Noise Impact Study – Proposed Development, 2535 Munster Road, Stittsville, Ontario

September 29, 2025

Prepared for:
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Cambium Reference: 23218-001

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Version Control

Revision	Date	Revision Description	Prepared By:	Submitted To:
1	September 29, 2025	Noise Impact Study	Cambium Inc.	Hasan Ahangaran

Executive Summary

Cambium Inc. has been retained by Hasan Ahangaran, in response to a request from the City of Ottawa, to complete a noise impact study for the proposed development to be located at 2535 Munster Road, Stittsville, Ontario (the Site).

The primary source of noise with potential to impact the proposed development is a pit and quarry site to the north licensed to Thomas Cavanagh Construction Limited, commonly referred to as the Gouldbourn Quarry. Operations associated with the quarry were assessed herein, and the assessment results compared to the applicable limits, as required by *NPC-300 Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning* (NPC-300).

Cambium has also assessed noise impacts from the nearest roadways onto the proposed development in addition to the potential impact of stationary noise sources. The results of the predicted noise impacts were compared to the applicable guidelines to assess the potential impact to the proposed residential dwellings, and to determine the potentially required mitigation measures and warning clauses.

The potential noise impacts from the proposed development onto itself and onto the surrounding receptors were not considered quantitatively in the scope of this report. If required, this analysis could be completed once the design of the proposed buildings are available. Note however that NPC-300 does not apply to residential-grade heating ventilating and air conditioning systems.

Construction noise is generally exempt from planning consideration and most provincial noise guidelines and is typically constrained by municipal noise by-laws.

The results of this noise impact study indicate the proposed development is feasible based on Ministry of the Environment, Conservation and Parks Guidance, and the implementation of the recommendations of this report.

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1.0 Introduction

Cambium Inc. (Cambium) has been retained by Hasan Ahangaran, in response to a request by the City of Ottawa, to complete a noise impact study (NIS) for the proposed severance to be located at 2535 Munster Road, Stittsville, Ontario (the Site). It is understood that this study is required as part of the Mineral Resource Impact Assessment (MRIA) for the proposed development. The MRIA is prepared by Milestone Aggregate Consulting Services and is dated October 7, 2024.

Cambium has assessed the impacts from local road traffic and stationary noise sources on the proposed development following applicable guidelines, including those listed in *NPC-300 Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning* (NPC-300) (MOECC, 2013). The results of the measured and calculated noise impacts were compared against applicable guidelines to assess the impact to residential dwellings and determined the potentially required mitigation measures and warning clauses for the proposed development.

An evaluation of railway noise and vibration impacts was not conducted as the proposed development location exceeds the 75-metre vibration, and 300 metre noise influence distance published by the Rail Authorities (RAC and FCM, 2013).

An evaluation of aircraft noise impacts was not conducted as the nearest airport is at a distance greater than 10 kilometers and the proposed development is outside any noise exposure forecast (NEF) contours.

Cambium personnel conducted a site visit to collect observations of the surroundings and measurements at the Site to confirm and characterize nearby uses.

The results of the predicted noise impacts were assessed against applicable guidelines to assess the potential impact on residential dwellings.

The impacts of the proposed development onto its surrounds were not quantitatively addressed. Conceptual recommendations are provided for use during the design of the dwellings to limit the potential impact of the development on its surroundings.

2.0 Site Description

This proposed development site is located at 2535 Munster Road, Ottawa. The property is currently zoned Rural Countryside Zone (RU), which permits residential lots created by severance. The site location, with the quarry and the surrounding roadways identified is shown in Figure 1. A conceptual plan of the proposed development plan is shown in Figure 2.

The proposed development includes for the severance of the existing lot (approximately 70 ha) creating two new residential lots (approximately 0.9 ha each), with a retained parcel of 68.2 ha. The existing lot is bounded by Munster Road to the west (Munster Road is taken to run north-south in this report), Fallowfield Road to the north, and Mansfield Road to the south. The nearest adjacent properties consist of additional rural countryside, rural residential areas, the pit/quarry to the north, as well as agricultural lands to the east.

An assessment of the potential noise impact of the pit/quarry to the north is required under the City of Ottawa's Official Plan section 10.2.1, policy 3, which states that a noise feasibility study is required where a noise-sensitive use is proposed within 500 m of a quarry licensed under the *Aggregate Resources Act*.

Cambium personnel conducted a site visit on June 5, 2025. During the site visit, a noise survey was completed to identify potential sources of noise that should be considered. These include traffic noise, commercial, institutional, and industrial noise sources as applicable. During the visit, the acoustical environment consisted mostly of natural sounds, with sound from occasional road traffic as well as activity on the licensed aggerate pit/quarry to the north also audible at times. Road traffic on Munster Road and Fallowfield Road were also considered.

3.0 Assessment Criteria

For land use planning purposes, noise criteria are provided in NPC-300. The guideline limits are set for road, rail, and air traffic noise impacts onto a proposed noise sensitive land use, as well as limits for the impacts of stationary noise sources (commercial/industrial operations).

In the case of this proposed development, the pertinent limits are:

- Sound level limits for road traffic impacts onto the proposed lots,
- Sound level limits for stationary noise sources.

3.1 Road Traffic Noise Criteria

The criteria for acceptable levels of road traffic noise are provided in NPC-300. It requires that for land use compatibility, a future sound level be used for assessment. Generally, a minimum 10-year prediction is considered appropriate by NPC-300.

For road traffic impacts at the plane of window, noise controls are not specifically required if predicted sound levels are less than 55 dBA during the daytime and less than 50 dBA during the nighttime. Predicted sound levels between 1 dB and 10 dB higher than these levels (i.e., 65 dBA daytime/60 dBA nighttime) require that the dwellings be designed with at least the future provision of air conditioning, as well as a warning clause (Type C). If predicted road traffic sound levels exceed these sound levels (i.e., 66 dBA daytime/61 dBA nighttime or greater), then air conditioning is mandatory, and the building components are to be designed to limit indoor noise levels from road traffic to the targets outlined below. Warning clause Type D is also required.

Embedded Table 1 Indoor Sound Level Limits (Road Noise Criteria)

Type of Space	07:00 to 23:00 Road (dBA)	23:00 to 07:00 Road (dBA)
Living/Dining/Den Areas of Residences Indoor (NPC-300 Table C-2)	45	45
Sleeping Quarters Indoor (NPC-300 Tale C-2)	45	40

In NPC-300, an outdoor living area (OLA) is part of a noise sensitive land use (e.g. a residential dwelling) that is intended and designed for the quiet enjoyment of the outdoor environment and is readily accessible from the building.

