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2305 MISSION COLLEGE BOULEVARD DATA CENTER ENVIRONMENTAL NOISE AND VIBRATION ASSESSMENT

Santa Clara, California

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INTRODUCTION

This report assesses the noise and vibration impacts resulting from the construction and operation of the Data Center project proposed at 2305 Mission College Boulevard in Santa Clara, California. The project proposes to demolish an existing two-story office/R&D campus to construct two, three-story data center buildings totaling 490,000 square feet (sf) on a 15.7-acre site. The construction would be carried out in two phases. Phase I would consist of a 279,840 sf data center building on the eastern portion of the site. Phase II would consist of the second, 210,160 sf data center building located on the western portion of the site. The project would also construct a new 99 megavolt amps (MVA) substation in the northeastern portion of the site. The substation would be constructed after the completion of Phase I, with Phase II following completion of the substation.

The report is divided into three sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise conditions; 2) the Plan Consistency Section discusses the noise and land use compatibility of the project; and, 3) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and presents mitigation measures, where necessary, to mitigate impacts to a less-than-significant level.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which

the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn}/CNEL and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn}/CNEL with open windows and 65 to 70 dBA L_{dn}/CNEL if the windows are closed. Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, and those facing major roadways and freeways typically need special glass windows.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m.to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

TABLE 3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Regulatory Background - Noise

The State of California and the City of Santa Clara have established regulatory criteria that are applicable in this assessment. The California Environmental Quality Act (CEQA) Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

State CEQA Guidelines. The CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels;

(c) For a project located within the vicinity of a private airstrip or 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, if the project would expose people residing or working in the project area to excessive noise levels.

2016 California Green Building Standards Code (Cal Green Code). The State of California established exterior sound transmission control standards for new non-residential buildings as set forth in the 2016 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). Section 5.507 states that either the prescriptive (Section 5.507.4.1) or the performance method (Section 5.507.4.2) shall be used to determine environmental control at indoor areas. The prescriptive method is very conservative and not practical in most cases; however, the performance method can be quantitatively verified using exterior-to-interior calculations. For the purposes of this report, the performance method is utilized to determine consistency with the Cal Green Code. Both of the sections that pertain to this project are as follows:

> **5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and roof-ceiling assemblies making up the building envelope that are exposed to the noise source shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 when the building falls within the 65 dBA L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the local general plan noise element.
>
> **5.507.4.2 Performance method.** For buildings located within the 65 dBA L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, wall and roof-ceiling assemblies making up the building envelope and exposed to the noise source shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level ($L_{eq\ (1\text{-}hr)}$) of 50 dBA in occupied areas during any hour of operation.

The performance method, which establishes the acceptable interior noise level, is the method typically used when applying these standards.

Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan. The Comprehensive Land Use Plan adopted by the Santa Clara County Airport Land Use Commission (ALUC) contains standards for projects within the vicinity of Norman Y. Mineta International Airport which are relevant to this project:

4.3.2 Noise Compatibility

> The objective of noise compatibility criteria is to minimize the number of people exposed to frequent and/or high levels of aircraft noise.

4.3.2.1 Policies

N-1 The Community Noise Equivalent Level (CNEL) method of representing noise levels shall be used to determine if a specific land use is consistent with the CLUP.

N-2 In addition to the other policies herein, the Noise Compatibility Policies presented in Table 4-1 shall be used to determine if a specific land use is consistent with this CLUP.

N-3 Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 3.

N-6 Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport.

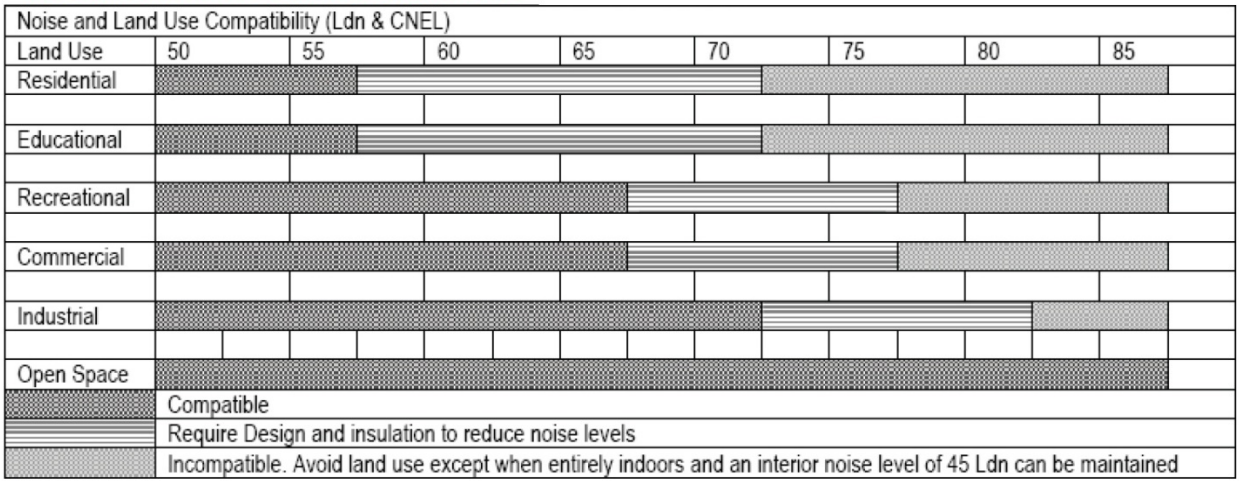
Table 4 - 1 NOISE COMPATIBILITY POLICIES

LAND USE CATEGORY	CNEL					
	55-60	60-65	65-70	70-75	75-80	80-85
Residential – low density Single-family, duplex, mobile homes	*	**	***	****	****	****
Residential – multi-family, condominiums, townhouses	*	**	***	****	****	****
Transient lodging - motels, hotels	*	*	**	****	****	****
Schools, libraries, indoor religious assemblies, hospitals, nursing homes	*	***	****	****	****	****
Auditoriums, concert halls, amphitheaters	*	***	***	****	****	****
Sports arena, outdoor spectator sports, parking	*	*	*	**	***	****
Playgrounds, neighborhood parks	*	*	***	****	****	****
Golf courses, riding stables, water recreation, cemeteries	*	*	*	**	***	****
Office buildings, business commercial and professional, retail	*	*	**	***	****	****
Industrial, manufacturing, utilities, agriculture	*	*	*	***	***	****
* Generally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Mobile homes may not be acceptable in these areas. Some outdoor activities might be adversely affected.					
** Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Outdoor activities may be adversely affected. Residential: Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
*** Generally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor activities are likely to be adversely affected.					
**** Unacceptable	New construction or development shall not be undertaken.					

Source: Based on General Plan Guidelines, Appendix C (2003), Figure 2 and Santa Clara County ALUC 1992 Land Use Plan, Table 1.

City of Santa Clara General Plan. The City of Santa Clara's General Plan identifies noise and land use compatibility standards for various land uses and establishes policies to control noise within the community. Table 5.10-2 from the General Plan shows acceptable noise levels for various land uses. Industrial land uses are considered compatible in noise environments of 70 dBA L_{dn}/CNEL or less. The guidelines state that where the exterior noise levels are greater than 70 dBA L_{dn}/CNEL and less than 80 dBA L_{dn}/CNEL, the design of the project should include measures to reduce interior noise to acceptable levels. Exterior noise levels exceeding 80 dBA L_{dn}/CNEL at industrial land uses are considered incompatible. Industrial land uses proposed in noise environments exceeding 80 dBA L_{dn}/CNEL should generally be avoided, except when the use is entirely indoors and where interior noise levels can be maintained at 45 dBA L_{dn}/CNEL or less.

TABLE 5.10-2: GENERAL PLAN NOISE STANDARDS



Applicable goals and policies presented in the General Plan are as follows:

5.10.6-G1 Noise sources restricted to minimize impacts in the community.

5.10.6-G2 Sensitive uses protected from noise intrusion.

5.10.6-G3 Land use, development and design approvals that take noise levels into consideration.

5.10.6-P1 Review all land use and development proposals for consistency with the General Plan compatibility standards and acceptable noise exposure levels defined on Table 5.10-1.

5.10.6-P2 Incorporate noise attenuation measures for all projects that have noise exposure levels greater than General Plan "normally acceptable" levels, as defined on Table 5.10-1.

5.10.6-P3 New development should include noise control techniques to reduce noise to acceptable levels, including site layout (setbacks, separation and shielding), building treatments (mechanical ventilation system, sound-rated windows, solid core doors and baffling) and structural measures (earthen berms and sound walls).

5.10.6-P4 Encourage the control of noise at the source through site design, building design, landscaping, hours of operation and other techniques.

5.10.6-P5 Require noise-generating uses near residential neighborhoods to include solid walls and heavy landscaping along common property lines, and to place compressors and mechanical equipment in sound-proof enclosures.

5.10.6-P6 Discourage noise sensitive uses, such as residences, hospitals, schools, libraries, and rest homes, from areas with high noise levels, and discourage high noise generating uses from areas adjacent to sensitive uses.

5.10.6-P7 Implement measures to reduce interior noise levels and restrict outdoor activities in areas subject to aircraft noise in order to make Office/Research and Development uses compatible with the Norman Y. Mineta International Airport land use restrictions.

