

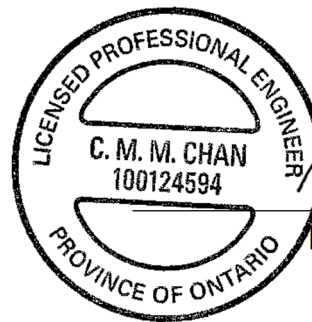
Noise Feasibility Study for a Category 3 – Class “A” Pit above Water Hallman Pit

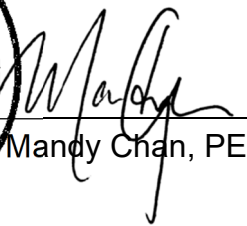
Part Lot 10 Concession South of Bleams Road Wilmot, Ontario

Prepared for:

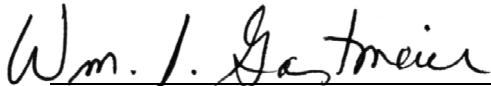
Jackson Harvest Farms Ltd.
2879 Herrgott Road
St. Clements ON N0B 2M0

Prepared by:




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and


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September 10, 2019

HGC Project No. 01800433

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1 INTRODUCTION AND SUMMARY

HGC Engineering was retained by Jackson Harvest Farms Ltd. to undertake an analysis of the potential impact of noise from a proposed gravel pit at neighbouring noise sensitive receptors (residential dwellings) in accordance with the Ministry of Natural Resources and Forestry (MNR) and the Ministry of the Environment, Conservation and Parks (MECP) Guidelines.

This assessment was conducted in accordance with MNR and MECP guidelines and considered the potential effects of noise from extraction, processing and transportation sources with regard to neighbouring noise sensitive receptors.

This assessment is also based on a review of the operational plans prepared by IBI Group dated June 28, 2019, measurement of sound levels of the equipment to be used in the pit and sound levels taken from our files based on measurements of similar aggregate processing equipment.

There are noise sensitive receptors located to the north, east and west of the proposed pit. The equipment and activities which are potential sound sources are outlined in Section 4. This assessment is based on a scenario representing the worst-case operations located closest to the receptors. The results of our analysis indicate that the sound levels produced by the operations in the pit under the worst-case operational scenario are expected to comply with MECP Guideline limits with the implementation of noise control measures.

2 SITE DESCRIPTION

The existing features plan attached as Figure 1 and aerial plan attached as Figure 2 show the location of the site, the neighbouring residences and nearby roadways.

The proposed gravel pit is located north of Witmer Road, south of Bleams Road (Regional Road 4) and west of Queen Street in the Town of Wilmot. The proposed licence area is ± 57.27 hectares with a maximum annual tonnage of excavation of 750,000 tonnes. There are existing residential and agricultural land uses surrounding the site. To the southeast of the site are existing gravel pits.

3 CRITERIA

3.1 Receptors

The Provincial Standards – Aggregate Resources of Ontario (Category 3 – Class “A” Pit above Water) state: “If extraction and / or processing facilities are located within 150 meters of a sensitive receptor, a noise assessment report is required to determine whether or not provincial guidelines can be satisfied” and “Sensitive receptors include residences or facilities where people sleep (nursing homes, hospitals, trailer parks, camping grounds, etc); schools; day-care centres.”

There are residential uses to the north, east and west of the subject site. Selected residences surrounding the site have been chosen as representative sensitive points of reception for the purposes of this study (R1 to R9)

R1, R2, R6 and R8 are 1-storey high dwellings and R3 to R5, R7 and R9 are 2-storey dwellings. Any useable locations on the residential property, within 30 m of the building facade and outside the plane of the residential windows are considered to be points of reception. The worst-case point of reception is generally considered to be outside upper storey windows due to the potentially increased exposure to activities in the pit. The receptor locations are shown on the Figures.

Based on observations by HGC Engineering personnel during site visits and surrounding area, residences along Bleams Road are subjected to significant traffic during the daytime hours. As such, R5 to R9 are considered to be located within a Class 2 (semi-urban) acoustic environment. For R1 to R4, which are located removed from the roadways, they are considered to be located in a Class 3 (Rural) acoustic environment, as defined in MECP publication NPC-300.

3.2 Noise Criteria

Appropriate sound level limits used in the assessment of sound from aggregate operations are provided in MECP publication NPC-300 [2]. NPC-300 specifies that the sound level limit at any receptors in a Class 2 acoustic environment due to the operation of a stationary source is the higher of background one hour energy equivalent sound level (L_{EQ-1hr}) or 50 dBA during daytime hours and 45 dBA during nighttime hours. The limits for receptors in a Class 3 acoustic environment due to the operation of a stationary source is the higher of background one hour energy equivalent sound



level (L_{EQ-1Hr}) or 45 dBA during daytime hours and 40 dBA during nighttime hours.

To ensure a conservative analysis, since road traffic sound levels may be relatively low during some daytime hours, the exclusionary daytime sound level limits of 50 dBA and 45 dBA are used in the following sections of this report as the criterion by which the potential noise impact of the proposed aggregate extraction and processing operations are assessed.

Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors, although there may be residual audibility during periods of low background sound. The guidelines of NPC-300 apply to sound from the ongoing day-to-day operations of the subject site. They do not apply to the temporary sound produced during the preparation and rehabilitation of aggregate operations, or to the sound produced by road trucks on public roadways. The initial operations of building access roadways, stripping topsoil, siting processing facilities, building localized shielding and perimeter berms, as well as the final operations of rehabilitation and removal of localized shielding and perimeter berms are defined as construction activity. In order to satisfy Provincial Standards, the sound levels emitted by the equipment involved in those construction activities must comply with MECP Guideline NPC-115, "Sound Levels due to Construction Equipment" [3].

4 NOISE ASSESSMENT

4.1 Description of Noise Sources and Aggregate Operations

The following details the future above water extraction and processing operations in the pit as indicated on the Operational Plan.

1. The gravel pit will typically operate from 07:00 to 18:00 on Monday to Friday, and from 08:00 to 12:00 on Saturday. Shipping activities from 06:00 to 18:00 on Monday to Friday, and from 06:00 to 12:00 on Saturday. No other evening or nighttime operations are anticipated.
2. The entrance to the pit is located on south side of the site.
3. Operations will begin in the south end of Phase 1 and proceed in westerly, easterly and northerly directions into Phases 2 and 3 and then southerly into Phase 4.

4. The aggregate excavation, processing and loading equipment will consist of a screening plant with an associated loader, a permanent crushing plant (recycling) with an associated loader, a permanent washing plant with an associated loader, a portable crushing plant with an associated loader and one additional loader. The additional loader will operate in each area for extraction at the working face and/or for loading trucks. Trucks and/or conveyors may also be used to transport material for processing between the working face and the processing plants.
5. All operations including excavation, processing, and loading will typically occur on the floor of each lift or at the final pit floor elevation given as 356 m ASL. Each lift is approximately 8 m in depth.
6. Processing equipment will not be located within 90 m of any boundary of the site that abuts residential land uses as per “The Provincial Standards – Aggregate Resources of Ontario”, Operational Standards for Licences, Section 5.13.
7. The peak number of trucks expected to arrive and depart in a typical busy hour is 34.

MECP guidelines require that a worst-case hourly scenario be used in the evaluation. This scenario is discussed below.

4.2 Acoustical Modelling

As per MECP guidelines, predictive modeling was used to assess the potential sound emissions of the worst case activity scenarios in all phases of operation. The prediction model is based on established engineering methods from the MECP and ISO Standard 9613 for the prediction of outdoor sound propagation.

To consider the worst case hourly operational scenarios, the following assumptions were made:

- All extraction, processing, and loading could occur simultaneously at the closest possible location to each receptor;
- All equipment will be located on the pit floor (approximately 356 mASL) or at the floor of



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the first lift, approximately 8 m below existing grade.

- 34 haul trucks pick up a load of aggregate (arrive and depart) for shipment off-site.

The calculations consider the acoustical effects of distance, foliage, topography and shielding by the excavation face where applicable. Sound levels at each receptor were predicted using the sound level data and the assumptions outlined above and the details contained in the operational plan.

Table 2 below presents the reference sound levels used in the acoustic modeling. These sound levels were based on site measurements of the processing equipment to be used in this pit and information taken from our files for similar operations.

Table 2 – Reference Sound Power Levels of Processing Equipment

Equipment	Sound Power Level dBA re: 10 ⁻¹² W	Sound Pressure Level dBA at 50 m
A Screening Plant with an associated loader	110	68
A Portable Crushing Plant with an associated loader	117	75
A Permanent Crushing Plant (Recycling), with an associate loader	117	75
A Permanent Wash Plant, with an associate loader	108	66
One Additional Loader	107	65
Highway Trucks	102	60

If other equipment is proposed for operation in the gravel pit, it shall be confirmed through measurement to produce sound levels consistent with the above referenced sound levels or additional mitigation measures may be required.

5 RECOMMENDATIONS

Using the predictive model and assumptions described in the previous section, the following noise control requirements were developed and should be included as notes on the Operational Plans.

Initial Start-Up Phase

1. Prior to extraction, the licensee shall construct a Designated Recycling Area, Washing Area and an Initial Portable Processing Crusher Area, in the general location as shown on Sheet 2 of 5 – Operational Plan, at the final pit floor elevation of 356.0 mASL
2. Processing and recycling equipment may be used during the initial start-up phase to construct these working areas.
3. During continued operations in this phase, processing equipment may be relocated to follow the pit working face. The recycling equipment shall remain in the Designated Recycling Area, at the final pit floor elevation.

