

# ACOUSTIC IMPACT ASSESSMENT

Joe White Malting, Minto, NSW

## **Project 216 126**

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### **Prepared For:**

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Disclaimer applicable to all PKA recommendations within this correspondence

*We stress that the advice given herein is for acoustic purposes only, and that the qualified personnel should be consulted with regard to compliance in disciplines other than in acoustics. All materials and recommendations have been determined only on the basis of their acoustic value. No consideration has been given to any other purpose or function. Separate advice must be sought for other issues including but not limited to, fire safety, structural and loading requirements, pressure drop, aesthetic value and for compatibility with any non acoustic requirements.*

## 1.0 INTRODUCTION

PKA Acoustic Consulting have been commissioned by Cardno Pty Ltd on behalf of Joe White Malting to provide an acoustic report to assess the noise impact from the vehicular movements associated to Joe White Malting, 111 Stonny Batter Road, Minto.

The company uses the nearby rail line and a fleet of trucks for the movement of their raw material and goods. The management intends to increase the number of trucks for the movements hence an acoustic report is required to assess the implications of the noise impact.

The acoustic report will be part of DA documentation to be submitted to the Dept of Planning and the Council.

## 2.0 SUMMARY

PKA personnel visited the site and conducted an observation of traffic flow over a 1-hour period. A noise survey was conducted to measure the traffic noise and to establish the factors and levels of amenity due to the generated traffic.

Based on our observations, Cardno traffic report data and measurements, we are of the opinion that noise from the generated traffic (18 trucks/day) will not change the existing amenity level of the surroundings, hence will not have any additional noise impact on the nearest sensitive receivers as per the conditions set out in the letter dated 01/06/2016 (ref: *MP08\_0157 MOD 4*) from the Department of Planning & Environment.

### 3.0 SITE PLAN

The site is bounded by a railway line on the west, industrial units on the north, east & south. Access to the site will be from Pembroke Road through Stonny Batter Road. The site location and the environs are shown in Figure 1.



**Figure 1** Site Location (source: Google Maps)

The nearest noise sensitive receivers which have potential for noise impact are as follows:

1. Residential properties along Pembroke Road.
2. Properties on Stonny Batter Road are commercial/industrial units. No residences along Stonny Batter Road.

## 4.0 ASSESSMENT

The hours of operation of the plant are:

- 6am – 6pm Monday to Friday
- 6 am -2pm Saturdays
- Closed on Sundays

The data provided in the Traffic Report (Report by Cardno, Ref 600330, dated 16 August 2016) and the results of our noise survey were used for the noise assessment.

The truck route in the vicinity of the site is through Stonny Batter Road into Pembroke Road.

- 1- Stonny Batter Road is a local unclassified Road primarily providing vehicular access to frontage properties. There are no sensitive buildings such as residential on this road. All properties on this road are commercial/industrial.
- 2- Pembroke Road is classified by RMS as a State Road and links between Minto Road and O'Sullivan Road. The road is typically configured with a four lane, two way divided carriageway with additional lanes provided at key intersections. There are numerous residential properties on Pembroke Road.

In particular we are assessing the noise impact at the roundabout intersection of the above roads. The assessment/observation point was 3 m from the edge of the roundabout.

All three roads joining the roundabout have a gradient at this intersection. The following observations were made:

- The through traffic (through Pembroke Road) was moderate with a mix of light & heavy vehicles.
- Most heavy vehicles (approx. 80% of trucks) went through Stonny Batter Road as this is an industrial area.
- The heavy vehicles approaching the roundabout often had to stop due to the uphill gradient and the oncoming traffic. This produced brake compression noise, engine noise and acceleration noise.
- On Pembroke Road 300 m to the roundabout there is a crest on the road surface. This will slow down the moving vehicles as result the vehicles have to brake or accelerate resulting in additional noise.

The existing daytime noise level measured on Pembroke Road is 70 dBA. This equates to approximately 60 dBA at the nearest residential building façade.

