PROPOSED PYROLYSIS PLANT AT BUILDING 10, STANMORE INDUSTRIAL ESTATE

Noise Impact Assessment

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CONTENTS

DOCUMENT REFERENCES

TABLES

FIGURES

APPENDICES

1.0 Introduction

Circular Resources UK Limited (the Client) has appointed SLR Consulting Limited to undertake a noise impact assessment for a proposed pyrolysis waste processing plant at Building 10, Stanmore Industrial Estate, Bridgenorth WV15 5HP (the site).

In June 2021, Shropshire Council provided informal approval to operate the site for research, development and testing to allow development of the industrial process and treat less than 50 tonnes of waste per year. This followed Schedule 1, Part 1, Paragraph 3(g) of The Environmental Permitting (England and Wales) Regulations (EPR, 2016).

This report has been prepared to support the following, Stage 2 permitting and growth strategy for the waste processing plant, as intended to be submitted to the Local Authority (LA) of Shropshire Council:

- Phase 1 / as existing: R&D exemption which has allowed for data collection ahead of permit submission, limited to the processing of < 50 tonnes of waste per year.
- Phase 2 / as proposed: LA approval allowing for a maximum design capacity of less than 10 tonnes per day (tpd) of hazardous material to be processed.
- Phase 3 / future: Environment Agency (EA) permitting as the business grows and has design capacity to process > 10 tpd of WEEE or other hazardous waste feedstocks.

It should be noted that this report has been limited to the scale of waste processing for the Phase 2 development proposal and review by the relevant regulatory body of the Local Authority only. This noise impact assessment has not been prepared for the scale and purpose of Phase 3 development with EA permitting.

This report has been prepared to inform of noise impacts arising from the proposed waste processing facility and sources of sound of an industrial and/or commercial nature, following the assessment principles of British Standard BS 4142 and in line with proposed 24-hour site and waste processing uses.

The following study has been prepared by a suitably qualified acoustician of at least 18-years practicing experience and covering environmental noise impact assessment, with higher level qualifications in acoustics / acoustic and noise control, being a corporate member of the Institute of Acoustics.

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature. To assist the reader, a glossary of terminology has been included in Appendix 01.

2.0 Site Description

2.1 Proposed Development

Unit 10 Stanmore Industrial Estate has been noted to define a detached industrial premises incorporating offices to the front (north west) with industrial area, car parking to the front of the building and vehicle access apron to the rear (south east). The property was extensively renovated in 2017 to provide a training facility, formerly known as The Marches Centre of Manufacturing and Technology. Its industrial bay has been noted south east facing with two electric roller shutter entrance doors and a further, side-shutter entrance facing south west.

The proposed waste processing activity has been understood as pyrolysis. This describes the thermal decomposition of waste in the absence of oxygen and at elevated temperatures. The pyrolytic products obtained include gases and ash. The advantage of pyrolysis has been understood as a cost-effect technology to assist in reducing environmental pollution, given a suitable strategy for controlling emission of exhaust gases.

The pyrolysis process has been proposed through modular design of the plant, as currently approved with research and development capacity, to be refined and ramped up for the proposed industrial process. This has included a single pyrolysis process consisting of a ball mill and BRP machine with external flue. To achieve the proposed processing capacity of 10 tpd of material, a doubling of current R&D plant has been proposed.

Operation of the proposed facility has been considered to require deliveries of waste materials to process, as well as removal of by-products from the pyrolysis process. To allow for a maximum design capacity of up to 10 tpd of hazardous material to be processed, a single HGV delivery of waste material would be required every other day. This would be supplied within 1 t bags and offloaded within the loading area using a forklift truck. A similar schedule has been assumed for by-product collection. The HGV delivery or collection activities have been established as infrequent, averaging a single movement to and from the site every day with associated external forklift activity for loading and unloading.

2.2 Noise Sensitive Receptors

The nearest noise sensitive receptors (NSRs) to the proposed development have been noted of residential use in the local area as follows.

A. Residences off Brook Lane to the north west. The closest dwelling in this direction has been noted as Bentley Cottage and nominally 500 m away from Building 10 over agricultural land, with unobstructed sight lines to the front / north façade.

B. Residences along Brook Lane to the north. The closest dwelling has been noted as Hoccum Cottage, nominally 625 m from the north of Building 10 over agricultural land, with fully obstructed sight lines from intervening buildings of Stanmore Industrial Estate.

C. Residences of Barnsley to the east. The closest dwelling has been noted Lower Barnsley House and nominally 675 m from the east façade of Building 10 over agricultural land, with partially obstructed sight lines from intervening buildings of Stanmore Industrial Estate.

D. Little Barnsley Farm to the south east. The farmhouse dwelling has been noted nominally 550 m from Building 10 over agricultural land, with partially obstructed sight lines from intervening buildings of Stanmore Industrial Estate.

E. Residences of Russell Close to the south. The closest dwelling has been nominally 340 m from the south façades of Building 10 through Stanmore Country Park, with partially obstructed sight lines from intervening buildings of Stanmore Industrial Estate and forestry.

All above-listed receptors have been identified within the site plan of Figure 2-1 below.

Figure 2-1
Area Plan and Identification of NSRs

3.0 Planning and Noise Guidance

3.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was introduced by The Department for Communities and Local Government in March 2012, with the latest revision dated July 2021.

The NPPF defines the Government's planning policies for England and sets out the framework, within which local authorities must prepare their local and neighbourhood plans, reflecting the needs and priorities of their communities. The Government's stated purpose in producing the NPPF was to streamline policy, so the planning process is less restrictive, to give a more easily understood framework for delivering sustainable development.

Under the heading of conserving and enhancing the natural environment and Paragraph 174 e), one aim of the NPPF is *"preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of… noise pollution…".*

Paragraph 185 requires planning policies and decision to ensure that new development is appropriate for its location. It stipulates a need to account for the likely effects of pollution on health and other matters, requiring the planning process to *"mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life"*.

The NPPF acknowledges that there is a host of existing sources of national and international guidance which can be used, in conjunction with the Framework, to inform the production of Local Plans and decision making.

3.2 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010. It sets out the long-term vision of government noise policy, which is fundamentally to: "Promote good health and good quality of life through the effective management and control of noise within the context of Government policy on sustainable development". The vision is supported by three key aims:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and reduce to a minimum, other adverse impacts on health; and
- Where possible, contribute to the improvement of health and quality of life.

The NPSE should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace. The NPSE has adopted the following concepts, to help consider whether noise is likely to have "significant adverse" or "adverse" effects on health and quality of life:

> SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.
>
> LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.
>
> NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available (Defra, 2010)."

