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Report

PRESTONS WAREHOUSE ASSESSMENT – AIR QUALITY AND ODOUR REPORT

LOGOS PROPERTY

Job ID. 20793

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1 INTRODUCTION

Pacific Environment Limited has been engaged by Logos Property to provide an estimation of the Air Quality and Odour impacts for the proposed development of Prestons Warehouse and Distribution Estate (the 'Project') located at the corner of Yarrunga Street and Bernera Road in Prestons, NSW 2170.

The proposed industrial estate will serve as a distribution and warehousing centre that will include:

- Six warehouse facilities with adjoining office space
- Internal roadways
- Associated hard-standing, loading and servicing areas
- Open-air parking
- Landscaping
- Service and infrastructure expansion.

The State significant assessment system comprises two separate assessment pathways: State significant infrastructure (SSI) and State significant development (SSD). These projects are assessed by the Department of Planning and Environment (DP&E) who then issue the Secretary's environmental assessment requirements (SEARs).

It is noted that the NSW EPA stated that the proposal does not constitute a Scheduled Activity under Schedule 1 of the Protection of the Environment Operations Act 1997 (POEO Act), and as such no request was made for a dispersion modelling assessment with respect to air quality. However, it is noted that if future tenancies of the new buildings constitute a Scheduled Activity under Schedule 1 of the POEO Act, these premises will require an Environment Protection Licence (EPL) prior to undertaking the activity, and it probable that at this time a detailed air quality assessment would be required.

This report responds to the SEARs issued in respect of SSD 7155 and specifically responds to the SEARs requirements for Air Quality and Odour, which are given in **Table 1-1**.

Potential air quality and odour impacts that may occur as a result of this development were qualitatively assessed with reference to the 2005 NSW DEC Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (**NSW DEC, 2005**).

Table 1-1: Secretary's Environmental Assessment Requirements

Secretary's Requirements	Section Addressed
An assessment of the potential air quality impacts (particularly dust) of the development on surrounding receivers, including impacts from construction, operation and transport	**Section 6**
An assessment of the potential odour impacts	**Section 6**
Details of the proposed mitigation, management and monitoring measures.	**Section 7**

2 PROJECT DESCRIPTION

The site plan of the proposed development of Prestons Warehouse and Distribution Estate is shown in **Figure 2-1**.

The proposed industrial estate has an area of approximately 20 ha and is bounded by Yarrunga Street, Bernera Road and Kurrajong Road (**Transport and Traffic Planning Associates, 2016**). The total area will be split into warehouses, car parks, internal roads and offices, as shown in **Figure 2-1**.

The zoning for the Project and surroundings areas is shown in Figure 2-2, and a description of zoning code is given in **Table 2-1**.

The majority of land immediately surrounding the Project is zoned for industrial purposes. This includes existing industrial estates that are located approximately 50 m to the north and east.

The closest Residential housing is located immediately to the south and southwest, and 830 m to the northwest.

Table 2-1: Zoning codes for the NSW planning system

Zoning code	Category
R1 General Residential R2 Low Density Residential R3 Medium Density Residential	Residential zone
B1 Neighbourhood centre	Commercial zone
IN1 General Industrial IN2 Light Industrial IN4 Working Waterfront	Light Industrial zone
IN3 Heavy Industrial	Heavy Industrial zone
E2 Environmental Conservation	Environmental Protection & Hazard Management zone
SP2 Infrastructure	Infrastructure zone

