

5.8 Noise

This section discusses the existing noise environment and the potential noise impacts of construction and operation of the Palen Solar Power Project (PSPP 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 nearby noise sensitive receptors. Project construction noise was also predicted at the noise sensitive receptors. Applicable laws, ordinances, regulations, and standards (LORS) are discussed in Section 5.8-1 below.

The PSPP comes under the jurisdiction of both the California Energy Commission (CEC) and the Bureau of Land Management (BLM). The noise evaluation in this section is intended to support CEC compliance with the requirements of the California Environmental Quality Act (CEQA) and BLM's compliance with the requirements of the National Environmental Policy Act (NEPA). These agencies are conducting a joint review of the Project, and a combined NEPA/CEQA document will be prepared.

Summary

Project noise impacts would be less than significant. The Project site and surrounding areas have few noise-sensitive land uses nearby that potentially could be impacted by Project noise emissions. There is one residence almost adjacent to the right-of-way (ROW) boundary, approximately 1,000 feet from the northwestern edge of the nearest solar field of Unit #2. There is a second residence approximately 3,500 feet north of the facility boundary near the Cocopah Nursery. The U.S. Interstate 10 (I-10) freeway is the predominant noise source.

Temporary short-term construction noise would be generated during Project construction. Elevated noise levels would be most noticeable when construction activities occur near the site boundary closest to the nearby residence. The Riverside County Noise Ordinance does not limit construction noise levels; it limits only construction to daytime hours Monday – Saturday when near a residence. However, construction noise equipment emissions will be controlled; a complaint procedure put in place, and arrangements made as needed to resolve noise issues with the owner of the nearby residence.

Operational noise levels from the Project would predominantly be from daytime operation of equipment (e.g., steam turbine, cooling tower) in the power blocks of Units #1 and #2. The modeled daytime operational plant noise levels are estimated to attenuate over approximately 6,000 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 less due to the primary noise sources in shutdown mode. The resultant Community Noise Equivalent Level [CNEL] of the plant noise at the residence would be approximately 42 dBA CNEL. The ambient CNEL at the residence without the project is 46 dBA CNEL. The 4 dBA difference between the two CNELs would result in a 2 dBA increase to the higher of the CNELs (46 dBA), resulting in a CNEL with the project of 48 dBA CNEL. This 2 dBA increase above ambient is less than perceptible.

The County Noise Ordinance sets limits not to exceed 45 dBA during day and night hours for rural residential properties. The daytime operational Project noise was estimated at 42 dBA Leq at the residence; the nighttime Project noise would be substantially less. Comparing the Project's estimated noise level at night (when the plant is not operating) and the lowest measured L90 of 29 dBA at the quietest time of the night (4:00 A.M.), the difference would be less than the applicable significance criteria of 5 dBA above the lowest measured L90 at any noise sensitive receptor.

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 and applicable 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: Title 40 Code of Federal Regulation (CFR) Section 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. | Section 5.8.1 |
| U.S. Fish and Wildlife Service, Riparian Bird Species | Establishes maximum permissible noise levels to which certain riparian bird species may be subjected to during mating and nesting seasons. | Sections 5.8.1 and 5.3, Biological Resources |
| Occupational Health and Safety Act of 1970 (Title 29 CFR 1910.95) | Regulates the worker noise exposure to 90 dBA over an 8-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(g) | Requires counties to draft a noise element as part of the general plan to establish acceptable noise limits. | Section 5.8.1 |
| California Vehicle Code Sections 23130 and 23130.5 | Regulates vehicle noise levels on California highways. | Section 5.8.1 |
| 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 Occupational Safety and Health Administration (OSHA) standards. Worker noise exposure limited to 90 dBA over an 8-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. | Section 5.8.3 |

Table 5.8-1 Summary of Applicable Noise LORS

| LORS | Applicability | Where Discussed in AFC |
|--|---|------------------------|
| Local: | | |
| Riverside County General Plan, Noise Element | Provides a program for incorporating noise issues into the land use planning process, with a goal of minimizing adverse noise impacts to receptors that are sensitive to noise. Identifies existing and future noise sources and defines noise-sensitive land uses. Establishes goals, objectives, and procedures to protect the public from noise intrusion. Discourages the development of noise-generating activities near noise-sensitive land uses. Identifies vibration sources and land uses sensitive to vibration. | Section 5.8.1 |
| Riverside County Noise Ordinance, Ordinance 847 Regulating Noise | Noise ordinance specifies sound level limits on or beyond the boundary of the property line anytime. Establishes allowable times of construction noise. | 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. U.S. Environmental Protection Agency (EPA) noise guidelines have been considered in developing local requirements.

