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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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" 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) South Bay Substation Relocation Project (Proposed Project). Noise would 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 would be reduced to the less-than-significant level with the implementation of applicant-proposed measures (APMs). Operational noise would be less than significant.

4.10.1 Methodology

Information regarding existing noise sources and standards was obtained from local, regional, state, and federal literature reviews to establish the noise standards for the Proposed Project location. Evaluation of potential noise impacts from the Proposed Project included measuring existing noise levels at the Proposed Project site and in the vicinity, characterizing the existing noise environment, calculating noise generation from the Bay Boulevard Substation equipment based on the performance of the equipment at other locations, and examining typical noise levels resulting from construction and operation activities. The noise analysis focuses on the construction of the Bay Boulevard Substation, installation of underground duct banks, and demolition of the South Bay Substation, where grading of the site and use of heavy equipment would occur.

4.10.2 Existing Conditions

Regulatory Setting

Federal

No federal noise standards directly regulate noise from operation of electrical transmission lines and substation facilities. However, in 1974 the United States (U.S.) 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 decibels¹ (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.

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 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.

By 2002, agencies including the Department of Transportation, Department of Labor, Federal Railroad Administration, and Federal Aviation Administration, 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 Level² (CNEL) as the noise standard associated with aircraft noise measured at exterior locations in noise sensitive land uses³ (NSLU). This standard is also generally applied to railroad noise.

² 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.

³ 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.

California Department of 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 human annoyance have been developed by Caltrans and will be used to evaluate potential Proposed Project vibration sources. Table 4.10-1: Human Response to Transient Vibration lists the Caltrans thresholds of 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

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.

City of Chula Vista General Plan Noise Element

Noise levels within the City of Chula Vista (City) are regulated by the City's General Plan. The purpose of the Noise Element in the General Plan is to identify existing conditions and to provide general guidelines that would reduce the negative impact of noise on the community in the future. The City's objectives are "to identify the main sources in the rising tide of sound which impact our citizenry..." and "...to suggest some ways in which the City may move forward to a quieter environment."

According to the General Plan Noise Element, all land uses are considered incompatible with noise levels in excess of 75 dBA CNEL. For other types of land uses, such as offices, businesses, churches, athletic fields, and community parks, a limit of 70 dBA CNEL has been established. More sensitive land uses, such as residences, schools, neighborhood parks, and libraries, are considered significantly affected by noise in excess of 65 dBA CNEL. The Proposed Project is located within an industrial zone; therefore, noise levels should not exceed 75 dBA CNEL.

City of Chula Vista Municipal Code Noise Ordinance

The City of Chula Vista Noise Ordinance—Chapter 19.68 of the Chula Vista Municipal Code—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: City of Chula Vista Sound Level Limits. In the case that two adjacent properties each have different zone classifications, the sound level limit at the more restrictive property is used. The Noise Ordinance prohibits 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 unless a variance is granted. The Noise Ordinance allows the City to grant variances from the noise limitations for temporary on-site noise sources, subject to terms and conditions intended to achieve compliance. 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.

Section 060 of the Noise Ordinance establishes an exemption from the noise levels presented in Table 4.10-2: City of Chula Vista Sound Level Limits for construction and demolition activities. In addition, Section 050(C) regulates construction-related vibration such that operating or permitting the operation of any device that creates a vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way is prohibited.

Table 4.10-2: City of Chula Vista Sound Level Limits

Zone Categories	One-Hour Average Noise Level (A-weighted Decibels)	
	10 p.m. to 7 a.m. (weekdays) 10 p.m. to 8 a.m. (weekends)	7 a.m. to 10 p.m. (weekdays) 8 a.m. to 10 p.m. (weekends)
All Residential (Except Multiple Dwelling)	45	55
Multiple Dwelling Residence	50	60
Commercial	60	65
Light Industry (I-R and I-L Zones)	70	70
Heavy Industry (I Zone)	80	80

Source: City of Chula Vista, 2010

Existing Noise Measurements

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}).

In order to quantify existing ambient and operational noise levels, noise monitoring was conducted on April 11 and July 11, 2007 at two locations within the Proposed Project site. The first monitoring site (Site 1) was located approximately 400 feet north of the Bay Boulevard Substation's northern fence line. The second site (Site 2) was located adjacent to the northwestern fence of the existing South Bay Substation. These sites were selected because they were acoustically representative of typical existing noise exposure within the Proposed Project area. The locations of the noise measurement sites are depicted on Figure 4.10-1: Noise Measurement Locations Map.

The 10-minute measurements ranged from approximately 45.2 dBA to 53.1 dBA with the L_{eq} being 45.3 dBA and 52.9 dBA at Site 1 and Site 2, respectively. The results of these field measurements are summarized in Table 4.10-3: Noise Measurement Results and the raw measurement data has been included as Attachment 4.10-A: Noise Measurement Data. The noise monitoring results indicate that the Proposed Project area is located in an area with ambient noise levels that are generally considered to be low.

Existing Noise Sources

The dominant ambient noise sources in the Proposed Project area are transportation-related. Heavy on-road traffic from Interstate 5 (I-5) and the existing adjacent road network—including Bay Boulevard, Palomar Street, Industrial Boulevard, and L Street—account for a portion of the existing ambient noise. Additional transportation-related noise is generated by the Blue Line of the San Diego Metropolitan Transit System, located adjacent to I-5. Finally, aircraft traffic from commercial and military airplanes and helicopters are another contributor to existing ambient noise in the Proposed Project area.



Figure 4.10-1: Noise Measurement Location Map **South Bay Substation Relocation Project**

- Noise Measurement Location
- New Access Routes and Driveways
- ▭ Substation Wall
- ▭ 12.42-Acre Parcel Boundary
- ▭ SDG&E Easement

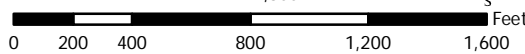


Table 4.10-3: Noise Measurement Results

Site Number	Site Description	Monitoring Results (A-weighted Decibels)		
		L _{min}	L _{max}	L _{eq}
1	At the northern portion of the existing liquefied natural gas property.	43.2	44.9	45.3
2	Directly west of the existing South Bay substation.	51.5	53.1	52.9

Noise-Sensitive Receptors

The Proposed Project area is dominated by light-industrial land uses. The Bay Boulevard Substation site is bounded to the south and east by industrial parks and to the north by the existing South Bay Substation and South Bay Power Plant. There are multiple sensitive noise receptors—defined as residences, schools, hospitals, recreation areas, and places of worship—located in the vicinity of the Proposed Project site. The nearest noise-sensitive receptors to the Proposed Project site are residential neighborhoods located approximately 800 feet east of SDG&E’s existing 300-foot-wide easement. I-5 and active railroads, as described previously, are located between the Proposed Project site and these residential areas. Table 4.10-4: Sensitive Noise Receptors provides a summary of the types of noise-sensitive receptors located within one mile of the Proposed Project.

Table 4.10-4: Sensitive Noise Receptors

Receptor Type	Receptor Name	Distance from Proposed Project Site (miles)	Direction from Proposed Project Site
Residential	Various Locations	<1.0	North
	Brentwood Park – Country Club Living	0.3	Southeast
Schools	Harborside Elementary School	0.5	Southeast
Hospitals	TRICARE Outpatient Clinic Chula Vista	0.6	East
	U.S. Healthworks of California, Chula Vista	0.8	East
Places of Worship	Christian Life Center of San Diego, Inc.	0.4	Northeast
	South Bay Baptist Church	1.0	Northeast
	Chula Vista Apostolic	1.0	Southeast
	Templo Ebenezer	0.9	Southeast
Parks	Chula Vista Bayfront Park	0.8	Northwest
	Marina View Park	0.7	Northwest

Note: Sensitive receptor populations utilized in this analysis are those within a one-mile radius of the Bay Boulevard Substation site.

4.10.3 Impacts

Significance Criteria

Noise

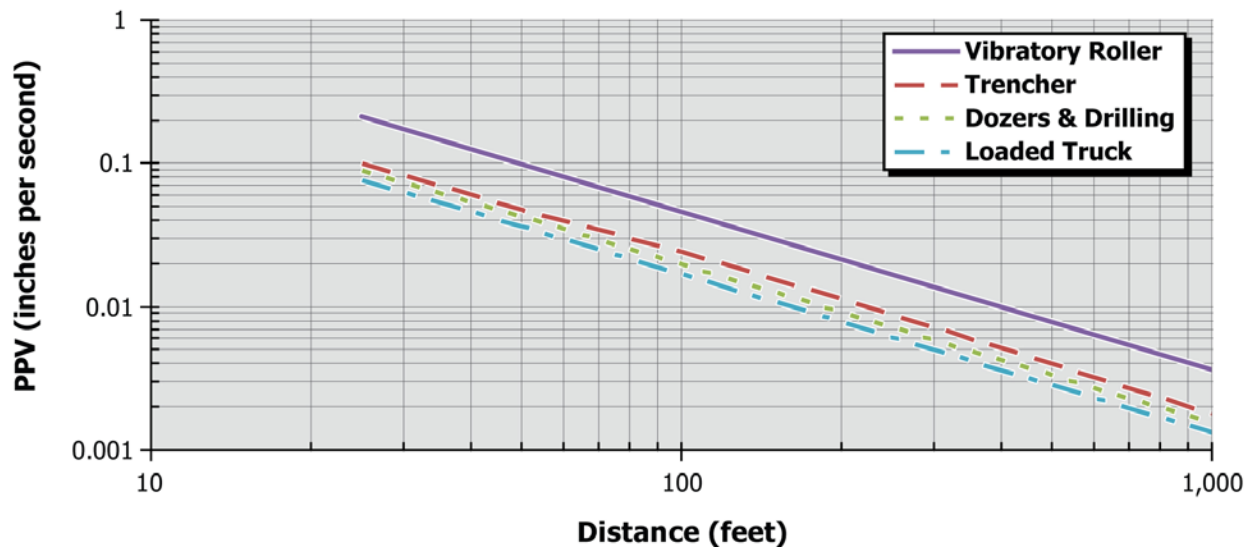
Standards of significance were derived from Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Noise impacts are considered significant if they:

