

5.8 Noise

This section discusses the existing noise environment and potential noise impacts of construction and operation of the Ridgecrest Solar Power Project (RSPP or Project). A 25-hour noise survey was conducted to establish ambient background noise levels in the Project area. The noise survey results were used to develop a noise model to predict operational noise levels from the Project at noise sensitive receptors near the Project site. Project construction noise was also predicted at noise sensitive receptors. Applicable laws, ordinances, regulations, and standards (LORS) are discussed in Section 5.8-1 below.

The noise discussion presented in the following pages is intended to support compliance by the California Energy Commission (CEC) with the requirements of the California Environmental Quality Act (CEQA), and by the Bureau of Land Management (BLM) with the requirements of the National Environmental Policy Act (NEPA). The two agencies are conducting a joint review of the Project and a combined CEQA/NEPA document will be prepared.

Summary

Project noise impacts would be less than significant. There are few noise-sensitive land uses located in the Project site vicinity that potentially could be impacted by Project noise emissions. The residence nearest to the power block is approximately 3,200 feet east of the northern solar field, approximately 3,600 feet from the nearest solar collectors, and approximately 6,300 feet from the power block. Other residences are about 3,250 feet east of the northeastern site boundary, and over one mile from the power block. The predominant existing noise source in proximity to the site is vehicle traffic, primarily on U.S. Highway 395.

Temporary short-term construction noise would be generated from Project construction activities. However, the County Noise Ordinance does not limit construction noise levels; it limits construction hours if the construction is within 1,000 feet of an inhabited residence, which is not the case for RSPP. Project construction noise would be audible at 150 feet; however, the nearest inhabited residence is beyond 1,000 feet of the construction. As a result, Kern County noise ordinances will not restrict Project construction activities. However, construction noise will be noticeable at the nearest residence for a short time when construction activities are ongoing at/near the closest site boundary.

Operational noise levels from the Project would predominantly be from daytime operation of equipment in the power block of the plant (e.g., steam turbine, cooling tower). The modeled daytime operational plant noise levels are estimated to attenuate over approximately 6,300 feet to approximately 42 decibels absolute (dBA) Equivalent Continuous Noise Level (Leq) at the nearest residence; non-daylight noise levels would be approximately 20 dBA Leq lower because the primary noise sources would be in shutdown mode. The day/night average sound level (Ldn) at the nearest residence would be approximately 42 dBA Ldn. The ambient Ldn at the residence (without the Project) is 52 dBA Ldn. The 10 dBA difference between the two Ldns would result in a 1 dBA increase added to the higher of the Ldn (52 dBA), resulting in an Ldn with the project of 53 dBA at the nearest residence. This 1 dBA increase above ambient is less than perceptible.

When comparing the plant's estimated noise level at night (when the plant is shutdown) of 22 dBA Leq at the residence with the lowest measured L90 of 36 dBA at the quietest time of the night (3:00 A.M.) at the residence, the increase would be less than the CEC's significance criteria of 10 dBA above the lowest measured L90 at any noise sensitive receptor. Therefore, there would be no significant impact.

5.8.1 LORS Compliance

Table 5.8-1 and the immediately following text summarize the noise LORS that apply to the Project. The Project will comply with applicable LORS during Project construction and operation. The nature of noise, applicable acronyms, and other terms are explained in Section 5.8.3.1, Noise Terminology.

Table 5.8-1 Summary of Applicable Noise LORS

| LORS | Applicability | Where Discussed in AFC |
|--|---|--------------------------|
| Federal: | | |
| Federal Noise Control Act of 1972: 42 United States Code (USC) Sections 4901- 4918 Title 40 Code of Federal Regulation (CFR) Part 204 | Regulates noise emissions from operation of construction equipment and facilities; establishes noise emission standards for construction and other categories of equipment and provides standards for testing, inspection, and monitoring of such equipment. Gives states and municipalities primary responsibility for noise control. | Sections 5.8.3 and 5.8.4 |
| Occupational Health and Safety Act of 1970: 29 USC Section 651 et seq. Title 29 CFR Section 1910.95 | Regulates the worker noise exposure to 90 dBA over an eight-hour work shift. Areas above 85 dBA need to be posted as high noise level areas and hearing protection will be required. | Section 5.8.1 |
| State: | | |
| Government Code Section 65302(f) | Requires counties to draft a noise element as part of the general plan to establish acceptable noise limits. | Section 5.8.3 |
| Title 8 California Code of Regulations (CCR) Section 5095 et seq. | Establishes California Occupational Safety and Health Administration (Cal/OSHA) employee noise exposure limits. These standards are equivalent to the Federal OSHA standards. Worker noise exposure limited to 90 dBA over an eight-hour work shift. Areas where worker noise exposure exceeds 85 dBA must be posted as a noise hazard zone and a hearing conservation program is required. | Sections 5.8.3 and 5.8.4 |
| Local: | | |
| Kern County General Plan, Noise Element | Establishes reasonable standards for maximum desired noise levels in Kern County to deal with noise issues. Also, establishes goals, policies, and implementation measures to protect the public from noise intrusion. | Section 5.8.3 |
| Kern County Code, Title 8 Chapter 8.36 (Noise Control) | The County Noise Code specifies allowed sound level limits on or beyond the boundary of the property line. | Section 5.8.3 |

5.8.1.1 Federal LORS

There are no Federal LORS directly regulating offsite (community) noise. Other Federal regulations applicable to noise are incorporated into state and local requirements. United States Environmental Protection Agency noise guidelines have been considered in developing local requirements.

