

4.13. NOISE

This section includes the following discussion and analysis related to noise: existing environmental and regulatory setting; criteria and methodology for evaluating impacts; and the results of the impact assessment, including identification of potentially significant impacts and corresponding mitigation measures to avoid or substantially lessen such impacts to the extent feasible. The following discussion is based on technical input prepared for the PEIR by Illingworth & Rodkin, Inc. (I&R), Acoustics and Air Quality Consultants, in July 2025. The noise measurement data prepared by I&R is contained in Appendix D of this PEIR.

PEIR Scoping Comments

During the PEIR Scoping Process, the District received one letter containing a comment related to noise. The comment is quoted below.

Leadership Counsel for Justice and Accountability

“The EIR must evaluate the noise impacts of implementation of the VCIP will have on nearby residents and local wildlife species, considering the vicinity of the proposed area to neighboring communities. This analysis should encompass assessing existing ambient noise levels to establish a baseline for comparison with projected noise levels from the proposed developments. This should include the use of advanced noise propagation modeling techniques which allow for predicting how noise generated by construction and operational activities will propagate through the surrounding environment.

Furthermore, the analysis should consider cumulative noise impacts by examining the combined effects of noise from the proposed developments along with other existing and planned noise sources in the area, such as transportation infrastructure and industrial facilities. Additionally, temporal noise patterns should be analyzed to understand variations in noise levels throughout the day, week, and year, which can significantly impact community health, sleep patterns, and overall quality of life. By conducting a thorough examination of noise impacts and proposing appropriate mitigation measures such as noise barriers, sound insulation, and operational controls, the EIR can provide valuable insights into safeguarding the well-being of both communities and wildlife in the VCIP region.”

[Potential impacts associated with noise are addressed below in Section 4.13.3. *Environmental Impact Analysis* under Impacts NOI-1 through NOI-3. Potential noise impacts to wildlife species are addressed in Section 4.3. *Biological Resources*.]

4.13.1. Environmental Setting

4.13.1.1. INTRODUCTION

Background Information on Acoustics and Noise Measurement

Noise may be defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. The objectionable effects of noise can be attributed to either pitch or loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch.

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Loudness is the intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

Sound levels are usually measured and expressed in decibels (dB), a unit of measurement that indicates the relative amplitude of sound pressure. Zero on the decibel scale is based on the lowest sound level that a healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while an increase of 20 decibels results from 100 times the energy, and a 30 decibel increase results from an energy increase of 1,000 times. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness. Thus, noise at zero decibels is barely audible, while noise at 120 to 140 decibels is painful and may cause hearing damage.

Sound produced by a small, stationary noise source or a “point” source radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dBA for each doubling of the distance between the noise source and receptor. This decrease in noise level with distance, resulting from the geometric spreading of the energy over an ever-increasing area, is referred to as the inverse square law. Mobile sources of noise, such as traffic along a roadway, is characterized as a “line” source rather than a point since the noise moves with time. This results in cylindrical spreading rather than spherical spreading. Because the change in surface area of a cylinder only increases by two times for each doubling of the radius instead of the four times associated with spheres, the change in sound level is 3 dBA for each doubling of the distance between the noise source and receptor.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level or dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive.

Representative outdoor and indoor noise levels in units of dBA are shown in Table 4.13-1. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized, as described here. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq} . The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration. Similarly, noise levels exceeded during 10 percent of the time are expressed as L_{10} , with noise levels exceeded 50 percent of the time expressed as L_{50} . Maximum noise levels during a given measurement period are expressed as L_{max} , while minimum noise levels are expressed as L_{min} . Additional metrics are described in Table 4.13-2.

Noise measurement equipment includes an electrical filter to reflect the fact that human hearing is less sensitive to low and very high frequencies than sound frequencies in the mid-range. The sound levels measured in this manner produce the A-weighted sound levels that are typically expressed as dBA. Unless otherwise noted, all noise levels indicated in this section are A-weighted (dBA).

Since the sensitivity to noise increases during the evening and at night (because excessive noise interferes with the ability to sleep), 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level (CNEL)* is a measure of the cumulative noise exposure in a community, with a 5 dBA penalty added to evening (7:00 PM to 10:00 PM) noise levels and a 10 dBA penalty added to nighttime (10:00 PM to 7:00 AM) noise levels. The *Day/Night Average Sound Level (L_{dn})* is

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essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise on People

There is no universally accepted way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way the new noise compares to the existing noise levels to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans 2013):

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a barely perceivable difference when the change in noise is perceived but does not cause a human response (such as annoyance or nuisance);
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response (such as hearing damage or psychological effects).

These relationships occur in part because of the logarithmic nature of sound and the decibel system. For example, a ruler is a linear scale: it has marks on it corresponding to equal quantities of distance. One way of expressing this is to say that the ratio of successive intervals is equal to one. A logarithmic scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1, 10, 100, 1,000, 10,000, etc., doubling the variable plotted on the x-axis. The human ear perceives sound in a non-linear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather they combine logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Vibration

Vibration is an oscillatory motion through a solid medium, in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, groundborne vibration generated by heavy equipment or traffic on rough roads attenuates rapidly with distance from the source of the vibration so that potential impact areas are usually confined within short distances (e.g., 200 feet or less) from the source (USDOT 2018).

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**TABLE 4.13-1
TYPICAL NOISE LEVELS IN THE ENVIRONMENT**

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Impact Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	
	10 dBA	Threshold of human hearing
	0 dBA	

Source: Illingworth & Rodkin, Inc.

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TABLE 4.13-2
DEFINITIONS OF ACOUSTICAL TERMS

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Illingworth & Rodkin, Inc.

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4.13.1.2. EXISTING NOISE ENVIRONMENT

The existing noise environment in the Plan Area is typical of rural agricultural environments. The primary noise sources in the area include: 1) vehicle traffic; 2) agricultural equipment and crop dusters; and 3) occasional overflights by military aircraft from Naval Air Station Lemoore (NASL).

In October 2024, Illingworth & Rodkin completed a noise monitoring survey to document existing noise levels at key locations within and around the Plan Area. The noise measurement locations are shown in Figure 4.13-1. Noise measurement locations were selected to represent “noise-sensitive receptors” such as residences, transient lodging, schools, libraries, churches, hospitals, and convalescent homes within the Plan Area. There are numerous rural dwellings and two elementary schools within the Plan Area. The community of Cantua Creek, near the center of the Plan Area, includes approximately 100 residences and the Cantua Elementary School, and represents the greatest concentration of sensitive receptors within the Plan Area.

Long-term (24-hour) and short-term (10-minute) noise measurements were made with Larson Davis Model LxT1 Integrating Sound Level Meters (SLMs) set at “slow” response. The sound level meters were equipped with PCB Model 377B02 1/2” free-field, prepolarized condenser microphones fitted with windscreens. The SLMs were calibrated prior to the noise measurements using a Larson Davis Model CAL200 or Model CA250 acoustical calibrator. At the completion of monitoring, the noise data were obtained from the SLMs using the Larson Davis G4 software program. All instrumentation used during the noise survey met the requirements of the American National Standards Institute SI 4-1983 for Type I use.

