Las Lomas Grading Project, City of Vista
Noise Technical Report

Submitted to:

City of Vista
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1.1 INTRODUCTION

This report presents an analysis of potential noise impacts associated with the Las Lomas Grading Project (the "Project") in the City of Vista, CA. The Project consists of grading a site for a single-family residence on a single parcel (APN 174-260-15, also referred to as Lot 7 in this report), and improving a road that provides fire access to the wider area. The grading for the single-family residence is proposed to occur on a property/parcel controlled by the proponent, while the fire access road passes along this parcel and passes between several other, privately-owned parcels south of APN 174-260-15 (Lot 7).

Access will be from Las Lomas, which will be widened to 24 ft in width to provide fire and traffic access i.e., the Fire Access Road portion of the project, to service the Lot 7 portion of the project, the other residences off Las Lomas, and because further development is planned to the north of this parcel across Las Lomas. The northeast end of the section of road which will be widened is at an elevation of 870 ft AMSL and is north of the Lot 7 parcel. From this point the road heads downhill to the west and turns into Tierra Del Cielo, where shortly after running along the west side of the Lot 7 parcel it has a "hairpin" turn which will be widened to provide better road visibility. It then continues south and crosses a steep gully where the road reaches its lowest elevation of 692 ft AMSL and will narrow to 20 ft in width to prevent any input of fill into the gully. The road then will widen back to 24 ft width and ends about 100 ft north of the intersection with Camino Culebra at an elevation of 709 ft AMSL. The road widening fits entirely within the existing easement for the road. Both the single-family residence pad and the road widening will make use of the local crystalline bedrock as a retaining wall to significantly reduce cut slope area.

The property (APN 174-260-15) is adjacent to the City's Warmland Highlands Specific Plan, within an Open Space Residential General Plan designation allowing 0.4 dwelling units per acre, in an Open Space zone as identified in the City's Zoning Map.

This report presents an overview of existing noise conditions at the Project site, an overview of noise background information, noise regulatory setting, and an analysis of potential noise impacts of the Project. All noise impacts were found to be **less than significant with mitigation.**

1.2 SETTING

1.2.1 NOISE SETTING

Noise Descriptors

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound pressure level has become the most common descriptor used to characterize the "loudness" of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Decibels are measured using different scales, and it has been found that A- weighting of sound levels best reflects the human ear's reduced sensitivity to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. All references to decibels (dB) in this report will be A-weighted unless noted otherwise.

Several time-averaged scales represent noise environments and consequences of human activities. The most commonly used noise descriptors are the equivalent A–weighted sound level over a given time period (Leq)[1]; average day–night 24-hour average sound level (Ldn)[2] with a nighttime increase of 10 dB to account for sensitivity to noise during the nighttime; and community noise equivalent level (CNEL)[3], also a 24-hour average that includes both an evening and a nighttime sensitivity weighting.

Noise Attenuation

Stationary point sources of noise, including construction equipment, attenuate (lessen) at a rate of 6 to 7.5 dB per doubling of distance from the source, depending on ground absorption. Soft sites attenuate at 7.5 dB per doubling because they have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. Hard sites have reflective surfaces (e.g., parking lots or smooth bodies of water) and therefore have less attenuation (6.0 dB per doubling). A street or roadway with moving vehicles (known as a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dB each time the distance doubles from the source, which also depends on ground absorption (CalTrans, 1998). Physical barriers located between a noise source and the noise receptor, such as berms or sound walls, will increase the attenuation that occurs by distance alone.

1 The Equivalent Sound Level (Leq) is a single value of a constant sound level for the same measurement period duration, which has sound energy equal to the time–varying sound energy in the measurement period.

2 Ldn is the day–night average sound level that is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to night between 10:00 p.m. and 7:00 a.m.

3 CNEL is the average A-weighted noise level during a 24-hour day, obtained by addition of 5 decibels in the evening from 7:00 to 10:00 p.m., and an addition of a 10–decibel penalty in the night between 10:00 p.m. and 7:00 a.m.

1.2.2 REGULATORY SETTING

City of Vista General Plan, Noise Element

The Noise Element of the City of Vista (COV) *GP 2030* includes a noise/land use compatibility matrix for assessing the suitability of different categories of planned land uses based on exterior noise level exposure (Table NE-3 from the COV's *GP 2030*). For Single Family Residential land uses, the Noise Element specifies exterior noise levels up to 65 dB, CNEL as normally acceptable and up to 70 dB, CNEL as conditionally acceptable. Noise levels exceeding 70 dB, CNEL are generally unacceptable for Single Family residential uses.

In addition, the COV defines specific maximum noise levels that shall not be exceeded for both interior and exterior use areas. A proposed project shall not generate noise levels that exceed these standards. The COV extends the provisions of the State of California Noise Insulation Standards (Title 24), limiting interior noise levels to 45 dB CNEL for Single Family residential development. **Table NOI-1,** *Interior and Exterior Noise Guidelines*, provides Maximum Noise Level limits for various types of land uses.

