TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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4.10 NOISE

Would the project:		Potentially Significant Impact	Potentially Significant Unless APMs Incorporated	Less than Significant Impact	No Impact
a.	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b.	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c.	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d.	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐	☐
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f.	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

4.10.1 Introduction

This section of the PEA describes existing conditions and the potential effects of the Proposed Project in relation to noise and vibration. Included in this section is background information on noise and vibration (see Appendix 4.10-A, Basics of Noise and Vibration), a brief summary of the regulatory framework that pertains to the Proposed Project, an evaluation of the significance of Proposed Project impacts including noise and land use compatibility, long-term noise level increases resulting from Proposed Project-generated sources, and temporary noise and vibration impacts during construction. This chapter incorporates the findings of noise studies prepared for the Proposed Project by Alliance Acoustical Consulting, Inc. (see Appendix 4.10-B, Ambient Noise Survey Report) as well as with calculations for noise and vibration impacts. APM NOISE-1 is being proposed to ensure that potential impacts associated with nighttime construction activities would be less than significant. All other impacts are less than significant.

4.10.2 Methodology

A review of local, regional, state, and federal literature was conducted to establish the noise standards for the Proposed Project locations. Measurements were made to establish the baseline environment at key segments of the Proposed Project area, including in the vicinity of the transmission line corridor. An evaluation of potential noise impacts from the Proposed

Project included examining typical noise and vibration levels that are expected from demolition and construction activities, primarily at the Capistrano Substation and at discrete pole locations along the transmission corridor. Future noise environments in and around the future, reconfigured San Juan Capistrano Substation were calculated for the on-going activities at this part of the Proposed Project. Additional technical methodologies (including noise measurement information) are included within Appendix 4.10-B, Ambient Noise Survey.

4.10.3 Existing Conditions

4.10.3.1 Regulatory Setting

Federal

There are no federal noise standards that directly regulate noise from the operation of electrical transmission lines and substation facilities. However, in 1974 the USEPA established guidelines for noise levels, defined to protect public health and welfare with an adequate margin of safety. That is, there would be no reason to suspect that the general population would be at risk from any of the identified detrimental effects of noise if environmental noise levels were below the indicated guidelines. The secondary impetus for the USEPA's noise guidelines was to provide guidance for the local implementation of noise standards as the USEPA document does not have established federally-mandated standards, criteria, regulations, or goals.

The USEPA established various noise guidelines, based on the intended use at the receiving property. These thresholds are in terms of either a 24-hour energy-equivalent sound value (L_{eq-24}) or a second 24-hour noise metric, the day-night sound level (L_{dn}). These and other acoustical terms are defined and discussed in more detail in Attachment 4.10-A. The USEPA guidelines are summarized as follows:

- A 24-hour equivalent sound level (L_{eq-24}) of less than or equal to 70 A-weighted decibels (dBA)[1] to protect against hearing loss;
- A day-night sound level (L_{dn}) of less than or equal to 55 dBA to protect against activity interference and annoyance in residential areas, farms, and other outdoor areas where quiet is a basis for use;
- A 24-hour energy-equivalent sound level (L_{eq-24}) of less than or equal to 55 dBA to protect against outdoor activity interference where limited time is spent, such as school yards and playgrounds;
- A day-night sound level (L_{dn}) of less than or equal to 45 dBA to protect against indoor activity interference and annoyance in residences; and
- A 24-hour energy-equivalent sound level (L_{eq-24})of less than or equal to 45 dBA to protect against indoor activity interference in school yards.

[1] The human ear is not uniformly sensitive to all sound frequencies; therefore, the A-weighting scale has been devised to correspond with the human ear's sensitivity. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless noted otherwise.

Beyond these USEPA guidance levels, the federal government has passed various general laws to regulate and limit noise levels, as discussed in the following sub-sections.

Noise Pollution and Abatement Act of 1970

The Noise Pollution and Abatement Act of 1970 established the Office of Noise Abatement and Control (ONAC) within the USEPA, authorized to conduct a full and complete investigation of noise and its effect on public health and welfare. The office was charged with the identification of noise sources, projected noise levels, and effects of noise on persons, animals, and property.

In 1981, the Administration concluded that noise issues were best handled at the state or local government level. As a result, the USEPA phased out funding for ONAC in 1982 to start the transfer of responsibility from the federal level to state and local governments and agencies for the regulation of noise. Nonetheless, the Noise Control Act of 1972 and the Quiet Communities Act of 1978 (described below) were not rescinded by Congress and they remain in effect today.

Noise Control Act of 1972

The Noise Control Act of 1972 was the first comprehensive statement of national noise policy. It declares, "It is the policy of the U.S. to promote an environment for all Americans free from noise that jeopardizes their health or welfare."

Quiet Communities Act of 1978

The Noise Control Act was amended by the Quiet Communities Act of 1978 to promote the development of effective state and local noise control programs, to provide funds for noise research, and to produce and disseminate educational materials to the public on the harmful effects of noise and ways to effectively control it.

By 2002, agencies including the DOT, Department of Labor, Federal Railroad Administration, and FAA, developed their own noise control programs and each agency has established their own noise-related criteria.

Occupational Health and Safety Act of 1970

The U.S. Occupational Health and Safety Administration is assigned the responsibility of setting standards and conducting inspections in the workplace to ensure that employers are providing safe and healthful workplaces. OSHA covers all employers and their employees in the 50 states, the District of Columbia, Puerto Rico, and other United States territories. The OSHA standards may require that employers adopt certain practices, means, methods, or processes reasonably necessary and appropriate to protect workers on the job. Thus, employers must become familiar with the standards applicable to their establishments and are required to eliminate hazards. For worker noise exposure, the regulation establishes a time-weighted average noise limit of 90 dBA over an eight-hour work shift (this is the Permissible Exposure Level or PEL). Areas where the time-weighted average exposure exceeds 85 dBA (this is the Action Level or AL) triggers the need for a hearing protection program, including the labeling of

high-noise-level areas, feasible limitation of exposure times, periodic audiometric testing for all at-risk employee, and the providing and promotion of individual hearing protection equipment.

Federal Aviation Administration

The FAA establishes 65 decibels (dB) Community Noise Equivalent Level (CNEL)[2] as the noise standard associated with aircraft noise measured at exterior locations at noise-sensitive land uses (NSLU)[3]. This standard is also generally applied to railroad noise.

Federal Transit Administration

The Federal Transit Administration (FTA), under the DOT, has created a noise and vibration impact assessment manual that provides guidance for evaluating roadway, railway, and construction sources. The manual presents practical techniques for screening, predicting, and assessing potential noise and vibration impacts, primarily based on receptor land use.

State

California Noise Control Act

The California Noise Control Act recognizes that a continuous and increasing bombardment of noise exists in urban, suburban, and rural areas. The act states that excessive noise is a serious hazard to public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. The measure establishes that the State of California has the responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise.

California Noise Insulation Standards

The California Noise Insulation Standards were adopted in 1974 by the California Commission on Housing and Community Development. These standards were meant to establish noise insulation benchmarks for multi-family residential buildings. This document, commonly referred to as Title 24, establishes limits for interior room environments that are attributable to outside noise sources. The regulations also specify that acoustical studies must be prepared whenever a residential building or structure is proposed to be located near an existing or adopted freeway route, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source, and where such noise source or sources create an exterior CNEL (or Ldn) 4 of 60 dBA or greater. Such acoustical analyses must demonstrate that the residence has been designed to limit exterior-to-interior intruding noise to no more than 45 dBA CNEL (or Ldn) inside.

[2] The CNEL is a 24-hour, A-weighted average sound level from midnight to midnight, obtained after the addition of five decibels to sound levels occurring in the evening from 7:00 PM to 10:00 PM and after the addition of 10 decibels to sound levels occurring in the nighttime between 10:00 PM and the following 7:00 AM

[3] Noise-sensitive land uses routinely include, but are not necessarily limited to; schools, hospitals, rest homes, long term care facilities, mental care facilities, residential uses, places of worship, libraries, and passive recreation areas.

[4] For typical community noise environments, the L_{dn} and CNEL levels are nearly always within 1 dB of each other and, therefore, are commonly used interchangeably (as would be the case in this document).

California Department of Transportation- and Construction-Induced Vibration Guidance

Like the FTA, the Caltrans provides practical guidance to engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans-related projects. Caltrans has established that continuous or frequent intermittent vibration sources, such as impact pile drivers, are significant when their peak particle velocity (PPV) exceeds 0.1 inch per second. Table 4.10-1, Human Response to Transient Vibration, summarizes the Caltrans thresholds regarding vibration perception.

Table 4.10-1: Human Response to Transient Vibration

Human Response	PPV (inches/second)
Severe	2.0
Strongly Perceptible	0.9
Distinctly Perceptible	0.24
Barely Perceptible	0.035
Source: Caltrans, 2004	

Local

Generally, every local government outlines requirements for noise abatement and control in their General Plan and municipal code. A General Plan typically sets overall goals and objectives, while the municipal codes set specific sound limits.

Since the Proposed Project is several miles long, it traverses two cities, as well as unincorporated portions of Orange County and Camp Pendleton. The various noise-related requirements for each jurisdiction are presented below.

County of Orange

The County of Orange Noise Ordinance and General Plan Noise Element contain the County's policies on noise. The County Noise Ordinance establishes maximum noise levels that may be experienced on a neighboring property as a result of noise generated on/from another property. The County's Noise Ordinance is found in the Civil Code, Title 4 "Health, Sanitation, and Animal Regulation", Division 6 "Noise Control", Article 1. "General Provisions" and is enforceable throughout all incorporated and unincorporated territory of the County. Section 4-6-5 establishes the exterior noise standards, Section 4-6-6 establishes the interior noise standards, and Section 4-6-7 delineates special provisions (including limitations for construction activities and their associated noise).

The County Noise Ordinance prescribes exterior and interior noise standards for the protection of residential zoned areas. The Noise Ordinance is designed to control unnecessary, excessive, and annoying sounds from sources on private property by setting limits that cannot be exceeded at adjacent properties. The Noise Ordinance requirements are not applicable to

mobile noise sources such as cars, motorcycles, and heavy trucks which are traveling on public roadways, as these mobile noise sources are preempted by Federal and State laws[5].

These noise level standards apply to all residential property and are given in terms of A-weighted sound pressure level limits during the daytime and nighttime periods[6] for both exterior and interior spaces. There is also a further delineation of limits for varying noise levels within a given hour in that shorter accumulations of noise are allowed to have higher levels. Lastly, there are reductions in the limits for noise levels that are particularly intrusive, such as sources that have impact or tonal characteristics.

The County Noise Ordinance states that the daytime noise level for a noise source measured at an outdoor area of a residential property cannot ever exceed 75 dBA; 70 dBA for more than one minute of any hour; 65 dBA for more than five minutes of any hour; 60 dBA for more than 15 minutes of any hour; or 55 dBA for more than 30 minutes of any hour. All these noise level limits are reduced by five dB during the nighttime hours to reflect the increased sensitivity to noise occurring during this time period.

