# 5.7 Noise

This section presents an assessment of potential noise effects related to the Almond 2 Power Plant (A2PP). Section 5.7.1 discusses the fundamentals of acoustics. Section 5.7.2 describes the affected environment, including baseline noise level survey methodology and results. Section 5.7.3 presents an environmental analysis of the construction and operation of the power plant and associated facilities. Section 5.7.4 discusses cumulative effects. Section 5.7.5 discusses mitigation measures. Section 5.7.6 presents applicable laws, ordinances, regulations, and standards (LORS). Sections 5.7.7 and 5.78 presents agency contacts and permit requirements. Section 5.7.9 provides the references used to prepare this section.

## 5.7.1 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Acoustical terms used in this section are summarized in Table 5.7-1.

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to the way in which a person perceives or hears sound. In this way, it provides a good measure for evaluating acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as equivalent sound pressure level ($L_{eq}$), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady-state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by $L_{xx}$, where xx represents the percentile of time the sound level is exceeded. The $L_{90}$ is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the $L_{10}$ represents the noise level exceeded for 10 percent of the measurement period.

Some metrics used in determining the impact of environmental noise consider the differences in response that people have to daytime and nighttime noise levels. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to nighttime noise levels, the Day-Night Sound Level ($L_{dn}$ or DNL) was developed. $L_{dn}$ is a noise index that accounts for the greater annoyance of noise during the nighttime hours.

$L_{dn}$ values are calculated by averaging hourly $L_{eq}$ sound levels for a 24-hour period, and apply a weighting factor to nighttime $L_{eq}$ values. The weighting factor, which reflects the increased sensitivity to noise during nighttime hours, is added to each hourly $L_{eq}$ sound level before the 24-hour $L_{dn}$ is calculated. For the purposes of assessing noise, the 24-hour day is divided into two time periods, with the following weightings:

- Daytime: 7 a.m. to 10 p.m. (15 hours) Weighting factor of 0 decibels (dB)
- Nighttime: 10 p.m. to 7 a.m. (9 hours) Weighting factor of 10 dB

**TABLE 5.7-1**
Definitions of Acoustical Terms

| Term | Definition |
|---|---|
| Ambient Noise Level | The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the $L_{eq}$ level. |
| Background Noise Level | The underlying ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the $L_{90}$ percentile noise level. |
| Intrusive | Noise that 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 content, the prevailing ambient noise level as well as the sensitivity of the receiver. The intrusive level is generally defined by the $L_{10}$ percentile noise level. |
| Sound Pressure Level Decibel (dB) | A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter). |
| A-Weighted Sound Pressure Level (dBA) | The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted 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 report are A-weighted. |
| Equivalent Noise Level ($L_{eq}$) | The average A-weighted noise level, on an equal energy basis, during the measurement period. |
| Percentile Noise Level ($L_n$) | The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., $L_{90}$) |
| Community noise equivalent level (CNEL) | The average A-weighted noise level during a 24-hour day, obtained after the addition of 5 decibels to sound levels from 7 p.m. to 10 p.m. and after the addition of 10 decibels to sound levels between 10 p.m. and 7 a.m. |
| Day-Night Noise Level ($L_{dn}$ or DNL) | The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels from 10:00 p.m. to 7:00 a.m. |

The Community Noise Equivalent Level (CNEL) is similar to the $L_{dn}$ and uses the same day and nighttime weightings but adds an additional evening weighting of 5 dB for the hours between 7 p.m. and 10 p.m. The $L_{dn}$ and CNEL values are typically within 1 dBA of each other.

The two time periods are then averaged to compute the overall $L_{dn}$ value. For a continuous noise source, the $L_{dn}$ value is easily computed by adding 6.4 dB to the overall 24-hour noise level ($L_{eq}$). For example, if the expected continuous noise level from the power plant were 60.0 dBA, the resulting $L_{dn}$ from the plant would be 66.4 dBA.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

Table 5.7-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

**TABLE 5.7-2**
Typical Sound Levels Measured in the Environment and Industry

| Noise Source At a Given Distance | A-Weighted Sound Level in Decibels | Qualitative Description |
|---|---|---|
| Carrier Deck Jet Operation | 140 | |
| | 130 | Pain threshold |
| Jet takeoff (200 feet) | 120 | |
| Auto Horn (3 feet) | 110 | Maximum Vocal Effort |
| Jet takeoff (2000 feet)<br>Shout (0.5 feet) | 100 | |
| N.Y. Subway Station<br>Heavy Truck (50 feet) | 90 | Very Annoying<br>Hearing Damage (8-hr, continuous exposure) |
| Pneumatic drill (50 feet) | 80 | Annoying |
| Freight Train (50 feet)<br>Freeway Traffic (50 feet) | 70 | Intrusive<br>Telephone Use Difficult |
| Air Conditioning Unit (20 feet) | 60 | |
| Light auto traffic (50 feet) | 50 | Quiet |
| Living Room<br>Bedroom | 40 | |
| Library<br>Soft whisper (5 feet) | 30 | Very Quiet |
| Broadcasting Studio | 20 | Recording studio |
| | 10 | Just Audible |

Source: Adapted from Table E, "Assessing and Mitigating Noise Impacts", NY DEC, February 2001.

## 5.7.2 Affected Environment

### 5.7.2.1 Local Land Use and Noise Sources

The proposed approximately 4.6-acre A2PP project site is located in Ceres, California, approximately 2 miles southwest from the Ceres city center. The A2PP site is located immediately north of the existing Almond Power Plant. The WinCo distribution warehouse is west of the A2PP site, a farm supply company is to the north, and lands to the east include various industrial facilities including a modular building distributor and drilling equipment storage laydown area. A railroad line owned by Union Pacific Railroad is aligned along the eastern boundary of the project site.

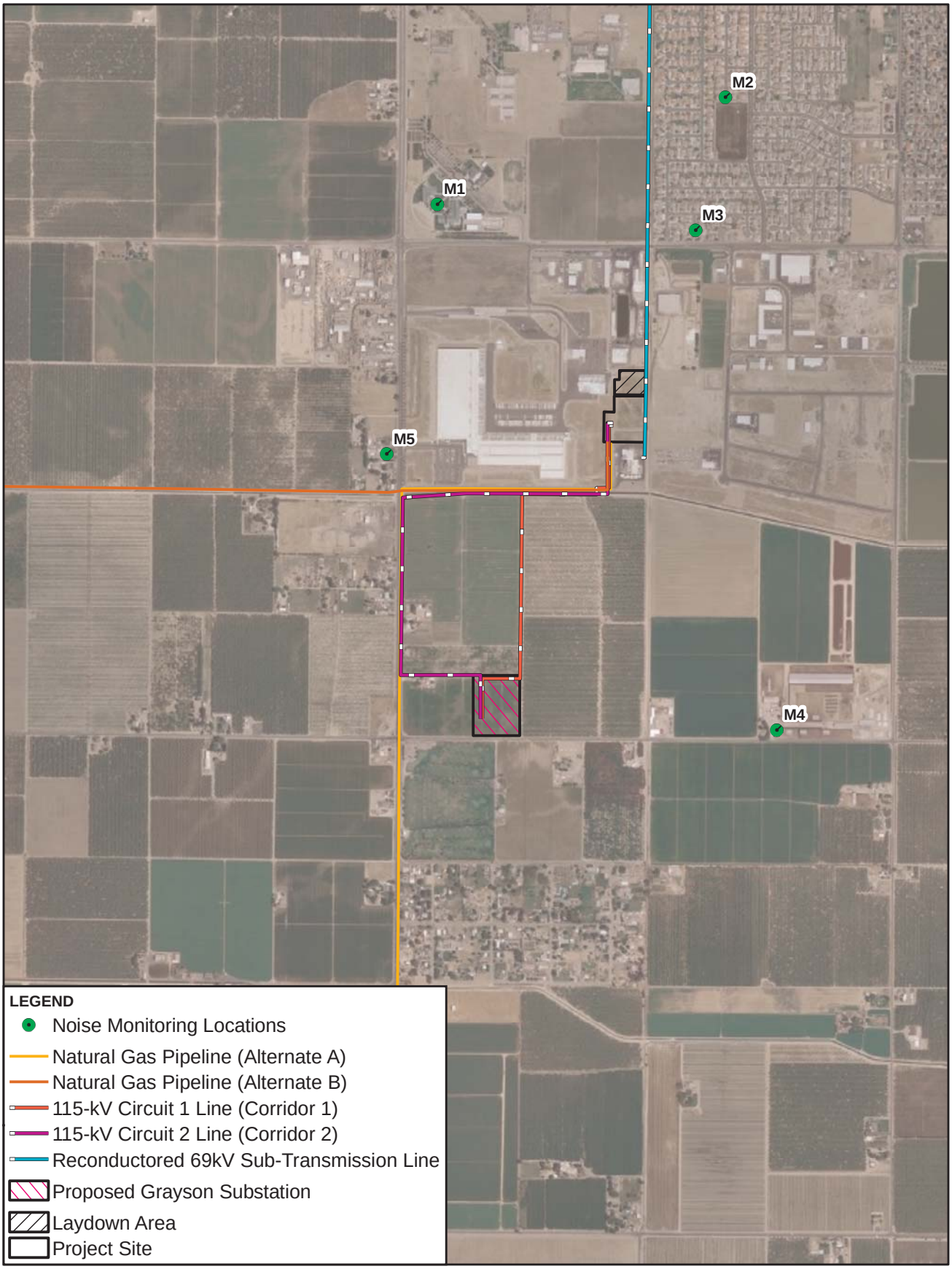
Lands within a one-mile radius of the A2PP site are within the City of Ceres and Stanislaus County. These lands are primarily agricultural fields and almond orchards (west, south, and east of the project site), single-family residences (northeast of the project site), and a community agricultural center (northwest of the project site). The City of Ceres Wastewater Treatment Plant is located approximately 0.5 mile east of the project site. Figure 5.6-1 shows existing land uses within 1 mile of project site.

