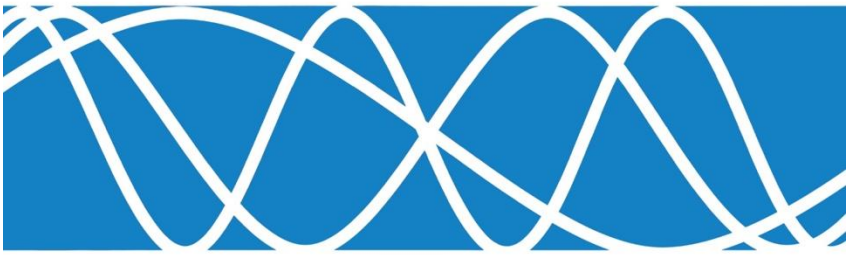
Acoustic Assessment Report

St. Marys Cement Inc. (Canada)
Bowmanville, Ontario

November 6, 2026
HGC Project#: 01800181



Prepared for:

St. Marys Cement Inc. (Canada)
55 Industrial Street
Toronto, Ontario
M4G 3W9

HGC
NOISE | VIBRATION | ACOUSTICS

HGC Noise Vibration Acoustics
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, L5N 1P7
t: 905.826.4044

Version Control

St. Marys Cement Inc. (Canada), Bowmanville, Ontario

Ver.	Date	Version Description	Prepared By
1	12-Aug-2010	Original Acoustic Assessment Report to satisfy condition 2.1 of Amended Certificate of Approval 8824-7HPPDA (Notice No. 1)	M. Munro
2	16-Apr-2012	Updated report incorporating comments received from MECP noise reviewer regarding Ver. 1	C. Kinart
3	13-May-2014	Updated report including low carbon alternative fuel feed system	C. Kinart
4	29-Sep-2020	Updated report to address proposed modifications related to handling/consumption of Alternative Low Carbon Fuels	C. Kinart
5	14-Jun-2024	Updated report to include a wet scrubber system	C. Kinart
6	25-June-2025	Updated report to include a ready-mix concrete plant	H. Cai
7	06-Nov-2026	Updated report to addressed proposed modifications related to handling/consumption of Alternative Low Carbon Fuels	H. Cai

Prepared by: [redacted] Reviewed by: [redacted]

Harry Ao Cai, MEng, P.Eng Corey D. Kinart, MBA, P.Eng., INCE

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EXECUTIVE SUMMARY

HGC was retained by St. Marys Cement Inc. (Canada) (SMC) to update the Acoustic Assessment Report for their cement plant in Bowmanville, Ontario. The updated Assessment supports a proposed amendment to Environmental Compliance Approval (0550-CEAHMA), issued by the Ontario Ministry of the Environment, Conservation and Parks (MECP) on September 19, 2022, to increase the maximum Alternative Low Carbon Fuel (ALCF) use from 400 tonnes per day to 800 tonnes per day. This updated report considers noise emissions from modifications to the calciner associated with ALCF operations. In addition, this report also addresses two ready-mix concrete (RMC) batching plants, a new finish mill, and main kiln stack modifications, all of which are unrelated to the ALCF modifications, but are included in this assessment to reflect the most up-to-date planned operation of the cement plant.

It is noted that while the RMC batching plants operate under separate Approvals, since they are operated by CBM Aggregates, this assessment addresses the cumulative sound emissions of all sources on the SMC Bowmanville property, inclusive of the RMC batching plants.

Sound level measurements were conducted at the facility near each stationary source and at the neighbouring offsite points of reception during various visits to the site since 2010. Sound emission levels of equipment associated with the new finish mill were calculated based on the equipment specifications using acoustical engineering formulae from reference texts. The source sound levels were used as input to a predictive acoustical model to quantify the environmental sound emissions of the facility. Acoustic assessment criteria were established in accordance with MECP Publication NPC-300 [1].

The acoustical measurements and analysis indicate that the sound levels of the facility remain within the limits set out in MECP Publication NPC-300. Given the absence of any sources of ground-borne vibration at the site, the facility also complies with the applicable vibration limits of MECP Publication NPC-207 [2].

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Ontario

Ministry of the Environment, Conservation and Parks

Acoustic Assessment Report Check-List

Company Name

St. Mary Cement Inc. (Canada)

Company Address

Unit Number	Street Number	Street Name	PO Box
	410	Bowmanville Avenue	

City/Town	Province	Postal Code
Bowmanville	Ontario	L1C 3K3

Location of Facility

Same as above

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC-233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17.

Company Contact

Last Name	First Name	Middle Initial
Plaza	Ruben	

Title	Telephone Number
Environmental Manager	[redacted]

Signature	Date (yyyy/mm/dd)
[redacted]	2026/11/06

Technical Contact

☑ By checking this each of the undersigned acknowledge that in providing their name on the applicable line below in electronic form will constitute a signature for the purposes of the *Electronic Commerce Act, 2000*, S.O. 2000, c. 17.

Technical Contact

Last Name	First Name	Middle Initial
Cai	Harry	

Representing	Telephone Number
HGC Noise Vibration Acoustics	[redacted]

Signature	Date (yyyy/mm/dd)
[redacted]	2026/11/06

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	Required Information	Submitted	Explanation/Reference
1.0	**Introduction (Project Background and Overview)**	☑ Yes	Section 1
2.0	**Facility Description**		
	2.1 Operating hours of Facility and significant Noise Sources	☑ Yes	Section 2
	2.2 Site Plan identifying all significant Noise Sources	☑ Yes	Figures 3A - 3D
3.0	**Noise Source Summary**		
	3.1 Noise Source Summary Table	☑ Yes	Appendix A
	3.2 Source noise emissions specifications	☑ Yes	Appendix A
	3.3 Source power/capacity ratings	☑ Yes	Appendix A
	3.4 Noise control equipment description and acoustical specifications	☑ Yes	Section 3, Section 4
4.0	**Point of Reception Noise Impact Calculations**		
	4.1 Point of Reception Noise Impact Table	☑ Yes	Appendix A
	4.2 Point(s) of Reception (POR) list and description	☑ Yes	Section 4
	4.3 Land-use Zoning Plan	☑ Yes	Appendix B
	4.4 Scaled Area Location Plan	☑ Yes	Figures 1 & 2
	4.5 Procedure used to assess noise impacts at each POR	☑ Yes	Appendix E
	4.6 List of parameters/assumptions used in calculations	☑ Yes	Appendix E
5.0	**Acoustic Assessment Summary**		
	5.1 Acoustic Assessment Summary Table	☑ Yes	Appendix A
	5.2 Rationale for selecting applicable noise guideline limits	☑ Yes	Appendix F
	5.3 Predictable Worst Case Impacts Operating Scenario	☑ Yes	Figures 4/5, Table A3
6.0	**Conclusions**		
	6.1 Statement of compliance with the selected noise performance limits	☑ Yes	Section 8
7.0	**Appendices (Provide details such as)**		
	Listing of Insignificant Noise Sources	☑ Yes	Appendix D
	Manufacturer's Noise Specifications	☑ Yes	Section 3
	Calculations	☑ Yes	Appendices G & H
	Instrumentation	☑ Yes	Appendix C
	Meteorology during Sound Level Measurements	☑ Yes	Appendix C
	Raw Data from Measurements	☑ Yes	Appendices G & H
	Drawings (Facility / Equipment)	☑ Yes	Figures 3A - 3E

1 INTRODUCTION

1.1 Context

The subject site is located at 410 Bowmanville Avenue in Bowmanville, Ontario. A scaled location map of the surrounding area is included as Figure 1.

This report has been prepared in accordance with the MECP guidelines NPC-233 "Information to be Submitted for Approval of Stationary Sources of Sound," [3], and "Basic Comprehensive Certificates of Approval (Air): User Guide" [4]. The three Acoustic Assessment summary tables are presented in Appendix A, in the standardized format required by the MECP. The purpose of the assessment is to evaluate the overall sound emissions of the facility during 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.

Zoning maps identifying the land uses surrounding the facility, obtained from the Municipality of Clarington, are included as Appendix B. The lands surrounding the facility are zoned for industrial use to the north, agricultural use to the west and residential use to the southeast. The nearest existing points of reception to the site are homes on lands zoned for residential use approximately 1500 metres to the southeast of the cement plant, labelled as location R1 in Figures 2, 4 and 5. There is also a single-storey non-conforming home on lands zoned for Light Industrial use approximately 350 metres north of the cement plant, labelled as location R3 in Figures 2, 4 and 5. This assessment also considers a currently vacant lot on which a noise sensitive use is permitted, labelled as location VL1 in Figures 2, 4 and 5. It may be noted that SMC owns the properties represented by R1 and VL1, and the majority of others in the vicinity thereof.

During a number of site visits by HGC since 2010, the acoustic environment in the vicinity of locations R1 and VL1 was dominated by road traffic on Highway

401 during both daytime and nighttime hours. This area is best characterized as a "Class 2" semi-urban area, under MECP noise assessment guidelines. The SMC facility was observed to be faintly audible during both daytime and nighttime hours during periods of low background sound.

In the vicinity of location R3, the local background sound was dominated by a preponderance of road traffic on Highway 401 during both daytime and nighttime hours, as well as by frequent rail traffic on the CN principal mainline railway that passes between R3 and the facility. This locale is best characterized as a "Class 1" urban area. The SMC facility was observed to be completely inaudible at location R3 during daytime hours, and audible at times during lulls in road traffic noise during nighttime hours.

1.2 Summary of Updates

This assessment, supporting a proposed ECA amendment application to addresses the following update:

- the increase of ALCF use from 400 tonnes to 800 tonnes per day, as detailed in Section 3.11, which includes proposed modifications to the calciner to facilitate increased ALCF use and process improvement to increase combustion residence time. Design information that are relevant for sound emissions for the calciner modifications are not yet available at the time of this report. Thus, maximum sound emission levels are provided in this assessment, as detailed in Section 4.3.

The SMC facility is undergoing other non-ALFC related modifications that are expected to be executed prior to the operation of the proposed increase of ALCF use. The following updates, which are un-related to the ALCF modifications described above, are also included in this assessment to reflect the most up-to-date planned mode of operation, including:

- the proposed operation of the new finish mill (referred to as FM4) as detailed in Section 3.7.
- the proposed operation of two new RMC batching plants (referred to as the "Planetary Plants) as detailed in Section 3.14.
- proposed modifications to the main kiln stack. Design information that are relevant for sound emissions for the main kiln stack modifications are not yet

available at the time of this report. Thus, maximum sound emission levels are provided in this assessment, as detailed in Section 4.4.

2 FACILITY DESCRIPTION

The site operates 24 hours per day, 7 days per week. The plant primarily produces Portland cement by combining materials bearing calcium carbonate, silica, alumina and iron oxide at high temperatures to produce cement clinker. The clinker is subsequently ground with finishing materials such as gypsum and limestone to produce cement. Other ancillary operations at the facility include comfort heating and emergency generators. There are no significant sources of ground-borne vibration at the facility.

2.1 Cement Manufacturing Operations

2.1.1 Raw Material and Fuel Delivery and Storage

The main raw material (limestone) is supplied by the on-site limestone quarry. Limestone is transferred from the [redacted] via [redacted] to a [redacted] which is controlled by [redacted]. Processed limestone is then fed via [redacted] to [redacted].

Other raw materials (e.g. [redacted]) are delivered by truck. Additives ([redacted]) are delivered by ship, and conventional solid fuels (i.e. [redacted]) are delivered by truck or ship. Gypsum and conventional solid fuel are transported by truck to the plant from the dock. A small portion of the conventional solid fuels is delivered by truck via the main plant road. SMC's material/conventional fuel storage and handling operations at the dock area are approved under Approval number 6346-9DSL5P dated December 5, 2013 and the latest ECA (0550-CEAHMA).

Most raw materials are stored in silos or buildings. Conventional solid fuels from the dock are deposited into t[redacted]per from where they are

transferred into the [redacted]. All raw material and conventional fuel storage silos are controlled by [redacted].

ALCF are delivered by enclosed trucks, which enter and unload inside the existing fuel storage building. In future, this storage building will be expanded to accommodate increased capacity of ALCF.

2.1.2 Clinker Production

[redacted]s are proportionately fed from the [redacted] via an [redacted] to a [redacted]. Emissions from the raw mill are controlled by the kiln feed baghouse, venting through the main kiln stack. In the raw mill, the raw materials are [redacted] to [redacted] and [redacted]. The raw mill uses the [redacted] from the [redacted] to [redacted] the raw meal. The [redacted] is stored in the [redacted].

Conventional solid fuels are fed to the fuel milling system from the [redacted]. Emissions are controlled by the fuel mill baghouse venting through the main kiln stack. Milled conventional fuel ([redacted]) is fed to the [redacted] and [redacted] through their [redacted].

Currently when ALCF are blended, inside the ALCF building, the homogenized fuel is fed via a series of conveyors that feed the calciner.

Dried raw meal is fed, via [redacted] and [redacted], up to a [redacted] consisting of [redacted]. As the raw meal progressively passes through a [redacted], it encounters [redacted] from the [redacted]. Prior to being directed into the [redacted], the [redacted] is fed into a [redacted]r where the material temperature is raised to [redacted]. In the kiln, the raw meal temperature is raised to over [redacted]. The chemical reactions and physical processes transform the raw meal into clinker. Flue gases from the kiln pass through the [redacted] and

the [redacted] and [redacted] to the [redacted] and are exhausted to the atmosphere via the main kiln stack.

The clinker product is cooled by passing ambient air across the product. This air is directed into the [redacted] for use [redacted]. The clinker is then further cooled in a [redacted], which achieves [redacted]. This additional air passes through the [redacted].

Clinker exits the [redacted] at an average temperature of between [redacted] onto [redacted], which feeds [redacted]. Cooled clinker from the [redacted] is conveyed to the [redacted] where it is [redacted]. Pre-ground clinker is then transferred into the [redacted].

2.1.3 Cement Production

Cement finishing is accomplished in [redacted]. Clinker, limestone and gypsum are milled together to produce cement. The three finish mills are controlled by [redacted].

The finished cement product is transferred into [redacted]. Product can be dispatched via tanker truck or by ship.

In addition to finished cement product, the plant also ships clinker. Cement and clinker are transported to the dock using [redacted].

2.1.4 Other Associated Equipment/Operations

In an effort to reduce nitrogen oxides (NOx) and sulphur dioxide (SO2) emissions, the Facility uses a [redacted] ammonia solution injection system and wet scrubber limestone injection while reducing NOx emissions and SO2 emissions, respectively.

2.2 Ancillary Operations

At the Facility, ancillary operations include:

- Propane and No.2 oil-fired comfort heating units;
- Three (3) emergency diesel generators;
- Maintenance shop; and
- Eight (8) laboratory fume hoods.

Noise sources associated with below-grade quarry operations adjoining this site are covered under an aggregate license from the Ministry of Natural Resources (Number 318) and therefore have not been included in this assessment.

The primary sound sources associated with the site considered herein include the cement plant, CBM Aggregates and Ready-mix operations, as well as onsite movements of trucks and front-end loaders.