5.8.1.2 State LORS

The California Government Code requires counties to draft a Noise Element for their General Plan to establish acceptable noise limits for various land uses in the County. The Kern County General Plan contains a Noise Element.

California is a "State Plan" state. The Federal government has approved the State's occupational safety program (State Plan). Cal/OSHA has adopted occupational noise standards. The noise exposure level of workers is regulated at 90 dBA over an eight-hour shift to protect hearing (Title 8 CCR Section 5095 et seq.). Onsite noise levels will generally be in the 70 to 85 dBA range. Onsite areas above 85 dBA will be posted as high noise level areas and hearing protection will be required in these work areas; the eight-hour exposure levels below 90 dBA will be maintained.

5.8.1.3 Local LORS

Kern County

The applicable Kern County noise LORS include the County Noise Element of the County General Plan, and the County Noise Ordinance.

General Plan, Noise Element. The Noise Element identifies the following noise sensitive land uses in the County: residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches.

The Element establishes noise goals to 1) ensure that residents of Kern County are protected from excessive noise and that moderate levels are maintained; and 2) protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise-producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.

The Element establishes the applicable noise policies to:

- 1) Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.
- 2) Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of Cal/OSHA.
- 3) Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.
- 4) Utilize good land use planning principles to reduce conflicts related to noise emissions.
- 7) Employ the best available methods of noise control.

The Element establishes Implementation Measures to be carried out by the Kern County to implement the goals and policies of the Noise Element. The following measures are applicable to the Project:

- 1) Utilize zoning regulations to assist in achieving noise-compatible land use patterns.
- 2) Review discretionary development plans, programs and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policies outlined in this element.
- 3) Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB Ldn and interior noise levels in excess of 45 dB Ldn.

- 4) Encourage cooperation between the County and the incorporated cities within the County to control noise.
- 5) Noise analyses shall include recommended mitigation, if required, and shall:
 - a) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
 - b) Include estimated noise levels, in terms of Community Noise Exposure Level (CNEL), for existing and projected future (10 to 20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
 - c) Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
 - d) Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the Project must be provided.
- 6) Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the Project permitting process.

Noise Control Ordinance. Kern County implements the noise standards and policies specified in the Noise Element through the Noise Control Ordinance (Kern County Code Chapter 8.36). The Kern County Municipal Code does not provide quantitative limits for construction noise.

According to the Ordinance (Chapter 8.36.020 (H)), it is unlawful for any person to create noise from construction, between the hours of 9:00 P.M. and 6:00 A.M. on weekdays, and 9:00 P.M. and 8:00 A.M. on weekends, that is audible to a person with average hearing faculties or capacity at a distance of 150 feet from the construction site, but only if the construction site is within 1,000 feet of an occupied residential dwelling except as provided below:

1. The resource management director or his designated representative may for good cause exempt some construction work for a limited time.
2. Emergency work is exempt from this section.

5.8.1.4 Involved Agencies

A local agency contact for noise-related issues is identified in Table 5.8-2.

Table 5.8-2 Agencies and Agency Contacts

| Agency Contact | Phone/E-mail | Permit/Issue |
|---|--|---|
| Ken James, Director Kern County Department of Planning 2700 M Street, Suite 100 Bakersfield, CA 93301 | (661) 862-8600 planning@co.kern.ca.us | Compliance with County noise requirements (e.g., General Plan Noise Element, Noise Control Ordinance) |

5.8.1.5 Required Permits and Permit Schedule

No specific noise-related permits will be required for the Project. However, the Project must comply with the applicable requirements of Kern County (compliance with County land use compatibility guidelines and applicable sound level standards).

5.8.2 Affected Environment

This section discusses the existing noise environment of the Project site (plant site and associated transmission lines) and surrounding vicinity. Noise terminology, sensitive noise receptors, and the ambient noise environment, including ambient noise levels, are identified.

5.8.2.1 Noise Terminology

Noise is generally defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment. Noise levels are measured as decibels (dB) on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, doubling the energy of a noise source (e.g., traffic volume) would not double the noise level, but would instead increase noise levels by three dB. In addition, the human ear is not equally sensitive to all frequencies within the sound spectrum. Sound heard by the human ear is typically characterized by the "A weighted" sound level (dBA), which filters out noise frequencies not audible to the human ear, thereby weighting the frequencies audible by humans. Table 5.8-3 provides typical instantaneous noise levels of common activities in dBA.

Table 5.8-3 Typical Noise Levels

| Common Outdoor Activities | Noise Level (dBA) | Common Indoor Activities |
|---|-------------------|---|
| | 110 | Rock Band |
| Jet Fly-over at 1,000 feet | 100 | |
| Gas Lawn Mower at three feet | 90 | |
| Diesel Truck at 50 feet, at 50 mph | 80 | Food Blender at three feet, Garbage Disposal at three feet |
| Noisy Urban Area, Daytime Gas Lawn Mower at 100 feet | 70 | Vacuum Cleaner at 10 feet |
| Commercial Area Heavy Traffic at 300 feet | 60 | Normal Speech at three feet |
| Quiet Urban Daytime | 50 | Large Business Office, Dishwasher in Next Room |
| Quiet Urban Nighttime | 40 | Theater, Large Conference Room (Background) |
| Quiet Suburban Nighttime | 30 | Library |
| Quiet Rural Nighttime | 20 | Bedroom at Night, Concert Hall (Background) |
| | 10 | Broadcast/Recording Studio |
| Lowest Threshold of Human Hearing | 0 | Lowest Threshold of Human Hearing |
| Source: Caltrans 1998 | | |

In addition to instantaneous maximum (L_{max}) and minimum (L_{min}) noise levels, noise limits and impacts are assessed by measuring noise levels and averaging them over a period of time. Typically, noise levels are averaged over one hour and expressed as dBA Leq, the equivalent one-hour noise level. Time of day is also an important factor for noise assessment; noise levels that may be acceptable during the day may interfere with the ability to sleep during evening or nighttime hours. Therefore, noise levels are averaged over a 24-hour period to represent a CNEL, which is the cumulative noise exposure in a community during a 24-hour period. CNEL adds five dBA to measured evening sound levels (between 7:00 P.M. and 10:00 P.M.), and 10 dBA to the measured nighttime sound levels (between 10:00 P.M. and 7:00 A.M.). The Ldn is the same as CNEL, except the evening period is included in the daytime period.

