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**Noise Assessment Review  
For Environmental Permit  
For the Proposed Thornton Energy Recovery Centre (TERC)**

**At**

**Hillhouse Business Park, Thornton-Cleveleys, Lancashire**

**For**

**Sesona Limited**

**Consultant: D.R. Kettlewell MSc MIOA MAE I.Eng  
Report No.: R22.1006/DRK**

**Noise & Vibration Consultants Ltd**

**Member of Institute of Acoustics  
Member of Association of Noise Consultants  
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**Report prepared by:  
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A handwritten signature in black ink, appearing to read 'D R Kettlewell', is written over a light blue horizontal line.

**Date: 31<sup>st</sup> October 2022**

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Figure 2: Plan of Site Showing Layout

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## APPENDICES

Appendix 1	Basic Acoustic Terminology
Appendix 2	Baseline Sound Survey Results
Appendix 3	Site Operational Noise Levels & Mitigation Measures
Appendix 4	Noise Model Settings & Mapping Results
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## 1.0 INTRODUCTION

- 1.1 Noise & Vibration Consultants Ltd (“NVC”) have been instructed by Sesona Limited (the Applicant) to review the site layout, construction and plant locations and advise on predicted noise levels with the assumed noise mitigation measures for the proposed Thornton Energy Recovery Centre (“TERC”, the Facility) at Hillhouse Business Park, Thornton-Cleveleys, Lancashire.
- 1.2 We have been asked to carry out a noise impact assessment using empirical data taken from measurements made at other Energy Recovery Centre (ERC) plant operating in the UK, based on information provided by Technology Providers, to determine the resultant noise contribution at identified sensitive receptors.
- 1.3 The main areas of plant and buildings relevant to the assessment include the following (as shown on Figure 2 of the attached):

### **Thornton Energy Recovery Centre (TERC) Facility:**

#### *Plant Enclosed Within Buildings*

- (i) RDF Reception
- (ii) Boiler Hall & Flue Gas Treatment
- (iii) Turbine Hall
- (iv) Fan Stacks (2)
- (v) Ash storage and conveyors
- (vi) Workshop
- (vii) Switchgear
- (viii) Control Room
- (ix) Offices and Staff Welfare

#### *External Plant*

- (i) Main Stacks
- (ii) Air Cooled Condenser
- (iii) Water Treatment
- (iv) Substation
- (v) Gatehouse
- (vi) Storage Skips
- (x) HGV's

- 1.5 The TERC would operate 24 hours a day and 7 days a week. Deliveries to the facility would occur during daytime periods with waste brought to the facility between the hours of 07.00 and 19.00 Monday to Friday and 08.00 to 13.00 hours on Saturday including Bank Holidays, except Christmas Day, Boxing Day and New Year's Day.
- 1.6 Information used in this review has been obtained from the following sources:
- Ordnance Survey maps of the local area;

- Layout and elevation drawings of the Proposed Development (GSDA 1447\_PL101, 1447\_PL300, 1447\_PL301, 1447\_PL400, 1447\_PL401, 1447\_PL402 and 1447\_PL403);
- National Planning Policy Framework – July 2021;
- Planning Practice Guidance – June 2021;
- Noise Policy Statement for England (NPSE) – March 2010;
- Noise and vibration management: environmental permits (January 2022);
- BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'
- BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'
- World Health Organisation: 'Guidelines for Community Noise' - April 1999;
- World Health Organisation 'Night Noise Guidelines for Europe' – 2009;
- Department of Transport 'Calculation of Road Traffic Noise': 1988;
- ISO 9613-2: 1996 Acoustics – Attenuation of Sound During Propagation Outdoors; and
- Chapter 7 'Noise & Vibration' of the Environmental Statement (ES) and associated Appendices.

## 2.0 LOCATION, RECEPTORS & BASELINE LEVELS

2.1 The 'Noise and Vibration' chapter of the ES (Chapter 7) and the associated Appendices for review include the following details:

- Location of the nearest noise sensitive receptors (NSRs);
- Baseline daytime and night-time noise levels at NSRs; and
- Predicted noise levels from proposed plant at the Site.

### Location

2.2 The Site covers an area of approximately 1.62 hectares of previously developed land, is flat and sits at around 6.5m AOD. At present, the Site is vacant and consists largely of hardstanding and internal roadways remaining from its previous industrial use.

2.3 The Site is located on the northern edge of Thornton, approximately 2.6km east of Cleveleys, 2.9km west of Stalmine, 3.9km south of Fleetwood and 8.2km northeast of Blackpool.

2.4 The Site is located within the larger Hillhouse Business Park, circa 1.5km east of the A585. The A585 connects Thornton with the M55 motorway which runs west to east from Blackpool to Preston, where it ultimately meets the M6 motorway.

2.5 The intervening land between the Site and receptors is generally formed by industrial and commercial development, vacant industrial grassland on the Business Park, site access roads and a disused railway line. This offers a mixed absorptive and reflective ground conditions for propagation (see Figure 2.1).

### Receptors

2.6 The 'Noise & Vibration' Chapter of the ES details the nearest sensitive receptors, with the following residential receptors identified in the area around the Site (see Figure 2.1 for ease of reference). The baseline monitoring positions are described in the ES as follows:

*Position A (Adjacent to eastern site boundary and River Wyre) – East of Site (Grid reference: 334503 444019)*

*Position A was chosen as a suitable monitoring position to represent typical baseline levels in the vicinity of the Ecological receptors at the River Wyre. Noise levels at this location are dominated by noise from the Business Park and the River. Photo 1 in Appendix 7.3 shows the location.*

*Position B (On site boundary opposite proposed housing development) – West of Site (Grid reference: 334083 444035)*

*Monitoring position B is representative of NSRs proposed to the west of the Site. The monitoring position was chosen at the Business Park boundary immediately opposite to the proposed residential development (currently under construction at the point of assessment) and away from any significant industrial noise sources. Photo 2 in Appendix 7.3 shows the location.*

Monitoring data recorded during the daytime construction activities on the new housing development have been removed from the data set.

**Position C (Off Bourne Road) - West of Site (Grid reference: 333959 443949)**  
This monitoring position is representative of the closest existing receptors west of the Site located off Bourne Road. Noise levels at this location are dominated by intermittent local road traffic noise. The noise meter was positioned circa 10m west of Bourne Road. Photo 3 in Appendix 7.3 shows the location. Monitoring data recorded during the daytime construction activities on the new housing development have been removed from the data set.

**Position D (Off Butts Road) – Southwest of Site (Grid reference: 333985 443917)**

This monitoring position is representative of the closest existing receptors southwest of the Site located off Butts Road. Noise levels at this location are dominated by intermittent local road traffic noise. The noise meter was positioned circa 10m west of Butts Road. Photo 3 in Appendix 7.3 shows the location.”

- 2.7 Based on distance relative to the Proposed Development, the NSR properties are located west of the Site, at the proposed residential housing off Bourne Road (Receptor R1) at circa 300m from the Site boundary, which, at the time of the ES assessment, were under construction (Grid reference: 334043 443953 & 334054 444012). There are other properties in this direction, however they are located at a greater distance and therefore the impact would be lower.

**Figure 2.1: Location of Baseline Monitoring and NSR Positions**



- 2.8 Receptors off Eagle Brow Close and Butts Road (Receptor R2) are located to the west of the Site, circa 400m from the TERC Site boundary (Grid reference: 333916 443959 & 333820 444037).
- 2.9 Receptors located to the southwest off Butts Road (Receptor R3) are located circa 360m from the TERC Site boundary (Grid reference: 334008 443873 & 333998 443790). There are other properties in this direction, however they are located at a greater distance and therefore the impact would be lower. Refer to Figure 1 for location of NSRs.
- 2.10 The nearest ecological receptors to the TERC are to the east of the Site and include the River Wyre, Morecambe Bay and Duddon Estuary Special Protection Area (SPA), Morecambe Bay Ramsar site and Wyre Estuary Site of Special Scientific Interest (SSSI), referred to as Receptor R4 at circa 60m to 140m distance from the Site boundary (Grid reference: 334581 443974 & 334496 444096).
- 2.11 The nearest commercial receptors are located at industrial facilities, with offices to the west and south of the Site on the Hillhouse Business Park (at circa 120m). These are referred to as Receptors R5 in Figure 1 attached (Grid reference: 334230 443931).

### Baseline Noise Levels

- 2.12 The 'Noise and Vibration' Chapter of the ES provides details of baseline sound monitoring undertaken at the nearest sensitive receptors during daytime and night-time periods. Tables 2.1 and 2.2 provide details of the baseline residual and representative background sound levels.
- 2.13 A baseline sound survey was undertaken over a 5-day period including a weekend from Wednesday 21<sup>st</sup> through to Sunday 25<sup>th</sup> September 2022 at four fixed locations under suitable monitoring weather conditions and is considered to provide representative baseline sound levels during the quietest period of the week.
- 2.14 The nearest sensitive receptor (R1: new residential development off Bourne Road) is deemed to be the most sensitive receptor (located west of the TERC), due to the separation distance.
- 2.15 The results of baseline monitoring are provided in Table 2.1 and 2.2.

**Table 2.1: Existing Background Sound Levels at Monitoring Positions (Daytime)**

Monitoring Position (Refer to Figure 1)	Time Period	Av. LAeq dB	LA10 dB	Av. LA90 dB	Most common place LA90 dB	LAmx dB	Representative <sup>1</sup> LA90 dB
A) East of Site	Daytime (0700-2300)	53	55	44	43	39-78	43
B) West of Site (proposed NSRs) New housing	Daytime (0700-2300)	52 <sup>2</sup>	54 <sup>2</sup>	46 <sup>2</sup>	47 <sup>2</sup>	43-90 <sup>2</sup>	46 <sup>2</sup> 41 <sup>3</sup>
C) West of Site Off Bourne Rd	Daytime (0700-2300)	55 <sup>2</sup>	57 <sup>2</sup>	45 <sup>2</sup>	39 <sup>2</sup>	63-97 <sup>2</sup>	37 <sup>2</sup>

D) Southwest of Site (Butts Rd)	Daytime (0700-2300)	56 <sup>2</sup>	59 <sup>2</sup>	46 <sup>2</sup>	39 <sup>2</sup>	62-91 <sup>2</sup>	<b>39<sup>2</sup></b>
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<sup>1</sup> Note: Takes into account the median, mean and most commonplace LA90 based on statistical analysis, whichever is lowest.

<sup>2</sup> Data set excludes measurement period during daytime construction works at new housing development.

<sup>3</sup> The planning submission for the new housing off Bourne Road by Echo Acoustics for Beck Homes (planning ref: 20/00405/LMAJ) dated 21<sup>st</sup> October 2020 provides baseline data recorded in March 2020 which indicates background levels of 41dB LA90.

**Table 2.2: Existing Background Sound Levels at Monitoring Positions (Night-time)**

Monitoring Position (Refer to Figure 1)	Time Period	Av. LAeq dB	LA10 dB	Av. LA90 dB	Most common place LA90 dB	LAmx dB	Representative <sup>1</sup> LA90 dB
A) East of Site	Night-time (2300-0700)	42	43	40	33	35-60	<b>38</b>
B) West of Site (proposed NSRs) New housing	Night-time (2300-0700)	45	46	43	47	41-78	<b>36<sup>2</sup> &amp; <sup>3</sup></b>
C) West of Site Off Bourne Rd	Night-time (2300-0700)	50	52	39	37	42-85	<b>37</b>
D) Southwest of Site (Butts Rd)	Night-time (2300-0700)	49	52	40	40	39-77	<b>39</b>

<sup>1</sup> Note: Takes into account the median, mean and most commonplace LA90 based on statistical analysis, whichever is lowest.

<sup>2</sup> Data set excludes measurement period during construction works at new housing development.

<sup>3</sup> The planning submission for the new housing off Bourne Road by Echo Acoustics for Beck Homes (planning ref: 20/00405/LMAJ) dated 21<sup>st</sup> October 2020 provides baseline data recorded in March 2020 which indicates background levels of 36dB LA90.

- 2.16 The results of existing background sound measurements taken at the fixed monitoring positions indicate that representative background sound levels during the daytime period (0700-2300 hours) vary between 37dB and 46dB LA90 and during the night-time period (i.e. between 2300-0700 hours) between 36dB and 39dB LA90.
- 2.17 In context, the residual sound levels at the monitoring positions during the daytime period (0700-2300 hours) vary between 52dB and 56dB LAeq and during the night-time period (i.e. between 2300-0700 hours) between 42dB and 50dB LAeq.



## 3.0 REVIEW OF NOISE GUIDANCE AND STANDARDS

### 3.1 Introduction

- 3.1.1 The ambient environmental noise at any location will vary according to the activities occurring around the location. In the vicinity of a busy motorway, for example, the noise level will remain fairly constant due to the relatively steady noise input from road traffic, whereas the noise level close to a source of high noise over short periods, such as an airport, will vary over a much wider range. It is therefore necessary to consider how to quantify the existing noise levels in an area in order to accurately assess the acceptability of the introduction of a new noise source.
- 3.1.2 The background sound level, defined as the  $L_{A90}$  parameter, represents the sound level exceeded for 90% of a measurement period, or the ninety-percentile level. It generally reflects the quieter sound level between peak events and generally ignores the effects of short-term higher sound level events. Another way of describing the  $L_{A90}$  level is that it represents the 'troughs' of the sound climate and the lower 10% of the fluctuating ambient sound.
- 3.1.3 The ten-percentile level  $L_{A10}$ , represents the level that is exceeded for 10% of the measurement period and is therefore an indication of the higher levels of sound. This is commonly used to describe and quantify noise from road traffic as it reflects the higher levels of noise and the upper 10% of the fluctuating ambient noise.
- 3.1.4 The equivalent continuous sound pressure level or  $L_{Aeq}$  parameter, is a measure of the average sound energy over a given time period. It will include noise from all contributing sources. This is commonly used to describe and quantify noise from specific industrial noise sources.

