HGC ENGINEERING

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Noise Impact Assessment for Proposed Lafarge Pit 3 Extension Class "A" Pit Part Lot 13, Concession 5 Town of Caledon, Ontario

Prepared for

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HGC Engineering Project No. 01800741

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1 Introduction & Summary

HGC Engineering was retained by Lafarge Canada Inc. to undertake an analysis of the potential impact of noise from the proposed Pit 3 Extension at neighbouring noise sensitive receptors (i.e. residential dwellings) in accordance with the guidelines of the Ministry of Natural Resources and Forestry (MNRF), Ministry of the Environment, Conservation and Parks (MECP) and the requirements of the Town of Caledon.

The analysis was based on consideration of the pertinent MNRF and MECP guidelines, a review of the pit plans prepared by MHBC, sound emission levels from equipment manufacturers and the files of HGC Engineering, as well as discussions with Lafarge and MHBC regarding the proposed pit.

The applicable sound level criteria were established at selected points of reception surrounding all phases of planned extraction in the proposed licenced area, in accordance with MECP guideline NPC-300 [1]. Considering the noise control measures recommended herein, sound levels resulting from the proposed aggregate extraction and processing activities were predicted at the selected receptor locations. The results of the analysis indicate that sound levels from the proposed pit, predicted under worst-case operating scenarios and with the noise control measures recommended herein, will comply with the MECP guideline limits at the most potentially impacted neighbouring receptors. Details of the analysis are included herein. Given the absence of any sources of ground-borne impulse vibration (existing or proposed), the site will also comply with the applicable vibration limits of MECP publication NPC-207 [2].

2 Description of Site & Surrounding Area

The proposed pit is to be located southeast of Regional Road 24 between Mississauga Road and Shaws Creek Road, in the Town of Caledon, Region of Peel, Ontario as shown in Figure 1 shows the location of the proposed pit and surrounding area. The proposed licence area is ±25.6 hectares and the extraction area is 20.8 hectares with a maximum annual extraction of one million tonnes. Aggregate extraction, processing, and shipping within and from the pit is proposed to take place between 07:00 and 19:00, Monday to Saturday, with no operations on Sundays or statutory holidays. Shipping activities will also take place between 06:00 and 07:00. The proposed pit abuts the existing Pit 3, which is also owned and operated by Lafarge, and licenced under the Aggregate Resources Act

(ARA), licence number 6525.

The nearest existing noise sensitive points of reception to the proposed pit are located southeast, south, southwest, west, and northeast of the licence area and include one- and two-storey homes, labelled in Figure 2 as locations R1 through R4 (one-storey) and R5 through R10 (two-storey). The outdoor amenity spaces of each of these homes (within 30 metres of the respective dwelling in the direction of the proposed pit) are represented by locations R1A through R10A. Also considered herein are currently vacant lands northeast of the proposed pit on which a noise sensitive use is permitted by the Niagara Escarpment Plan, labelled as location VL1 in Figure 2. Location VL1 was selected in accordance with the guidance provided in MECP guideline NPC-300, and with consideration to the existing built form. Note that lands immediately northwest of the proposed Pit 3 Extension are unoccupied and owned by Lafarge, and vacant lands northwest of the existing Pit 3 are designated in the Niagara Escarpment Plan as a Mineral Resource Extraction Area, which does not permit noise sensitive uses.

Based on observations by HGC Engineering personnel during several visits to the site and surrounding area between 2016 and 2023, the area surrounding the proposed pit is a Class 3 “rural” acoustic environment, as defined in MECP publication NPC-300 (discussed in detail in the following section).

3 Criteria

MECP publication NPC-300 is the pertinent guideline for developing sound level limits applicable in the assessment of sound from aggregate operations, which are classified as *stationary sources of sound*. In general, the acceptability limits for stationary sources are site dependent, and are based on the existing ambient background sound levels in the area of the subject site. MECP guidelines also stipulate that the noise assessment shall consider a *predictable worst-case hour*, which is defined as an hour when typically busy operation of the stationary sources under consideration could coincide with an hour of low background sound.

NPC-300 stipulates that the sound level limit for a stationary source operating in a Class 3 acoustic environment is the greater of the minimum one-hour energy-equivalent sound level ($L_{EQ\text{-}1Hr}$)

background sound level, or the exclusionary minimum limits of 45 dBA during daytime hours (07:00 to 19:00) and 40 dBA during evening (19:00 to 23:00) and nighttime hours (23:00 to 07:00). The nighttime limit is not applicable to outdoor amenity spaces.

Based on observations by HGC Engineering during several visits, background sound in the vicinity of receptor locations R1/A through R10/A and VL1 could fall as low as the exclusionary minimum limits of 45/40 dBA during the quietest hours of the day and night, which are therefore the applicable criterion, respectively. As the proposed pit will not operate during evening hours and the nighttime limit does not apply to outdoor amenity spaces, only the daytime criterion of 45 dBA applies at locations R1A through R10A.

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. Guideline NPC-300 applies to sound from the ongoing day-to-day operations of the subject site, but not to the temporary sound produced during the preparation and rehabilitation of extraction sites, to the sound produced by highway trucks on public roadways or by auditory warning devices required or authorized by law or in accordance with good safety practices (including 'back up beepers'). The initial operations of stripping top soil and building berms, as well as the final operations of rehabilitation (and removal of 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 [3].

4 Description of Aggregate Operations

On behalf of Lafarge, MHBC has prepared a phasing plan for the Pit 3 Extension, included as Figure 3, which was used to evaluate sound emissions from the proposed pit operations. Material extraction in the pit will progress through four phases, as labelled in Figure 3. The following details have been provided concerning the pit operations:

1. Aggregate extraction, processing, and shipping within and from the pit will take place between 07:00 and 19:00. Shipping activities will also take place between 06:00 and 07:00.

2. Pit operations will begin at the northeast end of Phase 1, proceeding sequentially from Phase

1 through Phase 4; the direction of extraction will generally be from northeast to southwest, thereby maximizing acoustical shielding afforded by the working face, with respect to the most potentially impacted homes to the south.

3. Equipment operating within the Pit 3 Extension will consist of: up to two production loaders for extraction, one mobile crusher, one mobile screener, up to two production loaders servicing the crusher and/or screener, one shipping loader, on-site trucks and/or conveyors for internal transport of materials, and shipping trucks.

4. Access to the site will be via the main gate of the existing Pit 3, on Mississauga Road.

5. Offsite shipping of materials will be accomplished by highway trucks. Lafarge's existing Pit 3 is permitted to ship an unlimited amount of aggregate per year and the Pit 3 Extension is proposed to permit a maximum of 1 million tonnes per year, utilizing the existing entrance/exit for Pit 3 on Mississauga Road. Based on the maximum number of shipping loaders permitted on Pit 3 and Pit 3 Extension, the maximum number of trucks that could be shipped during a peak hour is 45 trucks; however, this would require the addition of another scale at Pit 3, which is currently not contemplated. Based on the current scale configuration, the maximum number of trucks that could be shipped during a peak hour is 22. For the purpose of this impact assessment, it has been assumed that a peak hour could hypothetically include up to 45 trucks per hour to assess a hypothetical worst-case condition. However, for the majority of the operation, there are less trucks per hour, including numerous hours where this is no shipping at all. The hypothetical worst case of 45 trucks per hour also accounts for trucks that will be required to bring in excess soils for rehabilitation to restore the Pit 3 Extension to agricultural.

6. With the exception of initial operations at the northeast end of Phase 1, all extraction and processing equipment was assumed to operate on the pit floor at a nominal elevation of 390 metres +/- above sea level, with material pulled down from the working face by extraction equipment. All material processing (i.e. crushing and screening) will take place within Phase 1 (see Section 6 for further details).

7. Raw (unprocessed) material may be stockpiled within Phase 2, along the border of Phase 1; processed material may be stockpiled and shipped from Phases 1 or 2 (see Section 6 for further details).

8. Based on input from Lafarge, resources within the northeast phases of the existing Pit 3 are forecasted to be exhausted before operations commence within the Pit 3 Extension. The analysis presented herein thus includes a crusher or screen (with one production loader) to be operating in the southeast quadrant on the floor of the existing Pit 3; all shipping was conservatively assumed to occur from the Pit 3 Extension.

