

# Technical Memorandum

**To:** EPC Environmental, Inc. Ernest Perea

**From:** Kevin P. Carr, MS., KPC EHS Consultants, LLC

**Date:** November 17, 2023 **Revised June 14, 2024**

**Re:** EPC 23-29 Hickory Street Residential Project – Noise Assessment

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## 1.0 Purpose

The purpose of this memorandum is to document the impacts of construction, mobile, operational noise, and vibration as it relates to the potential environmental impacts associated with the construction and operation of the proposed Multi-Family Residential Project on approximately 0.69 acres.

## 2.0 Project Location & Description

### 2.1 Project Location:

The proposed project site is located in the City of Escondido, San Diego County, California on the northeast intersection of South Hickory Street and East 3rd Avenue at 240 South Hickory Street also referred to as APN 229-492-14-00.

### 2.2 Description:

The Applicant is proposing the renovation of an existing 19,431 square foot medical office building into 21 residential units with both interior and exterior improvements including installations of kitchens and bathrooms in each unit, shared laundry facility, tenant storage space, the creation of an outdoor community area, and upgrades to the existing parking lot and landscaping on approximately 0.69 acres.

## 3.0 Noise Impacts

### 3.1 Ambient Noise:

The primary sources for existing ambient noise in the Project area is from traffic generated primarily from South Hickory Street bordering on the west and East 3<sup>rd</sup> Avenue bordering on the south of the project site, and East Grand Avenue (approximately 735 feet north), as well as residential and professional office building noises and from surrounding properties.

**3.1.1 Existing Ambient Noise Level Measurements:** To assess the existing noise level environment short-term noise measurements were obtained from 4 locations in the Project study area. Exhibit 3-A Noise Monitoring Map, provides the locations of the noise level measurements. Table 3.1.1 Ambient Noise Level Measurements provides the noise measurements. Ambient noise datasheets are included in Appendix A.

**Exhibit 3-A Noise Monitoring Map**



**Table 3-1 Ambient Noise Level Measurements**

| Location | Distance to Project Center | Description   | Average Noise Level dBA (Leq) | Maimum Noise Level (Lmax) |
|----------|----------------------------|---|-------------------------------|---------------------------|
| #1       | 120 ft.                    | West boundary of Project site on South Hickory Avenue.                                    | 63.2                          | 77.1                      |
| #2       | 430ft                      | Town View Professional Center – 2155 South Hickory Avenue                                 | 53.1                          | 62.4                      |
| #3       | 695 ft                     | South Ivy Street – south of intersection with East 2 <sup>nd</sup> Avenue.                | 54.2                          | 63.5                      |
| #4       | 500 ft                     | Northeast corner of Intersection of South Hickory Street and East 4 <sup>th</sup> Avenue. | 50.4                          | 60.3                      |

Source: Ambient Noise Measurement Datasheets, Appendix A.

The Bureau of Transportation Statistics provides the National Transportation Noise Map as a basis for understanding what-if scenarios and helping policy makers and planners to prioritize noise-related transportation investments.<sup>1</sup> The data on the noise map allows for viewing the potential exposure to aviation, highway, and rail noise. The current data for the roadways in the project area as well as Interstate 15 and roadways near the Project site from the 2016 – 2018 noise map and is presented in Exhibit 3-B. The Noise Map contours are representative of the measured ambient noise measurements as presented in Table 3-1.

**Exhibit 3-B National Transportation Noise Map: Escondido Area**



<sup>1</sup> Bureau of Transportation Statistics, National Transportation Noise Map: <https://www.bts.gov/geospatial/national-transportation-noise-map> accessed November 14, 2023.

**3.1.2 Sensitive Receptors (Noise Sensitive Land Uses):** Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Sensitive receptor locations are generally identified as facilities where it is possible that an individual could remain for 24 hours. Commercial and industrial facilities are not included in the definition of sensitive receptor because employees typically are present for shorter periods of time, such as eight hours.

Residences, schools, hospitals, guest lodging, libraries, churches, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks are considered noise sensitive. The closest sensitive receptors to the Project site are include residential to the north, northeast, and south, as indicated in Table 3-2.

The properties surrounding the Project site are residential except for the Town View Professional Center located Northwest and dental office to the north. The nearest schools are the Classical Academy High School and Middle Schools approximately 3,280 northwest of the north site boundary.

**Table 3-2 Sensitive Receptors Locations**

| Receptor   | Distance from Project Site Boundary (feet) | Distance from Project Construction Center (feet) |
|--|--|--|
| Classical Academy High School & Middle Schools             | 3,280                                      | 3,400  |
| Multi-Family Residential (west)                            | 120  | 240  |
| Multi-Family Residential (adjacent property boundary east) | 10   | 95   |
| Residential (north)  | 30   | 120  |
| Residential (south)  | 75   | 170  |

Source: Google Earth Pro, November 14, 2023

### 3.2 Construction Noise:

The Project is proposing to renovate an existing medical office building into a multi-family residential structure. Construction activities that would create noise include interior demolition, site preparation, building construction, paving, and architectural coating. Noise levels associated with the construction will vary with the different types of construction equipment, the duration of the activity, and distance from the source. Construction noise will have a temporary or periodic increase in the ambient noise level above the existing levels within the Project vicinity. The nearest sensitive receptors to the Project site are east are multi-family residential, to the north an alley way followed by single family residential, to the west South Hickory Street followed by multi-family residential and to the south the site is bounded by East 3rd Avenue followed by single family residential. To estimate the potential impact of construction noise at the nearest sensitive receptors, equipment that is expected to be used during construction was

input into the Federal Highway Administration Roadway Construction Noise Model (RCNM) version 1.1 to generate anticipated noise levels and included as Appendix B. The RCNM generates the maximum noise levels (Lmax) and the equivalent continuous sound level (Leq). The Leq is a calculation of the anticipated steady sound pressure level which, over a given time period (day, evening, night) has the same total energy as the actual fluctuating noise. The RCNM also uses an acoustical use factor in the noise calculations. The acoustical use factor is the percentage of time each piece of construction equipment is assumed to be operating at the full power level and is used to estimate the Leq values from the Lmax values. For example, typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Noise levels will be loudest during the site preparation and paving phases. Table 3-3, Construction Equipment Noise Levels at the Nearest Receptor, identifies the level of noise generated by construction equipment.

**Table 3-3 Construction Equipment Noise Levels at the Nearest Sensitive Receptor  
(Property line of Project Site to East Residences)**

| Source               | Approximate Distance to Nearest Receptor <sup>1</sup><br>(Property Line of Construction Site to Residence) (feet) | Sound Level at Nearest Receptor |                           |      |
|----------------------|---|---------------------------------|---------------------------|------|
|                      |   | Lmax                            | Acoustical Use Factor (%) | Leq  |
| Backhoe              | 10  | 91.5                            | 40                        | 87.6 |
| Concrete Mixer Truck | 10  | 92.8                            | 40                        | 88.8 |
| Compressor (air)     | 10  | 91.6                            | 40                        | 87.7 |
| Concrete Pump Truck  | 10  | 95.4                            | 20                        | 88.4 |
| Dump Truck           | 10  | 90.4                            | 40                        | 86.5 |
| Flat Bed Truck       | 10  | 88.2                            | 40                        | 84.3 |
| Front End Loader     | 10  | 93.1                            | 40                        | 89.1 |
| Paver                | 10  | 91.2                            | 50                        | 88.2 |
| Pickup Truck         | 10  | 89.0                            | 40                        | 85.0 |
| Roller               | 10  | 94.0                            | 20                        | 87.0 |
| Tractor              | 10  | 98.0                            | 40                        | 94.0 |

Source: FHWA – RCNM Version 1.1, Appendix B.

**Table 3-4 Construction Equipment Noise Levels at the Nearest Sensitive Receptor  
(Center of Project Site to East Residences)**

| Source               | Approximate Distance to Nearest Receptor <sup>1</sup><br>(Center of Site to Residence) (feet) | Sound Level at Nearest Receptor |                           |      |
|----------------------|---|---------------------------------|---------------------------|------|
|                      |   | Lmax                            | Acoustical Use Factor (%) | Leq  |
| Backhoe              | 95  | 72.0                            | 40                        | 68.0 |
| Concrete Mixer Truck | 95  | 73.2                            | 40                        | 69.2 |
| Compressor (air)     | 95  | 72.1                            | 40                        | 68.1 |
| Concrete Pump Truck  | 95  | 75.8                            | 20                        | 68.8 |
| Crane                | 95  | 75.0                            | 16                        | 67.0 |
| Dump Truck           | 95  | 70.9                            | 40                        | 66.9 |
| Flat Bed Truck       | 95  | 68.7                            | 40                        | 64.7 |
| Front End Loader     | 95  | 73.5                            | 40                        | 69.6 |
| Man Lift             | 95  | 69.1                            | 20                        | 62.1 |
| Paver                | 95  | 71.6                            | 50                        | 68.6 |
| Pickup Truck         | 95  | 69.4                            | 40                        | 65.4 |
| Roller               | 95  | 74.4                            | 20                        | 67.4 |
| Tractor              | 95  | 78.4                            | 40                        | 74.4 |
| Welder / Torch       | 95  | 68.4                            | 40                        | 64.4 |

Source: FHWA – RCNM Version 1.1, Appendix B.

The highest anticipated construction noise levels would be from the use of outside activities that includes repairs to the parking lot, exterior of the building, and landscaping from a tractor with a level of 98 dBA Lmax and 94 dBA Leq at 10 feet from the source to the receptor and 78.4 Lmax and 64.4 Leq at 95 feet from the source to the receptor. During the exterior site construction equipment would not be stationary along the site boundary, additionally Mitigation Measure (MM) NOI-1 limits the amount of time a piece of construction equipment can operate along the eastern site boundary.

The City of Escondido has set restrictions to control noise impacts from construction activities. The Escondido Municipal Code 17-234 Construction Equipment noise prohibits construction noise between the hours of 6:00 p.m. and 7:00 a.m. Monday through Friday, between 5:00 p.m. and 9:00 a.m. Saturday, and no operation of construction on Sundays and days designated by the president, governor, or city as public holidays.