3 NOISE SOURCES

A Sound Source Summary is included as Table A1 in Appendix A, which lists the sources associated with the facility, in the standard format required by the MECP. A concurrent Emission Summary and Dispersion Modelling (ESDM) report is maintained by Ramboll. Where applicable, the source identification numbers and descriptions used in this acoustical assessment follow those of the ESDM. For sound-only sources which are not sources of air emissions, an identification number has been given in this assessment report of the form NS-## (e.g. NS-01).

Figures 3A through 3E show the locations of each noise source. Except where noted otherwise, sound levels of the individual sources were measured during a number of visits to the site since 2010, primarily using sound intensity methods. Details of the measurement methods used to quantify the sound power of each source are listed in Appendix C. Sources which were found to be acoustically insignificant are listed in Appendix D. The primary sources of sound at the site are described below. Except where noted otherwise, all equipment was assumed

to operate continuously during a predictable worst-case hour, or as indicated (including vehicular quantities) based on input from SMC/CBM personnel.

3.1 Surge Pile

There are two surge piles (represented as source PPILED) [redacted]. After being processed through a [redacted], limestone extracted from the quarry is transferred to an above-grade surge pile area east of the cement plant, which includes two material stockpiles, as well as two material silos. The dominant noise source associated with the surge pile area is the sound of rock falling onto either of the two stockpiles (only one of which can receive material at a given time). When material is delivered to either of the two storage silos, sound emissions from this area are insignificant. Typically, the stockpiles receive aggregate material [redacted]% of the time and the storage silos receive material [redacted]% of the time, which has been assumed for the purposes of this assessment.

3.2 Secondary Crusher

Material is drawn from the surge pile area via [redacted] for further processing in the secondary crusher (SCRUSH). The secondary crusher is housed inside a building which has three doors that can remain open during operation: one facing southwest (SCRUSHa) and two facing southeast (SCRUSHb and SCRUSHc).

3.3 Process/Dust Collector Exhausts

There are numerous process exhausts located on [redacted] throughout the plant. With the exception of the [redacted] and the [redacted], noise emissions from all acoustically non-negligible process/dust collector exhausts were measured during the site visits. The [redacted] and the [redacted] were not accessible for direct acoustic measurement; therefore, the noise emissions associated with these sources were calculated based on the physical characteristics of the fans in each of the systems using formulae from standard

engineering reference texts. These sound levels were calibrated using the predictive acoustical model (see Appendix E) based on numerous sound pressure level measurements conducted both on and off the site.

3.4 Process Fans/Motors

There are a number of process fans located [redacted]. These fans and the associated motors were measured during the site visits. The kiln induced draft (ID) fans, east of the [redacted], were observed to emit a tonal sound from a space between the concrete motor platforms and the fan casings, which have been included in this assessment as separate sources.

3.5 Baghouse Screw Conveyors

This assessment includes sound emissions from the screw conveyors located [redacted].

3.6 Wet Scrubber

The wet scrubber system consists of [redacted]. Sound emission from the [redacted] were included in this assessment.

3.7 Finish Mill 4

A new finish mill (referred to as Finish Mill 4, or FM4) is proposed to increase the production capacity provided by the existing three finish mills. The new finish mill will include processing equipment to [redacted] and [redacted] into [redacted]. Sound emissions from sources associated with FM4, including [redacted] were included in this assessment.

3.8 Open Doors

A number of open overhead and man doors leading to process areas around the facility were observed to emit non-negligible sound [redacted].

3.9 Kiln Cooling Fans

There are [redacted] fans [redacted] and [redacted] fans [redacted] used to cool the walls of the kiln. Several sound intensity measurements conducted over the surface of the kiln found the walls of the kiln itself to be acoustically insignificant.

3.10 Cooler/Burner Building Heat Exchanger

This assessment considers sound emissions from a heat exchanger on the [redacted], which includes [redacted].

3.11 Trucking Activities

Sound emission levels of all trucks were based on measurements of similar equipment conducted by HGC for past projects.

3.11.1 Cement Trucking Activities

Cement powder is shipped from the SMC site via tractor trailers, which enter the site via Bowmanville Avenue at a rate of up to [redacted] to [redacted] to be loaded. In addition to onsite movement of cement trucks, this assessment includes [redacted] trucks continuously idling in the loading area during a predictable worst-case hour of operation [redacted].

3.11.2 Other Trucking Activities

Tractor trailers deliver materials to the cement plant from the [redacted] at the following rates per hour: [redacted]. Tractor trailers deliver materials to the cement plant from offsite at the

following rates per hour: [redacted].

3.12 Alternative Low Carbon Fuels

The ALCF processing and feed system currently receive fuel materials by truck (VTd) at a rate of up to [redacted]. While the proposed ALCF modifications will increase daily volumes of ALCF use, the peak hourly volume of ALCF material deliveries will stay the same ([redacted]).

The fuel materials are stored within an enclosed building (the existing building will be expanded). [redacted] front-end loaders ([redacted]) will manage [redacted] within the storage buildings, which include a processing/delivery system consisting of s[redacted] that will deliver the processed fuel to the kiln via [redacted]. Manufacturer's sound data for the fuel processing/delivery system indicates a sound power level of [redacted]; no data was available for the equipment while processing fuel material. Therefore, sound emission data for similar equipment, measured by HGC for a past project (while processing fuel material, with a sound power level [redacted]) was assumed for the purposes of this assessment. The walls and roof of the storage building are/will be constructed of [redacted]; a modest 10 dBA of acoustical attenuation has been applied to sound emissions from equipment operating within the ALCF storage building.

Sound emissions from the calciner that processes the ALCF material were determined to be acoustically negligible in previous assessments. The proposed ALCF modifications will involve modifications to the calciner ([redacted]) to increase the use of ALCF.

3.13 CBM Aggregates

Aggregate material is transferred from the [redacted] to the [redacted] at a rate of up to [redacted] per hour. Aggregate material is shipped offsite from this area by [redacted], which enter the site via [redacted] and travel directly to the CBM Aggregates yard at a rate of [redacted] per hour. This assessment also includes the sound of an idling truck in the aggregate yard [redacted] as well as a front-end loader [redacted]. Sound levels of moving and idling trucks as well as the front-end loader were based on data from past projects on file at HGC.

3.14 CBM Ready-Mix Concrete Batching Plant

There are three CBM RMC batching plants located in two areas, one at the northwest side of the SMC site, designated as "Hagen 4 Plant", and two plants at the southwest side of the SMC site, designated as "Planetary Plants". These three RMC plants are approved under Approval number 7120-DPAKBM dated March 26, 2026.

The two Planetary Plants consist of [redacted]. Aside from having two sets of aggregate hoppers/conveyers and loading points, all other activities and equipment, such as [redacted], are shared between the two plants. Essentially, the two plants operate as a singular batching plant with [redacted] to ensure continuous output in case of unforeseen downtime with one of the plants. It is noted that the two plants may operate concurrently during periods of switch-over from one plant to the other and are thus assessed as such.

Noise sources at the Hagen 4 Plant have been assigned an identification number of the form [redacted], and noise sources at the Planetary Plants have been assigned an identification number of the form [redacted].

3.14.1 Tanker Trucks

Tanker trucks delivering Portland cement and slag will travel to [redacted] where they will [redacted], facing [redacted]. At this location, the cementitious materials will be unloaded from the tanker trucks using [redacted]. This assessment also considers sound emissions from the truck engines [redacted] and exhausts [redacted]. Once unloading is completed, the tanker trucks will leave the site [redacted].

3.14.2 Ready-Mix Trucks

Ready-mix trucks will travel to the [redacted]. At this location, the trucks will be loaded while operating at an elevated engine idle; sound emissions from the engines are represented by [redacted] whereas the combustion exhausts are represented by [redacted]. Once loading is completed, ready-mix trucks will move [redacted]. In this area, the trucks will "slump up"; a process by which the trucks will operate at an elevated idle to complete raw material mixing and to adjust for product consistency as required. The sound emissions from slumping trucks are represented by [redacted]. Once slumping is completed, the ready-mix trucks will leave the plants (also represented by [redacted]).

3.14.3 Aggregate Trucks & Front-End Loader

Aggregate/sand trucks will travel to [redacted]. The aggregate will be unloaded into the stockpiles ([redacted]) before the trucks leave the plants site (also represented by [redacted]). Each truck was assumed to require [redacted] to unload, based on observations at similar sites.

A front-end loader ([redacted]) will be used to transfer aggregate materials between the stockpiles and the aggregate hoppers.

3.14.4 Dust Collection System

The plants will be equipped with baghouse dust collection systems to control dust from the [redacted]. Sound emissions from the dust collector exhaust points are represented herein as [redacted].

3.14.5 Additional Sources

The aggregate hoppers ([redacted]) and cement scale are equipped with vibrators [redacted]) which will operate for short periods to loosen clumping materials. These sources were assumed to operate for [redacted] per ready-mix truck, based on site observations.

3.15 Emergency Generators & Water Pump

The SMC site includes three emergency diesel engines, two of which operate [redacted] and one which operates a [redacted]. Although the emergency operation of a generator/pump system during a power outage is exempt from acoustic assessment under MECP guidelines, as a life safety event, the periodic operation for maintenance purposes must be considered. Each of the emergency generators/pump is tested during daytime hours on a weekly basis for approximately [redacted]. Although the units are not typically all tested at the same time, this assessment conservatively considers simultaneous operation of all three emergency systems during any hour of the day or night. Under MECP guidelines, emergency generators are assessed separately from other equipment at the facility, as discussed below in Section 6.2.

Each of the diesel engines outlined above is equipped with a combustion exhaust silencer, the acoustic performances of which are unknown; the measurements and predictive analysis of these sources include the benefit of the installed exhaust silencers.

3.16 Summary of Predictable Worst-Case Hour Activities

The following table summarizes the predictable worst-case hour of operation at the SMC site, which has been considered for the purposes of this assessment.

Table 1: Summary of Predictable Worst-Case Hour of Operation

Source Type/Name	Predictable Worst-Case Hour Activity
St. Marys Cement	
Surge Pile	[redacted]
Process Equipment	
Cement Trucks	
Idling Trucks (entrance/exit, qty. 2)	
Petcoke/Coal, Iron/Sand, Ash & Overburden Rock Trucks	
Gypsum Trucks	
ALCF/LCF Trucks	
ALCF Front-End Loaders (qty. 3) & Processing Equipment	
CBM Aggregates	
Rock Trucks & Aggregate Trucks	
Idling Truck & Front-End Loader	
CBM Ready Mix Concrete Batching Plants	
Tanker Trucks	
Ready-Mix Trucks	
Aggregate/Sand Trucks	
Unloading Aggregate/Sand Trucks	
Aggregate & Cement Scale Vibrators	
All Other Sources	

The source sound levels were used to develop the sound source inventory included as Table [redacted], and were input to a predictive computer model (see Appendix E) to quantify the sound emissions of the facility during the predictable worst-case hour described above.

4 NOISE CONTROL MEASURES

4.1 CBM Hagen 4 RMC Plant

A noise barrier is located on the north side of the tanker unloading positions at the northwest (Hagen 4) CBM RMC plant as depicted in Figure 3F, with a length of 12.2 metres and height of 2.6 metres.

4.2 Cement Plant Processes

Two silencers are located at two existing process exhausts to address future sound impact of the new FM4 and the two new CBM RMC batching plants. The [redacted] (source ID [redacted]) and [redacted] (source ID [redacted]) are designed to be equipped with discharge silencers to achieve [redacted] dBA of noise reduction of these sources. Acoustical performance specifications are provided in the table below.

Table 2: Silencer Insertion Loss Specifications for [redacted] and [redacted], [dB]

Source ID	Octave Band Centre Frequency, [Hz]							
	63	125	250	500	1k	2k	4k	8k
[redacted]								

4.3 Proposed Calciner Modifications

Proposed calciner modifications include new equipment to increase processing capacities to accommodate the increase of ALCF use. Previous site visits indicate that the existing calciner equipment were acoustically negligible. As design details are not yet available, the new calciner equipment will be selected to ensure the sound power level does not exceed [redacted] dBA.

4.4 Proposed Main Stack Modifications

A new main kiln stack and ID fans are proposed to replace the existing main kiln stack and ID fans. As design details are not yet available, the equipment will be selected to ensure the sound power level of the main stack outlet does not exceed [redacted] dBA, and the maximum sound power levels of each new ID fan, inclusive of the fan motor and housing, does not exceed [redacted] dBA. These maximum levels are identical to the current levels for the main stack and ID fans, such that the replacement stack and ID fans will have sound emission levels equal or less than the existing equipment.

5 POINTS OF RECEPTION

Three key assessment locations were chosen to represent the nearest noise sensitive points of reception to the subject site, and are shown as locations R1, R3 and VL1 in Figures 2, 4, and 5.

Location R1 represents an upper storey window of a two storey home on the south side of Watson Drive, approximately 60 metres from the site boundary and between 1250 metres and 1650 metres from the cement plant. Location R3 represents a non-conforming single storey home approximately 350 metres north of the cement plant. This home is situated approximately 80 metres south of Highway 401, and approximately 325 metres north of a CN principal mainline railway. Location VL1 represents a hypothetical upper storey window of an assumed two storey home on currently vacant land zoned for residential use. In the case of location R1 (and location VL1), the most-potentially impacted point on the property is the upper-storey window, because this position is most exposed to the sources at the facility and benefits the least from ground absorption and shielding by intervening obstructions. Because the home represented by R3 is single storey, this receptor location represents first storey windows. Each point of reception is described briefly in Tables A3.1 and A3.2, the Acoustic Assessment Summary Tables.

In the vicinity of locations R1 and VL1, the local background sound was dominated by road traffic on Highway 401, during both daytime and nighttime hours, with the SMC facility faintly audible during both daytime and nighttime hours during periods of low background sound. The SMC facility was observed to be completely inaudible at location R3 over the preponderance of road traffic sound from Highway 401 during daytime hours; during nighttime hours, the facility was audible at times during lulls in road traffic noise.

6 ASSESSMENT CRITERIA

The appropriate document for defining the applicable sound level limits is MECP Publication NPC 300. The details by which the applicable sound level limits were

established for the assessment of this facility are provided in Appendix F. For the purposes of this assessment, the following sound level limits are applicable:

Table 2: Applicable Sound Level Limits at Points of Reception, L_{EQ} [dBA]

Receptor	Non-Emergency Equipment	Emergency Equipment
R1, VL1	45	50
R3	50	55

These limits are included in Tables A3.1 and A3.2 of Appendix A.

Some types of sound have a special quality which may tend to increase their audibility and potential for disturbance or annoyance. For tonal sound, MECP Publication NPC-104 [5] stipulates that a penalty of 5 dBA is to be added to the measured source level. A tonal sound is defined as one which has a "pronounced audible tonal quality such as a whine, screech, buzz or hum". In the subsequent analysis, a tonal penalty has been applied to sources as indicated in Tables A1 and A2 of Appendix A.

7 ASSESSMENT

The results of the analysis are summarized in the following subsections. Details of the prediction methods are summarized in Appendix E, and sample calculation results are included as Appendices G and H.

7.1 Non-Emergency Equipment

The sound levels of the facility were predicted to be 41 dBA at locations R1 and VL1, and 50 dBA at location R3, all of which are within the applicable MECP limits.

The sound levels of non-emergency equipment are summarized in Table A3.1 of Appendix A and represented graphically in Figure 4. It is evident that the contribution of sound from the ALCF modifications to the facility-total sound level is not significant.

