

3.12 NOISE

This section includes a description of acoustic fundamentals, existing ambient noise conditions in Yolo County, and an analysis of potential short- and long-term noise impacts associated with activities that would likely result from implementation of the CLUO including issuance of subsequent Cannabis Use Permits issued pursuant to the adopted CLUO.

Comment letters, in response to the NOP, addressed issues pertaining to noise associated with the short-term construction and vibration, as well as long-term operation of commercial cannabis facilities, including the use of generators and increases in traffic noise. Other comments suggested that licensing policies should be designed to minimize noise impacts. There were also concerns that a concentration of cannabis uses could create localized noise impacts. Comments related to noise were received from the California Department of Food and Agriculture and from residents. Noise comments are considered in the analysis below as well as Chapter 4, “Cumulative Impacts and Overconcentration.” The comments received on the NOP are provided in Appendix A.

CONCEPTS RELATED TO EVALUATION OF NOISE

Acoustic Fundamentals

Prior to discussing the noise setting for the project, background information about sound, noise, vibration, and common noise descriptors is needed to provide context and a better understanding of the technical terms referenced throughout this section.

Sound, Noise, and Acoustics

Noise is defined as loud, unexpected, annoying, or unwanted sound. In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz, or thousands of hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.0000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this large range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB).

Addition of Decibels

Because decibels are logarithmic units, SPLs cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness at the same time, the resulting sound level at a given distance would be 3 dB higher than if only one of the sound sources was producing sound under the same conditions. For example, if one idling truck generates an SPL of 70 dB, two trucks idling simultaneously

would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level approximately 5 dB louder than one source.

A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within this range better than sounds of the same amplitude with frequencies outside of this range. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an “A-weighted” sound level (expressed in units of A-weighted decibels [dBA]) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgment correlates well with the A-scale sound levels of those sounds. Thus, noise levels are typically reported in terms of A-weighted decibels. All sound levels discussed in this section are A-weighted decibels. Table 3.12-1 describes typical A-weighted noise levels for various noise sources.

Table 3.12-1 Typical A-Weighted Noise Levels

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

Note: dB = decibels.

Source: Caltrans 2013a: Table 2-5

Human Response to Changes in Noise Levels

As discussed above, the doubling of sound energy results in a 3-dB increase in the sound level. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

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 mid-frequency (1,000–8,000 Hz) range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 Hz and perceives both higher and lower frequency sounds of the same magnitude with less intensity (Caltrans 2013a:2-18). In typical noisy environments, changes in noise of 1–2 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 (Caltrans 2013a:2-10). 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.

Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery) or transient in nature (e.g., explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV and RMS vibration velocity are normally described in inches per second or in millimeters per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2006:7-3; Caltrans 2013a:6).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006:7-4; Caltrans 2013b:7). This is based on a reference value of 1 micro inch per second.

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Ground vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006:7-8; Caltrans 2013b:27).

Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur to fragile buildings. Construction activities can generate sufficient ground vibrations to pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006:7-5).

Vibrations generated by construction activity can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations are generated by vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment.

Table 3.12-2 summarizes the general human response to different ground vibration-velocity levels.

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Note: VdB = vibration decibels referenced to 1 μ inch/second and based on the root-mean-square velocity amplitude.
 Source: FTA 2006:7-8

Common Noise Descriptors

Noise in our daily environment fluctuates over time. Various noise descriptors have been developed to describe time-varying noise levels. The following noise descriptors are used throughout this section:

- **Equivalent Continuous 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 level that actually occurs during the same period (Caltrans 2013a:2-48). For instance, the 1-hour equivalent sound level, also referred to as the hourly L_{eq} , is the energy average of sound levels occurring during a 1-hour period.
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period (Caltrans 2013a:2-48; FTA 2006:2-16).
- **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 sound levels occurring during nighttime hours between 10 p.m. and 7 a.m. (Caltrans 2013a:2-48; FTA 2006:2-22).
- **Community Noise Equivalent Level (CNEL):** CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. and a 5-dB penalty applied to the sound levels occurring during evening hours between 7 p.m. and 10 p.m. (Caltrans 2013a:2-48).

Sound Propagation

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

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 dB for each doubling of distance from a point source. Roads and 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, thus propagating at a slower rate in comparison to a point source. 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 dB for each doubling of distance from a line source.

Ground Absorption

The propagation path of noise from a source to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling provides additional attenuation associated with geometric spreading. Traditionally, this additional 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 receiver, 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 receiver, such as soft dirt, grass, or scattered bushes and trees), additional ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the attenuate rate associated with cylindrical spreading, the additional ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance. This would hold true for point sources, resulting in an overall drop-off rate of up to 7.5 dB per doubling of distance.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver attenuate noise levels at the receiver. 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. A barrier that breaks the line

of sight between a source and a receiver will typically result in at least 5 dB of noise reduction (Caltrans 2013a:2-41; FTA 2006:5-6, 6-25). Barriers higher than the line of sight provide increased noise reduction (FTA 2006:2-12). Vegetation between the source and receiver is rarely effective in reducing noise because it does not create a solid barrier unless there are multiple rows of vegetation (FTA 2006:2-11).