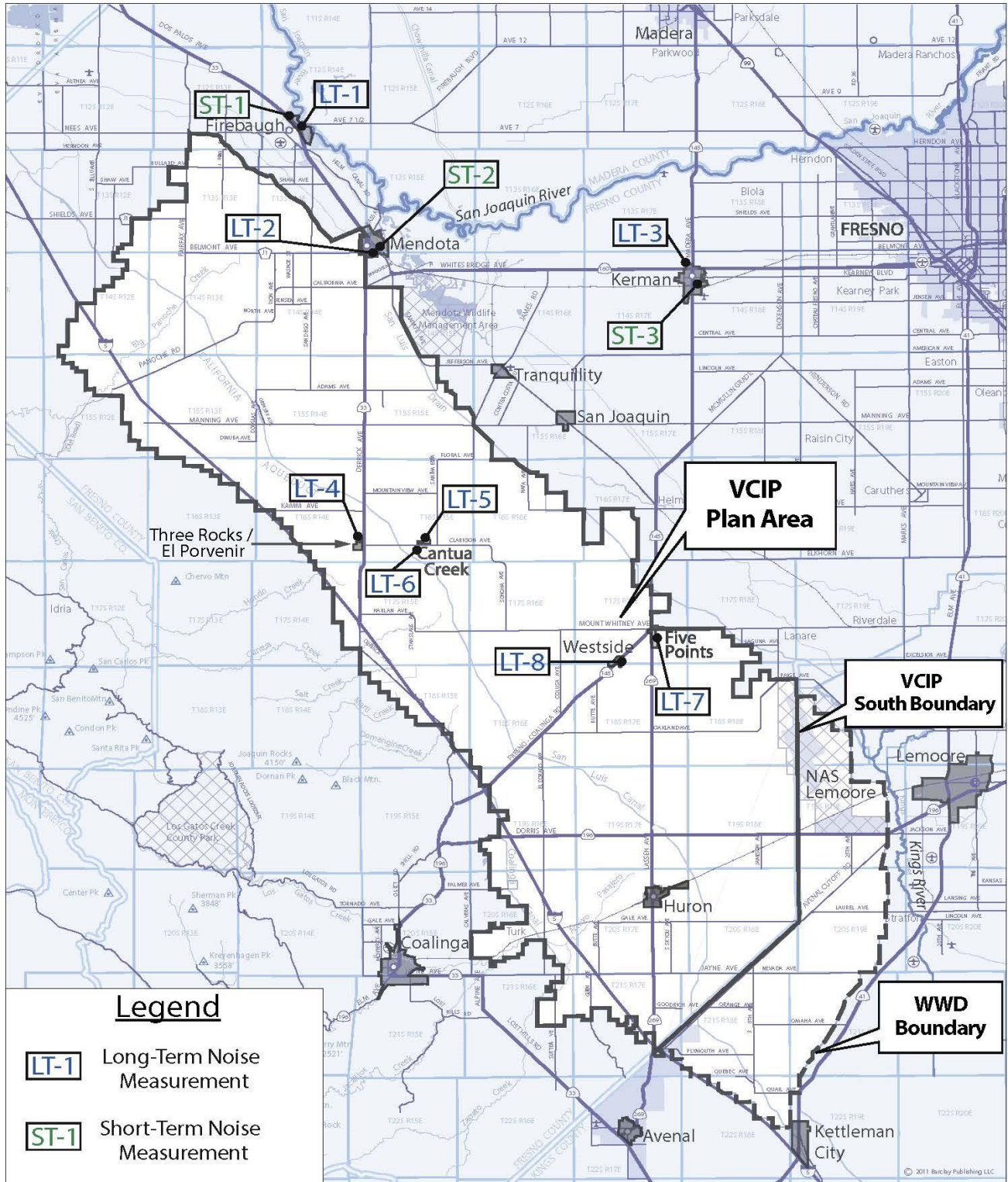
Weather conditions were observed during the long-term and short-term noise measurements. Conditions ranged from mostly cloudy to mostly sunny skies with calm to moderate winds (0 to 8 mph). Temperatures generally ranged between 66°F to 96°F. Weather conditions which have the potential to influence noise measurements, such as rain or high winds, did not occur during the noise survey.

Long-term noise measurements were conducted at eight locations in the communities of Firebaugh (LT-1), Mendota (LT-2), Kerman (LT-3), Three Rocks (LT-4), Cantua Creek (LT-5 and LT-6), Five Points (LT-7) and Westside (LT-8). The ambient (background) noise levels were recorded at locations near existing roadways traversing the area and are expected to be representative of the existing ambient noise levels at the nearest sensitive receptors to the transportation corridors. The ambient noise levels measured in the interior of the Cantua Creek community at LT-5 are expected to be representative of the existing ambient noise levels at sensitive receptors located some distance from Clarkson and San Mateo Avenues.

Table 4.13-3 summarizes the day-night average and hourly average noise levels measured at the long-term sites during the noise survey. Graphs depicting the noise data collected at each long-term site are contained in Appendix D of this PEIR.

Short-term measurements were conducted at three locations in the communities of Firebaugh (ST-1), Mendota (ST-2), and Kerman (ST-3). Table 4.13-4 summarizes the day-night average and hourly average noise levels measured at the short-term sites during the noise survey. Graphs depicting the noise data collected at each short-term site are contained in Appendix D of this PEIR.

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Source: Illingworth & Rodkin

Noise Measurement Locations
 Figure 4.13-1

TABLE 4.13-3
SUMMARY OF LONG-TERM NOISE MEASUREMENT DATA

Noise Measurement Site	Day-Night Average Noise Level (L _{dn})	Hourly Avg. Noise Level Range (L _{eq})	
		Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
LT-1 - Firebaugh - 45 feet from the Centerline of 13th Street at Q Street	74	64-74	60-72
LT-2 - Mendota - 75 feet from the Centerline of Belmont Avenue at 9th Street	66	58-67	50-64
LT-3 - Kerman - 100 feet from the Centerline of Whitesbridge Avenue at S. Del Norte Avenue	70	65-69	57-68
LT-4 - Three Rocks - 50 feet from the Centerline of S. Derrick Avenue at El Progreso Avenue	73	62-72	59-71
LT-5 - Cantua Creek - 25 feet from the Centerline of W. Latta Avenue	59	43-70	32-48
LT-6 - Cantua Creek - 40 feet from the Centerline of Clarkson Avenue	65	56-70	40-68
LT-7 - Five Points - 35 feet from the Centerline of Lassen Avenue	76	67-75	61-74
LT-8 - Westside - 100 feet from the Centerline of Fresno Coalinga Road	73	63-70	58-71

Source: Illingworth & Rodkin, Inc.

TABLE 4.13-4
SUMMARY OF SHORT-TERM NOISE MEASUREMENT DATA

Noise Measurement Site	Estimated Day-Night Average Noise Level (L _{dn})	Maximum Instantaneous Noise Level (L _{max})	Median Noise Level (L ₅₀)	Background Noise Level (L ₉₀)	Average Noise Level (L _{eq})
ST-1 - Firebaugh - 60 feet from the Centerline of Highway 33 at Yip Street (10/10/24, 2:50-3:00 p.m.)	67	81	58	44	66
ST-2 - Mendota - 80 feet from the Centerline of 11 th Street at Oller Street (10/10/24, 1:05-1:15 p.m.)	66	78	59	50	64
ST-3 - Kerman - 65 feet from the Centerline of S. Madera Avenue (10/10/24, 4:25-4:35 p.m.)	69	82	56	46	68

Source: Illingworth & Rodkin, Inc.

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4.13.2. Regulatory Context

Fresno County

Fresno County General Plan

The Fresno County (County) General Plan contains the following goals and policies related to noise and vibration which are relevant to the VCIP.

Health and Safety Element

H. Noise

GOAL HS-H To protect residential and other noise-sensitive uses from exposure to harmful or annoying noise levels; to identify maximum acceptable noise levels compatible with various land use designations; and to develop a policy framework necessary to achieve and maintain a healthful noise environment.

Policy HS-H.1 **Minimize Noise Impacts**

The County shall require that all proposed development incorporate design elements necessary to minimize adverse noise impacts on surrounding land uses.

Policy HS-H.4 **Noise Mitigation Design and Acoustical Analysis**

So that noise mitigation may be considered in the design of new projects, the County shall require an acoustical analysis as part of the environmental review process where:

- a. Noise sensitive land uses are proposed in areas exposed to existing or projected noise levels that are “generally unacceptable” or higher according to the Figure HS-9: “Land Use Compatibility for Community Noise Environments;”
- b. Proposed projects are likely to produce noise levels exceeding the levels shown in the County’s Noise Control Ordinance at existing or planned noise-sensitive uses.

Policy HS-H.5 **Noise Mitigation Measures**

Where noise mitigation measures are required to achieve acceptable levels according to land use compatibility or the Noise Control Ordinance, the County shall place emphasis of such measures upon site planning and project design. These measures may include, but are not limited to, building orientation, setbacks, earthen berms, and building construction practices. The County shall consider the use of noise barriers, such as soundwalls, as a means of achieving the noise standards after other design-related noise mitigation measures have been evaluated or integrated into the project.

Policy HS-H.6 **Construction-related Noise**

The County shall regulate construction-related noise to reduce impacts on adjacent uses in accordance with the County's Noise Control Ordinance.

