Environmental Noise Feasibility Study

Zephyr Subdivision - Phase 2

Proposed Residential Development

Town of Uxbridge
Region of Durham, Ontario

December 7, 2022
Project: 117-0307

Prepared for

Ecovue Consulting Services Inc.

Prepared by

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VALCOUSTICS
Canada Ltd.

Version History

Version #	Date	Comments
1.0	December 7, 2022	Final – Issued to Client

TABLE OF CONTENTS

LIST OF TABLES

…/cont'd

TABLE OF CONTENTS (continued)

LIST OF FIGURES

LIST OF APPENDICES

Environmental Noise Feasibility Study

Zephyr Subdivision - Phase 2

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Region of Durham, Ontario

EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study in support of the Draft Plan of Subdivision and Zoning By-law Amendment (ZBA) application submission to the Township of Uxbridge and Region of Durham.

The site is located at the southeast corner of the intersection of Zephyr Road and Concession Road 3 in the Township of Uxbridge. The proposed development consists of 17 single family dwellings.

The main noise source with potential for impact on the proposed development is road traffic on Zephyr Road and Concession 3 Road. The sound levels on site have been determined and compared with the applicable Ministry of the Environment, Conservation and Parks (MECP) noise guideline limits to determine the need for noise mitigation.

To meet the applicable transportation noise source guideline limits:

- Exterior wall and window construction meeting minimum OBC requirements are sufficient to ensure indoor noise levels are in line with MECP guidelines.
- There are no special ventilation requirements for any of the dwellings in the proposed development.

Final requirements should be checked when detailed building plans are available. This could be done as a condition for obtaining a building permit.

1.0 INTRODUCTION

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study in support of the concurrent Draft Plan of Subdivision and Zoning By-law Amendment (ZBA) application submission to the Township of Uxbridge and Region of Durham.

The predicted sound levels and noise mitigation measures needed for the proposed development to comply with noise guidelines of the Ministry of the Environment, Conservation and Parks (MECP) are outlined herein.

1.1 THE SITE AND SURROUNDING AREA

The proposed development is located at the southeast corner of the intersection of Zephyr Road and Concession Road 3 in the Township of Uxbridge. The site is bounded by:

- Hamlet residential and future residential development (Phase 1 of the Zephyr Subdivision), with Zephyr Road beyond, to the North;
- Environmental protection lands, with agricultural lands beyond, to the East;
- Agricultural and environmental protection lands to the South; and
- Concession Road 3, with residential housing and agricultural lands beyond, to the West.

A Key Plan is included as Figure 1

1.2 THE PROPOSED DEVELOPMENT

The Phase 2 of the development consists of 17 single family residential lots.

This report is based on the Draft Plan of Subdivision dated July 28, 2021, prepared by EcoVue Consulting Services Inc. The Draft Plan of Subdivision is included as Figure 2.

2.0 NOISE SOURCES

2.1 TRANSPORTATION SOURCES

The noise sources with potential to impact the proposed development is road traffic on Zephyr Road and Concession Road 3. Based on an area visit, there no stationary noise sources with significant noise impact on the proposed development and therefore are not considered further in this report.

Ultimate road traffic volumes including Annual Average Daily Traffic (AADT), posted speed limit and percentage of trucks for Zephyr Road and Concession Road 3 were obtained from the Region of Durham. The road traffic data is summarized in Table 1. Correspondence is included as Appendix A.

TABLE 1 ROAD TRAFFIC DATA

Roadway[(1)]	Year	24-hour Volume[(2)]	% Trucks		Day/Night (%)	Speed Limit (kph)
			Medium	Heavy		
Concession Road 3	Ultimate	6 000	7	3	90/10	50
Zephyr Road	Ultimate	5 000	4.9	2.1	90/10	50

Notes:

(1) Obtained from the Region of Durham.

(2) AADT – Annual Average Daily Traffic.