5.8.2.2 Sensitive Noise Receptors

The County identifies sensitive noise land uses as residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches.

The Project site and surrounding areas are remote and almost entirely open space with few scattered residences in proximity of the site; the City of Ridgecrest is approximately 4.5 miles northeast of the Project site. The residence nearest the site boundary, solar collectors, and power block of the plant is approximately 3,200 feet east of the northwest Project site boundary, and approximately 6,300 feet northwest of the power block. Several other residences are approximately 3,250 to 3,575 feet east of the eastern site boundary, and over one mile from the power block.

In addition to human sensitive noise receptors, some protected animal species and their habitats may be considered sensitive noise receptors if located near construction and operational noise sources, especially during the species' breeding seasons. See Section 5.3, Biological Resources, for a discussion of the potential for special-status noise sensitive species and habitat in proximity to the Project site.

5.8.2.3 Noise Environment

Regional Setting

The Project site is located in Kern County off of U.S. Highway 395 at Brown Road in a remote area of primarily undeveloped land, with some land developed for utilities and isolated residences. The site is relatively flat and level with no pronounced topographic features. There are minor increases in topographic relief near the Project site, particularly east of U.S. Highway 395. There are mountainous areas east, west and southwest of the site. The outskirts of the City of Ridgecrest are northeast of the Project site. Access to Ridgecrest from the site is provided by U.S. Highway 395 (Business) at its intersection with Brown Road. Adjacent to and northeast of the City of Ridgecrest is the China Lake Naval Air Weapons Station, which has frequent military aircraft operations.

Project Site

The Project site is primarily undeveloped open space commonly used for recreation activities including horseback riding, hiking, and Off-Highway Vehicle trail riding. The surrounding land uses include undeveloped, open space land, and small developed areas of scattered houses to the northeast and northwest near the site boundary (within 3,200 to 3,575 feet). A 160-acre private parcel is located directly east and adjacent to the southern solar field. An occasional-use trailer is located on this parcel. The nearest inhabited residence to the Project site is the residence approximately 3,200 feet west of the northwestern site boundary (see Figure 5.8-1). The predominant noise source in proximity to the site is vehicular traffic on U.S. Highway 395. Traffic on Brown Road and the unimproved roadways of the site are occasional noise sources depending upon local traffic.

There is an existing Southern California Edison (SCE) 230-kilovolt (kV) transmission line (proposed relocation by the Applicant), extending west of the southern solar field to the planned point of interconnection with the SCE regional transmission grid.

5.8.2.4 Ambient Noise Levels

Ambient noise levels were measured at the site and nearest residence on June 10 and 12, 2009. Per CEC requirements, one 25-hour measurement was taken at the residence nearest the power block over a 25-hour period from 6:30 P.M. on June 10 to noon on June 12, 2009, in order to identify the loudest and quietest hours of the 25-hour period for impact assessment purposes. Four short-term measurements were taken at the perimeter of the site during the 25-hour measurement. Noise measurement locations are shown on Figure 5.8-1.

During the measurements, the weather was clear, dry, and cool. Wind speeds were up to 10 to 15 miles per hour. Two Larson-Davis sound level meters were used to collect noise data: Model 820 for the 25-hour measurement and Model 820 for the short-term (10- and 20-minute) measurements. The meters were mounted on tripods approximately five feet above ground level to simulate the average height of the human ear. All measurements were taken at the edge of gravel or dirt roads. Sound level meters were calibrated before and after the measurements. The results of the short-term measurements are summarized in Table 5.8-4.

Table 5.8-4 Short-term Ambient Noise Measurements

| Measurement # | Measurement Location | Leq | L _{max} | L _{min} |
|---------------|----------------------------------|-----|------------------|------------------|
| ST-1 | Near residence northwest of site | 52 | 79 | 41 |
| ST-2 | Powerline Road at Brown Road | 65 | 79 | 61 |
| ST-3 | Near residence east of site | 46 | 79 | 34 |
| ST-4 | Near residence northeast of site | 40 | 53 | 35 |

Notes: All sound levels expressed as dBA.

Based on the data in Table 5.8-4, short-term ambient noise levels vary at the site depending on proximity to existing noise sources. Noise levels were higher when measured adjacent to U.S. Highway 395 and on the Project site roads with vehicle activity. Residences were located off primary paved roads in remote, rural areas. The dominant source of noise in the area observed during the short-term measurements was vehicular traffic on U.S. Highway 395 adjacent to and east of the Project site. The results of the long-term measurements are summarized in Table 5.8-5.

