

Kronospan Chirk

Baseline noise measurements in Woodland to inform Noise Impact Assessments

Report ref.

CJA4909/23241/Rev 1

Issued to

Kronospan Limited

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Rev 0	Issued for comment	15/03/24
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1. INTRODUCTION

Kronospan instructed Spectrum to undertake noise measurements in a woodland adjacent to the Kronospan Chirk site in support of the permit application for a proposed CHP plant development on the site.

The noise data is required to assess the impact of the proposed development on birds and bats.

2. MEASUREMENT REQUIREMENTS

2.1 MEASUREMENT LOCATIONS

The noise measurement locations provided to Spectrum are indicated in Figure 2.1 below.

Spectrum were able to gain access to these locations via pathways and a noise logger was installed at each location, as shown in Figure 2.2.

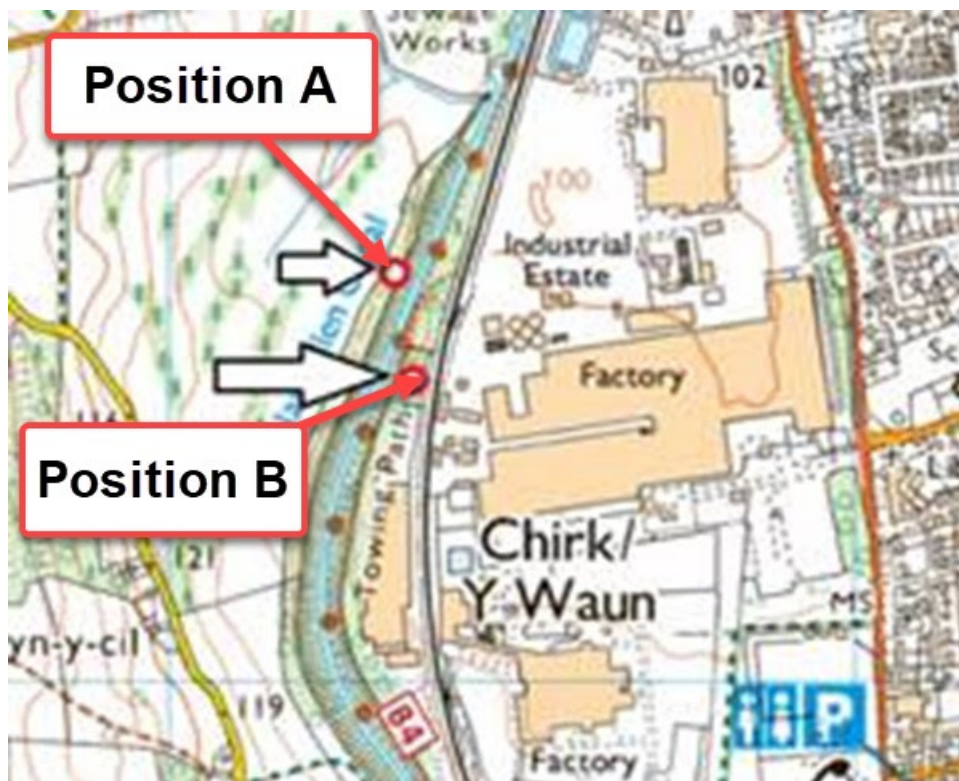


Figure 2.1: Measurement locations

Grid reference for Position A and Position B are as follows:

Position A: x=328353, y=338597

Position B: x=328365, y=338484



Figure 2.2: Noise logging equipment

3. NOISE PARAMETER REQUIREMENTS

Spectrum were instructed to obtain the following parameters over a minimum of 24 hrs:

- For assessing the impact of noise on birds: 15min contiguous LAeq and LAmix levels
- For assessing the impact of noise on bats: LAeq, LAmix and one-third octave band centre frequency spectra from 10Hz to 20kHz.

4. INSTRUMENTATION AND MEASUREMENT PROCEDURE

4.1 INSTRUMENTATION

Instrumentation used for the surveys was as follows:

Location 1:

- Bruel & Kjaer Type 2270 Sound Level Meter s/n 3003731
- Bruel & Kjaer Type 4189 Microphone s/n 2888222
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3009564
- Bruel & Kjaer Type UA1404 Outdoor Microphone Kit

Location 2

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3024398
- Bruel & Kjaer Type 4189 Microphone s/n 3147720
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3021283
- Bruel & Kjaer Type UA1404 Outdoor Microphone Kit
- Skywatch Eole Handheld wind meter



The noise meters were field calibrated before and after the survey and deviation was less than 0.2dB.

