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## CHAPTER 4 – ENVIRONMENTAL IMPACT ASSESSMENT

### 4.10 NOISE

Would the project result in:	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Measures	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) If located within an airport land use plan or within two miles of a public airport or public use airport for which such a plan has not been adopted, would the project result in exposure of persons residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) If located within the vicinity of a private airstrip, would the project result in exposure of persons residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### 4.10.0 Introduction

This section assesses the potential noise and vibration impacts associated with the construction, operation, and maintenance of the San Diego Gas & Electric Company (SDG&E) East County (ECO) Substation Project (Proposed Project). Noise will be generated during construction and operation of all Proposed Project components. Construction noise has the potential to adversely impact noise-sensitive receptors in the area; however, these impacts will be reduced to a less-

than-significant level with the implementation of applicant-proposed measures (APMs). Operational noise will be less than significant.

#### **4.10.1 Methodology**

The evaluation of potential noise and vibration impacts from the Proposed Project began with a review of San Diego County noise standards. A 25-hour noise survey was then conducted from March 13 to 14, 2008 to establish the background noise levels in the Proposed Project area. After characterizing the existing noise environment, the survey results and estimated noise levels of the typical major construction equipment to be used during Proposed Project construction and operation were used as inputs to CadnaA, a computer-aided noise model. These inputs are provided in Attachment 4.10-A: CadnaA Noise Model Input and Calculation Sheets. Multiple computer simulations were run to evaluate potential changes in noise levels from the construction and operation of the Proposed Project, the results of which were plotted for comparison to the significance criteria.

#### **4.10.2 Existing Conditions**

##### **Regulatory Background**

###### *Federal*

No federal noise standards directly regulate noise from operation of electrical transmission lines and substation facilities. However, in 1974 the United States Environmental Protection Agency (EPA) established guidelines for noise levels, below which no reason exists to suspect that the general population will be at risk from any of the identified effects of noise. The EPA guidelines include equivalent sound level ( $L_{eq}(24) \leq 70$  A-weighted decibels<sup>1</sup> (dBA) to protect against hearing loss; or day-night equivalent noise level ( $L_{dn} \leq 55$  dBA to protect against activity interference and annoyance in residential areas, farms and other outdoor areas where quiet is a basis for use;  $L_{eq}(24) \leq 55$  dBA to protect against outdoor activity interference where limited time is spent such as school yards and playgrounds;  $L_{dn} \leq 45$  dBA to protect against indoor activity interference and annoyance in residences; and  $L_{eq}(24) \leq 45$  dBA to protect against indoor activity interference in school yards. These levels are not standards, criteria, regulations, or goals, but are defined to protect public health and welfare with an adequate margin of safety, and to provide guidelines for implementing noise standards locally.

The federal government has passed various general laws to regulate and limit noise levels, identified as follows.

###### *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 EPA authorized to conduct a full and complete investigation of noise and its effect on public health and welfare. The investigation was to include an identification of noise sources, projected noise levels, and effects of noise on persons, animals, and property.

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<sup>1</sup> 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 scale uses the specific weighting of sound pressure levels from about 31.5 hertz (Hz) to 16 kilohertz (kHz) for determining the human response to sound.

In 1981, the Administration concluded that noise issues were best handled at the state or local government level. As a result, the EPA phased out ONAC's funding in 1982 as part of a shift in the federal noise control policy to transfer the primary responsibility of regulating noise to state and local governments. However, the Noise Control Act of 1972 and the Quiet Communities Act of 1978 (described in this section) were not rescinded by Congress and 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.

As of 2002, agencies including the Department of Transportation, Department of Labor, Federal Railroad Administration, and Federal Aviation Administration, have developed their own noise control programs, with each agency setting its own criteria.

#### *Occupational Health and Safety Act of 1970*

This act covers all employers and their employees in the 50 states, the District of Columbia, Puerto Rico, and other U.S. territories. Administered by the Occupational Health and Safety Administration (OSHA), the act assigns OSHA two regulatory functions—setting standards and conducting inspections to ensure that employers are providing safe and healthful workplaces. OSHA standards may require that employers adopt certain practices, means, methods, or processes reasonably necessary and appropriate to protect workers on the job. Employers must become familiar with the standards applicable to their establishments and eliminate hazards. Included in this act is a regulation for worker noise exposure at 90 dBA over an eight-hour work shift. Areas where exposure exceeds 85 dBA must be designated and labeled as high-noise-level areas and hearing protection is required.

#### *Federal Aviation Administration*

The Federal Aviation Administration establishes 65 decibels (dB) Community Noise Equivalent Level<sup>2</sup> (CNEL) as the noise standard associated with aircraft noise measured at exterior locations in noise sensitive land uses (NSLU<sup>3</sup>). This standard is also generally applied to railroad noise.

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<sup>2</sup> CNEL measurements are weighted averages of sound levels gathered over a 24-hour period, essentially measuring ambient noise. Measurements taken during day, evening and nighttime periods are weighted separately, recognizing that humans are most sensitive to noise in late night hours and are more sensitive during evening hours than in daytime hours.

<sup>3</sup> NSLU is defined as any residence, hospital, school, hotel, resort, library, or any other facility where quiet is an important attribute of the environment.

## ***State***

### *California Noise Control Act*

The California Noise Control 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. It also recognizes that continuous and increasing bombardment of noise exists in urban, suburban, and rural areas. This act declares 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, meant to establish noise insulation standards for multi-family residential buildings. This document establishes standards for interior room noise 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  $L_{dn}$ ) of 60 dB or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or  $L_{dn}$ ) of at least 45 dB.

### *Caltrans Transportation- and Construction-Induced Vibration Guidance*

This document provides practical guidance to California Department of Transportation (Caltrans) engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. 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. More specific criteria for structures and potential annoyance have been developed by Caltrans and will be used to evaluate potential Proposed Project continuous or transient sources. Table 4.10-1: Vibration Damage Threshold Guidance lists the maximum levels of vibration allowed by Caltrans.

## ***Local***

Each local government outlines requirements for noise abatement and control in their general plan and municipal code. The general plans typically set overall goals and objectives, while the municipal codes set specific sound limits.

### *San Diego County Guidelines for Determining Significance for Noise*

The San Diego County Guidelines for Determining Significance for noise is used by county staff for review of discretionary projects and environmental documents, pursuant to the California Environmental Quality Act (CEQA). Project implementation that is anticipated to result in the exposure of any on- or off-site, existing or reasonably foreseeable future noise-sensitive land use to exterior or interior noise (including noise generated from a project together with noise from roads, railroads, airports, heliports, and all other noise sources) that is either in excess of 60 dB (CNEL) or an increase of 10 dB (CNEL) over pre-existing noise is considered significant.

**Table 4.10-1: Vibration Damage Threshold Guidance**

Structure Type/Condition	Maximum PPV <sup>4</sup> (inches per second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, and ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans, 2004

#### *County of San Diego Noise Ordinance*

The County of San Diego Noise Ordinance establishes prohibitions for disturbing, excessive, or offensive noise and contains provisions, such as sound level limits, for the purpose of securing and promoting public health, comfort, safety, peace, and quiet. Limits, as specified by zoning, are provided in Table 4.10-2: San Diego County Sound Level Limits. In the case that two adjacent properties each have different zone classifications, the sound level limit at the location on the boundary between the two properties is the arithmetic mean of the respective limits for the two zones, except for extractive industries. It is unlawful for any person to cause or allow the creation of any noise that exceeds the applicable limits of the Noise Ordinance at any point on or beyond the boundaries of the property on which the sound is produced. Furthermore, the Noise Ordinance allows the county to grant variances from the noise limitations for temporary on-site noise sources, subject to terms and conditions intended to achieve compliance. The San Diego County Department of Planning and Land Use recommends the use of these limits to establish thresholds of significance for noise. Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line is subject to this noise level limit, measured at or beyond six feet from the boundary of the easement upon which the equipment is located.

The Noise Ordinance establishes additional noise limitations for the operation of construction equipment. It is unlawful for any person to operate construction equipment at any construction site on Monday through Saturday, except between the hours of 7 a.m. and 7 p.m., and on Sunday; days appointed by the President, Governor, or the Board of Supervisors for a public fast; Thanksgiving; or holidays. Construction noise cannot exceed an average of 75 dB during the allowed construction period when measured at or within the property lines of any property developed for residential purposes, unless a variance is granted.

<sup>4</sup> Transient sources create a single, isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

**Table 4.10-2: San Diego County Sound Level Limits**

<b>Zone Categories</b>	<b>Period</b>	<b>Applicable Limit 1-Hour Average Sound Level (dBA)</b>
RS, RD, RR, RMH, A70, A72, S80, S81, S87, S88, S90, S92, RV, and RU. Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
RRO, RC, RM, C30, S86, RV, RU, and V5. Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
S94, V4, and all other commercial zones	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
V1, V2	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
	10 p.m. to 7 a.m.	50
V2	10 p.m. to 7 a.m.	55
	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	60
M50, M52, M54	Anytime	70
S82, M58, and all other industrial zones	Anytime	75

Source: San Diego County, 1982

#### *San Diego County General Plan, Noise Element*

The San Diego County General Plan establishes limitations on sound levels to be received by NSLUs. New development<sup>5</sup> may cause an existing NSLU to be affected by noise or it may create or locate a NSLU in such a place that it is affected by noise. The Noise Element identifies airports and traffic on public roadways as the major sources of noise.

The Noise Element states that an acoustical study is required if it appears that a NSLU will be subject to noise levels of CNEL equal to 60 dBA or greater. If that study confirms that greater than 60 dBA CNEL will be experienced, modifications that reduce the exterior noise level to less than 60 dBA CNEL and the interior noise levels to below 45 dBA CNEL must be made to the development. If these modifications are not made, the development will not be approved unless a finding is made that specific social or economic considerations warrant project approval. However, if the noise level is expected to exceed 75 dBA CNEL even with such modifications, the development will not be approved, irrespective of such social or economic considerations.

