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**Huntingwood West Estate
Metcash High Bay Expansion
Additional Noise Assessment**

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Huntingwood West Estate

Metcash High Bay Expansion

Additional Noise Assessment

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR Consulting) has been commissioned by Goodman Limited (Goodman) to supply additional information in relation to the modification of the Metcash Facility at Huntingwood West Industrial Estate, NSW.

Broadly, the objectives of the assessments are to identify the potential impacts of noise from the proposed modification at the site and provide advice with regard to effective mitigation strategies where necessary.

The NIA has been prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in accordance with NSW Industrial Noise Policy (INP), Interim Construction Noise Guideline (ICNG) and the Road Noise Policy (RNP). Where issues relating to noise are not addressed in the INP, such as sleep disturbance, reference has been made to the NSW Environmental Noise Control Manual (ENCM).

2 PROJECT DESCRIPTION

The Huntingwood West Industrial Estate is a State Significant Site (SSS) that was rezoned as IN1 General Industrial under the State Environmental Planning Policy (Major Development) 2005 (SEPP 2005).

A Part 3A Concept Plan was approved for the subdivision of the Industrial Estate into 47 lots for future employment usage.

This application is in relation to the expansion of the Metcash Warehouse and Distribution Centre to include a High Bay Area. 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**)

Drawings upon which this NIA was based were supplied by Goodman and are as follows:

- 01 B Cover Sheet and Location Map
- 01 B Staged Development Site Plan
- 02 B Site Plan
- 03 B Demolition Plan
- 04 B Warehouse Floor Plan Stage 5A
- 05 B Warehouse Floor Plan Stage 5B
- 06 B Warehouse Floor Plan Stage 5C
- SK07 B Warehouse Elevation Options 7B
- 08 B Warehouse Sections
- 09 B Warehouse Elevations

Figure 1 Locality Map



Figure 2 Metcash Estate Masterplan



3 RECEIVER LOCATIONS

The nearest potentially affected residential receiver locations are located to the west of the development.

Figure 3 illustrates the locality of the proposed development in relation to the nearest sensitive receivers.

Figure 3 Receiver Locations



Source: Google Earth

4 PROJECT SPECIFIC NOISE CRITERIA

4.1 Project Approval

As part of the Project Approval for the Metcash Facility (PA 10_0140), granted on 1 February 2011, noise limits were established as given below:

23. The Proponent shall ensure that the combined operational noise from the project does not exceed the noise limits presented in Table 2.

Table 2: Operational Noise Limits (dB(A))

Location	Day	Evening L _{Aeq} (15 min)	Night L _{Aeq} (1 min) OR L _A max
Receiver 1 47 Pikes Lane	41	41	41
Receiver 2 711 Great Western Highway	38	38	38

Notes:

- Noise emission limits apply under meteorological conditions of wind speeds up to 3 m/s at 10 metres above ground level or temperature inversions conditions of 3°C/100m and wind speed up to 2 m/s at 10 metres above the ground. To determine compliance with this condition, noise from the development must be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary.
- However, where it can be demonstrated that direct measurement of noise from the development is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

4.2 Project Specific Noise Criteria

It should be noted that the Project Approval noise criteria were based on the predicted noise levels from the proposed operation at the time of the original Environmental Assessment (EA) and not on the project specific noise levels derived in accordance with the INP (i.e. the levels likely to cause disturbance.) The project specific noise criteria were determined for the site, in accordance with the INP (refer Heggies Pty Ltd report 630. 02154-R2 Huntingwood West Estate Noise Impact Assessment) and are given in Table 1.

Table 1 Project Specific Noise Criteria

Location	Period	Intrusiveness Criteria L _{Aeq} (15minute)	Acceptable Amenity Criteria L _{Aeq} (Period)	Project Specific Noise Criteria L _{Aeq} (15minute)	Sleep Disturbance Noise Goals LA1(1minute)
Receiver 1 47 Pikes Lane	Daytime	55	60	55	N/A
	Evening	55	50	50	N/A
	Night	51	45	45	61
Receiver 2 711 Great Western Highway	Daytime	55	60	55	N/A
	Evening	55	50	50	N/A
	Night	51	45	45	61

4.3 Construction Noise Criteria

The construction noise criteria were determined for the site, in accordance with the ICNG (refer Heggies Pty Ltd report 630. 02154-R2 *Huntingwood West Estate Noise Impact Assessment*) and are given in **Table 2**.