3.0 ENVIRONMENTAL NOISE GUIDELINES

The applicable noise guidelines for new residential development are those in MECP Publication NPC-300, "Environmental Noise Guideline, Stationary, and Transportation Sources – Approval and Planning".

The environmental noise guidelines of the MECP, as provided in Publication NPC-300, are discussed briefly below and summarized in Appendix B.

3.1 TRANSPORTATION SOURCE NOISE GUIDELINES

3.1.1 Architectural Elements

In the daytime (0700 to 2300), the indoor criterion for road noise is $L_{eq\ Day}$ (i.e., 16-hour energy equivalent sound level (0700-2300 hours)) of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night, the indoor criterion for road noise is $L_{eq\ Night}$ (i.e., 8-hour energy equivalent sound level (2300-0700 hours)) of 45 dBA for sensitive spaces such as living/dining rooms and dens and 40 dBA for bedrooms. The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve these indoor sound level limits, based on the applicable outdoor sound level on the facades.

3.1.2 Ventilation

In accordance with the MECP noise guideline for road traffic sources, if the daytime sound level, $L_{eq\ Day}$, at the exterior face of a noise sensitive window is greater than 65 dBA, means must be provided so that windows can be kept closed for noise control purposes and central air conditioning is required. For daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning at a later date. A warning clause advising the occupant of the potential interference with some activities is also required. At nighttime, air conditioning would be required when the sound level exceeds 60 dBA ($L_{eq\ Night}$) at a noise sensitive window (provision for adding air conditioning is required when greater than 50 dBA).

3.1.3 Outdoors

For outdoor amenity areas ("Outdoor Living Areas" – OLAs), the guideline is $L_{eq\ Day}$ of 55 dBA, with an excess not exceeding 5 dBA considered acceptable if it is technically not practicable to achieve the 55 dBA objective, providing warning clauses are registered on title. Note that for road traffic sources, a balcony is not considered an OLA, unless it is the only OLA for the occupant, and it is at least 4 m in depth; and unenclosed.

4.0 NOISE IMPACT ASSESSMENT

4.1 ANALYSIS METHOD

Using the road traffic data in Table 1, the sound levels, in terms of $L_{eq\ Day}$ and $L_{eq\ Night}$, were determined using STAMSON V5.04 – ORNAMENT, the computerized road traffic noise prediction models of the MECP.

The daytime and nighttime sound levels at the building envelope were assessed at the second-floor windows, 4.5 m above grade. The daytime sound levels at the rear yard OLAs were

assessed 1.5 m above grade, 3 m from the centre of the facade. Inherent screening of each building face due to its orientation to the noise source was taken into account for this assessment.

4.2 SOUND LEVEL PREDICTION

Table 2 summarizes the predicted sound levels outdoors at specific locations. The sound level calculations are included in Appendix C.

TABLE 2 PREDICTED UNMITIGATED SOUND LEVELS(1)

Location	Source	Distance (m)(2)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
R1 Lot 1 NW Corner N Facade	Concession Road 3	69	48	42
	Zephyr Road	197	42	36
	Total	**-**	**49**	**43**
R2 Lot 1 NW Corner W Facade	Concession Road 3	69	51	45
	Zephyr Road	197	39	33
	Total	**-**	**52**	**45**
R3 Lot 11 NE Corner N Facade	Zephyr Road	194	42	36
	Total	**-**	**42**	**36**
R4 Lot 7 W Facade	Concession Road 3	63	52	46
	Total	**-**	**52**	**46**
OLA 1 Lot 1 rear yard	Concession Road 3	68	51	-
	Zephyr Road	227	38	-
	Total	**-**	**51**	**-**
OLA 2 Lot 11 rear yard	Concession Road 3	200	43	-
	Total	**-**	**43**	**-**
OLA 3 Lot 7 rear yard	Concession Road 3	61	52	-
	Total	**-**	**52**	**-**

Notes:

(1) Daytime/nighttime receptors were taken at the top floor windows. OLA receptors were taken at 1.5 m above grade. Figure 2 shows the assessment receptor locations.