The County Noise Ordinance also states that the noise level for a source measured at an indoor area of a residential property cannot ever exceed 65 dBA; 60 dBA for more than one minute of any hour; and 55 dBA for more than five minutes of any hour. The nighttime interior noise level limits are reduced by ten dB, relative to the daytime interior limits. The County noise regulations are summarized in Table 4.10-2, County of Orange Noise Ordinance Limits (Exterior Noise Standards) and Table 4.10-3, County of Orange Noise Ordinance Limits (Interior Noise Standards).

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[5] However, the County's Noise Ordinance can be applied to vehicles traveling on private roads and on which are operated on private property (e.g. parking lots or loading docks).

[6] In the noise ordinance, 'daytime' is defined as 7:00 AM to 10:00 PM and 'nighttime' is defined as 10:00 PM to the following 7:00 AM

Table 4.10-2: County of Orange Noise Ordinance Limits (Exterior Noise Standards)

Timeframe	Equivalent statistical sound level*	Daytime Limit (7:00 AM to 10:00 PM)	Nighttime Limit (10:00 PM to the following 7:00 AM)
For a cumulative period of more than thirty (30) minutes in any hour	L_{50}	55 dBA	50 dBA
For a cumulative period of more than fifteen (15) minutes in any hour	L_{25}	60 dBA	55 dBA
For a cumulative period of more than five (5) minutes in any hour	$L_{8.3}$	65 dBA	60 dBA
For a cumulative period of more than one (1) minute in any hour	$L_{1.6}$	70 dBA	65 dBA
For any period of time	L_0	75 dBA	70 dBA

Notes:

Provision 1: In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise level limits shall be reduced by five (5) dB.
Provision 2: In the event the ambient noise level exceeds the above limits, the applicable levels shall be increased to reflect said ambient noise level.
* L_x is the sound pressure level that is the statistical indicator of the time-varying noise signal that is equaled or exceeded x % of the stated sampling time. As examples, the L_{10} symbol represents the sound level which is exceeded 10 percent of the sampled time period and the L_0 is the sound pressure level that is never equaled or exceeded during the stated sampling time, thus making this value equivalent to the maximum noise level or L_{max}. In the case of the Orange County Regulation, the $L_{1.6}$, $L_{8.3}$, L_{25}, and L_{50} noise metrics are the sound pressure levels that are the statistical indicators of the time-varying noise signal that is equaled or exceeded 1 minute, 5 minutes, 15 minutes, and 30 minutes, respectively, out of any given hour. Note that these are typical criterion levels in many community noise ordinances.
Source: County of Orange

Table 4.10-3: County of Orange Noise Ordinance Limits (Interior Noise Standards)

Timeframe	Equivalent statistical sound level*	Daytime Limit (7:00 AM to 10:00 PM)	Nighttime Limit (10:00 PM to the following 7:00 AM)
For a cumulative period of more than five (5) minutes in any hour	$L_{8.3}$	55 dBA	45 dBA
For a cumulative period of more than one (1) minute in any hour	$L_{1.6}$	60 dBA	50 dBA

Notes:

Provision 1: In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise level limits shall be reduced by five (5) dB.
Provision 2: In the event the ambient noise level exceeds the above limits, the applicable levels shall be increased to reflect said ambient noise level.
* L_x is the sound pressure level that is the statistical indicator of the time-varying noise signal that is equaled or exceeded x % of the stated sampling time. As examples, the L_{10} symbol represents the sound level which is exceeded 10 percent of the sampled time period and the L_0 is the sound pressure level that is never equaled or exceeded during the stated sampling time, thus making this value equivalent to the maximum noise level or L_{max}. In the case of the Orange County Regulation, the $L_{1.6}$, $L_{8.3}$, L_{25}, and L_{50} noise metrics are the sound pressure levels that are the statistical indicators of the time-varying noise signal that is equaled or exceeded 1 minute, 5 minutes, 15 minutes, and 30 minutes, respectively, out of any given hour. Note that these are typical criterion levels in many community noise ordinances.
Source: County of Orange

Also of particular relevance to the Proposed Project, the County Noise Ordinance exempts noise generated from construction activities, based on the day and time of such work. Specifically, as long as construction, repairs, remodeling, or grading of any real property does not take place between 8:00 PM and 7:00 AM on weekdays (including Saturdays), or at any time on Sunday or Federal holidays, noise from construction activities is exempt from the ordinance limits.

For the Proposed Project, the County of Orange noise standards pertain to areas around Proposed Project Pole Nos. 18 through 25, wherein the proposed new 230kV transmission line is near the border of unincorporated county areas and territory inside the city of San Juan Capistrano.

City of San Clemente

The City of San Clemente Municipal Code, Chapter 8.48, "Noise Control", contains several sections that deal with noise policy, definitions, exterior and interior standards, measurement procedures, and exceptions. Much like the County of Orange Ordinance, the city of San Clemente Municipal Code establishes allowable exterior and interior noise levels, based on receiving property land use, time of day, and the portion of any hour that the noise source of concern is observed. Table 4.10-4, City of San Clemente Exterior Noise Ordinance Limits outlines the established exterior noise standards for all property within the city of San Clemente, as prescribed by Section 8.48.050 of the San Clemente Municipal Code.

Table 4.10-4: City of San Clemente Exterior Noise Ordinance Limits

Land Use (at affected receiver property)	Allowable Exterior Noise Level	
	7:00 AM to 10:00 PM	10:00 PM to 7:00 AM
Residential	55 dBA	50 dBA
Residential portions of mixed-use, or residences located on property zoned for commercial, industrial or manufacturing land use	60 dBA	50 dBA
Commercial	65 dBA	60 dBA*
Industrial or manufacturing	70 dBA	70 dBA*
Notes: * Standard only applies if commercial, industrial or manufacturing buildings are occupied during these hours. Source: city of San Clemente		

As with the County's ordinance, the above nominal limits are modified by the time the potentially offending noise source is operating by:

1. The noise standard for a cumulative period of more than 30 minutes in any hour [that is, the L_{50} level]; or
2. The noise standard plus five dBA for a cumulative period of more than 15 minutes in any hour [that is, the L_{25} level]; or
3. The noise standard plus ten dBA for a cumulative period of more than five minutes in any hour [that is, the $L_{8.3}$ level]; or

4. The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour [that is, the $L_{1.6}$ level]; or
5. The noise standard plus 20 dBA for any period of time [that is, the L_0 or L_{max} level].

Note that in the event the ambient noise level exceeds any of the five noise limit categories above, the allowable noise level under said category shall be increased to reflect the ambient noise level.

Similarly, there are interior standards with similar time-of-day, operating period, and existing ambient allowances/adjustments as outlined in Table 4.10-5, City of San Clemente Interior Noise Ordinance Limits.

Table 4.10-5: City of San Clemente Interior Noise Ordinance Limits

Land Use (at affected receiver property)	Allowable Interior Noise Level	
	7:00 AM to 10:00 PM	10:00 PM to 7:00 AM
Residential, including residential portions of mixed-use	50 dBA	40 dBA
Source: city of San Clemente		

The above nominal limits are modified by the time the potentially offending noise source is operating by:

1. The noise standard plus five dBA for a cumulative period of more than five minutes in any hour [that is, the $L_{8.3}$ level]; or
2. The noise standard plus ten dBA for a cumulative period of more than one minute in any hour [that is, the $L_{1.6}$ level]; or
3. The noise standard plus 15 dBA for any period of time [that is, the L_0 or L_{max} level].

In addition, the allowable noise level under each category shall be increased to reflect the ambient noise level in the event the ambient noise level exceeds any of the three noise limit categories above.

For the Proposed Project, the following San Clemente Municipal Code sections also apply:

> *8.48.090 Exemptions from Chapter.*
>
> *The following activities shall be exempted from the provisions of this chapter:*
>
> ***E.*** *Noise sources associated with construction activity, provided said activities take place only between the hours of seven (7:00) AM and six (6:00) PM on Monday through Friday, between the hours of eight (8:00) AM and six (6:00) PM on Saturday, and at no time on a Sunday or a City-recognized holiday, and provided all grading*

activities also comply with Section 15.36.190[7] of the City's Municipal Code regarding time of grading operations.

F. *Noise sources associated with construction activity for which a permit has been granted by the City based upon:*

1. *A case of urgent necessity in the interest of public health and safety. Such permit may be granted for a period not to exceed three (3) days while the emergency continues; or,*
2. *A determination by the City that the public health and safety will not be impaired and that no loss or inconvenience would result to any party in interest.*

G. *Noise sources associated with the maintenance of real property provided said activities take place only between the hours of seven (7:00) AM and six (6:00) PM on Monday through Friday, except on a City-recognized holiday, or between the hours of eight (8:00) AM and six (6:00) PM on Saturday, Sunday or a City-recognized holiday.*

J. *Activities of the federal, state or local government and its duly franchised utilities.*

M. *Activities necessary to continue to provide utility services to the general public, whether this service is installing additional facilities, restoring worn or damaged facilities and/or maintaining existing services.*

For the Proposed Project, the San Clemente noise standards pertain to areas around Pole Nos. 26 through 49, 9a through 12a, and 3b through 9b. Note that the transmission line is near the border of San Clemente and San Juan Capistrano near Pole No. 26.

City of San Juan Capistrano

The City of San Juan Capistrano Noise Ordinance identifies exterior and interior noise standards for residential and non-residential land uses. Table 4.10-6, City of San Juan Capistrano Maximum Noise Levels, provides the exterior noise standards that are applicable for residential and institutional districts.

[7] *15.36.190 Time of grading operations. Grading and equipment operations within one-half ($^1/_2$) mile of a structure for human occupancy shall not be conducted between the hours of five-thirty (5:30) PM and seven-thirty (7:30) AM nor on Saturdays, Sundays and City-recognized holidays. The City Engineer may, however, permit grading or equipment operations during specific hours after five-thirty (5:30) PM or before seven-thirty (7:30) AM or on Saturdays, Sundays and City-recognized holidays if he or she determines that such operations are not detrimental to the health, safety or welfare of the inhabitants of such a structure. Permitted hours of operation may be shortened by the City Engineer's finding of a previously unforeseen effect on the health, safety or welfare of the surrounding community. (Ord. 1278 § 1, 2003)*

Table 4.10-6: City of San Juan Capistrano Maximum Noise Levels

Period of Time	Maximum Noise Level, Not to be Exceeded
Residential & institutional districts, between 7 AM and 7 PM	65 dBA
Residential & institutional districts, between 7 PM and 10 PM	55 dBA
Residential & institutional districts, between 10 PM and 7 AM	45 dBA
Commercial districts, any time during the day	65 dBA
Source: City of San Juan Capistrano Municipal Code Sec. 9-3.531.	

Each of the above limits shall be reduced by 5 dB for sound sources containing simple tone noises or for noise consisting of speech or music.

The City's Noise Ordinance further notes that no person at any location within the city, including the industrial and open space districts, shall create any noise, or permit the creation of any noise, which causes the noise level within a residential, public and institutional or commercial district to exceed the noise standards noted above for the period-of-time adjustments identified as follows:

1. *The noise standard for a cumulative period of more than thirty (30) minutes in any hour [that is, the L_{50} level]; or*
2. *The noise standard plus five (5) dBA for a cumulative period of more than fifteen (15) minutes in any hour [that is, the L_{25} level]; or*
3. *The noise standard plus ten (10) dBA for a cumulative period of more than five (5) minutes in any hour [that is, the $L_{8.3}$ level]; or*
4. *The noise standard plus fifteen (15) dBA for a cumulative period of more than one (1) minute in any hour [that is, the $L_{1.6}$ level]; or*
5. *The noise standard plus twenty (20) dBA for any period of time [that is, the L_0 or L_{max} level]*[8].

