- NOISE
  (SECTION 5.12 FROM 99-AFC-7)

5.12 NOISE

5.12.1 Affected Environment

5.12.1.1 Overview of Project Components

5.12.1.1.1 Plant Site. The proposed Pastoria Energy Facility (PEF) is located within a predominantly open space/rural agricultural area in Kern County, California. The project site of approximately 30 acres is located about 30 miles south-southeast of downtown Bakersfield, California and approximately 6.5 miles east of Grapevine, California. In general, the topography of the area is relatively flat with a slight (four percent) down-gradient slope running from southeast to northwest. The site, consisting mostly of soft ground, is undeveloped with the exception of an existing power transmission line running north-south along the western boundary of the site, fences, and unimproved dirt roads. The site is located adjacent to an active gravel quarrying operation.

5.12.1.1.2 Receptors. The nearest residential noise receptors are located approximately 4.4 miles northeast of the project site adjacent to Laval Road, and 5.4 miles northeast of the proposed plant site, within an agricultural activity support area known as Lower Citrus. The Laval Road location has about a dozen residences with industrial/agricultural facilities on either side, while the Lower Citrus area contains a field office, equipment storage and maintenance buildings, with four adjacent residential units housing twelve permanent occupants. Additional scattered rural residential uses are located along David Road and Sebastian Road. These residences are in the vicinity of the fuel gas linear facility alternative routes. No known urban development is presently planned within 5 miles of the plant site.

5.12.1.1.3 Linear Routes. The proposed project includes linear routes for pipelines, transmission lines, and a new plant access road (refer to Map 3.2.1). These linear routes are located primarily but not exclusively in non-noise-sensitive areas. For more information on linear route locations, refer to the Land Use section (5.9) of this document.

5.12.1.2 Acoustical Definitions

Sound levels are measured on a logarithmic scale in decibels, dB. The universal measure for environmental sound is the “A”-weighted sound level, dBA. “A” scale weighting is a “filter” or adjustment curve applied by the measuring instrument to shape the frequency content of the sound in a manner similar to the way the human ear responds to sounds. “Noise” is defined as unwanted sound.

The residual environmental noise level is the quasi-static noise level that exists in the absence of all identifiable, sporadic, individual noise events such as those caused by automobile pass-bys, aircraft flyovers, intermittent dog barking, etc. In most environments this residual level is called the ambient or background noise level and is composed of the cumulative sum of all noise sources, both near and far, and includes indistinguishable noise from road transportation, fixed and mobile machinery, aircraft, and other sources. The ambient level varies slowly with time as these sources increase or diminish. It has been found that the (measurable) statistical sound level quantity, L_{90} (in dBA) well represents the background sound level. L_{90} is the level that is exceeded 90 percent of the time during a given interval. Likewise, L_{50} is the level that is exceeded 50 percent of the time during a given time interval, while L_{10} is the level that is exceeded 10 percent of the time during a given time interval.

Because environmental noise, by its nature, varies with time, it is beneficial to define certain measurement terms that are used to characterize this fluctuating quantity. The true energy average level over a specific time period is defined as the equivalent level, abbreviated as L_{eq}. L_{eq} is the level over an interval that is equivalent to a perfectly constant level containing the same acoustic energy over the same interval. Hence, L_{eq} provides a measure of the true energy average sound level in an area and includes all sporadic or transient events. L_{eq} is usually measured in hourly intervals over long periods in order to develop 24-hour average noise levels. L_{eq} is generally used to measure noise affecting sensitive receptors where the noise source itself is not of special concern during evening and nighttime hours, or where the noise is only generated during daytime hours such as with construction activities. For locations that experience large intermittent variations in noise levels, the L_{50} is a reasonably good indicator of the noise environment and is perhaps more suitable than the L_{eq}.

Other descriptors of noise are also commonly used to help predict an average community reaction to adverse effects of environmental noise including traffic-generated and industrial noise. These descriptors include the Day-Night Average Noise Level (L_{dn}), and (in California) the Community Noise Equivalent Level (CNEL). Each of these descriptors use units of dBA. Both L_{dn} and CNEL noise metrics represent 24-hour periods and apply a time-weighted factor designed to penalize noise events that occur during non daytime hours, when relaxation and sleep disturbance is of more concern. In the case of CNEL, noise occurring during the daytime hours between 7:00 am and 7:00 p.m. receives no penalty. Noise occurring between 7:00 p.m. to 10:00 p.m. is penalized by adding 5 dB to the measured noise level, while noise occurring from 10:00 p.m. to 7:00 am is penalized by adding 10 dB to the measured level. L_{dn} differs from CNEL by not adding the penalty between 7:00 p.m. and 10:00 p.m. Both CNEL and L_{dn} are the predominant metrics used by local governments to describe noise environments within their jurisdictions and for planning purposes. Kern County uses the L_{dn} descriptor, with CNEL considered an equivalent metric.

