

2.6 Noise

This section of the Environmental Impact Report (EIR) evaluates noise and vibration impacts resulting from development of the Campo Wind Project with Boulder Brush Facilities (Project). Information contained in this section is based on review of existing documentation, including the following:

- Acoustical Analysis Report for The Campo Wind Project (Appendix G)
- Campo Wind Project with Boulder Brush Facilities – Draft EIR Appendix G (Noise) Addendum (Addendum)

Comments received in response to the Notice of Preparation (NOP) included concerns regarding construction noise, operational noise, vibrational and low frequency noise, noise impacts to biological resources, cumulative impacts, the adequacy of local regulations concerning noise, and secondary impacts related to aviation-related noise. 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 is included in Appendix A of this EIR.

2.6.1 Existing Conditions

This section describes basic noise information and the existing setting in the land within the Reservation Boundary plus the Boulder Brush Boundary (Project Area), and also identifies the resources that could be affected by the Project.

2.6.1.1 Noise Measurement

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

Sound, Noise, and Acoustics

Sound is a process that consists of three components: the sound source, sound path, and sound receptor. 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.

Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micronewton per square meter, also called micropascal. One micropascal is approximately one-hundred billionth (0.0000000001) of normal atmospheric pressure. The pressure of a very loud sound may be 200 million micropascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micropascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the ratio of actual sound pressure to a reference pressure squared. These units are called bels. To provide a finer resolution, a bel is subdivided into 10 decibels (dB).

Frequency-Weighted Sound Level

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness, or human response, is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies, but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 hertz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average healthy young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds.

Other weighting networks have been devised to address high noise levels or other special situations (e.g., the C-weighted scale). Community noise levels are typically reported in terms of A-weighted sound (dBA), but C-weighted sound levels are also presented and discussed in this report. Table 2.6-1, Comparison of A-Weighting and C-Weighting Adjustments, presents a side-by-side comparison of decibel adjustments that, when applied to an “unweighted,” “flat,” or Z-weighted measurement, produce A-weighted and C-weighted values.

Compared to the octave band center frequency (OBCF) weightings of the “A” scale, the C-weighting dB adjustments shown in Table 2.6-1 are much less in the lower frequencies. For this reason, C-weighted levels have been used to evaluate entertainment noise levels having high bass (i.e., low-frequency) content. So, while A-weighted sound levels may better represent what humans perceive, C-weighted levels help better describe sounds having energy in the lower end of the audible spectrum.

To help illustrate the large range of sound pressures that are audible to human hearing, examples of typical noise levels for common indoor and outdoor activities are expressed as unweighted dB values in Table 2.6-2, Typical Sound Levels in the Environment and Industry. Note that “0 dB” is not the absence of sound energy; rather, it is the quietest audible level of sound calculated with respect to a reference pressure of 20 micropascals.

Human Response to Changes in Noise Levels

It is generally accepted that the average healthy ear can barely perceive a noise level change of 3 dB (Caltrans 2013). A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice or half as loud. A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the average daily numbers of traffic on a road) would result in a barely perceptible change in sound level.

Noise Descriptors

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level (L_{eq}) is also referred to as the energy-average sound level. The 1-hour A-weighted equivalent sound level, L_{eq1h} , is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the usual basis for the County of San Diego (County) noise policies and standards. However, the County also uses an 8-hour energy-equivalent sound level (L_{eq8h}) to assess construction noise.

Because people are generally more sensitive and annoyed by noise occurring during the evening and nighttime hours, two descriptors are often used in community noise assessments as follows:

- Community noise equivalent level (CNEL) represents a time-weighted, 24-hour average noise level calculated from component L_{eq} values for daytime, evening, and nighttime periods. The CNEL value accounts for the increased noise sensitivity during the evening hours (7:00 p.m. to 10:00 p.m.) and nighttime hours (10:00 p.m. to 7:00 a.m.) by adding 5 dB and 10 dB “penalties,” respectively, to the energy-averaged sound levels occurring during the evening and nighttime hours.
- The day-night sound level (L_{dn}) represents sound over a 24-hour period similar to the CNEL descriptor, but it considers the three evening hours (7:00 p.m. to 10:00 p.m.) as part of the “daytime” period, with events between 10:00 p.m. and 7:00 a.m. increased by 10 dB to account for greater nighttime sensitivity to noise.

While some jurisdictions use CNEL and L_{dn} interchangeably, and under many conditions they are indeed comparable, the CNEL value will sometimes be slightly higher than the L_{dn} value for the same time period of sound; and, because of the evening and/or nighttime adjustments, CNEL and L_{dn} will always be greater than the 24-hour L_{eq} value for the same time period.

Statistical levels are another descriptor of sound levels measured over a period of time and commonly used for environmental noise monitoring. For this noise metric, L_{xx} is the sound level that was exceeded xx percent of the time. For example, L_{90} would be the sound level exceeded for 90% of the measurement time. The utility of the L_{90} value is that describes sounds that are “steady-state” or continuous in nature, since louder but less-frequently occurring sound during the measurement would effectively be excluded; hence, L_{90} is commonly used to approximate the “background” sound level, while L_{eq} encompasses all sound in the “ambient” sound environment.

Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receptor) is influenced by geometric spreading, ground absorption, atmospheric effects, and shielding by natural and/or built features.

Sound levels attenuate (or diminish) at a rate of approximately 6 dB per doubling of distance from an outdoor point source due to the geometric divergence (i.e., “hemispherical spreading”) of the sound waves. Atmospheric conditions such as humidity, temperature, and wind gradients can also affect sound levels. In general, the greater the distance the receptor is from the source, the greater the potential for variation in sound levels due to atmospheric effects. Additional sound attenuation can result from man-made structures such as intervening walls and buildings, and by natural topography such as hills and dense woods.

A “line” outdoor sound source, such as a roadway with many moving point sources constrained to the linear geometry of the pavement, propagates sound in what can be described as “cylindrical spreading,” with the resulting attenuation rate of only 3 dB per doubling of distance. At large distances, the acoustical combination of several identical sound-emitting point sources arranged in a line perpendicular to a common receptor will tend to emulate this cylindrical propagation effect.

2.6.1.2 Groundborne Vibration Fundamentals

Groundborne vibration is a rapidly oscillating motion transmitted through the ground. The strength of groundborne vibration attenuates rapidly over distance. Some soil types transmit vibration efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration

(FTA) are peak particle velocity (ppv), in units of inches per second, and vibration velocity decibel (VdB). The calculation to determine ppv at a given distance is as follows:

$$ppv_{\text{distance}} = ppv_{\text{ref}} * (25/D)^{1.5}$$

Where:

ppv_{distance} = the peak particle velocity in inches per second of the equipment adjusted for distance

ppv_{ref} = the reference vibration level in inches per second at 25 feet

D = the distance from the equipment to the receptor

The vibration velocity parameter (instead of acceleration or displacement) best correlates with human perception of vibration. Thus, the response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square velocity level in VdB units relative to 1 micro-inch per second. The threshold for perceptibility is approximately 65 VdB, but human response to vibration is not usually significant unless vibration levels exceed 70 VdB (FTA 2006). The calculation to determine the root-mean square at a given distance is as follows:

$$L_v(D) = L_v(25 \text{ feet}) - 30 * \log(D/25)$$

Where:

$L_v(D)$ = the vibration level at the receptor

$L_v(25 \text{ feet})$ = the reference source vibration level

D = the distance from the vibration activity to the receptor

Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB (FTA 2006).

2.6.1.3 Existing Setting

The Project Area is largely undeveloped, though utilities and recreational, commercial, agricultural, and residential land uses are present. Land uses within the 16,000-acre Campo Band of Diegueño Mission Indians Reservation (Reservation) Boundary (Reservation Boundary) are predominantly residential, but also include several institutional uses north of State Route 94 and the Golden Acorn Casino. Residential land uses surround the Reservation to the north, south, east, and west. The largest concentrations of Off-Reservation (i.e., outside of the Reservation Boundary) residential land uses are located east of the Reservation in the Live Oaks Springs and Tierra Del Sol communities. The Boulder Brush Boundary is located on private land in the McCain Valley area of the unincorporated San Diego County, within the Boulevard Subregional Planning area, to

the north of Interstate 8. The privately owned parcels within the Boulder Brush Boundary consist of largely undeveloped ranch land. The surrounding area primarily consists of vacant land; rural residences; the Tule Wind Project turbines to the north, east, and west; and the Kumeyaay wind turbines to the southwest (within the Reservation Boundary). The 500-kilovolt (kV) Sunrise Powerlink traverses the northeast portion of the Boulder Brush Boundary. Within the Boulder Brush Boundary, there is evidence of off-highway recreational vehicle activity, including motocross, all-terrain-vehicle use, and other off-highway use. Numerous ‘No Trespassing’ signs have been posted at locations along the Boulder Brush Boundary. The McCain Valley Recreation Management Zone, managed by the Bureau of Land Management (BLM), is located directly north of this land. Off-highway-vehicle use is considered a primary activity in the McCain Valley Recreation Management Zone.

Existing Noise Conditions

The primary existing noise source within the Project Area is vehicular traffic. Noise sources in the Project Area include traffic on local and regional roadways, existing turbines, the Golden Acorn Casino, farm equipment, off-highway recreational vehicles, civilian and military aircraft, rural residential land uses, and occasional gunfire from the La Posta Satellite Station/Navy Seal Mountain Training Center. Sound from birds and other fauna, rustling leaves, insects, distant conversations and other human activities, aircraft overflights, and operation of electro-mechanical systems (including heating, ventilation, and air-conditioning [HVAC] equipment, agricultural equipment, pumps, and wind turbine generators) in the Project Area plus surrounding areas (Project Vicinity) contribute to the outdoor ambient noise environment. As is the case for many of these localized sound-producing sources, at sufficient proximity the corona noise from existing power transmission lines in the Project Area can also be an audible component of the existing sound setting at a listener position.

Noise-Sensitive Land Uses

Sensitive noise receptors (i.e., noise-sensitive land uses [NSLUs]) are located at various locations in proximity to the 2,520-acre area of land, including the Campo Corridor plus the Boulder Brush Corridor (Project Site) both On-Reservation (i.e., within the Reservation Boundary) and Off-Reservation. Almost all of the NSLUs are residential homes. Other NSLUs On-Reservation include facilities such as the Campo Tribal Hall, the Kumeyaay Head Start preschool, and the Campo Health Center, which are generally located along Church Road. The nearest Off-Reservation NSLU to the Boulder Brush Facilities (in this instance an access road) is approximately 300 feet away from the proposed access road. The nearest Off-Reservation NSLU to the Campo Wind Facilities (in this instance also an access road) is an existing residence located approximately 800 feet away from an access road. Up to 76 turbine sites have been identified, of which only 60 would be constructed in accordance with the Campo

Lease. No Project turbines will be sited within 0.25 miles of any residential structure or tribal building on the Reservation. The closest Off-Reservation NSLU (i.e., on private lands) to a Project turbine site is approximately 1,030 feet away.

Noise Survey

As described in Appendix G, a site visit was conducted from September 5 to 7, 2018, to measure existing outdoor ambient noise levels in the vicinity of the Project Site using American National Standards Institute (ANSI) “Type 2” sound level meters. A total of 13 noise measurement locations, depicted as LT1 through LT13 on Figure 2.6-1, Noise Measurement Locations, represent On-Reservation NSLU areas and Reservation Boundary positions to capture “spillover” noise beyond the Reservation Boundary. Three of the surveyed locations (LT4, LT5, and LT7) exhibited existing L_{dn} values greater than 55 dBA. The other surveyed locations have existing L_{dn} values at or below 55 dBA. Based on the measurement data, existing hourly ambient noise levels range from 31 dBA to 70 dBA L_{eq1h} at the surveyed locations in the site vicinity. Statistical noise data was also collected during the measurements. The average hourly L_{90} results for the surveyed locations range from 32 dBA to 49 dBA.

A supplemental baseline outdoor ambient sound level survey was performed from August 29, 2019, to September 4, 2019, in the vicinities of many of the previously surveyed locations using ANSI “Type 1” sound level meters. The meter has the capability of measuring lower outdoor environment sound magnitudes than those of the previously utilized Type 2 sound level meters. Please refer to the Addendum to Appendix G of this EIR for a summary of the survey measurement results.

As detailed in Section III of the Addendum, baseline outdoor ambient sound level measurements were also performed at locations along sample positions of the Boulder Brush Boundary during field investigator visits to the Project Vicinity in May, June, and July 2018. These positions are identified as BBF-LT-1 through BBF-LT-9 in Figure 2.6-1. Durations of these SPL measurements captured a night-and-day cycle of the existing sound environment, from which L_{dn} and CNEL values could be calculated. In 2019, existing sound levels were re-measured with an ANSI Type 1 instrument near one of these locations (BBF-LT-8) and updated the quantified baseline conditions in a manner similar to what was done for the On-Reservation representative locations.

Where SPL was not re-measured, data from the 2018 field surveys have been retained; hence, for purposes of noise impact assessment discussed herein, the baseline represents a combination of measurement data from the 2018 and 2019 field surveys.

