Appendix 18

Maelor Foods Expansion, Pickhill Ln, Cross Lanes, Wrexham LL13 0UE

Noise Impact Assessment

for Salisbury Poultry Ltd, Salisbury House, Vulcan Road, Bilston, WV14 7HT

Our Reference	Your Reference	Issue Date	Author	Approver	Revision History
21705R01JBPK	-	16/03/2022	Jake Brickley AMIOA	Paul Kelly MIOA	1st issue
21705R01aJBPK	-	18/05/2022	Jake Brickley AMIOA	Paul Kelly MIOA	2nd issue – following comments from Maelor Foods and receipt of further plant information
21705R01bPKSW	-	10/08/2022	Paul Kelly MIOA	Sam Williams MIOA	3rd issue – Section 6 updated following comments from Cassidy & Ashton on 14.07.2022
21705R01cJBPK	-	08/09/2022	Jake Brickley AMIOA	Paul Kelly MIOA	4th issue – Section 4 updated following plant noise survey and further comments from Cassidy & Ashton on 31.08.2022
21705R01dJBPK	-	12/09/2022	Jake Brickley AMIOA	Paul Kelly MIOA	5th issue – Section 5 updated following further comments from Cassidy & Ashton on 12.09.2022.
21705R01eJBPK	-	15/02/2023	Jake Brickley AMIOA	Paul Kelly MIOA	6th issue – Sections 2, 3, 4, 5 and 6 updated following comments from Local Authority on 22.12.2022.

Executive Summary

Environoise Consulting Limited has been instructed by Salisbury Poultry Limited to do a noise impact assessment for the proposed expansion of operations at Maelor Foods, Pickhill Lane, Cross Lanes, Wrexham LL13 0UE.

The key report findings are as follows:

- A previous noise survey was undertaken between 13.00hrs, Monday 13th July and 08.45hrs, Thursday 16th July 2020 to determine background noise levels at the nearest three residential receptors ($L_{A90\ (15min)}$).

Plant Noise Impact

- An attended noise survey was done between 09.00hrs and 12.00hrs, Thursday 8th September 2022 to determine the ambient noise level ($L_{Aeq,T}$) of the existing condenser unit.
- The predicted level of plant noise exceeds the daytime target by 4dB and the night-time target by 13dB at the Pickhill Lane receptor, which depending on the context, is likely to be an indication of an adverse impact. The context is an existing and established item of plant at an industrial premises with other plant elsewhere subject to the previous Condition requirement. On this basis, we consider that the predicted level of excess can be reduced by 5dB, which results in no excess during the daytime and an excess of 8dB during the night-time at Pickhill Lane NSR.
- BS8233 internal ambient noise level targets are predicted to be met in living rooms and bedrooms of the nearest NSR considering a partially opened window. WHO Guidelines noise level targets for amenity areas are predicted to be met for the garden of the Pickhill Lane NSR. On this basis, we therefore consider that plant noise is sufficiently low and further noise mitigation measures are not necessary, see section 4. However, we have given recommendations in section 6 to mitigate the existing Evapco plant noise during the night-time period if required.
- The plant noise limit is met at both other receptors during the daytime and night-time periods.

HGV Noise Impact

- HGV noise is predicted to marginally exceed the daytime target by 1dB at the Pickhill Lane NSR, which is considered negligible. HGV noise during the night-time period (23.00 – 07.00hrs) is predicted to exceed the target by 8dB at the Pickhill Lane NSR. The daytime and night-time targets are predicted to be met at both other NSRs with no further mitigation measures required, see section 5.
- Recommendations including reduced HGV movements during the night-time period and an acoustic barrier have been provided to sufficiently mitigate HGV noise. HGV delivery Best Practice and Site Management recommendations have been provided so noise is not unduly generated, see section 6.

