Appendix H
(Available on City website)

Technical Memorandum

Noise Technical Study
October 2021

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October 7, 2021 10589

Patti Murphy
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Subject: ***Desert Peak Energy Center Project – Noise Technical Study***

Dear Ms. Murphy:

Dudek is pleased to present Desert Peak Energy Center, LLC, with the following construction and operation noise analyses for the proposed Desert Peak Energy Center Project (Project) – Phase 1 and Phase 2, located in the City of Palm Springs, California (City).

This memorandum summarizes the predictive assessment of potential Project-attributed noise and vibration impacts from construction and operation of the Project in accordance with the California Environmental Quality Act (CEQA) Guidelines. The contents and organization of this memorandum are as follows: Introduction and Background (Project Description and Acoustical Fundamentals), General Analysis and Methodology, Applicable Standards, Thresholds of Significance, Impact Analyses, Conclusions, and References Cited. Subsequent attachments to the memorandum are as follows:

A. *Baseline Outdoor Sound Level Survey* – details of the outdoor sound level field survey performed by Dudek to quantify and characterize the pre-Project or "baseline" outdoor ambient sound environment of the Project vicinity.

B. *Construction Noise Modeling* – input and output details of the Excel-based worksheets used to predict Project construction noise.

C. *Offsite Traffic Noise Modeling* – input and output details of the Excel-based worksheets used to predict traffic noise increase attributed to Project construction activities.

This study also includes an assessment of cumulative potential noise impact to the community associated with concurrent operation of onsite equipment from both the Phase 1 and Phase 2 sites.

Executive Summary

Construction, offsite transportation, and onsite operation noise and vibration attributed to both proposed sites (Phase 1 and Phase 2) of the Project are not expected to generate significant impacts and would not require mitigation measures beyond noise control strategies and means that are or will be incorporated into the Project design and its implementation as studied herein.

1 Introduction and Background

1.1 Project Location and Description

The Project is located in the City of Palm Springs at the northeastern intersection of Diablo Road and 16th Avenue. The Project site is located approximately 1.1 miles north of Interstate ("I") 10, 1.1 miles east of State Route 62, and 1.5 miles west of North Indian Canyon Drive. The Project site is located in the southwestern corner of Section 4 and northwestern corner of Section 9, Township 3 South, and Range 4 East of the San Bernardino Baseline and Meridian, U.S. Geological Survey Desert Hot Springs 7.5-minute quadrangle. The approximate center of the Project site corresponds to 33°55′44.37″ north latitude (33.928992) and 116°34′30.49″ west longitude (-116.575136).

The Project includes construction and operation of a battery energy storage system facility. The battery energy storage system facility would include a 400-megawatt facility on an approximately 35-acre footprint of the larger 188-acre Project site, along with associated on-site switchyard, inverters, fencing, roads, and supervisory control and data acquisition ("SCADA") system, and would store 1,600 megawatt-hours of energy. The Project also includes a 230-kilovolt overhead gen-tie line, which would extend approximately 0.3 miles north to the Southern California Edison ("SCE") Devers Substation.

1.2 Acoustical Fundamentals

The following subsections aim to provide the reader an adequate understanding of acoustical terminology and concepts that are used to frame the presentation of Project noise and vibration impact assessment herein.

1.2.1 Sound

Sound is mechanical energy transmitted by pressure waves in a compressible medium, such as air. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired. The sound pressure level (SPL) has become the most common descriptor used to characterize the loudness of an ambient sound level. The unit of measurement of sound pressure is a decibel (dB). Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dB when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dB in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dB. A change of 5 dB is readily perceptible, and a change of 10 dB is perceived as twice or half as loud (Caltrans 2013). A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the number of daily trips along a given road) would result in a barely perceptible change in sound level.

Sound may be described in terms of level or amplitude (measured in dB), frequency or pitch (measured in hertz or cycles per second), and duration (measured in seconds or minutes). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel (dBA) scale performs this compensation by discriminating against low and very high frequencies in a manner approximating the sensitivity of the human ear.

Several descriptors of noise (a.k.a., noise metrics) exist to help predict average community reactions to the adverse effects of environmental noise, including traffic-generated noise. These descriptors include the equivalent noise level over a given period (L_{eq}), the day–night average noise level (L_{dn}), and the community noise equivalent level (CNEL). Each of these descriptors uses units of dBA.

L_{eq} is a decibel quantity that represents the constant or energy-averaged value equivalent to the amount of variable sound energy received by a receptor during a time interval. For example, a 1-hour L_{eq} measurement of 60 dBA would represent the average amount of energy contained in all the noise that occurred in that hour. L_{eq} is an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors, which can then be compared to an established L_{eq} standard or threshold of the same duration. Another descriptor is maximum sound level (L_{max}), which is the greatest sound level measured during a designated time interval or event. The minimum sound level (L_{min}) is often called the floor of a measurement period.

Unlike the L_{eq}, L_{max}, and L_{min} metrics that can refer to user-defined time periods, L_{dn} and CNEL descriptors always represent 24-hour periods and differ from a 24-hour L_{eq} value because they apply a time-weighted factor designed to emphasize noise events that occur during the non-daytime hours (when speech and sleep disturbance is of more concern). Time weighted refers to the fact that L_{dn} and CNEL penalize noise that occurs during certain sensitive periods. In the case of CNEL, noise occurring during the daytime (7:00 a.m. to 7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m. to 10:00 p.m.) is penalized by adding 5 dB to the actual levels, and nighttime (10:00 p.m. to 7:00 a.m.) noise is penalized by adding 10 dB to the actual levels. L_{dn} differs from CNEL in that the daytime period is longer (defined instead as 7:00 a.m. to 10:00 p.m.), thus eliminating the dB adjustment for the evening period. L_{dn} and CNEL are the predominant criteria used to measure roadway noise affecting residential receptors. These two metrics generally differ from one another by no more than 0.5–1 dB, and are often considered or actually defined as being essentially equivalent by many jurisdictions.

1.2.2 Vibration

Vibration is oscillatory movement of mass (typically a solid) over time. It is described in terms of frequency and amplitude and, unlike sound, can be expressed as displacement, velocity, or acceleration. For environmental studies, vibration is often studied as a velocity that, akin to the discussion of sound pressure levels, can also be expressed in dB as a way to cast a large range of quantities into a more convenient scale and with respect to a reference quantity. Vibration impacts to buildings are generally discussed in terms of inches per second (ips) peak particle velocity (PPV), which will be used herein to discuss vibration levels for ease of reading and comparison with relevant standards. Vibration can also be annoying and thereby impact occupants of structures, and vibration of sufficient amplitude can disrupt sensitive equipment and processes (Caltrans 2020), such as those involving the use of electron microscopes and lithography equipment. Common sources of vibration within communities include construction activities and railroads. Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities where sudden releases of subterranean energy or powerful impacts of tools on hard materials occur. Depending on their distances to a sensitive receptor, operation of large bulldozers, graders, loaded dump trucks, or other heavy construction equipment and vehicles on a construction site also have the potential to cause high vibration amplitudes.

2 General Analysis and Methodology

The following subsections describe the methods, techniques, and model input parameters and assumptions for quantitative predictive analysis of construction noise and vibration, offsite transportation noise changes, and aggregate noise emission from major onsite stationary sound-producing sources attributed to the Project. Results from these assessments are presented in Section 4.3, where they are contrasted with applicable impact significance criteria from Section 4.2.

2.1 Construction

2.1.1 Noise

Noise emissions from the construction phases of the Project were estimated using a Microsoft Excel-based spreadsheet that emulates the Federal Highway Administration (FWHA) Roadway Construction Noise Model (RCNM) algorithms and reference data. Although the RCNM was funded and promulgated by the FHWA, it is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are often used for other types of construction (FHWA 2008). Input variables for the predictive model consist of the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time within a specific time period, such as an hour, when the equipment is expected to operate at full power or capacity and thus make noise at a level comparable to an L_{max} value at a reference source-to-receiver horizontal distance of fifty feet (50') per RCNM reference data (see Attachment B), and the distance from the noise-sensitive receiver.

The predictive model also considers how many hours that equipment may be on site and operating (or idling) within an established work shift. Conservatively, no topographical or structural shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which like the reference L_{max} at 50' noise levels were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis and also appear in Attachment B. Project construction would be approximately 13 months in duration. The analysis contained herein is based on the following subset area schedule assumptions (duration of phases is approximate):

- Site preparation – 2 weeks
- Substation site preparation – 1 month
- Grading – 1 month
- Substation grading – 1 month
- Battery/Container installation – 7 months
- Substation installation – 4 months
- Gen-tie foundation and tower erection – 1 week
- Gen-tie stringing and pulling – 2 months

The majority of the construction phases listed above would occur concurrently and would not occur sequentially in isolation. However, for purposes of this analysis, each identifiable construction phase comprising one or more associated activities and process is analyzed individually with respect to a representative nearest offsite noise-sensitive receptor. While other construction phase activities may occur concurrently, the average locations of these activities are assumed to be sufficiently distant from the studied offsite receptor so as to render their added acoustical contributions negligible. The estimated construction duration was provided by the Project applicant. Detailed construction equipment modeling assumptions are provided in Attachment B.

The construction equipment roster used for estimating the construction emissions of the Project is based on information provided by the Project applicant and is shown in Table 1.

