Environmental Noise Feasibility Report

Evergreen Community

Proposed Mixed-use Development

Tremaine Road and Dundas Street
City of Burlington

July 2015
Project: 113-425-200

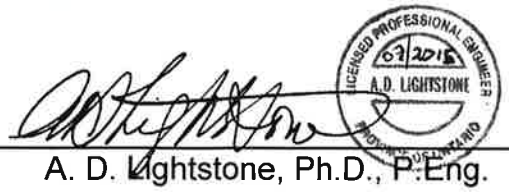
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VALCOUSTICS

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Environmental Noise Feasibility

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1.0 INTRODUCTION

The vacant lands north of Dundas Street and west of Tremaine Road, known as Evergreen, in the City of Burlington are proposed to be developed as a mixed-use community including a major component of residential. An Official Plan Amendment (OPA) and Rezoning will be required. This environmental noise feasibility study is to support the proposed OPA, rezoning and draft plan of subdivision required to facilitate such development.

Road and rail and existing stationary noise sources are assessed and appropriate noise mitigation measures are proposed in order to achieve compliance with the applicable Ministry of the Environment and Climate Change (MOE) noise guidelines. The primary noise source of concern is road traffic on several major thoroughfares.

As far as potential stationary sources of noise are concerned, lands on the east side of Tremaine Road, north of Dundas Street in the Town of Oakville are currently vacant but designated for employment uses in the North Oakville West Secondary Plan. As expressed in the Planning Services Department report (PD-031-12) of April 11, 2012, to the Planning and Development Council Meeting of April 30, 2012, Town of Oakville staff are concerned that residential uses on the Evergreen lands could negatively impact the development of employment uses within the North Oakville West Secondary Plan because of potential land use incompatibility due to environmental noise. Industrial employment uses and many commercial land uses are known as "stationary sources" in MOE terminology. This report also addresses this specific aspect.

To address the employment lands issue, this report provides an overview of provincial policies, legislation, official plan policies, MOE noise and land use compatibility guidelines and, environmental noise requirements that employment uses (stationary sources) must address and discusses the ramifications of implementing the intended land uses on both sides of Tremaine Road, north of Dundas Street.

2.0 SITE AND AREA DESCRIPTION

Figure 1 shows a key plan of the area.

The subject lands extend between Dundas Street and Highway 407, on the west side of Tremaine Road and are mostly vacant. The western edge of the site at about 730m west of Tremaine Road, has an irregular boundary with a natural Heritage area including the Bronte Creek. The northerly part of the site includes a wood lot. There is also an existing wood lot fronting onto Dundas Street, at the south west corner of the Evergreen lands.

There are properties, some with existing uses, within the overall boundary of the lands in question (Dundas Street to Highway 407, Tremaine Road to Bronte Creek) that are not part of the site:

1. 5331 and 5361 Dundas Street (two properties) on the north side of Dundas Street, just east of Bronte Creek; vacant; owned by the Province.

2. 5401 Dundas Street, on the north side of Dundas Street, just east of the Provincial lands, occupied by First Student Inc. bus facility. This use is expected to continue.

3. 5371 Dundas Street, on the west side of the bus facility, occupied by a one storey single family residence. This use is expected to continue.

There are two existing residential uses that are part of the site:

1. 5421 Dundas Street on the east side of the bus facility, occupied by a two storey heritage single family residence (Norton House). In the short term, this residential use is expected to continue. In the long term, there is the possibility this facility may be converted to a nature interpretive centre.

2. 3278 Tremaine Road, on the west side of Tremaine Road, about 260 m south of Highway 407, occupied by a one storey single family residence. In the short term, this residential use will continue. Ultimately, subject to the timing of build-out, this residence will be replaced by the proposed development.

To the west of Bronte Creek, on the north side of Dundas Street, there is the Hanson Brick Ltd. manufacturing facility and quarry. The quarry is expended and is replaced by a new quarry north of Highway 407, west of Tremaine Road. This is the Hanson Brick Tansley quarry, providing raw material to the brick factory.

Tremaine Road is the boundary between the City of Burlington and the Town of Oakville. On the east side of Tremaine Road are vacant lands intended for employment uses.

The area east of Tremaine Road in Oakville is addressed by the North Oakville West Secondary Plan, OPA 289. The land use strategy and permitted uses are found in Section 8.6. The Oakville lands in question are currently, mostly generally vacant for a distance of at least 1000 m east of Tremaine Road, between Dundas Street and Highway 407. These lands are designated as Employment District in the North Oakville West Secondary Plan.

To the west of the Hanson Brick facility is a CN railway right-of-way. The rail corridor is non-parallel to Tremaine Road, approaching closer to Tremaine Road at the north end of the Evergreen site, at a distance of about 415 m to the west side of the Evergreen lands. At the southerly end, at Dundas Street, the closest approach is about 980 m. At the middle of the Evergreen site, the closest approach to Evergreen of the railway is about 840 m.

3.0 THE PROPOSED DEVELOPMENT

Figure 2 shows the site preliminary draft plan. The proposed development will consist of:

- three and four-storey residential condominium, mixed-use buildings along a portion of Tremaine Road (shown as Blocks 401 to 403) and Dundas Street (Block 400);
- a mixed-use employment block (Block 399) at the corner of Tremaine Road and Dundas Street;
- two-storey business corridor blocks at the corner of Tremaine Road and Highway 407 (Blocks 396 to 398); and
- three-storey townhouses and two-storey single residential dwellings on the inner lots.

The two existing wood lots mentioned in Section 2 above will be retained (these are shown as Blocks 429 and 431).

4.0 POLICY, LEGISLATIVE BACKGROUND AND NOISE GUIDELINES

4.1 PROVINCIAL POLICY STATEMENT (PPS) 2014

The 2014 PPS was issued under Section 3 of the Planning Act. All planning matter decisions must be consistent with the policies in the 2014 PPS, as of April 30, 2014.

The PPS contains a specific policy related to land use compatibility and environmental noise.

> *1.2.6 Land Use Compatibility*
>
> *"Major facilities and sensitive land uses should be planned to ensure they are appropriately designed, buffered and/or separated from each other to prevent or mitigate adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term viability of major facilities."*

Sensitive land uses typically means residential and analogous land uses such as hospitals, nursing homes, etc., and long term care facilities as well as such land uses as daycare centres and educational facilities. Major facilities means infrastructure such as airports, transportation corridors, energy generation and transmission facilities, etc. as well as industries. Adverse effects are defined as in the Environmental Protection Act. See later.

We interpret policy 1.2.6 to mean that both potential sources of noise and sensitive uses need to be designed to prevent or mitigate adverse noise impact, typically on people at the sensitive land use. Where potential adverse noise impact is prevented or adequately mitigated, there is land use compatibility with respect to environmental noise.

Based on 1.2.6, the PPS does not insist that various, potentially incompatible land uses be addressed only by separation distances. The policy recognizes that there are alternatives to simply separating uses; such as appropriate design and other forms of mitigation (buffering and/or source noise control). Such approaches can be quite practicable. The matter of distance separation is discussed further below.

The PPS also has other policies relevant to land use compatibility, that encourage efficient use of land and intensification. All policies relevant to a particular situation are to be read together.

4.2 ENVIRONMENTAL PROTECTION ACT (EPA)

The EPA, in Section 14, prohibits the discharge of a contaminant into the natural environment, if the discharge causes or may cause an adverse effect. Sound (noise) and vibration are defined contaminants. The definition of "adverse effect" in the Act includes:

> *1.(1) (a) impairment of the quality of the natural environment for any use that can be made of it;*
>
> *© harm or material discomfort to any person;*
>
> *(g) loss of enjoyment of normal use of property;*
>
> *(h) interference with the normal conduct of business.*

As can be seen, the defined concepts of adverse effect are very broad.

Under Section 9 of the EPA, which is administered by the MOE, an industrial/commercial facility (stationary source) that emits a defined contaminant to the environment requires an Environmental Compliance Approval (ECA), to operate. In fact, a literal reading of the EPA shows that an ECA must be obtained, not just to operate, but prior to even constructing a new process or altering an existing process that emits a defined contaminant, even if the alteration reduces emissions.

To obtain an ECA, where there are sound or vibration sources and emissions, the facility must make formal application to MOE and show compliance with the applicable noise and vibration guidelines. (For other types of emissions, for example air, showing compliance with the air regulations is required.) For the case of environmental noise and vibration, there are no regulations under the EPA, as there are for air quality; only guidelines (discussed below), except for Ontario Regulation 346/12 which applies to noise from standby power systems (emergency power generators). For purposes of ECA's, the MOE treats Guideline NPC-300 as if it were a regulation. That is, it must be fully complied with in order to obtain an ECA.

4.3 MOE GUIDELINE D-1 “LAND USE COMPATIBILITY” and GUIDELINE D-6, "COMPATIBILITY BETWEEN INDUSTRIAL FACILITIES AND SENSITIVE LAND USES"

These MOE Guidelines (D series) are intended to assist in the planning process when new sensitive land uses are proposed within the potential influence area of existing facilities (stationary sources) or when new facilities are proposed where existing sensitive land uses would be within the new influence area. These guidelines are also relevant to planning land use designations in a "green field" context.

Guideline D-1 states:

"The objective of this guideline is to minimize or prevent, through the use of buffers, the exposure of any person, property, plant or animal life to adverse effects associated with the operation of specific facilities."

Environmental noise is one identified, potential, source of adverse effect.

Both Guideline D-1 and D-6 rely upon distance between stationary sources and sensitive land uses as the default approach to addressing potential impacts expressed either as "influence areas" or "minimum separation distances" according to the Class of Industrial Facility being considered. Other types of buffers or mitigation are recognized, such as sound barrier berms, walls or buildings. Where a specific site is proposed for development, it is the proponent's responsibility, to investigate, propose and implement alternative forms of mitigation that can be located either at the source, elsewhere on the facility site, on the sensitive land use site, or on intervening sites.

Where noise is an issue, Guideline D-6 (4.6.1) requires MOE Guideline LU-131 to be used. LU-131 has now been replaced by NPC-300.

The literal application of the separation distance recommendations of Guideline D-6 can be problematic.

The D-1 and D-6 guidelines are broad guidelines that consider a variety of potential environmental impacts, including noise and air quality, etc. Distance separation alone is generally not an efficient mitigation technique for noise, because of the non-linear relationship between sound level and distance from a source. That is, the rate of fall-off of sound level diminishes with increasing distance. Thus, relying on distance alone to create land use compatibility with respect to noise can lead to inefficient use of infrastructure and available land. Including mitigation such as sound barriers, building orientation (e.g., direction that loading docks face), or noise control at source (e.g., equipment selection, silencers on fans, etc.) can often lead to appropriate compliance with noise criteria and land use compatibility, using separation distances less than the minimum identified in the D-6 guidelines.

