WILKINSON MURRAY

18 August 2016

WM Project Number: 13317
Our Ref: PP17082016_Ltr_TC
Email: jeff@deepriver.com.au

Mr Jeff Bulfin
Precise Planning
PO Box 426
NORTHBRIDGE NSW 1560

Dear Jeff

Re: 25 Martin Road Badgerys Creek - Response to JRPP Vibration Request

Wilkinson Murray conducted a Noise Impact Assessment (NIA) for the proposed Resource Recovery Facility at 25 Martin Road, Badgerys Creek (Wilkinson Murray Report No. 13351 Version B).

Southwest Sydney Joint Regional Planning panel has requested additional information in reference to the emission of vibration from the proposed operation of the Resource Recovery.

The JRPP requested:

"the Panel requires confirmation that there would be no unacceptable amenity impacts upon local residual properties in the vicinity from vibration."

The proposed plant that would generate the greatest amount of vibration that could operate on site is a crusher. To assess the potential impact of vibration from a crusher to the closest residential receivers to the site, trial operations of a crusher were conducted. Attended vibration measurements were conducted of a crusher by Wilkinson Murray on the 10th August, 2016 at various setback distances with a crusher operating. The crusher was crushing sandstone during the vibration measurements.

SITE DESCRIPTION

Figure 1 shows the relative location of the nearest residential receivers to the site, along with the relative offset distance to any equipment possibly operating on site.

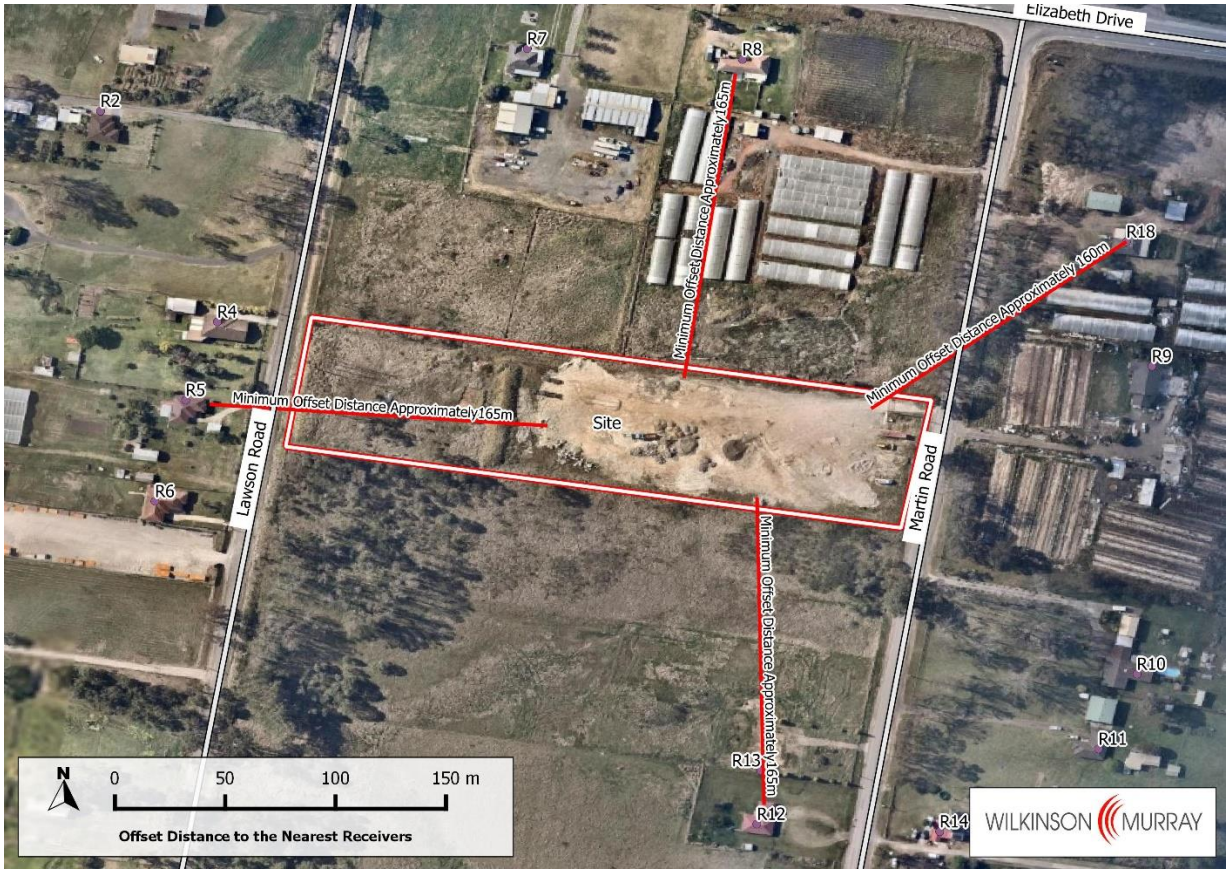
The presented distance is a worst case placement of equipment within the site, with the actual offset distance are expected to be greater.

