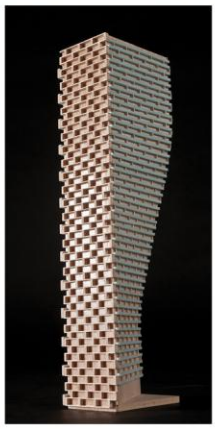
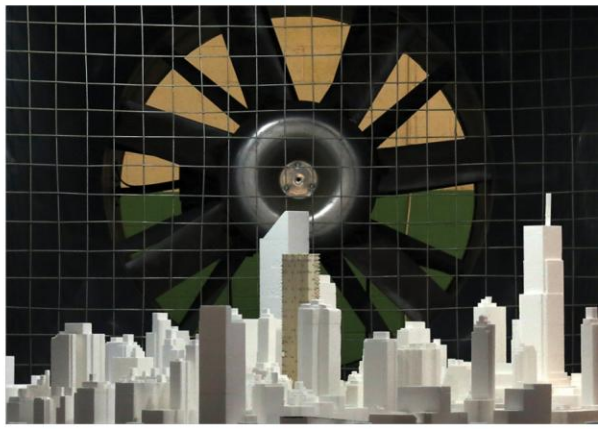
GRADIENTWIND
ENGINEERS & SCIENTISTS

LAND USE COMPATIBILITY, PRELIMINARY AIR QUALITY, & ODOUR ASSESSMENT

MECP-MLITSD Science Facility Complex
Oakville, Ontario

Report: 25-139 – LUC & AQ





March 11, 2026

PREPARED FOR

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EXECUTIVE SUMMARY

This report describes a land use compatibility, preliminary air quality, and odour assessment for Infrastructure Ontario's proposed development referred to as the MECP-MLITSD Science Facility Complex, located near the intersection between William Halton Parkway West and Glenorchy Road in Oakville, Ontario (hereinafter referred to as the "subject site", "study site", or "proposed development").

The proposed development comprises a science facility building containing laboratory space on Levels 1-4, a science workshop at-grade, and office spaces on Level 2. The building is topped with a mechanical penthouse. This study is based on architectural drawings provided by WZMH Architects in August 2025. Note that the current design concept is preliminary and subject to change.

Due to potential emissions from the laboratories, the proposed development can be classified as a medium industrial facility (Class II) as per the Land Use Compatibility (D-Series) Guidelines. The closest sensitive institutional buildings are located further than the minimum separation distance of 70 m from planned emission sources, which are expected to be located on the high roof of the proposed development.

From the environmental noise feasibility study prepared by Gradient Wind, it was determined that stationary noise impact from the proposed development onto nearby buildings will be compliant with the provincial sound level limits. Stationary noise impacts from the proposed development onto the surroundings and itself can be minimized by judicious placement of mechanical equipment or the incorporation of silencers and noise screens as necessary. It is also recommended that any large pieces of HVAC equipment, which are required to be situated outdoors, be placed on the mechanical penthouse avoiding the line of sight with the surrounding noise-sensitive buildings.

Gradient Wind concludes that the MECP-MLITSD Science Facility Complex is feasible as the minimum separation distance between sensitive uses and potential emission sources can be maintained by placing laboratory exhaust fans on the high roof.

In keeping with standard building construction and good engineering practice, as well as the provincial and city guidelines, the following comments and recommendations are provided to be incorporated into

the design of the building to ensure air quality and noise levels are maintained to acceptable standards for the nearby sensitive land uses:

(i) Based on the findings of this report, Gradient Wind concludes that the MECP-MLITSD Science Facility Complex is feasible as the minimum separation distance between sensitive uses and potential emission sources can be maintained by placing laboratory exhaust fans on the high roof.

(ii) As the nearby day care and hospital are within the zone of influence of the facility, a detailed air quality study will be required once the laboratory exhaust system and chemical use are more defined.

