# ACOUSTICAL SITE ASSESSMENT ORO VERDE TENTATIVE SUBDIVISION MAP SAN DIEGO, CA

Project ID PDS2014-TM5583 Environmental Log # PDS2014-ER-14-08-005

#### Submitted to:

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ISE Project #14-001

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#### INTRODUCTION AND DEFINITIONS

#### **Existing Site Characterization**

The proposed Oro Verde Tentative Subdivision Map (APN 241-140-02) consists of approximately 51.2 gross acres, located in the North County Metro Planning Area of San Diego County as shown in Figure 1 on the following page. Regional access to the site is obtained from San Pasqual Valley Road (SR 78) via Quail Ridge Road/Oro Verde Road as shown in Figure 2 on Page 3 of this report. Surrounding land uses consist of single family estate residential lots and limited agricultural development. These features, as well as the proposed site plan configuration, can be seen in Figure 3 on Page 4 of this report.

The project site itself resides as a fully disturbed agricultural land use (i.e., avocado grove). Elevations across the site range from approximately 620 feet to 900 feet above mean sea level (MSL).

#### **Project Description**

The Oro Verde Tentative Subdivision Map would construct ten (10) single family estate lots as shown in Figure 4 on Page 5 of this report. The project would also include necessary roadway and drainage improvements.

#### **Acoustical Definitions and Theory**

Sound waves are linear mechanical waves. They can be propagated in solids, liquids, and gases. The material transmitting such a wave oscillates in the direction of propagation of the wave itself. Sound waves originate from some sort of vibrating surface which alternatively compress the surrounding air on a forward movement, and expand it on a backward movement.

There is a large range of frequencies within which linear waves can be generated, sound waves being confined to the frequency range that can stimulate the auditory organs to the sensation of hearing. For humans, this range is from about 20 Hertz (Hz or cycles per second) to about 20,000 Hz. The air transmits these frequency disturbances outward from the source of the wave.

Noise can be represented as a superposition of periodic waves with a large number of components, and is generally defined as unwanted or annoying sound that is typically associated with human activity, and which interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day, and the sensitivity of the individual hearing the sound.



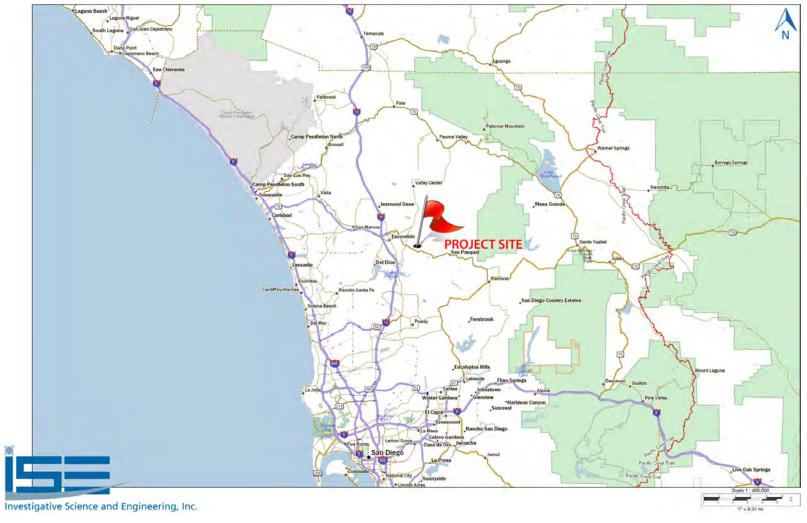


FIGURE 1: Project Study Area Vicinity Map (ISE 7/15)



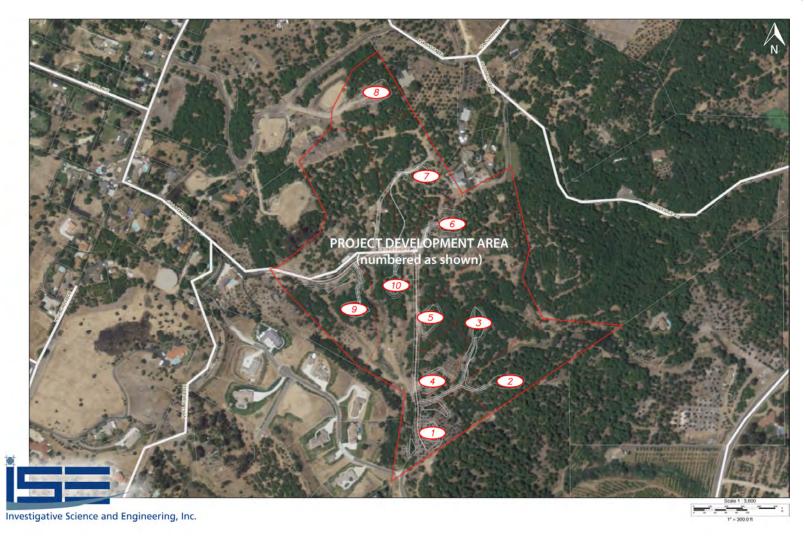


FIGURE 2: Project Study Area Parcel Map (ISE 7/15)





FIGURE 3: Aerial Image Showing Oro Verde Development and Surrounding Uses (ISE 7/15)





FIGURE 4: Proposed Oro Verde Site Development Map (Hunsaker & Associates 7/15)



The loudest sounds that the human ear can hear comfortably are approximately one trillion (or 1x10<sup>12</sup>) times the acoustic energy that the ear can barely detect. Because of this vast range, any attempt to represent the acoustic intensity of a particular sound on a linear scale becomes unwieldy. As a result, a logarithmic ratio, originally conceived for radio work, known as the decibel (dB), is commonly employed.<sup>1</sup>

A sound level of zero "0" dB is scaled such that it is defined as the threshold of human hearing, and would be barely audible to a human of normal hearing under extremely quiet listening conditions. Sound levels above 120 dB roughly correspond to the threshold of pain. The minimum change in sound level that the human ear can detect is approximately 3.0 dBA.<sup>2</sup> A change in sound level of 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness.<sup>3</sup> A change in sound level of 10 dB actually represents an approximate 90 percent change in the sound intensity, but only about a 50 percent change in the perceived loudness. This is due to the nonlinear response of the human ear to sound.