**City of Escondido Municipal Code: Sec. 17-234. Construction equipment.**

Except for emergency work, it shall be unlawful for any person, including the City of Escondido, to operate construction equipment as follows:

- (a) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site, except on Monday through Friday during a week between the hours of seven (7) a.m. and six (6) p.m. and on Saturdays between the hours of nine (9) a.m. and five (5) p.m., and provided that the operation of such construction equipment complies with the requirements of subsection (d) of this section.
- (b) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site on Sundays and on days designated by the president, governor or city council as public holidays.
- (c) A person may operate construction equipment at his/her residence or for the purpose of constructing or modifying a residence for himself/herself on Monday through Friday of a week between the hours of seven (7) a.m. and six (6) p.m., and on Saturdays, Sundays, and holidays between the hours of nine (9) a.m. and five (5) p.m.; provided, that such operation of construction equipment is not carried on for profit or livelihood and complies with the requirements of subsection (d) of this section.
- (d) No construction equipment or combination of equipment, regardless of age or date of acquisition, shall be operated so as to cause noise in excess of a one-hour average sound level limit of seventy-five (75) dB at any time, unless a variance has been obtained in advance from the city manager.
- (e) Persons engaged in construction for profit or as a business shall post signs at conspicuous places on a construction site, indicating hours of work as prescribed by this article or authorized by permit and the applicable noise level limits.

As shown in above in the Municipal Code Section 17-234 the City establishes limits to the hours during which construction activity may take place, and prohibits operation of construction equipment or combinations of construction equipment that generate noise levels in excess of 75 bB one-hour sound level (Leq 1-hour). To evaluate the potential impacts of construction equipment operating on the Project site, the equipment resources from the Air Quality GHG Technical Memorandum CalEEMod data for the Site Preparation and Paving Phases, each piece of equipment operating at the same time in the same location at a distance of 95-feet to the receptor for a full 8-hour period was calculated with results provided in Table 3-5, Worse Case Construction Noise Levels (Site Preparation & Paving).

**Table 3-5 Worse Case Construction Noise Levels - Site Preparation & Paving  
(Center of Site to Nearest Receptor)**

| Phase                   | Equipment Type           | Number of Units | Leq dBA/unit | Leq dBA Total |
|-------------------------|--------------------------|-----------------|--------------|---------------|
| Site Preparation        | Tractor/Loader/Backhoe   | 1               | 69.9         | 69.6          |
| <b>Site Preparation</b> | <b>Total Noise Level</b> |                 |              | <b>69.6</b>   |
| Paving                  | Cement Mixer             | 4               | 69.2         | 75.2          |
| Paving                  | Tractor/Loader/Backhoe   | 1               | 69.9         | 69.9          |
| Paving                  | Roller                   | 1               | 67.4         | 67.4          |
| Paving                  | Paver                    | 1               | 68.6         | 68.6          |
| <b>Paving</b>           | <b>Total Noise Level</b> |                 |              | <b>77.5</b>   |

During the construction phase the noise levels will be the highest during site preparation and paving as heavy equipment pass along the Project site boundaries. During the site preparation and paving phases, which produce the highest noise levels, equipment will not be stationary, rather equipment will be moving throughout the site at varying speeds and power levels and as a result not operating at the maximum noise level for the entire workday. Using the default equipment type and number for the site preparation and paving phases from the CalEEMod AQ report the potential noise impacts of the equipment operating simultaneously and in the same area at the center of the property to the closest residential uses the construction noise impacts would be 69.6 Leq dBA during site preparation and 77.5 Leq dBA during paving operations.

As the equipment will be moving during the site preparation and paving phases the levels of noise at the nearest sensitive receptor are best represented by the levels from the center of the site as indicated in Table 3-4, and 3-5. Construction noise is of short-term duration and will not present any long-term impacts on the project site or the surrounding area.

In order to assure that the residences located within 10 feet of the property boundary are not significantly impacted by noise or vibration levels the following mitigation measure is recommended:

**Mitigation Measure (MM) NOI-1 Construction Noise Mitigation Plan**

Prior to issuance of grading and/or building permits, a note shall be provided on grading and building plans indicating that, during grading and construction, the property owner/developer shall be responsible for requiring contractors to implement the following measures to limit construction-related noise:

- The construction contractor shall ensure that all internal combustion engine-driven equipment is equipped with mufflers that are in good condition and appropriate for the equipment.
- The construction contractor shall locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. In addition, the Project contractor shall place

such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the Project site.

- The construction contractor shall prohibit unnecessary idling (no more than 5 minutes) of internal combustion engines.
- Equipment shall not be operated along the eastern boundary of the site for more than 30 minutes in duration per hour during construction.
- The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the Project site during all project construction.
- The construction contractor shall designate a “disturbance coordinator” who would be responsible for responding to any complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., a bad muffler) and shall require that measures be implemented to correct the problem.
- These measures may only be granted an exception if an application for construction-related exception is made to and considered by the Building Official of the City

With implementation of the City’s mandatory restrictions on construction noise hours and MM-NOI-1 construction noise impacts would be less than significant.

### **3.3 Operational Noise:**

#### **3.3.1 Offsite Traffic Noise Impacts.**

Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires. The primary source of noise generated by the Project will be from the vehicle traffic generated by the vehicle ingress and egress to the Project site. Under existing conditions, the site does not generate any traffic noise that impacts the surrounding area.

According to the Federal Highway Administration, *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, the level of roadway traffic noise depends on three things: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of the traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. These factors are discussed below.

- *The Volume of the Traffic*

Upon buildout, the proposed Project is expected to generate approximately 160 average daily vehicle trips (ADT) during the weekdays.

The current average daily vehicle trips along South Hickory Street in the Project area used to determine the project’s impacts was calculated at approximately 4,961 ADT.

According to Caltrans, the human ear can begin to detect sound level increases of 3 decibels (dB) in typical noisy environments.<sup>2</sup> A doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dBA increase in sound, would generally be barely detectable. Implementation of the Project will decrease traffic volumes in the area occurring along South Hickory Street from the existing medical office building traffic estimates, therefore, traffic volumes will not be doubled or create a +3dBA noise increase or result in a perceivable noise increase. Therefore, operational noise impacts would be less than significant.

- *The Speed of Traffic*

South Hickory Street is a 2-lane road and has a posted speed limit of 25 mph.

- *The Number of Trucks in the Flow of the Traffic*

The Project is a residential development in a primarily residential area. The residential land use will not routinely generate noise from large trucks.

#### *Future Traffic Noise Levels along Existing Roadways Segments*

The roadway noise impacts from vehicular traffic were projected using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108 (the “FHWA Model”). The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions (“hard” or “soft” relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

The Community Noise Equivalent Level (CNEL) is the 24-hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7:00 p.m. and 10:00 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10:00 p.m. and 7:00 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

A vehicle’s noise level is a combination of the noise produced by the engine, exhaust, and tires. The cumulative traffic noise levels along a roadway segment are based on three primary factors: the amount of traffic, the travel speed of the traffic, and the vehicle mix ratio or number of

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<sup>2</sup> Caltrans, Traffic Noise Analysis Protocol, April 2020, p.7-1.

medium and heavy trucks. The intensity of traffic noise is increased by higher traffic volumes, greater speeds, and increased number of trucks.

Future operations of the proposed Project would decrease the current site operations ADT of 844 vehicles by approximately 684 trips on weekdays as the proposed Project is estimated to generate 160 ADT.

Figure 3.3-1 is the noise contour map generated from the Federal Highway Administration (FHWA) Traffic Noise Model 3.5 showing the estimated traffic noise that will be generated with the current traffic along South Hickory Street and with the Project. To determine the noise impacts existing traffic data was calculated using the traffic generated from the Summit Apartments and the Town View Professional Center. Summit Apartments was calculated based on 128 units at a rate of 8 ADT/du and the Town View Professional Center was calculated based on 61,177 SF at a rate of 50 ADT/KSF along with the current site medical office use ADT of 844 vehicles were used which indicated a daily traffic volume of 4,961 vehicles per day. Average Daily Traffic counts were converted to peak hour estimates with AM Peak rates for the Medical Offices at 6% and the Multi-family Residences at 8%, for PM Peak rates the Medical Offices at 11% and Multi-family at 10%. For Traffic vehicle mix was estimated at 97 percent automobile, 2 percent light truck, and 1 percent heavy trucks at the posted 25 miles per hour roadway speed limit. Additionally, the highest number of peak hour trips would be the PM Peak at 536 trips per hour and deducting the current land use Medical Office Peak traffic with traffic generated by the proposed project would be 459 PM Peak hour trips.

As indicated in Exhibit 3-C and 3-D the noise contours for South Hickory Street shows the proposed Project's impacts do not increase but rather will decrease the noise levels. As indicated in the noise contour exhibits and Table 3-6 impacts along South Hickory Street in the Project Area will not result in new significant noise impacts.

Exhibit 3-C Existing Traffic Noise Contours



**Exhibit 3-D Existing Plus Project Traffic Noise Contours**



**Table 3-6 Noise Level Comparison Existing vs. Existing Plus Project**

| Receptor  | Existing Traffic Noise Level (dBA) | Existing Plus Project Noise Level (dBA) | Noise Level Difference (dBA) |
|---|------------------------------------|---|------------------------------|
| Receptor 1 West Side of Project Site                          | 62.3                               | 61.7                                    | -0.6                         |
| Receptor 2 East Side of Project Site                          | 52.2                               | 51.6                                    | -0.6                         |
| Receptor 3 East Side of MFR on West Side of South Hickory St. | 57.7                               | 57.1                                    | -0.6                         |
| Receptor 2 West Side of MFR on West Side of South Hickory St  | 50.7                               | 50.1                                    | -0.6                         |

Source: Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108, Appendix C.

### 3.3.2 Operations (Residential Activity).

Typical operational sound levels generated by multi-family residential activities include normal outdoor conversations, air conditioner units, and landscaping equipment with levels as indicated below:

- Normal conversation, air conditioner - 60 dBA
- Gas-powered lawnmowers and leaf blowers – 80 to 85 dBA.<sup>3</sup>

Air conditioning equipment is roof mounted and current design features of the existing structure includes a solid parapet providing both visual and noise shielding. Noise generated from air conditioners and lawn care equipment are not at constant and consistent levels throughout the day. Lawn care is performed during daylight hours for short durations and although air conditioners are operating both day and night they are cycling on/off with windows closed conditions. Stationary noise levels would be attenuated as with mobile noise sources with standard building construction and windows closed by approximately 25 dBA.