TABLE NOI-1 INTERIOR AND EXTERIOR NOISE GUIDELINES

Land Use	Maximum Noise Level (L_{DN} or CNEL, dBA)	
	Interior[1,2]	Exterior
Residential – Single Family, Multi-family, Duplex	45	65[3]
Residential – Nursing Homes, Hospital	45	65[3]
Private Offices, Church Sanctuaries, Libraries, Board Rooms, Conference Rooms, Theaters, Auditoriums, Concert Halls, Meeting Halls, etc.	45	-
Schools	45	65[4]
General Offices, Reception, Clerical, etc.	50	-
Bank Lobby, Retail Store, Restaurant, Typing Pool, etc.	60	-
Manufacturing, Kitchen, Warehousing, etc.	65	-
Parks, Playgrounds, etc.	-	65[4]
Golf Courses, Outdoor Spectator Sports, Amusement Parks, etc.	-	70[4]

Notes:
1 Noise standard with windows closed. Mechanical ventilation shall be provided per UBC requirements to provide a habitable environment.
2 Indoor environment excluding bathrooms, toilets, closets, and corridors.
3 Outdoor environment limited to rear yard of single-family homes, multi-family patios and balconies (with a depth of 6 feet or more) and common recreation areas.
4 Outdoor environment limited to playground areas, picnic areas, and other areas of frequent human use.
LDN=Day-Night Level; CNEL=Community Noise Equivalent Level; dBA=A-weighted decibel

City of Vista Noise Ordinance (Municipal Code, Chapter 8.32, Noise Control)

Sections 8.32.010 through 8.32.060 of the City of Vista Municipal Code pertain to City noise requirements and enforcement of violations. The City has adopted the County of San Diego Noise Ordinance for the purpose of controlling excessive noise levels, including noise from construction activities.

Table NOI-2, *Applicable Exterior Property Line Noise Limits,* lists the applicable exterior property line noise limits. This table is specific to the City of Vista and replaces the table in Section 36.404 of the County noise ordinance. It is unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level at any point on or beyond the boundaries of the property exceeds these limits. The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones.

TABLE NOI-2 APPLICABLE EXTERIOR PROPERTY LINE NOISE LIMITS

Zone	Time	Applicable Limit One-hour Average Sound Level (dBA)
A-1, E-1, O, OSR R-1B, MHP	7:00 a.m. – 10:00 p. m. 10:00 p.m. – 7:00 a. m.	50 45
R-M	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	55 50
C-1, C-2, O-3, C-T, OP, M-U and Downtown Specific Plan	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	60 55
M-1, I-P, all areas of the Vista Business Park Specific Plan and Specific Plan 14	Any time	70

Source: City of Vista Municipal Code Section 8.32.40

A-1 = Agricultural; C-1 = Commercial; C-2 = Commercial; C-T = Commercial Transient; E-1 = Estate; I-P = Industrial; MHP = Mobile Home Park; M-U = Mixed Use; O = Open Space; O-3 = Office Park; OP = Office Professional; OSR = Open Space Residential; R-1B = Residence; R-M = Multi-Residential

The Project is zoned as O-R, Open Space Residential, therefore, the applicable exterior property line noise limits are 50 dB (one-hour average from 7:00 am to 10:00 p.m.) and 45 dB (one-hour average from 10:00 p.m. to 7:00 a.m.).

The adopted County of San Diego Noise Ordinance also stipulates controlling construction noise. San Diego County Code Sections 36.408 and 36.409, Construction Equipment, state that, except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

a. Between 7:00 p.m. and 7:00 a.m.

b. On Sunday or a holiday. For the purposes of this section, a holiday means January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence or for the purpose of construction of a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limits in Sections 36.409 and 36.410.

c. 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 dBA for an 8-hour period, between 7:00 a.m. and 7:00 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 of the County ordinance provides additional limitation on construction equipment beyond Section 36.404 pertaining to impulsive noise. 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 NOI-3***, Maximum Sound Levels (Impulsive)*, 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.

TABLE NOI-3 MAXIMUM SOUND LEVELS (IMPULSIVE)

Occupied Property Use	Decibels (dBA) L_{MAX}
Residential, village zoning or civic use	82

Source: County of San Diego Municipal Code Section 36.410

1.2.3 ENVIRONMENTAL SETTING

To quantify existing ambient noise levels, RCH Group conducted two long-term (72-hour) and several short-term (10-minute noise measurements) at the Project site. Long-term noise measurements were made using Metrosonics db308 Sound Level Meters calibrated before and after the measurements. Short-term measurements were made using a Larson Davis SoundTrack LxT Sound Level Meter calibrated before and after the measurements. **Table NOI-4,** *Existing Noise Levels,* summarizes the locations and results of the noise measurements. **Figure 1** shows the measurement locations on a map.

The **Noise Appendix** includes 24-hour noise plots for Site 1 and Site 2 and hourly measurements results. Based on observations from the short-term measurements, the main source of noise in the Project vicinity is vehicle and aircraft noise. Additional noise sources include residents conversing, birds, and wind.

FIGURE 1: NOISE MEASUREMENT LOCATIONS

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Source: RCH Group and Google Earth, 2022.