[8] It is important to note that for a steady-state noise source, such as a power distribution / transmission substation wherein the noise emissions would not appreciably change, the most restrictive parameter of the San Juan Capistrano Municipal Code is the L_{50} noise level metric. For conservatism, this would be the metric used for compliance assessments.

For interior noise, the city of San Juan Capistrano standards restrict the creation of any noise, on property owned, leased, occupied, or otherwise controlled by a person, when measured within a dwelling unit on any residential property during the period from 10:00 PM to 7:00 AM, to exceed:

(A) The noise standard plus 10 dBA for any period of time; or

(B) The noise standard plus 5 dBA for a cumulative period of more than one minute in any hour; or

(C) The noise standard for a cumulative period of more than 5 minutes in any hour.

The method of noise level measurement for interior noise shall be made with the windows and doors closed with the measurements made at a point at least four feet from the wall, ceiling, or floor nearest the noise source in the affected residential unit.

The following activities shall be exempted from the above restrictions:

Noise sources associated with construction, repairs, remodeling, or the grading of any real property, provided that such activities are conducted from 7:00 AM to 6:00 PM on Monday through Friday or from 8:30 to 4:30 PM on Saturday. Construction noise is not allowed at any time on Sunday or on a national holiday.

For the Proposed Project, the San Juan Capistrano noise standards pertain to areas in and around the SDG&E Capistrano Substation site and for areas around Pole Nos. 1 through 17 and 1a through 8a. As noted above, there may be some overlap with Pole Nos. 19 through 25 (County of Orange) and with Pole No. 26 (city of San Clemente).

Proposed Project Pole Nos. 43 through 49, 15a through 23a, 1b, and 2b are in the County of San Diego and are on Camp Pendleton.

4.10.3.2 Noise Setting

Overall Project Setting

The Proposed Project components are primarily located in portions of the cities of San Juan Capistrano and San Clemente as well as unincorporated area within Orange and San Diego Counties[9]. The Proposed Project and its associated components would be located primarily within existing SDG&E transmission line ROW. This area of southwestern Orange County is composed of residential, commercial, recreational, and open-space land uses. The transmission line crosses the I-5 east of the San Juan Substation, then spans San Juan Creek. At the approximate mid-section of the transmission line, the ROW is located to the east of the Prima Deshecha Landfill. Near San Juan Hills High School, the transmission line would be placed underground adjacent to existing underground circuits near Vista Montana Street. Please

[9] *The southernmost portions of the transmission line, as well as the Talega Substation are in the County of San Diego and are on Camp Pendleton (federal lands), which are leased to the State of California as part of the San Onofre State Beach.*

refer to Section 3, Project Description, for additional information and graphics regarding the overall Proposed Project setting.

Capistrano Substation Setting

The Capistrano Substation is located within an urbanized area in the city of San Juan Capistrano in South Orange County. The 138/12kV substation was built almost 60 years ago and contains three 138kV transmission lines, six 12kV circuits, one 138kV capacitor, two 12kV capacitors, two 138/12kV transformers, and a control shelter. The 6.4 acre site is composed of an upper yard and a lower yard (refer to Figure 3-4). The upper (eastern) yard portion consists of an open rack design for the active 138/12kV substation with structures approximately 30-40 feet above grade, plus the accompanying transmission and distribution poles. The lower (western) yard contains a building and remnant facilities from an out-of-service switching station. This lower yard is currently being used as a storage area for nursery products and SDG&E equipment such as distribution and transmission poles. The Capistrano Substation is bounded by a parking/storage lot to the southeast, residential developments to the south and north, and a major street, Camino Capistrano to the west. Further west, across Camino Capistrano, is a rail line for both Amtrak and Metrolink rail services. To the west is Junipero Serra Park which includes the first portion of the initial 230kV transmission line going to Talega Substation. Beyond Junipero Serra Park, farther to the east is the I-5

Transmission Line Setting

The Proposed Project transmission lines traverse through several residential, recreational, and open-space areas within San Juan Capistrano, San Clemente, and unincorporated Orange and San Diego Counties. The recreational uses include Junipero Serra Park (near the Capistrano Substation), Marbella Country Club, Arroyo Park (off of SR-74), Russell Cook Park, El Camino Real Park, and an equestrian center (on San Juan Creek Road), as well as three private parks.

The Proposed Project would involve the installation of new 69kV, 138kV, and 230kV structures, overhead conductors, and underground cable. All transmission line work would be completed within SDG&E's existing ROW between the Capistrano and Talega Substations as well as within a small portion of acquired additional ROW near the Talega Substation.

Summary of Noise-Sensitive Receptors

Sensitive receptors around the Proposed Project area (Capistrano Substation and the Transmission line route or corridor) are primarily residential land uses. There is a modicum of other types of sensitive receptors, including houses of worship, schools, day-care facilities, and parks.

In the vicinity of the Capistrano Substation, the surrounding residential receptors are on the order of 215 to 300 feet from the center of the upper yard area. However, several adjacent homes are as close at 70 to 125 feet from some of the substation equipment, breakers, and transformers.

The transmission line corridor runs through Junipero Serra Park (adjacent to the Capistrano Substation), as well as through Arroyo Park, El Camino Real Park, the Marbella Country

Club, Russell Cook Park, and a horse boarding/training facility (Tar Farms), as well as several hiking and equestrian trails. A bore pit would be located within El Camino Real Park, and Pole Nos. 1a through 5a would be located in the immediate vicinity of a condominium complex. Construction of new underground transmission line would also take place in the immediate vicinity of the condominium complex, between Pole Nos. 1a and 3a. Pole No. 4 (at the northeast end of Junipero Serra Park) is as close as 70 feet from a residential structure and Pole No. 8 (in the middle of Arroyo Park) is within approximately 50 feet from a residential structure. The Harold Ambuehl Elementary School is approximately 1,100 feet to the southwest of the corridor and Pole No. 10 and St Margaret's Episcopal School is approximately 1,550 feet to the southwest of the corridor and Pole No. 8. Several new Proposed Project facilities are adjacent to or near the San Juan Hills High School (as close as 540 feet). Houses of worship include Living Hope Christian Fellowship, Heritage Christian Fellowship, and South County Church of Christ; all near Pole Nos. 39 through 42. Also in that same line of Proposed Project corridor facilities is a South County Urgent Care medical office and the Talega KinderCare day care center (within approximately 375 to 400 feet of new Proposed Project poles).

4.10.3.3 Noise Surveys

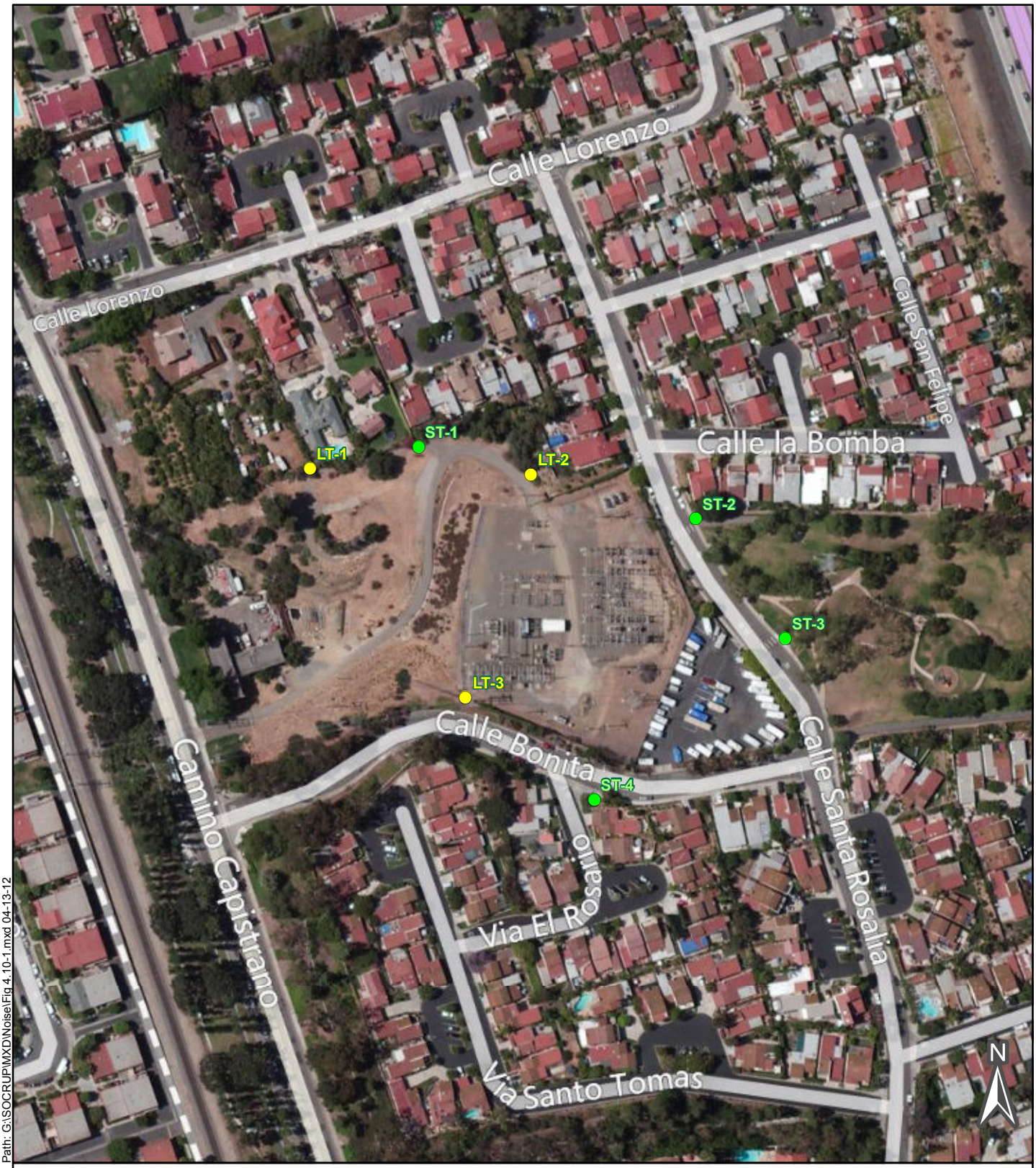
Capistrano Substation Survey Overview

The Capistrano Substation site and surroundings were visited beginning on the morning of Wednesday, June 9 and ending in the late afternoon of Thursday, June 10, 2010. A combination of long-term monitoring and short-term sampling was employed to capture overall sound levels, statistical sound levels, and frequency-band data at the various measurement locations.

