11 NOISE

This chapter includes a description of acoustic fundamentals and the existing noise environment in the project vicinity, a summary of applicable regulations, and analyses of potential short- and long-term noise impacts of the proposed project.

11.1 ENVIRONMENTAL SETTING

11.1.1 ACOUSTIC FUNDAMENTALS

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise. Common sources of environmental noise and noise levels are presented in Table 11-1.

Table 11-1 Typical Noise Levels

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet	100	
Gas lawnmower at 3 feet	90	
Diesel truck moving at 50 mph at 50 feet	80	Food blender at 3 feet, Garbage disposal at 3 feet
Noisy urban area, Gas lawnmower at 100 feet	70	Vacuum cleaner at 10 feet, Normal speech at 3 feet
Commercial area, Heavy traffic at 300 feet	60	
Quiet urban daytime	50	Large business office, Dishwasher in next room
Quiet urban nighttime	40	Theater, Large conference room (background)
Quiet suburban nighttime	30	Library, Bedroom at night, Concert hall (background)
Quiet rural nighttime	20	Broadcast/Recording Studio
	10	
Threshold of Human Hearing	0	Threshold of Human Hearing

Notes: dB=A-weighted decibels; mph=miles per hour
Source: Caltrans 2009

SOUND PROPERTIES

A sound wave is initiated in a medium by a vibrating object (e.g., vocal chords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in hertz.

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and have a more useable numbering system, the decibel (dB) scale was introduced. A sound level expressed in decibels is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure. For sound pressure in air the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly summed.

For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100 fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted sound levels (dBA). For this reason the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this chapter are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (i.e., transportation) such as automobiles, trucks, and airplanes and stationary sources (i.e., nontransportation) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (i.e., decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers. Noise generated from mobile sources generally attenuate at a rate of 4.5 dB per doubling of distance. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 to 7.5 dB per doubling of distance.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, and intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction (i.e., shielding) provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural (e.g., berms, hills, and dense vegetation) and human-made features (e.g., buildings and walls) may be used as noise barriers.

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dB with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30–40 dB with its windows closed (Caltrans 2002).

COMMON NOISE DESCRIPTORS

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment. The noise descriptors most often in relation to the environment are defined below (Caltrans 2009).

- Equivalent Noise Level (L_{eq}): The equivalent steady-state noise level in a stated period of time that would contain the same acoustic energy as the time-varying noise level during the same period (i.e., average noise level).
- Maximum Noise Level (L_{max}): The highest instantaneous noise level during a specified time period.
- Minimum Noise Level (L_{min}): The lowest instantaneous noise level during a specified time period.
- Day-Night Noise Level (L_{dn}): The 24-hour L_{eq} with a 10-dB penalty applied during the noise-sensitive hours from 10 p.m. to 7 a.m., which are typically reserved for sleeping.

- Community Noise Equivalent Level (CNEL): Similar to the L_{dn} described above with an additional 5-dB penalty applied during the noise-sensitive hours from 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and watching television.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the L_{eq} descriptor listed above, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

EFFECTS OF NOISE ON HUMANS

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustom to, the less tolerable the new noise source will be perceived.

With respect to how humans perceive and react to changes in noise levels, a 1 dB increase is imperceptible, a 3 dB increase is barely perceptible, a 6 dB increase is clearly noticeable, and a 10 dB increase is subjectively perceived as approximately twice as loud (Egan 2007). These subjective reactions to changes in noise levels were developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dB, as this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dB or more is typically considered substantial in terms of the degradation of the existing noise environment.

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart

disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (Caltrans 2009).

VIBRATION

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

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2006, Caltrans 2004). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

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

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

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

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table 11-2 describes the general human response to different levels of ground vibration-velocity levels.

Table 11-2 Human Response to Different Levels of Ground Noise and Vibration

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

Notes: VdB = vibration decibels referenced to 1 µ inch/second and based on the root mean square (RMS) velocity amplitude.
Source: FTA 2006

11.1.2 SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, schools, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Places of worship and transit lodging, and other places where low interior noise levels are essential are also considered noise-sensitive. Those noted above are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

Existing noise- and vibration- sensitive land uses in the vicinity of the project site primarily include single-family residences. Two temporary caretaker residences are located on the Eastern Regional MRF and Transfer Station site. The 3.7-acre project site includes one of the temporary caretaker residences, which would be removed as part of the project. The caretaker residence that would remain is located approximately 775 feet to the northwest of the project site. The closest offsite residences are approximately 1,500 feet to the east, across SR 89 and on the west side of the Truckee River. There are no other sensitive land uses located in close proximity to the project site.

11.1.3 SOURCES AND AMBIENT LEVELS

The existing noise environment in the project area is primarily influenced by transportation noise from vehicle traffic on the roadway systems (i.e., Cabin Creek Road). Other noise sources that contribute to the existing noise environment include existing activities on the Eastern Regional MRF and Transfer Station site. In addition, and to a lesser extent, occasional aircraft noise associated with the Truckee Tahoe Airport and noises associated with commercial and residential land uses (e.g., landscaping equipment, car doors slamming) influence the existing noise environment. Those noise sources noted above are also considered sources of vibration in the project area. Refer to Exhibit 11-1 for specific locations in relation to the proposed project.