TABLE NOI-4 EXISTING NOISE LEVELS

Location	Time Period	Noise Levels (dB)	Noise Sources
Site 1: Southwest area of the Project site along Tierra Del Cielo, approximately 170 feet east of Kings Road.	February 8, 2022 12:00 a.m. through February 10, 11:59 p.m. Tuesday – Thursday 72-hour measurement.	Hourly Leq's ranged from: 43-54 CNELs: 50,51,51	Unattended noise measurements do not identify noise sources.
Site 1: Southwest area of the Project site along Tierra Del Cielo, approximately 170 feet east of Kings Road.	Monday February 7, 2022 2:25 p.m. to 2:35 p.m.	5-minute Leq's: 53, 53	Plane overhead 57 dB.
Site 1: Southwest area of the Project site along Tierra Del Cielo, approximately 170 feet east of Kings Road.	Friday February 11, 2022 1:14 p.m. to 1:24 p.m.	5-minute Leq's: 53, 52	Car driving on Tierra Del Cielo 55 dB.
Site 2: On a tree, along the northern access road.	February 8, 2022 12:00 a.m. through February 10, 11:59 p.m. Tuesday – Thursday 72-hour measurement.	Hourly Leq's ranged from: 44-56 CNELs: 51,53,52	Unattended noise measurements do not identify noise sources.
Site 2: On a tree, along the northern access road.	Monday February 7, 2022 1:50 p.m. to 2:00 p.m.	5-minute Leq's: 49, 50	Wind 50 dB, birds 40 dB.
Site 2: On a tree, along the northern access road.	Friday February 11, 2022 1:29 p.m. to 1:39 p.m.	5-minute Leq's: 56, 55	Car driving on access road 58 dB.
Site 3: North area of the Project site, nearby existing residence.	Monday February 7, 2022 2:05 p.m. to 2:10 p.m.	5-minute Leq's: 50, 39	Plane overhead 55 dB, residents talking nearby 42 dB.
Site 4: Approximate center of the Project site.	Monday February 7, 2022 2:13 p.m. to 2:23 p.m.	5-minute Leq's: 43, 36	Very quiet area. Wind 45 dB.
Site 4: Approximate center of the Project site.	Friday February 11, 2022 1:50 p.m. to 2:00 p.m.	5-minute Leq's: 55, 48	Car driving on access road 62 dB.
Site 5: Intersection of Las Lomas and Tierra Del Cielo.	Monday February 7, 2022 2:50 p.m. to 3:00 p.m.	5-minute Leq's: 42, 39	Very quiet area. Birds 40 dB, wind 39 dB.

Source: RCH Group 2022. RCHGROUP

1.2.4 SENSITIVE RECEPTORS

Noise-sensitive land uses are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, churches, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. There are two existing residences immediately south/southeast of the Project site. There are several residences west of the Project site (opposite of Tierra del Cielo) and four residences along Tierra Del Cielo to the to the south. There are no schools within 3,500 feet of the Project site.

1.3 THRESHOLDS OF SIGNIFICANCE

The significance of potential impacts was determined based on State CEQA Guidelines, Appendix G. Using Appendix G evaluation thresholds, the Project would be considered to have significant noise impacts if it results in:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

- Impacts would be significant if the Project would expose proposed residential uses to levels exceeding 65 dB, CNEL or interior noise levels exceeding 45 dB, CNEL, as described in the COV GP Noise Element.

- Per the COV Noise Ordinance, impacts would be significant if the Project would generate noise levels at a common property line with a single-family residential zone that would exceed the following one-hour average exterior noise levels: 50 dB from 7:00 a.m. to 10:00 p.m. and 45 dB from 10:00 p.m. to 7:00 a.m.

- For traffic related noise, impacts are considered significant where existing traffic noise is less than 65 dB, CNEL and implementation of a Project would result in an increase of the noise level by 5 dB, CNEL or more.

- Construction activity would be considered significant for nearby residences if it exceeds an 8-hour average exterior noise level of 75 dB, or a maximum impulsive noise level of 82 dB, Lmax on an occupied residential use. The ordinance prohibits construction and building work between the hours of 7:00 p.m. and 7:00 a.m. the next day, on Sundays, or on a holiday.

B. Generation of excessive groundborne vibration or groundborne noise levels; or

i. If Project construction vibration exceeds Caltrans structural damage thresholds for structures on adjacent properties.

C. For a project located within the vicinity of a private airstrip or an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

i. The Project is not within the vicinity of a private airstrip or an airport land use plan or within two miles of a public airport, thus this impact is not addressed further.

1.4 IMPACT ANALYSIS

1.4.1 CONSISTENCY WITH CITY NOISE STANDARDS

Construction Noise Impacts

Project construction activities would include the widening of Tierra Del Cielo and Las Lomas, constructing the fire equipment access road that connects to Kings Road, and rough grading of APN 174-260-15. Construction activities would occur during the construction hours contained in the adopted County of San Diego Noise Ordinance Sections 36.408 and 36.409 between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday. No construction is permitted on Sundays or on holidays.