Table 1. Project Construction Phase Equipment Roster and Trip Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Site preparation	16	2	0	Graders	2	8
				Rubber-tired loaders	2	8
				Skid-steer loaders	2	8
				Tractors/loaders/ backhoes	2	8
Substation site preparation	10	2	0	Rubber-tired dozers	2	8
				Tractors/loaders/ backhoes	2	8
Grading	20	2	0	Graders	2	8
				Plate compactors	2	8
				Rollers	2	8
				Rubber-tired loaders	2	8
				Skid-steer loaders	2	8
				Tractors/loaders/ backhoes	2	8
Substation grading	10	2	0	Rollers	2	8
				Rubber-tired dozers	2	8
				Tractors/loaders/ backhoes	2	8
Battery/Container installation	60	20	0	Air compressors	4	8
				Cranes	2	8
				Excavators	2	8
				Generator sets	4	8
				Plate compactors	2	8
				Rollers	2	8
				Rough-terrain forklifts	2	8
				Skid-steer loaders	2	8
				Tractors/loaders/ backhoes	2	8
Substation Installation	60	20	0	Aerial lifts	6	8
				Air compressors	2	8
				Bore/drill rigs	2	8
				Cranes	2	8
				Excavators	2	8
				Generator sets	2	8
				Rollers	2	8
				Rough-terrain forklifts	2	8
				Rubber-tired dozers	2	8
				Skid-steer loaders	2	8
				Tractors/loaders/ backhoes	4	8
				Trenchers	4	8
	16	2	0	Air Compressors	1	8

Table 1. Project Construction Phase Equipment Roster and Trip Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Gen-tie foundation and tower erection				Cranes	1	4
				Forklifts	1	8
				Generator Sets	1	8
				Pumps	1	8
				Welders	1	8
Gen-tie stringing and pulling	8	2	0	Forklifts	1	6
				Generator Sets	1	8
				Tractors/Loaders/ Backhoes	1	8

Source: NextEra 2021

For the analysis, it was assumed that heavy construction equipment would be operating 5 days per week (22 days per month) during Project construction. Construction worker and vendor trips were based on CalEEMod default assumptions and rounded up to the nearest whole number to account for whole round trips.

Proposed project construction would take place both near and far from adjacent, existing noise-sensitive uses. For example, some construction activity phases near the western Project site boundary would take place as close as 228 feet to existing inhabited structures (e.g., the residential land uses immediately west of Diablo Road). But during other construction phases, the same noise-sensitive receptors would be further away from operating equipment and processes. For these reasons and for purposes of this assessment, aggregate noise emission from proposed Project construction activities, broken down by sequential phase as shown in Table 1, was predicted for two different conditions as follows:

- Conservatively, construction noise is predicted at the noise-sensitive receptor when the distance between it and one or more pieces of equipment or processes for each phase is expected to be shortest. For instance, during the grading phase, mobile heavy equipment pass-bys could occur as close as the afore-mentioned 228 feet—the horizontal distance between the edge of graded surface for Project equipment installation and the nearest residential receptors on the west side of Diablo Road. Since such construction equipment is usually mobile, and because equipment cannot be "stacked" at the same nearest position to a receptor at the same time, the anticipated quantity of equipment will be less than the total for the entire phase, and their duration of activity at this nearest distance will be a fraction of the studied 8-hour typical work shift. Under this scenario, the predictive analysis assumes that no more than one piece of each equipment type for the phase would be at this nearest distance to the receptor.

- In a manner similar to the "general assessment" construction noise prediction method described by FTA guidance (FTA 2018), one can assume that—on average—all construction activities associated with a particular phase would be represented geographically by an acoustic centroid, which represents the time-averaged position of mobile construction equipment and ongoing processes within the bounds of a construction phase nearest to the studied noise-sensitive receiver. For instance, the edge of grading activity may be as close as 228 feet to a Diablo Road residence, but the acoustic centroid of the graded geographic area representing the western region of installed rows of inverters would be approximately 364 feet. This scenario assumes the actual equipment positions for the phase and within the intended work area are unknown moment-to-moment and will change over the course of an 8-hour work shift, but they will remain within minimum and maximum distance proximities from which an average centroid-to-receptor distance can be estimated.

2.1.2 Vibration

Groundborne vibration attenuates rapidly, even over short distances. The attenuation of groundborne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with the following expression found in FTA and Caltrans guidance:

$PPV_{rcvr} = PPV_{ref} * (D_{ref}/D_{rcvr})^{W}$

where PPV_{rcvr} is the predicted vibration velocity at the receiver position some horizontal D_{rcvr} distance from the vibration-producing source, PPV_{ref} is the reference value at D_{ref} feet from the vibration source, and W is "Wiss exponent" (Caltrans 2020) that characterizes the soil/strata properties affecting groundborne propagation. FTA guidance assumes a value of 1.5 for W (FTA 2018).

2.2 Transportation

2.2.1 Offsite

Existing and future (i.e., existing plus Project) roadway noise levels were predicted with algorithms based on the Federal Highway Administration (FHWA) RD-77-108 report, with adjustments to reflect "Calveno" vehicle noise emission levels (Caltrans 1995) as adopted by the California Department of Transportation (Caltrans). Key model inputs and assumptions are as follows:

- Existing average daily traffic (ADT) volumes for proximate local roadway segments and the nearest State highway are from the following sources:
  - Diablo Road (north of Dillon Road) – ADT based on observed traffic count samples performed by the Dudek field investigator in the vicinity of the Project site in May and August of 2021;
  - Dillon Road (east of Worsley Road) – ADT per Riverside County Transportation Department Traffic Counts from February 12, 2019 (Riverside County 2019); and
  - State Highway 62 (north of the Interstate-10 junction, south of the Pierson Boulevard exit) – "ahead AADT" per Caltrans Traffic Census data from 2019 (Caltrans 2019).
- Vehicle speeds on Diablo Road and Dillon Road are 35 miles per hour (mph), and 65 mph on State Highway 62;
- This analysis assumes 80% of the ADT occurs during daytime hours (7:00 a.m. to 7:00 p.m.), 10% during the evening (7:00 p.m. to 10:00 p.m.), and 10% during the nighttime (10:00 p.m. to 7:00 a.m.); and
- For purposes of this analysis, existing flows of medium and heavy trucks each represent two percent (2%) of the total ADT on a modeled roadway segment.

While the Project is not expected to add substantial traffic to local roadways during normal operation as the Project would be unmanned, and use of onsite equipment during operations would be infrequent (see Section 2.2.2), its construction traffic would temporarily add vehicles to the local nearby roadways. Anticipated increases in roadway volumes would be consistent with the expected worker, vendor, and material haul trips shown in Table 1. In total, the passenger car equivalent (PCE) peak total daily trips are expected to be 262. Hence, the "plus Project" offsite traffic scenario would be modeled with the same Calveno-based technique and account for this traffic volume increase to Diablo Road or Dillon Road.

2.2.2 Onsite

Onsite mobile equipment is anticipated to be limited to the following noise-emitting sources: one worker truck visiting the Project site every month to perform routine maintenance; and, usage of a crane once every 5 years during routine maintenance to be able to lift, move, and replace/upgrade the modular containers. The frequency of occurrence for these two sources would render them, for purposes of this noise assessment, insignificant when compared to offsite transportation acoustical contributors to the outdoor sound environment.

2.3 Onsite Stationary Sources Operation

Propagation of sound from a combination of onsite stationary Project noise sources was modeled with commercially available Datakustik CadnaA software, which incorporates relevant International Organization of Standardization (ISO) 9613-2 algorithms and reference data (ISO 1996) that are generally considered to be industry standard for outdoor noise modeling. Key modeling assumptions and parameters are as follows:

- Phase 1 site:
    - There are approximately 728 battery containers, each featuring acoustic contribution from two (2) “silenced” Bard externally-mounted air-conditioning units that are represented as a vertical area noise emission source located on one of the two short sides of the battery container enclosure. The battery containers themselves are modeled as 9.5’-tall “building” blocks that can potentially occlude direct sound paths between a sound emission source and a distant receiver position. The height of these blocks includes the battery container cabinet height plus any at-grade supporting slab or other base element. From manufacturer data, each sound-attenuated (“silenced”) Bard unit (model W72AA) exhibits 51.2 dBA L_{eq} at a distance of 5 feet. For comparison purposes, without the noise silencing on the return air and supply air ducts, the Bard unit demonstrates a noise level of 62 dBA L_{eq} at 5 feet (Bard 2017).
    - Arranged in clusters, with equipment orientations and spacings generally exhibiting a consistent pattern per the site layout, each set of four (4) battery containers is served by a single inverter. The inverter is also modeled as a building block (8 feet tall, including the ground pad or other support structure), with noise emission depicted as a vertical area source on each of the four vertical surfaces of the inverter enclosure. The aggregate sound power (PWL) attributed to these four vertical area sources for an individual modeled inverter results in estimated sound pressure levels (SPL) that match (on average, within +/-1 dB) the “total sound pressure” A-weighted levels (at a distance of one meter, confirmed by the Applicant) for each of the five “measurement surface[s]” appearing in the Summary of Results section of the On-Site Acoustic Testing report dated June 2019 for an “HEM” model Power Electronics inverter (confidential and proprietary, provided to Dudek via Desert Peak Energy Center, LLC).
    - Per the Project design for the Phase 1 site, the prediction model includes a limited quantity (69, among the 182 total) of inverters that will feature noise control upgrades (e.g., close-fitting enclosure surrounding the inverter cabinet, with sound-attenuated ventilation ports) yielding 12 dB of broad-band sound reduction and thus overall lower SPL when compared to an “off-the-shelf” inverter per the aforementioned “HEM” model test data.

