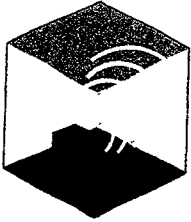


## **Appendix 4**

Noise Assessment (18 October 2011) produced by Ian Sharland Limited



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## ASSESSMENT OF NOISE FROM PROPOSED GENERATORS AT LLANDARCY BUSINESS PARK, LLANDARCY

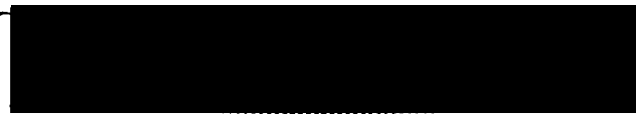


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P2012/1061  
Development Control  
Application Documents - DC  
Supporting Information  
Other  
noise survey

18 October 2011

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## **1. SUMMARY**

1. An assessment of noise has been undertaken on the Llandarcy Business Park, where an array of 12 new electricity generator sets are to be installed.
2. Ambient noise levels have been measured on the site, and this exercise indicates that the background noise level,  $L_{A90}$ , may fall there to levels of 40 dB(A) during the day (0700 - 2300).
3. Calculations of noise radiating from the proposed plant have predicted a level of 35 dB(A) at 1m from the facades of the nearest residential property on Pen-Yr-Hoel, to the east.
4. A formal assessment of the predicted in accordance with the methodology of BS4142:1997 "Method of rating industrial noise affecting mixed residential and industrial areas" indicates that the impact of the predicted noise would be less than 'of marginal significance'.
5. A further assessment of the predicted noise, in absolute terms, indicates that levels would fall comfortably within WHO and British Standard guideline for residential (night-time) occupation.
6. It is therefore concluded that the proposed installation of the generators would not have significant adverse impact on the neighbouring buildings.

### **3. SURVEY OF AMBIENT NOISE LEVELS**

To assess the ambient background noise levels, a Rion NL31 sound level meter was set up close to the land designated for the new generators (see Figure 1).

The sound level meter was set up 2m above ground, in a free field position. The equipment was calibrated before and after the measurements were taken, and showed no significant variation. Calibration details for the equipment are as follows:

Type	Manufacturer	Description	Serial number	Last Calibration Date	Calibration Certificate No.
NL31	Rion	Sound Level Meter	952333	03/06/2011	CAL061107

The survey ran from 15.00 Thursday 29th September to 09.00 Monday 3rd October 2011.

The conditions during the survey were dry throughout, with south-easterly winds averaging 3 - 5 m/s on each of the 4 days.

The primary noise sources in this area would be commercial activity associated with the Business Park, coupled to an underlying contribution from traffic on the M4 motorway (100m to the east of the site).

The meter was configured to measure 5 minute samples of the following acoustic parameters:

- $L_{Aeq}$  The A-weighted equivalent continuous sound pressure level which, over the sample period, contains the same acoustic energy as the time-varying signal being recorded.
- $L_{Amax}$  The A-weighted maximum sound pressure level recorded during each sample period (as measured on fast response).
- $L_{A90}$  A statistical parameter, representing the A-weighted noise level exceeded for 90% of each sample period. This gives a measure of the underlying noise, and is commonly used to describe the ambient background noise.

The variation of noise levels is shown graphically in Figure 2.

The key measurement for this exercise is the minimum value of the background noise recorded during the proposed operating period, 0700 - 2300. The levels were found to fall to a minimum of 40 dB(A)  $L_{A90, 5 \text{ mins}}$  during the period surveyed.

The significance of this figure will be discussed below.

#### **4. PREDICTION OF GENERATOR NOISE**

The proposal for the Llandarcy site covers the installation of 12 generator sets, to be arranged in an array of three rows of four engines.

The diesel engined generators to be installed are based on a SDMO X2500 engine. The engines and alternators are housed within an acoustically lined ISO container. Ventilation apertures and engine exhausts are all silenced.

Technical data received from the supplier of the generator confirms a noise level of 79.1 dB(A) at a distance of 1m from the container.

