

# Noise Analysis Technical Report

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## Yara Lakes Estates Development Along SH 146 and Wharton Weems Blvd

La Porte, Texas  
March 2026

Prepared for GardenBure Development LLC.

By BGE, Inc.



*Matthew Clinton*

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TxDOT Precertification #11899  
Category 2.1.1 Traffic Noise Analysis 5/14/03

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## **INTRODUCTION**

GardenBure Development LLC. is currently planning to develop a residential community in La Porte, TX. The Yara Lakes Estates Development is located east of SH 146 and is bound to the north by Hawthorne at Bay Forest Apartment complex, to the east by Bay Forest Gold Course and to the south by Wharton Weems Blvd. Due to the close proximity of the future subdivision with SH 146, a noise analysis was needed in order to proceed with development of that area. The current preliminary development plan (Appendix A) shows the project area for this noise analysis along SH 146 and Wharton Weems Blvd.

This analysis aims to determine the most effective noise reduction for future Yara Lakes Estates residents. Traffic data was generated using 2024 Design Hourly Volume (DHV) traffic data. Several assumptions were made such as growth rate, k-factor, vehicle percentages, and directional distribution. These assumptions were based upon other projects and similar conditions in the general area.

## **NOISE ANALYSIS**

This analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis and Abatement of Roadway Traffic Noise (2011). The FHWA traffic noise modeling (TNM) software (version 2.5) was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

Also, because traffic sound levels are never constant due to the changing number, type, and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

FHWA Noise Abatement Criteria (NAC)		
Activity Category	dB(A) Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio stations, recording studios, schools, and television studios
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	Undeveloped lands that are not permitted

A noise impact occurs when either the absolute or relative criterion is met:

**Absolute criterion** – The predicted noise level at a receiver approaches, equals or exceeds the NAC. “Approach” is defined as one dB(A) below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 67 dB(A) or above.

**Relative criterion** – The predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. “Substantially exceeds” is defined as more than 10 dB(A). For example: a noise impact would occur at a Category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

## RESULTS

Existing traffic noise levels were modeled at proposed receiver locations that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. All receivers are classified as an NAC Category B land use. **Table 1** shows the noise levels with no noise wall, a 6-foot, and an 8-foot concrete or brick wall surrounding the proposed Yara Lakes Estates Development. The noise level reduction from the different wall heights can be compared by analyzing the table.

Table 1: Traffic Noise Levels dB(A) Leq – Comparison Analysis									
Receiver	NAC Level	No Wall dB(A)	No Wall Impacts	6-ft Wall dB(A)	6-foot Wall Impacts	8-foot Wall dB(A)	8-foot Wall Impacts	12-foot Wall dB(A)	12-foot Wall Impacts
R1 – Residential	67	70	Yes	67	Yes	65	No	64	No
R2 – Residential	67	71	Yes	67	Yes	63	No	60	No
R3 – Residential	67	71	Yes	67	Yes	64	No	60	No
R4 – Residential	67	71	Yes	66	No	63	No	60	No
R5 – Residential	67	71	Yes	67	Yes	64	No	60	No
R6 – Residential	67	70	Yes	68	Yes	64	No	61	No
R7 – Residential	67	70	Yes	67	Yes	64	No	61	No
R8 – Residential	67	69	Yes	68	Yes	64	No	61	No
R9 – Residential	67	69	Yes	68	Yes	64	No	60	No
R10 – Residential	67	69	Yes	68	Yes	64	No	61	No
R11 – Residential	67	69	Yes	68	Yes	65	No	61	No
R12 – Residential	67	69	Yes	68	Yes	65	No	61	No
R13 – Residential	67	69	Yes	69	Yes	65	No	61	No
R14 – Residential	67	64	No	63	No	62	No	61	No
R15 – Residential	67	63	No	62	No	61	No	59	No
R16 – Residential	67	63	No	61	No	60	No	59	No
R17 – Residential	67	62	No	60	No	59	No	58	No
R18 – Residential	67	62	No	60	No	59	No	57	No
R19 – Residential	67	62	No	59	No	57	No	55	No
R20 – Residential	67	62	No	59	No	57	No	55	No
R21 – Residential	67	63	No	60	No	58	No	54	No
R22 – Residential	67	62	No	59	No	56	No	54	No
R23 – Residential	67	63	No	60	No	57	No	53	No
R24 – Residential	67	63	No	60	No	57	No	53	No
R25 – Residential	67	63	No	60	No	57	No	53	No

