2.9 Noise

This section of the Environmental Impact Report (EIR) evaluates noise and vibration impacts resulting from development of the JVR Energy Park Project (Proposed Project). Information contained in this section is based on review of existing documentation, including the following:

- Acoustical Assessment Report, JVR Energy Park Project (Appendix M to this EIR)

Comments received in response to the Notice of Preparation (NOP) included concerns regarding construction noise, operational noise, vibration, low frequency noise, noise impacts to biological resources, and cumulative impacts. These concerns are considered in the preparation of this section where applicable. A copy of the NOP and comment letters received in response to the NOP are included in Appendix A of this EIR.

2.9.1 Fundamentals of Noise and Vibration

The following is a brief discussion of fundamental noise and vibration concepts and terminology.

2.9.1.1 Sound, Noise, and Acoustics

Sound is a process that consists of three components: the sound source, sound path, and sound receiver. All three components must be present for sound to exist. Without a source to produce sound, there is no sound. Similarly, without a medium to transmit sound pressure waves, there is no sound. Finally, sound must be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound or noise. In most situations, there are many different sound sources, paths, and receptors rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

2.9.1.2 Sound Pressure Levels, Decibels and A-Weighted Sound Level

Noise is typically defined as unwanted sound. Sounds are perceived based on their loudness (i.e., volume or sound pressure level) or pitch (i.e., tonal or frequency content). The standard unit of measurement for sound pressure levels is the decibel (dB). Sound pressures in the environment have a wide range of values and the sound pressure level was developed to describe this range as a logarithm of the sound pressure. The sound pressure level is the logarithm of the ratio of the unknown sound pressure to an agreed upon reference quantity. To account for the pitch of sounds and the corresponding sensitivity of human hearing to them, the raw sound pressure level is adjusted with an A-weighting scheme based on frequency that is stated in units of decibels (dBA). The A-weighting scale is appropriate because it is a close approximation of the human response to different frequencies of sound and is in broad use across many disciplines that address noise. The

A-weighting scale discounts low-frequency noises in a manner that simulates how human ears attenuate low-frequency sound (for instance, approximately 16 dB reduction for the 125 hertz [Hz] octave band center frequency, which is comparable to the 120 Hz "hum" frequency of sound emission from electrical transformers operating at 60 Hz). The A-weighting scale is the most common weighting scale for environmental acoustics analysis and assessing compliance with applicable noise limits. State and federal agencies that regulate environmental noise throughout the United States rely on the A-weighted decibel, or dBA, as the appropriate metric for assessing human response to noise. San Diego County Code of Regulatory Ordinances Section 36.403, Sound Level Measurement, specifies that sound level measurements "shall be measured with a sound level meter using A-weighting."

While there are weighting scales other than the A-weighting scale, which simulates human response to frequencies of sound, use of other weighting scales produces results that do not reflect how human ears respond to different frequencies of sound. Therefore, they are not used in the context of an environmental acoustics analysis performed to assess compliance with applicable noise limits. C-weighting, for example, is nearly flat for audible frequencies and therefore used to evaluate musical performances or industrial noise sources suspected to have considerable energy in the lower end of the audible spectrum.

Typical A-weighted noise levels are listed in Table 2.9-1, Typical Sound Levels Measured in the Environment and Industry.

2.9.1.3 Noise Descriptors

A given level of noise can be more or less tolerable depending on the sound level, duration of exposure, character, time of day during which the noise is experienced, and activity affected by the noise. For example, noise that occurs at night tends to be more disturbing than that which occurs during the day because sleep has the potential to be disturbed. Additionally, rest at night is a critical requirement in the recovery from exposure to high noise levels during the day. In consideration of these factors, different measures of noise exposure have been developed to quantify the extent of the effects anticipated from these activities. For example, some indices consider the 24-hour noise environment of a location by using a weighted average to estimate its habitability on a long-term basis. Other measures consider portions of the day and evaluate the nearby activities affected by it as well as the noise sources. The most commonly used indices for measuring community noise levels are the equivalent energy level (L_{eq}), and the community noise equivalent level (CNEL).

- **L_{eq},** the equivalent energy level, is the average acoustical or sound energy content of noise, measured during a prescribed period, such as 1 minute, 15 minutes, 1 hour, or 8 hours. It

is the decibel sound level that contains an equal amount of energy as a fluctuating sound level over a given period of time.

- **CNEL,** community noise equivalent level, is an energy-equivalent A-weighted sound level representing varying sound over a 24-hour period. This metric applies predefined dB adjustments to noise levels during evening and nighttime hours to compensate for the increased disturbance response of people at those times: +5 dBA weighting applied to all sound occurring between 7:00 p.m. and 10:00 p.m., and a +10 dBA weighting applied to all sound occurring between 10:00 p.m. and 7:00 a.m.

2.9.1.4 Sound Propagation

The decibel level of a sound decreases (or attenuates) exponentially as the distance from the source of that sound increases. For a single point source such as a piece of mechanical equipment, this geometric divergence means sound decreases by about 6 dB for each doubling of distance from the source. Sound that originates from a linear source, such as a heavily traveled traffic corridor, attenuates by approximately 3 dB per doubling of distance, provided that the surrounding site conditions lack ground effects or obstacles that either scatter or reflect noise.

2.9.1.5 Noise Effects

Noise can have a substantial effect on the quality of life. An individual's reaction to a particular noise depends on many factors, such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dB change in community noise levels is perceivable, while 1 to 2 dB changes generally are not perceived. Although the reaction to noise can vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise can be organized into six broad categories: general annoyance, sleep disturbance, interruption of human performance and behavior, interruption of social interaction of communication, extra-auditory health effects, and permanent hearing loss.

2.9.1.6 Groundborne Vibration Fundamentals

Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hz. The normal frequency range of most groundborne vibration that can be felt

generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz. Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Ambient and source vibration are often expressed in terms of the peak particle velocity (PPV) in inches per second (ips) that correlate with human perception. Guidance from the California Department of Transportation (Caltrans) indicates that 0.035 ips PPV for transient vibration is "barely perceptible", and a vibration velocity level of 0.1 ips PPV from traffic "begins to annoy" receptors of occupied buildings.

2.9.1.7 Vibration-Sensitive Land Uses

Groundborne vibration can disrupt vibration-sensitive land uses by causing movement of buildings, rattling of windows and items inside buildings, rumbling sounds, and even property damage. Vibration-sensitive land uses include buildings where vibration would interfere with operations within the building, such as vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration depends on the specific equipment that would be affected by the vibration. Residential uses are also sensitive to excessive levels of vibration of either a regular or an intermittent nature. According to the Transit Noise and Vibration Impact Assessment (FTA 2006), background vibration level in residential areas is typically 0.001 ips PPV, which is lower than 0.006 ips PPV, the threshold of perception for humans. There are several sources of groundborne vibration in the unincorporated areas of San Diego County, including construction, railroad operations, and extractive mining operations.

2.9.2 Existing Conditions

This section describes the existing setting in the Project area and also identifies the noise sensitive land uses that could be affected by the Proposed Project.

2.9.2.1 Regional and Local Setting

The Project site is located to the south of Interstate 8, immediately to the east of the community of Jacumba Hot Springs and immediately north of the U.S./Mexico international border, as presented in Figure 1-1, Project Location, in Chapter 1, Project Description, of this EIR. Figure 2.9-1, Environmental Setting, illustrates the current General Plan land use designations and zoning for land surrounding the Project site.

Jacumba Hot Springs is a Census-designated place having a population of 561 residents and a population density of 92 people per square mile (USCB 2010). The unincorporated community is located within the Jacumba Valley at an altitude of approximately 2,800 feet.

2.9.2.2 Noise-Sensitive Land Uses

The Proposed Project consists of a solar energy facility with neither dedicated office space nor any related residential components. As such, no portion of the Proposed Project would involve the creation of new noise-sensitive land uses (NSLU). The nearest existing residential NSLU in the community of Jacumba Hot Springs is located approximately 50 feet to the west of the Project site boundary.

2.9.2.3 Airports

The nearest registered airport is Jacumba Airport, located immediately to the south and east of the Project site. The Project site is located within the Jacumba Airport's airport influence area (AIA). Although Jacumba Airport is within 1,000 feet of the southeastern boundary of the Project site, the average aircraft operations frequency of 34 flights per week (AirNav.com 2020), of which only 80% are single-engine powered flight (SDCRAA 2011), suggests that aviation noise is infrequent. The Jacumba Airport Land Use Compatibility Plan (ALUCP) indicates that aviation noise is less than 50 dBA CNEL east of parcels APN 66015005 and APN 6615006 that abut Old Highway 80 and are approximately 1,330 feet west-northwest of the airport's western property boundary (SDCRAA 2011). There are no active private airstrips within the vicinity of the Project site.

2.9.2.4 Noise Measurement Results

Existing outdoor ambient noise level measurements were conducted on January 9, 2019, by a Dudek field investigator. The noise measurements were conducted for 10 minutes at each of the locations depicted as Sites ST1 through ST6 in Figure 2.9-2, Noise Measurement Locations. The measured average, maximum, and minimum noise levels are shown in Table 2.9-2, Measured Outdoor Ambient Noise Levels in Proposed Project Vicinity. The measured average ambient noise levels ranged from approximately 35 dBA L_{eq} at Site ST5, located near the southwest boundary of the Project site, to 49 dBA L_{eq} at Site ST2, located at a noise-sensitive land use (a residence), located in the center of the Project site. At Site ST2 the dominant noise source was traffic from Old Highway 80.

An unattended "long-term" (LT1) continuous 24-hour sound pressure level (SPL) measurement was also conducted at a position near the eastern fence line of the Jacumba Community Park, approximately 400 feet due east of the ST1 field survey location. Measured L_{eq} during nighttime hours, sampled at five-minute intervals, ranged from as low as 31 dBA to as high as 51 dBA. Hourly L_{eq} values calculated from these successive five-minute duration intervals ranged from 33 to 44 dBA. The calculated CNEL value from these sequential L_{eq} intervals over the monitored 24-hour period is 46.4 dBA.

The outdoor ambient sound environment of the Proposed Project vicinity includes contribution from distant highway traffic, construction noise, and barking dogs. Localized acoustical

contributors proximate to a listener may include nearby traffic noise from local roadways, rustling leaves and other wind-induced noise, and the operation of mechanical equipment (e.g., HVAC units) associated with residential and commercial land uses of Jacumba Hot Springs.

2.9.3 Regulatory Setting

The County of San Diego (County) has two principal noise regulations: the Noise Element of the General Plan and the Noise Ordinance. These regulations comprise important aspects of relevant federal and state standards.

2.9.3.1 Federal Regulations and Standards

Federal Highway Administration (FHWA) Standards (23 CFR Chapter 1, Part 772, Section 772.19) override County standards for federally funded road construction projects. The FHWA establishes specific noise standards for different land use categories for federal highway projects. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment guidance document provides vibration standards that are referenced by the County.

2.9.3.2 State Regulations and Standards

The California Environmental Quality Act (CEQA) (California Code of Regulations, Guidelines for Implementation of CEQA, Appendix G, Title 14, Chapter 3, Sections 15000–15387 and 21000–21178) requires lead agencies to consider noise impacts. Under CEQA, lead agencies are directed to identify generation of substantial temporary or permanent increase in excess of locally established noise standards or those of other agencies, identify generation of excessive groundborne vibration or groundborne noise levels, and identify excessive noise exposures associated with air traffic to people residing or working in a project area.

The California Health and Safety Code (Sections 46000–46080 of the California Noise Control Act) finds that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economical damage. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizen through control, prevention, and abatement of noise.

2.9.3.3 Local Regulations and Standards

The County of San Diego has adopted noise policies and standards contained within the County's General Plan Noise Element, the County Noise Ordinance, and subsequent Amendments to the Zoning Ordinance. The County's noise policies and standards are summarized below.

Two main criteria apply to the operation of the Proposed Project:

- From the General Plan, a CNEL dBA limit accounting for exterior noise levels across a 24-hour period (County of San Diego 2011).
- From the County's Noise Ordinance, outdoor hourly L_{eq} dBA limits for daytime and nighttime based on zoned land use.

County of San Diego General Plan, Noise Element

The County's General Plan Noise Element establishes noise and land use compatibility standards and outlines goals and policies to achieve these standards. The Noise Element characterizes the noise environment in the County and provides the context for the County's noise/land use compatibility guidelines and standards. The Noise Element also describes the County's goals for achieving the standards and introduces policies designed to implement the goals (County of San Diego 2011). Under implementation of the General Plan, the County would use the Noise Compatibility Guidelines to determine the compatibility of land uses when evaluating proposed development projects. The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments. The community of Jacumba Hot Springs near the Proposed Project includes single-family residences and mobile homes for which up to 60 dBA CNEL for exterior use areas would be considered "acceptable" ("specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, and the interior noise level obtains 45 dBA CNEL without any special noise insulation requirements" [County of San Diego 2009a]); and, a resort and community park at which a 65 dBA CNEL of the exterior use area would be considered acceptable.

