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Toll IPEC - Freight Transport Facility

Air Quality Assessment

Report Number 670.10233 R6

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Goodman Property Services (Australia)
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Toll IPEC - Freight Transport Facility

Air Quality Assessment

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR Consulting) has been commissioned by Goodman Property Service (Australia) Pty Ltd, (Goodman) to prepare an air quality assessment (AQA) to be included in a development application for the proposed freight transport facility and distribution warehouse and associated offices in the Huntingwood West Estate (formerly known as Bungarribee Industrial Estate).

The objective of the assessment is to identify the potential impacts upon air quality from the construction and operation of the facility and provide advice with regard to effective mitigation strategies where necessary.

The AQA has been prepared with reference to NSW EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (hereafter "the Approved Methods").

The Scope for the AQA has been designed to qualitatively address the anticipated air quality impacts associated with the development.

The scope of the assessment was also designed to address the Director-Generals Requirements (DGR's) for the Project with regard to Dust. A synopsis of these requirements is provided in **Table 1**.

Table 1 Director-General's Requirements

Director-General's Requirements	Section Addressed
Dust	
Detail measures and procedures to minimise and manage the generation	**Section 6 and Section 7**
Relevant Policies and Guidelines: - Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)	**Section 3**

2 PROJECT DESCRIPTION

The proposal seeks approval for the construction and operation of a freight warehouse and distribution centre with associated offices, workshop, weighbridge, truck wash, gatehouses, car parking and landscaping for Toll IPEC.

The major components of the proposal are as follows:

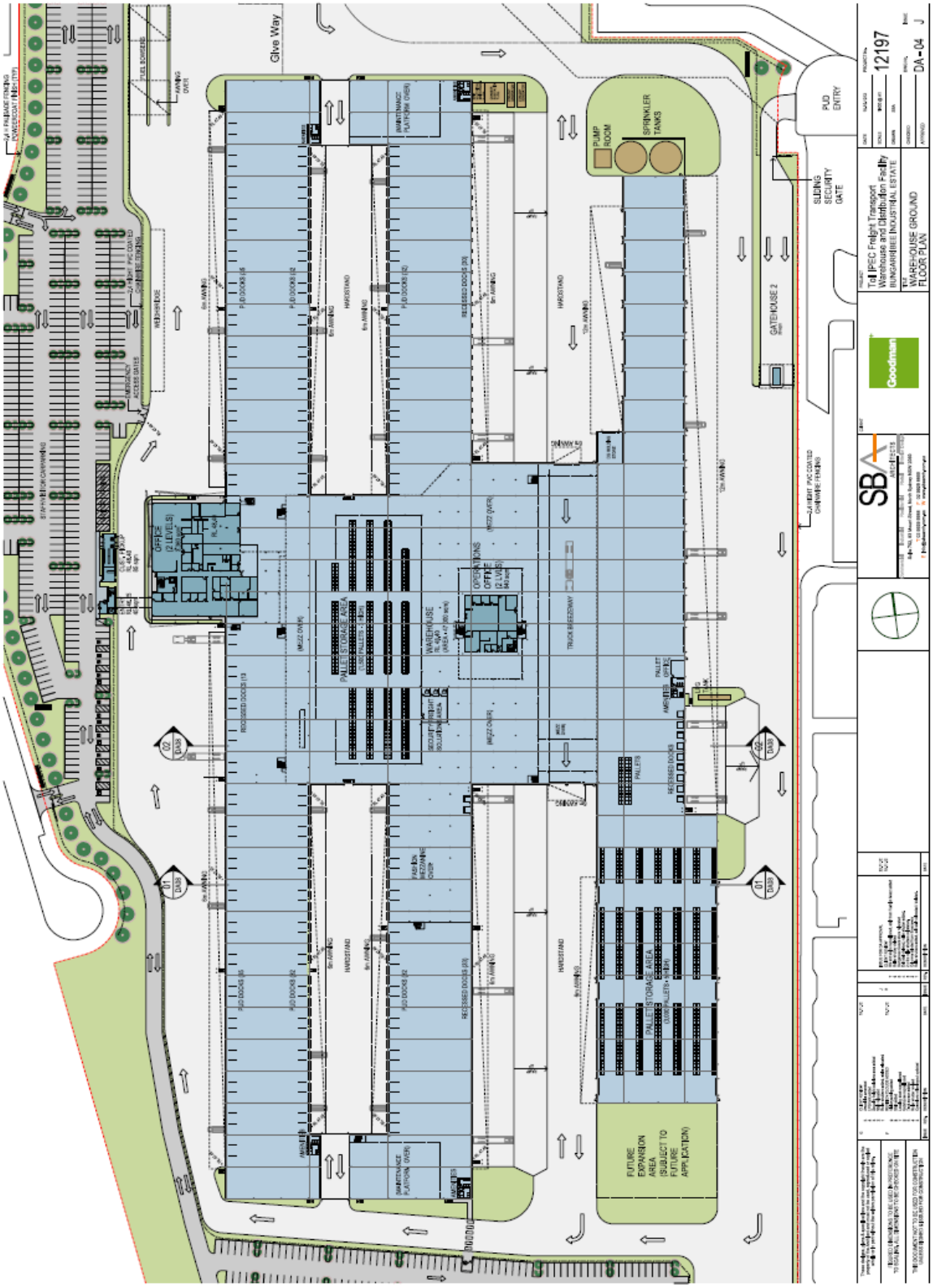
- One large warehouse building with an ancillary offices and staff amenities as well as workshop and gatehouses having a total Ground Floor Area (GFA) of 53,305 m^2.
- Car parking for 700 cars, 14 disabled spaces and an additional 154 spaces for truck parking.
- Associated hardstand, loading and servicing areas.
- Landscaping of the site boundaries, entrances and throughout the car park.
- Fit-out and use of the completed building for operation by Toll IPEC.

