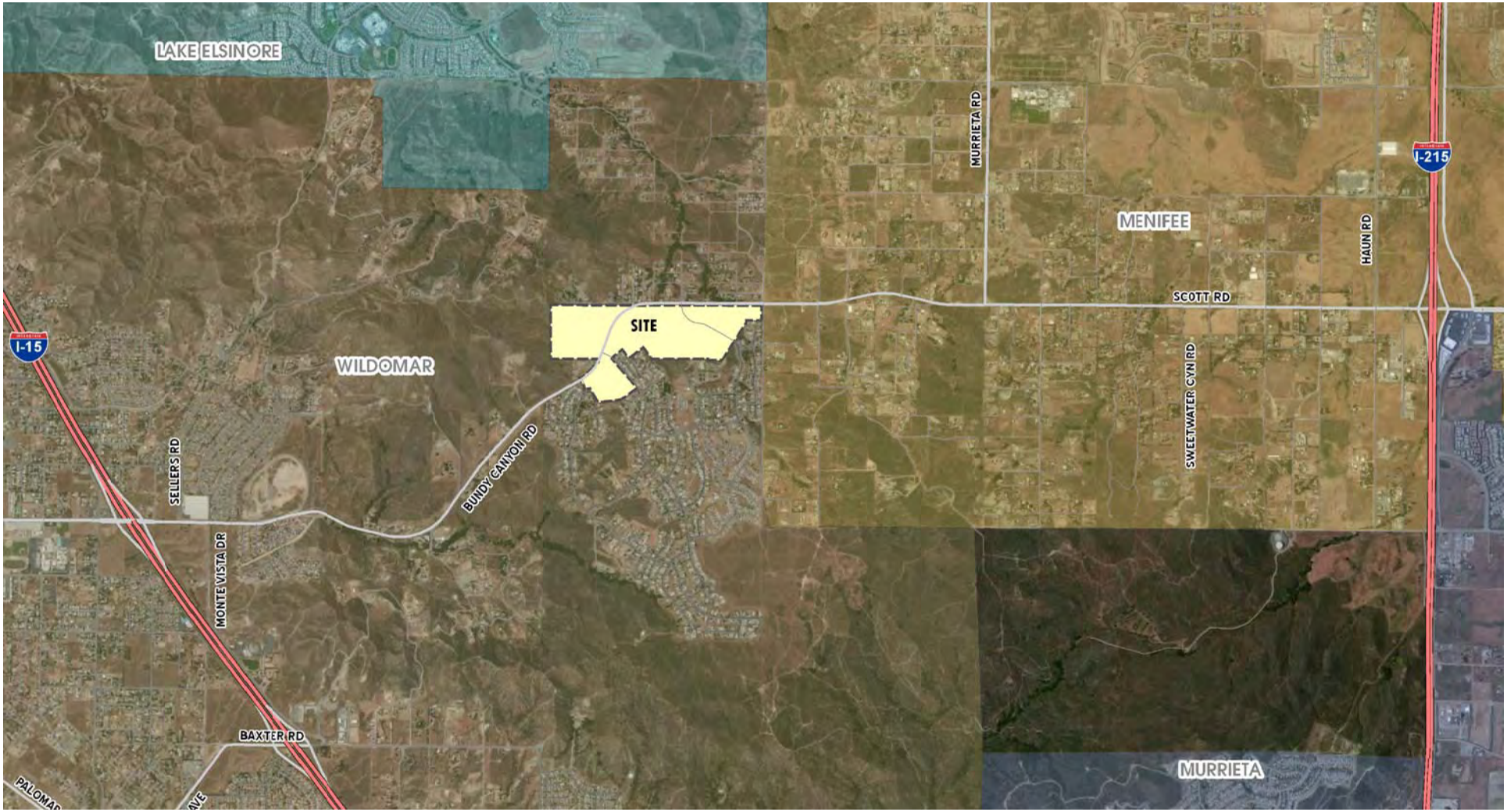


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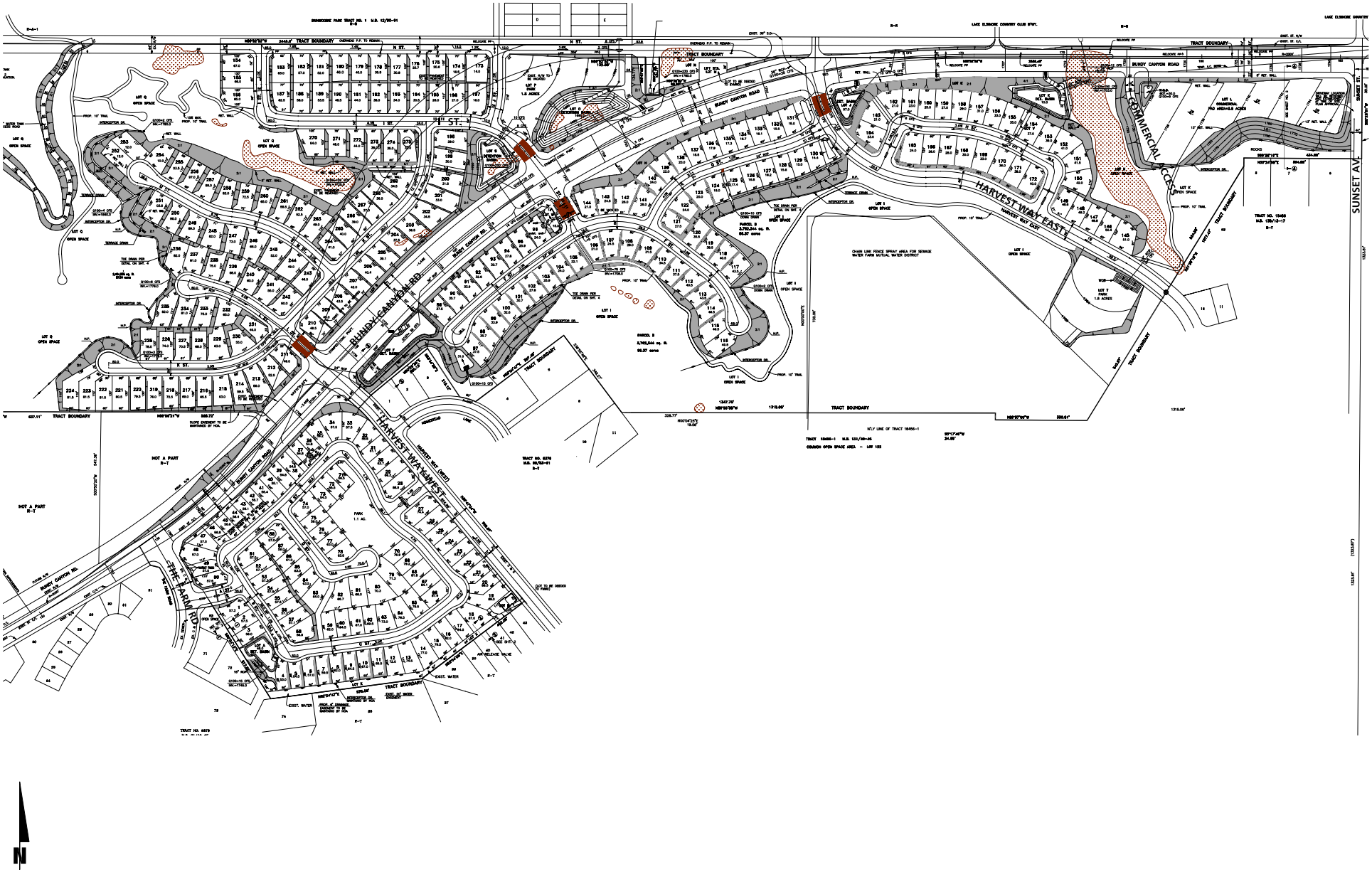
EXHIBIT 2-B

SITE PLAN



3.0 NOISE FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 3-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

3.1 Range of Noise

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort.

3.2 Noise Descriptors

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (Leq). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. In addition, the hourly Leq is the noise metric used to collect short-term noise level measurement samples and to estimate the 24-hour Community Noise Equivalent Levels (CNEL).

EXHIBIT 3-A

TYPICAL NOISE LEVELS AND THEIR SUBJECTIVE LOUDNESS AND EFFECTS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		SLEEP DISTURBANCE
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

SOURCE: NOISE TECHNICAL SUPPLEMENT BY CALTRANS

The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7 p.m. to 10 p.m., and the addition of 10 decibels to dBA Leq sound levels at night between 10 p.m. and 7 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any particular time, but rather represents the total sound exposure.

3.3 Traffic Noise Prediction

The level of traffic noise depends on three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and a greater number of trucks. A doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. The truck mix on a given roadway may also have an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires.

3.4 Noise Control

Noise control is the process of obtaining an acceptable noise environment for a particular observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to any and all of these three elements.

3.5 Ground Absorption

To account for the ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft site and hard site conditions. Soft site conditions account for the sound propagation loss over natural surfaces such as normal

earth and ground vegetation. A drop-off rate of 4.5 dBA per doubling of distance is typically observed over soft ground with landscaping, as compared with a 3.0 dBA drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. Based on our experience, soft site conditions better reflect the predicted noise levels. In addition, Caltrans' research has shown that the use of soft site conditions is more appropriate for the application of the FHWA traffic noise prediction model used in this analysis.

3.6 Noise Barrier Attenuation

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the view of the noise source.

