4.10 Noise

This section evaluates potential impacts on ambient noise levels from construction and operation of the Proposed Project and alternatives. The analysis presented below is based on review of the Proponent's Environmental Assessment (SCE, 2008), ambient noise measurements taken near the Proposed Project and alternative alignments, and local noise ordinances and regulations set by cities and the counties in the study area.

4.10.1 Setting

Noise Background

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. In fact, community noise varies continuously with time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. Background noise levels change throughout a typical day, but do so gradually, corresponding with the addition and subtraction of distant noise sources and atmospheric conditions. The addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) makes community noise constantly variable throughout a day.

These successive additions of sound to the community noise environment vary the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.

L_{dn}: The energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10 p.m. and seven a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.

CNEL: Similar to the L_{dn}, the Community Noise Equivalent Level (CNEL) adds a five dBA penalty for the evening hours between seven p.m. and 10 p.m. in addition to a 10 dBA penalty between the hours of 10 p.m. and seven a.m.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers at industrial plants often experience noise in the last category. There is no completely satisfactory 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 individuals 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 that one has adapted, which is referred to as the "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived;

- Outside of the laboratory, a three dBA change is considered a just-perceivable difference when the change in noise is perceived but does not cause a human response;

- A change in level of at least five 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.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. 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.

Noise Attenuation

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate (lessen) at a rate of six dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (e.g., atmospheric conditions, noise barriers, type of ground surface, etc.). Widely distributed noises such as a large industrial facility spread over many acres or a street with moving vehicles (a “line” source) would typically attenuate at a lower rate of approximately three to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans, 1998).

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 affect of vibration on the human body. The RMS amplitude is 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 (FTA, 2006). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

Existing Ambient Noise Environment

The Proposed Project and Alternatives 2, 3, and 6 would be located in Tulare County, California. The Big Creek 3 Substation, located in Fresno County, would also undergo minor modifications as part of the Proposed Project and alternatives. The Proposed Project corridor would cross

through the eastern edge of the City of Visalia and through the northern edge of the City of Farmersville. This corridor would include approximately 1.1 miles of construction within existing SCE right-of-way (ROW) and 17.4 miles of construction through agricultural and open space lands. Alternative 2 would utilize approximately 10.8 miles of exiting SCE ROW and would pass through approximately four miles of orchards, five miles of open space and would pass near the community of Elderwood before entering the foothills of the Sierra Nevada. Alternative 3 would utilize 14.6 miles of existing SCE ROW and would cross approximately 9.7 miles of open space through the Sierra Nevada foothills. Alternative 6 would utilize 8.1 miles of existing SCE ROW and would cross through approximately 9.2 miles of orchards and 3.2 miles of open space. A number of rural residences are present in the vicinity of the Proposed Project and the alternatives.

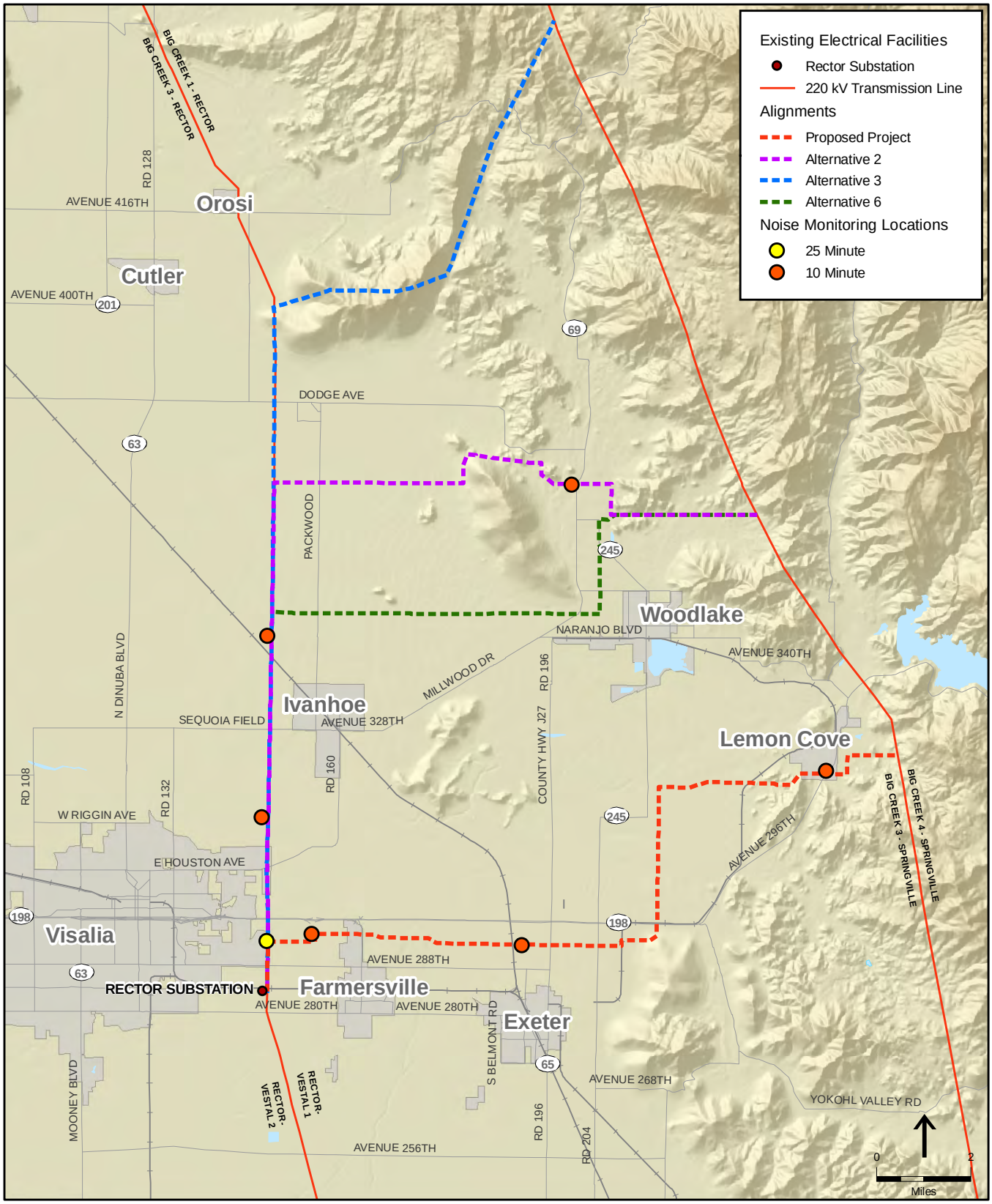
Much of the study area is typified by relatively low (40 to 55 dBA) noise levels due to the lack of loud noise sources. The main contributors to the noise environment along the corridors described above include roadway noise and agricultural equipment. Additional noise sources may include electrical and industrial devices and other man-made localized sources. Vehicle and overflight noises can range from approximately 50 to 80 dBA, depending on the distance from the source. Ambient natural noise sources such as wind can be expected to generate noise levels in the range of 45 to 55 dBA.