The U.S. Fish and Wildlife Service (USFWS) has established a level of 60 dBA Equivalent Continuous Noise Level (Leq) as the maximum permissible noise level to which certain (special-status) riparian bird species may be subjected during the mating and nesting seasons (see Section 5.3, Biological Resources). Although several common riparian dwelling bird species were observed onsite, riparian habitat is limited within the Project footprint. No special-status riparian dwelling bird species were documented.

Under the Occupational Safety and Health Act of 1970, OSHA has adopted regulations that are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which a worker is exposed. OSHA regulations also dictate hearing conservation program requirements and workspace noise monitoring requirements. OSHA requirements limit worker noise exposure to 90 dBA over an eight hour work shift. Furthermore, if eight-hour worker noise exposure exceeds 85 dBA, the area must be posted as a noise hazard zone and a hearing conservation program is required.

5.8.1.2 State LORS

The California State 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 Riverside County General Plan contains a Noise Element.

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's Office. Delivery trucks and other Project-related vehicles will meet applicable Code requirements.

The Cal/OSHA has adopted occupational noise standards. The noise exposure level of workers is regulated at 90 dBA over an 8-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 8-hour exposure levels below 90 dBA will be maintained.

5.8.1.3 Local LORS

The applicable Riverside 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 of the Riverside County General Plan examines noise sources and provides information to be used in setting land use policies to protect noise sensitive land uses, and for developing and enforcing the County Noise Ordinance. The Noise Element contains policies and programs to achieve and maintain noise levels compatible with various types of land uses.

Conformance with the County Noise/Land Use Compatibility Guidelines, provided in the Noise Element, is used to evaluate potential noise impacts and provide criteria for environmental impact findings and conditions for project approval. Land use compatibility defines the acceptability of a land use in a specified noise environment. For residential land uses, these guidelines categorize noise levels of up to 60 dBA CNEL as “normally acceptable” and up to 70 dBA CNEL as “conditionally acceptable”.

The Noise Element identifies vibration is a community annoyance related to noise. Construction equipment is a common source of vibration. Residential areas are sensitive to vibration.

Ordinance 847, Noise. Riverside County enforces construction and operation noise standards specified in the Noise Element through the Noise Ordinance. The County has an adopted Noise Ordinance that establishes standards to regulate noise in the County. The Ordinance allows for different levels of acceptable noise depending upon land use, as shown in the ordinance text below.

Section 4. GENERAL SOUND LEVEL STANDARDS. No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1¹ of Ordinance 847.

9.52.020 Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

- H. Private construction projects located 0.25 miles or more from an inhabited dwelling;
- I. Private construction projects located within 0.25 miles from an inhabited dwelling provided that:
 - 1. Construction does not occur between the hours of 6:00 P.M. and 6:00 A.M. during the months of June through September, and
 - 2. Construction does not occur between the hours of 6:00 P.M. and 7:00 A.M. during the months of October through May;
- J. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7:00 A.M. and 8:00 P.M.

¹ The sound level standards from Table 1 of Ordinance 847 that are applicable to the Project site are shown in Table 5.8-2