5.12.1.3 Ambient Noise Survey

In an effort to evaluate current conditions and assess any potential project noise impacts on the surrounding community, an ambient sound level survey was conducted November 9 and 10**,** 1999 at the proposed plant site and at selected offsite locations in the vicinity of the project. These offsite locations were chosen to represent the nearest residential receptors to the proposed site, as well as to evaluate construction noise impacts along the linear facilities' routes.

Table 5.12-1 itemizes the locations where both unattended long-term (25-hour) and attended short-term (less than 1-hour) measurements were taken. Two long-term and 10 short-term measurements were conducted at 10 locations to acoustically characterize the project site and its environs, and to determine the existing sound levels at potential noise-sensitive receptors. A long-term noise monitor (LT-1) was placed near a residence in the Lower Citrus agricultural activity area. The monitor measured hourly average noise levels during a 25+-hour period from November 9 to November 10, 1999. A second long-term monitor (LT-2) was placed across from a residence on Sebastian Road 0.5 mile east of Rancho Road and provided noise data for a 24+-hour period. Shorter duration (10 minute) attended noise measurements (ST-"x") were conducted during random morning, midday, and afternoon hours at several locations to corroborate the results of the long-term monitors and to allow for physical observations of the predominant local noise sources. The long-term measurements were made with Larson-Davis Model 820 and Metrosonics db308 community noise analyzers.

The attended measurements were made with a Type 1 Brüel & Kjær Type 2231 sound level meter (SLM) with statistical analyzer. The sound measuring instruments used for the survey were set on slow time response using the A-weighted decibel (dBA) scale for all of the noise measurements. To ensure accuracy, the instruments were field calibrated before and after each measurement. The accuracy of the acoustical calibrator is maintained through a program established through the manufacturer and traceable to the National Institute of Standards and Technology. The sound measurement instruments meet the requirements of the American National Standard S 1.4-1983 and the International Electrotechnical Commission Publications 804 and 651. In all cases, the microphone height was 5 feet above the ground and the microphone was equipped with a windscreen. General meteorological conditions were noted and air temperature, relative humidity, and wind velocity were measured.

A listing of the noise data for the long-term measurement surveys (LT 1 & 2) is shown in Table 5.12-2, while the measured short-term noise levels are summarized in Table 5.12-3. Existing ambient noise at the proposed plant site (measurements ST-4, 5, 6, and 7) and throughout the general area (ST-1, 2, 3, 8, 9 and 10) is due almost entirely to sand/gravel

extraction, motor-vehicle traffic, or agricultural/industrial activities in the area. To the east of the site is a sand and gravel mine. Consequently, mining machinery and transportation activities such as heavy trucks associated with the mining operation are the dominant contributors to the noise environment at the Pastoria Energy Facility site. Measured noise levels at each of the four plant site boundaries were within tenths of a decibel of 39 dBA L_{eq}.

The nearest residential receptors are located to the northwest of the project site along Laval Road (ST-8) and at LT-1 and near ST-3, the agricultural support area northeast of the project site. These residences are approximately 5.4, 6.2, and 4.4 miles distant from the project site, respectively. The ambient noise levels during the daytime hours are dominated by activities associated with agricultural production and/or local traffic activity. At ST-8, the midday L_{eq} was 41 dBA and the L_{50} was 39 dBA. The hourly L_{eq} noise levels at LT-1 (Lower Citrus) ranged from a low of 27 dBA to a high of 47 dBA during the long-term ambient noise survey. At ST-3, the afternoon L_{eq} was 39 dBA and the L_{50} was 38 dBA. Although the existing environmental noise levels are moderate to low, the receptors are very distant from the project site and noise from the plant is unlikely to be audible at any sensitive receptors.