Construction activities would require the use of numerous pieces of noise-generating equipment, such as excavating machinery (e.g., backhoes, excavators, front loaders, etc.) and other construction equipment (e.g., compactors, pavers, concrete mixers, trucks, etc.). The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed, the condition of the equipment. The nearest receptors to the construction would be the residential properties along Tierra Del Cielo that would be as close as 20 feet away from roadway construction (this is the approximate distance between the roadway and the nearest residential property lines) and a residence to the directly east of APN 174-260-15 (280 feet away). This is the approximate distance between the center of APN 174-260-15 and the nearest residential property line. The maximum noise levels at 20 and 280 feet for various types of construction equipment that could be used during construction are provided in **Table NOI-5**.

TABLE NOI-5 CONSTRUCTION EQUIPMENT NOISE LEVELS

Construction Equipment	L_{MAX} at 20 feet[1]	L_{MAX} at 280 feet[2]
Backhoe	88	63
Compactor (ground)	93	68
Compressor	88	63
Concrete Mixer Truck	89	64
Dozer	92	67
Dump Truck	86	61
Excavator	84	59
Flat Bed Truck	87	62
Front End Loader	86	61
Generator	90	65
Grader	91	66
Jackhammer	91	66
Paver	95	70
Roller	90	65
Vibratory Concrete Mixer	89	64

Source: Federal Highway Administration (FHWA) Roadway Construction Noise Model User's Guide, 2006.

Notes:
1 This is the distance from the roadway to the nearest residential property line on Tierra Del Cielo.
2 This is the distance from the center of lot 7 to the nearest residential receptor property line (east of proposed Lot 7, opposite of Tierra Del Cielo).

Construction equipment would not all operate at the same time or location. Furthermore, construction equipment would not be in constant use during the 8-hour operating day. A dozer and an excavator may be working on the Project site simultaneously but would not be working in close proximity to one another at a given time due to the nature of their respective operations. An excavator, loader, and dump truck were analyzed together for construction noise impacts (due to their likelihood of being used in conjunction with one another during construction of the residential lots and roadway improvements) using the Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM Version 1.1) (**See Noise Appendix** for construction noise modeling).

Based on these assumptions, grading operations using an excavator, loader, and dump truck at the nearest residential property line would be 64.9 dB, Leq at 280 feet (8-hour standard) and 65.7 dB, Lmax. These noise levels would not exceed the COV's Noise Ordinance standard of 75 dB, Leq (8-hour standard) and the 82 dB, Lmax (maximum sound level) standard. However, for roadway improvements, construction operations using an excavator, loader, and dump truck at the nearest residential property line would be 87.8 dB, Leq at 20 feet (8-hour standard) and 88.7 dB, Lmax at 20 feet. Note that these estimated noise levels at a source-to-receiver distance of 20 feet are very

conservative because the construction equipment noise is being modeled to the nearest residential property line and not the nearest residential façade (located approximately 50 feet or more from the roadway improvements). Furthermore, the modeling presumes that the noted pieces of equipment would each operate (on average at this distance) for a cumulative period of four hours a day. Using these assumptions, construction equipment used for roadway improvements could potentially exceed the COV's Noise Ordinance standard of 75 dB, Leq (8-hour standard) and 82 dB, Lmax (maximum sound level) standard. As a result, Mitigation Measure NOI-1 would be required to reduce noise levels from Project construction to a **less-than-significant impact.**

Mitigation Measure NOI-1: Construction Noise Management Plan: Noise levels from Project-related construction activities shall not exceed the noise limit specified in San Diego County Code (adopted by City of Vista) Sections 36.408 and 36.409 of 75 dBA (8-hour average) and 82 dBA (maximum sound level), when measured at the boundary line of the property where the noise is located or any occupied property where noise is being received. A Construction Management Plan shall be submitted to the City of Vista Planning Division for approval prior to issuance of the Grading Permit. The following measures may be included to reduce construction noise:

- Construction equipment shall be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment shall be operated with closed engine doors and equipped with factory- recommended mufflers.
- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment, where feasible.
- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) shall be prohibited.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise sensitive receptors.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be used for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent sensitive receptor.

- Prior to construction activities, designate a "Construction Noise Coordinator" who shall be responsible for responding to local complaints about construction noise. The Construction Noise Coordinator shall determine the cause of the complaint and shall require that reasonable measures be warranted to correct the problem be implemented (potentially including temporary noise barriers). The telephone number for the Construction Noise Coordinator shall be conspicuously posted at the construction site.
- Prior to construction activities, notify the adjacent residences of the construction schedule in writing and provide them with the contact information of the Construction Noise Coordinator.

