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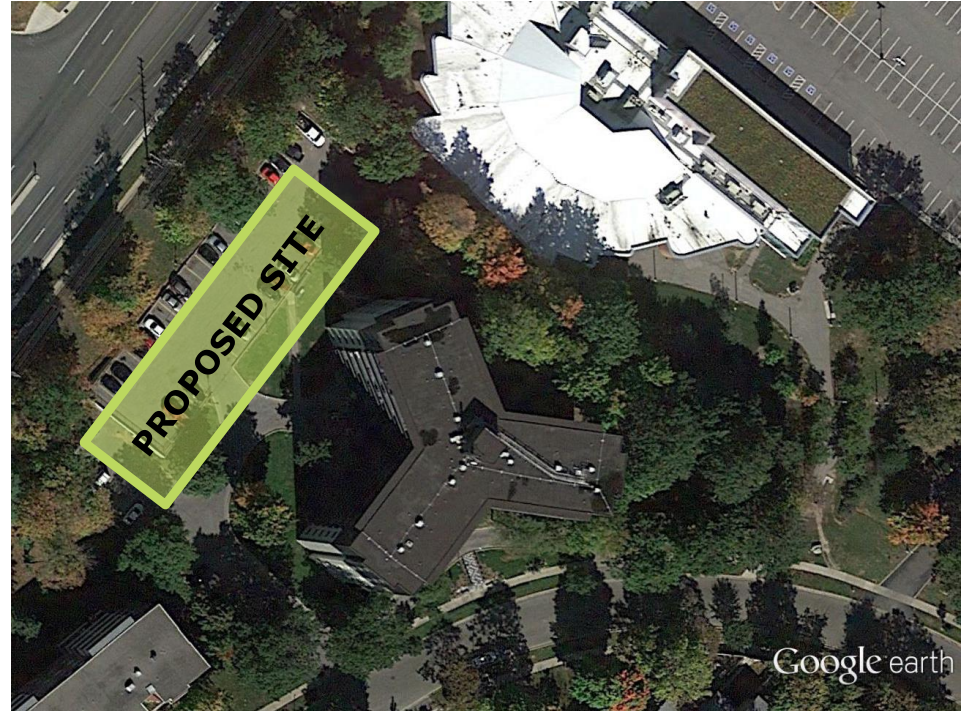
**Date:** November 8, 2017

**To:** Starlight Investments  
1400-3280 Bloor Street W, Centre Tower  
Toronto, ON M8X 2X3

**Re: Pedestrian Wind Assessment  
1315 Silver Spear Road  
Toronto, ON  
Novus Project #17-0173**

**Novus Team:**

Engineer: Jenny Vesely, P. Eng.  
Senior Specialist: Bill Waechter, C.E.T.



*Credit: Google Earth Pro™, dated October 9, 2016*



## 1.0 INTRODUCTION

Novus Environmental Inc. (Novus) was retained by Starlight Investments to conduct a pedestrian wind assessment for the proposed 1315 Silver Spear Road development in Mississauga, Ontario. This assessment is in support of the Official Plan Amendment (OPA)/Zoning by-Law Amendment (ZBA) application for the project.

### 1.1 Existing Development

The proposed development is located at 1315 Silver Spear Road, near the intersection of Burnhamthorpe Road East and Dixie Road. The site is currently occupied by a single storey parking deck. An image of the existing site is shown in **Figure 1**. Directly surrounding the site is a 5-storey residential building to the south, an 8-storey apartment immediately southeast, low-rise commercial buildings to the north and east. A 13-storey residential building is further to the southeast. Beyond the immediate surroundings are generally low-rise residential buildings, with low-rise commercial properties along Dixie Road. Images, dated November 2016, from a virtual site visit using Google Earth Pro™, are shown in **Figure 2**

### 1.2 Proposed Development

This assessment is based on drawings of the proposed development provided by Architecture Unfolded, on July 6, 2017. The proposed development includes a new 8-storey residential building built in place of the existing on-site parking deck. The new building has a footprint of approximately 66m by 24m, with the long axis aligned in the east-west direction. The main lobby entrance is on the north façade. There is one secondary entrance/exit on the north façade, and two secondary entrances/exits on the south façade. A site plan can be found in **Figure 3**.



**Figure 1: Context Plan**

*Credit: Google Earth Pro™, dated October 9, 2016*

### 1.3 Areas of Interest

Areas of interest for pedestrian wind conditions include those areas that pedestrians are expected to use on a frequent basis. Typically these include sidewalks, main entrances, transit stops, plazas and parks. For this particular development, areas of interest include the surrounding walkways for the residences, all entrances, including the entrance to the existing residence, the existing patio at the southeast corner of the existing residence and sidewalks along Burnhamthorpe Road East and Silver Spear Road.