Measurement Locations ST-1, 2/10, 3, 8, and 9 were chosen to describe the background ambient noise levels for residences potentially affected by short-term linear facilities construction noise. Location ST-1 is representative of the residential area associated with the agricultural support facility and is near long-term measurement location LT-1. An attended short-term noise measurement was conducted at this location during the daytime hours, when construction activities would be taking place. The L_{eq} was 40 dBA. The residences along Sebastian Road (ST-2/10 and LT-2) are currently exposed to noise from farm machinery and aircraft, transport trucks, school busses and light-duty trucks/automobiles. The measured 24-hour noise levels ranged from 48 dBA to 63 dBA L_{eq} at LT-2. Existing daytime noise levels along David Road (ST-9) are about 44 dBA L_{eq} from similar noise-producing sources.

The above-described locations represent the limit of the area of potential effect for noise from the Pastoria Energy Facility project.

5.12.1.4 Recommended A-Weighted Sound Level Design Goals

Several categories of noise receptors are found near the proposed project site: Insensitive, including gravel extraction which abuts the proposed site and agricultural uses in the general area of the site; and Sensitive to Highly Sensitive residential land uses to the northeast, north, and northwest of the site. The nearest of the residential land uses is located approximately 23,400 feet from the project site. Consistent with California Energy Commission and Kern County regulations regarding noise, new-source noise impacts at residential receptors are evaluated with respect to the pre-existing background noise level or specific performance

noise level limits. The California Energy Commission defines the area impacted by the project as that area where there is a potential increase in existing noise levels of 5 dBA or more during either construction or operation. The Kern County General Plan Noise Element establishes goals, policies, and programs for reducing noise within the County. Environmental noise limits are based on the land use of the property receiving the noise. Land uses are categorized as Insensitive, Moderately Sensitive, Sensitive, and Highly Sensitive. Land uses adjacent to the proposed plant would be Insensitive Uses located at the property boundaries. The County Noise Quality Standards for these uses are 65 dBA daytime and 60 dBA nighttime L_{50}. The nearest noise-sensitive receptors to the project site are dwellings that would be classified as Sensitive land uses, with the next nearest residences classified as rural Highly Sensitive. Thus, for noise-sensitive uses the most restrictive Noise Quality Standard (i.e., nighttime) is a maximum permissible noise level from the proposed project of 45 dBA L_{50} at the nearest residential properties and 40 dBA L_{50} at the next nearest rural residential properties.

As stated above, the Kern County Noise Quality Standards for Insensitive Use are 65 dBA L_{50} daytime and 60 dBA L_{50} nighttime. Theoretically these standards would apply to the boundary line between the project and the adjacent gravel extraction operation. The Applicant does not believe that it would be appropriate to apply the nighttime standard because the sand and gravel operation is not operated at night and the property is not occupied at night. Further, the 65 dBA L_{50} daytime standard should not be applied because the on-site noise levels generated by the sand and gravel operations are routinely in the 80+ dBA range and the personnel are either wearing personal protective equipment (ear plugs) or are working inside a structure.

5.12.1.5 Noise Prediction Modeling of Operational Noise

The preliminary plant design, including a complete listing of major plant equipment, and its associated noise level rating were provided by the project engineer as the basis for this noise impact evaluation. The equipment list includes the total number of pieces of equipment, including redundant equipment that would normally not be in service during standard operating conditions. The redundant items were not included in the calculation of project noise. The equipment listing with specific noise ratings is presented in Table 5.12-4. Each of the specified equipment sound pressure levels (SPL) was used to calculate the sound pressure level at a reference distance of 400 feet. Multiples of the same equipment type were added together on an energy basis to estimate the total sound emission for all of the same equipment type currently planned to be used on the site. The total predicted far field noise levels, in dBA, were then calculated for the reference distance. Additional propagation losses affecting the sound level due to additional distance and air absorption were conservatively considered and subtracted based upon recognized standards. A maximum of 15 decibels of excess

attenuation due to air absorption was subtracted. Barrier effects of existing structures and ground absorption effects between the plant site and receptor locations were not included in the predictions. This makes the predictions conservative for far field noise impact levels.

Noise contours (lines representing locations of equal and constant sound levels) at five-decibel intervals were then developed by calculating the distance to each L_{50} contour based upon the proposed project's noise contribution. At 4.4 miles (the distance to the nearest residential receptor from the site), the noise level from the proposed project was determined to be approximately 30 dBA L_{50} and 37 dBA L_{dn}. These noise levels would obviously be inaudible compared to the existing ambient environmental noise. The noise contour plots are shown on Figure 5.12-2.

