

Land Suitability Assessment

M District (PID Nos. 00100446, 40173684,
40173692, 40173676 and 00616946), Dartmouth,
Nova Scotia

WM Fares Architects
Report

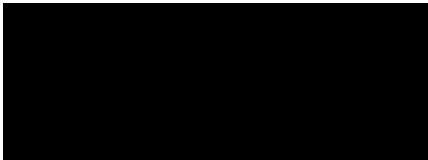
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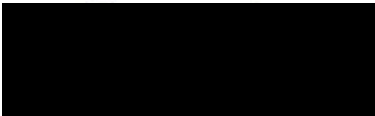
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1 Introduction

WM Fares Architects is currently in the initial stages of pre-construction design for land holdings in the Mic Mac Mall Shopping Center area at the site of a proposed mixed-use community. Englobe Corp. (Englobe) has been contracted to conduct a Land Suitability Assessment (LSA) through a review of available information within the area, and to identify environmental constraints to the proposed development. The requirement for this LSA is outlined in Halifax Regional Municipality's *Regional Centre Municipal Planning Strategy* under Policy F-4.

This report summarizes the findings of the review.

1.1 Objectives

A LSA determines areas of environmental importance based on physical attributes inherent to a study area of land. The process includes an assessment of natural systems and critical areas. The purpose is to identify and assess vulnerable landforms, sensitive ecological features and climate hazards, including but not limited to, any wetlands, watercourses, flood prone areas, steep slopes, forest cover, contaminated sites, and wildlife habitats and corridors.

The objectives of this LSA are to provide a broad scale, desktop overview to identify environmental limitations that may impact the development of the area of interest at the Mic Mac Mall site.

This assessment is not intended to provide a guarantee that any development of the site will be approved; rather, the assessment will allow a determination if the anticipated environmental constraints will pose a limitation to the proposed development.

1.2 Study Area

The LSA analyzed the Mic Mac Mall study area from two scales: 1) high-level reconnaissance (literature review) was undertaken, and; 2) detailed assessment (including a field investigation) was undertaken directly within the Mic Mac Mall study area.

A Site Location Map providing an overview of the study area is provided in Figure 1-1.

1.2.1 Project Site

The current area of interest is comprised of five parcels identified as PID Nos. 40173676, 00616946, 00100446, 40173684, and 40173692. The combined parcels cover an area of approximately 19.8 hectares (49 acres).

The site is bound by Highway 111 followed by residential dwellings and Lake Micmac to the north, Micmac Boulevard followed by residential dwellings to the east, south and west, and a mix of commercial and residential dwellings to the northwest. Lake Banook is also located approximately 250 metres to the southeast of the site.

Figure 1-1. Site Location Map, Mic Mac Mall, LSA, NS



1.2.2 Watershed Area

Based on the large-scale mapping, the site is located in the Sackville primary watershed (1EJ), and the secondary watershed for this area of Dartmouth is identified as Dartmouth Lakes (1EJ-2).

At the site, surface water flows are generally toward Lake Micmac and Lake Banook. This flow ultimately discharges into the Halifax Harbour (Atlantic Ocean) through watercourses and piped infrastructure. The primary watershed area that drains into the Halifax Harbour (1EJ) is 97233.7 hectares in size, and the secondary watershed area that also drains into the Halifax Harbour (1EJ-2) is 1,666.04 hectares in size.

2 Methodology

2.1 Land Suitability Assessment Evaluation Framework

All work has been conducted following generally accepted scientific and engineering practices. The assessment focused on identifying environmental factors that may affect the developability of the land. The information for this project was obtained from a review of available information, including environmental assessment reports, government databases and publicly available mapping.

2.2 Valued Ecological Components

The environmental effects evaluation methodology used in this report focuses the evaluation on those environmental components of greatest concern. The Valued Ecological Components (VECs) most likely to be affected by the project are listed below. The VECs were selected based on ecological importance to the existing environment, the relative sensitivity of environmental components to project influences, and their relative social, cultural or economic importance.