- The site layout of anticipated onsite equipment and surrounding geographic area as modeled in CadnaA and appearing in isometric view with feature callouts and a sample detail view is shown in Figure 1.

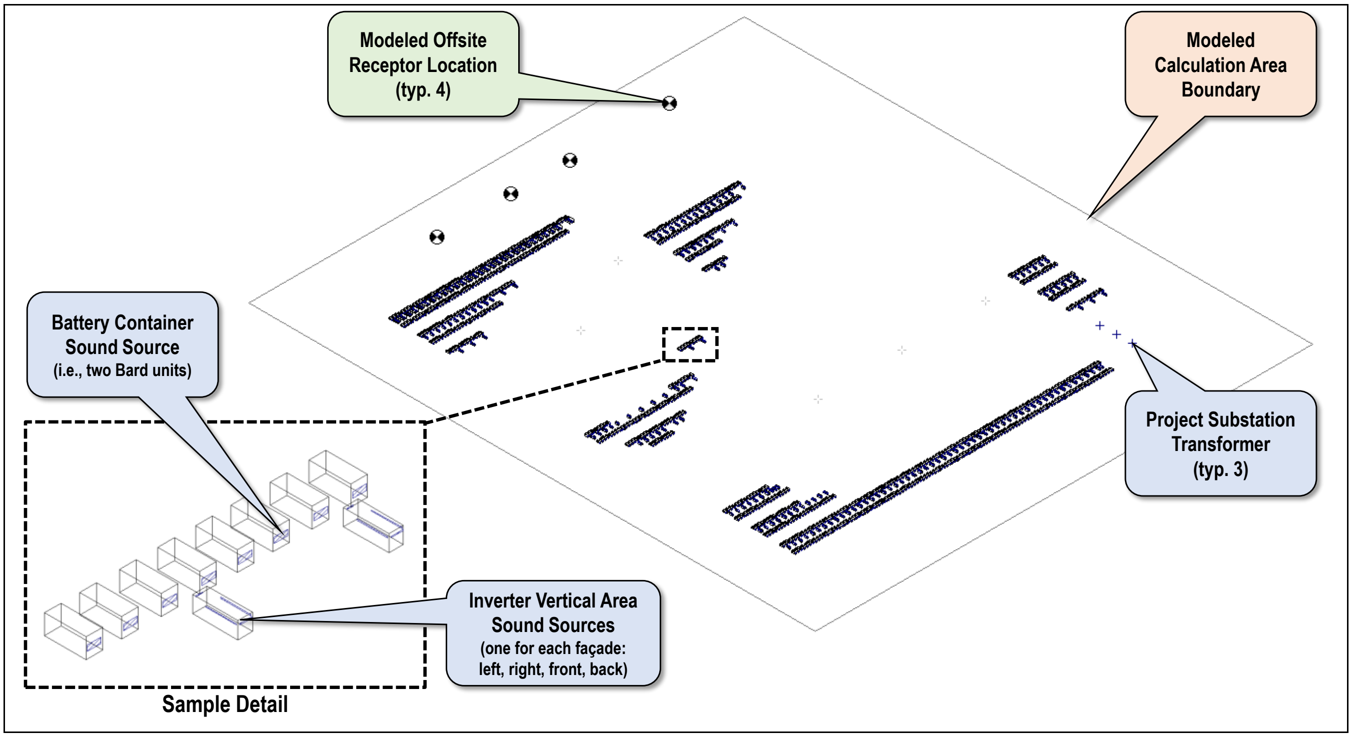


Figure 1. Isometric view, looking northwest, of Phase 1 site CadnaA prediction model and enlarged sample features

- Phase 2 site:
  - The battery containers are akin to those for the Phase 1 site, but modeled on the Phase 2 site as two units per building block, with each end featuring acoustic contribution from two (2) "silenced" Bard externally-mounted air-conditioning units that are represented as a vertical area noise emission source. Each battery container pair block is 9.5' tall, which includes the battery container cabinet height plus any at-grade supporting slab or other base element. From manufacturer data, and as described previously for the Phase 1 site parameters, each sound-attenuated ("silenced") Bard unit exhibits 51.2 dBA L_{eq} at a distance of 5 feet.
  - Arranged in clusters, with equipment orientations and spacings generally exhibiting a consistent pattern per the site layout, each set of four (4) battery containers is served by a single inverter. Each inverter is also modeled as a building block (8 feet tall, including the ground pad or other support structure), with noise emission depicted as vertical area sources akin to what is described above for the Phase 1 site.
  - Per the Project design for the Phase 2 site, the prediction model includes a limited quantity (18, among the 123 total) of inverters that will feature noise control upgrades (e.g., close-fitting enclosure surrounding the inverter cabinet, with sound-attenuated ventilation ports) yielding 12 dB of broad-band sound reduction and thus overall lower SPL when compared to an "off-the-shelf" inverter per the aforementioned "HEM" model test data.
  - The site layout of anticipated onsite equipment and surrounding geographic area as modeled in CadnaA and appearing in isometric view with feature callouts and a sample detail view is shown in Figure 2.

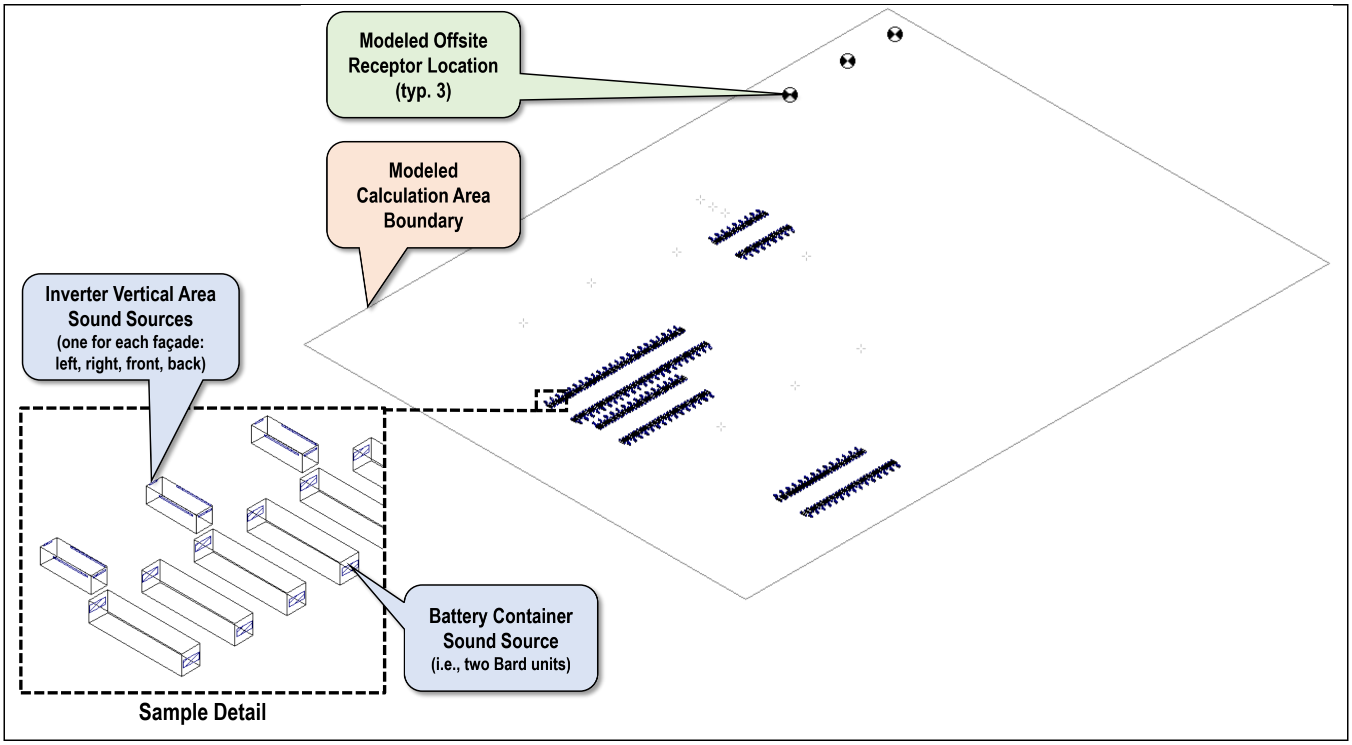


Figure 2. Isometric view, looking northwest, of Phase 2 site CadnaA prediction model and enlarged sample features

- Although the overall Project site, in general, tends to gently slope downward from north to south, the topography is fairly smooth and thus for purposes of this assessment considered "flat" with respect to where Project-attributed sound may traverse between an onsite source and an offsite receptor.
- Onsite noise sources are expected to operate for up to a full sixty (60) minutes within any given hour, so that the energy-equivalent level (L_{eq}) may be compared directly with the County's standard.
- Acoustical ground absorption of the Project sites and the surrounding topographies are set at 0.8, which on a zero (reflective) to one (absorptive) scale approximates a combination of the grass-covered soils that generally surround the Project area and any anticipated loosely graveled Project site cover.
- Each Project substation transformer is assumed to yield a sound power level no greater than 95.0 dBA.
- Meteorological conditions presume "calm" wind conditions (i.e., less than 0.5 meters per second in any direction) and average air temperature and relative humidity of 68 degrees Fahrenheit and 50%, respectively.
- The model "configuration" settings include reflection order set to "1", which can be interpreted to mean that a sound emission path from a source will continue to be analyzed after impingement upon and reflection from the first intervening structure or barrier.