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Policy HS-H.7

Noise impacts to Sensitive Uses

Where existing noise-sensitive uses may be exposed to increased noise levels due to roadway improvement projects, the County shall apply the following criteria to determine the significance of the impact:

- a. Where existing noise levels are less than 60 dB Ldn at outdoor activity areas of noise-sensitive uses, a 5 dB Ldn increase in noise levels will be considered significant;
- b. Where existing noise levels are between 60 and 65 dB Ldn at outdoor activity areas of noise-sensitive uses, a 3 dB Ldn increase in noise levels will be considered significant; and
- c. Where existing noise levels are greater than 65 dB Ldn at outdoor activity areas of noise-sensitive uses, a 1.5 dB Ldn increase in noise levels will be considered significant.

Policy HS-H.10

Construction Vibration Control Measures

The following measures to minimize exposure to construction vibration shall be included as standard conditions of approval for projects involving construction vibration within 50 feet of historic buildings or nearby sensitive receivers shall:

- a. Avoid the use of vibratory rollers within 50 feet of historic buildings or residential buildings with plastered walls that are susceptible to damage from vibration and;
- b. Schedule construction activities with the highest potential to produce vibration to hours with the least potential to affect nearby institutional, educational, and office uses that are identified as sensitive to daytime vibration by the Federal Transit Administration in Noise and Vibration Impact Assessment (FTA 2018).

Fresno County Ordinance Code (Ordinance Code)

Chapter 8.40 of the Ordinance Code sets forth requirements and procedures for noise abatement in the County (the Noise Ordinance). Section 8.40.040 (Exterior Noise Standards) provides:

- A. "It is unlawful for any person, including an owner, whether through the owner or the owner's agent, lessee, sublessor, sublessee or occupant, at any location within the unincorporated area of the county, to create any noise, or to allow the creation of any noise, on property owned, leased, occupied or otherwise controlled by such person which causes the exterior noise level when measured at any affected single- or multiple-family residence, school, hospital, church or public library situation in either the incorporated or unincorporated area to exceed the noise level standards as set forth in the following table:

Category	Cumulative Number of minutes in any one-hour time period	Noise Level Standards, dBA	
		Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

- B. In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal the ambient noise level.

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- C. Each of the noise level standards specified above shall be reduced by five dB(A) for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.
- D. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the noise level standards.”

In addition to the exterior noise standards, Ordinance Code section 8.40.090 (Electrical substations), identifies a noise level limit of 50 dBA for electrical substations when measured 50 feet from an affected residence.

Section 8.40.060 (Noise source exemptions) contains various noise source exemptions from the Noise Ordinance. Section 8.40.060(B) exempts noise from any mechanical device, apparatus or equipment used, related to or connected with emergency activities or emergency work. Section 8.40.060(C) exempts noise sources associated with construction activities from the standards provided they take place after 6:00 a.m. and before 9:00 p.m. on Monday through Friday, or after 7:00 a.m. and before 5:00 p.m. on weekends. Section 8.40.060(G) provides that noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities are exempt from the Noise Ordinance.

4.13.3. Environmental Impact Analysis

METHODOLOGY

The evaluation of potential noise and vibration impacts resulting from the VCIP implementation is based on technical input prepared for this PEIR by Illingworth & Rodkin, Inc., Acoustics and Air Quality Consultants, in June 2025. To establish baseline conditions, noise measurements were taken at several sensitive receptor locations throughout the Plan Area in October 2024. Graphs displaying the noise measurement data are contained in Appendix D of this PEIR. Projections of construction noise from potential VCIP projects were based on established noise emission levels for various pieces of equipment anticipated to be used during construction. Traffic noise generated by VCIP projects was calculated based on data contained in the traffic report prepared for this PEIR by Peters Engineering Group in January 2025. (The Traffic Report is contained in Appendix E of this PEIR). Resulting noise levels were calculated for each receptor site and compared to Fresno County’s noise criteria and standards to determine potential noise impacts and identify corresponding mitigation measures to avoid or substantially lessen such impacts to the extent feasible.

SIGNIFICANCE CRITERIA

Based on Appendix G of the state CEQA Guidelines, implementation of the VCIP would be considered to result in a significant impact related to noise or vibration if it would result in:

- a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- b. Generation of excessive groundborne vibration or groundborne noise levels.

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- 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, the project would expose people residing or working in the project area to excessive noise levels.

4.13.3.1. DIRECT AND INDIRECT EFFECTS

Impact NOI-1. Substantial Increase in Ambient Noise Levels

Implementation of the VCIP Energy Resource and Infrastructure Plans could result in substantial temporary or permanent increase in ambient noise levels in excess of applicable noise standards; however, noise levels would be reduced to less-than-significant through specified noise mitigation measures to be applied at the project-specific level. (*Less-than-Significant Impact with Mitigation*)

Noise would be generated during the construction, operation, and decommissioning phases of VCIP projects. The potential for temporary and permanent noise sources from VCIP projects to exceed applicable noise standards is discussed below.

Construction Phase

On-Site Construction Noise

Projects within the VCIP would be built out over a large geographic area during an approximately 10-year period. As the Plan Area is sparsely populated, much of the construction activity would occur in areas where construction noise levels would be sufficiently attenuated by distance alone. The steady rate of construction at any location within the project site would also minimize the overall noise exposure at any noise-sensitive receptor site.¹

The construction noise assessment for the VCIP focuses on the community of Cantua Creek, which has the greatest concentration of sensitive receptors near the large areas proposed for solar facility development in the Plan Area. Figure 4.13-2 on the next page shows the VCIP project areas near sensitive receptors in the Cantua Creek community, including residential areas and Cantua Elementary School. For purposes of this analysis, the LT-5 noise measurement location was identified as the location of the Maximally Exposed Individual (MEI), which would be representative of receptors having the lowest ambient noise levels that would be exposed to the highest construction noise levels over the longest period of time. It is estimated that approximately 1,700 acres of VCIP lands would be subject to potential development within three miles of this community. The noise assessment assumed that construction of the solar and battery energy storage system (BESS) facilities on these lands would be completed in approximately 12 months, which is typical for this amount of solar and BESS development. Therefore, construction activities occurring in the immediate vicinity of individual noise-sensitive land uses, where the receptors would be subject to the highest noise levels, would be temporary.

The construction noise levels at individual receptors in Cantua Creek and elsewhere within the Plan Area would depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-

¹ Under standard practices that would be followed during implementation of the proposed VCIP, construction of solar facilities progresses quickly through the solar field, such that any given location within the project site is only subject to construction activity for a month or two in total.

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generating activities, and the distance between construction noise sources and noise-sensitive receptors. Construction would be completed in several phases, including site preparation, installation of solar arrays, installation of inverters, transformers, and substations, and installation of the BESS. Construction noise levels produced by heavy-duty diesel equipment such as loaders, graders, and diesel-fueled haul trucks would be highest during site grading, excavation, and installation of solar equipment. Hourly average noise levels generated by construction equipment are calculated to range from 85 dBA L_{eq} to 87 dBA L_{eq} measured at a distance of 50 feet (the approximate distance of the MEI), conservatively assuming that all equipment is operating simultaneously.

During the vast majority of construction, however, noise levels at the nearest receptors would be much lower. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor, and noise levels decrease as construction moves away from sensitive receptors. Assuming that all equipment is operating simultaneously, at 500 feet, maximum construction noise levels would range from 65 to 67 dBA L_{eq} , and at 5,000 feet, maximum construction noise levels would range from 45 to 47 dBA L_{eq} . Beyond approximately 1,100 feet, construction noise levels would be reduced to 60 dBA L_{eq} or less, which would have little effect on speech communication outdoors or typical indoor activities such as reading or watching television.

FIGURE 4.13-2
CANTUA CREEK COMMUNITY, CONSTRUCTION AREAS AND SENSITIVE RECEPTORS



Source: Illingworth & Rodkin, Inc.

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VCIP implementation would also include construction of the five collection substations, which would generate noise levels similar to those noted for solar and BESS construction. At the planned locations of the substations, the nearest residential receptors would be at least 0.5 miles from a substation site. At this distance, noise generated by substation construction would be 51 to 53 dBA L_{eq} .

VCIP implementation would also involve construction of gen-tie lines and connecting transmission lines. The noisiest construction activity would occur during site preparation of tower sites and staging areas, when most construction equipment would be used. This equipment typically includes dozers, graders, compactors, auger drill rigs, and trucks, which produce maximum noise levels ranging from 80 to 85 dBA at 50 feet. Helicopter construction would be used for stringing pilot wires for conductors. The operation of a helicopter for construction would generate maximum noise levels of approximately 80 dBA at 200 feet (USBLM 2016, p. 3.23-11).