Phase 1

4. Prior to extraction in Phase 1, the licensee shall construct Berms 1, 2 and 3, which shall be at a minimum height of 5.0 m above existing grade.
5. During Phase 1 extraction operations, the portable processing crusher shall remain on the final pit floor, at an elevation of 356.0 mASL. Screening equipment may be located anywhere on the first lift floor or lower.
6. During extraction in Phase 1, the general direction of extraction will be northwards and southeast.
7. When the portable processing crusher is operating in Areas 1(a) and 1(b) it shall be surrounded by acoustical barriers, minimum 8.0 m high, along the south and east side of the equipment, to provide supplementary noise shielding.

Phase 2

8. Prior to the extraction of Phase 2, the licensee shall construct Berm 4, which shall be at a minimum height of 4.0 m above existing grade.
9. During the extraction of Phase 2, the portable processing crusher must remain on the final pit floor, at an elevation of 356.0 mASL. Screening equipment may be located anywhere on the first lift floor or lower.
10. During extraction in Phase 2 the general direction of extraction will be northwards.



11. When the portable processing crusher is operating in Area 2(a) it shall be surrounded by acoustical barriers, minimum 8.0 m high, along the south and east side of the equipment, to provide supplementary noise shielding.

Phase 3

12. Prior to the extraction of Phase 3, the licensee shall construct Berms 5, 6 and 7, which shall be at a minimum height of 4.0 m above existing grade.
13. During the extraction of Phase 3, the portable processing crusher shall remain outside the Phase 3 boundary at the final pit floor elevation of 356.0 mASL. Screening equipment may be located anywhere on the first lift floor elevation of 364.0 mASL or lower.
14. When the portable processing crusher is operating within 200 m of the Phase 3 boundary it must be surrounded by acoustical barriers that are minimum 8.0 m high, along the north, west and east side of the equipment to provide supplementary noise shielding.
15. When the portable processing crusher is operating between 200 and 300 m of the Phase 3 boundary, acoustical barriers are not required if the screener is operating at the final pit floor elevation.
16. When the portable processing crusher is operating further than 300 m from the Phase 3 boundary, no acoustical barriers are required for shielding purposes.
17. During extraction in Phase 3 the general direction of extraction will be northwards.

Phase 4

18. Extraction of Phase 4 shall start in the eastern portion of the Phase and proceed westward.
19. Direction of extraction in the eastern portion of the Phase will initially be in a southward direction then westwards.
20. During the extraction of Phase 4, recycling equipment must not operate simultaneously with processing equipment or washing equipment.
21. Once Berm 2 is removed, the portable processing crusher must remain outside the No Crusher zone surrounded by minimum 10.0 m high acoustical barriers located on the east and west.
22. During the extraction of Phase 4 all processing equipment must be located at the final pit floor elevation of 356.0 mASL.
23. The acoustical barriers mentioned above could be comprised of an earth berm, a noise wall, aggregate stockpiles or any other construction with a minimum surface density of 20 kg/m².



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24. Activities used to prepare the site for excavation, such as the stripping of topsoil and construction of berms, or activities related to the remediation of the site after the extraction is completed are considered to be construction activities. They are regulated under municipal bylaws and NPC-115 “Sound Level Limits for Motorized Construction Equipment”.

6 CONCLUSIONS

In summary, HGC Engineering has reviewed the operational plan, prepared an acoustical model of the proposed activities in the pit and conducted an analysis of those operations based on a worst-case operational scenario. Using the modeling assumptions detailed in Section 4, along with incorporation of the noise control recommendations detailed in Section 5 and Figure 3, sound levels were predicted at each of the selected receptors as summarized in Tables 3 and 4. Sample calculations are provided in Appendix A.

**Table 3: Predicted Sound Levels at the Residential Receptors [dBA]
During Worst-Case Operational Scenarios (With Noise Mitigation)**

Receptor	Daytime Criteria (dBA)	Predicted Sound Level (dBA)
R1	45	45
R2		45
R3		45
R4		45
R5	50	45
R6		40
R7		44
R8		46
R9		45



**Table 4: Predicted Night-time Sound Levels at the Residential Receptors [dBA]
Shipping Activities Only (With Noise Mitigation)**

Receptor	Night-time Criteria (dBA)	Predicted Sound Level (dBA)
R1	40	<35
R2		<35
R3		<35
R4		<35
R5	45	<35
R6		<35
R7		<35
R8		<35
R9		<35

The results summarized indicate that the sound emissions from the proposed pit operations, with the noise control measures in place, are expected to comply with MECP guideline limits at the neighbouring noise sensitive receptors under worst case operating scenarios.

7 REFERENCES

1. Ontario Ministry of the Natural Resources and Forestry, *Aggregate Resources of Ontario – Provincial Standards*, 1997.
2. Ontario Ministry of the Environment and Climate Change Publication NPC-300, *Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning*, August 2013.
3. Ontario Ministry of the Environment and Climate Change Publication NPC-115, *Sound Level Limits for Motorized Construction Equipment*”.
4. International Organization for Standardization, *Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation*, ISO-9613-2, Switzerland, 1996.
5. Google Maps Aerial Imagery, Internet application: *maps.google.com*.

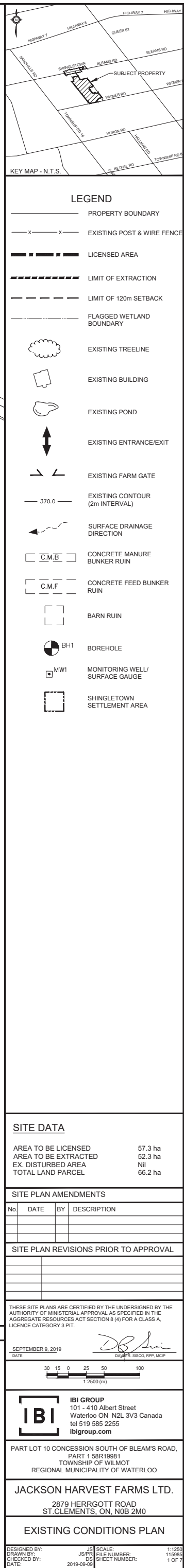
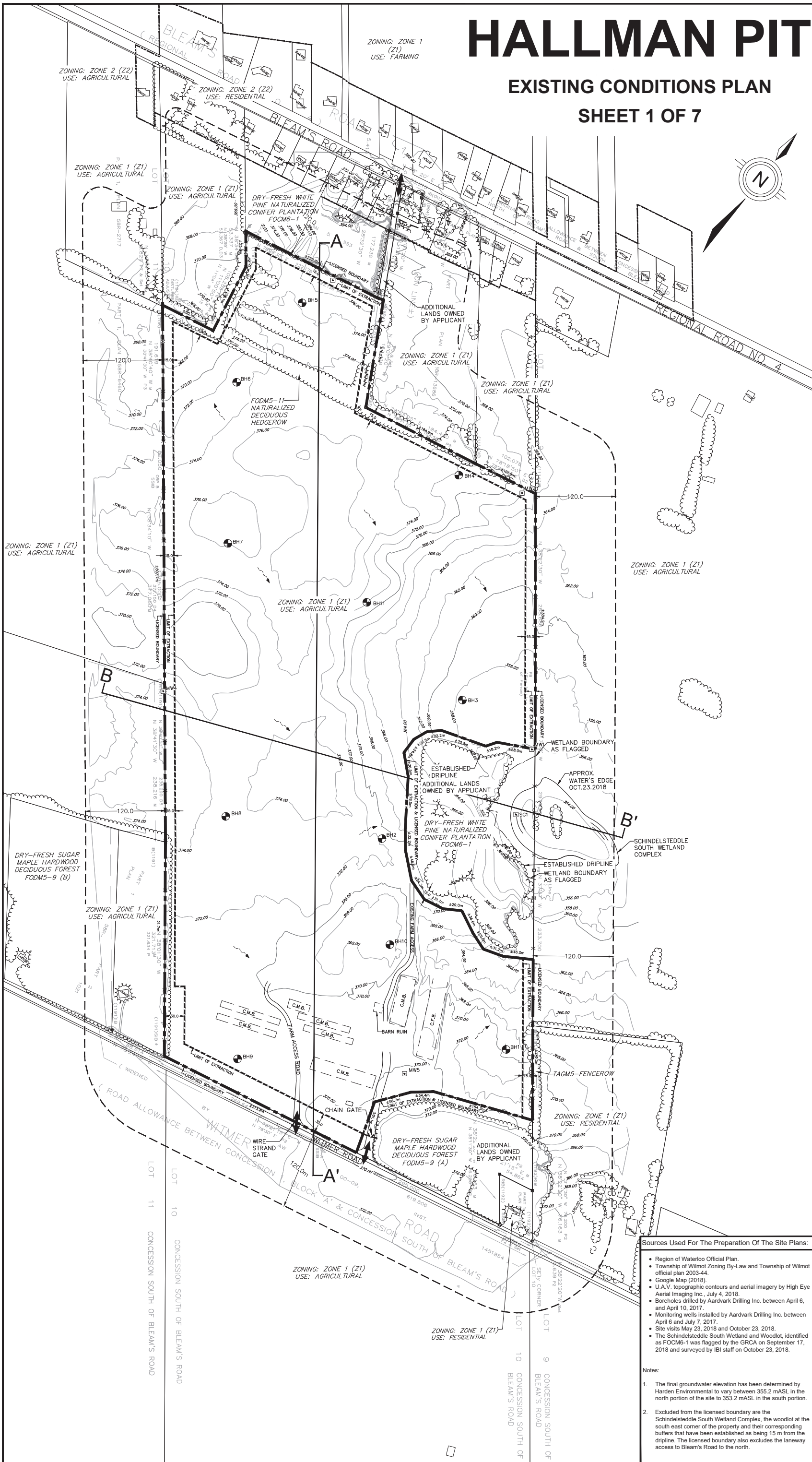


