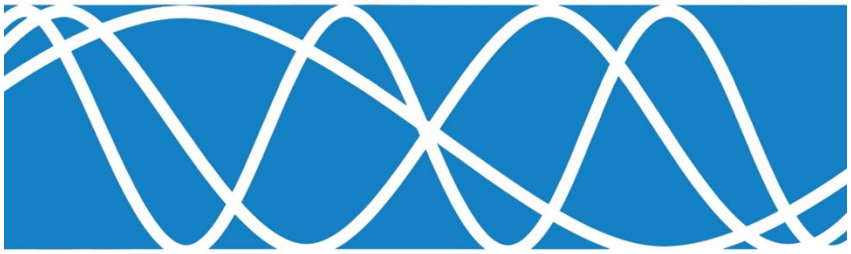
Noise Feasibility Study

Jedburgh Plains
Wrigley Road
Part Lot 32, Concession 8
North Dumfries, Ontario

August 11, 2025
HGC Project #: 02400860



Prepared for:

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HGC
NOISE | VIBRATION | ACOUSTICS

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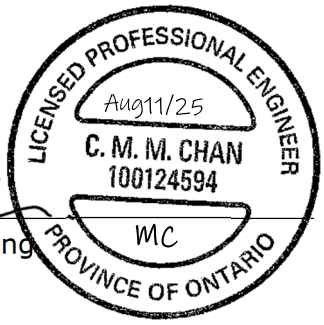
Version Control
Noise Feasibility Study,

Ver.	Date	Version Description	Prepared By
1.0	August 11, 2025	Noise Feasibility Study in support of ARA approvals process.	M. Chan

Prepared by:



Mandy Chan, P.Eng

Reviewed by:

Bill Gastmeier, MASc, PEng

Howe Gastmeier Chapnik Limited

Limitations

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Table of Contents

1 INTRODUCTION AND SUMMARY

HGC Noise Vibration Acoustics was retained by J-AAR Materials Limited to undertake an analysis of the sound emissions from their proposed pit at neighbouring noise sensitive receptors. This assessment was conducted in accordance with Ministry of the Environment, Conservation and Parks (MECP) and Ministry of Natural Resources (MNR) Guidelines.

The analysis is based on a review of the pertinent MECP and MNRF guidelines, a review of the Operational plans prepared by Harrington McAvan Ltd. dated August 2025, discussions with J-AAR personnel regarding equipment locations and planned operations, sound levels of equipment measured at their facilities that will be used in the pit and sound levels from HGC files measured at similar facilities.

The equipment and activities which are potential sound sources are outlined in Section 4. This assessment is based on scenarios representing the worst-case operations under maximum production located closest to the receptors.

The results of our analysis indicate that the sound levels produced by the proposed operations in the gravel pit under the worst- case operational scenarios can comply with the applicable MECP Guideline limits with the implementation of noise controls as outlined in Section 5.

The acoustic recommendations may be subject to modification if the site plan or operational plans for the pit are changed significantly, if the site plan for the residential development to the west is changed significantly from the draft plan considered herein, if pit operating scenarios are significantly different to those assumed in the assessment, or there is a significant increase in background sound levels at the noise sensitive receptors.

2 SITE DESCRIPTION

The existing features plan is attached as Figure 1. An aerial photograph attached as Figure 2 shows the location of the site, the neighbouring residences and the nearby roadways. The proposed pit is located north side of Wrigley Road and west of 31st Line in North Dumfries, Ontario. To the east is an existing aggregate extraction site and there are existing residential uses to the northwest, southeast and southwest. To the west is a proposed residential subdivision. It is understood that the Draft Plan of Subdivision and Zoning By-law amendment for the residential development were approved in February 2025.

The main entrance and scale will be located at the southeast corner of the site. The licensed area of the proposed pit is 39.6 hectares with a maximum annual excavation tonnage of 1,000,000 tonnes.

3 NOISE LEVEL CRITERIA

The Provincial Standards – Aggregate Resources of Ontario (Class "A" Pit above Water) [1]. 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."

HGC visited the site and surrounding areas in September 2024 to observe the acoustic environment. Four existing residences located within approximately 150 m of the licensed boundary are considered as representative noise sensitive receptors in this assessment (R1 to R4). The Draft Plan of Subdivision dated November 18, 2023 prepared by MHBC was used to determine representative receptors at the future residential subdivision to the west for assessment. Five locations have been chosen including four along the adjoining property boundary and one representing a medium residential block in the middle of the residential

development. R1 and R2 are existing 1-storey dwellings and R3 and R4 are existing 2-storey dwellings. R5 to R8 represents future 2-storey dwelling and R9 is assumed to be a future 3-storey dwelling. The receptor locations are shown on Figures 4 and 6.

Under the MECP guidelines, the acoustical environment at receptors R1 to R3 and R5 to R9 as Class 2 (semi-urban) and R4 which is located away from any roadway or built-up area, the acoustic environment is classified as Class 3 (rural).

The gravel pit is considered to be a stationary source of sound, and appropriate sound level limits are provided in MECP publication NPC-300 [2]. NPC-300 specifies that the sound level limit at any receptors in a Class 2 semi-urban or Class 3 rural acoustic environment due to the operation of a stationary source is the higher of background one hour energy equivalent sound level (LEQ-1Hr) or 50 dBA during daytime hours and 45 dBA during nighttime hours. The sound level limit at any receptors in a rural acoustic environment due to the operation of a stationary source is the higher of background one hour energy equivalent sound level (LEQ-1Hr) or 45dBA during daytime hours and 40 dBA during nighttime hours. The daytime limits also apply to Outdoor Living Areas (OLA) located within 30 m of the dwelling. 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 proposed facility will operate during daytime hours only and thus the exclusionary minimum daytime sound level limits of 50 dBA (Class 2) and 45 dBA (Class 3) are used in the following sections of this report as the criteria by which the impact of the proposed aggregate extraction and processing operations is assessed. The applicable sound level limits are also summarized in Table 1.

Table 1: Applicable Sound Level Limits at Residential Receptors, L_{EQ} [dBA]

Receptor	Description	Daytime at OLA	Daytime at Façade
R1	Existing 1-storey	50	50
R2	Existing 1-storey	50	50
R3	Existing 2-storey	50	50
R4	Existing 2-storey	45	45
R5 to R8	Future 2-storey residences to the west	50	50
R9	Future 3-storey residences to the west	50	50

These criteria apply to the ongoing daily operations of the facility. Activities used to prepare the site for excavation, such as the stripping of topsoil, locating the crushing and screening plants at their permanent locations at the final pit floor elevation, construction of berms, or activities related to the remediation of the site after the extraction is completed are considered to be construction activities which are regulated under municipal bylaws and NPC-115 [3].

Compliance with MECP criteria generally results in acceptable levels of sound at the sensitive receptors although there may be residual audibility during periods of low background sound.

4 ASSESSMENT METHODOLOGY

4.1 Description of Noise Sources and Operations

The following points detail the extraction and processing operations in the proposed pit based on a worst-case annual extraction of 1,000,000 tonnes.

1. Hours of operation are typically Monday to Friday between the hours of 7 am to 7 pm; and on Saturdays between the hours of 7 am to 12 pm. No activities will occur on Sundays or statutory holidays.

2. Two operating areas are proposed which are shown on Figure 3. Extraction will commence in Area 1 and proceed easterly into Area 2.

3. The entrance to the proposed gravel pit will be located near the southeast corner of the pit.

4. The aggregate excavation, processing and loading equipment will consist of one portable crushing and screening plant with an associated front-end loader, one portable screening plant with an associated front-end loader, as well as an additional front-end loader or excavator. The front-end loaders will be used to service the processing plants and to load trucks. Trucks or conveyors will be used to transport raw materials from the pit face to the processing plants.

5. All excavation will proceed on the floor of each lift (8 m bench) or final pit floor at the elevations shown on the Operational Plan.

6. The peak number of trucks expected to arrive and depart in a typical busy hour is 15 based on a review of the Traffic Impact Study.

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

4.2 Acoustical Modelling

Predictive modeling was used in order to estimate the worst-case sound levels from the proposed gravel pit in the surrounding neighbourhood. The prediction model (CadnaA) is based on established engineering methods from the MECP and ISO Standard 9613-2 [4] which takes into account for the reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers. Topography for the site and surrounding area was obtained from information as shown on Figure 1. Preliminary grading information for the residential development was obtained from the Conceptual Grading Plan prepared by Watler Fedy dated February 28, 2023 which also includes conceptual building locations. Existing berms located at the aggregate facility to the east were also included in the assessment. Additional details regarding the modelling methods are provided in Appendix A.

To consider a worst-case daytime operational scenario, the following assumptions were made:

- Extraction will occur at the closest possible location to each of the receptors;
- 15 haul trucks pick up aggregate materials during the busiest daytime hour (arrive and depart);
- Haul trucks will travel between extraction locations and the processing areas;
- Loader activities are associated with processing the material and loading trucks;
- Processing and Extraction equipment will be located on the floor of the first lift (8 m below grade) or pit floor elevation, whichever is higher in elevation.

5 ASSESSMENT RESULTS AND RECOMMENDATIONS

The predicted sound levels at the representative receptors (R1 to R9) during a worst-case busiest hour operating scenario, are summarized in Table 2 and shown on Figures 4 and 5. The higher of the predicted sound levels are shown which considered with or without the residential development. Cadna/A calculation summaries are provided in Appendix B.

Table 2: Predicted Sound Levels at Residential Receptors, Without Mitigation, L_{EQ} [dBA]

Receptor	Daytime Façade	Daytime OLA	Criteria	Criteria Met
R1	50	49	50	Y
R2	56	56	50	N
R3	52	49	50	N
R4	56	50	45	N
R5	68	57	50	N
R6	63	57	50	N
R7	63	57	50	N
R8	63	57	50	N
R9	49	44	50	N

The results of this analysis indicate that the predicted sound levels due to the aggregate are expected to exceed the applicable limits at the closest existing residences and future residences to the west and southwest during an assumed worst-case operational scenario. Noise control measures are provided in Section 5.1.

5.1 Recommendations

Feasible means exist to reduce sound levels at the nearest potential noise sensitive receptors to meet MECP criteria. 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. Two mitigation options are provided as the timing of occupancy at the residential development is unclear. One mitigation option is presented for pit operations occurring before occupancy of the residential development and the second option must be implemented before the residential dwellings are occupied.

1. Table 3 below presents the reference sound levels used for the acoustic modeling presented herein. These sound levels were based on site measurements of processing equipment to be used in this pit, and also additional information taken from our files for other similar facilities.

Table 3: Reference Sound Power Levels of Processing Equipment

Equipment	Reference Average 'A Weighted' Sound Power Level
Crushing & Screening Plant and associated loader (combined)	119 dBA (76 dBA, SPL at 50 m)
Screening Plant and associated loader (combined)	113 dBA (72 dBA, SPL at 50 m)
Loader or Excavator	107 dBA (65 dBA, SPL at 50 m)

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.

2. Activities used to prepare the site for excavation, such as the stripping of topsoil, construction of berms, locating the processing plants at their initial locations on the pit floor elevation, 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".

Scenario 1: Before the Residential Development is Occupied

If the pit begins operations before the residential development is occupied the following recommendations apply.

3. Prior to extraction activities in Area 1, a 3.0 m high noise barrier above existing grade shall be constructed along the western portion of the southern boundary.

4. The processing (crushing and screening) plant shall be located at the final pit floor elevation.

5. The processing (crushing and screening) plant shall not operate within 250 m of R2 and within 400 m of R4. A minimum 8 m high acoustical barrier shall be constructed beside this processing plant in the direction of R2 to R4.

6. The single screening plant shall not operate within 250 m of R4. A minimum 7 m high acoustical barrier shall be constructed beside the screening plant in the direction of R2 to R4.

Scenario 2: When the Residential Development is Occupied

Prior to occupancy of the dwelling units in the eastern portion of the residential development the following recommendations must be implemented.

7. Prior to extraction activities in Area 1, a 5.0 m high noise barrier above existing grade shall be constructed along the western boundary of Area 1 and a 3.0 m high noise barrier above existing grade shall be constructed along the western portion of the southern boundary.

8. The processing (crushing and screening) plant shall be located at the final pit floor elevation.

9. The processing (crushing and screening) plant shall not operate within 300 m of R2 to R8 and 400 m of R4. A minimum 8 m high noise barrier shall be constructed beside this processing plant in the direction of R2 to R8.

10. The single screening plant shall not operate within 200 m of R5 to R8 and within 250 m of R4. A minimum 8 m high acoustical barrier shall be constructed beside this screening plant in the direction of R2 to R8.

The boundary noise barriers recommended above can consist of an earth berm, a noise wall or a combination of a noise wall on top of an earth berm. The noise barriers recommended for placement near the processing plant (crushing and screening) and the single screening plant may consist of aggregate stockpiles which are continuously maintained to always provide shielding in the direction of the subject receptors. The noise wall component of the boundary noise barriers can be constructed from a variety of materials such as wood, metal, brick, pre-cast concrete or other concrete/wood composite systems provided that it is free of gaps or cracks and has a solid construction, with a surface density of no less than 20 kg/m2. Barrier height requirements should also be reviewed when additional details are available for the residential development.

6 CONCLUSIONS

In summary, HGC 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 worst-case operational scenarios. Using the modeling assumptions detailed in Section 4, along with incorporation of the noise control recommendations detailed in Section 5 and shown on Figures 6 and 7, sound levels were predicted at each of the selected receptors as summarized in Table 4 and shown on Figure 5. Sample calculations including results for Area 2 operations are provided in Appendix B.

The results of the analysis indicate with the recommended mitigation measures in place, the sound levels produced by the operation of the pit will not exceed the applicable sound level limits of the MECP. We conclude that the operation of the proposed gravel pit is feasible regarding noise emissions.

The acoustic recommendations may be subject to modification if the site plan or operational plans for the pit are changed significantly, if the site plan for the residential development to the west is changed significantly from the draft plan considered herein, if pit operating scenarios are significantly different to those assumed in the assessment, or there is a significant increase in background sound levels at the noise sensitive receptors.