The USEPA identifies noise levels affecting health and welfare as exposure levels over 70 dBA over a 24-hour period. Noise levels for various levels are identified according to the use of the area. Levels of 45 dbA are associated with indoor residential areas, hospitals, and schools, whereas 55 dBA is identified for outdoor areas where typical residential human activity takes place. According to the USEPA levels of 55 dbA outdoors and 45 dbA indoors are identified as levels of noise considered to permit spoken conversation and other activities such as sleeping, working, and recreation, which are part of the daily human condition.<sup>4</sup> Levels exceeding 55 dbA in a residential setting are normally short in duration and not significant in affecting health and welfare of residents.

### 3.4 Vibration

During construction the operation and movement of heavy equipment create seismic waves that radiate along the ground-surface in all directions. These waves are felt as ground vibrations. Vibrations from construction can result in effects ranging from annoyance to people to structure damage. Vibration levels are impacted by geology, distance, and frequencies. According to the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018<sup>5</sup>, while ground vibrations from construction activities do not often reach the levels that can damage structures, construction vibration may result in building damage or prolonged annoyance from activities such as blasting, piledriving, vibratory compaction, demolition, and drilling or excavation near sensitive structures. The Project does not require these types of construction activities.

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<sup>3</sup> Center for Disease Control, "*Loud Noised Can Cause Hearing Loss*". [https://www.cdc.gov/nceh/hearing\\_loss/default.html](https://www.cdc.gov/nceh/hearing_loss/default.html), accessed on November 14, 2023.

<sup>4</sup> USEPA "EPA Identifies Noise Levels Affecting Health and Welfare" <https://archive.epa.gov/epa/aboutepa/epa-identifies-noise-levels-affecting-health-and-welfare.html> accessed November 14, 2023.

<sup>5</sup> <https://www.transit.dot.gov/research-innovation/transit-noise-and-vibration-impact-assessment-manual-report-0123>

Vibration amplitude and impact decreases with distance and perceptible ground-borne vibration is generally limited to areas within one to two hundred feet of the construction activity.

The vibration standard used for to evaluate the Project’s vibration impacts is taken from the Caltrans *Transportation and Construction Vibration Guidance Manual* (2020). Based on the Caltrans guidance construction vibration impacts would be considered significant if vibration levels exceed 0.2 in/sec. PPV, which is the limit at which vibration becomes distinctly perceptible.

**Table 3-8 Vibration Source Levels for Construction Equipment at 25 feet**

| Equipment       | PPV (in/sec) at 25 feet | RMS (in/sec) at 25 feet |
|-----------------|-------------------------|-------------------------|
| Small bulldozer | 0.003                   | 0.002                   |
| Jackhammer      | 0.035                   | 0.025                   |
| Loaded Trucks   | 0.076                   | 0.054                   |
| Large bulldozer | 0.089                   | 0.063                   |

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.

The closest sensitive receptor to the Project property line are the residential units to the east, minimally 10 feet from the property line. The Project is an existing development being renovated from a medical office building to multi-family residential use which will not require heavy equipment normally associated with new development during grading and building phases. The estimated construction vibration level from a large bulldozer (worst case scenario) measured at 25-feet would create a vibration level of 0.089 in/sec PPV which does not exceed the 0.2 in/sec threshold and is below the Caltrans Guideline Vibration Annoyance Potential Criteria Strongly perceptible human response of 0.10 PPV in/sec continuous/frequent intermittent sources.<sup>6</sup> Therefore, the vibrations at the nearest sensitive receptor will remain well below the strongly perceptible annoyance criteria and potential residential vibration damage criteria thresholds listed in the Caltrans *Transportation and Construction Induced Vibration Guidance Manual* at or beyond the lot line. With the implementation of **MM-NOI-1** the proposed Project therefore is not considered to result in exposure of people to excessive ground vibration.

During operations of the Project following construction the primary source of vibration would be from vehicle traffic. Traffic vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels from heavy truck activity at normal traffic speeds are in the order of 0.004 in/sec PPV at 25 feet based on the FTA’s *Transit Noise Impact and Vibration Assessment* (2018). As the proposed Project is a multi-family residential use truck traffic which would create the largest vibration impact will be limited. Traffic once on site will be travelling at very low speeds and it is expected that traffic and any truck vibration impacts off site would not exceed the 0.2 in/sec PPV threshold.

Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated

<sup>6</sup> CalTrans *Transportation and Construction Vibration Guidance Manual*, April 2020.

events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that would cause annoyance to people or damage to buildings in the vicinity.

### **3.5 Airport Noise**

The closest airports to the Project site are the McClellan Palomar Airport approximately 12 miles west and Ramona Airport approximately 11 miles southeast. The Project site is located outside the airports noise contours and as such there will be less than significant airport noise impacts.

### **4.0 Conclusion**

Based on the assessment in Section 3.0 through compliance with mandatory City requirements and ordinances and **MM-NOI-1** to reduce noise during construction, the Project's construction noise impacts will not result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project. In addition, the Project's construction and operations vibration impacts as well as operational noise for mobile and operational noise impacts to the environment are less than significant.

**APPENDIX A**  
Ambient Noise Datasheets

# Session Report

Location #1

## Information Panel

Name S074\_BIJ050019\_16102023\_173102  
Start Time 10/10/2023 1:00:52 PM  
Stop Time 10/10/2023 1:15:52 PM  
Device Name BIJ050019  
Model Type SoundPro DL  
Device Firmware Rev R.13H  
Comments

## Summary Data Panel

| <u>Description</u> | <u>Meter</u> | <u>Value</u> | <u>Description</u> | <u>Meter</u> | <u>Value</u> |
|--------------------|--------------|--------------|--------------------|--------------|--------------|
| Leq                | 1            | 63.2 dB      |                    |              |              |
| Exchange Rate      | 1            | 3 dB         | Weighting          | 1            | A            |
| Response           | 1            | SLOW         | Bandwidth          | 1            | OFF          |
| Exchange Rate      | 2            | 5 dB         | Weighting          | 2            | A            |
| Response           | 2            | FAST         |                    |              |              |

## Statistics Table

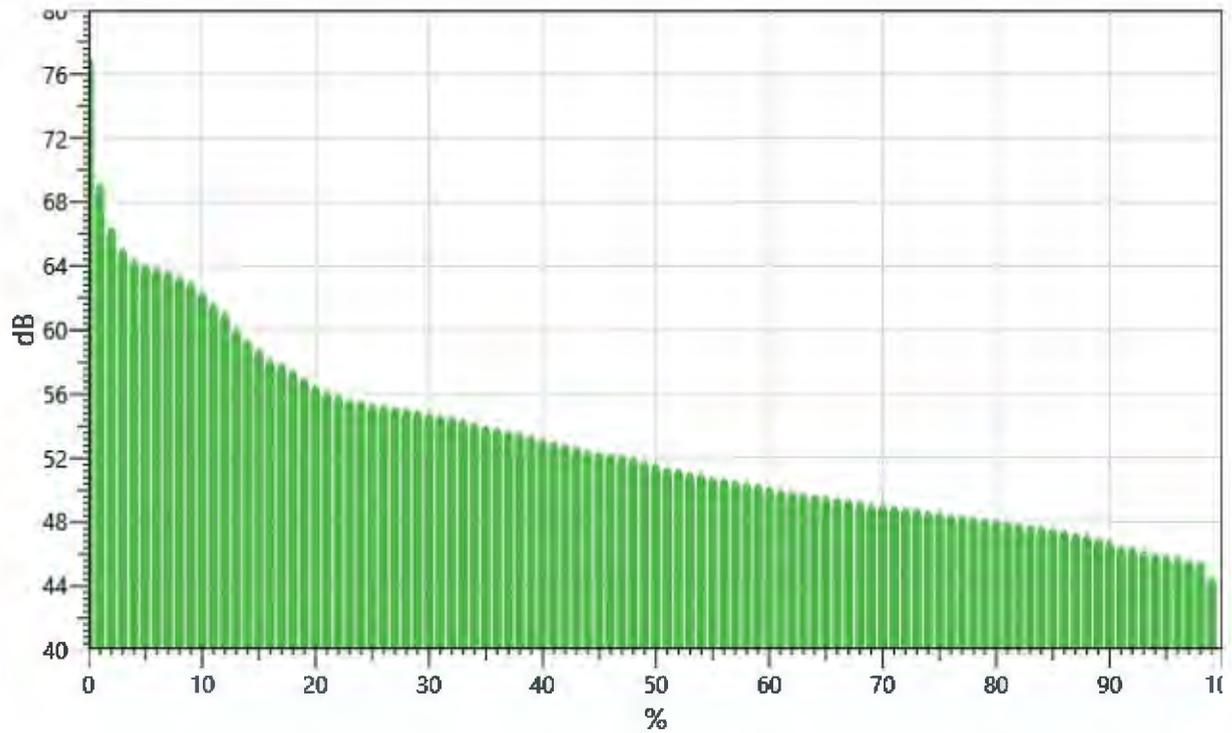
| <b>dB:</b> | <b>0.0</b> | <b>0.1</b> | <b>0.2</b> | <b>0.3</b> | <b>0.4</b> | <b>0.5</b> | <b>0.6</b> | <b>0.7</b> | <b>0.8</b> | <b>0.9</b> | <b>%</b> |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------|
| 44:        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.04       | 0.19       | 0.11       | 0.04       | 0.39     |
| 45:        | 0.06       | 0.07       | 0.05       | 0.08       | 0.10       | 0.19       | 0.27       | 0.74       | 0.97       | 0.72       | 3.25     |
| 46:        | 0.64       | 0.81       | 0.69       | 0.45       | 0.60       | 0.57       | 0.69       | 0.45       | 0.43       | 0.38       | 5.71     |
| 47:        | 0.57       | 0.51       | 0.54       | 0.65       | 0.57       | 0.57       | 0.88       | 0.89       | 0.99       | 1.05       | 7.23     |
| 48:        | 0.90       | 1.01       | 0.79       | 1.09       | 1.28       | 1.18       | 1.15       | 0.95       | 0.96       | 1.08       | 10.39    |
| 49:        | 0.89       | 1.01       | 1.13       | 0.92       | 0.89       | 1.10       | 1.05       | 0.90       | 0.95       | 0.87       | 9.72     |
| 50:        | 0.71       | 0.61       | 0.69       | 0.53       | 0.56       | 0.57       | 0.77       | 0.95       | 1.03       | 1.01       | 7.44     |
| 51:        | 0.77       | 0.78       | 0.50       | 0.63       | 0.71       | 0.73       | 0.64       | 0.53       | 0.53       | 0.55       | 6.37     |
| 52:        | 0.49       | 0.45       | 0.48       | 0.72       | 0.97       | 0.82       | 0.82       | 0.65       | 0.56       | 0.49       | 6.44     |
| 53:        | 0.56       | 0.51       | 0.59       | 0.60       | 0.53       | 0.50       | 0.52       | 0.60       | 0.66       | 0.73       | 5.80     |
| 54:        | 0.64       | 0.69       | 0.50       | 0.59       | 0.51       | 0.38       | 0.49       | 0.81       | 1.00       | 0.66       | 6.28     |
| 55:        | 0.67       | 0.83       | 0.95       | 1.05       | 0.88       | 0.84       | 0.74       | 0.64       | 0.60       | 0.64       | 7.85     |
| 56:        | 0.45       | 0.31       | 0.32       | 0.25       | 0.28       | 0.33       | 0.22       | 0.19       | 0.18       | 0.20       | 2.75     |
| 57:        | 0.23       | 0.28       | 0.15       | 0.24       | 0.26       | 0.22       | 0.17       | 0.19       | 0.30       | 0.31       | 2.34     |