As indicated in **Table 1**, the no-build alternative results in 13 receivers being impacted with db(A) above the NAC levels. The 6-foot wall results in 12 receivers being impacted with db(A) above the NAC levels. The 8-foot and 12-foot walls result in zero receivers being impacted with db(A) above the NAC levels.

A noise barrier 8-feet in height would reduce noise levels by at least 5 dB(A) for 14 receivers and meet the noise reduction design goal of 7 dB(A) for four of those receivers. A noise barrier 12-feet in height would reduce noise levels by at least 5 dB(A) for 21 receivers and meet the noise reduction design goal of 7 dB(A) for 18 of those receivers.

## CONCLUSION

Based on the traffic noise modeling results, multiple sound wall heights were evaluated to determine their effectiveness in meeting applicable noise abatement criteria for the proposed Yara Lakes Estates Development. The analysis indicates that a 6-foot sound wall would offer limited

noise reduction, while an 8-foot sound wall would fully meet the applicable noise-abatement criteria. Therefore, installation of a 12-foot sound wall is not justified.

Based on these findings, BGE confirms that an 8-foot sound barrier is sufficient to function as an effective sound wall and would provide adequate noise attenuation for the proposed Yara Lakes Estates Development, consistent with the conclusions of the approved noise study.

## **Appendix A**

### **YARA LAKES ESTATES SITE PLAN**

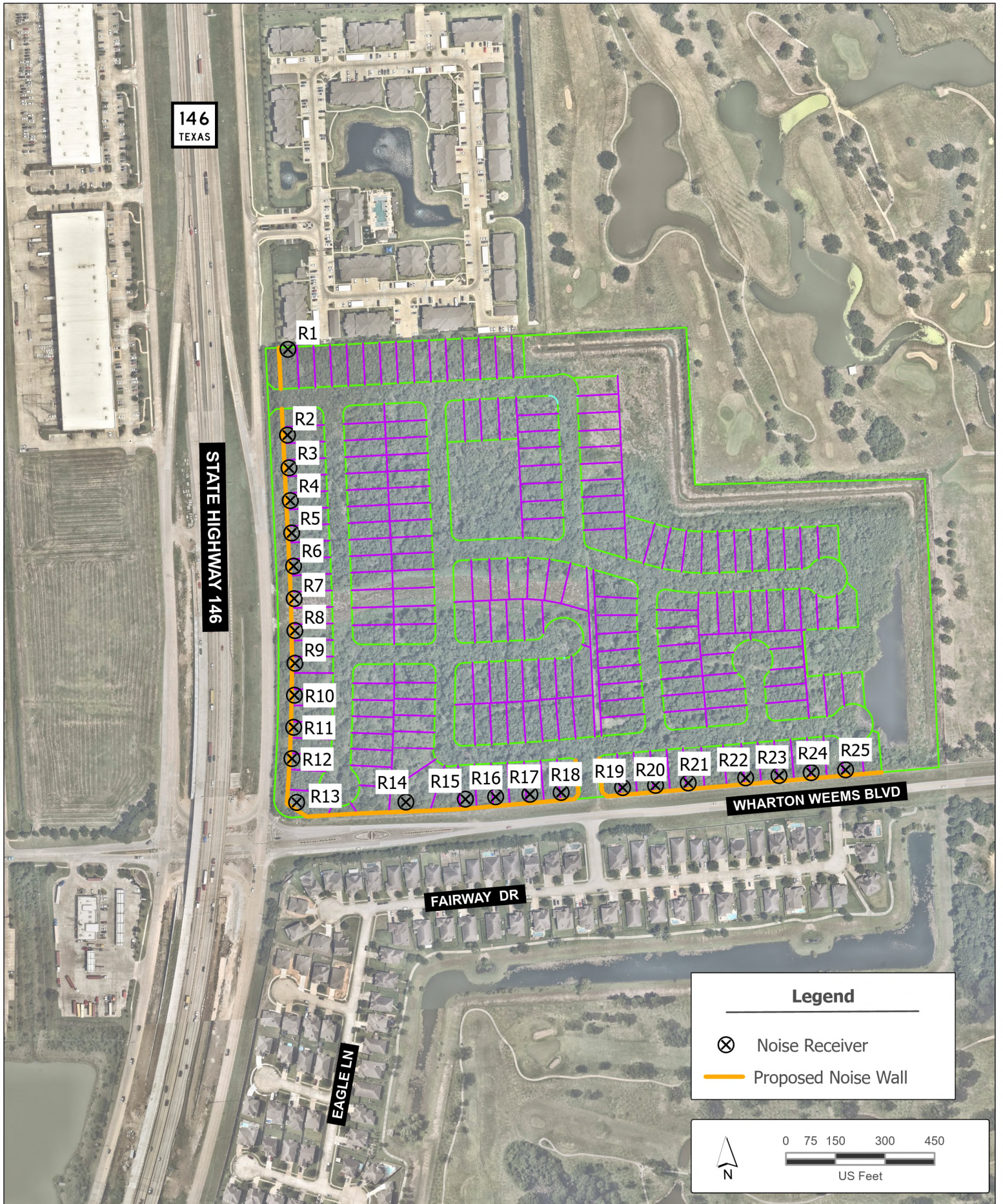




## **Appendix B**

### **NOISE RECEIVER EXHIBIT**





**Yara Lakes Estates  
Noise Receiver Exhibit**

**BGE, Inc.**  
Tel: 281-558-8700  
www.bgeinc.com

Project No: 15470-00  
