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PROPOSED DISTRIBUTION CENTRE FOR K-MART

EASTERN CREEK INDUSTRIAL PARK STAGE 3

ENVIRONMENTAL NOISE EMISSION ASSESSMENT

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1. INTRODUCTION

This report assesses the emission of noise from the proposed Distribution Centre for K-Mart at Eastern Creek Industrial Park Stage 3. Noise from the proposed development has been assessed at the nearest potentially affected residents and PA club nearby.

The noise assessment is based on the architectural drawings with drawing number: KM-EC3-AFL-000-D, KM-EC3-AFL-001-A, KM-EC3-AFL-002-A, KM-EC3-AFL-003-A, KM-EC3-AFL-100-C, KM-EC3-AFL-110-A, KM-EC3-AFL-111-A, KM-EC3-AFL-200-C, KM-EC3-AFL-201-D, KM-EC3-AFL-210-A, KM-EC3-AFL-500-B, KM-EC3-AFL-600-A, KM-EC3-AFL-601-A.

Noise emissions from the distribution centre were modelled using the movements of vehicles within the depot and noise breakout from distribution centre buildings. The assessment was carried out for the DECCW time periods being: Day Time (7am-6pm), Evening Time (6pm - 10pm), Night Time (10pm – 7am). Noise levels at the residents were predicted based on the numbers of expected vehicle movements (provided by the Australand), previously measured equipment noise emissions and an assumed internal noise level within the warehouse. The noise generated by container movements and use of an isoloader within the container yard have been included in this noise assessment.

2. EXISTING CONDITIONS

2.1 GENERAL DESCRIPTION

The distribution facility will be an ambient chamber providing Pick n Pick and Crossing Docking operations, processing over 8 million general merchandise cartons to 43 retail outlets within NSW. Merchandise is received on pallets from local Australian suppliers and overseas supplies via shipping containers. The operating hours are to be 24/7.

Approximately 50% of the floor space will be racked and the remaining 50% will comprise a large mechanised sortation system and bulk floor stacking. Dangerous goods will not be warehoused on site.

The proposed site is located off Wallgrove Road and will be used as a distribution centre for K-Mart. The nearest noise receivers are as below:

- Noise receiver 1- Residential dwelling located immediately across Western Motor Way which is approximately 1100mm distance to the project site.
- Noise receiver 2- Residential dwelling located western to the project site at St Clair which is approximately 2400m distance to the project site.

Detailed site map and noise receiver locations refer to Figure 1 below.

