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Report

GENESIS WASTE FACILITY PRE-SORT ENCLOSURE NOISE ASSESSMENT

DIAL-A-DUMP INDUSTRIES

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1 INTRODUCTION

Dial A Dump (EC) Pty Limited (DADI) are proposing to construct and operate an additional materials sorting building at their Genesis Resource Recovery Facility (RRF), Eastern Creek, NSW.

The proposed new pre-sort enclosure would operate for the same hours as the existing Material Processing Centre (MPC). No other significant alterations are proposed for operations of the site.

Pacific Environment previously provided a review of noise impacts from the proposed upgrade (Pacific Environment Letter ACO-NW-002-020177 23 March 2015) which provided a screening assessment for the addition of the pre-sort enclosure as part of Mod 5, based on a duplication of the existing MPC operating during the evening and night.

This report provides further assessment of impacts based on noise modelling and further information provided on the activities taking place within the pre-sort enclosure.

2 PROJECT BACKGROUND

The site is located at Honeycomb Drive, Eastern Creek, occupying Lots 1 & 4 DP1145808. The pre-sort enclosure is proposed to be located on Lot 1 next to the existing processing facilities.

The operational components of the site are largely restricted to the quarry void itself (for landfilling) and the area immediately to the west of the void (materials processing centre and associated infrastructure), which totals 61.32ha. The site is surrounded by land owned by Australand (North East), Hanson (South East), the Department of Planning and Infrastructure (South West) and Sargents (West). All of this land is earmarked under the Western Sydney Employment Area State Environmental Planning Policy (WSEA SEPP) to be redeveloped for higher end industrial and employment uses over the next decade.

The closest residential areas are located approximately 400 metres from the northern boundary of the site at Minchinbury, and 800 metres to the west of the site at Erskine Park, shown in **Figure 4-1**.

The original development was approved in September 2010 and currently operates under Environmental Protection Licence (EPL) number 20121.

Operations on site are approved for 7.00am to 4.00pm Monday to Friday and 8.00am to 4.00pm weekends and public holidays.

Modification 4 for the site extended the operating hours of the MPC only to 6.00am to 10.00pm Monday to Friday and 6.00am to 4.00pm weekends and public holidays. This modification was approved and the site is currently operating to these working times.

Noise assessment and measurement of the operations have previously been carried out for the initial project approval, Mod 4 and Mod 5 and were considered for this review as follows:

- ERM "*Light Horse Business Centre Noise Impact Assessment*", August 2008 Reference 0071234 Noise (Environmental noise assessment for initial Project Approval).
- Pacific Environment "*Materials Processing Centre Noise Assessment*" September 2013 Reference 7896A version 02 (Supporting noise assessment for Mod 4).
- Pacific Environment "*Genesis MPC Noise Measurements*", February 2013 Reference 7480 (Measurements carried out as part of investigations for Mod 4).
- Pacific Environment "Genesis Eastern Creek Modification 5 – Additional Pre-Sort Enclosure Noise Impact Review", March 2015 Reference ACO-NW-002-020177.

3 PROPOSED MODIFICATION

The proposed modification is to consist of the addition of a pre-sort enclosure located to the west of the quarry void and south of the existing MPC. The pre-sort enclosure is expected to operate during the hours approved for the current MPC (6.00am to 10.00pm Monday to Friday and 6.00am to 4.00pm weekends and public holidays).

Information supplied by DADI indicates that the pre-sort enclosure is expected to contain the following operations:

- Sorting machine similar to that present in the current MPC
- 2 wheeled excavators with hydraulic grapples
- 2 wheeled loaders
- An electronic bailer
- 2 forklifts (One 3 tonne and one 5 tonne)

Operations on the site are not expected to significantly change with the addition of the pre-sort enclosure during normal operating hours. The number of vehicles accessing the site is not expected to increase, nor the amount of plant operating outside. The most significant change is expected to be outside of normal operating hours, when the MPC and pre-sort enclosure operate simultaneously during the evening and night period. During these times, operations are restricted to within the MPC and pre-sort enclosure. Waste deliveries, external sorting/processing activities or landfilling will not occur outside of normal operating hours.

The pre-sort enclosure is approximately 180m long, 50m wide and 15m tall. It is to be constructed of sheet metal walls with a concrete base with metal roller doors and a sheet metal roof.

The location of the proposed pre-sort enclosure is provided in **Figure 3-1**.