Operational Noise Impacts

Potential Project Impacts on Nearby Off-Site Residences

Noise levels from single-family residences are typically quite low. The noise from development of the Project would not affect any surrounding sensitive receptors and the Project would not contribute to any cumulative noise impacts. Therefore, the noise from the activities (operations) at the Project site would result in a **less-than-significant impact.**

Potential Noise Impacts on Project Residences

As shown in **Table NOI-4**, existing 24-hour noise levels at Site 1 are 50-51 dB, CNEL and 51-53 dB, CNEL at Site 2. Therefore, the Project site is less than 65 dB, CNEL and would be within the Normally Acceptable range for Single Family Residential uses. Interior noise levels would be considered significant if they exceed 45 dB CNEL. Residential building facades typically provide a minimum exterior-to-interior noise reduction of 25-30 dB with windows closed (Caltrans, 2002a). Interior noise levels would be well below the 45 dB, CNEL threshold for interior noise standards in the General Plan. Therefore, the Project would be compatible with Normally acceptable exterior and interior noise level planning criteria. In summary, the Project site is noise appropriate for single-family residential use. The effect of existing noise on the Project would result in a **less-than-significant impact**.

Traffic Impacts on Project Residences

A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a road) would result in a barely perceptible change in sound level. The Project would not double the existing traffic volumes on local roadways and would result in a negligible increase in operational traffic noise. Thus, traffic volumes from Project operations would result in a **less-than-significant impact**.

Stationary Equipment Impacts on Project Residences

The Project would include mechanical equipment including heating, ventilating and air conditioning equipment (HVAC). Noise generated by HVAC varies significantly depending on the equipment type, capacity, location and enclosure design. Noise levels up to 60 dBA at a

distance of 15 feet are typical for HVAC equipment (Illingworth and Rodkin, Inc. 2009). Final Project design and development review would comply with the City's Exterior Property Line Noise limits outlined in Section 8.32.40 and would implement design features for mechanical equipment to not exceed the City's noise limits. Final design of the HVAC equipment would need to meet the most conservative threshold, which is the maximum nighttime (10:00 p.m.–7:00 a.m.) outdoor noise level of 45 dBA as measured at the adjacent receiving property. Therefore, noise impacts from stationary equipment from the Project would result in a **less-than-significant impact.**

1.4.2 CONSTRUCTION VIBRATION IMPACTS

Construction activities have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. At the highest levels of vibration, damage to structures is primarily architectural and rarely results in any structural damage. A peak particle velocity (ppv) threshold of 0.5 inches per second or less is sufficient to avoid structural damage (Caltrans, 2013). Project construction would utilize typical construction equipment and would not generate significant sources of vibration such as pile driving and/or blasting. Vibrational effects from typical construction activities are only a concern within 25 feet of existing structures (Caltrans, 2002b). Construction would not occur within 25 feet of an existing off-site structure. Thus, the Project would result in a **less-than-significant impact**.

1.4.3 AIRCRAFT NOISE IMPACTS

The Project site is subject to some aircraft noise, though the Project site is not within the vicinity of a public airport or private airstrip, or within an airport land use plan. The nearest airports are McClellan-Palomar Airport and Oceanside Municipal Airport, both of which are located approximately 8 miles from the Project site. At this distance, airport noise would result in a **less-than-significant impact**.

1.5 REFERENCES

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Noise Appendix

Long Term Noise Measurement Graphs for Site 1 and Site 2

Construction Noise Modeling - RCNM Noise Modeling Results

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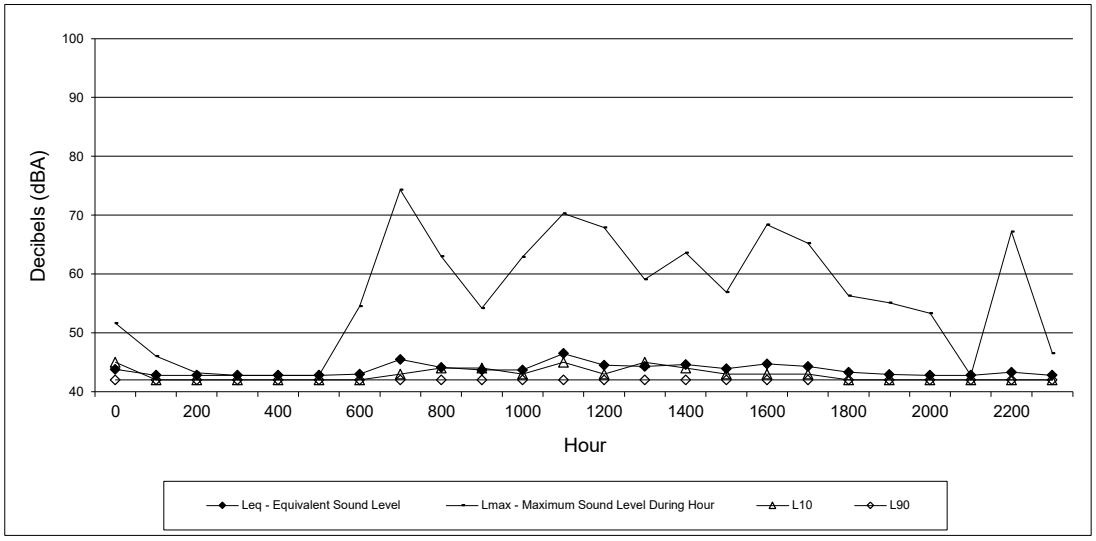
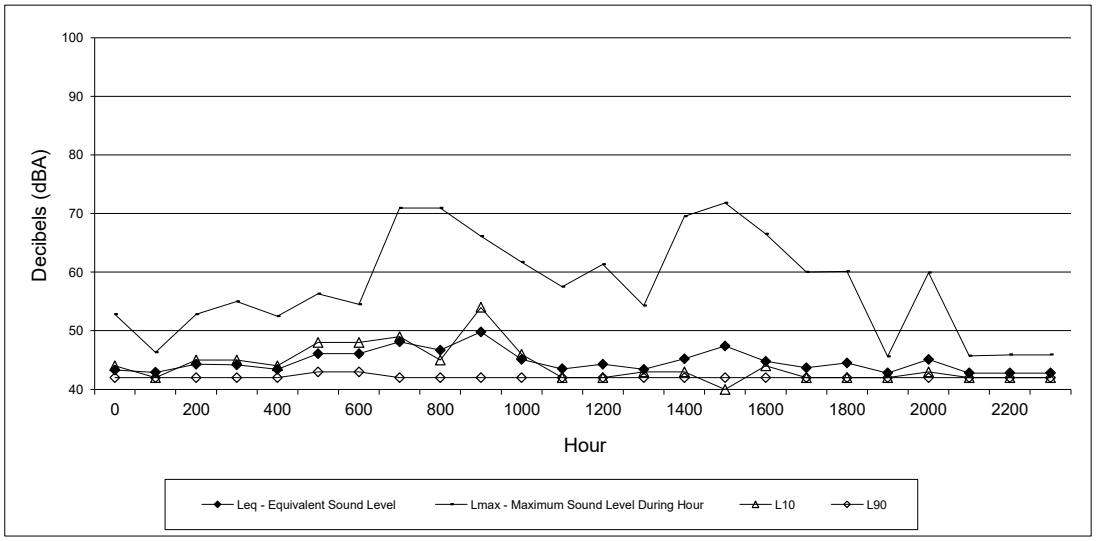