3.7 Community Response to Noise

Approximately ten (10) percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another 25 percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels. An increase or decrease of 1.0 dBA cannot be perceived except in carefully controlled laboratory experiments. A 3.0 dBA increase may be perceptible outside of the laboratory. An increase of 5.0 dBA is often necessary before any noticeable change in community response (i.e., complaints) would be expected.

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level of the receptor;
- Noise receptor's perception that they are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Receptor's belief that the noise source can be controlled.

Recent studies have shown that changes in long-term noise levels are noticeable, and are responded to by people. For example, about ten (10) percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one (1) dBA is associated with approximately two (2) percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people begin complaining. Group or legal actions to stop the noise should be expected to begin at traffic noise levels near 70 dBA and aircraft noise levels near 65 dBA.

3.8 Land Use Compatibility With Noise

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches and residences are more sensitive to noise intrusion than are commercial or industrial activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process.

4.0 NOISE STANDARDS

Due to its recent incorporation, the City of Wildomar currently does not have its own noise standards. For the purposes of this analysis, County of Riverside noise standards and noise ordinance will be use to assess potential noise impacts. The City of Wildomar addresses two separate types of noise sources through the CEQA process: (1) mobile, and (2) stationary. The mobile, or transportation related, noise impacts are controlled using the 24-hour Community Noise Equivalent Level (CNEL) to assess the land use compatibility for community noise exposure. To control community noise impacts from stationary (non-transportation) noise sources (such as speakerphones, trash compactors, etc.) the City of Wildomar has identified the worst-case noise levels for daytime and nighttime activities. In the context of this noise analysis, the noise impacts associated with the commercial / mixed-use land use activities found in the proposed development are governed by the County noise standards for stationary sources. The off-site Project-related vehicular traffic is governed by the CNEL noise level standards.