The site is located on land to the east of the M7 and south of the Great Western Highway and is bounded to the south by the M4 motorway and the east by an existing industrial estate (refer to **Figure 1** and **Figure 2**).

Figure 1 Locality Map

Source: Goodman Property Services, 2012

Figure 2 Proposed Development



Source: Goodman Property Services, 2012

3 PROJECT AIR QUALITY CRITERIA

The following air quality targets outlined in **Table 1** and **Table 2** have been identified as appropriate for the project:

Table 2 Air Quality Standards & Goals for Particulate Matter

Pollutant	Standard / Goal	Agency
Particulate matter <10 μm (PM_{10})	50 μg/m^3 (24hr maximum)	NSW EPA, NEPM Criteria
	30 μg/m^3 (annual mean)	NSW EPA long-term reporting goal

Table 3 NSW EPA Criteria for Dust Deposition

Pollutant	Averaging periods	Maximum increase in deposited dust level [1, 2]	Maximum total deposited dust level [1, 2]
Deposited Dust	Annual	2 g/m^2/mth	4 g/m^2/mth

Note 1: Source: NSW EPA "Approved Methods & Guidance for the Modelling and Assessment of Air Pollutants in NSW", 2005.

Note 2: Dust is assessed as Insoluble Solids as defined by AS 3580.10.1-1991.

4 BASELINE CONDITIONS

4.1 Local Sources

As illustrated in **Figure 1,** the site is bounded by the Great Western Highway to the north, Brabham Drive to the east and M4 Western Motorway to the south. To the west lies undeveloped land with low density residential use, with Pikes Lane and M7 Westlink Motorway further to the west.

The site is located close to predominantly industrial and commercial land uses to the east.

4.1.1 Local Sources of Air Pollutants

The area will be subject to road traffic exhaust emissions, particularly from the high volume traffic flows along the M4 Western Motorway and M7 Westlink Motorway, and the interchange between the two motorways.

To the east of Brabham Drive lie the Huntingwood and Arndell Park industrial areas.

A search of the NPI Database has identified the following sources of air pollution within the adjoining industrial parks:

Table 4 Local Sources: NPI Sources on the Hungtingwood and Arndell Park Industrial Areas

Name	Process	Significant Emissions	Location (UTM)	Approx Distance to Project Site
Arnotts Biscuits	Biscuit manufacturing	-	303150, 6258370	0.28km
Diagio	Wine and other alcoholic beverage manufacturing	-	303690, 6258300	0.79km
Cadbury Schweppes	Soft drink, cordial and syrup manufacturing	-	304140, 6258120	1.27km

To the south lies Eastern Creek landfill site, with the following sources being identified within the NPI database:

