Final

510 Erbsville Road
Waterloo, Ontario
Acoustical Report

Prepared for Muslim Association of Canada
by IBI Group

February 2017

CONSULTANT STATUTORY DECLARATION

CANADA	)	In the Matter of the
	)	Environmental Protection
PROVINCE OF ONTARIO	)	Act and the Planning Act
	)	
	)	And in the Matter of
	)	510 Erbsville Road
	)	Waterloo, Ontario
	)	Acoustical Report
	)	
	)	in the City of Waterloo
	)	in the Regional Municipality
	)	of Waterloo

I, John Perks, M.B.A., P.Eng. of the City of Waterloo, in the Regional Municipality of Waterloo, SOLEMNLY DECLARE THAT:

1. I am a Professional Engineer employed by IBI Group which holds a Certificate of Authorization and have personal knowledge of the matters set out below.

2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as 510 Erbsville Road, Waterloo, Ontario in the Regional Municipality of Waterloo.

3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.

4. The information used in the study entitled 510 Erbsville Road, Waterloo, Ontario Acoustical Report dated February 2017 is the best available information as of the date of the study.

5. The noise level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment and Energy Guidelines, Region of Waterloo policies, and any applicable policy or guidelines of the Area Municipality, and any other applicable policy or guideline.

6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.

7. I acknowledge that this study may be subject to a peer review conducted at my cost.

8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

DECLARED before me at the City of Waterloo, in the Regional Municipality of Waterloo this 17 day of February 2017.

Betty Anne White

Betty Anne White, a Commissioner, etc.,
Regional Municipality of Waterloo,
for IBI Group.
Expires May 27, 2018.

OWNER/AUTHORIZED AGENT STATEMENT

I am the owner, and that I understand and agree with the noise attenuation measures proposed in study entitled 510 Erbsville Road, Waterloo, Ontario Acoustical Report dated February 2017.

The application has been designed to avoid the use of berms or walls as noise attenuation features where feasible. Where berms or walls are recommended, the Noise Study provides economic, planning and engineering justification.

If the application is changed in a way that may affect the noise level calculations, I will have a revised noise study submitted to the Region.

Signature

Feb 17th, 2017
Date

Document Control Page

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REVIEWER:	
AUTHORIZATION:	
CIRCULATION LIST:	
HISTORY:	

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1 Introduction

IBI Group was retained to conduct an acoustical study to examine the impacts of noise created by surrounding traffic noise sources on the property located at 510 Erbsville Road in the City of Waterloo and recommend any mitigation, if required, based on criteria set by the Ministry of the Environment (MOE).

The total property area is approximately 1.31 ha and is located on the east side of Erbsville Road, north of Columbia Street West. The property currently contains a residential house, garage, shed, and landscaped areas. Provincially significant wetlands are located adjacent to the northeast property boundary and the southeast property boundary, with the southeast corner of the property included as a portion of the provincially significant wetland. A materials storage yard abuts the property to the north. Existing residential lots are located approximately 50m to the east, and on the west side of Erbsville Road.

This report documents the noise analysis and findings to demonstrate feasibility of the property from a noise perspective.

2 Background and Noise Criteria

The MOE publication NPC-300 “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning” was used in this noise study. The primary noise source for the subject property is from traffic noise along Erbsville Road. Air traffic and rail noise were not considered as the development is located outside the zone of influence of local airports and railways.

The materials storage yard located at 516 Erbsville Road to the north of the property is operated by Enasco Limited. Based on discussions with the company owner on November 3, 2016, the business is that of an electrical-mechanical and pole line contractor. There is no fixed in-place stationary equipment on site such as presses, compressors, lifts, or blowers and there is no manufacturing, processing, or production on site.

The site is used as a storage facility for items generally removed from job sites. Service vehicles required by the business are also parked on site. Any tools required to undertake work on site would be hand tools. Based on these uses, the property is not considered as a stationary noise source. No other stationary noise sources were identified in the vicinity of the property.

It will be assumed that the development is located in a “Class 1” area (urban) as defined by the Ministry of the Environment (MOE), due to the acoustical environment typical of a major population center, where the background sound level is dominated by the urban hum.

The MOE criteria for noise levels resulting from road traffic sources are summarized in Table 1.

