APPENDIX E
Sound Measurement and Impact Review for Proposed Directional Drilling, Trenching and Booster Station Operation North Fork Water Main Project Suffolk County Water Authority

Prepared by B. Laing Associates, March 2026

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Sound Measurement and Impact Review for Proposed Directional Drilling, Trenching and Booster Station Operation

North Fork Water Main Project
Suffolk County Water Authority

March 2026

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Contents

Figures and Tables

Appendices

1.0 INTRODUCTION

1.1 Purpose of Study

B. Laing Associates, Inc. is an environmental consulting firm providing sound/noise analysis services for the proposed North Fork Water Main installation project conducted by the Suffolk County Water Authority (SCWA) (herein referred to as the Project). The proposed Project includes the installation of a 24-inch transmission line over approximately 12 miles to maintain water pressure and reliability on the North Fork, especially during summer months when irrigation demand peaks. The installation will occur in two (2) phases.

Per the Final Scope for the Suffolk County Water Authority North Fork Water Main Project, prepared by Nelson, Pope & Voorhis, Phase 1 includes the Installation of approximately 43,449± linear feet (LF) (8.23± miles) of a 24-inch diameter ductile iron transmission water main within existing street and highway rights-of-way (ROWs) from Riverside-Flanders to Jamesport-Laurel. As part of the project, a booster station will be constructed to serve the proposed Riverside/Flanders to Jamesport/Laurel main extension. Phase 2 includes planning for a possible future 30,633± linear-foot (5.80-mile) water main extension consisting of a combination of 6, 8, and 12-inch diameter mains between East Marion and Orient in the Town of Southold. Figures 1 and 2 below depicts the varied phases of the proposed project.

Installation of the proposed water main will occur via trenching or directional drilling. The purpose of this analysis is to evaluate any temporary construction sound levels impacts that may occur as a result of the proposed Project.

Figure 1: Phase 1 Approximate Route (in red) beginning at the intersection of Flanders Road and Cross River Drive and ending along Sound Avenue.to the Town of Riverhead and Town of Southold line.

Map Source: Google Earth

Figure 2: Phase 2 Approximate Route (in red) starting on Main Road, south along Tabor Road, and throughout various residential streets.

Map Source: Google Earth

1.2 General Sound Characteristics

Sound is created when changes of pressure (waves) are produced in the air. These pressure changes are created at many frequencies (i.e., spacing of the waves). Sound is received and perceived when the human ear reacts to these pressure changes. The pressure changes are expressed as decibels (dB) depending upon the power of the source as expressed in watts of power (with a reference of 1 picowatt or 10-12 watts). Frequency varies depending on the rate at which sound pressures fluctuate in a cycle over time, which is measured in Hertz (Hz). One Hz equals 1 cycle per second. Frequency determines the perceived pitch of the sound. The average person's ear can detect sounds ranging from 20 to more than 10,000 hertz (Hz). Each frequency is detectable at different pressure levels, and so, the system for sound measurement, which mimics the human ear, is an A-weighted decibel system or dB(A)s. The human ear can barely detect a 3 dB(A) change in sound levels. A 6 dB(A) increase results in a generally audible change. A 10 dB(a) change in sound levels is approximately a doubling of sound wave pressure. As a point of reference, human conversations at a distance of two to three feet away occur at a sound pressure level (SPL) of 60 dB(A) with a calm voice to 75 dB(A) with a raised voice (USEPA's Community Noise, 1971). Pursuant to Table 3, Human Reaction to Increases in Sound Pressure Level, sound level increases of 0 to 5 dB(A) have no appreciable effect on receptors, increases of 5 to 10 dB(A) may have the potential for adverse impact, but only in cases where the most sensitive receptors are present. Increases of more than 10 dB(A) may require a closer analysis of impact potential depending on existing noise levels and surrounding land uses, and may necessitate the consideration of mitigation measures.

1.3 Sound Monitoring

Sound level meters (Cirrus Research plc CR:171A noise meter) were deployed to monitor both the construction levels and ambient sound levels across the proposed routes. On January 21, 2026, measurements were taken at an active directional drilling site and booster station for reference and comparative purposes. This occurred in sunny 18-degree Fahrenheit temperatures with 11 mph winds. On January 23, 2026, measurements were taken at an active trenching site for reference purposes. This occurred in cloudy 31-degree Fahrenheit temperatures with 12 mph winds. Ambient measurements were also taken at fifteen (15) locations (See Figures 3 and 4 for sampling locations) on January 23, 2026 along the project route. Measurement locations occurred at various sensitive receptors (i.e., locations that could be negatively impacted by an increase in noise levels, such as schools, places of worship, etc.) and residential receptors throughout the proposed path of construction. Four (4) samples were taken along the Phase 1 Route, seven (7) along the Phase 2 Route, and four (4) along the alternative route down Main Road. All measurement data is provided in L_{eq} or the equivalent continuous sound level (average sound level). A discussion of these results, as well as a table of the sound monitoring data, is included below. In addition to ambient monitoring, an existing booster station was monitored as a reference/control. These measurements were used to determine the level of potential impact temporary construction or long-term operation may pose to various receptors. The results of this monitoring are found in Table 1 and 2 below. Sound measurement sheets are in Appendix A.

Figure 3: Phase 1 Approximate Sampling Locations (Main and Alternative Route)

Map Source: Google Earth

Figure 4: Phase 2 Sampling Locations

Map Source: Google Earth

1.3.1 Pre-Construction and General Construction

On January 21, 2026, the noise meter was placed at the eastern corner of Nugent Drive and Pinehurst Boulevard during the pre-construction set-up phase for directional drilling. The meter remained stationary for approximately 23 minutes in this position. Sound levels from this location showed an L_{eq} of 72.1 dB(A). The sound levels at this location predominantly result from the construction activity; however, vehicle use of Nugent Drive was a contributor to the sound level measurement.

During construction, the noise meter was placed on the western corner of Nugent Drive and Pinehurst Boulevard for approximately 2.5 hours. Again, meter remained stationary and 15 feet was used as the average distance for analysis. The equivalent continuous sound level (average sound level) was 81.8 dB(A). The sound levels at this location predominantly result from the construction activity; however, vehicle use from Nugent Drive was a contributor to the sound level measurement.

1.3.2 Ambient Noise Monitoring Results

Sensitive Receptors are areas that are particularly vulnerable to an increase in noise pollution, such as places of worship, schools, retirement homes, etc. Sensitive receptors are defined by the EPA to "…include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities." Because the route of proposed construction is in a more rural/agricultural area, there are few sensitive receptors. Receptors of additional interest, in this case, were locations that possessed dwellings on either side of the road. These homes have the highest chance of potentially being negatively impacted by the construction compared to farms or commercial/industrial uses along the route. Major sound-level influences noted during sampling included traffic along the Phase 1 main and alternative route, whereas wind contributed to the sound level measurements in the residential streets of Phase 2. However, the Cirrus noise meters have microphone windshields to reduce the effects of wind and air movement across the microphone.

Below is a summary of each ambient measurement sample. Table 1 outlines specific details for each sampling including the time and date of each sample.

Sample location 1 was taken along Cross River Road. On the eastern side of this road, behind a tree line and fencing, is a residential community. Out of one of the homes operates a daycare (Elite Children Daycare Corp). The AM ambient for this location had an L_{eq} of 72 dB(A). Noise levels are characteristic of the existing traffic on Cross River Road.

Samples 2 and 3 were taken along Sound Avenue, where homes were found on either side of the road. Location 2 was by the intersection of Sound Ave and West Lane, with an ambient level of 74.9 dB(A). Sample 3 was taken about a quarter mile east of Church Lane, with L_{eq} of 75.7 dB(A). The sound levels at these locations result from vehicle traffic on Sound Avenue.

Sample 4 was taken at the location of the proposed Booster Station. The ambient measurement at this location was 60.5 dB(A). This sample was taken on a side road (Pier Avenue) just off of Sound Avenue and so further from traffic noise.

Samples 5 through 10 were all taken in the same residential community, with the lowest measurement recorded at 51.6 dB(A) at sample location 6, and the highest reading being 62.9 dB(A) at sample location 9. This variation in sound level may be attributed to the fact that location 9 had increased pedestrian traffic, with vehicles driving by and individuals walking dogs. As for the samples 5-8 and 10, the wind was a contributing factor to the noise levels due to velocity. During sampling, the residential community had little to no vehicle or pedestrian traffic, save for location 9 as previously mentioned.

Sample 11 was taken at the Orient Fire Department, with the microphone pointed towards Oysterponds Elementary School. The ambient L_{eq} was 65.5 dB(A). This level is characteristic of a main road with higher traffic compared to the residential side streets.

Samples 12 and 13 were taken along Main Road where residences were present. Sample 12 was near the intersection of Main Road and Herricks Lane, measuring an ambient of 74.3 dB(A). Sample 13 was near the intersection of Main Road and Colonial Drive, with a reading of 73 dB(A). This is a highly trafficked area and thus dominated the sound level measurements.

Sample 14, was on the corner of the Kingdom Hall of Jehovah's Witnesses property and Main Road, with a measurement L_{eq} of 73.6 dB(A). As previously mentioned, this roadway is heavily trafficked and thus traffic noise dominated the sound level measurements.

Sample 15, the alternative booster station location, was located along Cross River Drive and Main Road. The ambient reading here was 60.5 dB(A). While the leading noise source was traffic, this location was set back further from the road (taken in a residential yard). Thus, the distance from the traffic led to a lower ambient reading.

The results of this monitoring are found in Table 1 and 2 below. Sound measurement sheets are located in Appendix A.

Table 1: AMBIENT NOISE MONITORING DATA FOR VARIOUS RECEPTORS						
Sample No.	Location	Date	Time	Results (L_{eq})	Distance from Center of Roadway	Weather Conditions
1	In Home Daycare	Friday 1/23/26	9:20 am	72.0 dB(A)	10 FT	33 F, 14 mph winds, cloudy, 50% humidity
2	Residential along Sound Avenue	Friday 1/23/26	9:37 am	74.9 dB(A)	5 FT	33 F, 17 mph winds, cloudy, 48% humidity
3	Residential along Sound Avenue	Friday 1/23/26	9:52 am	75.7 dB(A)	5 FT	33 F, 17 mph winds, cloudy, 47% humidity
4	Proposed Booster Station	Friday 1/23/26	10:07 am	60.5 dB(A)	100 FT	33 F, 18 mph winds, cloudy, 45% humidity
5	Residential along Oyster Ponds Lane	Friday 1/23/26	10:49 am	57.3 dB(A)	5 FT	33 F, 21 mph winds, cloudy, 52% humidity
6	Residential along Skippers Lane	Friday 1/23/26	11:04 am	51.6 dB(A)	5 FT	33 F, 21 mph winds, partly cloudy, 49% humidity
7	Residential along Fletcher Street	Friday 1/23/26	11:19 am	57.7 dB(A)	5 FT	33 F, 21 mph winds, partly cloudy, 48% humidity
8	Residential along Willow Street	Friday 1/23/26	11:34 am	54.3 dB(A)	5 FT	33 F, 22 mph winds, partly cloudy, 48% humidity
9	Residential along King Street	Friday 1/23/26	11:52 am	62.9 dB(A)	5 FT	33 F, 22 mph winds, sunny, 48% humidity
10	Residential along Navy Street	Friday 1/23/26	12:07 pm	54.8 dB(A)	5 FT	34 F, 23 mph winds, sunny, 48% humidity
11	Oysterponds Elementary	Friday 1/23/26	12:23 pm	65.5 dB(A)	10 FT	34 F, 24 mph winds, sunny, 48% humidity
12	Residential along Main Road	Friday 1/23/26	1:44 pm	74.3 dB(A)	5 FT	36 F, 20 mph winds, cloudy, 40% humidity
13	Residential along Main Road	Friday 1/23/26	2:02 pm	73 dB(A)	5 FT	36 F, 19 mph winds, cloudy, 40% humidity
14	Kingdom Hall of Jehovah's Witness	Friday 1/23/26	2:18 pm	73.6 dB(A)	20 FT	36 F, 19 mph winds, cloudy, 39% humidity
15	Alternative Booster Station	Friday 2/6/26	10:02 am	60.5 dB(A)	40 FT	26 F, 6 mph winds, partly cloudy, 69% humidity

1.3.3 Active Construction Sampling Monitoring Results

B. Laing Associates personnel visited one of SCWA's active trenching/drilling projects, as well as an existing booster station to measure the sound levels that result from such activities. The sound levels produced from various activities and/or machines can be found in Table 2 below. It should be noted that sound level measurements are not exclusive of ambient conditions as they are field measurements.

Table 2: APPROXIMATE NOISE LEVELS EMITTED FROM CONSTRUCTION/OPERATIONAL EQUIPMENT			
Activity or Machinery	**Date & Time**	**Results (L_{eq})**	**Distance During Monitoring**
Existing Booster Station Ambient	1/21/26 10:40 AM	44.1 dB(A)	12 FT
Existing Booster Station (Two Pumps Operating)	1/21/26 10:50 AM	49.3 dB(A)	12 FT
Trenching	1/23/26 8:47 AM	73.3 dB(A)	50 FT
Tiger Cat T726G (Excavator)	1/21/26 9:54 AM	80.7 dB(A)	20 FT
Set Up Phase (pre-construction)	1/21/26 8:55 AM	72.1 dB(A)	15 FT
General construction	1/21/26 9:56 AM	81.8 dB(A)	15 FT
Directional Drilling	1/21/26 12:28 PM	73.6 dB(A)	24 FT

The noise produced by various machines has also been extracted from the sound measurement data. For example, the CAT excavator produced approximately 81.7 dB(A) at 25 feet, the vacuum excavation truck (McVac Environmental) produces approximately 81.8 dB(A) at 15 feet, and the Vermeer drill produces approximately 79.8 dB(A) at 24 feet. This data was used to determine potential impacts.

2.0 NOISE REGULATION

2.1 Department of Environmental Conservation Criteria

The New York State Department of Environmental Conservation (NYSDEC) published "Assessing and Mitigating Noise Impacts" (October 6, 2000, and revised February 2, 2001) to provide guidance and policy on existing and proposed sound levels. This document states that sound level increases of 0 to 5 dB(A) have no appreciable effect on receptors, increases of 5 to 10 dB(A) may have the potential for adverse impact, but only in cases where the most sensitive receptors are present. **Construction noise levels are not specifically addressed by this guidance.**

2.2 Riverhead Town Code

The Town of Riverhead Code outlines Noise, Public Nuisances, and Property Maintenance in Chapter 251. The code states that noise from construction is exempt from the A-weighted sound pressure level limits outlined in 251-4, with the following stipulations:

"251-5 Prohibited Acts.

K. Construction

1. No person shall operate or permit to be operated any construction device, including but not limited to construction and demolition work, excavating or earthmoving equipment:

a. Between the hours of 8:00 p.m. and 7:00 a.m. the following day on weekdays or at any time on Sundays or legal holidays, such that the sound therefrom creates unreasonable noise across a residential real property boundary.

b. At any other time such that the continuous sound-in-air level at or across a real property boundary exceeds an L{10} of 80 dBA.

c. At any other time such that the impulsive sound-in-air has a peak sound-pressure level at or across a real property boundary in excess of 130 dBA.

2. The provisions of this subsection shall not apply to emergency work."

2.3 Southold Town Code

The Town of Southold Code outlines Noise, Public Nuisances, and Property Maintenance in Chapter 180. Standard allowance of noise emissions at various times is outlined in 180-6:

"No person shall create or cause to be emitted any noise pollution which when measured on a sound-level meter from the property line of a complaining property owner exceeds the following standards:

A. Sunday through Thursday:

(1) From 7:00 a.m. to 7:00 p.m., airborne or amplified sound in excess of 65 dBA; and
(2) From 7:00 p.m. to 7:00 a.m., airborne or amplified sound in excess of 50 dBA.

B. Friday and Saturday:

(1) From 7:00 a.m. to 11:00 p.m., airborne or amplified sound in excess of 65 dBA; and
(2) From 11:00 p.m. to 7:00 a.m., airborne or amplified sound in excess of 50 dBA."

The code goes on to list exceptions to the above standards in 180-8, stating that the provisions of §§ 180-5 and 180-6 shall not apply to the following:

> (2) Construction activities between 7:00 a.m. through 7:00 p.m. and the associated use of construction devices or the noise produced thereby, provided that such activities and such equipment and their use comply with the other provisions hereof.