Table 4: Predicted Sound Levels at Residential Receptors With Mitigation L_{EQ} [dBA]

Receptor	Daytime Façade	Daytime OLA	Criteria	Criteria Met
R1	45	44	50	Y
R2	48	48	50	Y
R3	44	42	50	Y
R4	45	43	45	Y
R5	49	48	50	Y
R6	49	48	50	Y
R7	49	48	50	Y
R8	49	48	50	Y
R9	42	40	50	Y

7 REFERENCES

1. Ontario Ministry of the Natural Resources, Aggregate Resources of Ontario – Provincial Standards, 1997.

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

3. Ontario Ministry of the Environment, Conservation and Parks 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.

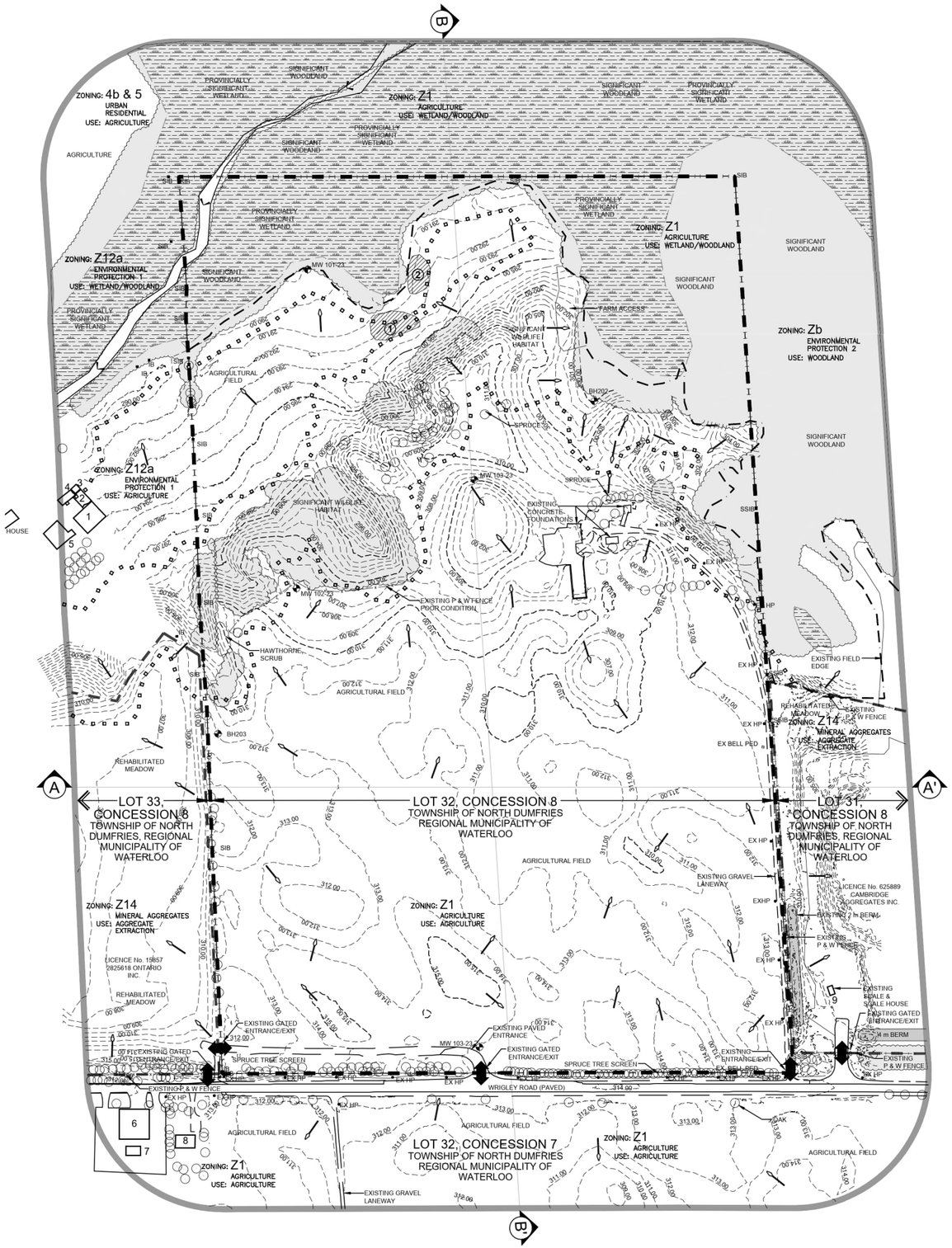
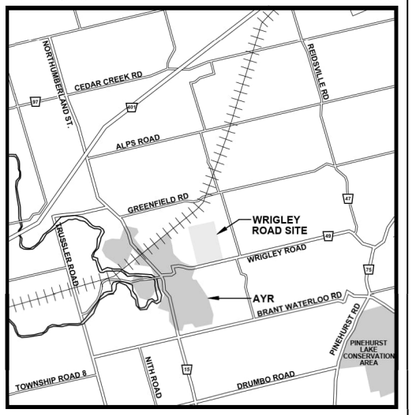


Figure 1: Existing Features Plan

KEY MAP

nts



LEGEND

- BOUNDARY OF PROPOSED LICENCE
- BOUNDARY OF EXISTING LICENCED AREA
- 120m INFORMATION BOUNDARY
- PROPERTY LINES
- GRCA REGULATED AREA LINE
- PROVINCIALLY SIGNIFICANT WETLAND BOUNDARY PER MNR MAPPING
- SIGNIFICANT WOODLAND BOUNDARY MAPPED BY MTE
- EXISTING FENCE
- EXISTING 5m ASL CONTOUR LINE
- EXISTING 1m ASL CONTOUR LINE
- EXISTING SPOT ELEVATION m ASL
- EXISTING VEGETATION
- EXISTING WETLAND
- LOCATION OF SECTION
- ARCHAEOLOGICAL SITE
- EXISTING BUILDING AND NUMBER
- EXISTING HYDRO POLE
- DIRECTION OF SURFACE WATER DRAINAGE
- BOREHOLE LOCATION AND NUMBER DRILLED AND MONITORING WELL INSTALLED APRIL 26, 2023 BY LDS.
- BOREHOLE LOCATION AND NUMBER DRILLED AND MONITORING WELL INSTALLED JUNE 2025 BY STONECAIRN CONSULTING
- EXISTING ENTRANCE/EXIT
- EXISTING GATED ENTRANCE/EXIT

BUILDING LIST

No.	
1.	BARN
2.	BARN
3.	BARN
4.	BARN
5.	BARN
6.	FIREHALL
7.	SHED
8.	ONE STOREY HOUSE
9.	SCALE HOUSE

COORDINATES

LOCATION	NORTHING	EASTING
SE	4793053.09	546057.38
SW	4792936.12	545564.88
NW	4793701.10	545344.72
NE	4793814.63	545824.29
ENTRANCE	4793053.00	546056.06

EXISTING FEATURES NOTES

GENERAL SITE PLAN INFORMATION

1. THIS SITE PLAN CONSIST OF 5 DRAWINGS AND MUST BE READ COLLECTIVELY.
2. ALL MEASUREMENTS SHOWN ON THIS SITE PLAN ARE IN METRES.
3. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES UNDER THE AGGREGATE RESOURCES ACT FOR A CLASS 'A' LICENCE, PIT ABOVE THE WATER TABLE.

LICENCE INFORMATION

4. APPLICANT
   J-AAR MATERIALS
   3003 PAGE STREET LONDON,
   ONTARIO N5V 4J1

5. TOTAL AREA TO BE LICENCED: 39.6 ha
   TOTAL AREA TO BE EXTRACTED: 29.9 ha
   TOTAL AREA TO REHABILITATED: 29.9 ha

BASE INFORMATION

6. TOPOGRAPHIC INFORMATION WAS OBTAINED FROM FROM TOPOGRAPHIC SURVEY PROVIDED VERICON GEOMATICS LTD., DATED APRIL 29, 2024

   THE SITE WAS FIELD CHECKED BY HARRINGTON MCAVAN LTD., OCTOBER 11, 2024

   REGULATED AREA BOUNDARY OBTAINED FROM GRCA NOVEMBER 2024.

   SIGNIFICANT FEATURE BOUNDARIES OBTAINED FROM NATURAL ENVIRONMENT REPORT BY MTE, DATED APRIL 2025.

7. ZONING INFORMATION OBTAINED FROM TOWNSHIP OF NORTH DUMFRIES ZONING BY-LAW 2019. PROPERTY IS CURRENTLY ZONED 1(AGRICULTURE). A ZBA WILL BE APPLIED FOR TO CHANGE A TO Z14 (MINERAL AGGREGATES).

HYDROGEOLOGICAL INFORMATION

8. HYDROGEOLOGICAL INFORMATION INCLUDING GROUNDWATER ELEVATION WAS OBTAINED FROM REPORT BY STONECAIRN CONSULTING DATED JULY 2025.
9. THE WATER TABLE ELEVATION VARIES ACROSS THE PROPERTY BETWEEN 288.29 - 295.00 m ABOVE SEA LEVEL (A.S.L.).
10. THE SITE IS LOCATED WITHIN THE GRAND RIVER SOURCE WATER PROTECTION AREA. IT IS LOCATED WITHIN A SIGNIFICANT GROUNDWATER RECHARGE AREA WITH A NO RATING/SCORE AND IS PARTIALLY WITHIN A WELLHEAD PROTECTION AREA. IT IS LOCATED WITHIN A HIGHLY VULNERABLE AQUIFIER ZONE. SOURCE WATER PROTECTION POLICIES DO NO NOT APPLY TO THIS SITE (REFER TO HYDROGEOLOGICAL REPORT).

TECHNICAL REPORTS

11. HYDROGEOLOGICAL INFORMATION WAS OBTAINED FROM REPORT BY STONECAIRN CONSULTING DATED JULY 2025 (REFER TO SHEET 3 OF 5 FOR TECHNICAL RECOMMENDATIONS).
12. NATURAL ENVIRONMENT INFORMATION WAS OBTAINED FROM REPORT BY MTE DATED JULY 2025 (REFER TO SHEET 3 OF 5 FOR TECHNICAL RECOMMENDATIONS).
13. ARCHAEOLOGICAL INFORMATION WAS OBTAINED FROM REPORT BY LINCOLN ENVIRONMENTAL CONSULTING DATED NOVEMBER 2023.
14. ACOUSTIC INFORMATION WAS OBTAINED FROM REPORT BY HGC DATED JULY 2025 (REFER TO SHEET 3 OF 5 FOR TECHNICAL RECOMMENDATIONS).

NO.	DATE	REVISIONS	OWNER	HM	MMR

Pre Licence Review

NO.	DATE	REVISIONS	OWNER	HM	MMR

Site Plan Amendments

Harrington McAvan Ltd
41 Main Street, Unit 102
Unionville, Ontario L3R 2E5
Tel: 905-294-8282 Fax: 905-294-7623
www.harringtonmcavan.com

Project Name

JEDBURGH PLAINS

LICENSEE SIGNATURE:_____

LICENCE No.

PART LOT 32, CONCESSION 8

TOWNSHIP OF NORTH DUMFRIES (FORMER TOWNSHIP OF DUMFRIES)

REGIONAL MUNICIPALITY OF WATERLOO

Scale 1:2000 (0 10 50 80m)	North	Stamp: DRAFT
Drawing Status: SUBMITTED FOR LICENCE APPROVAL		
Drawn SB	Checked RM	Issue Date AUG 2025
Drawing Title: EXISTING FEATURES PLAN		Project Number 23-20
		Drawing Number 1 OF 5