3.3 National Planning Practice Guidance

Revised Planning Practice Guidance was released in March 2014 to support the NPPF and last updated in July 2019. The Guidance stipulates that Local Planning Authorities' plan making and decision making should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

The guidance has also provided the following noise exposure hierarchy table *"when noise could be a concern"*.

Table 3-1
Planning Practice Guidance Noise Exposure Hierarchy Table

Response	Example of Outcomes	Increasing Effect Level	Action
NOEL – No observed effect level			
Not present	No effect	NOEL	No specific measures required
No observed adverse effect level			
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
LOAEL – Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for sleep disturbance. Affects acoustic character of the area and creates a perceived change in quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
SOAEL – Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

3.4 BS 4142:2014 +A1:2019

The British Standard BS 4142:2014 +A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound* (BS 4142) notably describes methods for rating and assessing sound of an industrial or commercial nature. It has been referenced where required in policy and guidance documents to assess the potential impact of sound of an industrial and/or commercial nature, at existing and proposed noise-sensitive receptor locations within the context of the existing sound environment.

In this assessment, industrial/commercial sources have been present on the Site with respect to proposed development emission, where the onus lies with the developer to mitigate any associated impacts arising from existing and proposed sources of commercial noise.

Certain acoustic features can increase the significance of impact from a comparison of the specific sound level to the background sound level where these features are likely to affect perception and response. Where such features are present at the assessment location, a character correction (or penalty) to the specific sound level is made to obtain the rating level. This can be approached from subjective, objective and reference methods.

- Tonality: A correction of 0 dB to + 6 dB for sound ranging from not tonal to prominently tonal.
- Impulsivity: A correction of up to + 9 dB can be applied for sound that is impulsive.
- Intermittency: A penalty of + 3 dB can be applied if on/off conditions are readily distinctive within the reference time interval over the period of the greatest amount of on-time.
- Other characteristics: A penalty of + 3 dB can be applied in the absence of all other defined characteristics, where the specific sound contains a distinctive feature in the residual acoustic environment.
- The rating sound level is equal to the specific sound level if there are no acoustic features present or expected to be present.

The significance of sound depends upon both the margin by which the rating level exceeds the background sound level and the context in which the sound occurs. An initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level.

- Typically, the greater the difference, the greater the magnitude of the impact;
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. It is an indication that the specific sound source has a low impact, depending on the context.

BS 4142 has stipulated that context is important when assessing the impact of sound of a commercial and/or industrial nature. Amongst a range of advocated considerations, this can include mitigation, residual sound levels, location and absolute sound levels in the consideration of context.

The scope of BS 4142 recognises that human response to sound can be subjective as affected by many factors, both acoustic and non-acoustic. The significance of its impact can depend on various factors such as the exceedance to the background level, its absolute level, time of day and change in environment, as well as local attitudes to the source of sound and character of the neighbourhood.

4.0 Environmental Sound Survey

To establish the prevailing sound climate at the Site, a baseline survey was undertaken over a weekend period from Friday 24th to Monday 27th September 2021.

This included a period of clear and sunny weather conditions, with wind speeds averaging typically < 3 m/s from a prevailing, southerly direction. A period of sudden rainfall was noted in the morning of Monday 27th September 05:30 – 08:00 which has been excluded from further consideration in this assessment. All other times have been deemed suitable conditions for sound surveying works.

A further survey of activity sound levels was undertaken on Thursday 28th October 2021. The purpose was to establish the exacting sound levels of processing equipment as currently being developed at the Site.

4.1 Equipment

Sound pressure level measurements were carried out using the following equipment listed in Table 4-1, confirming to Class 1 acoustic accuracy for sound level meters and matched calibrators.

The sound level meters were calibrated before the measurements using the handheld acoustic calibrator and the calibration was checked upon completion of the survey. No significant drift was observed with calibration offsets of ≤ 0.2 dB. The calibration chain of equipment has been maintained to UKAS requirements, no greater than one year for sound calibrators and two years for sound level meters.

Table 4-1
Baseline Sound Monitoring Equipment

Location	Description	Serial No.
All measurements	Cirrus CR:171B Class 1 sound level meter	G061094
	Cirrus CR:515 Class 1 sound calibrator	72210

Sound pressure levels were measured in free field conditions at all locations during the survey, at least 3.5 m from a reflecting surface. The following noise level indices were recorded at 15-minute intervals:

- $L_{Aeq,\,T}$ – The A-weighted equivalent continuous noise level over the measurement period.
- $L_{A90,\,T}$ – The A-weighted noise level exceeded for 90% of the measurement period.
- $L_{A10,\,T}$ – The A-weighted noise level exceeded for 10% of the measurement period.
- $L_{Amax(F)}$ – The maximum A-weighted noise level during the measurement period.

4.2 Baseline Sound Climate

The monitoring protocol for baseline measurements consisted of attended daytime readings at all accessible noise sensitive receivers in each orthogonal direction from the Stanmore Industrial Estate, identified as receptors A, B, C and E from Figure 2-1. No access could be facilitated at receptor D.

A longer and substantially unattended measurement was undertaken at a position close to the nearest noise sensitive receiver (NNSR), identified as receptor E, to measure environmental sound levels over a typical weekend without the development in operation, this position is described as Location F below.

The sound climate at all measurement locations was observed as follows on Friday 24th September 2021.

A. Rear of garden Bentley Cottage (52.5356722, -2.3803418). Sound climate 09:10 – 10:15 of substantial noise from industrial estate, including vehicle activity (reverse bleepers), HVAC, compressed gas or steam, saw sound towards end of assessment and consistent birdsong. Residents otherwise owned dogs that barked occasionally.

B. Front garden of Hoccum Cottage (52.5383747, -2.3728605). Sound climate 10:37 – 11:30 included birdsong, air traffic (helicopters flying overhead), road noise from distance north. Sounds remained audible from industrial estate, including banging of machinery, HVAC, vehicle activity such as reverse bleepers as well as intermittent sounds noted of livestock nearby.

C. Front Garden of Lower Barnsley House (52.5332312, -2.3638603). Sound climate 11:54 – 13:00 comprised of birdsong, air traffic, sound of reverse bleepers was audible from the industrial estate with positive wind vector.

D. Unable to access Little Barnsley Farm as gated from roadside.

E. Corner of Russell Close (52.5296251, -2.3779349) Sound climate 13:38 – 14:30 consisted of birdsong, intermitted air traffic, low level road traffic and industrial sound from industrial estate, trees movements with wind < 3 m/s.

F. Front porch of No. 14 Russell Close (52.5297668, -2.3782188) for a substantially unattended period from 15:15 Friday 24th to 12:00 Monday 27th September 2021. The sound climate at this location was directly comparable to E.