The closest single-family residences are located approximately 0.3 mile northeast of the project site, in Ceres. As discussed in the Section 5.6, Land Use, the existing residences south of Service Road and west of Crows Landing Road are located within Stanislaus County, and are within the City of Ceres' planning area and in an area designated as Industrial Reserve (IR). This is also true of the area south of the A2PP that is east of Crows Landing Road and north of Grayson Road. The area south of Grayson Road is outside of the City's planning area and is designated as General Agriculture by Stanislaus County.

### 5.7.2.2 Ambient Noise Survey

TID conducted continuous ambient noise monitoring to determine the level of noise in the project area. The continuous monitoring was conducted at the five locations shown in Figure 5.7-1. Location M3 is representative of the closest residences and is located within the city of Ceres. Location M2 is located within the same residential development as M3 and is located just north of a park located within the residential development. Location M2 is further removed from traffic on Service Road than M3 but is still within the city of Ceres. Location M1 was also within the city limits, adjacent to the parking lot of the community agricultural center and is representative of the area northwest of the project site. Location M4 is southeast of the project site and Location M5 is west of the project site. Both locations M4 and M5 are in Stanislaus County, but are within the City of Ceres' Industrial Reserve (IR) planning area.

Larson Davis 824 and 820 ANSI Type 1 (precision) statistical sound level meters were used to conduct the continuous measurements. The sound level meters were field calibrated before and after the measurement with a Larson Davis CAL200 and was factory calibrated within the previous 12 months.




Note:
1. The Grayson Substation is being developed as a separate Project

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 750 1,500

Feet

**FIGURE 5.7-1**
**NOISE MONITORING LOCATIONS**
ALMOND 2 POWER PLANT
*CERES, CALIFORNIA*

CH2MHILL

SAC\\ZION\SACGIS\PROJ\TURLOCKIRRIGATIONDIS\383194\MAPFILES\APP_NOISEMONITORING.MXD MHASKELL 4/24/2009 15:51:42

The hourly results are summarized in Tables 5.7-3 through 5.7-7. The existing Almond Power Plant was operating at part load (approximately 18 megawatts) from approximately 6 a.m. on Wednesday, January 21 through 4 a.m. on Thursday, January 22, 2009. The primary noise source at each of the monitoring locations was traffic on local roads and Highway 99. Within the residential community north of the A2PP site (represented by M2 and M3) noise from industrial activity north of these locations was audible while the existing Almond Power Plant (which is to the south of M2 and M3) was not discernable. The Almond Power Plant was faintly audible during the middle of the night along Grayson Road, near location M4 but was not discernible near location M5.

Ambient noise levels were measured at various locations along the property line while the existing plant was operating and varied between 58 and 80 dBA. These measurements are summarized in Figure 5.7-2.

Weather conditions during the survey were variable and are summarized in Table 5.7-8. Although there were a few short periods of generally light rain, the winds were predominately calm. Nighttime observations made between 2:30 a.m. and 4:00 a.m. on January 22, 2009 are consistent with the reported weather, a very slight drizzle that turned to rain at approximately 4:00 a.m. This light drizzle was not observed to adversely impact the measurements and the results are generally consistent with the previous nights monitoring when conditions were dry. Noise levels increased at M2, M4, and M5 approximately 4:00 a.m. on both nights likely from the increased traffic on Highway 99 and local roads. (Note that monitoring data is not available for the night of January 21 at locations M1 and M3 as a result of an equipment power failure.) Had noise levels only increased when the heavy rain started at 4:00 a.m. on January 22 it would have indicated that the rain had a substantial effect on the monitored levels. Given the similar trends and values, the precipitation was not found to substantially affect the conclusions regarding existing noise levels.

**TABLE 5.7-3**
Summary of Hourly Measurements at M1 – Agricultural Center (dBA)

| Date/Time | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|
| January 20, 2009 6:00 PM | 55 | 58 | 54 | 48 |
| January 20, 2009 7:00 PM | 56 | 60 | 55 | 47 |
| January 20, 2009 8:00 PM | 56 | 59 | 53 | 47 |
| January 20, 2009 9:00 PM | 55 | 58 | 52 | 46 |
| January 20, 2009 10:00 PM | 54 | 58 | 51 | 45 |
| January 21, 2009 11:00 AM | 49 | 51 | 47 | 44 |
| January 21, 2009 12:00 PM | 50 | 53 | 49 | 45 |
| January 21, 2009 1:00 PM | 52 | 55 | 50 | 46 |
| January 21, 2009 2:00 PM | 54 | 57 | 53 | 49 |
| January 21, 2009 3:00 PM | 56 | 58 | 55 | 51 |
| January 21, 2009 4:00 PM | 57 | 59 | 55 | 52 |
| January 21, 2009 5:00 PM | 58 | 60 | 57 | 54 |
| January 21, 2009 6:00 PM | 55 | 58 | 54 | 50 |
| January 21, 2009 7:00 PM | 53 | 56 | 52 | 49 |
| January 21, 2009 8:00 PM | 55 | 58 | 54 | 51 |
| January 21, 2009 9:00 PM | 53 | 57 | 52 | 47 |
| January 21, 2009 10:00 PM | 52 | 55 | 50 | 46 |
| January 21, 2009 11:00 PM | 51 | 54 | 48 | 44 |
| January 22, 2009 12:00 AM | 50 | 54 | 46 | 42 |
| January 22, 2009 1:00 AM | 49 | 52 | 45 | 42 |
| January 22, 2009 2:00 AM | 55 | 55 | 48 | 45 |
| January 22, 2009 3:00 AM | 50 | 53 | 48 | 45 |
| January 22, 2009 4:00 AM | 53 | 55 | 51 | 48 |
| January 22, 2009 5:00 AM | 54 | 56 | 52 | 49 |
| January 22, 2009 6:00 AM | 54 | 57 | 53 | 50 |
| January 22, 2009 7:00 AM | 55 | 57 | 54 | 50 |
| January 22, 2009 8:00 AM | 55 | 57 | 54 | 51 |
| January 22, 2009 9:00 AM | 50 | 52 | 48 | 44 |
| **$L_{dn}$** | **59** | | | |