Figure 1: Existing Features Plan



Figure 2: Aerial Photo Showing Receptor Locations



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NOISE

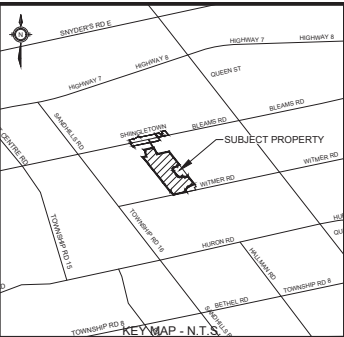


VIBRATION

HALLMAN PIT

OPERATIONAL PLAN

SHEET 2 OF 7



LEGEND

- | | |
|---|--|
|  | PROPERTY BOUNDARY |
|  | POST & WIRE FENCE |
|  | PHASING LINES |
|  | LICENSED AREA |
|  | LIMIT OF EXTRACTION |
|  | LIMIT OF 120m SETBACK |
|  | FLAGGED WETLAND BOUNDARY |
|  | 1.5m HIGH T-BAR POSTS |
|  | EXISTING TREELINE |
|  | EXISTING BUILDING |
|  | EXISTING POND |
|  | PHASING NUMBER |
|  | DIRECTION OF EXTRACTION |
|  | ENTRANCE/EXIT |
|  | FARM GATE |
|  | EXISTING ELEVATION
NUMBER OF LIFTS
FINAL EXTRACTED ELEVATION |
|  | MONITORING WELL/
SURFACE GAUGE |
|  | PROPOSED WASH POND |
|  | PROPOSED BERM |
|  | SHINGLETOWN
SETTLEMENT AREA
(WILMOT O.P.) |

NOTE: REFER TO SHEET 3 OF 7 FOR
OPERATIONAL NOTES

SITE PLAN OVERRIDES

5.1	No fencing abutting pine plantation as those lands are owned by the licensee and the exterior boundary will be fenced or access is restricted.
5.10.1	No setback abutting pine plantation as those lands are owned by the licensee and the buffer is in place outside the license boundary
	No setback abutting the sugar maple forest in the south-east as those lands are owned by the applicant.

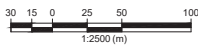
SITE DATA

AREA TO BE LICENSED	57.3 ha
AREA TO BE EXTRACTED	52.3 ha
EX. DISTURBED AREA	Nil
TOTAL LAND PARCEL	66.2 ha

#	DATE	BY	DESCRIPTION
REVISIONS PRIOR TO APPROVAL			

THESE SITE PLANS ARE CERTIFIED BY THE UNDERSIGNED BY THE
AUTHORITY OF MINISTERIAL APPROVAL AS SPECIFIED IN THE
AGGREGATE RESOURCES ACT SECTION 8 (4) FOR A CLASS A,
LICENCE CATEGORY 3 PIT.

DATE _____



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PART LOT 10 CONCESSION SOUTH OF BLEAM'S ROAD,
PART 1 58R19981
TOWNSHIP OF WILMOT
REGIONAL MUNICIPALITY OF WATERLOO

JACKSON HARVEST FARMS LTD.
2879 HERRGOTT ROAD
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OPERATIONAL PLAN

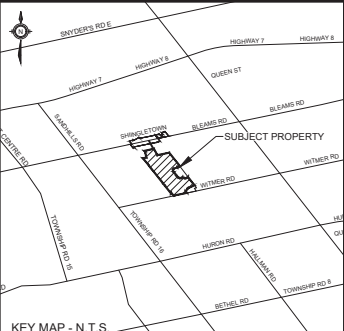
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DRAWN BY:	JFMSPR	FILE NUMBER:	115985
CHECKED BY:	DS	SHEET NUMBER:	2 OF 7
DATE:	2019-08-20		

Figure 3a: Operation Plan

FILE: Y:\115985_JacksonHarvest\5.9 Drawings\59pin Current\115985-OPERATIONAL LAYOUT.OP NOTES+DETAILS COTB AIA Standard.ctb SAVED BY:Paul.Riley, 2019-08-27 1:59 PM

HALLMAN PIT

OPERATIONAL NOTES & DETAILS SHEET 3 OF 7



KEY MAP - N.T.S.