In this situation, the generator sets will be located in a compound on the northern edge of the site (Figure 1). The containers are 2.8m in height, and it is proposed that a barrier totalling 3.5m in height will be constructed on (as a minimum) the north and east sides of the compound. The barrier may be built as a combination of an earth bund and a timber fence on top<sup>1</sup>.

The distance from the generator compound to the nearest noise sensitive residential property is approximately 190m, and it is noted that the land here is approximately 1m higher than the land at the houses.

Appendix 1 provides a calculation of transmitted noise from the generators to the facade of these properties. The result is summarised below:

<b>Location</b>	<b>Predicted Facade Noise Level, <math>L_{Aeq, 5 \text{ mins}}</math></b>
Pen-Yr-Heol	35 dB(A)

An assessment of noise reaching the rear of the adjacent commercial buildings suggests that noise levels with no screening would be 62 dB(A), or 55 dB(A) if the 3.5m high screen were returned along the southern boundary of the compound.

<sup>1</sup> The fence will be constructed in not less than 22mm timber boards, either tongued & grooved panels, or butted edged with a 100mm cover strip behind each joint.

## **5. ASSESSMENT OF NOISE AFFECTING ADJACENT PROPERTIES**

Any formal assessment of commercial noise affecting residential properties would normally be based upon the recommendations of British Standard 4142:1997 "Method for rating industrial noise affecting mixed residential and industrial areas".

In brief, this rating method determines "specific noise level" generated by the new plant, assessed immediately outside the residential properties most likely to be affected. For operation which occurs during the hours of 0700 - 2300<sup>2</sup>, this would be the equivalent continuous noise level of the new noise, evaluated over a 60 minute sampling period, its  $L_{Aeq}(60 \text{ mins})$ . A correction of + 5 dB (A) is then made to this measured level if the new noise is noticeably tonal in content or intermittent, to give the "Rating Noise Level".

If the rating noise level exceeds the ambient background noise level<sup>3</sup> by more than 10 dB(A), complaints are to be expected. An excess of 5 dB(A) is said to be "of marginal significance". If the rating level is more than 10 dB(A) below the measured background noise level then this is a positive indication that complaints are unlikely.

The noise survey indicated minimum background noise levels of 40 dB(A)  $L_{A90}$ .

A formal assessment of the predicted noise at the houses would then be as follows:

Specific Noise Level, $L_{Aeq}$ , 60 mins	35 dB(A)
Correction for Tonal Quality	+ 5 dB
Rating Noise Level, $L_{Aeq}$ , 5 mins	40 dB(A)
Lowest Ambient Noise Level, $L_{A90}$ , 5 mins	40 dB(A)
<b>BS4142 Rating</b>	<b>0 dB</b>

**BS4142 would therefore indicate that the impact of the predicted noise from the new generators would be less than one of 'marginal significance'.**

An alternative approach would be to consider the guideline set out in BS8233:1999 "Sound insulation and noise reduction in buildings - a code of practice.". Mirroring the guideline values in the 1999 WHO report "Guideline for Community Noise", this Standard provides standards for (amongst other building-type) acceptable living conditions within residential buildings. It advises that noise levels within living rooms should not exceed 30 dB(A)  $L_{Aeq}$  if a Good standard is to be provided.

This limit is given in respect of anonymous noise sources, such as distant road traffic. Where the noise will have a particular character, a lower noise level would be appropriate. Here,

<sup>2</sup> The hours defined within the Standard for day time conditions, and the proposed operating hours here

<sup>3</sup> That is the noise level which would prevail at that time and place, in the absence of any noise from the new plant under consideration. The background noise is normally measured and described as the  $L_{A90}$  parameter

with attenuated diesel engines as the source, it is proposed that an internal noise level of 25 dB(A) would represent a Good standard.

In order to equate this internal target to an external facade level, the conservative assumption must be that windows are open. PPG 24 'Planning and Noise' advises that there is no guidance given in the WHO document on the allowance to be made for the sound insulation qualities of a partially open window. This is usually taken to be 10 - 15 dB(A)<sup>4</sup>.

Adopting the lower of these figures, the recommended internal target would be met if the external facade noise level is less than 35 dB(A).

Comparison of this target with the predicted facade noise level of 35 dB(A) would confirm that confirms compliance.