Table 5.8-2 Riverside County Sound Level Standards (dB Lmax)¹ Applicable to Project Site

| General Plan Foundation Component | General Plan Land Use Designation | General Plan Land Use Designation | Density ² | Maximum dBA Level | |
|-----------------------------------|-----------------------------------|-----------------------------------|----------------------|-------------------------|-------------------------|
| | | | | 7:00 A.M. to 10:00 P.M. | 10:00 P.M. to 7:00 A.M. |
| Rural Community | EDR | Estate Density Residential | 2 AC | 55 | 45 |
| | VLDR | Very Low Density Residential | 1 AC | 55 | 45 |
| | LDR | Low Density Residential | 1/2 AC | 55 | 45 |
| Rural | RR | Rural Residential | 5 AC | 45 | 45 |
| | RM | Rural Mountainous | 10 AC | 45 | 45 |
| | RD | Rural Desert | 10 AC | 45 | 45 |
| Agriculture | AG | Agriculture | 10 AC | 45 | 45 |
| Open Space | C | Conservation | | 45 | 45 |
| | CH | Conservation Habitat | | 45 | 45 |
| | REC | Recreation | | 45 | 45 |
| | RUR | Rural | 20 AC | 45 | 45 |
| | W | Watershed | | 45 | 45 |
| | MR | Mineral Resources | | 75 | 45 |

Source: (Ord. 847 Section 4, 2006)

¹ dB Lmax is the maximum A-weighted noise level for a single noise event in decibels

² Establishes minimum acres/unit ("2 AC" for Estate Density Residential means that density cannot exceed one unit per two acres)

5.8.1.4 Involved Agencies

A local agency contact for noise-related issues is identified in Table 5.8-3.

Table 5.8-3 Agencies and Agency Contacts

| Agency Contact | Phone/E-mail | Permit/Issue |
|--|---------------------------------------|---|
| Ron Goldman, Planning Director Riverside County Administration Center 408 Lemon Street Riverside, California 92502 | (951) 955-6429 rgoldman@rctlma.org | Compliance with County noise requirements (e.g., General Plan Noise Element, Noise 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 Riverside 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 (Project site and 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 5.8-4 provides typical instantaneous noise levels of common activities in dBA.

Table 5.8-4 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 3 feet | 90 | |
| Diesel Truck at 50 feet, at 50 miles per hour (mph) | 80 | Food Blender at 3 feet Garbage Disposal at 3 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 3 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 noise levels, noise levels are measured and averaged over a period of time to assess noise limits and impacts. 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 CNEL (community noise equivalent level), which is the cumulative noise exposure in a community during a 24-hour period. CNEL adds 5 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 day/night average sound level (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 defines sensitive noise receptors as areas of habitation where the intrusion of noise has the potential to adversely impact the occupancy, use, or enjoyment of the environment. Sensitive noise receptors include, but are not limited to, residences, schools, hospitals, parks, and office buildings. Excessive exposure to noise can result in adverse physical and psychological responses; can interfere with sleep, speech, and concentration; and/or can generally diminish quality of life.

The Project site and surrounding areas are remote and almost entirely open space, with a few scattered residences and a nearby nursery operation. There are few noise sensitive land uses located near the Project site. The nearest human receptor is a residence located approximately 25 feet from the Project ROW boundary; one other residence is located approximately 3,500 feet north of the Project ROW boundary near the Cocopah Nursery. There are no other residences located nearby that would be potentially impacted by Project construction or operational noise.

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. Many riparian bird species are sensitive to excessive noise. The site is located within an area where there is potential for special-status wildlife species. See Section 5.3, Biological Resources, for a discussion of the potential for 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 Riverside County 0.5 mile north of I-10 at the Corn Springs Road intersection. The site is in a remote area of primarily undeveloped land, with open space and some land developed as a nursery. The site and immediately surrounding areas are relatively flat with no pronounced topographic features; there are mountainous areas to the south across I-10. The small community of Desert Center is located approximately 10 miles west of the site along I-10.

Project Site

The Project is to be located on an approximate 5,200-acre right of way, with the area disturbed by construction and operation activities encompassing approximately 3,870 acres. The site is undeveloped open space and is not bounded / delineated by gravel or dirt roads. The surrounding land uses are primarily undeveloped with agricultural land to the west (Cocopah Nurseries). The predominant noise source in proximity to the Project site is vehicular traffic on I-10. There is one residence located approximately 25 feet from the northwest corner of the Project ROW boundary, but over one mile from the nearest power block. The power block is essentially the only area of the solar plant where there would be noise generating sources when the facility is in operation. Another residence is located approximately 3,500 feet from the site boundary and well over a mile from the nearest of the PSPP's two power block

Offsite Facilities

A new 230-kilovolt (kV) transmission line will be constructed to interconnect the Project with the Southern California Edison (SCE) regional transmission grid. The precise location of the new substation that will be the terminus of the project transmission line has not been finalized and thus the transmission line route also has not been finalized.

