

NORTHSHORE HAMILTON DEVELOPMENT

330 MacArthur Avenue, Hamilton

Air Quality Assessment

Silverstone Developments



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1. INTRODUCTION

1.1 Overview

Trinity Consultants Australia was commissioned by Silverstone Developments to provide an air quality impact assessment for the residential unit development proposed at Northshore Hamilton.

The proposed development includes two buildings, six and eight stories high, with a total of 115 units. It is situated within the Northshore Hamilton Priority Development Area (PDA) and is close to several major industries, including:

- BCC Eagle Farm Asphalt Plant
- Boral Whinstanes Asphalt Plant
- Boral Whinstanes Concreted Batching Plant

This qualitative air quality assessment report has been carried out to support a development application over the subject site.

The assessment has been undertaken in accordance with the requirements of the Northshore Hamilton PDA Development Scheme (October 2022). The subject site is outside the air quality constraints area defined in the development scheme, however, the scheme also states a maximum building height of 30 metres. Therefore, further assessment is considered necessary.

1.2 Scope

This report describes the assessment of air quality impacts, which is based on the following tasks:

1. Undertake site visit to confirm industry sources.
2. Screening assessment:
 - a. Review development details, sensitive uses locations and development air intake locations.
 - b. Review Northshore Hamilton Priority Development Area Air Quality Constraints Assessment document.
 - c. Conduct a qualitative assessment of potential air quality impacts from the nearby industry.
 - d. Where relevant, provide recommendations to maintain acceptable air quality at sensitive use locations.

2. STUDY AREA DESCRIPTION

The subject site is located at 330 MacArthur Avenue, Hamilton, on part of Lot 5 on SP337697. This property is in a Priority Development Area declared under the Economic Development Act 2012 (effective February 2013). The Northshore Hamilton PDA (the PDA) was declared by regulation 4 under the former Urban Land Development Authority Act 2007 (ULDA Act) on 27 March 2008. The regulatory map identifying the boundaries of the PDA is identified in **Figure 2.1**– PDA Boundary.

The PDA is approximately 304 hectares in area and is bound by the Brisbane River to the south, Kingsford Smith Drive to the north and the Gateway Motorway and Southern Cross Motorway to the east as identified on Map 1b – PDA Location.

Figure 2.1: Northshore Hamilton PDA Boundary (Source: Economic Development Queensland, 2022)



According to Brisbane City Council (BCC) City Plan 2014, the property is designated as Emerging Community. It is surrounded by the following:

- Residential community and an open park in the east.
- A mix of general industries in the north and west.
- Mix of residential community and recreational facility towards south.

The site location and zoning are shown in **Figure 2.2**.

Figure 2.2: Site Location and Zoning



A site visit was conducted on 11 September 2024 to confirm the air-emitting industries in the area that could impact the site. The review and site visit indicated that the site's surrounding includes industrial uses such as asphalt, concrete, vehicle modification, software, transport, plating residential and commercial properties. Any potential air emissions from these land uses are described in **Section 5.1**.

3. PROPOSED DEVELOPMENT

The proposed development includes two residential buildings, six and eight stories high, with a total of 115 apartment units (1 to 3 bedrooms). A summary of key features include:

- Basement car parking
- 146 units (1 to 3 bedrooms)
- Communal spaces at ground level:
 - Pool/BBQ area
 - Gym

Figure 3.1 presents a concept plan of a typical floor level.

Figure 3.1: Site Layout (cropped from DA Plan TP1-1004 – Level 2 to 4 only)



4. PLANNING REQUIREMENTS

The proposed development site is within the Northshore Hamilton PDA and close to several major industries. Therefore, it was important to study the location of the proposed development, which may be constrained by potential air quality impacts in the Northshore Hamilton PDA subject to location and building height.