7.2 Emergency Equipment

The sound levels from testing of the emergency generators were predicted to range between 16 and 31 dBA at locations R1, R3 and VL1, which are well within the applicable limits. The sound levels of emergency equipment are summarized in Table A3.2 of Appendix A and represented graphically in Figure 5.

8 CONCLUSIONS

The acoustical measurements and analysis indicate that, with the proposed ALCF modifications, the sound levels of the SMC site remain within the applicable limits as set out in MECP publication NPC-300. Given the absence of any sources of ground-borne vibration at the site, the facility also complies with the impulse vibration limits set out in NPC-207 [6].

9 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-233, "Information to be Submitted for Approval of Stationary Sources of Sound," October, 1995.*

4. *Ontario Ministry of the Environment, Conservation and Parks Guide, "Basic Comprehensive Certificates of Approval (Air): User Guide," March, 2011.*

5. *Ontario Ministry of the Environment, Conservation and Parks Publication NPC-104, "Sound Level Adjustments," August, 1978.*

6. *International Organization for Standardization, "Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 2: Measurement by scanning, ISO-9614-2," Switzerland, 1996.*

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

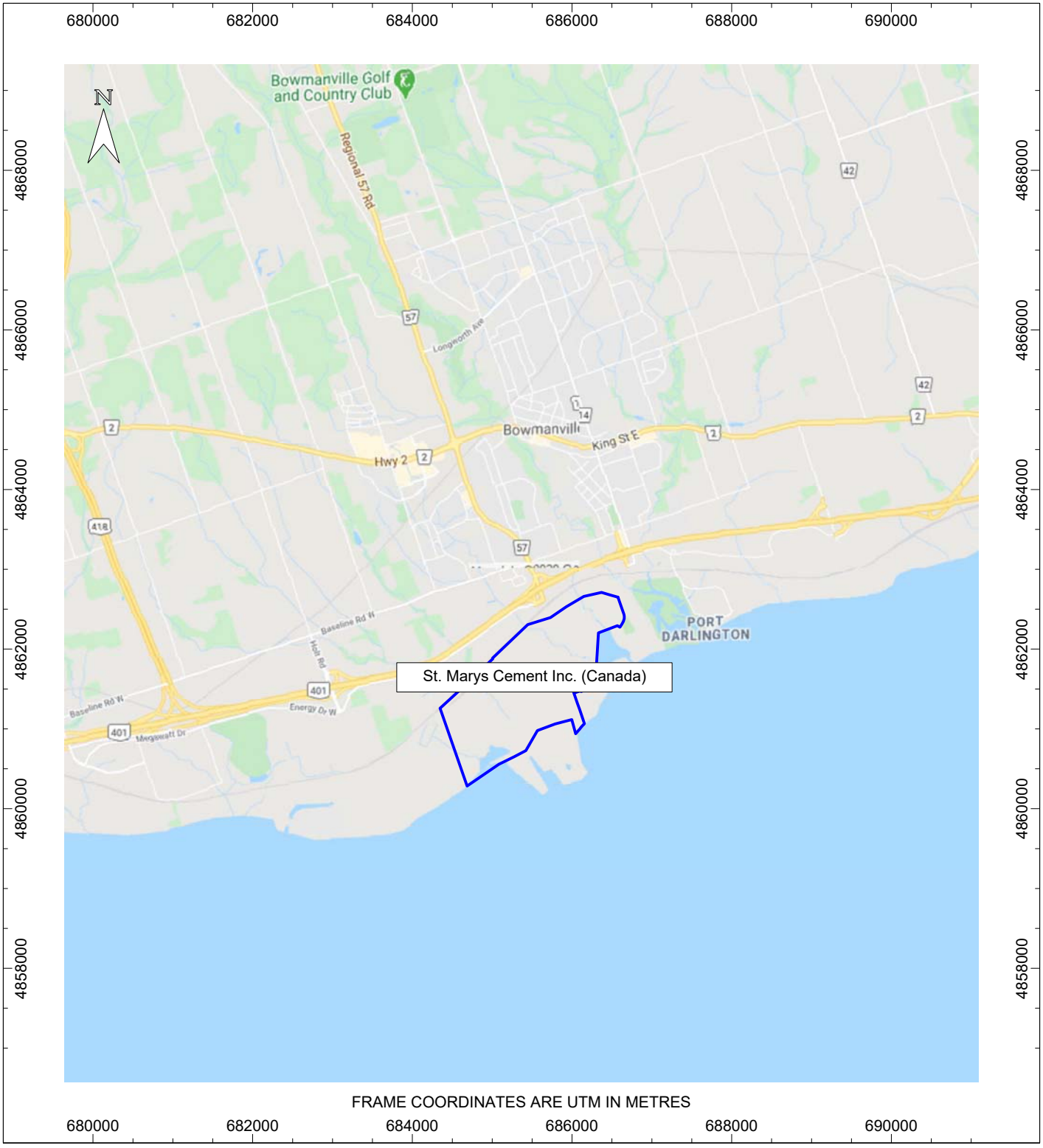


Figure 1: Scaled Location Map



Figure 2: Site and Points of Reception

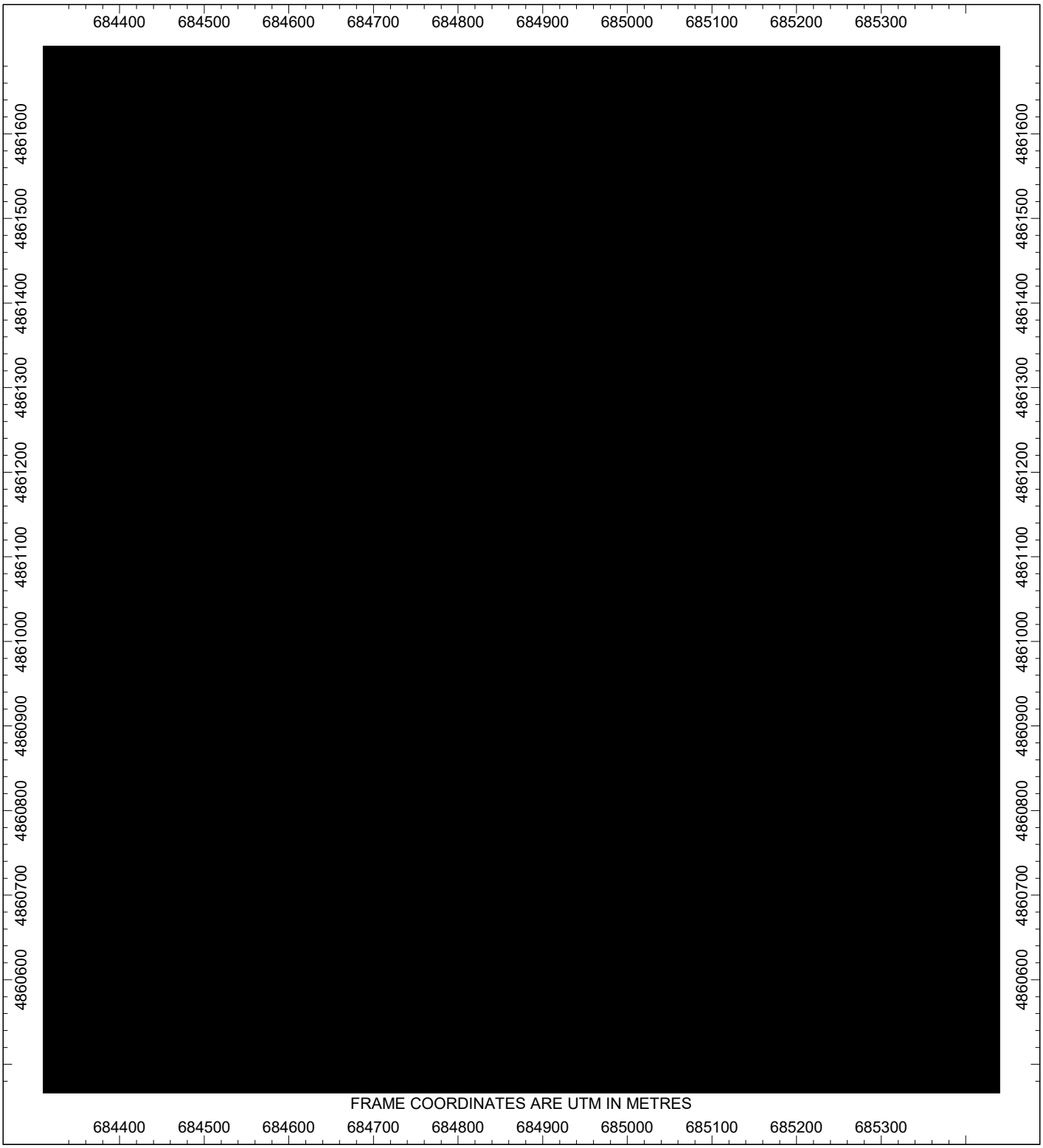


Figure 3A: Locations of Noise Sources

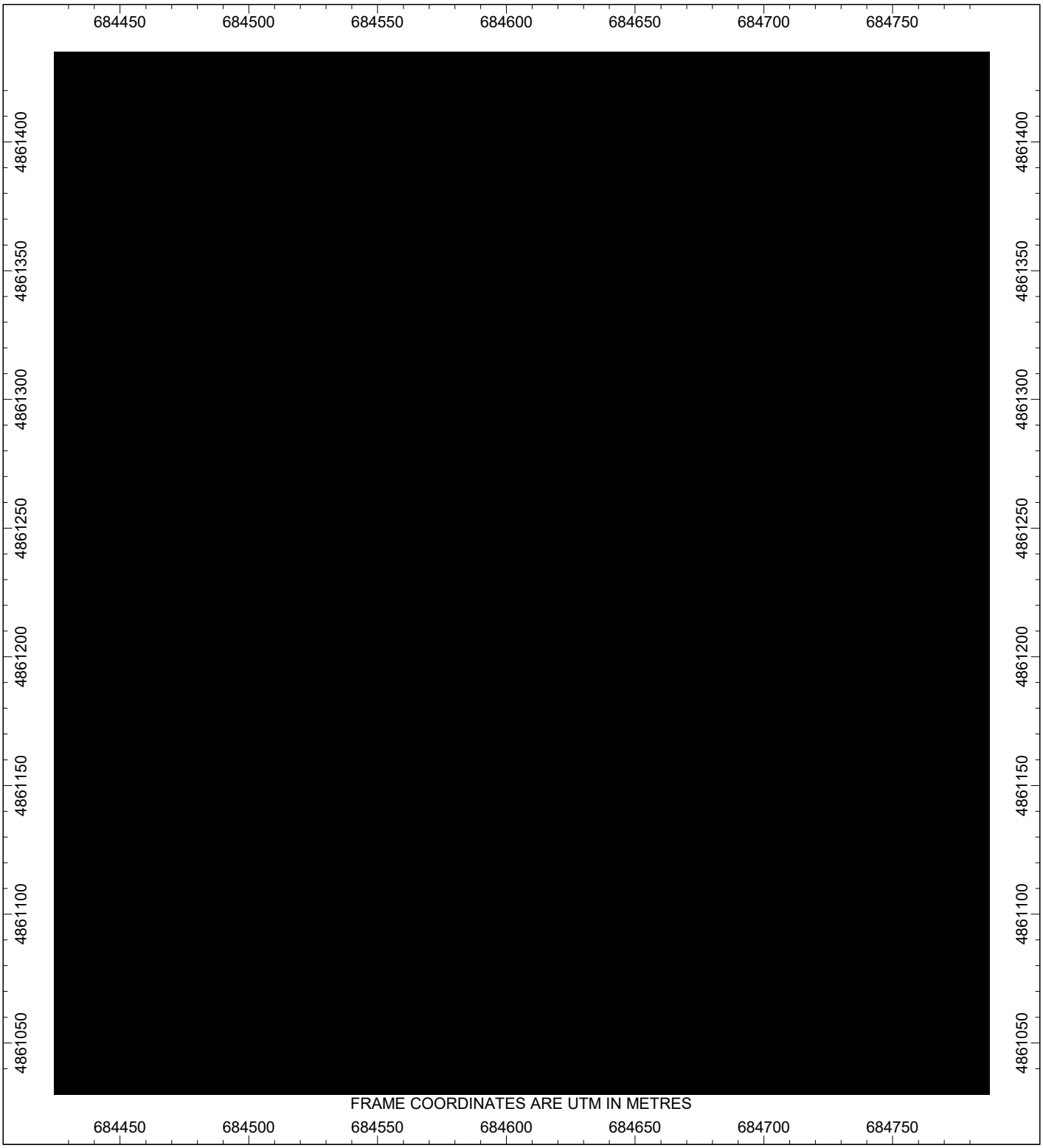


Figure 3B: Locations of Noise Sources

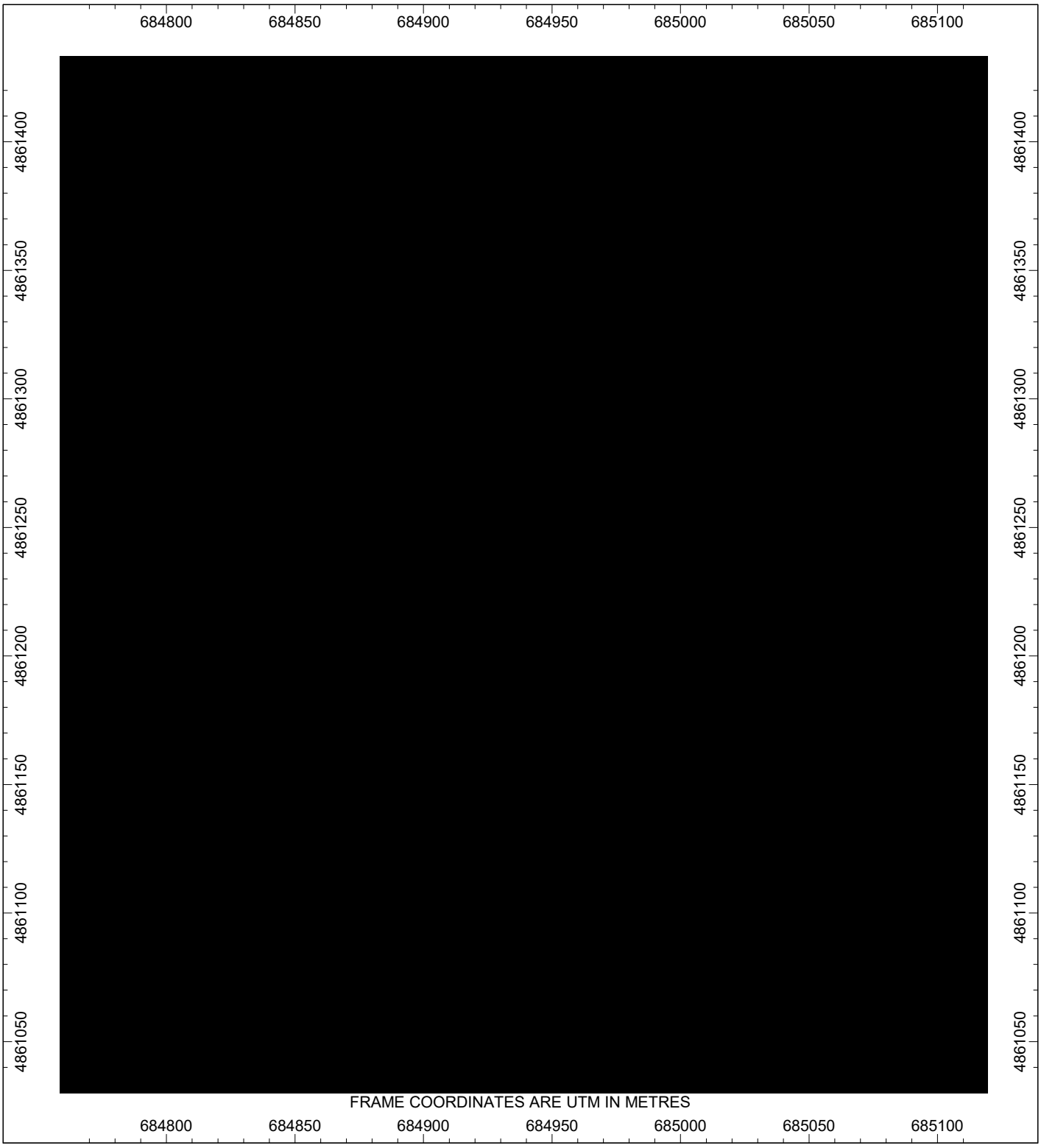


Figure 3C: Locations of Noise Sources

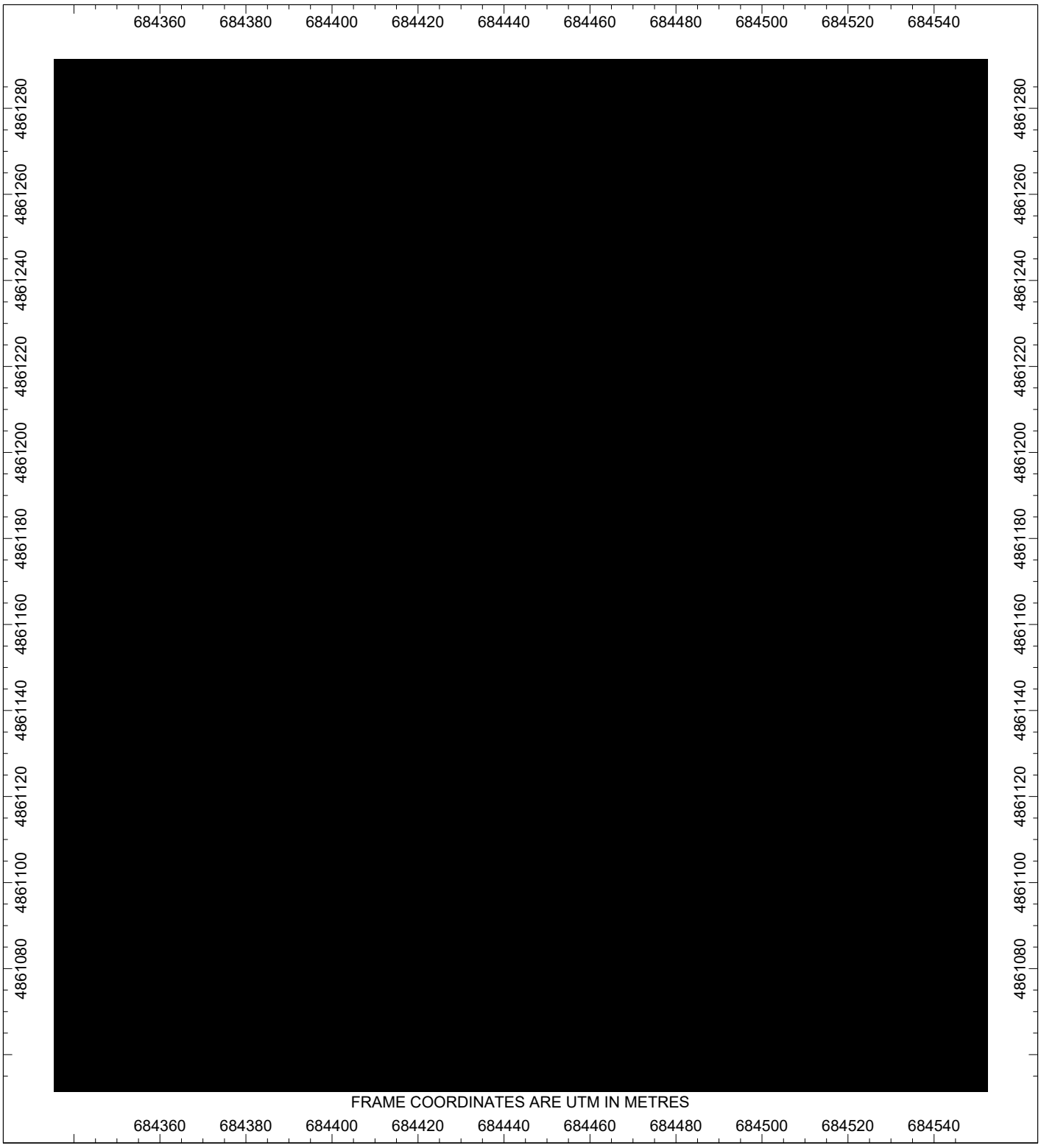


Figure 3D: Location of Noise Sources

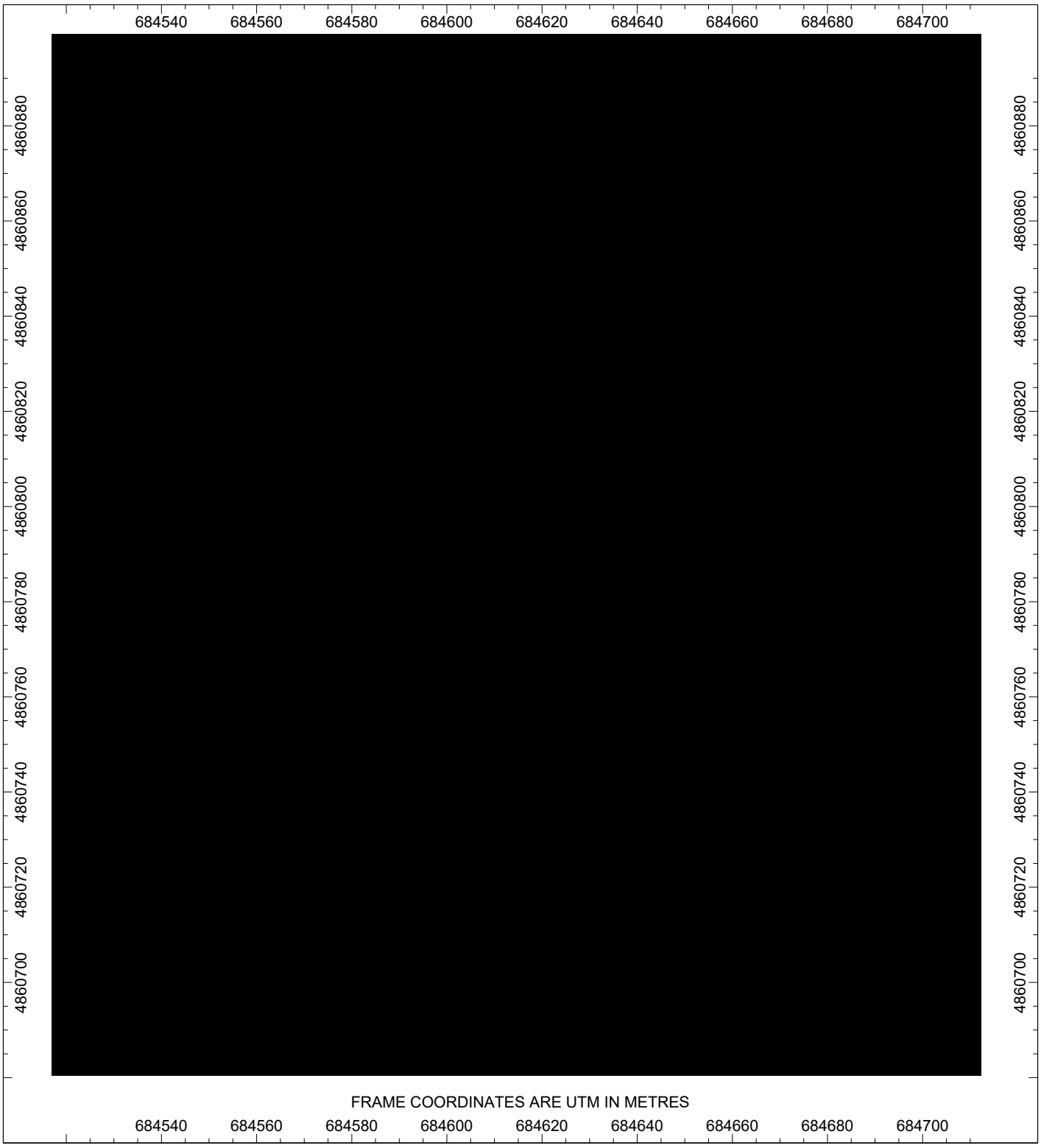


Figure 3E: Locations of Noise Sources

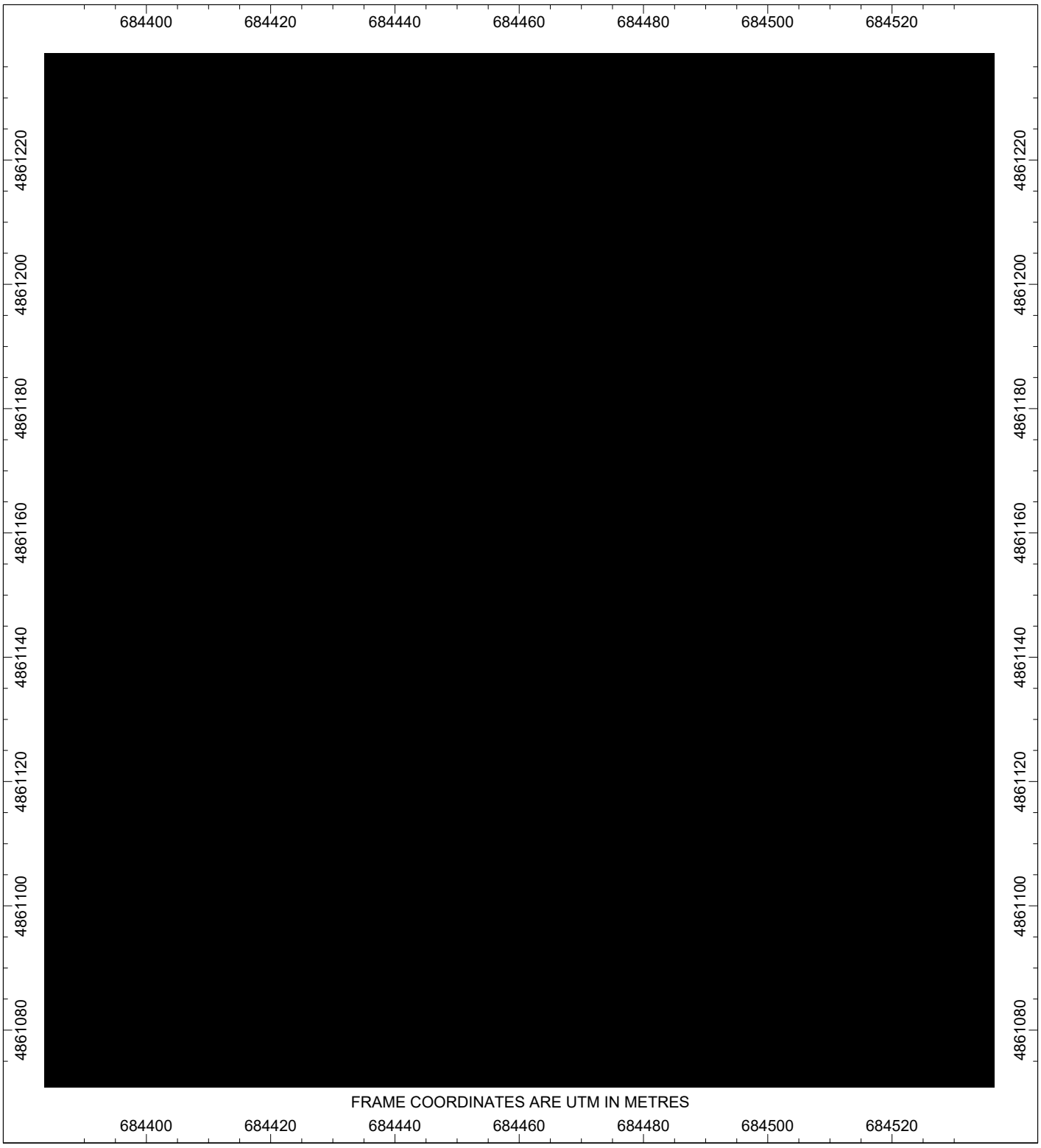


Figure 3F: Site Plan Showing Location of Noise Barrier
Hagen 4 Plant

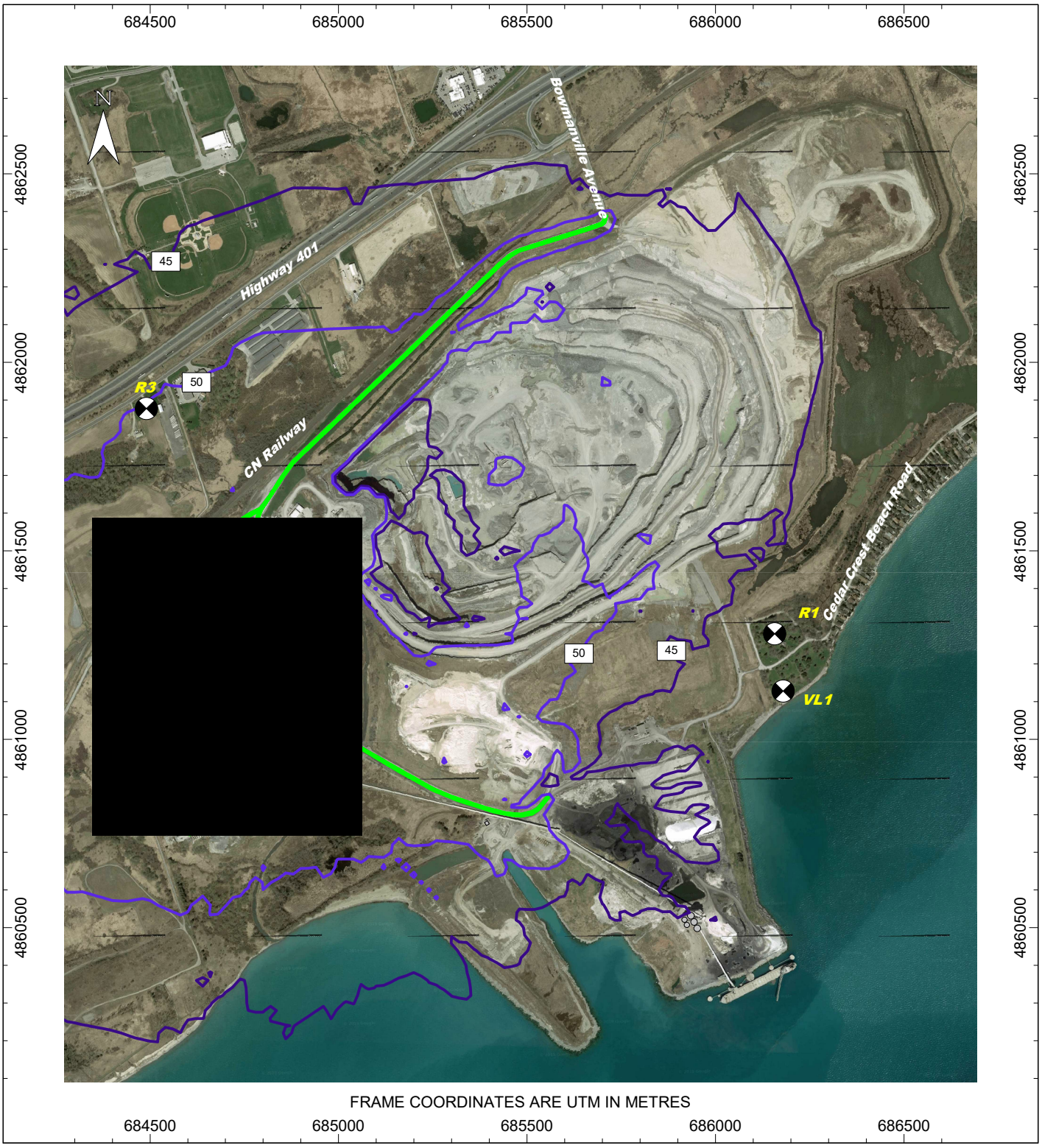


Figure 4: Predicted Sound Level Contours, Leq [dBA], Non-Emergency Equipment
Prediction Elevation = 1.5 m Above Grade