**Figure 2a: Existing Site (Looking East)**



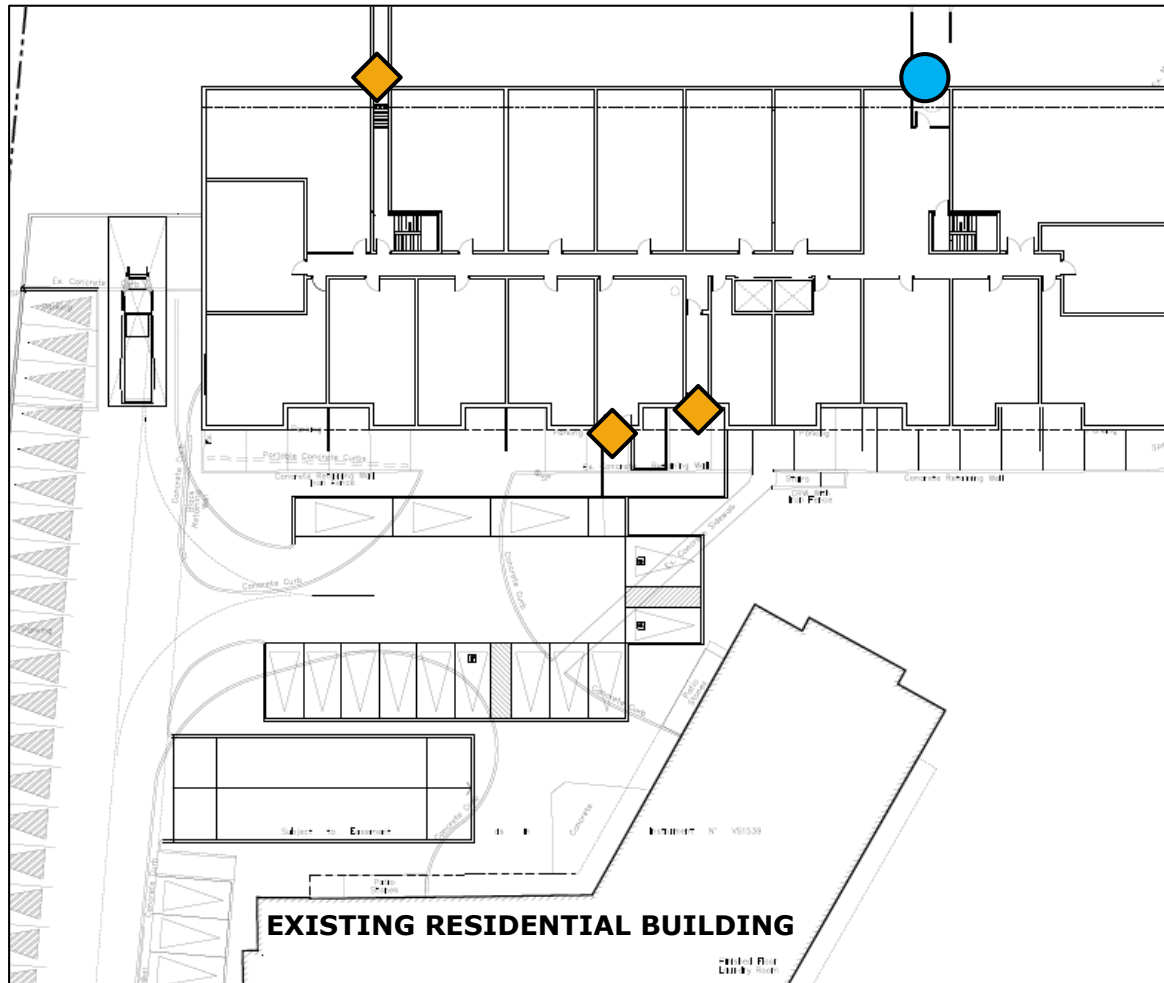
**Figure 2c: Burnhamthorpe Road E (Looking North)**



**Figure 2b: Burnhamthorpe Road E (Looking South)**



**Figure 2d: Hickory Drive (Looking Northwest from Site)**



 Main Entrance

 Secondary Entrance/Exit

Figure 3: Areas of Interest

## 2.0 APPROACH

A qualitative, numerical analysis has been undertaken, based on our extensive experience in estimating wind flow patterns around buildings, and using a knowledge-based expert system (KBES) developed by Novus. The KBES analysis tool is based on published numerical models and methods, consistent with our experience in modeling wind flows through wind tunnel testing. This qualitative method provides a screening-level estimate of potential wind comfort conditions at the site, and assists with the initial selection of conceptual mitigation measures, where needed.

