

Noise Study Report

Carlotta Gardens LLC

Humboldt County APN 206-331-028-000

PLN-2022-17611

August 2022



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Summary

Carlotta Gardens LLC plans to open and operate a Farm-Based Retail Stand (hereinafter referred to as “Project”) on the site of their existing licensed outdoor and mixed-light cultivation located on Humboldt County APN 206-331-028-000 located in Carlotta, CA. The project is designed to sell only products grown from the existing licensed outdoor and mixed-light cultivation operated by Carlotta Gardens LLC on the above-mentioned APN..

- Project Location: APN 206-331-028-00

6287 Highway 36

Carlotta, CA 95528
- Project Purpose: To operate a Farm-Based Retail Stand
- Existing Noise Levels: The main source of noise in relation to this project comes from Eastbound and Westbound traffic on CA Highway 36
- Average Decibel Reading: 61.37 dB

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Chapter 1. Introduction

1.1 Purpose of the Noise Study Report

The purpose of this Noise Study Report is to provide information and data to the Humboldt County Planning Department to assist with Carlotta Gardens LLC's application PLN-2022-17611 for a Farm-Based Retail Stand.

Chapter 2. Fundamentals of Noise Levels

Table 2-1. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet fly-over at 1000 feet	— 110 —	Rock band
Gas lawn mower at 3 feet	— 100 —	
Diesel truck at 50 feet at 50 mph	— 90 —	Food blender at 3 feet
Noisy urban area, daytime	— 80 —	Garbage disposal at 3 feet
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area	— 60 —	Normal speech at 3 feet
Heavy traffic at 300 feet	— 50 —	Large business office
Quiet urban daytime	— 40 —	Dishwasher next room
Quiet urban nighttime	— 30 —	Theater, large conference room (background)
Quiet suburban nighttime	— 20 —	Library
Quiet rural nighttime	— 10 —	Bedroom at night, concert hall (background)
	— 0 —	Broadcast/recording studio
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 2013.

2.1. Human Response to Changes in Noise Levels

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the midfrequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

2.2. Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq}[h]$) is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA.
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn} , CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

2.3. Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

2.3.1. Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

2.3.2. Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 decibels per doubling of distance.

2.3.3. Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

2.3.4. Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often

constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receptor is rarely effective in reducing noise because it does not create a solid barrier.

Chapter 3. Methods and Procedures

On May 30th, 2022 a sound survey was conducted on multiple property lines on APN 206-331-028-00 over a continuous 24 hour period to measure maximum, minimum, and average decibel readings. Position CG-1W was on the Westernmost property line; Position CG-2E was on the Easternmost property line; and Position CG3-S was on the Southernmost property line close to CA Highway 36.

Table 3-1. Summary of Short-Term Measurements

Position	Address	Area	Land Uses	Start Time	Duration (hours)	Maximum Measured dB	Minimum Measured dB	Average Measured dB		
CG-1W	6287 Hwy36 Carlotta, CA 95528	N/A	Agricultural	5:22 p.m.	24	68.5	43.4	55.95		
CG-2E	6287 Hwy36 Carlotta, CA 95528	N/A	Agricultural	5:31 p.m.	24	65.5	39.2	52.35		
CG-3S	6287 Hwy36 Carlotta, CA 95528	N/A	Agricultural	5:38 p.m.	24	79.5	72.1	75.8		

Chapter 4. Conclusion

The noise levels taken over a 24 hour period as referenced in Table 3-1 seem to fall into expected decibel readings for an outdoor commercial agricultural operation with the loudest readings taken close to the property line adjacent to CA Highway 36 which functions as a busy arterial highway to the US-101.



California Department of
Fish and Wildlife

Permit Details

Permit: EPIMS-HUM-29879-R1C - Carlotta Gardens - 2022

Status: Underway
Region: Region 1 (Coastal)
Permittee Organization: Carlotta Gardens
CDFW Contact: Joshua Gruver

Standard Agreement

Signature Page

This Standard Agreement is being issued to:

Val Levi

**Final Standard
Agreement:***

EPIMS-HUM-29879-R1C_Final_Standard_Agreement.pdf
Open and print the attached PDF file.

Exhibits

Concurrence

I am the applicant or I have the authority to sign for the applicant. By my signature, I accept and agree to comply with all the provisions contained herein.

**Final Agreement
Effective Date:** 07/19/2022

**Permittee Electronic
Signature:** Val Levi
First and Last Name

Date Signed: 07/19/2022

Department of Fish and Wildlife

**CDFW Electronic
Signature:** Angela Liebenberg

**CDFW Representative
Title:** Senior Environmental Scientist (Supervisor)

Date Signed: 07/19/2022

Acting for: Yes

**Acting for the listed
CDFW Representative:** Rebecca Garwood
First and Last Name