As mentioned above, most of the sounds we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate the sound we hear. The method commonly used to quantify environmental sounds, consists of determining all of the frequencies of a sound according to a weighting system that reflects the nonlinear response characteristics of the human ear. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (or dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of sounds from distant sources that create a relatively steady background noise in which no particular source is identifiable. For this type of noise, a single descriptor called the Leq (or equivalent sound level) is used. Leq is the energy-mean A-weighted sound level during a measured time interval, and would be defined mathematically by the following continuous integral,

$$L_{eq} = 10 Log_{10} \left[ \frac{1}{T} \int_{0}^{T} SPL(t)^{2} dt \right]$$

<sup>&</sup>lt;sup>3</sup> This is a subjective reference based upon the nonlinear nature of the human ear.



<sup>&</sup>lt;sup>1</sup> A unit used to express the relative magnitude of a sound wave. This level is defined as being equal to 20 times the common logarithm of the ratio of the pressure produced by a sound wave of interest, to a 'reference' pressure wave equal to 20 micro Pascal's (μPa) measured at a distance of 1 meter. 20 μPa is the smallest amount of pressure capable of producing the sensation of hearing in a human.

<sup>&</sup>lt;sup>2</sup> Every 3 dB equates to a 50% drop (or increase) in wave strength; therefore a 6 dB drop/increase = a loss/increase of 75% of total signal strength and so on.

In the previous expression,  $L_{eq}$  is the energy equivalent sound level, t is the independent variable of time, T is the total time interval of the event, and, SPL is the sound pressure level *re.* 20  $\mu$ Pa. Thus,  $L_{eq}$  is the 'equivalent' constant sound level that would have to be produced by a given source to equal the average of the fluctuating level measured. For most acoustical studies, the study interval is generally taken as one-hour and the abbreviation used is  $L_{eq-h}$  or  $L_{eq(h)}$ ; however, other time intervals are utilized depending on the jurisdictional preference.

To describe the time-varying character of environmental noise, the statistical noise descriptors  $L_{10}$  and  $L_{90}$  are commonly used. They are the noise levels equaled or exceeded during 10 percent and 90 percent of a stated time. Sound levels associated with the  $L_{10}$  typically describe transient or short-term events, while levels associated with the  $L_{90}$  describe the steady state (or most prevalent) noise conditions. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum and minimum measured sound level ( $L_{max}$  and  $L_{min}$ ) indicators. The  $L_{min}$  value obtained for a particular monitoring location is often called the acoustic floor for that location.

The aggregate of all community noise events are typically averaged into a single value known as the *Community Noise Equivalent Level* (CNEL). This descriptor is calculated by averaging all events over a specified time interval and applying a 5-dBA penalty to any sounds occurring between 7:00 p.m. and 10:00 p.m., and a 10-dBA penalty to sounds that occur during nighttime hours (i.e., 10 p.m. to 7 a.m.). This penalty is applied to compensate for the increased sensitivity to noise during the quieter nighttime hours.

Mathematically, CNEL can be derived based upon the hourly  $L_{eq}$  values, via the following expression where, ' $L_{eq}(x)_i$ ' is the equivalent sound level during period 'x' at time interval 'i', and 'n' is the number of time intervals:

$$CNEL = 10Log_{10} \frac{1}{n} \sum_{i=1}^{n} \left( 10^{\frac{\text{Leq(day)}_{i}}{10}} + 10^{\frac{\text{Leq(evening} + 5)_{i}}{10}} + 10^{\frac{\text{Leq(night + 10)}_{i}}{10}} \right)$$



#### ENVIRONMENTAL SIGNIFICANCE THRESHOLDS

#### **County of San Diego Community Noise Regulations**

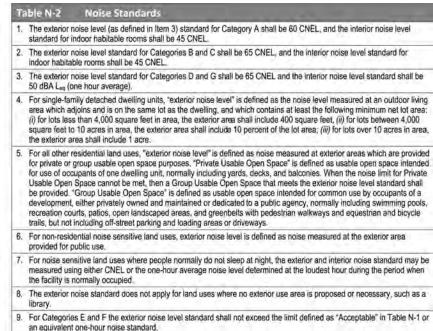
Transportation noise levels, such as those produced by roadways, railroads, airports, heliports, are governed under the *County of San Diego's Noise Element of the 2020 General Plan*. Chapter 8, Tables N-1 and N-2 of the General Plan specify the following exterior noise compatibility guidelines as shown in Table 1 below.



TABLE 1: County of San Diego General Plan 2020 Noise Element Compatibility Guidelines

		Exterior Noise Level (CNEL)								
	Land Use Category	55	60	65	70	75	80			
A	Residential—single family residences, mobile homes, senior housing, convalescent homes									
В	Residential—multi-family residences, mixed-use (commercial/residential)									
С	Transient lodging—motels, hotels, resorts									
D*	Schools, churches, hospitals, nursing homes, child care facilities									
E'	Passive recreational parks, nature preserves, contemplative spaces, cemeteries									
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation									
G'	Office\professional, government, medica\dental, commercial, retail, laboratories									
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair									
	ACCEPTABLE – Specified land use is satisfactor construction, without any special noise insula			n that any bu	ildings involv	ed are of no	rmal			
	CONDITIONALLY ACCEPTABLE—New construing analysis is conducted to determine if noise recriteria for determining exterior and interior mitigate noise to a level deemed Acceptable, been provided to the greatest extent practice.	duction measure noise levels are I the appropriate	s are necessal sted in Table county decisi	N-2, Noise Si on-maker mu	acceptable li andards, if a ist determine	evels for lan	d use.			

<sup>\*</sup> Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).





Thus, for the proposed Oro Verde Tentative Subdivision Map, an exterior noise abatement standard of 60 dBA CNEL would be applicable as applied to areas previously identified under N-2(4).

#### State of California CCR Title 24

The California Code of Regulations (CCR), State Building Code, Part 2, Title 24, Appendix Chapter 35; "Noise Insulation Standards for Multifamily Housing" requires that multi-family dwellings, hotels, and motels located where the CNEL exceeds 60 dBA require an acoustical analysis showing that the proposed design will limit interior noise to less than 45 dBA CNEL for all residential spaces. Worst-case noise levels, either existing or future, must be used.

The County of San Diego has adopted the CCR Title 24 regulations for all types of residential dwellings as codified under the General Plan guidelines N-2(1)(2).

#### San Diego County Construction Noise Ordinance Regulations

The County of San Diego Noise Ordinance Sections 36.409 through 36.410 govern construction noise emissions and allowable daily thresholds. The relevant parts are cited below.

Section 36.409: Sound Level Limitations on Construction Equipment 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.

