3.10 - Noise

3.10.1 - Introduction

This section describes the existing noise setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on noise modeling performed by FirstCarbon Solutions (FCS). The noise modeling output is included in this Draft Environmental Impact Report (Draft EIR) as Appendix G.

3.10.2 - Environmental Setting

Characteristics of Noise

Noise is generally defined as unwanted or objectionable sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment. Noise effects can be caused by pitch or loudness. *Pitch* is the number of complete vibrations or cycles per second of a wave that result in the range of tone from high to low; higher-pitched sounds are louder to humans than lower-pitched sounds. *Loudness* is the intensity or amplitude of sound.

Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit that expresses the ratio of the sound pressure level being measured to a standard reference level. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more as this level has been found to be barely perceptible to the human ear in outdoor environments. Only audible changes in existing ambient or background noise levels are considered potentially significant.

The human ear is not equally sensitive to all frequencies within the audible sound spectrum, so sound pressure level measurements can be weighted to better represent frequency-based sensitivity of average healthy human hearing. One such specific "filtering" of sound is called "A-weighting." A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear. Because decibels are logarithmic units, they cannot be added or subtracted by ordinary arithmetic means. For example, if one noise source produces a noise level of 70 dB, the addition of another noise source with the same noise level would not produce 140 dB; rather, they would combine to produce a noise level of 73 dB.

Noise Descriptors

There are many ways to rate noise for various intervals, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise

Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source, as well as ground absorption, atmospheric conditions (wind, temperature gradients, and humidity) and refraction, and shielding by natural and manmade features. Sound from point sources, such as an air conditioning condenser, a piece of construction equipment, or an idling truck, radiates uniformly outward as it travels away from the source in a spherical pattern.

The attenuation, or sound drop-off rate, is dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA per each doubling of the distance (dBA/DD) is typically observed over soft ground with landscaping, as compared with a 6 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources, such as traffic noise on a roadway, a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3 dBA/DD drop-off rate for hard-site conditions. Table 3.10-1 briefly defines these measurement descriptors and other sound terminology used in this section.

Table 3.10-1: Sound Terminology

Term	Definition
Sound	A vibratory disturbance created by a vibrating object which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism such as the human ear or a microphone.
Noise	Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

Term	Definition
Ambient Noise	The composite of noise from all sources near and far in a given environment.
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which represents the squared ratio of sound pressure amplitude to a reference sound pressure. The reference pressure is 20 micropascals, representing the threshold of human hearing (0 dB).
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level that approximates the frequency response of the human ear.
Equivalent Noise Level (L_{eq})	The average sound energy occurring over a specified time period. In effect, L_{eq} is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period.
Maximum and Minimum Noise Levels (L_{max} and L_{min})	The maximum or minimum instantaneous sound level measured during a measurement period.
Day-Night Level (DNL or L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring between 10 p.m. and 7 a.m. (nighttime).
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring between 7 p.m. and 10 p.m. and 10 dB added to the A-weighted sound levels occurring between 10 p.m. and 7 a.m.
Source: Data compiled by FirstCarbon Solutions (FCS) 2021.	

Traffic Noise

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the Federal Highway Administration (FHWA) community noise assessment criteria, this change is “barely perceptible”; for reference, a doubling of perceived noise levels would require an increase of approximately 10 dBA. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

Stationary Noise

A stationary noise producer is any entity in a fixed location that emits noise. Examples of stationary noise sources include machinery, engines, energy production, and other mechanical or powered equipment and activities such as loading and unloading or public assembly that may occur at commercial, industrial, manufacturing, or institutional facilities. Furthermore, noise generated by the use of motor vehicles over public roads is preempted from local regulation, although the use of these vehicles is considered a stationary noise source when operated on private property such as at a construction site, a truck terminal, or warehousing facility. The emitted noise from the producer can be mitigated to acceptable levels either at the source or on the adjacent property through the use of proper planning, setbacks, block walls, acoustic-rated windows, or dense landscaping or by changing the location of the noise producer.

The effects of stationary noise depend on factors such as characteristics of the equipment and operations, distance and pathway between the generator and receptor, and weather. Stationary noise sources may be regulated at the point of manufacture (e.g., equipment or engines), with limitations on the hours of operation or with provision of intervening structures, barriers, or topography.

Construction activities are a common source of stationary noise. Construction period noise levels are higher than background ambient noise levels but cease once construction is complete. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and, therefore, would change the noise levels as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 3.10-2 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

Table 3.10-2: Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Impact Pile Driver	95
Auger Drill Rig	85
Vibratory Pile Driver	95
Jackhammers	85
Pneumatic Tools	85
Pumps	77
Scrapers	85
Cranes	85
Portable Generators	82
Rollers	85
Bulldozers	85
Tractors	84
Front-End Loaders	80
Backhoe	80
Excavators	85

Type of Equipment	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Graders	85
Air Compressors	80
Dump Truck	84
Concrete Mixer Truck	85
Pickup Truck	55
Notes: dBA = A-weighted decibel Source: Federal Highway Administration (FHWA). 2006. Highway Construction Noise Handbook, August.	

Noise from Multiple Sources

Because sound pressure levels in decibels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. Therefore, sound pressure levels in decibels are logarithmically added on an energy summation basis. In other words, adding a new noise source to an existing noise source, both producing noise at the same level, will not double the noise level. Instead, if the difference between two noise sources is 10 dBA or more, the louder noise source will dominate and the resultant noise level will be equal to the noise level of the louder source. In general, if the difference between two noise sources is 0–1 dBA, the resultant noise level will be 3 dBA higher than the louder noise source, or both sources if they are equal. If the difference between two noise sources is 2–3 dBA, the resultant noise level will be 2 dBA above the louder noise source. If the difference between two noise sources is 4–10 dBA, the resultant noise level will be 1 dBA higher than the louder noise source.

Characteristics of Vibration

Groundborne vibration consists of rapidly fluctuating motion through a solid medium, specifically the ground, which has an average motion of zero and in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The effects of groundborne vibration typically only cause a nuisance to people, but in extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors, where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels—denoted as LV—and is based on the reference quantity of 1 microinch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB."

Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. When assessing annoyance from groundborne vibration, vibration is typically expressed as rms velocity in units of decibels of 1 microinch per second, with the unit written in VdB. Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. Human perception to vibration starts at levels as low as 67 VdB. Annoyance due to vibration in residential settings starts at approximately 70 VdB.

Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration. Construction activities, such as blasting, pile driving, and operating heavy earthmoving equipment, are common sources of groundborne vibration. Construction vibration impacts on building structures are generally assessed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 3.10-3.[1]

Table 3.10-3: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	rms Velocity in Decibels (VdB) at 25 Feet
Water Trucks	0.001	57
Scraper	0.002	58
Bulldozer—Small	0.003	58
Jackhammer	0.035	79
Concrete Mixer	0.046	81
Concrete Pump	0.046	81
Paver	0.046	81
Pickup Truck	0.046	81
Auger Drill Rig	0.051	82
Backhoe	0.051	82
Crane (Mobile)	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86
Bulldozer—Large	0.089	87
Caisson Drilling	0.089	87
Vibratory Roller (small)	0.101	88
Compactor	0.138	90
Clam Shovel Drop	0.202	94

[1] Federal Highway Administration (FHWA). 2006. Highway Construction Noise Handbook. August.

Construction Equipment	PPV at 25 Feet (inches/second)	rms Velocity in Decibels (VdB) at 25 Feet
Vibratory Roller (large)	0.210	94
Pile Driver (impact-typical)	0.644	104
Pile Driver (impact-upper range)	1.518	112

Notes:
PPV = peak particle velocity
rms = root mean square
Source: Compilation of scientific and academic literature, generated by the Federal Transit Administration (FTA) and Federal Highway Administration (FHWA).

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform medium, while groundborne vibrations travel through the earth, which may contain significant geological differences. Factors that influence groundborne vibration include:

- **Vibration source:** Type of activity or equipment, such as impact or mobile, and depth of vibration source;
- **Vibration path:** Soil type, rock layers, soil layering, depth to water table, and frost depth; and
- **Vibration receiver:** Foundation type, building construction, and acoustical absorption.

Among these factors that influence groundborne vibration, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock. Vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at large distance from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side, and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil type, but it has been shown to be effective enough for screening purposes in order to identify potential vibration impacts that may need to be studied through actual field tests. The vibration level (calculated below as "PPV") at a distance from a point source can generally be calculated using the vibration reference equation:

$$PPV = PPV_{ref} * (25/D)^n \text{ (in/sec)}$$

Where:

PPV_{ref} = reference measurement at 25 feet from vibration source
D = distance from equipment to the receptor
n = vibration attenuation rate through ground

According to Section 7 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual, an "n" value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.[2]

Existing Noise Levels

The project site is located in the City of American Canyon, Napa County, California. The project site is bounded by industrial development in the Green Island Business Park (west), the Napa Logistics Park and Devlin Road (north), the Napa Branch Line railroad (east), and Green Island Road, a stone supply business, and a wine distribution warehouse (south). Napa County Airport is located approximately 1 mile north of the project site. The dominant noise sources in the project vicinity is traffic on local roadways in the project vicinity and railroad and airport activity.

Existing traffic noise levels along selected roadway segments in the project vicinity were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The daily traffic volumes were obtained from the traffic analysis prepared for the proposed project by W-Trans.[3] The traffic volumes described here correspond to the existing without project conditions traffic scenario as described in the transportation analysis. The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA CNEL noise contour distances—are provided in the Appendix G of this document. A summary of the modeling results is shown in Table 3.10-4.

The results show that traffic noise levels along Green Island Road adjacent to the project site range up to 62 dBA L_{dn}. The project's nearest façade is located over 960 feet west of the centerline of State Route (SR) 29. At this distance traffic noise levels on SR-29 would attenuate to below 52 dBA L_{dn}. Therefore, the dominant noise source on the project site would be traffic noise on Green Island Road.

Table 3.10-4: Existing Traffic Noise Levels

Roadway Segment	Approximate ADT	Centerline to 70 L_{dn} (feet)	Centerline to 65 L_{dn} (feet)	Centerline to 60 L_{dn} (feet)	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane
Paoli Loop Road–south of Green Island Road	3,000	< 50	< 50	55	59.9

2 Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.
3 W-Trans. 2021. Traffic Impact Study for the Giovannoni Logistics Center. July.

Roadway Segment	Approximate ADT	Centerline to 70 L_{dn} (feet)	Centerline to 65 L_{dn} (feet)	Centerline to 60 L_{dn} (feet)	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane
Green Island Road–Paoli Loop Road to future Devlin Road	4,800	< 50	< 50	76	62.0
Green Island Road–west of future Devlin Road	4,800	< 50	< 50	76	62.0
South Kelly Road–SR-29 to Devlin Road	1,400	< 50	< 50	< 50	56.6
SR-29–South Kelly Road to Green Island Road	30,900	128	273	586	73.8

Notes:
ADT = Average Daily Traffic
L_{dn} = day/night average sound level
dBA = A-weighted decibel
1 The ADT values are calculated based on the PM peak-hour traffic volumes multiplied by a factor of 10.
2 Modeling results do not take into account mitigating features such as topography, vegetative screening, fencing, building design, or structure screening. Rather, they assume a worst-case scenario of having a direct line of site on flat terrain.
Source: FirstCarbon Solutions (FCS) 2021.

3.10.3 - Regulatory Framework

Federal

Noise Control Act

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees.

Among the agencies now regulating noise are the Occupational Safety and Health Administration (OSHA), which limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour; the United States Department of Transportation (USDOT), which assumed a significant role in noise control through its various operating agencies; and the Federal Aviation Administration (FAA), which regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the FTA. Transit noise is regulated by the federal Urban Mass Transit Administration, while freeways that are part of the interstate highway system are regulated by the FHWA. Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise-sensitive” uses are either prohibited from being sited adjacent to a highway, or alternatively, that developments are planned and constructed in such a manner that minimize potential noise impacts.Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise- sensitive" uses are either prohibited from being sited adjacent to a highway, or alternatively, that developments are planned and constructed in such a manner that minimize potential noise impacts.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by transportation sources, local jurisdictions are limited to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

Federal Transit Administration Standards and Guidelines

FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment Manual.[4] The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 3.10-5.