This Land Suitability Assessment considers the full range of project / environmental interactions and the environmental factors that could be affected by the project and the significance of related impacts with mitigation.

Mitigation measures, which can be used to reduce the potential impacts of the project on the VECs, are identified. Mitigation measures can include both project design, construction practices or project specific measures and are implemented by the proponent to reduce the identified impacts.

The VECs for this project were identified based on the existing biophysical environment, the nature of the undertaking and input from stakeholders and include:

- Wetlands;
- Watercourses;
- Watersheds;
- Flood Prone Areas;
- Steep Slopes;
- Forest Cover;
- Contaminated Sites;
- Soil and Bedrock; and
- Wildlife Habitats and Corridors.

2.3 Resources

2.3.1 Natural Features (Impact of Development on Nature)

Natural land features were organized for their ability to support or be an integral component of an ecological system. The following natural land features were evaluated:

- Section 3.1: Wetlands

- Section 3.2: Watercourses
- Section 3.4: Slopes
- Section 3.5: Land Use and Forest Cover
- Section 3.7: Wildlife Habitats and Corridors
- Section 3.8: Soil and Bedrock

2.3.2 Natural Hazards (Impact of Nature on Development)

Natural Hazard features were organized into areas with elevated risks associated with natural conditions and historic and ongoing human activities. The following natural hazard features were evaluated:

- Section 3.3: Flood Prone Areas
- Section 3.4: Slopes
- Section 3.6: Contaminated Sites
- Section 3.8: Soil and Bedrock

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3 Findings

3.1 Wetlands

For an area to be considered wetland, it must satisfy certain wetland criteria including soil, hydrology and vegetation properties that are wetland indicators. There are specific 'rules' that are followed in considering the indicators present and the strength of the evidence in making a determination that a wetland is present. Wetlands are determined by Englobe using procedures developed by the US Army Corps of Engineers, adapted for the Northeast and North Central regions of the US, and endorsed by Nova Scotia Environment and Climate Change (NSECC). The determination procedures follow a three-parameter approach, using indicators established for vegetation, soils and hydrology to identify the presence of wetlands.

The site is currently mostly vegetation-cleared and developed in a commercial capacity. No provincially mapped wetlands are present on the site, and none were noted during the site visit.

If a wetland with a contiguous watercourse were present onsite, HRM would require a buffer between the wetland and any proposed development. If wetland alteration were required for the development, any wetland alteration between 100 m² and 2 hectares would require an authorization from NSECC; wetland alterations greater than 2 hectares would require a provincial EA in addition to this provincial authorization.

Permitting Considerations: None.

3.2 Watercourses

The term watercourse is defined in the *Nova Scotia Environment Act*; it includes rivers, streams, lakes, creeks and ponds, and the water contained in them. Some water bodies are obviously watercourses, but other water flows may not be as definitive. There is a screening process to determine if a water feature is a watercourse, and includes:

- If a watercourse is drawn on a National Topographic Series (NTS) map, it is considered a watercourse by NSECC.
- If air photos less than 40 years old show evidence of a watercourse, it may be a watercourse and further review of characteristics is required; and
- Field characteristics such as clearly defined channels, flowing water, pools, riffles rapids, aquatic features (fish, insects, plants) are also used to identify watercourses.

In addition to potentially being identified as a watercourse, many water features can also support fish and are considered fish habitat. A fish habitat assessment was not part of this assessment.

One water feature labelled as a stream is drawn on the Halifax County NTS 11D12 map just north of the northern boundary of PID Nos. 00100446 and 40173676. It is not visible on the air photos reviewed (1954 to 2022). During the site visit, the area of the mapped water feature was visited and currently appears to be a constructed ditch. Stormwater from the site appears to be discharging into this area, originating from a presumed stormwater pipe that protrudes from a retaining wall along the northern boundary of the parking lot on PID No. 40173676. At the pipe discharge location, there was flowing and pooled water present which fanned out into a ditch area and eventually led to another culvert that crossed under Horizon Court, where the flow continued offsite toward the mapped stream. The onsite water feature appears to be anthropogenic and flows into what may historically have been a watercourse that was later modified for stormwater control.