5 Assessment Methodology

The predictive model used for this study (*Cadna-A, version 2023, build 197.5343*) is based on the methods from ISO Standard 9613-2.2 [4], which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures, including the extraction face, if applicable (or by topography and foliage where applicable). The ISO method tends to be conservative as it assumes a moderate downwind condition (favourable for the propagation of sound from the source to a receiver) in all directions, at all times. This modelling technique is acceptable to the MECP.

In the development of worst-case hour operational scenarios with respect to each of the selected points of reception, the following assumptions were made:

- Extraction, processing and loading at the closest possible location to the receptors during each of the proposed four phases of extraction.
- The following table presents the equipment sound emission levels employed in the analysis. These sound levels were based on manufacturer's data for equipment to be used in this pit and on measurements conducted by HGC Engineering of similar equipment for past projects.

Table 1: Equipment Reference Sound Emission Levels, dBA

Source	Sound Power Level	Sound Pressure Level at 30 m
Mobile Crusher	117	79
Mobile Screener	117	79
Production Loaders	111	73
Shipping Loader	109	71
Onsite Trucks	102	64
Conveyors	73 (per metre)	--

Note: All onsite trucks assumed to travel at a speed of 35 km/hr.

- As specified in Section 6, below, some equipment will require localized shielding, which was incorporated into the analysis as a modest 5 dBA sound emission level reduction for the applicable equipment. Similarly, a modest 5 dBA sound emission level reduction was assumed for production loaders employed for extraction in Phases 1 through 3, to represent acoustical shielding afforded by the working face (each phase was modelled with all resources removed). This adjustment was not applied to production loaders in Phase 4, where extraction will be in a westerly direction such that the working face will provide little acoustical shielding for most neighbouring points of reception.

6 Noise Control Measures

Using the predictive model and assumptions described in the previous section, the following noise control requirements were developed for the site. Note that the recommendations below make reference to Phase 1 as two sub-phases (Phase 1A and 1B) and Phase 2 as three sub-phases (Phase 2A, 2B and 2C), delineated as depicted in Figure 4.

- Prior to commencement of extraction/processing within the Pit 3 Extension, perimeter berms with heights and extents as detailed in Figure 4 shall be erected and maintained throughout the operational life of the pit. In addition, the existing berm on the southeast boundary of the existing Pit 3 must be maintained.

- All material extraction and processing within the Pit 3 Extension shall be restricted to daytime hours only (07:00 to 19:00). Shipping activities, consisting of one shipping loader and up to 45

shipping trucks per hour, may take place between 06:00 and 19:00.

- Extraction, processing and transport equipment employed within the pit shall be limited as detailed below (including quantities), with sound emission levels not greater than specified in Table 1.

- Highway trucks, conveyors, or any acoustically equivalent means may be employed to transport unprocessed materials extracted from Phases 2, 3 or 4 to stockpiles within Phase 1 or within Phase 2 along the border of Phase 1, provided that the production loader (servicing the processing equipment as described below) used to transfer material from these stockpiles to the processing equipment within Phase 1 operates on the north/west sides of the stockpiles, such that it is shielded from the homes to the south.

  <u>During Extraction in Phase 1:</u>

  - Up to two production loaders (for extraction) may operate anywhere within Phase 1.
  - One mobile crusher or one mobile screener (not both), serviced by one production loader, may operate anywhere within Phase 1, with localized shielding as described below.
  - One shipping loader may operate within Phase 1, 2A or 2B, loading up to 45 shipping trucks per hour.

  <u>During Extraction in Phase 2A:</u>

  - Up to two production loaders (for extraction) may operate anywhere within Phase 2A.
  - One mobile crusher or one mobile screener (not both), serviced by one production loader, may operate anywhere within Phase 1, with localized shielding as described below.
  - One shipping loader may operate within Phase 1, 2A or 2B, loading up to 45 shipping trucks per hour.

  <u>During Extraction in Phase 2B:</u>

  - One production loader (for extraction) may operate anywhere within Phase 2B.
  - One mobile crusher or one mobile screener (not both), serviced by one production loader, may operate anywhere within Phase 1, with localized shielding as described below.

- One shipping loader may operate within Phase 1, 2A or 2B, loading up to 45 shipping trucks per hour.

<u>During Extraction in Phase 2C:</u>

- One production loader (for extraction) may operate anywhere within Phase 2C.
- One mobile crusher or one mobile screener (not both), serviced by one production loader, may operate anywhere within Phase 1A, with localized shielding as described below.
- One shipping loader may operate within Phase 1A, loading up to 45 shipping trucks per hour.

<u>During Extraction in Phase 3:</u>

- One production loader (for extraction) may operate anywhere within Phase 3.
- One mobile crusher or one mobile screener (not both), serviced by one production loader, may operate anywhere within Phase 1A, with localized shielding as described below.
- One shipping loader may operate within Phase 1A, loading up to 45 shipping trucks per hour.

<u>During Extraction in Phase 4:</u>

- One production loader (for extraction) may operate anywhere within Phase 4.
- One mobile crusher or one mobile screener (not both), serviced by one production loader, may operate anywhere within Phase 1A, with localized shielding as described below.
- One shipping loader may operate within Phase 1A, loading up to 45 shipping trucks per hour.

<u>Localized Shielding for Mobile Crusher/Screener:</u>

- When in operation, the mobile crusher/screener and supporting production loader must be shielded by a U-shaped obstruction (e.g. material stockpile) on the southeast, southwest, and northwest sides that breaks the line-of-sight between the equipment and receptors R1 through R7, R9 and R10.

- In addition to the operating scenarios detailed above, one crusher and one screen (and two production loaders) can operate during the same hour within the majority of Phase 1, as

depicted in Figure 5, along with:

  - Shipping from Phases 1A/1B/2A/2B, and
  - Extraction and production (crushing or screening) using one loader in the existing Pit 3, as described in Section 4, provided that no extraction activity takes place within the Pit 3 Extension.

- Whenever possible, extraction and processing equipment shall be located as close as possible to working faces in order to maximize acoustical shielding.
- An updated Noise Impact Assessment, prepared by a qualified acoustical consultant, will be submitted to the MNRF within 12 months following Lafarge receiving notification of a building permit issued for a noise-sensitive use on the property designated herein as VL1. If the updated study concludes that the sound levels of Pit 3 and/or Pit 3 Extension do not comply with the applicable limits, the report must include the following:
  - Details regarding the noise control measures required to reduce the sound levels of Pit 3 and/or Pit 3 Extension to comply with the applicable limits;
  - A timetable for implementation of the noise control measures, including dates for achieving compliance with specific milestones;
  - A timetable for submitting further assessments to demonstrate compliance with the applicable sound level limits at the property designated herein as VL1;
- All mobile construction equipment used to prepare for, rehabilitate, or maintain the operations in the pit shall produce sound levels which comply with MECP Guideline NPC-115.
- Any proposed changes to the aspects of the extraction, processing and shipping operations detailed above as relating to noise control shall be reviewed by a qualified acoustical consultant for compliance with the relevant noise criteria.
- The operational plan should include the assumptions and recommendations as stated herein.
- It is recognized that advancements of equipment or different configurations may allow additional equipment or equipment to be substituted for certain activities while still meeting

MECP guidelines. Variations may be permitted to these noise controls, provided that the revision still meets MECP guidelines as confirmed through documentation by a professional engineer. Prior to modification, notification shall be given to the MNRF.

7 Assessment Results

Using the phasing plan as described in Section 4 and depicted in Figure 3, the modelling assumptions detailed in Section 5, along with incorporation of the noise control recommendations detailed in Section 6 and Figures 4 and 5, sound levels were predicted at each of the selected receptors under predictable worst-case conditions and summarized in the table below.

