

5.8 NOISE

This section addresses community noise impacts from project-related short-term and long-term noise sources. The noise analysis is based on project characteristics provided by the applicant.

5.8.1 Setting

5.8.1.1 Characteristics and Measurements of Noise

General Information on Noise. Noise is generally defined as unwanted or objectionable sound. Decibels and other technical terms are defined in Table 5.8-1. Noise levels are measured on a logarithmic scale because of physical characteristics of sound transmission and reception. Noise energy is typically reported in units of decibels (dB). Noise levels diminish (or attenuate) as distance to the source increases according to the inverse square rule, but the rate constant varies with type of sound source. Sound attenuation from point sources, such as industrial facilities, is about 6 dB per doubling of distance. Heavily traveled roads with few gaps in traffic behave as continuous line sources and attenuate at 3 dB per doubling of distance. Noise from more lightly traveled roads is attenuated at 4.5 dB per doubling of distance.

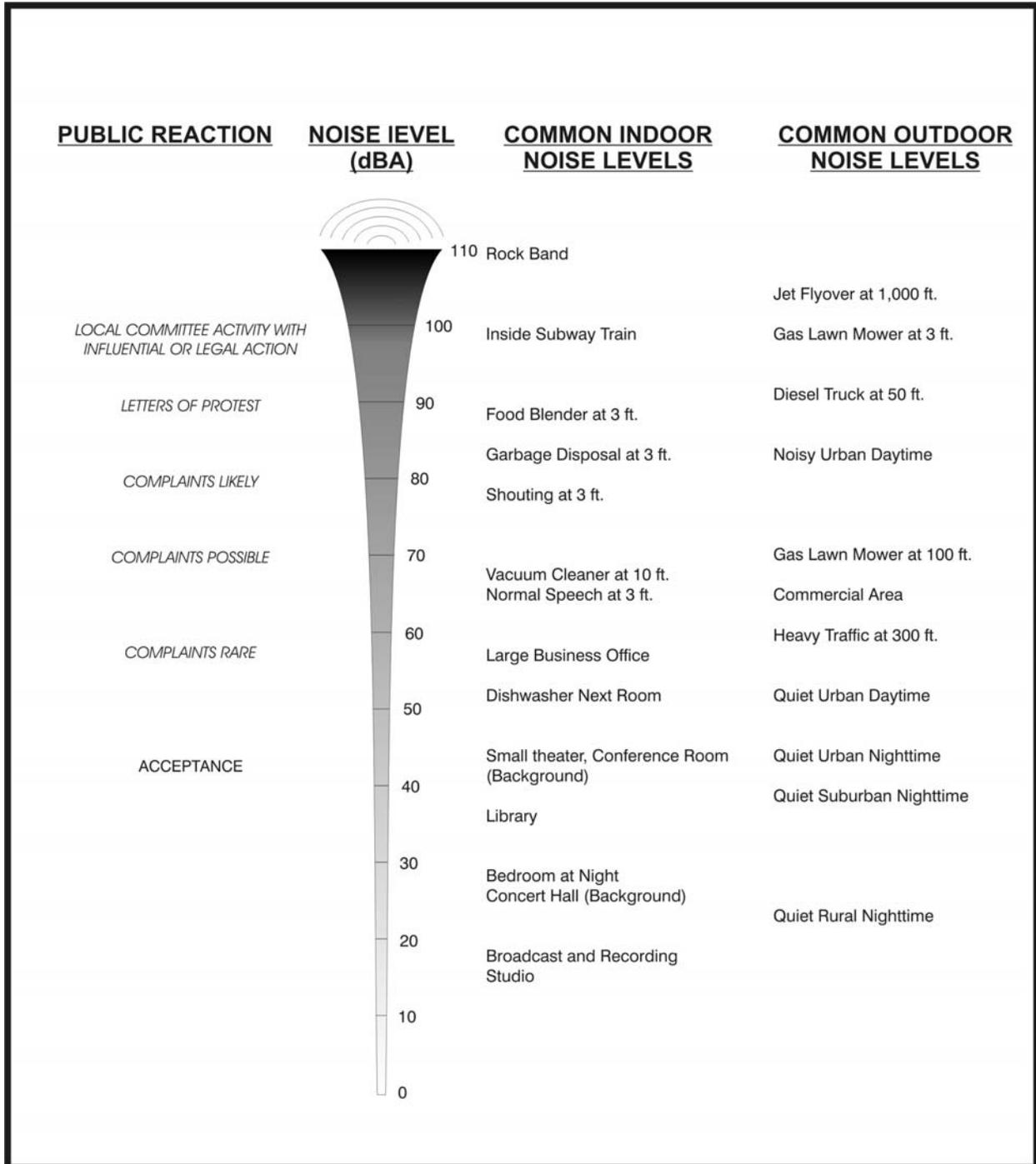
Community noise levels are measured in terms of the A-weighted decibel (dBA). A-weighting is a frequency correction that correlates overall sound pressure levels with the frequency response of the human ear. Equivalent noise level (L_{eq}) is the average noise level on an energy basis for a specific time period. The duration of noise and the time of day at which it occurs are important factors in determining the impact on communities. Figure 5.8-1 provides a graphical representation of sound energy and potential adverse effects of common sounds. Noise is more disturbing at night and noise indices have been developed to account for the time of day and duration of noise generation. The Community Noise Equivalent (CNEL) and Day Night Average Level (DNL or L_{dn}) are such indices. These indices are time-weighted average values equal to the amount of acoustic energy equivalent to a time-varying sound over a 24-hour period. The CNEL index penalizes night-time noise (10 p.m. to 7 a.m.) by adding 5 dB to account for increased sensitivity of the community after dark. The L_{dn} index penalizes night-time noise the same as the CNEL index, but does not penalize evening noise.