4.1 Transportation Noise Standards

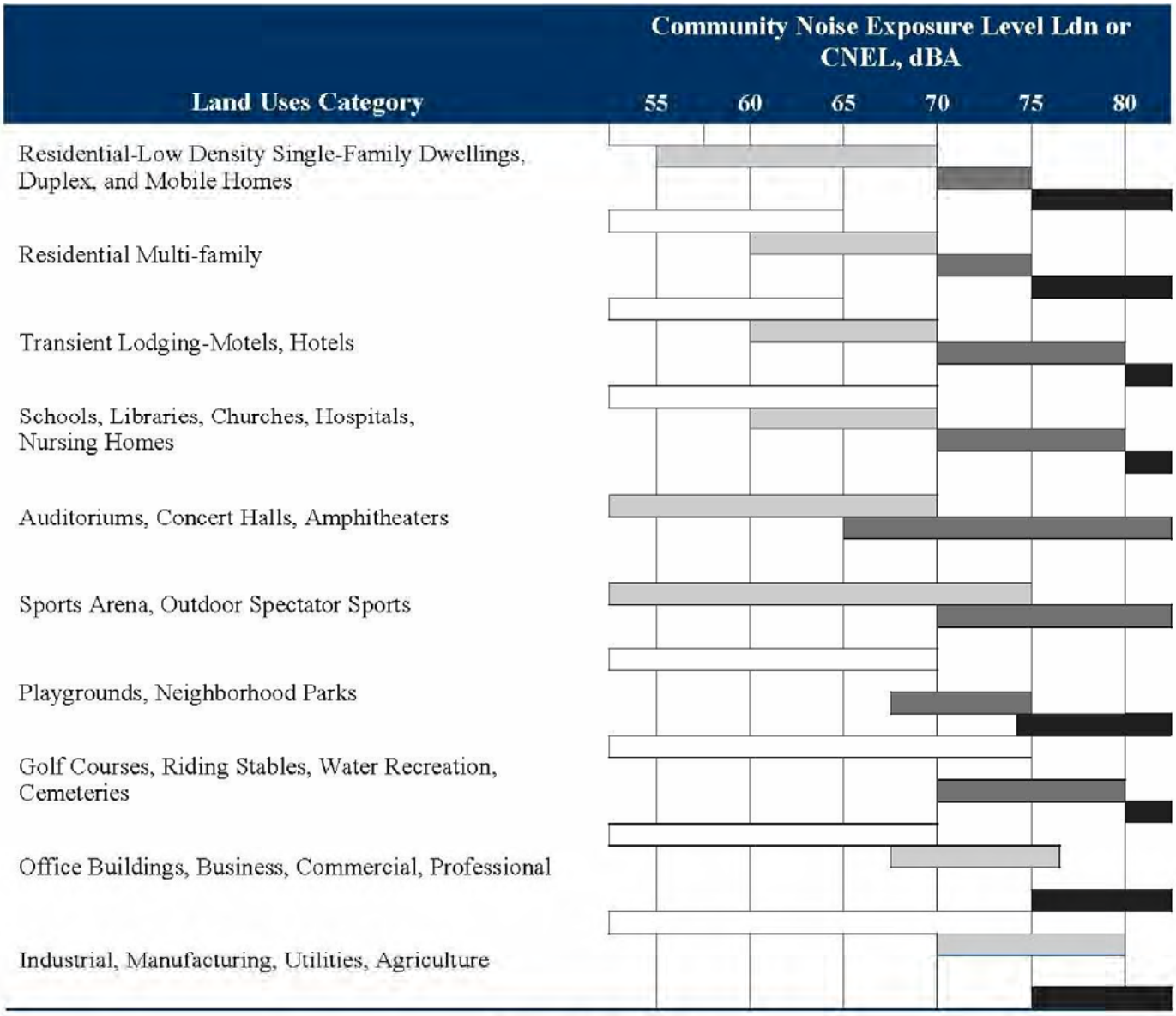
The Noise Element specifies the maximum noise levels allowable for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. For the purposes of this project, the noise impacts associated with traffic are controlled by the General Plan Noise Element. The General Plan Noise Element is included in Appendix 4.1.

The General Plan standards are derived from standards contained in the *General Plan Guidelines*, a publication of the California Office of Planning and Research. These standards are used by many California cities and counties. The Noise Element includes standards for land use compatibility for community noise exposure. For single family residential areas, the exterior noise levels should remain below 65 dBA CNEL, and the interior noise levels should remain below 45 dBA CNEL.

For commercial uses the noise compatibility matrix sets guidelines according to the predicted noise exposure level. Exhibit 4-A presents the General Plan land use and noise compatibility matrix. According to the noise compatibility matrix, an ambient noise level of

EXHIBIT 4-A

LAND USE AND NOISE COMPATIBILITY MATRIX



Explanatory Notes

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

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

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

Clearly Unacceptable:
New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

SOURCE: California Office of Noise Control

up to 65 dBA CNEL for residential uses and up to 70 dBA CNEL for commercial uses is considered “normally acceptable”.

4.2 Stationary Noise Standards

The City of Wildomar has set exterior noise limits to control delivery trucks, trash compactors, speakerphones, vehicle activities, and mechanical ventilation system noise impacts associated with the development of the proposed Oak Creek (T.T.M. 36388) Development. The County considers noise generated by the use of motor vehicles to be a stationary noise source when operated on private property such as at a truck terminal or warehousing facility. These facility-related noises, as projected to any portion of any surrounding property containing a "habitable dwelling, hospital, school, library or nursing home," must not exceed the following worst-case noise levels.

