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**HERRING STORER ACOUSTICS**

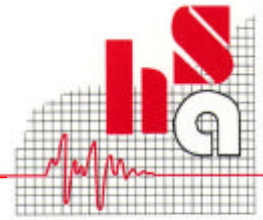
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**COOLANGATTA INDUSTRIAL ESTATE  
COLLIE, WESTERN AUSTRALIA**

**NOISE MANAGEMENT PLAN**

FOR

**GRIFFIN ENERGY PTY LTD**

BY

**HERRING STORER ACOUSTICS**

JANUARY 2005

OUR REFERENCE: 4185-2-04062

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## EXECUTIVE SUMMARY

The critical location for noise emissions from the Coolangatta Industrial Estate in terms of noise emissions is the boundary of the proposed Special Control Area along the Williams – Collie Road. With the inclusion of normal and practical noise amelioration noise emissions from a proposed industry can comply with the criteria stipulated in the *Environmental Protection (Noise) Regulations 1997*.

To achieve compliance at the boundary of the Special Control Area the following sound power noise levels for individual industries needs to be as listed in Table E1. Additionally, the resultant noise level from those industries when received at the boundary of the special control area will need to be as listed in Table E1.

**TABLE E1 – NOISE LEVELS TO ACHIEVE COMPLIANCE**

Industry	Sound Power Level, (dB(A))	Noise Level at Boundary, (dB(A))
Power Station	116 (Plant) 111 (Stack)	30
Industry 1	116 (Plant) 108 (Stack)	30
Industry 2	111 (Plant) 110 (Stack)	27
Industry 3	107 (Plant)	25

The proposed buffer distance for each industry are listed in Table E2.

**TABLE E2 – BUFFER DISTANCE (METRES)**

Industry	Buffer Distance (m)
Power Station	2600
Industry 1	3000
Industry 2	2200
Industry 3	2200

As part of each industries assessment to achieve planning and environmental approval, the proponent of each industry wanting to locate within the Coolangatta Industrial Estate should carry out a detailed environmental noise assessment. The noise assessment to be carried out by an approved acoustical consultant.

## 1.0 INTRODUCTION

Herring Storer Acoustics (HSA) was commissioned by Griffin Energy Pty Ltd to prepare a Noise Management Plan for the Coolangatta Industrial Estate.

The objective of the Noise Management Plan is to outline the acoustic criteria that needs to be met to ensure compliance with regulatory requirements.

The critical area for consideration is to the north of the Estate, on the northern side of the Williams – Collie Road. Although residences to the west also need to be taken into account.

Impact is taken to be acceptable if noise arising from the industries within the Industrial Estate is within the regulatory criteria of the *Environmental Protection Act 1986* and specifically the *Environmental Protection (Noise) Regulations 1997*. The acoustic criteria for this estate is for the additive (total) noise level from all industries to not exceed 30 dB(A).

## 2.0 METHODOLOGY

Prediction of the noise received at the boundary to the Special Control Area being along the Williams – Collie Road was carried out by modelling noise emission propagation from the industrial estate using an environmental noise modelling computer program, “SoundPlan” Version 6.1. Both overall noise level contour plots and single point calculations were performed. Noise contours show the overall noise level at any location due to the operations of industries within the industrial estate, whereas single point calculations show the same overall level at any selected location but indicate the contribution (ranking) of individual sources within the Estate.

The industrial estate is located approximately 3.5km to the north east of Collie, with the northern boundary of the estate being approximately 2 km from the Williams – Collie Road. A locality plan attached in Appendix A.

Acoustic modelling was carried out for industries having the sound power noise levels as listed in Table 1.

**TABLE 1 – SOUND POWER LEVEL**

Industry	Sound Power Level (dB(A))
Power Station	116 (Plant) 111 (Stack)
Industry 1	116 (Plant) 108 (Stack)
Industry 2	111 (Plant) 110 (Stack)
Industry 3	107

For information the following types of industry were used as generic industries within the noise model:

- Industry 1 - Paper pulp mill
- Industry 2 - Brick plant
- Industry 3 - Abattoir

The industries were model as either one or two sources, one source being for the plant and equipment, with the other being where applicable noise emissions from a stack. The plant and equipment were taken to be 5m above ground, with stacks being 40m above ground.