Table 2: Predicted Receptor Sound Pressure Levels, dBA

Point of Reception	Pit 3 Extension Maximum Sound Level		MECP Criterion		Within Criterion?
	06:00 – 07:00	07:00 – 19:00	06:00 – 07:00	07:00 – 19:00	
R1	37 (Phase 1A)	41 (Phase 2A)	40	45	Yes/Yes
R1A	--	42 (Phase 2A)			Yes
R2	37 (Phase 1A)	44 (Phase 4)			Yes/Yes
R2A	--	45 (Phase 4)			Yes
R3	36 (Phase 2B)	44 (Phase 4)			Yes/Yes
R3A	--	43 (Phase 3)			Yes
R4	36 (Phase 2B)	45 (Phase 4)			Yes/Yes
R4A	--	44 (Phase 3)			Yes
R5	35 (Phase 2A)	45 (Phase 4)			Yes/Yes
R5A	--	44 (Phase 4)			Yes
R6	35 (Phase 1B)	43 (Phase 4)			Yes/Yes
R6A	--	43 (Phase 4)			Yes
R7	37 (Phase 1B)	45 (Phase 4)			Yes/Yes
R7A	--	44 (Phase 4)			Yes
R8	37 (Phase 2C)	44 (Phase 4)			Yes/Yes
R8A	--	42 (Phase 4)			Yes
R9	39 (Phase 2A)	45 (Phase 2A)			Yes/Yes
R9A	--	44 (Phase 1A)			Yes
R10	36 (Phase 2A)	42 (Phase 2A)			Yes
R10A	--	41 (Phase 2A)			Yes

The analysis results summarized in Table 2 (with sample calculations provided in Appendix A) indicate that the predicted sound levels of the proposed pit operations, with the noise control measures recommended herein, comply with MECP guideline limits at the selected receptors under worst-case operating scenarios.

The Town of Caledon Official Plan includes provisions regarding the assessment of cumulative impacts from multiple aggregate extraction operations. As detailed above, sound emissions from the existing Pit 3 have been included in this analysis.

The MNRF has issued an Aggregate Resources Act (ARA) licence to James Dick Construction Limited for a Class A (below water) for the Erin Pit Extension, the northeast extent of which borders Shaws Creek Road, south of the proposed Pit 3 Extension. The potential for cumulative impacts from this operation and of the Pit 3 Extension is acknowledged. However, the likelihood that both pits would be simultaneously operating under worst-case conditions as it pertains to noise impacts at receptors located between the two pits is low and, were it to ever occur, could result in only a minor excess of up to 3 dBA. Moreover, as highlighted in Section 5, the ISO standard used to assess noise emissions from both pits is conservative insofar as it assumes a moderate downwind condition (favourable for the propagation of sound from the source to a receiver) in all directions, at all times. In reality, meteorological conditions would more likely favor propagation of sound from one pit operation at a given time, rather than both simultaneously.

8 Conclusions & Recommendations

The acoustical analysis indicates that sound levels from the proposed Pit 3 Extension, predicted under worst-case operating scenarios and with the noise control measures recommended herein, will comply with MECP guideline limits at the most potentially impacted neighbouring receptors.

The noise control measures specified in Section 6 should be incorporated into the operational plans for the aggregate pit. Any changes proposed for the pit plans that may affect offsite sound levels should be reviewed by a qualified acoustical consultant, and any necessary modifications to the noise control measures be incorporated into the pit plans.

References

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

2. Ontario Ministry of the Environment, Conservation and Parks Publication NPC-207, "Impulse Vibration in Residential Buildings," November, 1983.

3. Ontario Ministry of the Environment, Conservation and Parks Publication NPC-115, "Construction Equipment," August, 1978.

4. International Organization for Standardization, "Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation," ISO-9613-2, Switzerland, 1996.

LIMITATIONS

This document was prepared solely for the addressed party and titled project or named part thereof, and should not be relied upon or used for any other project without obtaining prior written authorization from HGC Engineering. HGC Engineering accepts no responsibility or liability for any consequence of this document being used for a purpose other than for which it was commissioned. Any person or party using or relying on the document for such other purpose agrees, and will by such use or reliance be taken to confirm their agreement to indemnify HGC Engineering for all loss or damage resulting therefrom. HGC Engineering accepts no responsibility or liability for this document to any person or party other than the party by whom it was commissioned.

Any conclusions and/or recommendations herein reflect the judgment of HGC Engineering based on information available at the time of preparation, and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.

