2.8 Noise

This section of the environmental impact report (EIR) evaluates noise and vibration impacts resulting from development of Otay Ranch Village 14 and Planning Areas 16/19 (Proposed Project). Information contained in this section is based on the Acoustical Analysis Report prepared for the Proposed Project by Dudek, which is included as Appendix 2.8-1 of this EIR.

This section tiers from the 1993 Otay Ranch Final Program EIR (Otay Ranch PEIR) (City of Chula Vista and County of San Diego 1993a) because the Proposed Project is within the boundaries of the Otay Ranch General Development Plan/Otay Subregional Plan (Otay Ranch GDP/SRP) (City of Chula Vista and County of San Diego 1993b), and development of the Project Area was analyzed in the 1993 Otay Ranch Final Program EIR. The 1993 Otay Ranch PEIR concluded that potentially significant impacts regarding noise would occur with implementation of the Otay Ranch GDP/SRP. Mitigation measures including site-specific noise studies, noise barriers and attenuation techniques, and requirements for interior acoustical analyses were incorporated, which would substantially lessen the identified noise impacts, but not to below a level of significance. Since certification of the Program EIR, the development concept for the Proposed Project has been further refined and more precise and site-specific technical analyses were performed to determine the potential noise impacts of the Proposed Project. Accordingly, this analysis for the Proposed Project is different than that contained within the Otay Ranch PEIR because it specifically considers the Project Area, which is a subset of Otay Ranch. As a result, this EIR's determinations regarding potential noise impacts and mitigation requirements is specific to the Proposed Project.

2.8.1 Introduction

The following is a brief discussion of fundamental noise concepts and terminology.

2.8.1.1 Sound, Noise, and Acoustics

Sound is a process that consists of three components: the sound source, the sound path, and the sound receiver. All three components must be present for sound to exist. In most situations, there are many different sound sources, paths, and receptors, rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

2.8.1.2 Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micronewton per square meter, also called micropascal. One micropascal is approximately one-hundred billionth (0.00000000001) of

normal atmospheric pressure. The pressure of a very loud sound may be 200 million micropascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micropascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the ratio of actual sound pressure to a reference pressure squared. These units are called Bels. To provide a finer resolution, a Bel is subdivided into 10 decibels (dB).

2.8.1.3 A-Weighted Sound Level

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness, or human response, is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies, but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 hertz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g., B-scale, C-scale, D-scale), but these scales are rarely used in conjunction with most environmental noise. Noise levels are typically reported in terms of A-weighted sound levels. All sound levels discussed in this report are A-weighted decibels (dBA). Examples of typical noise levels for common indoor and outdoor activities are depicted in Table 2.8-1.

2.8.1.4 Human Response to Changes in Noise Levels

Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dBA when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice or half as loud. A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a road) would result in a barely perceptible change in sound level.

2.8.1.5 Noise Descriptors

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level (L_{eq}) is also referred to as the time-average sound level. It is the equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy as the time-varying sound level during the same time period. The 1-hour A-weighted equivalent sound level, $L_{eq}(h)$, is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the basis for County of San Diego (County) noise policies and standards.

People are generally more sensitive to noise occurring during the evening and nighttime hours. Thus, another noise descriptor used in community noise assessments—the community noise equivalent level (CNEL)—was introduced. The CNEL scale represents a time-weighted, 24-hour average noise level based on the A-weighted sound level. The CNEL accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dBA and 10 dBA, respectively, to the average sound levels occurring during the evening and nighttime hours.

2.8.1.6 Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receiver) is influenced by geometric spreading, ground absorption, atmospheric effects, and shielding by natural and/or built features.

Sound levels attenuate (or diminish) at a rate of approximately 6 dBA per doubling of distance from an outdoor point source due to the geometric spreading of the sound waves. Atmospheric conditions such as humidity, temperature, and wind can also temporarily increase or decrease sound levels. In general, the greater the distance the receiver is from the source, the greater the potential for variation in sound levels due to atmospheric effects. Additional sound attenuation can result from built features such as intervening walls and buildings, and by natural features such as hills and dense woods.

2.8.1.7 Groundborne Vibration Fundamentals

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The strength of groundborne vibration attenuates fairly rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration are peak particle velocity (PPV), in units of inches per second, and velocity decibel (VdB). The calculation to determine PPV at a given distance is as follows:

$$PPV_{distance} = PPV_{ref}*(25/D)^{1.5}$$

Where:

$PPV_{distance}$ = the peak particle velocity in inches per second of the equipment adjusted for distance

PPV_{ref} = the reference vibration level in inches per second at 25 feet

D = the distance from the equipment to the receiver

The velocity parameter (instead of acceleration or displacement) best correlates with human perception of vibration. Thus, the response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square velocity level in VdB units relative to 1 micro-inch per second. As a point of reference, the average person can just barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). The calculation to determine the root-mean square at a given distance is as follows:

$$L_v(D) = L_v(25 \text{ feet}) - 30*\log(D/25)$$

Where:

$L_v(D)$ = the vibration level at the receiver

$L_v(25 \text{ feet})$ = the reference source vibration level

D = the distance from the vibration activity to the receiver

Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB.

2.8.2 Existing Conditions

2.8.2.1 Geographical Setting and Surrounding Land Uses

The Project Area is located in Proctor Valley, a south-sloping valley that encompasses Proctor Valley Road. The Project Area is undeveloped, with on-site elevation ranging between 550 and 1,345 feet above mean sea level. The Project Area is surrounded by San Miguel Mountain and the Jamul Mountains immediately to the northwest and southeast, with the foothills of these mountains encroaching into the Project Area. The eastern portions of Planning Area 16 are located in the Jamul Mountains and contain the highest elevations.

Existing development, including the master planned communities of Eastlake Woods, Bella Lago, Salt Creek Ranch, and Rolling Hills Ranch, is located within approximately 0.5 miles southwest of the Project Area. Commercial centers are located in Eastlake and Rolling Hills Ranch, and regional shopping is located in Otay Ranch. The proposed Village 13 Resort development is located south of the Project Area. The Otay Reservoir System is located south of the Project Area along with the City of San Diego's Multiple Species Conservation Program

(MSCP) "Cornerstone Lands," which are adjacent to the Project Area to the south. To the north and northeast of the Project Area lies the community of Jamul, and to the northwest is Rancho San Diego. Most of the land in the vicinity of the Project Area to the west and east is vacant; some of it consists of gently rolling hills used for agriculture and grazing, and the rest is more rugged, steep open space. Development is primarily concentrated around Rancho San Diego to the north and the rural community of Jamul to the northeast. Jamul is composed of primarily large-lot estates, horse ranches, and agriculture.

The 11,152-acre San Diego National Wildlife Refuge is located to the west of the Project Area. The San Diego National Wildlife Refuge stretches from Jamul to communities in Spring Valley and eastern Chula Vista, and is the U.S. Fish and Wildlife Service's contribution to the MSCP Preserve. The approximately 5,600-acre Rancho Jamul Ecological Reserve is also a component of the San Diego MSCP and is owned and managed by the California Department of Fish and Wildlife. Some state-owned lands are adjacent to the Project Area, with a large block of habitat located to the east of the Project Area.

The Bureau of Land Management manages two separate parcels within the northern portion of the Proctor Valley Parcel of Otay Ranch. The large northern parcel encompasses the Callahan Mountain Peak and some of the tops of side-slopes extending down from the peak.

2.8.2.2 Existing Noise Conditions

The primary existing noise source within the Project Area is vehicular traffic along existing Proctor Valley Road. Proctor Valley Road is a two-lane, partially improved road. The existing traffic volume within the Project Area is approximately 200 average daily traffic (see Appendix 2.9-1, Transportation Impact Study, of this EIR). No other existing noise sources potentially affecting the Proposed Project have been identified.

There are no existing noise-sensitive land uses (NSLUs) ~~immediately adjacent to~~within the Project Area. The nearest existing NSLUs to the Project Area are single-family residences near the southwest boundary of Jamul, located as close as 60 feet to the north, and single-family residences in the Bella Lago community (City of Chula Vista), located approximately 2,900 feet to the southwest.

2.8.2.3 Regulatory Setting

Set forth below are short descriptions of the various federal, state, and local regulations that generally apply to the resource or impact category analyzed in this section of the EIR. This information helps to place the impact analysis within its proper regulatory context. Note, however, that compliance with all applicable regulations is required. For this reason, the EIR does not specifically assess the Proposed Project's ability to comply with such regulations,

except in those instances where a regulatory standard is being used as the threshold for determining impact significance.

Federal

Occupational Safety and Health Administration

With regard to noise exposure and workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 Code of Federal Regulations, Section 1910.95). OSHA specifies that sustained noise that is louder than 85 dBA (8-hour time-weighted average) can be a threat to workers' hearing, and, if worker exposure exceeds this amount, the employer must develop and implement a monitoring program (29 Code of Federal Regulations, Section 1910.95(d)(1)).

State

California Noise Control Act of 1973

Pursuant to Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, the State Legislature finds and declares 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 urban, suburban, and rural areas. As also declared in the California Noise Control Act, the state 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 that is free from noise that jeopardizes their health or welfare.

As with federal standards, state regulations (8 California Code of Regulations, Section 5095) address worker exposure to noise levels. These regulations limit worker exposure to noise levels of 85 dBA or lower over an 8-hour period. The state has not established noise levels for non-work-related environments.

Local

County of San Diego General Plan, Noise Element

The County's General Plan Noise Element establishes noise and land use compatibility standards (Tables N-1 and N-2), and outlines goals and policies to achieve these standards. The County's General Plan Noise Element characterizes the noise environment in the County and provides the context for the County's noise/land use compatibility guidelines and standards. The Noise Element

also describes the County's goals for achieving the standards, and introduces policies designed to implement the goals. Under implementation of the General Plan, the County uses the Noise Compatibility Guidelines to determine the compatibility of land uses when evaluating proposed development projects. The Noise Compatibility Guidelines indicate ranges of compatibility, and are intended to be flexible enough to apply to a range of projects and environments (County of San Diego 2011). See Table 2.8-2, County of San Diego Land Use Compatibility Guidelines.

Noise levels identified as "normally acceptable" for a land use (Table 2.8-2) indicate that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can carry out outdoor activities with minimal noise interference. Noise levels identified as "conditionally acceptable" for a land use should have an acoustical study performed 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 noise levels identified as "conditionally acceptable" for a land use, structures must be able to attenuate the exterior noise to the indoor noise level, as indicated in the County's Noise Standards. For land uses where the exterior noise levels fall within the "unacceptable" range, new construction generally should not be undertaken.

County of San Diego Noise Ordinance

The County's Noise Ordinance (Code of Regulatory Ordinances Title 3, Division 6, Chapter 4, Sections 36.401–36.435, Noise Ordinance) establishes prohibitions for disturbing, excessive, or offensive noise, as well as provisions such as sound level limits for securing and promoting the public health, comfort, safety, peace, and quiet for its citizens. Planned compliance with sound level limits and other specific parts of the Noise Ordinance allows for the presumption that the noise is not disturbing, excessive, or offensive. Limits are specified depending on the zoning placed on a property (e.g., varying densities and intensities of residential, industrial, and commercial zones). Where two adjacent properties have different zones, the sound level limit on the boundary between the two properties is the arithmetic mean of the respective limits for the two zones. It is unlawful for any person to cause or allow the creation of any noise that exceeds the applicable limits of the Noise Ordinance at any point on or beyond the boundaries of the property on which the sound is produced.

Section 36.404 of the County Noise Ordinance contains sound level limits specific to receiving land uses. Sound level limits are in terms of a 1-hour average sound level. The allowable noise limits depend on the County's zoning district and time of day. Table 2.8-3 presents the County's Noise Ordinance sound level limits per zone. The Project Area falls under Zone 7, S88 Specific Planning Areas.

Section 36.408 of the County Noise Ordinance sets limits on the time of day and days of the week that construction can occur, and sets noise limits for construction activities. The Noise Ordinance prohibits operating construction equipment on the following days and times:

- Mondays through Saturdays, except between 7 a.m. and 7 p.m.
- Sundays and days appointed by the president, governor, or board of supervisors for a public fast, Thanksgiving, or other holiday.

In addition, Section 36.409 of the County Noise Ordinance requires that between 7 a.m. and 7 p.m., no equipment can be operated that would cause an 8-hour average construction noise level to be in excess of 75 dBA when measured at the boundary line of the property where the noise source is located, or on any occupied property where the noise is being received. In addition to the general limitations on sound levels discussed above, the maximum sound level limitations shown in Table 2.8-4 apply to impulsive noise from construction equipment, per County Noise Ordinance Section 36.410.

Additional sound level limitations are provided in Section 36.410 of the County Noise Ordinance, as follows:

> In addition to the general limitations on sound levels in Section 36.404 and the limitations on construction equipment in Section 36.409, the following additional sound level limitations shall apply:
>
> (a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 2.8-4, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period, as described in Section 36.410(c) of the County's Noise Ordinance. The maximum sound level depends on the use being made of the occupied property. The uses in Table A are as described in the County Zoning Ordinance.

Table A
County of San Diego Noise Ordinance, Section 36.410, Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels

Occupied Property Use	dBA
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 2.8-4, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period, as described [in Section 36.410(c) of the County's Noise Ordinance]. The maximum sound level depends on the use being made of the occupied property. The uses in Table B are as described in the County Zoning Ordinance.

Table B
County of San Diego Noise Ordinance, Section 36.410, Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels for Public Road Projects

Occupied Property Use	dBA
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

Otay Ranch General Development Plan/Otay Subregional Plan

One main purpose of Otay Ranch GDP/SRP's noise goals, objectives, and policies is to provide general guidelines to protect Otay Ranch residents from the adverse effects of unwanted sound. Policy directions are provided to control noise at its source, along its transmission path, and at the receiver site. The following policies from the Otay Ranch GDP/SRP apply to noise (County of San Diego 1993):

Goal: Promote a quiet community were residents live without noise which is detrimental to health and enjoyment of property.

Goal: Ensure residents are not adversely affected by noise.

Objective: Otay Ranch shall have a noise abatement program to enforce regulations to control noise.

Policy: Prohibit excessive noises which are a detriment to the health and safety of residents.

Policy: Limit noise at the source, along the path of transmission and/or at the receiver site.

Policy: Reduce the need for noise mitigation through site and land use planning techniques, whenever feasible.

Policy: Consider the effects of noise, especially from transportation, in land use decisions to ensure noise compatibility.

Policy: Comply with applicable noise ordinances and performance standards in zoning ordinances.

Policy: Use the Environmental Review Process to evaluate the effects of noise.

Policy: Regularly review technological developments and building techniques which decrease the project related noise impacts on site and off site and specify needed noise mitigation measures.

City of Chula Vista

Although the Project Area is located within unincorporated County of San Diego, the majority of Proposed Project traffic is predicted to travel along City of Chula Vista (City) arterial roads, coming to and from the Project Area. For this reason, City noise regulations are included herein and used in the assessment of off-site impacts to noise-sensitive land uses located in the City.

City of Chula Vista General Plan Environmental Element

The City of Chula Vista's General Plan Environmental Element outlines the City's exterior land use noise compatibility guidelines (see Table 2.8-5). These guidelines reflect the levels of noise exposure that are considered to be compatible with various types of land uses (City of Chula Vista 2005).

City of Chula Vista Performance Standards and Noise Control

Chapter 19.68 of the City's Zoning Code provides the City's performance standards and Noise Control Ordinance. Section 19.68.030 of the City's Noise Control Ordinance contains exterior noise limits specific to receiving land uses. The allowable noise limits depend on the City's zoning district and time of day. Table 2.8-6 lists the exterior noise limits for the City and Table 2.8-7 lists the interior noise limits for the City.

