

DRAFT

REPORT NO. WA12-032-A REV.2

**PRELIMINARY NOISE STUDY
MERTON TERTIARY PLANNING STUDY AREA
OAKVILLE, ONTARIO**

**SUBMITTED TO:
DAVID SCHAEFFER ENGINEERING LTD.
MARKHAM, ONTARIO**

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1.0 INTRODUCTION

The Merton Tertiary Planning Study area is identified as an area for potential future development in Livable Oakville policy 26.5 a). As such, on October 16, 2012, Town Council approved the development of a Tertiary Plan that will identify land use designations and policies for the entire Study Area. A number of technical studies are required to be completed as set out in Livable Oakville policy 26.5. A Terms of Reference for the Merton Tertiary Planning Study was developed in response to the Town's requirement for comprehensive studies to be completed prior to development proceeding. The subject study responds to the Town's Terms of Reference.

Presently, the study area is classified as an MOE Class 1 Area and consists of approximately 234 gross hectares and is located north of the Queen Elizabeth Way (north of the North Service Road), east of Bronte Road (and includes some parcels of land located on the west side of Bronte Road), south of Upper Middle Road and west of existing residentially developed lands west of Third Line. A map of the study area is provided in Figure 1. With the introduction of NPC-300, which replaces the MOE publications LU-131 and NPC-205, an area classification of Class 4 was introduced with more relaxed sound level limits than Class 1 or Class 2. The area designation of Class 4 is subject to approval by the municipal authorities as well as by other concerned parties, such as the Ministry of the Environment (MOE) if an approved Stationary Source in the influence area was approved by the Ministry for Environmental Compliance Approval (ECA). While it may be of benefit to relax the applicable criteria to be less stringent, it will be difficult to regulate the sound level emissions from the Regional offices as most of the noise sources associated with this Region of Halton facility is not subject to ECA requirements. In addition, we believe that the Region is likely to be subject to noise complaints from future residents that may live in the future Tertiary Plan area if the noise from the Halton Region buildings, including its Public Works Yard, is somewhat significant. More details regarding the new Class 4 area can be found in Section 3.0 of this report.

Currently, the Saw Whet and the Deerfield Golf Courses, existing rural residential, an Ontario Hydro right-of-way, the Mid-Halton Pollution Control Plant, an existing designated heritage cemetery, and the Region of Halton Offices and Halton Regional Policy Headquarters occupy the subject lands. Fourteen Mile Creek and natural heritage features associated with Bronte Creek traverses through the Study Area.

The services of SS Wilson Associates have been coordinated by David Schaeffer Consulting Engineering Ltd. (DSEL) to prepare a ***Preliminary Noise Study*** for the study area known as Merton Tertiary Planning Study Area shown in Figure 1.

The objective of this study is to address all issues related to environmental noise at a tertiary plan level of detail based on our knowledge of the Study Area including conducting site reconnaissance trips, meetings with key contact persons, and taking sample sound level readings; where deemed necessary.

Figure 2 is an aerial photo of the entire area.

2.0 THE LEVEL OF DETAIL REQUIRED FOR A NOISE STUDY

It is important for all concerned parties to appreciate the fact that addressing environmental noise/vibration concerns during the planning process in Ontario usually requires the preparation of different noise study details depending on the planning stage and on the availability of the necessary planning and engineering data needed to complete an assignment.

The guidelines prepared by the MOE discuss some of the differences and the level of detail required for a noise control feasibility study and a detailed noise control study. At the feasibility level, the MOE advises the following: ***“The feasibility study should assess the site layout including the roadways and orientation of the buildings, and consider the zoning of land uses including industrial, commercial, high, low and medium density residential use. The study should alert the proponent and the land use planning authority of the potential for conflicting land uses and determine the practicality and economic feasibility of physical noise control measures, in conjunction with the selected site design. Furthermore, the study should include direction on the need for additional detailed studies”***

At the Tertiary Planning Stage for this area, however, it is evident from the submitted project details that there are no specific site layouts to enable one to develop reasonably accurate details and descriptions of the noise control requirements as such intermediate level of details will be developed during the Draft Plan approval stage. Therefore, it is our submission that the data presented herein is more than adequate to allow this development to proceed to the next development stages with appropriate approval conditions. The choice of specific noise control measures is seldom determined with any degree of precision at the earlier stages of the planning process. Reliance on the various stages of the planning and development process is essential towards implementation. At the earlier stages of the planning process, such as at this tertiary plan level, however, decisions regarding all other considerations including noise should end up with requiring commitments at the appropriate levels such as Draft Plan Approval, Final Approval and Registration, Site Plan approval, etc. as appropriate for the case.

In the Town of Oakville, there are several Town documents that regulated the different levels of requirements depending on the approval stage/application as outlined in their document ***“Development application guidelines- Noise and vibration study: A noise and vibration study may be required as part of the following applications:***

- a. Official Plan Amendment***
- b. Zoning By-law Amendment***
- c. Draft Plan of Subdivision / Condominium***
- d. Site Plan Control”***

3.0 POTENTIAL SOURCES OF NOISE AFFECTING THE STUDY AREA

The subject area is bound by “linear” sources of noise: the QEW/403 freeway, Bronte Road, Upper Middle Road, North Service Road, and Third Line (in the noted order of magnitude). The other category of noise sources is “stationary sources”, which encompasses institutional, employment and commercial land uses of which

the Region of Halton Head Quarters (HQ offices) and Public Work Yard/Facility (PWY) at one location and the Mid-Halton Wastewater Treatment Plant are the dominant sources.