City of Santa Clara Municipal Code. Section 9.10.040 of the City's Municipal Code establishes noise level performance standards for fixed sources of noise, as seen below in Schedule A. Noise levels at single-family and multi-family residences, and at public spaces are limited to 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA at night (10:00 p.m. to 7:00 a.m.). Noise levels at commercial and office uses are limited to 65 dBA during daytime hours and 60 dBA during nighttime hours. Noise levels at light industrial land uses are limited to 70 dBA, and 75 dBA at heavy industrial land uses. If the measured ambient noise level at any given location differs from those levels set forth above, the allowable noise exposure standard shall be adjusted in five dBA increments in each category as appropriate to encompass or reflect the ambient noise level.

Schedule A Exterior Sound or Noise Limits

Receiving Zone	Noise Level (dBA)	
	7:00 a.m. – 10:00 p.m.	10:00 p.m. – 7:00 a.m.
Single-family and duplex residential	55	50
Multiple-family residential, public space	55	50
Commercial, Office	65	60
Light Industrial	70	70
Heavy Industrial	75	75

The noise limits are not applicable to the performance of emergency work, including the operation of emergency generators and pumps or other equipment necessary to provide services during an emergency, licensed outdoor events, City-owned electric, water, and sewer utility system facilities, construction activities occurring within allowable hours, permitted fireworks displays, or permitted heliports.

Construction activities are not permitted within 300 feet of residentially zoned property except within the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or holidays.

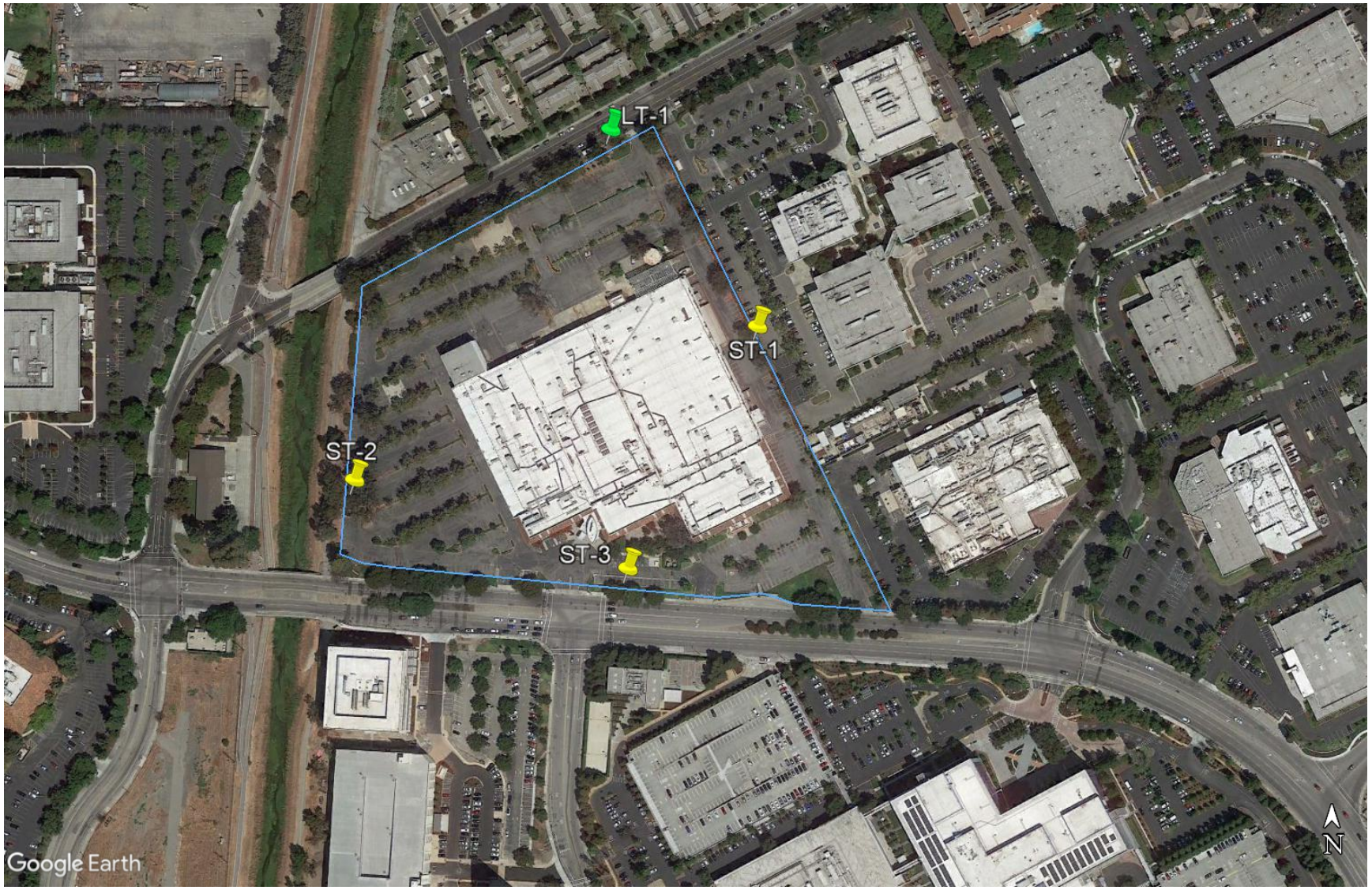
The City Code does not define the acoustical time descriptor such as L_{eq} (the average noise level) or L_{max} (the maximum instantaneous noise level) that is associated with the above limits. A reasonable interpretation of the City Code would identify the ambient base noise level criteria as an average or median noise level (L_{eq}/L_{50}).

Existing Noise Environment

The project site is located in a mixed commercial, industrial, and residential area. Along Agnew Road to the north is a multi-family residential neighborhood. To the west across San Tomas Aquino Creek is the Santa Clara Fire Department Station 8, and further west across Agnew Road are business parks along both the north and south sides of Mission College Boulevard. To the northwest is the California's Great America amusement park. To the east is a corporate campus for Omnivision Technologies and a manufacturing and office site for Varex Imaging. South of the site and across Mission College Boulevard are corporate offices. The nearest residences are across Agnew Street to the north, approximately 100 feet northwest of the northern site boundary.

A noise monitoring survey was performed in the project vicinity between Friday, October 25th, 2019 and Friday, November 1st, 2019 to quantify and characterize ambient noise levels at the site and in the surrounding area. The survey included 1 long-term measurement**(s)** and 3 short-term measurement**(s)**, as shown in Figure 1. The predominant sources of noise in the project vicinity included traffic on Mission College Boulevard and Agnew Road, and intermittent noise from aircraft associated with Norman Y. Mineta International Airport. The daily trends in noise levels at LT-1 are shown in Appendix Figures A1 – A8 at the end of this document. Measurement results are summarized in Table 4.

FIGURE 1 Noise Measurement Locations



Source: Google Earth 2019

TABLE 4 Summary of Long-Term Noise Measurements (dBA)

Location	Date	Hourly-Average Noise Level, L_{eq}		CNEL
		Daytime	Nighttime	
LT-1: ~30 ft. Southeast of Agnew Road Centerline	Friday, 10/25/2019[1]	65 – 68	64 – 65	-
	Saturday, 10/26/2019	63 – 68	55 – 65	70
	Sunday, 10/27/2019	65 – 69	53 – 63	69
	Monday, 10/28/2019	64 – 69	52 – 66	70
	Tuesday, 10/29/2019	63 – 69	53 – 66	69
	Wednesday, 10/30/2019	64 – 68	51 – 67	70
	Thursday, 10/31/2019	66 – 69	52 – 66	70
	Friday, 11/1/2019[1]	69	55 – 66	-

[1] Measurements taken on Friday, October 25, 2019 and Friday, November 1, 2019 were not 24 hours in duration and therefore cannot be used to determine a 24-hour average level.

TABLE 5 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	$L_{eq(10)}$
ST-1: East Side of Site (10/25/2019 1:20-1:30 p.m.)	72	70	61	51	50	58
ST-2: West Side of Site (10/25/2019 1:40-1:50 p.m.)	74	71	65	54	50	61
ST-3: ~75 ft. North of Mission College Boulevard Centerline (10/25/2019 2:00-2:10 p.m.)	76	74	69	59	53	64

PLAN CONSISTENCY ANALYSIS

The impacts of site constraints such as exposure of the proposed project to excessive levels of noise and vibration are not considered under CEQA. This section addresses Noise and Land Use Compatibility for consistency with the policies set forth in the Cal Green Code, the Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan, and the City of Santa Clara General Plan.

Noise and Land Use Compatibility

Applicable policies were presented in detail in the Regulatory Background section and are summarized below for the proposed project:

- For non-residential land uses, the Cal Green Code requires interior noise levels to be maintained at 50 dBA $L_{eq\ (1\text{-}hr)}$ or less during hours of operation in noise sensitive spaces such as offices.

- The Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan sets a generally acceptable noise level compatibility standard of 70 dBA CNEL for industrial land uses.

- The Santa Clara General Plan requires that exterior noise levels at industrial land uses be maintained at or below 70 dBA L_{dn}/CNEL.

The proposed land use is categorized as light industrial and is not considered sensitive to noise**.** There are no noise sensitive exterior areas on the project site. Noise levels at the exterior façades of the data center building would be 51 to 63 dBA CNEL, with the highest noise levels occurring along the northwestern façade of the building facing Agnew Road and at the southern façades facing Mission College Boulevard. Therefore, the exterior environment would be considered compatible with the City of Santa Clara's 70 dBA CNEL compatibility threshold for light industrial uses. The proposed site is located within the 60 dBA CNEL noise contour of the Norman Y. Mineta International Airport and is therefore compatible as an industrial land use with the Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan.