Table 5.8-5 25-Hour Ambient Noise Measurement Data

| Date | Hour | dBA Leq |
|---------------|------------------------|---------|
| June 10, 2009 | 6:00 P.M. ¹ | 47 |
| June 10, 2009 | 7:00 P.M. | 40 |
| June 10, 2009 | 8:00 P.M. | 39 |
| June 10, 2009 | 9:00 P.M. | 39 |
| June 10, 2009 | 10:00 P.M. | 40 |
| June 10, 2009 | 11:00 P.M. | 39 |
| June 11, 2009 | 12:00 A.M. | 40 |
| June 11, 2009 | 1:00 A.M. | 40 |
| June 11, 2009 | 2:00 A.M. | 39 |
| June 11, 2009 | 3:00 A.M. | 40 |
| June 11, 2009 | 4:00 A.M. | 38 |
| June 11, 2009 | 5:00 A.M. | 47 |
| June 11, 2009 | 6:00 A.M. | 39 |
| June 11, 2009 | 7:00 A.M. | 38 |
| June 11, 2009 | 8:00 A.M. | 36 |
| June 11, 2009 | 9:00 A.M. | 62 |
| June 11, 2009 | 10:00 A.M. | 49 |
| June 11, 2009 | 11:00 A.M. | 40 |
| June 11, 2009 | 12:00 P.M. | 52 |

Table 5.8-5 25-Hour Ambient Noise Measurement Data

| Date | Hour | dBA Leq |
|---|------------------------|---------|
| June 11, 2009 | 1:00 P.M. | 39 |
| June 11, 2009 | 2:00 P.M. | 41 |
| June 11, 2009 | 3:00 P.M. | 62 |
| June 11, 2009 | 4:00 P.M. | 42 |
| June 11, 2009 | 5:00 P.M. | 41 |
| June 11, 2009 | 6:00 P.M. | 42 |
| June 11, 2009 | 7:00 P.M. | 48 |
| June 11, 2009 | 8:00 P.M. ² | 44 |
| June 11, 2009 | 9:00 P.M. | 38 |
| June 11, 2009 | 10:00 P.M. | 41 |
| June 11, 2009 | 11:00 P.M. | 43 |
| June 12, 2009 | 12:00 A.M. | 44 |
| June 12, 2009 | 1:00 A.M. | 40 |
| June 12, 2009 | 2:00 A.M. | 39 |
| June 12, 2009 | 3:00 A.M. | 36 |
| June 12, 2009 | 4:00 A.M. | 39 |
| June 12, 2009 | 5:00 A.M. | 41 |
| June 12, 2009 | 6:00 A.M. | 39 |
| June 12, 2009 | 7:00 A.M. | 44 |
| June 12, 2009 | 8:00 A.M. | 36 |
| June 12, 2009 | 9:00 A.M. | 36 |
| June 12, 2009 | 10:00 A.M. | 37 |
| June 12, 2009 | 11:00 A.M. | 41 |
| Loudest Hour | | 62 |
| Quietest Hour | | 36 |
| 25-hour average Leq | | 50 |
| 1. The measurement began at 6:32 P.M., June 10, 2009 | | |
| 2. The measurement ended at 11:45 A.M., June 12, 2009 | | |

As shown on Table 5.8-5, the quietest hour at the nearest residence occurred during the 3:00 A.M. and 8:00 A.M. hours, measured at 36 dBA Leq with a corresponding background noise level (L90) value of 35 dBA. The corresponding ambient CNEL and Ldn for the 24-hour period at the residence is 52 dBA.

The noise monitoring results confirm that the Project site and surrounding areas are remote, rural areas with few substantial noise sources other than vehicle traffic on site and area roadways.

5.8.3 Environmental Impacts

NEPA requires the analysis of non-occupational noise impacts on surrounding populations and consideration of noise attenuation practices and of reasonable alternatives to reduce noise impacts. CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of the CEQA Guidelines sets forth characteristics that may signify a potentially significant impact:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
- Substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project; or
- Substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.

According to the CEC's interpretation of these criteria, a significant noise impact results when noise produced by a permitted power-producing facility during its operation causes an increase of more than 10 dBA in the L90 at a noise-sensitive receptor during the quietest hours of the night. An increase of less than 5 dBA is typically considered an insignificant impact, while an increase from 5 to 10 dBA may be considered significant, depending on the specific circumstances.

Noise due to construction activities is usually considered less than significant under CEQA if: 1) the construction activity is temporary; 2) use of heavy equipment and noisy activities is limited to daytime hours; and 3) all feasible noise abatement measures are implemented for noise-producing equipment.

The Kern County General Plan Noise Element establishes 65 dBA as the maximum Ldn considered compatible with residential uses or development.

For analysis of the noise impacts of the Project, noise levels would be considered significant if:

- Project operations increased noise by 10 dBA above the lowest measured L90 at any noise sensitive receptor; or
- Project operations exceeded 65 dBA Ldn at the nearest residential use.

A significant impact from vibration would occur if construction or operation activities would generate substantial vibrations levels in proximity to structures, and/or vibration-sensitive land uses.

5.8.3.1 Construction

Construction noise would be generated from construction activities on the Project site and along the transmission line corridor, and from construction-related traffic on area roadways to and from the Project site and transmission line corridor. Construction would be temporary and relatively short-term (approximately 28 months), starting in late 2010 and ending in early 2013.

Construction equipment and vehicles would result in a short-term, temporary increase in the daytime ambient noise level at the Project site and surrounding areas. Construction is anticipated to occur during traditional daylight workdays on weekdays (and possibly Saturdays as required by the Project schedule), and to exclude Sundays and holidays. The possible need for night work might occur due to worker safety considerations during extremely high midday temperatures in the summer months. Night construction could occur with the approval of a variance from the County Noise Ordinance.