Table of Contents

1 Introduction

1.1 Overview

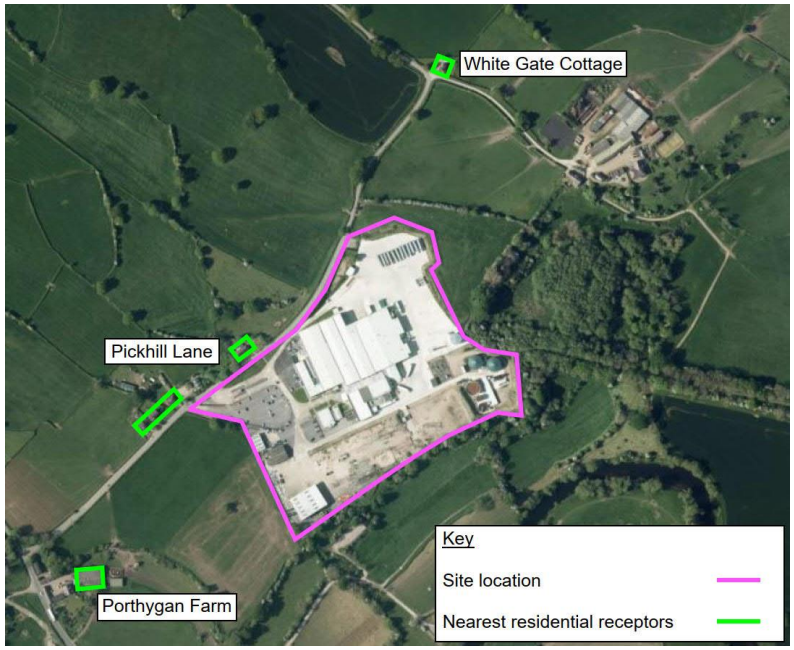
1.1.1 Environoise Consulting Limited has been instructed by Salisbury Poultry Limited to do a noise impact assessment for the proposed expansion of operations at Maelor Foods, Pickhill Lane, Cross Lanes, Wrexham LL13 0UE. Noise sources that require assessment are proposed fixed external plant and additional HGV deliveries.

1.1.2 Environoise has previously undertaken noise impact assessments and investigations at Maelor Foods, the most recent being report ref: 21426R01SWmdw in July 2020. Background noise data taken during this noise investigation has been used in this assessment.

1.2 Site Description

1.2.1 The site is located on Pickhill Lane, which accommodates the nearest existing residential receptors. Figure 1.1 provides the site location and nearest residential receptors (NSRs).

Figure 1.1: Site location and nearest residential receptors.



2 Criteria

2.1 Local Authority

2.1.1 Our assessments have to date been based on what was the Local Authorities condition requirement for industrial noise associated with the site achieving a noise level no higher than 5dB(A) above the background noise level assessed in accordance with BS4142.

2.1.2 The Local Authority has advised[1] that this target is now been retired and replaced with a more stringent requirement for industrial noise associated with the site achieving a noise level no higher than the background noise level assessed in accordance with BS4142.

2.2 BS 4142+A1:2019

2.2.1 BS 4142:2014+A1:2019[i] provides a method of determining the 'impact of specific sound' on dwellings due to industrial and commercial noise sources through comparison between the measured background noise level (L_{A90}) and the noise source rating level ($L_{Ar,Tr}$) under consideration. The rating level is the specific noise level plus penalties of up to 18dB added for features to account for the character of the noise as follows:

- **Tonality:** +2dB penalty: Just perceptible; +4dB penalty: Clearly perceptible and +6dB penalty: Highly perceptible.
- **Impulsivity:** +3dB penalty: Just perceptible; +6dB penalty: Clearly perceptible and +9dB penalty: Highly perceptible.
- **Intermittency:** +3dB penalty: identifiable on/ off conditions.
- **Other:** +3dB penalty: where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent.

2.2.2 When comparing the rating plant noise level against the background noise level, BS 4142 provides the following noise impact descriptors:

- +10dB(A) is likely to be an indicator of 'a significant impact, depending on the context'.
- +5dB(A) is likely to be an indicator of 'an adverse impact, depending on the context'.
- No excess of the background noise level is an indicator of 'a low impact, depending on the context'.

[1] Understood from Planning Memorandum P/2022/0820, 21 & 22 from Ian Jones, Public Protection Service Manager, forwarded by Guy Evans, Cassidy & Ashton on 16/01/2023.

3 Baseline Noise Data

3.1 Previous Noise Survey

3.1.1 Unattended background noise levels were previously measured in accordance with BS4142 at two positions representative of NSRs on Pickhill Lane, Porthygan Farm and White Gate Cottage between 13.00hrs, Monday 13th July and 08.45hrs, Thursday 16th July 2020. The noise measurement positions are indicated in Figure 3.1.

3.1.2 We therefore consider the previous noise data to be representative of the 'present day' background noise environment.

Figure 3.1: Previous noise survey measurement positions.

3.2 Baseline Noise Survey Results

3.2.1 BS4142 requires the use of a 'representative' background noise level, and suggests that the modal value can be used to assess the impact of plant and HGV operations. The limiting noise levels include a 5dB increase over the modal value, which relates to the Local Authority target given in section 2.1. Results of the full measurement period can be found in Figures A1 and A2, Appendix A.

Table 3.1: Previously measured background noise levels.