- Result in 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
- Result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels
- Result in substantial permanent increase in ambient noise levels in the Proposed Project vicinity above levels existing without the project
- Result in substantial temporary or periodic increase in ambient noise levels in the Proposed Project vicinity above levels existing without the project
- Lie 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, and, as a result, expose people residing or working in the Proposed Project area to excessive noise levels
- Lie in the vicinity of a private airstrip, and, as a result, expose people residing or working in the Proposed Project area to excessive noise levels

The construction and operational noise thresholds of significance for the Proposed Project components have been derived from the applicable regulatory documents as discussed previously in Section 4.10.2 Existing Conditions. The City of Chula Vista's Municipal Code exempts all construction and demolition activities from the standards set in the noise ordinance. Table 4.10-2: City of Chula Vista Sound Level Limits contains the applicable limits for the operational noise generated by the Proposed Project. Because the Proposed Project is bordered by light industrial land uses on three sides, operational noise would be considered significant if it exceeds 70 dBA at an adjacent property line.

Vibration

Vibration amplitude decreases with distance from the source, as presented in Figure 4.10-2: Construction Vibration Amplitudes. Perceptibility of vibrations from construction equipment can be estimated by comparing the vibration thresholds provided in Table 4.10-1: Human Response to Transient Vibration to Figure 4.10-2: Construction Vibration Amplitudes. Vibration amplitudes with a PPV above 0.032 inch/second would be considered potentially significant. This amplitude corresponds with a distance of approximately 50 feet from construction activities.

Figure 4.10-2: Construction Vibration Amplitudes**Question 4.10a – Noise in Excess of Standards*****Construction – No 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. Typical noise levels from construction equipment are provided in Table 4.10-5: Noise Levels Generated by Typical Construction Equipment. As demonstrated by Table 4.10-5: Noise Levels Generated by Typical Construction Equipment, noise levels from this equipment during construction would typically range from 75 to 89 dBA, measured at 50 feet. The noise level generated from operating a helicopter would be approximately 95 dBA at a distance of 200 feet. As discussed in Section 4.10.2 Existing Conditions, construction-related noise sources would be exempt from the City of Chula Vista Noise Ordinances. As a result, there would be no impact.

Operation and Maintenance – Less-than-Significant Impact***Bay Boulevard Substation***

The primary noise source associated with the operation of the Bay Boulevard Substation would be from the transformers and their associated 120-cycle vibration and cooling fans. The cooling fans typically operate in stages, with their load increasing and decreasing with the temperature of the windings located in the main tank. Attachment 4.10-B: Noise Study for the South Bay Relocated 230/69/12 kV Substation contains a study that simulates the operational noise anticipated from the Bay Boulevard Substation's ultimate arrangement.

Table 4.10-5: Noise Levels Generated by Typical Construction Equipment

Equipment	Noise Level Range 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

For this simulation, the transformers were assumed to emit the maximum noise allowed under SDG&E's specifications—71 dBA for the 230/69 kV transformers, 61 dBA for the 69/12 kV transformers, and 58 dBA for the 69 kV grounding transformers. Figure 4.10-3: Bay Boulevard Substation Operational Noise Contours depicts the results of this simulation. The contour lines on this figure show that the maximum noise level from the operation of the Bay Boulevard Substation would be approximately 50.9 dBA or less when measured at the substation's existing perimeter fence.

Because the noise generated would be less than the allowable noise limits of the receiving land uses that surround the substation—70 dBA for light industrial during the evening—the operation of the Bay Boulevard Substation would be consistent with the applicable noise regulations. As a result, there would be no impact.

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 Bay Boulevard and I-5. In addition, the proposed maintenance activities would be similar to those being performed at the existing South Bay Substation. As a result, there would be no exceedance of established noise standards due to the maintenance of the substation and there would be no impact.

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 230 kV line typically would produce noise levels up to 36 dBA when measured at the edge of the transmission line right-of-way (ROW) during dry conditions.⁴ A noise level of 36 dBA would be practically unnoticeable, as it is easily masked by other ambient noise sources in the area, including the Bay Boulevard Substation.

Corona levels (and audible noise levels) are the 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 five 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 six dBA for each doubling of distance from the source, the corona noise during poor weather conditions is expected to be less than 38 dBA at the nearest sensitive receptor, located approximately 800 feet east of SDG&E's transmission easement. As a result, the significance levels of 50 dBA during

⁴ Source: Sunrise Powerlink Environmental Impact Report (EIR)

the day and 45 dBA at night would not be exceeded during operation, and no impact would occur.

The transmission circuits that would loop into the substation would be inspected annually. The non-emergency major maintenance required could potentially include the replacement of insulators damaged by either vandals or line-surge and flashovers. Maintenance crews would consist of a crew comprised of as many as four people and may require a tool truck, an assist truck, and a large bucket lift truck. Because of the contaminants in the air that exist in coastal regions, insulators may also require washing up to three times a year. 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 be imperceptible to the surrounding land uses. As a result, no impacts would occur.

Question 4.10b – Groundborne Vibration and Noise

Construction – No Impact

Construction activities can generate varying degrees of ground-borne vibration, depending on the construction procedure and the construction equipment used. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiving buildings. The City of Chula Vista's vibration thresholds prohibit perceivable vibration from extending beyond the property boundary of the source or onto private property. Table 4.10-1: Human Response to Transient Vibration states that vibration becomes perceptible by humans at an amplitude of approximately 0.032 inch/second. When compared to Figure 4.10-2: Construction Vibration Amplitudes, a PPV of 0.032 is generated at a distance of approximately 50 feet by a loaded truck. Because the closest receptors would be located approximately 130 feet south of the Proposed Project site, construction activities would not generate perceivable levels of ground-borne vibration. As a result, there would be no impact.

Operation and Maintenance – No Impact

Increases in vibration from normal operation and maintenance, beyond those described for the construction activities, would not be anticipated. The operation and maintenance activities associated with the Proposed Project would involve minimal earthwork; most of the activities would involve upkeep of existing equipment. In addition, these maintenance activities are already being conducted by SDG&E within the Proposed Project area. None of the Proposed Project facilities generate vibration as a result of their operation. Thus, no impacts due to vibration from operation and maintenance would occur.