Policy N 4.1 of the Noise Element sets an exterior noise limit not to be exceeded for a cumulative period of more than ten (10) minutes in any hour of 65 dBA Leq for daytime hours of 7 a.m. to 10 p.m. and 45 dBA Leq during the noise sensitive nighttime hours of 10 p.m. to 7 a.m. This is consistent with the Stationary Source Requirements included in Appendix 4.2.

Policy N 4.8 of the Noise Element requires that loading docks of industrial land uses minimize the potential noise impacts of vehicles on the site as well on the adjacent land uses.

4.3 Community Noise Assessment Criteria

The noise criteria presented in this section is based on well documented criteria and research into human response to community noise. In community noise assessment, changes in noise levels greater than 3 dBA are often identified as "barely perceptible," while changes of 5 dBA are "readily perceptible." Studies show that a relative noise impact of 5 dBA triggers community reaction (sporadic complaints to widespread complaints to several legal threats to vigorous action). In the range of 1 dBA to 3 dBA, people who are very sensitive to noise may perceive a slight change in noise level. In laboratory testing

situations, humans are able to detect noise level changes of slightly less than 1 dBA. However, in a community situation the noise exposure is extended over a long time period, and changes in noise levels occur over years rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dBA, and 3 dBA appears to be appropriate for most people. While a 1dBA increase may be perceptible to a minority of very noise sensitive people, noise increases of up to 3dBA are "barely perceptible" to most people. The 3 dBA increase criteria represents a balance of community benefits and reasonableness.

For purposes of this study, based on our experience and also upon previous discussions with City staff, roadway noise impacts would be considered significant if the project increases noise levels for a noise sensitive land use by 3 dBA CNEL <u>and</u> if: (1) the existing noise levels already exceed the 65 dBA CNEL residential standard, <u>or</u> (2) the project increases noise levels from below the 65 dBA CNEL standard to above 65 dBA CNEL.

5.0 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

5.1 FHWA Traffic Noise Prediction Model

The roadway noise impacts from vehicular traffic were projected using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model-FHWA-RD-77-108 (the "FHWA Model"). The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

5.2 Traffic Noise Prediction Model Inputs

Table 5-1 presents the FHWA Traffic Noise Prediction Model roadway parameters used in this analysis. Soft site conditions were used to develop the noise contours to analyze the traffic noise impacts to the study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Based on our experience, soft site conditions better represent the noise level contours.

The Existing, Project Completion (Year 2015), and Horizon Year 2035 average daily traffic volumes used for this study and presented in Table 5-2 were provided by the Oak Creek (T.T.M. 36388) Traffic Impact Analysis prepared by Urban Crossroads, Inc. in May 2012.

Table 5-1

Off-Site Roadway Parameters

Roadway	Segment	Roadway Classification[1]	Vehicle Speed (MPH)	Site Conditions
Bundy Canyon Road	w/o I-15 Fwy.	Urban Arterial	40	Soft
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	Urban Arterial	40	Soft
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	Urban Arterial	40	Soft
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	Urban Arterial	40	Soft
Bundy Canyon Road	Harvest Way West to Harvest Way East	Urban Arterial	40	Soft
Bundy Canyon Road	Harvest Way East to Sunset Ave.	Urban Arterial	40	Soft
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	Urban Arterial	40	Soft
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	Urban Arterial	40	Soft
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	Urban Arterial	40	Soft
Bundy Canyon Road	e/o I-215 Fwy.	Urban Arterial	40	Soft
Sunset Avenue	n/o Bundy Canyon Rd.	Collector	40	Soft
Sunset Avenue	s/o Bundy Canyon Rd.	Collector	40	Soft
Murrieta Road	n/o Bundy Canyon Rd.	Arterial	40	Soft

[1] According to the County of Riverside General Plan Circulation Element.

Table 5-2

Average Daily Traffic For Existing, Year 2015, And Post Year 2035 Conditions

Roadway	Segment	Average Daily Traffic (1,000's)				
			Year 2015		Post Year 2035	
		Existing	No Project	With Project	No Project	With Project
Bundy Canyon Road	w/o I-15 Fwy.	15.6	23.8	24.2	29.2	29.5
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	18.4	29.5	31.4	32.7	34.6
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	17.1	28.8	30.9	31.9	34.0
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	17.6	28.7	30.6	31.8	33.7
Bundy Canyon Road	Harvest Way West to Harvest Way East	13.5	25.3	27.1	28.0	29.8
Bundy Canyon Road	Harvest Way East to Sunset Ave.	13.7	25.9	28.1	28.7	30.9
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	13.7	27.5	30.1	30.5	33.2
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	10.9	33.1	34.6	36.6	38.1
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	18.3	62.8	64.1	69.3	70.6
Bundy Canyon Road	e/o I-215 Fwy.	29.8	61.8	62.0	68.0	68.2
Sunset Avenue	n/o Bundy Canyon Rd.	0.6	0.7	1.1	4.3	4.7
Sunset Avenue	s/o Bundy Canyon Rd.	0.1	7.7	9.8	8.6	10.7
Murrieta Road	n/o Bundy Canyon Rd.	5.8	16.1	16.5	17.7	18.0

[1] According to the Oak Creek (TTM No. 36388) Traffic Impact Analysis by Urban Crossroads, Inc. in May 2012.

Table 5-3 presents the hourly traffic flow distributions (vehicle mix) used for this analysis. The vehicle mixes were based on the City of Wildomar requirements to prepare noise impact analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model.