5.12.2 Environmental Consequences

5.12.2.1 Power Plant Operational Noise

As described in Section 5.12.1.5, the noise impact calculations indicate that the normal operating noise impact from the proposed power plant would be approximately 30 dBA L_{50} at the nearest residential receptor, which is well below the Kern County maximum allowable noise level of 45 dBA L_{50}. At the next nearest (rural residential) land use, the predicted noise level would be approximately 28 dBA L_{50} which is below the 40 dBA L_{50} allowable level. Based on the Kern County standards, the project will not produce noise impacts. Also, because the proposed project will not cause an increase in the ambient noise levels of 5 decibels at a noise-sensitive location, the proposed project satisfies the California Energy Commission's guidelines as well. Thus, the plant's design sound level goal is appropriate to avoid generation of significant noise, and development of the PEF will not produce a significant noise impact.

5.12.2.2 Power Plant Construction Noise

The construction phase of the PEF project is scheduled to last approximately 24 months. During that time, a number of pieces of construction equipment will be onsite. The construction schedule currently plans for all construction activities to take place between the hours of 6:00 a.m. to 6:00 p.m.

An extensive field study conducted by Bolt, Beranek and Newman (1977) on power plant construction noise has produced the most comprehensive and realistic source of quantitative far field noise data. This study data was used to develop Table 5.12-5, which contains a sample of the construction equipment with the highest noise levels that may be onsite at any given time during the 24-month construction period. If all of this equipment were to operate

simultaneously at maximum power, a total noise level of approximately 89 dBA would occur at a distance of 50 feet from the acoustic center of the construction equipment activity. Accounting for the attenuation of sound by distance, the equipment noise of 89 dBA at 50 feet would be reduced to a noise level of 70 dBA at a distance of 400 feet from the construction activity. Construction activities are normally of short duration and do not occur all at the same time; therefore it is unlikely that the existing ambient noise level within adjacent mining or agricultural production areas will be impacted or that the noise levels indicated above would adversely impact (or even be audible at) the nearest residential receptors.

5.12.2.3 Transmission Line Operation

Currently, the existing power transmission lines in the project area are owned and operated by Southern California Edison (SCE). These facilities consist of 230 kV and 66 kV overhead lines. The project proponents are currently planning to construct a 230 kV dual circuit transmission line, Route 1 (Map 3.2-1), which would interconnect the PEF plant with the existing Pastoria substation located 1.38 miles south of the PEF site. The transmission line is described in Section 3.5.4 (Proposed Transmission Facilities).

Noise sources associated with power transmission include occasional breaker operation in the switchyard, and corona noise and very low magnetostriction hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration, and may occur only a very few times per year. Corona noise is characterized as a buzz or hum and is usually worse when the conductors are wet, such as in rain or fog.

The Electric Power Research Institute (EPRI) has conducted noise tests and studies and has published reference material on transmission line noise. EPRI states that noise produced by a conductor decreases at a rate of three decibels per doubling of distance from the source. The EPRI Transmission Line Reference Book indicates that the audible noise from a typical 230 kV line with two conductors per phase would likely be less than 40 dBA at a distance of 40 feet from the outside conductor at ground level. If only one conductor per phase is used the noise level will be less.

Based upon this analysis of transmission line operational noise levels, no significant noise impact will occur because the transmission line and switchyard is not proposed to be located near noise-sensitive land uses and, thus, this project component will not create adverse noise impact.

5.12.2.4 Transmission Line Construction

The proposed construction schedule for the transmission lines is four months. All construction activities will occur within the open space/agricultural area in and around the PEF site. The proposed work schedule calls for a normal work week (Monday - Friday) from 6:00 a.m. to 6:00 p.m. Construction activities will consist of digging footings and placing concrete. Placing the steel towers will consist of using a crane to erect the tower and bolting sections of steel together. Conductors will be strung by conventional methods using cable trucks and winches. None of these activities will generate noise of an unusual nature, or on a long-term basis, or during nighttime hours.

Because all transmission line construction activities will be taking place within an area far removed from noise-sensitive land use, no significant noise impact will occur.