Effects of Noise. People are subject to a multitude of sounds in the environment. Typical noise levels of indoor/outdoor environments and public response to these sounds are shown in Figure 5.8-1. Excessive noise cannot only be undesirable but may also cause physical and/or psychological damage. The amount of annoyance or damage caused by noise is dependent primarily upon three factors: the amount and nature of the noise, the amount of ambient noise present before the intruding noise, and the activity of the person working or living in the noise source area.

Table 5.8-1. Definitions of Acoustical Terms

Term	Definitions
Decibel, DB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the sample sound pressure to the standard sound pressure, which is 20 micropascals (20 micronewtons per square meter)
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. All sound levels in this reports are A-weighted
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 P.M. to 10:00 P.M. and after addition of 10 decibels to sound levels in the night between 10:00 P.M. and 7:00 A.M.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 P.M. and 7:00 A.M.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal or information content, as well as the prevailing ambient noise level

Figure 5.8-1. Magnitude of Common Sounds



The difficulty in relating noise exposure to public health and welfare is one of the major obstacles in determining appropriate maximum noise levels. Although there has been some dispute in the scientific community regarding the detrimental effects of noise, a number of general conclusions have been reached:

- Noise of sufficient intensity can cause irreversible hearing damage;
- Noise can produce physiological changes in humans and animals;
- Noise can interfere with speech and other communication; and,
- Noise can be a major source of annoyance by disturbing sleep, rest, and relaxation.

5.8.1.2 Noise Sensitive Land Uses

The County's Noise Element has identified noise sensitive land uses as follows:

- Residential development, except temporary dwellings and residential accessory uses
- Schools – preschool to secondary, college and university, specialized education and training
- Health care services (hospitals)
- Nursing and personnel care
- Churches
- Public assembly and entertainment
- Libraries and museums
- Hotel and motels
- Bed and breakfast facilities
- Outdoor sports and recreation
- Offices

5.8.1.3 Existing Noise Environment

Noise Sources. There are a number of potentially significant sources of community noise within San Luis Obispo County and its incorporated cities. These sources include traffic on state highways, major county roadways, and city streets; railroad operations; airport operations; military activities; and loud stationary facilities.