LEGEND

PROPERTY BOUNDARY

LICENSED AREA

LIMIT OF EXTRACTION

PHASE BOUNDARY

②

PHASING NUMBER

CRUSHING RESTRICTION ZONE

AREA 1B

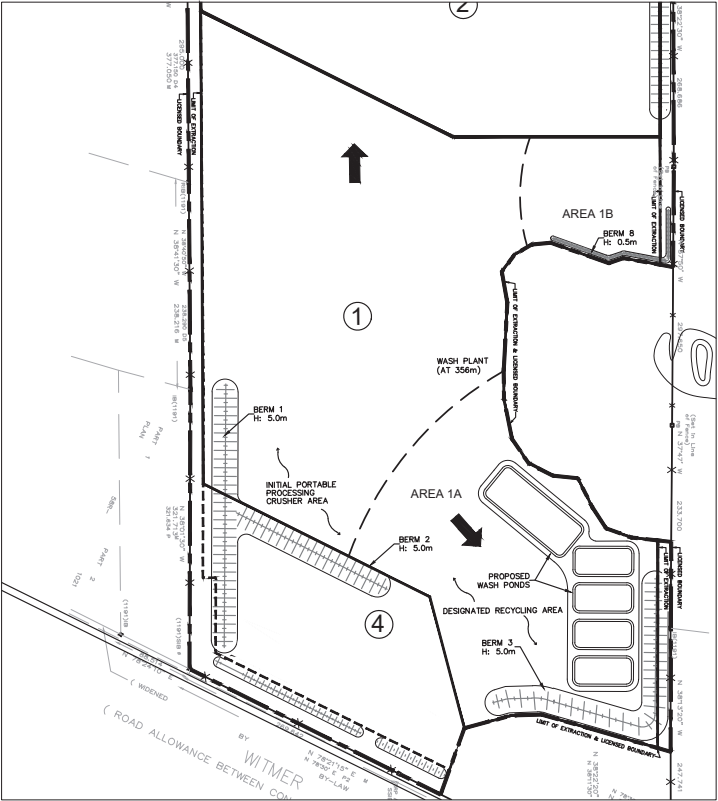
CRUSHING RESTRICTION AREA

↑

DIRECTION OF EXTRACTION

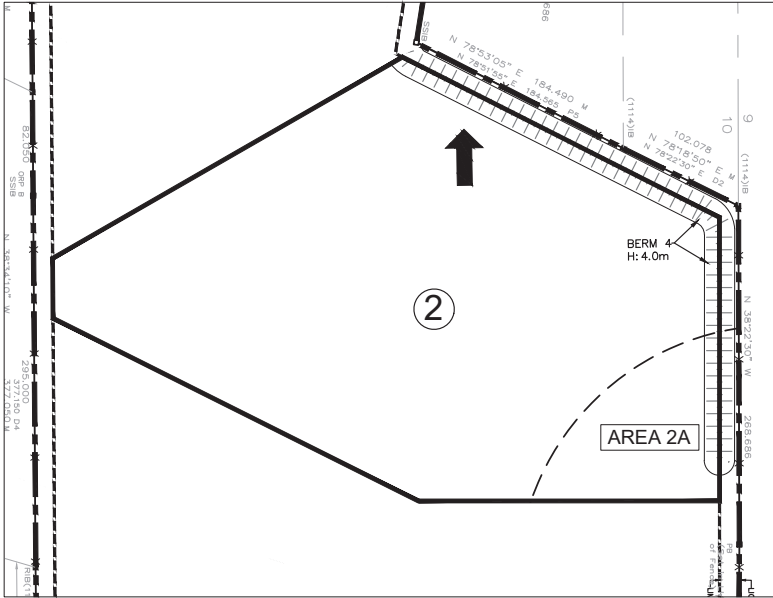
PROPOSED BERM

NOISE DETAIL FOR PHASE 1



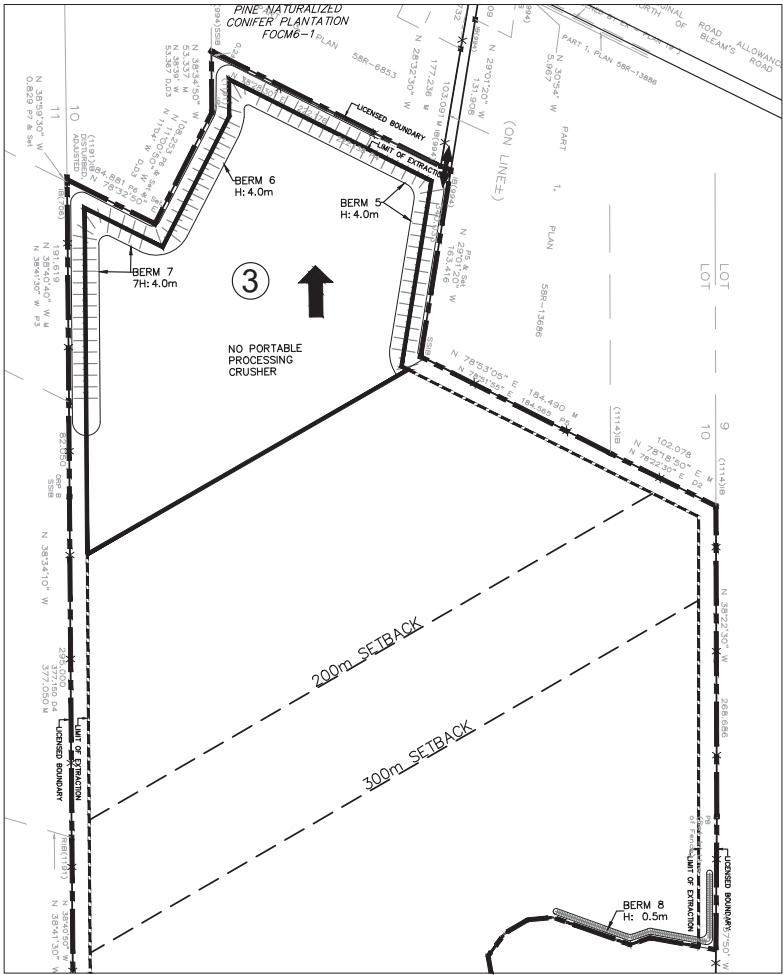
- Phase 1
- During Phase 1 extraction operations, the portable processing crusher shall remain on the final pit floor, at an elevation of 356.0 mASL. Screening equipment may be located anywhere on the first lift floor or lower.
 - During extraction in Phase 1, the direction of extraction will be northwards and southeast.
 - When the portable processing crusher is operating in areas 1(a) and 1(b) it must be surrounded by stockpiles, minimum 8.0 m high, along the south and east side of the equipment, to provide supplementary noise shielding.

NOISE DETAIL FOR PHASE 2



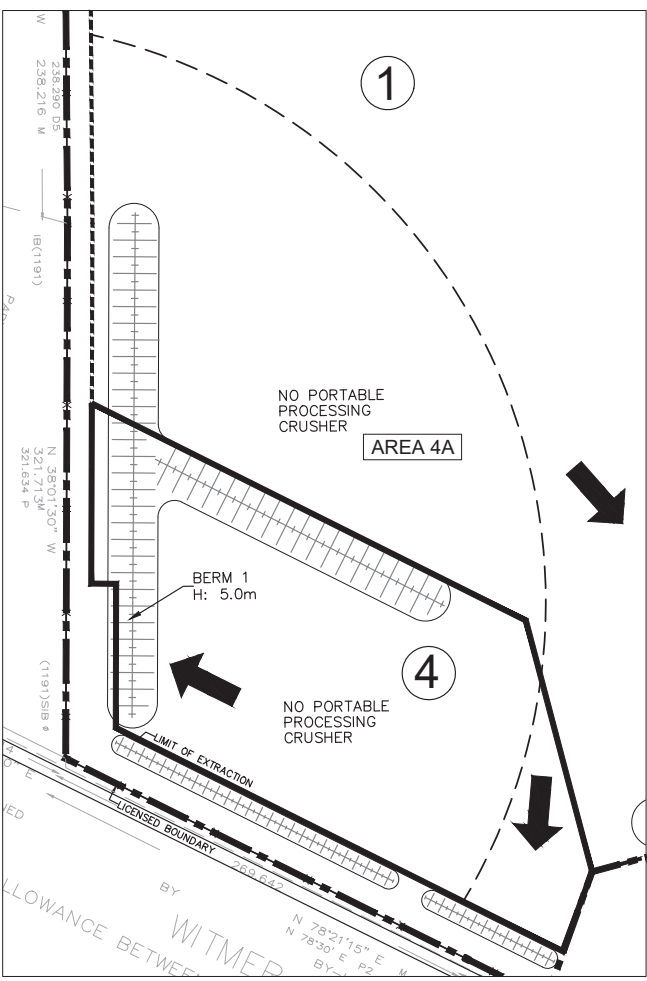
- Phase 2
- Prior to the extraction of Phase 2, the licensee shall construct Berm 4, which shall be at a minimum height of 4.0 m above existing grade.
 - During the extraction of Phase 2, the portable processing crusher shall remain on the final pit floor, at an elevation of 356.0 mASL. Screening equipment may be located anywhere on the first lift floor or lower.
 - During extraction in Phase 2, the general direction of extraction will be northwards.
 - When the portable processing crusher is operating in area 2(a) it shall be surrounded by stockpiles, minimum 8.0 m high, along the south and east side of the equipment, to provide supplementary noise shielding.

NOISE DETAIL FOR PHASE 3

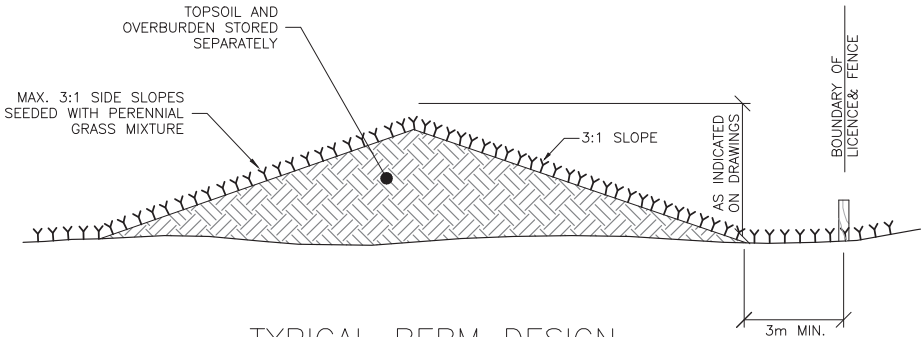


- Phase 3
- Prior to the extraction of Phase 3, the licensee shall construct Berms 5, 6 and 7, which shall be at a minimum height of 4.0 m above existing grade.
 - During the extraction of Phase 3, the portable processing crusher shall remain outside the Phase 3 boundary at the final pit floor elevation of 356.0 mASL. Screening equipment may be located anywhere on the first lift floor elevation of 364.0 mASL or lower.
 - When the portable processing crusher is operating within 200 m of the Phase 3 boundary it must be surrounded by stockpiles minimum 8.0 m high, along the north, west and east side of the equipment to provide supplementary noise shielding. When the portable processing crusher is operating between 200.0 m and 300.0 m of the Phase 3 boundary, stockpiles for supplementary noise shielding are not required if the screener is located at the final pit floor elevation.
 - When the portable processing crusher is operating 300 m away from the Phase 3 boundary, no stockpiles are required for shielding purposes.
 - During extraction in Phase 3 the direction of extraction will be northwards.

NOISE DETAIL FOR PHASE 4



- Phase 4
- Extraction of Phase 4 shall start in the eastern portion of the Phase and proceed westward.
 - Direction of extraction in the eastern portion of the Phase will initially be in a southward direction then westwards.
 - During the extraction of Phase 4, recycling equipment must not operate simultaneously with processing equipment or washing equipment.
 - Once Berm 2 is removed, the portable processing crusher must remain outside the No Crusher zone surrounded by minimum 10.0 m high stockpiles located on the east and west.
 - During the extraction of Phase 4 all processing equipment must be located at the final pit floor elevation of 356.0 mASL.
 - The acoustical barriers mentioned above could be comprised of an earthen berm, a noise wall, aggregate stockpiles or any other construction with a minimum surface density of 20 kg/m².



TYPICAL BERM DESIGN
SCALE : N.T.S.

SITE PLAN OVERRIDES

REVISIONS PRIOR TO APPROVAL

No.	DATE	BY	DESCRIPTION

THESE SITE PLANS ARE CERTIFIED BY THE UNDERSIGNED BY THE AUTHORITY OF MINISTERIAL APPROVAL AS SPECIFIED IN THE AGGREGATE RESOURCES ACT SECTION 8 (4) FOR A CLASS A, LICENCE CATEGORY 3 PIT.