Interior areas used for office space and employee amenities are proposed for the southern side of each floor. The Cal Green Building Code requires interior noise levels to be maintained at 50 dBA $L_{eq\ (1\text{-}hr)}$ or less during hours of occupation in rooms sensitive to noise. Hourly average exterior noise levels along the southern façade are anticipated to reach 62 dBA $L_{eq\ (1\text{-}hr)}$ during daytime hours. The building will be provided with forced-air mechanical ventilation, allowing occupants the option of closing windows to control noise. Standard industrial building construction with windows closed provides approximately 25 dBA of noise reduction in interior spaces. As a result, interior hourly average noise levels from exterior environmental noise sources would be expected to reach 37 dBA $L_{eq\ (1\text{-}hr)}$. Noise levels are compatible with the proposed use.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

The following criteria were used to evaluate the significance of noise and vibration impacts resulting from the project:

1. **Temporary or Permanent Noise Increases in Excess of Established Standards.** A significant noise impact would be identified if the project would generate a substantial temporary or permanent noise level increase over ambient noise levels at existing noise-sensitive receptors surrounding the project site and that would exceed applicable noise standards presented in the General Plan or Municipal Code at existing noise-sensitive receptors surrounding the project site.

- Operational Noise in Excess of Standards. A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plan or Municipal Code.

- Permanent Noise Increase. A significant impact would be identified if traffic generated by the project or project improvements/operations would substantially increase noise levels at sensitive receivers in the vicinity. A substantial increase would occur if: a) the noise level increase is 5 dBA CNEL or greater where the future noise level is compatible in terms of noise and land use compatibility, or b) the noise level increase is 3 dBA CNEL or greater where the future noise level exceeds the compatibility threshold.

- Temporary Noise Increase. A significant temporary noise impact would be identified if construction would occur outside of the hours specified in the Municipal Code. Construction activities are not permitted within 300 feet of residentially zoned property except within the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or holidays.

2. **Generation of Excessive Groundborne Vibration.** A significant impact would be identified if the construction of the project would generate excessive vibration levels surrounding receptors. A continuous vibration limit of 0.50 in/sec PPV (peak particle velocity) is used to minimize the potential for cosmetic damage at buildings of commercial or industrial construction.

3. **Excessive Aircraft Noise.** A significant noise impact would be identified if the project would expose people residing or working in the project area to excessive aircraft noise levels.

Impact 1: **Temporary or Permanent Noise Increases in Excess of Established Standards.** Project construction, operations, and traffic would not result in a substantial temporary or permanent noise level increase at existing noise-sensitive land uses in the project vicinity. **This is a less-than-significant impact.**

a. Permanent Noise Increases from On-Site Operational Noise

Section 9.10.040 of the City's Municipal Code establishes noise level performance standards for fixed sources of noise, as seen in Section A. At single- or multi-family residences or public spaces, hourly average noise levels exceeding 55 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. or 50 dBA L_{eq} between 10:00 p.m. and 7:00 a.m. would constitute a significant temporary noise increase. At commercial uses, hourly average noise levels exceeding 65 dBA $L_{eq,}$ between the hours of 7:00 a.m. and 10:00 p.m. or 60 dBA L_{eq} between 10:00 p.m. and 7:00 a.m. would constitute a significant temporary noise increase. At light industrial land uses, hourly average noise levels exceeding 70 dBA L_{eq} at any time would constitute a significant temporary noise increase. At heavy industrial uses, hourly average noise levels exceeding 75 dBA L_{eq} at any time would constitute a significant temporary noise increase. The Municipal Code states that noise limits set

forth in the code are not applicable to the performance of emergency work, including the operation of emergency generators and pumps or other equipment necessary to provide services during an emergency. However, the City has applied the noise limits to testing of the standby generators for previous data center buildings in Santa Clara.

The proposed project would include an approximately 1.5-acre generator yard located in between the two proposed buildings. The generator yard would include forty-three (43) 2.5 MW emergency backup generators and two (2) 600 kW house-power emergency backup generators. Each generator would be enclosed and only tested during daytime hours. Heating, ventilation, and air conditioning (HVAC) equipment would be located on the rooftops of both buildings. Proposed rooftop mechanical equipment includes a total of 56 upblast exhaust fans, with 32 on the eastern building and 24 on the western building, and a series of sidewall exhaust fans which would be enclosed within penthouse structures. An electrical distribution substation would be located at the north side of the site near Agnew Road, containing three transformers. The substation would be partially shielded by a 12-foot concrete wall along the northern, eastern, and southern sides. Data sheets including noise levels for the generators and HVAC equipment were provided by the project applicant. Under full load, each 2.5 MW enclosed generator would meet a design goal of 75 dBA at a distance of 23 feet. Each 600 kW enclosed generator would meet a design goal of 72 dBA at a distance of 23 feet under full load. Other mechanical and electrical equipment located inside the building would not be anticipated to emit audible noise outside. Both buildings would have rooftop parapet walls reaching six feet and three inches and would be constructed of metal panels with a surface weight greater than 3 pounds per square foot. Shielding from the parapet wall would be anticipated to provide additional noise reduction.

Proposed fixed sources of noise at the site were modeled using SoundPLAN, a three-dimensional noise modeling software that considers site geometry, the characteristics of the noise sources, and shielding from structures and barriers. Two scenarios for noise exposure were considered for this project: noise from continuously operating mechanical equipment (HVAC, substation), and noise from mechanical equipment concurrent with testing of generators. The latter scenario was designed considering the proposed generator testing schedule, indicating only one generator would be tested at a time. Results of the scenarios are summarized in Table 6 and provided as noise exposure maps in Figures 2a and 2b.

TABLE 6 Calculated Noise Levels Resulting from Mechanical Equipment Operations

Receiver Location	Calculated Noise Levels, dBA L_{eq}	
	HVAC Only	HVAC and Generator Testing
Agnew Road Residences	45 – 50	47 – 51
Santa Clara Fire Department Station 8	48 - 52	48 - 52
Omnivision Buildings	48 – 50	48 – 51
Varex Buildings	51 – 52	51 – 52
Intel Buildings	46 – 47	50 – 51