The asphalt plant site is located within an existing heavy commercial/industrial area, with a concrete batch plant and green waste recycling facility in close proximity. The facilities generate noise as a result of vehicles (primarily heavy-duty trucks), stationary equipment and mobile equipment. In addition, the asphalt plant site is located adjacent to U.S. 101 which generates noise through motor vehicle travel. The area affected by the proposed LUO/LUE amendment is also exposed to traffic noise from U.S. 101, and noise from the green waste recycling facility to the south.

Receptors. Noise sensitive receptors within the region of influence of the proposed project include several single-family residences located within and immediately to the north of the proposed LUO/LUE amendment area, and residential developments in Santa Maria, directly across the Santa Maria River from the asphalt plant site.

Ambient Noise Levels. Ambient noise levels were monitored at two locations adjacent to existing sensitive receptors, using a Larson-Davis DSP-80 precision integrating sound level meter. The sound level meter was calibrated using a Larson-Davis CAL200 sound generating calibrator. The first location is within the proposed LUO/LUE amendment area, the second location is adjacent to the Riverside Mobile Home Park, the nearest sensitive receptor in Santa Barbara County. The noise measurements were conducted on July 27, 2004 and October 8, 2004 (see Table 5.8-2). Nighttime ambient noise was measured at 4:15 a.m. on October 8, 2004, within the LUO/LUE amendment area. Table 5.8-2 also includes data provided by the applicant's *Preliminary Noise Study* by West Coast Environmental and Engineering (2003). These data indicate an average daytime ambient noise level of 57.1 dBA Leq within the LUO/LUE amendment area, and a peak nighttime ambient noise level of 58.1 dBA Leq. The large range of noise levels measured within the LUO/LUE amendment area (50.1 to 63.1 dBA Leq) appear to be a result of the large variation in activity at the existing concrete batch plant.

Table 5.8-2. Ambient Noise Levels at Nearby Residences

Data Source	Distance (feet)	Date	Time	Average Noise Level (dBA Leq)
Residence within LUO/LUE Amendment Area				
West Coast Environmental	600 feet from asphalt plant site	11/14/02	1301-1316 daytime	58.1
Padre Associates	800 feet from asphalt plant site	7/27/04	1422-1442 daytime	50.1
Padre Associates	700 feet from asphalt plant site	10/8/04	1645-1705 daytime	63.1
Padre Associates	700 feet from asphalt plant site	10/8/04	0415-0435 nighttime	58.1
Santa Barbara County, Riverside Mobile Home Park				
West Coast Environmental	1,850 feet from asphalt plant site	11/14/02	1133-1147 daytime	65.1
Padre Associates	1,750 feet from asphalt plant site	7/27/04	1452-1512 daytime	55.6

5.8.1.4 Regulatory Setting

Noise generated by the proposed project would affect receptors in San Luis Obispo and Santa Barbara counties; therefore, applicable policies for both counties are presented here.

San Luis Obispo County. The Noise Element of the San Luis Obispo County General Plan provides a policy framework within which potential noise impacts may be addressed during project review and long-range planning. The San Luis Obispo Noise Element contains policies that are applicable to all development in the County, the most relevant of which are summarized below. Proposed activities that do not conform to these policies constitute a significant impact.

Policy 3.3.2. “New develop of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected future levels of noise from transportation noise sources which exceed 60 dB L_{dn} or CNEL (70 L_{dn} or CNEL for outdoor sports and recreation) unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to or level the levels specified for the given land use in Table 3-1.

Policy 3.3.5. “Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated as follows and shall be the responsibility of the developer of the stationary noise:

For new proposed resource extraction, manufacturing or processing noise sources or modifications to those sources which increase noise levels: where such noise source will expose existing noise-sensitive land uses (which are listed in the Land Use Element as allowable uses within their land use categories) to noise levels which exceed [a daytime L_{eq} of 50 dBA and nighttime L_{eq} of 45 dBA], best available control technologies shall be used to minimize noise levels. The noise levels shall in no case exceed [a daytime L_{eq} of 50 dBA and nighttime L_{eq} of 45 dBA].”