#### Noise Guidance and Standards

- 3.1.5 The 'Noise and Vibration' chapter of the ES sets out the relevant guidance and standards for noise for industrial development. This provides detail of the most relevant noise criteria upon which the Site should be assessed, this includes:
1. BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (updated in June 2019);
  2. BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings';
  3. Noise Policy Statement for England: March 2010;
  4. National Planning Policy Framework (NPPF) (July 2021);
  5. Planning Practice Guidance: March (updated June 2021);
  6. World Health Organisation (WHO) Night Noise Guidelines for Europe: 2009; and
  7. Environment Agency (EA) Guidance (Noise and vibration management: environmental permits January 2022).

## BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

3.1.6 In terms of defining a suitable noise limit, achieving a low impact in accordance with BS4142:2014+A1:2019 would provide suitable protection for the amenity of NSRs. The Standard is based on the measurement of background sound using  $L_{A90}$  noise measurements, compared to source noise levels measured in  $L_{Aeq}$  units. Once any corrections have been applied for source noise tonality, distinct impulses and intermittency etc., the difference between these two measurements (i.e. known as the 'rating' level) determines the impact magnitude.

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact (although this can be dependent on the context).
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- 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. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact (although this can be dependent on the context).

3.1.7 In defining noise limits and the significance of the impact from the Site, BS4142 indicates that a low impact occurs where the 'rating' level from site (which includes a noise character) **does not exceed** the representative baseline sound level and an adverse impact where the 'rating' level is around +5dB above baseline sound levels (depending on the context i.e. if residual sound levels significantly increase).

3.1.8 Based on the requirements set out in BS4142: 2014+A1:2019 to achieve a **low impact**, the following noise limits would apply:

**Table 3.1: Noise Limits Daytime (relative to BS4142 low impact)**

NSR	Location	Grid Reference X Y	Day (0700-2300 hours)		
			Representative Background Sound Level LA90 dB	Residual Sound Level LAeq dB	Rating Level * Limit LAeq1hr dB
R1	Bourne Road (new residential)	334043 443953 & 334054 444012	41-46	52	41
R2	Eagle Brow Close and Butts Road	333916 443959 & 333820 444037	37	55	37
R3	Butts Road	334008 443873 & 333998 443790	39	56	39

**Table 3.2: Noise Limits Night-time**

NSR	Location	Grid Reference X Y	Night (2300-0700 hours)		
			Representative Background Sound Level LA90 dB	Residual Sound Level LAeq dB	Rating Level * Limit LAeq dB
R1	Bourne Road (new residential)	334043 443953 & 334054 444012	36	45	36
R2	Eagle Brow Close and Butts Road	333916 443959 & 333820 444037	37	50	37
R3	Butts Road	334008 443873 & 333998 443790	39	49	39

**Latest Advice Set Out in Environment Agency (EA) Guidance (Noise and vibration management: environmental permits January 2022)**

3.1.9 The latest guidance from the EA (Noise and vibration management: environmental permits – January 2022) states:

*“For industrial noise impacts where the sound is neither impulsive nor tonal, but you can readily distinguish it against the usual residual acoustic environment, the environment agencies will expect you to apply a minimum character correction of +3 decibels (dB) ‘other’. This is unless you can robustly justify that you do not need such a correction.”*

3.1.10 Whilst the TERC would be designed to eliminate noise character at NSRs during the detailed design stage (by specification to the EPC Contractor), to comply with the EA guidance on design, the above limits would be reduced by a further 3dB to allow for noise character. The resultant design limit levels are presented below in Table 3.3.

**Table 3.3: EA Noise Limits**

NSR	Location	Daytime Noise Limits LAeq,1hr dB	Night-time Noise Limits LAeq15mins dB
R1.	Bourne Road (new residential)	38	33
R2.	Eagle Brow Close and Butts Road	34	34
R3.	Butts Road	36	36

**Other Relevant Guidance and Standards**

BS8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’

3.1.11 The British Standard BS8233 provides additional guidance on noise levels within buildings. These are based on the WHO recommendations and the criteria given in BS8233 for unoccupied spaces within residential properties.

3.1.12 The guidance provided in section 7.7 of BS8233 provides recommended internal ambient noise levels for resting, dining and sleeping within residential dwellings. Table 3.4 provides detail of the levels given in the standard.

**Table 3.4: BS8233: 2014 Indoor Ambient Noise Levels for Dwellings**

<b>Activity</b>	<b>Location</b>	<b>07:00 to 23:00</b>	<b>23:00 to 07:00</b>
Resting	Living Room	35 dB $L_{Aeq,16hours}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hours}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hours}$	30 dB $L_{Aeq,8hours}$
Study & work requiring concentration	Office	35-45dB $L_{Aeq,16hours}$	-

3.1.13 For a partially open window the standard refers to a reduction of approximately 15dB. This would therefore indicate a noise level outside the window of approximately 50-55dB  $L_{Aeq,16hours}$  for living rooms during daytime and 45dB  $L_{Aeq,8 hours}$  during night-time outside bedrooms. For office environments the external noise level would be in the region of 50-60dB  $L_{Aeq,16hours}$  on the assumption that the office window is open.

World Health Organisation (WHO) Night Noise Guidelines for Europe: 2009

3.1.14 In 2009, the WHO published '*Night Noise Guidelines for Europe*', which it describes as an extension to the WHO '*Guidelines for community noise*' (1999). It concludes that "*Considering the scientific evidence on the thresholds of night noise exposure indicated by  $L_{night,outside}$  as defined in the Environmental Noise Directive (2002/48/EC), an  $L_{night,outside}$  of 40dB should be the target of the night noise guideline (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly.  $L_{night,outside}$  value of 55dB is recommended as an interim target for those countries where the NNG cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach.*" The target of 40dB(A) outside would relate to an internal noise level within bedrooms of 25-30dB(A)  $L_{eq8hours}$ .

## 4.0 NOISE PREDICTIONS

### 4.1 Mitigation Strategy

- 4.1.1 The predicted noise levels from the Proposed Development have been calculated using the noise levels provided within Appendix 2. The noise levels are based on plant noise data provided by Technology Providers on other similar projects in the UK. The noise mitigation strategy includes the following mitigation measures:

#### *Design Layout*

- (i) The design layout has taken into account the most significant noise sources and positioned these to have minimum impact on the NSR (i.e. west of the Site). This includes:
  - (a) ACC unit located at the southern end of the facility and design to include an extension to the western side wall of the Turbine Building to provide an acoustic screen to fan noise radiating towards residential receptors.
  - (b) Ventilation fans within the facility buildings located on eastern side of the plant with appropriate mitigation measures to ventilation openings to maximise screening towards west.

#### *Noise Control Measures*

- (ii) Sound power levels or reverberant sound pressure levels of plant as detailed in Appendix 2.
- (iii) Screen formed by extension of western façade of Turbine Building at ACC end of facility to assist in reducing noise radiating towards NSRs.
- (iv) Fan stacks reduced by 10dB(A) (i.e. 84dB(A) sound power level approx. 76dB LAeq15mins @ 1m/90deg from flue exit of point of stack)
- (v) Air cooled condenser fans operating at an overall sound power level of 101dB(A) (73dB LAeq15mins @ 10m (e.g. 8 fans at 92dB(A) each fan).
- (vi) Skylights on building roof areas formed by double or triple skinned polycarbonate panels with air gaps to a minimum Rw value of 35dB.
- (vii) RDF fuel reception building walls and roof insulated with double skin insulated cladding or solid walls having a minimum Rw value of 44dB.
- (viii) All other building cladding formed by double skin insulated cladding having a minimum Rw value of 39dB
- (ix) Noise levels from ventilation louvres to be reduced to a noise level of 64dB LAeq15mins at 1m on western, northern or southern façade. Noise levels from ventilation louvres on eastern façade to be reduced to a noise level not exceeding 70dB LAeq15mins at 1m.

- (x) Any external air conditioning units for offices or similar external plant should be designed to a level not exceeding 65dB(A) @ 3m. These should be installed to the rear of the southern end of the Turbine building at ground level.
- (xi) Doors closed except for access to vehicles for offloading and collection unless for maintenance or emergency. Doors into Tipping Hall fast acting minimum Rw 10dB. Turbine Hall doors minimum Rw 24dB. Workshop and Switchgear doors via insulated roller shutter doors minimum Rw 18dB and all other doors minimum Rw 12dB.
- (xii) Design to ensure no noise character is perceptible at NSRs in accordance with BS4142: 2014+A1:2019.
- (xiii) Mobile plant and site-controlled vehicles fitted with non-tonal reversing alarms (i.e. broadband noise, 'white noise' or SMART type reversing alarms).
- (viii) Traffic arrangements on Site utilises one-way system so that reversing in outside areas is minimised.

4.1.2 For the purpose of the noise model we have referred to the layout plans and elevations of the TERC provided by GDSA.

4.1.3 In terms of assumed sound reduction index for associated cladding and doors relative to the TERC buildings we have assumed the following acoustic performance, which is detailed below in Table 4.1.

**Table 4.1: Assumed SRI Values for the Cladding, Louvres and Doors into the Buildings**

Product	ID	Octave Spectrum (dB)									
		31.5	63	125	250	500	1000	2000	4000	8000	Rw
Kingspan Thermarroof TR26 LPC	THERMAROOF		22	28	31	40	49	50	50	50	44
Roller Shutter Door	RSD		2	3	5	8	10	11	13	12	10
CA Group Twin Therm Roof Panel	TWIN_THERM	8	13	16	30	38	42	43	46	51	39
Insulated Door Panel	DOOR	8	15	16	19	23	26	22	39	36	24
Insulated Roller Door	IRD		3	7	9	15	19	21	25	20	18
Danpalon 16	DAN	8	11	18	23	27	33	36	32	26	32
Danpalon Double Skinned	DAN32		11	18	23	33	38	42	38	32	35
Longspan Composite Wall Panel	AWP60	0	15	16	19	23	26	22	39	47	24

4.1.4 The information assumed for noise emission levels for the plant provides us with noise data for input into the noise model and is provided in Appendix 2 and below / overleaf for ease of reference.

Estimated grid references for the TERC building include the following:

- Northwest corner of RDF Reception building: 334373 444078
- Northeast corner of RDF Reception building: 334422 444085
- Southwest corner of ACC Screen: 334391 443942
- Southeast corner of Turbine Hall building: 334436 443968

**Table 4.2: Noise Source Input Data**

Noise Source	ID	Type	Octave Spectrum (dB)									
			31.5	63	125	250	500	1000	2000	4000	8000	A
Stack Outlet Silenced	ST	Lw	88	88	90	85	82	78	74	69	58	84
Air cooled condensers	ACC	Lw	96	96	93	91	89	86	82	75	68	91
Transformers	TRAN	Lw	86	92	86	83	80	78	75	71	72	83.5
HGV movement	HGV	Lw	97	110	106	102	101	97	95	90	86	103
Flue Gas & Boiler Treatment	FGT	Li	86	86	83	83	82	78	78	77	71	85.2
Turbine	TUR	Li	87.5	84.5	89.5	87.5	89	90	89.9	84.5	79	95
RDF Reception (night-time)	WASTE2	Li	90	89	83	73	59	46	46	50	46	70.1
RDF Reception (daytime)	WASTE1	Li	105.8	103.8	98.1	87.5	74.4	60.9	60.9	64.8	55.6	85
Workshop	W	Li	87	86	87	84	78	74	72	75	74	82.6

4.2.7 For daytime periods, the Site is assumed to have HGVs moving around the Site and doors into the buildings would be closed. For calculation purposes the number of HGVs over the daytime period on an hourly basis is assumed to be 5 (i.e. 10 movements per hour) for worst case scenario.

## 4.2 Noise Prediction Modelling

4.2.1 Noise prediction modelling of the Site is based on the information detailed in Table 4.1 and 4.2 using CadnaA noise prediction modelling software. The results of the noise mapping are shown below and Appendix 3 (noise maps 1 to 2).

4.2.2 The model utilises ISO9613-2 as the method of calculation for propagation from the building to the receptor. Settings for the noise model include the following, which is based on industry accepted standards:

Ground effect (Agr) = 0.5 (mixed ground absorption due to surrounding topography)

Temperature = 10degC

Humidity = 70%

Height above ground for receiver = 4m (night-time) 1.5m (daytime)

Maximum order of reflection = 1

4.2.3 Drawings of the Site layout and building elevations have been provided and the main building assumed heights, ACC, air coolers and fan stack within the noise model would indicate the following:

- (i) Tipping Hall: 10.6m to 13.6m
- (ii) Boiler Hall: 15m to 18m
- (iii) FGT: 15m to 18m
- (iv) Turbine Hall: 15m to 18m
- (v) ACC Fans: 12.8m above ground
- (vi) Stacks: 45m

4.2.4 The results of the noise predictions are provided in Table 4.3, which include the assumed building cladding and insulation specification for doors and louvres provided in Table 4.1.

**Table 4.3: Noise Prediction Results at Residential Receptors with Noise Mitigation**

Noise Receptor	Predicted Rating Noise Level LAeq dB with mitigation	Representative <sup>2</sup> Background Sound Level LA90 dB	Level Difference [predicted with LA90] dB
<b>Daytime (0700-2300 hours) Laeq dB<sub>1 hour</sub></b>			
R1. Bourne Road (new residential)	39 <sup>1</sup>	41 [52]	-2
R2. Eagle Brow Close and Butts Road	35-36 <sup>1</sup>	37 [55]	-2 to -1
R3. Butts Road	39 <sup>1</sup>	39 [56]	0
<b>Night-time (2300-0700 hours) Laeq dB<sub>15mins</sub></b>			
R1. Bourne Road (new residential)	35-36 <sup>1</sup>	36 [45]	-1 to 0
R2. Eagle Brow Close and Butts Road	33-34 <sup>1</sup>	37 [50]	-4 to -3
R3. Butts Road	39 <sup>1</sup>	39 [49]	0

Note 1: Whilst noise characteristics at receptor locations is not expected, to comply with EA guidelines a +3dB penalty is included in the assessment for robustness. This period also includes HGV movement on Site between 0700-1900 hours Mon-Fri & Saturday 0800-1300 hours.