An ambient noise survey was conducted on October 12, 2011. The purpose of the survey was to establish existing noise conditions in the project vicinity. A long-term noise measurement was taken near the entrance of the site and nearby the existing temporary caretaker residences located to the north and south of Cabin Creek Road (See Exhibit 11-1). Noise level measurements were taken in accordance with American National Standards Institute (ANSI) standards using a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter (SLM). The SLM was calibrated before and after use with an LDL Model CAL200 acoustical calibrator. The equipment used meets all pertinent specifications of the ANSI for Type 1 SLMs (ANSI S1.4-1983[R2006]). Meteorological conditions during the measurement period were adequate for reliable noise measurements, with clear blue skies, temperatures ranging from 50 °F to 70 °F, and light winds averaging one mile per hour (mph). Refer to Exhibit 11-1 for the specific location in relation to the project site. Refer to Table 11-3 and Exhibit 11-2 for a summary of the measurement data.

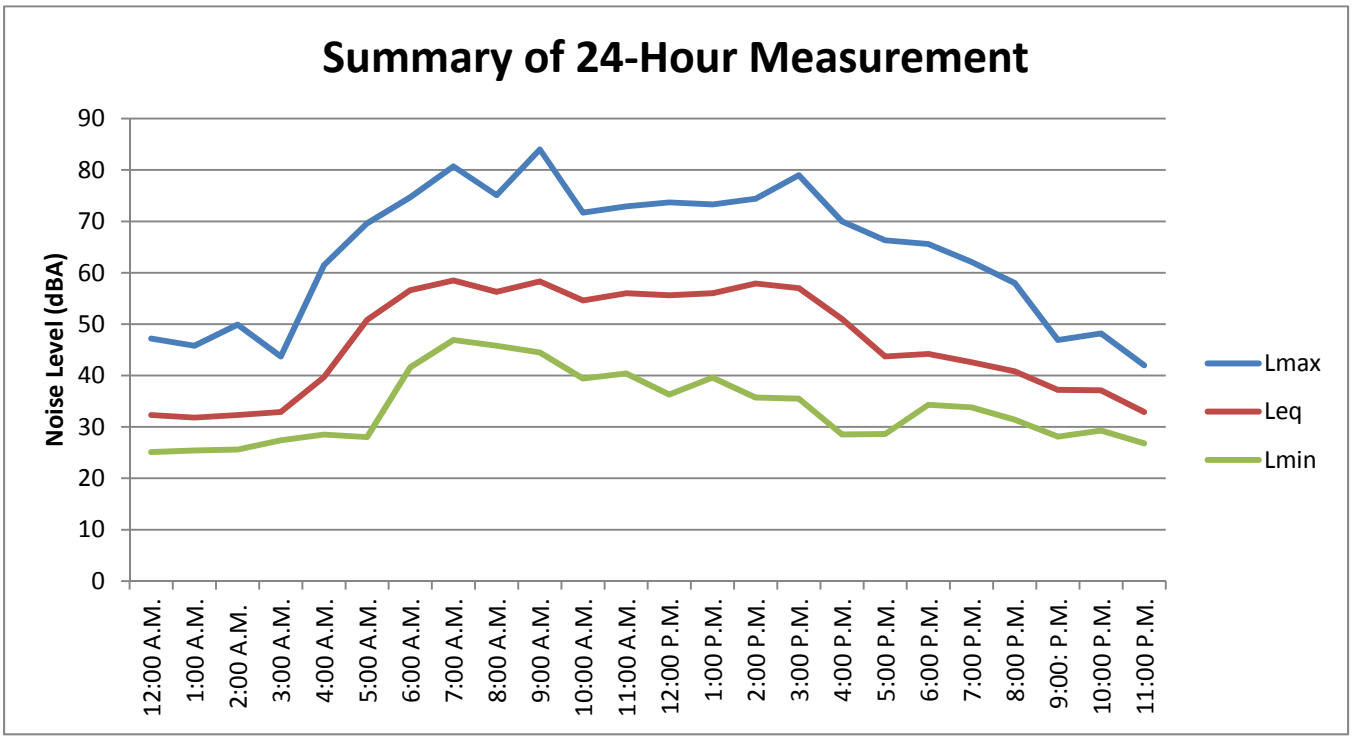
Existing traffic noise levels were modeled for roadway segments in the project vicinity based on Caltrans' traffic noise analysis protocol and the technical noise supplement (Caltrans 2006 and 2009) and project-specific traffic data (Appendix C of this DEIR). Truck usage and vehicle speeds on study area roadways were estimated from field observations, the project-specific traffic report, and information from existing studies of the project site.

Source: Placer County 2011

Exhibit 11-1 Ambient Noise Monitoring and Existing Noise -Sensitive Receptor Locations

Table 11-3 Summary of Existing Ambient Noise Level Measurements									
Location	Start (Date/Time)	Stop (Date/Time)	dB						
			CNEL/L_{dn}	Daytime			Nighttime		
				L_{eq}	L_{max}	L_{min}	L_{eq}	L_{max}	L_{min}
Site 1	October 12, 2011/12:00 pm	October 13, 2011/12:00 pm	56.5/56.4	54.6	84	66	48.7	69	25

Notes: dB = A-weighted decibels; CNEL = community noise equivalent level; L_{dn} = day-night noise level; L_{eq} = energy-equivalent noise level; L_{max} = maximum noise level; L_{min} = minimum noise level.
Site 1 corresponds to the location shown in Exhibit 11-1.
Source: Monitoring performed by Ascent Environmental, Inc. October, 2011.



