CBM Anthony Pit – Noise Impact Assessment Report

Final Report

January 6, 2026

Prepared for:
CBM Aggregates
55 Industrial Street
Toronto, Ontario M4G 3W9

Prepared by:
Stantec Consulting Ltd.

Project Number:
160961457

Stantec

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Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada), to conduct a noise impact assessment for the CBM Anothony Pit (the Project), a proposed gravel pit in located at 4454 Victoria Road in the Township of Puslinch, Wellington County, Ontario.

Project operations are not expected to generate significant vibration from the site; therefore, a vibration assessment has not been included in this report.

The noise impact assessment is intended to support the Project's application for a Class A license under the *Aggregate Resources Act, 1990* (ARA), permitting extraction of more than 20,000 tonnes annually on private land, including extraction above and below the established water table. As such, this noise impact assessment has been prepared in accordance with the following provincial guidelines:

- Ontario Ministry of Natural Resources (MNR) Publication entitled "Aggregate Resources of Ontario: Technical Reports and Information Standards" (MNR 2020)
- Ontario Ministry of the Environment Conservation and Parks (MECP) Publication entitled "Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning (NPC-300) " (MOECC 2013)

This noise impact assessment, conducted in accordance with applicable guidelines, evaluates whether noise levels from Project operations comply with the NPC-300 daytime noise limit of 50 dBA. The gravel pit will operate from 07:00 to 19:00 Monday through Friday and from 08:00 to 16:00 on Saturday.

This assessment considers noise sources, and their operating scenarios identified from the information provided by CBM. Sound power levels and operating conditions of the Project noise sources were used as inputs into a predictive acoustic model developed using Cadna/A (Datakustik GmbH 2025), a noise modelling software implementing the ISO 9613-2 (ISO 1996) environmental sound propagation algorithms The assessment models a predicable worst-case hour of operation, analyzing four separate scenarios for the above water and below water extraction phases.

Eleven (11) representative points of reception (PORs), including an on-site residence, were identified for this assessment based on a review of local aerial imagery and zoning maps. These PORs represent the plane of window of the highest storey and outdoor locations where applicable, including a dwelling located within the Project property parcel.

The noise assessment, based on the operating conditions and assumptions identified in this report, predicts that Project noise levels will meet the applicable MECP noise criteria, provided the noise controls identified in Section 8 are implemented.

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Acronyms / Abbreviations

ARA	Aggregate Resources Act
CBM	CBM Aggregates
dB	Decibel
dBA	Decibel, A-weighted
ISO	International Organization for Standardization
MECP	Ontario Ministry of the Environment, Conservation and Parks (formerly MOECC, Ontario Ministry of the Environment and Climate Change)
MOECC	Ontario Ministry of the Environment and Climate Change
MNR	Ontario Ministry of Natural Resources
m	Metres
ASL	Above sea level
NPC	Noise Pollution Control Guideline - Ontario
NRC	Noise reduction coefficient
POR	Point of Reception
OPOR	Outdoor Point of Reception
SLM	Sound Level Meter
Stantec	Stantec Consulting Ltd.

1 Introduction

Stantec Consulting Ltd. (Stantec) was retained by CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada), to conduct a noise impact assessment for the CBM Anthony Pit (the Project), a proposed gravel pit to be located at 4454 Victoria Road in the Township of Puslinch, Wellington County, Ontario. The noise impact assessment is intended to support the Project's application for a Class A licence under the *Aggregate Resources Act, 1990* (ARA) which would permit aggregate extraction above and below the established water table.

This noise impact assessment has been prepared in accordance with the following provincial guidelines:

- Ontario Ministry of Natural Resources (MNR) Publication entitled "Aggregate Resources of Ontario: Technical Reports and Information Standards" (MNR 2020)
- Ontario Ministry of the Environment Conservation and Parks (MECP) Publication entitled "Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning (NPC-300) " (MOECC 2013)

This noise impact assessment, conducted in accordance with applicable guidelines, evaluates whether noise levels from Project operations comply with the NPC-300 noise criteria.

Project operations are not expected to generate significant vibration from the site; therefore, a vibration assessment has not been included in this report.

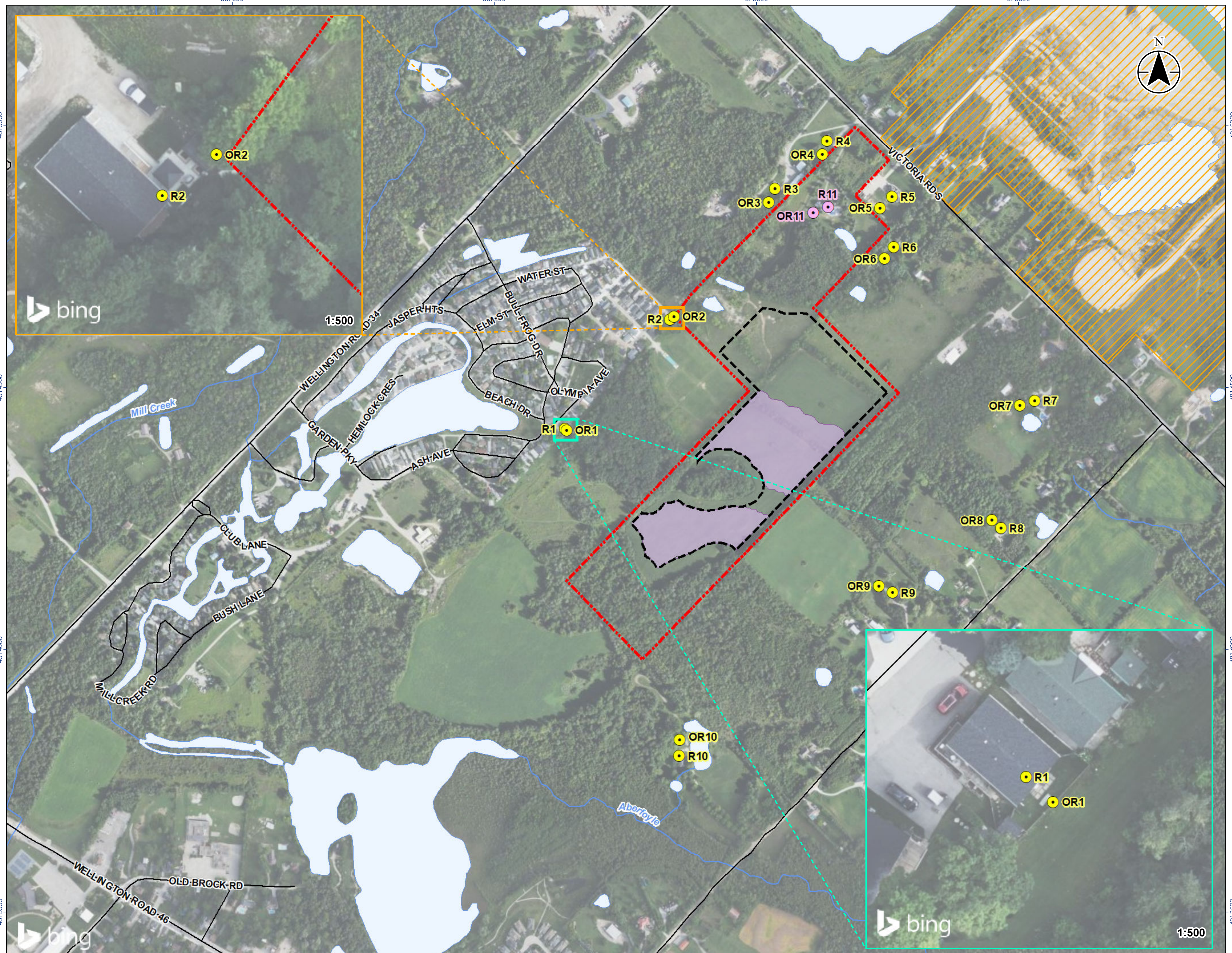
2 Project and Surrounding Area

The Project is located at 4454 Victoria Road South, in the Township of Puslinch, Wellington County, Ontario. The Project site is bounded by the following roadways, with access from Victoria Road South:

- Victoria Road South to the northeast
- Wellington Road 34 to the northwest
- Brock Road South to the southwest
- Gilmour Road to the southeast

The surrounding lands are mainly a mix of agricultural, residential, mixed-use, and natural environment zoned land under the Puslinch Zoning By-law (Corporation of the Township of Puslinch 2018). Noise-sensitive land uses near the Project include the Mini Lakes residential subdivision to the west, as well as residential subdivisions along Victoria Road and Gilmour Road. Along Brock Road, there are community facilities such as Aberfoyle Public School and Puslinch Community Centre serving these neighborhoods. The lands north of the Project, across Victoria Road, include extractive industrial zoned lands where an existing aggregate pit is located and operated by Dufferin Aggregates.

A map showing the Project site, extraction limits and surrounding area is provided in Figure 1. A land use zoning map of the area surrounding the Project is provided in Appendix A.



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Legend

- Property Boundary
- Points of Reception
- Discretionary Points of Reception
- Road
- Watercourse
- Waterbody
- Dufferin Aggregate Pit

Extraction Footprint

- Above Water Extraction Footprint
- Below Water Table Extraction Footprint

0 100 200 metres

1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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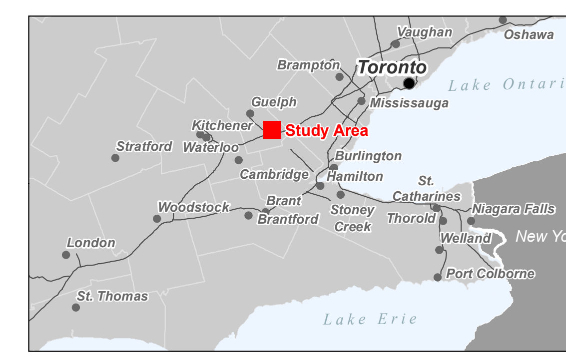


Project Location
Puslinch, ON

160961457 REVA
Prepared by PRM on 2025-12-19
Technical Review by FA on 2025-12-19

Client/Project
CBM ANTHONY PIT
NOISE IMPACT ASSESSMENT REPORT
4454 VICTORIA ROAD SOUTH, PUSLINCH, ONTARIO

Figure No.
1

Title
Project Area and Points of Reception

3 Project Operations

The Project will operate under a Class 'A' licence application under the Ontario ARA for a below groundwater pit operation extracting more than 20,000 tonnes annually on private land, which includes both above and below water gravel extraction. The above and below water extraction limits for the Project are shown in Figure 1.

The following list outlines the future above and below water extraction operations considered for this assessment:

- The gravel pit will typically operate from 07:00 to 19:00 Monday through Friday and from 08:00 to 16:00 on Saturdays. No aggregate (e.g., extraction, loading and hauling) operations will occur outside of these hours.
- The above water extraction phase will begin at the northwest end of the extraction area and then proceed generally south, concluding the phase at the southwest end of the extraction area.
- During the above water extraction phase, the excavation and loading will be carried out using one (1) loader.
- Following the above water extraction phase, the below water extraction phase will begin at the southernmost part of the below water extraction area and progress northward to the separate area further north.
- For the below water extraction phase, the excavation and loading will be carried out using one (1) dragline or excavator and one (1) loader.
- For both above and below water extraction phases, the equipment will operate at approximately 0.5 m above the water table, which varies between 320 and 323 m ASL within the extraction limits.
- During the busiest hour, twelve (12) trucks are expected to arrive and depart the site.
- Material processing (e.g., crushing) will not occur on site.