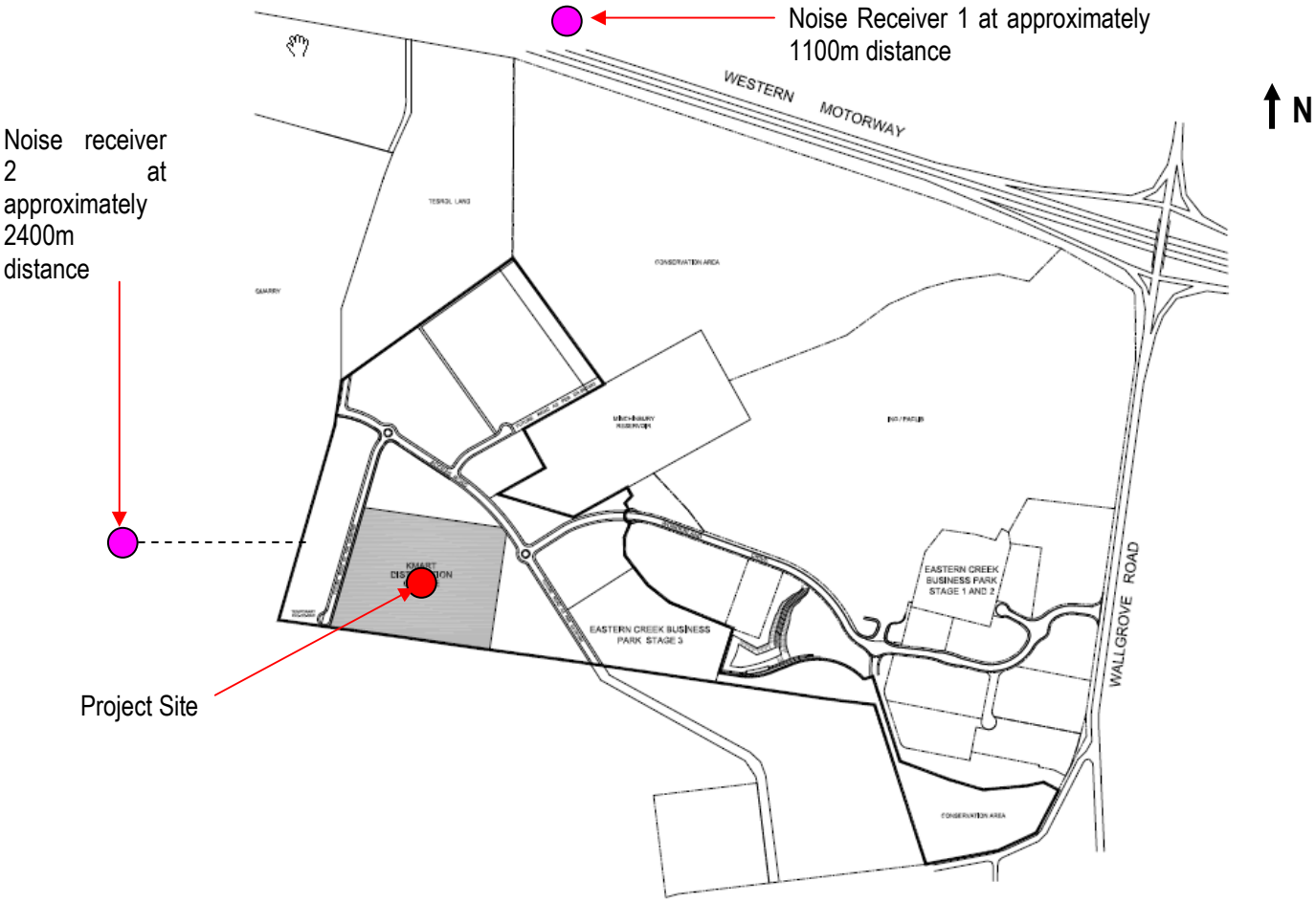


Figure 1 Site Map and Noise Receiver Locations

2.2 TOPOGRAPHY

It has been assumed that the entire site will be levelled to RL81 and that most surfaces within the depot will be acoustically "hard" surfaced, ie bitumen or concrete.

3. AMBIENT NOISE LEVELS

The background noise around the residential noise receiver locations have been estimated based on Australia Standard AS 1055.2-1997 and detailed as below.

Table 1 – Estimated Background Noise Levels dB(A) L_{90}

Noise Receiver Location	Average background A- Weighted sound pressure level, dB(A) L_{90}, T					
	Monday to Saturday			Sundays and public holidays		
	0700-1800	1800-2200	2200-0700	0900-1800	1800-2200	2200-0900
Noise Receiver 1	50	45	40	50	45	40
Noise Receiver 2	40	35	30	40	35	30

4. NOISE EMISSION CRITERIA

The external noise emission from the project site to the nearest noise receiver boundaries shall comply with the requirements of Eastern Creek Precinct Plan and DECCW Industrial Noise Policy.