The reasons for distinguishing between line and stationary sources of noise are summarized as follows:

- Line sources affect a more significant land extensive area for noise consideration by comparison with stationary sources (The extent of the QEW/403 is approximately 1.8 km and the extent of Bronte Road is approximately 1.7 km).
- The rate of sound level reduction with distance setbacks for line sources is lower, i.e. less beneficial for noise control than stationary sources.
- Control of line sources noise is provincially more acceptable for new developments with the use of conventionally/traditionally used noise control measures such as with the use of sound barriers, selection of appropriate building shell components (walls, doors and windows), the use of central air conditioning and the application of warning clauses. For stationary sources of noise, noise controls are more costly and difficult at times based on the Provincial requirements and the fact that some of the road noise control measures are not accepted by the Province.

The stationary sources of noise in the subject area include the following major classifications:

- Heating, ventilation, and air-conditioning (HVAC) equipment of all types (cooling towers, roof-top units, ventilation fans, etc).
- Standby emergency power generation equipment.
- Process equipment (pumps, motors, etc.).
- Aggregate handling equipment (loaders, etc.).
- Mobile equipment movements (trucks and loaders) within the stationary sources facilities.
- Numerous sources of nuisance type noise (such as parking areas).

There are two main facilities in proximity to the subject study area that are of concern in terms of noise: the Halton Region offices and facilities to the southwest and the Halton Region Water Treatment plant to the south.

Halton Region Offices

The Halton Region office area houses a public works yard, ambulatory services building, and police services building in addition to its main office building. It is expected that this facility in its entirety will be the biggest concern for noise due to the numerous operations that take place within it.

Halton Region Public Works Facility

The public works facility includes a small holding yard for aggregates, a main building, and a yard to house the various vehicles and equipment in.

The sources of noise emanating from the aggregate yard include the operation and idling of equipment, such as front-end loaders and loading/dump trucks. Typically,

aggregate yards will normally operate from 7:00am to 4:00pm; however emergency work can take place during the off hours.

The main public works building and yard houses the vehicles and equipment used for various public works operations and the sources of noise of concern include the idling and movement of the various vehicles and equipment. In addition, the main building has a repair shop for vehicles with three large overhead doors facing the north that will likely remain open on days with hotter temperatures. The noise emitted from these doors will be assumed to be the idling of large trucks¹.

The following are typical sound levels observed in previous projects done by SSWA for the type of equipment that can be found in a Public Works facility:

- Front End Loader Idling: 76dBA @ 7.5m
- Front End Loader Moving: 79dBA @ 7.5m
- Large Truck Idling: 72dBA @ 7.5m
- Large Truck Moving: 75dBA @ 15m
- Van/Pickup Truck Idling: 70dBA @ 7.5m
- Van/Pickup Truck Moving: 70dBA @ 7.5m

Halton Region EMS Services

The EMS building is a holding facility for the maintenance of EMS vehicles, as well as a storage area during off hours. There is a special exhaust on the roof of this building which turns on when the special exhaust system is coupled with an EMS vehicle and typically runs for approximately 3 minutes. The typical sound level for this type of high velocity exhaust fans are usually approximately 70dBA @ 15m.

In addition, there is an emergency generator within the building that is tested approximately once a month and during off hours, but must meet the specifications of Ontario Regulation 346/12 of having a maximum rated capacity of 700kW and a maximum rated sound pressure level of 75dBA @ 7m.

Halton Region Police Services

The main sources of noise of concern related to the Police Services building are the more-or-less frequent car door slamming and the idling of its parked police and staff vehicles in the parking lot towards the southeast of the subject development around the clock. The typical sound level of an idling automobile is 57dBA @ 5m.

Main Regional Building

There are two sources that are of concern from the Halton Region's main building: a kitchen exhaust fan serving the cafeteria and the cooling tower. The kitchen exhaust will be operating full tilt during the operating hours of the building and will be turned off during the off hours. The typical sound level for this type of high velocity exhaust fans are usually approximately 70dBA @ 15m. For the generator, the specifications

¹ Other noise sources including air operated pneumatic tools, hammering, etc. which are all considered as nuisance type sources.

must meet Ontario Regulation 346/12 of having a maximum rated capacity of 700kW and a maximum rated sound pressure level of 75dBA @ 7m.

Water Treatment Plant

There is a water treatment plant nearby located to the east of the subject study area on North Service Road West. The Water Treatment Plant may be, or may already have been, subject to an ECA. Typical sources of noise from treatment plants include exhaust fans, standby generators, and sometimes heat/cool units serving the offices. From past experience and projects done by this firm for similar treatment plants in the Town of Oakville, it can be expected that the sound levels due to these types of facilities to be in compliance with the applicable sound level criteria 70m from the plant or greater.

The following are typical sound levels observed in previous projects done by SSWA for the type of equipment that can be found in a Water Treatment facility in the Town of Oakville:

Exhaust Fan for a Blower Building	:	67dBA @ 15m (directional)
Exhaust fan for a Disinfection Building	:	70dBA @ 15m (directional)
On-site Diesel Generator	:	65dBA @ 15m
Exhaust fan for Pumping Station	:	56dBA @ 7m

4.0 GENERAL NOTES ON THE APPLICABLE SOUND LEVEL CRITERIA

Without getting into the details, the following is a basic outline and primer on the sound level criteria for line and stationary sources of noise (for details, reference should be made to the new MOE publication NPC-300):

<u>Location</u>	<u>Line Sources</u>	<u>Stationary Sources</u>
Outdoor Living Areas	Leq 55 dBA in defined OLA's daytime only	<ul style="list-style-type: none"> •Leq 50 dBA in all areas daytime •Leq 45 dBA in all areas - nighttime
Building Façade (outdoors)	<ul style="list-style-type: none"> • Leq 55 dBA daytime • Leq 50 dBA nighttime 	<ul style="list-style-type: none"> Leq 50 dBA - daytime Leq 45 dBA - nighttime
Indoors	<ul style="list-style-type: none"> • Leq 45 dBA – daytime • Leq 40 dBA - nighttime 	Not applicable. Must use building façade only

From the above, it will be noted that the stationary sound levels criteria are more stringent than that for line (road transportation) sources.