**TABLE 5.7-4**
Summary of Hourly Measurements at M2 - Near Park at 3610 Billy Court (dBA)

| Date/Time | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|
| January 20, 2009 6:00 PM | 49 | 52 | 47 | 44 |
| January 20, 2009 7:00 PM | 51 | 54 | 49 | 45 |
| January 20, 2009 8:00 PM | 51 | 54 | 46 | 42 |
| January 20, 2009 9:00 PM | 47 | 49 | 45 | 43 |
| January 20, 2009 10:00 PM | 46 | 48 | 45 | 44 |
| January 20, 2009 11:00 PM | 45 | 47 | 44 | 42 |
| January 21, 2009 12:00 AM | 44 | 46 | 44 | 42 |
| January 21, 2009 1:00 AM | 44 | 45 | 43 | 41 |
| January 21, 2009 2:00 AM | 45 | 46 | 44 | 42 |
| January 21, 2009 3:00 AM | 46 | 48 | 46 | 44 |
| January 21, 2009 4:00 AM | 48 | 50 | 48 | 46 |
| January 21, 2009 5:00 AM | 48 | 49 | 47 | 46 |
| January 21, 2009 6:00 AM | 49 | 51 | 49 | 47 |
| January 21, 2009 7:00 AM | 50 | 51 | 49 | 47 |
| January 21, 2009 8:00 AM | 57 | 54 | 51 | 49 |
| January 21, 2009 9:00 AM | 66 | 53 | 48 | 46 |
| January 21, 2009 10:00 AM | 50 | 50 | 46 | 43 |
| January 21, 2009 11:00 AM | 48 | 50 | 43 | 40 |
| January 21, 2009 12:00 PM | 55 | 50 | 43 | 40 |
| January 21, 2009 1:00 PM | 45 | 48 | 41 | 39 |
| January 21, 2009 2:00 PM | 48 | 49 | 44 | 40 |
| January 21, 2009 3:00 PM | 48 | 49 | 45 | 43 |
| January 21, 2009 4:00 PM | 49 | 52 | 46 | 44 |
| January 21, 2009 5:00 PM | 50 | 53 | 49 | 47 |
| January 21, 2009 6:00 PM | 48 | 51 | 46 | 45 |
| January 21, 2009 7:00 PM | 47 | 49 | 46 | 44 |
| January 21, 2009 8:00 PM | 48 | 50 | 47 | 45 |
| January 21, 2009 9:00 PM | 46 | 47 | 45 | 43 |
| January 21, 2009 10:00 PM | 45 | 46 | 43 | 42 |
| January 21, 2009 11:00 PM | 43 | 45 | 42 | 40 |
| January 22, 2009 12:00 AM | 42 | 44 | 41 | 39 |
| January 22, 2009 1:00 AM | 43 | 44 | 40 | 38 |
| January 22, 2009 2:00 AM | 45 | 48 | 43 | 40 |
| January 22, 2009 3:00 AM | 41 | 43 | 40 | 38 |
| January 22, 2009 4:00 AM | 51 | 54 | 48 | 43 |
| January 22, 2009 5:00 AM | 46 | 49 | 46 | 43 |
| January 22, 2009 6:00 AM | 47 | 50 | 46 | 44 |
| January 22, 2009 7:00 AM | 49 | 52 | 47 | 44 |
| January 22, 2009 8:00 AM | 47 | 50 | 45 | 42 |
| **$L_{dn}$** | **56** | | | |

**TABLE 5.7-5**
Summary of Hourly Measurements at M3 - Closest Residential Area at 3984 Rock Falls Court (dBA)

| Date/Time | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|
| January 21, 2009 10:00 AM | 59 | 63 | 55 | 47 |
| January 21, 2009 11:00 AM | 64 | 65 | 57 | 47 |
| January 21, 2009 12:00 PM | 59 | 62 | 55 | 45 |
| January 21, 2009 1:00 PM | 59 | 63 | 57 | 47 |
| January 21, 2009 2:00 PM | 60 | 63 | 58 | 51 |
| January 21, 2009 3:00 PM | 60 | 63 | 59 | 53 |
| January 21, 2009 4:00 PM | 60 | 63 | 59 | 52 |
| January 21, 2009 5:00 PM | 61 | 64 | 60 | 54 |
| January 21, 2009 6:00 PM | 58 | 61 | 55 | 49 |
| January 21, 2009 7:00 PM | 57 | 60 | 51 | 45 |
| January 21, 2009 8:00 PM | 56 | 60 | 52 | 47 |
| January 21, 2009 9:00 PM | 57 | 58 | 49 | 44 |
| January 21, 2009 10:00 PM | 52 | 56 | 46 | 43 |
| January 21, 2009 11:00 PM | 52 | 55 | 44 | 42 |
| January 22, 2009 12:00 AM | 51 | 53 | 43 | 40 |
| January 22, 2009 1:00 AM | 57 | 52 | 41 | 39 |
| January 22, 2009 2:00 AM | 51 | 54 | 44 | 41 |
| January 22, 2009 3:00 AM | 53 | 56 | 46 | 41 |
| January 22, 2009 4:00 AM | 55 | 59 | 51 | 45 |
| January 22, 2009 5:00 AM | 58 | 62 | 51 | 45 |
| January 22, 2009 6:00 AM | 59 | 63 | 57 | 48 |
| January 22, 2009 7:00 AM | 61 | 64 | 59 | 52 |
| January 22, 2009 8:00 AM | 62 | 64 | 59 | 50 |
| January 22, 2009 9:00 AM | 59 | 62 | 54 | 44 |
| **$L_{dn}$** | **63** | | | |

**TABLE 5.7-6**
Summary of Hourly Measurements at M4 – South of the project at 624 E. Grayson Road (dBA)

| Date/Time | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|
| January 20, 2009 5:00 PM | 60 | 64 | 53 | 48 |
| January 20, 2009 6:00 PM | 58 | 63 | 51 | 45 |
| January 20, 2009 7:00 PM | 55 | 58 | 45 | 41 |
| January 20, 2009 8:00 PM | 55 | 56 | 46 | 43 |
| January 20, 2009 9:00 PM | 56 | 58 | 49 | 46 |
| January 20, 2009 10:00 PM | 54 | 55 | 49 | 46 |
| January 20, 2009 11:00 PM | 53 | 54 | 48 | 46 |
| January 21, 2009 12:00 AM | 52 | 53 | 48 | 46 |
| January 21, 2009 1:00 AM | 52 | 52 | 48 | 46 |
| January 21, 2009 2:00 AM | 50 | 50 | 47 | 46 |
| January 21, 2009 3:00 AM | 52 | 51 | 48 | 46 |
| January 21, 2009 4:00 AM | 54 | 54 | 50 | 48 |
| January 21, 2009 5:00 AM | 57 | 58 | 50 | 48 |
| January 21, 2009 6:00 AM | 58 | 62 | 53 | 50 |
| January 21, 2009 7:00 AM | 59 | 64 | 53 | 51 |
| January 21, 2009 8:00 AM | 61 | 65 | 55 | 52 |
| January 21, 2009 9:00 AM | 59 | 62 | 54 | 51 |
| January 21, 2009 10:00 AM | 61 | 64 | 53 | 50 |
| January 21, 2009 11:00 AM | 58 | 61 | 52 | 48 |
| January 21, 2009 12:00 PM | 58 | 62 | 49 | 46 |
| January 21, 2009 1:00 PM | 59 | 64 | 51 | 47 |
| January 21, 2009 2:00 PM | 60 | 65 | 52 | 48 |
| January 21, 2009 3:00 PM | 60 | 65 | 52 | 49 |
| January 21, 2009 4:00 PM | 61 | 66 | 54 | 50 |
| January 21, 2009 5:00 PM | 61 | 65 | 53 | 50 |
| January 21, 2009 6:00 PM | 59 | 62 | 50 | 48 |
| January 21, 2009 7:00 PM | 55 | 55 | 49 | 46 |
| January 21, 2009 8:00 PM | 56 | 58 | 50 | 47 |
| January 21, 2009 9:00 PM | 56 | 56 | 49 | 47 |
| January 21, 2009 10:00 PM | 53 | 53 | 50 | 48 |
| January 21, 2009 11:00 PM | 54 | 54 | 49 | 47 |
| January 22, 2009 12:00 AM | 51 | 52 | 48 | 47 |
| January 22, 2009 1:00 AM | 52 | 53 | 49 | 47 |
| January 22, 2009 2:00 AM | 51 | 52 | 49 | 47 |
| January 22, 2009 3:00 AM | 52 | 53 | 48 | 46 |
| January 22, 2009 4:00 AM | 57 | 58 | 52 | 49 |
| January 22, 2009 5:00 AM | 58 | 58 | 50 | 48 |
| January 22, 2009 6:00 AM | 63 | 64 | 53 | 49 |
| January 22, 2009 7:00 AM | 63 | 68 | 53 | 49 |
| January 22, 2009 8:00 AM | 61 | 65 | 51 | 46 |
| $L_{dn}$ | **63** | | | |