4.3 Background and Residual Sound Levels

The 'typical' background sound levels have been reported in this section in accordance with BS 4142 as established from histograms of the recorded dB $L_{A90,\ 15min}$ data at Position 1, shown in Appendix 02. The measurement locations have been used to describe the underlying sound climate at NSRs during proposed operating periods.

In line with Section 8.1.4 of BS 4142, the monitoring duration should reflect the range of background noise levels for the period assessed. In practice, there is no single level for background sound as this is a fluctuating parameter, although a representative value of the period should be used. Note this is not either the lowest or mean average value of dB $L_{A90,\ T}$.

Table 4-2
Summary of Measured Sound Levels

Measurement Details				Background sound level dB $L_{Aeq, 15\ min}$		Residual sound level dB $L_{Aeq, T}$	
Location	Date Range	Period	Time HH:MM	Range	Typical*	Range	Typical*
A	24/09/2021	Day	09:15 – 10:15	42 – 46	44	48 – 51	50
B			10:45 – 11:30	31 – 33	32	41 – 54	51
C			12:00 – 13:00	37 – 38	37	45 – 54	51
E			13:45 – 14:30	40 – 42	41	44 – 47	45
F	24/09/2021 28/09/2021	Day	07:00 – 23:00	31 – 49	36	39 – 51	42
		Night	23:00 – 07:00	28 – 44	30	31 – 38	33

** Typical values of background sound level have been established from counts of data from Appendix 02. Typical residual sound levels have been equated at times of typical background sound as 1-hour daytime and 15-minute night.*

For the purposes of baseline noise impact assessment, Location F has been considered representative for all NSRs as not to underpredict noise impacts during any part of the day or night.

Full survey results describing the weekday and weekend monitoring period have been provided in full within Appendix 02.

4.4 Activity Sound Levels

Activity sound levels were recorded during Thursday 28th October 2021 with the development within typical operation under R&D processing. A single ball mill and BRP machine were operated individually to establish the typical internal sound pressure level in proximity to the source.

The results of all monitoring showed that plant noise levels were consistent with time but varied with location within the processing plant. The ball mill has been established as the main contributor to industrial noise, with significant high frequency content when operational inside the building. No plant was notably tonal.

It was established that the ball mill would be operational for approximately 3-hours of an 8-hour shift and that the BRP machine would generally run constantly.

Table 4-3
Octave Band Activity Sound Levels

Measurement	Distance (m)	Time (min)	Data	Sound pressure level (dB) per centre frequency (Hz)								Sum A
				63	125	250	500	1k	2k	4k	8k	
Ball Mill	3	15	dB $L_{p, rev}$	69	72	77	83	90	92	88	79	96
BRP Machine	3	45	dB $L_{p, rev}$	78	72	78	70	69	66	59	57	75
External Flue	3	10	dB $L_{p, ff}$	65	68	61	56	53	49	41	34	60
HGVs	*SLR library data*		dB L_w	96	90	90	84	86	86	76	64	91
Forklifts	*SLR library data*		dB L_w	77	68	72	69	69	75	63	55	78

At the time of site assessment, there were no scheduled deliveries or collections providing that the measurement of loading and unloading activities was not possible about the times of equipment measurements. This has been understood as circumstantial to the R&D nature of the facility, without a regular schedule of delivery and collection activities within the ramp up of current operations. A standard LPG forklift was noted for the purposes of loading and unloading activities.

In the absence of sound pressure level measurements for deliveries and forklift, these have been based upon SLR's octave band library data at 91 dB L_{wA} and 78 dB L_{wA} respectively, as equated from measurements at similar sites. This information has been shown in Table 4-3.

5.0 Noise Impact Assessment

The impact of industrial activity noise from the proposed development on the surrounding environment will depend on several factors, including (but not limited to) the time of day, frequency of occurrence and nature of sound source. Development activities will naturally pose greater noise risk when permissible during noise sensitive periods of the evening and night where the likelihood of annoyance or sleep disturbance increases. Human response to noise depends on sociological factors, attitudes and perceptions which can be difficult to define and account for any individual case.

The recognised methodology for assessment has been taken from BS 4142:2014 + A1:2019 *Methods for rating and assessing industrial and commercial sound* which includes consideration of industrial processes. The numerical assessment has been provided below for relevant periods of proposed operation, following the definition of specific sound levels.

5.1 Specific Sound Level Calculations

To understand specific sound levels for the purposes of assessment, a noise model has been created using CadnaA with input sound data of Table 4-3 in octave bands.

The modelling process has followed the technical requirements of ISO 9613 Parts 1 and 2, accounting for all plant items provided within at their existing and proposed locations. This has included 2 No. high level flues on the south façade, 2 No. BRP and ball mill machines inside the building, as well as HGV delivering once per day with consistent forklift activity within the loading bay to the south.

Breakout from the industrial building has been equated on the observation that the current structure comprises of 100 mm insulating panelling, with standard roller shutter doors on the south façades and rooflights above. As not to underpredict the resulting breakout, the acoustic loss from this composite structure has been conservatively assumed at 22 dB Rw.