SEPTEMBER 9, 2019
DATE

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PART LOT 10 CONCESSION SOUTH OF BLEAM'S ROAD,
PART 1 58R19981
TOWNSHIP OF WILMOT
REGIONAL MUNICIPALITY OF WATERLOO

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OPERATIONAL NOTES & DETAILS

DESIGNED BY: JS
DRAWN BY: JS/PR
CHECKED BY: DS
DATE: 2019-08-23

SCALE: FILE NUMBER:
SHEET NUMBER:

N.T.S.
115985
3 OF 7

Figure 3b: Operational Notes

APPENDIX A

Sample Calculations & Assessment Parameters



ACOUSTICS



NOISE



VIBRATION

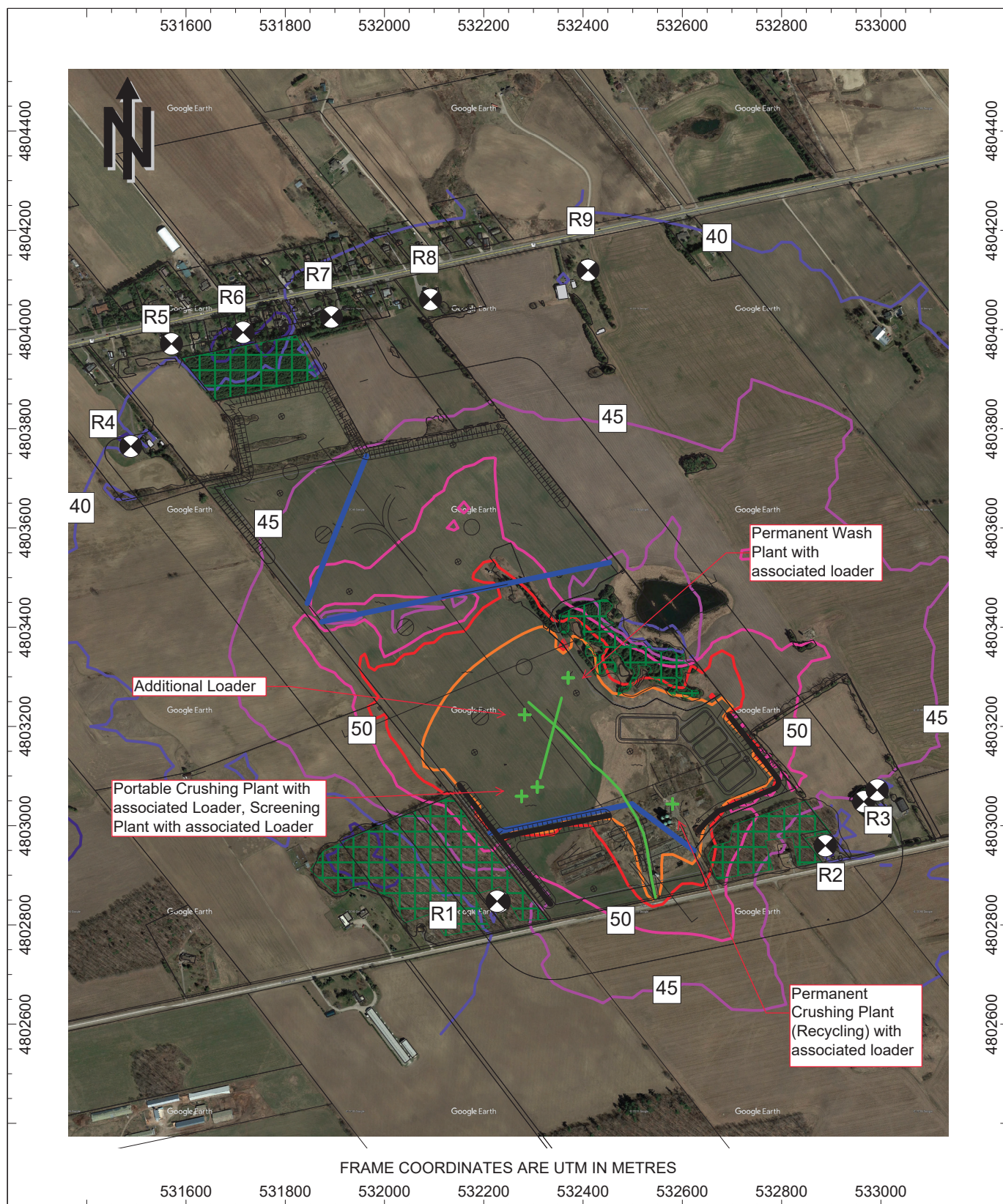


Figure A1: Prediction Results, Phase 1, Daytime Leq Sound Level Contours [dBA]

R1		532231			4802847			373.9																		
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN		
Crusher	Crusher	532308	4803080	359.0	117	--	--	58.8	0	0.0	3.1	14.6	0.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--		
FEL1	FEL1	532282	4803224	358.0	107	--	107	62.6	0	0.0	3.5	6.7	0.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32	--	32		
HaulRoute	HaulRoute	532341	4803195	358.0	102	--	--	62.0	0	0.0	3.0	9.6	0.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	--	--		
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	63.1	0	0.0	2.9	13.3	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--	--		
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	57.8	0	0.0	2.9	16.7	0.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--		
TruckRoute	TruckRoute	532457	4803003	364.1	105	--	105	61.2	0	0.0	-1.6	4.8	37.8	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	33		
Washplant	Washplant	532370	4803297	359.0	108	--	--	64.5	0	0.0	1.9	6.4	2.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31	--	--		

R1		532227			4802848			373.9																
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
Crusher	Crusher	532308	4803080	359.0	117	--	--	58.8	0	0.0	3.1	14.5	0.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--	--
FEL1	FEL1	532282	4803224	358.0	107	--	107	62.6	0	0.0	3.6	6.5	0.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32	--	32
HaulRoute	HaulRoute	532329	4803151	358.0	102	--	--	62.1	0	0.0	3.0	9.4	0.9	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	--	--
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	63.1	0	0.0	2.6	19.7	1.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	--	--
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	57.8	0	0.0	2.9	16.6	0.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--
TruckRoute	TruckRoute	532455	4803019	364.1	105	--	105	61.3	0	0.0	-1.6	25.0	38.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	25
Washplant	Washplant	532370	4803297	359.0	108	--	--	64.5	0	0.0	1.8	6.3	2.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31	--	--

R2		532888			4802960			374.5																		
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN		
Crusher	Crusher	532308	4803080	359.0	117	--	--	66.5	0	0.0	2.1	3.9	1.7	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--	--		
FEL1	FEL1	532282	4803224	358.0	107	--	107	67.4	0	0.0	1.9	2.6	2.7	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	--	29		
HaulRoute	HaulRoute	532335	4803177	358.0	102	--	--	66.5	0	0.0	1.3	4.1	2.1	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	--	--		
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	61.1	0	0.0	2.9	11.7	0.4	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--	--		
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	66.8	0	0.0	1.6	3.9	2.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32	--	--		
TruckRoute	TruckRoute	532468	4803048	364.7	105	--	105	65.4	0	0.0	-1.5	5.9	61.6	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	30		
Washplant	Washplant	532370	4803297	359.0	108	--	--	66.8	0	0.0	0.2	3.6	3.4	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--		

R3		R3		532993	4803072	371.0																		
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
Crusher	Crusher	532308	4803080	359.0	117	--	--	67.7	0	0.0	0.1	3.3	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43	--	--
FEL1	FEL1	532282	4803224	358.0	107	--	107	68.2	0	0.0	0.3	3.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32	--	32
HaulRoute	HaulRoute	532335	4803177	358.0	102	--	--	67.5	0	0.0	-0.3	3.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	--
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	63.3	0	0.0	1.3	11.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40	--	--
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	68.1	0	0.0	-0.1	3.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	--
TruckRoute	TruckRoute	532468	4803049	364.7	105	--	105	64.7	0	0.0	-1.2	4.8	56.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31	--	31
Washplant	Washplant	532370	4803297	359.0	108	--	--	67.4	0	0.0	1.3	14.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	--	--

R4		R4		531489		4803765		369.0																
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
Crusher	Crusher	532308	4803080	359.0	117	--	--	71.6	0	0.0	0.7	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--
FEL1	FEL1	532282	4803224	358.0	107	--	107	70.6	0	0.0	1.0	3.3	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	28
HaulRoute	HaulRoute	532335	4803177	358.0	102	--	--	71.3	0	0.0	0.2	3.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	--	--
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	73.3	0	0.0	0.5	4.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--	--
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	71.5	0	0.0	0.5	4.1	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--
TruckRoute	TruckRoute	532472	4803042	365.1	105	--	105	73.1	0	0.0	-1.8	4.8	148.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	25
Washplant	Washplant	532370	4803297	359.0	108	--	--	71.0	0	0.0	-0.7	4.9	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	--

RS		RS		531571	4803971	374.5																		
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
Crusher	Crusher	532308	4803080	359.0	117	--	--	72.3	0	0.0	0.3	4.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37	--	--
FEL1	FEL1	532282	4803224	358.0	107	--	107	71.3	0	0.0	0.8	3.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	28
HaulRoute	HaulRoute	532335	4803177	358.0	102	--	--	71.8	0	0.0	0.1	3.5	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	--	--
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	73.7	0	0.0	0.3	4.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	--
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	72.2	0	0.0	0.0	4.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--
TruckRoute	TruckRoute	532468	4803047	364.7	105	--	105	73.6	0	0.0	-1.8	4.8	157.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	--	24
Washplant	Washplant	532370	4803297	359.0	108	--	--	71.4	0	0.0	-0.7	4.5	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	--

R6		R6		531715	4803994	376.5																		
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
Crusher	Crusher	532308	4803080	359.0	117	--	--	71.8	0	0.0	0.9	6.6	2.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	--
FEL1	FEL1	532282	4803224	358.0	107	--	107	70.6	0	0.0	1.3	10.8	1.2	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19	--	19
HaulRoute	HaulRoute	532335	4803177	358.0	102	--	--	71.2	0	0.0	1.0	9.2	2.1	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	--	--
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	--	73.2	0	0.0	0.5	3.6	4.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34	--	--
ScreenPlant1	ScreenPlant1	532276	4803058	358.5	110	--	--	71.8	0	0.0	0.7	7.1	2.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26	--	--
TruckRoute	TruckRoute	532468	4803048	364.7	105	--	105	73.1	0	0.0	-1.8	5.0	148.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20	--	20
Washplant	Washplant	532370	4803297	359.0	108	--	--	70.6	0	0.0	0.0	8.5	2.9	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20	--	--