This assessment is based on:

- A review of the drawings of the proposed development provided by Architecture Unfolded on July 6, 2017;
- A review of the existing wind climate in the area, through examining historical climate data;
- A numerical analysis of predicted pedestrian wind comfort resulting from the additional buildings;
- A comparison of the predictions against the criteria provided in the Urban Design Terms of Reference for Pedestrian Wind Comfort and Safety Studies.

### 2.1 Pedestrian Wind Criteria

The wind comfort conditions are discussed in terms of being suitable for certain pedestrian activities and are based on frequencies of predicted wind force. Pedestrian activity, wind chill, clothing, humidity and exposure to direct sun, for example, all affect pedestrian (thermal) comfort; however, these influences are not considered in wind force criteria.

There are four categories for wind comfort. **Sitting:** Intended for cafes, terraces and other amenity spaces. Described as calm or light breezes desired for outdoor restaurants and seating areas where one can read a paper without having it blown away. **Standing:** Gentle breezes suitable for main building entrances and bus stops; places where people tend to linger. **Walking:** Intended for sidewalks and other areas pedestrians pass through; relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering. The comfort criteria are based on certain predicted hourly mean wind speeds being exceeded 20% of the time. If a rating of walking cannot be achieved, the wind conditions are considered to be **Uncomfortable**. Strong winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.

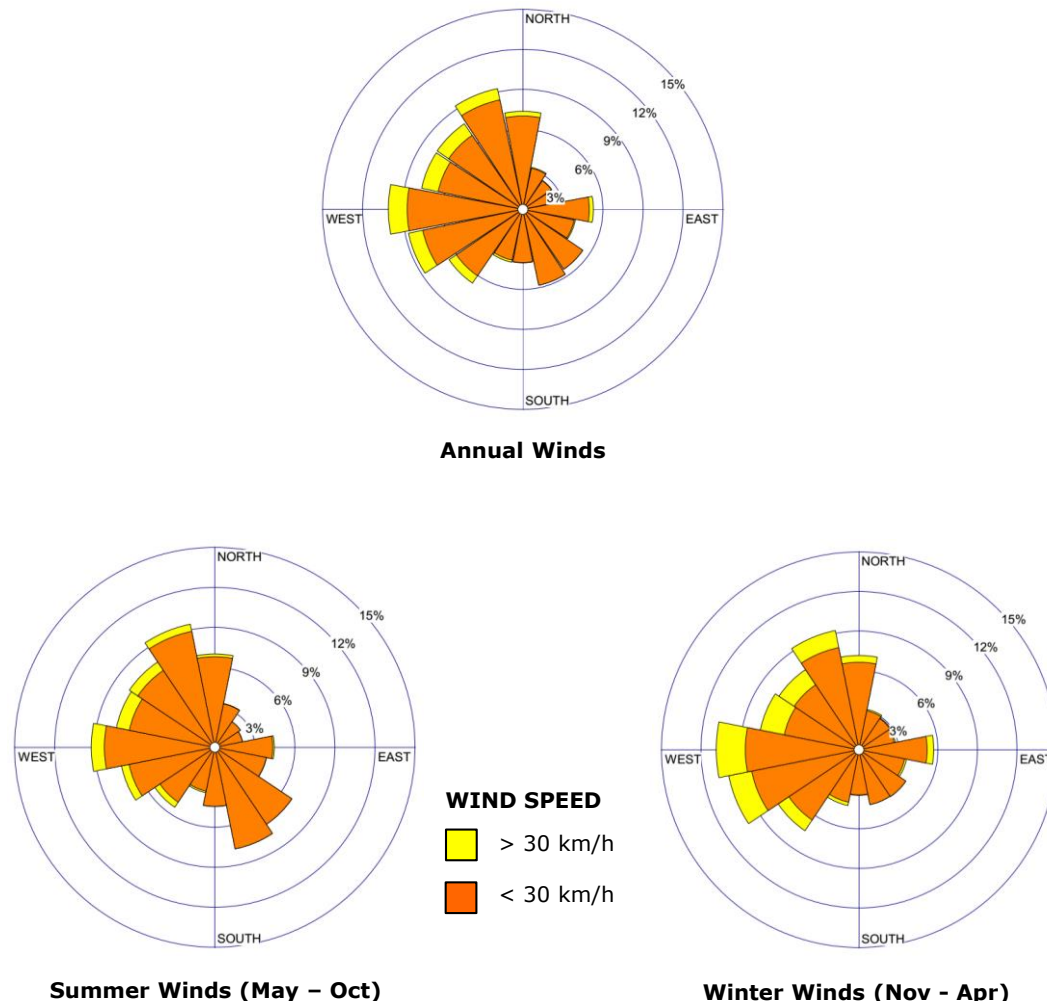
A criterion for wind safety is also reviewed and allows for one strong wind event on an annual basis. When more than one strong wind event is predicted, wind mitigation measures are then advised, especially for frequently accessed areas.