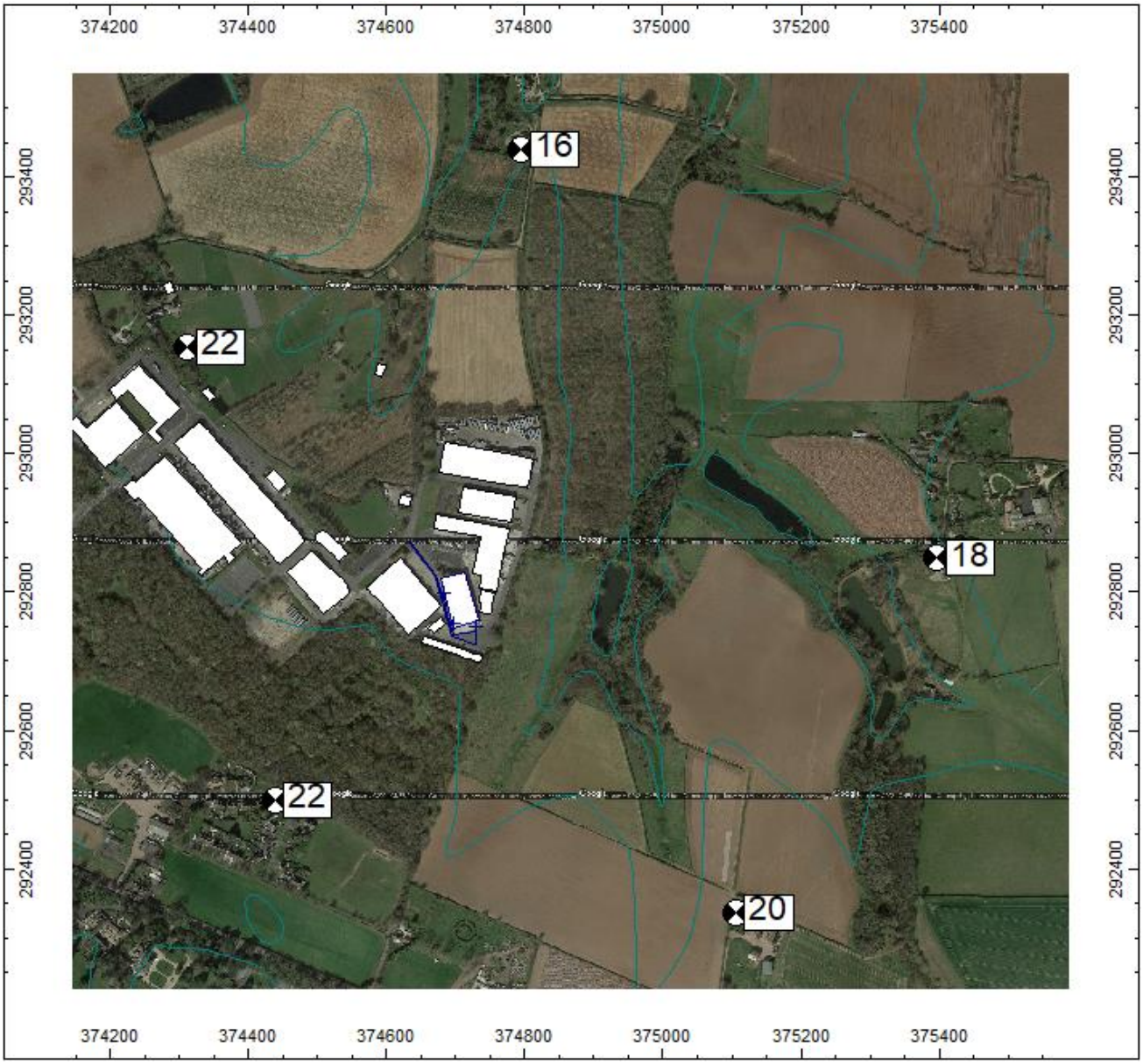
The format of calculations has included receptor locations of 1.5 m and 4.0 m for ground and first floors, following propagation over mixed ground. Results have highlighted the highest level at the receiver, at either ground or first floor level appropriate to the receptor.

The specific sound level calculations have included no corrections for on-time. As a general assumption, for the worst-case hour of the daytime all plant been assumed in constant operation for 100 % of the time, with two HGV movements and associated forklift activities. These external activities have been excluded during the night-time but realised to have little impact on the emission within the environment.

Table 5-1
Model Outputs of Specific Sound Level, dB $L_{Aeq, T}$

Noise Sensitive Receptor		Day/Evening 07:00 – 23:00	Night 23:00 – 07:00
Ref	Name		
A	Bentley Cottage	22	22
B	Hoccum Cottage	16	16
C	Barnsley	18	18
D	Little Barnsley Farm	20	20
E	Russell Close	22	22

Figure 5-1
Predicted Site Emission - Daytime dB $L_{Aeq, 1h}$



5.2 BS 4142 Assessment

The following numerical assessments have been provided in accordance with BS 4142 to provide a comparison between the **worst-case** rating sound levels of the proposal against the typical sound levels existing prior to development.

Table 5-2
BS 4142 Assessment of Proposed Development Activites

Results	Day 07:00 – 19:00	Night 23:00 – 07:00	Commentary
Residual sound level, dB $L_{Aeq, T}$	42	33	Representative residual and background sound levels from Location F of the assessment as representative of NSRs in the local area.
Background sound level, dB $L_{A90, T}$	36	30	
Reference time interval	1-hour	15-min	
Specific sound level, dB $L_{Aeq, T}$	22	22	Highest value established from Table 5-1 considering all surrounding noise sensitive receptors.
Acoustic feature correction, dB	+ 3	+ 3	A precautionary 3 dB feature correction has been applied to account for source that could have intermittent and distinguishable character in the residual sound climate.
Rating level	25	25	Specific sound level plus acoustic feature correction.
Excess of rating over background sound level	- 11	- 5	
Assessment indicates likelihood of	Low Impact		Where the rating level does not exceed the representative background sound level this is an indication of low impact, depending on context.
Uncertainty of the assessment	Not significant		The excess of the rating level over the background sound level is very large and in this instance the uncertainty of the measurement does not have any significance to the outcome of the assessment.

The numerical assessments in Table 5-2 have highlighted a low impact in the worse-case NSRs, where the rating sound levels have been predicted below the representative background sound levels at all times of operation.

It has been acknowledged that assessments in Table 5-2 need to be considered in context, following the requirements of BS 4142. The concept of “context” has been notably emphasised in Section 11 of BS 4142 when considering numerical impacts established from applying the standard.

Predictions have provided large differences between the residual sound level over the specific sound level, of nominally 10 dB(A), such that in context, the ambient sound level should not change by any perceptible degree

due to the development, regardless of usage times. It has subsequently been considered in context that these development activities will be largely indistinguishable for most of the time and masking will be afforded by the residual sound level.

The assessments in Table 5-2 have highlighted that rating sound levels are very low and background sound levels are low. Section 11 of BS 4142 has been noted to include the statement for the purposes of context, that:

"Where background sound level and rating levels are low, absolute level might be as, or more, relevant that the margin by which the rating level exceeds the background. This is especially true at night."

The evening and night have been considered as a particularly sensitive periods of proposed operation where it would normally be appropriate to consider that residents will likely be resting or attempting to sleep within their homes. During this time, it could be expected that residents may choose to leave windows open, where a level difference of approximately 13 dB would be expected inside the dwelling through a partially open window. The nearest NSR has not been acknowledged to contain any particular sound insulation provisions that allow residences to keep windows closed (e.g. mechanical ventilation) therefore an open window assessment has been considered appropriate in context.

Internal ambient noise levels within the closest dwellings have been considered inaudible from the proposed operations, being < 10 dB $L_{Aeq, T}$ (and below the sound level commonly associated with breathing, for example). In combination with the residual sound level, the internal ambient sound level would comprise of the residual sound from the environment rather than that of the development.

Where any industrial or commercial sound remains audible, as might be possible during periods of operation, then it has been considered possible in context for some very minor level of effect. This has been considered relevant for any source character that could have different temporal or spectral characteristics than the prevailing residual climate. The possibility of an adverse acoustic effect has been considered reduced, not only because of the resulting level (relatively or absolutely), but because the nearest receptor would be unlikely to see large proportions of the development site, particularly from ground level, because of the form of the intervening boundary; and so, would not know explicitly what is operating and when.