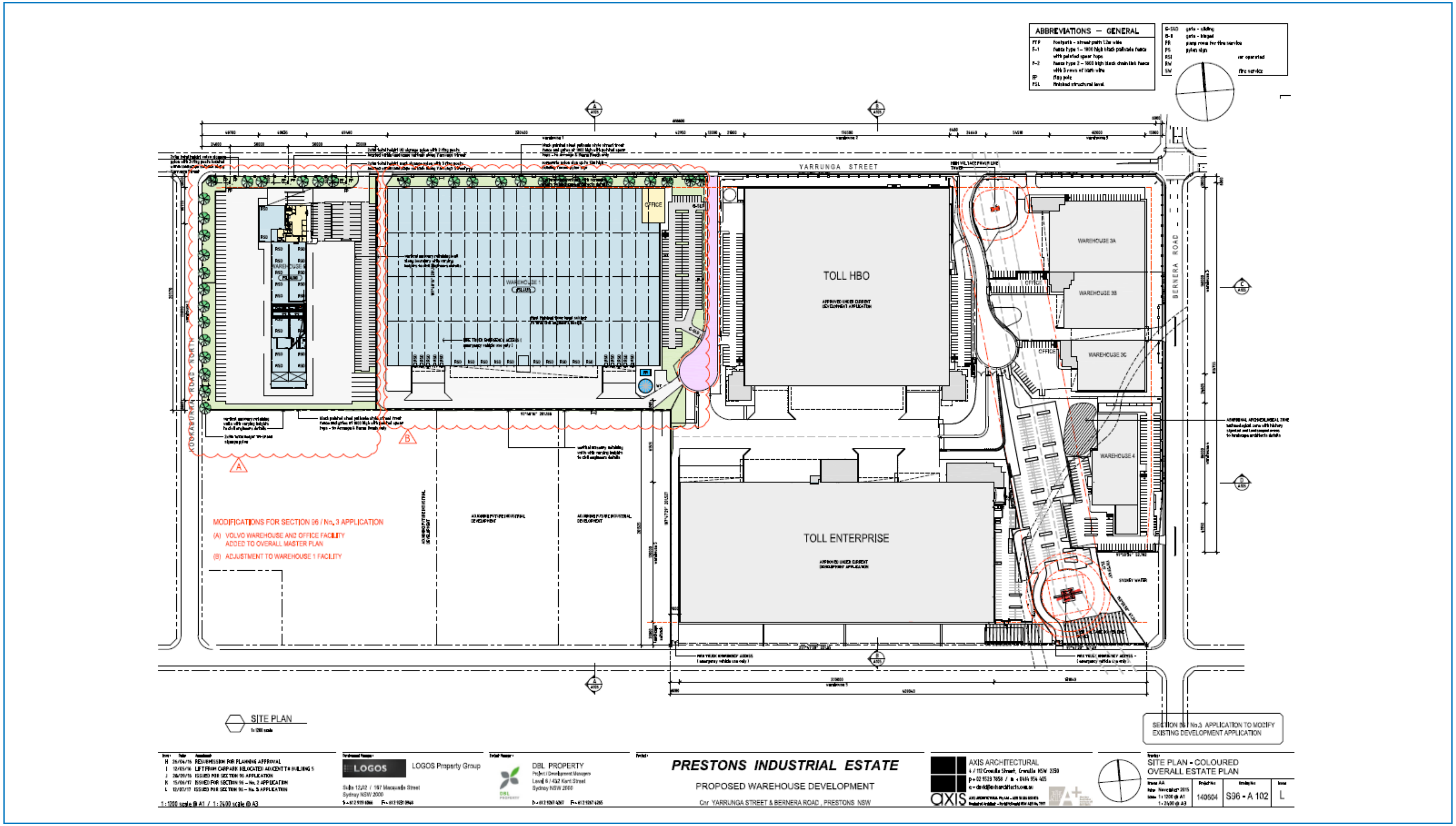

Figure 2-1: Site plan for the Project

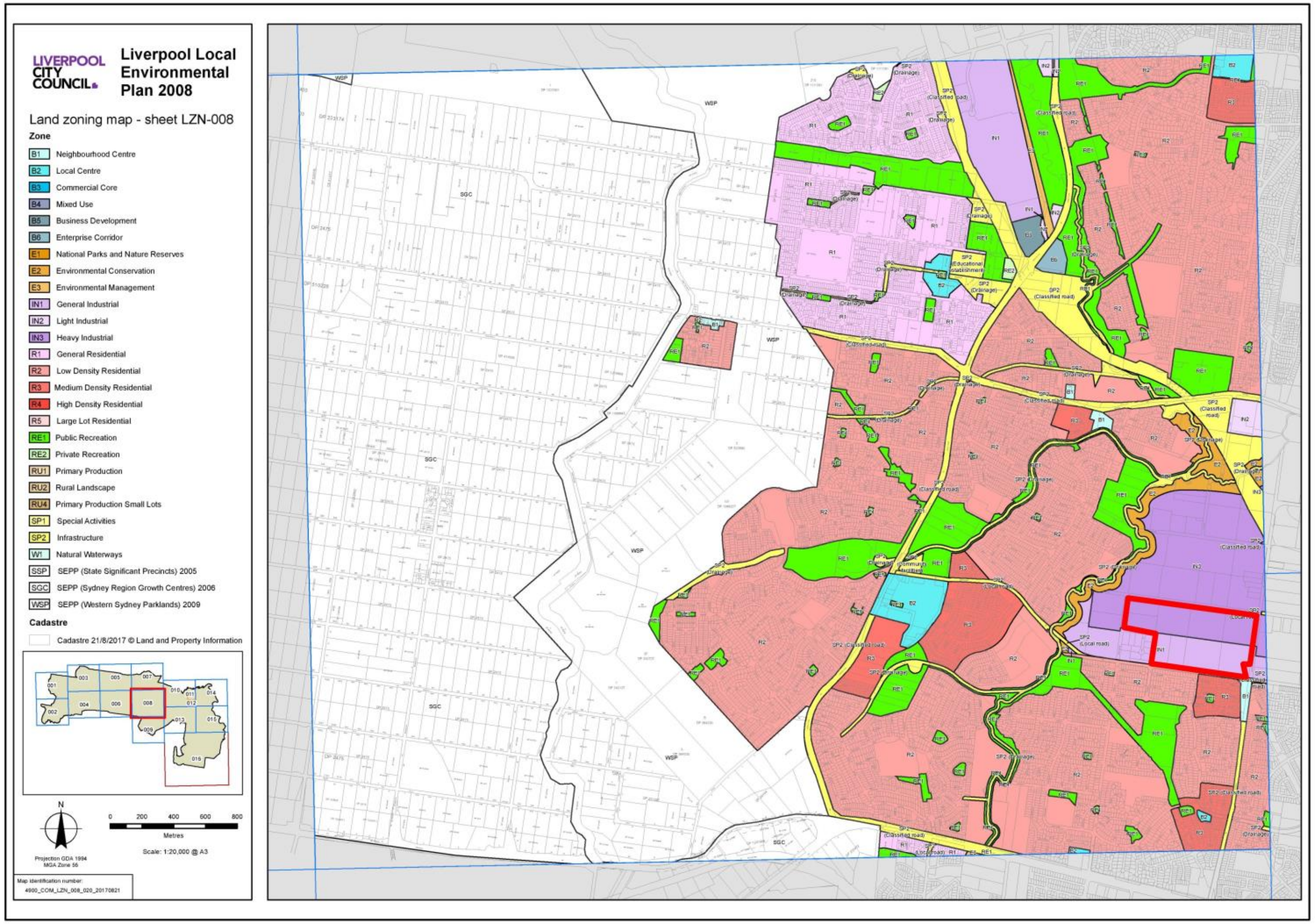

Figure 2-2: Zoning plan of the area surrounding the Project

2.1 Receptors

A sensitive receptor is defined as a location where people are likely to work or reside; and may include a dwelling, school, hospital office or public recreational area in addition to known or likely future locations (**NSW DEC, 2005**).

The nearest sensitive receptors to the Project are shown in **Figure 2-3**.

There are a number of Residential locations to the north, northwest, east, southwest and south of the site. The nearest Residential receptors were identified as follows, with the distance quoted being to the nearest boundary:

- R1: 72 Coffs Harbour Avenue (230 m to the northwest)
- R2: 10 Wingham Road (580 km to the east-northeast)
- R3: 35 Huskisson Street (200 m to the southwest)
- R4: 30 Michelago Circuit (immediately to the south)
- R12: 28 Plukavec Circuit (400 m to the south)

The nearest Industrial receptors were identified as:

- R5: Unidentified farm – it is assumed that this will be removed
- R6: WBG Trailer Repairs Pty Ltd.
- R7: Favelle Favco Cranes Pty Ltd.
- R8: Precision Fleet Maintenance Pty Ltd
- R9: Mainfreight Transport – Sydney
- R10: LDN - Local Direct Network
- R11: Boral Concrete Prestons

Figure 2-3: Nearest Sensitive Receptors to the Project

3 AIR QUALITY CRITERIA

3.1 Dust

The Approved Methods specifies air quality assessment criteria relevant for assessing impacts from air pollution (**NSW DEC, 2005**)[a]. The air quality goals relate to the total dust burden in the air and not just the dust from the Project. In other words, consideration of background dust levels needs to be made when using these goals