The magnitude of construction noise levels generated by the Project would be based on the type of construction activity, type and number of pieces of equipment, duration of each construction phase, and the distance between the construction noise source and noise receptor, as well as, any intervening topography and/or structures. Instantaneous maximum noise levels of typical construction equipment and vehicles range from 70 to 85 dBA L_{max} at 50 feet from the source, assuming there is no pavement breaking or pile driving. (No pile driving or pavement breaking will be needed for the RSPP.)

Instantaneous sound levels are averaged over a period of time (typically one hour) for impact assessment. Construction activities on a job site can be stationary or mobile, and are typically assessed as a point source at a reference distance from the center of the site activity.

Project construction would involve a variety of noise-producing activities over the 28-month construction schedule. These include site grading, excavation for foundations of Project structures, development of an access road, deliveries of equipment and materials, and actual construction of facilities (warehouse, solar equipment assembly building, and installation of power block equipment). Due to the nature of the Project's anticipated construction activity, with worker breaks and the repositioning of equipment, hourly construction noise levels are expected to average no more than 85 dBA Leq at 50 feet from the centroid of each work area.

The construction noise generated by the Project would naturally attenuate with distance. Noise from a point source attenuates at an approximate rate of six dBA per doubling of distance over acoustically hard ground, such as pavement or hard-packed ground, assuming that no intervening topography or structures act as a noise barrier. Over acoustically softer ground, noise attenuates at a slightly greater rate of 7.5 dBA per doubling of distance. The Project site is flat with scattered scrub vegetation but the ground surface is undisturbed; therefore, the former value of six dBA is applicable in this case as a conservative rate of attenuation. Therefore, 85 dBA Leq at 50 feet would attenuate to 79 dBA Leq at 100 feet, to 73 dBA Leq at 200 feet, etc.

Project Site

The nearest noise sensitive human receptor to the Project site is a residence approximately 3,200 feet west of the northern solar field. The anticipated noise levels from construction equipment and vehicles of 85 dBA Leq at 50 feet, when the activities are occurring at the site boundary nearest the nearest residence, would attenuate over distance to approximately 49 dBA Leq at the residence.

The Kern County Noise Ordinance does not limit construction noise levels. The Kern County Ordinance limits only the hours of construction activities to the hours of 6:00 A.M. to 7:00 P.M., June through September, and 6:00 A.M. to 6:00 P.M., October through May, when the noise is audible to a person within 150 feet of the construction and if the construction activity is within 1,000 feet of an inhabited residence. Typical construction noise of 85 dBA Leq is audible at 150 feet (76 dBA Leq); therefore, construction activities less than 1,000 feet from an inhabited residence are subject to these limits.

There are no inhabited residences within 1,000 feet of the site boundary. Thus, construction activities on the Project site are exempt from the construction time limits of the County Noise Ordinance. Therefore, no significant noise impacts would occur from plant construction.

As shown in Table 5.8-5, the average ambient Leq near the nearest residence (approximately 3,200 feet from the northern solar field) was approximately 50 dBA Leq. The difference between this ambient level and highest potential construction noise level at the residence of 49 dBA Leq (at the nearest site boundary) would be less than three dBA (i.e., a level above which is perceptible to the human ear). Therefore, the highest potential average Project construction noise level at the residence would not be noticeable. Construction near the site boundary from grading activities and solar collector installation would temporarily occur near the residence for a short time and then move away from the residence. The majority of site construction activities, including stationary construction noise, would be more in the center of the site at the power block (approximately 6,300 feet away from the nearest residence). Construction noise from activities at the power block would attenuate over this distance to approximately 43 dBA at the residence. This is less than a 3 dBA change from ambient and this would not be perceptible at the residence. However, when construction activity occurs at and near the site boundary, increased noise levels may be noticeable occasionally at the residence during daytime hours; this would occur only during a small portion of the overall 28-month construction schedule.

The nearest vibration sensitive receptor is a residence approximately 3,200 feet from the northern solar field. It is anticipated that no pile driving or pavement breaking will be required; typical earth-moving equipment and vehicles would be used. No significant vibration impacts would occur.

As part of the process of readying a steam turbine for startup, a process known as a “steam blow” is initiated. The piping and tubing within which steam will flow when the turbine is operating accumulate dust, rust, scale, and construction debris from welding activities, etc. Starting up the turbine without first carefully cleaning out these systems via a steam blow(s) would quickly destroy the turbine. Before the steam system is connected to the turbine, the steam line is routed temporarily to the atmosphere, and then steam is generated and allowed to escape through the steam piping, thereby flushing out the system. A series of these “steam blows”, lasting two or three minutes each, are performed daily several times for two or three weeks.

High-pressure steam blows can produce extremely high noise levels (up to 130 dBA at 100 feet). Even with silencing, noise levels would still be loud. There are newer, quieter steam blow techniques that use lower pressure steam over a continuous period of about 36 hours that result in noise levels of about 80 dBA at 100 feet. The Project expects to use a low-pressure steam blow technique with reduced noise levels. As the power block in the interior of the plant site is about 6,300 feet from the nearest residence, the low-pressure steam blow sound level would attenuate by distance to approximately 50 dBA at the residence, which would be similar to peak noise levels during construction at the power block.

Transmission Lines

Construction of the plant transmission line and the relocated SCE 115 kV and 220 kV lines west of the southern solar field would generate construction noise and temporarily increase ambient noise levels along the transmission line corridor. Transmission line development includes access road construction, soil excavation for tower footings, pre-constructed tower installation, and power line installation, and would generate construction noise not to exceed 85 dBA Leq at 50 feet. Given the few residences in proximity to the Project site and the width of the corridor and right of way, transmission line construction would not occur in immediate proximity to any residence. Construction along the proposed corridor would be temporary and short-term in any one location, as construction of the line progresses forward. The County Noise Ordinance does not limit construction noise levels, only what times of day construction is allowable, if audible within 150 feet, and only if construction occurs within 1,000 feet of an inhabited residence. Therefore, transmission line construction noise would not be a significant impact.