Furthermore MOE Guidelines D-1 and D-6 predate all versions of the PPS, more particularly the 2014 version, and the current noise guideline, NPC-300. In some respects, D-1 and D-6 are inconsistent with current planning policies. D-1 and D-6 together with recently replaced noise guideline LU-131 either discourage or attempt to preclude juxtapositioning stationary sources and sensitive land uses, such as residential in mixed use settings, contrary to the current reality in many municipalities and the PPS policies.

The MOE has updated the applicable noise guideline to address this type of situation (see NPC-300 below). However, D-1 and D-6 are in need of updating to be consistent with current planning objectives and policy in the Province.

It should be noted that in processing an application for an ECA where environmental noise is involved, MOE does not concern itself with the D-6 and distance separation approach; only whether there is compliance with the NPC-300 noise guidelines.

For these reasons, this report focuses on NPC-300.

4.4 ENVIRONMENTAL VIBRATION CRITERIA

There are no vibration regulations or guidelines that are formally part of the land use planning process in Ontario, although vibration is defined as an environmental contaminant in the EPA.

The MOE has had a draft proposed vibration guideline relating to the effects of impulse vibration on people in buildings for a number of years. An example of a source creating impulse vibration would be a metal stamping plant (e.g., producing auto parts). However, this vibration guideline has never been issued, although it is occasionally referred to and used by MOE. In the absence of any governmental regulations or guidelines, the railways have adopted their own vibration guidelines for reviewing proposed development adjacent to their rights-of-way. Canadian National Railways and Canadian Pacific Railways recommend a vibration velocity limit of 0.14 mm/sec overall (RMS).

Some guidance about vibration criteria for people in buildings including residential uses may be found in ISO 2631, "Evaluation of Human Exposure to Whole-Body Vibration". However, it does not contain specific vibration limit recommendations.

4.5 MOE GUIDELINE NPC-300, "ENVIRONMENTAL NOISE GUIDELINE, STATIONARY AND TRANSPORTATION SOURCES – APPROVAL AND PLANNING"

4.5.1 Introduction

In October 2013, MOE issued the updated noise guideline NPC-300 (although dated August 2013), replacing former noise guidelines LU-131, NPC-205 and NPC-232. Previously, LU-131 was the noise guideline for development of noise sensitive land uses such as residential. NPC-205 and NPC-232 were the noise guidelines applying to stationary sources for ECA's in urban/suburban and rural areas, respectively. One of the major difficulties with the use of the previous MOE documents related to inconsistencies/discrepancies between the noise guidelines with respect to stationary sources. This caused unnecessary confusion and difficulty in planning sensitive land uses in the vicinity of stationary sources.

NPC-300 consolidates and harmonizes the various (noise) requirements related to planning new noise sensitive land uses, planning new stationary noise sources and environmental approvals for stationary sources; removing many of the former discrepancies. NPC-300 is more consistent with the PPS. Another purpose of the consolidation of environmental noise requirements in NPC-300 is to emphasize the link between local planning and environmental approvals. See Section 4.6 also.

NPC-300, as did LU-131, also contains noise criteria for transportation (road, rail and aircraft) sources for new noise sensitive development. In this case, only road and rail traffic noise are relevant as transportation sources.

The noise limit criteria of NPC-300 are summarized in Appendix A.

4.5.2 Road and Rail Traffic Noise

In accordance with the MOE practice, if the daytime sound energy exposure, $L_{eq\,Day}$ (16-hour energy equivalent sound level – 0700-2300 hours), at the exterior face of living/dining rooms is greater than 65 dBA, or if the nighttime sound energy exposure, $L_{eq\,Night}$ (8-hour energy equivalent sound level – 2300-0700 hours), at the exterior face of bedrooms is greater than 60 dBA, means must be

provided so that windows can be kept closed, if desired, for noise control purposes and central air conditioning is required. For daytime sound exposures between 56 and 65 dBA inclusive, or for nighttime sound exposures between 51 and 60 dBA inclusive, there need only be the provision for adding air conditioning at a later date, at the occupant's discretion. A warning clause advising the occupants of the potential interference with some activities is also required.

For outdoor amenity areas ("Outdoor Living Areas" - OLA), the guideline is 55 dBA $L_{eq\ Day}$ (0700 to 2300 hours), with an excess not exceeding 5 dBA considered acceptable if it is technically not practicable to achieve the 55 dBA objective, providing warning clauses are registered on title. Note that for road traffic sources, a balcony is not considered an OLA, unless it is the only OLA for the occupant and it is:

- at least 4 m in depth;
- outside the building facade; and
- unenclosed.

For indoor areas, the daytime guideline for sensitive spaces such as living/dining rooms, and bedrooms, private offices and conference rooms is $L_{eq\ Day}$ = 45 dBA for road traffic and 40 dBA for rail sound sources. For general office, reception areas, retail stores, etc., the daytime indoor guideline limit is $L_{eq\ Day}$ = 50 dBA for road traffic and $L_{eq\ Day}$ = 45 dBA for rail. The nighttime guideline for living rooms and dens is $L_{eq\ Night}$ = 45 dBA for road traffic sources and 40 dBA for rail traffic sources. For bedrooms at night, the indoor limit is $L_{eq\ Night}$ = 40 dBA for road traffic and 35 dBA for rail sound sources. There are no nighttime indoor sound level guideline limits for office or commercial uses. The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve these indoor sound exposure limits, based on the applicable outdoor sound exposure at the facades. Where standard construction would otherwise result in exceeding the indicated noise limits, the building envelope elements must be upgraded.

4.5.3 Stationary Sources

Stationary sources are treated quite differently from transportation sources of noise. The sound limits apply at the exterior planes of windows associated with noise sensitive indoor spaces as well as outdoors in areas amenable for use within 30 m of a dwelling. Unlike for transportation sources, there are no indoor noise criteria. In the case of road/rail/aircraft noise, the building envelope must be designed (e.g., upgraded windows and exterior walls) to adequately reduce the exterior sound to no more than the indicated indoor limit. In the case of stationary sources, since there are no indoor sound limits, only exterior plane of window sound limits, upgraded windows for sensitive (residential) land uses would not result in compliance with the noise guidelines even if adequate noise buffering of indoor spaces is achieved in practice.

A further difference between transportation and stationary source sound limits is the acoustic descriptor used. For stationary sources it is a one-hour Leq as opposed to the 16-hour day and 8-hour night L_{eq} used for road and rail.

Tables C-5 to C-8 from NPC-300 summarize the sound limits, termed "exclusion limits". Tables C-5 and C-6 are for non-impulsive sources, such as machinery like fans, compressors, chillers, etc. Tables C-7 and C-8 are for impulsive sources such as punch presses or coupling of tractors to trailers or coupling of railway cars (i.e. banging sounds). At any point of reception, the applicable stationary source sound limit is the relevant value in Table C-5 to C-8 or the ambient sound level

whichever is higher. Regardless of ambient, a stationary source does not have to attenuate below the exclusion limits in Tables C-5 to C-8. That is, if the ambient sound level is less than the relevant values in the tables, the sound level limit is the applicable numerical value from the appropriate table. If the ambient sound level is higher than the relevant table entry, the ambient value becomes the sound limit for the stationary source at the point of reception. In many cases, particularly in urban areas, the ambient sound environment is dominated by, and determined by, road traffic sound (noise). In particular circumstances in addition to traffic noise, the ambient sound level may also include contributions from existing adjacent stationary sources.

In Tables C-5 to C-8, a Class 1 Area is one where the sound environment around the clock is determined by the activities of people; i.e., an urban area. A Class 3 Area is one where the sound environment is determined primarily by the sound of nature and where there is little road traffic; typical of a rural area. A Class 2 Area is one with the sound environment characteristics of Class 1 during day and Class 3 during evening and night.

Table C-5
Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq1} dBA)
Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
0700 – 1900	50	50	45	55
1900 – 2300	50	45	40	55

Table C-6
Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq1} dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
0700 – 1900	50	50	45	60
1900 – 2300	50	50	40	60
2300 – 0700	45	45	40	55

For impulsive sounds, the guideline sound limits are in Tables C-7 and C-8 of NPC-300.

Table C-7
Exclusion Limit Values for Impulsive Sound Level (L_{LM1} dBAI)
Outdoor Points of Reception

Time of Day	Actual # of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
0700 – 2300	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

Table C-8
Exclusion Limit Values for Impulsive Sound Level (L_{LM1} dBAI)
Plane of Window – Noise Sensitive Spaces

Actual # of Impulses in Period of One-Hour	Class 1 Area 0700 –2300/ 2300-0700	Class 2 Area 0700 –2300/ 2300-0700	Class 3 Area 0700 –1900/ 1900-0700	Class 4 Area 0700 –2300/ 2300-0700
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

The Class 4 Area is newly introduced in NPC-300. This is an area or a specific site that would otherwise be Class 1 or 2 and which is:

- intended for development with new sensitive land use(s) that are not yet built;
- is in proximity to existing, lawfully established stationary source(s);
- has formal confirmation from the land use planning authority (the municipality in this case) that it agrees with classifying the site or area in question as Class 4.

Existing noise sensitive land uses cannot be classified as Class 4; that is, it cannot be used retroactively. Class 4 is intended to be used where compliance with Class 1 or 2 noise criteria is not practical for valid technical, administrative or financial reasons.

4.6 MOE ROLE IN LOCAL PLANNING

Originally, with the introduction of noise guidelines (in 1978), the MOE was involved in reviewing noise study submissions required by the land use planning process, or at least in providing technical support to municipalities in this regard. Subsequently, all matters relating to local planning were "downloaded" to the local planning authorities and MOE is no longer involved in local planning matters at all and concentrates solely on environmental approvals of stationary sources and other aspects of enforcing the EPA (and not the Planning Act).

The noise guidelines related to planning (Section C of NPC-300) and guidelines D-1 and D-6 are offered as advise/guidance to planners and land use planning authorities. With respect to local planning matters, the requirements in these guidelines are not mandatory and have been recognized as such by the Ontario Municipal Board in adjudicating land use approval disputes. That is, land use planning authorities are free to interpret the guidelines, vary, adjust or supplement them as they see fit. Nevertheless, most land use approval authorities try to follow the MOE guidelines, with minor deviations to suit local conditions. MOE has made it clear it has no intention of becoming involved in local planning issues, nor involved in providing interpretations of its (MOE) guidelines related to land use planning.

4.7 RELATIONSHIP BETWEEN ENVIRONMENTAL AND LAND USE APPROVALS

The noise guidelines and noise limits are receptor based. That is, in the absence of a receptor, the noise limits applicable to a stationary source may be not very stringent or nil (as opposed to air quality regulations which apply at the property line, regardless of neighbouring land uses). The same facility operating in the presence of neighbouring sensitive land uses (receptors), such as residential, would have more stringent noise requirements to meet, compared to having insensitive neighbouring land uses such as agriculture, industry or commercial.

In this particular case, the proposal is to introduce mixed land uses, some of which would be noise sensitive (residential) and some of which would not (employment uses), on the Evergreen Community site on the west side of Tremaine Road in the City of Burlington. At the same time, it is proposed to introduce employment land uses, which are generally considered noise insensitive, but which are potential sources of noise (and/or vibration) on the lands on the east side of Tremaine Road, in the Town of Oakville. However, some of the land uses permitted by the North Oakville West Secondary Plan are also sensitive land uses. In both the Burlington and Oakville cases, the proposed uses are not in place and the required zonings are also not yet in place.