At the planned route of the connection transmission corridor, the nearest sensitive land uses would generally be located at least 0.5 miles away, except for one land use (the UC Westside Research and Extension Center - WSREC) where the nearest residences would be 650 feet from the transmission corridor. Assuming that the nearest tower would be planned directly opposite the affected residences, the highest noise levels at the nearest receptor locations would be 55 to 60 dBA L_{eq} from general construction and 67 dBA L_{eq} from helicopter construction. At receptors located 0.5 miles away, construction noise levels would be 44 to 49 dBA L_{eq} from general construction and 56 dBA L_{eq} from helicopter construction. The general sequence of activities for construction of the connecting transmission lines would involve the following steps: clearing of right-of-way and staging areas; installation of tower footings and structures; and conductor stringing. These construction activities would proceed in a stepwise fashion from one end of the corridor to the other. The duration of construction at any given tower location would be very brief (several days at most).

Due to the conceptual nature of the VCIP, the potential gen-tie line routes cannot presently be determined, and would be established at the project level in conjunction with the proposed development of individual solar and BESS projects. However, gen-tie construction would proceed in the same manner as described for connecting transmission lines above. It is assumed that gen-tie routes would be planned to avoid sensitive receptors to the extent practicable, like the connecting transmission corridors. As such, noise levels associated with gen-tie construction would be similar to those for connecting transmission lines discussed above.

The noise levels resulting from construction of proposed VCIP projects would be intermittent and temporary in duration. The locations affected would vary throughout the area as the focus of construction moves along. The Ordinance Code exempts noise sources associated with construction activities, provided the noise occurs between 6:00 a.m. and 9:00 p.m. Monday through Friday, or between 7:00 a.m. and 5:00 p.m. on weekends. The Ordinance Code further provides that noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities are also exempt from quantitative noise limits. This analysis assumes that construction of the VCIP energy and infrastructure projects would only occur during allowable daytime hours, which avoids common sleeping hours when the noise disturbance would be most harmful and annoying. It is also anticipated that the construction timelines of potential VCIP projects would ensure that construction occurring in close proximity of receptors would not generally extend over long periods of time (i.e., up to a month or two in total). Construction activities occurring beyond approximately 1,100 feet of a particular receptor would be reduced to 60 dBA L_{eq} or less, which would have little effect on speech communication outdoors or typical indoor activities such as reading or watching television. Most reasonable persons can tolerate a temporary increase in daytime noise levels recognizing that the construction

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timeline is finite. Therefore, project construction activities would not result in a substantial temporary increase in ambient noise levels in excess of the standards established in the local general plan or noise ordinance, or applicable standards of other agencies, and the impact would be *less than significant*.

Off-Site Construction Traffic Noise

The VCIP buildout is planned to be phased over a 10-year period, with substantial construction scheduled to commence in 2029. During peak construction years there would be approximately 6,000 construction workers and supervisors commuting to the site. Construction deliveries would primarily arrive from the Port of Oakland for solar components, with other materials and equipment originating from various California ports, as well as Fresno and Sacramento. Aggregate and concrete is expected to be delivered from the Los Banos area or the Coalinga Area, whichever is nearest to a given VCIP project within the Plan Area.

The analysis of construction traffic noise was based on existing Average Daily Traffic (ADT) volumes on the affected roadway segments. These counted volumes were incrementally increased by one percent per year to establish baseline traffic conditions for each construction year.² The estimated worker commute volumes and truck deliveries generated during project construction were added to the baseline volumes to determine traffic conditions with project construction traffic added. Note that the traffic study (Appendix E of this PEIR) focused on the early peak construction years of 2029, 2031, and 2033 when the most intense construction activity would occur around VCIP collection Substations 1, 3, and 5, as VCIP development progresses from north to south in the Plan Area. The traffic study did not focus on traffic conditions in 2030 and 2032, since the conditions would not vary greatly from the prior and following years. Thus, the three study years are considered representative of highest traffic volumes that could reasonably foreseeably occur in the northern, central, and southern sections of the Plan Area. In the subsequent construction years of 2034-2038, VCIP project development would be more evenly distributed throughout the Plan Area since all the collection substations and connecting transmission lines would be complete and able to accommodate solar and BESS projects anywhere in the Plan Area. This more dispersed development pattern would result in much lower traffic volumes on any given road and highway providing construction access to the various VCIP projects under development in the latter buildout years. For example, in the first year of VCIP development, all construction worker traffic would be focused on the area around the Newpoint Substation (Substation No. 1) at the northern end of the Plan Area, since no infrastructure would have been completed to support solar development in other areas of the Plan Area. As such, construction traffic in the first year, and associated traffic noise, would be concentrated on a few highways connecting the first-year development area with the main population center in Fresno. In the latter development years, all five VCIP substations would be complete and operating, thus facilitating VCIP development throughout the remaining areas of the Plan Area. The construction workers would still largely originate from the Fresno area, but instead of all heading to the north end of the Plan Area, they would fan out southwestward and utilize many traffic routes to arrive at work sites spread over 50 miles between the Newpoint Substation and Substation No. 5. As such traffic conditions on any given roadway in those latter buildout years would not approximate the peak traffic volumes anticipated in the early development years. Therefore, it was not necessary to evaluate the Plan-wide traffic or related noise impacts for those latter years. (For detailed discussion and analysis, see Section 4.16. *Transportation*, under Impact TR-1.)

² Based on population growth projections for Fresno County. The following annual average growth rates are forecast through 2050: Fresno County – 1.1%; cities in western Fresno County – 0.6-1.0%; unincorporated Fresno County – 0.4% (Fresno County 2023b, p.2-9). Based on these forecasts, the growth rate for the Plan Area and vicinity would be less than 1 percent, so the applied growth rate is conservative.
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County of Fresno General Plan Policy HS-H.7 states that where existing noise-sensitive uses may be exposed to increased noise levels due to roadway improvement projects, the project would result in a significant noise impact if: a) the noise level increase is 5 dBA L_{dn} or greater, where the pre-project noise level is less than 60 dBA L_{dn} ; or b) the noise level increase is 3 dBA L_{dn} or greater, where the pre-project noise level between 60 and 65 dBA L_{dn} ; or c) the noise level increase is 1.5 dBA L_{dn} or greater, where the pre-project noise level is 65 dBA L_{dn} or greater (Fresno County 2024b). Although Policy HS-H.7 only applies where existing noise-sensitive uses may be exposed to increased noise levels due to roadway improvement projects, the County General Plan and Ordinance Code do not contain quantitative significance criteria regarding noise-related impacts from other types of construction projects. Therefore, for purposes of this analysis, the standards contained in Policy HS-H.7 are applied as noise criteria for evaluating all VCIP traffic noise sources.

Table 4.13-5 on the following page summarizes the results of the traffic noise level calculations for the anticipated peak traffic noise years of 2029, 2031, and 2033. The noise level calculations were based on projected construction traffic volumes without considering traffic mitigations which would be required to reduce traffic Level of Service impacts. As shown in the table, the receptors that would be most affected by VCIP project construction traffic in 2029 would be those along 13th Street in Firebaugh and Belmont Avenue in Mendota (shown in red in the table). This is because construction activity would be focused solely on the northern portion of the Plan Area around Substation 1 (Newpoint), and because of a limited number of access routes from the main source of workers in the Fresno area. Project construction traffic would increase daily average noise levels at those two locations by 1.6 to 2.1 dBA L_{dn} where the pre-project noise levels are 65 dBA L_{dn} or greater. The construction traffic noise increase along these roadway segments would exceed the 1.5 dBA L_{dn} noise level threshold used to assess the significance of noise impacts where pre-project noise levels are 65 dBA L_{dn} or greater, resulting in a significant temporary impact under the applied noise criteria.

Construction noise level increases along the remaining roadway segments in 2029 would be less than 1 dBA L_{dn} and below the thresholds used to assess the significance of noise impacts due to roadway improvement projects. As noted above, the noise levels shown in Table 4.13-5 reflect unmitigated traffic conditions and do not take into account mitigation measures that would be required to reduce traffic volumes. However, due to capacity constraints on the highways and roads providing access to the anticipated VCIP construction sites, it will be necessary for the VCIP projects to provide substantial reductions in traffic volumes, as specified in Mitigation Measure TR-1, such as shuttle bus service, to avoid congestion during peak commute periods. (For detail see section 4.16. *Transportation*, under Impact TR-1.) While these mitigated traffic conditions are not reflected in the noise levels shown in Table 4.13-5, it is anticipated that with implementation of MM TR-1, overall construction volumes would be approximately 20 percent lower than estimated, with correspondingly lower traffic noise. Therefore, the noise levels projected in Table 4.13-5 are conservative and would likely be higher than actual noise conditions under the buildout of the VCIP.

