South Orange County Reliability Enhancement Project

AMBIENT NOISE SURVEY REPORT

CAPISTRANO SUBSTATION NOISE & CORONA NOISE

March 2012

San Diego Gas & Electric Company

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Executive Summary

The San Diego Gas and Electric Company (SDG&E) is proposing, via the South Orange County Reliability Enhancement Project (Proposed Project), to bring a new 230 kilo volt (kV) transmission source into the service area and to rebuild the existing 138kV/ 12kV Capistrano substation with a new 230kV/ 138kV/ 12kV substation and to make tie-in modifications/upgrades at the Talega Substation. As part of the Proposed Project design engineering effort, Alliance Acoustical Consulting (AAC) was contracted to document the present noise environments at the existing Capistrano Substation and at selected locations along the transmission line corridor. This report is a summary of an Ambient Noise Survey Study (Study) that was conducted by AAC in June of 2010 (Capistrano Substation portion) and in January of 2012 (transmission line portion).

The Capistrano Substation survey results – including 24-hour monitoring, spectral sampling, and field observations – indicate that the substation site is typical for a suburban residential neighborhood near transportation corridors (Camino Capistrano, the Amtrak rail line, and the Interstate 5 [I-5] freeway). Ambient noise levels are primarily controlled throughout the daytime and nighttime by either the I-5 traffic flows or noise from the existing transformers (or a combination of both). Noise from general urban activities in the adjoining residential neighborhoods also contributed to the overall sound environment. The amount of influence of these sources is dependent on the receptor location, proximity to substation equipment, and local shielding effects. The amplitudes of the energy-average (L_{eq}) levels around the existing Capistrano Substation site were generally confined to fairly narrow ranges, indicating that the average noise environment is fairly steady. Long-term (24-hour) ambient noise measurements were taken from three locations at the existing Capistrano Substation site (LT-1, -2, and -3). Location LT-1 registered in the 40's to 50's dBA, location LT-2 sound levels were generally between 45 and 55 dBA, and location LT-3 levels had the highest recorded noise levels of between 50 and 60 dBA. Single-event sound levels, such as from individual vehicle or train pass-bys, were measured in the low-70's to low-80's dBA maximum sound pressure level (L_{max}).

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

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1.0 Introduction

SDG&E is a regulated public utility that provides electric service to three million customers within a 4,100 square mile service area, covering parts of two counties and 25 cities in the southern California area. The Proposed Project is intended to meet the area load growth and service reliability for approximately 118,000 customers within southern Orange County. The Proposed Project will bring a new 230kV transmission source into the service area by upgrading the existing 138kV transmission line with a twin 230 kV circuit between the Capistrano and Talega Substations. Also, SDG&E is proposing to rebuild the existing 138/12kV Capistrano Substation with a new 230/138/12kV substation and to make tie-in modifications/upgrades at the Talega Substation.

As part of its Application for a Certificate of Public Convenience and Necessity (CPCN), to be submitted to the California Public Utilities Commission (CPUC), SDG&E must generate a Proponent's Environmental Assessment (PEA)[1]. This report will serve as documentation of existing conditions for the Capistrano Substation, as well as for portions of the transmission line with respect to corona noise.

2.0 Overall Project Setting

The Proposed Project components are primarily located in portions of the cities of San Juan Capistrano and San Clemente as well as unincorporated area within Orange and San Diego Counties[2]. The Proposed Project and its associated components will be located primarily within existing SDG&E transmission line rights-of-way and substation properties. This area of southwestern Orange County is composed of residential, commercial, recreational, and open-space land uses. The transmission line crosses the I-5 east of the existing Capistrano Substation, then spans San Juan Creek. At the approximate mid-section of the transmission line, the right-of-way is located to the east of the Prima Deshecha Landfill. Near San Juan Hills High School, the transmission line will be placed underground adjacent to existing underground circuits near Vista Montana Street.

Figure 1 shows the regional setting for the Proposed Project and Figure 2 shows the Project vicinity map, including the proposed structure locations.

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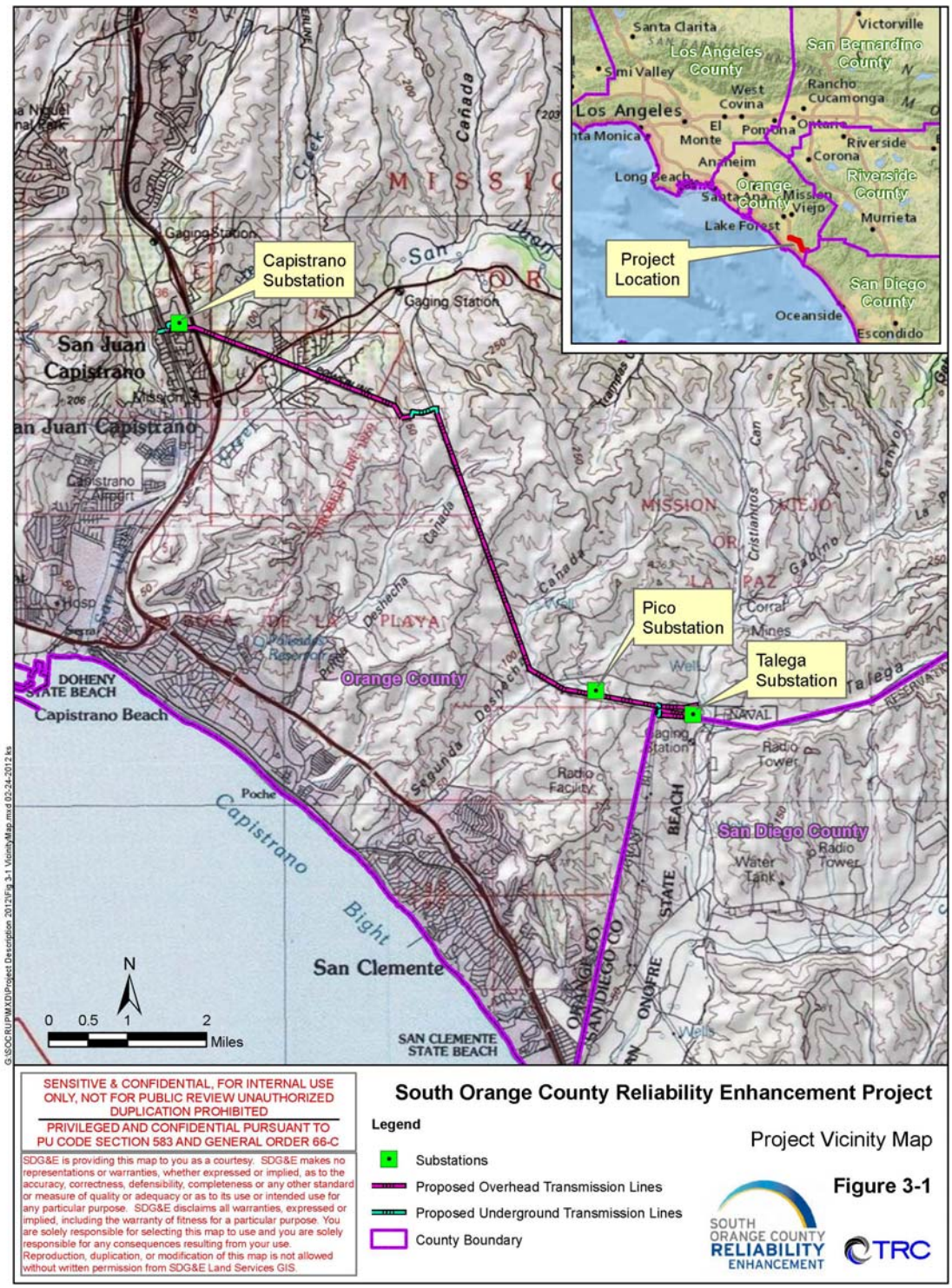
[1] *These documents fall under the procedures of the California Environmental Quality Act (CEQA), with the CPUC acting as the lead agency for the Proposed Project.*