Vehicular Traffic

Construction of the proposed facilities would generate a temporary, relatively long-term increase in vehicular traffic on roadways in the vicinity of the Project site (see Section 5.13, Traffic and Transportation). Construction traffic would consist of construction worker vehicle trips from approximately 405 workers, 633 workers at the height of construction in Month 11. Construction shifts have been proposed to reduce the number of vehicle trips during peak A.M. and P.M. periods. The delivery of construction equipment, vehicles, and building materials to the Project site would be along roadways in the Project vicinity including U.S. Highway 395 and its intersection with Brown Road. There are noise sensitive receptors along this access route, east of U.S. Highway 395. This construction traffic would be temporary, and relatively short-term. This traffic would occur during daytime hours on weekdays when ambient noise levels are higher and people are less sensitive to noise intrusions. Therefore, noise generated by construction-related traffic on local roadways would not result in significant impacts.

5.8.3.2 Operation

Operational noise from the Project would result from the power plant operations and from operation-generated traffic.

Power Plant

The power plant would be operational 24 hours per day, seven days per week; however, the power plant would be in the shutdown mode from sundown to sunrise. Power generation noise would occur primarily during the daylight hours, when the sun's energy is utilized in the solar power plant process. The primary noise source of solar thermal power plants is the power block, where the steam turbine generator, air-cooled condenser and other noise generating equipment are located. The power block of the Project (one 250-megawatt unit) will be located between the two solar fields. In addition, there are diesel-powered emergency generators, which would be enclosed by a noise-reducing structure that would reduce noise levels to approximately 70 dBA at 50 feet. The overall noise generated by these various noise sources on the Project site would be based on the configuration of the sources, the number and power rating of the equipment, and any noise-reducing measures incorporated.

The operational noise levels of the proposed Project were estimated by modeling the operational noise levels using the plant equipment noise specifications provided by the plant equipment manufacturers. The SoundPlan Noise Prediction Model was the model used to estimate the operational noise levels. The model predicts and assesses noise levels of industrial noise sources and uses industry standard propagation algorithms and sound level inputs from equipment manufacturers and operational sources. The model calculations account for sound wave divergence and attenuation factors such as absorption, ground effects, and barrier/shielding.

The results of the modeling are shown on Figure 5.8-1 as daytime operational noise contour lines in increments of five dBA Leq from 90 dBA Leq at the Project's loudest daytime noise source, radiating out to 45 dBA Leq contour. The nearest residence is located outside of this 45 dBA Leq contour. Based on the distance of approximately 6,300 feet from the approximate center of the power block in proximity to the nearest residence, the modeled daytime operational plant noise levels would attenuate over this distance to approximately 42 dBA Leq at the residence.

During the hours between sunset and sunrise, the Project would be in the shutdown mode with its noisiest components not operational. Plant noise during the non-daylight hours is anticipated to be at approximately 20 dBA lower than during the daytime. Comparing this estimated non-daylight noise level (22 dBA Leq) with the corresponding L90 of the lowest measured Leq of 36 dBA at the quietest time of the night (3:00 A.M.) shows that there would be no increase over the existing lowest L90 noise level. The CEC significance criterion is that an increase of less than 5 dBA in the background noise level (L90) at a noise-sensitive receptor during the quietest hours of the night would be considered an insignificant impact. Since the resulting noise level at the residence would represent no increase in dBA Leq, there would be no significant impact.

The corresponding Ldn for the modeled plant noise at the residence would be approximately 42 dBA Ldn; when combined with the measured ambient Ldn at the residence of 52 dBA Ldn, the resultant future Ldn with the Project would be 53 dBA Ldn (a difference of 10 dBA results in an increase of one dBA to the higher Ldn value). The future Ldn with the Project of 53 dBA Ldn would be less than the maximum Ldn of 65 dBA Ldn considered compatible with residential uses, established by the Noise Element of the Kern County General Plan. The increase of 1 dBA Ldn above the ambient Ldn of 52 dBA, would be less than a 3 dBA increase and thereby not a perceptible increase above levels existing without the Project.

The nearest vibration sensitive receptor is a residence approximately 3,200 feet from the northern solar field. Project operation does not involve vibration-generating activities; no vibration impacts would be expected.

Transmission Line

Operation of the Project transmission line would generate noise from three major sources: 1) corona from the transmission lines (a crackling or hissing noise); 2) operation of the transformers at the substations; and 3) maintenance work and vehicles. This would result in a minimal increase in ambient noise levels along the transmission line corridor. As discussed in Section 5.14, Transmission Line Safety and Noise, corona is the electrical breakdown of air into charged particles caused by the electrical field at the conductor surface. Corona-generated noise from transmission lines is audible as a crackling or hissing noise. During dry weather conditions, audible noise from transmission lines is not noticeable (less than three dBA) above ambient noise beyond the edge of the transmission line corridor. Modern transmission lines are designed, constructed, and maintained so that in dry conditions they generate minimal corona-related noise; in wet weather, corona discharges can be produced by water droplets and fog. Transformers generate minimal operational noise. Noise from maintenance activities on the transmission lines and substations would be intermittent.

The transmission line route will be to the west of the southern solar field, west of the power block and on the Project site. Due to the minimal noise generated by the transmission line corridor and the absence of noise sensitive receptors, no significant impact would be expected regardless of the route selected.