Permitting Considerations: HRM requires buffers to watercourses. The NSE *Activities Designation Regulations* designate activities, including watercourse alterations, that require an Approval from, or a Notification to, NSECC. All in-stream work such as crossing structures, stream bed realignment, dredging, etc. require Approval from NSECC. Certain alterations, such as culvert installations that conform to certain prescribed specifications, require a Notification to NSECC. Where appropriate, NSECC consults other provincial and federal departments (such as DFO) to coordinate permitting requirements. For water features that are fish habitat, consultation with DFO is required to ensure there is no harmful alteration, disruption, or destruction (HADD) to fish or fish habitat under the *Fisheries Act*. There is no provincial or federal submission requirement for work that does not alter a watercourse.

If any additional development is required in close proximity to the aforementioned stormwater outfall location or farther downstream, or if alteration of the surface water feature is required as part of development activities, NSECC should be consulted for a watercourse determination.

3.3 Flood Prone Areas

Land development can affect the risk of flooding in a number of ways. Buildings, infilling with earth and other structures placed within flood plains can obstruct the passage of floodwaters. In addition, the potential for flood damage is greatly increased when, through lack of awareness or disregard for the potential danger, unsuitable development takes place in areas that are already subject to flooding.

Based on online predictive modelling, the study area is not expected to be at risk for flooding unless the nearby lakes (Lake Micmac and Lake Banook) rise 45m or more. Since this is highly unlikely, flood risk is not a concern for this area.

Permitting Considerations: Although the site is not flood prone, climate change considerations such as increased intensity of precipitation events should be incorporated into site design, to mitigate potential negative impacts to downstream receptors during construction and operational phases of any new development.

3.4 Steep Slopes

Slope gradient is a key factor in influencing the relative stability of a landscape. It determines the degree to which gravity acts upon a soil mass. Slopes are often irregular and complex, with gradients varying greatly over large areas. Slopes are an important LSA factor when considering what lands are most suitable for development, as well as when considering where to locate roads and other infrastructure. The locations of stormwater, sewer and water infrastructure coincide with road layout, all of which are considered during the development planning process.

The area of interest has a mainly flat topography that slopes to the east. It is elevated compared to surrounding lands due to previous infilling.

Permitting Considerations: Through geotechnical investigation, concerns associated with development on or near slopes such as these, including in soil fill, can be mitigated. Since the study area slopes slightly to the east toward Lake Micmac and Lake Banook, an appropriate erosion and sediment control plan should be put in place during development to prevent soil erosion, siltation of stormwater entering HRM infrastructure and downstream watercourses, and sedimentation of downstream lakes. The erosion and sediment control plan should take climate change considerations into account to ensure intense precipitation events that inevitably occur during construction do not cause negative impacts to stormwater infrastructure and downstream watercourses.

3.5 Forest Cover

The study area was assessed on a desktop level by using the provincial forest cover layers, which portrayed the whole site as urban (or non-forest). During the site visit it was confirmed that the site is mainly tree-cleared and developed. There were very small patches of trees noted along some of the outer edges of the onsite PIDs. These areas consisted of a mixture of what looked to be predominately Red Maple, Black Spruce, Red Spruce, White Pine, and Grey Birch.

Permitting Considerations: All work is to be conducted in accordance with the *Migratory Birds Convention Act (MBCA)*, which outlines that no migratory bird nests or eggs will be moved or obstructed during the construction or operational phase of the project. To ensure project activities are in compliance with the *MBCA*, tree clearing, if required for the development, will take place outside of the migratory/nesting bird season, or a qualified person will be onsite to confirm the absence of nesting or migratory birds prior to and during clearing.