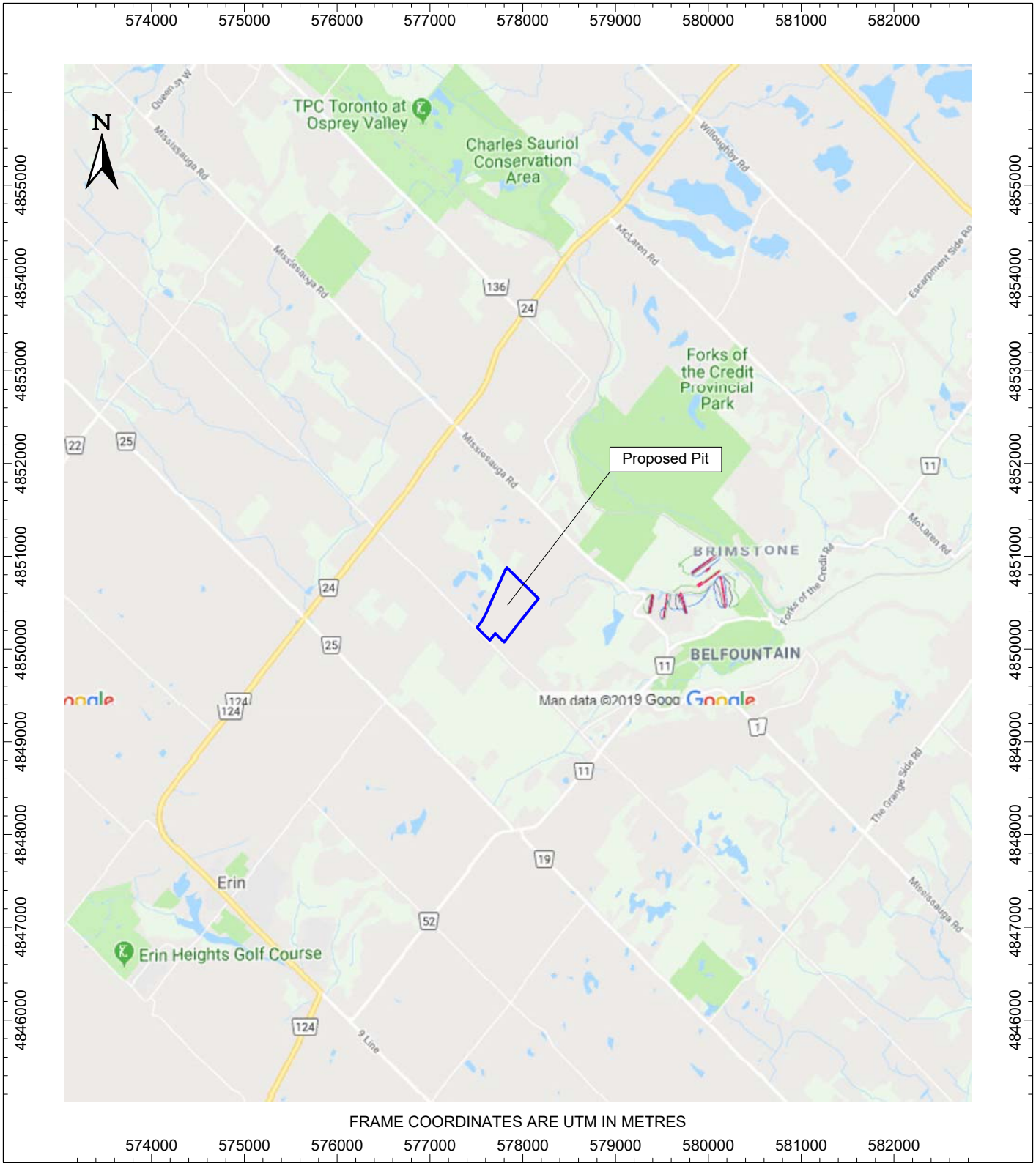

Figure 1: Location Map

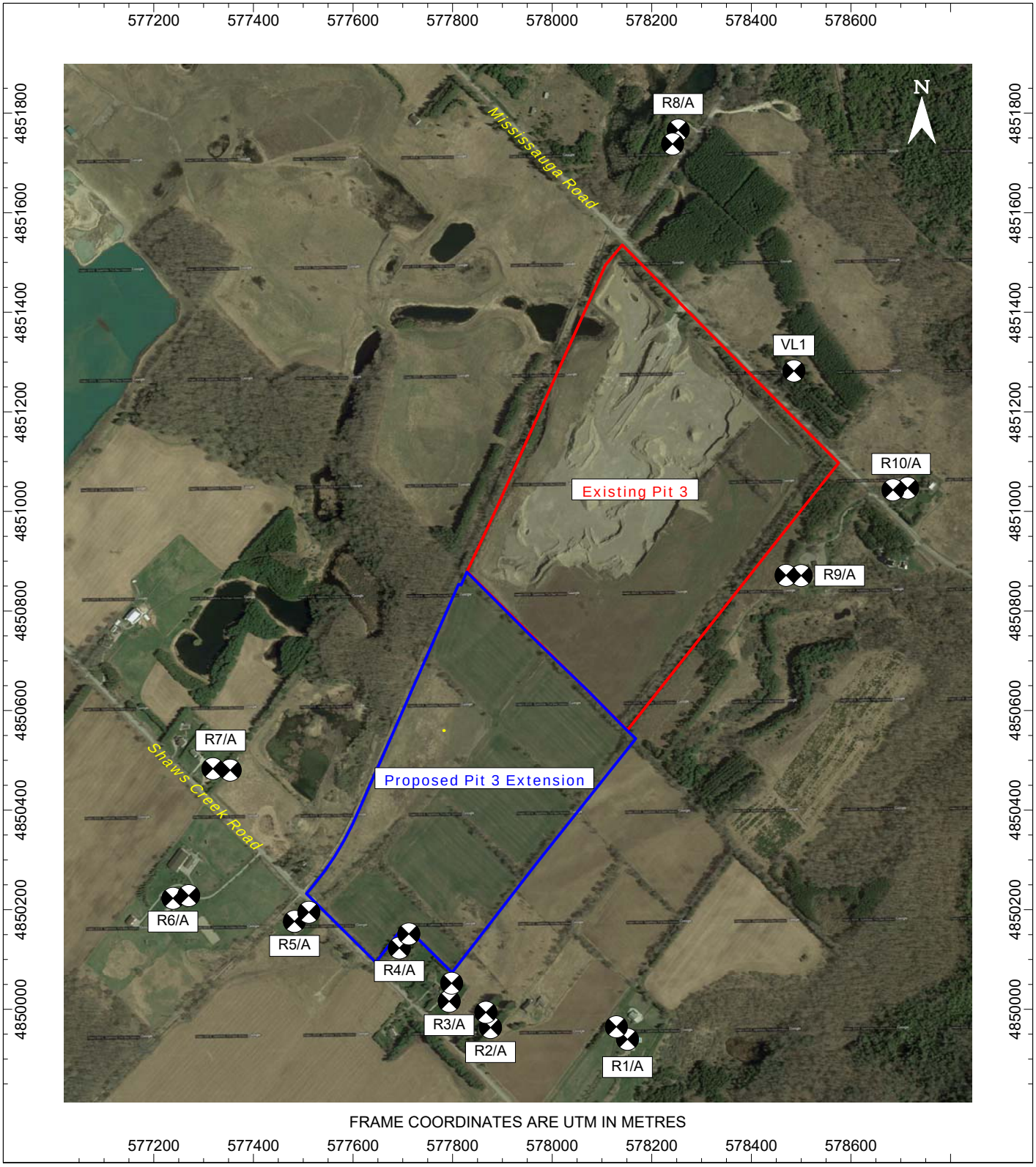

Figure 2: Satellite Image Showing Existing Pit 3, Proposed Pit 3 Extension and Surrounding Points of Reception

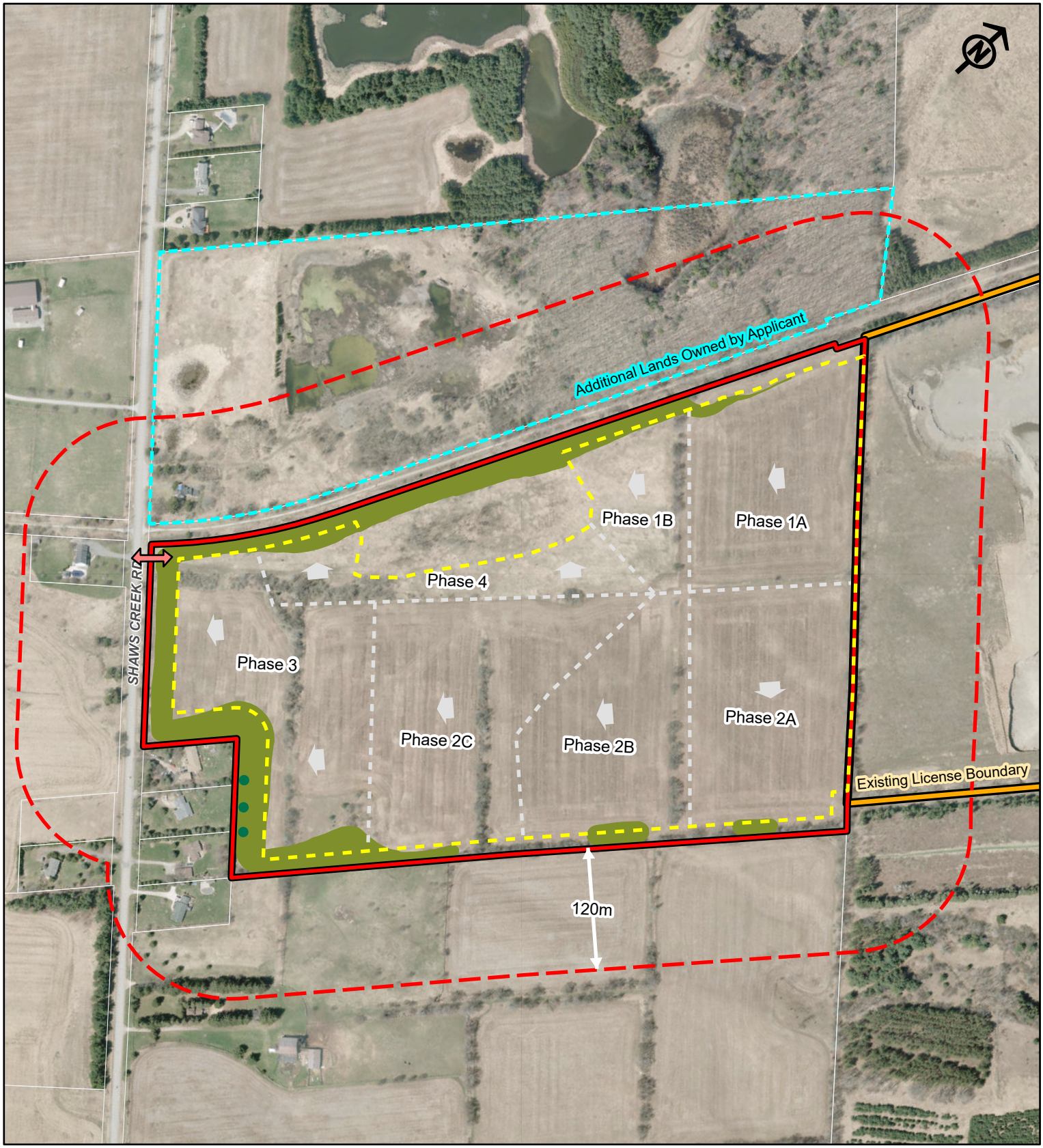

FIGURE 3
PHASING PLAN

Pit 3 Extension
Part of Lot 13, Con 5 WHS
Town of Caledon
Region of Peel

LEGEND

- Proposed Licence Boundary
- Proposed Extraction Limit
- Proposed Phasing Boundary
- Proposed Licence Boundary 120m Offset
- Proposed Acoustic / Visual Berms
- Proposed Tree Plantings