The consideration of context relevant to the assessed sound sources has been viewed to support the notion of a "low impact" assessment in accordance with BS 4142 whereby the possible effects of the proposal have been considered in context.

Mitigation has not been viewed necessary to support a sustainable and low impact development.

5.3 Predicted Noise Impacts, Planning and Mitigation

The evaluated noise impacts in this report should be considered by Shropshire Council mindful of the National Planning Policy Framework and Noise Policy Statement for England that define policy and decision-making requirements for planning and noise.

It has been provided within Section 2.0 of this report, that the NPSE suggests noise levels above the SOAEL should be avoided and that if noise levels fall between the LOAEL and SOAEL all reasonable steps should be taken to minimise and mitigate adverse effects, while considering guiding principles of sustainable development. Where sound levels lie between the NOEL and LOAEL, then no specific measures are required.

The range of noise impacts for the proposed industrial development have been deemed acceptable with respect to overarching requirements for planning and noise. Resulting impacts have been anticipated below the LOAEL and approximating the NOEL threshold of the NPSE.

It has been expected that development sound will be unnoticeable to cause no effect, or just perceptible during the most sensitive periods of assessment. In the worst-case, it has been considered possible for the sound to be audible, but not expected to cause any change in behaviour or attitude. The development may marginally affect the acoustic character of the area but not to the extent that there is a perceived change in quality of life.

6.0 Conclusions

An assessment of environmental sound levels has been carried out for a proposed pyrolysis waste processing plant at Building 10, Stanmore Industrial Estate, Bridgenorth WV15 5HP. Environmental sound levels have been taken from a site survey at locations representative of nearest noise sensitive receptors.

A noise impact assessment has been carried out in line with BS 4142 methodology. Cumulative rating sound levels have been predicted at nearest sensitive receptors using noise modelling techniques of quantified noise emissions, established from in-situ measurements of the plant as far as could be established.

The numerical assessment in Section 5.0 has predicted worst-case rating levels below the background sound level. Predicted noise impacts have been supported when considering the context of the site.

It has been concluded from the findings of this assessment that the proposed pyrolysis plant will result in acceptable acoustic effects in the environment, to support Local Authority approval for a maximum design capacity of up to 10 tonnes per day of hazardous material to be processed.

The likely acoustic effects have been established about the NOEL to LOAEL threshold of the NPSE. It has been expected that development sound will be unnoticeable to cause no effect, or just perceptible during the most sensitive periods of assessment. In the worst-case, it has been considered possible for the sound to be audible, but not expected to cause any change in behaviour or attitude.

Following overarching requirements for planning and noise, no specific noise mitigation measures have been considered necessary to support the proposed pyrolysis waste processing development, based upon the noise impacts assessed within this report.

APPENDIX 01

Glossary of Terminology

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 01-01
Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel) — The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (of 20 µPa).

dB(A) — A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

$L_{Aeq, T}$ — $L_{Aeq, T}$ is defined as the notional steady sound level which, over a stated period T, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

$L_{A10, T}$ & L_{A90} — If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

$L_{Amax(F)}$ — $L_{Amax(F)}$ is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

APPENDIX 02

Survey Results

Table 02-01
15-minute Attended Time History Results at Locations ABCE, dB

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Location A				
Fri 24/09/2021 09:15	50.7	44.9	52.8	78.3
Fri 24/09/2021 09:30	51.4	45.9	50.0	72.9
Fri 24/09/2021 09:45	47.8	42.3	48.5	70.2
Fri 24/09/2021 10:00	47.9	42.2	48.6	73.2
Location B				
Fri 24/09/2021 10:45	54.3	33.2	46.9	78.3
Fri 24/09/2021 11:00	49.8	31.5	50.2	70.9
Fri 24/09/2021 11:15	40.5	30.6	42.8	63.6
Location C				
Fri 24/09/2021 12:00	50.2	38.1	48.2	69.2
Fri 24/09/2021 12:15	54.4	37.3	53.1	76.2
Fri 24/09/2021 12:30	47.3	36.7	50.4	65.3
Fri 24/09/2021 12:45	44.6	37.1	45.8	64.2
Location E				
Fri 24/09/2021 13:45	44.2	42.2	45.7	53.1
Fri 24/09/2021 14:00	44.8	41.7	46.5	61.8
Fri 24/09/2021 14:15	46.5	39.5	47.3	63.9

Table 02-02
15-minute Unattended Time History Results at Location F, dB

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Fri 24/09/2021 15:15	44.6	40.9	46.3	61.7
Fri 24/09/2021 15:30	46.8	41.2	47.9	64.5
Fri 24/09/2021 15:45	44.6	40.2	46.0	59.8
Fri 24/09/2021 16:00	43.6	41.4	45.2	52.8
Fri 24/09/2021 16:15	45.2	40.5	45.4	61.7
Fri 24/09/2021 16:30	43.2	39.6	44.7	56.4
Fri 24/09/2021 16:45	43.5	39.8	44.5	59.4
Fri 24/09/2021 17:00	48.0	41.3	46.6	73.6
Fri 24/09/2021 17:15	51.0	41.3	51.7	73.5
Fri 24/09/2021 17:30	43.2	39.9	45.2	58.0
Fri 24/09/2021 17:45	44.6	41.0	46.2	58.0
Fri 24/09/2021 18:00	45.5	40.7	48.5	63.6
Fri 24/09/2021 18:15	44.4	39.0	45.8	63.8
Fri 24/09/2021 18:30	43.1	39.4	44.8	59.6
Fri 24/09/2021 18:45	44.5	39.5	45.9	62.4
Fri 24/09/2021 19:00	41.7	37.3	44.2	58.9
Fri 24/09/2021 19:15	40.8	36.7	40.9	57.1
Fri 24/09/2021 19:30	43.7	37.7	45.3	66.7
Fri 24/09/2021 19:45	49.8	37.3	50.6	76.8
Fri 24/09/2021 20:00	39.4	36.1	41.5	50.2
Fri 24/09/2021 20:15	40.0	37.2	41.8	55.9
Fri 24/09/2021 20:30	40.0	36.8	41.9	53.9
Fri 24/09/2021 20:45	37.6	34.5	39.3	52.5
Fri 24/09/2021 21:00	35.3	32.5	37.2	50.8
Fri 24/09/2021 21:15	35.7	33.2	37.5	53.6
Fri 24/09/2021 21:30	34.8	31.7	37.0	41.8
Fri 24/09/2021 21:45	35.5	31.9	37.6	44.0
Fri 24/09/2021 22:00	37.1	32.2	40.2	48.6
Fri 24/09/2021 22:15	35.5	32.0	37.5	57.0
Fri 24/09/2021 22:30	34.9	32.4	36.9	42.6
Fri 24/09/2021 22:45	35.4	32.8	37.2	57.7