2.6.2 Regulatory Setting

This section reviews regulations related to the Project. Because the Project includes both wind turbines associated with the Campo Wind Facilities that would be located On-Reservation and Boulder Brush Facilities features such as the high-voltage substation that would be built on private lands under County jurisdiction, a number of regulations, codes, and standards at the federal, state, and local level would apply as appropriate.

2.6.2.1 Federal

Various federal agencies have established rules and guidelines addressing noise and vibration. For example, the Occupational Safety and Health Administration (OSHA) regulates worker noise exposure in a variety of settings. But while the Project under analysis relates to energy production, there are no applicable federal noise regulations that specifically apply to such power utility infrastructure. In such instances where federal regulations are lacking, the U.S. Environmental Protection Agency (EPA) provides guidance based on its “Levels Document” (EPA 1974).

In Section 4.5.4, Noise Standards and Guidelines, of its Final Programmatic Environmental Impact Statement (EIS) on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005), BLM mentions the EPA public-protecting guideline of 55 dBA L_{dn} , understood to be assessed at the exterior of any existing NSLU where the existing outdoor ambient sound level is not already in excess of this value. In the absence of applicable local noise regulations or other established policies at an On-Reservation NSLU, this EPA-based recommendation of 55 dBA L_{dn} functions as an appropriate criterion for determining potential noise impact from the operation of the Project.

When evaluating potential construction noise impacts at On-Reservation NSLU, and due to lack of other applicable standards, FTA guidance recommends a daytime standard at residential land uses of no more than 80 dBA (FTA 2006) energy-averaged over an 8-hour period (L_{eq8hr}).

Although it is possible for vibrations from construction near buildings to cause building damage, the vibrations from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings (FTA 2006). Groundborne vibration generated by construction is usually highest during rock drilling and blasting, soil compacting, jackhammering, and demolition-related activities. As an example of construction vibration assessment criteria with respect to building damage risk, the FTA indicates 0.2 inches per second ppv for “non-engineered timber and masonry buildings” (FTA 2006).

2.6.2.2 State

There are no state noise regulations applicable to the Boulder Brush Facilities. State regulations are not applicable to the Campo Wind Facilities or the Reservation.

2.6.2.3 Local

County of San Diego

County of San Diego Noise Standards

The County 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. The County noise standards are used only to evaluate noise impacts of the Project on private lands. The analysis does not apply these noise standards to Project impacts on the Reservation.

Three main criteria apply to operation of the Project to the extent noise impacts occur on private lands under County jurisdiction:

- A CNEL dBA limit accounting for noise levels across a 24-hour period based on the General Plan
- Hourly L_{eq} dBA limits for daytime and nighttime based on zoned land use from the Municipal Code
- A quantified differential between the predicted C-weighted wind turbine sound level and the existing outdoor background sound level at a receptor, as detailed in the County's Wind Project Guidelines

County of San Diego General Plan Noise Element

The County General Plan Noise Element (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. Under implementation of the General Plan, the County uses 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 (County of San Diego 2011). In this analysis, the Noise Element is relevant only for determining the significance of the Project's potential noise impacts on private lands.

San Diego County Noise Ordinance

The San Diego County Code of Regulatory Ordinances Title 3, Division 6, Chapter 4, Sections 36.401–36.435, Noise Ordinance (Noise Ordinance) establishes prohibitions for disturbing, excessive, or offensive noise, as well as provisions such as sound level limits to secure and promote the public health, comfort, safety, peace, and quiet for its citizens. Planned compliance with sound level limits and other specific parts of the Noise Ordinance allows presumption that the noise is not disturbing, excessive, or offensive. Limits are specified depending on the zoning placed on a 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 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 Noise Ordinance at any point on or beyond the boundaries of the property on which the sound is produced.

Section 36.404 of the Noise Ordinance contains sound level limits specific to receiving land uses. Sound level limits are in terms of a 1-hour average sound level. The allowable noise limits depend on the County’s zoning district and time of day. Table 2.6-3 (which is a copy of Table 36.404 from the Noise Ordinance) lists the sound level limits for the County. The following is from Section 36.404 of the Noise Ordinance:

- (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 sounds level limits in Table 36.404 (included as Table 2.6-3 in this section), 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 4 in Appendix G] 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 3 in Appendix G], 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 2.6-3 in this report], 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 measures 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 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 Ordinance 9478, 2002).

In this analysis, the Noise Ordinance is relevant only for determining the significance of the Project’s potential noise impacts on Off-Reservation private lands (i.e., under County jurisdiction).

County Zoning Ordinance Definitions Related to Large Wind Turbines

The provisions of Section 6950 thru 6959 of the County Zoning Ordinance are known as the Renewable Energy Regulations. The purpose of these provisions is to prescribe reasonable standards and procedures for the installation and operation of Solar Energy Systems and Wind Turbines. Section 6952 specifically applies to large wind turbines.

Section 6952 requires that the applicant prepare and submit an acoustical study which demonstrates that (a) each large wind turbine complies with all applicable sound level limits in the Noise Ordinance, County Code Section 36.401 et. seq.; and (b) the C-weighted sound level from each large wind turbine while operating does not exceed the Residual Background Sound Criterion (RBSC) for Wind Energy Facilities by more than 20 decibels as both sound levels are measured at each property line of the lot on which the large turbine is located. This section of the Zoning

Ordinance allows for a noise waiver as discussed under subsection 6259.f.2. Applicable noise standards are also reduced if the sound from a large wind turbine contains a pure tone, as set forth in subsection 6259.f.3.

The following definitions from Section 1110 of the County Zoning Ordinance are provided:

Background Sound Level (L₉₀). The sound level that is exceeded for 90 percent of the total measurement period as described in the current edition of Quantities and Procedures for Description and Measurement of Environmental Sound by the American National Standard Institution. Background Sound Level may be measured relative to A-weighting or C-weighting, in which case it would be denoted as LA₉₀ and LC₉₀, respectively. **Residual Background Sound Criterion (RBSC L₉₀) for Wind Energy Facilities.** The Background Sound Level measured relative to A-weighting (LA₉₀) plus 5 dBA.

In this analysis, the County Zoning Ordinance is relevant only for determining the significance of the Project's potential noise impacts on private lands.

County of San Diego Guidelines for Determining Significance

The County Guidelines for Determining Significance (County of San Diego 2009a) are used for reference and are relevant only for the Project's potential noise impacts on private lands. According to these guidelines, a proposed project would result in a significant impact under the California Environmental Quality Act (CEQA) if implementation would result in the exposure of any on-site or off-site existing or reasonably foreseeable future NSLUs to exterior or interior noise (including noise generated from a project combined with noise from roads, railroads, airports, heliports, and all other noise sources) greater than any of the following:

A. Exterior Locations

- i. 60 dB (CNEL); or
- ii. An increase of 10 dB (CNEL) over preexisting noise

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area that adjoins and is on the same lot as the dwelling and that contains at least the following minimum area:

- i. Net lot area up to 4,000 square feet: 400 square feet
- ii. Net lot area 4,000 square feet to 10 acres: 10% of net lot area
- iii. 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.

B. Interior Locations

45 dB (CNEL) except for the following cases:

- i. Rooms that are usually occupied only part of the day (i.e., schools, libraries, or similar facilities) in which the interior 1-hour average sound level due to noise outside should not exceed 50 dBA.
- ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

County of San Diego Construction Noise Regulations

Some Off-Reservation receptors may be impacted by Project construction. Off-Reservation construction impacts were assessed with respect to Section 36.408 of the County Construction Noise Ordinance, which sets limits on the time of day and days of the week that construction can occur, as well as setting noise limits for construction activities. In summary, the Noise Ordinance prohibits operating construction equipment on the following days and times:

- Mondays through Saturdays except between 7:00 a.m. and 7:00 p.m.
- Sundays or a holiday. A holiday means January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the president as a special national holiday or the governor of the state as a special state holiday.

In addition, Section 36.409 requires that between 7:00 a.m. and 7:00 p.m., no equipment shall be operated so as to cause an 8-hour average construction noise level in excess of 75 dBA 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. And in Section 36.410, limits of 82 dBA L₂₅ and 85 dBA L₂₅ are established for residential and commercial (or agricultural) properties, respectively, concerning impulsive sounds.

County of San Diego Report Format and Content Requirements – Noise

The County's Report Format and Content Requirements (County of San Diego 2009b) offer insight on what would be considered a "cumulatively considerable" noise impact. A cumulatively considerable contribution from the proposed Project that would require mitigation or design measures would be identified whenever "a more than a one decibel increase from the project was identified in the model analysis." A cumulative impact would occur when the combined sound level exceeds 60 dBA CNEL. In this assessment, such insights are relevant only for the Project's potential noise impacts on private lands under County jurisdiction.

2.6.2.4 Tribal

The Campo Lease requires a 0.25-mile setback from any residential structure or tribal building as of the date that the Campo Lease is made, dated and entered into.

2.6.3 Analysis of Project Effects and Determination as to Significance

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

Although the County, as Lead Agency, is analyzing the Project as a whole, the County's land use jurisdiction for the Project, and thus its ability to require conformance to its code or to impose feasible mitigation measures, is limited to the portions of the Project site that are on private lands, which in this case includes only the Boulder Brush Facilities. The BIA has jurisdiction over the Campo Wind Facilities, and has prepared an EIS to evaluate the impacts of the Project under the National Environmental Policy Act. This analysis hereby adopts and incorporates by reference the EIS. In addition, this section provides an analysis of the Project's impacts, both on the Reservation and on private lands, pursuant to the requirements of CEQA.

CEQA Guidelines

Guidelines to address the significance of noise impacts are contained in Appendix G of the CEQA Guidelines and were updated in December 2018. Based on those guidelines, a project would have a significant environmental impact if the project would result in:

- a. 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;
- b. Generation of excessive groundborne vibration or groundborne noise levels; and
- c. 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.

County Requirements and Guidelines for Determining Significance

For the purposes of this EIR, the following significance thresholds for noise are summarized from the aforementioned relevant portions of the County Noise Ordinance, and also include criteria provided in the County's Guidelines for Determining Significance and Report Format and Content Requirements – Noise (County of San Diego 2009b).

A significant impact would result if any of the following would occur when attributed to the Project:

- **Construction Noise:** per San Diego County Code Section 36.409, when it 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.
- **Impulse Noise:** per Section 36.410, 82 dBA L_{25} exceeded if measured during an hour at the boundary of the residential, village zoning or civic use from which the sound emanates; or, 85 dBA L_{25} exceeded if measured during an hour at the boundary of the commercial, agricultural, or industrial use from which the sound emanates.
- **Exterior Locations:** 60 dB (CNEL) exceeded, or an increase of more than 10 dB (CNEL) over preexisting noise. In the case of 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.
- **Interior Locations:** 45 dB (CNEL) exceeded, except for the following cases:
 - 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.
- **Exterior, hourly:** 50 dBA hourly L_{eq} exceeded during the day (7:00 a.m. to 10:00 p.m.); or, 45 dBA hourly L_{eq} exceeded at night (10:00 p.m. to 7:00 a.m.). If the outdoor ambient sound level (without Project contribution) is already higher than these limits, up to a 3 dBA increase above pre-existing outdoor ambient sound level is permissible.
- **Low-frequency:** predicted aggregate C-weighted L_{eq} from operating wind turbines exceeds the A-weighted RBSC (i.e., the pre-existing measured A-weighted L_{90} value plus 5 dB) by more than 20 dB.
- **Cumulative:** More than a 1.5 dBA difference occurs when the “cumulative + existing” sound level (i.e., measured outdoor ambient plus acoustical contribution from any past, present, or foreseeable future projects in the Project vicinity) is contrasted with the

“cumulative + existing + Project” sound level. A cumulative impact would occur when the combined sound level exceeds 60 dBA CNEL.

2.6.3.1 Analysis of Project Impacts on Exceeding an Applicable Standard

Guideline for the Determination of Significance

- a) *Would the project result in 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?*

Analysis

Construction

Project

According to the Acoustical Analysis Report (Appendix G), with results for Off-Reservation nearest receptors summarized in Table 2.6-4, predicted Project construction (both Campo Wind Facilities and Boulder Brush Facilities) noise for all but the closest identified sensitive Off-Reservation receptor (the property line of a receiving occupied property, at a distance of only 38 feet from the centerline of Boulder Brush Facilities access roadway improvement activities) would not exceed the San Diego County limit of 75 dBA Leq(8h) at the closest Off-Reservation receiving property line of an occupied property, as discussed in further detail below. Therefore, construction noise impacts for the Project would be **potentially significant (Impact N-1)**, as the Project would exceed an applicable County standard at the closest Off-Reservation receptor.

Boulder Brush Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), predictive modeling based on Federal Highway Administration (FHWA) Road Construction Noise Model (RCNM) algorithms and reference data was used to estimate construction noise levels for construction phases related to the Boulder Brush Facilities. While the Boulder Brush Facilities would only be located within private lands under the jurisdiction of the County, construction impacts associated with the Boulder Brush Facilities were assessed both On- and Off-Reservation to account for noise that could potentially spill over into the Reservation Boundary. Table 2.6-4 shows noise predictions at Off-Reservation receptors for construction activities specific to the Boulder Brush Facilities, among which is an expected access route consisting of a paved road approximately 38 feet from the nearest sensitive Off-Reservation receptor: a receiving property line of an occupied private land use under County jurisdiction.