Position	Measurement period	Measured background noise level [$L_{A90\ (15min)}$ (dB)]		Limiting noise level [$L_{Ar,Tr}$ (dB)]
		Range	Modal value	
1	Daytime (07.00 – 23.00hrs)	30 – 47	41	41
	Night-time (23.00 – 07.00hrs)	29 – 45	32	32
2	Daytime (07.00 – 23.00hrs)	40 – 58	50	50
	Night-time (23.00 – 07.00hrs)	39 – 52	40	40

4 Plant Noise Assessment

4.1 Proposed External Plant Items

4.1.1 Details of the existing and proposed additional external plant are given in Table 4.1 together with associated sound pressure levels sourced from manufacturers noise data and on-site noise level measurements. This assessment considers existing plant from a report done by Environoise in 2017 (ref: 21773R01aPKrmw). A water-cooled condenser is proposed; however, we understand that there are no moving parts and all pumps are to be housed internally[2]. We therefore consider that it will be of low noise level and it has not been considered further. The key colours correlate with the existing and proposed plant locations shown in Figure 4.1.

4.2 Existing Plant Noise Survey

4.2.1 A noise survey to determine the ambient noise level ($L_{Aeq,T}$) of the existing Evapco ATC-1166E condenser unit was done between 09.00hrs and 12.00hrs, Thursday 8th September 2022. Short-term measurements were taken at multiple positions at a distance of 5m from the condenser unit. Measurements were taken while the unit was operating at 30% and 100% load for a robust assessment; although there was negligible difference in measured noise levels between the two. The measured sound pressure level at 5m is presented in Table 4.1.

Table 4.1: Existing and proposed external plant and sound pressure level data.

Key	Item	No. of units	Measured combined sound pressure level at 5m (dB(A)
	Evapco ATC-1166E condenser (existing)	1	70
Key	**Item**	**No. of units**	**Sound pressure level per unit at 1m dB(A)**
	Wastewater Treatment Plant Membrane Bioreactor (MBR) (proposed)	2	79
	Effluent Treatment Plant Air Blower (existing)		

[2] Understood from email received from James Colley, Maelor Foods to Jake Brickley, Environoise Consulting on 05/09/2022.

Figure 4.1: Locations of existing and proposed external plant.

4.3 Assessment

4.3.1 A SoundPLAN® computer noise model of the site has been used for this assessment (see Appendix B). All plant has been considered to be operating continuously and simultaneously throughout any 1-hour daytime (07.00 – 23.00hrs) period and 15-minute night-time (23.00 – 07.00hrs) period as per BS4142.

Acoustic Features Correction

4.3.2 BS4142 suggests an impulsivity and tonality feature correction of 0 to 9dB each depending on how perceptible the noise is. No penalty has been applied for intermittency due to the continuous, non-varying nature of plant equipment. We also consider that noise from plant combined with be broadband at the NSRs with no perceptible tonal features. No penalty has been applied for 'intermittency' as plant is expected to run continuously without clearly identifiable 'on/off' conditions. Therefore, the rating level of plant noise is equivalent to the calculated specific noise level.

4.3.3 Tables 4.2 and 4.3 compare the predicted plant noise levels at the considered NSRs for the daytime and night-time period to determine compliance with the noise limits given in Table 3.1.

Table 4.2: BS4142 plant noise impact at considered NSRs – Daytime (07.00 – 23.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	45	26	28
Acoustic features correction dB	+0	+0	+0
Rating level dB(A)	45	26	28
Limiting noise level dB(A)	41	41	50
Level of excess (dB)	+4	0 (-15)	0 (-22)

Table 4.3: BS4142 plant noise impact at considered NSRs – Night-time (23.00 – 07.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	45	26	28
Acoustic features correction dB	+0	+0	+0
Rating level dB(A)	45	26	28
Limiting noise level dB(A)	32	32	40
Level of excess (dB)	+13	0 (-6)	0 (-12)

4.4 Discussion

4.4.1 As shown in Table 4.2, the limiting noise level target is exceeded by 4dB at the Pickhill Lane receptor during the daytime period. The limiting noise level is met at the other considered NSRs.

4.4.2 Table 4.3 shows that the predicted plant noise level at the Pickhill Lane receptor exceeds the limiting noise level during the night-time period. This is due to the existing Evapco plant. The predicted night-time excess of 13dB is greater than 5dB which depending upon the context, is likely to be an indication of an adverse impact in accordance with BS4142. The limiting noise level is met at the other considered NSRs.

Context

4.4.3 The context is an existing and established item of plant at an industrial premises with other plant elsewhere subject to the previous Condition requirement as discussed in section 2.1.1. On this basis, we consider that the level of excess predicted in Table 4.2 and 4.3 can be reduced by 5dB. This results in no excess during the daytime and an excess of 8dB during the night-time at Pickhill Lane NSR.