During the survey, three long-term (i.e. 24+ hours) sampling locations were chosen along key boundary positions around the substation's upper yard area. These locations were near (or in the direction of) the closest noise-sensitive receptors around the substation property. At each long-term measurement location, various statistical sound levels[10], the minima/maxima, and the energy-average sound levels[11] were acquired over a complete day-night cycle. In addition, several short-term (i.e. 15-minute duration) samples were made during various times of the day and night to acquire supplemental information about the spectral content of the ambient noise environment and to document the observed noise sources contributing to that environment. These noise data were acquired at four short-term locations, most of which are outside the substation fenceline. The long-term and short-term ambient measurement locations at the Capistrano Substation are shown in Figure 4.10-1, Ambient Noise Measurement Locations at the Capistrano Substation. Refer to Appendix 4.10-B for specific details concerning the ambient noise measurement methodology.

[10] The sound pressure level, denoted L_x, that is the statistical indicator of the time-varying noise signal that is equaled or exceeded x % of the stated sampling time. For example, the L_{10} metric represents the sound level which is exceeded 10 percent of the sampled time period (commonly called the "intrusive noise level" or the 'effective maximum noise level'). Likewise, the L_{100} metric is the level equaled or exceeded 100% of the stated sampling time – i.e. it is always exceeded, thus making this value equivalent to the minimum noise level or L_{min}.

[11] The single-number noise descriptor that represents the energy-average sound levels over a given time period, where the actual sound level varies with time. That is, if the varying sound level were constant for the specified time, that level would be the L_{eq}.



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0 100 200 400 Feet

Created For: Mary Turley

Created By: TRC

Date: 4/25/2012

SDG&E is providing this map with the understanding that the map is not survey grade.

Source: Alliance Acoustical Consulting, Inc.

Legend

- Long-Term Ambient Measure Location
- Short-term Ambient Measure Location

South Orange County Reliability Enhancement Project

Ambient Noise Measurement Locations at the Capistrano Substation

Figure 4.10-1

SOUTH ORANGE COUNTY RELIABILITY ENHANCEMENT

SDGE A Sempra Energy utility

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BACK OF FIGURE 4.10-1

Transmission Line Corona Survey Overview

A survey to collect corona-influenced noise data was made on the evening of Saturday, January 14, 2012 between the hours of 9:00 PM and 11:00 PM Short-term sampling, typically 15 minutes in duration, was employed to capture overall sound levels, statistical sound levels, and frequency-band data at the various measurement locations.

During the corona survey, locations along the transmission line were selected to (a) focus on residential areas that are close to the corridor towers and power lines or (b) away from extraneous sources, in an effort to isolate line-dominated noise. For the former, the locations near transmission line Pole Nos. 8, 11, and 29 were very close to residential areas. For the latter, the location near Pole No. 28 was removed from nearby houses, roadways, or other major non-line noise sources. This part of the transmission line, near Pole No. 28, was also chosen to attempt making noise attenuation-with-distance measurements as the corridor access/maintenance roadway runs perpendicular to the transmission line corridor for several hundred feet. Additional information concerning the ambient noise survey locations and measurement methods is contained in Appendix 4.10-B.

4.10.3.4 Measured Noise Environments

Capistrano Substation General Noise Environment

The short-term noise samples, made during several times of the day and night, are summarized in Table 4.10-7, Summary of Ambient Noise Short-term Measurements, which provides the minimum, maximum, and energy-average sound levels over each 15-minute sample.

Table 4.10-7: Summary of Ambient Noise Short-term Measurements

Location	Date	Time	Period	A-weighted Sound Pressure Level in decibels, dBA			
				L_{min}	L_{eq}	L_{50}	L_{max}
ST-1	6/9/2010	10:06:48	Morning	43.9	52.0	46.8	70.8
	6/9/2010	16:40:14	Day	43.0	65.5	46.2	82.7
	6/9/2010	22:04:46	Evening	42.9	47.3	47.2	50.9
	6/10/2010	3:31:27	Nighttime	40.5	43.8	43.6	48.0
ST-2	6/9/2010	11:10:40	Morning	42.4	55.8	48.9	76.8
	6/9/2010	15:57:00	Day	47.2	54.5	49.7	72.8
	6/10/2010	20:12:44	Evening	49.5	54.0	52.1	67.1
	6/10/2010	3:07:22	Nighttime	38.0	44.4	43.8	54.4
ST-3	6/9/2010	11:28:01	Morning	48.1	52.2	50.9	62.5
	6/9/2010	15:34:38	Day	49.3	52.3	50.7	63.0
	6/9/2010	21:15:54	Evening	46.5	51.9	50.7	66.0
	6/10/2010	2:49:15	Nighttime	40.7	46.5	46.2	53.6
ST-4	6/9/2010	11:48:00	Morning	44.3	54.8	48.9	72.4
	6/9/2010	16:17:40	Day	45.5	56.2	48.0	71.3
	6/10/2010	19:50:18	Evening	45.1	53.4	47.6	71.1
	6/9/2010	22:31:19	Late Evening	44.4	50.5	46.8	66.7
	6/10/2010	2:26:21	Nighttime	39.1	44.7	43.3	62.9

Source: Alliance Acoustical Consulting, Inc., 2010

The short-term results and field notes indicate that the existing noise environments were controlled by various sources, depending on the time of day and the measurement location. The nighttime conditions were dominated by traffic noise from the freeway with some influences from transformer 'hum' at the substation. Plots of the short-term measurements' spectral (frequency) results are also provided in Attachment 4.10-B.

In addition to the short-term data, three long-term monitoring stations were set to acquire data over a 24-hour period to investigate the day-to-night changes in the area's ambient noise conditions. These monitors were set to obtain and process noise data in continuous 15-minute samples at positions along the northwest, northeast, and southwest boundaries of the substation site.

The Capistrano Substation survey results – including 24-hour monitoring, spectral sampling, and field observations – indicate that the substation site is typical for a suburban residential neighborhood near transportation corridors (Camino Capistrano, the Amtrak rail line, and the I-5). Ambient noise levels are primarily controlled throughout the daytime and nighttime by either the I-5 traffic flows or noise from the existing transformers (or a combination of both). Noise from general urban activities in the adjoining residential neighborhoods also contributed to the overall sound environment. The amount of influence of these sources is dependent on the receptor location, proximity to substation equipment, and local shielding effects. During the ambient survey, the following local noise sources were noted by the field engineer:

- Car and truck vehicle movements on the adjacent Camino Capistrano roadway, local side streets, and the I-5 to the east;
- General urban noises in the neighborhoods (music, talking, tools, church bells, etc.);
- Birds (during the daytime) and crickets (during the evening and late-night hours);
- Dogs barking;
- Substation transformer hum (depending on location, conditions, and other sources);
- Occasional rustling of vegetation during periods of light winds;
- Occasional train pass-bys on the Amtrak line across Camino Capistrano; and
- Occasional aircraft overflights in the distance.

In general, the long-term noise level records show a significant amount of moment-to-moment variability, in terms of the fluctuations in the maximum sound levels from period to period. This is due to the intermittent vehicle and train movements along the Camino Capistrano corridor and at local streets adjacent to the substation site. Single-event sound levels, such as from individual vehicle or train pass-bys, were measured in the low-70's to low-80's dBA maximum sound level (L_{max}). However, the amplitudes of the energy-equivalent sound levels (L_{eq}) around the existing Capistrano Substation site were generally confined to fairly narrow ranges, indicating that the average noise environment is fairly steady. Location LT-1 registered in the 40's to 50's dBA, location LT-2 sound levels were generally between 45 and 55 dBA, and location LT-3 levels had the highest recorded noise levels of between 50 and 60 dBA L_{eq}. It should be noted that at several times during the day, evening, and nighttime periods, locations around the Capistrano Substation have existing, ambient noise levels that exceed the Municipal Code standards; primarily due to traffic flow noise on the nearby freeway (and, to a lesser extent, from local

vehicle movements). The full data record from the ambient survey is found in Appendix 4.10-B, including charts of the 24-hour data results (Appendix B, Figures 5a through 5c).

Transmission Corridor Corona Noise Environment

The short-term noise samples, made during several times of the day and night, are summarized in Table 4.10-8, Summary of Corona Noise Measurement Data, which provides the minimum, maximum, and energy-average sound levels over each 15-minute sample.

Table 4.10-8: Summary of Corona Noise Measurement Data

Location	Time	Period	A-weighted Sound Pressure Level in decibels, dBA		
			L_{min}	L_{eq}	L_{max}
Structure 8	20:59	Evening	47.5	50.7	54.8
Structure 11	21:29	Late Evening	45.0	49.7	54.2
Structure 28	22:56	Early Night	25.6	30.5	40.3
Structure 29	22:39	Early Night	30.1	36.4	50.3

Notes:
All data acquired on January 14, 2012 (Saturday)
Source: Alliance Acoustical Consulting, Inc., 2012

The transmission line survey results – primarily focusing on establishing the ambient noise from corona effects – indicate that most of the corridor area is fairly quiet for an urbanized area. As with the situation at the Capistrano Substation, the dominant evening and early nighttime noise sources were typically roadway and freeway traffic flows from adjacent or distant transportation routes. Although the data were acquired on a humid night that would be conducive for corona noise effects[12], there was no observed corona noise from the existing transmission lines.

As the Proposed Project area is located among developed, suburban areas, the major noise source was predominantly traffic-related; mostly from major arterials or freeways in the distance. It is important to note that corona noise was not experienced at any location during the survey. During the corona survey, the following local noise sources were noted by the field engineer:

- Vehicle movements on distant roadways (e.g., I-5, Ortega Highway, San Juan Creek Road, and Calle Saluda);
- Occasional dogs barking or other wildlife (i.e., coyotes) in the distance;
- Occasional rustling of vegetation during periods of very light winds (at Pole No.11 only);
- Infrequent train movements in the distance; and
- Residential equipment (e.g., pool pumps or water features) in the distance.

The amplitudes of the energy-average (L_{eq}) levels near the transmission line corridor were centered around 50 dBA for locations primarily dominated by local and distant traffic flows,

[12] The survey evening was chosen during a cool time of the year and on an evening shortly following a mild winter storm which left the humidity level relatively high….all conditions that are conducive for corona noise emissions.

while more secluded and remote areas of the corridor had average noise levels in the low- to mid-30's dBA L_{eq}.

4.10.4 Potential Impacts

4.10.4.1 Significance Criteria

Standards of impact significance were derived from Appendix G of the *CEQA Guidelines*. Under these guidelines, the Proposed Project could have a potentially significant impact regarding noise if it would result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

e) Exposure of people residing or working in the project area to excessive noise levels for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public-use airport; or

f) Exposure of people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip.

4.10.4.2 Question 10a – Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Construction – Less than Significant Impact

Construction of all of the Proposed Project components would require the temporary use of various types of noise-generating equipment, including graders, backhoes, augers, flatbed boom trucks, rigging and mechanic trucks, air compressors and generators, mobile cranes, concrete trucks, and man lifts. Wire stringing operations would require pullers, tensioners, and cable reel trailers. Helicopters would be used to assist with the conductor stringing process. Heavy equipment would be used to remove and install substation components.

As discussed in Section 4.10.3 above, construction-related noise sources are exempt from the pertinent local noise ordinances, provided that the respective allowable hours of construction activity are followed. These allowable hours are summarized in Table 4.10-9, Allowable Times for Construction Activities. Given the exemption of construction activities during these hours, there would be no impact from the preponderance of construction activities.