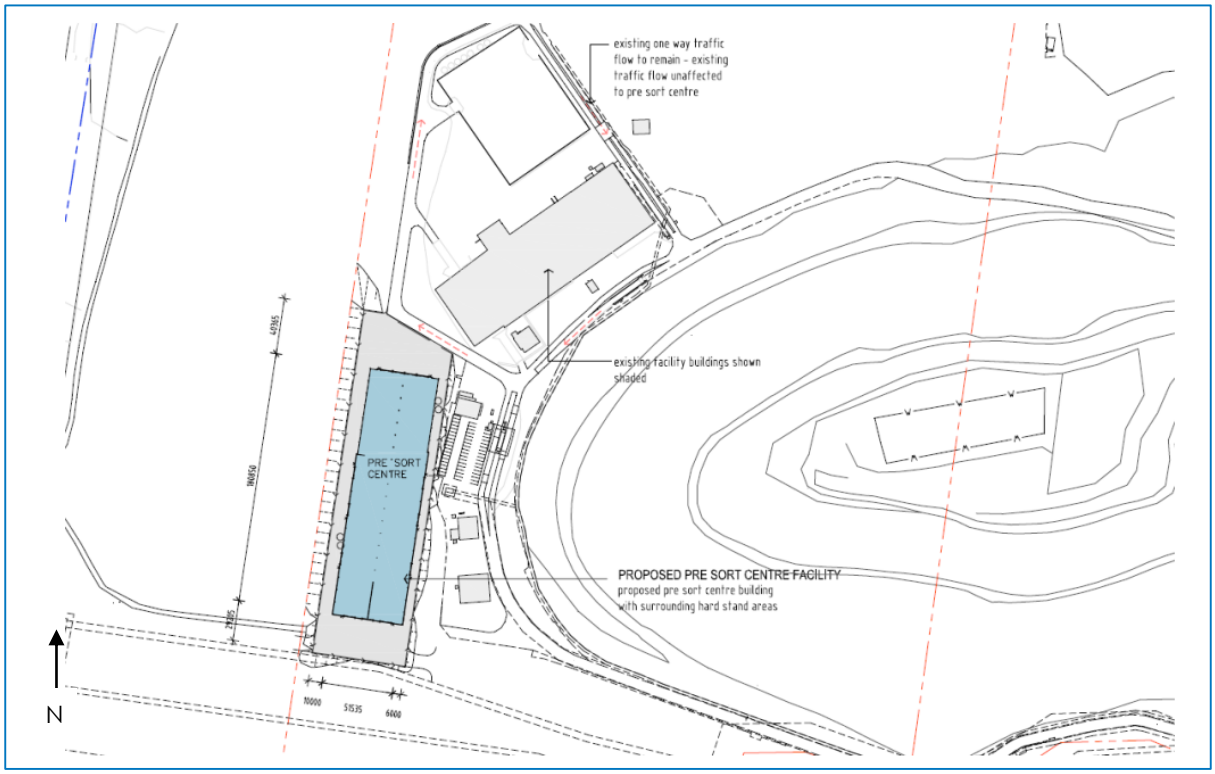

Figure 3-1: Proposed Location of Pre-Sort Enclosure

4 SENSITIVE RECEIVERS

The project is surrounded by a mix of commercial and industrial developments to the south and east of the site. The nearest residential receivers are located to the north and west of the project. The residential receivers to the west are located in the suburb of Erskine Park and are approximately 1 km from the site boundary. The intervening land between the project and receivers is park and bush land as well as an easement for high voltage power lines. Residential receivers to the north are located in the suburb of Minchinbury and are approximately 375m from the Licence boundary and approximately 550m from the MPC and 750m from the pre-sort enclosure. The intervening land between Minchinbury and the project contains the M4 motorway corridor, located approximately 60m from receivers.

Table 4-1 presents details of the nearest and most potentially affected residential receivers in Minchinbury and Erskine Park. **Figure 4-1** presents aerial figures of the two residential areas and the existing site layout.

Table 4-1: Nearest Sensitive and Potentially Most Affected Receiver Locations

Suburb	Street Number and Name
Minchinbury	3-21 Cobbler Crescent
Minchinbury	1-7 Tod Place
Minchinbury	1-6 Eber Place
Minchinbury	158-192 MacFarlane Drive
Minchinbury	1-10 Bergin Place
Minchinbury	2-22 Barossa Drive
Minchinbury	3-11 Rookin Place
Minchinbury	1-20 Rutherglen Place
Erskine Park	2-44 Warbler Street
Erskine Park	1-19 Swamphen Street
Erskine Park	3-8 Blackbird Glen

Figure 4-1: Site Layout and Surrounding Receivers

5 NOISE CRITERIA

5.1 Environmental Protection Licence

Environmental Protection Licence (EPL) number 20121 details noise limits for the facility of L_{Aeq} 36 dB(A) (6.00am and 6.00pm weekdays and 6.00am to 4.00pm weekends and public holidays) and L_{Aeq} 35 dB(A) (6.00pm to 6.00am) at the nearest residences in both Minchinbury and Erskine Park.