Table 3.10-5: Federal Transit Administration Construction Vibration Impact Criteria

Building Category	PPV (in/sec)	Approximate VdB
I. Reinforced-Concrete, Steel, or Timber (no plaster)	0.5	102
II. Engineered Concrete and Masonry (no plaster)	0.3	98
III. Non-engineered Timber and Masonry Buildings	0.2	94
IV. Buildings Extremely Susceptible to Vibration Damage	0.12	90

Notes:
VdB = vibration measured as root mean square (rms) velocity in decibels of 1 microinch-inch per second
PPV = peak particle velocity
Source: Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

State

California General Plan Guidelines

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The Governor's Office of Planning and Research (OPR) has issued and periodically updated advisory General Plan Guidelines that provide suggestions regarding how agencies may want to comply with this statutory requirement. The latest version of the General Plan Guidelines was issued in 2020. It contains an Appendix (D) entitled, Noise Element Guidelines, which were developed in 1976 by the former Department of Health Services Office of Noise Control pursuant to former Health and Safety Code section 46050.1. These Guidelines represent "an additional resource that local governments may consult in addition to this chapter to develop noise elements" (OPR, *General Plan Guidelines*, p. 130 [2020]). One significant model is the "Land Use Category and Community Noise Exposure Matrix,"

[4] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

which allows the local jurisdiction to delineate compatibility of sensitive uses with various incremental levels of noise.[5]

The Noise Element Guidelines rank noise/land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable (Noise Element Guidelines, Figure 2, p. 374). The project is also subject to review under the State of California Environmental Quality Act (CEQA). Appendix G of the CEQA Guidelines provides questions relating to potential noise impacts that can be used in the formulation of impact thresholds for potential noise and vibration impacts. The City of American Canyon has developed its own CEQA thresholds, which are described in the local regulatory section below.

California Building Standards Code

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor-ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Local

Since the state and federal government have preempted the setting of standards for noise levels that can be emitted by transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning. The applicable sections of the General Plan[6] and Municipal Code[7] are stated below.

City of American Canyon

General Plan

The City of American Canyon General Plan sets forth the following goal of ensuring that American Canyon's existing and future residents, employees and employers, as well as visitors to the City, are protected from the adverse human health and environmental impacts of excessive noise levels

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5 Governor's Office of Planning and Research. Noise Element Guidelines, Appendix D, Figure 2. 2020. Website: https://opr.ca.gov/planning/general-plan/guidelines.html. Accessed June 29, 2021.
6 City of American Canyon. Noise Element. Accessed June 29th, 2020. Website: https://www.cityofamericancanyon.org/government/community-development/planning-zoning/general-plan-update.
7 American Canyon Municipal Code. Community Noise. Accessed June 29, 2021. Website: https://qcode.us/codes/americancanyon/.

created by stationary and ambient (intrusive) noise sources and conditions. The City takes all necessary and appropriate action to avoid or mitigate the detrimental effects of such excessive noise on the community. Exhibit 3.10-1 illustrates the acceptable noise-compatible land use relationships by implementing the noise standards identified in Figure 11-2 of the General Plan. The objectives and policies relevant to noise that are applicable to the proposed project are:

Objective 11.1 Control both ambient and stationary (intrusive) noise conditions and impacts that may occur in American Canyon. Maintain base line information regarding ambient and stationary noise sources within the community.

Policies

Policy 11.1.1 Promote noise-compatible land use relationships by implementing the noise standards identified in Figure 11-2 [of the General Plan], to be utilized for design purposes in new development and for establishing a program to attenuate existing noise problems.

Policy 11.1.2 Monitor and update available data regarding the community's ambient and stationary noise levels.

Objective 11.2 Protect residents, employees, and visitors to the community from excessive noise exposure. If possible, mitigate the adverse impacts of existing or unavoidable excessive noise on these same groups.

Policies

Policy 11.2.1 Require that new development for locations in which the exterior or interior noise levels indicated in Figure 11-2 [of the General Plan] are likely to be exceeded, submit a noise attenuation study prepared by a qualified acoustical engineer in order to determine appropriate mitigation measures.

Policy 11.2.4 Require that new industrial, commercial, and related land uses, or the expansion of these existing land uses, demonstrate that they would not directly cause ambient noise levels to exceed an exterior L_{dn} of 65 dB(A) in areas containing housing, schools, health care facilities, or other "noise-sensitive" land uses. Additionally, require that potentially significant noise generators, including uses such as night clubs that cause sporadic noise intensities, submit noise analyses prepared by an acoustical expert that include specific recommendations for mitigation when: a) the project is located in close proximity to noise-sensitive land uses or land that is planned for noise-sensitive land uses, or b) the proposed noise source could violate the noise provisions of the General Plan or City Noise Ordinance.

Objective 11.3 Minimize the adverse impacts of traffic-generated noise on residential and other "noise-sensitive" uses as depicted on Figure 11-5 [of the General Plan].

Policies

Policy 11.3.1 Minimize motor vehicle noise impacts from streets and highways through proper route location and sensitive roadway design by employing the following strategies:

a. Consider the impacts of truck routes, the effects of a variety of truck traffic, and future motor vehicle volumes on noise levels adjacent to master planned roadways when improvements to the circulation system are planned.
b. Mitigate traffic volumes and vehicle speed through residential neighborhoods.
c. Work closely with the State of California Department of Transportation (Caltrans) in the early stages of highway improvements and design modifications to ensure that proper consideration is given to potential noise impacts on the City.

Policy 11.3.2 Require that all new nonresidential development design and configure on-site ingress and egress points to divert traffic (and its resultant noise) away from "noise-sensitive" land uses to the greatest degree practicable.

Policy 11.4.1 Restrict the development of uses located within the 65 CNEL contour of Napa Airport to industrial, agricultural, or other open space uses (see Figure 11-5 [of the General Plan]).

Policy 11.4.1 Require that development in the vicinity of Napa Airport comply with the noise standards contained in the Airport Land Use Compatibility Plan (ALUP).

Objective 11.5 Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or "noise-sensitive" uses.

Objective 11.7 Minimize the impacts of construction noise on adjacent uses.