Table 4.10-9: Allowable Times for Construction Activities

Jurisdiction	Day	Allowable Time Window
Orange County (unincorporated)	Mon – Fri: Saturday: Sunday:	7 AM to 8 PM 7 AM to 8 PM None
City of San Clemente	Mon – Fri: Saturday: Sunday:	7 AM to 6 PM 8 AM to 6 PM None
City of San Juan Capistrano	Mon – Fri: Saturday: Sunday:	7 AM to 6 PM 8:30 AM to 4:30 PM None
Source: Various noise regulations, cited in Section 4.10.3 above.		

As discussed more fully in Section 4.10.4.5, below, a few very short-term construction activities would have to occur at night or on the weekend. First, overnight work to fill the 230/138kV transformer tanks could take as long as 96 hours to complete, but would generate noise levels of less than 45 dBA, which would be below the pertinent nighttime L_{50} limit. Second, the opening and closing of breakers may have to be conducted during evening/nighttime hours, depending on the cut-over schedule. Even if it does occur at night, however, the sound generated would be very short lived[13] and would take place inside of buildings, bringing the noise levels down to 60 dBA L_{max} at the nearest residential receptors. This is below the L_{max} limit of 65 dBA during the nighttime hours (i.e., the basic exterior nighttime standard of 45 dBA L_{50} plus 20 dB for an L_{max} limit of 65 dBA per Tables 3-29 and 3-31 of the San Juan Capistrano Municipal Code, Section 93.531.). Finally, night and weekend work would also be required to accommodate delivery of one or two large pieces of equipment, but the limited number of trucks and the limited number of days on which these delivery-focused trips would be required would not result in significant impacts. Further, the short duration of these delivery events[14] is not expected to create any exceedances of the noise standards; either in terms of the hourly L_{50} or the L_{max} limits (45 dBA and 65 dBA, respectively, during the nighttime hours). Given the short duration, the few expected occurrences, and/or the anticipated adherence to the pertinent municipal code limits, even during nighttime hours, these special circumstances during the construction phase are expected to produce nighttime noise impacts that are less than significant.

Operation & Maintenance – Less Than Significant Impact

Capistrano Substation

The primary noise source associated with the operation of the Capistrano Substation would be from the transformers and their associated cooling fans. For the transformers themselves, the magnetic interaction between the alternating current field and the transformer core generates

[13] Breaker activation is a transient, 'popping' event and would be regulated by the city's L_{max} noise level standard.

[14] It is expected that deliveries of the large transformers during the nighttime hours, made necessary by restrictions on hauling this type of large, heavy equipment the daytime, will simply entail pulling the delivery vehicle onto the project site, parking it overnight, and unloading the item(s) during normal, daytime construction hours. To minimize nighttime noise disturbance during these delivery operations, APM Noise-1 is proposed.

noise predominantly at 120, 240, 360, and 480 Hertz (Hz)[15]. The transformer cooling fans typically operate in stages and at different load settings, depending on the temperature of the windings located in the main tank.

To evaluate the future sound emissions from the Capistrano Substation and its proposed complement of transformers, a proprietary computerized noise prediction program[16] was used to simulate the future sound environment from the reconfigured substation. The modeling program uses industry-accepted propagation algorithms based on American National Standards Institute (ANSI) and International Standards Organization (ISO) standards[17] to account for classical sound wave divergence (spherical spreading loss with adjustments for source directivity from point sources) plus attenuation factors due to air absorption, ground effects, and barrier/shielding (from either intervening structures or topographical features)[18]. The computer outputs are in terms of octave band and overall A-weighted noise levels at discrete receptor positions.

Proposed Project layout and architectural drawings, supplied by the SDG&E, were used to establish the relevant physical and positional characteristics of the substation equipment and buildings. With this information, the source locations and physical characteristics were translated into input *x, y, z* coordinates for the noise modeling program. For conservatism, and as is standard practice in the description of environmental noise, the modeling assumed stable atmospheric conditions suitable for reproducible measurements (under "standard-day" conditions of 59° F and 70% Relative Humidity (RH), that are favorable for outdoor sound propagation. Also, the model used the future substation's buildings/structures as barriers, as well as the topographical differences discussed above to account for propagation losses due to shielding between a given noise source and a receptor location.

For this modeling simulation, the transformers were assumed to emit the maximum noise allowed under SDG&E's specifications. That is, a National Electrical Manufacturer's Association (NEMA) noise rating of 71 dBA for the larger, 230kV transformers and a noise rating of 61 dBA for the smaller, 138kV transformers. As the substation equipment items are effectively steady-state sound sources, their noise emissions would not vary substantially over time. As such, the statistical sound levels associated with the substation noise sources would, ideally, be equal for any given measurement period. That is, the L_{50}, L_{25}, $L_{8.3}$, $L_{1.6}$, and L_0 sound levels (pertinent to the San Juan Capistrano Municipal Code) should be equal; both in terms of the modeling input parameters and the predictive output results. The predictive modeling outputs, in the form of contour lines of constant noise levels, are depicted in Figure 4.10-2, Predicted Noise Level Contours for the San Juan Capistrano Substation, sound pressure level (SPL) in dBA for the Future, Full Build-Out Case[19].

[15] This effect is called magnetostriction and generates a fundamental at twice the line frequency, along with the associated harmonics.

[16] The modeling program is an in-house computer application developed by Alliance Acoustical Consulting, Inc. staff for predicting outdoor noise propagation from large commercial and/or industrial facilities.

[17] ANSI is the American National Standards Institute, while ISO is the International Standards Organization. Algorithms and methods for this program are included in the ISO 9613, ISO 1996, or ANSI 126 standards.

[18] This model has been validated over the years via noise measurements at several operating facilities that had been previously modeled during the engineering design phases. The comparison of modeled predictions versus actual measurements has consistently shown close agreement.

[19] The predicted contour map shows the modeled contributions from the future substation configuration, in the absence of background noise levels. The model included the effects of barrier attenuation from the on-site screening walls & retaining walls, the on-site buildings & 230kV fire walls, and key topographical features at the site.

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Mary Turley	TRC
Date: 4/25/2012	

SDG&E is providing this map with the understanding that the map is not survey grade.

Legend

- 45 dBA contours
- Noise contours

Does not include existing ambient (background) noise levels
Equivalent noise emissions for Transformers found using SDG&E standard specification levels
Includes the following as Sound Barriers:
- On-site Screening Walls and Retaining Walls
- On-site Substation Buildings
- On-site 230 kV fire walls
- Topographical features

Source: Alliance Acoustical Consulting, Inc., Google Earth

South Orange County Reliability Enhancement Project

Predicted Noise Level Contours for the San Juan Capistrano Substation

Figure 4.10-2

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Map not to Scale

SOUTH ORANGE COUNTY RELIABILITY ENHANCEMENT

SDGE A Sempra Energy utility

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BACK OF FIGURE 4.10-2

Figure 4.10-2 shows that the maximum noise level from the operation of the Capistrano Substation would be approximately 45 dBA or less when measured outside of the substation's property line at adjoining land uses when all transformers are operating under secondary auxiliary cooling conditions (e.g., full load). The results are summarized in Table 4.10-10, Calculated Substation Operational Sound Levels and are given in terms of the L_{50} statistical sound level (i.e., the most restrictive San Juan Capistrano noise metric).

Table 4.10-10: Calculated Substation Operational Sound Levels

Receptor Location	Noise Level Limits for Day/Evening/Night, SPL L_{50} dBA	Existing Ambient Day/Evening/Night SPL L_{50} Sound Levels, dBA[a]	Predicted, Future L_{50} Project-related Sound Levels, dBA
LT-1	65 / 55 / 45	41.8 / 40.4 / 39.1	44
LT-2	65 / 55 / 45	47.6 / 45.3 / 44.8	45
LT-3	65 / 55 / 45	50.5 / 49.3 / 47.8	53[b]
ST-1	65 / 55 / 45	46.5 / 47.2 / 43.6	44
ST-2	65 / 55 / 45	49.3 / 52.1 / 43.8	26
ST-3	65 / 55 / 45	50.8 / 50.7 / 46.2	24
ST-4	65 / 55 / 45	48.4 / 47.2 / 43.3	39
P-1*	65 / 55 / 45	42 / 40 / 39	38
P-2*	65 / 55 / 45	42 / 40 / 39	38
P-3*	65 / 55 / 45	48 / 47 / 43	41
P-4*	65 / 55 / 45	51 / 51 / 46	25
P-5*	65 / 55 / 45	49 / 52 / 44	36

Notes:
a. Sound levels for the LT-x locations are arithmetic averages of the measured fifteen-minute L_{50} values across each portion of the day. Sound levels for the ST-x locations are the measured L_{50} values for each short-term session. Sound levels for the P-x analysis locations are estimated from similar/nearby data points.
b. This location is inside the proposed substation screening walls due to the choice of a secured location for the ambient survey…all other locations are outside of the substation perimeter.
* These supplemental locations are for analysis only.
Source: Alliance Acoustical Consulting, Inc., 2012

Table 4.10-10 shows that all off-site analysis locations are predicted to have Proposed Project-generated sound levels below the applicable city of San Juan Capistrano noise limits for all portions of the day and night[20]. In several cases, the screening walls, elevation-change retaining walls, substation buildings, and/or topographical characteristics would substantially attenuate substation noise levels by 20 or more dB below the existing ambient conditions for the neighborhood (see Locations ST-2, ST-3, and P-4). All locations are predicted to be at or below

[20] Since it is on the substation property and inside the proposed 10 foot high screening wall (due to the choice made during the ambient survey for a secured location), Location LT-3 is not relevant to an off-site compliance assessment. It is included in the presentation for completeness and to compare the pre-Project conditions with the post-installation environments.

45 dBA L_{50} which is the overnight (and most restrictive) noise level limit. Only one off-site location, LT-1, is expected to have material increases with the Proposed Project equipment, as compared to the existing conditions, although substation noise levels would be below the most restrictive city of San Juan Capistrano noise ordinance limit. These increases are predicted to be between 2 and 5 dB, depending on the time of day. Note that is common in environmental impact assessments to consider changes in community noise between 0 and 3 dB as being generally not discernible, changes between 3 and 5 dB as being noticeable, but not substantial, and changes above 5 dB as being substantial and significant. As such, the elevated noise environment for the new transformer operations may be noticeable to a small set of nearby residences (near Location LT-1), but the nature and character of the future noise environment would not be modified from the existing conditions, as the primary on-site sources (both existing and future) are distribution power transformers.

Because the noise generated would be less than the allowable noise limits of the receiving land uses that surround the substation, the operation of the proposed San Juan Capistrano Substation would be consistent with the applicable noise regulations. Future sound levels are also projected to be at or below existing nighttime noise levels or, at worst, experiencing less than a (substantial) 5 dB increase at all noise sensitive locations. As a result, noise impacts would be less than significant.

The substation would be unmanned and electric equipment within the substation would be controlled from SDG&E's central operations facilities. Entry to an operational substation is restricted to authorized personnel only. Maintenance activities at the substation are planned to be limited to occasional inspection and repair activities by a crew consisting of as many as four people and may require a tool truck, an assist truck, and a large bucket lift truck. Maintenance activities would include equipment testing, equipment monitoring, and repair, as well as emergency and routine procedures for service continuity and preventive maintenance. Noise generated as the result of the previously described activities would be masked by the substation's operation and the existing traffic in the area along Camino Capistrano and I-5. In addition, the proposed maintenance activities would be similar to those being performed at the existing Capistrano Substation. As a result, there would be no exceedances of established noise standards and there would be no noise impacts associated with substation maintenance.