<sup>5</sup> Development is defined as any physical development including, but not limited to, residences, commercial or industrial facilities, roads, civic buildings, hospitals, schools, and airports.

The Noise Element includes special provisions for county road construction projects and interior noise levels in rooms that are usually occupied for only a part of the day (e.g., schools, libraries, etc.).

*San Diego County Department of Planning and Land Use Noise and Vibration Guidelines*

The Department of Planning and Land Use has issued guidelines for determining significance for noise and vibration based largely on federal transit guidelines. Vibration is considered significant if project implementation will expose the uses listed in Table 4.10-3: County Groundborne Vibration and Noise Limits to groundborne vibration or noise levels equal to or in excess of the levels shown.

### **Existing Noise Levels**

The sound levels in most communities fluctuate, depending on the activity of nearby and distant noise sources, time of the day, or season of the year. Within an hour, the sound level can fluctuate between the lowest level ( $L_{\min}$ ) and the highest level ( $L_{\max}$ ).

Ambient sound measurements were taken at three locations to characterize the existing environment. These sound measurements included the following:

- $L_{\text{eq}}$  is an average of the time-varying sound energy for a specified time period. The  $L_{\text{eq}}$  was measured and reported for each hour of measurement and for the daytime period when construction is expected to occur.
- $L_{(10)}$  is the level that is exceeded 10 percent of the time period.
- $L_{(50)}$  is the level that is exceeded 50 percent of the time period.
- $L_{(90)}$  is the level that is exceeded 90 percent of the time and is often utilized as a descriptor of the background noise.
- $L_{\text{dn}}$ , Day-Night Sound Level, is an average of the time-varying sound energy for one 24-hour period, with a 10 dB addition to the sound energy for the time period between 10 p.m. and 7 a.m.
- All sound levels were recorded in dBA.

*East County Substation and Southwest Powerlink Loop-In*

Figure 4.10-1: Ambient Sound Levels and Wind Speeds – ECO Substation presents the sound levels and wind speeds measured approximately 400 feet south of the proposed ECO Substation 230 kilovolt (kV) yard. The  $L_{\text{dn}}$  was measured at 46 dBA, and a list of the average daytime and nighttime levels are provided in Table 4.10-4: Sound Measurement Survey Results. The peak  $L_{\text{eq}}$  measurement was recorded at 21:00 (9 p.m.) on March 13, 2008. This reading was probably due to a very short, loud sound ( $L_{\text{max}}$  was recorded at 83 dBA), possibly attributable to a vehicle passing in close proximity to the measurement location. The noise measurements at this location would be representative for the ECO Substation and the Southwest Powerlink (SWPL) loop-in.

**Table 4.10-3: County Groundborne Vibration and Noise Limits**

Land Use Category <sup>6</sup>	Groundborne Vibration Impact Levels (inches/second rms) <sup>7</sup>		Groundborne Noise Impact Levels (dBA)	
	Frequent Events <sup>8</sup>	Infrequent Events <sup>9</sup>	Frequent Events <sup>8</sup>	Infrequent Events <sup>9</sup>
Category 1: Buildings where low ambient vibration is essential for interior operations (research and manufacturing facilities with special vibration constraints)	0.0018 <sup>10</sup>	0.0018 <sup>10</sup>	Not Applicable (NA) <sup>11,12</sup>	NA <sup>11,12</sup>
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, and other sleeping facilities)	0.0040	0.010	35	43
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, and quiet offices)	0.0056	0.014	40	48

Source: San Diego County, 1982

<sup>6</sup> For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the PPV exceeds one inch per second. Continuous or frequent intermittent vibration sources such as impact pile drivers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance have been developed by Caltrans and will be used to evaluate these continuous or transient sources in San Diego County.

<sup>7</sup> “rms” is defined as root mean square.

<sup>8</sup> “Frequent Events” is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

<sup>9</sup> “Infrequent Events” is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

<sup>10</sup> This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research requires detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating, ventilation, and air conditioning systems and stiffened floors.

<sup>11</sup> Vibration-sensitive equipment is not sensitive to groundborne noise.

<sup>12</sup> Some buildings such as concert halls, television and recording studios, and theaters can be very sensitive to vibration and noise, but they do not fit into any of the three categories. The San Diego County guidelines give criteria for acceptable levels of groundborne vibration and noise for these various types of special uses.

**Table 4.10-4: Sound Measurement Survey Results**

Measurement	138 kV Transmission Line Downtown Jacumba		Boulevard Substation		ECO Substation and SWPL Loop-In	
	Day	Night	Day	Night	Day	Night
$L_{eq}$	58	52	58	57	46	37
$L_{(10)}$	53	42	59	58	45	37
$L_{(50)}$	49	39	58	57	40	33
$L_{(90)}$	43	32	57	57	37	30

Note: All measurements are reported in dBA

#### *138 kV Transmission Line*

Figure 4.10-2: Ambient Sound Levels and Wind Speeds – Downtown Jacumba presents the sound levels and the wind speeds measured at the local park, near the corner of Jacumba Street and Old Highway 80 in the community of Jacumba (approximately 66 feet west of the center of Jacumba Street and approximately 54 feet north of the center of Old Highway 80). Jacumba represents the largest residential area near the 138 kV transmission line corridor. The  $L_{dn}$  was measured at 60 dBA. A list of average daytime and nighttime levels is provided in Table 4.10-4: Sound Measurement Survey Results.

#### *Boulevard Substation Rebuild*

Figure 4.10-3: Ambient Sound Levels and Wind Speeds – Boulevard Substation presents the sound levels and wind speeds measured approximately 12 feet east of the existing Boulevard Substation fence and approximately 43 feet north of the south fence line. Because the major noise source at this location is the substation, the sound levels are very constant. The  $L_{dn}$  was measured at 64 dBA. A list of the average daytime and nighttime levels is provided in Table 4.10-4: Sound Measurement Survey Results.

#### *White Star Communication Facility Rebuild*

No ambient noise measurements were made near the White Star Communication Facility. The rebuilt facility will be approximately 35 feet from Tierra Del Sol Road and no noise-sensitive receptors were identified within 500 feet of the facility. Based upon measurements taken at other locations and the proximity to road traffic, the site noise levels are estimated to be approximately 50 dBA during daytime hours and 40 dBA during nighttime hours.

### **Noise-Sensitive Receptors**

The community of Jacumba is approximately 0.5 mile south of the SWPL transmission line corridor. There are four residences within approximately 1,000 feet of the SWPL towers, just west of where the corridor passes over Old Highway 80. One residence along the corridor is located within 300 feet of a SWPL tower.

The nearest noise-sensitive receptors to the proposed Boulevard Substation rebuild site include two residences located approximately 500 feet to the west-northwest and 600 feet to the south of the substation, respectively.

The nearest noise-sensitive receptors to the proposed ECO Substation and SWPL loop-in include two residences—a residence located approximately 0.4 mile northwest of the site and approximately 290 feet south of Interstate 8 (I-8), and a residence located approximately 1.4 miles northeast of the site, approximately 280 feet north of I-8. There are also residences located over two miles west-southwest of the site, near the intersection of Carrizo Gorge Road and Old Highway 80.

Approximately 14 residences are within approximately 500 feet of the proposed 138 kV transmission line right-of-way (ROW). The locations of these residences are identified in Section 4.9 Land Use and Planning and Table 4.10-5: Existing Residences within 1,000 Feet of the 138 kV Transmission Line.

### **4.10.3 Impacts**

#### **Significance Criteria**

The following significance criteria have been noted from the laws, ordinances, regulations, and standards applicable to the Proposed Project area. Separate noise significance criteria were developed for the construction, and operation and maintenance phases of the Proposed Project. The vibration significance criteria are applicable for both the construction and the operation and maintenance phases.

#### *Noise*

In general, any noise that exceeds the local jurisdiction's adopted standards will be considered potentially significant. Specific criteria for the construction phase and the operation and maintenance phase noise levels are as follows.

#### *Construction*

Based on the previous discussion, the following thresholds of significance for temporary or periodic increases and from construction noise have been developed for Proposed Project-related average  $L_{eq}$  values at noise-sensitive receptor locations:

- Less than 75 dB average between 7 a.m. and 7 p.m. when measured at or within the property lines of any property that is developed and used either in part or in whole for residential purposes will be considered noticeable, but not significant.
- 75 dB average and above between 7 a.m. and 7 p.m. when measured at or within the property lines of any property that is developed and used either in part or in whole for residential purposes will be considered significant.