San Diego County Code of Regulatory Ordinances Title 3, Division 6, Chapter 4, Sections 36.401–36.435, Noise Ordinance

Section 36.404 of the County Noise Ordinance contains sound level limits specific to the receiving land uses. It establishes prohibitions for disturbing, excessive, or offensive noise as well as provisions such as sound level limits for the purpose of securing and promoting the public health, comfort, safety, peace, and quiet for its citizens. Planned compliance with sound level limits and other specific parts of the ordinance, by way of conducting predictive analyses of anticipated noise levels, supports a reasonable expectation that the noise from a project will not be disturbing, excessive, or offensive. Limits are specified depending on the zoning requirements for the property (e.g., varying densities and intensities of residential, industrial, and commercial zones). Where two adjacent properties have different zones, the sound level limit at a location on a boundary between the two properties is the arithmetic mean of the respective limits for the two zones, except for extractive industries. It is unlawful for any person to cause or allow the creation of any noise that

exceeds the applicable limits of the County Noise Ordinance at any point on or beyond the boundaries of the property on which the sound is produced.

The sound level limits are in terms of a one-hour average sound level. The allowable noise limits depend upon the County's zoning district and time of day. Section 36.404 of the County's Noise Ordinance reads as follows:

(a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404 [included as Table 2.9-3 in this analysis below], when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in Table 36.404 [included as Table 2.9-3 in this analysis] above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404 [included as Table 2.9-3 in this analysis], subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) If the measures ambient noise level exceeds the applicable limit in Table 36.404 [included as Table 2.9-3 in this analysis], the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

(f) A fixed-location public utility distribution or transmission facility location on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located.

In 2002, the County added note (b) to this section to allow greater compliance flexibility for projects for which a Major Use Permit has been granted. In the ordinance document adopting this amendment, the County explained: "It is the purpose of this ordinance to amend the San Diego County noise control regulations, to permit noise created by a project for which a Major Use Permit has been approved based upon a specific noise study, to be controlled by the noise mitigation conditions of that permit rather than the general standards of the noise ordinance" (County of San Diego 2002).

The Noise Ordinance also regulates temporary noise levels from construction activities. Sections 36.408 through 36.411 of the Noise Ordinance establish additional noise limitations for operation of construction equipment.

Sections 36.408 and 36.409 state that, except for emergency work, in shall be unlawful for any person to operate or cause to be operated, construction equipment:

(a) Between 7 p.m. and 7 a.m.

(b) On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, the fourth Thursday in November and December 25th. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

(c) Section 36.409 limits allowable construction noise to no more than 75 dB over an eight-hour period between 7:00 a.m. and 7:00 p.m. when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Section 36.410, which regulates sound limitations on impulsive noise, states that in addition to the general limitations on sound levels in Section 36.404 and the limitations on construction equipment in Section 36.409, the following additional sound-level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410A, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period, as described in subsection (c), below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A are as described in the County Zoning Ordinance.

Table 36.410A
County of San Diego Code Section 36.410, Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels (dBA)

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(a) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410B, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410B are as described in the County Zoning Ordinance.

(b) The minimum measurement period for any measurements conducted under this section shall be 1 hour. During the measurement period, a measurement shall be conducted every 1 minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it would be deemed that the maximum sound level was exceeded during that minute.

Table 36.410B
County of San Diego Code Section 36.410, Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels (dBA) for Public Road Projects

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

Jacumba Airport Land Use Capability Plan (ALUCP)

The Jacumba ALUCP identifies 55 dBA CNEL as being a "compatible" exterior noise level for single-family, multi-family and mobile homes (SDCRAA 2011).

2.9.4 Analysis of Proposed Project Effects and Determination as to Significance

Noise and vibration impacts are evaluated based on specified thresholds identified in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) and in the County of San Diego's Guidelines for Determining Significance – Noise (County of San Diego 2009a).

For the purposes of this analysis, the switchyard which would be operated by San Diego Gas & Electric (as described in Chapter 1 of this EIR), is a component of the Proposed Project and has been analyzed as part of the whole of the action. However, the EIR highlights the specific analysis of the switchyard under each threshold of significance.

2.9.4.1 Methodology and Noise Calculations

Measurement of Baseline Outdoor Ambient Conditions

SPL measurements were conducted at the Project site boundary and at nearby representative NSLUs on January 9, 2019 to determine the existing outdoor ambient noise levels. These sound level measurements were measured with a sound level meter using the A-weighted and "slow" response, pursuant to the County Noise Ordinance, Section 36.403. The measurements were made using a calibrated Rion NL-52 integrating sound level meter (SLM) equipped with 0.5-inch pre-polarized condenser microphone with a pre-amplifier. This SLM meets the current American National Standards Institute (ANSI) standard for a Type 1 (Precision Grade) SLM. The SLM (serial number [SN] 00553896) was positioned on a tripod at a height of approximately 5 feet above the ground, and fitted with a wind screen. Performance of these measurements in the field by an attending Dudek field investigator was compatible with appropriate portions of International Organization of Standardization's (ISO) Description, Measurement and Assessment of Environmental Noise (ISO 1996, 2003).

Proposed-Project-attributed construction and post-construction operation noise levels at studied NSLUs and property line positions were quantitatively predicted with techniques and reference data as described in the following paragraphs.

Noise Formulas and Calculations

Predicted outdoor noise levels associated with the post-construction operation of the Proposed Project equipment described in the preceding paragraphs have been calculated with a Microsoft Excel workbook that incorporates the following algorithms:

- Point-source sound propagation (i.e., geometric divergence, known casually as the "6 dB per doubling of distance" rule of thumb) for the battery storage containers and inverter/transformer

platforms which would be installed at 25 locations throughout the solar facility, and the planned step-up transformer at the Proposed Project collector substation.

- In addition to aforementioned geometric divergence, attenuation due to atmospheric acoustical absorption (A_{atm}) and ground surface acoustical absorption (A_{grnd}) that are expressed as follows:

  A_{atm} = 4.16*(d_{rcvr}/3280), where d_{rcvr} is the source-to-receiver distance in feet, and assumes the attenuation rate at 1kHz is representative for overall A-weighted broadband sound at standard air conditions (i.e., 10 degrees Celsius, 70% relative humidity, and 1 atmosphere of pressure).

  A_{grnd} = the greater of zero or 4.8–[(h_s+h_r)/(d_{rcvr}/3.28)]*[17+300/(d_{rcvr}/3.28)], where h_s is the average source height, and h_r is the average receiver height.

These above expressions, as well as geometric divergence from point-type sound sources, are described in Noise & Vibration Control Engineering (Beranek & Ver 1992), and A_{grnd} is also referenced in ISO 9613-2 (ISO 1996).

Locations of the sound-emitting sources and the studied NSLU positions were geo-referenced to a common coordinate system (state plane coordinates), which allowed for accurate source-to-receiver distance values (d_{rcvr}) on which the predicted noise levels depend.

2.9.4.2 NSLU Affected by Airborne Noise – Exterior (Non-Construction)

Guidelines for the Determination of Significance

According to Section 4.1.A of the County Guidelines, the Proposed Project would have a significant noise impact if it would result in an exterior noise exposure at an existing or reasonably foreseeable future NSLU in excess of 60 dBA CNEL or an increase of 10 dBA CNEL over preexisting noise. For single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

- Net lot area up to 4,000 square feet: 400 square feet
- Net lot area 4,000 square feet to 10 acres: 10% of net lot area
- Net lot area over 10 acres: 1 acre

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

Analysis

On-site operational noise sources associated with the Proposed Project would include stationary equipment and occasional mobile operational noise associated with PV panel washing. On-site stationary noise sources associated with the Proposed Project would include inverter/transformer platforms and cooling systems for each of three battery storage containers that would be clustered at each of 25 locations within the solar facility layout. The electrical transformer located within the collector substation would also generate a relatively steady-state source of continuous noise. The switchyard equipment is expected to be intermittent, acoustically insignificant compared to the continuously operating substation transformer, and therefore was not included in the predictive operation noise modeling for the Proposed Project. The following subsections discuss the Proposed-Project-attributed operational noise sources.

Stationary Noise Sources

Inverter/Transformer Platforms

Inverters and transformers would be installed at 25 locations within the solar facility. Each location would include up to two inverters and one transformer. The Proposed Project's Noise Acoustical Assessment Report (AAR) (Appendix M) found the combined Sound Pressure Level from an inverter/transformer platform (i.e., two inverters served by a transformer) is 64.2 dBA at 50 feet. Since these inverter/transformer platforms are no closer than 300 feet to the nearest Proposed Project boundary and would operate during daytime hours when electricity is received from the PV panels, noise from individual inverter/transformer platforms would be less than 44 dBA (based on sound propagation with distance) hourly L_{eq} at the nearest residential property line.

Battery Energy Storage System

The proposed battery energy storage system would consist of static equipment installed within containers, each of which features an air conditioning unit for cooling purposes and a self-extinguishing fire system. The containers would be approximately 55 feet long by approximately 10 feet in height, and approximately 19 feet wide. With respect to potential long-term operational noise associated with the battery energy storage system, the HVAC unit for each container would be a primary source of noise generation and expected to operate 24 hours a day, 7 days a week, so as to keep the batteries from overheating. The Proposed Project's AAR assumed that the HVAC unit for each container would be a Daikin Applied Model 025D "quiet" unit or comparably performing unit having the same or lower sound emission level: 56.8 dBA at 50 feet. Since each of the 25 inverter/transformer platform locations on-site will be accompanied by three of these battery storage containers, the logarithmically combined noise level from three Model 025D cooling units would be 61.6 dBA at 50 feet (i.e., 56.8 + 10*LOG[3] = 56.8 + 4.8 = 61.6). At a

distance of no less than 300 feet to the nearest Proposed Project property line, the noise emission from three Model 025D units would be less than 41 dBA hourly L_{eq}.

Collector Substation

The Proposed Project on-site collector substation would include a single 34.5 kV to 135 kV transformer rated to handle 180 Megavolt amperes (MVA) (90 MVA from the aggregate PV solar panel electricity production, plus 90 MVA from the battery storage units). The Proposed Project's AAR (Appendix M) assumed that the estimated SPL from the proposed substation transformer (SPL_{sub}) will be 45.2 dBA at a distance of 492 feet. Since this transformer would be no closer than 650 feet to the nearest Proposed Project boundary, the expected level at that receiving distance would be less than 43 dBA hourly L_{eq}.

Other Stationary Equipment

As described in the AAR (Appendix M), electric motors associated with the planned single-axis PV panel rotation system are expected to exhibit intermittent noise levels (i.e., operating occasionally to help the PV panels track the sun) that are far less than those of the aforementioned inverter/transformer platforms and the battery storage container cooling units.

Combined Stationary Equipment Noise Levels at NSLU

Predicted operation noise levels were evaluated with the afore-described modeling techniques and source sound level input data at each studied NSLU and then compared with appropriate County of San Diego noise impact assessment criteria to determine potential adverse effects and consequential anticipated mitigation need. Table 2.9-4 presents the predicted aggregate operation noise levels from anticipated Proposed Project-attributed operating equipment—both for all stationary equipment, and the collector substation separately. Additionally, Figure 2.9-3, Predicted Project Operation Noise Levels displays anticipated aggregate operation noise level contours of 45 dBA L_{eq}.

At known existing NSLU in the community of Jacumba Hot Springs nearest to the Proposed Project site, noise attributed to normal operations of stationary equipment would not cause the outdoor ambient sound level to exceed 56.4 dBA CNEL, which represents a significant impact level based on the arithmetic sum of the measured existing outdoor ambient CNEL at the long-term ("LT", 24-hour continuous sound level monitoring) plus 10 dBA as allowed by Section 4.1.A.i of the County's Noise Guidelines for Determining Significance. The predicted hourly L_{eq} values, if considered samples of hourly exposure from generally continuous noise emission attributed to normal operation of stationary noise sources associated with the Proposed Project, at nearest NSLU positions R-1, R-2, R-3, R-4, R-5, and R-6 as appearing in Figure 2.9-2 translate into CNEL values ranging between 35.5 dBA and 50.5 dBA for these six locations.

Thus, the predicted noise levels associated with operation of on-site stationary equipment as currently shown in the Proposed Project plot plans, including the PV panel array, inverter/transformer platforms, battery container cooling systems, and the collector substation, received at these NSLU would not result in exceedances of the County's noise standards. However, if the layout and/or types of stationary equipment of the Proposed Project were to change from what is studied herein, the stationary operational noise levels from the Proposed Project may have the potential to exceed the County's noise standards and impacts would be **potentially significant** (**Impact NOI-1**).