(2) Distance indicated is from the centreline of the noise sources to facade or OLA.

The highest unmitigated daytime/nighttime sound levels of 52 dBA/46 dBA are predicted to occur at the west facade of Lot 7. The unmitigated daytime sound level of 52 dBA is predicted to occur at the Outdoor Living Area (OLA) of Lot 7.

4.3 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which can be treated separately for the most part:

- Architectural elements to achieve acceptable indoor noise guidelines for transportation sources; and
- Design features to protect the OLAs.

Noise abatement requirements are summarised in Table 3 and notes to Table 3.

4.3.1 Indoors

4.3.1.1 Architectural requirements

The indoor sound level guidelines can be achieved by using appropriate construction for exterior walls, windows, and doors. In determining the worst-case architectural requirements for the single-family homes, exterior wall and window areas were assumed to be 80% and 30%, respectively, of the associated floor area at a corner room with facades exposed directly or at an angle to the road traffic noise source, for both living/dining areas and sleeping quarters.

For all the residential units, exterior walls and windows meeting OBC building standards are sufficient to meet the indoor sound level criteria of the MECP noise guidelines.

The final sound isolation requirements should be reviewed when architectural plans are developed. Wall and window constructions should also be reviewed at this point to ensure that they will meet the required sound isolation performance.

4.3.1.2 Ventilation requirements

Based on the predicted sound levels, there is no special ventilation requirement for any of the lots in the proposed development for noise control purposes.

4.3.2 Outdoors

The unmitigated daytime sound levels at all OLAs in the proposed development are within the 55 dBA design objective of the MECP noise guidelines. Sound barriers are not required for noise control purposes.

4.3.3 Warning clauses

Warning clauses are a tool to inform prospective owners/occupants of potential annoyance due to existing noise sources. Where the guideline sound level limits are exceeded, appropriate warning clauses should be registered on title or included in the development agreement that is registered on title. The warning clauses should also be included in agreements of Offers of Purchase and Sale and lease/rental agreements to make future occupants aware of the potential noise situation.

Table 3 and the notes to Table 3 summarize the warning clauses for the site.

TABLE 3 MINIMUM NOISE ABATEMENT MEASURES

Location	Air Conditioning(1)	Exterior Wall(2)	Window STC Rating(3)	Sound Barrier(4)	Warning Clauses(5)
All residential dwellings	None	OBC	OBC	None	A

Notes:

(1) Where methods must be provided to allow windows to remain closed for noise control purposes, a commonly used technique for is the use of air conditioning. Provision for adding air conditioning typically takes the form of a ducted ventilation system suitably sized to permit the addition of central air conditioning by the occupant.

(2) STC - Sound Transmission Class Rating (Reference ASTM-E413). Analyses were based upon the assumption that wall and window areas are as indicated in Section 4.2.1.1 of this report. Requirements should be checked once floor plans have been finalized and exterior wall construction details are defined.

(3) STC values are based upon the assumption that all wall and window areas are as indicated in Section 4.2.1.1 of this report. Requirements should be checked once floor plans have been finalized and exterior wall construction details are defined.

(4) Sound barriers must be of solid construction with no gaps, cracks, or holes, and must meet a minimum surface density of 20 kg/m². Suitable material can include wood, concrete metal sandwich panel, glazing or a combination of these.

(5) The warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:

A. "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

5.0 CONCLUSIONS

With the incorporation of the recommended noise mitigation measures, the indoor and outdoor transportation noise guidelines can be met. Future occupants will be made aware of potential noise situation through warning clauses, as per MECP guidelines.

The approvals and administrative procedures are available to ensure that the noise requirements are implemented.

6.0 REFERENCES

1. PC STAMSON 5.04, "Computer Program for Road Traffic Noise Assessment", Ontario Ministry of the Environment.

2. Building Practice Note No. 56: "Controlling Sound Transmission into Buildings", by J. D. Quirt, Division of Building Research, National Council of Canada, September 1985.