Note 2: Based on a 5-day period of baseline sound monitoring including a weekend at NSRs.

- 4.2.5 The above table shows the impact relative to the likely noise condition and shows that the noise contribution is equal to or up to 3dB **lower** than the representative daytime background sound levels.
- 4.2.6 The night-time table of results shows that the Site noise rating noise level is predicted to be equal to or up to 4dB **lower** than the representative background sound levels.
- 4.2.7 With the proposed mitigation strategy, the Site is not expected to produce any noise character at NSRs. The above predictions do however allow for a +3dB noise penalty for noise character as advised by the EA guidelines.
- 4.2.7 The results show that the daytime and night-time predicted noise levels (according to BS4142: 2014+A1:2019) are likely to show a **low** impact magnitude.

#### *Ecological Receptors*

- 4.2.10 Ecological receptors included in the ES Chapter include the following:
- a) River Wyre - Special Protection Area (SPA), Ramsar, Site of Special Scientific Interest (SSSI).
- 4.2.11 Predicted noise levels at the above ecological receptors are provided below in Table 4.4.



**Table 4.4: Noise Prediction Results at Non-residential Receptors with Noise Mitigation**

Noise Receptor	Predicted Noise Level LAeq <sub>1hr</sub> dB	Residual Sound Level LAeq dB	Noise Limits LAeq <sub>1hr</sub> dB	Excess over limit LAeq dB
<b>Daytime</b>				
River Wyre SPA, Ramsar & SSSI	47-50	53	55	-8 to -5
<b>Night-time</b>				
River Wyre SPA, Ramsar & SSSI	43-48	42	55	-12 to -7

4.2.12 The above resultant noise levels at the ecological receptors shows no significant impact.

*Office Receptors*

4.2.13 The predicted daytime levels at the nearest industrial facilities with offices to the west (circa 120m) and to the south of the Site on the Business Park are between 43dB to 44dB LAeq. This is well within BS8233:2014 guidance for office environments (external level of circa 55-60dB LAeq with open window).

*Noise Limits at Residential Receptors*

4.2.14 For noise limits, we would expect that given the residual and background sound levels in the area, the design should aim to achieve a noise contribution that is no higher than the background sound level during daytime and night-time periods. Additionally, in consideration of the latest EA Guidance 'Noise and vibration management: environmental permits': January 2022, the design levels have been lowered by 3dB to allow for noise character.

*L<sub>Amax</sub> Levels*

4.2.15 L<sub>Amax</sub> levels predicted for the operation of the TERC are provided below in Table 4.5. Results from measurements at other similar ERC sites in the UK indicate that in near field positions during night-time the L<sub>Amax</sub> levels are circa 3dB to 9dB higher than the LAeq levels.

**Table 4.5: Noise Prediction Results L<sub>Amax</sub> (night-time)**

Noise Receptor	Night-time Predicted Operational Noise Level L <sub>Amax</sub> dB	WHO night noise guidelines external limits (bedroom window) L <sub>Amax</sub> dB
R1. Bourne Road (new residential)	35 to 42	57
R2. Eagle Brow Close and Butts Road	33 to 40	57
R3. Butts Road	39 to 45	57

4.2.16 The L<sub>Amax</sub> levels are predicted to be well below the WHO guidelines for sleep disturbance.

## 5.0 CONCLUSIONS

### **Noise Limits**

- 5.1 In terms of noise limits at NSRs the indicative background noise levels enable us to establish reasonable noise limits based on satisfying appropriate and relevant standards and guidance. The majority of the residential receptors are located at circa 300m or greater distance from the Site and therefore the noise contribution from Site is relatively low.
- 5.2 By applying BS4142 methodology, we have assumed that reasonable noise limits at each NSR for daytime and night-time operational periods would achieve a 'rating' level that does not exceed background sound levels and night-time operating periods would also not exceed sleep disturbance criteria (i.e. <40dB LAeq<sub>1hr</sub> and <57dB L<sub>Amax</sub>) as a contribution at NSRs. A further reduction of 3dB has been included in the design for noise character to comply with the latest EA guidance on environmental permits, which supersedes the previous H3 Horizontal Guidance on noise.

### **Noise Predictions**

- 5.3 A noise prediction model has been developed based on information from ERC plant library data from similar facilities and information concerning the Proposed Development. The prediction model used includes the use of ISO9613-2 which is a nationally recognised calculation method to provide good accuracy.
- 5.4 Within BS4142: 2014, section 10.3 deals with 'uncertainty in calculation' and states:

*"Uncertainty in calculating sound levels can arise from:*

- a) uncertainty in any measured sound levels used in the calculations;*
- b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;*
- c) uncertainty in the calculation method;*
- d) simplifying the real situation to "fit" the model (user influence on modelling); and*
- e) error in the calculation process.*

*Where the sound power level is used for calculating sound pressure levels, it ought to be representative of the source and the conditions under which the source is expected to operate.*

*Where possible, use recognized standards to establish the sound power level and the uncertainty (e.g. BS EN ISO 3740 and BS EN ISO 3747). Where it is not possible to use appropriate standards, describe the method of establishing the sound power level, report the uncertainty and state the reasons for using this method.*

*Use a validated method of calculating sound levels, e.g. ISO 9613-2 or similar. If an alternative calculation method is used, fully describe the method and state the reasons for using this method.*

*Check the implementation of the calculation method for errors.*

*For simple cases, e.g. where the level of variability in sound propagation resulting from changes in meteorological conditions is likely to be small, simple calculation methods might be sufficient.”*

5.5 In terms of the prediction calculations undertaken, the following points are noted:

- (i) A recognised standard for calculation has been used with appropriate settings to give an accurate prediction.
- (ii) Input data for the TERC is based on typical measured plant noise levels within a reverberant environment.
- (iii) Input data for the TERC plant and associated equipment has been based on library data from Technology Providers and NVC empirical library based on measurements at other similar sites.
- (iv) Detailed layout of the Site and elevations for the proposed TERC buildings have been used to inform the noise model.
- (v) Typical manufacturers' data on building cladding has been provided for input into the noise model.
- (vi) Baseline levels have been recorded by NVC over a weekday and weekend period in the vicinity of the most sensitive receptor positions.

5.6 The only potential variation in predicted noise levels is likely to be as a result of sound propagation resulting from changes in meteorological conditions. This is difficult to predict, and in the situation where there is a positive wind vector in the direction of nearest sensitive receptors the actual background noise level could, in any case, be higher than when measured under ideal conditions. We therefore would not consider this to be a significant factor due to the fact that when assessing the Site for compliance this would be carried out in suitable meteorological conditions. It should be noted that the predominant national wind direction is southwest to west during the year, which would mean that the wind direction under these conditions would blow from the sensitive receptor towards the Site and therefore provide benefit of wind directivity and assist in reducing noise levels further.

### **Assessment Results**

5.7 The results show no exceedance above relevant noise limits determined from standards and guidance for daytime and night-time periods at nearest sensitive receptor locations.

5.8 Predicted noise levels using typical plant operating noise levels with appropriate noise mitigation would produce levels which would be well within sleep disturbance criteria, guidance levels within BS8233: 2014, WHO guidelines for community noise and amenity, and produce a low impact magnitude in accordance with BS4142: 2014+A1:2019.

5.9 Noise levels are expected to be below LOAEL levels according to national policy guidelines.

- 5.10 The detailed design in conjunction with the appointed EPC Contractor and Technology Providers would enable the noise mitigation strategy to be further developed including choice of plant.

## REFERENCES

1. ISO 9613-2: 1996 Acoustics – ‘Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation’
2. British Standards BS4142: 2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’
3. BS8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’
4. Guidelines for Community Noise – World Health Organisation: April 1999
5. World Health Organisation ‘Night Noise Guidelines for Europe’ – 2009
6. BS7445: 2003 - Description and measurement of environmental noise
7. National Planning Policy Framework – July 2021
8. Planning Practice Guidance – June 2021
9. Noise Policy Statement for England (NPSE) – March 2010
10. Noise and vibration management: environmental permits (January 2022)
11. Chapter 7 ‘Noise & Vibration’ of the Environmental Statement
12. Environmental Statement Chapter 7 Appendices

## FIGURES

**Figure 1: Site Location, Baseline Monitoring and Noise Sensitive Receptors**



**Baseline Noise Monitoring Positions**



**Receptor Positions**



**Nearest Sensitive Ecological Receptor Positions**



**Commercial Office Receptors (Industrial Units)**



**Figure 2: Plan of Site Showing Layout**

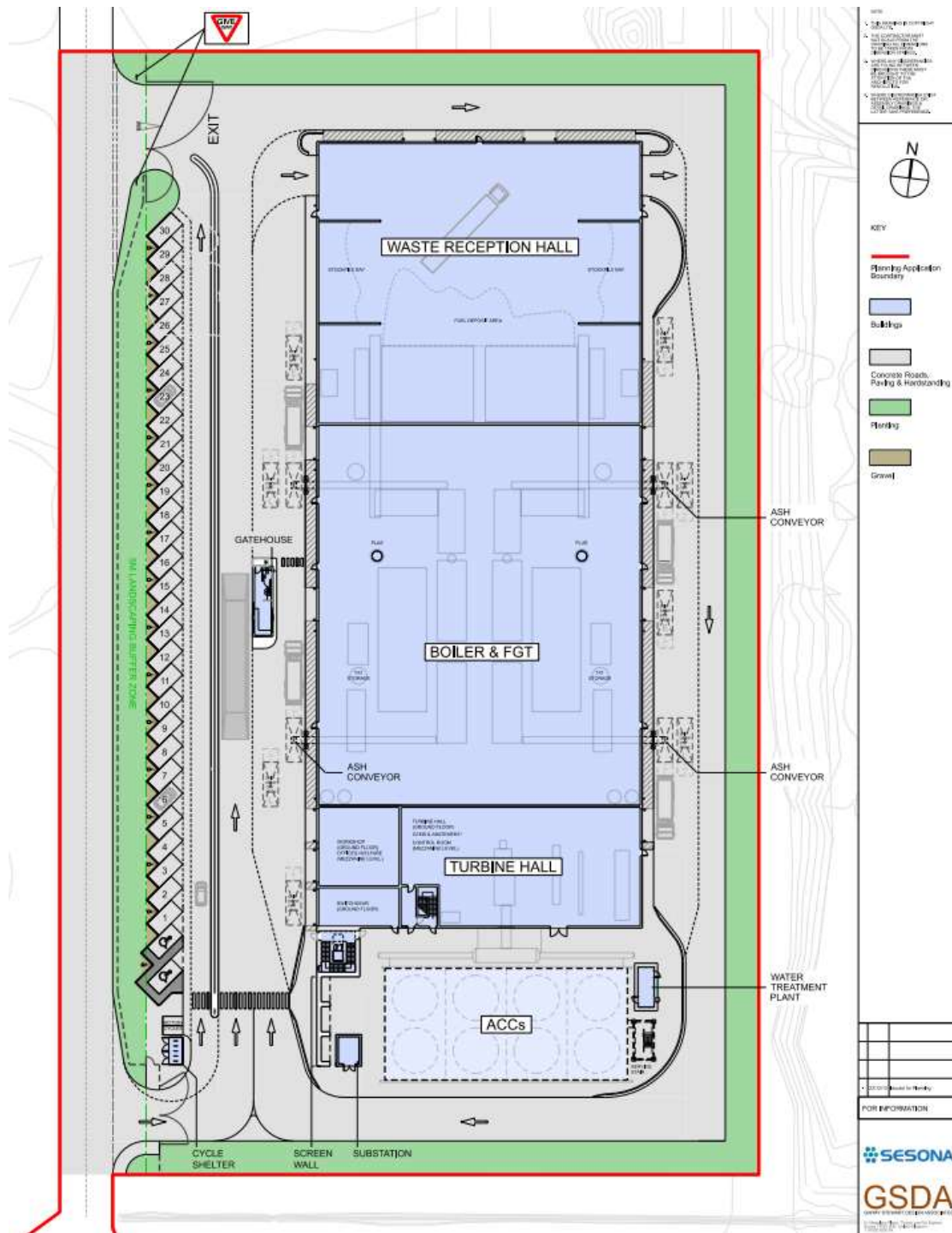
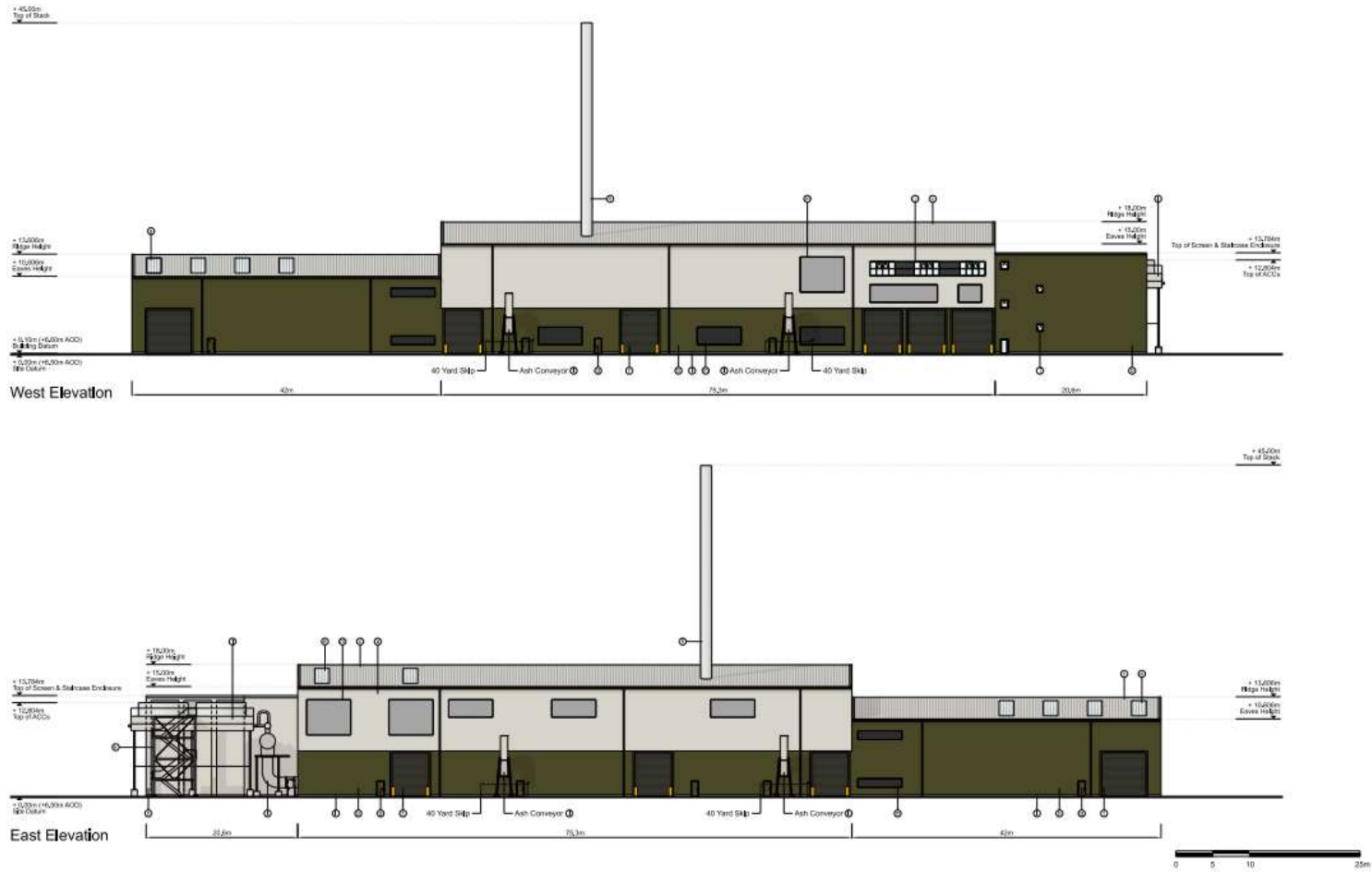
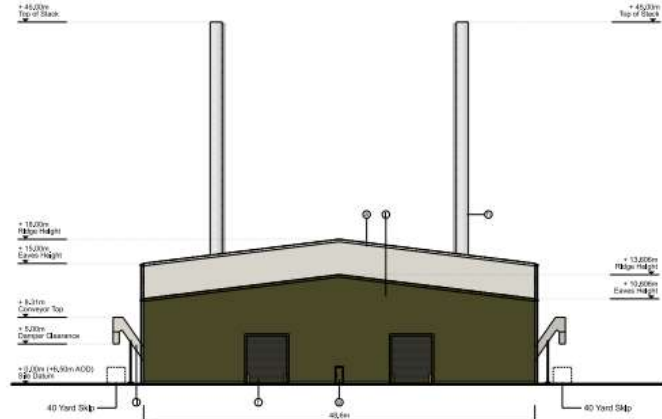