As presented in Table 2.6-4, noise levels at this nearest sensitive receptor on private lands are anticipated to reach 83 dBA due to access road paving as part of the Boulder Brush Facilities, which exceeds the San Diego County limit of 75 dBA $L_{eq(8h)}$. Construction noise levels at all other studied receptor locations, both on private lands and the Reservation Boundary, would not exceed the San Diego County limit of 75 dBA $L_{eq(8h)}$.

Table 2.6-6 presents noise predictions at nearest potential On-Reservation receptors (i.e., at the nearest Reservation Boundary) for the same construction activities specific to the Boulder Brush Facilities as listed in Table 2.6-4. No predicted values in Table 2.6-6 exceed the FTA-based guidance limit of 80 dBA $L_{eq(8h)}$ that would apply on these potential On-Reservation noise-sensitive receptors.

Because predicted construction noise would exceed the San Diego County limit of 75 dBA $L_{eq(8h)}$ at the receiving property line of a single NSLU on private lands, construction noise impacts for the Boulder Brush Facilities would be **potentially significant (Impact N-1)**.

Campo Wind Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), predictive modeling based on FHWA RCNM algorithms and reference data was used to estimate construction noise levels for construction phases related to the Campo Wind Facilities. While construction of the Campo Wind Facilities would only occur inside the Campo Corridor, noise impacts associated with Campo Wind Facilities construction were assessed both On- and Off-Reservation to account for noise potentially spilling outside the Reservation Boundary. Table 2.6-4 presents estimated noise levels at the Reservation Boundary adjoining private lands under County jurisdiction, and at receiving property lines of Off-Reservation NSLUs from Campo Wind Facilities construction phases for nearest source-to-receptor distances. Table 2.6-5 presents predicted Campo Wind Facilities construction noise level predictions at 120-foot, 0.25-mile, and 0.5-mile distances to nearest On-Reservation NSLUs.

As presented in Tables 2.6-4 and Table 2.6-5, the highest noise levels are predicted to occur during clearing, grading, and construction of access roads. However, Table 2.6-4 demonstrates that predicted Campo Wind Facilities construction noise would be compliant with the County-required 75 dBA $L_{eq(8h)}$ threshold at the nearest property lines of existing Off-Reservation NSLUs, and Table 2.6-5 exhibits predicted Campo Wind Facilities construction noise levels at potential On-Reservation nearest NSLU distances that are compliant with the FTA-based guidance limit of 80 dBA $L_{eq(8h)}$ that would apply on these potential On-Reservation NSLUs. For these reasons, the On-Reservation construction noise associated with Campo Wind Facilities development at these On-Reservation and Off-

Reservation NSLU is not expected to exceed either the County limit of 75 dBA $L_{eq(8h)}$ at an Off-Reservation NSLU or the FTA 80 dBA L_{eq8hr} guidance-based criterion at an On-Reservation NSLU and construction noise impacts associated with On-Reservation work would be considered a **less-than-significant impact**.

Impulsive Construction Noise

Project

Potential impulsive noise sources associated with construction activities include rock crushing and blasting. The blasting and rock crushing activities could occur during the clearing, grading, and construction of access roads for the Campo Wind Facilities within the Campo Corridor. No blasting activities would occur outside of the Campo Corridor.

As analyzed in the Acoustical Analysis Report (Appendix G), intermittent noises due to blasting events and rock crushing processes are predicted to be less than the County impulse noise threshold of 82 dBA L_{25} at the nearest expected NSLU, either on private lands or On-Reservation, and impacts would therefore be considered **less than significant**.

Boulder Brush Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), no blasting would occur Off-Reservation. No NSLU located Off-Reservation would experience impulse noises exceeding the County impulse noise threshold of 82 dBA L_{25} . As such, impacts would be **less than significant**.

Campo Wind Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), intermittent noises due to blasting events and rock crushing processes are predicted to be less than the County impulse noise threshold of 82 dBA L_{25} at the nearest expected NSLU, either on private lands or On-Reservation, and impacts would therefore be considered **less than significant**.

Construction Traffic Noise

Project

Construction noise would be generated by workers commuting to and from the job site, and from deliveries of construction materials and Project components. The estimated 1,122 daily worker trips for the Campo Wind Facilities and 288 daily worker trips for Boulder Brush Facilities, both using Interstate 8 and State Route 94 to access the Project Site, are much lower than existing traffic volumes on these major roadways and would thus not

cause a doubling of the existing traffic (and correspondingly significant 3 dB increase in traffic noise). Since no such traffic doubling is anticipated, the Project's contribution to traffic noise during Project construction would be **less than significant**.

Boulder Brush Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), the Project's contribution to traffic noise during Project construction would be less than significant. It follows that because construction of the Boulder Brush Facilities would be less intensive than construction of the entire Project, construction traffic noise impacts associated with the Boulder Brush Facilities alone would be **less than significant**.

Campo Wind Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), the Project's contribution to traffic noise during Project construction would be less than significant. It follows that because construction of the Campo Wind Facilities would be less intensive than construction of the entire Project, construction traffic noise impacts associated with the Campo Wind Facilities alone would be **less than significant**.

Operation

Project

County General Plan (60 dBA CNEL)

The County General Plan limits the noise level from the Project to 60 dBA CNEL (or 10 dBA greater than the existing CNEL) at the exterior living area of a NSLU. Table 2.6-7 shows the modeled CNEL results, varying by average wind speed at wind-turbine hub height, at representative receptors located in the Project Vicinity. The LT locations shown in Table 2.6-7 are the measurement locations from the Project Vicinity baseline noise level survey.

Figure 2.6-2, Operational 60 dBA CNEL Noise Contour by Average Hub-Height Wind Speed, shows sets of 60 dBA CNEL contour lines, corresponding with average wind speed at wind-turbine hub height above grade, for the operation of Project turbines. At position LT-10, where the measured baseline CNEL was 48 dBA, the corresponding impact significance guidance would be this value plus 10 dB (i.e., equal to 58 dBA CNEL) consistent with Section 4.1.A.ii of the County guidelines. Hence, per the predicted aggregate turbine operation noise level at LT-10, the County guideline would not be exceeded at average wind speeds greater than 10 meters per second (m/s). Furthermore, there is currently no existing NSLU in the vicinity of LT-10 on private lands under County jurisdiction. In light of these conditions, noise impacts with respect to these County CNEL guidelines at the exteriors of NSLU would be **less than significant**.

County Noise Ordinance 36.404

Noise thresholds for operational activities are regulated through the County's Noise Ordinance, Noise Abatement and Control. Section 36.404 includes sound level limits for non-construction-related stationary noise sources (i.e., 1-hour average sound level limits for the Project's operational-related noise sources) such as Project wind turbines.

The allowable noise limits depend upon the zoning district and time of day. The 1-hour average sound level limits for residential zoned areas with a density of 11 or less dwelling units per acre is 50 dB from 7:00 a.m. to 10:00 p.m., and 45 dB from 10:00 p.m. to 7:00 a.m. If the measured ambient noise level exceeds the applicable limit previously noted, the allowable 1-hour average noise levels shall be the ambient noise level.

Assuming Project turbines at all 76 identified turbine sites, Table 2.6-8 shows modeled hourly noise levels, varying by average wind speed at wind turbine hub height, from Project turbines during daytime and nighttime periods, and a determination of exceedances with respect to the County hourly limits. Values in Table 2.6-8 that are bold and italicized show where the County exterior daytime hourly limit (50 dBA L_{eq}) would be exceeded under the indicated average wind speed; and, underlined values are those where the nighttime limit (45 dBA L_{eq}) would be exceeded.

Figure 2.6-3, Operational 50 dBA L_{eq} Noise Contour by Average Hub-Height Wind Speed, shows the daytime hourly 50 dBA L_{eq} operational noise contour lines, varying by average wind speed at wind turbine hub height, for the operation of Project turbines. Figure 2.6-4, Operational 45 dBA L_{eq} Noise Contour by Average Hub-Height Wind Speed, shows similar noise contours, but instead with respect to the County's nighttime hourly 45 dBA L_{eq} threshold. These figures show some areas where predicted sound levels greater than or equal to these thresholds extend beyond the Reservation Boundary into private lands within County jurisdiction, such as locations near LT-1, LT-10, LT-11, LT-12, and LT-13. As presented in Table 2.6-8, predicted turbine noise levels spilling off the Reservation into private lands would exceed the County ordinance requirements on private lands within the County near representative Project property line location LT-1, and due north of LT-12.

As such, operational wind turbine noise impacts would be **potentially significant (Impact N-A)**, as Project wind turbines would generate noise levels that exceed County Ordinance 36.404.

County Zoning Ordinance Section 6952 Large Wind Turbine

As detailed in Appendix G, CadnaA (the commercially available sound propagation modeling software program) was used to predict the OBCF spectral content of the Campo

Wind Facilities aggregate operating wind turbine noise at and beyond the Reservation Boundary. This predicted spectral data was used to determine, over private lands within County jurisdiction that adjoin the Reservation Boundary, the potential low frequency noise impacts in terms of L_{eq1h} dBC compared with an RBSC (i.e., average measured hourly $L_{90} + 5$ dB). Assuming wind turbines at all 76 identified turbine sites, Table 2.6-9 shows the predicted dB differentials at each indicated study location. Bold italicized values in Table 2.6-9 show under what wind conditions the expected difference between the C-weighted predicted level and the RBSC is greater than 20 dB. The RBSC for the three studied locations in Table 2.6-9 are shown in the Addendum and range from 37 to 50 dBA.

For purposes of illustration, Figure 2.6-5, Operational Noise Contours: $LC_{eq} - RBSC = 20$ dB by Average Hub-Height Wind Speed, conservatively shows the contour lines, for different average hub-height wind speeds, where the differential between the predicted wind turbine operations C-weighted noise and an A-weighted RBSC of 37 dBA (the lowest of the three studied locations presented in Table 2.6-9) exceeds 20 dB. This graphical hypothetical scenario is considered conservative because it applies the RBSC value of 37 dBA everywhere to describe the existing environment in the Project Vicinity.

As presented in Table 2.6-9, C-weighted aggregate hourly L_{eq} is expected to be greater than the RBSC value at the Reservation Boundary near representative location LT-1, and due northeast of LT-10. As such, operational wind turbine noise impacts would be **potentially significant (Impact N-B)**, as wind turbines would generate noise levels that exceed County standards.

EPA Exterior Noise Standard

Adoption of EPA guidance sets 55 dBA L_{dn} as the operation noise threshold at On-Reservation NSLU. Table 2.6-10 shows the predicted L_{dn} results, per indicated average wind speed at hub height above grade, at representative receptor positions at and within the Reservation Boundary. As On-Reservation NSLU locations have not been disclosed in this analysis in order to respect tribal resident privacy, the tagged positions in Table 2.6-10 (and as appearing on Figure 2.6-1) are intended to represent potential residential or otherwise noise-sensitive areas for purposes of this analysis. Bold italicized values occur when the predicted level exceeds 55 dBA.

Among a number of NSLUs shown in Table 2.6-10 where predicted L_{dn} exceeds the guidance-based threshold of 55 dBA when average wind speeds are 8 m/s or greater, the NSLU represented by LT-9 is located within 0.25-mile of five Project turbines. After respecting a 0.25-mile setback distance required by the Campo Lease between any NSLU and a Project turbine, certain turbine locations (among the 76 sites evaluated) would not be

constructed; therefore, the predicted operations noise level at LT-9 without the specified nearby turbines would likely remain less than the 55 dBA L_{dn} guidance-based threshold even under 10 m/s (or greater) average wind speeds over a 24-hour period.

Figure 2.6-6, Operational 55 dBA L_{dn} Noise by Average Hub-Height Wind Speed, illustrates the predicted 55 dBA L_{dn} iso-levels (i.e., “noise contours”) due to modeled operational Project wind turbines at different average wind speeds received at the turbine hub height above grade.

High-Voltage Substation and 500 kV Switchyard

As presented in the Addendum to Appendix G of this EIR, operation noise from the high-voltage substation and 500 kV switchyard are predicted to produce less than 20 dBA L_{eq} at a distance of 13,200 feet from the closest potential NSLU to the southwest. At this noise level, the noise impact associated with the high-voltage substation and switchyard would be considered **less than significant**.

Gen-Tie Transmission Lines

Aboveground electrical transmission lines associated with the Project may produce corona noise during normal operation. Research by the Electric Power Research Institute (EPRI) suggests that the fair-weather audible noise from modern transmission lines is generally indistinguishable from background noise at the edge of a right-of-way (ROW) of 100 feet or more (CEC 2009). For instance, a study for the Tri-Valley project calculated 25 dBA at the ROW for a 230 kV transmission line (CPUC 1999). This previous finding is consistent with estimated audible corona noise levels presented in the Addendum to Appendix G of this EIR. Even under weather conditions that would moisten or wet the conductor surfaces, the resulting noise from the gen-tie transmission line would only be audible at very close distances. Therefore, impacts would be **less than significant**.

Boulder Brush Facilities

The closest Off-Reservation NSLU within the jurisdiction of the County would be located approximately 13,200 feet from the high-voltage substation and switchyard. At this distance, the expected sound pressure level from continuous operation of the high-voltage substation transformers would be less than 20 dBA L_{eq} and hence be expected to result in a less than significant effect.