The new NPC-300 also mentions a new area classification, Class 4. From NPC-300, a Class 4 area “means an area or specific site that would otherwise be defined as Class 1 or 2 and which:

- is an area intended for development with new noise sensitive land use(s) that are not yet built;
- is in proximity to existing, lawfully established stationary source(s); and
- has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.”

A Class 4 area would have more relaxed sound level criteria. For stationary sources, the maximum exclusion limits at the plane of a window are 60dBA/55dBA for the day/night time and the exclusion limits in the outdoor living areas pertaining to transportation sources of noise is 55dBA for day and night times.

For the subject study area, it is our opinion and recommendation that the Class 4 classification is not sought after for the study area as this may potentially lead to putting undue pressure on the Region in the form of future complaints from future residences subject to the noise from the Public Works Yard. It is our opinion that while the sound level impact on future residences adjacent to the Regional Offices may be high, it is feasible to mitigate the sound levels to meet the applicable criteria for Class 1 areas.

5.0 TYPICAL SOURCE SOUND LEVELS

For prediction of stationary sources of noise, a 3-D computer program for multiple point and line sources and multiple receivers developed by SS Wilson Associates was used to calculate the sound levels. The program takes into account:

- Reference sound levels and reference distances for the equipment working in each area of the subject development, i.e. sound emission levels.
- The Cartesian co-ordinates (x, y & z) of all sources and receivers.
- The number of events or occurrences of the noise in a given time period and the time period of each event.
- Spherical divergence factor.
- Additional attenuation due to sound barriers; natural or man-made types.
- Additional attenuation due to ground (as modified by sources/receiver elevations, the presence of intervening barriers and the type of ground).
- Atmospheric attenuation due to air molecular absorption.

For transportation sources of noise, predictions were carried out using STAMSON Version 5.04 (2000)², the computerized version of the MOE noise prediction models, ORNAMENT and/or STEAM.

For the purposes of this preliminary noise investigation, reliance is made on the use of prediction techniques and sample sound level readings taken at some selected

²The MOE's noise prediction model 'STAMSON' has a limitation as to the minimum AADT value for 24 hour traffic volume (calculated for the daytime and nighttime hourly volume). When the AADT value is less than 40 vph, there is a neutral mathematical manipulation that can be used as long as the hourly traffic volume is not very low. The manipulation is implemented by multiplying the traffic volume by any reasonable factor (for example a factor of 10) and then by deducting $10 \times \log$ "factor" from the results (in this case, $10 \times \log 10=10$).

locations to demonstrate the order of magnitude of the current sound levels. The following is a summary of the typical sound levels.

QEW/403³

- At 50 m from CL: Leq 76/70 dBA (Day/Night), 74dBA (24h)
- At 200 m from CL: Leq 66/60 dBA (Day/Night), 64dBA (24h)

Bronte Road⁴:

- At 30 m from CL: Leq 68/62 dBA (Day/Night)
- At 120 m from CL: Leq 62/56 dBA (Day/Night)

Upper Middle Road⁵

- At 30 m from CL: Leq 63/57 dBA (Day/Night)
- At 120 m from CL: Leq 54/47 dBA (Day/Night)

Halton Region HQ HVAC:

- Leq 50-55 dBA at S-W corner of the Saw Whet Golf Course lands

Halton PWY North & East Property Lines:

- Leq hourly 50-60 dBA

Halton Water Treatment Plant:

- Leq 45-50 dBA at 70m from any building/structure within the plant

From the above, it is evident that the some of the actually measured and predicted sound levels are in excess of the applicable sound level criteria thus warranting the need to investigate and apply noise control measures as briefly discussed in the section to follow.

6.0 OPPORTUNITIES FOR NOISE CONTROLS IN THE STUDY AREA

The objective of this section is to provide an overview of the opportunities for noise control considerations at a tertiary plan level detail based on meeting Provincial, Regional and Local Municipal objectives. Generally, the preferred methods of control are at the sources themselves or the use of higher sound barriers and innovative site and building designs.

At the tertiary stage level, it is difficult to determine precision the details of what type of mitigation would be required and at which locations. At this tertiary plan level, decisions regarding all other considerations including noise should end up with requiring commitments at the appropriate levels, such as Draft Plan Approval, Final Approval and Registration, Site Plan approval, etc. as appropriate for the case.

³ Based on 220,000 vpd (2031), 100km/h, 6%HT, 2.5%MT, 90%/10% Day/Night Split, and flat grades.

⁴ Based on 50,000 vpd (2031), 60 km/h, 3.8% HT, 2.5% MT, 92%/8% Day/Night Split, and flat grades

⁵ Based on 27,850 vpd (2031), 60km/h, 1.7% HT, 1.7% MT, 90%/10% Day/Night Split, and flat grades

The following discussion is split into two categories depending on the source type; line or stationary noise.

Line Source (Freeway Transportation) Controls

There are several available options that can be explored depending on the most desirable planning objective in the subject planning area.

Firstly, a buffer strip of employment land uses like commercial and industrial buildings such as those located along the QEW from Southdown Road westerly to Guelph Line. Such buffer land uses range from 200m to 1000m deep in some areas. This approach has several benefits including:

- Land is utilized rather than sterilized
- The added distance setback alone can provide anywhere from 6 to 12 dB reduction which is considered significant
- Presence of the employment buildings can provide from 0 to 10 dB reduction (considered significant) depending on the grade elevations at the QEW/403, the buffer lands and the noise sensitive developments⁶

The design of the employment lands and the balance of the development further north should also take into consideration the fact that employment lands, if not properly governed by other noise control policies, will become sources of stationary noise, i.e. requiring further and sometimes difficult noise control measures. It should be noted that light industries are preferred over heavy industry should they be placed adjacent to residential land uses and must meet the applicable sound level criteria.