5.12.2.5 Operation of Offsite Pipelines

The proposed project requires offsite pipelines. These include a 20-30 inch diameter make-up water supply line connected to a new main to be constructed 300 feet west of the PEF site by the Wheeler Ridge-Maricopa Water Storage District; a 16-24 inch diameter, approximately 12 to 14-mile-long natural gas fuel line connected to the Kern River-Mojave transmission pipeline north of the site (shown on Map 3.2-1); and a 10-12 inch diameter discharge line for
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The fuel gas line will have a filter, metering and pressure control station above ground within the power block area located near the combustion turbines. The audible noise produced by this equipment has been accounted for in the plant's noise evaluation and impact calculations. All other sections of the fuel gas line and all other pipelines will be below ground and will not produce audible noise. Thus, there will be no noise impact created by any of the pipelines associated with the project.

5.12.2.6 Construction of Offsite Pipelines

As discussed above, pipelines are proposed to be constructed offsite as part of the project. All of these pipelines will be underground pipelines.

The methods to be used for constructing these pipelines will be trenching (approximately 2 to 3 feet wide by up to 5 feet deep), pipe installation and backfill, compaction and repaving, where applicable. The total duration of construction will be approximately four months for all pipelines. Scheduled work hours are Monday through Friday from 6:00 a.m. to 6:00 p.m. Generally, linear projects of this type proceed in a sequential fashion from one section of pipe

to the next, and can install several hundred feet of pipe per day. Thus, construction noise will be taking place at different locations along the route at any given time, and noise impacts at any one point are short-term, typically lasting less than a week. Construction work will only take place during normal weekday working hours. Listed in Table 5.12-6 are typical noise levels generated by pipeline construction equipment that will be used during the placement of these pipelines. The typical maximum noise level is 84 dBA at a distance of 50 feet.

The noise-sensitive receptors potentially affected by this phase of the project are located at the agricultural activity support facility, along Sebastian Road and David Road. These receptors are normally exposed to short-term high/moderate levels of machinery and heavy truck noise, but the expected construction equipment noise levels may be somewhat higher than the average existing noise levels. Because the construction activities will be moving along the route on a daily basis, the residences closest to the pipeline alignments will be exposed to short periods of daytime construction noise above ambient lasting from a few hours to a few days as the construction activities pass by any given location during the construction phase.

Ambient noise was measured at representative residential locations adjacent to the fuel gas pipeline alternative construction alignments. The data reported for Location ST-1 and ST-2/10, LT-2, ST-3, and ST-9 in Table 5.12-3, indicates existing maximum noise levels of 54 to 75 dBA and average levels of 40 to 56 dBA L_{eq} from existing sources of environmental noise. The pipeline construction noise will attenuate to ambient maximum noise levels within about 500 feet in any direction from the location of construction activity and will not adversely impact any other residences, schools, hospitals or churches. Because the construction-phase noise will only marginally increase the existing ambient noise levels for a very limited duration during weekday daytime hours, construction of the pipelines will not cause a significant noise impact.

5.12.2.7 Operation of Access Road

The approximately one-mile long Access Road is proposed to be constructed for worker access (approximately 25 full-time employees) and occasional materials delivery to the PEF site. Traffic on this road will be minimal and noise associated with use of the road will be inaudible at any noise-sensitive receptor. Noise associated with use of this road will not cause any impact.

5.12.2.8 Construction of Access Road

Construction of the Access Road will involve the use of heavy machinery (graders, scrapers, bulldozers). This noise will attenuate with distance as discussed previously such that no adverse noise impacts will occur.

5.12.3 Mitigation Measures

5.12.3.1 Power Plant Operations

NOISE-1: The proposed power plant will be designed and operated to limit far field noise levels in order to comply with local standards and existing ambient noise levels. The major pieces of plant equipment must, at a minimum, meet the noise level guidelines presented in Table 5.12-4. This can be accomplished by placing noise specifications into the equipment bid specifications and requiring compliance to these specifications in the bidders proposals. Operation of the proposed plant will satisfy the sound level design goal and will not cause a noise impact; thus, no noise mitigation measures are required for normal plant operations.

5.12.3.2 Power Plant Construction

NOISE-2: Construction equipment will be fitted with properly functioning mufflers. Movement of construction equipment on or off site will be scheduled to minimize noise generated near offsite noise sensitive uses. Plant construction will not cause significant noise impacts; thus, no noise mitigation measures are required.