Section 36.410: Sound Level Limitations on Impulsive Noise

- 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... {of 82 dBA within a residential, village zoning or civic use area, or 85 dBA within an agricultural, commercial or industrial use zone}, ...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 percent of the minutes in the measurement period. The maximum sound level depends on the use being made of the occupied property.
- 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... {of 85 dBA within a residential, village zoning or civic use area, or 90 dBA within an agricultural, commercial or industrial use zone}, ...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 percent of the minutes in the measurement period. The maximum sound level depends on the use being made of the occupied property.

c) 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.



#### APPROACH AND METHODOLOGY

#### **Field Acoustical Reconnaissance**

Two independent monitoring locations were selected within the proposed Oro Verde Tentative Subdivision Map for the purpose of determining the ambient baseline community noise levels during normal free-flow weekday traffic conditions. The instrumentation locations, denoted as Monitoring Locations ML 1 (near proposed Lot 7) and ML 2 (near proposed Lot 1) are shown in Figure 5 on Page 12 of this report. Measurements were performed on January 21, 2013, between 11:20 a.m. and 12:50 p.m., under normal traffic conditions.

For the field monitoring effort, two Quest SoundPro SP-DL-2 ANSI Type 2 integrating sound level meters were used as the data collection devices. The meters were affixed to tripods five-feet above ground level, in order to simulate the noise exposure of an average-height human being. Prior to testing, all equipment was calibrated at ISE's acoustics and vibration laboratory to verify conformance with ANSI S1-4 1983 Type 2 and IEC 651 Type 2 standards.<sup>4</sup> Photos of the test setup are shown in Figures 6a and -b starting on Page 13 of this report.

#### **Construction Noise Impact Assessment Approach**

Major construction noise emission generators expected within the Oro Verde site would consist predominately of diesel-powered grading and earthwork equipment required for grading activities, underground work, and surface paving. Construction noise present at the project site was based upon past measured levels and sources from EPA PB 206717 of each expected equipment type, the duty cycle of each of the

<sup>&</sup>lt;sup>4</sup> All testing and calibration is performed by ISE's Acoustics and Vibration Laboratory using a LORAN-C and Rubidium atomic frequency and time standard traceable to National Institute of Standards & Technology (NIST). The time and frequency calibration signal has a long-term stability of 10<sup>-10</sup>. Specifications for traceability can be obtained at *www.nist.gov*.



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equipment components, and the expected average noise level (over a given eight-hour workday), as well as the expected worst-case noise level at the nearest sensitive receptor.

Cumulative (i.e., worst case aggregate) levels were calculated for a range of expected worst-case noise emissions from proposed equipment at the closest sensitive receptor under spherically-soft propagation conditions, and compared against the aforementioned County of San Diego Noise Ordinance Sections 36.409 through 36.410.

#### **Exterior Traffic Noise Impact Assessment Approach**

The *Traffic Noise Model version 2.5* (TNM 2.5) based on FHWA-PD-96-010 and FHWA/CA/TL-87/03 standards was used to calculate future onsite vehicular traffic noise levels. Currently, TNM 2.5 is the only noise-modeling program formally accepted for use within the State of California. Dominant input to the acoustical model included the following:

- The proposed site development plan (Source: Hunsaker & Associates, 12/13, revision consistency checked 7/15).
- A digitized line-of-sight representation of all major roadways affecting the project site under the worst-case future noise condition (i.e., Cloverdale Road, Oro Verde Road, and San Pasqual Valley Road).
- Future Average Daily Trips (ADT's) for the aforementioned roadway segments (Source: County of San Diego GP 2020 build out year 2030 Planning Commission Recommended Volumes GIS layer).
- A traffic mix of 88.4% LDA/LDT, 6.4% MDT, 4.7% HDT, and 0.5% MCY in accordance with the Caltrans ITS Transportation Protocols (Source: Caltrans Traffic Data Branch, 3/09).
- A peak hour traffic percentage of 8% of the ADT.<sup>7</sup>
- Receptor and topographic elevations (Source: USGS Digital Elevation Model).
- A composite pavement type, consisting of an average of Portland Cement Concrete (PCC) and Dense-Graded Asphaltic Concrete (DGAC) in accordance with TNM 2.5 test results (1998).

Modeled receptor areas consisting of useable space locations within the project footprint as well as exterior building façade points were sampled at various locations to determine the variation of all acoustic sources across, and affecting, the project site.

<sup>&</sup>lt;sup>7</sup> For values between approximately 8 and 12 percent, the energy-mean A-weighted sound level is equivalent to the CNEL.



<sup>&</sup>lt;sup>5</sup> The components of the TNM model are supported by a scientifically founded and experimentally calibrated acoustic computation methodology. The database is made up of over 6,000 individual pass-by events measured at forty sites across the country.

<sup>&</sup>lt;sup>6</sup> The Caltrans vehicle classifications are as follows: LDA = Light Duty Automobile, LDT = Light Duty Truck, MDT = Medium Duty Truck, HDT = Heavy Duty Truck, and MCY = Motorcycle.

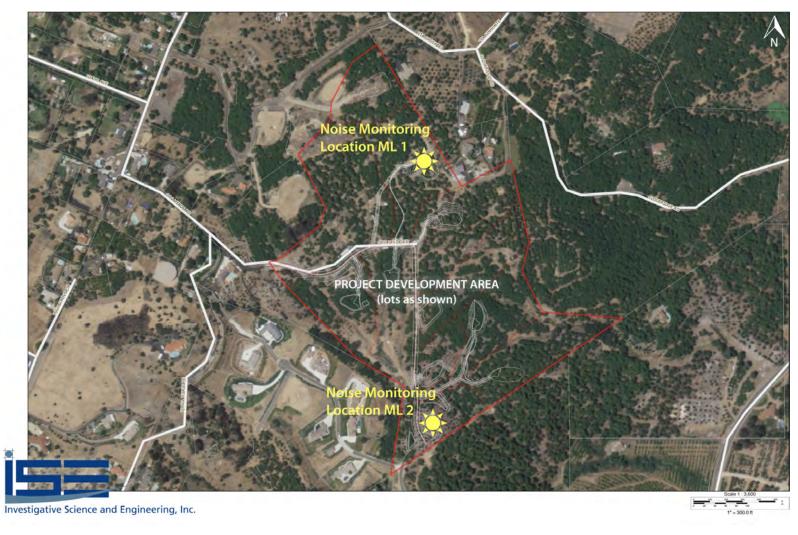


FIGURE 5: Ambient Noise Monitoring Locations ML 1 and ML 2 (ISE 7/15)