Notes: dB = A-weighted decibels; L_{eq} = energy-equivalent noise level; L_{max} = maximum noise level; L_{min} = minimum noise level.
Data represents monitoring data at Cabin Creek Site (October 11-13, 2011).
Source: Monitoring performed by Ascent Environmental, Inc. October, 2011.

Exhibit 11-2 **Summary of Existing Ambient Noise Level Measurements**

Table 11-4 summarizes the modeled existing traffic noise levels at 100 feet from the centerline of each major roadway in the project vicinity and lists distances from each roadway centerline to the 65-dB, 60-dB, and 55-dB CNEL/L_{dn} traffic noise contours. Traffic noise modeling results are based on existing average daily traffic (ADT) volumes and speeds from the project-specific traffic report analysis and assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings). As shown in Table 11-4, the location of the 60-dB CNEL/L_{dn} traffic noise contours along segments in the project vicinity range from 27 to 279 feet from the centerline of the modeled roadways under existing conditions. The extent to which existing land uses in the project vicinity are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

Table 11-4 Summary of Modeled Existing Traffic Noise Levels

Roadway Segment	Between		CNEL/L_{dn} (dB) at 100 feet from Roadway Centerline	Distance (feet) from Roadway Centerline to CNEL/L_{dn} (dB)		
	From	To		65	60	55
Cabin Creek Road	West of State Route 89		51.5	13	27	58
State Route 89	Squaw Valley Road		64.3	90	193	416
State Route 89	Placer County/Nevada County Line		66.7	129	279	600

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level
Refer to Appendix E for detailed modeling input data and output results.
Source: Data modeled by Ascent Environmental, Inc. 2012

11.2 REGULATORY SETTING

Various private and public agencies have established noise guidelines and standards to protect citizens from potential hearing damage and other adverse physiological and social effects associated with noise. Applicable standards and guidelines are described below.

11.2.1 FEDERAL

The U.S. Environmental Protection Agency's (EPA's) Office of Noise Abatement and Control was originally established to coordinate Federal noise control activities. After its inception EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies where relevant.

11.2.2 STATE

The State of California has adopted noise standards in areas of regulation not preempted by the Federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation.

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, establishes building standards applicable to all occupancies throughout the state. The code provides acoustical regulations for both exterior-to-interior sound insulation as well as sound and impact isolation between adjacent spaces of various occupied units. Title 24 regulations state that interior noise levels generated by exterior noise sources shall not exceed 45 dB L_{dn}/CNEL, with windows closed, in any habitable room for general residential uses.

Though not adopted by law, the *State of California General Plan Guidelines 2003*, published by the California Governor's Office of Planning and Research (OPR), provides guidance for the compatibility of projects within areas of specific noise exposure. Table 11-5 presents acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table 11-5 Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (L_{dn} or CNEL, dBA)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential - Single Family, Duplex, Mobile Home	<60	60-70	70-75	75+
Residential - Multiple Family	<65	65-70	70-75	75+
Transient Lodging, Motel, Hotel	<65	65-70	70-80	80+
School, Library, Church, Hospital, Nursing Home	<65	65-70	70-80	80+
Auditorium, Concert Hall, Amphitheater		<70		70+
Sports Arenas - Outdoor Spectator Sports		<75		75+
Playground, Neighborhood Park	<70		70-75	75+
Golf Courses, Stable, Water Recreation, Cemetery	<75		75-80	80+
Office Building, Business Commercial and Professional	<70	70-75	75+	
Industrial, Manufacturing, Utilities, Agriculture	<75	75-80	75+	

1 Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
2 New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
3 New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4 New construction or development should generally not be undertaken.
Source: State of California Governor's Office of Planning and Research 2003

11.2.3 LOCAL

The Placer County General Plan Noise Element contains noise policies and standards (e.g., exterior and interior noise-level performance standards for new projects affected by or including non-transportation noise sources, and maximum allowable noise exposure levels for transportation noise sources) (Placer County 1994) and the Placer County Noise Ordinance (Article 9.36 of the Placer County Code) contains noise limits for sensitive receptors (Placer County 2004). The applicable policies and standards contained in the General Plan and Ordinance are summarized below. Project consistency with these policies is addressed in Table 4.1 in Chapter 4, Land Use.

PLACER COUNTY GENERAL PLAN

- **Policy 9.A.2:** The County shall require that noise created by new non-transportation noise sources be mitigated so as not to exceed the noise level standards of Table 11-6 as measured immediately within the property line of lands designated for noise-sensitive uses.
- **Policy 9.A.5:** Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 11-6 at existing or planned noise-sensitive uses, the County shall require submission of an acoustical analysis as part of the environmental review process so that noise mitigation may be included in the project design.
- **Policy 9.A.9:** Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 11-7 at outdoor activity areas or interior spaces of existing noise-sensitive land uses.