Site 1: Southwest area of the Project site along Terra Del Cielo, approximately 170 feet east of Kings Road
Tuesday February 8, 2022

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	44	52	45	42
100	43	46	42	42
200	43	43	42	42
300	43	43	42	42
400	43	43	42	42
500	43	43	42	42
600	43	55	42	42
700	46	74	43	42
800	44	63	44	42
900	44	54	44	42
1000	44	63	43	42
1100	47	70	45	42
1200	45	68	43	42
1300	44	59	45	42
1400	45	64	44	42
1500	44	57	43	42
1600	45	68	43	42
1700	44	65	43	42
1800	43	56	42	42
1900	43	55	42	42
2000	43	53	42	42
2100	43	43	42	42
2200	43	67	42	42
2300	43	47	42	42

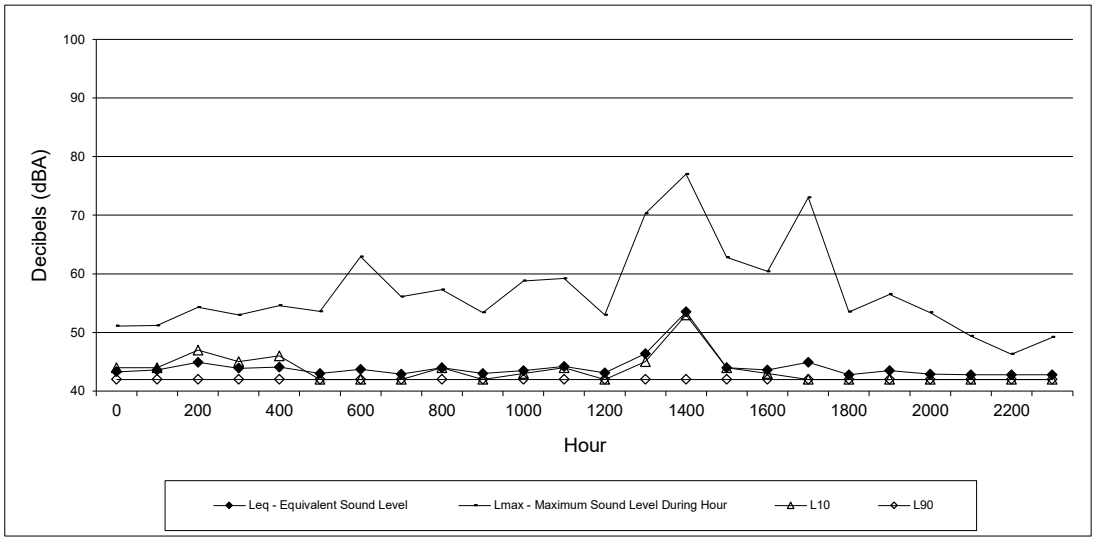
CNEL 50



Site 1: Southwest area of the Project site along Terra Del Cielo, approximately 170 feet east of Kings Road
Wednesday February 9, 2022