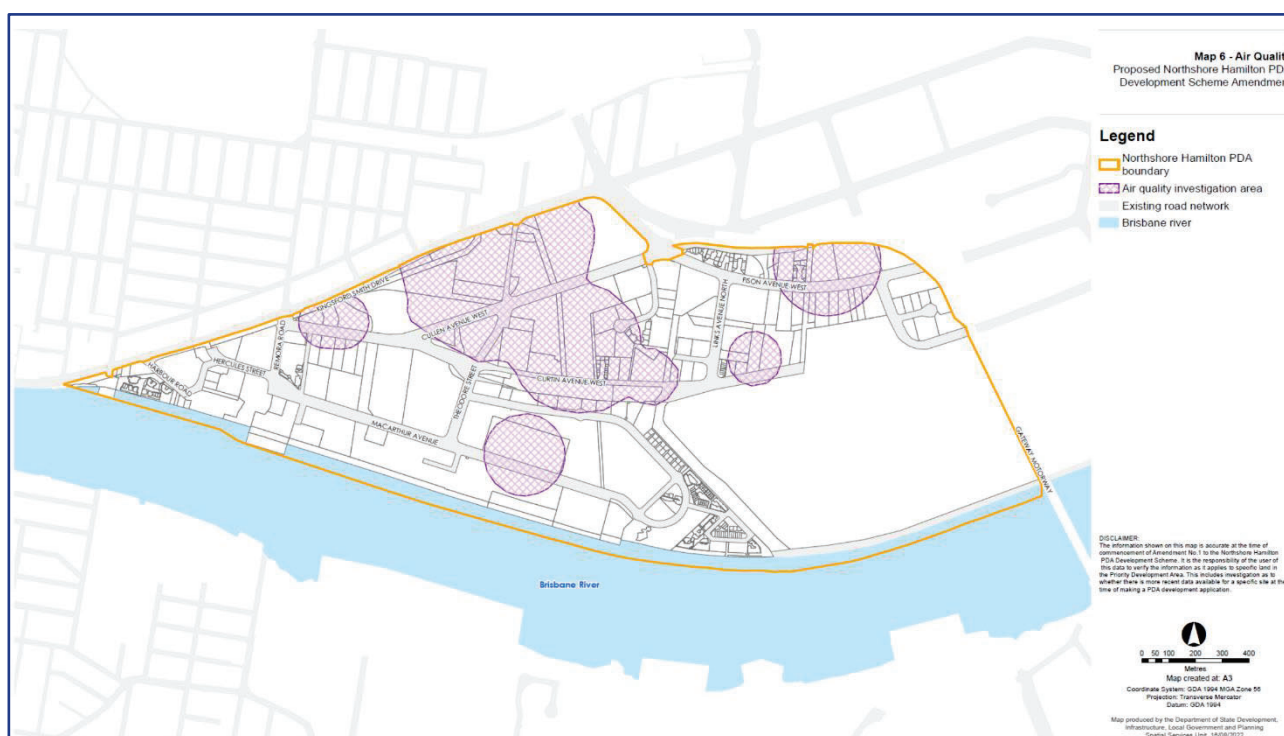
With respect to air quality impacts onto sensitive uses, Section 2.5.9.4 of the development scheme states the following:

Development within the investigation areas shown on Map 6 – Air quality must be designed and constructed to be compatible with the existing uses that have the potential for off-site air emissions in a way that:

- *limits the exposure of occupants in the development to pollutants that could have an adverse effect on human health, and*
- *does not adversely affect the continued operation of the existing activities.*

Figure 4.1 shows the air quality constraint map (Map 6) for the Northshore Hamilton PDA. The shaded areas indicate the PDA's sites that might be impacted by the aforementioned industries; the level of constraint decreases as one moves farther away from the industrial facility.