3. "Sound Level Limits for Stationary Sources in Class 1 and 2 Areas (URBAN)", Ontario Ministry of the Environment, Publication NPC-205, October 1995.

4. "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, August 2013

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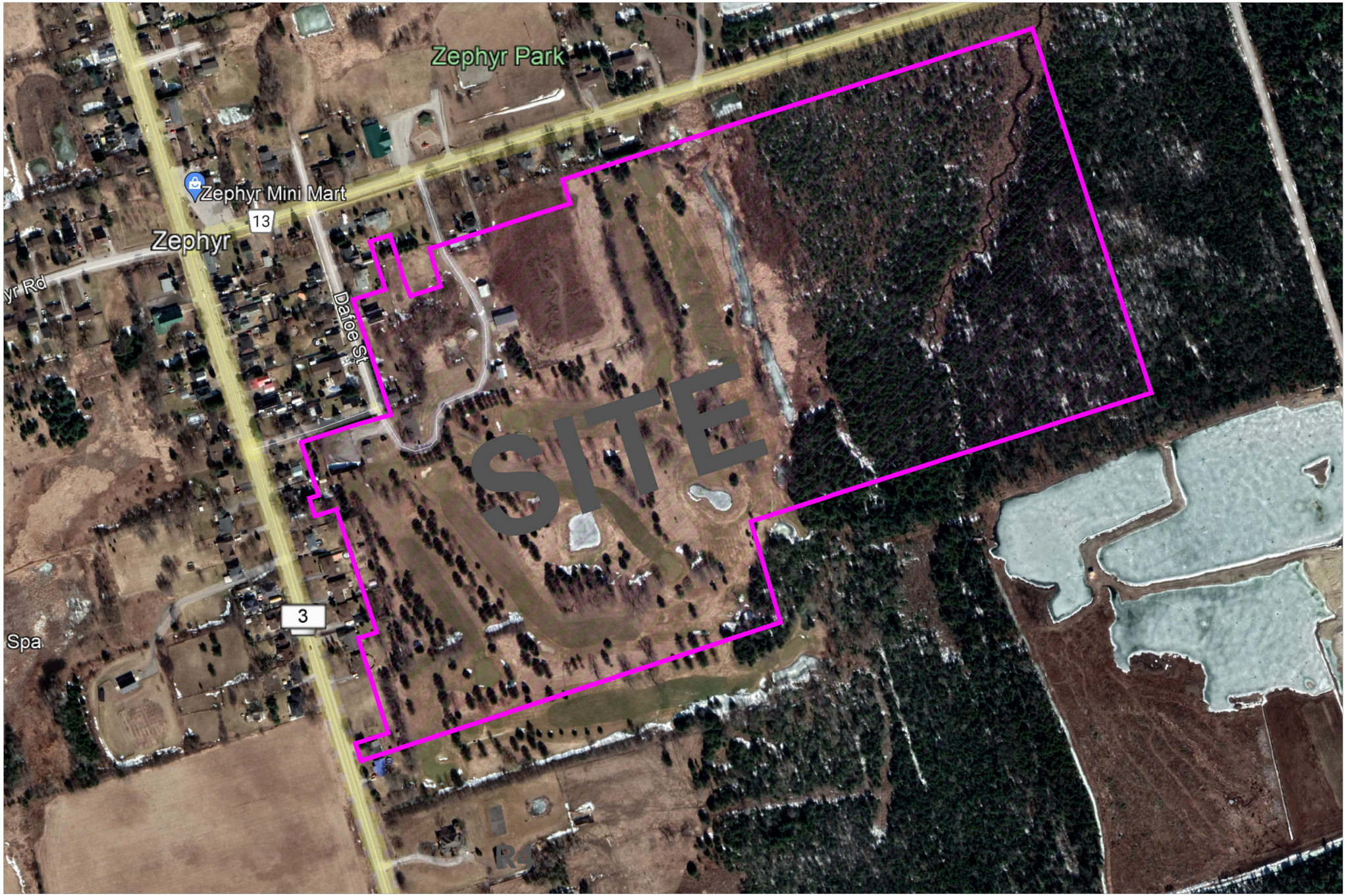