(iii) The subject site will require EASR registration as per O. Reg. 1/17 and Section 9 of the EPA. In support of registration, an Emission Summary and Air Dispersion Modelling (ESDM) Study and Acoustic Assessment Report (AAR) will need to be conducted during the detailed design phase of the project once mechanical systems and laboratory operations are more defined.

(iv) The laboratory exhaust systems should incorporate high-plume fans, with bypass air to incorporate predilution into the systems. As noted by ASHRAE[1], the following stack parameters should be consisted in the design:

- The recommended dilution ratios between critical point of impingement and a single fume hood are 1:5000, or ensure all chemical species are compliant with the Air Containment Benchmark Standards.
- The minimum exit velocity of the fans should be 10 meters per second.
- The minimum stack height above the mechanical penthouse roof should be 3 m.

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[1] American Society of Heating, Refrigeration, and Air Conditioning Engineers, AHRAE Handbook – HVAC Applications, 2023, Chapter 46

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Sajecki Planning Inc. on behalf of Infrastructure Ontario to undertake a land use compatibility/mitigation, preliminary air quality, and odour assessment for Infrastructure Ontario's proposed development referred to as the MECP-MLITSD Science Facility Complex, located near the intersection between William Halton Parkway West and Glenorchy Road in Oakville, Ontario.

The scope of work within our mandate for this study includes a preliminary review and a professional opinion in terms of anticipated noise, vibration, odour, and air pollution impacts from the proposed development onto nearby sensitive land uses. The study is based on the Ontario Ministry of Environment, Conservation and Parks (MECP) Land Use Compatibility Guidelines (D-Series), and other relevant MECP guidelines, as well as the Town of Oakville's Terms of Reference.

2. TERMS OF REFERENCE

The study site is situated on a rectangular parcel of land bounded by William Halton Parkway West to the southeast, Glenorchy Road to the northeast, and vacant land to the northwest and southwest.

The proposed development comprises a science facility building containing laboratory space on Levels 1-4, a science workshop at-grade, and office spaces on Level 2. The building is topped with a mechanical penthouse. The project is in the early schematic design phase, and the concept plan is expected to evolve over time. The work in this report is based on preliminary information and is subject to change.

An environmental noise feasibility study was conducted by Gradient Wind and considered as part of this assessment. The current land use compatibility/mitigation, air quality, and odour assessment provides commentary on the potential impact of the proposed development's potential emissions from sources such as the laboratory exhaust fans. The commentary was provided to satisfy the Town of Oakville's requirements for application support materials for compatibility studies.

The Science Complex is both an industrial / office facility. Primary sources of emissions would be from laboratory exhaust and products of combustion from fuel burning equipment, such as boilers and

generators. As such, according to the MECP Guideline D-6[2], the subject site can be classified as a Class II industrial facility.

The facility is planned to accommodate a laboratory capable of measuring environmental radioactivity. The MECP Guideline D-6 does not address radioactivity. However, as the facility will only be testing radioactive material, and not a producer of isotopes, the classification of the site is not expected to change. The facility will need to be designed to limit environmental impacts from the handling of radioactive materials.

The nearby sensitive land uses within the zone of influence of a Class II Facility (300 m) include 2000 Glenorchy Road (ErinoakKids Centre for Treatment and Development), and 3001 Hospital Gate (Oakville Trafalgar Memorial Hospital).

3. OBJECTIVES

The main goals of this work are to (i) identify critical points of impingement and sources of emissions (odour, dust), and (ii) provide measures to comply with the requirements of the Ministry of the Environment, Conservation and Parks (MECP) *Guideline D-6 – Compatibility Between Industrial Facilities and Sensitive Land Uses*, and Section 9 of the *Environmental Protection Act* (EPA) R.S.O 1990 and *Ontario Regulation* (O. Reg.) 419/05 - *Air Pollution and Local Air Quality*.