**TABLE 5.7-7**
Summary of Hourly Measurements at M5 – West of the project at 4401 Crows Landing Road (dBA)

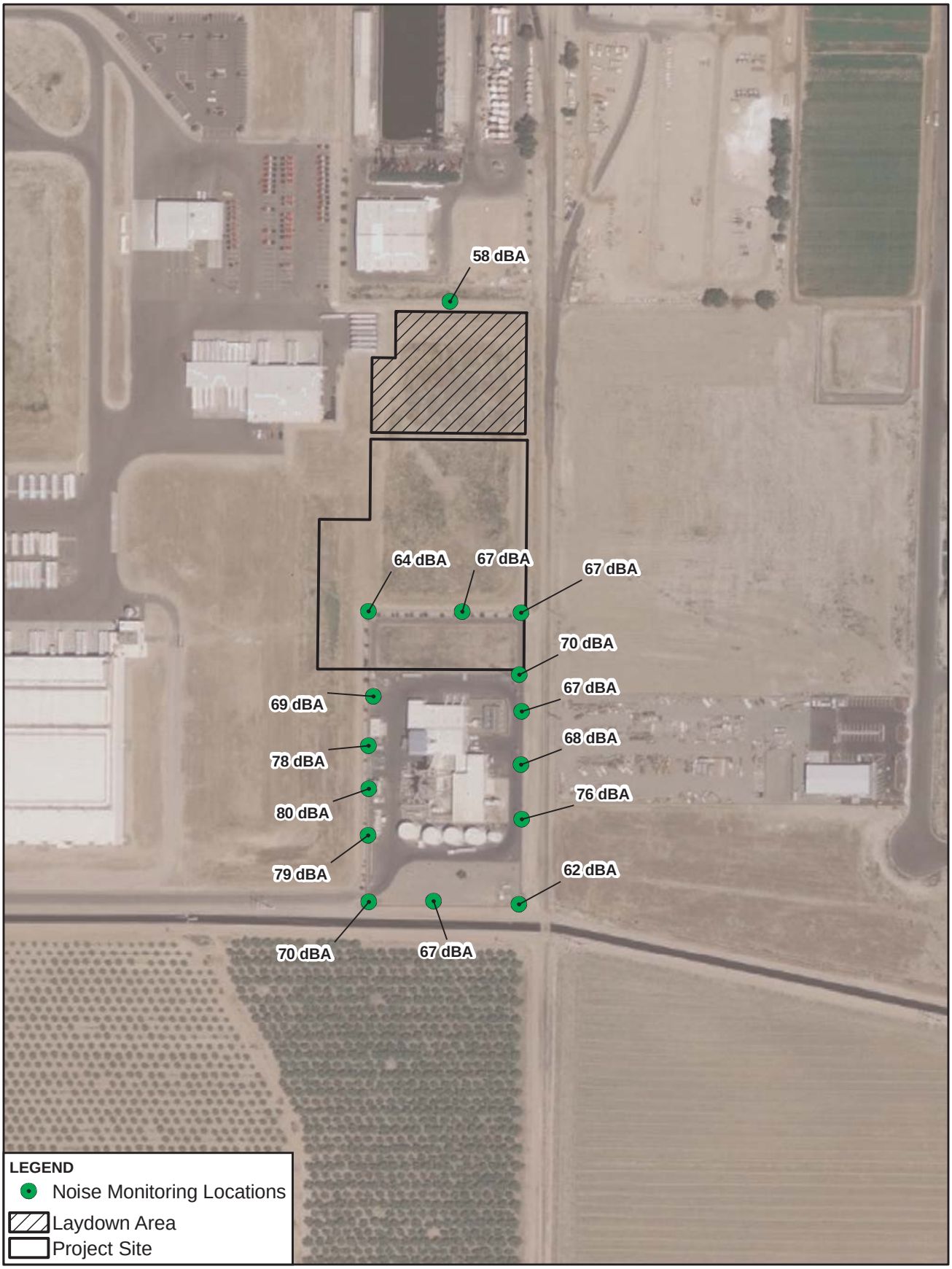
| Date/Time | $L_{eq}$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|
| January 20, 2009 7:00 PM | 62 | 67 | 56 | 47 |
| January 20, 2009 8:00 PM | 60 | 64 | 54 | 46 |
| January 20, 2009 9:00 PM | 61 | 65 | 55 | 45 |
| January 20, 2009 10:00 PM | 60 | 64 | 52 | 44 |
| January 20, 2009 11:00 PM | 57 | 61 | 49 | 43 |
| January 21, 2009 12:00 AM | 57 | 60 | 49 | 44 |
| January 21, 2009 1:00 AM | 56 | 58 | 46 | 42 |
| January 21, 2009 2:00 AM | 55 | 57 | 46 | 43 |
| January 21, 2009 3:00 AM | 57 | 59 | 47 | 43 |
| January 21, 2009 4:00 AM | 61 | 64 | 51 | 46 |
| January 21, 2009 5:00 AM | 62 | 66 | 56 | 49 |
| January 21, 2009 6:00 AM | 64 | 68 | 60 | 54 |
| January 21, 2009 7:00 AM | 64 | 67 | 60 | 52 |
| January 21, 2009 8:00 AM | 64 | 67 | 60 | 53 |
| January 21, 2009 9:00 AM | 63 | 67 | 58 | 51 |
| January 21, 2009 10:00 AM | 63 | 66 | 58 | 48 |
| January 21, 2009 11:00 AM | 64 | 67 | 59 | 46 |
| January 21, 2009 12:00 PM | 63 | 67 | 59 | 46 |
| January 21, 2009 1:00 PM | 63 | 67 | 60 | 49 |
| January 21, 2009 2:00 PM | 64 | 68 | 61 | 51 |
| January 21, 2009 3:00 PM | 64 | 68 | 62 | 53 |
| January 21, 2009 4:00 PM | 64 | 68 | 62 | 54 |
| January 21, 2009 5:00 PM | 65 | 69 | 63 | 55 |
| January 21, 2009 6:00 PM | 64 | 68 | 60 | 51 |
| January 21, 2009 7:00 PM | 62 | 67 | 57 | 49 |
| January 21, 2009 8:00 PM | 61 | 64 | 55 | 49 |
| January 21, 2009 9:00 PM | 61 | 65 | 54 | 47 |
| January 21, 2009 10:00 PM | 58 | 62 | 50 | 44 |
| January 21, 2009 11:00 PM | 57 | 59 | 45 | 42 |
| January 22, 2009 12:00 AM | 58 | 61 | 46 | 42 |
| January 22, 2009 1:00 AM | 55 | 57 | 44 | 41 |
| January 22, 2009 2:00 AM | 57 | 59 | 48 | 44 |
| January 22, 2009 3:00 AM | 58 | 60 | 46 | 43 |
| January 22, 2009 4:00 AM | 62 | 65 | 54 | 49 |
| January 22, 2009 5:00 AM | 63 | 66 | 55 | 49 |
| January 22, 2009 6:00 AM | 65 | 68 | 60 | 50 |
| January 22, 2009 7:00 AM | 65 | 69 | 62 | 51 |
| January 22, 2009 8:00 AM | 66 | 69 | 62 | 52 |
| **$L_{dn}$** | **63** | | | |

**TABLE 5.7-8**
Summary of Weather Reported at Modesto Airport

| Date | Time | Temperature (F) | Humidity (%) | Wind Speed (mph) | Wind Direction | Precipitation (in.) | Conditions |
|---|---|---|---|---|---|---|---|
| 1/20/2009 | 4:53 PM | 66 | 38 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 5:53 PM | 63 | 43 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 6:53 PM | 58 | 51 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 7:53 PM | 53 | 61 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 8:53 PM | 52 | 63 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 9:53 PM | 48 | 71 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 10:53 PM | 45 | 82 | Calm | Calm | N/A | Clear |
| 1/20/2009 | 11:53 PM | 45 | 80 | 3.5 | ESE | N/A | Clear |
| 1/21/2009 | 12:53 AM | 43 | 82 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 1:53 AM | 43 | 86 | Calm | Calm | N/A | Clear |
| 1/21/2009 | 2:53 AM | 45 | 82 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 3:53 AM | 46 | 83 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 4:53 AM | 47 | 80 | Calm | Calm | N/A | Clear |
| 1/21/2009 | 5:53 AM | 46 | 83 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 6:53 AM | 47 | 80 | 3.5 | East | N/A | Scattered Clouds |
| 1/21/2009 | 7:53 AM | 48 | 77 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 8:53 AM | 50 | 74 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 9:53 AM | 53 | 66 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 10:53 AM | 55 | 64 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 11:53 AM | 57 | 62 | Calm | Calm | N/A | Haze |
| 1/21/2009 | 12:53 PM | 58 | 60 | Calm | Calm | 0 | Light Rain |
| 1/21/2009 | 1:53 PM | 57 | 64 | Calm | Calm | 0 | Light Rain |
| 1/21/2009 | 2:10 PM | 57 | 67 | 4.6 | North | 0 | Light Rain |
| 1/21/2009 | 2:53 PM | 57 | 72 | 5.8 | WNW | 0 | Haze |
| 1/21/2009 | 3:00 PM | 57 | 72 | 6.9 | WNW | N/A | Haze |
| 1/21/2009 | 3:53 PM | 57 | 72 | 5.8 | WNW | 0 | Light Rain |
| 1/21/2009 | 4:53 PM | 55 | 77 | 4.6 | NNW | 0.01 | Light Rain |
| 1/21/2009 | 5:53 PM | 53 | 86 | 5.8 | NW | 0.03 | Light Rain |
| 1/21/2009 | 6:53 PM | 52 | 86 | 4.6 | NW | 0.01 | Light Rain |
| 1/21/2009 | 7:53 PM | 53 | 83 | 3.5 | NE | 0 | Light Rain |