Figure 4.1: Northshore Hamilton PDA Air Quality Constraint Map (Development, Northshore Hamilton Priority Development Area - Development Scheme Amendment no.1, 2022)



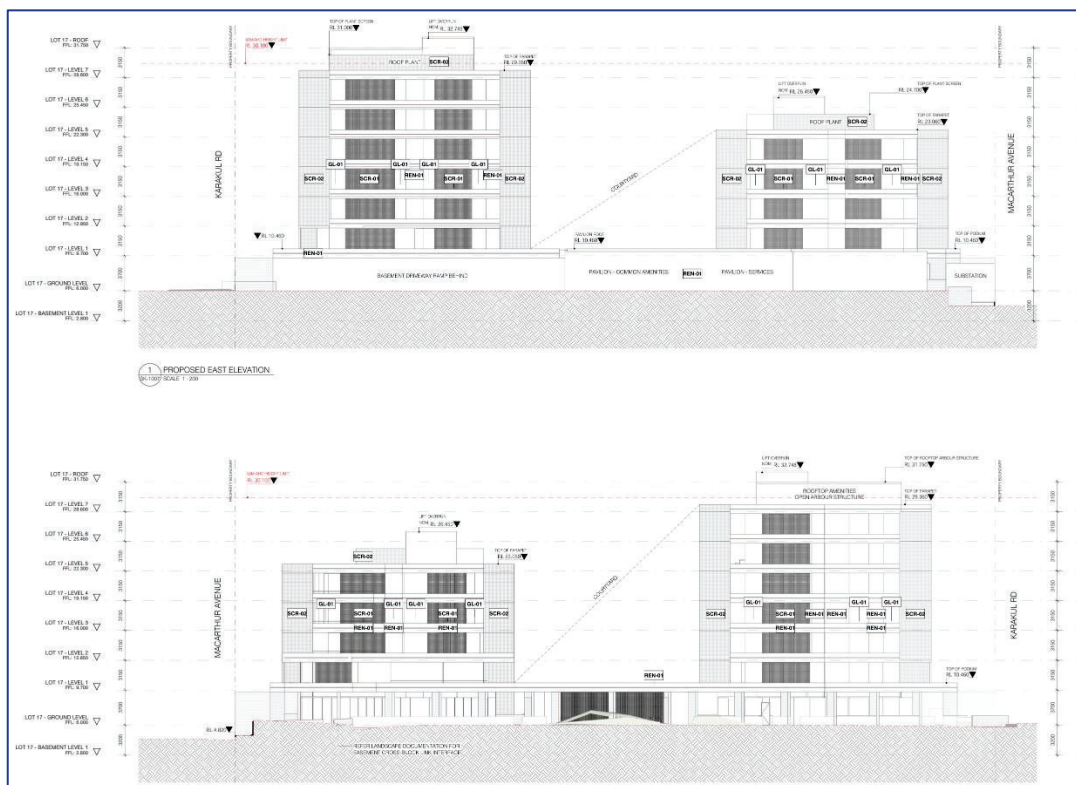
The above figure shows that the subject site is outside the air quality constraint areas in the Northshore Hamilton PDA. However, the development scheme also requires a maximum building height of 30 metres, as per Map 7 presented in **Figure 4.2**. Therefore, further assessment is considered necessary.

Figure 4.2: Northshore Hamilton PDA Building Height Constraint Map



PDA Development Scheme has specified that the building height should be 30 m in mixed use medium density. This height limit is based on the assumption that impacts below this level are acceptable. The proposed southern building includes rooftop amenities at 28.6 metres (floor level), with a roof and lift cover extending above 30 metres, as shown in **Figure 4.3**. Nonetheless, a review of impacts has still been undertaken giving consideration to the air quality modelling report prepared by Advanced Environmental Dynamics (AED, 2020), which was undertaken to inform the development scheme constraints map.