5.8.2.4 Ambient Noise Levels

Ambient noise levels were measured along the western site boundary and in proximity to nearest residence on May 18 through 19, 2009. One 25-hour measurement (per CEC requirements) was taken just west of the nearest residence (R) over a 25-hour period from 6:00 P.M. on May 18 to 7:00 P.M. on May 19, 2009. Four short-term daytime measurements were taken during and near the 25-hour measurement period at the perimeter of the site. The noise measurement locations are shown on Figure 5.8-1.

During the measurements, the weather was clear, dry, and very hot. Wind speeds were less than 5 mph. Two Larson-Davis sound level meters were used to collect noise data: Model 820 for the 25-hour measurement and Model 824 for the short-term (10-minute) measurements. The meters were mounted on tripods approximately five feet above ground level to simulate the average height of the human ear. The measurements were taken at the edge of gravel/dirt roads moving progressively farther away from I-10, towards the residence. Sound level meters were calibrated before and after the measurements. The results of the short-term measurements are summarized in Table 5.8-5.

Table 5.8-5 Short-Term Ambient Noise Measurements

| Measurement # | Measurement Location | Leq | Lmin | Lmax |
|----------------------|--|------------|-------------|-------------|
| ST-1 | At Callie Road and Powerline Road | 68 | 35 | 102 |
| ST-2 | Along Callie Road, 0.5 mile north of ST-1 | 50 | 40 | 67 |
| ST-3 | Along Callie Road, 0.75 mile north of ST-1 | 42 | 36 | 63 |
| ST-4 | Along Callie Road, 1 mile north of ST-1 | 39 | 34 | 58 |

Notes: All sound levels expressed as dBA.

Based on the data in Table 5.8-5, short-term ambient noise levels vary at the site depending on proximity to existing noise sources. Noise levels were higher when measured adjacent to active nearby roadways, and when closer to I-10. The dominant source of noise in the area observed during the short-term measurements was vehicle traffic on I-10.

The results of the long-term measurements are summarized as hourly average noise levels in Table 5.8-6.

Table 5.8-6 Long-term Ambient Noise Measurement

| Date | Hour | dBA Leq |
|--------------|------------------------|----------------|
| May 18, 2009 | 6:00 P.M. ¹ | 53 |
| May 18, 2009 | 7:00 P.M. | 31 |
| May 18, 2009 | 8:00 P.M. | 32 |
| May 18, 2009 | 9:00 P.M. | 40 |

Table 5.8-6 Long-term Ambient Noise Measurement

| Date | Hour | dBA Leq |
|---|------------------------|---------|
| May 18, 2009 | 10:00 P.M. | 38 |
| May 18, 2009 | 11:00 P.M. | 38 |
| May 19, 2009 | 12:00 A.M. | 32 |
| May 19, 2009 | 1:00 A.M. | 33 |
| May 19, 2009 | 2:00 A.M. | 32 |
| May 19, 2009 | 3:00 A.M. | 33 |
| May 19, 2009 | 4:00 A.M. | 31 |
| May 19, 2009 | 5:00 A.M. | 31 |
| May 19, 2009 | 6:00 A.M. | 36 |
| May 19, 2009 | 7:00 A.M. | 36 |
| May 19, 2009 | 8:00 A.M. | 34 |
| May 19, 2009 | 9:00 A.M. | 33 |
| May 19, 2009 | 10:00 A.M. | 32 |
| May 19, 2009 | 11:00 A.M. | 34 |
| May 19, 2009 | 12:00 P.M. | 35 |
| May 19, 2009 | 1:00 P.M. | 33 |
| May 19, 2009 | 2:00 P.M. | 46 |
| May 19, 2009 | 3:00 P.M. | 50 |
| May 19, 2009 | 4:00 P.M. | 53 |
| May 19, 2009 | 5:00 P.M. | 49 |
| May 19, 2009 | 6:00 P.M. | 53 |
| May 19, 2009 | 7:00 P.M. ² | 49 |
| Loudest Hour | | 53 |
| Quietest Hour | | 31 |
| Average Leq | | 43 |
| 1. The measurement began at 6:51 P.M., May 18, 2009 | | |
| 2. The measurement ended at 7:51 P.M., May 19, 2009 | | |