3.0 SOUND MODELING RESULTS

The noise data collected by this office (ambient, construction, and machinery) were utilized to estimate how the installation of the water main line could increase sound levels at various sensitive receptors along the path of construction.

It is important to note that, during construction, noise levels will be (1) temporary and (2) will occur at two distinctly different levels. First, the temporary component results from the transient nature of the construction process. The U.S. EPA reports sound levels at construction projects range from a high of 88 dB(A) to a low of 75 dB(A) from grading through finishing operations (U.S. EPA, Construction Noise Control Technology Initiatives, Table 2.2, as measured at 50 feet). The noise generated during construction is mainly due to diesel engines that run the equipment. Exhaust is typically the predominant source of diesel engine noise, which is the reason that maintaining mufflers on all equipment is imperative.

While some construction activities may result in elevated noise, it is noted that construction during daytime hours within the Towns of Riverhead and Southold have exemptions as described above in Chapter 2.0.

The analysis below predicts potential impacts from differing phases of construction on local receptors.

3.1 Directional Drilling

Directional drilling is proposed in nine (9) locations, typically at the intersections of roads. Of these nine, three locations will be near (i.e., within 1,500 FT) identified Sensitive Receptors. As seen in Table 2, directional drilling is estimated to produce a sound pressure level of 73.6 dB(A) at 24 feet. According to the inverse square law, every doubling of the distance from a sound's source will result in a noticeable 6 dB(A) reduction in the resultant sound level. Without dedicated abatement/mitigation measures, natural attenuation is normally the only method by which sound will lessen. Location 1, the daycare, is 1,200 FT south of the proposed drilling at Main Road and Cross River Drive. Taking attenuation into account, the sound produced from the drilling would be approximately 40 dB(A) when it reaches the daycare. As the ambient at this location was measured to be 72 dB(A), the directional drilling would have no significant sound levels impact on the receptor.

The directional drilling at Main Road and Oyster Ponds Lane is approximately 350 feet north of sample location 5, a residential community. At the receptor, sound levels will be approximately 50 dB(A). This level is less than the ambient of 57.3 dB(A) that was measured in the field.

The drilling at Main Road and Tabor Road is on the corner where sample location 11 was taken, approximately 20 feet west. Because of this proximity, the noise produced from the drilling would be at 75 dB(A) upon reaching location 11. The ambient measurement in this area was 65.5, thus there would be a 9.5 decibel increase at this location. However, Oysterponds Elementary School is estimated to be 188 feet north of the intersection, therefore the noise produced by construction would attenuate with distance. The approximate sound pressure level would be 56 dB(A) at the school building receptor.

These data were also implemented into the NoiseTools© computer modeling to determine the noise emission dispersion analysis at the sensitive receptor. NoiseTools© computer modeling is based on International Organization for Standardization (ISO) standards (i.e., ISO96-13-2:2024), which is used worldwide in sound/noise analysis.

The modeler defines the properties of the objects to be analyzed including:
- building locations and heights,
- receivers' locations, and height,
- the sound power or emission level for "construction sources" (e.g., excavator),
- mitigation wall heights and finishes.

The above inputs allow the calculation, superimposition, reflection, and compilation of different noise sources at the receivers and a comparison to the existing ambient levels

The results of the modeling determined that sound levels at Oysterponds Elementary School north of the proposed construction would be 54 dB(A).

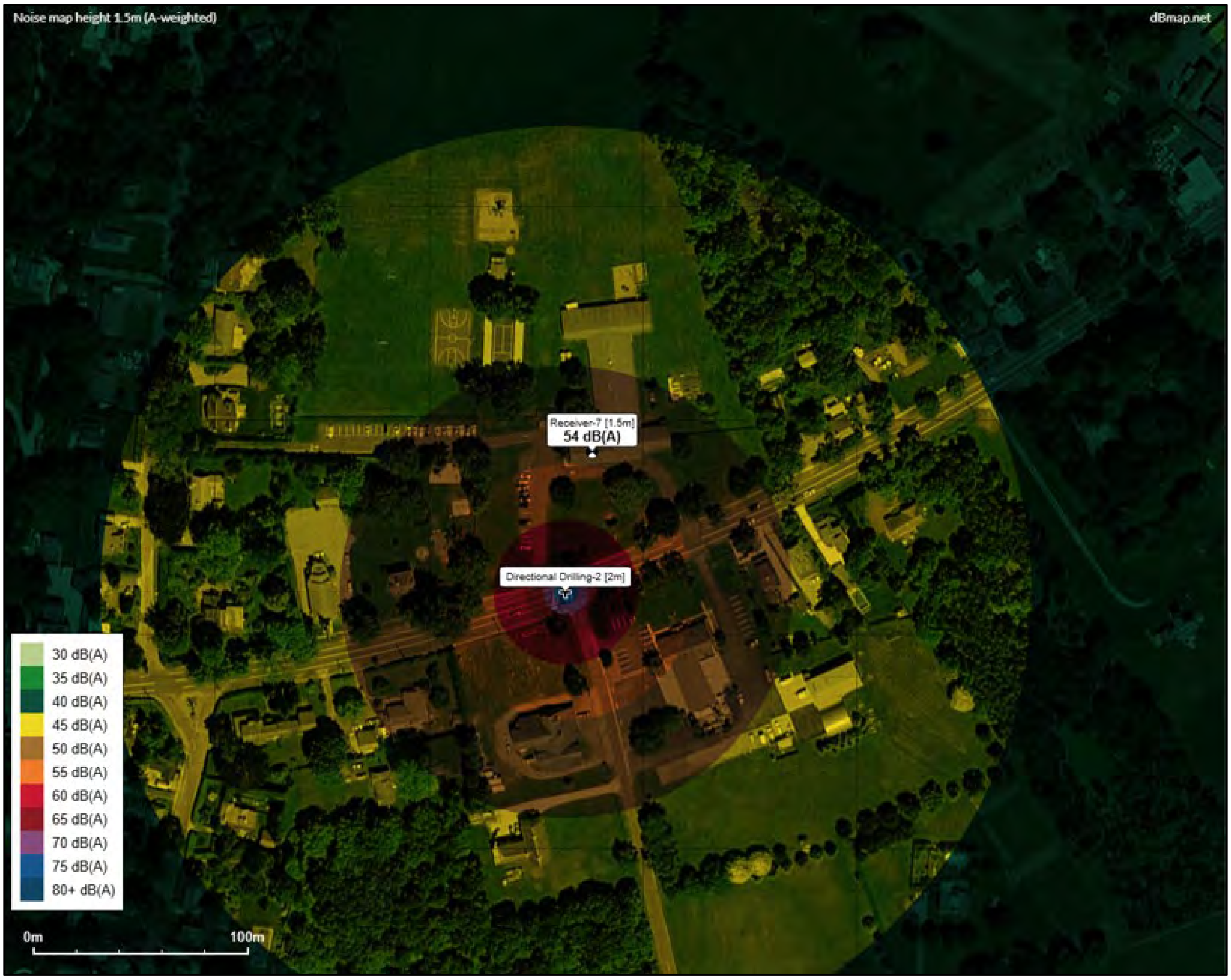


Figure 5

NoiseTools© Modeling of sound level dispersion as a result of directional drilling at Location 11.

3.2 Trenching

Trenching is a large majority of the project, with an approximate sound pressure level of 73.3 dB(A) at 50 feet from the source. The locations potentially at temporary risk of disturbance are residential sample locations 5 through 10, as the measured ambient noise levels in these locations were significantly less than the temporary construction sound levels (over a 10 dB increase). Locations 4 and 15, the potential locations of the proposed booster station, were not included in this trenching analysis because they will be uninhabited lots and therefore no significant disturbance will occur by an increase in sound levels during construction. Noise calculations, including dB(A) at various distances as well as various receptors, can be found in Table 3 below.

TABLE 3: APPROXIMATE SOUND ATTENUATION LEVELS FROM TRENCHING AT VARIOUS DISTANCES						
Location	Ambient dB(A)	Sound Pressure Level at 50 FT	dB(A) 50 Feet	dB(A) 100 Feet	Approximate Distance of Buildings to Roadway	Calculated Noise Levels During Trenching at Buildings
1: In Home Daycare	72.0 dB(A)	73.3	73.3	67.3	280 FT	58.3 dB(A)
2: Residential along Sound Avenue	74.9 dB(A)	73.3	73.3	67.3	80 FT	69.2 dB(A)
3: Residential along Sound Avenue	75.7 dB(A)	73.3	73.3	67.3	80 FT	69.2 dB(A)
5: Residential along Oyster Ponds Lane	57.3 dB(A)	73.3	73.3	67.3	50 FT	73.3 dB(A)
6: Residential along Skippers Lane	51.6 dB(A)	73.3	73.3	67.3	40 FT	75.2 dB(A)
7: Residential along Fletcher Street	57.7 dB(A)	73.3	73.3	67.3	30 FT	77.7 dB(A)
8: Residential along Willow Street	54.3 dB(A)	73.3	73.3	67.3	45 FT	74.2 dB(A)
9: Residential along King Street	62.9 dB(A)	73.3	73.3	67.3	40 FT	75.2 dB(A)
10: Residential along Navy Street	54.8 dB(A)	73.3	73.3	67.3	45 FT	74.2 dB(A)
11: Oysterponds Elementary	65.5 dB(A)	73.3	73.3	67.3	188 FT	62.7 dB(A)
12: Residential along Main Road	74.3 dB(A)	73.3	73.3	67.3	60 FT	71.7 dB(A)
13: Residential along Main Road	73.0 dB(A)	73.3	73.3	67.3	50 FT	73.3 dB(A)
14: Kingdom Hall of Jehovah's Witness	73.6 dB(A)	73.3	73.3	67.3	200 FT	61.2 dB(A)

These data were also implemented into the computer NoiseTools© modeling to determine the noise emission dispersion analysis at several residential receptors in the vicinity of Fletcher Street (Location 7).

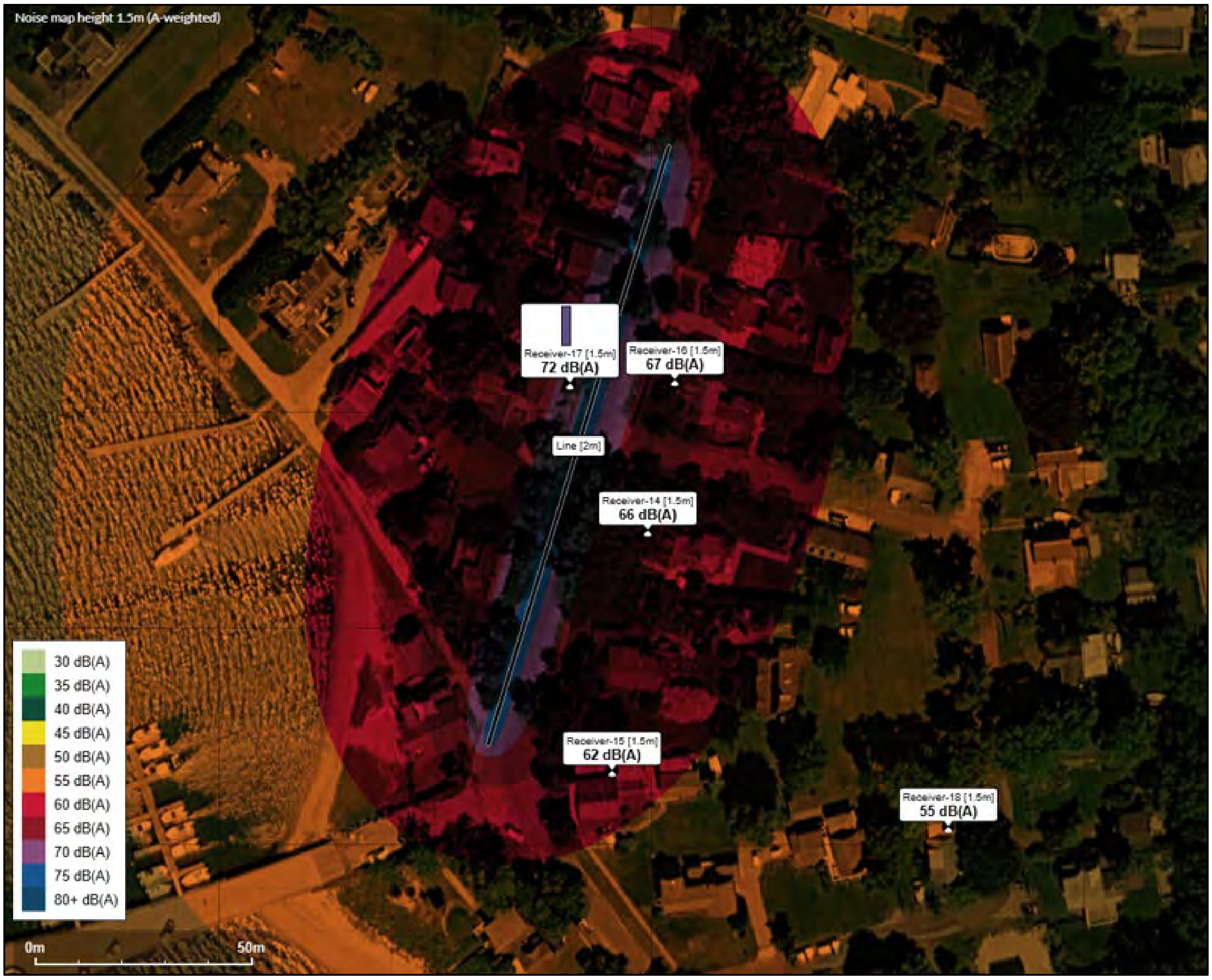


Figure 6

NoiseTools© Modeling of sound level dispersion as a result of trenching at and in the vicinity of Location 7.

3.3 Booster Station

An existing booster station was measured for baseline sampling. This took place in a remote part of nearby Laurel, New York, with very little background noise. The measured noise level at 12 feet had an L_{eq} of 44.1 dB(A). With two pumps operating, the noise level measured 49.3 dB(A). Both levels are considered quiet by state guidance. The site of the proposed booster station, as well as the alternative location, was recorded having an ambient noise level of 60.5 dB(A). Therefore, no significant impacts are anticipated with the proposed operational booster station.

Table 3 below provides a summary of approximate equipment sound levels, as measured in the field, with distance attenuation.

Table 4: APPROXIMATE DISTANCE SOUND ATTENUATION LEVELS FROM CONSTRUCTION/OPERATIONAL EQUIPMENT					
Activity or Machinery	Date Sampled	SPL Results (L_{eq})	Distance From Source	Noise at 50 Feet	Noise at 100 Feet
Existing Booster Station Ambient	1/21/26	44.1 dB(A)	12 FT	31.7 dB(A)	25.7 dB(A)
Existing Booster Station (Two Pumps Operating)	1/21/26	49.3 dB(A)	12 FT	36. 9 dB(A)	30.9 dB(A)
Trenching	1/23/26	73.3 dB(A)	50 FT	73.3 dB(A)	67.3 dB(A)
Tiger Cat T726G	1/21/26	80.7 dB(A)	20 FT	72.2 dB(A)	66.7 dB(A)
Set Up Phase (pre-construction)	1/21/26	72.1 dB(A)	15 FT	61.6 dB(A)	55.6 dB(A)
General construction	1/21/26	81.8 dB(A)	15 FT	71.3 dB(A)	65.3 dB(A)
Directional Drilling	1/21/26	73.6 dB(A)	24 FT	67.2 dB(A)	61.2 dB(A)

Multiple sound sources, in proximity to each other, can be added to determine a cumulative sound level. For example, when several pieces of proximal equipment are operating simultaneously, we would use the Approximate Addition of Sound Levels (Table 5) to calculate the resultant dB(A) to a receptor. The difference between the two lowest sound pressure levels is calculated, and that result is added to the next highest source. Pursuant to the table below, the difference between two sound levels at 1 dB or less (essentially a doubling of noise) will add 3 dB to the higher of the two sounds, and so forth. Once the difference between two sound levels is 10 decibels or more, no additional increase of sound levels is added.

TABLE 5 APPROXIMATE ADDITION OF SOUND LEVELS	
Difference Between Two Sound Levels	**Add to the Higher of the Two Sound Levels**
1 dB or less	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0 dB
	***USEPA, Protective Noise Levels, 1978** *** NYSDEC, Assessing and Mitigating Noise Impacts**

As above, during construction sampling, various equipment was active to prepare for and include directional drilling. The noise meter was placed on the western corner of Nugent Drive and Pinehurst Boulevard for approximately 2.5 hours. These data were analyzed in smaller subsets as shown below in Table 6 and provided in Appendix A.