Municipal Code

The City of American Canyon General Plan establishes an exterior noise level criterion of 50 dBA in residential single or double and 55 in residential multiple land uses from 10:00 p.m. to 7:00 a.m. and 60 dBA for all residential land uses from 7:00 a.m. to 10:00 p.m. within outdoor activity areas of residential land uses. Additionally, the City requires that cumulative noise exposure from exterior noise sources within noise-sensitive dwellings not exceed 55 dBA from 10:00 p.m. to 7:00 a.m. and 60 dBA from 7:00 a.m. to 10:00 p.m. The City establishes different exterior noise limits for construction noise impacts for residential land uses to be 75 dBA from 7:00 a.m. to 7:00 p.m. and 60 dBA from 7:00 p.m. to 7:00 a.m.

3.10.4 - Methodology

Noise Assessment

Construction Noise Analysis Methodology

A worst-case scenario was analyzed assuming each piece of modeled equipment would operate simultaneously at the nearest reasonable locations to the closest noise-sensitive receptor for the loudest phase of construction. Noise emission levels recommended by FHWA's Highway Construction Noise Handbook were used to ascertain the noise generated by specific types of construction equipment. The construction noise impact was evaluated in terms of maximum levels (L_{max}). Analysis requirements were based on the sensitivity of nearby receptors and the Noise Ordinance specifications.

Traffic Noise Modeling Methodology

The FHWA highway traffic noise prediction model (FHWA-RD-77-108) was used to evaluate traffic-related noise conditions in the vicinity of the project site. Traffic data used in the model was obtained from the traffic impact analysis prepared for this EIR by W-Trans. The resultant noise levels were weighted and summed over a 24-hour period in order to determine the L_{dn} values. The FHWA-RD-77-108 Model arrives at a predicted noise level through a series of adjustments to the reference energy mean emission level. Adjustments are then made to the reference energy mean emission level to account for the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway); the total Average Daily Traffic (ADT); the percentage of ADT that flows during the day, evening, and night; the travel speed; the vehicle mix on the roadway; a percentage of the volume of automobiles, medium trucks, and heavy trucks; the roadway grade; the angle of view of the observer exposed to the roadway; and the site conditions (“hard” or “soft”) as they relate to the absorption of the ground, pavement, or landscaping.

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the FHWA community noise assessment criteria, this change is considered “barely perceptible.”

The model analyzed the noise impacts from the nearby roadways onto the project vicinity, which consists of the area that has the potential of being impacted from the on-site noise sources as well as the project-generated traffic on the nearby roadways**.** The roadways were analyzed based on a single-lane-equivalent noise source combining both directions of travel. A single-lane-equivalent noise source is when the vehicular traffic from all lanes is combined into a theoretical single-lane that has a width equal to the distance between the two outside lanes of a roadway, which provides almost identical results to analyzing each lane separately where elevation changes are minimal. The modeling assumes a direct line of sight to the roadway and flat terrain conditions.

Stationary Noise Source Analysis Methodology

The proposed project would generate noise from parking lot activities, new exterior mechanical equipment sources, such as rooftop ventilation systems on proposed industrial uses, and from truck loading and unloading activities. To provide a conservative analysis, the highest end of the range of reference noise levels for these stationary noise sources was used to calculate the reasonable worst-case hourly average noise levels from each noise source. These hourly averages were then assumed to occur for every hour for a 24-hour period to calculate the reasonable worst-case 24-hour average L_{dn} noise levels as measured at the nearest sensitive receptor land use. These individual source noise levels were then combined to calculate the reasonable worst-case combined stationary source 24-

hour L_{dn} noise level as measured at the nearest sensitive receptor land use. These noise levels were then compared to the City's applicable noise performance threshold to determine whether these noise sources would result in a substantial increase in excess of this standard.

Vibration Impact Analysis Methodology

The City of American Canyon does not have adopted criteria for construction or operational groundborne vibration impacts. Therefore, the FTA's vibration impact criteria and modeling and analysis methodology were utilized to evaluate potential vibration impacts. The FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment document,[8] and are summarized in Table 3.10-5. in the regulatory discussion above.

3.10.5 - Thresholds of Significance

Appendix G to the CEQA Guidelines is a sample Initial Study Checklist that includes questions for determining whether noise impacts are significant. These questions input of planning and environmental professionals at the OPR and the California Natural Resources Agency, based on input from stakeholder groups and experts in various other governmental agencies, nonprofits, and leading environmental consulting firms. As a result, many lead agencies derive their significance criteria from the questions posed in Appendix G. The City has chosen to do so here, but has also included language consistent with CEQA case law. Thus, noise impacts resulting from the implementation of the proposed project would be considered significant if the project would cause:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in noise-sensitive locations 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.

3.10.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Substantial Noise Increase in Excess of Standards

Impact NOI-1:	**The proposed project could generate a substantial temporary or permanent increase in ambient noise levels in noise-sensitive locations 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.**

[8] Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. May.

Impact Analysis

Construction

For purposes of this analysis, a significant impact would occur if construction noise impacts were greater than 75 dBA between the hours of 7:00 a.m. and 7:00 p.m. or greater than 60 dBA from 7:00 p.m. to 7:00 a.m., per the City's policies, and would result in a substantial temporary increase in ambient noise levels that could result in annoyance or sleep disturbance of nearby sensitive receptors.

Construction-related Traffic Noise

Noise impacts from construction activities associated with the project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. One type of short-term noise impact that could occur during project construction would result from the increase in traffic flow on local streets associated with the transport of workers, equipment, and materials to and from the project site. The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from passing trucks would be similar to existing vehicle-generated noise on these local roadways. Typically, a doubling of the ADT hourly volumes on a roadway segment is required in order to result in an increase of 3 dBA in traffic noise levels, which, as discussed in the characteristics of nose discussion above, is the lowest change that can be perceptible to the human ear in outdoor environments. Project-related construction trips would not be expected to double the hourly or daily traffic volumes along any roadway segment in the project vicinity. For this reason, short-term intermittent noise from construction trips would not be expected to result in a perceptible increase in hourly or daily average traffic noise levels in the project vicinity. Therefore, short-term construction-related noise impacts associated with the transportation of workers and equipment to the project site would be less than significant.

Construction Equipment Operational Noise

The second type of short-term noise impact is related to noise generated during construction on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 3.10-2 lists typical construction equipment noise levels, based on a distance of 50 feet between the equipment and a noise receptor. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings. Impact equipment such as pile drivers are not expected to be used during construction of this project.

The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery and compacting equipment, such as bulldozers, draglines, backhoes, front loaders, roller compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings.