Twenty four hours of continuous noise data were collected to help characterize the ambient L_{dn} and CNEL in the study area. Figure 4.10-1 shows the location where the 24-hour noise measurement was taken. Table 4.10-1 displays the hourly L_{eq} as well as the L_{dn} and CNEL for this monitoring site. As shown in the table, noise levels are generally low in the existing ROW with a L_{dn} and CNEL of approximately 53 dBA.

Ten-minute average noise measurements were taken along the Proposed Project and alternative alignments to determine typical short-term noise levels in the study area. Figure 4.10-1 shows the locations at which 10-minute average measurements were collected. Table 4.10-2 displays the L_{eq} and L_{max} for these 10-minute measurements. As shown, ambient L_{eq} noise levels in the study area were between 43.8 and 60.0 dBA. The predominant noise source at most of the noise monitoring locations was vehicle traffic on nearby roadways.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.



SOURCE: ESRI, 2008; SCE, 2008; Thomas Bros. Maps, 2008; ESA, 2008

San Joaquin Cross Valley Loop Transmission Project. 207584.01

Figure 4.10-1

Noise Monitoring Locations

TABLE 4.10-1
AMBIENT NOISE LEVELS – 24-HOUR MEASUREMENT

Hour	L_{eq}	L_{max}
12:00 a.m.	43.6	53.2
1:00 a.m.	43.1	48.6
2:00 a.m.	43.8	47.2
3:00 a.m.	43.2	53.8
4:00 a.m.	43.5	51.3
5:00 a.m.	46.1	63.5
6:00 a.m.	47.8	60.7
7:00 a.m.	46.9	53.3
8:00 a.m.	45.9	53.1
9:00 a.m.	53.0	72.9
10:00 a.m.	54.6	69.8
11:00 a.m.	51.1	71.6
12:00 p.m.	47.6	67.0
1:00 p.m.	46.4	59.3
2:00 p.m.	47.7	60.7
3:00 p.m.	51.3	80.2
4:00 p.m.	51.4	63.6
5:00 p.m.	50.6	61.8
6:00 p.m.	49.4	58.2
7:00 p.m.	47.8	57.6
8:00 p.m.	47.7	53.6
9:00 p.m.	47.5	53.3
10:00 p.m.	47.3	55.7
11:00 p.m.	44.9	54.5
	L_{dn}	**53**
	CNEL	**53**

NOTE: Measurements began at 4:00 p.m. on September 17th and concluded at 4:00 p.m. on September 18th, 2008.

Proposed Project

There are a number of residences located within 200 feet of the first 1.1 miles of the Proposed Project. There are also rural residences scattered intermittently along the remaining 17.4 miles of new ROW that would be acquired by SCE. Some of these residences are located within 50 feet of the Proposed Project ROW.

Union Elementary School, on Road 148 just north of East Caldwell Avenue, is approximately 1,500 feet south of the Rector Substation. New Structure #58 would be approximately 1,000 feet east of Kaweah High School and New Structure #92 would be approximately 1,000 feet south of Sequoia Union School. New Structures #18 and #19 would be approximately 1,500 feet north of Liberty Park.