3.12.1 Environmental Setting

PREDOMINANT NOISE SOURCES

The dominant sources of noise in the County are mobile, related to automobile and truck traffic, aircraft and train transportation. Stationary sources in the County include farming activities, mining activities, commercial and industrial facilities, and construction. Noise levels along County roads that provide access to the more sparsely populated areas are generally low because these roads do not carry high volumes of traffic.

To characterize existing noise levels, traffic noise levels on 119 County roadway segments were modeled using calculation methods consistent with Federal Highway Administration (FHWA) Traffic Noise Model, Version 2.5 (FHWA 2004) and using average daily traffic volumes provided in the traffic analysis conducted by KD Anderson & Associates, Inc (2019) (see Appendix G). Based on the modeling conducted, traffic noise levels within The County range from 41.9 dBA L_{dn} to 79.3 dBA L_{dn} . Appendix E summarizes the modeled traffic noise levels at 100 feet from the centerline of each area roadway segments and lists distances from each roadway centerline to the 70, 65, 60, and 55 L_{dn} traffic noise contours.

EXISTING NOISE-SENSITIVE LAND USES

Noise-sensitive land uses generally include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels, and because this is where people sleep. Parks, schools, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels but less likely to result in health effects. Places of worship, and other similar places where low interior noise levels are of great importance, are also considered noise-sensitive. Within The County, all of the aforementioned types of noise-sensitive land uses are present.

3.12.2 Regulatory Setting

FEDERAL

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate Federal noise control activities. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments. However, documents and research completed by the EPA Office of Noise Abatement and Control continue to provide value in the analysis of noise effects.

STATE

California General Plan Guidelines

The State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR 2017), provides guidance for the compatibility of projects within areas of specific noise exposure. Acceptable and unacceptable community noise exposure limits for various land use categories have been determined to help guide new land use decisions in California communities. In many

local jurisdictions, these guidelines are used to derive local noise standards and guidance. Citing EPA materials and the state Sound Transmissions Control Standards, the state's general plan guidelines recommend interior and exterior CNEL of 45 and 60 dB for residential units, respectively (OPR 2017:378).

LOCAL

Yolo County 2030 Countywide General Plan

The Health and Safety Element of the 2030 Countywide General Plan (General Plan) contains policies and implementation programs regarding noise that are applicable to the project, and are summarized below.

- **Policy HS-7.1:** Ensure that existing and planned land uses are compatible with the current and projected noise environment. However, urban development generally experiences greater ambient (background) noise than rural areas. Increased density, as supported by the County in this General Plan, generally results in even greater ambient noise levels. It is the County's intent to meet specified indoor noise thresholds, and to create peaceful backyard living spaces where possible, but particular ambient outdoor thresholds may not always be achievable. Where residential growth is allowed pursuant to this general plan, these greater noise levels are acknowledged and accepted, notwithstanding the guidelines in Figure HS-7 (see Table 3.12-3 for an interpretation of Figure HS-7).
- **Policy HS-7.3:** Protect important agricultural, commercial, industrial, and transportation uses from encroachment by land uses sensitive to noise and air quality impacts.
- **Policy HS-7.4:** For proposed new discretionary development, where it is not possible to reduce noise levels in outdoor activity areas to 60 dB CNEL or less using practical application of the best-available noise reduction measures, greater exterior noise levels may be allowed, provided that all available reasonable and feasible exterior noise level reduction measures have been implemented.
- **Policy HS-7.5:** Minimize the impact of noise from transportation sources including roads, rail lines, and airports on nearby sensitive land uses.
 - **Action HS-A62:** Regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise to the following sensitive receptors: residentially designated land uses; hospitals, nursing/convalescent homes, and similar board and care facilities; hotels and lodging; schools and day care centers; and neighborhood parks. Home occupation uses are excluded. (Policy HS-7.1, Policy HS-7.4).
 - **Action HS-A63:** Review proposed development projects for compatibility with surrounding and planned uses in accordance with the Noise Compatibility Guidelines and the County's Right to Farm Ordinance; however these guidelines shall not be applied to outdoor activity areas nor shall they be used to prohibit or preclude otherwise allowed density and intensity of development. (Policy HS-7, Policy HS-7.4).