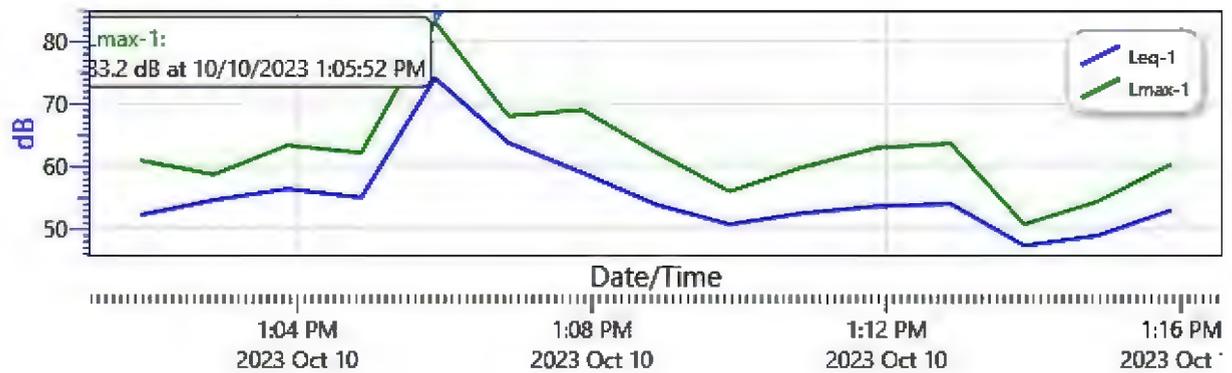
## Exceedance Chart

S074\_BIJ050019\_16102023\_173102: Exceedance Chart



## Logged Data Chart

S074\_BIJ050019\_16102023\_173102: Logged Data Chart



# Session Report

Location #2

## Information Panel

Name S075\_BIJ050019\_16102023\_173105  
Start Time 10/10/2023 1:19:58 PM  
Stop Time 10/10/2023 1:34:58 PM  
Device Name BIJ050019  
Model Type SoundPro DL  
Device Firmware Rev R.13H  
Comments

## Summary Data Panel

| <u>Description</u> | <u>Meter</u> | <u>Value</u> | <u>Description</u> | <u>Meter</u> | <u>Value</u> |
|--------------------|--------------|--------------|--------------------|--------------|--------------|
| Leq                | 1            | 53.1 dB      |                    |              |              |
| Exchange Rate      | 1            | 3 dB         | Weighting          | 1            | A            |
| Response           | 1            | SLOW         | Bandwidth          | 1            | OFF          |
| Exchange Rate      | 2            | 5 dB         | Weighting          | 2            | A            |
| Response           | 2            | FAST         |                    |              |              |

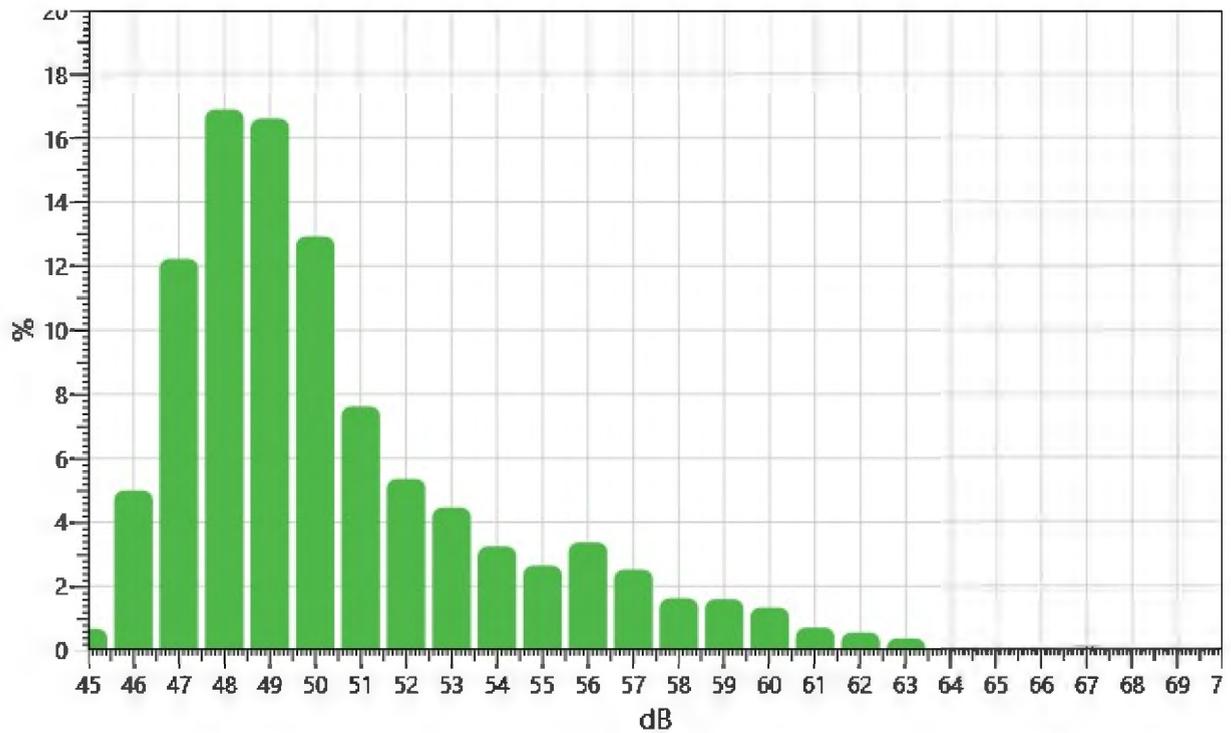
## Statistics Table

| <b>dB:</b> | <b>0.0</b> | <b>0.1</b> | <b>0.2</b> | <b>0.3</b> | <b>0.4</b> | <b>0.5</b> | <b>0.6</b> | <b>0.7</b> | <b>0.8</b> | <b>0.9</b> | <b>%</b> |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------|
| 45:        | 0.00       | 0.00       | 0.01       | 0.03       | 0.03       | 0.09       | 0.11       | 0.07       | 0.19       | 0.13       | 0.67     |
| 46:        | 0.16       | 0.17       | 0.43       | 0.57       | 0.56       | 0.59       | 0.59       | 0.64       | 0.54       | 0.74       | 4.99     |
| 47:        | 1.07       | 1.26       | 1.09       | 1.24       | 0.93       | 1.30       | 1.06       | 1.33       | 1.35       | 1.61       | 12.22    |
| 48:        | 1.82       | 1.86       | 1.24       | 1.63       | 1.42       | 1.63       | 1.78       | 1.92       | 1.78       | 1.81       | 16.89    |
| 49:        | 1.66       | 1.40       | 1.57       | 1.56       | 1.80       | 1.86       | 1.32       | 1.70       | 2.01       | 1.72       | 16.61    |
| 50:        | 1.60       | 1.59       | 1.28       | 1.16       | 1.21       | 1.03       | 1.11       | 1.31       | 1.28       | 1.35       | 12.92    |
| 51:        | 1.17       | 0.98       | 0.56       | 0.72       | 0.92       | 0.74       | 0.68       | 0.60       | 0.68       | 0.57       | 7.62     |
| 52:        | 0.58       | 0.53       | 0.55       | 0.59       | 0.54       | 0.62       | 0.62       | 0.47       | 0.41       | 0.46       | 5.35     |
| 53:        | 0.44       | 0.48       | 0.47       | 0.40       | 0.56       | 0.60       | 0.41       | 0.39       | 0.32       | 0.38       | 4.46     |
| 54:        | 0.39       | 0.33       | 0.22       | 0.31       | 0.29       | 0.29       | 0.28       | 0.47       | 0.36       | 0.31       | 3.24     |
| 55:        | 0.27       | 0.36       | 0.30       | 0.22       | 0.25       | 0.26       | 0.28       | 0.23       | 0.26       | 0.23       | 2.65     |
| 56:        | 0.23       | 0.27       | 0.33       | 0.31       | 0.34       | 0.36       | 0.41       | 0.36       | 0.37       | 0.38       | 3.37     |
| 57:        | 0.40       | 0.38       | 0.21       | 0.28       | 0.20       | 0.21       | 0.24       | 0.19       | 0.19       | 0.23       | 2.52     |
| 58:        | 0.24       | 0.20       | 0.18       | 0.15       | 0.15       | 0.18       | 0.15       | 0.13       | 0.13       | 0.13       | 1.63     |

|     |      |      |      |      |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|------|------|------|------|
| 59: | 0.14 | 0.14 | 0.15 | 0.14 | 0.22 | 0.15 | 0.16 | 0.16 | 0.16 | 0.17 | 1.60 |
| 60: | 0.25 | 0.21 | 0.13 | 0.19 | 0.11 | 0.12 | 0.10 | 0.09 | 0.06 | 0.07 | 1.33 |
| 61: | 0.07 | 0.06 | 0.07 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.09 | 0.11 | 0.71 |
| 62: | 0.05 | 0.03 | 0.03 | 0.03 | 0.04 | 0.05 | 0.04 | 0.10 | 0.12 | 0.05 | 0.55 |
| 63: | 0.05 | 0.03 | 0.02 | 0.05 | 0.06 | 0.07 | 0.03 | 0.02 | 0.01 | 0.02 | 0.37 |
| 64: | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.07 |
| 65: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.06 |
| 66: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.06 |
| 67: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 | 0.01 | 0.00 | 0.00 | 0.10 |