4.1 PRECINCT PLAN

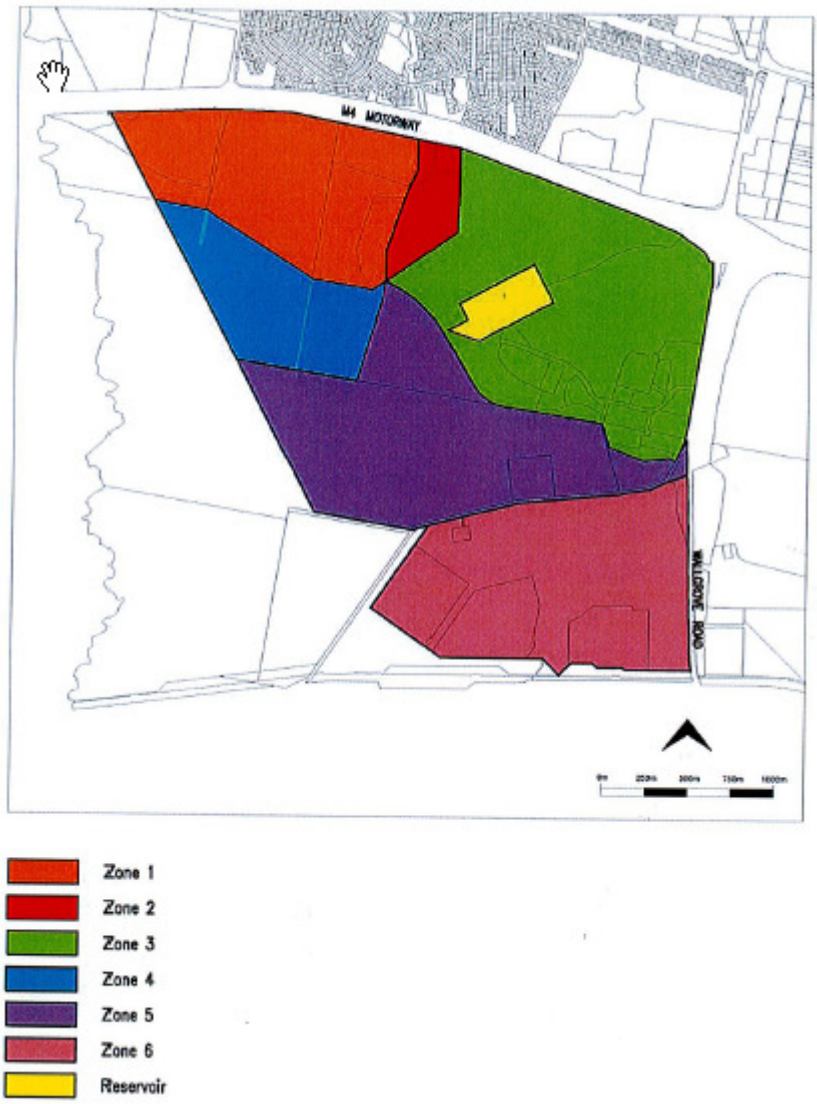
Given the nature of the development within the Precinct, noise generation from the site is to be restricted to a reasonable level, Noise is to be contained where possible and not unreasonably impact on the operation or amenity of adjoining or surrounding sites.

Detailed noise goals of the precinct have been setup by Environmental Management Section 7.8 which has been repeated as below.

The optimised noise level goals for the precinct are outlined in Table below. These goals will provide adequate protection to the noise amenity of residential areas surrounding the Precinct without unduly restricting the operation of development.

Table 2 –Noise Goals by Precinct Plan

Period	Zone 5
Day	49 dB(A)
Evening	39 dB(A)
Night	34 dB(A)



4.2 DECCW INDUSTRIAL NOISE POLICY

4.2.1 Noise Assessment Objectives

The DECCW Industrial Noise Policy provides guidelines for assessing noise impacts from industrial developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The DECCW Industrial Noise Policy has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion. In addition, the DECCW in its Environmental Noise Control Manual states that noise controls should be applied with the general intent to protect residences from sleep arousal.

4.2.2 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

4.2.3 Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The DECCW's Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table 3 provides the recommended ambient noise levels for the rural residential receivers for the day, evening and night periods. For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm; and
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

Table 3 - DECC Recommended Acceptable Noise Levels

Type of Receiver	Time of day	Recommended Acceptable Noise Level dB(A) L_{eq}
Residential Urban	Day	50
	Evening	45
	Night	40

4.2.4 Sleep arousal

To minimise the potential for sleep arousal the $L_{1\ (1\ minute)}$ noise level of any specific noise source does not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. The L_1 noise level is the level exceeded for 1 per cent of the time and approximates the typical maximum noise level from a particular source. Where the typical repeatable existing L_1 levels exceed the above requirement then the existing L_1 levels form the basis for, sleep disturbance criteria.

4.2.5 Project Specific Noise Objectives

Table 4 below provides a summary of our recommended assessment criteria applicable to the nearest residential receiver.