City of Chula Vista Municipal Code, Title 17 (Environmental Quality)

Title 17 of the Chula Vista Municipal Code (Environmental Quality), Chapter 24, addresses managing noisy and disorderly conduct. Section 17.24.040.C.8 specifically addresses restrictions against generation of construction noise in overnight periods. The use of any tools, power machinery, or equipment, or the conduct of construction and building work in residential zones that would cause noise disturbing to the peace, comfort, and quiet enjoyment of property of any person residing or working in the vicinity, are prohibited between 10 p.m. and 7 a.m., Monday through Friday, and between 10 p.m. and 8 a.m., Saturday and Sunday, except when the work is necessary for emergency repairs required for the health and safety of any member of the community (City of Chula Vista 2010).

2.8.3 Analysis of Project Effects and Determination as to Significance

Methodology

Noise Measuring Methodology and Procedures

The existing noise environment in the Project Area was measured on May 6, 2015. Noise measurements were taken with calibrated Rion NL 32 integrating sound level meters using A-weighting and "slow" response settings. The sound level meters are equipped with a 0.5-inch pre-polarized condenser microphone and pre-amplifier. The sound level meters meet the current American National Standards Institute standard for a Type 1 precision sound level meter. The sound level meters were positioned at a height of approximately 5 feet above the ground during the noise measurements. Eleven noise measurement locations that represent key potential sensitive receptors or sensitive land uses were selected along Proctor Valley Road within the Project Area and adjacent to other roadways projected to carry potentially significant Proposed Project traffic volumes. These locations are depicted as M1 through M11 in Figure 2.8-1, Noise Measurement Locations. A description of the noise measurement locations and the results of the noise measurements are presented in Table 2.8-8, Noise Measurement Results.

Noise Modeling Software

The vehicle noise level from Proctor Valley Road within the Project Area and along other roadway segments projected to carry potentially significant Proposed Project traffic volumes was calculated using the Federal Highway Administration's Traffic Noise Model (TNM) Version 2.5 (FHWA 2004). TNM sound modeling input/output data are included in Appendix C of the Acoustical Analysis Report, which is included as Appendix 2.8-1 of this Draft EIR.

Noise Calculations

Traffic Noise Modeling Screening

Because of the size of the off-site traffic impact analysis area and the number of associated roadway segments (see Appendix 2.9-1), a preliminary screening analysis was performed to estimate the relative increase in traffic noise from the Proposed Project. Roadway segments with an estimated increase in noise levels of 0.5 dBA or more based on average daily traffic volumes (either in the Existing Plus Project scenario or the Year 2030 with Project [i.e., Year 2030 Cumulative Conditions] scenario) were modeled using the TNM to determine the potential for a significant noise impact. Roadway segments with an estimated increase in noise levels of less than 0.5 dBA were not modeled using the TNM. The off-site roadway segments and modeled receivers were analyzed using the TNM, and the input data are listed in Table 2.8-9 and shown in Figure 2.8-2.

Modeled vehicle speeds were based on the posted speed limits. The modeled vehicle mix of 97% automobiles, 2% medium trucks, and 1% buses was based on the vehicle counts conducted in concurrence with the field noise measurements.

2.8.3.1 Noise-Sensitive Land Uses Affected by Airborne Noise

Noise generated as a result of the Proposed Project potentially would affect NSLUs located within the County and the City. Accordingly, in assessing Proposed Project impacts, the analysis applies the significance criteria specific to each respective jurisdiction. That is, for impacts within the County, the County criteria were applied, and for impacts within the City, the City's criteria were applied. The relevant criteria for each jurisdiction are presented below.

Guidelines for the Determination of Significance

County of San Diego

For the purpose of this EIR, the County's Guidelines for Determining Significance: Noise applies to the noise impact analysis. Based on the guidelines, the Proposed Project would result in a significant impact if it would result in the exposure of any on- or off-site existing or reasonably foreseeable future NSLU to exterior or interior noise in excess of any of the following (County of San Diego 2009a):

A. Exterior Locations:
    i. 60 dB (CNEL) (Single-Family Residential); 65 dB (CNEL) (Multi-Family Residential, Mixed-Use, Schools, Passive Recreation Parks, etc.); or
    ii. An increase of 10 dB (CNEL) over pre-existing noise.

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

1. Net lot area up to 4,000 square feet: 400 square feet
2. Net lot area 4,000 square feet to 10 acres: 10% of net lot area
3. Net lot area over 10 acres: 1 acre

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

45 dB (CNEL) except for the following cases:

i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 dB(A).

ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

A potentially significant noise increase is defined as an increase of 10 dBA CNEL above existing conditions, as stated in the County's Guidelines for Determining Significance: Noise, Section 4.1-A(ii) (County of San Diego 2009a). However, the County's Report Format and Content Requirements: Noise, Section 2.3, includes a statement that a "doubling of sound energy" is considered a significant impact at a "documented noisy site" (County of San Diego 2009b). A doubling of sound energy is equivalent to a 3 dBA increase. Based on the County's Noise Compatibility Guidelines (Table N-1) and related Noise Standards (Table N-2) in the County's General Plan Noise Element, a documented noisy site is a location with an NSLU that currently exceeds 60 dBA CNEL in the case of single-family residences, 65 dBA CNEL in the case of multi-family or mixed-use residences, and 70 dBA in the case of office/professional uses (County of San Diego 2011).

Thus, a substantial increase is defined as a 10 dBA increase or greater over existing noise levels when existing and future noise levels are below the County's General Plan Noise Compatibility Guidelines and Noise Standards, or a 3 dBA increase when existing or future noise levels equal or exceed the County's General Plan Compatibility Guidelines and Noise Standards.

Cumulative Noise Impact Criteria

Based on the guidance contained in the County's Report Format and Content Requirements, Noise (County of San Diego 2009b):

> Cumulative noise impacts may occur in discretionary applications where other permitted or planned projects will combine to exceed the standards of the Noise Element. It is more likely to occur in locations where existing noise levels are elevated or approach the applicable criterion of 60 dBA CNEL for an exterior noise-sensitive land use (NSLU).

Further (County of San Diego 2009b):

> Mitigation measures are required to reduce potential 'Cumulatively Considerable' impacts. Evaluation of mitigation feasibility and limitations shall be addressed in association with their implementation. A 'cumulatively considerable' contribution requiring mitigation or design measures is identified whenever … more than a one decibel increase from the project was identified in the model analysis.

By inference, "more than a one decibel increase" implies a 2 dBA or greater increase (when comparing Existing Plus Cumulative versus Existing Plus Cumulative Plus Project).

City of Chula Vista

Based on the City's noise guidelines and ordinance (City of Chula Vista 2005, 2015), the Proposed Project would result in a significant noise impact if it would result in the exposure of any on- or off-site existing or reasonably foreseeable future NSLU within the City of Chula Vista corporate boundaries to noise levels exceeding the exterior land use noise compatibility guidelines outlined in Table 2.8-5, or to exterior/interior noise levels exceeding the limits set forth in Tables 2.8-6 and 2.8-7.

Analysis

On-Site Traffic Noise

In the future, vehicular traffic on Proctor Valley Road is anticipated to be the primary noise source that would affect the Project Area. Using the TNM, the Future (Year 2030 Buildout) Plus Project traffic noise levels were modeled for locations representative of the exterior living areas (i.e., future rear yards, side yards, patios) of the parcels along Proctor Valley Road (shown in Figure 2.8-3, Modeled On-Site Receiver Locations). The results of the noise modeling conducted for the proposed on-site NSLUs under the Existing Plus Project and Future (Year 2030) Plus Project scenarios are shown in Table 2.8-10.

The traffic noise modeling results indicate that Future Plus Project traffic noise levels would exceed the County's exterior noise standard of 60 dBA CNEL along some of the outdoor residential living areas located near Proctor Valley Road. Therefore, on-site traffic noise levels

would result in a **potentially significant impact** (**Impact-N-1**). Proposed noise barriers (i.e., sound walls) are shown in Figure 2.8-4, Soundwall Locations.

Noise levels at the proposed school site, parks, and the mixed-use area would not exceed the County's 65 dBA CBEL noise standard.

The County requires that interior noise levels not exceed a CNEL of 45 dBA. Typically, with the windows open, building shells provide approximately 15 dBA of noise reduction; thus, an exterior noise level exceeding 60 dBA has the potential to result in interior noise levels above 45 dBA. The noise levels at second floor façades[1] of the proposed residences facing Proctor Valley Road are shown in Table 2.8-11. As shown in Table 2.8-11, noise levels would exceed the County's exterior noise standard at 23 of the 27 modeled representative second-floor receivers in the Future Plus Project scenario. The second-floor exterior noise level would range from 55 to 69 dBA CNEL at proposed residential lots, which implies that interior noise levels at second-floor elevations would range from approximately 40 to 54 dB CNEL. Therefore, the interior noise level for habitable spaces would exceed the County's 45 dBA CNEL interior noise criterion, resulting in a **potentially significant traffic noise impact (Impact N-2)**.

Off-Site Traffic Noise

The Proposed Project would result in additional vehicle trips on adjoining roadways, which potentially could result in significant noise increases. Noise modeling was conducted at 18 representative NSLUs adjacent to roadways with a potential for a significant noise increase. As shown in Table 2.8-12, the off-site traffic noise modeling results indicate that Existing Plus Project traffic noise levels would range from approximately 48 dBA CNEL at receiver R9 (representing residences along Hunte Parkway between Olympic Parkway and Eastlake Parkway) to approximately 65 dBA CNEL at receiver R1 (representing residences along San Miguel Ranch Road west of State Route 125). Future Plus Project noise levels would range from approximately 52 dBA CNEL at receiver R11 (residences along Northwoods Drive between Proctor Valley Road and Blue Ridge Drive) to 67 dBA CNEL at receiver R1.

Noise level increases as a result of the Proposed Project are also shown in Table 2.8-12. The increase in noise levels as a result of the Proposed Project ranges from 0 to 5 dBA; however, in one instance, at a location within the County (receiver M8/R14, a cluster of several rural residential properties located on the north side of Proctor Valley Road, north of the Proposed Project and west of Melody Road; see Figure 2.8-5, Off-Site Noise Impacts – M8/R14), the Existing Plus Project scenario would be 12 dBA higher than the existing scenario.

[1] It is not known at this time which of the residential lots would have second floors and/or second-floor balconies facing Proctor Valley Road; second-floor noise exposures were conservatively assumed for all of the modeled on-site receiver locations.

The noise level at M8/R14 would increase from 39 dBA CNEL in the existing condition to 51 dBA CNEL in the Existing Plus Project condition. The 12 dBA increase in the Existing Plus Project scenario versus the existing scenario is because Proctor Valley Road currently carries very low existing traffic volumes, as shown in Table 3.2a of Appendix 2.9-1 of this EIR. The baseline for a project is typically the condition that exists when the Notice of Preparation is published; therefore, the unimproved, low-traffic volume on Proctor Valley Road is considered the existing roadway condition in this analysis. However, as discussed in Section 2.8.4, Cumulative Impact Analysis, in comparing the Future (Year 2030 Cumulative Condition) traffic noise level at M8/R14 with the Future (Year 2030 Cumulative Condition) Plus Project traffic noise level, the incremental increase resulting from the Proposed Project at this location would only be 1 dBA (Proctor Valley Road would be improved by 2030). In the context of community noise, 1 dBA is not an audible change and is considered less than significant.

Nonetheless, based on the County's Guidelines for Determination of Significance, because the Proposed Project would increase noise levels greater than 10 dBA over existing levels, the Proposed Project would result in a **potentially significant impact** in the form of a substantial noise increase at residential receiver M8/R14, located north of the Proposed Project along Proctor Valley Road and west of Melody Road (**Impact N-3**).

Modeled receivers R1 through R13 are located in the City of Chula Vista, which has an exterior noise standard of 65 dB CNEL (City of Chula Vista, 2005). The Proposed Project would not cause any of the receivers located in the City of Chula Vista to exceed the City of Chula Vista's noise standard of 65 dBA CNEL.

The potential for traffic noise impacts to vehicles using the proposed connection to Whispering Meadows Lane (to Melody Road) was also analyzed. Due to the resulting circuitous route that would be required for residents within Village 14 and a majority of Planning Area 16 to access the connection, seven Proposed Project vehicle trips in the AM peak hour and nine Proposed Project vehicle trips in the PM peak hour are anticipated to use the Whispering Meadows Lane connection on a typical day. Such a low volume of vehicles would not alter the hourly or daily levels of traffic noise on Whispering Meadows Lane, particularly given the low vehicle speeds associated with this roadway type.

Receivers R14 through R18 are located in the County of San Diego. The Proposed Project would cause one of the modeled representative receivers located in the County of San Diego (M8/R14) to exceed the County's noise standard of 60 dBA CNEL. Specifically, the traffic noise level at receiver M8/R14 is estimated to increase by 1 dBA (from 60 dBA CNEL to 61 dBA CNEL) as a result of the Proposed Project under Year 2030 conditions. However, as stated above, in the context of community noise, 1 dBA is not an audible change, and the impact would be **less than significant**.

2.8.3.2 Project-Generated Airborne Noise

Guidelines for the Determination of Significance

Based on the County's Guidelines for Determining Significance: Noise (County of San Diego 2009a), the Proposed Project would result in a significant impact if the Proposed Project would generate airborne noise that, together with noise from all sources, would be in excess of any of the following:

A. Non-Construction Noise (Operational): The limit specified in San Diego County Code Section 36.404, General Sound Level Limits, at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

   Section 36.404 includes sound level limits for non-construction-related stationary noise sources, i.e., 1-hour average sound level limits for a project's operational-related noise sources, such as mechanical equipment (pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment), operation-related traffic (vehicle movement, engine noise), speakers, bells, chimes, and outdoor human activity in defined limited areas.

   The allowable noise limits depend on the zoning district and time of day. The 1-hour average sound level limits for residential-zoned areas with a density of 11 or less dwelling units per acre is 50 dBA from 7:00 a.m. to 10:00 p.m., and 45 dB between 10:00 p.m. and 7:00 a.m.[2] If the measured ambient noise level exceeds the applicable limit noted above, the allowable 1-hour average noise levels shall be the ambient noise level.

B. Construction Noise: The standards listed in San Diego County Code Section 36.409, Sound Level Limitations on Construction Equipment. Section 36.409 states (County of San Diego 2008):

   > Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

C. Impulsive Noise: The standards listed in San Diego Code Section 36.410, Sound Level Limitations on Impulsive Noise. Section 36.410 states (County of San Diego 2008):

   > In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

[2] Based on Table 1, Site Utilization Plan – Land Use Summary, of the San Diego County Code, this is the appropriate standard.

i. Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds 82 dBA for residential, village zoning or civic use, and 85 dBA for agricultural, commercial or industrial use.

ii. Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds 85 dBA for residential, village zoning or civic use, and 90 dBA for agricultural, commercial or industrial use.

iii. The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

Analysis

Non-Construction Noise (Operational)

The Proposed Project's operational noise sources would include a potential elementary school; neighborhood parks and private recreational facilities; and operation of heating, ventilation, and air conditioning (HVAC) units at each of the single-family homes.

Relative to the elementary school site, neighborhood parks and private recreational facilities, these uses would be subject to compliance with the County Noise Ordinance. Therefore, through compliance with the County Noise Ordinance, impacts would be **less than significant**.