Date: 09/11/2025  
Scale: 1:4,500

**Appendix C**  
**TNM 2.5 Output**

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Yara Lakes Estates  
Morgan Manning, BGE, Inc.

10 September 2025  
TNM 2.5  
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

15470-00

RUN:

Traffic Noise Barrier Analysis

BARRIER DESIGN:

6-foot Barrier

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with approval of FHWA.

ATMOSPHERICS:

68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0	70.8	66	70.8	11	Snd Lvl	67.9	2.9	5	-2.1
R2	2	1	0	71.1	66	71.1	11	Snd Lvl	67.0	4.1	5	-0.9
R3	3	1	0	71.2	66	71.2	11	Snd Lvl	67.8	3.4	5	-1.6
R4	4	1	0	71.2	66	71.2	11	Snd Lvl	66.4	4.8	5	-0.2
R5	5	1	0	71.3	66	71.3	11	Snd Lvl	67.4	3.9	5	-1.1
R6	6	1	0	70.6	66	70.6	11	Snd Lvl	68.1	2.5	5	-2.5
R7	7	1	0	70.0	66	70.0	11	Snd Lvl	67.9	2.1	5	-2.9
R8	8	1	0	69.5	66	69.5	11	Snd Lvl	68.3	1.2	5	-3.8
R9	9	1	0	69.2	66	69.2	11	Snd Lvl	68.1	1.1	5	-3.9
R10	10	1	0	69.2	66	69.2	11	Snd Lvl	68.6	0.6	5	-4.4
R11	11	1	0	69.1	66	69.1	11	Snd Lvl	68.5	0.6	5	-4.4
R12	12	1	0	69.3	66	69.3	11	Snd Lvl	68.8	0.5	5	-4.5
R13	13	1	0	69.7	66	69.7	11	Snd Lvl	69.2	0.5	5	-4.5
R14	14	1	0	64.7	66	64.7	11	----	63.7	1.0	5	-4.0
R15	15	1	0	63.5	66	63.5	11	----	62.1	1.4	5	-3.6
R16	16	1	0	63.1	66	63.1	11	----	61.8	1.3	5	-3.7
R17	17	1	0	62.6	66	62.6	11	----	60.9	1.7	5	-3.3
R18	18	1	0	62.6	66	62.6	11	----	60.6	2.0	5	-3.0
R19	19	1	0	62.4	66	62.4	11	----	59.8	2.6	5	-2.4
R20	20	1	0	62.5	66	62.5	11	----	59.5	3.0	5	-2.0
R21	21	1	0	63.1	66	63.1	11	----	60.5	2.6	5	-2.4
R22	22	1	0	62.9	66	62.9	11	----	59.5	3.4	5	-1.6
R23	23	1	0	63.3	66	63.3	11	----	60.2	3.1	5	-1.9
R24	25	1	0	63.2	66	63.2	11	----	60.2	3.0	5	-2.0
R25	26	1	0	63.3	66	63.3	11	----	60.6	2.7	5	-2.3