TABLE 6 MULTIPLE EQUIPMENT USE CONSTRUCTION MONITORING				
Subset	Date	Time	L_{eq} dB(A)	Construction Activity Notes
Block 1	1/21/2026	10 AM to 10:30 AM	81.2	10:06 - 10:13 McVac (vacuum excavator) in use.
Block 2	1/21/2026	10:30 AM to 11 AM	82.4	10:30 Start Drill. 10:25 - 10:42 Vac truck. 10:50 vibrate vac truck for removal.
Block 3	1/21/2026	11 AM to 11:30 AM	75.2	11-11:08 digging with backhoe.
Block 4	1/21/2026	11:30 AM to 12 PM	73.6	11:42-11:50 pulling pipe.11:55 -11:58 digging with backhoe
Block 5	1/21/2026	12 PM to 12:30 PM	86.8	McVac truck in use from 12:18 until 12:30.

The overall equivalent continuous sound level (average sound level) was 81.8 dB(A) at 15 feet. Thus, at 50 feet, sound levels will be approximately 71.3 dB(A) and at 100 feet, 65.3 dB(A). At an L_{eq} of 86.8 dB(A), the highest sound pressure level subset, sound levels at 50 feet will be approximately 76 dB(A) and at 100 feet, 70 dB(A).

While some construction activities may result in elevated noise, construction is short-lived and construction hours, within the Town of Riverhead and Southold, have exemptions as described above in Chapter 2.0. Trenching progresses at around 300 feet per day or moves on average 25 feet each hour. Thus, at a certain receptor, in a 12 hour day, work will have progressed approximately 100 feet in four hours. The predicted sound levels are for a receptor outdoors. A building itself will also act as a very effective sound barrier for receptors. Pursuant to NYSDEC's Assessing and Mitigating Noise Impacts, "building walls and windows that are closed provide a 15 dB reduction in noise levels." Thus, a building or house will provide significant attenuation for those who are indoors. At an L_{eq} of 86.8 dB(A), sound levels at 50 feet will be approximately 76 dB(A) for an outside receptor but approximately 61 dB(A) for a receptor indoors. At 100 feet sound levels will be reduced to 70 dB(A) outside and 55 dB(A) indoors. Decibel range from 50 to 60 is considered quiet to moderate. Normal conversation ranges from 60 to 70 decibels. Relative quiet for hours outside the allotted construction timeframes are expected.

Directional drilling is estimated to take up to two days to install. Again, the predicted sound levels will be temporary and on average about 15 decibels lower for receptors indoors. The drilling at Main Road and Tabor Road is approximately 20 feet at the closest receptor. Because of this proximity, the noise produced from the drilling is predicted to be approximately 75 dB(A) for a receptor outdoors and approximately 50 dB(A) for a receptor indoors. The ambient measurement in this area was 65.5 dB(A).

In brief, residences may only experience elevated noise levels for a short duration within a single day. Elevated levels will be for those receptors outdoors. A building or house will provide significant attenuation for receptors indoors.

4.0 MITIGATION

As outlined above, without sound abatement measures, the proposed construction has the potential to temporarily increase sound levels at sampled locations along the Project construction route.

Few guidelines to assist with noise abatement include utilizing and maintaining exhaust silencers and mechanical equipment for trucks, compressors, cranes and other equipment, equipment baffles/mufflers, and shut-down equipment when not in use (no idling of unused equipment in excess of State regulations). To the extent practical, noisy equipment shall be kept far from site boundaries and scheduling several noisy operations concurrently to reduce long exposure to noticeable sound levels. Air compressors shall have critical environmental silencers with maximum noise attenuation. Strobe lights shall be substituted for back up signals when possible. Utilizing modern equipment when possible as new equipment is less noisy than worn-out/outdated equipment. Chapter 7.0 of the Federal Highway Administration can be consulted in regards to mitigation techniques for further scenarios.

The consideration of mitigation includes an assessment of FHWA Chapter 7.2 Design Options, 7.2.1. Design Phases which state "As early as possible in the design development process, natural and artificial barriers such as ground elevation changes, existing buildings, noise walls, and other structures can be considered for use as a noise shield during certain operations" and potential implementation of sound attenuation measures (e.g., sound barriers) which can reduce sound levels up to 20 dB(A).

Any construction activities outside of the regulated Town hours will require sound abatement measures. Echo Barriers (or equivalent sound barriers) are physical barriers that effectively reduce noise pollution by up to 40 dB by blocking or absorbing sound waves. These types of barriers can be moved, reconfigured, and redeployed to follow progression of construction work to mitigate the impact of temporary noise impacts. Physical barriers should be implemented where necessary.

APPENDIX A

SOUND LEVEL MEASUREMENT DATA

Measurement Summary Report

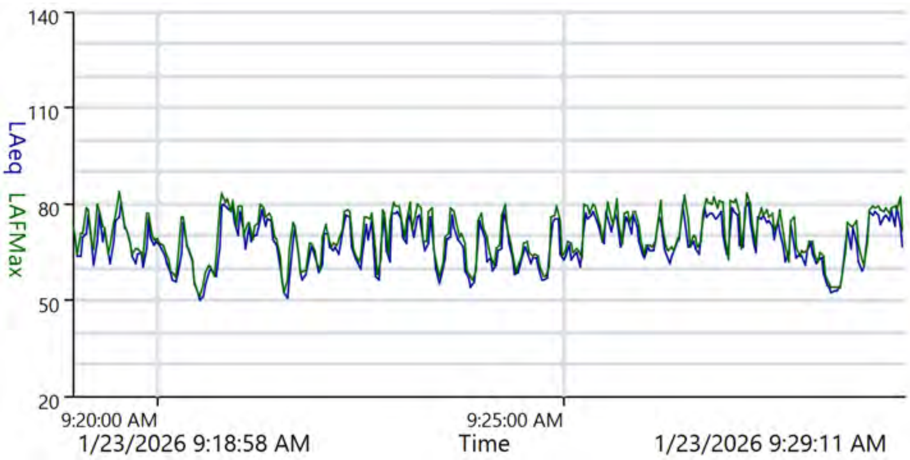
Name	55				
Time	1/23/2026 9:18:58 AM	**Person**		**Place**	**Project**
Duration	00:10:14	Valerie Facini			NPVSCW01
Instrument	G301840, CR:171A				

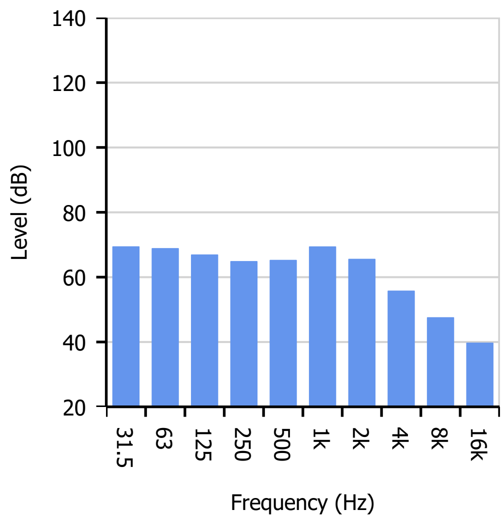
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	72.0 dB
LAE	99.9 dB
LAFMax	84.0 dB

Statistical Levels (Ln)	
LAS1	79.5 dB
LAS5	77.5 dB
LAS10	76.3 dB
LAS50	68.1 dB
LAS90	58.3 dB
LAS95	56.0 dB
LAS99	52.1 dB





Notes

SR, Sample Location 1
By in home daycare
9:20 am, 33F, 14 MPH winds, 50% humidity, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

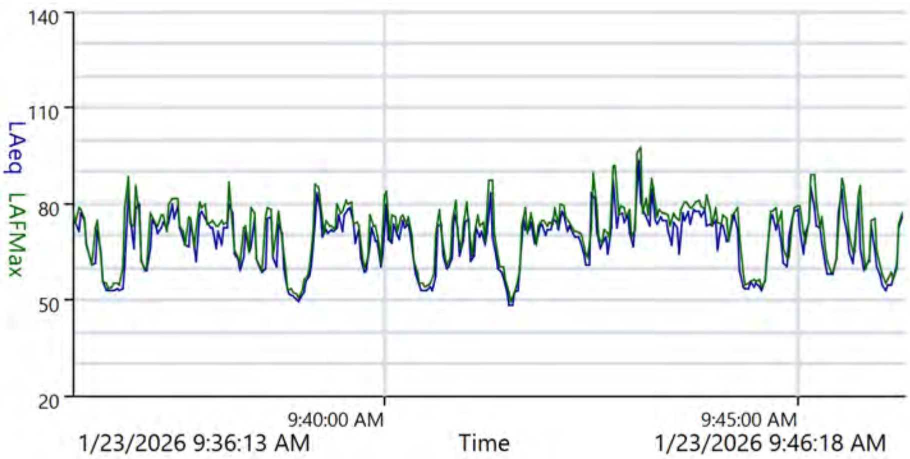
Name	56				
Time	1/23/2026 9:36:13 AM	**Person**	**Place**	**Project**	
Duration	00:10:05	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

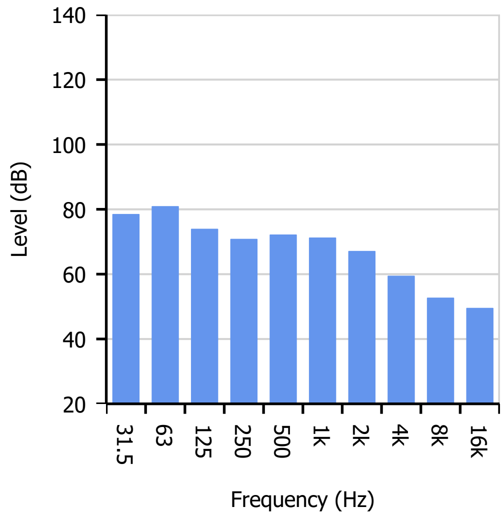
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	74.9 dB
LAE	102.7 dB
LAFMax	97.3 dB

Statistical Levels (Ln)	
LAS1	84.9 dB
LAS5	80.0 dB
LAS10	77.5 dB
LAS50	70.5 dB
LAS90	54.6 dB
LAS95	53.1 dB
LAS99	50.0 dB





Notes

Location 2: Homes on Sound Ave by West Lane
9:37 am, 33F, 17mph, 48% humidity, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

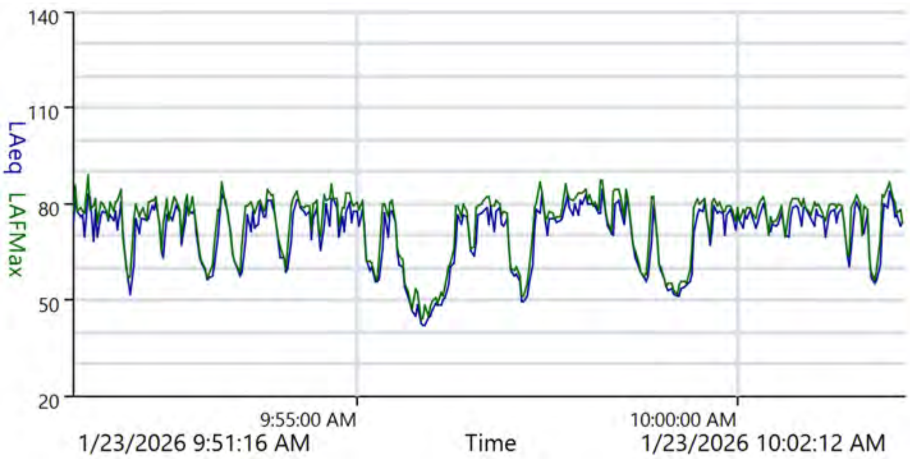
Name	57				
Time	1/23/2026 9:51:16 AM	**Person**	**Place**	**Project**	
Duration	00:10:56	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

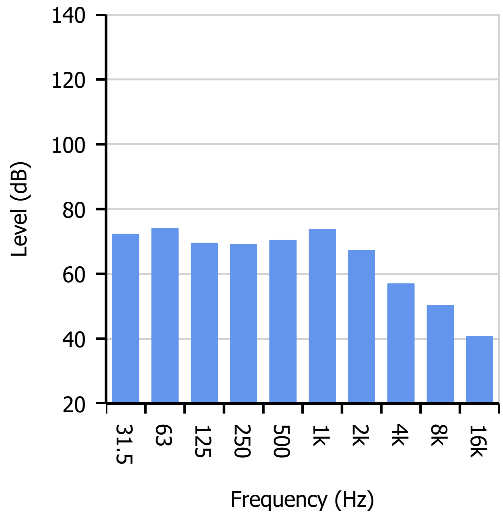
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	75.7 dB
LAE	103.9 dB
LAFMax	89.0 dB

Statistical Levels (Ln)	
LAS1	82.9 dB
LAS5	80.3 dB
LAS10	79.2 dB
LAS50	74.4 dB
LAS90	55.6 dB
LAS95	50.6 dB
LAS99	43.9 dB





Notes

Location 3: Residential on sound ave pt 2
9:52, 33F, 17mph, 47%, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

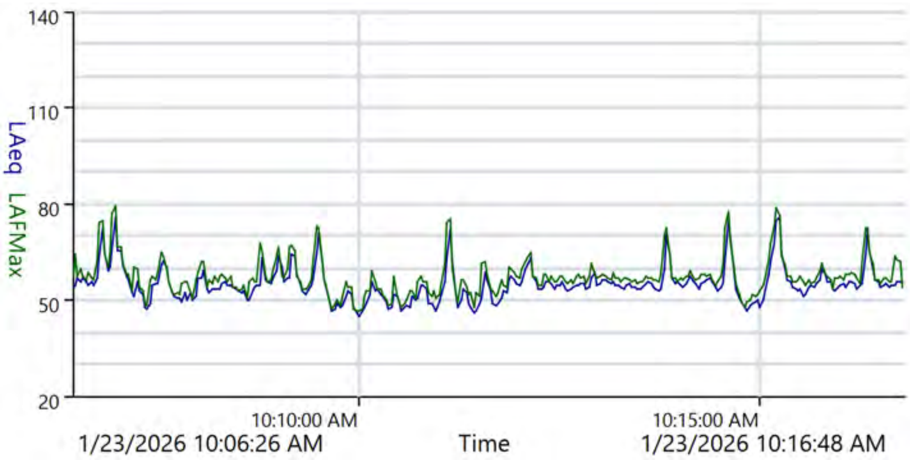
Name	58				
Time	1/23/2026 10:06:26 AM	**Person**		**Place**	**Project**
Duration	00:10:22	Valerie Facini			NPVSCW01
Instrument	G301840, CR:171A				

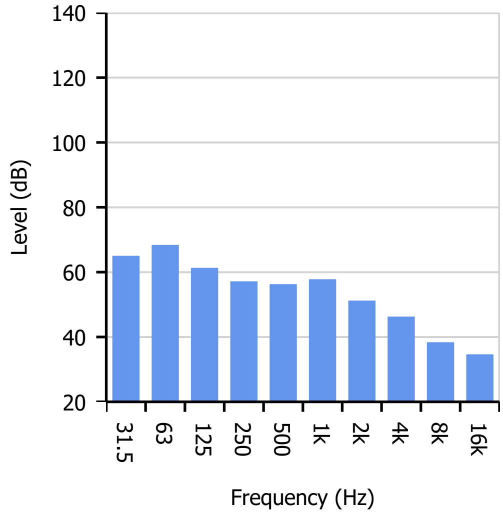
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	60.5 dB
LAE	88.4 dB
LAFMax	79.0 dB

Statistical Levels (Ln)	
LAS1	72.8 dB
LAS5	66.7 dB
LAS10	61.8 dB
LAS50	54.5 dB
LAS90	48.8 dB
LAS95	47.8 dB
LAS99	46.5 dB





Notes

Location 4: Booster station Sound Ave/Pier Ave
10:07 am, 33F, 18mph, 45% humidity, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