The most stringent EPL licence limits for operations apply during the 6.00pm to 6.00am period at sensitive receivers in Minchinbury and Erskine Park.

5.2 Low Frequency Noise

The characteristics of a noise source can increase annoyance for sensitive receivers. Examples of annoying characteristics are: prominent tones, impulsiveness, intermittent sources and low frequency noise. The Industrial Noise Policy (INP) provides guidance on 'modifying factors' which should be applied to predicted or measured noise levels when a dominant low frequency noise characteristic is present. Table 4.1 of the INP states that low frequency noise is considered dominant where the difference between the A-weighted and C-weighted noise levels is 15 dB or greater. Where this difference occurs the INP recommends a modifying factor of 5 dB is added to the predicted noise level.

The C-weighting network was designed to account for the ear's response to low frequency noise at high noise levels and is typically used to assess short peaks of high noise levels to ensure protection against hearing damage.

Recent research into annoyance from low frequency noise when assessed at lower noise levels is suggesting that the approach of applying subtracting C and A weighted noise levels is not

representative of annoyance potential and in many situations would results in the 5 dB penalty being applied to sources which are very low risk of causing annoyance.

It is recognised that the difference between A-weighted and C-weighted noise levels can provide an indication of how much low frequency noise is present in a sound. Broner (*Acoustics Australia Vol. 39, 2011*) states that the predictive ability of the C-A difference is of limited value for the following reasons:

- Averaging the sound pressure levels to obtain the difference can lead to loss of information in terms of fluctuations and spectral balance. Broner recommends to also consider modulation.
- Greater difference may be permissible at low A-weighted levels, as there is empirical evidence that the C-A difference for low levels of background noise may exceed 20-25 dB without causing annoyance. Broner recommends the implementation of an overall noise level criterion.

Based on the review of many case histories and the literature, Broner recommends the following criteria listed in **Table 5-1**, with a 5 dB(C) penalty if the sound pressure level is fluctuating at least +/- 5 dB(C).

A low frequency noise criteria of 60 dB(C) has been adopted for the operational noise assessment.

Table 5-1: Low Frequency Noise Criteria

Sensitive Receiver		Range	Criteria L_{Ceq}, dB(C)
Residential	Night time or 24/7 operation	Desirable	60
		Maximum	65
	Daytime or Intermittent operation (1-2 hours)	Desirable	65
		Maximum	70
Commercial / Office / Industrial	Night time or 24/7 operation	Desirable	70
		Maximum	75
	Daytime or Intermittent operation (1-2 hours)	Desirable	75
		Maximum	80

6 NOISE ASSESSMENT

Noise modelling was undertaken to calculated the noise level from the pre-sort enclosure at the nearest residential receivers in Minchinbury and Erskine Park.

6.1 Noise Modelling Methodology

Noise modelling was conducted using the software CadnaA which implements the algorithms contained in ISO 9613-2 and CONCAWE adjustments for meteorological effects. The model accounts for the following factors:

- Source sound power levels of equipment.
- Source directivity, tonality and orientation.
- Distance attenuation, including source and receptor heights.
- Barrier effects due to noise bunds, facility structures and other buildings.
- Ground effects.
- Atmospheric attenuation.
- Enhancements due to meteorological effects.

The conservative modelling takes into account the prevailing meteorological conditions relevant to the project area. The prevailing meteorological conditions were defined in the original NIA (ERM 2008) and have been applied to this assessment and are summarised in **Table 6-1**.

Table 6-1: Modelling Meteorological Conditions

Conditions	Period	Temperature (°C)	Wind Speed (m/s)	Wind Direction (°)	Relative Humidity (%)	Stability Class
Neutral	Day	20	0	0	65	D
Neutral	Eve	15	0	0	80	D
Neutral	Night	10	0	0	80	D
Adverse 1	Eve	15	3	225	80	D
Adverse 2	Night	10	3	135	80	D
Adverse 3	Night	10	3	180	80	D
Adverse 4	Night	10	0	0	80	F

6.2 Modelling Scenarios

The modelling scenario considered the pre-sort enclosure and MPC operating simultaneously during the evening and night period and included:

- Equipment operating in the pre-sort enclosure as specified in **Section 3** with all doors closed expect the southern facing doors.
- The Existing MPC operating.

6.3 Noise Sources

Noise source sound power levels are summarised in **Table 6-2**. Noise source levels were taken from equipment manufacturer data, previous noise measurements of similar equipment and the existing MPC and Pacific Environment's database. Noise sources associated with the pre-sort enclosure are all operating within the building assumed to have walls, roofs and doors of performance Rw 21 with all doors closed except the doors on the southern facade.