As shown on Table 5.8-6, based on the long-term measurement, the quietest hour at the nearest residence occurred at 4:00 and 5:00 A.M., with the lowest measured noise level of 31 dBA Leq and a corresponding background noise level (L90) value of 29 dBA. The corresponding ambient CNEL for the 24-hour period at the residence is 46 dBA CNEL.

5.8.3 Environmental Impacts

5.8.3.1 Significance Criteria

The NEPA requires the analysis of non-occupational noise impacts on surrounding populations and promotes noise attenuation practices and the selection of reasonable alternatives to reduce noise impacts. The 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 causes an increase of more than 10 dBA in the L90 at a noise-sensitive receptor during the quietest hours of the night. In contrast, 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.

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 60 dBA CNEL at the nearest noise sensitive receptor.

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

5.8.3.2 Construction

Construction noise would be generated from construction activities on the Project site and along a 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 (over 39 months).

Construction of the Project would result in a short-term, temporary increase in the daytime ambient noise level at the Project site due to operation of construction equipment and vehicles. 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 to 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 typically range from 70 to 85 dBA L_{max} at 50 feet from the source, assuming no pavement breaking or pile driving (EPA 1972), neither of which are required for the Project. 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 and 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 39-month construction schedule. These include site grading, excavation for foundations of Project structures, development of an access road, deliveries of equipment and materials, actual construction of facilities (warehouse, solar equipment assembly building, installation of power block equipment), etc. 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 would naturally attenuate with distance. Noise from a point source attenuates at an approximate rate of 6 dBA per doubling of distance over acoustically hard ground, such as pavement, 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 6 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, and 73 dBA Leq at 200 feet, etc.

Project Site

Construction activities at the Project site would generate temporary, relatively short-term noise levels from the use of construction equipment and vehicles. The nearest noise sensitive human receptor to the Project site (the residence adjacent to the northwestern site boundary) is approximately 25 feet north of the northwestern site boundary. The anticipated construction noise levels of 85 dBA Leq would attenuate with distance, and the corresponding noise level at the residence would depend upon the location of the construction activities. Only for the very brief period of time when construction activities are occurring in the corner of the site closest to that residence would there be substantially elevated noise levels there and there would be minimal activities in that area. The nearest location where there would be more than minimal activities is the northwestern extent of the solar arrays of Unit #2, approximately 1,000 feet from the residence. At this distance, construction noise from site grading and array installation would not exceed 59 dBA Leq at the residence, and only for the short time that construction activities occur in that portion of the site. Noise levels would decrease the farther away construction activities occur from the residence.

The County Noise Ordinance does not provide a numerical threshold noise limit for construction. For counties that do provide a threshold limit for construction noise, typically 75 dBA Leq is established (e.g., Imperial County). The Riverside County Ordinance only limits the hours of construction activities when within 0.25 miles of an inhabited dwelling 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. Construction activities greater than 0.25 miles from an inhabited dwelling are exempt from these limits. Therefore, the Project is subject to the hours of construction, when near the residence and when the residence is inhabited. Since this minor restriction would be easily implemented, no significant noise impacts would occur from Project construction.

As shown in Table 5.8-6, the hourly ambient noise measurements near the residence range from 32 to 53 dBA Leq during daylight hours. The highest potential Project construction noise levels of approximately 59 dBA Leq at the residence would be greater than three dBA and thus perceptible to the human ear and noticeable. However, construction at this location would be from grading activities that would continuously move about the site, and away from the residence. The majority of site construction activities, including stationary construction noise, would be in the interior of the site at the center of the Unit #2 solar field in the power block. The power block is located about 6,000 feet from the nearest residence; the highest power block construction noise levels at the residence would be of approximately 43 dBA.