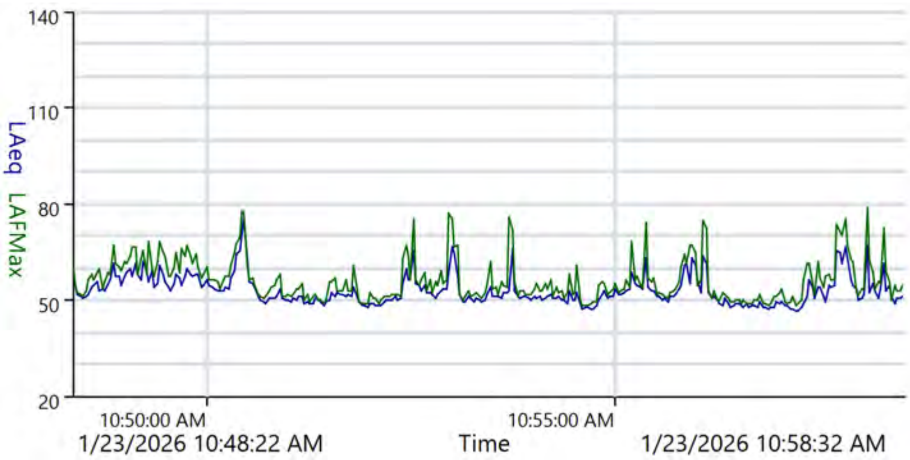
Name	59				
Time	1/23/2026 10:48:22 AM	**Person**	**Place**	**Project**	
Duration	00:10:10	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

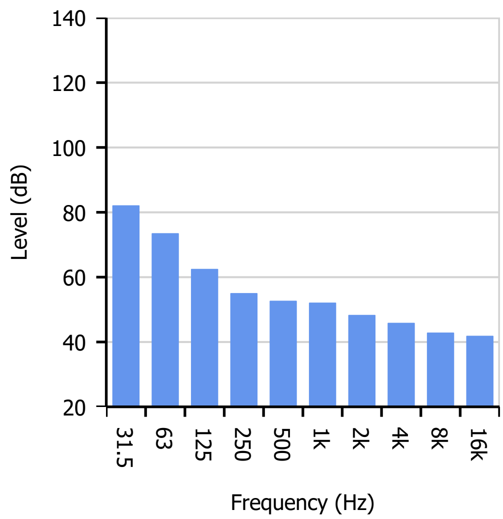
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	57.3 dB
LAE	85.2 dB
LAFMax	78.7 dB

Statistical Levels (Ln)	
LAS1	67.4 dB
LAS5	62.6 dB
LAS10	59.5 dB
LAS50	51.7 dB
LAS90	48.4 dB
LAS95	47.8 dB
LAS99	47.1 dB





Notes

Location 5: Residential Oyster Ponds Lane
10:49, 33F, 21 mph, 52%, cloudy

ReportId

Measurement Summary Report

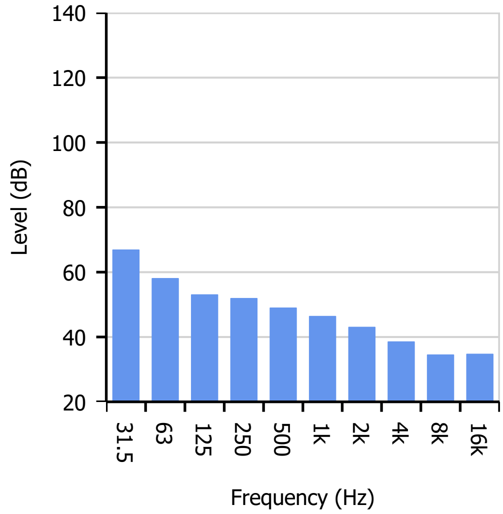
Name	60			
Time	1/23/2026 11:03:31 AM	**Person**	**Place**	**Project**
Duration	00:10:08	Valerie Facini		NPVSCW01
Instrument	G301840, CR:171A			

Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	51.6 dB
LAE	79.4 dB
LAFMax	60.8 dB

Statistical Levels (Ln)	
LAS1	57.3 dB
LAS5	55.8 dB
LAS10	54.7 dB
LAS50	50.2 dB
LAS90	47.7 dB
LAS95	47.2 dB
LAS99	46.0 dB



Notes

Location 6: Skippers lane/harbor rivers road
11:04 am, 33F, 21 MPH, 49% humidity, partly cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

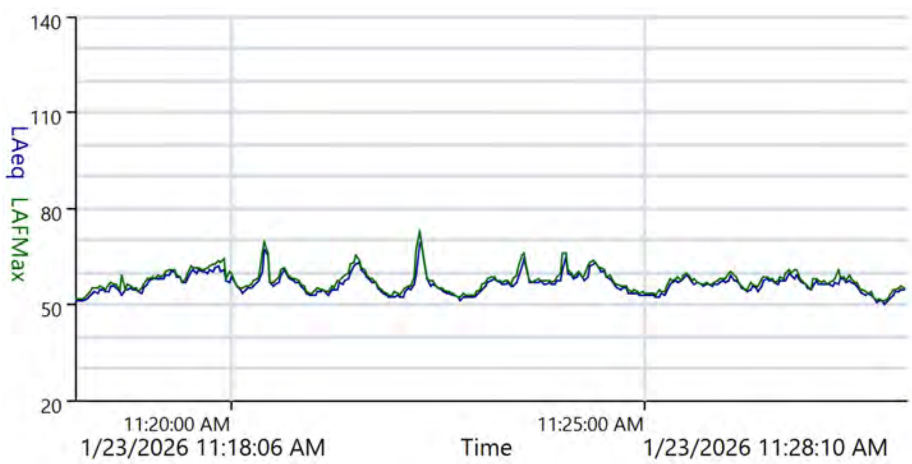
Name	61				
Time	1/23/2026 11:18:06 AM	**Person**	**Place**	**Project**	
Duration	00:10:04	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

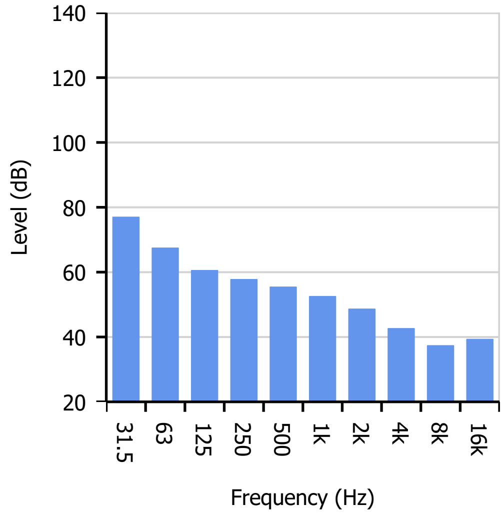
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	57.7 dB
LAE	85.5 dB
LAFMax	72.8 dB

Statistical Levels (Ln)	
LAS1	65.4 dB
LAS5	61.5 dB
LAS10	60.3 dB
LAS50	56.3 dB
LAS90	52.7 dB
LAS95	52.2 dB
LAS99	50.9 dB





Notes

Location 7: Fletcher st/village ln
11:19 am , 33F, 21 mph, 48% humidity, partly cloudy

ReportId

Measurement Summary Report

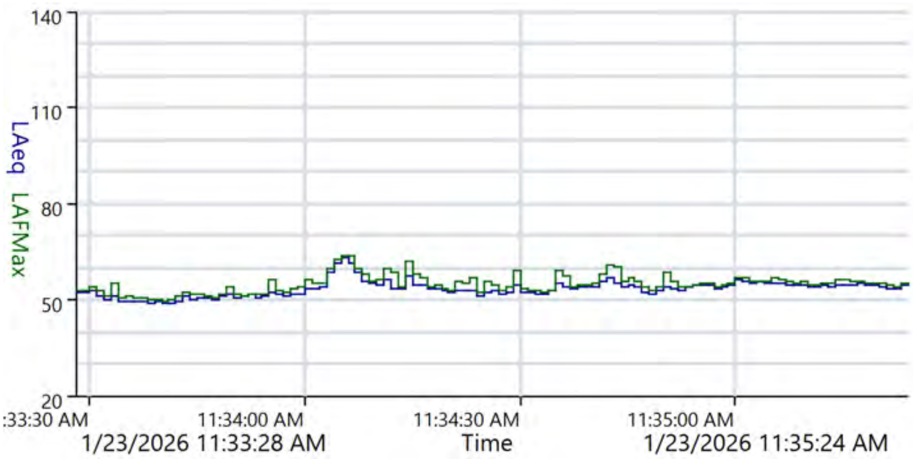
Name	62				
Time	1/23/2026 11:33:28 AM	**Person**	**Place**	**Project**	
Duration	00:01:56	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

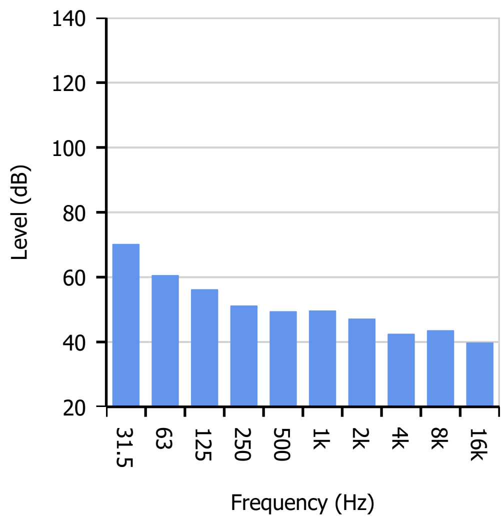
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	54.3 dB
LAE	74.9 dB
LAFMax	63.7 dB

Statistical Levels (Ln)	
LAS1	62.0 dB
LAS5	56.9 dB
LAS10	55.6 dB
LAS50	53.7 dB
LAS90	50.4 dB
LAS95	49.5 dB
LAS99	49.1 dB





Notes

Location 8: Willow st/village ln
11:34am, 33F, 22 mph, 48% humidity, partly cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

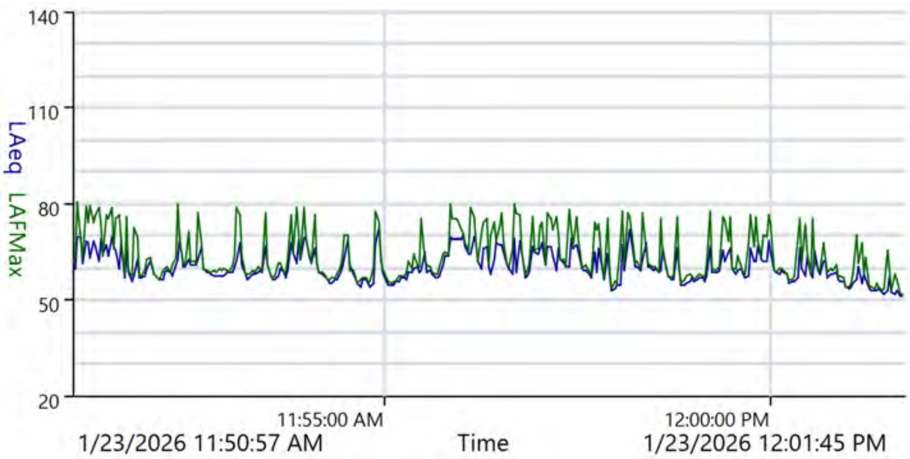
Name	63				
Time	1/23/2026 11:50:57 AM	**Person**	**Place**	**Project**	
Duration	00:10:48	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

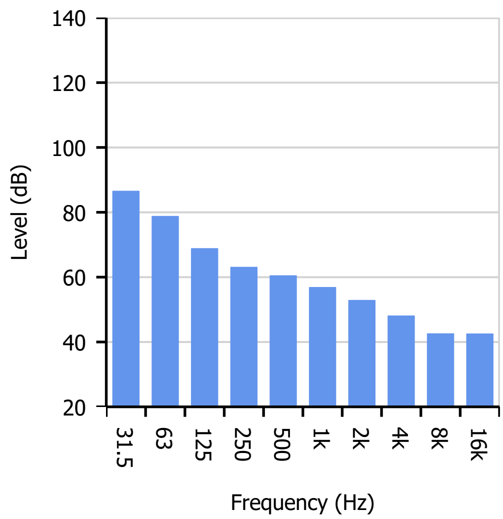
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	62.9 dB
LAE	91.0 dB
LAFMax	80.3 dB

Statistical Levels (Ln)	
LAS1	70.4 dB
LAS5	68.5 dB
LAS10	67.1 dB
LAS50	59.6 dB
LAS90	55.4 dB
LAS95	54.1 dB
LAS99	52.1 dB





Notes

Location 9: king street
11:52 am, 33F, 22mph, 48% humidity, sunny

ReportId

Measurement Summary Report

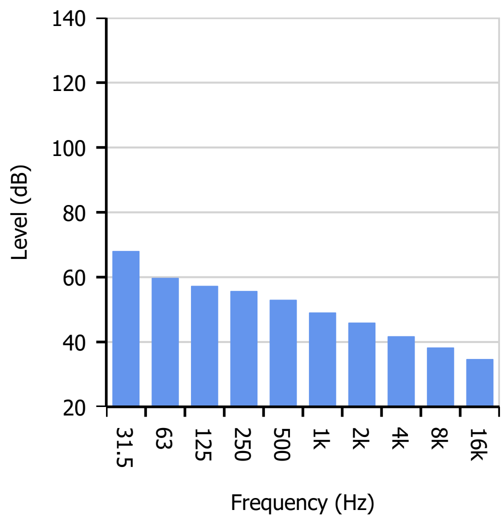
Name	64				
Time	1/23/2026 12:06:07 PM	**Person**		**Place**	**Project**
Duration	00:10:37	Valerie Facini			NPVSCW01
Instrument	G301840, CR:171A				

Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	54.8 dB
LAE	82.8 dB
LAFMax	68.8 dB

Statistical Levels (Ln)	
LAS1	62.1 dB
LAS5	58.1 dB
LAS10	57.1 dB
LAS50	53.7 dB
LAS90	50.3 dB
LAS95	49.6 dB
LAS99	48.8 dB



Notes

Location 10: Residential Navy Street
12:07 pm, 34F, 23 mph, 48% humidity, sunny

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

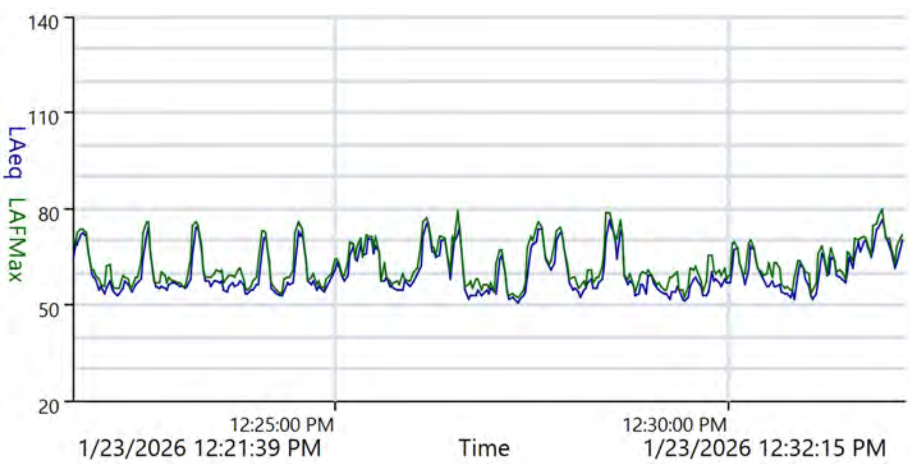
Name	65				
Time	1/23/2026 12:21:39 PM	**Person**	**Place**	**Project**	
Duration	00:10:36	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

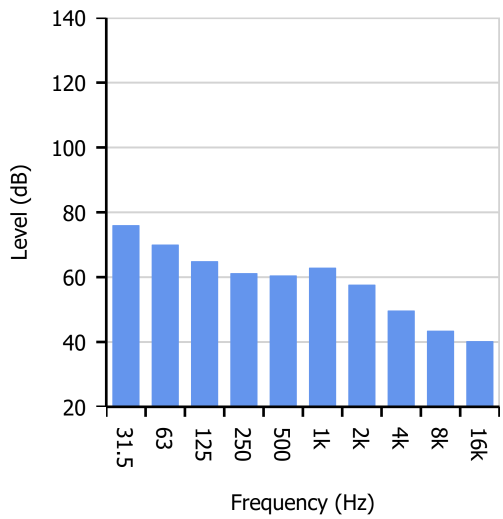
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	65.5 dB
LAE	93.5 dB
LAFMax	79.9 dB

Statistical Levels (Ln)	
LAS1	74.9 dB
LAS5	72.5 dB
LAS10	70.0 dB
LAS50	57.7 dB
LAS90	53.4 dB
LAS95	52.8 dB
LAS99	51.4 dB