Table 5-3

Hourly Traffic Flow Distribution [1]

Motor-Vehicle Type	Daytime (7 am to 7 pm)	Evening (7 pm to 10 pm)	Night (10 pm to 7 am)	Total % Traffic Flow
Secondary, Collector				
Automobiles	77.5%	12.9%	9.6%	97.42%
Medium Trucks	84.8%	4.9%	10.3%	1.84%
Heavy Trucks	86.5%	2.7%	10.8%	0.74%
Major, Arterial, Urban Arterial				
Automobiles	75.0%	14.0%	10.5%	92.00%
Medium Trucks	48.0%	2.0%	50.0%	3.00%
Heavy Trucks	48.0%	2.0%	50.0%	5.00%

[1] Required County of Riverside vehicle mixes.

6.0 OFF-SITE TRANSPORTATION EXTERIOR NOISE IMPACTS

To assess the off-site noise level impacts associated with development of the proposed Project, noise contours were developed for the following traffic scenarios:

Existing: This scenario refers to the existing traffic noise conditions, without the proposed Project.

Project Completion (Year 2015) Without / With Project: This scenario refers to the background noise conditions at Project Completion (Year 2015) without and with the proposed Project.

Horizon Year 2035 Without / With Project: This scenario refers to the background noise conditions at Horizon Year 2035 without and with the proposed Project.

6.1 Traffic Noise Contour Boundaries

Traffic noise contour boundaries are often desired by local land planning and zoning authorities to represent sound level exposures on land that is being considered for development and is adjacent to highways. Noise contour boundaries represent the equal levels of noise exposure and are measured from the center of the roadway. Traffic noise contour boundaries are typically calculated at distances of 100 feet from a roadway centerline. CNEL noise contour boundaries are also determined below for the 55, 60, 65 and 70 dBA noise levels. The off-site transportation noise contour calculations are presented in Appendix 6.1.

The distance from the centerline of the roadway to the CNEL contour boundaries for roadways in the proposed Project's vicinity are presented in Tables 6-1 through 6-5. The noise contour boundaries do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels.

6.2 Existing Roadway Noise Levels

Table 6-1 presents the existing noise contour boundaries. Table 6-1 shows for existing traffic volumes all segments adjacent to Bundy Canyon Road currently exceed the City of Wildomar 65 dBA CNEL standard for noise sensitive residential areas at 100 feet from each roadway's centerline.

Table 6-1

Existing Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Bundy Canyon Road	w/o I-15 Fwy.	72.0	135	291	627	1,351
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	72.7	151	325	700	1,508
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	72.4	144	309	667	1,436
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	72.5	146	315	680	1,464
Bundy Canyon Road	Harvest Way West to Harvest Way East	71.3	123	264	570	1,227
Bundy Canyon Road	Harvest Way East to Sunset Ave.	71.4	124	267	575	1,239
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	71.4	124	267	575	1,239
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	70.4	106	229	494	1,064
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	72.7	150	324	698	1,503
Bundy Canyon Road	e/o I-215 Fwy.	74.8	208	448	966	2,080
Sunset Avenue	n/o Bundy Canyon Rd.	48.5	RW	RW	RW	RW
Sunset Avenue	s/o Bundy Canyon Rd.	40.7	RW	RW	RW	RW
Murrieta Road	n/o Bundy Canyon Rd.	66.6	RW	128	275	592

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-2

Year 2015 Without Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Bundy Canyon Road	w/o I-15 Fwy.	73.8	179	386	831	1,791
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	74.7	207	445	959	2,066
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	74.6	203	438	944	2,033
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	74.6	203	437	942	2,029
Bundy Canyon Road	Harvest Way West to Harvest Way East	74.1	187	402	866	1,865
Bundy Canyon Road	Harvest Way East to Sunset Ave.	74.2	189	408	879	1,894
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	74.4	197	425	915	1,972
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	75.2	223	481	1,036	2,231
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	78.0	342	737	1,587	3,419
Bundy Canyon Road	e/o I-215 Fwy.	77.9	338	729	1,570	3,383
Sunset Avenue	n/o Bundy Canyon Rd.	49.1	RW	RW	RW	41
Sunset Avenue	s/o Bundy Canyon Rd.	59.6	RW	43	93	201
Murrieta Road	n/o Bundy Canyon Rd.	71.0	117	252	543	1,170

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-3

Year 2015 With Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Bundy Canyon Road	w/o I-15 Fwy.	73.9	181	390	840	1,811
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	75.0	215	464	1,000	2,154
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	74.9	213	459	989	2,131
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	74.9	212	456	983	2,117
Bundy Canyon Road	Harvest Way West to Harvest Way East	74.4	195	421	906	1,953
Bundy Canyon Road	Harvest Way East to Sunset Ave.	74.5	200	431	928	2,000
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	74.8	209	451	972	2,094
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	75.4	230	495	1,067	2,298
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	78.1	347	747	1,609	3,466
Bundy Canyon Road	e/o I-215 Fwy.	78.0	339	730	1,574	3,390
Sunset Avenue	n/o Bundy Canyon Rd.	51.1	RW	RW	RW	55
Sunset Avenue	s/o Bundy Canyon Rd.	60.6	RW	51	110	236
Murrieta Road	n/o Bundy Canyon Rd.	71.1	119	256	552	1,189

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-4

Horizon Year 2035 Without Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Bundy Canyon Road	w/o I-15 Fwy.	74.7	205	442	953	2,052
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	75.2	221	477	1,027	2,213
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	75.1	218	469	1,010	2,177
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	75.1	217	468	1,008	2,172
Bundy Canyon Road	Harvest Way West to Harvest Way East	74.5	200	430	926	1,996
Bundy Canyon Road	Harvest Way East to Sunset Ave.	74.6	203	437	942	2,029
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	74.9	211	455	981	2,113
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	75.7	239	514	1,107	2,386
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	78.4	365	787	1,695	3,651
Bundy Canyon Road	e/o I-215 Fwy.	78.4	361	777	1,673	3,605
Sunset Avenue	n/o Bundy Canyon Rd.	57.0	RW	RW	63	136
Sunset Avenue	s/o Bundy Canyon Rd.	60.0	RW	47	101	217
Murrieta Road	n/o Bundy Canyon Rd.	71.4	125	269	579	1,246