The worst case offset distances are as follows:

- Approximately 165m to R4 / R5 / R6 located to the west of the site;
- Approximately 165m to R8 located to the north of the site;
- Approximately 160m to R18 to the east of the site; and
- Approximately 165m to R12 to the south of the site.

It should be noted that residential receivers R9 and R13 have been demolished.

Figure 1 Offset Distance to Nearest Identified Receivers



VIBRATION CRITERIA

The perception and sensitivity to vibration are dependent on many factors, including among others, the direction in which the vibration acts, the frequency content and the implications associated with the perceived source of vibration.

Assessing Vibration: A technical Guideline (2006) produced by the NSW Department of Environment and Conservation provides criteria for acceptable values of human exposure to vibration dependent on the time of day and the activity, with a summary given in Table 1.

Table 1 Criteria for exposure to continuous and impulsive vibration

Place	Time	RMS Velocity (mm/s)		Peak Particle Velocity (mm/s)	
		Preferred	Maximum	Preferred	Maximum
Residences	Daytime	0.2	0.4	0.28	0.56
	Night-time	0.14	0.28	0.2	0.4

The German Standard DIN4150-2:1975 (Table 2) provides a reference for the degrees of human perception of vibration. This indicates what the threshold of perception is approximately between 0.15 and 0.35mm/s.

Table 2 Vibration and human perception of motion (Table 15.2 DIN4150-2:1975)

Approximate Vibration level (mm/s)	Degree of Perception
0.1	Not Felt
0.15	Threshold of perception
0.35	Barely Noticeable
1	Noticeable
2.2	Easily Noticeable
6	Strong Noticeable

Note: The approximate vibrations (in floor of building) are for vibration having frequency content in the range 8Hz to 80Hz

MEASUREMENT AND INSTRUMENTATION

Vibration measurements of the crusher were conducted using a SVAN 958 vibration meter utilising a SVAN SV84 tri-axial accelerometer to directly measure the Peak Particle Velocity (PPV) and Root Mean Square (RMS) Velocity.

Vibration was measured at several setback distances at approximately 7m, 35m, 70m and 165m.

A summary of the measured vibration levels is provided in Table 3.

Table 3 Summary of Vibration Measurement Results

Measurement Distance (m)	Measured PPV (mm/s)	RMS Velocity (mm/s)
7	1.01	0.156
35	0.35	0.025
65	0.27	0.012
165	0.06	0.003

CONCLUSION

The vibration levels measured from a crusher are likely to be perceivable on the Resource Recovery Facility site, however at distances greater than 65m it would be unlikely to be perceivable.

Specifically, the measured vibration level of 0.06mm/s PPV at an offset distance of 165m indicates that the vibration emission from the site would not be perceivable at any of the nearest residential receivers.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

Tim Collins
Engineer

Reviewed by John Wassermann

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