Mobile Sources (PV Panel Power-washing)

Regular cleaning of the Proposed Project installed PV panels is anticipated to involve use of a self-propelled powered mechanical system (e.g., MultiOne Solar Panel Washer, Mazaka Solar Cleaner, or comparable motorized equipment [Groundwork Group LLC 2019; MultiOne 2016]) at an anticipated frequency of four times per year. The Proposed Project's AAR (Appendix M) assumed that panel washing could operate as close as 50 feet to the property line adjoining the S80-zoned land south of Old Highway 80 and south of Interstate 8 near the northeastern corner of the Proposed Project, as close as 83 feet to the property line adjoining Jacumba Hot Springs residential uses north of Seeley Avenue, and as close as 100 feet to the adjoining property lines of existing residential uses on the eastern portion of Jacumba Hot Springs located between Holtville Avenue and Seeley Avenue. Additionally, the PV panel washing activity could occur as close as 83 feet to existing commercial land use along Carrizo Gorge Road.

The Proposed Project's AAR (Appendix M) described five PV panel washing scenarios involving usage of a self-propelled powered mechanical system (i.e., resembling a tractor with a mounted wash-roller apparatus) traveling at low velocity along the rows of PV linear panel arrays that are proximate to residentially zoned property lines that adjoin the Proposed Project. The AAR found that the estimated hourly noise levels associated with these activity scenarios using this self-propelled system range from 59 dBA to 67 dBA L_{eq} at the Proposed Project property line.

Alternately, the AAR describes usage of a portable vehicle-mounted or towed IPC Eagle Wash Station (or comparable technology) that would involve a gasoline-powered pressure washer exhibiting noise emission of 81 dBA at 9 feet, transported by a pickup truck (55 dBA at 50 feet [FHWA 2006]). As evaluated in the AAR, and for comparable operation scenarios studied for the self-propelled PV panel washer that consider orientation of the solar panel arrays and the nearest NSLU, the estimated hourly L_{eq} for the portable IPC Eagle Wash station ranges from 46 dBA to 49 dBA at the Proposed Project property line.

As described in the preceding paragraphs, the estimated hourly noise levels associated with self-propelled solar panel washer activity ranges from 59 dBA to 67 dBA L_{eq} at the property line. With respect to existing NSLU proximate to this panel washing activity, Figure 2.9-2 shows locations

R-1 and R-2 are closest to the Proposed Project PV solar arrays. If panel washing is limited to daylight hours (7:00 a.m. to 7:00 p.m.), then estimated CNEL values at these positions would be 60 dBA for R-1 and 57 dBA for R-2. Both of these predicted CNEL values are greater than the aforementioned 56.4 dBA CNEL value that represents the existing measured CNEL plus 10 dB per Section 4.1.A.i of the County's Noise Guidelines for Determining Significance. Therefore, noise from solar panel washing with self-propelled equipment (e.g., a MultiOne, Mazaka, or comparable) would not be compliant with this County expectation at the nearest NSLU and thus would the impact would be **potentially significant (Impact NOI-2**).

Switchyard

The proposed 138 kV switchyard would be located easterly adjacent to the collector substation and be expected to contain circuit breakers, overhead electrical bus work, switches and controls that occasionally produce noise. However, the character and long-duration magnitude of these sources contrasts with the continuous noise emission of the adjoining collector substation step-up transformer. As described in a recent acoustical report for a larger substation/switchyard site, "cycling of the capacitors and associated circuit-breaker and switching operations can also cause short duration audible impulse noise with the magnitude varying with voltage, load, and operation speed. However, the noise generated by the cycling of the capacitors and associated circuit-breaker and switching operations is of very short duration (5 seconds or less), occurs only once or twice a year, and do not significantly contribute to the substation's overall noise level" (Acentech 2015). Furthermore, the multiple 138 kV circuit breakers planned for the switchyard will feature sulfur hexafluoride (SF_6) closed gas circuits that, unlike air blast circuit breakers (ABCB), do not exhaust to the atmosphere and therefore operate at much quieter noise levels. For these reasons, noise emission from the switchyard equipment is expected to be intermittent, acoustically insignificant compared to the continuously operating substation transformer, and therefore not included in the predictive operation noise modeling for the Proposed Project.

Thus, the switching operations at the switchyard would primarily involve capacitors and closed gas circuit breakers that would make noise very infrequently and at sufficiently low magnitudes. Expressed as CNEL values, which energy-average these sounds over an entire 24-hour period, the operation noise attributed to normal functions of the switchyard would result in a **less than significant** impact.

Combined Operation Noise at NSLU

As discussed in the preceding subsections, operation noise from distinct features or activities of the Proposed Project were are not expected to exceed the County's noise standards based on the current layout shown in the plot plans when compared to the 56.4 dBA CNEL threshold for NSLU. The same conclusion can be made for the logarithmic combination of these sources at a common

nearest NSLU. For example, the anticipated operation noise from the inverter/transformer platforms, battery storage container cooling systems, collector substation transformer, switchyard, and solar panel washing activity at R-1 and R-2 would be 55.7 dBA CNEL and 50.9 dBA CNEL, respectively. Both are less than the threshold tied to the existing outdoor ambient CNEL. However, if the type of equipment and layout were to change, there may be an exceedance at NSLU (**Impact NOI-1 and Impact NOI-2**).

2.9.4.3 NSLU Affected by Airborne Noise – Interior (Non-Construction)

Guidelines for the Determination of Significance

According to Section 4.1.B of the County Guidelines (County of San Diego 2009a), the Proposed Project would have a significant noise impact if it would result in an interior noise exposure at an existing or reasonably foreseeable future NSLU in excess of 45 dBA CNEL except for the following situations:

- Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 dB.
- Corridors, hallways, stairwell, closets, bathrooms, or any room with a volume less than 490 cubic feet.

Analysis

Based on the preceding analysis, predicted exterior CNEL levels with the incorporation of the continuous normal operation of the Proposed Project at the four nearest NSLU in the vicinity would not exceed the County's exterior threshold of 56.4 dBA CNEL. The arithmetic difference between this outdoor significance threshold and the interior significance threshold of 45 dBA CNEL is less than 12 dB, which according to the California State Planning Guidelines represents the low end of a "typical range of noise reduction provided by residential dwellings (12 to 18 dB with windows partially open)" (State of California 2017). Hence, one can reasonably expect interior noise level due to Proposed Project operation within these nearest NSLU to be compliant with the interior threshold and thus **less than significant**.

Switchyard

Based on the preceding analysis for the Switchyard, the exterior noise emissions from the switchyard equipment are expected to be intermittent, acoustically insignificant compared to the continuously operating substation transformer. Thus, the switching operations at the switchyard would primarily involve capacitors and closed gas circuit breakers that would make noise very infrequently and at

sufficiently low magnitudes. Expressed as CNEL values, which energy-average these sounds over an entire 24-hour period, the operation noise attributed to normal functions of the switchyard would be compliant with the interior threshold and thus **less than significant** impact.

2.9.4.4 Proposed-Project-Generated Noise, Operation

Guidelines for the Determination of Significance

According to Section 4.2.A of the County Guidelines, noise attributed to normal operation of the Proposed Project would have a significant noise impact if it exceeded daytime (i.e., between 7:00 a.m. and 10:00 p.m.) and nighttime (i.e., between 10:00 p.m. and 7:00 a.m.) hourly L_{eq} thresholds that depend on the zoning district of the receiving property line and/or the property producing the noise per Section 36.404(a) of the County's Noise Ordinance.

Currently, the Project site's zoning is largely Specific Plan (S-88), which allows for different uses. According to Section 36.404(a) and (c) of the County's Noise Ordinance, the County's noise standards that applies to S-88 zoning depends on the use being made of the property. The current use of the property is largely rural, and the nearest adjoining noise-sensitive receptors to the west of the Project site in Jacumba Hot Springs are either Rural Residential (RR) or Residential Mobile Home (RMH). Thus, both the Project site and these adjoining and surrounding properties apply the same noise standard of 50 dBA hourly L_{eq} during daytime hours and 45 dBA hourly L_{eq} during nighttime hours. Since the Proposed Project equipment may operate during the early morning hours before 7 a.m., it would be subject to the more restrictive nighttime noise standard of 45 dBA during those times at the property boundaries.

Per Section 36.404(e), where the Proposed Project boundary abuts a commercial zone or S-94 property, the applicable nighttime hourly L_{eq} threshold would be 50 dBA: an arithmetic average of the residential and commercial noise limits.

Analysis

Combined Stationary Noise Sources

Section 2.9.4.1, Methodology and Noise Calculations, describes the Proposed Project operation stationary noise sources and details the sound propagation methodology used to predict outdoor noise exposures at nearest NLSU. These stationary noise sources include the inverter/transformer platforms, battery storage units, and collector substation. The same methodology applies to predicting outdoor noise levels at representative Proposed Project property boundary positions B1, B2, and B3 as appearing in Figure 2.9-2 and Table 2.9-4. At all three of these representative boundary positions, predicted noise attributed to normal operations would not exceed the 45 dBA hourly L_{eq} nighttime standard. The 45-dBA hourly L_{eq} is appropriate because the Proposed Project

operation noise sources are expected to be active twenty-four hours a day, seven days per week. Figure 2.9-3 shows the predicted operation noise emission scenario, demonstrating compliance with the nighttime County threshold of 45 dBA L_{eq} at the Proposed Project property lines. Therefore, the Proposed Project, as designed, is anticipated to comply with the County's Noise Ordinance; however, if the layout and/or design for the Proposed Project is changed, the Proposed Project has the potential to have operational noise impacts (**Impact NOI-1**).

Mobile Sources (PV Panel Power-washing)

Section 2.9.4.2 summarized that solar panel washing scenarios involving usage of a self-propelled powered mechanical system (i.e., resembling a tractor with a mounted wash-roller apparatus) traveling at low velocity along the rows of linear solar panel arrays proximate to residentially zoned property lines range from 59 dBA to 67 dBA L_{eq} hourly L_{eq} at the property line. At these predicted levels, the County's Noise Ordinance (per Section 36.404) daytime noise threshold of 50 dBA hourly L_{eq} would be exceeded and result in a significant impact. But for cleaning solar panel rows that are more distant from the Proposed Project boundary, this powered mechanical system could be used as long as the average distance between the equipment and the residentially zoned property line over an hour period is at least 450 feet—the distance that yields a predicted hourly noise level of 50 dBA for the solar panel cleansing operation.

On the other hand, an alternative and quieter PV panel washing method involving a portable pressure washer and a pick-up truck is predicted to have a lower range of hourly L_{eq} values: 46 dBA to 49 dBA for the same three studied scenarios as outlined in the AAR (Appendix M). Usage of this alternative equipment would result in levels that are less than the County's daytime threshold of 50 dBA hourly L_{eq}.

Based on these potential noise impact findings that are dependent upon the equipment used to perform the PV panel washing task, the Proposed Project is likely to comply with the County's Noise Ordinance. However, since the Project would exceed the threshold if the self-propelled powered mechanical system is used, the Proposed Project has the potential to have significant operational noise impacts (**Impact NOI-2**).

Switchyard

As summarized in Section 2.9.4.2, NSLU Affected by Airborne Noise – Exterior (Non-Construction), normal expected operation of the switchyard would result in a less than significant impacts. Similarly, infrequent intermittent noise emission from the switchyard closed gas circuit breakers would, energy-averaged over an hour, result in hourly L_{eq} at nearest Proposed Project property lines that are compatible with the County's Noise Ordinance hourly L_{eq} limits and thus be a **less than significant** impact.

2.9.4.5 Proposed-Project-Generated Noise, Low Frequency

The inverter/transformer platforms distributed across the Project site will produce low-frequency noise, which is normal for such equipment involving electrical transformers and related components because they can emit sound at harmonics of the conducted alternating current line frequency. A-weighted noise levels from the inverter/transformer platforms has already been evaluated in Section 2.9.4.2 and includes acoustical contribution from the first harmonic (e.g., 120 Hz) in the "low frequency" range of audible noise defined as being between 20 Hz and 200 Hz. Due to distance, the A-weighted aggregate noise from the proposed operating stationary inverter/transformer platforms is expected to comply with County of San Diego A-weighted thresholds and thus cause a less than significant impact.

But because the A-weighting scale dramatically discounts sound decibels at low frequencies, and in response to some community concerns regarding low frequency noise emission from the Proposed Project, the Proposed Project's AAR (Appendix M) estimates that the G-weighted noise level from an 1.8 MVA inverter would be no greater than 47 dBG at 300 feet—the shortest distance between the inverter and a proximate property line of an NSLU. Like A-weighting, the G-weighting scale is a set of decibel adjustments applied to unweighted sound pressure levels and can be used to evaluate low frequency noise at one-third octave bands 20 Hz, 25 Hz, and 31.5 Hz that are typically considered audible (albeit on the low end of the audible spectrum) to the average healthy human ear. In fact, the G-weighting scale actually increases an unweighted sound pressure level at 20 Hz by 9 dB, thus reflecting its sensitivity and application for low frequency noise level assessment.