[2] Ministry of the Environment, Conservation and Parks (MECP) *Guideline D-6 – Compatibility Between Industrial Facilities and Sensitive Land Uses*

4. METHODOLOGY

The assessment is based on the desktop review of satellite imagery, street views, official plan, and zoning maps. The report is prepared in general conformance to the Town of Oakville's Terms of Reference[3] for Air Quality Reports and the Region of Halton's Land Use Compatibility Guidelines[4].

Related to land use compatibility, the Provincial Planning Statement (PPS 2024) Section *3.5 Land Use Compatibility* states:

> *Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.*

Where *major facilities* are defined as*:*

> *Facilities which may require separation from sensitive land uses, including but not limited to airports, manufacturing uses, transportation infrastructure and corridors, rail facilities, marine facilities, sewage treatment facilities, waste management systems, oil and gas pipelines,* ***industries****, energy generation facilities and transmission systems, and resource extraction activities.*

The PPS requires separation between *major facilities* and *sensitive land uses*, such as residential, so that among other things, excessive emissions, dust, and odour noise do not adversely impact individuals in the *sensitive land uses*.

[3] https://www.oakville.ca/business-development/planning-development/planning-and-development-applications-forms/planning-development-applications/development-application-guidelines/
[4] Halton Region, Land Use Compatibility Guidelines – Regional Official Plan Guidelines

4.1 Identifying Sources of Emissions

Following the definition of the critical points of impingement, a review of the study area was conducted to locate sources of airborne pollutants, dust, odours, and noise. In general, emission sources that are considered potentially influential to sensitive land uses include the subject site itself.

Industrial processes are bound by the requirements of **Section 9** of the **Environmental Protection Act (EPA) R.S.O 1990** and **Ontario Regulation (O. Reg.) 419/05 - Air Pollution and Local Air Quality**. Section 9 of the Environmental Protection Act states that "*No person shall, except under and in accordance with an environmental compliance approval, use, operate, construct, alter, extend or replace any plant, structure, equipment, apparatus, mechanism or thing that may discharge, or from which may be discharged a contaminant into any part of the natural environment other than water*". Despite compliance with Section 9 of the EPA, a facility may be liable under Section 14 of the EPA if they permit the discharge of a contaminant, including odour, which causes an adverse effect. Under O. Reg 419/05 "*a person shall not discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment, if the discharge causes or may cause an adverse effect*".

In order to obtain and maintain an Environmental Compliance Approval (ECA) (formerly referred to as a Certificate of Approval (CoA)), the emitting source must show compliance with O. Reg. 419/05. Compliance with O. Reg. 419/05 for air emissions is shown through an Emissions Summary and Dispersion Modelling (ESDM) report. An ESDM report quantifies all emissions from a facility and must demonstrate, through air dispersion modelling, that contaminant concentrations are below standards prescribed in O.Reg 419/05 at all points of impingement. To minimize the potential for adverse impacts of industrial activities on sensitive land uses, the MECP has provided guidelines for adequate buffering of incompatible land uses under "Guideline D-6 Compatibility Between Industrial Facilities and Sensitive Land Uses". The minimum separation distances are based on both the size of a facility and the scope of industrial activities within the facility, classified as Class I, II, or III, for light, medium, and heavy industrial uses, respectively. Table 1 summarizes the recommended separation distance and potential area of influence for each class. A sensitive development may be permitted within an industrial influence zone if appropriate air quality studies are undertaken, and potential causes of adverse effects are mitigated.

TABLE 1: D-6 RECOMMENDED SEPARATION & INFLUENCE AREA

Class	Minimum Recommended Separation Distance (m)	Potential Influence Area (m)
I	20	70
II	70	300
III	300	1000