Table 5 Local Sources: Eastern Creek Landfill

Name	Process	Significant Emissions	Location (UTM)	Approx Distance to Project Site
Eastern Creek LFG Power Station	Other electricity generation	-	301350,6256430	1.81km
Eastern Creek Waste and Recycling Centre	Waste treatment and disposal services	-	301600,6256430	1.81km
Eastern Creek Waste and Recycling Centre (closed landfill)	Waste treatment and disposal services	-	301600,6256430	1.81km

It is considered that the Eastern Creek Waste and Recycling Centre may represent a source of local dust emissions, and potentially odour, in the local area,

Looking further afield, the site may be potentially affected by air pollution (with notable emissions) from the following sources within a nominal 10km radius of the Project Site:

Table 6 Local Sources: NPI Sources with Notable Emissions within 10km of the Project Site

Name	Process	Significant Emissions	Location (UTM)	Approx Distance to Project Site
Austral Bricks Plants 1,2,3	Clay brick manufacturing	Fluoride	301830,6255190	2.86km
PGH Bricks and pavers	Clay brick manufacturing	Chromium VI	299680,6250160	8.29km
One Steel	Iron smelting and steel manufacturing	Carbon monoxide	301040,6261980	3.28km
Wattyl	Paint and coatings manufacturing	Xylenes	306670,6263150	5.73km
Intercast and Forge	Other motor vehicle parts manufacturing	Toluene, xylenes	310310,6261800	7.93km
ANPAC Services	Printing	Ethanol	309570,6253360	8.15km
Dunlop Flexible Foams	Base organic chemical manufacturing	DCM	305930,6253460	5.42km

4.2 Surrounding Receptors

The desk top study indicates that there are a number of residential land uses to the west of the project site. The SLR Consulting Noise Impact Assessment identifies the nearest sensitive receptor locations as Receiver 1 (711 Great Western Highway, Eastern Creek), approximately 440 metres from the Project site and Receiver 2 (47 Pikes Lane, Eastern Creek), approximately 620 metres from the Project site, as shown in **Figure 3**.

Figure 3 Nearest Affected Receiver Locations

5 BACKGROUND AIR QUALITY MONITORING

NSW EPA operates a network of air quality monitoring stations in NSW. The closest monitoring station to the Project Site is located at Chullora. The EPA data archive was searched to determine indicative background air quality data for 2011, which may be used as indicative proxy for the Project Site.

Table 7 Background Indicative Air Quality (2011)

Pollutant	Annual Average	Annual Maxima	Annual Excedences
SO_2	0.1 pphm	2.6 pphm	0
NO_2	1.3pphm	5.1 pphm	0
CO	0.4 ppm	1.5 ppm	0
PM_{10}	19.9 $\mu g/m^3$	65.2 $\mu g/m^3$	7

Further review of the PM_{10} data indicates that exceedences of the daily maximum (24-hour) criterion of 50$\mu g/m^3$ occurred on the following dates during 2011 (with corresponding 24-hour average concentrations). These dates have been cross referenced to the NSW Government Emergency Management records:

1/02/2011 57 $\mu g/m^3$

5/02/2011 52 $\mu g/m^3$

01/03/2011 65 $\mu g/m^3$

10/03/2011 56 $\mu g/m^3$

05/07/2011 51 $\mu g/m^3$

03/08/2011 58 $\mu g/m^3$

20/09/2011 53 $\mu g/m^3$

Comparison of the exceedences with data provided by NSW Government Emergency Management indicates that no exceedence was reported simultaneously with dust storms and bushfires. The values therefore may be attributed to other regional events not recorded, or other events more local to the Chullora monitoring station (possibly in relation to traffic pollution and industrial emissions). From the above data, it indicates that PM_{10} is of primary concern in the area.

6 AIR QUALITY IMPACT ASSESSMENT

6.1 Construction Phase

6.1.1 Construction Dust

The potential for dust formation during construction activities is difficult to quantify and is dependent on a number of factors. These include the type of activity to be undertaken, soil and substrata type, the number of preceding dry days, prevailing wind speed as well as the shape, size, density and moisture content of dust particles, as well as the geographical distribution of those activities.

Due to the difficulties in quantifying meaningful dust emission levels, emphasis is placed upon identifying the activities which cause dust propagation and formulating suitable control strategies to manage those risks. Receptors within 100 m of the construction site are generally considered to experience the most significant impacts from construction dust (USEPA, 1985).