FILE NAME: 23-20 COMP 2025-1.DWG
PLOT DATE: AUGUST 5, 2025

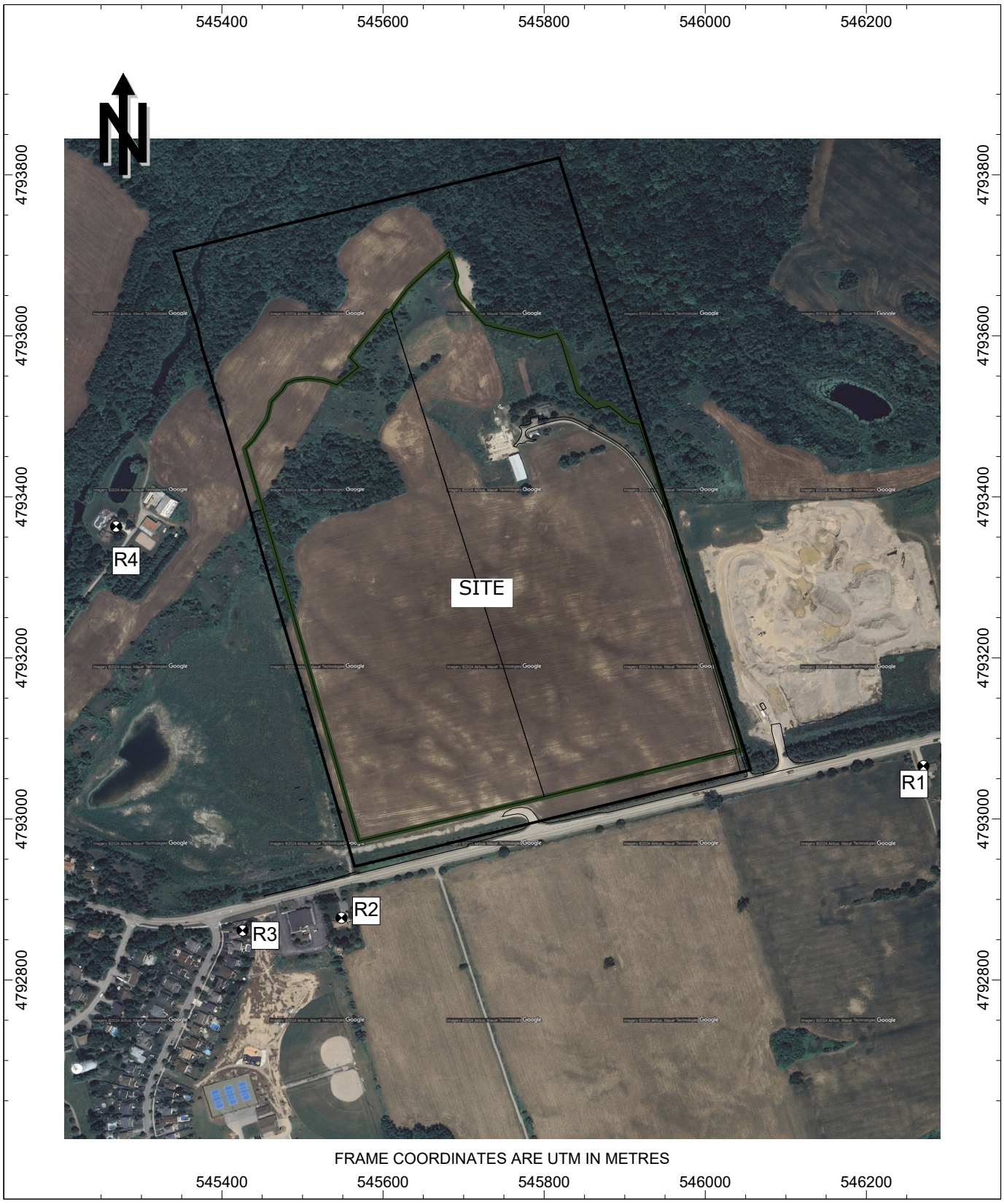


Figure 2: Aerial Plan

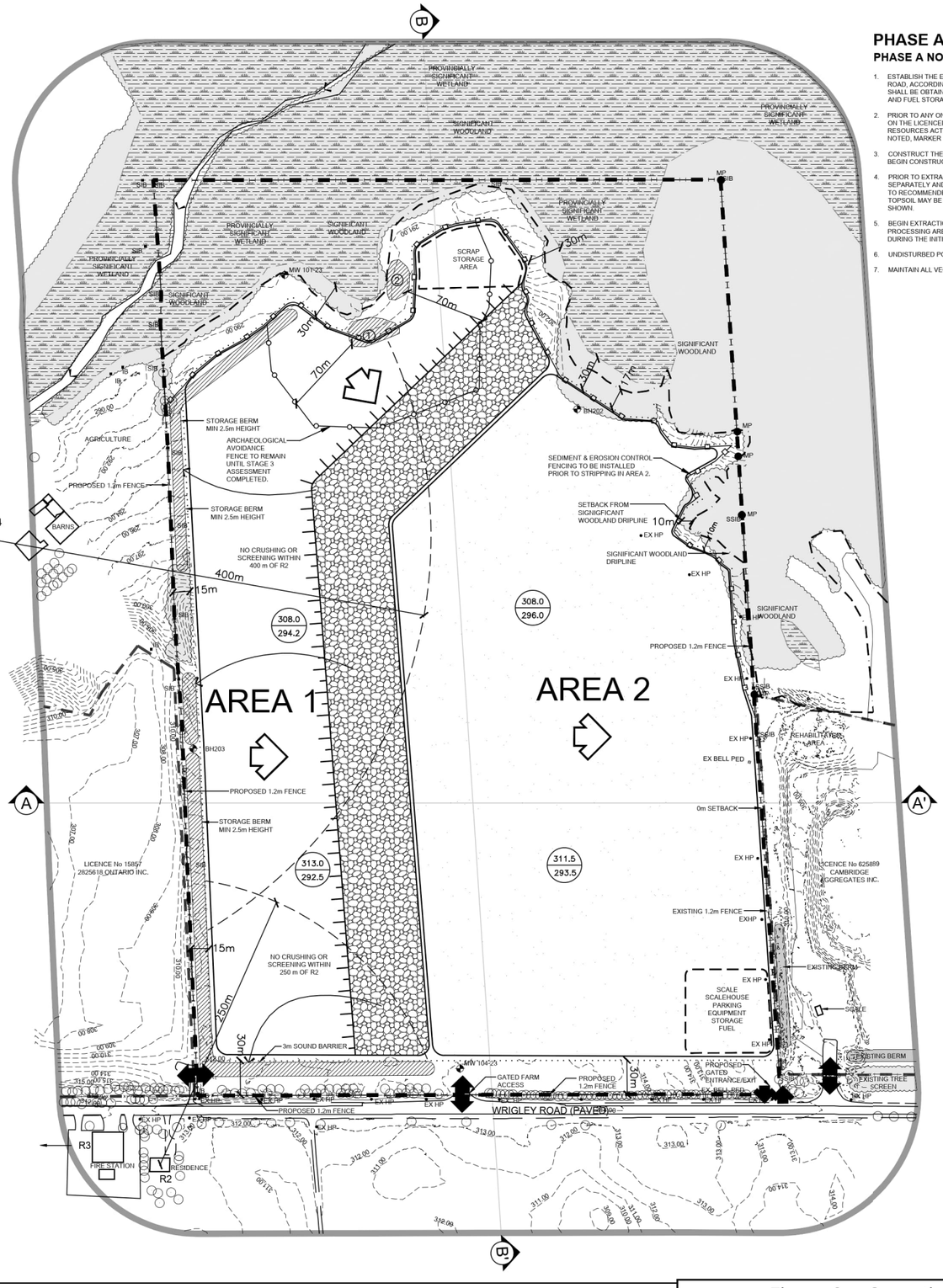


Figure 3a: Operational Plans

PHASE A

PHASE A NOTES

1. ESTABLISH THE ENTRANCE EXIT AND HAUL ROAD INTO THE SITE OFF WRIGLEY ROAD, ACCORDING TO THE APPROPRIATE MUNICIPAL STANDARDS. A PERMIT SHALL BE OBTAINED. CONSTRUCT THE PROPOSED OFFICE/STORAGE BUILDING AND FUEL STORAGE IN THE AREA SHOWN.
2. PRIOR TO ANY ON SITE OPERATIONS, CONSTRUCT OR UPGRADE THE FENCING ON THE LICENCED BOUNDARIES TO THE STANDARDS OF THE AGGREGATE RESOURCES ACT (1.2m HIGH WIRE FENCE). WHERE SITE PLAN VARIANCES ARE NOTED, MARKER POSTS SHALL BE INSTALLED.
3. CONSTRUCT THE HAUL ROAD THROUGH AREA 1 AND USE STRIPPED SOIL TO BEGIN CONSTRUCTION OF ACOUSTIC BERM.
4. PRIOR TO EXTRACTION IN AREA 1, STRIP TOPSOIL AND OVERBURDEN SEPARATELY AND USE THE MATERIALS TO COMPLETE THE ACOUSTICAL BERM TO RECOMMENDED SPECIFICATIONS FOR PHASE A. EXCESS OVERBURDEN AND TOPSOIL MAY BE STORED IN STOCKPILES ON PIT FLOOR OR STORAGE BERM AS SHOWN.
5. BEGIN EXTRACTION OF AREA 1 IN DIRECTION SHOWN. STOCKPILING AND PROCESSING AREA MAY BE TEMPORARILY LOCATED NEAR THE PIT FACE DURING THE INITIAL EXCAVATION OF AGGREGATE.
6. UNDISTURBED PORTIONS OF AREA 2 REMAIN IN AGRICULTURAL USE.
7. MAINTAIN ALL VEGETATION IN A HEALTHY, VIGOROUS GROWING CONDITION

OPERATIONS NOTES

GENERAL INFORMATION

1. THIS PLAN DEPICTS A SCHEMATIC OPERATIONS AND REHABILITATION SEQUENCE FOR THIS PROPERTY BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION. PHASES SHOWN ARE SCHEMATIC AND WILL BE OPERATED ACCORDING TO MATERIAL QUALITY, SITE HYDROLOGY AND HYDROGEOLOGY OR MARKET DEMAND. PHASES DO NOT REPRESENT ANY SPECIFIC OR EQUAL TIME PERIOD.

   EXTRACTION SHALL FOLLOW THE SEQUENCE SHOWN. WHEN PARTIAL REHABILITATION OF A PHASE IS POSSIBLE IT SHALL BE CARRIED OUT.

2. SITE PLAN VARIANCES ARE LISTED IN THE SITE PLAN OVERRIDE TABLE SHOWN ON THIS PAGE.

EXTRACTION/PROCESSING/HAULING INFORMATION

3. TOTAL AREA TO BE EXTRACTED IS 29.9 HECTARES.

4. a) MAXIMUM NUMBER OF TONNES OF AGGREGATE TO BE REMOVED FROM THE SITE IN ANY CALENDAR YEAR IS 1,000,000 TONNES.

   b) EXTRACTION OF SAND AND GRAVEL ABOVE WATER TABLE WILL TAKE PLACE IN THREE BENCHES, WITH A MAXIMUM HEIGHT OF 7 METRES AND WILL COMPLY WITH OHSA REGULATIONS REGARDING FACE HEIGHTS. THE MAXIMUM GROUNDWATER TABLE VARIES ACROSS THE SITE FROM 288.29 - 295.00 ASL. FRONT END LOADERS WILL BE USED TO EXTRACT MATERIAL AND HAUL TRUCKS OR CONVEYORS WILL CARRY MATERIAL TO THE PLANT FOR FURTHER PROCESSING. REFER TO SECTIONS A-A' AND B-B' ON DRAWING 4 OF 5 FOR FURTHER DETAILS.

   c) PORTABLE PROCESSING EQUIPMENT, FOR CRUSHING AND SCREENING WILL BE USED ON SITE AND WILL BE LOCATED ON THE PIT FLOOR CLOSE TO THE FACE. IN ADDITION TO PROCESSING, SITE ACTIVITIES WILL INCLUDE STRIPPING AND REHABILITATION. OPERATIONAL EQUIPMENT MAY INCLUDE TRUCKS, LOADERS, EXCAVATOR, BACKHOES, BULLDOZERS, CONVEYORS, AND OTHER RELATED EQUIPMENT. PROCESSING EQUIPMENT, STACKERS AND PRODUCT STOCKPILES WILL NOT EXCEED ±15 METRES IN HEIGHT AND WILL BE LOCATED IN THE AREAS SHOWN AND/OR CLOSE TO PIT FACES.

   d) HAUL ROADS SHALL BE DEVELOPED AS REQUIRED.

   e) MATERIAL FROM OTHER PROPERTIES MAY BE IMPORTED INTO THE SITE FOR BLENDING, CUSTOM PRODUCTS AND/OR RESALE. THIS MAY INCLUDE AGGREGATE AND/OR PEAT AND TOPSOIL.
   i) EXCESS SOIL SHALL ONLY BE IMPORTED FOR BLENDING, RESALE AND/OR TEMPORARY STORAGE ON-SITE IN ACCORDANCE WITH ONTARIO REGULATION 244/97 UNDER THE AGGREGATE RESOURCES ACT.
   ii) LIQUID SOIL, AS DEFINED IN ONTARIO REGULATION 406/19 UNDER THE ENVIRONMENTAL PROTECTION ACT, IS NOT AUTHORIZED FOR IMPORTATION TO THE SITE.
   iii) THERE SHALL BE NO FURTHER IMPORTATION OF EXCESS SOIL FOR BLENDING, RESALE, AND/OR TEMPORARY STORAGE ONCE EXCAVATION ON-SITE HAS BEEN COMPLETED.
   iv) THE TOTAL AMOUNT OF EXCESS SOIL BROUGHT ONTO THE SITE ANNUALLY AND THE TOTAL AMOUNT STORED ON-SITE AT ANY ONE TIME WILL NOT EXCEED 25,000 M3.

5. OFFICE/STORAGE BUILDING AND/OR SCALE/SCALEHOUSE MAY BE CONSTRUCTED WHERE SHOWN. TEMPORARY STORAGE BUILDINGS/TRAILERS MAY BE LOCATED ON SITE AS REQUIRED.

6. EQUIPMENT, SCRAP AND MACHINERY ASSOCIATED WITH THE EXTRACTION OPERATIONS WILL BE REMOVED UPON COMPLETION OF EXTRACTION.

HYDROGEOLOGICAL INFORMATION

7. THE WATER TABLE ELEVATION VARIES ACROSS THIS LICENCE FROM APPROXIMATELY 288.29 - 295.00 m ABOVE SEA LEVEL (A.S.L.). REFER TO SECTIONS ON SHEET 4 OF 5.

8. SURFACE DRAINAGE WILL BE DIRECTED TO LOW AREAS FOR WATER TO INFILTRATE INTO THE GRANULAR MATERIALS ON THE PIT FLOOR. THERE WILL BE NO OFF-SITE DITCHING/ DISCHARGE.

NOISE MITIGATION INFORMATION

9. HOURS OF OPERATION:

SITE PREPARATION AND REHABILITATION:	07:00-19:00 WEEKDAYS; 07:00 - NOON SATURDAYS
EXCAVATION AND PROCESSING	07:00-19:00 WEEKDAYS; 07:00 - NOON SATURDAYS
SHIPPING:	07:00-19:00 WEEKDAYS; 07:00 - NOON SATURDAYS

AIR QUALITY INFORMATION

10. WATER OR CALCIUM CHLORIDE WILL BE APPLIED TO INTERNAL HAUL ROADS AND PROCESSING AREAS AS OFTEN AS REQUIRED TO MITIGATE DUST.

SITE MANAGEMENT INFORMATION

MAINTENANCE/ PROTECTION OF VEGETATION INFORMATION

11. EXISTING VEGETATION WITHIN THE LICENCED AREA SHALL BE MAINTAINED IN A HEALTHY VIGOROUS GROWING CONDITION UNTIL SEQUENTIAL STRIPPING BEGINS OR UNTIL THE REHABILITATION IS COMPLETE. ANY VEGETATION PLANTED AS PART OF SITE IMPROVEMENTS OR PROGRESSIVE AND FINAL REHABILITATION WILL ALSO BE MAINTAINED IN A HEALTHY, VIGOROUS GROWING CONDITION.

FENCING INFORMATION

12. BOUNDARIES OF THE AREA TO BE LICENCED THAT ARE PRESENTLY FENCED ARE SHOWN ON DRAWING 1 OF 5, EXISTING FEATURES. UNFENCED BOUNDARIES SHALL BE DEMARCATED WITH HIGHLY VISIBLE MARKER POSTS AT INTERVISIBLE INTERVALS. ALL FENCING/MARKER POSTS SHALL BE MAINTAINED.

TOPSOIL/SUBSOIL/OVERBURDEN STORAGE INFORMATION

13. TOPSOIL AND OVERBURDEN SHALL BE STRIPPED AND STORED SEPARATELY IN BERMS WHERE SHOWN AND IN STOCKPILES ON THE PIT FLOOR.

BERM INFORMATION

14. BERMS SHALL BE A MINIMUM OF ±2.5 METRES ABOVE THE EXISTING GRADE, OR AS SPECIFIED IN THE NOISE ASSESSMENT REPORT DATED MARCH 2025 AND SHOWN ON OPS PLAN. BERMS SHALL NOT EXCEED 2:1. REFER TO TYPICAL BERM CROSS SECTION ON DRAWING 4 OF 5 DETAILS AND SECTIONS. ALL BERMS SHALL BE SEEDED (USING GRASS/ LEGUME MIXTURE, SEE REHABILITATION PLAN, NOTE #7) IMMEDIATELY UPON COMPLETION TO MINIMIZE NOISE, DUST AND EROSION.

15. ON COMPLETION OF THE BERMS, EXCESS ON-SITE OVERBURDEN WILL BE USED TO PROGRESSIVELY BACKFILL AND REHABILITATE THE SITE. TOPSOIL CAN BE TEMPORARILY STOCKPILED ON THE PIT FLOOR.

SCRAP STORAGE INFORMATION

16. ALL SCRAP, USED MACHINERY AND STUMPS GENERATED THROUGH THE OPERATIONS WITHIN THIS LICENCE WILL BE STORED IN THE SCRAP AREA AS SHOWN, A MINIMUM OF 30m FROM THE BOUNDARY OF THE SITE AND NOT WITHIN 30m OF ANY BODY OF WATER. SCRAP SHALL BE DISPOSED OF ON AN ONGOING BASIS. UPON COMPLETION OF EXTRACTION, ALL SCRAP EQUIPMENT AND USED MACHINERY SHALL BE REMOVED.

TREE/STUMP REMOVAL

17. STUMPS/ WOODY MATERIAL MAY BE CHIPPED AND USED FOR SOIL ENHANCEMENT DURING PROGRESSIVE REHABILITATION. TREES WILL BE HARVESTED AND SOLD AS LUMBER OR UTILIZED FOR FIREWOOD AND/ OR THEIR BEST USE.

PETROLEUM STORAGE INFORMATION

18. FUEL, OIL, RADIATOR AND HYDRAULIC FLUID, AND OTHER CHEMICALS NEEDED FOR THE MAINTENANCE AND FUNCTIONING OF ON-SITE AGGREGATE PROCESSING EQUIPMENT SHALL BE APPROPRIATELY STORED IN ABOVE-GROUND CONTAINERS AND SHALL MEET THE REQUIREMENTS OF THE GASOLINE HANDLING ACT, AS AMENDED, AND THE GASOLINE HANDLING CODE AND REGULATIONS, AS AMENDED BY THE TECHNICAL STANDARDS AND SAFETY ACT (TSSA) AND LIQUID FUELS HANDLING CODE, AND IN ACCORDANCE WITH THE MINISTRY OF THE ENVIRONMENT, CONSERVATION, AND PARK'S CHEMICAL STORAGE GUIDELINES. ALL REFUELING SHALL BE WITHIN A CONTAINMENT PAD. ALL SPILLS TO THE ENVIRONMENT MUST BE REPORTED TO THE SPILLS ACTION CENTRE OF MECP. ANY SPILL SHALL BE REMOVED AND DISPOSED OF AT AN APPROPRIATE MECP APPROVED FACILITY

SPILLS PLAN

19. IN CASE OF AN ACCIDENTAL SPILL OF PETROLEUM PRODUCTS, THE FOLLOWING CONTINGENCY PLAN WILL BE ACTIVATED:
   e) THE MINISTRY OF ENVIRONMENT & CLIMATE CHANGE (SEE ADDRESS & PHONE NUMBER BELOW) AND SURROUNDING LANDOWNERS WILL BE NOTIFIED.
   f) FOR A LEAKAGE OR SPILL IMMEDIATE ACTION WILL BE TAKEN TO STOP IT. AT THE SAME TIME MEASURES WILL BE TAKEN TO PREVENT SPREADING. THESE MEASURES MAY INCLUDE BUILDING OF A BERM OR CONSTRUCTION OF A DITCH, FOR INSTANCE.
   g) THE PIT OPERATOR SHALL COMMENCE RECOVERY PROCEDURES BY THE SPILLED SUBSTANCE INTO CONTAINERS.
   h) THE SOIL IN THE AREA AFFECTED BY THE SPILL OR LEAK SHALL BE REMOVED AND DISPOSED OF AT A LOCATION PRESCRIBED BY THE MINISTRY OF THE ENVIRONMENT & CLIMATE CHANGE.