FIGURE 6a: Ambient Noise Monitoring Location ML 1 (ISE 1/14)



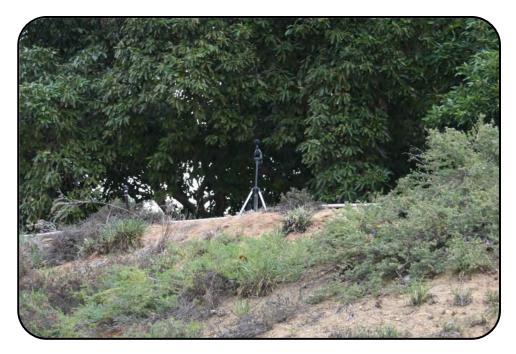




FIGURE 6b: Ambient Noise Monitoring Location ML 2 (ISE 1/14)





#### FINDINGS AND RECOMMENDATIONS

#### **Field Acoustical Reconnaissance Findings**

The results of the field reconnaissance sound level monitoring are shown in Table 2 below with the field data record provided as attachment APP 1 to this report. The values for the equivalent sound level ( $L_{\text{eq-h}}$ ), the maximum and minimum measured sound levels ( $L_{\text{max}}$  and  $L_{\text{min}}$ ), and the statistical indicators  $L_{10}$  and  $L_{90}$ , are given for the monitoring location examined.

TABLE 2: Measured Ambient Sound Levels - Oro Verde Tentative Subdivision Map

		me L <sub>eq</sub> L <sub>max</sub> L <sub>min</sub> L <sub>10</sub> L <sub>90</sub>						
Monitoring Location	Start Time	L <sub>eq</sub>	$L_{max}$	L <sub>min</sub>	L <sub>10</sub>	L <sub>90</sub>		
ML 1	11:20 a.m.	38.1	61.0	30.9	38.9	32.5		
ML 2	11:40 a.m.	40.9	58.6	34.1	42.0	36.2		

#### **Monitoring Location:**

Location ML 1: Near Proposed Lot 7. GPS: CA-VI 6323630.7, 1984540.4 Location ML 2: Near Proposed Lot 1. GPS: CA-VI 6323671.8, 1982852.6

Measurements performed by ISE on 1/21/14.

EPE = Estimated GPS Position Error = 8 ft.

Temperature = 74.3 °F. Relative Humidity = 31.5 %. Barometric Pressure = 29.18 in-Hg.

Measurements collected reflect the ambient daytime community sound levels in the vicinity of the proposed project site. As can be seen, the hourly average sound level (or  $L_{\text{eq-h}}$ ) recorded over the monitoring period ranged between 38 to 41 dBA and was observed to be entirely due to an aggregation of community noise from afar. These levels were found to be in compliance with the County's compatibility standards and consistent with the observed community setting.

#### Construction Noise Emission Levels

The estimated worst-case construction vehicle noise emissions are provided in Table 3 for the combination of site clearing, remedial grading, and infrastructure work inclusive of any powered haulage. Construction within the proposed project area would typically occur between the hours of 7:00 a.m. and 3:00 p.m. Monday through Friday.



TABLE 3: Predicted Construction Noise Levels - Oro Verde Development Site

Equipment Type Model	Selected EPA Tier Level	Quantity Used (#)	Duty Cycle (hrs/day)	Source Level @ 50 Feet (dBA)	Cumulative Effect @ 50 Feet (dBA Leq <sub>8h</sub> )
Dozer D10T	3	2	8	75	78.0
Dozer D9R	3	1	8	70	70.0
Dozer D6T LGP	3	1	8	75	75.0
Scraper- 657G Tractor	3	1	8	80	80.0
Motor Grader 120K	3	1	8	70	70.0
Water Truck	3	2	8	70	73.0
Hydraulic Excavator 349EL	3	1	8	75	75.0
			Worst-Case Aggre	gate Sum @ 50 Ft. (Σ):	84.3
			Leq <sub>8h</sub> at Receptor	Area 150-Feet Distant:	72.3

Source: EPA PB 206717, Environmental Protection Agency, 12/31/71, "Noise from Construction Equipment and Operations"



The nearest sensitive residential receptor line would be, at a minimum, approximately 150-feet from any construction activity centroid (i.e., existing residence to proposed building Pad #7). As can be seen, predicted worst-case construction noise levels could be as high as 84.3 dBA Leq<sub>8h</sub> at 50-feet, with a resultant receptor level of 72.3 dBA Leq<sub>8h</sub> or less. This level is below the County of San Diego construction noise abatement threshold, and is not expected to generate impacts, nor require mitigation.

#### **Future Traffic Noise Impacts to Proposed Development**

Traffic noise affecting the proposed Oro Verde Tentative Subdivision Map is currently, and would continue to be, the aggregation of surface street traffic along Cloverdale Road, Oro Verde Road, and San Pasqual Valley Road. Both Cloverdale and Oro Verde Roads have maximum travel speeds of 25 MPH for automobiles, while San Pasqual Valley Road has a maximum speed of 55 MPH.

Figure 7 on the following page identifies worst case average daily traffic (ADT) volumes along affected roadways as being 5,184 ADT for Cloverdale Road, 1,695 ADT for Oro Verde Road, and 16,134 ADT for San Pasqual Valley Road. Given these traffic volumes, Table 4 below shows the predicted TNM receptor ID corresponding to the proposed physical lot number and whether or not mitigation measures are indicated. The complete model runs are provided as Attachment APP 2 to this report.

TABLE 4: Predicted Future Transportation Noise Levels – Oro Verde Tentative Subdivision Map

TNM Calculation Receptor ID	Ground Receptor Sound Levels in dBA	Elevated Receptor Sound Levels in dBA	GP 2020 Exterior Mitigation Required?	CCR Title 24 Interior Mitigation Required?
1	41.8	41.5	No	No
2	40.9	40.7	No	No
3	40.3	40.1	No	No
4	40.7	40.7	No	No
5	39.6	39.5	No	No
6	38.5	38.5	No	No
7	38.1	38.1	No	No
8	37.6	37.6	No	No
9	39.9	39.8	No	No
10	39.3	39.3	No	No

Based upon the findings, no exterior noise levels within sensitive usable space areas are identified which would exceed the County's noise abatement standards. No significant exterior acoustical impacts are identified. Future first- and second-floor building façade noise levels were found to be below the CCR Title 24 Noise Insulation threshold of 60 dBA CNEL and would not require mitigation measures pursuant to State code.