If the 16-Hour Equivalent Sound Level, $L_{eq}(16)$ during the daytime hours in the OLA is greater than 55 dBA and less than or equal to 60 dBA, noise control measures may be applied to reduce the sound level to 55 dBA. If measures are not provided, prospective purchasers or tenants should be informed of potential noise impacts by a warning clause Type A.

If the 16-Hour daytime L_{eq} (16) in the OLA is greater than 60 dBA, noise control measures should be implemented to reduce the level to 55 dBA. Only in cases where the required noise control measures are not feasible for technical, economic, or administrative reasons would an excess above the limit (55 dBA) be acceptable with a warning clause Type B. In the above situations, any excess above the limit will not be acceptable if it exceeds 5 dBA.

3.2 Stationary Noise Sources

NPC-300 Part C provides limits for stationary noise source impacts onto proposed residential, or noise sensitive institutional/commercial developments. Receptors are classified as Class 1, Class 2, Class 3 or Class 4. A summary of the characteristics of these areas is as follows:

- Class 1: an urban area, where the background sound level is dominated by road traffic and human activity (often referred to as “urban hum”).
- Class 3: a rural area, where the background sound is dominated by natural sounds, and little/no road traffic.
- Class 2: an acoustical environment having characteristics of both Class 1 and Class 3 areas, often similar to a Class 1 area during the daytime hours, and similar to a Class 3 area during the evening and nighttime hours.
- Class 4: a special area class, intended to provide enhanced flexibility between existing, lawfully operating stationary sources and new, noise sensitive uses on lands intended for such development.

Based upon site observations, site measurements, existing nearby land use, and distance from points of reception to significant roadways, the area in the vicinity of the Site is best described as Class 3 (rural).

NPC-300 provides exclusionary limit values for steady sounds for each area class and time period, in terms of the single-hour equivalent sound level (the $L_{eq}(1)$) during a "predictable worst-case noise impact" may occur. If the current background sound level (measured or predicted in accordance with Ministry guidelines) exceeds these exclusionary limits, the background noise level becomes the applicable criteria.

In this case, traffic volumes on the roads in the vicinity of the site are relatively low, such that the background sound level is not expected to exceed these exclusionary limits; consequently, the exclusionary limits are the applicable criteria.

The exclusionary limit values for steady stationary noise sources in a Class 3 area are summarized below:

Embedded Table 2: Exclusionary Limit Values at Points of Reception, Class 3, Steady Noise Sources

Location	Time of Day		
	07:00-19:00	19:00-23:00	23:00-07:00
Outdoor Points of Reception	45	40	--
Plane of Window	45	40	40

Impulsive sounds are assessed separately from steady noise sources, in terms of the logarithmic mean impulse sound level (the L_{LM}). The associated exclusionary limit values for impulsive sources are dependent on the number of impulses that occur during a worst-case hour. The impulsive exclusionary limit values are summarized below.

Embedded Table 3: Exclusionary Limit Values at Points Of Reception, Class 3, Impulsive Noise Sources

Location	Time of Day	Number of Impulses Per Hour						
		1	2	3	4	5 to 6	7 to 8	9 +
Outdoor Points of Reception	07:00-23:00	75	70	65	60	55	50	45
Plane of Window	07:00-19:00	75	70	65	60	55	50	45
Plane of Window	19:00-23:00	70	65	60	55	50	45	40

4.0 Impact of the Environment on the Proposed Lots

Cambium has completed an assessment of the potential for noise impacts onto the sensitive land use within the Proposed Development from the surrounding environment, including road noise and stationary noise sources.

4.1 Future Traffic Noise Assessment

The future traffic noise assessment was conducted using the *Ontario Road Noise Assessment Method for Environment and Transportation* (ORNAMENT). This method was implemented using the STAMSON Calculation program.

4.1.1 Road Traffic Data

The road traffic data used for the road noise assessment was obtained from the City of Ottawa's Open Data portal (Open Ottawa). The AADT value for Munster Road was obtained directly, and an AADT value for the intersection of Conley and Fallowfield Roads was obtained; conservatively, it was assumed that 100% of the traffic at this intersection travelled along Fallowfield Road. The AADT values were forecasted to 2035 at 2% growth per year according to Ministry preferences. Cambium has used the ORNAMENT recommended day/night split of 90%/10% for regional roads, which assumes 90 percent of the daily traffic occurs between 07:00 and 23:00. Cambium also assumed a medium truck percent of 7% and 5% for heavy trucks (as per the City of Ottawa's Environmental Noise Control Guideline, Table B1); these truck ratios are conservatively high, used in the absence of specific data.

4.1.2 Traffic Noise Impact Predictions - Building Façades

The projected noise impacts from nearby roadways are calculated at the building façade. The results are then compared to the applicable limits and used to recommend building façade requirements if required.

The proposed severance includes for the development of dwellings on each of the new properties; two-storey dwellings are permitted by the current zoning. Each plane of window receptor was assessed at the height of a second-storey window (4.5 m)

The calculations and results of Cambium's analysis are summarized in appended Tables 1 and 2. Traffic data and all calculations are provided in Appendix A.

The maximum predicted plane of window sound levels are 58 dBA (daytime) and 52 dBA (nighttime) at both of the proposed dwellings. As noted in Section 3.1, this requires that the dwellings be designed with provisions for the future installation of central air conditioning (or another means of mechanical cooling) which will allow occupants to keep windows closed (if such a system is not provided initially). Warning Clause Type C is also recommended.

Because the predicted road traffic sound levels are less than 65 dBA (daytime) and less then 60 dBA (nighttime), no specific requirements apply for the acoustical performance of the building components; typical construction meeting the requirements of the Ontario Building Code (OBC) will be sufficient to limit road traffic noise indoors.

4.1.3 Traffic Noise Impact Predictions – Outdoor Living Spaces

With regard to OLA's at the Site, based on Cambium's review, only the backyards of the proposed lots were considered, per NPC-300 conditions.