Table 1 – MOE Traffic Noise Level Criteria

LOCATION	NOISE LEVELS (dBA)	REQUIREMENT
Outdoor Living Areas (Daytime- 0700 to 2300)	Less than 55	i) No control required
	55-60	i) Physical control required -or- ii) Type A warning clause required
	Greater than 60	i) Physical control required -and- ii) Type B warning clause required
Outside Living Room Window (Daytime- 0700 to 2300)	Less than 55	i) No control required
	55-65	i) Forced air heating required -and- ii) Type C warning clause required
	Greater than 65	i) Central air conditioning required -and- ii) Type D warning clause required -and- iii) Special building components required
Outside Bedroom Window (Night time- 2300 to 0700)	Less than 50	i) No control required
	50-60	i) Forced air heating required -and- ii) Type C warning clause required
	Greater than 60	i)) Central air conditioning required -and- ii) Type D warning clause required -and- iii) Special building components required

3 Noise Prediction Methods and Noise Data

3.1 Transportation Noise

The noise levels produced by traffic along Erbsville Road were calculated using the MOE's computer modelling software known as "STAMSON 5.04".

The MOE requires that all traffic data be projected ten (10) years into the future such that the proposed mitigation will be relevant for future volumes. Traffic volumes for 2026 and other data were obtained from the Region of Waterloo (refer to Appendix B). Traffic volumes along with other relevant traffic data utilized by STAMSON are summarized in Table 2, and the model output is included in Appendix C.

Table 2 – Traffic Data (2026)

ITEM	ERBSVILLE ROAD
Annual Average Daily Traffic	14,900 vpd
% Medium Trucks	1.6%
% Heavy Trucks	4.4%
Road Grade	5%
Speed Limit	60 km/h
Day/Night Percent Split	90/10

4 Free Field Analysis

A free-field analysis was completed using "STAMSON 5.04". This is the assessment of traffic noise impacts on the proposed development without any proposed structures or features to provide noise mitigation. From this analysis, the limits at which warning clauses and/or building components are required can be established. The results of this analysis are shown in Table 3.

Table 3 – Free Field Analysis Results

FREE FIELD LIMITS	DISTANCE FROM CENTRELINE OF ERBSVILLE ROAD
65 dBA (Day)	24.4m
60 dBA (Day)	48.9m
55 dBA (Day)	97.8m
60 dBA (Night)	20.5m
50 dBA (Night)	89.2m

The daytime acoustical impact on development located within 97.8 metres of the centreline of Erbsville Road will have noise levels in excess of 55 dBA which exceeds the daytime noise level criteria. The nighttime acoustical impact on development located within 89.2 metres of the centreline of Erbsville Road will have noise levels in excess of 50 dBA which exceeds the nighttime noise level criteria. As such, warning clauses are required for the existing house and are discussed below in Sections 6 and 7.

5 Receiver Locations

As demonstrated by the Free Field Analysis in Section 4, the MOE noise guidelines are exceeded and thus additional analysis was carried out as outlined below.

To facilitate the analysis, various sensitive receiver locations were identified. All receivers were located at the worst-case locations (most exposed) for both day and night time traffic noise. For indoor daytime and nighttime noise, Receiver A is located flush with the west façade of the house, and represents the outside of bedroom and living room windows as shown on Figure 1 in Appendix A.

For outdoor living areas, the worst-case receiver (Receiver B) is located at the outdoor area 4.5m to the west of the existing house as shown on Figure 1 in Appendix A.

Table 4 identifies the receiver locations within the proposed development.

Table 4 – Receiver Locations

RECEIVER	LOCATION*	DISTANCE TO CENTRELINE OF ERBSVILLE ROAD
Receiver A	Indoor Living Area	42.0m
Receiver B	Outdoor Living Area (OLA)	37.5m

6 Results

6.1 Transportation Noise

The noise modeling program “STAMSON 5.0” was used to estimate noise levels produced by the expected future traffic volumes along Erbsville Road based on the information provided in Table 3. The results from the modeling are shown in Table 5.

Table 5 – Predicted Unattenuated Noise Levels (dBA)

RECEIVER	LOCATION*	NOISE DAY (dBA)	NOISE NIGHT (dBA)
A	POW	61.1	55.1
B	OLA	61.9	-

** POW = Pane of Window, OLA = Outdoor Living Area*

Noise levels at Receiver A do not exceed 65 dBA (day) or 60 dBA (night), no physical mitigation is required and compliance with the Ontario Building Code will ensure the building components are adequate. However, as the noise levels do exceed the minimum criteria, central air conditioning and warning clauses are required as a result of the traffic noise along Erbsville Road.

Receiver B (OLA) is above the minimum criteria of 55 dBA for daytime noise. Therefore, the OLA should be located adjacent to the east façade of the existing house, which will block traffic noise from Erbsville Road.