The Proposed Project is still in its preliminary design stages, and the specific HVAC units, screening, and configurations are not yet known. Noise levels from HVAC equipment can vary substantially depending on unit efficiency, size, and location, but generally range from 50 to 65 dBA L_{eq} at a distance of 50 feet (City of Santa Ana 2010). Assuming a typical attenuation rate of 6 dBA per doubling of distance for point-source noise sources, noise levels attributed to unshielded HVAC mechanical systems could exceed the County's daytime property line noise limit for residential land uses (50 dBA L_{eq}) within 250 feet of the source. In addition, sources within 450 feet of a residentially zoned property line could exceed the County's nighttime noise

limit (i.e., 45 dBA L_{eq}) for stationary source noise. As a result, noise from HVAC equipment under the Proposed Project would be a **potentially significant impact** (**Impact N-4).**

Construction Noise

Construction noise and vibration are temporary. Construction noise and vibration levels would vary from hour-to-hour and day-to-day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor. The Proposed Project's construction activities would include the following:

- Site preparation. Noise sources could include crawler tractors, loaders, and a grinder.
- Grading. Noise sources could such equipment as crawler tractors, excavators, graders, loaders and backhoes, drill rigs, water trucks, and off-highway trucks.
- Building construction. Noise sources could include cranes, forklifts, tractors, loaders, backhoes, and generator sets.
- Trenching (utilities). Noise sources could include excavators, tractors, loaders, backhoes, and water trucks.
- Architectural coatings. Noise sources could include air compressors.
- Paving. Noise sources could include pavers, paving equipment (i.e., oilers, sweepers), loaders, water trucks, rollers, and scrapers.
- Brush maintenance/landscaping. Noise sources could include loaders, dump trucks, water trucks, rollers, and trenchers.

To assess the potential noise effects of construction activities, this noise analysis used data from an extensive field study by the U.S. Environmental Protection Agency of various types of industrial and commercial construction projects (EPA 1971). Noise levels associated with construction phases, assuming pertinent equipment is present and operating at a reference distance of 50 feet, are shown in Table 2.8-13. Because of vehicle technology improvements and stricter noise regulations since the field study was published in 1971, these levels likely are overstated. Nonetheless, this analysis conservatively uses these noise levels, as shown in Table 2.8-13, in assessing potential impacts. This information indicates that the overall (hourly) average noise level generated on a construction site could be 89 dBA at a distance of 50 feet during the excavation and finishing phases. The noise levels presented are value ranges; the magnitude of construction noise typically varies over time because construction activity is intermittent and the power demands on construction equipment (and the resulting noise output) are cyclical. Typically, a 12-hour L_{eq} would be lower than an hourly L_{eq}.

Construction may also involve blasting to break up bedrock close to the ground surface. Typically, most of the noise generated by blasting is very low in frequency—below the frequency range audible to humans.

Noise levels generated by construction equipment (or by any point source) decrease at a rate of approximately 6 dBA per doubling of distance from the source (Harris 1979). The loudest construction activities associated with on-site construction of the Proposed Project would be during excavating, grading, and finishing (approximately 89 dBA at 50 feet), and on-site construction noise would be approximately 83 dBA at 100 feet, 77 dBA at 200 feet, 71 dBA at 400 feet, and so on. Intervening structures that block the line of sight, such as buildings, would further decrease the resultant noise level by a minimum of 5 dBA. The effects of molecular air absorption and anomalous excess attenuation would further reduce the noise level from construction activities at more distant locations at the rates of 0.7 dBA and 1 dBA per 1,000 feet, respectively.

Construction Noise Impact to Off-Site Residences

The Proposed Project has the potential to result in short-term noise impacts at off-site residential NSLUs as a result of construction of off-site improvements to Proctor Valley Road and development of Proctor Valley Village 14.

Proctor Valley Road Improvements

As part of the Proposed Project, the currently unimproved Proctor Valley Road would be improved approximately from east of Northwoods Drive/Agua Vista Drive in Chula Vista to Echo Valley Road in Jamul. Additional infrastructure would be constructed within the Proctor Valley Road easement, including a sewer, water, and dry utility extension; a sewer pump station; and the Proctor Valley Community Pathway. The nearest existing NSLUs to the Proctor Valley Road improvements are several single-family residences along Proctor Valley Road near Echo Valley Road in Jamul, approximately 60 feet away from the northern extent of roadway improvements. Additionally, existing single-family residences are located approximately 140 feet away from the westerly extent of proposed off-site Proctor Valley Road improvements, adjacent to Proctor Valley Road at Northwoods Drive/Agua Vista Drive in the City of Chula Vista.

The nearest existing NSLUs are shown in Figure 2.8-6, Nearest Existing Off-Site Noise-Sensitive Land Uses. Construction of the Proctor Valley Road improvements would result in noise levels as high as 87 dBA L_{eq} at the nearest existing residences 60 feet away, and as high as 80 dBA L_{eq} at the next-nearest existing residences 140 feet away. Because construction work is cyclical, the 8-hour average noise levels would be lower. Nonetheless, construction associated with the Proposed Project would likely result in exceedances of the County's 75 dBA $L_{eq(8\text{-}hr)}$

noise standard at the nearest property of existing NSLUs in Jamul (unincorporated San Diego County). This would be a **potentially significant impact (Impact N-5)**.

Furthermore, although the City of Chula Vista does not have a construction noise level threshold, noise from construction operations at the nearest existing residence in Chula Vista would exceed existing ambient noise levels and, potentially, constitute a temporary substantial noise increase. Therefore, this would be a **potentially significant impact (Impact N-6)**.

In addition, the Proctor Valley Road North Option described in Chapter 1, Project Description, includes the addition of two dedicated bike lanes (one on each side of the road) along the portion of Proctor Valley Road from Street AA in the North Village to Echo Valley Road, which would result in an increased right-of-way width from 40 feet to 64 feet. If chosen by the Board of Supervisors, the Proctor Valley Road North option would not result in additional construction noise impacts because these improvements would use the same equipment as analyzed above.

Proctor Valley Village 14 and Planning Areas 16 / 19

The nearest existing NSLUs to the Project Area are single-family residences located near the southwest boundary of Jamul, located as near as 60 feet to the north, and single-family residences approximately 2,900 feet to the west of the Project Area (in the Bella Lago community of Chula Vista). Proposed Project construction would result in noise levels as high as approximately 87 dBA L_{eq} at the nearest existing residences 60 feet away, and approximately 49 dBA L_{eq} at the next-nearest set of existing residences 2,900 feet away. Because construction work is cyclical, the 8-hour average noise levels would be lower. Nonetheless, construction associated with the Proposed Project would likely result in exceedances of the County's 75 dBA $L_{eq(8\text{-}hr)}$ noise standard at the nearest existing property of an NSLUs in Jamul (unincorporated San Diego County); therefore, this would be a **potentially significant impact** (**Impact N-7**).

At the nearest existing residences in Chula Vista, the City of Chula Vista does not have a construction noise level threshold; moreover, noise from construction operations would be relatively low compared to existing ambient noise levels. Therefore, this impact would be **less than significant**.

Construction Noise Impact to Adjacent On-Site Residences

Because construction of the Proposed Project would be a multi-year endeavor, portions of the development would be completed and occupied during construction of subsequent portions (phases). Therefore, the occupied Proposed Project phases have the potential to be impacted by noise from ongoing construction activities. Location-specific phasing schedules are not available at this time, and it is possible that construction of a new phase of the Proposed Project could take place as near as 50 feet from an occupied phase. In such an instance, short-term noise levels as

high as 89 dBA L_{eq} could result. Because construction work is cyclical, the 8-hour average noise levels would be lower. Nonetheless, construction associated with the Proposed Project could result in exceedances of the County's 75 dBA $L_{eq(8\text{-}hr)}$ noise standard. This would be a **potentially significant impact (Impact N-8)**.

The Perimeter Trail Option descried Chapter 1, Project Description, if chosen by the Board of Supervisors, would not result in additional construction noise impacts because these improvements would use the same equipment as analyzed above. The Preserve Trail Option would not result in any improvements and, therefore, no impacts due to construction noise would occur.

Impulsive Noise

Impulsive noise sources associated with construction activities could include rock drilling and blasting. Pile-driving is not anticipated to be necessary as part of the Proposed Project.

It is preliminarily estimated that approximately 5,354,227 cubic yards of rock would be blasted during the early stages of excavation and mass grading for Phase 1 (January 2018 through December 2024) of the Proposed Project, and that approximately 1,778,632 cubic yards of rock would be blasted during the early stages of excavation and mass grading for Phase 2 (December 2020 through November 2027) (TM 5616).

Blasting (and the associated drilling that precedes blasting) would be limited to between 7 a.m. and 7 p.m.. Based on preliminary estimates (Hunsaker 2017), potential areas where rock blasting may be necessary are located within approximately 140 feet of existing noise- and vibration-sensitive land uses (in this case, residences located to the north of the Project Area). The next-closest area where rock blasting may be necessary are residences located approximately 1,100 feet west of the Project Area. Construction blasting generates a maximum noise level of approximately 94 dBA at a distance of 50 feet (FHWA 2006). This source noise level is used in this analysis because it provides a reasonable estimate of the construction blasting noise level. However, the noise level would vary depending on various factors, as more fully described in the following text. The blast would generally be perceived as a dull thud rather than as a loud explosion.

U.S. Bureau of Mines: The United States Bureau of Mines has an impact guide for structural response to vibration (USBM 1989). The criteria are well accepted for all types of ground vibration, and are based on the peak particle velocity (PPV) to receiving structures. The potential for damage to residential structures is greater with low-frequency blast vibrations (below 40 Hertz (Hz)) than with high-frequency blast vibrations (40 Hz and above). For low-frequency blast vibrations (below 40 Hz), a vibration limit of 0.75 inches per second for modern drywall construction and 0.50 inches per second for older plaster-on-lath construction is recommended. For high frequencies (above 40 Hz), a limit of 2 inches per second for all types of construction is recommended.

The United States Bureau of Mines also published a document regarding recommendations for maximum safe air overpressure levels for blasting. This document recommends a maximum safe air overpressure of 134 dBA (linear) for residential structures (USBM 1980). The first occurrence of air-blast damage is usually the breakage of poorly mounted windows at approximately 152 dBA (linear) (Caltrans 2004). The response and annoyance problem from air-blast is primarily caused by wall and window rattling and the resulting secondary noises. The recommended levels are considered low enough to preclude damage to residential structures, but they may not address the annoyance of individuals.

County of San Diego Blasting Permit: Prior to blasting activities, a blasting permit would be required to be obtained from the County, as defined in Section 96.1.202 in the County Code of Regulatory Ordinances, which would ensure that all blasting is conducted according to the County Code and minimizes adverse effects to safety. The permit is issued in accordance with the California Health and Safety Code requirements. As part of the permit conditions, pre-blast notifications to all residences and businesses within 600 feet of the blast site, pre-blast structure survey inspections for structures within 300 feet, pre-blast inspection reports, seismograph monitoring of the nearest structure within 600 feet, and post-blast inspections are required.

Blasting involves drilling a series of bore holes and placing explosives in each hole. By limiting the amount of explosives in each hole, the blasting contractor can limit the total energy released at any single time, which, in turn, can reduce noise and vibration levels. Rock drilling generates impulsive noise from the striking of the hammer with the anvil within the drill body, which drives the drill bit into the rock. Rock drilling generates noise levels of approximately 80 to 98 dBA L_{max} at a distance of 50 feet. Given a typical work cycle, this would equate to 78 dBA L_{eq} at 50 feet. Assuming a noise level of 98 dBA L_{max} at 50 feet, the noise level from rock drilling would be less than the County noise standard for impulsive noise at a distance of approximately 350 feet.

When explosive charges detonate in rock, most of the energy from the explosion is used in breaking and displacing the rock mass. However, some blast energy escapes into the atmosphere as a sequence of airborne sound waves, a phenomenon known as “air-blast overpressure.” These sound waves are very low frequency, below the audible range. Very high air-blast overpressure levels can rattle or, in some cases, break windows. However, air-blast overpressure rarely reaches levels that could cause building damage with modern blasting practices. Specific locations where blasting may be necessary, and other details such as blast-charge weights for the Proposed Project, are not known at this time. Thus, air-blast overpressures cannot be reliably predicted. However, based on a preliminary estimate of the nearest potential areas where rock blasting may be necessary within approximately 140 feet of existing residences, a maximum noise level of up to 89 dBA L_{max} from the rock drilling and up to 85 dBA L_{max} from the blasting could occur. These levels would exceed the County’s threshold of significance for impulsive

sounds at residential land uses of 82 dBA L_{max}. Therefore, for purposes of this analysis, impulsive impacts associated with blasting would be **potentially significant (Impact N-9)**.

Portable Rock-Crushing/Processing Facility

A portable rock-crushing/processing facility would be used during on-site construction activities. Typically, rock-crushing operation would begin with a front-end loader picking up material and dumping the material into a primary crusher. The material would then be crushed, screened, and stacked in product piles. The material would be stockpiled adjacent to the rock-crushing equipment. Crushed rock material would be used within the Project Area. Electric power would most likely be provided by a diesel-engine generator. Based on noise measurements that have been conducted for portable rock-crushing operations, the rock-crushing activity would generate a 1-hour average noise level of approximately 80 dBA at a distance of 100 feet from the primary crusher. The primary crusher would also generate impulsive noise events. Maximum noise levels associated with the primary crusher could reach approximately 88 dBA at 100 feet (ICF International 2011). At a distance of 250 feet, the average noise level from a typical rock-crushing operation would be reduced to below County of San Diego 8-hour construction noise and impulsive noise thresholds. Ideally, however, rock-crushing equipment should be located farther than this where possible to minimize annoyance to nearby NSLUs.

The closest existing off-site Planning Area 19 residential property line or boundary line of an NSLU could be located within approximately 140 feet of the proposed rock crushing. At this distance, the noise level (both 8-hour average and impulsive noise) associated with the rock-crushing activities would be approximately 77 dBA L_{eq} and approximately 85 dBA $L_{max.}$. These noise levels would exceed County of San Diego 8-hour construction noise and impulsive noise thresholds, and therefore would be a **potentially significant impact** (**Impact N-10**).

2.8.3.3 Groundborne Vibrations

Guidelines for the Determination of Significance

Based on the County's Guidelines for Determining Significance: Noise (County of San Diego 2009a), the Proposed Project would result in a significant groundborne vibration and noise impact if the Proposed Project would expose NSLUs to groundborne vibration or noise levels equal to or exceeding designated levels. The identified land use types and corresponding vibration and noise levels are listed in Tables 2.8-14 and 2.8-15.

As listed in Table 2.8-14, criteria from the California Department of Transportation (Caltrans) would be used for pile drivers and transient sources such as those associated with Proposed Project construction, but pile driving is not anticipated for the Proposed Project. For the purposes

of this vibration analysis, impacts from general construction would occur if vibration levels exceed 0.0040 inches per second root mean square (County of San Diego 2009a).

Analysis

Operations

No operational components of the Proposed Project would include significant groundborne noise or vibration sources, and no substantial vibration sources currently exist, or are planned, in the Project Area. Thus, operational groundborne noise or vibration impacts would be **less than significant**.

Construction

In general, on-site construction equipment that would cause the most groundborne vibration and noise would be associated with site grading and pile driving for foundations. For the Proposed Project, no pile driving is anticipated. Groundborne vibration associated with blasting is anticipated, and is addressed separately below. During grading, the largest groundborne vibration levels are anticipated to be generated by large bulldozers and loaded trucks used for earthmoving. According to the Federal Transit Administration, vibration levels associated with the use of bulldozers range from approximately 0.003 to 0.089 inches per second PPV and 58 to 87 VdB at 25 feet, as shown in Table 2.8-16. Additionally, loaded trucks used for soil hauling during grading could generate vibration levels of approximately 0.076 inches per second PPV and vibration levels of 86 VdB at 25 feet. According to the Federal Transit Administration's methodology for determining vibration propagation, vibration levels would exceed County-recommended Caltrans thresholds for residences, which is 0.004 PPV inches per second root mean square (RMS), within 190 feet of large bulldozers and 170 feet of loaded trucks (FTA 2006).