Policy 3.3.6. “San Luis Obispo County shall consider implementing mitigation measures where existing noise levels produce significant noise impacts to noise sensitive land uses or where new development may result in cumulative increases of noise upon noise sensitive land uses.”

Santa Barbara County. In planning land use, 65 dBA CNEL is the maximum exterior noise exposure compatible with noise-sensitive uses unless mitigation features are included in project designs.

City of Santa Maria. The City boundary is located south of the project site, along the south bank of the Santa Maria River. The City’s General Plan Noise Element limits exterior noise at residences to 60 dBA CNEL, 65 dBA CNEL at commercial land uses, and 70 dBA CNEL at industrial land uses.



Source: County of San Luis Obispo

NOISE MEASUREMENT LOCATIONS
FIGURE 5.8-2

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Impact Analysis

Project impacts include both short-term impacts (construction-related) and long-term impacts (operation-related). Short-term impacts consist of noise generated by construction equipment, vehicles associated with grading, excavation/trenching, and erection of structures. Long-term impacts would be associated with operation of new commercial and industrial facilities, such as the asphalt plant, including noise generated by heavy-duty trucks, stationary equipment, and mobile equipment. These impacts would be significant if the project results in an exceedance of acceptable noise standards.

5.8.2.15.8.1.5 Thresholds of Significance

San Luis Obispo County. Consistent with the stationary source noise exposure limits of the Noise Element of the General Plan, exterior noise levels at noise-sensitive receptors exceeding an hourly average (L_{eq}) of 50 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at night (10:00 p.m. to 7:00 a.m.) will be considered a significant impact. Consistent with Section 22.06.044 of the Land Use Ordinance, exterior noise levels exceeding 1 dBA over the existing noise level will be considered a significant impact if existing noise levels exceed 50 dBA Leq daytime, or 45 dBA Leq nighttime. Therefore, the daytime threshold is 58.1 dBA Leq and the nighttime threshold is 59.1 dBA Leq, at the nearest residence.

Consistent with the Noise Element, new development exposed to existing or projected future noise levels of noise from transportation noise sources which exceed 60 dB L_{dn} is considered a significant impact.

Consistent with Section 22.06.042 of the Land Use Ordinance, noise generated by construction activities are exempt from the noise standards, provided such activities are limited to 7 a.m. to 9 p.m. on weekdays, and 8 a.m. to 5 p.m. on weekends.

Santa Barbara County. Project-related exterior noise levels exceeding 65 dBA CNEL at noise-sensitive receptors in Santa Barbara County will be considered a significant impact. Noise generated by construction activities greater than 1,600 feet away from noise-sensitive receptors are considered a less than significant impact.

City of Santa Maria. Project-related exterior noise levels exceeding 60 dBA CNEL at residential receptors in the City of Santa Maria will be considered a significant impact.

5.8.2.25.8.1.6 Asphalt Plant - Short-term Impacts

Impact NOS-1: Construction activities would result in short-term noise impacts to nearby residences.

Discussion: Noise generated by construction was estimated for a peak day during site grading. Noise levels would reach 62.4 dBA Leq at the nearest residences within the LUO/LUE amendment area, which would exceed the threshold of significance established in Section 5.8.2.1 (58.1 dBA Leq daytime). Noise-sensitive receptors in Santa Barbara County are located greater than 1,600 feet from the asphalt plant site. Therefore, construction-related impacts to residences in adjacent Santa Barbara County would be less than significant.

Impact Category: Class 2

Mitigation Measure NOS-1:

- A. No use of heavy equipment or heavy-duty trucks shall occur between 9 p.m. and 7 a.m. on weekdays, or between 5 p.m. and 8 a.m. on weekends;
- B. Equipment engine covers shall be in place and mufflers shall be in good condition; and
- C. Adjacent residents and the County of San Luis Obispo will be given advanced written notification of proposed construction activities, scheduling and hours of construction, and noise compliant procedures to minimize potential annoyance related to construction activities.

Residual Impacts

With the incorporation of mitigation, impacts would be insignificant.