to assess potential impacts. These criteria are health-based (i.e. they are set at levels to protect against health effects). These criteria are consistent with the *National Environment Protection Measure for Ambient Air Quality* (referred to as the Ambient Air-NEPM) (**NEPC, 1998**). However, the EPA's criteria include averaging periods, which are not provided in the Ambient Air-NEPM, and also reference other measures of air quality, namely dust deposition.

In May 2003, the NEPC released a variation to the Ambient Air-NEPM (**NEPC, 2003**) to include advisory reporting standards for particulate matter with an equivalent aerodynamic diameter of 2.5 µm or less ($PM_{2.5}$). The purpose of the variation was to gather sufficient data nationally to facilitate the review of the Ambient Air-NEPM, which is currently underway. The variation includes a protocol setting out monitoring and reporting requirements for $PM_{2.5}$ particles. It is noted that the Ambient Air-NEPM $PM_{2.5}$ advisory reporting standards are not impact assessment criteria.

Table 3.3 summarises the air quality goals for pollutants that are relevant to this study. It is important to note that the criteria are applied to the cumulative impacts due to the Project and other sources.

Table 3-1: EPA Air Quality Standards/Goals for Particulate Matter Concentrations

Pollutant	Standard	Averaging Period	Source
PM_{10}	50 µg/m³	24 hour	NSW DEC (2005) (assessment criteria) EPA impact assessment criteria; and Ambient Air NEPM reporting goal which allows five exceedances per year.
	30 µg/m³	Annual	NSW EPA impact assessment criteria
$PM_{2.5}$	25 µg/m³	24 hour	NEPM Advisory Reporting Standard
	8 µg/m³	Annual	NEPM Advisory Reporting Standard

Notes: µg/m³ – micrograms per cubic meter.