Question 4.10c – Permanent Ambient Noise Increases

Construction – No Impact

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

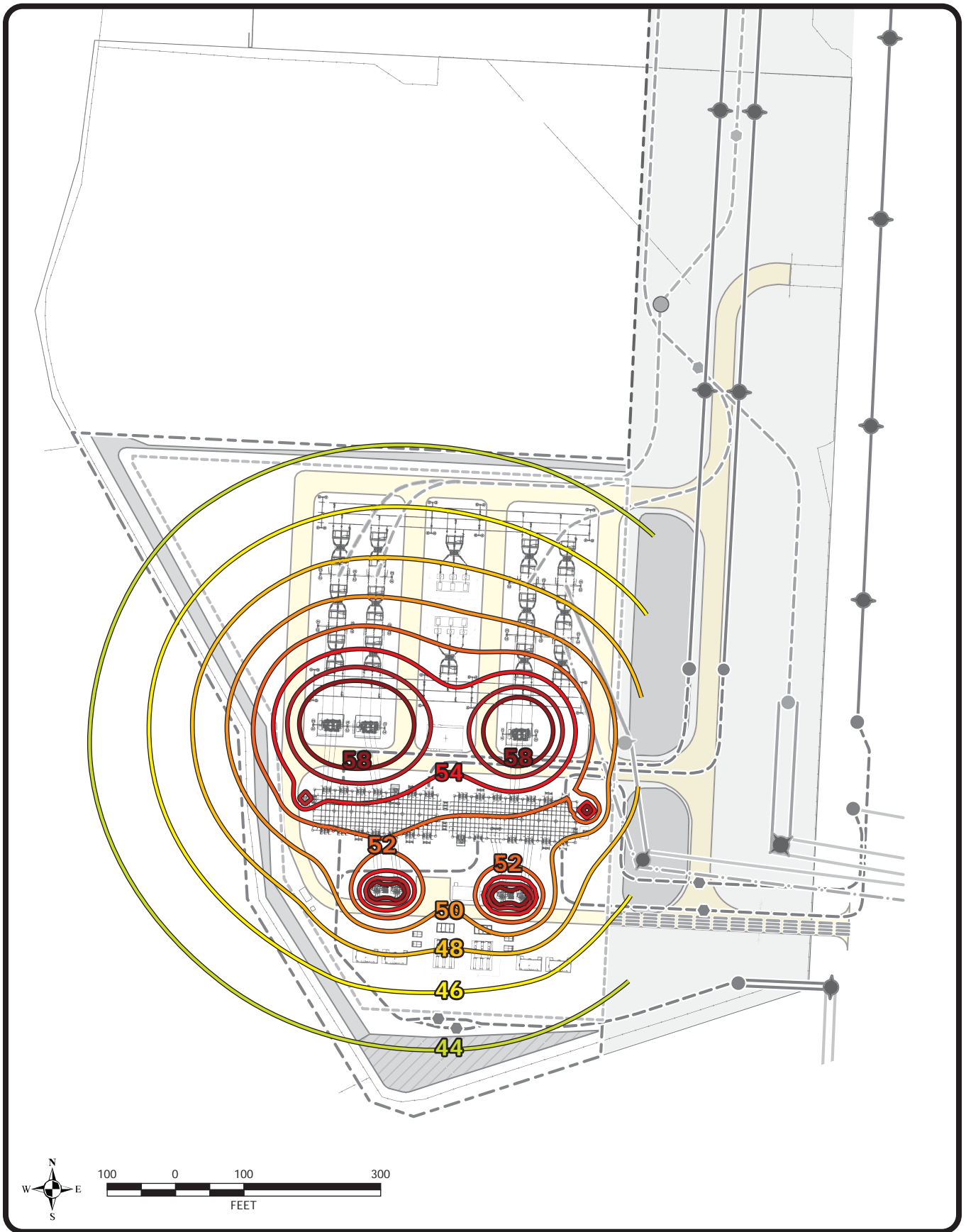


Figure 4.10-3: Bay Boulevard Substation Operational Noise Contours

Operation and Maintenance – No Impact***Bay Boulevard Substation***

As described in the response to Question 4.10a, the primary source of operational noise at the Bay Boulevard Substation would be its transformers and their associated cooling fans. Figure 4.10-3: Bay Boulevard Substation Operational Noise Contours presents the simulated noise contours resulting from the operation of the substation.

Ambient noise levels in the area were measured to be approximately 45.3 dBA. The City of Chula Vista limits noise generation that would cause the adjacent industrial and residential land uses to be in exceedance of 70 dBA and 45 dBA, respectively. Because the 70 dBA and 45 dBA contours are contained within the parcel on which the Bay Boulevard Substation would be constructed, no significant permanent noise increases would occur. As a result, there would be no impact.

Transmission Lines

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 would generate a minimum of corona-related noise during dry conditions. The corona hum typically would 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 would be practically unnoticeable and would most likely be masked by other ambient noises. A permanent increase of five dBA or more would not extend beyond the ROW partly because the ambient noise includes the noise from the existing transmission lines. No noise-sensitive receptors would experience a permanent increase in noise; therefore, there would be no impact.

Question 4.10d – Temporary or Periodic Ambient Noise Level Increases***Construction – Less-than-Significant Impact***

Construction noise would be temporary and impacts during construction have been identified in the response to Question 4.10a. Noise-sensitive receptors would experience a temporary increase in ambient noise during construction activities, as previously described. Due to the short-term nature of the earth-moving activities, the existing transportation-related ambient noise sources in the area, and the generally industrial setting of the Proposed Project site, impacts would be less than significant.

Operation and Maintenance – No 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, the closest sensitive noise receptors to the Proposed Project are located approximately 800 feet to the east. I-5 serves as a major interstate in the area, and is located between these sensitive receptors and the Proposed Project. As a result, the periodic increases in ambient noise from construction vehicles would be masked by the significant amount of traffic noise from vehicles that pass along I-5 daily. In addition, SDG&E already performs similar maintenance activities in the

Proposed Project area that would not change following construction. Therefore, there would be no impact.

Question 4.10e – Air Traffic Noise from Public Airports

Construction – No Impact

The closest public airport to the Proposed Project—Brown Field Municipal Airport—is located approximately 6.3 miles southeast of the Bay Boulevard Substation. SDG&E would not use this airport for helicopter operations during construction. As a result, helicopter operations from the Brown Field Municipal Airport would not change as a result of the Proposed Project; therefore, there would be no impact.

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 would not increase. 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, would produce minimal noise that would not add to the existing airport noise in a way that adversely affects residents in the area. Thus, no impact would 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. Imperial Beach’s Outlying Landing Field is the closest private airstrip to the Proposed Project. This United States Navy facility is located approximately three miles southwest of the Bay Boulevard Substation. Construction, operation, and maintenance would not involve use of these or any other private airstrips. Thus, no impact would occur.

4.10.4 Applicant-Proposed Measures

Because no potentially significant impacts relative to noise would result from the Proposed Project, no applicant-proposed measures are provided.

4.10.5 References

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Bolt, Beranek, and Newman, Noise Control for Buildings and Manufacturing Plants, 1987.

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- CPUC. Memorandum. Applicants Filing Proponent's Environmental Assessment. November 24, 2008.
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- City of Chula Vista. Chula Vista General Plan. December 2005.
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- SDG&E. Noise Study South Bay 230/69/12 kV Substation. March 2009.
- U.S. Department of Transportation, Federal Transit Administration. *Transit Noise and Vibration Impact Assessment*. May 2006.
- U.S. Department of Transportation, Federal Aviation Administration. 2001. *AC No. 36-1H Noise Levels for U.S. Certificated and Foreign Aircraft, Appendix 10*. November 2001.

