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Subject: Town of New Canaan
New Canaan YMCA Microgrid
Airborne Noise Test
At 564 South Avenue

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Summary

This document makes a positive acoustic assessment that should assist in meeting any acoustic noise concerns during the operation of the Battery Energy Storage System (BESS) and Combined Heat and Power (CHP) generator at the New Canaan YMCA at 564 South Avenue in New Canaan CT. An acoustic assessment plan was developed and executed to acquire airborne acoustic information useful in explaining and mitigating the potential airborne noise issues associated with operation of the new BESS & CHP System. It is important to show that the airborne noise generated by the BESS & CHP System will not significantly impact any of the facility's neighbors.

The airborne noise levels generated by the BESS & CHP System operating at the New Canaan site were measured on November 19 and 20, 2025. Both the CHP and BESS were operated simultaneously. During the daylight hours on November 19 the System plus background noise produced an overall average airborne noise level that varied from 48.5 to 52.3 dBA (reference 20 microPascals) along Putnam Road. During the evening hours on November 20 the System plus background noise produced an overall average airborne noise level that varied from 43.5 to 45.7 dBA along Putnam Road. Airborne noise levels with the System operating were measured at distances from 2 to 117 meters from the Sytem location at the New Canaan YMCA. The airborne noise levels at nearby property lines on Putnam Road were measured during six different background and System events at levels from 43 to 57 dBA. The measurement locations on Putnam Road were influenced by vehicle traffic and YMCA fans. Analysis of the System data indicated propagation losses from 8.4 to 10.8 dB from the System P9 location to the nearby residential property lines. The airborne noise level dropped 6.9 dB between P8 and P9 meaning the 5-meter noise level decreased at least 15 dB to Putnam Road.

The measured and estimated airborne noise from the System at all of the nearby residential property lines on Putnam Road are below both the day and night time residential noise limits. (The day time measured background corrected airborne noise levels with a higher traffic background are below 52 dBA with the CHP System on meeting the 55 dBA day time limit.) All of the nearby residential property lines on Putnam Road are below the night time noise limit of 45 dBA when the background noise at P7 is removed. The November 19 day time noise produced only by the System was calculated by background correcting the combined levels with the background only noise measured on November 19. No acoustic issues are expected during operation of the System.

The State of Connecticut's Noise Code (Ref. 1) and New Canaan's Noise Ordinance (Ref. 2) calls for review of acoustic issues associated with impulse noise. Operation of the BESS & CHP System meets all of these impulse noise requirements at all of the nearby properties. The CT Noise Code calls for review of acoustic issues associated with prominent discrete tones, infrasonic and ultrasonic noise. Operation of the System meets all of these discrete tone, infrasonic and ultrasonic noise requirements at all of the nearby properties. Two rotational frequency tones at 75 and 77 Hertz were found in the 80 Hertz one-third octave band but do **not** implement a 5 dB reduction in the CT overall noise requirements. Operation of the System meets all of these CT noise requirements at all of the nearby properties. **No acoustic issues** are expected during operation of the System.

Introduction

Acoustic Technology LLC was tasked as part of a commissioning study with an assessment of potential acoustic issues associated with Battery Energy Storage System (BESS) and Combined Heat and Power System (CHP) airborne noise reaching the properties adjacent to the New Canaan YMCA site at 564 South Avenue in New Canaan, CT. Responding to a request from John Rheaume (Kinsley Energy Systems), site visits were made on November 19 and 20, 2025. During the visits, surveys of the airborne noise levels produced by the Kinsley Energy System were made in order to identify any potential airborne noise issues. Airborne noise measurements were taken during the day and night time hours to quantify the propagation of the System airborne noise to the adjacent properties. This document provides an acoustic assessment to demonstrate that the System meets its acoustic requirements and does not generate any noise concerns during its operation at 564 South Avenue in New Canaan, CT. A description of the site is shown in Figure 1. The Kinsley Energy System is located next to the gas valves shown in Figure 2 below.

Figure 1. Kinsley Energy CHP Information

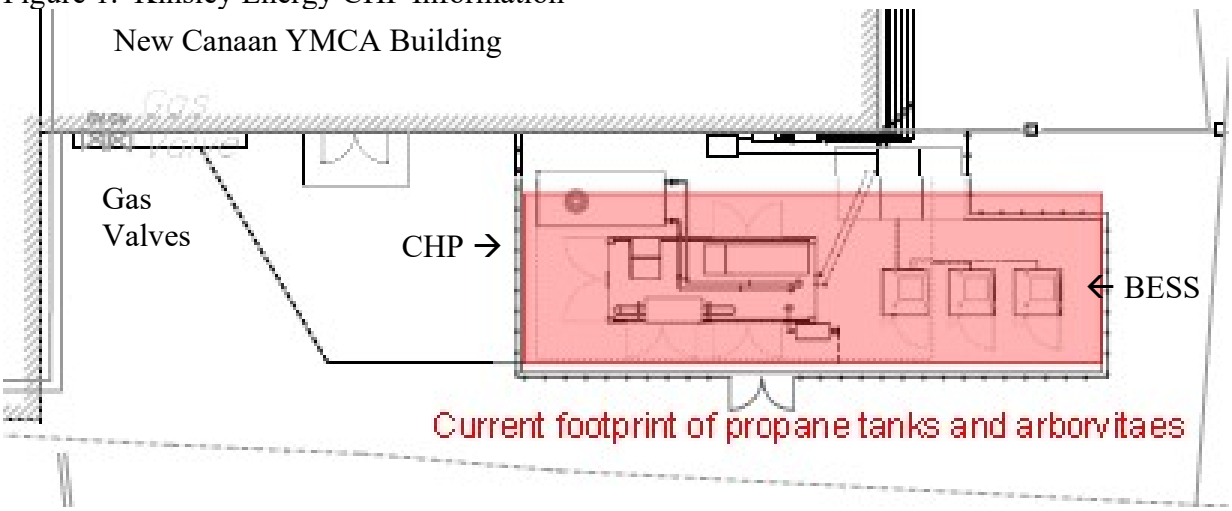


Figure 2. Photo Showing the Natural Gas Valves

Table 3 below shows that the System noise level is 8.6 dB higher at 5 meters than the gas valves at 2 meters or roughly 16 dB higher at the same distance.