The Off-Reservation aboveground electrical transmission lines associated with the Boulder Brush Facilities may produce corona noise during normal operation, but even under weather conditions that would moisten or wet the conductor surfaces, the resulting noise

both On-Reservation and Off-Reservation would only be audible at very close distances and therefore would not result in an adverse effect. Please refer to Section III of the Addendum to Appendix G of this EIR, which provides a detailed analysis of potentially audible corona noise using an industry-accepted prediction technique. Figure 2.6-7, Off-Reservation Boulder Brush Facilities Transmission Line Audible Corona Noise – Rainy Conditions, depicts predicted Off-Reservation audible noise (AN) from corona effects of electricity conducted by the transmission line during rainy conditions. At a level of 24 dBA L_{eq} under such conditions, this predicted region of gen-tie line corona noise from the Boulder Brush Facilities is far from the nearest NSLU under County jurisdiction. As such, impacts would be **less than significant**.

The Boulder Brush Facilities are expected to include two 150-kilowatt (kW) emergency generators: one at the high-voltage substation and one at the switchyard. Although operation of such systems are generally exempt from noise regulations and standards during actual emergencies, they need to be regularly tested to ensure they perform when needed. Testing is anticipated to be during daytime hours and for a 30-minute period per month, and such daytime (between 7:00 a.m. and 7:00 p.m.) generator testing is exempt from San Diego County noise limits per Section 36.417 (a)(5). Assuming each generator was comparable to a Cummins DGFA model with a “Level 1” enclosure, the reference sound emission level would be 77 dBA at a distance of 23 feet (Cummins 2008). At a distance of 13,200 feet, the nearest On-Reservation NSLU, the expected 1-hour noise exposure level would be less than 10 dBA and thus result in a **less-than-significant** impact. At a distance of 13,200 feet, the nearest Off-Reservation NSLU under County jurisdiction, the expected 1-hour noise exposure level would also be less than 10 dBA and thus would result in a **less-than-significant** impact.

Campo Wind Facilities

Operational turbine and Campo Wind Facilities -attributed traffic noise levels were predicted at On-Reservation NSLUs and Reservation Boundary positions to assess where an EPA-based guideline exterior noise standard of 55 dBA L_{dn} would be exceeded. Predicted Campo Wind Facilities-related operating turbine noise levels vary from 44 dBA to 65 dBA L_{dn} at the identified NSLUs listed in Table 2.6-10. At one modeled location (LT-9), predicted operational noise levels exceed the 55 dBA L_{dn} guideline but includes the proximity of five Project turbines located within 0.25-mile of the represented NSLU. When including consideration that Project turbines cannot be sited within 0.25-mile of any residential structure or tribal building On-Reservation, modelled noise levels would be no greater than 55 dBA at sensitive receptors, which would not exceed the dBA L_{dn} guidance-based threshold even under 10 m/s (or greater) average wind speeds over a 24-hour period. However, even if the potential impact at LT-9 was reduced to a less than significant level due to compliance with the Campo Lease, Table 2.6-10

shows the potential—under this 76-turbine studied wind turbine operation scenario—for average hub-height wind speed of 10 m/s to cause operational noise impacts at up to five other represented locations, including LT-1, LT-2, LT-5, LT-8, and LT-10. On this basis, impacts to potential NSLUs on the Reservation in the proximity of these five modeled areas due to the Campo Wind Facilities would be **potentially significant (Impact N-C)**.

Given the potential for operational turbine noise associated with the Campo Wind Facilities on the Reservation to spill outside the Reservation Boundary, operational noise impacts have been assessed for NSLUs on private lands as well. As discussed in preceding paragraphs, operational turbine noise associated with the Campo Wind Facilities on the Reservation would exceed daytime and nighttime dBA L_{eq} thresholds outlined in the County Noise Ordinance for NSLUs on private lands due to spillover noise spilling outside the Reservation Boundary. Additionally, operational Project turbine C-weighted aggregate hourly L_{eq} is expected to be greater than the RBSC, per County standards, for NSLUs on private lands. As such, operational turbine noise impacts associated with the Campo Wind Facilities would be **potentially significant (Impact N-A and Impact N-B)**.

On-Reservation NSLUs may be proximate to the collector substation, which would feature a single 35 kV/230 kV transformer (for purposes of this analysis, a continuous source of noise emission as compared to other Project ancillary systems and equipment within the Campo Corridor that may only produce noise intermittently). At a source-to-receptor distance of at least 300 feet from this transformer, the expected sound pressure level would be less than 48 dBA L_{eq} , which converted to an L_{dn} value would be less than 55 dBA (the EPA recommended exterior noise level for sensitive receptors) and thus result in a noise impact that would be considered **less than significant**.

The collector substation is expected to include an emergency generator rated at 150 kW. Although operation of such a back-up power system is generally exempt from noise regulations and standards during actual emergencies, it needs to be regularly tested to ensure mission-critical performance when needed. Testing is anticipated to be during daytime hours and for a 30-minute period once a month. Assuming it is comparable to a Cummins DGFA model with a “Level 1” enclosure, the reference sound emission level would be 77 dBA at a distance of 23 feet (Cummins 2008). At an On-Reservation source-to-receptor distance of at least 300 feet from this operating generator, the expected sound pressure level would be less than 47 dBA L_{eq} for the single hour, which converted to an L_{dn} value would be less than 33 dBA (the EPA recommended exterior noise level for sensitive receptors) and thus result in a noise impact that would be considered **less than significant**.

The Campo Wind Facilities operations and maintenance (O&M) facility is anticipated to feature an enclosed structure with air conditioning to provide interior comfort for occupants

and electrical control equipment. Such expected components suggest a need for regular, continuous operation of refrigeration units with one or more rooftop air-cooled condenser units having individual sound emission levels of 74 dBA at 3 feet (Johnson Controls 2010). For purposes of this analysis, during hot summer months, a quantity of these rooftop units may be operating and would thus produce an aggregate noise level of less than 48 dBA L_{eq} at the nearest On-Reservation NSLU. Hence, for this continuous noise level under such conditions, which converted to an L_{dn} value would be less than 55 dBA (the EPA-recommended exterior noise level for sensitive receptors), potential noise impacts from operation of the O&M Facility HVAC system would be considered **less than significant**.

The O&M Facility is also expected to include an emergency generator rated at 150 kW. Although operation of such a back-up power system is generally exempt from noise regulations and standards during actual emergencies, it needs to be regularly tested to ensure mission-critical performance when needed. Testing is anticipated to be during daytime hours and for a 30-minute period once a month. Assuming it is comparable to a Cummins DGFA model with a “Level 1” enclosure, the reference sound emission level would be 77 dBA at a distance of 23 feet (Cummins 2008). At the nearest On-Reservation NSLU to this operating generator, the expected sound pressure level would be less than 69 dBA L_{eq} for the single hour, which converted to an L_{dn} value would be less than 55 dBA (the EPA-recommended exterior noise level for sensitive receptors) and thus result in a noise impact that would be considered **less than significant**.

2.6.3.2 Analysis of Groundborne Vibration or Groundborne Noise Levels

- b) *Would the project result in generation of excessive groundborne vibration or groundborne noise levels?*

Analysis

Conventional Construction Activities

Project

As detailed in the Acoustical Analysis Report (Appendix G), the nearest vibration-sensitive receptors to Project conventional construction activities for either On-Reservation or Off-Reservation work would be residences to the east of Ribbonwood Road, located approximately 300 feet from the nearest roadway improvement work. At a distance of 300 feet, vibration levels from a roller are anticipated to be less than 0.005 inches per second ppv from construction activities at these nearest receptors: the actual occupied structures. As this vibration level is far less than the aforementioned 0.2 inches per second ppv threshold (FTA 2006), the impact would be considered **less than significant**.

Boulder Brush Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), vibration impacts associated with conventional construction activities for the Project would be less than significant. Thus, it follows that because the construction of the Boulder Brush Facilities would be less intensive than the construction of the Project, vibration impacts associated with conventional construction activities for the Boulder Brush Facilities would be **less than significant**.

Campo Wind Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), vibration impacts associated with conventional construction activities and blasting activities for the Project would be less than significant. Thus, because the construction of the Campo Wind Facilities would be less intensive than the construction of the Project, vibration impacts associated with conventional construction activities for the Campo Wind Facilities would be **less than significant**.

Blasting Activities

Project

Assuming heavily confined per-detonation charge weights of up to 2.4 pounds each would be needed to prepare the foundations of the Project wind turbines, the Acoustical Analysis Report (Appendix G) predicts that a blast event at a distance of 1,030 feet from a sensitive Off-Reservation NSLU would generate groundborne vibration of 0.02 inches per second ppv. As this expected value is less than the 0.2 inches per second ppv threshold, the corresponding impact would be considered **less than significant**.

Since the Campo Lease requires that Project turbines (and their corresponding foundations where blasting may occur) must be at least 0.25-mile from any On-Reservation residential structure or tribal building, the predicted vibration would be (due to larger source-to-receptor distance than 830 feet) less than the afore-stated 0.02 inches per second, and the corresponding impact would be considered **less than significant**.

Boulder Brush Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), no blasting activities would be required for construction of the Boulder Brush Facilities. Therefore, there would be **no impact** from potential blasting vibration impacts associated the Boulder Brush Facilities.

Campo Wind Facilities

As discussed above and detailed in the Acoustical Analysis Report (Appendix G), vibration impacts associated with blasting activities for the Project would be less than significant. Thus, it follows that because the construction of the Campo Wind Facilities would be less intensive than the construction of the entire Project, vibration impacts associated with blasting activities impacts for the Campo Wind Facilities would be **less than significant**.

Operational Activities

Project

No operational activities associated with the Project would produce ground-borne vibrations; therefore, **no impact** would occur.

Boulder Brush Facilities

No operational activities associated with the Boulder Brush Facilities would produce ground-borne vibrations; therefore, **no impact** would occur.

Campo Wind Facilities

No operational activities associated with the Campo Wind Facilities would produce ground-borne vibrations; therefore, **no impact** would occur.

2.6.3.3 Analysis of Exposure of People to Excessive Aviation Noise

- c) *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 2 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?*

Analysis

Project

The closest private airstrip to the Project Site is Reider Ranch Airport, which is a local private jet airport located approximately 18 miles west of the Project Site; therefore, the Project is not located within the vicinity of a private airstrip and no potential noise impacts would occur. The closest public airport to the Project Site is Jacumba Airport located approximately 9 miles away. Therefore, the Project is not located within an airport land use plan or within 2 miles of a public airport or public use airport, and no potential noise impacts would occur.

Boulder Brush Facilities

As discussed above, the Project is not located within an airport land use plan or within 2 miles of a public airport or public use airport, and no potential noise impacts would occur.

Campo Wind Facilities

As discussed above, the Project is not located within an airport land use plan or within 2 miles of a public airport or public use airport, and no potential noise impacts would occur.

2.6.4 Cumulative Impact Analysis

EPA L_{dn} Guidance Limit

To assess for cumulatively considerable impacts at NSLUs within the Reservation, an additional noise model was created that included other nearby existing operating turbines (Kumeyaay, and to a lesser degree the single wind turbine associated with the Golden Acorn Casino) and proposed future (e.g., Torrey Wind) vicinity wind turbines to assess the cumulative impact the Project would have in acoustical combination with other wind turbines in the Project Vicinity. Acoustical contributions from the currently operating Tule Wind turbines were, due to their average distance from the Project, considered part of the measured existing outdoor ambient level. Logarithmically added together, the cumulative projects (e.g., Torrey Wind) and measured existing (Kumeyaay+Tule and other existing noise sources, such as roadways) are represented in Table 2.6-11 as a total (albeit excluding the Project) “cumulative + Existing” L_{dn} for comparison with the predicted Project operations L_{dn} value.

The test for cumulatively considerable in this analysis context is grounded in acoustical principles: when there are two sound sources (in this case, “cumulative + existing” and “predicted Project”) contributing to the combined level at a receptor, there can only be two possibilities:

1. They are acoustically equivalent, which means their logarithmic sum yields a value that cannot be more than 3 dB higher than the value of either contributor; or,
2. One of them is acoustically greater than the other, which therefore requires their logarithmic sum yields a combined dB value that must be at least 3 dB higher than the lesser of the two acoustical contributors.

For representative location LT-9 shown in Table 2.6-11, the predicted Project operations noise is the larger of the two acoustical contributors to the “future” logarithmic sum and is cumulatively considerable because its adverse effect is to cause the combined future noise level to exceed the EPA guidance limit. As such, cumulative impacts at LT-9 as modeled the 76 turbine locations in operation scenario are **potentially significant (Impact N-CU-A)**. At the other listed locations, the

predicted Project noise level is either not greater than the cumulative + existing level, or its acoustical contribution is not sufficient to result in an adverse effect when compared to the EPA guidance standard.

County CNEL Limits

To assess for cumulatively considerable impacts at NSLUs on private lands, an additional noise model was created that included other existing (e.g., Kumeyaay and Tule) and proposed future (Torrey Wind) vicinity wind turbines to assess the cumulative impact the Project would have in acoustical combination with these other acoustical contributors in the Project vicinity. Table 2.6-12 shows the CNEL results of the cumulative noise model for the 76-turbine Project scenario, and no studied receptor locations at boundaries with private land featuring NSLU exceed the 60 dBA CNEL County threshold. Thus, the Project's cumulative impact would be **less than significant**.