Project Traffic

Operation of the Project would generate an increase in vehicular traffic on local roads and area highways in the vicinity of the Project site (see Section 5.13, Traffic and Transportation). An estimated 60 peak-hour vehicle trips would be generated by the estimated 84 employees needed for the operation of the proposed plant, which would operate 24 hours per day, seven days per week. Vehicle access to the Project site would be U.S. Highway 395 and Brown Road. The increased traffic levels would be expected to increase noise levels along these roadways by less than three dBA (the dBA increase obtained from doubling traffic volumes), which is barely perceivable to the human ear. Therefore, operational traffic noise would not cause a significant impact.

Project Impact Summary

Noise impacts of the Project would be less than significant for the following reasons:

- While there may be occasional instances during construction (when construction activity occurs at/near the closest site boundary), when elevated noise levels would be noticeable at the nearest residence, hourly average noise levels during construction would cause changes in ambient noise levels that would be less than perceptible. The construction period itself would be temporary; use of heavy equipment and other activities with high noise emissions would be limited to daytime hours; use of low noise, longer duration steam blow techniques are expected; all practicable noise abatement measures would be implemented for noise-producing equipment; and if needed, acceptable mitigation would be arranged with the residence owner.
- The 65 dBA Ldn limit at the nearest residence, as identified by the Noise Element of the County General Plan, would not be exceeded during construction or operation;
- The five dBA threshold above the lowest measured L90 at any noise sensitive receptor, the key measure of whether or not a significant adverse impact would occur, would not be exceeded during plant operation; and
- The Ldn increase of one dBA with the Project would not be a substantial increase above levels existing without the Project.

Occupational Noise

Occupational safety noise standards limit worker noise exposure to 90 dBA over an eight-hour workday. Areas of the Project site where noise exposures could exceed 85 dBA will be posted as a noise hazard zone. A hearing conservation program will also be established. Because of the absence of noise sources anywhere except at the power block, it is likely that occupational noise concerns will be limited to the RSPP power block.

5.8.3.3 Cumulative Impacts

Cumulative noise impacts include those impacts from the Project combined with other past, present, and reasonably foreseeable future impacts. Of particular concern would be noise emissions from different projects that occur at the same time and near enough to each other so that the resulting sound levels at a location(s) are higher than noise levels from the individual projects.

The Project site is remotely located but is in proximity to other planned projects. Construction of these projects would generate noise from construction and traffic, and the construction noise of RSPP would cumulatively add to the construction noise of all of the projects, if concurrently constructed. Proposed wind monitoring projects located south and west of the Project site will have minimal noise impacts. Future residential development in Ridgecrest may result in increased construction noise, but currently no residential projects are proposed near the Project. The proposed Wal-Mart may increase vehicular traffic along major roadways but is not expected to result in significant noise impacts. Therefore, there would be no significant cumulative noise impact potential.

These projects would be individually responsible for complying with applicable noise LORS. Because of the remoteness of the general area from population (sensitive receptors), and the size of the individual projects, instances where there would be significant noise impacts at a given sensitive receptor during construction would be infrequent (i.e., only when construction activities occur near the site boundary closest to the receptor). In addition, because of the lack of a construction noise limit under the County Noise Ordinance, there would be no significant noise impacts due to construction noise levels from one or multiple projects.

During operation, the primary noise sources of solar thermal facilities are the power blocks, which are partially surrounded by the very large areas for the solar collectors, and thus are buffered from potential offsite noise receptors to some degree.

The cumulative construction noise would be temporary, relatively short-term, occur during the day, and allowable under the County Noise Ordinance. Operation of these projects would generate noise primarily from the vehicle trips generated by their respective residential and commercial development, and the operational noise of the Project would cumulatively contribute to daytime noise in proximity to the site, with a minimal addition to the traffic noise from operational vehicle trips. However, there would be no significant cumulative noise impacts expected and in any case, the Project's contribution would be less than cumulatively considerable.

5.8.4 Mitigation Measures

Since there are no significant noise impacts, no mitigation measures are required. However, the following measures are recommended to minimize offsite noise levels.

NOISE-1 At least 15 days prior to the start of ground disturbance, the Project owner shall notify all residents within one mile of the site and the linear facilities, by mail or other effective means, of the commencement of Project construction. At the same time, the Project owner shall establish a telephone number for use by the public to report any 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 one year.

NOISE-2 Throughout the construction and operation of the Project, the Project owner shall document, investigate, evaluate, and attempt to resolve all Project-related noise complaints.

The Project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form or functionally equivalent procedure acceptable to the CEC Compliance Project Manager (CPM) 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 determine the source of noise related to the complaint;
- If the noise is Project-related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

NOISE-3 If needed to resolve a noise complaint from a residence in the Project vicinity, the Project owner shall make arrangements with the owner of the residence up to and including retrofitting the dwelling (e.g., sound wall, improved insulation and windows).

NOISE-4 The Project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

NOISE-5 Following the Project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazard areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8 CCR Sections 5095-5099 (Article 105) and Title 29 CFR Section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The Project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and Federal regulations.

NOISE-6 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.

NOISE-7 If a traditional, hg-pressure steam blow process is used, the Project owner shall perform the steam blow in such a manner that the noise level is not greater than 110 dBA measured at 100 feet from the property line. The steam blows shall be conducted between 8 A.M. to 5 P.M. unless arranged with the CPM such that offsite impacts would not cause annoyance to receptors. If a low-pressure, continuous steam blow process is proposed, the Project owner shall submit to the CPM a description of the process, with expected noise levels and planned hours of operation.