In principle, in establishing the land uses and zoning in both cases (east and west sides of Tremaine Road), the proposed zoning standards should be cognizant of the other proposed land uses, with the objective of resulting in compatibility with respect to acoustics. It must also be kept in mind that any of the future employment uses emitting noise (or vibration) will also require environmental approvals in addition to meeting the zoning standards. The presence of noise sensitive land uses (on both sides of Tremaine Road) can have a direct effect on what is required for environmental approvals (ECA).

4.8 REGION OF HALTON OFFICIAL PLAN (ROP)

The ROP contains a number of policies dealing with noise:

- Sections 143(8) and 143(13) address road noise.

- Section 143(9) requires noise studies for proposed developments within 300 m of a railway right-of-way and a vibration study within 75 m. (Not applicable in this case because distance is greater than 300 m.)

- Section 143(10) requires the Region to develop Land Use Compatibility Guidelines to minimize the adverse effects of noise, vibration and other factors.

- Section 143(11) encourages local municipalities to permit land uses requiring minimal noise, vibration, odour and air pollution abatement measures adjacent to industrial, transportation and utility uses and to require proponents of development in those areas to do impact analysis and implement abatement to comply with Regional and MOE guidelines.

- Section 143(12) requires proponents of sensitive land uses in proximity to industrial, transportation and utility sources of noise, vibration, odour and air pollutions to do appropriate studies and undertake mitigation for compliance with Regional and MOE guidelines.

4.9 REGION OF HALTON NOISE GUIDELINES

Under the Regional Official Plan, "Noise Abatement Guidelines" have been issued. These guidelines concern themselves with dealing with noise from regional roads and policies primarily related to sound barriers for new development, new roadways and retrofitting for existing residential development. It is based on the MOE noise guideline LU-131 which has been replaced with NPC-300 as of October 2013. With respect to road traffic noise, the criteria and noise mitigation requirements in NPC-300 are essentially the same as in LU-131.

4.10 REGION OF HALTON LAND USE COMPATIBILITY GUIDELINES

Under the Official Plan (OP), guidelines have been prepared to clarify, inform, and aid in the implementation of the policies in the OP. In the case of the Land Use Compatibility Guidelines, they apply to industrial and sensitive land uses in proximity and are based on MOE Guidelines D-1 and D-6. The stated purpose is to minimize adverse effects of noise, vibration and other environmental effects. Sections 9 and 14 of the EPA are pointed out. With respect to noise, MOE noise guideline NPC-300 is referenced. Examples of the steps required for land use approvals are given.

4.11 CITY OF BURLINGTON OFFICIAL PLAN

The City OP contains a variety of policies dealing with noise. The most relevant, in Part II, are:

- Section 2.7.3 n) requires exposure of residential or other sensitive land uses to noise, vibration and other factors caused by transportation or industrial facilities to be avoided and to avoid encroachment by separation, intervening non-sensitive land uses and/or other

means. Studies and mitigation to address compatibility issues and mitigation may be required, with reference to Provincial guidelines.

- Section 3.3.2 r) requires residential and other sensitive land uses within 50 m of a provincial highway or freeway or major, multi-purpose or minor arterial road (or other greater distance at the discretion of the City or Region) to have noise studies and appropriate mitigation in accordance with Provincial policy.

- Section 3.3.2 s) repeats 3.3.2 r) for within 300 m of a Provincial freeway or highway ((or other greater distance at the discretion of the City or Region).

5.0 NOISE SOURCES

5.1 TRANSPORTATION NOISE SOURCES

5.1.1 Road Traffic

The transportation noise sources with potential to impact the proposed development are vehicles using Tremaine Road, Dundas Street and Highway 407.

The road traffic data for Dundas Street and Tremaine Road were obtained from BA Consulting Group (the traffic engineers on the project). The data was obtained for the existing (2014) and future (2031) conditions.

5.1.1.1 Future Road Traffic Volumes

There are several proposed or possible future infrastructure changes to the roadways. These include adding commuter lanes, and eventually public transit dedicated rights-of way to Dundas Street as well as an interchange for Highway 407 at Tremaine Road. These improvements are predicted to ultimately result in a decrease in road traffic volumes on Dundas Street and at portions of Tremaine Road. To be conservative for traffic noise control, the future road traffic noise impact analysis was done using the traffic projections that do not include the above infrastructure improvements, i.e. the higher road traffic volumes were used.

The road data was obtained in terms of peak hourly volumes. As recommended by BA Group, the peak hourly volumes were converted to 24-hour volumes by using a factor of 10 (i.e. assuming the peak hour accounts for 10% of the 24 hour volume). A day/night split of 90%/10% was used. Truck percentages used were recommended by BA Group.

Note, the Region requires that Regional road volumes be escalated to a 20 year future design condition for transportation noise assessments. However, as recommended by BA Group, the provided 2031 data is also representative of the expected 20 year future volumes (2035). Thus, the road data was not escalated beyond the provided 2031 data.

Road traffic volumes applicable to the year 2011 for Highway 407 were obtained from the University of Toronto Data Management Group. A multiplication factor of 1.2 was used to convert the 14-hour counts to 24-hour volumes. A day/night split of 90%/10% was used. The percentages of heavy and medium trucks were taken from the individual vehicle types provided in the traffic

count. A growth rate of 2% compounded annually was applied to obtain future (year 2025) traffic volumes.

5.1.1.2 Existing Road Traffic Volumes

An hourly assessment of the ambient sound environment was also done to determine the applicable sound level limits for the stationary source assessment. The ambient analysis was done by determining the minimum hourly road traffic volumes by applying the typical ITE traffic distribution model for well travelled roadways to the provided existing 24-hour traffic volumes. According to this, the minimum hourly volumes occur at:

- 1000 to 1100 in the day, where 3.5% of the 24 hour volumes occurs;
- 2200 to 2300 in the evening, where 2.5% of the 24 hour volumes occurs; and
- 0400 to 0500 at night, where 0.2% of the 24 hour volume occurs.

The minimum hourly road traffic volumes were then used to predict the minimum hourly ambient sound levels on the site.

The road traffic volumes are shown in Table 1A below.

Table 1A
Road Traffic Volumes

Roadway	24 Hour Road Traffic Volumes		Truck Percentage (%)		Posted Speed (kph)	24 hour day/night split
	Future	Existing	Medium	Heavy		
Dundas Street	60300	26850	2	3	80	90/10
Tremaine Road	22550	8450	2	3	80	90/10
Highway 407	53974	40905	3	4	100	90/10

5.1.2 Rail Traffic

Rail traffic volumes for the Canadian National Railways (CN) Halton Subdivision was were obtained from Reference 26. The data is applicable to year 2008 and was escalated to the future 2025 design condition using a 2.5% growth rate, as recommended by the MOE. The rail traffic volumes are included as Table 1B.

Table 1B
Rail Traffic Volumes

Time	Type of Train	Max # of Train	Max # of Cars	Max Speed	Max # of Locomotives
Day (0700-2300)	Freight	16	140	80	4
	Way Freight	1	25	80	2
Night (2300-0700)	Freight	8	140	80	4
	Way Freight	0	25	80	2

5.2 STATIONARY SOURCES

5.2.1 Existing Sources

Existing stationary sources in the immediate vicinity are:

- Hanson Brick, located on the north side of Dundas Street, about 780 m from the westerly edge of the proposed Evergreen development. Originally, clay raw material was mined on the Hanson site, in addition to making bricks in the factory building. The original clay quarry on the property is now expended and no longer active. Raw materials are now mined at a new quarry on a site north of Highway 407 on the west side of Tremaine Road at the Hanson Brick Tansley quarry. The material is trucked to the existing brick factory for manufacturing.

- First Student Inc. (5401 Dundas Street), a school/charter bus facility located on the north side of Dundas Street close to the southwest corner of the Evergreen site. This operation is effectively a storage yard (parking lot) for school buses. It is considered to have minimal potential for noise impact, particularly in view of the road traffic and attendant mitigation discussed later.

- A manual car wash facility located at the south side of the Hanson Brick facility, on the north side of Dundas Street. The car wash is located approximately 850 m away from the site.

5.2.2 Future Potential Noise Sources in the North Oakville West Secondary Plan

In the future, on the east side of Tremaine Road, there is the potential for new stationary sources when the North Oakville West Secondary Plan is implemented. With respect to environmental noise, there are two concerns: (i) potential noise impact on the noise sensitive (residential) part of the Evergreen development and (ii) the potential for the presence of noise sensitive receptors (development) on the Evergreen lands acting as a deterrent to developing the lands east of Tremaine Road as intended by the Town of Oakville in its North Oakville West Secondary Plan.

The permitted uses in the Employment District designation as set out in Section 8.6.5.2 of the North Oakville West Secondary Plan includes:

8.6.5.2 Permitted Uses, Buildings and Structures

Permitted uses may include:

a) light industrial operations, including light manufacturing, assembling, processing, fabricating, repairing, warehousing, distribution and wholesaling;
b) business and professional office uses and medical clinics;
c) service establishments such as print shops, equipment rental establishments, restaurants, hotels, banquet halls, financial institutions, and service establishments which primarily provide services at the customer's location such as electricians and plumbers and limited retail commercial development such as business supply and industrial supply establishments subject to the requirements of Section 8.6.5.3 and 8.6.5.4 d);
d) public uses, institutional uses including places of worship, vocational schools;
e) sport and recreation, and place of amusement uses;
f) automobile related uses, including gas stations; and
g) ancillary retail sales of products produced, assembled and/or repaired on the premises,
h) as part of a distribution use, the ancillary retail sale of the products distributed from an ancillary showroom;
I) research and development;
j) information processing, call centres and similar uses; and
k) computer based services including design studios.

In addition, Section 8.6.5.2 of the North Oakville West Secondary Plan restricts the uses listed below to areas which do NOT abut the Health Oriented Mixed Use Node (HOMUN), major arterial roads or Highway 407.

i) general industrial operations within enclosed buildings including manufacturing, assembling, processing, fabricating, repairing, warehousing, distribution, and wholesaling;
ii) outside storage, and outside operations incidental to industrial operations;
iii) transportation terminal, works yard and outside storage yard;
iv) waste processing station subject to a zoning by-law amendment, and
v) waste transfer station, subject to a zoning by-law amendment.

These are heavier industrial uses that are more likely to have potential for incompatibilities with noise sensitive land uses. Note, this North Oakville West Secondary Plan policy precludes these uses along either of Tremaine Road, Dundas Street or Highway 407 and thus, these uses cannot be immediately adjacent to Evergreen along Tremaine Road.

It must be emphasized that the lands of the North Oakville West Secondary Plan have not yet been zoned and that details of the future development do not exist. It is likely that the development of these lands will proceed by way of Plans of Subdivision.