The nearest NSLUs to Proposed Project construction activities that could produce high vibration levels would be at the same residences to the north and west of off-site Proctor Valley Road improvements in Jamul and the City of Chula Vista, identified as part of the construction noise impact assessment, above, located approximately 60 feet and 140 feet away. At a distance of 60 feet and greater, vibration levels from grading activities are anticipated to exceed 0.004 inches per second RMS or 0.1 inches per second PPV at the nearest off-site residences. This would be a **potentially significant impact** (**Impact N-11**).

Because construction of the Proposed Project would be a multi-year endeavor, portions of the development would be completed and occupied during construction of subsequent portions (phases). Therefore, the occupied Proposed Project phases have the potential to be impacted by vibration from ongoing construction activities. Location-specific phasing schedules are not available at this time; it is, therefore, possible that construction of a new phase of the Proposed Project could take place as near as 50 feet from an occupied phase. In such an instance, short-term vibration levels as high as 0.03 inches per second RMS could result. Therefore, vibration

levels from grading activities may exceed 0.004 inches per second RMS at the nearest on-site residence. This would be a **potentially significant impact (Impact N-12**).

Blasting

Due to the geologic character of the Project Area, blasting and/or on-site rock breaking is anticipated during site preparation activities for the Proposed Project. Thus, construction-related blasting activities may result in significant groundborne vibration or groundborne noise impacts. A Blasting Study is required prior to construction that must be approved by the County of San Diego, which will address on-site measures. At the current stage of Proposed Project design, a Blasting Study has not been completed, and no specific blasting timelines or blast numbers are available. However, it is anticipated (based on prior projects) that blasting would occur at 2- to 3-day intervals, with no more than one blast per day. Preliminary blasting location identification (Hunsaker 2017) indicates that blasting could take place within approximately 140 feet of existing residences.

When explosive charges detonate in rock, most of the available energy from the explosion is used in breaking and displacing the rock mass. However, a small portion of the energy is released in the form of vibration waves that radiate away from the charge location. The strength, or amplitude, of the waves reduces as the distance from the charge increases. The rate of amplitude decay depends on local geological conditions, but can be estimated with a reasonable degree of consistency, which allows regulatory agencies to control blasting operations by means of relationships between distance and explosive quantity. The explosive charges used in mining and mass grading are typically wholly contained in the ground. However, because the exact blasting locations, necessary geotechnical data, and blasting and materials handling plans are not known at this time, it is not possible to conduct a groundborne vibration analysis assessing the proposed blasting and materials handling associated with the Proposed Project. Therefore, for purposes of this analysis, this would be a **potentially significant impact** (**Impact N-13**).

2.8.3.4 Private Air Strip

Guidelines for the Determination of Significance

Based on the County's Guidelines for Determining Significance: Noise (County of San Diego 2009a), the Proposed Project would result in a significant noise impact if the Proposed Project would be within the vicinity of a private airstrip and expose people residing or working in the Project Area to excessive noise levels.

Analysis

The nearest private airstrip is the John Nichol's Field Airport, located at 13531 Otay Lakes Road, Jamul, California. The airport is located approximately 3 miles to the southeast of the

Project Area, and separated from the Project Area by numerous hills and ridgelines. The airport, which has one unpaved, 1,800-foot-long runway, has approximately 25 aircraft based there, with 20 of these being ultralights (Airnav.com 2017). Although aircraft affiliated with the airstrip may be audible when occasionally flying overhead or in the distance, the noise levels would be unlikely to be individually or cumulatively obtrusive or excessive. Because of the distance, intervening topography, and the airport's size, the Proposed Project would not expose people living or residing in the Project Area to excessive noise levels from private airstrips or associated activities. This impact would be **less than significant**.

2.8.4 Cumulative Impact Analysis

Proposed Project traffic would contribute to cumulative increases in traffic noise levels. Noise level increases would be greatest nearest the Project Area, which would have the greatest concentration of Proposed Project traffic. Traffic noise is primarily a function of volume, vehicle mix, speed, and proximity. For this evaluation, vehicle mix, speed, and proximity were assumed to remain the same as the existing condition in the future. Thus, the primary factor affecting noise levels would be increased traffic volumes.

A significant cumulative traffic noise impact occurs when the noise level would exceed the applicable standard or when a substantial noise level increase over existing noise occurs and a project's contribution to that exceedance is cumulatively considerable. Cumulative impacts are caused by a project's traffic contributions to traffic from other close past, present, and reasonably foreseeable future projects. The Proposed Project's contribution to future noise levels was determined by analyzing the Year 2030 Cumulative Conditions (see Appendix 2.8-1).

As defined by the County's Guidelines for Determining Significance: Noise, an increase of 2 dBA CNEL or greater would be considered cumulatively considerable and potentially significant (County of San Diego 2009a). As shown in Table 2.8-12, in comparing the Future (Year 2030) traffic noise with the Future (Year 2030) Plus Project traffic noise, the following receivers would experience a potentially cumulatively considerable noise increase (i.e., 2 dBA CNEL or greater):

- R10: Proctor Valley Road, Hunte Parkway–Northwoods Drive
- R11: Northwoods Drive, Proctor Valley Road–Blue Ridge Drive
- M4 / R12: Proctor Valley Road west of Northwoods Drive

However, at receivers R10, R11 and M4 / ~~R11~~R12, the future noise level is not predicted to exceed the County's or City's acceptable compatibility standard at the nearest NSLU as a result of the Proposed Project; therefore, the increase is **not considered a significant cumulative impact** since the land use would remain compatible with the noise environment.

Proposed Project implementation could result in significant noise impacts associated with the combination of construction activities. Noise is a localized occurrence and attenuates rapidly with distance. Therefore, only future development projects in the direct vicinity of the Project Area could add to construction or stationary-source noise generated by the Proposed Project and result in a cumulative noise impact.

As part of the Proposed Project, off-site improvements along Proctor Valley Road from east of Northwoods Drive/Agua Vista Drive in Chula Vista to Echo Valley Road in Jamul could result in short-term noise levels as high as 77 dBA L_{eq} at the nearest existing residences, 200 feet away. As such, the Proposed Project, in combination with other cumulative projects, could result in a **cumulative noise impact** at off-site NSLUs during construction (**Impact CUM-N-1**).

The nearest existing NSLUs to the Project Area are single-family residences located approximately 60 to the north of the Project Area (in the southwestern portion of Jamul) and approximately ~~3,100~~ 2,900 feet to the west of the Project Area (in the Bella Lago community of Chula Vista). The nearest cumulative project in the County (as identified in Section 1 (Project Description), Figure 1-16, Cumulative Projects) is located approximately 2,500 feet to the north of the Project Area and approximately 4,800 feet from the nearest existing NSLU to the Project Area. ~~and approximately 3,700 to the north of the Project Area (in the southwestern portion of Jamul).~~ It is unlikely that Proposed Project implementation would create cumulative impacts due to stationary-source noise because the nearest existing and proposed developments are located at such a distance that they would not contribute to cumulative noise levels. Therefore, this cumulative impact would be **less than significant**.

2.8.5 Significance of Impacts Prior to Mitigation

Based on the analyses above, the Proposed Project would have the following significant impacts prior to mitigation:

Impact N-1 The traffic noise modeling results indicate that Future Plus Project traffic noise levels would exceed the County of San Diego's exterior noise standard of 60 dBA CNEL along some of the outdoor residential living areas located near Proctor Valley Road.

Impact N-2 The Proposed Project's second-floor exterior noise levels would range from 55 to 69 dBA CNEL at proposed residential lots, which implies that interior noise levels at second-floor elevations would range from approximately 40 to 54 dBA CNEL. Therefore, the interior noise level for habitable spaces potentially would exceed the County of San Diego's 45 dBA CNEL interior noise criterion.

Impact N-3 Roadway noise attributable to the Proposed Project would result in a substantial noise increase (more than 10 dBA) at residential receiver M8/R14, located north of the Proposed Project along Proctor Valley Road and west of Melody Road.

Impact N-4 Noise levels attributed to unshielded HVAC mechanical systems could exceed the County of San Diego's daytime property line noise limit for occupied noise-sensitive land uses (NSLUs) (50 dBA L_{eq}) within 250 feet of the source. In addition, sources within 450 feet of an occupied NSLU property line could exceed the County's nighttime noise limit (45 dBA L_{eq}) for stationary-source noise.

Impact N-5 Construction activities associated with Proctor Valley Road improvements could result in exceedances of the County of San Diego's 75 dBA $L_{eq(8\text{-}hr)}$ noise standard at the nearest existing noise-sensitive land uses in Jamul (County of San Diego).

Impact N-6 Construction activities associated with Proctor Valley Road improvements would exceed ambient existing noise levels at the nearest existing noise-sensitive land uses in the City of Chula Vista.

Impact N-7 Construction activities associated with Proctor Valley Road in Village 14 could result in exceedances of the County of San Diego's 75 dBA $L_{eq(8\text{-}hr)}$ noise standard at adjacent on-site residences.

Impact N-8 Construction activities associated with Proctor Valley Road in Planning Areas 16/19 could result in exceedances of the County of San Diego's 75 dBA $L_{eq(8\text{-}hr)}$ noise standard for adjacent existing residences.

Impact N-9 Based on a preliminary estimate of the nearest potential areas where rock blasting may be necessary within approximately 140 feet of existing residences, a maximum noise level of up to 89 dBA L_{max} from the rock drilling and up to 85 dBA L_{max} from the blasting could occur. These levels would exceed County of San Diego's threshold of significance for impulsive sounds at residential land uses of 82 dBA L_{max}.

Impact N-10 The closest existing off-site residence property line (Planning Areas 16/19) or noise-sensitive land use could be located within approximately 140 feet of the proposed rock crushing. At this distance, the noise level (both 8-hour average and impulsive noise) associated with the rock-crushing activities would be approximately 77 dBA L_{eq} and approximately

85 dBA L_{max}. These noise levels would exceed County of San Diego's 8-hour construction noise and impulsive noise thresholds.

Impact N-11 The nearest sensitive receptors to Proposed Project construction activities that could produce high vibration levels would be at residences to the north and west of off-site Proctor Valley Road improvements in Jamul and the City of Chula Vista, located approximately 60 feet and 140 feet away. At a distance of 60 feet and greater, vibration levels from grading activities are anticipated to exceed 0.004 inches per second root mean square or 0.1 inches per second peak particle velocity at the nearest off-site residences.

Impact N-12 The occupied Proposed Project phases have the potential to be impacted by vibration from ongoing construction activities. Location-specific phasing schedules are not available at this time; it is, therefore, possible that construction of a new phase of the Proposed Project could take place as near as 50 feet from an occupied phase. In such an instance, short-term vibration levels as high as 0.03 inches per second root mean square (RMS) could result. Therefore, vibration levels from grading activities may exceed 0.004 inches per second RMS at the nearest on-site residence.

Impact N-13 Because the exact blasting locations, necessary geotechnical data, and blasting and materials handling plans are not known at this time, it is not possible to conduct a noise analysis assessing the proposed blasting and materials handling associated with the Proposed Project. Therefore, for purposes of this analysis, impacts are considered potentially significant.

Impact CUM-N-1 The Proposed Project's contribution to increases in noise levels at off-site noise-sensitive land uses could be cumulatively considerable due to construction noise.

2.8.6 Mitigation

The 1993 Otay Ranch PEIR and Mitigation Monitoring Program (MMP) identified mitigation measures to reduce the significant noise impacts of the Otay Ranch GDP/SRP. This EIR conducted a new analysis of the Proposed Project's specific noise impacts, using updated technical reports that account for changes in conditions, both environmental and regulatory, that have occurred since 1993 when the Otay Ranch PEIR was certified. Based on this updated, project-specific analysis, the noise mitigation measures identified in the Otay Ranch PEIR are either (i) not applicable; (ii) satisfied; or (iii) replaced with project-specific mitigation measures or regulatory compliance requirements, as determined by the qualified preparers of this EIR.

Attached as Appendix 2-1 is a matrix, entitled "1993 GDP/SRP PEIR Mitigation Measure Compliance." The following mitigation measures are required to address the identified potentially significant noise impacts.

Exterior Residential Noise Levels

M-N-1 The single-family residential lots shown in Figure 2.8-4 with rear- or side-yard exposures adjacent to Proctor Valley Road shall include minimum 6-foot-high solid noise barriers along the exposure. The noise barriers may be constructed as a wall or berm, or a combination of both. The materials used in construction of the barrier shall have a minimum surface density of 4 pounds per square foot. They may consist of masonry material, 0.625-inch-thick Plexiglas, 0.25-inch-thick plate glass, or a combination of these materials. The barriers must be designed so there are no openings or cracks.

Interior Residential Noise Levels

M-N-2 Prior to issuance of building permits (and after preparation of detailed building plans) for proposed single-family residential units directly adjacent to Proctor Valley Road, as shown in Figure 2.8-4, the building permit applicant or its designee shall demonstrate that interior noise levels will not exceed the applicable County of San Diego noise ordinance standard of 45 dBA CNEL for the subject land use. In addition to the installation of sound walls that shall be constructed under mitigation measure M-N-1, it is anticipated that compliance with the applicable standard shall be achieved by structure setbacks, acoustically rated windows and doors, and/or air conditioning or equivalent forced air circulation to allow occupancy with closed windows, which, for most construction, would provide sufficient exterior-to-interior noise reduction. A supplemental acoustical study shall be prepared to demonstrate and verify that interior noise levels will be below 45 dBA CNEL within habitable residential rooms.

Implementation: Applicant or its designee, and primary contractor(s) of all Proposed Project phases for the single-family residential units directly adjacent to Proctor Valley Road.

Timing: A Noise Restriction Easement shall be dedicated to the Final Map, required prior to issuance of building permits for development of on-site single-family residential units directly adjacent to Proctor Valley Road, and after detailed building plans are available and model numbers/types have been sited on a precise grading plan.

Enforcement: County of San Diego

Off-Site Traffic Noise

In comparing Existing and Existing Plus Project noise levels, the Proposed Project would result in a substantial increase in noise levels (from 39 dBA CNEL in the existing scenario to 51 dBA CNEL in the Existing Plus Project scenario) at existing off-site residences located adjacent to Proctor Valley Road north of the Project Area and west of Melody Road (as represented by receiver M8/R14). Although the resulting noise level would be an acceptable 51 dBA CNEL per the County's criteria, the increase would exceed 10 dBA, thereby resulting in a **significant impact**.

Several methods can be used to reduce traffic noise, including noise barriers, road surface improvements, regulatory measures (such as lower speed limits), and traffic-calming devices (such as speed bumps). However, none of these measures are considered feasible for this impact. For example, constructing noise barriers (e.g., sound walls) on private property would require permission of the property owner and would raise potential liability and maintenance concerns. Additionally, to be most effective, noise barriers would need to be continuous, but due to the need for driveways and other access points, the continuity of the barrier and its effectiveness would be limited.

Measures such as reduced speed limits or traffic-calming devices would require legal or government enforcement, and may have undesirable or unacceptable impacts in other areas, such as speed bumps lengthening emergency response times.

For these reasons, mitigation for off-site impacts from noise level increases along Proctor Valley Road north of the Project Area and west of Melody Road is considered infeasible. As previously explained, identification of this significant impact is based on the Existing Plus Project scenario and the increase in noise over existing levels (i.e., an increase greater than 10 dBA CNEL) (see Table 2.8-12, Receiver Location M8/R14). The resulting noise level under the Existing Plus Project scenario would be 51 dBA CNEL, which is within the County's compatibility criteria. Nonetheless, for the purposes of this analysis, the impact would be **significant and unavoidable**.