Figure 4.3: Proposed Building Plan



5. DESKTOP REVIEW

5.1 Potential Air Emission Sources

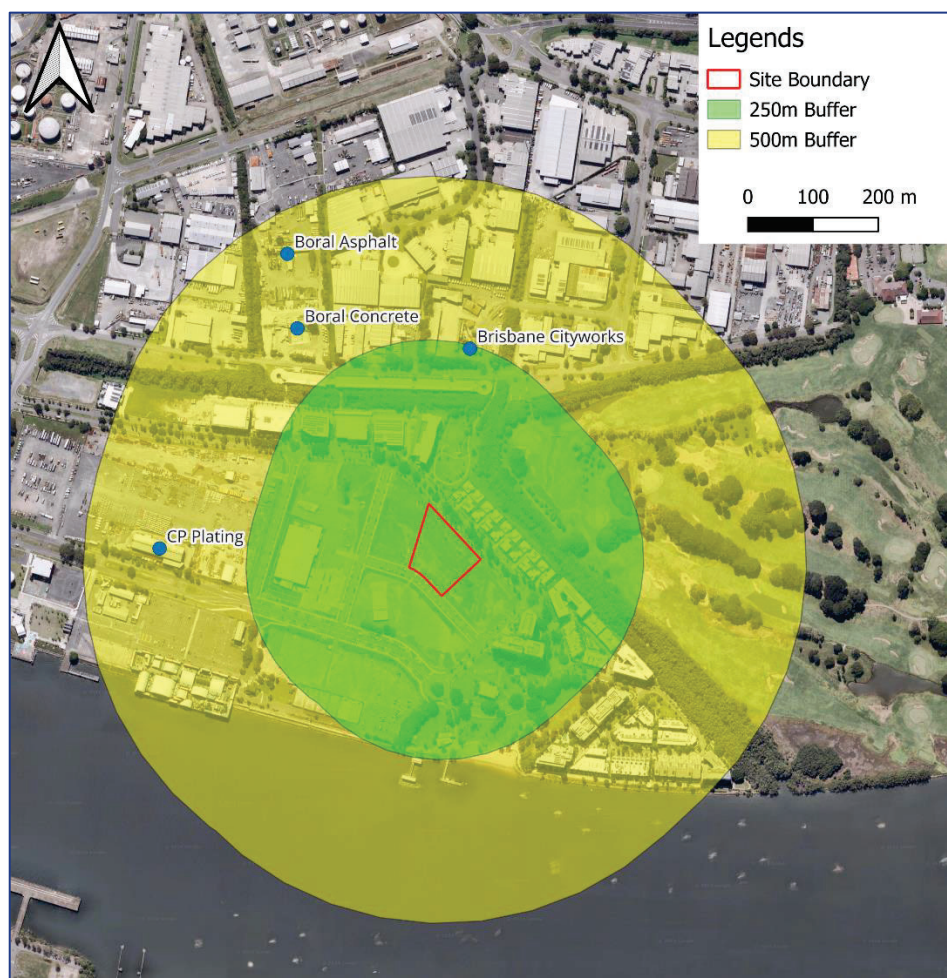
Key air emission sources were identified to assess the impacts from the industrial operations. The potential air quality risks are discussed below. The key emission sources are:

- BCC Eagle Farm Asphalt Plant
- Boral Whinstanes Asphalt Plant
- Boral Whinstanes Concrete Batching Plant

It is noted that the CP Plating surface coating facility, located about 300 metres away, may affect background values and cumulative impacts. There are other industrial uses with potential air emissions in the wider area, but these are beyond 500 metres from the subject site. Other closer land uses are considered to have minimal air quality risk for the subject site.

Figure 5.1 shows the site boundary and buffer zones in site surroundings. It is evident that all four important industries with emission sources surrounding the site are located on the periphery of the 250 m buffer. Moreover, the wind rose plot shows that there will be minimum influence of the emissions from the north and west direction.