As noted in Section 3.1, the traffic sound level limits for the OLA of noise sensitive land uses are 55 dBA during daytime hours (7:00-23:00), though a minor excess (up to 60 dBA) is considered acceptable, with the inclusion of a suitable warning clause. One OLA was assessed at each proposed lot, at a height of 1.5 m, at the north end of the assumed rear yard (nearest to Fallowfield Road). The results of Cambium's analysis are summarized in appended Table 1. Traffic data and all calculations are provided in Appendix A.

4.2 Stationary Noise Impact Predictions

The following relates to the impacts of existing stationary noise sources in the vicinity onto the proposed development. NPC-300 states that a proposed noise sensitive land use is required to ensure that compliance is maintained for any nearby approved stationary noise source. Ontario Regulation 528/98 exempts many types of smaller stationary noise sources from approval. Therefore, many nearby businesses may not have approvals in place. However as outlined in NPC-300 an exemption from approval does not mean exemption from compliance with noise guidelines in the context of land use planning, so Cambium has reviewed all nearby

industrial and commercial operations, as well as those that have approvals or registrations in place.

During Cambium's site visit in June 2025, all off-site facilities that pose a potential concern with respect to noise were identified. Only one such facility was identified, the Goulbourn pit/quarry to the north of the Site operated by Thomas Cavanagh Construction (the Pit). It is noted that there are residential dwellings closer to the Pit than the proposed development and the Pit's noise impact must comply with NPC-300 at these dwellings, though it is understood that this rationale alone is not considered acceptable.

4.2.1 Noise Modelling Methodology

Where applicable, noise modelling has been conducted with sources that best represent the potential noise sources associated with the facility of concern.

Potential were performed using the DataKustik CadnaA Version 2025 (CadnaA) noise modelling software running the Ministry accepted calculation method ISO 9613-2 *Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation* (ISO, 1996). All software settings follow Ministry preferences with regards to temperature, humidity, line-of-sight for barriers and meteorological correction.

4.2.2 Thomas Cavanagh Construction Goulbourn Quarry

As described above, an aggregate pit/quarry (the Pit) is located to the north of the site, at 7676 Flewellyn Rd, Stittsville. The Pit operates under an aggregate license, ALPS ID 4114. The Site is located approximately 380 m from the south property line of the Pit, though the Pit includes an additional buffer zone of approximately 130 m from the south property line, within which no more extraction will occur. It is Cambium's understanding that mineral extraction at the south end of the Pit is complete, and that these areas are now used as infill for excess soil. This infilling activity (backfill and grading) is anticipated to fall within the rehabilitation scope of the facility's license, and is thus best characterized as construction activity (which would not require assessment under NPC-300). However, noise sources associated with this activity have been included in this assessment as a conservative measure.

Typical extraction operations are ongoing within the northern areas of the Pit. The Pit's advertised operational hours are from 06:00 to 18:00 (i.e., all hours of the daytime, and one hour of the nighttime).

Cambium's understanding of the operations, combined with an analysis of available imagery, photos, and our experience with this type of operation, led to the identification of the following assumed sources for inclusion in the noise impact calculations.

- TR01 – A point source representing an idling truck importing fill near the southwest corner of the Pit. This has been conservatively modelled as operating 100% of any one-hour period during the daytime hours (7:00 – 19:00). During the operational nighttime period (06:00 – 07:00), this has been modelled as occurring 50% of the full hour.
- TR02 – A point source representing an idling truck being loaded with extracted material at the north end of the pit. This has been conservatively modelled as operating 100% of any one-hour period during the daytime hours (7:00 – 19:00). During the nighttime hour (06:00 – 07:00), this has been modelled as occurring 50% of the full hour.
- TR03 – A line source representing trucks moving within the Pit for the purpose of importing fill at the southwest corner of the site; trucks enter the site from the south entrance off of Fallowfield Road, travel to the southwest corner, and drive through the rest of the site, exiting at the northern site access on Flewellyn Road. This has been modelled as potentially 12 truck movements within a one-hour period during the daytime, and 6 truck movements in a one-hour period during the nighttime.
- TR04 – A line source representing trucks moving around the Pit for the purpose of transporting extracted material. Trucks were assumed to enter the site from the south entrance off of Fallowfield Road, drive northwards to the loading area, and exit at the northern site access on Flewellyn Road. This has also been modelled as potentially 12 truck movements within a one-hour period during the daytime, and 6 truck movements in a one-hour period during the nighttime.
- SCR01 – A point source representing a screening plant at the north end of the facility, near the main site access. This has been modelled to potentially operate for 100% of any single-hour during the daytime or nighttime.

- CRSHR01 – A point source representing a crusher operating at the north end of the facility. This has been modelled to potentially operate for 100% of any single-hour during the daytime or nighttime.
- DR01 – A point source representing operation of a rock drill near the northern limit of the facility. The rock drill is assumed to operate continuously for a daytime hour.
- LDR01 – A moving source representing loader movement at the southwest corner of the site to process imported fill material. This has been modelled as potentially 2 loaders operating continuously within an hour period during the daytime and 1 loader operating continuously during the nighttime hour.
- LDR02 – A moving source representing loader movement at the north end of the site to move extracted material to the crusher, and to load processed material into trucks. This has been modelled as potentially 2 loaders operating continuously within a one hour period during daytime and nighttime hours.
- DZ01 – A moving source representing bulldozer movement at the southwest corner end of the site to process imported fill material. This has been modelled as potentially 2 dozers operating continuously within an hour period during the daytime and 1 dozer operating continuously during the nighttime hour.
- IMP01 – A point source representing impulsive noise generated from the tailgate of a dump truck slamming against the dump body as it is lowered (fill import trucks only), located in approximately the same location as TR01. This source has been modeled as occurring with the same frequency as the fill import truck movements (12 impulses during a daytime hour, and 6 movements during a nighttime hour).

4.2.3 Stationary Noise Impact Results

A noise source summary is provided in Table 3. The noise modelling impact results are summarised in Table 4. Based upon the predicted noise impacts, the predicted noise levels at the potential sensitive land use are less than the applicable limits. As noted above, there are existing sensitive residential uses closer to the Pit than that would experience similar or greater noise impacts.

5.0 Impact of the Proposed Development on the Environment

The design of the proposed development has not progressed to the design of the dwellings, and thus mechanical equipment configurations are unknown. As this proposed development includes single detached homes, no significant noise sources that require analysis for land use planning under NPC-300 are expected.

