APPENDIX J

TECHNICAL NOISE ANALYSIS

Brady Vineyard Subdivision

Brady Lane and Vineyard Road
Placer County, California

Prepared For

Raney Planning & Management
1501 Sports Drive, Suite A
Sacramento, CA 95834

Prepared By

RCH Group
11060 White Rock Road Suite 150-A
Rancho Cordova, CA

June 2019

TABLE OF CONTENTS

Page

Executive Summary 1

Introduction 2

Noise Analysis 2

Background 3

Impacts 11

References 19

FIGURES

1: Noise Measurement Sites 8
2: Project Location 9
3: Recommended Noise Barrier Locations 15

TABLES

1: Typical Noise Levels 3
2: Exterior Noise Level Performance Standards for New Projects Affected by or Including Non—Transportation Noise Sources 4
3: Maximum Allowable Noise Exposure Transportation Noise Sources 5
4: Placer County Noise Ordinance Sound Level Standards (On-site) 5
5: Existing Noise Measurements 10
6: Estimated Transportation Noise Levels at Project Outdoor Activity Areas (dB Ldn/CNEL) 12
7: Estimated Future Cumulative Transportation Noise Levels at Project Outdoor Activity Areas by Noise Barrier Height (dB Ldn/CNEL) 12
8: Estimated Transportation Noise Levels at Existing Residences (dB Ldn/CNEL) 13
9: Typical Noise Levels from Construction Equipment 16
10: Typical Construction Activities Noise Levels 17

NOISE APPENDIX

Executive Summary

This report analyzes the existing noise levels and potential noise impacts of the proposed Brady Vineyard Subdivision (the "project"). The project would consist of the construction and operation of a 119-unit single family residential housing development including parks, trails, landscaping and utility improvements on a 35-acre project site. In addition, the project would include the widening of Brady Lane and Vineyard Road along project frontages, and off-site sewer improvements. The project site is located at the northwest corner of Vineyard Road and Brady Lane in an unincorporated area of Placer County, CA. The project site is located adjacent to the City of Roseville limits, within the Dry Creek-West Placer Community Plan (DCWPCP) area. The project site is identified by Assessor's Parcel Numbers (APNs) 473-020-002 & -013.

The major source of noise on the project site is traffic noise from Brady Lane and Vineyard Road. To quantify existing ambient noise levels in the immediate project vicinity, RCH conducted short-term (10-minute) noise measurements at six locations and two long-term (72-hour) measurements of existing noise levels at the project site. RCH also conducted one short-term noise measurement east of the project site at the northwest corner of Vineyard Road and Riesling Drive where off-site sewer improvements would be constructed. The short-term noise measurements were conducted near Brady Lane and Vineyard Road to measure peak-hour morning traffic noise and at other locations on the project site to measure ambient noise levels farther from roadways. The long-term noise measurement locations were selected as close as possible to the locations of future building envelopes nearest to Brady Lane and Vineyard Road to capture the existing noise levels that would affect the proposed residences.

Future cumulative traffic scenario noise modeling predicted that the closest outdoor activity areas fronting Brady Lane would have a noise level of approximately 67-68 dB Ldn/CNEL. The closest outdoor activity areas fronting Vineyard Road would have a noise level of approximately 67 dB Ldn/CNEL. Therefore, noise from transportation sources under the future cumulative traffic scenario would potentially exceed the Placer County standard of 60 dB Ldn/CNEL at the outdoor activity areas of the residences fronting Brady Lane and Vineyard Road. The Placer County General Plan indicates a noise level up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with the 45 dB Ldn/CNEL standard. Construction of a 5-foot noise barrier along the project frontages on Vineyard Road and Brady Lane would reduce future cumulative traffic noise to less than 65 dB Ldn/CNEL at all proposed outdoor activity areas (Mitigation Measure N-1).

Typical residential construction consistent with the Uniform Building Code will provide an exterior-to interior noise level reduction of no less than 25 dB provided that exterior windows/doors are closed. With a 25 dB reduction, interior noise levels at residences closest to Brady Lane and Vineyard Road with future cumulative traffic would be approximately 43 and 42 dB Ldn/CNEL, respectively, well below the 45 dB Ldn interior noise level standard. Interior noise levels with the project would comply with the Placer County transportation noise source standards, and no mitigation for interior noise levels would be required.

Project construction is required to comply with the construction hours specified in the Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08. Compliance with the required construction hours would result in a less than significant impact.

Construction activities associated with the proposed off-site sewer improvements in the City of Roseville is required to comply with the City of Roseville Municipal Code, which includes construction hours that are less restrictive than the Placer County and DCWPCP. Compliance with the City of Roseville Municipal Code would result in a less than significant impact.

Based on the construction equipment to be used and the distance from construction to the nearest structures, vibration from the project would not be a concern and impacts would be less than significant.

The analysis identified no impacts from airport noise, as there are no airports near the project site.

Introduction

RCH Group (RCH) has conducted this noise assessment for the Brady Vineyard Subdivision (the "project"). The project would consist of the construction and operation of a 119-unit single family residential housing development including parks, trails, landscaping and utility improvements on a 35-acre project site. In addition, the project would include the widening of Brady Lane and Vineyard Road along project frontages, and off-site sewer improvements. The project site is located at the northwest corner of Vineyard Road and Brady Lane in an unincorporated area of Placer County, CA. The project site is located adjacent to the City of Roseville limits, within the Dry Creek-West Placer Community Plan (DCWPCP) area. The project site is identified by Assessor's Parcel Numbers (APNs) 473-020-002 and -013.

The project site is currently undeveloped. **Figure 2** shows the project location and boundary. Vacant land and a church fronting Brady Lane is immediately north of the project site. The nearest home to the west of the project site is approximately 1,000 feet from the site boundary with vacant land in between. A single-family residential subdivision is to the east of the project site across Brady Lane and is screened by a sound barrier and landscaping. Four residential properties are south of the project site across Vineyard Road. There is also a single-family home and associated outbuilding on a two-acre rectangular-shaped parcel fronting Vineyard Road that extends approximately 700 feet north (roughly halfway) into the project site (See **Figure 2**).

This report analyzes the noise impacts from the project and is prepared in a format to answer the noise questions in the Initial Study Environmental Checklist Form in Appendix G of the State *CEQA Guidelines (Revised in 2019)*. This report provides an overview of existing noise levels measured at the project site, local noise regulatory framework, and an analysis of potential noise and vibration impacts that would result from construction and operation of the project.

Noise Analysis

XI. NOISE -- Would the project result in:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
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?	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Background:

Noise Descriptors

To describe noise environments and to assess impacts on noise–sensitive areas, a frequency weighting measure, which simulates human perception, is commonly used. 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 (dB)[1] is cited in most noise criteria. All references to decibels (dB) in this report will be A-weighted unless noted otherwise. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **Table 1** identifies decibel levels for common sounds heard in the environment.

Table 1: Typical Noise Levels

Noise Level (dB)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at 3 feet, jet flyover at 1,000 feet	Rock Band
80–90	Diesel truck at 50 feet	Loud television at 3 feet
70–80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at 3 feet, vacuum cleaner at 10 feet
60–70	Commercial area	Normal speech at 3 feet
40–60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20–40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10–20		Broadcast / recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

Source: (modified from Caltrans Technical Noise Supplement, 1998)

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);[2] average day-night 24-hour average sound level (Ldn)[3] with a nighttime increase of 10 dB to account for sensitivity to noise during the nighttime; and community noise equivalent level (CNEL),[4] also a 24-hour average that includes both an evening and a nighttime sensitivity weighting.

[1] A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level") measured in dB. An A-weighted decibel (dB) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels.

[2] The Equivalent Sound Level (L_{eq}) 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.

[3] L_{dn} 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.

[4] 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.

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.

Noise Standards

Placer County General Plan

The Noise Section of the Placer County General Plan establishes goals and policies for both transportation and non-transportation noise sources. Allowable noise levels within specified zone districts applicable to new projects affected by or including non-transportation noise sources are shown in **Table 2**. The maximum allowable noise exposure at residential land uses from transportation noise sources is shown in **Table 3**. As shown in **Table 3**, the maximum allowable exposure to transportation noise sources for residential land uses is 60 dB Ldn at outdoor activity areas and 45 dB Ldn in interior spaces.

Table 2: Exterior Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Noise Sources

Zone District of Receptor	Property Line of Receiving Land Use Ldn, dB	Interior Spaces Ldn, dB
Residential Adjacent to Industrial	60	45
Other Residential	50	45
Professional Office	70	45
Neighborhood Commercial	70	45
General Commercial	70	45
Shopping Center	70	45
Farm/Agriculture	See footnote	-

Source: Placer County General Plan, 2013

Notes: Normally, agricultural uses are noise insensitive and will be treated this way. However, conflicts with agricultural noise emissions can occur where single-family residences exist within or adjacent to agricultural zone districts. Therefore where effects of agricultural noise upon residences located in these areas is a concern, an Ldn of 70 dBA will be considered acceptable outdoor exposure at a residence.