Table 3.12-3 Land Use/Noise Compatibility Standards

Land Use Category	Land Use Interpretation for L_{dn} Value			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Single Family, Duplex, Mobile Homes	Under 60	55-70	70-75	Above 75
Residential-Multiple Family	Under 65	60-70	70-75	Above 75
Transient Lodging -Motels, Hotels	Under 65	60-70	70-80	Above 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	Under 70	60-70	70-80	Above 80
Auditoriums, Concert Halls, Amphitheaters	N/A	50-70	N/A	Above 65
Sports Arenas, Outdoor Spectator Sports	N/A	50-75	N/A	Above 70
Playgrounds, Neighborhood Parks	Under 70	67-75	67-75	Above 72
Golf Courses, Riding Stables, Water Rec., Cemeteries	Under 75	70-80	70-80	Above 80
Office Buildings, Business Commercial and Professional	Under 70	75-85	75-85	N/A
Industrial, Manufacturing, Utilities, Agriculture	Under 75	75-85	75-85	N/A

Notes: N/A = not applicable.

¹ Due to exterior sources.

Source: Yolo County 2009, Figure HS-7

Yolo County Code

Noise in Yolo County is addressed within the regulations for specific activities (e.g., Title 10 of the Yolo County Code provides noise regulations for mining within the Cache Creek Area Plan). Section 10-3.411 Noise establishes the following noise standards for excavation activities within the Cache Creek Area Plan:

- Noise levels shall not exceed an 80 dBA L_{eq} measured at the outermost boundaries of the parcel being excavated. However, noise levels may not exceed 60 dBA L_{eq} at any nearby residences or other noise-sensitive land uses, unless emergency conditions require otherwise as determined by the Director.

3.12.3 Environmental Impacts and Mitigation Measures

METHODS AND ASSUMPTIONS

The environmental analysis in this EIR is structured to ensure analysis of cannabis activities over a range of assumed locations throughout the County for Alternatives 1, 2, 3, 4, and 5 (see Exhibits 2-4 through 2-8). While precise site impacts cannot be determined without specific project and property information, the analysis does assess the potential for impacts under various scenarios that are likely to represent actual conditions using the construction and operational assumptions for the five alternatives provided in Appendix D. Further, the analysis provides a conservative analysis of noise-related impacts that could occur from construction and operation of new cannabis uses and relocation of existing cannabis cultivation sites consistent requirements of the CLUO as compared to the noise standards of the General Plan. Thus, attention is given to the limitations and restrictions imposed by the CLUO regarding the types, location, and intensity of noise-generating activity.

Impacts were determined based on methods and reference noise levels from the Federal Transit Administration's Guide on Transit Noise and Vibration Impact Assessment (FTA 2006) and FHWA's Roadway Construction Noise Model User's Guide (FHWA 2006). Reference levels are noise levels for specific equipment or activity types that are documented and the use of them is common practice in the field of acoustics.

Project-generated long-term operational noise would include stationary source such as generators and refrigerated shipping containers and increases in traffic noise. Stationary sources were evaluated using reference noise levels and attenuation calculations and compared to thresholds of significance. The assessment of long-term operational noise impacts from project-generated increases in traffic was conducted using modeling based on the Caltrans traffic noise analysis protocol and the technical noise supplement (Caltrans 2013a), as well as project-specific traffic data (Appendix G). To assess this impact, traffic noise levels under cumulative no project and cumulative plus project conditions for affected roadway segments were modeled to determine the worst-case condition. The modeling conducted does not account for any natural or human-made shielding (e.g., the presence of vegetation, berms, walls, or buildings) and, consequently, represents worst-case noise levels.

Chapter 4, “Cumulative Impacts and Overconcentration,” contains a separate detailed analysis of the potential for cumulative effects not otherwise identified in this section, and effects from concentrations or clusters of multiple cannabis uses located in distinct subregions of the County.

THRESHOLDS OF SIGNIFICANCE

Thresholds of significance are based on Appendix G of the State CEQA Guidelines. The project would result in a significant impact related to noise if it would:

- generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the General Plan, or applicable standards of other agencies; specific thresholds for temporary (construction) and permanent (operational) noise increases are as follows:
 - **construction noise:** result in a substantial temporary increase in ambient noise levels in the project vicinity. The Yolo County Code does not contain any noise standards or noise-exemption time periods related to construction activity.
 - **operational stationary noise:** result in a substantial permanent increase in ambient noise levels in the project vicinity in excess of the General Plan industrial, manufacturing, utilities, agriculture land use compatibility standards (General Plan Policy HS-7.1) of 75 dBA L_{dn}.
 - **operational traffic noise:** result in a substantial permanent increase in ambient noise levels in the project vicinity in excess of the General Plan industrial, manufacturing, utilities, agriculture land use compatibility standards (General Plan Policy HS-7.1) of 75 dBA L_{dn}; for roadways that currently exceed applicable standards.

These noise thresholds also address the Mandatory Findings of Significance under State CEQA Guidelines Section 15065(a)(4) on whether the environmental effects of the project will cause adverse effect on human beings, either directly or indirectly. As described in Section 3.0, “Approach to the Environmental Analysis,” no significant impacts related to the creation of noise-sensitive land uses, airport noise, or vibration impacts would occur from implementation of the CLUO. Therefore, this impact issue area is not further evaluated.