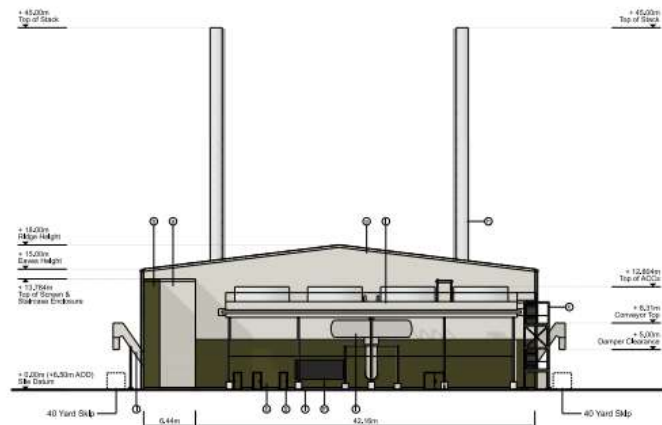
Figure 3: Elevation Drawings of Proposed TERC (East & West)



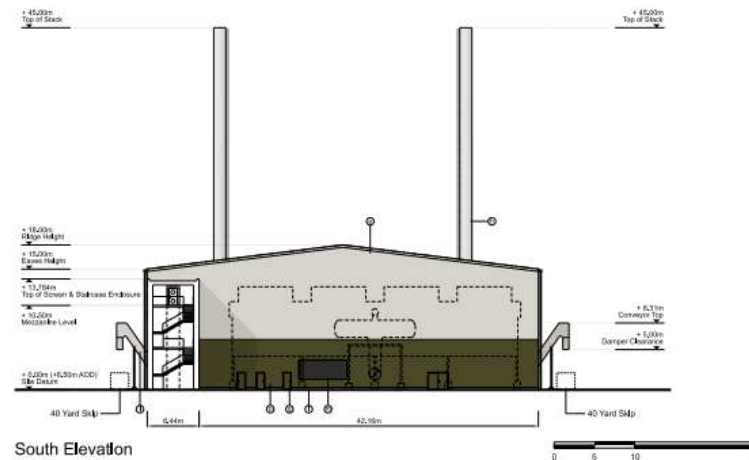
**Figure 4: Elevation Drawings of Proposed TERC (North & South)**



North Elevation



South Elevation Inc ACCs



South Elevation

## APPENDIX 1

### BASIC ACOUSTIC TERMINOLOGY

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

Sound Pressure Level is a measurement of the size of these pressure fluctuations. It is expressed in decibels (dB) on a logarithmic scale. Each 3 dB increase in sound pressure level represents a doubling of the sound energy. An increase of around 10dB is said to subjectively double the sound level. The threshold of hearing is approximately 0 dB.

The rate at which the pressure fluctuations occur determines the pitch or frequency of the sound. The frequency is expressed in Hertz (Hz), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hz to 20,000 Hz. Although sound can be of one discrete frequency - a 'pure tone' - most noises are made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same 'subjective' way. This is the basis of the A-weighted sound level dB(A), normally used to assess the effect of noise on people. The dB(A) weighting emphasises or reduces the importance of certain frequencies within the audible range.

#### Noise Measurement

The measurement of sound pressure level is only really meaningful where the level of noise is constant. In the typical industrial environment noise levels can vary widely and sometimes short duration high levels of noise are interspersed with periods of relative quiet. The most widely used means of 'averaging' the noise over a period of time is the Equivalent Continuous Sound Level. Normally written as  $L_{Aeq}$  this value takes into account both the level of noise and the length of time over which it occurs. There are many meters available which are capable of measuring  $L_{Aeq}$  by electronic integration over the measurement period.

The  $L_{Aeq}$  or A-weighted equivalent continuous noise level is a measure of the total noise energy over a stated time period and includes all the varying noise levels and re-expresses as an 'average', allowing for the length of time for which each noise level was presented.

The  $L_{An}$  parameters are defined as the noise levels which are exceeded for n% of the monitoring period, thus, for example, the  $L_{A90}$  parameter is the noise level exceeded for 90% of the 15-minute period, i.e. 13.5 minutes. The  $L_{A50}$  parameter is the noise level exceeded for 50% of the hourly period, i.e. 30 minutes, etc. The  $L_{max}$  parameter is the maximum RMS A-weighted noise level occurring during the measurement period.

The definition in layman's terms is given below for terminology used in the measurement and results obtained during the survey work.

**A-weighting:** Normal hearing covers the frequency (pitch) range from about 20Hz to 20,000 Hz but sensitivity of the ear is greatest between about 500Hz and 5000Hz. The "A-weighting" is an electrical circuit built into noise meters to mimic this characteristic of the human ear.

**Ambient noise:** The totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

**Attenuation:** Noise reduction

**Background noise:** The general quiet periods of ambient noise when the noise source under investigation is not there.

**Decibel (dB):** The unit of measurement for sound based on a logarithmic scale. 0dB is the threshold of normal hearing; 140dB is the threshold of pain. A change of 1dB is only detectable under controlled laboratory conditions.

**dB(A) [decibel A weighted]:** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) serves to distinguish sounds of different frequency (or pitch) in a similar way to how the human ear responds. Measurements in dB(A) broadly agrees with an individual's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal everyday conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of sound.

**dB(C): [decibel C weighted]:** Frequency weighting which does not alter low frequency octave band levels by very much compared to 'A' weighting. Similar to linear reading (i.e. linear does not alter frequency spectra at all)

**Frequency (Hz):** The number of sound waves to pass a point in one second.

**L<sub>Aeq</sub>:** This is a noise index used to describe the "average" level of a noise that varies with time (T). It allows for the different sensitivities of the human ear to different frequencies (pitch), and averages fluctuating noise levels in a manner, which correlates well with human perceptions of loudness.

**L<sub>A10,T</sub>:** This noise index gives an indication of the upper limit or peak levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 10 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L<sub>A10</sub> reading was say 60dB, then this means that for 1 hour out of 10 the level went above 60dB.

**L<sub>A90,T</sub>:** This noise index gives an indication of the lower limit or levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L<sub>A90</sub> reading was say 50dB, then this means that for 9 hours out of 10 the level went above 50dB.

**L<sub>Amax</sub>:** This is the highest 'A' weighted noise level recorded during a noise measurement period.

**Residual noise:** The ambient noise remaining at a given position in a given situation when the noise source under investigation is not there.

**Specific noise:** The noise source under investigation for assessing the likelihood of complaints

**Examples of typical noise levels**

<b>Source/Activity</b>	<b>Indicative noise level [dB(A)]</b>
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Busy road at 5km	35-45
Car at 65km/h at 100m	55
Busy general office	60
Conversation	60
Truck at 50km/h at 100m	65
City Traffic at 5m	75-85
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

## **APPENDIX 2**

### **BASELINE SOUND SURVEY RESULTS**

## BASELINE SURVEY

### NOISE INSTRUMENTATION, METHODOLOGY & SURVEY DETAILS

#### Survey Methodology

#### Instrumentation and Fieldwork Details

The background sound measurements were undertaken at accessible receptor positions or the closest accessible position or similar distance relative to the nearest sensitive receptors to identify typical baseline sound levels. The monitoring of residual and background sound was carried out during a weekday and weekend period such that the representative background sound levels could be established for the assessment.

The following instrumentation was used for all noise measurements:

#### September 2022

<b>Manufacturer</b>	<b>Description</b>	<b>Type</b>	<b>Calibration Due date</b>	<b>Serial No.</b>
Cirrus	Real Time Sound Analyser	171A	June 2023	G061253
Cirrus	Real Time Sound Analyser	171B	April 2023	G056142
Cirrus	Real Time Sound Analyser	1710	April 2023	G066350
Norsonic	Integrating Sound Level Meter	116	January 2023	22748
Cirrus	Electronic Calibrator	CR: 513A	April 2023	031523

The following set-up parameters were used on the sound level meters during noise measurement:

#### Static Noise Monitoring:

Time Weighting: Fast  
Frequency Weighting: 'A'  
Measurement Period: 15minute intervals

#### **Calibration**

Calibration setting: 94dB

The noise meters were calibrated with the electronic calibrator prior to commencement and on completion of the survey. No significant drift in calibration was observed.

#### **Survey Dates and Personnel**

##### *Baseline Survey – 21<sup>st</sup> to 25<sup>th</sup> September 2022*

Static noise measurement positions in 2022 were chosen following a study of the local area and this was subsequently agreed with the Local Authority that the monitoring was suitable to determine representative baseline sound level data at NSRs to the Proposed Development (see Appendix 3 for detailed information). Mr. D.R. Kettlewell of Noise & Vibration Consultants Limited set up the noise monitoring equipment and removed the equipment after completion of the survey.

Measurements were recorded at four fixed monitoring positions during daytime and night-time periods. Data logging of  $L_{Aeq}$ ,  $L_{A10}$ ,  $L_{A90}$  and  $L_{Amax}$  were recorded at 15-minute intervals for information on the variation of sound levels at NSRs.

The noise meters were mounted on a tripod at a height of circa 1.5m above ground level and fitted with a wind and rain shield.

## ***Meteorological Conditions***

### ***Baseline Survey***

Weather details were recorded by the NVC engineer during the period of the surveys, and appear below:

- ***Wednesday 21<sup>st</sup> September 2022***  
The monitoring period was dry, light cloud cover and a light south westerly to south-south-west wind (1-2m/sec) and temperature 16-18degC.  
Overnight it remained dry, variable cloud, light southerly wind (1-3m/s) and temperature 12-14degC.
- ***Thursday 22<sup>nd</sup> September 2022***  
Dry conditions initially with rain between 1200 to 1600 hours, light south to south-south-west winds (1-3m/s), variable cloud cover, temperature 13-15degC.  
Overnight the conditions were dry, variable cloud cover, light north to north-north-east winds (1-2m/s), temperature 11deg to 14degC.
- ***Friday 23<sup>rd</sup> September 2022***  
The monitoring period was dry, clear skies, sunny and a light east to northwest wind direction (1-3m/sec) and temperature 11-17degC.  
Overnight it remained dry, clear skies, light north to north-easterly winds (0-1m/s) and temperature 10-14degC.
- ***Saturday 24<sup>th</sup> September 2022***  
The daytime was dry, variable cloud and a light east-north-east to north-east wind (0-2m/sec) with a temperature of 9-16deg C.  
During the night-time period the conditions were dry, clear skies, light east to south winds (0-2m/s) and temperature 4-6degC.
- ***Sunday 25<sup>th</sup> September 2022***  
The daytime period was dry, light cloud cover with a light east-south-east to north-west wind at 1-4m/sec. with temperature range between 5-15degC.

