APPENDIX K

Acoustical Analysis Report

DRAFT

Acoustical Analysis Report for the Campo Wind Project with Boulder Brush Facilities

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SUMMARY

Dudek has prepared this noise study for the Project to evaluate exterior noise and vibration impacts associated with construction and operation of the Project.

The primary existing noise source within the Project Area, which includes the Reservation and private land parcels through which the Boulder Brush Facilities extend, is local vehicular traffic. Other existing noise sources include noise from landscaping maintenance activities. Sound from birds and other fauna, rustling leaves, distant conversations and other human activities, aircraft overflights, and operation of electro-mechanical systems (including HVAC, agricultural equipment, pumps, and wind turbine generators) in the Project Area 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. An outdoor ambient noise level survey was conducted in the Project Area to establish existing (a.k.a., baseline) noise levels at representative receiver locations. Based on 24-hour sound level monitoring data, the existing day/night noise level (Ldn) measured at representative positions along the Project boundaries ranged from 44 A-weighted decibels (dBA) to 67 dBA.

Project operation would create new stationary noise emission sources on the Reservation in the form of operating wind turbines ("turbines"), the collector substation transformers, O&M building activities and HVAC, aboveground transmission lines, and maintenance and inspection activities across the Project site. For purposes of this analysis, the aggregate noise emission from 76 possible turbine locations was predicted and assessed for potential impacts to proximate noise-sensitive land uses (NSLUs). However, only 60 turbine locations would be constructed per the Campo Lease. Therefore, while this analysis potentially overstates effects at some NSLUs, it provides the reader a conservative "worst-case" for consideration. By way of example, some proposed possible turbine positions cannot be utilized on the basis of being located within 0.25 miles of a pre-existing residence (which qualifies as an NSLU and for which modeled locations (LTs) are intended to be representative of) and thus are considered incompatible with the terms and conditions of the Campo Lease.

Operational turbine and Project-attributed traffic noise levels were predicted for all 76 possible turbine locations at On-Reservation NSLU areas and Reservation Boundary positions to assess where an EPA-based guideline exterior noise standard of 55 dBA Ldn would be exceeded. Predicted Project-related operating turbine noise levels vary from 44 dBA to 65 dBA Ldn at these identified NSLU areas. At one modeled location (LT-9), predicted operational noise levels exceed the 55 dBA Ldn guideline but includes the proximity of five turbine sites located within 0.25 miles of the represented NSLU.

With the 0.25-mile minimum screening distance respected between any residence and a possible turbine site, the expected exterior sound level at a residence exposed to noise from one operating turbine (at maximum sound emission) should not exceed 49 dBA equivalent continuous sound level (Leq) during the daytime. Each additional operating turbine in 0.25-mile proximity to the same NSLU would cause a logarithmic addition of sound energy to the total noise level; for instance, two turbines at 0.25 miles would yield a predicted level of 52 dBA Leq, and three would yield 54 dBA Leq. As another example, a residence located 0.25 miles perpendicular distance from the midpoint of a "string" or line of five operating turbines would probably experience an outdoor level of 53 dBA Leq—louder than two turbines each 0.25 miles distant from the receptor, but quieter than three equidistant to the receptor because the turbines at the far ends of the string are more distant from the residence.

With respect to potential cumulative project effects, several On-Reservation representative locations would see cumulatively considerable contribution from Project turbine operation for both the 76-turbine case (Alternative 1) and 48-turbine case (Alternative 2) under average wind speeds that generate maximum turbine noise emission. When these average wind speeds are less (e.g., 7 m/s), fewer occurrences of cumulatively considerable effect can be expected..

With respect to the Boulder Brush Facilities on private lands and its spillover noise that extends beyond the Reservation boundary, the operation noise from the aggregate of Project wind turbines is expected to comply with County General Plan expectations (60 dBA CNEL) at NSLU located Off-Reservation.

With respect to the County's daytime and nighttime hourly Leq limits per noise ordinance 36.404, predicted turbine noise level spillover would exceed them at and beyond the Project property line locations LT-1 (as representative of noise levels at the Reservation boundary that adjoin private lands under County jurisdiction) and LT-10, when average wind speeds are greater than 7 meters per second (m/s) and 8 m/s, respectively. When wind speeds at hub height are less than these values, noise emission levels near these two locations should be compliant with the County's daytime and nighttime hourly standards.

For operating Project turbine spillover noise beyond the Reservation Boundary, consideration is afforded with respect to the County's WET Guidelines. C-weighted aggregate hourly Leq is expected to be greater than the average measured A-weighted L90 by 25 dB or more near representative Project property line locations LT-1 and LT-10 when average wind speeds are at least 8 m/s and 9 m/s, respectively.

Representing a Project boundary line position abutting private lands to the north of the Project within County jurisdiction, location LT-10 is predicted to experience a cumulatively considerable effect, with the predicted Project contribution causing the cumulative noise level to exceed 56 dBA CNEL by 2 dB under wind conditions that generate the maximum turbine noise levels. At a lower average wind speed, such as 8 m/s or less, the predicted cumulative noise level at LT-10 would be 56 dBA CNEL and thus comply with the 56 dBA CNEL threshold applicable at that representative location.

Noise generated from the operating Boulder Brush Facilities, O&M building, and Project maintenance and inspection activities would not be expected to result in increases of the existing outdoor ambient level greater than 10 dBA at nearest NSLU; hence, adverse noise effects from these sources are not anticipated. Thus, the Project would not result in adverse effects related to a substantial increase in ambient noise.

Operational noise levels from the high-voltage substation are predicted to be no louder than 20 dBA Leq at the closest NSLU—approximately 1,400 feet away—and are not expected to produce adverse effects. Audible corona noise from the Off-Reservation gen-tie line would not cause adverse effects. 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).

For all but the closest identified sensitive receptor at a distance of only 80 feet from roadway improvement activities, predicted construction noise would not exceed the San Diego County limit of 75 dBA Leq(8h) at the closest Off-Reservation NSLU. Best management practices for controlling noise emission from construction activities, which could include temporary barrier placement, are recommended as a mitigation measure (MM-NOI-1, Construction Noise Best Management Practices) to help ensure consistency with prediction parameters and help keep construction noise at County-jurisdiction NSLU to levels consistent with the 75 dBA Leq(8h) regulation.

Project-related construction traffic noise and construction vibration are expected to not produce adverse effects on NSLUs On-Reservation and off-Reservation with implementation of recommended MM-NOI-1.

For On-Reservation NSLUs, the highest noise levels are predicted to occur during clearing, grading, and construction of access roads when noise levels from construction activities would be as high as 75 dBA equivalent continuous sound level (Leq) at the nearest existing residences. During other phases of construction work and more typically, the noise levels would range from approximately 45 to 74 dBA Leq at the nearest noise sensitive receptors. Since these construction activities would not be expected to generate short-term noise levels greater than 80 dBA Leq at existing NSLUs, the construction noise at these On-Reservation receptors is not expected to exceed the Federal Transit Administration's 80 dBA Leq(8hr) noise level criteria and would not be considered an adverse effect.

Special, impulse-producing construction activities (blasting, rock drilling, rock crushing) are expected to comply with the County impulse noise standard (82 dBA maximum sound level (Lmax)), and thus not yield adverse effects for distant Off-Reservation NSLUs.

1 INTRODUCTION

Dudek has prepared this noise study for the Campo Wind Project with Boulder Brush Facilities (collectively, the "Project"), evaluating construction and operation exterior noise and groundborne vibration effects on known pre-existing and potentially sensitive receptors in the Project Area and the surrounding environment.

The proposed action consists of Bureau of Indian Affairs (BIA) approval of a 25-year lease of land (with the possibility of a 13-year extension) between the Campo Band of Diegueño Mission Indians (Tribe) and Terra-Gen Development Company LLC (Terra-Gen), the developer, on the Campo Indian Reservation (Reservation) (Campo Lease). The proposed action would authorize the Campo Lease, allowing Terra-Gen to develop, construct, operate, maintain and ultimately decommission a renewable energy generation facility (Campo Wind Facilities) on land within the Reservation. The Project consists of both the Campo Wind Facilities located on land within the Reservation (Campo Wind Project) and the Boulder Brush Facilities which are located on adjacent private lands. Throughout this document, the term "On-Reservation" refers to anything within the Reservation Boundary while the term "Off-Reservation" refers to anything outside of the Reservation Boundary, including the Boulder Brush Boundary (See Appendix E, Figure 1-1). Additional details regarding the Project components and construction can be found in Appendix B, Project Description Details, to this Draft EIS. The Campo Lease would allow Terra-Gen to develop and operate a wind energy project capable of generating approximately 252 megawatts (MW) of electricity.

The Project Site is located within southeastern San Diego County, California (see Figure 1, Project Location). The Project Site is on the Campo Band of Diegueño Mission Indians Reservation (Reservation) and private land. The Project Site is largely undeveloped ranch land, a portion of which is grazed by cattle, and is surrounded by rural residential homes and ranches scattered throughout the region.

This report conservatively analyzes noise from the operation of 76 possible Project turbine locations, of which only 60 would be used for turbine installation per the Campo Lease. The Campo Lease provides: "the base of any wind turbine tower shall not be installed on the Leased Property within one-quarter (1/4) of a mile of any residential structure or tribal building existing as of the date that this Wind Lease is made, dated and entered into."

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2 PROJECT DESCRIPTION

The Project is primarily located on the Reservation, which is over 16,000 acres in area and includes lands both north and south of Interstate (I) 8 along the Tecate Divide, extending south from the Manzanita Indian Reservation to approximately 0.25 miles north of the U.S./Mexico International Border (Figures 1-1 and 1-2 (see Appendix E)). The Reservation is in the vicinity of the communities of Boulevard, Jacumba, and Live Oak Springs, and is bisected by Church Road.

Additional detail regarding the Project components and phasing is provided in Appendix B to the Draft Environmental Impact Statement (EIS). Eventual decommissioning would occur at the end of the Project's useful life cycle.

The BIA is considering three alternatives for the Project, including a "no-build" alternative. The development footprint of the Project, under either of the build alternatives, would be confined to the minimal area necessary for construction and safe and reliable operation. The Project was carefully designed to avoid impacts to key resources, including protected species, jurisdictional waters, and cultural resources. Development of new access roads would be limited to the maximum extent possible. Table 1 provides a summary of the components common to all build alternatives.

Table 1
Summary of Project Components

Project Component	Description
Access roads	Approximately 25 miles of new roads that would range from 25 to 40 feet wide during construction and that would be reduced to 16 feet wide post-construction.
Wind turbine generators (WTG)	Up to sixty (60) WTG, each rated for up to 4.2 megawatts (MW) of electricity production.
Electrical Collection and Communication System	Approximately 28 miles of underground cables.
Collector substation	A collector substation to collect the energy generated and transform it from 34.5 kilovolts (kV) to 230 kV. The structure would be 190 feet by 190 feet with a parking area.
Generator transmission (gen-tie) lines	Approx. 5 miles of 230 kV overhead gen-tie lines and associated pole structures.
Operations and maintenance (O&M) facility	A 5,000-square-foot O&M facility along with a 1.5 acre parking and equipment storage area.
Meteorological towers	Up to three permanent and six temporary meteorological towers occupying up to approx.. 0.1 acres each.
Water collection	Water collection by truck from Padre Dam (worst-case) during the entire construction period.
Temporary batch plant	A temporary concrete batch plant for the duration of construction occupying approximately 3.7 acres.
Temporary staging and laydown areas	During construction, an approximately 20-acre central staging area and an approximately 100-foot by 200-foot laydown area at each turbine site, with an adjacent blade-laydown area of approximately 10,000 square feet.

Table 1
Summary of Project Components

Project Component	Description
Boulder Brush Facilities (on private lands)	Approx. 3.5 miles of gen-tie lines and associated pole structures. Dirt access roads/spurs from existing dirt roads to gen-tie line. A high-voltage substation on approximately 2.5 acres. A 500 kV switchyard on approximately 16 acres – and incoming and outgoing connection lines. Paved 30-foot-wide access road to high-voltage substation and switchyard.

3 FUNDAMENTALS OF NOISE AND VIBRATION

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

3.1 Sound, Noise, and Acoustics

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

3.2 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 (0.00000000001) 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 squared ratio of actual sound pressure to a reference pressure. These units are called bels. To provide a finer resolution, a bel is subdivided into 10 decibels (dB).

3.3 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, but C-weighted sound levels are also presented and discussed in this report. Table 2 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.

Table 2
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: https://www.engineeringtoolbox.com/decibel-d_59.html.
Notes: Hz = hertz; dB = decibels.

Compared to the octave band center frequency (OBCF) weightings of the "A" scale, the C-weighting dB adjustments shown in Table 2 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 3. 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.

Table 3
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 1998.

3.4 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 2013a). A change of 5 dB is readily perceptible, and a change of 10 dB is perceived as twice or half as loud. A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the average daily numbers of traffic on a road) would result in a barely perceptible change in sound level.

3.5 Noise Descriptors

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level (Leq) is also referred to as the energy-average sound level. The 1-hour A-weighted equivalent sound level, Leq(1h), is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the usual basis for the County noise policies and standards. However, the County also uses an 8-hour energy-equivalent sound level (Leq(8h)) 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 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 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 p.m. to 10 p.m.) as part of the "daytime" period.

While some jurisdictions use CNEL and Ldn interchangeably, and under many conditions they are indeed comparable, the CNEL value will sometimes be slightly higher than the Ldn value for the same time period of sound; and, because of the evening and/or nighttime adjustments, CNEL and Ldn will always be greater than the 24-hour Leq 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, Lxx is the sound level that was exceeded for xx percent of the time. For example, L90 would be the sound level exceed for 90% of the measurement time. The utility of the L90 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, L90 is commonly used to approximate the "background" sound level, while Leq encompasses all sound in the "ambient" sound environment.

3.6 Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receiver) 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 (a.k.a., "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 receiver 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 receiver will tend to emulate this cylindrical propagation effect.

3.7 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 quite 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:

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

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 receiver

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 receiver

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

D = the distance from the vibration activity to the receiver

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).

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4 APPLICABLE NOISE REGULATIONS AND STANDARDS

This section reviews regulations potentially applicable to the Project. Since the Campo Wind Project would be located on the Reservation of a federally recognized Indian tribe, it would not be subject to some of the regulations and codes that would typically apply to wind projects on private lands in the region.

4.1 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. The Project under analysis relates to energy production, and 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).

Under Section 4.5.4 Noise Standards and Guidelines of its Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005), the U.S. Bureau of Land Management (BLM) mentions the EPA public-protecting guideline of 55 dBA Ldn, 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. NSLUs include but are not limited to residences. In the absence of applicable local noise regulations or other established policies at an On-Reservation NSLU, this EPA-based recommendation of 55 dBA Ldn 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, guidance from the FTA recommends a daytime standard at residential land uses of no more than 80 dBA (FTA 2006) energy-averaged over an 8-hour period (Leq(8hr)).

4.2 County of San Diego Noise Standards

The County has adopted noise policies and standards which are 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. This 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:

- A CNEL dBA limit accounting for noise levels across a 24-hour period based on the General Plan, assessed at the outdoor use area of an NSLU
- Hourly L_{eq} dBA limits for daytime and nighttime based on zoned land use from the Municipal Code, assessed at the property line of the sound source emitter
- 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 and assessed at the property line of the lot containing the wind turbine

4.2.1 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 2011b). In this analysis, the Noise Element is relevant only for the Project's potential noise impacts on private lands.

4.2.2 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 the 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 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 4 in this report], 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.

Table 4
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 a.m. to 10 p.m.	50
	10 p.m. to 7 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 a.m. to 10 p.m.	55
	10 p.m. to 7 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 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
FB-V1, FB-V2, RM-V1, RM-V2	7 a.m. to 7 p.m.	60
	7 p.m. to 7 a.m.	55
FB-V1, RM-V2	10 p.m. to 7 a.m.	55
FB-V2, RM-V1	10 p.m. to 7 a.m.	50
FB-V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
M50, M52, and M54	Anytime	70
S82, M56, and M58	Anytime	75
S88 (see subsection (c) below)	—	—

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.

(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 this report] 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 this report], 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 measured ambient noise level exceeds the applicable limit in Table 36.404 [included as Table 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 measured at or beyond six feet from the boundary of the easement upon which the facility is located.

In 2002, the County added note (b) to this section to allow greater compliance flexibility for projects for which a Major Use Permit has been granted. In the ordinance 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 the Project’s potential noise impacts on private lands under County jurisdiction.

4.2.3 County Code Amendment for Wind Energy Turbines

The County has provided guidance and regulations related to wind projects in An Ordinance Amending the San Diego County Zoning Ordinance Related to Wind Energy Turbines. This document amends the Zoning Ordinance with a number of edits that relate to the Project's potential noise impacts on private lands.

The following definitions are provided [numbering and lettering from original] (County of San Diego 2013):

> **Background Sound Level (L_{90})**. 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 LA_{90} and LC_{90}, respectively.
>
> **Residual Background Sound Criterion (RBSCL90) for Wind Energy Facilities**. The Background Sound Level measured relative to A-weighting (LA_{90}) plus 5 dBA.

In this analysis, the County Code is relevant only for the Project's potential noise impacts on private lands under County jurisdiction.

County of San Diego Guidelines for Determining Significance

In this analysis, the County Guidelines are used as reference and relevant only for the Project's potential noise impacts on private lands. According to the County's Guidelines for Determining Significance (County of San Diego 2009a), a proposed project would result in a significant impact under 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 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.

4.2.4 County of San Diego Construction Noise Regulations

Section 36.408 of the Noise Ordinance 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 a.m. and 7 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 a.m. and 7 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.

Additional sound level limitations are provided in Section 36.410:

> In addition to the general limitations on sound levels in Section 36.404 and the limitations on construction equipment in Section 36.409, the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 5, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period, as described in Section 36.410(c) of the County's Noise Ordinance. The maximum sound level depends on the use being made of the occupied property.

Table 5
County of San Diego Noise Ordinance, Section 36.410, Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels

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

dBA = A-weighted decibels.

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

In this analysis, the County Construction Noise Ordinance is relevant only for the Project's potential noise impacts on private lands.

4.2.5 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 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."

In this analysis, the County Code is relevant only for the Project's potential noise impacts on private lands under County jurisdiction.

4.3 Campo Band of Mission Indians Land Use Code and Plan

Under the terms of the Campo Lease, Tribal laws are limited or made inapplicable to the Project. , The Campo Lease does, however, specifically require a 0.25-mile setback for wind turbines from residential structures and tribal buildings as described in Appendix C (Regulatory Setting) to the Draft EIS. Even though they , the Campo Land Use thresholds are considered in evaluating the Project's potential noise impacts for the purposes of this analysis only.

The Campo Land Use Code does not contain specific noise level limits or specific standards for wind turbines. However, the Tribe's Land Use Plan includes a Noise Element. In the Noise Element, noise sensitive land uses are defined as single and multiple family residential areas, group homes, business and professional offices, parks, and open space lands where quiet is a basis for use. These uses shall be discouraged in areas where noise levels exceed 65 dBA CNEL. Interior noise levels shall be mitigated to 45 dBA for business and professional offices (Campo LUP).

4.4 Vibration

Although it is possible for groundborne vibrations from construction activity 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 or demolition activity is usually highest during pile driving, 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).

5 EXISTING CONDITIONS

The Project Area and its vicinity can generally be characterized as rural, but containing a few major surface transportation routes and existing residential, commercial, agricultural, and industrial developments. This section provides a summary description of the existing noise emission sources in the Project vicinity, along with a representative quantitative study of the Project sound environment as supported by empirical data measured and collected during recent field surveys.

5.1 Project Area

The Project area is largely undeveloped, though development includes utilities and recreational, commercial, and residential. Land uses within the Reservation are predominately residential but also include several institutional uses north of SR 94 and the Golden Acorn Casino. Residential land uses surround the Reservation to the north, south, east, and west. The Project area is bisected by the Interstate 8 highway, and include pre-existing wind turbine development including the Kumeyaay Wind project. The largest concentrations of residential land uses on private lands are located east of the Reservation in the Live Oaks Springs and Tierra Del Sol communities. The private properties through which Boulder Brush Facilities would extend currently consist of largely undeveloped ranch land, a portion of which is grazed by cattle and a portion of which is used by off-road recreational vehicles. The affected parcels are surrounded by the following uses: existing nearby wind turbine facilities (Kumeyaay Wind, which is located on the Reservation, and Tule Wind, located 1 mile to the west, north and east of the Boulder Brush Facilities), transmission infrastructure (Sunrise Powerlink), and a small number of rural residential homes. The Sunrise Powerlink crosses the northeast portion of these parcels. The Kumeyaay Wind facilities are located to the west and Tule Wind facilities are located to the west, north, and east of the Boulder Brush Facilities.

5.2 Existing Noise Levels

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 wind 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, rustling leaves, distant conversations, and distant aircraft contribute to the ambient noise environment.

5.2.1 Noise Survey

A site visit was conducted to measure existing outdoor ambient noise levels in the vicinity of the Project site. Locations of pre-existing and operating wind turbines in the Project vicinity were noted, so that subsequent predictive modeling of these noise sources could be performed and help quantitatively assess their contribution to the measured outdoor ambient sound levels at the surveyed representative locations. More detail on the field measurement survey can be found in Appendix A, Baseline Measurement Data.

The existing noise environments at the Project boundaries were measured on September 5, September 6, and September 7, 2018. These noise level measurements were performed with factory-calibrated SoftdB Piccolo Sound Level Meters (SLM), which meet the current ANSI "Type 2" standard. Using a camera tripod, the SLM was consistently positioned at a height of approximately 5 feet above grade. The field survey included 13 unattended "long-term" (LT) monitoring locations, whereby after deployment, the SLM was left to measure and record to onboard instrument memory sound level data at predefined consecutive intervals. These locations are depicted as LT1 through LT13 in Figure 2, Noise Measurement Locations. Using the collected field data, Table 6 shows the calculated L_{dn} based on the hourly measured ambient sound levels.

Table 6
Calculated A-Weighted Day/Night Sound Levels from Field-Collected Survey Data

Receiver ID	Ambient L_{dn} Noise Level (dBA)
LT1	51
LT2	48
LT3	53
LT4	56
LT5	57
LT6	45
LT7	67
LT8	50
LT9	43
LT10	45
LT11	49
LT12	56
LT13	50

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

Existing hourly ambient noise levels ranged from 31 dBA to 70 dBA $L_{eq(1h)}$ at the surveyed locations in the site vicinity. Statistical noise data was also collected during the measurements, including average hourly L_{90} results for the surveyed locations that ranged from 32 dBA to 49 dBA. Based on these outdoor ambient sound level measurements and as presented in Table 6, three surveyed locations (LT4, LT5, and LT7) were found to have existing L_{dn} values greater than 55 dBA, the EPA-recommended limit for exterior noise at a sensitive receptor. The other surveyed locations feature L_{dn} values at or below the 55 dBA L_{dn} guidance. In general, the surveyed L_{dn}

values seem reasonably illustrative of the Project vicinity based on the following expectations and acoustical principles:

- Higher hourly sound levels, and corresponding calculated L_{dn}, would tend to be closer to busy roads and highways;
- Lower outdoor sound levels would characterize areas that are remote from sources of regular sound emission; and,
- The acoustical energy from short-duration, intermittent, or even impulsive sounds in proximity to the SLM, such as occasional pass-bys from recreational vehicles or the burst of a truck horn, can skew L_{dn} values higher than what other acoustical metrics might suggest about the surveyed location.

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6 IMPACTS

Operational wind turbine noise and traffic noise are analyzed in the following section. Construction noise impacts are analyzed after operational noise impacts.

6.1 Methodology

6.1.1 Thresholds for Determining Impacts

Operational

Based on the noise and vibration standards presented in Chapter 4 of this report, the following criteria are used to assess noise impacts attributed to Project operation:

- For On-Reservation NSLUs,
  - 55 dBA Ldn exterior noise level (unless existing outdoor ambient Ldn already exceeds this EPA guidance); and
  - More than a 3 dB increase to the "cumulative + existing" Ldn (i.e., measured outdoor ambient plus acoustical contribution from any past, present, or foreseeable future projects in the Project vicinity) due to logarithmic addition of Project-attributed noise level that causes the combined or "future" level to exceed 55 dBA Ldn (unless cumulative + existing Ldn already exceeds this EPA guidance).
- For Off-Reservation NSLUs (applicable private lands under County jurisdiction), the County noise ordinance provides:
  - 50 dBA hourly Leq during the day (7 a.m. to 10 p.m.) and 45 dBA hourly Leq at night (10 p.m. to 7 a.m.);
  - Up to a 3 dB increase above pre-existing outdoor ambient sound level when it is already higher than the daytime or nighttime hourly Leq limit, as applicable;
  - 60 dBA CNEL (or the existing CNEL plus 10 dB) at the exterior of a noise-sensitive receptor;
  - No more than a 25 dB difference between the predicted C-weighted Leq and the pre-existing measured L90 value; and
  - No more than a 1.5 dB difference 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.

Construction

The FTA daytime standard for residential land uses of 80 dBA Leq(8h) is used in this assessment to evaluate daytime construction noise impacts at On-Reservation residential structures. For private lands that are residentially zoned, the County of San Diego construction noise ordinance (36.409) threshold of 75 dBA Leq(8h) is used.

6.1.2 Traffic Noise

The FHWA Highway Traffic Noise Model algorithms (FHWA 1998) were used within the CadnaA noise modelling software program to predict operational and traffic noise levels at specific receptor locations. Inputs to the model were the three-dimensional coordinates of the roadways, noise receptors, and wind turbine hub locations; vehicle volumes and speeds; and ground absorption. Traffic volumes were taken from the Project traffic report (Dudek 2018).

6.1.3 Operational Noise Modeling Methodology

Wind Turbines

A computer program called CadnaA (Computer Aided Noise Abatement) was used to predict the aggregate sound propagation from Project wind turbine operation. CadnaA is a commercially available software program that enables predictive sound propagation in a three-dimensional (3D) model space from multiple point, line, and area-type sources. The outdoor noise propagation formulas and reference data incorporated into the software code adhere to several accepted standards, including the International Organization of Standardization (ISO) Standard 9613-2, "Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation" (ISO 1996). In summary, the CadnaA-based wind turbine operation noise model was setup and "run" with input parameters that included the following:

- Wind turbine sound power level data, at OBCF resolution, from manufacturer specifications and according to appropriate portions of International Electrotechnical Commission (IEC) Standard 61400-11 and -14. Low-frequency sound in the 31.5 Hz, 63 Hz, and 125 Hz OBCF are included in the analysis. (At the time of this analysis, the per-turbine A-weighted sound power level data reflects the values associated with a General Electric 2.X-127 60 Hz model wind turbine.)
- Wind turbines were treated as point sources located at hub height (110 meters, or 361 feet) relative to grade, and receptors were assumed to be 5 feet above grade.
- Respecting recent research findings on wind turbine noise predictive modeling (RSG et al. 2016), the model broadly applies to the Project area a ground acoustical absorption factor

("G") of 0.5, which is roughly the mean value on a spectrum from zero (acoustically reflective surfaces, such as bodies of water or coated pavement) to unity (acoustically absorptive ground conditions, such as porous soils or dense vegetative cover [grasses]).

- Separate from the manufacturer-recommended +2 dB adjustment to wind turbine sound power levels to account for measurement uncertainties, which was applied to the sound power levels for each modeled operating turbine, an additional +2 dB was applied to the wind turbine operation prediction model on the likelihood of enhancing prediction model precision. "When comparing to the measured five-minute L_{eq}, the ISO 9613 model with mixed ground and a 2 dB penalty (G=0.5 plus 2 dB) showed the greatest precision for receivers at 330 meters downwind. Longer averaging times (15 minutes and one hour) increased the modeling precision" (RSG et al. 2016).
- Topographical data for the Project area and surrounding vicinity, developed from U.S. Geological Survey sources, was imported to the model and thus accurately portrays the presence of natural terrain features that may affect sound propagation, such as path-intervening ridgelines or prominent hills.
- Meteorological conditions include an air temperature of 10°C (50°F) and 70% relative humidity.
- Consistent with ISO 9613-2, the sound propagation algorithm conservatively presumes a "downwind" condition regardless of actual wind direction.

Appendix B, CadnaA Sound Modeling Input/Output Data, provides additional details on the CadnaA input parameters and analysis results.

To predict Project turbine operation noise emission levels at different average wind velocities as received by the turbine rotors, supplemental predictive noise modeling was performed with Microsoft Excel workbooks containing sound propagation algorithms and input parameters that emulate ISO 9613-2 methodology. Comparison of predicted results between the CadnaA models and these Excel-based techniques at many geographic locations around and within the Project site exhibit differences of less than +/-3 dB, which is barely a perceptible difference.