## Statistics Chart

S075\_BIU050019\_16102023\_173105: Statistics Chart



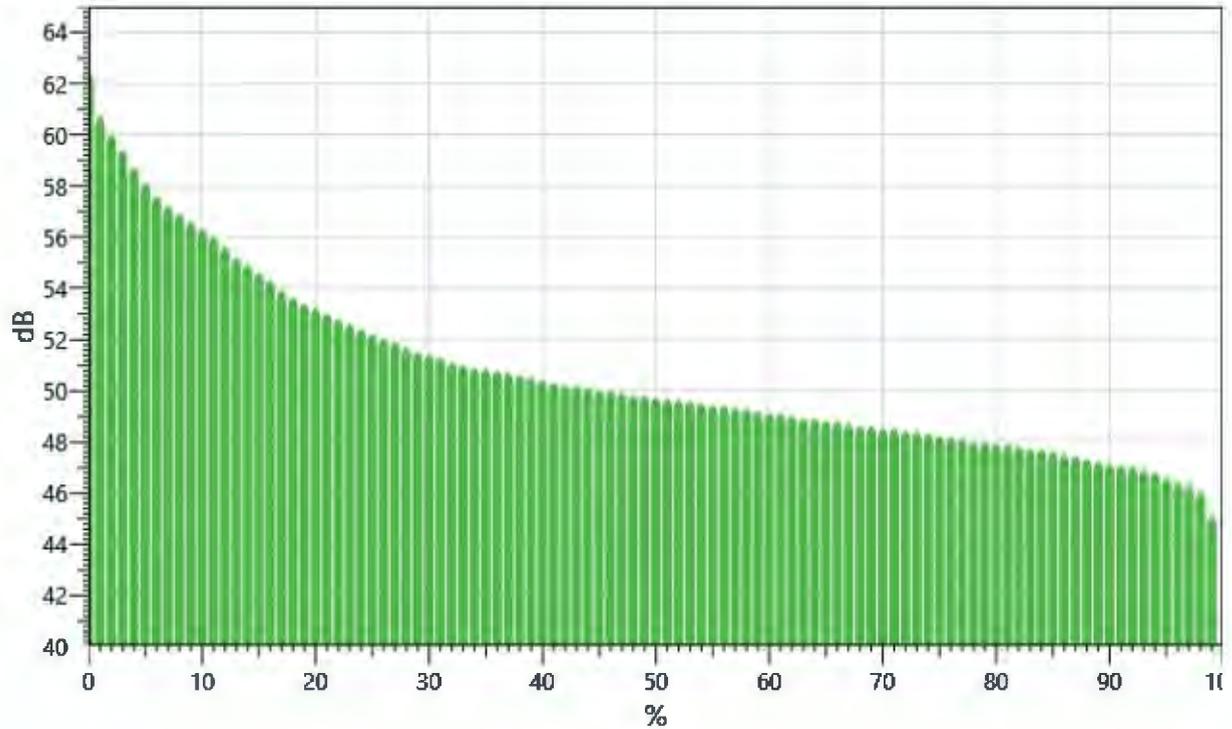
## Exceedance Table

|      | 0%   | 1%   | 2%   | 3%   | 4%   | 5%   | 6%   | 7%   | 8%   | 9%   |
|------|------|------|------|------|------|------|------|------|------|------|
| 0%:  |      | 62.4 | 60.7 | 60.0 | 59.4 | 58.7 | 58.1 | 57.6 | 57.2 | 56.9 |
| 10%: | 56.6 | 56.3 | 56.0 | 55.6 | 55.2 | 54.9 | 54.6 | 54.3 | 53.9 | 53.6 |
| 20%: | 53.4 | 53.2 | 53.0 | 52.8 | 52.6 | 52.4 | 52.2 | 52.0 | 51.9 | 51.7 |
| 30%: | 51.5 | 51.4 | 51.3 | 51.1 | 51.0 | 50.9 | 50.8 | 50.8 | 50.7 | 50.6 |
| 40%: | 50.5 | 50.4 | 50.3 | 50.2 | 50.2 | 50.1 | 50.0 | 50.0 | 49.9 | 49.8 |
| 50%: | 49.8 | 49.7 | 49.7 | 49.6 | 49.6 | 49.5 | 49.4 | 49.4 | 49.3 | 49.3 |

|       |      |      |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|------|------|
| 60%:  | 49.2 | 49.1 | 49.1 | 49.0 | 48.9 | 48.9 | 48.8 | 48.8 | 48.7 | 48.6 |
| 70%:  | 48.6 | 48.5 | 48.5 | 48.4 | 48.4 | 48.3 | 48.2 | 48.2 | 48.1 | 48.0 |
| 80%:  | 48.0 | 47.9 | 47.9 | 47.8 | 47.7 | 47.7 | 47.6 | 47.5 | 47.4 | 47.3 |
| 90%:  | 47.2 | 47.1 | 47.1 | 47.0 | 46.9 | 46.8 | 46.6 | 46.4 | 46.3 | 46.0 |
| 100%: | 45.1 |      |      |      |      |      |      |      |      |      |

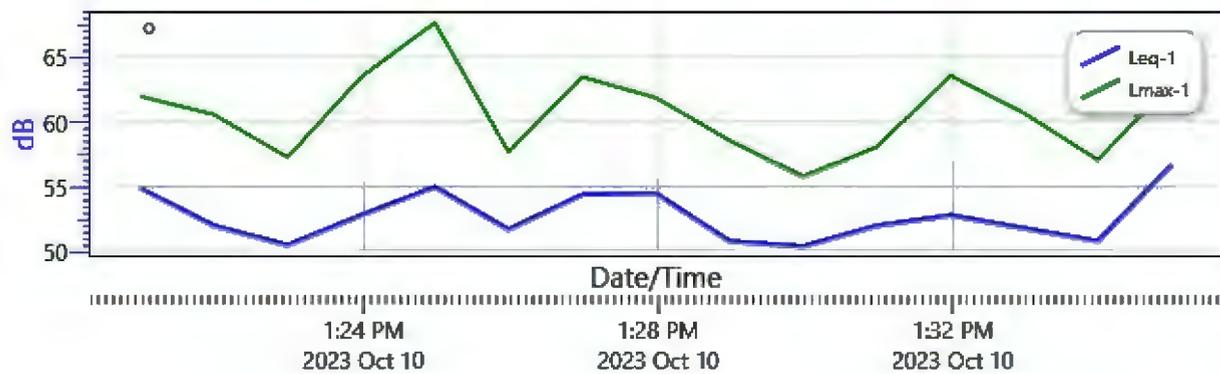
## Exceedance Chart

S075\_BII050019\_16102023\_173105: Exceedance Chart



## Logged Data Chart

S075\_BII050019\_16102023\_173105: Logged Data Chart

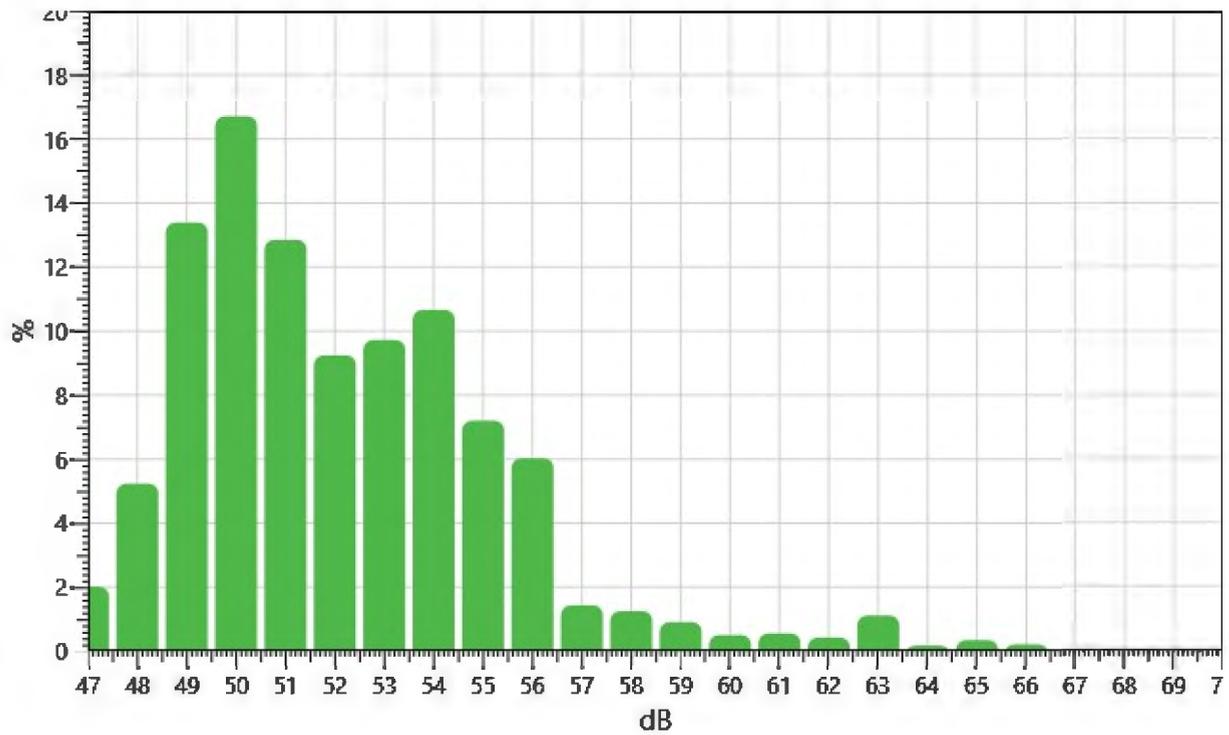




|     |      |      |      |      |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|------|------|------|------|
| 61: | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 | 0.04 | 0.06 | 0.10 | 0.09 | 0.09 | 0.55 |
| 62: | 0.05 | 0.05 | 0.05 | 0.05 | 0.03 | 0.03 | 0.03 | 0.03 | 0.06 | 0.06 | 0.43 |
| 63: | 0.08 | 0.07 | 0.04 | 0.07 | 0.14 | 0.26 | 0.25 | 0.08 | 0.07 | 0.06 | 1.11 |
| 64: | 0.04 | 0.01 | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.18 |
| 65: | 0.04 | 0.03 | 0.05 | 0.03 | 0.01 | 0.02 | 0.06 | 0.05 | 0.02 | 0.02 | 0.35 |
| 66: | 0.11 | 0.06 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 |