Figure 3 below shows the noise mitigation placed on the chain link fence facing the Putnam Road direction.

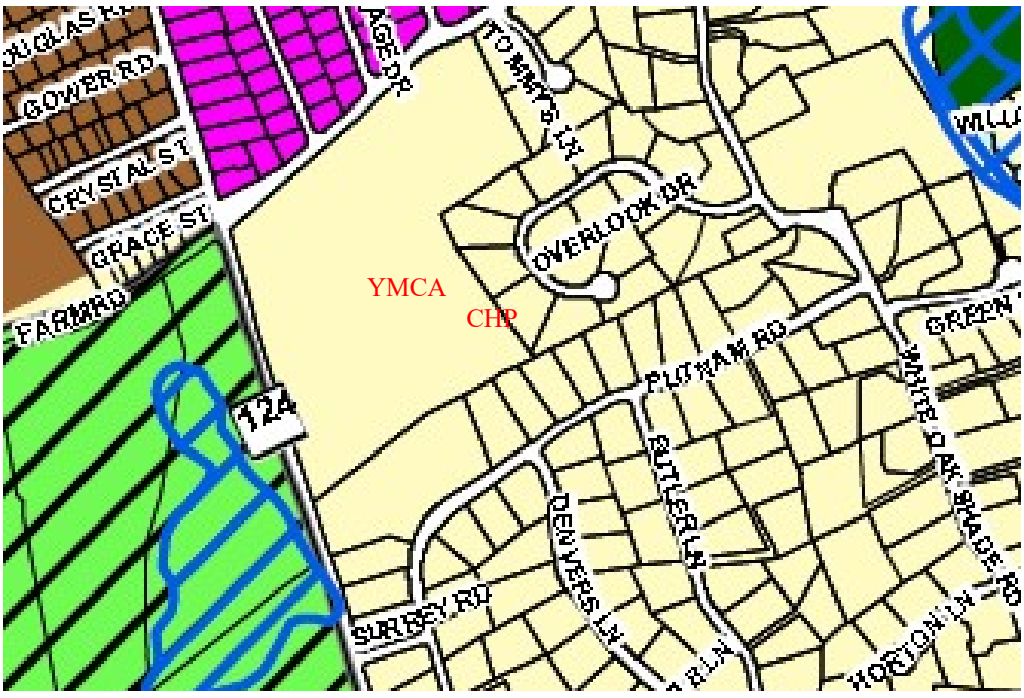
Figure 3. Photo of the Wall Noise Treatment Facing Putnam Road

Development of the Acoustic Assessment Plan

The purpose of this effort is to acquire acoustic information useful in understanding the potential airborne noise issues associated with the operation of a Kinsley Energy 650 BESS & CHP System at the New Canaan YMCA. The New Canaan site is located in a Residential Zone next to Putnam Road and is surrounded by other Residential Zones. (The New Canaan zoning map is given below in Figure 4 with all colors being residential.) It is important to determine whether the airborne noise generated by the Kinsley Energy System will negatively impact these neighbors.

The acoustic impact is assessed in the following way. The System operating airborne noise levels were measured at the new site on November 19 and 20, 2025. Using this data, the noise levels are compared to the allowable noise levels in the State of Connecticut[1] and Town of New Canaan[2] Noise Ordinances. With the System operating at full power, this approach then follows the traditional "What is the airborne noise level at the neighbor's property line?". Is the airborne noise below the allowable airborne noise levels? This measured site data can also be used to estimate noise levels at other neighbor's property lines. The effect of background noise can also be considered. The Town of New Canaan and the State of Connecticut's Noise Code will be consulted to assess the impact of the measured and estimated acoustic levels. Because of the closeness of the Kinsley Energy System site to the nearest property lines, noise mitigation was recommended[3]. (The airborne noise estimated for the System without mitigation was expected to exceed the night time airborne noise requirements at the closest neighbors' property lines.) As shown above in Figure 3, part of the Kinsley Energy CHP was treated on the Putnam Road side of the enclosure. The much lower-level gas valve airborne noise does not need to be treated.