Consultations with planning staff of the Town of Oakville were held to exchange information and to obtain input on what form of development could be expected on the North Oakville West Secondary Plan lands and in particular along Tremaine Road. Oakville staff indicated that, based on examples of existing development in the Town of Oakville, employment use lots fronting on

Tremaine Road could be either wide-shallow or narrow-deep lots. The expected range of lot depth along Tremaine Road is about 80 to 110 m. Regardless, 80 m is expected to be a minimum.

Based on the North Oakville West Secondary Plan, the permitted uses with frontage on Tremaine Road would be either non-industrial or Class 1 industrial uses. (Note, it may be the case that this first tier of lots is not accessed from Tremaine Road, but from the east via an internal road.) The separation distance from the Evergreen proposal to the permitted land uses on the east side of Tremaine Road would be expected to exceed 20 m, the minimum recommended separation distance in Guideline D-6 for Class 1 industries, if this Guideline were applied.

Based on the assumed permitted uses along the Tremaine frontage, Class II industrial uses would not occur on the first row of lots abutting Tremaine Road. Thus, the separation distance to Class II uses would be expected to exceed 70 m (first tier lot depth, plus the 30 m width of the Tremaine Road allowance; again, in compliance with the minimum separation distance in Guideline D-6, if this guideline were applied.

5.2.3 Future Potential Noise Sources in Evergreen Community

As indicated in Section 3.0 earlier, in addition to residential, the proposed land uses for the Evergreen Community include Business Corridor and Mixed Uses (Mixed Use Corridor - General and Mixed Use Corridor - Employment) as reflected in the Draft Secondary Plan.

The Business Corridor would permit a broad range of offices, including prestige-type, research and information processing, communications and light industrial use involving assembling, fabricating, manufacturing, warehousing, distribution and service trades.

The Mixed Use Corridor - General area would permit offices, retail, service commercial, personal services, financial institutions, community facilities as well as residential land uses.

The Mixed Use Corridor - Employment area would permit a broad range of offices, retail, service commercial, personal service, financial institutions, entertainment, recreation, hotels, conference facilities and community facilities such as libraries and day care centres.

6.0 ENVIRONMENTAL NOISE ASSESSMENT PURSUANT TO NPC-300

6.1 ACOUSTIC MODELLING

A 3-D acoustic model of the proposed Evergreen development was created using CadnaA V4.4 environmental noise modelling software, which follows the protocol of the ISO Standard 9613.2, "Acoustics - Attenuation of Sound During Propagation Outdoors" , to determine the predicted sound exposures at each receptor location. The model accounts for sound propagation factors such as distance attenuation, ground attenuation and atmospheric absorption.

6.2 TRANSPORTATION NOISE SOURCES

6.2.1 Predicted Future Transportation (Road or Rail) Noise Impact

Road traffic noise was assessed using the RLS-90 road traffic noise prediction model built into Cadna. It was set-up (`calibrated`) using reference noise emission levels for each roadway as

determined from ORNAMENT, the Ontario road traffic noise prediction model of the MOE. The values of $L_{eq\ Day}$ (dBA) and $L_{eg\ Night}$ (dBA) were determined using the road traffic data in Table 1A.

Using the railway data in Table 1B, the railway sound levels in terms of $L_{eq\ Day}$ and $L_{eq\ Night}$ were calculated using the CadnaA acoustic software (based on the propagation algorithms of ISO 9613). Two line sources were used to model the noise impact from the railway, one representing the wheel/rail nosie noise and one representing the locomotive noise. These line sources were calibrated using reference data from the MOE train noise prediction model STEAM as implemented in the MOE computer program STAMSON.

Figures 3 and Table 2 show the predicted daytime (L_{eq16}) and nighttime (L_{eq8}) cumulative road and rail traffic sound exposure levels.

The highest sound exposures at a residential use building of 70 dBA day and 64 dBA night are predicted to occur at the mixed-use corridor at the southern end of the site in proximity to Dundas Street (Block 400).

The road and rail noise analysis results are used to determine the sound isolation requirements for building envelope design, in order to achieve the indoor road and rail noise criteria. Similarly these results are used to determine whether road and rail noise mitigation is needed for outdoor living (amenity) areas.

6.3 STATIONARY SOURCES

6.3.1 Existing

6.3.1.1 Hanson Brick Manufacturing Facility

This facility operates 24 hours a day, 7 days a week. A computerized model of the Hanson Brick operation was created using data on hand for this facility from a previous project. The results of the modelling indicate that sound exposures on the Evergreen site will be less than the minimum exclusion limits at all points of reception. Thus, compliance with the applicable sound level limits is concluded and mitigation measures for this facility are not required. These conclusions are similar to the results of previous assessments of this facility (Reference 26).

6.3.1.2 Hanson Brick Tansley Quarry

The Hanson Brick Tansley Quarry is located on the north side of Highway 407. The quarry operations include the extraction of raw material used in the manufacturing of bricks at the Hanson Brick manufacturing facility. The quarry operates during daytime hours only, from 0700 to 1700.

A computerized model of the quarry operation was created using operational and sound source information obtained from Reference 27. The results of the modelling indicate that sound exposures on the Evergreen site will be less than the daytime ambient sound levels, mainly due to Highway 407. Thus, compliance with the applicable sound level limits is concluded and mitigation measures for this facility are not required.

6.3.1.3 Car Wash Facility

For the car wash facility, located about 850 m away, the distance setback is sufficiently great that adverse noise impact would not be expected. Thus, this source has not been considered further.

6.3.1.4 First Student Bus Facility

A computerized model of the first student bus facility was created using data presented in Reference 26. The sources of noise include idling of bus engines during morning circle check routines (for approximately 3 minutes each), and bus movements on the property, as busses exit/enter the facility. The facility operates typically during daytime hours only, but can operate during nighttime hours (pre 0700) during times of extreme weather.

The results of the modelling indicate that sound exposures on the Evergreen site will be less than the nighttime minimum exclusion limits at all points of reception. Thus, compliance with the applicable sound level limits is concluded and mitigation measures for this facility are not required. Note, these conclusions are not the same as those from Reference 26. The reason is the closest proposed points of reception on the current concept plan are much further away (about twice the distance) as those assessed in the Reference 26 material. Due to the greater setback distance the noise impact is significantly less.

It is noted that there are existing residential land uses on each side of this facility, along Dundas Street.

6.3.2 Future

6.3.2.1 North Oakville West Secondary Plan

The North Oakville West Secondary Plan anticipates potential, future, stationary sources to the east of Tremaine Road. (Zoning and other details are not yet in place.) This is discussed in detail in Section 8 below.

6.3.2.2 Evergreen Community

The majority of proposed non-residential land uses for within the Evergreen Community are compatible acoustically with residential uses. Most are office, retail or analogous to office or small retail uses; for example financial institutions, service commercial, personal service, etc. Some are themselves sensitive and/or analogous to residential; eg. hotel, day care. For these uses, the potential noise sources would be mechanical systems for HVAC, eg. air conditioning equipment. Ensuring that these uses do not impact each other or nearby residential is a matter of good design and appropriate equipment selection. This is routinely done, for example for neighbourhood commercial uses, and is fundamentally no different than what is required for high density residential design.

In the case of permitted light industrial land uses, these can be analogous to service commercial uses, for example assembling, warehousing, distribution. Comfort mechanical systems, such as air conditioning, can be anticipated and would be treated as for the other permitted uses. In the case of light fabricating or manufacturing, a process may have emissions to the environment, including noise. In such a case, an Environmental Compliance Approval from the MOECC would

be required, ensuring compliance with the stationary source noise guidelines and no adverse impact on neighbouring land uses. Example situations are a light manufacturing operation requiring a paint spray booth or a dust collector. Again, it would be a matter of appropriate engineering design, routinely done.

6.3.3 Applicable Noise Criteria at Evergreen

As indicated in Section 4.5.3, the applicable sound limit for any stationary source at any point of reception is the higher of the exclusion limits in Tables C-5 to C-8 in NPC-300, or the ambient (background) sound level, typically established by road traffic.

Figures 4 and 5 show the applicable stationary source guideline limits during day/evening and night, respectively; i.e., the figures indicate the higher of the one-hour L_{eq} values for the quietest road traffic noise hours or the minimum exclusion limits. At night, for almost all of the Evergreen site, the stationary source sound limit criterion will be the exclusion limit of 45 dBA. During the day and evening, the MOE exclusion limit will be exceeded significantly, closer to Highway 407 and Dundas Street and very close to Tremaine Road. Thus, for sensitive uses, the traffic ambient during the day and evening will set the stationary source sound limit, particularly around the north, east and south perimeters of the site.

Note, on Figures 4 and 5 the octagons around the building facades represent the highest ambient plane of window sound level predicted at that location at any storey of the building or the minimum exclusion limit, whichever is higher. The blue colour indicates that the ambient sound level at that location exceeds the minimum exclusion limit. The white indicates locations where the minimum exclusion limits apply.

7.0 NOISE ABATEMENT REQUIREMENTS – TRANSPORTATION SOURCES

Figure 6 and Table 3 show the anticipated transportation noise mitigation requirements.

7.1 ARCHITECTURAL UPGRADES

Based on the predicted sound exposures, it is expected that upgrades to the building construction for the dwellings and office uses closest to Highway 407, Tremaine Road and Dundas Street will be required.

Brick veneer (or STC 54 equivalent) exterior wall construction should be anticipated for the mixed use condominium and office buildings closest to Tremaine Road and Dundas Street.

Accounting for the above, the mixed-use condominium townhouse dwellings and office uses closest to Tremaine Road and Dundas Street may require upgraded windows. Windows with Sound Transmission Class (STC) ratings up to 30 should be anticipated. A window STC rating of 30 is considered a minor upgrade. This analysis was based on assumptions of exterior wall and window areas to associated floor area ratios of 80% and 30%, respectively.

It is expected that window and exterior wall construction meeting the minimum non-acoustical requirements of the Ontario Building Code would be sufficient to meet the indoor sound level limits of the MOE at all other locations.

7.2 VENTILATION REQUIREMENTS

The sound exposures are such that the first row of dwellings adjacent to Tremaine Road or Dundas Street will require mandatory air conditioning (Blocks 400 to 403).

Several rows of dwellings in proximity to Highway 407 as well as Block 395 in proximity to Dundas Street will require the provision for adding air conditioning at a later date. This typically takes the form of a ducted forced air heating system.

7.3 OUTDOORS – SOUND BARRIERS

It is anticipated that the single family dwellings will have grade level amenity spaces. The townhouse dwellings and mixed use condominiums will likely not have grade level amenity spaces, but will have balconies or terraces. These balconies/terraces are expected to be less than 4 m in depth. Thus, the OLA sound level limits would not be applicable at these locations.

The highest OLA daytime sound exposure level of 60 dBA is predicted to occur at the single family dwelling at the northwest corner of the site, siding towards Highway 407 (Lot 361). The 55 dBA daytime OLA sound level objective is predicted to be exceeded but the sound exposure will be less than 60 dBA in the rear yard areas of the dwellings on Lots 361 to 372 and 288 to 292. The daytime sound exposures are predicted to be 55 dBA or less at all other OLA locations.