FIGURE 2a Noise Exposure Resulting from HVAC Equipment and Electrical Substation

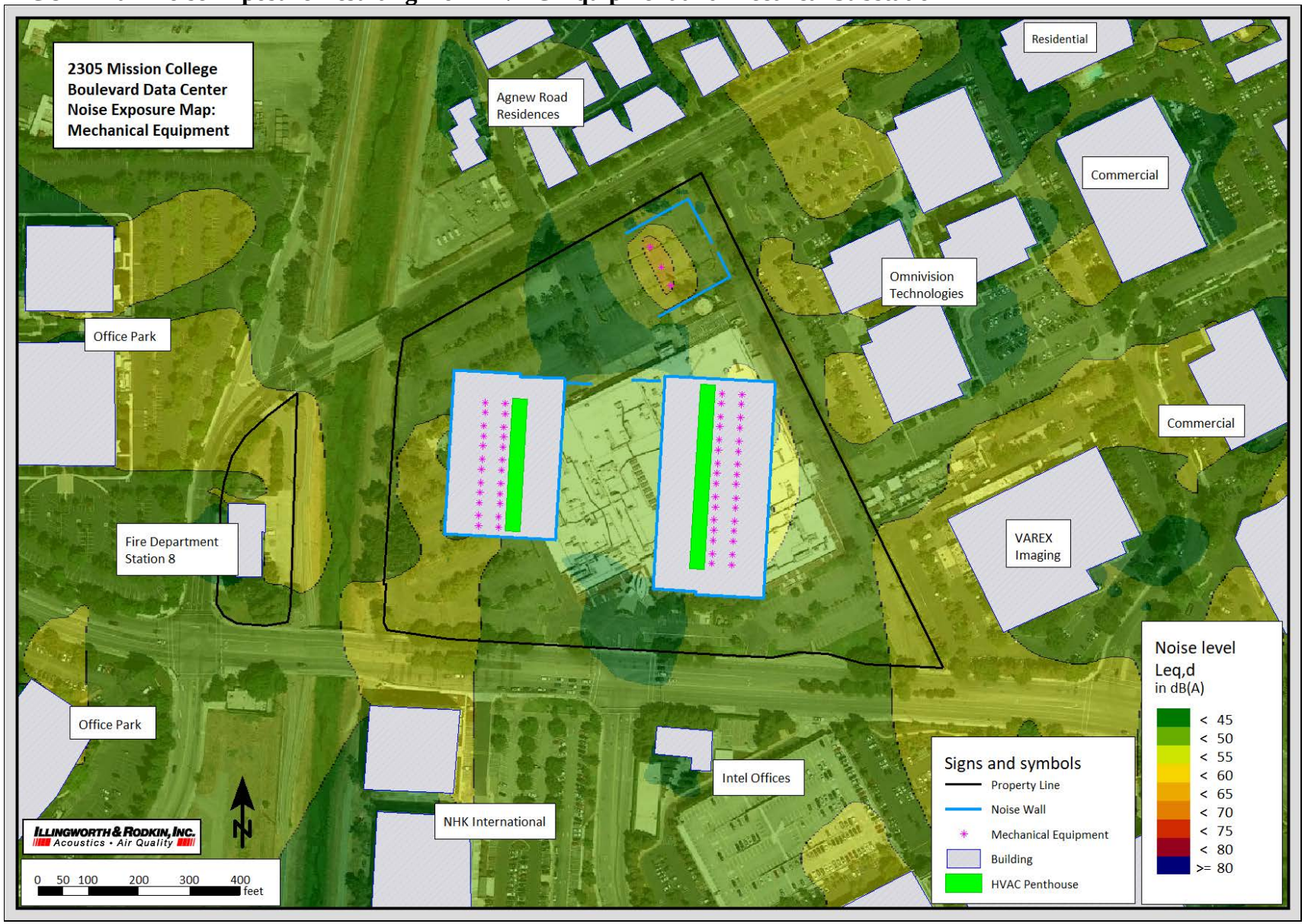
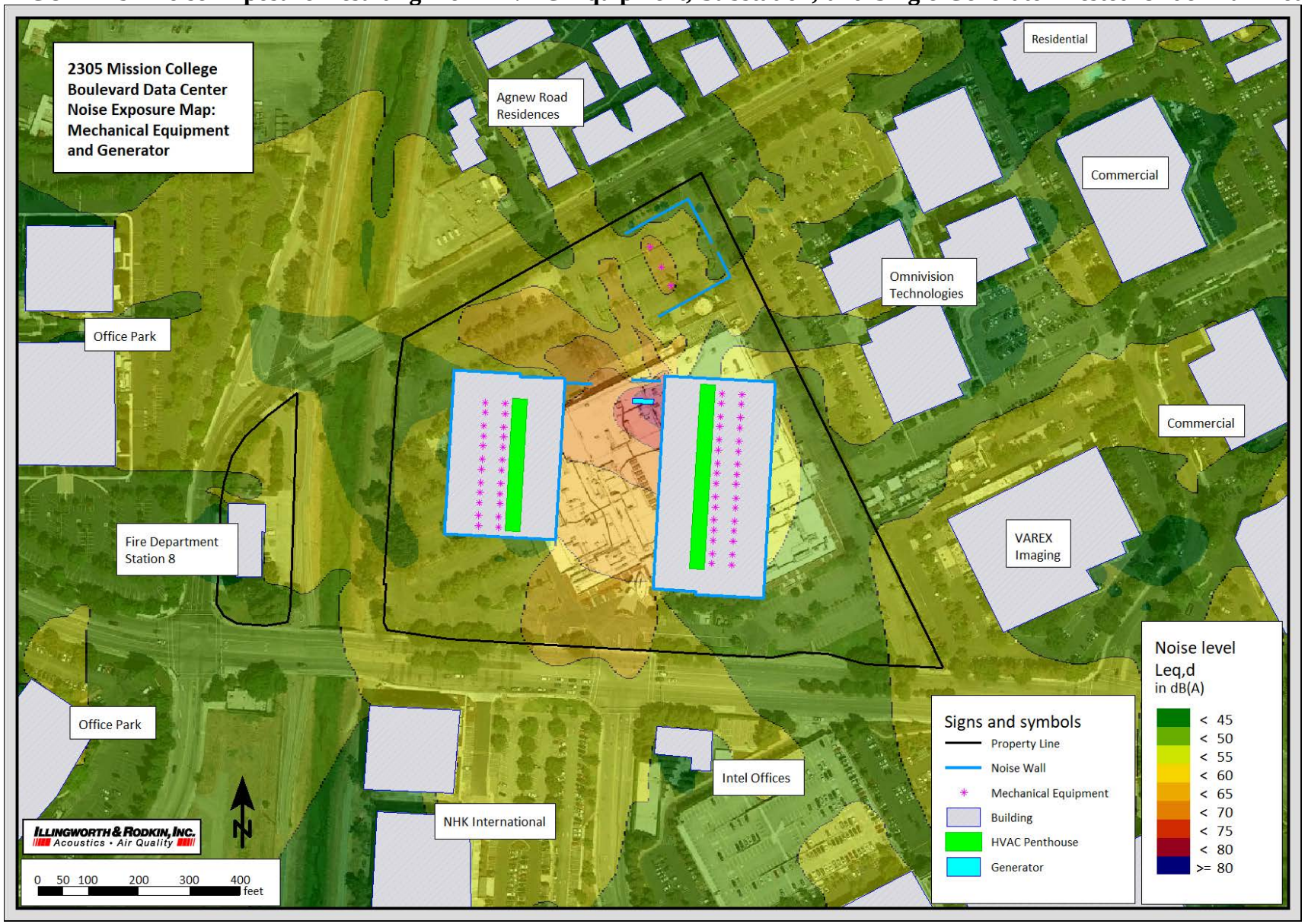


FIGURE 2b Noise Exposure Resulting from HVAC Equipment, Substation, and Single Generator Tested Under Full Load



As seen above in Figure 2a and Table 6, noise resulting from operation of HVAC equipment and the electrical substation is not anticipated to result in levels that would exceed the daytime or nighttime residential limits of 55 dBA L_{eq} and 50 dBA L_{eq} at the nearest residences along Agnew Road to the north. The Santa Clara Fire Department Station 8 is zoned as a public or quasi-public use and therefore has the same noise limits as described for residential uses. Noise levels resulting from the operation of HVAC equipment and the electrical substation would exceed 50 dBA L_{eq} during nighttime hours at points throughout the northern half of the fire station property, which consists primarily of an empty yard and access road. Noise levels along façades of the fire station are not anticipated to exceed 50 dBA L_{eq}.

As seen in Figure 2b and Table 6, generator testing concurrent with HVAC and substation operations would result in noise levels reaching 51 dBA L_{eq} at the Agnew Road residences, and 52 dBA L_{eq} at the fire station. As generator testing will only take place during daytime hours, this would not result in standards being exceeded. Daytime and nighttime commercial limits of 65 dBA L_{eq} and 60 dBA L_{eq}, and industrial limits of 70 dBA L_{eq} would not be exceeded at any time. Additionally, anticipated hourly noise levels at the Agnew Road residences were calculated from the measurements taken between Friday, October 5th, 2019 and Friday, November 1st, 2019 at location LT-1. Daytime ambient noise levels are expected to be between 58 and 64 dBA L_{eq} at the nearest residences.

Noise levels resulting from on-site operations have the potential to exceed the nighttime noise level standard of 50 dBA L_{eq} set forth in the City of Santa Clara Municipal Code at points throughout the Santa Clara Fire Department Station 8 property. This is a **potentially significant** impact.

Mitigation Measure 1a: Implementation of either of the following measures would reduce the on-site operational noise impact to a less-than-significant level.

Noise abatement would be needed to reduce the noise resulting from operations of HVAC equipment located on the Phase II building rooftop. Increasing the height of the parapet wall, or adding a screen wall, to reach a height of 10 feet along the western side of the Phase II building would reduce operational noise at the Fire Department property to a maximum of 50 dBA L_{eq} during nighttime hours. The parapet or screen will be constructed without any gaps or cracks and have a minimum surface weight of 3 pounds per square foot (such as 1-inch-thick wood, ½-inch laminated glass, masonry block, concrete, or metal one-inch). This would reduce noise levels to meet the regulations set in Schedule A of Section 9.10.040 of the City of Santa Clara Municipal Code.

Alternatively, equipping the HVAC penthouse structure located on the rooftop of the Phase II building with an acoustical louver would significantly decrease noise levels emanating from the structure. This would result in noise levels at the Fire Department property below the 50 dBA L_{eq} nighttime Municipal Code regulation.

b. Permanent Noise Increases from Project Traffic

Neither the City of Santa Clara nor the State of California define the traffic noise level increase that is considered substantial. A significant impact would occur if the permanent noise level increase

due to project-generated traffic was 3 dBA CNEL or greater at noise-sensitive receptors for existing levels exceeding 55 dBA CNEL or was 5 dBA CNEL or greater for existing levels at or below 55 dBA CNEL. For reference, a 3 dBA CNEL noise increase would be expected if the project would double existing traffic volumes along a roadway and a 5 dBA CNEL noise increase would be expected if the project would triple existing traffic volumes along a roadway.

Total parking at the site will decrease substantially from approximately 1,200 spaces to approximately 144 spaces. Given this, and the relatively high traffic volumes in the project vicinity, traffic contributed by the project will be insignificant. This is a **less-than-significant impact**.

Mitigation Measure 1b: None required.

c. Temporary Noise Increases from Project Construction

Section 9.10.230 of the City's Municipal Code limits construction activities within 300 feet of residentially-zoned property to be within the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or Holidays. Construction noise levels at commercial or industrial land uses, or residential uses within allowed hours, are not regulated in the City Code or General Plan.

Construction activities for individual projects are typically carried out in stages. During each stage of construction, there would be a different mix of equipment operating, and noise levels would vary by stage and vary within stages, based on the amount of equipment in operation and the location at which the equipment is operating. Typical construction noise levels at a distance of 50 feet are shown in Tables 7 and 8. Table 7 shows the average noise level ranges by construction phase, and Table 8 shows the maximum noise level ranges for different construction equipment. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA noise reduction at distant receptors.

TABLE 7 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	**II**	**I**	**II**	**I**	**II**	**I**	**II**
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

I - All pertinent equipment present at site.
II - Minimum required equipment present at site.

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

TABLE 8 Construction Equipment 50-foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

1 Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

2 Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

3 Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Source: Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances, National Cooperative Highway Research Program, 1999.