**TABLE 5.7-8**
Summary of Weather Reported at Modesto Airport

| Date | Time | Temperature (F) | Humidity (%) | Wind Speed (mph) | Wind Direction | Precipitation (in.) | Conditions |
|---|---|---|---|---|---|---|---|
| 1/21/2009 | 8:53 PM | 52 | 86 | 4.6 | WSW | 0 | Mostly Cloudy |
| 1/21/2009 | 9:53 PM | 52 | 86 | 5.8 | WNW | 0 | Overcast |
| 1/21/2009 | 10:53 PM | 53 | 80 | 5.8 | NW | 0 | Overcast |
| 1/21/2009 | 11:53 PM | 52 | 83 | 8.1 | NW | N/A | Overcast |
| 1/22/2009 | 12:53 AM | 51 | 86 | 9.2 | NW | 0 | Light Rain |
| 1/22/2009 | 1:40 AM | 52 | 82 | 8.1 | NW | N/A | Overcast |
| 1/22/2009 | 1:53 AM | 51 | 86 | 11.5 | NNW | N/A | Overcast |
| 1/22/2009 | 2:53 AM | 51 | 89 | 12.7 | NNW | 0.02 | Light Rain |
| 1/22/2009 | 3:01 AM | 52 | 88 | 3.5 | NNW | 0 | Light Rain |
| 1/22/2009 | 3:53 AM | 51 | 92 | 3.5 | East | 0.01 | Light Rain |
| 1/22/2009 | 4:14 AM | 52 | 88 | 3.5 | WSW | 0.05 | Rain |
| 1/22/2009 | 4:21 AM | 52 | 88 | 3.5 | West | 0.07 | Rain |
| 1/22/2009 | 4:41 AM | 52 | 88 | 3.5 | East | 0.12 | Light Rain |
| 1/22/2009 | 4:49 AM | 52 | 88 | 3.5 | East | 0.12 | Light Rain |
| 1/22/2009 | 4:53 AM | 51 | 92 | 3.5 | East | 0.12 | Overcast |
| 1/22/2009 | 5:53 AM | 52 | 89 | 3.5 | Variable | N/A | Overcast |
| 1/22/2009 | 6:10 AM | 52 | 88 | 4.6 | WNW | 0.01 | Light Rain |
| 1/22/2009 | 6:26 AM | 52 | 88 | 5.8 | West | 0.02 | Light Rain |
| 1/22/2009 | 6:39 AM | 52 | 88 | 5.8 | West | 0.02 | Light Rain |
| 1/22/2009 | 6:50 AM | 52 | 88 | Calm | Calm | 0.03 | Light Rain |
| 1/22/2009 | 6:53 AM | 51 | 92 | Calm | Calm | 0.03 | Light Rain |
| 1/22/2009 | 7:46 AM | 52 | 88 | 3.5 | West | 0.03 | Light Rain |
| 1/22/2009 | 7:53 AM | 51 | 89 | 3.5 | NW | 0.04 | Light Rain |
| 1/22/2009 | 8:07 AM | 52 | 88 | 4.6 | NW | 0 | Light Rain |
| 1/22/2009 | 8:53 AM | 51 | 89 | 3.5 | NNW | 0 | Overcast |
| 1/22/2009 | 9:08 AM | 52 | 88 | 4.6 | NE | N/A | Overcast |
| 1/22/2009 | 9:23 AM | 52 | 88 | Calm | Calm | N/A | Overcast |
| 1/22/2009 | 9:35 AM | 52 | 88 | Calm | Calm | 0 | Light Rain |
| 1/22/2009 | 9:53 AM | 52 | 89 | 4.6 | East | 0.01 | Light Rain |




# FIGURE 5.7-2
# SUMMARY OF EXISTING PROPERTY LINE NOISE LEVELS (dBA)

ALMOND 2 POWER PLANT
*CERES, CALIFORNIA*

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

CH2MHILL

SAC\\ZION\SACGIS\PROJ\TURLOCKIRRIGATIONDIS\383194\MAPFILES\APP_NOISEMONITORING2.MXD MHASKELL 4/24/2009 15:43:54

## 5.7.3 Environmental Analysis

The construction and operation of the A2PP will produce noise, but the facility will comply with the applicable requirements and result in a less-than-significant impact. Potential noise impacts from construction and operation activities are assessed in this subsection.

### 5.7.3.1 Significance Criteria

Following the California Environmental Quality Act (CEQA) guidelines (California Code of Regulations [CCR], Title 14, Appendix G, Section XI), the project would cause a significant impact if it would result in the following:

- Exposure of people to noise levels in excess of standards established in the local General Plan or noise ordinance
- Exposure of people to excessive ground-borne noise levels or vibration
- Substantial permanent increase in ambient noise levels in the project vicinity
- Substantial temporary or periodic increase in ambient noise levels in the project vicinity

Generally, the design basis for noise control is the minimum, or most stringent, noise level required by any of the applicable LORS. Therefore, noise from this project is evaluated against the City of Ceres' requirements. The City has established quantitative standards for determining appropriate noise levels for various land uses in its Municipal Code and has established guidelines in the Noise Element of its General Plan.

California Energy Commission (CEC) Staff has previously stated that an increase in background ($L_{90}$) noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is considered significant by Staff; and an increase between 5 and 10 dBA may be either significant or insignificant, depending on the particular circumstances of a case.

The CEC also has concluded that construction noise is typically insignificant if the construction activity is temporary, use of heavy equipment and noisy activities is limited to daytime hours, and all feasible noise abatement measures are implemented for noise-producing equipment.

### 5.7.3.2 Construction Impacts

#### 5.7.3.2.1 Plant Construction Noise

Construction of the A2PP is expected to be typical of other power plants in terms of schedule, equipment used, and other types of activities. The noise level will vary during the construction period, depending on the construction phase. Construction of power plants can generally be divided into five phases that use different types of construction equipment. The five phases are demolition, site preparation, and excavation; concrete pouring; steel erection; mechanical; and clean-up (Miller et al., 1978).

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control and the Empire State Energy Research Company have extensively studied noise from individual pieces of construction equipment as well as from construction sites of power plants and other types of facilities (EPA, 1971; Barnes et al., 1976). Information from these

documents for similarly sized industrial projects will be used. Use of these data, which are more than 30 years old, is conservative because the evolution of construction equipment has been toward quieter designs to protect operators from exposure to high noise levels.

The loudest equipment types generally operating at a site during each phase of construction are presented in Table 5.7-9. The composite average or equivalent site noise level, representing noise from all equipment, also is presented for each phase.

**TABLE 5.7-9**
Construction Equipment and Composite Site Noise Levels

| Construction Phase | Loudest Construction Equipment | Equipment Noise Level (dBA) at 50 feet | Composite Site Noise Level (dBA) at 50 feet |
|---|---|---|---|
| Demolition, Site Clearing, and Excavation | Dump Truck<br>Backhoe | 91<br>85 | 89 |
| Concrete Pouring | Truck<br>Concrete Mixer | 91<br>85 | 78 |
| Steel Erection | Derrick Crane<br>Jack Hammer | 88<br>88 | 87 |
| Mechanical | Derrick Crane<br>Pneumatic Tools | 88<br>86 | 87 |
| Cleanup | Rock Drill<br>Truck | 98<br>91 | 89 |

Source: EPA, 1971; Barnes et al., 1976.