4 Noise Sources

This assessment considers noise sources and operating scenarios identified from the information provided by CBM. An excavator may be used for below water extraction; however, a dragline was considered for the assessment as it generates higher noise emissions. The noise emissions for the sources are expressed in terms of sound power levels, which were obtained from field measurements from a similar site (CBM's Neubauer Pit) and published reference sound data (BSI 2008) for comparable equipment intended for use in the Project. The following sub-sections provide details on the field measurements, sound power level calculations and a summary of the noise sources identified for this assessment.

4.1 Field Measurements

Stantec personnel visited the Neubauer Pit on October 24, 2022, to conduct sound level measurements of equipment similar to those intended for the Project. The sound level measurements were conducted using a Larson Davis model 831 sound level meter (SLM). The SLM was factory calibrated within 2 years of the site visit and was field calibrated before and after the site visit using a Larson Davis CAL200 acoustic calibrator. Calibration certificates for the measurement instrumentation are provided in Appendix B.

The sound pressure level measurements were conducted in accordance with MECP Publication NPC-103 (MOE 1978) under suitable weather conditions. The weather conditions during the measurements are provided in Appendix B and were obtained from available online weather data from the nearest Environment Canada weather station.

4.2 Sound Power Level Calculations

Sound power levels were calculated from measured sound pressure levels or obtained from published reference data for equipment similar to those intended in the Project. The sound power calculations consider the source measurement distance and where applicable, directivity of the source. Spectral sound power levels for the assessed noise sources are provided in Appendix C.

MECP Publication NPC-104 (MOE 1978) prescribes adjustments for sources with special qualities or characteristics of sound. These are punitive adjustments which apply to noise sources with subjectively annoying characteristics, including tonal sounds, quasi-impulsive sounds and beating sounds (sounds with cyclically varying amplitudes). The sources considered in this assessment were neither observed or expected to exhibit such characteristics. Therefore, the source sound power levels in this assessment do not include adjustments for NPC-104 sound characteristics.

4.3 Noise Source Summary

The types of noise sources considered in this assessment are summarized in Table 4-1, including the overall sound power level and sound characteristics.

Table 4-1 Noise Source and Sound Power Level Summary

Noise Source	Overall Sound Power Level (dBA)	Source Location [b]	Sound Characteristics [c]
Loader	108	O	S
Dragline [d]	114	O	S
Moving Truck	106	O	S
Idling Truck	91	O	S

Notes:

a. The listed sound power level does not reflect the time-weighting considered in the model
b. "O" indicates Outdoor
c. Sound Characteristics per NPC-104: S = Steady
d. Although an excavator may be alternatively used for below water extraction, only the dragline is considered as it generates higher noise emissions and results in a conservative assessment

5 Points of Reception

In accordance with NPC-300, Project noise levels are evaluated at points of reception (PORs) located on noise sensitive land uses such as:

- a property of a person that accommodates a dwelling and includes a legal nonconforming residential use
- a property of a person that accommodates a building used for noise sensitive commercial purposes, such as hotels and motels
- a property of a person that accommodates a building used for noise sensitive institutional purposes, such as hospitals, schools and long-term cares

A POR can also be located on a property zoned to permit a noise sensitive land use, even if the property is currently vacant and no building permit has been issued. The property must also be accessible by road or water to qualify as a vacant lot POR. No vacant lot PORs have been identified for this assessment.

Further, NPC-300 indicates that a land use that would normally be considered noise sensitive, such as a dwelling, but is located within the property boundaries of the Project noise sources is not considered a receptor.

Eleven (11) representative PORs, including an on-site residence, have been identified for this assessment based on a review of local aerial imagery and zoning maps. Although NPC-300 indicates that the existing residence within the at 4454 Victoria Road South, within Project property boundary, would not be considered a receptor, this assessment includes R11/OR11 as discretionary PORs.

The identified PORs represent the plane of window of the highest storey and outdoor locations, where applicable, for the nearby dwellings. For a conservative approach, dwellings were assumed to have two-storeys where the number of storeys could not be verified through a review of aerial and street-level imagery.

The receptor locations considered for each POR are given below:

- Receptor location at 4.5 m above ground at Plane of Window PORs for the two-storey dwellings (i.e., highest window level).
- Receptor location at 1.5 m above ground at Plane of Window PORs for the single-storey dwellings and within 30 m of a facade of a dwelling for the Outdoor POR (OPOR) associated with the dwellings.

The PORs considered in this assessment are listed in Table 5-1 and shown in Figure 1.

Table 5-1 Points of Reception Summary

POR ID	POR Description	POR Height Above Ground (m)
R1	1.5 Storey Residence - 6 Dogwood Road	3.0 [a]
OR1	Residence Yard - 6 Dogwood Road	1.5
R2	1.5 Storey Residence - 22 Sumac Street	3.0 [a]
OR2	Residence Yard - 22 Sumac Street	1.5
R3	1 Storey Residence - 4458 Victoria Road South	1.5
OR3	Residence Yard - 4458 Victoria Road South	1.5
R4	1 Storey Residence - 4456 Victoria Road South	1.5
OR4	Residence Yard - 4456 Victoria Road South	1.5
R5	2 Storey Residence - 4442 Victoria Road South	4.5
OR5	Residence Yard - 4442 Victoria Road South	1.5
R6	2 Storey Residence - 4436 Victoria Road South	4.5
OR6	Residence Yard - 4436 Victoria Road South	1.5
R7	2 Storey Residence - 4414 Victoria Road South	4.5
OR7	Residence Yard - 4414 Victoria Road South	1.5
R8	2 Storey Residence - 82 Gilmour Road	4.5
OR8	Residence Yard - 82 Gilmour Road	1.5
R9	2 Storey Residence - 70 Gilmour Road	4.5
OR9	Residence Yard - 70 Gilmour Road	1.5
R10	2 Storey Residence - 46 Gilmour Road	4.5
OR10	Residence Yard - 46 Gilmour Road	1.5
R11	On-site 2-Storey Residence - 4454 Victoria Road South	4.5
OR11	On-site Residence Yard - 4454 Victoria Road South	1.5

Note:

a. The receptor height for one and a half storey dwellings is considered to be 3 m above ground.

6 Applicable Guidelines and Assessment Criteria

The MNR Publication entitled “Aggregate Resources of Ontario: Technical Reports and Information Standards” indicates the applicable noise guidelines and criteria for this assessment are the provincial guidelines provided in MECP Publication NPC-300.

NPC-300 establishes the applicable noise criteria in terms of the one-hour equivalent noise level ($L_{eq\text{-}1hr}$). The applicable noise level limits are set as higher of the background noise level and the exclusion limit specified in NPC-300. The exclusion limits apply at a POR based on the characteristics of its acoustic environment and the time of day (e.g., daytime, evening, or nighttime).

Based on a review of local aerial imagery, the local acoustic environment is classified as an MECP Class 2 Area. A Class 2 Area is described as an area where the background sound level is dominated by human activities during daytime (07:00 to 19:00) with lower background sound levels during the evening (19:00 to 23:00) and nighttime (23:00 to 07:00), and where the soundscape is otherwise influenced primarily by natural environment with infrequent human activity. This classification is supported by the presence of major roadways (e.g., Wellington Road 34, Brock Road), industrial activity associated with the Dufferin Aggregate Pit, community facilities, and residential subdivisions, all of which contribute to the existing background sound levels.

This assessment uses the MECP Class 2 exclusion limit of 50 dBA as the daytime noise limit to evaluate Project noise impacts at the PORs. Evening and nighttime noise limits are not considered in this study, as the Project will not operate during those periods (i.e., 19:00 to 07:00).

7 Impact Assessment

7.1 Methods

The assessment uses the commercially available software package Cadna/A (Datakustik GmbH 2024) to predict operational noise levels at the PORs. The Cadna/A noise model implements ISO 9613-2 noise propagation algorithms (ISO 1996) and accounts for noise attenuation factors such as:

- Geometrical divergence (noise attenuation due to distance)
- Barrier effects (noise shielding) of the intervening structures/buildings and topography
- Atmospheric absorption
- Ground absorption
- Local topography

Local topography outside of the extraction area was modelled based on Light Detection and Ranging (LIDAR) data obtained from GeoOptics Inc. while the topography within the extraction area was modelled based on ground elevation contours from the Project's hydrogeology models.

The model conservatively considers a downwind condition, where the wind is directed always from each noise source location to each receptor. Further, noise attenuation due to foliage was not included in the model as an additional level of conservatism. A summary of key acoustic model parameters used in the model is provided in Table 7-1

Table 7-1 Key Acoustic Model Inputs

Parameter	Value	Rationale
Ground Absorption	0.3	Models acoustically reflective ground conditions (e.g. hard packed ground) within the extraction areas
	1	Accounts for acoustically absorptive ground conditions (e.g., grass covered areas) between the extraction areas and the modelled receptors
Temperature	10°C	Ontario standard conditions
Relative Humidity	70%	Ontario standard conditions
Max. Order of Reflection	2	Accounts for building/barrier reflections
Noise Source Height	3 m	The noise source height was set at 3 m above ground to model the engine exhaust noise from the Project equipment, as this is expected to be the dominant noise source.

7.2 Noise Modelling Assumptions and Scenarios

In accordance with NPC-300 guidelines, the noise assessment evaluates the predictable worst-case hour of Project operation. The noise modelling is based on the operations described in Section 3 with the following assumptions applied for both above and below water extraction phases during a worst-case hour:

- Excavation and loading equipment may operate anywhere within the extraction area.
- Excavation and loading equipment operate continuously for 60 minutes.
- Twelve (12) trucks arrive at and depart from the site.
- Two trucks simultaneously idling for 60 minutes at the site.
- Noise barriers are implemented as outlined in Table 7-2. These noise barriers may consist of noise walls, berms or a combination of both.

Project operations noise will vary at the PORs as the working areas advance through the above water and below water extraction phases. To capture this variation in operations noise, four separate scenarios were considered for both the above water and below water extraction phases. Each scenario models a distinct working area for each extraction phase.

The modelling scenarios for both the above water and below water extraction phases are summarized in Table 7-2, including associated equipment, working areas, and noise barriers. The modelled working areas and noise barriers modelled for the above water extraction scenarios are shown in Figure 2, while those for the below water extraction scenarios are shown in Figure 3.