3 Existing Conditions

3.1 Settings

The proposed Project is an area having and outdoor ambient environment comprising multiple sources of sound that include operating wind energy conversion systems (WECS, a.k.a., wind turbine generators [WTG]), the Southern

California Edison (SCE) Devers Substation, overhead electrical transmission lines, steady winds and wind gusts that generate noise-producing turbulence as it flows across natural terrain and structures, and roadway traffic (both nearby, such as local routes Dillon Road and Diablo Road, and distant like State Highway 62 and Interstate 10).

3.2 Noise-sensitive Receptors

For purposes of this noise and vibration assessment, the nearest existing noise-sensitive receptors are single family residences sited on parcels along the western side of Diablo Road, opposite the Phase 1 site to the east and the Phase 2 site to the southeast, and include as follows: 61984 Smoke Tree Road, 16365 Diablo Road, 16531 Diablo Road, and 61980 Barrel Cactus Road. Per the County, these land uses are zoned "W-2", which allows residential use. As such, and based on the allowable W-2 size (<1 acre), the exterior noise limits for such low-density residential would appear to be 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA at night (10:00 p.m. to 7:00 a.m.), akin to the "low density residential" (LDR) or "very low density residential" (VLDR) general plan land use designations as appearing in Table 1 of the County's noise ordinance (No. 847, as described further under Section 4.1.3.2 herein).

3.3 Measured Outdoor Sound Environment

Outdoor ambient sound level measurements were taken at and near the Project site on August 26, 2021 to characterize the existing noise environment. Short-term ("ST", typically 15 minutes each in duration) investigator-attended sound level measurements were taken with a SoftdB "Piccolo" brand sound level meter (SLM), which meets the current American National Standards Institute (ANSI) standard for a Type 2 "general use" instrument. The calibration status of the SLM was checked before and after the measurements were taken, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground surface. Four short-term (ST) noise measurement locations (ST1, ST2, ST3, and ST4) as appearing in Figure 3 were selected to represent the proximity of noise-sensitive offsite receptors and other locations on or near the Project site. Summarized noise metrics for the measurement locations are provided in Table 2.

Details of the existing outdoor sound level measurement survey, including investigator field notes and sample photographs of the SLM deployments, appear in Attachment A and includes the results of an additional unattended long-term ("LT-1", a continuous 24-hour period from August 25-26, 2021) monitor deployed at the ST-1 position. A plot of one-minute duration L_{eq} and L_{90} values from the LT-1 monitor, showing how outdoor ambient sound levels rise and fall over the course of a typical diurnal cycle, appears in Figure 4.

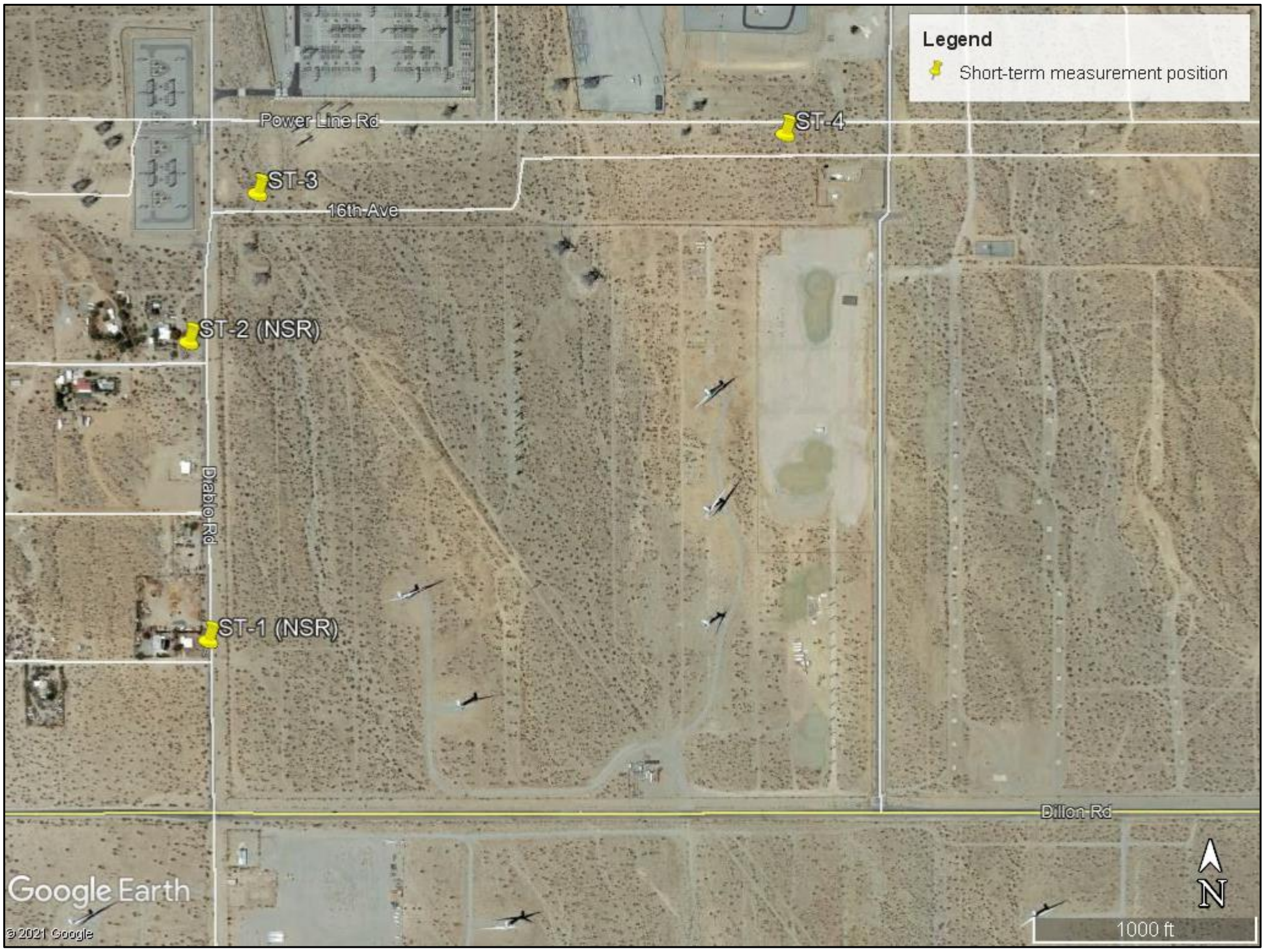


Figure 3. Map of short-term (ST) baseline sound pressure level survey locations, including nearby noise-sensitive receptors (NSR) in Project vicinity

Table 2. Summarized Baseline Short-term Sound Pressure Level Survey Data

Location/Address	Figure Tag	Date (mm/dd/yy)	Time (hh:mm)	L_{eq} (dBA)	L_{max} (dBA)	L_{90} (dBA)
61980 Barrel Cactus Road	ST-1	08/26/21	7:43 to 7:59	58.6	79.7	54.1
61984 Smoke Tree Road	ST-2	08/26/21	8:04 to 8:20	59.3	76.7	51.5
South of SCE Devers Substation (16th Avenue)	ST-3	08/26/21	8:24 to 8:39	56.5	69.6	51.1
East of SCE Devers Substation (Power Line Road)	ST-4	08/26/21	8:46 to 9:01	57.7	70.6	50.7

Notes: dBA = A-weighted decibel; L_{eq} = energy-equivalent sound level; L_{max} = maximum sound level during the measurement period; L_{90} = sound level exceeded ninety percent (90%) of the time.