TABLE 4.10-2
10-MINUTE AVERAGE AMBIENT NOISE LEVELS IN THE STUDY AREA

#	Measurement Location	Time	L_{eq}	L_{max}	Description of Noise Sources
Proposed Project					
1	Along Road 156 near New Lattice Tower 14.	10:45 a.m.	55.2	66.6	Vehicle traffic along Road 156 was the predominant noise source.
2	Along Filbert Road between New TSP Structure 39 and 40.	11:10 a.m.	50.1	67.7	Vehicle traffic along Filbert Road was the predominant noise source. Other noise sources observed included a rooster crowing and operation of a weed whacker at a nearby residence.
3	Along Avenue 296 near New TSP Structure 94.	11:37 a.m.	60.0	76.4	Vehicle traffic along Avenue 296 was the predominant noise source.
Alternative 2					
4	Along Millwood Drive approximately 0.25 miles north of Avenue 368.	12:13 p.m.	55.2	70.6	Some roadway traffic was observed (an average of about one car per minute).
Alternative 2, 3, & 6					
5	At the intersection of Avenue 344 and Road 148 underneath existing 220kV transmission line.	12:56 p.m.	43.8	56.4	Transmission line humming was the predominant noise source. Relatively little vehicle traffic was observed.
6	At the intersection of Avenue 313 and Road 148.	2:07 p.m.	53.8	65.3	Vehicles traveling along Avenue 313 were the predominant noise source.

NOTE: Short-term (10-minute) measurements were collected on September 18, 2008.

Alternative 2

The first 1.1 miles of Alternative 2 would pass by the same residential units as the Proposed Project, and then rather than heading east, Alternative 2 would continue in existing SCE ROW passing directly adjacent to a number of existing residential developments for the next three miles. The next 6.7 miles of the alignment would also be located within existing ROW and would pass within close proximity to a few rural residences. Approximately 10.8 miles north of the Rector Substation, Alternative 2 would leave the existing ROW and turn east toward the-tie in location at the Big Creek-Springville line, passing by a few residences located near the Community of Elderwood.

In addition to residential receptors, Alternative 2 would pass approximately 1,000 feet east of a church located on Race Avenue.

Alternative 3

Alternative 3 would pass by the same residential units as the Proposed Project for the first 1.1 miles. Then it would continue north within the existing SCE ROW for another 14.6 miles. For the first three miles north of the Proposed Project turning point, Alternative 3 would be located directly adjacent to a number of existing residential developments. However, as it continues

north, it would pass fewer rural residences. At mile 14.6, Alternative 3 would turn east and then northeast for 9.7 miles passing primarily through open space land to reach the tie-in location at the Big Creek-Springville line.

In addition to residential receptors, Alternative 3 would pass within 1,000 feet of the church located on Race Avenue.

Alternative 6

Alternative 6 would pass by the same residential units as the Proposed Project for the first 1.1 miles. Continuing north, Alternative 6 would remain in existing SCE ROW for an additional seven miles, the first three miles of which would be directly adjacent to a number of existing residential developments. The following four miles in existing SCE ROW would be located near a few rural residences. At mile 8.1, Alternative 6 would turn east for 6.9 miles through orchards, passing within close proximity to a few rural residences. The alignment would then turn north for approximately two miles, again passing by a few rural residences. From here the alignment would turn east, crossing through open space until it reached the tie-in location at the Big Creek-Springville line.

In addition to residential receptors, Alternative 6 would pass within 1,000 feet of the church located on Race Avenue.

Regulatory Context

Federal, State, and local agencies regulate different aspects of environmental noise. Federal and State agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Tulare County (Proposed Project and Alternatives 2, 3 and 6)

Section 4 of the Tulare County General Plan provides a framework for addressing and minimizing noise impacts. The following policies identified in the General Plan Noise Element may be applicable to the Proposed Project and alternatives:

> *Policy 4.A.1:* Areas within Tulare County shall be designated as noise-impacted if exposed to existing or projected future noise levels at the exterior of buildings which exceed 60 dB L_{dn} (or CNEL).
>
> *Policy 4.B.1:* New development of industrial, commercial or other noise-generating land uses will not be permitted if resulting noise levels will exceed 60 dB L_{dn} (or CNEL) at the boundary of areas planned and zoned for residential or other noise-sensitive land uses, unless determined to be necessary to promote public health, safety and welfare to the County.

(County of Tulare, 2001).

Fresno County (Proposed Project and Alternatives 2, 3 and 6)

Municipal Code

As stated under Section 8.40.060 of the Fresno County Municipal Code, noise sources associated with construction activities are exempt from exterior noise level standards provided that such activities do not take place before six a.m. or after nine p.m. on weekdays or before seven a.m. or after five p.m. on Saturdays or Sundays. Furthermore, noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities are also exempt from exterior noise limits (County of Fresno, 2008).

General Plan

The Fresno County General Plan Health and Safety Element include goals that aim to "protect residential and other noise sensitive uses from exposure to harmful and 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". The following policy may be applicable to the Proposed Project and alternatives:

> *Policy HS-G.6:* The County shall regulate construction-related noise to reduce impacts on adjacent uses in accordance with the County's Noise Control Ordinance.

(County of Fresno, 2000).

City of Visalia (Proposed Project and Alternatives 2, 3 and 6)

Municipal Code

Table 4.10-3 presents the exterior noise level standards for fixed noise sources as set forth in Section 8.36.040 of the City of Visalia Municipal Code. These standards are not applicable to mobile sources such as construction equipment. However, Section 8.36.050 of the Municipal Code prohibits the operation of construction equipment between the weekday hours of seven p.m. and six a.m., and between the weekend hours of seven p.m. and nine a.m. (City of Visalia, 2008).