Construction of the project is expected to require the use of scrapers, bulldozers, water trucks, haul trucks, and pickup trucks. Based on the information provided in Table 3.10-2, the maximum noise level generated by each scraper is assumed to be 85 dBA L_{max} at 50 feet from this equipment. Each bulldozer would also generate 85 dBA L_{max} at 50 feet. The maximum noise level generated by graders is approximately 85 dBA L_{max} at 50 feet. A characteristic of sound is that each doubling of sound sources with equal strength increases a sound level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, a reasonable worst-case combined noise level during this phase of construction would be 90 dBA L_{max} at a distance of 50 feet from the acoustic center of a construction area. This would result in a reasonable worst-case hourly average of 86 dBA L_{eq}. The acoustic center reference is used because construction equipment must operate at some distance from one another on a project site and the combined noise level as measured at a point equidistant from the sources (acoustic center) would be the worst-case maximum noise level. The effect on sensitive receptors is evaluated below.

The closest noise-sensitive receptor to the project site construction footprint is the single-family residence located southwest of the project site, on Green Island Road. The closest façade of the residence would be located 1,240 feet from the acoustic center of construction activity where multiple pieces of heavy construction equipment would operate simultaneously during construction of the proposed parking areas near the project's northeastern boundary. At this distance, construction noise levels could range up to approximately 62 dBA L_{max}, with a relative worst-case hourly average of 57 dBA L_{eq} at this receptor. These noise levels could occur temporarily under the reasonable worst-case scenario of multiple pieces of heavy construction equipment operating simultaneously in relatively the same locations at the nearest project boundary for an hour period.

These construction noise levels are within the construction noise limits established by the City of no greater than 75 dBA during the hours of 7:00 a.m. to 7:00 p.m.; but these levels could exceed the City's nighttime threshold for construction noise of 60 dBA. Therefore, construction activities shall be restricted to daytime hours and best management noise reduction techniques and practices shall be implemented as outlined in Mitigation Measure (MM) NOI-1, to ensure that construction noise would not result in a substantial temporary increase in ambient noise levels that would result in annoyance or sleep disturbance of nearby sensitive receptors. MM NOI-1 would reduce impacts from construction noise by requiring mufflers on construction equipment powered by internal engines, which are the primary source of construction noise. Additionally, MM NOI-1 would require contractors to limit idling times of vehicles with internal combustion engines to 5 minutes or less and utilize quiet mode on air compressors and other stationary noise sources. Furthermore, MM NOI-1 would require contractors to locate stationary noise-generating equipment be located as far away as the equipment allows and also placed such that noise is directed away from adjacent residential homes. Finally, MM NOI-1 would require construction staging areas be located as far away as possible from noise-sensitive receptors nearest the project site and would limit construction activities to the permitted hours Monday through Saturday. The measures outlined in MM NOI-1 would collectively reduce temporary construction noise impacts to a less than significant level.

Operation

Implementation of the project would result in mobile and stationary operational noise sources. Potential noise impacts with these project-related sources are analyzed below.

Mobile Source Operational Noise Impacts

A significant impact would occur if implementation of the proposed project would result in a substantial increase in traffic noise levels compared with traffic noise levels existing without the project. The County does not define what is a substantial increase in traffic noise levels. As noted in the characteristics of noise discussion, audible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. A change of 5 dBA is considered the minimum readily perceptible change to the human ear in outdoor environments. Therefore, for purposes of this analysis, a 3 dBA or greater increase above traffic noise levels that would existing without the project would be considered a substantial permanent increase in traffic noise levels.

Table 3.10-6 shows a summary of the traffic noise levels for Existing, Existing Plus Project, Future without the Project, and Future Plus Project traffic conditions, as defined in the traffic study prepared by W-Trans.[9] These modeling results represent the projected traffic noise levels as measured at 50-feet from the centerline of the outermost travel lane of the modeled roadway segment.

Table 3.10-6: Traffic Noise Increase Summary

Roadway Segment	Existing No Project (dBA) L_{dn}	Existing Plus Project (dBA) L_{dn}	Increase from Existing No Project Conditions (dBA)	Future No Project (dBA) L_{dn}	Future Plus Project (dBA) L_{dn}	Increase from Future No Project Conditions (dBA)
Paoli Loop Road–south of Green Island Road	59.9	60.8	0.9	60.8	61.5	0.7
Green Island Road–Paoli Loop Road to future Devlin Road	62.0	63.2	1.2	62.9	63.8	0.9
Green Island Road–west of future Devlin Road	62.0	62.0	0.0	62.9	62.9	0.0
South Kelly Road–SR-29 to Devlin Road	56.6	59.1	2.5	59.0	60.6	1.6
SR-29–South Kelly Road to Green Island Road	73.8	73.9	0.1	76.1	76.2	0.1

Notes:
dBA = A-weighted decibel
L_{dn} = day/night average sound level
Source: FirstCarbon Solutions (FCS) 2021.

9 W-Trans. 2021. Traffic Impact Study for the Giovannoni Logistics Center. July.

As shown in Table 3.10-6, the highest traffic noise level increase with implementation of the proposed project would occur along South Kelly Road under Existing Plus Project conditions. Along this roadway segment, the proposed project would result in traffic noise levels ranging up to 59.1 dBA L_{dn} as measured at 50 feet from the centerline of the nearest travel lane, representing an increase of 2.5 dBA over existing conditions for this roadway segment.

This increase is less than a 3 dBA or greater increase that would be considered a substantial increase. Therefore, project-related traffic noise levels would not result in a substantial permanent increase in traffic noise levels in excess of applicable standards and would represent a less than significant impact.

Stationary Source Operational Noise Impacts

A significant impact would occur if operational noise levels generated by stationary noise sources at the proposed project site would result in a substantial permanent increase in ambient noise levels in excess of the City's noise performance standards. The City requires that new industrial, commercial, and related land uses demonstrate that they would not directly cause ambient noise levels to exceed an exterior L_{dn} of 65 dBA in areas containing housing, schools, health care facilities, or other "noise-sensitive" land uses.

The proposed project would generate noise from parking lot activities, new exterior mechanical equipment sources, such as rooftop ventilation systems on proposed industrial uses, and truck loading and unloading activities. Potential impacts from these noise sources are discussed below.