Notes

Location 11: Oysterponds Elementary
12:23 pm, 34F, 24 mph, 48% sunny

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

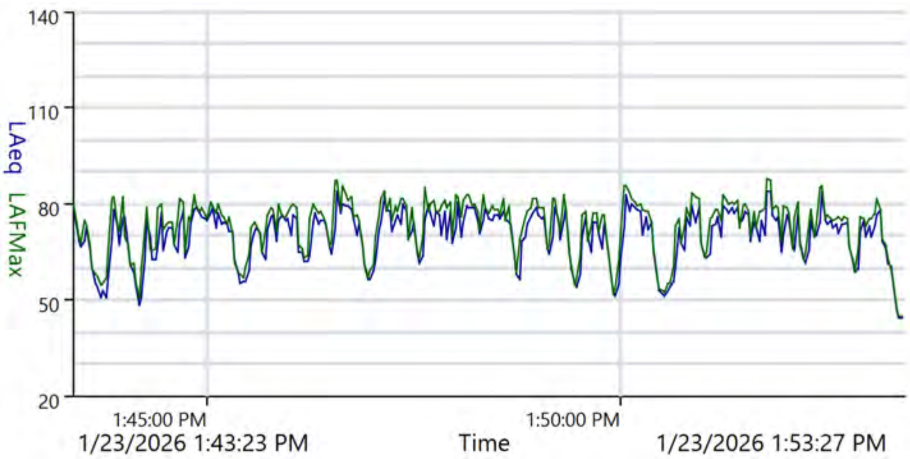
Name	66					
Time	1/23/2026 1:43:23 PM	**Person**		**Place**	**Project**	
Duration	00:10:04	Valerie Facini			NPVSCW01	
Instrument	G301840, CR:171A					

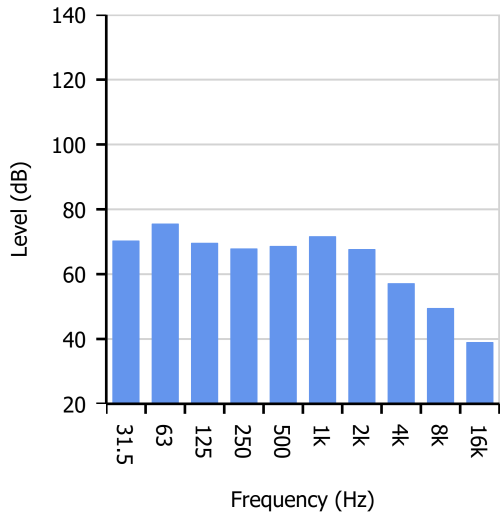
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	74.3 dB
LAE	102.1 dB
LAFMax	87.8 dB

Statistical Levels (Ln)	
LAS1	82.4 dB
LAS5	79.1 dB
LAS10	78.1 dB
LAS50	72.4 dB
LAS90	58.2 dB
LAS95	54.4 dB
LAS99	50.2 dB





Notes

Location 12: Residential on Main street by Herricks
1:44pm, 36F, 20 mph, 40% humidity, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

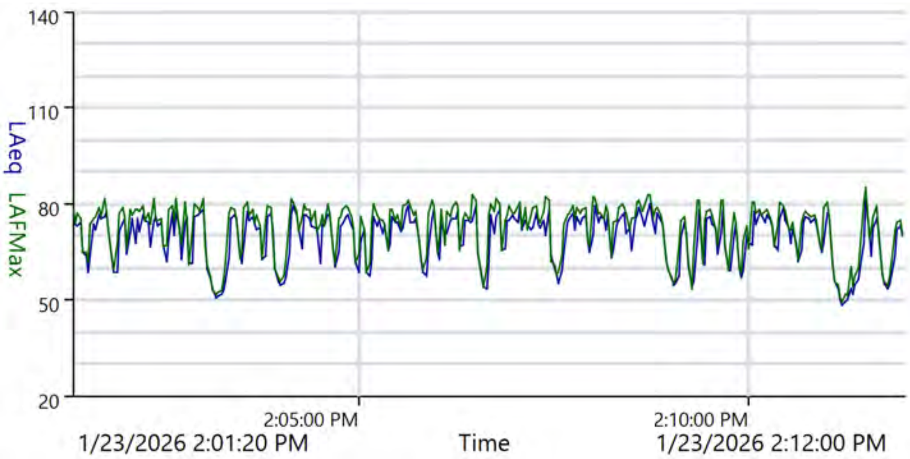
Name	67				
Time	1/23/2026 2:01:20 PM	**Person**	**Place**	**Project**	
Duration	00:10:40	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

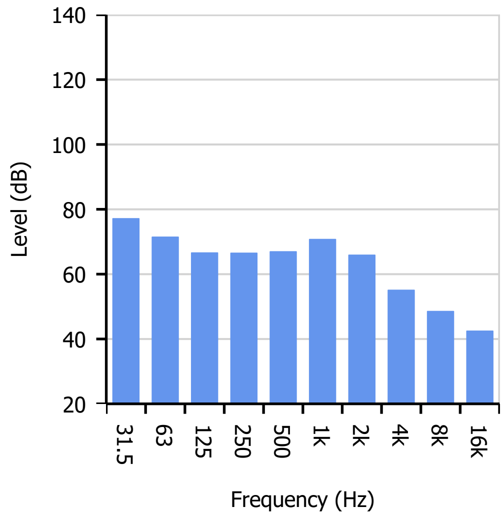
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	73.0 dB
LAE	101.1 dB
LAFMax	84.6 dB

Statistical Levels (Ln)	
LAS1	78.8 dB
LAS5	77.3 dB
LAS10	76.5 dB
LAS50	72.2 dB
LAS90	58.3 dB
LAS95	54.8 dB
LAS99	50.1 dB





Notes

Location 13: Main road and colonial
2:02 pm, 36F, 19mph, 40% humidity, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

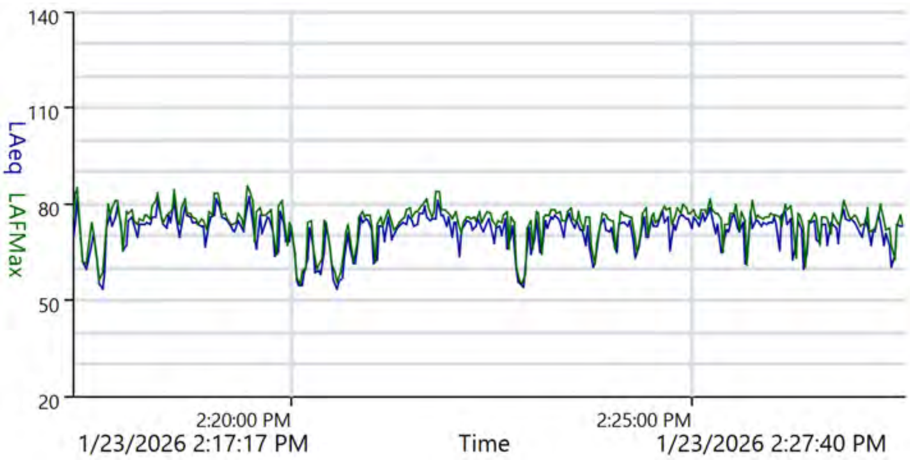
Name	68				
Time	1/23/2026 2:17:17 PM	**Person**		**Place**	**Project**
Duration	00:10:23	Valerie Facini			NPVSCW01
Instrument	G301840, CR:171A				

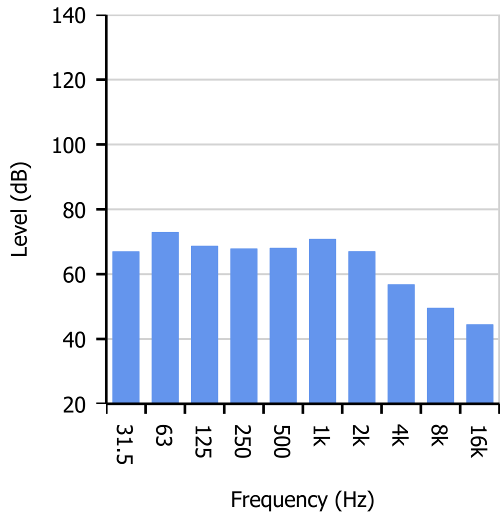
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	73.6 dB
LAE	101.5 dB
LAFMax	85.4 dB

Statistical Levels (Ln)	
LAS1	80.5 dB
LAS5	77.5 dB
LAS10	76.3 dB
LAS50	72.9 dB
LAS90	64.0 dB
LAS95	59.8 dB
LAS99	54.9 dB





Notes

Location 14: Kingdom Hall of Jehovahs Witness
2:18 pm, 36F, 19mph, 39% humidity, partly cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

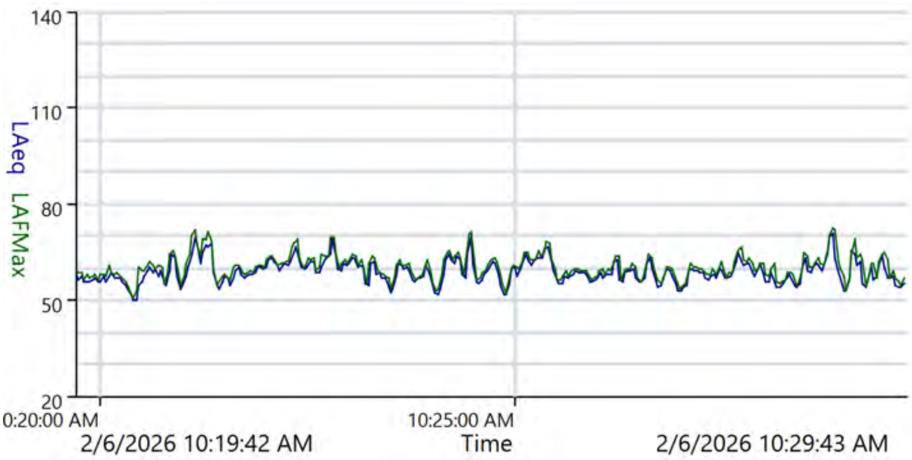
Name	70						
Time	2/6/2026 10:19:42 AM	**Person**		**Place**		**Project**	
Duration	00:10:02	Valerie Facini				NPVSCW01	
Instrument	G301840, CR:171A						

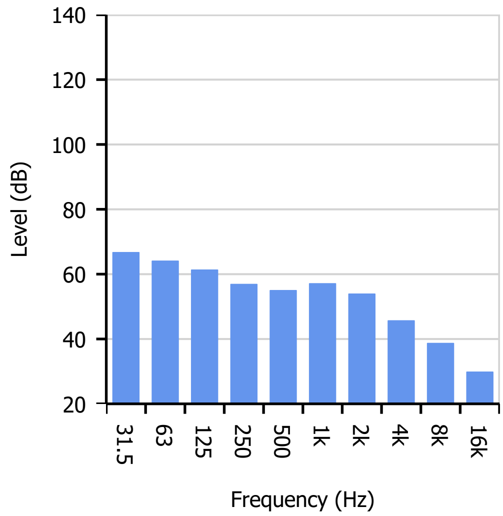
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	60.5 dB
LAE	88.3 dB
LAFMax	72.1 dB

Statistical Levels (Ln)	
LAS1	68.9 dB
LAS5	65.2 dB
LAS10	63.3 dB
LAS50	58.6 dB
LAS90	54.6 dB
LAS95	53.8 dB
LAS99	51.7 dB





Notes

Proposed Alternative Booster Station (Main road and cross river drive)
10:20 am, 26 F, 6 MPH, 69% humidity, partially cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

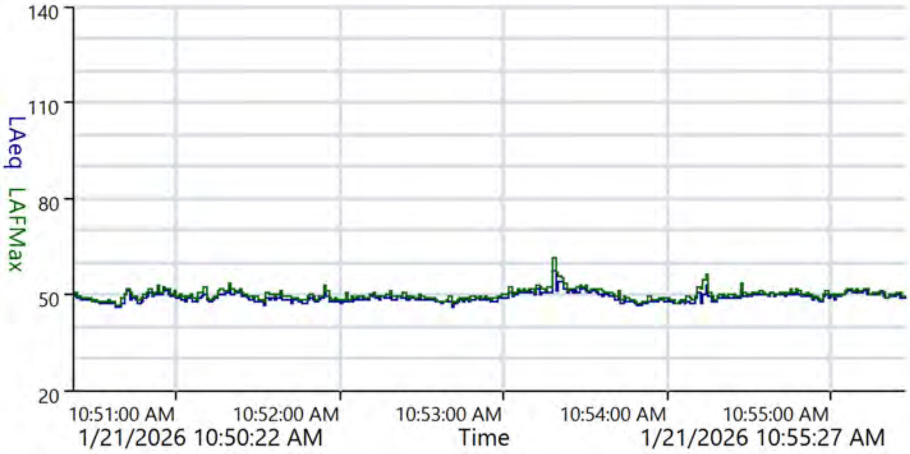
Name	246						
Time	1/21/2026 10:50:22 AM	**Person**	Valerie Facini	**Place**	Calverton	**Project**	
Duration	00:05:05		Valerie Facini		Calverton		NPVSCW01
Instrument	G304264, CR:171A						

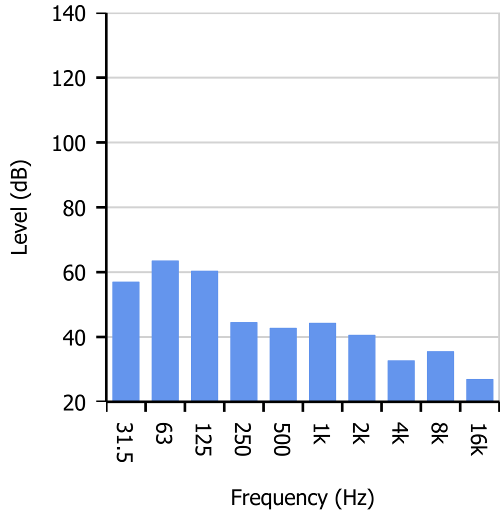
Calibration

Before Offset **After** Offset

Basic Values	
LAeq	49.3 dB
LAE	74.1 dB
LAFMax	61.4 dB

Statistical Levels (Ln)	
LAS1	54.2 dB
LAS5	51.1 dB
LAS10	50.8 dB
LAS50	48.9 dB
LAS90	47.5 dB
LAS95	47.2 dB
LAS99	46.6 dB





Notes

Booster Station (2 Pumps Operating)
Baiting Hallow
Sunny, 10:50 AM, 25F, 33% Humidity, 7 MPH wind

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

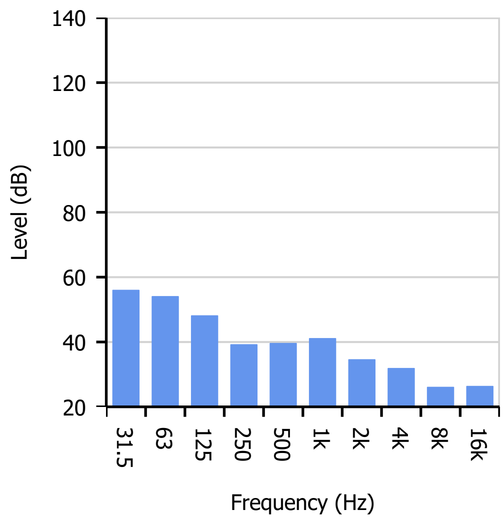
Name	245						
Time	1/21/2026 10:40:59 AM	**Person**		**Place**		**Project**	
Duration	00:05:02	Valerie Facini		Calverton		NPVSCW01	
Instrument	G304264, CR:171A						

Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	44.1 dB
LAE	68.9 dB
LAFMax	55.3 dB

Statistical Levels (Ln)	
LAS1	52.2 dB
LAS5	47.3 dB
LAS10	46.3 dB
LAS50	43.6 dB
LAS90	40.0 dB
LAS95	38.1 dB
LAS99	36.3 dB



Notes

Booster Station (Ambeint)
Baiting Hallow
Sunny, 10:41 AM, 23F, 5 MPH winds, 39% Humidity