ARCHAEOLOGICAL SITES

20. ARCHAEOLOGICAL SITES 1 AND 2 (PER ARCHAEOLOGICAL REPORT) SHALL BE PROTECTED BY A 70m BUFFER. 1.2m FENCING SHALL BE INSTALLED ALONG THE BUFFER UNDER THE SUPERVISION OF A QUALIFIED PERSON AND SHALL REMAIN AND BE MAINTAINED UNTIL A STAGE 3 ARCHAEOLOGICAL ASSESSMENT HAS BEEN COMPLETED.

SITE PLAN VARIANCES

THE FOLLOWING CONDITIONS ILLUSTRATED ON THESE PLANS VARY FROM THE OF THE PROVINCIAL STANDARDS MADE UNDER THE AGGREGATE RESOURCES ACT

ITEM		SECTION
1.	THE COMMON EAST BOUNDARY SETBACK IS REDUCED TO 0m PER AGREEMENT WITH ADJACENT LICENSEE.	0.13(1)10i
2.	STOCKPILING AND PROCESSING EQUIPMENT MAY BE LOCATED WITHIN 30m OF THE COMMON EAST BOUNDARY PER AGREEMENT WITH ADJACENT LICENSEE.	0.13(1)13i
3.	FENCING SHALL NOT BE INSTALLED ALONG THE NORTH WOODED PART OF THE EAST BOUNDARY, THE NORTH BOUNDARY, AND THE NORTH WOODED PART OF THE EAST BOUNDARY DUE TO EXISTING WETLAND/WOODLANDS THAT PREVENT ACCESS.	0.13(3)a

LEGEND

- BOUNDARY OF PROPOSED LICENCE
- BOUNDARY OF EXISTING LICENCED AREA
- 120m INFORMATION BOUNDARY
- PROPERTY LINE
- PROVINCIALLY SIGNIFICANT WETLAND BOUNDARY PER MNR MAPPING
- EXTRACTION SETBACK
- EXISTING FENCE
- 285 EXISTING 5m ASL CONTOUR LINE
- 284 EXISTING 1m ASL CONTOUR LINE
- EXISTING VEGETATION
- EXISTING WETLAND
- A LOCATION OF SECTION
- EXTRACTION FACE
- BERM (MIN. HEIGHT AS SHOWN)
- UNDISTURBED AREA
- AREA STRIPPED OF TOPSOIL AND OVERBURDEN
- 1 ARCHAEOLOGICAL SITE
- EROSION CONTROL FENCE
- ARCHAEOLOGICAL AVOIDANCE FENCE
- EXISTING BUILDING
- HP EXISTING HYDRO POLE
- MW101 BOREHOLE LOCATION AND NUMBER DRILLED AND MONITORING WELL INSTALLED APRIL 26, 2023 BY LDS.
- BH203 BOREHOLE LOCATION AND NUMBER DRILLED AND MONITORING WELL INSTALLED JUNE 2025 BY STONECAIRN CONSULTING.
- GATED FARM ACCESS
- EXISTING GATED ENTRANCE/EXIT
- DIRECTION OF EXTRACTION
- DIRECTION OF TOPSOIL AND OVERBURDEN MOVEMENT
- R3 LOCATION OF NOISE RECEPTOR
- MP PROPOSED MARKER POST

NO.	DATE	REVISIONS	OWNER	HM	MNR

Pre Licence Review

NO.	DATE	REVISIONS	OWNER	HM	MNR

Site Plan Amendments

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41 Main Street, Unit 102
Unionville, Ontario L3R 2E5
Tel: 905-294-8282 Fax: 905-294-7623
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Project Name

J-AAR

JEDBURGH PLAINS

LICENSEE SIGNATURE: _____

LICENCE No.

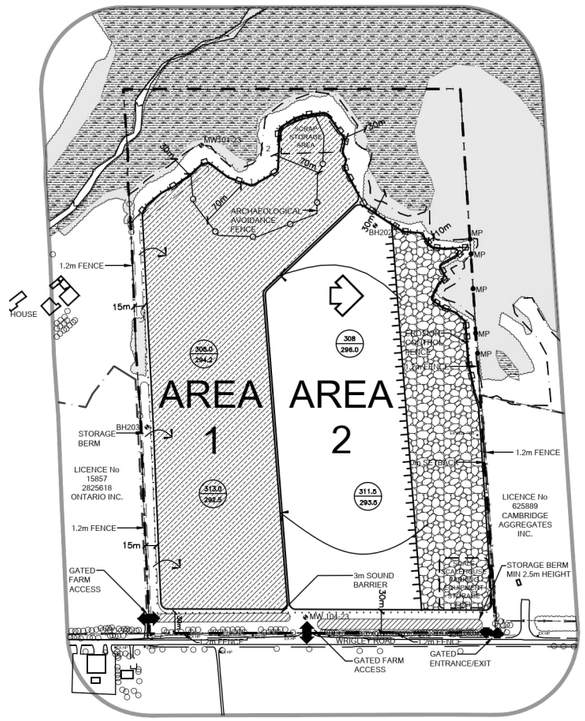
PART LOT 32, CONCESSION 8

TOWNSHIP OF NORTH DUMFRIES (FORMER TOWNSHIP OF DUMFRIES)

REGIONAL MUNICIPALITY OF WATERLOO

Scale 1:2000 (0 10 50 80m)	North	Stamp: DRAFT
Drawing Status: SUBMITTED FOR LICENCE APPROVAL		
Drawn SB	Checked RM/BJ	Issue Date AUG 2025
Drawing Title: OPERATIONAL PLAN PHASE A		Project Number 23-20
		Drawing Number 2 OF 5

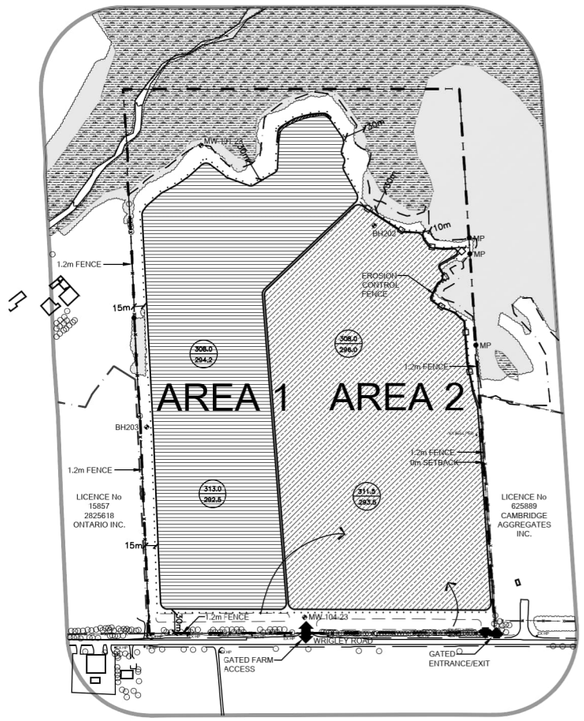
FILE NAME: 23-20/COMP/2023-2.DWG
PLOT DATE: AUGUST 5, 2025



PHASE B

PHASE B NOTES

1. BEGIN PROGRESSIVE REHABILITATION OF AREA 1 AS RESERVES ARE DEPLETED USING STRIPPED MATERIAL AND MATERIAL IN STORAGE BERM.
2. COMPLETE EXTRACTION OF AREA 1 AND CONTINUE PROGRESSIVE REHABILITATION OF AREA 1 USING IMPORTED EXCESS SOIL AND MATERIAL STOCKPILED ON PIT FLOOR.
3. BEGIN STRIPPING TOPSOIL AND OVERBURDEN SEPARATELY IN AREA 2 AND USE TO COMPLETE REHABILITATION OF AREA 1.
3. BEGIN EXTRACTION IN AREA 2 IN DIRECTION SHOWN.
4. MAINTAIN ALL VEGETATION IN A HEALTHY, VIGOROUS GROWING CONDITION



PHASE C

PHASE C NOTES

1. BEGIN PROGRESSIVE REHABILITATION OF AREA 2 AS RESERVES ARE DEPLETED USING MATERIAL FROM STORAGE BERM AND IMPORTED EXCESS SOIL.
2. COMPLETE EXTRACTION IN AREA 2 AND CONTINUE REHABILITATION OF AREA 2 USING MATERIAL STORED IN BERMS AND IMPORTED EXCESS SOIL.
3. MAINTAIN ALL VEGETATION IN A HEALTHY, VIGOROUS GROWING CONDITION

PHASE D (NOT SHOWN)

PHASE D NOTES

1. REMOVE ALL SCRAP FROM SITE.
2. COMPLETE REHABILITATION OF ALL AREAS USING MATERIAL STORED IN BERMS AND IMPORTED EXCESS SOIL.
3. RETURN TO AGRICULTURE.

LEGEND

- BOUNDARY OF PROPOSED LICENCE
- BOUNDARY OF EXISTING LICENCED AREA
- 120m INFORMATION BOUNDARY
- PROPERTY LINE
- PROVINCIALLY SIGNIFICANT WETLAND BOUNDARY PER MNR MAPPING
- EXTRACTION SETBACK
- SIGNIFICANT WOODLAND BOUNDARY MAPPED BY MTE
- EXISTING FENCE
- EXISTING VEGETATION
- EXISTING WETLAND
- EXTRACTION FACE
- BERM (MIN. HEIGHT AS SHOWN)
- UNDISTURBED AREA
- AREA STRIPPED OF TOPSOIL AND OVERBURDEN
- PROGRESSIVE REHABILITATION
- FINAL REHABILITATION
- EROSION CONTROL FENCE
- EXISTING BUILDING
- HP EXISTING HYDRO POLE
- MW101 BOREHOLE LOCATION AND NUMBER DRILLED AND MONITORING WELL INSTALLED APRIL 26, 2023 BY LDS.
- MW202 BOREHOLE LOCATION AND NUMBER DRILLED AND MONITORING WELL INSTALLED JUNE 2025 BY STONECAIRN CONSULTING
- GATED FARM ACCESS
- EXISTING GATED ENTRANCE/EXIT
- DIRECTION OF EXTRACTION
- DIRECTION OF TOPSOIL AND OVERBURDEN MOVEMENT
- MP PROPOSED MARKER POST

TECHNICAL RECOMMENDATIONS

THE FOLLOWING ARE THE TECHNICAL RECOMMENDATIONS FROM ALL OF THE EXPERTS' REPORTS AS OF APRIL 2025. ADDITIONAL RECOMMENDATIONS MAY BE INCLUDED AS A RESULT OF THE LICENCE REVIEW PROCESS.

AIR QUALITY ASSESSMENT - RWDI - MARCH 2025

1. THE LICENSEE OR PERMITTEE SHALL APPLY WATER OR ANOTHER PROVINCIALLY APPROVED DUST SUPPRESSANT TO INTERNAL HAUL ROADS AND PROCESSING AREAS, AS NECESSARY TO MITIGATE DUST, IF THE PIT OR QUARRY IS LOCATED WITHIN 1,000 METRES OF A SENSITIVE RECEPTOR.
2. THE LICENSEE OR PERMITTEE SHALL EQUIP ANY PROCESSING EQUIPMENT THAT CREATES DUST WITH DUST SUPPRESSING OR COLLECTION DEVICES IF IT IS LOCATED WITHIN 300 METRES OF A SENSITIVE RECEPTOR.
3. THE LICENSEE OR PERMITTEE SHALL OBTAIN ENVIRONMENTAL COMPLIANCE APPROVAL UNDER THE ENVIRONMENTAL PROTECTION ACT WHERE REQUIRED TO CARRY OUT OPERATIONS AT THE PIT OR QUARRY.
4. THE SITE WILL OPERATE IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICES PLAN FOR FUGITIVE DUST, DATED <<MONTH>>, 2025, WHICH MAY BE AMENDED FROM TIME TO TIME, CONSIDERING ACTUAL IMPACTS AND OPERATIONAL CONSIDERATIONS. THE RECOMMENDATIONS IN THE BEST MANAGEMENT PRACTICES PLAN ARE BASED ON THE MAXIMUM DAILY PRODUCTION RATES. AT LOWER PRODUCTION RATES, THE CONTROL MEASURES SPECIFIED IN THE BEST MANAGEMENT PRACTICES PLAN CAN BE REDUCED ACCORDINGLY, PROVIDED DUST REMAINS MITIGATED ON SITE.

HYDROGEOLOGICAL ASSESSMENT - STONECAIRN - JULY 2025

1. FUEL STORAGE, EQUIPMENT FILLING, AND EQUIPMENT MAINTENANCE SHALL BE CARRIED OUT IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES OUTLINED IN SECTION 7.1, INCLUDING DESIGNATED FUELING LOCATIONS AND IMPLEMENTATION OF SPILLS MANAGEMENT RESPONSE PLANS, AS APPROPRIATE TO REDUCE THE POTENTIAL AND MITIGATE RISKS ASSOCIATED WITH THE EQUIPMENT OPERATION.
2. GROUNDWATER LEVEL MONITORING SHALL CONTINUE AT THE SITE ON A QUARTERLY BASIS AFTER THE PIT IS LICENSED, AND CONTINUE UNTIL SITE RESTORATION IS COMPLETE.

a) GROUNDWATER MONITORING SHALL INCLUDE STABILIZED GROUNDWATER LEVEL MEASUREMENTS, AND GROUNDWATER TEMPERATURE PROFILES AT EACH MONITORING LOCATION.

b) A STAFF GAUGE SHALL BE INSTALLED AT THE POND TO PROVIDE A MONITORING POND FOR SURFACE WATER ELEVATIONS WITHIN THE POND AREA.

c) DATA SHALL BE COMPILED INTO AN ANNUAL REPORT, PREPARED BY A QUALIFIED ENGINEER OR HYDROGEOLOGIST, AND CIRCULATED TO THE MINISTRY OF NATURAL RESOURCES, AND ANY OTHER APPROVAL AGENCIES, AS PRESCRIBED UNDER THE TERMS AND CONDITIONS OF THE LICENSE.

d) IN THE EVENT THAT EXISTING MONITORING WELLS ARE REMOVED OR DAMAGED DURING THE SITE ACTIVITIES, A REPLACEMENT MONITORING WELL SHALL BE INSTALLED. THE LOCATION AND DEPTH OF THE WELL SCREEN SHALL BE CONFIRMED BY THE ENGINEER/HYDROGEOLOGIST TO CONFIRM THAT SUITABLE DATA COLLECTION CAN OCCUR IN THE ALTERNATE LOCATION.

e) IN THE EVENT THAT WATER LEVELS ARE FOUND TO FALL OUTSIDE OF THE SEASONAL WATER LEVEL MEASUREMENTS WHICH HAVE BEEN ESTABLISHED AT THE EXISTING MONITORING WELL LOCATIONS, A MORE DETAILED REVIEW AND ASSESSMENT OF THE GROUNDWATER CONDITIONS SHALL BE UNDERTAKEN TO IDENTIFY IF CHANGES OUTSIDE OF THE EXISTING THRESHOLD VALUES ARE THE RESULT OF AGGREGATE EXTRACTION ACTIVITIES.