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



<u>Figure 1</u> – Regional Setting for the Proposed Project

Source: TRC Solutions and SDG&E

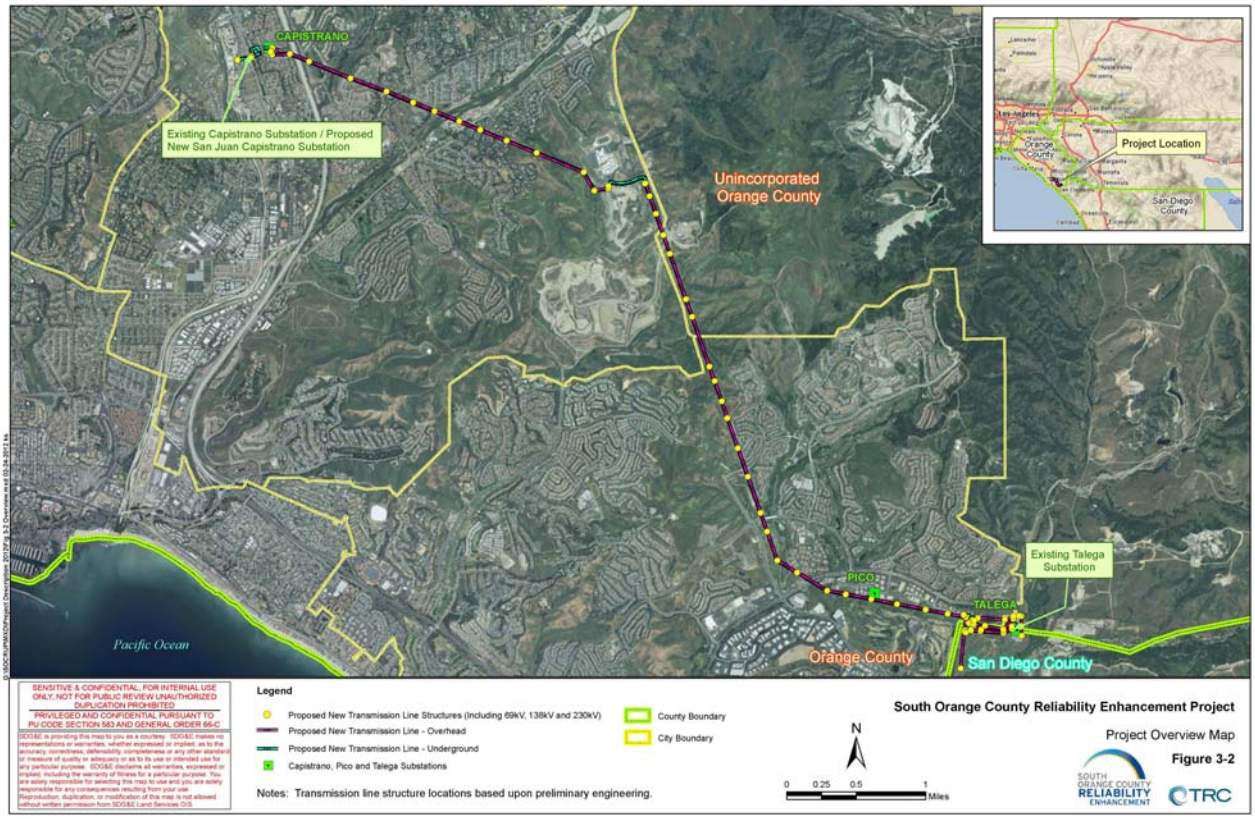


Figure 2 - General Vicinity of the Proposed Project

Source: TRC Solutions and SDG&E

2.1 Capistrano Substation Setting

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

Serra Park which includes the first portion of the initial transmission line going to Talega Substation. Beyond the park, farther to the east is the I-5 freeway.

2.2 Transmission Line Setting

The Proposed Project transmission lines traverse through several residential, recreational, and open-space areas within San Juan Capistrano, San Clemente, and unincorporated Orange and San Diego Counties. The recreational uses include El Camino Real Park, Junipero Serra Park (near the Capistrano substation), Marbella (golf) Country Club, Arroyo Park (off of Ortega Highway), Russell Cook Park, an equestrian center (Tar Farms Horse Stable located on San Juan Creek Road), and private/community parks and recreation areas located west of the Capistrano Substation site (adjacent to Avenida De La Vista).

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

The following sub-sections of this report are divided between the Capistrano Substation Ambient Survey and the Transmission Line Corona Noise Survey.

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3.0 Ambient Noise Survey Details – Capistrano Substation

3.1 Capistrano Substation Survey Sessions

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

3.2 Capistrano Substation Survey Locations

During the survey, three long-term (i.e. 24+ hours) sampling locations were chosen along key boundary positions around the substation's upper yard area. These locations were near (or in the direction of) the closest noise-sensitive receptors around the substation property. At each long-term measurement location, various statistical sound levels[3], the minima/maxima, and the energy-average sound levels[4] were acquired over a complete day-night cycle. The long-term location information is summarized in Table 1.

Table 1 - Summary of Capistrano Substation Ambient Noise Long-term Measurement Locations

Loc'n	Description	Start Time	End Time	Latitude	Longitude
LT-1	Northwest	6/9/10 10:21	6/10/10 16:24	N 33° 30.785'	W 117° 40.008'
LT-2	Northeast	6/9/10 09:49	6/10/10 16:11	N 33° 30.785'	W 117° 39.944'
LT-3	Southwest	6/9/10 10:52	6/10/10 16:34	N 33° 30.733'	W 117° 39.963'

Source: Alliance Acoustical Consulting, Inc., 2010, data from a Garmin eTrex handheld GPS unit

In addition, several short-term (i.e. 15-minute duration) samples were made during various times of the day and night to acquire supplemental information about the spectral content of the ambient noise environment and to document the observed noise sources contributing to that environment. These noise data were acquired at four short-term locations, most of which are outside the substation fenceline. The short-term locations are summarized in Table 2. The ambient measurement locations at the Capistrano Substation are shown in Figure 3 on the next page.