Figure 2.2 of the traffic report provides figures for the existing traffic volumes for the different legs of the intersection. To get an indication of the number of heavy vehicles we have added up the figures and obtained the following results;

**For AM peak:**

- Pembroke Road, north of roundabout 1070 vehicle movements, includes 88 trucks (8.3% heavy vehicle)
- Pembroke Road, south of roundabout 1077 vehicle movements, includes 89 trucks (8.3% heavy vehicle)

**For PM peak:**

- Pembroke Road, north of roundabout 1106 vehicle movements, includes 44 trucks (4% heavy vehicle)
- Pembroke Road, south of roundabout 1107 vehicle movements, includes 44 trucks (4% heavy vehicle)

Section 5 of the Traffic Report is on Conclusions and states that the proposed modification seeks to deliver an additional 103,000 tonnes of grain and barley on top of the previously approved 54,000 tonnes by road. The analysis shows that the proposed modification will yield a traffic generation potential of:

- 2 truck movements during the AM and PM peak hour (ie an additional 1 truck arriving & departing the site in the same hour)
- 18 truck movements on a typical weekday (ie an additional 9 trucks arriving & departing on the same weekday), and
- 12 truck movements on a Saturday (ie an additional 6 trucks arriving & departing on the same Saturday).

The generated truck movement is 18/day or 2 trucks during AM or PM peak hour.

Noise increase from the generated traffic (2 trucks in one hour) over the existing volume (44 trucks at peak hour) was calculated. Calculations indicate that the noise increase will be 0.2 dBA. The noise increase due to this additional traffic will be even lower if the additional 2 trucks are compared against the total existing traffic volume (ie 1070 vph for AM peak and 1106 vph for pm peak).

This marginal noise increase is not perceptible by human hearing and will have no effect on the existing level of amenity of the nearby residential buildings.

We comment that the 0.2 dB noise increase due to the generated traffic is well within the 12 dBA relative noise increase limit for sub-arterial roads and 2 dBA limit for the local roads as shown in section 4.

For truck movements on Saturdays, the relative noise increase and effects will be approximately the same therefore the existing amenity will not be changed. For any night time truck movements (between 6 am and 7 am), the noise increase and the relative impact will be the same, as the area is industrial and there will be considerable truck movement in the area.

In our opinion, the generated traffic being a small proportion of the existing traffic volume will cause a marginal increase in noise level which is not perceptible by human ears and will not change the existing amenity level at the nearby residential properties close to Pembroke Road roundabout.

## 5.0 NOISE CRITERIA

### 5.1 Department of Planning

Department of Planning letter ref MP08\_0157 MOD 4 dated 01-06-16 requires Minto Malting Plant to conduct an environmental assessment. The letter highlights the Amenity requirements related to road traffic noise for residences near the Stonny Batter Road/ Pembroke Road

roundabout and requires to consider physical geometry of the roads as the speed at which vehicles take off from a stopped position at the roundabout may have potential noise impact on nearby sensitive receivers.

## 5.2 EPA NSW Road Noise Policy

Noise from the vehicles associated with the subject Malting Plant can also be assessed using EPA NSW Road Noise Policy (RNP). Section 2.4 of the RNP presents the values for Relative Increase Criteria. The values are presented in the following Table 1.

Table 1 Relative Increase Criteria for residential land use

| Road category  | Type of project/land use  | Assessment criteria, dBA                      |  |
|--|---|---|--|
|  |   | Day: 7am-10 pm                                | Night: 10pm – 7 am                           |
| Freeway/arterial/sub-arterial roads and transit ways | New road corridor/redevelopment of existing roads/land use development with potential to generate additional traffic on existing road | Existing traffic Leq (15 hr)+12 dB (external) | Existing traffic Leq (9 hr)+12 dB (external) |

1. In cases where noise exceeds the criteria, RNP recommends that “feasible and reasonable mitigation” measure should be employed to meet the noise criteria. In this regard the RNP states that for existing roads there is limited potential for noise control as the development is not linked to road improvements. It does however advise that applicable strategies include appropriate location of private access roads, regulating times of use, using clustering, using quiet vehicles, and using barriers and acoustic treatments”.
2. For residences on local roads, the RNP does not provide a mandatory limit for relative noise increase, however in general it favours a limit of 2 dBA increase as this presents a minor impact that is considered barely perceptible to the average person. Some local Councils such as Hornsby Shire Council have a 2 dBA limit increase in existing noise levels for developments which have potential to create additional traffic on local roads.