Calibration certificates are included in Appendix A.

4.2 MEASUREMENT PROCEDURE

The noise loggers were set to measure over contiguous 15 min periods for approximately 48 hours to allow for expected changes in plant operating conditions.

5. WEATHER CONDITIONS

The weather was calm and dry throughout the survey period. Wind speed was sampled periodically throughout the survey and was below 3.5m/s or not measurable.

6. MEASUREMENT RESULTS

Detailed data for each of the parameters identified in Section 3 above are provided separately in spreadsheet format.

The graphs below are included in order to provide an overview of the $L_{Aeq,T}$, L_{Amax} and $L_{A90,T}$ levels at each location, along with 100ms traces.

It should be noted that subjectively noise from the Kronospan site was dominant at each location, characterised by continuous industrial noise (typically from continuously operating rotating machinery such as fans and pumps), and periodic impulsive noise (from bag filter pulse cleaners).

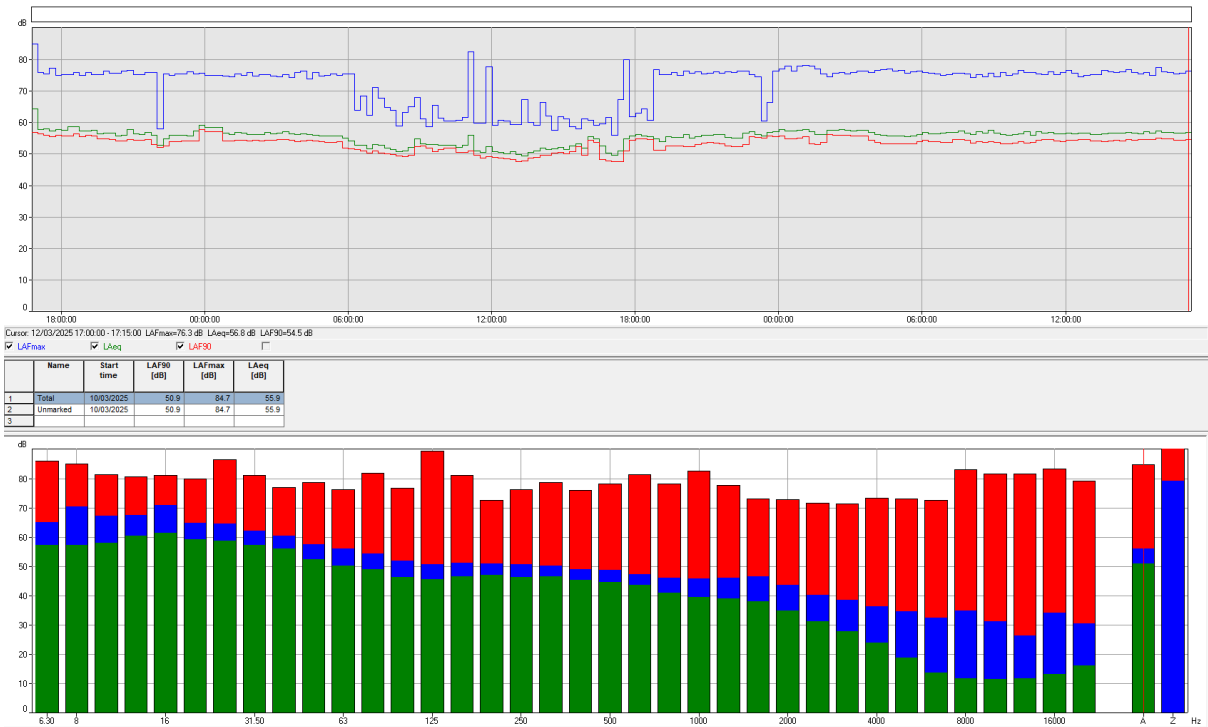


Figure 6.1(a): Graphical summary of noise levels at Position A over 48 hrs ($L_{Aeq,T}$, L_{Amax} and $L_{A90,T}$)