The second approach is to rely on the use of a buffer area, including the use of an earth berm, along the entire length of the south boundary of the planning area in a like manner with the existing buffer and berm between Bronte Road and Burloak Drive which is expected to provide a typical sound level reduction of 10+ dB for any development in the immediate vicinity of the berm. There are several issues of concern with such approach including the following:

- The presence of Halton's wastewater Treatment facility to interrupt the barrier continuity.
- The amount of land needed is extensive as more than 70-80 m lateral space is need to accommodate a minimum 10 m high berm
- Construction cost and availability of fill material to construct a minimum 10 m high berm over an extended length of approximately 1,800 m on both sides of the Halton Plant
- Maintenance costs of such berm(s)

A small variation of such berm is to use a base berm of approximate height of 5 to 6 m and sound barrier wall of 4m to 5m on top. This will also have high cost implications, loss of land and on-going maintenance, etc.

⁶ Care should be taken to ensure that the future employment land elevations do provide adequate interruption of the line-of sight- from the residences to the highway; otherwise, the noise wall height will be amplified.

The third approach is to rely on the use of a combination of noise control measures such as distance setback, a modest use of buffer land uses the use of sound barrier berms and walls not exceeding 5m to 6 m high, and building orientation to achieve the objective sound levels for parcels of land designed in a linear fashion parallel to QEW/403.

Line Sources (Regional and Municipal Transportation Roads) Controls

The use of buffer areas for noise control is used by some municipalities to provide visual and partial noise relief along Major/Regional arterial roads where a buffer strip accommodating a 3± m high berms are used. While a 3 m structure seldom provides any significant noise reduction, its use provides the opportunity to use a “service” road (sometimes referred to as “window” road) and houses that front along a major arterial road without having to build a high sound barrier. The added buffer space plus the 3± m berm provide the opportunity for this noise control, improved visual relief, control of pedestrian access directly onto the major arterial road, and noticeable noise reduction.

For flanking lots in such a case, the berm could also provide the base for a sound barrier wall on top thus cutting down the undesirability of high free standing noise walls.

Secondly, where the use of reversed frontage lots is desired along major arterials, the use of a base berm plus a sound barrier wall on top has proven itself to be desirable on many accounts including effective control of noise, improved privacy of dwellers, and reduced pedestrian access to the road (except through formally designated access lanes). Issues of concern include safety of pedestrians, height of barriers if the total structure height exceeds 5± m and on-going maintenance of berms and walls. Of concern is also the impact on the 2nd storey windows as traffic noise remains unabated despite the fact that these dwelling are fitted with mandatory air conditioning equipment.

The use of preferential grade elevations may prove to be valuable for improved acoustic efficiency of sound barriers and reduced sound barrier heights. For example, if a future residential dwelling is to be located at a higher elevation (more exposure to sources of noise), then the land can be designed in such a way where the property line is at the same or higher elevation as the building so that property line sound barriers become more effective at mitigating noise.

Stationary Sources of Noise

It is expected that any future housing immediately north of the Halton Region offices (on the west end of the study area) will be subject to the greatest noise impact from stationary sources due to its close proximity to the Regional Public Works Yard and storage area. The fact that the sound level objectives must be met at the face of the windows at all dwelling levels during the day and night and that the use of central air conditioning is not an acceptable solution for noise control makes the controls stricter and more limited to the following range of alternatives:

Firstly, application of the required noise control measures right at the source may be more economical, where technically and administratively feasible. Controls include the use of sound barrier walls on the source property, partial or full enclosures of

certain equipment, the use of silencers, and other forms of noise mitigation measures. The primary issue may be practicality of the controls for the source owners and reluctance of source owners to apply any controls on their site.

Secondly, where space permits, the use of fairly high sound barriers, in excess of 6 m and at times up 12m, may prove to be valuable for land use compatibility and general noise controls. The location of such barrier would have to be as close as possible to the source(s) of noise and/or to the noise-sensitive receptors.

Thirdly, the uses of innovative house design as well as supplementary sound barriers have proven to be one of the best alternative combinations for stationary noise control. There are now numerous examples in Ontario of such designs with excellent results and acceptance by new homeowners. The use of conventional first floor house designs and a modified second floor design (the side of the house facing the source would have no windows in habitable areas) are only a simple example of such applications.

General Notes Regarding the Three Proposed Concept Plans

The three conceptual plans (Options A, B, and C) proposed for the study area typically plan for residential land uses with the possibility of an elementary school on the west end of the study area and commercial land uses for the south end.

Option A

Option A proposes a possible exchange of land with the Regional Offices where the portion to the northeast of the Region will be given to them in exchange for the plot of land north of the Region along Bronte Road. The entire area north of the Regional Offices will then be developed into low to medium density housing.

For this Option A, it may prove to be difficult for the sound levels from the Regional Public Works Yard to be in compliance with and future residences directly north of it due to its close proximity and the inherent nature of a Public Works Yard. It can be estimated that a minimum 5m barrier will be required along the property line to shield any future 2nd storey receptors. This can be achieved as a 4m structure or a barrier and berm combination.

Another option that may be considered is to place a buffer strip of commercial uses between the Regional lands and the proposed future residences, but the impact of the commercial must also be assessed for compliance with the residential uses. The proposed elementary school will be located farther away from the Public Works Yard and will have many rows of housing in between to reduce the noise impact, which we support.

With the road located and aligned where it is proposed, it may prove difficult to incorporate any form of a commercial use due to the lack of the space required. It would be preferable to incorporate space required for a berm and barrier to shield the dwellings, but the presence of the proposed road between the Region lands and the low density housing may require that additional space north of the road be used for berm construction.

Option B

Option B proposes that the entire area north and northeast of the Regional Offices will be developed into low to medium density housing.