Project construction for the Phase I building is scheduled to begin in December 2019 and is anticipated to finish in March 2021, a total of 15 months. The schedule for construction of the second phase was not available at the time of this writing. The construction of the proposed project would involve demolition of the existing structure and pavement, site preparation, grading and excavation, trenching, building erection, interior/architectural coating, and paving. Table 9 shows the anticipated construction noise levels calculated for each phase of construction using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). Pile driving is not anticipated as a method of construction.

TABLE 9 Calculated Construction Noise Levels for Each Phase of Construction

Construction Phase	At Distance of 50 ft.	
	L_{eq}, dBA	**L_{max}, dBA**
Demolition (80 days)	93	90
Site Preparation (100 days)	88	85
Grading/Excavation (10 days)	88	85
Trenching (30 days)	85	84
Building-Exterior (180 days)	81	81
Building-Interior (30 days)	80	78
Paving (5 days)	86	90

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. As indicated in Table 9, at 50 feet from the noise source, maximum instantaneous noise levels generated by project construction equipment are calculated to range from 78 to 90 dBA L_{max} and hourly average noise levels are calculated to range from 80 to 93 dBA L_{eq}.

Noise sensitive uses surrounding the site include residential buildings, located 120 feet north of the project site. The residential buildings would be exposed to a maximum noise level of 82 dBA L_{max} during demolition and paving and maximum noise levels of 70 – 78 dBA L_{max} during other phases of construction when construction is located adjacent to Agnew Road. Typical hourly average noise levels of 85 dBA L_{eq} during demolition and 72 – 80 dBA L_{eq} during other phases of construction are anticipated at the residences when construction is located adjacent to Agnew Road. Noise levels would be lower as construction moves away from Agnew Road or into shielded areas. Implementation of the following construction best management practices would regulate the hours of construction, reduce construction noise levels emanating from the site, and minimize disruption and annoyance at existing noise-sensitive receptors in the project vicinity**.**

Construction Best Management Practices

Develop a construction noise control plan, including, but not limited to, the following available controls:

- Construction activities shall be limited to hours between 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or Holidays.

- Construct temporary noise barriers, where feasible, to screen stationary noise-generating equipment. Temporary noise barrier fences would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receiver and if the barrier is constructed in a manner that eliminates any cracks or gaps.

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Unnecessary idling of internal combustion engines should be strictly prohibited.

- Locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as possible from sensitive receptors as feasible. If they must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used reduce noise levels at the adjacent sensitive receptors. Any enclosure openings or venting shall face away from sensitive receptors.

- Utilize "quiet" air compressors and other stationary noise sources where technology exists.

- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

- Control noise from construction workers' radios to a point where they are not audible at existing residential uses to the north of the project site.

- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.

- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

Implementation of the above measures would reduce this impact to a **less-than-significant** level.

Mitigation Measure 1c: None required.

Impact 2: Generation of Excessive Groundborne Vibration due to Construction. Construction-related vibration levels are not anticipated to exceed limits at the nearest structures. This is a **less-than-significant impact**.

The City of Santa Clara does not specify a construction vibration limit. For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for

buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a limit of 0.25 in/sec PPV for historic and some old buildings (see Table 3). The 0.3 in/sec PPV vibration limit would be applicable to residences across Agnew Road. The 0.5 in/sec PPV vibration limit would be applicable to other properties in the vicinity of the project site.

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g. jackhammers, hoe rams) are used. Construction activities would include demolition, site preparation, grading and excavation, trenching, building (exterior), interior/architectural coating, and paving. Pile driving, which can cause excessive levels of vibration, is not anticipated as a method of construction. Other project construction activities, such as the use of jackhammers, rock drills, and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may potentially generate substantial vibration in the immediate vicinity. Erection of the building structure is not anticipated to be a source of substantial vibration with the exception of sporadic events such as dropping of heavy objects, which should be avoided to the extent possible.

The closest structures to the project site are the residences to the north across Agnew Road, the Omnivision Technologies corporate campus to the east, and the Varex Imaging manufacturing and office buildings to the southeast, all approximately 120 feet from site boundaries. The Mission City Center shared office building located at 2350 Mission College Boulevard is located approximately 150 feet from site boundaries. Table 10 presents typical vibration levels that could be expected from construction equipment at a reference distance of 25 feet and calculated levels at distances of 120 feet and 150 feet.

TABLE 10 Vibration Source Levels for Construction Equipment

Equipment		Reference PPV at 25 ft. (in/sec)	PPV at 120 ft. (in/sec)[1]	PPV at 150 ft. (in/sec)[1]
Clam shovel drop		0.202	0.036	0.028
Hydromill (slurry wall)	in soil	0.008	0.001	0.001
	in rock	0.017	0.003	0.002
Vibratory Roller		0.210	0.037	0.029
Hoe Ram		0.089	0.016	0.012
Large bulldozer		0.089	0.016	0.012
Caisson drilling		0.089	0.016	0.012
Loaded trucks		0.076	0.014	0.011
Jackhammer		0.035	0.006	0.005
Small bulldozer		0.003	0.001	0.000

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, October 2018 as modified by Illingworth & Rodkin, Inc., November 2019.

[1]These levels calculated assuming normal propagation conditions, using a standard equation of *PPVeqmt-PPVref * (25/D) 1.5*, from FTA, May 2006.

As indicated in Table 10, there are not predicted to be any times during construction when vibration levels will exceed the limit of 0.3 in/sec PPV at residences or 0.5 in/sec PPV at other buildings in

the site vicinity. Vibration levels would be further below the threshold at more distant locations. This is a **less-than-significant impact**.

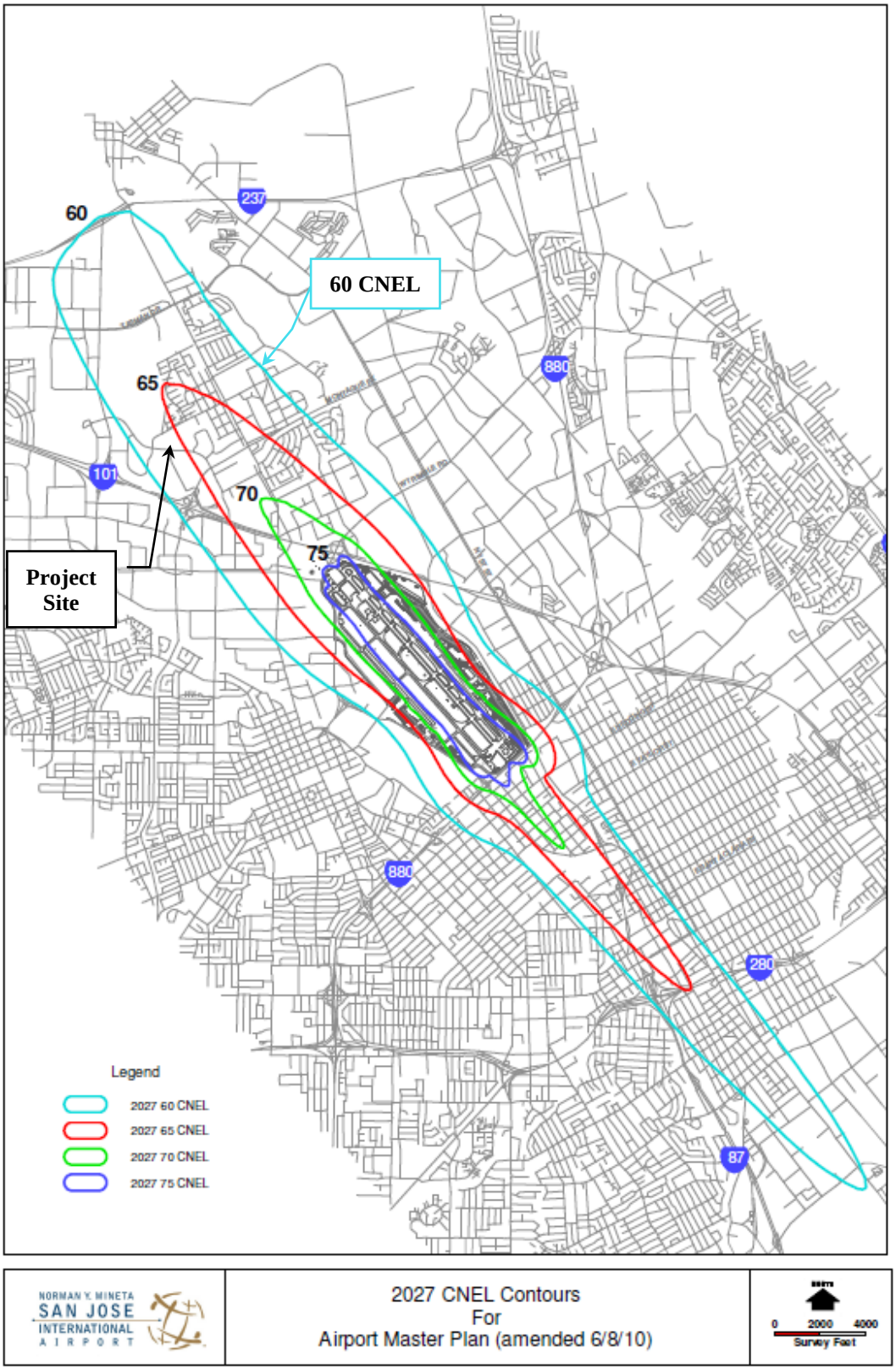
Mitigation Measure 2: None required.