2.6.5 Significance of Impact Prior to Mitigation

2.6.5.1 Exceedance of an Applicable Standard

Construction

Conventional Construction Noise

Project

Construction noise impacts for the Project would be **potentially significant (Impact N-1)**.

Boulder Brush Facilities

Construction noise impacts for the Boulder Brush Facilities would be **potentially significant (Impact N-1)**.

Campo Wind Facilities

Construction noise impacts associated with the Campo Wind Facilities would be **less than significant**.

Impulse Construction Noise

Project

Intermittent noises due to blasting events and rock crushing processes for the Project are predicted to be **less than significant**.

Boulder Brush Facilities

Intermittent noises due to blasting events and rock crushing processes for the Boulder Brush Facilities are predicted to be **less than significant**.

Campo Wind Facilities

Intermittent noises due to blasting events and rock crushing processes for the Campo Wind Facilities are predicted to be **less than significant**.

Construction Traffic Noise

Project

The Project's contribution to traffic noise during Project construction would be **less than significant**.

Boulder Brush Facilities

Construction traffic noise impacts associated with the Boulder Brush Facilities would be **less than significant**.

Campo Wind Facilities

Construction traffic noise impacts associated with the Campo Wind Facilities would be **less than significant**.

Operation

Project

For Off-Reservation NSLU within the Project Vicinity, operational Project wind turbine noise would not exceed the 60 CNEL threshold outlined in the County General Plan. As such, impacts would be less than significant in this regard. However, operational Project wind turbine noise would exceed daytime and nighttime dBA L_{eq} thresholds outlined in the County Noise Ordinance. Additionally, operational aggregate wind turbine C-weighted hourly L_{eq} is expected to be greater than the RBSC threshold, per County standards. As such, operational wind turbine noise impacts associated with the Campo Wind Facilities on the Reservation would be **potentially significant (Impact N-A and Impact N-B)**.

Boulder Brush Facilities

Operation of the Boulder Brush Facilities would have a **less than significant** noise impact.

Campo Wind Facilities

Operational Project wind turbine noise impacts would be **significant and unavoidable** as modeled with the 76-turbine scenario, since operational wind turbine noise associated with the Campo Wind Facilities would result in **potentially significant (Impact N-C)** impacts at On-Reservation NSLUs based on exceedance of the EPA-based standard.

At two studied Off-Reservation NSLUs, operational wind turbine noise would exceed daytime and nighttime dBA L_{eq} thresholds outlined in the County Noise Ordinance. Additionally, operational aggregate wind turbine C-weighted hourly L_{eq} is expected to be greater than the RBSC value (average measured L_{90} plus 5 dB) threshold, per County standards. As such, operational Project wind turbine noise impacts would be **potentially significant (Impact N-A and Impact N-B)**.

2.6.5.2 Groundborne Vibration and Groundborne Noise Levels

Conventional Construction Activities

Project

Groundborne vibration and noise impacts associated with conventional construction activities for the Project would be **less than significant**.

Boulder Brush Facilities

Groundborne vibration and noise impacts associated with conventional construction activities for the Boulder Brush Facilities would be **less than significant**.

Campo Wind Facilities

Groundborne vibration and noise impacts associated with conventional construction activities for the Campo Wind Facilities would be **less than significant**.

Blasting Activities

Project

Groundborne vibration and noise impacts associated with blasting activities for the Project would be **less than significant**.

Boulder Brush Facilities

No blasting activities would occur during construction of the Boulder Brush Facilities; therefore, **no impact** from groundborne vibration and noise would result.

Campo Wind Facilities

Groundborne vibration and noise impacts associated with blasting activities for the Campo Wind Facilities would be **less than significant**.

Operational Activities

Project

No operational activities associated with the Project would produce ground-borne vibrations; therefore, **no impact** would occur.

Boulder Brush Facilities

No operational activities associated with the Boulder Brush Facilities would produce ground-borne vibrations; therefore, **no impact** would occur.

Campo Wind Facilities

No operational activities associated with the Campo Wind Facilities would produce ground-borne vibrations; therefore, **no impact** would occur.

2.6.5.3 Exposure of People to Excessive Aviation Noise

Project

No noise impacts relating to aviation noise would occur for the entire Project Area.

Boulder Brush Facilities

No noise impacts relating to aviation noise would occur for the Boulder Brush Boundary.

Campo Wind Facilities

No noise impacts relating to aviation noise would occur for the Reservation Boundary.

2.6.5.4 Cumulative Impacts

EPA L_{dn} Guidance Limit

Cumulative noise impacts with regard to the L_{dn} Guidance Limit would be **potentially significant (Impact N-CU-A)**.

County CNEL Limits

Cumulative noise impacts with regard to County CNEL limits would be **less than significant**.

2.6.6 Mitigation Measures

The mitigation measures below are provided to reduce impacts associated with noise to the extent feasible. The mitigation provided below shall be required to address impacts identified on private lands within the jurisdiction of the County as part of its Major Use Permit approval. The County has no ability to require mitigation for impacts occurring on or emanating from activity on the Reservation but refers the reader to the EIS for the Project, which contains the noise mitigation measures summarized below to be implemented to mitigate impacts occurring on or emanating from activities on the Reservation. BIA can and should include these measures as a requirement of approval and the record of decision.

M-N-1 Construction Noise Best Management Practices for Activities on Private Land.

- Ensure that all construction equipment driven or powered by internal combustion engines shall be equipped with a factory-approved or recommended muffler. If traffic control and construction signs that require power for lighting or flashing are located near residences, the source of power should be batteries, solar cells, or another quiet source.
- Where and when construction activity is expected to occur within 200 feet of an Off-Reservation noise-sensitive land use (NSLU) and/or along the segment of Ribbonwood Road from the intersection of Opalocka Road to the entrance to the Boulder Brush Boundary, provide the owner/occupant at least 24 hours advance notice of anticipated construction schedule and activities. Information should include a contact phone number so that noise concerns can be brought to the contractor's attention.
- Restrict the use of engine exhaust compression braking (a.k.a. "jake braking") on all trucks.

- All stationary construction equipment (especially pieces that are expected to operate frequently, or in a continuous or otherwise “steady-state” manner) should be located as far as practicable from NSLUs.
- Vehicles should observe limitations on duration of engine idling, as defined by applicable standards (e.g., air quality regulations and policies).
- For roadway improvements to Ribbonwood Road, which would benefit members of the community that use this roadway, the Project applicant or its contractors shall apply for a variance per Sections 36.423 through 36.427 of the San Diego County Code. This variance, granted after review and approval by the County’s designated noise control officer, provides a means for “non-emergency work on a public right-of-way, public utility facility, public transportation facility or some other project for the benefit of the general public” to temporarily deviate from the 75 dBA $L_{eq(8hr)}$ construction noise standard per 36.409 of the County Noise Ordinance.

2.6.7 Conclusion

2.6.7.1 Exceedance of an Applicable Standard

Construction

As discussed in Section 2.6.5.1, construction noise impacts, including conventional construction noise, impulse construction noise, and construction traffic noise, would be less than significant for all parts of the Project throughout all parts of the Project Site, with the exception of conventional construction noise impacts for construction of the Project on private land (**Impact-N-1**), and by extension, construction noise impacts for the Project throughout the entire Project Vicinity.

As discussed in Section 2.6.3, predicted construction noise levels at the nearest sensitive Off-Reservation receptor are anticipated to reach 83 dBA due to the paving of an access road as part of the Boulder Brush Facilities, which exceeds the County limit of 75 dBA $L_{eq(8h)}$. Implementation M-N-1 would require, among other construction best management practices, the application for and granting of a variance, as allowed by Section 36.423 of the County’s noise ordinance, when these access road improvements would be expected to occur within 100 feet of the property line of an occupied parcel under County jurisdiction. Upon implementation of **M-N-1**, noise emission from the roadway improvement activities would be allowed to temporarily deviate from the 75 dBA $L_{eq(8hr)}$ County threshold. Therefore, with implementation of **M-N-1**, all construction noise impacts for the Project Vicinity would be **less than significant**.

Operation

Project

As discussed in Section 2.6.5.1, for Off-Reservation existing NSLUs within the Project Vicinity, operational Project wind turbine noise would not exceed the 60 CNEL threshold (or 10 dB above the existing outdoor CNEL) outlined in the County General Plan and would thus be less-than-significant impacts. However, operational Project wind turbine noise would exceed daytime and nighttime dBA L_{eq} thresholds outlined in the County Noise Ordinance for NSLU on private land. Additionally, operational aggregate wind turbine C-weighted hourly L_{eq} is expected to be greater than the RBSC threshold by 20 dB, per County standards, for NSLUs on private land. As such, operational wind turbine noise impacts associated with the Campo Wind Facilities on the Reservation would be **potentially significant (Impact N-A and Impact N-B)**.

As discussed in the Acoustical Analysis Report (Appendix G), this noise analysis conservatively predicted noise as if all 76 identified turbine sites featured an operating turbine. Due to the parameters of the aforementioned Campo Lease, which only authorizes 60 turbines to be constructed for the Project, there is an opportunity for reduced noise exposure at one or more of these studied representative locations. Final Project turbine layout may offer potential reduction of predicted aggregate sound pressure level at Off-Reservation NSLUs due to their increased distance from one or multiple operating turbines. The quantifiable effect of such a layout would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to existing turbines, and the pre-existing outdoor ambient sound level. Nonetheless, because the Campo Wind Facilities would be located outside of the jurisdiction of the County, the County would not have authority to require a site layout that reduces these operational impacts to below a level of significance or to impose other feasible mitigation measures. As such, operational noise impacts associated with the Project would remain **significant and unavoidable (Impact N-A and Impact N-B)**. In addition, based on the 76 identified wind turbine locations, **Impact N-C** would be significant and unavoidable; however, the lease allows for only 60 turbines and requires a 0.25-mile distance from any On-Reservation residential structure or tribal building, which would address this impacts as described in the BIA's EIS.

Boulder Brush Facilities

Operational noise impacts associated with the Boulder Brush would be **less than significant**.

Campo Wind Facilities

Operational wind turbine noise impacts associated with the Campo Wind Facilities would be **potentially significant (Impact N-C)** on the Reservation, as five studied representative On-Reservation NSLUs would experience operational noise levels in excess of the EPA-based exterior noise level standard (55 dBA L_{dn}).

For NSLUs on private lands, operational wind turbine noise would exceed daytime and nighttime dBA L_{eq} thresholds outlined in the County Noise Ordinance. Additionally, operational aggregate wind turbine C-weighted hourly L_{eq} is expected to be greater than the RBSC by 20 dB, per County standards, for NSLUs on private land. As such, operational wind turbine noise impacts associated with the Campo Wind Facilities on the Reservation would be **potentially significant and unavoidable (Impact N-A and Impact N-B)**.

As discussed in the Acoustical Analysis Report (Appendix G), this noise analysis conservatively predicted noise as if all 76 identified turbine sites featured an operating turbine. Due to the parameters of the aforementioned Campo Lease, which only authorizes 60 turbines to be constructed for the Project, there is an opportunity for reduced noise exposure at one or more of these studied representative locations. Final Project turbine layout may offer potential reduction of predicted aggregate sound pressure level at Off-Reservation NSLUs due to their increased distance from one or multiple operating turbines. The quantifiable effect of such a layout would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to existing turbines, and the pre-existing outdoor ambient sound level. Nonetheless, because the Campo Wind Facilities would be located outside of the jurisdiction of the County, the County would not have authority to require a site layout that reduces these operational impacts to below a level of significance or to impose other feasible mitigation. As such, operational noise impacts associated with the Project but would remain **significant and unavoidable (Impact N-A and Impact N-B)**. Based on the 76 identified turbine locations, **Impact N-C** would be significant and unavoidable; however, the Campo Lease allows for only 60 turbines and requires a 0.25-mile setback from any On-Reservation residential structure or tribal building, which would address this impact as described in the BIA-prepared EIS.

2.6.7.2 Groundborne Vibration and Groundborne Noise Levels

During construction, vibration from conventional construction activities and blasting activities associated with the Project would be **less than significant**. No operational activities associated with the Project would produce ground-borne vibrations; therefore, **no impact** would occur.

2.6.7.3 Exposure of People to Excessive Aviation Noise

The Project Site does not lie within any of the calculated noise contours and does not propose any land uses that would be considered an NSLU; therefore, **no impact** would occur in this regard for the Project.

2.6.7.4 Cumulative Impacts

EPA L_{dn} Guidance Limit

As discussed above in Section 2.6.4, predicted cumulative noise levels would exceed EPA-based L_{dn} Guidance Limits, and would be **potentially significant (Impact N-CU-A)**.

As discussed in the Acoustical Analysis Report (Appendix G), this noise analysis conservatively predicted noise as if all 76 identified turbine sites featured an operating turbine. Due to the parameters of the aforementioned Campo Lease, which only authorizes 60 turbines to be constructed for the Project, there is an opportunity for reduced cumulative noise exposure at one or more of these studied representative locations. Final Project turbine layout may offer potential reduction of predicted cumulative noise levels at Off-Reservation NSLU due to their increased distance from one or multiple operating turbines. The quantifiable effect of such a layout would depend on the turbine locations based on final engineering, the existing NSLU location, its current proximity to existing turbines, and the pre-existing outdoor ambient sound level. Nonetheless, because the Campo Wind Facilities would be located outside of the jurisdiction of the County, the County would not have authority to require a site layout that reduces these cumulative impacts to below a level of significance. As such, cumulative noise impacts would remain **significant and unavoidable (Impact N-CU-A)**.