At the single family dwellings on Lots 361 to 372 and 288 to 292, sound barriers 1.8 m above grade would be sufficient to mitigate the daytime sound exposures to 55 dBA or below.

Sound barriers must be of solid construction with no gaps cracks or holes and have a minimum surface density of 20 kg/sq.m.

8.0 NOISE IMPLICATIONS OF THE PROPOSED EVERGREEN LAND USES ON THE NORTH OAKVILLE WEST SECONDARY PLAN WITHIN THE CONTEXT OF NPC-300

As noted previously, the basic land use compatibility question with respect to environmental noise in the context of the North Oakville West Secondary Plan is whether introducing noise sensitive land uses on the west side of Tremaine Road (in Burlington) would have a negative impact on introducing employment uses on the east side of Tremaine Road (in Oakville). As expressed by staff of the Town of Oakville, the potential negative impact on employment uses east of Tremaine Road may be to make it more difficult to meet the MOE noise guidelines and therefore, to obtain the required environmental approvals than if there were no noise sensitive receptors nearby. This could provide a disincentive for employment uses to locate in the part of the North Oakville West Secondary Plan area potentially affected by the proposed sensitive uses within the Evergreen Community.

To put the staff comments in perspective, Section 8.6.5.4 a) of the North Oakville West Secondary Plan indicates that "it is not intended that the full range of employment uses will be permitted in all locations designated Employment District". The exact uses will be established by zoning which has not occurred. This approach is reflected in the restrictions on types of uses along the Tremaine frontage which is discussed in Section 5.2;2 of this report. It is our view that for the reasons given

below, the risk of such "impact" by the proposed Evergreen Community on the North Oakville West Secondary Plan is considered negligible.

In a noise context, the types of industries that could experience somewhat more difficulty with environmental approvals are those with noisy equipment on the exterior or interfacing to the exterior. Examples include operations that need a dust collector, large exhaust fans, large compressors, refrigerated trailers or an operation needing major loading dock facilities. A number of factors are relevant to addressing the land use compatibility question:

1. The major noise control problem for a stationary source with a proximate noise sensitive receptor is meeting the sound level limits at the planes of windows (at residential land uses). Unlike for transportation sources of environmental noise, where there are indoor noise criteria and designing the building envelope to achieve the indoor sound limits is normal and acceptable practice, for stationary sources there are no indoor noise criteria and the sound limits apply outdoors at the plane of windows (POW) and upgraded windows, etc., are irrelevant. Compliance with POW sound limits requires particular attention, especially for elevated receptors (windows) on multi-storey residential buildings.

2. Fortunately, the North Oakville West Secondary Plan restricts the land uses immediately on the east side of Tremaine Road to exclude the "heavier" uses (see Section 5.2.2 above). The permitted (employment) land uses along arterial roads such as Tremaine Road are either Class I industrial uses (light manufacturing, assembling, processing, fabricating, repairing, warehousing, distribution, wholesaling) or commercial, services, institutional, retail, recreational/amusement or IT based land uses. The vast majority of the permitted land uses such as professional offices, medical clinics, service establishments, retail, showrooms, etc., are not sources of environmental noise, are not stationary sources and do not require environmental approvals. Some of the permitted uses, such as institutional, may themselves actually be noise sensitive. Thus, in general, these uses are inherently compatible with sensitive uses such as residential, as proposed for Evergreen, or can easily be made compatible. They are also the types of uses that are appropriate as intervening between sensitive land uses and "heavier" stationary sources.

3. The North Oakville West Secondary Plan itself includes some noise sensitive uses such as hotels/motel, daycare centres, schools and places of worship. These may discourage some industries from locating nearby, because of such factors as air quality and odour. However, under NPC-300, these sensitive uses fall under the category of "noise sensitive commercial purpose building" and "noise sensitive institutional purpose building", respectively. For these categories, unlike for residential, inoperable (sealed) windows are an acceptable noise mitigation measure and the plane of window is not a point of reception. That is, for these sensitive land uses, the plane of window noise criteria related to stationary sources do not apply. Thus, these otherwise potentially problematic sensitive land uses can be placed anywhere on the development site without concern about compromising the environmental approvals of nearby stationary sources. Thus, assuming appropriate design, at least some of the noise sensitive land uses permitted in the North Oakville West Secondary Plan can be configured to minimize the risk of incompatibility. The same is true of these kinds of noise sensitive, non-residential lands uses in the Evergreen lands.

4. Furthermore, Places of Worship are defined as noise sensitive land uses (noise sensitive institutional building) and are permitted uses in the Employment District designation of the

North Oakville West Secondary Plan. The same is true for vocational schools. In the case of place of worship, NPC-300 does not consider this land use as noise sensitive if it is on commercially or industrially zoned lands. Thus, these noise sensitive uses could be within the North Oakville West Secondary Plan lands without adversely affecting the employment land uses. A place of worship can be used as an acceptable and fully compatible land use intervening between stationary sources and residential. However, it preferably should not be on lands zoned institutional but on lands zoned industrial or commercial, to comply with the current wording of NPC-300.

5. A development concept for employment uses has been put forward for the Lazy Pat Farm lands, which are part of the North Oakville West Secondary Plan, extending from Dundas Street to Highway 407, starting at about 375 m east of Tremaine Road and extending for about 620 m easterly. The concept for the Lazy Pat Farm is for Prestige Industrial along Highway 407, Prestige Office along Dundas Street and General Industrial in the Central area. Prestige Industrial would tend to be Class I industries. The General Industrial is most likely to be Class II, although Class III is also possible. These clearly would all be more than 300 m from any sensitive uses on the west side of Tremaine Road which means that the more problematic potential sources will be quite distant from the sensitive land uses on the Evergreen Community.

6. It is important to note that the proposed development scheme for Evergreen does not introduce new sensitive receptors where none exist now because there is an existing detached residence at 3278 Tremaine Road, within about 60 m of Tremaine Road. As long as this use exists (even if in the form of legal non-conforming), any new stationary sources in the vicinity must take this land use into account. While this existing use is much more localized than the proposed sensitive development along Tremaine Road, at least some of the new development on the east side of Tremaine Road would have to address this receptor. (The other existing residential uses on the Evergreen site, on Dundas Street are of less relevance to the North Oakville West Secondary Plan.)

7. In the worst case, a particular industry wishing to locate in proximity to the Evergreen Community may face some additional design constraints due to the presence of residential uses on the Evergreen lands. However, the risk of this is considered low because of the nature of the likely uses along the east side of Tremaine Road and the likely distance separation between the Evergreen lands and the "heavier" industries which would be well set back from Tremaine Road in the North Oakville West Secondary Plan.

8. Thus, taking all of the above into account, in practice, by proper site plan, process and building design, it is considered generally practicable to comply with the MOE noise guidelines and thereby have land use compatibility between different land uses on either side of Tremaine Road. Some particular stationary sources may face design constraints and may have to implement more extensive noise mitigation than would otherwise be the case were no sensitive receptors present in the area at all. (Note, the North Oakville West Secondary Plan itself allows some noise sensitive land uses.)

9. Examples of suitable and typical noise mitigation techniques for the planning and design of employment uses are: placing loading docks or air intakes/exhausts on the sheltered side of the building; adding silencers to stacks or air grilles; using acoustic enclosures for

rooftop or other outdoor mechanical equipment; and sound barriers to provide acoustical screening. These are all routinely used at industrial and commercial facilities.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Applicable Noise Guidelines

1. The applicable MOE noise guideline is NPC-300 (as of October 2013). NPC-300 provides guidance and criteria with respect to environmental noise from transportation, and as well as from stationary sources, for planning of noise sensitive land uses such as residential. NPC-300 is also the basis for ECA's issued by MOE for stationary sources, under Section 9 of the EPA.

Transportation Noise Sources

2. The transportation noise source guidelines are feasible to meet. Mandatory air conditioning should be anticipated for the first row of dwellings in proximity to either Dundas Street or Tremaine Road. Provision for adding air conditioning should be anticipated for the dwellings in proximity to Highway 407 as well as some dwellings beyond the first row adjacent to Dundas Street.

3. Architectural upgrades to windows and/or exterior facade construction should be anticipated for the dwellings or office use buildings closest to Tremaine Road, Dundas Street or Highway 407, subject to final design.

4. Sound barriers to mitigate transportation noise in the grade level OLA's should be anticipated for the single family dwellings in proximity to Highway 407 (Lots 361 to 372 and 288 to 292).

Existing Stationary Sources

5. Sound emissions from the Hanson Brick facility, Hanson Brick Tansley quarry, First Student Bus facility and the car wash are expected to comply with the applicable MOE sound level limits at all locations on the Evergreen site. Noise mitigation measures are not required for these facilities.

Future Stationary Sources

6. NPC-300 contains specific provisions to address the types of land use compatibility concerns raised in this case by the Town of Oakville, which are also now commonly encountered in Southern Ontario. It is concluded that the proposed mixed land use development concepts for the Evergreen lands on the west side of Tremaine Road in Burlington are appropriate in terms of noise compatibility with intended employment land uses based on the North Oakville West Secondary Plan on the east side of Tremaine Road in Oakville for the reasons summarized below.

    - The North Oakville West Secondary Plan restricts employment uses along arterial roads to non-industrial uses or light industry (Class 1). Thus, the potential

employment uses along the east side of Tremaine Road, closest to the proposed Evergreen Community, are inherently compatible.

- The employment uses that could be of concern regarding (noise) compatibility with the proposed Evergreen Community would be well separated from Evergreen by the Tremaine Road road allowance plus the depth of the first tier of compatible lots in the North Oakville West Secondary Plan, expected to be at least 80 m deep.

- Neither zoning of the lands in the North Oakville West Secondary Plan nor a development concept (draft plan of subdivision) are yet in place. Thus, there is the opportunity to introduce appropriate zoning standards and site planning concepts that would facilitate compatibility not only with Evergreen but with sensitive uses permitted within the North Oakville West Secondary Plan itself.

- There already exist sensitive receptors on the west side of Tremaine Road that need to be taken into account in the detailed planning within the North Oakville West Secondary Plan, regardless of the Evergreen proposal.

- There exist both site planning and facility design techniques for stationary sources to facilitate land use compatibility and Environmental Compliance Approvals for employment uses.

Ensuring that any potential, stationary sources within Evergreen itself create no adverse noise impact on neighbouring land uses is a matter of proper engineering design, as is commonly done.

7. It is recommended that when the subdivision plan(s) and zoning by-law for the North Oakville West Secondary Plan are being considered, appropriate standards should be incorporated into the zoning by-law and subdivision plans to address land use compatibility for neighbouring land uses in both the Town of Oakville and the City of Burlington.

8. It is recommended that all of the lands in question immediately adjacent to both sides of Tremaine Road be subject to Site Plan Control and that a condition of Site Plan Approval in each case require the preparation of a detailed noise study and report submission addressing compliance with NPC-300 and land use compatibility relative to environmental noise.