Figure 4. Part of the New Canaan Zoning Map Showing the Area near the New Canaan YMCA



Acoustic Measurement Program

The acoustic data necessary to assess the impact of the Kinsley Energy System are described below: Airborne sound pressure measurements and spectral analysis were conducted at the New Canaan site on and near 564 South Avenue on November 19 and 20, 2025 during the day time and night time hours. This testing established background noise levels and combined background airborne noise levels and System operating noise levels. The overall A-weighted airborne noise measurements were made with an ExTech model 407780A Digital Sound Level Meter (s/n 240707520) that had been calibrated prior to and just after the test with a CE model AZ 8390 Calibrator (s/n 2300908). Measurements were all taken with A-weighting (frequency filtering that corresponds to human hearing) and with the sound level meter in a Slow response mode. The post-test spectral analysis was made with a Hewlett Packard Dynamic Signal Analyzer (model 3561A s/n 2549A03551) playing sound levels recorded at 172 Putnam Road on a Zoom F3 digital recorder. This data was taken using two PCB microphones (model 130F20 s/n 53933 and model 378C01 s/n 121246) using two Wilcoxon model P702B power supplies. The PCB microphones were also calibrated prior to and after the test with the CE model AZ 8390 Calibrator (s/n 2300908). All measurements were made with the microphones at a height above ground between five and six feet. The Hewlett Packard model HP3561A Dynamic Signal Analyzer was also used to perform A-weighted spectral analysis to confirm the ExTech overall readings as well as unweighted impulse, infrasonic and ultrasonic measurements . For reference, a noise level increase of 1 dB is equal to an airborne sound pressure increase of 12.2 per cent.

At the New Canaan YMCA, System operating airborne noise measurements were taken at the following six nearby property lines in the Residential Zone and two sides of the System enclosure:

Location	Business	Distance	Zone	Type
P1 – Gas Line	YMCA	2 meters	1 Acre	Residential
P2 – 195 Putnam Road	Home	108 meters	1 Acre	Residential
P3 – 194 Putnam Road	Home	117 meters	1 Acre	Residential
P4 – 172 Putnam Road	Home	67 meters	1 Acre	Residential
P5 – 158 Putnam Road	Home	71 meters	1 Acre	Residential
P6 – 9 Danvers Lane	Home	110 meters	1 Acre	Residential
P7 – 137 Putnam Road	Home	86 meters	1 Acre	Residential
P8 - 564 South Avenue SE	YMCA	5 meters	1 Acre	Residential
P9 - 564 South Avenue SE	YMCA	13 meters	1 Acre	Residential
P10 - 564 South Avenue NE	YMCA	5 meters	1 Acre	Residential
P11 - 564 South Avenue NE	YMCA	20 meters	1 Acre	Residential

See the Google satellite map in Figure 5 below for approximate locations of all the measurement positions. Measurements at P4 as shown in Figure 7 were taken with the ExTech sound level meter and two microphones recording on the Zoom F3 digital recorder. Both microphones were 67 meters from the System with channel 1 having a low frequency response up to 20 KHz while the channel 2 microphone had a higher frequency response up to 100 KHz. Measurements at all the other positions were taken with just the ExTech sound level meter. Figures 6 and 7 provide photographs of the site locations for the System at 13 meters (P9) and the property line (P4).

At each location, a one-minute record of the acoustic noise was analyzed. Two minutes of data were recorded at 172 Putnam Road on the Zoom F3 digital recorder (the closest residential location). This recorded data is analyzed on the HP3561A spectrum analyzer to determine whether a discrete tone is present and also to measure subsonic and ultrasonic noise levels.

Figure 5. Google Map Showing Measurement Positions P1 through P11 and the System

P7

Figure 6. System Location (P9) at 13 Meters Looking Northwest Towards the YMCA

Figure 7. P4 Location at 172 Putnam Road Looking Northeast along Putnam Road

Airborne noise measurements taken outside are corrupted by rain and wind so two days were selected when the winds were expected to be 10 miles per hour or less. Table 1 provides the weather data at Sikorsky Airport (closest to New Canaan) for the measurements on November 19 and 20, 2025. Data were taken over the period from 2 pm to 10:30 pm on the 19th and from 9 to 11:15 pm on the 20th . The table below shows the temperature and wind speeds in hourly intervals. Wind conditions were very good for both day's measurements. All of the property line airborne measurements were below the day time requirement of 55 dBA on November 19, 2025. Measurements were suspended during truck, car and plane passing and these short periods did not adversely affect the operating airborne noise measurements at most locations. There was one location that was affected by vehicles on South Avenue. The measurement at 137 Neptune Road was somewhat affected because there is a flat, open field between South Avenue and that measurement location. (The YMCA building blocks most traffic sound from South Avenue for the other locations). Measurements did have to be suspended for an hour during leaf blowing around 5 pm on November 19. Later that day (around 7:15 pm), a YMCA ventilation fan turned on and prohibited further measurements on Neptune Road that evening. There was no rain during all of the testing on November 19 and 20. While no vehicles could be seen, the far-off sound of traffic on South Avenue and the Merrit Parkway was the predominant background noise during the day time testing. Traffic on the Merrit Parkway was the predominant background noise during the night time testing on November 20.

Table 1. Weather Data near New Canaan on November 19 and 20, 2025
https://www.wunderground.com/history/daily/us/ct/stratford/KBDR/date/2025-11-19

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Pressure	Condition
	19-Nov						
12:52 PM	46 °F	29 °F	51 %	E	7 mph	30.14 in	Cloudy
1:52 PM	47 °F	29 °F	50 %	SE	7 mph	30.14 in	Fair
2:52 PM	46 °F	28 °F	50 %	SE	3 mph	30.15 in	Fair
3:52 PM	46 °F	29 °F	51 %	CALM	0 mph	30.17 in	Fair
4:52 PM	44 °F	29 °F	55 %	CALM	0 mph	30.18 in	Fair
5:52 PM	39 °F	29 °F	67 %	NNW	3 mph	30.19 in	Fair
6:52 PM	41 °F	28 °F	60 %	NNW	3 mph	30.21 in	Fair
7:52 PM	39 °F	28 °F	65 %	N	6 mph	30.23 in	Fair
8:52 PM	40 °F	27 °F	60 %	N	6 mph	30.22 in	Fair
9:52 PM	37 °F	24 °F	59 %	N	6 mph	30.23 in	Fair
10:52 PM	34 °F	24 °F	67 %	NNW	5 mph	30.24 in	Fair
11:52 PM	35 °F	24 °F	64 %	N	5 mph	30.24 in	Fair
	20-Nov						
7:52 PM	36 °F	27 °F	70 %	N	5 mph	30.17 in	Fair
8:52 PM	33 °F	27 °F	78 %	CALM	0 mph	30.17 in	Fair
9:52 PM	35 °F	27 °F	72 %	N	3 mph	30.16 in	Fair
10:52 PM	33 °F	26 °F	75 %	CALM	0 mph	30.17 in	Fair
11:52 PM	33 °F	26 °F	75 %	CALM	0 mph	30.17 in	Fair