Since the County of San Diego has no low frequency noise thresholds that apply for these kinds of electrical equipment, and because the estimated G-weighted noise level (47 dBG) from an installed inverter as received by the nearest noise sensitive land use or occupied residential property line is expected to be far less than an audible threshold of 85 dBG (Soitec 2014), low frequency noise from the Proposed Project would be a **less than significant** impact.

2.9.4.6 Proposed-Project-Generated Noise, Construction

Guidelines for the Determination of Significance

San Diego County Code Section 36.409, Sound Level Limitations on Construction Equipment states: "Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 dB for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received" (County of San Diego 2009b).

Analysis

Construction Activities Summaries

The construction of the proposed solar facility would consist of several phases, including site preparation, development of staging areas and site access driveways, solar array assembly and installation, and construction of electrical transmission facilities as summarized in the following paragraphs. This analysis presumes that these site preparation activities and other construction phases are distinct and sequential, such that no NSLU or boundary line position would be expected to witness or experience concurrent activities with all equipment impractically "stacked" together at a geographically common position or otherwise operating in a manner not reflecting typical construction practice.

Clearing and Grading

Construction of the Proposed Project would involve clearing and grubbing of the existing vegetation; grading necessary for the construction of access and service driveways and the installation of solar arrays; trenching for the electrical DC and alternating current AC collection system including the telecommunication lines; installation of the inverter stations; construction of 34.5 kV collection systems leading to the Proposed Project substation; and construction of the Proposed Project substation and the gen-tie line from the Proposed Project substation to the adjacent 138 kV high-voltage facilities.

Collection System Trenching

Trenching requirements for the DC electrical collection system and telecommunication lines would consist of a trench up to approximately 3 to 4 feet deep and 1 to 2 feet wide. The trenches may be filled with sand or another inert material to provide insulation and heat dissipation for the direct buried cable within the collection system. Excessive material from the foundation and trench excavations would be used for site leveling.

PV System Construction Overview

Proposed Project construction would include several phases occurring simultaneously with the construction of (1) PV systems assembly consisting of pile-driving of support racks and the placement of panels on support racks, (2) trenching and installation of the DC and AC collection system; (3) point of interconnection upgrades; and (4) the grading of access driveways.

Soil Stabilization

To reduce fugitive dust and erosion, the disturbed areas on the Project site would either be treated in one of the following methods, or a combination of both: Treatment with a permeable nontoxic soil binding agent (preferred method), and/or placement of disintegrated granite (DG) or other base material (good for driveways).

Construction Personnel, Traffic, and Equipment

The number of workers expected on the site during construction would vary over the construction period, with a maximum of 1,000 trips a day during the most intense phase of construction (i.e., the racks and panels installation). Deliveries of equipment and supplies to the site would also vary over the construction period but are expected to average about 40 to 70 daily trips.

It is assumed that all employees would arrive within the morning peak hour and depart within the evening peak hour, and delivery truck trips would be distributed evenly throughout a 12-hour-shift day, between the hours of 7:00 a.m. and 7:00 p.m. Since the surrounding area is rural, traffic is very low on the local roads surrounding the Project site. Implementation of the Proposed Project would result in a temporary increase in traffic along these roads, but not to the level of the road carrying capacity. No road closures are anticipated during Proposed Project construction. With the implementation of Project Design Feature **(PDF) TR-1**, as described in Section 3.1.7, Transportation, a County-required Traffic Control Plan to provide safe and efficient traffic flow in the area and on the Project site would be prepared prior to construction. The Traffic Control Plan would be prepared in consultation with the County of San Diego and would contain Proposed-Project-specific measures for noticing, signage, policy guidelines, and the limitation of lane closures to off-peak hours (although it is noted that no requirement for lane closures has been identified).

During the peak of construction, a typical day would include the transportation of parts, movement of heavy equipment, and transportation of materials.

Similar to the Proposed Project, the construction of the switchyard and its 1,390-foot-long asphalt-paved access driveway would consist of several phases, including site preparation (i.e., clearing and grading of the switchyard site work area and access driveway), setting foundations for the electrical equipment, laying conduit and grounding, and paving the access driveway. Transmission line tie-ins would also involve site preparation, erecting steel poles, and installing the conductors.

Anticipated Construction Noise

On-Site Noise Emission

Construction activities would occur during the County's allowable hours of operation (Monday through Saturday from 7:00 a.m. to 7:00 p.m.). The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed and the condition of the equipment. The average sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction during the time period.

Construction equipment would include standard equipment such as graders, scrapers, backhoes, loaders, cranes, dozers, water trucks, portable generators and air-compressors, and miscellaneous trucks. The maximum noise level ranges for various pieces of construction equipment at a distance of 50 feet are depicted in Table 2.9-5. The maximum noise levels at 50 feet for typical equipment would range up to 85 dB for the type of equipment normally used for this type of project. The hourly average noise levels would vary, but construction noise levels of up to approximately 75 to 80 dB at 50 feet are typical for the anticipated construction activities.

The Proposed Project's AAR (Appendix M) used an Excel-based construction noise model for the construction scenario. The AAR's model emulated the FHWA Roadway Construction Noise Model (RCNM) and included a temporal parameter to account for actual equipment operating presence and time (within an 8-hour work shift) at a specified distance to a studied receptor, activity-specific construction noise was estimated for up to three source-to-receiver distance values as follows:

- 50 feet from an assumed geographic center-point for the indicated construction activity to a location on the Proposed Project boundary that adjoins a NSLU property line
- 83 feet between the geographic activity center and the NSLU property line, which is the closest expected distance between a Proposed Project boundary line location to the nearest expected post-driving for the PV panel support structure foundations
- Approximately 300 feet between a Proposed Project boundary location and the nearest inverter/transformer platform

At these studied distances, not all construction equipment anticipated for a phase would be clustered at the same location. By way of example, it would be unreasonable to assume that all 20 anticipated all-terrain vehicles (ATV) expected for usage across the entire Project site would be present at any of these three nearest distances. Instead, and reflecting expectation of how the Proposed Project construction activity would likely unfold, the AAR assumed that equipment expected for each phase will be distributed across the Project site. Hence, only a portion of the

listed equipment would be as close as the indicated distance and for only a portion of the full eight-hour period against which the construction noise was being assessed against the County's 8-hour L_{eq} threshold.

Additionally, the AAR's analysis presumed that phased construction activity would be sequential. If any activities were to be concurrent, then only one of these activities would be proximate to the Proposed Project boundary (i.e., one of the above-listed source-to-receiver distances, as appropriate) and any others would be sufficiently distant so as to not cause a cumulative additive effect that would risk exceeding the County's construction noise limit of 75 dBA 8-hour L_{eq}

Consequently, and as shown in Table 2.9-6, the Proposed Project's AAR (Appendix M) found that the predicted 8-hour L_{eq} values during construction at the property line adjoining the nearest NSLU are estimated to range from 31 dBA to 75 dBA depending on phase, activity, and sound propagation distance. Under these conditions, noise exposures from construction activities involving conventional heavy equipment and processes would comply with the County's 8-hour 75 dBA L_{eq} standard at the property lines. However, if actual conditions were to be different from these predictions, (i.e., should Proposed Project construction phases or other activities overlap in schedule or otherwise occur concurrently), the Proposed Project does have the potential to exceed the 8-hour L_{eq} County threshold at the Project boundary and impacts may be **potentially significant** (**Impact NOI-3**).

Construction Traffic Noise

The San Diego Association of Governments (SANDAG) Transportation Forecast Information Center (TFIC) forecasts that Old Highway 80 should experience a total average weekday traffic (AWT) volume of 5,300 vehicles in 2020 (SANDAG 2019). Using calculation methods from the Federal Transit Administration (FTA), and assuming 50 miles per hour vehicle speed and daytime traffic represents 85% of the AWT total, estimated traffic noise would be 63 dBA L_{dn} at a distance of 75 feet from the roadway centerline (FTA 2018).

Conservatively assuming one worker per vehicle making a trip to and from the Project site, the total of 1,000 Proposed-Project-related vehicles added to the daytime portion of the 5,300 AWT baseline would result in only a 19% increase in daily traffic volume and hence less than a dB change to the daily traffic noise (e.g., assessed as CNEL or L_{dn}). The change is less than 1 dB due to acoustical principles. All other factors being equal, it requires a doubling of traffic volumes to cause a 3 dB increase (i.e., 3 dB = 10*LOG[2]). Therefore, and using the same mathematical expression, a 19% change would only result in a 0.75 dB increase (= 10*LOG[1.19]), which would be a **less than significant** cumulative traffic noise impact.

Switchyard

The construction of the switchyard and its asphalt-paved access driveway would consist of several phases, including site preparation (i.e., clearing and grading of the switchyard site work area and access road), setting foundations for the electrical equipment, laying conduit and grounding, and paving the access road. Transmission line tie-ins would also involve site preparation, erecting steel poles, and installing the conductors.

Because the nearest residential land use is approximately 3,500 feet away from the switchyard work area and its access route, the predicted 8-hour noise levels from anticipated construction activities associated with the switchyard and transmission line tie-ins are expected to range from 25 dBA to 60 dBA. Compared to the County's 8-hour standard of 75 dBA L_{eq8hr}, this construction noise level range would be **less than significant**.

Further, because it is more than 10 dBA less than the 75 dBA limit, the estimated construction noise level range for switchyard construction activity would not cause a significant additive effect to other Proposed Project construction noise assessed at the same noise-sensitive receptor location. The combination of such noise level exposures is logarithmic; hence, a level of 60 dBA logarithmically added to 75 dBA would yield 75 dBA and thus remain complaint with the County's construction noise level standard and a **less than significant impact**.

2.9.4.7 Proposed-Project-Generated Noise, Impulsive

Guidelines for the Determination of Significance

San Diego County Code Section 36.410, Sound Level Limitations on Impulsive Noise, states, "Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period. The maximum sound level depends on the use being made of the occupied property and are as follows:

- Residential, village zoning, or civic use – 82 dBA
- Agricultural, commercial, or industrial use – 85 dBA

The minimum measurement period for any measurements conducted for impulse noise determination shall be one hour. During the measurement period, a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the

maximum sound level for any portion of any minute it will be deemed that the maximum sound level was exceeded during that minute" (County of San Diego 2009b).

Analysis

Each tracker assembly, on which an array of PV panels would be arranged (and thus tilt in unison), would be installed on 4- to 6-inch-diameter pipes or beams. The beams would be driven into grade using a pile/vibratory/rotary driving technique similar to that used to install freeway guardrails. Most foundations would be driven to approximate depths of 10 to 15 feet deep.

It is anticipated that a RTG Model RG21T vibratory pile driver or comparable machine would be used. Based on data provided by the equipment vendor for this product and prior project experience, this size and type of equipment is anticipated to generate a maximum noise level of approximately 85 dBA at a distance of 50 feet (RTG 2014). At a distance of 83 feet, which is the shortest distance between the expected pile driving activity and the property boundary of any occupied residence, the maximum noise level from this post-driving process would be approximately 81 dBA and thus under the County's 82 dBA threshold per Section 36.410.

It takes 10 minutes or less to drive a post for the solar array tracker support structure, so each site would experience noise emission over less than 20% of an hour—assuming the remainder of the hour involves moving the post-driving machine to a new site and preparing a new post for ground installation. Assuming post driving occurs for approximately 20% of an hour at each tracker site, the average hourly noise level would be approximately 78 dB at 50 feet from the pile driver or 74 dBA at 83 feet, the distance to the closest residential property boundaries. This consideration has already been included in the predicted noise levels for the System Installation phase as appearing in Table 2.9-6; thus, noise from pile driving would also comply with Section 36.409 from the County's Noise Ordinance.

On the basis of these findings, post-driving activities would result in a **less than significant** noise impact.

2.9.4.8 Excessive Groundborne Vibration

Guidelines for the Determination of Significance

Per the County's Guidelines for Determining Significance for Noise (County of San Diego 2009a), the County of San Diego refers to FTA guidance for evaluation criteria to assess potential groundborne vibration impact at sensitive receptors such as residences (and other occupied

structures where inhabitants normally sleep). At such sensitive receptors, the following impact criteria are established:

- A vibration velocity level of 0.004 ips root mean squared (rms) would be considered a significant impact with respect to "frequent events," which for purposes of this analysis would be assumed to mean regular operation of conventional construction equipment, such as active bulldozers or graders, that may momentarily work in an area near a sensitive receptor. Expressed as a PPV value, and assuming a crest value of 4 as adopted by the FTA (FTA 2006), this criterion would be 0.016 ips.
- For "infrequent events" (i.e., less than 70 events per day), the threshold would be 0.01 ips rms. Expressed as a PPV value, and assuming the same crest value of 4, this criterion would become 0.04 ips.
- A vibration velocity level of 0.1 ips PPV would be considered a significant impact with respect to operation of post-driving equipment (i.e., pile drivers).