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

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

Table 2 - Summary of Capistrano Substation Ambient Noise Short-term Measurement Locations

Loc'n	Latitude	Longitude	Description
ST-1	N 33° 30.791'	W 117° 39.976'	North (between LT-1 and LT-2)
ST-2	N 33° 30.775'	W 117° 39.897'	Northwest corner of Serra Park
ST-3	N 33° 30.745'	W 117° 39.870'	At sign of Serra Park
ST-4	N 33° 30.708'	W 117° 39.925'	Calle Bonita and Via El Rosario

Source: Alliance Acoustical Consulting, Inc., 2010, positional data from a Garmin eTrex handheld GPS unit and Google Earth

Figure 3 - Ambient Noise Measurement Locations at the Capistrano Substation
[Long-term locations shown in yellow, short-term locations shown in green]
Source: Google Earth

3.3 Capistrano Substation Survey Instrumentation

All noise measurements were conducted in general accordance with industry standards and guidelines for the engineering evaluation of exterior noise sources. Instrumentation made by Brüel and Kjær, Larson-Davis, and Norsonics were used to conduct the noise measurements. The data acquisition systems meet the requirements set forth in the American National Standards Institute (ANSI) S1.4-1983 Standards for Type I quality and accuracy. Each instrument was field calibrated and operated according to the manufacturer's specifications. The sound level meters were operated to sample noise using the A-weighting filter and the slow metering response. Measurements included the acquisition of time history data, frequency-band data (in one-third-octave bands), and statistical sound level data at selected locations. A windscreen was used on each instrument during all sampling periods and all measurements were conducted with the microphone height approximately 5 feet (1.5m) above ground level. Additional instrumentation details are provided in Attachment A.

3.4 Capistrano Substation Survey Conditions

Site conditions and meteorological conditions were noted during the field survey[5] and can generally be described as mild and are considered as being a bit cooler than typical for this time of year in the area. The air temperature during the daytime was typically in the low-60's to low-70's degrees Fahrenheit (°F) with relative humidity between 70 and 85%. During the evening and nighttime sessions, the temperature was in the low-60's °F with humidity in the upper 80's%. For the survey, the barometric pressure was generally centered about 29.9 (± 0.2) inches of mercury. Skies were noted as being partly cloudy during the daytime hours. The nighttime skies were overcast with the moon being in its waning crescent phase (9% illumination)[6].

During the survey, the typical wind conditions were from calm to a very light breeze (i.e. 2 to 5 mph) and no wind gusts were noted. Overnight and morning winds were generally calm or just a 'whisper'. Winds, when present, were generally from the west.

All these meteorological conditions were within appropriate ranges for acceptable outdoor noise measurements per ANSI S1.13.

4.0 Ambient Noise Survey Results – Capistrano Substation

4.1 Capistrano Substation General Noise Environment

As the Proposed Project site is located in a suburban area near major roadways, the major noise sources were either from traffic flows or general urban activities in the adjoining residential neighborhoods. During the ambient survey, the following local noise sources were noted by the field engineer:

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[5] *Field meteorological data was acquired with a tripod-mounted Kestrel 4500 NV weather instrument, with supplemental data from www.wunderground.com.*

[6] *Sunset on 6/9/10 was at 20:00; moonrise was at 03:54 on the morning of 6/10; sunrise was later that morning at 05:40.*

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

4.2 Capistrano Substation Short-Term Data Results

The short-term noise samples, made during several times of the day and night, are summarized in Table 3, which provides the minimum, maximum, and energy-average sound levels over each 15-minute sample.

Table 3 - Summary of Ambient Noise Short-term Measurements

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

Source: Alliance Acoustical Consulting, Inc., 2010

The short-term results and field notes indicate that the existing noise environments were controlled by various sources, depending on the time of day and the measurement location. The nighttime conditions were dominated by traffic noise from the freeway with some

influences from transformer 'hum' at the substation. The measured noise spectral levels (sound levels versus frequency) are shown in Figures 4a – 4d.