The above climatic conditions were suitable for monitoring environmental noise levels in accordance with advice given in BS4142:2014+A1:2019 and BS 7445:2003 'Description and measurement of environmental noise'.

## **Baseline Survey Results**

Appendix 3, details all measurements taken showing the resultant levels at the selected measurement positions.



## Photographs of Noise Monitoring Locations

**Photo 1: Position A: Adjacent to Boundary with River Wyre Monitoring Position**



**Photo 2: Position B: Monitoring Position Boundary Opposite New Housing Development**



**Photo 3: Position C: Monitoring Position off Bourne Road**



**Photo 4: Position D: Monitoring Position off Butts Road**



**Noise Survey Results**

Date: Wednesday 21st September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

**TABLE 1**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
13:30	15:00	56.8	59.0	45.8	72.3	Distant road traffic noise
13:45	15:00	59.0	60.6	46.9	73.8	
14:00	15:00	58.4	60.2	48.1	76.0	
14:15	15:00	58.8	61.7	48.6	74.2	
14:30	15:00	59.9	60.8	53.4	74.2	
14:45	15:00	58.2	60.1	47.7	75.3	
15:00	15:00	57.6	59.3	47.1	75.5	
15:15	15:00	57.5	60.1	46.7	73.2	
15:30	15:00	59.0	61.5	48.7	74.1	
15:45	15:00	59.1	61.1	52.2	74.4	
16:00	15:00	56.1	58.4	50.3	69.1	
16:15	15:00	54.6	56.6	46.8	68.7	
16:30	15:00	58.3	60.2	49.1	76.9	
16:45	15:00	57.6	59.1	43.3	73.1	
17:00	15:00	44.9	46.8	42.1	56.0	
17:15	15:00	44.4	46.1	41.9	54.3	
17:30	15:00	42.3	43.5	40.8	48.7	
17:45	15:00	43.4	45.0	41.4	51.5	
18:00	15:00	44.0	45.2	42.4	54.5	
18:15	15:00	45.3	46.5	42.0	55.8	
18:30	15:00	44.0	45.6	42.0	50.3	
18:45	15:00	45.8	46.8	42.5	63.8	
19:00	15:00	44.7	46.2	42.6	52.4	
19:15	15:00	44.0	45.2	42.5	49.0	
19:30	15:00	43.9	45.2	42.5	48.4	
19:45	15:00	43.3	44.4	42.2	46.7	
20:00	15:00	43.0	44.1	41.8	47.7	
20:15	15:00	43.4	44.5	42.0	49.5	
20:30	15:00	43.1	44.0	41.8	50.5	
20:45	15:00	42.9	44.2	41.5	49.4	
21:00	15:00	42.7	43.8	41.4	47.0	
21:15	15:00	42.5	43.8	41.0	47.5	
21:30	15:00	43.2	44.4	41.9	47.1	
21:45	15:00	42.7	43.7	41.6	46.5	
22:00	15:00	42.5	43.6	41.1	47.1	
22:15	15:00	42.6	43.8	41.2	50.4	
22:30	15:00	42.2	43.4	40.8	46.0	
22:45	15:00	42.0	43.1	40.6	51.9	
Average 1330-2300		54.0	55.9	45.8	46-77	

## Noise Survey Results

Date: Wednesday 21st - Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 2**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	41.5	42.7	40.1	45.1	
23:15	15:00	40.8	42.1	39.4	44.2	
23:30	15:00	41.1	42.2	39.8	46.8	
23:45	15:00	41.2	42.5	39.9	44.2	
00:00	15:00	41.5	42.8	40.3	45.1	
00:15	15:00	41.6	42.7	40.2	44.7	
00:30	15:00	41.9	43.2	40.4	46.4	
00:45	15:00	42.2	43.5	40.7	46.8	
01:00	15:00	43.0	44.6	41.3	46.4	
01:15	15:00	42.7	44.1	41.1	46.7	
01:30	15:00	43.4	44.8	41.8	46.9	
01:45	15:00	43.1	44.5	41.6	47.8	
02:00	15:00	43.4	44.6	41.9	48.2	
02:15	15:00	43.6	45.2	41.9	47.6	
02:30	15:00	43.8	45.2	42.2	47.9	
02:45	15:00	43.8	45.2	42.2	48.6	
03:00	15:00	43.9	45.4	42.2	48.7	
03:15	15:00	43.6	45.0	42.0	48.0	
03:30	15:00	43.8	44.9	42.4	47.3	
03:45	15:00	44.3	45.7	42.6	48.9	
04:00	15:00	44.1	45.5	42.7	49.4	
04:15	15:00	44.0	45.3	42.4	48.4	
04:30	15:00	44.3	45.9	42.7	47.6	
04:45	15:00	44.0	45.3	42.4	48.7	
05:00	15:00	43.7	44.8	42.6	47.9	
05:15	15:00	44.6	45.8	43.2	52.2	
05:30	15:00	45.1	46.4	43.6	49.8	
05:45	15:00	45.9	47.0	44.4	50.2	
06:00	15:00	44.9	46.1	43.7	49.2	
06:15	15:00	46.1	46.9	44.1	57.1	
06:30	15:00	46.2	47.1	44.8	54.1	
06:45	15:00	47.1	48.2	45.6	52.7	
Average 2300-0700		43.8	45.1	42.3	44-57	
Average 1330-2300		54.0	55.9	45.8	46-77	

### Noise Survey Results

Date: Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 3**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	47.1	48.2	45.8	54.1	
07:15	15:00	47.1	48.2	45.8	54.1	
07:30	15:00	47.6	49.1	46.0	54.2	
07:45	15:00	48.9	52.0	45.8	56.9	
08:00	15:00	55.8	59.0	47.1	67.6	
08:15	15:00	56.9	59.9	47.4	73.3	
08:30	15:00	57.9	60.3	47.2	74.4	
08:45	15:00	57.2	59.1	47.7	75.3	
09:00	15:00	58.6	60.8	52.4	72.7	
09:15	15:00	57.3	59.8	47.4	71.1	
09:30	15:00	58.1	60.5	51.4	70.2	
09:45	15:00	56.1	58.9	45.9	71.3	
10:00	15:00	46.7	47.7	44.5	61.7	
10:15	15:00	48.1	51.2	43.2	63.1	
10:30	15:00	58.7	60.5	50.7	73.7	
10:45	15:00	59.8	62.2	52.6	72.1	
11:00	15:00	59.1	61.1	52.8	73.5	
11:15	15:00	58.6	60.5	53.6	76.1	
11:30	15:00	55.7	58.6	47.7	70.7	
11:45	15:00	58.0	60.3	52.1	70.2	
12:00	15:00	57.6	59.9	49.3	71.7	
12:15	15:00	55.7	58.9	47.3	67.3	
12:30	15:00	57.5	59.8	50.9	71.4	
12:45	15:00	56.3	59.1	47.8	73.3	
13:00	15:00	56.0	59.0	47.1	70.4	
13:15	15:00	51.5	55.5	45.3	66.3	
13:30	15:00	54.7	57.7	47.3	67.9	
13:45	15:00	57.5	59.7	48.7	71.9	
14:00	15:00	58.5	59.9	50.0	77.7	
14:15	15:00	56.3	58.7	46.1	71.7	
14:30	15:00	57.4	59.6	47.5	71.3	
14:45	15:00	59.5	60.9	52.1	75.2	
Average 0700-1500		56.6	57.7	48.3	54-78	

**Noise Survey Results**

Date: Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

**TABLE 4**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	56.1	58.1	46.4	70.7	
15:15	15:00	56.6	58.4	48.9	70.8	
15:30	15:00	57.3	59.0	48.0	75.2	
15:45	15:00	55.2	58.3	47.1	68.6	
16:00	15:00	57.8	59.3	47.5	72.2	
16:15	15:00	56.3	58.6	44.3	71.9	
16:30	15:00	48.2	51.0	43.8	57.7	
16:45	15:00	44.5	45.6	43.1	50.4	
17:00	15:00	44.3	45.7	42.6	49.9	
17:15	15:00	44.3	45.8	42.7	49.3	
17:30	15:00	44.9	46.7	42.8	51.3	
17:45	15:00	44.8	46.0	43.3	53.0	
18:00	15:00	52.9	55.4	45.4	67.6	
18:15	15:00	58.4	62.0	38.6	72.0	
18:30	15:00	39.0	41.1	35.0	48.7	
18:45	15:00	38.2	37.4	33.1	60.4	
19:00	15:00	36.0	38.0	33.8	40.9	
19:15	15:00	37.9	39.9	33.8	49.1	
19:30	15:00	41.4	44.1	38.2	50.5	
19:45	15:00	39.8	40.6	38.8	42.9	
20:00	15:00	40.3	41.4	37.3	52.0	
20:15	15:00	38.7	39.8	37.5	43.1	
20:30	15:00	38.6	39.8	36.4	50.2	
20:45	15:00	38.6	39.5	37.5	41.8	
21:00	15:00	38.6	39.9	36.5	47.5	
21:15	15:00	37.5	39.1	35.7	44.3	
21:30	15:00	36.7	38.2	35.2	43.0	
21:45	15:00	36.4	37.5	34.9	43.0	
22:00	15:00	39.0	40.3	34.7	53.0	
22:15	15:00	36.0	37.7	34.1	42.4	
22:30	15:00	35.2	36.3	33.9	39.0	
22:45	15:00	35.2	36.2	34.1	40.1	
Average 1500-2300		50.9	53.2	42.3	39-75	



### Noise Survey Results

Date: Thursday 22nd - Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 5**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	35.1	36.0	34.0	40.7	
23:15	15:00	35.4	36.3	33.5	47.3	
23:30	15:00	34.0	34.8	33.1	36.0	
23:45	15:00	35.0	35.8	34.1	39.2	
00:00	15:00	36.0	37.1	34.0	44.9	
00:15	15:00	34.4	35.1	33.5	36.7	
00:30	15:00	33.8	34.6	32.8	38.4	
00:45	15:00	33.3	34.1	32.5	41.0	
01:00	15:00	32.5	33.2	31.6	36.7	
01:15	15:00	32.9	33.8	31.8	35.4	
01:30	15:00	33.9	35.0	32.5	40.3	
01:45	15:00	34.9	36.5	33.3	40.4	
02:00	15:00	34.0	35.1	32.7	40.3	
02:15	15:00	33.0	34.0	32.1	37.3	
02:30	15:00	33.6	34.4	32.7	38.6	
02:45	15:00	34.7	35.4	33.5	43.3	
03:00	15:00	33.2	34.2	31.9	40.7	
03:15	15:00	33.5	34.3	32.2	40.5	
03:30	15:00	35.8	36.9	34.4	40.9	
03:45	15:00	35.8	37.2	34.0	42.7	
04:00	15:00	34.5	35.5	33.4	39.7	
04:15	15:00	34.6	35.4	33.6	40.8	
04:30	15:00	33.7	34.8	32.2	39.1	
04:45	15:00	34.1	35.2	32.5	41.3	
05:00	15:00	34.3	35.8	32.9	39.7	
05:15	15:00	35.8	37.6	33.3	40.3	
05:30	15:00	40.2	41.6	37.7	44.2	
05:45	15:00	41.1	42.2	39.8	44.7	
06:00	15:00	41.4	42.9	38.7	52.3	
06:15	15:00	42.4	44.2	39.7	51.5	
06:30	15:00	41.7	43.3	39.4	49.9	
06:45	15:00	44.5	46.3	41.5	51.0	
Average 2300-0700		37.2	38.6	35.2	35-52	
Average 0700-2300		54.6	57.0	47.0	39-78	

## Noise Survey Results

Date: Friday 23rd September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 6**

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	45.9	48.0	43.7	54.3	
07:15	15:00	46.5	47.9	45.0	50.9	
07:30	15:00	48.3	49.4	45.6	57.8	
07:45	15:00	49.1	51.8	45.2	57.5	
08:00	15:00	50.0	52.9	44.5	64.7	
08:15	15:00	47.6	51.0	43.0	64.0	
08:30	15:00	49.6	51.7	43.1	68.8	
08:45	15:00	53.6	56.3	44.3	67.7	
09:00	15:00	52.6	54.9	43.3	66.6	
09:15	15:00	57.1	59.1	44.3	75.7	
09:30	15:00	55.0	56.3	46.3	71.5	
09:45	15:00	54.9	55.7	36.5	72.2	
10:00	15:00	41.6	44.6	35.5	52.0	
10:15	15:00	43.2	46.5	33.7	56.8	
10:30	15:00	53.1	55.2	38.6	69.6	
10:45	15:00	56.3	57.8	49.7	71.7	
11:00	15:00	56.4	57.4	46.9	73.2	
11:15	15:00	56.3	57.1	47.8	71.2	
11:30	15:00	56.8	58.0	49.0	71.9	
11:45	15:00	56.8	58.3	48.4	72.6	
12:00	15:00	55.5	57.1	44.5	72.3	
12:15	15:00	55.4	55.5	41.5	73.6	
12:30	15:00	58.2	59.6	49.6	71.2	
12:45	15:00	51.8	54.7	41.4	69.5	
13:00	15:00	51.4	49.8	38.2	67.9	
13:15	15:00	44.0	46.9	38.9	52.2	
13:30	15:00	55.9	58.4	46.0	71.8	
13:45	15:00	59.0	60.3	52.0	72.7	
14:00	15:00	55.5	57.1	48.3	69.1	
14:15	15:00	55.3	57.4	46.8	69.4	
14:30	15:00	55.5	58.4	45.0	69.3	
14:45	15:00	53.1	56.1	43.5	66.3	
Average 0700-1500		54.3	55.9	45.7	51-76	