IMPACT ANALYSIS

Impact NOI-1: Create Excessive Noise Levels from Construction Activities

Adoption and implementation of the proposed CLUO, including subsequent Cannabis Use Permits pursuant to the adopted CLUO could result in new cannabis operations that would result in temporary noise increases associated with construction of new buildings, ancillary structures, and minor earth movement/excavation. This impact would be **significant** for all the alternatives.

Construction of new cannabis uses (e.g., buildings, infrastructure, and land clearing) may involve the use of off-road construction equipment for grubbing and removal of existing vegetation, breaking ground, initial plowing, terracing, and/or grading to establish a gravel pad or foundation and lifting supplies and building materials. These construction activities could generate temporary noise levels that could disturb people if they were to occur during the sensitive times of the day (i.e., 7:00 a.m. to 6:00 p.m.). The General Plan EIR identified that planned growth would result in significant and unavoidable construction noise impacts (Yolo County 2009).

Alternatives 1, 2, 3, and 5 assume that personal use outdoor cultivation may occur in any zoning district on a parcel with a legal residence. Personal use outdoor cultivation of up to six plants is assumed to occur within pots or garden areas on the grounds of the parcel. Alternative 4 would limit personal use cultivation to indoor only. These activities would likely involve no more than 100 square feet of land area and would be required to be outside of front yard and side yard setback areas. Given that personal outdoor cultivation would be small in size and an ancillary use to the residential parcel maintained by the residence, no significant construction noise is expected.

Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)

Nine of the 78 existing and eligible cannabis cultivation sites are assumed to relocate under Alternative 1 due to compliance with zoning standards of the CLUO but no expansion of cannabis cultivation uses would occur.

Using published reference noise levels for these equipment types, a dozer generates noise levels of 85 dBA L_{max} and 81 dBA L_{eq} at a distance of 50 feet and a grader generates noise levels of 80 dBA L_{eq} and 76 dBA L_{eq} at 50 feet (FHWA 2006:3). Combining these noise levels and assuming attenuation rates from distance alone, at a distance of 75 feet, consistent with buffer distance under this alternative for off-site residences, construction from relocation of existing outdoor cultivation sites could result in noise levels of 83 dBA L_{max} and 79 dBA L_{eq} . Construction activities are typically exempt from noise standards provided they occur during the less sensitive times of the day. However, Yolo County has not adopted daytime construction noise exemptions. Thus, considering that the type and duration of individual construction activities are unknown for individual sites at this time, and no daytime construction exemption exists, construction noise could result in a substantial temporary increase in noise at existing sensitive receptors. This impact would be **significant** for Alternative 1.

Alternative 2: All License Types with Moderate Limits

Exhibit 2-5 identifies the assumed distribution of new cannabis uses in the County that consists of 54 new cannabis (cultivation and noncultivation) uses (see Table 2-4). Alternative 2 is also assumed to result in the relocation of 30 of the 78 existing and eligible cannabis cultivation sites due to compliance with zoning and buffer requirements in the CLUO.

Generally, the extent of construction activity for new cannabis sites would vary depending on the location and existing site conditions (e.g., there are existing buildings on the site that can be used to support the cannabis use). As identified in Appendix D, cannabis site construction activities may involve the use of off-road construction equipment for grubbing and removal of existing vegetation, breaking ground, initial plowing, terracing, and/or grading to establish a gravel pad or foundation and lifting supplies and building materials. It is assumed that up to two pieces of heavy off-road equipment would be used at a time (e.g. loader, grader, scraper, dozer, or something with a comparable engine size and power rating). Using published reference noise levels for these equipment types, a dozer generates noise levels of 85 dBA L_{max} and 81 dBA L_{eq} at a distance of 50 feet and a grader generates noise levels of 80 dBA L_{eq} and 76 dBA L_{eq} at 50 feet (FHWA 2006:3). Combining these noise levels and assuming attenuation rates from distance alone, at a distance of 1,000 feet, consistent with buffer distance requirements for outdoor cannabis sites under this alternative, construction for new cannabis sites could result in noise levels of 60 dBA L_{max} and 56 dBA L_{eq} . At this distance, construction noise would not likely disturb existing sensitive land uses. However, there are no buffer requirements for cannabis uses that would be contained within a building. Further, Yolo County has not adopted daytime construction noise exemptions and considering that the type and duration of individual construction activities are unknown for individual sites at this time, and no daytime construction

exemption exists, construction noise could result in a substantial temporary increase in noise at existing sensitive receptors. This impact would be **significant** for Alternative 2.