Average or equivalent construction noise levels projected at various distances from the site are presented in Table 5.7-10. These results are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air. The noisiest construction activities will be confined to the daytime hours. Table 5.7-11 presents noise levels from common construction equipment at various distances. Given the distance to the closest receptors, general construction noise levels are anticipated to be within the range of existing levels.

**TABLE 5.7-10**
Average Construction Noise Levels at Various Distances

| Construction Phase | Sound Pressure Level (dBA) | | |
|---|---|---|---|
| | 375 feet | 1,500 feet | 4,000 feet |
| Demolition, Site Clearing, and Excavation | 71 | 59 | 50 |
| Concrete Pouring | 60 | 48 | 39 |
| Steel Erection | 69 | 57 | 48 |
| Mechanical | 69 | 57 | 48 |
| Clean-Up | 71 | 59 | 50 |

**TABLE 5.7-11**
Noise Levels from Common Construction Equipment at Various Distances

| Construction Equipment | Typical Sound Pressure Level at 50 feet (dBA) | Typical Sound Pressure Level at 1,500 feet (dBA) | Typical Sound Pressure Level at 4,000 feet (dBA) |
|---|---|---|---|
| Pile Drivers (20,000-32,000 ft-lbs./blow) | 104 | 74 | 65 |
| Dozer (250-700 hp) | 88 | 58 | 49 |
| Front End Loader (6-15 cu. yds.) | 88 | 58 | 49 |
| Trucks (200-400 hp) | 86 | 56 | 47 |
| Grader (13 to 16 ft. blade) | 85 | 55 | 46 |
| Shovels (2-5 cu. yds.) | 84 | 54 | 45 |
| Portable Generators (50-200 kW) | 84 | 54 | 45 |
| Derrick Crane (11-20 tons) | 83 | 53 | 44 |
| Mobile Crane (11-20 tons) | 83 | 53 | 44 |
| Concrete Pumps (30-150 cu. yds.) | 81 | 51 | 42 |
| Tractor (3/4 to 2 cu. yds.) | 80 | 50 | 41 |
| Unquieted Paving Breaker | 80 | 50 | 41 |
| Quieted Paving Breaker | 73 | 43 | 34 |

Noise generated during the testing and commissioning phase of the project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops are more frequent during this period, but they are usually short lived.

#### 5.7.3.2.2 Construction Vibration

Construction vibrations can be divided into three classes, based on the wave form and its source (see Table 5.7-12). Pile driving, if required, will be limited to daytime hours and will be of short duration; therefore, no additional mitigation is required.

**TABLE 5.7-12**
Construction Vibrations

| Wave Form | Example Source |
|---|---|
| Impact | Impact pile driver or blasting |
| Steady state | Vibratory pile driver |
| Pseudo steady state | Double acting pile hammer |

#### 5.7.3.2.3 Worker Exposure to Noise

Worker exposure levels during construction of the A2PP will vary depending on the phase of the project and the proximity of the workers to the noise-generating activities. Construction noise is potentially harmful to the health and hearing of construction workers.

As required on all projects licensed by the CEC, the A2PP project will develop a Hearing Protection Plan, which complies with California Occupational Safety and Health Administration (Cal-OSHA) requirements. This Hearing Protection Plan will be incorporated into the project construction Health and Safety Plan. The plan will require, among other things, appropriate hearing protection for workers and visitors throughout the duration of the construction period.

### 5.7.3.3 Operational Impacts

#### 5.7.3.3.1 Worker Exposure

Nearly all components will be specified not to exceed near-field maximum noise levels of 90 dBA at 3 feet (or 85 dBA at 3 feet where available as a vendor standard). Because there are no permanent or semi-permanent workstations located near any piece of noisy plant equipment, no worker's time-weighted average exposure to noise should routinely approach the level allowable under Occupational Safety and Health Act of 1970 (OSHA) guidelines. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA, such as inside acoustical enclosures, and the project will comply with applicable Cal-OSHA requirements. A current hearing conservation program is currently in place at the existing facility. An identical program will be put in place at the A2PP location as workers will be shared between the two plants. Outdoor levels throughout the plant will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source. Therefore, noise impacts to workers during operation will be less than significant.

#### 5.7.3.3.2 Transmission Line and Switchyard Noise Levels

One of the electrical effects of high-voltage transmission lines is corona. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Corona is generally a principle concern with transmission lines of 345 kilovolts (kV) and higher. Noise is also generally associated with foul weather conditions. As stated in Section 2.1.5, Major Electrical Equipment Systems, and Section 3.0, Electric Transmission, the electric power produced by the facility will be transmitted to the electrical grid through two new 115-kV transmission lines. Since the A2PP will be connected at the 115-kV voltage level, it is expected that no corona-related design issues will be encountered, and no significant increases in audible corona noise are anticipated.

#### 5.7.3.3.3 Plant Operational Noise Levels

A noise model of the proposed A2PP facility has been developed using source input levels derived from manufacturers' data and field surveys of similar equipment. The noise emissions from the plant have been calculated at the residential receptors of potential concern. The noise levels presented represent the anticipated steady-state level from the plant with essentially all equipment operating.

Standard acoustical engineering methods were used in the noise analysis. The computer software noise model, CADNA/A by DataKustik GmbH of Munich, Germany, is very sophisticated and is capable of fully modeling complex industrial plants. The sound propagation factors used in the model have been adopted from ISO 9613-2 *Acoustics - Sound Attenuation During Propagation Outdoors* and VDI 2714 *Outdoor Sound Propagation*. The model

divides the proposed facility into a list of individual point and area noise sources representing each piece of equipment that produces a significant amount of noise. The sound power levels representing the standard performance of each of these components are assigned based either on field measurements of similar equipment made at other existing plants, data supplied by manufacturers, or information found in the technical literature. Using these standard power levels as a basis, the model calculates the sound pressure level that would occur at each receptor from each source after losses from distance, air absorption, blockages, etc. are considered. The sum of all these individual levels is the total plant level at the modeling point.

The A-weighted sound power levels for the major noise sources used in the model are summarized in Table 5.7-13. Because the GE Energy LM6000 PG turbine is a new product, this data is considered representative.

**TABLE 5.7-13**
Summary of Sound Power Levels Used to Model A2PP Plant Operations

| Plant Component | Sound Power Level, dBA |
|---|---|
| Combustion Turbine Generator | 108 |
| SCR | 102 |
| Stack | 100 |
| Gas Compressors | 116 |
| GSU Transformers | 92 |

Operational noise from the A2PP, with noise control incorporated in the design, is not anticipated to exceed 49 dBA at the closest residential receptor, M3, and will be less than 49 dBA at more distant receptors. The resulting levels are consistent with the City of Ceres' performance standards for non-transportation sources as the project levels will be below the existing nighttime $L_{eq}$ levels. On CEC Staff's $L_{90}$ basis, a project level of 49 dBA at M3 (the closest receptor) combines with the existing midnight to 4:00 a.m. $L_{90}$ of 40 dBA for a cumulative level of 49.5 dBA. This is less than Staffs 10 dBA threshold increase and is also less than the lowest hourly $L_{eq}$ of 51 dBA. The specifications for the requisite noise controls may include silencers, barriers, or enclosures.

#### 5.7.3.3.4 Tonal Noise

At the nearby residential locations, no significant tones are anticipated. That is not to say that audible tones are impossible. Certain sources within the plant, such as the combustion turbine inlets, transformers, pump motors, and cooling tower fan gearboxes have been known to sometimes produce significant tones. The A2PP will anticipate the potential for audible tones in the final design and specification of the plant's equipment and take necessary steps to prevent sources from emitting tones that might be disturbing at the nearest receptors.

#### 5.7.3.3.5 Ground and Airborne Vibration

Similar LM6000 facilities have not resulted in ground or airborne vibration impacts. The proposed project is primarily driven by gas turbines exhausting into a SCR duct and a stack

silencer. These large ducts reduce low-frequency noise, which is the main source of airborne-induced vibration of structures. It is the A2PP's intention to anticipate the potential for low-frequency noise in the design and specification of the plant's equipment and take necessary steps to prevent ground or airborne vibration impacts.

The equipment that would be used in the proposed project is well balanced and is designed to produce very low vibration levels throughout the life of the project. An imbalance could contribute to ground vibration levels in the vicinity of the equipment. However, vibration-monitoring systems installed in the equipment are designed to ensure that the equipment remains balanced. Should an imbalance occur, the event would be detected and the equipment would automatically shut down. Given these protective measures, impacts related to ground and airborne vibrations will be less than significant.