Boulder Brush Facilities

Operation of the Boulder Brush Facilities would include the high-voltage substation, which would primarily be characterized by continuous noise from the on-site transformers, which for purposes of this analysis are assumed to be a set of five forced-air and oil-cooled 35 kV/230 kV units (that collect the generated electricity from the individual wind turbine pad-mounted transformers distributed across the Project site) that feed into a single 230 kV/500 kV forced-air and oil-cooled transformer that connects to the adjoining switchyard to the east. While the switching operations involving capacitors and breakers at the switchyard can cause impulsive noises, this analysis assumes that they would be very infrequent (Acentech 2015) and thus would not significantly contribute to aggregate noise emission from the high-voltage substation site.

Predictive modeling of sound propagation for these high-voltage substation transformers on private lands would involve comparable ISO 9613-2 techniques as the previously mentioned CadnaA software algorithms.

6.1.4 Construction Noise Modeling Methods

The noise levels generated by construction equipment would vary greatly depending on factors such as the type and specific model of the equipment, the condition of the equipment, and the operation or process being performed. The energy-averaged sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction during the time period.

The Federal Highway Administration's Roadway Construction Noise Model (RCNM; FHWA 2008) and Project-specific construction equipment rosters were used to estimate construction noise levels at the nearest noise-sensitive land uses. Input variables for the RCNM consist of the receiver/land use types, the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time the equipment is in operation versus idle, over the workday), and the distance between the construction activity and noise-sensitive receivers. The model space conservatively presumes a flat, featureless plane (i.e., devoid of topographical features and the presence of pre-existing buildings and other structures) over which sound propagates between the studied sources and receptors. As a result, the usage of RCNM may over-predict construction activity noise exposure at some receptors that would actually benefit from sound path occlusion due to natural and man-made terrain. The RCNM has default duty cycle and reference maximum sound level (Lmax) values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Both the default duty cycle and equipment-specific reference Lmax values, as appropriate, were used for this construction noise analysis.

6.1.5 Vibration

The Project is not anticipated to include post-construction operating equipment or activities capable of producing substantial long-term groundborne vibration or groundborne noise levels. The only ground vibration potential would therefore be associated with the temporary construction phases of the Project.

Table 7 shows peak particle velocity values at a reference distance of 25 feet for samples of typical construction equipment (FTA 2006). Prediction of groundborne vibration exposure at potentially sensitive structures in the Project vicinity can be performed with the mathematical expressions already presented in Section 3.7, which use reference PPV levels to estimate attenuated vibration velocity at an input receptor distance.

Table 7
Typical Construction Equipment Vibration Levels

Equipment	PPV at 25 Feet (Inches per Second)	Approximate Noise Level at 25 Feet*
Jackhammer	0.035	79
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Small bulldozer	0.003	58

Sources: FTA 2006; Caltrans 2013b.
Notes: PPV = peak particle velocity
* Where noise level is the velocity level in decibels (VdB) referenced to 1 micro-inch per second and based on the RMS velocity amplitude.

6.2 Assumptions

6.2.1 Construction Modeling Assumptions

Construction noise and vibration are temporary phenomena. Construction noise and vibration levels will vary from hour to hour and day to day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor.

The Project site would be developed in successive stages. For analysis purposes, it is assumed that some portions of each stage will occur simultaneously. The maximum noise levels (Lmax) for various pieces of construction equipment at a reference distance of 50 feet are depicted in Table 8. The energy-averaged sound level from a piece of operating construction equipment is typically less than the maximum noise level because it operates in alternating cycles of full power and lower power. To quantify this power delivery variance, the Acoustical Use Factor (AUF) shown in Table 8 represents the portion (expressed as a percentage) of time, such as an hour, when the indicated equipment is actually operating at full power and thus under conditions that produce the Lmax value. The energy-averaged Leq at the 50-foot reference distance is then calculated from these two input values with the following expression:

$$\text{Construction equipment } L_{eq1h} \text{ (at 50 feet)} = L_{max} \text{ (at 50 feet)} + 10*\text{LOG(AUF)}$$

where the AUF value is the decimal equivalent of the percentage shown in Table 8.

Table 8
Construction Equipment Noise Emission Levels

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Measured L_{max} @50 ft (dBA, slow)
Auger drill rig	No	20	84
Backhoe	No	40	78
Compactor (ground)	No	20	83
Compressor (air)	No	40	78
Concrete batch plant	No	15	83
Dozer	No	40	82
Dump truck	No	40	76
Excavator	No	40	81
Flatbed truck	No	40	74
Front-end loader	No	40	79
Generator	No	50	81
Generator (<25 kVA, VMS signs)	No	50	73
Grader	No	40	85[a]
Horizontal boring hydraulic jack	No	25	82
Personnel lift	No	20	75
Pavement scarifier	No	20	90
Paver	No	50	77
Pickup truck	No	40	75
Pneumatic tools	No	50	85
Pumps	No	50	81
Rock drill	No	20	81
Roller	No	20	80
Scraper	No	40	84
Tractor	No	40	84*

Source: DOT 2006.
Notes: L_{max} = maximum sound level; ft = feet; dBA = A-weighted decibels; kVA = kilovolt-amperes; VMS = variable message sign.
[a] Specification 721, a specified value, not a measured result.

To predict the overall Leq representing noise exposure at a receptor some distance from a studied construction activity phase, construction equipment rosters are based on CalEEMod defaults used in the Air Quality Analysis (Dudek 2018). Listed "usage hours" in the rightmost column of Table 9 represent the anticipated hours (with a typical 8-hour per-day period) that the indicated equipment is non-idle on site. As a result, and for purposes of this analysis, the Project's construction activities would include the following per-phase breakdown of involved equipment as summarized in Table 9.

The construction noise analysis also applies the expected effect of acoustical ground absorption, which depending on distance offers up to 5 dBA of noise reduction (ISO 1996).

Table 9
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Clearing and grading	72	32	734	Graders	3	5
				Rubber-tired dozers	8	5
				Scrapers	3	5
Construction of access roads	120	0	22	Scrapers	3	5
				Rubber-tired loaders	7	5
Paving	66	0	0	Pavers	1	5
				Paving equipment	4	5
				Rollers	8	5
Wind turbine foundation construction	168	20	3,046	Air compressors	3	5
				Generator sets	3	5
				Pumps	1	5
Wind turbine erection	144	0	720	Cranes	19	4.5
				Air compressors	2	5
				Generator sets	3	5
				Pumps	2	5
				Welders	7	5
Construction of underground Electrical Collection and Communication System	240	12	368	Rubber-tired dozers	2	4.5
				Tractors/loaders/backhoes	4	5
				Trenchers	3	5
Boulder Brush Facilities High-voltage substation and switchyard	144	8	415	Air compressors	1	5
				Cranes	2	4.5
				Generator sets	6	5
				Pumps	3	5
				Tractors/loaders/backhoes	3	4.5
				Welders	2	5
Boulder Brush Facilities (clearing and grading)	48	10	0	Tractors/loaders/backhoes	4	4.5
				Rubber-tired dozers	4	5
				Graders	2	4.5
Boulder Brush Facilities (construction of access roads)	48	10	32	Pavers	1	5
				Rollers	4	5
				Scrapers	2	5
				Paving equipment	4	5
				Pump	1	4.5

Table 9
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Boulder Brush Facilities (foundation construction and tower erection	96	10	30	Forklifts	1	5
				Welder	1	4.5
				Air compressor	1	4.5
				Generator sets	2	4
				Pump	1	4.5
Boulder Brush Facilities (stringing and pulling)	72	10	20	Welder	1	4.5
				Air compressor	1	4.5
Operations and maintenance building	120	4	20	Cranes	1	4.5
				Generator sets	1	5
				Tractors/loaders/backhoes	1	4.5
				Welders	1	5
Meteorological tower	24	4	43	Cranes	1	4.5
				Generator sets	2	5
				Tractors/loaders/backhoes	1	4.57
				Welders	1	5

6.2.2 Operational Modeling Assumptions

Anticipated noise attributed to Project operation would be primarily related to aggregate sound emission from the wind turbines and the collector substation transformers. For noise prediction purposes, the turbines and collector substation were conservatively assumed to operate at maximum noise output during the day. Actual turbine operation and noise levels would be a function of wind speed, as detailed in the following subsection.

Existing Wind Conditions

Wind turbine sound emission levels vary with received wind speed. Per manufacturer specifications that follow IEC 61400 standards and conditions, this variance is quantified via reference sound power levels (at OBCF resolution) that are associated with specific wind speeds, from the established “cut-on” minimum air speed (4 meters per second [m/s]) required for the bladed rotor to begin turning and generating electricity, to what is considered a maximum air speed at which the bladed rotor would not be permitted to spin faster. As the rotor speed increases and allows for more energy production, noise emission increases. At a received wind speed of 10 m/s at hub height, the wind turbine under study generates its highest noise levels and does not get louder—even as wind speeds may exceed this quantity.

In addition to the CadnaA noise prediction model input parameters listed in Section 6.1.3, this study included consideration of historical wind data for the Project site vicinity. Meteorological data supplied by Terra-Gen included a year-long sample of measured wind velocity, collected at ten-minute intervals by On-Reservation anemometers at a height of 58 meters (190 feet) above grade. Table 10 presents the number of diurnal cycles (i.e., complete 24-hour periods, from midnight to the subsequent midnight) within this sample year when the measured average wind speed fell within the indicated ranges. Table 10 also shows the A-weighted sound power level for an individual turbine operating under conditions of the lowest wind speed value for each listed range.

Table 10
Occurrence of Average Wind Speed over Sample Year of Diurnal Cycles

Average Wind Speed (m/s) for 24-hour Period	>10	9-10	8-9	7-8	6-7	5-6	4-5	< 4
Occurrence (number of diurnal cycles)	14	15	12	25	28	55	66	155
Occurrence Percentage (out of 365 Days)	4%	4%	3%	7%	8%	14%	18%	42%
Proposed Wind Turbine Sound Power Level (dBA)	110.0	109.2	106.8	103.9	100.4	96.9	96.7	n/a*

Sources: Terra-Gen 2019; Dudek 2019.
Notes: wind turbine sound power levels are based on General Electric 2.X-127 sound specification, provided via Terra-Gen, for limited purposes of this analysis.
* at wind speeds less than cut-on (4 m/s) velocity, wind turbine rotor will not turn to generate electricity.

Assuming the studied sample year of meteorological data is indicative of present and future wind conditions experienced in the Project site and immediate vicinity, the key findings revealed by Table 10 are as follows:

- Based on average wind speed over a 24-hour period, maximum operating wind turbine noise emission would only be expected for a cumulative total of two weeks during the year; and,
- For nearly 200 days and nights of the year, average wind speed and corresponding individual wind turbine noise level varies between 4 to 10 m/s and 96.7 to 110.0 dBA, respectively.

Amplitude Modulation

Available reports on monitored performance of some existing wind turbine projects suggest that under the right conditions, audible wind turbine noise amplitude modulation occurs. Amplitude modulation is understood to be a cyclical variation of sound pressure due to noise-producing aerodynamic effects that include the wind turbine rotor blades spinning through stratified air masses. Such stratification is due to phenomena such as temperature inversion, which often results in calm conditions near grade, with potentially higher wind speeds near the turbine nacelle or above through which the rotor blades pass. Temperature inversions also refract sound downwards toward the ground surface, rather than upwards into the atmosphere, which can result in wind turbine noise traveling farther. However, as noted in Section 5.5.3.1 of the Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States, "this condition would occur only at low wind speeds, approximately less than 9 ft/s (3 m/s), because stronger winds interfere with this effect. Modern-day wind turbines have a cut-in speed of about 8.2 to 13 ft/s (2.5 to 4 m/s)…; thus, increased noise propagation associated with temperature inversion would be minimal in most operations" (BLM 2005).

Offering insight on the magnitude of such amplitude modulation, recent research of multiple operating wind turbine facilities led to the following conclusions regarding its potential "depth" and frequency of occurrence (RSG et al. 2016):

- Our analysis of data at three monitoring locations showed clear differences in modulation depth between background and turbine sounds. We found amplitude-modulated sounds in the mid-frequency range of about 250 Hz to 2 kHz, but did not find notable amplitude modulation in infrasonic, low, and high frequencies.
- For the flat sites, 91% of the modulation is of 2 dB or less. At the mountain site, 88% of the modulation is of 2 dB or less. Going higher in modulation depth, for the flat sites, 99.87% of the modulation is of 4.5 dB or less. At the mountain site, 99.996% is of 4.5 dB or less. Higher modulation events do occur, but they are rare. Of the 105,907 10-second readings, fewer than 300 had modulation depths of 4 dB or greater.

At these indicated percentages, and if conditions are assumed to be similar for the Project, measurable and audible amplitude modulation is expected to be a very rare event. Nine times out of ten, as suggested by these statistics, the modulation depth of 2 dB (or less) would be accounted for by the 2 dB upward adjustment (i.e., in addition to the 2 dB that accounts for measurement uncertainty, as detailed in Section 6.1.3) to the predicted operation noise levels.

Infrasound

Defined as sound of a frequency that is below the range of human hearing, generally below 20 Hz, infrasound is not evaluated in this report. Based on recent research, involving measurements of infrasound at multiple wind turbine facilities, wind turbines do increase infrasound levels—especially at higher wind speeds. However, the resulting levels are, "at the least, 25 dB below ISO

7196 audible perception thresholds, and the difference between measured infrasound levels and the audibility threshold increases as frequency decreases" (RSG et al. 2016).

Low Frequency Sound

In order to evaluate low frequency sound emission from operating Project wind turbines, the predictive modeling efforts included consideration of C-weighted individual turbine point-source sound power levels, which were derived from the manufacturer's A-weighted levels by "adding back" the standardized A-weighting dB adjustments prior to applying the standardized C-weighting dB adjustments—both of which are shown in Table 2. The predicted C-weighted levels enable this study to assess the Project's potential effects at NSLU within unincorporated San Diego County jurisdiction with respect to the WET Guidelines as summarized in Section 4.2.

Non-Turbine Operations

Noise would also be generated during Project maintenance and inspections, as well as from activities at the O&M building. Based on information from the Project traffic report (Dudek 2018), the Project would generate minimal vehicle trips associated with these ancillary operations.

6.3 On-Reservation Operation Noise Impact Assessment

Project implementation and operation would create stationary noise sources on the Reservation. These sources would include the wind turbines, collector substation, transmission lines, and maintenance and inspection activities.

6.3.1 Roadway Traffic Noise

The Project would employ 10 to 12 full-time employees, generating up to 24 daily two-way trips, 7 days per week. Security staff traveling throughout the Project site would use light-duty pickup trucks. Traffic volumes at this level would not have a measurable effect on existing traffic noise levels. Project operation would involve vehicular traffic on access roads for inspection and maintenance. While these activities would increase noise levels immediately adjacent to the access road during vehicle pass-bys, these events would not result in a substantial increase in ambient noise. Operational traffic noise associated with the Project would not result in an adverse noise effect.

6.3.2 Wind Turbine Noise Modeling Results

Adoption of EPA guidance sets 55 dBA Ldn as the operation noise threshold at On-Reservation NSLU. Table 11a shows the predicted Ldn results, per indicated average wind speed, at representative receivers located at Project property boundaries and within the Project site on Reservation lands. Bold italicized values occur when the predicted level exceeds 55 dBA.

Table 11a
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels

Representative NSLU Site/Area	Predicted L_{dn} (dBA) at Indicated Average Wind Speed (meters per second [m/s])						
	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

NSLU = noise-sensitive land use; L_{dn} = day/night sound level; dBA = A-weighted decibels.

Figure 3a illustrates the predicted 55 dBA Ldn iso-level (a.k.a., “noise contour”) due to modeled operational Project wind turbines receiving hub-height average wind speeds corresponding with the values shown in Table 11a.

Among a number of NSLU Site/Areas shown in Table 11a where predicted Ldn exceeds the guidance-based threshold of 55 dBA when average wind speeds are 8 m/s or greater, the sensitive receptor site represented by LT-9 is located within 0.25 miles of five turbines. After respecting a 0.25-mile minimum screening distance between any potential NSLU and a possible turbine site, 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 Ldn guidance-based threshold even under 10 m/s (or greater) average wind speeds over a 24-hour period.

Were the project layout to have fewer operating wind turbines, respecting the aforementioned 0.25-mile setback distance, Table 11b presents the predicted results for such a scenario at the same representative areas indicated in Table 11a.

Table 11b
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels – Alternative 2

Representative NSLU Site/Area	Predicted L_{dn} (dBA) at Indicated Average Wind Speed (meters per second [m/s])						
	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	42	42	46	49	52	55	***56***
LT-3	35	35	39	42	45	48	48
LT-4	40	40	43	47	50	52	53
LT-5	39	39	43	46	49	51	52
LT-6	28	29	32	36	38	41	42
LT-7	31	31	35	38	41	43	44
LT-8	33	34	37	41	44	46	47
LT-9	27	27	31	34	37	40	40
LT-10	44	44	48	51	54	***57***	***58***
LT-11	34	34	38	41	44	47	47
LT-12	34	34	38	41	44	47	47
LT-13	31	31	35	38	41	44	44

NSLU = noise-sensitive land use; L_{dn} = day/night sound level; dBA = A-weighted decibels.

Compared with the predicted results in Table 11a, which account for all 76 turbines, the alternative scenario presented in Table 11b represents only 48 operating wind turbines and shows compliance with the 55 dBA Ldn guidance at locations LT-5, LT-8, and LT-9. If an On-Reservation NSLU was located at assessment position LT-1, LT-2, or LT-10, this analysis predicts that it would be exposed to a noise level, under the right conditions (e.g., average wind speed at hub height), that exceeds the 55 dBA Ldn guidance. Similar to Figure 3a, Figure 3b illustrates the 55 dBA Ldn contours for various wind speeds for the Alternative 2 wind turbine layout case.

Since the locations of On-Reservation NSLU are not known, they may or may not be represented by one of the thirteen studied locations appearing in Tables 11a and 11b. To address this uncertainty, Table 11c features wind turbine noise prediction results for a set of hypothetical situations that could describe an On-Reservation NSLU with respect to its proximity to one or more nearest turbines. These geographic situations are summarized as follows:

- *Encirclement* – an NSLU is located no closer than a ¼-mile to an operating wind turbine, but there may be as many as four that surround the NSLU in each cardinal direction (north, east, south, west).
- *Perpendicular* – an NSLU is located no closer than a ¼-mile to the nearest operating wind turbine, but it is perpendicular to a "string" of up to seven wind turbines. This case assumes the nearest wind turbine is at the mid-point of the string. Hence, the NSLU is more distant from

the wind turbines at the ends of the string, and added wind turbines to the ends of the string, located no closer than 600 feet to the neighboring turbines, would increase this distance.

- *Co-axial* – an NSLU is located no closer than a ¼-mile to an operating wind turbine, but there may be as many as five additional turbines that are located beyond the position of the first one, but share the same horizontal axis as the NSLU and the nearest turbine. Each additional turbine is no closer than 600 feet to its neighboring turbine.

While these three above forms of proximity between an NSLU and the nearest proposed operating turbines may not reflect all geographic situations, they should provide guidance on how to characterize the wind turbine proximity at an actual NSLU of interest and use the prediction results of Table 11c to determine whether or not it would experience an adverse effect.

Table 11c
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels

Proximity Type, and Number of Turbines	Predicted L_{dn} (dBA) at Indicated Average Wind Speed (meters per second [m/s])						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
Encirclement, 1	42	42	46	49	52	55	55
Encirclement, 2	45	45	49	52	55	***58***	***58***
Encirclement, 3	47	47	51	54	***57***	***59***	***60***
Encirclement, 4	48	48	52	55	***58***	***61***	***61***
Perpendicular, 1	42	42	46	49	52	55	55
Perpendicular, 3	46	46	50	53	***56***	***59***	***59***
Perpendicular, 5	47	47	51	54	***57***	***60***	***60***
Perpendicular, 7	48	48	51	55	***58***	***60***	***61***
Co-Axial, 1	42	42	46	49	52	55	55
Co-Axial, 2	43	43	47	50	53	***56***	***56***
Co-Axial, 3	44	44	47	51	54	***56***	***57***
Co-Axial, 4	44	44	48	51	54	***56***	***57***
Co-Axial, 5	44	44	48	51	54	***56***	***57***
Co-Axial, 6	44	44	48	51	54	***57***	***57***

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

At an average wind speed of up to 7 m/s, for all NSLU-to-turbine proximity examples listed in Table 11c, no predicted wind turbine noise levels exceed the EPA guidance threshold of 55 dBA Ldn. When average wind speeds over the course of an entire 24-hour period may be greater, predicted Ldn tends to exceed this guidance standard when multiple turbines are in proximity to the NSLU. Therefore, under such high wind speed conditions and for when multiple proximate wind turbines are operating concurrently, adverse effects would be expected at the On-Reservation NSLU of interest.

6.3.3 Low-Frequency Turbine Noise

A study conducted in 2009 measured low-frequency noise associated with two modern turbines: the GE 1.5SLE and the Siemens 2.3-93. The study determined that noise generated by the turbines at distances beyond 1,000 feet were below the interior low-frequency noise criteria for bedrooms, classrooms, and hospitals. In addition to meeting background noise criteria, the measured noise levels also demonstrated that wind turbine setbacks of 1,000 feet would not cause "more than minimal annoyance (if any) from low-frequency noise, and there should be no wind rattles or perceptible vibration of light-weight walls or ceilings within homes" (Epsilon 2009). The Campo Lease provides a minimum setback for turbine units of 1,320 feet (i.e., 0.25 miles) from local residential uses; therefore, low-frequency noise would not result in adverse noise impacts.

6.3.4 Boulder Brush Facilities

High-Voltage Substation and 500 kV Switchyard

The high-voltage substation and 500 kV switchyard are predicted to produce less than 20 dBA Leq at a distance of 14,000 feet from the closest potential NSLU to the south. At this noise level, the transformer noise impact would be considered a less than significant or less than adverse effect.

Gen-Tie Transmission Lines

Aboveground electrical transmission lines associated with the Boulder Brush Facilities may produce corona during normal operation, but even under foul weather conditions that would moisten or wet the conductor surfaces, the resulting noise would only be audible at very close distances and thus not result in an adverse effect.

6.3.5 Cumulative Discussion

To assess for cumulatively considerable impacts at NSLU within the Reservation, an additional noise model was created that included other nearby existing operating turbines (Kumeyaay) and foreseeable future (Torrey Wind Project) 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 and Kumeyaay 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 other projects (proposed Torrey Wind Project) and measured existing (Kumeyaay+Tule and other noise sources, such as roadways) are represented in Table 12a as a total (albeit excluding the Project) "cumulative + Existing" Ldn for comparison with the predicted Project operations Ldn value.

Table 12a
Predicted Future Cumulative Noise Levels due to Project Operation (at 10 m/s)

Receiver ID	Cumulative + Existing* L_{dn} (dBA)	Predicted Project Operations** L_{dn} (dBA)	Cumulative + Existing Plus Predicted Project*** L_{dn} (dBA)	Cumulative Impact caused by Project?
LT-1	51	59	60	Yes
LT-2	49	56	57	Yes
LT-3	53	54	57	Yes
LT-4	56	55	59	No
LT-5	57	58	61	No
LT-6	46	44	48	No
LT-7	67	46	67	No
LT-8	51	56	57	Yes
LT-9	49	65	65	Yes
LT-10	46	58	58	Yes
LT-11	49	52	54	No
LT-12	50	48	52	No
LT-13	55	51	56	No

* Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.
** Predicted Project Operations is from Table 11a, at an average wind speed of 10 meters per second (m/s).
*** This value is the logarithmic sum of Cumulative + Existing and Predicted Project, or what could be called a "future" outdoor ambient noise level.

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 locations LT-1, LT-2, LT-3, LT-8, LT-9 and LT-10 shown in Table 12a, 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 (where it is not already exceeded by existing conditions). 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.

Similar in format to Table 12a, the predicted cumulative results shown in Table 12b reflect an average wind speed of only 7 m/s received by Project turbines. The occurrences of cumulatively considerable effect at the representative receiver locations due to Project are fewer under these wind conditions—only LT-9 would experience this cumulatively considerable effect.

Table 12b
Predicted Future Cumulative Noise Levels due to Project Operation (at 7 m/s)

Receiver ID	Cumulative + Existing* L_{dn} (dBA)	Predicted Project Operations** L_{dn} (dBA)	Cumulative + Existing Plus Predicted Project*** L_{dn} (dBA)	Cumulative Impact caused by Project?
LT-1	51	53	55	No
LT-2	49	50	53	No
LT-3	53	48	54	No
LT-4	56	49	57	No
LT-5	57	52	58	No
LT-6	46	38	47	No
LT-7	67	40	67	No
LT-8	51	50	54	No
LT-9	49	59	60	Yes
LT-10	46	52	53	No
LT-11	49	46	51	No
LT-12	50	42	51	No
LT-13	55	44	55	No

* Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.
** Predicted Project Operations is from Table 11a, at an average wind speed of 7 meters per second (m/s).
*** This value is the logarithmic sum of Cumulative + Existing and Predicted Project, or what could be called a “future” outdoor ambient noise level.

For the 48-turbine alternative Project layout, Tables 12c and Table 12d present the predicted cumulative noise results for received hub-height wind speeds of 10 m/s and 7 m/s, respectively.

Table 12c
Predicted Future Cumulative Noise Levels due to Project Operation – Alternative 2 (at 10 m/s)

Receiver ID	Cumulative + Existing* L_{dn} (dBA)	Predicted Project Operations** L_{dn} (dBA)	Cumulative + Existing Plus Predicted Project*** L_{dn} (dBA)	Cumulative Impact caused by Project?
LT-1	51	59	60	Yes
LT-2	49	56	57	Yes
LT-3	53	48	54	No
LT-4	56	53	58	No
LT-5	57	52	58	No
LT-6	46	42	47	No
LT-7	67	44	67	No
LT-8	51	47	52	No
LT-9	49	40	50	No
LT-10	46	58	58	Yes
LT-11	49	47	51	No
LT-12	50	47	52	No
LT-13	55	44	55	No

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

** Predicted Project Operations is from Table 11b, at an average wind speed of 10 meters per second (m/s).

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

Table 12d
Predicted Future Cumulative Noise Levels due to Project Operation – Alternative 2 (at 7 m/s)

Receiver ID	Cumulative + Existing* L_{dn} (dBA)	Predicted Project Operations** L_{dn} (dBA)	Cumulative + Existing Plus Predicted Project*** L_{dn} (dBA)	Cumulative Impact caused by Project?
LT-1	51	53	55	No
LT-2	49	49	52	No
LT-3	53	42	53	No
LT-4	56	47	57	No
LT-5	57	46	57	No
LT-6	46	36	46	No
LT-7	67	38	67	No
LT-8	51	41	51	No
LT-9	49	34	49	No
LT-10	46	51	52	No
LT-11	49	41	50	No
LT-12	50	41	51	No
LT-13	55	38	55	No

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

** Predicted Project Operations is from Table 11b, at an average wind speed of 7 meters per second (m/s).

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

Compared to the predicted results shown in Tables 13a and 13b, the values in Tables 13c and 13d indicate fewer occurrences of cumulatively considerable effect. Under the 7 m/s wind speed condition, the 48-turbine Alternative 2 scenario would not be expected to result in cumulatively considerable effects at any of the thirteen representative locations.

6.4 County Operational Analysis

Operation of Project wind turbines, maintenance activities, and the O&M building, as well as the collector substation and aboveground transmission lines, would be located on Reservation lands but may cause noise that could travel or 'spill' onto private lands within the jurisdiction of San Diego County; hence, the following subsections analyze potential noise exposure impacts at receptors considered Off-Reservation within unincorporated San Diego County. This analysis uses County plans and ordinances for reference for spillover effects on private lands and to the extent that such plans and ordinances would be applicable to the Boulder Brush Facilities private lands. County plans and ordinances do not apply on the Reservation.

6.4.1 General Plan

The County of San Diego General Plan limits the noise level from the Project to 60 dBA CNEL at the exterior living area of a noise-sensitive land use. Table 13a shows the modeled CNEL results at representative receivers located in the Project vicinity. The LT locations shown in Table 13a are the measurement locations in the Project vicinity. Some measurement locations are not included in the table because they are within Reservation lands.