Table 11-6 Placer County Allowable L_{dn} Noise Levels Within Specified Zone Districts[1] Applicable to New Projects Affected by or Including Non-Transportation Noise Sources

Zone District of Receptor	L_{dn} (dBA) at Property Line of Receiving Use	Interior Spaces (dBA)[2]
Residential Adjacent to Industrial[3]	60	45
Other Residential[4]	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood/General Commercial/Shopping Center	70	45
Heavy Commercial/Limited Industrial/Highway Service	75	45
Industrial	-	45
Industrial Park	75	45
Industrial Reserve	-	-
Airport	-	45
Unclassified	-	-
Farm/Agriculture Exclusive[6]	-	-
Recreation and Forestry	70	-

Notes:
Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.
Where existing transportation noise levels exceed the standards of this table, the allowable L_{dn} shall be raised to the same level as that of the ambient level.
If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, or if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dBA.
Where a use permit has established noise level standards for an existing use, those standards shall supersede the levels specified in this table. Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in this Table, said excess noise shall be considered the allowable level. If a new development is proposed which will be affected by noise from such an existing use, it will ordinarily be assumed that the noise levels already existing or those levels allowed by the existing use permit, whichever are greater, are those levels actually produced by the existing use.
Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art[5] at the time of expansion. In no case will expansion of an existing industrial operation because to decrease allowable noise emission limits. Increase emissions above those normally allowable should be limited to a one-time 5 dBA increase at the discretion of the decision-making body.
The noise level standards applicable to land uses containing incidental residential uses, such as caretaker dwellings at industrial facilities and homes on agriculturally-zoned land, shall be the standards applicable to the zone district, not those applicable to residential uses.
Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.

1 Overriding policy on interpretation of allowable noise levels: Industrial-zoned properties are confined to unique areas of the County, and are irreplaceable. Industries which provide primary wage-earner jobs in the County, if forced to relocate, will likely be forced to leave the County. For this reason, industries operating upon industrial zoned properties must be afforded reasonable opportunity to exercise the rights/privileges conferred upon them be their zoning. Whenever the allowable noise levels herein fall subject to interpretation relative to industrial activities, the benefit of the doubt shall be afforded to the industrial use.
Where an industrial use is subject to infrequent and unplanned upset or breakdown of operations resulting in increased noise emissions, where such upsets and breakdowns are reasonable considering the type of industry, and where the industrial use exercises due diligence in preventing as well as correcting such upsets and breakdowns, noise generated during such upsets and breakdowns shall not be included in calculations to determine conformance with allowable noise levels.

2 Interior spaces are defined as any locations where some degree of noise-sensitivity exists. Examples include all habitable rooms of residences, and areas where communication and speech intelligibility are essential, such as classrooms and offices.

3 Noise from industrial operations may be difficult to mitigate in a cost-effective manner. In recognition of this fact, the exterior noise standards for residential zone districts immediately adjacent to industrial, limited industrial, industrial park, and industrial reserve zone districts have been increased by 10 dB as compared to residential districts adjacent to other land uses.
For purposes of the Noise Element, residential zone districts are defined to include the following zoning classifications:
AR, R-1, R-2, R-3, FR, RP, TR-1, TR-2, TR-3, and TR-4.

4 Where a residential zone district is located within an -SP combining district, the exterior noise level standards are applied at the outer boundary of the -SP district. If an existing industrial operation within an -SP district is expanded or modified, the noise level standards at the outer boundary of the -SP district may be increased as described above in these standards.
Where a new residential use is proposed in an -SP zone, an Administrative Review Permit is required, which may require mitigation measures at the residence for noise levels existing and/or allowed by use permit as described under "NOTES," above, in these standards.

5 State of the art should include the use of modern equipment with lower noise emissions, site design, and plant orientation to mitigate offsite noise impacts, and similar methodology.

6 Normally, agricultural uses are noise insensitive and will be treated in this way. However, conflicts with agricultural noise emissions can occur where single-family residences exist within agricultural zone districts. Therefore, where effects of agricultural noise upon residences located in these agricultural zones are a concern, an L_{dn} of 70 dBA will be considered acceptable outdoor exposure at a residence.

Source: Placer County 1994

Table 11-7 Placer County Maximum Allowable Noise Exposure Transportation Noise Sources			
Land Use	Outdoor Activity Areas[1]	Interior Spaces (dBA)	
	L_{dn}/CNEL (dBA)	L_{dn}/CNEL	L_{eq}[2]
Residential	60	45	-
Transient Lodging	60	45	-
Hospitals, Nursing Homes	60	45	-
Theaters, Auditoriums, Music Halls	-	-	35
Churches, Meeting Halls	60	-	40
Office Buildings	-	-	45
Schools, Libraries, Museums	-	-	45
Playgrounds, Neighborhood Parks	70	-	-

[1] Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
[2] As determined for a typical worst-case hour during periods of use.
[3] Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
Source: Placer County 1994

- **Policy 9.A.11:** The County shall implement one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses, or where the cumulative increase in noise levels resulting from new development significantly impacts noise-sensitive land uses:
  a. Rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses;
  b. Lowering speed limits, if feasible and practical;
  c. Programs to pay for noise mitigation such as low cost loans to owners of noise-impacted property or establishment of developer fees;
  d. Acoustical treatment of buildings; or
  e. Construction of noise barriers.
- **Policy 9.A.12.** Where noise mitigation measures are required to achieve the standards of Tables 11-6 and 11-7, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.
- **Policy 9.B.3**. Because many industrial activities and processes necessarily produce noise which will likely be objectionable to nearby non-industrial land uses, existing and potential future industrial noise emissions shall be accommodated in all land use decisions.

PLACER COUNTY NOISE ORDINANCE

The Placer County Noise Ordinance (Article 9.36 of the Placer County Code) defines sound level performance standards for sensitive receptors (refer to Table 11-8). The ordinance states that it is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on properly owned, leased, occupied, or otherwise controlled by such a person that causes the exterior sound level, when measured at the property line of any affected sensitive receptor, to exceed the ambient sound level by 5 dBA or exceed the sound level standards as set forth in Table 11-8, whichever is greater.

Each of the sound level standards specified in Table 11-8 shall be reduced by 5 dBA for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus 5 dBA.