Transmission Lines

Modern transmission lines are designed, constructed, and maintained so that during dry conditions they operate below the corona-inception voltage and generate a minimum of corona-related noise. The corona hum from a 230kV line typically would produce noise levels up to 36 dBA when measured at the edge of the transmission line ROW during dry conditions. A noise level of 36 dBA would be practically unnoticeable, as it is easily masked by other ambient noise sources in the area.

Corona levels (and audible noise levels) are the highest during heavy rain, when the conductors are wet, but the noise generated by the rain would likely be greater than the noise generated by corona; thus, the increased corona-related noise would not be noticeable. In foul weather conditions, water droplets and fog can produce corona discharges from high voltage lines that are typically 5 dB higher than with fair weather conditions, but can be 20 dB higher than usual.

Because noise levels generally decrease in intensity by 6 dB for each doubling of distance from the source, the future corona noise from the proposed design during poor/foul weather conditions is expected to be at or below 36 dBA at the edge of the SDG&E ROW. These predicted corona noise levels for the Proposed Project are comparable to the existing noise levels at the quietest portions of the corridor; near Pole Nos. 28 and 29. Further, the predicted levels are well below all pertinent daytime and nighttime noise level limits for all jurisdictions along the transmission corridor. As a result, the applicable significance levels at night would not be exceeded during future operations of the proposed transmission lines and no impact would occur.

The transmission circuits in to and out of the substation would be inspected annually. Routine maintenance for non-emergency situations could potentially include the cleaning or replacement of insulators. Cleaning activities may require washing up to three times a year to remove contaminants. These non-emergency maintenance procedures would occur during normal, daytime hours. Maintenance crews may be comprised of a crew of as many as four workers and may require a tool truck, an assist truck, and a large bucket lift truck. These maintenance activities would be short-term, typically lasting less than one day at each location. Due to the short duration of these activities, the limited amount of heavy equipment used, and the fact that these activities are already being performed on the existing facilities in the area, noise generated during maintenance would not change substantially from existing conditions and, as a result, impacts would be less than significant.

4.10.4.3 Question 10b – Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Construction – Less than Significant Impact

During construction of the Proposed Project, operation of heavy construction equipment has the potential to generate high ground vibration levels which have the potential to cause structural damage and/or annoyance to nearby sensitive receptors. Vibration levels generated by construction activities would vary depending on distance from the source, soil conditions, construction methods, and the equipment used. This analysis evaluates the potential for architectural damage or annoyance due to vibration caused by construction equipment.

The threshold at which there is a risk of "architectural" damage (visible cracks) to normal dwellings, such as plastered walls or ceilings, is 0.2 inches per second PPV. Heavy construction equipment such as bulldozers, backhoe/hoe rams, and jackhammers generally generate vibration levels of less than 0.1 in/sec PPV[21] at a reference distance of 25 feet. Boring or drilling operations, represented by caisson drilling, would generally generate vibration levels of 0.089 in/sec PPV at a reference distance of 25 feet.

The nearest existing structures to proposed construction activities are a set of condominium buildings adjacent to the ROW west of the Capistrano Substation. These condominium buildings are located near the bore pits and the receiving pits areas which would be used to tunnel under the railroad tracks that run parallel to Camino Capistrano. These buildings are also represented by noise analysis location P-1. The condominium buildings are approximately 150 feet from the

[21] Federal Transit Administration (FTA), 2006. Transit Noise and Vibration Impact Assessment. U. S. Department of Transportation. FTA-VA-90-1003-06.

bore pits and 25 feet from the receiving pits. Even with the relatively close proximity of the condominiums to the receiving pit, vibration from the boring operations would be expected to be below 0.1 in/sec PPV, which is half of the threshold for risk of "architectural" damage to normal dwellings.

The nearest existing structures to the Proposed Project site are the condominiums near the bore pit and receiving pit, west of the Capistrano Substation site. These condominiums could be as near as 25 feet to some of the boring operations. The next nearest homes are those at the northeast corner of Junipero Serra Park and those that are immediately outside the substation fence to the north; both of which are from 75 to 100 feet from the closest potential construction activities (near the site boundary). Even with residential structures within 25 to 100 feet of site construction activities, the potential construction-related vibration would be well below the FTA's 0.2 PPV inches/second criteria for vibration-induced architectural damage at the surrounding structures, even with the use of large and/or vibration-intensive equipment such as bulldozers, hoerams, and jackhammers. For other existing structures that are more distant from the site, the groundborne vibration from Proposed Project sources would be greatly reduced by the relatively long propagation pathways – to the point of negligibility – and would result in construction-related vibration that would be considerably below the FTA's 0.2 PPV inches/second criteria for vibration-induced architectural damage. The vibration damage evaluation results are summarized in Table 4.10-11, Construction-Related Architectural Damage Potential.

Table 4.10-11: Construction-Related Architectural Damage Potential

Nearest Structure	Distance	Projected Construction Vibration, PPV (in/sec)[a]	Project Construction Activity	Vibration Damage Threshold, PPV (in/sec)[b]	Exceeds Threshold?
Condominium (west)	25 feet	<0.1	Bore pits	0.20	No
Residences (north and northeast)	75 feet	<0.02	Bulldozer, hoeram, and/or jackhammer	0.20	No

Notes:
[a] Vibration levels from the listed off-road construction equipment are equivalent to vibration levels generated by a large bulldozer based at a distance of 25 feet.
[b] Per methodology from FTA Chapter 12, with the threshold based on engineered concrete and masonry buildings, per Table 12-3.
Source: Alliance Acoustical Consulting, Inc., 2012

From these results, therefore, no architectural damage from vibration impacts would occur, and there would be no impact.

In addition to architectural damage, the Proposed Project construction activities have the potential to create vibration-related annoyance responses at the nearest sensitive receptors. Peak vibration levels occur when construction equipment operates directly adjacent to the property line. Although the maximum vibration could be perceptible in certain instances, peak vibration events occur infrequently. In addition, construction activities occur during weekdays which are least sensitive portions of the day. Therefore, construction vibration impacts are based on the

average vibration levels that would be experienced by sensitive receptors the majority of the time. Note that commercial and industrial land uses are not considered to be noise- or vibration-sensitive land uses.

Perceptibility of vibrations from construction equipment can be estimated by comparing the vibration thresholds provided in Table 4.10-11 to expected levels for construction equipment at different distances shown in Figure 4.10-3, Construction Vibration Levels with Distance from Several Source Types. Vibration amplitudes with a PPV above 0.032 inch/second (approximately equivalent to 78 Vibration Velocity level decibels) would be detectible and could be annoying. Thus, construction activities that might generate more 0.032 inch/second PPV would be considered potentially significant. This amplitude corresponds with a distance of approximately 50 feet from most construction activities.

Because of the close proximity of the receiving pits (for the under-railroad boring process) to residential receptors, these drilling/boring activities could potentially produce vibration levels near 0.1 in/sec PPV and could be considered as potentially significant. However, these jack-and-bore activities are scheduled for a one-month duration. Further, they would take place during daytime hours, when construction activities are exempt and when most people would be away from their homes, i.e. the least-sensitive portions of the day. Because of the short-term vibration exposure to these activities and due to the fact that this drilling/boring construction would take place during the least-sensitive time of the day, the vibration annoyance from the jack-and-bore process is considered less than significant.

For the main portion of the Proposed Project in and around the Capistrano Substation and along the transmission line corridor, the closest vibration-sensitive receptors would be no closer than 50 to 75 feet[22]. Given these distances, Proposed Project-generated construction vibration levels are expected to be at or below the 0.032 inches/second threshold as a worst case condition. All other potential vibration-sensitive receptors would be farther away from the Proposed Project construction activities and would experience lower vibration levels due to increased distance attenuation. As no off-site sensitive land uses associated with the substation site or the transmission line corridor would exceed the criterion for vibration annoyance, impacts from construction vibration annoyance are less than significant.

Operation & Maintenance – No Impact

Increases in vibration from normal operation and maintenance, beyond those described for the construction activities, are not anticipated. The operation and maintenance activities associated with the Proposed Project would involve minimal earthwork as most of the activities would involve the maintenance and up-keep of existing equipment.

In addition, these maintenance activities are already being conducted by SDG&E within the Proposed Project area. As none of the Proposed Project facilities generate vibration in the course of their normal operations, no impacts due to vibration from operation and maintenance would occur. Thus, there would be no vibration impacts during operations and maintenance.

[22] The closest residential properties are along the Arroyo Park strip at approximately 50 feet from the Proposed Project structure and at the residences at the far northeast corner of Junipero Serra Park which are approximately 75 from the Proposed Project structure. Residences to the north of the substation site are from 75 to 100 feet from potential substation construction activities that might generate groundborne vibration.

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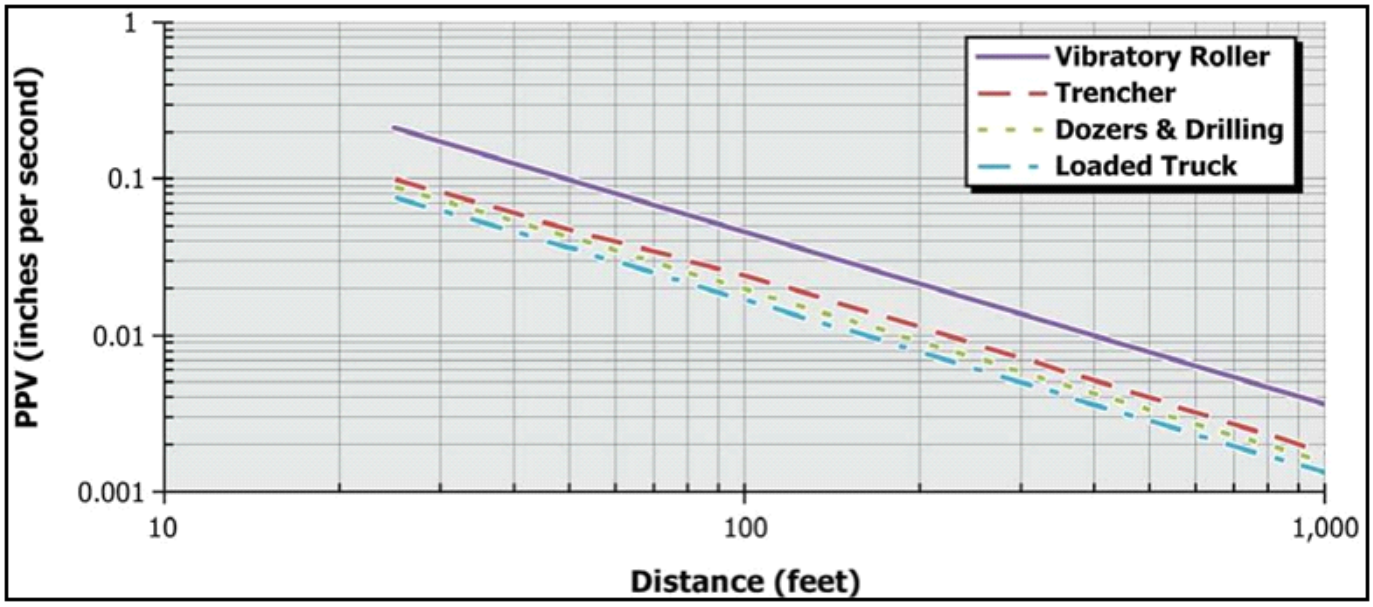

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Legend

- Vibratory Roller
- Trencher
- Dozers & Drilling
- Loaded Truck

Source: FTA, 2006

South Orange County Reliability Enhancement Project

Construction Vibration Levels with Distance from Several Source Types

Figure 4.10-3

SOUTH ORANGE COUNTY RELIABILITY ENHANCEMENT

SDGE A Sempra Energy utility

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BACK OF FIGURE 4.10-3

4.10.4.4 Question 10c – A substantial permanent increase in ambient noise levels in the project vicinity above levels without the project.