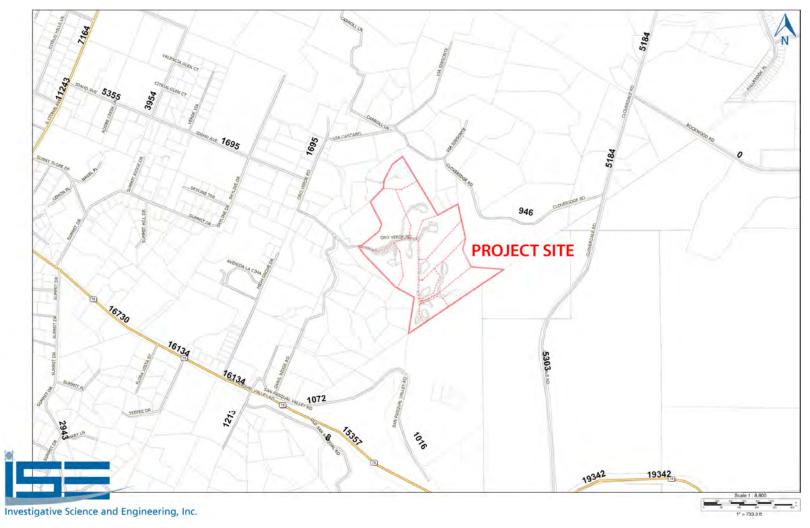


FIGURE 7: County of San Diego GP 2020 Future Traffic Segment Predictions (ISE 7/15)





### CERTIFICATION OF ACCURACY AND QUALIFICATIONS

This report was prepared by Investigative Science and Engineering, Inc. (ISE), located at 1134 D Street, Ramona, CA 92065. The members of its professional staff contributing to the report are listed below:

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ISE affirms to the best of its knowledge and belief that the statements and information contained herein are in all respects true and correct as of the date of this report. Content and information contained within this report is intended only for the subject project and is protected under 17 U.S.C. §§ 101 through 810.

Should the reader have any questions regarding the findings and conclusions presented in this report, please do not hesitate to contact ISE at (760) 787-0016.

Approved as to Form and Content:

Rick Tavares, Ph.D.

Project Principal

Investigative Science and Engineering, Inc. (ISE)





### APPENDICIES AND SUPPLEMENTAL INFORMATION

#### **APP 1 – Field Reconnaissance Measurement Results**

# ML 1 - Proposed Lot #7

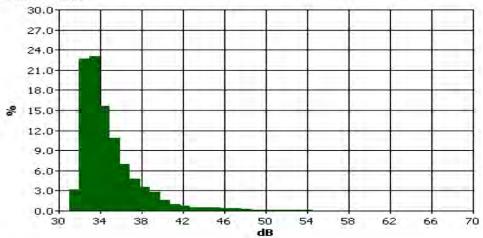
#### Information Panel

Name Start Time Stop Time Device Model Type Comments ML 1 Tuesday, January 21, 2014 11:19:55 Tuesday, January 21, 2014 12:14:29 SoundPro DL

#### **General Data Panel**

Description	Meter	Value	Description	Meter	Value
Leg	1	38 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

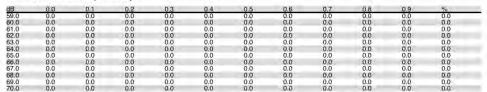
#### **Statistics Chart**



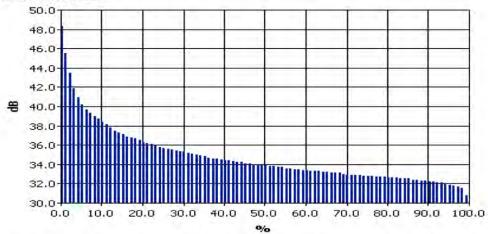
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#### Statistics Table (cont'd)



#### **Exceedance Chart**



# Exceedance Table

Control of the	0%	1%	2%	3%	4%	5%	8%	7%	8%	9%
0%		48.3	45.5	43.5	41.9	40.9	40.2	39.7	39.3	39.0
10%	38.7	38.4	38.1	37.8	37.5	37.3	37.1	36.9	36.8	36.7
20%	36.5	36.3	36.2	36.1	35.9	35.8	35.7	35.6	35.5	35.4
30%	35.3	35.3	35.2	35.1	35.0	34.9	34.8	34.7	34.6	34.6
40%	34.5	34.4	34.4	34.3	34.2	34.2	34.1	34.1	34.0	34.0
50%	33.9	33.9	33.8	33.8	33.7	33.7	33.6	33.6	33.5	33.5
60%	33.4	33.4	33.3	33.3	33.3	33.2	33.2	33.1	33.1	33.1
70%	33.0	32.9	32.9	32.9	32.9	32.8	32.8	32.8	32.7	32.7
80%	32.7	32.6	32.6	32.6	32.5	32.5	32.5	32.4	32.4	32.3
90%	32.3	32.2	32.2	32.1	32.1	32.0	31.9	31.8	31.7	31.5
100%	30.8			2007.19						



# ML 2 - Proposed Lot #1

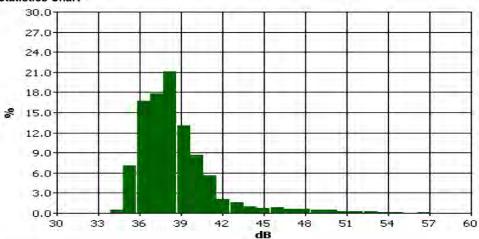
#### Information Panel

Name Start Time Stop Time Device Model Type Comments ML 2 Tuesday, January 21, 2014 11:37:52 Tuesday, January 21, 2014 12:22:56 SoundPro DL

#### **General Data Panel**

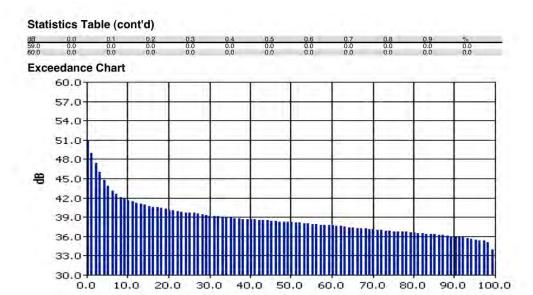
Description	Meter	Value	Description	Meter	Value
Leq	1	40.9 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