4.4.4 To provide further context, during the daytime, the noise-sensitive locations are indoors with open windows and outdoors in amenity areas; during the night-time, the noise sensitive location is indoors with open windows. The primary concern during the daytime is the potential for disturbance of residents in living spaces or outdoor areas of the Pickhill Lane NSR; during the night-time, the potential for disturbance of residents who could be sleeping with open bedroom windows of the Pickhill Lane NSR. BS4142 states that other guidance, such as BS8233, might also be applicable in this instance.

4.4.5 Consideration therefore needs to be given to the cumulative sound level within a bedroom and the character of the specific sound. The predicted plant noise level at the NSR is 45dB $L_{Aeq,T}$. The BS8233 internal ambient noise level target for living rooms during the daytime is ≤35dB $L_{Aeq,16hours;}$ the target for bedrooms during the night-time (23.00 – 07.00hrs) is ≤30dB $L_{Aeq,8hours}$ to avoid sleep disturbance. An assessment considering a typical reduction of 15dBA due to a partially open window and plant noise that is broadband and continuous with no acoustically distinguishing characteristics (as noted on site), indicates that these targets will be met.

4.4.6 WHO Guidelines states that external amenity ambient noise levels should be ideally less than 50dB $L_{Aeq,16hours}$ to prevent moderate annoyance with an upper limit of 55dB $L_{Aeq,16hours}$ to prevent serious annoyance. The predicted plant noise level in the garden of the Pickhill Lane NSR is 51dB $L_{Aeq,T}$, which marginally exceeds the lower limit to prevent moderate annoyance, and is below the upper limit to prevent serious annoyance.

4.4.7 On this basis, we consider that the noise is sufficiently low and further mitigation measures are not warranted. However, we have given recommendations in section 6 to mitigate the existing Evapco plant noise during the night-time period if required.

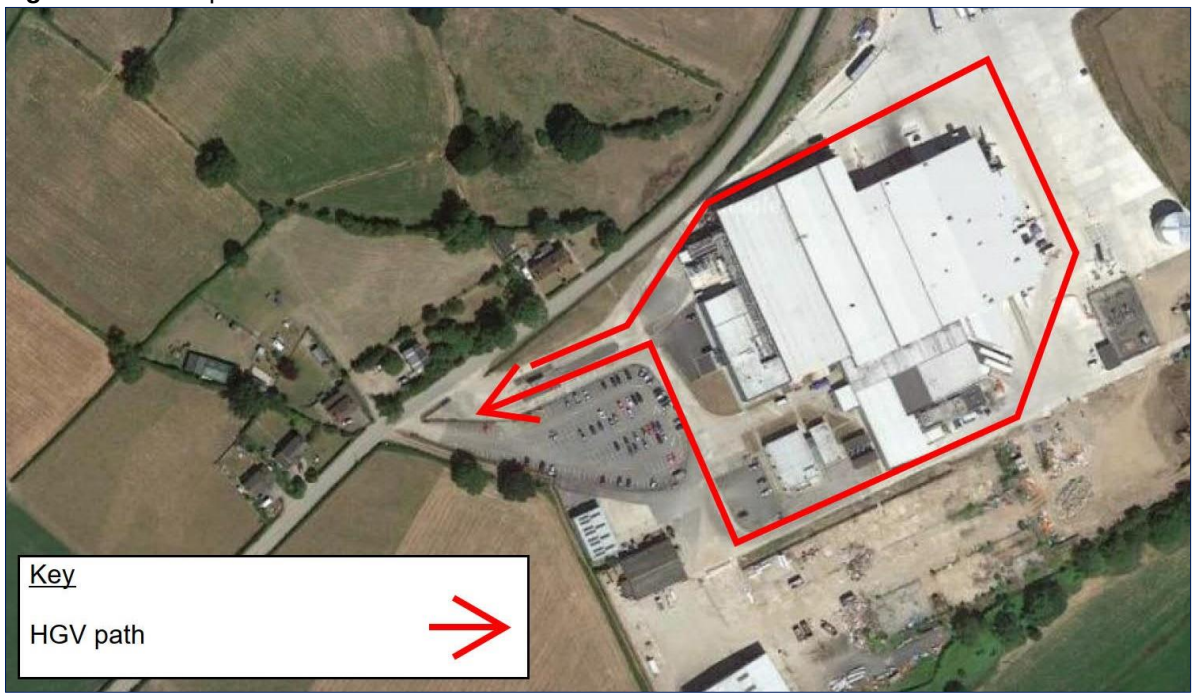
5 HGV Noise Assessment

5.1 HGV Movements

5.1.1 An average of 210 HGV movements are proposed per 20-hour working day[3]. This approximately equates to 186 movements during a 16-hour daytime period and 24 movements during a 4-hour night-time period. We have therefore considered 12 HGV movements per hour for the daytime. We understand that 4-6 movements are proposed per hour in the night-time[4]; we have therefore considered 2 movements per any 15-minutes for the night-time period.