The nearest vibration sensitive receptor is a residence approximately 25 feet from the site boundary, which is approximately 1,000 feet from the northwestern extent of the solar arrays of Solar Unit #2. No pile driving or pavement breaking will be required; typical earth-moving equipment and vehicles would be used. Any occurrences of perceptible vibration would occur (if at all) only in a very short period when construction activities were at their very closest point along the site boundary. Vibration thresholds would not be exceeded at the residence due to substantial distance (1,000 feet) and no high vibration equipment used (i.e., pile driving and pavement breaking). No significant vibration impacts would be expected.

As part of the process of readying a steam turbine for startup, a process known as a “steam blow”. 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. By this time, the steam lines are cleaned out, and ready for connection to the steam turbine for operation.

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 nearest power block in the interior of the plant site is about 6,000 feet from the nearest residence, the sound level of steam blows would attenuate by distance to approximately 44 dBA at the residence, which is essentially the same as the approximately 43 dBA peak noise level during construction at the power block.

Transmission Line

Construction of the Project transmission line 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 typically 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 a residence. Construction along the corridor would be temporary and short-term in any one location, as construction of the line progresses forward. Construction noise levels are not limited by the County Noise Ordinance, only when allowable, when construction occurs within ¼ mile of a residence. Therefore, transmission line construction noise would not be a significant impact.

Vehicular Traffic

Construction of the proposed facilities would generate a temporary, short-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 1,141 workers at the height of construction in the early morning and late afternoon/early evening; and the delivery of construction equipment, vehicles, and building materials to the Project site along roadways in the Project vicinity including I-10 and the Corn Springs Road interchange with I-10. However, there are no noise sensitive receptors along the materials delivery route, and this traffic would be temporary, and would occur during daytime hours on weekdays when people are less sensitive to noise intrusions. Therefore, noise generated by construction-related traffic on local roadways would not result in significant impacts.

5.8.3.3 Operation

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

Power Plants

The two power plants (Units #1 and #2) would be operational 24 hours per day, seven days per week; however, power generation noise would occur primarily during the daylight hours, when the sun's energy is utilized in the power-generating 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 two power blocks of the Project (one for each 250-megawatt unit) are centrally located in the middle of each 1,380-acre solar unit. In addition, there are diesel-powered emergency generators; these 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 noise contour lines in 5 dBA Leq increments from a 90 dBA Leq contour at the plant's loudest noise source, radiating out to a 50 dBA Leq contour (entirely within the plant boundary), and a 45 dBA Leq contour approximately 1,000 feet southeast of the nearest residence. Based on the distance of approximately 6,000 feet from the approximate center of the closest power block of the Project site to the nearest residence (at the northwestern site boundary), the modeled daytime operational plant noise levels are estimated to attenuate over this distance to approximately 42 dBA Leq at the residence. Therefore, the modeled noise levels at the residence are less than the 45 dBA Leq day/night operational property line noise limit established by the County Noise Ordinance for property designated as rural residential (as shown in Table 5.8-2).

At sundown, when the Project goes into shutdown mode, operational plant noise levels would reduce substantially since the primary noise sources are the power-generating components of the plant. Plant noise levels during the non-daylight hours are conservatively estimated to reduce by approximately 20 dBA Leq over daylight noise levels. Plant noise levels at the quietest time of the night at the residence (22 dBA Leq) would be less than the CEC's significance criteria of 5 dBA above the lowest measured L90

(29 dBA) at the quietest time of the night (4:00 A.M.) at any sensitive receptor. Therefore, there would be no significant impact.

The corresponding CNEL for the modeled plant noise at the residence would be approximately 42 dBA CNEL at the residence, which when added to the measured ambient CNEL of 46 dBA CNEL, the resultant CNEL would be 48 dBA CNEL (a difference of 4 dBA between two CNELs results in an increase of 2 dBA to the higher CNEL value). The future CNEL with the Project of 48 dBA CNEL will be within the “normally acceptable” noise levels in the County’s Noise/Land Use Compatibility Guidelines for residential use (60 dBA CNEL), and would be an increase of 2 dBA CNEL above the ambient CNEL of 46 dBA CNEL, which 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 25 feet from the site boundary, and approximately 1,000 feet from the northwestern extent of the solar arrays of Unit #2. Project operation does not involve major vibration-generating activities (i.e.; pile driving and blasting). Therefore, there would be no significant vibration impacts.