By 2031 when the focus of proposed VCIP development would be in the central portion of the Plan Area, receptors along San Mateo Avenue in the community of Cantua Creek would be most affected by project construction traffic. Project construction traffic would increase daily average noise levels by 7.5 dBA L_{dn} where the pre-project noise levels are between 60 and 65 dBA L_{dn} . The construction traffic noise increase along this roadway segment would exceed the 3 dBA L_{dn} noise level threshold used to assess the significance of noise impacts where pre-project noise levels are 60 to 65 dBA L_{dn} , resulting in a significant temporary impact under the applied noise criteria. Construction noise level increases along the remaining roadway segments would be less than 1 dBA L_{dn} and below the thresholds used to assess the significance of noise impacts due to roadway improvement projects.

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TABLE 4.13-5
DAILY AVERAGE CONSTRUCTION TRAFFIC NOISE LEVELS AT 50 FEET FROM THE
ROADWAY CENTERLINE

Roadway/ Community	Location	Existing	2029	2031	2033
13th Street Firebaugh	East of N Street (SR 33)	73.5	75.6*	73.8	73.9
Oller Street (SR 180) Mendota	North of Belmont Avenue	68.1	69.1	68.4	68.5
Belmont Avenue Mendota	West of Oller Street (SR 180)	67.9	69.5*	68.2	68.2
Derrick Avenue (SR 33) Three Rocks	North of Clarkson Avenue	72.7	72.9	73.4	73.0
Derrick Avenue (SR 33) Three Rocks	South of Clarkson Avenue	72.7	72.9	73.4	73.0
Clarkson Avenue Three Rocks	West of San Mateo Avenue and east of Cantua School	64.2	64.4	66.9	64.6
Clarkson Avenue Cantua Creek	East of Santa Clara Avenue and west of Cantua School	64.2	64.4	66.9	64.6
San Mateo Avenue Cantua Creek	North of Clarkson Avenue	60.4	60.7	67.9*	60.8
Mt. Whitney Avenue Five Points	East of Lassen Avenue (SR 269 and 145)	74.2	74.4	74.5	75.4
Fresno-Coalinga Road (SR 145) Five Points	South of Mt. Whitney Avenue	75.8	76.0	76.4	76.3
Whitesbridge Rd (SR 180) Kerman	West of Madera Ave (SR 145)	73.1	74.0	73.4	73.5
Madera Ave (SR 145) Kerman	South of Whitesbridge Rd (SR 180)	71.2	71.5	71.8	71.6

* Red font indicates locations where the noise criteria would be exceeded.

Source: Illingworth & Rodkin, Inc.

In 2033 when the focus of VCIP development would be in the southern portion of the Plan Area, all receptor locations would be subject to noise level increases that do not exceed the applied noise criteria. .

In the intervening years of 2030 and 2032, traffic and noise conditions would be similar to those estimated for 2029, 2031, and 2033, and therefore there is a potential that the same receptors that would be subject to noise level increases in the study years would also be subject to noise impacts in the intervening years. However, there is little or no potential for additional receptors to be subject to noise impacts during the

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intervening years. During the subsequent construction years of 2034-2038, no receptors are anticipated to be subject to noise levels that exceed the applied noise criteria, for the reasons discussed above.

In summary, the construction traffic generated by the VCIP projects would result in substantial temporary noise level increases at receptors along 13th Street in Firebaugh and along Belmont Avenue in Mendota in 2029, and at receptors along San Mateo Avenue in the community of Cantua Creek in 2031. As noted, the noise level estimates are based on peak traffic conditions without mitigation for traffic or noise impacts. Therefore, the noise impacts identified above would be potentially significant but would be reduced to *less-than-significant with mitigation*.

As noted above, Fresno County has not established noise limit standards for construction traffic noise, apart from those associated with transportation improvement projects, and noise from construction activity is exempt from the County's noise limits provided the work is performed within specified daytime hours. Nevertheless, the County's roadway construction noise standards are applied as noise criteria in the above analysis, and they serve as significance thresholds for general construction traffic noise associated with VCIP implementation for purposes of this PEIR.

In summary, although the traffic noise increases during construction would be temporary and relatively brief at any receptor location, significant noise impacts would occur at certain locations. Therefore, the traffic noise impact due to the VCIP project construction would be potentially significant but would be reduced to *less than significant with mitigation*.

Operational Phase

During the operational phase of the VCIP projects, the two main sources of noise would be from on-site operational activities and from off-site traffic generation by operations staff, each of which is discussed in turn below.

On-Site Noise Sources

The operational noise sources at VCIP energy and infrastructure facilities would primarily include photovoltaic (PV) modules and trackers, power conversion stations (PCSs), and BESS, as well as project substations and VCIP collection substations.

PV modules and trackers produce low noise levels during brief periods of time as the individual slew drive trackers rotate the panels following the path of the sun. The noise level produced by these individual sources is about 52 dBA at 5 feet over a 10-second or less rotation period during daytime hours.

A typical utility-scale solar facility (250 MW) would include a total of about 62 PCS (i.e., inverter/transformer units at 1 unit per 4 MW of output). The predicted noise level attributable to each PCS is 52 dBA L_{eq}/L_{50} measured at a distance of 50 feet from the equipment. Noise generated by an individual PCS would decrease to 50 dBA L_{eq}/L_{50} at a distance of 60 feet. Due to the substantial distance separating each PCS in the solar field (700-850 feet), the operation of multiple PCS would not result in an additive noise effect at a given receiver location.

A typical 250-MW utility-scale solar facility would also include a battery energy storage system (BESS) with approximately 250 storage battery units, each enclosed within 40-foot-long cargo containers. Each battery storage unit would be self-contained and would include racks, switchboards, inverters, and integrated HVAC {AM0006.1}

units. The battery units would be served by transformers located on separate pads outside the containers, with each transformer serving four battery containers. Thus, the typical BESS would consist of 250 battery containers and 63 transformers. The primary BESS noise source would be the electrically powered HVAC units on each container, which would typically produce noise levels of 68 dBA L_{eq}/L_{50} at a distance of 50 feet during full operation. The noise level would decrease to 50 dBA L_{eq}/L_{50} at a distance of 400 feet. However, commonly used BESS (e.g., Tesla Megapack) are water-cooled and generate substantially less noise as observed by Illingworth & Rodkin, Inc. at the Castanea Solar Facility in Kings County in October 2024. Based on the results of the observation and noise measurements, noise levels produced by a typical water-cooled BESS (e.g., Tesla Megapack) are approximately 53 to 56 dBA L_{eq}/L_{50} at 10 feet, decreasing to 50 dBA L_{eq}/L_{50} at 15 to 20 feet. Since BESS are typically clustered together in a dedicated area, the noise measurements at the referenced distances from the outer edge of the BESS facility represent the additive noise effect of multiple BESS units.

Sources of audible noise within substations include equipment such as transformers and their associated cooling fans, reactors, voltage regulators, circuit breakers and other intermittent noise generators. Among these sources, transformers, reactors, and circuit breakers have the greatest potential for producing noise. The broadband sound from fans, pumps and coolers has the same character as ambient sound and tends to blend with the ambient noise. Reactors are similar to transformers in terms of audible noise and would generate noise levels of about 40 dBA L_{eq}/L_{50} at 200 feet. Based on the results of noise measurements made by Illingworth & Rodkin at the Castanea Solar Facility in October 2024, noise levels produced by a typical project substation are approximately 55 dBA L_{eq}/L_{50} at 125 feet (or 63 dBA L_{eq}/L_{50} at 50 feet). The noise level would decrease to 50 dBA L_{eq}/L_{50} at a distance of 250 feet. The highest noise levels would be produced by circuit breakers, which would occur very infrequently (less than once per year) during emergency conditions when breakers are thrown to protect the system during an electrical fault due to line overloads (which on-site system operators would diligently strive to avoid). The maximum noise level from the breakers would be approximately 105 dBA L_{max} at 50 feet. Under Ordinance Code, section 8.40.060(B)), the emergency circuit breakers would be exempt from the County's noise level limits. Collection substations typically have about three times as much noise generating equipment, therefore noise levels produced by a typical collection substation are approximately 60 dBA L_{eq}/L_{50} at 125 feet (or 68 dBA L_{eq}/L_{50} at 50 feet). The noise level would decrease to 50 dBA L_{eq}/L_{50} at a distance of 400 feet.