Table 13a
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels

Receiver ID	Predicted CNEL (dBA) at Indicated Average Wind Speed (m/s)						
	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-5	45	45	48	52	55	57	58
LT-6	31	31	35	38	41	44	45
LT-7	33	33	37	40	43	45	46
LT-8	43	43	47	50	53	55	56
LT-10	45	45	48	52	55	57	58
LT-11	39	39	43	46	49	51	52
LT-12	35	35	38	42	45	47	48
LT-13	38	38	41	45	48	50	51

CNEL = community noise equivalent level; dBA = A-weighted decibels; m/s = meters per second.

When comparing the modeled CNEL results with the 60 dBA CNEL threshold from 4.1.A.i of the County guidelines, no modeled receptor locations exceed the guideline. Figure 4a shows the 60 dBA CNEL contour line for the operation of the proposed turbines. At positions LT-6 and LT-10, where the measured baseline CNEL was 46 dBA, the corresponding impact significance guidance would be this value plus 10 dBA (i.e., equal to 56 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 be exceeded at average wind speeds greater than 8 m/s. However, there is currently no existing NSLU in the vicinity of LT-10 on private lands under County jurisdiction.

A scenario with fewer turbines, such as the one presented as Alternative 2 in Section 6.3.2 with only 48 operating instead of the conservative case featuring 76, results in predicted aggregate operation noise levels shown in Table 13b. Figure 4b shows the 60 dBA CNEL contour line for the operation of the proposed turbines for this case.

Table 13b
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels – Alternative 2

Receiver ID	Predicted CNEL (dBA) at Indicated Average Wind Speed (m/s)						
	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-5	39	39	43	46	49	52	52
LT-6	29	29	32	36	39	41	42
LT-7	31	31	35	38	41	44	44
LT-8	34	34	38	41	44	46	47
LT-10	45	45	48	52	55	57	58
LT-11	34	34	38	41	44	47	48
LT-12	34	35	38	42	45	47	48
LT-13	31	32	35	39	42	44	45

CNEL = community noise equivalent level; dBA = A-weighted decibels; m/s = meters per second.

No modeled receptor locations listed in Table 13b are predicted to experience an operation noise CNEL that exceed the County's 60 dBA CNEL standard. But at LT-10, where the threshold would be 56 dBA CNEL, the predicted operation noise level per Table 13b is greater by 2 dBA. But as described previously for the Table 13a predicted results, there is currently no existing NSLU in the vicinity of LT-10 on private lands under County jurisdiction.

6.4.2 Municipal Code, Noise Ordinance Hourly

Noise thresholds for operational activities are regulated through the County's Noise Ordinance, (County of San Diego 2011c) "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 the proposed 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 a.m. to 10 p.m., and 45 dB from 10 p.m. to 7 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.

While only 60 turbines can be constructed pursuant to the Campo Lease, this analysis has conservatively modeled wind turbines at all possible 76 sites. Table 14a shows modeled hourly noise levels from the Project during daytime and nighttime periods, and a determination of exceedances with respect to the County hourly limits. As noted above, this analysis represents a worst case scenario that is unlikely to occur. Values in Table 14a 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 surpassed.

Table 14a
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels

Receiver ID	Predicted Hourly L_{eq} (dBA) at Indicated Average Wind Speed (m/s)						
	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-11	32	32	36	39	42	45	45
LT-12	28	28	32	35	38	41	41
LT-13	31	31	35	38	41	43	44

L_{eq} = equivalent continuous sound level; dBA = A-weighted decibels; m/s = meter per second.

Figure 5a shows the daytime hourly 50 dBA L_{eq} operational noise contour line on a site plan. Figure 6a shows the nighttime hourly 45 dBA L_{eq} operational noise contour line on a site plan. These figures show some areas where predicted sound levels greater than or equal to these thresholds extend beyond the Project boundaries into private lands within County jurisdiction, such as locations near LT-1, LT-10, LT-11, LT-12, and LT-13.

Assuming wind turbines at only 48 sites, Table 14b shows modeled hourly noise levels from the Project during daytime and nighttime periods, and a determination of exceedances with respect to the County hourly limits. Values in Table 14b 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 surpassed. Figure 5b shows the daytime hourly 50 dBA L_{eq} operational noise contour line on a site plan. Figure 6b shows the nighttime hourly 45 dBA L_{eq} operational noise contour line on a site plan. Comparison of Tables 14a and 14b indicate that while the areas represented by LT-11 and LT-13 would experience lower operation noise levels due to the fewer-turbine scenario, predicted noise levels at representative locations LT-1 and LT-10 still exceed County standards at sufficient hub-height average wind speeds.

Table 14b
Predicted A-Weighted Aggregate Project Wind Turbine Noise Levels – Alternative 2

Receiver ID	Predicted Hourly L_{eq} (dBA) at Indicated Average Wind Speed (m/s)						
	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	46	49	***52***	***53***
LT-10	38	38	42	45	48	50	***51***
LT-11	28	28	31	35	38	40	41
LT-12	28	28	32	35	38	40	41
LT-13	25	25	29	32	35	37	38

L_{eq} = equivalent continuous sound level; dBA = A-weighted decibels; m/s = meter per second.

6.4.3 County WET Guidelines

CadnaA was used to predict the OBCF spectral content of the noise at receiver locations in the site vicinity. This predicted spectral data was used to determine, over private lands within County jurisdiction that adjoin the Project site, the potential low frequency noise impacts in terms of nighttime L_{eq1h} dBC compared with a nighttime RBSC (i.e., average hourly nighttime L_{90} dBA + 5 dB). Assuming wind turbines at all possible 76 sites, Table 15a shows the predicted dB differentials at each indicated study location, based on common RBSC calculated by adding 5 dB to a logarithmic average of the A-weighted L_{90} values from the field measurement survey. Bold italicized values in Table 15a show under what wind conditions the expected difference between the C-weighted predicted level and the RBSC is greater than 20 dB.

Table 15a
Predicted C-Weighted Aggregate Project Wind Turbine Noise Levels

Receiver ID	Predicted Hourly L_{eq} (dBC) minus Residual Background Sound Criterion (RBSC) at Indicated Average Wind Speed (m/s)						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	12	12	15	18	***21***	***24***	***25***
LT-10	11	11	14	16	19	***22***	***23***
LT-11	7	7	10	12	15	19	19

Table 15a
Predicted C-Weighted Aggregate Project Wind Turbine Noise Levels

Receiver ID	Predicted Hourly L_{eq} (dBC) minus Residual Background Sound Criterion (RBSC) at Indicated Average Wind Speed (m/s)						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-12	4	3	6	9	12	15	16
LT-13	6	5	8	11	14	17	18

L_{eq} = equivalent continuous sound level; dBC = C-weighted decibels; m/s = meter per second.

Figure 7a shows the contour lines where the nighttime differential between the predicted wind turbine operations C-weighted noise and the measurement-based RBSC exceeds 20 dB.

Assuming wind turbines located at only 48 sites, Table 15b shows the predicted dB differentials at each indicated study location. Bold italicized values in Table 15b show under what wind conditions the expected difference between the C-weighted predicted level and the RBSC is greater than 20 dB. Figure 7b shows the contour lines where the nighttime differential between the predicted wind turbine operations C-weighted noise and the measurement-based RBSC exceeds 20 dB.

Table 15b
Predicted C-Weighted Aggregate Project Wind Turbine Noise Levels – Alternative 2

Receiver ID	Predicted Hourly L_{eq} (dBC) minus Residual Background Sound Criterion (RBSC) at Indicated Average Wind Speed (m/s)						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	>= 10 m/s
LT-1	12	12	15	18	***21***	***24***	***25***
LT-10	11	11	14	16	19	***22***	***23***
LT-11	4	3	6	9	11	15	16
LT-12	3	3	6	8	11	15	15
LT-13	1	1	4	6	9	12	13

L_{eq} = equivalent continuous sound level; dBC = C-weighted decibels; m/s = meter per second.

Comparison of Tables 15a and 15b indicate that while the areas represented by LT-11 and LT-13 would experience lower operation noise levels due to the fewer-turbine scenario, predicted noise levels at representative locations LT-1 and LT-10 still exceed County standards at sufficient hub-height average wind speeds.

6.4.4 Cumulative Discussion

To assess for cumulatively considerable impacts at NSLU on private lands, an additional noise model was created that included other existing (e.g., Kumeyaay and Tule) and foreseeable future (Torrey) 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 16 shows the CNEL results of the cumulative noise model for the 76 possible Project turbine locations, with each turbine operating at maximum noise emission (i.e., associated with 10-15 m/s average wind speed at hub height). Location LT-10 would see a cumulatively considerable effect, with the predicted Project contribution causing the cumulative noise level to exceed 56 dBA CNEL by 2 dB. At a lower average wind speed, such as 8 m/s or less, the predicted cumulative noise level at LT-10 would be 56 dBA CNEL and thus comply with the 56 dBA CNEL threshold applicable at that representative location.

Table 16
Predicted Cumulative Noise Levels from Project Operation

Receiver ID	Cumulative + Existing* CNEL (dBA)	Cumulative + Existing Plus Project Modeled CNEL (dBA)	Over 60 dBA CNEL (or Existing CNEL + 10 dB) Threshold and Cumulative Considerable?
LT1	51	60	No
L10	46	58	Yes
L11	49	54	No
L12	56	57	No
L13	55	56	No

CNEL = community noise equivalent level; dBA = A-weighted decibels.
* Cumulative + Existing is the measured noise level, including predicted noise exposure from present Kumeyaay Wind project turbines, and foreseeable future Torrey Wind project turbines.

None of the four other receiver locations near boundaries with County lands exceed the CNEL-based County thresholds when Project operating noise and other vicinity wind turbine projects are cumulatively considered in the modeling..

6.4.5 Boulder Brush Facilities Operation

The closest Off-Reservation potential NSLU within the County's jurisdiction would be located approximately 8,950 feet from the high-voltage substation. 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 expected to result in a less than adverse effect. Aboveground electrical transmission lines associated with the Boulder Brush Facilities may produce corona during normal operation, but even under "foul" weather conditions that would moisten or wet the conductor surfaces, the resulting noise would only be audible at very close distances and thus not result in an adverse effect.

6.4.6 Construction Noise Impact Assessment

6.4.6.1 Potential Construction Activity Noise Impacts

Construction noise would be generated by workers commuting to and from the job site; by construction-material deliveries; and, by the use of construction equipment during site preparation, grading, and construction activities. Typical heavy construction equipment will include bulldozers, excavators, dump trucks, front-end loaders, graders, and industrial/concrete saws. It is assumed that diesel engines would power all construction equipment. Maximum noise levels measured at a distance of 50 feet from an individual piece of construction equipment can reach as high as 90 dBA (DOT 2006). However, with construction equipment moving around the Project site and pausing for measurements and worker breaks, average hourly noise levels would typically be significant less. For this analysis, a conservative drop-off rate of 6 dBA per doubling of distance was used for construction noise attenuation. The aforementioned ground attenuation effect (per ISO 9613-2) was also applied, which by way of example yields approximately 2-3 dB of additional attenuation for a source-to-receptor distance of 116 feet over average absorptive ground cover, and up to 4.8 dB of attenuation for much larger distances. Using the FHWA's RCNM construction noise model and construction information (types and number of construction equipment by phase), the estimated noise levels from construction were calculated for a representative range of distances, as presented in Table 17. The RCNM inputs and outputs are provided in Appendix C.

Table 18 shows the construction phases that only have On-Reservation work, with expected noise levels at the identified quarter-mile and half-mile distances to nearest On-Reservation receptors. Table 19 shows construction activities specific to the Boulder Brush Facilities, for which an expected portion of its access is a paved road only 80 feet from the nearest sensitive Off-Reservation receptor.

Table 17
Predicted Off-Site Construction Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)	
	Nearest Receiver 116 feet	*Typical Receiver 700 feet*
Clearing and grading	75	62
Construction of access roads	72	58
Paving	74	60
Construction of underground Electrical Collection and Communication System	72	58
Boulder Brush Facilities (clearing and grading)	74	60
Boulder Brush Facilities (construction of access roads)	73	61
Boulder Brush Facilities (foundation construction and tower erection)	68	54

Table 17
Predicted Off-Site Construction Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)	
	Nearest Receiver 116 feet	*Typical Receiver 700 feet*
Boulder Brush Facilities (stringing and pulling)	61	46
Operations and maintenance building	69	54
Meteorological tower construction	70	55

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

Table 18
Predicted Wind Turbine On-Site Construction Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)	
	Nearest Receiver 0.25 mile (1,320 feet)	*Typical Receiver >0.5 mile (2,640 feet)*
Wind turbine foundation construction	50	44
Wind turbine erection	55	49

L_{eq} = equivalent continuous sound level; dBA = A-weighted decibels.

Table 19
Predicted Boulder Brush Facilities Construction Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)	
	Nearest Receiver (80 feet)	*Typical Receiver 0.25 mile (1,320 feet)*
Boulder Brush Facilities (existing road improvements [paving])	79	54

L_{eq} = equivalent continuous sound level; dBA = A-weighted decibels.

As presented in Tables 17 and 18, the highest noise levels are predicted to occur during clearing, grading, and construction of access roads when noise levels from construction activities would be as high as 75 dBA L_{eq} at the nearest existing residences. During other phases of construction work and more typically, the noise levels would range from approximately 46 to 74 dBA L_{eq} at the nearest noise sensitive receptors. Table 19, on the other hand, predicts 79 dBA due to Boulder Brush Facilities access road paving near an NSLU; hence, Mitigation Measure (MM) NOI-1 (provided in Chapter 7, Noise Mitigation Measures) would be needed to help ensure that resulting construction noise levels at this nearest receptor would be less than the 75 dBA $L_{eq(8h)}$ threshold.

Although nearby off-site residences would be exposed to elevated construction noise levels, the exposure would be short term, and would cease upon Project construction. While typical construction activities would typically occur between 7 a.m. and 7 p.m., Monday through Friday, construction might occasionally occur during the night and/or on Saturdays and Sundays to enable deliveries or other activities for which Caltrans may restrict hours during which I-8 may be used for oversized loads.

On-Reservation Construction Noise Impact

Construction activities would not generate short-term noise levels greater than 80 dBA L_{eq} at existing NSLU. Thus, the construction noise would not exceed the FTA guidance-based 80 dBA $L_{eq(8hr)}$ noise level criterion.

Off-Reservation Construction Noise Impact

The nearest Off-Reservation noise-sensitive receptors for Campo Wind construction assessment purposes are the single-family residences located off roadways that would have work done as part of the Project. The closest residences are located at distances of approximately 116 feet from any proposed road work. The construction noise would not exceed the limit in County of San Diego Noise Ordinance Section 36.409 of 75 dBA $L_{eq(8hr)}$. Therefore, noise effects from construction are considered potentially less than adverse with respect to these nearest Off-Reservation receptors at this nearest distance of 116 feet.

Although the concrete batch plant location for the Project is anticipated to be near the southeastern property line, its predicted noise level over an 8-hour period would be compliant with the County's 75 dBA $L_{eq(8hr)}$ threshold per the following analysis assumptions: 1) the major noise-producing equipment associated with this stationary construction activity are within the approximately 500' x 500' portion of the Project's area of ground disturbance but no closer than 100 feet to the property line; and 2) the source sound level and AUF values are as shown in Table 8.

Due to the shorter distance of 80 feet between an Off-Reservation noise-sensitive receptor and road improvements as part of building access to the Boulder Brush Facilities,the predicted construction noise level as presented in Table 19 exceeds the Section 36.409 threshold of 75 dBA L_{eq8h} by 4 dB and would thus require mitigation. Mitigation would involve implementation of mitigation measure MM-NOI-1 as described in Section 7. Therefore, noise effects from construction of the Boulder Brush Facilities would not be considered adverse with this mitigation measure properly applied.

6.4.6.2 Potential Off-Site Temporary Construction Traffic Noise Impacts

During construction, the Project would also result in a short-term increase in noise levels from off-site traffic (beyond the Reservation boundary and beyond the private land parcels through which the Boulder Brush Facilities extend) on the local roadway network, but this increase would not be sufficient to increase traffic noise levels a substantial amount. Trip generation and distribution for workers and delivery trucks would ultimately vary depending on the phase of construction.

It is estimated that construction activities would require a maximum of 1,002 average daily worker trips (during the construction of underground electric collection system phase) and a maximum of 44 average daily vendor truck trips (during the clearing and grading construction phase) as shown in Table 8 (Dudek 2018). These vehicles would access the Project Site via I-8 and SR-94.

It has been conservatively assumed that all construction worker trips would occur during the AM peak traffic period. This increase in traffic volume and change in vehicular mix from the Project would result in a less than 3 dB increase in noise levels along I-8 and SR-94 during the AM peak period. An increase of 3 dB is just barely perceptible to the human ear. Typically, traffic volumes must double to create a perceptible increase (3 dB) in traffic noise (Caltrans 2011). The main access roads of I-8 and SR-94 have existing traffic greater than the construction related trips. Thus, a doubling in the traffic on these roads is not expected during the construction of the Project.

Thus, the vehicles added to the local roadway network from the Project's construction-related traffic would not result in a 3 dB increase in the daily or peak hour traffic noise levels. A 3 dB increase in noise level is a barely perceptible change in sound level. Based on Caltrans (2013) and CEC (2012), a 10 dB increase is considered a substantial increase in ambient noise. Therefore, the additional construction-related traffic would not have a temporary adverse effect on NSLU due to increases in traffic noise levels.

6.4.6.3 Potential Impulsive Construction Noise Impacts

Blasting and Rock Drilling

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 phases. Blasting activities would occur only on the Reservation.

No more than two blasts per day would occur during construction activities. Blasting would only be required where existing topography or geologic conditions require blasting to be conducted, and potential blasting locations would in the same locations as the proposed turbines only when blasting is deemed necessary. The blasting information provided by Terra-Gen and additional calculation assumptions are provided in Table 20.

Table 20
Anticipated Blasting Characteristics

Activities and Materials	Amount
Total Rock Requiring Blasting (cubic yards)	1,537,480
Rock blasted per blast (cubic yards per blast)	15,000
Maximum blasts per day (blasts per day)	3
Total blasts	102 full 1 partial
Maximum explosive per blast (tons ANFO per blast)	8.25
Total explosives used (tons ANFO)	845.61
Maximum area blasted per day (square feet per day)	4,004
Total area blasted (square feet)	136,786

Sources: Terra-Gen 2018.
ANFO = ammonium nitrate/fuel oil.

Based on preliminary estimates, potential areas where rock blasting may be necessary are located no closer than 1,320 feet of existing noise- and vibration-sensitive land uses (located off of the Project site). At this distance, and assuming a per-blast charge weight of up to 10 pounds that is fully contained per industry guidance (Dyno Nobel 2010), a single blast would produce an airblast noise level of 107 dB, which roughly converts to an A-weighted value that is 25 dB less (hence, 107−25=82) based on available research (Richards 2008). This A-weighted L_{max} value complies with the County of San Diego impulse noise standard and would thus not produce an adverse effect.

Blasting involves drilling a series of boreholes and placing explosives in each hole. By limiting the amount of explosives in each hole, the blasting contractor can limit the total energy released at any single time, which in turn can reduce noise and vibration levels. Rock drilling generates impulsive noise from the striking of the hammer with the anvil within the drill body, which drives the drill bit into the rock. Rock drilling generates noise levels of approximately 81 dB L_{max} (maximum sound level during the measurement interval) at a distance of 50 feet (FHWA 2006). Given a typical work cycle, this would equate to 74 dBA L_{eq} at 50 feet. Assuming a noise level of 81 dBA L_{max} at 50 feet, the noise level from rock drilling would be less than the County noise standard for impulsive noise (82 dBA L_{max}) at a distance of approximately 350 feet.

Portable Rock-Crushing/Processing Facility

A portable rock-crushing/processing facility would be used on site during construction activities. Rock-crushing information was provided by the developer's construction contractor, and calculation assumptions are provided in Table 21.

Table 21
Rock-Crushing Characteristics

Activities and Materials	Amount
Amount of rock to be processed (cubic yards)	30,770
Number of rock-crushing facilities	1
Number of generators	1
Operating hours per day per generator (hours per day)	8
Total rock processed per day (cubic yards day)	**3,077**
Total operating days per phase (days)	**10**

Source: Campo Wind LLC 2018.

This analysis assumes the rock-crushing equipment would consist of a crusher, screen, and conveyor, and the crushed rock would be stockpiled for future use. Although a single primary crusher and screen may be all that is required, use of a secondary crusher and additional screen would expedite this process.

Based on noise measurements that have been conducted for portable rock-crushing operations, the rock-crushing activity would generate a 1-hour average ($L_{eq(1h)}$) noise level of approximately 80 dBA at a distance of 100 feet from the primary crusher. The primary crusher would also generate impulsive noise events. Maximum noise levels associated with the primary crusher could reach approximately 88 dBA at 100 feet (LDN 2011). Using this reference data, for a receptor no closer than 200 feet to the rock crushing activity, predicted hourly L_{eq} and L_{max} (impulsive noise) would be 74 dBA and 82 dBA, respectively. These noise levels would not exceed the County's 8-hour construction noise and impulsive noise thresholds of 75 dBA L_{eq} or 82 dBA L_{max}, respectively.

This predicted hourly L_{eq} of 74 dBA for rock crushing would also be less than the 80 dBA $L_{eq(8h)}$ FTA-based guidance limit applied in this analysis to On-Reservation potentially sensitive locations. Therefore, the Project would have less than significant effects from rock-crushing noise.

6.4.6.4 Design Considerations and Temporary Mitigation Measures

To help maximize the likelihood of resultant Project-attributed construction noise levels complying with the County standards for NSLU on private lands within County jurisdiction, implementation of Mitigation Measure (MM) Construction-1 by the Project contractor(s) is recommended.

6.4.6.5 Construction Vibration Impact Assessment

Conventional Construction Equipment

The nearest sensitive receptors to Project construction activities that could produce high vibration levels would be at the residences to the south of the Project site, located approximately 116 feet from the nearest applicable construction work. At a distance of 116 feet, vibration levels are anticipated to be less than 0.006 inches per second PPV from construction activities at the nearest off-site residences. At this vibration level is less than the previously mentioned 0.2-inch-per-second PPV threshold (FTA 2006). Thus, this effect would not be considered adverse.

For the Boulder Brush Facilities access road construction activities associated with roadway improvements along Ribbonwood Road, the nearest NSLU at 80 feet may experience up to 0.06 inches per second PPV (assuming usage of a roller, as a worst-case) and would thus also be lower than the afore-mentioned 0.2 inch-per-second PPV threshold. Hence, this would also be considered a less than adverse effect.

Blast Event Vibration

Assuming a “heavily confined” condition (Dyno Nobel 2010), this analysis predicts the same individual blast event as defined in Section 6.4.5.3 (i.e., charge weight up to 10 pounds and 1,320-foot distance between blast and receptor) would generate groundborne vibration of 0.045 inches per second PPV. As this expected value is far less than the 0.2-inch-per-second PPV threshold adopted by this study, the corresponding impact would be considered less than significant or not a substantially adverse effect.

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7 NOISE MITIGATION MEASURES

Construction

Because construction noise is expected to exceed the County standard of 75 dBA $L_{eq(8h)}$ at a sensitive receptor just 80 feet from road paving associated with access to the Boulder Brush Facilities, the following construction activity best management practices (BMP) are nonetheless recommended as responsibilities of the construction contractor(s).

MM-NOI-1 Construction Noise Best Management Practices.

- Ensure that all construction equipment driven or powered by internal combustion engines is 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), provide the owner/occupant at least one week's 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 Off-Reservation NSLUs closer than 100 feet to construction activity, the contractor should temporarily erect or install a sound barrier having sufficient vertical height, solidity, and horizontal extent to occlude direct sound paths between the construction activity and the receiving land use. The sound barrier should be composed of material(s) that can exhibit a sound transmission loss (TL) of at least 20 dB.

Operation

Depending on the average wind speed received by the Project turbines at hub height, their aggregate operation for the conservatively analyzed 76-turbine study could expose On-Reservation NSLU in the vicinities of LT-1, LT-2, LT-5, LT-8, LT-9, and LT-10 to noise levels that exceed the EPA outdoor noise guideline of 55 dBA L_{dn}. Due to the parameters of the Campo Lease, which only authorizes 60 turbines to be constructed for the Project and requires that no turbines be placed within 0.25 miles of residences, there exists opportunity for actual residence locations to experience reduced noise exposure compared to the exposure at the disclosed representative On-Reservation locations.

However, as illustrated by the studied alternative layout scenario with only 48 operating Project turbines, where individual turbine positions comply with the minimum setback requirement stated in the Campo Lease, the predicted operational noise level would still exceed the EPA-based standard of 55 dBA L_{dn} under either build alternative (1 or 2) for representative locations LT-1, LT-2, and LT-10 at sufficiently high average hub-height wind speeds as presented in Table 11b. These instances of expected exceedance appear to result from exposure of the representative location to not one but multiple operating turbines. For example, the predicted turbine noise exposure at LT-1 resembles the “perpendicular” scenario shown in Table 12 where the receptor location is perpendicular to a string of operating turbine positions that may individually satisfy the Campo Lease minimum setback requirement.

With respect to potential cumulative project effects, several representative locations would see cumulatively considerable contribution from Project turbine operation for both the 76-turbine case (Alternative 1) and 48-turbine case (Alternative 2) under average wind speeds that generate maximum turbine noise emission. When these average wind speeds are less (e.g., 7 m/s), fewer occurrences of cumulatively considerable effect can be expected.

Turbine pre-installation site selection or relocation considerations and opportunities that could affect the final Project turbine layout may also offer potential reduction of predicted aggregate sound pressure level at Off-Reservation NSLU as a result of increased distance from one or multiple operating turbines. The quantifiable effect would depend on the turbine locations to be determined based on final engineering, the existing NSLU location, its current proximity to multiple on-site turbines, and the pre-existing outdoor ambient sound level.