ATTACHMENT 4.10-A: NOISE MEASUREMENT DATA



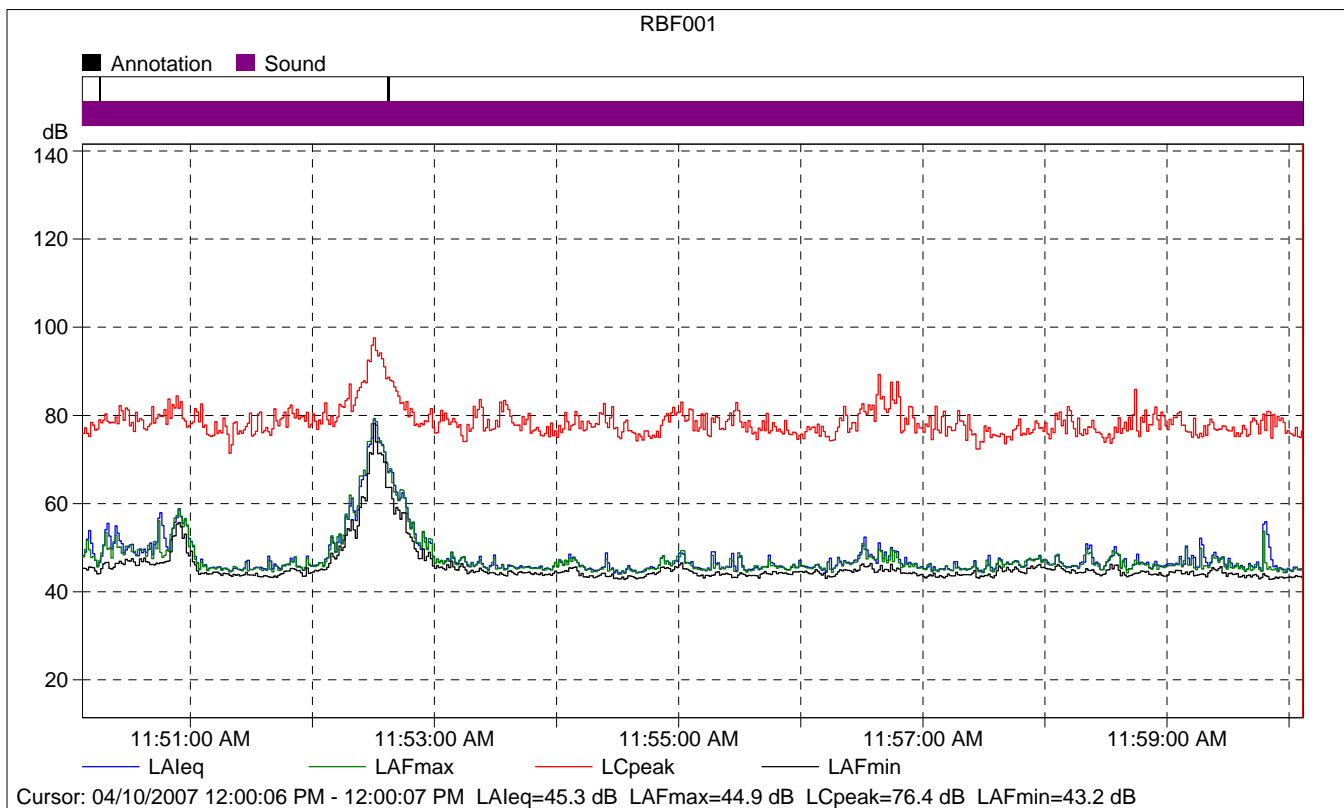
RBF001

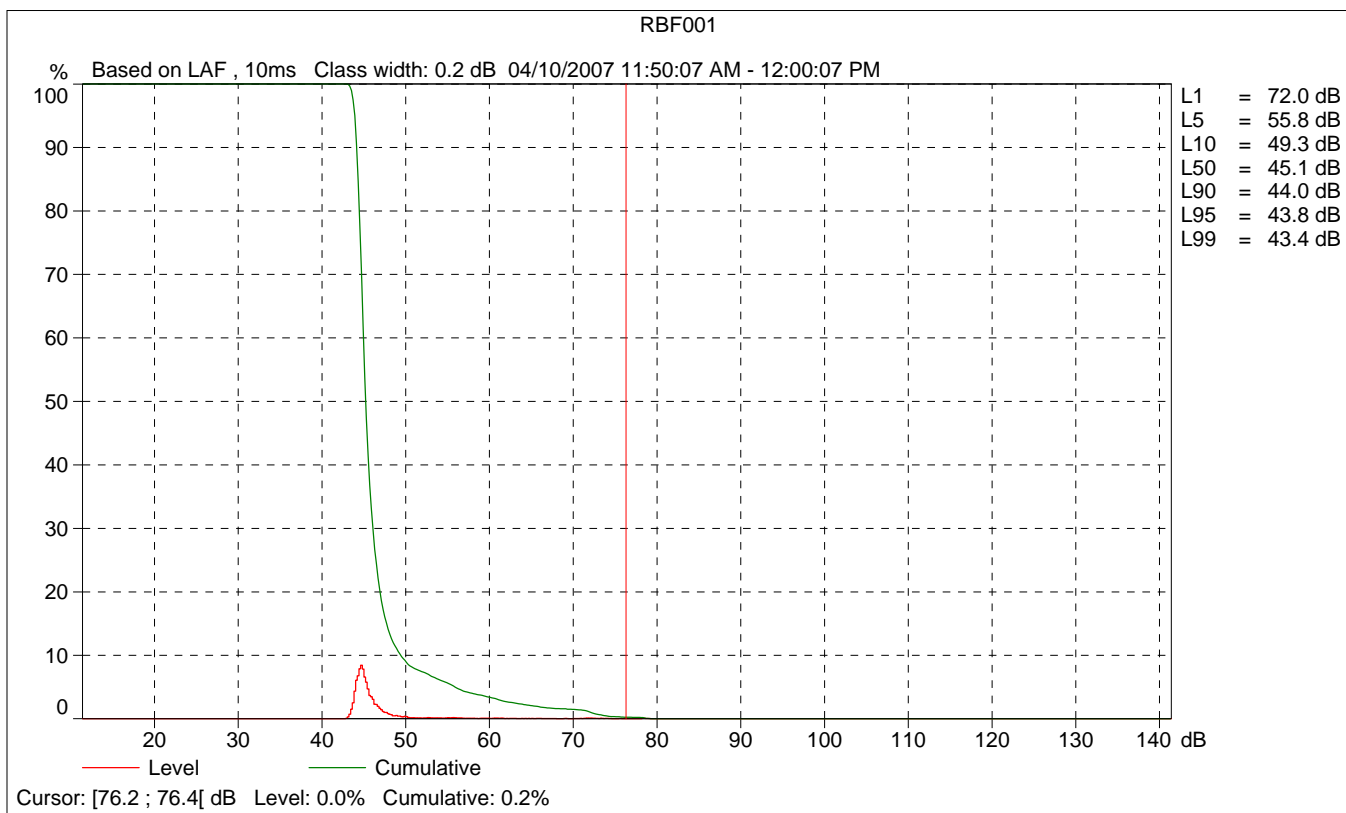
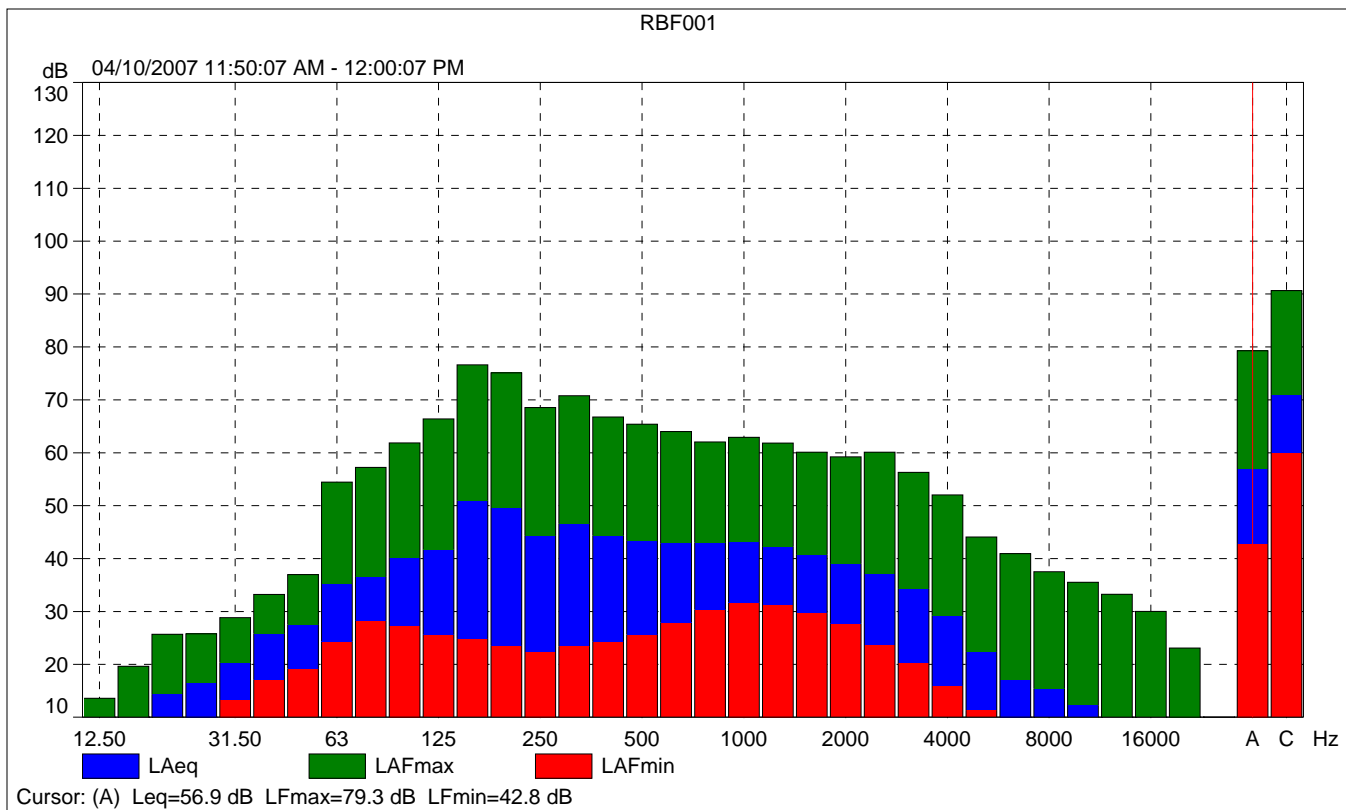
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End Time:		04/10/2007 12:00:07
Elapsed Time:		00:10:00
Bandwidth:		Broadband
Max Input Level:		140.23

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

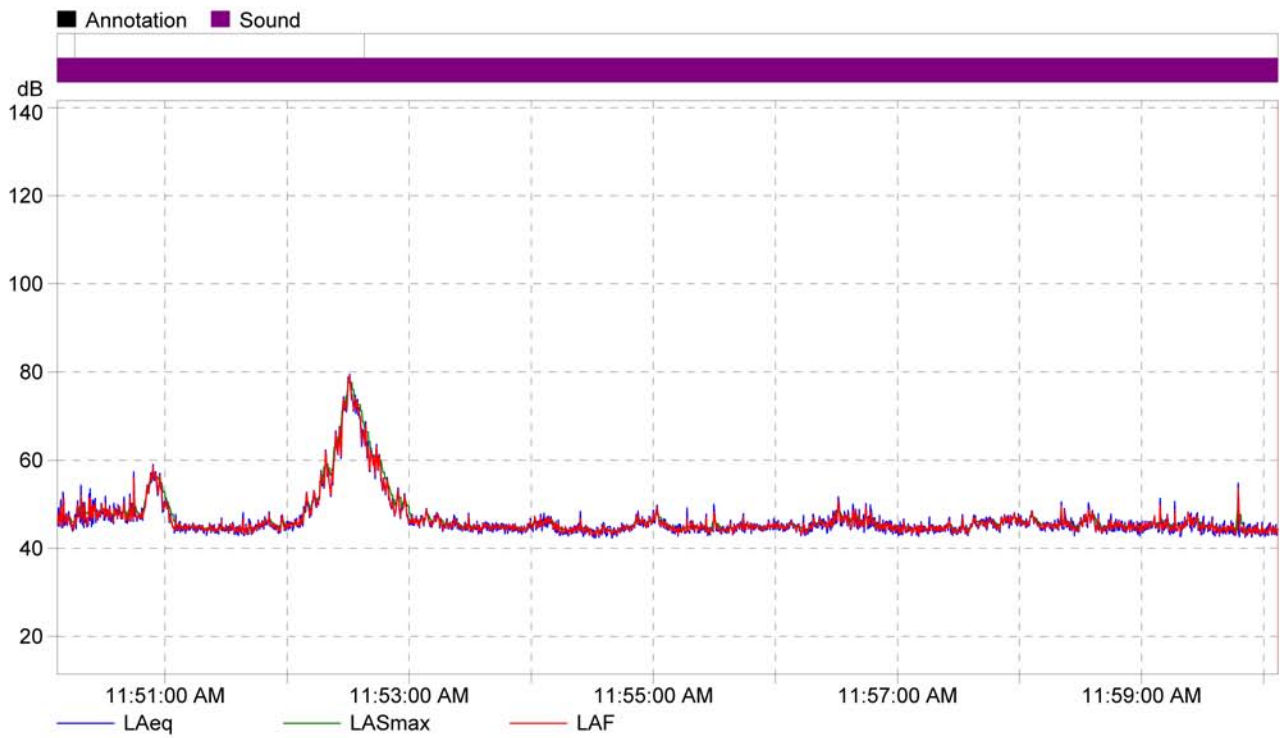
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Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		UA 1650
Sound Field Correction:		Free-field