County CNEL Limits

Cumulative noise impacts with regard to County CNEL limits would be **less than significant**.

Table 2.6-1
Comparison of A-Weighting and C-Weighting Adjustments

Octave Band Center Frequency (Hz)	A-weighting (dB)	C-weighting (dB)
31.5	-39.4	-3
63	-26.2	-0.8
125	-16.1	-0.2
250	-8.6	0
500	-3.2	0
1,000	0	0
2,000	+1.2	-0.2
4,000	+1.1	-0.8
8,000	-1.1	-3.0

Source: Engineering Toolbox 2003.
Notes: Hz = hertz; dB = decibels.

Table 2.6-2
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
—	110	Rock band
Jet flyover at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	80	Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area; heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quiet urban, daytime	50	Large business office; dishwasher next room
Quiet urban, nighttime	40	Theater; large conference room (background)
Quiet suburban, nighttime	30	Library
Quiet rural, nighttime	20	Bedroom at night; concert hall (background)
—	10	Broadcast/recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2013.

Note: dB = decibels.

Table 2.6-3
San Diego County Noise Ordinance Sound Level Limits

Zone	Time	1-Hour Average Sound Level Limits (dBA)
RS, RD, RR, RMH, A70, A72, S80, S81, S90, S92, RV, and RU with a General Plan Land Use Designation density of less than 10.9 dwelling units per acre.	7:00 a.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
RRP, RC, RM, S86, FB-V5, RV and RU with a general Plan Land Use Designation density of 10.9 or more dwelling units per acre.	7:00 a.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
S94, FB-V4, AL-V2, AL-V1, AL-CD, RM-V5, RM-V4, RM-V3, RM-CD and all commercial zones.	7:00 a.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	55
FB-V1, FB-V2, RM-V1, RM-V2	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 7:00 a.m.	55
FB-V1, RM-V2	10:00 p.m. to 7:00 a.m.	55
FB-V2, RM-V1	10:00 p.m. to 7:00 a.m.	50
FB-V3	7:00 a.m. to 10:00 p.m.	70
	10:00 p.m. to 7:00 a.m.	65
M50, M52, and M54	Anytime	70
S82, M56, and M58	Anytime	75
S88	—	—

Notes: dBA = A-weighted decibels; RS, RD, RM, RR, RU, RV, RRO, RMH, RU = residential uses; A70, A72 = agricultural uses; S80, S81, S82, S87, S90 = open space uses, ecological resource areas, or holding area uses; S92 = general rural uses; RC = residential/commercial uses; S86 = parking uses; V1, V2, V3, V4, V5 = village uses; M50, M52, M54, M56, M58 = manufacturing and industrial uses; S88 = special planning area uses; FB = Fallbrook; RM = Ramona; AL = Alpine.

Table 2.6-4
Predicted Construction Noise Modeling Summary Results at Off-Reservation Receptors

Construction Phase (or specific equipment/process)	Distance to Nearest Receptor (feet)	8-hour L_{eq} (dBA)	Receptor Note
Campo Wind Facilities – Clearing and grading	320	67	A
Campo Wind Facilities – Construction of access roads	250	63	B
Campo Wind Facilities – Wind turbine foundation construction	585	55	C
Campo Wind Facilities – Wind turbine erection	585	61	C
Campo Wind Facilities – Construction of underground electrical collection system	585	60	C
Campo Wind Facilities – Construction of collector substation	1970	46	D
Campo Wind Facilities – Gen-tie line foundation construction and tower erection	200	63	E
Campo Wind Facilities – Gen-tie line stringing and pulling	315	54	E
Campo Wind Facilities – Operations and maintenance facility	1,390	44	F
Campo Wind Facilities – Meteorological towers	250	60	G
Campo Wind Facilities – Temporary concrete batch plant	320	54	H
Boulder Brush Facilities – High-voltage substation and switchyard	13,200	31	I
Boulder Brush Facilities – Clearing and grading	13,000	34	I
Boulder Brush Facilities – Unpaved construction access roads	200	72	J
Boulder Brush Facilities – Gen-tie line foundation construction and tower erection	2,500	40	K
Boulder Brush Facilities – Gen-tie line stringing and pulling	2,400	36	K
Boulder Brush Facilities – Paving of switchyard access road	38	83	L

Notes: Off-Reservation = outside the 16,000-acre Campo Band of Diegueño Mission Indians Reservation; L_{eq} = equivalent energy level; dBA = A-weighted decibels.

- A Center of construction activity to Reservation Boundary that adjoins Assessor's Parcel Number (APN) 65804005
- B Construction activity to northeast corner of APN 60811004
- C Center of construction activity to Reservation Boundary that adjoins APN 61005016
- D Center of construction activity to Reservation Boundary that adjoins APN 60918224
- E Construction activity to Reservation Boundary that adjoins APN 60916102
- F Construction activity to Reservation Boundary that adjoins APN 60905023
- G Undetermined location, but no new disturbance area (thus, along any planned access road)
- H Center of construction activity to Reservation Boundary that adjoins APN 65804005
- I Construction activity to northern property line of APN 61102005
- J Construction activity to northwest corner of APN 61102006
- K Construction activity to northwest corner of APN 61102005
- L Centerline of roadway construction activity to western property line of APN 61106101

Table 2.6-5
Predicted Campo Wind Facilities Construction Noise Modeling
Summary Results at On-Reservation Receptors

Construction Phase (or specific equipment/process)	8-hour L_{eq} (dBA) at 100 feet	8-hour L_{eq} (dBA) at 1,320 feet	8-hour L_{eq} (dBA) at 2,640 feet
Campo Wind Facilities – Clearing and grading	77	55	49
Campo Wind Facilities – Construction of access roads	71	48	42
Campo Wind Facilities – Wind turbine foundation construction	NA	48	42

Table 2.6-5
Predicted Campo Wind Facilities Construction Noise Modeling
Summary Results at On-Reservation Receptors

Construction Phase (or specific equipment/process)	8-hour L_{eq} (dBA) at 100 feet	8-hour L_{eq} (dBA) at 1,320 feet	8-hour L_{eq} (dBA) at 2,640 feet
Campo Wind Facilities – Wind turbine erection	NA	54	48
Campo Wind Facilities – Construction of underground electrical collection system	NA	52	46
Campo Wind Facilities – Construction of collector substation	72	49	43
Campo Wind Facilities – Gen-tie line foundation construction and tower erection	68	45	39
Campo Wind Facilities – Gen-tie line stringing and pulling	64	41	35
Campo Wind Facilities – Operations and maintenance facility	67	44	38
Campo Wind Facilities – Meteorological towers	68	45	39
Campo Wind Facilities – Temporary concrete batch plant	64	42	36

Notes: L_{eq} = equivalent energy level; dBA = A-weighted decibels; NA = not applicable.

Table 2.6-6
Predicted Boulder Brush Facilities Construction Noise Modeling
Summary Results at Reservation Boundary

Construction Phase (or Specific Equipment/Process)	Distance to Nearest Reservation Boundary (feet)	8-hour L_{eq} (dBA)
Boulder Brush Facilities – High-voltage substation and switchyard	10,400	33
Boulder Brush Facilities – Clearing and grading	120	77
Boulder Brush Facilities – Unpaved construction access roads	120	79
Boulder Brush Facilities – Gen-tie line foundation construction and tower erection	120	68
Boulder Brush Facilities – Gen-tie line stringing and pulling	300	54
Boulder Brush Facilities – Paving of switchyard access road	6,000	37

Notes: L_{eq} = equivalent energy level; dBA = A-weighted decibels.

Table 2.6-7
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels (CNEL)

Receptor ID	Predicted CNEL (dBA) at Indicated Average Wind Speed						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	≥10 m/s
LT-1	46	46	50	53	56	58	59
LT-10	45	45	48	52	55	57	58
LT-13	38	38	41	45	48	50	51

Notes: CNEL = Community Noise Equivalent Level; dBA = A-weighted decibels; m/s = meters per second.

Table 2.6-8
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels (Hourly L_{eq})

Receptor ID	Predicted Hourly L_{eq} (dBA) at Indicated Average Wind Speed						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	≥10 m/s
LT-1	39	39	43	<u>46</u>	<u>49</u>	52	53
LT-10	38	38	42	45	<u>48</u>	<u>50</u>	51
LT-13	31	31	35	38	41	43	44

L_{eq} = equivalent energy level; dBA = A-weighted decibels; m/s = meters per second; underlined values indicate where the nighttime limit (45 dBA L_{eq}) would be exceeded; *BI* = bold/italic values indicate where the County exterior daytime hourly limit (50 dBA L_{eq}) would be exceeded.

Table 2.6-9
Predicted Aggregate Project Wind Turbine Noise Levels: dBC minus RBSC

Receptor ID	Predicted Hourly L_{eq} (dBC) minus (RBSC) at Indicated Average Wind Speed						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	≥10 m/s
LT-1	14	14	17	20	23	26	27
LT-10	16	16	19	22	25	28	29
LT-13	6	6	9	12	15	18	19

Notes: dBC = C-weighted decibels; RBSC = Residual Background Sound Criterion; L_{eq} = equivalent energy level; m/s = meters per second; *BI* = bold/italic values indicate under what wind conditions the expected difference between the C-weighted predicted level and the RBSC is greater than 20 dB.

Table 2.6-10
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels – On-Reservation

Receptor ID	Predicted L_{dn} (dBA) at Indicated Average Wind Speed						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	≥10 m/s
LT-1	46	46	49	53	56	58	59
LT-2	43	43	47	50	53	56	56
LT-3	40	41	44	48	50	53	54
LT-4	42	42	46	49	52	55	55
LT-5	44	45	48	52	55	57	58
LT-6	31	31	35	38	41	43	44
LT-7	32	33	36	40	43	45	46
LT-8	43	43	47	50	53	55	56
LT-9	52	52	56	59	62	65	65
LT-10	44	45	48	52	54	57	58
LT-11	38	39	42	46	49	51	52
LT-12	34	35	38	42	45	47	48
LT-13	37	37	41	44	47	50	51

Notes: L_{dn} = day/night sound level; dBA = A-weighted decibels; m/s = meters per second; *BI* = bold/italic values indicate when the predicted level exceeds 55 dBA.

Table 2.6-11
Predicted Future Cumulative Noise Levels due to Project Operation

Receptor ID	Cumulative + Existing L _{dn} (dBA) ^a	Predicted Project Operations L _{dn} (dBA) ^b	Cumulative + Existing Plus Predicted Project L _{dn} (dBA) ^c	Cumulative Impact Caused by Project?
LT-1	51	53	55	No
LT-2	49	50	53	No
LT-3	59	48	59	No
LT-4	51	49	53	No
LT-5	54	52	56	No
LT-6	51	38	51	No
LT-7	67	40	67	No
LT-8	52	50	54	No
LT-9	56	59	61	Yes
LT-10	50	52	54	No
LT-11	62	46	62	No
LT-12	53	42	53	No
LT-13	50	44	51	No

Notes: L_{dn} = day/night sound level; dBA = A-weighted decibels.

^a Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.

^b Predicted Project Operations is from Table 2.6-10, at an average wind speed of 7 meters per second (m/s).