**It is therefore concluded that the residual noise from the generator sets will achieve a 'Good' standard, as described in BS8233.**

In respect of the adjacent units on the industrial estate, the predicted facade noise level of 55 dB(A) with the acoustic screen would be similar to the typical day time noise levels currently measured. As such, it would be suggested that the impact of the new generators would be of minor significance.

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<sup>4</sup> Transportation Noise Reference Book: Edited by Paul Nelson, published by Butterworths, 1987.



Figure 1 - Aerial View of Site

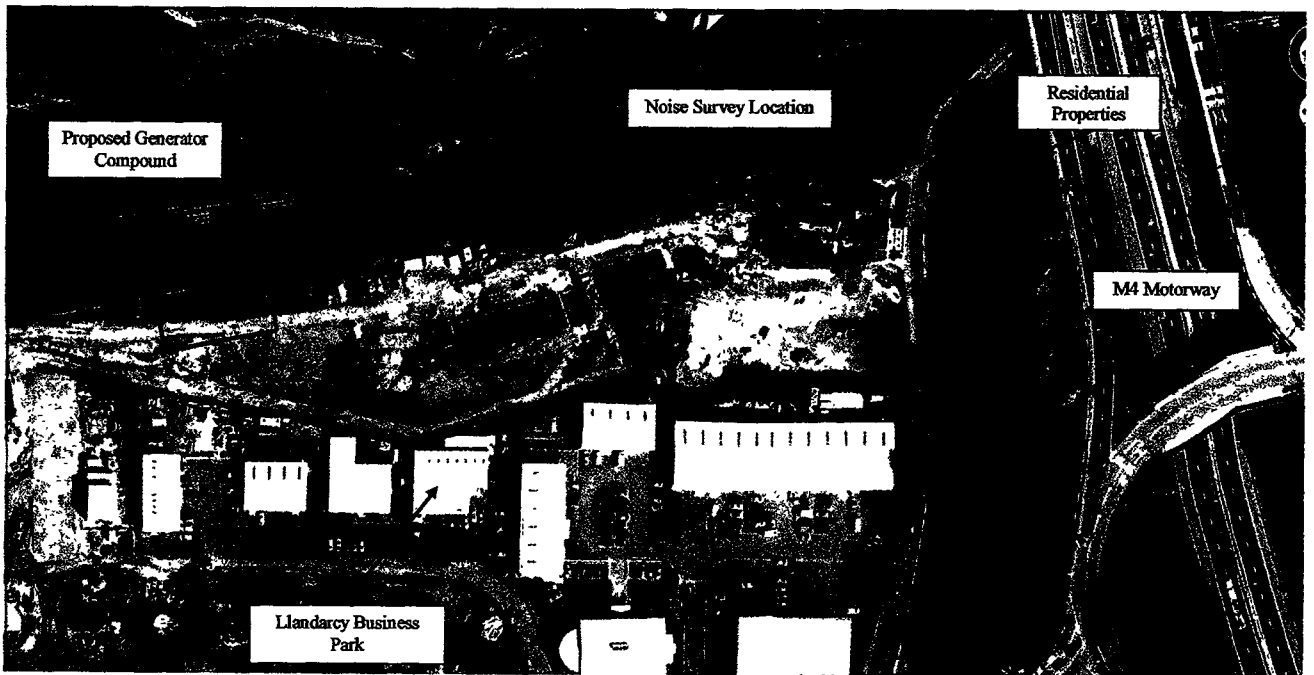