On-Site Stationary-Source Noise Impacts

M-N-3 Prior to the issuance of any building permit for stationary noise-generating equipment such as heating, ventilation, and air conditioning (HVAC) systems, the Proposed Project applicant or its designee shall prepare a supplemental acoustical study of the proposed stationary noise sources associated with the HVAC systems for submittal to the County of San Diego (County) for review and approval. Best engineering practices shall be implemented, and the placement of noise-generating equipment and shielding shall be considered when installing stationary noise sources associated with HVAC systems. The acoustical study shall identify

noise-generating equipment and predict noise levels from identified equipment at the applicable property lines. Where predicted noise levels would exceed those levels deemed acceptable as established by the County's Noise Ordinance, Section 36.404, the acoustical study shall identify mitigation measures shown to effectively reduce noise levels (e.g., enclosures, barriers, site orientation) to comply with Section 36.404. Such mitigation measures shall be implemented by the applicant or its designee prior to issuance of any building permits.

Implementation: Applicant or its designee, and primary contractor(s) of all Proposed Project phases

Timing: Prior to issuance of building permits

Enforcement: County of San Diego

Construction Noise Impacts

Construction activities have the potential to generate short-term noise levels greater than 75 dBA $L_{eq(8\text{-}hr)}$ at existing NSLUs near the off-site Proctor Valley Road improvements construction and at future on-site receivers adjacent to subsequent construction. The following mitigation measures shall be implemented and included as notes in the grading plan:

M-N-4 The Proposed Project applicant or its designee shall take those steps necessary to ensure that construction equipment is properly maintained and equipped with noise-reduction intake, exhaust mufflers, and engine shrouds in accordance with manufacturer recommendations. Equipment engine shrouds shall be closed during equipment operation.

M-N-5 The Proposed Project applicant or its designee shall take those steps necessary to ensure that, whenever feasible, electrical power shall be used to run air compressors and similar power tools.

M-N-6 The Proposed Project applicant or its designee shall take those steps necessary to ensure that equipment staging areas are located as far as feasible from occupied residences and schools.

M-N-7 The Proposed Project applicant or its designee shall take those steps necessary to ensure that for construction activities on and off the Project Area, noise attenuation techniques are employed to ensure that noise levels remain below 75 dBA L_{eq} at existing noise-sensitive land uses. Such techniques shall include use of sound blankets on noise-generating equipment and construction of temporary

sound barriers adjacent to construction sites near affected uses to achieve noise levels below 75 dBA L_{eq}.

Implementation: Applicant, or its designee, and primary contractor(s) of all Proposed Project phases involving construction

Timing: Prior to and during Proposed Project construction

Enforcement: County of San Diego

Impulsive Noise Impact (Blasting and Rock Crushing)

M-N-8 Prior to approval of the grading permit issued for any portion of the Project Area, the Proposed Project applicant or its designee shall direct that the designated contractor prepare a blasting and monitoring plan with an estimate of noise and vibration levels of each blast at noise-sensitive land uses within 1,000 feet of each blast. Where potential exceedance of either the County of San Diego's (County) Noise Ordinance or the City of Chula Vista's Noise Control Ordinance is identified, the blast drilling and monitoring plan shall identify mitigation measures shown to effectively reduce noise and vibration levels (e.g., altering orientation of blast progression, increased delay between charge detonations, presplitting) to be implemented to comply with the noise level limits of the County's Noise Ordinance, Sections 36.409 and 36.410; the Chula Vista Noise Control Ordinance, Chapter 19.68; and the vibration-level limits of 1 inch per second peak particle velocity. Such measures shall be implemented by the Proposed Project applicant or its designee prior to the issuance of the grading permit. Additionally, Proposed Project phases involving blasting shall conform to the following requirements:

- Blasting activities shall be performed by a blast contractor and blasting personnel licensed to operate in the County.
- Each blast shall be monitored and recorded with an air-blast overpressure monitor and groundborne vibration accelerometer that is located outside the closest residence to the blast and is approved by the County. Blasting shall not exceed 0.1 inch per second peak particle velocity at the nearest occupied residence, in accordance with County of San Diego's Noise Guidelines, Section 4.3.

Implementation: Applicant or its designee, and primary contractor(s) of all Proposed Project phases involving blasting

Timing: Prior to and during Proposed Project blasting activities

Enforcement: County of San Diego

M-N-9 Prior to approval of the grading permit for any portion of the Proposed Project, the Proposed Project applicant or its designee shall take those steps necessary to ensure that on-site rock-crushing facilities are located a minimum of 250 feet from the property line of occupied residences or other noise-sensitive uses.

Implementation: Applicant or its designee, and primary contractor(s) of all Proposed Project phases involving rock crushing

Timing: Prior to and during Proposed Project related rock-crushing activities

Enforcement: County of San Diego

On-Site Groundborne Vibration Impacts

M-N-10 Prior to beginning construction of any Proposed Project component within 300 feet of an existing or future occupied residence, the Proposed Project applicant or its designee shall require preparation of a Vibration Monitoring Plan (VMP) for submittal to the County of San Diego (County) noise control officer for review and approval. At a minimum, the VMP shall require data to be sent to the County noise control officer or designee on a weekly basis or more frequently as determined by the noise control officer. The data shall include vibration-level measurements taken during the previous work period.

In the event that the County noise control officer determines there is reasonable probability that future measured vibration levels would exceed allowable limits, the County noise control officer or designee shall take the necessary steps to ensure that future vibration levels do not exceed such limits, including suspending further construction activities that could result in excessive vibration levels, until either alternative equipment or alternative construction procedures can be used that generate vibration levels that do not exceed 0.004 inches per second root mean square (RMS) or 0.1 inches per second peak particle velocity (PPV) at the nearest residential structure. Construction activities not associated with vibration generation could continue.

The VMP shall be prepared and administered by a County-approved noise consultant. In addition to the data described previously, the VMP shall include the location of vibration monitors, the vibration instrumentation used, a data acquisition and retention plan, and exceedance notification and reporting procedures. A description of these plan components is as follows:

Location of Vibration Monitors: The VMP shall indicate monitoring locations, including the location of measurements to be taken at construction site boundaries and at nearby residential properties.

***Vibration Instrumentation*:** Vibration instrumentation shall be capable of measuring maximum unweighted RMS and PPV levels triaxially (in three directions) over a frequency range of 1 to 100 Hertz. The vibration instrumentation shall be set to automatically record daily events during working hours, and to record peak triaxial PPV values in 5-minute-interval histogram plots. The method of coupling the geophones to the ground shall be described and included in the VMP. The vibration instrumentation shall be calibrated within 1 year prior to the measurement, and a certified laboratory conformance report shall be included in the VMP.

Data Acquisition: The information to be provided in the data reports shall include, at a minimum, daily histogram plots of PPV versus time of day for three triaxial directions, and maximum peak vector sum PPV and maximum frequency for each direction. The reports shall also identify the construction equipment in operation during the monitoring period, and their locations and distances to vibration measurement locations.

Exceedance Notification and Reporting Procedures: The VMP shall include a description of the notification of exceedance and reporting procedures, and the follow-up procedures taken to reduce vibration levels to below the allowable limits.

Implementation: Applicant or its designee, and primary contractor(s) of all Proposed Project phases involving the use of heavy construction equipment within 300 feet of existing or future occupied residences

Timing: Prior to and during construction activities

Enforcement: County of San Diego

2.8.7 Conclusion

2.8.7.1 Noise-Sensitive Land Uses Affected by Airborne Noise

On-Site Traffic Noise

The traffic noise modeling results indicate that Existing Plus Project and Future Plus Project traffic noise levels would exceed the County's exterior noise standard of 60 dBA CNEL along

some of the outdoor residential living areas located near Proctor Valley Road (Impact N-1). Existing and future Proctor Valley Road vehicle noise levels at all identified outdoor living areas of the Proposed Project residential units would comply with the County's 60 dBA CNEL exterior noise criterion, provided that **M-N-1** (construction of 6-foot-high solid walls at residential units adjacent to Proctor Valley Road) (see Figure 2.8-4 for locations). Thus, vehicle noise impacts to on-site residences would be **less than significant with mitigation incorporated**. See Table 2.8-17, which details results of the noise modeling with the inclusion of 6-foot-high noise barriers.

Interior Noise Levels

Exterior noise at the second-floor levels of proposed single-family residences directly adjacent to Proctor Valley Road could exceed 60 dBA CNEL. Thus, without mitigation, the interior noise level could exceed the County's 45 dBA CNEL interior noise criterion (Impact N-2). Prior to issuance of building permits, an interior noise study would be required for the residences adjacent to Proctor Valley Road to ensure that the interior CNEL would not exceed 45 dBA (mitigation measure **M-N-2**). The residences would most likely require air conditioning and/or mechanical ventilation systems to meet the County's interior noise standard. Sound-rated windows may also be required. Thus, impacts would be **less than significant with mitigation incorporated.**

Off-Site Traffic Noise

Proposed Project traffic noise impacts at existing off-site NSLUs would be less than significant, with the exception of residences located along Proctor Valley Road north of the Project Area and west of Melody Road (Impact N-3). Compared to existing traffic noise levels, a significant increase in traffic noise along this roadway segment would occur because Proctor Valley Road currently experiences very low traffic volumes, and although the resulting noise level of 51 dBA CNEL is considered acceptable per the County's criteria, the Proposed Project would increase noise above existing ambient levels by greater than 10 dBA. Moreover, because there is no feasible mitigation, this impact would be **significant and unavoidable**.

Cumulative Impacts

No cumulatively considerable Proposed Project contributions to a significant cumulative noise increase would result from the Proposed Project. Impacts would be **less than significant**.

2.8.7.2 Project-Generated Airborne Noise

Non-Construction Noise (Operational)

The Proposed Project's operational noise sources would include air conditioning units at each of the proposed residential units. Noise from HVAC equipment could potentially result in a

significant impact (Impact N-4); however, mitigation measure **M-N-3** would reduce impacts to **less than significant**.

No operational components of the Proposed Project would involve significant groundborne noise or vibration sources, and no significant vibration sources currently exist or are planned in the Project Area. Thus, no significant groundborne noise or vibration impacts would occur with operation of the Proposed Project.

Construction Noise

Construction noise for adjacent, occupied residences associated with improvements of Proctor Valley Road and on-site construction noise would be potentially significant impacts (Impacts N-5, N-6, N-7, N-8, and N-9). Mitigation measures M-N-4 through M-N-7 are provided to reduce potential impacts to **less than significant**.

Blasting Impacts

Noise from blasting activities associated with the excavation and mass-grading phase of the Proposed Project would be potentially significant (Impact N-13), and mitigation measure M-N-8 is provided to reduce potential impacts to **less than significant**.

Rock Crushing Impacts

Noise from rock-crushing activities associated with the excavation and mass-grading phase of the Proposed Project would be a potentially significant impact (Impact N-10), and mitigation measure M-N-9 is provided to reduce potential impacts to **less than significant**.

Cumulative Impacts

The Proposed Project, in combination with other cumulative projects, could result in a cumulative noise impact at off-site NSLUs during construction (Impact CUM-N-1). Incorporation of mitigation measures M-N-4 through M-N-7 would reduce potential impacts to **less than significant**.

2.8.7.3 Groundborne Vibration Impacts

Construction

Based on the anticipated construction equipment and distance from the equipment to the proposed homes, construction activities would result in vibration anticipated to be below the level of human perception at existing off-site vibration-sensitive land uses. Thus, construction vibration would not disturb off-site residences, and the potential vibration impacts to these residential structures would be **less than significant**.

Because development of the Proposed Project would be a multi-year endeavor, portions of the Proposed Project would be completed and occupied during construction of subsequent portions (phases). Vibration from construction activities, if they occur within 300 feet of on-site residences, has the potential to result in vibration levels exceeding County standards. This would be potentially significant (Impact N-11 and N-12), and mitigation measure M-N-10 is provided to reduce potential impacts to **less than significant**.

Operation

No operational components of the Proposed Project would include significant groundborne noise or vibration sources, and no substantial vibrations sources currently exist, or are planned, in the Project Area. Thus, operational groundborne noise and vibration impacts would be **less than significant**.

Table 2.8-1
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
—	110	Rock band
Jet fly over at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	80	Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area; heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quiet urban, daytime	50	Large business office; dishwasher next room
Quiet urban, nighttime	40	Theater; large conference room (background)
Quiet suburban, nighttime	30	Library
Quiet rural, nighttime	20	Bedroom at night; concert hall (background)
—	10	Broadcast/Recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 1998

Table 2.8-2
County of San Diego Land Use Compatibility Guidelines

Land Use Category	Exterior Noise Level (CNEL)		
	Normally Acceptable	*Conditionally Acceptable*	*Unacceptable*
Residential: Single-family residences, mobile homes, senior housing, convalescent homes	Up to 60 dBA	60–75 dBA	Over 75 dBA
Residential: Multi-family residences, mixed-use (commercial/residential)	Up to 65 dBA	65–75 dBA	Over 75 dBA
Transient lodging: Motels, hotels, resorts	Up to 65 dBA	65–75 dBA	Over 75 dBA

Table 2.8-2
County of San Diego Land Use Compatibility Guidelines

Land Use Category	Exterior Noise Level (CNEL)		
	Normally Acceptable	*Conditionally Acceptable*	*Unacceptable*
Schools, churches, hospitals, nursing homes, child care facilities*	Up to 65 dBA	65–75 dBA	Over 75 dBA
Passive recreational parks, nature preserves, contemplative spaces, cemeteries*	Up to 65 dBA	65–75 dBA	Over 75 dBA
Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation*	Up to 70 dBA	70–75 dBA	Over 75 dBA
Office/professional, government, medical/dental, commercial, retail, laboratories*	Up to 70 dBA	70–75 dBA	Over 75 dBA
Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair*	Up to 70 dBA	Over 70 dBA	NA

Source: County of San Diego 2011, Table N-1.

* These facilities are used part of the day; therefore, an hourly standard would be used, rather than CNEL. For more information, refer to the General Plan Noise Element, Table N-2.

Table 2.8-3
County of San Diego Noise Ordinance Sound Level Limits per Zone

Zone	1-Hour Average Sound Level (dBA) Applicable Limit		
	7 a.m. to 7 p.m.	*7 p.m. to 10 p.m.*	*10 p.m. to 7 a.m.*
1. RS, RD, RR, RHM, A70, A72, S80, S81, S87, S90, S92, RV, and RU with a density of less than 11 dwelling units per acre	50	50	45
2. RRO, RC, RM, S86, V5, RV, and RU with a density of 11 or more dwelling units per acre	55	55	50
3. S94, V4, and all other commercial zones	60	60	55
4. V1 and V2	60	55	See below
V1	60	55	55
V2	60	55	50
V3	70	70	65
5. M50, M52, and M54	70	70	70
6. S82, M56, and M58	75	75	75
7. S88 (see note 4 below)			

Source: County of San Diego 2011.

1 If the measured ambient level exceeds the applicable limit noted in the table, the allowable 1-hour average sound level would be the ambient noise level. The ambient noise level would be measured when the alleged noise violation source is not operating.

2 The sound-level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts, provided, however, that the 1-hour average sound-level limit applicable to extractive industries, including borrow pits and mines, would be 75 dBA at the property line, regardless of the zone where the extractive industry is actually located.

3 Fixed-location, public utility distribution or transmission facilities located on or adjacent to a property line are subject to the noise-level limits of this section, measured at or beyond 6 feet from the boundary of the easement upon which the equipment is located.

4 S88 zones are Specific Planning Areas, which allow different uses. The sound level limits that apply in an S88 Zone depend on the use being made of the property. The limits in Subsection 1 apply to a property with a residential, agricultural, or civic use. The limits in Subsection 3 apply to a property with a commercial use. The limits in Subsection 5 apply to a property with an industrial use that would only be allowed in an M50, M52, or M54 Zone. The limits in Subsection 6 apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 Zone.