The acoustic model takes into account ground topography, including ground absorption, which in this case was taken to be predominantly rural on an undulating terrain.

Input data for computer modelling included:

- Topographical data.
- EPA standard weather condition for the night period (see Table 2).

Weather conditions for the modelling were generally in accordance with the Environmental Protection Authority's *"Draft Guidance for Assessment of Environmental Factors No.8 - Environmental Noise"* for the night period and as listed in Table 2.

**TABLE 2 - WEATHER CONDITIONS**

Condition	Night Period
Temperature	15 °C
Relative humidity	50%
Pasquil Stability Class	E
Wind speed	3 m/s

The resultant noise contours are shown as Figure 01 in Appendix B.

### 3.0 CRITERIA

The *Environmental Protection (Noise) Regulations 1997* stipulate the allowable noise levels that can be received at any noise sensitive premises from another premises. The allowable noise level is determined by the calculation of an influencing factor, which is added to the baseline criteria set out in Table 1 of the Regulations. At noise sensitive premises located in and around the town of Collie, the influencing factor would be 0. Therefore, the assigned noise level at the various times of the day would be as listed in Table 3 below.

**TABLE 3 - ASSIGNED NOISE LEVELS AT RESIDENCE**

Time of Day	Assigned Noise Level (dB(A))		
	$L_{A10}$	$L_{A1}$	$L_{max}$
0700 - 1900 hours - Monday to Saturday	45	55	65
0900 - 1900 hours - Sunday & Public Holidays	40	50	65
1900 - 2200 hours - All Days	40	50	55
2200 - 0700 hours - Monday to Saturday	35	45	55
2200 - 0900 hours - Sunday & Public Holidays	35	45	55

Note: The  $L_{A10}$  noise level is the noise that is exceeded for 10% of the time.  
The  $L_{A1}$  noise level is the noise that is exceeded for 1% of the time.  
The  $L_{Amax}$  noise level is the maximum noise level recorded.

In accordance with Regulation 7, noise emissions from an industry would be considered as not “significantly contributing” to any exceedance of the Regulatory criteria assigned level at any noise sensitive premises, if the noise received at the premises is 5 dB(A) below the assigned noise level. Therefore, to comply with Regulation 7, noise received from each industry within the Industrial Estate at the nearest noise sensitive premises would need to be 30 dB(A) or less.

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at another premises, defined below as per Regulation 9.

“**impulsiveness**” means a variation in the emission of a noise where the difference between  $L_{Apeak}$  and  $L_{Amax\ Slow}$  is more than 15dB when determined for a single representative event;

“**modulation**” means a variation in the emission of noise that –

- (a) is more than 3dB  $L_{A\ Fast}$  or is more than 3dB  $L_{A\ Fast}$  in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

“**tonality**” means the presence in the noise emission of tonal characteristics where the difference between –

- (a) the A-weighted sound pressure level in any one-third octave band; and
- (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands, is greater than 3dB when the sound pressure levels are determined as  $L_{Aeq,T}$  levels where the time period T is greater than 10% of the representative assessment period, or greater than 8dB at any time when the sound pressure levels are determined as  $L_{A\ Slow}$  levels.

Where the above characteristics are present and cannot be practicably removed, the following adjustments are made to the measured or predicted level at that other premises. The possible adjustments for annoying characteristics are listed in Table 4.

**TABLE 4 - ADJUSTMENTS**

<b>Tonality</b>	<b>Modulation</b>	<b>Impulsiveness</b>
+5 dB	+5 dB	+10 dB

In accordance with Regulation 7, noise emissions from an industry would be considered as not “significantly contributing” to any exceedance of the Regulatory criteria assigned level at any noise sensitive premises, if the noise received at the premises is 5 dB(A) below the assigned noise level. Therefore, to comply with Regulation 7, noise received from each industry within the Industrial Estate at the nearest noise sensitive premises would need to be 30 dB(A) or less.