Alternative 3: All License Types with High Limits

As shown in Exhibit 2-6, Alternative 3 assumes 186 new cannabis uses would be constructed and generally spread throughout the County though 40 new cannabis uses are assumed to be sited along the SR 16 corridor west of the City of Woodland. This alternative is also assumed to result in the relocation of nine of the 78 existing and eligible cannabis cultivation sites due to compliance with zoning requirements under the CLUO.

Additional cultivation sites and new noncultivation sites would result in short-term construction involving equipment such as graders and dozers for earth movement and structure construction. It is anticipated that up to two pieces of heavy off-road equipment would be used at a time (e.g. loader, grader, scraper, dozer, or something with a comparable engine size and power rating). Using published reference noise levels for these equipment types, a dozer generates noise levels of 85 dBA L_{max} and 81 dBA L_{eq} at a distance of 50 feet and a grader generates noise levels of 80 dBA L_{eq} and 76 dBA L_{eq} at 50 feet (FHWA 2006:3). Combining these noise levels and assuming attenuation rates from distance alone, at a distance of 75 feet, consistent with buffer distance requirements for outdoor cannabis sites under this alternative, construction could result in noise levels of 83 dBA L_{max} and 79 dBA L_{eq} . However, Yolo County has not adopted daytime construction noise exemptions. Thus, considering that the type and duration of individual construction activities are unknown for individual sites at this time, and no daytime construction exemption exists, construction noise could result in a substantial temporary increase in noise at existing sensitive receptors. This impact would be **significant** for Alternative 3.

Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types

Exhibit 2-7 identifies the assumed distribution of new cannabis uses. Alternative 4 assumes the relocation of nine of the 78 existing and eligible cannabis cultivation sites. This alternative also assumes that 75 of the existing and eligible outdoor cannabis cultivation sites would convert entirely to indoor or mixed-light (greenhouse) cultivation. It also assumes the development of 54 new cannabis cultivation and noncultivation uses.

New cannabis sites constructed under this alternative could require up to two pieces of heavy off-road equipment used at a time (e.g. loader, grader, scraper, dozer, or something with a comparable engine size and power rating). Using published reference noise levels for these equipment types, a dozer generates noise levels of 85 dBA L_{max} and 81 dBA L_{eq} at a distance of 50 feet and a grader generates noise levels of 80 dBA L_{eq} and 76 dBA L_{eq} at 50 feet (FHWA 2006:3). No buffer requirements are associated with this alternative, and therefore, it was assumed that construction noise could occur as close as 50 feet to nearby existing development. Combining noise from these pieces of equipment could result in noise levels of 86 dBA L_{max} and 82 dBA L_{eq} at a distance of 50 feet. Yolo County has not adopted daytime construction noise exemptions. Thus, considering that the type and duration of individual construction activities are unknown for individual sites at this time, and no daytime construction exemption exists, construction noise could result in a substantial temporary increase in noise at existing sensitive receptors. This impact would be **significant** for Alternative 4.

Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail

Exhibit 2-8 identifies the assumed distribution of new cannabis uses in the County that consists of 52 cultivation and noncultivation uses (see Table 2-4). Alternative 5 is also assumed to result in the relocation of 30 of the 78 existing and eligible cannabis cultivation sites due to compliance with zoning and 1,000-foot buffer requirements between outdoor cannabis uses and defined sensitive receptors.

It is anticipated that up to two pieces of heavy off-road equipment would be used at a time (e.g. loader, grader, scraper, dozer, or something with a comparable engine size and power rating). Using published reference noise levels for these equipment types, a dozer generates noise levels of 85 dBA L_{max} and 81 dBA L_{eq} at a distance of 50 feet and a grader generates noise levels of 80 dBA L_{eq} and 76 dBA L_{eq} at 50 feet (FHWA 2006:3). Combining these noise levels and assuming attenuation rates from distance alone, at a

distance of 1,000 feet, consistent with buffer distance requirements for outdoor cannabis sites under this alternative, construction could result in noise levels of 60 dBA L_{max} and 56 dBA L_{eq} .

At this distance, construction noise would not likely disturb existing sensitive land uses. However, Yolo County has not adopted daytime construction noise exemptions and considering that the type and duration of individual construction activities are unknown for individual sites at this time, and no daytime construction exemption exists, construction noise could result in a substantial temporary increase in noise at existing sensitive receptors. This impact would be **significant** for Alternative 5.

Mitigation Measures

Mitigation Measure NOI-1: Implement Construction-Noise Reduction Measures (Alternatives 1, 2, 3, 4, and 5)

The following new performance standards shall be included under Section 8-2.1408 of the CLUO:

- From 6:00 a.m. to 6:00 p.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of eighty (80) decibels (dBA) measured at the property boundaries of the site. However, noise levels shall not exceed an average noise level equivalent (L_{eq}) of sixty (60) decibels (dBA) for any nearby off-site residences or other noise-sensitive land uses.
- From 6:00 p.m. to 6:00 a.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of sixty-five (65) decibels (dBA) measured at the property boundaries of the site.
- At no time shall noise levels exceed a community noise equivalent (CNEL) of sixty (60) decibels (dBA) for any existing residence or other noise-sensitive land use. An existing residence shall be considered the property line of any residentially zoned area or, in the case of agricultural land, any occupied off-site residential structures. Achieving the noise standards may involve setbacks, the use of quieter equipment adjacent to residences, or other appropriate measures.