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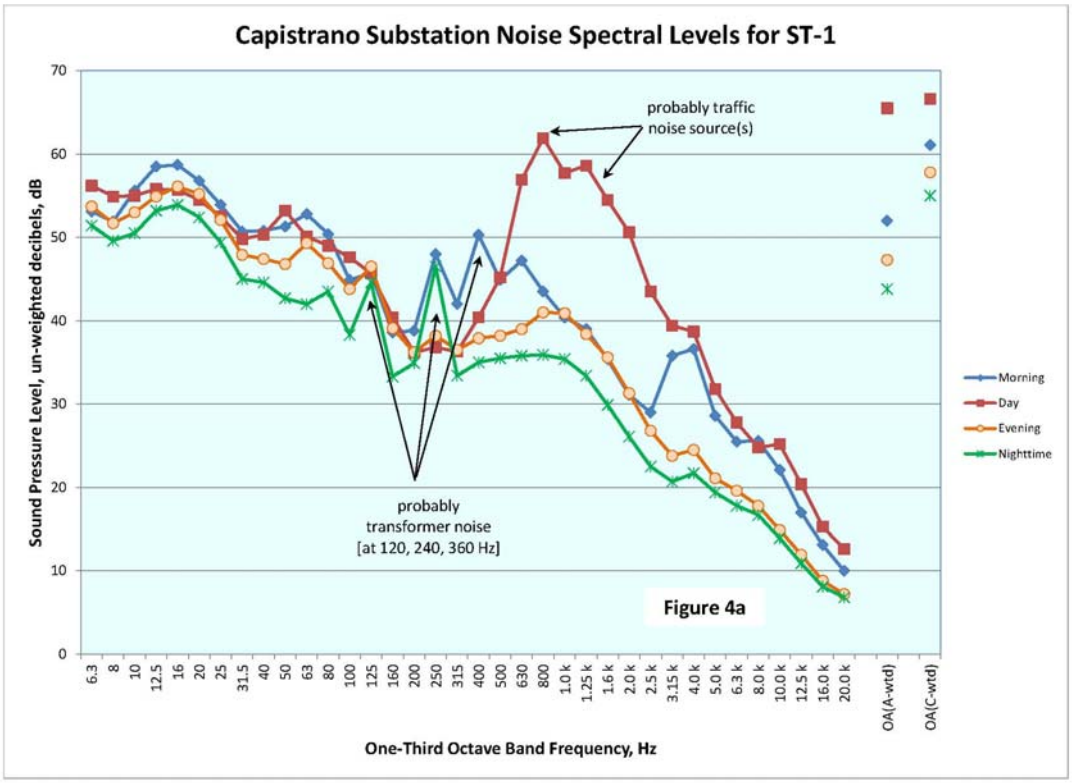
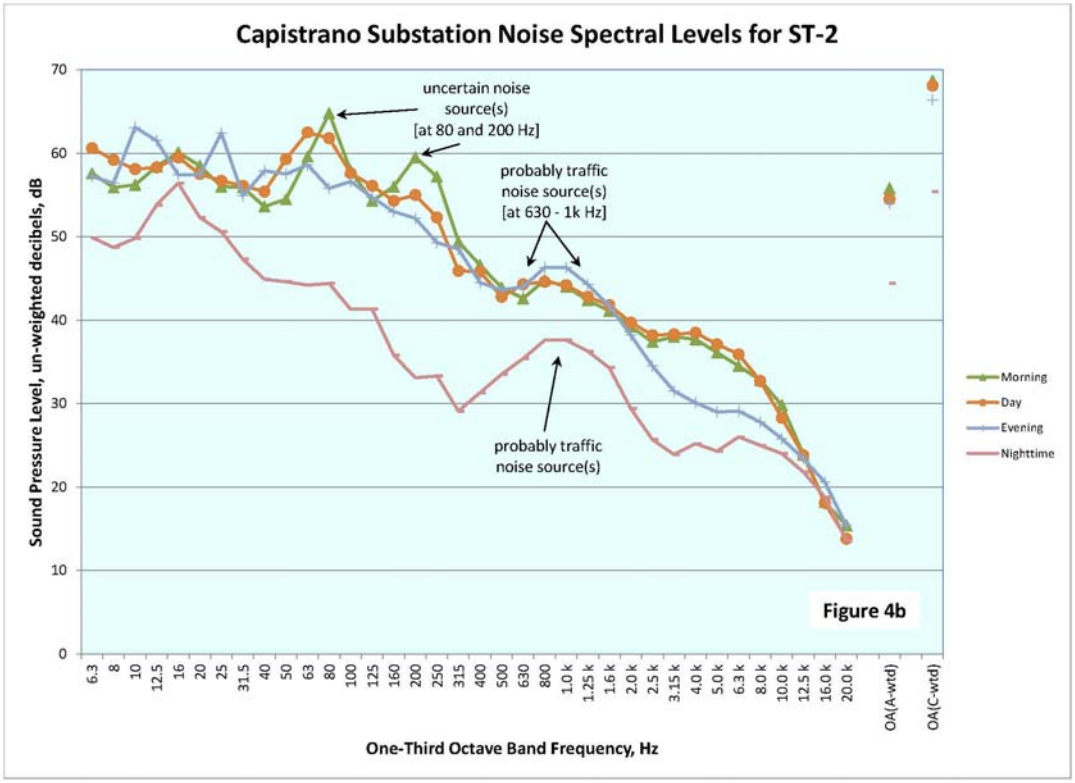
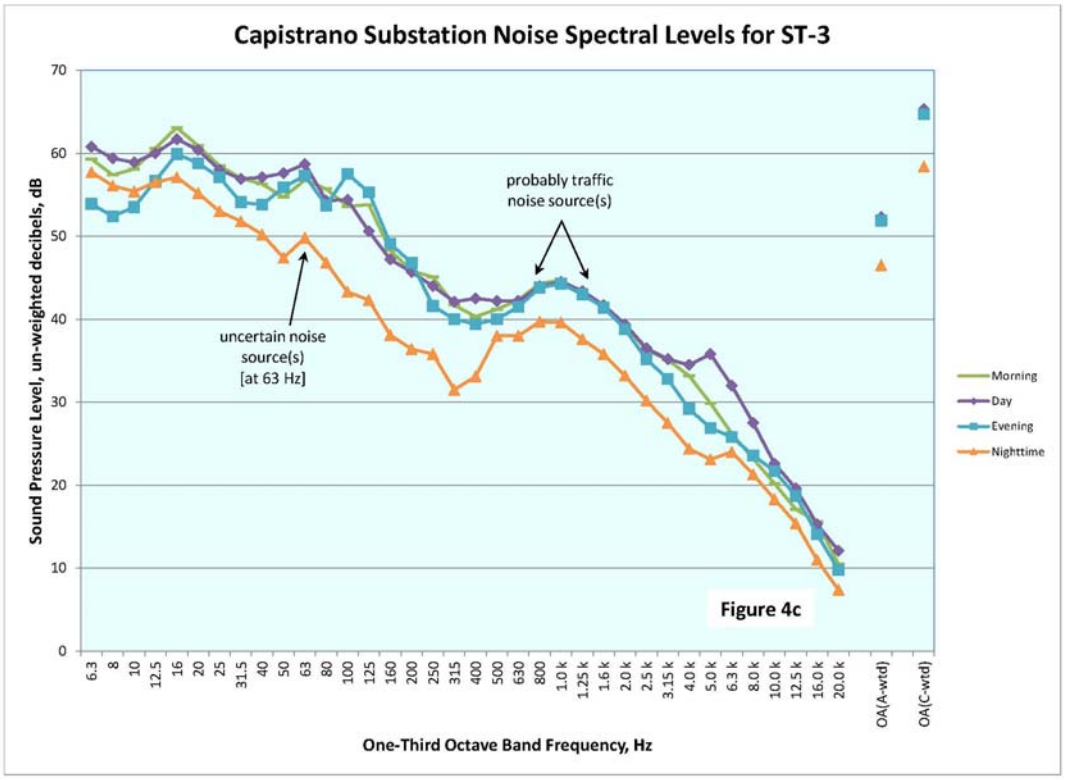
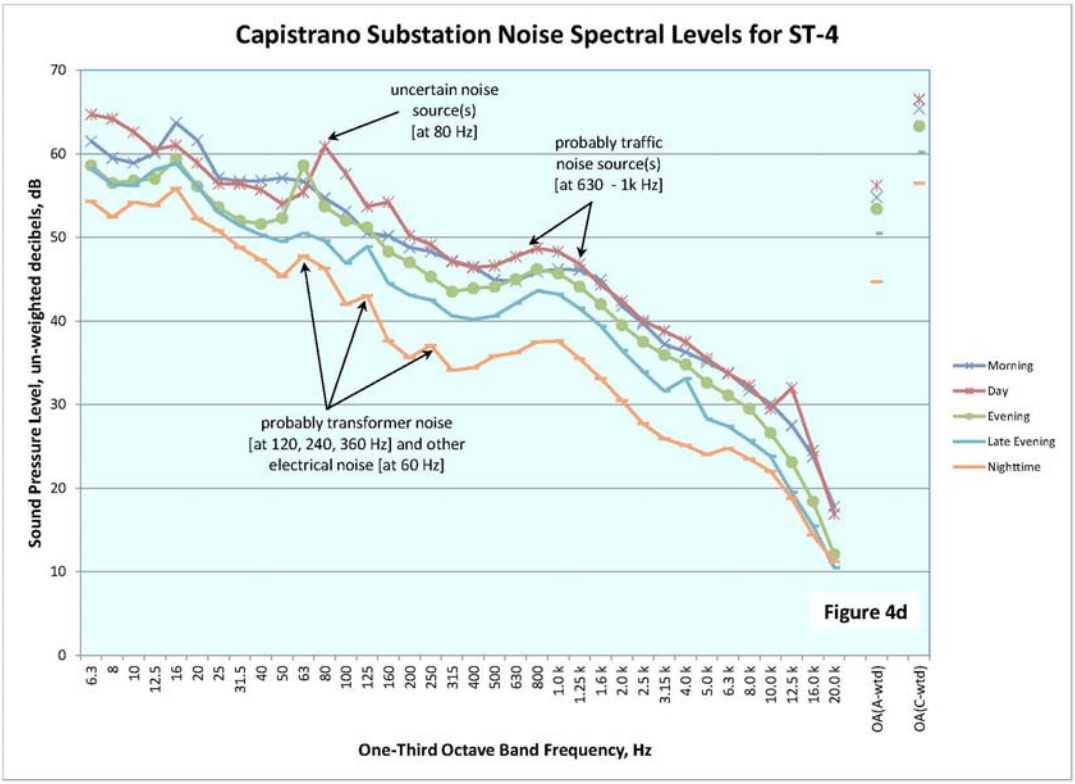