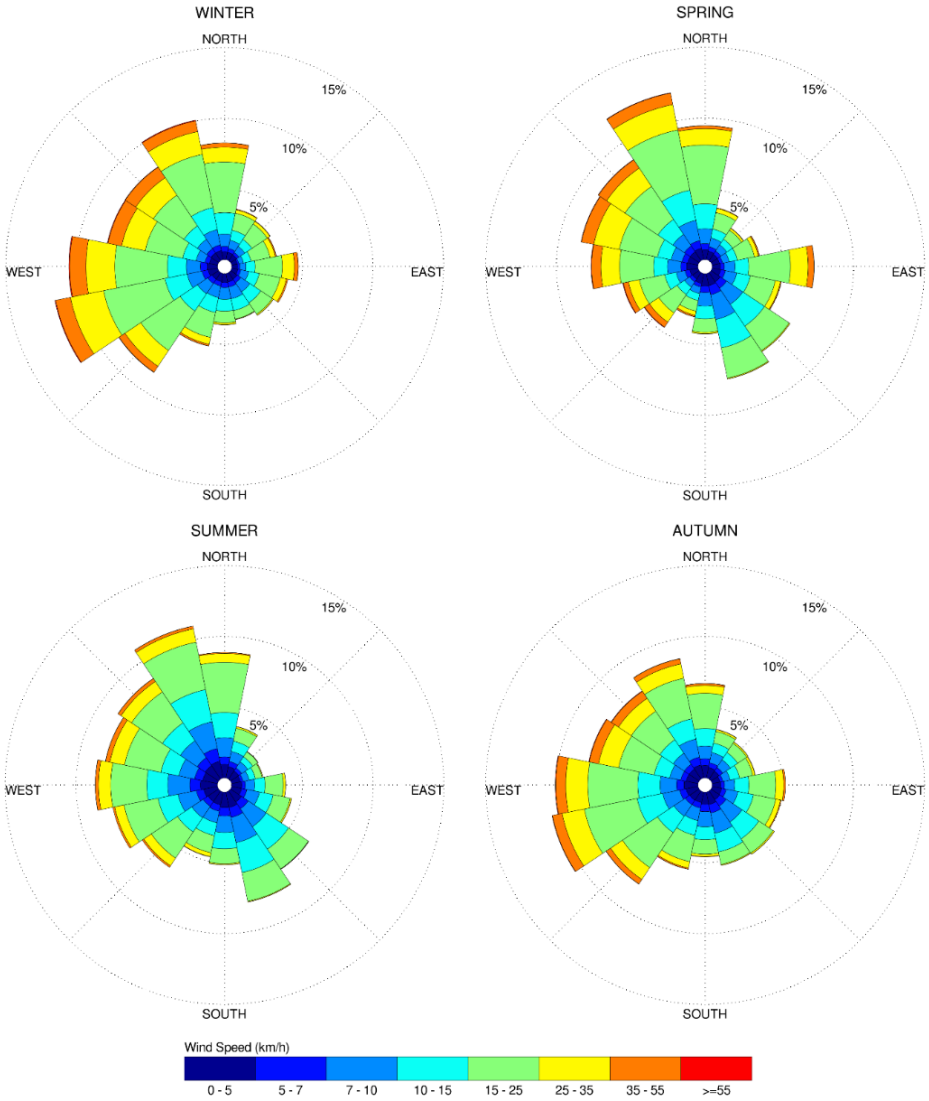
Sensitive land uses that are within the potential influence area of the subject site indicate where detailed air quality and noise studies may be required which would investigate mitigation measures that can be taken to avoid adverse effects.

4.2 Meteorological Data Analysis

A statistical model for winds in the Oakville / Greater Toronto area was developed from approximately 40 years of hourly meteorological wind data recorded at Lester B. Pearson International Airport and obtained from Environment and Climate Change Canada. Wind speed and direction data were analyzed for each month of the year in order to determine the statistically prominent wind directions and corresponding speeds, and to characterize similarities between monthly weather patterns. Based on this portion of the analysis, the four seasons are represented by grouping data from consecutive months based on the similarity of weather patterns, and not according to the traditional calendar method.