Although the above applies to individual industries, in this case a Special Control Area has been established and the noise criteria in this case is to ensure that noise from each individual industry does not exceed 30 dB(A) and the total noise level from all industries does not exceed 35 dB(A) during the night period.

## 4.0 RESULTS & DISCUSSION

To achieve compliance at the boundary of the Special Control Area, the resultant noise level from those industries when received at the boundary of the special control area will need to be as listed in Table 5.

**TABLE 5 – NOISE LEVELS TO ACHIEVE COMPLIANCE**

<b>Industry</b>	<b>Noise Level at Boundary (dB(A))</b>
Power Station	30
Industry 1	30
Industry 2	27
Industry 3	25

The above noise levels do not take into account any adjustments for annoying characteristics. The most likely characteristic of noise emissions from industry is tonality, due to various rotational equipment such as fans. The resultant noise levels due to individual industries (with noise control in some cases) at noise sensitive premises under 3m/s wind conditions is shown to be less than 30 dB(A). As the background noise during wind conditions of 3m/s is likely to be greater than 30 dB(A), the noise received at a residential premises would be masked by the natural background noise and hence would not be considered tonal and no penalty would be applied to the calculated noise level.

It is noted that it is proposed that noise monitoring of the existing background noise level be carried out of the in the area. From this monitoring further information on the likely hood of tonality can be determined.

As part of each industries assessment to achieve planning and environmental approval, the proponent of each industry wanting to locate within the Coolangatta Industrial Estate should carry out a detailed environmental noise assessment. The noise assessment should be carried out by an approved acoustical consultant. The consultant to be a member of the Australian Acoustical Society.

Acoustic modeling to be carried out using a recognized noise modeling computer program.

Modelling to incorporate:

- Topographical data
- Weather conditions
- Sound power levels in at least octave or 1/3 octave bands

The report shall contain at least:

- Methodology
- Noise contours and results of single point calculations
- Sound power levels of noise sources in at least octave bands
- Noise controls to be incorporated in design of plant

## 5.0 CONCLUSION

The critical location for noise emissions from the Coolangatta Industrial Estate is for the total noise level from all industries not to exceed 35 dB(A) at the boundary of the special control area along the Williams – Collie Road. With the inclusion of normal and practical noise amelioration noise emissions from a proposed industry can, comply with the criteria stipulated in the *Environmental Protection (Noise) Regulations 1997*.

To achieve compliance at the boundary of the Special Control Area the following industry sound power noise levels will need to be as listed in Table 6. Additionally, the resultant noise level from those industries when received at the boundary of the special control area will need to be as listed in Table 6.

**TABLE 6 – NOISE LEVELS TO ACHIEVE COMPLIANCE**

Industry	Sound Power Level (dB(A))	Noise Level at Boundary (dB(A))
Power Station	116 (Plant) 111 (Stack)	30
Industry 1	116 (Plant) 108 (Stack)	30
Industry 2	111 (Plant) 110 (Stack)	27
Industry 3	107 (Plant)	25

The proposed buffer distance for each industry are listed in Table 7.

**TABLE 7 – BUFFER DISTANCE (METRES)**

Industry	Buffer Distance (m)
Power Station	2600
Industry 1	3000
Industry 2	2200
Industry 3	2200



As part of each industries assessment to achieve planning and environmental approval, the proponent of each industry wanting to locate within the Coolangatta Industrial Estate should carry out a detailed environmental noise assessment. The noise assessment to be carried out by an approved acoustical consultant.