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Fri 24/09/2021 23:00	36.0	33.0	38.0	41.9
Fri 24/09/2021 23:15	37.2	33.5	39.3	52.5
Fri 24/09/2021 23:30	36.5	32.7	38.5	54.1
Fri 24/09/2021 23:45	34.9	31.1	36.6	50.3
Sat 25/09/2021 00:00	33.3	31.2	35.2	43.1
Sat 25/09/2021 00:15	33.5	31.3	35.3	39.4
Sat 25/09/2021 00:30	31.9	30.1	33.0	43.5
Sat 25/09/2021 00:45	33.1	31.0	34.3	49.4
Sat 25/09/2021 01:00	33.4	31.9	34.5	40.8
Sat 25/09/2021 01:15	32.0	31.1	32.7	38.1
Sat 25/09/2021 01:30	32.7	31.5	33.6	41.8
Sat 25/09/2021 01:45	32.2	31.1	32.8	42.6
Sat 25/09/2021 02:00	32.0	31.0	32.7	35.3
Sat 25/09/2021 02:15	31.0	30.0	31.9	37.2
Sat 25/09/2021 02:30	30.1	29.2	30.9	36.0
Sat 25/09/2021 02:45	30.5	29.6	31.3	35.6
Sat 25/09/2021 03:00	31.6	29.2	33.8	48.5
Sat 25/09/2021 03:15	32.1	29.0	31.8	50.2
Sat 25/09/2021 03:30	31.2	29.7	32.8	39.8
Sat 25/09/2021 03:45	31.3	30.1	32.3	39.2
Sat 25/09/2021 04:00	31.9	29.9	33.5	41.3
Sat 25/09/2021 04:15	32.2	29.2	34.4	46.1
Sat 25/09/2021 04:30	31.5	29.4	32.1	49.4
Sat 25/09/2021 04:45	32.0	29.2	33.7	45.6
Sat 25/09/2021 05:00	32.6	29.3	34.3	49.9
Sat 25/09/2021 05:15	33.1	29.4	36.7	45.2
Sat 25/09/2021 05:30	33.9	29.6	37.1	44.3
Sat 25/09/2021 05:45	34.1	30.2	36.8	45.3
Sat 25/09/2021 06:00	35.9	29.7	39.6	50.2
Sat 25/09/2021 06:15	39.8	31.3	42.9	59.0
Sat 25/09/2021 06:30	41.8	33.3	44.1	63.6
Sat 25/09/2021 06:45	39.7	33.5	41.4	62.0

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Sat 25/09/2021 07:00	40.9	34.2	43.2	59.0
Sat 25/09/2021 07:15	42.0	35.7	44.5	58.5
Sat 25/09/2021 07:30	40.2	34.7	42.0	60.5
Sat 25/09/2021 07:45	44.9	35.4	42.6	78.0
Sat 25/09/2021 08:00	40.3	36.0	42.6	59.1
Sat 25/09/2021 08:15	42.2	36.4	42.8	61.6
Sat 25/09/2021 08:30	44.6	36.2	47.1	63.2
Sat 25/09/2021 08:45	41.2	35.9	43.2	59.2
Sat 25/09/2021 09:00	45.1	36.1	49.0	60.4
Sat 25/09/2021 09:15	49.6	37.2	50.4	70.0
Sat 25/09/2021 09:30	48.4	36.5	49.3	65.0
Sat 25/09/2021 09:45	45.1	36.3	48.4	67.6
Sat 25/09/2021 10:00	43.0	37.1	44.0	63.4
Sat 25/09/2021 10:15	45.1	37.4	47.8	70.6
Sat 25/09/2021 10:30	44.4	36.5	47.8	59.9
Sat 25/09/2021 10:45	42.8	36.9	44.3	65.2
Sat 25/09/2021 11:00	43.2	38.0	45.0	62.3
Sat 25/09/2021 11:15	54.1	40.7	54.9	83.6
Sat 25/09/2021 11:30	46.3	39.0	47.7	72.9
Sat 25/09/2021 11:45	43.2	37.4	46.2	59.3
Sat 25/09/2021 12:00	45.0	37.6	48.2	62.1
Sat 25/09/2021 12:15	43.6	37.7	45.9	60.0
Sat 25/09/2021 12:30	41.1	36.1	42.0	57.7
Sat 25/09/2021 12:45	46.7	37.1	49.0	64.2
Sat 25/09/2021 13:00	41.4	36.7	42.0	69.3
Sat 25/09/2021 13:15	44.0	36.7	41.4	65.3
Sat 25/09/2021 13:30	41.8	36.6	42.5	63.4
Sat 25/09/2021 13:45	44.5	36.9	47.9	60.8
Sat 25/09/2021 14:00	41.0	35.8	42.7	57.8
Sat 25/09/2021 14:15	40.1	37.4	41.8	52.4
Sat 25/09/2021 14:30	43.4	37.1	42.6	73.0
Sat 25/09/2021 14:45	44.6	36.0	41.0	73.0

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Sat 25/09/2021 15:00	48.8	35.7	49.6	68.0
Sat 25/09/2021 15:15	43.3	35.5	46.2	59.5
Sat 25/09/2021 15:30	41.7	35.8	43.0	64.8
Sat 25/09/2021 15:45	40.9	34.6	40.3	63.6
Sat 25/09/2021 16:00	43.3	36.0	45.7	59.7
Sat 25/09/2021 16:15	41.5	35.4	42.2	58.9
Sat 25/09/2021 16:30	42.1	36.1	45.4	55.5
Sat 25/09/2021 16:45	42.2	36.0	43.4	61.1
Sat 25/09/2021 17:00	38.9	35.0	41.6	54.1
Sat 25/09/2021 17:15	44.2	35.9	47.6	63.6
Sat 25/09/2021 17:30	41.2	35.9	41.6	67.4
Sat 25/09/2021 17:45	40.5	36.1	42.4	54.5
Sat 25/09/2021 18:00	42.0	36.0	43.0	65.0
Sat 25/09/2021 18:15	51.6	38.0	53.1	76.3
Sat 25/09/2021 18:30	53.1	37.4	55.0	80.3
Sat 25/09/2021 18:45	53.0	37.0	50.7	84.5
Sat 25/09/2021 19:00	42.5	35.4	46.0	55.0
Sat 25/09/2021 19:15	44.4	37.0	47.2	60.9
Sat 25/09/2021 19:30	42.0	36.3	45.1	55.9
Sat 25/09/2021 19:45	44.0	35.4	44.5	65.7
Sat 25/09/2021 20:00	40.6	36.0	42.5	57.1
Sat 25/09/2021 20:15	42.3	36.9	44.9	58.5
Sat 25/09/2021 20:30	39.5	34.6	42.3	54.1
Sat 25/09/2021 20:45	44.1	35.2	46.2	68.2
Sat 25/09/2021 21:00	42.3	33.6	43.3	69.4
Sat 25/09/2021 21:15	41.3	33.4	44.5	63.0
Sat 25/09/2021 21:30	40.0	33.5	41.9	68.6
Sat 25/09/2021 21:45	45.3	32.1	48.8	64.9
Sat 25/09/2021 22:00	35.3	31.0	37.9	46.2
Sat 25/09/2021 22:15	36.3	31.1	39.3	46.6
Sat 25/09/2021 22:30	37.4	31.0	40.6	57.1
Sat 25/09/2021 22:45	35.9	31.4	38.3	49.4