In addition to health impacts, airborne dust also has the potential to cause nuisance effects by depositing on surfaces, including vegetation. Larger particles do not tend to remain suspended in the atmosphere for long periods of time and will fall out relatively close to source. Dust fallout can soil materials, damage vegetation/crops and generally degrade aesthetic elements of the environment, and are assessed for nuisance or amenity impacts.

Table 3-2 shows the maximum acceptable increase in dust deposition over the existing dust levels from an amenity perspective. These criteria for dust fallout levels are set to protect against nuisance impacts (**NSW EPA, 2005**).

Table 3-2: EPA Criteria for Dust (Insoluble Solids) Fallout

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m²/month	4 g/m²/month

Notes: g/m²/month – grams per square meter per month.

[a] This assessment was completed prior to the issuance of the updated Approved Method beiing released in January 2017.

Motor vehicles emit a number of pollutants that are known to be potentially harmful to human health. These pollutants are carbon monoxide (CO), nitrogen oxides (NO_x), hydrocarbons (HC), sulphur dioxide (SO_2) and particulate matter. Each of these pollutants has the capacity to adversely affect health if the concentration is too great over a particular exposure period. Emissions of SO_2 are minor, due to the low sulphur content of fuels in Australia, and are not considered further in this assessment.

The most relevant NSW EPA criteria for nitrogen dioxide (NO2) and carbon monoxide (CO) are listed in **Table 3.3**.

Table 3.3: NSW EPA Air Quality Assessment Criteria

Pollutant	Goal	Averaging period	Source
Nitrogen dioxide (NO_2)	246 µg/m³ 62 µg/m³	1-hour Annual	NEPC (1998)
Carbon monoxide (CO)	30 mg/m³ 10 mg/m³	1-hour 8-hour	

3.2 Odour

The determination of air quality goals for odour and their use in the assessment of odour impacts is recognised as a difficult topic in air pollution science. The topic has received considerable attention in recent years and the procedures for assessing odour impacts using dispersion models have been refined considerably. There is still considerable debate in the scientific community about appropriate odour goals as determined by dispersion modelling.

The EPA has developed odour goals and the way in which they should be applied with dispersion models to assess the likelihood of nuisance impact arising from the emission of odour.

There are two factors that need to be considered:

1. What "level of exposure" to odour is considered acceptable to meet current community standards in NSW?
2. How can dispersion models be used to determine if a source of odour meets the goals which are based on this acceptable level of exposure?

The term "level of exposure" has been used to reflect the fact that odour impacts are determined by several factors the most important of which are (the so-called FIDO factor):

- the Frequency of the exposure;
- the Intensity of the odour;
- the Duration of the odour episodes; and
- the Offensiveness of the odour.

In determining the offensiveness of an odour it needs to be recognised that for most odours the context in which an odour is perceived is also relevant. Some odours, for example the smell of sewage, hydrogen sulfide, butyric acid, landfill gas etc., are likely to be judged offensive regardless of the context in which they occur. Other odours such as the smell of jet fuel may be acceptable at an airport, but not in a house, and diesel exhaust may be acceptable near a busy road, but not in a restaurant. Odour goals need to take account of these factors.

Frequency and duration are accounted for in the modelling process assuming (conservatively) that worst case emissions occur for every day of the year. Odour intensity relates to the perceived strength of an odour. The Association of German Engineers (Verein Deutsche Ingenieure or VDI) has developed a standard scale for describing odour intensity which is summarised in **Table 3-4**.

Table 3-4: VDI 3882 (1) Odour Intensity Descriptors

Odour	Intensity Level
Extremely strong	6
Very strong	5
Strong	4
Distinct	3
Weak	2
Very weak	1
Not perceptible	0

The limit of detection is represented by a concentration of 1 OU and would correspond to an odour intensity of between 'non-perceptible' and 'very weak' (using the relationship detailed in the German Standard VDI 3882(1)). According to that same relationship, the odour concentration would need to double to 2 OU before increasing intensity to 'very weak' (Intensity level of 1). It would then need to more than double again (4 OU) before reaching the next intensity level of 'weak' (Intensity level of 2).

The relationship between odour intensity and concentration is therefore non-linear. An example of odour intensity – concentration curve is shown in **Figure 3.1**, where the concentration (x-axis) is plotted on a logarithmic scale.