Although vibration level assessment criteria would be different for land uses with primarily daytime uses (e.g., school), or where scientific research or other processes within a potentially affected structure require low levels of vibration to avoid disruption of progress or production yield, neither category of land use exists or is sufficiently proximate to the study area. Additionally, there are no "special buildings" such as auditoriums, concert halls, recording studios, or theaters near the Proposed Project that would have similar vibration velocity thresholds to those of occupied residences, but more stringent groundborne noise criteria.

Analysis

Operation of the Proposed Project largely involves stationary equipment installed on massive platforms and post-driven foundations; therefore, groundborne vibration expected from these systems distributed across the Project area is not expected to create perceptible levels of vibration velocity at the nearest sensitive receptors, which in this context would be the previously studied NSLU. Groundborne vibration attenuates rapidly through intervening soils and rock strata as it propagates from the source to a sensitive receptor.

Construction activities, on the other hand, present more likely opportunities for vibration impact due to the anticipated operation of conventional heavy construction equipment (e.g., graders) and post-driving processes evaluated for airborne noise impact studied for noise emission under Section 2.9.4.6, Proposed-Project-Generated Noise, Construction. The following presents an assessment of vibration levels and potential impact for each of these two types of expected on-site construction activities.

At 83 feet, the nearest potential distance between operating construction equipment and a sensitive receptor position (e.g., occupied residence), the predicted groundborne vibration velocity level from a large bulldozer (PPV_{equip}) would be 0.01 ips PPV and thus compliant with the FTA-based guideline threshold. This finding is based on a reference vibration velocity level (PPV_{ref}) of 0.089 ips PPV for the bulldozer at a reference source-to-receptor distance of 25 feet (FTA 2006), and using these quantities as inputs in the following expression for estimating PPV at a sensitive receptor:

$$PPV_{equip} = PPV_{ref} * (25/D)^{1.5}$$

Where D is the distance (in feet) between the vibration-producing equipment and the sensitive receptor.

By complying with this County-adopted standard, vibration from operating conventional construction equipment would be expected to cause a **less than significant** impact at sensitive receptors.

At 83 feet, the nearest potential distance between an anticipated post-driving machine and a sensitive receptor position (e.g., occupied residence), the predicted groundborne vibration velocity level (PPV_{equip}) would be 0.03 ips PPV and thus compliant with the County's threshold of 0.1 ips. This finding is based on a reference vibration velocity level (PPV_{ref}) of 0.17 ips PPV at a reference distance of 25 feet for the post-driver, assuming it compares with a "pile driver (sonic)" per FTA guidance (FTA 2006). By complying with this County-adopted standard, vibration due to normal operation of the post-driving equipment would not be expected to cause a significant adverse effect at sensitive receptors and thus impact would be **less than significant**.

Switchyard

Due to expected attenuation of groundborne vibration as it propagates through soils and strata between the switchyard site vicinity and the nearest County sensitive receptor that is approximately 3,500 feet away, vibration velocity levels from either construction or operation of the switchyard would be far less than the aforementioned thresholds that determine impact significance. Hence, vibration from the switchyard should be a **less than significant** impact.

2.9.4.9 Airport Related Noise

Guidelines for the Determination of Significance

According to the County of San Diego's Guidelines for Determining Significance, the Proposed Project would have a significant noise impact resulting from airport noise if it would result in exposure at the exterior of an on- or off-site, existing or reasonably foreseeable future NSLU in excess of 60 dBA CNEL or an increase of 10 dBA CNEL over pre-existing noise (County of San Diego 2009a).

Additionally, Table JAC-1 from the Jacumba Airport Land Use Capability Plan (ALUCP) identifies 55 dBA CNEL as being a "compatible" exterior noise level for single-family, multi-family and mobile homes (SDCRAA 2011).

Analysis

According to the Jacumba ALUCP, the Project site partially lies within the 50 to 55 dB CNEL and 55 to 60 dB CNEL calculated noise contours (SDCRAA 2011). However, the Proposed Project does not propose adding any land uses that would be considered a NSLU, and therefore would not expose a NSLU to airport noise. In addition, the Proposed Project would be operated remotely; therefore, the amount of on-site workers would be limited to maintenance workers who would only visit the Project site periodically. This would limit the potential exposure workers or visitors would have to airport noise. Therefore, impacts would be **less than significant**.

Switchyard

According to the Jacumba Airport Land Use Compatibility Plan, the switchyard area lies outside of the 50-55 dB CNEL calculated noise contours (SDCRAA 2011). In addition, the switchyard does not propose any land uses that would be considered a NSLU, and therefore would not expose NSLU to airport noise. Additionally, the switchyard would be an un-staffed facility that would limit the exposure of potential on-site workers or visitors to airport noise. Therefore, impacts would be **less than significant**.

2.9.5 Cumulative Impact Analysis

Noise levels tend to diminish quickly with distance from a source; therefore, the geographic scope for the analysis of cumulative impacts related to noise would be limited to projects within approximately 0.25 miles of the Proposed Project, the switchyard, and the access routes. This area is defined as the geographic extent of the cumulative impact area because noise impacts would generally be localized, mainly within approximately 500 feet from any noise source; however, it is possible that noise from different sources within 0.25 miles of each other could combine to create a significant impact to receptors at any point between the projects. At distances greater than 0.25 miles, construction noise would be briefly audible and steady construction noise from the Proposed Project would generally dissipate into quiet background noise levels. The temporal scope for cumulative impacts associated with noise would include the construction and operation phases of the Proposed Project and the switchyard. The baseline for assessing cumulative noise impacts includes the noise sources associated with other projects within 0.25 miles of the Proposed Project that could be constructed and/or operated at the same time as the Proposed Project. Based on the foregoing criteria, the only cumulative projects included in this cumulative analysis are as follows:

the Jacumba Solar Project, East County (ECO) Substation project, Southwest Powerlink 500 kV, Sunrise Powerlink 500 kV, and the ECO 138 kV to 230 kV interconnection lines.

2.9.5.1 Construction Noise

The Proposed Project would have a short-term construction-related potential to generate temporary increases in outdoor ambient noise levels. Construction is estimated to take approximately 13 months. Grading for the Proposed Project is designed to be balanced, thus, there would be no import or export of dirt. However, there would be worker vehicles and truck material deliveries to the site. It is anticipated that up to 500 construction workers per day would visit the Project site during construction (including truck trips).

No cumulative impact regarding construction could occur because the afore-listed cumulative projects are complete. Other construction activities may be occurring in or outside the Proposed Project vicinity, but at distances with respect to common NSLU (i.e., receptors of the Proposed Project and others) such that their acoustical contribution would not be cumulatively considerable. Noise attenuates with distance due to geometric divergence, atmospheric acoustical absorption, and ground effects (due to acoustical absorption from porous ground surfaces and vegetative cover, as well as potentially path-intervening natural terrain features and built structures). Therefore, with conditions not giving rise to cumulatively impactful noise levels, Proposed Project construction noise would **not result in a cumulatively considerable impact**.

As discussed above, construction of the Proposed Project would cause a temporary increase in traffic on area roadways that is not expected to result in a significant noise impact from the temporary increase in trips. Conservatively assuming one worker per vehicle making a trip to and from the Project site, the total of 1,000 Proposed-Project-related vehicles (i.e., making one-way trips) added to the daytime portion of the 5,300 AWT baseline would result in only a 19% increase in daily traffic volume and hence less than a dB change to the daily traffic noise (e.g., assessed as CNEL or L_{dn}). Since the pre-Proposed-Project traffic noise level already exceeds 60 dBA, and a change in traffic noise would have to be 3 dB in order to be considered perceptible (Caltrans 2009), this less than 1 dB change in traffic noise would therefore be considered a less than significant cumulative noise impact.

In addition, none of the cumulative projects located in the vicinity of the Proposed Project that may have overlapping construction schedules are substantial in size such that they would contribute to a cumulatively considerable increase in area traffic trips that would result in a temporary noticeable increase in traffic noise. Therefore, the Proposed Project's contribution of noise from increased traffic along area roadways **would not be cumulatively considerable**.

2.9.5.2 Operation Noise

The Proposed Project is designed to operate under remote monitoring, with few site visitors to conduct periodic inspection and maintenance of on-site systems. Hence, AWT attributed to these infrequent trips (likely numbering less than one trip per week) added to existing volumes on Old Highway 80 would be considered a less than significant impact on the basis of changing the pre-existing noise at existing or reasonably foreseeable future NSLU by less than a 1 dB, which would not be considered a perceptible increase.

While there are a number of existing and planned energy production and transmission projects in the shared vicinity of southeastern San Diego County, the propagated sound levels from operating Proposed Project features (inverter/transformer platforms, battery storage container cooling systems, and the collector substation) attenuates to a sound level less than 45 dBA within the boundary. At such relatively low noise levels, and because noise from other projects (e.g., operation of the ECO Substation, Jacumba Solar, and potential new facilities including Campo Wind Energy, Cameron Solar, and Boulevard Solar) would similarly diminish with distance, the opportunity for a "cumulatively considerable" effect as defined by the San Diego County Noise Report Format and Requirements (County of San Diego 2009b) guidance would be very unlikely.

The primary source of operating noise at the ECO Substation would be the on-site transformers that result in a 1-hour average 45 dBA noise contour within the substation property line (Dudek 2010). Beyond its property line, noise from the ECO Substation would continue to attenuate with distance traveled. Upon reaching studied NSLU of the Proposed Project, its acoustical combination with Proposed Project operation noise **would not result in a cumulatively considerable impact.**

The nearest sensitive receptor to the ECO Substation is a residence located approximately 2,600 feet (i.e., approximately 0.5 miles) northwest of the substation site adjacent to Interstate 8. This sensitive receptor is also located approximately 3,500 feet (approximately 0.7 miles) north of Jacumba Solar, but is over 2 miles distant from the nearest edge of the Proposed Project. Therefore, the Proposed Project (or from the switchyard) contribution **would not be cumulatively considerable**.

Under the right conditions, such as after the accumulation of dust or moisture on their conductors, normal operation of the aforementioned Southwest Powerlink 500 kV, Sunrise Powerlink 500 kV, and ECO 138 kV to 230 kV interconnection lines would cause audible corona noise. However, the audibility of such noise generation is typically proximate to the transmission lines, and at much larger distances the noise levels would be attenuated and thus not be expected to have a cumulatively considerable acoustical contribution to Proposed Project operation noise at studied NSLU. "For example, the calculated rainy weather audible noise for a 230 kV transmission line at the right-of-way edge is about 25 dBA, which is less than ambient levels in a library and much

less than background noise for wind and rain" (CPUC 1999). Therefore, anticipated Proposed Project operation noise in combination with existing transmission line corona noise would be **less than significant cumulative impact**.

2.9.5.3 Vibration

No cumulative impact regarding groundborne vibration, which is limited to the construction phase, could occur because the afore-listed cumulative projects are complete. Other construction activities may be occurring in or outside the Proposed Project vicinity, but at distances with respect to common NSLU (i.e., receptors of the Proposed Project and others) such that their contribution would not be cumulatively considerable. Vibration attenuates with distance due to geometric divergence and the variability of subsurface soils and rock strata through which vibration waves propagate. Therefore, with conditions not giving rise to cumulatively impactful levels, construction activity vibration attributed to the Proposed Project would be a **less than significant cumulative impact**.

2.9.5.3 Airport Noise

The Project site lies partially within the 55 to 60 dB CNEL calculated noise contours as presented in the Jacumba Airport Land Use Compatibility Plan (ALUCP). However, the Proposed Project does not propose any land uses that would be considered an NSLU. The solar facilities would be operated remotely. Therefore, the Proposed Project **less than significant cumulative impact**.

2.9.6 Significance of Impacts Prior to Mitigation

Excessive Noise Levels

Operation Noise Levels

As described in Sections 2.9.4.2 and 2.9.4.4, the Proposed Project's AAR found that the operational noise levels from the stationary equipment of the Proposed Project would be compliant with both the San Diego County Guidelines threshold of 56.4 dBA CNEL at the nearest NSLU and the Noise Ordinance (36.404) threshold of 45 dBA hourly L_{eq} nighttime limit if the Proposed Project's equipment and layout is the same as what was evaluated in the AAR; however, if the equipment was to change and/or the layout is different from what was evaluated, operational noise levels have the potential to exceed the County's Noise Ordinance threshold and impacts may be **potentially significant** (**Impact NOI-1**).

As described in Sections 2.9.4.2 and 2.9.4.4, the Proposed Project's AAR found that when the PV panel washing operations of the Proposed Project occur at a distance of 250 feet or greater from the nearest property line that adjoins an offsite commercial property, a self-propelled washer

vehicle (e.g., Mazaka, MultiOne, or comparable tractor/excavator based system of up to 34.6 kW rated power) may be used to perform PV panel surface cleansing during daytime hours. Where the activity occurs in proximity to a Proposed Project property line that adjoins an offsite property having a rural or residential zoning classification per the County (i.e., akin to "Noise Zone (1)" per its Table 36.404 from the County's Noise Ordinance), this minimum distance value increases to 450 feet. If this PV panel cleaning activity occurs less than either of these distance values, the Proposed Project's impact may be **potentially significant** (**Impact NOI-2**).