Dwelling Units	# DUs	Noise Reduction		
		Min dB	Avg dB	Max dB
All Selected	25	0.5	2.2	4.8
All Impacted	13	0.5	2.2	4.8
All that meet NR Goal	0	0	0	0

Noise Reduction Criteria Level # Receivers (R#)

Meets 5 dB(A) Criteria 0 N/A  
Meets 7 dB(A) Criteria 0 N/A

Yara Lakes Estates  
Morgan Manning, BGE, Inc.

10 September 2025  
TNM 2.5  
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

15470-00

RUN:

Traffic Noise Barrier Analysis

BARRIER DESIGN:

8-foot Barrier

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with approval of FHWA.

ATMOSPHERICS:

68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0	70.8	66	70.8	11	Snd Lvl	65.7	5.1	5	0.1
R2	2	1	0	71.1	66	71.1	11	Snd Lvl	63.8	7.3	5	2.3
R3	3	1	0	71.2	66	71.2	11	Snd Lvl	64.0	7.2	5	2.2
R4	4	1	0	71.2	66	71.2	11	Snd Lvl	63.5	7.7	5	2.7
R5	5	1	0	71.3	66	71.3	11	Snd Lvl	64.1	7.2	5	2.2
R6	6	1	0	70.6	66	70.6	11	Snd Lvl	64.6	6.0	5	1.0
R7	7	1	0	70.0	66	70.0	11	Snd Lvl	64.0	6.0	5	1.0
R8	8	1	0	69.5	66	69.5	11	Snd Lvl	64.7	4.8	5	-0.2
R9	9	1	0	69.2	66	69.2	11	Snd Lvl	64.0	5.2	5	0.2
R10	10	1	0	69.2	66	69.2	11	Snd Lvl	64.7	4.5	5	-0.5
R11	11	1	0	69.1	66	69.1	11	Snd Lvl	65.4	3.7	5	-1.3
R12	12	1	0	69.3	66	69.3	11	Snd Lvl	65.7	3.6	5	-1.4
R13	13	1	0	69.7	66	69.7	11	Snd Lvl	65.8	3.9	5	-1.1
R14	14	1	0	64.7	66	64.7	11	----	62.9	1.8	5	-3.2
R15	15	1	0	63.5	66	63.5	11	----	61.1	2.4	5	-2.6
R16	16	1	0	63.1	66	63.1	11	----	60.7	2.4	5	-2.6
R17	17	1	0	62.6	66	62.6	11	----	59.6	3.0	5	-2.0
R18	18	1	0	62.6	66	62.6	11	----	59.0	3.6	5	-1.4
R19	19	1	0	62.4	66	62.4	11	----	57.7	4.7	5	-0.3
R20	20	1	0	62.5	66	62.5	11	----	57.2	5.3	5	0.3
R21	21	1	0	63.1	66	63.1	11	----	58.0	5.1	5	0.1
R22	22	1	0	62.9	66	62.9	11	----	56.8	6.1	5	1.1
R23	23	1	0	63.3	66	63.3	11	----	57.0	6.3	5	1.3
R24	25	1	0	63.2	66	63.2	11	----	57.3	5.9	5	0.9
R25	26	1	0	63.3	66	63.3	11	----	57.6	5.7	5	0.7