The criteria for wind comfort and safety considered in this assessment are based on those outlined in the Urban Design Terms of Reference for Pedestrian Wind Comfort and Safety Studies. Academic references considered in developing our modeling approach and the assessment of this project can be found in **Section 6.0**.

## 2.2 Wind Climate

Wind data recorded at Pearson International Airport in Toronto for the period of 1986-2015 were obtained and analysed to create a wind climate model for the region. Annual and seasonal wind distribution diagrams (“wind roses”) are shown in **Figure 4**. These diagrams illustrate the percentage of time wind blows from the 16 main compass directions. Of main interest are the longest peaks that identify the most frequently occurring wind directions. The annual wind rose indicates that wind approaching from the northerly through westerly directions are most prevalent. The seasonal wind roses readily show how the prevalent winds shift throughout the year. The seasonal wind roses show daytime winds, from 6:00 – 23:00, while the annual wind rose shows all hours.

The directions from which stronger winds (e.g., > 30 km/h) approach are also of interest as they have the highest potential of creating problematic wind conditions, depending upon site exposure and the building configurations. The wind roses in **Figure 4** also identify the directional frequency of these stronger winds, as indicated in the figure’s legend colour key. On an annual basis, strong winds occur from the northwesterly and westerly sectors. All wind speeds and directions were included in the wind climate model.



**Figure 4: Wind Roses for Pearson (1986-2015, 6am-11pm)**

## 3.0 RESULTS

Wind conditions at areas of interest were predicted using Novus' proprietary knowledge-based expert system (KBES). The results present a reasonable worst-case assessment of potential wind conditions at the site. Results are presented for the summer and winter seasons, with a graphical representation of the winter results in **Figure 5**.

Wind conditions are predicted to meet the wind safety criterion around the proposed development in both the Existing and Proposed Configuration.

### 3.1 Existing Wind Conditions

The existing site includes an 8-storey residential building at the southeast and a parking deck to the north. At the main entrance to the building, on the south façade, wind conditions are predicted to be comfortable for standing throughout the year for the Existing Configuration. Surrounding the existing building and in the parking lot, wind conditions are generally predicted to be comfortable for sitting or standing throughout the year. The exceptions are at the southeast and southwest corners of the existing building, where wind conditions are predicted to mainly be comfortable for walking in the winter season. This includes the existing patio at the southeast corner of the building.

On Burnhamthorpe Road East and Silver Spear Road, wind conditions in the Existing Configuration are comfortable for walking or better throughout the year.

### 3.2 Proposed Building - Entrances & Walkways

The main residential entrance of the proposed building is located on the north façade. Wind conditions here are expected to be comfortable for standing throughout the year, which is ideal. Similarly, at the secondary