Impact 3: **Excessive Aircraft Noise Levels.** The proposed project would be located in a compatible noise environment with respect to noise generated by Norman Y. Mineta International Airport. This is a **less-than-significant impact**.

Norman Y. Mineta International Airport is located approximately 1.6 miles southeast of the project site. Based on the 2027 noise contours shown in the Norman Y. Mineta International Airport Master Plan Update Project Report (2010), the project site has an airport noise exposure of about 60 dBA CNEL (see Figure 3). This noise level would be considered compatible with industrial use. This is a **less-than-significant impact**.

Mitigation Measure 3: **None required.**

FIGURE 3 2027 CNEL Noise Contours for SJIA Relative to Project Site



APPENDIX A

Figure A1 Daily Trend of Noise Levels at LT-1 on Friday, October 25th

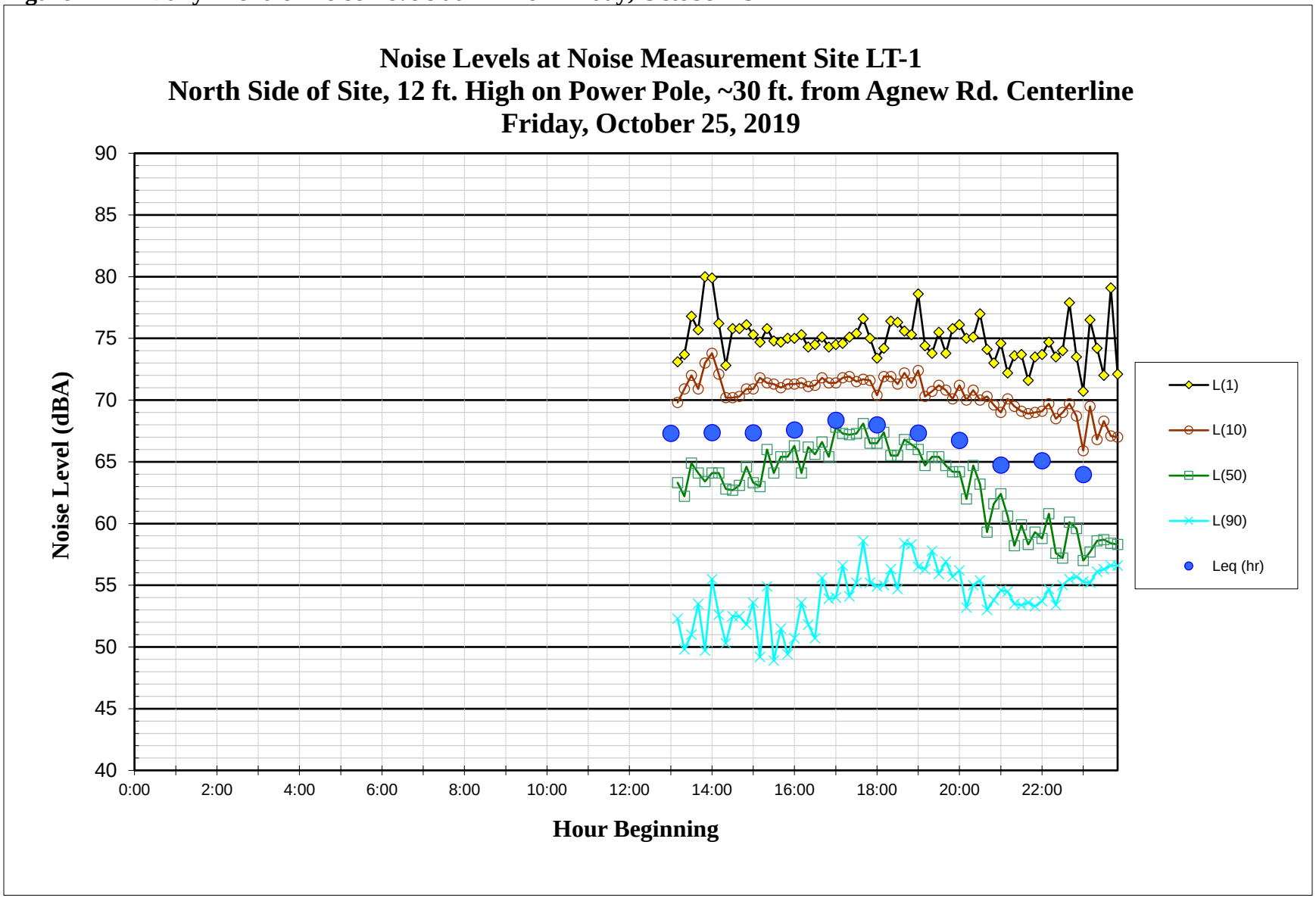


Figure A2 Daily Trend of Noise Levels at LT-1 on Saturday, October 26th

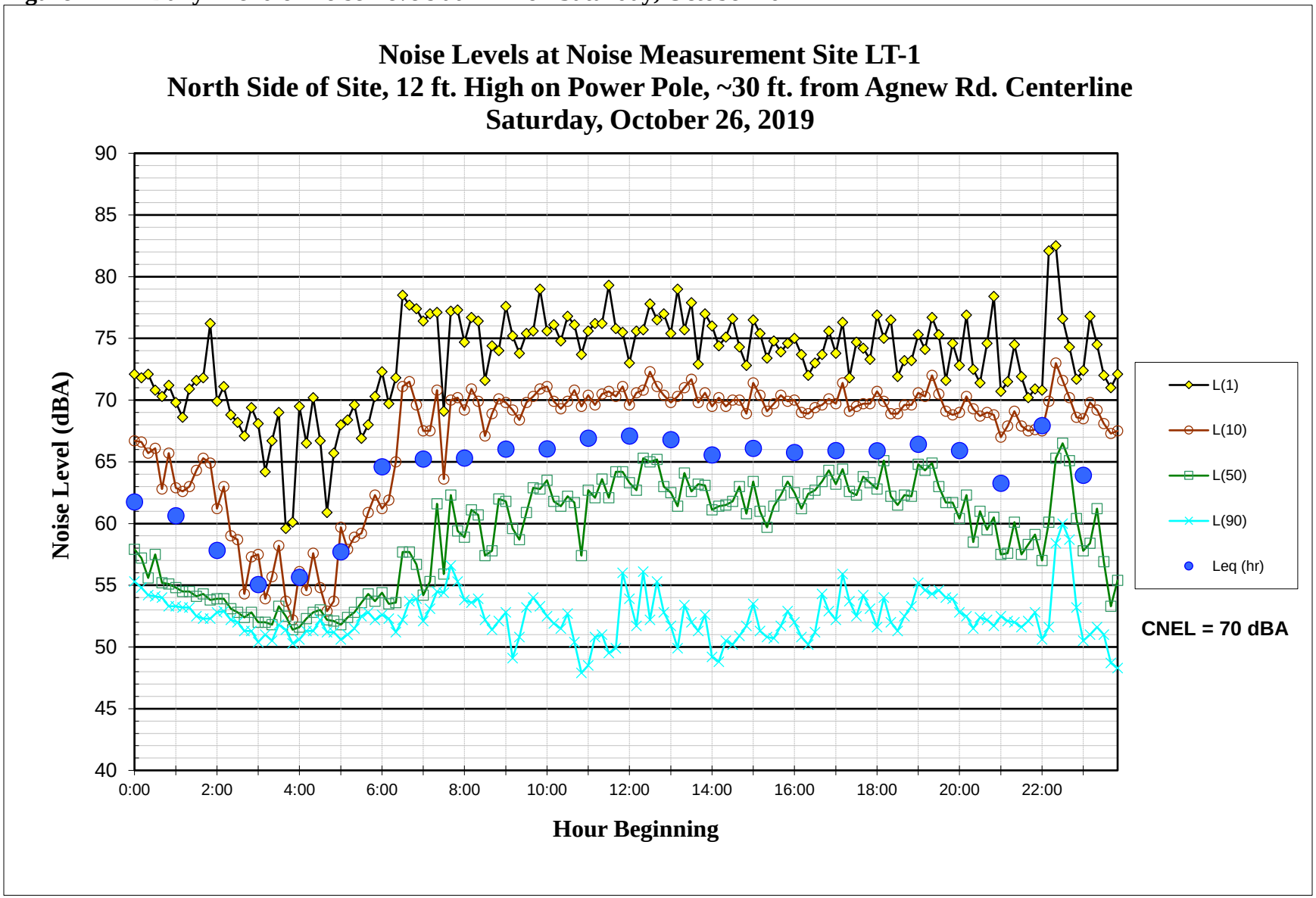


Figure A3 Daily Trend of Noise Levels at LT-1 on Sunday, October 27th