3.6 Contaminated Sites

Subject Properties

Englobe contacted NSECC on January 5, 2023 and requested a search of the *Environmental Registry* for information related to the five onsite PIDs. Based on the review of received information, four underground petroleum storage tanks (USTs) were registered on PID No. 00100446 in 1995. All of the tanks were installed in 1972, had a capacity of 2000 L, and were made of steel. The status of three of the tanks is abandoned (and filled with crusher dust) in 1989, and the status of one of the tanks is removed in 1989.

During a Limited Phase II ESA completed by Stantec in 2021, six boreholes were drilled throughout PID No. 00100446 and revealed detected petroleum hydrocarbons (PHCs), metals, and polycyclic aromatic hydrocarbons (PAHs) in soil, however they all satisfied the Tier 1 Environmental Quality Standards (EQS).

Although previous environmental studies did not report environmental contamination in the study area from the previous USTs, any soil that is to be removed from the site during future development should be tested for contaminants as a precautionary measure.

Adjacent Properties

A previous Phase I completed by Stantec in 2019 included information on polychlorinated biphenyls (PCBs), metals, and PAH exceedances at a nearby property identified as 10 Horizon Court. Upon further investigation of a requested *Freedom of Information and Protection of Privacy* (FOIPOP) report of the property, it was discovered that 10 Horizon court was subdivided in 2016. The area of concern is now identified as PID No. 41354796. Based on the distance from this property to the study area, as well as the fact that there is a commercial property located in between, this property poses a low risk of contamination to the study area.

Permitting Considerations: All areas satisfy criteria under the NSE *Contaminated Sites Regulations*, however soil testing is recommended if any of the onsite fill material is to be removed.

3.7 Wildlife Habitats and Corridors

Species at Risk (SAR) appearing on the federal *Species at Risk Act* (*SARA*) Schedule 1 benefit from all the legal protection afforded and the mandatory recovery planning required under *SARA* (ECCC, 2021). Similar protection is afforded to species under the provincial NS *Endangered Species Act*.

Information from the ACCDC was requested by Englobe in January 2023. From review of the ACCDC report of rare species list within 5km of the subject site, there were 21 flora species listed; only 7 had provincial rarity ranks (S1 or S2) that are considered rare. One of the species (Butternut) is on the COSEWIC and SARA list as endangered and one species (Dense Blazing Star) is on the COSEWIC and SARA list as threatened. Black Ash (species at risk) was also identified on the location sensitive list.

There were 36 fauna species that were on a federal or provincial species at risk list or were considered rare (S1 or S2); these included 26 birds, 0 fish, 1 porpoise, 2 turtles, 3 butterflies, 1 dragonfly, 2 bumble bees, and 1 mussel. The Wood Turtle (species at risk) and bat species (species at risk) were also identified on the location sensitive list.

None of the listed SARs were reported onsite in the ACCDC report and, during the site visit, none of these species were observed.

From review of the habitats present onsite and based on the degree of previous development of the site, most of the SARs are not likely to be present at the site or to depend on the site.

The site has been mapped as part of a larger deer wintering area, as well as a mainland moose concentration area, however the onsite habitats are not suitable for deer overwintering or mainland moose.

Permitting Considerations: All work is to be conducted in accordance with the *MBCA*, which outlines that no migratory bird nests or eggs will be moved or obstructed during the construction or operational phase of the project. To ensure project activities are in compliance with the *MBCA*, tree clearing, if required for the development, will take place outside of the migratory/nesting bird season or a qualified person be onsite to confirm the absence of nesting or migratory birds prior to and during clearing. For any species present at the site identified on the federal or provincial SARA, mitigation measures would be required to ensure that rare species will not be disturbed.

3.8 Soil and Bedrock

Geological mapping indicates that bedrock underlying the current area of interest is the Meguma Supergroup of gold-bearing metasediments. Specifically, a combination of Goldenville Formation (sandstone turbidites and slate) and Halifax Formation (slope-outer shelf slate, siltstone, minor sandstone and Fe-Mn nodules) underly the immediate development area. A previous subsurface

investigation conducted by Pinchin in 1999 indicated that bedrock was encountered at depths ranging from 1.05 - 4.40m below grade (Stantec, 2019). There are no environmental hazards associated with this bedrock type.