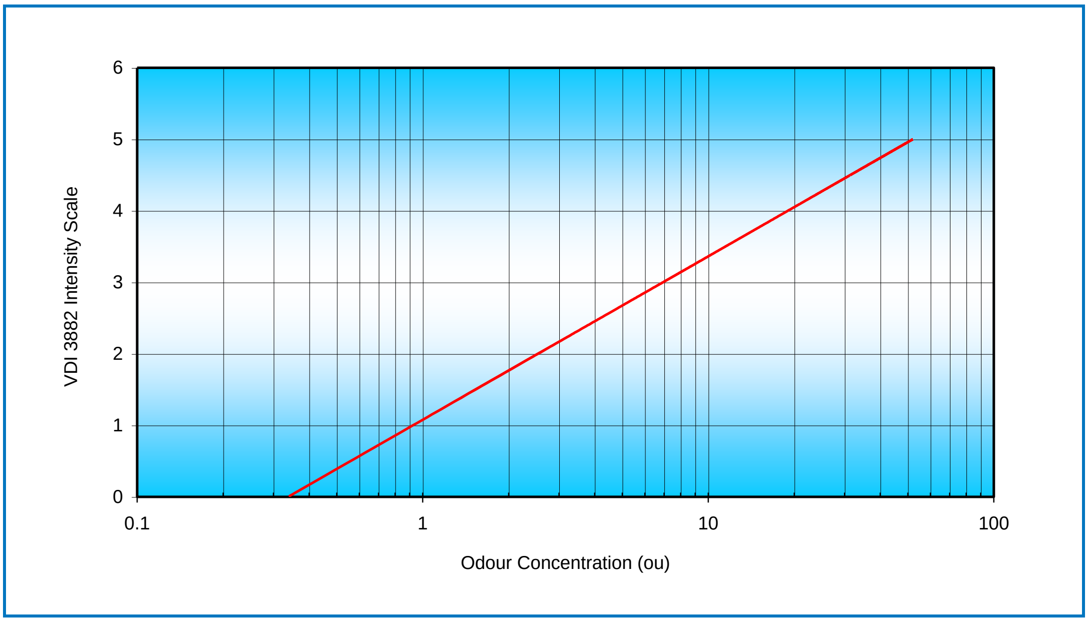

Figure 3-1: Example of the odour intensity – concentration relationship (Misselbrook, 1993)

In summary, whether or not an individual considers an odour to be a nuisance will depend on the FIDO factors outlined above and although it is possible to derive formulae for assessing odour annoyance in a community, the response of any individual to an odour is still unpredictable. Odour goals need to take account of these factors.

The EPA Approved Methods include impact assessment criteria for complex mixtures of odorous air pollutants. They have been refined by the EPA to take account of population density in the area.

Table 3-4 lists the odour thresholds, to be exceeded not more than 1% of the time, for different population densities.

Table 3-5: Odour performance criteria for the assessment of odour

Population of affected community	Odour performance criteria (OU) (nose response odour units at the 99th percentile)
Single residence (≤ ~2)	7
~10	6
~ 30	5
~ 125	4
~ 500	3
Urban (~ 2000)	2

The difference between odour goals is based on considerations of risk of odour impact and not differences in odour acceptability between urban and rural areas. For a given odour level there will be a wide range of responses in the population exposed to the odour. In a densely populated area there will therefore be a greater risk that some individuals within the community will find the odour unacceptable than in a sparsely populated area.

In terms of odour impact, the most stringent criterion of 2 OU would apply to the residential receptors.

An important point to note is that the odour assessment criteria are not intended to achieve 'no odour'. They are concerned with controlling odours to ensure offensive odour impacts will be effectively managed.

4 EXISTING AIR QUALITY

4.1 Dust sources

The Project lies next to existing farmland, which would be expected to be agricultural sources of dust pollution resulting from wind erosion of soils, ploughing of fields etc. It should be noted that this land which has been zoned for industrial development and will likely be progressively developed, which may result in dust emissions from construction activities in the future.

The nearby industrial park includes a trailer repair company and a crane construction company. These activities are expected to be existing sources of dust, resulting mainly from vehicle movements.

The closest dust source identified within the National Pollutant Inventory database was the Glenfield Sewage Treatment Plant (**NPI, 2015**), which is located 6.1 km to the southeast of the Project.

Table 4-1 Local dust sources

Company	Activity	Total emissions (kg/year)	Distance from the Project (km)
WBG Trailer Repairs Pty Ltd	Trailer supply store	n/a	0.23
Favelle Favco Cranes Pty Ltd	Crane manufacturer	n/a	0.43
Precision Fleet Maintenance Pty Ltd	Truck repair	n/a	0.58
Mainfreight Transport - Sydney	Freight	n/a	0.61
M7 Motorway	Vehicle emissions	n/a	1.08
Boral Concrete Prestons	Concrete batcher	n/a	1.13
Glenfield Sewage Treatment Plant	Sewage Treatment	$PM_{2.5}$ = 340 PM_{10} = 340	6.10

4.2 Odour sources

The closest industrial odour source identified within the NPI database was the Glenfield Sewage Treatment Plant, which is located 6.1 km to the southeast of the Project. This was considered to be a sufficient distance away from the Project as not to affect the local air quality with respect to odour.

Other local odour sources may include agricultural fertiliser use by the farmland that immediately surrounds the project.