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 3 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.

As noted earlier, no final determination has been made with respect to the Project transmission line route because of uncertainties in the location of the SCE substation where the Project will interconnect. However, due to the minimal noise generated by the transmission line corridor, 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 268 one-way vehicle trips would be generated by the estimated 134 employees needed for the operation of the proposed Project, which would operate 24 hours per day, seven days per week. Vehicle access to the Project site would use I-10 and the Corn Springs Road interchange. The increased traffic levels would be expected to result in an increase in noise levels along these roadways of less than 3 dBA (the increase 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 relatively short periods of time during construction when noise levels would increase at the single residence within one-half mile of the site boundary, the construction period

itself would be temporary; use of heavy equipment and noisy activities 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 60 dBA CNEL limit at the nearest noise sensitive receptor, as identified by CEC and the Noise Element of the County General Plan, would not be exceeded during construction or operation;
- The 5 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 operation;
- The CNEL noise increase of 2 dBA with the project would not be a substantial increase above levels existing without the project; and
- The property line noise limits of 45 dBA Leq day/night for land zoned operational property line noise limit, established by the County Noise Ordinance for property designated as rural residential would not be exceeded.

5.8.3.4 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 (and resulting impacts) at a location(s) are higher than noise levels from the individual projects. Any cumulative projects would be individually responsible for complying with applicable noise LORS. Because of the remoteness of the general area from the population (sensitive receptors), and the size of the individual projects (the cumulative solar projects are almost all in the thousands of acres in size), instances where there would be increased 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)..

Solar facilities have fewer operational noise sources than fossil fuel-fired plants. During operation, the primary noise sources of solar thermal facilities are the power blocks, which are in the interior of very large sites and thus remote from potential offsite noise receptors. Some of the cumulative projects are solar photovoltaic projects which have even fewer noise sources than solar thermal facilities. The Project site is sufficiently distant from any of the other cumulative projects that there would not be any combined noise impacts at the same receptor. Thus, the Project would not make a cumulatively considerable contribution to other project's noise impacts.

5.8.4 Mitigation Measures

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

- NOISE-1** At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within 1 mile of the site and the linear facilities 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 and 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 shall:

- Use a Noise Complaint Resolution Form 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 the single residence near the project site boundary, 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 Heavy equipment operation and noisy construction work relating to any project features shall be restricted to the times of day delineated below: Monday through Friday 6:00 A.M. to 7:00 P.M., June through September; 6:00 A.M. to 6:00 P.M. October through May; Saturday 9:00 A.M. to 5:00 P.M.; and Sunday and Holidays not allowed.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers and all noise abatement equipment must be kept in good working order. 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.