5.12.3.3 Transmission Line Operation

Operation of the high voltage transmission line will not cause significant noise impacts; thus, no noise mitigation is required.

5.12.3.4 Transmission Line Construction

NOISE-3: Construction equipment to be used for the transmission line construction will be fitted with properly functioning mufflers. Use of pile drivers, pneumatic hammers or other particularly noisy equipment will be limited in conformance with the County's noise regulations. Movement of equipment shall be scheduled to minimize noise affecting offsite locations. Construction activities shall comply with applicable laws, regulations, and ordinances.

5.12.3.5 Offsite Pipeline Operation

Because the offsite pipelines are underground, no noise mitigation is required.

5.12.3.6 Offsite Pipeline Construction

NOISE-4: Most pipelines will be located within open space/agricultural areas and construction noise will be consistent with the land uses and associated activities conducted thereon. However, construction of portions of the fuel gas pipeline will generate some elevated short-term noise impacts in proximity to a residential location. In order to minimize this noise, all construction equipment will be fitted with functioning exhaust mufflers. Movement of construction equipment and material will be scheduled to take place during normal construction hours and all activities will be conducted according to normally permitted construction standards.

5.12.4 LORS Compliance

The proposed facility will satisfy all applicable laws, ordinances and regulations pertaining to noise emissions. The following sections summarize LORS compliance with respect to noise. Refer to Section 7.4.10 for more information.

5.12.4.1 Federal

There are a number of laws and guidelines at the Federal level that direct the consideration of a broad range of noise and vibration issues. Some of these areas of concern are not directly related to the proposed project. Several of the more significant rules are listed below:

- National Environmental Policy Act (42 U.S.C. 4321, et. seq.) (PL-91-190) (40 C.F.R. § 1506.5)

- Noise Control Act of 1972 (42 U.S.C. 4910)

- EPA recommendations on “Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety”, NTIS 550\9-74-004, USEPA, Washington, D.C., March 1974

- Federal Energy Regulatory Commission Guidelines on noise emissions from compressor stations, power plants, substations, and transmission lines (18 C.F.R. 157.206(d)5)

- FHWA Noise Abatement Procedures (23 C.F.R. Part 772)

- HUD Environmental Standards (24 C.F.R. Part 51)

- OSHA Occupational Noise Exposure; Hearing Conservation Amendment (FR 48 (46), 9738--9785 (1983).

Additional noise emission/exposure guidelines, regulations, codes, and statutes exist that are promulgated and/or enforced by various federal agencies including the National Park Service, the U.S. Coast Guard, and the Fish and Wildlife Service.

The U.S. Environmental Protection Agency has not promulgated standards or regulations for environmental noise generated by power plants. However, as listed above, the EPA has published a guideline (EPA Levels Document, Report No. 556/9-74-664) containing recommendations for noise levels affecting residential land use of L_{dn} 55 dBA for outdoors and L_{dn} 45 dBA for indoors. The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues, and therefore should not be construed as standards or regulations.

5.12.4.2 State of California

The California Department of Industrial Relations, Division of Occupational Safety and Health (Cal OSHA) (8 CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, §5095) requires that all in-plant noise levels be limited to 85 dBA at three feet from equipment sources to protect worker safety. If areas of the plant exceed 85 dBA then all aspects of the hearing conservation program must be implemented by the employer.

There are likely to be areas within the plant with noise levels above 85 dBA, but none of them can be considered a normal stationary eight-hour working station. Full-time operations and maintenance personnel will have only limited exposure to these high noise areas under most circumstances. In areas where 85 dBA is typically exceeded, signs will be posted requiring the use of hearing protection. Additionally hearing conservation programs must be implemented.

The State also requires local jurisdictions (CCR 65302F) to prepare General Plans which include Land Use and Noise Elements.

5.12.4.3 Local Noise Regulations

The project is governed by the Kern County General Plan Noise Element. Project noise at the plant site boundaries may be required to comply with the Noise Element Guidelines established for Insensitive Uses (e.g., agriculture, mining and extraction), while the plant's offsite effects must comply with guidelines established for nearby land uses, including Sensitive and Highly Sensitive Uses (e.g., rural residential). The nearest residential property is located approximately 23,400 feet from the plant. The predicted plant noise level at this location is below the existing measured ambient noise conditions and complies with the intent of the Noise Element.