## 5.7.4 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code § 21083; California Code of Regulations, title 14, § 15064(h), 15065(c), 15130, and 15355). The CEQA Guidelines (Section 15355) defines cumulative effects as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Cumulative noise impacts could occur if the development of the proposed project and other related past, present, and reasonably foreseeable probable future projects would result in noise levels that are inconsistent with applicable plans and policies. Of the projects described in Section 5.6, Land Use, that are either underway or in planning phases within the City and County only one clearly introduced a new noise source.

- **Larger Stand-by Power at Blaker Reservoir –** The City plans to either replace the existing stand-by power unit currently capable of powering two of the six booster pumps, with a power unit capable of running four booster pumps, or add a second unit to power the two additional pumps. This project is currently in the planning phase.

## 5.7.5 Mitigation Measures

The A2PP proposes to implement the following measures to ensure that any potential noise impacts of the A2PP are mitigated below the level of significance.

### 5.7.5.1 Noise Hot Line

TID shall establish a telephone number for use by the public to report any significant undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least 1 year.

### 5.7.5.2 Noise Complaint Resolution

Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all legitimate project-related noise complaints.

The applicant or authorized agent shall:

- Use the Noise Complaint Resolution Form typically suggested by CEC or functionally equivalent procedure to document and respond to each noise complaint.
- Attempt to contact the person(s) making the noise complaint within 24 hours.
- Conduct an investigation to attempt to determine the source of noise related to the complaint.
- If the noise complaint is legitimate, take all feasible measures to reduce the noise at its source.

### 5.7.5.3 Equipment Noise Controls

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

## 5.7.6 Laws, Ordinances, Regulations, and Standards

Table 5.7-14 presents the LORS that apply to noise.

**TABLE 5.7-14**
Laws, Ordinances, Regulations, and Standards for Noise

| LORS | Requirements/Applicability | Administering Agency | AFC Section Explaining Conformance |
|---|---|---|---|
| **Federal** | | | |
| EPA | Guidelines for state and local governments. | EPA | 5.7.6.1.1 |
| OSHA | Exposure of workers over 8-hour shift limited to 90 dBA. | OSHA | 5.7.6.1.2 |
| **State** | | | |
| Cal-OSHA, 8 CCR Article 105 Sections 095 et seq. | Exposure of workers over 8-hour shift limited to 90 dBA. | Cal-OSHA | 5.7.6.2.1 |
| California Vehicle Code Sections 23130 and 23130.5 | Regulates vehicle noise limits on California highways. | Caltrans, California Highway Patrol and the County Sheriff's Office | 5.7.6.2.2 |
| **Local** | | | |
| California Government Code Section 65302 | Requires local government to prepare plans that contain noise provisions. | California Office of Planning and Research | 5.7.6.3 |
| City of Ceres General Plan | The General Plan provides quantitative compatibility goals and policy. | City of Ceres | 5.7.6.3 |

**TABLE 5.7-14**
Laws, Ordinances, Regulations, and Standards for Noise

| LORS | Requirements/Applicability | Administering Agency | AFC Section Explaining Conformance |
|---|---|---|---|
| City of Ceres Municipal Code | The Municipal Code provides quantitative compatibility standards. | City of Ceres | 5.7.6.3 |
| Stanislaus County General Plan | The County Code provides compatibility goals and policy. | Stanislaus County | 5.7.6.3 |
| Stanislaus County Municipal Code | The Municipal Code addresses nuisance noise. | Stanislaus County | 5.7.6.3 |

### 5.7.6.1 Federal LORS

#### 5.7.6.1.1 EPA

Guidelines are available from the EPA (1974) to assist state and local government entities in development of state and local LORS for noise. Because there are local LORS that apply to this project, these guidelines are not applicable.

#### 5.7.6.1.2 OSHA

Onsite noise levels are regulated through OSHA. The noise exposure level of workers is regulated at 90 dBA, over an 8-hour work shift to protect hearing (29 Code of Federal Regulations 1910.95). Onsite noise levels will generally be in the 70- to 85-dBA range. Areas above 85 dBA will be posted as high noise level areas and hearing protection will be required. The power plant will implement a hearing conservation program similar to the one currently in place for the existing plant, for applicable employees and maintain exposure levels below 90 dBA.

### 5.7.6.2 State LORS

#### 5.7.6.2.1 Cal-OSHA

The California Department of Industrial Relations, Division of Occupational Safety and Health enforces Cal-OSHA regulations, which are the same as the federal OSHA regulations described previously. The regulations are contained in Title 8 of the CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.

#### 5.7.6.2.2 California Vehicle Code

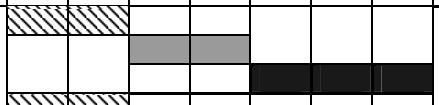
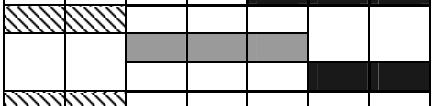
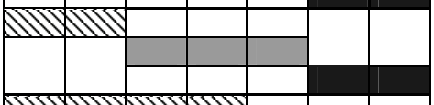
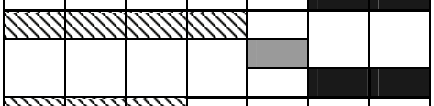
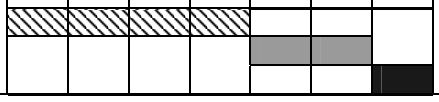
Noise limits for highway vehicles are regulated under the California Vehicle Code, Sections 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff offices.

### 5.7.6.3 Local LORS

The California State Planning Law (California Government Code Section 65302) requires that all cities, counties, and entities (such as multi-city port authorities) prepare and adopt a General Plan to guide community development.

The Noise Element in the City of Ceres' General Plan established feasibility guidelines depicted in Table 5.7-15. The "probably feasible" level for residential uses is an $L_{dn}$ of 70 dBA. For a steady continuous source this is equivalent to 64 dBA.

**TABLE 5.7-15**
Feasibility of Developments with Respect to Noise

| Land Use Category | Community Noise Exposure $L_{dn}$ or CNEL, dB: 55 60 65 70 75 80 | *INTERPRETATION* |
|---|---|---|
| Residential, Theaters, Auditoriums, Music Halls, Meeting Halls, Churches |  | **Feasible**<br>Specified land use is satisfactory. No noise mitigation measures are required. |
| Transient Lodging – Motels, Hotels |  | **Probably Feasible**<br>Use should be permitted only after careful study and inclusion of protective measures as needed to satisfy the policies of the noise section of the General Plan. |
| Schools, Libraries, Museums, Hospitals, Nursing Homes, Child Care Facilities |  | |
| Playgrounds, Neighborhood Parks |  | |
| Office Buildings, Retail Commercial |  | **Usually Not Feasible**<br>Development is usually not feasible in accordance with the goals and policies of the noise section of the General Plan. |
| Industrial, Manufacturing, Utilities |  | |
| Golf Courses, Outdoor Spectator Sports |  | |

Source: City of Ceres, 1997.

The General Plan also establishes Noise Level Performance Standards for non-transportation sources, summarized in Table 5.7-16. The General Plan notes that the performance standards apply at the property line of the noise sensitive use and shall be reduced by 5 dB for simple tone noises, noises consisting primarily of speech or music or for recurring impulsive noise (none of which are anticipated from the A2PP).

**TABLE 5.7-16**
City of Ceres – Noise Level Performance Standards (dBA)

| Noise Level Descriptor | Daytime (7 a.m. to 10 p.m.) | Nighttime (10 p.m. to 7 a.m.) |
|---|---|---|
| Hourly, $L_{eq}$ | 55 | 45 |
| Maximum Level | 75 | 65 |

The existing nighttime hourly ambient ($L_{eq}$) values measured at the closest receptor, M3, varied between 51 and 59 dBA (refer to Table 5.7-5) and exceed the City of Ceres' nighttime performance standard of 45 dBA. The City has stated that if the ambient noise levels exceed the levels specified in the City's performance standard, the ambient noise levels apply. Thus, the existing ambient is used as the baseline for comparing pre- and post-project noise effects. When the proposed project level of 49 dBA is combined with the lowest hourly ambient level of 51 dBA, the result is a cumulative level of 53 dBA or a 2 dBA increase above the quietest hourly $L_{eq}$. In addition, if the project level of 49 dBA at M3 is combined with the quietest nighttime background level ($L_{90}$) of 40 dBA, the result is less than the lowest hourly ambient ($L_{eq}$) of 51 dBA.