Table 4 - Noise Objectives for Residential Receivers, dB(A)

Receiver	Time of day	Estimated Background Noise Level	Amenity Criteria L_{eq}	Intrusiveness Criteria L_{eq}	Objective
Noise Receiver 1	Day	50	50	55	50 dB(A) L_{eq}
	Evening	45	45	50	45dB(A) L_{eq}
	Night	40	40	45	40 dB(A) L_{eq} and 55 dB(A) L_1
Noise Receiver 2	Day	40	50	45	45 dB(A) L_{eq}
	Evening	35	45	40	40dB(A) L_{eq}
	Night	30	40	35	35 dB(A) L_{eq} and 45 dB(A) L_1

4.3 SUMMARY OF THE NOISE EMISSION OBJECTIVES

The noise emission criteria specified by Precinct Plan is more stringent than DECCW Industrial Noise Policy during night time period. The lowest noise objective of each time period is selected to summarise the overall noise emission objectives for the project site which has been presented as below.

Noise emission objectives have been summarised as below.

Table 5 –Summarised Noise Emission Objectives

Receiver	Time of day	Noise Emission Objectives dB(A)
Noise Receiver 1	Day	49 dB(A) L_{eq}
	Evening	39dB(A) L_{eq}
	Night	34 dB(A) L_{eq} and 55 dB(A) L_1
Noise Receiver 2	Day	45dB(A) L_{eq}
	Evening	39dB(A) L_{eq}
	Night	34 dB(A) L_{eq} and 45 dB(A) $_{L1}$

5. ASSESSMENT OF NOISE IMPACT

This section identifies the potential sources of noise and assesses the potential noise impact from each source. Meteorological conditions potentially affecting the predicted noise levels are also considered.

The noise sources in the proposed development have been divided into two categories, as noise sources with different characteristics require different assessment methods and objectives. Noise sources with similar characteristics have been grouped and the combined noise impact from that grouping of noise sources will be assessed.

The categories of noise sources that have been defined are:

Category 1 - Steady and Quasi-Steady Noise Sources

- Vehicle loading/unloading.
- Vehicle movements around the site.
- Air conditioning/ventilation plant.

Category 2 - Transient Noise Sources

- Vehicle doors opening/closing.
- Truck parking brakes.
- Impacts occurring during loading/unloading.

5.1 NOISE SOURCES

The potentially significant noise sources are listed in Table 6 along with the noise emissions levels. The emission levels have been obtained from noise monitoring carried out at similar warehouse loading dock facilities.

Noise measurements were obtained using a Norsonics SA 110 sound level meter or CEL 993 sound analyser, set to fast response. The sound level meters were calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was recorded.

Table 6 - Noise Source Emission Levels

Noise Source	Sound Emission Level dB(A) at 7m	Type of Noise Source
Outside loading docks during peak morning loading period	76* L_{eq} 89 L_1	Quasi-Steady with intermittent impacts
Trucks Manoeuvring/Reversing	75 L_1	Quasi-Steady
Fork Lift Truck	75* L_1	Quasi-Steady
Truck Air Brakes	89 L_1	Transient
Truck Door Closing	75 L_1	Transient
Truck Starting	72 L_1	Transient
Semi-trailer Starting	89 L_1	Transient
Car engine starting	72 L_1	Transient
Car door closing	68 L_1	Transient
Forklift Unloading Container	78* L_{eq} 89 L_1	Quasi-Steady with intermittent impacts

* includes 5 dB(A) tonality penalty for reversing alarms

5.2 NOISE LEVEL PREDICTIONS

Noise emission from the project site has been predicted based on the source noise data above and the proposed layouts.

The following information has been taken into the noise prediction:

- Approximate 100 various types truck movements income to the site every day.
- Approximate 100 various types truck movements outgoing off the site every day.
- 250 car park spaces.
- 4 class 9 truck park on site.
- Trucks most frequently deliver and distribute on site are: Class 3- Two Axle Truck, Class4, Three Axle Truck, Class 7 Four Axle Articulated Vehicle, Class 8 Five Axle Articulated Vehicle, Class 9 Six Axle Articulated Vehicle, Class 10 B Double, Class 11 Double Road Train, Class 12 Triple Road Train.

Noise predictions for operational noise emission levels for the worst case scenarios for the L_{eq} noise level and L_1 noise level. The L_{eq} noise level was calculated by including all quasi-steady or steady noise sources in the calculations which then calculated the cumulative effect of all noise sources. For the L_1 noise level, the loudest noise source (truck air brakes and doors) was modelled at the locations likely to produce the highest noise level at the future residential land.