#### **Statistics Chart**



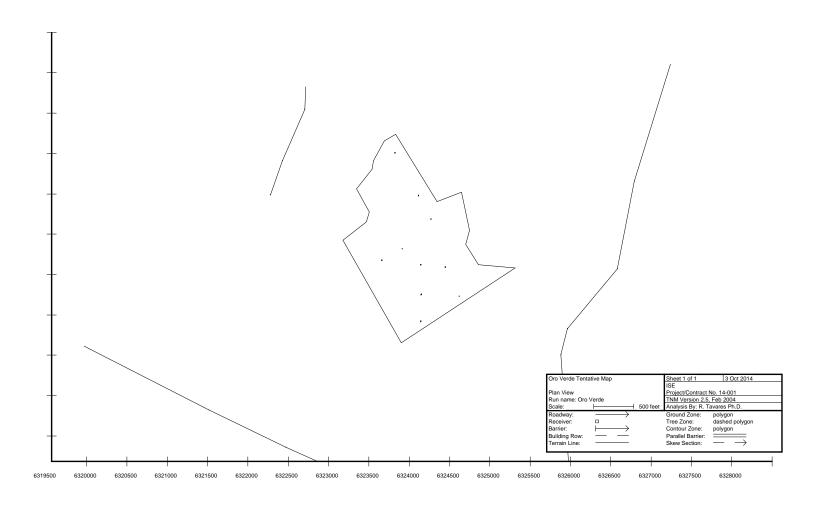
Stati	stics Ta	able									
dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	19/6
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5
35.0	0.2	0.3	0.3	0.5	0.7	1.0	0.9	1.0	1.1	1.1	7.1
36.0	1.5	1.1	1.5	1.6	1.8	1.6	2.0	2.0	1.8	1.7	16.7
37.0	2.0	2.0	2.0	1.8	1.6	1.7	1.6	1.7	1.7	1.8	17.8
38.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.0	1.9	21.0
39.0	1.8	1.2	1.6	1.4	1.3	1.2	1.3	1.2	1.1	1.0	13.0
40.0	1.1	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.7	8.7
41.0	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	5.6
42.0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.1
43.0	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	1.5
44.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
45.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
46.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
47.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
48.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
49.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
50.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.5
51.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0







APP 2 - TNM Model Input/Output Data





INPUT: ROADWAYS							14-00	)1			
ISE R. Tavares Ph.D. INPUT: ROADWAYS					3 October 20 TNM 2.5	014	A		o aball bo .	used unless	_
PROJECT/CONTRACT:	14-001						_	pavement typi ighway agend			
RUN:	Oro Verde Tentative Map						rent type with				
Roadway		Points									
Name	Width	Name	No.	Coordinates	(pavement)		Flow Co	ntrol		Segment	
				х	Υ	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
CLOVERDALE RD	12.0	CLOVERD	35	6,326,732.0	1,986,109.0	447.00	0			Average	
		CLOVERD	36	6,326,282.0	1,984,660.0	419.10	0			Average	
		CLOVERD	37	6,326,071.0	1,983,576.0	408.20	0			Average	
		CLOVERD	38	6,325,453.0	1,982,831.0	402.50	0			Average	
		CLOVERD	39	6,325,372.0	1,982,512.0	397.20	0			Average	
		CLOVERD		6,325,529.0	1,980,324.0	378.40	0				
ORO VERDE RD	12.0			6,322,212.0	1,985,830.0					Average	
		ORO VER		6,322,198.0	, ,		-			Average	
		ORO VER		-,,-	.,,					Average	
		ORO VER		6,321,771.0	.,,						
SAN PASQUAL RD	60.0			-,,						Average	
		SAN PAS		0,000,000	.,					Average	
		SAN PAS		-,,	.,,		-			Average	
		SAN PAS		-,,	.,,		-			Average	
		SAN PAS		-,,						Average	
		SAN PAS	50	6,324,654.0	1,979,816.0	436.3	0				



NPUT: TRAFFIC FOR LAeq1h Volumes						14	4-001						
ISE R. Tavares Ph.D.					ober 2014 2.5	4							
INPUT: TRAFFIC FOR LAeq1h Volumes PROJECT/CONTRACT: RUN:	14-001 Oro Verde Ten	ıtative	Мар										
Roadway	Points												
Name	Name	No.	Segmer	nt									
			Autos		MTruck	S	HTruck	s	Buses		Motorc	ycles	9
			V	S	V	S	٧	s	V	s	V	s	
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mpl	h
CLOVERDALE RD	CLOVERDAL	35	367	25	5 27	7 2	5 19	9 2	5	1 2	5	2	25
	CLOVERDAL	36	367	25	27	7 2	5 19	9 2	5	1 2	5	2	25
	CLOVERDAL		367	25	5 27	7 2	5 19	9 2	5	1 2	5	2	25
	CLOVERDAL					_		_	_	1 2	_	2	25
	CLOVERDAL			25	5 27	7 2	5 19	9 2	5	1 2	5	2	25
	CLOVERDAL												
ORO VERDE RD	ORO VERDE	41						3 2		1 2		1	25
	ORO VERDE	42			_			5 2	-	1 2	-	1	25
	ORO VERDE	43		25	5 5	2	5 (	5 2	5	1 2	5	1	25
	ORO VERDE	44							_		_	_	
SAN PASQUAL RD	SAN PASQUA					-	-		_	1 5	_	6	55
	SAN PASQUA			-			-		-	1 5	-	6	55 55
	SAN PASQUA					-	-		-	1 5	-	6	55
	SAN PASQUA								-	1 5	-	6	55
	SAN PASQUA			55	) 83	5 5	5 6	1 5	5	1 5	5	р	50