Based on the analysis in Section 2.9.4.2, predicted exterior CNEL levels due to the continuous normal operation of the Proposed Project at the four nearest NSLU in the vicinity would not exceed the County's exterior threshold of 56.4 dBA CNEL. And as described in Section 2.9.4.3, the arithmetic difference between this outdoor significance threshold and the interior significance threshold of 45 dBA CNEL is less than 12 dB, which according to the California State Planning Guidelines represents the low end of a "typical range of noise reduction provided by residential dwellings (12 to 18 dB with windows partially open)." Hence, one can reasonably expect interior noise level due to Proposed Project operation within these nearest NSLU to be compliant with the interior threshold and thus **less than significant**.

Construction Noise

As described in Section 2.9.4.6, Proposed Project construction is anticipated to include several phases of activity involving typical heavy construction equipment and vehicles. Additionally, mobile post-driving machines are anticipated to install foundation elements for the single-axis tracking assemblies upon which the 300,000 PV panels are to be mounted.

For multiple source-to-receptor distances (i.e., between average positions of anticipated construction activities and Proposed Project property line positions adjoining NSLU), prediction of aggregate noise from the anticipated sequence of these phased construction activities is anticipated to be compliant with the County's construction noise thresholds of 75 decibels L_{eq} for an 8-hour metric between 7:00 a.m. to 7:00 p.m., and the impulse noise limit of 82 dBA maximum sound level [L_{max}], pursuant to the Noise Ordinance Sections 36.408 through 36.410 (County of San Diego 2009a). However, should Proposed Project construction phases or other activities overlap in schedule or otherwise occur concurrently, the Proposed Project does have the potential to exceed these thresholds and impacts may be **potentially significant** (**Impact NOI-3**).

Construction Traffic Noise

As described in Section 2.9.4.6, the estimated traffic noise from the Proposed Project would be 63 dBA L_{dn} at a distance of 75 feet from the roadway centerline (FTA 2018). Conservatively assuming one worker per vehicle making a trip to and from the Project site, the total of 1,000 Proposed-

Project-related vehicles added to the daytime portion of the 5,300 AWT baseline would result in only a 19% increase in daily traffic volume and hence less than a dB change to the daily traffic noise (e.g., assessed as CNEL or L_{dn}). The change is less than 1 dB due to acoustical principles. All other factors being equal, it requires a doubling of traffic volumes to cause a 3 dB increase (i.e., 3 dB = 10*LOG[2]). Therefore, and using the same mathematical expression, a 19% change would only result in a 0.75 dB increase (= 10*LOG[1.19]), which would be a **less than significant** traffic noise impact.

Groundborne Vibration

As described in Section 2.9.4.8, based on the anticipated construction equipment and distance from the equipment to the adjacent residences, construction activities would result in vibration levels below County standards at noise sensitive land use. Hence, County-compliant vibration levels from operation of the construction equipment would be a **less than significant** impact.

During construction, vibration from post-driving activities near the Project site west boundary would be **less than significant** because groundborne vibration would not exceed the County's Guidelines for Determining Significance at the nearest sensitive receptor.

No operational components of the Proposed Project include significant groundborne noise or vibration sources, and no significant vibrations sources currently exist, or are planned, in the Proposed Project vicinity. Thus, groundborne noise or vibration attributed to the operation of the Proposed Project would be a **less than significant** impact.

Operational activities associated with the Proposed Project, would not produce significant groundborne vibrations; therefore, vibration and groundborne noise attributed to Proposed Project operation would result in **less than significant** impact.

Airport Noise

As described in Section 2.9.4.9, most of the Project site is located outside the 55 to 60 dBA noise level contours of Jacumba Airport. and those areas of the Project site that are within the 55 to 60 dBA noise level contours would not include land uses that would expose a NSLU to airport noise. The Project site lies partially within the 55 to 60 dB CNEL calculated noise contours as presented in the Jacumba Airport Land Use Compatibility Plan (ALUCP). However, the Proposed Project does not propose any land uses that would be considered an NSLU. The solar facilities would be operated remotely; therefore, impacts from airport noise would be **less than significant**.

Cumulative Impacts

Cumulative impacts would be less than cumulatively considerable.

2.9.7 Mitigation

M-NOI-1 **Stationary Equipment**: The Proposed Project would comply with the County's Noise Ordinance §36.404 based upon the current proposed layout of the Proposed Project and the anticipated major noise producing operating stationary equipment (Equipment) deployed for the Proposed Project. The Equipment modeled in the Acoustical Analysis Report (AAR) prepared for the EIR was selected as representative technology at the time this AAR was prepared. The Project applicant may propose to use different Equipment than what was used to perform the noise modeling in the AAR or propose a change in the Equipment layout. If different Equipment is selected and/or the layout of Equipment is changed subsequent to Project approval, the applicant will be required to submit a revised AAR, and a revised site plan if needed, as follows:

a. The Project applicant shall retain a County Approved CEQA Noise Consultant to prepare a new predictive operations noise analysis in accordance with the County's Noise Report Format and Content requirements.

b. Any proposed Equipment selections, equipment duty cycles, Project layout alterations, and/or the addition, modification, reduction of the preceding equipment noise limits and measures may be approved, if they are demonstrated to comply with applicable outdoor hourly L_{eq} noise limits per Section 36.404(a) of the County's Noise Ordinance at the property line.

c. The above identified measures shall take place prior to approval of any building plans for the Proposed Project. Any alterations or modifications proposed and approved pursuant to this procedure shall be included in the proposed Project design plans.

M-NOI-2 **PV Panel Washing Protocol:** To ensure noise from mobile operating equipment associated with regular cleansing of Project PV panel surfaces complies with daytime County noise standards, the following shall be implemented:

a. As part of the Project operations and maintenance program, the Applicant shall prepare a PV Panel Washing Plan (PVPWP) that addresses the usage of self-propelled or towed washing systems during the expected quarterly (or other frequency as reasonably anticipated annually) PV panel washing. The PVPWP shall demonstrate compliance with the County Noise Ordinance for avoiding potential impacts caused by operating PV panel washing equipment and vehicle noise sufficiently proximate to the property line of the property on which the noise is produced or at any location that is receiving the noise. The PVPWP

shall be submitted to County Planning & Development Services (PDS) a minimum of 30 days prior to the first PV panel washing. The County shall review the PVPWP to ensure compliance with the County Noise Ordinance prior to any panel washing. A subsequent plan shall be submitted to County PDS if there are any anticipated changes to the panel washing in the future. The subsequent Plan shall be submitted to the County 30 days prior to any new PV panel washing procedures occur. Components of the PVPWP shall include the following:

- Affected property owners shall be notified in writing two weeks prior to the use of PV panel washing activity with 500 feet of their property boundaries.
- Noise emission from a self-propelled PV panel washer (Mazaka, MultiOne, or comparable) must not exceed 83 dBA L_{eq} at 16 feet over a full hour; and, its operation must be restricted to daytime operation at the specified distance between it and a position along the property line that adjoins S80, RR or similar County-classified Noise Zone 1 property:

  within 150 feet – not permitted;

  150 to 250 feet – up to five minutes within any hour;

  250 to 300 feet – up to fifteen minutes within any hour;

  300 to 450 feet – up to thirty minutes within any hour; and,

  beyond 450 feet – no restriction.

- Noise emission from a self-propelled PV panel washer (Mazaka, MultiOne, or comparable) must not exceed 83 dBA L_{eq} at 16 feet over a full hour; and its operation must be restricted to daytime operation at the specified distance between it and a position along the property line that adjoins C44 or similar County-classified Noise Zone 3 property:

  within 100 feet – not permitted;

  100 to 150 feet – up to five minutes within any hour;

  150 to 200 feet – up to fifteen minutes within any hour;

  200 to 250 feet – up to thirty minutes within any hour; and,

  beyond 250 feet – no restriction.

- Noise emission from a pick-up truck (or ATV) and its towed IPC Eagle wash station (or comparable equipment) must not exceed 74 dBA L_{eq} at 9 feet over a full hour; and, its operation must be restricted to daytime operation at the specified distance between it and a position along the

property line that adjoins S80, RR or similar County-classified Noise Zone 1 property:

within 50 feet – not permitted;

50 to 75 feet – up to five minutes within any hour;

75 to 100 feet – up to fifteen minutes within any hour;

100 to 125 feet – up to forty-five minutes within any hour; and,

beyond 125 feet – no restriction.

- Noise emission from a pick-up truck (or ATV) and its towed IPC Eagle wash station (or comparable equipment) must not exceed 74 dBA L_{eq} at 9 feet over a full hour; and, its operation must be restricted to daytime operation at the specified distance between it and a position along the property line that adjoins C44 or similar County-classified Noise Zone 3 property:

  within 25 feet – not permitted;

  25 to 40 feet – up to five minutes within any hour;

  40 to 60 feet – up to fifteen minutes within any hour;

  60 to 75 feet – up to thirty minutes within any hour; and,

  beyond 75 feet – no restriction.

- Visual guides (flags, reflectors, or other markers) shall clearly delineate distances or zones of operation allowed for either of the afore-mentioned PV panel washing systems (self-propelled or towed).

b. Operators of the PV panel washing equipment shall be informed of the PVPWP as part of customary on-site Project training and awareness of County noise standard compliance to avoid potential noise impacts to the Jacumba Hot Springs community.

M-NOI-3 **Construction Noise Management Plan:** Prior to construction and decommissioning, the Applicant shall prepare a construction noise management plan (CNMP) which establishesconstruction activity restrictions in order to reliably achieve compliance with theCounty's 8-hour 75 dBA L_{eq} standard at the Project property lines adjoiningexisting occupied properties (defined by Section 36.402.m as "property on whichthere is a building for which a certificate of occupancy has been issued"). TheCNMP shall demonstrate compliance with the County Noise Ordinance foravoiding potential impacts caused by operating construction equipment and vehiclenoise sufficiently proximate to these property lines of occupied properties. The

CNMP shall be submitted to County Planning & Development Services (PDS) thirty (30) days prior to any land disturbance. Components of the CNMP shall include the following:

a. Affected property owners shall be notified in writing two weeks prior to construction activity within 500 feet of their property boundaries.

b. In order to comply with the County Noise Ordinance (Section 36.409 – Construction Equipment), the acoustical usage factors (AUF) of heavy construction equipment used on the Project site shall be comparable to those listed on Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide Table 1, reference L_{max} values at 50 feet shall be the lower of either the "Spec. 721.560" or "Actual Measured" values from the same RCNM User's Guide Table 1, and duration of heavy equipment operating for construction shall comply with the following limitations by activity, for the specified distance between the indicated heavy equipment operations and a position along the property line of an occupied parcel:

- Perimeter fence installation – up to two flatbed trucks and a front end loader:

  within 15 feet – not permitted;

  15 to 25 feet – no more than twenty minutes per 8-hour period;

  25 to 50 feet – no more than one hour per 8-hour period;

  50 to 75 feet – no more than 4 hours per 8-hour period; and,

  beyond 75 feet – no restriction.

- Site preparation (clearing) – water truck and tractor (mowing attachment):

  within 20 feet – not permitted;

  20 to 25 feet – no more than twenty minutes per 8-hour period;

  25 to 50 feet – no more than thirty minutes per 8-hour period;

  50 to 75 feet – no more than 2 hours per 8-hour period;

  75 to 100 feet – no more than 4 hours per 8-hour period; and,

  beyond 100 feet – no restriction.

- Site preparation (earth-moving) – bulldozer, water truck, and scraper:

  within 25 feet – not permitted;

  25 to 50 feet – no more than twenty minutes per 8-hour period;

50 to 75 feet – no more than one hour per 8-hour period;

75 to 100 feet – no more than three hours per 8-hour period;

100 to 125 feet – no more than six hours per 8-hour period; and,

beyond 125 feet – no restriction.

- Site preparation (grading) – flatbed truck, grader, water truck, and sheepsfoot roller:

  within 25 feet – not permitted;

  25 to 50 feet – no more than twenty minutes per 8-hour period;

  50 to 75 feet – no more than one hour per 8-hour period;

  75 to 100 feet – no more than three hours per 8-hour period;

  100 to 125 feet – no more than six hours per 8-hour period; and,

  beyond 125 feet – no restriction.

- Underground work (trenching) – excavator, sheepsfoot roller, water truck, 5kW generator, and gradall (4x4 forklift):

  within 25 feet – not permitted;

  25 to 50 feet – no more than twenty minutes per 8-hour period;

  50 to 75 feet – no more than 1.5 hours per 8-hour period;

  75 to 100 feet – no more than 3 hours per 8-hour period; and,

  beyond 100 feet – no restriction.