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-5

Horizon Year 2035 With Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Bundy Canyon Road	w/o I-15 Fwy.	74.7	207	445	959	2,066
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	75.4	230	495	1,067	2,298
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	75.3	227	489	1,054	2,271
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	75.3	226	486	1,048	2,258
Bundy Canyon Road	Harvest Way West to Harvest Way East	74.8	208	448	966	2,080
Bundy Canyon Road	Harvest Way East to Sunset Ave.	74.9	213	459	989	2,131
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	75.2	224	482	1,038	2,235
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	75.8	245	528	1,137	2,450
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	78.5	370	796	1,716	3,697
Bundy Canyon Road	e/o I-215 Fwy.	78.4	361	778	1,677	3,612
Sunset Avenue	n/o Bundy Canyon Rd.	57.4	RW	RW	67	145
Sunset Avenue	s/o Bundy Canyon Rd.	61.0	RW	54	116	251
Murrieta Road	n/o Bundy Canyon Rd.	71.5	126	272	585	1,260

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

6.3 Opening Year (Year 2015) Project Traffic Noise Level Contributions

Table 6-6 presents a comparison of the Opening Year (Year 2015) without and with the proposed Project noise levels shown in Tables 6-2 and 6-3. The roadway noise impacts will increase on all segments from 0.0 dBA CNEL to 2.0 dBA CNEL with the development of the proposed Project.

6.4 Horizon Year 2035 Project Traffic Noise Level Contributions

Table 6-7 presents a comparison of the Horizon Year 2035 without and with the proposed Project noise levels shown in Tables 6-4 and 6-5. The roadway noise impacts will increase on all segments from 0.0 dBA CNEL to 0.9 dBA CNEL with the development of the proposed Project.

6.5 Off-Site Transportation Related Project Noise Impacts

Project-related vehicular source noise may affect permanent and on-going ambient noise conditions and would not be considered a temporary or periodic noise source. Applying the Thresholds of Significance discussed in Section 4 of this report, potentially permanent increases in the ambient noise levels generated by Project traffic will be considered potentially significant if:

a) Vehicular source noise exceeds applicable City standards;

b) Ambient conditions are within the normally acceptable community noise exposure levels identified in the Noise Element, and the Project increases the noise to levels above the normally acceptable community noise exposure at any sensitive receptor by an audible amount (3 dB or more) or;

c) Ambient conditions exceed the normally acceptable community noise exposure level identified in the Noise Element, *and* the Project increases the ambient noise at any sensitive receptor by an audible amount (3 dB or more).

Table 6-6

Year 2015 Off-Site Project Related Traffic Noise Impacts

Roadway	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
		No Project	With Project	Project Contribution	
Bundy Canyon Road	w/o I-15 Fwy.	73.8	73.9	0.1	NO
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	74.7	75.0	0.3	NO
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	74.6	74.9	0.3	NO
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	74.6	74.9	0.3	NO
Bundy Canyon Road	Harvest Way West to Harvest Way East	74.1	74.4	0.3	NO
Bundy Canyon Road	Harvest Way East to Sunset Ave.	74.2	74.5	0.4	NO
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	74.4	74.8	0.4	NO
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	75.2	75.4	0.2	NO
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	78.0	78.1	0.1	NO
Bundy Canyon Road	e/o I-215 Fwy.	77.9	78.0	0.0	NO
Sunset Avenue	n/o Bundy Canyon Rd.	49.1	51.1	2.0	NO
Sunset Avenue	s/o Bundy Canyon Rd.	59.6	60.6	1.0	NO
Murrieta Road	n/o Bundy Canyon Rd.	71.0	71.1	0.1	NO

[1] A significant impact is considered both a level above 65 dBA CNEL and an increase greater than 3.0 dBA.

Table 6-7

Horizon Year 2035 Off-Site Project Related Traffic Noise Impacts

Roadway	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
		No Project	With Project	Project Contribution	
Bundy Canyon Road	w/o I-15 Fwy.	74.7	74.7	0.0	NO
Bundy Canyon Road	I-15 Fwy. to Sellers Rd.	75.2	75.4	0.2	NO
Bundy Canyon Road	Sellers Rd. to Monte Vista Dr.	75.1	75.3	0.3	NO
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	75.1	75.3	0.3	NO
Bundy Canyon Road	Harvest Way West to Harvest Way East	74.5	74.8	0.3	NO
Bundy Canyon Road	Harvest Way East to Sunset Ave.	74.6	74.9	0.3	NO
Bundy Canyon Road	Sunset Ave. to Murrieta Rd.	74.9	75.2	0.4	NO
Bundy Canyon Road	Murrieta Rd. to Sweetwater Canyon Rd.	75.7	75.8	0.2	NO
Bundy Canyon Road	Sweetwater Canyon Rd. to I-215 Fwy.	78.4	78.5	0.1	NO
Bundy Canyon Road	e/o I-215 Fwy.	78.4	78.4	0.0	NO
Sunset Avenue	n/o Bundy Canyon Rd.	57.0	57.4	0.4	NO
Sunset Avenue	s/o Bundy Canyon Rd.	60.0	61.0	0.9	NO
Murrieta Road	n/o Bundy Canyon Rd.	71.4	71.5	0.1	NO

[1] A significant impact is considered both a level above 65 dBA CNEL and an increase greater than 3.0 dBA.