## 6.0 NOISE SURVEY

The site was visited by PKA personnel to conduct a noise survey as follows.

A survey was conducted at the Stonny Batter Road/Pembroke roundabout. Observations were made on the behaviour of vehicles especially of heavy trucks when stopping & taking off at the roundabout. Attended noise measurements were also made at this location.

The position of noise measurement & observation point is shown in Figure 1.

### 6.1 Instrumentation

Noise measurements were conducted using the following equipment:

- Precision Sound analyser (& monitor) NTI XL2-TA, Serial number A2A-06988-E0.
- Sound calibrator B&K 4230, Serial number 9299985.

The instruments were calibrated before and after the noise measurements and there were no deviations between the two.

The sound analyser is type 1 and complies with AS1259.2: 1990. The instruments carry traceable calibration certificates.

### 6.2 Traffic noise levels

Attended measurements were made to obtain traffic noise levels at the roundabout on Pembroke Road. During the measurement the weather was good, calm & dry.

Results of the measurements are presented in the following Table 3.

Table 3 Traffic noise levels - attended measurements

| Location  | Date/Time      | Leq(15 mins), dBA |
|---|----------------|-------------------|
| Stonny Batter Road/Pembroke Road intersection, 3m from the Roundabout | 26 August/9 am | 69.7              |

## 7.0 CONCLUSION

In conclusion, as a result of our traffic observations and noise survey, PKA has determined that it is our opinion that noise from the generated traffic (18 trucks/day) will not change the existing amenity level of the surroundings. Hence the proposed changes to activity will not have additional noise impact on the nearest sensitive receivers as per the conditions set out in the letter (ref: *MP08\_0157 MOD 4*) from the Department of Planning & Environment.

## APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

dB – A decibel (dB) is a unit of measurement that represents sound levels. Sound levels are measured by pressure variations in the air. The human ear can perceive a large range of sound levels however it responds to the change in sound levels in a logarithmic fashion, therefore for convenience the decibel is a logarithmic unit of measurement.

dBA or dB(A) – As well as the human ear perceiving sound levels in a logarithmic fashion (see dB) the ear also is more sensitive to high (treble) frequencies than it is to low (bass) frequencies. The “A” in dBA stands for “A-weighting” which applies a correction to certain frequencies to approximate the ear’s sensitivity and subjective reaction to how loud a sound is perceived.

Sound Pressure Level – The amount of noise from a source measured at a particular distance.

Sound Power Level – The total amount of noise from a particular source.

Octave Band Centre Frequency (Hz) – Divides the single figure dBA into separate ranges from low (bass) to high (treble) frequencies. This allows for more detailed analysis of a source’s sound level. Low frequencies in this report range from 31.5Hz to 250Hz, mid-range frequencies are between 250Hz and 1000Hz, high frequencies are between 1000Hz and 8000Hz.

Leq – The level for the overall noise exposure over a specific time. As noise levels fluctuate the  $L_{eq}$  represents the energy average if a continuous steady sound was measured. The time intervals stated in this report are typically  $L_{eq\ 15min}$  (15 minutes) and  $L_{eq\ 1hr}$  (60 minutes)

Lmax – The maximum noise level during the measurement.

L90 – The noise level exceeded for 90% of the measurement time, or simply the lowest 10% of noise measured. This can be representative of the Background Noise.

Ambient Noise – The combined noise level from all noise producing sources within a given environment

Background Noise – The underlying noise level within the Ambient Noise. This is typically noted as  $L_{90}$  and defined as “the noise level that is exceeded for 90% of the time measured”, or simply the lowest 10% of noise measured.

Assessment Background Level (ABL) – The individual background noise level for each period. It is calculated for each period by taking the  $L_{90}$  for each daytime / evening / nighttime periods measured.

Rating Background Level (RBL) – The overall background noise level for each period. It is calculated for each period by taking the median (middle) value from all the daytime / evening / nighttime ABL figures measured.

Receptor (Sensitive Receiver) – Nominated locations surrounding the proposed development which can include residential dwellings, schools, accommodation premises etc.