DATE: February 2024

SOURCES

0 20 40 80 120 160 200
Meters

9526CO - Report Figures - April 2024

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

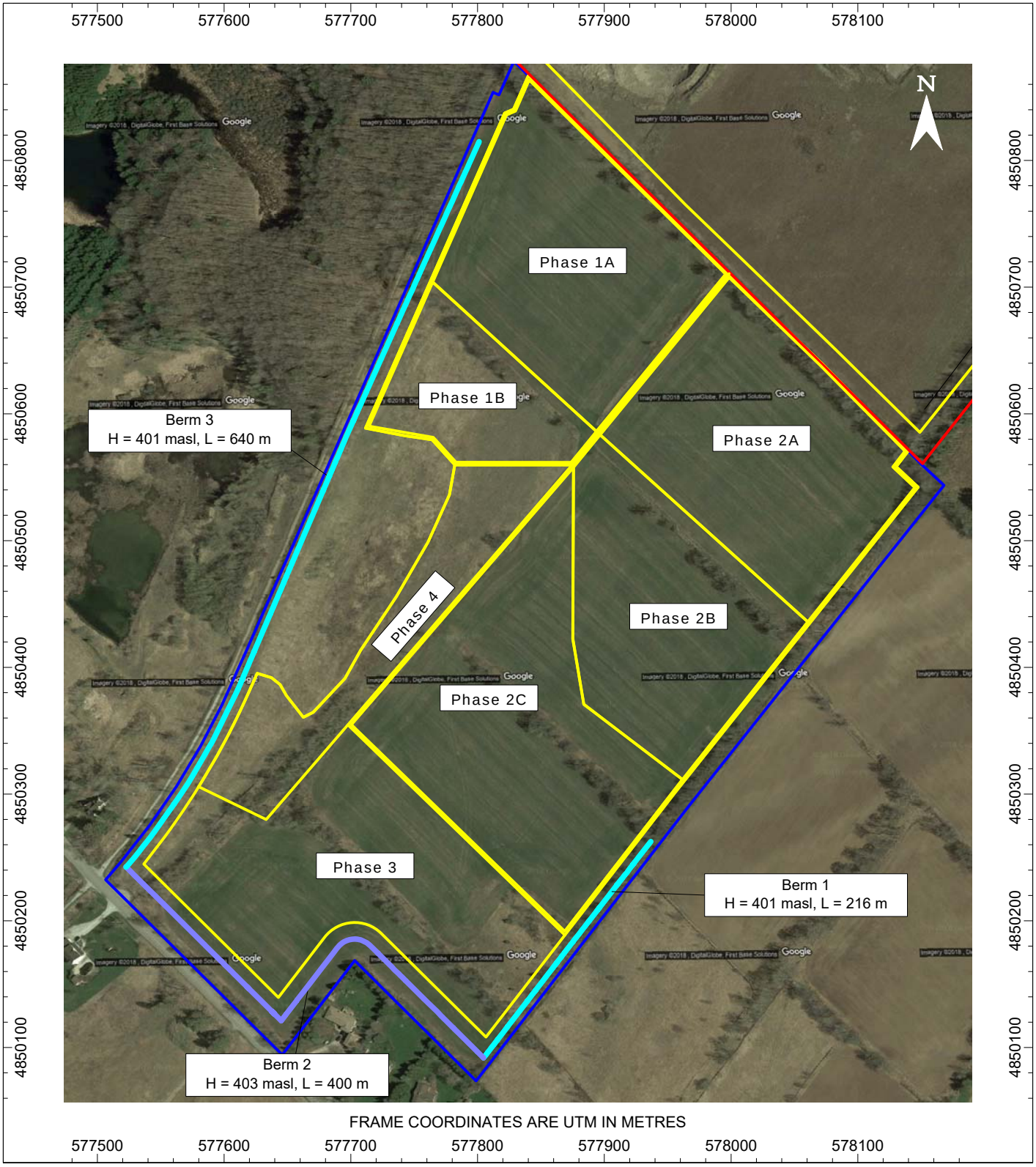

Figure 4: Pit 3 Extension Plan Showing Operational Phases and Noise Berms

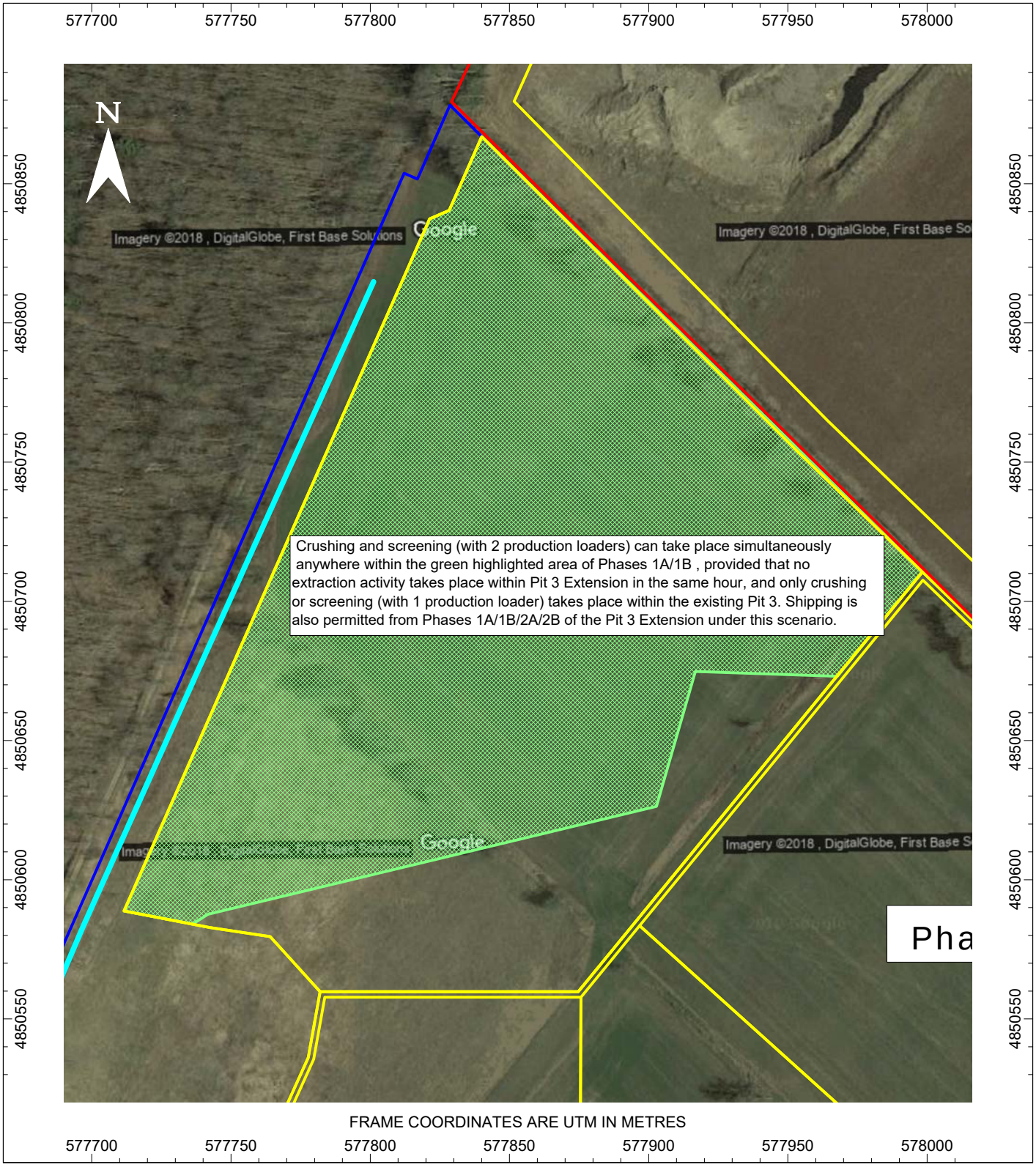

Figure 5: Pit 3 Extension Phase 1, Showing Area Where Simultaneous Crushing & Screening Can Occur (Highlighted Green) Under Conditions as Noted