Significance after Mitigation

Implementation of Mitigation Measure NOI-1 would reduce levels of nighttime construction noise exposure at residential receptors by ensuring construction would not occur during the more noise-sensitive nighttime hours. Limiting construction to the less sensitive times of the day (i.e., 7:00 a.m. to 6:00 p.m.) would ensure that people are not disrupted during sleep. Further, people are generally not home or as sensitive to construction noise during the daytime hours when various other noise is present, and therefore, would not be exposed to a substantial temporary increase in noise. Construction noise impacts under all five alternatives would not result in any new or greater construction noise impacts than were disclosed in the General Plan EIR (Yolo County 2009). This impact would be reduced to **less than significant**.

Impact NOI-2: Create Excessive Operational Non-Transportation Noise

Adoption and implementation of the proposed CLUO, including subsequent Cannabis Use Permits pursuant to the adopted CLUO could result in new cannabis operations that could result in long-term increases in noise from the use of electric trimmers, generators, refrigerated storage containers, greenhouse fans, and utility vehicles. Compliance with CLUO noise requirements would ensure that noise generated is consistent with the General Plan noise compatibility standards. This impact would be **less than significant** for all the alternatives.

The major stationary noise sources from cannabis uses consist of maintenance and harvest of cannabis at outdoor cultivation sites. Mixed-light and indoor cultivation is operated within buildings that significantly attenuate exterior noise levels. Noncultivation uses (nurseries, processing, manufacturing, testing, distribution, retail, and microbusinesses) are also operated within buildings that mitigate stationary noise

sources. Cannabis uses may require outdoor generators or refrigerated storage units to store fresh frozen cannabis after harvest. These potential noise sources are discussed below for each alternative.

Section 8-2.1408(BB) of the CLUO requires compliance with General Plan noise standards:

- Permittees shall control interior and exterior noise in compliance with the Noise chapter of the Health and Safety Element of the County General Plan including Figure HS-7, Noise Compatibility Guidelines, and Policy HS-7.1 and HS-7.4.

CLUO Sections 8-2.1408(F) and 8-2.1408(OO) also require buildings and site design shall comply with all applicable codes, standards, regulations, and guidelines, and shall demonstrate consideration of noise mitigation.

Alternatives 1, 2, 3, and 5 assume that personal use outdoor cultivation may occur in any zoning district on a parcel with a legal residence. Personal use outdoor cultivation of up to six plants is assumed to occur within pots or garden areas on the grounds of the parcel. Alternative 4 would limit personal use cultivation to indoor only. These activities would likely involve no more than 100 square feet of land area and would be required to be outside of front yard and side yard setback areas. Given that personal outdoor cultivation would be an ancillary use to the residential parcel maintained by the residence and its minimal size (100 square feet of area), no significant operational noise is expected.

Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)

Noise sources associated with the operation of existing and eligible cultivation sites could include the use of off-road utility vehicles, generators, trimming tools, greenhouse fans, and refrigerated storage units with externally-mounted air conditioning units.

A reference noise level for a mechanized trimmer is 81 dB L_{eq} at a distance of 3 feet and for a window air condition unit, 61 dBA at 10 feet (Berger et al. 2010). A reference noise level for a generator is 64 dBA L_{eq} at 100 feet (FHWA 2006). Based on these reference noise levels, a generator would result in the highest noise levels from operational activities. Thus, a generator was used for the basis of this analysis. Conservatively assuming 24-hour operation of a generator and accounting for the 75-foot buffer requirement between outdoor cultivation sites and existing off-site residence, the calculated L_{dn} from a generator would be 73.6 dBA, below the General Plan land use compatibility standards for industrial, manufacturing, utilities, agriculture (General Plan Figure HS-7) and within the requirements of CLUO Section 8-2.1408(BB). Considering that a generator would be the loudest operational noise source and it would not exceed applicable County standards, noise from other sources (e.g., trimmers, storage units) would also not exceed County standards. This alternative would be subject to the CLUO noise standards and would be required to demonstrate compliance as part of building and site design (CLUO Sections 8-2.1408[F] and 8-2.1408[OO]). Compliance may consist of placement of noise barriers around generators and externally-mounted air conditioning units. This impact would be **less than significant** for Alternative 1.

