VCAT Proceeding Nos P1829/2011 and P1846/2011

Expert Evidence for Dual Gas Pty Ltd

- Final

25th October, 2011

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1. INTRODUCTION

This report details the Evidence in Reply for VCAT Proceeding No.s P1829/2011 and P1846/2011 on behalf of Dual Gas Pty Ltd

1.1. NAME and ADDRESS

Dr Norm Broner

SKM, 452 Flinders Street, Melbourne, 3000

1.2. QUALIFICATIONS:

Bachelor of Engineering (Hons.)

Masters of Engineering Science, Monash University 1977

PhD (Psychoacoustics), University of London 1979

2. EVIDENCE IN REPLY

1. On or about 6th October, 2011, I became aware that the Princes Freeway had reopened.

   This is of interest because it can potentially impact on the background noise levels in McMillan Street, Morwell for the purposes of establishing the background noise level in accordance with SEPP No. N-1.

   The Freeway is located approximately 280 - 320 metres from the residential properties located at No.8 and No.22 McMillan St. and approximately 460 metres from the Satelberg / McMillan St. intersection.

2. Between midnight and 0100 hrs on 18th October, 2011, I and Paul Walsh undertook noise level measurements in McMillan Street, Morwell, in order to determine the background noise levels in the area of McMillan Street, Morwell.

3. The results from this measurement are set out in a report prepared by Paul Walsh of SKM, which is appended to my report as Attachment A. I have reviewed this report and adopt it as my evidence.

In summary:

1. As a result of traffic along the Princes Freeway, the ambient noise level at McMillan Street, Morwell, is quite variable and dependent on the presence or absence of cars and trucks. The sound level did increase considerably as some trucks went past and truck/car noise was audible for most of the time.

2. No industrial noise was audible during the visit. A slight easterly breeze was present.

3. On comparison with the result of a similar noise survey conducted in September, 2011, it is suggested that the re-opening of the Princes Freeway may have resulted in an increase in the representative background noise level in the McMillan Street area. The Noise Limit may have increased to 42 – 44 dBA.

4. In order to verify this, we recommend that a number of attended night surveys be conducted to determine the background noise level with the newly opened Princes

Freeway. The audibility of any industrial noise could be assessed and whether it "contributes to the effective noise level" if at all, could also be assessed.

I have made all the inquiries that I believe are desirable and appropriate. No matters of significance which I regard as relevant have to my knowledge been withheld from the Tribunal.

ATTACHMENT A

SKM report entitled "HRL Pty Ltd. Dual Gas Demonstration Project

– Ambient Noise Levels at McMillan Street" dated 25th October 2011

HRL Pty Ltd. Dual Gas Demonstration Project

– Ambient Noise Levels at McMillan Street"

ATTENDED ENVIRONMENTAL NOISE SURVEY AT MCMILLAN ST. MORWELL.

- Final
- 25th October 2011

HRL Pty Ltd. Dual Gas Demonstration Project

– Ambient Noise Levels at McMillan Street"

ATTENDED ENVIRONMENTAL NOISE SURVEY AT MCMILLAN ST. MORWELL.

- Final
- 25h October 2011

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Name of project:	Environmental Noise Survey
Name of document:	Attended Environmental Noise Survey at McMillan St. Morwell, October 2011
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1. Introduction

This report details the result of an attended noise measurement survey at McMillan Street, Morwell between 0000 and 0200 hours, on the 18th October, 2011.

Noise level measurements were conducted by Dr. Norm Broner and Mr. Paul Walsh at three measurement locations with a view to (1) obtaining an indication of the background noise level at this location and (2) determining the impact of the newly opened Princes Freeway.

A previous unattended survey had been conducted at 22 McMillan Street during 3/11 – 10/11, 2010. During this survey, based on SODAR measurements (the unit is located at the Power Works Visitor Centre), a slight breeze was generally blowing through from the northwest to the southwest but predominantly from the west.

An attended survey had then been conducted at the corner of McMillan and Satelberg Streets on the 15th /16th September, 2011. The reason for choosing this location rather than 22 McMillan Street itself was that a dog had started barking during our visit and thus the measurement could not be taken at the original location. During this visit, there was a slight westerly (based on the SODAR data) and we heard some "industrial noise" coming from the direction of Hazelwood. We did not hear any noise from the direction of Energy Brix.