5.12.5 References

Bolt, Beranek and Newman, Inc. 1977. Power Plant Construction Noise Guide (Report 3321).

California Energy Commission. 1997. Rules of Practice and Procedure, Power Plant Site Certification Regulations.

EEI. 1983. Electric Power Plant Environmental Noise Guide, 2nd Edition, Revised.

Harris, Cyril M. 1979. Handbook of Noise Control, 2nd Edition, McGraw-Hill, Inc. , New York.

Kern County General Plan, Noise Element, 1989.

Patch Inc. 1999. Pastoria Energy Facility, Preliminary Noise Information for Pastoria Energy Facility.

TABLE 5.12-1

AMBIENT NOISE MEASUREMENT LOCATIONS[1]

Monitor Position Number	Monitor Position Description and Approximate Location
1	Long - term monitor and short-term measurement; "Lower Citrus" agricultural support area; 75 feet east of residence at Lower Citrus.
2	Long - term monitor and short-term measurement; 2254 Sebastian Road at Mazzie Road, adjacent to power pole, across street from residence.
3	Short-term measurement; 100 feet southeast of residence, 2 oil wells near residence.
4	Short – term measurement; northwest corner of project site.
5	Short – term measurement; northeast corner of project site.
6	Short - term measurement; southeast corner of project site.
7	Short - term measurement; southwest corner of project site.
8	Short - term measurement; 4500 Laval Road; approximately 2 miles from freeway, 0.2 mile from where Laval Road turns north.
9	Short - term measurement; David Road, 0.25 mi east of Rancho Road
10[2]	Short - term measurement; 2254 Sebastian Road (same as LT-2 and ST-2)

[1]Refer to Figure 5.12-1 for approximate locations.

[2]Note: LT = long term; ST = short term.

TABLE 5.12-2

LONG-TERM NOISE DATA (dBA)

Long-Term Monitor Location	24 Hour L_{eq}	24 Hour L_{dn}	24 Hour CNEL	24 Hour Average L_{10}	24 Hour Average L_{50}	24 Hour Average L_{90}
1	40.4	44.3	44.3	41.6	33.4	28.5
2	59.8	63.1	63.0	n/a	48.2	44.0

TABLE 5.12-3

SHORT-TERM NOISE DATA (dBA)

Monitor Location	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
1	40.1	54.4	27.9	30.4	33.9	44.9
2	55.8	75.3	31.4	37.9	46.9	56.9
3	38.8	55.0	34.0	35.9	37.9	40.4
4	38.8	52.9	31.5	33.4	35.4	40.4
5	38.9	48.0	34.0	35.4	37.4	41.4
6	39.2	49.7	34.7	36.4	37.9	41.4
7	39.4	51.8	33.0	34.4	36.9	41.4
8	41.4	49.5	33.9	35.9	38.9	44.9
9	44.5	65.1	30.1	32.4	35.4	44.4
10	53.8	68	37.6	39.9	47.4	57.9

TABLE 5.12-4

ESTIMATED NOISE LEVELS FOR MAJOR EQUIPMENT AT PASTORIA ENERGY FACILITY[1]