Table 11-8 Placer County Noise Ordinance Noise Level Standards for Sensitive Receptors

Sound Level Descriptor (dBA)	Daytime (7:00 AM to 10:00 PM)	Nighttime (10:00 PM to 7:00 AM)
Hourly L_{eq}	55	45
L_{max}	70	65

Source: Placer County 2004

According to Section 9.36.030, "Exemptions," some noise-generating activities are exempt from the above noise ordinance standards, including construction that is performed between 6:00 AM and 8:00 PM, Monday through Friday, and between 8:00 AM and 8:00 PM Saturday and Sunday, provided that all construction equipment is fitted with factory-installed muffler devices and maintained in good working order.

VIBRATION CRITERIA

CEQA states that the potential for any excessive ground noise and vibration levels must be analyzed; however, it does not define the term "excessive" vibration. Numerous public and private organizations and governing bodies have provided guidelines to assist in the analysis of ground noise and vibration; however, the Federal, state, and local governments have yet to establish specific ground noise and vibration requirements. The following publications of the FTA and Caltrans are two of the seminal works for the analysis of ground noise and vibration relating to transportation and construction-induced vibration.

With respect to structural damage, Caltrans recommends that a level of 0.2 in/sec PPV not be exceeded for the protection of normal residential buildings, and that 0.1 in/sec PPV not be exceeded for the protection of old or historically significant structures (Caltrans 2004).

To address the human response to groundborne vibration, FTA has guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines recommend 65 VdB referenced to one microinch per second (µin/sec) and based on the root mean square (RMS) velocity amplitude for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities); 80 VdB for residential uses and buildings where people normally sleep; and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices) (FTA 2006).

With respect to human response within residential uses (i.e., annoyance), FTA recommends maximum acceptable vibration levels of 80 VdB, respectively (FTA 2006).

11.3 IMPACTS

11.3.1 SIGNIFICANCE CRITERIA

In accordance with CEQA Guidelines Appendix G and Placer County's Environmental Questionnaire, noise impacts are considered significant if implementation of the proposed project under consideration would result in any of the following:

- Exposure of persons to or generation of noise levels in excess of applicable standards (e.g., long-term exposure of nearby sensitive receptors to increased stationary-source noise levels from project operations

that exceed exterior noise levels of 55 dB L_{eq} during daytime hours (7 a.m. to 10 p.m.) and 45 dBA L_{eq} during nighttime hours (10 p.m. to 7 a.m.).

- Exposure of persons to or generation of excessive ground vibration or ground noise levels (e.g., exceed Caltrans's recommended level of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or FTA's maximum acceptable level of 80 VdB with respect to human response for residential uses [i.e., annoyance] at nearby existing vibration-sensitive land uses);
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (e.g., long-term exposure of nearby sensitive receptors to increased stationary- or traffic source noise levels that exceed noise levels of 60 dB L_{eq} during daytime hours (7 a.m. to 10 p.m.) and 45 dBA L_{eq} during nighttime hours (10 p.m. to 7 a.m.).
- A substantial temporary (or periodic) increase in ambient noise levels in the project vicinity above levels existing without the project
- For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of an active private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

11.3.2 METHODS AND ASSUMPTIONS

To assess potential short-term (construction-related) noise and vibration impacts, sensitive receptors and their relative exposure were identified. Project-generated construction source noise and vibration levels were determined based on methodologies, reference emission levels, and usage factors from FTA's Guide on Transit Noise and Vibration Impact Assessment methodology (FTA 2006) and FHWA's Roadway Construction Noise Model User's Guide (FHWA 2006). Reference levels are noise and vibration emissions for specific equipment or activity types that are well documented and the usage thereof common practice in the field of acoustics.

With respect to non-transportation noise sources (e.g., stationary) associated with project implementation, the assessment of long-term (operational-related) impacts was based on reconnaissance data, existing documentation, reference noise emission levels, and standard attenuation rates and modeling techniques. As stated above, reference levels are noise emissions for specific equipment or activity types that are well documented and the usage thereof common practice in the field of acoustics.

To assess potential long-term (operation-related) noise impacts due to project-generated increases in traffic, modeling was conducted for affected roadway segments based on Caltrans' traffic noise analysis protocol and the technical noise supplement (Caltrans 2006 and 2009)and project-specific traffic data (Appendix C of this DEIR). The analysis is based on the reference noise emission levels for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors. Truck usage and vehicle speeds on study area roadways were estimated from field observations and the project-specific traffic report. Please note that the modeling conducted does not account for any natural or human-made shielding (e.g., the presence of vegetation, berms, walls, or buildings) and; consequently, represents worst-case noise levels.

To evaluate relative significance, noise and vibration impacts were determined based on comparisons to applicable regulations and guidance provided by federal, state, and local agencies.

11.3.3 ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

The project site is not located within two miles of an active private airstrip. The Truckee Tahoe Airport is a public airport located approximately 3.5 miles from the Eastern Regional MRF and Transfer Station. Thus, the proposed

project would not result in noise impacts related to the exposure of people residing or working in the project area to excessive aircraft-related noise levels. This issue is not discussed further in the EIR.

Operation of the biomass facility would result in the use of noise-generating equipment (e.g., chipping equipment and haul trucks) to collect and deliver biomass material at various locations throughout the fuel shed of the biomass facility. The noise generated from the use of heavy equipment would be similar to noise generated by equipment that is currently used for existing fuel reduction activities conducted by a variety of agencies throughout the forests. Additionally, these activities would take place during the less sensitive daytime hours of the day when people are most likely not in their homes and not sleeping. Therefore, because noise generated from biomass chipping and haul trucks would be similar to existing noise sources and would take place during the daytime, these activities would not result in substantial increase in noise at sensitive receptors, and this issue is not discussed further in the EIR.