VALCOUSTICS Canada Ltd.	Title: Key Plan	Date: 2022-03-21	Figure: 1
	Project Name: Zephyr Subdivision - Phase 2	Project No.: 117-0307	

VALCOUSTICS Canada Ltd.	Title: Site Plan	Date: 2022-03-21	Figure: 2
	Project Name: Zephyr Subdivision - Phase 2	Project No.: 117-0307	

APPENDIX A
ROAD TRAFFIC DATA

Abhishek Thyagarajan

From: Chris Leitch <Chris.Leitch@Durham.ca>
Sent: September 7, 2021 10:17 AM
To: Abhishek Thyagarajan
Cc: Sam Du
Subject: RE: 1170307.000 - Zephyr Subdivision-Phase 2/Noise Feas

Hi Abhishek,

The data that was provided in 2017 is still valid for these two road sections in Zephyr for the noise impact study you are working on. I would suggest including this email as an appendix to the noise impact study in case a reviewer flags the information form as being a bit stale; we accept forms within 2-3 years but this is just a bit beyond that timeframe.

Thanks for running this by us!
Chris

Chris Leitch, MCIP, RPP | Principal Planner, Transportation Planning
Planning and Economic Development Department
The Regional Municipality of Durham
Chris.Leitch@durham.ca | 905-668-7711 extension 2567 | durham.ca

My pronouns are he/him

From: Abhishek Thyagarajan <abhishek@valcoustics.com>
Sent: September 7, 2021 9:52 AM
To: Chris Leitch <Chris.Leitch@Durham.ca>
Cc: Sam Du <sam@valcoustics.com>
Subject: 1170307.000 - Zephyr Subdivision-Phase 2/Noise Feas

Hello Chris,

We are working on a noise study for a proposed development in the South-East corner of the intersection at Zephyr Road and Concession Road 3. We previously received traffic data for this site from the Region of Durham (Please see attached).
Can you please confirm if this data is still valid? If not, could you please provide up to date data?

Please let me know if you need any other information.

Best regards,
Abhishek Thyagarajan, M.S.
Acoustic Specialist

Planning and Economic
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Brian Bridgeman, MCIP, RPP
Commissioner of Planning and
Economic Development

The Regional Municipality of Durham

ROAD SEGMENT TRAFFIC FORECASTS FOR NOISE ANALYSES

This information is to be used as the basis for assessing the potential impacts of noise, generated by traffic on Provincial Highways and arterial roads, on proposed land uses that are sensitive (e.g., residential subdivisions). Arterial roads include existing and future Type A, B and C, as designated in the Durham Regional Official Plan.

Noise assessment reports recommend specific measures to be integrated into the design of sensitive developments to reduce road noise impacts to acceptable levels.

Provided For:

Name / Name of Firm: Sami Rahman, Valcoustics

Address: 30 Wertheim Ct., Unit 25, Richmond Hill, ON

Telephone: (905) 764-5223 Fax:

Location of Proposal:

Hamlet of Zephyr (east of Concession 3, south of Zephyr Road)

Municipality: Uxbridge Lot(s): Concession:

Durham Region File No. (if available):

Name of Property Owner (if available):

Date Request Received: June-21-17 Received By: Chris Leitch

Date Forecast Sent: June-21-17

Name of Road Segment	Forecasted AADT*	No. of Lanes	% of Trucks	Heavy : Medium Truck Ratio		Speed (km/h)
Zephyr Road (RR#13), east of Concession 3	5,000	2	10	30	70	50
Concession 3 (RR #39), south of Zephyr Road	6,000	2	7	30	70	50
	0	0	0	0	0	0
	0	0	0	0	0	0

* Average Annual Daily Traffic. Forecast based on ultimate development according to the Durham Regional Official Plan.