Alternative 2: All License Types with Moderate Limits

New mixed-light cultivation, indoor cultivation, and noncultivation uses (nurseries, processing, manufacturing, testing, distribution, retail, and microbusinesses) assumed under this alternative would be contained within buildings that would attenuate noise levels. Exterior noise sources associated with the operation of cannabis uses could include the use of off-road utility vehicles, generators, externally mounted air condition units on storage containers, greenhouse fans, and trimming tools. As discussed above, a generator would result in the highest noise levels from operational activities. Thus, a generator was used for the basis of this analysis. Therefore, assuming 24-hour operation of a generator and accounting for the 1,000-foot buffer requirement between outdoor cannabis sites and CLUO defined sensitive receptors, the calculated L_{dn} from a generator would be 44.4 dBA, within the requirements of CLUO Section 8-2.1408(BB). It should be noted that this analysis focuses on noise levels associated with sources located outdoors. Thus, considering that estimated noise levels would not exceed County standards, any noise sources located within enclosed buildings would lower than estimated noise levels discussed above, and also would be below applicable standards. The

CLUO would require all cannabis uses comply with General Plan noise standards and demonstrate compliance in building and site design (Sections 8-2.1408[F], 8-2.1408[BB], and 8-2.1408[NN]). Compliance may consist of placement of noise barriers around generators and externally-mounted air conditioning units. This impact would be **less than significant** for Alternative 2.

Alternative 3: All License Types with High Limits

As addressed in Alternative 2, new mixed-light cultivation, indoor cultivation, and noncultivation uses (nurseries, processing, manufacturing, testing, distribution, retail, and microbusinesses) would be contained within buildings that would attenuate noise levels. Exterior noise sources associated with the operation of cannabis uses could include the use of off-road utility vehicles, generators, externally mounted air condition units on storage containers, greenhouse fans, and trimming tools. As discussed above, a generator would result in the highest noise levels from operational activities. Thus, a generator was used for the basis of this analysis. Assuming 24-hour operation of a generator and accounting for the 75-foot buffer requirement between outdoor cannabis sites and CLUO defined sensitive receptors, the calculated L_{dn} from a generator would be 73.6 dBA, below the land use compatibility standards for industrial, manufacturing, utilities, agriculture. It should be noted that this analysis focusses on noise levels associated with sources located outdoors and within the requirements of CLUO Section 8-2.1408(BB). Thus, considering that estimated noise levels would not exceed County standards, any noise sources located within enclosed buildings would lower than estimated noise levels discussed above, and also would be below applicable standards. The CLUO would require all cannabis uses comply with General Plan noise standards and demonstrate compliance in building and site design (Sections 8-2.1408[F], 8-2.1408[BB], and 8-2.1408[NN]). Compliance may consist of placement of noise barriers around generators and externally-mounted air conditioning units. This impact would be **less than significant** for Alternative 3.

Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types

Alternative 4 would restrict cannabis cultivation to mixed-light and indoor operations within greenhouse buildings that would include the existing cultivation sites (conversion of 75 existing outdoor cultivation sites indoor or mixed-light [greenhouse] cultivation).

As noted above, new mixed-light cultivation, indoor cultivation, and noncultivation uses (nurseries, processing, manufacturing, testing, distribution, retail, and microbusinesses) would be contained within buildings that would attenuate noise levels. Exterior noise sources associated with the operation of cannabis uses could include the use of off-road utility vehicles, generators, greenhouse fans, and externally mounted air condition units on storage containers. A reference noise level for a generator is 64 dBA Leq at 100 feet and could result in exterior noise levels in excess of General Plan standards in Figure HS-7 for industrial, manufacturing, utilities, and agriculture. However, the CLUO would require all cannabis uses comply with General Plan noise standards and demonstrate compliance in building and site design (Sections 8-2.1408[F], 8-2.1408[BB], and 8-2.1408[NN]). Compliance may consist of placement of noise barriers around generators and externally-mounted air conditioning units. This impact would be **less than significant** for Alternative 4.

Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail

As addressed in Alternative 2, new mixed-light cultivation, indoor cultivation, and noncultivation uses (nurseries, processing, manufacturing, testing, distribution, retail, and microbusinesses) would be contained within buildings that would attenuate noise levels. Exterior noise sources associated with the operation of cannabis uses could include the use of off-road utility vehicles, generators, externally mounted air condition units on storage containers, greenhouse fans, and trimming tools. As discussed above, a generator would result in the highest noise levels from operational activities. Thus, a generator was used for the basis of this analysis. Assuming 24-hour operation of a generator and accounting for the 1,000-foot buffer requirement between cannabis sites and CLUO defined sensitive receptors, the calculated L_{dn} from a generator would be 44.4 dBA, within the requirements of CLUO Section 8-2.1408(BB). It should be noted that this analysis focuses on noise levels associated with sources located outdoors. Thus, considering that estimated noise levels would not exceed County standards, any noise sources located within enclosed buildings would lower than estimated noise levels discussed above, and also would be below applicable standards. The CLUO would require all cannabis uses comply with General Plan noise standards and demonstrate compliance in

building and site design (Sections 8-2.1408[F], 8-2.1408[BB], and 8-2.1408[NN]). Compliance may consist of placement of noise barriers around generators and externally-mounted air conditioning units. This impact would be **less than significant** for Alternative 5.