According to the *Karst Risk Map*, the site is located in a low-risk zone. The low-risk zone contains less than 0.1% of the sinkholes in the NSDNRR Nova Scotia Sinkhole Database. This zone typically does not contain sinkholes or karst terrain. However, sinkholes may still occur in this area due to unmapped soluble rocks or where soluble rocks are close to the ground surface but are overlain by other rock types or unconsolidated material.

According to the *Potential for Radon in Indoor Air* map, the site is located in an area of a combination of low and medium risk for radon in indoor air. The NSDNRR test database indicates that 5% of buildings in the low risk areas and 14% of buildings in the medium risk areas exceed the Health Canada guideline.

Surficial geology mapping indicates that the native surficial soils in the study area consist of stony till plain (Ground Moraine). Mapping also indicates that currently, the study area's surficial soils are anthropogenic due to infilling during the development of the site. A previous subsurface investigation conducted by Pinchin in 1999 indicated that the subsurface soil profile consisted of stoney till, with fragments derived from local bedrock sources (Stantec, 2019). The follow-up Limited Phase II by Stantec in 2021 included the drilling of six boreholes around PID No. 00100446 that recovered sand and gravel with quartzite cobble and boulder fill. There are no environmental hazards associated with these soil types, however since it is unknown what the site was infilled with, the fill material should be tested if it will be moved off-site during development.

Permitting Considerations: Slates that are prone to acid rock drainage are not expected to be encountered at the site, however they are nearby, therefore if discovered, any disturbance must be in accordance with the *Sulphide Bearing Material Disposal Regulations*.

Due to unknown fill at the site, any fill material to be moved off-site should be tested.

An appropriate erosion and sediment control plan should be put in place during development to prevent potential sedimentation into Lake Micmac and Lake Banook.

4 Conclusions

Englobe has conducted a desktop evaluation to assess for potential environmental constraints, with field verification for wetlands, watercourses, and species at risk.

Based on the results of the assessment, generally there were limited environmental constraints identified. Most areas of the site consist of developed uplands in commercial capacity.

No wetlands are present in the study area. No watercourses are mapped onsite however one water feature is mapped on a NTS map just north of the site and was noted during the site visit. Although the mapped feature (offsite to the north) currently appears to be a ditch, its appearance on the NTS map could designate it a watercourse. Site stormwater discharges to this area although the onsite water feature does not appear to be watercourse. If new development occurs within close proximity to this feature or if alteration of this feature is required during future development, further investigation would be required (consultation with NSECC to make a watercourse determination). HRM requires buffers to watercourses.

The topography of the study area does not pose any environmental concerns; however it should be noted that since the study area slopes slightly to the east toward Lake Micmac and Lake Banook, an appropriate erosion and sediment control plan should be put in place during development to prevent sedimentation. Further, since the site topography was leveled through historic infilling and grading,

geotechnical investigation is recommended prior to development, to mitigate any potential soil fill and slope concerns. The site is not flood prone, however climate change considerations such as increased precipitation intensity should be taken into account when designing the construction and operational phases of the new development.

There are limited trees in the study area, however all work must be conducted in accordance with the *Migratory Birds Convention Act* (MBCA), which outlines that no migratory bird nests or eggs will be moved or obstructed during the construction or operational phase of the project. To ensure project activities are in compliance with the MBCA, any tree clearing will take place outside of the migratory/nesting bird season or a qualified person will be onsite to confirm the absence of nesting or migratory birds prior to and during clearing. Also, for any species present at the site identified on the federal *Species at Risk Act* or the NS *Endangered Species Act*, mitigation measures will be required to ensure that rare species will not be disturbed.

Testing of the onsite fill material and bedrock is recommended if any of it is to be moved offsite. The testing should include laboratory analysis for contaminants in the soil, as well as any slate that is suspected to be prone to acid rock drainage.



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