**Noise Survey Results**

Date: Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

**TABLE 7**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	54.9	57.9	46.5	69.5	
15:15	15:00	56.0	58.2	48.3	69.2	
15:30	15:00	53.5	56.3	43.8	69.8	
15:45	15:00	58.6	61.0	47.2	72.0	
16:00	15:00	54.6	56.7	42.6	71.6	
16:15	15:00	53.0	55.4	43.0	67.1	
16:30	15:00	44.3	47.4	39.3	54.2	
16:45	15:00	43.3	46.0	39.0	55.6	
17:00	15:00	43.6	45.8	38.9	54.7	
17:15	15:00	42.0	44.2	38.7	50.9	
17:30	15:00	40.0	41.8	37.7	48.3	
17:45	15:00	41.1	43.0	38.4	48.9	
18:00	15:00	41.0	42.7	38.7	48.0	
18:15	15:00	40.3	42.0	38.0	48.5	
18:30	15:00	41.3	43.7	38.3	49.3	
18:45	15:00	40.5	42.1	38.3	50.8	
19:00	15:00	40.3	41.5	38.3	48.9	
19:15	15:00	41.4	43.5	37.9	53.5	
19:30	15:00	41.1	43.3	37.5	50.4	
19:45	15:00	39.4	41.2	37.1	49.6	
20:00	15:00	40.1	43.6	35.5	50.3	
20:15	15:00	38.9	41.1	36.1	48.0	
20:30	15:00	38.7	41.1	35.7	47.1	
20:45	15:00	36.7	38.3	34.7	47.1	
21:00	15:00	36.4	38.1	34.4	44.4	
21:15	15:00	34.6	36.1	32.7	42.5	
21:30	15:00	33.3	34.4	31.8	42.7	
21:45	15:00	33.7	35.3	31.6	41.7	
22:00	15:00	33.9	35.3	32.2	39.5	
22:15	15:00	34.4	35.7	32.3	43.5	
22:30	15:00	33.9	35.1	32.4	40.7	
22:45	15:00	33.9	35.2	32.5	40.4	
Average 1500-2300		48.7	51.1	40.4	40-72	

### Noise Survey Results

Date: Friday 23rd - Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 8**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	33.8	34.9	32.6	38.3	
23:15	15:00	34.1	35.1	32.9	40.9	
23:30	15:00	34.2	35.1	33.0	44.5	
23:45	15:00	34.5	35.6	33.3	40.0	
00:00	15:00	35.9	37.0	34.2	45.8	
00:15	15:00	37.0	38.2	35.4	45.1	
00:30	15:00	38.3	39.6	36.7	45.3	
00:45	15:00	37.4	38.4	36.3	42.5	
01:00	15:00	37.0	37.9	35.9	43.1	
01:15	15:00	35.9	36.7	34.9	37.8	
01:30	15:00	35.5	36.5	34.2	39.4	
01:45	15:00	34.9	35.7	33.9	40.2	
02:00	15:00	34.4	35.1	33.5	36.7	
02:15	15:00	34.5	35.6	33.3	39.5	
02:30	15:00	33.4	34.3	32.3	37.0	
02:45	15:00	33.0	34.4	31.4	39.6	
03:00	15:00	32.5	33.5	31.2	37.7	
03:15	15:00	33.0	35.0	31.0	41.6	
03:30	15:00	33.0	34.5	31.3	39.3	
03:45	15:00	34.3	35.9	31.4	45.2	
04:00	15:00	37.3	38.6	35.8	43.5	
04:15	15:00	34.6	36.9	32.5	38.4	
04:30	15:00	34.6	35.9	32.8	44.2	
04:45	15:00	34.7	36.2	32.5	42.2	
05:00	15:00	35.7	39.0	32.4	42.6	
05:15	15:00	38.3	40.0	35.9	44.5	
05:30	15:00	39.2	40.9	37.1	45.4	
05:45	15:00	38.0	39.6	36.1	45.1	
06:00	15:00	39.8	41.2	38.3	43.8	
06:15	15:00	42.7	44.8	36.9	56.3	
06:30	15:00	38.7	40.8	35.0	51.1	
06:45	15:00	39.8	41.6	36.5	52.6	
Average 2300-0700		36.6	38.2	34.5	37-56	
Average 0700-2300		17.1	17.2	16.3	40-76	

### Noise Survey Results

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 9**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	37.9	40.0	34.5	48.0	
07:15	15:00	39.5	40.8	34.1	54.9	
07:30	15:00	39.1	41.8	33.6	51.5	
07:45	15:00	38.9	41.2	34.1	53.9	
08:00	15:00	39.0	41.5	34.4	50.1	
08:15	15:00	39.3	42.0	34.2	50.9	
08:30	15:00	40.4	43.4	35.3	49.9	
08:45	15:00	39.8	42.7	35.3	50.3	
09:00	15:00	38.2	40.6	35.0	48.3	
09:15	15:00	38.7	40.2	34.4	56.8	
09:30	15:00	41.7	43.7	34.9	54.9	
09:45	15:00	51.3	54.3	35.2	68.5	
10:00	15:00	42.0	45.7	35.0	52.0	
10:15	15:00	45.0	48.9	35.0	56.8	
10:30	15:00	43.6	47.2	36.5	56.4	
10:45	15:00	56.8	55.4	38.7	75.9	
11:00	15:00	52.1	55.7	38.2	68.8	
11:15	15:00	42.2	45.5	35.0	55.3	
11:30	15:00	40.3	43.0	34.7	50.1	
11:45	15:00	41.9	46.1	32.6	53.6	
12:00	15:00	41.2	44.7	33.8	51.3	
12:15	15:00	40.9	43.5	36.6	50.0	
12:30	15:00	43.2	47.2	37.4	51.5	
12:45	15:00	45.1	48.3	39.4	56.6	
13:00	15:00	43.7	46.5	38.0	55.0	
13:15	15:00	42.5	45.4	38.1	54.1	
13:30	15:00	41.2	43.3	38.2	52.7	
13:45	15:00	42.9	44.8	38.7	54.3	
14:00	15:00	39.1	40.7	37.1	46.3	
14:15	15:00	41.7	43.7	37.4	56.1	
14:30	15:00	42.0	44.5	37.8	52.7	
14:45	15:00	40.6	41.6	36.3	62.2	
Average 0700-1500		45.6	44.8	35.9	46-76	

**Noise Survey Results**

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

**TABLE 10**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	41.3	44.1	36.3	52.6	
15:15	15:00	41.6	43.2	34.7	61.3	
15:30	15:00	46.1	45.6	35.8	63.7	
15:45	15:00	39.2	41.8	34.6	50.6	
16:00	15:00	42.9	45.9	34.7	56.1	
16:15	15:00	37.9	40.0	33.2	56.5	
16:30	15:00	46.5	43.3	34.0	64.3	
16:45	15:00	39.1	41.7	33.2	55.7	
17:00	15:00	37.7	39.7	31.0	51.3	
17:15	15:00	39.7	43.3	32.5	55.2	
17:30	15:00	35.3	38.0	30.7	44.1	
17:45	15:00	39.7	40.7	31.1	55.5	
18:00	15:00	35.4	37.1	32.7	48.8	
18:15	15:00	37.4	39.5	33.1	48.3	
18:30	15:00	35.3	37.5	32.4	45.2	
18:45	15:00	36.8	39.2	33.2	52.8	
19:00	15:00	36.7	38.0	34.0	50.2	
19:15	15:00	40.2	40.6	34.6	52.9	
19:30	15:00	43.8	48.0	38.1	57.0	
19:45	15:00	40.2	40.5	38.0	59.2	
20:00	15:00	40.4	43.3	36.5	50.7	
20:15	15:00	38.0	40.8	34.6	47.2	
20:30	15:00	36.4	38.0	34.5	43.0	
20:45	15:00	36.8	38.1	35.1	41.2	
21:00	15:00	39.6	41.2	37.4	46.0	
21:15	15:00	39.3	41.1	36.9	45.9	
21:30	15:00	41.3	43.5	38.3	47.8	
21:45	15:00	40.8	43.3	37.4	47.1	
22:00	15:00	39.7	41.0	37.7	47.3	
22:15	15:00	42.9	46.2	37.1	55.1	
22:30	15:00	38.4	39.9	36.5	43.2	
22:45	15:00	38.4	41.0	35.9	43.6	
Average 1500-2300		40.5	42.3	35.3	41-64	

### Noise Survey Results

Date: Saturday 24th - Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 11**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	41.2	42.3	40.0	46.4	
23:15	15:00	40.6	40.7	37.5	59.9	
23:30	15:00	36.7	37.9	35.0	39.5	
23:45	15:00	36.5	37.5	35.6	39.0	
00:00	15:00	37.2	38.0	36.3	40.5	
00:15	15:00	39.7	41.1	37.3	42.9	
00:30	15:00	40.8	41.7	39.8	46.5	
00:45	15:00	40.2	41.1	39.0	43.4	
01:00	15:00	41.3	42.5	40.1	43.4	
01:15	15:00	42.5	44.6	40.3	47.0	
01:30	15:00	44.9	46.5	42.7	48.7	
01:45	15:00	41.7	42.5	40.8	45.0	
02:00	15:00	44.2	45.3	42.5	53.6	
02:15	15:00	44.8	46.3	43.3	48.8	
02:30	15:00	46.2	47.5	44.7	54.2	
02:45	15:00	46.0	47.3	44.1	49.2	
03:00	15:00	43.2	44.6	41.7	46.5	
03:15	15:00	43.8	45.3	42.2	48.0	
03:30	15:00	48.3	50.0	46.0	53.4	
03:45	15:00	46.4	48.2	43.4	50.0	
04:00	15:00	47.5	49.1	45.9	51.2	
04:15	15:00	47.2	49.3	44.7	53.0	
04:30	15:00	45.5	47.3	43.3	49.6	
04:45	15:00	45.1	46.1	43.9	47.6	
05:00	15:00	44.6	45.8	43.2	48.1	
05:15	15:00	45.6	46.7	44.3	50.5	
05:30	15:00	45.6	46.8	44.3	49.5	
05:45	15:00	44.9	45.9	43.8	48.9	
06:00	15:00	45.0	46.1	43.6	55.6	
06:15	15:00	45.0	46.0	43.6	53.0	
06:30	15:00	45.2	46.5	43.8	50.7	
06:45	15:00	45.9	47.1	44.7	49.5	
Average 2300-0700		44.4	45.8	42.7	39-60	
Average 0700-2300		43.8	45.6	35.8	41-76	

### Noise Survey Results

Date: Sunday 25th September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 12**

Client: Sesona Ltd

12

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)

Calibration: 94dB

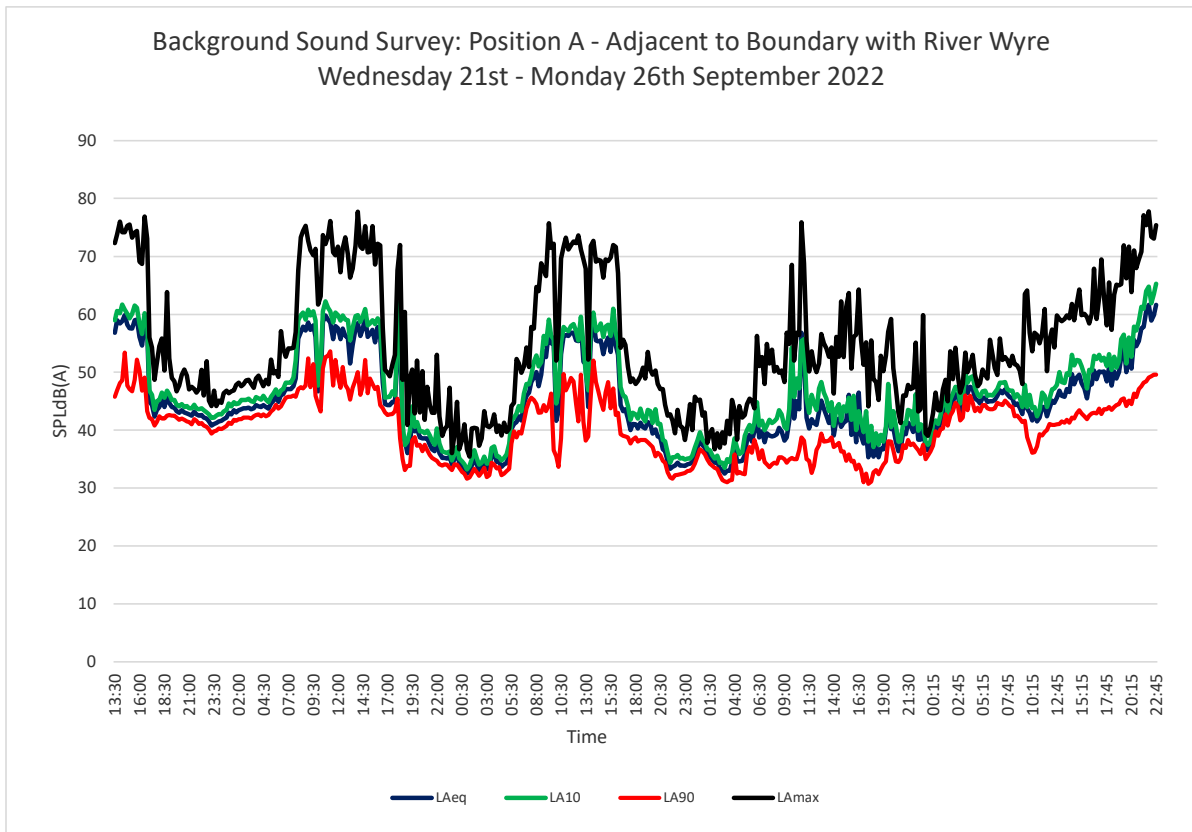
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	46.9	48.2	44.5	55.8	
07:15	15:00	46.4	48.2	44.3	52.1	
07:30	15:00	47.0	48.3	45.1	52.6	
07:45	15:00	46.2	47.1	44.7	52.1	
08:00	15:00	45.7	46.8	44.2	51.1	
08:15	15:00	45.5	46.8	44.0	52.8	
08:30	15:00	44.3	45.6	42.4	51.4	
08:45	15:00	44.6	46.2	42.5	51.2	
09:00	15:00	43.9	45.6	42.0	50.3	
09:15	15:00	42.8	44.0	41.4	48.0	
09:30	15:00	47.1	47.8	41.6	63.5	
09:45	15:00	43.7	44.0	38.8	64.1	
10:00	15:00	43.0	46.1	37.5	56.8	
10:15	15:00	41.7	43.8	36.1	53.6	
10:30	15:00	43.0	44.0	36.2	56.8	
10:45	15:00	41.5	42.4	37.2	56.4	
11:00	15:00	42.2	43.5	39.3	55.0	
11:15	15:00	44.0	46.5	39.1	56.7	
11:30	15:00	44.0	45.9	39.7	60.9	
11:45	15:00	42.4	44.0	40.0	50.2	
12:00	15:00	43.8	45.4	41.1	55.6	
12:15	15:00	45.1	47.0	40.9	57.4	
12:30	15:00	44.7	47.2	40.9	54.3	
12:45	15:00	45.6	47.8	41.0	59.8	
13:00	15:00	46.8	50.0	41.1	59.2	
13:15	15:00	45.9	48.3	41.5	58.8	
13:30	15:00	45.8	48.1	41.3	59.2	
13:45	15:00	47.1	49.8	41.8	59.8	
14:00	15:00	46.6	49.5	41.3	59.3	
14:15	15:00	49.7	53.0	42.2	61.8	
14:30	15:00	47.9	51.2	42.0	59.0	
14:45	15:00	49.1	52.1	42.9	61.8	
Average 0700-1500		45.6	47.7	41.7	48-64	