Parking Lot Activities

Typical parking lot activities include people conversing, doors shutting, and vehicles idling which generate noise levels ranging from approximately 60 dBA to 70 dBA L_{max} at 50 feet. These activities are expected to occur sporadically throughout the day as visitors and staff arrive and leave parking lot areas at the project site.

The nearest noise-sensitive receptor is single-family residence located southwest of the project site on Green Island Road. The nearest façade of the residence is located approximately 1,360 feet southwest of the nearest proposed parking areas. With the distance attenuation, noise levels associated with daily parking lot activities would attenuate to approximately 41 dBA L_{max} at this façade. Assuming a reasonable worst-case scenario of one parking movement for every parking stall within a single hour would result in an hourly average noise level of 24 dBA L_{eq} as measured at this nearest façade. If these noise levels were to occur every hour for a 24-hour period, they would result in a reasonable worst-case average noise level of 30 dBA L_{dn} as measured at this nearest receptor. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix G.

Therefore, the proposed project's reasonable worst-case parking lot noise levels would not cause ambient noise levels to exceed an exterior L_{dn} of 65 dBA as measured at the nearest receptor. Existing traffic noise levels along Green Island Road are shown in Table3.10-6 to be 62 dBA L_{dn}. Therefore, project parking lot activities would not result in a substantial permanent increase in ambient noise levels in the project vicinity. Because the proposed project would not generate a substantial permanent increase in ambient noise levels in noise-sensitive locations in the vicinity of the project, and would also not generate 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, the impact of noise produced by project-related parking lot activities to off-site sensitive receptors would be less than significant.

Mechanical Equipment Operations

At the time of preparation of this analysis, details were not available pertaining to the proposed rooftop mechanical ventilation systems for the project; therefore, a reference noise level for typical rooftop mechanical ventilation systems was used. Noise levels from commercially available rooftop mechanical ventilation equipment range from 50 dBA to 60 dBA L_{eq} at a distance of 25 feet.

The nearest noise-sensitive receptor is a single-family residence located southwest of the project site on Green Island Road. The nearest façade of the residence is located approximately 1,470 feet southwest of the nearest potential location for proposed rooftop mechanical ventilation equipment. At this distance, noise generated by typical rooftop mechanical ventilation equipment would attenuate to below 22 dBA L_{eq} at the nearest façade. If these noise levels were to occur every hour for a 24-hour period, they would result in a reasonable worst-case average noise level of 29 dBA L_{dn} as measured at this nearest receptor. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix G.

Therefore, the proposed project's reasonable worst-case mechanical ventilation equipment operations noise levels would not cause ambient noise levels to exceed an exterior L_{dn} of 65 dBA as measured at the nearest receptor. Existing traffic noise levels along Green Island Road are shown in Table 3.10-6 to be 62 dBA L_{dn}. Therefore, noise levels from proposed mechanical ventilation equipment operations would not result in a substantial permanent increase in ambient noise levels in the project vicinity. Because the project would not generate a substantial permanent increase in ambient noise levels in noise-sensitive locations in the vicinity of the project, and would also not generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, the impact of noise produced by proposed mechanical ventilation equipment operations to off-site sensitive receptors would be less than significant.

Truck Loading Activities

Noise would be also generated by truck loading and unloading activities at the loading docks along the western side of the proposed building and at the proposed surface level loading areas on the north and south sides of the building. Typical maximum noise levels from truck loading and unloading activity are 70 dBA L_{max} as measured at 50 feet. These maximum noise levels include noise from associated truck loading/unloading activity, including trucks maneuvering, truck trailer loading, truck trailer unloading, backup alarms or beepers, and truck docking noise.

The nearest noise-sensitive receptor is a single-family residence located south of the project site on Green Island Road. The nearest façade of the residence is located approximately 1,600 feet from the nearest loading docks. Assuming a reasonable worst-case scenario of one truck loading operation for every loading stall and every loading dock within a single hour would result in an hourly average noise level of 40 dBA L_{max} and 29 dBA L_{eq} as measured at the nearest façade of the residence. If these noise levels were to occur every hour for a 24-hour period, they would result in a reasonable worst-case average noise level of 35 dBA L_{dn} as measured at this nearest receptor. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix G.

Therefore, the proposed project's reasonable worst-case truck loading/unloading activity noise levels would not cause ambient noise levels to exceed an exterior L_{dn} of 65 dBA as measured at the nearest receptor. Existing traffic noise levels along Green Island Road are shown in Table3.10-6 to be 62 dBA L_{dn}. Therefore, project truck loading/unloading activities would not result in a substantial permanent increase in ambient noise levels in the project vicinity. Because the proposed project would not generate a substantial permanent increase in ambient noise levels in noise-sensitive locations in the vicinity of the project, and would also not generate 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, the impact of noise produced by project-related parking lot activities to off-site sensitive receptors would be less than significant.

Stationary Source Operational Noise Impact Conclusion

As shown in the analysis above, none of the project stationary operational noise sources would result in an increase of 3 dBA or greater above the City's performance threshold of 65 dBA L_{dn} for stationary noise sources as measured at the nearest sensitive receptor. Therefore, noise impacts from stationary operational noise sources would be less than significant.

Table 3.10-7 provides a summary of the stationary source operation noise impacts. The combined stationary source operational noise levels would not exceed the City's exterior L_{dn} threshold of 65 dBA as measured at the nearest receptor. Therefore, project stationary source operational noise levels would be less than significant.

Table 3.10-7: Stationary Operational Noise Impact Summary

Source (Reference Noise Levels)	Approximate Distance from Source to Nearest Sensitive Receptor (feet)	Operational Noise Level as Measured at the Project Boundary	City's Noise Performance Threshold	Exceed Threshold by 3 dBA or greater? (Yes/No)
Parking Lot Activities (70 dBA L_{max} at 50 feet)	1,360	30 dBA L_{dn}	65 dBA L_{dn}	No
Mechanical Ventilation Equipment (60 dBA L_{eq} at a distance of 25 feet)	1,470	29 dBA L_{dn}	65 dBA L_{dn}	No
Truck Loading and Unloading Activities (80 dBA L_{max} as measured at 50 feet)	1,600	35 dBA L_{dn}	65 dBA L_{dn}	No
Combined Noise Levels	NA	36.9 dBA L_{dn}	65 dBA L_{dn}	No

Notes:
dBA = A-weighted decibel
L_{max} = maximum noise/sound level
L_{dn} = day/night average sound level
Source: FirstCarbon Solutions (FCS) 2021.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Based on the above analysis, impacts from noise generated from stationary operational noise sources would be less than significant. However, project construction activity noise impacts, which could result in a temporary increase in ambient noise levels in the project vicinity that could result in annoyance or sleep disturbance of nearby sensitive receptors, would be reduced to less than significant levels with implementation of the following multi-part mitigation measure.