Thursday, March 13, 2008

Friday, March 14, 2008

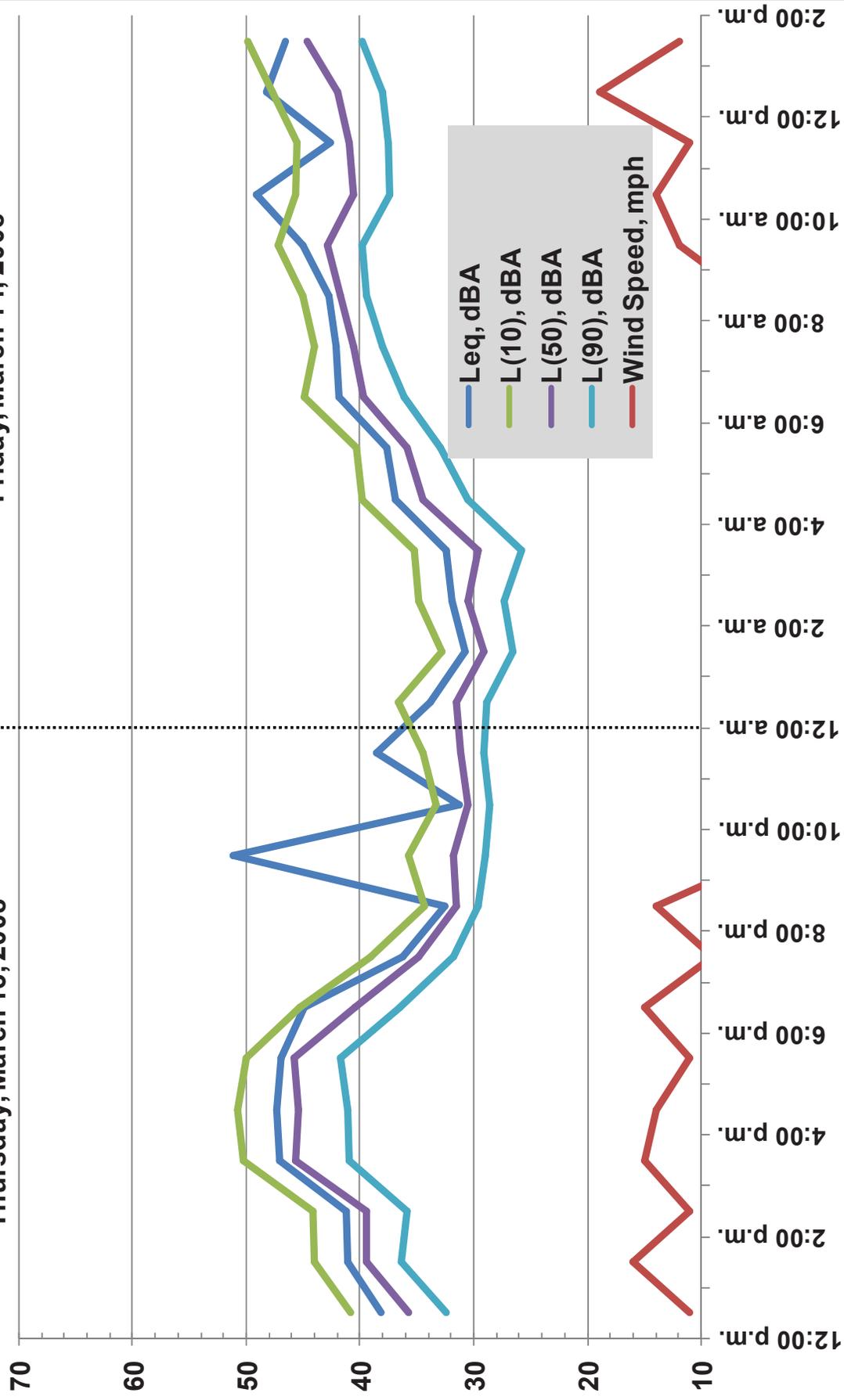


Figure 4.10-1: Ambient Sound Levels and Wind Speeds – ECO Substation



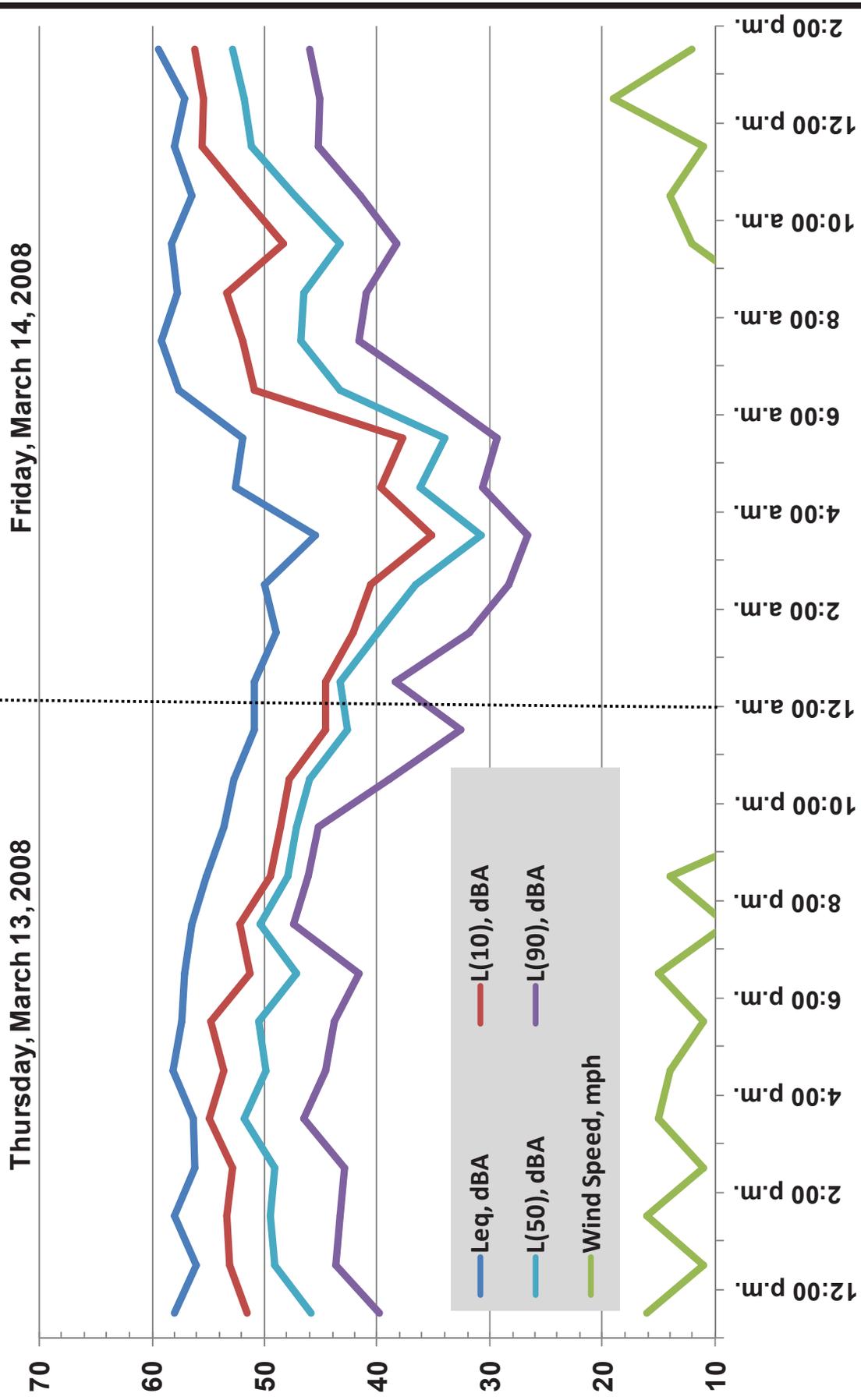


Figure 4.10-2: Ambient Sound Levels and Wind Speeds – Downtown Jacumba



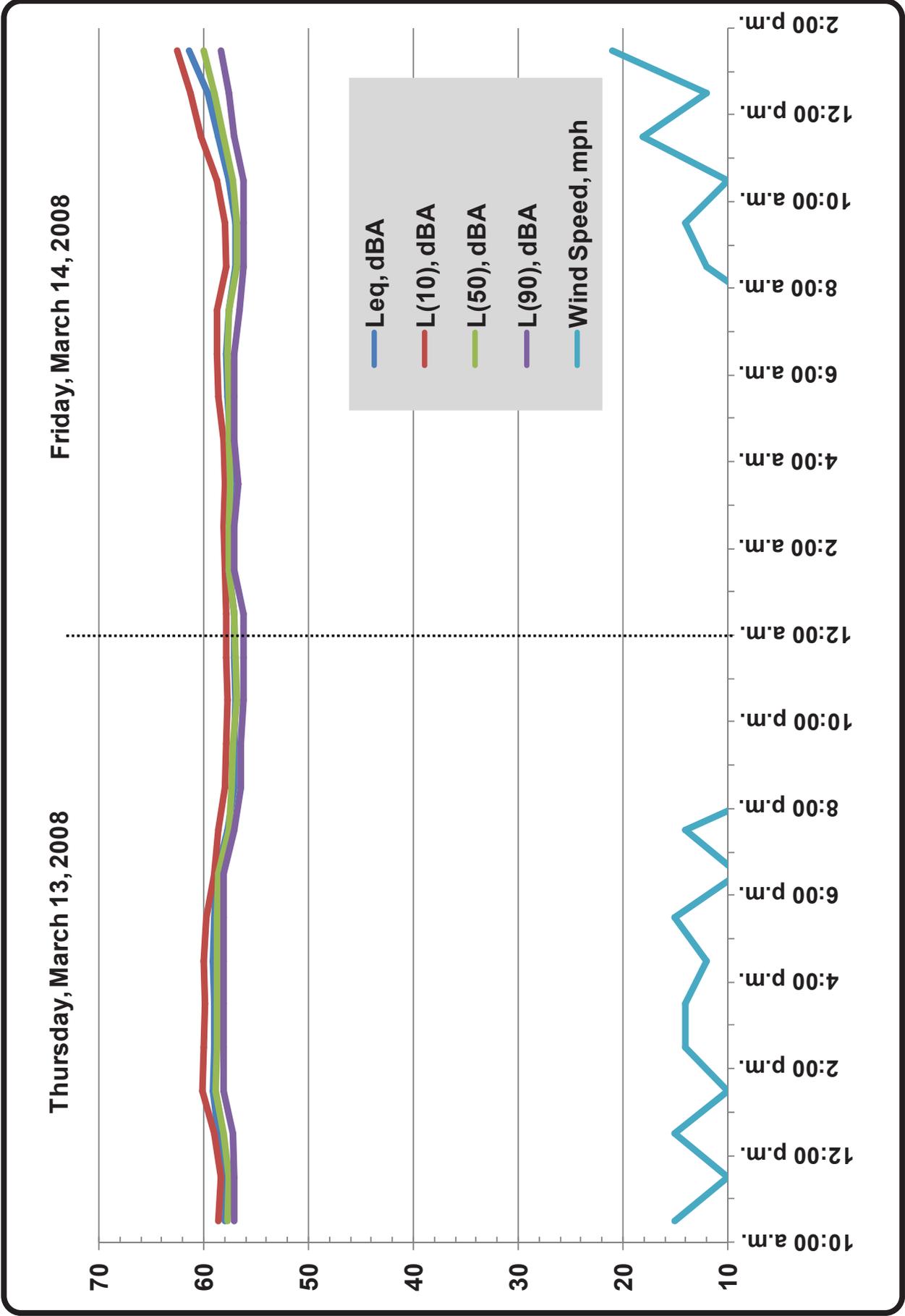


Figure 4.10-3: Ambient Sound Levels and Wind Speeds – Boulevard Substation



**Table 4.10-5: Existing Residences within 1,000 Feet of the 138 kV Transmission Line**

<b>Approximate Milepost</b>	<b>Approximate Distance From the Line (feet)</b>	<b>Orientation From the Line</b>	<b>Approximate Number of Residences</b>
5.8	400	South	1
6.0	800	North	2
	400		1
6.9	300	South	1
7.4	130	North	1
10.4	600	East	3
	500	East	1
10.7	400	West	1
	130	Northwest	1
11.0	200	South	1
	950	West	1
11.9	600	East	1
12.0	900	East	1
	115		1
	400		1
12.1	750	East	1
	950		1
12.4	400	East	1
13.1	880	West	1
13.2	200	West	1
	400	West	1
13.3	400	Northwest	1
	400		1

*Operation and Maintenance*

Based on the previous discussion, the following thresholds of significance for operational noise have been developed for Proposed Project-related increases at noise-sensitive receptor locations:

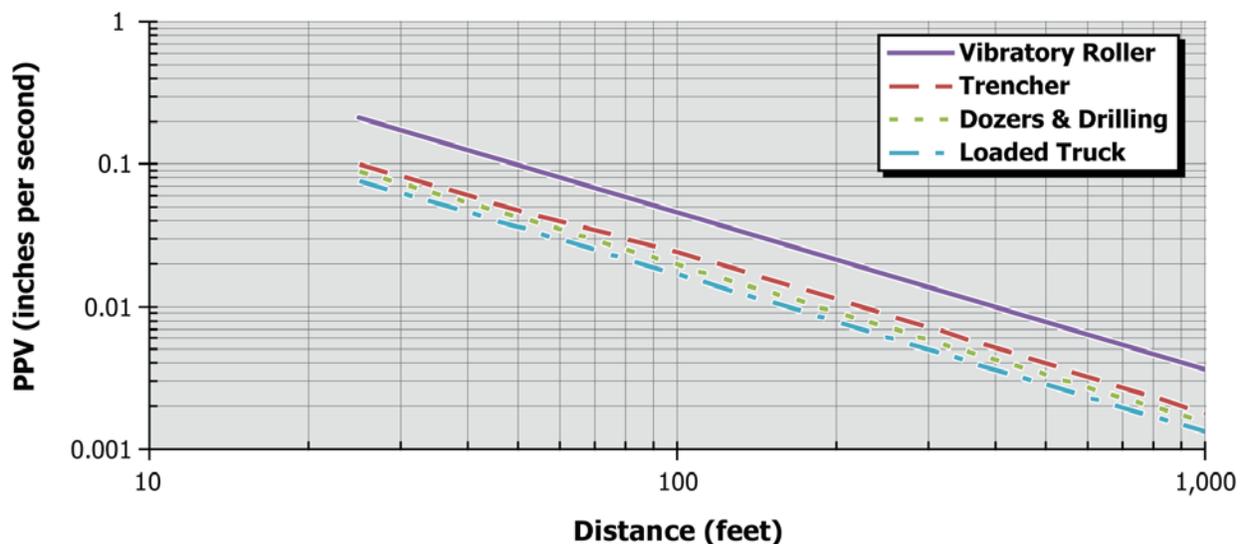
- Less than 3 dB will be considered not discernable and not significant.
- Increases above 3 dB will be considered noticeable, but not significant if noise levels remain below the County of San Diego Sound Level Limits.
- Noise increases will be considered significant if the noise meets or exceeds the county of San Diego Sound Level Limits.
- An increase in CNEL of 10 dB near airports will be considered significant.

The San Diego County Sound Limits for land use zoned for less than 11 dwellings per acre is 45 dBA during nighttime hours and 50 dBA during daytime hours. Project-related noise above 45 dBA at residential property lines during nighttime hours or 50 dBA during daytime hours will be considered significant. Project-related noise below 40 dBA at residential property lines will be considered not discernable and not significant.

**Vibration**

Vibration amplitude decreases with distance from the source, as presented in Figure 4.10-4: Construction Vibration Amplitudes. Damage potential can be estimated by comparing the vibration damage potential threshold criteria provided in Table 4.10-3: County Groundborne Vibration and Noise Limits to Figure 4.10-4: Construction Vibration Amplitudes. Vibration levels beyond 25 feet from construction activities are below the damage threshold for older and newer residential buildings. Vibration levels beyond 200 feet from construction activities are below the damage threshold for fragile buildings.

**Figure 4.10-4: Construction Vibration Amplitudes**



The ratio of PPV to maximum rms amplitude is defined as the crest factor for the signal. For groundborne vibration from construction equipment, the crest factor is usually less than four. For a crest factor of four, an rms value of 0.0056 inches per second corresponds to a PPV of 0.022 inches per second. Residences within approximately 100 feet of most construction activities will exceed the county's annoyance threshold for frequent events.

Based on the previous discussion, thresholds of significance have been developed for Proposed Project-related vibration at sensitive receptor locations and are provided in Table 4.10-6: Vibration Thresholds of Significance.

**Table 4.10-6: Vibration Thresholds of Significance**

<b>Sensitive Receptor Type</b>	<b>Significance Threshold (inches/second)</b>
Institutional land uses with primarily daytime use (e.g., schools, churches, libraries, other institutions, and quiet offices)	0.0056
Buildings where people normally sleep during daytime hours (e.g., hospitals)	0.0040
Fragile historic buildings, ruins, and ancient monuments	0.08
Fragile buildings	0.1
Historic buildings	0.25
Older residential buildings	0.3
Other structures	0.5