## Noise Survey Results

Date: Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position A - Adjacent to Boundary with River Wyre**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22748)  
 Calibration: 94dB

TABLE 13

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	49.6	52.0	43.4	64.3	
15:15	15:00	48.1	51.1	42.9	59.9	
15:30	15:00	47.2	49.5	42.4	60.1	
15:45	15:00	45.5	47.2	41.9	59.5	
16:00	15:00	47.8	50.4	42.5	58.4	
16:15	15:00	47.9	50.3	42.9	60.1	
16:30	15:00	50.3	52.8	43.0	67.9	
16:45	15:00	48.8	52.3	42.9	59.2	
17:00	15:00	50.1	53.0	43.7	62.9	
17:15	15:00	50.0	52.0	42.8	69.5	
17:30	15:00	50.1	52.5	43.6	63.1	
17:45	15:00	48.4	51.1	43.6	58.1	
18:00	15:00	50.9	53.1	44.0	65.5	
18:15	15:00	47.7	50.4	43.5	57.3	
18:30	15:00	50.1	52.7	44.0	63.4	
18:45	15:00	48.9	50.8	44.3	65.1	
19:00	15:00	50.0	51.9	44.5	65.0	
19:15	15:00	52.6	55.7	45.3	65.2	
19:30	15:00	54.6	56.5	45.5	71.9	
19:45	15:00	50.0	51.5	44.2	66.2	
20:00	15:00	53.7	56.0	45.1	71.7	
20:15	15:00	50.6	52.7	44.5	63.8	
20:30	15:00	55.6	57.9	46.3	71.0	
20:45	15:00	54.5	57.2	45.7	68.0	
21:00	15:00	55.4	58.8	47.1	69.5	
21:15	15:00	57.6	61.3	47.6	70.8	
21:30	15:00	57.8	61.0	48.2	77.1	
21:45	15:00	60.5	64.0	48.4	75.4	
22:00	15:00	61.6	64.8	49.1	77.8	
22:15	15:00	58.9	61.9	49.3	73.4	
22:30	15:00	59.9	63.5	49.6	73.1	
22:45	15:00	61.6	65.3	49.6	75.4	
Average 1500-2300		55.0	58.2	45.7	57-78	
Average 0700-2300		52.5	55.5	44.1	48-78	
<b>Overall Average</b>		<b>41.8</b>	<b>43.2</b>	<b>40.2</b>	<b>35-60</b>	
<b>Overall Average</b>		<b>52.5</b>	<b>54.8</b>	<b>44.4</b>	<b>39-78</b>	





## Noise Survey Results

Date: Wednesday 21st September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

**TABLE 14**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
13:45	15:00	57.7	58.7	50.9	77.3	Construction Works Noise & Ambient
14:00	15:00	57.2	55.9	50.6	76.4	
14:15	15:00	60.6	63.5	50.3	82.5	
14:30	15:00	64.4	66.8	51.3	91.8	
14:45	15:00	61.0	58.4	49.5	90.4	
15:00	15:00	60.8	63.3	50.4	80.4	
15:15	15:00	59.9	63.0	51.8	74.5	
15:30	15:00	59.3	55.8	50.5	88.2	
15:45	15:00	55.2	57.4	51.2	68.7	
16:00	15:00	52.9	55.1	49.9	64.9	
16:15	15:00	51.7	54.6	46.6	67.5	
16:30	15:00	51.1	54.0	45.2	68.7	
16:45	15:00	51.8	54.6	46.3	70.0	
17:00	15:00	50.3	52.1	45.2	78.6	
17:15	15:00	50.0	53.2	44.7	70.2	
17:30	15:00	53.0	55.1	42.7	76.3	
17:45	15:00	48.1	49.6	43.9	68.2	
18:00	15:00	49.0	51.5	44.4	59.8	
18:15	15:00	47.6	49.9	42.1	61.1	Baseline Levels
18:30	15:00	45.3	47.0	41.8	60.7	
18:45	15:00	50.3	49.7	42.8	73.9	
19:00	15:00	50.4	50.7	42.3	69.8	
19:15	15:00	44.6	46.4	42.4	54.5	
19:30	15:00	45.5	46.8	42.0	70.0	
19:45	15:00	45.0	45.6	41.2	59.4	
20:00	15:00	41.9	43.3	40.0	54.7	
20:15	15:00	42.7	44.5	40.0	57.3	
20:30	15:00	43.1	44.8	39.7	61.5	
20:45	15:00	43.5	45.2	39.4	64.2	
21:00	15:00	42.8	45.0	39.7	54.8	
21:15	15:00	42.3	44.9	39.0	61.0	
21:30	15:00	40.2	42.1	37.1	48.4	
21:45	15:00	40.0	41.6	37.3	51.2	
22:00	15:00	41.2	43.8	37.4	55.9	
22:15	15:00	45.4	48.4	39.9	57.8	
22:30	15:00	45.1	48.4	39.6	57.1	
22:45	15:00	45.2	48.4	39.4	57.1	
Average 1345-2300		54.9	56.6	46.4	48-92	

<b>Average 1815-2300</b>	<b>45.3</b>	<b>46.8</b>	<b>40.4</b>	<b>48-74</b>	<b>No Construction Noise</b>
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## Noise Survey Results

Date: Wednesday 21st - Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 15**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	39.0	40.9	36.0	49.6	
23:15	15:00	37.9	40.9	33.3	49.5	
23:30	15:00	35.9	37.0	34.7	40.8	
23:45	15:00	36.2	37.1	34.9	41.2	
00:00	15:00	36.9	37.9	35.7	50.1	
00:15	15:00	37.4	38.3	36.2	47.5	
00:30	15:00	38.8	39.6	37.7	45.0	
00:45	15:00	41.2	40.7	37.9	57.1	
01:00	15:00	39.9	41.1	38.2	47.3	
01:15	15:00	39.6	40.9	38.0	47.4	
01:30	15:00	40.8	41.9	39.3	50.2	
01:45	15:00	40.6	41.9	39.2	46.7	
02:00	15:00	40.8	42.1	38.7	47.2	
02:15	15:00	40.2	41.4	38.6	44.4	
02:30	15:00	41.1	42.0	40.0	48.1	
02:45	15:00	41.6	42.6	40.3	46.8	
03:00	15:00	41.8	42.9	40.5	45.9	
03:15	15:00	42.0	42.9	40.7	49.7	
03:30	15:00	42.3	43.3	40.9	52.0	
03:45	15:00	42.5	43.8	41.1	50.3	
04:00	15:00	42.7	43.7	41.5	47.2	
04:15	15:00	42.7	43.9	41.2	52.9	
04:30	15:00	42.9	44.0	41.7	49.6	
04:45	15:00	43.1	44.3	41.6	52.9	
05:00	15:00	44.0	45.0	42.7	50.3	
05:15	15:00	45.4	46.9	43.5	53.2	
05:30	15:00	45.6	47.0	43.9	53.8	
05:45	15:00	46.5	47.4	45.2	52.4	
06:00	15:00	49.3	48.1	44.2	75.9	
06:15	15:00	49.1	50.3	45.6	69.6	
06:30	15:00	47.6	48.3	45.8	66.6	
06:45	15:00	49.9	50.3	46.9	68.2	
Average 2300-0700		43.7	44.5	41.4	41-76	
Average 1345-2300		54.9	56.6	46.4	48-92	

## Noise Survey Results

Date: Thursday 22nd September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 16**

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**

Instrumentation: Cirrus Real Time Analyser (G066350)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	50.7	51.7	48.9	63.5	
07:15	15:00	51.5	52.2	49.7	66.5	
07:30	15:00	53.3	54.4	50.5	70.7	
07:45	15:00	55.9	54.8	50.8	77.7	
08:00	15:00	58.3	54.9	50.6	82.9	
08:15	15:00	55.4	56.4	50.9	73.7	
08:30	15:00	54.1	55.7	51.8	65.5	
08:45	15:00	60.7	56.6	51.1	83.5	
09:00	15:00	56.0	60.0	49.8	69.5	
09:15	15:00	57.5	60.6	50.0	77.1	
09:30	15:00	61.6	61.0	49.9	81.0	
09:45	15:00	57.8	58.7	49.4	82.3	
10:00	15:00	56.3	60.5	48.3	69.9	
10:15	15:00	58.2	59.8	48.6	79.5	
10:30	15:00	59.2	59.3	49.5	79.6	
10:45	15:00	61.7	60.0	49.6	88.8	
11:00	15:00	65.2	68.5	50.1	80.6	
11:15	15:00	53.6	55.2	51.3	70.4	
11:30	15:00	58.6	55.7	50.9	82.4	
11:45	15:00	55.6	57.1	52.3	78.8	
12:00	15:00	58.4	55.5	50.5	81.1	
12:15	15:00	61.6	60.7	50.4	83.8	
12:30	15:00	58.7	58.4	51.8	81.3	
12:45	15:00	62.6	63.4	51.7	83.9	
13:00	15:00	54.9	58.1	50.1	79.9	
13:15	15:00	60.8	61.6	50.4	84.3	
13:30	15:00	62.2	62.8	50.4	86.0	
13:45	15:00	63.8	63.2	51.0	85.4	
14:00	15:00	60.3	61.9	51.2	81.8	
14:15	15:00	61.0	62.3	50.1	82.9	
14:30	15:00	63.4	67.8	50.8	83.2	
14:45	15:00	62.4	64.2	51.6	81.4	
Average 0700-1500		59.8	59.2	50.4	64-89	

## Noise Survey Results

Date: Thursday 22nd September 2022

TABLE 17

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**

Instrumentation: Cirrus Real Time Analyser (G066350)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	61.1	60.8	50.3	84.6	Construction Works Noise & Ambient
15:15	15:00	56.3	59.3	51.1	69.6	
15:30	15:00	56.9	59.8	50.3	71.8	
15:45	15:00	56.4	59.2	50.6	78.4	
16:00	15:00	54.2	55.8	50.7	74.1	
16:15	15:00	52.8	54.5	49.8	69.3	
16:30	15:00	51.0	51.7	48.7	72.1	
16:45	15:00	51.4	52.7	48.2	65.7	
17:00	15:00	51.3	51.6	48.4	67.5	
17:15	15:00	51.0	51.4	48.5	68.7	
17:30	15:00	50.1	51.3	48.3	64.8	
17:45	15:00	50.2	51.2	48.9	65.1	
18:00	15:00	60.0	62.1	51.1	84.9	
18:15	15:00	63.5	63.7	47.9	90.1	Baseline
18:30	15:00	48.2	49.0	47.0	68.9	
18:45	15:00	47.4	48.3	46.6	60.4	
19:00	15:00	46.8	47.1	46.3	68.2	
19:15	15:00	47.0	47.4	46.6	52.4	
19:30	15:00	47.3	48.0	46.6	53.1	
19:45	15:00	51.7	48.4	46.7	71.5	
20:00	15:00	47.2	47.7	46.4	57.6	
20:15	15:00	47.1	47.6	46.5	53.9	
20:30	15:00	48.3	48.0	46.8	71.9	
20:45	15:00	47.9	48.2	47.0	62.5	
21:00	15:00	47.9	48.5	47.2	59.0	
21:15	15:00	48.0	48.7	47.2	54.9	
21:30	15:00	47.9	48.5	47.3	53.8	
21:45	15:00	48.2	48.6	47.3	73.4	
22:00	15:00	48.6	49.6	47.2	59.6	
22:15	15:00	47.6	48.0	47.0	54.9	
22:30	15:00	47.6	47.9	47.1	51.7	
22:45	15:00	47.5	48.0	47.0	51.5	
Average 1500-2300		54.0	55.1	48.3	52-90	
<b>Average 1815-2300</b>		<b>52.5</b>	<b>52.7</b>	<b>46.9</b>	<b>52-90</b>	<b>No Construction Noise</b>