Figure 5.1: Site Location and Nearby Air Emission Sources



5.2 Site Visit

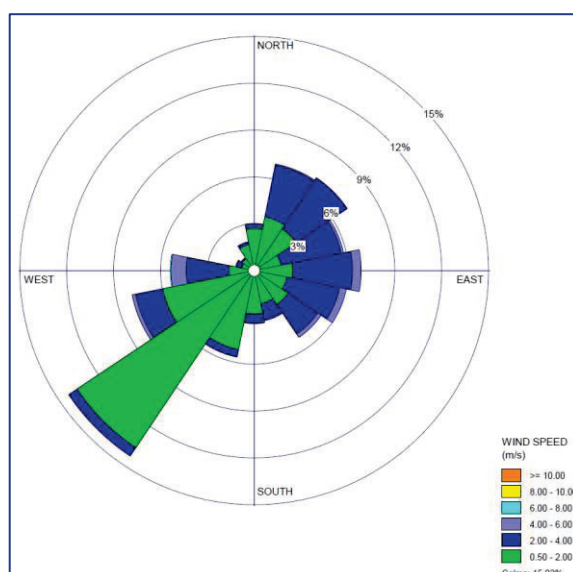
Trinity carried out a site visit on 12 September 2024 to confirm the nearby air emission sources and whether there have been an establishment of new industries in the surrounding area. The following observations were made:

- The industrial sites with emission sources that are located on Curtin Avenue are Boral Asphalt, Boral Concrete, Brisbane Cityworks. Besides these, there are other commercial spaces including warehouse, vehicle modification, mining equipment maintenance. There is another industry namely CP Plating on MacArthur Avenue. All these are ongoing and operational.
- Smell of the bitumen could be smelt around the entry gate of Brisbane Cityworks which is located towards Curtin Avenue.
- Dust could be seen on the site boundary of Boral concrete on the entry and exit gate towards Curtin Avenue.
- Other areas directly to the north of the developmental site located between Curtin Avenue and MacArthur are now developed and comprise of office buildings and a parking space. The parking space is approximately 340 meters in length, 15 m width and 8 m in height. Besides there are also thick outgrowth of trees behind the parking space and the commercial buildings on MacArthur Avenue.
- A new commercial building was being constructed at 393 MacArthur Avenue which is about 400 m northwest of the proposed development site.
- This field visit revealed that the odour from the Brisbane Cityworks could not be smelt near the proposed development site even though there was gentle wind blowing from north to south. In addition, there was absence of any further sources of air emissions which could impact the development site.

5.3 Review of Local Meteorology

Historical (2019-2023) winds measured at the nearest BOM Brisbane (Raymond Park) station (approximately 6 kilometres southwest of the site) have been reviewed to gain an understanding of the prevailing winds in the Hamilton region. Based on the wind rose presented in **Figure 5.2**, predominant wind directions are from the southwest and west-southwest. There are also components from the east, west, north-northeast and northeast. The wind rose plot indicates that source-to-receiver winds (north-west to northerly) are not a dominant feature of the area (i.e. the nearest air emission sources are located upwind of the subject site the majority of the time).

Figure 5.2: Brisbane BOM Wind Rose (2019 – 2023)



5.4 Northshore Hamilton PDA Air Quality Constraints Modelling

An air quality modelling assessment was previously commissioned by Economic Development Queensland (EDQ) to inform the air quality constraints map of the development scheme. The outcomes of the assessment are presented in a report prepared by Advanced Environmental Dynamics (23 July 2020). Key aspects of the report are listed below:

- Modelling was undertaken for the following facilities:
 - Caltex petrol station
 - Puma Energy bulk fuel storage
 - BP bulk fuel storage
 - BCC Eagle Farm asphalt plant
 - Boral Whinstanes asphalt plant
 - Boral Whinstanes concrete batching plant
 - CP Plating
- Other industries in the area were identified (typically less intensive than the above listed) but were not modelled due to a lack of information. It is noted that these other industries were less intensive than the main air emission sources modelled.
- Modelling was undertaken using TAPM/CALMET for meteorology and CALPUFF for pollutant dispersion.
- Background concentrations from select DESI stations were adopted to account for cumulative impacts.
- Pollutant emission estimates were based on a combination of site license information, NPI, operator information and stack testing results.
- The modelling considers receptor heights of up to 37.5 metres (relative height) and receptors cover the whole of the Northshore Hamilton PDA (refer to Figure 23 of the AED Report).