Table 7-2 Modelled Scenarios for Above and Below Water Extraction Phases

	Above Water Extraction				Below Water Extraction			
Equipment	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Loader (Qty.)	1	1	1	1	1	1	1	1
Dragline [d] (Qty.)	-	-	-	-	1	1	1	1
Moving Trucks (Qty.)	12	12	12	12	12	12	12	12
Idling Trucks (Qty.)	2	2	2	2	2	2	2	2
Modelled Working Area ID [a]	A1	A2	A3	A4	B1	B2	B3	B4
Noise Barrier [b] ID and Height	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
NB0 – 5 m [c]	X	X	X	X	X	X	X	X
NB1 – 3.5 m	X	X	X	X	X	X	X	X
NB2 – 3.5 m	X	X	X	X	X	X	X	X
NB3 – 4 m	X	-	-	-	-	-	-	X
NB4 – 3 m	-	-	-	-	-	-	X	X
NB5 – 3.5 m	-	-	-	-	-	-	X	X
NB6 – 4 m	-	-	-	-	X	X	X	X
NB7 – 3.5 m	-	-	-	-	X	X	-	-

Notes:

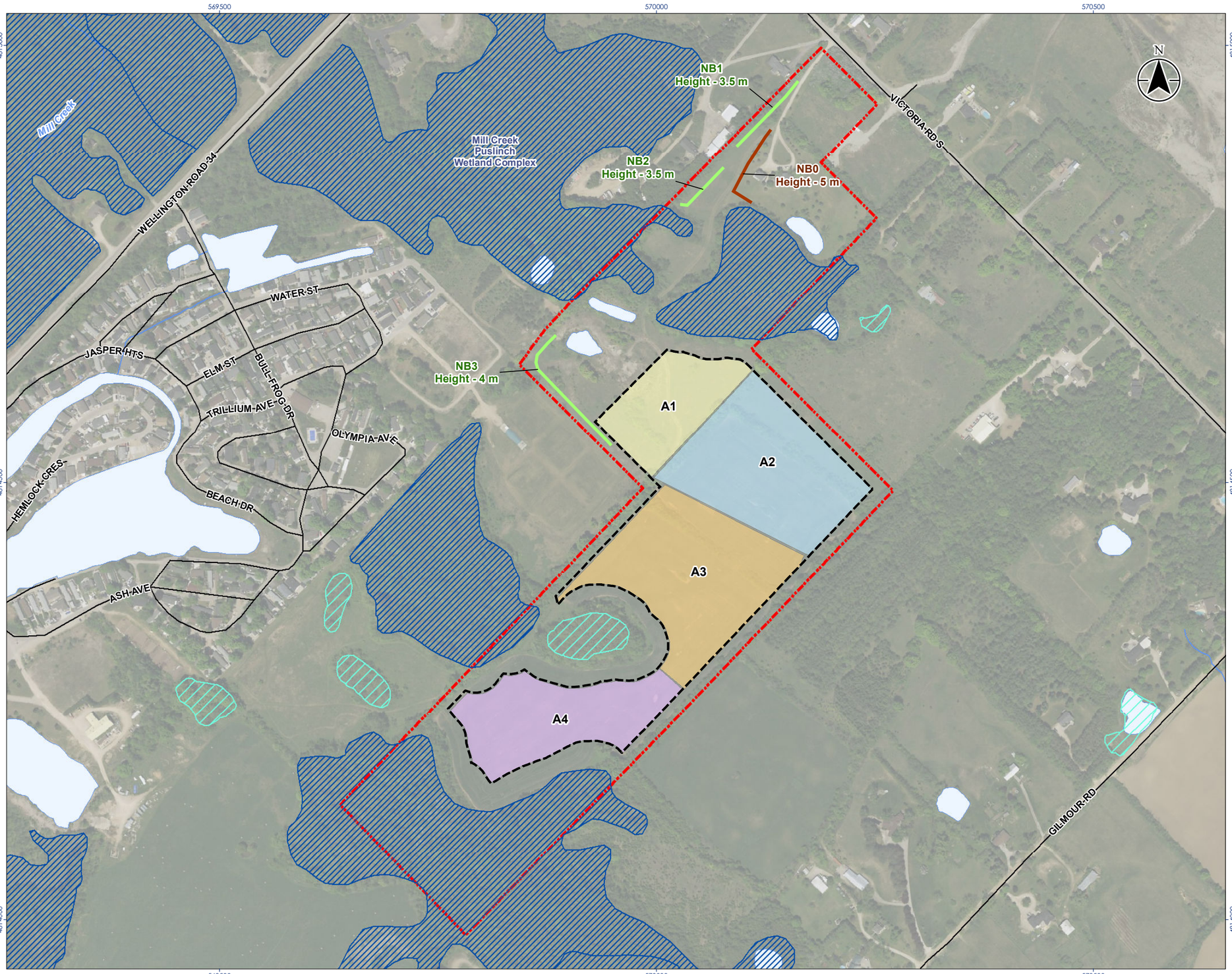
a. See Figure 2 for the modelled working area of the above water extraction scenarios and Figure 3 for the below water extraction scenarios.

b. Noise barrier (NB) refers to noise wall, berm, or a combination of both.

c. NB0 is a discretionary barrier for the on-site receptors R11/OR11.

d. Although an excavator may be alternatively used for below water extraction, only the dragline is considered as it generates higher noise emissions and results in a conservative assessment.

e. "-" indicates equipment/noise barrier is not considered for the identified modelling scenario. "X" indicates the noise barrier is considered for the identified modelling scenario.



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Legend

- Property Boundary
- Modelled Noise Barrier
- Modelled Discretionary Noise Barrier
- Road
- Watercourse
- Waterbody
- Wetland - Evaluated (Provincial)
- Wetland - Not evaluated per Ontario Wetland Evaluation System

Modelled Equipment Working Areas – Above Water Extraction Phase

- A1
- A2
- A3
- A4

Extraction Footprints

- Above Water Extraction Footprint

0 100 200 metres

1:4,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
Puslinch, ON

160961457 REVA
Prepared by PRM on 2025-12-18
Technical Review by FA on 2025-12-19

Client/Project
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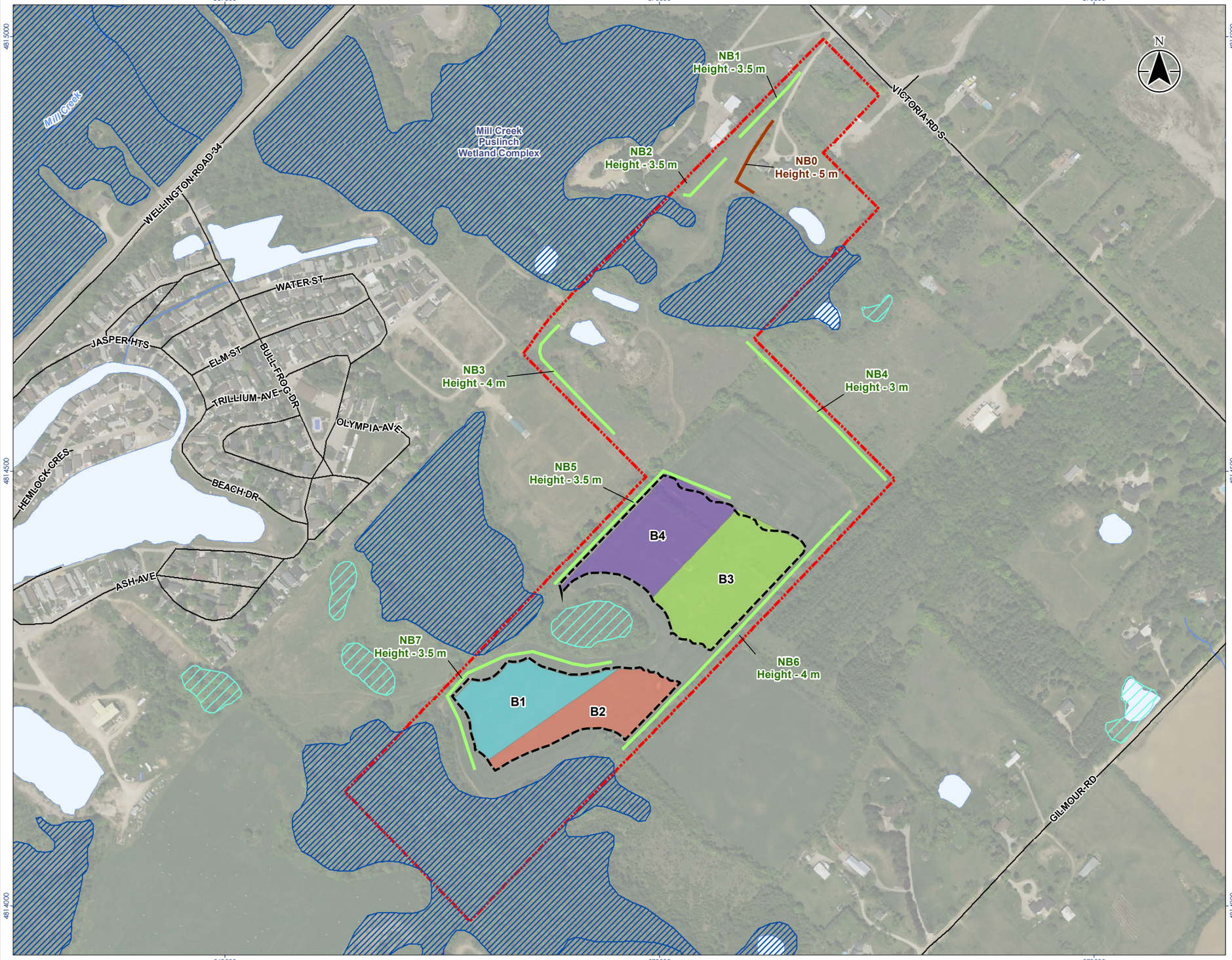
Figure No.
2

Title
Modelled Equipment Working Areas and Noise Barriers – Above Water Extraction Phase



Stantec

Legend

- Property Boundary
- Modelled Noise Barrier
- Modelled Discretionary Noise Barrier
- Road
- Watercourse
- Waterbody
- Wetland - Evaluated (Provincial)
- Wetland - Not evaluated per Ontario Wetland Evaluation System

Modelled Equipment Working Areas – Below Water Extraction Phase

- B1
- B2
- B3
- B4

Extraction Footprints

- Below Water Table Extraction Footprint

0 100 200 metres

1:4,500 (At original document size of 11x17)

Notes

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Figure No.
3

Title
Modelled Equipment Working Areas and Noise Barriers – Below Water Extraction Phase

7.3 Noise Modelling Results

A noise assessment summary for the modelled above water extraction phase scenarios is provided in Table 7-3. The results show that the maximum predicted noise levels at the modelled PORs are within the 50 dBA noise level limit with the operating conditions and noise barriers identified in Section 7.2. Sample noise model calculations for Above Water Extraction – Scenario 1 are provided in Appendix D.

Table 7-3 Noise Assessment Summary – Above Water Extraction Phase

POR ID	Predicted Noise Levels, $L_{eq\text{-}1hr}$ (dBA)				Maximum Predicted Noise Level, $L_{eq\text{-}1hr}$ (dBA)	Noise Level Limit, $L_{eq\text{-}1hr}$ (dBA)	Maximum Predicted Noise Level Meets Noise Level Limit (Y/N)
	Scenario 1	Scenario 2	Scenario 3	Scenario 4			
R1	41	42	43	47	47	50	Y
OR1	40	40	42	46	46	50	Y
R2	48	48	47	47	48	50	Y
OR2	46	47	46	46	47	50	Y
R3	46	45	44	44	46	50	Y
OR3	49	48	48	48	49	50	Y
R4	46	46	46	46	46	50	Y
OR4	49	49	48	48	49	50	Y
R5	47	48	47	46	48	50	Y
OR5	46	47	45	45	47	50	Y
R6	47	49	46	45	49	50	Y
OR6	47	49	45	44	49	50	Y
R7	41	44	43	41	44	50	Y
OR7	40	43	41	39	43	50	Y
R8	38	41	40	39	41	50	Y
OR8	36	39	39	37	39	50	Y
R9	42	43	46	45	46	50	Y
OR9	41	41	45	43	45	50	Y
R10	37	37	39	43	43	50	Y
OR10	35	35	37	42	42	50	Y
R11	50	49	49	48	50	50	Y
OR11	48	49	47	47	49	50	Y

A noise assessment summary for the modelled below water extraction phase scenarios is provided in Table 7-4. The results show that the maximum predicted noise level at each POR meet the 50 dBA noise level limit with the operating conditions and noise barriers identified in Section 7.2. Sample noise model calculations for Below Water Extraction – Scenario 4 are provided in Appendix D.