APPENDIX A

Sample Calculations

R01	578151	4849943	404.6												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	5.9	11.4	1.7	0.0	0.0	0.0	0.0	23
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	6.6	9.0	1.1	0.0	0.0	0.0	0.0	31
Extraction Equipment - Phase 2A	578017	4850481	391.3	109	66	0	0.0	2.6	2.2	2.9	0.0	0.0	0.0	0.0	35
Conveyor - Phase 2A	577982	4850637	390.3	96	68	0	0.0	3.2	2.9	1.9	0.0	0.0	0.0	0.0	20
Processing Equipment	577871	4850569	392.0	113	68	0	0.0	2.5	3.6	1.8	0.0	0.0	0.0	0.0	37
Shipping Loader	578030	4850578	391.5	109	67	0	0.0	3.1	1.6	2.9	0.0	0.0	0.0	0.0	34
Shipping Trucks	578176	4851402	396.5	106	71	0	0.0	3.1	3.2	2.3	0.0	0.0	0.0	0.0	26

R01A	578129	4849965	405.4												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	5.7	11.2	1.7	0.0	0.0	0.0	0.0	24
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	6.5	8.8	1.1	0.0	0.0	0.0	0.0	32
Extraction Equipment - Phase 2A	578027	4850472	391.2	109	65	0	0.0	2.7	2.3	2.7	0.0	0.0	0.0	0.0	36
Conveyor - Phase 2A	577982	4850637	390.3	96	68	0	0.0	3.1	2.9	1.8	0.0	0.0	0.0	0.0	21
Processing Equipment	577871	4850569	392.0	113	67	0	0.0	2.4	1.8	3.5	0.0	0.0	0.0	0.0	38
Shipping Loader	578030	4850578	391.5	109	67	0	0.0	3.0	1.6	2.9	0.0	0.0	0.0	0.0	34
Shipping Trucks	578176	4851402	396.5	106	70	0	0.0	3.1	3.2	2.3	0.0	0.0	0.0	0.0	27

R02	577873	4849966	403.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	3.9	4.3	2.9	0.0	0.0	0.0	0.0	30
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	3.3	4.9	2.4	0.0	0.0	0.0	0.0	37
Extraction Equipment - Phase 4	577663	4850320	391.9	111	63	0	0.0	1.8	2.6	2.3	0.0	0.0	0.0	0.0	41
Conveyor - Phase 4	577851	4850424	390.1	101	64	0	0.0	2.8	3.5	1.2	0.0	0.0	0.0	0.0	30
Processing Equipment	577881	4850600	391.9	113	67	0	0.0	2.0	2.0	3.4	0.0	0.0	0.0	0.0	38
Shipping Loader	577899	4850736	392.3	109	69	0	0.0	2.5	3.4	1.6	0.0	0.0	0.0	0.0	32
Shipping Trucks	578188	4851505	396.9	104	72	0	0.0	2.4	2.6	2.5	0.0	0.0	0.0	0.0	25

R02A	577867	4849994	403.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	5.1	7.3	2.1	0.0	0.0	0.0	0.0	27
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	6.2	5.1	1.5	0.0	0.0	0.0	0.0	35
Extraction Equipment - Phase 4	577653	4850310	391.9	111	63	0	0.0	1.7	2.7	2.2	0.0	0.0	0.0	0.0	42
Conveyor - Phase 4	577850	4850424	390.1	101	64	0	0.0	2.7	3.5	1.2	0.0	0.0	0.0	0.0	31
Processing Equipment	577791	4850698	392.4	113	68	0	0.0	0.6	0.0	3.3	0.0	0.0	0.0	0.0	41
Shipping Loader	577899	4850736	392.3	109	68	0	0.0	2.4	1.6	3.4	0.0	0.0	0.0	0.0	33
Shipping Trucks	578188	4851505	396.9	104	72	0	0.0	2.4	2.6	2.5	0.0	0.0	0.0	0.0	25

R03	577793	4850023	396.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	4.5	6.8	2.3	0.0	0.0	0.0	0.0	28
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	5.7	4.6	1.6	0.0	0.0	0.0	0.0	35
Extraction Equipment - Phase 4	577683	4850338	391.9	111	61	0	0.0	2.9	5.8	1.3	0.0	0.0	0.0	0.0	39
Conveyor - Phase 4	577790	4850524	390.5	100	64	0	0.0	2.7	4.4	0.9	0.0	0.0	0.0	0.0	27
Processing Equipment	577901	4850609	391.9	113	66	0	0.0	1.7	2.6	3.1	0.0	0.0	0.0	0.0	39
Shipping Loader	577899	4850736	392.3	109	68	0	0.0	2.4	2.6	2.9	0.0	0.0	0.0	0.0	32
Shipping Trucks	578187	4851505	396.9	104	71	0	0.0	2.5	3.5	2.4	0.0	0.0	0.0	0.0	25

R03A	577798	4850053	396.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	4.4	7.8	2.2	0.0	0.0	0.0	0.0	28
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	5.6	5.7	1.5	0.0	0.0	0.0	0.0	35
Extraction Equipment - Phase 3	577813	4850129	391.5	106	49	0	0.0	4.4	12.4	0.3	0.0	0.0	0.0	0.0	40
Conveyor - Phase 3	577858	4850440	390.2	101	63	0	0.0	5.9	2.0	0.7	0.0	0.0	0.0	0.0	30
Processing Equipment	577891	4850600	392.0	113	66	0	0.0	2.1	4.3	2.4	0.0	0.0	0.0	0.0	38
Shipping Loader	577899	4850736	392.3	109	68	0	0.0	3.7	10.2	1.5	0.0	0.0	0.0	0.0	25
Shipping Trucks	578188	4851505	396.9	104	71	0	0.0	2.6	4.0	2.0	0.0	0.0	0.0	0.0	25

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R04	577696	4850127	398.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	4.0	10.0	2.1	0.0	0.0	0.0	0.0	26
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	5.1	7.8	1.4	0.0	0.0	0.0	0.0	33
Extraction Equipment - Phase 4	577633	4850289	391.9	111	56	0	0.0	3.7	8.9	0.6	0.0	0.0	0.0	0.0	42
Conveyor - Phase 4	577738	4850439	390.5	100	62	0	0.0	2.0	5.4	0.7	0.0	0.0	0.0	0.0	29
Processing Equipment	577871	4850609	391.9	113	65	0	0.0	1.9	3.8	2.4	0.0	0.0	0.0	0.0	39
Shipping Loader	577899	4850736	392.3	109	67	0	0.0	2.2	2.5	2.7	0.0	0.0	0.0	0.0	34
Shipping Trucks	578187	4851504	396.8	104	70	0	0.0	2.4	3.7	2.2	0.0	0.0	0.0	0.0	26

R04A	577712	4850152	397.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	69	0	0.0	3.2	14.9	1.9	0.0	0.0	0.0	0.0	22
Pit 3 Processing Equipment	578215	4850726	390.5	117	69	0	0.0	4.0	12.8	1.3	0.0	0.0	0.0	0.0	30
Extraction Equipment - Phase 3	577743	4850178	391.5	106	43	0	0.0	1.9	17.2	0.3	0.0	0.0	0.0	0.0	43
Conveyor - Phase 3	577796	4850407	390.3	101	59	0	0.0	5.4	5.4	0.3	0.0	0.0	0.0	0.0	31
Processing Equipment	577891	4850600	392.0	113	65	0	0.0	2.8	8.5	1.6	0.0	0.0	0.0	0.0	35
Shipping Loader	577899	4850736	392.3	109	67	0	0.0	3.4	11.9	1.3	0.0	0.0	0.0	0.0	25
Shipping Trucks	578186	4851503	396.8	104	71	0	0.0	3.4	5.8	3.2	0.0	0.0	0.0	0.0	21

R05	577483	4850177	398.7												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	70	0	0.0	0.0	11.5	2.5	0.0	0.0	0.0	0.0	27
Pit 3 Processing Equipment	578215	4850726	390.5	117	70	0	0.0	0.5	10.4	1.8	0.0	0.0	0.0	0.0	34
Extraction Equipment - Phase 4	577593	4850310	392.0	111	56	0	0.0	0.4	12.0	0.6	0.0	0.0	0.0	0.0	42
Conveyor - Phase 4	577790	4850524	390.5	100	64	0	0.0	1.9	3.7	0.9	0.0	0.0	0.0	0.0	30
Processing Equipment	577881	4850600	391.9	113	66	0	0.0	-1.0	4.8	2.7	0.0	0.0	0.0	0.0	40
Shipping Loader	577899	4850736	392.3	109	68	0	0.0	0.1	3.8	2.8	0.0	0.0	0.0	0.0	34
Shipping Trucks	578187	4851505	396.9	104	71	0	0.0	-0.1	3.9	3.8	0.0	0.0	0.0	0.0	26