TABLE 4.10-3
CITY OF VISALIA EXTERIOR NOISE LIMITS

Category	Cumulative number of minutes in any one-hour time period	Noise Level (dBA)	
		Evening and Daytime (six a.m. to seven p.m.)	Nighttime (seven p.m. to six a.m.)
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

SOURCE: City of Visalia, 2008.

General Plan

The City of Visalia General Plan Noise Element includes the following goals: (1) protect citizens from harmful effects of exposure to excessive noise; (2) protect the City's economic base by preventing the encroachment of incompatible land uses near known noise producing industries, railroads, airports and other sources; and (3) protect existing and future noise-sensitive land uses from encroachment and exposure to excessive levels of noise. The following policies from the Noise Element may be applicable to the Proposed Project and alternatives:

> *Policy 1.1:* Areas within Visalia shall be recognized as noise impacted if exposed to existing or projected future noise levels at the exterior of buildings which exceed 65 dB L_{dn} (or CNEL).
>
> *Policy 1.3:* New development of industrial, commercial or other noise generating land uses (including roadways, railroads, and airports) should be discouraged if resulting noise levels will exceed 65 dB L_{dn} (or CNEL) at the boundary areas of planned or zoned residential or other noise sensitive land uses.

(City of Visalia, 1995).

City of Farmersville (Proposed Project)

Section 9.04.040 of the City of Farmersville Municipal Code limits noise levels from fixed noise sources to 50 dBA during nighttime hours and 65 dBA during daytime hours when measured at the property lines of noise sensitive receptors. Section 9.04.050 of the Municipal Code prohibits the use of construction equipment between the weekday hours of nine p.m. and six a.m., and between the weekend hours of nine p.m. and nine a.m. (City of Farmersville, 2003).

4.10.2 Significance Criteria

According to Appendix G of the CEQA Guidelines, a project impact would be considered significant if it would:

a) Expose people to or generate noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) Expose people to or generate excessive groundborne vibration or groundborne noise levels;

c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels;

f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

For the purposes of this EIR, temporary impacts during construction are considered significant if they would substantially interfere with affected land uses. Substantial interference could result from a combination of factors including: the generation of noise levels substantially greater than existing ambient noise levels, construction efforts lasting long periods of time, or construction activities that would affect noise-sensitive uses during the nighttime.

The Proposed Project's long term operational impacts on the ambient noise environment would be considered substantial if it would expose sensitive receptors or other identified land uses to noise levels in excess of regulatory standards or codes. In addition to concerns regarding the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing ambient noise environment. If the ambient noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur.

A numerical threshold to identify the point at which a vibration impact occurs has not been identified by local jurisdictions in the applicable standards or municipal codes. In the absence of local regulatory significance thresholds for vibration from construction equipment, it is appropriate to use a California Department of Transportation (Caltrans) identified PPV thresholds for human perception and risk of architectural damage to buildings, which are 0.010 inches per second and 0.20 inches per second, respectively (Caltrans, 2002).

4.10.3 Applicant Proposed Measures

No Applicant Proposed Measures have been identified by SCE to reduce noise impacts from construction, operation, and maintenance of the Proposed Project.

4.10.4 Impacts and Mitigation Measures

Approach to Analysis

Equipment noise during project construction would be the primary concern in evaluating short-term noise impacts. Noise from corona discharge along high-voltage transmission lines in wet conditions would be the primary concern associated with long-term noise impacts. In addition, maintenance activities would include use of a light duty truck and/or helicopter to conduct routine annual inspections of the transmission line.

Evaluation of potential noise impacts from Proposed Project construction, operation and maintenance included reviewing relevant city and county noise standards and policies, characterizing the existing noise environment throughout the Proposed Project area, and projecting noise from construction, operation and maintenance of the Proposed Project. Impacts were assessed by comparing the published noise levels of construction equipment and operational activities to the ambient noise environment and significance criteria, based on applicable noise regulations.

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Construction

Construction activities located in the City of Visalia would be limited to between the hours of six a.m. and seven p.m. on weekdays and between the hours of nine a.m. and seven p.m. on weekends per the City's Municipal Code. In the City of Farmersville, construction activities would be restricted pursuant to the City's Municipal Code to between the hours of six a.m. and nine p.m. on weekdays and nine a.m. to nine p.m. on weekends. Tulare County does not have a noise ordinance and does not set specific restrictions on construction noise. Fresno County restricts construction hours to between the hours of six p.m. and nine p.m. on weekdays and between the hours of seven a.m. and five p.m. on Saturdays and Sundays.

As identified in Section 2.7.3, *Construction Workforce and Equipment*, construction activities are proposed to occur between the hours of seven a.m. and five p.m., Monday through Friday. If SCE determines that different work hours or days would be necessary that would violate a local noise ordinance, it would be required to obtain noise ordinance variances from the jurisdictions where the work would take place pursuant to regulatory requirements. Therefore, construction activities would not conflict with applicable noise ordinances and plans, and no impacts would occur (No Impact).