Calibration Time:		03/27/2007 09:40:29
Calibration Type:		External reference
Sensitivity:		54.30 mV/Pa





RBF001 - Fast Logged



Cursor: 04/10/2007 12:00:06 PM.900 - 12:00:07 PM.000 LAeq=43.3 dB LASmax=44.4 dB LAF =43.6 dB





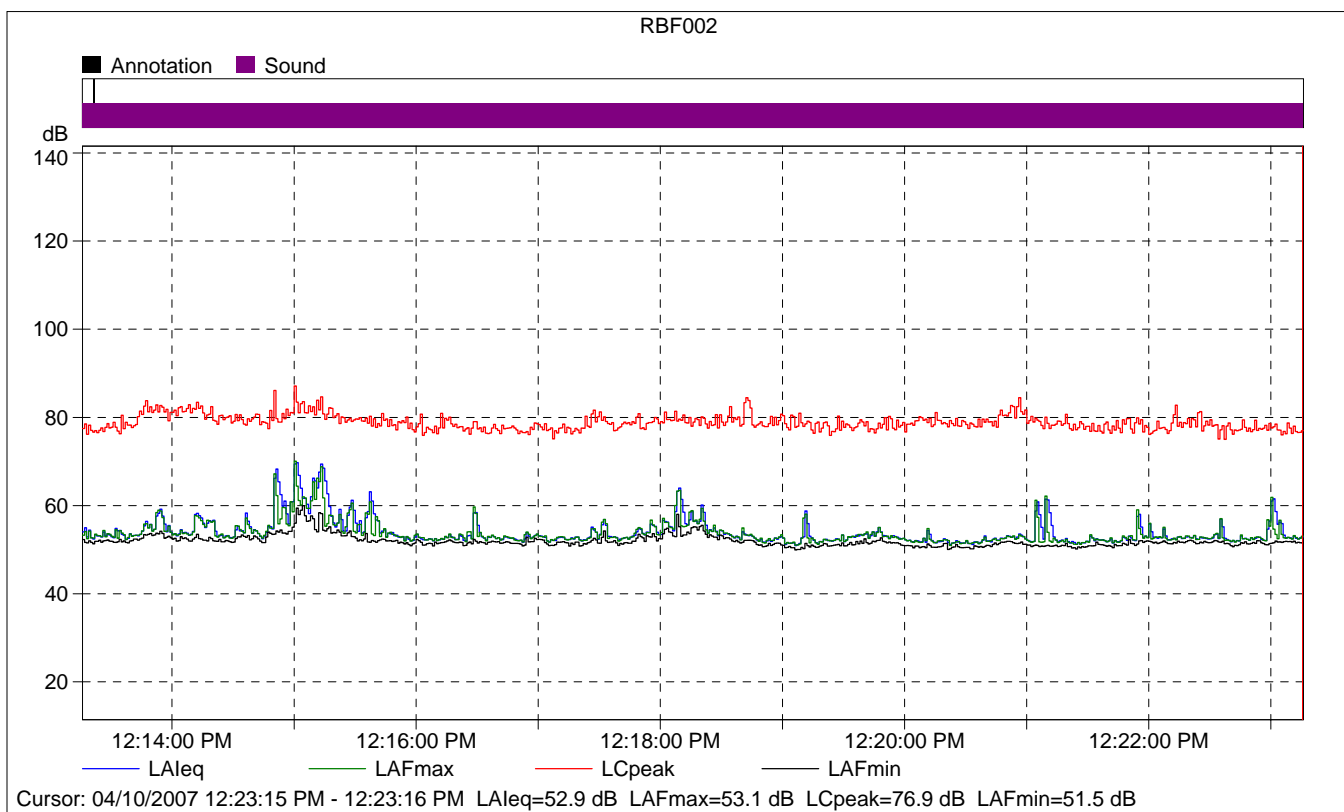
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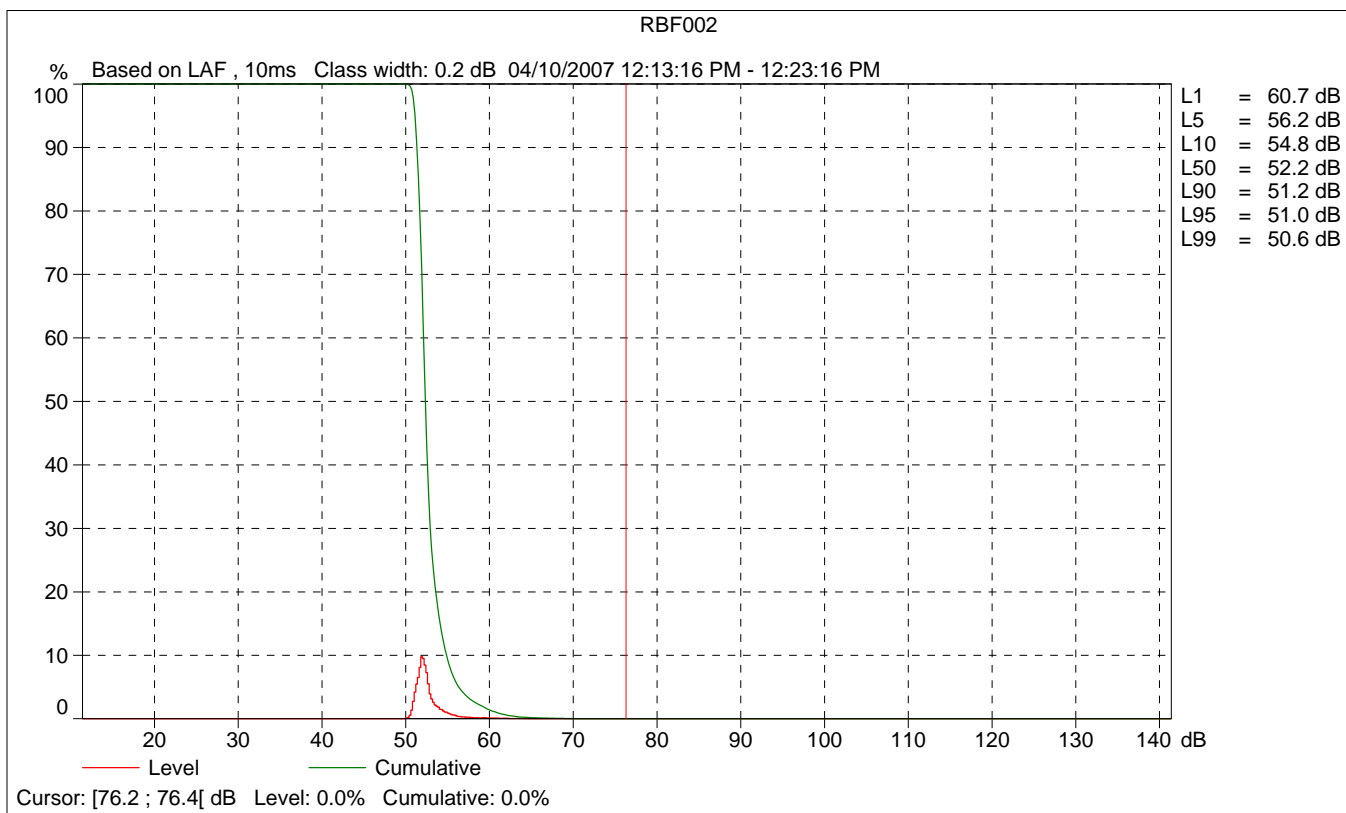
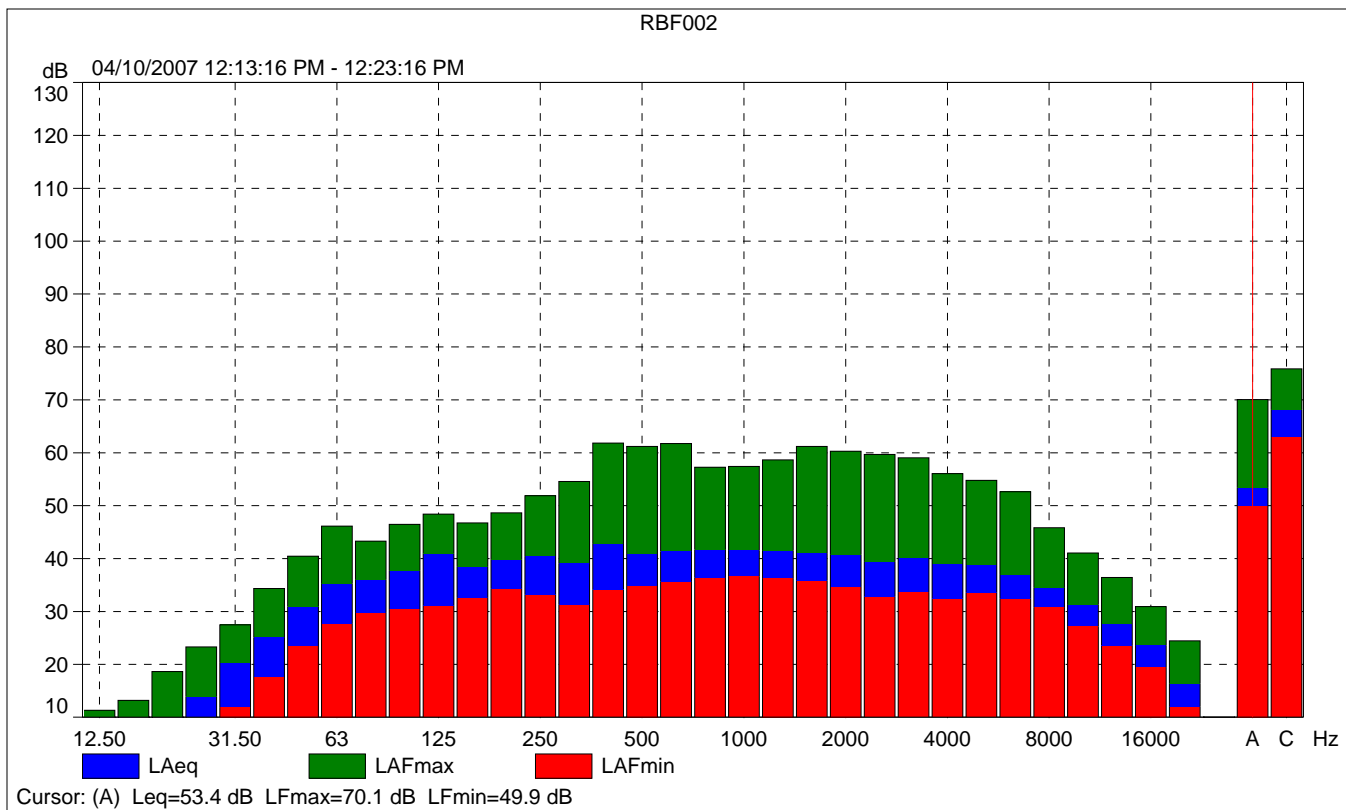
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Elapsed Time:		00:10:00
Bandwidth:		Broadband
Max Input Level:		140.23