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

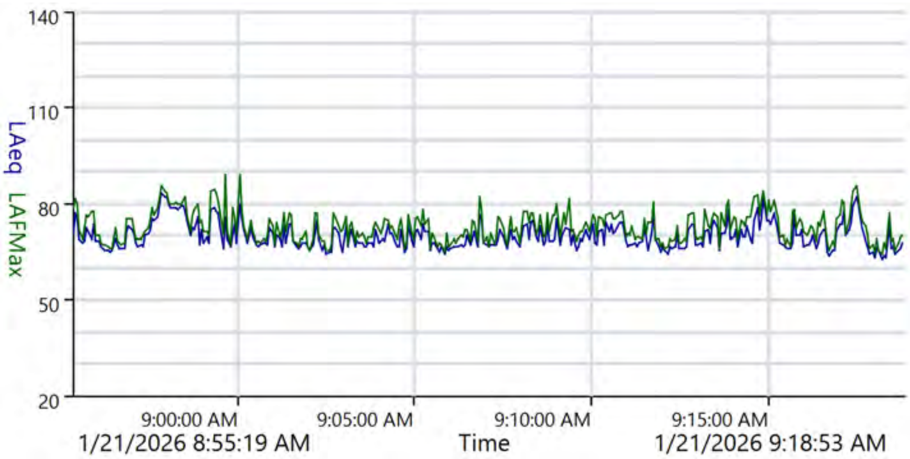
Name	50						
Time	1/21/2026 8:55:19 AM	**Person**		**Place**		**Project**	
Duration	00:23:34	Valerie Facini		Calverton		NPVSCW01	
Instrument	G301840, CR:171A						

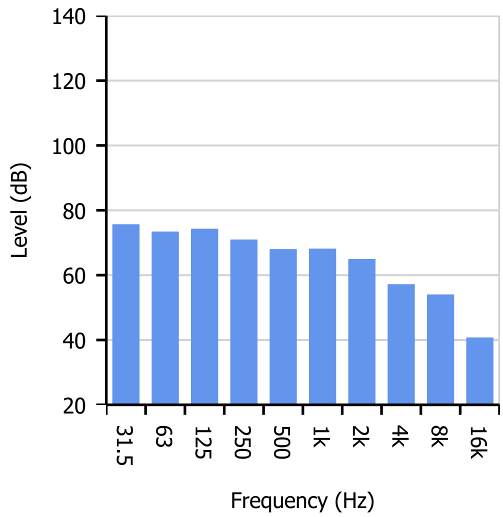
Calibration

Before	1/13/2026 7:06 AM	Offset	0.37 dB	**After**		Offset

Basic Values	
LAeq	72.1 dB
LAE	103.6 dB
LAFMax	88.7 dB

Statistical Levels (Ln)	
LAS1	81.4 dB
LAS5	78.3 dB
LAS10	75.4 dB
LAS50	68.5 dB
LAS90	65.5 dB
LAS95	64.8 dB
LAS99	63.4 dB





Notes

Corner of Nugent/Pinehurst (Set up phase)
8:56 am, 18 F, 11 MPH, Sunny

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

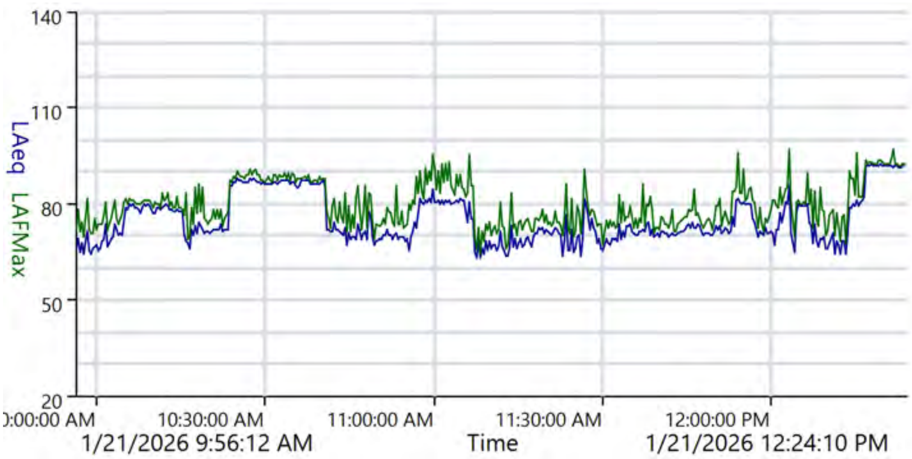
Name	52						
Time	1/21/2026 9:56:12 AM	**Person**		**Place**		**Project**	
Duration	02:27:58	Valerie Facini		Calverton		NPVSCW01	
Instrument	G301840, CR:171A						

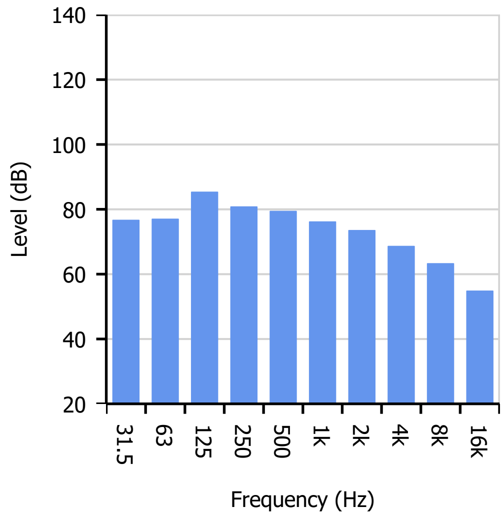
Calibration

Before	1/13/2026 7:06 AM	Offset	0.37 dB	**After**		Offset

Basic Values	
LAeq	81.8 dB
LAE	121.3 dB
LAFMax	96.8 dB

Statistical Levels (Ln)	
LAS1	91.8 dB
LAS5	88.9 dB
LAS10	86.6 dB
LAS50	71.5 dB
LAS90	65.3 dB
LAS95	63.9 dB
LAS99	62.9 dB





Notes

Corner Nugent/Pinehurst
9:57 AM, 21F, Sunny, 5MPH, 41% Humidity

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

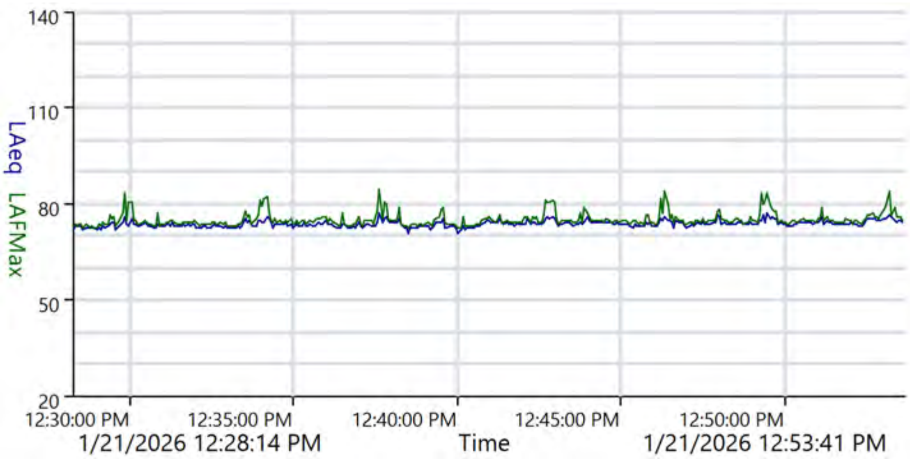
Name	53						
Time	1/21/2026 12:28:14 PM	**Person**		**Place**		**Project**	
Duration	00:25:27	Valerie Facini		Calverton		NPVSCW01	
Instrument	G301840, CR:171A						

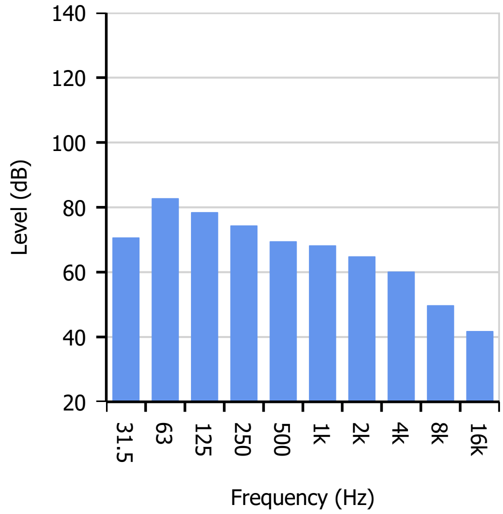
Calibration

Before	1/13/2026 7:06 AM	Offset	0.37 dB	**After**		Offset

Basic Values	
LAeq	73.6 dB
LAE	105.4 dB
LAFMax	84.2 dB

Statistical Levels (Ln)	
LAS1	76.5 dB
LAS5	75.3 dB
LAS10	74.7 dB
LAS50	73.4 dB
LAS90	72.3 dB
LAS95	72.1 dB
LAS99	71.3 dB





Notes
Nugent and Pine opposite side
20F, 8MPH, 42% Humidity, 12:29PM

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Summary Report

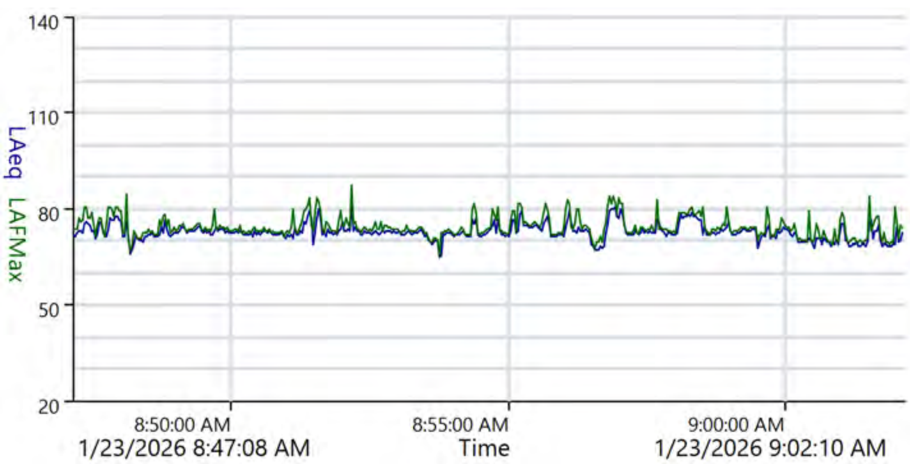
Name	54				
Time	1/23/2026 8:47:08 AM	**Person**	**Place**	**Project**	
Duration	00:15:02	Valerie Facini		NPVSCW01	
Instrument	G301840, CR:171A				

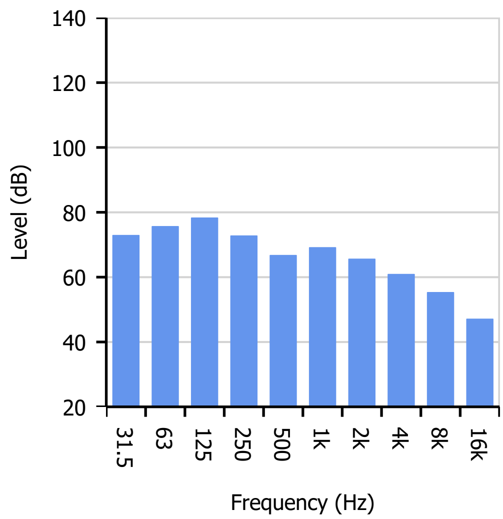
Calibration

Before	Offset	**After**	Offset

Basic Values	
LAeq	73.3 dB
LAE	102.9 dB
LAFMax	87.2 dB

Statistical Levels (Ln)	
LAS1	79.2 dB
LAS5	77.4 dB
LAS10	76.0 dB
LAS50	72.3 dB
LAS90	69.3 dB
LAS95	68.5 dB
LAS99	67.2 dB





Notes

Trenching
50 Ft away
8:48 am, 31F, 12mph winds, 55% humidity, cloudy

ReportId

Cirrus Research plc

B. LAING ASSOCIATES

Measurement Time History Report

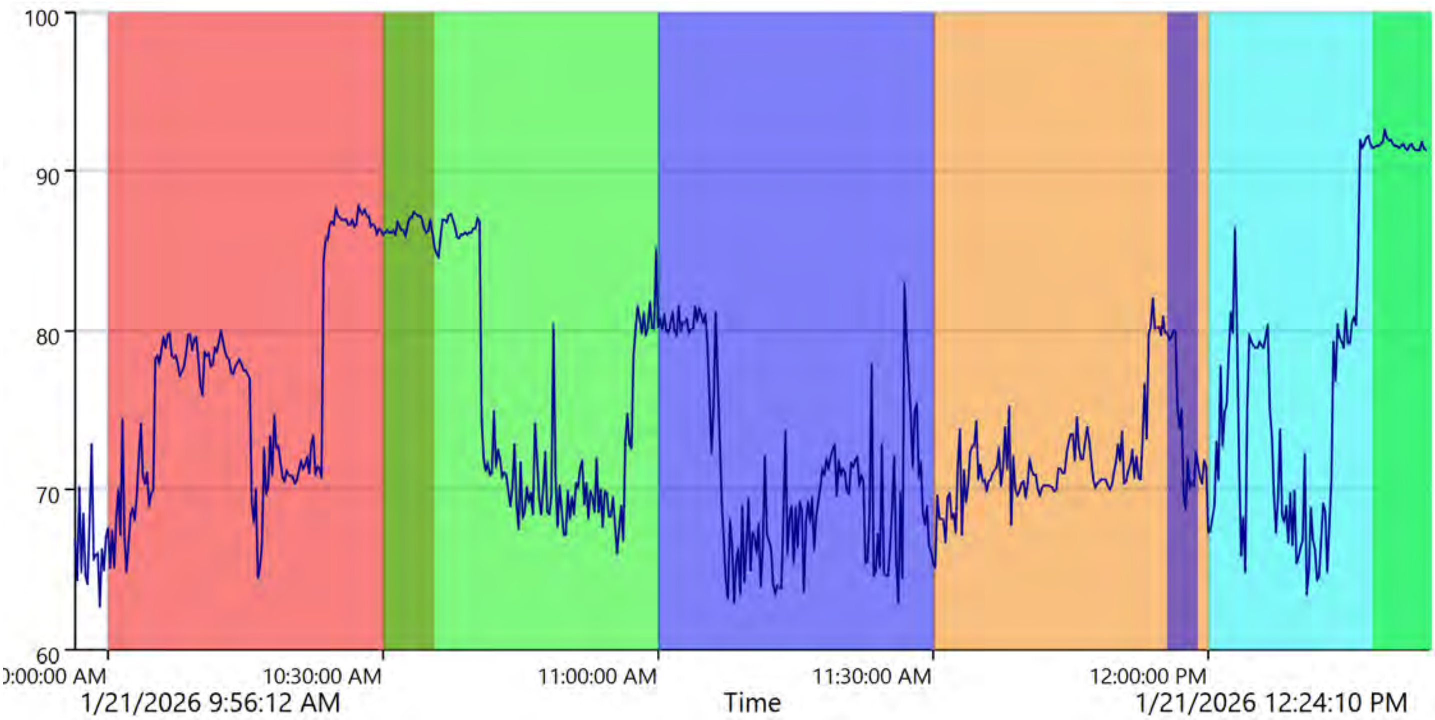
Name	52						
Time	1/21/2026 9:56:12 AM	**Person**		**Place**		**Project**	
Duration	02:27:58	Valerie Facini		Calverton		NPVSCW01	
Instrument	G301840, CR:171A						

Calibration

Before	1/13/2026 7:06 AM	Offset	0.37 dB	**After**		Offset

Period 1/21/2026 9:56:12 AM - 1/21/2026 12:24:10 PM

Legend	LAeq
Value	81.8 dB



These values have been recalculated due to the large number of samples displayed.