Table 2 Construction Noise Goals – Potentially Affected Residential Areas

Location	Construction LAeq(15minute) Noise Goal (dBA)	
	Noise Affected	Highly Noise Affected
Receiver 1 47 Pikes Lane	60	75
Receiver 2 711 Great Western Highway		

Note: Recommended standard hours: Monday to Friday 7am to 6pm, Saturday 8am to 1pm and no work Sundays or public holidays

5 NOISE IMPACT ASSESSMENT

5.1 Noise Modelling Parameters

A computer model will be used to predict noise emissions from the Metcash Facility with the additional high bay racking system. SoundPLAN V7.1 with CONCAWE algorithm has been used to calculate the noise emissions from the subject development. A three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. The model used the following parameters to predict noise levels at the nearest potentially affected receivers:

- The topographic map,
- The noise source data, which was compiled from a SLR Consulting database,
- Ground cover,
- Shielding by barriers and/or adjacent buildings, and
- Atmospheric information. Prediction of operational noise under calm and prevailing meteorological condition (temperature inversion) was conducted. Atmospheric parameters under which noise predictions were made are given in **Table 3**.

Table 3 Meteorological Parameters for Noise Predictions

	Temperature	Humidity	Wind Speed	Wind Direction	Temperature Gradient
Calm (all Periods)	20°C	70%	N/A	N/A	N/A
Temperature inversion	10°C	90%	N/A	N/A	3°C/100 m

The following assumptions were made in predicting LAeq(15minute) noise emission levels from the existing and proposed developments:

Proposed Operations

Fresh Warehouse

- 8 forklifts operate continuously outside the factory building at any one time.
- 8 delivery trucks are on site and operating continuously.
- 5 external condenser units operating continuously
- 5 rooftop compressors

Perishables

- 17 forklifts operate continuously outside the factory building at any one time.
- 17 delivery trucks are on site and operating continuously.
- 7 external condenser units operating continuously
- 10 rooftop compressors

IGAD Warehouse

- 47 forklifts operate continuously outside the factory building at any one time.
- 47 delivery trucks are on site and operating continuously.

ALM Warehouse

- 13 forklifts operate continuously outside the factory building at any one time.
- 13 delivery trucks are on site and operating continuously.

CSD Warehouse

- 5 forklifts operate continuously outside the factory building at any one time.
- 5 delivery trucks are on site and operating continuously.

High Bay Racking System

- High bay racking system operational.
- Substation.

Carpark

- 44 vehicles parking.

Warehouse Offices

- 5 rooftop air-conditioning units.

5.2 Operational Noise Emission

5.2.1 Equipment Sound Power Levels

Sound power levels for acoustically significant items of plant and equipment have been obtained from Heggies noise source database of similar equipment. The LAeq sound power levels of plant and equipment from proposed operations are given below in **Table 4**. **Appendix A** provides the octave band plant and equipment sound power levels used in the noise modelling.

Table 4 Equipment Sound Power Levels

Plant and Equipment	LAeq Sound Power Level (dBA re 10⁻¹² W)
Truck departure/arrival	92
Condenser unit (single unit)	95
Gas powered forklift	95
Carpark (per level 22 car movements)	92
Air-conditioning Unit (single unit)	65
Compressor Unit (single unit)	92
Substation	110
Generator (2)	107

It has been assumed that noise from the high bay racking system would create a reverberant sound pressure level within the proposed building extension of 85 dBA. This is considered a conservative assessment and therefore would provide a worst case analysis.

5.2.2 Operational Noise Modelling Scenario

Noise levels were predicted at all nearest affect residential locations from the Metcash operations. The following scenarios were modelled:

Scenario 1

- Metcash facility operations with high bay racking system.
- Calm weather conditions.

Scenario 2

- Metcash facility operations with high bay racking system.
- Prevailing weather condition (Temperature Inversion).