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP)

Reference: MECP Publication NPC-300, October 2013: *"Environmental Noise Guideline, Stationary and Transportation Source – Approval and Planning"*.

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30[#]
	Stationary Source		
	Class 1 Area	07:00 to 19:00[(1)]	50[*] dBA
		19:00 to 23:00[(1)]	50[*] dBA
	Class 2 Area	07:00 to 19:00[(2)]	50[*] dBA
		19:00 to 23:00[(2)]	45[*] dBA
	Class 3 Area	07:00 to 19:00[(3)]	45[*] dBA
		19:00 to 23:00[(3)]	40[*] dBA
	Class 4 Area	07:00 to 19:00[(4)]	55[*] dBA
		19:00 to 23:00[(4)]	55[*] dBA

…./cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
		23:00 to 07:00(1)	45* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	50* dBA
		23:00 to 07:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	45* dBA
		23:00 to 07:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	60* dBA
		19:00 to 23:00(4)	60* dBA
		23:00 to 07:00(4)	55* dBA

\# may not apply to in-fill or re-development.
* or the minimum hourly background sound exposure $L_{eq(1)}$, due to road traffic, if higher.
(1) Class 1 Area: Urban.
(2) Class 2 Area: Urban during day; rural-like evening and night.
(3) Class 3 Area: Rural.
(4) Class 4 Area: Subject to land use planning authority's approval.

Reference: MECP Publication ISBN 0-7729-2804-5, 1987: *"Environmental Noise Assessment in Land-Use Planning"*.

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

APPENDIX C

SAMPLE SOUND LEVEL CALCULATIONS

```
STAMSON 5.04        NORMAL REPORT        Date: 28-09-2021 32:51:59
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: r1.te                Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: CR 3 (day/night)
----------------------------------------
Car traffic volume  :  4860/540   veh/TimePeriod  *
Medium truck volume :   378/42    veh/TimePeriod  *
Heavy truck volume  :   162/18    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   6000
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: CR 3 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  69.00 / 69.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Zephyr (day/night)
----------------------------------------
Car traffic volume  :  4185/465   veh/TimePeriod  *
Medium truck volume :   221/25    veh/TimePeriod  *
Heavy truck volume  :    94/11    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   5000
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   4.90
    Heavy Truck  % of Total Volume     :   2.10
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Zephyr (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  : 197.00 / 197.00 m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: CR 3 (day)
-------------------------------

Source height = 1.32 m

ROAD (0.00 + 48.42 + 0.00) = 48.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.58  63.19   0.00 -10.44  -4.32   0.00   0.00   0.00  48.42
-------------------------------------------------------------------------------

Segment Leq : 48.42 dBA

Results segment # 2: Zephyr (day)
---------------------------------

Source height = 1.20 m

ROAD (0.00 + 42.33 + 0.00) = 42.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  61.30   0.00 -17.66  -1.32   0.00   0.00   0.00  42.33
-------------------------------------------------------------------------------

Segment Leq : 42.33 dBA

Total Leq All Segments: 49.38 dBA

Results segment # 1: CR 3 (night)
---------------------------------

Source height = 1.32 m

ROAD (0.00 + 41.89 + 0.00) = 41.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.58  56.66   0.00 -10.44  -4.32   0.00   0.00   0.00  41.89
-------------------------------------------------------------------------------

Segment Leq : 41.89 dBA
```

```
Results segment # 2: Zephyr (night)
-----------------------------------

Source height = 1.22 m

ROAD (0.00 + 35.92 + 0.00) = 35.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  54.89   0.00 -17.65  -1.32   0.00   0.00   0.00  35.92
-------------------------------------------------------------------------------

Segment Leq : 35.92 dBA

Total Leq All Segments: 42.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.38
                           (NIGHT): 42.87
```