The only sources of stationary noise associated with a typical detached dwelling include heating, ventilation, and air conditioning (HVAC) equipment (typically an outdoor condenser). If only residential type systems are installed, they are not considered noise sources by NPC-300.

NPC-300 recommends that residential air conditioning systems comply with MECP Guideline NPC-216 and the Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices (Ontario Ministry of Environment and Energy, 1994) and/or the local noise bylaw (discussed below). Note that residential air conditioning systems are routinely implemented and are not a land use planning concern.

5.1 Local Noise Bylaw

The City of Ottawa's Noise By-Law will be applicable to certain activities associated with the proposed development; several relevant clauses are reproduced below:

- *No person shall cause or permit any bass noise, unusual noise or noise likely to disturb the inhabitants of the City.*
- *No person shall use or operate or cause to be used or operated any air conditioner, heat pump, compressor, condenser, chiller, cooling tower or similar device, the noise from which has a level greater than 50 dB(A) when measured at the point of reception.*
- *No person shall operate or cause to be operated any power equipment such as chainsaws, power lawnmowers, leaf blowers, power tools or other similar devices, between 2100 hours of one day and 0700 hours of the next day, the noise from which disturbs or tends to disturb the inhabitants of the neighbourhood, or persons in the vicinity. No person shall operate or cause to be operated any power equipment before 0900 hours on any Saturday, Sunday, statutory or public holiday.*

Most of these source types are exempt from NPC-300 and are not considered land use planning concerns. The Local noise bylaw will be enforceable and will provide recourse to any land users that are disturbed by these types of sources.

6.0 Summary of Recommendations

In summary Cambium has made the following recommendations:

- Layout of the proposed development site may affect the environmental impacts and land use compatibility. This noise impact study should be updated if significant changes are made to the development plan.
- It is recommended that some type of verification procedure be considered to confirm that the implementation and consideration of the recommendations of this report are implemented during construction either by design team professionals, or acoustic professionals. This type of verification is often completed at site plan approval, or as a condition of site plan approval, or building permit. In this case, the required acoustical performance of the building components can be met with building code compliant construction.
- All the required warning clauses are detailed in Appendix B. Note that the actual implementation and wording of the warning clauses into any agreements is a legal and planning issue. Ministry guidance suggests that whatever method is used for warning clauses that the consideration of warning all future tenants or owners of the property be made. The wording provided in this report is as the wording for warning clauses is shown in NPC-300.
- The potential noise impacts from the proposed development onto itself and onto the surrounding receptors were not considered quantitatively in the scope of this report as residential air conditioners are exempt from NPC-300 and therefore not considered a land use planning issue. Given the nature of the development, we would suggest the designer consider NPC-216 when laying out the air conditioning systems.
- While not a land use compatibility issue, the project should be aware of and comply with the local noise bylaw during construction. The bylaw will also apply to the homes once constructed.

7.0 Closing

Cambium Inc. has been retained by Hasan Ahangaran, in response to a request by the City of Ottawa to complete a Noise Impact Study for the proposed land severance.

The results of this noise impact study indicate the proposed development is feasible provided Cambium's recommendations are implemented. Specific controls and warning clauses are required.

Cambium relies on information provided by others in completing our work. Based on the terms and the information provided to Cambium, it is our opinion that the proposed development can be developed in a manner that will comply with NPC-300 and is therefore compatible from a noise perspective.

Respectfully submitted,

Cambium Inc.

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9.0 Standard Limitations

Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

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The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

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When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

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A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in a report prepared by Cambium, are beyond the scope of the work performed by Cambium and such matters have not been investigated or addressed.

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Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

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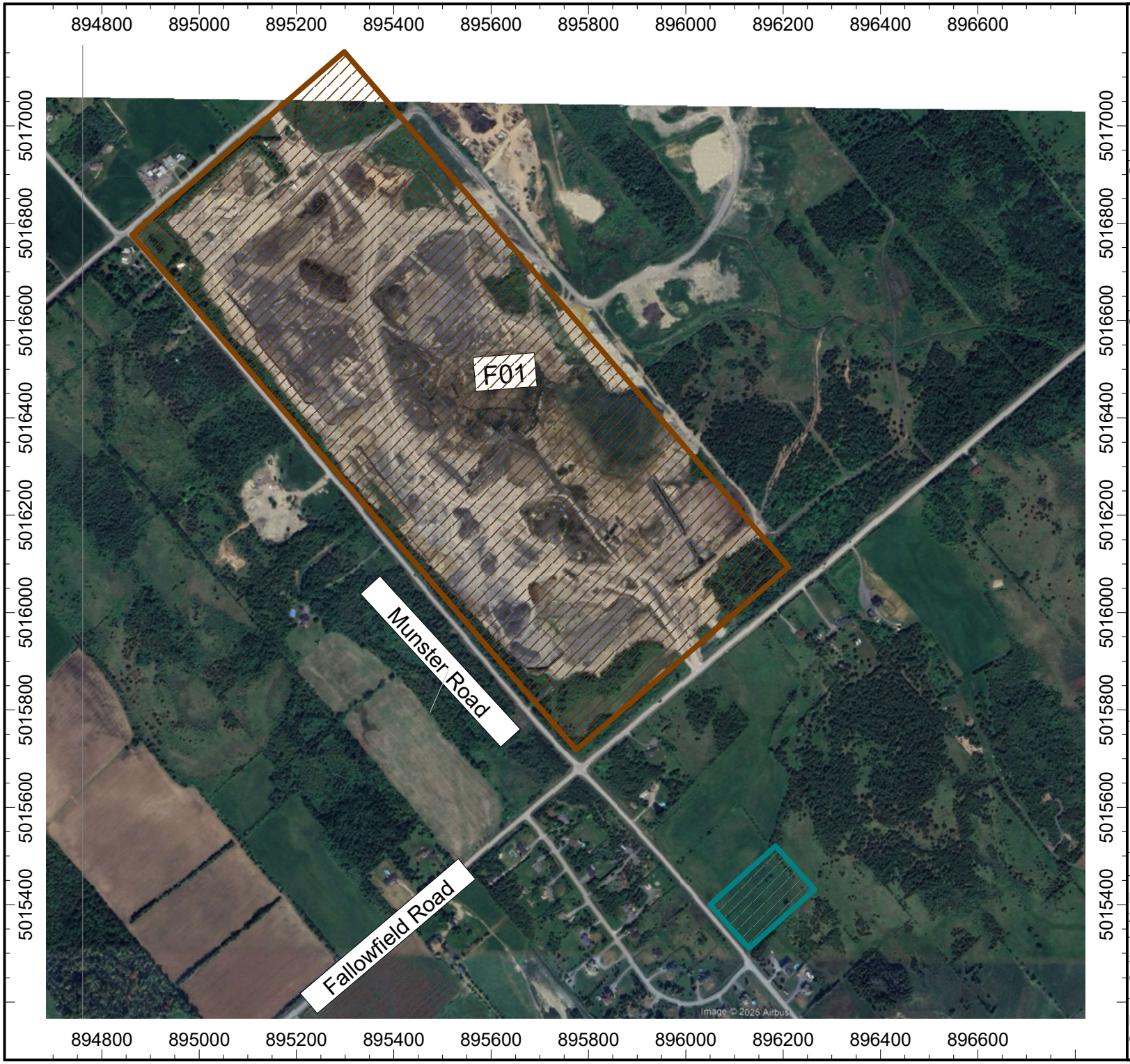
The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.