Quantity				Noise per Unit [1, 2, 3] dBA @ Horizontal Distance		
Operating	Spare	Description	Peak Capacity and Remarks	Near Field	Far Field	Far Field Sum
3	--	Combustion Gas Turbine	168 MW nominal at 60ºF ambient	90 dBA @ 3'	67 dBA @ 400'	72 dBA @ 400'
2	--	Steam Turbine	185 MW maximum for 2x1; 90 MW for 1x1	90 dBA @ 3'	63 dBA @ 400'	66 dBA @ 400'
5	--	Generators	168 MW each CTG-STG 185 MW/90 MW	90 dBA @ 3'	63 dBA @ 400	70 dBA @ 400'
3	--	CT Air Intake Filter	3,600,000 lb/hr each	85 dBA @ 3'	63 dBA @ 400'	68 dBA @ 400'
3	--	Combustion Turbine Exhaust Stack	213' High		63 dBA @ 400'	68 dBA @ 400'
3	--	Heat Recovery Steam Generator (HRSG)	550,000 lb/hr each	90 dBA @ 3'	63 dBA @ 400'	68 dBA @ 400'
3	--	Steam Control Valve Manifold	550,000 lb/hr each	90 dBA @ 3'	55 dBA @ 400'	55 dBA @ 400'
Lot		Vents and Blowers			53 dBA @ 400'	53 dBA @ 400'
3	3	HP/IP Boiler Feedwater Pumps	1000 gpm each	85 dBA @ 3'	42 dBA @ 400'	47 dBA @ 400'
3	--	Fuel Gas Filter/Separator and Metering Runs	80,000 lb/hr each	85 dBA @ 3'	42 dBA @ 400'	47 dBA @ 400'
1-	--	Fuel-Gas Turbo-Expander	240,000 lb/hr-Enclosed in Building	90 dBA @ 3'	47 dBA @ 400'	47 dBA @ 400'
3	--	Fuel Gas Pressure Reduction Station	80,000 lb/hr each	90 dBA @ 3'	47 dBA @ 400'	52 dBA @ 400'
1	1	Make-up Water Treatment Pumps	5000 gpm each	85 dBA @ 3'	42 dBA @ 400'	42 dBA @ 400'
1	1	Demineralized Water Pumps	250 gpm each	85 dBA @ 3'	42 dBA @ 400'	42 dBA @ 400'
1	--	Demineralized Water Treatment Package	300 gpm	85 dBA @ 3'	42 dBA @ 400'	42 dBA @ 400'
1	--	Zero Discharge Wastewater Treatment	1000 gpm		63 dBA @ 400'	63 dBA @ 400'
1	1	Wastewater Disposal Pump	1000 gpm (Disposal Well Option)	85 dBA @ 3'	42 dBA @ 400'	42 dBA @ 400'
3	2	Condensate Pumps	1000 gpm each	85 dBA @ 3'	42 dBA @ 400'	47 dBA @ 400'

TABLE 5.12-4

(Continued)

Quantity				Noise per Unit [1, 2, 3] dBA @ Horizontal Distance		
Operating	**Spare**	**Description**	**Peak Capacity and Remarks**	**Near Field**	**Far Field**	**Far Field Sum**
6	3	Cooling Water Pumps	32,000 gpm each	85 dBA @ 3’	42 dBA @ 400’	50 dBA @ 400’
24	--	Wet Cooling Tower Fans	Two Speed 200/25 hp each[4]	88 dBA @ 5’	62 dBA @ 400’	76 dBA @ 400’
2	--	Wet Cooling Tower Structure	One w/16 cells, one w/8 cells, including fan noise	78 dBA @ 5’	60 dBA @ 400’	60 dBA @ 400’
1	--	Fire Water Pump-Electric Primary	3000 gpm, contained in Fire Pump House [5]	105 dBA @ 3’	62.5 dBA @ 400’	63 dBA @ 400’
1	--	Fire Water Pump-Diesel Back-up	3000 gpm, contained in Fire Pump House [5]	85 dBA @ 3’	42 dBA @ 400’	42 dBA @ 400’
5	--	Step-up Transformers	13.8/230 kV	72 dBA @ 50’	54 dBA @ 400’	61 dBA @ 400’
						79.8 Total at 400’

[1] Noise data are not-to-exceed maximums per unit of equipment running at full load condition with all necessary equipment. Overall noise profile should assume no spare equipment operating.

[2] Actual values may be significantly lower depending on final equipment selection and use of noise attenuation enclosures or design.

[3] Given numbers may include or require benefit of noise reduction enclosures or design.

[4] Cooling tower fan noise will be approximately 10 dBA less when fans are at half speed during part load or cool weather full load conditions.

[5] Fire pumps may run separately or together for emergency operation. Weekly testing is 10 minutes for electric and 30 minutes for diesel.

TABLE 5.12-5

MAXIMUM NOISE LEVELS FROM TYPICAL CONSTRUCTION EQUIPMENT

Equipment	Estimated Maximum Sound Level at 50 feet (dBA)
Backhoe	83
Large Mobile Crane	85
Dozer	88
Grader	86
Scraper	89
Dump Trucks	87

TABLE 5.12-6

NOISE LEVELS FROM TYPICAL
PIPELINE CONSTRUCTION EQUIPMENT

Equipment	Average Noise Level, Leq @ 50 feet (dBA)
Paver	82
Trencher	82
Water Truck	84
SideBoom Hoist	85
Masonry Saw	78
Backhoe	85
Jack Hammer	88

Source: Bolt, Beranek and Newman, Inc., 1977.