- Underground work (back-filling) – Aussie padder, sheepsfoot roller, water truck, 5kW generator, and gradall (4x4 forklift):

  within 25 feet – not permitted;

  25 to 50 feet – no more than twenty minutes per 8-hour period;

  50 to 75 feet – no more than 1.5 hours per 8-hour period;

  75 to 100 feet – no more than 3 hours per 8-hour period; and,

  beyond 100 feet – no restriction.

- System installation – gradall (4x4 forklift), crane, ATV, vibratory pile driver (RGT Model RG21T or comparable), pick-up truck, and 5kW generator:

  within 25 feet – not permitted;

25 to 50 feet – no more than twenty minutes per 8-hour period;

50 to 75 feet – no more than 1.5 hours per 8-hour period;

75 to 100 feet – no more than 4 hours per 8-hour period; and,

beyond 100 feet – no restriction.

All construction equipment operations shall incorporate all recommended noise reducing measures such as, but not limited to, limiting construction equipment operations, installation of temporary noise barriers, and implementation of the recommendations within the CNMP to demonstrate compliance with the County Code Noise Ordinance, Sections 36.408 and 36.409.

Concurrent construction activities may occur so long as next closest construction activity to the same studied property line position is at least four times its "no restriction" distance away. By way of example, if earth-moving was occurring near a fixed point on the potentially affected property line, the next-closest set of earth-moving equipment performing like work, or perhaps an overlapping and comparable scheduled activity (e.g., grading), would be permitted if no closer than 500 feet (= 4 x 125') from the same receptor point.

c. If distance buffers or duration limits cannot be maintained, then the Project Applicant or its contractor will implement on-site temporary sound abatement measures, such as a field-erected noise barrier (e.g., sound blankets) of sufficient height and horizontal extent, or the placement of storage containers and other similarly solid sound-occluding structures, to ensure construction activity noise at the Project property line complies with County standards.

d. The CNMP will also include direction for the Project applicant or its contractor(s) to implement the following:

- Trucks and other engine-powered equipment shall be equipped with noise reduction features, such as mufflers and engine shrouds, which are no less effective than those originally installed by the manufacturer;
- Trucks and other engine-powered equipment shall be operated in accordance with posted speed limits and limited engine idling requirements;
- Usage of truck engine exhaust compression braking systems shall be limited to emergencies;
- Back-up beepers for all construction equipment and vehicles shall be adjusted to the lowest noise levels possible, provided that Occupational

Safety and Health Administration (OSHA) and Cal OSHA's safety requirements are not violated;

- Vehicle horns shall be used only when necessary, as specified in the contractor's specifications; and,
- Radios and other noise-generating "personal equipment" shall be prohibited.

2.9.8 Conclusion

This section provides a synopsis of the conclusion reached in each of the above impact analyses with mitigation incorporated.

Operational Noise

The operational noise levels from the stationary equipment of the Proposed Project would be compliant with the County's noise standards if the Proposed Project's equipment and layout is the same as what was evaluated in the AAR; however, if the equipment was to change and/or the layout is different from what was evaluated, operational noise levels have the potential to exceed the County's Noise Ordinance threshold (**Impact NOI-1**). Mitigation Measure **M-NOI-1** would ensure predicted stationary equipment operation noise levels would be compliant with the applicable County Noise Ordinance nighttime noise level standard at the Proposed Project property lines and at nearest NSLU per the County's Guidelines with respect to a CNEL standard. With implementation of **M-NOI-1**, impacts from noise caused by stationary equipment (**Impact NOI-1)** would be reduced to **less than significant**.

PV panel washing activities have the potential to exceed noise level standards in the County's Noise Ordinance and Guidelines. Mitigation measure **M-NOI-2** would be required to ensure that operation of mobile PV panel washing processes for the Proposed Project comply with the County's Noise Ordinance and Guidelines (i.e., daytime hourly L_{eq} standards and expected CNEL at the nearest NSLU). With implementation of **M-NOI-2**, impacts from noise caused by occasional on-site PV panel washing procedures (**Impact NOI-2)** would be reduced to **less than significant**.

Construction Noise

If the Proposed Project construction phases or other activities overlap in schedule or otherwise occur concurrently, the Proposed Project does have the potential to exceed these thresholds and impacts may be **potentially significant** (**Impact NOI-3**). Mitigation measure **M-NOI-3** would be required to ensure construction noise emission is compliant with County standards. With implementation of mitigation measure **M-NOI-3,** impacts from construction related noise (**Impact NOI-3**) would be reduced to **less than significant**. Additionally, should Proposed Project construction phases or other activities overlap in schedule or otherwise occur concurrently, the

Construction Noise Management Plan as outlined in **M-NOI-3** would include specified distance restrictions that when implemented would help ensure such concurrence does not cause logarithmically combined noise levels to exceed the County's standard per Section 36.409 of the Noise Ordinance.

Impacts associated with construction traffic noise, groundborne vibration, and airport noise would be less than significant; therefore, no mitigation is required. Cumulative impacts would be less than cumulatively considerable.

Table 2.9-1
Typical Sound Levels Measured in the Environment and Industry

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet flyover at 1,000 feet		
	— 100 —	
Gas lawnmower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher in next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 2009, pp. 2–21.
dBA = A-weighted decibels.

Table 2.9-2
Measured Outdoor Ambient Noise Levels in Proposed Project Vicinity

Site	Location	Start Time	Noise Level (dB)		
			L_{eq}[1]	L_{max}[2]	L_{min}[3]
ST1	West side of Project site	10:55 a.m.	41.2	48.1	32.8
ST2	Residence at center of Project site	12:10 p.m.	49.2	66.9	32.1
ST3	East side of Project site	12:30 p.m.	46.1	63.6	31.9
ST4	Adjacent to nearest residence, approx. 50 feet west of Project site	11:50 a.m.	36.2	47.7	29.7
ST5	Southwest side of Project site	11:15 a.m.	35.3	48.0	29.0
ST6	Residence at north boundary of Project site	11:30 a.m.	36.0	47.3	31.9

1 Equivalent Continuous Sound Level (Time-Average Sound Level)
2 Maximum Sound Level
3 Minimum Sound Level

Table 2.9-3
County of San Diego Exterior Noise Standards

Zone	Time	One-Hour Sound Level Limits (dB)
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	50 45
(3) S-94, V4 and all commercial zones (C-44)	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 55
(7) S-88 (see subsection (c))		

Source: County of San Diego Noise Ordinance, Section 36.404.

Table 2.9-4
Predicted Proposed Project Operations
Noise Levels at Property Line and Off-Site Locations

Receiver Locations (Property Line Positions and Noise-Sensitive Land Uses)	One-Hour Average Noise Level (L_{eq1h}, dBA) at the Receiver Location	
	*All Proposed Project Sources**	*Collector Substation Transformer Only*
ST2 = near 44993 Old Highway 80	43.7	13.4
ST4 = Corner of Seeley Avenue and Laguna Street	41.6	12.7
ST5 = Railroad Street, south of Heber Street	35.2	6.2
ST6 = Corner of Heber Street and Seeley Avenue	34.6	9.4
B1 = Corner of Holtville Avenue and Laguna Street	44.4	11.9
B2 = southeastern corner of Jacumba Community Park	43.8	8.3
B3 = east of the switchyard, adjoining S-92 zoned land	39.3	36.9
R1 = Residence north of Seeley Avenue and Laguna Street	40.7	12.3
R2 = Residence on the south side of Holtville Avenue, east of Campo Street	41.0	11.3
R3 = Residences within "Wagon Wheel Trailer Park" located at 44726 Old Highway 80	41.5	11.0
R4 = Apparent residence on the west side of Railroad Street, south of Old Highway 80	34.2	5.7
R5 = Apparent residence at 45093 Old Highway 80	43.8	13.6
R6 = Apparent residence at 45851 Old Highway 80	28.8	17.6

* Includes Proposed Project inverter/transformer platforms and battery storage HVAC units; and, the collector substation step-up transformer (34.5 kV to 138 kV).

Table 2.9-5
Typical Construction Equipment Noise Emission Levels

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Measured L_{max} at 50 Feet (dBA, slow)
Auger drill rig	No	20	84
Backhoe	No	40	78
Compactor (ground)	No	20	83
Compressor (air)	No	40	78
Concrete pump truck	No	20	81
Crane	No	16	81
Dozer	No	40	82
Drill rig truck	No	20	79
Dump truck	No	40	76
Excavator	No	40	81
Flat-bed truck	No	40	74
Front end loader	No	40	79
Generator (<25KVA, VMS signs)	No	50	73
Gradall	No	40	83
Man lift	No	20	75
Paver	No	50	77
Pickup truck	No	40	75
Roller	No	20	80
Scraper	No	40	84
Slurry trenching machine	No	50	80

Source: FHWA 2006.

Table 2.9-6
Conventional Construction Equipment Noise Prediction Results

Construction Phase or Activity	Eight-hour L_{eq} (dBA) at Indicated Source-to-Receiver Distance		
	Nearest NSLU (50 Feet) [A]	*Nearest NSLU (83 Feet)* [B]	*Nearest NSLU (300 Feet)* [C]
Perimeter fence installation	74	65	54
Site preparation (clearing)	73	64	53
Site preparation (earth-moving)	74	65	54
Site preparation (grading)	74	65	54
Underground work (trenching)	75	65	55
Underground work (back-filling)	75	65	55
System installation	N/A [D]	75	60
Energy storage unit installation	N/A [D]	N/A [D]	64
Testing & commissioning	51	45	31
Site cleanup & restoration	75	69	55

[A] Distance to access road near Proposed Project property line
[B] Distance to PV tracker support structure
[C] Distance to inverter/transformer platform and battery storage containers
[D] Not applicable (distance does not occur for this activity)

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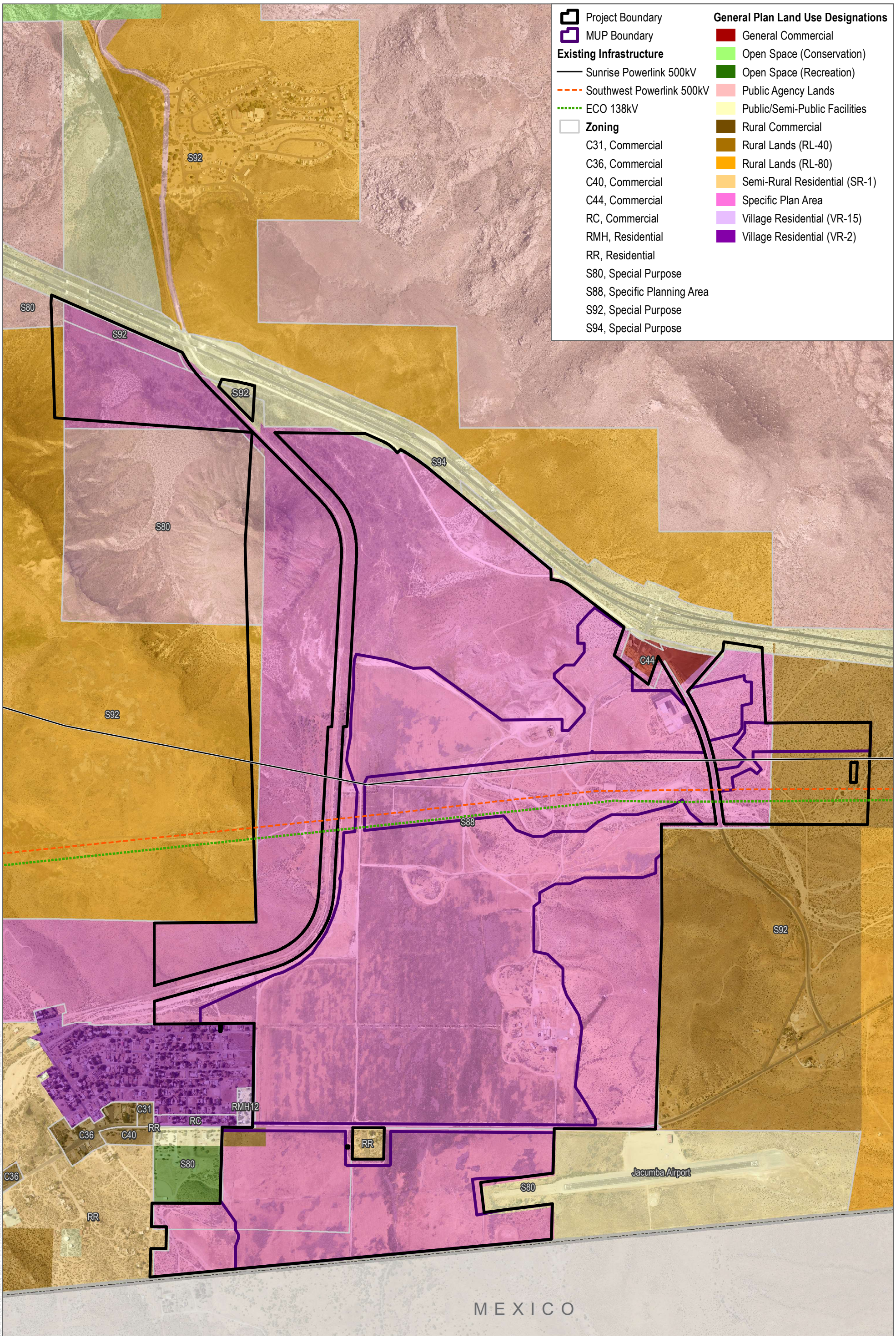