## Statistics Chart

S076\_BIJ050019\_16102023\_173107: Statistics Chart



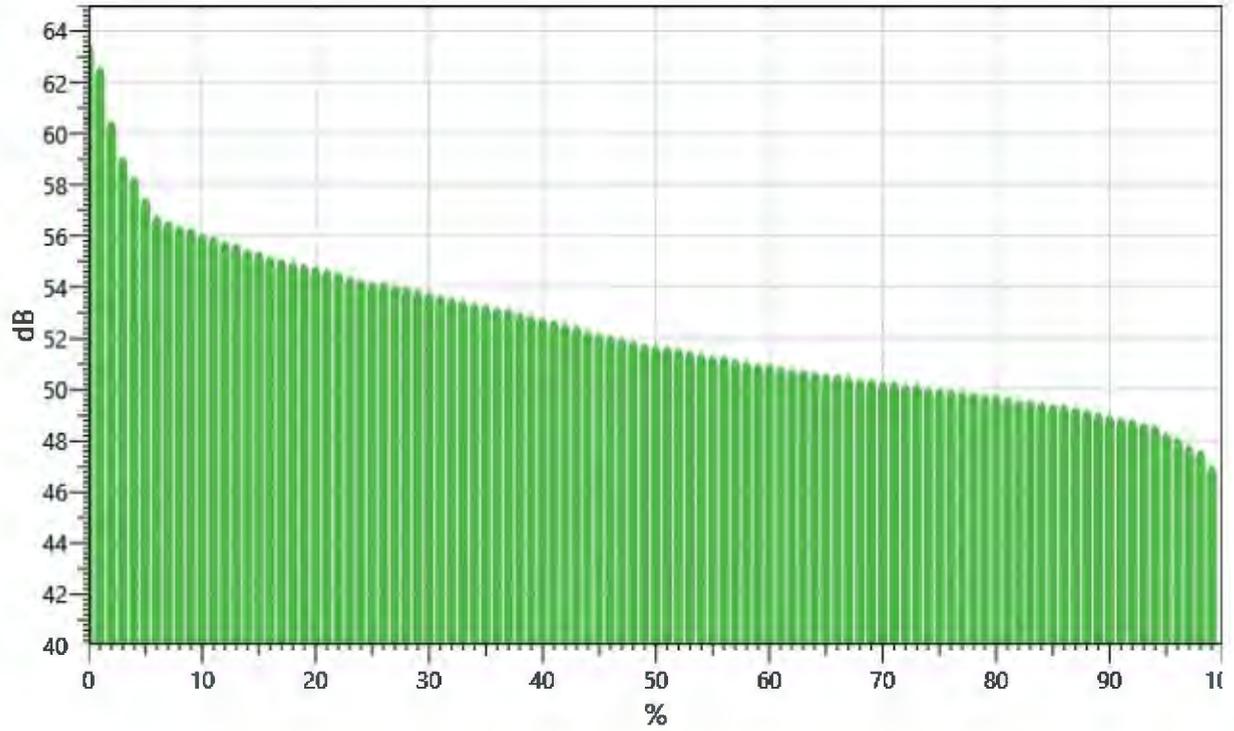
## Exceedance Table

|      | 0%   | 1%   | 2%   | 3%   | 4%   | 5%   | 6%   | 7%   | 8%   | 9%   |
|------|------|------|------|------|------|------|------|------|------|------|
| 0%:  |      | 63.5 | 62.6 | 60.5 | 59.1 | 58.3 | 57.5 | 56.8 | 56.6 | 56.4 |
| 10%: | 56.3 | 56.1 | 56.0 | 55.8 | 55.7 | 55.5 | 55.4 | 55.2 | 55.1 | 55.0 |
| 20%: | 54.9 | 54.8 | 54.7 | 54.6 | 54.4 | 54.3 | 54.2 | 54.2 | 54.1 | 54.0 |
| 30%: | 53.9 | 53.8 | 53.7 | 53.6 | 53.5 | 53.4 | 53.3 | 53.2 | 53.2 | 53.0 |
| 40%: | 52.9 | 52.8 | 52.7 | 52.6 | 52.5 | 52.3 | 52.2 | 52.1 | 52.0 | 51.9 |
| 50%: | 51.8 | 51.7 | 51.7 | 51.6 | 51.5 | 51.4 | 51.3 | 51.3 | 51.2 | 51.1 |
| 60%: | 51.0 | 51.0 | 50.9 | 50.8 | 50.8 | 50.7 | 50.6 | 50.6 | 50.5 | 50.4 |
| 70%: | 50.4 | 50.3 | 50.3 | 50.2 | 50.2 | 50.1 | 50.0 | 50.0 | 49.9 | 49.9 |
| 80%: | 49.8 | 49.8 | 49.7 | 49.6 | 49.6 | 49.5 | 49.4 | 49.4 | 49.3 | 49.2 |

90%: 49.1 49.0 48.9 48.8 48.7 48.6 48.3 48.1 47.8 47.6  
 100%: 47.0

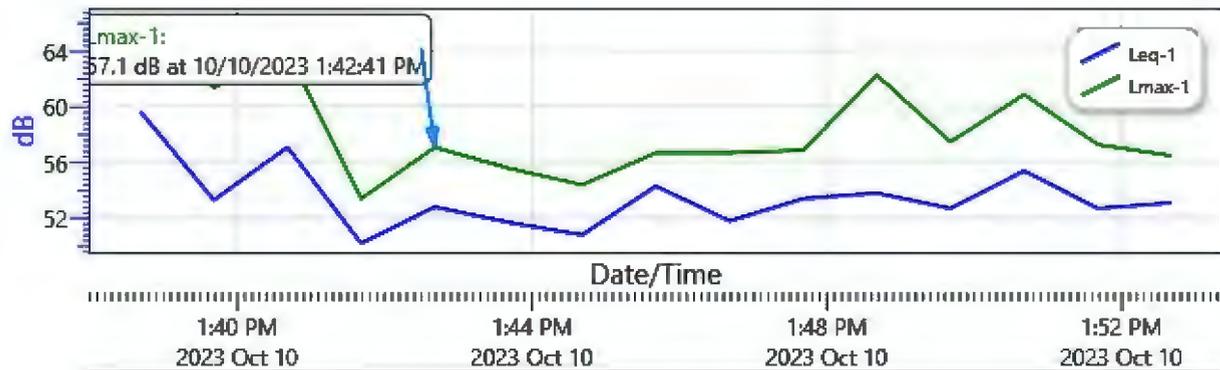
### Exceedance Chart

S076\_BIJ050019\_16102023\_173107: Exceedance Chart



### Logged Data Chart

S076\_BIJ050019\_16102023\_173107: Logged Data Chart



# Session Report

Location #4

## Information Panel

Name S077\_BIJ050019\_16102023\_173109  
Start Time 10/10/2023 2:02:01 PM  
Stop Time 10/10/2023 2:17:01 PM  
Device Name BIJ050019  
Model Type SoundPro DL  
Device Firmware Rev R.13H  
Comments

## Summary Data Panel

| <u>Description</u> | <u>Meter</u> | <u>Value</u> | <u>Description</u> | <u>Meter</u> | <u>Value</u> |
|--------------------|--------------|--------------|--------------------|--------------|--------------|
| Leq                | 1            | 50.4 dB      |                    |              |              |
| Exchange Rate      | 1            | 3 dB         | Weighting          | 1            | A            |
| Response           | 1            | SLOW         | Bandwidth          | 1            | OFF          |
| Exchange Rate      | 2            | 5 dB         | Weighting          | 2            | A            |
| Response           | 2            | FAST         |                    |              |              |