Dwelling Units	# DUs	Noise Reduction		
		Min dB	Avg dB	Max dB
All Selected	25	1.8	5	7.7
All Impacted	13	3.6	5.6	7.7
All that meet NR Goal	14	5.1	6.2	7.7

Noise Reduction Criteria Level	#	Receivers (R#)
Meets 5 dB(A) Criteria	14	R1 - R7, R9, R20 - R25
Meets 7 dB(A) Criteria	4	R2 - R5

Yara Lakes Estates  
Morgan Manning, BGE, Inc.

10 September 2025  
TNM 2.5  
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

15470-00

RUN:

Traffic Noise Barrier Analysis

BARRIER DESIGN:

12-foot Barrier

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with approval of FHWA.

ATMOSPHERICS:

68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0	70.8	66	70.8	11	Snd Lvl	64.4	6.4	5	1.4
R2	2	1	0	71.1	66	71.1	11	Snd Lvl	60.7	10.4	5	5.4
R3	3	1	0	71.2	66	71.2	11	Snd Lvl	60.7	10.5	5	5.5
R4	4	1	0	71.2	66	71.2	11	Snd Lvl	60.4	10.8	5	5.8
R5	5	1	0	71.3	66	71.3	11	Snd Lvl	60.7	10.6	5	5.6
R6	6	1	0	70.6	66	70.6	11	Snd Lvl	61.1	9.5	5	4.5
R7	7	1	0	70.0	66	70.0	11	Snd Lvl	61.0	9.0	5	4.0
R8	8	1	0	69.5	66	69.5	11	Snd Lvl	61.0	8.5	5	3.5
R9	9	1	0	69.2	66	69.2	11	Snd Lvl	60.8	8.4	5	3.4
R10	10	1	0	69.2	66	69.2	11	Snd Lvl	61.1	8.1	5	3.1
R11	11	1	0	69.1	66	69.1	11	Snd Lvl	61.3	7.8	5	2.8
R12	12	1	0	69.3	66	69.3	11	Snd Lvl	61.5	7.8	5	2.8
R13	13	1	0	69.7	66	69.7	11	Snd Lvl	61.4	8.3	5	3.3
R14	14	1	0	64.7	66	64.7	11	----	61.9	2.8	5	-2.2
R15	15	1	0	63.5	66	63.5	11	----	59.8	3.7	5	-1.3
R16	16	1	0	63.1	66	63.1	11	----	59.0	4.1	5	-0.9
R17	17	1	0	62.6	66	62.6	11	----	58.0	4.6	5	-0.4
R18	18	1	0	62.6	66	62.6	11	----	57.2	5.4	5	0.4
R19	19	1	0	62.4	66	62.4	11	----	55.7	6.7	5	1.7
R20	20	1	0	62.5	66	62.5	11	----	55.0	7.5	5	2.5
R21	21	1	0	63.1	66	63.1	11	----	54.9	8.2	5	3.2
R22	22	1	0	62.9	66	62.9	11	----	54.1	8.8	5	3.8
R23	23	1	0	63.3	66	63.3	11	----	53.8	9.5	5	4.5
R24	25	1	0	63.2	66	63.2	11	----	53.8	9.4	5	4.4
R25	26	1	0	63.3	66	63.3	11	----	53.9	9.4	5	4.4

Dwelling Units	# DUs	Noise Reduction		
		Min dB	Avg dB	Max dB
All Selected	25	2.8	7.8	10.8
All Impacted	13	6.4	8.9	10.8
All that meet NR Goal	21	5.4	8.6	10.8

Noise Reduction Criteria Level	#	Receivers (R#)
Meets 5 dB(A) Criteria	21	R1 - R13, R18 - R25
Meets 7 dB(A) Criteria	18	R2 - R13, R20 - R25