Figure 5: Predicted Sound Level Contours, Leq [dBA], Emergency Equipment
Prediction Elevation = 1.5 m Above Grade

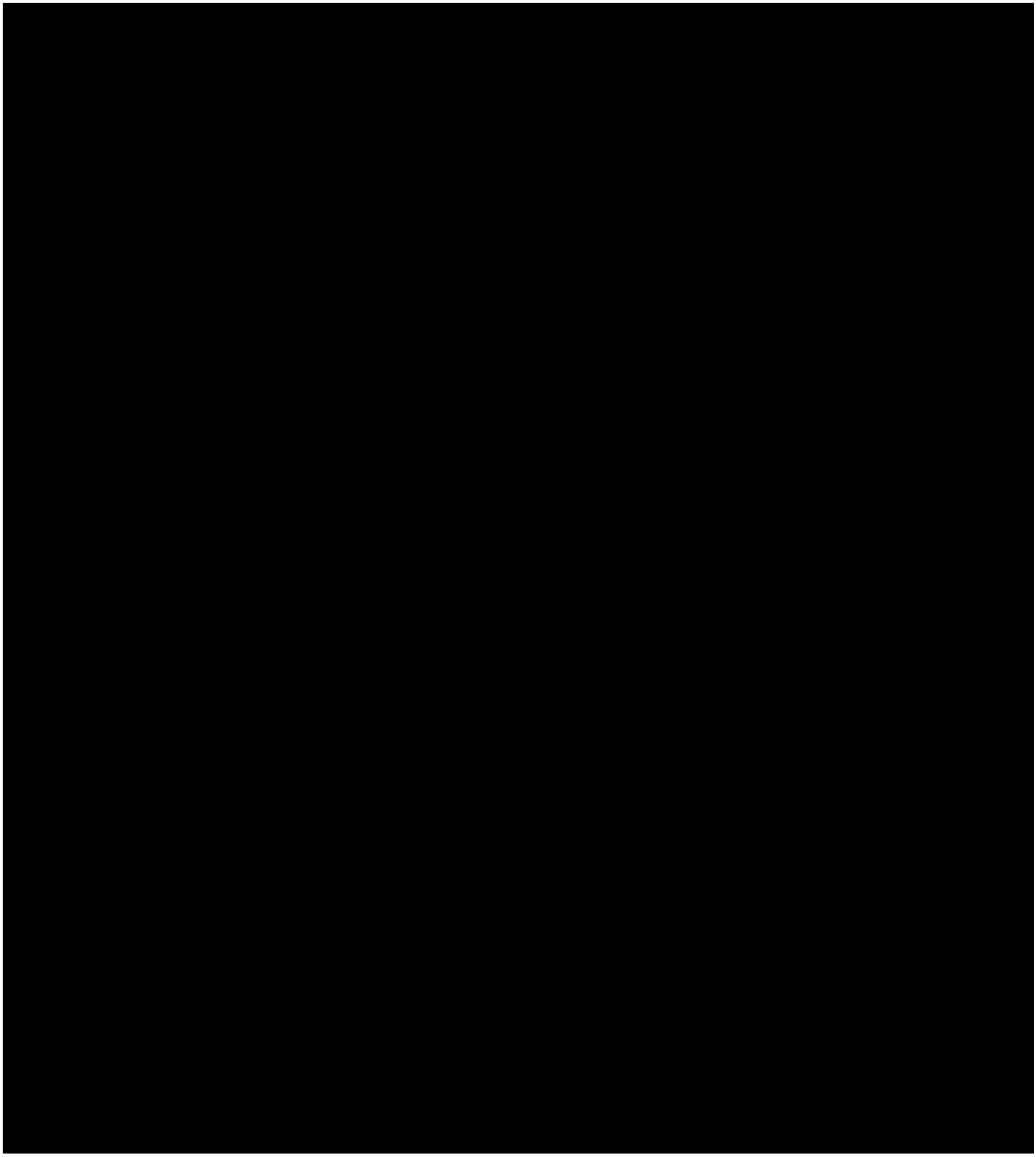
Appendix A
Acoustic Assessment Summary

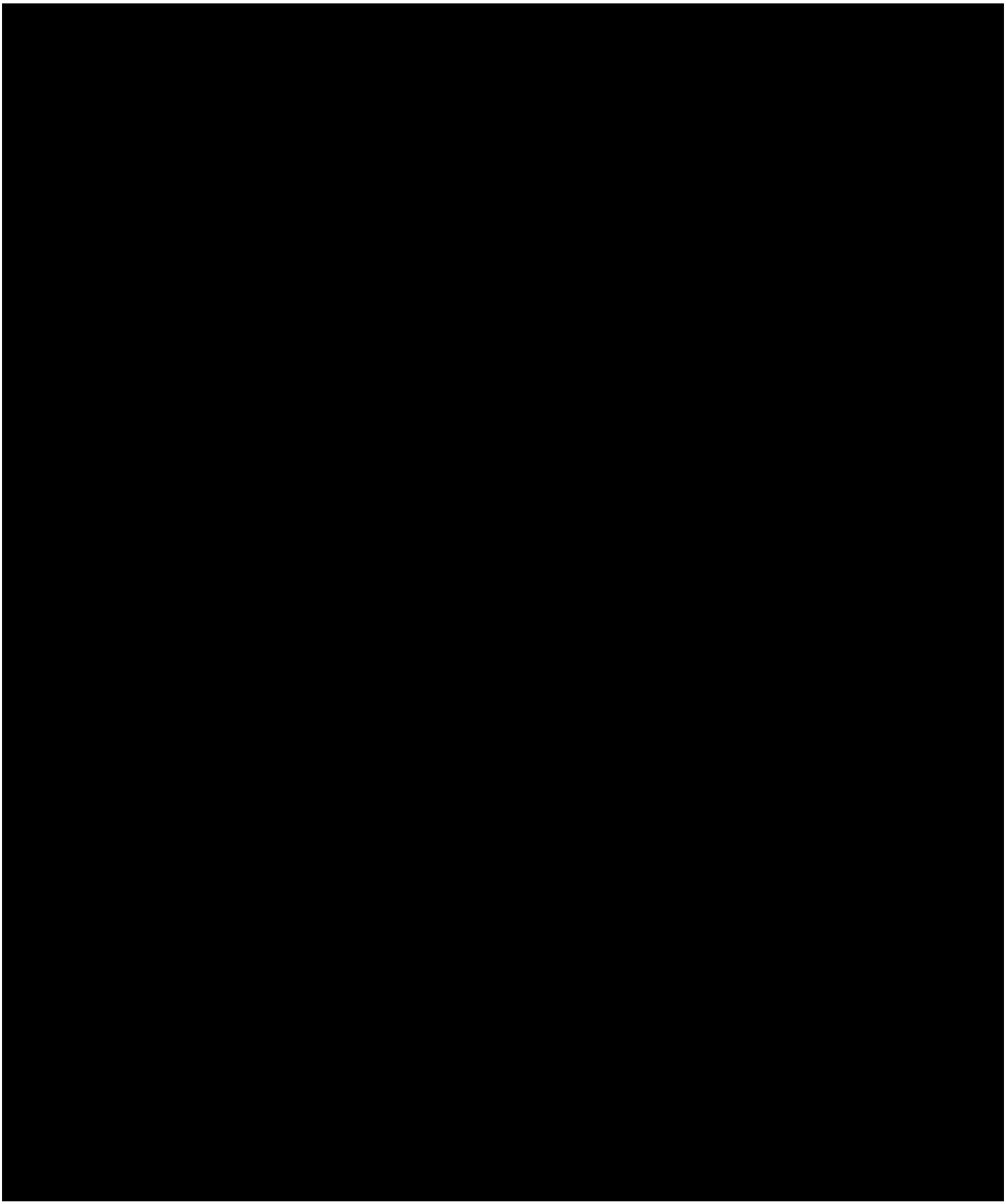
Acoustic Assessment Summary Tables

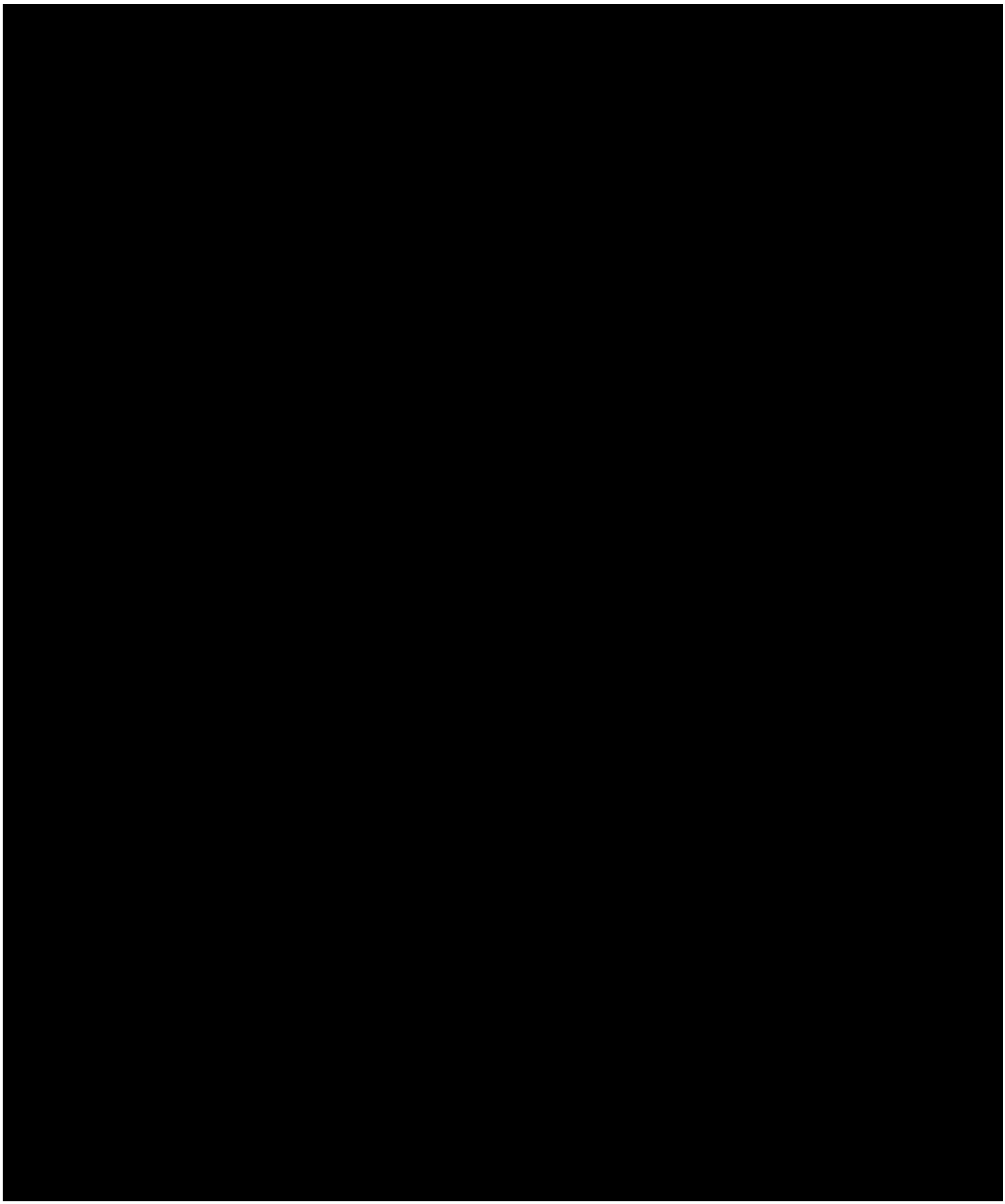
Version Control

St. Marys Cement Inc. (Canada), Bowmanville, Ontario

Ver.	Date	Issued As Part of AAR?	Version Description	Prepared By
1.0	12-Aug-2010	Y	Original version of tables as part of Ver. 1 of Acoustic Assessment Report	M. Munro
2.0	16-Apr-2012	Y	Original version of tables as part of Ver. 2 of Acoustic Assessment Report	C. Kinart
3.0	13-May-2014	Y	Updated version of tables as part of Ver. 3 of Acoustic Assessment Report	C. Kinart
4.0	29-Sep-2020	Y	Updated version of tables as part of Ver. 4 of Acoustic Assessment Report	C. Kinart
5.0	14-Jun-2024	Y	Updated version of tables as part of Ver. 5 of Acoustic Assessment Report	C. Kinart
6.0	25-June-2025	Y	Updated version of tables as part of Ver. 6 of Acoustic Assessment Report	H. Cai
7.0	06-Nov-2026	Y	Updated version of tables as part of Ver. 7 of Acoustic Assessment Report	H. Cai