5 BACKGROUND AIR QUALITY MONITORING

5.1 Dust

The existing air quality at the Project was assessed in terms of particulate matter with an equivalent aerodynamic diameter of 2.5 µm or less ($PM_{2.5}$) and particulate matter with an equivalent aerodynamic diameter of 10 µm or less (PM_{10}) (as discussed in **Section 3.1**)

The Office for Environment and Heritage (OEH) operates a number of monitoring stations at sites around Sydney. The closest monitoring station to the Project is Liverpool, and data from this station were therefore used to assess background air quality.

The OEH archive was searched for exceedances of 24 hour average concentrations for the past five years from 1 January 2010 to 20 October 2015 for PM_{10}, and $PM_{2.5}$.

For PM_{10}, five exceedances of local air quality criteria occurred on:

- 31 May 2011
- 30 November 2011
- 30 April 2013
- 31 October 2013
- 30 June 2015
- 31 August 2015

For $PM_{2.5}$, five exceedances of local air quality criteria occurred on:

- 30 November 2011
- 30 September 2013
- 31 October 2013
- 30 November 2013
- 31 May 2015

Exceedances of PM_{10} and $PM_{2.5}$ from September 2013 to November 2013 are likely related to a series of bushfires in NSW. These were caused by Australia's warmest spring temperatures on record, with a mean temperature anomaly of +2.75°C in September (**BOM, 2013**).

Aside from these instances, there were no reported bushfires or dust states on any of the other dates by the NSW Government Emergency Management (**NGEM, 2015**). Elevated dust concentrations may be attributed to particular meteorological conditions, such as temperature inversions in the Planetary Boundary Layer or strong winds from a particular direction with high dust concentrations.

5.2 Odour

Odour is not routinely monitored in the ambient environment, it is either collected from the source of the odour for use in air quality dispersion modelling assessments, or odour surveys are completed in the vicinity of specific projects.

As such no data for existing odour in the area are available from OEH, or any other sources.

6 AIR QUALITY IMPACT ASSESSMENT

6.1 Construction Phase

6.1.1 Dust

The principal emissions from the construction phase will be dust and particulate matter, occurring from the following activities:

- Vegetation clearing and earthmoving during site preparation.
- Excavation and stockpiling of excavated material.
- Haul road construction within the site.
- Wind erosion from exposed surfaces.

6.1.2 Odour

In view of the current land use, it is considered that construction phase activities will not result in any significant odour emissions.

6.1.3 Construction vehicle emissions

Construction vehicle emissions will occur from the following activities:

- Vegetation clearing.
- Earthmoving during site preparation.
- Excavation.
- Movement of heavy plant and machinery within the site.
- Haul roads.

The following vehicle numbers are expected from demolition, earthworks, and construction activities according to **Transport and Traffic Planning Associates** (**2016**).

It is expected that 10 – 20 workers (up to 40 traffic movements per day) will be on site for demolition works with trucks and cars using a new construction access on Yarrunga Road.

Earthworks will be carried out for a 9 month (36 weeks) period with an average 80 vehicle visits per day.

Construction will be staged over approximately 9-12 months per building with the following truck activity:

- Steel erection 15 semitrailer visits per day for 12 weeks
- Concrete slab 25 concrete truck visits per day for 12 weeks
- Fitout 10 truck visits per day and 100 worker cars

Although there are episodic exceedances of EPA and NEPM criteria/advisory goals for PM_{10} and $PM_{2.5}$, it is not anticipated that this Project will significantly impact local air quality as a result of increased vehicle emissions resulting from construction activities.

6.2 Operational Phase

6.2.1 Dust

It is expected that the Project will result in decreased windblown dust emissions as the development includes the construction of a roofed warehouse and hard-standing areas. Furthermore, the Project also proposes to plant vegetation around the site perimeter which may assist in stabilising exposed soil and is also expected to result in decreased windblown dust emissions.

6.2.2 Odour

It is anticipated that the Project will not result in any odours impacts based on the proposed activities.

6.2.3 Vehicle emissions

The proposed development will serve as a distribution warehouse and may lead to addition vehicle emissions. However, as detailed in the Traffic and Transport report completed for the proposed development (**Transport and Traffic Planning Associates, 2016**), there are already a significant number of heavily-trafficked roads in the immediate vicinity of the site:

Arterial and Sub-Arterial Routes
- Westlink (M7) Motorway which links between the M2 Motorway at Seven Hills and the M5 Motorway at Prestons
- South Western (M5) Motorway which links across the Georges River and continues southwards past Campbelltown
- Hume Highway which runs along the western edge of Liverpool CBD to The Crossroads
- Camden Valley Way which extends from The Crossroads across Cowpasture Road to Camden
- Hoxton Park Road which extends from Hume Highway to Cowpasture Road
- Cowpasture Road which extends northwards from Camden Valley Way across Hoxton Park Road

Collector Road Routes
- Kurrajong Road which extends westerly from Hume Highway and will connect to Cowpasture Road when the current upgrading over Cabramatta Creek is completed
- Bernera Road which extends (north-south) between Camden Valley Way and Hoxton Park Road (via sections of Jedda Road and Joadja Road)
- Ryan Avenue which extends which extends to the south of Camden Valley Way
- Croatia Avenue which extends to the south of Camden Valley Way.