Appended Figures



Noise Feasibility Study

Hasan Ahangaran
2535 Munster Road
Stittsville, ON

Grid Legend

- ... < 45 dBA
- 45 <= ... < 50 dBA
- 50 <= ... < 55 dBA
- 55 <= ... < 60 dBA
- 60 <= ... < 65 dBA
- 65 <= ... dBA

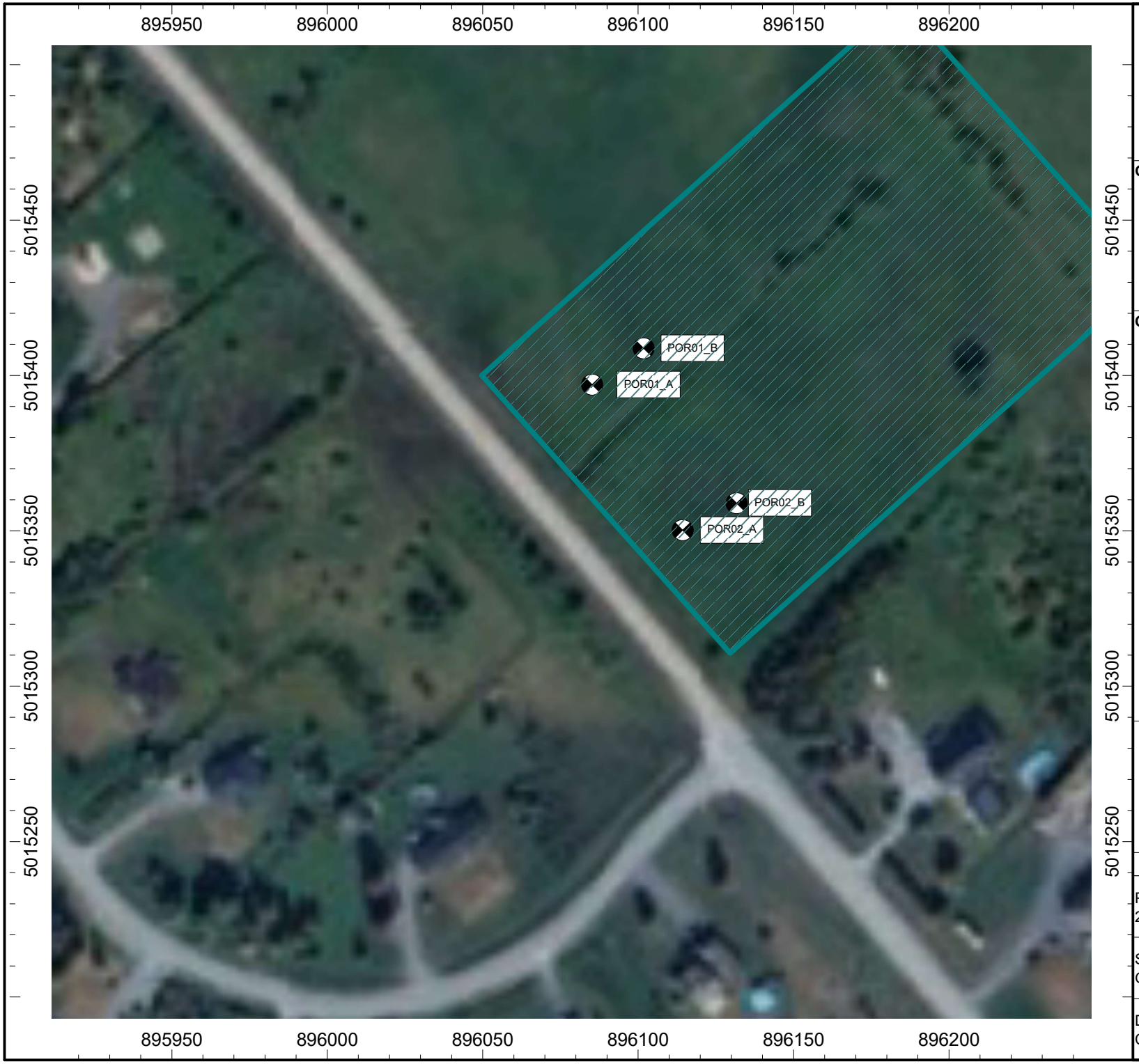
Object Legend

- Point Source
- Line Source
- Area Source
- Embankment
- Ground Absorption
- Receiver
- Calculation Area

CAMBIUM
194 Sophia Street
Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
www.cambium-inc.com

Site Context Plan

Project Number 23218-001	Date: 2025-09-22 Rev:
Scale: 1:10813 Grid Height: 1.50 m	N
Drawn By: ADD Checked By:	Figure



Noise Feasibility Study

Hasan Ahangaran
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- ... < 45 dBA
- 45 <= ... < 50 dBA
- 50 <= ... < 55 dBA
- 55 <= ... < 60 dBA
- 60 <= ... < 65 dBA
- 65 <= ... dBA

Object Legend

- Point Source
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- Area Source
- Embankment
- Ground Absorption
- Receiver
- Calculation Area

CAMBIUM
194 Sophia Street
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www.cambium-inc.com

Receptor Identification

Project Number 23218-001	Date: 2025-09-22 Rev:
Scale: 1:1694 Grid Height: 1.50 m	N
Drawn By: ADD Checked By:	Figure