Construction – No Impact

As Proposed Project construction activities would conclude after a scheduled and defined period, these activities would not be permanent. Since no permanent increase in noise would occur during construction activities, there would be no impact.

Operation & Maintenance – Less Than Significant Impact

Capistrano Substation

As described in the response to Question 4.10a, the primary source of operational noise at the Capistrano Substation would be its transformers and their associated cooling fans. Figure 4.10-2 presented the predicted noise contours for the substation operations.

The city of San Juan Capistrano limits noise generation that would cause the adjacent residential land uses to exceed 65/55/45 dBA for the daytime/evening/nighttime periods, respectively, for the L_{50} noise metric. Typical ambient noise levels in the area were measured to be range of the mid-40's to mid-50's dBA L_{eq}. Predicted noise levels from the Proposed Project are below a 5 dB increase and are below the most restrictive nighttime noise level limit per the city code. Given these predictive results, no substantial permanent noise increases would occur and long-term operations of the San Juan Capistrano Substation would result in less than significant impacts.

Transmission Lines

As described in the response to Question 4.10a, modern transmission lines are designed, constructed, and maintained so that they produce a minimum level of corona noise during dry conditions. Even during wet/foul weather when there is a heightened probability of corona noise effects, the corona hum or crackle is expected to produce noise levels of less than or equal to 36 dBA, when measured at the edge of the transmission line ROW. A noise level of 36 dBA would be effectively unnoticeable and would most likely be masked by the existing noise environment and other ambient sound sources. No noise-sensitive receptors would experience a substantial permanent increase in noise from the Proposed Project's transmission line reconfiguration. Therefore, noise impacts would be less than significant.

4.10.4.5 Question 10d – A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Construction – Less than Significant Impact with Incorporation of APMs

Typical noise levels from construction equipment are provided in Table 4.10-12, Typical Noise Levels Generated by Construction Equipment. This table shows that energy-average (L_{eq}) noise from typical construction equipment ranges from 75 to 89 dBA, measured at 50 feet. The noise level generated from an operating helicopter would be approximately 95 dBA at a distance of 200 feet.

Table 4.10-12: Typical Noise Levels Generated by Construction Equipment

Equipment Item	Range of L_{eq} Noise Levels at approximately 50 Feet (dBA)
Earth-Moving	
Front loader	79 – 80
Backhoe	78 – 80
Tractor, dozer	82 – 85
Scraper, grader	84 – 85
Paver	77 – 85
Truck	74 – 84
Materials-Handling	
Concrete mixer truck	79 – 85
Concrete pump	81 – 82
Crane (movable)	81– 85
Stationary	
Pump	77 – 81
Generator	70 – 82
Compressor	78 – 80
Impact	
Jackhammers and rock drills	81 – 89
Compactors	80 – 83
Source: The Federal Highway Administration (FHWA), 2006	

Construction noise would be temporary and would primarily be conducted during prescribed hours pertinent to each jurisdiction (see Table 4.10-12 above). As such, these activities are exempt from local noise ordinances. Nonetheless, noise-sensitive receptors would experience a temporary increase in ambient noise levels during the construction activities.

For the Capistrano Substation construction, the expected activity schedule is approximately 48 months in duration. However, noise emissions from substation construction activities would vary appreciably during the overall construction schedule, depending on the activity phasing and the types and numbers of equipment items that are used in any given week or month. Further, the equipment loading and power requirements to accomplish particular tasks would vary and would be sporadic; resulting in different noise levels at each individual receptor location. Given the number and types of heavy equipment items that are typically employed during the site demolition and grading phase, this early portion of the overall construction schedule may be expected to generate higher intermittent noise levels than subsequent phases.

There are some special circumstances associated with the completion of the San Juan Capistrano Substation that would deviate from the exempt time periods for construction. The first is the filling of the transformers with oil, just prior to being energized. This process involves establishing a vacuum on the top of the 230/138kV transformer tanks, while pumping oil into bottom. The continuous filling process can take between 48 and 96 hours (per bank), depending on the dew point of the transformer and manufacturer's specifications. This would be done either with a pump connected directly to the existing 480 Volt (V) power in the substation or the installation crew would use an oil pump connected to a generator. The generator would be a "Whisper Watt" (or equivalent) generator which keeps the total noise level for the pump and generator to below 60 dBA at three feet[23]. Since this process would take from two to four days of continuous pumping, overnight work would be needed. This overnight portion of the effort, since it is outside the exempt daytime hours for construction, would be subject to the standard requirements of the City of San Juan Capistrano noise ordinance. As discussed in the Operations and Maintenance portion of Section 4.10.4.2 above, the expected noise emissions of the new transformers was established at 71 dBA at three feet. With the already-installed buildings and perimeter screening walls, this transformer noise emissions rating was shown to comply with the City's municipal code, even during the most restrictive nighttime hours. Since the transformer filling operation is predicted to be on the order of 10 dB quieter than the to-be energized transformer operations, this overnight filling process would also comply with the City's noise code.

A second potential special circumstance at the substation is the opening and closing of breakers and the testing of relays which would be done just before the substation is put into service. This testing process may or may not be conducted during evening/nighttime hours, depending on the cut-over schedule at the time. The noise level for a breaker closing is approximately 105 dBA L_{max} at three feet from the equipment, but it is a very short-lived impulsive sound (and could be described as a 'pop' noise). Since the breaker and relays are inside of the project buildings, these breaker/relay testing noises would be substantially encapsulated within the building shells. At least 25 dB of interior-to-exterior sound reduction can be expected from these buildings. Additional barrier attenuation from the perimeter screening walls and distance attenuation to the nearest community receptors would provide another 20 dB of sound reduction for these sources. Thus, breaker/relay testing noise would be expected to be on the order of 60 dBA L_{max} at the nearest receptors (i.e., 105 dBA – 25 dB – 20 dB = 60 dBA). From Table 4.10-6 and the associated item 5 above, the late-night, maximum allowable sound level for residential areas is 65 dBA. Since the breaker/relay testing noise would be expected to be below this L_{max} limit, such testing activities would be in compliance with the applicable local noise code. Therefore, both special circumstances (transformer oil filling and breaker/relay testing) would comply with overnight noise code requirements and noise impacts would be less than significant.

Any other endeavors during the construction phase where nighttime and weekend activities are necessary, including, but not limited to, delivery of substation transformers, system transfers, and/or pulling of the conductor, which require continuous operation or must be conducted during off-peak hours per agency requirements would be limited to the extent feasible so that noise would not exceed the hourly L_{50} of 45 dBA when measured at the nearest residential property. If activities cannot be limited to meet this noise threshold, SDG&E will communicate the exception

[23] From information provided by SDG&E Substation Engineering staff (2012).

to the city of San Juan Capistrano in advance of conducting the work that may exceed the threshold. This is addressed via APM NOISE-1.

For the transmission line portion of the Proposed Project, construction activities are expected to last approximately six to eight weeks at each pole site, but they are expected to occur intermittently over that duration. As work is completed at one portion of the transmission line, work crews would move on to other portions and the construction noise levels would subside for any given receptor location. For information purposes, projected noise levels associated with the construction area around each Proposed Project pole were calculated. Using the proposed construction schedule and envisioned equipment mix, a typical activity scenario was used to synthesize an aggregate construction noise emissions profile[24] along the transmission line corridor. This aggregate noise emissions profile, including the noise emissions from Table 4.10-12 above, standard usage factors for each equipment type, and the forecasted daily activity durations, was calculated to be an average noise level of 87 dBA at 50 feet from the center of activities. For distance attenuation due to spreading loss, a conservative value of 6 dB per doubling of distance was used, even though the majority of areas around the transmission line corridor would reasonably qualify as 'soft site' areas that could be expected to experience a higher 7.5 dB per distance doubling. Beyond the basic spreading loss attenuation, additional reduction(s) were applied on a location-by-location basis to account for shielding from topographical features, shielding from intervening structures, and/or ground absorption effects over particularly long propagation pathways. The results of these transmission corridor noise projections for construction activities are summarized in Table 4.10-13, Predicted Aggregate Average (L_{eq}) Construction Noise Along the Transmission Corridor at Nearest Receptors to each Proposed Project Pole.

Table 4.10-13: Predicted Aggregate Average (L_{eq}) Construction Noise Along the Transmission Corridor at Nearest Receptors to each Proposed Project Pole[a]

Pole #	Distance (feet)	Spreading Atten[b]	Other Atten[c]	Total Atten	Expected SPL(A)[d]	Closest Sensitive Receptor Type
1a	79	4.0	–	4.0	83	Residential
2a	39	-2.2	–	-2.2	89	Residential
3a	39	-2.2	–	-2.2	59	Residential
4a	98	5.8	–	5.8	81	Residential
5a	90	5.1	–	5.1	82	Residential
6a*	90	5.1	–	5.1	82	Residential
7a*	90	5.1	–	5.1	82	Residential
1*	145	9.2	–	9.2	78	Residential
2*	175	10.9	–	10.9	76	Residential
3*	170	10.6	–	10.6	76	Residential

[24] This profile included a 1-ton pick-up truck (at 2 hours usage per day), a maintenance truck, two air compressors (used ½-time each), a water truck (used ½-time), an excavator (used ½-time), a backhoe/front-loader, a dump/haul truck, and a compactor (used ½-time).