11.3.4 IMPACT ANALYSIS

Impact 11-1	**Short-Term Construction Noise Impacts.** Existing noise-sensitive receptors are located in close proximity to proposed construction areas. However, as stated in the project description, construction activities would be limited to the less noise-sensitive hours of the day (e.g., 6:00 A.M. and 8:00 P.M. Monday through Friday and 8:00 A.M. and 8:00 P.M. Saturday and Sunday) and, therefore, would be exempt from the Placer County noise standards. Thus, short-term onsite construction source noise would not result in the exposure of persons to noise levels in excess of applicable standards, or a substantial temporary increase in ambient noise levels in the project vicinity above levels existing without the project. This impact would be **less than significant.**

Construction noise levels in the vicinity of the project site would fluctuate depending on the particular type, number, and duration of usage for the varying equipment. The effects of construction noise largely depend on the type of construction activities occurring on any given day, noise levels generated by those activities, distances to noise sensitive receptors, and the existing ambient noise environment in the receptor's vicinity. Construction generally occurs in several discrete stages, each phase requiring a specific complement of equipment with varying equipment type, quantity, and intensity. These variations in the operational characteristics of the equipment change the effect they have on the noise environment of the project site and in the surrounding community for the duration of the construction process.

To assess noise levels associated with the various equipment types and operations, construction equipment can be considered to operate in two modes, mobile and stationary. Mobile equipment sources move around a construction site performing tasks in a recurring manner (e.g., loaders, graders, dozers). Stationary equipment operates in a given location for an extended period of time to perform continuous or periodic operations. Operational characteristics of heavy construction equipment are additionally typified by short periods of full-power operation followed by extended periods of operation at lower power, idling, or powered-off conditions.

Additionally, when construction-related noise levels are being evaluated, activities that occur during the more noise-sensitive evening and nighttime hours are of increased concern. Because exterior ambient noise levels typically decrease during the late evening and nighttime hours as traffic volumes and commercial activities decrease, construction activities performed during these more noise-sensitive periods of the day can result in increased annoyance and potential sleep disruption for occupants of nearby residential uses.

The site preparation phase typically generates the most substantial noise levels because of the onsite equipment associated with grading, compacting, and excavation are the noisiest. Site preparation equipment and activities include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers). Erection of large

structural elements and mechanical systems could require the use of a crane for placement and assembly tasks, which may also generate noise levels. Although a detailed construction equipment list is not currently available, based on the types of construction activities associated with the proposed project (e.g., site grading, biomass facility construction, parking improvements) it is expected that the primary sources of noise would include backhoes, dozers, and graders. Noise emission levels from these types of construction equipment are shown in Table 11-9 below.

Table 11-9 Noise Emission Levels from Construction Equipment

Equipment Type	Typical Noise Level (dBA) @ 50 feet
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tools	85
Rail Saw	90
Rock Drill	98
Roller	74
Scraper	89
Trucks	74–88
Water Pump	76

Notes:
Assumes all equipment is fitted with a properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are manufacture-specified noise levels for each piece of heavy construction equipment.
Source: FTA 2006

Based on the information provided in Table 11-9 and accounting for typical usage factors of individual pieces of equipment and activity types along with typical attenuation rates, onsite construction-related activities could result in hourly average noise levels of approximately 85 dB L_{eq} and 89 dB L_{max} at 50 feet. Accounting for typical attenuation rates, these noise levels could reach 53 dB L_{eq} and 57 dB L_{max} at the closest sensitive receptor to the project site (i.e., 775 feet to the northwest of the project site), which could exceed the applicable exterior daytime noise standard of 55 dBA $L_{eq.}$

However, Section 9.36.030, “Exemptions,” of the Placer County Noise Ordinance, exempts construction related noise, provided that all construction activities are performed between 6:00 AM and 8:00 PM, Monday through Friday, and between 8:00 AM and 8:00 PM Saturday and Sunday. As stated in the project description, construction activities would be limited to the less noise-sensitive hours (e.g., daytime) between 6:00 A.M. and 8:00 P.M. Monday through Friday and 8:00 A.M. and 8:00 P.M. Saturday and Sunday, and, thus, consistent with the limitations of the County Noise Ordinance. Therefore, short-term onsite construction source noise would not

result in the exposure of persons to or generation of noise levels in excess of applicable standards, or a substantial temporary increase in ambient noise levels in the project vicinity above levels existing without the project. This impact would be **less than significant.**

Impact 11-2	Ground Vibration Impacts. Construction- and operational-related project activities would not result in vibration levels at the nearest sensitive land use that exceed Caltrans's recommended level of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or FTA's maximum acceptable level of 80 VdB with respect to human response for residential uses (i.e., annoyance). Thus, implementation of the project would not result in the exposure of existing sensitive receptors to excessive ground vibration or noise levels. Therefore, this impact is considered less than significant.

The project includes the construction and operation of a two MW biomass energy facility. Construction activities are anticipated to result in the greatest levels of ground vibration from the potential use of blasting to remove unwanted stone and earth material. Sources of ground vibration from operation of the facility include the use of trucks to carry woody material to and from the project site, and ground vibration levels from the use of trucks is minimal in comparison to blasting. Therefore, ground vibration from construction related activities is the focus of this analysis.