Operations

The primary noise source from operation of the Proposed Project would be associated with corona discharge. The term corona is used to describe the breakdown of air into charged particles caused by the electrical field at the surface of conductor. Audible noise levels generated by corona discharge vary depending on weather conditions as well as voltage of the line. Wet weather conditions often increase corona discharge due to accumulation of raindrops, fog, frost or condensation on the conductor surface which causes surface irregularities thereby promoting corona discharge.

In the first 1.1 miles of Proposed Project ROW, two existing single circuit transmission lines would be replaced with one double circuit line, and a new double circuit line would be added. This would double the energy-carrying capacity of the lines in the existing ROW, and would therefore have the potential to increase noise levels associated with transmission line operation. Furthermore, the Proposed Project would transverse 17.4 miles of new ROW and would represent a new permanent noise source in the area.

Based on noise modeling conducted by CH2M Hill, corona noise levels that would be generated by the Proposed Project during wet conditions would be approximately 37 dBA at the edge of the existing ROW and approximately 35 dBA at the edge of new ROW to be acquired (CH2M Hill, 2008). Assuming that the noise levels presented above would remain constant for 24 hours, the CNEL would be approximately 44 dBA at the edge of the existing ROW and 42 dBA at the edge of new ROW during wet conditions. These noise levels would not violate exterior noise standards set forth in the Tulare County General Plan, the City of Visalia Municipal Code or the

Farmersville Municipal Code. Therefore, project operations would not conflict with applicable noise ordinances and plans, and no impacts would occur (No Impact).

Maintenance

Maintenance activities would include annual visual inspections of the transmission line and access/spur roads constructed as part of the Proposed Project. These activities would require use of a light duty truck and/or helicopter, which would temporarily increase noise levels in the immediate vicinity of the Proposed Project. These activities would occur infrequently and would not result in any long-term notable noise level increases. Therefore, maintenance activities would not conflict with applicable noise ordinances and plans, and no impact would occur (No Impact).

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b) Expose people to or generate excessive groundborne vibration or groundborne noise levels.

Impact 4.10-1: Blasting activities could expose people and/or structures to substantial vibration levels. ***Less than significant with mitigation*** **(Class II)**

Blasting activities may be required during road construction, grading, and foundation work in some locations if rock is present. Blasting activities typically generate the most noticeable vibrations associated with construction activities. Areas where blasting would be utilized have not been determined; therefore, it is difficult to assess the potential impacts on sensitive receptors and existing structures from groundborne vibration that would be caused by blasting activities. As described in Chapter 2, *Project Description*, prior to blasting, a person licensed by the Federal Bureau of Alcohol, Tobacco, and Firearms would assess the area and take site measurements in order to engineer the blast for a safe and effective explosion. Furthermore, pre-blast notification would be made to the local fire department, residents, utilities, and others potentially affected by blasting operations. Although SCE has committed to taking precautions, implementation of Mitigation Measure 4.10-1, below, would be required to set forth appropriate performance criteria and to ensure that vibration impacts associated with blasting would be reduced to less than significant levels.

> **Mitigation Measure 4.10-1:** SCE and/or its contractors shall develop and implement a Blasting Plan for construction activities. The plan shall be submitted for review and approval by the CPUC. At a minimum, the plan shall include the following measures:
>
> - Evidence of licensing, experience, and qualifications of blasters.
> - A Blast Survey Workplan shall be prepared by the blaster. The Plan shall establish vibration limits in order to protect structures from blasting activities and identify specific monitoring points. At a minimum, a pre–blast survey shall be conducted of any potentially affected structures and underground utilities within 500 feet of a blast area, as well as the nearest commercial or residential structure, prior to blasting.
> - The survey shall include visual inspection of the structures, documentation of structures by means of photographs, video, and a level survey of the ground floor of

structures or the crown of major and critical utility lines, and these shall be submitted to the City. This documentation shall be reviewed with the individual owners prior to any blasting operations. The CPUC and impacted property owners shall be notified at least 48 hours prior to the visual inspections.

- Scaled drawings of blast locations, and neighboring buildings, streets, or other locations that could be inhabited.

- Blasting notification procedures, lead times, and list of those notified. Public notification to potentially affected vibration receptors describing the expected extent and duration of the blasting.

- Description of blast vibration monitoring program.

- Vibration and settlement threshold criteria (for example PPV of 0.2 inches per second) shall be submitted by the blaster to the CPUC for review and approval during the design process. If the settlement or vibration criteria are exceeded at any time or if damage is observed at any of the structures or utilities, then blasting shall immediately cease and the CPUC immediately notified. The stability of any structures, creek canals, etc. shall be monitored and any evidence of instability due to blasting operations shall result in immediate termination of blasting. The blaster shall modify the blasting procedures or use alternative means of excavating in order to reduce the vibrations to below the threshold values, prevent further settlement, slope instability, and/or to prevent further damage.

- Post–construction monitoring of structures shall be performed to identify (and repair if necessary) all damage, if any, from blasting vibrations. Any damage shall be documented by photograph, video, etc. This documentation shall be reviewed with the individual property owners.

- Reports of the results of the blast monitoring shall be provided to the CPUC, the local fire department, and owners of any buried utilities on or adjacent to the site within 24 hours following blasting. Reports documenting damage, excessive vibrations, etc. shall be provided to the CPUC and impacted property owners.

Significance after Mitigation: Less than Significant.