Table 2.8-4
Maximum Sound Level (Impulsive) Measured

Occupied Property Use	Decibels (dBA)
Residential, village zoning, or civic use	82
Agricultural, commercial, or industrial use	85

Source: County of San Diego 2008, the County Noise Ordinance Section 36.409.
Note: The maximum sound level limitations apply to impulsive noise from construction equipment when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received for 25% of the minutes in the measurement period.

Table 2.8-5
City of Chula Vista Exterior Land Use/Noise Compatibility Guidelines

Land Use	Annual Community Noise Equivalent Level (dBA)					
	50	*55*	*60*	*65*	*70*	*75*
Residential						
Schools, libraries, daycare facilities, convalescent homes, outdoor use areas, and other similar uses considered noise sensitive						
Neighborhood parks, playgrounds						
Community parks, athletic fields						
Offices and professionals						
Places of worship (excluding outdoor use areas)						
Golf courses						
Retail and wholesale commercial, restaurants, movie theaters						
Industrial, manufacturing						

Source: City of Chula Vista 2005

Table 2.8-6
City of Chula Vista Exterior Noise Limits

Receiving Land Use Category	Noise Level (dBA)	
	10 p.m. to 7 a.m. (Weekdays)	*7 a.m. to 10 p.m. (Weekdays)*
	10 p.m. to 8 a.m. (Weekends)	*8 a.m. to 10 p.m. (Weekends)*
All residential (except multiple dwelling)	45	55
Multiple dwelling residential	50	60
Commercial	60	65
Light industry: I-R and I-L Zones	70	70
Heavy industry: I Zone	80	80

Source: City of Chula Vista 2015
dBA=A-weighted decibel; I-R = Research Industrial Zone; I-L = Limited Industrial Zone; I = General Industrial Zone

Table 2.8-7
City of Chula Vista Interior Noise Limits

Type of Land Use	Time Interval	Noise Level (dBA) Not To Be Exceeded		
		Anytime	*1 Minute in 1 Hour*	*5 Minutes in 1 Hour*
Multifamily	10 p.m.–7 a.m.	45	40	35
Residential	7 a.m.–10 p.m.	55	50	45

Source: City of Chula Vista 2015
dBA=A-weighted decibel

Table 2.8-8
Noise Measurement Results

Receptor	Date	Time	Description	L_{eq} (dBA)	L_{max} (dBA)
M1	May 6, 2015	3:54–4:14 p.m.	Open space area along the east side of Proctor Valley Road, approximately 60 feet from the center line	49.1	68.0
M2	May 6, 2015	3:11–3:31 p.m.	Open space area along the east side of Proctor Valley Road, approximately 50 feet from the center line	50.7	69.5
M3	May 6, 2015	2:35–2:55 p.m.	Open space area along the east side of Proctor Valley Road, approximately 165 feet from the center line	50.7	67.6
M4	May 6, 2015	4:35–4:55 p.m.	790 Lake House Place, Chula Vista, California 91914 – Residence elevated from Proctor Valley Road	47.3	62.2
M5	May 6, 2015	5:47–6:07 p.m.	Pedestrian walkway northeast of 606 San Marino Place, Chula Vista, California 91914 – Elevated from Proctor Valley Road	66.4	72.7
M6	May 6, 2015	6:24–6:44 p.m.	2335 Paseo Veracruz, Chula Vista, California 91914 – Park on a lower elevation than Mount Miguel Road	55.1	61.9
M7	May 6, 2015	5:13–5:33 p.m.	704 Pueblo Place, Chula Vista, California 91914 – Residence elevated from Lane Avenue	53.4	60.6
M8	May 6, 2015	1:58–2:18 p.m.	2852 Shadow Valley, Jamul, California 91935 – In front of residence gate on dirt access road	53.8	72.1
M9	May 6, 2015	1:27–1:47 p.m.	13828 Proctor Valley Road, Jamul, California 91935 – Residence driveway	50.8	63.1
M10	May 6, 2015	12:58–1:18 p.m.	3007 Calle Mesquite, Jamul, California 91935 – Residence driveway	48.7	64.1
M11	May 6, 2015	12:15–12:35 p.m.	13939 Maxfield Road, Jamul, California 91935	46.9	66.2

Source: Appendix 2.8-1, Figure 4
L_{eq}=equivalent continuous sound level (time-averaged sound level); L_{max} = maximum sound level during the measurement interval; dBA=A-weighted decibel

Table 2.8-9
Modeled Roadway Segments (Off-Site Receivers)

Roadway	From / To	Modeled Receiver	Average Traffic Speed (mph)	Existing Traffic Volume for CNEL (ADT)	Existing Plus Project Traffic Volume for CNEL (ADT)	Year 2030 Traffic Volume for CNEL (ADT)	Year 2030 Plus Project Traffic Volume for CNEL (ADT)
San Miguel Ranch Road	Proctor Valley Road to State Route (SR) 125 Southbound Ramp (City)	R1	45	8,300	9,400	13,600	14,600
San Miguel Ranch Road/ Mt Miguel Road	SR-125 Northbound Ramp to Proctor Valley Road (City)	R2, R13	40	10,100	11,200	9,700	10,700
Proctor Valley Road	SR-125 Northbound Ramps to Mt Miguel Road (City)	R3	45	21,700	26,800	25,700	30,800
Proctor Valley Road	Mt Miguel Road to Lane Avenue (City)	R4	45	20,000	27,400	34,000	40,400
Lane Avenue	Proctor Valley to Otay Lakes Road (City)	R5	40	10,800	11,400	12,700	14,400
Proctor Valley Road	Lane Avenue to Hunte Pkwy (City)	R6	45	14,200	23,400	21,900	30,200
Hunte Pkwy	Proctor Valley to Otay Lakes Road (City)	R7	45	6,300	8,900	9,100	11,400
Hunte Pkwy	Otay Lakes Road to Olympic Pkwy (City)	R8	45	10,900	12,300	17,200	18,500
Hunte Pkwy	Olympic Pkwy to Eastlake Pkwy (City)	R9	50	2,000	2,400	35,000	35,400
Proctor Valley Road	Hunte Pkwy to Northwood Drive (City)	R10, R12	45	5,800	**17,500**[b]	14,800	30,000

Table 2.8-9
Modeled Roadway Segments (Off-Site Receivers)

Roadway	From / To	Modeled Receiver	Average Traffic Speed (mph)	Existing Traffic Volume for CNEL (ADT)	Existing Plus Project Traffic Volume for CNEL (ADT)	Year 2030 Traffic Volume for CNEL (ADT)	Year 2030 Plus Project Traffic Volume for CNEL (ADT)
Northwoods Drive	Proctor Valley to Blue Ridge Drive (City)	R11	45	1,400	1,900	400	1,200
Proctor Valley Road	Proposed Project Driveway #8 to Melody Road (County)	R14	25 (existing)/ 45 (future)[a]	200	700	6,200	6,900
Proctor Valley Road	Melody Road to Schlee Canyon Road (County)	R15	45	1,700	2,200	6,600	6,900
Melody Road	Proctor Valley Road to SR-94 (County)	R16	40	300	600	5,200	5,500
Proctor Valley Road	Schlee Canyon Road to Maxfield Road (County)	R17	40	2,100	2,500	5,400	5,600
Proctor Valley Road	Maxfield Road to SR-94 (County)	R18	40	2,500	2,800	5,300	5,500

mph = miles per hour; ADT = average daily traffic

a Because Proctor Valley Road is currently unpaved in this area, the speed limit is 25 mph. In the future (Year 2030) scenarios, Proctor Valley Road will be fully paved and it is anticipated that the speed limit will be the same as the adjoining roadway segments.

b Existing Plus Project traffic volumes would result in more than double the existing traffic volume along this segment. There is a potential for a direct noise impact.

Table 2.8-10
Modeled On-Site Ground-Floor Traffic Noise Levels (dBA CNEL)

Receiver	Land Use	County of San Diego Exterior Noise Standard	Future (Year 2030) plus Proposed Project[a]	County of San Diego Noise Standard[b] Exceeded?
R19 P-1	Park	65	62	No
R20 R-4 southwest side	Single-family residential	60	69	Yes
R21 R-4 west side	Single-family residential	60	69	Yes
R22 R-4 northwest side	Single-family residential	60	69	Yes

Table 2.8-10
Modeled On-Site Ground-Floor Traffic Noise Levels (dBA CNEL)

Receiver	Land Use	County of San Diego Exterior Noise Standard	Future (Year 2030) plus Proposed Project[a]	County of San Diego Noise Standard[b] Exceeded?
R23 R-5 Lot 10 southwest side	Single-family residential	60	66	Yes
R24 R-5 Lot 5 west side	Single-family residential	60	68	Yes
R25 R-5 PPP-1 northwest side	Park	65	62	No
R26 R-12 south side	Park	65	63	No
R27 southwest side	School	65	61	No
R28 R-12 north side	Park	65	63	No
R29 S-1 west side	School	65	63	No
R30 S-1 northwest side	School	65	62	No
R31 P-2	Park	65	62	No
R32 MU-1	Mixed-Use	65	64	No
R33 R-10 Lot 6	Single-family residential	60	67	Yes
R34 R-10 Lot 4	Single-family residential	60	67	Yes
R35 R-10 Lot 2	Single-family residential	60	67	Yes
R36 R-11 PP-4	Park	65	61	No
R37 R-11 Lot 54	Single-family residential	60	66	Yes
R38 R-11 Lot 58	Single-family residential	60	66	Yes
R39 R-11 Lot 61	Single-family residential	60	66	Yes
R40 R-11 Lot 1	Single-family residential	60	65	Yes
R41 R-11 Lot 4	Single-family residential	60	64	Yes
R42 R-11 Lot 6	Single-family residential	60	59	No
R43 R-11 Lot 8	Single-family residential	60	53	No
R44 R-14 Lot 64	Single-family residential	60	59	No
R45 R-14 Lot 28	Single-family residential	60	63	Yes
R46 R-14	Open space	65	55	No
R47 R-14 Lot 27	Single-family residential	60	68	Yes
R48 R-14 Lot 2	Single-family residential	60	67	Yes
R49 R-14 Lot 1	Single-family residential	60	67	Yes
R50 R-14 P-4	Park	65	63	No
R51 R-13 Lot 8	Single-family residential	60	66	Yes
R52 R-13 Lot 9	Single-family residential	60	65	Yes
R53 R-13 Lot 7	Single-family residential	60	62	Yes
R54R-13 Lot 10	Single-family residential	60	66	Yes
R55 R-13 Lot 11	Single-family residential	60	67	Yes
R56 R-13 Lot 12	Single-family residential	60	66	Yes

dBA=A-weighted decibel; CNEL = Community Noise Equivalent Level

[a] On-site traffic noise analysis uses year 2030 with full Otay Ranch GDP/SRP buildout traffic conditions.

[b] 60 dBA CNEL for single-family residential; 65 dBA CNEL for multi-family residential

Table 2.8-11
Modeled On-Site Second-Floor Traffic Noise Levels (dBA CNEL)

Receiver (Second-Floor Level)	Land Use Type	County of San Diego CNEL Exterior Noise Standard (dBA)	Existing Plus Project	County of San Diego Noise Standard[a] Exceeded?	Future (Year 2030) Plus Project[b]	County of San Diego Noise Standard[a] Exceeded?
R20 R-4 southwest Side 2nd Floor	Single-family residential	60	65	Yes	69	Yes
R21 R-4 west Side 2nd Floor	Single-family residential	60	65	Yes	69	Yes
R22 R-4 northwest Side 2nd Floor	Single-family residential	60	65	Yes	69	Yes
R23 R-5 Lot 10 southwest Side 2nd Floor	Single-family residential	60	63	Yes	67	Yes
R24 R-5 Lot 5 west Side 2nd Floor	Single-family residential	60	64	Yes	68	Yes
R32 MU-1 2nd Floor	Mixed-Use	65	58	No	64	No
R33 R-10 Lot 6 2nd Floor	Single-family residential	60	61	Yes	67	Yes
R34 R-10 Lot 4 2nd Floor	Single-family residential	60	60	No	67	Yes
R35 R-10 Lot 2 2nd Floor	Single-family residential	60	60	No	67	Yes
R37 R-11 Lot 54 2nd Floor	Single-family residential	60	59	No	66	Yes
R38 R-11 Lot 58 2nd Floor	Single-family residential	60	59	No	66	Yes
R39 R-11 Lot 61 2nd Floor	Single-family residential	60	59	No	66	Yes
R40 R-11 Lot 1 2nd Floor	Single-family residential	60	57	No	65	Yes
R41 R-11 Lot 4 2nd Floor	Single-family residential	60	57	No	64	Yes
R42 R-11 Lot 6 2nd Floor	Single-family residential	60	52	No	60	No
R43 R-11 Lot 8 2nd Floor	Single-family residential	60	48	No	55	No
R44 R-14 Lot 64 2nd Floor	Single-family residential	60	51	No	60	No
R45 R-14 Lot 28 2nd Floor	Single-family residential	60	58	No	67	Yes
R47 R-14 Lot 27 2nd Floor	Single-family residential	60	59	No	68	Yes

Table 2.8-11
Modeled On-Site Second-Floor Traffic Noise Levels (dBA CNEL)

Receiver (Second-Floor Level)	Land Use Type	County of San Diego CNEL Exterior Noise Standard (dBA)	Existing Plus Project	County of San Diego Noise Standard[a] Exceeded?	Future (Year 2030) Plus Project[b]	County of San Diego Noise Standard[a] Exceeded?
R48 R-14 Lot 2 2nd Floor	Single-family residential	60	59	No	67	Yes
R49 R-14 Lot 1 2nd Floor	Single-family residential	60	59	No	67	Yes
R50 R-13 Lot 8 2nd Floor	Single-family residential	60	56	No	65	Yes
R51 R-13 Lot 9 2nd Floor	Single-family residential	60	56	No	65	Yes
R52 R-13 Lot 7 2nd Floor	Single-family residential	60	54	No	64	Yes
R53R-13 Lot 10 2nd Floor	Single-family residential	60	56	No	66	Yes
R54 R-13 Lot 11 2nd Floor	Single-family residential	60	57	No	66	Yes
R55 R-13 Lot 12 2nd Floor	Single-family residential	60	56	No	66	Yes

[a] 60 dBA CNEL for single-family residential; 65 dBA CNEL for multi-family residential
[b] On-site traffic noise analysis uses year 2030 with full Otay Ranch GDP/SRP buildout traffic conditions.