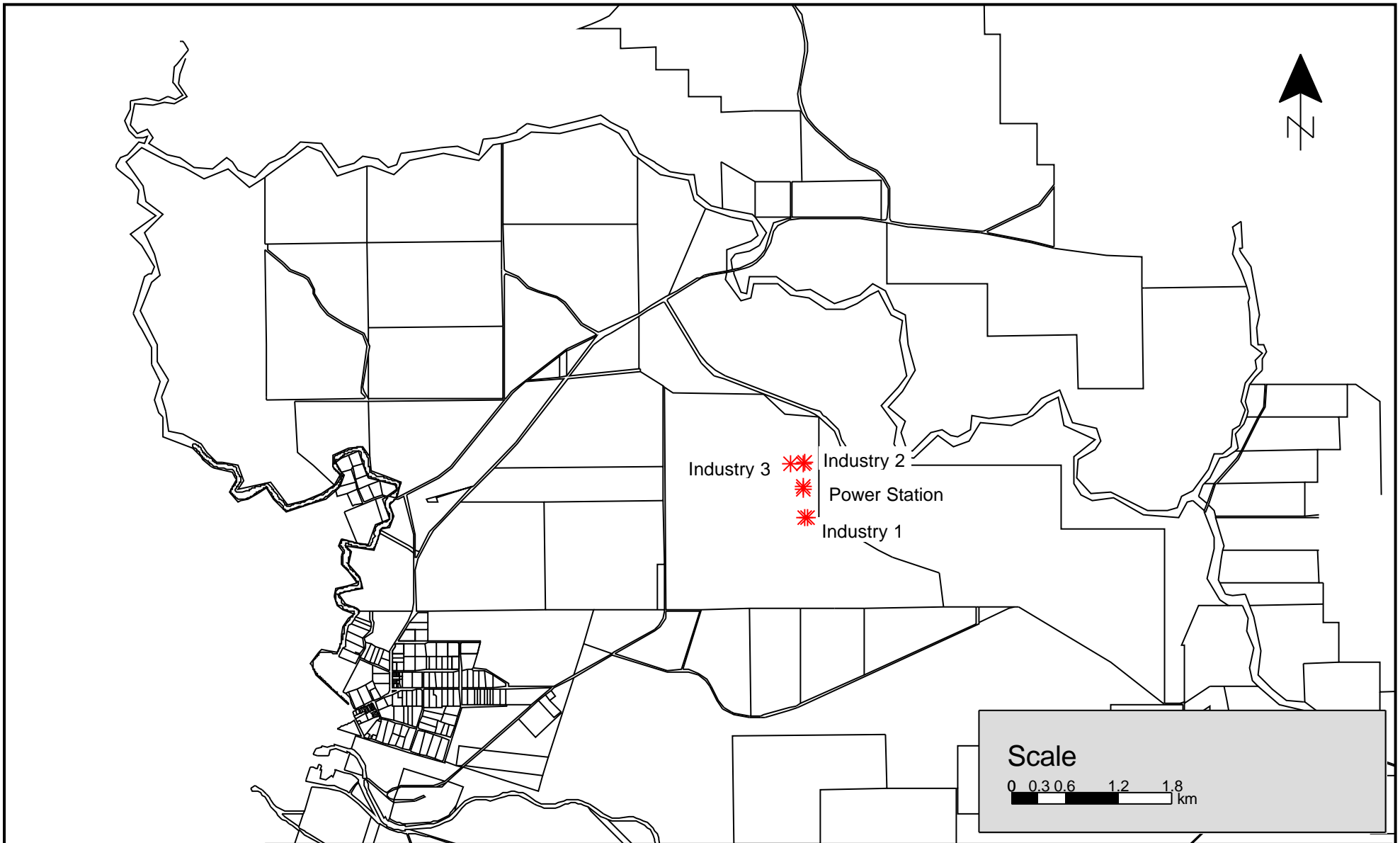
For: **HERRING STORER ACOUSTICS**

Tim Reynolds

28 January 2005

# **APPENDIX A**

## LOCALITY PLAN



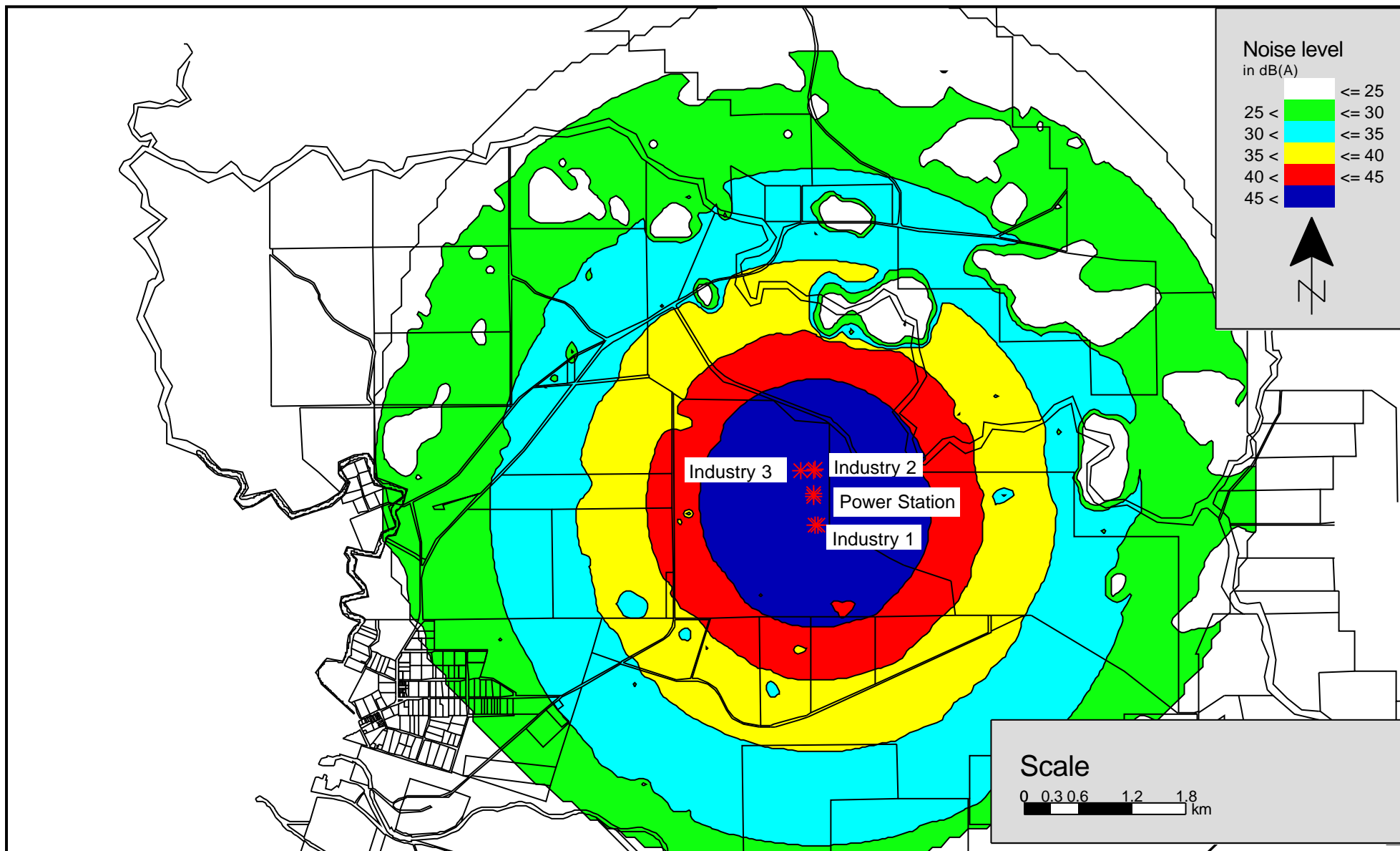
Herring Storer Acoustics  
Job No : 04193-3  
File :Cool Ind 10 01  
Date : 10 January 2005

**GRIFFIN ENERGY PTY LTD**  
**COOLANGATTA INDUSTRIAL AREA - INDUSTRY LOCATIONS**

Figure A1

## **APPENDIX B**

SOUNDPLAN NOISE CONTOUR MAP  
FIGURE 01



Herring Storer Acoustics  
 Job No : 04193-3  
 File :Cool 10 01 E  
 Date : 10 January 2005

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**COOLANGATTA INDUSTRIAL AREA - COMBINED NOISE CONTOUR**

Figure 01