Table 7-4 Noise Assessment Summary – Below Water Extraction Phase

POR ID	Predicted Noise Levels, $L_{eq\text{-}1hr}$ (dBA)				Maximum Predicted Noise Level, $L_{eq\text{-}1hr}$ (dBA)	Noise Level Limit, $L_{eq\text{-}1hr}$ (dBA)	Maximum Predicted Noise Level Meets Noise Level Limit (Y/N)
	Scenario 1	Scenario 2	Scenario 3	Scenario 4			
R1	50	48	46	46	50	50	Y
OR1	50	48	45	46	50	50	Y
R2	48	48	50	50	50	50	Y
OR2	47	47	49	48	49	50	Y
R3	45	45	47	45	47	50	Y
OR3	48	49	50	50	50	50	Y
R4	46	46	47	46	47	50	Y
OR4	49	49	49	49	49	50	Y
R5	47	47	48	48	48	50	Y
OR5	45	46	47	47	47	50	Y
R6	46	47	49	48	49	50	Y
OR6	45	46	48	47	48	50	Y
R7	43	42	49	45	49	50	Y
OR7	41	41	49	45	49	50	Y
R8	43	42	45	44	45	50	Y
OR8	42	41	44	44	44	50	Y
R9	49	49	46	50	50	50	Y
OR9	49	49	46	46	49	50	Y
R10	47	49	41	45	49	50	Y
OR10	48	49	40	44	49	50	Y
R11	48	49	50	50	50	50	Y
OR11	47	47	48	48	48	50	Y

8 Noise Controls

Based on the noise assessment results presented in this report, the following noise control measures are to be implemented for the Project operations to meet applicable NPC-300 noise criteria:

- Sound power levels for the Project equipment must be at or below the values identified in Table 4-1. If other equipment is used for the Project, their sound levels must be confirmed through measurements or manufacturer data to meet the levels provided in Table 4-1. Otherwise, additional noise controls may be required.
- The quantity of equipment, including truck volumes, must not exceed those modelled in this assessment. Otherwise, additional noise controls may be required.
- Noise barrier NB0 is a discretionary noise barrier for the on-site dwelling (R11/OR11), which is exempted per NPC-300. It should be implemented as shown in Figure 2 before any extraction phases begin.
- Noise barriers NB1 and NB2 are to be implemented as shown in Figure 2 before any extraction phases begin.
- Noise barrier NB3 is to be implemented as shown in Figure 2 before any extraction phases begin in working area A1 or B4.
- Noise barriers NB4, NB5, and NB6 are to be implemented as shown in Figure 3 before below water extraction occurs in working area B3 or B4
- Noise barriers NB6 and NB7 are to be implemented as shown in Figure 3 before below water extraction occurs in working area B1 or B2.
- Noise barriers NB0 through NB7 are to meet the minimum heights and extents shown in Figure 2 and Figure 3.
- Noise barriers NB0 through NB7 are to be of solid construction with no gaps and have a surface density of at least 20 kg/m^2. The noise barriers can be a single or combination of barrier system such as noise wall, earth berm, acoustical fence or shipment containers provided they meet the overall height and extents shown in Figure 2 and Figure 3.
- Noise barriers NB3, NB5, NB6, and NB7 are to be acoustically absorptive on the surface facing the extraction area. These noise barrier surfaces are to meet a minimum noise reduction coefficient (NRC) value of 0.7. Earth berms would be expected to satisfy this NRC requirement.
- Activities used to prepare the site for excavation, such as the stripping of topsoil, construction of the berm, or activities related to the remediation of the site after the extraction is completed as considered to be construction activities and are only permitted to occur during the daytime (i.e. 07:00 to 19:00) Monday to Friday except statutory holidays.

9 Conclusion

Stantec was retained by CBM to conduct a noise impact assessment for the CBM Anthony Pit.

This noise impact assessment has been conducted in accordance with applicable MECP guidelines and evaluates compliance of Project noise levels with the NPC-300 daytime noise limit of 50 dBA. The gravel pit will operate during daytime hours only, from 07:00 to 19:00 Monday through Friday and from 08:00 to 16:00 on Saturdays.

Eleven (11) representative points of reception (PORs) were identified for this assessment based on a review of local aerial imagery and zoning maps. These PORs represent the plane of window of the highest storey and outdoor locations where applicable, including a dwelling located within the Project property parcel.

This assessment modelled a predicable worst-case hour of operation, analyzing four separate scenarios for the above water and below water extraction phases. Based on the operating conditions and assumptions identified in this report, Project-related noise levels are predicted to comply with the applicable MECP noise criteria, subject to implementation of the noise control measures identified in Section 8.

10 References

BSI. 2008. "BS 5228-1:2009 Code of practice for noise and vibration control on construction and open sites-Part 1:Noise."

Corporation of the Township of Puslinch. 2018. "Township of Puslinch Comprehensive Zoning By-law No. 023-18."

ISO. 2017. "ISO 1996-2:2017 Description, measurement and assessment of environmental noise-Part 2: Determination of Environmental noise levels."

ISO. 1996. "ISO 9613-2. Acoustics – Attenuation of Sound during propagation outdoors. Part 2 – General method."

MNRF. 2020. "Aggregate Resources of Ontario: Technical Reports and Information Standards."

MNRF. 2021. "O. Reg 244/97: General."

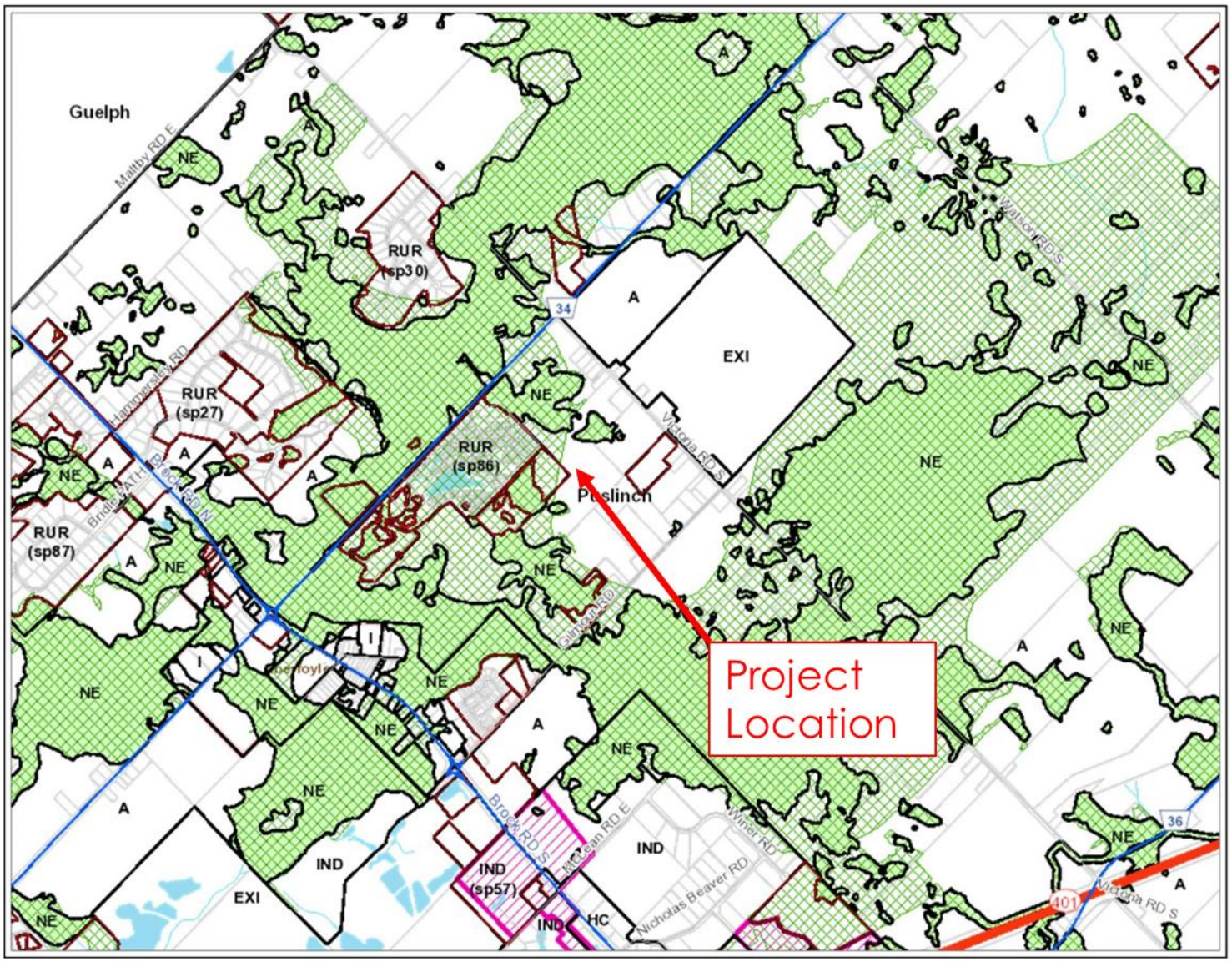
MOE. 1978. "Publication NPC-103 - Procedures."

MOE. 1978. "Publication NPC-104 - Sound Level Adjustments."

MOECC. 2013. "Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (NPC-300)."

Appendices

Appendix A Zoning Map



Source. https://sgis.wellington.ca/Maps/index.html?viewer=WellingtonCountyExternal

Table 1 Zones and Zone Symbols – Township of Puslinch Comprehensive Zoning By-law No. 023-18

Zones	Zone Symbols
A	Agricultural
EXI	Extractive
FD2	Future Development Two Zone
HC	Highway Commercial
IND	Industrial
NE	Natural Environment Zone
OS	Open Space Zone
RUR	Rural Residential
UR	Urban Residential

Appendix B Instrumentation Calibration Certificates and Weather Data

Calibration Certificate

Certificate Number 2022000699

Customer:
Stantec Consulting

,

Model Number	CAL200	***Procedure Number***	D0001.8386
Serial Number	10294	***Technician***	Abraham Ortega
Test Results	**Pass**	***Calibration Date***	19 Jan 2022
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	19 Jan 2023
Description	Larson Davis CAL200 Acoustic Calibrator	***Temperature***	22 °C ± 0.3 °C
		Humidity	46 %RH ± 3 %RH
		Static Pressure	101.0 kPa ± 1 kPa

Evaluation Method The data is aquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity. Data reported in dB re 20 µPa.