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	43	53	44	42
100	43	46	42	42
200	44	53	45	42
300	44	55	45	42
400	43	53	44	42
500	46	56	48	43
600	46	55	48	43
700	48	71	49	42
800	47	71	45	42
900	50	66	54	42
1000	45	62	46	42
1100	44	58	42	42
1200	44	61	42	42
1300	43	54	43	42
1400	45	70	43	42
1500	47	72	40	42
1600	45	67	44	42
1700	44	60	42	42
1800	45	60	42	42
1900	43	46	42	42
2000	45	60	43	42
2100	43	46	42	42
2200	43	46	42	42
2300	43	46	42	42

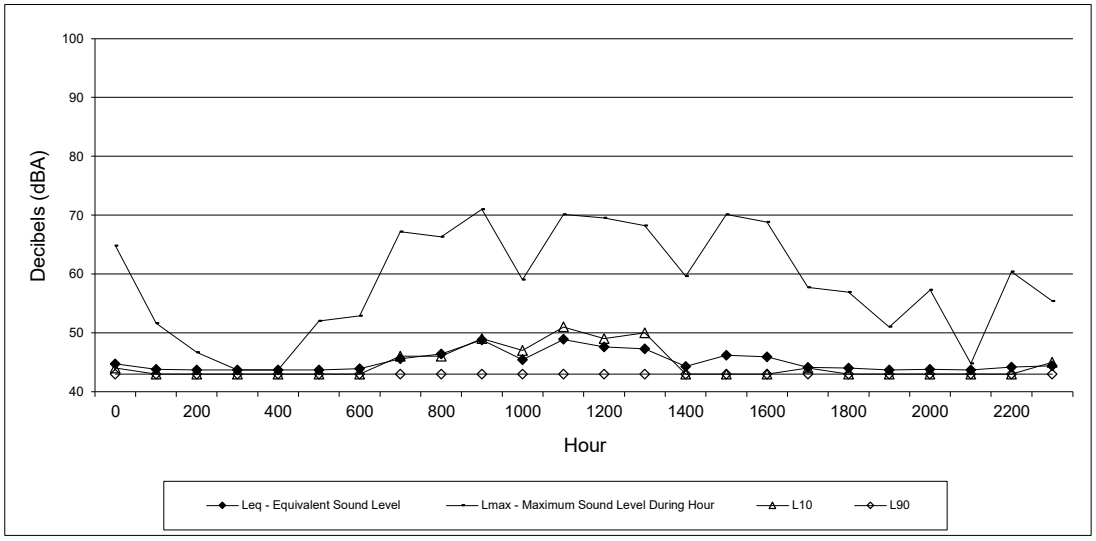
CNEL: 51



Site 1: Southwest area of the Project site along Terra Del Cielo, approximately 170 feet east of Kings Road
Thursday February 10, 2022

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	43	51	44	42
100	44	51	44	42
200	45	54	47	42
300	44	53	45	42
400	44	55	46	42
500	43	54	42	42
600	44	63	42	42
700	43	56	42	42
800	44	57	44	42
900	43	53	42	42
1000	44	59	43	42
1100	44	59	44	42
1200	43	53	42	42
1300	46	70	45	42
1400	54	77	53	42
1500	44	63	44	42
1600	44	60	43	42
1700	45	73	42	42
1800	43	54	42	42
1900	44	57	42	42
2000	43	53	42	42
2100	43	49	42	42
2200	43	46	42	42
2300	43	49	42	42