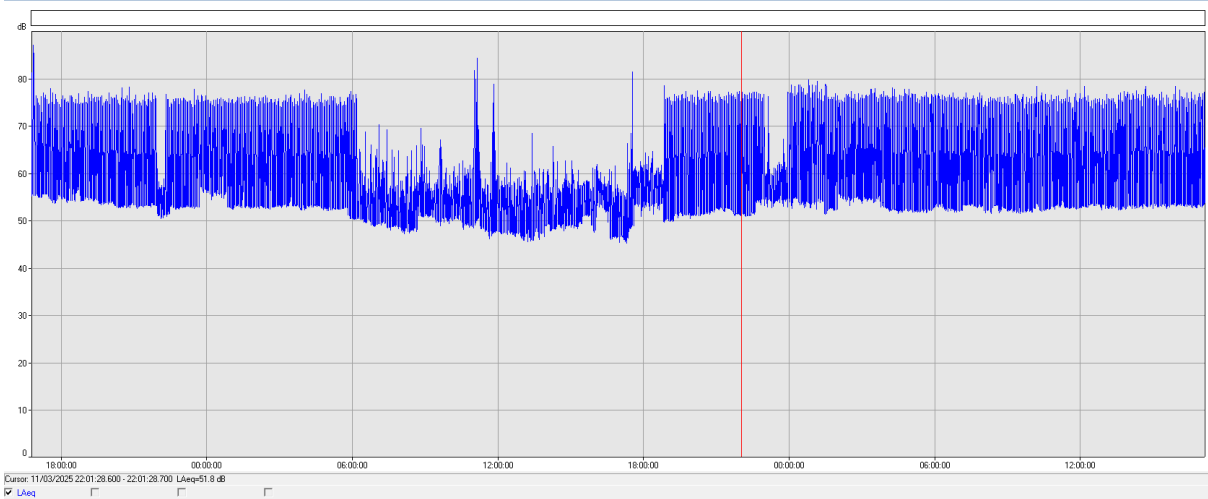


Figure 6.1(b): Graphical summary of noise levels at Position A (100ms trace)