Table 3: Maximum Allowable Noise Exposure to Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] Ldn/CNEL, dB	Interior Spaces Ldn/CNEL, dB
Residential	60[2]	45

Source: Placer County General Plan, 2013

Notes:

[1]Where the location of the outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

[2]Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Placer County Noise Ordinance

The Placer County Noise Ordinance sets limits for sensitive receptors and makes it unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person that:

1. Causes the exterior sound level when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by five dBA; or
2. Exceeds the sound level standards as set forth in **Table 4**, whichever is the greater

Table 4: Placer County Noise Ordinance Sound Level Standards (On-site)

Sound Level Descriptor	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
Hourly Leq, dB	55	45
Maximum level, (Lmax) dB	70	65

Source: Placer County Noise Ordinance

The Placer County Noise Ordinance exempts construction between the hours of 6:00 a.m. and 8:00 p.m. Monday through Friday, and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday, provided that all construction equipment is fitted with factory installed muffling devices and that all construction equipment is maintained in good working order. However, the hours of construction were modified in the Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08 and the following is applicable to the project:

> Construction noise emanating from any construction activities for which a Grading or Building Permit is required is prohibited on Sundays and Federal Holidays, and shall only occur: a) Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings) b) Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time) c) Saturdays, 8:00 a.m. to 6:00 p.m.
>
> In addition, temporary signs shall be located throughout the project, as determined by the Development Review Committee, at key intersections depicting the above construction hour limitations.

Dry Creek-West Placer Community Plan

Policy 7 of the Noise Section of the Dry Creek-West Placer Community Plan (DCWCP) (Placer County 1990) limits construction activities to daytime hours (7:00 a.m. to 7:00 p.m. Monday through Friday).

City of Roseville Noise Ordinance

Roseville Municipal Code Section 9.24.030 (G): Construction, alteration or repair activities shall not be permitted at any time other than between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and 8:00 a.m. and 8:00 p.m. Saturdays, Sundays, and State and Federal Legal Holidays. Provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

Significance Criteria

Based on these criteria, operational noise impacts of the residential development would be significant if they result in exceedance of noise standards contained in the Placer County Noise Ordinance at nearby residential land uses. A significant impact would also occur if residents at the project site are exposed to transportation noise sources in excess of the Placer County maximum allowable noise exposure from transportation noise sources contained in the Placer County General Plan. Future cumulative traffic noise increases attributable to the project would be significant if the noise level increase is 3 dB, Ldn or greater (FICON, 2000). Temporary construction noise impacts would be significant if construction conflicts with the construction hours in the Placer County Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08 or the City of Roseville Noise Ordinance (for proposed off-site sewer improvements).

Existing Noise Sources and Levels

To quantify existing ambient noise levels in the immediate project vicinity, RCH conducted short-term (10-minute) noise measurements at six locations and two long-term (72-hour) measurements of existing noise levels at the project site. RCH also conducted one short-term noise measurement east of the project site at the northwest corner of Vineyard Road and Riesling Drive, near the proposed off-site sewer improvements alignment. The short-term noise measurements were conducted near Brady Lane and Vineyard Road to measure peak-hour morning traffic noise and at other locations on the project site to measure ambient noise levels farther from roadways. The long-term noise measurement locations were selected as close as possible to the locations of future building envelopes nearest to Brady Lane and Vineyard Road to capture the existing noise levels that would affect the proposed residences. The noise measurement sites are shown in **Figure 1**. The noise measurements are summarized in **Table 5** below and 24-hour noise plots and sound level data are provided in the Noise Appendix. The dominant source of noise during the measurements was traffic from Brady Lane and Vineyard Road. Other than that there were birds, and distant train movements and train horns from the Roseville Rail Yard.

As indicated in **Table 5**, short-term noise measurements at the site were conducted on Friday March 29, 2019. The average noise level (Leq) for the 5-minute periods measured near Brady Lane during peak-hour morning traffic was 60 dB approximately 50 feet from the centerline (Site 3). The average noise level (Leq) for the 5-minute periods measured near Vineyard Road during peak-hour morning traffic was 54-56 dB approximately 55 feet from the centerline (Site 5) and 54-55 dB approximately 60 feet from the centerline (Site 6). The long-term sound level measurements were conducted from Friday March 29 through Sunday March 31, 2019 at Site 1 and from April 7, 2019 through April 9, 2019 at Site 2. The 24-hour noise level (Ldn/CNEL) was 57-60 dB at Site 1 and 59-60 dB at Site 2.

Existing Sensitive Receptors

Noise sensitive land uses typically include residences, schools, child care centers, hospitals, long-term health care facilities, convalescent centers, retirement homes and recreation areas. The project site is currently undeveloped. **Figure 2** shows the project location and boundary. Vacant land and a church fronting Brady Lane is immediately north of the project site. The nearest home to the west of the project site is approximately 1,000 feet from the site boundary with vacant land in between. A neighboring single-family residential subdivision is to the east of the project site across Brady Lane and is screened by a sound barrier and landscaping. Four residential properties are south of the project site across Vineyard Road. There is also a single-family home and associated outbuilding on a two-acre rectangular-shaped parcel fronting Vineyard Road that extends approximately 700 feet north (roughly halfway) into the project site (See **Figure 2**).