The main impacts are considered likely to be short term nuisance caused by the settling of construction dust on properties, vehicles and street furniture. Impacts may also be found up to 500 m from active construction sites (Bate, 1990), and may include visual effects such as reduced visibility and the coating, soiling, physical and/or chemical contamination and corrosion of artefacts, coating of vegetation and contamination of soils and most importantly health effects due to inhalation and dermal absorption through the skin.

The most significant potential impact on air quality during the construction phase of the development is likely to be associated with dust and fine particulate materials, with key activities identified as:

- demolition of existing structures;
- ground breaking and site preparation;
- excavation;
- storage/use of construction materials;
- wind blown material from stockpiles;
- material transfer to and from trucks;
- material spills during transportation and transfer;
- vehicle/plant movements on unpaved roads and over construction sites; and,
- concrete batching and finishing.

6.1.2 Construction Odour

Given the historic unimproved land uses, it is considered that construction activities would not cause any significant odour emissions.

6.1.3 Construction Vehicle Emissions

There is also the potential for construction vehicle and plant exhaust emissions to impact on air quality, including site vehicles, vehicles and vessels carrying materials to and from the construction sites, mobilisation of plant, site visits, worker journeys etc.

Following discussions with the Client, the following construction activities / plant that may contribute to air emissions:

Earthworks

Scraper (3 off)

Compactor

Dozer (2 off)

Articulated dump truck (2 off)

Building Construction

Concrete agitators

Cranes

Delivery trucks

Genset

Given the scale of the propose development, and the lack of cut/fill operations generating significant volumes of material import / export from the site, it is not considered that construction vehicle emissions would cause a significant impact.

6.2 Operational Dust

The improvement of the land to commercial uses will result in a significant reduction in wind blown dust emissions, as the Project Site will become increasingly developed to include hard standing areas, lawns, grassed verges, and other hard and soft landscaping etc.

6.3 Operational Odour

Following a review of the TOLL IPEC Freight Transport Facility, no major odour emitting sources were evident.

It is therefore not anticipated that the operation of the Project Site would lead to any significant odour impacts, and that this would offer neither opportunity nor constraint to the improvement of the Project Site.

6.4 Road Traffic Emissions

The operation of the distribution warehouse with associated offices may give rise to additional emissions of road traffic exhaust emissions.

Following discussions with the Client, the following traffic data in relation to operational activities that may contribute to air emissions include:

- 30 delivery trucks on site and operating outside the building enclosure.
- 30 forklifts operating outside the building enclosure.
- 8 external condenser units operating.

- 8 external compressor units operating.
- 30 light vehicles operating on site.

Background concentrations of CO, SO_2 and NO_X are considered to be low, and it is considered highly unlikely that the additional vehicle movements generated through the land improvements and zoning for general industrial use would cause a breach of the NEPM standards.

Background concentrations of particulate matter (PM_{10}) are high, although episodic in nature (see **Section 5**), and are inferred to be in exceedences of the NEPM standards at times.

Given the nature and location of the operational phase activities, it is considered highly unlikely that the identified sources would significantly contribute to local air quality.

7 MITIGATION

It is not anticipated that any construction or operational phase activities would give rise to significant air impacts. However, the following mitigation measures are proposed, so that the impacts associated with the development are minimised as far as practicable and the best practice measures are employed.

7.1 Dust Management

The generation of dust is of concern during construction. The following procedures and requirements will be followed during the life of each project to minimise the dust generated by the project:

- Watering of roads and sealing of roads where possible.
- Wind breaks composed of earth banks and other screens will be installed to protect areas by reducing the capacity of the wind to raise dust.
- Trucks entering and leaving the site will be well maintained in accordance with the manufacturer's specification to comply with all relevant regulations. Fines may be imposed on vehicles which do not comply with smoke emission standards. Truck movement should be controlled on site and restricted to designated roadways. Truck wheel washes or other dust removal procedures will be installed to minimise transport of dust offsite.
- If necessary amending of construction activities during periods of high wind including, but not limited to covering watering/revegetating of stockpiles and exposed areas.

The following are basic procedures which will be adopted on site to control dust and other emissions from construction operations and on-site equipment. The aim of these procedures is to minimise off-site dust nuisance and air quality impacts.