Table 6-2: Noise Sources

Item	Descriptor	Noise Level dB(A)
Pre-sort enclosure		
14 tonne wheeled excavator with grapple	Sound Power Level	105
10 tonne wheeled loader	Sound Power Level	107
3 tonne forklift	Sound Power Level	97
5 tonne forklift	Sound Power Level	100
Materials Processing Machine	Internal Sound Pressure Level	82
Total pre-sort enclosure	Internal Sound Pressure Level	85
Existing MPC		
Existing MPC	Internal Sound Pressure Level	82

6.4 Assessment

The predicted noise levels during the evening and night period are presented in **Table 6-3**. The noise levels indicate that the operation of the MPC and pre-sort enclosure would not exceed the most stringent limits as specified in the EPL during the evening and night under adverse or neutral conditions.

Attended noise measurements undertaken in 2013 (Pacific Environment, 2013) on three separate evenings between 6.00pm and 10.00pm at the nearest receivers in Minchinbury indicated that ambient $L_{Aeq,15min}$ and $L_{A90,15min}$ noise levels at receivers in Minchinbury are in excess of 54 and 52 dB(A) respectively without influence from the existing MPC. As a result, worst-case noise levels from the combined operation of the MPC and pre-sort enclosure of 35 dB(A) at Minchinbury, would not be expected to cause any significant change to the existing noise environment at these receivers.

The predicted C-weighted noise levels are well below the criteria and as a result, low frequency noise impacts are not expected.

Table 6-3: Predicted Noise Levels for MPC and Pre-Sort Enclosure operating during the Evening and Night

Receiver Area	Criteria	Predicted Noise Level $L_{eq,15min}$						
		Neutral Eve	Neutral Night	Adverse 1	Adverse 2	Adverse 3	Adverse 4	Units
Minchinbury	35	31	35	35	35	35	35	dB(A)
	60	46	46	48	48	48	48	dB(C)
Erskine Park	35	27	32	24	32	29	32	dB(A)
	60	46	46	44	48	45	48	dB(A)

The greatest predicted noise level from only the pre-sort enclosure operating during the day time is 27 dB(A) at nearest receivers in Minchinbury. The daytime licence limit is $L_{Aeq,15min}$ 36 dB(A). Where the existing facility meets the licence limits, the addition of the pre-sort enclosure would add approximately 0.5 dB to the facility's noise levels resulting in a combined noise level of $L_{Aeq,15min}$ 37 dB(A). The INP defines a non-compliance where the facility's noise level is more than 2 dB(A) above the licence limit. Therefore a marginal exceedance of 1 dB(A) is not considered to be a non-compliance.

The addition of the pre-sort enclosure would add less than 1 dB to the facility's noise level during the day. Attended measurements previously conducted during the evening and night (Pacific

Environment, 2013 ref. 7480) indicated that ambient noise levels from sources other than the facility are more than 10 dB(A) higher than the licence limits and a change of 1 dB(A) from the facility's noise level would not be typically be perceptible at the receivers.

6.5 Recommendations

Recommendations for the pre-sort enclosure are as follows:

- The roof, doors and walls of the enclosure should have an installed performance of at least Rw 21.
- The MPC and pre-sort enclosure doors on the north, west and east of the building should be closed during the evening and night.
- Any ventilation system for the enclosure should be designed to not compromise the performance of the overall enclosure.

7 CONCLUSION

The potential noise impacts have been assessed for the addition of a pre-sort enclosure at the Genesis Eastern Creek Resource Recovery Facility, Honeycomb Drive, Eastern Creek. The assessment considered noise levels from the operation of the existing MPC and proposed pre-sort enclosure under the most stringent EPL limits during the evening and night period.

The modelled noise levels of the combined MPC and proposed pre-sort enclosure were predicted to comply with the licence limits under neutral and adverse weather conditions during the evening and night. The predicted noise level from the pre-sort enclosure indicated that its addition to the facility would add up to 1 dB(A) to the noise level from the facility during the day at the nearest sensitive receiver where the facility is meeting the day time licence limits. As a result, the facility's noise level is predicted to be 1 dB(A) above the licence limits during the day. The INP considers a non-compliance to be where the measured noise level is more than 2 dB(A) above the licence limit. Therefore, the exceedance is not considered significant and the facility would be considered to comply with the licence limits during the day.

Furthermore, previously conducted attended noise monitoring at Minchinbury and Erskine Park during the day, evening and night periods confirmed that existing ambient noise levels are much greater than the levels predicted from the facility. The addition of the pre-sort enclosure would not cause a significant change in the existing noise environment at these receivers.