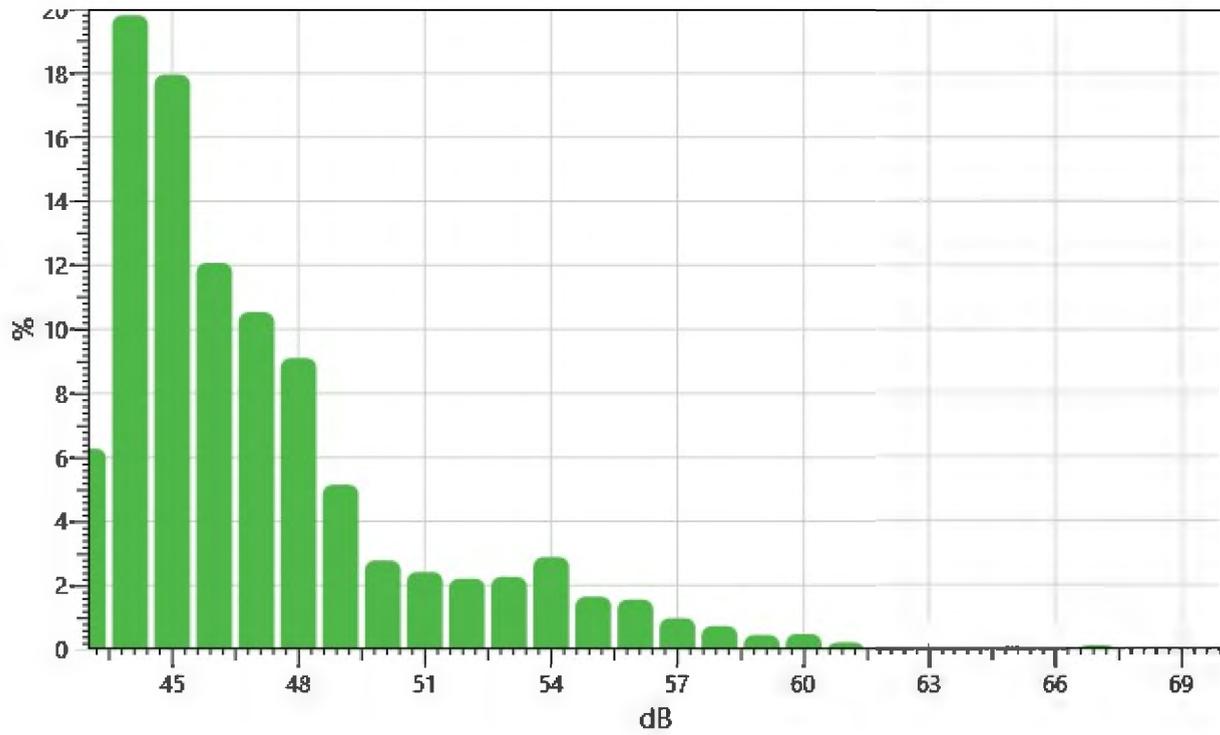
## Statistics Table

| <b>dB:</b> | <b>0.0</b> | <b>0.1</b> | <b>0.2</b> | <b>0.3</b> | <b>0.4</b> | <b>0.5</b> | <b>0.6</b> | <b>0.7</b> | <b>0.8</b> | <b>0.9</b> | <b>%</b> |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------|
| 43:        | 0.01       | 0.09       | 0.05       | 0.48       | 0.61       | 0.92       | 0.78       | 1.05       | 0.81       | 1.48       | 6.27     |
| 44:        | 1.45       | 1.38       | 1.16       | 1.29       | 1.60       | 2.14       | 2.47       | 2.40       | 3.07       | 2.85       | 19.81    |
| 45:        | 2.45       | 2.55       | 1.94       | 1.73       | 1.30       | 1.66       | 1.63       | 1.73       | 1.54       | 1.41       | 17.95    |
| 46:        | 1.22       | 1.16       | 1.40       | 1.43       | 1.23       | 1.06       | 1.06       | 1.10       | 1.19       | 1.23       | 12.08    |
| 47:        | 1.21       | 1.20       | 1.18       | 1.10       | 0.99       | 0.93       | 0.95       | 0.92       | 1.08       | 0.99       | 10.53    |
| 48:        | 1.01       | 1.08       | 0.57       | 0.90       | 0.85       | 0.97       | 0.95       | 0.90       | 0.99       | 0.89       | 9.10     |
| 49:        | 0.63       | 0.69       | 0.58       | 0.69       | 0.57       | 0.48       | 0.36       | 0.34       | 0.41       | 0.39       | 5.15     |
| 50:        | 0.39       | 0.32       | 0.35       | 0.28       | 0.26       | 0.22       | 0.19       | 0.26       | 0.26       | 0.25       | 2.78     |
| 51:        | 0.24       | 0.26       | 0.13       | 0.30       | 0.29       | 0.27       | 0.25       | 0.23       | 0.20       | 0.24       | 2.42     |
| 52:        | 0.24       | 0.25       | 0.25       | 0.27       | 0.23       | 0.20       | 0.19       | 0.18       | 0.20       | 0.20       | 2.21     |
| 53:        | 0.24       | 0.22       | 0.22       | 0.16       | 0.17       | 0.20       | 0.27       | 0.27       | 0.27       | 0.26       | 2.27     |
| 54:        | 0.24       | 0.31       | 0.21       | 0.39       | 0.29       | 0.33       | 0.31       | 0.32       | 0.27       | 0.22       | 2.89     |
| 55:        | 0.24       | 0.18       | 0.14       | 0.14       | 0.15       | 0.14       | 0.14       | 0.16       | 0.19       | 0.18       | 1.65     |
| 56:        | 0.19       | 0.14       | 0.17       | 0.13       | 0.11       | 0.14       | 0.14       | 0.21       | 0.16       | 0.17       | 1.56     |

|     |      |      |      |      |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|------|------|------|------|
| 57: | 0.15 | 0.12 | 0.09 | 0.10 | 0.10 | 0.09 | 0.07 | 0.10 | 0.10 | 0.08 | 0.98 |
| 58: | 0.10 | 0.06 | 0.07 | 0.11 | 0.08 | 0.10 | 0.05 | 0.04 | 0.06 | 0.05 | 0.73 |
| 59: | 0.07 | 0.06 | 0.06 | 0.05 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.45 |
| 60: | 0.03 | 0.04 | 0.02 | 0.04 | 0.04 | 0.06 | 0.07 | 0.09 | 0.04 | 0.05 | 0.48 |
| 61: | 0.04 | 0.04 | 0.05 | 0.03 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.22 |
| 62: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.07 |
| 63: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.07 |
| 64: | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.07 |
| 65: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.08 |
| 66: | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.07 |
| 67: | 0.01 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.12 |

### Statistics Chart

S077\_BIU050019\_16102023\_173109: Statistics Chart



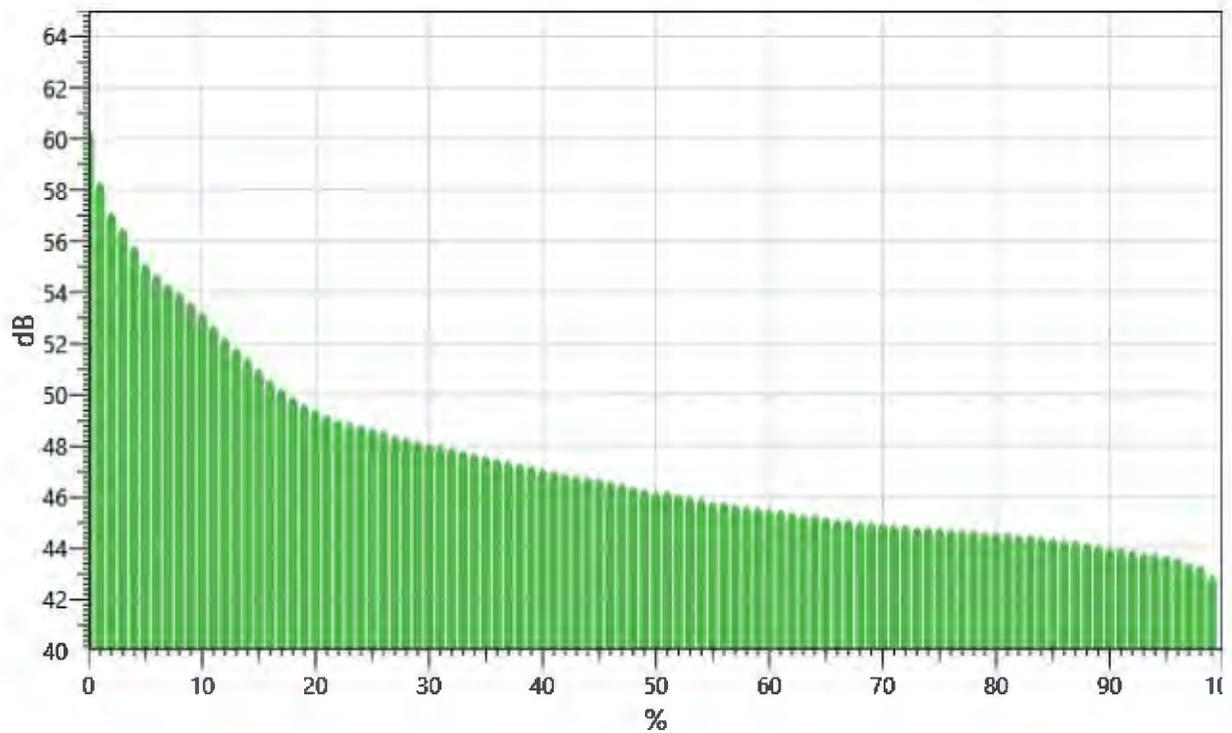
### Exceedance Table

| .    | 0%   | 1%   | 2%   | 3%   | 4%   | 5%   | 6%   | %7   | %8   | %9   |
|------|------|------|------|------|------|------|------|------|------|------|
| 0%:  |      | 60.3 | 58.3 | 57.1 | 56.5 | 55.8 | 55.1 | 54.7 | 54.3 | 54.0 |
| 10%: | 53.6 | 53.2 | 52.7 | 52.2 | 51.8 | 51.4 | 51.0 | 50.6 | 50.2 | 49.9 |
| 20%: | 49.6 | 49.4 | 49.2 | 49.0 | 48.9 | 48.8 | 48.7 | 48.6 | 48.4 | 48.3 |
| 30%: | 48.2 | 48.1 | 48.0 | 47.9 | 47.8 | 47.7 | 47.6 | 47.5 | 47.4 | 47.3 |

|       |      |      |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|------|------|
| 40%:  | 47.2 | 47.1 | 47.0 | 46.9 | 46.8 | 46.8 | 46.7 | 46.6 | 46.5 | 46.4 |
| 50%:  | 46.3 | 46.2 | 46.2 | 46.1 | 46.0 | 45.9 | 45.8 | 45.8 | 45.7 | 45.6 |
| 60%:  | 45.6 | 45.5 | 45.5 | 45.4 | 45.3 | 45.3 | 45.2 | 45.1 | 45.1 | 45.0 |
| 70%:  | 45.0 | 45.0 | 44.9 | 44.9 | 44.8 | 44.8 | 44.8 | 44.7 | 44.7 | 44.7 |
| 80%:  | 44.6 | 44.6 | 44.6 | 44.5 | 44.5 | 44.4 | 44.4 | 44.3 | 44.3 | 44.2 |
| 90%:  | 44.1 | 44.0 | 44.0 | 43.9 | 43.8 | 43.8 | 43.7 | 43.6 | 43.4 | 43.3 |
| 100%: | 42.9 |      |      |      |      |      |      |      |      |      |