<u>Figure 4a-b</u> – Capistrano Substation Ambient Noise Spectral Samples
Source: Alliance Acoustical Consulting, Inc., 2010





<u>Figure 4c-d</u> – Capistrano Substation Ambient Noise Spectral Samples
Source: Alliance Acoustical Consulting, Inc., 2010

These spectra show the general influence of traffic sources throughout most periods of the day and night. Also, there is some evidence of low-frequency tones; most often at 80 hertz (Hz). At Locations ST-1 and ST-4, there are tones in the bands that would be characteristic of transformer-produced noise; that is, in the 125, 250, and 400 Hz bands. These transformer tones were typically most evident at the quietest periods.

4.2 Capistrano Substation Long-Term Data Results

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

These long-term noise data results are shown in Figures 5a through 5c with associated explanatory notes following each plot.

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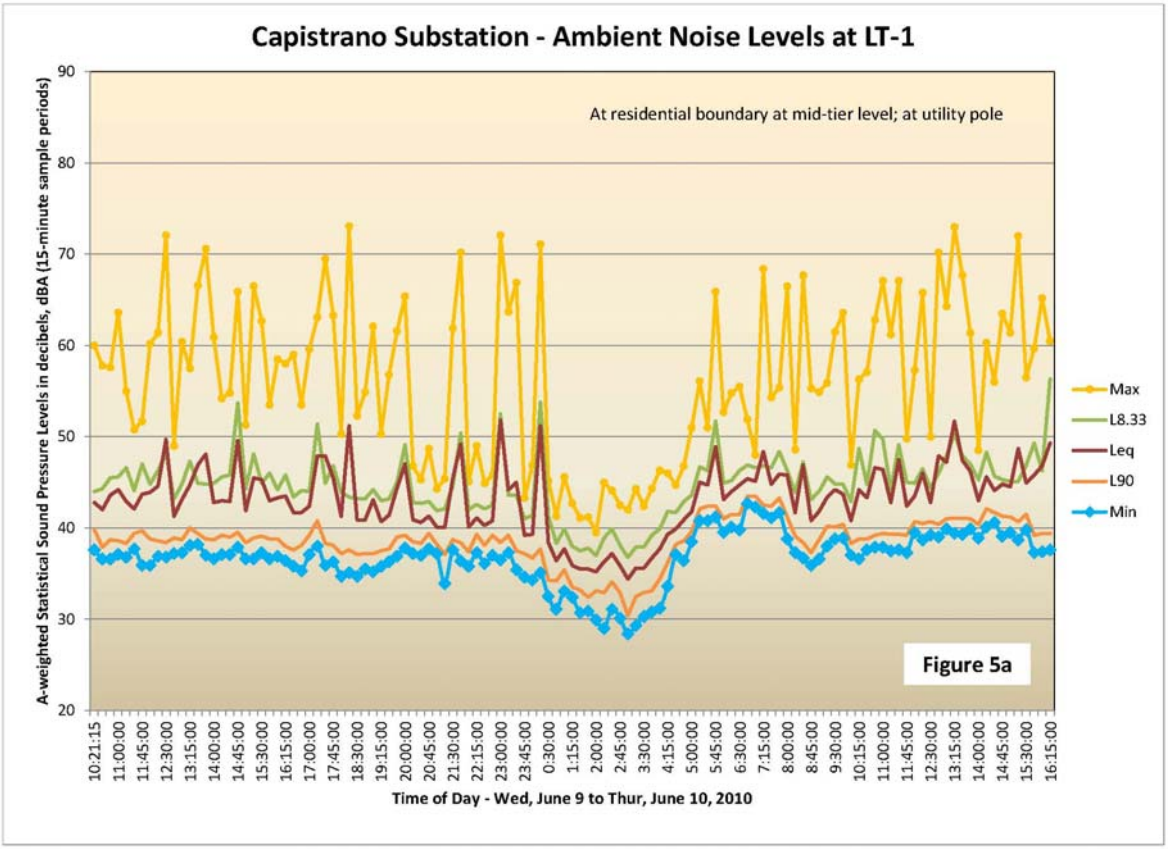
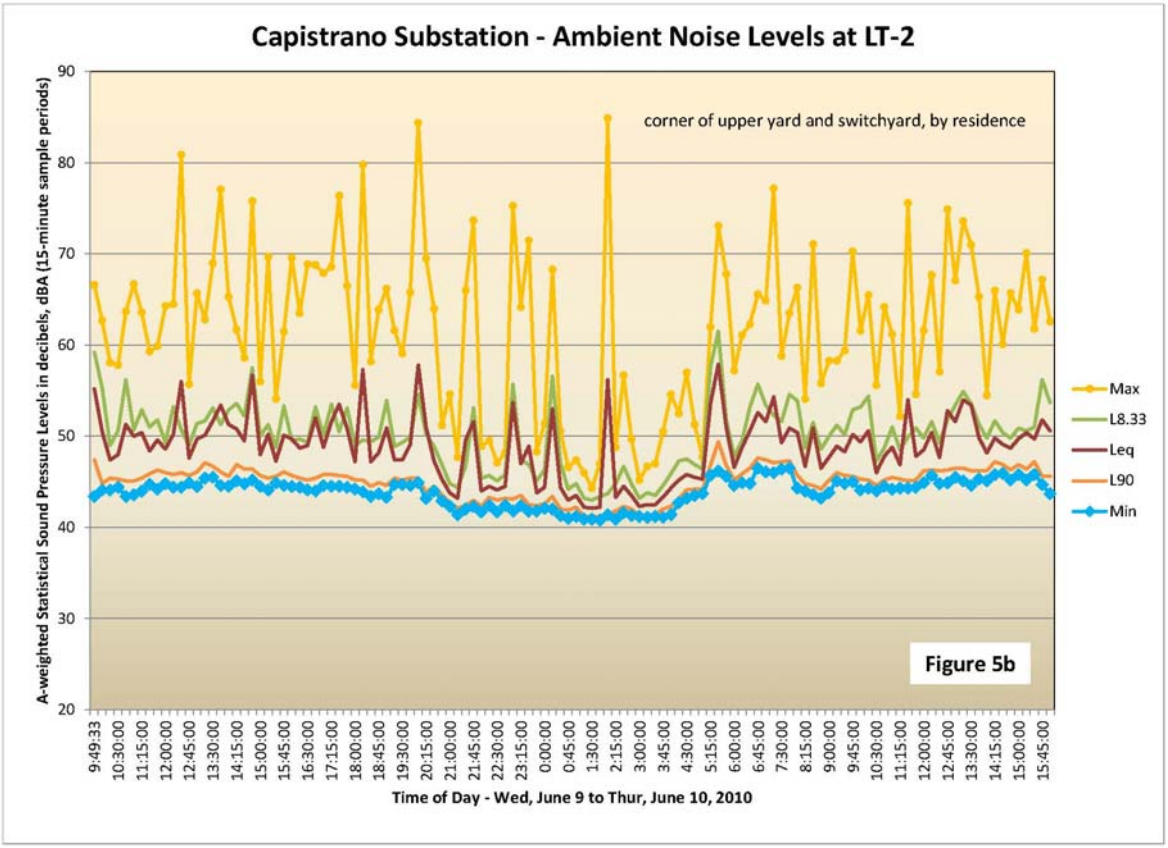