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Sat 25/09/2021 23:00	35.5	30.8	38.7	46.5
Sat 25/09/2021 23:15	36.3	30.6	39.2	56.9
Sat 25/09/2021 23:30	38.2	30.7	41.7	50.7
Sat 25/09/2021 23:45	37.5	29.6	41.3	53.2
Sun 26/09/2021 00:00	37.1	29.7	39.5	54.2
Sun 26/09/2021 00:15	35.4	29.4	38.4	51.2
Sun 26/09/2021 00:30	33.8	28.6	37.4	47.9
Sun 26/09/2021 00:45	34.4	28.8	36.9	50.6
Sun 26/09/2021 01:00	34.6	29.9	37.6	48.3
Sun 26/09/2021 01:15	36.6	32.2	39.6	48.1
Sun 26/09/2021 01:30	35.4	30.3	38.1	47.6
Sun 26/09/2021 01:45	32.6	29.5	34.7	43.3
Sun 26/09/2021 02:00	32.5	29.9	34.6	42.8
Sun 26/09/2021 02:15	33.0	29.6	35.9	47.7
Sun 26/09/2021 02:30	32.7	29.5	34.9	45.5
Sun 26/09/2021 02:45	33.2	29.7	34.9	45.9
Sun 26/09/2021 03:00	32.1	29.7	34.0	47.0
Sun 26/09/2021 03:15	31.7	29.0	33.4	41.3
Sun 26/09/2021 03:30	29.9	28.3	30.9	38.9
Sun 26/09/2021 03:45	30.7	28.7	32.7	40.4
Sun 26/09/2021 04:00	32.3	29.3	34.7	46.7
Sun 26/09/2021 04:15	31.1	28.8	33.2	43.7
Sun 26/09/2021 04:30	31.5	28.4	33.4	44.0
Sun 26/09/2021 04:45	35.0	29.0	37.5	53.3
Sun 26/09/2021 05:00	37.0	32.8	39.5	46.3
Sun 26/09/2021 05:15	34.2	29.1	36.7	51.4
Sun 26/09/2021 05:30	40.2	28.9	41.7	65.2
Sun 26/09/2021 05:45	33.9	28.8	36.7	51.2
Sun 26/09/2021 06:00	34.7	29.5	37.8	47.4
Sun 26/09/2021 06:15	37.3	30.2	40.3	60.2
Sun 26/09/2021 06:30	47.0	32.8	50.9	67.2
Sun 26/09/2021 06:45	41.9	33.2	43.5	60.2

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Sun 26/09/2021 07:00	40.0	34.4	42.9	57.7
Sun 26/09/2021 07:15	44.9	36.3	47.6	60.8
Sun 26/09/2021 07:30	40.7	34.4	43.4	58.9
Sun 26/09/2021 07:45	42.4	33.2	44.0	62.8
Sun 26/09/2021 08:00	39.9	34.4	42.0	66.1
Sun 26/09/2021 08:15	43.2	34.8	45.9	65.5
Sun 26/09/2021 08:30	39.2	33.6	42.2	52.7
Sun 26/09/2021 08:45	40.8	35.9	42.9	59.6
Sun 26/09/2021 09:00	39.7	36.0	40.6	58.4
Sun 26/09/2021 09:15	42.8	36.1	44.6	59.3
Sun 26/09/2021 09:30	46.0	37.5	47.5	68.3
Sun 26/09/2021 09:45	44.3	38.8	45.8	59.8
Sun 26/09/2021 10:00	45.5	38.5	48.2	59.5
Sun 26/09/2021 10:15	44.7	40.3	46.4	67.5
Sun 26/09/2021 10:30	45.0	38.7	47.5	61.2
Sun 26/09/2021 10:45	45.2	38.4	46.2	63.2
Sun 26/09/2021 11:00	48.0	39.6	51.6	64.8
Sun 26/09/2021 11:15	50.0	42.0	53.2	67.8
Sun 26/09/2021 11:30	45.3	39.5	48.0	59.3
Sun 26/09/2021 11:45	43.1	39.7	44.3	59.1
Sun 26/09/2021 12:00	44.6	40.7	47.1	56.8
Sun 26/09/2021 12:15	45.1	40.4	47.6	64.1
Sun 26/09/2021 12:30	47.3	40.8	50.1	65.4
Sun 26/09/2021 12:45	48.4	41.2	51.0	67.4
Sun 26/09/2021 13:00	48.1	40.1	52.3	70.3
Sun 26/09/2021 13:15	55.9	48.7	58.6	70.3
Sun 26/09/2021 13:30	62.8	38.3	69.2	84.7
Sun 26/09/2021 13:45	61.3	40.0	66.9	75.9
Sun 26/09/2021 14:00	43.5	39.7	45.6	58.2
Sun 26/09/2021 14:15	43.6	39.2	46.1	58.8
Sun 26/09/2021 14:30	42.3	38.5	45.0	56.9
Sun 26/09/2021 14:45	45.4	39.4	46.9	61.0