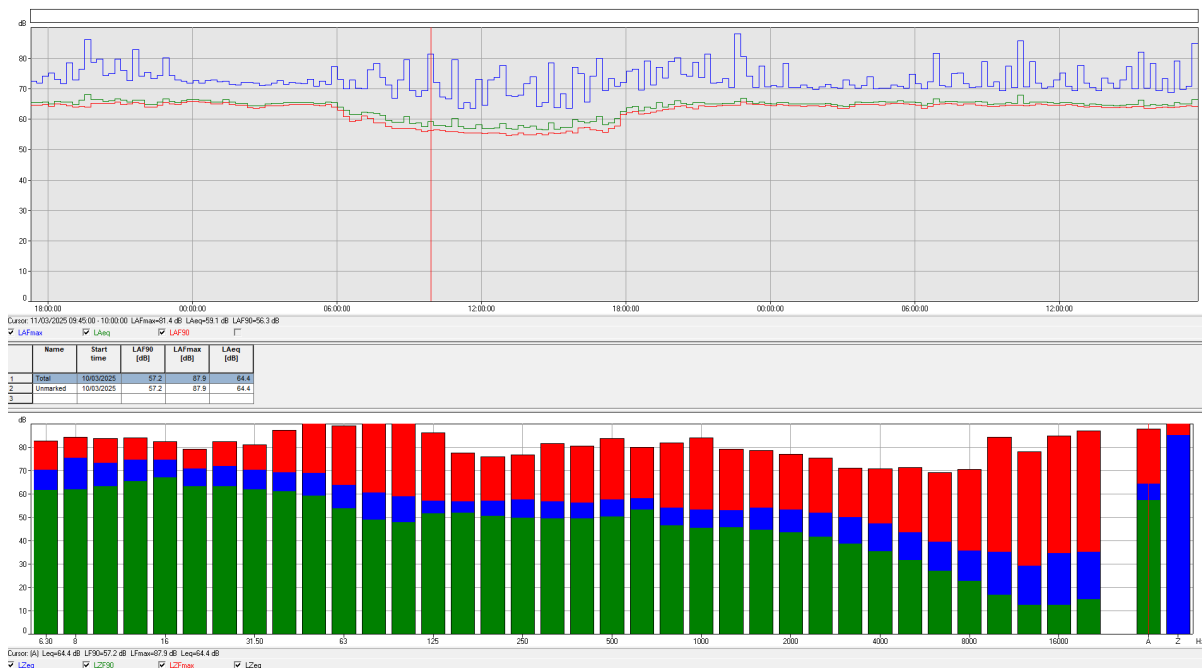


Figure 6.2(a): Graphical summary of noise levels at Position B over 48 hrs ($L_{Aeq,T}$, L_{Amax} and $L_{A90,T}$)

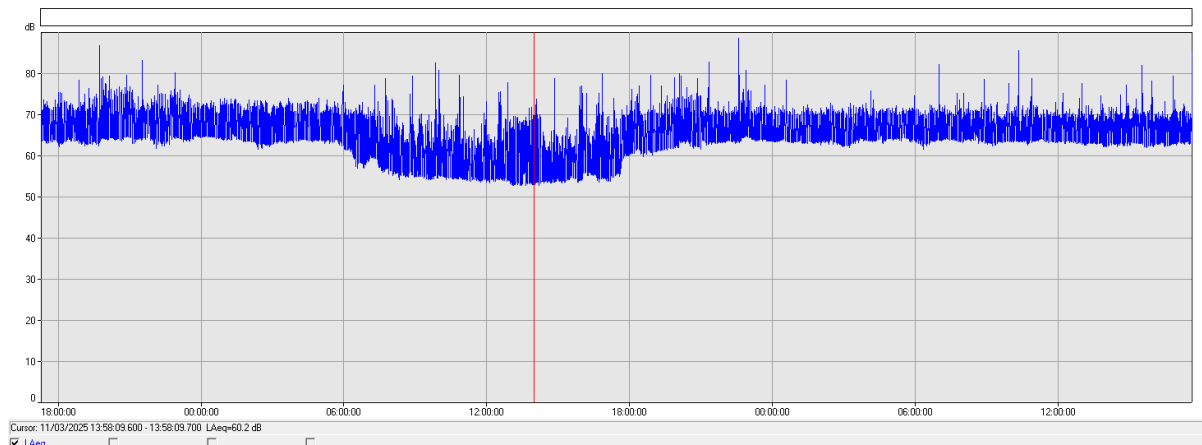
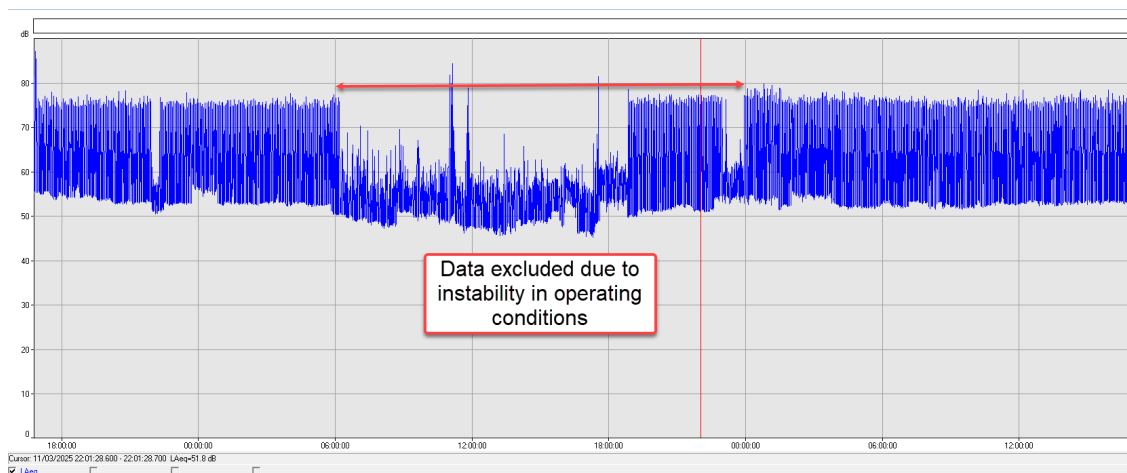


Figure 6.2(b): Graphical summary of noise levels at Position B (100ms trace)

The graphs show marked instability in noise levels from 06:00 hrs on 11/03/25 until 00:00 hrs on 11/03/25, and Kronospan subsequently confirmed that significant parts of the plant were not operating fully during that period (see also Appendix B).