3. GROUNDWATER SAMPLES HAVE BEEN COLLECTED AT THE SITE TO ESTABLISH BASELINE WATER QUALITY CONDITIONS FOR SHALLOW GROUNDWATER WITHIN THE UNCONFINED AQUIFER WHICH IS EXPECTED TO BE ENCOUNTERED DURING THEAGGREGATE EXTRACTION OPERATION. FUTURE WATER QUALITY TESTING CAN BE COMPARED TO THE BACKGROUND INFORMATION PRESENTED IN THIS REPORT, IF REQUIRED.
4. IF COMPLAINTS ARE RECEIVED FROM NEARBY OR NEIGHBOURING PROPERTY OWNERS (WITHIN 120 m OF THE SITE), THE WATER SUPPLY INTERFERENCE PROTOCOLS OUTLINED IN SECTION 7.3 OF THIS REPORT SHALL BE ADHERED TO.

WELL INTERFERENCE COMPLAINT PROTOCOL:

1. NEARBY AND NEIGHBOURING PROPERTIES SHALL BE PROVIDED WITH 24-HOUR EMERGENCY CONTACT INFORMATION FOR THE LICENSEE, TO FACILITATE REPORTING OF PERCEIVED WATER SUPPLY IMPACTS.
2. NEARBY AND NEIGHBOURING PROPERTIES WHICH EXPERIENCE DISRUPTION OR QUALITY PROBLEMS SHALL NOTIFY THE LICENSEE, WHO WILL BE RESPONSIBLE TO REPORT THE WELL INTERFERENCE COMPLAINT TO MNR AND MECP.
3. IN THE EVENT THAT THE WELL OWNER EXPERIENCES A SIGNIFICANT DISRUPTION IN THEIR WATER SUPPLY, OR EXPERIENCE SIGNIFICANT ADVERSE EFFECTS UPON THEIR WATER QUALITY, AND IF THE OPERATION OF THE PIT CANNOT OBVIOUSLY AND DEFINITIVELY BE EXCLUDED AS THE CAUSE, THE LICENSEE SHALL PROVIDE A TEMPORARY WATER SUPPLY WITHIN 24 HOURS AND THEREAFTER UNTIL SUCH TIME AS THE CAUSE OF THE DISTURBANCE CAN BE DETERMINED AND THE SITUATION ADDRESSED.
4. THE LICENSEE SHALL INVESTIGATE THE CAUSE OF THE WATER SUPPLY DISTURBANCE AND SHALL REPORT TO THE MNR, MECP AND THE WELL OWNER.
5. IF IT IS DETERMINED THAT THE AGGREGATE EXTRACTION AT THE PIT HAS BEEN FOUND TO HAVE CAUSED A DOMESTIC OR FARM WATER SUPPLY TO BE ADVERSELY AFFECTED, THE LICENSEE SHALL, AT THE LICENSEES EXPENSE, EITHER RESTORE OR REPLACE THE WATER SUPPLY TO ENSURE THAT HISTORIC WATER SUPPLY AND QUALITY ARE RESTORED FOR SUCH A RESIDENT. IF IT IS DETERMINED THAT THE OPERATION OF THE PIT HAS NOT CAUSED ANY DOMESTIC OR FARM WATER SUPPLY TO BE ADVERSELY AFFECTED, THE TEMPORARY WATER SUPPLY WILL BE MAINTAINED FOR AN ADDITIONAL 24 HOURS TO ALLOW THE RESIDENT TO MAKE ALTERNATE WATER SUPPLY ARRANGEMENTS.

ACOUSTIC ASSESSMENT - HGC - JULY, 2025

1. TABLE 2 BELOW PRESENTS THE REFERENCE SOUND LEVELS USED FOR THE ACOUSTIC MODELING PRESENTED HEREIN. THESE SOUND LEVELS WERE BASED ON SITE MEASUREMENTS OF PROCESSING EQUIPMENT TO BE USED IN THIS PIT, AND ALSO ADDITIONAL INFORMATION TAKEN FROM OUR FILES FOR OTHER SIMILAR FACILITIES.

REFERENCE SOUND POWER LEVELS OF PROCESSING EQUIPMENT

EQUIPMENT	REFERENCE AVERAGE 'A WEIGHTED SOUND POWER LEVEL
CRUSHING & SCREENING PLANT AND ASSOCIATED LOADER (COMBINED)	119 dBA (76 dBA, SPL AT 50 m
SCREENING PLANT AND ASSOCIATED LOADER (COMBINED)	113 dBA (72 dBA, SPL AT 50 m
LOADER OR EXCAVATOR	107 dBA (65 dBA, SPL AT 50 m

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.

2. ACTIVITIES USED TO PREPARE THE SITE FOR EXCAVATION, SUCH AS THE STRIPPING OF TOPSOIL, CONSTRUCTION OF BERMS, LOCATING THE PROCESSING PLANTS AT THEIR INITIAL LOCATIONS ON THE PIT FLOOR ELEVATION, 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".

SCENARIO 1: BEFORE THE RESIDENTIAL DEVELOPMENT IS OCCUPIED - SHOWN ON OPERATIONAL PLAN
IF THE PIT BEGINS OPERATIONS BEFORE THE RESIDENTIAL DEVELOPMENT IS OCCUPIED THE FOLLOWING RECOMMENDATIONS APPLY.

3. PRIOR TO EXTRACTION ACTIVITIES IN AREA 1, A 3.0 m HIGH NOISE BARRIER ABOVE EXISTING GRADE SHALL BE CONSTRUCTED ALONG THE WESTERN PORTION OF THE SOUTHERN BOUNDARY.
4. THE PROCESSING (CRUSHING AND SCREENING) PLANT SHALL BE LOCATED AT THE FINAL PIT FLOOR ELEVATION.
5. THE PROCESSING (CRUSHING AND SCREENING) PLANT SHALL NOT OPERATE WITHIN 250 m OF R2 AND WITHIN 400 m OF R4. A MINIMUM 8 m HIGH ACOUSTICAL BARRIER SHALL BE CONSTRUCTED BESIDE THIS PROCESSING PLANT IN THE DIRECTION OF R2 TO R4.
6. THE SINGLE SCREENING PLANT SHALL NOT OPERATE WITHIN 250 M OF R4. A MINIMUM 7 M HIGH ACOUSTICAL BARRIER SHALL BE CONSTRUCTED BESIDE THE SCREENING PLANT IN THE DIRECTION OF R2 TO R4.

SCENARIO 2: WHEN THE RESIDENTIAL DEVELOPMENT IS OCCUPIED
PRIOR TO OCCUPANCY OF THE DWELLING UNITS IN THE EASTERN PORTION OF THE RESIDENTIAL DEVELOPMENT THE FOLLOWING RECOMMENDATIONS MUST BE IMPLEMENTED.

7. PRIOR TO EXTRACTION ACTIVITIES IN AREA 1, A 5.0 m HIGH NOISE BARRIER ABOVE EXISTING GRADE SHALL BE CONSTRUCTED ALONG THE WESTERN BOUNDARY OF AREA 1 AND A 3.0 m HIGH NOISE BARRIER ABOVE EXISTING GRADE SHALL BE CONSTRUCTED ALONG THE WESTERN PORTION OF THE SOUTHERN BOUNDARY.
8. THE PROCESSING (CRUSHING AND SCREENING) PLANT SHALL BE LOCATED AT THE FINAL PIT FLOOR ELEVATION.
9. THE PROCESSING (CRUSHING AND SCREENING) PLANT SHALL NOT OPERATE WITHIN 300 m OF R2 TO R8 AND 400 m OF R4. A MINIMUM 8 m HIGH NOISE BARRIER SHALL BE CONSTRUCTED BESIDE THIS PROCESSING PLANT IN THE DIRECTION OF R2 TO R8.
10. THE SINGLE SCREENING PLANT SHALL NOT OPERATE WITHIN 200 m OF R5 TO R8 AND WITHIN 250 m OF R4. A MINIMUM 8 m HIGH ACOUSTICAL BARRIER SHALL BE CONSTRUCTED BESIDE THIS SCREENING PLANT IN THE DIRECTION OF R2 TO R8.

NATURAL ENVIRONMENT ASSESSMENT - MTE - JULY, 2025

1. COMPENSATION PLANTINGS FOR THE REMOVAL OF POLYGONS 1 AND 2 SHALL BE PROVIDED AT A 1:1 AREA RATIO WITHIN THE SOUTHERN, WESTERN, EASTERN AND NORTHERN PORTIONS OF THE LICENCE AREA DURING THE REHABILITATION PHASE. PROPOSED COMPENSATION AREAS WILL BE SITED WITHIN THE PROPOSED INFILTRATION AREA, WHEREIN FUTURE HYDROLOGIC CONDITIONS ARE EXPECTED TO LIMIT THE PRODUCTIVITY OF FUTURE AGRICULTURAL LAND USES, AND ALONG THE NORTHEASTERN SIGNIFICANT WOODLAND BOUNDARY AS TO REESTABLISH VEGETATION WITHIN AREAS MAPPED AS ENVIRONMENTALLY SENSITIVE LANDSCAPE. NATIVE, NON-INVASIVE SPECIES SHALL BE USED ONLY. TARGETED SPECIES PLANTINGS SHALL REFLECT THE COMPOSITION OF THE ADJACENT FEATURES AND POLYGONS 1 AND 2. TREE SPECIES MAY INCLUDE YELLOW BIRCH (BETULA ALLEGHANIENSIS), RED MAPLE (ACER RUBRUM), SUGAR MAPLE (ACER SACCHARUM) AND GROUND SPECIES MAY INCLUDE NATIVE ASTERS AND GOLDENRODS.
2. IF REQUIRED AS A RESULT OF MECP CONSULTATION, FIVE BAT BOXES SHALL BE INSTALLED WITHIN PROPOSED COMPENSATION AREAS PRIOR TO THE REMOVAL OF CAVITY AND LEAF CLUSTER TREES IDENTIFIED IN POLYGONS 1AND 2 UNDER THE DIRECTION OF A QUALIFIED ECOLOGIST.
3. THE DRIPLINE OF THE SIGNIFICANT WOODLANDS SHALL BE FORMALLY SURVEYED PRIOR TO CONSTRUCTION AND OPERATIONS. A MINIMUM OF 10 METRES SETBACK FROM THE SURVEYED DRIPLINE SHALL BE APPLIED TO THE SIGNIFICANT WOODLANDS. NO CONSTRUCTION, AGGREGATE OPERATIONAL WORKS OR BERMS SHALL BE PLACED WITHIN THE SETBACK. THE 10-METRE SETBACK IS THE MINIMUM REQUIRED SETBACK AS PER POLICY 7.C.11 OF THE ROP.
4. PRIOR TO CONSTRUCTION, HEAVY-DUTY SEDIMENT AND EROSION CONTROL FENCING SHALL BE INSTALLED BETWEEN THE EXTRACTION LIMITS AND THE NATURAL FEATURES TO PROTECT ADJACENT NATURAL AREAS. ESC FENCING WILL ACT AS A BARRIER TO SPILLS AND DISTURBANCE THAT MAY IMPACT THE ADJACENT WETLANDS AND WOODLANDS, AS WELL AS AID IN KEEPING EXISTING VEGETATION INTACT. SEDIMENT AND EROSION CONTROL FENCING WILL BE INSTALLED ACCORDING TO THE EROSION AND SEDIMENT CONTROL GUIDE FOR URBANCONSTRUCTION (TRCA, 2019) OR APPROVED EQUIVALENT.
5. DURING CONSTRUCTION AND OPERATIONS, THE LANDS BETWEEN THE SEDIMENT AND EROSION CONTROL FENCING AND NATURAL AREAS SHALL BE MAINTAINED. DISTURBED AREAS (INCLUDING STRIPPED AREAS) THAT ARE INACTIVE FOR 30 DAYS SHOULD BE STABILIZED WITH A COVER CROP.
6. SEDIMENT AND EROSION CONTROL FENCING SHALL BE INSPECTED PRIOR TO CONSTRUCTION TO ENSURE IT HAS BEEN INSTALLED CORRECTLY AND DURING CONSTRUCTION TO ENSURE THAT THE FENCING IS BEING MAINTAINED AND IS FUNCTIONING PROPERLY.
7. SEDIMENT AND EROSION CONTROL FENCING SHALL NOT BE REMOVED UNTIL EXTRACTION OPERATIONS END.
8. NO HEAVY EQUIPMENT, VEHICLES OR OTHER EQUIPMENT IS TO ENTER ADJACENT NATURAL AREAS.
9. PROHIBIT REFUELING AND MAINTENANCE ACTIVITIES WITHIN 30 METRES OF PROTECTED NATURAL FEATURES.
10. CREATION OF SUITABLE BANK SWALLOW HABITAT (E.G., SOIL STOCKPILES) DURING EXTRACTION SHALL BE AVOIDED. BEST MANAGEMENT PRACTICES FOR DETERRING NESTING DURING EXTRACTION ACTIVITIES WILL BE IMPLEMENTED (MNRF, 2017). THESE MEASURES SHALL INCLUDE STOCKPILE SLOPE MANAGEMENT (I.E., GRADING STOCKPILES, ELIMINATING VERTICAL EXTRACTION FACES, REDUCING SLOPES TO 70 DEGREES OR LESS) BEGINNING AT THE START OF APRIL UNTIL AT LEAST JULY 20 OF ANY YEAR.
11. ALL NECESSARY LIGHTING FOR OPERATIONS SHALL BE DIRECTED DOWNWARD AND DIRECTED AWAY FROM THE ADJACENT PSW AND SIGNIFICANT WOODLAND FEATURES.
12. AS PER THE MBCA (1994), ANY TREE REMOVALS SHALL OCCUR OUTSIDE OF THE MIGRATORY BREEDING BIRDS SEASON (I.E., APRIL 1 TO AUGUST 31). IF THIS WINDOW CANNOT BE AVOIDED, NEST SEARCHES TO DETERMINE THE PRESENCE OR ABSENCE OF NESTING BIRDS OR BREEDING HABITAT SHALL BE CONDUCTED UNTIL CLEARING IS COMPLETE, OR UNTIL AUGUST 31, WHICHEVER COMES FIRST.
13. ADVISE WORKERS OF POTENTIAL ENCOUNTERS WITH WILDLIFE DURING CONSTRUCTION. IF AN ANIMAL ENTERS THE WORK SITE, WORK AT THAT LOCATION WILL STOP AND THE ANIMAL SHALL BE PERMITTED TO LEAVE UNHARASSED. IF THERE ARE REPEAT OBSERVATIONS OF WILDLIFE IN THE WORK AREA, BARRIER FENCING (E.G., SILT FENCE) MAYBE NEEDED TO DIRECT WILDLIFE AWAY FROM ACTIVE CONSTRUCTION/OPERATIONS AND TOWARD NATURAL AREAS.
14. WHERE TREE REMOVAL IS PROPOSED, REMOVAL OF TREES OF ANY SIZE SHALL OCCUR OUTSIDE THE BAT MATERNITY ROOST PERIOD, WHICH IS APPROXIMATELY APRIL 1 TO SEPTEMBER 30.
15. A 30-METRE SETBACK FROM THE PSW AND A 10 METRE SETBACK FROM THE SIGNIFICANT WOODLAND SHALL BE IMPLEMENTED. THE NATURAL COMPENSATION AREAS SHALL BE SEEDED AND PLANTED WITH A SUITABLE MIX COMPRISED OF NATIVE SPECIES ASSEMBLAGES REMINISCENT OF THE ADJACENT VEGETATION COMMUNITIES, INCLUDING POLLINATOR-BENEFICIAL SPECIES THAT ARE NATIVE TO THE AREA. NO INVASIVE OR NON-NATIVE SPECIES SHALL BE INCLUDED IN THE SEED MIX. PRIOR TO INSTALLATION, THE CORRECT SEED AND TREE/SHRUB SPECIES SHALL BE CONFIRMED BY THE LANDSCAPE CONTRACTOR.
16. COMPLETE VEGETATION MONITORING IN THE COMPENSATION AREAS OVER THREE YEARS (I.E., MONITORING IN YEARS 2 AND 3), TO DOCUMENT COMPLIANCE WITH A PREPARED LANDSCAPE PLAN. MONITORING IN YEAR 1 BY THE LANDSCAPE CONTRACTOR SHALL DOCUMENT THE SUCCESS OF SEED GERMINATION, VEGETATIVE COVER AND TREE/SHRUB INSTALLATION. MONITORING IN YEARS 2 AND 3 SHALL DOCUMENT PLANT ESTABLISHMENT AND GROWTH THROUGH THE COMPLETION OF A FLORAL INVENTORY THROUGH ONE SITE VISIT CONDUCTED BY A QUALIFIED PROFESSIONAL DURING THE GROWING SEASON.
17. IMPLEMENT ADAPTIVE MANAGEMENT STRATEGIES, SUCH AS SUPPLEMENTAL PLANTINGS AND/OR CONTROL OF NON-NATIVE INVASIVE SPECIES, IF REQUIRED. ADAPTATIVE MANAGEMENT MAY BE TRIGGERED BY POOR SURVIVAL OF PLANTED MATERIAL (I.E., TRIGGERED AT <80% SURVIVAL OF SEEDED SPECIES OR WOODY MATERIALS), INSUFFICIENT VEGETATION COVER (I.E., TRIGGERED AT <80% IF PLANTED AT 100%) AND THE PRESENCE OF INVASIVE SPECIES (I.E., TRIGGERED AT >20% INVASIVE GROUNDCOVER, 80% NONNATIVE/NATIVE IS TARGET).
ADAPTIVE MANAGEMENT STRATEGIES WITHIN WOODLAND COMPENSATION AREAS WILL DEPEND ON THE ISSUE ENCOUNTERED, BUT MAY INCLUDE:
- RE-SEEDING WITH A TARGET SEED MIX;
- REPLANTING OF DEAD TREES/SHRUBS OR OTHER PLANT MATERIALS; AND
- INCREASED MONITORING FREQUENCY OR LENGTH (E.G., ADDING MONITORING IN YEAR 4).