Appended Tables

Table 1 - Future Traffic (Road) Noise Calculations

Source	Existing AADT [1]	Traffic Breakdown, (Day/Night) [2, 3]			Receptor	Notes	Predicted Sound Level (dBA) [4]	
		Cars	Med. Trucks	Heavy Trucks			Day	Night
POR01_A	1463	1441/160	115/13	82/9	30 m from Munster Road	4.5 m Height, Front	58	52
	2541	2552/284	203/23	145/16	414 m from Fallowfield Road	4.5 m Height, Side		
POR02_A	1463	1441/160	115/13	82/9	30 m from Munster Road	4.5 m Height, Front	58	52
	2541	2552/284	203/23	145/16	471 m from Fallowfield Road	4.5 m Height, Side		
POR01_B	1463	1441/160	115/13	82/9	55 m from Munster Road	1.5 m Height, Rear Yard	53	
	2541	2552/284	203/23	145/16	414 m from Fallowfield Road	1.5 m Height, Rear Yard		
POR02_B	1463	1441/160	115/13	82/9	55 m from Munster Road	1.5 m Height, Rear Yard	53	
	2541	2552/284	203/23	145/16	471 m from Fallowfield Road	1.5 m Height, Rear Yard		

1 - AADT (2023/2024) from City of Ottawa GIS, forecasted at 2% growth to 2035.

2 - Truck percentage by reference to City of Ottawa Noise Control Guideline, Table B1, applied as medium (7%) and heavy (5%) truck percentage.

3 - Generally, 90%/10% day-night split from Ministry ORNAMENT for "Regional Roads".

4 - If specified, predicted Levels for side windows and rear windows based on MECP assumption of 3 dB reduction for side walls and 15 dB reduction for rear

Table 2 - Road Noise - Results Summary and Noise Controls

Receptor	Description	Noise Impact (dBA, Leq)			
		07:00 to 23:00		23:00 to 07:00	
		Road	Minimum Controls	Road	Minimum Controls
POR01_A	West Facing WIndow	58	Warning Clause C + Provision AC	52	Warning Clause C + Provision AC
POR02_A	West Facing WIndow	58	Warning Clause C + Provision AC	52	Warning Clause C + Provision AC
POR01_B	Outdoor Living Area	53	NONE	-	NONE
POR02_B	Outdoor Living Area	53	NONE	-	NONE

Notes
WC - Warning Clause
Implement AC - Ensure central air conditioning is installed
Design AC - Ensure it is possible for tenant to upgrade to central air conditioning in future
STC - Indicates windows and walls should be acoustically designed to meet indoor noise targets Per NPC-300
OBC - Ontario building code, NPC-300 indicates standard construction should be satisfactory
Controls - Indicates that controls should be considered for OLA

Table 3 - Noise Source Summary

Source ID	Source Description	Sound Power Level [dBA]	Data Source	Equipment Location	Operating Times Day/Eve/Night (min/hr)	Number of Moving Point Sources Day/Eve/Night (per hour)	Noise Quality	Noise Control	UTM Easting [m]	UTM Northing [m]	Height Above Roof (RF) or Ground (GR)
CRSHR01	Crusher	115	Cambium Library	Quarry North	60/0/60	N/A	SS	N/A	895191	5016851	2.5 (GR)
SCR01	Screening Plant	119	Cambium Library	Quarry North	60/0/60	N/A	SS	N/A	895198	5016855	2.5 (GR)
TR01	Import Truck Idle	96	Cambium Library	Quarry South	60/0/30	N/A	SS	N/A	895625	5016097	2.5 (GR)
TR02	Extraction Truck Idle	96	Cambium Library	Quarry North	60/0/30	N/A	SS	N/A	895208	5016860	2.5 (GR)
IMP01	Tailgate Bang	120	Cambium Library	Quarry South	60/0/60	N/A	SS	N/A	895586	5016108	2.0 (GR)
DR01	Rock Drill	118	Cambium Library	Quarry North	60/0/0	N/A	SS	N/A	895067	5016868	2.0 (GR)
TR03	Truck Importing Fill	101	Cambium Library	Quarry South	60/60/60	12/0/6	SS	N/A	895669	5016131	2.5 (GR)
TR04	Extraction Truck	101	Cambium Library	Quarry North	60/60/60	12/0/6	SS	N/A	895250	5016926	2.5 (GR)
LDR01	Loader - Imported Fill Area	102	Cambium Library	Quarry South	60/60/60	1/0/1	SS	N/A	895755	5016164	2.5 (GR)
LDR02	Loader - Extraction Area	102	Cambium Library	Quarry North	60/60/60	2/0/1	SS	N/A	895360	5016621	2.5 (GR)
EXC	Excavator - Extraction Area	100	Cambium Library	Quarry North	60/60/60	2/0/1	SS	N/A	895360	5016621	2.5 (GR)
DZ01	Dozer - Imported Fill Area	106	Cambium Library	Quarry South	60/60/60	1/0/1	SS	N/A	895754	5016164	2.5 (GR)

CAMBIUM

Table 4A - Acoustic Assessment Summary - Steady Sources

POR Description	POR ID	POR Type	UTM Easting [m]	UTM Northing [m]	Height Above Roof (RF) or Ground (GR) [m]	Level Day [dBA]	Level Evening [dBA]	Level Night [dBA]	Verified By Acoustic Audit	Limit Day [dBA]	Limit Evening [dBA]	Limit Night [dBA]	Compliant With Limit
POR01_A	POR01_A	POW	896085	5015397	4.5 (GR)	41	-64	39	No	45	40	40	Yes
POR02_A	POR02_A	POW	896114	5015350	4.5 (GR)	40	-65	38	No	45	40	40	Yes
POR01_B	POR01_B	OPOR	896132	5015359	1.5 (GR)	38	-67	37	No	45	46	-	Yes
POR02_B	POR02_B	OPOR	896102	5015409	1.5 (GR)	39	-66	37	No	45	46	-	Yes

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Table 4B - Acoustic Assessment Summary - Impulsive Sources

POR Description	POR ID	POR Type	UTM Easting [m]	UTM Northing [m]	Height Above Roof (RF) or Ground (GR) [m]	Level Day [dBA]	Level Evening [dBA]	Level Night [dBA]	Verified By Acoustic Audit	Limit Day [dBA]	Limit Evening [dBA]	Limit Night [dBA]	Compliant With Limit
POR01_A	POR01_A	POW	896085	5015397	4.5 (GR)	45	-80	45	No	45	-	50	Yes
POR02_A	POR02_A	POW	896114	5015350	4.5 (GR)	45	-80	45	No	45	-	50	Yes
POR01_B	POR01_B	OPOR	896132	5015359	1.5 (GR)	42	-80	42	No	45	-	-	Yes
POR02_B	POR02_B	OPOR	896102	5015409	1.5 (GR)	43	-80	43	No	45	-	-	Yes

Appendix A

Traffic Data and ORNAMENT Outputs

Transportation Intersection Volume 2023

Private Member
City of Ottawa

Summary

Data includes: intersection volume totals, date of collection and Intersection location name.