ADL\mk\sr\hd\sr\gks
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TABLE 2

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Block 379 North Facade	CN Galt	531	51	51
	Highway 407 Eastbound	131	60	53
	Highway 407 Westbound	151	59	52
	Dundas Street	1211	21	15
	Tremaine Road	504	43	36
	Total	-	63	57
Block 392 Southwest Facade	CN Galt	1180	30	30
	Highway 407 Eastbound	1177	25	19
	Highway 407 Westbound	1197	25	18
	Dundas Street	160	54	48
	Tremaine Road	221	40	34
	Total	-	55	48
Block 393 Southwest Facade	CN Galt	1106	46	46
	Highway 407 Eastbound	1114	40	33
	Highway 407 Westbound	1134	39	33
	Dundas Street	224	54	48
	Tremaine Road	278	30	24
	Total	-	55	50
Block 394 Southwest Facade	CN Galt	1125	45	45
	Highway 407 Eastbound	1144	38	31
	Highway 407 Westbound	1164	37	31
	Dundas Street	194	55	49
	Tremaine Road	269	30	24
	Total	-	56	50
Block 395 Southwest Facade	CN Galt	1145	45	45
	Highway 407 Eastbound	1177	37	31
	Highway 407 Westbound	1197	37	31
	Dundas Street	161	56	50
	Tremaine Road	261	31	24
	Total	-	57	51

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Block 396 North Facade	CN Galt	741	48	48
	Highway 407 Eastbound	132	60	54
	Highway 407 Westbound	152	59	53
	Dundas Street	1203	24	18
	Tremaine Road	270	48	42
	Total	-	63	57
Block 397 North Facade	CN Galt	1038	45	45
	Highway 407 Eastbound	364	53	47
	Highway 407 Westbound	383	53	46
	Dundas Street	967	26	19
	Tremaine Road	35	62	56
	Total	-	63	57
Block 400 South Facade	CN Galt	1285	29	29
	Highway 407 Eastbound	1299	23	16
	Highway 407 Westbound	1319	23	16
	Dundas Street	37	70	64
	Tremaine Road	156	46	40
	Total	-	70	64
Block 399 South Facade	CN Galt	1384	28	28
	Highway 407 Eastbound	1299	24	17
	Highway 407 Westbound	1319	24	17
	Dundas Street	35	70	64
	Tremaine Road	44	60	53
	Total	-	71	64
Block 401 East Facade	CN Galt	1235	27	27
	Highway 407 Eastbound	865	42	36
	Highway 407 Westbound	885	42	35
	Dundas Street	466	49	43
	Tremaine Road	27	68	61
	Total	-	68	61

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Block 402 East Facade	CN Galt	1219	27	27
	Highway 407 Eastbound	822	43	36
	Highway 407 Westbound	842	42	36
	Dundas Street	509	49	42
	Tremaine Road	27	68	61
	Total	-	68	61
Block 403 East Facade	CN Galt	1072	30	30
	Highway 407 Eastbound	439	48	42
	Highway 407 Westbound	459	48	41
	Dundas Street	891	43	36
	Tremaine Road	28	67	61
	Total	-	67	61
Lot 1 South Facade	CN Galt	1070	39	39
	Highway 407 Eastbound	1092	29	23
	Highway 407 Westbound	1112	29	22
	Dundas Street	247	54	48
	Tremaine Road	309	33	27
	Total	-	54	48
Lot 11 South Facade	CN Galt	947	44	44
	Highway 407 Eastbound	1055	30	23
	Highway 407 Westbound	1075	29	23
	Dundas Street	287	54	48
	Tremaine Road	431	32	25
	Total	-	55	49
Lot 266 North Facade	CN Galt	524	51	51
	Highway 407 Eastbound	432	50	44
	Highway 407 Westbound	452	50	43
	Dundas Street	914	30	23
	Tremaine Road	641	40	34
	Total	-	55	53

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 269 North Facade	CN Galt	564	49	49
	Highway 407 Eastbound	431	48	42
	Highway 407 Westbound	451	48	41
	Dundas Street	913	29	23
	Tremaine Road	595	41	35
	Total	-	54	51
Lot 272 North Facade	CN Galt	606	48	48
	Highway 407 Eastbound	431	50	43
	Highway 407 Westbound	451	49	43
	Dundas Street	913	30	23
	Tremaine Road	548	42	35
	Total	-	54	50
Lot 275 North Facade	CN Galt	643	47	47
	Highway 407 Eastbound	430	49	43
	Highway 407 Westbound	450	49	43
	Dundas Street	912	30	24
	Tremaine Road	507	41	34
	Total	-	54	50
Lot 280 East Facade	CN Galt	691	38	38
	Highway 407 Eastbound	406	49	43
	Highway 407 Westbound	426	49	42
	Dundas Street	935	42	36
	Tremaine Road	442	45	38
	Total	-	53	47
Lot 284 East Facade	CN Galt	670	37	37
	Highway 407 Eastbound	346	50	44
	Highway 407 Westbound	366	50	43
	Dundas Street	994	42	35
	Tremaine Road	440	45	39
	Total	-	54	48

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 288 East Facade	CN Galt	646	39	39
	Highway 407 Eastbound	279	52	46
	Highway 407 Westbound	299	52	45
	Dundas Street	1062	40	34
	Tremaine Road	439	46	39
	Total	-	56	49
Lot 293 North Facade	CN Galt	569	47	47
	Highway 407 Eastbound	207	54	48
	Highway 407 Westbound	227	53	47
	Dundas Street	1134	28	21
	Tremaine Road	495	44	37
	Total	-	57	52
Lot 296 East Facade	CN Galt	592	40	40
	Highway 407 Eastbound	254	53	46
	Highway 407 Westbound	274	52	45
	Dundas Street	1088	40	34
	Tremaine Road	488	45	38
	Total	-	56	50
Lot 298 North Facade	CN Galt	539	47	47
	Highway 407 Eastbound	209	52	45
	Highway 407 Westbound	229	51	44
	Dundas Street	1134	28	21
	Tremaine Road	529	42	35
	Total	-	55	51
Lot 300 North Facade	CN Galt	520	48	48
	Highway 407 Eastbound	209	50	43
	Highway 407 Westbound	229	49	43
	Dundas Street	1134	28	21
	Tremaine Road	551	41	34
	Total	-	54	50

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 302 North Facade	CN Galt	501	49	49
	Highway 407 Eastbound	209	50	44
	Highway 407 Westbound	229	49	43
	Dundas Street	1134	28	21
	Tremaine Road	572	40	34
	Total	-	54	51
Lot 304 North Facade	CN Galt	481	50	50
	Highway 407 Eastbound	209	51	44
	Highway 407 Westbound	229	50	44
	Dundas Street	1135	28	21
	Tremaine Road	595	40	33
	Total	-	55	52
Lot 307 North Facade	CN Galt	490	48	48
	Highway 407 Eastbound	239	51	45
	Highway 407 Westbound	259	50	44
	Dundas Street	1105	28	22
	Tremaine Road	598	41	34
	Total	-	55	51
Lot 315 North Facade	CN Galt	604	47	47
	Highway 407 Eastbound	282	53	46
	Highway 407 Westbound	302	52	46
	Dundas Street	1060	29	22
	Tremaine Road	487	43	37
	Total	-	57	52
Lot 320 North Facade	CN Galt	550	49	49
	Highway 407 Eastbound	282	52	45
	Highway 407 Westbound	302	51	45
	Dundas Street	1061	28	22
	Tremaine Road	548	42	36
	Total	-	56	51

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 325 North Facade	CN Galt	491	51	51
	Highway 407 Eastbound	283	52	46
	Highway 407 Westbound	303	52	45
	Dundas Street	1062	28	22
	Tremaine Road	615	41	35
	Total	-	56	53
Lot 337 North Facade	CN Galt	579	48	48
	Highway 407 Eastbound	356	50	44
	Highway 407 Westbound	376	50	44
	Dundas Street	987	29	23
	Tremaine Road	546	42	36
	Total	-	55	51
Lot 349 North Facade	CN Galt	519	52	52
	Highway 407 Eastbound	401	49	43
	Highway 407 Westbound	421	48	42
	Dundas Street	944	41	34
	Tremaine Road	633	28	22
	Total	-	55	53
Lot 352 North Facade	CN Galt	500	50	50
	Highway 407 Eastbound	355	51	45
	Highway 407 Westbound	375	51	44
	Dundas Street	990	29	22
	Tremaine Road	635	41	34
	Total	-	56	52
Lot 353 West Facade	CN Galt	484	52	52
	Highway 407 Eastbound	325	51	45
	Highway 407 Westbound	345	50	44
	Dundas Street	1020	39	32
	Tremaine Road	641	28	22
	Total	-	56	53

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 360 North Facade	CN Galt	442	52	52
	Highway 407 Eastbound	207	55	48
	Highway 407 Westbound	227	54	47
	Dundas Street	1138	28	21
	Tremaine Road	637	41	34
	Total	-	58	54
Lot 361 North Facade	CN Galt	388	53	53
	Highway 407 Eastbound	168	58	52
	Highway 407 Westbound	188	57	51
	Dundas Street	1178	27	20
	Tremaine Road	681	37	31
	Total	-	61	57
Lot 373 East Facade	CN Galt	440	53	53
	Highway 407 Eastbound	320	51	45
	Highway 407 Westbound	340	51	44
	Dundas Street	1026	38	31
	Tremaine Road	688	27	21
	Total	-	57	54
Lot 361 Rear Yard	CN Galt	383	50	50
	Highway 407 Eastbound	171	57	50
	Highway 407 Westbound	191	56	49
	Dundas Street	1175	37	31
	Tremaine Road	688	26	20
	Total	-	60	55
Lot 373 Rear Yard	CN Galt	439	49	49
	Highway 407 Eastbound	325	51	45
	Highway 407 Westbound	345	51	44
	Dundas Street	1022	41	35
	Tremaine Road	691	26	20
	Total	-	55	51

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 292 Rear Yard	CN Galt	624	42	42
	Highway 407 Eastbound	226	55	48
	Highway 407 Westbound	246	54	48
	Dundas Street	1114	40	34
	Tremaine Road	441	46	39
	Total	-	58	52
Lot 288 Rear Yard	CN Galt	651	39	39
	Highway 407 Eastbound	285	52	46
	Highway 407 Westbound	305	52	45
	Dundas Street	1055	41	35
	Tremaine Road	436	46	39
	Total	-	56	49
Lot 253 Rear Yard	CN Galt	915	44	44
	Highway 407 Eastbound	571	49	43
	Highway 407 Westbound	591	49	42
	Dundas Street	766	31	25
	Tremaine Road	261	44	38
	Total	-	53	48
Lot 246 Rear Yard	CN Galt	767	46	46
	Highway 407 Eastbound	620	47	40
	Highway 407 Westbound	640	47	40
	Dundas Street	722	45	38
	Tremaine Road	448	34	27
	Total	-	52	48
Lot 115 Rear Yard	CN Galt	892	44	44
	Highway 407 Eastbound	996	43	36
	Highway 407 Westbound	1016	42	36
	Dundas Street	347	50	44
	Tremaine Road	467	32	26
	Total	-	52	48