5.2.3 Operational Noise Modelling Results

The operational noise levels were predicted at two (2) nearest potentially affected residential locations. A summary of the results of these predictions for scenario 1 and 2 are contained within **Table 5** and **Table 6** respectively.

Table 5 Scenario 1 - Predicted Operational Noise Levels at Residential Receivers Under Calm Weather Condition

Residential Receiver Location	Predicted LAeq(15minute) Noise Level (dBA)	Project Approval Criteria / INP Project Specific Noise Criteria		
		Operations including high bay racking system	Day	Evening Night
Receiver 1 47 Pikes Lane	39		41 55	41 50 41 Project Approval 45 INP
Receiver 2 711 Great Western Highway	35		38 55	38 50 38 Project Approval 45 INP

The LAeq(15minute) noise levels for the proposed Metcash operations under calm weather conditions are predicted to meet the INP LAeq(15minute) project specific noise criteria at all residences.

Table 6 Scenario 2 - Predicted Operational Noise Levels at Residential Receivers Under Temperature Inversion Condition

Residential Receiver Location	Predicted LAeq(15minute) Noise Level (dBA)	Project Approval Criteria / INP Project Specific Noise Criteria		
		Operations including high bay racking system	Day	Evening Night
Receiver 1 47 Pikes Lane	42		41 55	41 50 41 Project Approval 45 INP
Receiver 2 711 Great Western Highway	39		38 55	38 50 38 Project Approval 45 INP

The LAeq(15minute) noise levels for the Metcash facility under temperature inversion condition are predicted to meet the INP LAeq(15minute) project specific noise criteria at all residences. The predicted noise levels exceed the Project Approval noise conditions marginally by 1 dBA at each of the receiver locations.

The potential for sleep disturbance at nearby residence locations has been assessed as the facility is proposed to operate 24 hours a day 7 days per week. Typical LMax noise levels for these activities are provided in **Table 7**.

The predicted sleep disturbance worst case scenario noise levels associated with the proposed Metcash facility operations are present in **Table 8**.

Table 7 Equipment Maximum Sound Power Levels

Plant and Equipment	LAeq Sound Power Level (dBA re 10 ⁻¹² W)
Truck departure/arrival	97
Condenser unit (single unit)	100
Gas powered forklift	100
Carpark (per level)	97
Air-conditioning Unit (single unit)	70
Compressor Unit (single unit)	97
Substation	110
Generators (2)	107

Table 8 Predicted Sleep Disturbance Noise Levels at Residential Receivers

Residential Receiver Location	Predicted LMax Noise Level (dBA)	Night-time LA1(1minute) Sleep Disturbance Goals (dBA)
	Operations including high bay racking system	Night
Receiver 1 47 Pikes Lane	42	67 Project Approval 61 INP
Receiver 2 711 Great Western Highway	39	64 Project Approval 61 INP

The LMax noise levels are predicted to be below the sleep disturbance noise goals specified in **Table 8** for night-time operation of the Metcash facility. This being the case, sleep disturbance is unlikely to occur at residential locations surrounding the proposed Metcash facility.

5.2.4 Construction Noise Assessment

It has been assumed that the same the same construction scenario would apply as previously assessed for the site (refer Heggies Pty Ltd report 630. 02154-R2 *Huntingwood West Estate Noise Impact Assessment*). This is considered to provide a worst case assessment for the potential construction noise impacts.

The noise levels from the proposed construction were predicted at two (2) nearest potentially affected residential locations (see **Figure 3**). A summary of the results of these predictions are contained within **Table 9**.

Table 9 Predicted Construction Noise Levels at Residential Receivers

Assessment Location	Predicted LAeq(15minute) Noise Level (dBA)	Construction LAeq(15minute) Design Goal (dBA)	
		Noise Affected	Noise Affected
Receiver 1 47 Pikes Lane	43	60	75
Receiver 2 711 Great Western Highway	41		

The modelling results in **Table 9** indicate that the predicted LAeq(15minute) noise levels for construction meet all construction noise goals at all residences.

5.2.5 Cumulative Noise Assessment

The proposed development site is situated within a developed industrial area in Huntingwood, NSW. Existing industrial properties are located to the north and east of the subject site.