For this Option B, it may prove to be difficult for the sound levels from the Regional Public Works Yard to be in compliance with and future residences directly north and east of it due to its close proximity and the inherent nature of a Public Works Yard. It can be estimated that a minimum 5m barrier will be required along the property lines to shield any future 2nd storey receptors. Another option that may be considered is to place a buffer strip of commercial uses between the Regional lands and the proposed future residences, but the impact of the commercial must also be assessed for compliance with the residential uses.

For this option, the preference would be to rely on the construction of a berm and barrier along the property line bordering the Regional offices.

Option C

Option C proposes that the entire area north and northeast of the Regional Offices will be developed into low to medium density housing.

For this Option C, it may prove to be difficult for the sound levels from the Regional Public Works Yard to be in compliance with and future residences directly north and east of it due to its close proximity and the inherent nature of a Public Works Yard. It can be estimated that a minimum 4m barrier will be required along the property lines to shield any future 2nd storey receptors. Another option that may be considered is to place a buffer strip of commercial uses northeast of the Regional lands instead of the proposed future residences, but the impact of the commercial must also be assessed for compliance with other residential uses.

The proposed location of the elementary school is within close proximity to the Public Works Yard, which is considered a noise-sensitive land use and must be assessed. As such, it is likely that noise mitigation in the form of high property line sound barriers are required, which may not be preferred or accepted.

For this option, the preference would be to rely on some high property line sound barriers to shield the medium and low density dwellings bordering the Regional offices and to use the medium density dwellings to provide shielding for the rows of housing behind it.

7.0 POTENTIAL IMPACT OF THE FUTURE LAND USES ON THE DEVELOPMENT AREA AND THE SURROUNDING LAND USES

Placement of noise incompatible land uses adjacent to each other without serious and early consideration in the planning process will result in hardship to all concerned parties. For example, new residential land uses adjacent to transportation sources without serious and effective noise controls will result in public complaints to the MTO, the Region and the municipality and the request for last minute noise control solutions that are unsightly, expensive and not acoustically effective.⁷

⁷ SS Wilson Associates investigated noise issues on behalf of the noted authorities in connection with older and ineffective solutions some of which resulted in more financial burdens on the authorities.

The greatest potential noise compatibility issue arises from the proposed residential uses in the vicinity of the Region of Halton facility which would place the Region as being in violation of the Town of Oakville's Noise By-Law and the MOE NPC-300 policies. Noise control measures are, in our estimation, capable of making them compatible land uses.

Otherwise, we do not foresee any other noise impacts on the existing residential developments on the east and north sides of the subject planning area.