<u>Figure 5a</u> - 24-hour Ambient Record for the Northeast part of the Capistrano Substation
Source: Alliance Acoustical Consulting, Inc., 2010

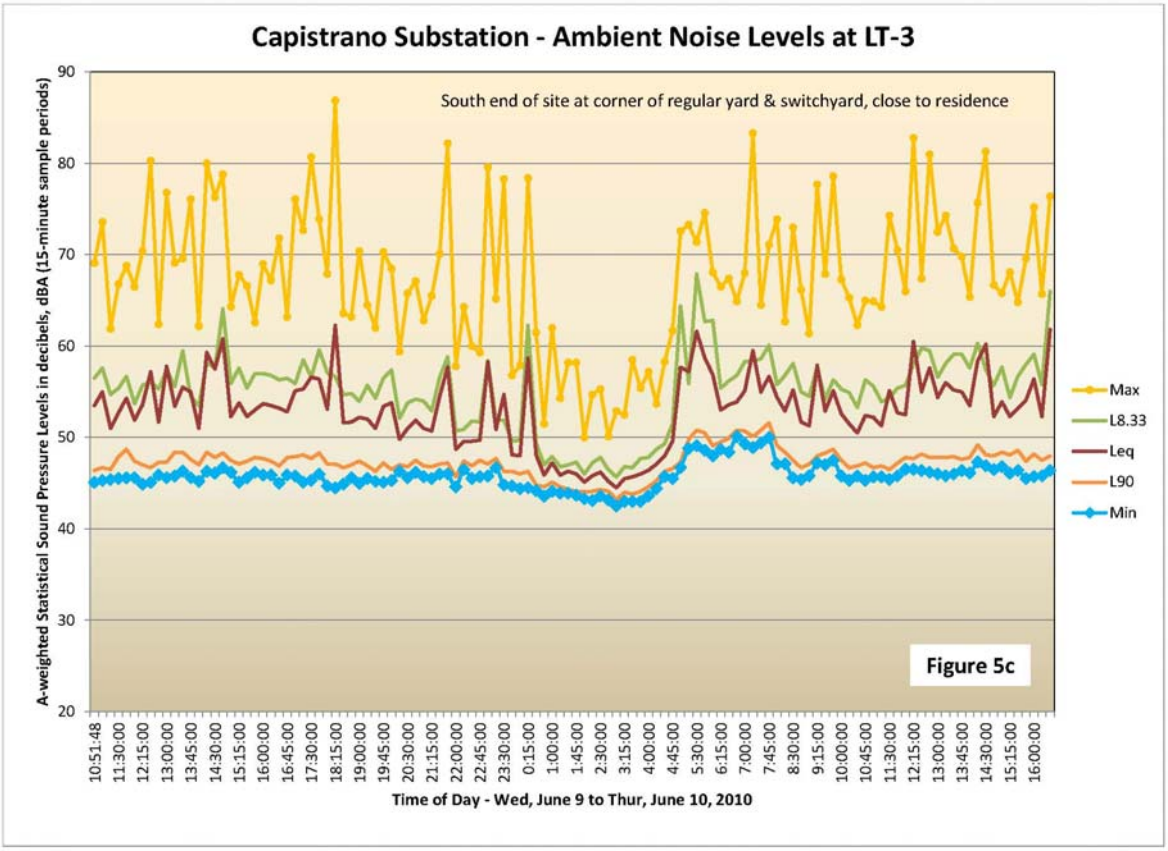
The northeast measurement location is toward the mid-point of the northern boundary of the substation site and has visual access to nearly all of the upper and lower yard areas. This plot of sound levels over the 24-hour period shows a fairly steady residual noise environment (exemplified by the L_{90} noise metric). The plot shows a common drop-off in sound levels overnight; between the hours of midnight and 5 a.m. Outside of these quietest, nighttime hours, the energy-average sound levels (L_{eq}) stayed in a consistent 10 dB-wide band (40 to 50 dBA) throughout all the daytime and evening periods. Excursions in the L_{max} metric are indicative of short-term noise events; most likely from individual car and train pass-bys on Camino Capistrano and the adjacent rail line. Traffic noise from local roadways and the freeway was noted as being the primary noise source at this location. The existing transformers were just audible, but were not a dominant source in the ambient session.



Source: Alliance Acoustical Consulting, Inc., 2010

<u>Figure 5b</u> - 24-hour Ambient Record for the Northeast part of the Capistrano Substation

The northeast measurement location was at the closest residential receptor to the main substation yard, adjacent to that yard's entrance gate. Future, project-related construction and rebuilt substation operations noise levels would be expected to be the highest (relative to other residential neighbors) at this location, due to its proximity to the main, upper yard sources. This location had the least variation in the range of residual sound levels throughout the 24-hour session (i.e., the L_{min} and L_{90} sound levels stayed within a relatively narrow 5-dB band for the entire measurement session). This result is most likely due to this measurement location being shielding from I-5 traffic noise by intervening houses and retaining walls, as well as experiencing the steady noise from the existing transformers throughout the 24-hour period. The Leq metric was generally confined to the 45 to 55 dBA range. As with the results for LT-1, there is evidence in the L_{max} results of many short-term noise events. This location generally overlooks and is up-slope from Camino Capistrano and the adjacent rail line and would experience the car, truck, and train pass-by events.