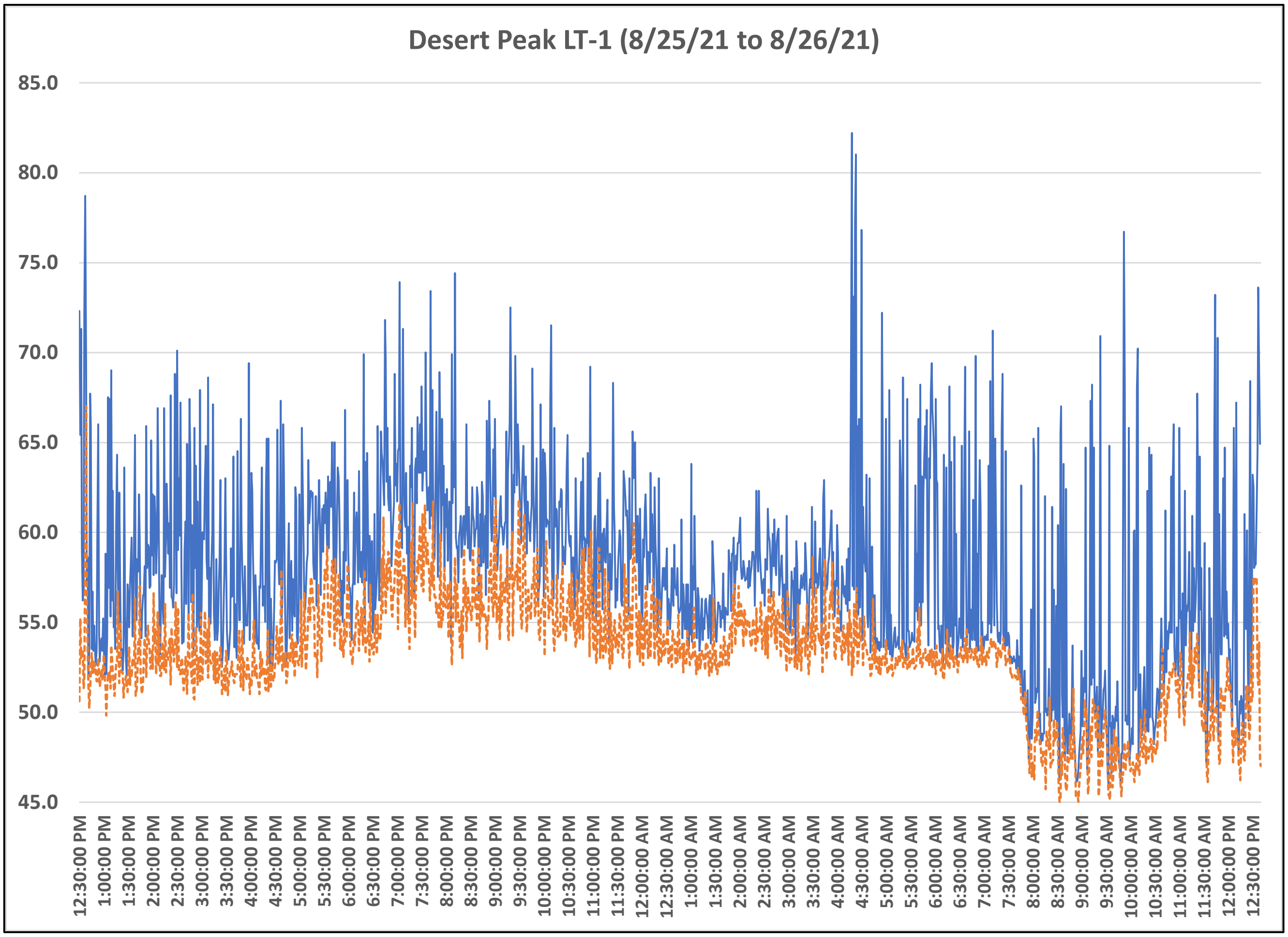


Figure 4. Plot of L_{eq} (solid blue line) and L_{90} (dashed orange line) values per successive one-minute intervals

According to tabular wind speed and directional data collected by weather station “KCADESER50” (Weather Underground 2021), winds north of the Project vicinity were generally from the west (270 degrees) and ranged from approximately 4.5 miles per hour (mph) to 18 mph on August 25, 2021 during the first twelve hours (12:30 p.m. to 12:00 a.m.) of SPL monitoring at LT-1. To the south of the Project vicinity, data collected at weather station “KCADESER90” on August 26, 2021 from 12:00 a.m. to 12:00 p.m. shows wind speeds below 10 mph from 7:54 a.m. through 9:19 a.m., with velocity as low as 0.9 mph at 8:34 a.m. Similar low wind velocities (i.e., below 5 mph) were documented by the field investigator at the ST measurement locations on the morning of August 26, 2021, and would therefore appear to explain the sudden drop in measured L_{90} values after 7:30 a.m. as shown in Figure 4. Hence, the LT monitored sample shows how the background sound level (i.e., the L_{90} descriptor) varies with near-ground wind speeds in the Project vicinity, and can—when winds are calm—be as low as 45 dBA.

4 Noise and Vibration Assessment

4.1 Applicable Standards

The significance criteria used to evaluate the Project impacts to air quality are based on the recommendations provided in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). For the purposes of this air quality analysis, a significant impact would occur if the Project would:

4.1.1 Federal

Although the U.S. Department of Transportation's Federal Transit Administration (FTA) standards were established for federally funded mass transit projects, the impact assessment procedures and criteria included in the Transit Noise and Vibration Impact Assessment Manual (FTA 2018) are routinely used for projects proposed by local jurisdictions. The FTA and Federal Railroad Administration (FRA) have published guidelines for assessing the impacts of ground-borne vibration associated with rail projects, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 inch/second peak particle velocity (PPV). Additionally, in the Transit Noise and Vibration Impact Assessment guidance manual, the FTA recommends a daytime construction noise level threshold of 80 dBA L_{eq} over an 8-hour period when detailed construction noise assessments are performed to evaluate potential impacts to community residences surrounding a project. Although this FTA guidance is not a regulation, it can serve as a quantified standard in the absence of such noise limits at the state and local levels.

4.1.2 State

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, declares 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 economic damage. It also identifies a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

4.1.3 Local

Because the Project Phase 1 site lies within the City of Palm Springs (City) but adjoins occupied residential land uses within unincorporated Riverside County (County), the following are summarized or reproduced relevant noise standards from both jurisdictions.

4.1.3.1 City of Palm Springs

GENERAL PLAN NOISE ELEMENT

The City's Noise Element of the General Plan includes several *policies* as follows that would be pertinent to development of the proposed Project:

NS1.1 Continue to enforce acceptable noise standards consistent with health and quality of life goals established by the City and employ noise abatement measures, including the noise ordinance, applicable building codes, and subdivision and zoning regulations.

NS1.3 Utilize maximum anticipated, or "worst case," noise conditions as the basis for land use decisions and design controls as a means of preventing future incompatibilities.

NS1.4 Evaluate the compatibility of proposed land uses with the existing noise environment when preparing, revising, or reviewing development proposals.

NS1.5 Protect noise-sensitive land uses such as schools, hospitals, and convalescent homes from unacceptable noise levels from both existing and future noise sources.

NS1.10 Minimize noise spillover from commercial uses into adjacent residential neighborhoods.

Corresponding *actions* described by the City's Noise Element of the General Plan includes as follows:

NS1.5 Require that noise analyses for future developments be prepared by a qualified acoustical consultant. Studies must indicate how proposed developments are in compliance with the City noise ordinance. Studies will be reviewed by the appropriate decision-making body prior to the issuance of permits.

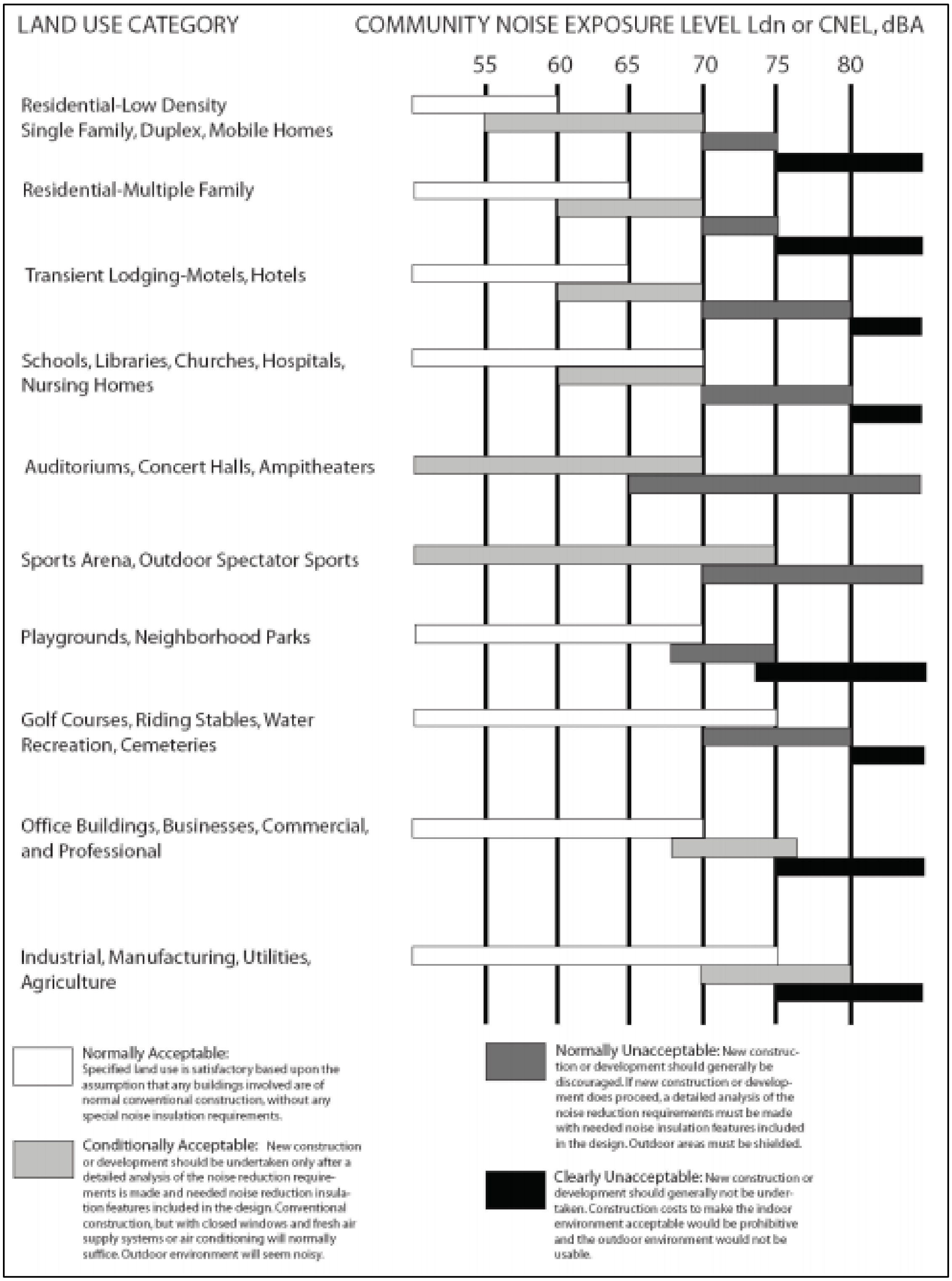
Goals described by the City's Noise Element of the General Plan includes as follows:

NS3.10 Require that construction activities that impact adjacent residential units comply with the hours of operation and noise levels identified in the City Noise Ordinance.