The current attended noise level measurements were conducted at:

- Corner of McMillan and Satelberg Streets,
- Front boundary of No. 26 McMillan Street,*
- Front boundary No.8 McMillan Street.

Note that the noise level measurement was this time performed at No.26 McMillan St. rather than at No. 22 McMillan Street due to a dog again consistently barking in a residential property located across the road from 22 McMillan Street. The distance between these two measurement positions is of the order of 25 – 30 metres which would result in an insignificant difference in the measured ambient noise level.

2. Instrumentation

The attended noise level monitoring was performed using a Bruel & Kjaer 2250 Hand Held Analyser. This instrument was calibrated in a NATA accredited laboratory and is a Type 1 meter.

Statistical software calculates and stores the Ln percentile noise levels for each measurement period.

The meter was checked for calibration before and after the noise level measurements using a Bruel & Kjaer NATA accredited Acoustic Calibrator, type 4231

3. Noise Measurement Locations

A general inspection of the local residential area and the neighbouring industrial area was performed to determine any ambient noise sources and to obtain a general idea of the noise emissions from local industry.

The residential area in and around McMillan Street consists of nominally single storey residential buildings on 'normal' size building blocks.

The measurement locations and the corresponding measurement times are listed below:

- Corner of McMillan and Satelburg Streets, - 00:11 – 00:22 hours
- Front boundary of No. 26 McMillan Street, - 00:36 – 00:46 hours
- Front boundary No.8 McMillan Street. - 00:51 – 01:01 hours

Figure 1 shows the location of the proposed Dual Gas Power Station site and the location of the Princes Freeway in relation to the measurement positions along McMillan St.

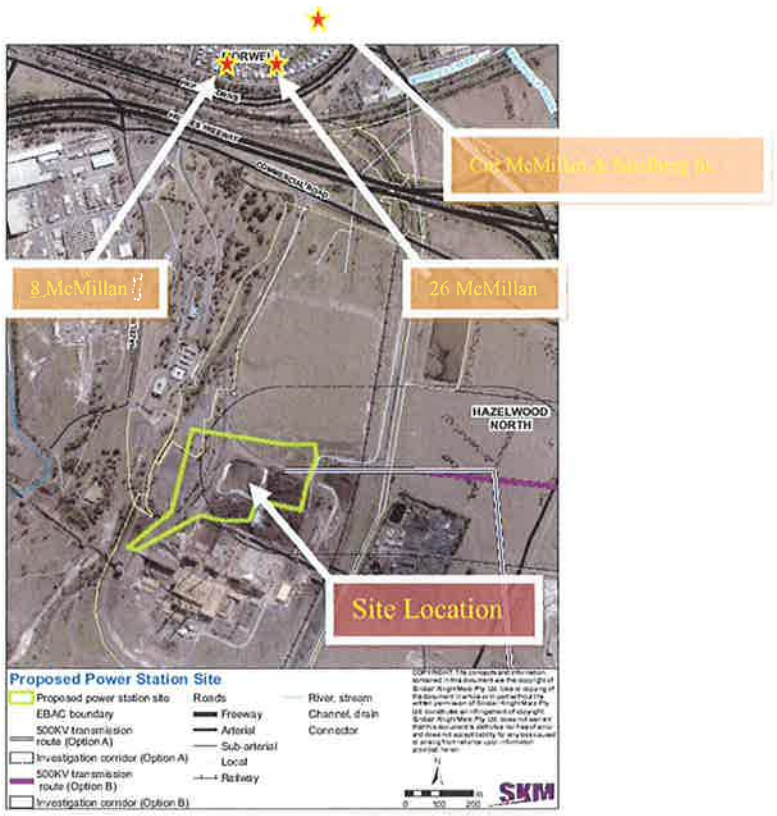

Figure 1 – Attended measurement locations with respect to the Proposed Power Station Site

4. Weather Conditions

The weather conditions at the time of the noise survey were:

- Clear skies
- Slight easterly breeze (the data from the weather station on top of the Hazelwood mine office showed an easterly at approx 3.5 m/s. The SODAR data was unavailable due to equipment malfunction).
- Temperature 4- 5 ^{O}C

5. Measurement Methodology

The measurements were performed on the nature strip at the front boundary of No.26 and No.8 McMillan St. and on the street at the McMillan St. / Satelberg St. intersection.