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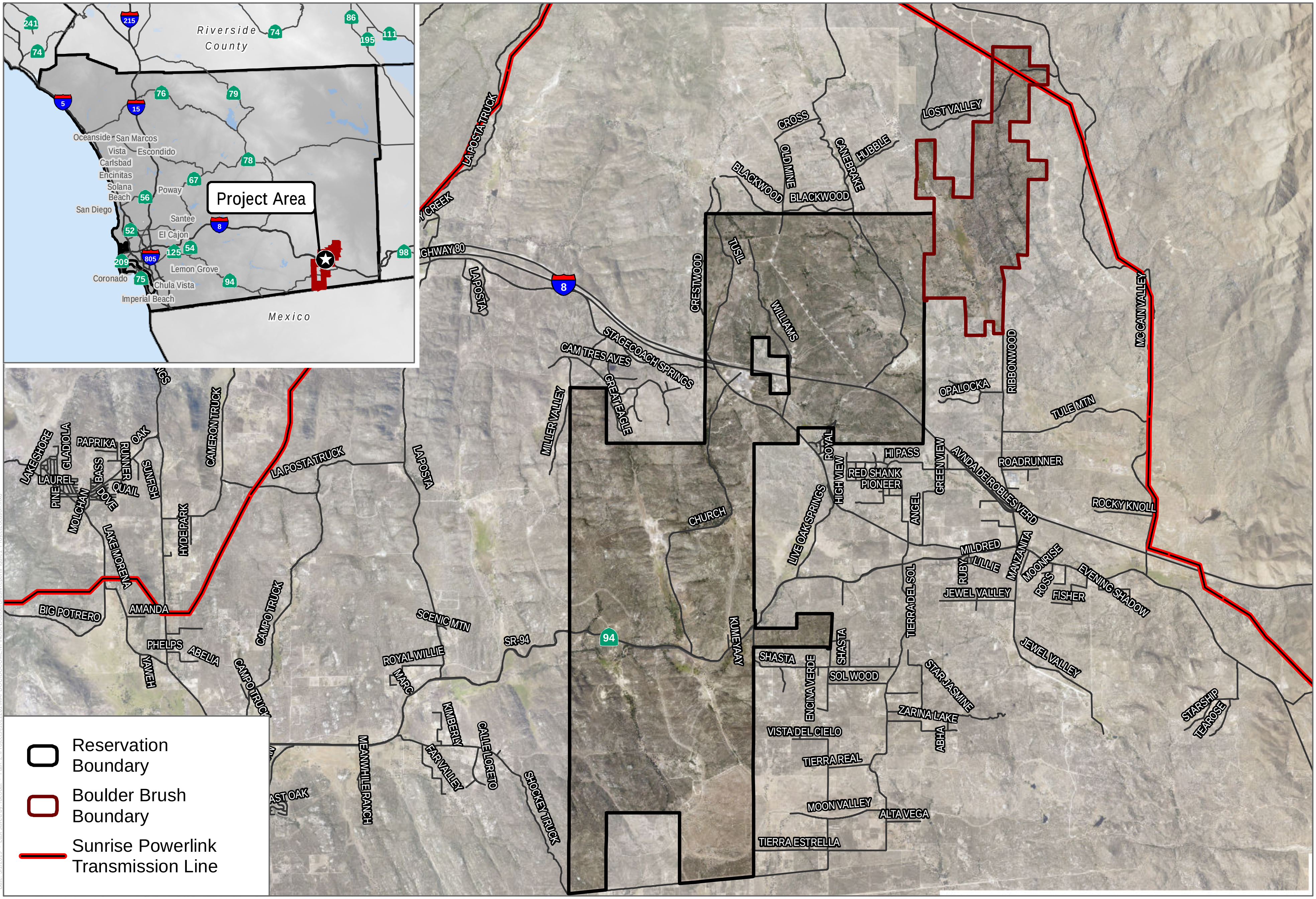

SOURCE: SANGIS 2017

DUDEK

0 4,000 8,000 Feet

FIGURE 1

Project Location

Campo Wind with Boulder Brush Facilities

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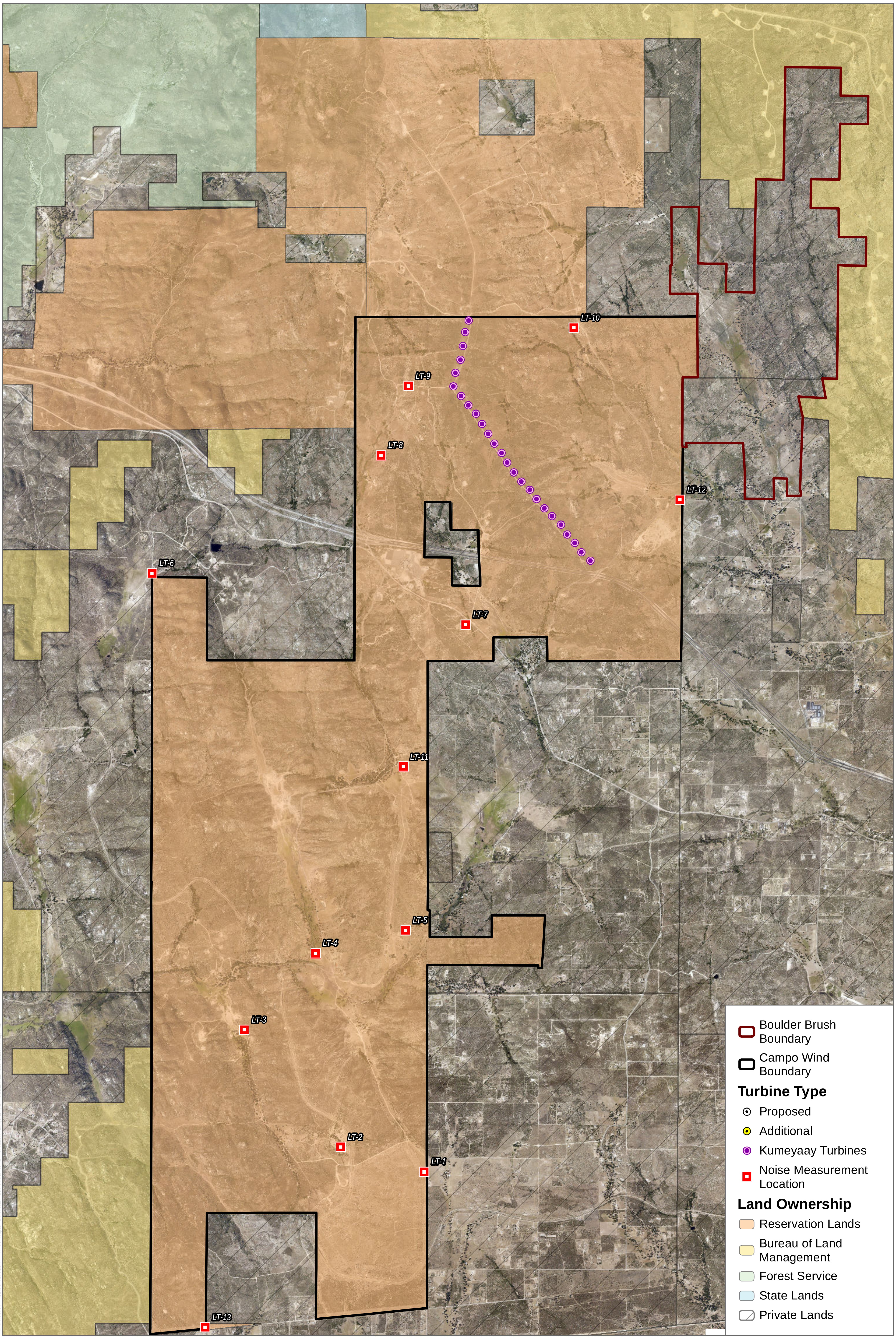

SOURCE: SANGIS 2017

DUDEK

FIGURE 2

Noise Measurement Locations

Campo Wind with Boulder Brush Facilities

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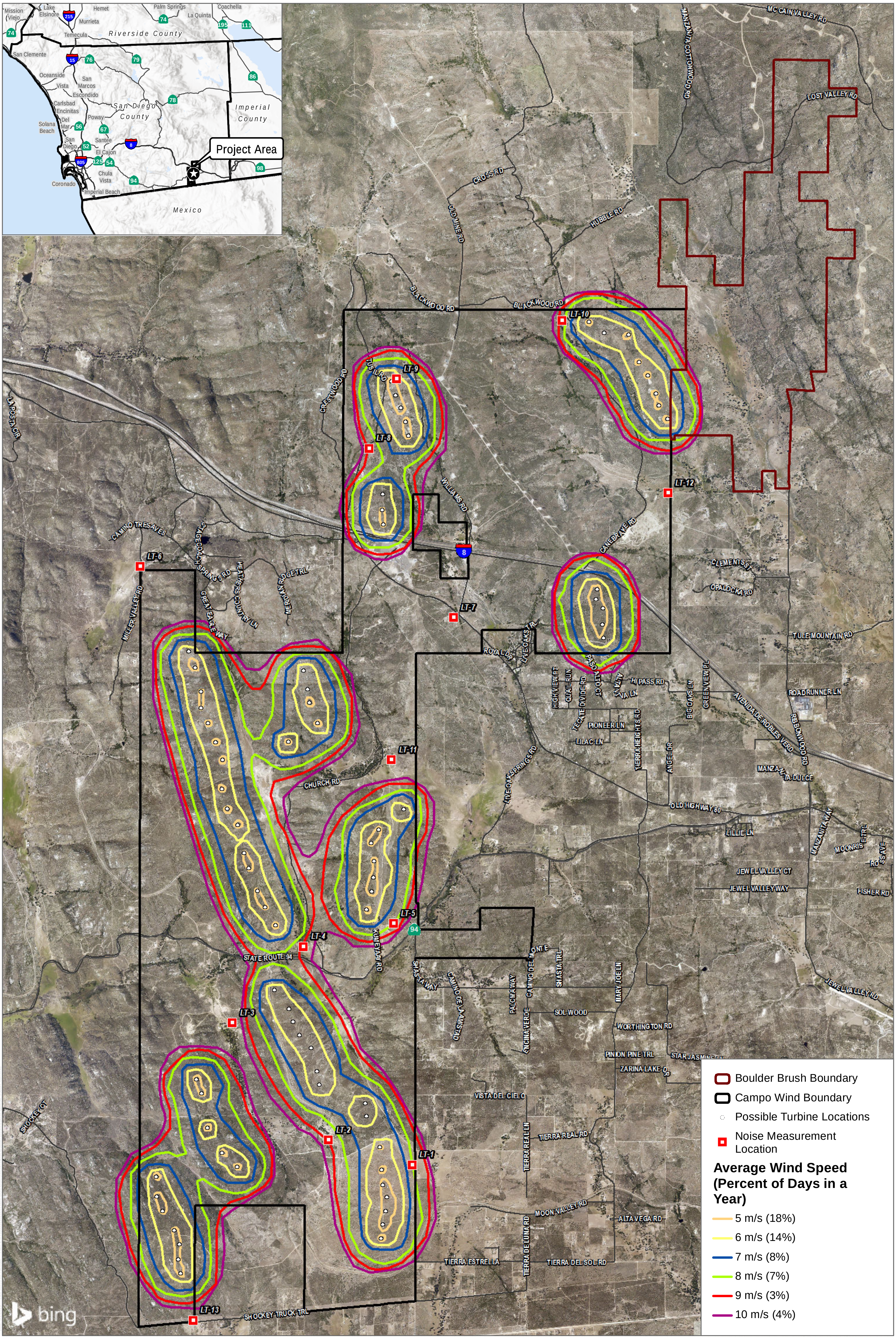

SOURCE: SANGIS 2017

DUDEK

0 1,850 3,700 Feet

FIGURE 3A

Operational 55 dBA Ldn Noise Contours

Campo Wind with Boulder Brush Facilities

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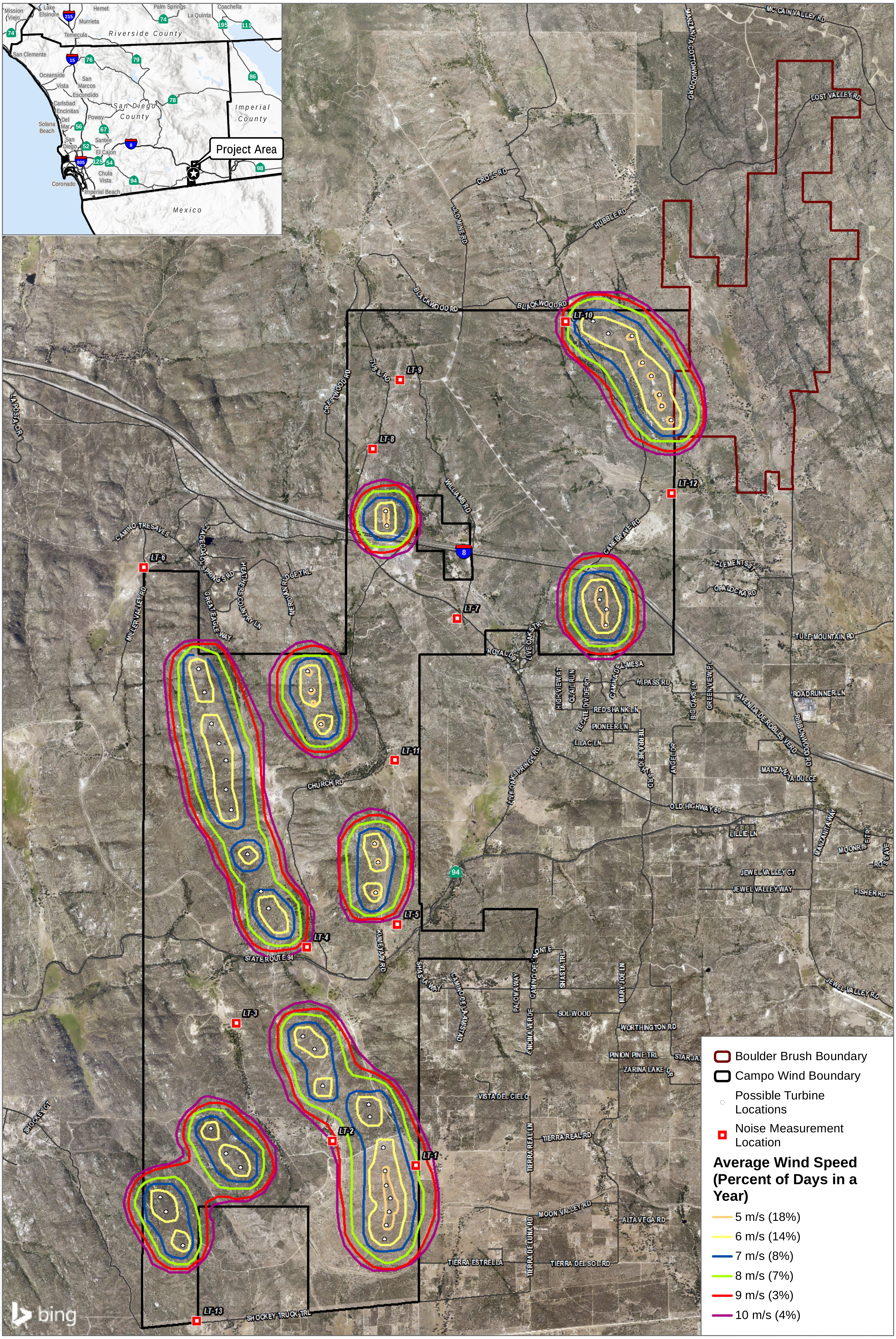

SOURCE: SANGIS 2017

DUDEK

0 1,850 3,700 Feet

FIGURE 3B

Alternative Operational 55 dBA Ldn Noise Contours

Campo Wind with Boulder Brush Facilities

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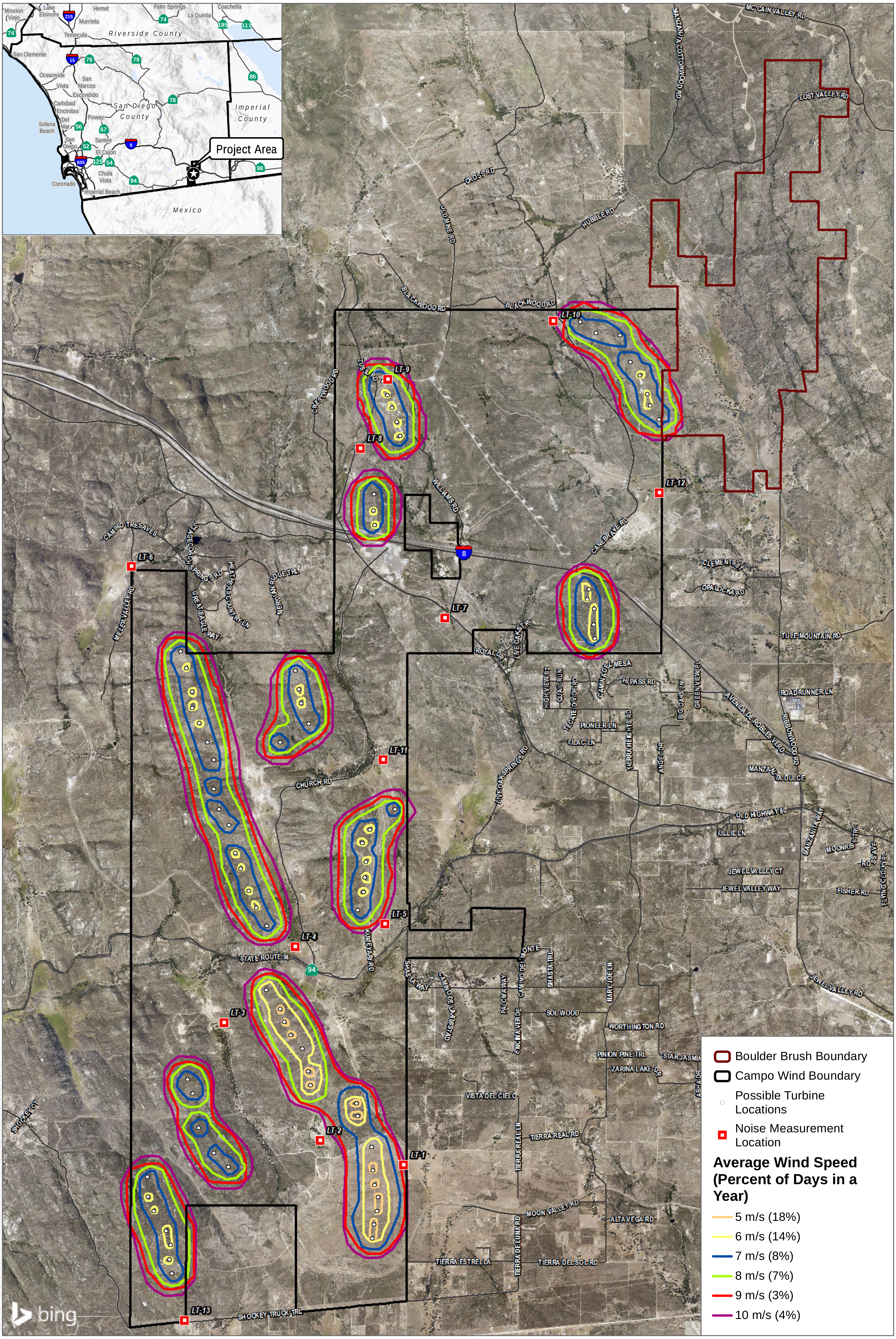


SOURCE: SANGIS 2017

FIGURE 4A

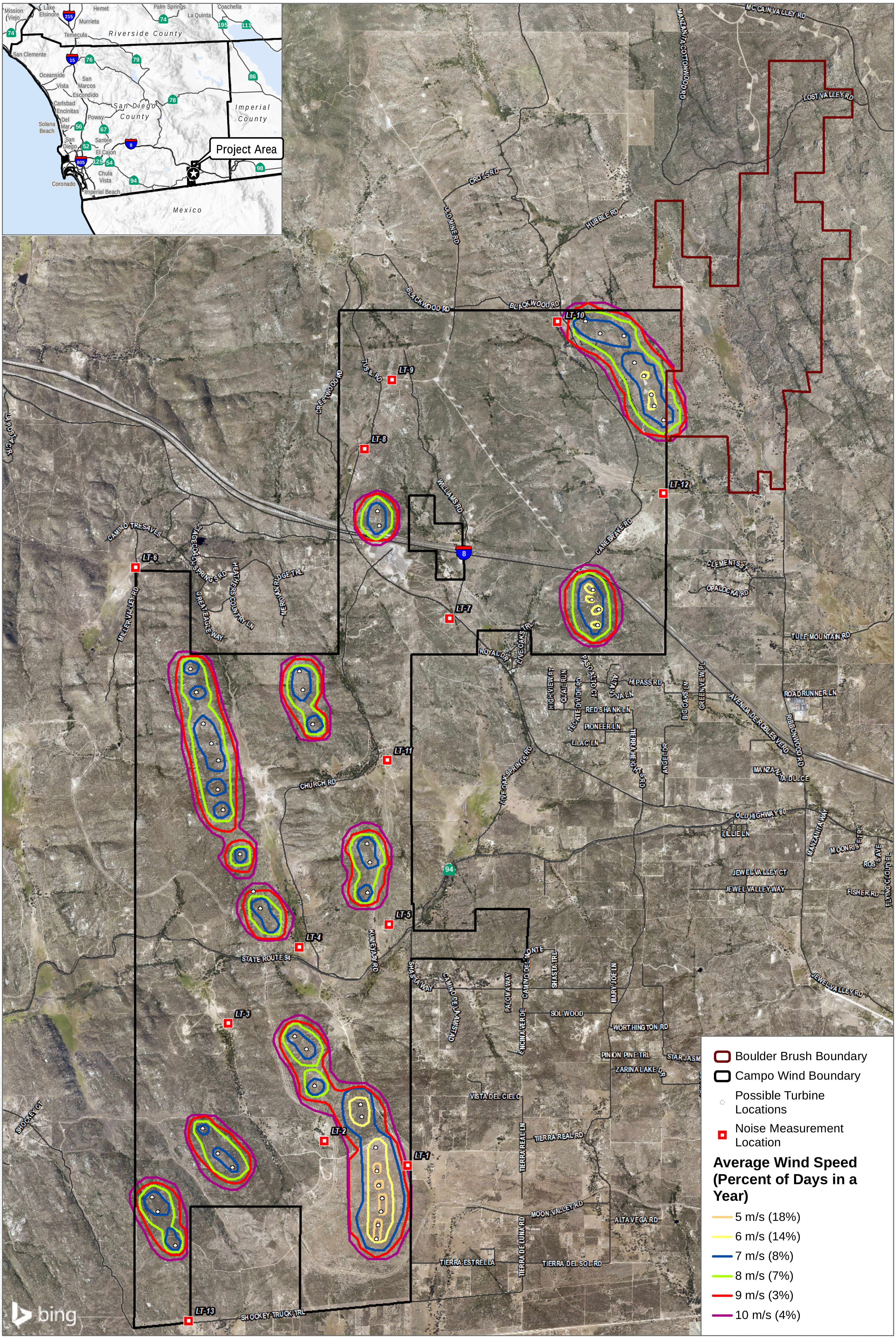
Operational 60 dBA CNEL Noise Contour

Campo Wind with Boulder Brush Facilities

DUDEK

0 1,850 3,700 Feet

INTENTIONALLY LEFT BLANK



SOURCE: SANGIS 2017

DUDEK

FIGURE 4B

Alternative Operational 60 dBA CNEL Noise Contour

Campo Wind with Boulder Brush Facilities

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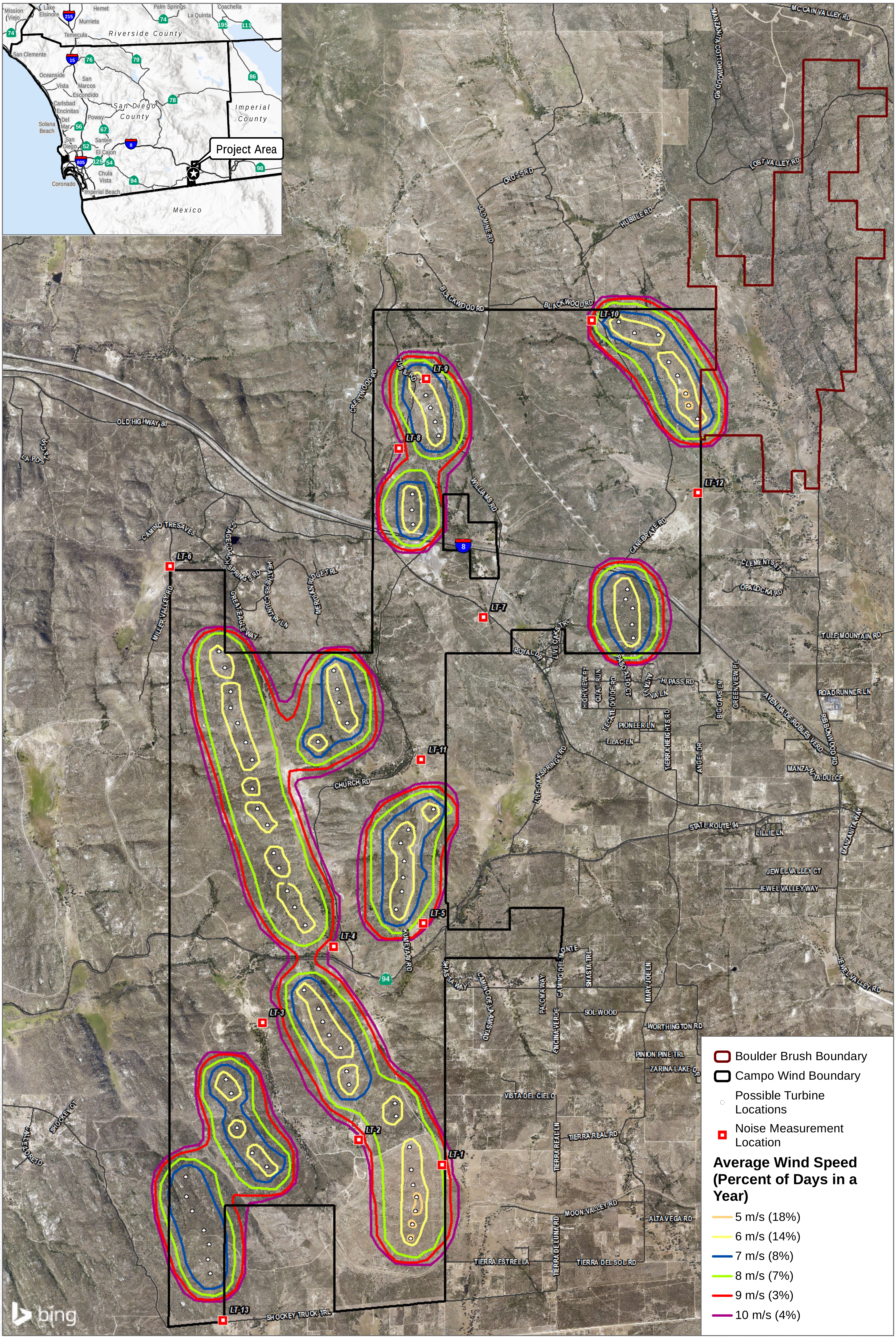

SOURCE: SANGIS 2017

0 1,850 3,700 Feet

DUDEK

FIGURE 5A

Operational 50 dBA Leq Noise Contour

Campo Wind with Boulder Brush Facilities

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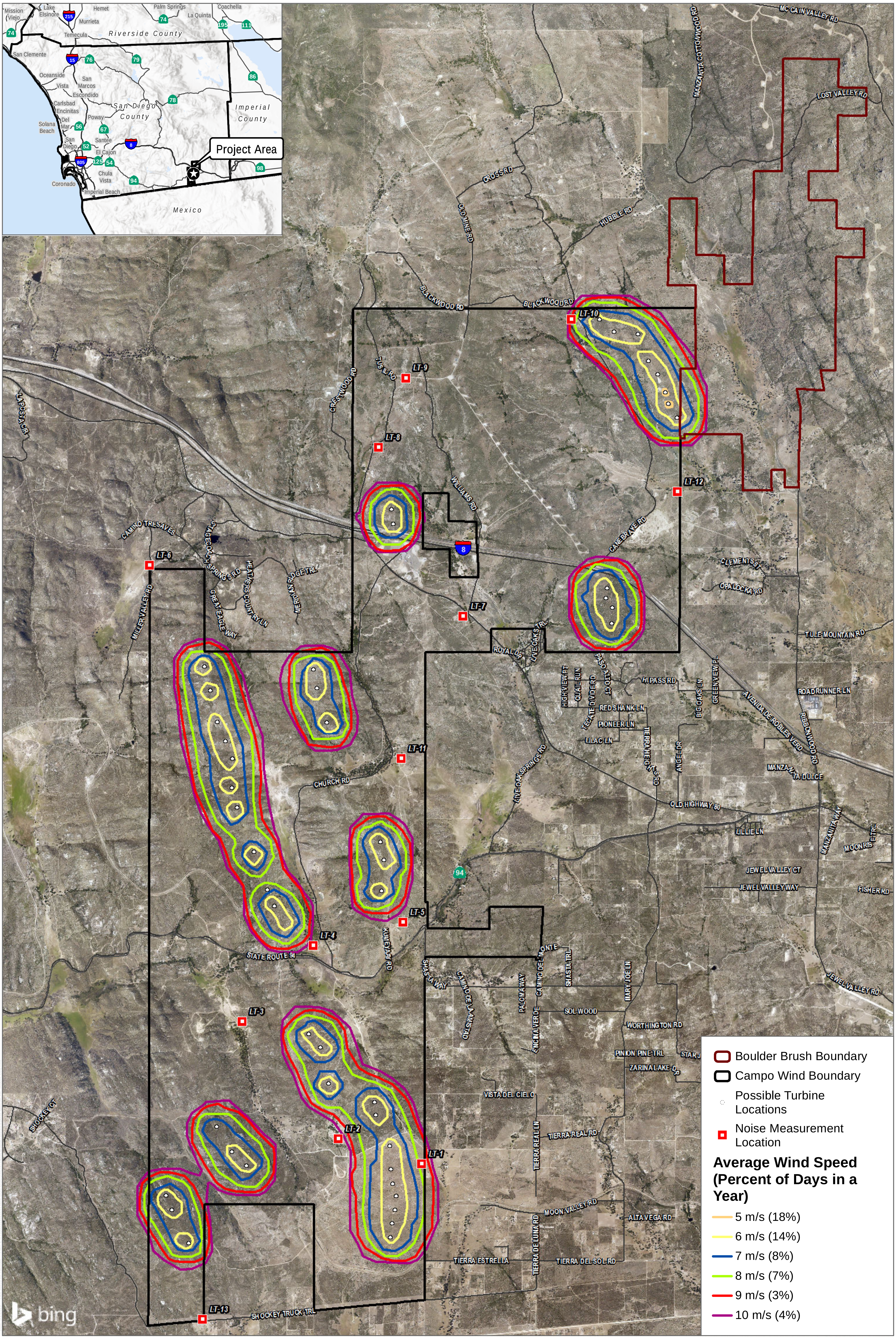