Potential cumulative noise impacts from existing and successive developments are embraced by the INP procedures by ensuring that the appropriate noise emission criteria (and consent limits) are established with a view to maintaining acceptable noise *amenity* levels for residences. Therefore, the cumulative impact of the proposed development with existing industrial noise sources has been assessed in the determination of the amenity levels at surrounding potentially noise sensitive areas.

6 CONCLUSION

SLR Consulting has undertaken a noise impact assessment for the expansion of the Metcash Facility to include a High Bay Rack system.

Computer noise modelling has been carried out to predict the noise level, from the Metcash facility, at the nearest residential receiver locations.

Operational Noise Assessment

The noise emissions from the proposed operation of Metcash facility have been assessed against the existing Project Approval and the project specific noise criteria established in accordance with the INP.

The noise modelling has been carried out under two meteorological conditions (ie Scenario 1: Calm weather and Scenario 2: Prevailing weather (including the effects of temperature inversion).

From the noise modelling results in **Table 5** and **Table 6**, the LAeq(15minute) noise levels are predicted to comply with the project specific noise criteria at the nearest affected residential locations.

The predicted noise levels marginally exceed the Project Approval conditions for the original development by 1 dBA at each residential location. It should be noted that these Project Approval noise limits were based on noise predictions for the original development and are not based on a level of noise that is likely to cause disturbance at the residential receivers. Given a background noise level at the receivers in excess of 46 dBA at all times a noise level increase of 1 dBA will not be detectable at the receiver locations.

Sleep Disturbance Assessment

The potential for sleep disturbance at nearby residence locations due to the noise emissions from the night-time operations of the proposed Metcash facility has been assessed. From the noise modelling results in **Table 8**, the LA1(1minute) noise levels are predicted to be less the sleep disturbance noise goals and Project Approval noise limits at all residential locations.

Construction Noise Assessment

The results of modelling indicate that the predicted LAeq(15minute) noise levels for construction meet the construction noise goals at all residences.

Appendix A

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Equipment Sound Power Levels

Equipment Description	1/1 Octave Band LAeq Sound Power Levels (dB)										Overall (dBA)
	31.5	63	125	250	500	1k	2k	4k	8k	16k	
Truck departure/arrival	100	95	93	88	88	88	85	81	76	72	92
Gas powered forklift	-	102	93	93	91	89	88	80	72	-	95
Genset	109	112	113	110	101	102	99	93	84	76	107
Condenser unit (single unit)	84	85	98	93	90	90	88	84	75	66	95
Carpark (per level 22 car movements)	100	95	93	88	88	88	85	81	76	72	92
Air-conditioning Unit (single unit)	54	55	69	63	60	60	58	54	45	42	65
Compressor Unit (single unit)	81	82	96	90	87	87	85	81	72	69	92
Substation	103	108	108	105	106	107	105	99	94	86	110
Generator	108	106	113	110	104	98	97	92	88	-	107
Concrete Boom Pump	100	106	113	110	104	98	97	92	88	88	107
Concrete Transit mixer	103	108	108	105	106	107	105	99	94	86	111
Mobile Crane	103	109	99	99	102	100	96	92	90	90	104
Hand Tools (grinder)	63	67	65	67	75	84	95	100	100	95	104
Scraper	103	108	108	105	106	107	105	99	94	86	111
Compactor	61	74	84	91	97	100	101	101	99	93	110
Dozer	114	114	111	108	107	104	104	99	87	87	110
Articulated Dump truck	96	104	106	99	100	98	92	85	77	77	102

Equipment Description	1/1 Octave Band Typical Maximum Sound Power Levels (dB)										Overall (dBA)
	31.5	63	125	250	500	1k	2k	4k	8k	16k	
Truck departure/arrival	105	100	98	93	93	93	90	86	81	77	97
Gas powered forklift	-	107	98	98	96	94	93	85	77	-	100
Condenser unit (single unit)	89	90	103	98	95	95	93	89	80	71	100
Air-conditioning Unit (single unit)	59	60	74	68	65	65	63	59	50	47	70
Compressor Unit (single unit)	86	87	101	95	92	92	90	86	77	74	97
Substation	103	108	108	105	106	107	105	99	94	86	110
Generator	108	106	113	110	104	98	97	92	88	-	107