Additional **peak hour traffic** generated by the site has been estimated at a total of 258 vehicles, comprising 10% large trucks (**Transport and Traffic Planning Associates, 2016**).

6.2.3.1 Vehicle emission estimates

This section provides a brief description of the methods used to calculate the major emissions from vehicles, namely CO, NO_2 and PM_{10}. This information is required as input to the dispersion model used to predict ground-level concentrations of the various pollutants.

Vehicle emission data from PIARC[b] (**PIARC, 2004**) were adjusted to reflect the NSW vehicle fleet. The modified tables include emissions of NO_x and PM_{10} by age and type of vehicle. The ages of vehicles are categorised into seven periods which correspond to the introduction of emission standards. The types of vehicle are categorised into light and heavy vehicle groups.

[b] The acronym PIARC refers to the Permanent International Association of Road Congress. While this body is now known as the World Road Association, the PIARC acronym has been retained.

The modelling assumptions for these calculations are as follows:

- The peak additional traffic flow will be 258 vehicles per hour in each direction,
- 50% will be heavy vehicles.
- The traffic speed would be 50 km/h

Emission estimates are summarised in **Table 6.1**.

Table 6.1: Estimated traffic emissions (g/km/v)

Direction of flow	Carbon Monoxide (CO)	Nitrogen Oxides (NO_x)	Particulate Matter (PM_{10})
Eastbound	4.62	3.95	0.32
Westbound	4.62	3.95	0.32

6.2.3.1 Dispersion modelling

The Caline4 dispersion model was used to estimate the additional worst-case concentration of carbon monoxide, oxides of nitrogen and particulate matter, which are likely to result due to the additional road traffic emissions in the vicinity of the proposed development. This model is a steady state Gaussian model which can determine concentrations at receptor locations downwind of "at grade", "fill", "bridges" and "cut section" highways located in relatively uncomplicated terrain. The model is applicable for any wind direction, roadway orientation and receptor location.

The approach in this report has been to identify worst case conditions which comprise 1-hour peak hour traffic flow, combined with the poorest dispersion conditions, equivalent to atmospheric inversions with very light winds. It has conservatively been assumed that the traffic is constant (i.e. an increase of 258 vehicles) in both directions with 50% heavy vehicles.

The position of the receptors with respect to the road is also a factor when determining "worst-case" conditions along a roadway. Pollutant concentrations have been modelled at the kerbside, at distances of 10 m increments from the road to 50 m, then 75 m, 150 m and 200 m

Table 6.2 presents the worst-case increase in pollutant concentrations for the peak traffic flows. Assuming a wind speed of 1.0 m/s and that F-class stability[c] conditions occur, the model has been set to determine the worst-case wind angle (that is, across the road and towards the development).

The concentrations in reality are likely to be lower in reality than those predicted. This is due to the fact that constant traffic volumes, including an assumption that 50% of the traffic will be heavy-vehicles, were combined with worst-case dispersion conditions were modelled. This obviously will not occur for extended periods of time such as one day or one year. In other words, the worst case wind angle (blowing across the roadway to incorporate combined emissions from all lanes) will not prevail over a whole 24-hour or annual period. Similarly, low wind speeds and F-class stability will not occur constantly over those time periods either. Therefore, in reality, the resultant increase in ground level concentrations are likely to be lower than those predicted.

[c] The best known stability classification is the Pasquill-Gifford (P-G) scheme, which denotes stability classes from A to F. Class A is described as highly unstable and occurs in association with strong surface heating and light winds, leading to intense convective turbulence and much enhanced plume dilution. At the other extreme, class F denotes very stable conditions associated with strong temperature inversions and light winds, such as those that commonly occur under clear skies at night and in the early morning. Under these conditions plumes can remain relatively undiluted for considerable distances downwind. Intermediate stability classes grade from moderately unstable (B class), through neutral (D class), to slightly stable (E class).

It can be seen from the results in **Table 6.2**, that the predicted increase in ground level concentrations do not exceed the relevant short-term EPA criteria at the proposed development during peak traffic flow conditions. The main sources of NO_2 in a Sydney suburban area such as this will be vehicle emissions, and so the background estimates used will already account for some of this. Adding modelling results to background in this case will therefore be conservative. Notwithstanding this, predicted increases are well below the EPA criterion, and reduces significantly beyond the kerbside.