The key input that may have changed since the time of the assessment is the pollutant emission rates, which is subject to the scale of operations (e.g. material throughputs, equipment capacity). For the BCC asphalt plant, it is noted that the environmental authority for the site (EPPR00463513), which specifies stack emission limits for pollutants has not changed since 2009. Operational information for the Boral sites is not publicly available (e.g. NPI, environmental authorities), nonetheless, review of Google Earth aerial photography indicates no major changes in on-site infrastructure, which suggests the Boral site operation have not changed.

It is concluded that the air modelling undertaken is considered applicable for this assessment. Furthermore, it is noted that the modelling outcome covers both the location and elevation of the development site.

With respect to location, the subject site is outside the air quality constraints map developed by AED based on the modelling and subsequently incorporated into Map 6 of the Northshore Hamilton PDA. With respect to height, as noted above, modelling considers receptor heights of up to 37.5 metres (relative height) and receptors cover the whole of the Northshore Hamilton PDA (refer to Figure 23 of the AED Report). The proposed building includes rooftop amenities at 27.6 metres in the northern section, with a roof and lift cover extending above 30 metres. The AED report states that “no additional air quality constraints were identified” based on the investigation in constraints for different receptor heights. This indicates that there is no additional air quality risk associated with the building height being above the maximum height defined in Map 7 of the development scheme.

The AED report discusses risks associated with odour from the asphalt facilities. It identifies that odour can still be detectable outside the air quality constraint area. The risk of impacts can be minimised by restricting window openings on the side of the buildings facing the asphalt plants (northern) and located ventilation intakes away from the asphalt plants.

6. CONCLUSIONS

Trinity Consultants Australia was commissioned by Silverstone Developments to provide an air quality impact assessment for the unit development proposed for Northshore Hamilton. The proposed development site is situated within the Northshore Hamilton Priority Development Area, close to several major industries including two asphalt plants and a concrete batching plant.

To evaluate the effects of emissions from nearby industries, the following methodology was used:

- Review of the relevant documents including:
 - i. Northshore Hamilton Priority Development Area, Economic Development Queensland, 2022.
 - ii. Northshore Hamilton Priority Development Area Air Quality Constraints Assessment
- Desktop/qualitative review and site visit

The proposed development site is outside of the PDA air quality investigative areas and based on this, air quality is compatible for the development of the site for sensitive uses. It is noted that the proposed building height is slightly above the maximum development scheme height of 30 metres (noting the floor level of the highest occupied area (rooftop amenities) is below 30 metres). Furthermore, the air dispersion modelling prepared by AED on behalf of EDQ, which was used to develop the air quality constraints map in the development scheme, takes into consideration the subject site location and proposed building height (with the modelling covering receptors heights up to 37.5 metres).

All three major industries with air emission sources are located on the periphery of a 250 m buffer of the development site, to the north and north-west of the site. The wind rose plot shows that the predominant wind directions are from the southwest and west-southwest direction indicating that there will be a low risk of emissions from the north and north-west direction.

A desktop review and site visit was carried out to determine the establishment of new industries in the surrounding area and additional emission sources. There were no additional air emission sources identified (compared to those already considered in the AED air quality constraints report) and an online review suggests these industries have not changed in capacity. There was an on-going construction of new commercial building at 393 MacArthur Avenue which is about 380 meters from the site. The construction activities will not impact the development site as the predominant wind direction is from southwest direction and the site is located on the southeast of 393 MacArthur Avenue.

The AED report discusses risks associated with odour from the nearby asphalt facilities. It identifies that odour can still be detectable outside the air quality constraint area. The risk of impacts can be minimised by restricting window openings on the side of the buildings facing the asphalt plants (northern) and located ventilation intakes away from the asphalt plants.

Therefore, it is concluded that the impacts of air pollution from the nearby emission sources are expected to be within acceptable limits, thus meeting the requirements of the Northshore Hamilton Priority Development Area Development Scheme.

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