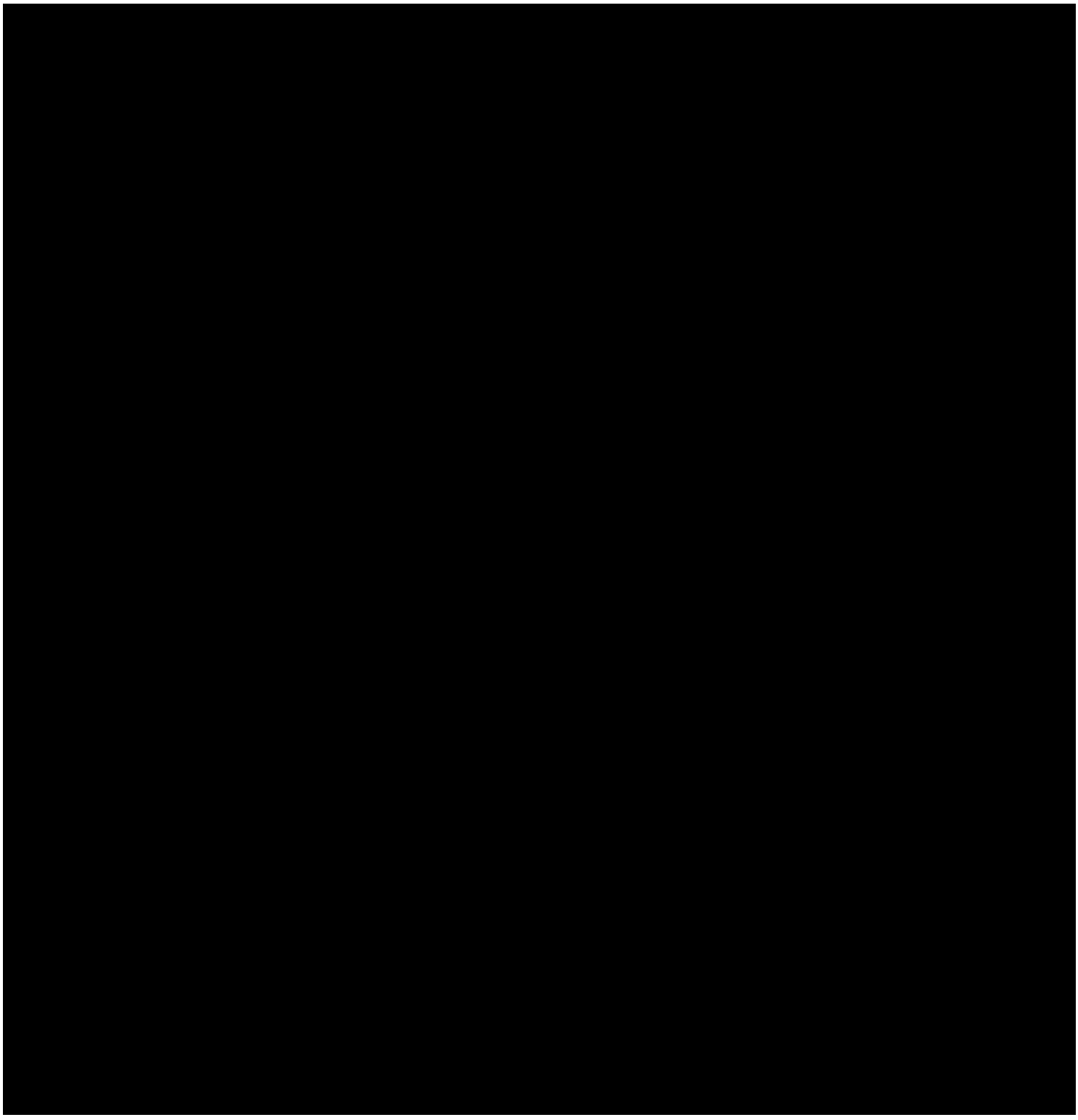
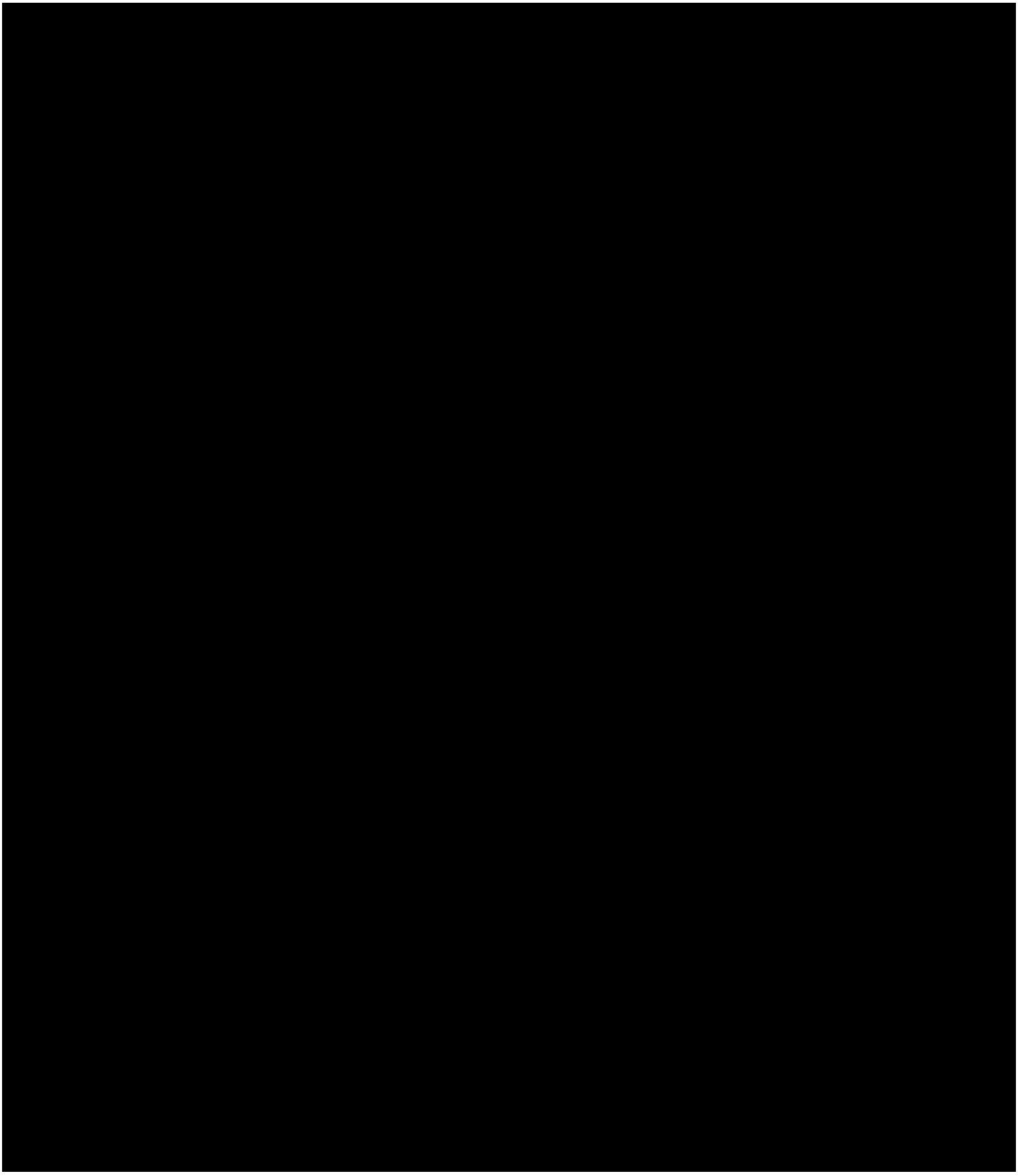
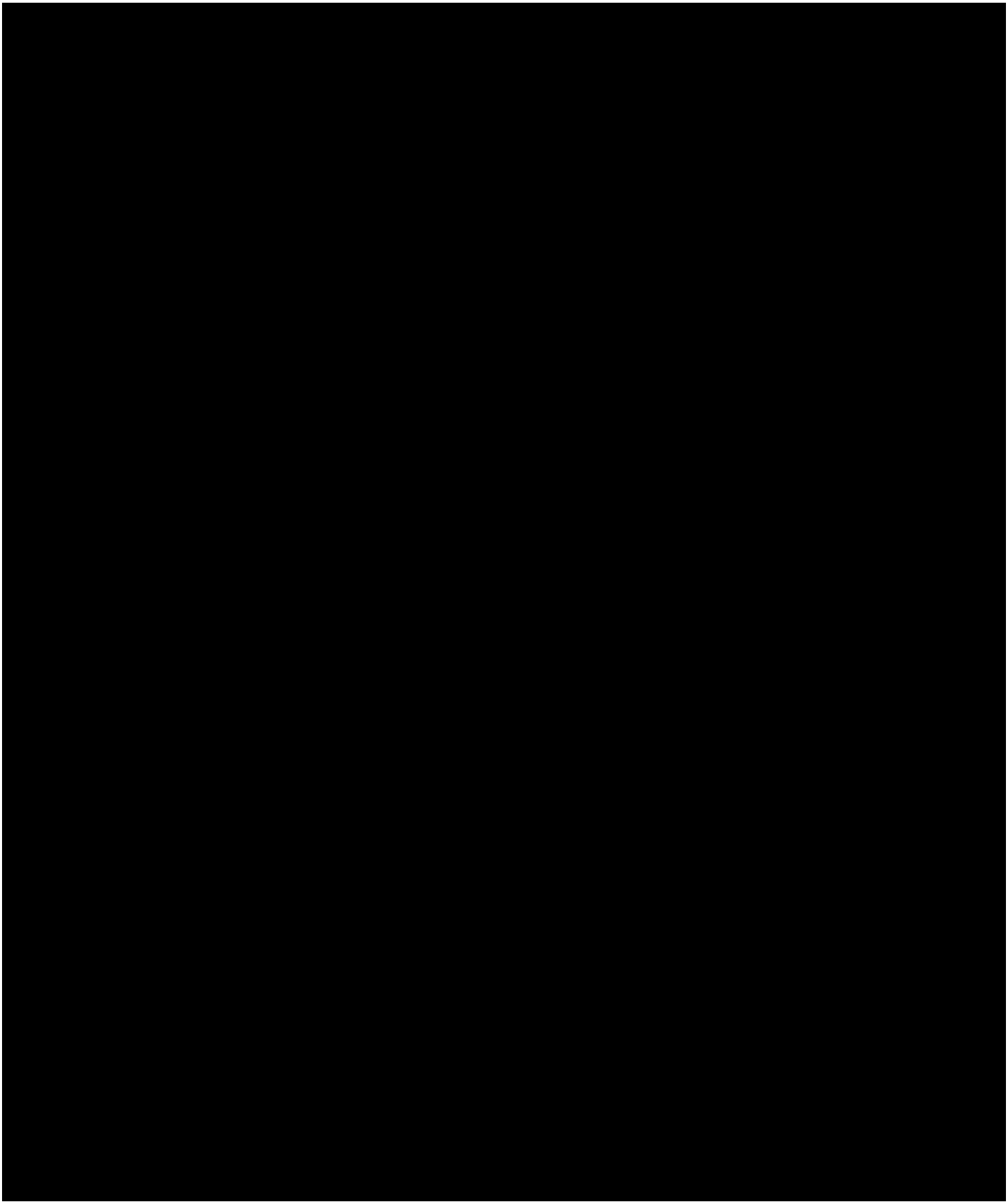
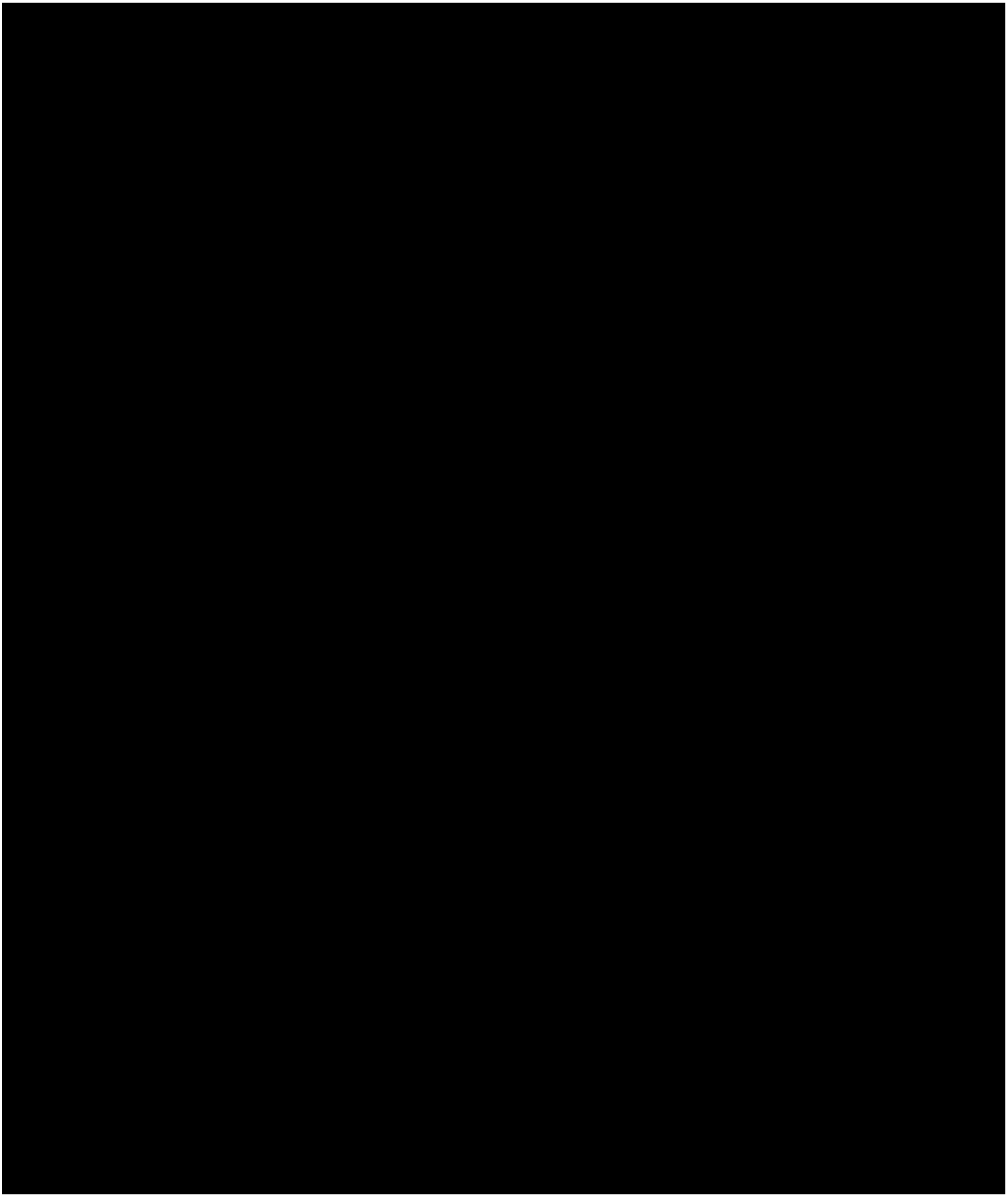