#### **Question 4.10a – Noise in Excess of Standards**

Potential noise levels from facility operation and construction were evaluated using CadnaA, which is capable of providing noise simulations in rugged terrain. Noise emission rates for the construction equipment listed in Table 3-5: Typical Construction Equipment by Activity, in Chapter 3 – Project Description were characterized and entered into the model. Construction equipment noise emission rates were based on data published by the Federal Highway Administration (FHWA).

#### ***Construction – Less-than-Significant Impact***

Construction activities will require the temporary use of various types of noise-generating construction equipment, including bulldozers, graders, backhoes, drill rigs, augers, flatbed boom trucks, rigging and mechanic trucks, air compressors and generators, mobile cranes, concrete trucks, pole trailers, man lifts, and impact equipment. Wire stringing operations will require pullers, tensioners, and cable reel trailers. Helicopters will be used to string the sock line and to install transmission structures. Table 4.10-7: Typical Noise Levels of Construction Equipment

lists the typical noise levels generated by some of the construction equipment that will be used on the Proposed Project, although not all simultaneously or continuously.

If noise levels exceed an average of 75 dB for the hours of 7 a.m. and 7 p.m. when measured at or within the property lines of any property that is developed and used either in part or in whole for residential purposes, it will be considered significant. In addition, the San Diego County Noise Ordinance limits the hours of construction to between 7 a.m. and 7 p.m., Monday through Saturday. On occasion, construction activities may be required at night or on weekends to minimize impacts on schedules and facilitate cutover<sup>13</sup> work, and as required by other property owners or agencies, such as the California Independent System Operator (CAISO), which may require outages of certain portions of the electric system. SDG&E will implement APM-NOI-01, which requires construction hours to be limited to those permissible by the San Diego County Noise Ordinance and coordination with the county for all exceptions, to reduce these impacts to a less-than-significant level.

#### *East County Substation*

Construction activities associated with the proposed ECO Substation will include clearing, grading, and paving of access roads; clearing, excavating, and grading of the 230 kV and 500 kV yards; and installing equipment and facilities. Based on the equipment identified previously, noise contours were developed at the proposed ECO Substation site. Figure 4.10-5: ECO Substation Average Construction Noise Contour depicts, in black, a simulated noise contour where  $L_{eq}$  is approximately 75 dBA. Access roads to be used for construction are depicted in red. The County of San Diego Noise Ordinance stipulates that developed residential land uses cannot be subjected to construction noises in excess of 75 dBA when measured at the property line. Because the nearest residence is 0.5 mile away, noise levels will be below this standard and no impact will occur.

Construction activities may be required beyond the hours stipulated in the County of San Diego Noise Ordinance, and described previously in Section 4.10.2 Existing Conditions, to allow for materials delivery at night and to comply with Caltrans weight limits on state highways. In addition, the construction schedule may be periodically dictated by the CAISO if system outages are required to perform work. These outages often occur at night and are scheduled to avoid peak-usage hours. Given the proximity of the ECO Substation to the nearest residence, impacts to sensitive receptors resulting from night work will be less than significant. In addition, work will be coordinated with San Diego County's Chief of the Code Enforcement Division so that activities comply with the local noise ordinance to the extent feasible.