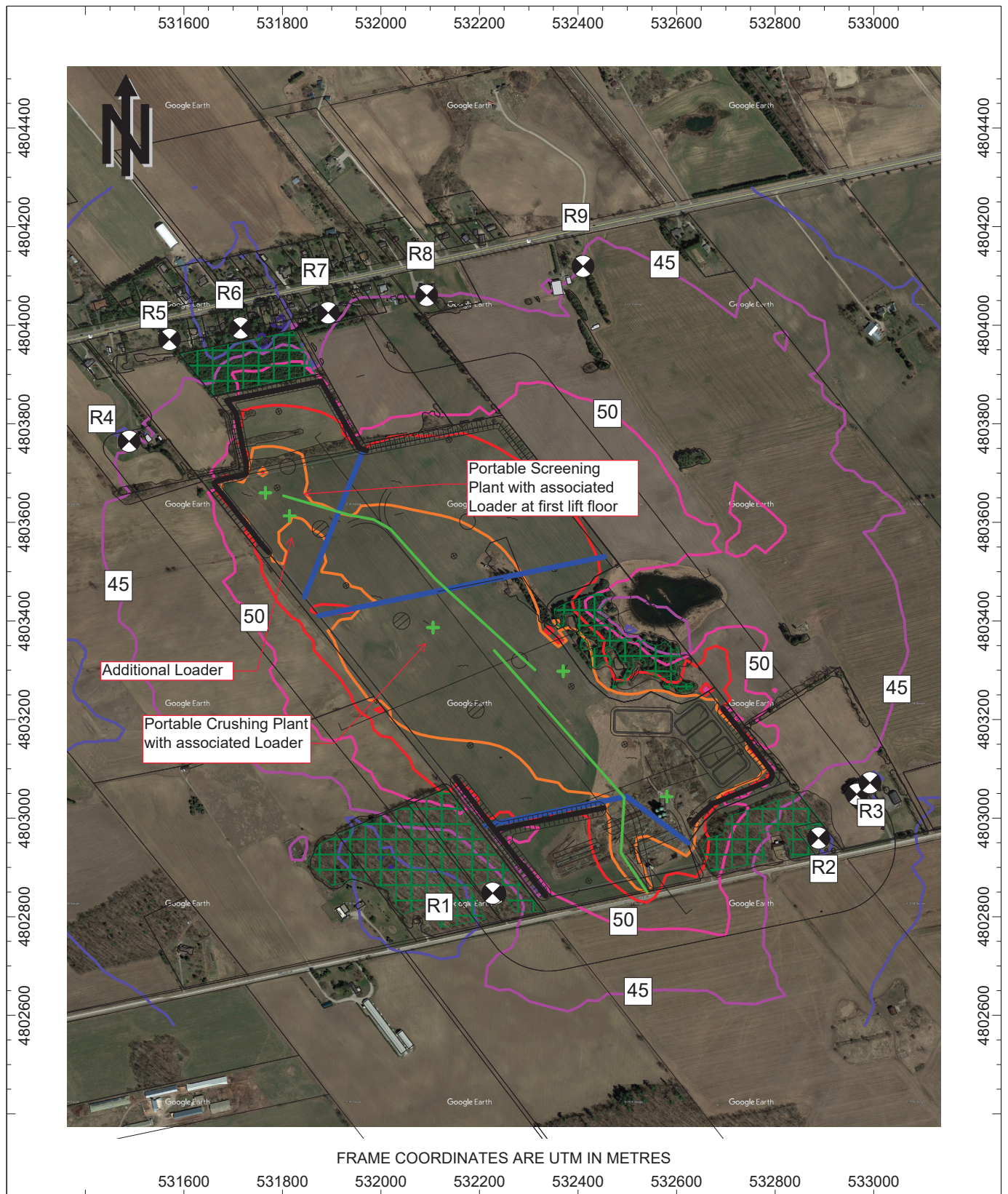


Figure A2: Prediction Results, Phase 3 (Screening Plant at first lift floor),
Daytime Leq Sound Level Contours [dBA]

R1		532231		4802847		373.9																
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN
Crusher	Crusher	532106	4803386	359.0	117	--	65.9	0	0.0	2.3	3.7	1.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--
FEL1	FEL1	531765	4803658	365.0	107	--	70.4	0	0.0	2.8	3.6	2.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27	--
HaulRoute	HaulRoute	532191	4803401	358.1	102	102	67.3	0	0.0	1.7	3.1	2.5	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	24
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	63.1	0	0.0	2.9	13.3	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	69.8	0	0.0	2.2	2.3	3.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--
TruckRoute	TruckRoute	532415	4803029	368.0	106	--	59.6	0	0.0	-1.4	4.9	31.4	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--
Washplant	Washplant	532370	4803297	359.0	108	--	64.5	0	0.0	1.9	6.4	2.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31	--

R1		532227		4802848		373.9																
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN
Crusher	Crusher	532106	4803386	359.0	117	--	65.9	0	0.0	2.4	3.7	1.8	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--
FEL1	FEL1	531765	4803658	365.0	107	--	70.4	0	0.0	2.8	3.6	2.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27	--
HaulRoute	HaulRoute	532197	4803395	358.1	102	102	67.3	0	0.0	1.7	3.1	2.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	24
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	63.1	0	0.0	2.6	19.7	1.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	--
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	69.8	0	0.0	2.2	2.3	3.6	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--
TruckRoute	TruckRoute	532412	4803010	368.0	106	--	59.7	0	0.0	-1.4	25.0	31.9	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--
Washplant	Washplant	532370	4803297	359.0	108	--	64.5	0	0.0	1.8	6.3	2.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31	--

R2		R2		532888		4802960		374.5															
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN	
Crusher	Crusher	532106	4803386	359.0	117	--	70.0	0	0.0	1.6	2.0	3.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--	
FEL1	FEL1	531765	4803658	365.0	107	--	73.4	0	0.0	1.9	3.7	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	
HaulRoute	HaulRoute	532022	4803554	358.7	102	102	70.5	0	0.0	0.7	2.7	3.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	23	
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	61.1	0	0.0	2.9	11.7	0.4	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--	
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	73.0	0	0.0	1.2	4.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	
TruckRoute	TruckRoute	532432	4803061	368.6	106	--	63.0	0	0.0	-1.1	0.0	46.6	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	
Washplant	Washplant	532370	4803297	359.0	108	--	66.8	0	0.0	0.2	3.6	3.4	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	

R3		R3		532993		4803072		371.0															
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN	
Crusher	Crusher	532106	4803386	359.0	117	--	70.5	0	0.0	0.4	3.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--	
FEL1	FEL1	531765	4803658	365.0	107	--	73.7	0	0.0	1.4	3.7	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	
HaulRoute	HaulRoute	532022	4803554	358.7	102	102	70.7	0	0.0	0.5	3.4	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	23	
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	63.3	0	0.0	1.3	11.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40	--	
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	73.3	0	0.0	0.6	4.1	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	
TruckRoute	TruckRoute	532432	4803061	368.6	106	--	65.2	0	0.0	-0.9	4.8	59.9	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	
Washplant	Washplant	532370	4803297	359.0	108	--	67.4	0	0.0	1.3	14.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	--	

R4		531489		4803765		369.0																
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN
Crusher	Crusher	532106	4803386	359.0	117	--	68.2	0	0.0	0.3	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42	--
FEL1	FEL1	531765	4803658	365.0	107	--	60.4	0	0.0	1.8	8.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--
HaulRoute	HaulRoute	532022	4803554	358.7	102	102	66.4	0	0.0	0.3	4.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	28
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	73.3	0	0.0	0.5	4.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	62.1	0	0.0	1.2	14.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31	--
TruckRoute	TruckRoute	532464	4803011	370.4	106	--	73.6	0	0.0	-1.7	4.8	157.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26	--
Washplant	Washplant	532370	4803297	359.0	108	--	71.0	0	0.0	-0.8	4.5	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--

R5		R5		531571		4803971		374.5															
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN	
Crusher	Crusher	532106	4803386	359.0	117	--	69.0	0	0.0	0.3	3.3	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41	--	
FEL1	FEL1	531765	4803658	365.0	107	--	62.3	0	0.0	2.5	6.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	
HaulRoute	HaulRoute	532000	4803567	359.0	102	102	67.9	0	0.0	0.4	2.5	2.8	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	25	
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	73.7	0	0.0	0.3	4.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	63.7	0	0.0	1.3	13.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	
TruckRoute	TruckRoute	532464	4803010	370.4	106	--	74.1	0	0.0	-1.8	4.8	167.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26	--	
Washplant	Washplant	532370	4803297	359.0	108	--	71.4	0	0.0	-0.7	4.5	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	

R6		R6		531715		4803994		376.5															
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrN	
Crusher	Crusher	532106	4803386	359.0	117	--	68.2	0	0.0	1.1	6.3	1.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	
FEL1	FEL1	531765	4803658	365.0	107	--	61.6	0	0.0	2.6	11.1	0.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	
HaulRoute	HaulRoute	532022	4803554	358.7	102	102	66.8	0	0.0	1.1	8.3	1.4	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19	19	
RecyclingPlant	RecyclingPlant	532580	4803042	359.0	117	--	73.2	0	0.0	0.4	4.0	3.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34	--	
ScreenPlant1	ScreenPlant1	531814	4803614	362.3	110	--	62.9	0	0.0	0.5	15.6	0.6	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	
TruckRoute	TruckRoute	532464	4803008	370.4	106	--	73.7	0	0.0	-1.8	13.1	159.3	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	--	
Washplant	Washplant	532370	4803297	359.0	108	--	70.6	0	0.0	-0.3	4.6	3.7	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	--	

Assessment Parameters

The computational acoustical model used for this Assessment (*Cadna/A*, version 2019 MR 2, build 173.4950) is based on the methods from ISO Standard 9613-2.2 “Acoustics - Attenuation of Sound During Propagation Outdoors” [4], which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures (or by topography and foliage where applicable). This modelling technique is acceptable to the MECP.