The closet residences to the increased traffic flow are located approximately 15 m from Bernera Road, on Plukavec Circuit (see R12 on **Figure 2-3**). It is apparent from the predicted worst-case concentrations at 10m from the road (presented in **Table 6.2**), that the Project will not significantly impact the air quality at the residences as a result of increased vehicle emissions resulting from operational activities.

Table 6.2: Predicted worst-case increase in ground level concentrations due to vehicle emissions (µg/m³)

	CO (mg/m³)		NO2 (µg/m³)		PM_{10} (µg/m³)	
	Averaging period					
	1-hour	8-hour	1-hour	Annual	24-hour	Annual
	Assessment criteria					
Distance from kerb	*30 mg/m³*	*10 mg/m³*	*246 µg/m³*	*62 µg/m³*	*50 µg/m³*	*30 µg/m³*
Kerbside (0m)	0.8	0.6	68.6	13.7	27.9	11.2
10m*	0.3	0.2	41.5	8.3	11.3	4.5
20m	0.2	0.2	39.1	7.8	8.0	3.2
30m	0.2	0.1	31.8	6.4	6.5	2.6
40m	0.2	0.1	27.2	5.5	5.5	2.2
50m	0.1	0.1	24.1	4.8	4.9	2.0
75m	0.1	0.1	19.2	3.8	3.9	1.6
100m	0.1	0.1	16.2	3.2	3.3	1.3
150m	0.1	0.1	12.5	2.5	2.5	1.0
200m	0.1	0.0	10.3	2.1	2.1	0.8

*maximum predicted increase at residences located approximately 15m from Bernera Road

7 MITIGATION

Although the Project is not anticipated to cause any significant impacts on air quality during the construction or operational phase, mitigation measures are proposed as a precautionary measure. These measures are proposed to minimise impacts as far as practicable and the best practice measures are employed.

7.1 Clearing/Excavation

Emissions from vegetation stripping, topsoil clearing and excavation can occur, particularly during dry and windy conditions. Emissions can be effectively controlled by increasing the moisture content of the soil/surface. Other controls that will be considered are:

- Modify working practices by limiting excavation during periods of high winds (greater than 20 km/hour).
- Limiting the extent of clearing of vegetation and topsoil to the designated footprint required for construction and appropriate staging of any clearing.

7.2 Haul Road

The use of earth moving equipment can be significant sources of dust, and emissions should be controlled through the use of water sprays during internal haul road construction. Where conditions are excessively dusty and windy, and fugitive dust can be seen leaving the site, work practices should be modified by limiting the use of machinery.

7.3 Haulage and Heavy Plant and Equipment

Vehicles travelling over paved or unpaved surfaces tend to produce wheel generated dust and can result in dirt track-out on paved surfaces surrounding the work areas.

- All vehicles on-site should be confined to a designated route with speed limits enforced (20 km/hour);
- Trips and trip distances should be controlled and reduced where possible, for example by coordinating delivery and removal of materials to avoid unnecessary trips; and
- When conditions are excessively dusty and windy, and dust can be seen leaving the works site the use of a water truck (for water spraying of travel routes) should be used.

7.4 Wind Erosion

Wind erosion from exposed ground should be limited by avoiding unnecessary vegetation clearing and ensure rehabilitation occurs as quickly as possible. Wind erosion from temporary soil stockpiles can be limited by minimizing the number of stockpiles on-site and minimizing the number of work faces on stockpiles.

7.5 Odour

Recommended management practices to control odour emissions include:

- Traffic management procedures to co-ordinate the delivery schedule and avoid a queue of the incoming or outgoing trucks for extended periods of time;
- Spill management procedures to include immediate clean-up of any spill/leakage from incoming and outgoing trucks;
- Maintaining an odour complaint logbook and in the event of a complaint immediately investigate any unusual odour sources (including spill or leakage in the traffic areas) within the site boundary and take appropriate action to eliminate these.

8 CONCLUSIONS

This report has presented a qualitative assessment of the air quality and odour impacts of the proposed development of Prestons Warehouse and Distribution.

Baseline conditions were assessed, leading to the conclusion that PM_{10} and $PM_{2.5}$ are of primary concern for air quality in the region. However, exceedances of air quality criteria and advisory goals were rare and episodic. Furthermore, the Project is not expected to result in significant dust emissions during either the Construction or Operational phases. Therefore, this Project is not likely to affect local air quality with respect to dust.

Background odour monitoring data were not available, but assumed to be low in the area. The Project is not expected to result in significant odour emissions during either the Construction or Operational phases. Therefore, this Project is not likely to affect local air quality with respect to odour.

Although this Project is not expected to result is significant dust or odour emissions from construction or operational activities, mitigation measures are proposed to ensure that dust and odour emissions as a result of this Project will be to a minimum.

An assessment of the worst-case increase in operational traffic has shown that is not anticipated that this Project will significantly impact local air quality as a result of increased vehicle emissions resulting from operational activities.

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