Impact 4.10-2: Conventional construction activities could expose people and/or structures to substantial vibration levels. *Less than significant* (Class III)

Other temporary sources of groundborne vibration and noise during construction would result from operation of conventional heavy construction equipment such as drill rigs, bulldozers, and loaded haul trucks. Typical PPV levels from drill rigs and bulldozers measured at 25 feet from the source are approximately 0.089 inches per second while typical PPV levels from loaded haul trucks are approximately 0.076 inches per second at 25 feet (FTA, 2006). These vibration levels would not have the potential to cause structural damage to nearby buildings. However, they could potentially be perceptible at residences or other sensitive uses in the immediate vicinity of the construction corridor.

Construction activities would not be concentrated at the same location for an extended period of time; rather, they would progress in a linear fashion along the Proposed Project alignment such that an individual receptor would not be exposed to groundborne vibration for longer than a few days. Therefore, impacts would be less than significant.

Mitigation: None required.

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c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact 4.10-3: Corona noise levels could increase ambient noise levels in the vicinity of the new transmission line ROW. ***Less than significant*** **(Class III)**

As discussed in more detail under item a), the only permanent noise source included as part of the Proposed Project would be the hissing and crackling associated with corona discharge. As identified in Tables 4.10-1 and 4.10-2, the measured ambient average noise levels in the Proposed Project area are between approximately 43 and 60 dBA. Worst case corona discharge noise levels that would be associated with the Proposed Project are estimated to average up to 37 dBA. Although corona discharge noise levels would likely be audible within the immediate vicinity of the Proposed Project alignment, they would not be expected to permanently increase ambient noise levels in the project vicinity; therefore, impacts would be less than significant.

Mitigation: None required.

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d) Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Noise sources of concern associated with construction and operation of the Proposed Project include construction equipment noise, construction blasting activities, corona discharge associated with operation of high-voltage transmission lines, and vehicle noise associated with routine inspection and maintenance of new transmission lines.

Impact 4.10-4: Construction equipment would generate noise levels that would adversely affect nearby sensitive receptors. ***Less than significant with mitigation*** **(Class II)**

Construction of the Proposed Project would result in temporary increases to ambient noise levels associated with operation of heavy duty construction equipment. Table 4.10-4 lists heavy duty construction equipment that would likely be required onsite as well as typical noise levels for each piece of equipment measured at 50 feet from the source. As shown, equipment noise levels at construction sites would range from 80 dBA to up to 98 dBA during pole and tower foundation drilling activities.

TABLE 4.10-4
TYPICAL MAXIMUM NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Line Truck	88
Backhoe	80
Flatbed Truck	88
Drill Rig	98
Air Compressor	81
Dozer	85
Air Compressor	85
Mobile Crane	83
Grader	85
Front End Loader	85
Water Trucks	88
Cranes	83
Concrete Trucks	88

SOURCE: FTA, 2006.

As discussed previously, 10-minute average ambient noise levels measured in the Proposed Project ROW ranged from 55.2 dBA to 60.0 dBA. It can therefore be assumed that noise sources such as those shown in Table 4.10-4 would have the potential to impact nearby sensitive receptors.

Construction would also cause off-site noise, primarily from commuting workers and from trucks that would bring materials to the construction sites. In addition, a helicopter would be needed to help string the conductors on the new 220 kV towers and poles. Based on the analysis of a similar project, operation of a light-duty helicopter can be expected to generate noise levels of approximately 80 dBA at 200 feet (CPUC, 2006). These noise levels would have the potential to impact nearby sensitive receptors.

Equipment staging would occur at existing commercial facilities if possible. From these points, some workers would drive or ride in construction vehicles to work areas along the transmission line ROW. Trucks would haul poles, tower components, conductor line, and other materials to the various construction sites and would also haul away demolished electrical equipment and excavated material and waste. The peak noise levels associated with passing trucks and commuting worker vehicles would be approximately 75 dBA at 50 feet and would therefore have the potential to cause temporary increases to ambient noise levels at sensitive receptors.

Construction would occur at each pole site in batches (i.e., holes would be drilled and foundations poured for all pole sites, then all poles would be constructed and then the line would be strung). Therefore, equipment used to construct poles would not remain at one site for an extended period of time, thereby limiting the amount of time any individual receptor would be exposed to elevated noise levels. In addition, construction activities are proposed to occur between the hours of seven a.m. and five p.m., Monday through Friday; however, SCE has indicated that different construction work hours or days may be necessary. If nighttime (e.g., between 8:00 p.m. and 6:00 a.m.)

construction activities are determined to be necessary, such activities could result in a significant nuisance to nearby residences.

Implementation of Mitigation Measure 4.10-4a would require pre-construction notification to nearby receptors, and would require appropriate noise mitigation measures such as maintaining equipment mufflers and shielding compressors and other small stationary equipment. Mitigation Measure 4.10-4b would require the development and implementation of a nighttime noise reduction plan should construction activities be required after 8:00 p.m. and/or before 6:00 a.m. These measures would help reduce noise levels generated by construction equipment and would ensure that construction noise would not represent a significant nuisance to nearby receptors. Furthermore, these measures would aid in the reduction of ground borne vibration impacts as discussed above under Impact 4.10-2.

Therefore, impacts related to the construction activities associated with the Proposed Project would be less than significant with mitigation.