Compliance Standards Compliant to Manufacturer Specifications per D0001.8190 and the following standards:
IEC 60942:2017 ANSI S1.40-2006

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Larson Davis Model 2900 Real Time Analyzer	04/01/2021	04/01/2022	001051
Agilent 34401A DMM	03/02/2021	03/02/2022	002588
Microphone Calibration System	02/24/2021	02/24/2022	005446
1/2" Preamplifier	08/26/2021	08/26/2022	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/09/2021	08/09/2022	006507
1/2 inch Microphone - RI - 200V	09/23/2021	09/23/2022	006511
Hart Scientific 2626-H Temperature Probe	02/04/2021	08/04/2022	006767
Pressure Transducer	06/28/2021	06/28/2022	007310

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Provo, UT 84601, United States
716-684-0001

ilac-MRA ACCREDITED Cert. #3622.01

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A PCB DIVISION

Output Level

Nominal Level [dB]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
114	101.2	114.02	113.80	114.20	0.14	Pass
94	101.0	93.98	93.80	94.20	0.15	Pass

-- End of measurement results--

Frequency

Nominal Level [dB]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
114	101.2	999.95	993.00	1,007.00	0.20	Pass
94	101.0	999.99	993.00	1,007.00	0.20	Pass

-- End of measurement results--

Total Harmonic Distortion + Noise (THD+N)

Nominal Level [dB]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
114	101.2	0.29	0.00	2.00	0.25 ‡	Pass
94	101.0	0.40	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

Level Change Over Pressure

Tested at: 114 dB, 21 °C, 46 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
108.0	107.9	-0.03	-0.25	0.25	0.04 ‡	Pass
101.3	101.5	0.00	-0.25	0.25	0.04 ‡	Pass
92.0	92.0	0.04	-0.25	0.25	0.04 ‡	Pass
83.0	83.1	0.05	-0.25	0.25	0.04 ‡	Pass
74.0	73.9	0.03	-0.25	0.25	0.04 ‡	Pass
65.0	65.1	-0.06	-0.25	0.25	0.04 ‡	Pass

-- End of measurement results--

Frequency Change Over Pressure

Tested at: 114 dB, 21 °C, 46 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
108.0	107.9	0.00	-7.00	7.00	0.20 ‡	Pass
101.3	101.5	0.00	-7.00	7.00	0.20 ‡	Pass
92.0	92.0	0.00	-7.00	7.00	0.20 ‡	Pass
83.0	83.1	0.00	-7.00	7.00	0.20 ‡	Pass
74.0	73.9	-0.01	-7.00	7.00	0.20 ‡	Pass
65.0	65.1	-0.02	-7.00	7.00	0.20 ‡	Pass

-- End of measurement results--

Total Harmonic Distortion + Noise (THD+N) Over Pressure

Tested at: 114 dB, 21 °C, 46 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
108.0	107.9	0.30	0.00	2.00	0.25 ‡	Pass
101.3	101.5	0.29	0.00	2.00	0.25 ‡	Pass
92.0	92.0	0.29	0.00	2.00	0.25 ‡	Pass
83.0	83.1	0.30	0.00	2.00	0.25 ‡	Pass
74.0	73.9	0.31	0.00	2.00	0.25 ‡	Pass
65.0	65.1	0.33	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

Signatory: *Abraham Ortega*

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Hourly Data Report for October 24, 2022

If selected Local Standard Time (LST), add 1 hour to adjust for Daylight Saving Time where and when it is observed.

GUELPH TURFGRASS INSTITUTE
ONTARIO

Latitude:	43°32'30.741" N	**Longitude**:	80°13'19.492" W	**Elevation**:	334.50 m
Climate ID:	6143092	**WMO ID**:	73073	**TC ID**:	OGI

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	6.6	3.9	83	0.0	9	6		98.21			NA
01:00	6.9	4.3	84	0.0	7	5		98.21			NA
02:00	6.1	3.8	85	0.0	6	3		98.20			NA
03:00	5.4	3.5	88	0.0	31	3		98.24			NA
04:00	3.4	2.5	94	0.0		0		98.27			NA
05:00	2.8	1.8	94	0.0	8	4		98.27			NA
06:00	3.2	2.7	96	0.0	8	3		98.27			NA
07:00	2.3	1.7	96	0.0	7	3		98.27			NA
08:00	6.3	3.9	85	0.0		0		98.27			NA
09:00	11.8	7.3	74	0.0	10	5		98.26			NA
10:00	14.5	8.5	67	0.0	12	9		98.23			NA
11:00	16.5	8.5	59	0.0	16	8		98.22			NA
12:00	18.4	7.9	50	0.0	13	9		98.14			NA
13:00	19.6	6.9	43	0.0	13	12		98.04			NA
14:00	20.0	5.6	39	0.0	15	11		97.97			NA
15:00	19.9	5.8	40	0.0	15	11		97.97			NA
16:00	19.3	6.8	44	0.0	14	10		97.96			NA
17:00	17.4	7.9	54	0.0	12	7		97.95			NA
18:00	14.1	8.0	67	0.0	11	6		97.93			NA
19:00	11.8	8.4	80	0.0	10	8		97.92			NA
20:00	11.6	8.6	82	0.0	11	11		97.82			NA
21:00	11.5	8.4	81	0.0	10	11		97.82			NA
22:00	11.1	8.1	81	0.0	6	3		97.86			NA
23:00	10.5	7.4	81	0.0	5	4		97.81			NA

Legend

- E = Estimated
- M = Missing
- NA = Not Available*
- [empty] = Indicates an unobserved value

Calibration Certificate

Certificate Number 2022011045
Customer:
STANTEC CONSULTING LTD

,

Model Number	831	***Procedure Number***	D0001.8384		
Serial Number	0003334	***Technician***	Jacob Cannon		
Test Results	**Pass**	***Calibration Date***	22 Aug 2022		
Initial Condition	Inoperable	***Calibration Due***	22 Aug 2023		
Description	Larson Davis Model 831 Class 1 Sound Level Meter Firmware Revision: 2.403	***Temperature***	23.7	°C	± 0.25 °C
		Humidity	50.3	%RH	± 2.0 %RH
		Static Pressure	86.56	kPa	± 0.13 kPa

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis CAL200, S/N 9079
Larson Davis PRM831, S/N 0211
Larson Davis CAL291, S/N 0108
PCB 377B02, S/N 319522

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis Model 831 Sound Level Meter Manual, I831.01 Rev O, 2016-09-19

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to 1/2" adaptor is used with the preamplifier.

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa; Reference Range: 0 dB gain

Periodic tests were performed in accordance with precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2016-02-24 certificate number DE-15-M-PTB-0056.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Larson Davis CAL291 Residual Intensity Calibrator	2021-09-10	2022-09-10	001250
Hart Scientific 2626-H Temperature Probe	2021-08-25	2023-02-25	006798
Larson Davis CAL200 Acoustic Calibrator	2022-07-21	2023-07-21	007027
Larson Davis Model 831	2022-02-21	2023-02-21	007182
PCB 377A13 1/2 inch Prepolarized Pressure Microphone	2022-03-02	2023-03-02	007185
SRS DS360 Ultra Low Distortion Generator	2022-03-29	2023-03-29	007635
Larson Davis 1/2" Preamplifier for Model 831 Type 1	2021-09-28	2022-09-28	PCB0004783

Acoustic Calibration

Measured according to IEC 61672-3:2013 10 and ANSI S1.4-2014 Part 3: 10

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz	114.01	113.80	114.20	0.14	Pass

Adjusted Level: 114.01
As Received Level: 114.16

-- End of measurement results--

Loaded Circuit Sensitivity

Measurement	Test Result [dB re 1 V / Pa]	Lower Limit [dB re 1 V / Pa]	Upper Limit [dB re 1 V / Pa]	Expanded Uncertainty [dB]	Result
1000 Hz	-26.66	-27.84	-24.74	0.14	Pass

-- End of measurement results--

Acoustic Signal Tests, C-weighting

Measured according to IEC 61672-3:2013 12 and ANSI S1.4-2014 Part 3: 12 using a comparison coupler with Unit Under Test (UUT) and reference SLM using slow time-weighted sound level for compliance to IEC 61672-1:2013 5.5; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Expected [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
125	-0.23	-0.20	-1.20	0.80	0.23	Pass
1000	0.17	0.00	-0.70	0.70	0.23	Pass
8000	-2.20	-3.00	-5.50	-1.50	0.32	Pass

-- End of measurement results--

Self-generated Noise

Measured according to IEC 61672-3:2013 11.1 and ANSI S1.4-2014 Part 3: 11.1

Measurement	Test Result [dB]
A-weighted, 20 dB gain	40.23

-- End of measurement results--

-- End of Report--

Signatory: Jacob Cannon

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Appendix C Sound Power Level Data

Table C.1 Sound Power Level Summary

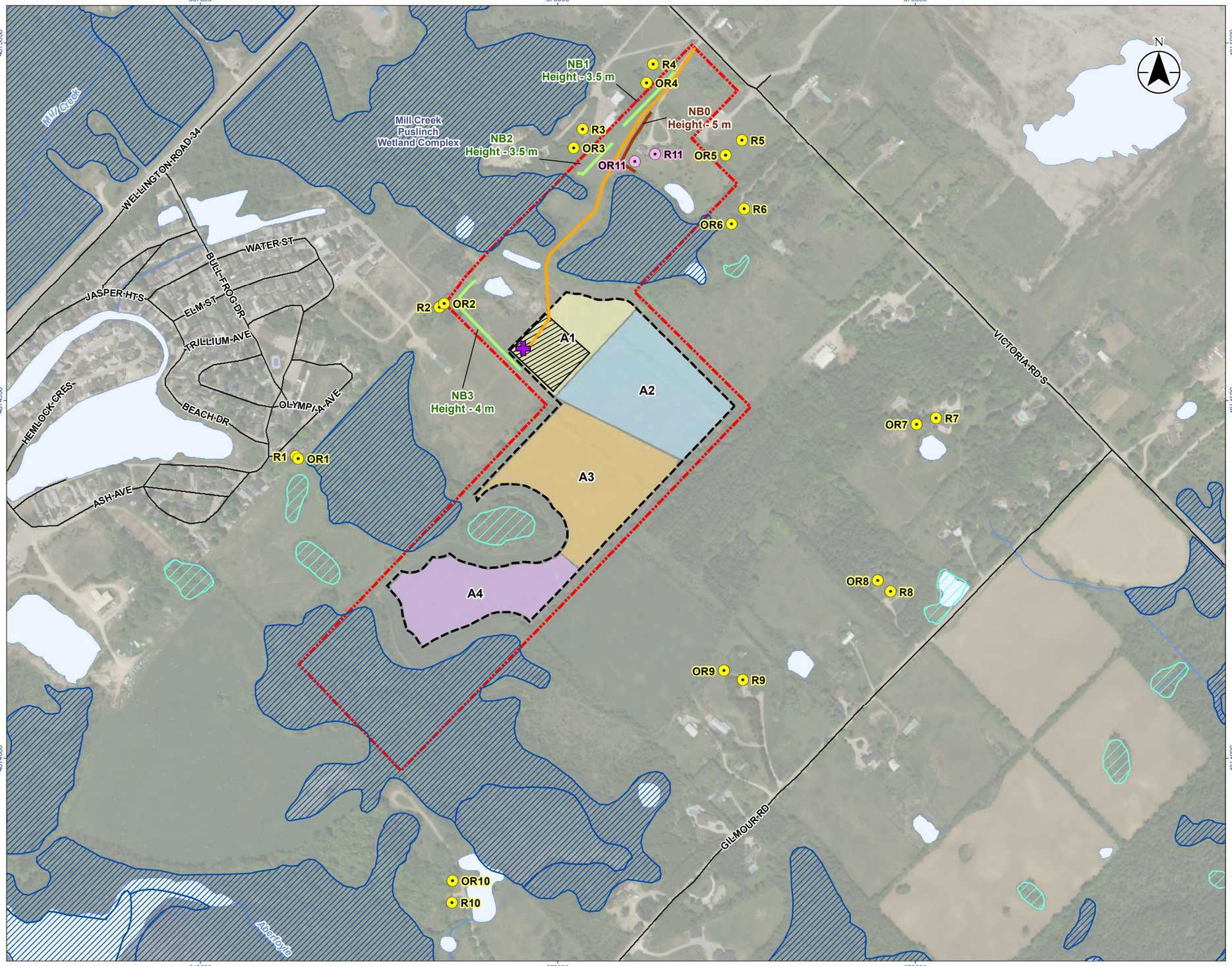
Source Name	ID	Distance [a] (m)	Partition Coefficient [b] (%)	Sound Power Level Octave Band Spectrum (dB)								Overall		Measurement Reference/Data Source
				63	125	250	500	1000	2000	4000	8000	dBA	dB	
Moving Truck	Lw1	25	50	105	107	109	103	100	96	89	79	106	113	1/1 and OA: Meas.004.s
Crane w/dragline	Lw2	50	50	117	124	109	107	108	107	100	93	114	125	1/1 and OA: Meas.010.s
Loader	Lw3	10	50	113	111	104	103	103	100	100	89	108	116	1/1 and OA: BSI 5228 2009
Truck Idling	Lw4	10	50	101	92	83	83	88	84	78	71	91	102	1/1 and OA: BSI 5228 2009