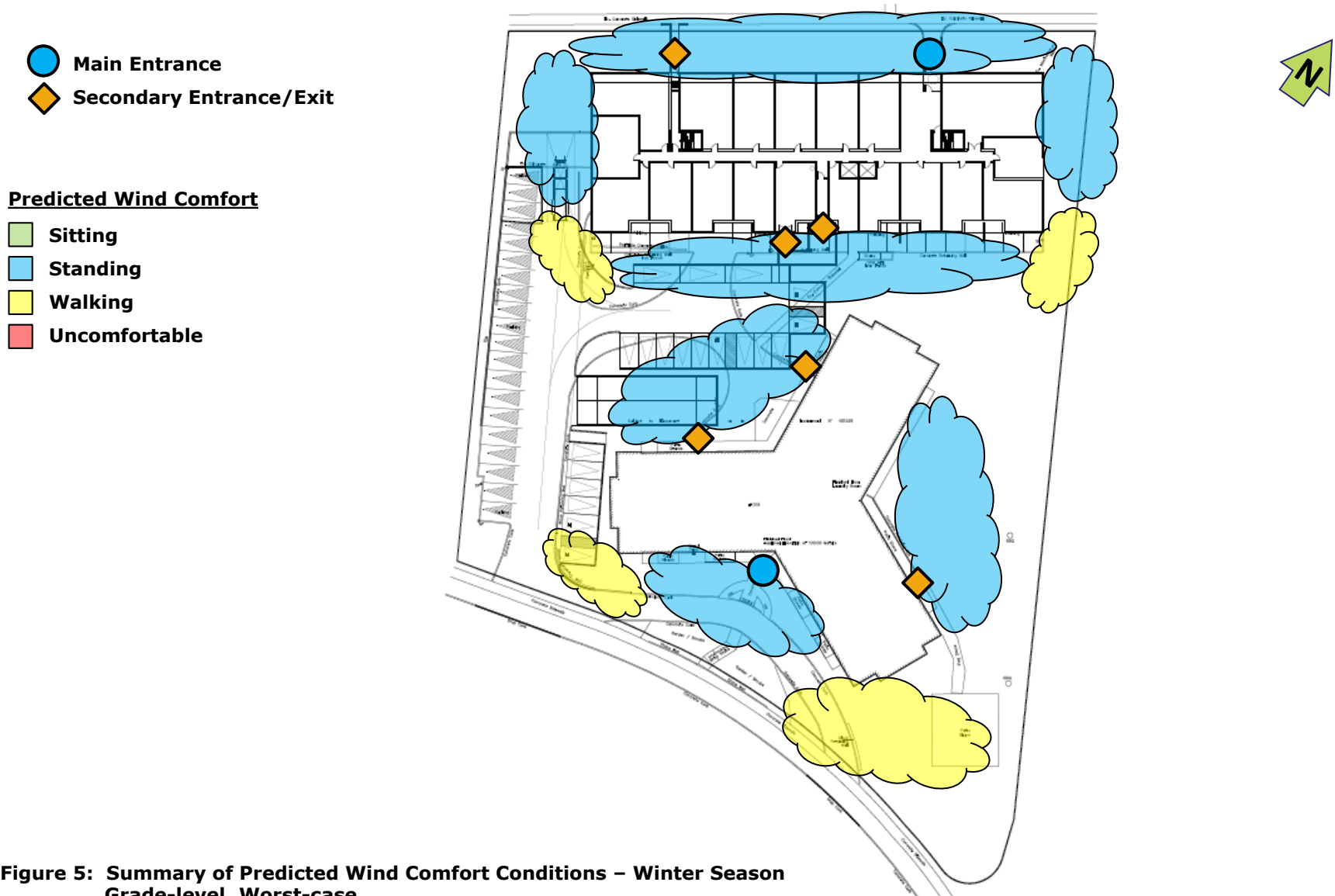
entrances/exits on the north and south facades, wind conditions are also predicted to be comfortable for standing throughout the year.

Wind conditions on the walkways and surface parking areas on-site are generally expected to be comfortable for standing or better throughout the year. The exceptions are at the southeast and southwest corners of the proposed building and the existing building during the winter, where wind conditions are predicted to be comfortable for walking. This includes the existing patio to the southeast of the existing building. Increased wind activity at these corners are due to the localized acceleration of northwesterly, westerly and southeasterly winds around the building corners, which are partly downwashed towards grade. These localized accelerations typically occur around the existing residence for the Existing Configuration. There is significant coverage of mature trees on and around the site, which will enhance wind comfort during the summer.

Overall, wind conditions surrounding the proposed development are predicted to be suitable for the intended usage.

### 3.3 Surrounding Sidewalks

In the Proposed Configuration, wind conditions on the sidewalks along Burnhamthorpe Road East and along Silver Spear Road are predicted to remain comfortable for walking or better throughout the year. The proposed addition will have no noticeable affect on existing wind comfort conditions on these public sidewalks.



**Figure 5: Summary of Predicted Wind Comfort Conditions – Winter Season  
Grade-level, Worst-case**



#### 4.0 CONCLUSIONS & RECOMMENDATIONS

A qualitative numerical analysis was conducted to estimate the wind comfort conditions associated with the proposed building at 1315 Silver Spear Road in Mississauga.

Wind conditions in and around the proposed development are predicted to meet the wind safety criterion.

Wind conditions on the proposed site and surrounding sidewalks are considered appropriate for the indented usage throughout the year.

No additional wind analysis has been recommended nor is considered necessary for this development.

#### 5.0 ASSESSMENT APPLICABILITY

This assessment provides a qualitative overview of the anticipated pedestrian wind comfort conditions on and surrounding the proposed development. Any subsequent alterations to the design may influence these findings, possibly requiring further review by Novus.

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Sincerely,  
**Novus Environmental Inc.**



Jenny Vesely, P.Eng.  
Engineer



Bill Waechter, C.E.T.  
Senior Specialist – Microclimate

## 6.0 REFERENCES

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