As indicated above, for all other roadway segments, the Project's incremental vehicular-source noise contributions will be considered "barely perceptible" (less than 3.0 dBA CNEL) and therefore, no mitigation is required.

7.0 ON-SITE NOISE IMPACTS

The project site will be subjected to transportation and non-transportation related noise impacts. This section discusses the potential noise impacts from the adjacent streets to the noise sensitive residential portions of the proposed project and the potential stationary noise impacts associated with the operation of the proposed commercial properties to surrounding noise sensitive uses. The City of Wildomar does not consider the commercial property within the proposed project site noise sensitive and therefore specific analysis and mitigations will not be considered within this report.

7.1 Traffic Noise Level Assessment

An analysis has been performed to determine the expected transportation related noise impacts for the affected outdoor usable areas. The grading plan was used to predict the future noise environment. This information identifies the relationship between the roadway centerline elevation, the pad elevation and the centerline distance to the noise barrier, and the backyard observer. The rear-yard exterior noise levels were determined based on an observer location ten feet from the existing property line wall. Key input data for these barrier performance equations include the relative source-barrier-receiver horizontal separations, the relative source-barrier-receiver vertical separations, the typical noise source spectra and the barrier transmission loss. The following general assumptions were used in determining the source and receiver geometry:

7.2 Receiver Assumptions

Horizontal Geometry: Distance behind top-of-slope: 10 feet

Vertical Geometry: Height above pad for ground level receivers:

- Exterior noise: 5 feet
- First Floor Interior: 5.5 feet
- 2nd Floor Interior: 14.5 feet

7.3 Source Assumptions

Horizontal Geometry: All vehicles are located at the single lane equivalent acoustic center of the full roadway.

Vertical Geometry: Height above road grade:

- Autos = 0.0 feet
- Medium Trucks = 2.3 feet
- Heavy Trucks = 8.0 feet

7.4 Future Traffic Noise Levels

Using the FHWA traffic noise prediction model, the parameters outlined in Tables 5-3 and 7-1, calculations of the expected future noise impacts were completed. Table 7-2 presents a summary of future exterior noise level impacts. Based on the FHWA traffic noise prediction model, the future unmitigated exterior noise levels for the lots analyzed will range from 72.8 to 75.0 dBA CNEL. Based on the calculated noise level impacts presented, future traffic related noise level impact are expected to exceed the City of Wildomar exterior noise level standard of 65 dBA CNEL. In order to reduce exterior noise level impact below the exterior noise level standard, a 6.5-foot high noise barrier is required for lots 33-50 and a 6.0-foot high barrier is required for lots 89-96, 131-144, 150-164 and 198-222 adjacent to Bundy Canyon Road. With the construction of the noise barrier, exterior noise level impact will range from 60.9 to 64.8 dBA CNEL and remain below the City of Wildomar exterior noise level standard of 65 dBA CNEL.

The computer outputs for the specific site impacts are included in Appendix 7.1. The grading plans used for this analysis are included in Appendix 7.2.

7.5 Noise Barrier

The noise barrier recommendations presented on Exhibit 1-A indicates a barrier location at the property line, between the adjacent roadway and the exterior living areas. Indicated barrier heights are assumed to be the top of the slope, above pad or roadway elevation,

Table 7-1

On-Site Roadway Parameters

Roadway	Segment	Buildout ADT[2]	Speed (MPH)	Site Conditions
Bundy Canyon Road	Monte Vista Dr. to Harvest Way West	32,000	55	Soft
	Harvest Way West to Harvest Way East	29,900	55	Soft
	Harvest Way East to Sunset Ave.	30,700	55	Soft

[1] Road Classification based upon the County of Riverside General Plan Circulation Element.

[2] Based on required County of Riverside Level of Service "C" Roadway Design Capacity.

Table 7-2

Future Exterior Noise Levels (dBA CNEL)

Lot	Unmitigated Noise Level (dBA CNEL)	Mitigated Noise Level (dBA CNEL)	Required Barrier Height (Feet)
46	75.0	60.9	6.5
38	74.4	64.8	6.5
213	73.8	64.1	6.0
207	73.4	63.6	6.0
91	73.6	64.1	6.0
203	73.3	63.6	6.0
94	73.8	64.8	6.0
137	72.9	62.9	6.0
161	72.8	62.2	6.0

whichever is greater. Where applicable, the barriers should wrap around the ends of the dwelling units to prevent flanking of noise into the site**.**

7.6 Noise Control Barrier Construction Materials

The designed noise screening may only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area and has no decorative cutouts or line-of-site openings between shielded areas and the roadways. The recommended noise control barrier may be constructed using one of the following alternative materials:

1. Masonry block
2. Stucco veneer over wood framing (or foam core), or 1 inch thick tongue and groove wood of sufficient weight per square foot
3. Glass (1/4 inch thick), or other transparent material with sufficient weight per square foot
4. Earthen berm
5. Any combination of these construction materials

The recommended barrier must present a solid face from top to bottom. Unnecessary openings or decorative cutouts should not be made. All gaps (except for weep holes) should be filled with grout or caulking.

7.7 Stationary Noise Impacts

Future uses within the commercial area of the Oak Creek (T.T.M 36388) development near the intersection of Bundy Canyon Road and Sunset Street has the potential to produce unacceptable operational noise levels. Typical noise impacts associated with the operation of the commercial center include truck maneuvering and unloading, air conditioning units, trash compactors and speakerphones. It is not possible to calculate the specific noise impacts at the specific plan level without final plans and the location of the potential noise

sources. At the time that site plans or building permits are proposed for uses within the 3.5 acre commercial site, a site-specific noise analysis shall be completed to determine if the proposed uses would result in any significant noise impacts affecting nearby off-site sensitive receptors.