Figure 1
Noise Measurement Locations

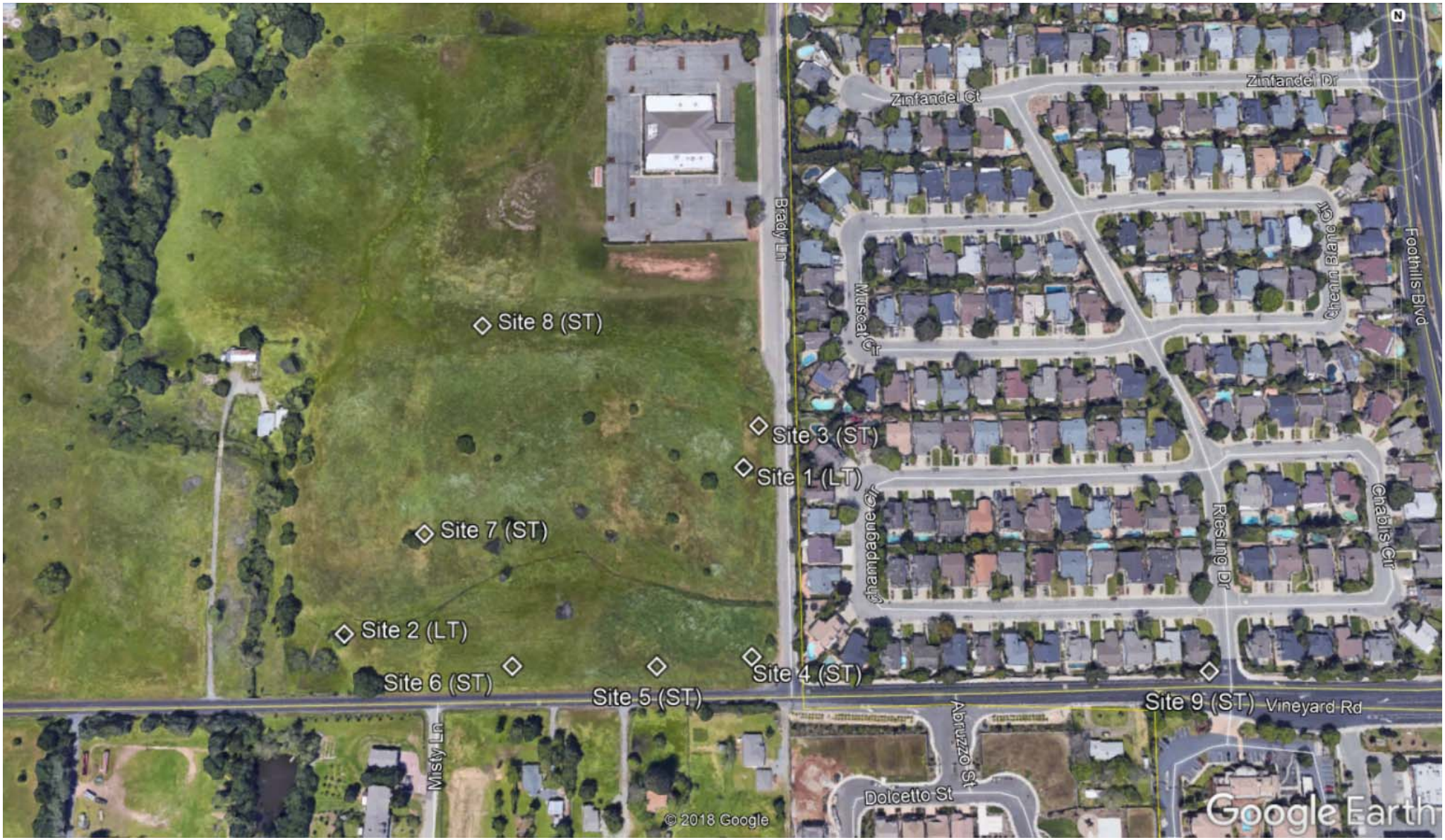


Figure 2
Project Location

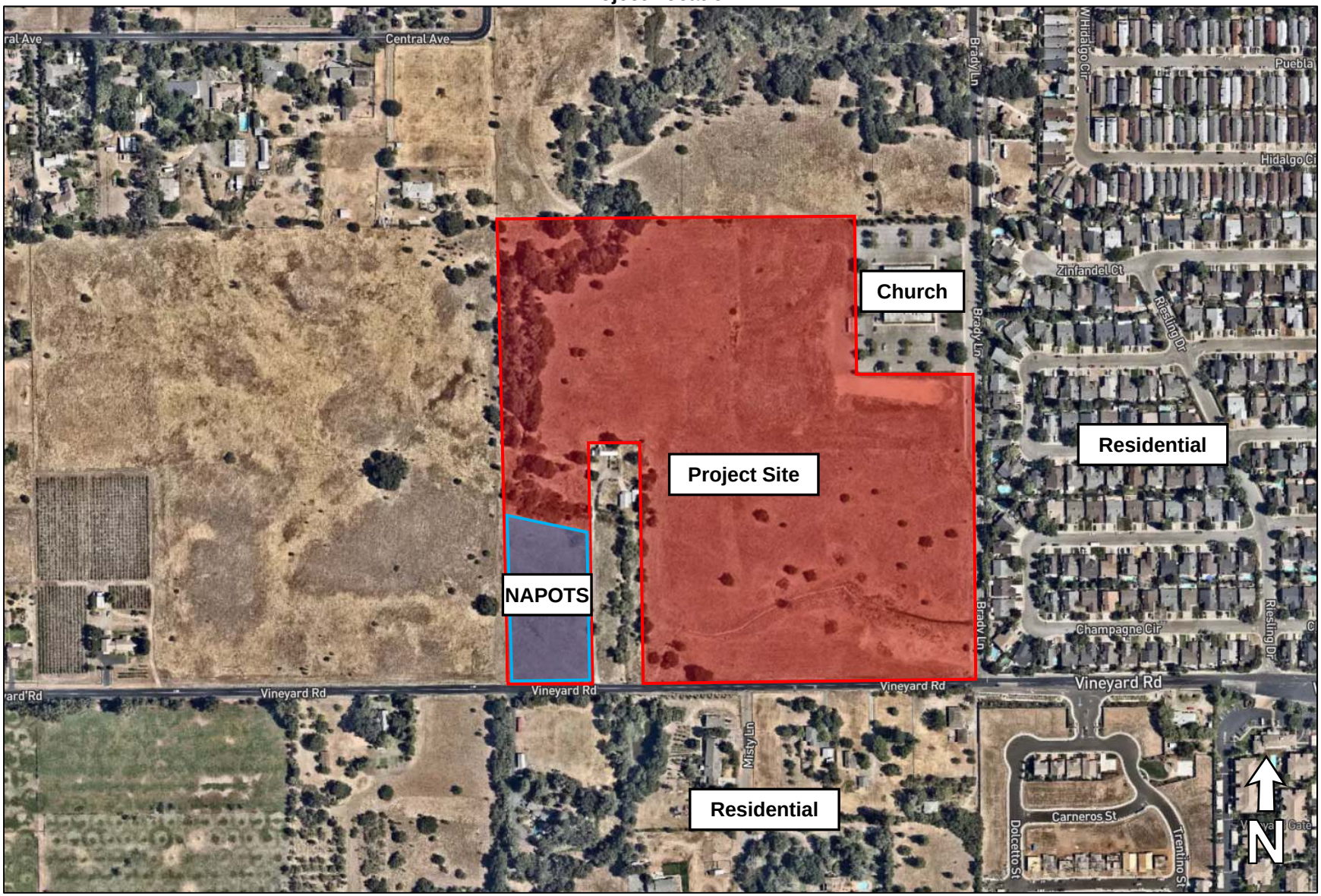


Table 5: Existing Noise Measurements

Location	Time Period	Noise Levels (dB)	Noise Sources
Site 1. Eastern edge of project site, 75 feet west of the centerline of Brady Lane.	Friday, March 29, 12:00 a.m. through Sunday, March 31, 11:59 p.m., 2019 72-hour measurement	24-hour Ldns: 60, 58, 57 Hourly Leqs ranged from: 47-63	Unattended noise measurements do not specifically identify noise sources. See data graphs in Noise Appendix.
Site 2. Southern edge of project site, 120 feet north of the centerline of Vineyard Road.	Sunday, April 7, 12:00 a.m. through Tuesday, April 9, 11:59 p.m., 2019 72-hour measurement	24-hour Ldns: 60, 59, 60 Hourly Leqs ranged from: 46-61	Unattended noise measurements do not specifically identify noise sources. See data graphs in Noise Appendix.
Site 3. 50 feet west of the centerline of Brady Lane.	Friday March 29, 2019 7:48 – 7:58 a.m.	5-Min Leqs: 60, 60 5-Min Lmaxs: 74, 69	Cars on Brady Lane 74, 67, 68, 68, 69, 64, & 68 dB. Train noise (no horn) ~60 dB. Train horn ~67 dB and ~53 dB.
Site 4. Northwest corner of Brady Lane and Vineyard Road. 70 feet west of Brady Lane centerline and 70 feet north of Vineyard Road centerline.	Friday March 29, 2019 8:04 – 8:14 a.m.	5-Min Leqs: 54, 55 5-Min Lmaxs: 64, 66	Bird noise ~48 dB, lots of bird noise, constant bird noise. Cars generally 55-66 dB approaching stop sign. Sirens (below ambient noise level). Plane overhead ~56 dB.
Site 5. Southern edge of project site, 55 feet north of Vineyard Road.	Friday March 29, 2019 8:18 – 8:28 a.m.	5-Min Leqs: 54, 56 5-Mine Lmaxs: 64, 69	Cars generally 56-65 dB. Bird noise ~48 dB. Train horn noise 49-54 dB. Leaf blower noise ~50 dB. Plane flyover ~55 dB.
Site 6. Southern edge of project site, 60 feet north of Vineyard Road.	Friday March 29, 2019 8:30 – 8:40 a.m.	5-Min Leqs: 55, 54 5-Min Lmaxs: 63, 64	Cars generally 55-64 dB. Rooster noise ~50-52 dB. Leaf blower noise ~49-53 dB. Garbage truck on Misty Lane 62 dB. Birds chirping ~52 dB. Background noise is affected by constant bird noise.
Site 7. South central portion of project site, 300 feet north of Vineyard Road centerline.	Friday March 29, 2019 8:44 – 8:54 a.m.	5-Min Leqs: 49, 47 5-Min Lmaxs: 57, 63	Garbage truck noise on Vineyard 52-56 dB. Dog barking ~47 dB. Birds chirping, ambient down to 43-44 dB with no bird noise. Train horns < 50 dB. Cars on Vineyard generally 45-50 dB.
Site 8. Middle of project site, 700 feet north of	Friday	5-Min Leqs: 42, 42	Cars generally 55-64 dB. Rooster noise ~50-52 dB. Leaf

Vineyard Road centerline and 550 feet west of Brady Lane centerline.	March 29, 2019 8:58 – 9:08 a.m.	5-Min Lmaxs: 48, 55	blower noise ~49-53 dB. Garbage truck on Misty Lane 62 dB. Birds chirping ~52 dB. Background noise is affected by constant bird noise.
Site 9. Northwest corner of Vineyard Road and Riesling Drive.	Friday March 29, 2019 9:34 – 9:44 a.m.	5-Min Leqs: 63, 66 5-Min Lmaxs: 76, 76	Cars and trucks 67-76 dB. Backup beeper at AMPM. Garbage noise at Vineyard Gate Apartments ~60 dB.

Source: RCH Group, 2019

Impacts

Potential noise impacts associated with the project would be related to noise from the construction of the residences and/or long-term noise from the residences. After construction, the impacts would include the effect of the environmental noise (including traffic) on the residences and any noise generated by the residences that would affect surrounding land uses. In general, residences are one of the quietest land uses (other than open space), and noise from the residences would be considered compatible with the surrounding residences. This analysis will not further assess impacts from noise generated by the residences.

a) Would the project result in 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? **Less than Significant with Mitigation.**

Potential Traffic Noise Impacts on Project Residences

Exterior Noise Levels

The closest outdoor activity areas to roadways would be the backyards of the closest proposed homes to Vineyard Road and Brady Lane (approximately 60 feet from the centerline of Vineyard Road and 75 feet from the centerline of Brady Lane). See **Table 5** for existing 24-hour noise levels at the project site.

RCH conducted traffic noise modeling using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) to analyze the potential impact on proposed residences from existing plus project traffic and future cumulative traffic scenarios (See Noise Appendix for detailed modeling results and assumptions) (Barry and Reagan, 1978). The existing plus project traffic and future cumulative traffic predicted noise levels were based on a conservative estimate of 10 percent of all average daily traffic (ADT) in the peak hour. Trip generation data was provided by KD Anderson & Associates to be consistent with the project-specific traffic study. The peak hour was then used as an estimate of the 24-hour future Ldn/CNEL. It is a fairly typical case, that Ldn/CNEL is approximately equal to the peak hour Leq. The rule of thumb is that Ldn or CNEL is within +/- 2 dB of the peak hour Leq under normal conditions. For the two weekday long-term measurements conducted at Sites 1 and 2, the Ldn/CNEL was equal to the peak hour Leq at Site 1 and the Ldn/CNEL was +1 dB from the peak hour Leq at Site 2 (*Technical Noise Supplement*, Caltrans, 1998). Therefore, this analysis assumes the modelled peak hour Leq is equal to the estimated future cumulative Ldn or CNEL at the project site. **Table 6** displays the predicted noise level estimates at project outdoor activity areas at the closest proposed residences fronting Brady Lane and Vineyard Road for the modelled project scenarios.