Notes:

a. Refers to the distance used to calculate the sound power level for the source

b. Refers to the partition coefficient used to calculate the sound power level for the source based on the observed/expected directivity of the source.

Appendix D Noise Model Sample Calculations



Stantec

Legend

- Property Boundary
- Points of Reception
- Discretionary Points of Reception
- Two Trucks Idling
- Loader
- Truck Route
- Modelled Noise Barrier
- Modelled Discretionary Noise Barrier
- Road
- Watercourse
- Waterbody
- Wetland - Evaluated (Provincial)
- Wetland - Not evaluated per Ontario Wetland Evaluation System

Modelled Equipment Working Areas – Above Water Extraction Phase

- A1
- A2
- A3
- A4

Extraction Footprints

- Above Water Extraction Footprint

0 100 200 metres

1:5,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.
3. Orthoimagery ©

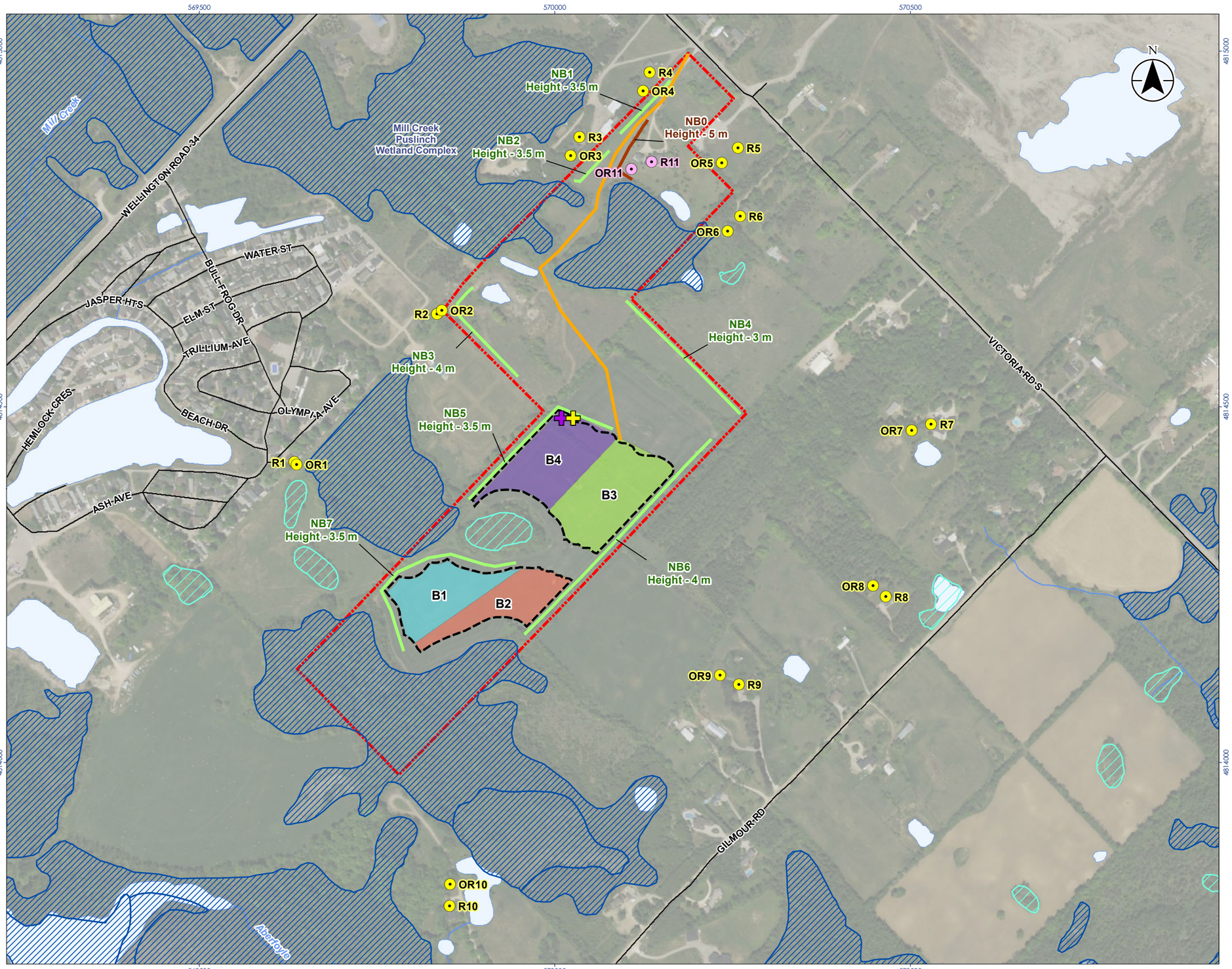
Project Location
Puslinch, ON

160961457 REVA
Prepared by PRM on 2025-12-19
Technical Review by FA on 2025-12-19

Client/Project
CBM ANTHONY PIT
NOISE IMPACT ASSESSMENT REPORT
4454 VICTORIA ROAD SOUTH, PUSLINCH, ONTARIO

Figure No.
D.1

Title
Modelled Equipment and Noise Barriers for Scenario 1 – Above Water Extraction Phase



Stantec

Legend

- Property Boundary
- Points of Reception
- Discretionary Points of Reception
- Two Trucks Idling
- Drag Line
- Truck Route
- Modelled Noise Barrier
- Modelled Discretionary Noise Barrier
- Road
- Watercourse
- Waterbody
- Wetland - Evaluated (Provincial)
- Wetland - Not evaluated per Ontario Wetland Evaluation System

Modelled Equipment Working Areas – Below Water Extraction Phase

- B1
- B2
- B3
- B4

Extraction Footprints

- Below Water Table Extraction Footprint

0 100 200 metres

1:5,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.
3. Orthoimagery ©

Project Location
Puslinch, ON

160961457 REVA
Prepared by PRM on 2025-12-19
Technical Review by FA on 2025-12-19

Client/Project
CBM ANTHONY PIT
NOISE IMPACT ASSESSMENT REPORT
4454 VICTORIA ROAD SOUTH, PUSLINCH, ONTARIO

Figure No.
D.2

Title
Modelled Equipment and Noise Barriers for Scenario 4 – Below Water Extraction Phase

Appendix E Curriculum Vitae

Fabian Alvarado M.Eng., P.Eng.

Noise and Acoustics Engineer

Fabian is a Noise and Acoustics Engineer within Stantec's Acoustics, Noise and Vibration in Ontario. Fabian has experience conducting noise and vibration assessments for domestic and international clients and stakeholders from a variety of market areas such as: transportation, construction, industrial and power generation. These noise and vibration assessments typically include, but are not limited to: noise and vibration field instrumentation specification and measurements; noise and vibration measurement data reduction and analysis; predictive noise and vibration modelling; assessment of potential adverse noise and vibration impacts; and reporting of assessment results including applicable mitigation recommendations.

EDUCATION

Master of Engineering, Mechanical Engineering, University of Toronto, Toronto, Ontario, Canada, 2015

Bachelor of Science with Distinction, Mechanical Engineering , University of Alberta, Edmonton, Alberta, Canada, 2014

REGISTRATIONS

Professional Engineer # 100520247, Professional Engineers Ontario

PROJECT EXPERIENCE

CONSTRUCTION NOISE AND VIBRATION ASSESSMENTS

GO Expansion and Network Wide Structures Project-McNaughton Road Grade Separation* | Metrolinx | Toronto, ON, Canada

The scope of work documents a Noise and Vibration Assessment for construction activities associated with the McNaughton Road Grade Separation. Fabian performed the noise and vibration assessments of the associated construction activities, as well as an assessment of rail operations and local road traffic directly affected. The assessments involved using standardized noise and vibration analysis methods from the U.S. Federal Transit Administration and U.S. Federal Highway Administration. Recommendations for best practices and construction mitigation measures to minimize adverse noise and vibration impacts were also developed.

CN Milton Logistics Hub - Acoustic Follow-up Program | Canadian National Railway | Milton, ON

Stantec was retained by the Canadian National Railway (CN) to implement the acoustic environment follow-up program (FUP) in reference to the construction of the Milton Logistics Hub (the Project). The FUP was developed to meet the conditions of approval stipulated in the Minister of the Environment's Decision Statement issued on January 21, 2021 (Decision Statement). As per condition 4.10 of the Decision Statement, the FUP involves monitoring noise levels during each phase of construction to assess compliance with the criteria established in the Project Noise Effects Technical Data Report. Mr. Alvarado completed the field work, technical analysis, and reporting for Phase 1 construction of the Project.

CN Halton Subdivision Expansion, Environmental Evaluation Phase 2 – Construction Noise and Vibration Assessment | Canadian National Railway Company | Ontario, Canada

CN retained Stantec Consulting Ltd. (Stantec) to complete a construction noise and vibration assessment report to support the Phase 2 environmental evaluation for the planned expansion of the Halton subdivision (the Project). The Project involves upgrades and modifications to the existing mainline within the Halton subdivision within the existing CN Right-of-Way (ROW) for approximately 23 kilometres (km) between Bramalea (Mile 11.06) and Georgetown (Mile 24.10).. Mr. Alvarado lead and completed the field investigations, noise and vibration modelling and reporting for the Project.