5.1.2 Figure 5.1 shows the HGV path around the site.

Figure 5.1: HGV paths.



[3] Confirmed in email from James Colley, Maelor Foods to Sam Williams, Environoise Consulting on 09.02.2022.
[4] Confirmed in email from Guy Evans, Maelor Foods to Jake Brickley, Environoise Consulting on 12.09.2022.

HGV Pass-Bys

5.1.3 The calculation for determining the level of HGV noise events has been done using the following formulae within SoundPLAN® and in-house data of HGV movement noise:

$L_{Aeq,T} = (L_w - 20 \times \log (R) - 8) + (10 \times \log (n/t))$

Where:

L_w = event sound power level (dB) [i.e., 103dB L_{wA}]
R = Distance of noise source to 1m from nearest NSR (m)
n = number of events occurring in t (seconds).

5.2 Assessment

5.2.1 Table 5.1 shows the predicted specific noise levels of HGV pass-bys at the nearest residential receptors.

Table 5.1: Calculated delivery noise levels at the considered NSRs.

NSR	Activity	Specific noise level at NSR	
		Daytime [$L_{Aeq,1hr}$ (dB)]	Night-time [$L_{Aeq,15min}$ (dB)]
Pickhill Lane	HGV pass-by	39	39
Porthygan Farm		15	15
White Gate Cottage		23	24

Acoustic Feature Corrections

5.2.2 HGV noise can be impulsive. Considering the industrial environment of the existing site with a number of HGV deliveries already taking place every day, we consider that additional HGV noise will be 'just perceptible' against the existing noise environment. We have therefore applied a +3dB penalty for 'impulsivity' in accordance with BS4142.

5.2.3 The calculated noise levels in Table 5.1 have been compared to the operational hours noise limits in Table 3.1 to determine the level of delivery noise impact for the daytime and night-time periods, see Tables 5.2 and 5.3 respectively.

Table 5.2: BS4142 delivery noise impact assessment – Daytime (07.00 – 23.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	39	15	23
Acoustic feature correction (i.e., impulsive noise) dB	+3	+3	+3
Rating level dB(A)	42	18	26
Limiting noise level dB(A)	41	41	50
Level of excess (dB)	+1	0 (-23)	0 (-24)

Table 5.3: BS4142 delivery noise impact assessment – Night-time (23.00 – 07.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	37	13	22
Acoustic feature correction (i.e., impulsive noise) dB	+3	+3	+3
Rating level dB(A)	40	16	25
Limiting noise level dB(A)	32	32	40
Level of excess (dB)	+8	0 (-16)	0 (-15)

5.3 Discussion

5.3.1 As shown in Table 5.2, the limiting noise level target is exceeded by 1dB at the Pickhill Lane receptor during the daytime period; however, an excess of 1dB is considered negligible where a difference of +3dB is generally considered to be of 'just noticeable difference' to someone with good hearing under normal listening conditions. The limiting noise level target is met at the other NSRs.

5.3.2 Table 5.3 shows that the limiting noise level is exceeded by 8dB at Pickhill Lane during the night-time. Targets are met for the other NSRs.

5.3.3 Recommended noise mitigation measures are detailed in section 6.

6 Recommendations

6.1 Noise Mitigation Measures

6.1.1 We recommend the following mitigation measures are implemented so that plant and HGV noise can achieve the targets at the Pickhill Lane NSR. The recommendations are mainly driven by predicted noise from operations during the night-time period where background noise levels are lower:

Evapco Condenser Plant

- A noise attenuation system capable of providing 8dBA reduction where the plant is to operate during the night-time (23.00 - 07.00hrs) should be installed to the open vents at the side of the condenser unit, as these are the primary source of noise.