R05A	577511	4850195	397.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	70	0	0.0	4.1	11.4	2.2	0.0	0.0	0.0	0.0	23
Pit 3 Processing Equipment	578215	4850726	390.5	117	70	0	0.0	5.0	9.3	1.5	0.0	0.0	0.0	0.0	31
Extraction Equipment - Phase 4	577603	4850298	391.9	111	54	0	0.0	3.9	10.8	0.5	0.0	0.0	0.0	0.0	42
Conveyor - Phase 4	577790	4850524	390.5	100	63	0	0.0	6.0	2.6	0.6	0.0	0.0	0.0	0.0	28
Processing Equipment	577891	4850600	391.8	113	66	0	0.0	2.5	5.3	2.2	0.0	0.0	0.0	0.0	37
Shipping Loader	577899	4850736	392.3	109	67	0	0.0	3.2	3.7	2.3	0.0	0.0	0.0	0.0	32
Shipping Trucks	578188	4851505	396.9	104	71	0	0.0	3.1	2.2	3.8	0.0	0.0	0.0	0.0	24

R06	577238	4850223	401.8												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	72	0	0.0	0.4	4.2	4.2	0.0	0.0	0.0	0.0	30
Pit 3 Processing Equipment	578215	4850726	390.5	117	72	0	0.0	1.3	3.5	3.6	0.0	0.0	0.0	0.0	37
Extraction Equipment - Phase 4	577663	4850320	391.9	111	64	0	0.0	0.5	5.4	1.8	0.0	0.0	0.0	0.0	39
Conveyor - Phase 4	577786	4850513	390.5	100	67	0	0.0	2.0	2.9	1.3	0.0	0.0	0.0	0.0	27
Processing Equipment	577811	4850670	392.3	113	68	0	0.0	0.2	3.9	3.4	0.0	0.0	0.0	0.0	37
Shipping Loader	577899	4850736	392.3	109	69	0	0.0	0.4	3.5	3.3	0.0	0.0	0.0	0.0	32
Shipping Trucks	578188	4851506	396.9	104	72	0	0.0	0.3	3.7	4.2	0.0	0.0	0.0	0.0	24

R06A	577270	4850229	398.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	72	0	0.0	3.2	2.9	4.2	0.0	0.0	0.0	0.0	29
Pit 3 Processing Equipment	578215	4850726	390.5	117	72	0	0.0	2.5	3.9	3.6	0.0	0.0	0.0	0.0	35
Extraction Equipment - Phase 4	577683	4850338	391.9	111	64	0	0.0	2.7	3.9	1.9	0.0	0.0	0.0	0.0	39
Conveyor - Phase 4	577786	4850513	390.5	100	66	0	0.0	3.3	3.4	1.4	0.0	0.0	0.0	0.0	26
Processing Equipment	577811	4850670	392.3	113	68	0	0.0	2.9	3.5	1.8	0.0	0.0	0.0	0.0	37
Shipping Loader	577899	4850736	392.3	109	69	0	0.0	3.1	3.3	1.6	0.0	0.0	0.0	0.0	31
Shipping Trucks	578188	4851505	396.9	104	72	0	0.0	3.5	3.1	2.6	0.0	0.0	0.0	0.0	24

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R07	577325	4850476	403.0												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	70	0	0.0	0.1	4.2	3.8	0.0	0.0	0.0	0.0	33
Pit 3 Processing Equipment	578215	4850726	390.5	117	70	0	0.0	1.0	3.4	3.3	0.0	0.0	0.0	0.0	39
Extraction Equipment - Phase 4	577737	4850401	391.9	111	63	0	0.0	1.5	4.3	1.8	0.0	0.0	0.0	0.0	40
Conveyor - Phase 4	577778	4850505	390.5	100	65	0	0.0	2.1	3.3	1.0	0.0	0.0	0.0	0.0	29
Processing Equipment	577831	4850649	392.3	113	66	0	0.0	0.1	4.3	2.6	0.0	0.0	0.0	0.0	40
Shipping Loader	577899	4850736	392.3	109	67	0	0.0	0.3	3.7	2.7	0.0	0.0	0.0	0.0	35
Shipping Trucks	578187	4851504	396.9	104	70	0	0.0	0.3	3.8	3.5	0.0	0.0	0.0	0.0	27

R07A	577353	4850481	396.9												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	70	0	0.0	3.1	3.5	3.4	0.0	0.0	0.0	0.0	31
Pit 3 Processing Equipment	578215	4850726	390.5	117	70	0	0.0	2.5	4.4	3.0	0.0	0.0	0.0	0.0	37
Extraction Equipment - Phase 4	577777	4850450	391.9	111	64	0	0.0	3.3	3.5	1.9	0.0	0.0	0.0	0.0	39
Conveyor - Phase 4	577778	4850505	390.5	100	64	0	0.0	3.3	4.4	1.0	0.0	0.0	0.0	0.0	27
Processing Equipment	577851	4850630	392.1	113	65	0	0.0	2.6	2.5	2.7	0.0	0.0	0.0	0.0	40
Shipping Loader	577899	4850736	392.3	109	67	0	0.0	3.0	2.1	2.6	0.0	0.0	0.0	0.0	34
Shipping Trucks	578187	4851504	396.9	104	70	0	0.0	3.4	3.4	1.9	0.0	0.0	0.0	0.0	26

R08	578253	4851766	399.8												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	71	0	0.0	-0.1	4.3	3.6	0.0	0.0	0.0	0.0	32
Pit 3 Processing Equipment	578215	4850726	390.5	117	71	0	0.0	0.8	3.8	3.0	0.0	0.0	0.0	0.0	38
Extraction Equipment - Phase 4	577867	4850552	391.8	111	73	0	0.0	-0.8	0.0	4.9	0.0	0.0	0.0	0.0	34
Conveyor - Phase 4	577790	4850524	390.5	100	73	0	0.0	1.5	0.3	2.7	0.0	0.0	0.0	0.0	22
Processing Equipment	577841	4850849	392.5	113	71	0	0.0	-1.0	0.0	4.2	0.0	0.0	0.0	0.0	38
Shipping Loader	577899	4850736	392.3	109	72	0	0.0	-0.8	0.0	3.9	0.0	0.0	0.0	0.0	34
Shipping Trucks	578187	4851508	396.9	104	67	0	0.0	-0.2	0.4	2.3	0.0	0.0	0.0	0.0	35

R08A	578242	4851738	397.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	71	0	0.0	2.4	3.7	2.6	0.0	0.0	0.0	0.0	31
Pit 3 Processing Equipment	578215	4850726	390.5	117	71	0	0.0	4.0	3.1	1.7	0.0	0.0	0.0	0.0	37
Extraction Equipment - Phase 4	577857	4850552	391.8	111	73	0	0.0	0.8	0.0	4.8	0.0	0.0	0.0	0.0	32
Conveyor - Phase 4	577790	4850524	390.5	100	73	0	0.0	3.5	0.3	2.6	0.0	0.0	0.0	0.0	21
Processing Equipment	577841	4850849	392.5	113	71	0	0.0	0.9	0.0	4.1	0.0	0.0	0.0	0.0	37
Shipping Loader	577899	4850736	392.3	109	71	0	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	32
Shipping Trucks	578187	4851509	396.9	104	66	0	0.0	1.8	0.6	2.1	0.0	0.0	0.0	0.0	34