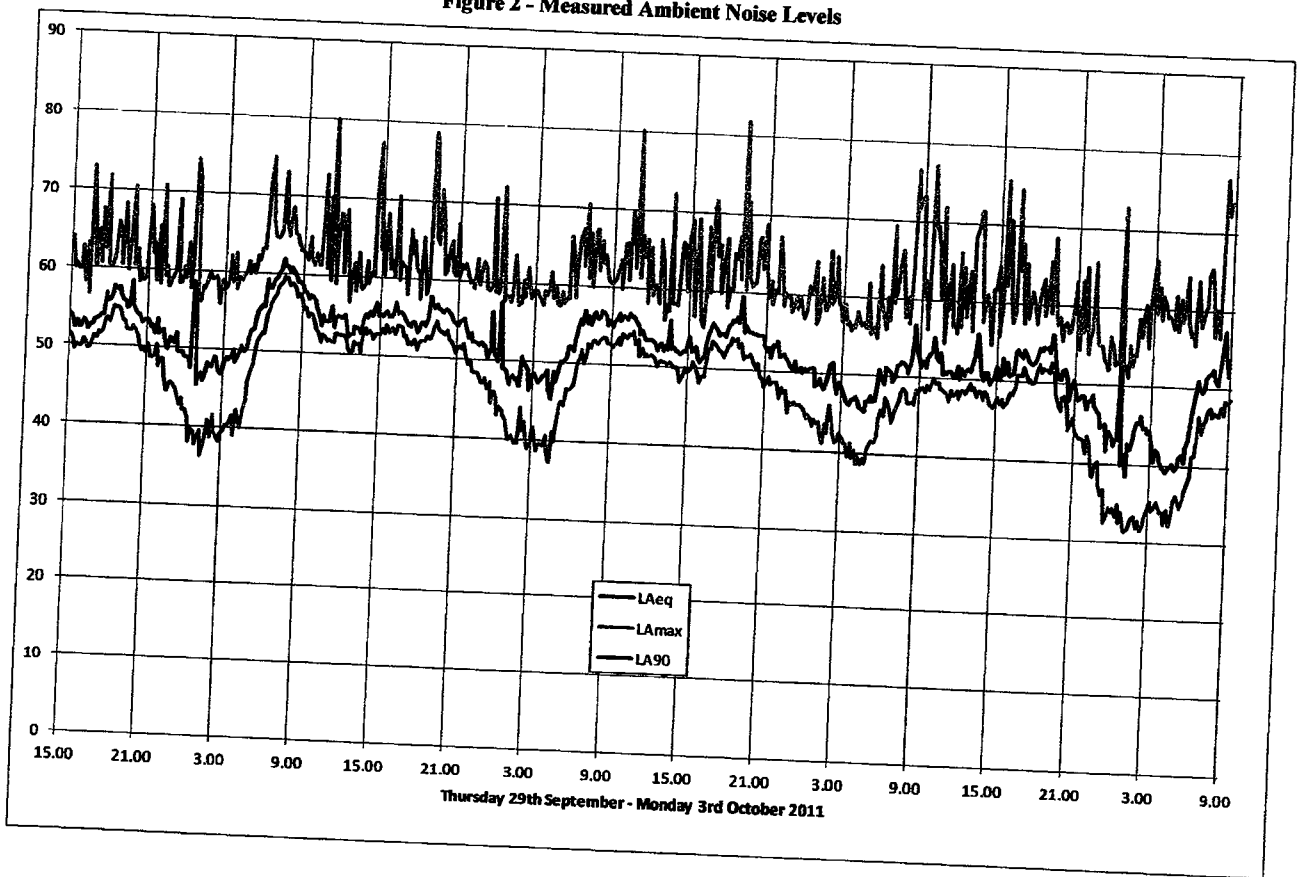


Figure 2 - Measured Ambient Noise Levels



*Appendix I - Calculation of predicted noise levels at the nearest facades*

**Residential Property to East (Pen Yr Hoel)**

Generator Set	SPL @1m	Total Distance	Distance Correction	Screening Loss	Facade Correction	SPL @ Facade
	dB	m	dB	dB	dB	dB
1	79	190	-45.6	-15.0	2.5	20.9
2	79	190	-45.6	-15.0	2.5	20.9
3	79	190	-45.6	-15.0	2.5	20.9
4	79	190	-45.6	-15.0	2.5	20.9
5	79	210	-46.4	-10.0	2.5	25.1
6	79	210	-46.4	-10.0	2.5	25.1
7	79	210	-46.4	-10.0	2.5	25.1
8	79	210	-46.4	-10.0	2.5	25.1
9	79	230	-47.2	-9.0	2.5	25.3
10	79	230	-47.2	-9.0	2.5	25.3
11	79	230	-47.2	-9.0	2.5	25.3
12	79	230	-47.2	-9.0	2.5	25.3

Total LAeq 34.9