Table 6: Estimated Transportation Noise Levels at Project Outdoor Activity Areas (dB, Ldn/CNEL)

Roadway Segment / Scenario	Existing	Existing Plus Project	Project Increase from Existing	Future Cumulative Traffic No Project	Future Cumulative Traffic Plus Project	Project Increase from Future Cumulative
Brady Ln (S)	59.2	61.5	+2.3	67.8	68.2	+0.4
Brady Ln (N)	59.2	60.6	+1.4	66.8	67.1	+0.3
Vineyard Rd	62.0	62.1	+0.1	66.4	66.5	+0.1

Source: RCH Group, 2019

Notes: 1. See Noise Appendix for detailed modeling results and assumptions.
2. Modelling results are for project outdoor activity areas closest to the roadway segments.
3. Brady Ln (S) is Project to Vineyard Rd Segment. Brady Ln (N) is Project to Baseline Rd Segment.

The future cumulative traffic scenario noise modeling analysis showed that the closest outdoor activity areas fronting Brady Lane would have a noise level of approximately 67-68 dB Ldn/CNEL. The closest outdoor activity areas fronting Vineyard Road would have a noise level of approximately 67 dB Ldn/CNEL. Therefore, noise from transportation sources under the future cumulative traffic scenario would potentially exceed the Placer County standard of 60 dB Ldn/CNEL at the outdoor activity areas of the residences fronting Brady Lane and Vineyard Road. The Placer County General Plan indicates a noise level up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with the 45 dB Ldn/CNEL standard. **Table 7** displays the predicted noise level estimates at project outdoor activity areas at the closest proposed residences fronting Brady Lane and Vineyard Road with different noise barrier heights under the future cumulative traffic scenario.

Table 7: Estimated Future Cumulative Transportation Noise Levels at Project Outdoor Activity Areas by Noise Barrier Height (dB, Ldn/CNEL)

Roadway Segment / Scenario	Future Cumulative Traffic Plus Project (No Barrier)	5- Foot Barrier	6- Foot Barrier	7- Foot Barrier	8- Foot Barrier
Brady Ln (S)	68	63	62	61	60
Brady Ln (N)	67	62	61	60	59
Vineyard Rd	67	62	60	59	58

Source: RCH Group, 2019

Notes: 1. Brady Ln (S) is Project to Vineyard Rd Segment. Brady Ln (N) is Project to Baseline Rd Segment.
2. The modeled noise barriers assume flat site conditions where elevations, base of wall elevations and building pad elevations are approximately equivalent.
3. Outdoor activity area noise levels with noise barrier are modeled 20 feet behind noise barrier. Outdoor activity area with no noise barrier are modeled at the property line.
4. Noise barriers less than 5 feet tall were not estimated because they would not break the line of sight.
5. Noise levels rounded to the nearest dB.

As shown in **Table 7**, Construction of a five-foot noise barrier along the project frontages on Vineyard Road and Brady Lane would reduce future cumulative traffic noise to less than 65 dB Ldn/CNEL at all proposed outdoor activity areas. **Table 7** also displays the noise barrier heights that would reduce noise levels at outdoor activity areas to the Placer County standard of 60 dB Ldn/CNEL. **Figure 3** displays the recommended noise barrier locations. With implementation of **Mitigation Measure N-1**, exterior noise level impacts would be less than significant.

> **Mitigation Measure N-1**: Construct an approximate five-foot sound barrier along the project frontages on Vineyard Road and Brady Lane. The barrier could include an earthen berm to achieve some or all of the necessary height of the barrier.

It is worth noting that the DCWPCP states that "where noise levels have a potential to be in excess of normally acceptable CNEL levels, landscaped setbacks should be considered versus sound walls for noise mitigation." However, this may not be feasible for the project because the site plan is currently designed to preserve wetlands and open space, and setting proposed lots back farther from roadways would require other lots to encroach into these preservation areas.

Interior Noise Levels

Typical residential construction consistent with the Uniform Building Code (UBC) will provide an exterior-to interior noise level reduction of no less than 25 dB provided that exterior windows and doors are closed (Bollard, 2005, Burn, 1994). As discussed above and shown in **Table 6**, under the future cumulative traffic scenario without mitigation, noise levels at residences fronting Brady Lane would be approximately 68 dB Ldn/CNEL, and with a 25 dB reduction interior noise levels would be approximately 43 dB Ldn/CNEL. Under the future cumulative traffic scenario without mitigation, noise levels at residences fronting Vineyard Road would be approximately 67 dB Ldn/CNEL, and with a 25 dB reduction interior noise levels would be approximately 42 dB Ldn/CNEL. Interior noise levels at the second story of the two-story homes proposed would be approximately equal to the noise levels stated above (or slightly lower than the values stated above due to increased distance from the roadway). Therefore, interior noise levels would not exceed the Placer County interior standard of 45 dB Ldn/CNEL and would result in a less-than-significant impact.

Potential Traffic Noise Impacts on Existing Residences

RCH conducted traffic noise modeling using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) to analyze the potential impacts on existing residences from project traffic increases (See Noise Appendix) (Barry and Reagan, 1978). **Table 8** displays the predicted noise level estimates at the outdoor activity areas at the closest existing residents for modelled project scenarios.

Table 8: Estimated Transportation Noise Levels at Existing Residences (dB, Ldn/CNEL)

Roadway Segment / Scenario	Existing	Existing Plus Project	Project Increase from Existing	Future Cumulative Traffic No Project	Future Cumulative Traffic Plus Project	Project Increase from Future Cum.
1. PFE Rd. (Walerga to Cook Riolo)	65.9	65.9	0.0	67.6	67.6	0.0
2. PFE Rd. (Cook Riolo to N. Antelope)	66.9	66.9	0.0	71.3	71.3	0.0
3. Cook-Riolo Rd. (Baseline to Vineyard)	61.8	61.8	0.0	65.9	65.9	0.0
4. Cook-Riolo Rd. (Vineyard to Creekview School)	60.0	60.1	+0.1	64.3	64.3	0.0
5. Cook-Riolo Rd. (Creekview School to PFE)	62.6	62.7	+0.1	66.9	67.0	+0.1
6. N. Antelope Rd. (PFE to Great Valley)	67.5	67.6	+0.1	73.8	73.8	0.0

7. Vineyard Rd. (Crowder to Cook-Riolo)	57.3	57.4	+0.1	62.6	62.6	0.0
8. Vineyard Rd. (Cook-Riolo to Brady)	62.0	62.1	+0.1	66.4	66.5	+0.1
9. Vineyard Rd. (Brady to Foothills)	54.7	55.1	+0.4	59.8	59.9	+0.1
10. Brady Ln. (Baseline to Project)	59.2	60.6	+1.4	66.8	67.1	+0.3
11. Brady Ln. (Project to Vineyard)	59.2	61.5	+2.3	67.8	68.2	+0.4

Source: RCH Group, 2019. Note: See Noise Appendix for detailed modeling results and assumptions.

Predicted noise levels in **Table 8** indicate that existing residences would experience a 0.1 dB increase or less from project traffic on all traffic segments modeled except for Vineyard Road (from Brady Lane to Foothills Boulevard) and along Brady Lane (From Vineyard Road to Project and from Project to PFE Road). For the Vineyard Road segment (Brady Lane to Foothills Boulevard), the project would increase traffic noise by approximately 0.4 dB above existing levels and the closest residences (north of Vineyard Road) are shielded by an existing sound barrier. For the Brady Lane segments, residences fronting Brady Lane would experience a 1.4-2.3 dB increase from project traffic above existing levels and the closest residences (east of Brady Lane) are shielded by an existing sound barrier. The project's traffic noise increase on existing receptors would be imperceptible and would not be considered annoying.[5] Project-related traffic would increase noise levels with future cumulative traffic by 0.4 dB or less. Therefore, traffic noise impacts on existing receptors along project roadways would be less than significant.