Source: Alliance Acoustical Consulting, Inc., 2010

Figure 5c - 24-hour Ambient Record for the Southwest part of the Capistrano Substation

The southwest measurement location was similar to the northwest location with respect to the day-to-night pattern of the sound levels. Again, there is a notable decrease in the L_{max} through L_{eq} sound levels late at night (i.e., 1 a.m. to 5 a.m.), along with evidence of numerous, short-lived noise events (such as local vehicle pass-bys). This location had the highest sound levels of the three monitoring locations as it is exposed to both I-5 freeway noise and noise from the substation transformers. Like the other plots, though, the L_{eq} metric stayed within a relatively narrow range of approximately 10 dB (typically from 50 to 60 dBA). As this location is the closest to existing transformers, they were noted as being the dominant background noise source, regardless of the time of day.

5.0 Ambient Noise Survey Details – Transmission Line Corona

5.1 Transmission Line Corona Survey Sessions

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

5.2 Transmission Line Corona Survey Locations

During the corona survey, locations along the transmission line were selected to (a) focus on residential areas that are close to the corridor towers and power lines or (b) away from extraneous sources, in an effort to isolate line-dominated noise. For the former, the locations near transmission line Pole Nos. 8, 11, and 29 were very close to residential areas. For the latter, the location near Pole No. 28 was removed from nearby houses, roadways, or other major non-line noise sources. This part of the transmission line, near Pole No. 28, was also chosen to attempt making noise attenuation-with-distance measurements as the corridor access/maintenance roadway runs perpendicular to the transmission line corridor for several hundred feet. The corona survey location information is summarized in Table 4. The corona noise survey locations are shown in Figure 6 on the next page.

Table 4 - Summary of Corona Noise Measurement Locations
[All data acquired on January 14, 2012 (Saturday)]

Loc'n	Description	Latitude	Longitude	Start Time
Pole 8	In Arroyo Park; houses on either side of parkway strip	N 33° 30.444'	W 117° 38.825'	20:59
Pole 11	Next to homes by Juliana Farms Road	N 33° 30.275'	W 117° 38.352'	21:29
Pole 29	Near homes off Avenida Fresas	N 33° 28.440'	W 117° 36.436'	22:39
Pole 28	Removed from homes off Avenida Fresas	N 33° 28.623'	W 117° 36.527'	22:56

Source: Alliance Acoustical Consulting, Inc., 2012, Position data from Google Earth

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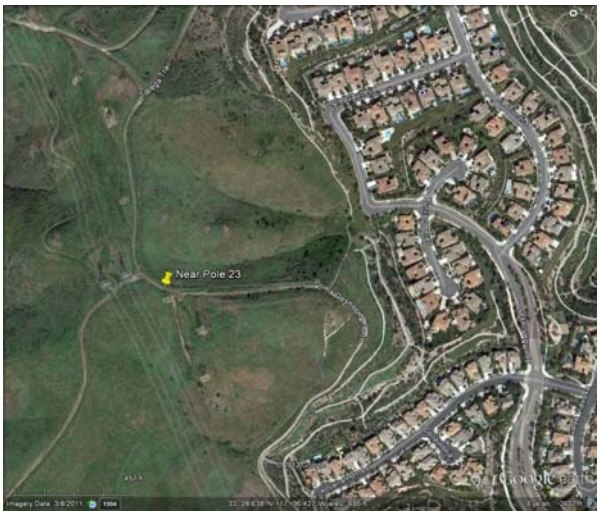
"Pole No. 8"

"Pole No. 11"

"Pole No. 29"

"Pole No. 28"



<u>Figure 6</u> – Corona Noise Survey Locations

Source: Google Earth

5.3 Transmission Line Corona Survey Instrumentation

All noise measurements were conducted in general accordance with industry standards and guidelines for the engineering evaluation of exterior noise sources. Instrumentation made by Brüel and Kjær and Norsonics were used to conduct the noise measurements. The data acquisition systems meet the requirements set forth in the ANSI S1.4-1983 Standards for Type I quality and accuracy. Each instrument was field calibrated and operated according to the manufacturer's specifications. The sound level meter was operated to sample noise using the A-weighting filter and the slow metering response. Measurements included the acquisition of time history data, frequency-band data (in one-third-octave bands), and statistical sound level data at selected locations. A windscreen was used on the instrument during all sampling periods and all measurements were conducted with the microphone height approximately 5 feet (1.5 meters) above ground level. Additional instrumentation details are provided in Attachment A.

5.4 Transmission Line Corona Survey Conditions

Site conditions and meteorological conditions were noted during the field survey[7] and can generally be described as mild and are considered as being a bit cooler than typical for this time of year in the area. The air temperature during the survey was typically in the low- to mid-40's °F with relative humidity around 63%. The barometric pressure was generally centered about 30.08 (± 0.01) inches of mercury and the winds were calm. The nighttime skies were completely clear and the moon was in its waning gibbous phase (67% illumination), but only visible at the very end of the survey[8].

All these meteorological conditions were within appropriate ranges for acceptable outdoor noise measurements per ANSI S1.13.

6.0 Ambient Noise Survey Results – Transmission Line Corona

6.1 Transmission Line Corona General Noise Environment

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

- Vehicle movements on distant roadways (e.g., I-5 freeway, Ortega Highway, San Juan Creek Road, and Calle Saluda);
- Occasional dogs barking or other wildlife (i.e., coyotes) in the distance;
- Occasional rustling of vegetation during periods of very light winds (at Pole No. 8 only);

[7] *Field meteorological data was taken from www.wunderground.com.*

[8] *Sunset on 1/14/12 was at 17:04; moonrise was at 23:08, per http://aa.usno.navy.mil/cgi-bin/aa_pap.pl.*

- Infrequent train movements in the distance; and
- Residential equipment (e.g., pool pumps or water features) in the distance.

6.2 Transmission Line Corona Short-Term Data Results

The short-term noise samples, made during several times of the day and night, are summarized in Table 5, which provides the minimum, maximum, and energy-average sound levels over each 15-minute sample.

Table 5 - Summary of Corona Noise Measurement Data
[All data acquired on January 14, 2012 (Saturday)]

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

Source: Alliance Acoustical Consulting, Inc., 2012

The short-term results and field notes indicate that the existing noise environments were controlled by typical suburban noise sources; primarily vehicle movements on major streets or highways. No corona noise effects were experienced; even at the very quiet Pole No. 28 location.

The measured noise spectral levels (sound levels versus frequency) are shown in Figure 7.