Construction of the project may result in varying degrees of temporary ground vibration and noise, depending on the specific construction equipment used and activities involved. Ground vibration and noise levels associated with various types of construction equipment and activities are summarized in Table 11-10. Although a detailed construction equipment list is not currently available, based on the types of construction activities associated with the proposed project (e.g., roadway and facility construction, retaining walls, and parking improvements) and the location of the project site, it is possible that blasting could be required if stone is encountered during construction activities and, therefore, maximum ground vibration and noise levels would be associated with the use of blasting.

Table 11-10 Representative Ground Vibration and Noise Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)[1]	Approximate L_v (VdB) at 25 feet[2]
Blasting	1.13	109
Large Dozer	0.089	87
Caisson Drilling	0.089	87
Trucks	0.076	86
Rock Breaker	0.059	83
Jackhammer	0.035	79
Small Dozer	0.003	58

[1] Where PPV is the peak particle velocity
[2] Where Lv is the root mean square velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.
Source: FTA 2006

According to FTA, levels associated with blasting are 1.13 in/sec PPV and 109 VdB at 25 feet. Based on FTA's recommended procedure for applying a propagation adjustment to these reference levels, vibration levels from blasting could reach 0.038 in/sec PPV at the nearest structure (i.e., the MRF building located approximately 240 feet to the west of the project site), and 64 VdB at the nearest sensitive receptor (i.e. onsite resident located approximately 775 feet to the northwest of the project site). These levels would not exceed the Caltrans recommended level of 0.2 in/sac PPV with respect to the structural damage at the nearby MRF or the FTA's maximum acceptable level of 80 VdB with respect to human response for residential uses (i.e., annoyance), at

the nearby resident. Thus, implementation of the project would not result in the exposure of existing offsite sensitive receptors to excessive ground vibration levels. Therefore, this impact is considered **less than significant**.

Impact 11-3	Operational Stationary Source Noise Impacts. Project-generated stationary source noise levels would not exceed applicable noise standards and; therefore, would not result in a substantial increase in ambient noise levels at nearby existing noise-sensitive receptors. As a result, this impact is considered **less than significant**.

Implementation of the project would result in the following onsite noise-generating activities: fuel-delivery and biochar (gasification byproduct) hauling activities (e.g., truck unloading), fuel-handling and processing activities (e.g., material moving and storage with wheeled loader, biochar compaction), and operation mechanical equipment (e.g., internal combustion engine, transformer). The levels of noise typically associated with these types of stationary sources are discussed separately below.

FUEL-DELIVERY AND BIOCHAR HAULING-RELATED ACTIVITIES

Fuel delivery and hauling activities would be completed with the use of delivery trucks. While trucks are typically a mobile noise source, delivery- and hauling-related activities behave more like a stationary noise source when they operate on a project site because they primarily occur in one location (e.g., various operational modes including short periods of full-power operation followed by extended periods of operation at lower power, idling, powered-off conditions, or extended presence at a given location to perform continuous or periodic operations [e.g., weighing, unloading]). As discussed in the project description, all fuel delivery and biochar hauling would take place on weekdays during daytime hours throughout the months of May through November. Up to approximately 46 daily one-way truck trips (includes fuel delivery and biochar hauling) would result from daily operations of the biomass facility. With regard to a majority of these trips, the trucks would enter and leave the site from Cabin Creek Road. Based on reference noise values, such activities could result in noise levels of 60 dBA L_{eq} and 85 dBA L_{max} at a distance of 50 feet.

ONSITE FUEL-HANDLING AND STORAGE-RELATED ACTIVITIES

As discussed in the project description, material transported to the site would be unloaded and stored in the covered materials storage structure as well as the uncovered storage area. Onsite equipment would include a diesel-fueled wheeled loader used to move material into piles in the storage building (and uncovered storage area) and then to push material into the system that feeds the gasification equipment. The loader would also be used to load the biochar into outgoing haul trucks. Should more material be needed (beyond the four to five months) during the winter, chipped material would be hauled from the wood debris area at the Eastern Regional MRF and Transfer Station facility located within the same complex. Based on reference noise values and accounting for typical usage factors of individual pieces of equipment, such activities could result in noise levels of approximately 82 dB L_{eq} and 86 dB L_{max} at a distance of 50 feet. Activities within the fuel storage yard would be limited to the less noise-sensitive daytime hours.

MECHANICAL EQUIPMENT

As discussed in the project description, other mechanical equipment onsite would include two internal combustion engines, a transformer, water pumps, a fuel dryer, fuel conveyor system, and exhaust fans. Based on reference noise values and accounting for typical usage factors of individual pieces of equipment and activity types, such activities could result in noise levels of approximately 74 dB L_{eq} at a distance of 50 feet from the center of the project site. The operation of this stationary mechanical equipment would not be limited to the less noise-sensitive daytime hours.

TOTAL

In summary, all of the above activities associated with operation of the proposed project could result in combined noise levels of approximately 82 dB L_{eq} at 50 feet from the proposed facility footprint. Based on typical attenuation rates, project-generated noise levels at the closest existing noise-sensitive receptor (e.g., temporary caretaker residence located approximately 775 feet to the northwest of the project site) could reach approximately 50 dB L_{eq} during the daytime hours and 46 dB L_{eq} during the night time hours. As stated in the project description, the fuel-delivery and hauling would not typically occur during the more noise-sensitive hours of the day and, therefore, nighttime noise levels would be expected to be slightly lower than daytime noise levels. In addition, assuming a typical exterior-to-interior reduction amount of 15 dB, project-generated noise levels could result in interior noise levels of approximately 38 dB L_{dn} at the closest existing sensitive receptor (e.g., home located approximately 775 feet to the northwest of the project site). Refer to Exhibit 1 for the exact location of nearby existing land uses in relation to the project site.