Section 9.36 of the City's Municipal Code is a nuisance ordinance and limits construction to between the hours of 7:00 a.m. and 8:00 p.m., except by special permit issued. Construction of the A2PP will occur during these hours.

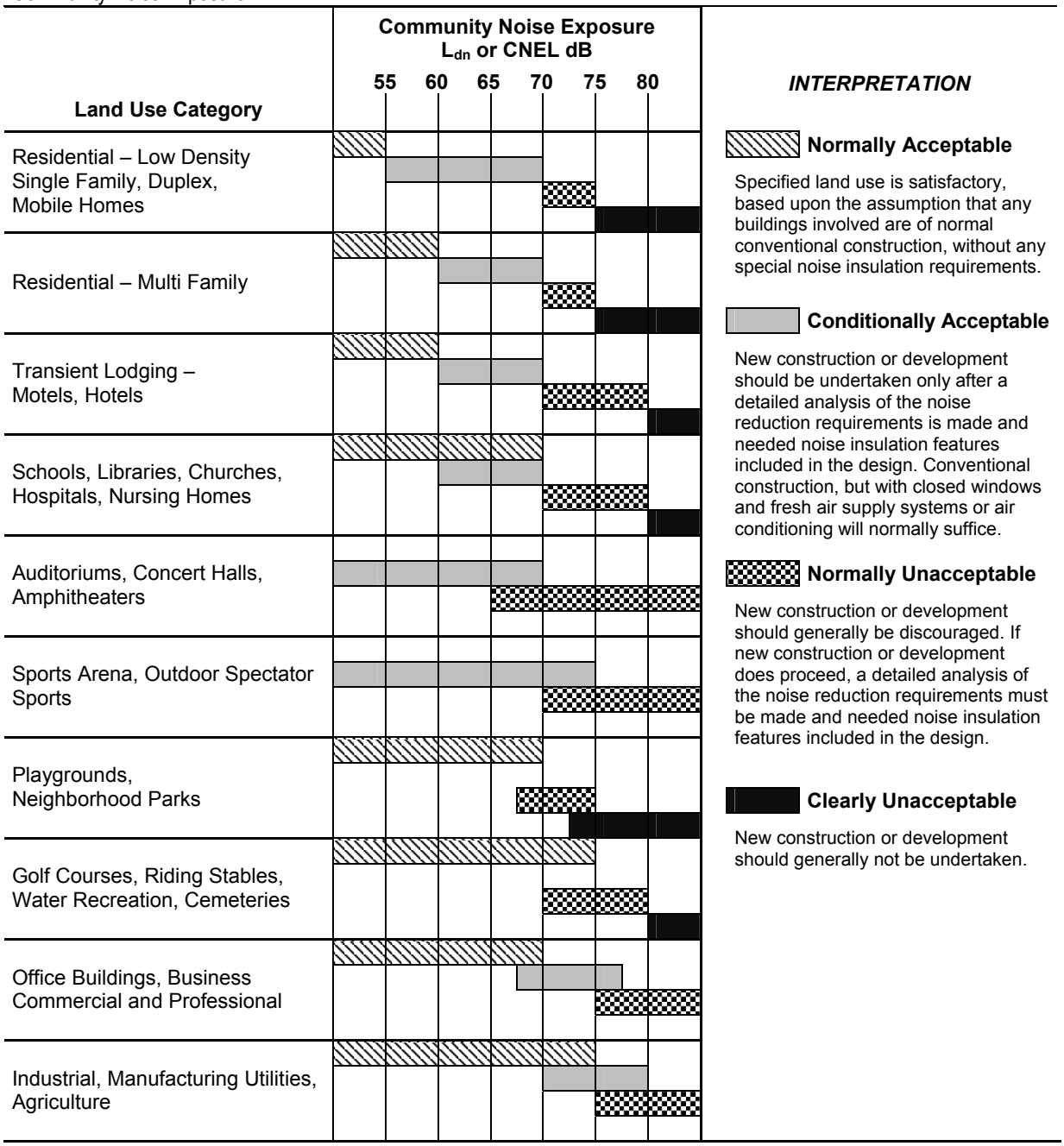
Section 18.38.060(A) of the City's Zoning Code also prohibits the creation of a noise nuisance or substantially exceeding the standards shown in Table 5.7-17. The conditionally acceptable level for residential uses is an $L_{dn}$ of 70 dBA. For a steady continuous source this is equivalent to 64 dBA. A project level of 49 dBA does not result in a substantial exceedance of standards identified in Table 5.7-17.

As described in Section 5.6, Land Use, the project site is in the City of Ceres but some of the nearby noise sensitive land uses are located within Stanislaus County. The applicable noise regulations are those of the City, because the source of the noise will be located in Ceres.

The Stanislaus County Code (Chapter 10.46) prohibits nuisance noise while General Plan establishes quantitative requirements are consistent the City of Ceres' performance standards discussed above. The General Plan also provides land use compatibility guidelines summarize in Table 5.7-18. It notes that these guidelines only apply to uses that are not considered noise sensitive.

Portions of the linear facilities (e.g., transmission line) will be constructed in unincorporated Stanislaus County and the city of Modesto. The Stanislaus County Code and General Plan do not establish specific guidelines or hours for noise from construction activities, rather the code (Chapter 10.46) states that the time, day, proximity to residences, duration and volume will considered in determining if the noise is "loud and raucous" and therefore is a nuisance. The City of Modesto Municipal Code (Title 4, Chapter 9), defines "loud and raucous" to include construction activities before 7:00 a.m. or after 9:00 p.m. daily (except Saturday and Sunday and state or federal holidays, when the prohibited time shall be before 9:00 a.m. and after 9:00 p.m.). Construction of the A2PP linear facilities will comply with appropriate local requirements.

**TABLE 5.7-17**
Community Noise Exposure




Source: City of Ceres, 2009.

**TABLE 5.7-18**
Stanislaus County Land Use Compatibility Guidelines for Community Noise Environments

| Land Use Category | Exterior Noise Exposure $L_{dn}$ or CNEL, dBA 55 | 60 | 65 | 70 | 75 | 80 |
|---|---|---|---|---|---|---|
| Residential – Low Density Single Family, Duplex, Mobile Homes | | | | | | |
| Multi Family Residential | | | * | | | |
| Hotels and Motels | | | | | | |
| Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches | | | | | | |
| Auditoriums, Concert Halls, and Amphitheaters | | | | | | |
| Sports Arena and Outdoor Spectator Sports | | | | | | |
| Playgrounds, and Neighborhood Parks | | | | | | |
| Golf Courses, Riding Stables, Water Recreation, and Cemeteries | | | | | | |
| Office Buildings, Business Commercial, and Professional | | | | | | |
| Industrial, Manufacturing Utilities, and Agriculture | | | | | | |

***INTERPRETATION***

**Normal Acceptable**

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements.

**Conditionally Acceptable**

Specified land use may be permitted only after detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

**Normally Unacceptable**

New construction or development should generally be discouraged. If new construction of development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

**Clearly Unacceptable**

New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

* Interior noise levels shall not exceed 45 $L_{dn}$ in all new residential units (single and multi family). Development sites exposed to noise levels exceeding 60 $L_{dn}$ shall be analyzed following protocols in Appendix Chapter 12, Section 1206, A, Sound Transmission Control, 1996 California Building Code.

Source: Stanislaus County. 2009

## 5.7.7 Agencies and Agency Contacts

Table 5.7.19 lists the agency contacts for noise issues.

**TABLE 5.7-19**
Agency Contacts

| Issue | Agency | Contact |
|---|---|---|
| Noise Level Performance Standard | City of Ceres | Tom Westbrook, Senior Planner<br>City of Ceres Community Development Department, Planning Division<br>2220 Magnolia Street<br>Ceres, California 95307<br>(209) 538-5778<br>Email: Tom.Westbrook@ci.ceres.ca.us |

**TABLE 5.7-19**
Agency Contacts

| Issue | Agency | Contact |
|---|---|---|
| Construction Hours | Stanislaus County | Angela Freitas, Deputy Director<br>Stanislaus County Planning and Community Development Department<br>1010 10th Street<br>Modesto, California 95354<br>(209) 525-6330<br>Email: planning@mail.co.stanislaus.ca.us |

## 5.7.8 Permits and Permit Schedule

No noise related permits are required.

## 5.7.9 References

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Westbrook, Tom/City of Ceres Planning Department. 2009. Personal Communication with Susan Strachan/Strachan Consulting on March 26.