Ground attenuation was assumed to be spectral for all sources, with the ground factor (G) assumed to be 0.5 in all extraction areas and in the processing area (chosen to yield the best agreement between predictions and onsite measurements based on HGC Engineering experience); the ground factor was assumed to be 1.0 in all other areas, representative of grassy fields and forest areas and 0.0 for water surfaces. The temperature and relative humidity were assumed to be 10° C and 70%, respectively.

The modelling considered one order of reflection, the sufficiency of which was confirmed using an iterative convergence analysis with increasing orders of reflection.

Onsite movement of trucks were modelled as line sources (shown as thin green lines in Appendix A), with time weighting factors based 15 km/hr for trucks travelling within the pit.



APPENDIX B

Consultant Curriculum Vitae



ACOUSTICS



NOISE



VIBRATION

Mandy Chan, Senior Engineer PEng.

Education	University of Waterloo, Bachelor of Applied Science, 2006
Professional Memberships	Professional Engineers of Ontario (PEO) Canadian Acoustical Association (CAA) Ontario Society of Professional Engineers (OSPE)
Professional History	2014 to Present Senior Engineer, Associate, HGC Engineering, Mississauga 2010 to 2014 Project Engineer, HGC Engineering, Mississauga 2006 to 2010 Project Consultant, HGC Engineering, Mississauga
Experience	Ms. Chan has been involved in a wide variety of projects related to acoustics, noise and vibration. She has experience with the measurement and analysis of traffic noise and stationary noise sources, architectural acoustic design of learning spaces, office spaces and churches. She has a broad familiarity with Ministry of Environment guidelines regarding noise and vibration and an understanding of Ministry criteria and methods for prediction of noise due to roadway, railway, aircraft traffic, industrial and aggregate facilities. Additionally, Ms. Chan has analysis experience using computer aided modelling and prediction software.
Selected Projects	Banner Pit, <i>Thamesford, Ontario</i> Block 5 Developments, <i>Brampton, Ontario</i> Bremont Homes, <i>Mississauga, Ontario</i> City Centre Condominiums, <i>Mississauga, Ontario</i> Edmonton Clinic, <i>Edmonton, Alberta</i> Greensborough Subdivision, <i>Markham, Ontario</i> Gurney Sands and Gravel, <i>Brantford, Ontario</i> Knox Presbyterian Church, <i>Waterloo, Ontario</i> Inland West Pit, <i>Warwick, Ontario</i> Johnson Bros. Gravel Pits, <i>Southern Ontario</i> Mattamy Homes, <i>Milton, Ontario</i> Liberty Village Condominiums, <i>Toronto, Ontario</i> Linamar Tech Centre, <i>Guelph, Ontario</i> Nelson Granite Quarries, <i>Kenora, Ontario</i> St. Leonard's Boys' Secondary School, <i>Bermuda</i> Tisdale Mining Lands, <i>Timmins, Ontario</i> Waterloo Christian Reformed Church, <i>Waterloo, Ontario</i> Warren Stewart Limestone Quarry, <i>Cockburn Island, Ontario</i> West Village at Stratford, <i>Stratford, Ontario</i>

William J. Gastmeier, Principal, MSc, PEng

Education:

BSc, Honours Physics, University of Waterloo, May 1974.
MSc, Electrical Engineering (Acoustics) University of Waterloo, May 1976.
“Preparing & Presenting Evidence”, York University, 1991
“Noise Control in Land Use Planning”, Ministry of the Environment, 1987

Memberships:

Designated Consulting Engineer, Province of Ontario
Registered Professional Engineer, Association of Professional Engineers of Ontario (PEO)
Acoustical Society of America (ASA)
Canadian Acoustical Association (CAA), Member, Board of Directors
Canadian Environmental Industries Association (CEIA)

Professional Experience:

1993 to Present

Principal, Howe Gastmeier Chapnik Limited Mississauga, ON

Assess environmental noise and vibration from transportation and industrial sources, mining operations race tracks and gun ranges. Provide expert testimony with regard to noise and vibration in land use planning and land use compatibility. Gained extensive experience with noise control in Land Use Planning including Official Plan and Secondary Plan Amendments and Zone Change Applications across Ontario.

Design architectural acoustics and noise control for council chambers, performance spaces, worship spaces, studios, music rooms, offices, laboratories, museums and public spaces.

Provide third party expert peer review and certification services for clients across North America.

Specify and design noise control measures to ensure compliance with Ministry of the Environment Guidelines and the Occupational Health and Safety Act.

1987 to 1993

Project Coordinator, Vibron Limited, Mississauga, ON, Consulting Engineering Division

Supervised engineering staff in consulting engineering projects in acoustics, noise and vibration. Provided client liaison, technical expertise, attended public meetings and hearings.

1981 to 1987

Manager, Unitron Industries, Electroacoustic Design

Hired and supervised staff in the acoustical and electronic design of hearing aids.



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VIBRATION

Researched the physiology of hearing, hearing loss, psychoacoustics, speech intelligibility and audiology to design the electroacoustic performance of hearing assistive devices.

1976 to 1978

Project Engineer, Turner Division of Conrac Corporation

Developed a vibration sensor to detect engine knock, designed high intelligibility paging microphones and other new microphone products.

Selected Significant Projects & Studies:

Transportation

- Blue Water Bridge Twinning, Sarnia, Ontario
- Ambassador Bridge Enhancement Project (twinning), Windsor, Ontario
- Highway Widening and Alignments in Sudbury, Port Colborne, Brantford and Thunder Bay
- Winnipeg International Airport
- Layover/Expansion Facilities for Go Transit and CPR
- Golf Links Road Widening, Thunder Bay, 2010
- Pavement Rehabilitation, Highway 140, Port Colborne, 2009
- Highway 11/17, Sault Ste. Marie, 2009
- Ambassador Bridge Twinning, Windsor, 2007 and 2011
- Road Widening/Realignment, RR 35, Sudbury, 2006
- Kingsway Road Widening, Sudbury, 2005
- Fischer Hallman Road Widening, Waterloo, 2003
- Southwest Bypass Extension, Brantford, 2001
- The Kingsway Realignment, Sudbury, 2000
- Blue Water Bridge Twinning, Sarnia, 1995
- Many Noise Impact Studies for Subdivisions (Road, Rail & Air traffic sources) in Ontario

Noise Studies for Expropriation Proceedings:

- Highway 6 South, Puslinch
- Derry Road Mississauga
- Highway 403, Ancaster
- Highway 407, Markham
- Leslie Street, Newmarket

Acoustics

- Lecture and performance theatres, studios and classrooms at McMaster University, Western University, University of Windsor, University of Alberta, University of Waterloo, Upper Canada College, Ryerson University and Fanshawe, Mohawk and Niagara Colleges
- Performance Theatres for Drayton Entertainment in Kitchener and St. Jacobs, Ontario and the Toronto District School Board
- The Carlu (Eaton's Theatre), College Park, Toronto
- Design and Certification of Acoustical Test Facilities across North America



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VIBRATION

- Acoustical Design of Worship Spaces for many faiths across Canada including 1000+ seat sanctuaries for the Metropolitan Bible Church in Ottawa, Richmond Hill Chinese Community Church and St. Thomas the Apostle Roman Catholic Church in Waterdown.
- Recreational, Library and Civic Facilities in Kitchener, Welland, Ingersoll and Brantford

Land Use Planning and Compatibility

- Transmetro Properties 1500 Unit Residential Development, Scarborough, ON
- Peer Reviews for Toronto, Waterloo Region, Simcoe, Oxford and Wellington Counties
- Hundreds of Road and Rail Traffic Noise and Vibration Impact Studies for new Residential Developments
- Noise Compatibility Studies for Official Plan Amendments and Zone Change Applications for Adjacent Proposed Residential/Industrial Land Uses.

Mines, Pits and Quarries

- Scores of Ministry of Natural Resources applications for licences for pits and quarries across Ontario, above and below water.
- De Beers Diamond Mine, Attawapiskat, Gold Mines in Red Lake, Timmins and Matheson ON
- Vale Inco in Sudbury and Port Colborne.