18. INVENTORY INVASIVE PLANTS THROUGHOUT THE ECOLOGICAL MONITORING PERIOD. THIS SHALL INCLUDE
IDENTIFICATION OF INVASIVE SPECIES TYPE, LOCATION AND ABUNDANCE WITHIN COMPENSATION AREAS AS WELL AS A RECORD OF COMPLETED MANAGEMENT STRATEGIES.

NO.	DATE	REVISIONS	OWNER	HM	MMR

Pre Licence Review

NO.	DATE	REVISIONS	OWNER	HM	MMR

Site Plan Amendments

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Unionville, Ontario L3R 2E5
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Project Name

JEDBURGH PLAINS

LICENSEE SIGNATURE: _____

LICENCE No.

PART LOT 32, CONCESSION 8

TOWNSHIP OF NORTH DUMFRIES (FORMER TOWNSHIP OF DUMFRIES)

REGIONAL MUNICIPALITY OF WATERLOO

Scale 1:4000

0 50 100 150m

North

Stamp

DRAFT

Drawing Status

SUBMITTED FOR LICENCE APPROVAL

Drawn SB | Checked RM | Issue Date AUG 2025

Drawing Title

OPERATIONAL PLAN PHASE B-D

Project Number 23-20

Drawing Number 3 OF 5

FILE NAME: 23-20/COMP/2023-3.DWG
PLOT DATE: AUGUST 5, 2025

Figure 3b: Operational Plans

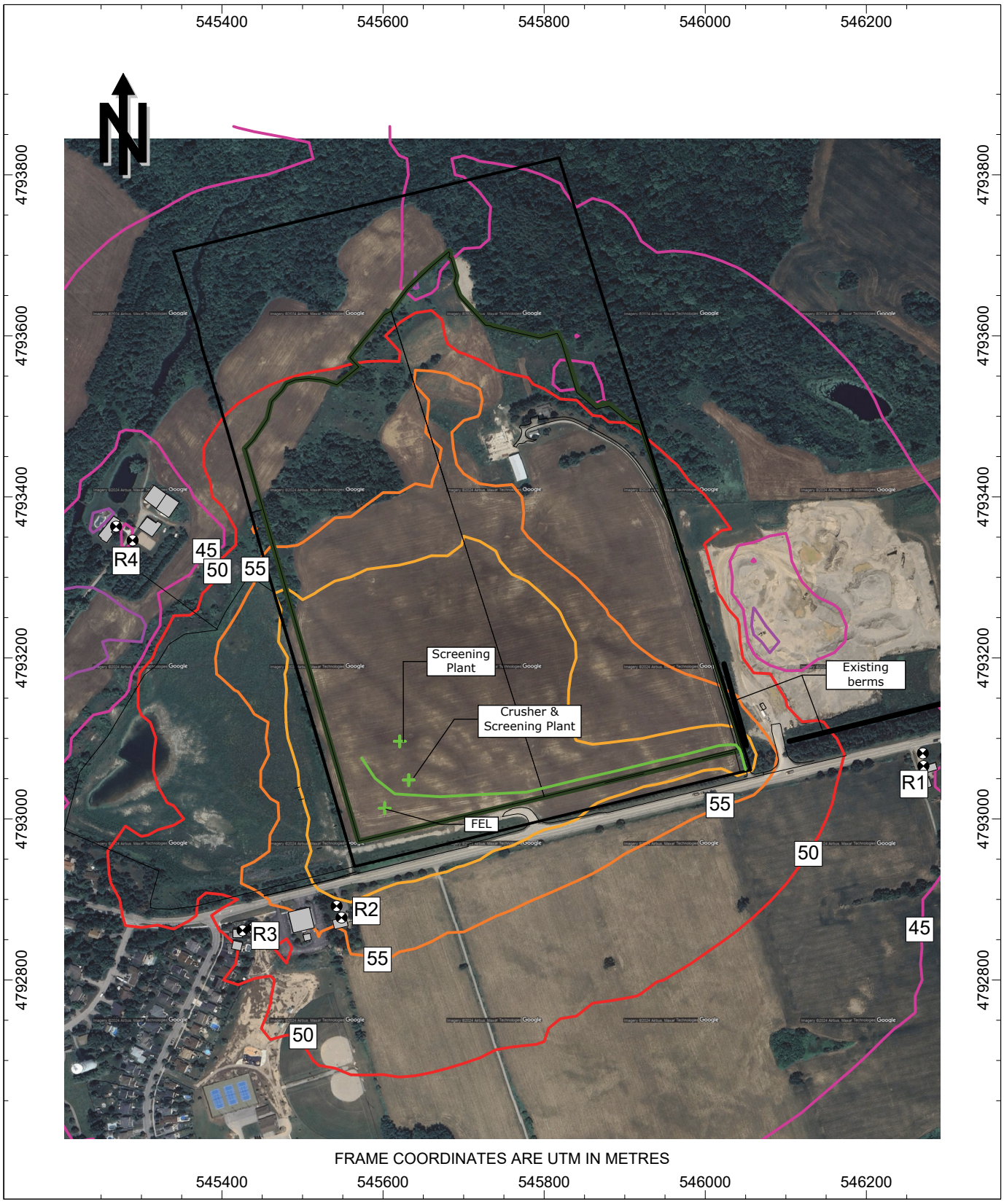

Figure 4: Predicted Daytime Sound Levels,
Area 1 Operations, No Mitigation

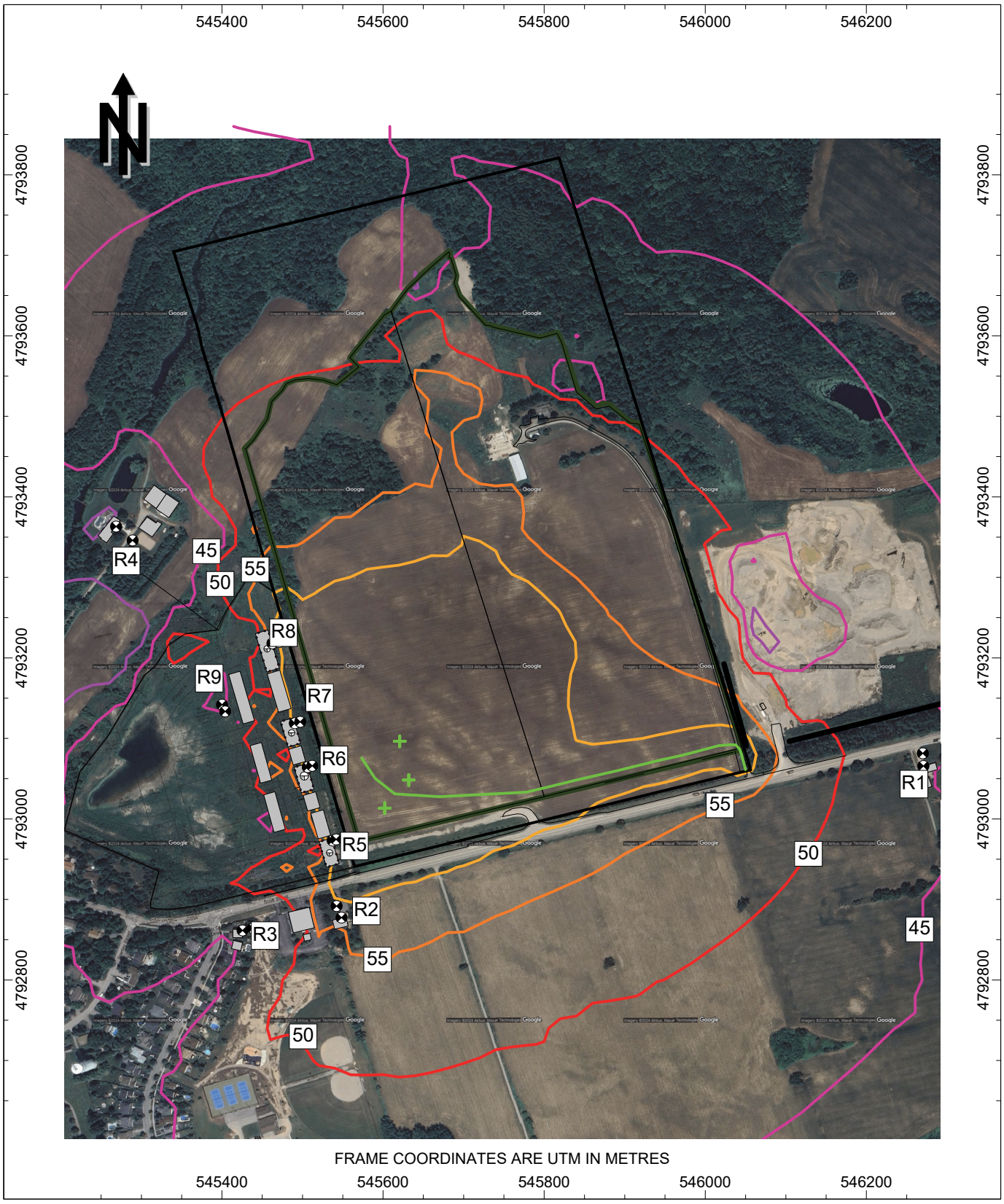

Figure 5: Predicted Daytime Sound Levels with Residential Development, Area 1 Operations, No Mitigation

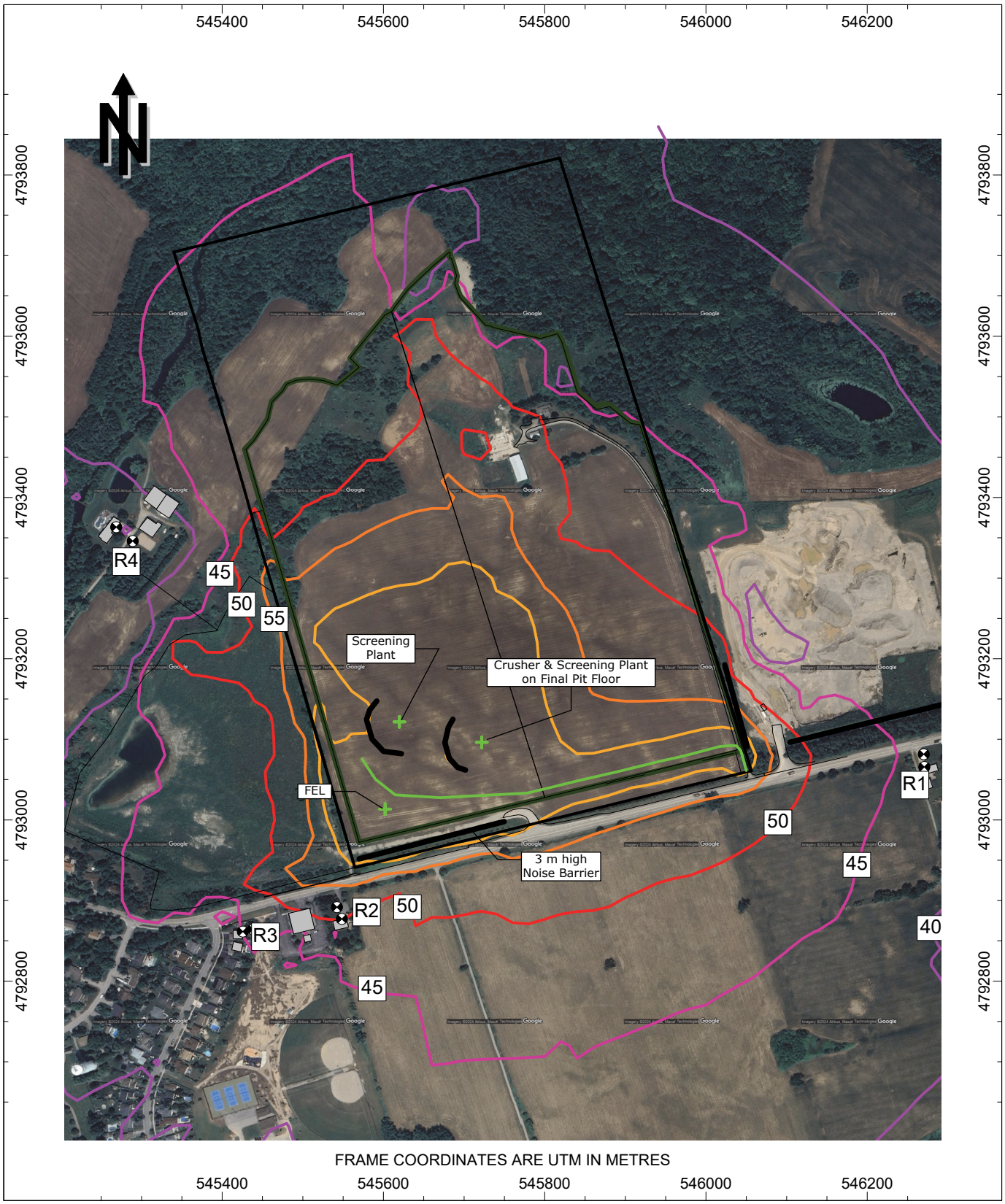

Figure 6: Predicted Daytime Sound Levels, Area 1 Operations, Scenario 1 Mitigation