Mitigation Measure 4.10-4a: SCE and/or its contractors shall employ the following noise reduction and suppression techniques during project construction to minimize the impact of temporary construction-related noise on nearby sensitive receptors:

- All construction equipment mufflers comply with manufacturers' requirements.
- Nearby residents shall be notified of the construction schedule and how many days they may be affected by construction noise prior to commencement of construction activities. Notices sent to residents shall include a project hotline where residents would be able to call and issue complaints. All calls shall be returned by SCE and/or its contractor within 24 hours to answer noise questions and handle complaints. Documentation of the complaint and resolution shall be submitted to the CPUC weekly.
- Idling of engines shall be minimized; engines shall be shut off when not in use except in cases where idling is required to ensure safe operation of equipment or when idling is necessary to accomplish work for which the piece of equipment was designed (such as operating a crane).
- Compressors and other small stationary equipment shall be shielded with portable barriers when operated within 100 feet of residences.

Mitigation Measure 4.10-4b: In the event that nighttime (i.e., between 8:00 p.m. and 6:00 a.m.) construction activity is determined to be necessary, a nighttime noise reduction plan shall be developed by SCE and submitted to the CPUC for review and approval. The noise reduction plan shall include a set of site-specific noise attenuation measures that apply state of the art noise reduction technology to ensure that nighttime construction noise and levels and associated nuisance are reduced to the most extent feasible.

The attenuation measures may include, but not be limited to, the control strategies and methods for implementation that are listed below. If any of the following strategies are determined by SCE to not be feasible, an explanation as to why the specific strategy is not feasible shall be included in the nighttime noise reduction plan.

- Plan construction activities to minimize the amount of nighttime construction.
- Offer temporary relocation of residents within 200 feet of nighttime construction areas.
- Temporary noise barriers, such as shields and blankets, shall be installed immediately adjacent to all nighttime stationary noise sources (e.g., drilling rigs, generators, pumps, etc.).
- Install temporary noise walls that blocks the line of sight between nighttime activities and the closest residences.
- The notification requirements identified in Mitigation Measure 4.10-4a shall be extended to include residences within 1,000 feet of pending nighttime construction activities.

Significance after Mitigation: Less than Significant.

Impact 4.10-5: Blasting activities could expose people to substantial noise levels. ***Less than significant with mitigation*** **(Class II)**

Blasting activities may be required during road construction, grading, and foundation work in some locations if rock is present. Blasting can generate instantaneous noise levels of up to 115 dBA at 50 feet. Areas where blasting would be utilized have not been specifically identified; therefore, it is difficult to assess the potential impacts on sensitive receptors that would be caused by blasting activities. As described in Chapter 2, *Project Description*, prior to blasting, pre-blast notification would be made to the local fire department, residents, utilities, and others potentially affected by blasting operations. Although SCE has committed to taking precautions, implementation of Mitigation Measure 4.10-5 (see below) would be required to set forth appropriate performance criteria and to ensure that noise impacts associated with blasting would be reduced to less than significant levels.

Mitigation Measure 4.10-5: SCE and/or its contractors shall, at a minimum, include the following measures within the Blasting Plan described under Mitigation Measure 4.10-1 (above).

- Methods of matting or covering of blast area to prevent excessive air blast pressure.
- Description of air blast monitoring program.

Significance after Mitigation: Less than significant.

Impact 4.10-6: Inspection and maintenance activities associated with project operations could cause periodic increases in ambient noise levels that could negatively affect nearby receptors. ***Less than significant*** **(Class III)**

As discussed above, maintenance activities associated with the Proposed Project would require use of a light duty truck and/or helicopter to inspect new transmission lines and access/spur roads. These activities would result in a temporary increase in noise levels. However, vehicles would be turned off when stops are made to inspect facilities, thereby limiting the amount of time that any one receptor would be exposed to increased noise levels. Therefore, it can be concluded that inspection and maintenance activities would not expose sensitive receptors to excessive noise levels, and impacts would be less than significant.

Mitigation: None required.

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e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels.

The Proposed Project would not be located within a proposed or existing airport land use plan area or within two miles of a public airport or public use airport; therefore, there would be no impact associated with this criterion (No Impact).

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f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

The Proposed Project would not be located within the vicinity of a private airstrip. Therefore, there would be no impacts associated with this criterion (No Impact)

4.10.5 Cumulative Impacts

Noise levels tend to lessen quickly with distance from a source; therefore, the geographic scope for cumulative impacts associated with noise would be limited to projects located within one mile of the Proposed Project. Construction of the Proposed Project would result in a potentially significant impact associated with construction equipment and blasting noise and vibrations; however, this impact would be reduced to less than significant with mitigation. Operation and maintenance activities associated with the Proposed Project would not result in permanent increases to existing noise levels and impacts would be less than significant.

As discussed in Section 3.6, *Cumulative Projects*, there are a number of projects located within one mile of the Proposed Project that are reasonably foreseeable and would have the potential to be constructed simultaneously with the Proposed Project. Examples of such projects include the State Route 65 road widening and resurfacing as well as a number of proposed and approved residential subdivisions in the City of Visalia and the City of Farmersville. If construction of any of these projects were to occur simultaneously with construction of the Proposed Project, the potential for impacts to nearby receptors from construction noise would increase. However, as discussed previously, the human ear perceives noise in a logarithmic fashion rather than a linear fashion. Therefore if a new noise source is introduced near an existing source and the two produce equal noise levels, the ambient noise level would increase by approximately three dB rather than doubling. Based on this information, even if the Proposed Project would be constructed simultaneously with another project in the immediate vicinity, substantial increases in noise levels at nearby receptors would not be expected to occur.