NS3.11 Require that construction activities incorporate feasible and practical techniques which minimize the noise impacts on adjacent uses, such as the use of mufflers and intake silencers no less effective than originally equipped.

NS3.12 Encourage the use of portable noise barriers for heavy equipment operations performed within 100 feet of existing residences, or make applicants provide evidence as to why the use of such barriers is infeasible.

Figure 5, Land Use Compatibility for Community Noise Exposure, presents the land use compatibility chart for community noise prepared by the California Office of Noise Control and adopted in this Noise Element to demonstrate land-use compatibility.



Source: City of Palm Springs (2007)

Figure 5. Land Use Compatibility for Community Noise Exposure

MUNICIPAL NOISE ORDINANCE

The applicable standards for the Project are specified in the Palm Springs Municipal Code, and include the following reproduced sections or excerpts thereof:

11.74.030 On or after the effective date of the ordinance codified in this chapter, unless a permit has been granted by the board of appeals, it shall be unlawful for any person to operate or cause to be operated any single or combination of fixed source or non-stationary source type of equipment or machinery except construction equipment used in connection with construction operations, that individually or collectively constitute an identifiable sound source in such a manner as to cause the sound level at any point on the property line of any property to exceed by five decibels or more, the noise level limits set forth in Section 11.74.031, plus allowances for time duration in Section 11.74.032.

11.74.031 The noise level or sound level referred to in this section shall mean the higher of the following: (1) actual measured ambient noise level; or (2) that noise level limit as determined from the table in this subsection:

Zone	Time	Sound Level (A-weighted) Decibels
Residential	7 a.m. to 6 p.m.	50
Low Density	6 p.m. to 10 p.m.	45
	10 p.m. to 7 a.m.	40
Residential	7 a.m. to 6 p.m.	60
High Density	6 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial	7 a.m. to 6 p.m.	60
	6 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Industrial	7 a.m. to 6 p.m.	70
	6 p.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55

If the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone plus five dB shall apply.

11.74.032 The time duration allowances set forth in the table below shall apply to those noise level limits set forth in Section 11.74.031 during the daytime hours:

Duration of Sound	dB(A) Allowance
Up to 30 minutes per hour	+ 3
Up to 15 minutes per hour	+ 6
Up to 10 minutes per hour	+ 8
Up to 5 minutes per hour	+11
Up to 2 minutes per hour	+15
Up to 1 minutes per hour	+18

Up to 30 seconds per hour	+21
Up to 15 seconds per hour	+24

11.74.042 It shall be unlawful for any person within the city to operate construction tools or equipment in the performance of any outside construction or repair work on buildings, structures, or projects except in accordance with Section 8.04.220.a, which is as follows:

No person shall be engaged or employed nor shall any person cause any other person to be engaged or employed in any work of construction, erection, alteration, repair, addition to, or improvement of any realty, building or structure, except during the hours specified as follows, if the noise or other sound produced by such work is of such intensity or quality that it disturbs the peace and quiet of any other person of normal sensitivity. For new construction, the permitted hours of construction specified below shall be conspicuously posted on site: weekdays (7 a.m. to 7 p.m.), and Saturday (8 a.m. to 5 p.m.).

On Sundays and holidays (Thanksgiving Day, Christmas Day, New Years Day, July 4th, Labor Day and Memorial Day), there are no hours during which exception to Section 8.04.220.a would be permitted.

11.74.043 The following acts, among others, are declared to be loud, disturbing, and unnecessary noises in violation of this section, but said enumeration shall not be deemed to be exclusive:

(j) Vibration. Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or one hundred fifty feet from the source if on a public space or public right-of-way, is unlawful.

4.1.3.2 Riverside County

GENERAL PLAN NOISE ELEMENT

Chapter 7 (Noise Element) of the County's General Plan includes several *policies* as follows that would be pertinent to development of the proposed Project:

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 1.6 Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise-sensitive uses.

N 2.3 For residential land uses, mitigate exterior noises to the following preferred levels for stationary sources, to the extent feasible: nighttime (10 p.m. to 7 a.m.) 45 dBA L_{eq} (10 minute); daytime (7 a.m. to 10 p.m.) 65 dBA L_{eq} (10 minute).

N 3.5 Require that a noise analysis be conducted by an acoustical specialist for all proposed projects that are noise producers. Include recommendations for design mitigation if the project is to be located either within proximity of a noise-sensitive land use, or land designated for noise-sensitive land uses.

N 4.1 Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels: 45 dBA 10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.; 65 dBA 10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

N 4.3 Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed, and ensure that the recommended mitigation measures are implemented.

N 4.4 Require that detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources.

N 4.5 Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of Conditional Use Permits or business licenses or prior to the approval and/or issuance of new Conditional Use Permits for said facilities.

N 12.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices.

N 12.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

N 12.4 Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

N 15.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

The County's land use compatibility matrix for community noise is the same as that presented in Figure 5.

MUNICIPAL NOISE ORDINANCE

The County's noise ordinance (Ordinance No. 847) has two relevant features as follows:

- Under Section 2 – Exemptions, the sound emanating from a private construction project located within one-quarter (1/4) of a mile from an inhabited dwelling would be exempt from the provisions of the ordinance provided that construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September; and construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May. This means that within these time periods, which tend to describe evening and nighttime, the noise thresholds per No. 847 would apply.

- Under Section 4 – General Sound Level Standards, a "Table 1" (reproduced in Figure 6) displays the daytime (7am – 10pm) and nighttime (10pm – 7am) "maximum decibel levels" associated with the listed general plan land use. However, the noise impact analysis prepared for the Clinton Keith Road "Grove Park" project within the City of Wildomar indicates that the County's adoption of the "L_{max}" descriptor appearing in Table 1 is an "inaccuracy" and should instead "reflect the average L_{eq} noise levels" (Urban Crossroads 2015). The noise impact analysis is Appendix I of the Draft Environmental Impact Report (DEIR) prepared for the Grove Park project (City of Wildomar, 2015).

TABLE 1
SOUND LEVEL STANDARDS (Db L_{max})

GENERAL PLAN FOUNDATION COMPONENT	GENERAL PLAN LAND USE DESIGNATION	GENERAL PLAN LAND USE DESIGNATION NAME	DENSITY	MAXIMUM DECIBEL LEVEL	
				7am-10pm	10pm-7am
Community Development	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
	MDR	Medium Density Residential	2--5	55	45
	MHDR	Medium High Density Residential	5--8	55	45
	HDR	High Density Residential	8--14	55	45
	VHDR	Very High Density Residential	14-20	55	45
	H'TDR	Highest Density Residential	20+	55	45
	CR	Retail Commercial		65	55
	CO	Office Commercial		65	55
	CT	Tourist Commercial		65	55
	CC	Community Center		65	55
	LI	Light Industrial		75	55
	HI	Heavy Industrial		75	75
	BP	Business Park		65	45
	PF	Public Facility		65	45
	SP	Specific Plan-Residential		55	45
		Specific Plan-Commercial		65	55
		Specific Plan-Light Industrial		75	55
		Specific Plan-Heavy Industrial		75	75
Rural Community	EDR	Estate Density Residential	2 ac	55	45
	VLDR	Very Low Density Residential	1 ac	55	45
	LDR	Low Density Residential	1/2 ac	55	45
Rural	RR	Rural Residential	5 ac	45	45
	RM	Rural Mountainous	10 ac	45	45
	RD	Rural Desert	10 ac	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation Habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral Resources		75	45

Source: Riverside County (2007)

Figure 6. Riverside County Ordinance No. 847 Exterior Noise Level Thresholds

4.2 Thresholds of Significance

The significance criteria used to evaluate the Project impacts to noise are based on the recommendations provided in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). For the purposes of this noise and vibration analysis, the proposed Project would have a significant impact on noise if it would result in:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Generation of excessive groundborne vibration or groundborne noise levels.
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

Per CEQA Appendix G criterion #1 above, the proposed Project would cause a potentially significant noise impact if any of the following conditions were met as follows:

- Project-attributed changes to the proximate roadway traffic volumes cause more than a 3 dB increase to the existing traffic noise CNEL;

- Project-attributed changes to the proximate roadway traffic volumes cause the existing traffic noise CNEL to exceed 65 dBA CNEL (when it was otherwise less than 65 dBA CNEL);

- Project stationary sources of noise (e.g., battery container cooling systems, inverters) exceed the following standards:

  - Because the Project site is zoned for industrial-type uses and, the allowable exterior noise level is 60 dBA hourly L_{eq} at the Project property line, per 11.74.030 and 11.74.031 of the City noise ordinance during nighttime hours (10 p.m. to 7 a.m.) that represents the arithmetic sum of 55 dBA + 5 dB. For informational purposes, the evening (6 p.m. to 10 p.m.) standard would be 5 dB higher than this nighttime threshold, and the daytime (7 a.m. to 6 p.m.) standard would be 10 dB higher than the evening threshold.