7 Recommendations

As demonstrated in this report, physical noise mitigation in the form of noise barriers or fences is not required to bring the existing property into compliance with the MOE noise criteria. Further, the expected noise levels are such that warning clauses are required.

With the inclusion of these controls and warning clauses, and compliance with the Ontario Building Code, the noise criteria are satisfied.

The following specific recommendations summarize the required noise mitigation and warning clauses to be placed on title.

Recommendation #1

Due to expected traffic noise levels from Erbsville Road, if the existing house is to be used as a residential dwelling, the existing house shall be fitted with provisions for central air conditioning and Warning Clause C which reads as follows:

> *"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."*

Recommendation #2

The OLA should be located adjacent to the east façade of the existing house, so that it is protected from traffic noise from Erbsville Road.

Recommendation #3

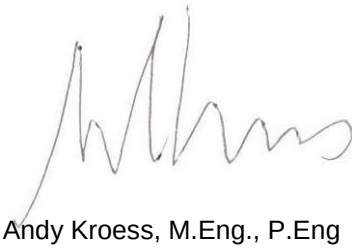
Given that the site development is in a preliminary stage, it is recommended that once the specific layout and design for the proposed site is known, that this Noise Study be reviewed and updated accordingly.

Based on the preceding we conclude that this property has been assessed appropriately to address impacts from traffic noise.