The statistical model of the area's wind climate, which indicates the directional character of local winds on a seasonal basis, is illustrated on the following page. The plots illustrate the seasonal distribution of measured wind speeds and directions in kilometres per hour (km/h). Probabilities of occurrence of different wind speeds are represented as stacked polar bars in sixteen azimuth divisions. The radial direction represents the percentage of time for various wind speed ranges per wind direction during the measurement period. The common wind speeds and directions can be identified by the longer length of the bars. For the area, the most common winds occur from the southwest clockwise to the north, as well as those from the east. The directional preference and relative magnitude of the wind speed vary somewhat from season to season, with the summer months displaying the calmest winds relative to the remaining seasonal periods.

SEASONAL DISTRIBUTION OF WIND
LESTER B. PEARSON INTERNATIONAL AIRPORT, TORONTO, ONTARIO



Notes:

1. Radial distances indicate the percentage of time of wind events.
2. Wind speeds are mean hourly in km/h, measured at 10 m above the ground.

4.3 Sources of Emission from the Subject Site to Nearby Buildings

The proposed development can be classified as a Class II industrial facility due to potential emissions from the laboratory exhaust fans on the roof of the building. Emissions from fuel burning equipment such as boilers and generators, is considered insignificant as Ontario Regulation 524/98 exempt this type of equipment from EPA Section 9 permitting requirements. Nearby sensitive land-use within the zone of influence of 300 m include the ErinoakKids Centre for Treatment and Development, and the Oakville Trafalgar Memorial Hospital as shown on Table 2. There are no residential areas located within the zone of influence. Figure 1 outlines the potential area of influence and recommended separation distance from the high roof of the subject site.

TABLE 2: SENSITIVE LAND USES WITHIN 300 METRES OF THE STUDY SITE

Business / Institution	Address	Type of Institution	Distance and Location to the Proposed Development (m)*
ErinoakKids Centre for Treatment and Development	2000 Glenorchy Road	Child Health Care Center	Approx. 0 m to the northeast property line. Potential sources are 80 m.
Oakville Trafalgar Memorial Hospital	3001 Hospital Gate	Hospital	Approx. 30 m to the southeast to the property line. Potential sources are 120 m.

*Distance is from property line of the business/institution to the property line of the proposed development

The Oakville Trafalgar Memorial Hospital is located 30 m to the southeast at 3001 Hospital Gate when measured from property line to property line. However, due to the large parking area at the Hospital, the actual set back distance from the proposed development to the nearest sensitive location on the Hospital building is greater than 120 m. As such, the Hospital is not expected to be impacted by emissions as it is beyond the minimum separation distance for a Class II facility.

The ErinoakKids Centre for Treatment and Development located directly northeast at 2000 Glenorchy Road is closer to the subject site than the minimum separation distance for a Class II facility. However, it is assumed that emissions from the subject site will be exhausted from the rooftop of the mechanical penthouse. As such, the distance from the rooftop of the subject site to the nearest rooftop of the ErinoakKids Centre is 80 m which is greater than the minimum separation distance to the at grade play

area of the day care. Therefore, no significant emission impact on the ErinoakKids Centre for Treatment and Development are expected.

As the nearby day care and hospital are within the zone of influence of the facility, a detailed air quality study will be required once the laboratory exhaust system and chemical use are more defined.

An Environmental Activity and Sector Registry (EASR) registration is required for the facility. While MECP is the regulatory agency for EASR and ECA's, it is anticipated they would follow the same due process as other proponents.

4.4 Stationary Noise Impacts on New & Existing Buildings from the Study Site

From the environmental noise feasibility study prepared by Gradient Wind, it was determined that stationary noise impacts from the proposed development onto nearby buildings will not be a concern.

Impacts from the proposed development on the surroundings can be minimized by judicious placement of mechanical equipment or the incorporation of silencers and noise screens as necessary. It is also recommended that any large pieces of HVAC equipment, which is required to be situated outdoors, be placed on the mechanical penthouse avoiding the line of sight with the surrounding noise-sensitive buildings. As part of the EASR process, a detailed Acoustic Assessment Report will need to be filed once the mechanical design of the building has been formalized.