Data Analysis

The ExTech model 407780A Digital Sound Level Meter provided the following acoustic calculations which have been recorded in Tables 2 through 7 for each sensor location. In the "Slow" measurement mode one second sound pressure samples are taken for a period of one minute and analyzed as follows:

Leq : Equivalent continuous sound level over one-minute measurement period.
Leq is the level to be identified as the estimated System noise after background correction
SPL MAX : Maximum sound level over one-minute measurement period.
SPL MIN : Minimum sound level over one-minute measurement period.
L90: 90% percentile sound level – this number is used as the estimate of background noise

This section analyzes the airborne noise levels measured at the New Canaan YMCA site and then documents the airborne noise levels at the property lines during System operation. These levels will be compared to the noise limits in the Connecticut and New Canaan noise ordinances. The measured background and System operating noise levels are reported in Tables 2 through 6. Tables 2 and 5 are background measurements with the System turned off. The background sound pressure levels on November 19 between 2:30 pm and 3 pm are all below the night time noise limit of 45 dBA. The background levels on November 20 between 9 and 10 pm are slightly higher reaching 45.7 dBA at two locations because of traffic noise.

The sound pressure values in Tables 3, 4 and 6 include both background and System operating noise. The property line noise measurements given in Tables 3 and 4 with the System running are all well below 55 dBA indicating the System meets the day time noise limit of 55 dBA. The background values in Table 2 were used to correct the measured operating airborne noise levels (Leq) in Tables 3 and 4 providing estimates in Table 7 of only the System noise contribution at all the property line locations. This was not possible for November 20 because four of the locations have background airborne noise levels between 9 and 10 pm that are above the System on data in Table 6. Removing the background contribution at P7 will then show the New Canaan YMCA System estimated sound pressure levels all meet the night time airborne noise requirements.

The Connecticut State Noise Ordinance identifies the L90 calculation as useful in estimating background noise levels. We use it here to remove the background airborne noise that is combined with the System noise. L90 is the level that is exceeded 90% of the time. Because the background noise is essentially constant the L90 value excludes some of the transient noise made by vehicles and other non-BESS & CHP sources like the HVAC plant at the New Canaan YMCA. The L90 value averages 1.65 dB lower than the Leq value for Table 2 during the day and 1.17 dB lower than the Leq value for Table 5 during the night.

Table 2 shows the daytime noise L90 levels at the property lines to range from 41.5 to 44.5 dBA while the night time levels vary from 43.5 to 45.7 dBA at the property lines. The lower traffic during the day and the slightly higher traffic at night dominated the property line measurements. The Table 6 measurements taken from 11:17 to 11:45 pm showed lower traffic levels dropping most of the property line noise levels below 45 dBA with only P7 slightly above 45 dBA.

Table 2. 19 November Day Time Background Levels in dBA reference 20 microPascals

Location	Range in Meters	Direction	Time	Leq	Max	Min	L90
CHP	5	Southeast	2:30 pm	46.2	61.7	44.2	44.5
CHP	13	Southeast	2:32 pm	47.1	55.3	43.2	43.7
172 Putnam	67	Southeast	2:36 pm	44.4	67.8	41.9	42.2
158 Putnam	71	Southeast	2:40 pm	42.5	44.7	41.3	41.5
9 Danvers	110	East	2:44 pm	43.6	71.7	41.8	42.5
137 Putnam	86	Northeast	2:48 pm	44.3	45.6	43.5	43.8

Table 3. 19 November Day Time Door Open CHP Levels in dBA reference 20 microPascals

Location	Range in Meters	Direction	Time	Leq	Max	Min	L90
CHP	5	Southeast	3:05 pm	74.8	75.7	74.0	74.2
CHP	13	Southeast	3:10 pm	65.7	66.9	65.4	65.5
BESS	5	Northeast	3:38 pm	65.6	76.2	63.0	63.2
BESS	20	Northeast	3:41 pm	55.9	66.3	52.2	52.9
194 Putnam	117	Southeast	3:13pm	49.8	63.5	47.4	48.4
195 Putnam	108	Southeast	3:18 pm	49.0	51.0	48.1	48.4
172 Putnam	67	Southeast	3:21 pm	51.8	53.5	50.4	50.8
158 Putnam	71	Southeast	3:24 pm	48.3	68.7	47.2	47.5
9 Danvers	110	East	3:26 pm	49.0	67.7	44.1	44.4
137 Putnam	86	Northeast	3:35 pm	48.5	56.2	47.3	47.5
Gas Line	2	Southwest	3:45 pm	66.2	72.4	65.5	65.6

Table 4. 19 November Day Time Door Closed CHP Levels in dBA reference 20 microPascals