  - 45 dBA L_{eq} over a 10-minute period during nighttime hours, per the County general plan noise element policy N 2.3, which is consistent in magnitude with the "very low density" and "low density" residential land use standards appearing in Figure 6.

- Project construction noise at an offsite residential receiving land use exceeds 80 dBA L_{eq} over an 8-hour period.

Per CEQA Appendix G criterion #2 above, impacts related to excessive ground-borne vibration would be significant if the Project results in the exposure of persons to or generation of excessive ground-borne vibration equal to or in excess of 0.2 inches/second PPV, which is considered the building damage risk criteria for the "non-engineered timber and masonry buildings" receptor category per FTA (FTA 2018). With respect to building occupant annoyance, guidelines from Caltrans suggest that this same value falls within the "strongly perceptible" to "severe range" of human response attributed to vibration from "continuous/frequent" sources that include vibratory compaction equipment.

Per CEQA Appendix G criterion #3 above, there are no private or public airports or airfields within 2 miles of the proposed Project. Further, as shown by Exhibit PS-5 from the Riverside County Airport Land Use Compatibility Plan (ALUCP), aviation noise contours greater than or equal to 65 dBA CNEL from Palm Springs International Airport do not intersect the Project area (Riverside County 2005); hence, no impacts are expected and this impact evaluation topic is no longer discussed herein.

4.3 Impact Analysis

4.3.1 Would the Project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

4.3.1.1 Offsite Transportation Noise

Using the FHWA-based technique described in Section 2.2.1, the predicted noise exposure level from existing roadway traffic noise sources that include Diablo Road, Dillon Road, and State Highway 62 is 50.7 dBA CNEL at a nearby sample NSR (i.e., the ST-1 location from the baseline sound level survey). Adding anticipated peak PCE daily construction traffic trips to the existing estimated Diablo Road segment ADT, the existing-plus-Project traffic noise exposure level estimate is 53.0 dBA CNEL, thus representing only a 2.3 dB increase that would not be considered excessive and thus a less than significant noise impact. The calculation worksheets for these existing and existing-plus-Project traffic noise level estimates appear in Attachment C.

4.3.1.2 Construction Noise

Project construction activity noise levels were predicted using techniques described in Section 2.1.1. For each of the seven listed Project construction activity phases, Table 3 presents the input horizontal distances between the nearest existing offsite noise-sensitive receptor and the anticipated equipment associated with the "construction site boundary" and "acoustical centroid" cases.

Table 3. Estimated Distances and Construction Noise Level Exposures at nearest NSR

Construction Phase (and Equipment Types Involved)	Distance from nearest NSR to *Construction Site Boundary*	Distance from nearest NSR to Site *Acoustical Centroid*	8-Hour L_{eq} at nearest NSR from equipment at *Construction Site Boundary*	8-Hour L_{eq} at nearest NSR from equipment at Site *Acoustical Centroid*
	Horizontal feet		A-weighted decibel (dBA)	
Substation Site Preparation (dozer, backhoe)	2,364	2,546	38.9	44.1
Grading (grader, plate compactor, roller, loader, skid-steer loader, backhoe)	228	364	68.5	67.0
Substation Grading (roller, dozer, backhoe)	2,364	2,546	39.8	42.0
Battery/Container Installation (air compressor, crane, excavator, generator, plate compactor, roller, rough-terrain forklift, skid-steer loader, backhoe)	272	364	67.1	67.6

Table 3. Estimated Distances and Construction Noise Level Exposures at nearest NSR

Construction Phase (and Equipment Types Involved)	Distance from nearest NSR to *Construction Site Boundary*	Distance from nearest NSR to Site *Acoustical Centroid*	8-Hour L_{eq} at nearest NSR from equipment at *Construction Site Boundary*	8-Hour L_{eq} at nearest NSR from equipment at Site *Acoustical Centroid*
	Horizontal feet		A-weighted decibel (dBA)	
Substation Installation (aerial lift, air compressor, bore/drill rig, crane, excavator, generator, roller, rough-terrain forklift, dozer, skid-steer loader, backhoe, trencher)	2,364	2,546	46.8	49.7
Gen-tie Foundation and Tower Erection (air compressor, crane, forklift, generator, pump, welder)	2,818	2,818	37.1	37.1
Gen-tie Stringing and Pulling (forklift, generator, backhoe)	2,818	2,818	33.4	33.4
FTA Guidance Threshold (80 dBA) Exceeded?	n/a	n/a	No	No

Notes: NSR = noise-sensitive receptor.

As presented in Table 3, the estimated Project construction noise levels at the nearest offsite NSR within County jurisdiction are predicted to be far less than the FTA guidance-based threshold of 80 dBA L_{eq} over an 8-hour period. Compared to measurements of the daytime outdoor ambient sound level at representative sample locations ST-1 and ST-2 as shown in Table 2, predicted construction noise levels presented in Table 3 are expected to be either perceptibly higher or substantially lower in magnitude. These increases in the outdoor ambient noise level at ST-1 or ST-2 would typically be relatively short term and temporary—lasting only as long as construction occurs. Because construction activities associated with the Project would be expected to take place within the hours that the County considers exempt from its noise ordinance requirements, and during such time would exhibit aggregate noise level exposures that are less than the FTA guidance-based threshold, construction noise impacts would be considered less than significant.

4.3.1.3 Onsite Stationary Operations Noise

The CadnaA-based stationary source operation noise modeling method described in Section 2.3 logarithmically combines the acoustical contribution of outdoor sound propagation from all input sources and calculates an aggregate SPL at each point in a horizontal plane defined by the user, which for purposes of this analysis will be 5 feet above grade (to simulate a listener standing at grade level). Based on these input data, predicted operation noise levels were evaluated at a set of four (4) distinct representative nearest NSR locations as presented in Table 4.

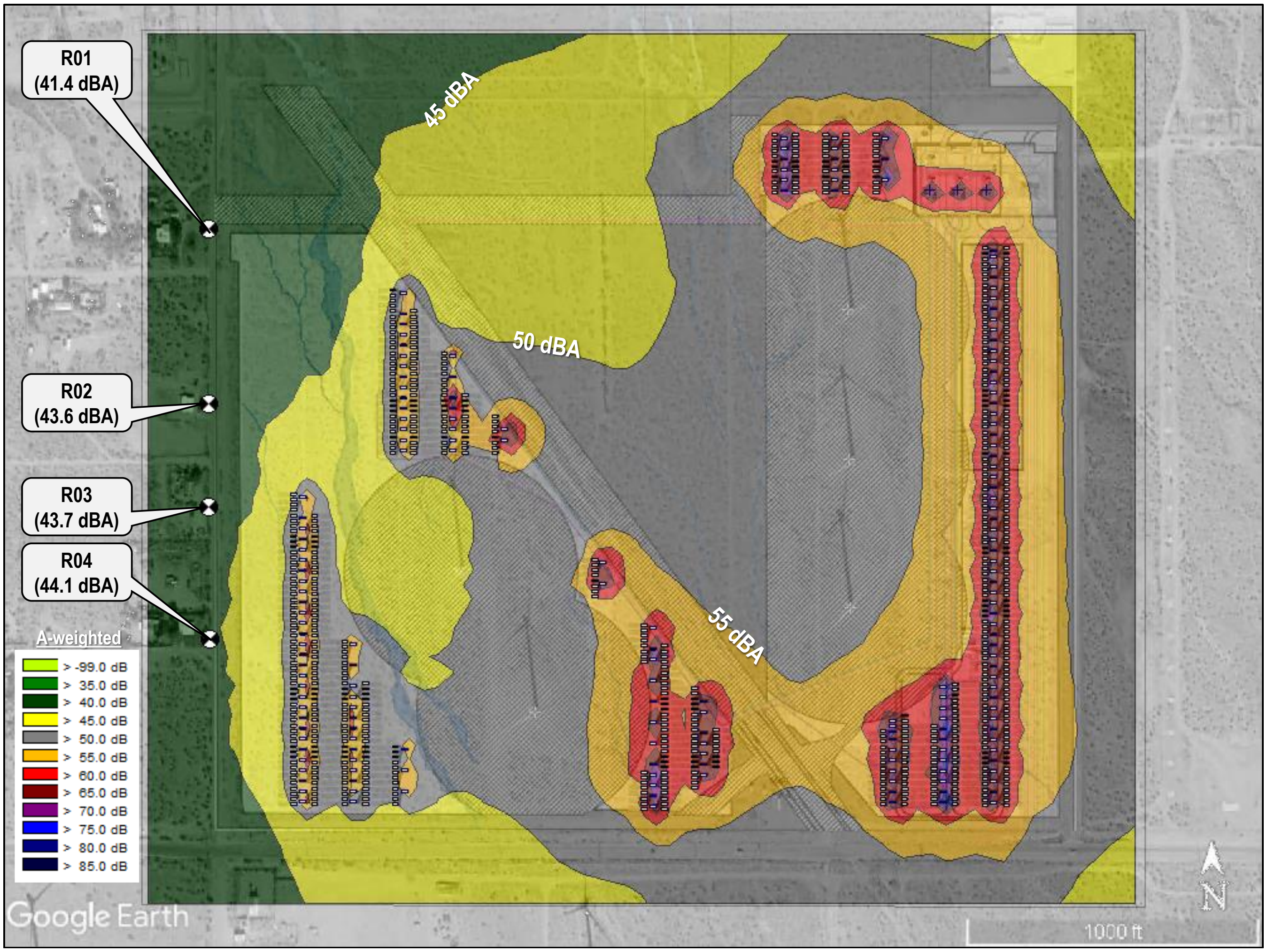
Table 4. Predicted Project Stationary Operations Noise Levels at nearest NSR

Modeled Receiver Position	Operations Noise Exposure Level (dBA) for Modeled Scenario		
	Phase 1 Site only (dBA)	Phase 2 Site only (dBA)	Approximate Logarithmic Combination of Phase 1 & Phase 2 Sites (dBA)
R01 - 61984 Smoke Tree Road (ST-2 from baseline survey)	41.4	< 36	**42**
R02 - 16365 Diablo Road	43.6	36.5	**44**
R03 - 16531 Diablo Road	43.7	37.7	**45**
R04 - 61980 Barrel Cactus Road (ST-1 from baseline survey)	44.1	39.8	**45**

Notes: dBA = A-weighted decibel.