..../cont'd

TABLE 2 (continued)

PREDICTED SOUND ENERGY EXPOSURE OUTDOORS

TRANSPORTATION NOISE – NO MITIGATION

Location	Source	Distance (m)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 11 Rear Yard	CN Galt	952	42	42
	Highway 407 Eastbound	1059	29	22
	Highway 407 Westbound	1079	28	22
	Dundas Street	283	54	47
	Tremaine Road	426	32	26
	Total	-	54	48
Lot 1 Rear Yard	CN Galt	1067	39	39
	Highway 407 Eastbound	1094	29	22
	Highway 407 Westbound	1114	28	22
	Dundas Street	245	54	48
	Tremaine Road	312	33	27
	Total	-	54	48

TABLE 3

SUMMARY OF MINIMUM NOISE ABATEMENT MEASURES

Building	Air Conditioning[1]	Exterior Wall[2]	Exterior Window[3]	Sound Barrier[4]	Warning Clauses[5]
Lots 288 to 292, 361 to 372	Provision	OBC	OBC	1.8 m	A, C
Lots 266 to 269, 293 to 325, 337 to 342, 349 to 360; Blocks 375 to 380	Provision	OBC	OBC	No	A, C
Block 395	Provision	OBC	OBC	No	A, C, D
Block 400	Mandatory	Brick Veneer	STC 30	No	A, B, D
Lots 1 to 15, 115 to 127; Blocks 393 & 394	None	OBC	OBC	No	D
Blocks 401 to 403	Mandatory	Brick Veneer	STC 30	No	A, B
All other lots/blocks	None	OBC	OBC	No	None
Blocks 397 to 399	None	Brick Veneer	STC 30	No	None

For notes to this table, see following page.

NOTES TO TABLE 3

1. Central air conditioning allows windows to remain closed for noise control purposes. Provision for adding air conditioning typically takes the form of a ducted ventilation system sized to accommodate the addition of central air conditioning by the occupant.

2. Masonry construction or acoustically equivalent construction to brick veneer meeting minimum STC 54.

3. Upgraded means construction beyond that governed by the minimum non-acoustical requirements governed by the OBC (typically about STC 25). A sliding glass walkout door should be considered as a window and be included in the percentage of glazing. Window requirements were based on standard assumptions and should be reviewed once building (floor) plans are finalized.

   The window STC rating applies to the entire window assembly and not just the glazing. The window supplier should provide acoustical laboratory test data (following a recognized test standard) for the intended windows indicated the STC ratings can be met.

4. Sound barriers must be solid and constructed with no gaps, cracks or holes and meet a minimum surface density of 20 kg/m^2.

5. Standard example warning clauses to be registered on title and be included in Offers of Purchase and Sale and Leases on designated units:

   A. "Purchasers are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound level may exceed the noise guidelines of the Municipality and the Ministry of the Environment."

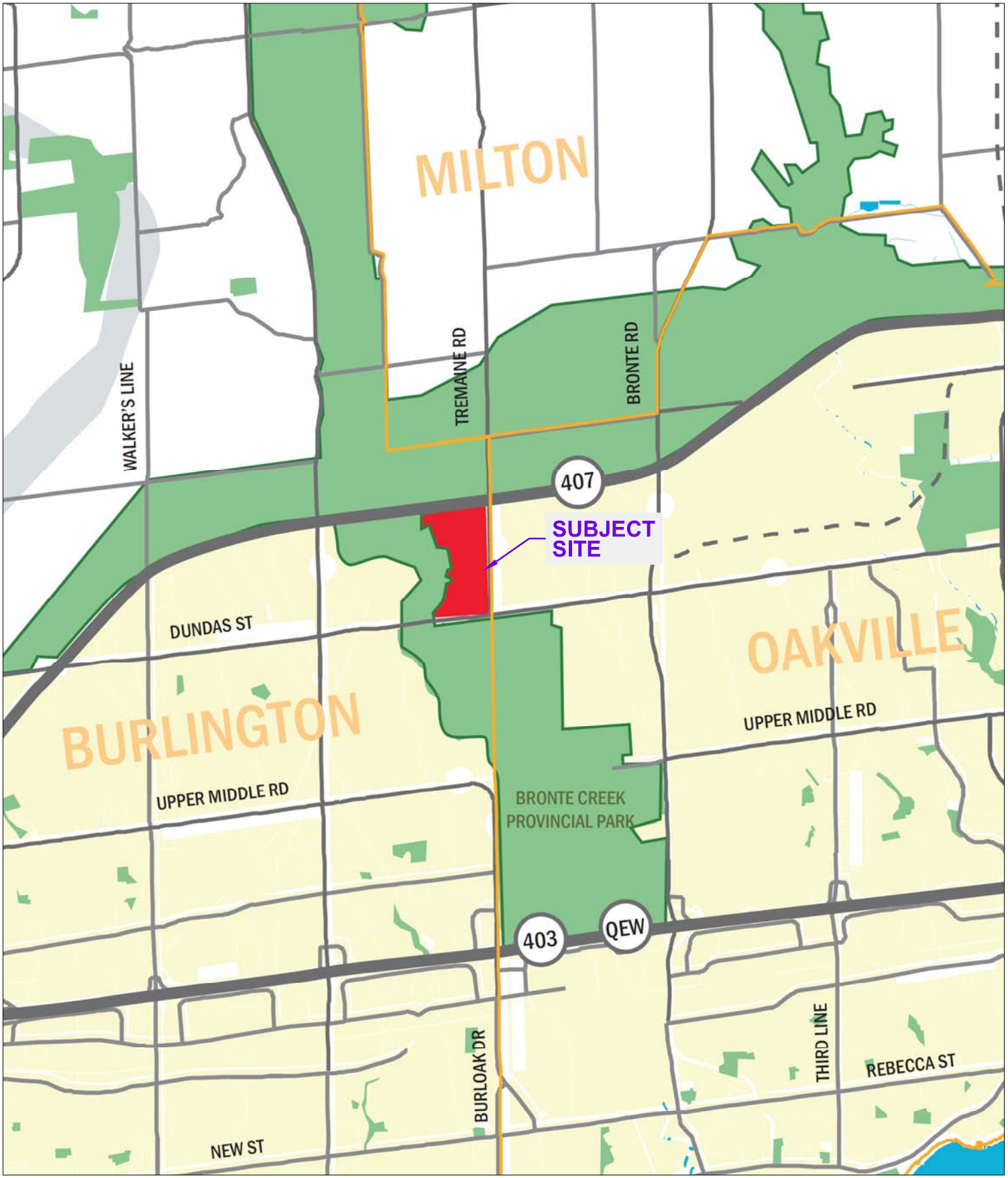
   B. "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

   C. "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment."

   D. "Purchasers are advised that due to the proximity of the nearby school bus facility, noise from the facility may at times be audible".

6. Conventional roof construction meeting Ontario Building Code requirements is satisfactory in all cases.

7. All exterior doors shall be fully weatherstripped.



No.	Revision/Issue	Date

VALCOUSTICS Canada Ltd.

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Title	Project No.	Date
Key Plan	113-425-200	2015-07-08
Project Name	**Scale**	**Figure**
Evergreen Community	N.T.S.	1



LAND USE / UNIT TYPE	LOTS / BLOCKS	AREA ha	AREA ac	UNITS
Business Corridor	396–398	4.57	11.29	
Mixed Use Corridor – Employment	399	1.48	3.66	
Mixed Use Corridor – General	400–403	5.81	14.36	410 *
Future Transit	404	0.66	1.63	
Parks	405–411	2.02	4.99	
LID / SWM / Naturalized Area	412–427	2.85	7.04	
NHS	428–432	19.61	48.46	
Road Widening	433–435	0.95	2.35	
0.3m Reserve	436–440	0.02	0.05	
Right of Way		13.38	33.06	
Special Right of Way (Eco Passage)		0.25	0.62	
Townhomes (6.10m / 20')	375–395	2.34	5.78	123
Single Detached WS (10.40m / 34')		2.26	5.58	75
Single Detached WS (11.60m / 38')		4.02	9.93	124
Single Detached WS (12.50m / 41')		3.69	9.12	101
Single Detached (12.50m / 41')		1.28	3.16	33
Single Detached (13.72m / 45')		0.74	1.83	18
Single Detached (15.24m / 50')		1.05	2.59	23
TOTAL		**66.98**	**165.51**	**907**

*Final unit count to be determined at a later date.

	m (width)	(l) m
Collector Road	27	370.0
Local Road	20	5420.3
Special Local Road (Eco Passage)	17	141.0
Minor Local Road	18.5	479.2
Lane	8.5	665.6
TOTAL		7076.1

No.	Revision/Issue

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Title	Project No.	
Preliminary Draft Plan	113-425-200	2015-07-09
Project Name	**Scale**	**Figure**
Evergreen Community	N.T.S.	2

Legend

Receptor

D: Daytime (0700-2300)
N: Nighttime (2300-0700)

HIGHWAY 407

TREMAINE ROAD

DUNDAS STREET

BLOCK 396 BUSINESS CORRIDOR

BLOCK 397 BUSINESS CORRIDOR

BLOCK 398 BUSINESS CORRIDOR

BLOCK 399 MIXED USE CORRIDOR - EMPLOYMENT

BLOCK 400 MIXED USE CORRIDOR

BLOCK 401 MIXED USE CORRIDOR

BLOCK 402 MIXED USE CORRIDOR

BLOCK 403 MIXED USE CORRIDOR

2 Storey Office

3 Storey Office

B379 D: 63 N: 57
B396 D: 63 N: 57
B397 D: 63 N: 57
B399 D: 71 N: 64
B400 D: 70 N: 64
B401 D: 68 N: 61
B402 D: 68 N: 61
B403 D: 67 N: 61
B392 D: 55 N: 48
B393 D: 55 N: 50
B394 D: 56 N: 50
B395 D: 57 N: 51

L298 D: 55 N: 51
L293 D: 57 N: 52
L292 (OLA) D: 58
L296 D: 56 N: 50
L300 D: 54 N: 50
L302 D: 54 N: 51
L288 D: 56 N: 49
L288 (OLA) D: 56
L315 D: 57 N: 52
L304 D: 55 N: 52
L284 D: 54 N: 48
L307 D: 55 N: 51
L280 D: 53 N: 47
L361 D: 61 N: 57
L361 (OLA) D: 60
L337 D: 55 N: 51
L360 D: 58 N: 54
L275 D: 54 N: 50
L320 D: 56 N: 51
L325 D: 56 N: 53
L272 D: 54 N: 50
L373 D: 57 N: 54
L373 (OLA) D: 55
L353 D: 56 N: 53
L269 D: 54 N: 51
L352 D: 56 N: 52
L266 D: 55 N: 53
L349 D: 55 N: 53
L253 (OLA) D: 53
L001 D: 54 N: 48
L001 (OLA) D: 54
L115 (OLA) D: 52
L011 D: 55 N: 49
L011 (OLA) D: 54