R09	578500	4850871	403.1												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	61	0	0.0	1.4	17.4	0.8	0.0	0.0	0.0	0.0	30
Pit 3 Processing Equipment	578215	4850726	390.5	117	61	0	0.0	1.7	15.5	0.5	0.0	0.0	0.0	0.0	38
Extraction Equipment - Phase 2A	578017	4850650	391.7	109	66	0	0.0	-0.4	4.2	2.6	0.0	0.0	0.0	0.0	37
Conveyor - Phase 2A	577982	4850637	390.3	96	66	0	0.0	2.2	2.5	1.3	0.0	0.0	0.0	0.0	24
Processing Equipment	577961	4850738	392.2	113	66	0	0.0	-0.8	4.2	2.9	0.0	0.0	0.0	0.0	40
Shipping Loader	578030	4850578	391.5	109	66	0	0.0	-0.1	4.1	2.3	0.0	0.0	0.0	0.0	36
Shipping Trucks	578176	4851397	396.5	106	65	0	0.0	-0.8	3.9	2.4	0.0	0.0	0.0	0.0	35

R09A	578470	4850872	399.7												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	60.4	0	0.0	4.3	15.0	0.7	0.0	0.0	0.0	0.0	30.4
Pit 3 Processing Equipment	578215	4850726	390.5	117	60.4	0	0.0	5.4	12.2	0.5	0.0	0.0	0.0	0.0	38.2
Extraction Equipment - Phase 1A	577951	4850750	392.2	109	65.5	0	0.0	1.6	2.9	2.7	0.0	0.0	0.0	0.0	36.3
Processing Equipment	577961	4850738	392.2	113	65.4	0	0.0	1.8	2.8	2.8	0.0	0.0	0.0	0.0	39.9
Shipping Loader	578030	4850578	403.8	109	65.5	0	0.0	1.5	3.4	2.6	0.0	0.0	0.0	0.0	35.5
Shipping Trucks	578169	4851368	397.9	106	64.9	0	0.0	2.3	2.6	2.4	0.0	0.0	0.0	0.0	33.3

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R10	578714	4851047	404.5												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	66	0	0.0	1.7	13.8	1.4	0.0	0.0	0.0	0.0	28
Pit 3 Processing Equipment	578215	4850726	390.5	117	66	0	0.0	1.9	12.1	0.9	0.0	0.0	0.0	0.0	35
Extraction Equipment - Phase 2A	578027	4850632	391.6	109	69	0	0.0	0.1	3.6	3.6	0.0	0.0	0.0	0.0	33
Conveyor - Phase 2A	577982	4850637	390.3	96	70	0	0.0	2.5	1.8	1.9	0.0	0.0	0.0	0.0	21
Processing Equipment	577971	4850729	392.1	113	69	0	0.0	-0.5	4.0	3.7	0.0	0.0	0.0	0.0	36
Shipping Loader	578030	4850578	391.5	109	69	0	0.0	0.3	3.5	3.3	0.0	0.0	0.0	0.0	32
Shipping Trucks	578176	4851397	396.5	106	67	0	0.0	-0.5	1.7	3.1	0.0	0.0	0.0	0.0	34

R10A	578685	4851043	399.0												
Src Name	Easting	Northing	Elevation	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
Pit 3 Production Loader	578215	4850726	390.5	111	66	0	0.0	4.9	11.3	1.3	0.0	0.0	0.0	0.0	27
Pit 3 Processing Equipment	578215	4850726	390.5	117	66	0	0.0	5.7	8.8	0.9	0.0	0.0	0.0	0.0	35
Extraction Equipment - Phase 2A	578037	4850622	391.6	109	69	0	0.0	2.4	1.9	3.8	0.0	0.0	0.0	0.0	32
Conveyor - Phase 2A	577982	4850637	390.3	96	69	0	0.0	3.2	3.2	1.9	0.0	0.0	0.0	0.0	19
Processing Equipment	577961	4850738	392.2	113	69	0	0.0	2.2	3.6	2.2	0.0	0.0	0.0	0.0	36
Shipping Loader	578030	4850578	391.5	109	69	0	0.0	3.0	3.4	1.6	0.0	0.0	0.0	0.0	31
Shipping Trucks	578176	4851396	396.5	106	67	0	0.0	2.6	1.8	3.1	0.0	0.0	0.0	0.0	31

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

APPENDIX B

Consultant Curriculum Vitae

Corey D. Kinart

Senior Associate, MBA, PEng

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HGC Engineering
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ACOUSTICS NOISE VIBRATION

Education

University of Waterloo, Bachelor of Applied Science, Mechanical Engineering, 2001
Schulich School of Business, York University, Master of Business Administration, 2015

Professional Memberships

Professional Engineers Ontario (PEO)
Canadian Acoustical Association (CAA)

Professional History

2009 to present	Senior Associate, HGC Engineering, Mississauga
2006 to 2009	Project Engineer, HGC Engineering, Mississauga
2001 to 2006	Mechanical Engineer, Magellan Aerospace, Mississauga
2000 to 2001	Contract Engineer, HGC Engineering, Mississauga

Experience

Mr. Kinart has extensive experience in the assessment and mitigation of noise emissions from industrial and commercial facilities, and specializes in the use of advanced sound intensity measurement equipment and techniques. He has conducted feasibility studies, acoustic assessments and audits for government approvals, as well as noise complaint investigations for hundreds of facilities across Ontario and abroad. His experience spans a wide variety of industrial and commercial sectors and is highlighted by natural gas fired power generation facilities, natural gas transmission and distribution facilities, electrical transformer stations, petrochemical refineries, mineral mines, hot mix asphalt, ready-mix concrete and cement plants, aggregate pits and quarries and myriad of other sites and facilities of varying size and complexity.

Selected Projects

Union Gas Limited, Numerous sites throughout Ontario
General Dynamics Land Systems, London, Ontario
Vale, Copper Cliff & Garson, Ontario
Suncor Energy Products Inc., Mooretown, Ontario
Lafarge Canada Inc., Numerous sites throughout Ontario
National Gas Company of Trinidad & Tobago, Trinidad & Tobago
General Motors, St. Catharines, Ontario
Enbridge Gas Distribution, Numerous sites throughout Ontario
Petro-Canada, Mississauga, Ontario
TransCanada Pipelines Ltd., Numerous sites in Ontario and Western Canada
Canada Building Materials, Numerous sites throughout Ontario
DeBeers Victor Mine Project, Northern Ontario
Staatsolie, Tout Lui Faut, Suriname
Dufferin Concrete, Numerous sites throughout Ontario
NOVA Chemicals, Corunna, Mooretown & St. Clair, Ontario
Hydro One, Numerous sites throughout Ontario

William J. Gastmeier

Principal, MASc, PEng

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ACOUSTICS NOISE VIBRATION

Education

University of Waterloo, Master of Applied Science, 1976
University of Waterloo, Bachelor of Science, 1974

Professional Memberships

Professional Engineers of Ontario (PEO)
Acoustical Society of America (ASA)
Audio Engineering Society (AES)
Canadian Acoustical Association (CAA)

Professional History

1994 to Present	Principal, HGC Engineering, Mississauga
1998 to 2017	Lecturer, Dalhousie University, Halifax, NS
1988 to 2018	Adjunct Professor, University of Waterloo, Waterloo
1988 to 1994	Project Coordinator, Vibron Limited, Mississauga
1978 to 1988	Electroacoustics Manager, Unitron Industries, Kitchener
1976 to 1978	Microphone Engineer, Turner Company, Cedar Rapids, IA

Experience

Mr Gastmeier's areas of expertise include the acoustical design of buildings, environmental noise, and mechanical noise control. He specialises in architectural acoustics for lecture, workplace, performance and multi-use spaces and is expert in thedesign of acoustical test facilities, residential developments and community noise issues.

Selected Projects

St. Andrew's College, Toronto
Bishop Strachan School, Toronto
Conrad Grebel College, Waterloo
Upper Canada College, Toronto
Royal St. George's College,
Toronto
Humber Arts & Media Studio, Toronto
Bergeron Centre for Engineering Excellence, York
UniversityThe Maitland Recreation Centre , Goderich
Ontario
Centennial Centre for Integrated Sciences, University of Alberta,
EdmontonPiqqusilirivvik Gathering Place Iqualuit, Nunavit
University of Waterloo School of Architecture, Waterloo
Fanshawe College Centre for Digital & Performance Arts,
LondonUniversity of Toronto's Student Commons, St. George
Campus Mitchel Hall, Queens University, Kingston
University of Windsor School of Creative Arts, Windsor
Lancer Sport and Recreation Centre (LSRC), University of Windsor,
Windsor
L.R. Wilson Hall, McMaster University,