8.0 INTERIOR NOISE ANALYSIS

To ensure that interior noise levels comply with the City of Wildomar 45 dBA CNEL criteria, future exterior noise levels were estimated at the first and second floor building facades.

8.1 Interior Noise Reduction Methodology

The interior noise exposure is the difference between the projected exterior dBA CNEL exposure at the building facade and the noise reduction of the structure. Typical building construction will provide an approximate 12 dBA noise reduction with "windows open" and a minimum 25 dBA noise reduction with "windows closed." Several methods are used to improve interior noise reduction including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

New construction will generally produce a "windows closed" noise reduction ranging from 25 dBA to 30 dBA. However, leaks, cracks and openings within the window assembly can greatly diminish the effectiveness.

8.2 Interior Noise Level Assessment

Tables 8-1 and 8-2 present the future first and second floor interior noise levels. With the recommended exterior noise mitigation measures including: the construction of a 6.5-foot high noise barrier at lots 33-50 and a 6.0-foot high barrier at lots 89-96, 131-144, 150-164 and 198-222 adjacent to Bundy Canyon Road, the exterior noise levels at the first and second floor building facade will range from 63.5 to 74.3 dBA CNEL. The calculations show that the "windows open" condition will not provide adequate interior noise mitigation.

To meet the 45 dBA CNEL interior noise standard an interior noise level reduction ranging from 18.5 to 29.3 dBA CNEL is required. The required interior noise level reduction at lots 33-50, 89-96, 131-144, 152-164 and 198-222 adjacent to Bundy Canyon Road can be accomplished with a "window closed" condition, requiring a means of mechanical ventilation and standard dual glazed windows with a minimum Sound Transmission Class (STC) rating of 26 at first floor elevations with upgraded dual glazed windows with a

Table 8-1

First Floor Interior Noise Impacts (dBA CNEL)[1]

Lot	Noise Level At Façade	Interior Noise Level For Windows		Required Interior Noise Reduction
		Open[2]	Closed[3]	
46	64.0	52.0	39.0	19.0
38	67.0	55.0	42.0	22.0
213	65.1	53.1	40.1	20.1
207	65.4	53.4	40.4	20.4
91	66.1	54.1	41.1	21.1
203	65.4	53.4	40.4	20.4
94	66.7	54.7	41.7	21.7
137	64.5	52.5	39.5	19.5
161	63.5	51.5	38.5	18.5

[1] Includes the noise attenuation provided by the barrier as shown on Table 6-1.

[2] A minimum of 12 dBA noise reduction is assumed with a windows open condition

[3] A minimum of 25 dBA noise reduction is assumed with a windows closed condition and standard dual-glazed windows with a minimum STC (Sound Transmission Class) rating of 26.

Table 8-2

Second Floor Interior Noise Impacts (dBA CNEL)[1]

Lot	Noise Level At Façade	Interior Noise Level For Windows		Required Interior Noise Reduction
		Open[2]	Closed[3]	
46	74.3	62.3	49.3	29.3
38	73.5	61.5	48.5	28.5
213	72.4	60.4	47.4	27.4
207	72.6	60.6	47.6	27.6
91	72.8	60.8	47.8	27.8
203	72.5	60.5	47.5	27.5
94	73.0	61.0	48.0	28.0
137	72.3	60.3	47.3	27.3
161	72.1	60.1	47.1	27.1

[1] Includes the noise attenuation provided by the barrier as shown on Table 6-1.

[2] A minimum of 12 dBA noise reduction is assumed with a windows open condition

[3] A minimum of 25 dBA noise reduction is assumed with a windows closed condition and standard dual-glazed windows with a minimum STC (Sound Transmission Class) rating of 26.

minimum Sound Transmission Class (STC) rating of 29 at second floor elevations. Additionally, lots 1-3, 223-224, 145-151, 173, and 197 will require a "window closed" condition, requiring a means of mechanical ventilation and standard dual glazed windows with a minimum Sound Transmission Class (STC) rating of 26 at first and second floor elevations. With these design features, the future interior noise levels will be below the City of Wildomar 45 dBA CNEL interior level standard.

Verification of these requirements will be based upon the final noise study, which is required prior to obtaining building permits. The final noise study will evaluate the affects of the precise building placement, design and materials used for construction.

9.0 SHORT-TERM CONSTRUCTION NOISE IMPACTS

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

9.1 Construction Related Noise Standards

Due to their short-term nature, construction activities are not covered by the County's standards for stationary noise sources. The Noise Element has included the following policies to minimize the noise impacts from construction activities:

N 12.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices.

N 12.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

N 12.3 Condition subdivision approval adjacent to developed/occupied noise sensitive land uses by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project through the use of such methods as:

- Temporary noise attenuation fences
- Preferential location of equipment
- Use of current noise suppression technology and equipment

N 12.4 Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

9.2 Construction Noise Level Impacts

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to noise levels in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 68 dBA measured at 50 feet from the noise source to the receptor would be reduced to 62 dBA at 100 feet from the source to the receptor, and would be further reduced by another 6 dBA to 56 dBA at 200 feet from the source to the receptor.

9.3 Construction Noise Level Impact Analysis

Although construction noise would result in a short-term increase greater than 5 dBA over ambient noise levels, construction noise is of short-term duration and will not present any long-term impacts on the project site or the surrounding area. To minimize the potential short-term noise impacts during the construction activities for the proposed project, several construction noise reduction measures are identified in the Executive Summary.