View Full Details

Download

Details

Dataset
Feature Layer

April 6, 2024
Info Updated

April 3, 2024
Data Updated

April 3, 2024
Published Date

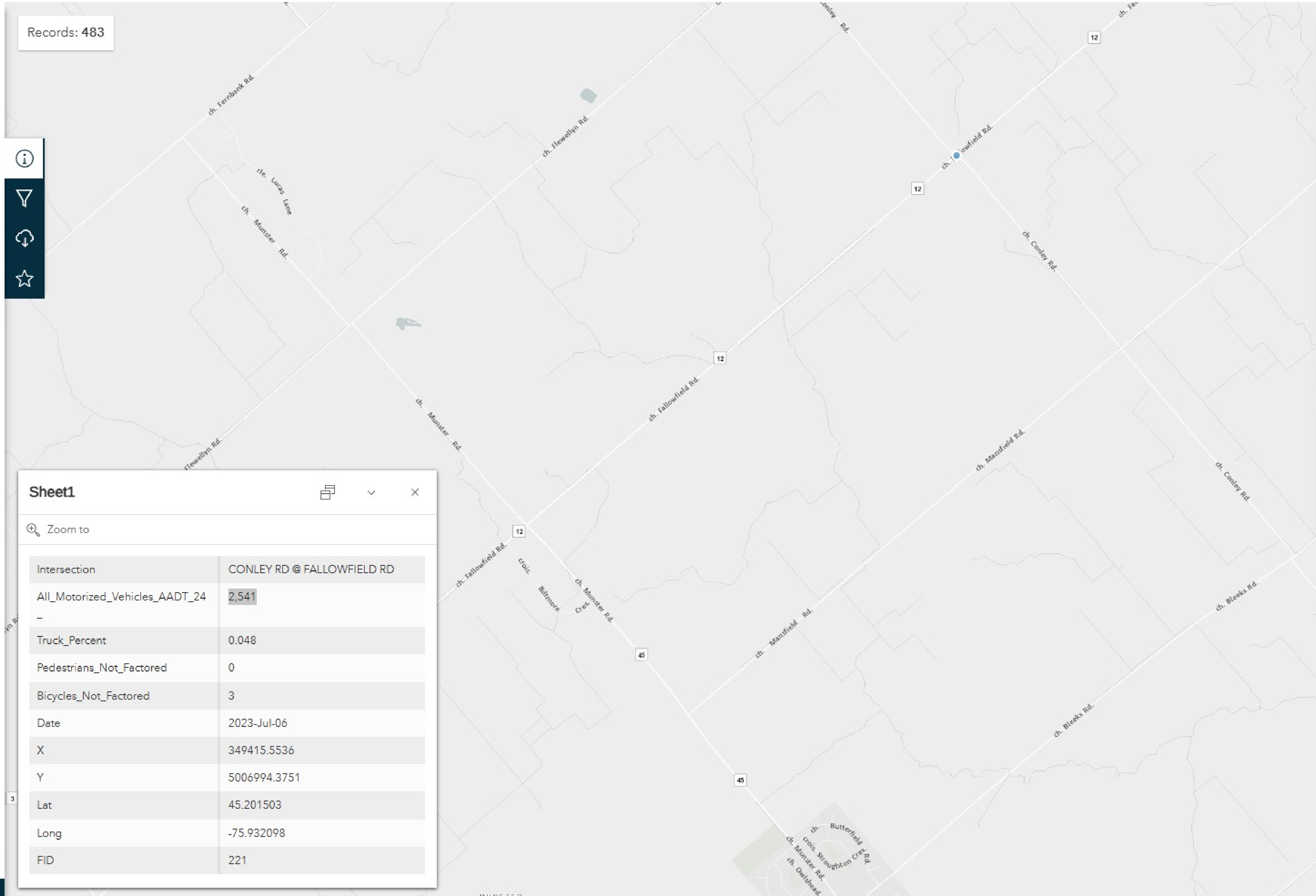
Records: 483
View data table

Public
Anyone can see this content

Custom License
View license details

I want to use this

Records: 483



Sheet1

Zoom to

Intersection	CONLEY RD @ FALLOWFIELD RD
All_Motorized_Vehicles_AADT_24 –	2,541
Truck_Percent	0.048
Pedestrians_Not_Factored	0
Bicycles_Not_Factored	3
Date	2023-Jul-06
X	349415.5536
Y	5006994.3751
Lat	45.201503
Long	-75.932098
FID	221

Transportation Midblock Volumes 2024

Private Member
City of Ottawa

Summary

Data includes: midblock volume totals (AADT) and Intersection location name.

View Full Details

Download

Details

Dataset
Feature Layer

May 13, 2025
Info Updated

May 13, 2025
Data Updated

May 13, 2025
Published Date

Records: 895
View data table

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Records: 895

MANSFIELD

12

45

45

STAPLEDON

Sheet1

Zoom to

OBJECTID__	591
Shape__	Point
Geo_ID	__3Z0926
Midblock	MUNSTER RD btwn BLEEKS RD & DOGWOOD DR (__3Z0926)
AADT_Year	2,024
Volume	1,463
x	348924.03125
y	5002813.5
Lat	45.16392135620117
Long	-75.93872833251953
FID	479

```
STAMSON 5.0        NORMAL REPORT        Date: 16-07-2025 13:57:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n_ola.te             Time Period: 16 hours
Description: Outdoor Living Area, North Parcel


Road data, segment # 1: Munster
-------------------------------
Car traffic volume  :  1441 veh/TimePeriod
Medium truck volume :   115 veh/TimePeriod
Heavy truck volume  :    82 veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Munster
-----------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  55.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: Fallow
-------------------------------
Car traffic volume  :  2552 veh/TimePeriod
Medium truck volume :   203 veh/TimePeriod
Heavy truck volume  :   145 veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Fallow
-----------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 414.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: Munster
```