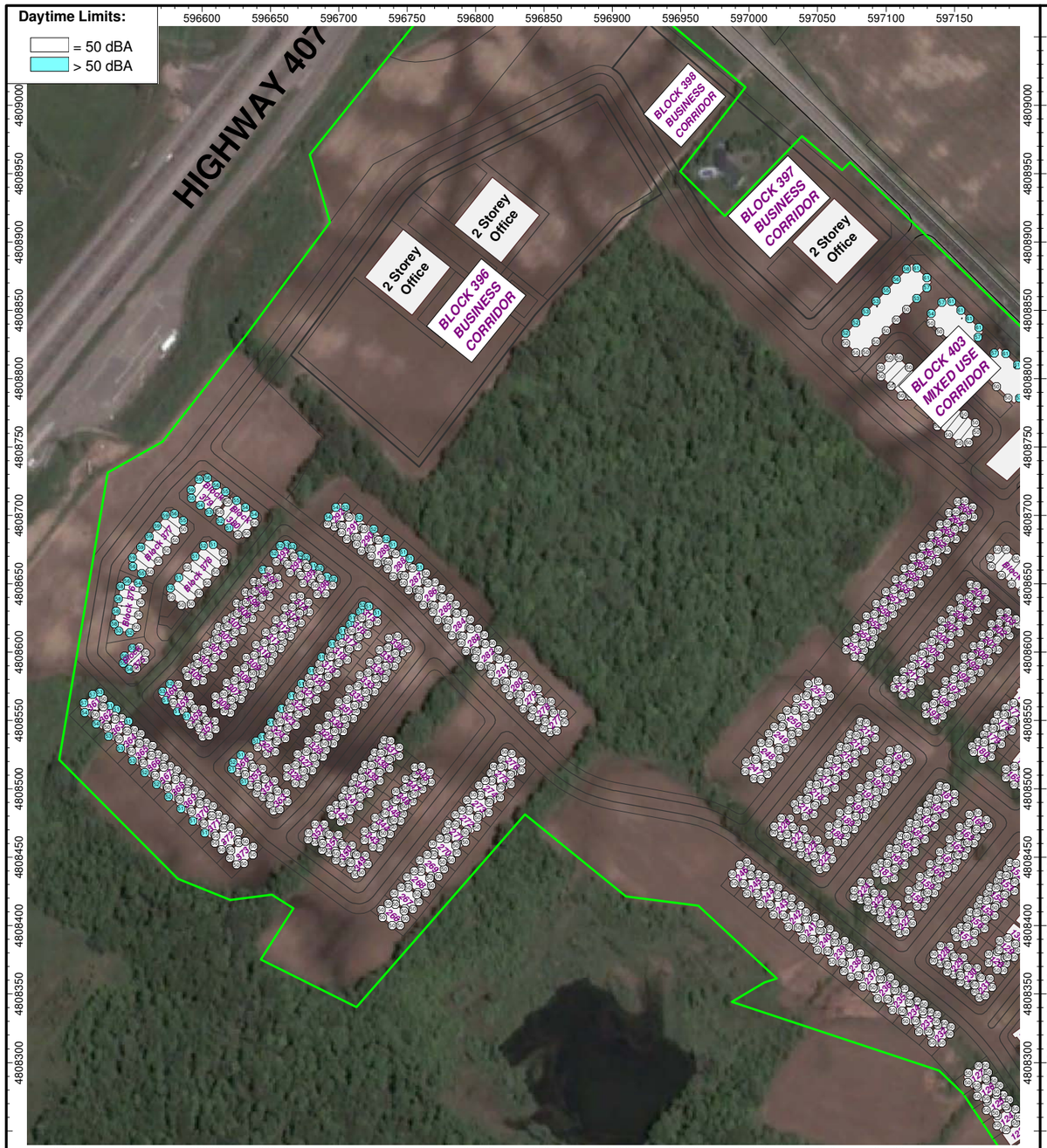
Image © 2014 DigitalGlobe

Image © 2014 DigitalGlobe

VALCOUSTICS Canada Ltd. consulting acoustical engineers	Title: **Predicted Sound Exposures (dBA) - Future Transportation Sources**	Date: **2015-07-08**	Figure: **3**
	Project Name: **Evergreen Community**	Project No.: **113-425-200**	

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Date Plotted: 09.07.15



Daytime (0700-2300)



Nighttime (2300-0700)

VALCOUSTICS Canada Ltd.
consulting acoustical engineers

Title
Applicable Guideline Limits (dBA) for Stationary Sources - Northwestern Parcels

Date
2015-07-08

Figure
4

Project Name
Evergreen Community

Project No.
113-425-200

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Date Plotted: 08.07.15

Daytime Limits:

= 50 dBA

> 50 dBA

Nighttime Limits:

= 45 dBA

> 45 dBA

TREMAINE ROAD

DUNDAS STREET

BLOCK 403 MIXED USE CORRIDOR

BLOCK 402 MIXED USE CORRIDOR

BLOCK 401 MIXED USE CORRIDOR

BLOCK 400 MIXED USE CORRIDOR

BLOCK 399 MIXED USE CORRIDOR - EMPLOYMENT

3 Storey Office

3 Storey Office

Daytime (0700-2300)

Nighttime (2300-0700)

VALCOUSTICS Canada Ltd. consulting acoustical engineers

Title

Applicable Guideline Limits (dBA) for Stationary Sources - Southeastern Parcels

Date

2015-07-08

Figure

5

Project Name

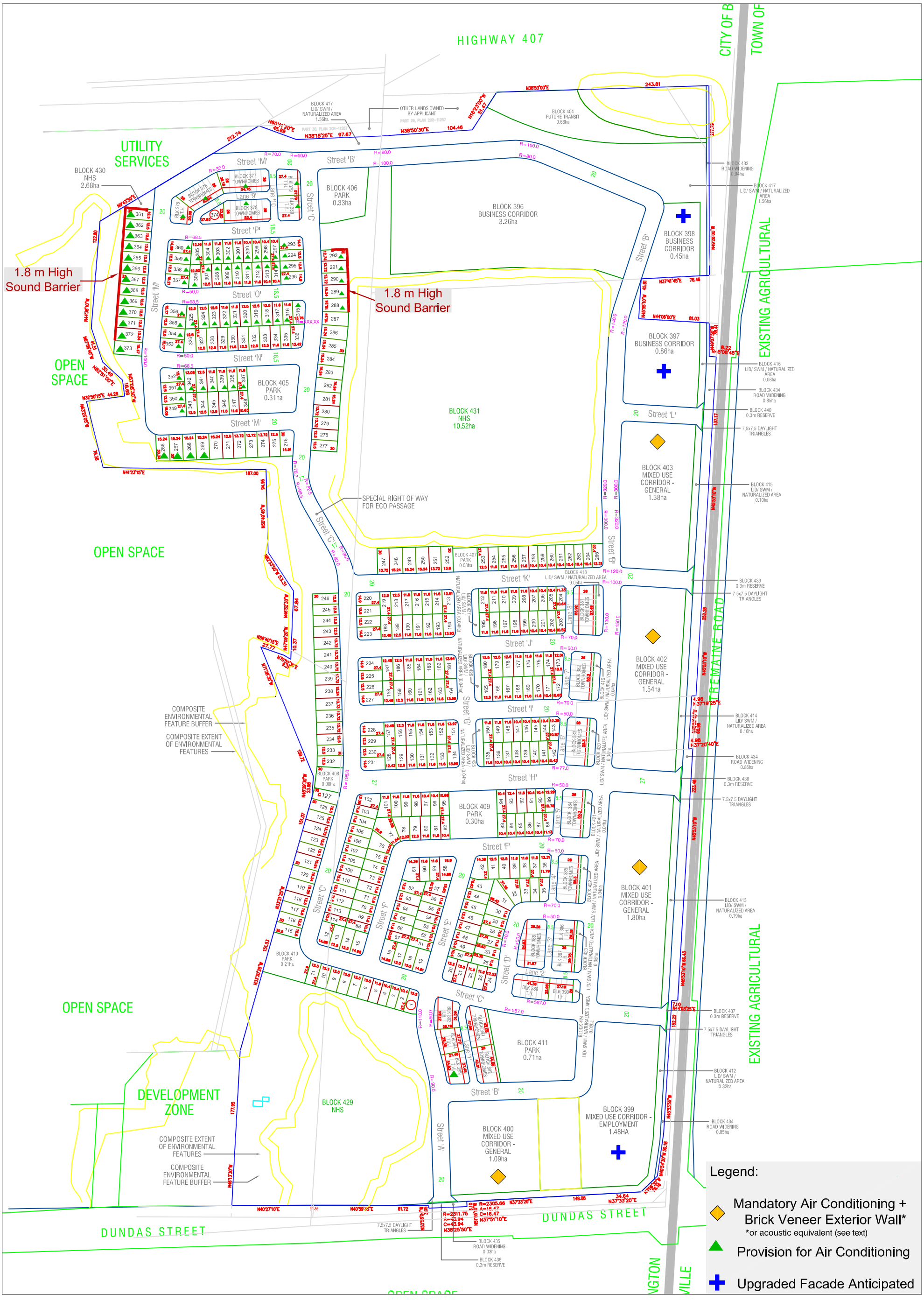
Evergreen Community

Project No.

113-425-200

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Date Plotted: 08.07.15



No.	Revision/Issue

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solutions@valcoustics.com

Title	Project No.	
Mitigation Requirements	113-425-200	2015-07-08
Project Name: Evergreen Community	Scale: N.T.S.	Figure: 6

APPENDIX A

SUMMARY OF MOE NPC-300 NOISE GUIDELINE CRITERIA

Appendix A

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT (MOE)

Reference: MOE Publication NPC-300, October 2013: "Environmental Noise Guideline, Stationary and Transportation Source - Approval and Planning".

Space	Time	Sound Level Limit (L_{eq})						
		Road (dBA)	Rail (dBA)	Aircraft (NEF)	Sound Source (dBA)[5]			
					Class 1[6]	Class 2[6]	Class 3[6]	Class 4[6]
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	0700 – 2300 16 hours	45[1]	40[1]	5[4]				
	2300 – 0700 8 hours	45[2], [3]	40[2], [3]	5[4]				
Sleeping quarters	0700 – 2300	45[1]	40[1]	0[4]				
	2300 – 0700	40[2]	35[2]	0[4]				
Outdoor Living Areas	0700 – 2300	55 – 60	55 – 60	—				
Plane of Window	0700 – 1900				50	50	45	60
	1900 – 2300				50	50	40	60
	2300 – 0700				45	45	40	55
Outdoor Point of Reception	0700 – 1900				50	50	45	55
	1900 – 2300				50	45	40	55

Notes:

(1) 16 hour L_{eq}.
(2) 8 hour L_{eq}.
(3) Not including schools, daycare centres.
(4) Over 24 hours.
(5) One-hour L_{eq} (dBA).
(6) Receptor area class.