The Fresno County General Plan Health and Safety Policy HS-H.4 requires proposed projects that are likely to produce noise levels exceeding the levels shown in the County's Noise Control Ordinance at existing or planned noise-sensitive uses to conduct an acoustical analysis and design noise mitigation. The daytime noise limit enforced at noise-sensitive land uses for projects of this type is 50 dBA L_{50} (Fresno County 2024b). The noise generating components of a typical solar facility would operate only during daytime hours when the solar facility is generating power. There would be no noise generated by the solar facility at night, when County noise limits are 5 dBA more restrictive than the daytime limit (i.e., 45 dBA L_{50}).

Noise from "point" sources decreases at a rate of 6 dBA with each doubling of the distance between the noise source and receptor. Based on the highest noise level estimate of 70 dBA L_{eq}/L_{50} at a distance of 50 feet from solar fields (i.e., assuming project PCSs, electrically cooled BESS, and project substations are all located in proximity to a noise receptor), predicted noise levels are calculated to exceed 50 dBA L_{eq}/L_{50} when located within 500 feet of noise-sensitive land uses. For utility-scale solar projects utilizing water-cooled BESS, this overall noise level would be approximately 66 dBA L_{eq}/L_{50} at 50 feet and would exceed 50 dBA L_{eq}/L_{50} when located within 315 feet of noise-sensitive land uses. Noise produced by the collection substations would exceed 50 dBA L_{eq}/L_{50} when located within 400 feet of noise-sensitive land uses. In summary, the estimated noise levels from project operations can be maintained below the County's 50 dBA L_{50} noise limit for noise-

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sensitive land uses with proper site planning and/or implementation of noise control. However, in cases where operational noise sources would be located within the distances identified above, the potential operational noise impacts would be considered *less-than-significant with mitigation*.

Operational Traffic Noise

Traffic generated during project operations would be very light, given the small number of workers who would travel to the VCIP facilities. It was calculated that the highest traffic noise increase attributable to project operational traffic on the affected roadways would be 0.4 dBA L_{dn} or less as compared to baseline traffic noise conditions. The noise levels would be well below the applicable noise standards discussed above, and would not be noticeable to the potentially affected sensitive receptors. Therefore, the operational traffic generated by the VCIP projects would not result in a substantial permanent increase in ambient noise levels in the project vicinity, and the impact would be *less than significant*.

Decommissioning Phase

Noise levels generated during decommissioning activities would be similar to those generated during construction except that some of the noisiest construction equipment, such as pile drivers and vibratory rollers, would not be used during decommissioning. As is the case with construction noise, the on-site noise generated during decommissioning would only occur during allowable hours and would only affect noise levels at individual receptors over a relatively short period of time. Traffic volumes generated during decommissioning would be similar to those associated with construction, and the resulting noise levels would also be temporary. Therefore, the decommissioning activity and associated traffic would result in a substantial temporary increase in ambient noise levels in the project vicinity. The noise impact could be potentially significant in certain locations, but the impact would be reduced to *less than significant with mitigation*.

In summary, the noise generated during the construction and decommissioning phases of the VCIP projects would be temporary and could exceed applicable noise standards in certain locations. The impact would be potentially significant, but would be reduced to *less-than-significant with mitigation*.

Mitigation Measure NOI-1a: Noise Mitigation for Project Construction and Decommissioning

To reduce potential construction and decommissioning noise impacts resulting from VCIP implementation, the following mitigation measures are identified for application at the project-specific level, with applicability depending on the individual circumstances of each project, as follows:

- 1) **Implement Mitigation Measure TR-1. Mitigation Measure TR-1 specifies traffic volume reduction measures that would ensure that project traffic does not reduce Level of Service below LOS C on any roadways providing construction routes to VCIP projects.**
- 2) **Within the roadway segment of South San Mateo Avenue between West Carlson Avenue and West Conejo Avenue, no through-traffic for VCIP project construction or decommissioning shall be permitted on this roadway segment to maintain average daily noise at levels no greater than 3 dBA L_{dn} above ambient levels at the existing residences along this roadway segment. This measure shall be implemented and enforced in accordance with the traffic and truck routing plan prepared pursuant to Mitigation Measure TR-3.**

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- 3) Within the roadway segment of West Clarkson Avenue between South Stanislaus Avenue and South San Mateo Avenue no delivery truck or equipment traffic shall be permitted on this roadway segment in order to minimize traffic noise at the Cantua Elementary School and community. This measure shall be implemented and enforced in accordance with the traffic and truck routing plan prepared pursuant to Mitigation Measure TR-3.
- 4) Acoustical studies shall be required to be prepared for each VCIP project. These studies shall establish baseline noise levels and evaluate estimated project traffic distribution to calculate noise level increases due to project traffic, and also identify any additional traffic reductions required to maintain construction and decommissioning noise level increases to 5 dBA Ldn or less where noise levels with the project would remain below 60 dBA Ldn, 3 dBA Ldn or less where noise levels with the project would range from 60 to 65 dBA Ldn, and 1.5 dBA Ldn or less where noise levels with the project would exceed 65 dBA Ldn.

Significance After Mitigation: Less-than-Significant Impact with Mitigation.

Implementation of item 1 would reduce overall construction and decommissioning traffic volumes by about 20 percent, which would reduce noise levels by about 1 dBA Ldn. Implementation of item 2 would limit daily construction and decommissioning traffic to less than 900 vehicles per day (approximately double baseline volumes) on S. San Mateo Avenue, which would result in noise level increases of less than 3 dBA Ldn along this road segment. Implementation of item 3 would maintain noise levels at or near baseline levels along this road segment and minimize construction traffic noise within the Cantua Creek community, including Cantua Elementary. Implementation of item 4 would ensure that all temporary noise increases due to VCIP construction and decommissioning traffic would be mitigated to acceptable levels.

Mitigation Measure NOI-1b: Noise Mitigation for Project Operations

To reduce potential operational noise impacts resulting from VCIP implementation, the following noise mitigation measures are identified for application at the project-specific level, with applicability depending on the individual circumstances of each project, as follows:

- 1) Noise generating equipment at each energy resource and infrastructure project site shall be located at the following setback distances from the nearest noise-sensitive land uses unless an acoustical analysis identifies feasible mitigation (defined below) to reduce noise produced by the equipment to 50 dBA L₅₀ at the location of any noise-sensitive land use:
 - a. Power Conversion Stations (PCSs): 60 feet from nearest receptor.
 - b. Battery Energy Storage System (BESS) with electrically powered HVAC system: 400 feet from nearest receptor.
 - c. Battery Energy Storage System (BESS) with water cooling system: 65 feet from nearest receptor.
 - d. Project Substation: 225 feet from nearest receptor.
- 2) Collection substations shall not be located within 400 feet of noise-sensitive land uses unless an acoustical analysis identifies feasible mitigation to reduce noise produced by collection substations to 50 dBA L₅₀ at the location of any noise-sensitive land use.

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Feasible mitigation would include, but not be limited to, noise barriers which shield project noise sources from nearby sensitive land uses and selection of quieter equipment. A noise barrier that interrupts the line-of-site between the noise source and receptor would achieve a minimum 5 dBA reduction in noise. The use of noise barriers would reduce but not eliminate the minimum setback distances identified above, so some setback distance would likely still be required to meet the 50 dBA L₅₀ noise limit. The acoustical studies required for each VCIP project would determine the combination of shielding and setback that would be appropriate for the proposed equipment and feasible in each case to meet the applicable noise standard.

Significance After Mitigation: Less-than-Significant Impact with Mitigation.

Impact NOI-2. Vibration

Implementation of the VCIP Energy Resource and Infrastructure Plans could result in generation of excessive groundborne vibration; however, vibration levels would be reduced to less-than-significant through application of specified vibration mitigation measures at the project-specific level. (*Less-than-Significant Impact with Mitigation*)

Groundborne vibration produced by construction activities would be considered significant if the vibration levels are high enough to damage structures (e.g., cosmetic damage) or cause substantial disturbance to people. Groundborne vibration levels would be highest during site preparation activities and when the solar arrays are installed, given that the cylindrical steel posts (or H-beams) will be driven into the ground using truck-mounted vibratory drivers.