Table A2: Point of Reception Noise Impact Table







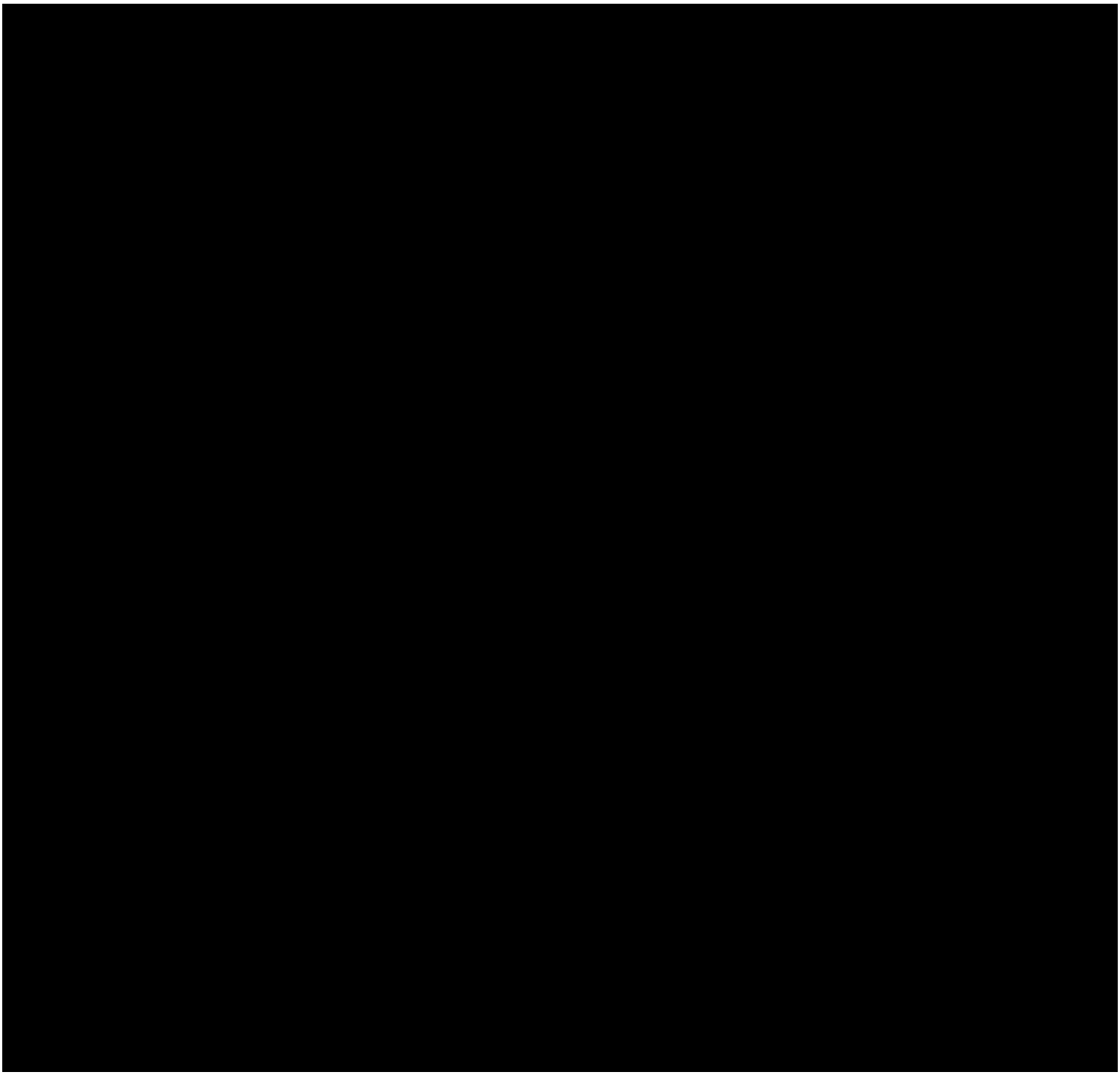


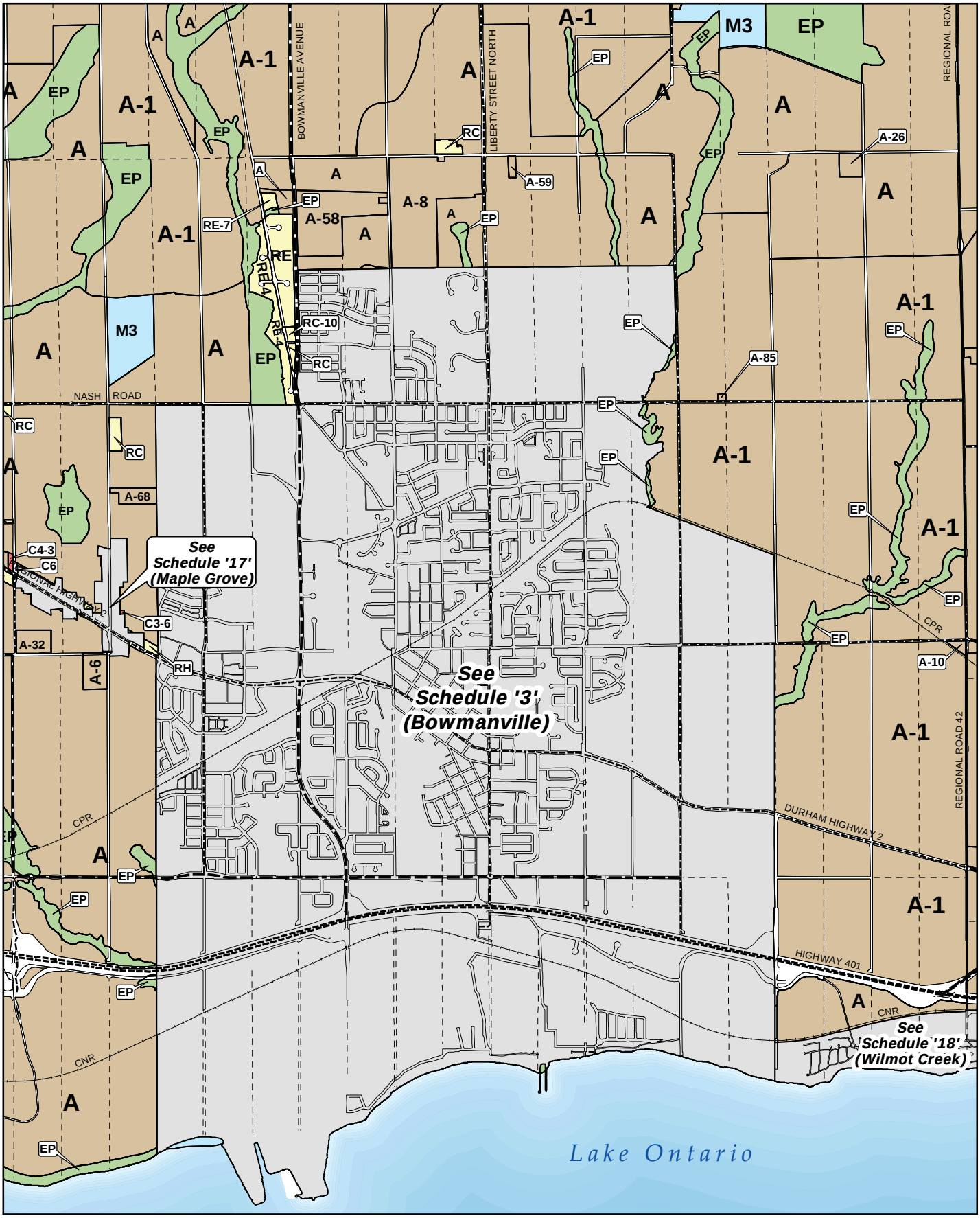
Table A3.1: Acoustic Assessment Summary Table - Non-Emergency Equipment

Point of Reception	Point of Reception Description	Sound Level at Point of Reception, LEQ [dBA]			Performance Limit, LEQ [dBA]	Compliance with Performance Limit	Acoustical Classification Area	Verified by Acoustic Audit
		SMC Facility without Proposed ALCF Modifications	Proposed ALCF Modifications Only	SMC Facility, Total (with Proposed ALCF Modifications)				
R1	Two storey home approx. 1450 m southeast of cement plant	41	9	41	45	Yes	Class 2	No
R3	Non-conforming single storey home approx. 350 m north of cement plant	50	25	50	50	Yes	Class 1	No
VL1	Vacant residential lot approx. 1490 m southeast of cement plant	41	9	41	45	Yes	Class 2	No

Table A3.2: Acoustic Assessment Summary Table - Emergency Equipment

Point of Reception	Point of Reception Description	Sound Level at Point of Reception, LEQ [dBA]	Performance Limit, LEQ [dBA]	Compliance with Performance Limit	Acoustical Classification Area	Verified by Acoustic Audit
R1	Two storey home approx. 1450 m southeast of cement plant	16	50	Yes	Class 2	No
R3	Non-conforming single storey home approx. 350 m north of cement plant	31	55	Yes	Class 1	No
VL1	Vacant residential lot approx. 1490 m southeast of cement plant	21	50	Yes	Class 2	No

Appendix B
Zoning Information



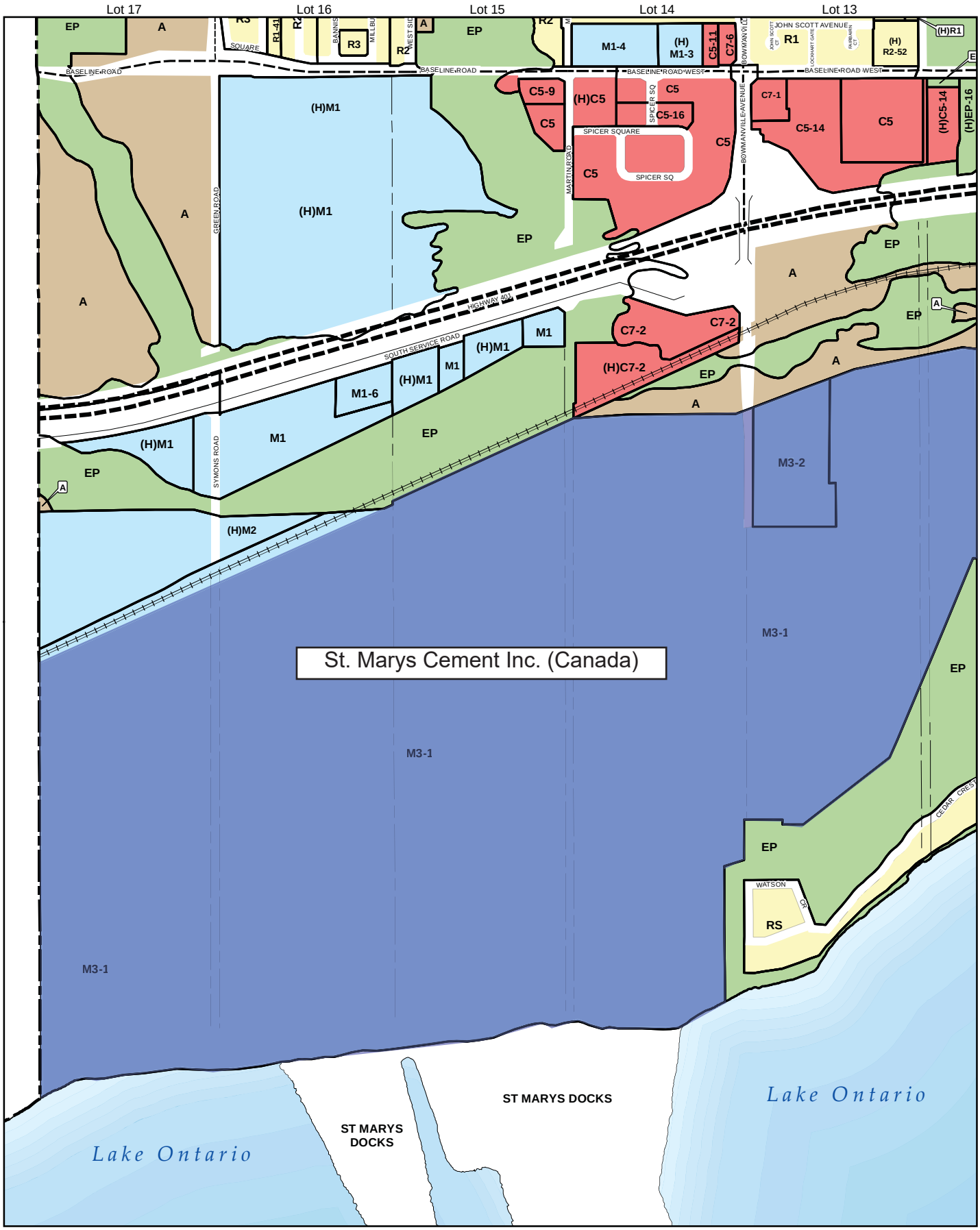
Residential
Commercial
Institutional
Industrial
EP
Agricultural

December, 2010

ZONE BOUNDARY
ARTERIAL ROAD TYPE 'A'
ARTERIAL ROAD TYPE 'B'

Municipality of Clarington
Zoning By-Law 84-63
Schedule 1 (Darlington)

1D
1A **1B** 2A



Residential
Commercial
Institutional
Industrial
EP
Agricultural

July, 2018

ZONE BOUNDARY
ARTERIAL ROAD TYPE 'A'
ARTERIAL ROAD TYPE 'B'

Municipality of Clarington
Zoning By-Law 84-63
Schedule 3 (Bowmanville)

3D
1B **3A** 3B



Residential
Commercial
Institutional
Industrial
EP
Agricultural

December, 2010

ZONE BOUNDARY
ARTERIAL ROAD TYPE 'A'
ARTERIAL ROAD TYPE 'B'

Municipality of Clarington
Zoning By-Law 84-63
Schedule 3 (Bowmanville)

3E
3A **3B** 3C

4. Zones and Zone Mapping

Zones

For the purposes of this By-law, the following zones are used and the same are established within the defined areas on the Schedules attached hereto.

Section/Zone Symbol/Zone Title

5	EP	Environmental Protection
6	A	Agricultural
7	RC	Rural Cluster
8	RE	Residential Estate
9	RH	Residential Hamlet
10	RM	Residential Mobile Home
11	RS	Residential Shoreline
12	R1	Urban Residential Type One
13	R2	Urban Residential Type Two
14	R3	Urban Residential Type Three
15	R4	Urban Residential Type Four
15A	P1	Major Institutional Zone
16	Cl	General Commercial
16A	MU	Mixed Use
17	C2	Neighbourhood Commercial
18	C3	Hamlet Commercial
19	C4	Special Purpose Commercial
20	C5	Special Purpose Commercial (Serviced)
21	C6	Service Station Commercial
22	C7	Service Station Commercial (Serviced)
22A	C8	Large Format Commercial
22B	C9	Street Related Commercial
22C	OC	Office Commercial
23	M1	Light Industrial
23A	MO1	Energy Park Office
23B	MO2	Energy Park Prestige
23C	ML1	Energy Park Light Industrial
23D	ML2	Energy Park General Industrial
23E	MP1	Technology Park Prestige
23F	MP2	Technology Park Prestige
23G	MP3	Technology Park Light Industrial

23H	MP4	Technology Park Mixed Use Corridor
24	M2	General Industrial
25	M3	Extractive Industrial

Appendix C
Measurement Methods and Instrumentation

All instrumentation was within its laboratory calibration period. Field checks of correct calibration were made before and after the measurements. Weather conditions during the site visits were suitable for outdoor acoustical measurements.

Sound intensity measurement techniques were employed to measure the sound power of each source. Methods from ISO 9614-2 "Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning" [7] were employed in this regard. Sound intensity measurement instrumentation has a high inherent ability to reject extraneous sounds originating from outside the measurement control-volume, and can therefore separate the sound emitted by each component. The measurements were conducted in 1/3 octave bands using a Hewlett Packard model 3569A Real Time Frequency Analyzer, connected to a G.R.A.S. model 50AI-HP sound intensity probe, equipped with a phase-matched pair of G.R.A.S. type 40AK condenser microphones.