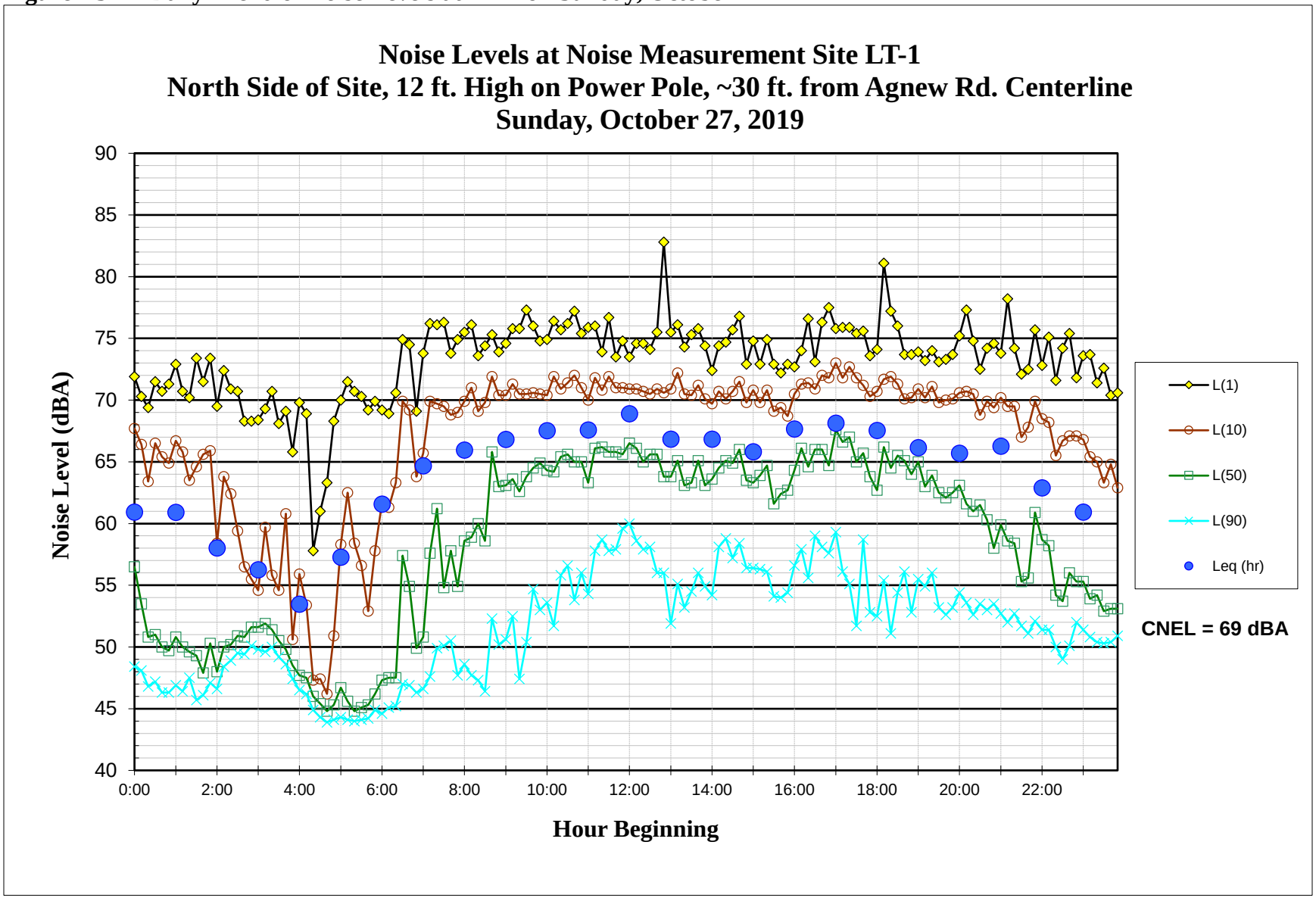


Figure A4 Daily Trend of Noise Levels at LT-1 on Monday, October 28th

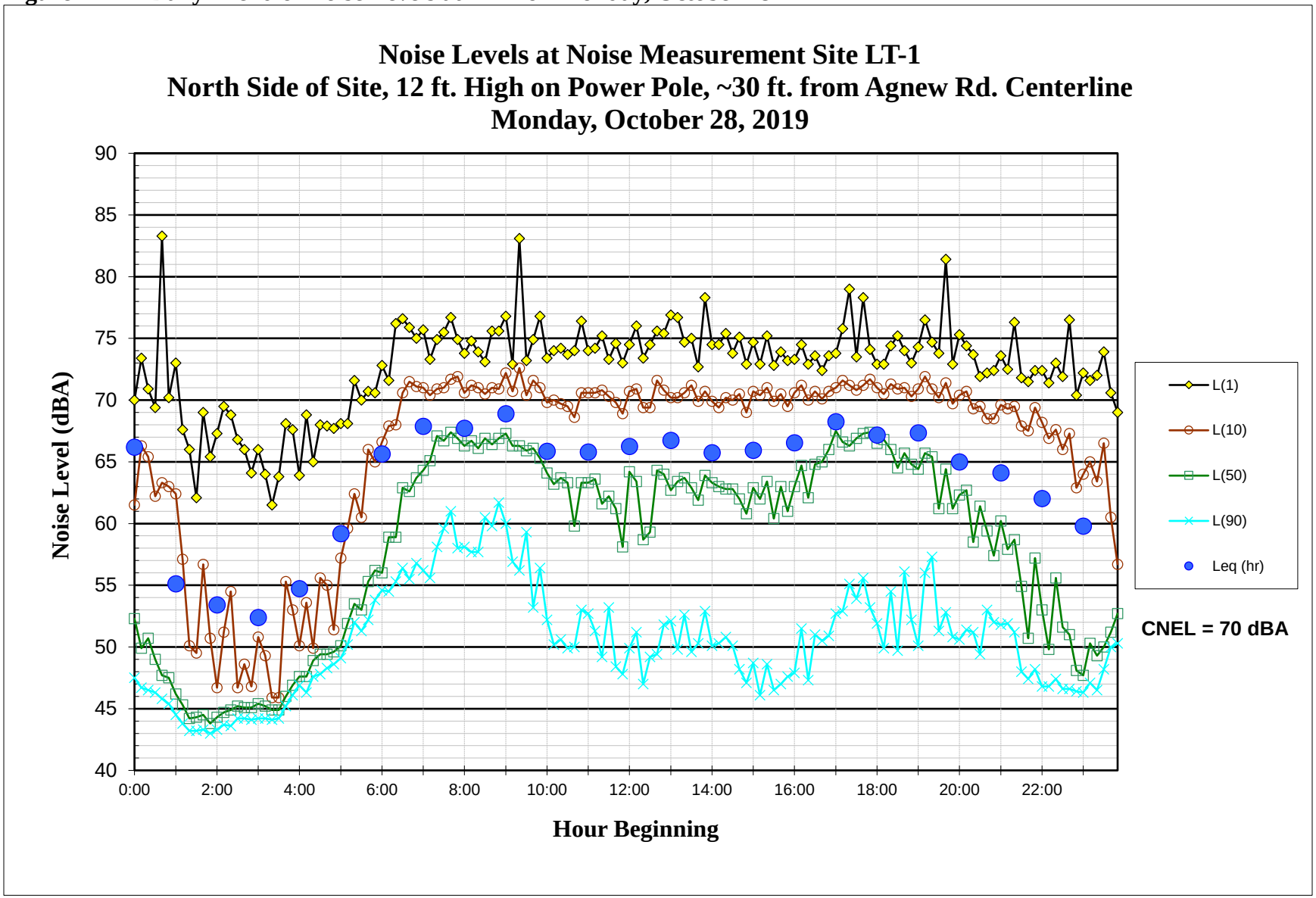


Figure A5 Daily Trend of Noise Levels at LT-1 on Tuesday, October 29th

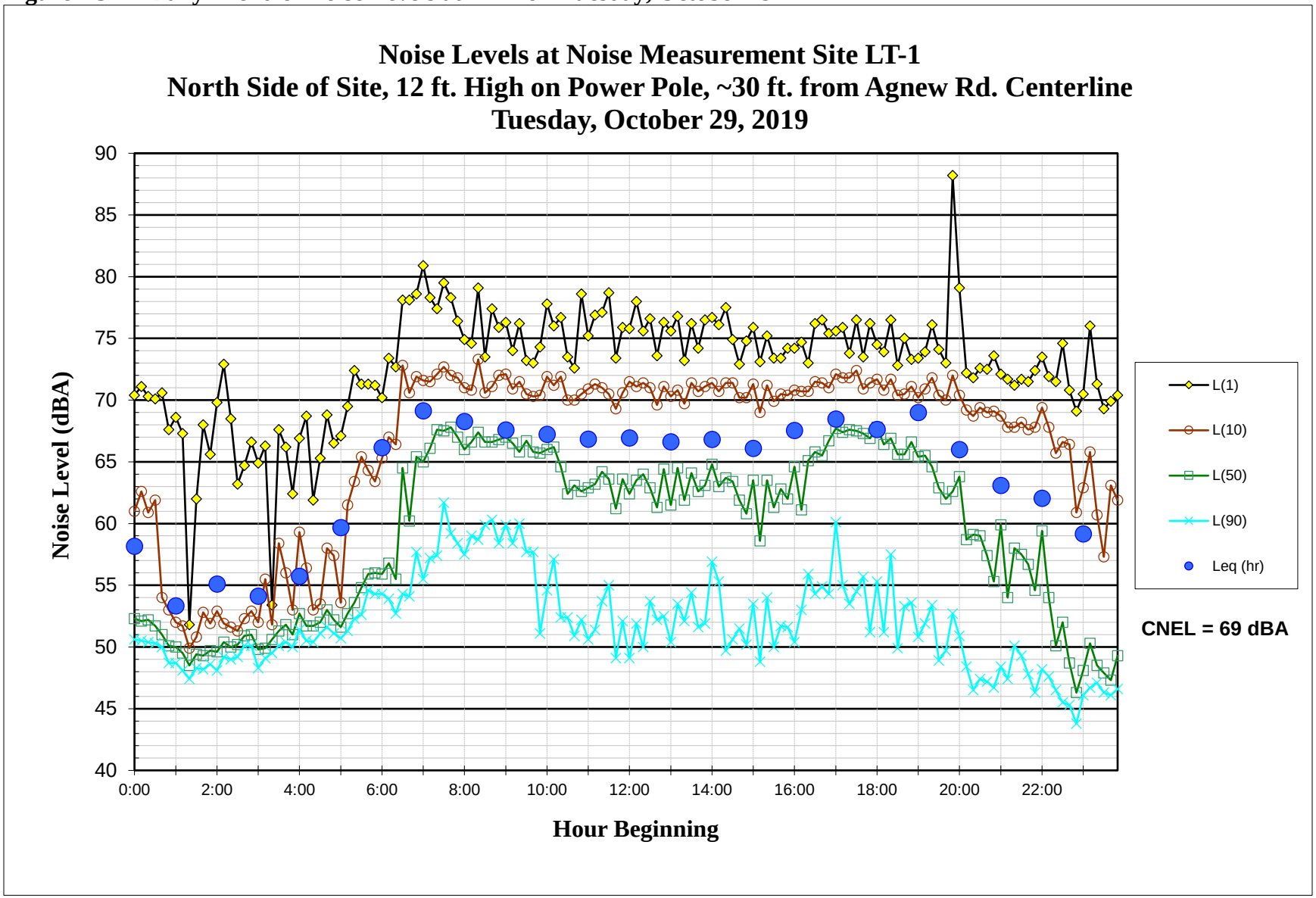


Figure A6 Daily Trend of Noise Levels at LT-1 on Wednesday, October 30th

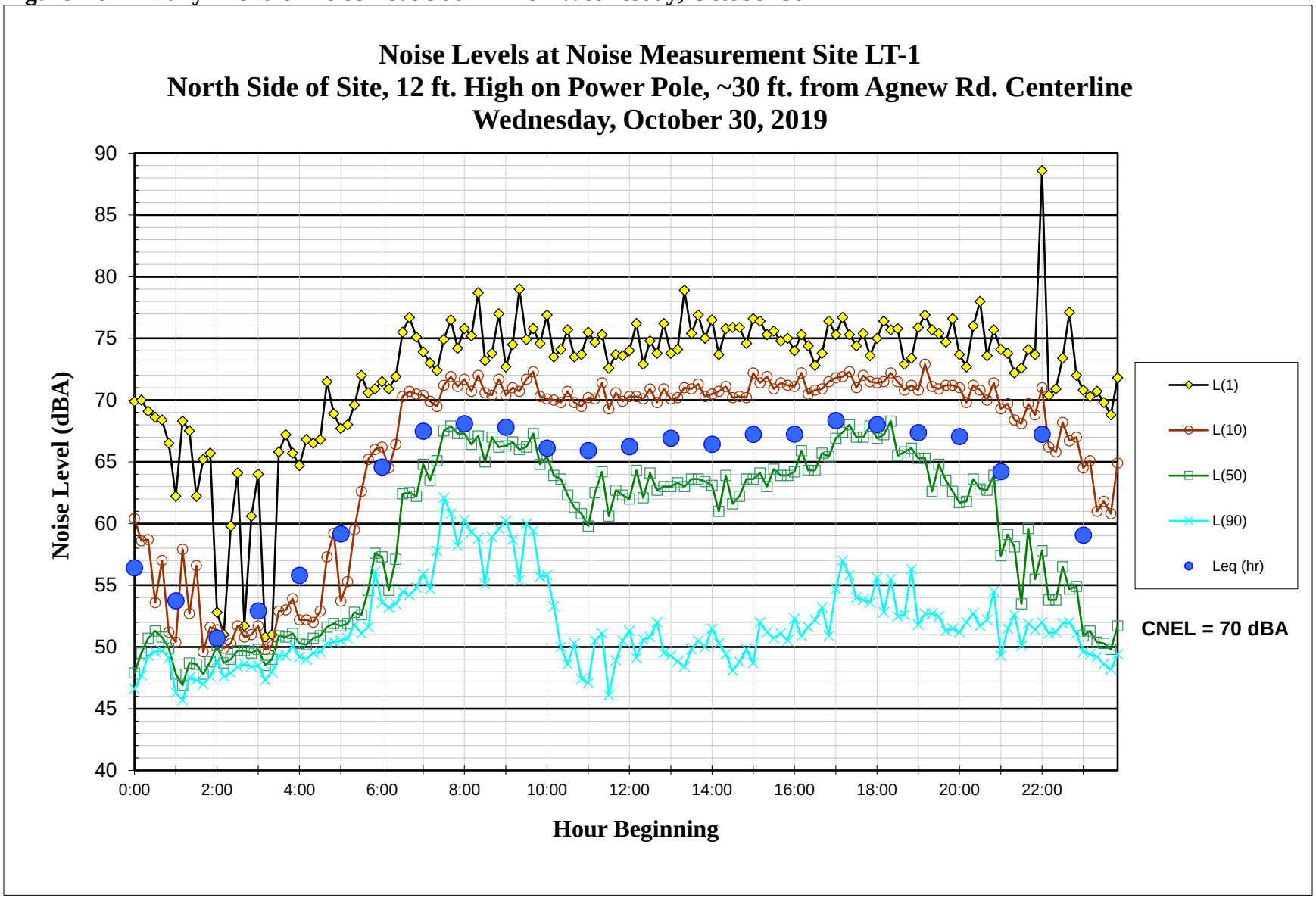


Figure A7 Daily Trend of Noise Levels at LT-1 on Thursday, October 31st

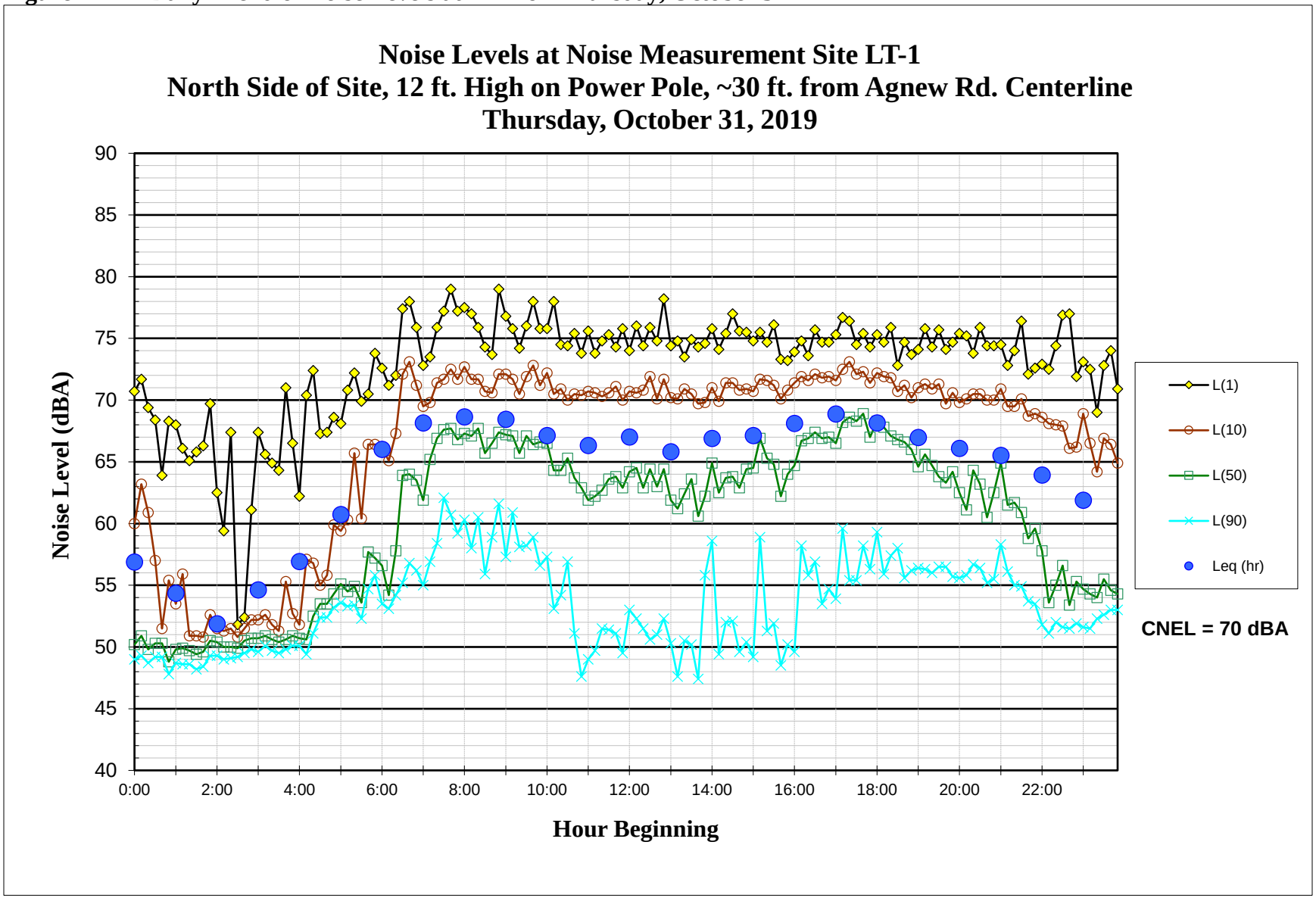


Figure A8 Daily Trend of Noise Levels at LT-1 on Friday, November 1st