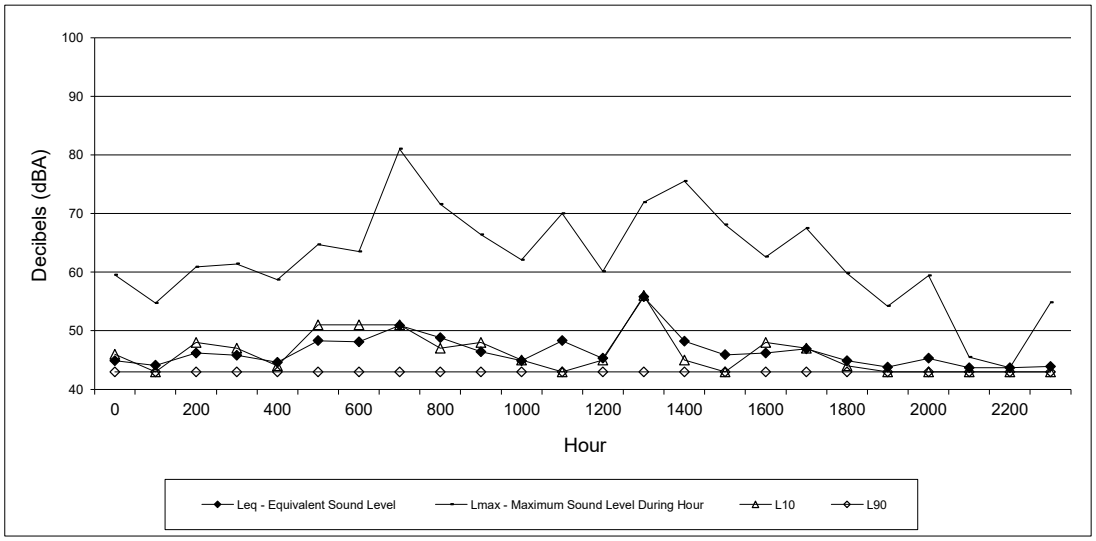
CNEL: 51



Site 2: On a tree, along the northern access road
Tuesday February 8, 2022

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	45	65	44	43
100	44	52	43	43
200	44	47	43	43
300	44	44	43	43
400	44	44	43	43
500	44	52	43	43
600	44	53	43	43
700	46	67	46	43
800	46	66	46	43
900	49	71	49	43
1000	45	59	47	43
1100	49	70	51	43
1200	48	70	49	43
1300	47	68	50	43
1400	44	60	43	43
1500	46	70	43	43
1600	46	69	43	43
1700	44	58	44	43
1800	44	57	43	43
1900	44	51	43	43
2000	44	57	43	43
2100	44	45	43	43
2200	44	60	43	43
2300	44	55	45	43

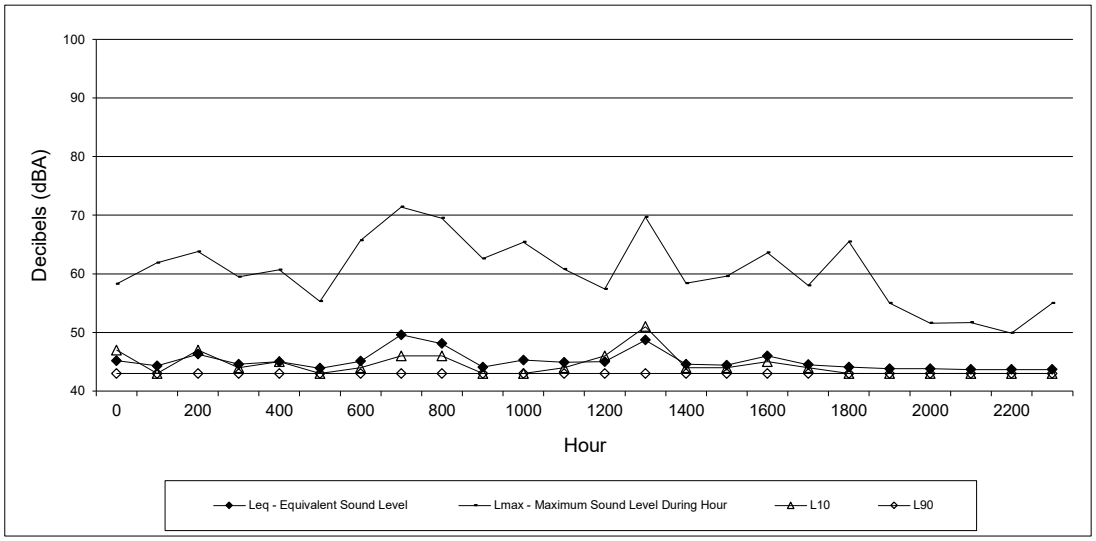
CNEL 51



Site 2: On a tree, along the northern access road
Wednesday February 9, 2022

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	45	60	46	43
100	44	55	43	43
200	46	61	48	43
300	46	61	47	43
400	45	59	44	43
500	48	65	51	43
600	48	64	51	43
700	51	81	51	43
800	49	72	47	43
900	46	66	48	43
1000	45	62	45	43
1100	48	70	43	43
1200	45	60	45	43
1300	56	72	56	43
1400	48	76	45	43
1500	46	68	43	43
1600	46	63	48	43
1700	47	68	47	43
1800	45	60	44	43
1900	44	54	43	43
2000	45	59	43	43
2100	44	46	43	43
2200	44	44	43	43
2300	44	55	43	43

CNEL: 53



Site 2: On a tree, along the northern access road
Thursday February 9, 2022

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	45	58	47	43
100	44	62	43	43
200	46	64	47	43
300	45	60	44	43
400	45	61	45	43
500	44	55	43	43
600	45	66	44	43
700	50	71	46	43
800	48	70	46	43
900	44	63	43	43
1000	45	65	43	43
1100	45	61	44	43
1200	45	57	46	43
1300	49	70	51	43
1400	45	58	44	43
1500	44	60	44	43
1600	46	64	45	43
1700	45	58	44	43
1800	44	66	43	43
1900	44	55	43	43
2000	44	52	43	43
2100	44	52	43	43
2200	44	50	43	43
2300	44	55	43	43

CNEL: 52

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/19/2023
Case Description: Las Lomas Grading Project Construction

**** Receptor #1 ****

Description	Baselines (dBA) Land Use	Daytime	Evening	Night
Residential property lines 20 feet away	Residential	50.0	48.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	20.0	0.0
Front End Loader	No	40		79.1	20.0	0.0
Dump Truck	No	40		76.5	20.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	88.7	84.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	87.1	83.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	84.4	80.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	88.7	87.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/18/2023
Case Description: Las Lomas Grading Project Construction

**** Receptor #1 ****

Description	Baselines (dBA) Land Use	Daytime	Evening	Night
Residential property line 280 feet east	Residential	50.0	48.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	280.0	0.0
Front End Loader	No	40		79.1	280.0	0.0
Dump Truck	No	40		76.5	280.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	65.7	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	64.1	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.7	64.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A