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<sup>13</sup> Cutover is a term that means to move service from one circuit to another.

**Table 4.10-7: Typical Noise Levels of Construction Equipment**

<b>Equipment</b>	<b>Noise Level Range at Approximately 50 Feet (dBA)</b>
<b>Earth-moving</b>	
Front loader	79 – 80
Backhoe	78 – 80
Tractor, dozer	82 – 85
Scraper, grader	84 – 85
Paver	77 – 85
Truck	74 – 84
<b>Materials-handling</b>	
Concrete mixer truck	79 – 85
Concrete pump	81 – 82
Crane (movable)	81– 85
<b>Stationary</b>	
Pump	77 – 81
Generator	70 – 82
Compressor	78 – 80
<b>Impact</b>	
Pneumatic tools	83 – 85
Jackhammers and rock drills	81 – 89
Compactors	80 – 83

Source: The Federal Highway Administration (FHWA), 2006

### *Southwest Powerlink Loop–In*

The major sources of SWPL loop-in construction noise will be heavy equipment used to clear and grade the access roads and install foundations for each tower. In addition, helicopters may be used to install structures and conductors. The noise level generated from operating a rock drill or a helicopter is approximately 95 dBA at a distance of 30 feet and 200 feet, respectively (U.S. Department of Transportation, 2001). Rock drilling activity may occur approximately four hours per day and helicopter activity is not expected to exceed 10 minutes at any one location. Noise-sensitive receptors located within approximately 235 feet of these activities may experience temporary noise levels in excess of a 75 dBA average between 7 a.m. and 7 p.m.<sup>14</sup> However, the closest residence is located approximately 0.4 mile northwest of the site. At this distance, there will be no impact.

### *138 kV Transmission Line*

The major sources of noise for the 138 kV transmission line construction will be heavy equipment used to clear and grade access roads and the installation of foundations for tangent poles. In areas where there is limited access or sensitive resources may inhibit ground-based activity, helicopters may be used intermittently to assist with the installation of transmission line poles and conductors. The noise level generated from operating a rock drill or a helicopter is approximately 95 dBA at a distance of 30 feet and 200 feet, respectively (U.S. Department of Transportation, 2001). Because no residents are located within 30 feet of the transmission line, rock-drilling activities will not pose an adverse noise impact. However, sensitive receptors that are located within approximately 235 feet of helicopter use may experience temporary noise levels in excess of a 75 dBA average between 7 a.m. and 7 p.m. As previously described and shown in Table 4.10-5: Existing Residences within 1,000 Feet of the 138 kV Transmission Line, there are five residences within 235 feet of the line where helicopters may be used intermittently during construction. Without minimization measures, these activities may expose sensitive noise receptors to potentially significant noise levels for brief periods. In order to reduce these potential impacts to a less-than-significant level, the APMs listed in Section 4.10.4 Applicant-Proposed Measures, which generally limit construction activities to the hours and sound levels permitted by the San Diego County Noise Ordinance (or coordinate any exceptions with the county), require that property owners be notified prior to construction, and limit the location of helicopter use to avoid more densely populated areas or relocate residents temporarily during helicopter use, will be implemented. With the implementation of APM-NOI-03, no residents within 235 feet will be exposed to any helicopter noise. As a result, impacts to sensitive noise receptors along the 138 kV transmission line ROW due to noise will be less than significant.

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<sup>14</sup> The impact distance (d) for rock drills was determined using the following:  $75 \text{ dBA} = 95 \text{ dBA} - 20 * \text{Log}(d/30) + 10 * \text{Log}(4\text{hrs}/12\text{hrs})$   
The impact distance (d) for helicopter was determined using the following:  $75 \text{ dBA} = 95 \text{ dBA} - 20 * \text{Log}(d/200) + 10 * \text{Log}(20 \text{ min}/(12\text{hrs} * 60 \text{ min/hr}))$

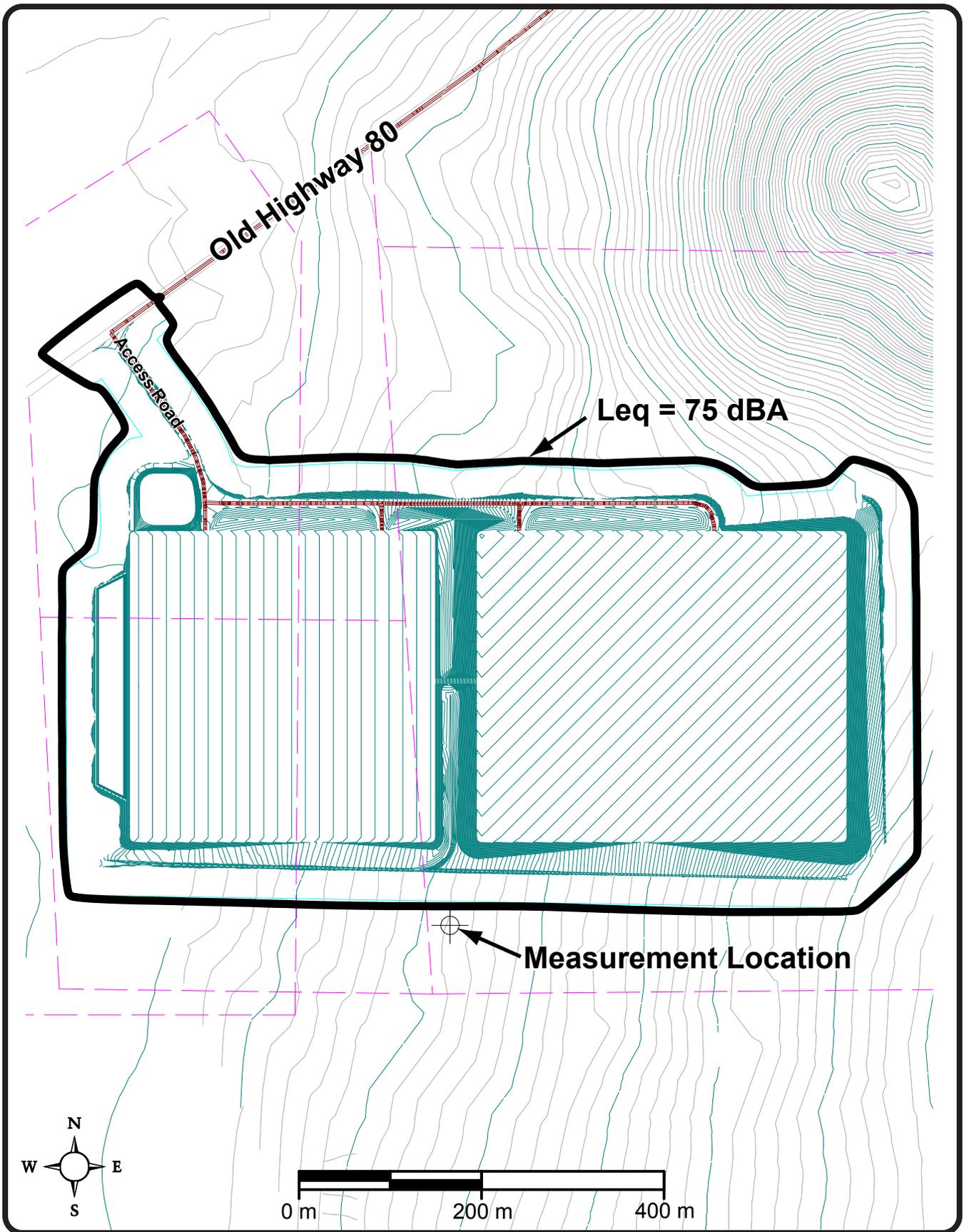


Figure 4.10-5: ECO Substation Average Construction Noise Contour



*Boulevard Substation Rebuild*

Construction activities at the Boulevard Substation rebuild site will include clearing, grading, and installation of equipment and facilities. Activities at the existing Boulevard Substation will involve the removal of all equipment and fencing. Based on the equipment identified in Section 3.7.3 Equipment, an average noise contour was developed for the Boulevard Substation rebuild site. Figure 4.10-6: Boulevard Substation Average Construction Noise Contour depicts, in black, a simulated noise contour where the  $L_{eq}$  is approximately 75 dBA. Access roads to be used for construction are depicted in red. Noise levels will be below 75 dBA at the nearest residence and as a result, no impact will occur.

*White Star Communication Facility Rebuild*

The major sources of construction noise at the White Star Communication Facility rebuild site will be cranes or boom trucks used to remove two of the existing poles and install the new communication pole and equipment. Because no noise-sensitive receptors are within 500 feet of the White Star Communication Facility, the noise generated from construction will not exceed any standards; therefore, no impact will occur.

***Operation and Maintenance – No Impact***

The noise sources associated with the operation and maintenance activity at the substations include noise from transformers and shunt reactors, an occasional pickup truck visiting during the week, and vegetation clearance as needed. The transformers located at the ECO Substation were modeled as National Electrical Manufacturers Association (NEMA) rated 68/70/71 dBA.<sup>15</sup> The distribution transformers at the Boulevard Substation were modeled as NEMA rated 68/70/71 dBA. The shunt reactors at the ECO Substation have a noise emission of 68 dBA measured at six feet from the 16 three-shunt reactor assemblies. The noise sources associated with the transmission lines will include vegetation clearance, as needed, and annual inspections and maintenance procedures to maintain service continuity.

*East County Substation*

The primary source of operating noise at the ECO Substation will be the on-site transformers. Figure 4.10-7: ECO Substation Operation Noise Contour depicts simulated noise contours at five dBA increments. Noise contours are shown from 40 dBA (thick grey line) up to 70 dBA (thin red line). The thick black noise contour line indicates where the  $L_{eq}$  is approximately 45 dBA. This noise contour falls within the station property line; thus, no noise-sensitive areas will be exposed to noise levels above 45 dBA. Therefore, operation of the ECO Substation will comply with the applicable noise standards and no impact will occur.