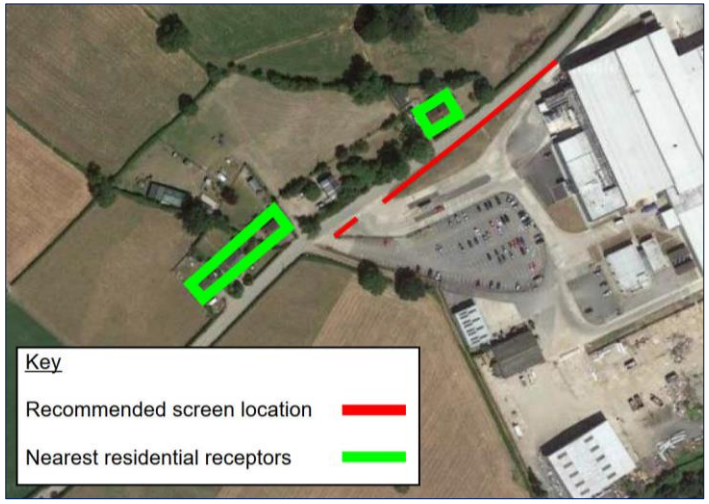
HGV Movements

- A 3.3m high acoustic barrier (e.g., close boarded timber fence) should be installed at the boundary of the site between the HGV path and the NSRs to suitably mitigate the level of excess at the NSR, see Figure 6.1. The screen should be homogenous, free from gaps including at the base and have a surface mass of ≥12kg/m².

Alternatively,

- If barrier heights of between 2.6m and 3.3m are preferred, the number of night-time HGV movements should be limited to 1 per any 15-minute period during the night-time (23.00 – 07.00hrs) to suitably mitigate the level of excess.

Figure 6.1: Recommended 3m high acoustic barrier location.



6.2 HGV Best Practice

6.2.1 For the management of deliveries and noise, reference should be made to the Department of Transport's - Quiet Deliveries Good Practice Guidance – Key Principles and Processes for Community and Resident Groups, February 2015 document - https://www.gov.uk/government/publications/quiet-deliveries-demonstration-scheme

6.2.2 The following measures are recommended to reduce noise impacts:

- Low volume broadband white noise reversing alarms are recommended.
- Limit delivery vehicle speed to 5mph where appropriate to avoid excessive bumping and jolting particularly on more uneven surfaces around the site.
- Effective preparation and maintenance of the vehicle area surfaces to minimise potholes and other defects.

6.3 Site Management

6.3.1 It is important to reduce noise impact that an open dialogue is kept with nearby residents and any concerns they have in relation to noise are dealt with and followed up. Management of the Unit must introduce procedures within a Noise Management Plan to reduce the possibility of workers slamming doors, shouting and causing unnecessary noise.

Appendix A: Noise Survey Data

Figure A1: Time history noise data – Position 1.