Location	Range in Meters	Direction	Time	Leq	Max	Min	L90
CHP	5	Southeast	4:39 pm	63.7	66.9	62.9	63.2
CHP	13	Southeast	3:58 pm	56.9	57.2	56.5	56.7
195 Putnam	108	Southeast	4:13pm	48.5	49.6	47.1	47.4
194 Putnam	117	Southeast	4:17 pm	49.1	67.9	47.6	48.3
172 Putnam	67	Southeast	4:21 pm	48.6	49.6	48.2	48.4
158 Putnam	71	Southeast	4:24 pm	49.8	54.5	48.6	49.0
9 Danvers	110	East	4:30 pm	52.0	67.4	49.4	49.8
137 Putnam	86	Northeast	4:34 pm	52.3	56.0	49.6	50.5

Table 5. 20 November Night Time Background Levels in dBA reference 20 microPascals

Location	Range in Meters	Direction	Time	Leq	Max	Min	L90
CHP	5	Southeast	10:00 pm	48.6	51.4	47.2	47.7
CHP	13	Southeast	9:58 pm	46.5	48.4	44.9	45.3
BESS	5	Northeast	10:04 pm	17.9	52.7	45.9	46.3
BESS	20	Northeast	10:10 pm	45.4	46.3	44.5	44.9
158 Putnam	71	Southeast	9:05 pm	46.9	48.9	45.2	45.7
172 Putnam	67	Southeast	9:12 pm	45.1	54.5	43.3	43.5
9 Danvers	110	East	9.25 pm	44.7	48.6	43.6	43.9
137 Putnam	86	Northeast	9:32 pm	46.8	52.5	45.5	45.7
194 Putnam	117	Southeast	9:39 pm	45.9	48.6	44.9	45.1
195 Putnam	108	Southeast	9:43 pm	49.0	52.1	46.2	47.0

Table 6. 20 November Night Time Door Closed CHP Levels in dBA reference 20 microPascals

Location	Range in Meters	Direction	Time	Leq	Max	Min	L90
CHP	13	Southeast	11:11 pm	54.3	54.7	54.2	54.2
BESS	20	Northeast	11:09 pm	**48.5**	50.0	48.1	48.3
195 Putnam	108	Southeast	10:47 pm	44.4	46.4	43.4	43.6
194 Putnam	117	Southeast	10:50 pm	43.5	49.7	42.7	43.0
158 Putnam	71	Southeast	10:56 pm	44.7	46.1	44.4	44.6
9 Danvers	110	East	10:59 pm	43.8	48.4	43.1	43.4
137 Putnam	86	Northeast	11:02 pm	**45.7**	46.7	45.2	45.4
172 Putnam	67	Southeast	11:45 pm	44.7	47.3	44.3	44.6

Red indicates the combined System and background noise exceeds the night time limit of 45 dBA.

A comparison of the transfer function from the BESS side of the System enclosure (P11) to the 137 Putnam Road property line (P7) can be used to estimate the System airborne noise level at the P7 location. A level of 45.7 dBA was obtained in the November 20 night time measurement. At the same time, the level at P11 was 48.5 dBA (see green above) and drops to 46.9 dBA when background corrected. The transfer function between P11 and P7 was 3.9 dB when measured on November 19 during the same closed-door testing. If one subtracts 3.9 dB from the level of 46.9 dBA estimated at P11, the P7 estimate at 137 Putnam Road becomes 43 dBA. Table 7 below shows the background corrected measured and estimated property line data on November 19 and 20. The airborne noise created by the System at the nearby property lines is expected to all be below 45 dBA when the System is operating at full power. Opening the CHP door raises the P2, P3 and P4 airborne noise levels by an average of 1.7 dB.

Table 7. Background Corrected Property Line Measurements in dBA re 20 microPascals

Location	P2 - 195 P	P3 - 194 P	P4 - 172 P	P5 - 158 P	P6 - 9 Dan.	P7 - 137 P
Open Door on 19 Nov. (day)	48.2	49.1	51.4	47.5	48.1	47.3
Closed Door on 19 Nov. (day)	47.6	48.3	47.7	49.2	51.5	51.7
Closed Door on 20 Nov (night)	43.6	43	44.6	44.6	43.4	43

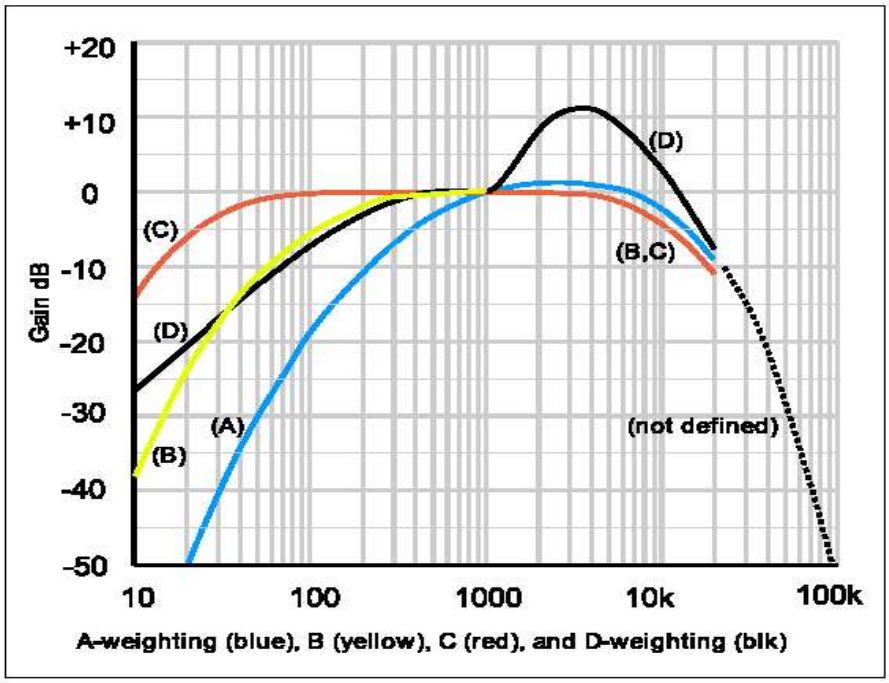
Note: The measurements on November 19 were background corrected while the November 20 measurements were not because the background noise levels were higher than the operating System levels. The road traffic noise earlier in the evening when the background noise was collected dropped in level for the later System data. The last value in the table at 137 Putnam Road (P7) is estimated based on a measured transfer function from a position 20 meters from the System (P11).