*Southwest Powerlink Loop-In*

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 500 kV line typically will produce noise levels up to 36

<sup>15</sup> NEMA Standards Publication No. TR 1-1993 audible sound level measurement locations is 0.3 m (1 ft) from the surface, except when fans are operating, then 2 m (6.5 ft) from the forced air cooling feature. The three ratings are self-cooled/forced-oil-cooled/forced-air-cooled.

dBA when measured at the edge of the transmission line ROW during dry conditions.<sup>16</sup> A noise level of 36 dBA will be practically unnoticeable, as it is easily masked by other ambient noises, as shown in Figure 4.10-1: Ambient Sound Levels and Wind Speeds – ECO Substation, including the existing 500 kV SWPL.

Corona levels (and audible noise levels) are highest during heavy rain, when the conductors are wet, but the noise generated by the rain will likely be greater than the noise generated by corona; thus, the increased corona-related noise will not be noticeable. In foul weather conditions, water droplets and fog can produce corona discharges from high voltage lines that are typically 5 dBA higher than fair weather conditions, but can be 20 dBA higher than usual. The existing noise levels in the immediate area reflect contribution from the existing transmission lines. Because noise levels generally decrease in intensity by 6 dBA for each doubling of distance from the source, the corona noise during poor weather conditions is expected to be less than 34 dBA at the nearest sensitive receptor and the closest privately held residential parcel available for development, both 2,000 feet from the SWPL loop-in. As a result, the one-hour average significance levels of 50 dBA during the day and 45 dBA at night standards will not be exceeded and no impact will occur.

#### *138 kV Transmission Line*

As described previously for the SPWL loop-in, corona-related noise is not anticipated to exceed the one-hour average sound level limits nor subject any noise-sensitive receptors to a  $L_{eq}$  of 45 dBA. Therefore, no standard will be violated and no impact will occur.

#### *Boulevard Substation Rebuild*

The primary source of operating noise at the rebuilt Boulevard Substation will be the on-site transformers. Figure 4.10-8: Boulevard Substation Operation Noise Contour – Daytime Operations and Figure 4.10-9: Boulevard Substation Operation Noise Contour – Nighttime Operations depict a simulated noise contours at 5 dBA increments. Noise contours are shown from 40 dBA (thick grey line) up to 70 dBA (thin red line). In Figure 4.10-8: Boulevard Substation Operation Noise Contour – Daytime Operations, the thick red noise contour line indicates where the  $L_{eq}$  is approximately 50 dBA. In Figure 4.10-9: Boulevard Substation Operation Noise Contour – Nighttime Operations, the thick black noise contour line indicates where the  $L_{eq}$  is approximately 45 dBA. Both of these contour lines fall within the station property line; thus, no noise-sensitive areas will be exposed to noise levels above 50 dBA during daytime hours or 45 dBA during nighttime hours. As a result, operation of the rebuilt Boulevard Substation will comply with the noise standard and no impact will occur.

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<sup>16</sup> Average noise measurements made during “fair” conditions in 2004 under cleaned spans of a 500 kV line of the SnoKing Project of the Bonneville Power Administration.