5.8.2-35.8.1.7 Asphalt Plant - Long-term Impacts

Impact NOS-2: Asphalt plant operation would result in noise impacts to nearby residences.

Discussion: Noise generated by stationary equipment, mobile equipment and motor vehicles were estimated for peak day operation (6,000 tons per day) and logarithmically added to the existing average ambient noise level (57.1 dBA Leq) to determine post project noise level at the nearest sensitive receptor. Estimates of stationary equipment noise are based on noise contours provided by the plant manufacturer (ALmix), and calculated geometric divergence and ground attenuation assuming a 6 db drop per doubling of distance. Mobile equipment noise (two wheeled loaders and one backhoe) was estimated using noise reference values from EPA (1971), and calculated geometric divergence and ground attenuation assuming a 6 db drop per doubling of distance. Motor vehicle noise was estimated using the Caltrans SOUND2000 model and included modeling the access road from the U.S. 101/S.R. 166 interchange to the site and internal roadways. Peak hour volumes were assumed to include six autos (worker vehicles), 2 medium-duty trucks and 48 heavy-duty trucks (481 round-trip, 962 one-way trips per 20 hour day). Noise levels at noise-sensitive receptors are provided in Table 5.8-3.

Daytime noise levels and nighttime noise levels at the nearest residence (within the LUO/LUE amendment area) would exceed the thresholds of significance (see Table 5.8-3, 59.7 dBA Leq), for noise-sensitive receptors in San Luis Obispo County. ~~Project-related noise levels at the nearest residences in the City of Santa Barbara County would not exceed the 65 dBA CNEL threshold and is considered a less than significant noise impact.~~

Following implementation of the proposed asphalt plant, residences along the south levee of the Santa Maria River (within the City of Santa Maria) would be exposed to exterior noise levels of approximately 62 dBA CNEL, which exceeds the City's 60 dBA CNEL noise standard. However, existing noise levels at these residences are approximately 61 dBA CNEL, primarily due the adjacent freeway (U.S. 101) and existing industrial land uses adjacent to the project site. Harris (1991) indicates that the human ear can detect changes of 0.5 dBA (broadband noise), but changes less than 3 dBA are not readily noticeable. Therefore, the project-related increase of 1 dBA CNEL would not be noticeable at these residences and is considered a less than significant impact.

Impact Category: Class 2 (at nearest residences within SLO County)

Mitigation Measure NOS-2: Noise monitoring at the two nearest residences shall be conducted immediately following project implementation to determine if noise levels are significant (greater than 58.1 dBA Leq, or 1 dBA above existing, without the asphalt plant operating). If noise monitoring indicates that noise levels are significant, the applicants shall:

- Construct and maintain An 8-foot high concrete or masonry block wall (noise barrier) shall be constructed and maintained along the northern and western boundaries of the asphalt plant site. The noise barrier shall be placed between the plant and associated internal access roads and land uses north of the site. The noise barrier would reduce noise levels at the nearest residential receptor by approximately 4 dBA Leq (see barrier insertion loss in Harris, 1991). However, many components of the asphalt plant extend greater than 8 feet above the ground and noise generated by these components would not be reduced by the noise barrier. Therefore, the noise barrier would not reduce ambient noise levels generated by the proposed asphalt plant by 4 dBA Leq;

~~Due to the complexity involved with modeling the magnitude, location, operating hours and frequency of the numerous noise sources proposed (vehicles, mobile equipment, stationary equipment), it is unclear if an 8-foot noise barrier would reduce the project noise impact to a level of less than significant. A taller wall may be proposed, but would likely have significant aesthetics impacts. Therefore, noise monitoring at the two nearest residences shall be conducted immediately following project implementation to determine if noise levels are significant (greater than 58.1 dBA Leq, or 1 dBA above existing, without the asphalt plant operating). If noise monitoring indicates noise levels are significant, noise walls adjacent to the affected residences shall be provided to reduce noise levels at these two residences below the significance threshold. Alternatively, the applicant may~~

- Purchase and demolish the two affected residences; or
- Retrofit the receptor homes with noise attenuating building materials (e.g., windows or insulation).