Table 2.8-12
Modeled Off-Site Traffic Noise Levels

Receiver: Location	Modeled Exterior Noise Levels (dBA CNEL)										
	Applicable Exterior Noise Standard (dBA CNEL)	*Existing*	*Existing Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Impact (Noise Standard Exceedance or Substantial Increase)?*	*Future (Year 2030)*	*Future (Year 2030) Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Cumulative Impact (Noise Standard Exceedance or Substantial Increase)?*
R1: San Miguel Ranch Road; west of State Route (SR) 125	65 (City of Chula Vista)	64	65	1	No	No	66	67	1	No	No
R2: Mt. Miguel Road; Proctor Valley Road – San Miguel Ranch Road	65 (City of Chula Vista)	54	54	0	No	No	54	55	1	No	No
R3: Proctor Valley Road; SR-125 – Mt Miguel Road	65 (City of Chula Vista)	55	56	1	No	No	55	~~57~~56	1	No	No
R4: Proctor Valley Road; Mt. Miguel Road – Lane Avenue	65 (City of Chula Vista)	63	64	1	No	No	61	62	1	No	No
R5: Lane Ave: Proctor Valley Road – Otay Lakes Road	65 (City of Chula Vista)	54	55	1	No	No	55	56	1	No	No

Table 2.8-12
Modeled Off-Site Traffic Noise Levels

Receiver: Location	Modeled Exterior Noise Levels (dBA CNEL)										
	Applicable Exterior Noise Standard (dBA CNEL)	*Existing*	*Existing Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Impact (Noise Standard Exceedance or Substantial Increase)?*	*Future (Year 2030)*	*Future (Year 2030) Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Cumulative Impact (Noise Standard Exceedance or Substantial Increase)?*
R6: Proctor Valley Road; Lane Avenue –Hunte Pkwy	65 (City of Chula Vista)	55	57	2	No	No	57	58	1	No	No
R7: Hunte Pkwy; Proctor Valley Road – Otay Lakes Road	65 (City of Chula Vista)	52	54	2	No	No	54	55	1	No	No
R8: Hunte Pkwy; Otay Lakes Road – Olympic Pkwy	65 (City of Chula Vista)	57	58	1	No	No	59	60	1	No	No
R9: Hunte Pkwy; Olympic Pkwy – Eastlake Pkwy	65 (City of Chula Vista)	47	48	1	No	No	59	59	0	No	No
R10: Proctor Valley Road; Hunte Pkwy – Northwoods Drive	65 (City of Chula Vista)	50	54	4	No	No	53	56	3	No	No

Table 2.8-12
Modeled Off-Site Traffic Noise Levels

Receiver: Location	Modeled Exterior Noise Levels (dBA CNEL)										
	Applicable Exterior Noise Standard (dBA CNEL)	*Existing*	*Existing Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Impact (Noise Standard Exceedance or Substantial Increase)?*	*Future (Year 2030)*	*Future (Year 2030) Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Cumulative Impact (Noise Standard Exceedance or Substantial Increase)?*
R11: Northwoods Drive; Proctor Valley Road – Blue Ridge Drive	65 (City of Chula Vista)	50	52	2	No	No	48	52	4	No	No
M4 / R12: Proctor Valley Road west of Northwoods Drive	65 (City of Chula Vista)	51	56	5	No	No	55	57	2	No	No
M6 / R13: San Miguel Ranch Road east of SR-125	65 (City of Chula Vista)	59	60	1	No	No	61	61	0	No	No
M8 / R14: Proctor Valley Road north of Proposed Project	60 (County of San Diego)	39	51	12	No	Yes (Substantial Increase)	60	61	1	Yes	~~Yes~~No (less than 2 dB Increase)

Table 2.8-12
Modeled Off-Site Traffic Noise Levels

Receiver: Location	Modeled Exterior Noise Levels (dBA CNEL)										
	Applicable Exterior Noise Standard (dBA CNEL)	*Existing*	*Existing Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Impact (Noise Standard Exceedance or Substantial Increase)?*	*Future (Year 2030)*	*Future (Year 2030) Plus Proposed Project*	*Increase from Proposed Project*	*Noise Standard Exceedance as a Result of Proposed Project?*	*Significant Cumulative Impact (Noise Standard Exceedance or Substantial Increase)?*
M9 / R15: Proctor Valley Road; Melody Road – Schlee Canyon Road	60 (County of San Diego)	49	50	1	No	No	55	55	0	No	No
M10 / R16: Melody Road; Proctor Valley Road – SR-94	60 (County of San Diego)	48	51	3	No	No	60	60	0	No	No
M11 / R17: Proctor Valley Road; Schlee Canyon Road – Maxfield Road	60 (County of San Diego)	57	58	1	No	No	61	61	0	No	No
R18: Proctor Valley Road; Maxfield Road to SR-94	60 (County of San Diego)	59	60	1	No	No	63	63	0	No	No

Table 2.8-13
Typical Noise Levels from Construction Activities for Large Construction Projects

Construction Activity	Average Sound Level at 50 Feet (dBA L_{eq})*	Standard Deviation (dBA)
Ground Clearing	84	7
Excavation/Grading	89	6
Foundations	78	3
Erection	87	6
Finishing	89	7

Source: EPA 1971

* Sound level with all pertinent equipment operating.

Table 2.8-14
Guidelines for Determining the Significance of Groundborne Vibration and Noise Impacts

Land Use Category	Groundborne Vibration Impact Levels (inches per second RMS)		Groundborne Noise Impact Levels (dBA re 20 micropascals)	
	Frequent Events[a]	*Occasional or Infrequent Events*[b]	*Frequent Events*[a]	*Occasional or Infrequent Events*[b]
Category 1: Buildings where low ambient vibration is essential for interior operations (research and manufacturing facilities with special vibration constraints)[f]	0.0018[c]	0.0018[c]	N/A[d,e]	N/A[d,e]
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, and other sleeping facilities)[f]	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, and quiet offices)[f]	0.0056	0.014	40 dBA	48 dBA

Source: FTA 2006

RMS = root mean square; re = relative

a "Frequent events" is defined as more than 70 vibration events per day. Most rapid-transit projects fall into this category.

b "Infrequent events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

c This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

d N/A = not applicable. Vibration-sensitive equipment is not sensitive to groundborne noise.

e N/A = not applicable. There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 2.8-15 gives criteria for acceptable levels of groundborne vibration and noise for these various types of special uses.

f For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the peak particle velocity (PPV) exceeds 1 inch per second. Non-transportation vibration sources such as impact pile drivers or hydraulic breakers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by the California Department of Transportation (Caltrans 2004) and are used to evaluate these continuous or transient sources in the County.

Table 2.8-15
Guidelines for Determining the Significance of Groundborne Vibration and Noise Impacts for Special Buildings

Type of Building or Room	Groundborne Vibration Impact Levels (inches per second RMS)		Groundborne Noise Impact Levels (dBA re 20 micropascals)	
	Frequent Events[a]	*Occasional or Infrequent Event*[b]	*Frequent Events*[a]	*Occasional or Infrequent Events*[b]
Concert halls, TV studios, and recording studios	0.0018	0.0018	25 dBA	25 dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

Source: FTA 2006
RMS=root mean square; re = relative
[a] Frequent events is defined as more than 70 vibration events per day. Most rapid-transit projects fall into this category.
[b] Infrequent events is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

Table 2.8-16
Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (inches per second)	Approximate Noise Level at 25 Feet*
Vibratory roller	0.210	94
Jackhammer	0.035	79
Large bulldozer	0.089	87
Loaded truck	0.076	86
Small bulldozer	0.003	58

Sources: Caltrans 2013; FTA 2006
* Where noise level is the velocity level in decibels (VdB) referenced to 1 microinch per second and based on the RMS velocity amplitude

Table 2.8-17
Modeled On-Site Ground-Floor Traffic Noise Levels (dBA CNEL) with Noise Barriers

Receiver	Land Use Type	County of San Diego Exterior Noise Standard	Future (Year 2030) plus Proposed Project without Mitigation	County of San Diego Noise Standard[a] Exceeded?	Future (Year 2030) plus Proposed Project with Mitigation (6-foot-high noise barriers)	County of San Diego Noise Standard[a] Exceeded with Mitigation?
R19 P-1	Park	65	62	No	N/A	No
R20 R-4 southwest side	Single-family residential	60	69	Yes	58	No
R21 R-4 west side	Single-family residential	60	69	Yes	58	No

Table 2.8-17
Modeled On-Site Ground-Floor Traffic Noise Levels (dBA CNEL) with Noise Barriers

Receiver	Land Use Type	County of San Diego Exterior Noise Standard	Future (Year 2030) plus Proposed Project without Mitigation	County of San Diego Noise Standard[a] Exceeded?	Future (Year 2030) plus Proposed Project with Mitigation (6-foot-high noise barriers)	County of San Diego Noise Standard[a] Exceeded with Mitigation?
R22 R-4 northwest side	Single-family residential	60	69	Yes	58	No
R23 R-5 Lot 10 southwest side	Single-family residential	60	66	Yes	55	No
R24 R-5 Lot 5 west side	Single-family residential	60	68	Yes	58	No
R25 R-5 PPP-1 northwest side	Park	65	62	No	N/A	No
R26 R-12 south side	Park	65	63	No	N/A	No
R27 southwest side	School	65	61	No	N/A	No
R28 R-12 north side	Park	65	63	No	N/A	No
R29 S-1 west side	School	65	63	No	N/A	No
R30 S-1 northwest side	School	65	62	No	N/A	No
R31 P-2	Park	65	62	No	N/A	No
R32 MU-1	Mixed-Use	65	64	No	N/A	No
R33 R-10 Lot 6	Single-family residential	60	67	Yes	58	No
R34 R-10 Lot 4	Single-family residential	60	67	Yes	57	No
R35 R-10 Lot 2	Single-family residential	60	67	Yes	57	No
R36 R-11 PP-4	Park	65	61	No	N/A	No
R37 R-11 Lot 54	Single-family residential	60	66	Yes	56	No
R38 R-11 Lot 58	Single-family residential	60	66	Yes	59	No
R39 R-11 Lot 61	Single-family residential	60	66	Yes	57	No
R40 R-11 Lot 1	Single-family residential	60	65	Yes	56	No
R41 R-11 Lot 4	Single-family residential	60	64	Yes	58	No

Table 2.8-17
Modeled On-Site Ground-Floor Traffic Noise Levels (dBA CNEL) with Noise Barriers

Receiver	Land Use Type	County of San Diego Exterior Noise Standard	Future (Year 2030) plus Proposed Project without Mitigation	County of San Diego Noise Standard[a] Exceeded?	Future (Year 2030) plus Proposed Project with Mitigation (6-foot-high noise barriers)	County of San Diego Noise Standard[a] Exceeded with Mitigation?
R42 R-11 Lot 6	Single-family residential	60	59	No	N/A	No
R43 R-11 Lot 8	Single-family residential	60	53	No	N/A	No
R44 R-14 Lot 64	Single-family residential	60	59	No	N/A	No
R45 R-14 Lot 28	Single-family residential	60	63	Yes	55	No
R46 R-14	Open Space	65	55	No	N/A	No
R47 R-14 Lot 27	Single-family residential	60	68	Yes	58	No
R48 R-14 Lot 2	Single-family residential	60	67	Yes	55	No
R49 R-14 Lot 1	Single-family residential	60	67	Yes	58	No
R50 R-14 P-4	Park	65	63	No	N/A	No
R51 R-13 Lot 1	Single-family residential	60	66	Yes	55	No
R52 R-13 Lot 9	Single-family residential	60	65	Yes	54	No
R53 R-13 Lot 8	Single-family residential	60	62	Yes	52	No
R54 R-13 Lot 10	Single-family residential	60	66	Yes	55	No
R55 R-13 Lot 11	Single-family residential	60	67	Yes	57	No
R56 R-13 Lot 12	Single-family residential	60	66	Yes	60	No

N/A=not applicable

[a] On-site traffic noise analysis uses year 2030 with full Otay Ranch GDP/SRP buildout traffic conditions.

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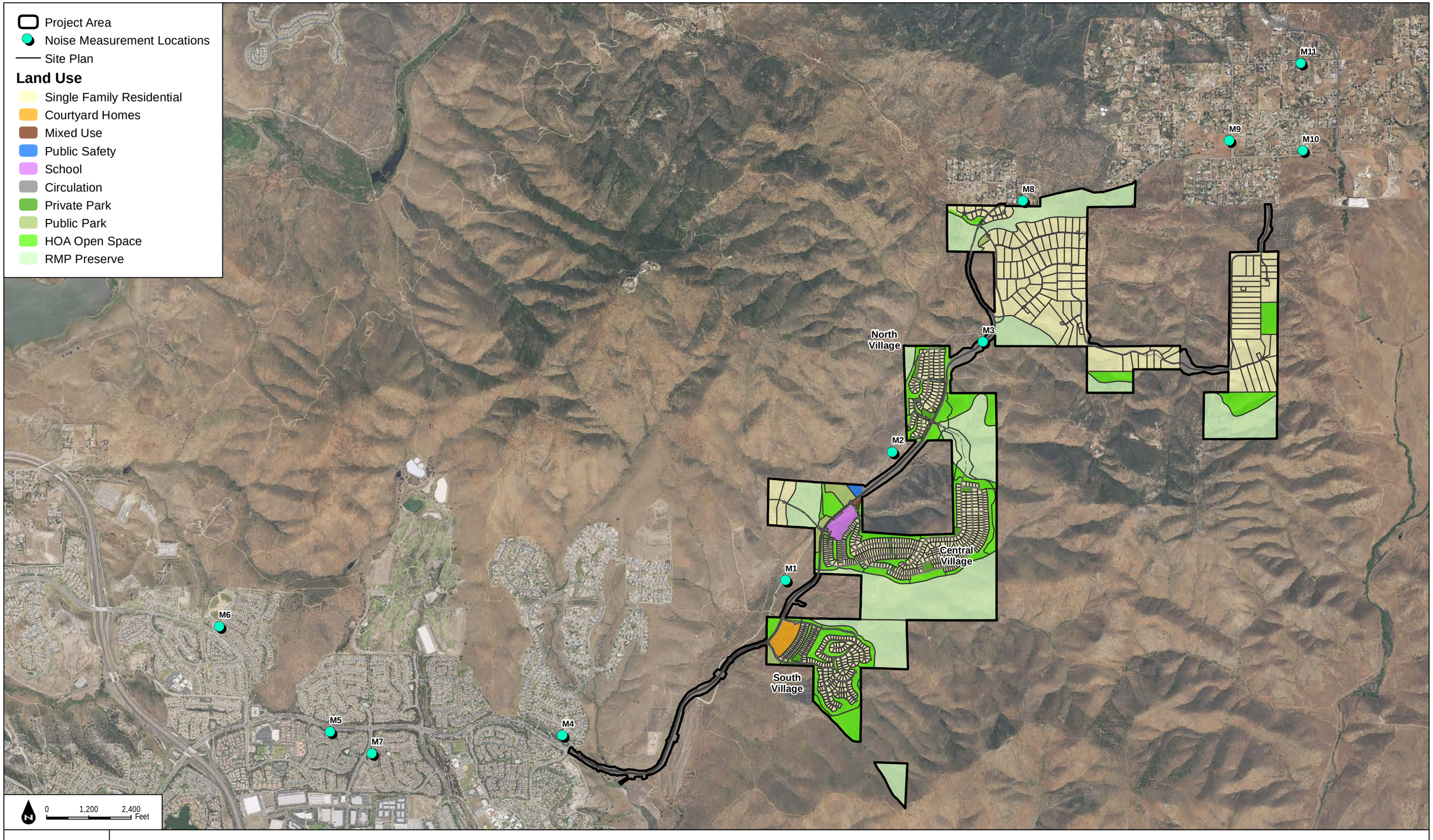

SOURCE: NAIP 2016; Hunsaker 2017

DUDEK

Figure 2.8-1
Noise Measurement Locations

Otay Ranch Village 14 and Planning Areas 16/19

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Project Area
Modeled Roadway Segments
Modeled Receiver Locations
Site Plan

Land Use

Single Family Residential
Courtyard Homes
Mixed Use
Public Safety
School
Circulation
Private Park
Public Park
HOA Open Space
RMP Preserve

R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
MT MIGUEL RD
PROCTOR VALLEY RD
NORTHWOODS DR
HUNTE PKY
MELODY RD
North Village
Central Village
South Village