ReportId

10-10:30

	Start Time	End Time	LAeq (dB)
	1/21/2026 10:00:00 AM	1/21/2026 10:30:00 AM	81.2
		Total	81.2

Total Duration	00:30:00
Count	1

Drill

	Start Time	End Time	LAeq (dB)
	1/21/2026 10:30:00 AM	1/21/2026 10:35:23 AM	86.6
		Total	86.6

Total Duration	00:05:23
Count	1

10:30-11

	Start Time	End Time	LAeq (dB)
	1/21/2026 10:30:00 AM	1/21/2026 11:00:00 AM	82.4
		Total	82.4

Total Duration	00:30:00
Count	1

11-11:30

	Start Time	End Time	LAeq (dB)
	1/21/2026 11:00:00 AM	1/21/2026 11:30:00 AM	75.2
		Total	75.2

Total Duration	00:30:00
Count	1

11:30-12

	Start Time	End Time	LAeq (dB)

	1/21/2026 11:30:00 AM	1/21/2026 12:00:00 PM	73.6
		Total	73.6

Total Duration	00:30:00
Count	1

CAT

	Start Time	End Time	LAeq (dB)
	1/21/2026 11:55:36 AM	1/21/2026 11:58:38 AM	76.9
		Total	76.9

Total Duration	00:03:02
Count	1

12-12:30

	Start Time	End Time	LAeq (dB)
	1/21/2026 12:00:00 PM	1/21/2026 12:24:10 PM	86.8
		Total	86.8

Total Duration	00:24:10
Count	1

McVAC

	Start Time	End Time	LAeq (dB)
	1/21/2026 12:18:00 PM	1/21/2026 12:24:10 PM	91.6
		Total	91.6

Total Duration	00:06:10
Count	1

All Markers

	LAeq (dB)
Remainder	67.2
Total	81.9

Notes

Corner Nugent/Pinehurst
9:57 AM, 21F, Sunny, 5MPH, 41% Humidity

ReportId

APPENDIX B
SITE PHOTOGRAPHS

Photo 1: Showing the northern intersection of Nugent Drive and Pinehurst Boulevard looking south (1/21/26).


Photo 2: Showing the northern corner of Nugent Drive and Pinehurst Boulevard prior to directional drilling (1/21/26).

Photo 3: Showing active construction activities on the northern corner of Nugent Drive and Pinehurst Boulevard (1/21/26).

Photo 4: Noise monitoring on the southern corner of Nugent Drive and Pinehurst Boulevard during directional drilling (1/21/26).

Photo 5: Demonstrating the noise monitoring at Sample Location 14 along Main Road. (1/23/26)

Photo 6: Showing B. Laing Associates personnel collecting reference sound level data at the existing booster station in Laurel NY for ambient analysis. (1/21/26)

Photo 7: Active trenching occurring for a separate project, used to acquire noise data for the analysis of this report (1/23/26).

Photo 8: Active trenching occurring for a separate project, used to acquire noise data for the analysis of this report (1/23/26).

APPENDIX C

NOISETOOLS© REPORT

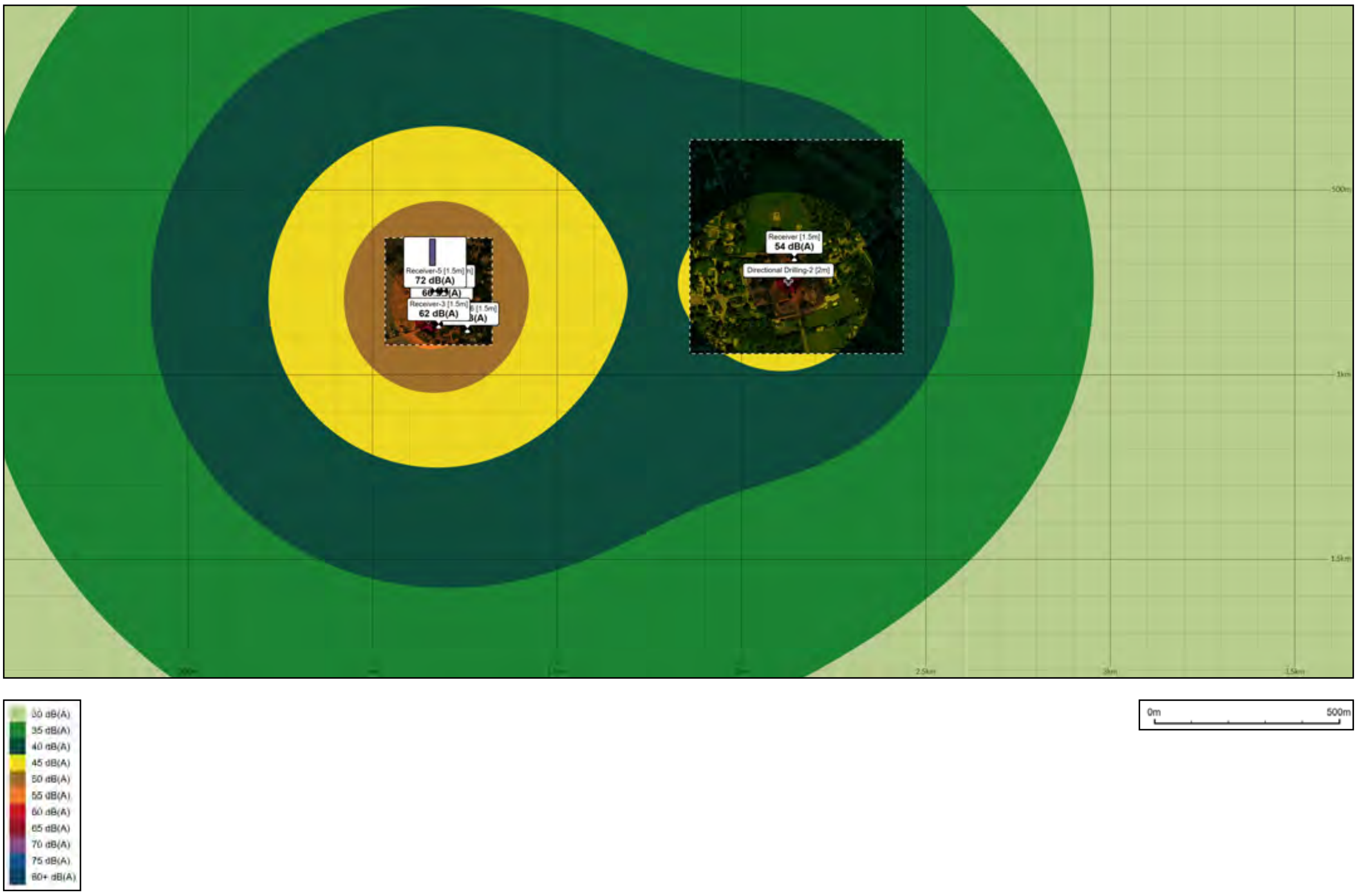
dBmap.net

Noise Mapping Results

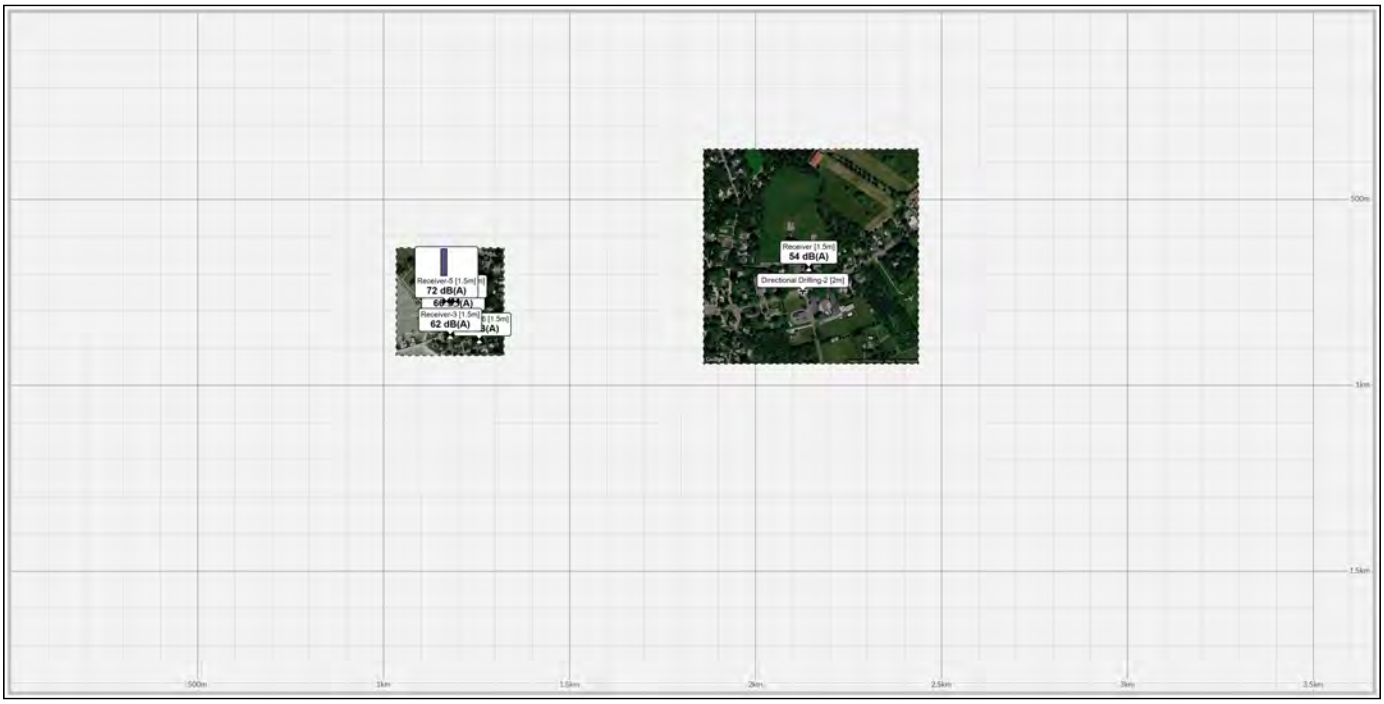
Report

March 2, 2026

Noise Map - Noise map height 1.5m (A-weighted)



Model Overview



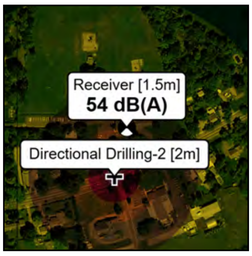
Receiver Results - Summary

Receiver Name	Height (m)	Total dB(A)	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Receiver	1.5	54				54				
Receiver-2	1.5	66				66				
Receiver-3	1.5	62				62				
Receiver-4	1.5	67				67				
Receiver-5	1.5	72				72				
Receiver-6	1.5	55				55				

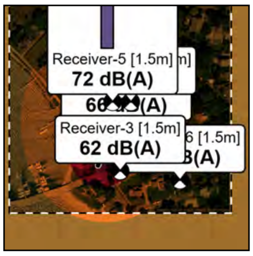
Sources

Source Name	Height (m)	Total dB	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Directional Drilling-2	2	102				102				
Line	2	108				108				