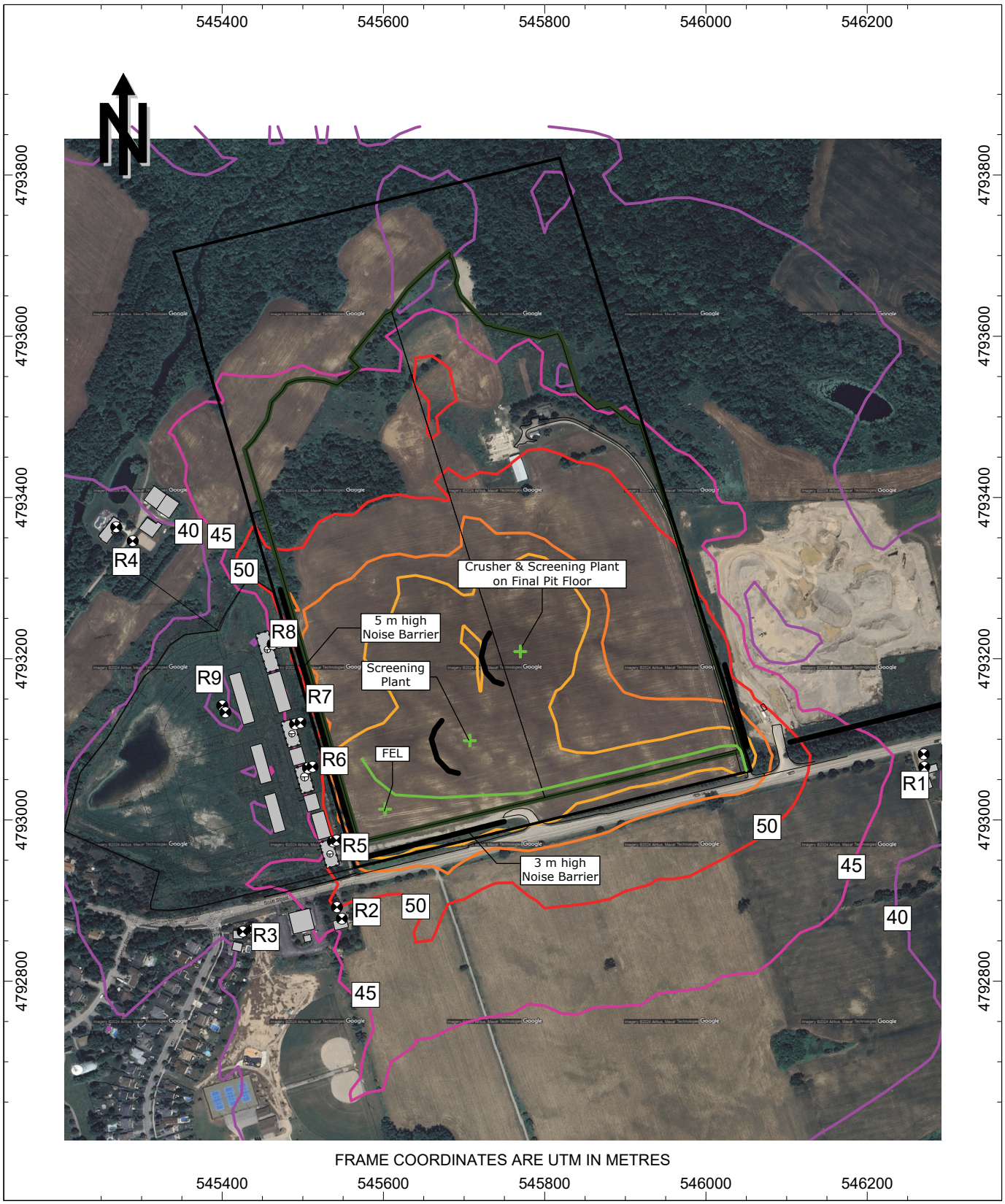

Figure 7: Predicted Daytime Sound Levels with Residential Development, Area 1 Operations, Scenario 2 Mitigation

Appendix A
Acoustical Assessment Methods

Assessment Modelling Assumptions

The computational acoustical model used for this Assessment (*Cadna/A* version 2025, build 209.5501) is based on the methods from ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors" [3], 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 where applicable). This modelling technique is acceptable to the MECP. Existing topography for the surrounding area was obtained from the Existing Features Plan and Grand River Conservation Authority and the Grading Plan for the residential development

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 on-site measurements based on HGC experience); the ground factor was assumed to be 0.9 for soft ground areas and 0.25 for the residential development area. 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. All buildings included in the model have an absorption coefficient of 0.2.

All mechanical sources, with the exception of on-site truck movements, were modeled as point sources of sound, shown as crosses in the appropriate figures. On-site movement of trucks were modelled as line sources (shown as thin green lines), with time weighting factors based 15 km/hr for trucks travelling within the pit.

Appendix B
Cadna/A Calculation Summary

R1	546271	4793066	311.7												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	65.6	0	0.0	-0.1	21.2	1.9	0.0	0.0	0.0	0.0	30
Area1_FEL	545595	4793008	306.5	108	67.6	0	0.0	1.3	2.9	2.6	0.0	0.0	0.0	0.0	33
Area1_Screener	545674	4793154	301.5	113	66.6	0	0.0	0.2	10.9	1.6	0.0	0.0	0.0	0.0	34
Trucks_PP	545874	4793074	313.3	104	61.9	0	0.0	-0.1	4.3	2.5	0.0	0.0	0.0	0.0	35

R1OLA	546270	4793082	310.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	65.5	0	0.0	1.6	20.1	1.9	0.0	0.0	0.0	0.0	30
Area1_FEL	545595	4793008	306.5	108	67.6	0	0.0	3.0	3.6	1.9	0.0	0.0	0.0	0.0	31
Area1_Screener	545674	4793154	301.5	113	66.6	0	0.0	2.0	10.6	1.5	0.0	0.0	0.0	0.0	33
Trucks_PP	545883	4793076	313.4	104	61.6	0	0.0	1.2	4.5	2.2	0.0	0.0	0.0	0.0	34

R2	545548	4792877	315.1												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	62.8	0	0.0	-0.4	11.7	1.4	0.0	0.0	0.0	0.0	43
Area1_FEL	545595	4793008	306.5	108	53.8	0	0.0	2.9	8.6	0.3	0.0	0.0	0.0	0.0	42
Area1_Screener	545674	4793154	301.5	113	60.7	0	0.0	0.1	16.8	0.8	0.0	0.0	0.0	0.0	35
Trucks_PP	545855	4793073	313.1	104	60.7	0	0.0	0.0	4.4	2.1	0.0	0.0	0.0	0.0	36

R2OLA	545542	4792892	314.3												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	62.6	0	0.0	1.4	10.7	1.4	0.0	0.0	0.0	0.0	43
Area1_FEL	545595	4793008	306.5	108	53.0	0	0.0	4.3	8.2	0.3	0.0	0.0	0.0	0.0	42
Area1_Screener	545674	4793154	301.5	113	60.4	0	0.0	1.7	15.9	0.7	0.0	0.0	0.0	0.0	35
Trucks_PP	545857	4793074	313.1	104	60.5	0	0.0	1.4	4.2	2.0	0.0	0.0	0.0	0.0	35

R3	545425	4792862	313.2												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	64.6	0	0.0	-1.4	15.7	1.6	0.0	0.0	0.0	0.0	38
Area1_FEL	545595	4793008	306.5	108	58.0	0	0.0	0.5	15.6	0.4	0.0	0.0	0.0	0.0	33
Area1_Screener	545674	4793154	301.5	113	62.7	0	0.0	-1.5	18.9	1.0	0.0	0.0	0.0	0.0	32
Trucks_PP	545831	4793075	312.2	104	63.7	0	0.0	-0.5	5.9	2.6	0.0	0.0	0.0	0.0	32

R3OLA	545438	4792864	311.0												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	64.4	0	0.0	1.4	15.2	1.5	0.0	0.0	0.0	0.0	36
Area1_FEL	545595	4793008	306.5	108	57.5	0	0.0	2.7	13.5	0.4	0.0	0.0	0.0	0.0	33
Area1_Screener	545674	4793154	301.5	113	62.5	0	0.0	1.3	17.0	0.9	0.0	0.0	0.0	0.0	32
Trucks_PP	545823	4793074	312.2	104	63.6	0	0.0	1.0	5.7	2.4	0.0	0.0	0.0	0.0	31

R4	545269	4793363	294.9												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	65.2	0	0.0	-0.7	18.3	1.6	0.0	0.0	0.0	0.0	34
Area1_FEL	545595	4793008	306.5	108	64.7	0	0.0	-0.3	16.0	0.7	0.0	0.0	0.0	0.0	26
Area1_Screener	545674	4793154	301.5	113	64.2	0	0.0	-1.2	19.6	1.1	0.0	0.0	0.0	0.0	30
Trucks_PP	545873	4793074	313.3	104	67.6	0	0.0	-1.0	7.7	3.2	0.0	0.0	0.0	0.0	26

R4OLA	545289	4793346	293.3												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	64.7	0	0.0	1.6	18.0	1.6	0.0	0.0	0.0	2.1	35
Area1_FEL	545595	4793008	306.5	108	64.2	0	0.0	2.2	14.3	0.7	0.0	0.0	0.0	0.7	27
Area1_Screener	545674	4793154	301.5	113	63.7	0	0.0	0.9	18.5	1.1	0.0	0.0	0.0	0.8	30
Trucks_PP	545873	4793074	313.3	104	67.3	0	0.0	1.6	8.3	2.8	0.0	0.0	0.0	3.1	27

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

R5	545537	4792973	315.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	61.1	0	0.0	-1.4	13.8	1.2	0.0	0.0	0.0	0.0	44
Area1_FEL	545595	4793008	306.5	108	47.5	0	0.0	0.1	12.9	0.2	0.0	0.0	0.0	0.0	47
Area1_Screener	545674	4793154	301.5	113	58.2	0	0.0	-0.9	19.0	0.7	0.0	0.0	0.0	0.0	36
Trucks_PP	545725	4793080	309.7	104	59.0	0	0.0	-1.1	6.5	1.4	0.0	0.0	0.0	0.0	38

R5OLA	545542	4792975	312.8												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	61.0	0	0.0	0.3	17.8	1.1	0.0	0.0	0.0	2.6	41
Area1_FEL	545595	4793008	306.5	108	46.9	0	0.0	1.4	13.6	0.3	0.0	0.0	0.0	1.6	47
Area1_Screener	545674	4793154	301.5	113	58.0	0	0.0	0.6	18.9	0.7	0.0	0.0	0.0	0.0	35
Trucks_PP	545737	4793081	310.0	104	58.2	0	0.0	0.7	10.7	1.0	0.0	0.0	0.0	2.5	35

R6	545506	4793065	314.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	60.1	0	0.0	-1.2	18.0	1.0	0.0	0.0	0.0	0.0	41
Area1_FEL	545595	4793008	306.5	108	51.5	0	0.0	0.2	13.4	0.3	0.0	0.0	0.0	0.0	42
Area1_Screener	545674	4793154	301.5	113	56.6	0	0.0	-0.8	20.0	0.6	0.0	0.0	0.0	0.0	37
Trucks_PP	545829	4793079	312.2	104	59.7	0	0.0	-0.9	9.9	1.2	0.0	0.0	0.0	0.0	34

R6OLA	545512	4793066	310.0												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	60.0	0	0.0	0.3	21.7	1.3	0.0	0.0	0.0	0.0	35
Area1_FEL	545595	4793008	306.5	108	51.2	0	0.0	2.3	17.5	0.3	0.0	0.0	0.0	0.0	36
Area1_Screener	545674	4793154	301.5	113	56.4	0	0.0	0.5	21.2	0.8	0.0	0.0	0.0	0.0	34
Trucks_PP	545832	4793077	312.7	104	56.7	0	0.0	0.7	20.5	0.8	0.0	0.0	0.0	0.0	25

R7	545490	4793119	314.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	59.9	0	0.0	-1.2	16.9	1.0	0.0	0.0	0.0	0.0	42
Area1_FEL	545595	4793008	306.5	108	54.7	0	0.0	0.1	11.8	0.4	0.0	0.0	0.0	0.0	41
Area1_Screener	545674	4793154	301.5	113	56.5	0	0.0	-0.8	19.4	0.6	0.0	0.0	0.0	0.0	38
Trucks_PP	545762	4793017	310.7	104	60.8	0	0.0	-1.1	8.4	1.4	0.0	0.0	0.0	0.0	34

R7OLA	545497	4793121	310.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	59.7	0	0.0	0.3	20.7	1.1	0.0	0.0	0.0	2.6	39
Area1_FEL	545595	4793008	306.5	108	54.5	0	0.0	3.2	10.6	0.4	0.0	0.0	0.0	1.4	40
Area1_Screener	545674	4793154	301.5	113	56.1	0	0.0	0.6	20.5	0.7	0.0	0.0	0.0	1.8	37
Trucks_PP	545760	4793046	310.8	104	59.0	0	0.0	1.2	13.9	1.1	0.0	0.0	0.0	3.0	31

R8	545463	4793218	313.8												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	60.3	0	0.0	-1.2	17.3	1.0	0.0	0.0	0.0	0.0	41
Area1_FEL	545595	4793008	306.5	108	58.9	0	0.0	0.2	7.4	0.8	0.0	0.0	0.0	0.0	40
Area1_Screener	545674	4793154	301.5	113	57.9	0	0.0	-0.8	19.9	0.7	0.0	0.0	0.0	0.0	36
Trucks_PP	545873	4793074	313.3	104	62.1	0	0.0	-1.3	6.6	1.9	0.0	0.0	0.0	0.0	34

R8OLA	545471	4793220	310.8												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	60.1	0	0.0	0.3	20.7	1.2	0.0	0.0	0.0	2.8	39
Area1_FEL	545595	4793008	306.5	108	58.8	0	0.0	3.2	5.6	0.7	0.0	0.0	0.0	0.8	40
Area1_Screener	545674	4793154	301.5	113	57.6	0	0.0	0.6	20.2	0.8	0.0	0.0	0.0	1.7	36
Trucks_PP	545873	4793074	313.3	104	61.3	0	0.0	1.3	11.1	1.4	0.0	0.0	0.0	3.6	32

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

R9	545400	4793142	314.2												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	62.2	0	0.0	-1.4	16.6	1.2	0.0	0.0	0.0	0.0	40
Area1_FEL	545595	4793008	306.5	108	58.5	0	0.0	-0.5	18.0	0.5	0.0	0.0	0.0	0.0	31
Area1_Screener	545674	4793154	301.5	113	59.8	0	0.0	-1.1	19.9	0.8	0.0	0.0	0.0	0.0	34
Trucks_PP	545849	4793076	312.9	104	64.4	0	0.0	-1.6	7.4	2.5	0.0	0.0	0.0	0.0	31

R9OLA	545404	4793134	311.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area1_Crusher	545755	4793206	296.2	119	62.1	0	0.0	-1.9	20.2	1.3	0.0	0.0	0.0	0.0	37
Area1_FEL	545595	4793008	306.5	108	58.2	0	0.0	-1.1	19.0	0.6	0.0	0.0	0.0	0.0	31
Area1_Screener	545674	4793154	301.5	113	59.7	0	0.0	-1.9	21.3	0.9	0.0	0.0	0.0	0.0	33
Trucks_PP	545853	4793075	312.8	104	63.5	0	0.0	-1.7	15.2	1.6	0.0	0.0	0.0	0.0	25