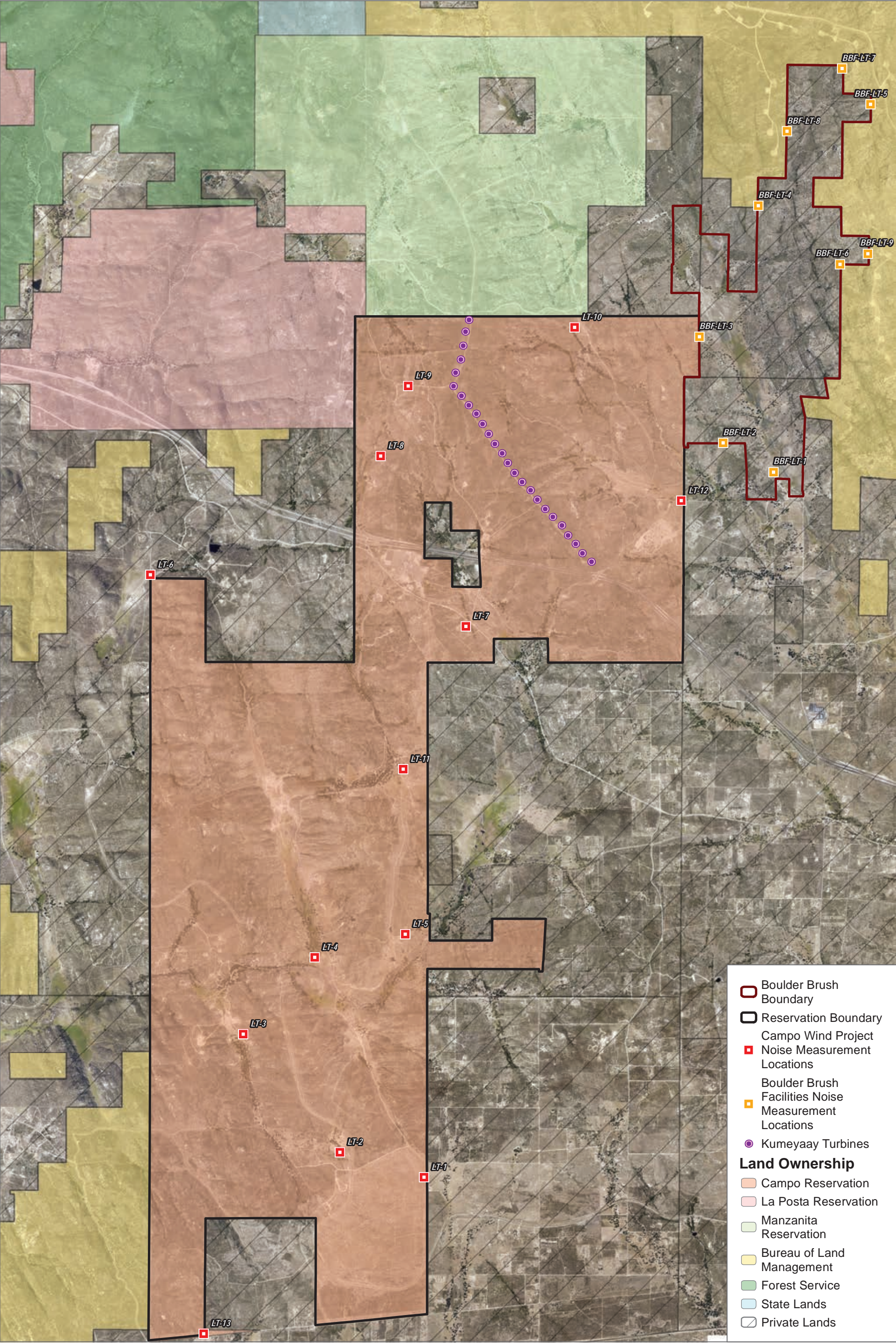
^c This value is the logarithmic sum of Cumulative + Existing and Predicted Project, or what could be called a "future" outdoor ambient noise level.

Table 2.6-12
Predicted Cumulative Noise Levels from Project Operation

Receptor ID	Cumulative + Existing CNEL (dBA) ^a	Cumulative + Existing Plus Project Modeled CNEL (dBA)	Over 60 dBA CNEL Threshold and Cumulative Impact?
LT1	52	60	No
L10	50	59	No
L13	51	54	No

Notes: CNEL = Community Noise Equivalent Level; dBA = A-weighted decibels.

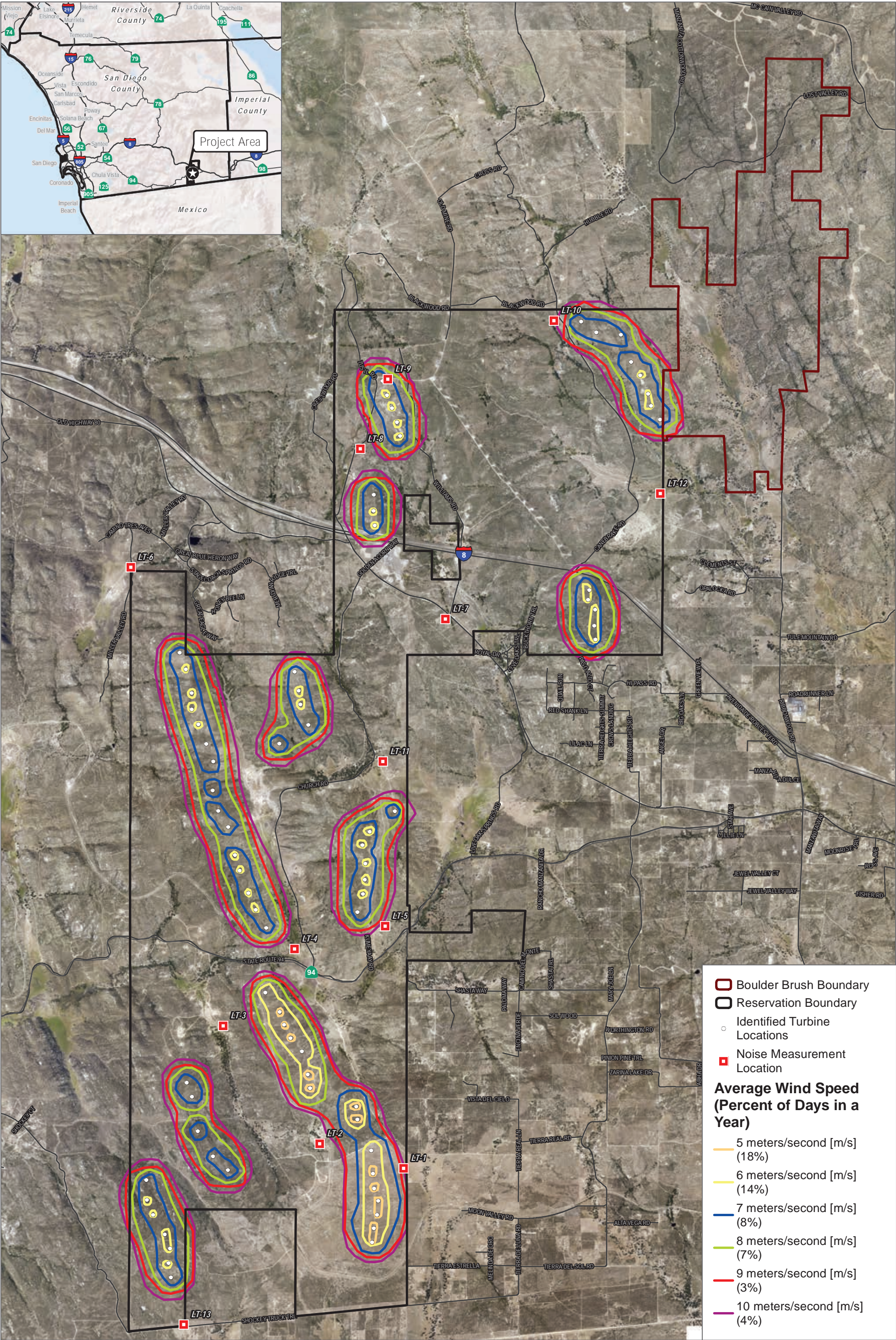
^a Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.



SOURCE: SANGIS 2017

FIGURE 2.6-1
Noise Measurement Locations
Campo Wind Project with Boulder Brush Facilities

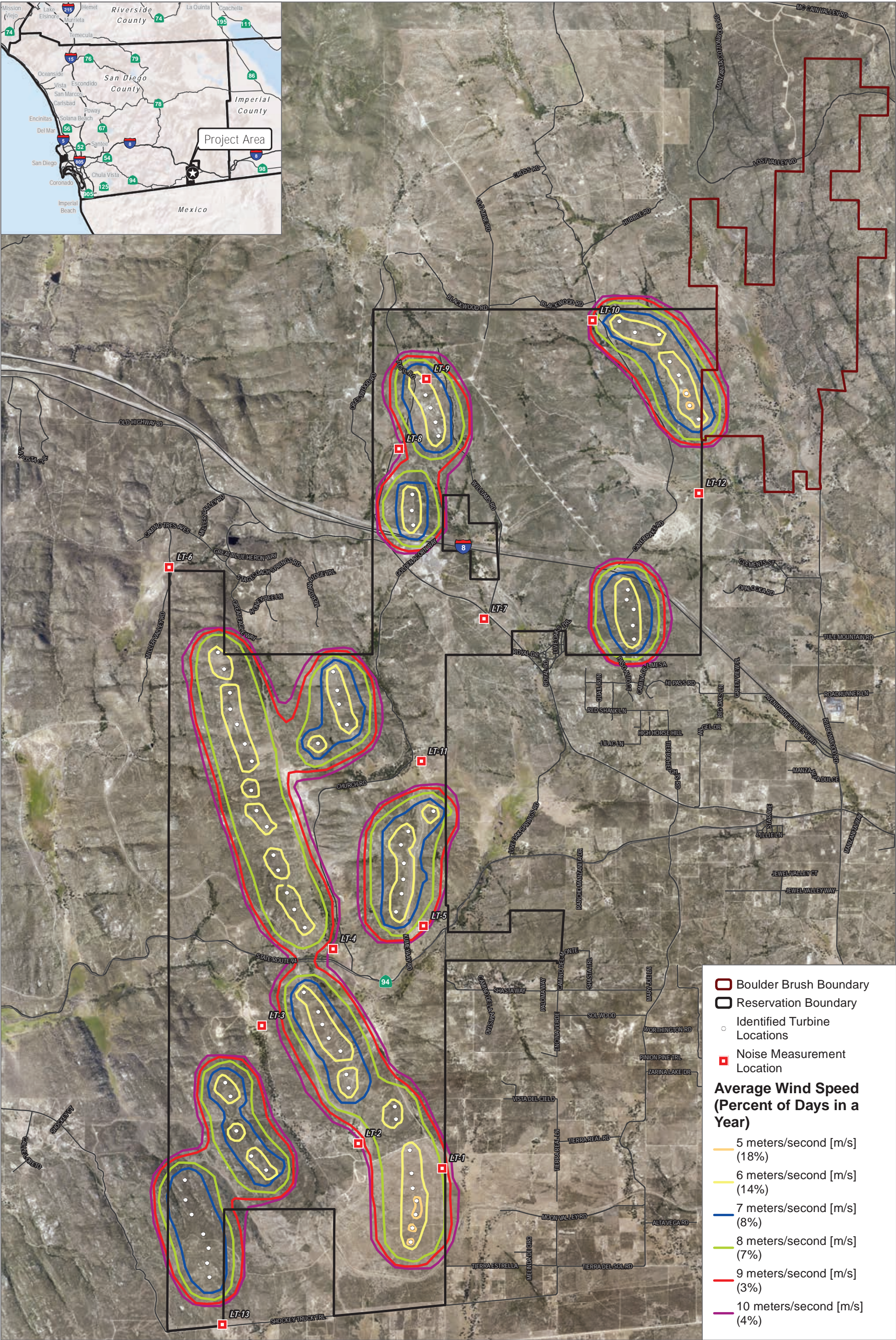
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SOURCE: SANGIS 2017

FIGURE 2.6-2
Operational 60 dBA CNEL Noise Contour by Average Hub-height Wind Speed
Campo Wind Project with Boulder Brush Facilities

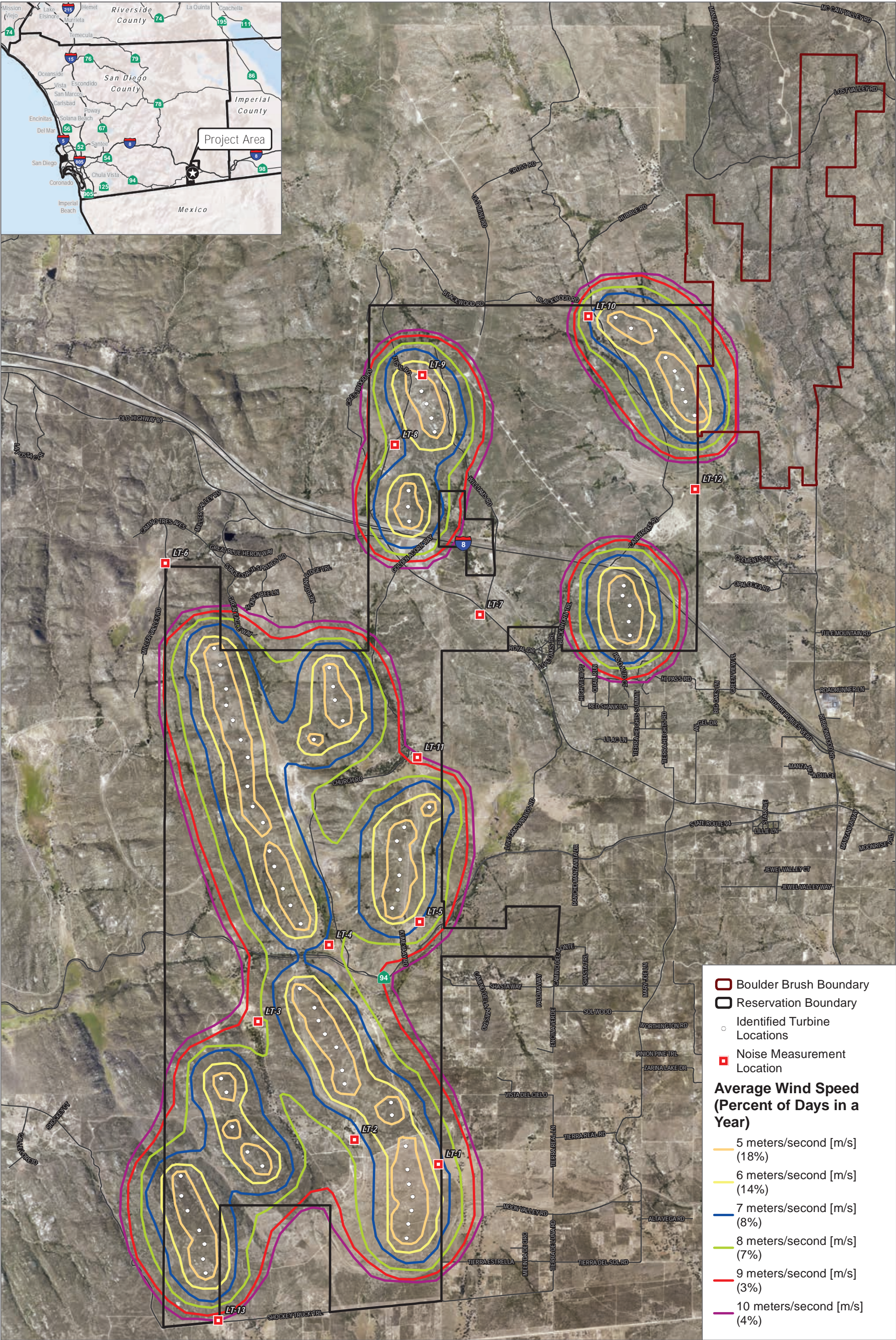
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SOURCE: SANGIS 2017