The measurements were performed over a 10 minute measurement period at each location to determine the typical noise levels experienced at each location.

The Hand Held Analyser was programmed to record L_{Aeq} Sound Pressure Levels at 1 second intervals over the 10 minute measurement period (it must be noted that the L_{A90} noise levels were not recorded on the 18th October due to a programming error).

6. Results

6.1. Survey Performed on 15th September, 2011

The noise level survey performed on the 15th September presented L_{Aeq} and L_{A90} 1 second Sound Pressure Levels measured at the intersection of Satelberg and McMillan Streets (see the Figure below excerpted from SKM report "Ambient Noise Levels at McMillan Street" dated 23 Sept, 2011). During this visit, there was a slight westerly breeze based on SODAR data collected at the Power Works Visitor Centre.

A review of the time traces for both parameters shows that the noise level difference is marginal and that, in this instance, the $L_{Aeq(10\ minute)}$ can provide a reasonable estimate of the background noise level.

Therefore, for the data obtained on the 18th October, 2011, the $L_{Aeq(10\ min)}$ Sound Pressure Level was used as an indication of the background noise level.

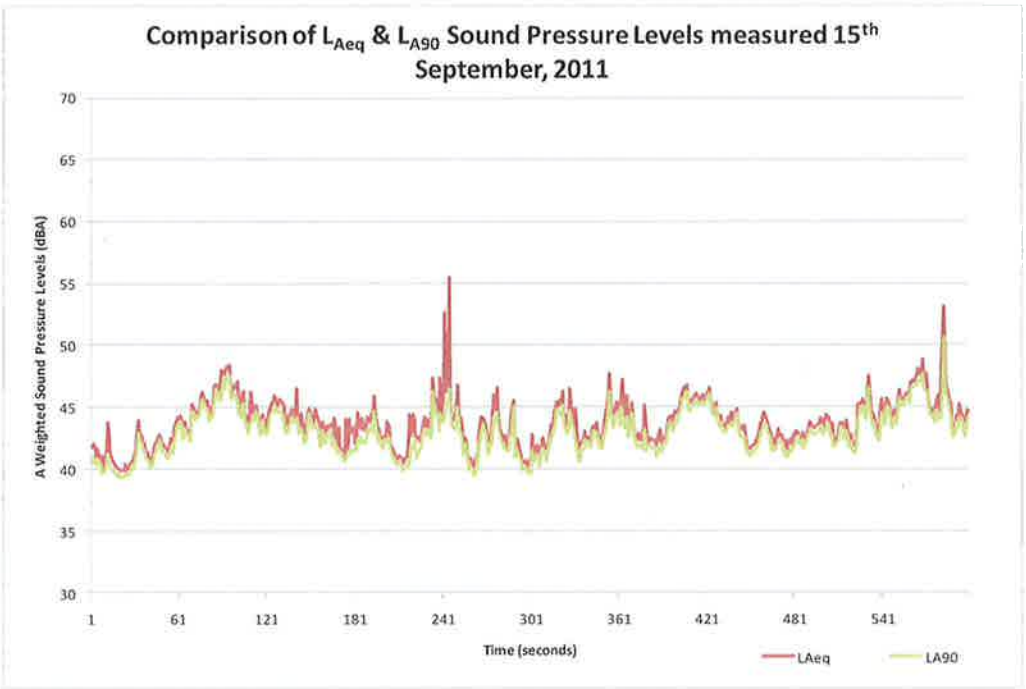

Figure 2 Comparison of L_{Aeq} and L_{A90} 1 second Sound Pressure Levels Measured at the Corner of Satelberg and McMillan Street on the 15th September, 2011.

6.2. Survey Performed on the 18th October, 2011

The results of the noise level measurements performed on the 18th October, 2011, are presented below.

A comparison of the $L_{Aeq\ (1\ second)}$ noise levels measured over each 10 minute measurement period is presented as a time trace in Figure 3 below. It can be seen that a "representative background" sound level might be of the order of 39 - 41 dBA.

Note that no industrial noise was audible during these various noise level measurements.