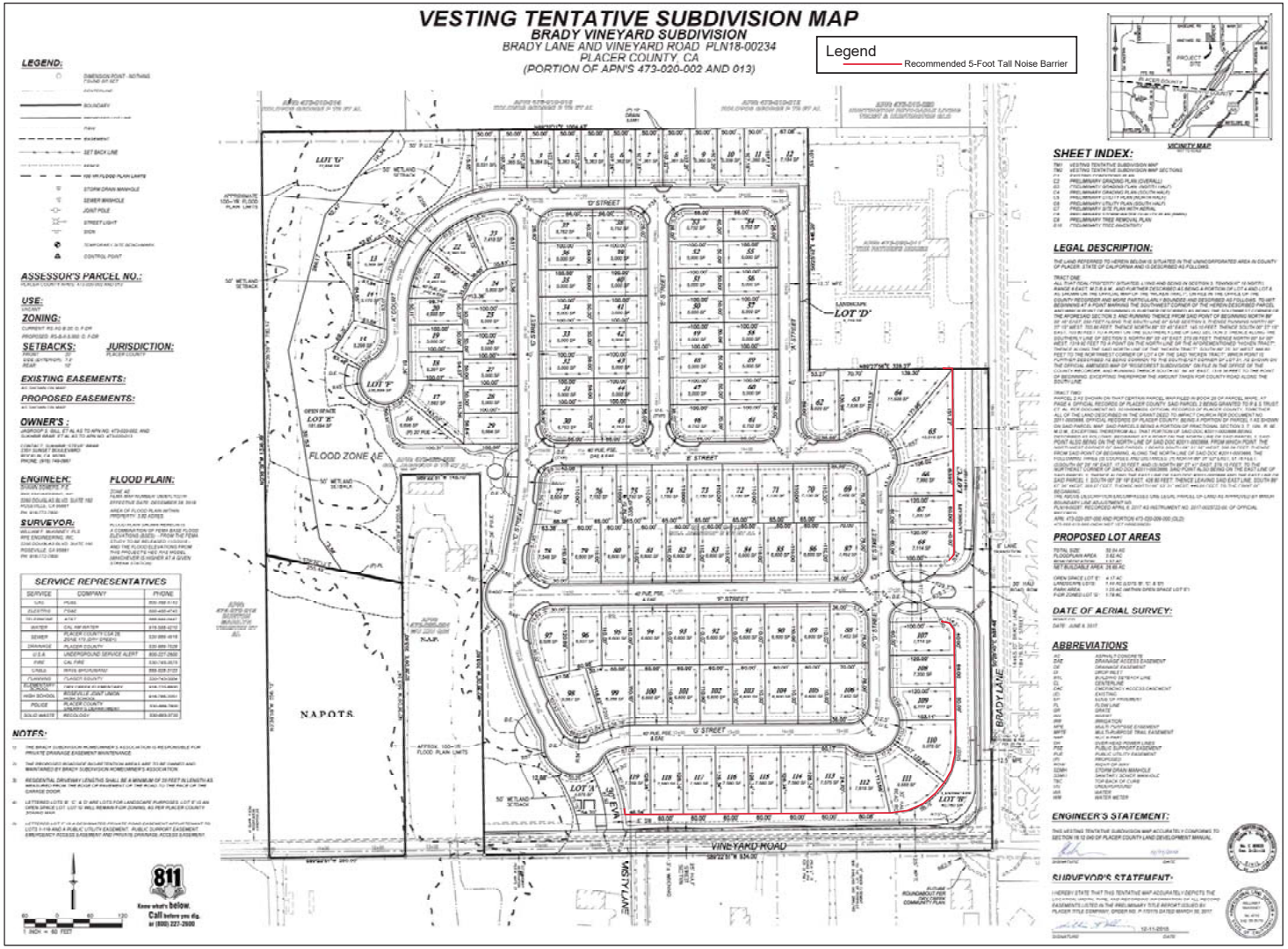
Potential Operational Noise Impacts on Existing Residence within Adjacent Two-Acre Parcel

The existing single-family home (and associated outbuilding) within the adjacent two-acre parcel is greater than 500 feet north of the centerline of Vineyard Road. As shown in **Table 8**, the project would only increase future cumulative traffic noise by 0.1 dB on the Vineyard Road segment adjacent to the adjacent two-acre parcel (Segment 8. Vineyard Rd. [Cook-Riolo to Brady]). The traffic noise increase attributable to the project would not be perceptible at the existing residence. Therefore, traffic noise impacts on the existing single-family home within the adjacent two-acre parcel would be less than significant.

Long-term noise from the residences of the proposed project and users of the proposed tot-lot park would take place upon completion of the project. In general, residences are one of the quietest land uses and noise from the residences would be considered compatible with the adjacent residence within the adjacent two-acre parcel. The proposed tot-lot park would be located just east of the adjacent two-acre parcel, but small neighborhood parks like the proposed tot-lot park are generally very quiet and are only used during daylight hours. The proposed tot-lot park would be considered compatible with the adjacent residence within the adjacent two-acre parcel. Any permanent increase in ambient noise levels from operation of the project would not be substantially greater than existing noise levels without the project. Therefore, operational noise impacts associated with the proposed residences and parks would be less than significant.

[5] The Federal Interagency Committee on Noise (FICON) developed noise guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. An increase of 5 dB, Ldn or greater would typically be considered to result in increased levels of annoyance where existing noise levels are less than 60 dB, Ldn. Within areas where the ambient noise level ranges from 60 to 65 dB, Ldn, increased levels of annoyance would be anticipated at increases of 3 dB, Ldn or greater (FICON, 2000).

Figure 3
Recommended Noise Barrier Locations



Temporary Construction Noise

Construction activities would require the use of numerous pieces of noise-generating equipment, such as excavating machinery (e.g., backhoes, bulldozers, excavators, front loaders, etc.) and other construction equipment (e.g., compactors, scrapers, graders, etc.). Construction worker traffic and construction-related material haul trips would raise ambient noise levels along local haul routes, depending on the number of haul trips made and types of vehicles used. Construction activities and associated traffic would occur primarily during the daytime.

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 and the prevailing wind direction. As shown in **Table 9**, maximum noise levels generated by various types of construction equipment can range from 76 to 89 dB at 50 feet. The highest noise levels associated with construction activities typically occur during ground excavation and finishing (See **Table 10**). **Table 10** gives average typical construction activities noise levels at 50 feet.

Table 9: Typical Noise Levels from Construction Equipment

Construction Equipment	Noise Level (dB, Lmax at 50 feet)
Dump Truck	76
Air Compressor	78
Concrete Mixer (Truck)	79
Jackhammers	89
Scraper	84
Dozer	82
Paver	77
Generator	81
Auger Drill Rig	84
Front End Loader	79
Grader	85
Backhoe	78

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

Table 10: Typical Construction Activities Noise Levels

Construction Phase	Noise Level (dB Leq at 50 feet)
Ground Clearing	83
Excavation	88
Foundations	81
Erection	81
Finishing	88

Notes: Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.
Leq = equivalent sound level
Source: U.S. Environmental Protection Agency, *Legal Compilation*, 1973

Noise levels from project construction at sensitive receptors would usually be much lower than the reference levels in **Tables 9** and **10** because construction activities would move around the project site and would be much farther than 50 feet from construction equipment for the majority of construction. Furthermore, noise levels from project construction at sensitive receptors would be generally in the same range as measured existing ambient noise levels and would only occur during daytime hours. The existing residence within the adjacent two-acre parcel would experience noise levels above existing ambient noise levels when construction activities are occurring nearby, but these activities would be temporary and would only occur during daytime hours. Project construction is required to comply with the constructions hours in the Placer County Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08. Compliance with the aforementioned construction hours would result in a less than significant impact.

Construction activities associated with the proposed off-site sewer construction would be typical of other minor roadway linear construction projects. The existing sensitive receptors to the north (single-family residential subdivision) of the proposed off-site sewer improvements are shielded by a noise barrier and the sensitive receptors to the south are approximately 100 feet south of the centerline of Vineyard Road. Noise levels from off-site sewer construction along Vineyard Road would be generally in the same range as measured existing ambient noise levels and would only occur during daytime hours. Construction activities associated with the proposed off-site sewer improvements in the City of Roseville shall be required to only occur between 7:00 a.m. and 7:00 p.m. Monday through Friday and between 8:00 a.m. and 8:00 p.m. on weekends and state and federal holidays (City of Roseville, 2013). Compliance with the City of Roseville Municipal Code would result in a less than significant impact.

b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels? **Less-than-Significant Impact.**

Construction operations have the potential to result in varying degrees of temporary ground vibration depending on the specific construction equipment used and operations involved. In most cases, vibration induced by typical construction equipment does not result in adverse effects on people or structures (Caltrans, 2013). Project construction would utilize typical construction equipment and would not require significant sources of vibration such as pile driving or blasting. Vibrational effects from typical construction activities are only a concern within 25 feet of existing structures (Caltrans, *Transportation Related Earthborne Vibrations,* 2002). Based on the construction equipment to be used and the distance from construction activities to the nearest structures, vibration from the project would not be a concern. Therefore, the project would result in a less-than-significant impact.

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? **No Impact.**

The project site is not located within the vicinity of a private airstrip or an area covered by an airport land use plan. The project site is not within two miles of a public airport or public use airport. Therefore, the project would not expose project construction workers or future project residents to excessive aircraft noise levels. Therefore, the project would result in no impact.

References

Barry, T.M. and J.A. Regan. *FHWA Highway Traffic Noise Prediction Model. Report No. FHWA-RD-77-108. Washington, DC: Federal Highway Administration*, December 1978.

Bollard Acoustical Consultants, 2005. *PFE/Walerga Mixed-Use Development, Environmental Noise Assessment*, 2005.

Burn, Melissa, 1994. WYLE Laboratories. *WYLE Research Report WR 94-23. Raleigh-Durham International Airport New Construction Acoustical Design Guide*, 1994. (reference for homes having 20 -35 dBA of noise attenuation).

California Department of Transportation (Caltrans), 1998. *Technical Noise Supplement*, 1998.