Project-generated stationary source noise levels would not exceed the County's applicable threshold of 60 dB for exterior noise levels and 45 dB L_{dn} for interior noise levels for residential land uses located adjacent to industrial land uses at the noise-sensitive receptor located to the west of Cabin Creek Road. Additionally, Placer County has specific noise standards for sensitive receptors affected by new development. The project-generated stationary noise levels would not exceed the hourly 55 dB L_{eq} daytime standard at the nearby sensitive receptor but could exceed the nighttime standard of 45 dB L_{eq} (noise levels at 46 dB L_{eq}) When sound barriers (i.e., buildings, walls, etc.) are located in the direct path of a noise source, a typical attenuation rate of 5 dB reduction in noise levels would be achieved (Caltrans 2009:p. 2-45). The existing MRF building is located in the direct noise path between the existing noise sensitive receptor and the proposed biomass facility and, therefore, it would be expected and is reasonable to assume that the MRF building would serve as a typical sound barrier and would provide up to 5 dB in noise reduction from the proposed biomass facility. Therefore, accounting for attenuation from the existing building, and distance to the nearest noise-sensitive receptor, project-generated noise levels during nighttime hours could reach levels of 41 dB L_{eq}. These noise levels would comply with Placer County's nighttime hourly noise standard of 45 dB L_{eq}.

With regards to the daytime and nighttime standards of 70 dB L_{max} and 65 dB L_{max}, respectively, the stationary equipment (e.g., pumps, transformer, fans, dryer, fuel conveyance system, internal combustion engines) would operate continuously and, therefore, would generate a steady noise level in contrast to noise generated from the delivery trucks and loader that is characterized by more sporadic activities (e.g., doors slamming, beeping, the decompression of brakes), resulting in greater variability in maximum and minimum noise levels. Therefore, the maximum level of noise exposure at the nearest sensitive receptor would be 43 dB L_{max} and is equivalent to the estimated hourly L_{eq} of 43 dB, which would not exceed either the daytime or nighttime standard of 70 dB L_{max} or 65 dB L_{max}, respectively. The delivery trucks and loader would only operate during the daytime hours and could result in noise levels of 86 dB L_{max} at a distance of 50 feet. Based on typical attenuation rates, noise at the nearest sensitive receptor located approximately 775 away would be approximately 56 dB L_{max}, and, therefore, would not exceed the daytime standard of 70 dB L_{max}.

Thus, project-generated stationary source noise levels would not exceed applicable noise standards and would not result in a substantial increase in ambient noise levels at nearby existing noise-sensitive receptors. As a result, this impact is considered **less than significant.**

Impact 11-4	**Operational Traffic Noise Impacts.** Implementation of the project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project with regard to the long-term exposure of existing sensitive receptors to project-generated operational-related increases in traffic source noise levels. Therefore, this impact is considered **less than significant**.

Project implementation would result in an increase in ADT volumes on affected roadway segments and, potentially, an increase in traffic source noise levels. Generally, a doubling of a noise source is required to result in an increase of 3 dB, which is perceived as barely noticeable by humans (Egan 2007: p. 21). The Placer County Noise Ordinance establishes a 5 dB increase in a noise sources as a substantial noise increase. Thus, in regards to traffic noise specifically, an increase in 5 dB or more in traffic noise would be considered substantial.

To assess this impact, traffic noise levels associated with the proposed project under existing no project and plus project conditions were predicted for affected roadway segments. Table 11-11 summarizes the modeled traffic noise levels at 100 feet from the roadway centerlines under existing no project and existing plus project conditions along with the overall net change. As shown in Table 11-11, project implementation would result in a maximum increase of less than one dB along Cabin Creek Road.

Cabin Creek Road would represent the greatest increase in traffic volume, and thus traffic noise, because all truck delivery, haul trips, and employee trips would terminate at the project site and use Cabin Creek Road as a primary means of ingress and egress to the project site. As shown by the modeling below, the additional trips as a result of the proposed project would not result in substantial increases (i.e., 5 dB or greater) in traffic noise on affected roadways. This is primarily due to the fact that existing traffic volumes are relatively high and the additional trips would be a minimal increase in comparison to existing traffic volumes. Thus, increases in traffic as a result of the proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project with regard to the long-term exposure of existing sensitive receptors to project-generated operational-related increases in traffic source noise levels. Therefore, this impact is considered **less than significant.**

Table 11-11 Summary of Modeled Traffic Noise Levels under Existing No Project and Existing Plus Project Conditions

Roadway Segment	Location	CNEL/L_{dn} (dB) at 100 feet from Roadway Centerline		Net Change (dB)
		Existing (No Project) Conditions	Existing (Plus Project) Conditions	
Cabin Creek Road	West of State Route 89	51.5	52.3	+0.8
State Route 89	Squaw Valley Road	64.3	64.3	0
State Route 89	Placer County/Nevada County Line	66.7	66.7	0

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level
The net change may not be the exact difference between no project and plus project conditions due to rounding.
Refer to Appendix E for detailed modeling input data and output results.
Source: Data modeled by Ascent Environmental, Inc. 2010

11.4 MITIGATION MEASURES

No mitigation measures would be necessary.

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