Vibration is measured as PPV in inches per second. The California Department of Transportation (Caltrans) recommends a vibration limit of 0.5 in/sec PPV for new residential and modern commercial/industrial structures, 0.3 in/sec PPV for older residential structures, and a limit of 0.25 in/sec PPV for historic and some old buildings (Caltrans 2020). This analysis conservatively assumes that historic or old buildings could border the areas proposed for the installation of solar arrays and could possibly be damaged by construction activities. Therefore, regarding structures the applicable impact threshold for excessive groundborne vibration would be levels exceeding 0.25 in/sec PPV.

People can also be adversely affected by excessive vibration levels. The level at which humans begin to perceive vibration is 0.015 inches per second. Transient vibrations created by a single isolated vibration event at 0.2 inches per second are considered bothersome to most people, while continuous/frequent intermittent exposure to vibration is considered unacceptable at 0.10 inches per second as such vibration levels are considered strongly perceptible. Continuous/frequent intermittent construction vibration sources typically include impact or vibratory pile drivers and vibratory compaction equipment. Therefore, the applicable impact threshold for perceptible groundborne vibration would be 0.10 in/sec PPV.

The construction equipment having the greatest potential for vibration includes sonic pile drivers, vibratory rollers, and large bulldozers. The vibration levels typically produced by a sonic pile driver can reach 0.170 in/sec PPV at a distance of 25 feet. These levels conservatively represent the truck-mounted vibratory drivers that would be used to install the posts. Vibratory rollers and large bulldozers typically generate vibration levels ranging from 0.089 to 0.210 in/sec PPV at a distance of 25 feet.

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Vibration levels are highest close to the source and then attenuate with increasing distance from the source. Vibration levels at various distances can be calculated as follows:

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

Where: PPV_{Ref} = reference PPV at 25 ft.

D = distance from equipment to the receiver in ft.

$n = 1.1$ (the value related to the attenuation rate through ground)

Table 4.13-6 shows the source levels for typical construction equipment and the minimum distances required to not exceed damage or perceptibility thresholds.

A review of Table 4.13-6 indicates that the equipment having the greatest potential to produce vibration levels exceeding the damage threshold would only yield such levels when used within 21 feet of historic or other old buildings. Strongly perceptible vibration levels could result when construction activities occur within 48 feet of sensitive receptors. In most instances, however, construction activities throughout the VCIP area would occur at far greater distances from buildings or receptors, and vibration impacts in areas outside of the screening distances would not be expected. However, if construction occurs within the screening distances identified in Table 4.13-6, then potential groundborne vibration impacts would be considered *less-than-significant with mitigation*.

TABLE 4.13-6
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 ft. (in/sec)	Minimum Distance to Meet 0.25 in/sec PPV (feet)	Minimum Distance to Meet 0.10 in/sec PPV (feet)
Pile Driver (Sonic – typical range)	0.170	18	40
Clam shovel drop	0.202	21	46
Hydromill (slurry wall)	in soil	0.008	3
	in rock	0.017	5
Vibratory Roller	0.210	21	48
Hoe Ram	0.089	10	22
Large bulldozer	0.089	10	22
Caisson drilling	0.089	10	22
Loaded trucks	0.076	9	19
Jackhammer	0.035	5	10
Small bulldozer	0.003	1	1

Source: *Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., December 2024.*

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Mitigation Measure NOI-2: Vibration Mitigation for Project Construction

To reduce potential construction vibration impacts and annoyance to residents resulting from VCIP implementation, (i.e., to maintain vibration levels at less than 0.1 PPV at buildings and sensitive receptors), the following vibration mitigation measures are identified for application at the project-specific level, with applicability depending on the individual circumstances of each project, as follows:

- 1) Avoid using sonic pile drivers, vibratory rollers, or dropping heavy equipment (e.g., clam shovel drops) within 50 feet of adjacent buildings.
- 2) Avoid using hoe rams, bulldozers, or drills within 25 feet of adjacent buildings.
- 3) Substitute smaller equipment to complete the tasks designated for vibratory equipment within 50 feet of sensitive receptors.
- 4) Provide construction notification. Notice shall be mailed no less than 15 days prior to construction to all residents, property owners, businesses, and public agencies that have facilities within 500 feet of the project area. The notice shall state the type of construction activities that will be conducted, the location and duration of construction, and contact information for the project Disturbance Coordinator.
- 5) Designate a Disturbance Coordinator responsible for registering and investigating claims of excessive vibration. The contact information for the Disturbance Coordinator shall be posted on the construction site.

Significance After Mitigation: Less-than-Significant Impact with Mitigation.

Impact NOI-3. Exposure to Aircraft Noise

Implementation of the VCIP Energy Resource and Infrastructure Plans would not result in exposure of workers at VCIP project sites to excessive noise levels from aircraft operations at airports or airstrips in the vicinity. (*Less-than-Significant Impact*)

The predominant source of aircraft noise in the vicinity of the Plan Area is NASL, which is located approximately 9 miles southeast of the Five Points community. Noise produced by NASL aircraft operations primarily affect the noise environment at the southeast portion of the Plan Area within the NASL flight pattern that is mapped in the Fresno County Airport Land Use Compatibility Plan (Fresno COG 2023, Exhibit K3) as land subject to noise levels between 60 dBA CNEL and 85 dBA CNEL. Specifically, VCIP sites proposed south of Mt. Whitney Avenue, east of Lassen Avenue (SR 269), and north of W. Dorris Avenue (SR 198) would be exposed to NASL noise levels exceeding 60 dBA CNEL. The proposed solar, BESS, and infrastructure facilities are not considered noise-sensitive land uses. Aircraft overflights would expose construction workers in the affected area to noise levels exceeding 60 dBA CNEL; however, construction workers would be required to wear adequate hearing protection. The hearing protection required to reduce noise levels from local construction activities and equipment to safe levels would be sufficient to also reduce noise levels from NASL aircraft operations to safe levels. Therefore, VCIP implementation would not expose workers to excessive noise levels from aircraft operations at NASL, and as such, the impact of any VCIP project's exposure to excessive aircraft noise would be *less than significant*.

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There are also four public airports within or adjacent to the Plan Area that experience sufficient aircraft activity to warrant noise contours as mapped in the Fresno County Airport Land Use Compatibility Plan for the Coalinga Municipal, Firebaugh, Harris Ranch, and William Robert Johnston (Mendota) airports. The aircraft activity at these four airports is limited, and as such, the noise contours generated by these airports often do not extend beyond the boundary of the individual airport. Based on a review of the noise contour maps prepared for each of these airports (Fresno COG 2023, Attachment A Displacement Analysis Figures A18, A19, A22, and A26), areas proposed for the potential development of solar facilities are a minimum of two miles from the 60 dBA CNEL contours produced by each of these public airports. The contemplated VCIP solar and energy storage facilities are not considered noise-sensitive land uses, and aircraft overflights would not expose construction workers or operations staff to noise levels exceeding 60 dBA CNEL. Therefore, implementation of the VCIP would not expose workers on VCIP facility sites to excessive noise levels from aircraft operations, and as such, the impact would be *less than significant*.

There are also six private airstrips distributed throughout the Plan Area, and another five airstrips within five miles of the Plan Area. Aircraft operations at private airstrips are infrequent in nature, and involve small aircraft, and as such, would not expose people at VCIP facilities to excessive noise levels. Therefore, *no impact* would occur within the Plan Area due to noise generated by private airstrips in the vicinity.

In summary, the impact resulting from the exposure of people at VCIP facilities to noise from aircraft operations associated with a private airstrip or public airport or public use airport would be *less than significant*.

Mitigation Measures: No mitigation is required.

4.13.3.2. TRANSMISSION CORRIDORS OUTSIDE THE VCIP

The transmission corridors for delivery of solar generation from potential VCIP projects to urban electricity markets in northern and southern California have been identified at a conceptual level in this PEIR to allow a general discussion of environmental impacts associated with transmission line development for informational purposes. These transmission delivery corridors extend far beyond the District's boundaries and are not part of the proposed VCIP. Planning and approval of these outside transmission lines are under the jurisdiction of the state and federal energy regulatory agencies, public utilities, and cities and counties traversed by the transmission corridors. The following discussion provides an overview of potential impacts of the outside transmission lines with respect to noise.