The worst noise impact scenario will be night time operation. Predicted noise levels have been presented as below.

Table 7 – Predicted Noise Levels

Noise Receiver	Predicted Noise Level dB(A)	Criteria	Compliance
Noise Receiver 1- Residents located across M4	32 dB(A) L_{eq} 45 dB(A) L_1	Night : 34 dB(A) L_{eq} and 55 dB(A) L_1	Yes
Noise Receiver 2- Residents located Western to the site	29 dB(A) L_{eq} 38 dB(A) L_1	Night : 34 dB(A) L_{eq} and 45 dB(A) L_1	Yes

The predictions indicate that noise emissions will be at or below the relevant noise objectives at all times and all locations. Therefore, noise emissions from the proposed warehouse and distribution centre would not adversely impact any sensitive receiver.

5.3 NOISE EMISSIONS FROM ANCILLARY PLANT

The noise predictions do not include noise from minor ancillary plant such as ventilation and air conditioning units serving office areas as specific details regarding the nature and location of this plant is not available at this stage.

Noise emissions from ancillary plant should comply with the levels recommended in Section 6. Due to the relatively small scale of this plant and the significant separation between the site and sensitive receivers noise emissions from this plant would readily comply with the recommendations by appropriately selecting plant, appropriate siting and where necessary treating or enclosing plant.

5.4 METEOROLOGICAL CONDITIONS

The DECCW Industrial Noise Policy provides a procedure for assessing noise increase due to temperature inversions.

The detailed method provided requires a detailed knowledge of meteorological conditions and the prevalence of inversions. Because this is not typically available, the INP provides an alternative "screening" test to indicate whether conditions may potentially impact the assessment of noise emissions. If the site passes the screening test then adverse weather conditions will have no significant impact and can be ignored. If the screening test indicates that noise levels could increase by more than 3 dB(A) under adverse weather conditions then a more detailed analysis is needed.

The nearest receivers along M4 are approximately 1100m from the site. Appendix C of the INP indicates that the increase in noise during temperature inversions will be less than 3 dB for the inversions applicable to F-Class Stability category. This indicates that inversions will have no significant impact and no allowance for their occurrence is needed.

5.5 VEHICLE NOISE EMISSIONS

The DECCW "Environmental Criteria for Road Traffic Noise" provides guidelines for assessing traffic noise impacts on local streets. The guidelines provide for recommended noise levels at sensitive receivers due to noise from public roads.

Given the proximity of residences to existing roads and the level of traffic on these roads existing noise levels would already exceed the goals in Table 1 of the ECRTN

In these circumstances (where existing noise levels (in the absence of the proposed development) are close to or already exceed the recommended noise levels) the ECRTN indicates that any increase in noise should be limited to 2 dB(A) due to increased traffic flows generated by a development on existing roads.

The truck movements in or out of the project site will through Wallgrove Road which is already busy road with medium to high traffic volumes. The increased vehicle movements by the project site will be imperceptible therefore comply with the requirements ECRTN.

6. RECOMMENDED DEVELOPMENT CONTROLS

The following development controls are recommended to ensure the proposed development will not result in adverse noise impacts:

- Noise emissions from any air conditioning or ventilation plant for the site should be assessed once details plant selections and locations are available, and treatment applied, if required, to reduce noise emissions to less than 30 dB(A) at any residential receiver at night, 35 dB(A) during the evening and 45 dB(A) during the day.

7. CONCLUSION

Potential noise impacts from the proposed Distribution Centre for K-Mart at Eastern Creek Industrial Park Stage 3 and associated vehicle movements have been assessed.

Noise emissions from similar existing facilities have been measured. The results of these measurements were used to predict the resultant noise levels at all potentially affected receivers. The potential impact of these emissions has been assessed based on noise objectives determined using DECCW guidelines and Precinct Plan.

It is concluded that:

- The above development has been assessed against the DECCW Industrial Noise Policy and the permitted use of the land under the existing Local Environmental Plan. The assessment concludes that noise emissions will satisfy the assessment criteria at the nearest affect residents.
- At this early stage of the project the external mechanical plant has yet to be specified and as such cannot be assessed, however a noise emission goal has been given for compliance.

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