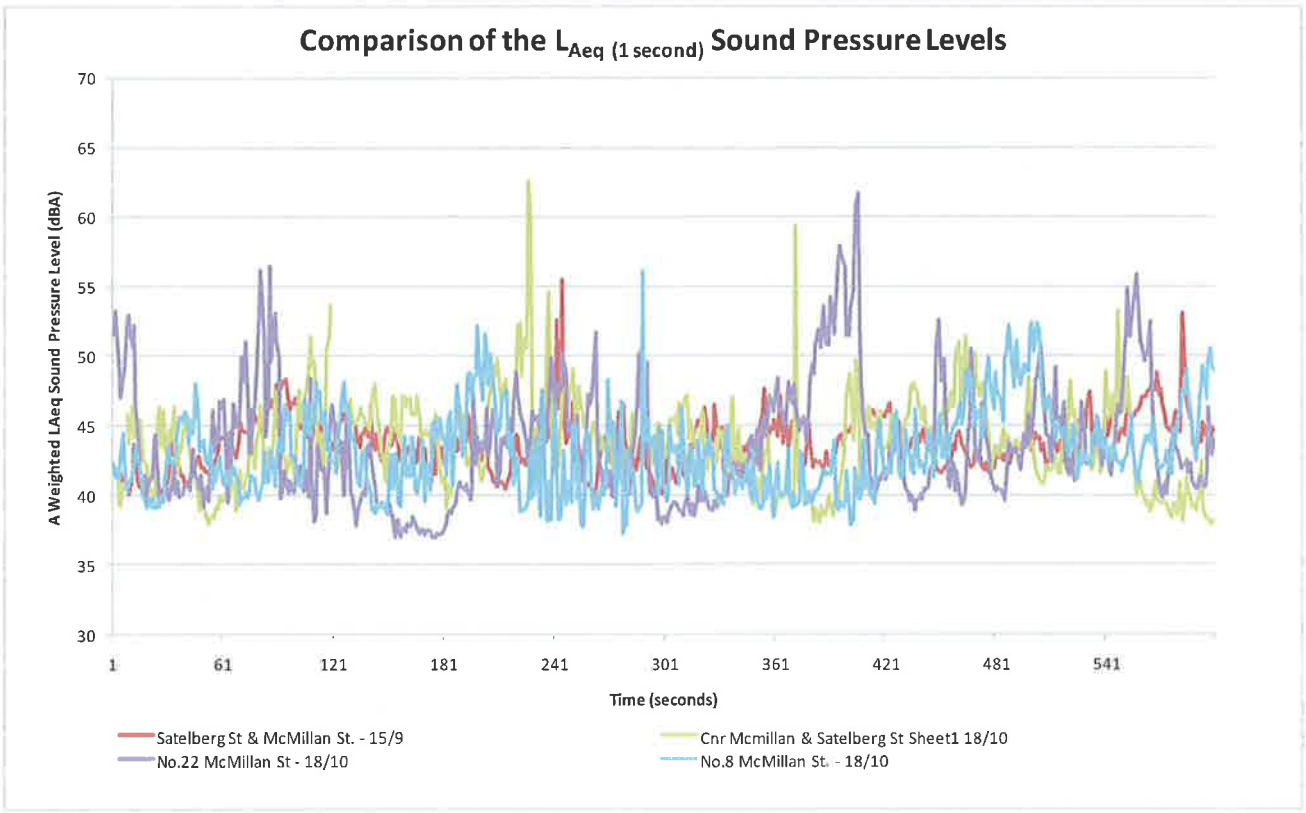

Figure 3 Comparison of $L_{Aeq(1\ sec)}$ Sound Pressure Levels Measured at the 3 Measurement Locations on the 18th October with the $L_{Aeq(1\ sec)}$ measured at the Corner of Satelberg and McMillan Street on the 15th September, 2011.

Table 1 below presents the calculated $L_{Aeq\ (10\ minute)}$ for each of the measurements including the results for the 15th September, 2011.