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

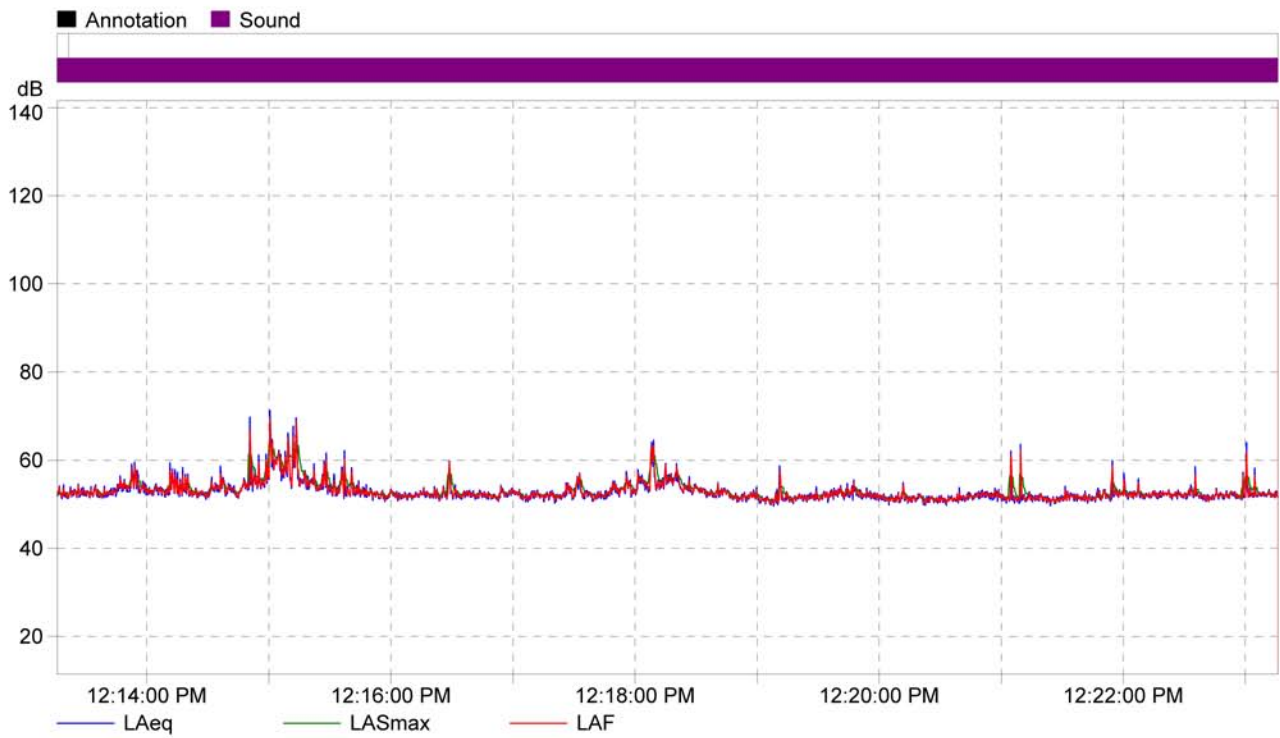
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Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		UA 1650
Sound Field Correction:		Free-field

Calibration Time:		03/27/2007 09:40:29
Calibration Type:		External reference
Sensitivity:		54.30 mV/Pa





RBF002 - Fast Logged



Cursor: 04/10/2007 12:23:15 PM.900 - 12:23:16 PM.000 LAeq=51.6 dB LASmax=52.3 dB LAF =51.7 dB



**ATTACHMENT 4.10-B: NOISE STUDY FOR THE SOUTH BAY RELOCATED 230/69/12 KV
SUBSTATION**

NOISE STUDY

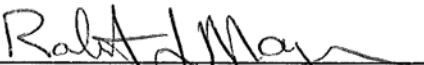
SOUTH BAY RELOCATED 230/69/12 KV SUBSTATION



A Sempra Energy™ company


San Diego Gas & Electric Co.

Prepared By:


R. J. Mayer, Principal Engineer
Substation Engineering & Design

Date: 2-27-09

Approved By:


J. D. Jenkins, Manager
Substation Engineering & Design

Date: MARCH 2, 2009

Summary

The calculated sound levels along all sides of the parcel lines are below the City of Chula Vista guidelines for noise in a Industrial zone of 70 dbA during the hours of 7 AM-10 PM and 70 dbA during the hours of 10 PM-7 AM. Attachment A-1 is a noise contour of the substation site that shows the sound level at various points along the perimeter during the maximum noise condition.

Attachment A-3 shows the location and equipment layout of the substation relative to the surrounding development. The substation is located in a parcel zoned for Industrial use.

Attachment A-4 is a copy of the Section 19.68.030 of the City of Chula Vista Municipal Code entitled "Exterior Noise Limits".

The sound analysis was performed for the ultimate substation configuration of three 230/69 kV transformers, four 69/12 kV transformers, and two 69 kV grounding transformers. The sources of noise for these transformers are typically 120-cycle vibration and cooling fans. The cooling fans operate in stages as the main tank oil temperature increases due to increased loading. The additional cooling allows the transformer to achieve the higher ratings.

The noise levels used in this study was 71 dbA for the 230/69 kV transformers, 61 dbA for the 69/12 kV transformers, and 58 db for the 69 kV grounding transformers. These sound levels are the maximum allowed by SDG&E specifications. A typical 230/69 kV, 224 MVA transformer sound test report from Siemens is shown in Attachment A-5.

Method of Analysis

Sound level calculations were performed using the EENoise program. The program uses noise equations published in the Standard Handbook for Electrical Engineers, 10th Edition, Section 11-100. They are as follows:

$$A = 20 \log_{10} \frac{2.83D}{Q} \quad (1)$$

$$Q = 1.7(WH)^{\frac{1}{2}} \quad (2)$$

A - decibel attenuation for distance > Q

D - distance from the noise source

Q - critical distance from noise source beyond which it appears as a point source

W - width of noise source perpendicular to a line from the noise source to the point in question. (i.e. an observer)

H - height of the noise source

The following equation calculates the noise level from a particular noise source observed at a given point:

$$SL = NSSL - A \quad (3)$$

SL = Sound level at the point in question

NSSL = Noise source sound level

A = decibel attenuation for distance > Q (see above)

For multiple noise sources the total sound level at a point from a number of noise sources is:

$$SL_{TOTAL} = 10 \text{ Log}_{10} (10^{X_1} + 10^{X_2} + \dots + 10^{X_n}) \quad (4)$$

Where

$$X_1 = SL_1/10$$

$$X_2 = SL_2/10$$

$$X_n = SL_n/10$$

Input Data

The input data required for the sound analysis program includes the length, width, and height dimensions of each transformer main tank, the sound level of each transformer, the number of transformers, the coordinates of the receptors, and coordinates of each noise source. All coordinates are referenced to the origin of the coordinate system. The dimensions and coordinates for each transformer are listed below. The noise level for each 230/69 kV transformer is 71 dbA; 61 dbA for the 69/12 kV transformers, and 58 db for the 69 kV grounding transformers. The coordinates of the receptors with associated sound level are shown in the table below and on the noise contours in Attachment A-1.