California Department of Transportation (Caltrans), 1998. *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*, October 1998.

Caltrans, 2002. *Transportation Related Earthborne Vibrations*, February, 2002.

Caltrans, 2013. *Transportation and Construction Vibration Guidance Manual*, September 2013.

City of Roseville, 2013. *City of Roseville Noise Ordinance*. Roseville Municipal Code Section 9.24.030 (G), 2013.

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

Federal Interagency Committee on Noise (FICON), 2000. *Discussion of Methodologies of Measuring Noise Impact*, October 22, 2000.

KD Anderson & Associates, *March 2019 Traffic Volumes*, March 2019.

U.S. Environmental Protection Agency, 1973. *Legal Compilation*, 1973.

Placer County, 1990. *Dry Creek West Placer Community Plan*, 1990.

Placer County, 2013. *General Plan Noise Element*, 2013.

Placer County, 2004. *Noise Control Ordinance*. 2004

Noise Appendix

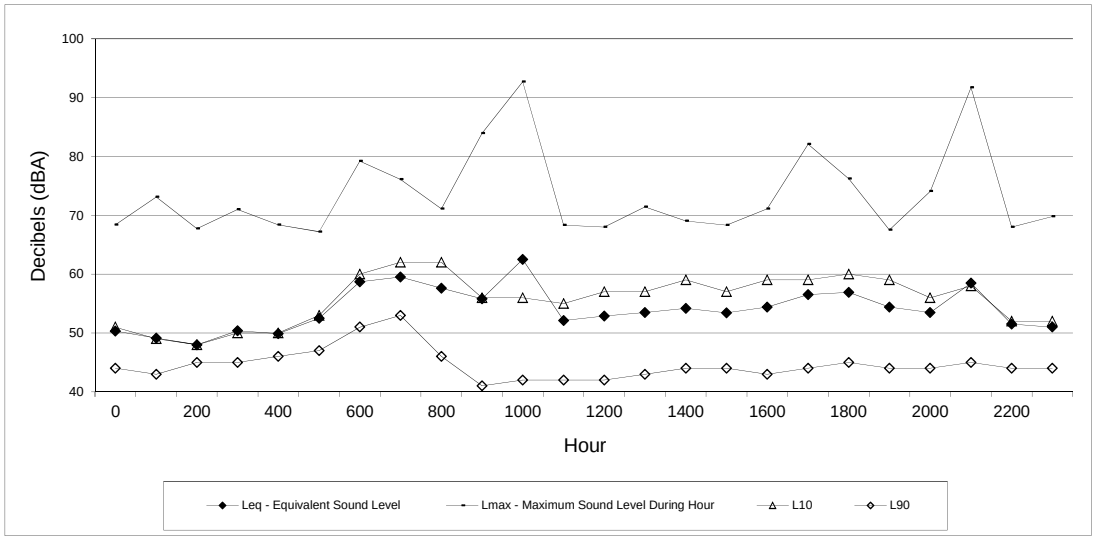
Brady Vineyard Subdivision

Site 1: 24-Hour Noise Plots and Hourly Noise Data (3 Pages)

Site 2: 24-Hour Noise Plots and Hourly Noise Data (3 Pages)

Table A-1: Inputs to and Results of Traffic Noise Prediction Model

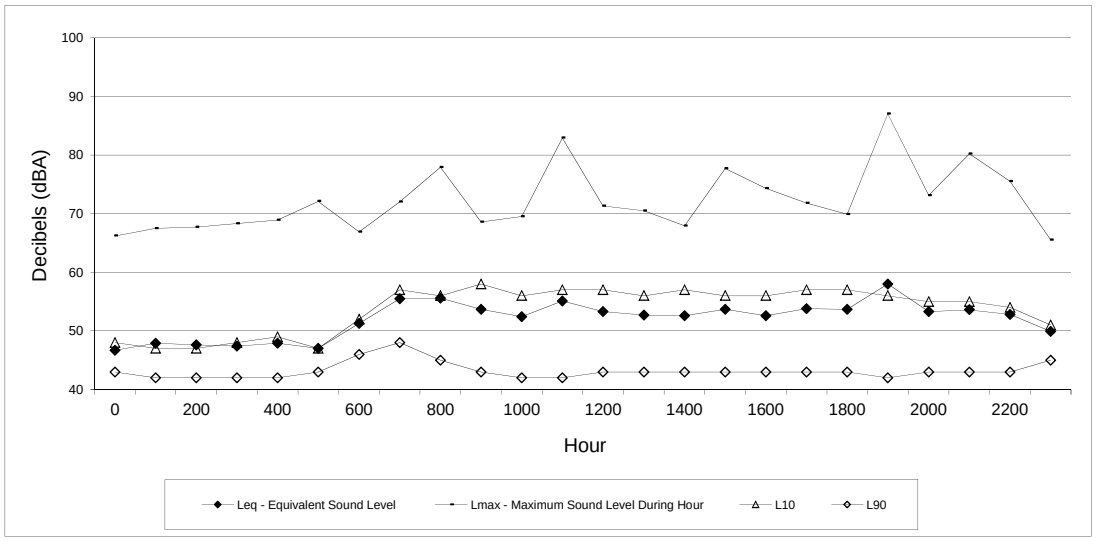
Table A-2: Peak Hour Traffic Volumes



Site 1: 75 Feet west of Brady Lane Centerline
Friday, March 29, 2019

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	50	68	51	44
100	49	73	49	43
200	48	68	48	45
300	50	71	50	45
400	50	68	50	46
500	53	67	53	47
600	59	79	60	51
700	60	76	62	53
800	58	71	62	46
900	56	84	56	41
1000	63	93	56	42
1100	52	68	55	42
1200	53	68	57	42
1300	54	71	57	43
1400	54	69	59	44
1500	53	68	57	44
1600	54	71	59	43
1700	57	82	59	44
1800	57	76	60	45
1900	54	68	59	44
2000	54	74	56	44
2100	59	92	58	45
2200	52	68	52	44
2300	51	70	52	44

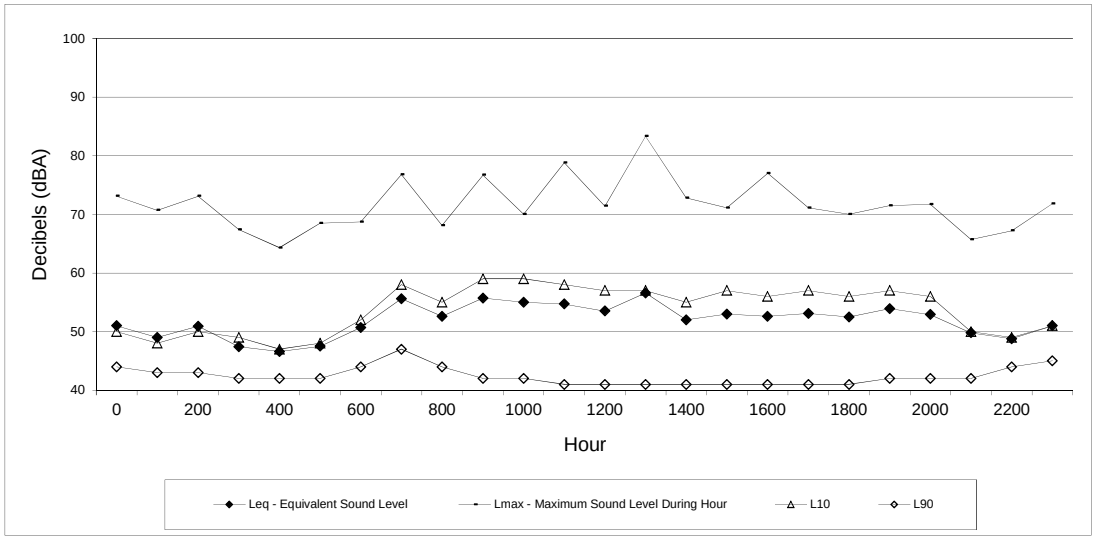
CNEL 60



Site 1: 75 Feet west of Brady Lane Centerline
Saturday, March 30, 2019

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	47	66	48	43
100	48	68	47	42
200	48	68	47	42
300	47	68	48	42
400	48	69	49	42
500	47	72	47	43
600	51	67	52	46
700	56	72	57	48
800	56	78	56	45
900	54	69	58	43
1000	52	70	56	42
1100	55	83	57	42
1200	53	71	57	43
1300	53	71	56	43
1400	53	68	57	43
1500	54	78	56	43
1600	53	74	56	43
1700	54	72	57	43
1800	54	70	57	43
1900	58	87	56	42
2000	53	73	55	43
2100	54	80	55	43
2200	53	76	54	43
2300	50	66	51	45