MM NOI-1 Implementation of the following multi-part mitigation measure is required to reduce potential construction period noise impacts:

- The construction contractor shall ensure that all equipment driven by internal combustion engines shall be equipped with mufflers that are in good condition and appropriate for the equipment.
- The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.
- The construction contractor shall utilize “quiet” models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, the construction contractor shall ensure that stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from adjacent residences.
- The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and noise-sensitive receptors nearest the project site.
- The construction contractor shall ensure that all on-site construction activities, including the operation of any tools or equipment used in construction, drilling, repair, alteration, grading, or demolition work, are limited to between the daytime hours of 7:00 a.m. to 7:00 p.m. Monday through Saturday. No construction shall be permitted on Sundays and federal holidays.

Level of Significance After Mitigation

Less than significant impact.

Groundborne Vibration/Noise Levels

Impact NOI-2: **The proposed project would not result in generation of excessive groundborne vibration or groundborne noise levels.**

Impact Analysis

This section analyzes both construction and operational groundborne vibration and noise impacts. Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. Groundborne noise is generated when vibrating building components radiate sound, or noise generated by groundborne vibration. In general, if groundborne vibration levels do not exceed levels considered perceptible, then groundborne noise levels would not be perceptible in most interior environments. Therefore, this analysis focuses on determining exceedances of groundborne vibration levels.

The City of American Canyon has not established quantitative groundborne vibration thresholds for construction or operation. Therefore, for purposes of this analysis, the FTA's vibration impact criteria are utilized to analyze vibration impacts. The FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment Manual.[10] The construction vibration impact criteria are summarized in Table 3.10-5.

Construction

A significant impact would occur if existing structures at the project site or in the project vicinity would be exposed to groundborne vibration levels in excess of levels established by the FTA's Construction Vibration Impact Criteria for the listed type of structure, as shown in Table 3.10-5.

Of the variety of equipment used during construction, the large vibratory rollers that could be used in the site preparation phase of construction would produce the greatest groundborne vibration levels. Large vibratory rollers produce groundborne vibration levels ranging up to 0.201 inch per second (in/sec) PPV at 25 feet from the operating equipment.

The nearest off-site receptors to the project construction footprint where the heaviest construction equipment would operate is the commercial building located south of the project site on Green Island Road. The façade of this structure would be located approximately 120 feet from the nearest point on the project site where the heaviest construction equipment would potentially operate. At this distance, groundborne vibration levels would range up to 0.008 PPV from operation of the types of equipment that would produce the highest vibration levels, which is well below the FTA's Construction Vibration Impact Criteria of 0.2 PPV for this type of structure, which is a building of non-engineered timber and masonry construction. Therefore, the impact of short-term groundborne vibration associated with construction to off-site receptors would be less than significant.

Operation

Implementation of the project would not include any permanent sources that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any existing sensitive land use in the project vicinity.

The Napa Branch Line railroad is located approximately 130 feet east of the nearest proposed façade of the project. At this distance potential groundborne vibration impacts would be less than significant for the proposed type of structure, based on FTA vibration screening criteria. There are no other existing significant permanent sources of groundborne vibration in the project vicinity to which the proposed project would be exposed. Therefore, project operational groundborne vibration level impacts would be considered less than significant.

[10] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

Level of Significance Before Mitigation

Less than significant impact.

Excessive Noise Levels from Airport Activity

Impact NOI-3:	**The proposed project would not expose people residing or working in the project area to excessive noise levels 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.**

Impact Analysis

A significant impact would occur if the proposed project would expose people residing or working in the project area to excessive noise levels for a project located in the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport. The City's Policy 11.4.1 restricts the development of uses located within the 65 CNEL contour of Napa Airport to industrial, agricultural, or other open space uses; and Policy 11.4.1 requires that development in the vicinity of Napa Airport comply with the noise standards contained in the ALUP.

The project site is not located within the vicinity of a private airstrip. However, the project is located within 2 miles of a public airport; the Napa County Airport is located approximately 1 mile north of the project site. According to the airport's noise exposure map and shown in Exhibit 3.10-2, the project site is located outside of the 55 dBA CNEL airport noise contours.[11] Therefore, while aircraft noise is occasionally audible on the project site from aircraft flyovers, aircraft noise associated with nearby airport activity would not expose people residing or working near the project site to excessive noise levels. These noise levels are considered normally acceptable for new industrial land use development within the City as shown in Exhibit 3.10-1. On this basis, implementation of the project would not expose persons residing or working in the project vicinity to noise levels from airport activity that would be in excess of normally acceptable standards for the proposed land use development, and no impact would occur.

Level of Significance Before Mitigation

Less than significant impact.

[11] Napa County Airport Master Plan. 2008. Noise Contours 2022. Website: https://www.countyofnapa.org/DocumentCenter/View/1981/Airport-Master-Plan-Environmental-Assessment-NEPA-PDF. Accessed June 30, 2021.

ZONE	LOCATION	IMPACT ELEMENTS	MAXIMUM DENSITIES (8)		
			Residential (1)	Other Structures (people/acre) (2)	
				In Structures	Total in and out of Structures
A (9)	Runway Protection Zone and Primary Surface	•High risk •High Noise Levels •Low overflights below 50' AGL	0	0	10
B	Inner Approach / Departure Zone	•Substantial risk •High Noise Levels •Low overflights below 100' AGL	0	10	25
C	Approach / Departure Zone	•Moderate risk •Substantial Noise •Low overflights below 300' AGL	0	50	75
D	Common Traffic Pattern	•Moderatel risk •Frequent Noise Intrusion •Low overflights below 1,000' AGL	0	100	150
E	Other Airport Environs	•Low risk •Overflight annoyance	See Note 7		