Allowable Noise Levels

The Connecticut regulation for the control of noise provides in *CT section 22a-69*-3 (Ref. 1) the requirements for noise emission in Connecticut. *CT section 22a-69*-3.1 states that no person shall cause or allow the emission of excessive noise beyond the boundaries of his/her Noise Zone so as to violate any provisions of these Regulations. The New Canaan Noise Ordinance (Ref. 2) has the same allowable noise levels as the CT ordinance with a change in the day-night hours. The night time hours are changed to start at 7:00 pm instead of 10 pm during the week. Night time is defined as 6 pm to 8 am on Saturdays / holidays and 4 pm to 10 am on Sundays. The two ordinances will be used to evaluate the noise generated by the Kinsley Energy CHP. Following sections discuss each type of noise using the results obtained from the November 2025 System measurements at the New Canaan YMCA.

A part of the New Canaan zoning map is given in Figure 4. As stated above, the New Canaan YMCA site at 564 South Avenue is located in a Residential Zone that is surrounded by other residential zones. The acoustic estimates from all the nearby locations on Putnam Road show that the System noise is expected to be below 45 dBA. As a result, the Kinsley Energy System will meet all the day and night time overall noise requirements. Other nearby residential properties at greater distances are also expected to be well below the day and night time Residential Zone noise limits for an emitter in a residential zone for both the CT and New Canaan ordinances.

Figure 8. Acoustic Airborne Noise Weighting Curves



Impulse Noise

The Connecticut noise code states in *CT section 22a-69*-3.2 (part a) *Impulse Noise* that no person shall cause or allow the emission of impulse noise in excess of 80 dB peak sound pressure level during the night time to any class A Noise Zone. CT Night time is defined as 10 pm to 7 am. *CT section 22a-69-3.2 (part b) Impulse Noise* states that no person shall cause or allow the emission of impulse noise in excess of 100 dB peak sound pressure level at any time to any Noise Zone. New Canaan has the same night time impulse noise limits as the State of CT.

Impulse noise in excess of 80 dBA was not observed during any of the six night time property line measurements of the Kinsley Energy System made at the New Canaan site in November 2025. The maximum level measured was 49.7 dBA at location P3 using the ExTech sound level meter. Other levels below 70 dBA were caused by vehicle traffic during the day time measurements and not by the System. Given the steady state nature of the System's noise signature there should be no acoustic issues with the State of Connecticut's or the Town of New Canaan's impulse noise requirements.

A few words are in order to discuss the difference between A-weighted and un-weighted impulse noise. A-weighting emphasizes the middle and higher frequencies while reducing the influence of the low frequencies. Figure 8 plots the A-weighting curve versus frequency in blue. Below a frequency of 1 kiloHertz the acoustic level is attenuated by increasing amounts. The reduction is about 10 dB at 200 Hertz, 20 dB at 90 Hertz and 30 dB at 50 Hertz. It also reduces the level at

very high frequency being down in level by 10 dB at 20 kiloHertz. Other measurements show unweighted overall levels to be about 10 dB higher than the A-weighted noise levels. This implies that the vehicle caused impulses in the 60 to 70 dBA range might increase to the 70 to 80dB range without the A-weighted filter. These levels are still below the 100 dB day time limit.

Prominent Discrete Tones

The Connecticut regulation for the control of noise states in *CT section 22a-69-3.3 Prominent discrete tones:* Continuous noise measured beyond the boundary of the Noise Zone of the noise emitter in any other Noise Zone which possesses one or more audible discrete tones shall be considered excessive noise when a level of 5 dBA below the levels specified in section 3 of these Regulations is exceeded. The CT Regulations establish different noise limits for different land use zones. Residential (homes and condominiums) and hotel uses are in Class A. Schools, parks, recreational activities and government services are in Class B. Forestry and related services are in Class C. By my reading of the regulations the New Canaan YMCA is a Class B emitter in a Residential Zone. The noise zone standards in *CT section 22a-69-3.5* state that a Class B emitter cannot exceed the following overall sound pressure levels:

To Class C 62 dBA To Class B 62 dBA To Class A 55 dBA (day) 45 dBA (night)

Discrete tones limits are 5 dBA lower so the overall level may be no higher than the following:

To Class C 57 dBA To Class B 57 dBA To Class A 50 dBA (day) 40 dBA (night)

The New Canaan Noise Ordinance does not discuss discrete tones so the CT Noise Ordinance will be used. To address the discrete tone issue, we use measured System spectral data from the November 20, 2025 testing. Figure 9 plots the airborne noise measured at 172 Putnam Road, the closest residence, for frequencies from 12.5 Hz to 20,000 Hz in 1-3rd octave bands. This figure shows a peak in the 80 Hertz band produced by the System. The peak consists of two tones at 75 and 77 Hertz. The discrete tone criteria start at 100 Hertz so this tone is not considered in determining whether a discrete tone exists. At higher frequencies there are no discrete tones so the CT criteria does not find a discrete tone. This is shown in Figure 10 where the discrete tone criteria are plotted versus the criteria calculation for 172 Putnam Road. This calculation curve must be higher than the CT criteria curve for a discrete tone to exist. Operating the Kinsley Energy System should produce airborne noise levels without a discrete tone so the overall noise requirements do not have to be reduced by 5 dB. There should be no acoustic issue with the CT discrete tone noise requirements.