SOURCE: SANGIS 2017

DUDEK

0 1,850 3,700 Feet

FIGURE 5B

Alternative Operational 50 dBA Leq Noise Contour

Campo Wind with Boulder Brush Facilities

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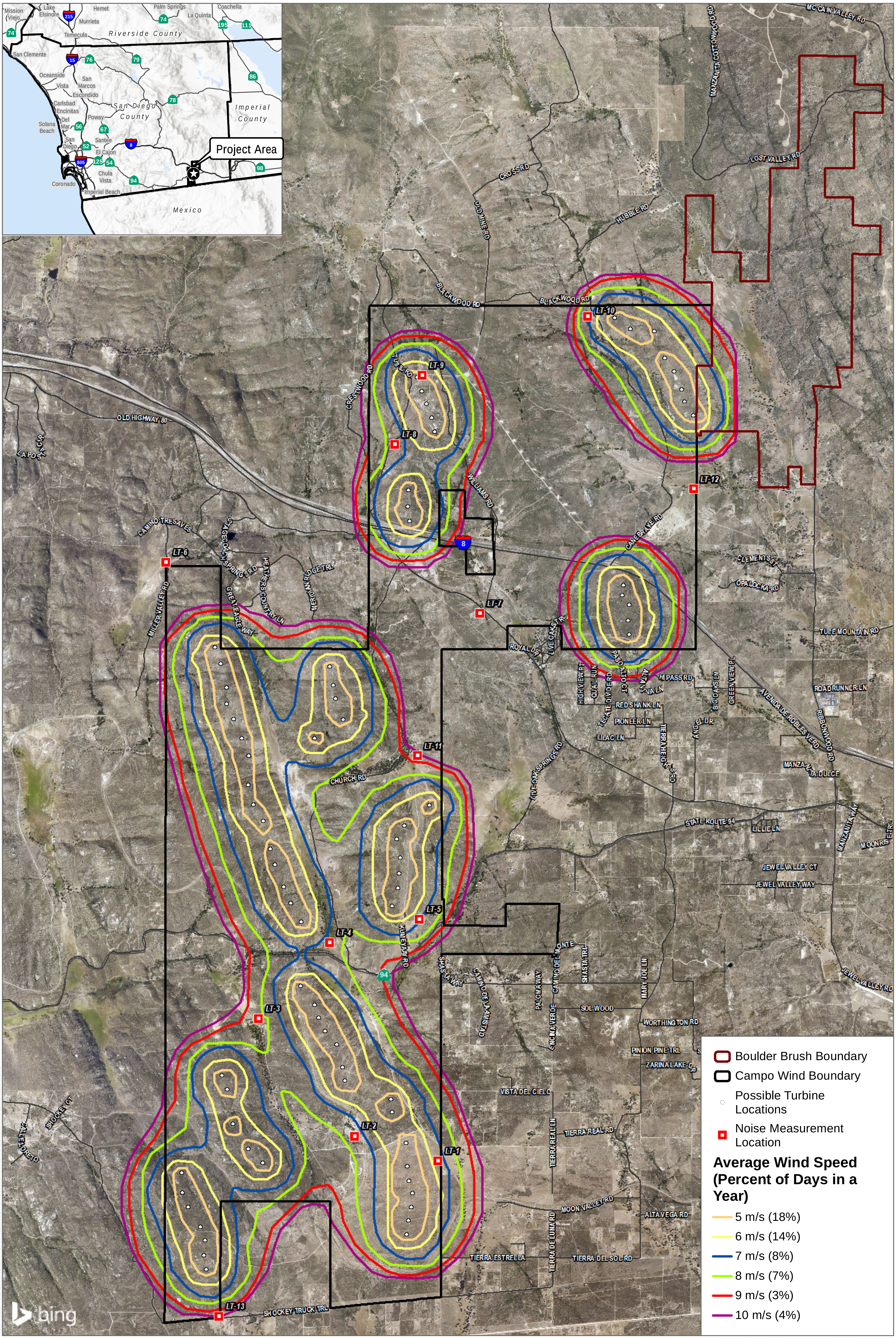

SOURCE: SANGIS 2017

DUDEK

0 1,850 3,700 Feet

FIGURE 6A

Operational 45 dBA Leq Nighttime Noise Contour

Campo Wind with Boulder Brush Facilities

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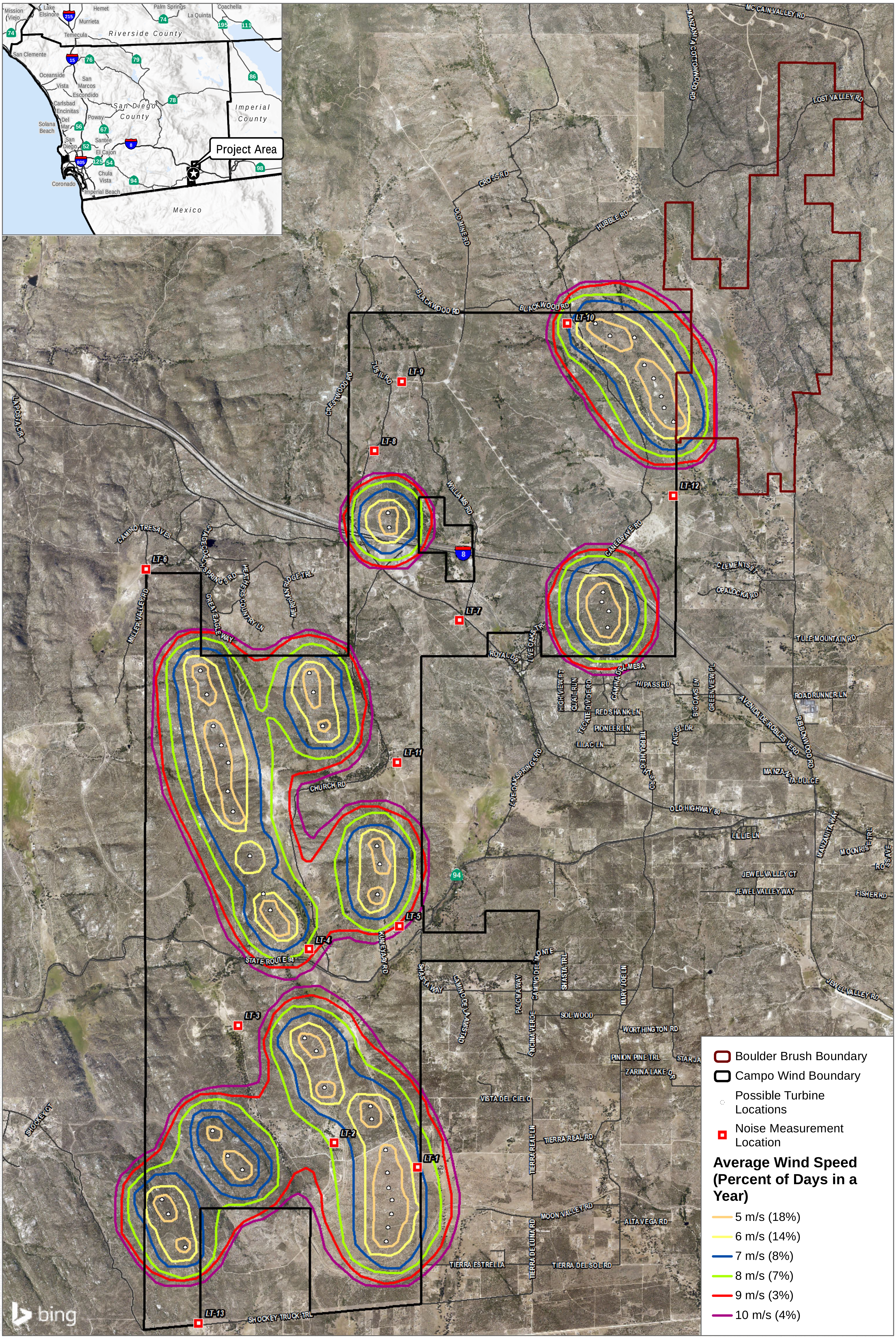

SOURCE: SANGIS 2017

DUDEK

0 1,850 3,700 Feet

FIGURE 6B

Alternative Operational 45 dBA Leq Nighttime Noise Contour

Campo Wind with Boulder Brush Facilities

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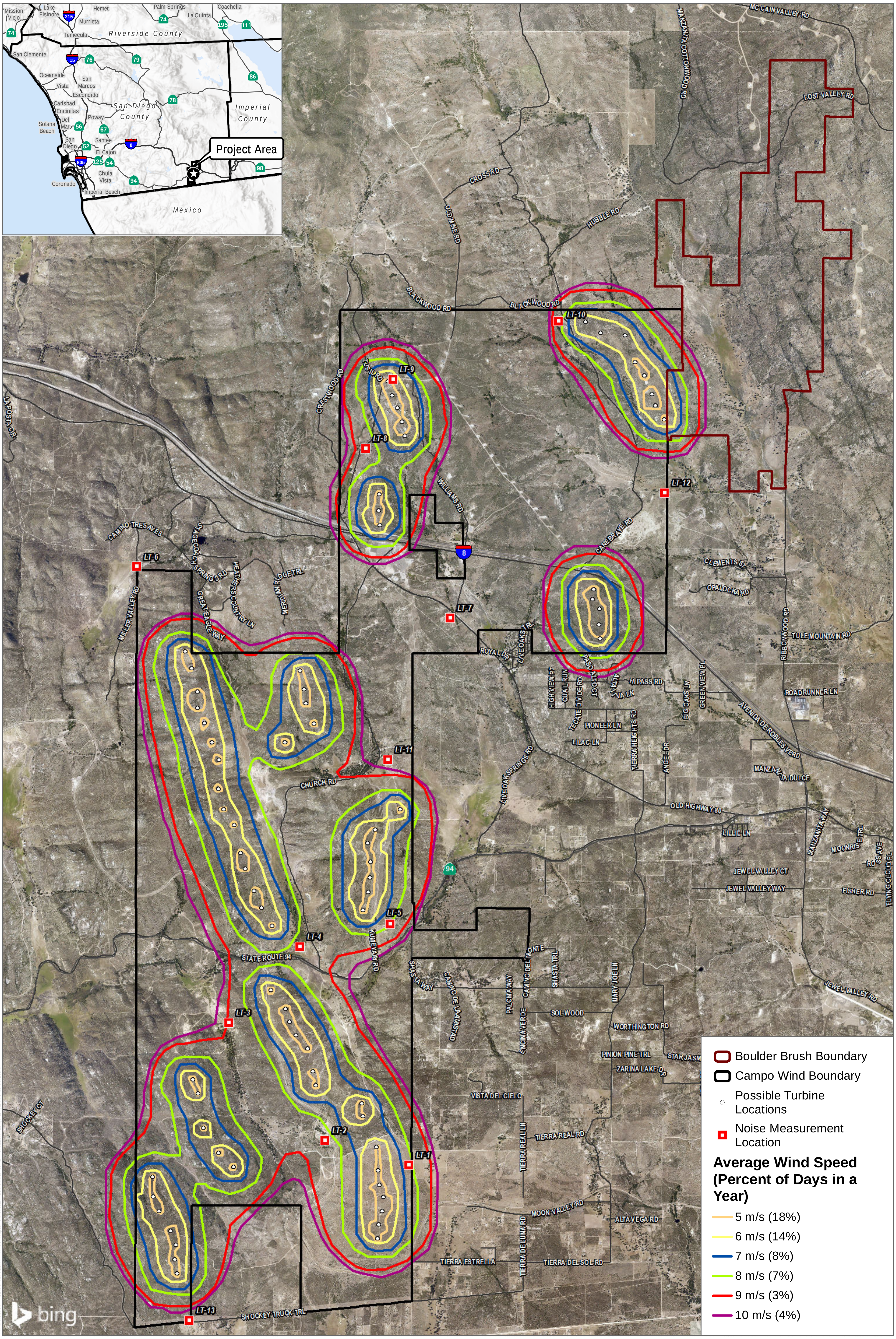


SOURCE: SANGIS 2017

FIGURE 7A

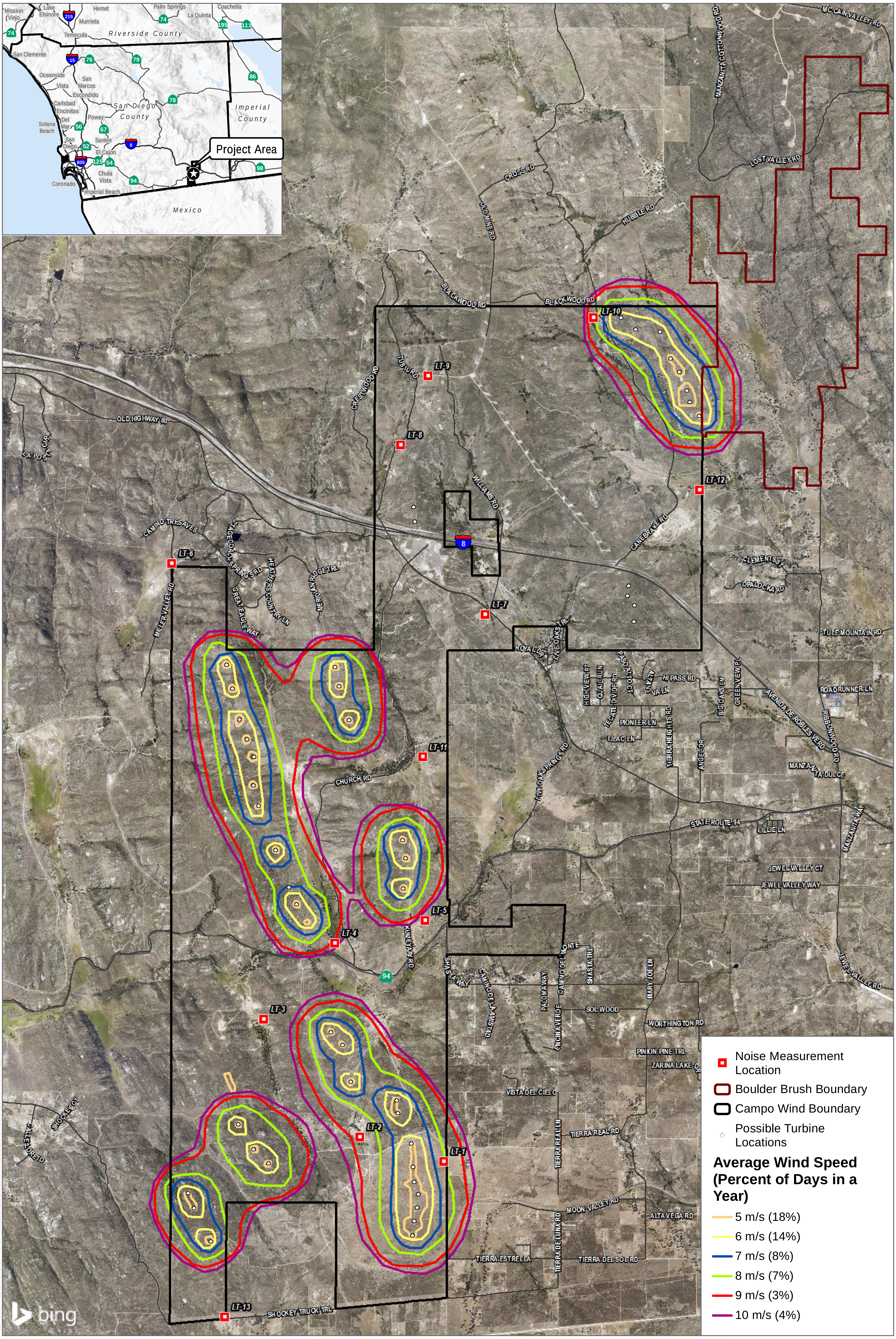
Operation Noise Contours: LCeq - RBSC = 20 dB

Campo Wind with Boulder Brush Facilities

DUDEK

0 1,850 3,700 Feet

INTENTIONALLY LEFT BLANK



SOURCE: SANGIS 2017

DUDEK 0 1,850 3,700 Feet

FIGURE 7B

Alternative Operation Noise Contours: LCeq - RBSC = 20 dB

Campo Wind with Boulder Brush Facilities

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APPENDIX A

Baseline Measurement Data

Rec 3 to 27	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:55	1.0 hour	53.5	89.1	82.2	36.5	55	47	45	39	35	35	35	39	39.6	4.36	51	45	41
9/5/2018 9:55	1.0 hour	63.7	99.3	92	36.6	67	51	47	39	35	35	35	39	41.2	6.43	63	49	43
9/5/2018 10:55	1.0 hour	47	82.6	70.1	33.6	57	51	49	39	35	35	35	39	39.9	5.55	55	49	41
9/5/2018 11:55	1.0 hour	48	83.6	66	35.5	57	53	51	41	35	35	35	41	41.9	6.13	57	51	45
9/5/2018 12:55	1.0 hour	43.4	79	64.6	33.6	53	49	45	37	35	35	35	37	38.6	4.69	51	47	39
9/5/2018 13:55	1.0 hour	43.2	78.8	66	33.6	55	47	43	35	35	35	35	35	37.4	4.33	51	45	37
9/5/2018 14:55	1.0 hour	38.8	74.4	63.3	33.6	47	39	37	35	35	35	35	35	35.8	2.3	43	39	35
9/5/2018 15:55	1.0 hour	37	72.6	51.7	33.6	45	39	37	35	35	35	35	35	35.7	1.9	43	39	35
9/5/2018 16:55	1.0 hour	42	77.6	66.7	33.6	55	41	39	35	35	35	35	35	36.2	3.26	47	39	35
9/5/2018 17:55	1.0 hour	42.9	78.5	72.2	33.6	47	41	39	35	35	35	35	35	35.8	2.68	43	39	35
9/5/2018 18:55	1.0 hour	39.5	75.1	46.9	33.6	43	43	43	35	35	35	35	35	37.4	3.41	43	43	41
9/5/2018 19:55	1.0 hour	43	78.6	63.2	35.7	53	43	43	39	35	35	35	39	39.5	3.65	51	43	41
9/5/2018 20:55	1.0 hour	43.7	79.3	66.2	33.6	55	41	37	35	35	35	35	35	36.4	3.51	49	39	37
9/5/2018 21:55	1.0 hour	35.8	71.4	54.5	33.6	41	37	35	35	35	35	35	35	35.2	1.27	39	35	35
9/5/2018 22:55	1.0 hour	34.6	70.2	43.1	33.6	37	35	35	35	35	35	35	35	35.1	0.52	37	35	35
9/5/2018 23:55	1.0 hour	36.8	72.4	57.9	33.6	45	41	35	35	35	35	35	35	35.6	2.13	43	37	35
9/6/2018 0:55	1.0 hour	44.4	80	71.1	33.6	53	39	35	35	35	35	35	35	35.6	3.13	47	35	35
9/6/2018 1:55	1.0 hour	34.5	70.1	58.2	33.6	35	35	35	35	35	35	35	35	35.1	0.88	35	35	35
9/6/2018 2:55	1.0 hour	33.5	69.1	40.6	33.6	35	35	35	35	35	35	35	35	35	0.1	35	35	35
9/6/2018 3:55	1.0 hour	33.3	68.9	39.8	33.6	35	35	35	35	35	35	35	35	35	0.09	35	35	35
9/6/2018 4:55	1.0 hour	33.8	69.4	51	33.6	41	35	35	35	35	35	35	35	35.1	0.94	37	35	35
9/6/2018 5:55	1.0 hour	36.2	71.8	55.9	33.6	39	39	39	35	35	35	35	35	35.8	1.7	39	39	35
9/6/2018 6:55	1.0 hour	43.1	78.7	74.8	36.6	43	39	39	37	37	37	35	37	37.9	1.97	41	39	39
9/6/2018 7:55	1.0 hour	40	75.6	59.8	36.6	47	39	39	37	35	35	35	37	37.2	2.1	43	39	37
9/6/2018 8:55	7.3 min	51.5	77.9	75.6	36.6	51	45	43	39	37	35	35	39	39.2	3.89	47	43	39

daytime (9am to 10pm) Leq	53.4
daytime (7am to 9am) Leq	41.8
nighttime (10pm to 7am) Leq	37.7
Ldn	51.5

average daytime L90	35.1
average nighttime L90	35.0
lowest L90	35.0

Rec 2 to 26	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:45	1.0 hour	48.1	83.7	80.6	33.4	45	37	35	35	35	35	35	35	35.5	2.62	41	35	35
9/5/2018 9:45	1.0 hour	39.1	74.7	59.5	33.4	51	41	37	35	35	35	35	35	35.9	2.96	49	39	35
9/5/2018 10:45	1.0 hour	43.6	79.2	65.5	33.4	57	45	41	35	35	35	35	35	36.6	4.11	51	43	35
9/5/2018 11:45	1.0 hour	42	77.6	61.4	33.4	53	47	43	35	35	35	35	35	37.6	4.16	51	45	37
9/5/2018 12:45	1.0 hour	39.3	74.9	60.7	33.4	49	43	41	35	35	35	35	35	36.2	2.99	47	41	35
9/5/2018 13:45	1.0 hour	38.4	74	58.1	33.4	47	43	41	35	35	35	35	35	36.4	2.65	45	41	37
9/5/2018 14:45	1.0 hour	42	77.6	58.2	33.4	51	47	45	37	35	35	35	37	38.4	4.17	49	45	39
9/5/2018 15:45	1.0 hour	42.4	78	57.1	33.4	51	47	45	37	35	35	35	37	38.9	4.17	49	45	41
9/5/2018 16:45	1.0 hour	41.1	76.7	55.6	33.4	51	45	43	37	35	35	35	37	37.9	3.73	49	45	39
9/5/2018 17:45	1.0 hour	39.5	75.1	60.9	33.4	47	43	39	35	35	35	35	35	36.5	2.81	45	41	37
9/5/2018 18:45	1.0 hour	43	78.6	64	33.4	47	47	45	35	35	35	35	35	38.4	4.57	47	45	41
9/5/2018 19:45	1.0 hour	44.2	79.8	55.8	38.2	51	45	45	43	41	41	39	43	42.6	2.04	49	45	43
9/5/2018 20:45	1.0 hour	40.9	76.5	55.1	36.3	49	43	41	39	37	35	35	39	38.8	2.47	47	41	39
9/5/2018 21:45	1.0 hour	42.1	77.7	60.8	36.3	53	41	41	39	37	35	35	39	38.6	2.71	47	41	39
9/5/2018 22:45	1.0 hour	37.4	73	49.9	33.4	43	39	37	35	35	35	35	35	35.9	1.55	39	37	37
9/5/2018 23:45	1.0 hour	37.2	72.8	49.8	33.4	45	37	37	35	35	35	35	35	35.5	1.55	41	37	35
9/6/2018 0:45	1.0 hour	37.2	72.8	44.7	33.4	39	39	39	35	35	35	35	35	35.9	1.38	39	39	37
9/6/2018 1:45	1.0 hour	36.8	72.4	45.9	33.4	41	37	37	35	35	35	35	35	35.6	1.27	41	37	35
9/6/2018 2:45	1.0 hour	34.4	70	37	33.4	35	35	35	35	35	35	35	35	35	0.02	35	35	35
9/6/2018 3:45	1.0 hour	33.3	68.9	36.8	33.4	35	35	35	35	35	35	35	35	35	0	35	35	35
9/6/2018 4:45	1.0 hour	33.2	68.8	48.4	33.4	39	35	35	35	35	35	35	35	35.1	0.66	35	35	35
9/6/2018 5:45	1.0 hour	50.1	85.7	83.8	33.4	57	43	37	35	35	35	35	35	36.2	4.03	53	39	35
9/6/2018 6:45	1.0 hour	36.2	71.8	53.6	33.4	43	39	39	35	35	35	35	35	35.8	1.81	41	39	35
9/6/2018 7:45	1.0 hour	39.4	75	69.1	33.4	45	37	35	35	35	35	35	35	35.4	2.04	39	37	35
9/6/2018 8:45	8.5 min	48.8	75.9	72.1	33.4	55.2	39	39	35	35	35	35	35	36.6	3.61	45	39	37

daytime (9am to 10pm) Leq	42.7
daytime (7am to 9am) Leq	38.1
nighttime (10pm to 7am) Leq	42.1
Ldn	48.5

average daytime L90	35.5
average nighttime L90	35.2
lowest L90	35.0

Rec 1 to 25	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:43	1.0 hour	49.1	84.7	82.2	34.4	53	41	39	35	35	35	35	35	36.3	3.41	47	39	35
9/5/2018 9:43	1.0 hour	43.3	78.9	66.4	34.4	55	45	39	35	35	35	35	35	36.5	3.65	49	41	35
9/5/2018 10:43	1.0 hour	54.3	89.9	81.5	34.4	63	49	43	37	35	35	35	37	38.5	5.21	57	45	37
9/5/2018 11:43	1.0 hour	46.3	81.9	72	34.4	59	45	39	35	35	35	35	35	36.8	4.24	53	41	37
9/5/2018 12:43	1.0 hour	43.9	79.5	68.1	34.4	53	41	39	37	35	35	35	37	37.4	3.07	47	39	37
9/5/2018 13:43	1.0 hour	43.8	79.4	66.6	34.4	53	41	39	37	37	35	35	37	38	2.98	47	41	39
9/5/2018 14:43	1.0 hour	46	81.6	68.5	34.4	57	47	41	37	35	35	35	37	38.4	4.25	53	43	39
9/5/2018 15:43	1.0 hour	41.5	77.1	62.8	34.4	51	43	41	37	35	35	35	37	38.3	3.1	49	41	39
9/5/2018 16:43	1.0 hour	49.2	84.8	73.1	34.4	61	49.1	45	37	35	35	35	37	38.6	5.38	57	47	39
9/5/2018 17:43	1.0 hour	48.2	83.8	73.6	34.4	61	45.1	41	35	35	35	35	35	37.1	4.89	57	43	37
9/5/2018 18:43	1.0 hour	54.4	90	66	34.4	63	63	59	35	35	35	35	35	41.2	9.5	63	59	41
9/5/2018 19:43	1.0 hour	57.2	92.8	62.9	44.5	61	61	59	57	51	51	45	57	55.6	2.9	61	59	57
9/5/2018 20:43	1.0 hour	53.5	89.1	61.1	42.8	59	57	55	51	45	45	43	51	51.1	3.73	57	57	53
9/5/2018 21:43	1.0 hour	51.8	87.4	63.7	39.2	57	55	55	49	41	41	39	49	48	5.65	55	55	53
9/5/2018 22:43	1.0 hour	49.4	85	74.2	37.4	59	45	43	39	39	37	37	39	40.4	3.71	53	43	41
9/5/2018 23:43	1.0 hour	42.6	78.2	61.8	34.4	55	41	41	37	35	35	35	37	37.9	3.3	49	41	39
9/6/2018 0:43	1.0 hour	40	75.6	63.8	34.4	47	41	39	37	35	35	35	37	36.7	2.45	43	39	37
9/6/2018 1:43	1.0 hour	37.3	72.9	58.3	34.4	41	39	39	35	35	35	35	35	36.2	1.75	41	39	37
9/6/2018 2:43	1.0 hour	33.9	69.5	38.8	34.4	37	35	35	35	35	35	35	35	35	0.23	35	35	35
9/6/2018 3:43	1.0 hour	33.4	69	45.9	34.4	35	35	35	35	35	35	35	35	35	0.35	35	35	35
9/6/2018 4:43	1.0 hour	33.7	69.3	45.5	34.4	37	35	35	35	35	35	35	35	35.1	0.56	37	35	35
9/6/2018 5:43	1.0 hour	37.2	72.8	59.2	34.4	45	39	37	35	35	35	35	35	35.7	2.14	43	37	35
9/6/2018 6:43	1.0 hour	47.5	83.1	77.1	34.4	51	45	43	37	35	35	35	37	37.7	3.8	47	43	39
9/6/2018 7:43	1.0 hour	48.1	83.7	75.6	34.4	57	47	43	35	35	35	35	35	37.5	4.73	53	43	37
9/6/2018 8:43	9.0 min	53.5	80.8	79.1	34.4	63	55	49	35	35	35	35	35	38.8	6.91	61	51	37

daytime (9am to 10pm) Leq	51.1
daytime (7am to 9am) Leq	47.8
nighttime (10pm to 7am) Leq	45.0
Ldn	52.9