Zone	Prohibited Uses	Other Development Conditions[3]	Examples of Normally Acceptable ses[4]	Examples of Uses not Normally Acceptable[5]
A	• All residential uses • Any assemblage of people • Any new structure which exceeds height limits • Noise-sensitive uses • Uses hazardous to flight[10]	• Avigation easement required	• Pasture, open space • Aircraft tiedowns • Auto parking • Most agricultural uses	• Heavy poles, signs, large trees, etc. • Ponds
B	• All residential uses • Any noise-sensitive uses •Schools, libraries, hospitals, nursing homes, daycare centers • Uses hazardous to flight[10]	• Avigation easement required • Structures to be as far as possible from extended runway centerline • Clustering is encouraged to maximize open land areas • Minimum NLR of 25 dBA in office buildings[6] • Building envelopes and approach surfaces required on all subdivision maps and development plans	• All uses from Zone A • Parks with low-intensity uses, golf courses • Nurseries • Mini-storage	• Retail uses • Office uses (except as accessory uses) • Hotels, motels, resorts • Theaters, assembly halls, and conference centers • Ponds
C	• All residential uses • Schools, libraries, hospitals, nursing homes, daycare centers • Uses hazardous to flight[10] • Landfills	• Avigation easement required • Structures to be set back as far as possible from extended centerline • Clustering is encouraged to maximize open land areas • Building envelopes and approach surfaces required on all subdivision maps • NLR measures may be required for noise-sensitive uses (offices)[6]	• All uses from Zone B • Warehousing and low-intensity light industrial • Small retail uses • Outdoor recreation uses; marina, ballpark • Office uses	• Large retail buildings • Hotels, motels, resorts, health clubs • Restaurants, bars • Multi-story buildings • Theaters, assembly halls, and conference centers • Ponds
D	• All residential uses • Uses hazardous to flight[10]	• Overflight easement or deed notice required[11] • Building envelopes and approach surfaces required on all development plans within 100 feet of approach zones • Clustering is encouraged to maximize open land areas • NLR measures may be required for noise-sensitive uses[6]	• All uses from Zone C • Most nonresidential uses • Accessory daycare centers	• Schools, libraries, hospitals, nursing homes • Large shopping malls • Amphitheaters • Ponds
E	• Noise-sensitive outdoor uses	• Overflight easement or deed notice required[11]	• Any permitted use	• Amphitheaters • Landfills • Ponds

Source: The City of American Canyon General Plan.

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Exhibit 3.10-1
General Plan Noise Element

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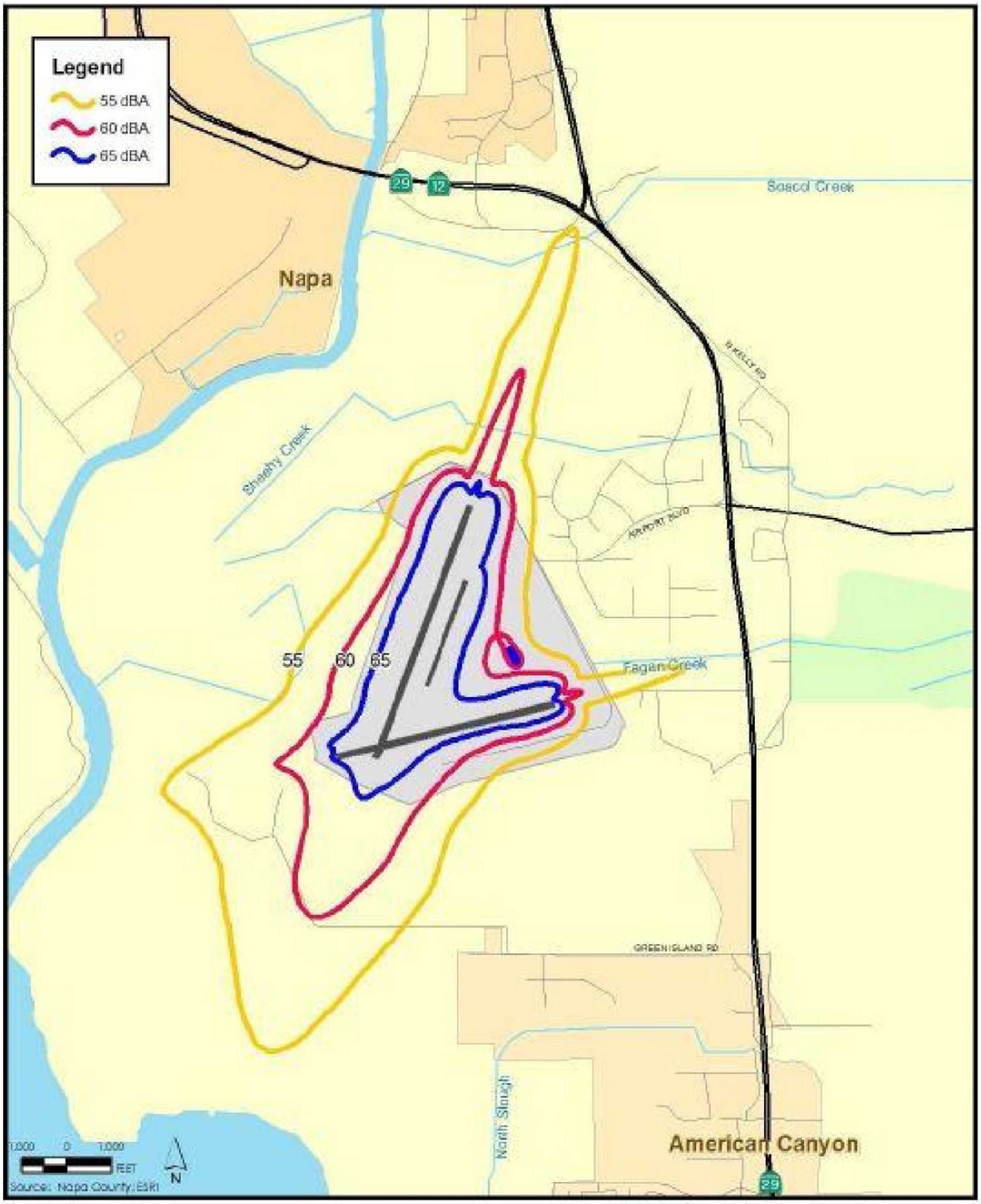

Source: Napa County, 2004. The City of American Canyon General Plan.

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Exhibit 3.10-2
Napa County Airport Noise Levels

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