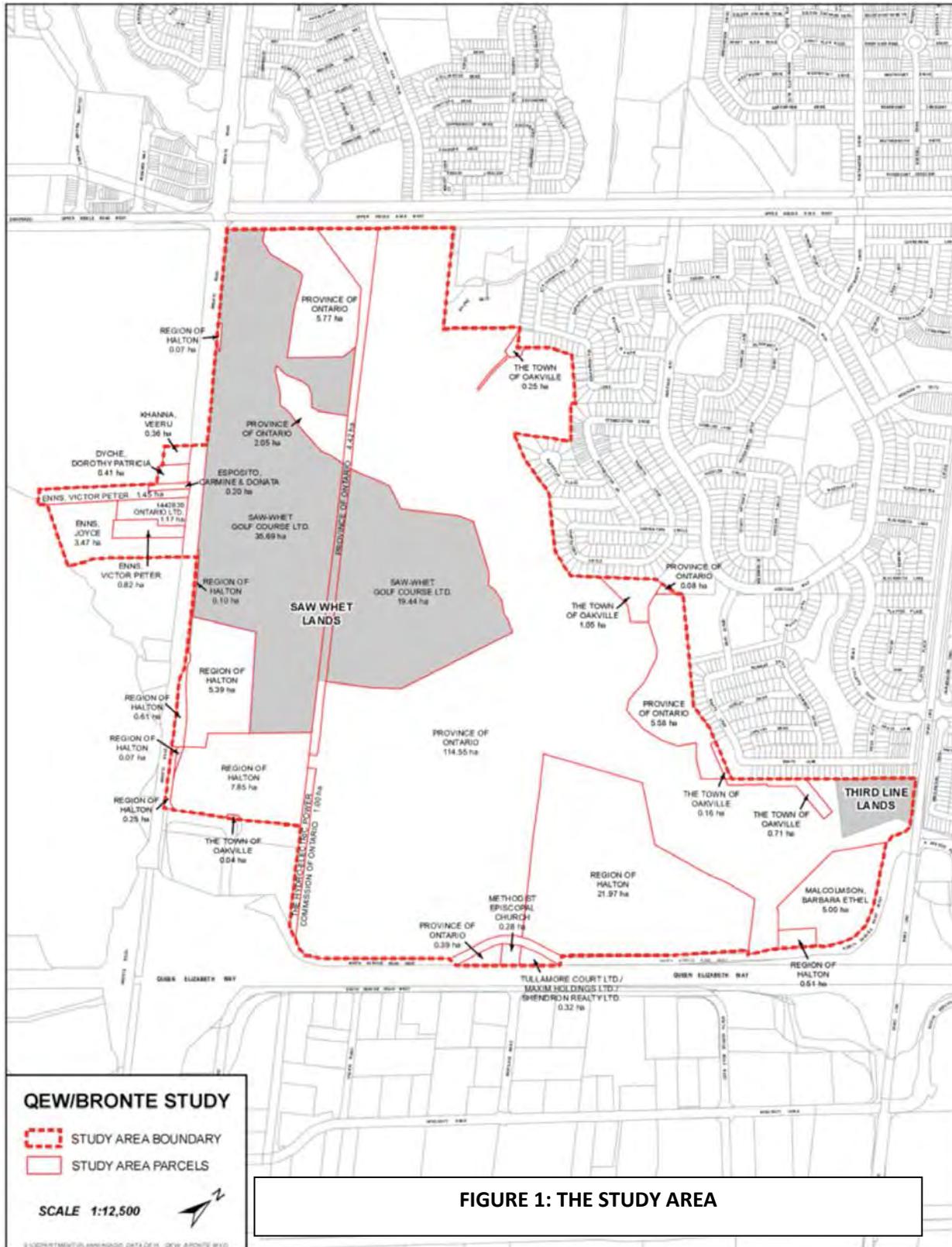
8.0 IMPLEMENTATION OF THE NECESSARY NOISE CONTROL

The choice of specific noise control measures is seldom determined with any degree of precision at the earlier stages of the planning process. Reliance on the various stages of the planning and development process is essential towards implementation. At the earlier stages of the planning process, such as at this tertiary plan level, however, decisions regarding all other considerations including noise should end up with requiring commitments at the appropriate levels such as Draft Plan Approval, Final Approval and Registration, Site Plan approval, etc. as appropriate for the case.

During the Draft Plan Approval stage, for example, decisions are usually made on the need for land buffers for berms/barriers, buffer land uses, the use of service/window roads, etc. Refinements of the acoustic requirements take place during the Final Approval and/or Site Plan approval stages.

Therefore, once a consensus or a compromise is reached on the ultimate land use designations, the approval process should include the necessary conditions directing the developer(s) towards further and detailed noise investigations in concert with other disciplines.