Figure 9. CHP One-Third Octave Band Levels at 172 Putnam Road

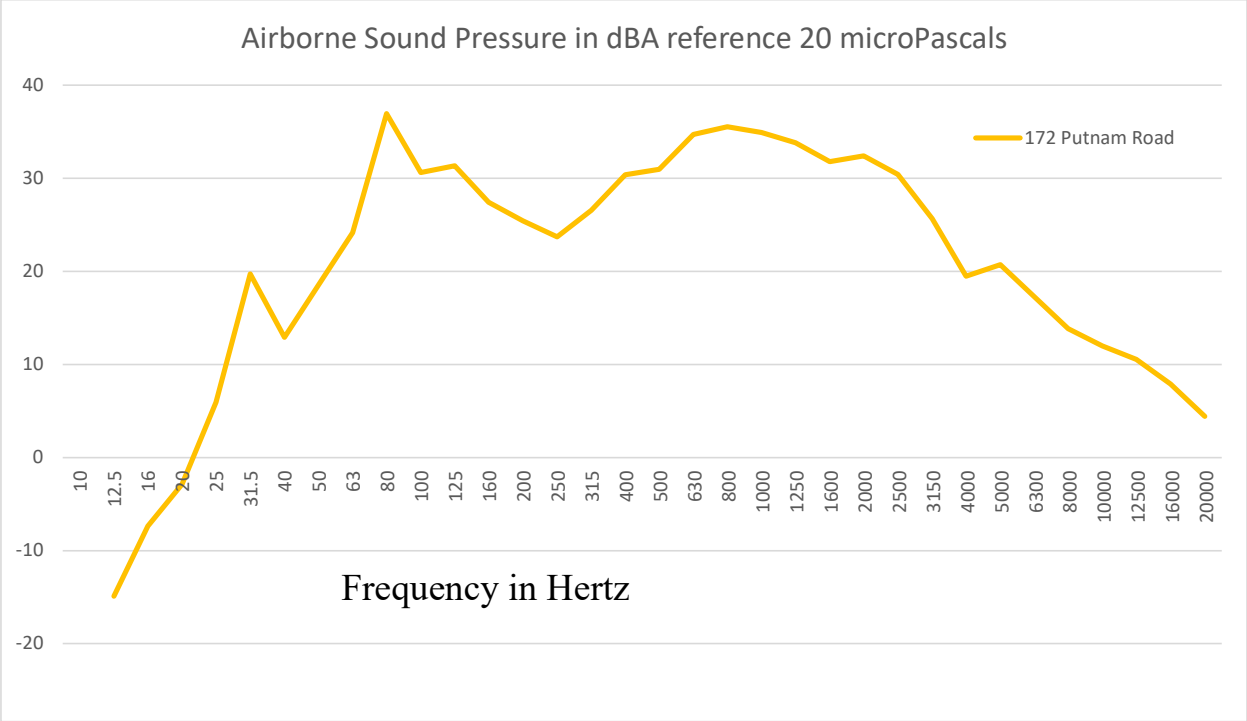
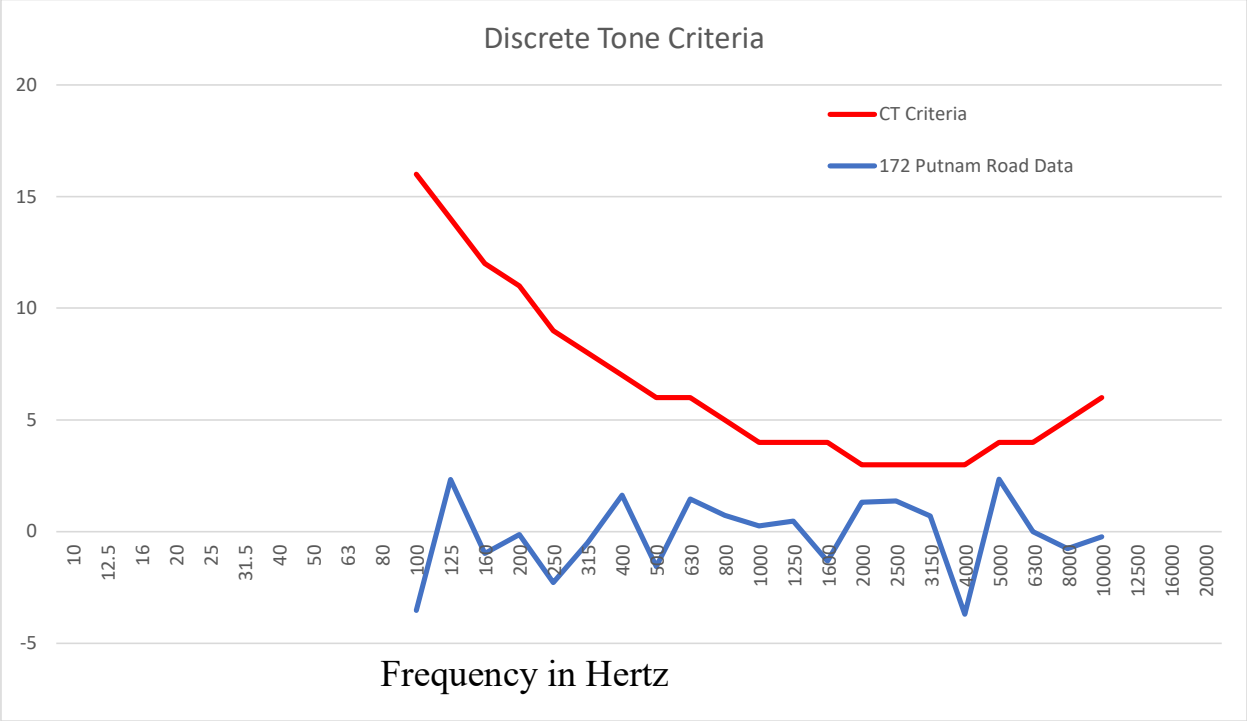