Source height = 1.50 m

ROAD (0.00 + 52.41 + 0.00) = 52.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.24	0.00	-9.37	-1.46	0.00	0.00	0.00	52.41

Segment Leq : 52.41 dBA

↟

Results segment # 2: Fallow

Source height = 1.50 m

ROAD (0.00 + 40.34 + 0.00) = 40.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.71	0.00	-23.92	-1.46	0.00	0.00	0.00	40.34

Segment Leq : 40.34 dBA

Total Leq All Segments: 52.67 dBA

↟

TOTAL Leq FROM ALL SOURCES: 52.67

↟

↟

```
STAMSON 5.0        NORMAL REPORT        Date: 16-07-2025 15:02:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n_pow.te             Time Period: Day/Night 16/8 hours
Description: Plane of Window, North Parcel


Road data, segment # 1: Munster (day/night)
-------------------------------------------
Car traffic volume  :  1441/298   veh/TimePeriod
Medium truck volume :   115/13    veh/TimePeriod
Heavy truck volume  :    82/9     veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Munster (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  :  30.00 / 30.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: Fallow (day/night)
------------------------------------------
Car traffic volume  :  2552/284   veh/TimePeriod
Medium truck volume :   203/23    veh/TimePeriod
Heavy truck volume  :   145/16    veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Fallow (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  : 414.00 / 414.00 m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: Munster (day)
```

Source height = 1.50 m

ROAD (0.00 + 57.21 + 0.00) = 57.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.24	0.00	-4.73	-1.30	0.00	0.00	0.00	57.21

Segment Leq : 57.21 dBA

↑

Results segment # 2: Fallow (day)

Source height = 1.50 m

ROAD (0.00 + 41.79 + 0.00) = 41.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.71	0.00	-22.62	-1.30	0.00	0.00	0.00	41.79

Segment Leq : 41.79 dBA

Total Leq All Segments: 57.33 dBA

↑

Results segment # 1: Munster (night)

Source height = 1.30 m

ROAD (0.00 + 51.52 + 0.00) = 51.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	57.58	0.00	-4.74	-1.31	0.00	0.00	0.00	51.52

Segment Leq : 51.52 dBA

↑

Results segment # 2: Fallow (night)

Source height = 1.49 m

ROAD (0.00 + 35.26 + 0.00) = 35.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq

```
-------------------------------------------------------------------------------
   -90     90   0.57  59.19   0.00 -22.63  -1.30   0.00   0.00   0.00  35.26
-------------------------------------------------------------------------------

Segment Leq : 35.26 dBA

Total Leq All Segments: 51.62 dBA

↑



TOTAL Leq FROM ALL SOURCES (DAY): 57.33
                           (NIGHT): 51.62
↑
↑
```

```
STAMSON 5.0        NORMAL REPORT        Date: 16-07-2025 13:57:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s_ola.te             Time Period: 16 hours
Description: Outdoor Living Area, South Parcel


Road data, segment # 1: Munster
-------------------------------
Car traffic volume  :  1441 veh/TimePeriod
Medium truck volume :   115 veh/TimePeriod
Heavy truck volume  :    82 veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Munster
-----------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  55.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: Fallow
-------------------------------
Car traffic volume  :  2552 veh/TimePeriod
Medium truck volume :   203 veh/TimePeriod
Heavy truck volume  :   145 veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Fallow
-----------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 471.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: Munster
```

Source height = 1.50 m

ROAD (0.00 + 52.41 + 0.00) = 52.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.24	0.00	-9.37	-1.46	0.00	0.00	0.00	52.41

Segment Leq : 52.41 dBA

Results segment # 2: Fallow

Source height = 1.50 m

ROAD (0.00 + 39.41 + 0.00) = 39.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.71	0.00	-24.85	-1.46	0.00	0.00	0.00	39.41

Segment Leq : 39.41 dBA

Total Leq All Segments: 52.62 dBA

TOTAL Leq FROM ALL SOURCES: 52.62

```
STAMSON 5.0        NORMAL REPORT        Date: 16-07-2025 13:58:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s_pow.te             Time Period: Day/Night 16/8 hours
Description: Plane of Window, South Parcel


Road data, segment # 1: Munster (day/night)
-------------------------------------------
Car traffic volume  :  1441/298   veh/TimePeriod
Medium truck volume :   115/13    veh/TimePeriod
Heavy truck volume  :    82/9     veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Munster (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  :  30.00 / 30.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: Fallow (day/night)
------------------------------------------
Car traffic volume  :  2552/284   veh/TimePeriod
Medium truck volume :   203/23    veh/TimePeriod
Heavy truck volume  :   145/16    veh/TimePeriod
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Fallow (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  : 471.00 / 471.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: Munster (day)
```

Source height = 1.50 m

ROAD (0.00 + 57.64 + 0.00) = 57.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.48	63.24	0.00	-4.46	-1.14	0.00	0.00	0.00	57.64

Segment Leq : 57.64 dBA

↑

Results segment # 2: Fallow (day)

Source height = 1.50 m

ROAD (0.00 + 42.42 + 0.00) = 42.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.48	65.71	0.00	-22.16	-1.14	0.00	0.00	0.00	42.42

Segment Leq : 42.42 dBA

Total Leq All Segments: 57.77 dBA

↑

Results segment # 1: Munster (night)

Source height = 1.30 m

ROAD (0.00 + 51.95 + 0.00) = 51.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	57.58	0.00	-4.47	-1.15	0.00	0.00	0.00	51.95

Segment Leq : 51.95 dBA

↑

Results segment # 2: Fallow (night)

Source height = 1.49 m

ROAD (0.00 + 35.89 + 0.00) = 35.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq

```
-------------------------------------------------------------------------------
   -90     90   0.48  59.19   0.00 -22.16  -1.14   0.00   0.00   0.00  35.89
-------------------------------------------------------------------------------

Segment Leq : 35.89 dBA

Total Leq All Segments: 52.06 dBA

↑



TOTAL Leq FROM ALL SOURCES (DAY): 57.77
                           (NIGHT): 52.06
↑
↑
```

Appendix B
Warning Clauses

NPC 300 Type C:

"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."