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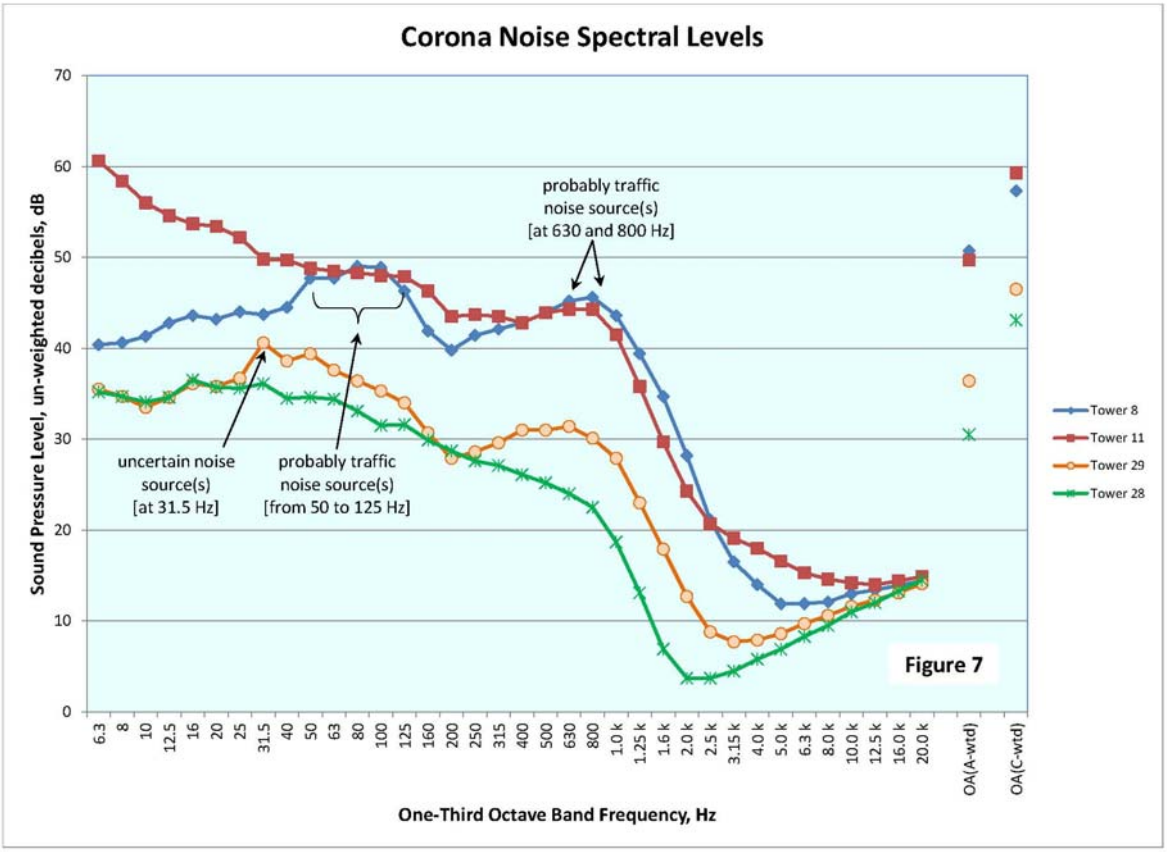

Figure 7 - Ambient Noise Spectral Samples
Source: Alliance Acoustical Consulting, Inc., 2012

These spectra are generally consistent and show typical influences from traffic-related noise sources; particularly at the Pole Nos. 8 and 11 locations, which were relatively close to major roadways.

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7.0 Summary of Both Ambient Noise Surveys

7.1 Capistrano Substation Summary

In general, the long-term noise level records show a significant amount of variability, in terms of the fluctuations in the maximum sound levels from period to period. This is due to the intermittent vehicle and train movements along the Camino Capistrano corridor and at local streets adjacent to the substation site. The data record and field notes also showed consistent influences from traffic on the I-5 and from the existing transformers, depending on measurement location, proximity to substation equipment, and local shielding effects. The L_{eq} levels around the existing Capistrano Substation site generally stayed in fairly narrow, 10-dB bands with LT-1 registering in the 40's to 50's dBA, LT-2 generally between 45 and 55 dBA, and LT-3 having the highest noise levels (between 50 and 60 dBA).

7.2 Transmission Line Corona Summary

While data were taken on an evening when corona noise effects might be expected to be readily apparent[9], no corona noise effects were experienced; either in the data or in the observations of the field engineer. Thus, the baseline conditions for the existing transmission line facilities include no corona noise effects.

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

Attachment A

Ambient Survey Measurement Instrumentation Details

The following instruments were used in the noise measurements:

1. Norsonics model N-118 Integrating Sound Level Meter
2. Larson-Davis model 814 Sound Level Meters
3. Norsonics model 1206 Preamplifier
4. Larson-Davis model 904 Preamplifiers
5. Larson-Davis, Norsonics, G.R.A.S., and Brüel and Kjær ½" Microphones
6. Larson Davis model CAL200 (primary) and Brüel and Kjær 4230 (spare) Acoustic Calibrators

Additional details are as follows:

Field Instrumentation Documentation

Capistrano Substation Noise Survey of June 2010

System	Component	Manufacturer	Model	S/N	Last Calib	Calib due
System 1	SLM/Analyzer	Larson-Davis	814	152	3/28/2011	3/28/2012
	Preamp	Larson-Davis	904	101	3/28/2011	3/28/2012
	Mic	Bruel & Kjaer	2560	2036	3/28/2011	3/28/2012
System 2	SLM/Analyzer	Larson-Davis	814	156	3/28/2011	3/28/2012
	Preamp	Larson-Davis	904	126	3/28/2011	3/28/2012
	Mic	Bruel & Kjaer	2560	2306	3/28/2011	3/28/2012
System 3	SLM/Analyzer	Larson-Davis	814	153	3/28/2011	3/28/2012
	Preamp	Larson-Davis	904	139	3/28/2011	3/28/2012
	Mic	GRAS	2560	2958	3/28/2011	3/28/2012
System 4	SLM/Analyzer	Larson-Davis	814	124	3/28/2011	3/28/2012
	Preamp	Larson-Davis	904	134	3/28/2011	3/28/2012
	Mic	Bruel & Kjaer	2559	1782	3/28/2011	3/28/2012
System 5	SLM/Analyzer	Larson-Davis	814	164	3/28/2011	3/28/2012
	Preamp	Larson-Davis	904	385	3/28/2011	3/28/2012
	Mic	Larson-Davis	2560	2880	3/28/2011	3/28/2012
Short-term	SLM/Analyzer	Norsonic	N-118	28106	3/28/2011	3/28/2012
Sampling	Preamp	Norsonic	1206	27572	3/28/2011	3/28/2012
	Mic	Norsonic	1225	41498	3/28/2011	3/28/2012
All	Calibrator	Larson-Davis	CAL200	2367	3/28/2011	3/28/2012
All	*Calibrator**	*Bruel & Kjaer*	*4231*	*1795555*	*1/19/2009*	*1/19/2010*
Weather	Pocket Tracker	Kestrel	4500 NV	593031	n/a	n/a

** spare*

Field Instrumentation Documentation

Transmission Line Corona Noise Survey of January 2012

System	Component	Manufacturer	Model	S/N	Last Calib	Calib due
Short-term	SLM/Analyzer	Norsonic	N-118	28106	3/28/2011	3/28/2012
Sampling	Preamp	Norsonic	1206	27572	3/28/2011	3/28/2012
	Mic	Norsonic	1225	41498	3/28/2011	3/28/2012
All	Calibrator	Larson-Davis	CAL200	2367	3/28/2011	3/28/2012
All	*Calibrator**	*Bruel & Kjaer*	*4231*	*1795555*	*1/19/2009*	*1/19/2010*

** spare*