C:\TNM25\Oro Verde 1 3 October 2014



l erde Te					3 October TNM 2.5	2014					
erde Te											
	entative Map										
#DUs	Coordinates	(ground)			Height	Input Sou	nd Levels	and Criter	ia	,	Active
	x	Υ	Z		above	Existing	Impact Ci	riteria	NR	i	in
					Ground	LAeq1h	LAeq1h	Sub'l	Goal	(	Calc.
	ft	ft	ft		ft	dBA	dBA	dB	dB		
1	6.323.634.0	1.982.923.0		674.00	5.00	0.00	60	0 10.	0	5.0	Υ
1	6,324,111.0	1,983,235.0		649.00	5.00	0.00	60	0 10.	0	5.0	Υ
1	6,323,941.0	1,983,596.0		650.00	5.00	0.00	60	0 10.	0	5.0	Υ
1	6,323,640.0	1,983,255.0		675.00	5.00	0.00	60	0 10.	0	5.0	Υ
1	6,323,635.0	1,983,625.0		715.00	5.00	0.00	60	0 10.	0	5.0	Υ
1	6,323,761.0	1,984,191.0		780.00	5.00	0.00	60	0 10.	0	5.0	Υ
1	6,323,606.0	1,984,481.0		840.00	5.00	0.00	60	) 10.	0	5.0	Υ
	6,323,316.0	1,985,010.0		959.00	5.00	0.00	60	) 10.	0	5.0	Υ
	6,323,153.0	1,983,680.0		720.00	5.00	0.00	60	) 10.	0	5.0	Υ
		,		733.00						5.0	Υ
	-,,	.,,									Υ
	.,	.,,							-		Υ
	.,,.	.,,									Υ
											Y
											Υ
	-,,	.,,									Y
											Y
		.,									Y
1		, ,					- 60			5.0	Y
	1 1 1 1 1 1 1 1 1 1	1 6,323,606.0 1 6,323,316.0 1 6,323,153.0 1 6,323,405.0 1 6,323,634.0 1 6,323,941.0 1 6,323,641.0 1 6,323,640.0 1 6,323,761.0 1 6,323,364.0 1 6,323,366.0 1 6,323,316.0	1 6,323,606.0 1,984,481.0 1 6,323,316.0 1,985,010.0 1 6,323,455.0 1,983,826.0 1 6,323,405.0 1,983,826.0 1 6,323,640.0 1,983,260.0 1 6,323,640.0 1,983,260.0 1 6,323,640.0 1,983,260.0 1 6,323,661.0 1,983,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 1,933,601.0 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1,985,015.0 969.00	1 6,323,606.0 1,984,481.0 840.00 5.00 1 6,323,316.0 1,985,010.0 959.00 5.00 1 6,323,153.0 1,983,880.0 720.00 5.00 1 6,323,405.0 1,983,826.0 733.00 5.00 1 6,323,640.0 1,982,928.0 684.00 5.00 1 6,323,941.0 1,983,260.0 659.00 5.00 1 6,323,640.0 1,983,260.0 685.00 5.00 1 6,323,640.0 1,983,260.0 685.00 5.00 1 6,323,640.0 1,983,630.0 725.00 5.00 1 6,323,610.0 1,984,196.0 790.00 5.00 1 6,323,360.0 1,984,486.0 850.00 5.00 1 6,323,316.0 1,984,486.0 850.00 5.00 1 6,323,316.0 1,985,015.0 969.00 5.00 1 6,323,153.0 1,985,615.0 969.00 5.00	1 6,323,606.0 1,984,481.0 840.00 5.00 0.00 1 6,323,316.0 1,985,010.0 959.00 5.00 0.00 1 6,323,153.0 1,983,680.0 720.00 5.00 0.00 1 6,323,405.0 1,983,826.0 733.00 5.00 0.00 1 6,323,405.0 1,982,928.0 684.00 5.00 0.00 1 6,324,111.0 1,983,240.0 659.00 5.00 0.00 1 6,324,111.0 1,983,601.0 660.00 5.00 0.00 1 6,323,941.0 1,983,601.0 665.00 5.00 0.00 1 6,323,640.0 1,983,630.0 725.00 5.00 0.00 1 6,323,640.0 1,984,196.0 790.00 5.00 0.00 1 6,323,761.0 1,984,196.0 790.00 5.00 0.00 1 6,323,606.0 1,984,486.0 850.00 5.00 0.00 1 6,323,316.0 1,984,486.0 850.00 5.00 0.00	1 6,323,606.0 1,984,481.0 840.00 5.00 0.00 66 1 6,323,316.0 1,985,010.0 959.00 5.00 0.00 66 1 6,323,405.0 1,983,826.0 720.00 5.00 0.00 66 1 6,323,405.0 1,983,826.0 733.00 5.00 0.00 66 1 6,323,405.0 1,982,928.0 684.00 5.00 0.00 66 1 6,324,111.0 1,982,240.0 659.00 5.00 0.00 66 1 6,323,641.0 1,983,601.0 660.00 5.00 0.00 66 1 6,323,640.0 1,983,260.0 685.00 5.00 0.00 66 1 6,323,640.0 1,983,630.0 725.00 5.00 0.00 66 1 6,323,361.0 1,984,196.0 790.00 5.00 0.00 66 1 6,323,316.0 1,984,486.0 850.00 5.00 0.00 66 1 6,323,316.0 1,984,486.0 850.00 5.00 0.00 66 1 6,323,316.0 1,985,015.0 969.00 5.00 0.00 66 1 6,323,153.0 1,983,685.0 730.00 5.00 0.00 66	1 6,323,360.0 1,984,481.0 840.00 5.00 0.00 60 10.0 1 6,323,316.0 1,985,000 5.00 0.00 60 10.0 1 6,323,316.0 1,985,000 720.00 5.00 0.00 60 10.0 1 6,323,405.0 1,983,826.0 720.00 5.00 0.00 60 10.0 1 6,323,405.0 1,983,826.0 733.00 5.00 0.00 60 10.0 1 6,323,430.0 1,982,928.0 684.00 5.00 0.00 60 10.0 1 6,323,4111.0 1,983,240.0 659.00 5.00 0.00 60 10.0 1 6,323,411.0 1,983,601.0 660.00 5.00 0.00 60 10.0 1 6,323,640.0 1,983,260.0 685.00 5.00 0.00 60 10.0 1 6,323,635.0 1,983,630.0 725.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 790.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 850.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 950.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 950.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,316.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,316.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,315.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0 10.0 10.0 10.0 10.0 10.	1 6,323,666.0 1,984,481.0 840.00 5.00 0.00 60 10.0 1 6,323,316.0 1,985,010 959.00 5.00 0.00 60 10.0 1 6,323,4153.0 1,983,826.0 720.00 5.00 0.00 60 10.0 1 6,323,405.0 1,983,826.0 733.00 5.00 0.00 60 10.0 1 6,323,405.0 1,983,826.0 684.00 5.00 0.00 60 10.0 1 6,323,401.0 1,982,928.0 684.00 5.00 0.00 60 10.0 1 6,323,411.0 1,983,240.0 659.00 5.00 0.00 60 10.0 1 6,323,411.0 1,983,601.0 660.00 5.00 0.00 60 10.0 1 6,323,640.0 1,983,260.0 685.00 5.00 0.00 60 10.0 1 6,323,635.0 1,983,630.0 725.00 5.00 0.00 60 10.0 1 6,323,636.0 1,984,486.0 850.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 790.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 790.00 5.00 0.00 60 10.0 1 6,323,3761.0 1,984,196.0 950.00 5.00 0.00 60 10.0 1 6,323,316.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,316.0 1,985,015.0 969.00 5.00 0.00 60 10.0 1 6,323,153.0 1,985,015.0 730.00 5.00 0.00 60 10.0	1       6,323,606.0       1,984,481.0       840.00       5.00       0.00       60       10.0       5.0         1       6,323,316.0       1,985,010.0       959.00       5.00       0.00       60       10.0       5.0         1       6,323,153.0       1,983,680.0       720.00       5.00       0.00       60       10.0       5.0         1       6,323,405.0       1,983,826.0       733.00       5.00       0.00       60       10.0       5.0         1       6,323,634.0       1,982,928.0       684.00       5.00       0.00       60       10.0       5.0         1       6,323,941.0       1,983,601.0       660.00       5.00       0.00       60       10.0       5.0         1       6,323,640.0       1,983,260.0       685.00       5.00       0.00       60       10.0       5.0         1       6,323,640.0       1,983,630.0       725.00       5.00       0.00       60       10.0       5.0         1       6,323,761.0       1,984,486.0       790.00       5.00       0.00       60       10.0       5.0         1       6,323,316.0       1,985,015.0       969.00       5.00       0.00       6