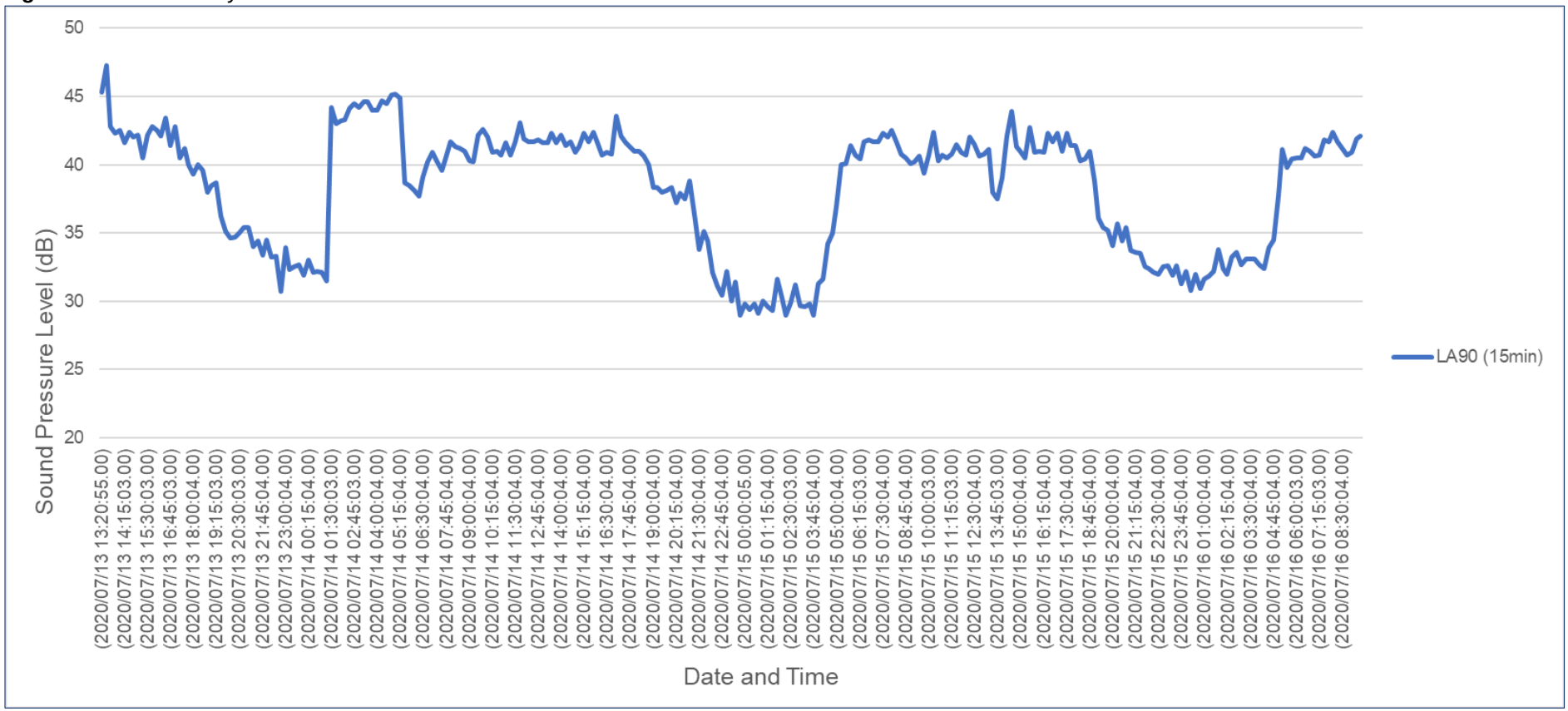
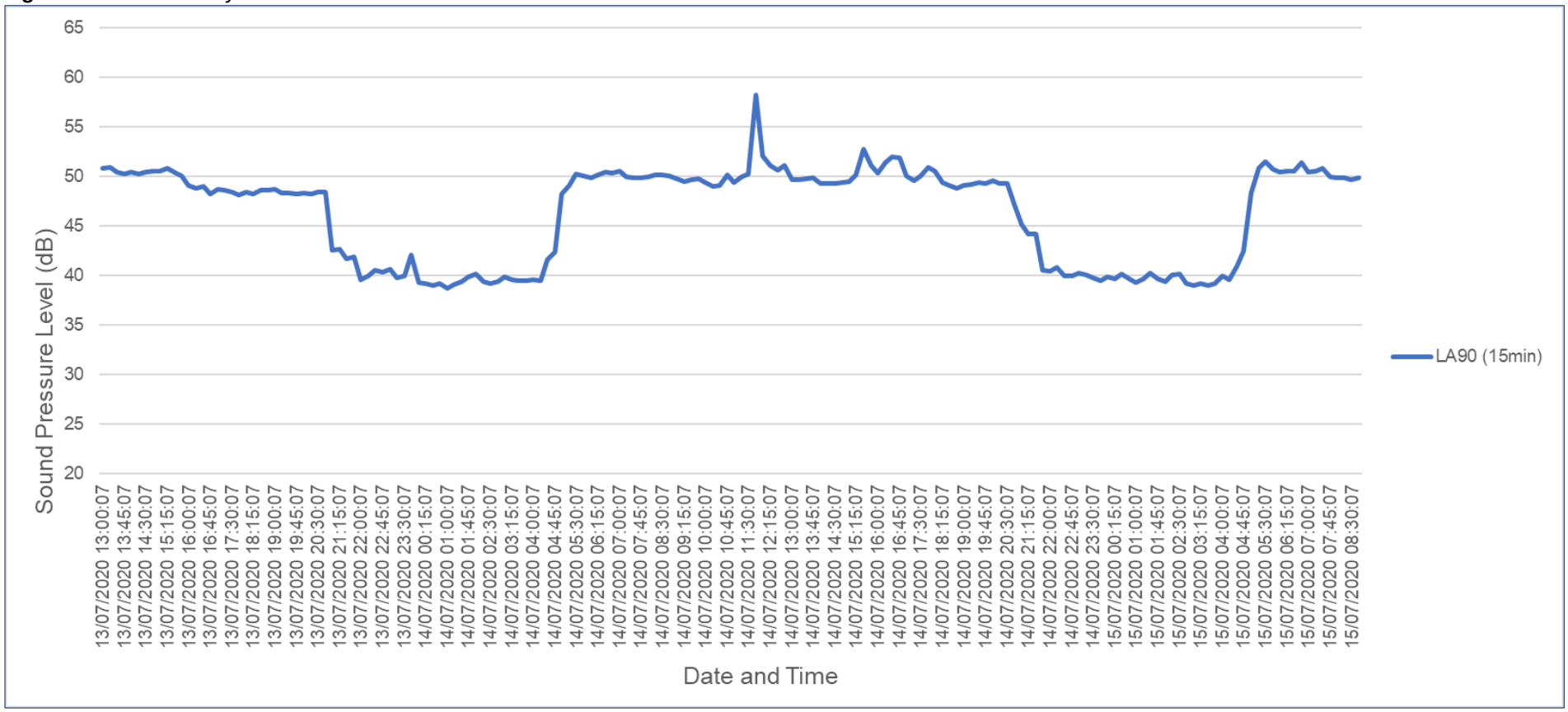
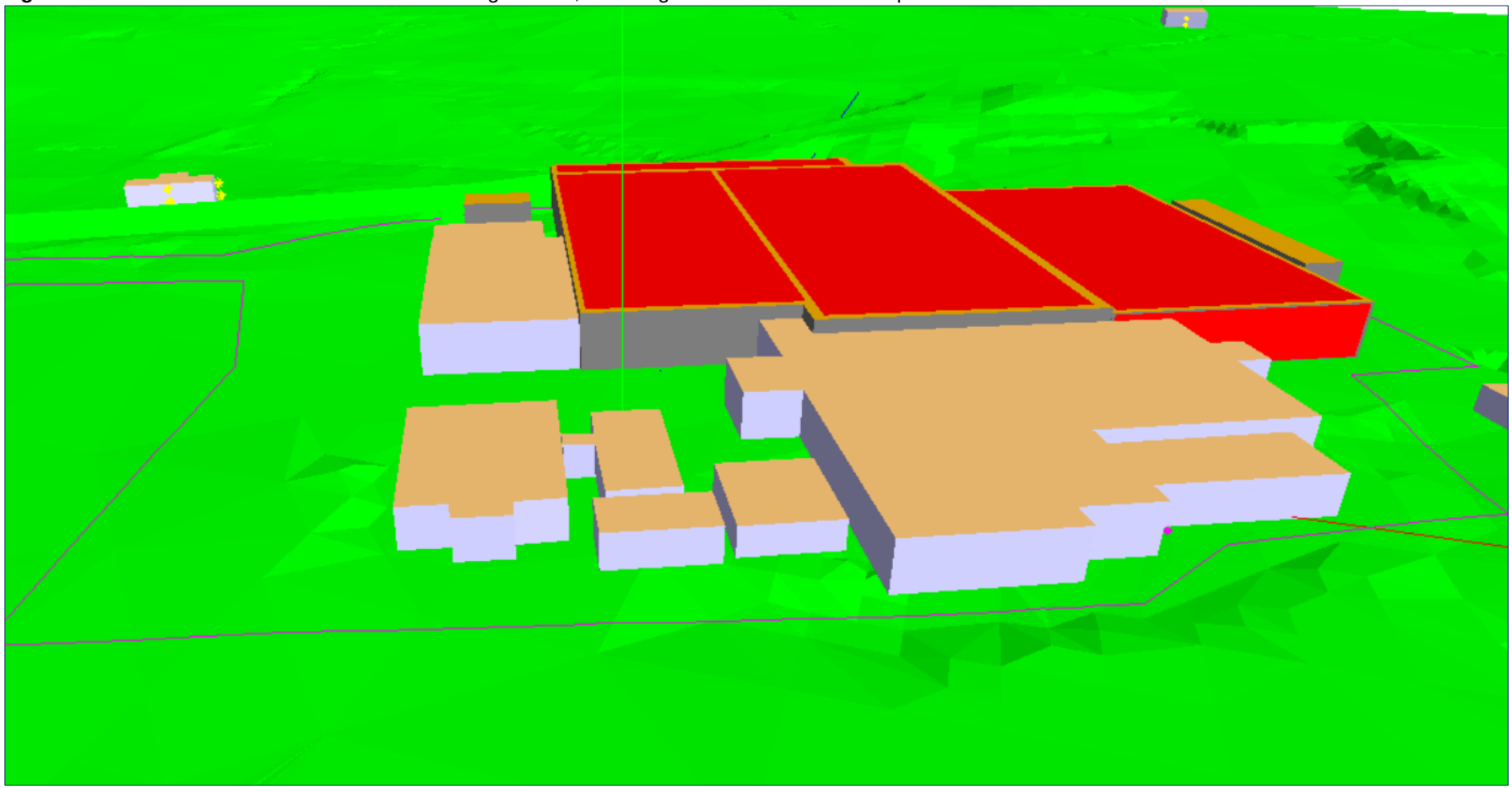


Figure B2: Time history noise data – Position 2.



Appendix B: SoundPLAN® Model

Figure B1: 3D view of SoundPLAN® model showing the site, including nearest residential receptors.



References

[i] BS4142:2014+A1:2019: ‘Methods for rating and assessing industrial and commercial sound’