Figure 10. Criteria for Determining a Discrete Tone Exists



Infrasonic and Ultrasonic Noise

The Connecticut regulation for the control of noise states in *CT section 22a-69-3.4 Infrasonic and Ultrasonic* that no person shall emit beyond his/her property infrasonic or ultrasonic sound in excess of 100 dB at any time. 100 dB with respect to the reference of 20 microPascals is a sound pressure of 2 Pascals or 0.00029 psi. Infrasonic sounds are sound pressure fluctuations below a frequency of 20 Hertz. Ultrasonic sounds are sound pressure fluctuations at frequencies above 20,000 Hertz. The New Canaan Noise Ordinance does not discuss infrasonic or ultrasonic noise so the State of CT Noise Ordinance will be discussed.

One-third octave sound pressure spectrums in dB reference 20 microPascals at the P4 measurement location can be used to compare with these infrasonic and ultrasonic noise requirements. The P4 airborne noise data on November 20 were processed without A-weighting in the 6.3 Hertz to 100,000 Hertz one-third octave band frequency range. The infrasonic noise for frequencies up to 20 Hertz have a maximum amplitude of 51 dB at 16 Hertz. The entire 20 Hertz band can be power summed and is less than 59 dB reference 20 microPascals at the property lines of Putnam Road. The maximum possible infrasonic noise at the Putnam Road property lines will be less than 60 dB. There should be no issue with the infrasonic noise requirement at any of the neighboring properties.

The maximum ultrasonic noise for frequencies up to 100 KiloHertz is 12.1 dB at 40 KHz. The entire 80 KiloHertz band from 20 to 100 kiloHertz has been power summed and never exceeds a noise level of 33.3 dB reference 20 microPascals at 172 Putnam Road. The entire 20 to 100 kiloHertz band can be power summed and will be less than 35 dB reference 20 microPascals at all the property lines of Putnam Road. The noise levels at the other residential neighbors will be lower and there should be no issue with ultrasonic noise at any of the neighboring properties.

It should be noted that the spectrum analysis covers frequencies up to 100 kiloHertz and the PCB microphone model 378C01 s/n 121246 has a sensor that can measure up to 100 KHz.

Overall Sound Pressure Levels

The Connecticut regulations for the control of noise state that
(a) No person in a Class A Noise Zone shall emit noise exceeding the levels below:

To Class C 62 dBA To Class B 62 dBA To Class A 55 dBA (day) 45 dBA (night)

The New Canaan YMCA is in a Residential Zone that is surrounded by Residential Zones. The nearby neighbors are classified as residential with residential noise limits of 55 dBA during the day and 45 dBA at night. The Kinsley Energy System meets the town and state noise ordinances by producing airborne noise levels below 45 dBA at all the nearby property lines.

The estimated overall A-weighted sound pressure level measurements in dBA re 20 microPascals are given in Table 7 above for the background corrected measurements made on November 19 and 20, 2025. The property line measurement locations are identified by a P number in Figure 5.

The airborne noise levels are contaminated with a variable amount of traffic noise. Table 7 gives an upper limit to the System noise. The airborne noise measured during the day is higher than the airborne noise measured at night due the absence of motor vehicles on South Avenue. The measured noise levels also increase when the YMCA's ventilation fans are turned on.

Operation of the Kinsley Energy System will have no acoustic impact at all of the residential properties adjacent to the New Canaan YMCA. Background airborne levels from South Avenue and the Merritt Parkway increased the measured noise levels to as much as 51.7 dBA. This necessitated the use of a measured transfer functions to estimate the System contribution at the 137 Putnam Road property lines. No acoustic issues are expected during operation of the Kinsley Energy BESS & CHP System.

Conclusions

The purpose of this effort is to evaluate the acoustical environment at the New Canaan YMCA during operation of the Kinsley Energy BESS & CHP System. This effort has been accomplished and the results show that the operation of a Kinsley Energy BESS & CHP System will meet all of the State of Connecticut and Town of New Canaan airborne noise requirements at all the residential properties. Residences at all nearby locations not measured are also expected to meet all the noise requirements because they are further away from the new equipment.

References

1) CT DE&EP *Noise Control Regulation*
https://eregulations.ct.gov/eRegsPortal/Browse/RCSA/Title_22aSubtitle_22a-69/

2) New Canaan Noise Control Ordinance
https://portal.ct.gov/-/media/deep/air/noise/ordinances/newcanaannoiseordinancepdf.pdf

3) New Canaan Community YMCA Noise Treatment Recommendations, Carl Cascio, September 21, 2024