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NPUT: GROUND ZONES					
ISE R. Tavares Ph.D.				3 October 20 TNM 2.5	14
INPUT: GROUND ZONES					
PROJECT/CONTRACT:	14-001				
RUN:		Tentative Map			
Ground Zone			Points	1	
Name	Type	Flow	No.	Coordinates	
		Resistivity		X	Υ
		cgs rayls		ft	ft
Oro Verde Boundary	Loose Soil	500	30	6,322,672.0	1,983,929.0
			31	6,322,964.0	1,984,154.0
			32	6,322,996.0	1,984,278.0
			33	6,322,841.0	1,984,568.0
			34	6,323,031.0	1,984,809.0
			35	6,323,048.0	1,984,918.0
			36	6,323,183.0	1,985,159.0
			37	6,323,325.0	1,985,244.0
			38	6,323,836.0	1,984,405.0
			39	6,324,143.0	1,984,527.0
			40	6,324,242.0	1,984,050.0
			41	6,324,193.0	1,983,879.0
			42	6,324,348.0	1,983,628.0
			43	6,324,803.0	1,983,586.0
			44	6,323,392.0	1,982,659.0

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RESULTS: SOUND LEVELS							1	4-001						
ISE R. Tavares Ph.D. RESULTS: SOUND LEVELS PROJECT/CONTRACT: RUN: BARRIER DESIGN: ATMOSPHERICS:		INPUT	rde Tentati HEIGHTS F, 50% RH	•				3 October TNM 2.5 Calculate	d with TN Average a State h	M 2.5  pavement type lighway agency serent type with	y substantiate	es the use		
Receiver		oo deg	r, 50% Nn	•					or a diffe	rent type with	approvai oi r	nwa.		
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n		Increase over Calculated	existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduc Calculated	ction Goal	Calcul minus Goal	
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB	
LOT 1 GROUND FLOOR	71	1	0.0	41	8	60	41.8	10		41.8	0.0	)	5	-5.0
LOT 2 GROUND FLOOR	72	1	0.0	40	9	60	40.9	10		40.9	0.0	)	5	-5.0
LOT 3 GROUND FLOOR	73	1	0.0	40	3	60	40.3	10		40.3	0.0	)	5	-5.0
LOT 4 GROUND FLOOR	74	1	0.0	40	7	60	40.7	10		40.7	0.0	)	5	-5.0
LOT 5 GROUND FLOOR	75	1	0.0	39	6	60	39.6	10		39.6	0.0	)	5	-5.0
LOT 6 GROUND FLOOR	76	1	0.0	38	5	60	38.5	10		38.5	0.0	)	5	-5.0
LOT 7 GROUND FLOOR	77	1	0.0	38	1	60	38.1	10		38.1	0.0	)	5	-5.0
LOT 8 GROUND FLOOR	78	1	0.0	37	6	60	37.6	10		37.6	0.0	)	5	-5.0
LOT 9 GROUND FLOOR	79	1	0.0	39	9	60	39.9	10		39.9	0.0	)	5	-5.0
LOT 10 GROUND FLOOR	80	1	0.0	39	3	60	39.3	10		39.3	0.0	)	5	-5.0
LOT 1 SECOND FLOOR	81	1	0.0	41	5	60	41.5	10		41.5	0.0	)	5	-5.0
LOT 2 SECOND FLOOR	83	1	0.0	40	7	60	40.7	10	)	40.7	0.0	)	5	-5.0
LOT 3 SECOND FLOOR	84	1	0.0	40	1	60	40.1	10	)	40.1	0.0	)	5	-5.0
LOT 4 SECOND FLOOR	85	1	0.0	40	7	60	40.7	10		40.7	0.0	)	5	-5.0
LOT 5 SECOND FLOOR	86	1	0.0	39	5	60	39.5	10	)	39.5	0.0	)	5	-5.0
LOT 6 SECOND FLOOR	87	1	0.0	38	5	60	38.5	10		38.5	0.0	)	5	-5.0
LOT 7 SECOND FLOOR	88	1	0.0	38	1	60	38.1	10	)	38.1	0.0	)	5	-5.0
LOT 8 SECOND FLOOR	89	1	0.0	37	6	60	37.6	10		37.6	0.0	)	5	-5.0
LOT 9 SECOND FLOOR	90	1	0.0	39	8	60	39.8	10		39.8	0.0	)	5	-5.0
LOT 10 SECOND FLOOR	91	1	0.0	39	3	60	39.3	10		39.3	0.0	)	5	-5.0
Dwelling Units		# DUs	Noise Re	duction										
			Min dB	Avg dB	Max dB									

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 1
 3 October 2014



Acoustical Site Assessment Oro Verde Tentative Subdivision Map – San Diego, CA ISE Project #14-001 July 28, 2015 (Revised) Page 30

RESULTS: SOUND LEVELS					14-001	
All Selected	20	0.0	0.0	0.0		<del>"</del>
All Impacted	0	0.0	0.0	0.0		
All that meet NR Goal	0	0.0	0.0	0.0		

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