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Sun 26/09/2021 15:00	45.8	39.0	48.1	62.0
Sun 26/09/2021 15:15	43.3	39.8	45.2	56.6
Sun 26/09/2021 15:30	43.8	39.7	45.5	59.0
Sun 26/09/2021 15:45	42.3	39.9	43.9	53.1
Sun 26/09/2021 16:00	49.6	41.5	51.5	66.4
Sun 26/09/2021 16:15	45.4	41.8	47.6	56.8
Sun 26/09/2021 16:30	44.3	40.2	47.3	54.2
Sun 26/09/2021 16:45	43.9	40.4	45.7	63.7
Sun 26/09/2021 17:00	43.7	39.4	46.3	55.9
Sun 26/09/2021 17:15	43.8	39.5	46.5	59.8
Sun 26/09/2021 17:30	46.9	41.0	48.1	63.5
Sun 26/09/2021 17:45	43.7	38.8	45.9	64.8
Sun 26/09/2021 18:00	44.1	39.8	46.0	59.4
Sun 26/09/2021 18:15	43.1	38.8	45.9	54.7
Sun 26/09/2021 18:30	43.4	36.9	45.2	61.8
Sun 26/09/2021 18:45	45.5	39.0	47.6	61.5
Sun 26/09/2021 19:00	43.6	37.0	45.2	60.8
Sun 26/09/2021 19:15	45.0	37.5	45.3	63.5
Sun 26/09/2021 19:30	42.3	35.3	44.7	61.5
Sun 26/09/2021 19:45	41.4	36.7	44.1	55.0
Sun 26/09/2021 20:00	44.4	38.3	47.5	65.2
Sun 26/09/2021 20:15	46.9	41.5	49.7	62.0
Sun 26/09/2021 20:30	46.5	41.3	49.7	59.4
Sun 26/09/2021 20:45	45.6	40.3	48.7	56.5
Sun 26/09/2021 21:00	46.2	41.7	48.9	58.3
Sun 26/09/2021 21:15	43.0	37.9	45.5	57.7
Sun 26/09/2021 21:30	42.9	38.2	45.8	59.1
Sun 26/09/2021 21:45	44.7	39.2	47.6	58.4
Sun 26/09/2021 22:00	44.3	40.1	46.9	58.8
Sun 26/09/2021 22:15	46.3	40.7	49.6	59.1
Sun 26/09/2021 22:30	48.9	41.9	52.2	62.0
Sun 26/09/2021 22:45	47.9	41.2	51.4	61.4

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Sun 26/09/2021 23:00	46.5	39.4	50.3	60.3
Sun 26/09/2021 23:15	47.9	40.2	51.0	62.8
Sun 26/09/2021 23:30	46.6	40.6	49.8	61.9
Sun 26/09/2021 23:45	44.5	38.6	47.3	61.9
Mon 27/09/2021 00:00	46.4	39.1	50.1	58.9
Mon 27/09/2021 00:15	44.2	37.6	47.7	57.2
Mon 27/09/2021 00:30	42.9	36.9	45.7	57.2
Mon 27/09/2021 00:45	44.8	39.0	47.9	59.2
Mon 27/09/2021 01:00	44.1	37.8	48.0	54.4
Mon 27/09/2021 01:15	46.8	38.1	50.7	58.0
Mon 27/09/2021 01:30	43.6	36.1	47.1	56.5
Mon 27/09/2021 01:45	45.8	38.5	48.9	61.7
Mon 27/09/2021 02:00	47.0	40.5	50.7	58.0
Mon 27/09/2021 02:15	44.0	38.2	47.0	61.6
Mon 27/09/2021 02:30	46.8	40.5	50.1	59.0
Mon 27/09/2021 02:45	46.4	38.8	50.3	57.9
Mon 27/09/2021 03:00	48.4	42.4	51.8	60.6
Mon 27/09/2021 03:15	46.5	40.0	49.9	58.8
Mon 27/09/2021 03:30	47.7	40.2	51.5	61.4
Mon 27/09/2021 03:45	48.3	42.0	51.3	61.8
Mon 27/09/2021 04:00	49.3	44.4	52.2	60.3
Mon 27/09/2021 04:15	50.5	43.9	53.6	64.5
Mon 27/09/2021 04:30	47.7	41.1	50.8	64.1
Mon 27/09/2021 04:45	49.7	42.6	53.4	61.4
Mon 27/09/2021 05:00	48.7	42.2	52.2	58.7
Mon 27/09/2021 05:15	47.2	41.9	50.3	59.5
Mon 27/09/2021 05:30	47.9	42.7	51.1	59.6
Mon 27/09/2021 05:45	49.5	44.1	52.7	60.6
Mon 27/09/2021 06:00	52.2	49.3	54.2	64.0
Mon 27/09/2021 06:15	53.3	49.8	55.8	67.4
Mon 27/09/2021 06:30	62.9	54.9	66.6	80.4
Mon 27/09/2021 06:45	56.0	51.3	58.4	72.3

Day, Date and Time	$L_{Aeq, 15\ min}$	$L_{A90, 15\ min}$	$L_{A10, 15\ min}$	$L_{Amax(F)}$
Mon 27/09/2021 07:00	57.2	53.1	59.3	73.0
Mon 27/09/2021 07:15	53.7	47.3	53.9	71.7
Mon 27/09/2021 07:30	52.7	46.8	52.4	71.8
Mon 27/09/2021 07:45	49.2	45.7	49.9	68.6
Mon 27/09/2021 08:00	46.8	44.9	48.3	56.7
Mon 27/09/2021 08:15	47.3	44.3	49.3	59.0
Mon 27/09/2021 08:30	49.2	43.1	48.5	70.8
Mon 27/09/2021 08:45	45.8	42.5	47.7	60.5
Mon 27/09/2021 09:00	47.2	42.2	48.7	65.2
Mon 27/09/2021 09:15	50.0	41.9	53.9	65.2
Mon 27/09/2021 09:30	49.3	40.3	51.9	67.5
Mon 27/09/2021 09:45	47.7	41.8	49.3	70.3
Mon 27/09/2021 10:00	47.5	41.5	50.1	65.3
Mon 27/09/2021 10:15	45.5	41.1	47.8	63.9
Mon 27/09/2021 10:30	46.9	42.3	48.3	64.7
Mon 27/09/2021 10:45	53.8	41.7	52.4	77.8
Mon 27/09/2021 11:00	52.7	42.4	56.1	72.7
Mon 27/09/2021 11:15	50.0	40.8	50.4	68.8
Mon 27/09/2021 11:30	44.3	40.8	45.9	59.8
Mon 27/09/2021 11:45	45.9	40.5	47.5	65.4
Mon 27/09/2021 12:00	46.2	40.7	47.8	71.3

Table 02-03
Count of Background Sound Levels at Location 1, dB

Background sound level	Day 07:00 – 23:00	Night 23:00 – 07:00
< 28	0	0
28	0	2
29	0	19
30	0	21
31	4	11
32	6	3
33	5	6
34	7	2
35	12	0
36	27	1
37	26	1
38	12	4
39	15	6
40	23	3
41	21	4
42	13	4
43	2	1
44	1	2
45	1	0
>45	1	0
Representative level	**36 dB $L_{A90, T}$**	**30 dB $L_{A90, T}$**

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