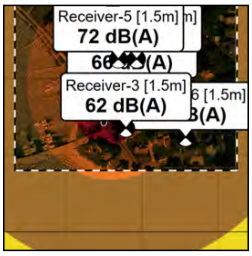
Receiver Locations



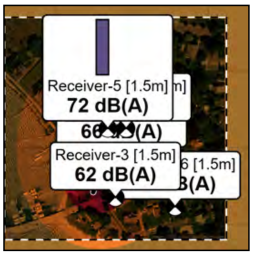
Receiver



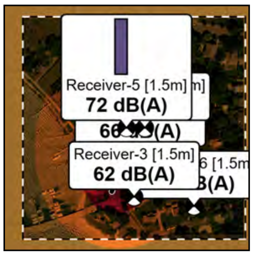
Receiver-2



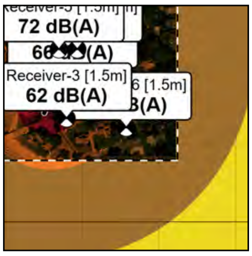
Receiver-3



Receiver-4

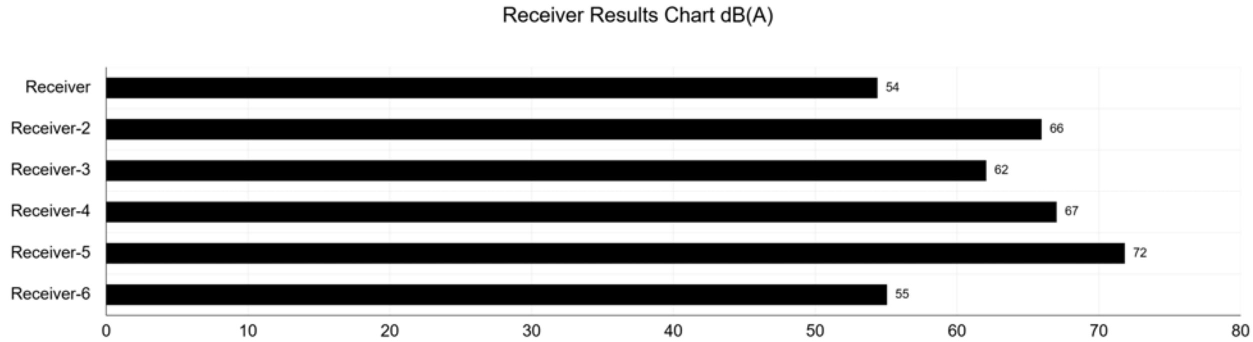


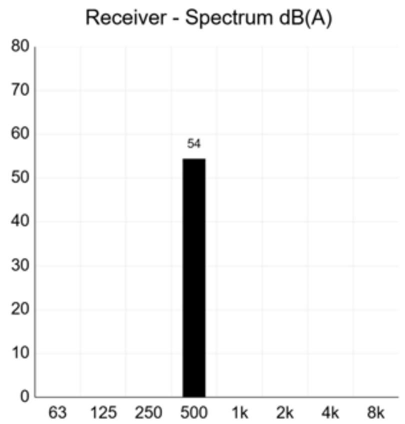
Receiver-5

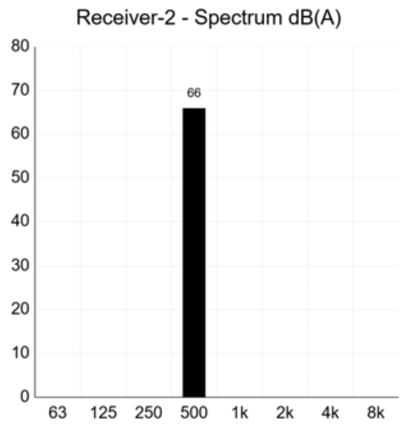


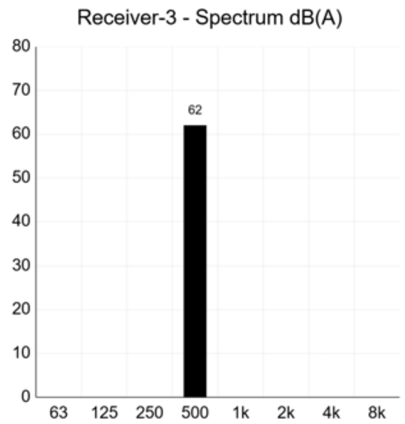
Receiver-6

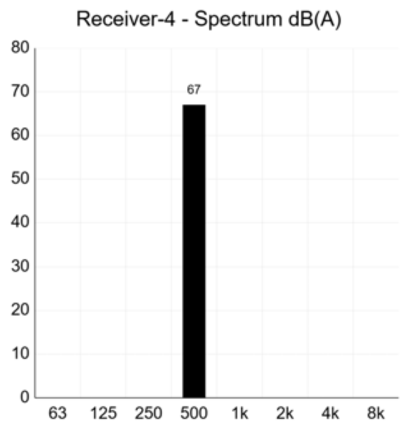
Receiver Charts

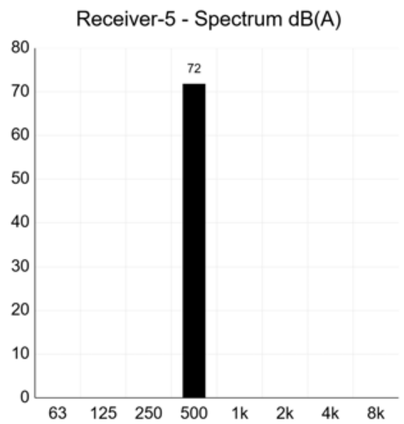


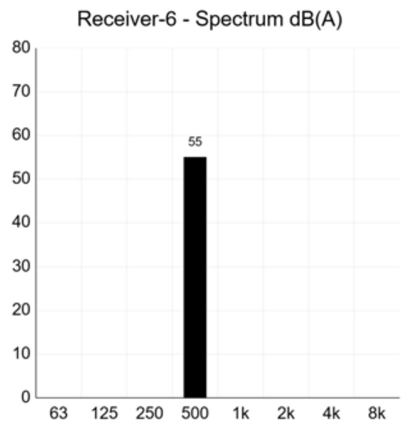




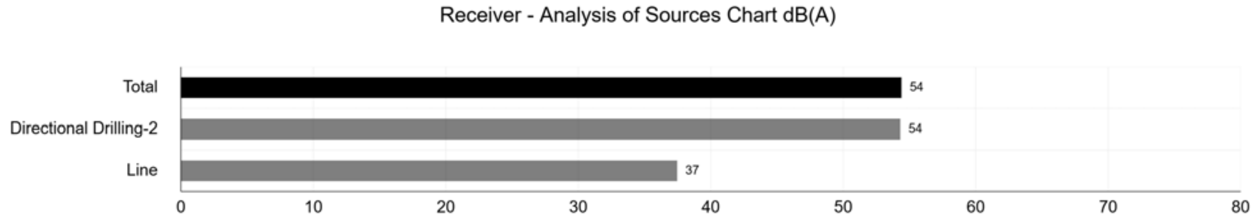


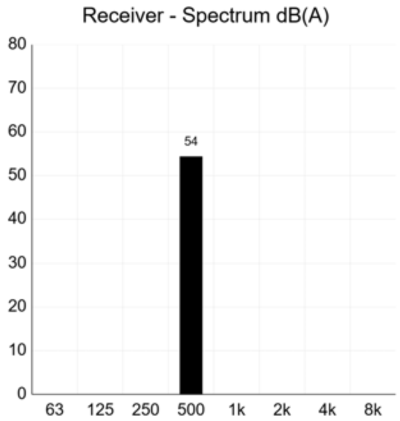




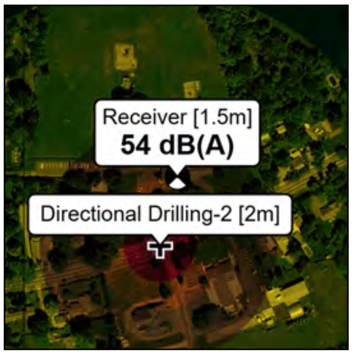


Receiver



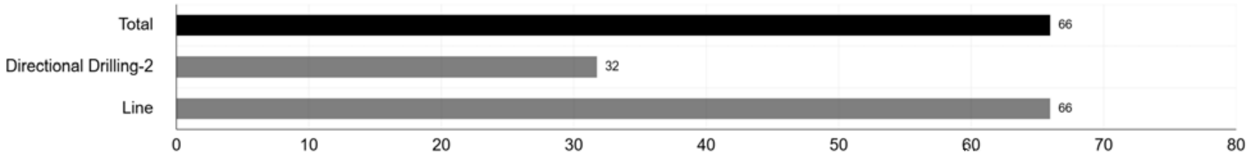


Location

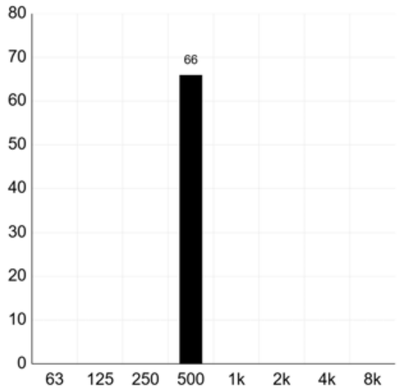


Receiver-2

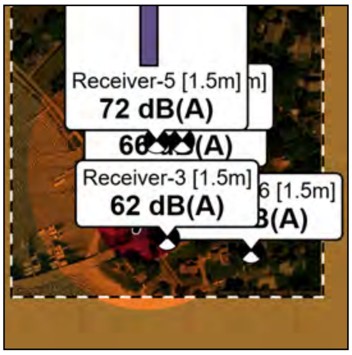
Receiver-2 - Analysis of Sources Chart dB(A)



Receiver-2 - Spectrum dB(A)

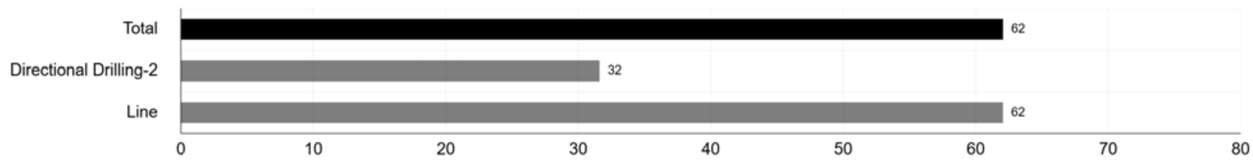


Location

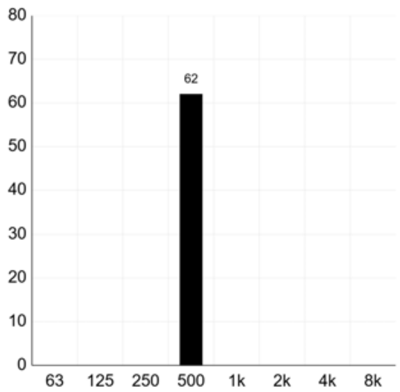


Receiver-3

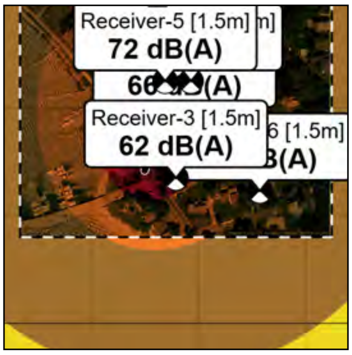
Receiver-3 - Analysis of Sources Chart dB(A)



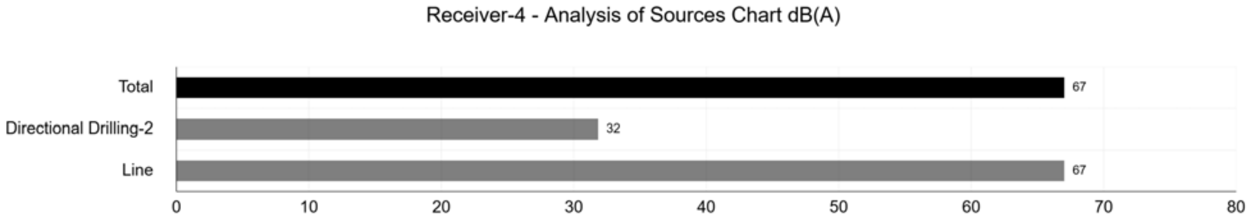
Receiver-3 - Spectrum dB(A)

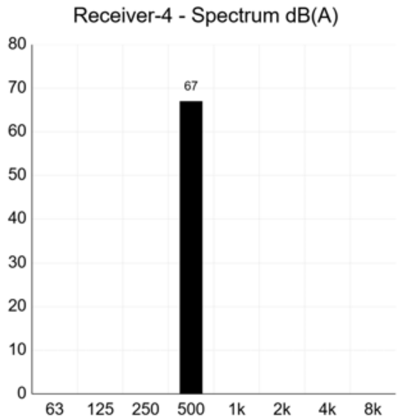


Location

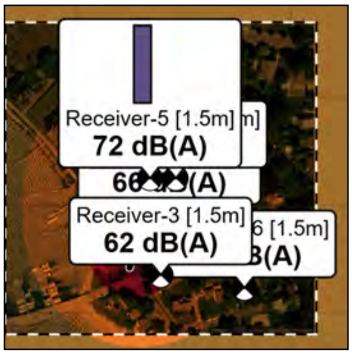


Receiver-4

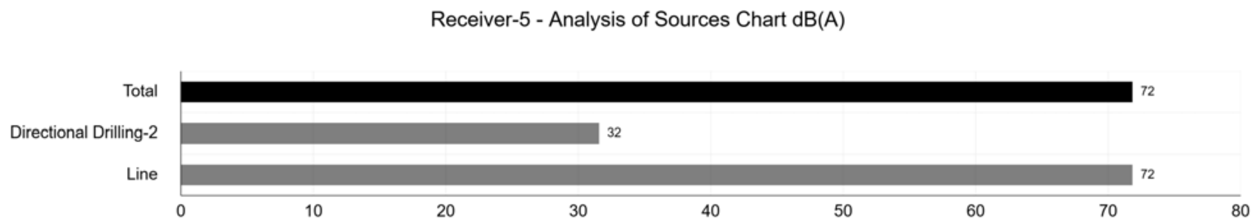


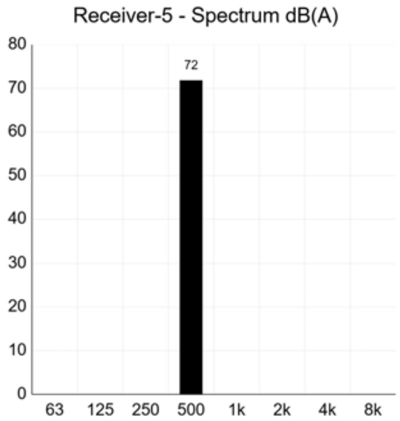


Location

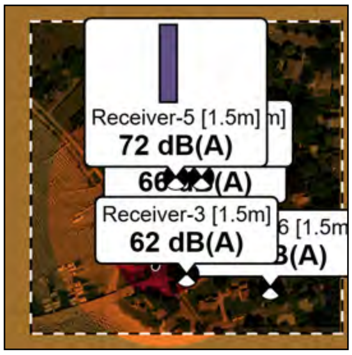


Receiver-5

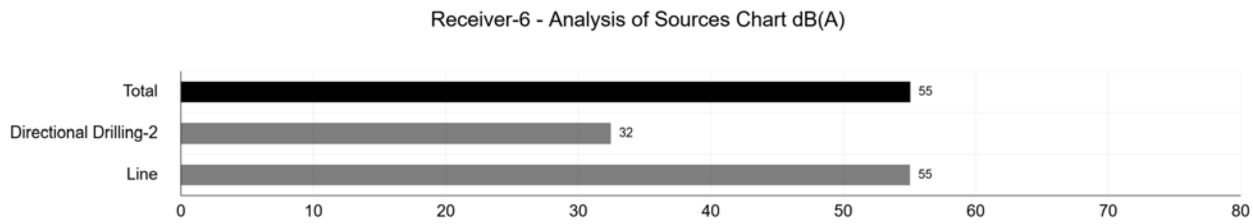


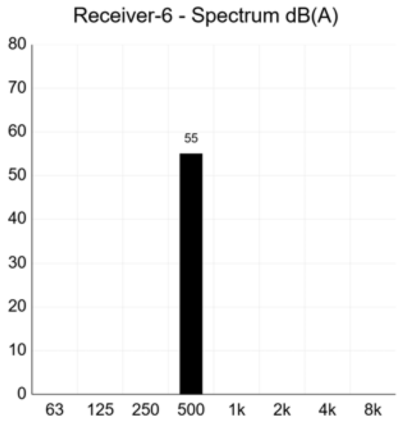


Location

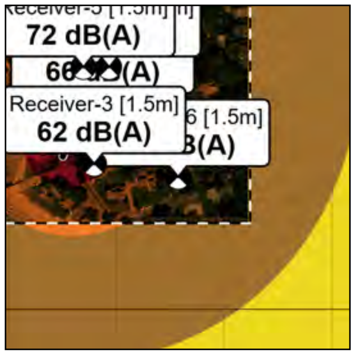


Receiver-6





Location



Configuration

Calculation Method ISO96132:2024 (New)
Hard Ground (Ground Factor = 0)
15.0°C Temperature
70% Humidity
Results are A-weighted
Results are rounded to 0 decimal places
Second order reflections are included
Reflections are only considered at a distance of 1m or greater from a reflector (facade level)
ISO9613-2 barrier attenuation limit (20/25dB) is enabled
Vertical edges (lateral paths) are included
Limited to convex paths
Limited in distance (ISO17534-3 recommendation)
Ground reflections are not screened (ISO17534-3 recommendation)

References

ISO 9613-1:1993 — Attenuation of sound during propagation outdoors — Part 1: Calculation of the absorption of sound by the atmosphere

ISO 9613-2:2024 — Attenuation of sound during propagation outdoors — Part 2: Engineering method for the prediction of sound pressure levels outdoors

ISO/TR 17534-3:2015 — Acoustics — Software for the calculation of sound outdoors — Part 3: Recommendations for quality assured implementation of ISO 9613-2 in software according to ISO 17534-1. Quality Assurance and Test Cases: https://dbmap.net/iso17534results

APPENDIX D

Common Sound Terminology

Common Sound Level Terms:

Source: Handbook of Acoustical Measurements and Noise Control

Acoustics (1) The science of sound, including its production, transmission, reception, and effects. (2) Of a room, those qualities that together determine the room character with respect to human auditory perception.

Ambient noise The all-encompassing noise associated with a given environment at a specified time, being usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.

A-weighted sound level The sound level obtained by use of A-weighting. Unit decibel. Unit symbol: dB. Often, the unit symbol is followed by the letter A in parentheses, i.e., dB(A), to indicate that A-weighting has been used.

Day-evening-night average sound pressure The square root of the quotient of the day-evening-night sound exposure divided by 86,400 seconds (i.e., the number of seconds in a day). Unit: pascal. Unit symbol: Pa.

Day-night average sound level Ten times the common logarithm (i.e., to the base of 10) of the square of the ratio of the day-night average sound pressure to the reference sound pressure of 20 micropascals (μPa). Unit: decibel. Unit symbol: dB. Abbr.: DNL. Letter symbol: Ldn.

Decibel A unit of level which denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base of 10) of this ratio. In many sound fields, the sound pressure ratios are not proportional to the corresponding power ratios, but it is common practice to extend the use of the unit to such cases. Once decibel is 0ne-tenth of a bel. Unti symbol: dB

Frequency (1) Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second). (2) The reciprocal of the period. Unit: hertz. Unit symbol: hz.

Impulse The time integral of a force over the time interval during which the force is applied.

Inverse square law In the far field of a source, under free-field conditions, the sound intensity varies inversely with the square of the distance from the source; this results in a decrease in sound pressure level of 6 dB for each doubling of distance from the source.

Leq/equivalent continuous sound level (average sound level) The level of steady sound which, in a stated time period at a stated location, has the same A-weighted sound energy as the time-varying sound. Unit: decibel. Unit symbol: dB. Abbr.: QL. Letter symbol: Leq.

Maximum A-weighted sound level The greatest sound level measured on a sound level meter, during a designated time interval or event, using fast time-averaging and A-weighting. Unit: decibel. Unit symbol: dB. Abbr.:MXLA. Letter symbol $L_{^max}$.

Noise (1) Any disagreeable or undesired sound or other disturbance; unwanted sound. By extension, any unwanted disturbance within a useful frequency band, such as undesired electric waves in a transmission channel or device. (2) Sound of a general random nature, the spectrum of which does not exhibit clearly defined frequency components.

Octave The frequency interval between two sounds whose frequency ratio is 2.

Octave-band sound pressure level (octave-band sound level or octave-band level) For an octave frequency band, the sound pressure level of the sound contained within that band. Unit: decibel. Unit symbol: dB. Abbr.: OBSPL. Letter symbol: L1/1.

Percentile level For a stated duration of total measurement period, the sound level or time-average sound level that is exceeded for x percent of the total measurement period. Unless otherwise state, A-weighting is understood. If sound level is used, then the time-weighting should be specified; if time-average sound level is used, then the measurement period for each sample should be specified. Unit: decibel. Unit symbol: dB.

Receiver A person (or persons) or equipment which is affected by noise.

Reflected sound Sound that persists in an enclosed space as a result of repeated reflections or scattering; it does not include sound which travels directly from the source without reflections.

Sound (1) A physical disturbance in a medium (e.g. air) that is capable of being detected by the human ear. (2) The hearing sensation excited by a physical disturbance in a medium.

Sound level meter An instrument that is used for the measurement of sound level, with a standard frequency-weighting and standard exponentially weighted time-averaging. Abbr.: SLM.

Sound pressure level In air, 20 times the logarithm (to the base of 10) of the given sound pressure to the reference sound pressure of 20 micropascals (μPa). Unit: decibel. Unit symbol: dB. Abbr.: SPL. Letter symbol: Lp.

Transmission loss Of a partition, for a specified frequency band, the difference between the average sound pressure levels in the reverberant source room and receiving room (expressed in decibels) plus 10 times the logarithm to the base 10 of the ratio of the area of the common partition to the toal Sabine absorption in the receiving room. Abbr.: TL.

Weighting A prescribed frequency response provided in a sound level meter.

X-percentile-exceeded sound level The fast A-weighted sound level equaled or exceeded by a fluctuating sound level x percent of a stated time period. For example, the letter symbol L10 represents that sound level which is exceeded 10 percent of the stated time period.