Appendix D
Acoustically Insignificant Sources

The following ESDM sources were found to be acoustically insignificant during the various site visits, or are associated with below-grade quarry operations adjoining the site and have not been included in this assessment:

Table D1: List of Insignificant Sources

Source ID	Source Description
BHTRUCK	Truck Loading Silo Baghouse
CBH	Clinker Cooler Baghouse
CFSILO	Storage Silo Baghouses
CKD	Temp. Storage and Transfer of CKD
FFS	Fuel Feed System Baghouses
FMHEAT	Propane-fired Heater – Finish Mill Building
FUELHD	Delivery of Fuel
KDBLD	Kiln Feed Building Baghouses
LBIN	Loading Bin Baghouses
LUNCHR	No. 2 Oil Heaters - Lunch Rooms
MAINSH	No. 2 Oil-fired Heater - Service Room
NTT	North Transfer Tower
PCRUSH	Primary Crusher Baghouse
QGARAGE	Propane-fired Heater – Quarry Office
QUARRY	Quarry Operations
SCREEN	Screen Baghouse
SGCRUSHE	Slag/gypsum Crusher Baghouse
SGHOPPER	Slag/gypsum Hopper
SLAG	Slag crusher and loader
TT	Transfer Tower
TT2	Cement Transfer Tower
TT3	Transfer Tower

Appendix E
Details of Predictive Acoustical Modelling

The source sound power levels were used as input to a predictive computer model (Cadna-A Version 2026 MR1 build 215.5625). The model is based on the methods from ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors" [8], which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures (or by topography and foliage where applicable). This modelling technique is acceptable to the MECP.

Digital topographical data for the subject site was provided by SMC, and Ontario Base Maps were obtained for the area surrounding the site; all topographical data was input into the acoustic model and supplemented based on site observations, where appropriate. Ground attenuation was assumed to be spectral for all sources, with the ground factor (G) assumed to be 0.4 on roadways and amongst the plant buildings on the SMC site and 1.0 in all other areas, each chosen to achieve optimal agreement between predictions and the sound levels measured both offsite and at a number of locations around the facility. 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 verified via an iterative convergence analysis with successively increasing orders of reflection), with shielding/reflections afforded by buildings both on and off the subject site. Spectral absorptive characteristics were applied to each structure as appropriate, typically with values representative of corrugated metal, concrete block or steel.

Most mechanical sources were modelled as point sources of sound (shown as green crosses in Figures 3A through 3F, 4 and 5). Several building envelopes and open doors were modelled as vertical area sources (shown as green lines next to building facades in Figures 3A through 3F and 4). Several screw conveyors were modelled as line sources, as were onsite movements of trucks (shown as thin lines in Figure 3A through 3F and 4). Time weighting factors were applied to the sound from on-site trucks based on a speed of 40 km/h.

Appendix F
Acoustically Assessment Criteria

MECP Publication NPC-300 draws a distinction between sound produced by traffic sources and that produced by industrial or commercial activities, which are classified as stationary sources of sound. In essence, the sound from the stationary sources is evaluated against (i.e. compared to) the typical background sound at any potentially impacted, sound-sensitive points of reception (e.g., residences). Background sound is considered to include road traffic sound and other typical sounds, but excludes the sound of the facility under assessment. 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.

Publication NPC-300 stipulates that the sound level limit for a stationary source which operates continuously, 24 hours per day, in a Class 1 (urban) or Class 2 (semi-urban) environment is the greater of the minimum one-hour energy-equivalent (L_{EQ}) background sound level, or the exclusionary minimum limit of 45 dBA. The guideline also stipulates 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.

Non-Emergency Equipment

The characteristic background sound level can be determined through automated long-term measurement, or by predictive analysis based on road traffic volume counts, in cases where the background sound is dominated by road traffic.

The applicable sound level limits were prepared when NPC-205 was the MECP guideline in use for Class 1 and Class 2 areas. The sound level limits in NPC-300 do not differ from those of NPC-205, in the context of the subject site, and thus the previously approved limits remain unchanged, and are 45 dBA at location R1 and 50 dBA at location R3. Details regarding the derivation of the applicable limits are included below.

Locations R1 and VL1

Observations and measurements conducted in the vicinity of location R1 and VL1 indicate that background sound levels are likely to fall below the exclusionary minimum levels set out by NPC-300 during the quietest hours of the night. Accordingly, the exclusionary minimum limit of 45 dBA is applicable at locations R1 and VL1.

Location R3

Background sound level monitoring was conducted by Aercoustics Engineering Limited from December 4 through December 6, 2009 in the vicinity of location R3, when the SMC site was shut down (included at the end of this Appendix). The minimum measured hourly L_{EQ} sound level during nighttime hours was 57 dBA. However, the sound level monitoring was conducted at a location representative of the north façade of location R3, whereas the most potentially impacted location on this property is the south façade, as this location is most exposed to the site under assessment and is shielded from Highway 401 by the home itself. A correction factor of 15 dBA was therefore applied to the minimum monitored sound levels outlined above to estimate the background sound due to Highway 401 at the rear façade of the home represented by location R3. This correction factor is consistent with that factor specified in the MECP publication, "Environmental Noise Assessment in Land Use Planning". Given the preponderance of road traffic on Highway 401 (a significant portion of which is heavy trucks), and the modest degree of shielding afforded by the bungalow represented as location R3, a correction factor of 15 dBA to account for shielding afforded by this building likely underestimates the background sound significantly. Nevertheless, with the factor applied, the exclusionary minimum limit of 45 dBA would be conservatively applicable at location R3.

As outlined previously, receptor R3 is situated on lands zoned for Light Industrial use, and is therefore a non-conforming land use. It is located adjacent to several industrial facilities/operations, and thus the surrounding environment is not typical of a residential area. The MECP sound level limits do not strictly

apply to a non-conforming property, because by its very nature, a non-conforming use is inconsistent with the surrounding land uses and with the municipality's long-term planning objectives for the area. The zoning designation for these lands specifies that residential land uses are prohibited (Section 23 of the Municipality of Clarington Zoning Bylaw 84-63). On this basis, the sound level limits for SMC were previously established to be 50 dBA during the nighttime period, at location R3.

Emergency Equipment

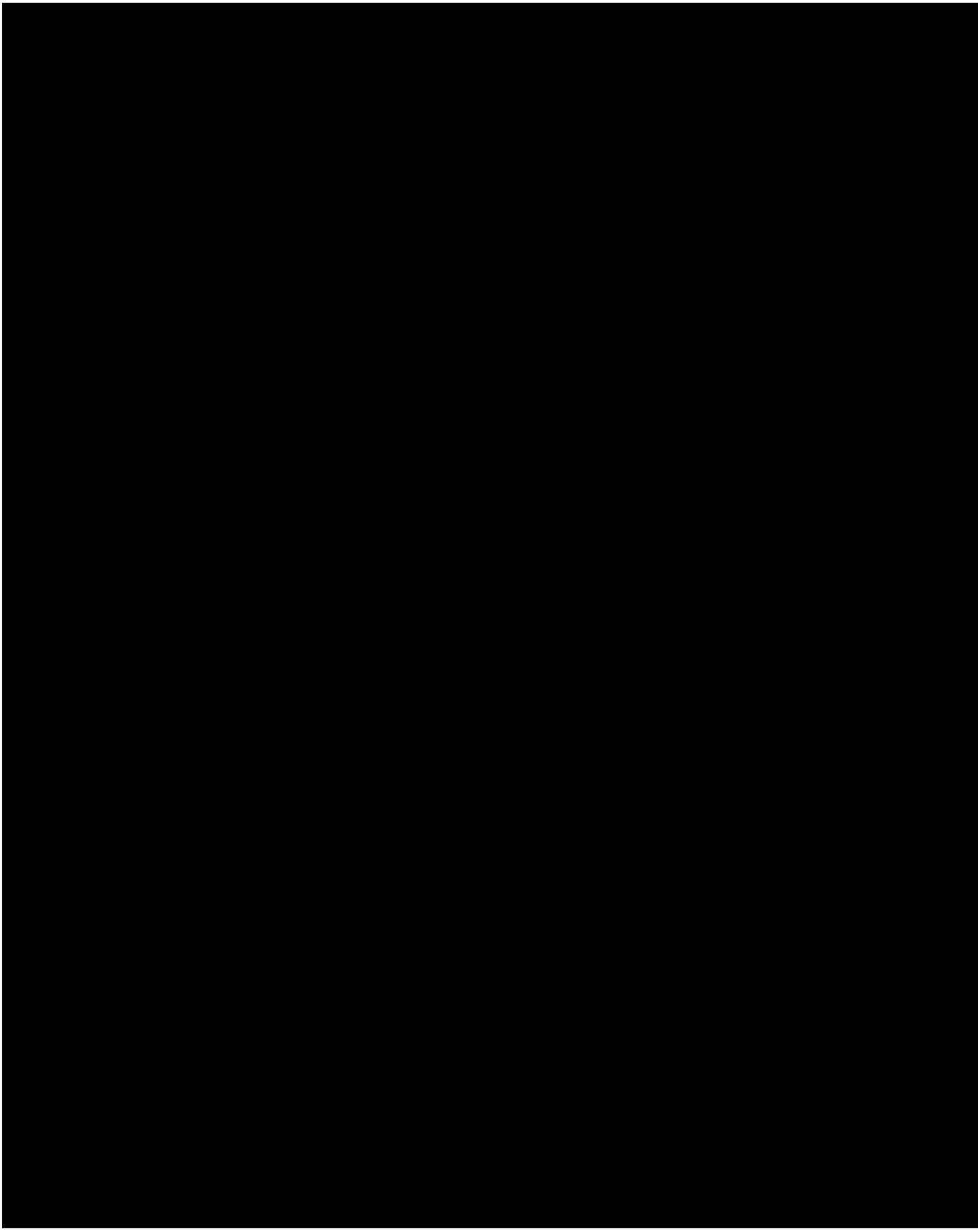
NPC-300 stipulates that sound emissions from emergency equipment operating in non-emergency situations, such as maintenance testing, be assessed independently of all other stationary sources of noise. Further, the sound level limits for emergency equipment are 5 dB greater than the limits otherwise applicable to stationary sources. Since the emergency generators at the subject site are tested during daytime hours only, the sound level limit applicable thereto is 5 dBA greater than the daytime limits for non-emergency equipment, as summarized in Table F1, below.

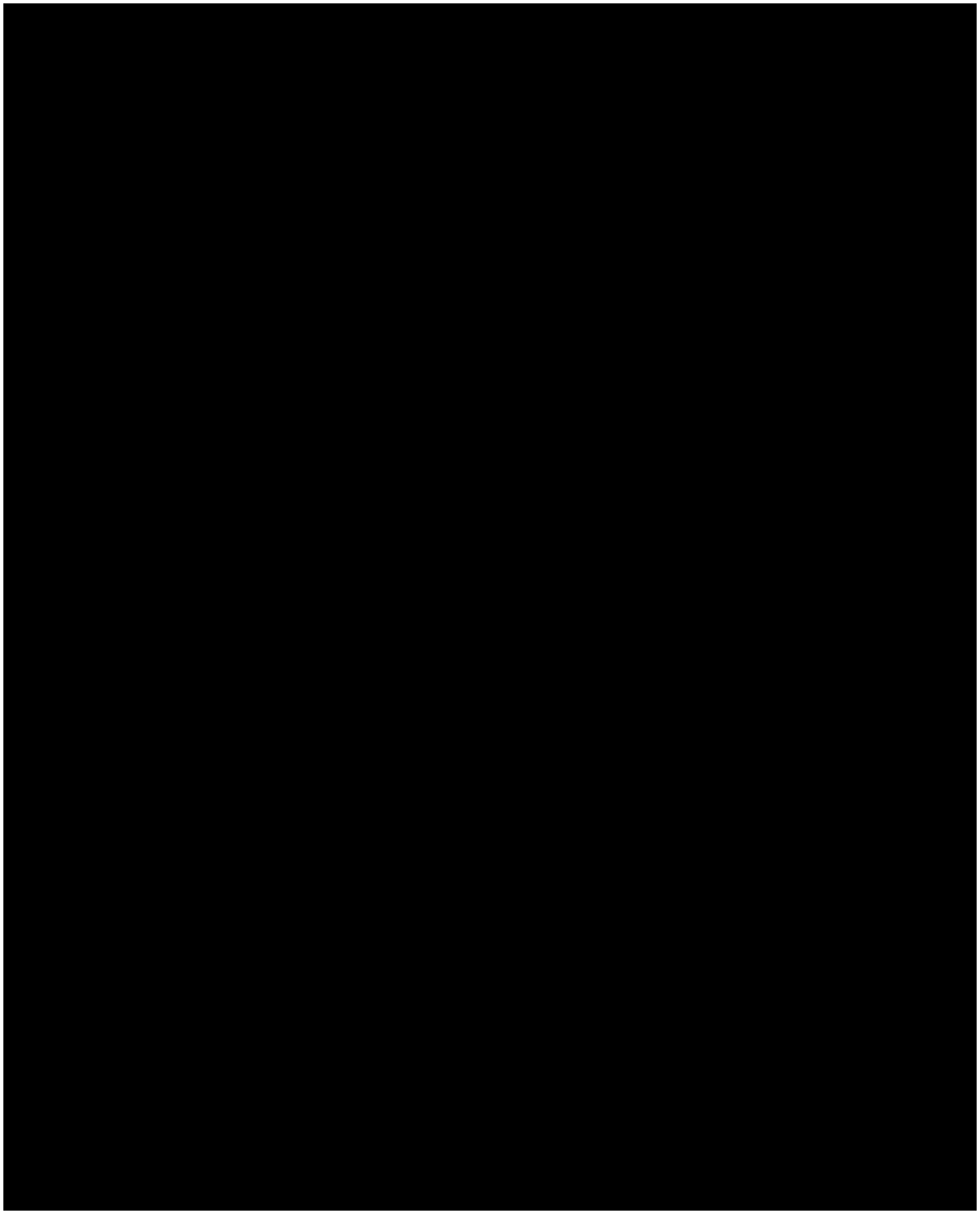
Table F1: Applicable Sound Level Limits at Points of Reception, L_{EQ} [dBA]

Receptor	Non-Emergency Equipment	Emergency Equipment
R1, VL1	45	50
R3	50	55

Appendix G
Sample Calculation Results, Condensed, Overall dBA Format

In the following tables of calculation results, the column headings for the various sound attenuation mechanisms follow the terminology of ISO Standard 9613-2. Lx is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) source sound power level, which includes the effects of any source-abatement measures included in the model, and any time-averaging effects for intermittent sources. Lr is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) sound level at the point of reception. The results are presented in terms of overall A-weighted results, at the most impacted off-site point of reception.





Appendix H
Sample Calculation Results, Octave Band Format

In the following tables of calculation results, the column headings for the various sound attenuation mechanisms follow the terminology of ISO Standard 9613-2. Lx is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) source sound power level, which includes the effects of any source-abatement measures included in the model, and any time-averaging effects for intermittent sources. Lr is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) sound level at the point of reception. The results are presented in terms of full octave band sound levels, at the most impacted off-site point of reception.