Table 1 Comparison of the $L_{Aeq(10\ min)}$ Sound Pressure Levels

Measurement Position	$L_{Aeq\ (10\ minute)}$ Sound Pressure Level (dBA)
Intersection Satelberg & McMillan St.- 15/9/2011	44
Intersection Satelberg & McMillan St.- 18/10/2011	45.5
No. 22 McMillan St.	46.5
No. 8 McMillan St.	44.5

It can be seen that the more recent $L_{Aeq\ (10\ minute)}$ noise level at the intersection of Satelberg and McMillan Streets is of the order of 1.5 dBA higher than the level measured in the 10 minute sample from the 15th September, 2011,. We believe that this slight increase reflects an increase due to the opening of the Princes Freeway and that a similar increase in background noise level in the area is very likely. As the SEPP requires that background noise level be chosen that "represents the background level during the period of concern" (SEPP N-1 Clause C3.2), we would recommend that a number of attended night surveys be conducted to determine the background noise level with the newly opened Princes Freeway. The audibility of any industrial noise could be assessed and whether it "contributes to the effective noise level" if at all, could be assessed.

7. Discussion

Attended noise levels measurements were performed along McMillan Street on the 18th October, 2011 with the intention of determining the background noise level at McMillan Street. No industrial noise was audible during the measurements. However, a programming error meant that the LA90 at each location was not recorded.

Noise level data from the 15th September indicated that, in McMillan Street, the L_{Aeq} and L_{A90} 1 second Sound Pressure Levels were similar in magnitude and that therefore the $L_{Aeq(1\ sec)}$ Sound Pressure Levels could be used to provide an indication of the background noise level.

A review of the noise levels measured on the 18th October, 2011, at the 3 measurement locations showed that the results were of similar magnitudes over the 10 minute measurement periods.

A comparison of the current noise level results at the corner of McMillan & Satelberg Street with those obtained on the 15th September, 2011, shows that there was a marginal increase in the $L_{Aeq\ (10\ minute)}$ sound pressure levels.

It was noted that on the 18th October, 2011, road traffic noise was the dominant noise impacting on the overall background noise level and that noise from industry was not audible at any of the three measurement locations.

The overall noise level generated by the road traffic as the vehicles travelled along the Princes Freeway was not only due to vehicle exhaust and engine noise but also due to the tyre / road interaction.

A sound similar to an industrial type noise was audible at No. 8 McMillan Street. The noise seemed to be coming from a direction north of the EBAC complex. Upon further investigation, by driving around the neighbourhood in the general direction of the sound, it was concluded that this noise was being generated by road traffic travelling along the Princes Freeway.

It was also noted that there were numerous truck movements along the Princes Freeway which were clearly audible at McMillan Street and that the instance of traffic noise was by far representative of the background noise at McMillan Street.

We point out that audbility of an industrial plant at any given location does not necessarily imply that the plant is contributing in any significant way to the measured noise level. This is because our ear can pick noises amongst the background noise when specifically listening for them, even when they are up to 10 dBA lower in level than the background noise level, depending on noise

character. Thus, even the presence of audible industrial noise does not necessarily invalidate a backgound noise level measurement.

7.1. Implication with Respect to Noise Limits

The unattended noise level survey conducted between 30/8 – 6/9/11 resulted in a representative background noise level of 38 dBA. This would result in a night time Noise Limit of 41 dBA. Given that the background noise level as a result of this latest survey implies that the opening of the Princes Freeway may have increased the background noise level by 1 – 3 dBA, this would result in an increase in Noise Limit to 42 – 44 dBA.

While the current background noise result in not based on at least two ten minute samples as per Schedule C3.1 of the SEPP N-1, it still indicates that the background noise level in the area of McMillan Street may have increased as a result of the opening of the Princes Freeway. In order to verify this, we recommend that a number of attended night surveys be conducted to determine the background noise level with the newly opened Princes Freeway. The audibility of any industrial noise could be assessed and whether they "contribute to the effective noise level" if at all, could be also assessed.

8. Conclusion

An attended noise survey was performed at three locations along McMillan Street on the 18th October, 2011 between of 0000 and 0100 hours.

It was noted that the noise levels measured at each measurement position were dominated by road traffic travelling along the Princes Freeway, Morwell.

No industrial noise was audible during this survey.

On comparison with the result of a similar noise survey conducted in September, 2011, it is suggested that the re-opening of the Princes Freeway may have resulted in an increase in the representative background noise level in the McMillan Street area. The Noise Limit may have increased to 42 – 44 dBA.

In order to verify this, we recommend that a number of attended night surveys be conducted to determine the background noise level with the newly opened Princes Freeway. The audibility of any industrial noise could be assessed and whether it "contributes to the effective noise level" if at all, could also be assessed.