FIGURE 2.6-3
Operational 50 dBA Leq Noise Contour by Average Hub-height Wind Speed
Campo Wind Project with Boulder Brush Facilities

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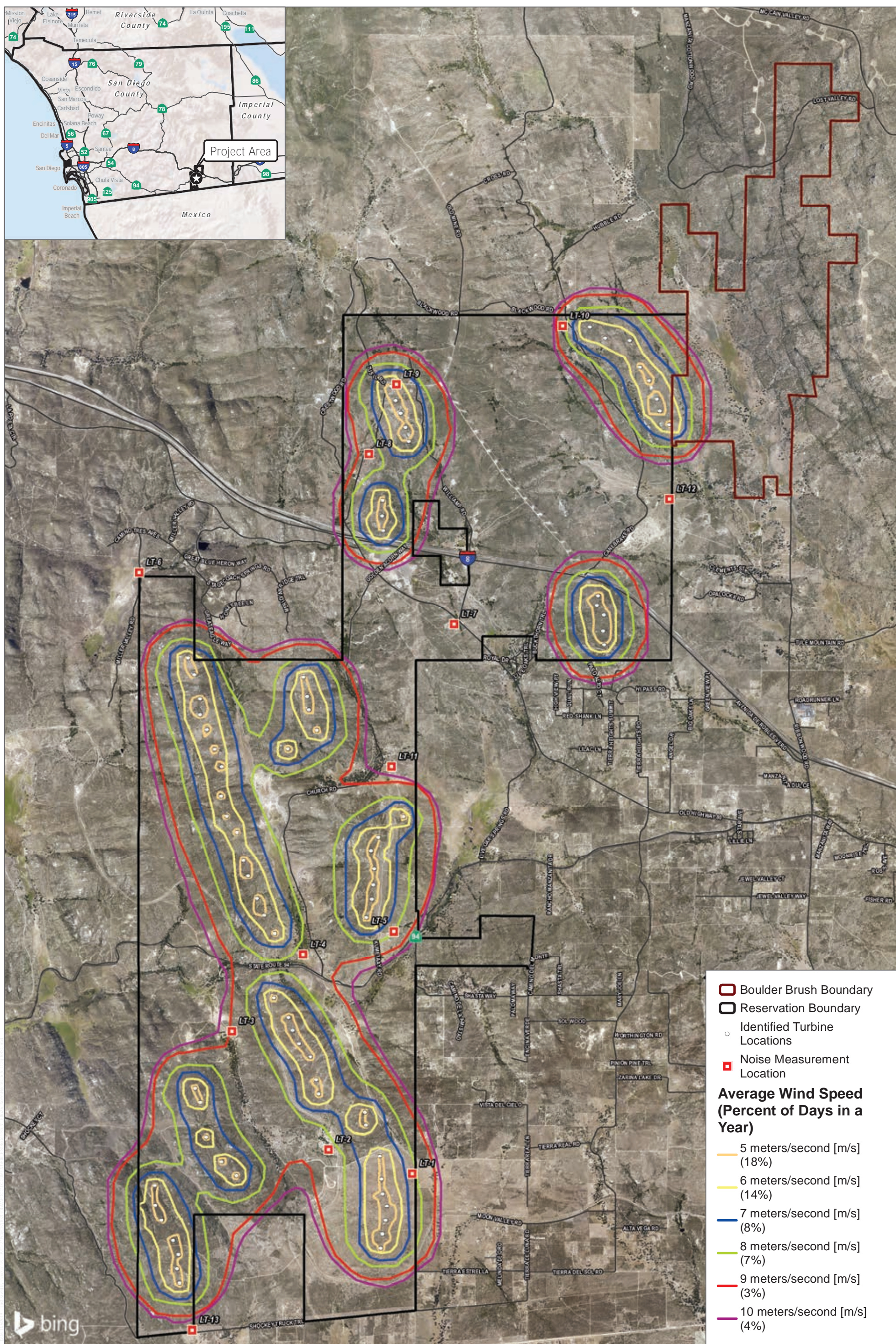
SOURCE: SANGIS 2017

DUDEK

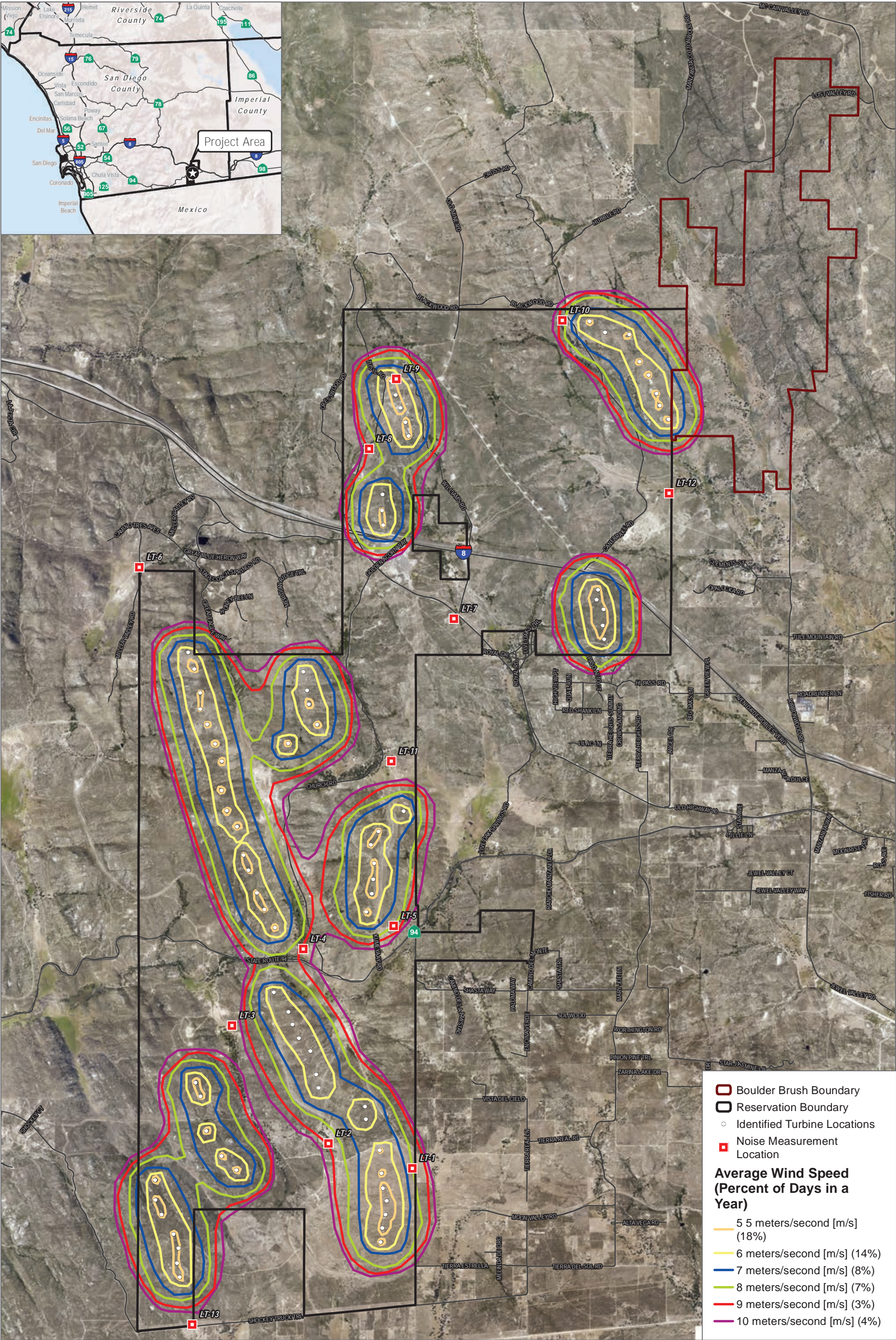
0 1,800 3,600 Feet

FIGURE 2.6-4
Operational 45 dBA Leq Nighttime Noise Contour by Average Hub-height Wind Speed
Campo Wind Project with Boulder Brush Facilities

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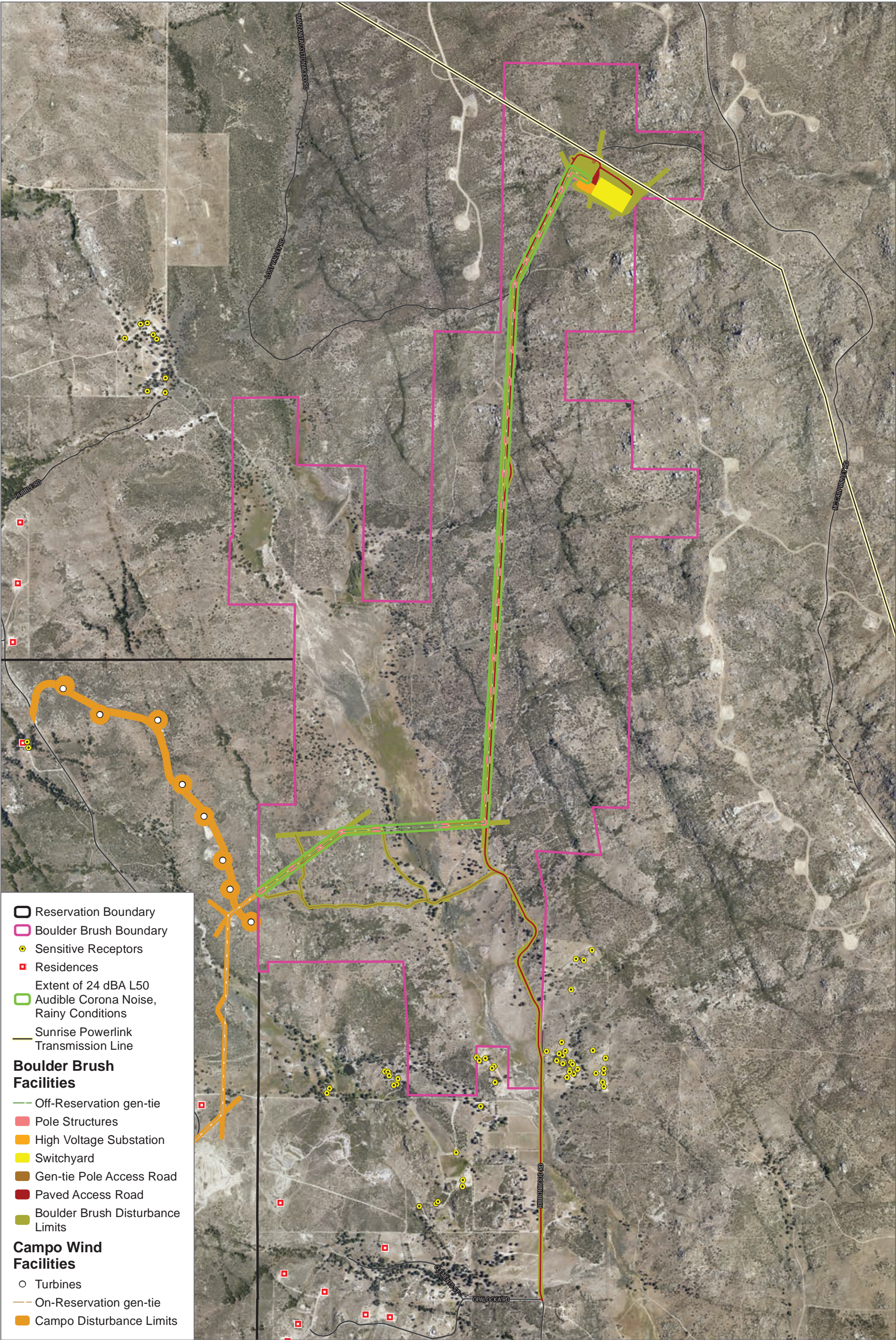
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SOURCE: SANGIS 2017

FIGURE 2.6-6
Operational 55 dBA Ldn Noise by Average Hub-height Wind Speed
Campo Wind Project with Boulder Brush Facilities

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SOURCE: SANGIS 2017

FIGURE 2.6-7
Off-Reservation Boulder Brush Facilities Transmission Line Audible Corona Noise - Rainy Conditions
Campo Wind Project with Boulder Brush Facilities

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