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

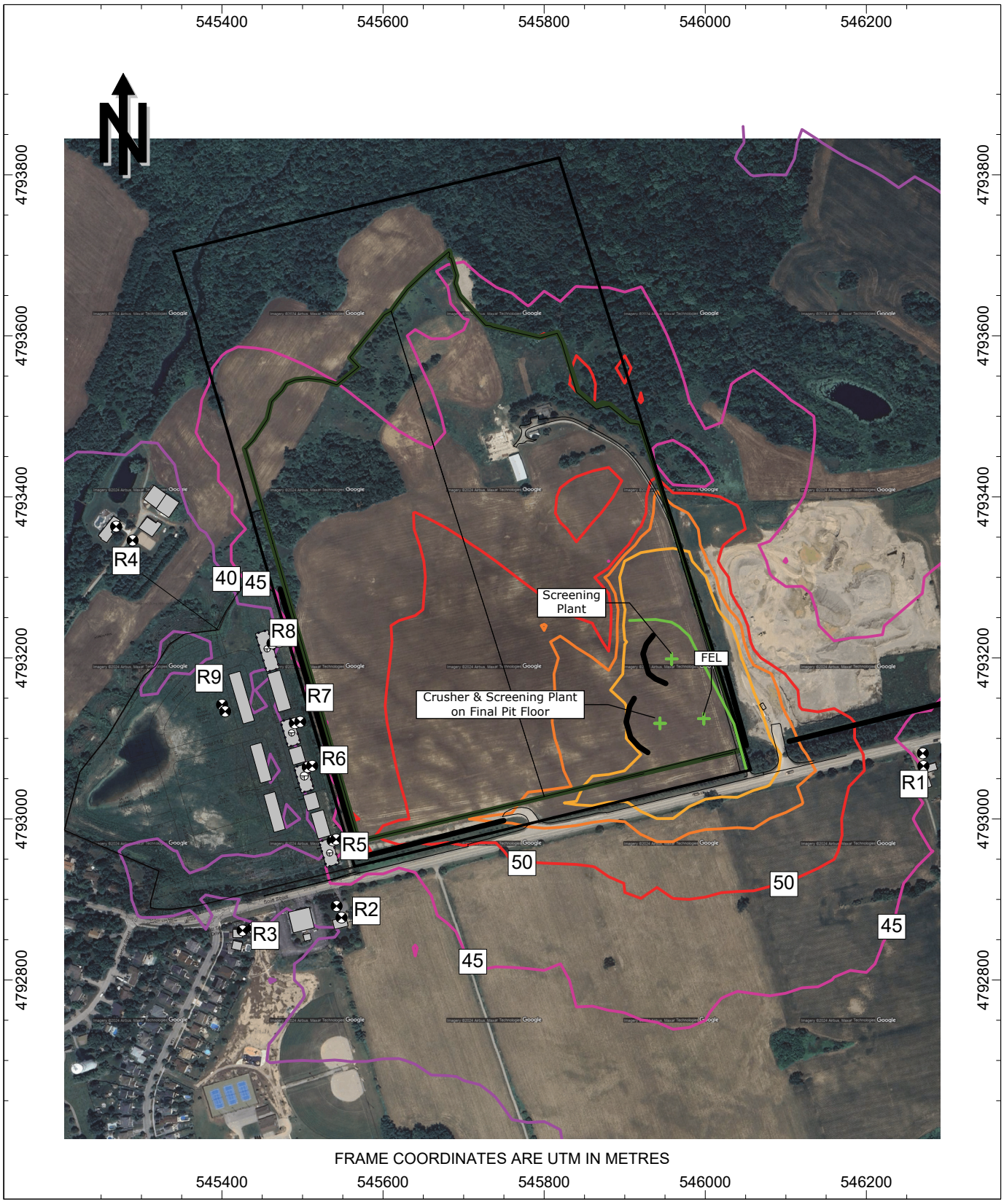

Figure B1: Area 2 Operations near R1, With Mitigation

R1	546271	4793066	311.7												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	61.4	0	0.0	0.2	15.8	1.2	0.0	0.0	0.0	0.0	40
Area2_FEL	545998	4793126	306.5	108	59.9	0	0.0	2.2	10.5	0.4	0.0	0.0	0.0	0.0	34
Area2_Screener	545958	4793200	306.5	113	61.6	0	0.0	1.0	11.1	1.0	0.0	0.0	0.0	0.0	39
Trucks_PP	545992	4793175	309.2	102	59.1	0	0.0	0.5	8.8	1.9	0.0	0.0	0.0	0.0	32

R1OLA	546270	4793082	310.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	61.3	0	0.0	1.9	15.7	1.0	0.0	0.0	0.0	0.0	38
Area2_FEL	545998	4793126	306.5	108	59.8	0	0.0	3.7	9.8	0.4	0.0	0.0	0.0	0.0	34
Area2_Screener	545958	4793200	306.5	113	61.4	0	0.0	2.8	10.6	0.9	0.0	0.0	0.0	0.0	38
Trucks_PP	545992	4793174	309.2	102	58.9	0	0.0	2.1	8.9	1.6	0.0	0.0	0.0	0.0	31

R2	545548	4792878	315.1												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	64.3	0	0.0	0.0	14.3	1.5	0.0	0.0	0.0	0.0	38
Area2_FEL	545998	4793126	306.5	108	65.2	0	0.0	1.0	2.7	2.5	0.0	0.0	0.0	0.0	36
Area2_Screener	545958	4793200	306.5	113	65.3	0	0.0	0.1	12.5	1.3	0.0	0.0	0.0	0.0	34
Trucks_PP	545985	4793190	308.4	102	65.7	0	0.0	-0.4	4.8	3.2	0.0	0.0	0.0	0.0	29

R2OLA	545542	4792892	314.3												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	64.3	0	0.0	1.8	12.8	1.6	0.0	0.0	0.0	0.0	38
Area2_FEL	545998	4793126	306.5	108	65.2	0	0.0	2.2	1.8	2.7	0.0	0.0	0.0	0.0	36
Area2_Screener	545958	4793200	306.5	113	65.3	0	0.0	1.8	11.4	1.3	0.0	0.0	0.0	0.0	34
Trucks_PP	545986	4793189	308.5	102	65.6	0	0.0	0.9	3.8	3.4	0.0	0.0	0.0	0.0	29

R3	545426	4792862	313.2												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	66.2	0	0.0	-0.6	14.6	1.8	0.0	0.0	0.0	0.0	36
Area2_FEL	545998	4793126	306.5	108	67.0	0	0.0	-0.1	3.9	2.5	0.0	0.0	0.0	0.0	34
Area2_Screener	545958	4793200	306.5	113	67.0	0	0.0	-1.1	14.1	1.5	0.0	0.0	0.0	0.0	32
Trucks_PP	545989	4793185	308.7	102	67.3	0	0.0	-0.9	5.2	3.6	0.0	0.0	0.0	0.0	27

R3OLA	545438	4792864	311.0												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	66.1	0	0.0	1.4	14.5	1.8	0.0	0.0	0.0	0.0	35
Area2_FEL	545998	4793126	306.5	108	66.8	0	0.0	1.9	3.2	2.1	0.0	0.0	0.0	0.0	33
Area2_Screener	545958	4793200	306.5	113	66.8	0	0.0	1.8	12.0	1.4	0.0	0.0	0.0	0.0	31
Trucks_PP	545988	4793188	308.6	102	67.1	0	0.0	0.7	4.8	3.5	0.0	0.0	0.0	0.0	26

R4	545269	4793363	294.9												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	68.1	0	0.0	-0.9	16.5	2.1	0.0	0.0	0.0	0.0	33
Area2_FEL	545998	4793126	306.5	108	68.7	0	0.0	-0.3	5.0	2.3	0.0	0.0	0.0	0.0	32
Area2_Screener	545958	4793200	306.5	113	68.0	0	0.0	-1.3	16.4	1.5	0.0	0.0	0.0	0.0	29
Trucks_PP	545987	4793186	308.6	102	68.4	0	0.0	-1.2	5.9	3.8	0.0	0.0	0.0	0.0	25

R4OLA	545289	4793346	293.3												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	67.8	0	0.0	1.3	17.0	2.1	0.0	0.0	0.0	2.0	32
Area2_FEL	545998	4793126	306.5	108	68.4	0	0.0	2.5	3.3	2.3	0.0	0.0	0.0	1.6	33
Area2_Screener	545958	4793200	306.5	113	67.7	0	0.0	1.0	15.4	1.3	0.0	0.0	0.0	0.0	28
Trucks_PP	545983	4793196	308.3	102	68.1	0	0.0	1.2	6.8	3.2	0.0	0.0	0.0	1.4	24

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

R5	545537	4792973	315.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	63.7	0	0.0	-1.6	14.5	1.5	0.0	0.0	0.0	0.0	40
Area2_FEL	545998	4793126	306.5	108	64.7	0	0.0	-1.3	4.6	2.3	0.0	0.0	0.0	0.0	37
Area2_Screener	545958	4793200	306.5	113	64.6	0	0.0	-1.8	16.2	1.2	0.0	0.0	0.0	0.0	33
Trucks_PP	545978	4793198	308.0	102	65.1	0	0.0	-1.9	5.8	3.0	0.0	0.0	0.0	0.0	30

R5OLA	545542	4792975	312.8												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	63.6	0	0.0	0.1	18.1	1.5	0.0	0.0	0.0	2.6	38
Area2_FEL	545998	4793126	306.5	108	64.6	0	0.0	1.3	7.1	1.1	0.0	0.0	0.0	2.6	36
Area2_Screener	545958	4793200	306.5	113	64.5	0	0.0	0.0	17.4	1.1	0.0	0.0	0.0	1.9	32
Trucks_PP	545979	4793198	308.0	102	65.0	0	0.0	0.1	10.0	2.3	0.0	0.0	0.0	3.3	28

R6	545506	4793065	314.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	63.9	0	0.0	-1.6	18.1	1.4	0.0	0.0	0.0	0.0	37
Area2_FEL	545998	4793126	306.5	108	64.9	0	0.0	-1.1	7.6	1.4	0.0	0.0	0.0	0.0	35
Area2_Screener	545958	4793200	306.5	113	64.5	0	0.0	-1.8	18.2	1.2	0.0	0.0	0.0	0.0	31
Trucks_PP	545985	4793189	308.5	102	65.1	0	0.0	-1.7	9.4	2.3	0.0	0.0	0.0	0.0	27

R6OLA	545512	4793066	310.0												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	63.8	0	0.0	0.1	22.0	1.9	0.0	0.0	0.0	0.0	31
Area2_FEL	545998	4793126	306.5	108	64.8	0	0.0	0.3	15.8	0.6	0.0	0.0	0.0	0.0	26
Area2_Screener	545958	4793200	306.5	113	64.4	0	0.0	0.0	20.6	1.4	0.0	0.0	0.0	0.0	27
Trucks_PP	545982	4793198	308.0	102	64.8	0	0.0	0.6	17.8	2.0	0.0	0.0	0.0	0.0	17

R7	545490	4793119	314.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	64.1	0	0.0	-1.6	17.1	1.5	0.0	0.0	0.0	0.0	37
Area2_FEL	545998	4793126	306.5	108	65.1	0	0.0	-1.1	6.6	1.6	0.0	0.0	0.0	0.0	35
Area2_Screener	545958	4793200	306.5	113	64.5	0	0.0	-1.8	16.9	1.2	0.0	0.0	0.0	0.0	32
Trucks_PP	545997	4793172	309.2	102	65.1	0	0.0	-1.8	7.5	2.6	0.0	0.0	0.0	0.0	29

R7OLA	545497	4793121	310.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	64.0	0	0.0	0.2	20.8	1.7	0.0	0.0	0.0	2.6	34
Area2_FEL	545998	4793126	306.5	108	65.0	0	0.0	1.4	10.2	0.9	0.0	0.0	0.0	2.6	33
Area2_Screener	545958	4793200	306.5	113	64.4	0	0.0	0.1	19.2	1.2	0.0	0.0	0.0	1.9	30
Trucks_PP	545997	4793172	309.3	102	65.0	0	0.0	0.6	13.9	2.0	0.0	0.0	0.0	3.6	24

R8	545463	4793218	313.8												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	64.8	0	0.0	-1.6	16.5	1.6	0.0	0.0	0.0	0.0	37
Area2_FEL	545998	4793126	306.5	108	65.7	0	0.0	-1.2	5.9	1.9	0.0	0.0	0.0	0.0	35
Area2_Screener	545958	4793200	306.5	113	64.9	0	0.0	-1.8	17.3	1.2	0.0	0.0	0.0	0.0	32
Trucks_PP	545987	4793191	308.5	102	65.6	0	0.0	-1.8	7.7	2.7	0.0	0.0	0.0	0.0	28

R8OLA	545471	4793220	310.8												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	64.7	0	0.0	0.3	19.9	1.7	0.0	0.0	0.0	2.8	35
Area2_FEL	545998	4793126	306.5	108	65.6	0	0.0	1.5	9.1	1.0	0.0	0.0	0.0	2.8	33
Area2_Screener	545958	4793200	306.5	113	64.8	0	0.0	0.0	19.2	1.3	0.0	0.0	0.0	2.1	30
Trucks_PP	545987	4793191	308.5	102	65.5	0	0.0	0.5	13.3	2.1	0.0	0.0	0.0	4.2	25

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

R9	545400	4793142	314.2												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	65.7	0	0.0	-1.8	15.8	1.8	0.0	0.0	0.0	0.0	37
Area2_FEL	545998	4793126	306.5	108	66.5	0	0.0	-1.5	5.9	2.1	0.0	0.0	0.0	0.0	35
Area2_Screener	545958	4793200	306.5	113	66.0	0	0.0	-2.0	16.7	1.4	0.0	0.0	0.0	0.0	31
Trucks_PP	545984	4793192	308.4	102	66.6	0	0.0	-1.9	6.6	3.2	0.0	0.0	0.0	0.0	28

R9OLA	545404	4793134	311.5												
Src ID	X	Y	Z	LxD	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	ReflD	LrD
Area2_Crusher	545944	4793120	296.5	119	65.7	0	0.0	-2.0	19.6	1.8	0.0	0.0	0.0	0.0	33
Area2_FEL	545998	4793126	306.5	108	66.5	0	0.0	-1.6	12.3	1.1	0.0	0.0	0.0	0.0	29
Area2_Screener	545958	4793200	306.5	113	65.9	0	0.0	-2.3	19.2	1.3	0.0	0.0	0.0	0.0	29
Trucks_PP	545994	4793175	309.2	102	66.6	0	0.0	-1.8	14.6	2.3	0.0	0.0	0.0	0.0	21

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

Appendix C
Consultant Curriculum Vitae

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NOISE VIBRATION ACOUSTICS

Education
University of Waterloo, Bachelor of Applied Science

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 Noise Vibration Acoustics, Toronto
2010 to 2014 Project Engineer, HGC Noise Vibration Acoustics, Toronto
2006 to 2010 Project Consultant, HGC Noise Vibration Acoustics, Toronto

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, Thamesford, Ontario
Block 5 Developments, Brampton, Ontario
Bremont Homes, Mississauga, Ontario
City Centre Condominiums, Mississauga, Ontario
Edmonton Clinic, Edmonton, Alberta
Greensborough Subdivision, Markham, Ontario
Gurney Sands and Gravel, Brantford, Ontario
Knox Presbyterian Church, Waterloo, Ontario
Inland West Pit, Warwick, Ontario
Johnson Bros. Gravel Pits, Southern Ontario
Mattamy Homes, Milton, Ontario
Liberty Village Condominiums, Toronto, Ontario
Linamar Tech Centre, Guelph, Ontario
Nelson Granite Quarries, Kenora, Ontario
Niagara College, Welland, Ontario
Tisdale Mining Lands, Timmins, Ontario
Waterloo Christian Reformed Church, Waterloo, Ontario
Warren Stewart Limestone Quarry, Cockburn Island, Ontario
West Village at Stratford, Stratford, Ontario