SOURCE: Kimley-Horn 2020; SANGIS 2017, 20020

DUDEK

0 500 1,000 Feet

FIGURE 2.9-1

Environmental Setting

JVR Energy Park Project

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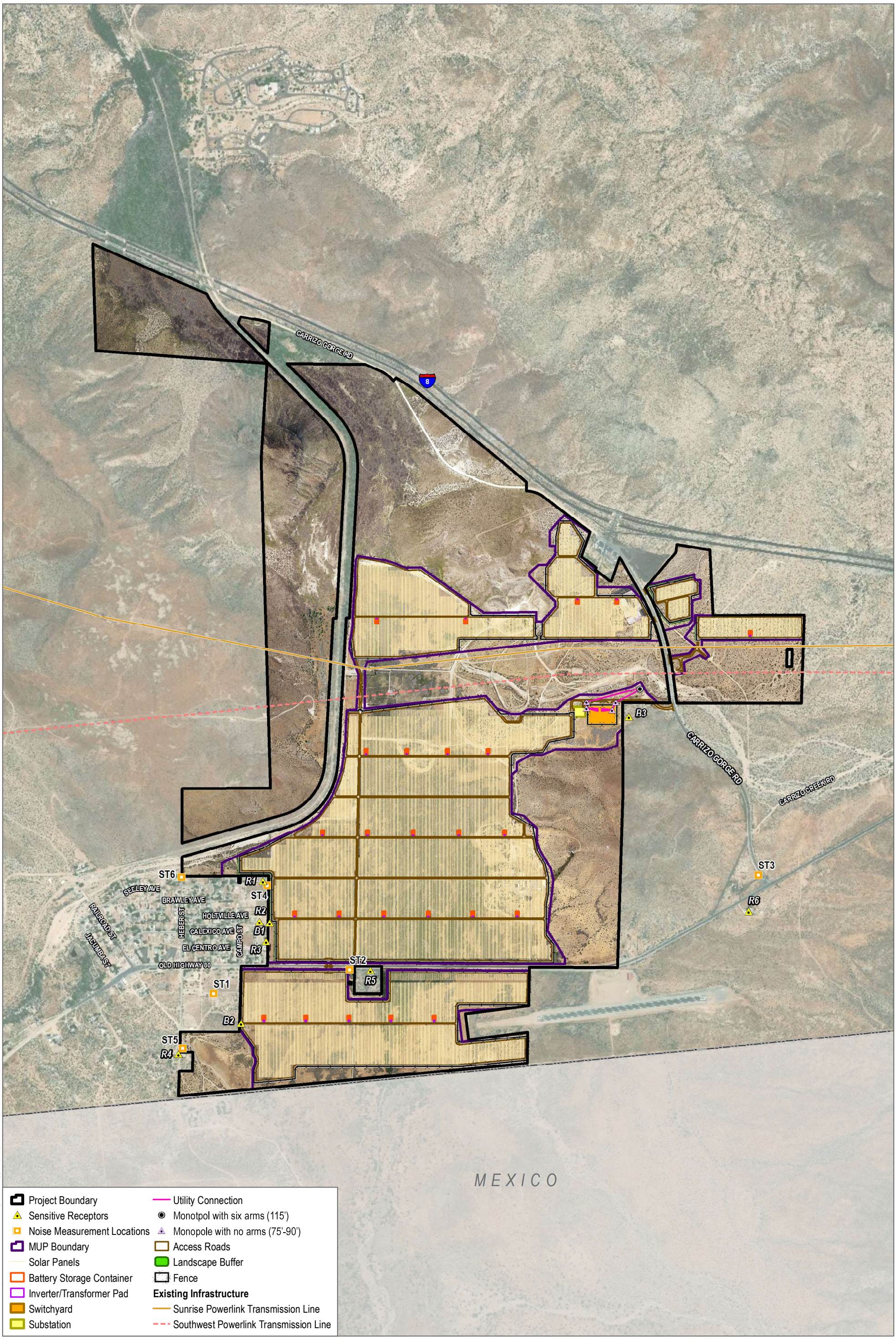

SOURCE: Kimley-Horn 2020; SANGIS 2017, 2020

DUDEK

0 500 1,000 Feet

FIGURE 2.9-2

Noise Measurement Locations

JVR Energy Park Project

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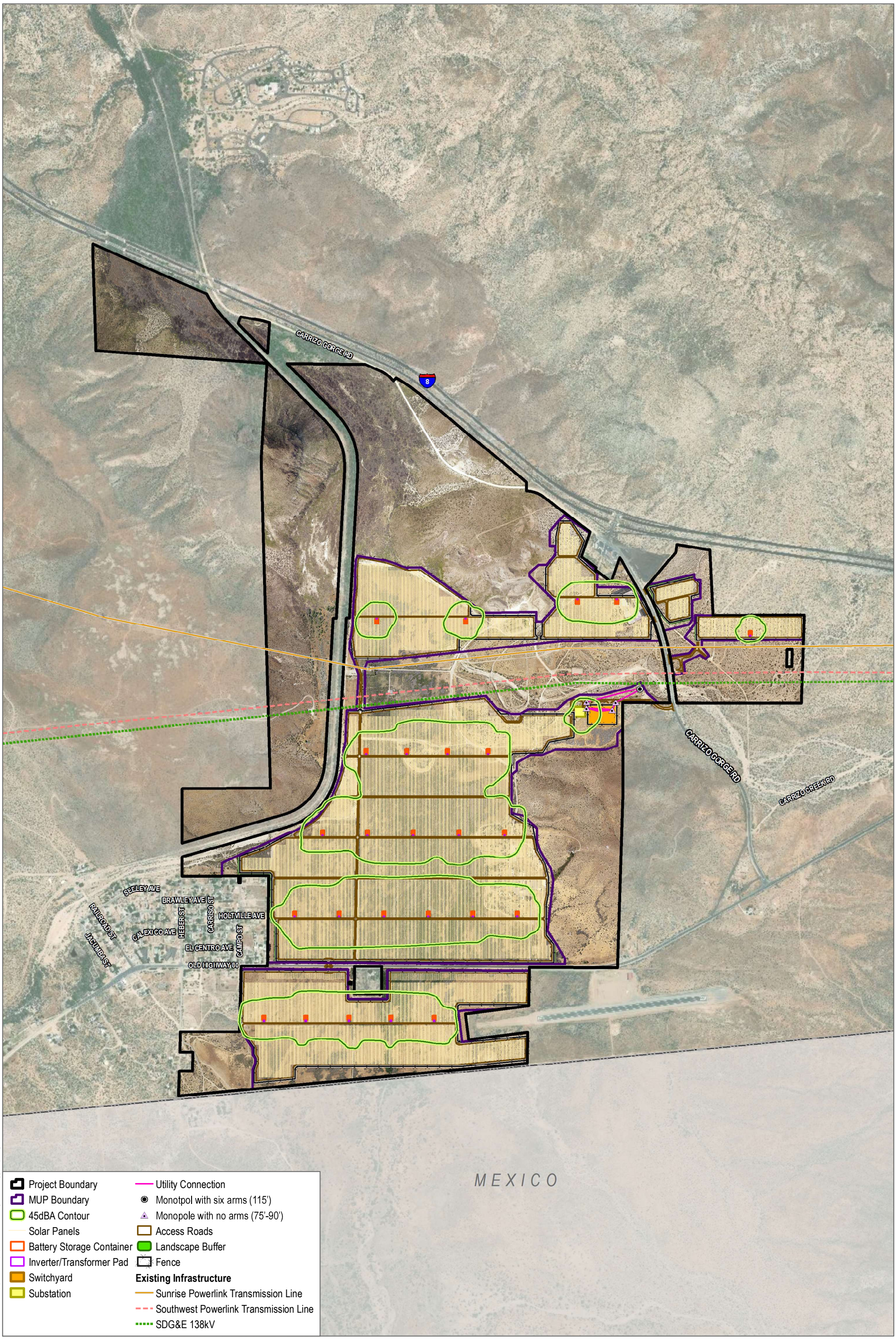

SOURCE: Kimley-Horn 2020; SANGIS 2017, 2020

DUDEK

0 500 1,000 Feet

FIGURE 2.9-3

Predicted Project Operations Noise Contour (45 dBA Leq)

JVR Energy Park Project

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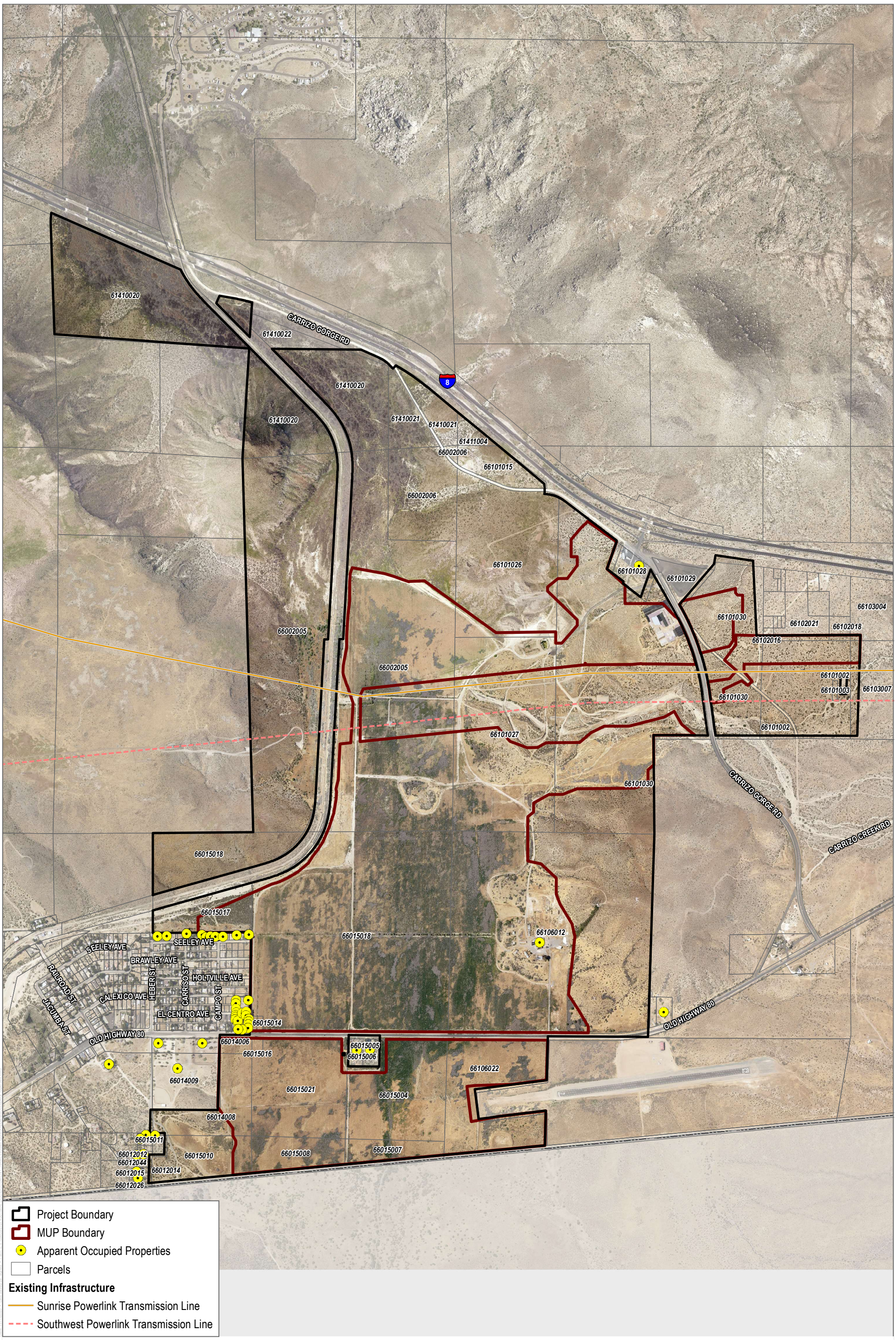

SOURCE: Kimley-Horn 2020; SANGIS 2017, 2020

DUDEK

0 500 1,000 Feet

FIGURE 2.9-4

Apparent Occupied Properties

JVR Energy Park Project

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