Table 5.8-3. Plant Operation Peak Day Noise Impacts

Receptor Description	Existing Average Daytime Noise Level (dBA Leq)	Threshold	Equipment (stationary and mobile, dBA Leq)	Motor Vehicles (dBA Leq)	Combined Noise, Ambient + Equipment + Motor Vehicles (dBA Leq)	Combined Noise (dBA CNEL)
Residence 1 (LUO/LUE area)	57.1	58.1*	53.8	51.2	59.7	66
Residence 2 (LUO/LUE area)	57.1	58.1*	53.8	51.2	59.7	66
Residence 3 (Riverside Mobile Home Park)	55.6	65**	46.8	42.9	56.4	62
Residence 4 (Riverside Mobile Home Park)	55.6	65**	47.9	44.0	56.6	62

* Existing noise level + 1 dBA Leq (San Luis Obispo County)

**dBA CNEL (Santa Barbara County)

Residual Impacts

Due to the complexity involved with modeling the magnitude, location, operating hours and frequency of the numerous noise sources proposed (vehicles, mobile equipment, stationary equipment), it is unclear if an 8-foot noise barrier would reduce the project noise impact to a level of less than significant. A taller wall may be proposed, but would likely have significant aesthetics impacts. Retrofitting the receptor homes would reduce the interior noise levels, but would not reduce ambient exterior noise levels. Therefore, if the 8-foot sound wall would not reduce the project noise impact to a level of less than significant, the applicant shall purchase and demolish the two receptor homes.

5.8-2.45.8.1.8 LUO/LUE Amendment Area

Impact NOS-3. The LUO/LUE Amendment would result in manufacturing-related noise.

Discussion: The proposed change in land use designation from RS to IND could result in the generation of loud noise from uses not allowed under the existing land use designation. Such noise would adversely affect noise-sensitive receptors (residences) within the existing CS land use designation. In addition, certain industrial use noise could adversely affect residences outside the LUO/LUE Amendment area. It is possible that noise from the additional uses allowed under the Industrial category would result in noise levels at existing residences exceeding ambient levels by more than one dBA Leq, which would be considered a significant impact.

Impact Category: Class 2

Mitigation Measure NOS-3: A project-specific acoustical study shall be conducted by a qualified acoustical engineer at the time an industrial land use is proposed for the LUO/LUE amendment area that identifies loud noise-making activities. The study shall quantify impacts to adjacent residences, and specify noise reduction measures and structures to minimize noise levels to the extent feasible, as determined by the County.

All measures recommended by the acoustical study shall be fully implemented. Such measures may include:

- All noise-producing activities shall be conducted within insulated enclosures;
- Masonry block walls shall be constructed along the property boundaries; and
- Equipment shall be fitted with isolators to reduce ground vibration.

Residual Impacts

As the manufacturing process(es) and associated noise producing characteristics of the land use has not been specified, it is unknown if noise impacts can be reduced below the threshold. Residual impacts may be significant.

5.8.2.55.8.1.9 Cumulative Impacts

As discussed in Section 8.2 of this EIR, cumulative projects include the Caldwell Minor Use Permit, Loomis Minor Use Permit and Troesh Land Use Ordinance Amendment which would result in the development of two office buildings, a warehouse, and a commercial composting facility. Construction of the asphaltic concrete plant and changing the land use designations of the LUO/LUE amendment area to IND could result in the generation of industrial-related noise, not allowed under the existing land use designation. Such noise would adversely affect noise-sensitive receptors (residences) within the existing CS land use designation, until the existing residences were replaced with non-residential development. In addition, industrial-related noise would adversely affect residences outside the LUO/LUE Amendment area. It is likely that at a cumulative level, manufacturing noise could result in noise levels at existing residences exceeding ambient levels by more than one dBA Leq, which is considered a significant cumulative impact.

It is possible that loud noise-generating uses currently allowed under the CS designation could also adversely affect existing noise sensitive receptors both within and outside the LUO/LUE amendment area.