Table 4.10-13 (cont.): Predicted Aggregate Average (L_{eq}) Construction Noise Along the Transmission Corridor at Nearest Receptors to each Proposed Project Pole[a]

Pole #	Distance (feet)	Spreading Atten[b]	Other Atten[c]	Total Atten	Expected SPL(A)[d]	Closest Sensitive Receptor Type
4	70	2.9	–	2.9	84	Residential
5	415	18.4	–	18.4	69	Residential
6	200	12.0	–	12.0	75	Residential
7	110	6.8	–	6.8	80	Residential
8	50	0.0	–	0.0	87	Residential
9	210	12.5	–	12.5	74	Residential
10	350	16.9	–	16.9	70	Residential
11	140	8.9	–	8.9	78	Residential
12	200	12.0	–	12.0	75	Residential
13	650	22.3	20	42.3	45	Residential
14	725	23.2	–	23.2	64	San Juan Hills High School
15	790	24.0	–	24.0	63	San Juan Hills High School
16	540	20.7	–	20.7	66	San Juan Hills High School
17	580	21.3	–	21.3	66	San Juan Hills High School
18	1050	26.4	–	26.4	61	San Juan Hills High School
19	1100	26.8	–	26.8	60	San Juan Hills High School
20	1670	30.5	5	35.5	51	San Juan Hills High School
21	2260	33.1	5	38.1	49	San Juan Hills High School
22	3100	35.8	5	40.8	46	San Juan Hills High School
23	3850	37.7	5	42.7	44	San Juan Hills High School
24	3300	36.4	20	56.4	31	Residential
25	2600	34.3	20	54.3	33	Residential
26	890	25.0	5	30.0	57	Residential
27	760	23.6	20	43.6	43	Residential
28	910	25.2	10	35.2	52	Residential
29	210	12.5	–	12.5	74	Residential
30	160	10.1	–	10.1	77	Residential
31	350	16.9	–	16.9	70	Residential
32	540	20.7	5	25.7	61	Residential
33	1260	28.0	5	33.0	54	Residential
34	500	20.0	5	25.0	62	Residential
35	165	10.4	5	15.4	72	Residential
36	390	17.8	–	17.8	69	Day Care Center
37	375	17.5	–	17.5	69	Day Care Center
38	1200	27.6	–	27.6	59	Church
39	1050	26.4	–	26.4	61	Church
40	915	25.2	20	45.2	42	Resid'l (across Avenida Pico)
41	650	22.3	20	42.3	45	Resid'l (across Avenida Pico)

Table 4.10-13 (cont.): Predicted Aggregate Average (L_{eq}) Construction Noise Along the Transmission Corridor at Nearest Receptors to each Proposed Project Pole[a]

Pole #	Distance (feet)	Spreading Atten[b]	Other Atten[c]	Total Atten	Expected SPL(A)[d]	Closest Sensitive Receptor Type
42	660	22.4	20	42.4	45	Resid'l (across Avenida Pico)
43	1150	27.2	20	47.2	40	Resid'l (across Avenida Pico)
44	720	23.2	5	28.2	59	Resid'l (across Avenida Pico)
45	1000	26.0	20	46.0	41	Resid'l (across Avenida Pico)
46	1175	27.4	5	32.4	55	Resid'l (across Avenida Pico)
47	1350	28.6	5	33.6	53	Resid'l (across Avenida Pico)
48**	1580	30.0	5	35.0	52	Resid'l (across Avenida Pico)
49**	1850	31.4	5	36.4	51	Resid'l (across Avenida Pico)
Set TS1	Poles 9a & 10a are similar to Pole 42				~45	See note ***
Set TS2	Poles 11a & 12a are similar to Pole 44				~59	See note ***
Set TS3	Poles 11a & 12a are similar to Pole 44				~59	See note ***
Set TS4	Poles 3b, 4b, & 5b are less than Pole 44				<59	See note ***
Set TS5	Poles 6b, 14a, & 20a are less than Pole 45				<41	See note ***
Set TS6	Poles 7b, 8b, a& 9b are similar to Pole 46				~55	See note ***
Set TS7	Poles 21a, 22a, & 23a are similar to Pole 48				~52	See note ***
Set TS8	Poles 2b, 15a, 16a, 17a, 18a, 13a, & 19a, are similar to or less than Pole 43				~40	See note ***
1b	2,600	34.3	20	54.3	33	Resid'l (across Avenida Pico)

Notes:
a. Using an aggregate sound emissions profile for the collection of equipment at 87 dBA at 50 feet
b. Assuming 6 dB per doubling of distance for spreading loss attenuation
c. Accounting for topographical shielding, intervening structure shielding, and/or excess ground attenuation over particularly long propagation distances.
d. Energy average (Leq) sound level at the closest noise-sensitive receptor.
* Poles 6a, 7a, 1, 2, and 3 are inside the San Juan Capistrano Substation site
** Poles 48, 49, and 22a are inside the Talega Substation site
*** Groupings of poles near the Talega Substation (TS) are compared to nearby single-pole results
Source: Alliance Acoustical Consulting, Inc., 2012

For the transmission line portion of the Proposed Project, a special circumstance may occur that could possibly involve nighttime activities. Depending on the outage schedule at the time of the switch-over, power transfer could occur outside of daytime working hours. The power transfer normally takes from two to four hours, depending on the proximity of the overhead to the cable pole. The noise during this portion of the final construction would consist of a bucket truck moving into different positions and, possibly, the use of a small generator or compressor for completing compression connections. This cut-over work would be done outside of normal hours only if outage constraints restrict SDG&E to taking outages at off-peak hours[25]. Given the nature and magnitude of ambient noise sources along the transmission corridor (i.e., primarily traffic-related sources, as discussed above in Section 4.10.3.3), this

[25] From information provided by SDG&E Substation Engineering staff (2012).

relatively small complement of equipment would not be expected to substantially increase the ambient noise environment; even if evening/nighttime power transfer activities were needed.

For the Capistrano Substation, a similar methodology to the one summarized in Table 4.10-13 was used to arrive at an aggregate construction noise emissions profile[26] for the re-configuration efforts at the substation site. This aggregate noise emissions profile, including the noise emissions from Table 4.10-12 above, standard usage factors for each equipment type, and the forecasted daily activity durations, was calculated to be an average noise level of 85 dBA at 50 feet from the center of activities. As above, a conservative value of 6 dB for spreading loss attenuation was used. Also, for conservatism, no shielding due to topographical features or intervening structures was employed, even though such effects would be pertinent for several locations around the site. The barrier attenuation from the screening walls (nominally proposed to be 10 feet tall) around the majority of the substation site were also neglected. The results of these substation noise projections for construction activities are summarized in Table 4.10-14, Predicted Aggregate Average (L_{eq}) Construction Noise around the San Juan Capistrano Substation Site.

Table 4.10-14: Predicted Aggregate Average (L_{eq}) Construction Noise around the San Juan Capistrano Substation Site[a]

Receptor #	Distance (feet)	Spreading Atten[b]	Other Atten[c]	Total Atten	Expected SPL(A)[d]	Closest Sensitive Receptor Type
ST-1	300	15.6		15.6	70	Residential
ST-2	215	12.7		12.7	73	Residential
ST-3	300	15.6		15.6	70	Residential
ST-4	275	14.8		14.8	70	Residential
LT-1	415	18.4		18.4	67	Residential
LT-2	175	10.9		10.9	74	Residential
LT-3	230	13.3		13.3	72	Residential

Notes:
a. Using an aggregate sound emissions profile for the collection of equipment at 85 dBA at 50 feet
b. Assuming 6 dB per doubling of distance for spreading loss attenuation
c. Accounting for topographical shielding and/or intervening structure shielding.
d. Energy average (Leq) sound level at the closest noise-sensitive receptor.
Source: Alliance Acoustical Consulting, Inc., 2012

In summary, due to the short-term nature of the earth-moving, erection, and finishing activities at both the substation site and along the transmission line corridor, along with conducting construction primarily during the exempt time periods in each jurisdiction, construction noise impacts would be less than significant. For the special circumstances wherein (non-exempt) evening/nighttime construction might possibly take place, these activities are expected to generate noise levels that would comply with the municipal code noise limit requirements of the pertinent jurisdictions and they, too, would be less than significant.

[26] This profile included six 1-ton pick-up trucks (at 2 hours usage per day), a maintenance truck, two air compressors (used ½-time each), a water truck (used ½-time), a bulldozer (used ¾-time), a compactor (used ½-time), a backhoe/front-loader (used ½-time), a loader (used ½-time), and a dump/haul truck (used 3/8-time).

Operation & Maintenance – Less than Significant Impact

As discussed previously in the response to Question 4.10a, the maintenance activities conducted for the Proposed Project would result in temporary and periodic increases in ambient noise levels due to the operation of crew trucks and heavy equipment. As described previously, though, noise generated as the result of these on-going operations and maintenance activities would be masked by the substation's operation and by the existing traffic in the area along Camino Capistrano and I-5. In addition, the proposed maintenance activities would be similar to those being performed at the existing Capistrano Substation. As a result, there would be no exceedances of established noise standards due to the maintenance of the substation and there would be no impact.

In addition, SDG&E already performs similar maintenance activities in the Proposed Project area that would not change as part of the Proposed Project. As a result, the periodic increases in ambient noise from on-going Proposed Project maintenance activities would be similar to current operational conditions. Therefore, noise impacts from temporary or periodic operations activities would be less than significant

4.10.4.6 Question 10e – For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

Construction – No Impact

The closest public airport to the Proposed Project is John Wayne/Orange County Airport, which is located approximately 15 miles to the northwest of Capistrano Substation. SDG&E would not use this airport for helicopter operations during construction. As a result, helicopter operations from the John Wayne Airport would not change as a result of the Proposed Project; therefore, there would be no impact.

Operation & Maintenance – No Impact

SDG&E already conducts aerial inspections of its existing facilities in the area by helicopter several times a year. Aircraft activity associated with this aerial inspection is not anticipated to increase beyond current activity; therefore, noise levels would not increase. Furthermore, as previously described in Question 4.10a, all operational noise from the Proposed Project components would not add to the existing public airport noise in a way that adversely affects residents in the area. Thus, no impact from the Proposed Project would occur.

4.10.4.7 Question 10f – For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Construction – No Impact

The closest public private airstrips or airports to the Proposed Project are helicopter facilities at San Onofre Nuclear Generating Station (SONGS) (approximately six miles to the southeast) and at Saddleback Memorial Medical Center (approximately seven miles to the northwest). SDG&E would not use these private facilities for helicopter operations during construction. As a result,

operations from these private airports would not change as a result of the Proposed Project and there would be no impact.

Operation & Maintenance –No Impact

As discussed in Question 10e, aircraft activity associated with aerial inspection of the transmission line facilities is not anticipated to increase beyond current activity and operational noise from the Proposed Project components would not add to the existing private airport noise in a way that adversely affects residents in the area. Thus, no impact from the Proposed Project would occur.

4.10.5 Applicant Proposed Measures

In order to minimize potential impacts relating to potential work during nighttime hours, the following APM is being proposed:

NOISE-1: Any endeavors during the construction phase wherein nighttime and weekend activities are necessary (such as due to Caltrans transportation constraints for oversized/ overweight loads), will be limited to the extent feasible so that noise will not exceed the pertinent maximum noise level limits or the hourly L_{50} limits when measured at the nearest residential property. For example, to minimize potential noise disturbances during nighttime deliveries of transformers, the Applicant will make every reasonable effort to minimize the duration of trucking activities at the project site. This will entail pulling the delivery vehicle onto the project site, parking it overnight, and unloading/installing the item(s) during normal, daytime construction hours. If nighttime or weekend activities cannot be conducted to meet the city's noise standards, SDG&E will communicate the exception to the City of San Juan Capistrano in advance of conducting the work that may exceed the threshold(s)[27].

4.10.6 References

29 Code of Federal Regulations 1910.95. 1970. *Occupational Health and Safety Act of 1970*.

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Bolt, Beranek, and Newman. 1987. *Noise Control for Buildings and Manufacturing Plants. California Health and Safety Code*. California Noise Control Act of 1973 46000-46080.

[27] This APM is consistent with the conditions deemed acceptable by the CPUC for the similar situation at the Silvergate Transmission Substation Project.

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