Mitigation Measures

No mitigation is required for any of the alternatives.

Impact NOI-3: Create Excessive Traffic Noise

Adoption and implementation of the proposed CLUO, including subsequent Cannabis Use Permits pursuant to the adopted CLUO could result in traffic noise increases. No increases in cannabis operations would occur under Alternative 1, and therefore, there would be no long-term increases in traffic noise and **no impact** would occur. All other alternatives would result in varying degrees of traffic and associated traffic noise increases that would not exceed General Plan standards. No roadway currently below 75 dBA L_{dn} would experience traffic noise increases that would exceed this standard. The impact from operational traffic noise would be **less than significant** for Alternatives 2, 3, 4, and 5.

Traffic generated by cannabis uses have the potential to generate increases in existing and future traffic noise levels along roadways and state highways in the County. Appendix F provides a detailed traffic noise analysis for each of the alternatives.

Alternatives 1, 2, 3, and 5 assume that personal use outdoor cultivation may occur in any zoning district on a parcel with a legal residence. Personal use outdoor cultivation of up to six plants is assumed to occur within pots or garden areas on the grounds of the parcel. Alternative 4 would limit personal use cultivation to indoor only. These activities would likely involve no more than 100 square feet of land area and would be required to be outside of front yard and side yard setback areas. No additional traffic would be generated.

Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)

Alternative 1 assumes the continued operation of 78 existing and eligible cannabis cultivation sites. No new commercial cultivation sites would be developed. Therefore, there would be no increase in operation-related traffic noise over existing conditions and **no impact** from operational noise under Alternative 1.

Alternative 2: All License Types with Moderate Limits

Traffic noise modeling was conducted for cumulative no project conditions and for cumulative plus Alternative 2 assumed cannabis uses (Appendix F). Based on the modeling conducted, the greatest increase in noise would be 1.3 dB, occurring on State Route 16 from Arbuckle Road to County Road 78. An increase in noise of 1.3 dB would not be audible to the human ear and would not exceed General Plan noise standard. This impact would be **less than significant** under Alternative 2.

Alternative 3: All License Types with High Limits

Traffic noise modeling was conducted for cumulative no project conditions and for cumulative plus Alternative 3 assumed cannabis uses (Appendix F). Based on the modeling conducted, the greatest increase in noise would be 4.1 dB, occurring on County Road 6 from County Road 86 to Dunnigan. Noise increases of 3 dB are considered just barely perceptible and noise increases of 6 dB are considered clearly noticeable (Egan 2007). Thus, an increase of approximately 4 dB could potentially be noticeable. However, there are no existing sensitive land uses located along this road segment. Further, cumulative plus project noise levels on this road would be well below the General Plan 75-dBA L_{dn} noise standard (i.e., 51 dBA L_{dn}), used as a threshold of significance for this impact. Therefore, Alternative 3 would not result in an increase in noise that could affect any existing sensitive land receptor or in an increase in noise that would exceed applicable thresholds of significance. Therefore, the impact would be **less than significant** under Alternative 3.

Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types

Traffic noise modeling was conducted for cumulative no project conditions and for cumulative plus Alternative 4 assumed cannabis uses (Appendix F). Based on the modeling conducted, the greatest increase in noise would be 1.5 dB, occurring on County Road 12A. An increase in noise of 1.5 dB would not be audible to the human ear. In addition, cumulative plus project noise levels on this road would be below the General Plan 75-dBA L_{dn} noise standard (i.e., 43.5 dBA L_{dn}), used as a threshold of significance for this impact. Therefore, Alternative 4 would not result in an audible increase in noise or in an increase in noise that would exceed applicable thresholds of significance. Therefore, the impact would be **less than significant** under Alternative 4.

Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail

Traffic noise modeling was conducted for cumulative no project conditions and for cumulative plus Alternative 5 assumed cannabis uses (Appendix F). Based on the modeling conducted, the greatest increase in noise would be 1.3 dB, occurring on County Road 12A. An increase in noise of 1.3 dB would not be audible to the human ear. In addition, cumulative plus project noise levels on this road would be below the General Plan 75-dBA L_{dn} noise standard (i.e., 43.3 dBA L_{dn}), used as a threshold of significance for this impact. Therefore, Alternative 5 would not result in an audible increase in noise or in an increase in noise that would exceed applicable thresholds of significance. Therefore, the impact would be **less than significant** under Alternative 5.

Mitigation Measures

No mitigation is required for any of the alternatives.

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