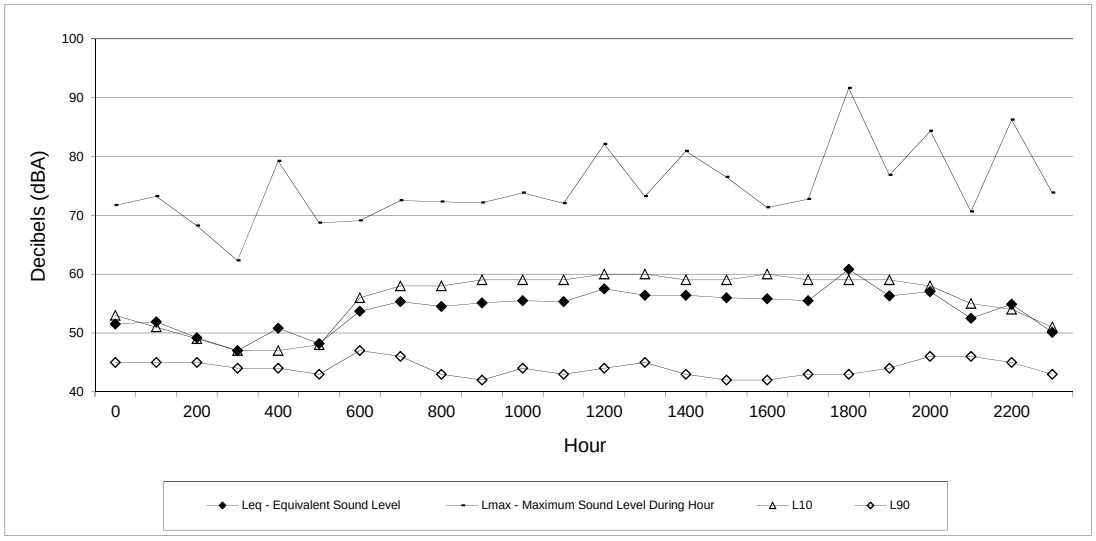
CNEL: 58



Site 1: 75 Feet west of Brady Lane Centerline
Sunday, March 31, 2019

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	51	73	50	44
100	49	71	48	43
200	51	73	50	43
300	47	67	49	42
400	47	64	47	42
500	48	69	48	42
600	51	69	52	44
700	56	77	58	47
800	53	68	55	44
900	56	77	59	42
1000	55	70	59	42
1100	55	79	58	41
1200	54	71	57	41
1300	57	83	57	41
1400	52	73	55	41
1500	53	71	57	41
1600	53	77	56	41
1700	53	71	57	41
1800	53	70	56	41
1900	54	72	57	42
2000	53	72	56	42
2100	50	66	50	42
2200	49	67	49	44
2300	51	72	51	45

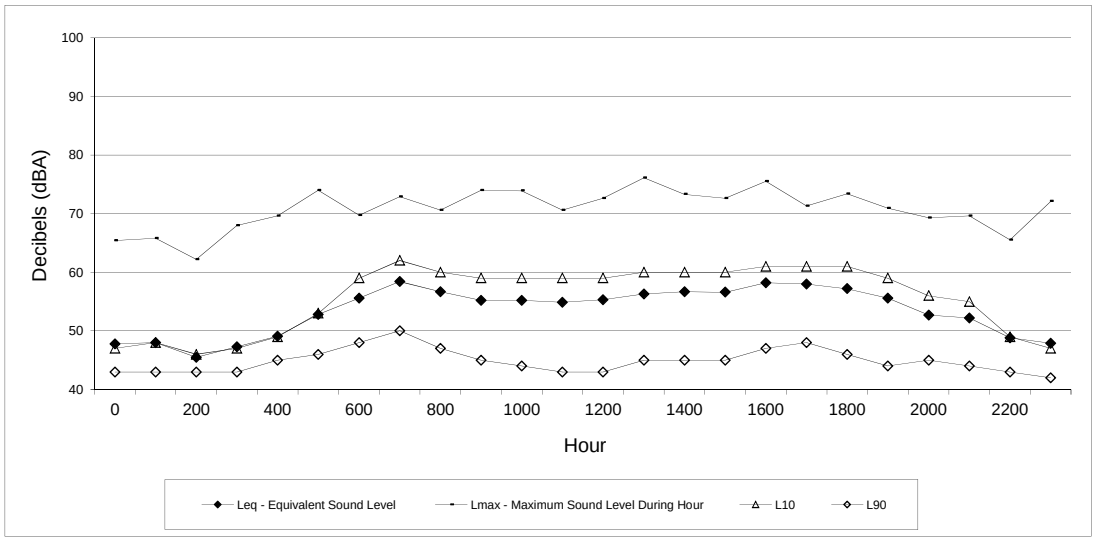
CNEL: 57



Site 2: 120 Feet North of Vineyard Road Centerline
Sunday, April 7, 2019

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	52	72	53	45
100	52	73	51	45
200	49	68	49	45
300	47	62	47	44
400	51	79	47	44
500	48	69	48	43
600	54	69	56	47
700	55	73	58	46
800	55	72	58	43
900	55	72	59	42
1000	56	74	59	44
1100	55	72	59	43
1200	58	82	60	44
1300	56	73	60	45
1400	56	81	59	43
1500	56	77	59	42
1600	56	71	60	42
1700	56	73	59	43
1800	61	92	59	43
1900	56	77	59	44
2000	57	84	58	46
2100	53	71	55	46
2200	55	86	54	45
2300	50	74	51	43

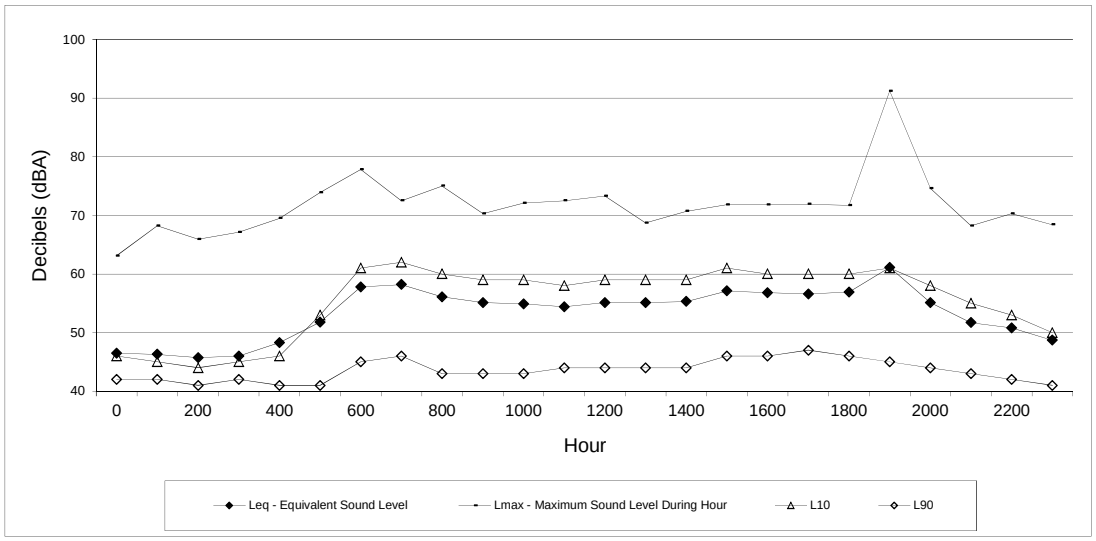
CNEL 60



Site 2: 120 Feet North of Vineyard Road Centerline
Monday, April 8, 2019

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	48	65	47	43
100	48	66	48	43
200	46	62	46	43
300	47	68	47	43
400	49	70	49	45
500	53	74	53	46
600	56	70	59	48
700	58	73	62	50
800	57	71	60	47
900	55	74	59	45
1000	55	74	59	44
1100	55	71	59	43
1200	55	73	59	43
1300	56	76	60	45
1400	57	73	60	45
1500	57	73	60	45
1600	58	76	61	47
1700	58	71	61	48
1800	57	73	61	46
1900	56	71	59	44
2000	53	69	56	45
2100	52	70	55	44
2200	49	66	49	43
2300	48	72	47	42

CNEL: 59



Site 2: 120 Feet North of Vineyard Road Centerline
Tuesday, April 9, 2019

Hour	Leq - Equivalent Sound Level	Lmax - Maximum Sound Level During Hour	L10	L90
0	47	63	46	42
100	46	68	45	42
200	46	66	44	41
300	46	67	45	42
400	48	70	46	41
500	52	74	53	41
600	58	78	61	45
700	58	73	62	46
800	56	75	60	43
900	55	70	59	43
1000	55	72	59	43
1100	54	73	58	44
1200	55	73	59	44
1300	55	69	59	44
1400	55	71	59	44
1500	57	72	61	46
1600	57	72	60	46
1700	57	72	60	47
1800	57	72	60	46
1900	61	91	61	45
2000	55	75	58	44
2100	52	68	55	43
2200	51	70	53	42
2300	49	68	50	41

CNEL: 60

Table A-1. Inputs to and Results of Traffic Noise Prediction Model

** See bottom of table for notes.

ROAD SEGMENT #1:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Medium Truck Auto	Medium Truck %	Medium Truck MT	Heavy Truck %	Heavy Truck HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	530	98	519	1	5	1	5	45	72	45	72	45	72	64.6	53.0	59.0	65.9	15	65.9
Existing Plus Project	534	98	523	1	5	1	5	45	72	45	72	45	72	64.6	53.0	59.0	65.9	15	65.9
Cumulative No Project	790	98	774	1	8	1	8	45	72	45	72	45	72	66.3	54.7	60.7	67.6	15	67.6
Cumulative Plus Project	794	98	778	1	8	1	8	45	72	45	72	45	72	66.4	54.7	60.7	67.6	15	67.6