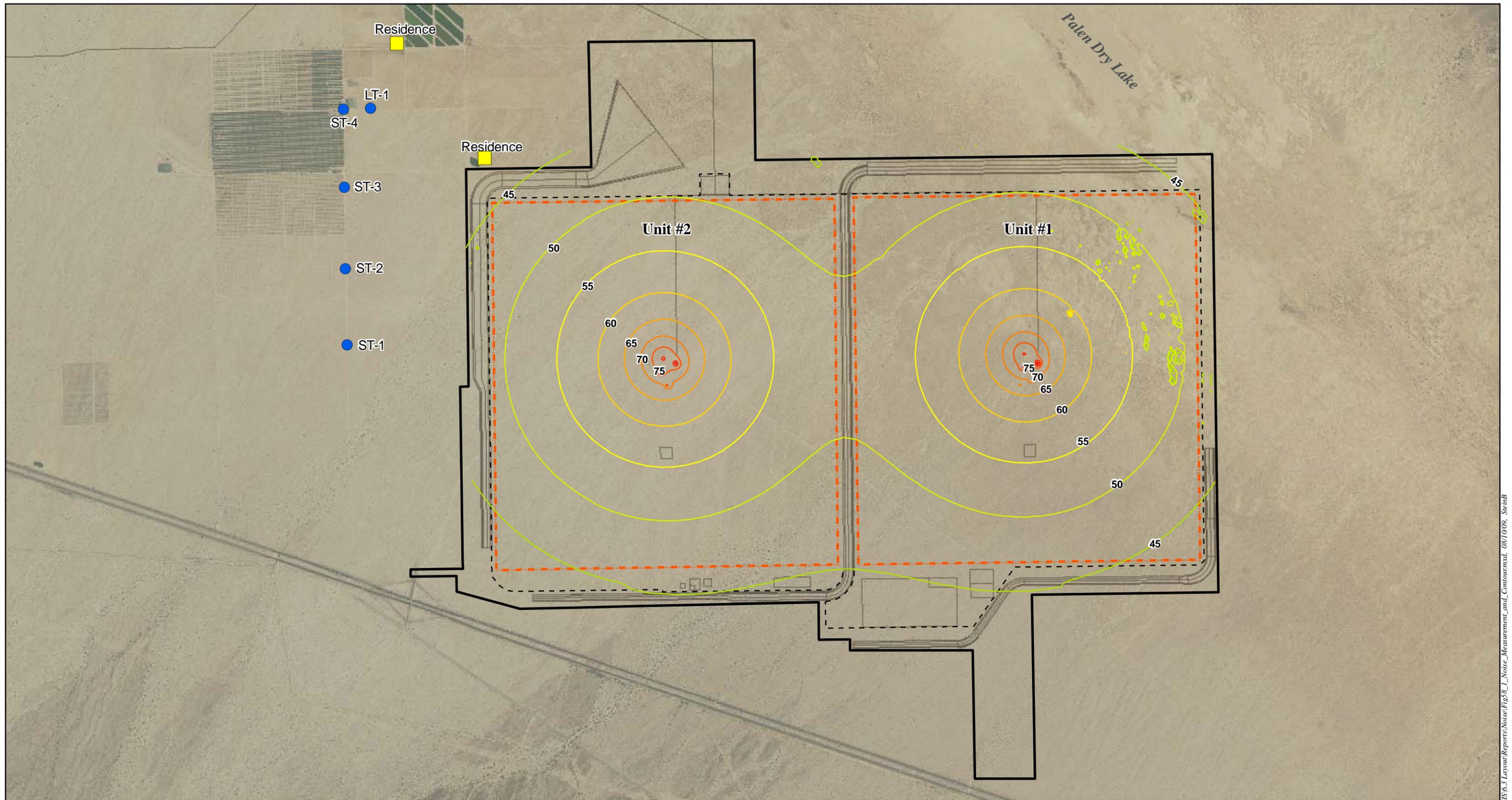
NOISE-8 At least 15 days prior to the first steam blow(s), the project owner shall notify all residents or business owners within one mile of the facility boundary. The notification may be in the form of letters, phone calls, fliers, or other effective means. The notification shall include a description 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

Riverside County, 2008. General Plan. Chapter 7: Noise Element.

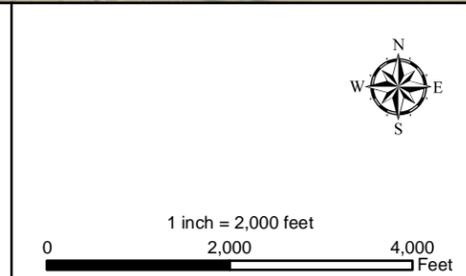
Riverside County, 2007. Noise Ordinance. Ordinance No. 847 Regulating Noise.

U.S. Environmental Protection Agency (USEPA), 1972. Construction Equipment Noise.



| Legend | | Noise Contours | |
|-----------------------------|------------|----------------|------------|
| Disturbance Area | 45 dBA Leq | 60 dBA Leq | 80 dBA Leq |
| Facility Footprint | 50 dBA Leq | 65 dBA Leq | 85 dBA Leq |
| Noise Measurement Locations | 55 dBA Leq | 70 dBA Leq | |
| Solar Unit | | 75 dBA Leq | |
| Facility Layout | | | |

Source: NAIP 2005; ESRI; AECOM 2009; EDAW 2009



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

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

Date: August 2009