Power Plants, Pipelines and Utilities

- Combined Cycle Peaking Power Plant, Eastern Power, Mississauga
- Compressor Station Noise Assessments at TransCanada PipeLines Facilities across Canada
- Union Gas Province Wide Certificate of Approval Application and Environmental Noise Management
- Electrical/Steam Cogeneration Facilities, York University and Brock University

Teaching Experience:

1998 to 2010

Lecturer, Dalhousie University, School of Architecture: “Architectural Acoustics Module of ARB 211 Environment”

1988 to 2014

Adjunct Professor, University of Waterloo, Dept of Environmental Studies, School Of Architecture: “Architectural Acoustics, Noise Control, Sound Systems”

1988 to 1990

Lecturer, Ontario Ministry of the Environment: “Noise Control in Land Use Planning”

1982 to 1993

Guest lecturer, Physics Department, University of Waterloo: “Science of Hi-Fidelity”

Expert Testimony:

OMB Hearing, Aggregate License Application, Zoning and OP Amendment, Galway Cavendish, ON, 2014

Provincial Court, Prosecution under the Environmental Protection Act, Race Track, Seguin Twp., 2014

OMB Hearing, Aggregate License, Zone Change Application, Woolwich Township, 2013

OMB Hearing, Aggregate Licence Application, Ashfield- Colborne-Wawanosh, ON, 2011



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OMB Hearing, Aggregate Licence Application, Thames Centre ON, 2010
 OMB Hearing, Proposed Golf Driving Range, Markham ON, 2010
 OMB Hearing, Proposed Commercial Development near a Recycling Facility, Newmarket ON, 2010
 OMB Hearing, proposed Quarry, Michipicoten Harbour, Wawa ON, 2009
 OMB Hearing, proposed Residential Development near existing Industrial Land Use, Listowel, ON, 2009
 OMB Hearing, proposed Mixed Use Development near Industrial Uses, Brampton ON, 2008
 OMB Hearing, proposed Power Plant, Mississauga, Ontario, 2007
 OMB Hearing, proposed Retirement Complex in Scarborough, 2007
 OMB Hearing, compatibility of Residential Development near Feed Mill, Ingersoll, Ontario, 2006
 OMB Hearing, proposed gravel pit, Simcoe, Ontario, 2005.
 Ontario Superior Court of Justice, matter relating to noise from the St.Thomas Dragway, 2004
 OMB Hearing, proposed aviary, Scotland, Ontario, 2004
 OMB Hearing, proposed warehousing facility near existing residential neighbourhood, Oakville, 2004
 OMB Hearing, proposed gravel pit, Oro-Medonte Township, 2004
 OMB Hearing, high-rise residential development near industry and Highway 401, 2002
 Provincial Court, Brantford Ontario, Prosecution under the Municipal Noise Bylaw, 2000
 OMB Hearing, residential development adjacent to a CPR Classification Yard, Scarborough, 1999
 OMB Hearing, Aggregate Extraction Facility, Windy Lake, Ontario, 1998
 OMB Hearing, residential development adjacent to railway, Norwood Road, Toronto, 1996
 OMB Hearing, proposed rail transfer facility, Shakespeare, Ontario, 1995
 OMB Hearing, residential development, Rogers Road, City of Toronto, 1993
 Consolidated Board Hearing, residential development in the City of York, 1992
 NEC Hearing, Cogeneration Plant, Brock University, St. Catharines, 1992

Patents:

U.S. Patent 4,553,627 "Hearing Aid Wax Guard"
 U.S. Patent 4,349,082 "Acoustical Damping Element and Method of Forming Same"
 U.S. Patent 4,193,647 "Piezoelectric Ceramic Transducers with uniform Resonant Frequency"

Publications:

"Considerations in the Acoustical Design of Black Box Theatres", Proceedings of Acoustics Week in Canada, Canadian Acoustics, October 2015
 "Recent Trends in the Acoustical Design of Institutional Facilities", Proceedings of Acoustics Week in Canada, Canadian Acoustics, September 2014
 "Architectural Personality" Perspectives, Fall 2010
 "Occupational Noise Exposure in Nightclubs" Proceedings of Acoustics Week in Canada, Canadian Acoustics, September 2010.
 "The Consumer Handbook on Hearing Loss and Noise - Chapter 11 - Architectural Strategies to Minimize Noise" Edited by Marshall Chasin, Auricle Ink Publishers, 2010
 "Acoustical Performance Criteria and Treatment Protocols for Learning Spaces at a Large Institutional Teaching Facility" Proceedings of Acoustics Week in Canada, Canadian Acoustics, September 2009.
 "Hearing Loss in Musicians – Prevention and Management - Chapter 8 - Room and Stage Acoustics for Optimal Listening and Playing" Edited by Marshall Chasin, Plural Publishing Inc., 2009

“Acoustical Performance Criteria, Treatment and Guidelines for Multifunctional School Gymnasias” with Kana A. Ananthaganesan, Canadian Acoustics, December 2007

“Room Acoustics and Modifications for Performing Artists” Hearing Review, March 2006

“The Use of Environmental Noise Standards and Guidelines in Canada”, Canadian Acoustics, Sept. 2005

“ISO-1996 ‘Acoustics-Description and Measurement of Environmental Noise’ Round Robin Testing”, Canadian Acoustics, December 2001

“Reverberation in Public School Gymnasias” Canadian Acoustics, December, 1999

“Air Traffic Noise”, Ontario Planning Journal, Spring, 1998

“Musicians and the Prevention of Hearing Loss, Chapter 7, Room Acoustics” Edited by Marshall Chasin, Singular Publishing Group, San Diego, 1996

“Applying Sound Intensity Methods In-situ to Measure Exhaust Noise levels and Estimate Silencer Performance” Proceedings of the Alberta Energy & Utilities Board 1996 Conference on Environmental Noise Control Engineering

“The Assessment of Rail Traffic Noise and Vibration in Land Use Planning” Ontario Planning Journal, March /April, 1996

“Acoustical Materials” The Canadian Architect, April, 1995

“Environmental Noise & Vibration Part 2” Ontario Planning Journal, Jan/Feb, 1995

“Noise Control & the Building Envelope” Ontario Building Envelope Council Newsletter, 1995

“Environmental Noise & Vibration Part 1” Ontario Planning Journal, Nov/Dec, 1994.

“Occupational Noise Exposure in the High School Music Practice Room” 1994 Congress of the Canadian Acoustical Association.

“Field Sound Transmission Loss of Demising Walls and Floor/Ceiling Assemblies”. Proceedings of the 1992 International Congress on Noise Control Engineering.

“The Control of Bus Noise and Vibration in Mixed Use Urban Construction”. Proceedings of the 1992 International Congress on Noise Control Engineering, Toronto, 1992, pp.857-860.

“Noise Complaints in Residential Condominiums” Proceedings of Noise Control, 1990.

“Noise Control of Underground Bus Stations - A Case Study” Canadian Acoustical Association Conference, Toronto, 1988.

“The Acoustically Damped Earhook” Hearing Instruments No. 10, October 1981

Standardization and Professional Committees:

Canadian Standards Association Member of Occupational Hearing Technical Committee, 2010 to Present

Canadian Standards Association Member of Technical Committee S251 “Acoustics and Noise Control” 2005 to 2010

Canadian Standards Association “Chair of Environmental Noise Subcommittee of Technical Committee S251 “Acoustics and Noise Control” 2005 to 2010

Canadian Standards Association ISO 9613 / CSA Z107.55 Working Group on Industrial Noise Propagation, 2002 to 2010



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VIBRATION

Canadian Standards Association - Working Group for the Adoption of "ISO-1996 'Acoustics-Description and Measurement of Environmental Noise', 2000 – 2007

Acoustical Society of America – Member of Noise Control Technical Committee, 1999 – Present

Association of Professional Engineers of Ontario - Committee for the Establishment of Guidelines for Professional Engineers Providing Acoustical Services in Land Use Planning, 1997



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APPENDIX C

Consultant Declaration



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CONSULTANT STATUTORY DECLARATION

CANADA	)	In the Matter of the
	)	Environmental Protection
PROVINCE OF ONTARIO	)	Act and the Planning Act
	)	
	)	And in the Matter of a
	)	a Proposed Gravel Pit
	)	at Part Lot 10 Concession South of
	)	Bleam's Road Part 1 58R19981
	)	in the Township of Wilmot
	)	Regional Municipality of Waterloo

I, Mandy Chan, of the City of Toronto, SOLEMNLY DECLARE THAT:

1. I am a Professional Engineer employed by HGC Engineering which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as Part Lot 10 Concession, South of Bleam's Road, Part 1 58R19981, Township of Wilmot, Regional Municipality of Waterloo.
3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the study entitled Noise Feasibility Study, Category 3 – Class "A" Pit above Water Hallman Pit, Part Lot 10 Concession South of Bleams Road, Wilmot, Ontario dated September 10, 2019 is the best available information as of the date of the study.
5. The sound level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment Guidelines, Region of Waterloo policies, any applicable policy of guidelines or the Area Municipality, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.

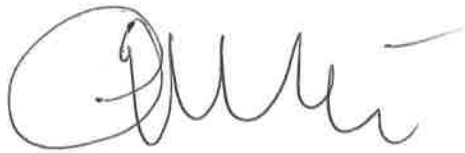
7. I acknowledge that this study may be subject to a peer review at my cost.
8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

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

DECLARED before me at the City
of Mississauga, in the Region of Peel
this 11th day of September 2019

)
)
)


Mandy Chan



Greg Guzik
Professional Corporation
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FAX. 905-286-9692