In view of this, data from the period shown below (using Figure 6.1 (b) as a reference) has been excluded from the analysis.



With the data indicated above removed from the analysis, the relevant data from the measurements is as follows:

Position	$L_{Aeq,T}$ (15min)		Lamax (15min)	
	Mean	Range	Mean	Range
A (Woodland West)	57	53-59	75	58-77
B (Woodland East)	65	64-68	74	69-86

Table 6.1: Daytime 07:00-23:00

Position	$L_{Aeq,T}$ (15min)		Lamax (15min)	
	Mean	Range	Mean	Range
A (Woodland West)	57	55-59	76	74-79
B (Woodland East)	65	64-67	72	70-82

Table 6.2: Night-time 23:00-00:00

7. DISCUSSION OF RESULTS

Measured noise levels at Position A are generally lower than at Position B as would be expected due to the increased distance from the Kronospan site, with a difference of approximately 8 dB between them.

It should be noted that Position A was higher physically than Position B, with Position A perhaps 10m higher and close to the top of the canal embankment, and Position B close to site ground level.

This would tend to expose Position A to more noise sources from the Kronospan site than Position B, albeit at a greater distance.

The strong correlation between daytime and night-time levels indicates that at both locations industrial noise was dominant, since traffic noise would tend to decrease at night. Further to this, attended measurements meant it could be confirmed that the Kronospan site was the dominant source.

A P P E N D I X A

Instrumentation Calibration Certificates

CERTIFICATE OF CALIBRATION

No: CDK2403291

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CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2270	No: 3003731	Id: -
Microphone:	Brüel & Kjær Type 4189	No: 2888222	
PreAmplifier:	Brüel & Kjær Type ZC-0032	No: 20663	
Calibrator:	Brüel & Kjær Type 4231	No: 3009564	
Software version:	BZ7222 Version 4.7.7	Pattern Approval:	-
Instruction manual:	BE1712-22		

CUSTOMER

Spectrum Acoustics
27-29 High Street
SG18 0JE Biggleswade
Bedfordshire, United Kingdom

CALIBRATION CONDITIONS

Preconditioning: 4 hours at $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$
Environment conditions: *See actual values in **Environmental conditions** sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2270 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 9.1 - DB: 9.10) by using procedure B&K proc 2270, 4189 (IEC 61672:2013).

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device(s) under calibration. The results are only applicable for the specific device(s) listed above.

Date of calibration: 2024-05-21

Date of issue: 2024-05-21



Jeannie Gerd Nielsen
Calibration Technician



Jesper Bo Vedel
Approved Signatory

CERTIFICATE OF CALIBRATION

No: CDK2403278

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CALIBRATION OF

Calibrator: Brüel & Kjær Type 4231 No: 3009564 Id: -
Acoustical Adaptor: Brüel & Kjær Type UC-0210 (1/2" Adaptor)
Pattern Approval: None

CUSTOMER

Spectrum Acoustics
27-29 High Street
SG18 0JE Biggleswade
Bedfordshire, United Kingdom

CALIBRATION CONDITIONS

Preconditioning: 4 hours at $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$
Environment conditions: See actual values in **Environmental conditions** section.

SPECIFICATIONS

The Calibrator Brüel & Kjær Type 4231 has been calibrated in accordance with the requirements as specified in IEC 60942:2017 Annex B - Microphone method. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Calibrator Calibration System 3630 with application software type 7763 (version 8.6 - DB: 8.60) by using procedure P_4231_4180_M_LS_A01.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device(s) under calibration. The results are only applicable for the specific device(s) listed above.

Date of calibration: 2024-05-17

Date of issue: 2024-05-21



Sylvia Wu Andersen
Calibration Technician



Jesper Bo Vedel
Approved Signatory


A P P E N D I X B

Kronospan plant operation and wind speed measurements during the survey


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