FIGURES



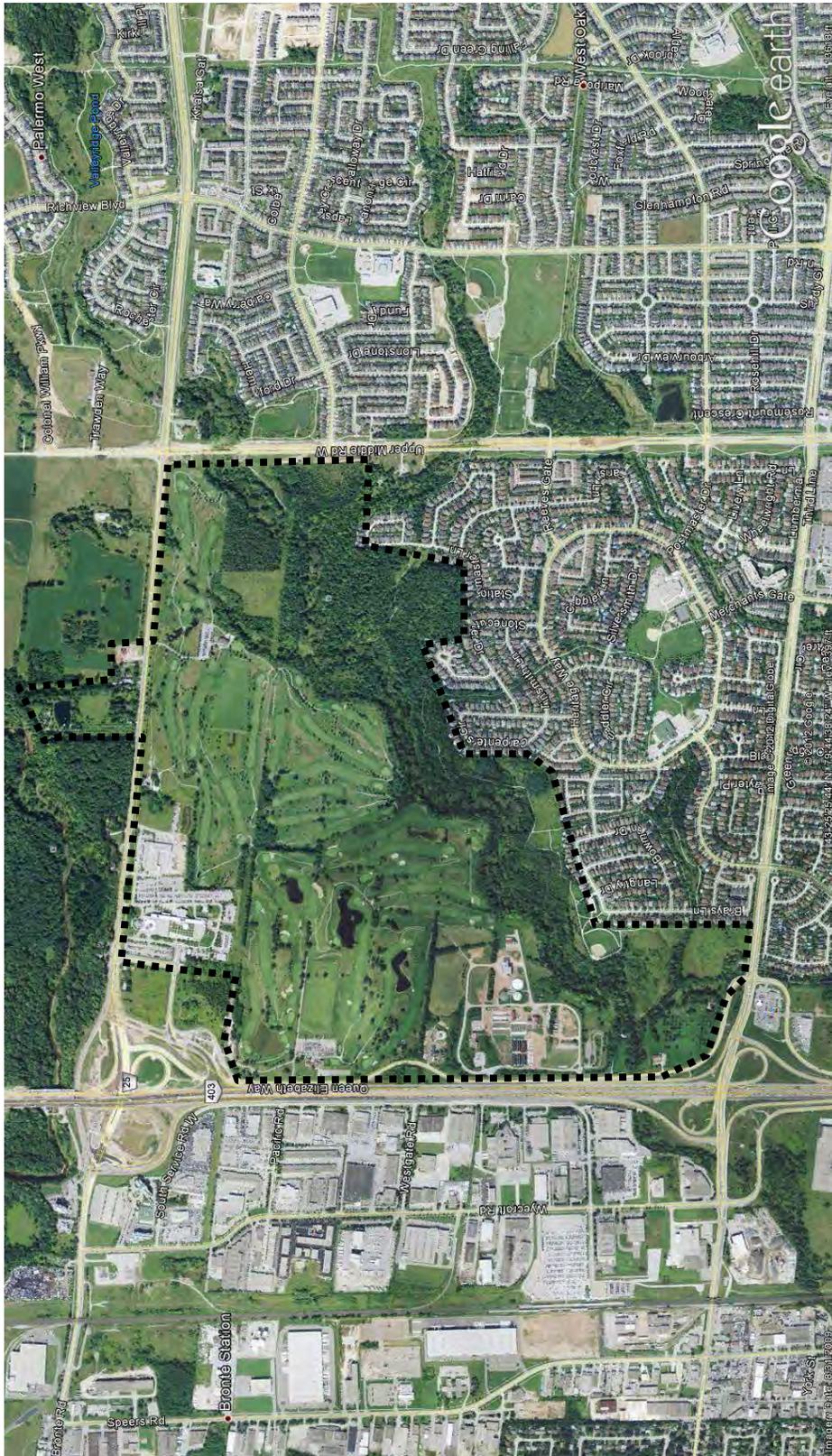


FIGURE 2: AERIAL PHOTO OF THE SUBJECT AREA

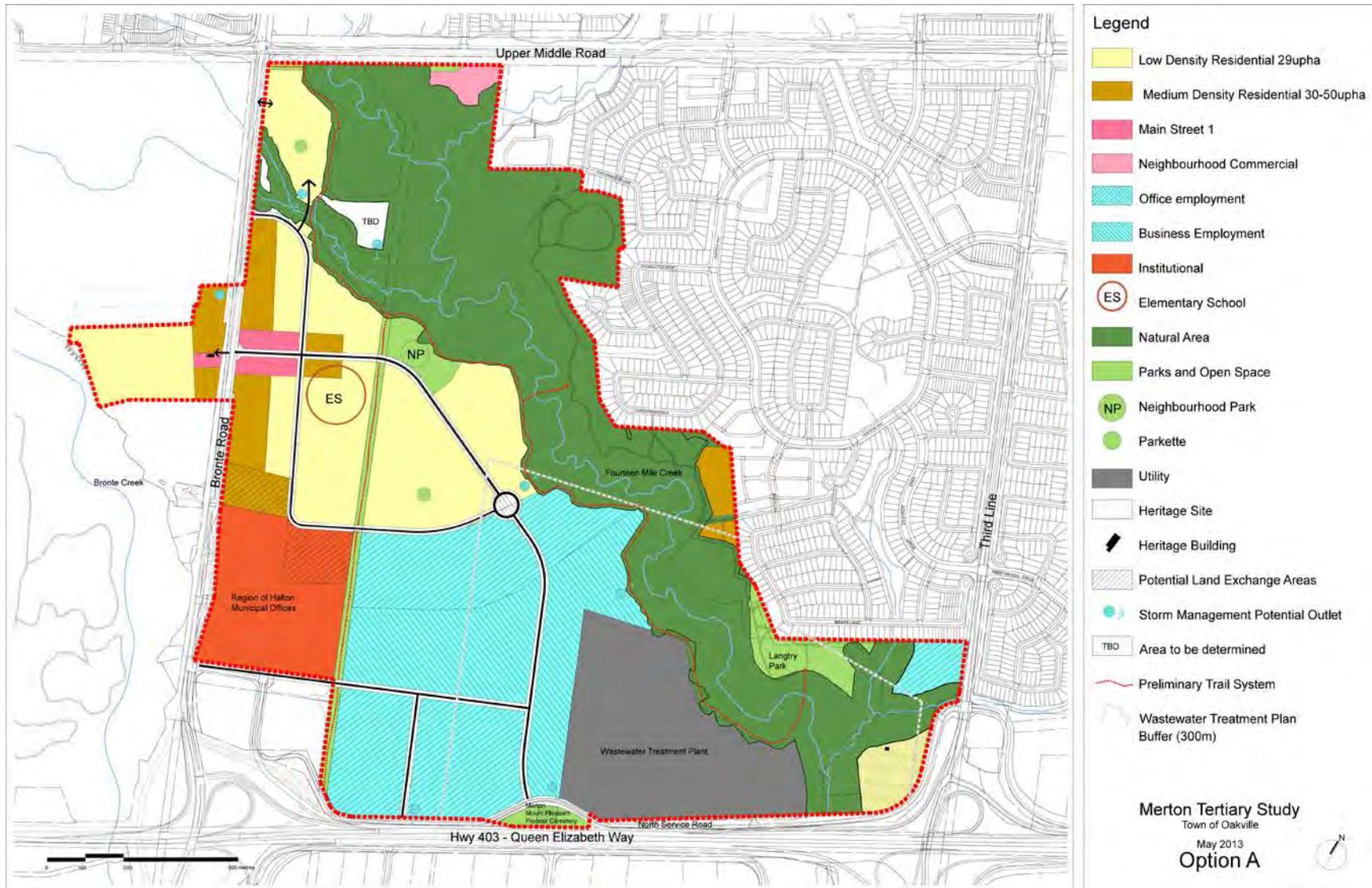


FIGURE 3: CONCEPT PLAN OPTION A

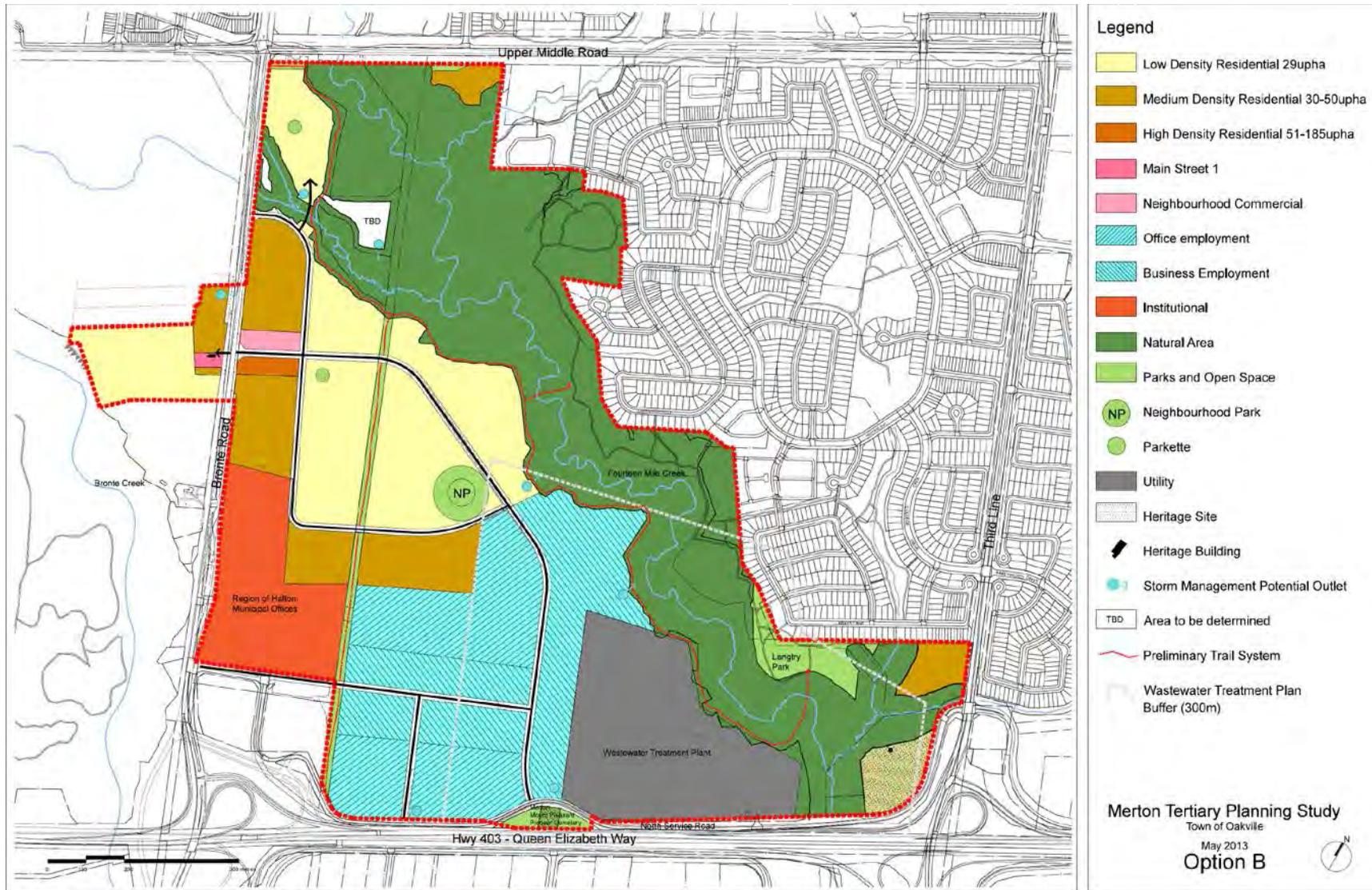


FIGURE 4: CONCEPT PLAN OPTION B

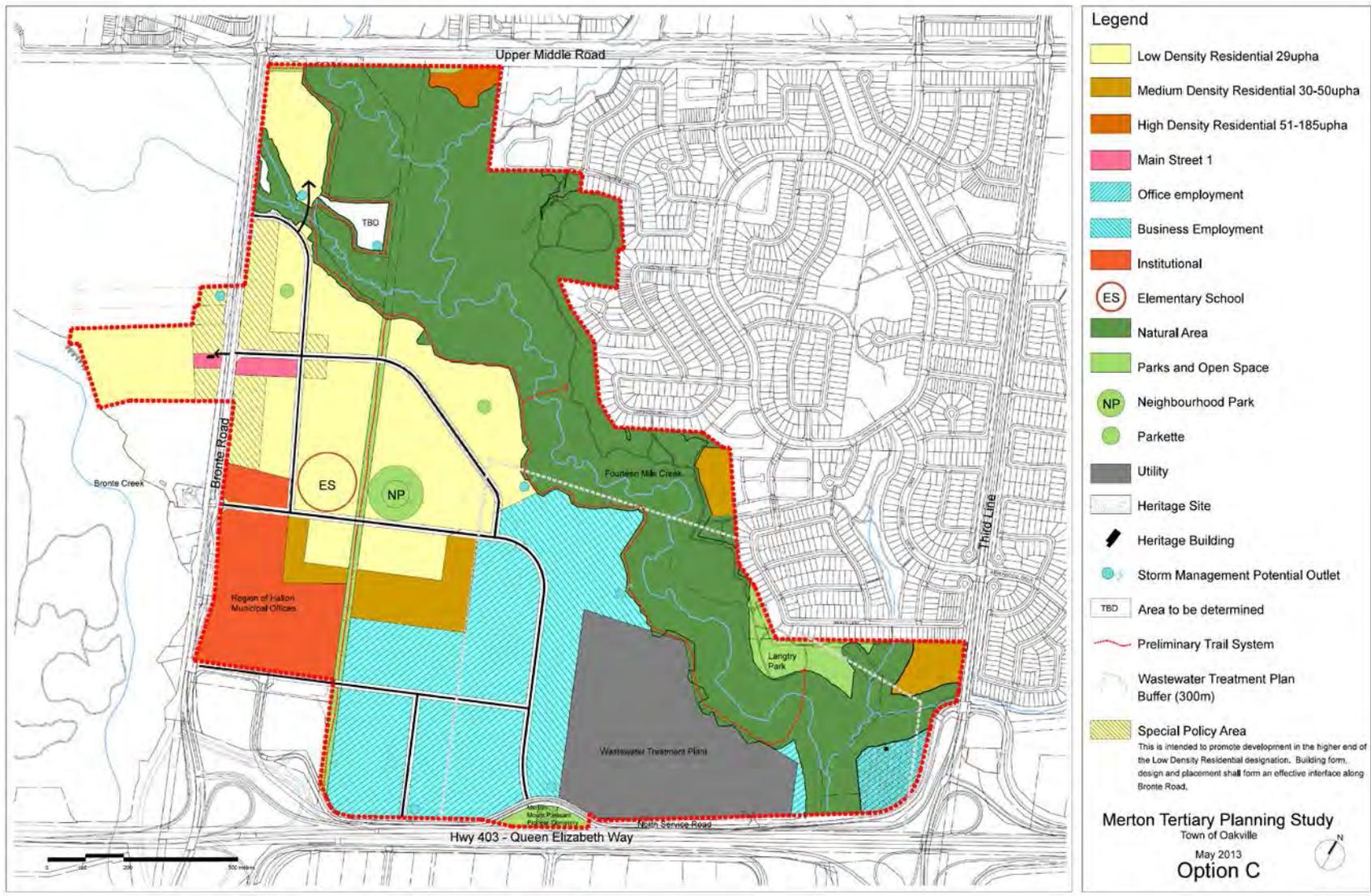


FIGURE 5: CONCEPT PLAN OPTION C

SAMPLE CALCULATION

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	62.80	0.00	0.00	-1.32	0.00	0.00	0.00	61.48

Segment Leq : 61.48 dBA
Total Leq All Segments: 61.48 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.89
(NIGHT): 61.48