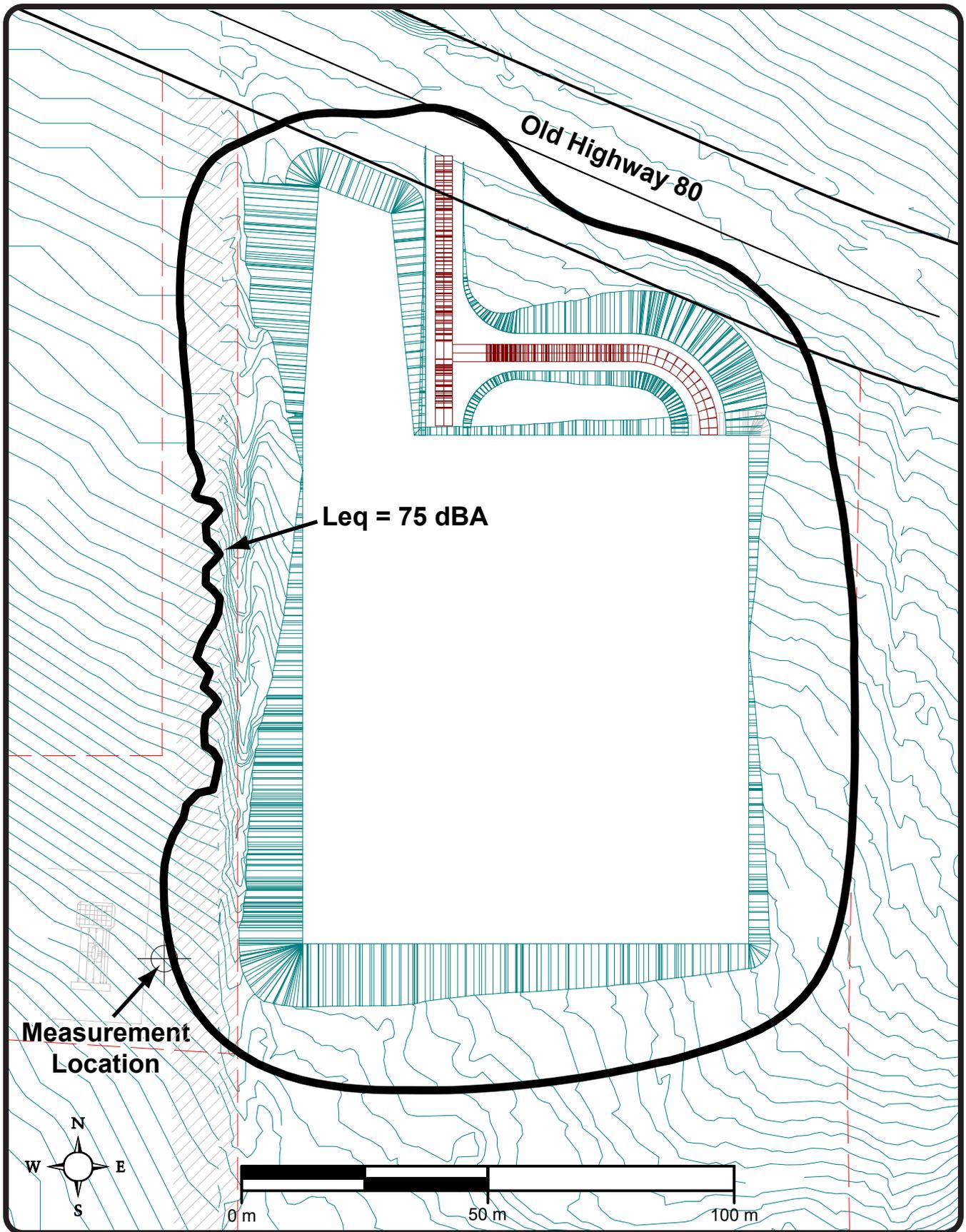


Figure 4.10-6: Boulevard Substation Average Construction Noise Contour



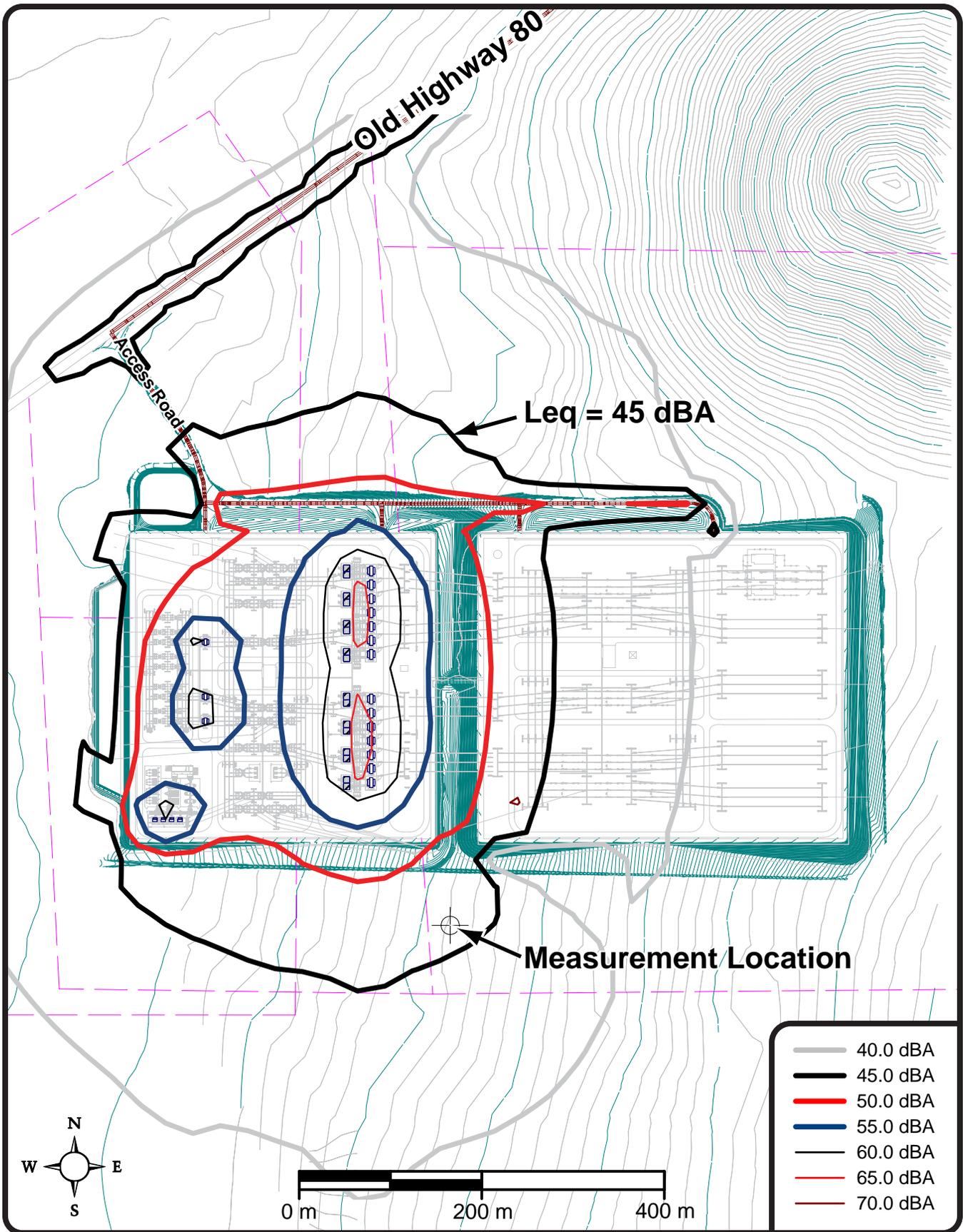


Figure 4.10-7: ECO Substation Operation Noise Contour





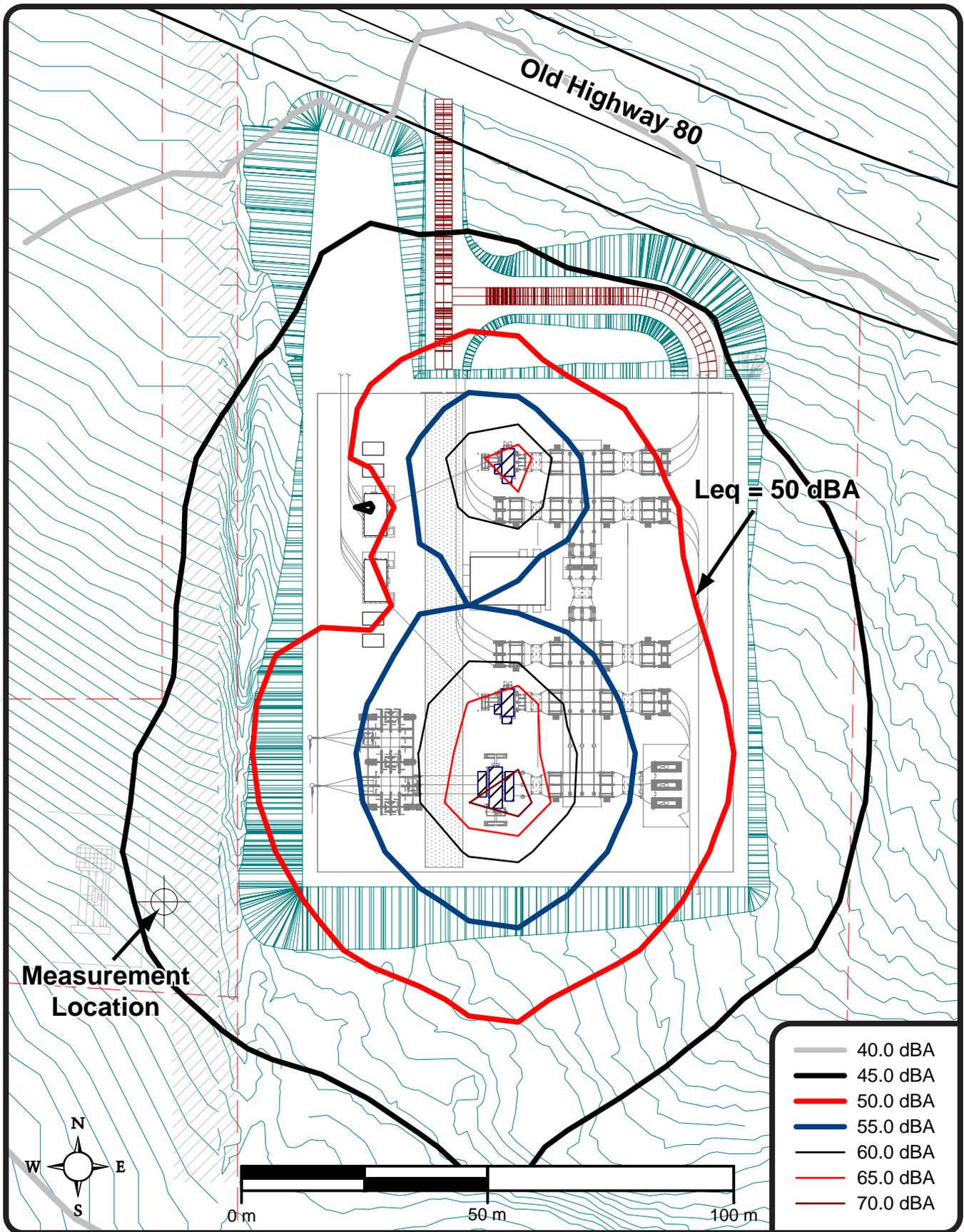


Figure 4.10-8: Boulevard Substation Operation Noise Contour - Daytime Operations



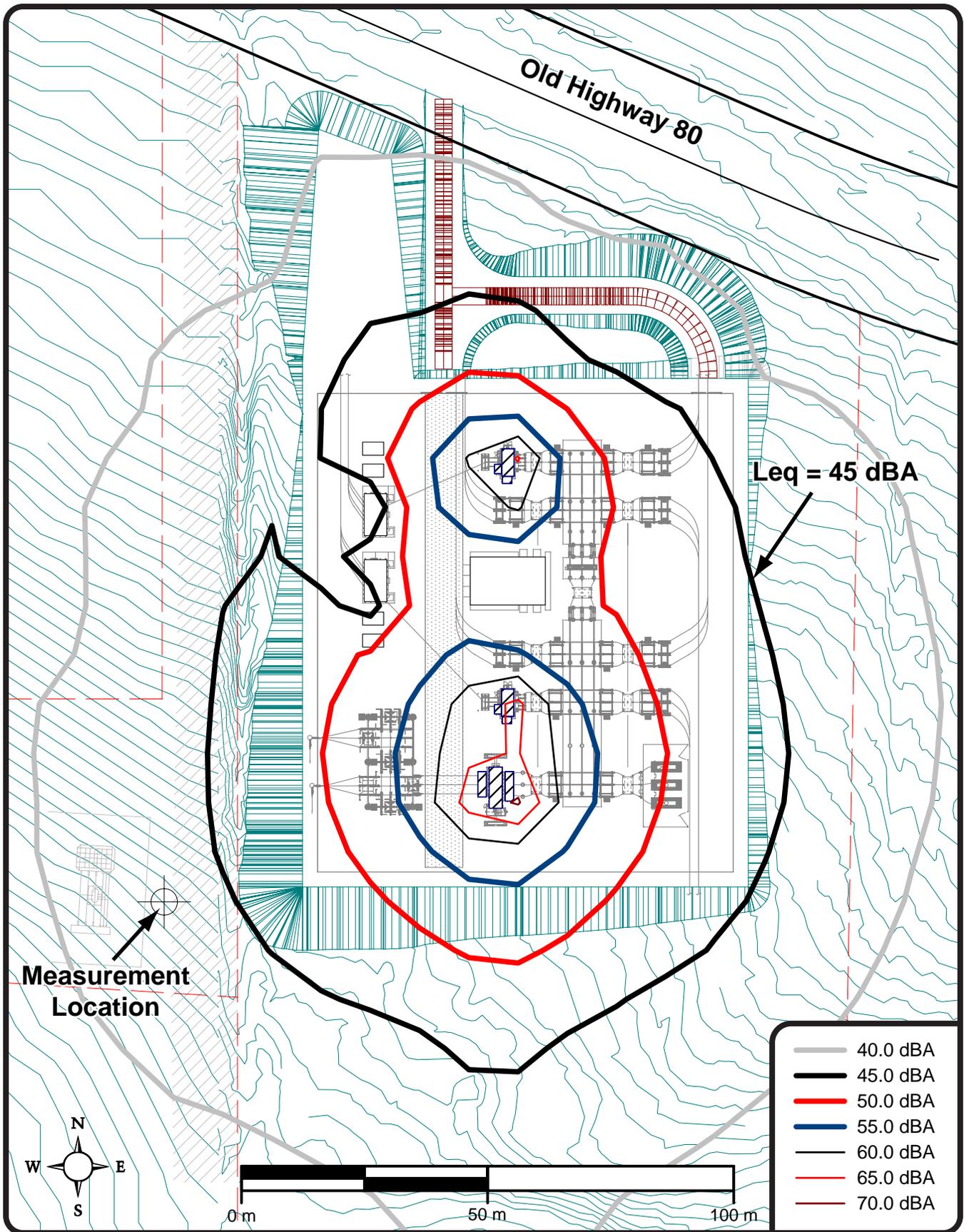


Figure 4.10-9: Boulevard Substation Operation Noise Contour - Nighttime Operations



*White Star Communication Facility Rebuild*

The communication monopole to be installed as part of the White Star Communication Facility rebuild will not emit any operational noises. However, a backup generator will be installed. The backup generator will be furnished with a noise-control enclosure and exhaust muffling. Backup generator noise levels at the nearest residence will not exceed 45 dBA. Because this facility is in compliance with current noise standards and the replacement and modification to be conducted as part of the Proposed Project will not change its noise emissions, no impact will occur.