Transformer Dimensions:

	230/69 kV	69/12 kV	69 kV Gnd
Length (X)	12.50 feet	6.25 feet	9.25 feet
Width (Y)	34.00 feet	14.00 feet	4.34 feet
Height (Z)	13.00 feet	12.70 feet	11.6 feet

Transformer Coordinates:

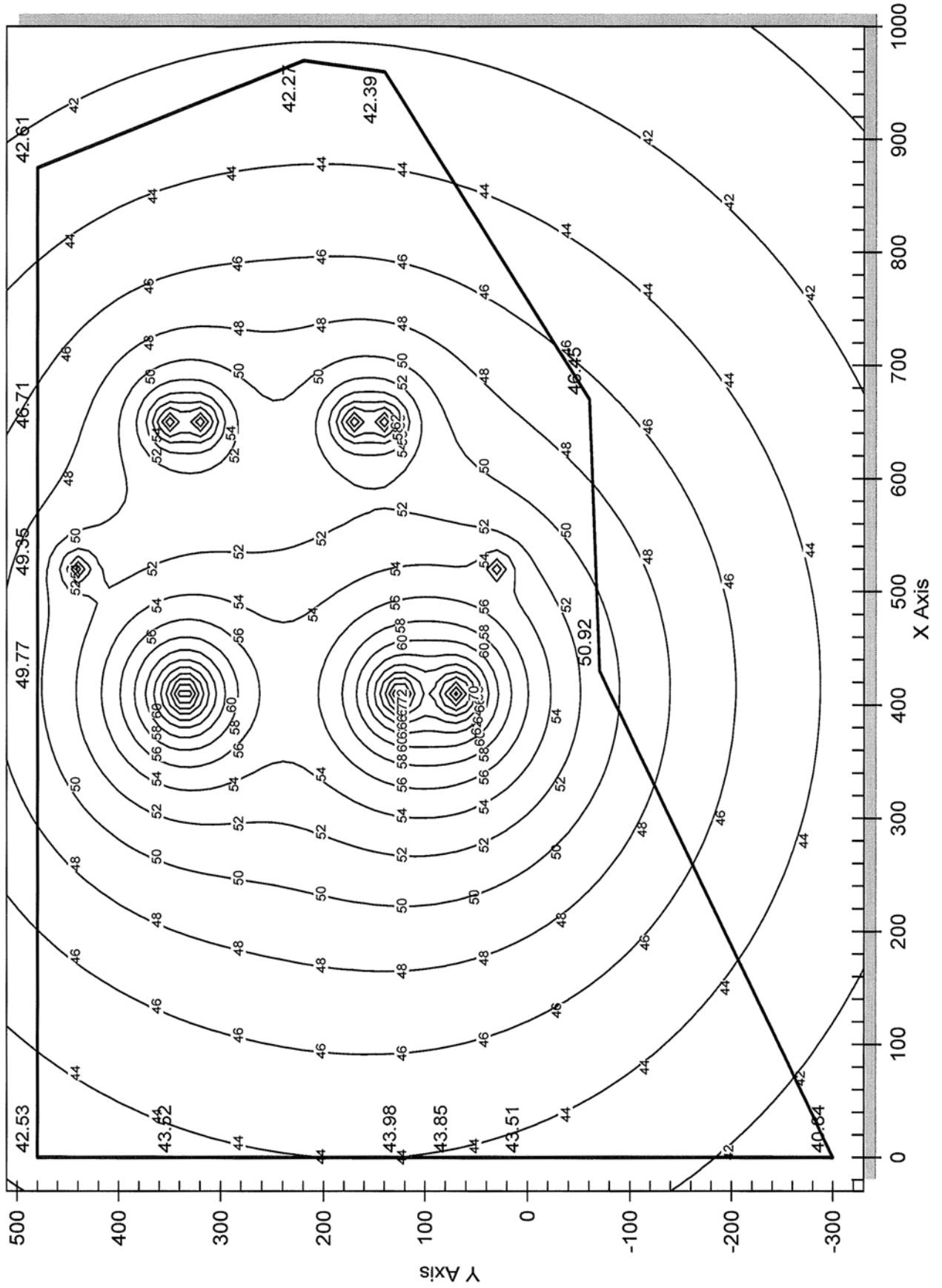
Bank	Position X (ft)	Position Y (ft)
70	410	70
71	410	125
72	410	335
30	650	140
31	650	170
32	650	320
33	650	350
No. Bus Gnd Bk	520	30
So. Bus Gnd Bk	520	440

Receptor Coordinates & Noise Levels:

Receptor	Position X (ft)	Position Y (ft)	Position Z (ft)	Noise (dbA)
1	0	0	6	43.51
2	0	-300	6.	40.84
3	430	-70	6	50.92
4	670	-60	6	46.45
5	960	140	6	42.39
6	970	220	6	42.27
7	875	480	6	42.61
8	640	480	6	46.71
9	510	480	6	49.35
10	410	480	6	49.77
11	0	480	6	42.53
12	0	340	6	43.52
13	0	120	6	43.98
14	0	70	6	43.85

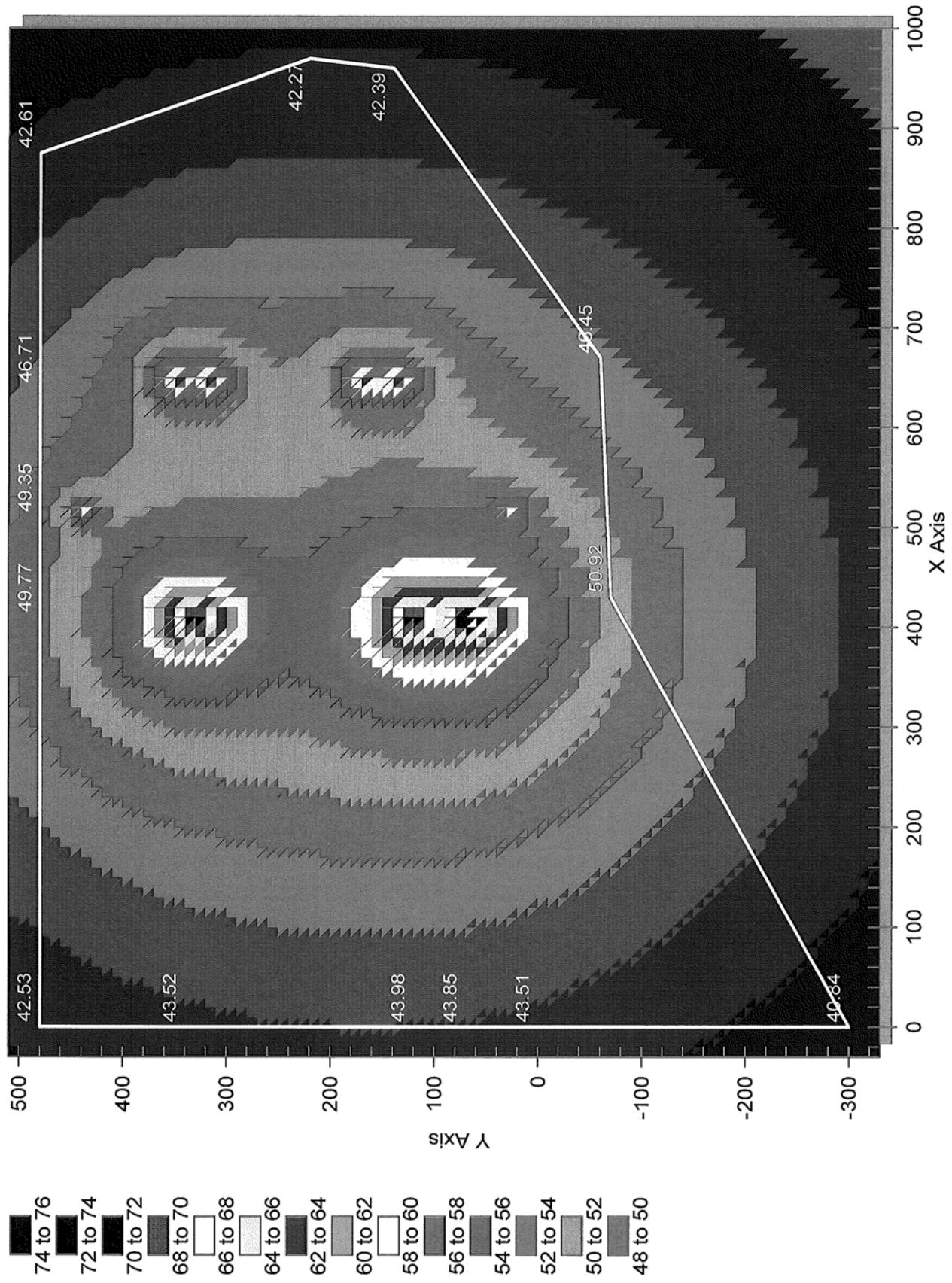
ATTACHMENT 1

Bayfront 230/69/12 kV Sub Substation Noise Contour (Z = 6)