ENVIRONMENTAL NOISE ASSESSMENT - INDUSTRIAL FACILITIES

Acoustic Assessment Report for Valbruna ASW Inc. | Valbruna ASW Inc. | Welland, ON

Stantec Consulting Ltd. (Stantec) was retained by Valbruna ASW Inc. (Valbruna) to prepare an Acoustic Assessment Report (AAR) for their facility located at 42 Centre Street in Welland, Ontario (the Facility) in support of an Environmental Compliance Approval (ECA) renewal application. The AAR reflected planned Facility upgrades and expanded operation schedule, as well as proposed noise control measures to demonstrate compliance with Ontario Ministry of the Environment, Conservation and Parks noise criteria. Mr. Alvarado was the author of the AAR.

** denotes projects completed with other firms*

Noise Technical Data Report for Enbridge Pipelines Inc. | Enbridge Pipelines Inc. | Hamilton, ON

Preparation of a Noise Technical Data report (TDR) in support of the Environmental and Socio-economic Assessment for the Westover Facility Project (the Project) for Canada Energy Regulator (CER) approval. In accordance CER Filing requirements, the TDR provided a noise impact assessment for Project operations and construction with respect to provincial and federal noise guidelines: The Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 – Environmental Noise Guideline and Health Canada (HC) Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. The TDR noise impact assessment was based on field measurements and noise emission modelling using CadnaA, a noise modelling software which implements ISO-9613 series environmental sound propagation algorithms.

Barbados Light and Power Company Clean Energy Bridge Project-Trents Facility Noise Assessment and Monitoring Program* | Barbados Light and Power | St Lucy, Barbados

Fabian prepared the noise assessment report for the BLPC Trent's Facility located in St. Lucy, Barbados. The noise assessment included a detailed noise analysis and model (Cadna/A) which reflected noise emissions from conventional diesel and solar power generation and storage. Fabian also developed and prepared the Environmental Noise and Vibration Monitoring Program to meet the conditions of the Environmental Planning Permission document. This Program provided a detailed noise and vibration monitoring protocol to be followed in terms of: instrumentation, monitoring locations, and data collection and documentation.

Noise and Vibration Technical Data Report for the proposed Co-op Renewable Diesel Complex | Federated Co-operatives Limited | Regina, Saskatchewan

Federated Co-operatives Limited (FCL) is proposing to build the Co-op Renewable Diesel Complex (CRDC, the Project) in the City of Regina, Saskatchewan. The CRDC includes a 15,000 barrel per day Renewable Diesel Refinery comprised of a feedstock Pre-Treatment unit, Hydrogen production unit, a Carbon Capture unit, rail yard, and other ancillary processes. Stantec Consulting Ltd. (Stantec) was retained by FCL to conduct a noise and vibration impact assessment of the Project in support of the Project's Technical Proposal submission to the Environmental Assessment and Stewardship Branch (EASB). Mr. Alvarado worked as the technical lead for the noise assessment of Project operations.

Noise and Vibration Technical Data Report for the proposed FCL-AGT Joint Venture Canola Crush Facility | Federated Co-operatives Limited and AGT Food and Ingredients Inc. | Regina, Saskatchewan

Federated Co-operatives Limited (FCL) and Food and Ingredients Inc. (AGT) are proposing to build a 3,500 tonnes per day Canola Crush Facility (CCF) as a joint venture (JV) in the City of Regina, Saskatchewan (the Project). The Project will output approximately 1,500 tonnes per day of super degummed canola oil, and 2,000 tonnes per day of canola meal pellets. The Project will have the potential to increase capacity to 8,000 tonnes per day. Stantec Consulting Ltd. (Stantec) was retained by the JV to conduct a noise and vibration impact assessment of the proposed CCF, inclusive of seed receiving, seed preparation, oil extraction, meal handling and pelleting, oil degumming and associated rail loop. This assessment considers the CCF operating at a capacity of 4,000 tonnes per day to allow for organic growth of the Project. Mr. Alvarado worked as technical lead for the noise assessment of Project operations.

Acoustic Assessment Report for Carmeuse Beachville Operations | Ingersoll, Ontario

Stantec Consulting Ltd. (Stantec) was retained by Carmeuse Lime (Canada) Ltd. (Carmeuse) to prepare an Acoustic Assessment Report (AAR) in support of an application for an Environmental Compliance Approval (ECA) with Limited Operation Flexibility (LOF) for its lime manufacturing facility located in Beachville, Ontario (the Facility or Beachville Operations). The Facility is located on Lots 15 to 18, Concession 2 & 3, Zorra (North Oxford), 374681 Oxford County Road #6, Ingersoll, Ontario. The AAR included proposed noise control measures for the Facility to demonstrate compliance with Ontario Ministry of the Environment, Conservation and Parks noise criteria. Mr. Alvarado was the author of the AAR.

Mohammed Salim MBA, P.Eng.

Senior Acoustical Lead Engineer - Noise & Vibration

27 years of experience · Stoney Creek, Ontario

Mohammed is an Associate and Senior Acoustical Engineer within the Environmental Services Division at Stantec. In his 27 years of experience in the field of acoustics, noise and vibration consulting, Mohammed has a very good understanding of the municipal, provincial and federal noise and vibration regulations and brings extensive experience in dealing with acoustics, noise and vibration problems in transportation projects. He has worked on many road and rail projects and grade separation projects. He has completed many acoustic studies to support building design, land use planning, Environmental Compliance Approvals for industrial projects and Environmental Assessments for many transportation projects. He is a Professional Engineer with the Ontario Society of Professional Engineers and the Professional Engineers and Geoscientist in the Province of British Columbia. Mohammed is a certified acoustical specialist with the Ontario Ministry of Transportation and the Region of Waterloo.

EDUCATION

Bachelor of Mechanical Engineering, Mahatma Gandhi University, Kottayam, Kerala, 1992

Master of Business Administration, Questrom School of Business, Boston University, Boston, Massachusetts, USA, 2022

REGISTRATIONS

Professional Engineer #100114731, Ontario Society of Professional Engineers

Professional Engineer #57361, The Association of Professional Engineers and Geoscientists

PROJECT EXPERIENCE

Mining/Quarry

Canada Nickel Company (Canada Nickel), North of Timmins, Ontario

Canada Nickel proposes to develop, operate, and progressively reclaim the Crawford Nickel Project, a new open pit nickel mine and processing facility approximately 42 km north of Timmins, Ontario along Highway 655. The project is an open pit nickel, iron and cobalt mine north of Timmins Ontario. The Project is being currently assessed in accordance with the Impact Assessment Act, 2019, and the noise and vibration assessment is part of the EIA. Stantec is currently involved in preparing the environmental noise and vibration assessment for the Project and it also includes blasting impact assessment to structures and fish habitats. Wildlife noise impacts are also being assessed. Mohammed is the quality reviewer for the Project noise and vibration assessment.

Greenstone Gold Mine, Greenstone, Ontario

Prepared a Noise and Vibration Management and Monitoring Plan (NVMMP) to satisfy regulatory/permit requirements and commitments made during EA for the open pit mining project with a capacity of about 30,000 tpd. Noise and vibration technical lead and quality reviewer for the Project Acoustic Assessment Report to support Environmental Compliance Approval. The Project components included an open pit, waste rock storage areas, overburden storage areas, ore stockpile, ore crushing and mill feed ore storage activities, process plant, water management facilities, tailings management facility, power plant, liquefied natural gas plant, and explosives facility.

Marathon Palladium Mining Project, Town of Marathon, Ontario

The Project, a platinum group metals (PGM), copper (Cu) and possibly iron (Fe) open pit mine with the processing operations was being assessed in accordance with the Canadian Environmental Assessment Act (CEA Act, 2012) and Ontario's Environmental Assessment Act (EA Act) through a Joint Review Panel. Acted as a quality reviewer for the Project updated noise and vibration assessment report as part of the Environmental Impact Statement (EIS Addendum) to support the Joint Review Panel process. Completed quality review of the acoustic assessment for the Project acoustic assessment to support the Environmental Compliance Approval. Steady noise associated with the mining activities was conducted using Cadna/A noise modelling software, and the Project haul route noise impact was assessed using US FWHA Traffic Noise Model (v 2.5).

Rockridge Aggregate Pit Blasting Noise and Vibration Report Peer Review, Peterborough, Ontario

A third-party peer review on the Project blasting noise and vibration was completed on behalf of the County of Peterborough for their approval of the proposed aggregate pit. The review looked at the receptors, assessment methodology, criteria, assessment and recommendations. The review included discussion of requirements of Ministry of the Environment, Conservation and Parks applicable to the Project.

Goldcorp Borden Gold Project*, Chapleau, Ontario

The Borden Gold Project is an underground gold mine with a capacity of 4,000 tpd ore capacity. Noise emission from the Project site have the potential to disturb residential and campers in the area. Provincial regulatory criteria will be met at surrounding noise sensitive receptors. Assessed data collected during project exploration as part of auditing. Modelled stationary steady noise associated with the underground mine using Cadna/A noise modelling software, and prepared acoustic assessment reports for EA and complete a separate acoustic assessment to support an ECA for an offsite coreshack.

Cote Gold Mine Project*, Chester and Neville Townships, Ontario

Worked as a technical reviewer for the Noise and Vibration Technical Study for the Cote Gold Mine project. Completed QA/QC of the operation and construction noise models and reviewed noise impact assessment report for EA. Modelled ground-borne vibration and overpressure (concussion) levels from open pit blasting operations at the closest receptor locations for EA. The assessment included impact from tailings and open pit operations at the closest receptors.

Pampa de Pongo Mine*, Peru

Completed a detailed peer review of the noise and vibration impact assessment. Included detailed review of compliance criteria, baseline and operational impact methodologies for both noise and vibration.

Rainy River Project*, Chapple, Ontario

Rainy River Project a gold mine project with 25,000 TPD ore capacity. Worked as the technical lead for preparing noise and vibration assessment from project blasting operations as well as noise impact from Project construction and operation in support of the EA and ECA for the Rainy River Project. Blasting noise and vibration assessment was completed in accordance with the MECP NPC-117. Modelled stationary noise from open pit and underground mine using Cadna/A noise modelling software. Assessed data collected during project exploration and provided technical support to MNRF and New Gold. Conducted yearly noise monitoring at Whip-poor-will Habitat Receptors as required by the MNRF Endangered Species Act (ESA) Permit for the Rainy River mining project. Sound level monitoring of the Whip-poor-will habitat receptor area near the site were conducted every year during the first week of May and June. The purpose of the noise monitoring was to confirm that the construction sound levels are at or below the criteria limit of 50 dBA, as provided in the permit.

** denotes projects completed with other firms*

Black Fox Gold Mine*, Matheson, Ontario
Modelled stationary steady noise emanating from the open pit and underground mining operations using Cadna/A software and provided acoustical assessment report to support ECA application. Updated the site-wide noise model and assessment report for the exploration activities at the site as part of the mine expansion.