average daytime L90	36.9
average nighttime L90	37.2
lowest L90	35.0

Number	Start Date	Start Time	End Time	Duration	LAeq	LAmax	LAmin	LAE	LApeak	L1%	L5%	L10%	L50%	L90%	L95%	L99%
1	9/5/2018	8:24:29 AM	9:00:00 AM	0:35:31	45	64.9	29.9	78.3	95.4	54.9	50.8	48.4	38.5	32	31.2	30.5
2	9/5/2018	9:00:02 AM	10:00:00 AM	0:59:58	46.3	64	30.8	81.9	78.8	55.9	49.8	48.7	43.3	36.3	35	32.7
3	9/5/2018	10:00:02 AM	11:00:00 AM	0:59:58	44.8	57.2	31.1	80.4	75.9	53.5	49.9	48.3	42.3	36.6	34.9	32.7
4	9/5/2018	11:00:02 AM	12:00:00 PM	0:59:58	58.2	81.4	30.3	93.8	102	72.2	52.7	48.4	41.2	34.7	33.2	31.8
5	9/5/2018	12:00:02 PM	1:00:00 PM	0:59:58	45.8	56.8	31.3	81.4	75.4	53.1	51.1	49.7	43.3	37.2	35.6	33.4
6	9/5/2018	1:00:02 PM	2:00:00 PM	0:59:58	55.9	79.5	28.8	91.5	96.6	67.6	50.5	45.6	37.5	31.1	30.4	29.2
7	9/5/2018	2:00:02 PM	3:00:00 PM	0:59:58	53.6	78.7	32.8	89.2	94.9	61.8	53.8	51.5	45.2	39	37.5	34.6
8	9/5/2018	3:00:02 PM	4:00:00 PM	0:59:58	48.3	60.7	29.7	83.9	74.2	55.9	53.8	52.4	45.6	38.3	35.9	31.8
9	9/5/2018	4:00:02 PM	5:00:00 PM	0:59:58	49.4	63.8	33.9	85	90.8	58.6	54.3	52.6	46.6	39.8	38.3	35.7
10	9/5/2018	5:00:02 PM	6:00:00 PM	0:59:58	60	86.3	31.2	95.6	102.4	72.9	54.2	51.2	44.1	36.4	35.3	33.5
11	9/5/2018	6:00:02 PM	7:00:00 PM	0:59:58	44.2	62.3	29.3	79.8	77.5	55.1	50.3	47.7	38.2	32.2	30.7	29.9
12	9/5/2018	7:00:02 PM	8:00:00 PM	0:59:58	49.1	59.2	29.5	84.7	77.5	54.2	52.9	51.9	49.1	35.6	33.2	30.6
13	9/5/2018	8:00:02 PM	9:00:00 PM	0:59:58	52.5	60.3	44.8	88.1	73.9	56.8	55.5	55	51.9	47.9	47.3	46.3
14	9/5/2018	9:00:02 PM	10:00:00 PM	0:59:58	52.3	62.6	39.4	87.9	87.6	57.9	56.7	56.1	51.8	42.5	41.9	41
15	9/5/2018	10:00:02 PM	11:00:00 PM	0:59:58	51.3	74.9	37.1	86.9	90.1	62.7	51.3	48.9	41.2	39.6	39	38.3
16	9/5/2018	11:00:02 PM	12:00:00 AM	0:59:58	55	78.4	33.1	90.6	95.5	68.5	55.2	50.7	39.6	37.5	36.8	34
17	9/6/2018	12:00:02 AM	1:00:00 AM	0:59:58	42.1	62.2	31.1	77.7	76.3	55	47.7	43.6	35	32.8	32.6	31.9
18	9/6/2018	1:00:02 AM	2:00:00 AM	0:59:58	41.7	61.8	30.3	77.3	75.8	53.6	48.8	42.5	34	32.4	32	31.2
19	9/6/2018	2:00:02 AM	3:00:00 AM	0:59:58	38.1	55.9	29.8	73.7	72.5	51.2	42.3	35.8	33.3	32.2	31	30
20	9/6/2018	3:00:02 AM	4:00:00 AM	0:59:58	33.6	55	29.6	69.2	69.9	43.9	33.2	32.4	30.1	29.8	29.7	29.7
21	9/6/2018	4:00:02 AM	5:00:00 AM	0:59:58	37.7	61.4	29.4	73.3	76.4	51.9	36.9	32.7	29.9	29.6	29.6	29.5
22	9/6/2018	5:00:02 AM	6:00:00 AM	0:59:58	40.8	61	29.3	76.4	75.4	53.2	47.4	42.5	30.5	29.6	29.5	29.4
23	9/6/2018	6:00:02 AM	7:00:00 AM	0:59:58	49.2	69.5	29.8	84.8	84.8	59.6	55.5	52.9	42.6	32.5	31.5	30.6
24	9/6/2018	7:00:02 AM	8:00:00 AM	0:59:58	50.4	66.9	31	86	82.7	61.2	56.3	54	44	35.1	33.4	31.8

daytime (9am to 10pm) Leq	53.4
daytime (7am to 9am) Leq	49.8
nighttime (10pm to 7am) Leq	48.8
Ldn	56.1

average daytime L90	37.3
average nighttime L90	32.9
lowest L90	29.6

Rec 1 to 25 Slow Response dBA weighting 2.0 dB resolution stats

Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 8:35	1.0 hour	48.4	84	74	33.5	57	49	45	37	35	35	35	37	39.2	5	55	47	41
9/5/2018 9:35	1.0 hour	50	85.6	68.8	33.2	61	55	51	41	35	35	35	41	42.6	6.32	59	53	45
9/5/2018 10:35	1.0 hour	53.9	89.5	79.2	33.2	61	53	51	41	35	35	35	41	42.1	6.12	55	51	45
9/5/2018 11:35	1.0 hour	56.1	91.7	80.5	33.2	67	57	53	45	35	35	35	45	44.9	7.16	61	55	49
9/5/2018 12:35	1.0 hour	54.5	90.1	80.7	33.2	61	57	53	41	35	35	35	41	42.4	7.14	59	55	45
9/5/2018 13:35	1.0 hour	52.9	88.5	78.9	33.2	61	51	47	35	35	35	35	35	38.7	5.87	55	49	39
9/5/2018 14:35	1.0 hour	50.4	86	73.6	33.2	63	53	49	39	35	35	35	39	40.7	5.88	57	49	43
9/5/2018 15:35	1.0 hour	49	84.6	77.7	33.2	53	45	43	37	35	35	35	37	38.2	4.17	49	43	39
9/5/2018 16:35	1.0 hour	54	89.6	80.2	33.2	61	55	47	37	35	35	35	37	39.7	6.17	59	49	41
9/5/2018 17:35	1.0 hour	56.8	92.4	83.5	33.2	67	53	47	39	35	35	35	39	39.9	6.22	61	49	39
9/5/2018 18:35	1.0 hour	43.8	79.4	68.6	36.1	55	45	41	37	35	35	35	37	37.5	3.75	51	41	37
9/5/2018 19:35	1.0 hour	42.9	78.5	72.4	37.7	49	43	39	39	37	37	37	39	38.8	2.28	45	41	39
9/5/2018 20:35	1.0 hour	40.4	76	59	36.3	49	43	41	37	37	35	35	37	37.9	2.58	47	41	37
9/5/2018 21:35	1.0 hour	38.3	73.9	53.7	36.2	43	41	39	37	35	35	35	37	36.6	1.95	43	39	37
9/5/2018 22:35	1.0 hour	56.3	91.9	80.5	36.2	69	55	49	37	35	35	35	37	38.9	7.16	63	53	37
9/5/2018 23:35	1.0 hour	48.7	84.3	71.5	36.2	59	47	41	35	35	35	35	35	37.1	4.94	55	43	37
9/6/2018 0:35	1.0 hour	48.7	84.3	69.2	36.2	61	55	49	35	35	35	35	35	38.3	6.5	59	53	37
9/6/2018 1:35	1.0 hour	44.1	79.7	66.8	36.2	57	43	37	35	35	35	35	35	36.1	4.03	53	37	35
9/6/2018 2:35	1.0 hour	45.8	81.4	67.9	36.2	59	51	43	35	35	35	35	35	36.8	5.03	55	45	35
9/6/2018 3:35	1.0 hour	50.1	85.7	69.3	36.2	63	57	49	35	35	35	35	35	37.6	6.74	61	51	35
9/6/2018 4:35	1.0 hour	49	84.6	69.6	36.2	63	55	43	35	35	35	35	35	37.2	6.06	61	47	35
9/6/2018 5:35	1.0 hour	44.1	79.7	66.9	36.2	55	45	41	37	35	35	35	37	37.4	3.93	49	43	37
9/6/2018 6:35	1.0 hour	49.7	85.3	74.3	36.2	61	53	47	39	35	35	35	39	39.9	5.61	57	49	41
9/6/2018 7:35	1.0 hour	51.6	87.2	68.7	33.2	65	59	49	37	35	35	35	37	39.7	7.16	63	53	39
9/6/2018 8:35	9.2 min	54.8	82.2	74.7	33.2	69	59	45	35	35	35	35	35	38.5	7.45	65	51	37

daytime (9am to 10pm) Leq	52.4
daytime (7am to 9am) Leq	50.8
nighttime (10pm to 7am) Leq	49.8
Ldn	56.6

average daytime L90	35.3
average nighttime L90	35.0
lowest L90	35.0

Rec 28 to 52 | Slow Response | dBA weighting | 2.0 dB resolution stats

Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/6/2018 9:34	1.0 hour	41.6	77.2	71.1	36.6	45	41	39	35	35	35	35	35	36.3	2.39	43	39	37
9/6/2018 10:34	1.0 hour	40	75.6	60.7	36.5	51	41	37	35	35	35	35	35	36.1	2.9	47	39	35
9/6/2018 11:34	1.0 hour	38.6	74.2	63.7	36.5	45	39	37	35	35	35	35	35	35.6	1.92	41	37	35
9/6/2018 12:34	1.0 hour	39.1	74.7	59	36.4	49	41.1	39	35	35	35	35	35	36.2	2.71	45	39	35
9/6/2018 13:34	1.0 hour	40.8	76.4	60.8	33.6	51	45	41	35	35	35	35	35	36.8	3.44	49	41	37
9/6/2018 14:34	1.0 hour	52.4	88	80.3	33.6	57	45	43	35	35	35	35	35	37.3	4.69	51	43	37
9/6/2018 15:34	1.0 hour	42.7	78.3	66.3	33.6	53	45	41	35	35	35	35	35	37.1	3.84	51	43	37
9/6/2018 16:34	1.0 hour	36.6	72.2	54.5	33.6	41	39	37	35	35	35	35	35	35.5	1.41	41	37	35
9/6/2018 17:34	1.0 hour	36.6	72.2	58.7	33.6	43	39	37	35	35	35	35	35	35.4	1.59	41	37	35
9/6/2018 18:34	1.0 hour	33.9	69.5	43.3	33.6	37	35	35	35	35	35	35	35	35.1	0.5	37	35	35
9/6/2018 19:34	1.0 hour	39.5	75.1	53.8	34	45	39	39	37	35	35	35	37	37.7	1.85	41	39	39
9/6/2018 20:34	1.0 hour	47.5	83.1	74.6	36.3	57	39	39	35	35	35	35	35	36.5	3.55	47	39	37
9/6/2018 21:34	1.0 hour	36.8	72.4	43.9	34.2	39	37	37	35	35	35	35	35	35.3	0.93	39	37	35
9/6/2018 22:34	1.0 hour	36.1	71.7	42.8	33.6	39	37	35	35	35	35	35	35	35.2	0.72	37	35	35
9/6/2018 23:34	1.0 hour	36.1	71.7	40.3	33.6	37	37	37	35	35	35	35	35	35.3	0.69	37	37	35
9/7/2018 0:34	1.0 hour	35.9	71.5	40.1	33.6	39	37	37	35	35	35	35	35	35.3	0.82	37	37	35
9/7/2018 1:34	1.0 hour	34.1	69.7	43.7	33.6	37	35	35	35	35	35	35	35	35	0.32	35	35	35
9/7/2018 2:34	1.0 hour	34	69.6	40.7	33.6	37	35	35	35	35	35	35	35	35	0.39	35	35	35
9/7/2018 3:34	1.0 hour	35.2	70.8	57.6	33.6	37	35	35	35	35	35	35	35	35.1	1.16	35	35	35
9/7/2018 4:34	1.0 hour	37	72.6	66.4	33.6	43	35	35	35	35	35	35	35	35.2	1.55	37	35	35
9/7/2018 5:34	1.0 hour	35	70.6	54	33.6	41	37	35	35	35	35	35	35	35.3	1.33	39	35	35
9/7/2018 6:34	1.0 hour	38.7	74.3	66	33.6	43	39	37	35	35	35	35	35	36.3	1.95	43	39	37
9/7/2018 7:34	1.0 hour	37.2	72.8	48.2	36.4	41	39	37	35	35	35	35	35	35.5	1.37	39	37	35
9/7/2018 8:34	1.0 hour	40.9	76.5	67.7	36.4	47	39	37	35	35	35	35	35	35.6	2.36	43	37	35
9/7/2018 9:34	20.2 min	40.7	71.5	67	36.5	43.1	37	35	35	35	35	35	35	35.4	2.01	41	37	35

daytime (9am to 10pm) Leq	44.0	average daytime L90	35.0
daytime (7am to 9am) Leq	39.4	average nighttime L90	35.0
nighttime (10pm to 7am) Leq	36.0	lowest L90	35.0
Ldn	44.7		

Number	Start Date	Start Time	End Time	Duration	Meas Mod	LAeq	LAmax	LAmin	LAE	LApeak	L1%	L5%	L10%	L50%	L90%	L95%	L99%
546	9/5/2018	8:07:09 AM	9:00:00 AM	0:52:51	Auto	56.8	80.5	33.7	91.8	98.7	69	59.2	55.8	42.2	37.6	37	35.5
547	9/5/2018	9:00:02 AM	10:00:00 AM	0:59:58	Auto	60.1	75.1	35.5	95.7	89	73	68.8	61.3	46	38.6	37.5	36.3
548	9/5/2018	10:00:02 AM	11:00:00 AM	0:59:58	Auto	48.5	66.1	34.2	84.1	83.1	60	53.6	51	43.8	38.9	37.4	35.5
549	9/5/2018	11:00:02 AM	12:00:00 PM	0:59:58	Auto	49.8	78.6	33.8	85.4	97.1	60.4	52.7	49.4	40	36.3	35.7	35
550	9/5/2018	12:00:02 PM	1:00:00 PM	0:59:58	Auto	49.3	75	33.5	84.9	90.5	59.9	54.1	49.9	39.8	36.6	36	34.6
551	9/5/2018	1:00:02 PM	2:00:00 PM	0:59:58	Auto	51.8	73.4	33.6	87.4	86.9	63.9	58.7	55.3	39.4	36.1	35.5	34.7
552	9/5/2018	2:00:02 PM	3:00:00 PM	0:59:58	Auto	53	79.4	32.6	88.6	99.8	63.9	58.8	55.8	38.8	34.9	34.3	33.7
553	9/5/2018	3:00:02 PM	4:00:00 PM	0:59:58	Auto	51.8	69.4	32.2	87.4	86.4	63	59.2	56.6	39.2	33.9	33.2	32.7
554	9/5/2018	4:00:02 PM	5:00:00 PM	0:59:58	Auto	53.5	75	32.1	89.1	93.7	64.9	59.8	57	39.9	34.1	33.4	32.7
555	9/5/2018	5:00:02 PM	6:00:00 PM	0:59:58	Auto	54.3	73.6	32	89.9	89.6	65.7	61.3	58.4	41.4	34.1	33.3	32.5
556	9/5/2018	6:00:02 PM	7:00:00 PM	0:59:58	Auto	57.6	86.1	31.7	93.2	101.4	68.2	62.1	59	40.1	32.8	32.4	32
557	9/5/2018	7:00:02 PM	8:00:00 PM	0:59:58	Auto	57.1	85.3	32.7	92.7	106.1	65.2	61.8	59	49.6	35.4	34.2	33.3
558	9/5/2018	8:00:02 PM	9:00:00 PM	0:59:58	Auto	54	69.5	44.8	89.6	91.9	64.6	61.2	58.1	48.2	46.5	46.2	45.6
559	9/5/2018	9:00:02 PM	10:00:00 PM	0:59:58	Auto	55	79.6	42.6	90.6	97.8	67.1	61.1	54.3	45.6	44.5	44.1	43.5
560	9/5/2018	10:00:02 PM	11:00:00 PM	0:59:58	Auto	59.5	85.8	42.6	95.1	106.4	70.6	65.7	61.7	45.4	44.3	44	43.6
561	9/5/2018	11:00:02 PM	12:00:00 AM	0:59:58	Auto	53.7	74.5	42.6	89.3	95.2	67.4	57.6	49.5	44.6	43.7	43.5	43.2
562	9/6/2018	12:00:02 AM	1:00:00 AM	0:59:58	Auto	58.7	88.7	42.4	94.3	112.1	68.2	58.5	49.1	44.5	43.4	43.2	43
563	9/6/2018	1:00:02 AM	2:00:00 AM	0:59:58	Auto	52.2	78.8	37.2	87.8	95.5	65.7	51.3	44.8	41.8	38.9	38.4	37.8
564	9/6/2018	2:00:02 AM	3:00:00 AM	0:59:58	Auto	52.6	74.7	36.9	88.2	94.8	67.2	53.8	45.9	40.6	38.3	38	37.6
565	9/6/2018	3:00:02 AM	4:00:00 AM	0:59:58	Auto	53.5	77	37.4	89.1	93.5	67.8	56.9	47.5	40.8	39	38.8	38.4
566	9/6/2018	4:00:02 AM	5:00:00 AM	0:59:58	Auto	55.3	73.4	32.5	90.9	94.5	69.1	63	55.2	39.4	36.1	34.4	33.7
567	9/6/2018	5:00:02 AM	6:00:00 AM	0:59:58	Auto	57.1	75	31.2	92.7	97.2	69.3	65.2	61.1	40.2	32.2	31.8	31.4
568	9/6/2018	6:00:02 AM	7:00:00 AM	0:59:58	Auto	69.6	81.4	39.1	105.2	102.7	79.1	77.2	75.5	60.5	51.1	44	40
569	9/6/2018	7:00:02 AM	8:00:00 AM	0:59:58	Auto	51.2	71.1	34.3	86.8	89	61	57.3	55.1	45.6	38	36.7	35.1
570	9/6/2018	8:00:01 AM	8:20:02 AM	0:20:01	Auto	53.6	69.7	34.5	84.4	96.1	65.2	61.5	56.3	44.2	38.3	36.9	35.3

daytime (8am to 10pm) Leq	55.0
daytime (7am to 8am) Leq	51.2
nighttime (10pm to 7am) Leq	61.4
Ldn	67.3

average daytime L90	37.2
average nighttime L90	40.8
lowest L90	32.2

Rec 27 to 51	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/6/2018 9:40	1.0 hour	55.6	91.2	86.9	36.3	61	55	51	39	35	35	35	39	41.8	6.69	59	53	43
9/6/2018 10:40	1.0 hour	45.9	81.5	67.3	33.4	57	51	47	37	35	35	35	37	39.1	5.54	55	49	41
9/6/2018 11:40	1.0 hour	38.8	74.4	57.6	33.4	47	41	39	35	35	35	35	35	36.6	2.64	45	41	37
9/6/2018 12:40	1.0 hour	43.2	78.8	64.8	33.4	55	47	43	37	35	35	35	37	37.9	4.06	51	45	39
9/6/2018 13:40	1.0 hour	46.8	82.4	67.7	33.6	59	49	45	39	35	35	35	39	39.5	4.77	53	47	41
9/6/2018 14:40	1.0 hour	48.5	84.1	74.9	35.8	59	45	43	37	35	35	35	37	38.1	4.41	53	43	39
9/6/2018 15:40	1.0 hour	42.8	78.4	59	33.4	51	47	45	39	35	35	35	39	39.4	3.86	51	45	41
9/6/2018 16:40	1.0 hour	43.2	78.8	64.7	36.3	51	47	45	39	37	35	35	39	40.1	3.48	49	45	41
9/6/2018 17:40	1.0 hour	41.8	77.4	61	33.4	51	45	43	37	35	35	35	37	38.4	3.4	49	43	39
9/6/2018 18:40	1.0 hour	41.2	76.8	58.1	33.4	47	45	45	37	35	35	35	37	38.6	3.54	45	45	41
9/6/2018 19:40	1.0 hour	46.8	82.4	60.4	44.2	53	47	47	45	45	45	43	45	45.4	1.32	49	47	45
9/6/2018 20:40	1.0 hour	45.7	81.3	54.2	43.2	47	45	45	45	43	43	43	45	44.7	0.99	47	45	45
9/6/2018 21:40	1.0 hour	45	80.6	61.7	42.4	47	45	45	43	43	43	43	43	43.6	1.3	47	45	43
9/6/2018 22:40	1.0 hour	44.8	80.4	54.1	42.4	47	45	45	43	43	43	43	43	43.6	1.13	47	45	43
9/6/2018 23:40	1.0 hour	44.6	80.2	48.7	42.1	47	45	45	43	43	43	43	43	43.5	0.98	45	45	43
9/7/2018 0:40	1.0 hour	43.8	79.4	57.2	40.7	49	45	43	43	41	41	41	43	42.4	1.6	47	45	43
9/7/2018 1:40	1.0 hour	42.7	78.3	57.6	39	47	45	43	41	39	39	39	41	41.4	1.68	45	43	41
9/7/2018 2:40	1.0 hour	42	77.6	52.1	37.9	47	45	43	41	39	39	37	41	40.6	1.95	45	43	41
9/7/2018 3:40	1.0 hour	40.9	76.5	53.6	36.3	45	43	43	39	37	37	35	39	39.4	2.21	45	43	41
9/7/2018 4:40	1.0 hour	41	76.6	51.7	33.4	47	45	43	39	35	35	35	39	38.9	2.92	45	43	41
9/7/2018 5:40	1.0 hour	42.7	78.3	59.2	33.7	51	45	43	41	37	37	35	41	40.4	3	47	45	41
9/7/2018 6:40	1.0 hour	43	78.6	63.4	33.4	49	45	43	39	35	35	35	39	40	3.35	47	45	41
9/7/2018 7:40	1.0 hour	40.6	76.2	63.2	33.4	51	43	41	35	35	35	35	35	37.2	3.32	47	43	37
9/7/2018 8:40	1.0 hour	38.4	74	62.9	33.4	43	41	39	35	35	35	35	35	36.1	2.16	43	39	37
9/7/2018 9:40	18.6 min	54.8	85.3	83.8	33.4	45	41	39	35	35	35	35	35	36.4	3.47	43	39	37

daytime (9am to 10pm) Leq	47.5		average daytime L90	36.3
daytime (7am to 9am) Leq	39.6		average nighttime L90	39.7
nighttime (10pm to 7am) Leq	43.0		lowest L90	35.0
Ldn	50.3			

Start Date	Start Time	End Time	Duration	LAeq	L90%	L95%	L99%
9/6/2018	9:44:45 AM	10:00:00 AM	0:15:15	45.9	35.4	35	34.7
9/6/2018	10:00:02 AM	11:00:00 AM	0:59:58	42.1	35.4	34.9	34.1
9/6/2018	11:00:02 AM	12:00:00 PM	0:59:58	38.5	34.8	34.3	33.6
9/6/2018	12:00:02 PM	1:00:00 PM	0:59:58	38.4	34.4	34	33.4
9/6/2018	1:00:02 PM	2:00:00 PM	0:59:58	38.7	34.1	33.8	33.1
9/6/2018	2:00:02 PM	3:00:00 PM	0:59:58	47	33.8	33.1	32.1
9/6/2018	3:00:02 PM	4:00:00 PM	0:59:58	38.2	33.4	32.9	32
9/6/2018	4:00:02 PM	5:00:00 PM	0:59:58	39	31	30.5	29.7
9/6/2018	5:00:02 PM	6:00:00 PM	0:59:58	40.7	31	30.5	30
9/6/2018	6:00:02 PM	7:00:00 PM	0:59:58	36.7	30	29.8	29.4
9/6/2018	7:00:02 PM	8:00:00 PM	0:59:58	39.3	31.1	30.5	30.1
9/6/2018	8:00:02 PM	9:00:00 PM	0:59:58	41.7	38.5	37.9	36.8
9/6/2018	9:00:02 PM	10:00:00 PM	0:59:58	38.4	33.7	33.1	32.3
9/6/2018	10:00:02 PM	11:00:00 PM	0:59:58	39.1	34.8	34.4	33.7
9/6/2018	11:00:02 PM	12:00:00 AM	0:59:58	35.2	31.9	31.4	30.8
9/7/2018	12:00:02 AM	1:00:00 AM	0:59:58	34.9	32.9	32.4	31.7
9/7/2018	1:00:02 AM	2:00:00 AM	0:59:58	34.8	31.9	31.5	31
9/7/2018	2:00:02 AM	3:00:00 AM	0:59:58	36.5	33.4	32.8	32.3
9/7/2018	3:00:02 AM	4:00:00 AM	0:59:58	36.2	34.1	33.6	31.8
9/7/2018	4:00:02 AM	5:00:00 AM	0:59:58	35.8	32.4	31.7	30.6
9/7/2018	5:00:02 AM	6:00:00 AM	0:59:58	34.4	30.9	30.4	30
9/7/2018	6:00:02 AM	7:00:00 AM	0:59:58	36.6	31	30.3	29
9/7/2018	7:00:02 AM	8:00:00 AM	0:59:58	36.6	29.5	28.9	28.7
9/7/2018	8:00:02 AM	9:00:00 AM	0:59:58	37.4	28.6	28.4	28.2
9/7/2018	9:00:02 AM	10:00:00 AM	0:59:58	38.4	31	29.9	29.5
9/7/2018	10:00:01 AM	10:02:54 AM	0:02:53	57	35.9	35	34.2
				38.42			

daytime (10am to 10pm) Leq	40.9	32.7	average daytime L90
daytime (7am to 10am) Leq	37.5	32.6	average nighttime L90
nighttime (10pm to 7am) Leq	36.2	28.6	lowest L90
Ldn	43.5		