5. CONCLUSIONS AND RECOMMENDATIONS

The study site is situated on a rectangular parcel of land bounded by William Halton Parkway West to the southeast, Glenorchy Road to the northeast, and vacant land to the northwest and southwest. The subject site was assessed for noise, vibration, dust, odour, and air quality concerns. The conclusions of our assessment are summarized below.

Emissions, Odour, and Vibration Impacts from the Proposed Development:

The proposed development can be classified as a Class II facility due to potential emissions from the laboratory exhaust fans. Nearby buildings within the zone of influence of 300 m include the ErinoakKids Centre for Treatment and Development, and the Oakville Trafalgar Memorial Hospital. There are no residential areas located within the zone of influence. The subject site is not expected to produce vibrations that can impact nearby sensitive land uses.

The distance from the subject site emission source on the rooftop of the mechanical penthouse to the nearby buildings exceed the minimum separation distance of 70 m for a Class II facility. As such, no adverse emissions from the proposed development to nearby buildings are expected. As the nearby day care and hospital are within the zone of influence of the facility, a detailed air quality study will be required once the laboratory exhaust system and chemical use are more defined. In addition, an EASR registration is required for the facility as per O. Reg 1/17 and Section 9 of the EPA.

Stationary Noise Source Impacts:

From the environmental noise feasibility study prepared by Gradient Wind, it was determined that stationary noise impact from the proposed development onto nearby buildings are expected to comply with the provincial sound level limits. Impacts from the proposed development on the surroundings and itself can be minimized by judicious placement of mechanical equipment or the incorporation of silencers and noise screens as necessary. It is also recommended that any large pieces of HVAC equipment, which is required to be situated outdoors, be placed on the mechanical penthouse avoiding the line of sight with the surrounding noise-sensitive buildings. As part of the EASR registration, a detailed Acoustic Assessment Report (AAR) will be required once the mechanical design in more formalized.

CONCLUSION:

In keeping with standard building construction and good engineering practice, as well as the provincial and city guidelines, the following comments and recommendations are provided to be incorporated into the design of the building to ensure air quality and noise levels are maintained to acceptable standards for the nearby sensitive land uses:

(v) Based on the findings of this report, Gradient Wind concludes that the MECP-MLITSD Science Facility Complex is feasible as the minimum separation distance between sensitive uses and potential emission sources can be maintained by placing laboratory exhaust fans on the high roof.

(vi) As the nearby day care and hospital are within the zone of influence of the facility, a detailed air quality study will be required once the laboratory exhaust system and chemical use are more defined.

(vii) The subject site will require EASR registration as per O. Reg. 1/17 and Section 9 of the EPA. In support of registration, an Emission Summary and Air Dispersion Modelling (ESDM) Study and Acoustic Assessment Report (AAR) will need to be conduced during the detailed design phase of the project once mechanical systems and laboratory operations are more defined.

(viii) The laboratory exhaust systems should incorporate high-plume fans, with bypass air to incorporate predilution into the systems. As noted by ASHRAE[5] the following stack parameters should be consisted in the design:

- The recommended dilution ratios between critical point of impingement and a single fume hood are 1:5000, or ensure all chemical species are complaint with the Air Containment Benchmark Standards.
- The minimum exit velocity of the fans should be 10 meters per second.
- The minimum stack height above the mechanical penthouse roof should be 3 m.

[5] American Society of Heating, Refrigeration, and Air Conditioning Engineers, AHRAE Handbook – HVAC Applications, 2023, Chapter 46

This concludes our assessment and report. If you have any questions or wish to discuss our findings, please advise us. In the interim, we thank you for the opportunity to be of service.