**Question 4.10b – Groundborne Vibration and Noise*****Construction – No Impact***

No residences are within 100 feet of the any of the Proposed Project components and no residential structures will be within 25 feet of construction activities; therefore, no impact from construction vibration will occur.

***Operation and 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 will involve minimal earthwork; most of the activities will involve upkeep of existing equipment. None of the Proposed Project facilities generate vibration as a result of their operation. Thus, no impacts due to vibration from operation and maintenance will occur.

**Question 4.10c – Permanent Ambient Noise Increases*****Construction – No Impact***

Construction activities will occur over a finite period; therefore, no permanent increase in noise will occur and there will be no impact.

***Operation and Maintenance – Less-than-Significant Impact******East County Substation***

As described in the response to Question 4.10a, the primary source of operational noise at the ECO Substation will be its transformers. Figure 4.10-7: ECO Substation Operation Noise Contour presents the simulated contour of 45 dBA  $L_{eq}$  from operational noise.

The ambient noise level in this area is approximately 35 dBA during the night and exceeds 40 dBA during daytime hours. The County of San Diego sound level limit is 45 dBA  $L_{eq}$ . No noise-sensitive areas will be exposed to greater noise levels than 40 dBA; therefore, impacts from operation noise will be less than significant.

***Southwest Powerlink Loop-In***

As described in the response to Question 4.10a, modern transmission lines are designed, constructed, and maintained so that they operate below the corona inception voltage and the line will generate a minimum of corona-related noise during dry conditions. The corona hum typically will produce noise levels ranging up to 36 dBA, when measured at the edge of the

transmission line ROW during dry conditions. A noise level of 36 dBA will be practically unnoticeable and most likely masked by other ambient noises, and will be similar to the corona hum from the existing SWPL line. A permanent increase of five dBA or more will not extend beyond the ROW partly because the ambient noise includes the noise from the existing transmission line. No noise-sensitive receptors will experience a permanent increase in noise; therefore, impacts will be less than significant.

#### *138 kV Transmission Line*

As discussed previously, a permanent increase of five dBA or more due to corona-related noise will not extend beyond the ROW. No noise-sensitive receptors will experience a permanent increase in noise; therefore, impacts will be less than significant.

#### *Boulevard Substation Rebuild*

As described in the response to Question 4.10a, the primary source of operating noise at the rebuilt Boulevard Substation will be the on-site transformers. Figure 4.10-8: Boulevard Substation Operation Noise Contour – Daytime Operations depicts a simulated noise contour where the  $L_{eq}$  is approximately 50 dBA. Figure 4.10-9: Boulevard Substation Operation Noise Contour – Nighttime Operations depicts a simulated noise contour where the  $L_{eq}$  is approximately 45 dBA. The County of San Diego sound level limit is 50 dBA  $L_{eq}$  during daytime hours and 45 dBA  $L_{eq}$  during nighttime hours. No noise-sensitive areas will be exposed to greater than 50 dBA during daytime hours or 45 dBA during nighttime hours; therefore, impacts will be less than significant.

#### *White Star Communication Facility Rebuild*

As previously discussed in the response to Question 4.10a, no noise-sensitive receptors are within 500 feet of the White Star Communication Facility. Thus, while there may be a slight increase in noise, impacts will be less than significant.

### **Question 4.10d – Temporary or Periodic Ambient Noise Level Increases**

#### ***Construction – Less-than-Significant Impact***

Construction noise is temporary and impacts during construction have been identified in the response to Question 4.10a. Noise-sensitive receptors will experience a temporary or periodic increase that exceeds 75 dBA  $L_{eq}$  during construction activities, as previously described. With the implementation of the APMs described in Section 4.10.4 Applicant-Proposed Measures, which generally limit construction activities to the hours and sound levels permitted by the San Diego County Noise Ordinance, require that all property owners be notified prior to construction, and limit the location of helicopter use or the relocation of residents, impacts will be reduced to a less-than-significant level.

#### ***Operation and Maintenance – Less-than-Significant Impact***

##### *East County Substation*

A temporary or periodic increase in noise will result from maintenance crews visiting the substation several times a week, as well as from the major maintenance inspection that will take

place annually. However, no noise-sensitive receptors will experience a temporary or periodic increase in noise that exceeds 75 dBA  $L_{eq}$ ; therefore, impacts will be less than significant.

#### *Southwest Powerlink Loop-In*

Construction of the SWPL loop-in will not require any significant changes to the current operation and maintenance activities for the existing SWPL line. Thus, no noise impact will occur.

#### *138 kV Transmission Line*

Routine land or aerial (helicopter) inspections of the 138 kV transmission line will take place after it has been put into service. The length of time required for inspections at any one location will be short in duration, lasting a few minutes at each tower. Some noise-sensitive receptors may experience a periodic, temporary, short-term increase in noise that exceeds 75 dBA  $L_{eq}$ . Noise above 75 dBA  $L_{eq}$  will be limited to within 235 feet of the transmission line. Because this noise increase will be temporary and short-term, lasting only a few minutes, it is not anticipated to exceed the hourly average of 75 dBA at any one receptor location. In addition, it is unlikely that the helicopter will be closer than 235 feet from any residence. As a result, impacts will be less than significant.

#### *Boulevard Substation Rebuild*

Reconstruction of the Boulevard Substation will not require any significant changes to the current operation and maintenance activities at the existing substation. Preventive maintenance for the expanded substation will continue with approximately the same crew sizes and frequency as the existing substation, with the visits lasting for longer durations. Therefore, noise levels due to operation and maintenance will not change significantly and impacts will be less than significant.

#### *White Star Communication Facility Rebuild*

Operation and maintenance activities and preventive maintenance may increase slightly for the rebuilt White Star Communication Facility; however, the increase will not result in substantial noise-generating activities. Therefore, impacts will be less than significant.

### **Question 4.10e – Air Traffic Noise from Public Airports**

#### ***Construction – Less-than-Significant Impact***

The Jacumba Airport will be utilized for initial helicopter take-offs and landings and as the primary refueling area. Helicopter operations out of Jacumba Airport are anticipated to occur approximately 10 days during construction with no more than 10 operations per day. The airport currently operates with 325 flights per year.<sup>17</sup> Therefore, the annual average noise levels will increase by less than 10 dB.<sup>18</sup> In addition, the Jacumba Airport Land Use Compatibility Plan projected the annual operations at this facility to increase to approximately 4,100 operations per

<sup>17</sup> <http://www.sdcounty.ca.gov/dpw/airports/jacumba.html>

<sup>18</sup> Assuming that the noise from a helicopter operation is 10 dB more than an existing single-engine plane operation,  $\Delta dB = 10 * \log((100 * 10^{(9.5)} + 325 * 10^{(8.5)}) / (325 * 10^{(8.5)})) = 6.1$  dB

year by 2024. The anticipated noise generated by this future level of activity, which is greater than the sum of the current airport traffic and that expected from the Proposed Project, creates a noise contour of 60 dBA CNEL that is located within the airport's parcel. As a result, the increased activity at the Jacumba Airport due to the construction of the Proposed Project will not expose the surrounding land uses to noise in excess of 75 dBA  $L_{eq}$ , making this activity consistent with the San Diego County Noise Ordinance. Although Proposed Project construction in the vicinity of the airport will temporarily increase noise, no residences are within 0.10 mile of the airport and none will be exposed to noise level in excess of 75 dBA  $L_{eq}$ . Therefore, impacts due to construction-related aircraft traffic will be less than significant.

#### ***Operation and 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 will not increase by 10 dB. Furthermore, as previously described in Question 4.10a, all operational noise from the Proposed Project components, including inspection and maintenance work conducted on the ground, will produce minimal noise that will not add to the existing airport noise in a way that adversely affects residents in the area, the nearest being 0.10 mile from the airport. The increase in helicopter inspection after construction of the Proposed Project will be minimal. Thus, no impacts will occur.

#### **Question 4.10f – Air Traffic Noise from Private Airstrips – No Impact**

Use of any private airstrips is not anticipated during the construction of the various components of the Proposed Project. The only Proposed Project component in close proximity to a private airstrip is the 138 kV transmission line, but its construction, operation, and maintenance will not involve the private airstrip. Thus, no impacts will occur.

#### **4.10.4 Applicant-Proposed Measures**

The following APMs will reduce any potentially significant impacts due to noise and vibration to a less-than-significant level:

- APM-NOI-01: Construction activities will occur during the times established by the local ordinances (generally between 7 a.m. and 7 p.m. Monday through Saturday), with the exception of certain activities where nighttime and weekend construction activities are necessary, including, but not limited to, delivery of substation transformers, filling of substation transformers, system transfers, pouring of foundations, and pulling of the conductor, which require continuous operation or must be conducted during off-peak hours per agency requirements. For any work that cannot occur during those timeframes, SDG&E will limit construction activities so that noise will not exceed an hourly average of 45 dB when measured at the border of the nearest parcel with an inhabited residence. If activities cannot be limited to meet this noise threshold, SDG&E will communicate the exception to San Diego County in advance of conducting the work that will exceed the threshold.

- APM-NOI-02: SDG&E will provide notice of the construction plans to all property owners within 300 feet of the Project by mail at least one week prior to the start of construction activities. The announcement will state the construction start date, anticipated completion date, and hours of operation, and well as provide a telephone contact number for receiving questions or complaints during construction.
- APM-NOI-03: Helicopter operation will be prohibited during construction of the 138 kV transmission line in the immediate vicinity of pole SP-52, located at approximate MP 7.3, and between pole SP-26, located at approximate MP 10.5, and the Rebuilt Boulevard Substation. If helicopter use cannot be avoided in these locations, SDG&E will temporarily relocate the impacted residents, on an as-needed basis, for the duration of the helicopter use that would impact them.

#### 4.10.5 References

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