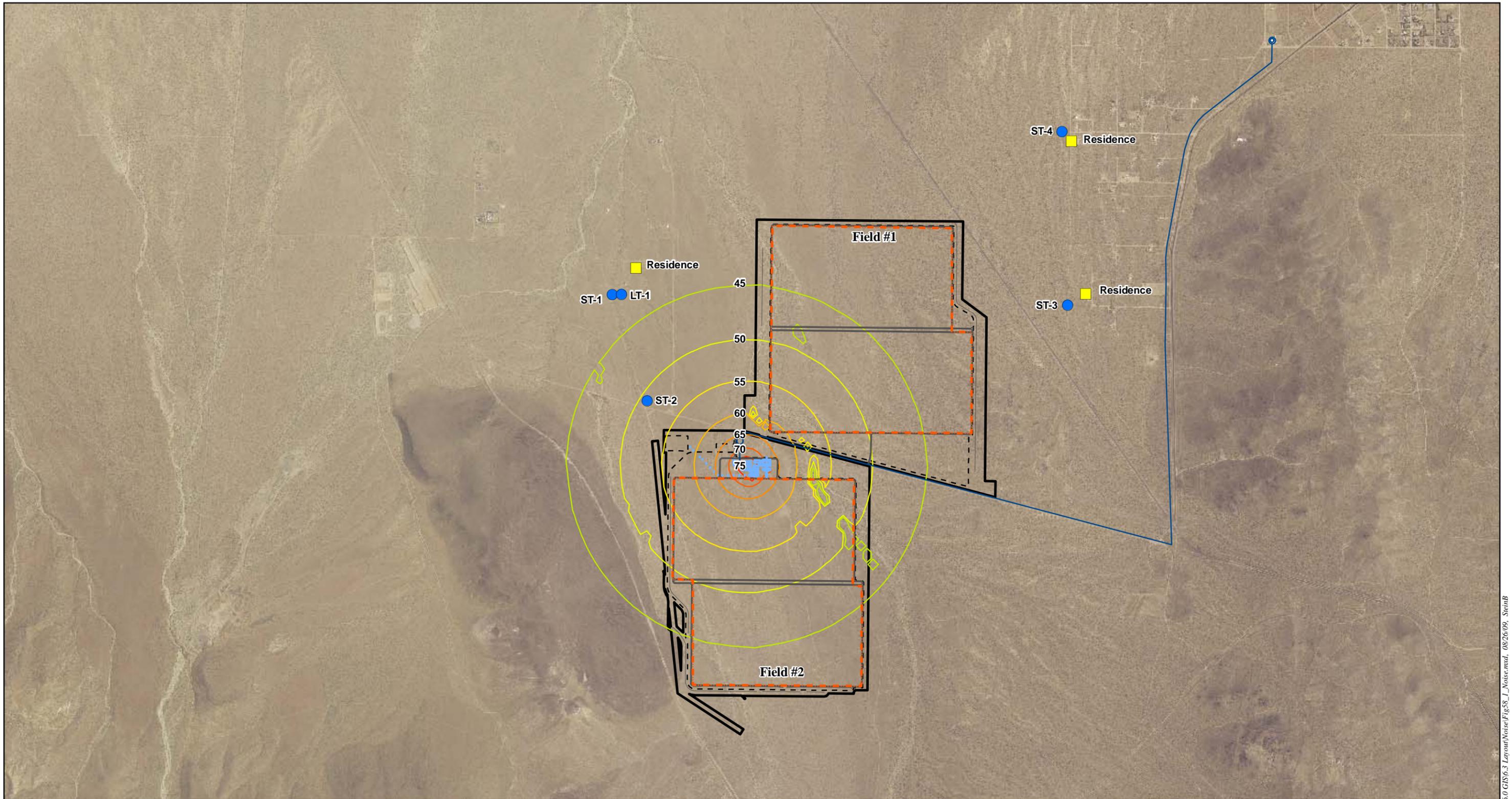
NOISE-8 At least 15 days prior to the first steam blow(s), the Project owner shall notify all residents or business owners within one mile of the facility boundary. The notification may be in the form of letters, phone calls, fliers, or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the planned schedule, expected sound levels, and explanation that it is a one-time activity and not part of normal plant operation.

5.8.5 References

Kern County, 2007. General Plan. Noise Element. March 13, 2007.

Kern County, 2008. Noise Control Ordinance. Municipal Code, Title 8 (Health and Safety), Chapter 8.36 Noise Control.

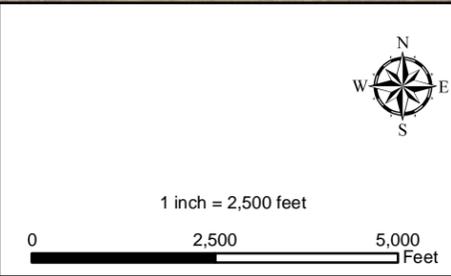
United States Environmental Protection Agency (EPA), 1972. Construction Equipment Noise.



- Legend**
- Disturbance Area
 - Facility Footprint
 - Solar Field
 - Facilities Layout
 - Power Block
 - Water Line Route
 - Residence
 - Noise Measurement Location

- Noise Contours**
- 45 dBA Leq
 - 50 dBA Leq
 - 55 dBA Leq
 - 60 dBA Leq
 - 65 dBA Leq
 - 70 dBA Leq
 - 75 dBA Leq
 - 80 dBA Leq

- 65 dBA Leq
- 70 dBA Leq
- 75 dBA Leq
- 80 dBA Leq



**Ridgecrest Solar Power Project
Application for Certification
Noise**

**Figure 5.8-1
Noise Measurement Locations
and Noise Contours**

Solar Millennium

AECOM

Date: September 2009