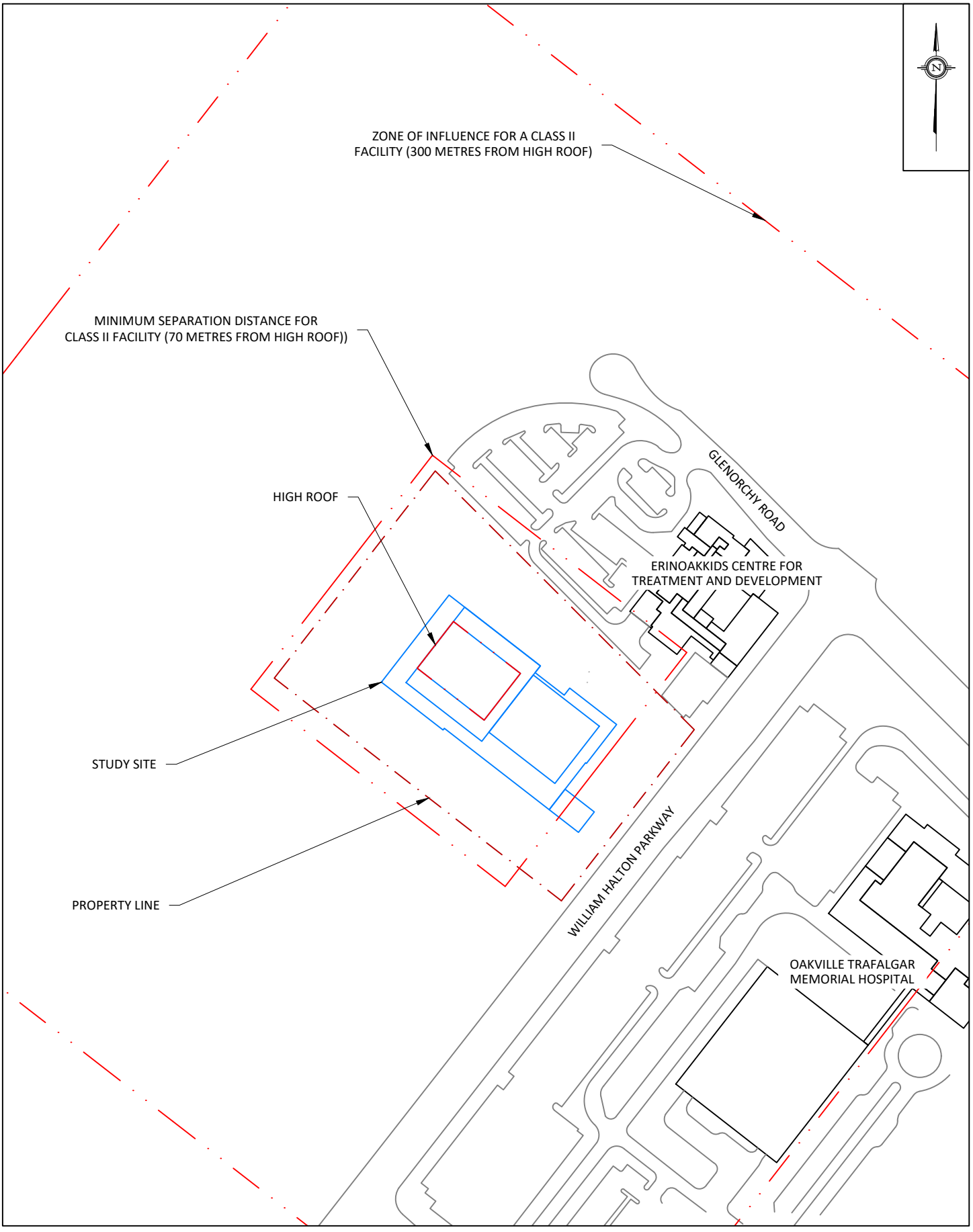
Sincerely,

Gradient Wind Engineering Inc.

Doryan Saavedra, B.Eng.
Junior Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #25-139 – LUC & AQ



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PROJECT	MECP-MLITSD SCIENCE FACILITY COMPLEX, OAKVILLE LAND USE COMPATIBILITY ASSESSMENT
SCALE	1:3000
DRAWING NO.	25-139-1
DATE	MARCH 10, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE 1:
PROPERTY LINE AND SURROUNDING CONTEXT