Therefore, when considered in combination with these projects, the Proposed Project's incremental contribution to temporary noise impacts from construction, with proposed mitigation, would not be cumulatively considerable. Furthermore, the main noise source from operation of the Proposed Project would be corona discharge; however, corona discharge would not substantially increase ambient noise levels and would therefore not result in a cumulatively considerable contribution to noise impacts. Moreover, maintenance activities would include infrequent inspection of the lines and would also not result in a cumulatively considerable contribution to noise impacts. Therefore, construction, operation and maintenance of the Proposed Project would not result in a cumulatively considerable impact (Class II).

4.10.6 Alternatives

No Project Alternative

Under the No Project Alternative, the Proposed Project would not be implemented; therefore, no noise or vibration impacts would occur (No Impact).

Alternative 2

Noise impacts from construction, operation and maintenance of Alternative 2 would generally be the same as those anticipated from the Proposed Project. However, Alternative 2 would pass by a greater number of residential receptors than the Proposed Project, and would therefore be more likely to expose people to increased noise levels. Therefore, construction activities associated with Alternative 2 would be more likely to expose sensitive receptors to excessive noise levels and groundborne vibration. However, as with the Proposed Project, implementation of Mitigation Measures 4.10-1, 4.10-4a, 4.10-4b, and 4.10-5 would reduce impacts from construction of Alternative 2 to less than significant (Class II).

As with the Proposed Project, the primary noise source from operation of Alternative 2 would be corona discharge. Similarly to the Proposed Project, maximum CNEL associated with corona discharge would be approximately 44 dBA at the edge of the ROW and would occur only during wet weather conditions. Therefore, operation of Alternative 2 would neither violate any exterior noise level standards nor would it permanently increase ambient noise levels in the project vicinity. Maintenance activities would involve the same activities as the Proposed Project, and would therefore not be expected to result in a permanent increase to ambient noise levels. Impacts would be less than significant (Class III).

Alternative 3

Noise impacts from construction, operation and maintenance of Alternative 3 would generally be the same as those anticipated from the Proposed Project. Alternative 3 would pass by a greater number of residential receptors than the Proposed Project, and would therefore be more likely to expose people to increased noise levels. Therefore, while construction activities associated with Alternative 3 would result in similar noise levels as the Proposed Project, these activities would also pass within close proximity to a greater number of sensitive receptors. Therefore, the potential to expose sensitive receptors to excessive noise levels and groundborne vibration during construction would be higher under implementation of Alternative 3. However, as with the Proposed Project, implementation of Mitigation Measures 4.10-1, 4.10-4a, 4.10-4b, 4.10-5 would reduce impacts from construction of Alternative 3 to less than significant (Class II).

As with the Proposed Project, the primary noise source from operation of Alternative 3 would be corona discharge. Similarly to the Proposed Project, maximum CNEL associated with corona discharge would be approximately 44 dBA at the edge of the ROW and would occur only during wet weather conditions. Therefore, operation of Alternative 3 would not violate any exterior noise level standards nor would it permanently increase ambient noise levels in the project vicinity. Maintenance activities would involve the same activities as the Proposed Project, and would therefore not be expected to result in a permanent increase to ambient noise levels. Impacts would be less than significant (Class III).

Alternative 6

Noise impacts from construction, operation and maintenance of Alternative 6 would generally be the same as those anticipated from the Proposed Project. Alternative 6 would pass by a greater number of residential receptors than the Proposed Project, and would therefore be more likely to expose people to increased noise levels. Therefore, while construction activities associated with Alternative 6 would result in similar noise levels as the Proposed Project, these activities would also pass within close proximity to a greater number of sensitive receptors. Therefore, the potential to expose sensitive receptors to excessive noise levels and groundborne vibration during construction would be higher under implementation of Alternative 6. However, as with the

Proposed Project, implementation of Mitigation Measures 4.10-1, 4.10-4a, 4.10-4b, 4.10-5 would reduce impacts from construction of Alternative 6 to less than significant (Class II).

As with the Proposed Project, the primary noise source from operation of Alternative 6 would be corona discharge. Similarly to the Proposed Project, maximum CNEL associated with corona discharge would be approximately 44 dBA at the edge of the ROW and would occur only during wet weather conditions. Therefore, operation of Alternative 6 would not violate any exterior noise level standards nor would it permanently increase ambient noise levels in the project vicinity. Maintenance activities would involve the same activities as the Proposed Project, and would therefore not be expected to result in a permanent increase to ambient noise levels. Impacts would be less than significant (Class III).

Alternative 6 would be located within two miles of an airport (i.e., approximately 1.5 miles north of Woodlake Airport); however, it would not involve the development of noise-sensitive land uses, and thus, would not expose people to excessive aircraft noise. As identified for the Proposed Project, there would be no impact under Alternative 6 associated with exposing people to excessive airport noise (No Impact).

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