Transportation Projects

Oshawa-Bowmanville GO Rail Corridor Extension| Metrolinx, Bowmanville, Ontario
Stantec was awarded the contract to provide technical advisory, design, and construction support services for Metrolinx's Bowmanville Rail Expansion project. This commuter rail expansion project will provide infrastructure improvements to accommodate a 20 km extension of Metrolinx's GO Transit service along their Lakeshore East rail corridor, from Oshawa to Bowmanville. The assessment includes, baseline noise and vibration assessment, rail noise and vibration impact assessment, station noise impact assessment, construction noise and vibration impact assessment, and identifying area for noise and vibration mitigation and monitoring. Mohammed worked as the Technical Lead and Quality Reviewer for Project Noise and Vibration impact assessment.

Stouffville Corridor Grade Separation, Toronto and Markham ON
Metrolinx has undertaken an expansion of the GO Transit system to transform GO Rail into a comprehensive regional rapid transit network to provide faster and more frequent two-way all-day service to core parts of the rail network. As part of the infrastructure modifications, Stouffville corridor grade separation is to support the introduction of additional trains on the Stouffville Rail Corridor, including reducing the number of at-grade rail crossings which will enhance on-time performance and operational flexibility/reliability. The Project included grade separation of seven road-rail crossings along the Stouffville Rail Corridor: Denison Street and Kennedy Road in the City of Markham and Passmore Avenue, McNicoll Avenue, Huntingwood Drive, Havendale Road and Progress Avenue in the City of Toronto. Mohammed acted as the Lead Noise and Vibration Engineer and completed quality assurance for the project. A baseline noise and vibration study and construction noise and vibration impact assessment were completed as part of the Project. The assessment included noise and vibration impacts from detours, construction noise impacts from construction activities, and vibration impacts from construction equipment. Mohammed worked as the Technical Lead and Quality Reviewer for Project Noise and Vibration.

Scarborough Junction Rail/Rail Grade Separation, Toronto, ON
Scarborough Junction grade separation project was completed under Metrolinx's expansion of the GO Transit rail service as defined by the Regional Express Rail (RER) plan. RER proposed increased train frequency on all lines including the Lakeshore East and Stouffville Lines. The Stouffville Line, which operates on the Uxbridge Subdivision, and the Lakeshore East Line, which operates on the Kingston Subdivision merge at Scarborough Junction near the intersection of St. Clair Avenue and Midland Avenue. Stantec was retained by Metrolinx to look at the feasibility of rail-to-rail grade separation solutions at the Scarborough Junction and move forward with the Detailed Design, Environmental Assessment and Technical Advisory Services following selection of the preferred alternative. Stantec successfully completed the TPAP for this project in February 2021. The assessment included noise and vibration impacts from detours, construction noise impacts from construction activities, and vibration impacts from construction equipment. The potential construction noise and vibration impacts were evaluated by establishing zones of influence. Recommendations for construction operational changes, mitigation and monitoring were provided in the report. Mohammed worked as the Lead Engineer for Project Noise and Vibration assessment.

West Side Collector Road Class Environmental Assessment, Town of Kingsville, Essex Region, Ontario

** denotes projects completed with other firms*

Stantec Consulting Ltd. (Stantec) was retained by the Town of Kingsville (the Town) to conduct a noise impact assessment in support of a Municipal Class Environmental Assessment for the for the construction of West Side Collector Road, an extension of Heritage Road to Road 2 West in the Town of Kingsville, Essex Region in Ontario. The existing Heritage ends at the south of Main Street West. The purpose of the noise impact assessment was to evaluate the Project's noise impact on surrounding noise sensitive areas in accordance with applicable regional and provincial noise guidance documents for road projects. The most current version of the United States Federal Highway Administration (FHWA) Traffic Noise Model (TNM v3.1), as recommended by the province, was used for the noise impact assessment. Mohammed worked as technical lead for the Project noise impact assessment.

Bass Pro Mills Drive Extension Class Environmental Assessment, City of Vaughan, Ontario

Stantec was retained by the City of Vaughan to conduct a noise impact assessment in support of a MCEA for the Bass Pro Mills Drive Extension located in the City of Vaughan, Ontario. The Project involves extending the existing Bass Pro Mills Drive from Highway 400 to Weston Road making it an internal road to service the area. The existing Bass Pro Mills Drive ends at the west of Highway 400, in the City of Vaughan. The Vaughan Mills Center Secondary Plan recommended the extension of Bass Pro Mills Drive westerly to Weston Road. The purpose of the noise impact assessment was to evaluate the Project's noise impact on surrounding noise sensitive areas in accordance with applicable regional and provincial noise guidance documents for road projects. Mohammed provided technical direction and acted as Quality Reviewer for noise.

Weston Road Detailed Design, York Region, City of Vaughan, Ontario

Stantec completed a noise impact assessment for the Weston Road Widening project for the Regional Municipality of York as part of the Detail Design. Weston Road would be a 6-lane roadway after completion of the Project. The assessment also validated the noise study completed as part of Individual Environmental Assessment for Western Vaughan in 2011. Mohammed provided technical direction and acted as Quality Reviewer for noise assessment.

Lincolnville GO Station, Whitchurch-Stouffville, Ontario

Through ongoing planning for the Lincolnville Layover and GO Station Improvements and continued detailed design work, it was determined that a new GO station was required to accommodate projected passenger growth and allow for full build-out of the layover improvements and relocation of Lincolnville GO station. The development of a relocated GO station on a new 5.5 hectares site was proposed. A noise and vibration impact assessment report was completed to support the EA and the Project design. The assessment was completed as per the Ministry of the Environment, Conservation and Parks (MECP)/GO Transit Draft Protocol for Noise and Vibration Assessment, and MECP guideline NPC-300 "Environmental Noise Guideline. An acoustic assessment report was completed for the new Lincolnville station, as part of the Environmental Compliance Approval (ECA) process, and noise barrier was recommended as noise mitigation for bus idling at the station.

Highway 401 Commercial Vehicle Inspection Station Relocation, Milton & Halton Hills, Ontario

A noise impact assessment report to support the preliminary design and Class EA for the Project on behalf of the Ministry of Transportation (MTO) was completed. The assessment was completed as per the Ministry of Environment, Conservation and Parks (MECP) and MTO noise guidelines. Both operation and construction noise were assessed.

** denotes projects completed with other firms*

Frank Babic P.Eng. INCE

Technical Lead Noise, Vibration and Acoustics - Environmental Services

27 years of experience · Mississauga, Ontario

Frank has over 27 years of engineering consulting experience in the areas of acoustics, noise and vibration engineering from notable consulting firms in our industry, and currently leads the Technical team for Stantec. His areas of technical expertise include engineering consulting in Environmental Noise, Transportation Noise, Building Acoustics, Vibration and Monitoring (Noise and Vibration). He has a breadth of project experience in key markets including Buildings, Construction, Environmental Services, Land Development, Oil & Gas, Transportation and Water/Wastewater. He is also fully experienced in the environmental assessment, construction administration and compliance requirements for these projects for both noise and vibration. Frank has led the growth of acoustics teams while being a key technical resource and support for multi-disciplinary, multi-million-dollar projects in Canada and the US.

EDUCATION

Bachelor of Applied Science, Civil Engineer; Option in Management Science, University of Waterloo, ON, Canada, 1996

REGISTRATIONS

Professional Engineer #90475229, Professional Engineers Ontario, 2001-present

Registered Member, Institute of Noise Control Engineering of the USA

MEMBERSHIPS

Member, Institute of Noise Control Engineering of the USA

Member, Canadian Acoustical Association

AWARDS

2012 SMART (Technology) Award for Remote Monitoring of Noise and Vibration on the Southeast Collector Project

PROJECT EXPERIENCE

GGM Environmental Assessment, Monitoring and Management Plan | Greenstone, Ontario | 2018 | Technical Lead for Noise & Vibration Management

Stantec completed the environmental noise and vibration assessment for the Greenstone Gold Mines Hardrock Project. This involved noise and vibration analysis and mitigation for operations and construction. Mr. Babic was technical lead for the Noise and Vibration Management and Monitoring Plan that was also prepared for the project.

Joint Panel Review: Marathon Palladium Project | Generation PGM Inc. | Marathon, Ontario, Canada | 2020-present | Technical Lead, Acoustics, Noise and Vibration

Providing technical advice for the environmental assessment for the Joint Review Panel (JRP) Federal-Provincial Environmental Assessment (EA) for the proposed Marathon Palladium Project, an open pit platinum group metal and copper mine located north of Marathon Ontario.

Canadian Nickel Mine | Canada Nickel Company | Timmins, ON | CAD 100k | Noise & Vibration Technical Lead

Frank is involved as the noise and vibration technical lead for the Canadian Nickel Mine. The project is an open pit nickel, iron and cobalt mine north of Timmins Ontario. Stantec is involved in preparing the environmental noise and vibration assessment for the construction, operation and decommissioning of the mine. This includes assessment of construction and operational noise and vibration impacts to federal (Health Canada) noise guidelines. This also includes blasting impact assessment to structures and fish habitats. Wildlife noise impacts are also provided. Frank is involved in the independent technical review of the noise and vibration work associated with the project.

IAMGOLD Cote Gold Mine Environmental Assessment* | 2013-2015 | Senior Lead

Senior lead in the preparation of the Noise and Vibration Technical Study for the Cote Gold Mine project. Included an assessment of construction and operational noise to Ministry of Environment noise guidelines NPC-300 and blasting noise and vibration to NPC-117. Assessment included impact from tailings and open pit operations.

** denotes projects completed with other firms*

Deloro Mine Phase 3 Cleanup Monitoring* | 2013-2016 | Senior Lead

Senior lead in preparing the Construction Noise Monitoring and Control Plan for the Deloro Phase 3 Cleanup project. Senior lead overseeing the installation and on-going noise monitoring of construction noise at the site. Technical challenges included low-temperature installation, power considerations and extreme winter considerations for real-time monitoring. Senior lead overseeing preparation of blast noise and vibration monitoring.

PUBLICATIONS & WHITEPAPERS

F. Babic; Transmission Loss of Ultra Lightweight Concrete Block. *Canadian Acoustics Journal*, 2006.

F. Babic; An Approach to Noise Impact Assessment for Long-Term Construction. *The Journal of the Acoustical Society of America, vol. 127, issue 3, p. 1829*, 2010.

F. Babic, AC Transmission Line Corona Noise. *AWMA Ontario Section Air Quality and Environment Acoustic Modeling Conference*, 2013.

F. Babic et. al.; “NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems & NFPA 502 Standard for Road Tunnels, Bridges, and Other Limited Access Highways”, Technical Contributor. *National Fire Protection Association*, 2014.

F. Babic, M. Salim. A. Rodrigues; Rooftop Noise Impact Investigation to the Community. *Canadian Acoustical Association, Acoustics Week in Canada 2014*, 2014.

F. Babic, Rumble Strip Noise. *CAA Conference 2015*, 2015.

F. Babic, Discussion on Noise And Its Impact on Birds. *CAA Conference 2017*, 2018.

PRESENTATIONS

https://prezi.com/-rx7swftdtvb/rumble-strip-design-characteristics-on-wayside-noise/. *Canadian Acoustics Conference*, 2016.

Transmission Line Corona Noise Presentation. *AWMA Ontario Section Air Quality and Environmental Acoustic Modelling Conference*, 2014.

** denotes projects completed with other firms*