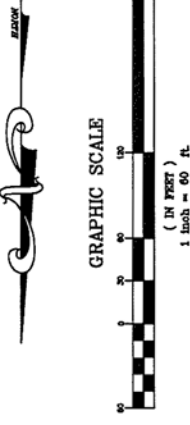
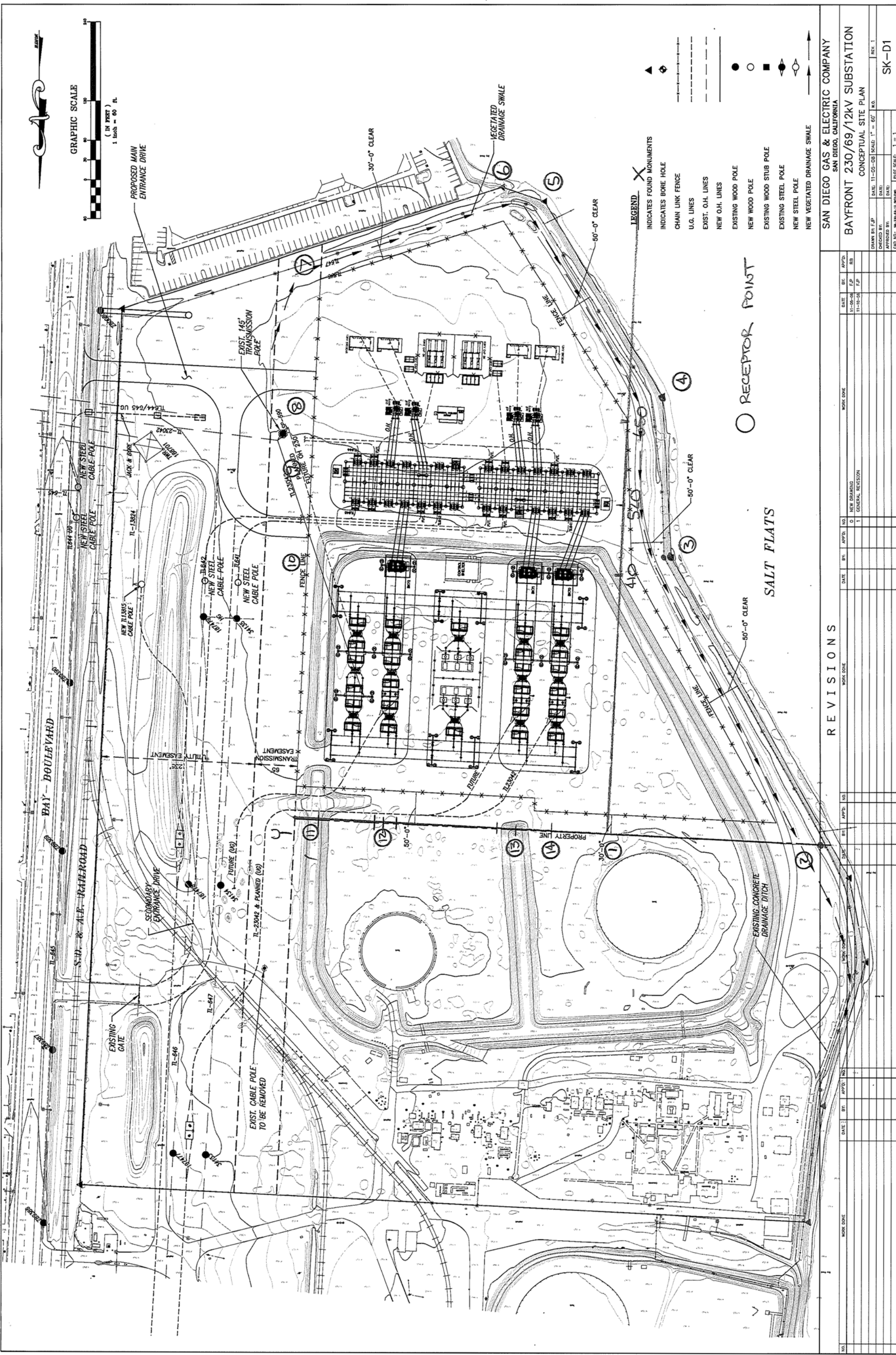


ATTACHMENT 2

Bayfront 230/69/12 kV Sub Substation Noise Contour (Z = 6)



ATTACHMENT 3



- LEGEND**
- INDICATES FOUND MONUMENTS
 - INDICATES BORE HOLE
 - CHAIN LINK FENCE
 - U.G. LINES
 - EXIST. O.H. LINES
 - NEW O.H. LINES
 - EXISTING WOOD POLE
 - NEW WOOD POLE
 - EXISTING WOOD STUB POLE
 - EXISTING STEEL POLE
 - NEW STEEL POLE
 - NEW VEGETATED DRAINAGE SWALE

○ RECEPTOR POINT

SALT FLATS

REVISIONS

NO.	DATE	BY	APP'D.	NO.	WORK DONE
1	11-05-08	F.P.	REB	0	NEW DRAWING
2	11-10-08	F.P.	REB	1	GENERAL REVISION

SAN DIEGO GAS & ELECTRIC COMPANY
 SAN DIEGO, CALIFORNIA
BAYFRONT 230/69/12KV SUBSTATION
 CONCEPTUAL SITE PLAN

DATE: 11-05-08 SCALE: 1" = 60' REV. 1
 DRAWN BY: F.P.
 CHECKED BY:
 APPROVED BY:
 CAD NO.: 08-2044-12-00000 PLOT SCALE: 1" = 1"

SK-D1

ATTACHMENT 4

visual observation of moving objects. The perception threshold shall be presumed to be a motion velocity of 0.01 inch/second over the range of 1 to 100 Hertz.

CC. "Weekday" means any day, Monday through Friday, which is not a legal holiday. (Ord. 2642 § 3, 1995; Ord. 2101 § 3, 1985).

19.68.030 Exterior noise limits.

A. Maximum Permissible Sound Levels by Receiving Land Use.

1. The noise standards for the various categories of land use as presented in Table III, and set forth in terms defined in the city land use code set forth in Chapter 19.04 CVMC, shall, unless otherwise specifically indicated, apply to each property or portion of property substantially used for a particular type of land use reasonably similar to the land use types shown in Table III. Where two or more dissimilar land uses occur on a single property, the more restrictive noise limits shall apply.

2. Additional land use classifications may be added by action of the city council to reflect both lower and higher existing ambient levels than those shown.

3. Where doubt exists when making identification of receiving land use, the director of planning and building may make an interpretation.

4. No person shall operate, or cause to be operated, any source of sound at any location within the city or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level to exceed the environmental and/or nuisance interpretation of the applicable limits given in Table III.

a. Environmental noise shall be measured by the equivalent sound level (Leq) for any hour.

b. Nuisance noise shall be measured as a sound level not to be exceeded at any time.

c. Sound levels by receiving land use shall be measured at the boundary or at any point within the boundary of the property affected.

d. Fixed-location public utility distribution or fixed transmission facilities, located on or adjacent to a property line, shall be subject to noise level limits of this section measured at or beyond six feet from the boundary of the easement upon which the equipment is located.

B. Corrections to Exterior Noise Level Limits.

1. If the noise is continuous, the Leq for any hour will be represented by any lesser time period within that hour. Noise measurements of a few

minutes only will thus suffice to define the noise level.

2. If the noise is intermittent, the Leq for any hour may be represented by a time period typical of the operating cycle. Measurement should be made of a representative number of noisy/quiet periods. A measurement period of not less than 15 minutes is, however, strongly recommended when dealing with intermittent noise.

3. In the event the alleged offensive noise, as judged by the enforcement officer, contains a steady, audible sound such as a whine, screech or hum, or contains a repetitive impulsive noise such as hammering or riveting, the standard limits set forth in Table III shall be reduced by five dB.

4. If the measured ambient level exceeds that permissible in Table III, the allowable noise exposure standard shall be the ambient noise level. The ambient level shall be measured when the alleged noise violations source is not operating.

TABLE III
EXTERIOR NOISE LIMITS^{1,2}

Receiving Land Use Category	Noise Level [dB(A)]	
	10 p.m. to 7 a.m. (Weekdays)	7 a.m. to 10 p.m. (Weekdays)
	10 p.m. to 8 a.m. (Weekends)	8 a.m. to 10 p.m. (Weekends)
All residential (except multiple dwelling)	45	55
Multiple dwelling residential	50	60
Commercial	60	65
Light industry – I-R and I-L zone	70	70
Heavy industry – I zone	80	80

¹Environmental Noise – Leq in any hour.

²Nuisance Noise – Not to be exceeded any time.

(Ord. 2790, 1999; Ord. 2276 § 2, 1988; Ord. 2101 § 3, 1985).