ROAD SEGMENT #2:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Medium Truck Auto	Medium Truck %	Medium Truck MT	Heavy Truck %	Heavy Truck HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	671	98	658	1	7	1	7	45	72	45	72	45	72	65.6	54.0	60.0	66.9	15	66.9
Existing Plus Project	672	98	659	1	7	1	7	45	72	45	72	45	72	65.6	54.0	60.0	66.9	15	66.9
Cumulative No Project	1,830	98	1,793	1	18	1	18	45	72	45	72	45	72	70.0	58.4	64.4	71.3	15	71.3
Cumulative Plus Project	1,831	98	1,794	1	18	1	18	45	72	45	72	45	72	70.0	58.4	64.4	71.3	15	71.3

ROAD SEGMENT #3:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Medium Truck Auto	Medium Truck %	Medium Truck MT	Heavy Truck %	Heavy Truck HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	371	98	364	1	4	1	4	35	56	35	56	35	56	59.9	49.7	56.4	61.8	15	61.8
Existing Plus Project	372	98	365	1	4	1	4	35	56	35	56	35	56	59.9	49.7	56.4	61.8	15	61.8
Cumulative No Project	960	98	941	1	10	1	10	35	56	35	56	35	56	64.0	53.9	60.6	65.9	15	65.9
Cumulative Plus Project	962	98	943	1	10	1	10	35	56	35	56	35	56	64.1	53.9	60.6	65.9	15	65.9

ROAD SEGMENT #4:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Medium Truck Auto	Medium Truck %	Medium Truck MT	Heavy Truck %	Heavy Truck HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	497	98	487	1	5	1	5	25	40	25	40	25	40	57.0	48.7	56.4	60.0	15	60.0
Existing Plus Project	509	98	499	1	5	1	5	25	40	25	40	25	40	57.1	48.8	56.5	60.1	15	60.1
Cumulative No Project	1,330	98	1,303	1	13	1	13	25	40	25	40	25	40	61.3	53.0	60.6	64.3	15	64.3
Cumulative Plus Project	1,342	98	1,315	1	13	1	13	25	40	25	40	25	40	61.3	53.0	60.7	64.3	15	64.3

ROAD SEGMENT #5:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Medium Truck Auto	Medium Truck %	Medium Truck MT	Heavy Truck %	Heavy Truck HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	448	98	439	1	4	1	4	35	56	35	56	35	56	60.7	50.5	57.3	62.6	15	62.6
Existing Plus Project	453	98	444	1	5	1	5	35	56	35	56	35	56	60.8	50.6	57.3	62.7	15	62.7
Cumulative No Project	1,210	98	1,186	1	12	1	12	35	56	35	56	35	56	65.0	54.9	61.6	66.9	15	66.9
Cumulative Plus Project	1,215	98	1,191	1	12	1	12	35	56	35	56	35	56	65.1	54.9	61.6	67.0	15	67.0

ROAD SEGMENT #6:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Medium Truck Auto	Medium Truck %	Medium Truck MT	Heavy Truck %	Heavy Truck HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	776	98	760	1	8	1	8	45	72	45	72	45	72	66.3	54.6	60.6	67.5	15	67.5
Existing Plus Project	779	98	763	1	8	1	8	45	72	45	72	45	72	66.3	54.7	60.7	67.6	15	67.6
Cumulative No Project	3,255	98	3,190	1	33	1	33	45	72	45	72	45	72	72.5	60.9	66.9	73.8	15	73.8
Cumulative Plus Project	3,258	98	3,193	1	33	1	33	45	72	45	72	45	72	72.5	60.9	66.9	73.8	15	73.8

Table A-1. Inputs to and Results of Traffic Noise Prediction Model

ROAD SEGMENT #7:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten
Existing Conditions	263	98	258	1	3	1	3	45	72	45	72	45	72	61.6	49.9	55.9	62.8	15	57.3
Existing Plus Project	265	98	260	1	3	1	3	45	72	45	72	45	72	61.6	50.0	56.0	62.9	15	57.4
Cumulative No Project	890	98	872	1	9	1	9	45	72	45	72	45	72	66.9	55.2	61.2	68.1	15	62.6
Cumulative Plus Project	892	98	874	1	9	1	9	45	72	45	72	45	72	66.9	55.2	61.3	68.1	15	62.6

ROAD SEGMENT #8:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten with calibration
Existing Conditions	431	98	422	1	4	1	4	45	72	45	72	45	72	63.7	52.1	58.1	65.0	15	62.0
Existing Plus Project	445	98	436	1	4	1	4	45	72	45	72	45	72	63.8	52.2	58.2	65.1	15	62.1
Cumulative No Project	1,190	98	1,166	1	12	1	12	45	72	45	72	45	72	68.1	56.5	62.5	69.4	15	66.4
Cumulative Plus Project	1,204	98	1,180	1	12	1	12	45	72	45	72	45	72	68.2	56.5	62.6	69.5	15	66.5

ROAD SEGMENT #9:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten - 6 dBA for Wall
Existing Conditions	563	98	552	1	6	1	6	45	72	45	72	45	72	64.9	53.2	59.3	66.2	15	54.7
Existing Plus Project	625	98	613	1	6	1	6	45	72	45	72	45	72	65.3	53.7	59.7	66.6	15	55.1
Cumulative No Project	1,825	98	1,789	1	18	1	18	45	72	45	72	45	72	70.0	58.3	64.4	71.3	15	59.8
Cumulative Plus Project	1,888	98	1,850	1	19	1	19	45	72	45	72	45	72	70.1	58.5	64.5	71.4	15	59.9

ROAD SEGMENT #10:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten with calibration
Existing Conditions	101	98	99	1	1	1	1	45	72	45	72	45	72	57.4	45.8	51.8	58.7	23	59.2
Existing Plus Project	141	98	138	1	1	1	1	45	72	45	72	45	72	58.9	47.2	53.2	60.1	23	60.6
Cumulative No Project	590	98	578	1	6	1	6	45	72	45	72	45	72	65.1	53.4	59.5	66.4	23	66.8
Cumulative Plus Project	630	98	617	1	6	1	6	45	72	45	72	45	72	65.4	53.7	59.7	66.6	23	67.1

ROAD SEGMENT #11:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	Calculated dBA (15 meters from roadway center)	Receptor Distance from Roadway Center (m.)	Adjusted Level (dBA) 3 dBA Atten with calibration
Existing Conditions	101	98	99	1	1	1	1	45	72	45	72	45	72	57.4	45.8	51.8	58.7	23	59.2
Existing Plus Project	174	98	171	1	2	1	2	45	72	45	72	45	72	59.8	48.1	54.2	61.1	23	61.5
Cumulative No Project	735	98	720	1	7	1	7	45	72	45	72	45	72	66.0	54.4	60.4	67.3	23	67.8
Cumulative Plus Project	808	98	792	1	8	1	8	45	72	45	72	45	72	66.4	54.8	60.8	67.7	23	68.2

* Notes: 1. Highlighted segments front the project site -- See Table A-2 for details regarding segments and corresponding traffic volumes.

2. Predicted noise levels are in terms of peak hour Leq.

3. The existing plus project and future cumulative values were based on a conservative estimate of 10 percent of all ADT in the peak hour. The peak hour was then used as an estimate of the 24-hour future Ldn. It is a fairly typical case, that Ldn is approximately equal to the peak hour Leq. The rule of thumb is that Ldn is within +/- 2 dB of the peak hour Leq under normal conditions. For the two weekday long-term measurements conducted at Sites 1 and 2, the Ldn was equal to the peak hour Leq at Site 1 and the Ldn was +1 dB from the peak hour Leq at Site 2 (Technical Noise Supplement, Caltrans, 1998). Therefore, this analysis assumes the peak hour Leq is equal to the Ldn at the project site.

Table A-2 Peak Hour Traffic Volumes

SEGMENT #	STREET	LOCATION	COUNT 2018	2018 WITH PROJECT	CUM NO PROJECT ROUNDED	PROJECT ROUNDED ONLY	CUM WITH PROJECT
1	PFE Rd	Walerga Rd to Cook Riolo Rd	530	534	790	4	794
2	PFE Rd	Cook Riolo Rd to N. Antelope Rd	671	672	1830	1	1831
3	Cook Riolo Rd	Baseline Rd to Vineyard Rd	371	372	960	2	962
4	Cook riolo Rd	Vineyard Rd to Creekview School	497	509	1330	12	1342
5	Cook Riolo Rd	Creekview Ranch School to PFE Rd	448	453	1210	5	1215
6	N. Antelope Rd	PFE Rd to Great Valley Dr	776	779	3255	3	3258
7	Vineyard Road	Crowder Lane to Cook Riolo Rd	263	265	890	2	892
8	Vineyard Road	Cook Riolo Road to Brady Lane	431	445	1190	14	1204
9	Vineyard Road	Brady Lane to Foothills Blvd	563	625	1825	63	1888
10	Brady lane	Baseline Road to Project	101	141	590	40	630
11	Brady lane	Project to PFE Rd	101	174	735	73	808