* * * * * * * * * * * * * * * *

Yours truly

IBI GROUP



John Perks, MBA, P.Eng
Associate Director, Senior Engineer

Andy Kroess, M.Eng., P.Eng
Engineer

Appendix A

Noise Information Plan

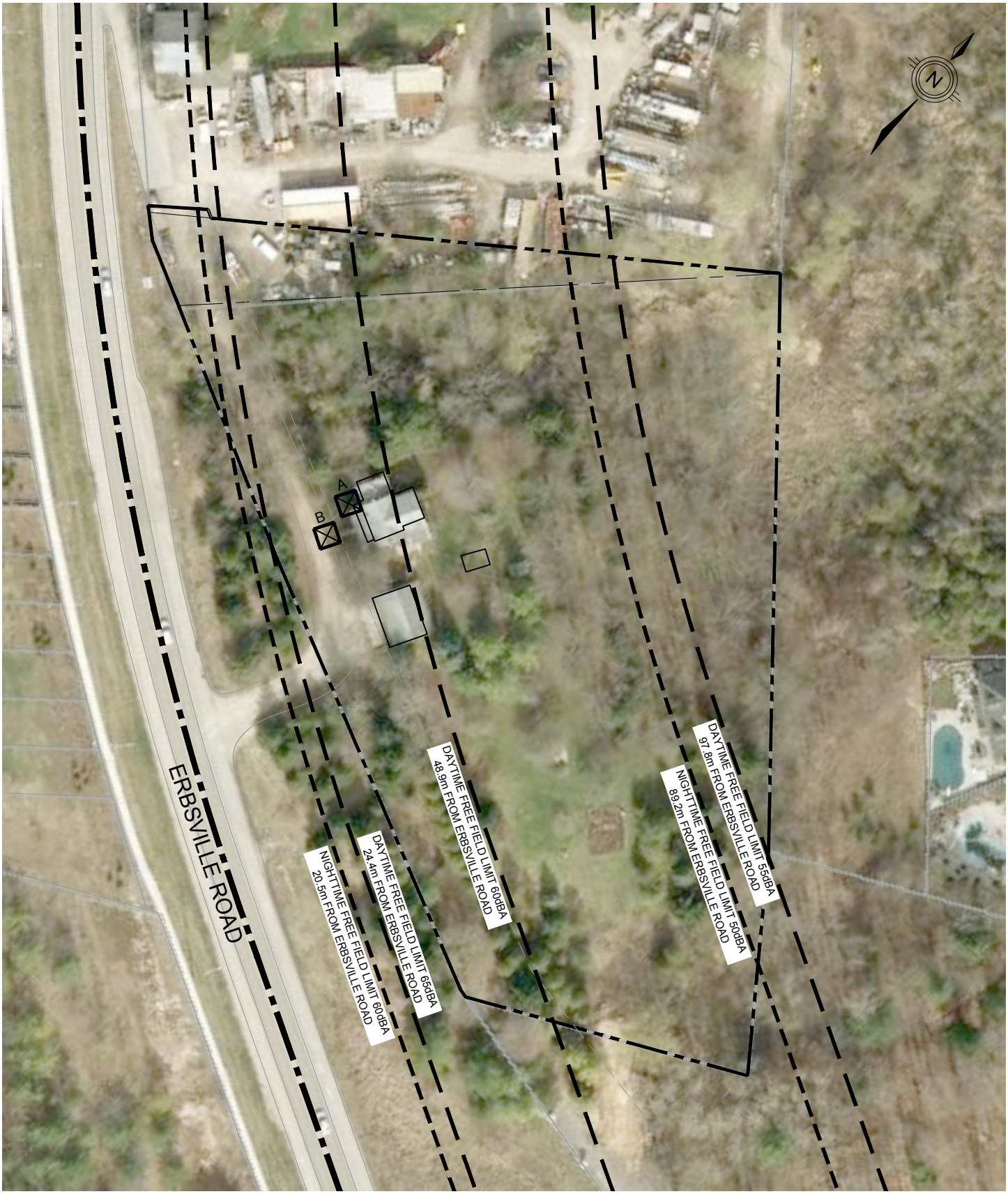


FIGURE 1: TRAFFIC NOISE INFORMATION PLAN

510 ERBSVILLE ROAD
WATERLOO, ON.

SCALE	1:1000
DATE	February 2016
PROJECT No.	35928

LEGEND:

A — RECEIVER LOCATION

FREE FIELD LIMITS

PROPERTY LINE

IBI GROUP
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Waterloo ON N2L 3V3 Canada
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Appendix B

Traffic Data

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location 510 Erbsville Rd, Waterloo

2. Current AADT (2016) 11,600

3. Forecast AADT (2026) 14,900

4. Commercial Vehicle Rates

Heavy	Medium
4.4%	1.6%

5. Posted Speed Limit 60 km/h

6. Day/Night Splits Regional Standard 90/10 Day/Night Split

7. Validity Period December 31st, 2017

8. Notes

This forecast is intended for the purpose of carrying out a noise study only. The above AADT represents the average traffic volumes along Erbsville Rd (Willow Wood Dr - Laurelwood Dr). This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Appendix C

STAMSON Data

STAMSON 5.0 NORMAL REPORT Date: 02-03-2016 09:24:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 35928a.te Time Period: Day/Night 16/8 hours
Description: Reciever A - Daytime and Nighttime

Road data, segment # 1: Erbsville Rd (day/night)

Car traffic volume : 12605/1401 veh/TimePeriod *
Medium truck volume : 215/24 veh/TimePeriod *
Heavy truck volume : 590/66 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 5 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 14900
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.60
Heavy Truck % of Total Volume : 4.40
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Erbsville Rd (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 42.00 / 42.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

♀
Results segment # 1: Erbsville Rd (day)

Source height = 1.45 m

ROAD (0.00 + 61.10 + 0.00) = 61.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	69.98	0.00	-7.42	-1.46	0.00	0.00	0.00	61.10

Segment Leq : 61.10 dBA

Total Leq All Segments: 61.10 dBA

♀
Results segment # 1: Erbsville Rd (night)

Source height = 1.45 m

ROAD (0.00 + 55.14 + 0.00) = 55.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.47	0.00	-7.03	-1.30	0.00	0.00	0.00	55.14

Segment Leq : 55.14 dBA

Total Leq All Segments: 55.14 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 61.10
(NIGHT): 55.14

STAMSON 5.0 NORMAL REPORT Date: 02-03-2016 09:24:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 35928b.te Time Period: Day/Night 16/8 hours
Description: Reciever B - Daytime

Road data, segment # 1: Erbsville Rd (day/night)

Car traffic volume : 12605/1401 veh/TimePeriod *
Medium truck volume : 215/24 veh/TimePeriod *
Heavy truck volume : 590/66 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 5 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 14900
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.60
Heavy Truck % of Total Volume : 4.40
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Erbsville Rd (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 37.50 / 37.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

♀
Results segment # 1: Erbsville Rd (day)

Source height = 1.45 m

ROAD (0.00 + 61.92 + 0.00) = 61.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	69.98	0.00	-6.61	-1.46	0.00	0.00	0.00	61.92

Segment Leq : 61.92 dBA

Total Leq All Segments: 61.92 dBA

♀
Results segment # 1: Erbsville Rd (night)

Source height = 1.45 m

ROAD (0.00 + 55.91 + 0.00) = 55.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.47	0.00	-6.25	-1.30	0.00	0.00	0.00	55.91

Segment Leq : 55.91 dBA

Total Leq All Segments: 55.91 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 61.92
(NIGHT): 55.91