Number	Start Date	Start Time	End Time	Duration	Meas Mod	LAeq	LAmax	LAmin	LAE	LApeak	L1%	L5%	L10%	L50%	L90%	L95%	L99%
571	9/6/2018	9:50:02 AM	10:00:00 AM	0:09:58	Auto	43.1	64.2	30.8	70.9	91.7	57.5	43.5	38.2	31.9	30.9	30.9	30.8
572	9/6/2018	10:00:02 AM	11:00:00 AM	0:59:58	Auto	38.3	59.8	30.7	73.9	74.9	50.7	42.6	38.7	31.6	30.9	30.9	30.8
573	9/6/2018	11:00:02 AM	12:00:00 PM	0:59:58	Auto	33.9	50.5	30.8	69.5	64.4	45	37.2	34.4	31.2	30.9	30.9	30.8
574	9/6/2018	12:00:02 PM	1:00:00 PM	0:59:58	Auto	34.4	48.6	30.8	70	64.4	44.7	39.7	35.9	31.4	30.9	30.9	30.8
575	9/6/2018	1:00:02 PM	2:00:00 PM	0:59:58	Auto	40.3	63.3	30.8	75.9	79.5	54.1	38.9	35.6	31.7	31	31	30.9
576	9/6/2018	2:00:02 PM	3:00:00 PM	0:59:58	Auto	40.5	61.7	30.8	76.1	78.2	56	41.1	36.1	31.7	31	30.9	30.9
577	9/6/2018	3:00:02 PM	4:00:00 PM	0:59:58	Auto	36.3	59.1	30.7	71.9	75.3	47	41.3	37.6	31.3	30.9	30.9	30.8
578	9/6/2018	4:00:02 PM	5:00:00 PM	0:59:58	Auto	36.4	59.5	30.6	72	78.1	48.5	39.3	36.2	31.4	30.8	30.7	30.7
579	9/6/2018	5:00:02 PM	6:00:00 PM	0:59:58	Auto	41.2	65.1	31.1	76.8	91.3	54.4	44.1	38.8	32.2	31.5	31.4	31.3
580	9/6/2018	6:00:02 PM	7:00:00 PM	0:59:58	Auto	37.7	58.9	31.1	73.3	75.6	48.2	42.8	39.1	31.9	31.4	31.3	31.2
581	9/6/2018	7:00:02 PM	8:00:00 PM	0:59:58	Auto	46.2	62.8	31	81.8	81.6	53.7	52.3	51.9	38.5	31.4	31.3	31.1
582	9/6/2018	8:00:02 PM	9:00:00 PM	0:59:58	Auto	46.3	66.6	37.2	81.9	89.4	52.9	51	49.6	42.9	39.9	39.3	38.4
583	9/6/2018	9:00:02 PM	10:00:00 PM	0:59:58	Auto	41.9	67.9	35.1	77.5	78.7	48	45.7	44.1	38.3	36.8	36.4	35.9
584	9/6/2018	10:00:02 PM	11:00:00 PM	0:59:58	Auto	41	48.7	34.8	76.6	64.7	48.2	47.1	46.4	38	36.2	35.9	35.5
585	9/6/2018	11:00:02 PM	12:00:00 AM	0:59:58	Auto	36.2	46.9	33.9	71.8	66.7	42.5	38.1	37.2	35.5	34.6	34.4	34.1
586	9/7/2018	12:00:02 AM	1:00:00 AM	0:59:58	Auto	36.8	49.4	34	72.4	62	40.2	38.6	38	36.2	35	34.8	34.5
587	9/7/2018	1:00:02 AM	2:00:00 AM	0:59:58	Auto	38	48.6	33.8	73.6	59.8	47.6	41.9	38.2	36.3	35	34.8	34.3
588	9/7/2018	2:00:02 AM	3:00:00 AM	0:59:58	Auto	41.1	57.3	33.4	76.7	78.2	49.4	47.8	46.3	36.1	34.8	34.5	34.1
589	9/7/2018	3:00:02 AM	4:00:00 AM	0:59:58	Auto	39.7	52.2	32.4	75.3	64.2	50.6	45	42.1	35.6	34	33.5	33
590	9/7/2018	4:00:02 AM	5:00:00 AM	0:59:58	Auto	34.3	40.7	31.1	69.9	56.1	39.6	38.4	36.9	33.3	31.5	31.4	31.2
591	9/7/2018	5:00:02 AM	6:00:00 AM	0:59:58	Auto	35.5	58.9	30.8	71.1	76.6	46.2	36.8	33.1	31.4	30.9	30.9	30.9
592	9/7/2018	6:00:02 AM	7:00:00 AM	0:59:58	Auto	37.1	57.9	30.8	72.7	76.3	48.3	41.7	36.1	31.4	31	31	31
593	9/7/2018	7:00:02 AM	8:00:00 AM	0:59:58	Auto	39.2	65.6	30.7	74.8	86.9	50.8	40.3	37.2	31.6	30.9	30.8	30.8
594	9/7/2018	8:00:02 AM	9:00:00 AM	0:59:58	Auto	39.7	63.4	30.6	75.3	79.1	49.4	41.8	37.5	31.4	30.7	30.7	30.6
595	9/7/2018	9:00:02 AM	10:00:00 AM	0:59:58	Auto	35.9	57.8	30.6	71.5	74.1	45.9	40.3	37	31.4	30.8	30.8	30.7
596	9/7/2018	10:00:00 AM	10:07:46 AM	0:07:46	Auto	52	74.9	30.9	78.7	102.8	67.4	41.5	39.3	31.5	31.1	31	31

daytime (10am to 10pm) Leq	41.3
daytime (7am to 10am) Leq	38.6
nighttime (10pm to 7am) Leq	38.3
Ldn	45.2

average daytime L90	32.0
average nighttime L90	33.7
lowest L90	30.7

Start Date	Start Time	LAeq	LAmax	LAmin	LAE	L1%	L5%	L10%	L50%	L90%	L95%	L99%
9/5/2018	8:17:53 AM	41.4	70.6	39.1	43.0	30.9	59.1	64.2	48.5	47.1	45.4	35.5
9/5/2018	9:17:53 AM	40.4	67.6	38.6	41.7	30.5	58.2	62.7	46.9	45.8	44.5	34.7
9/5/2018	10:17:53 AM	40.7	71.0	38.6	41.8	30.5	58.5	63.0	47.3	46.2	44.8	34.8
9/5/2018	11:17:53 AM	39.5	71.8	38.7	43.1	30.8	57.3	63.0	46.8	44.9	43.2	34.9
9/5/2018	12:17:53 PM	40.3	67.8	40.3	42.8	31.2	58.1	63.1	47.1	45.6	44.0	36.0
9/5/2018	1:17:53 PM	37.3	71.6	38.3	40.9	29.4	55.1	59.9	43.3	41.9	40.4	33.4
9/5/2018	2:17:53 PM	41.9	66.5	39.0	44.5	31.7	59.7	65.4	49.4	47.6	45.7	37.0
9/5/2018	3:17:53 PM	42.7	66.3	40.7	45.8	33.0	60.5	66.3	50.0	48.2	46.6	38.6
9/5/2018	4:17:53 PM	44.0	64.6	39.1	44.1	32.4	61.8	67.4	51.6	50.0	48.5	38.7
9/5/2018	5:17:53 PM	40.3	65.7	40.9	45.2	31.2	58.1	63.2	47.2	45.5	43.9	36.2
9/5/2018	6:17:53 PM	40.4	66.6	41.4	43.7	31.4	58.2	63.7	47.4	45.4	44.0	36.5
9/5/2018	7:17:53 PM	55.5	74.9	46.8	51.2	49.8	73.3	70.8	58.3	57.8	57.1	54.3
9/5/2018	8:17:53 PM	48.6	63.9	45.7	48.2	45.1	66.4	65.2	51.5	50.9	50.3	47.7
9/5/2018	9:17:53 PM	45.8	65.4	43.4	44.7	42.0	63.6	64.2	49.7	49.0	48.1	43.8
9/5/2018	10:17:53 PM	45.0	65.2	42.8	45.1	41.1	62.8	63.4	48.7	47.9	47.1	43.3
9/5/2018	11:17:53 PM	42.6	61.6	41.3	42.9	39.4	60.4	60.5	45.5	44.7	44.1	41.4
9/6/2018	12:17:53 AM	40.6	69.1	40.1	41.2	37.3	58.4	59.3	43.3	42.6	42.1	39.5
9/6/2018	1:17:53 AM	36.0	56.4	39.6	39.2	33.8	53.8	56.4	38.9	37.8	37.1	35.2
9/6/2018	2:17:53 AM	33.6	57.9	37.5	37.0	31.9	51.4	51.8	35.3	34.8	34.5	33.0
9/6/2018	3:17:53 AM	30.9	58.2	34.2	34.0	29.2	48.7	49.2	32.9	32.1	31.7	30.2
9/6/2018	4:17:53 AM	35.8	59.8	36.4	35.8	29.7	53.6	59.1	41.2	39.6	38.3	33.9
9/6/2018	5:17:53 AM	36.6	61.9	37.0	37.4	29.1	54.4	59.6	43.0	40.7	39.0	33.0
9/6/2018	6:17:53 AM	42.3	73.1	38.1	45.3	32.0	60.1	64.9	49.0	47.6	46.2	38.7
9/6/2018	7:17:53 AM	43.7	76.1	38.9	44.5	31.5	61.3	68.0	52.1	49.6	48.0	37.7

ytime (9am to 10pm) Leq	46.6
daytime (7am to 9am) Leq	42.7
ttime (10pm to 7am) Leq	41.1
Ldn	48.7

average daytime L90	47.7
average nighttime L90	40.9
lowest L90	32.1

Start Date	Start Time	LAeq	LAmax	LAmin	LAE	L1%	L5%	L10%	L50%	L90%	L95%	L99%
9/6/2018	9:57:03 AM	39.1	76.1	43.8	46.1	32.4	56.9	70.9	45.6	43.2	41.8	36.9
9/6/2018	10:57:03 AM	39.0	55.3	43.2	45.9	32.7	56.8	69.1	45.3	43.6	42.1	36.9
9/6/2018	11:57:03 AM	38.9	55.3	43.2	45.8	32.6	56.7	69.0	45.2	43.4	42.0	36.8
9/6/2018	12:57:03 PM	51.7	65.7	44.3	47.7	40.1	69.5	78.1	58.6	56.5	55.1	49.9
9/6/2018	1:57:03 PM	46.6	70.1	43.4	45.8	35.6	64.4	75.4	54.3	52.2	50.2	43.3
9/6/2018	2:57:03 PM	38.2	63.4	41.5	43.7	31.4	56.0	68.4	44.4	42.5	41.1	35.9
9/6/2018	3:57:03 PM	35.5	67.0	39.7	42.2	30.7	53.3	65.2	41.4	39.3	37.8	33.6
9/6/2018	4:57:03 PM	45.2	65.3	46.8	48.6	36.0	63.0	73.8	52.0	50.0	48.5	43.2
9/6/2018	5:57:03 PM	52.3	71.8	46.9	49.6	40.0	70.1	79.6	59.7	57.2	55.7	49.9
9/6/2018	6:57:03 PM	49.7	67.0	46.9	49.4	41.5	67.5	72.0	54.6	53.0	51.9	48.4
9/6/2018	7:57:03 PM	56.3	58.1	52.3	54.2	55.4	74.1	71.3	56.7	56.6	56.5	56.3
9/6/2018	8:57:03 PM	53.4	55.6	49.6	51.2	52.4	71.2	68.7	53.9	53.8	53.7	53.4
9/6/2018	9:57:03 PM	53.0	56.0	49.7	51.1	52.0	70.8	68.3	53.6	53.5	53.4	53.0
9/6/2018	10:57:03 PM	52.4	55.4	47.9	50.4	51.4	70.2	67.6	52.9	52.8	52.7	52.4
9/6/2018	11:57:03 PM	50.5	51.5	48.2	48.8	49.8	68.3	65.9	50.9	50.8	50.7	50.5
9/6/2018	12:57:03 AM	49.6	52.6	46.2	47.5	48.9	67.4	64.9	50.1	50.0	49.9	49.6
9/6/2018	1:57:03 AM	49.3	50.9	46.3	47.2	48.3	67.1	64.6	49.8	49.7	49.6	49.3
9/6/2018	2:57:03 AM	48.4	56.6	45.8	46.2	47.0	66.2	64.8	49.1	48.9	48.8	48.5
9/6/2018	3:57:03 AM	44.8	49.1	42.3	43.0	43.0	62.6	61.9	45.7	45.5	45.3	44.9
9/6/2018	4:57:03 AM	33.7	55.0	36.9	36.6	30.5	51.5	59.8	36.8	35.7	35.1	33.2
9/6/2018	5:57:03 AM	44.9	73.2	38.0	38.5	32.1	62.7	74.1	53.8	50.4	47.6	39.3
9/6/2018	6:57:03 AM	38.7	68.3	40.3	43.7	32.8	56.5	66.0	44.9	42.5	40.9	36.4
9/6/2018	7:57:03 AM	38.8	71.7	37.6	40.4	30.3	56.6	70.7	47.7	43.5	40.2	33.9
9/6/2018	8:57:03 AM	36.6	76.9	39.3	40.6	30.2	54.4	70.3	44.2	40.5	38.3	33.4

ytime (9am to 10pm) Leq	49.9	average daytime L90	48.2
daytime (7am to 9am) Leq	38.1	average nighttime L90	48.6
httime (10pm to 7am) Leq	49.5	lowest L90	35.7
Ldn	55.8		

Rec 1 to 25	Slow Response		dBA weighting		2.0 dB resolution stats													
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin	L1%	L5%	L10%	L50%	L90%	L95%	L99%	Lmedian	Lmean	StdDev	L2%	L8%	L30%
9/5/2018 9:02	1.0 hour	52.4	88	81.1	36.8	65	49	43	37	37	37	37	37	39.5	5.17	59	45	39
9/5/2018 10:02	1.0 hour	51.1	86.7	83.9	36.9	51	45	41	37	37	37	37	37	38.4	3.33	47	43	37
9/5/2018 11:02	1.0 hour	44	79.6	70.4	36.9	53	45	41	37	37	37	37	37	38.2	3.21	49	41	37
9/5/2018 12:02	1.0 hour	41	76.6	62.1	37.1	49	45	41	37	37	37	37	37	38.5	2.69	47	43	39
9/5/2018 13:02	1.0 hour	44.2	79.8	61.9	37.4	53	49	47	39	37	37	37	39	40.8	3.77	51	47	41
9/5/2018 14:02	1.0 hour	45.1	80.7	64.3	37.4	53	49	47	41	37	37	37	41	41.7	3.9	51	47	43
9/5/2018 15:02	1.0 hour	44.6	80.2	65.6	37.4	51	49	47	41	37	37	37	41	41.7	3.57	51	47	43
9/5/2018 16:02	1.0 hour	45.6	81.2	63.9	37.4	55	49	47	41	39	37	37	41	42.4	3.62	53	47	43
9/5/2018 17:02	1.0 hour	54.7	90.3	79.9	37.3	61	47	43	39	37	37	37	39	39.8	4.56	53	45	39
9/5/2018 18:02	1.0 hour	46.4	82	76.4	37.4	53	41	39	39	37	37	37	39	39.2	2.58	45	39	39
9/5/2018 19:02	1.0 hour	41.4	77	64.7	37.2	49	41	41	39	37	37	37	39	38.8	2.35	43	41	39
9/5/2018 20:02	1.0 hour	46.2	81.8	66.8	37.2	57	47	41	37	37	37	37	37	38.3	4.04	55	41	37
9/5/2018 21:02	1.0 hour	45.8	81.4	60.4	36.3	51	47	47	45	37	37	37	45	42.9	4.66	49	47	47
9/5/2018 22:02	1.0 hour	36.8	72.4	57.1	34.4	39	37	37	37	35	35	35	37	36.7	1.01	37	37	37
9/5/2018 23:02	1.0 hour	47.3	82.9	55.8	35	49	49	49	47	37	37	35	47	44.8	4.74	49	49	47
9/6/2018 0:02	1.0 hour	39.7	75.3	51.3	34.4	49	49	37	35	35	35	35	35	36.4	3.21	49	37	37
9/6/2018 1:02	1.0 hour	38.9	74.5	66	34.4	39	37	37	35	35	35	35	35	35.3	1.58	37	37	35
9/6/2018 2:02	1.0 hour	37.4	73	54.4	34.4	45	39	37	35	35	35	35	35	35.7	1.88	43	37	35
9/6/2018 3:02	1.0 hour	36.5	72.1	46.6	34.4	37	37	37	35	35	35	35	35	35.9	1.08	37	37	37
9/6/2018 4:02	1.0 hour	38.9	74.5	66.1	34.4	37	37	37	37	35	35	35	37	36.5	1.47	37	37	37
9/6/2018 5:02	1.0 hour	39.6	75.2	64	34.4	47	37	37	37	35	35	35	37	37	2.04	43	37	37
9/6/2018 6:02	1.0 hour	48.3	83.9	67.9	37.3	51	49	49	47	37	37	37	47	44.1	5.59	51	49	49
9/6/2018 7:02	1.0 hour	40.2	75.8	63.2	34.4	49	39	39	37	35	35	35	37	37.7	2.3	45	39	39
9/6/2018 8:02	1.0 hour	40.1	75.7	66	34.4	43	39	39	37	35	35	35	37	36.8	2.05	39	39	37
9/6/2018 9:02	2.6 min	61.5	83.5	82.4	38.4	75.5	51	49	39	39	37	37	39	41.4	6.63	69	49	39

daytime (9am to 10pm) Leq	48.4	average daytime L90	37.0
daytime (7am to 9am) Leq	40.2	average nighttime L90	35.7
nighttime (10pm to 7am) Leq	42.8	lowest L90	35.0
Ldn	50.4		

	Ldn (from measured Leq hourly values)	geography to explain the Ldn…	Average daytime L90 (from measured L90 hourly values)	Average nighttime L90 (from measured L90 hourly values)	Lowest hourly L90 (from measured L90 hourly values)	
LT1	51.5	distant from major roadway	35.1	35.0	35.0	
LT2	48.5	distant from major roadway	35.5	35.2	35.0	
LT3	52.9	distant from major roadway	36.9	37.2	35.0	
LT4	56.1	near major roadway	37.3	32.9	29.6	
LT5	56.6	near major roadway	35.3	35.0	35.0	
LT6	44.7	distant from major roadway	35.0	35.0	35.0	
LT7	67.3	adjoining Old Highway 80	37.2	40.8	32.2	
LT8	50.3	distant from major roadway	36.3	39.7	35.0	
LT9	43.5	distant from major roadway	32.7	32.6	28.6	
LT10	45.2	distant from major roadway	32.0	33.7	30.7	
LT11	48.7	distant from major roadway	47.7	40.9	32.1	
LT12	55.8	distant from major roadway	48.2	48.6	35.7	
LT13	50.4	distant from major roadway	37.0	35.7	35.0	
energy-avg	**57.5**		37.4	37.1	33.4	<-- arithmetic L90 averages

APPENDIX B

CadnaA Sound Modeling Input/Output Data
(Available Upon Request
Due to the Size of the Data)

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
ProposedGEA_Plus2dB	ProposedGEA2	Lw	A	84.8	94.6	100	102.6	106.2	107.5	104.1	96.1	78	112	126.6	GE Data 2p5_127_plus2dBForModelingAsumption
ExistingTurbines Plus2	ExistTurbsPlus2	Lw	A	87.4	87.4	96.2	101.8	103.4	101.7	97.4	90.6	88.8	108.1	127.3	Tule Noise Report Table 6, GE 1.5 XLE

Cumulative = Campo + Torrey + Kumeyaay

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m^2)	Attenuatio	Operating Time Day (min)	Special (min)	Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Height (m)	Coordinates X (m)	Y (m)	Z (m)
Torrey		!08!Torrey0	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996269	565252.9	1360.7
Torrey		!08!Torrey1	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996220	565538.1	1353.58
Torrey		!08!Torrey10	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995517	563727.8	1277.45
Torrey		!08!Torrey11	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995508	563940.8	1284.13
Torrey		!08!Torrey12	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995330	562566.4	1246.09
Torrey		!08!Torrey13	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996258	562678.9	1292.53
Torrey		!08!Torrey14	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996166	562957.8	1280.43
Torrey		!08!Torrey15	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996201	563284.3	1304.82
Torrey		!08!Torrey16	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996293	563532	1321.16
Torrey		!08!Torrey17	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995480	563410.4	1270.82
Torrey		!08!Torrey18	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995461	563214.6	1268.24
Torrey		!08!Torrey19	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995334	562814.9	1256.05
Torrey		!08!Torrey2	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996738	565989.3	1304.82
Torrey		!08!Torrey20	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995438	562138.3	1238.17
Torrey		!08!Torrey21	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995367	562340.6	1241.79
Torrey		!08!Torrey22	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996055	561983.4	1250.81
Torrey		!08!Torrey23	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996207	562456.3	1279.14
Torrey		!08!Torrey24	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996192	562256.2	1269.57
Torrey		!08!Torrey25	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994667	562311.5	1250.02
Torrey		!08!Torrey26	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994606	562566.7	1249.36
Torrey		!08!Torrey27	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994519	562779.4	1252.65
Torrey		!08!Torrey28	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994831	561519.9	1243.72
Torrey		!08!Torrey29	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994774	561738.5	1253.44
Torrey		!08!Torrey3	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996295	563743.8	1329.2
Torrey		!08!Torrey4	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996375	563948.9	1341.33
Torrey		!08!Torrey5	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1996295	564149.4	1336.33
Torrey		!08!Torrey6	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995899	564384.8	1312.2
Torrey		!08!Torrey7	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995898	564640.9	1329.2
Torrey		!08!Torrey8	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995905	564908.5	1334.27
Torrey		!08!Torrey9	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1995498	564137.9	1292.62
Kumayaay0		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992848	559419.3	1377.97
Kumayaay1		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992740	559547.8	1384.98
Kumayaay2		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992653	559672.2	1399.9
Kumayaay3		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992537	559800.8	1413.26
Kumayaay4		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992438	559941.8	1426.74
Kumayaay5		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992321	560066.2	1426.74
Kumayaay6		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992205	560194.8	1426.74
Kumayaay7		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992098	560315.1	1424.73
Kumayaay8		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1992002	560451.9	1426.74
Kumayaay9		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991869	560576.3	1438.93
Kumayaay10		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991766	560704.9	1438.93
Kumayaay11		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991675	560850.1	1446.22
Kumayaay12		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991579	560991.1	1451.12
Kumayaay13		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991475	561127.9	1456.79
Kumayaay14		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991388	561273.1	1463.31
Kumayaay15		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991305	561405.8	1475.5
Kumayaay16		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991202	561555.1	1478.81
Kumayaay17		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991110	561687.8	1487.7
Kumayaay18		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1990994	561816.4	1499.59
Kumayaay19		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1990899	561957.4	1512.08
Kumayaay20		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1990940	562168.9	1512.08
Kumayaay21		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1990986	562338.9	1501.15
Kumayaay22		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991044	562567	1499.89
Kumayaay23		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991073	562737.1	1499.89
Kumayaay24		!09!KUMAYAAYTURBINES060	110.1	105.1	105.1	Lw	ExistTurbsPlus2		2	-3	-3							0		(none)	110 r	1991082	562960.2	1499.89
Campo		!01!CampoC-21	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987923	555475.2	1207.28
Campo		!01!CampoC-32	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989072	551890.3	1194.32
Campo		!01!CampoC-35	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989792	551241.1	1206
Campo		!01!CampoC-26	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988472	554012.7	1170.21
Campo		!01!CampoC-43	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988884	557720.3	1353.58
Campo		!01!CampoC-20	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987775	555708.1	1231.66
Campo		!01!CampoC-44	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988940	557446.9	1312.47
Campo		!01!CampoC-45	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988967	557248.3	1317.01
Campo		!01!CampoC-14	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987390	557412.3	1317.01
Campo		!01!CampoC-31	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988988	552226.2	1182.87
Campo		!01!CampoC-29	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988728	552612.2	1158.51
Campo		!01!CampoC-3	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986832	549860	1210.65
Campo		!01!CampoC-19	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987699	556001.7	1202.44
Campo		!01!CampoC-25	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988321	554276.5	1176.85

Campo	!01!CampoC-27	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988459	553077.2	1146.32
Campo	!01!CampoC-5	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987078	549374.8	1237.12
Campo	!01!CampoC-13	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987305	557757.1	1280.43
Campo	!01!CampoC-52	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989897	554712.5	1217.79
Campo	!01!CampoC-39	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990091	550061.5	1231.66
Campo	!01!CampoC-4	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987003	549576.9	1237.68
Campo	!01!CampoC-8	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987321	551772	1158.51
Campo	!01!CampoC-47	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988663	556680.7	1255.98
Campo	!01!CampoC-48	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990335	555700.3	1256.05
Campo	!01!CampoC-53	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989875	554504.2	1206.45
Campo	!01!CampoC-10	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987480	551072.5	1134.13
Campo	!01!CampoC-37	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990015	550457.2	1224.19
Campo	!01!CampoC-36	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989991	550793	1214.11
Campo	!01!CampoC-46	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989082	556950.7	1285.7
Campo	!01!CampoC-15	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987391	557175.1	1317.01
Campo	!01!CampoC-12	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987915	550506.2	1181.96
Campo	!01!CampoC-42	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990004	549462.5	1227.19
Campo	!01!CampoC-49	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989971	555407.6	1256.05
Campo	!01!CampoC-51	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989908	554944.7	1228.79
Campo	!01!CampoC-28	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988668	552796.8	1158.51
Campo	!01!CampoC-7	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987093	548955.6	1219.47
Campo	!01!CampoC-33	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989107	551695.1	1184.18
Campo	!01!CampoC-16	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987490	556958	1304.82
Campo	!01!CampoC-24	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988213	554518.2	1158.51
Campo	!01!CampoC-18	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987705	556421.6	1231.66
Campo	!01!CampoC-40	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990075	549861.3	1231.66
Campo	!01!CampoC-1	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1986737	550363	1170.7
Campo	!01!CampoC-22	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988018	555066.1	1172.84
Campo	!01!CampoC-41	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990029	549666.7	1231.66
Campo	!01!CampoC-11	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987700	550708	1182.9
Campo	!01!CampoC-23	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988088	554843	1173.96
Campo	!01!CampoC-30	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1988821	552415.6	1170.7
Campo	!01!CampoC-50	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989863	555211.4	1243.86
Campo	!01!CampoC-38	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990035	550242	1229.48
Campo	!01!CampoC-54	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989794	554241.4	1195.09
Campo	!01!CampoC-17	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987605	556674.3	1280.43
Campo	!01!CampoC-2	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1986744	550074.3	1195.09
Campo	!01!CampoC-34	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1989777	551425.4	1207.28
Campo	!01!CampoC-6	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987057	549160.9	1231.04
Campo	!01!CampoC-9	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987397	551571.4	1158.51
Campo	!01!CampoC-57	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993886	562011.9	1329.2
Campo	!01!CampoC-59	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1994044	561568.9	1314.08
Campo	!01!CampoC-60	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1994173	561371.1	1304.82
Campo	!01!CampoC-58	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993999	561744.9	1329.2
Campo	!01!CampoC-55	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993605	562598	1338.8
Campo	!01!CampoC-56	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993754	562206.2	1329.2
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990042	559837.7	1397.78
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990024	560049.5	1406.42
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990031	560282.9	1414.54
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990409	561132	1451.12
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990364	561330.9	1487.44
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990292	561536.5	1486.65
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993253	562630.2	1353.58
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990221	561722.3	1487.7
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993233	558618.9	1402.35
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993132	558761.5	1388.43
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993150	558904.7	1389.02
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993221	558385.8	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993240	558187.2	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987217	557998.2	1304.82
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990156	561927.9	1487.7
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993029	562789.1	1365.78

Campo Only

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night					X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m^2)		(min)	(min)	(min)	(dB)	(Hz)		(m)	(m)	(m)	(m)
Campo		!01!CampoC-21	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987923	555475.2	1207.28
Campo		!01!CampoC-32	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989072	551890.3	1194.32
Campo		!01!CampoC-35	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989792	551241.1	1206
Campo		!01!CampoC-26	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988472	554012.7	1170.21
Campo		!01!CampoC-43	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988884	557720.3	1353.58
Campo		!01!CampoC-20	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987775	555708.1	1231.66
Campo		!01!CampoC-44	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988940	557446.9	1312.47
Campo		!01!CampoC-45	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988967	557248.3	1317.01
Campo		!01!CampoC-14	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987390	557412.3	1317.01
Campo		!01!CampoC-31	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988988	552226.2	1182.87
Campo		!01!CampoC-29	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988728	552612.2	1158.51
Campo		!01!CampoC-3	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986832	549860	1210.65
Campo		!01!CampoC-19	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987699	556001.7	1202.44
Campo		!01!CampoC-25	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988321	554276.5	1176.85
Campo		!01!CampoC-27	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988459	553077.2	1146.32
Campo		!01!CampoC-5	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987078	549374.8	1237.12
Campo		!01!CampoC-13	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987305	557757.1	1280.43
Campo		!01!CampoC-52	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989897	554712.5	1217.79
Campo		!01!CampoC-39	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990091	550061.5	1231.66
Campo		!01!CampoC-4	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987003	549576.9	1237.68
Campo		!01!CampoC-8	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987321	551772	1158.51
Campo		!01!CampoC-47	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988663	556680.7	1255.98
Campo		!01!CampoC-48	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990335	555700.3	1256.05
Campo		!01!CampoC-53	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989875	554504.2	1206.45
Campo		!01!CampoC-10	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987480	551072.5	1134.13
Campo		!01!CampoC-37	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990015	550457.2	1224.19
Campo		!01!CampoC-36	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989991	550793	1214.11
Campo		!01!CampoC-46	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989082	556950.7	1285.7
Campo		!01!CampoC-15	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987391	557175.1	1317.01
Campo		!01!CampoC-12	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987915	550506.2	1181.96
Campo		!01!CampoC-42	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990004	549462.5	1227.19
Campo		!01!CampoC-49	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989971	555407.6	1256.05
Campo		!01!CampoC-51	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989908	554944.7	1228.79
Campo		!01!CampoC-28	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988668	552796.8	1158.51
Campo		!01!CampoC-7	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987093	548955.6	1219.47
Campo		!01!CampoC-33	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989107	551695.1	1184.18
Campo		!01!CampoC-16	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987490	556958	1304.82
Campo		!01!CampoC-24	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988213	554518.2	1158.51
Campo		!01!CampoC-18	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987705	556421.6	1231.66
Campo		!01!CampoC-40	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990075	549861.3	1231.66
Campo		!01!CampoC-1	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986737	550363	1170.7
Campo		!01!CampoC-22	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988018	555066.1	1172.84
Campo		!01!CampoC-41	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990029	549666.7	1231.66
Campo		!01!CampoC-11	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987700	550708	1182.9
Campo		!01!CampoC-23	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988088	554843	1173.96
Campo		!01!CampoC-30	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1988821	552415.6	1170.7
Campo		!01!CampoC-50	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989863	555211.4	1243.86
Campo		!01!CampoC-38	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990035	550242	1229.48
Campo		!01!CampoC-54	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989794	554241.4	1195.09
Campo		!01!CampoC-17	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987605	556674.3	1280.43
Campo		!01!CampoC-2	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1986744	550074.3	1195.09
Campo		!01!CampoC-34	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1989777	551425.4	1207.28
Campo		!01!CampoC-6	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987057	549160.9	1231.04
Campo		!01!CampoC-9	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1987397	551571.4	1158.51
Campo		!01!CampoC-57	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993886	562011.9	1329.2
Campo		!01!CampoC-59	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994044	561568.9	1314.08
Campo		!01!CampoC-60	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1994173	561371.1	1304.82
Campo		!01!CampoC-58	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993999	561744.9	1329.2
Campo		!01!CampoC-55	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993605	562598	1338.8
Campo		!01!CampoC-56	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993754	562206.2	1329.2
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990042	559837.7	1397.78
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990024	560049.5	1406.42
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990031	560282.9	1414.54
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990409	561132	1451.12
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990364	561330.9	1487.44
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990292	561536.5	1486.65
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993253	562630.2	1353.58
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1990221	561722.3	1487.7
Campo		!01!Campo	114	109	109	Lw	ProposedGEA2		2	-3	-3							0		(none)	110 r	1993233	558618.9	1402.35

Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993132	558761.5	1388.43
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993150	558904.7	1389.02
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993221	558385.8	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993240	558187.2	1390.16
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1987217	557998.2	1304.82
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1990156	561927.9	1487.7
Campo	!01!Campo	114	109	109	Lw	ProposedGEA2	2	-3	-3	0	(none)	110	r	1993029	562789.1	1365.78

Cumulative = Campo + Torrey + Kumeyaay

Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Ldn (dBA)	Lden (dBA)	Limit. Value Day (dBA)	Night (dBA)	Ldn (dBA)	Lden (dBA)	Land Use Type	Auto	Noise Type	Height (m)		Coordinates X (m)	Y (m)	Z (m)	Campo Pro Day Leq dBA	Proposed Campo Daytime Z-Spectrum 32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
LT-1		CAMPOLTNAMES00001	53.2	48.2	55.8	55.6	0	0	0	0		x	Total	1.5	r	1990492	550628.4	1115.42	53.2	70.5	67	58.7	51.8	50.4	49.4	41.3	20.1	-41.1
LT-2		CAMPOLTNAMES00012	52.5	47.5	55.1	54.8	0	0	0	0		x	Total	1.5	r	1989349	550863.5	1058.53	52.5	70.3	66.9	58.1	51.4	49.8	48.5	39.4	15.4	-53.5
LT-3		CAMPOLTNAMES00011	50	45	52.6	52.3	0	0	0	0		x	Total	1.5	r	1987889	552532.6	976.86	50	68.1	64.6	55.8	49.2	47.5	45.9	35.9	7.5	-76.4
LT-4		CAMPOLTNAMES00008	52	47	54.6	54.4	0	0	0	0		x	Total	1.5	r	1988915	553645.9	989.05	51.5	69.6	66.1	57.2	50.5	48.9	47.4	37.9	13.5	-54.4
LT-5		CAMPOLTNAMES00010	52.8	47.8	55.4	55.2	0	0	0	0		x	Total	1.5	r	1989937	553913.7	1061.86	52.8	69.8	66.3	58.4	51.2	49.8	48.9	41.5	23.8	-24.6
LT-6		CAMPOLTNAMES00005	37.1	32.3	39.8	39.8	0	0	0	0		x	Total	1.5	r	1986512	559602.6	1097.44	33.6	53.2	49.7	40.8	34	31.6	28.4	13.5	-35	-80.2
LT-7		CAMPOLTNAMES00009	53	48.2	55.7	55.8	0	0	0	0		x	Total	1.5	r	1991056	558550.9	1223.13	36.5	56.4	52.8	43.5	36.6	34.3	31.6	17	-29.9	-80.2
LT-8		CAMPOLTNAMES00003	51.9	46.9	54.5	54.3	0	0	0	0		x	Total	1.5	r	1989745	560906.6	1299.16	51.4	68.6	65.1	57.1	50.7	48.9	47.3	38	12.3	-64.2
LT-9		CAMPOLTNAMES00002	61.5	56.5	64.1	63.9	0	0	0	0		x	Total	1.5	r	1990094	561989.3	1379.2	61.4	76.5	73.1	66.5	59.3	58.1	57.5	52	40.5	12.6
LT-10		CAMPOLTNAMES00004	51.2	46.2	53.8	53.5	0	0	0	0		x	Total	1.5	r	1992643	562957.8	1266.23	51	67.6	64.2	56.5	49.6	48.1	47.1	39.6	21	-31.7
LT-11		CAMPOLTNAMES00007	47.4	42.4	50	49.8	0	0	0	0		x	Total	1.5	r	1990056	556519.8	1110.03	47.4	66	62.5	53.6	47	45.1	43.1	32	1.1	-79.8
LT-12		CAMPOLTNAMES00006	46.8	41.8	49.4	49.2	0	0	0	0		x	Total	1.5	r	1993994	560325.5	1171.93	44.5	63.7	60.2	51	44.3	42.2	40	27.8	-7.1	-80.2
LT-13		CAMPOLTNAMES00013	46.9	41.9	49.5	49.2	0	0	0	0		x	Total	1.5	r	1987202	548246	1075.59	46.9	64.9	61.4	52.6	46	44.3	42.9	33.2	6.9	-70.7

Campo Only

Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Ldn (dBA)	Lden (dBA)	Limit. Value Day (dBA)	Night (dBA)	Ldn (dBA)	Lden (dBA)	Land Use Type	Auto	Noise Type	Height (m)	Coordinates X (m)	Y (m)	Z (m)
LT-1		CAMPOLTNAMES00001	53.2	48.2	55.8	55.6	0	0	0	0		x	Total	1.5 r	1990492	550628.4	1115.42
LT-2		CAMPOLTNAMES00012	52.5	47.5	55.1	54.8	0	0	0	0		x	Total	1.5 r	1989349	550863.5	1058.53
LT-3		CAMPOLTNAMES00011	50	45	52.6	52.3	0	0	0	0		x	Total	1.5 r	1987889	552532.6	976.86
LT-4		CAMPOLTNAMES00008	51.5	46.5	54.1	53.8	0	0	0	0		x	Total	1.5 r	1988915	553645.9	989.05
LT-5		CAMPOLTNAMES00010	52.8	47.8	55.4	55.1	0	0	0	0		x	Total	1.5 r	1989937	553913.7	1061.86
LT-6		CAMPOLTNAMES00005	33.6	28.6	36.2	36	0	0	0	0		x	Total	1.5 r	1986512	559602.6	1097.44
LT-7		CAMPOLTNAMES00009	36.5	31.5	39.2	38.9	0	0	0	0		x	Total	1.5 r	1991056	558550.9	1223.13
LT-8		CAMPOLTNAMES00003	51.4	46.4	54	53.7	0	0	0	0		x	Total	1.5 r	1989745	560906.6	1299.16
LT-9		CAMPOLTNAMES00002	61.4	56.4	64	63.7	0	0	0	0		x	Total	1.5 r	1990094	561989.3	1379.2
LT-10		CAMPOLTNAMES00004	51	46	53.6	53.3	0	0	0	0		x	Total	1.5 r	1992643	562957.8	1266.23
LT-11		CAMPOLTNAMES00007	47.4	42.4	50	49.8	0	0	0	0		x	Total	1.5 r	1990056	556519.8	1110.03
LT-12		CAMPOLTNAMES00006	44.5	39.5	47.1	46.9	0	0	0	0		x	Total	1.5 r	1993994	560325.5	1171.93
LT-13		CAMPOLTNAMES00013	46.9	41.9	49.5	49.2	0	0	0	0		x	Total	1.5 r	1987202	548246	1075.59

Excel-based Model (LT positions per figures)	Day (dBA)	Night (dBA)	Ldn (dBA)
LT-1	54	49	56
LT-2	51	46	54
LT-3	48	43	51
LT-4	50	45	53
LT-5	53	48	55
LT-6	40	35	43
LT-7	41	36	44
LT-8	51	46	53
LT-9	61	56	64
LT-10	53	48	55
LT-11	47	42	49
LT-12	43	38	45
LT-13	46	41	48

Excel-based Model (LT positions per figures) - CadnaA				**Difference Notes:**
LT-1	1	1	0	apparent location match w/ CadnaA model
LT-2	-1	-1	-1	apparent location match w/ CadnaA model
LT-3	-2	-2	-2	apparent location match w/ CadnaA model
LT-4	-1	-1	-1	apparent location match w/ CadnaA model
LT-5	0	0	0	apparent location match w/ CadnaA model
LT-6	6	6	7	Excel model location is on the prop line corner, in CadnaA model it's north by ~415m
LT-7	5	5	5	decent location match w/ CadnaA model, discrepancy possibly due to CadnaA's incorporated topography
LT-8	-1	-1	-1	apparent location match w/ CadnaA model
LT-9	0	0	0	apparent location match w/ CadnaA model
LT-10	2	2	1	in CadnaA, LT-10 is on the property line; while Excel model is ~600 south into the project site
LT-11	-1	-1	-1	apparent location match w/ CadnaA model
LT-12	-2	-2	-2	Excel model is on the prop line, in CadnaA model it's west by ~240m
LT-13	-1	-1	-2	apparent location match w/ CadnaA model

APPENDIX C

RCNM Sound Modeling Input/Output Data

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018
Case Description: Campo Wind_Boulder Brush Clearing and Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		130	0
Grader	No	40	85		130	0
Dozer	No	40		81.7	150	0
Dozer	No	40		81.7	170	0
Dozer	No	40		81.7	170	0
Dozer	No	40		81.7	190	0
Tractor	No	40	84		190	0
Front End Loader	No	40		79.1	210	0
Backhoe	No	40		77.6	210	0
Tractor	No	40	84		230	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Grader		76.7	72.7	N/A	N/A	N/A	N/A	N/A
Grader		76.7	72.7	N/A	N/A	N/A	N/A	N/A
Dozer		72.1	68.1	N/A	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A	N/A
Dozer		70.1	66.1	N/A	N/A	N/A	N/A	N/A
Tractor		72.4	68.4	N/A	N/A	N/A	N/A	N/A
Front End Loader		66.6	62.7	N/A	N/A	N/A	N/A	N/A
Backhoe		65.1	61.1	N/A	N/A	N/A	N/A	N/A
Tractor		70.7	66.8	N/A	N/A	N/A	N/A	N/A
	Total	76.7	78.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		700	0
Grader	No	40	85		700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Tractor	No	40	84		700	0
Front End Loader	No	40		79.1	700	0
Backhoe	No	40		77.6	700	0
Tractor	No	40	84		700	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader		62.1	58.1	N/A	N/A	N/A	N/A	N/A
Grader		62.1	58.1	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Backhoe		54.6	50.7	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A
	Total	62.1	65.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018
Case Description: Campo Wind_Boulder Brush_Construction of Access Roads

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	130	0

Roller	No	20		80	130	0
Roller	No	20		80	150	0
Roller	No	20		80	150	0
Roller	No	20		80	170	0
Scraper	No	40		83.6	170	0
Scraper	No	40		83.6	190	0
All Other Equipment > 5 HP	No	50	85		190	0
All Other Equipment > 5 HP	No	50	85		210	0
All Other Equipment > 5 HP	No	50	85		210	0
All Other Equipment > 5 HP	No	50	85		250	0
Pumps	No	50		80.9	200	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Paver	68.9	65.9	N/A	N/A	N/A	N/A	N/A
Roller	71.7	64.7	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A
Roller	69.4	62.4	N/A	N/A	N/A	N/A	N/A
Scraper	73	69	N/A	N/A	N/A	N/A	N/A
Scraper	72	68	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	73.4	70.4	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	72.5	69.5	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	72.5	69.5	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71	68	N/A	N/A	N/A	N/A	N/A
Pumps	68.9	65.9	N/A	N/A	N/A	N/A	N/A
Total	73.4	78.2	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Scraper	No	40		83.6	700	0
Scraper	No	40		83.6	700	0

All Other Equipment > 5 HP	No	50	85		700	0
All Other Equipment > 5 HP	No	50	85		700	0
All Other Equipment > 5 HP	No	50	85		700	0
All Other Equipment > 5 HP	No	50	85		700	0
Pumps	No	50		80.9	700	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Paver	54.3	51.3	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Scraper	60.7	56.7	N/A	N/A	N/A	N/A	N/A
Scraper	60.7	56.7	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
Pumps	58	55	N/A	N/A	N/A	N/A	N/A
Total	62.1	67	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018
Case Description: Campo Wind_Boulder Brush_Foundation Construction and Tower Erection

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	130	0
Welder / Torch	No	40		74	130	0
Compressor (air)	No	40		77.7	150	0
Generator	No	50		80.6	150	0
Generator	No	50		80.6	170	0
Pumps	No	50		80.9	170	0

Results

		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		66.4	59.4	N/A	N/A	N/A	N/A	N/A
Welder / Torch		65.7	61.7	N/A	N/A	N/A	N/A	N/A
Compressor (air)		68.1	64.1	N/A	N/A	N/A	N/A	N/A
Generator		71.1	68.1	N/A	N/A	N/A	N/A	N/A
Generator		70	67	N/A	N/A	N/A	N/A	N/A
Pumps		70.3	67.3	N/A	N/A	N/A	N/A	N/A
	Total	71.1	73.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	700	0
Welder / Torch	No	40		74	700	0
Compressor (air)	No	40		77.7	700	0
Generator	No	50		80.6	700	0
Generator	No	50		80.6	700	0
Pumps	No	50		80.9	700	0

Results

		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		51.8	44.8	N/A	N/A	N/A	N/A	N/A
Welder / Torch		51.1	47.1	N/A	N/A	N/A	N/A	N/A
Compressor (air)		54.7	50.8	N/A	N/A	N/A	N/A	N/A
Generator		57.7	54.7	N/A	N/A	N/A	N/A	N/A
Generator		57.7	54.7	N/A	N/A	N/A	N/A	N/A
Pumps		58	55	N/A	N/A	N/A	N/A	N/A
	Total	58	60.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018
Case Description: Campo Wind_Stringing and Pulling

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Welder / Torch	No	40		74	130	0
Compressor (air)	No	40		77.7	150	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Welder / Torch		65.7	61.7	N/A	N/A	N/A	N/A	N/A
Compressor (air)		68.1	64.1	N/A	N/A	N/A	N/A	N/A
	Total	68.1	66.1	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Welder / Torch	No	40		74	700	0
Compressor (air)	No	40		77.7	700	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Welder / Torch		51.1	47.1	N/A	N/A	N/A	N/A	N/A
Compressor (air)		54.7	50.8	N/A	N/A	N/A	N/A	N/A
	Total	54.7	52.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Campo Wind_Clearing and Grading

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		130	0
Grader	No	40	85		130	0
Grader	No	40	85		150	0
Dozer	No	40		81.7	150	0
Dozer	No	40		81.7	170	0
Dozer	No	40		81.7	170	0
Dozer	No	40		81.7	190	0
Dozer	No	40		81.7	190	0
Dozer	No	40		81.7	210	0
Dozer	No	40		81.7	210	0
Dozer	No	40		81.7	230	0
Scraper	No	40		83.6	230	0
Scraper	No	40		83.6	250	0
Scraper	No	40		83.6	250	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader		76.7	72.7	N/A	N/A	N/A	N/A	N/A
Grader		76.7	72.7	N/A	N/A	N/A	N/A	N/A
Grader		75.5	71.5	N/A	N/A	N/A	N/A	N/A
Dozer		72.1	68.1	N/A	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A	N/A
Dozer		71	67.1	N/A	N/A	N/A	N/A	N/A
Dozer		70.1	66.1	N/A	N/A	N/A	N/A	N/A
Dozer		70.1	66.1	N/A	N/A	N/A	N/A	N/A
Dozer		69.2	65.2	N/A	N/A	N/A	N/A	N/A
Dozer		69.2	65.2	N/A	N/A	N/A	N/A	N/A
Dozer		68.4	64.4	N/A	N/A	N/A	N/A	N/A
Scraper		70.3	66.3	N/A	N/A	N/A	N/A	N/A
Scraper		69.6	65.6	N/A	N/A	N/A	N/A	N/A
Scraper		69.6	65.6	N/A	N/A	N/A	N/A	N/A
	Total	76.7	79.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		700	0
Grader	No	40	85		700	0
Grader	No	40	85		700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Scraper	No	40		83.6	700	0
Scraper	No	40		83.6	700	0
Scraper	No	40		83.6	700	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	62.1	58.1	N/A	N/A	N/A	N/A	N/A
Grader	62.1	58.1	N/A	N/A	N/A	N/A	N/A
Grader	62.1	58.1	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Dozer	58.7	54.8	N/A	N/A	N/A	N/A	N/A
Scraper	60.7	56.7	N/A	N/A	N/A	N/A	N/A
Scraper	60.7	56.7	N/A	N/A	N/A	N/A	N/A
Scraper	60.7	56.7	N/A	N/A	N/A	N/A	N/A
Total	62.1	67.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018

Case Description: Campo Wind_Construction of Access Roads

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Scraper	No	40		83.6	130	0
Scraper	No	40		83.6	130	0
Scraper	No	40		83.6	150	0
Front End Loader	No	40		79.1	150	0
Front End Loader	No	40		79.1	170	0
Front End Loader	No	40		79.1	170	0
Front End Loader	No	40		79.1	190	0
Front End Loader	No	40		79.1	190	0
Front End Loader	No	40		79.1	210	0
Front End Loader	No	40		79.1	210	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Scraper		75.3	71.3	N/A	N/A	N/A	N/A	N/A
Scraper		75.3	71.3	N/A	N/A	N/A	N/A	N/A
Scraper		74	70.1	N/A	N/A	N/A	N/A	N/A
Front End Loader		69.6	65.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		68.5	64.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		68.5	64.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		67.5	63.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		67.5	63.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		66.6	62.7	N/A	N/A	N/A	N/A	N/A
Front End Loader		66.6	62.7	N/A	N/A	N/A	N/A	N/A
	Total	75.3	77.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Scraper	No	40		83.6	700	0
Scraper	No	40		83.6	700	0

Scraper	No	40		83.6	700	0
Front End Loader	No	40		79.1	700	0
Front End Loader	No	40		79.1	700	0
Front End Loader	No	40		79.1	700	0
Front End Loader	No	40		79.1	700	0
Front End Loader	No	40		79.1	700	0
Front End Loader	No	40		79.1	700	0
Front End Loader	No	40		79.1	700	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Scraper		60.7	56.7	N/A	N/A	N/A	N/A	N/A
Scraper		60.7	56.7	N/A	N/A	N/A	N/A	N/A
Scraper		60.7	56.7	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		56.2	52.2	N/A	N/A	N/A	N/A	N/A
	Total	60.7	64.1	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018

Case Description: Campo Wind_Operations and Maintenance Building

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	130	0
Generator	No	50		80.6	130	0
Tractor	No	40	84		150	0
Welder / Torch	No	40		74	150	0

Results

Calculated (dBA) Noise Limits (dBA)

				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		72.3	64.3	N/A	N/A	N/A	N/A	N/A
Generator		72.3	69.3	N/A	N/A	N/A	N/A	N/A
Tractor		74.5	70.5	N/A	N/A	N/A	N/A	N/A
Welder / Torch		64.5	60.5	N/A	N/A	N/A	N/A	N/A
	Total	74.5	73.7	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	700	0
Generator	No	50		80.6	700	0
Tractor	No	40	84		700	0
Welder / Torch	No	40		74	700	0

Results

		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		57.6	49.7	N/A	N/A	N/A	N/A	N/A
Generator		57.7	54.7	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A
Welder / Torch		51.1	47.1	N/A	N/A	N/A	N/A	N/A
	Total	61.1	59.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Campo Wind_Paving

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 130'	Residential	65	60	55

		Equipment			
		Spec	Actual	Receptor	Estimated
Impact		Lmax	Lmax	Distance	Shielding

Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Paver	No	50		77.2	130	0
All Other Equipment > 5 HP	No	50	85		130	0
All Other Equipment > 5 HP	No	50	85		150	0
All Other Equipment > 5 HP	No	50	85		150	0
All Other Equipment > 5 HP	No	50	85		170	0
Roller	No	20		80	170	0
Roller	No	20		80	190	0
Roller	No	20		80	190	0
Roller	No	20		80	210	0
Roller	No	20		80	210	0
Roller	No	20		80	230	0
Roller	No	20		80	230	0
Roller	No	20		80	250	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Paver	68.9	65.9	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	76.7	73.7	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.5	72.4	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.5	72.4	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	74.4	71.4	N/A	N/A	N/A	N/A	N/A
Roller	69.4	62.4	N/A	N/A	N/A	N/A	N/A
Roller	68.4	61.4	N/A	N/A	N/A	N/A	N/A
Roller	68.4	61.4	N/A	N/A	N/A	N/A	N/A
Roller	67.5	60.5	N/A	N/A	N/A	N/A	N/A
Roller	67.5	60.5	N/A	N/A	N/A	N/A	N/A
Roller	66.7	59.8	N/A	N/A	N/A	N/A	N/A
Roller	66.7	59.8	N/A	N/A	N/A	N/A	N/A
Roller	66	59	N/A	N/A	N/A	N/A	N/A
Total	76.7	79.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 700'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Paver	No	50		77.2	700	0
All Other Equipment > 5 HP	No	50	85		700	0
All Other Equipment > 5 HP	No	50	85		700	0

All Other Equipment > 5 HP	No	50	85		700	0
All Other Equipment > 5 HP	No	50	85		700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Paver	54.3	51.3	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.1	59.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Roller	57.1	50.1	N/A	N/A	N/A	N/A	N/A
Total	62.1	66.2	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018

Case Description: Campo Wind_Substation and Switchyard

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 900'	Residential	65	60	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	900	0
Crane	No	16		80.6	900	0

Crane	No	16		80.6	950	0
Generator	No	50		80.6	900	0
Generator	No	50		80.6	950	0
Generator	No	50		80.6	1000	0
Generator	No	50		80.6	1050	0
Generator	No	50		80.6	1100	0
Generator	No	50		80.6	1150	0
Pumps	No	50		80.9	900	0
Pumps	No	50		80.9	950	0
Pumps	No	50		80.9	1000	0
Backhoe	No	40		77.6	900	0
Front End Loader	No	40		79.1	950	0
Tractor	No	40	84		1000	0
Welder / Torch	No	40		74	900	0
Welder / Torch	No	40		74	900	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		52.6	48.6	N/A	N/A	N/A	N/A	N/A
Crane		55.4	47.5	N/A	N/A	N/A	N/A	N/A
Crane		55	47	N/A	N/A	N/A	N/A	N/A
Generator		55.5	52.5	N/A	N/A	N/A	N/A	N/A
Generator		55.1	52	N/A	N/A	N/A	N/A	N/A
Generator		54.6	51.6	N/A	N/A	N/A	N/A	N/A
Generator		54.2	51.2	N/A	N/A	N/A	N/A	N/A
Generator		53.8	50.8	N/A	N/A	N/A	N/A	N/A
Generator		53.4	50.4	N/A	N/A	N/A	N/A	N/A
Pumps		55.8	52.8	N/A	N/A	N/A	N/A	N/A
Pumps		55.4	52.4	N/A	N/A	N/A	N/A	N/A
Pumps		54.9	51.9	N/A	N/A	N/A	N/A	N/A
Backhoe		52.5	48.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		53.5	49.6	N/A	N/A	N/A	N/A	N/A
Tractor		58	54	N/A	N/A	N/A	N/A	N/A
Welder / Torch		48.9	44.9	N/A	N/A	N/A	N/A	N/A
Welder / Torch		48.9	44.9	N/A	N/A	N/A	N/A	N/A
	Total	58	63	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 1320'	Residential	65	60	55

	Equipment			
	Spec	Actual	Receptor	Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Compressor (air)	No	40		77.7	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Pumps	No	50		80.9	1320	0
Pumps	No	50		80.9	1320	0
Pumps	No	50		80.9	1320	0
Backhoe	No	40		77.6	1320	0
Front End Loader	No	40		79.1	1320	0
Tractor	No	40	84		1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		49.2	45.3	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Pumps		52.5	49.5	N/A	N/A	N/A	N/A	N/A
Pumps		52.5	49.5	N/A	N/A	N/A	N/A	N/A
Pumps		52.5	49.5	N/A	N/A	N/A	N/A	N/A
Backhoe		49.1	45.1	N/A	N/A	N/A	N/A	N/A
Front End Loader		50.7	46.7	N/A	N/A	N/A	N/A	N/A
Tractor		55.6	51.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
	Total	55.6	60.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018

Case Description: Campo Wind_Wind Turbine Erection Cranes

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 1320'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0
Crane	No	16		80.6	1320	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane	52.1	44.2	N/A	N/A	N/A	N/A	N/A

Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
Crane		52.1	44.2	N/A	N/A	N/A	N/A	N/A
	Total	52.1	56.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 2640'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0
Crane	No	16		80.6	2640	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A

Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A
	Total	46.1	50.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018

Case Description: Campo Wind_Wind Turbine Erection Non-Cranes

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 1320'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1320	0
Compressor (air)	No	40		77.7	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Pumps	No	50		80.9	1320	0
Pumps	No	50		80.9	1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0
Welder / Torch	No	40		74	1320	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		49.2	45.3	N/A	N/A	N/A	N/A	N/A
Compressor (air)		49.2	45.3	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Pumps		52.5	49.5	N/A	N/A	N/A	N/A	N/A
Pumps		52.5	49.5	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		45.6	41.6	N/A	N/A	N/A	N/A	N/A
	Total	52.5	57.7	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 2640'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	2640	0
Compressor (air)	No	40		77.7	2640	0
Generator	No	50		80.6	2640	0
Generator	No	50		80.6	2640	0
Generator	No	50		80.6	2640	0
Pumps	No	50		80.9	2640	0
Pumps	No	50		80.9	2640	0
Welder / Torch	No	40		74	2640	0
Welder / Torch	No	40		74	2640	0
Welder / Torch	No	40		74	2640	0
Welder / Torch	No	40		74	2640	0
Welder / Torch	No	40		74	2640	0
Welder / Torch	No	40		74	2640	0
Welder / Torch	No	40		74	2640	0

			Results	
	Calculated (dBA)			Noise Limits (dBA)

Equipment		*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Compressor (air)		43.2	39.2	N/A	N/A	N/A	N/A	N/A
Compressor (air)		43.2	39.2	N/A	N/A	N/A	N/A	N/A
Generator		46.2	43.2	N/A	N/A	N/A	N/A	N/A
Generator		46.2	43.2	N/A	N/A	N/A	N/A	N/A
Generator		46.2	43.2	N/A	N/A	N/A	N/A	N/A
Pumps		46.5	43.5	N/A	N/A	N/A	N/A	N/A
Pumps		46.5	43.5	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
Welder / Torch		39.5	35.6	N/A	N/A	N/A	N/A	N/A
	Total	46.5	51.7	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/27/2018
Case Description: Campo Wind_Wind Turbine Foundation Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 1320'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1320	0
Compressor (air)	No	40		77.7	1320	0
Compressor (air)	No	40		77.7	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Generator	No	50		80.6	1320	0
Pumps	No	50		80.9	1320	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)	49.2	45.3	N/A	N/A	N/A	N/A	N/A
Compressor (air)	49.2	45.3	N/A	N/A	N/A	N/A	N/A

Compressor (air)		49.2	45.3	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Generator		52.2	49.2	N/A	N/A	N/A	N/A	N/A
Pumps		52.5	49.5	N/A	N/A	N/A	N/A	N/A
	Total	52.5	56.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 2640'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2640	0
Compressor (air)	No	40		77.7	2640	0
Compressor (air)	No	40		77.7	2640	0
Generator	No	50		80.6	2640	0
Generator	No	50		80.6	2640	0
Generator	No	50		80.6	2640	0
Pumps	No	50		80.9	2640	0

Results

		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		43.2	39.2	N/A	N/A	N/A	N/A	N/A
Compressor (air)		43.2	39.2	N/A	N/A	N/A	N/A	N/A
Compressor (air)		43.2	39.2	N/A	N/A	N/A	N/A	N/A
Generator		46.2	43.2	N/A	N/A	N/A	N/A	N/A
Generator		46.2	43.2	N/A	N/A	N/A	N/A	N/A
Generator		46.2	43.2	N/A	N/A	N/A	N/A	N/A
Pumps		46.5	43.5	N/A	N/A	N/A	N/A	N/A
	Total	46.5	50.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.