- Activities carried out on site will be such as to ensure that all equipment used and all facilities erected are designed and operated to control the emission of smoke, dust, fume and other objectionable matter into the atmosphere.
- Precautions to be taken include spraying of earthworks, roads and other surfaces as necessary with water or other suitable liquids, providing dust suppression equipment to any onsite materials batching plant, sealing of temporary haul roads and the modification of operations during high or unfavourable wind conditions.
- Working areas and access roads will be stabilised as soon as practicable to prevent or minimise wind blown dust.
- All disturbed areas will be stabilised as soon as practicable to prevent or minimise wind blown dust.

- All unsealed trafficable areas be kept sufficiently damp during working hours to minimise wind blown or traffic generated dust emissions. Continued use of water on dirt roads helps the formation of a crust so that dust is not as easily generated.
- Water sprays, sprinklers and water carts may be employed if needed to adequately dampen stockpiles, work areas and exposed soils to prevent the emissions of dust from the site. Water carts and other equipment will be available to enable watering at least at an hourly rate of 2 litres per square metre.
- Stockpiles and handling areas will be maintained in a condition which minimises wind blown or traffic generated dust. Areas that may be inaccessible by water carts will be kept in a condition which minimises wind blown or traffic generated dust using other means.
- All equipment for dust control will be kept in good operating condition. The equipment will be operable at all times with the exception of shutdowns required for maintenance. Construction equipment will be properly maintained to ensure exhaust emissions comply with the Protection of Environmental Operations (POEO) Act.
- If visible smoke can be seen from any equipment (while working on a construction site) for longer than 10 seconds duration, the equipment will be taken out of service and adequately repaired or tuned so that smoke is no longer visible for periods longer than 10 seconds.
- Cleared vegetation, demolition materials and other combustible waste material will not be burnt on site.
- Silt will be removed from behind filter fences and other erosion control structures on a regular basis, so that collected silt does not become a source of dust.
- No dust, soil or mud shall be deposited from any vehicle on public roads. Where wheel washing facilities are provided on construction works area, all drivers of construction vehicles shall utilise the wheel wash prior to leaving the works area and entering public roads.
- Any dust soil or mud deposited on public roads by sub contractors construction activities and vehicle movements shall be removed immediately and disposed of appropriately.
- Hire agreements will contain provisions to stand down equipment which has excessively smoky exhaust.

7.2 Dust Mitigation

The NSW EPA has reviewed the environmental hazards associated with construction sites and prepared a general document containing safeguards to protect the environment during such activities. Many of these safeguards relate to controlling water pollution and run-off, however these procedures frequently help in control of air pollution.

The following headings outline specific controls and approaches to minimise impacts from wind erosion and spoil stockpiles.

7.2.1 Wind Erosion

- Watering of exposed surfaces/application of a crusting agent will be carried out during dry weather, if necessary.
- When winds reach (or exceed) a velocity of 2.5 metres per second (m/s), the frequency of watering shall increase. When winds exceed 10 m/sfor 10 minutes, work will cease.
- Progressive rehabilitation of exposed sites on completion of different work stages to be undertaken where practical.

7.2.2 Spoil Stockpiles

- Minimising of spoil stockpiling on site.

- Minimising the number of work faces on stockpiles.
- Stockpiles to be temporarily covered (if short term) or sprayed with water/crusting agent (Polo Dust Bind) (long-term) to keep dust to a minimum.
- When conditions are excessively dusty such that the project air quality goals are anticipated to be exceeded, then all dust generating activities shall cease until conditions improve/dust suppression can be adequately carried out.

8 DISCUSSION AND CONCLUSION

SLR Consulting has undertaken a qualitative air quality assessment for the construction and the operation of the proposed TOLL IPEC project.

It is noted that an air quality assessment was *not* requested through the DGRs.

This air quality assessment has examined the baseline conditions likely to be encountered at the project site and identified potential air quality impacts associated with the construction and operational phases of the proposed development. Based upon the information available at the time, it was not determined that any processes or activities would cause any significant emissions to air, and that baseline conditions would not be significantly impacted.

It is not considered that there are any air quality considerations that would cause any significant concern, and based upon the assumptions presented in this report, that air quality should not be a constraint to planning approval for the development.