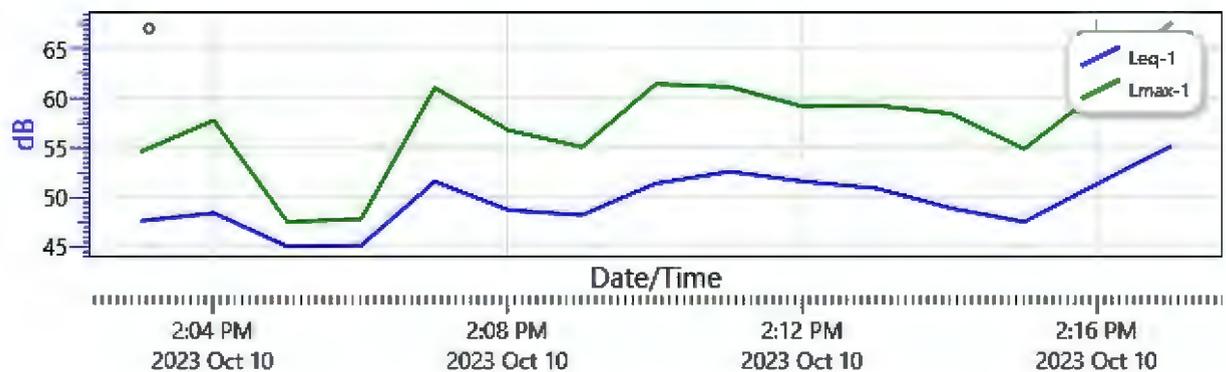
## Exceedance Chart

S077\_BII050019\_16102023\_173109: Exceedance Chart



## Logged Data Chart

S077\_BII050019\_16102023\_173109: Logged Data Chart



APPENDIX B  
FHWA - RCNM Datasheets

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 11/08/2023  
 Case Description: MFR - Hickory Street - Escondido

\*\*\*\* Receptor #1 \*\*\*\*

| Description                         | Baselines (dBA) |         |         |       |
|-------------------------------------|-----------------|---------|---------|-------|
|                                     | Land Use        | Daytime | Evening | Night |
| Residential to east - site boundary | Residential     | 65.0    | 45.0    | 45.0  |

| Description          | Equipment     |           |                 |                   |                          |                           |
|----------------------|---------------|-----------|-----------------|-------------------|--------------------------|---------------------------|
|                      | Impact Device | Usage (%) | Spec Lmax (dBA) | Actual Lmax (dBA) | Receptor Distance (feet) | Estimated Shielding (dBA) |
| Backhoe              | No            | 40        |                 | 77.6              | 10.0                     | 0.0                       |
| Concrete Mixer Truck | No            | 40        |                 | 78.8              | 10.0                     | 0.0                       |
| Compressor (air)     | No            | 40        |                 | 77.7              | 10.0                     | 0.0                       |
| Concrete Pump Truck  | No            | 20        |                 | 81.4              | 10.0                     | 0.0                       |
| Crane                | No            | 16        |                 | 80.6              | 10.0                     | 0.0                       |
| Dump Truck           | No            | 40        |                 | 76.5              | 10.0                     | 0.0                       |
| Flat Bed Truck       | No            | 40        |                 | 74.3              | 10.0                     | 0.0                       |
| Front End Loader     | No            | 40        |                 | 79.1              | 10.0                     | 0.0                       |
| Man Lift             | No            | 20        |                 | 74.7              | 10.0                     | 0.0                       |
| Paver                | No            | 50        |                 | 77.2              | 10.0                     | 0.0                       |
| Pickup Truck         | No            | 40        |                 | 75.0              | 10.0                     | 0.0                       |
| Roller               | No            | 20        |                 | 80.0              | 10.0                     | 0.0                       |
| Tractor              | No            | 40        | 84.0            |                   | 10.0                     | 0.0                       |
| Welder / Torch       | No            | 40        |                 | 74.0              | 10.0                     | 0.0                       |

Results

| Noise Limit Exceedance (dBA) |         |     |                        |      | Noise Limits (dBA) |     |         |     |       |     |      |
|------------------------------|---------|-----|------------------------|------|--------------------|-----|---------|-----|-------|-----|------|
| Day                          | Evening |     | Calculated (dBA) Night |      | Day                |     | Evening |     | Night |     | Lmax |
|                              | Lmax    | Leq | Lmax                   | Leq  | Lmax               | Leq | Lmax    | Leq | Lmax  | Leq |      |
| Backhoe                      | N/A     | N/A | 91.5                   | 87.6 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Concrete Mixer Truck         | N/A     | N/A | 92.8                   | 88.8 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Compressor (air)             | N/A     | N/A | 91.6                   | 87.7 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Concrete Pump Truck          | N/A     | N/A | 95.4                   | 88.4 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Crane                        | N/A     | N/A | 94.5                   | 86.6 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Dump Truck                   | N/A     | N/A | 90.4                   | 86.5 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Flat Bed Truck               | N/A     | N/A | 88.2                   | 84.3 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Front End Loader             | N/A     | N/A | 93.1                   | 89.1 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Man Lift                     | N/A     | N/A | 88.7                   | 81.7 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Paver                        | N/A     | N/A | 91.2                   | 88.2 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Pickup Truck                 | N/A     | N/A | 89.0                   | 85.0 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Roller                       | N/A     | N/A | 94.0                   | 87.0 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |
| Tractor                      | N/A     | N/A | 98.0                   | 94.0 | N/A                | N/A | N/A     | N/A | N/A   | N/A | N/A  |



|                |     |       |      |      |     |     |     |     |     |     |     |
|----------------|-----|-------|------|------|-----|-----|-----|-----|-----|-----|-----|
| Tractor        |     |       | 78.4 | 74.4 | N/A |
| N/A            | N/A | N/A   | N/A  | N/A  | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Welder / Torch |     |       | 68.4 | 64.4 | N/A |
| N/A            | N/A | N/A   | N/A  | N/A  | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
|                |     | Total | 78.4 | 80.0 | N/A |
| N/A            | N/A | N/A   | N/A  | N/A  |     |     |     |     |     |     |     |

## APPENDIX C

FHWA Traffic Noise Prediction Model- FHWA-RD-77-108,

REPORT:

**Results: Sound Levels - No Barrier Objects**

|                        |                                       |   |                       |
|------------------------|---------------------------------------|---|-----------------------|
| TNM VERSION            | 3.1.7970.37608                        | REPORT DATE:  | 16 November 2023      |
| CALCULATED WITH:       | 3.1.7970.37608                        | CALCULATION DATE:   | 11/16/2023 1:23:07 PM |
| CASE:                  | Hickory Street - Escondido - Existing | ORGANIZATION:   | EPC Environmental     |
| UNITS:                 | English                               | ANALYSIS BY:  | kpcarr                |
| DEFAULT GROUND TYPE:   | HardSoil                              | PROJECT/CONTRACT  |                       |
| ATMOSPHERICS:          | 68°F, 50%                             | Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval FHWA. |                       |
| PAVEMENT TYPE(S) USED: | Average                               |   |                       |

| Receiver   |     |          |                   | Modeled Traffic Noise Levels |                    |                        |                    |                |  |
|------------|-----|----------|-------------------|------------------------------|--------------------|------------------------|--------------------|----------------|--|
| Name       | No. | Nb. R.R. | Existing LAeq dBA | LAeq                         |                    | Increase over Existing |                    | Type of Impact |  |
|            |     |          |                   | Calc.                        | Absolute Criterion | Calc.                  | Relative Criterion |                |  |
|            |     |          |                   | dBA                          | dBA                | dBA                    | dBA                |                |  |
| Receiver-1 | 1   | 4        | ---               | 62.3                         | 0.0                | ---                    | ---                | Sound Level    |  |
| Receiver-2 | 2   | 4        | ---               | 52.2                         | 0.0                | ---                    | ---                | Sound Level    |  |
| Receiver-3 | 3   | 4        | ---               | 57.7                         | 0.0                | ---                    | ---                | Sound Level    |  |
| Receiver-4 | 4   | 4        | ---               | 50.7                         | 0.0                | ---                    | ---                | Sound Level    |  |

REPORT:

**Results: Sound Levels - No Barrier Objects**

TNM VERSION

3.1.7970.37608

REPORT DATE:

16 November 2023

CALCULATED WITH:

3.1.7970.37608

CALCULATION DATE:

11/16/2023 1:30:44 PM

CASE:

Hickory Street -  
Escondido w/Project

ORGANIZATION:

EPC Environmental

UNITS:

English

ANALYSIS BY:

kpcarr

DEFAULT GROUND TYPE:

HardSoil

PROJECT/CONTRACT

ATMOSPHERICS:

68°F, 50%

Average pavement type shall be used unless a state

PAVEMENT TYPE(S) USED:

Average

highway agency substantiates the use of a different  
type with approval FHWA.

| Receiver   |     |             |                         | Modeled Traffic Noise Levels |                       |                        |                       |                      |  |
|------------|-----|-------------|-------------------------|------------------------------|-----------------------|------------------------|-----------------------|----------------------|--|
| Name       | No. | Nb.<br>R.R. | Existing<br>LAeq<br>dBA | LAeq                         |                       | Increase over Existing |                       | Type<br>of<br>Impact |  |
|            |     |             |                         | Calc.                        | Absolute<br>Criterion | Calc.                  | Relative<br>Criterion |                      |  |
|            |     |             |                         | dBA                          | dBA                   | dBA                    | dBA                   |                      |  |
| Receiver-1 | 1   | 4           | ---                     | 61.7                         | 0.0                   | ---                    | ---                   | Sound Level          |  |
| Receiver-2 | 2   | 4           | ---                     | 51.6                         | 0.0                   | ---                    | ---                   | Sound Level          |  |
| Receiver-3 | 3   | 4           | ---                     | 57.1                         | 0.0                   | ---                    | ---                   | Sound Level          |  |
| Receiver-4 | 4   | 4           | ---                     | 50.1                         | 0.0                   | ---                    | ---                   | Sound Level          |  |