0 2,000 4,000 Feet

SOURCE: NAIP 2016; Hunsaker 2017

DUDEK

Figure 2.8-2
Modeled Roadway Segments and Off-site Receiver Locations

Otay Ranch Village 14 and Planning Areas 16/19

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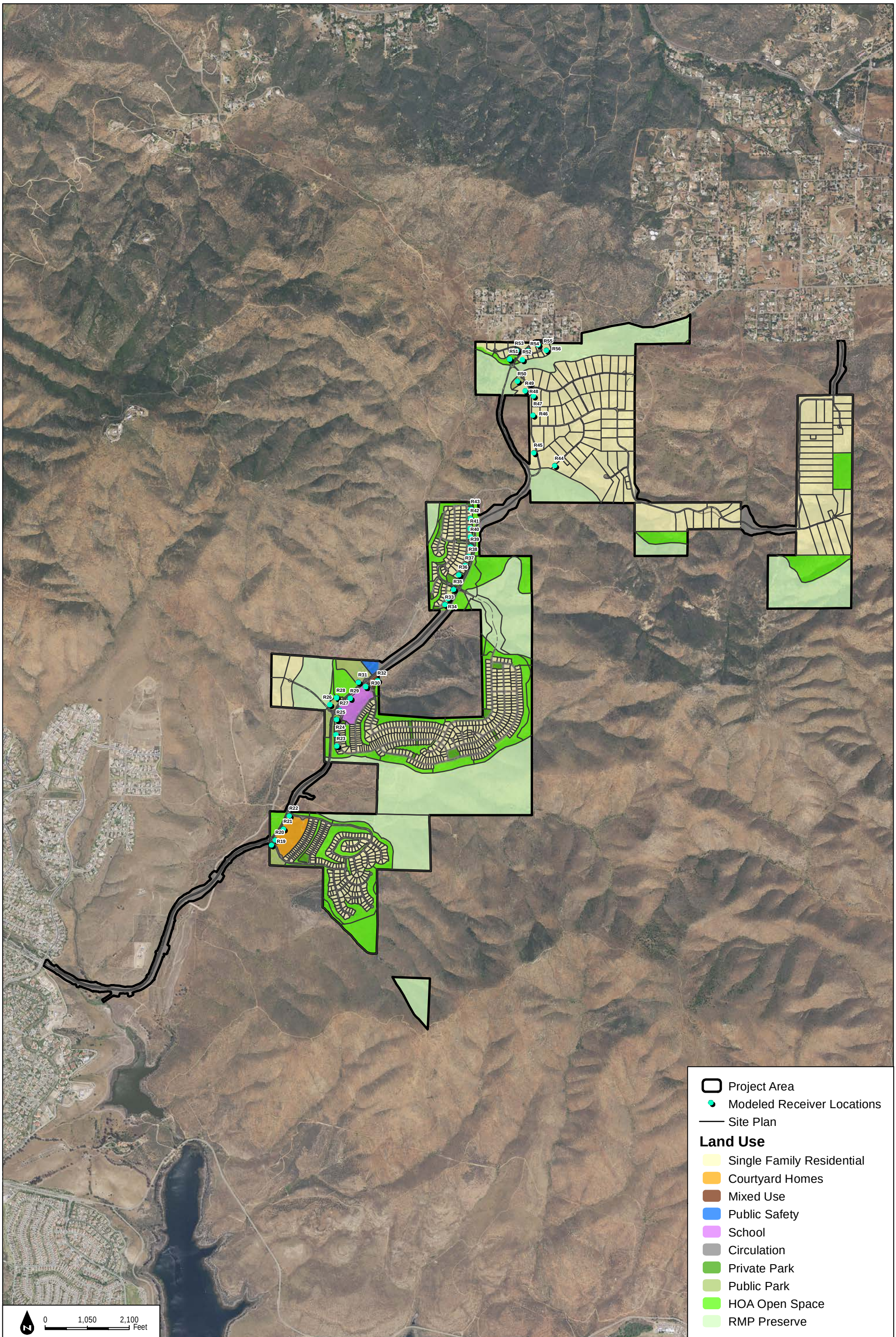

DUDEK

SOURCE: NAIP 2016; Hunsaker 2017

Figure 2.8-3

Modeled On-site Receiver Locations

Otay Ranch Village 14 and Planning Areas 16/19

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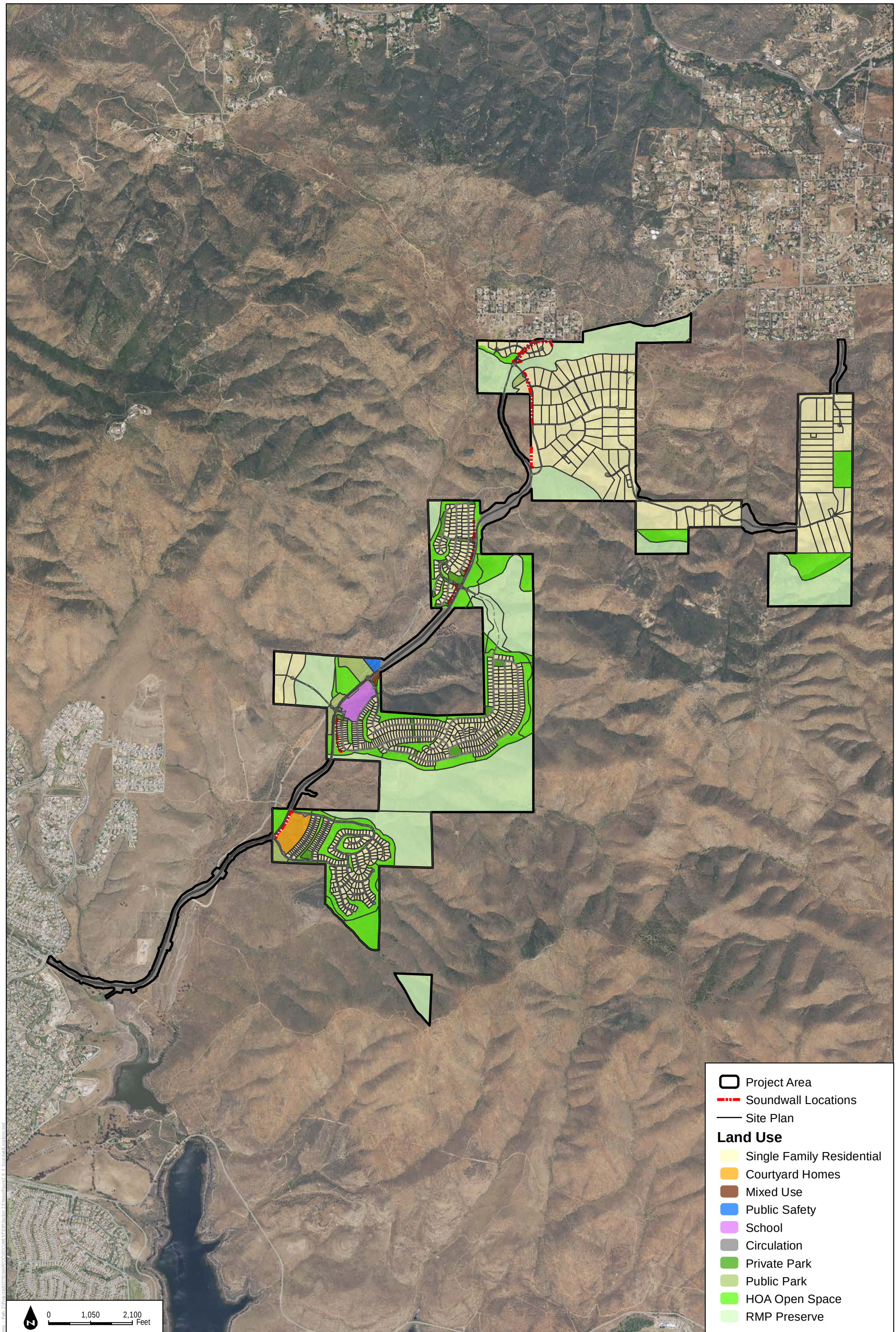

SOURCE: NAIP 2016; Hunsaker 2017

FIGURE 2.8-4

Soundwall Locations

Otay Ranch Village 14 and Planning Areas 16/19

DUDEK

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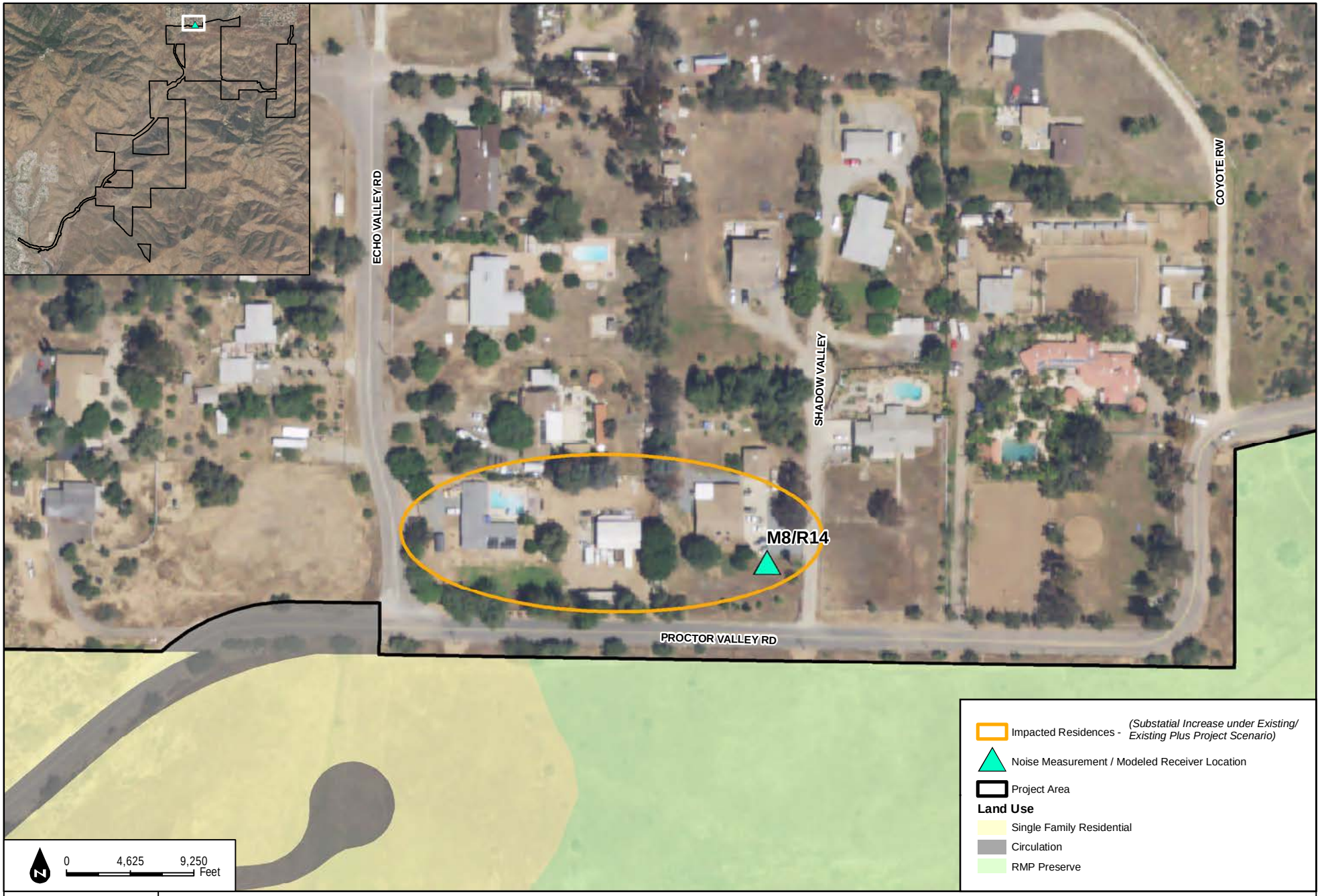

SOURCE: NAIP 2016; Hunsaker 2017

FIGURE 2.8-5

Off-Site Noise Impacts - M8/R14

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Otay Ranch Village 14 and Planning Areas 16/19

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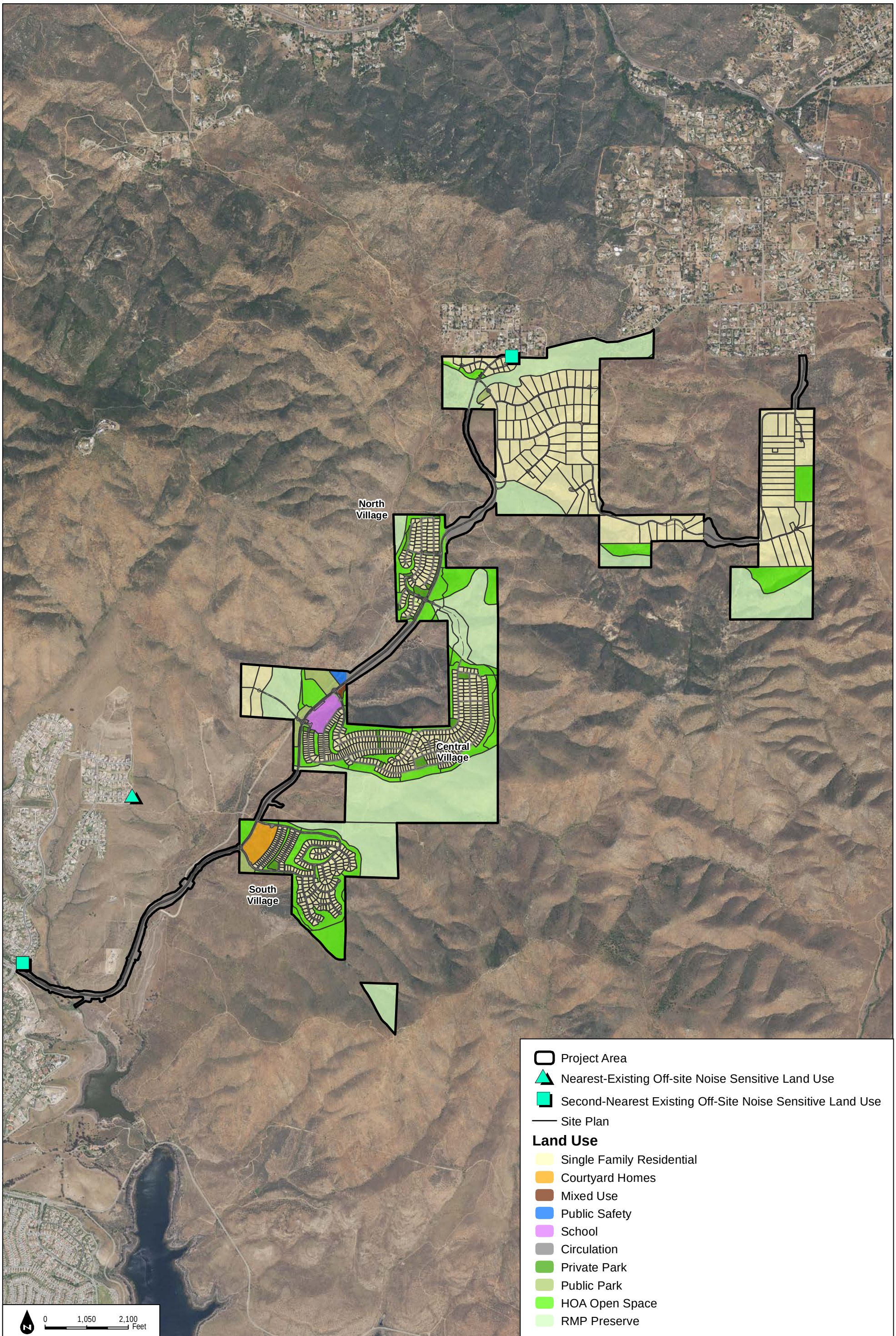

SOURCE: NAIP 2016; Hunsaker 2017

Figure 2.8-6

Nearest Existing Off-Site Noise-Sensitive Land Uses

DUDEK

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