Construction of the outside transmission lines would generally involve the following steps: clearing of right-of-way and staging areas; installation of tower footings and structures; and conductor stringing. Since the transmission corridors are planned to run parallel to existing transmission lines, construction access would be obtained from existing access roads, and the need for new access roads would be limited. The construction activities would proceed in a stepwise fashion from one end of each corridor to the other, and as such the duration of construction at any given location would be relatively brief.

The noisiest construction activity would occur during site preparation of tower sites and staging areas, when most construction equipment would be used. This equipment typically includes dozers, graders, compactors,

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auger drill rigs, and trucks, which produce maximum noise levels ranging from 80 to 85 dBA at 50 feet. Helicopters would be used for stringing pilot wires for conductors, and could also be used for assembly of lattice towers in the mountainous segments of the transmission corridors. The operation of a helicopter for construction would generate maximum noise levels of approximately 80 dBA at 200 feet (USBLM 2016, p. 3.23-11).

The outside transmission corridors generally pass through sparsely settled rural areas with few sensitive receptors in the immediate vicinity. However, there may be instances where the transmission construction would occur in proximity to existing rural residences and possibly other sensitive receptors. At those locations, the residents would be temporarily subject to construction noise for several days at any given location. The noise limits applicable to construction noise vary by county. All affected counties limit construction activity to daytime hours, and some counties (e.g., Fresno, Merced) otherwise exempt construction from noise standards. Some other counties (e.g., Kings, Kern, Monterey) do not exempt construction noise from their general noise standards, while Los Angeles County regulates construction noise but applies higher limits on construction noise than operational noise (Fresno Co. 2024i; Merced Co. 2025a; Kings Co. 2025c; Kern Co, 2025a; Monterey Co. 2025e; LA Co. 2025a).

In the absence of a common noise standard for transmission construction, a conservative approach would be to apply a maximum noise metric of 70 dBA, which is the noise limit applied to general noise sources by Fresno County and most other counties. Receptors within about 300 feet of transmission construction would be subject to maximum noise levels of 70 dBA or greater during the height of construction activity. However, it is expected that transmission towers would be planned to be located at greater distances from existing residences to avoid noise and visual impacts. Although transmission construction would be audible from greater distances, the more intense activity and resulting noise levels would occur intermittently and would be temporary, lasting for several days at any given tower location. Preparation of tower sites may produce some vibration from drilling and compacting equipment, but these activities would be brief and several hundred feet from the nearest receptor. Similarly, conductor stringing by helicopter would be brief and distant from any receptor location. Therefore, the potential noise impacts due to the construction of the outside transmission lines are not anticipated to be significant.

4.13.3.3. CUMULATIVE IMPACTS

As discussed under Impact NOI-1, the potential for noise level increases would be greatest during construction, with the primary noise sources being construction activity at the VCIP project sites, and traffic generated by construction workers and trucks delivering materials and equipment. Project construction noise would vary from place to place as construction proceeds, so noise level increases at sensitive receptor locations would be intermittent and temporary. Traffic generated during project construction would result in increased ambient noise levels along the affected roadways, although the increased traffic volumes on any given roadway would be highest during the peak daily periods and would be temporary at any given location as the focus of VCIP development proceeds from north to south through the Plan Area. The traffic noise levels are estimated to exceed the applied noise criteria along travel routes in Mendota and Firebaugh in 2029, and in Cantua Creek in 2031. However, it is expected that the traffic reduction measures required for VCIP construction would reduce traffic volumes substantially, and that the resulting noise levels at the most affected sensitive receptor locations would be reduced to meet the applicable noise standards. Traffic noise levels are anticipated to

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remain within the applicable noise limits on all other roadways during the latter VCIP buildout years. Noise levels generated by operational VCIP traffic would be lower and would not exceed applicable noise standards.

During construction, noise generated at the VCIP project sites could potentially combine with noise generated by other approved and pending projects in the vicinity and result in cumulatively higher noise levels. There are three cumulative solar projects that have been approved but have not yet been constructed and two solar projects pending approval that could contribute to a cumulative noise effect. These include the approved Luna Valley, Sonrisa, and Darden solar projects, and the pending Heartland and ICF Rosemary solar projects. However, as noted in Section 4.0.5. *Cumulative Impacts* and elsewhere, four of these projects (Sonrisa, Darden, Heartland, and ICF Rosemary) are located in VCIP DFAs. Since the plan level impacts of the DFAs, including these projects, are addressed in the main impact analysis sections of this PEIR, they are not duplicated in the cumulative analyses. However, for informational purposes only, the following cumulative analysis of noise impacts includes these four projects.

It is anticipated that potential VCIP solar projects would commence construction in 2030 at the earliest. The five cumulative solar projects in the vicinity would likely be constructed and fully operational by 2030. Therefore, it is unlikely that the construction of the VCIP projects would overlap with the construction of these cumulative solar projects. There are no other current or foreseeable projects in the vicinity of VCIP DFAs which would be under construction at the same time as the VCIP projects. In the unlikely event that construction of the VCIP projects were to overlap with any other nearby projects, the noise increases at the nearest common receptors would be negligible. This is because none of these other cumulative projects are within one mile of both a potential VCIP project and a sensitive receptor, and because noise levels drop rapidly from the source and would be negligible at greater distances. Therefore, the cumulative noise impact associated with the VCIP projects would be *less than significant*, and the contribution of VCIP projects, individually and collectively, to cumulative noise level increases *would not be considerable*.

Regarding noise from construction traffic, the only other projects that could contribute substantial construction traffic within the Plan Area are the five large solar projects mentioned above; however, those solar projects are anticipated to be completed prior to the 2030 when the construction of VCIP projects in the vicinity of those five projects would be expected to begin. Thus, those other solar projects would only generate very light volumes of operational traffic at the same time as any VCIP projects in the vicinity under construction, and thus would not appreciably increase traffic noise levels along the travel routes used by VCIP construction traffic. Other approved and pending projects in the Plan Area would be too small and too distant from potential VCIP projects to result in a substantial increase in traffic noise along any common travel routes. Moreover, these projects would likely be completed before substantial construction of any VCIP project commences. Although VCIP construction traffic would result in noise level increases on a few road segments in the initial construction years, it is anticipated that the traffic reductions required to relieve traffic congestion under MM TR-1 would also reduce noise levels at all receptor locations, while additional noise measures in MM NOI-1 would reduce remaining noise impacts to less-than-significant. Therefore, the combined increases in traffic noise levels from the construction of the VCIP projects and other *cumulative projects would be less than significant*, and the project *contribution would not be considerable*.

During VCIP project operations, the potential noise impacts to adjacent sensitive receptors would have been reduced through project design measures such as specified setbacks from noise-generating equipment like BESSs, PCSs, and project substations, and related traffic would be very light. Thus, project operations would not generate excessive noise levels at any receptor location and would not generate noise levels that would be audible at any receptor location. It is expected that similar operational noise conditions would prevail at any

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adjacent and nearby solar/BESS facilities, such that combined operational noise sources would not result in higher noise levels that would exceed applicable standards. Therefore, the incremental noise impacts from the combined operation of the VCIP facilities and other *cumulative projects would be less than significant*, and the project *contribution would not be considerable*.

Construction activities at the potential VCIP projects would result in ground vibration. However, mitigation measures identified in MM NOI-2 would reduce potential vibration to less than significant for VCIP projects. Additionally, construction activities resulting in perceptible vibration would be short in duration, lasting a few days at most at any given location within project construction sites. Other cumulative projects would generate vibration during construction, but given the very short attenuation distance for vibration, and the general absence of cumulative projects in the immediate vicinity of potential VCIP projects expected during the VCIP construction period, there would not be a cumulative vibration effect. Therefore, the combined vibration from construction of the cumulative projects would be *less than cumulatively significant*, and the project *contribution would not be considerable*.

The outside transmission lines would result in increased noise levels during construction. Since the transmission corridors pass through rural areas, the cumulative development would mainly consist of dispersed residential development pursuant to general plan and zoning regulations of each affected county. The noise from this cumulative development would be minor and would not combine with noise increases from transmission line construction to result in significant cumulative noise impacts.

In summary, the noise and vibration impacts associated with VCIP implementation, combined with the noise and vibration impacts from the other cumulative projects, would not result in a cumulatively significant noise and vibration impact. Therefore, the *cumulative impact would be less than significant*, and the *contribution from VCIP projects would not be cumulatively considerable*.

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