The predicted levels at each of the four NSR positions for all three modeled scenarios, including the logarithmic combination of Project concurrent operation noise from both built-out Phase 1 and Phase 2 sites, do not exceed the County's nighttime threshold of 45 dBA L_{eq} and would therefore be considered a less than significant impact.

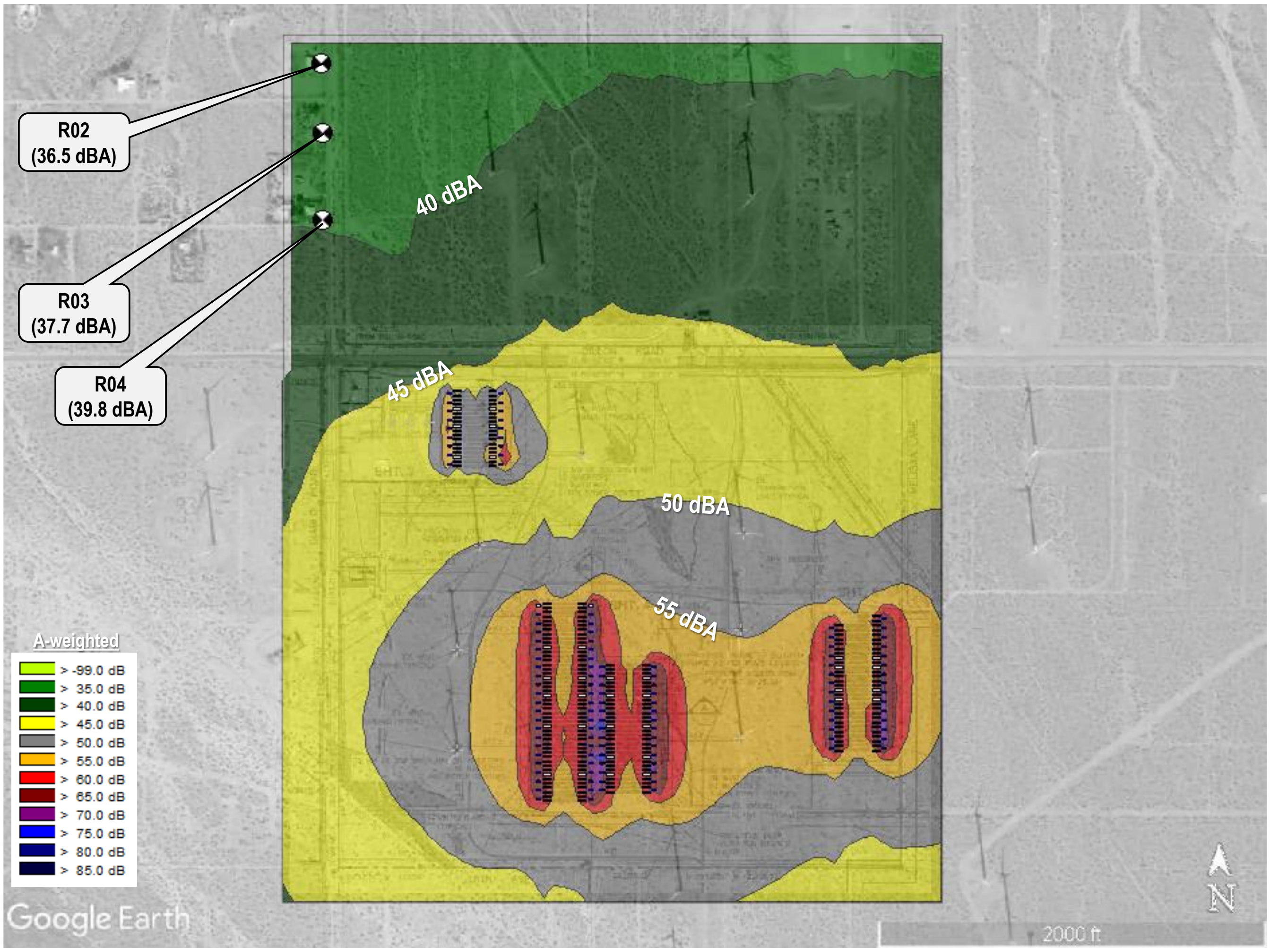
Figure 7 displays predicted Project aggregate operation noise level across the Phase 1 site and surrounding offsite areas, with adjoining color bands representing 5-dB ranges as listed in the legend.



Source: Dudek (2021)

Figure 7. Predicted aggregate noise level from operation of Project Phase 1 site stationary sources

Similar to Figure 7, Figure 8 displays predicted Project aggregate operation noise level across the Phase 2 site and surrounding offsite areas, with adjoining color bands representing 5-dB ranges as listed in the legend.



Source: Dudek (2021)

Figure 8. Predicted aggregate noise level from operation of Project Phase 2 site stationary sources

Although NSR are not located near the northern, eastern and southern boundaries of the Project sites, the red-colored zones in Figures 7 and 8 indicate that aggregate operation noise level of 60 dBA should not be exceeded at the Project boundaries for the Phase 1 and Phase 2 sites and would therefore be compliant with the City standard and correspondingly be a less than significant impact.

Compared to the measured outdoor ambient noise levels at survey position LT-1 as appearing in Figure 4 that do not drop below 45 dBA L_{eq}, the predicted Project operation noise levels from stationary on-site sources shown in Table 4 are comparable or lower. This means that under similar background environmental conditions in the future, the acoustically additive effect of Project operation noise would result in a cumulative future outdoor ambient noise level at the studied four representative NSR that is no more than a 3 dB increase above pre-existing conditions and thus considered barely perceptible and correspondingly a less than significant impact.

4.3.2 Would the Project generate excessive groundborne vibration or groundborne noise levels?

4.3.2.1 Construction

Using the groundborne vibration propagation expression presented in Section 2.1.2, and assuming a vibratory roller would be the type of heavy construction equipment exhibiting the greatest vibration magnitude, the predicted vibration velocity exposure level at the nearest existing offsite occupied residential receptor would be 0.006 ips PPV per the following equation:

$PPV_{rcvr} = 0.006 = 0.21 * (25/272)^{1.5}$

where 0.21 ips PPV is the reference vibration velocity at a horizontal source-to-receptor distance of 25 feet for a vibratory roller (FTA 2018), and the closest source-to-receptor distance is 272 feet as presented in Table 44. Because this predicted PPV exposure due to intermittent operation of Project construction equipment is much less than the 0.2 ips PPV guidance-based threshold adopted herein for both building occupant annoyance and building damage risk, the potential impact would be less than significant.

4.3.2.2 Operation

Once operational, the Project would not be expected to feature major on-site producers of groundborne vibration. Anticipated mechanical systems like air-conditioning units, refrigeration compressors, and ventilation fans are designed and manufactured to feature rotating, reciprocating, or oscillating components (e.g., impellers, scrolls, and pistons) that are well-balanced, involve repetitive motion with extremely small variance, and consequently produce negligible vibration velocity magnitudes compared to pre-existing environmental surroundings. Further, such electro-mechanical or fluid-handling systems are often vibrationally isolated or dampened within or external to their equipment casings. On this basis, potential vibration impacts due to proposed project operation would be less than significant.

4.3.3 Is the Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport and would thus expose people residing or working in the project area to excessive noise levels?

There are no private or public airfields within sufficient proximity to the Project to require assessment against this CEQA noise impact significance criterion, and the Project is located well beyond the 65 dBA CNEL aviation traffic noise contour attributed to the Palm Springs Airport; hence, potential aviation noise impacts to Project onsite workers and other personnel would be considered less than significant.

5 Conclusions

Construction, offsite transportation, and onsite operation noise and vibration attributed to both proposed sites (Phase 1 and Phase 2) of the Project are not expected to generate significant impacts and would not require mitigation measures beyond noise control strategies and means that are or will be incorporated into the Project design and its implementation as studied herein.

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14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

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Attachment A

Acoustical Terminology

Attachment B

Outdoor Sound Level Survey Data Detail and Field Notes