## Noise Survey Results

Date: Thursday 22nd - Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 18**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	47.5	47.9	47.0	53.2	
23:15	15:00	47.4	47.7	46.9	54.6	
23:30	15:00	47.2	47.5	46.9	50.2	
23:45	15:00	47.3	47.6	46.9	50.4	
00:00	15:00	47.3	47.6	46.9	55.0	
00:15	15:00	47.2	47.5	46.9	49.7	
00:30	15:00	47.2	47.4	46.9	51.3	
00:45	15:00	47.2	47.4	46.9	50.8	
01:00	15:00	47.1	47.4	46.8	49.4	
01:15	15:00	47.1	47.3	46.8	48.7	
01:30	15:00	47.0	47.2	46.7	48.2	
01:45	15:00	47.1	47.3	46.8	48.4	
02:00	15:00	47.0	47.1	46.7	50.6	
02:15	15:00	47.0	47.2	46.8	49.6	
02:30	15:00	47.1	47.4	46.8	48.0	
02:45	15:00	47.3	47.4	46.8	53.4	
03:00	15:00	47.1	47.3	46.7	50.8	
03:15	15:00	47.2	47.3	46.9	50.0	
03:30	15:00	47.2	47.5	46.8	49.7	
03:45	15:00	47.5	47.8	47.0	53.3	
04:00	15:00	47.5	47.7	47.1	51.4	
04:15	15:00	47.5	47.7	47.2	50.3	
04:30	15:00	47.5	47.6	47.1	50.8	
04:45	15:00	47.5	47.9	47.1	49.8	
05:00	15:00	47.6	47.9	47.1	51.0	
05:15	15:00	48.1	49.1	47.3	53.5	
05:30	15:00	48.3	49.0	47.4	54.3	
05:45	15:00	49.0	49.5	48.2	54.2	
06:00	15:00	52.7	52.5	47.8	76.0	
06:15	15:00	56.9	53.6	48.3	77.9	
06:30	15:00	49.7	50.9	48.4	56.1	
06:45	15:00	51.8	53.3	48.8	64.7	
Average 2300-0700		48.8	48.7	47.1	48-78	
Average 0700-2300		57.8	59.0	49.5	52-90	

## Noise Survey Results

Date: Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 19**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	53.1	53.8	49.2	71.6	
07:15	15:00	51.5	51.7	49.7	72.7	
07:30	15:00	53.0	54.6	49.8	66.6	
07:45	15:00	60.8	58.3	51.6	85.5	
08:00	15:00	66.8	67.8	50.4	86.6	
08:15	15:00	66.2	66.6	52.1	82.8	
08:30	15:00	66.8	66.9	53.5	83.8	
08:45	15:00	66.1	69.8	50.2	84.7	
09:00	15:00	66.3	70.2	49.6	78.8	
09:15	15:00	72.1	73.8	60.6	81.1	
09:30	15:00	71.7	77.3	51.2	89.6	
09:45	15:00	65.2	65.6	50.7	81.7	
10:00	15:00	56.8	56.6	49.0	81.0	
10:15	15:00	60.0	56.8	48.9	83.0	
10:30	15:00	65.8	65.4	50.7	89.0	
10:45	15:00	62.5	60.9	51.2	80.1	
11:00	15:00	57.8	60.8	51.9	66.5	
11:15	15:00	66.3	67.2	51.9	89.5	
11:30	15:00	65.7	63.3	51.0	83.1	
11:45	15:00	64.3	62.9	52.2	84.6	
12:00	15:00	58.7	58.8	50.6	79.6	
12:15	15:00	64.2	63.1	51.0	82.2	
12:30	15:00	56.8	57.3	50.1	78.7	
12:45	15:00	69.0	70.9	51.2	85.0	
13:00	15:00	59.8	62.1	48.7	79.2	
13:15	15:00	60.5	62.4	48.9	81.6	
13:30	15:00	71.5	73.8	50.8	91.4	
13:45	15:00	70.5	72.4	54.0	88.7	
14:00	15:00	63.7	61.0	51.4	88.5	
14:15	15:00	62.3	61.8	50.2	79.1	
14:30	15:00	62.3	57.7	50.3	83.6	
14:45	15:00	63.6	62.3	51.2	85.6	
Average 0700-1500		65.8	67.9	51.9	67-91	

## Noise Survey Results

Date: Friday 23rd September 2022 **TABLE 20**  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	64.1	63.0	51.6	80.7	Construction Works Noise & Ambient
15:15	15:00	65.8	67.8	49.9	82.7	
15:30	15:00	63.3	66.9	48.7	85.3	
15:45	15:00	60.8	63.3	48.0	78.5	
16:00	15:00	56.3	58.7	45.3	78.2	
16:15	15:00	53.8	55.4	44.8	77.6	
16:30	15:00	53.8	52.2	45.1	75.9	
16:45	15:00	53.8	56.7	46.3	72.0	
17:00	15:00	53.9	56.3	50.1	72.9	
17:15	15:00	51.6	53.3	44.2	66.9	
17:30	15:00	46.9	49.4	43.2	65.9	
17:45	15:00	51.7	49.6	43.9	76.0	
18:00	15:00	48.5	50.5	44.6	69.1	
18:15	15:00	47.0	49.1	44.1	55.2	Baseline
18:30	15:00	46.6	48.7	43.6	53.6	
18:45	15:00	46.2	48.3	43.1	61.3	
19:00	15:00	45.5	47.2	43.0	68.2	
19:15	15:00	45.5	47.9	41.9	58.0	
19:30	15:00	44.6	46.9	41.8	53.6	
19:45	15:00	43.4	45.0	41.4	51.6	
20:00	15:00	42.7	44.4	40.4	54.2	
20:15	15:00	44.1	46.9	40.3	64.1	
20:30	15:00	43.9	46.3	40.1	55.4	
20:45	15:00	42.5	44.5	39.2	56.3	
21:00	15:00	42.9	45.2	39.4	53.1	
21:15	15:00	39.7	41.5	37.0	51.3	
21:30	15:00	38.4	40.1	36.3	48.2	
21:45	15:00	37.7	39.1	35.7	49.5	
22:00	15:00	37.9	39.4	35.9	45.4	
22:15	15:00	39.4	40.4	36.3	64.7	
22:30	15:00	38.5	40.0	36.4	46.9	
22:45	15:00	38.5	40.3	36.0	47.7	
Average 1500-2300		55.7	57.5	44.6	45-85	
<b>Average 1815-2300</b>		<b>43.4</b>	<b>45.4</b>	<b>40.4</b>	<b>45-68</b>	<b>No Construction Noise</b>

## Noise Survey Results

Date: Friday 23rd - Saturday 24th September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 21**

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**

Instrumentation: Cirrus Real Time Analyser (G066350)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	38.3	40.3	36.0	47.0	
23:15	15:00	38.7	40.7	35.9	46.5	
23:30	15:00	38.0	39.9	35.8	48.5	
23:45	15:00	38.4	40.3	35.3	52.8	
00:00	15:00	39.3	41.5	36.1	50.7	
00:15	15:00	39.3	41.7	36.4	47.0	
00:30	15:00	40.5	42.4	37.8	48.6	
00:45	15:00	40.6	42.9	37.7	48.7	
01:00	15:00	39.4	41.5	36.7	49.2	
01:15	15:00	38.6	40.1	36.4	48.0	
01:30	15:00	38.6	40.0	36.1	57.3	
01:45	15:00	37.5	39.0	35.6	47.6	
02:00	15:00	37.0	38.2	35.4	43.2	
02:15	15:00	36.7	38.1	35.1	43.9	
02:30	15:00	36.0	37.2	34.5	44.0	
02:45	15:00	35.9	37.3	34.0	42.6	
03:00	15:00	35.6	36.9	33.8	47.2	
03:15	15:00	35.5	37.0	33.6	43.9	
03:30	15:00	35.3	36.5	33.3	46.9	
03:45	15:00	34.9	36.5	31.8	49.2	
04:00	15:00	35.7	37.2	32.9	47.3	
04:15	15:00	34.5	35.5	30.9	51.3	
04:30	15:00	33.8	35.5	30.5	46.2	
04:45	15:00	35.0	38.3	30.7	47.1	
05:00	15:00	37.7	40.8	33.5	49.8	
05:15	15:00	38.0	40.9	33.8	47.7	
05:30	15:00	41.5	44.2	37.1	49.0	
05:45	15:00	41.4	44.1	34.8	57.4	
06:00	15:00	45.6	43.0	36.5	69.7	
06:15	15:00	52.6	48.4	39.9	74.0	
06:30	15:00	41.5	44.4	37.3	58.5	
06:45	15:00	45.2	44.6	35.9	64.5	
Average 2300-0700		41.4	41.3	35.5	43-74	
Average 0700-2300		63.2	65.3	49.6	45-91	



## Noise Survey Results

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 22**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	49.7	50.4	47.5	65.4	
07:15	15:00	49.4	50.2	47.9	63.0	
07:30	15:00	50.8	53.0	47.9	63.6	
07:45	15:00	51.3	53.2	48.4	61.9	
08:00	15:00	53.8	56.4	48.5	70.6	
08:15	15:00	55.1	59.1	47.7	66.0	
08:30	15:00	56.5	59.8	48.8	69.6	
08:45	15:00	56.4	58.6	48.3	74.4	
09:00	15:00	54.8	57.1	48.9	69.4	
09:15	15:00	54.4	56.8	50.3	67.6	
09:30	15:00	53.9	57.0	47.7	66.0	
09:45	15:00	54.3	57.4	47.9	67.4	
10:00	15:00	53.1	57.0	47.2	66.2	
10:15	15:00	54.3	57.4	47.5	67.6	
10:30	15:00	54.9	58.1	48.4	67.1	
10:45	15:00	58.9	59.8	48.8	82.2	
11:00	15:00	55.8	58.9	48.7	70.9	
11:15	15:00	54.2	57.6	45.8	69.9	
11:30	15:00	53.1	57.1	45.2	67.4	
11:45	15:00	51.5	51.5	42.9	73.5	
12:00	15:00	48.3	51.5	43.6	61.8	
12:15	15:00	50.8	52.8	43.1	69.1	
12:30	15:00	49.4	51.9	42.9	65.7	
12:45	15:00	49.0	51.8	44.0	60.2	
13:00	15:00	53.5	53.7	43.4	74.7	
13:15	15:00	46.6	49.3	41.9	58.6	
13:30	15:00	50.0	48.2	41.6	71.8	
13:45	15:00	47.3	48.7	40.5	64.1	
14:00	15:00	44.1	46.6	40.7	58.3	
14:15	15:00	49.7	50.9	42.8	77.6	
14:30	15:00	46.4	48.9	42.3	60.6	
14:45	15:00	45.5	47.4	41.5	61.4	
Average 0700-1500		53.0	54.0	45.7	58-82	
<b>Average 0700-1500</b>		<b>48.7</b>	<b>50.1</b>	<b>45</b>	<b>58-72</b>	<b>No Construction</b>

## Noise Survey Results

Date: Saturday 24th September 2022 **TABLE 23**  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	47.8	50.1	42.0	63.3	
15:15	15:00	46.6	49.2	41.1	63.8	
15:30	15:00	48.4	50.7	42.3	67.7	
15:45	15:00	45.5	48.2	41.0	58.7	
16:00	15:00	45.9	48.0	40.9	66.0	
16:15	15:00	45.7	46.8	40.4	60.8	
16:30	15:00	48.9	49.7	40.2	66.2	
16:45	15:00	44.0	46.7	36.6	57.8	
17:00	15:00	41.9	43.7	34.5	57.8	
17:15	15:00	42.5	46.6	35.2	54.7	
17:30	15:00	37.9	40.5	32.5	51.1	
17:45	15:00	40.2	42.1	32.9	57.1	
18:00	15:00	39.4	40.9	32.7	62.6	
18:15	15:00	39.1	41.3	33.3	61.6	
18:30	15:00	35.3	36.9	33.0	49.9	
18:45	15:00	37.4	40.7	33.0	48.3	
19:00	15:00	35.8	36.8	33.0	51.8	
19:15	15:00	36.5	37.9	32.4	54.7	
19:30	15:00	39.6	42.7	33.8	55.7	
19:45	15:00	35.2	36.2	33.3	47.7	
20:00	15:00	35.9	37.3	33.8	48.6	
20:15	15:00	36.8	38.9	34.0	48.2	
20:30	15:00	36.0	37.9	33.5	46.7	
20:45	15:00	33.9	35.4	32.1	43.1	
21:00	15:00	35.7	37.5	33.2	46.8	
21:15	15:00	37.2	38.9	35.0	44.0	
21:30	15:00	38.7	40.3	36.3	47.3	
21:45	15:00	39.5	41.8	35.7	51.8	
22:00	15:00	35.7	37.9	33.2	43.8	
22:15	15:00	36.3	38.0	34.0	45.6	
22:30	15:00	39.4	41.0	35.4	54.8	
22:45	15:00	44.2	42.0	35.2	65.4	
<b>Average 1500-2300</b>		<b>42.5</b>	<b>44.4</b>	<b>36.8</b>	<b>43-68</b>	

## Noise Survey Results

Date: Saturday 24th - Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 24**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	39.2	41.6	36.3	51.7	
23:15	15:00	38.8	40.7	36.2	51.8	
23:30	15:00	37.2	38.5	35.4	49.5	
23:45	15:00	38.4	40.0	35.7	52.8	
00:00	15:00	35.5	36.8	33.8	53.3	
00:15	15:00	37.8	39.9	34.7	49.6	
00:30	15:00	40.6	42.4	37.9	57.0	
00:45	15:00	40.5	42.1	38.6	51.7	
01:00	15:00	40.1	40.7	38.1	59.4	
01:15	15:00	40.2	41.8	37.6	47.0	
01:30	15:00	40.0	41.0	38.4	43.5	
01:45	15:00	40.7	42.3	38.2	49.6	
02:00	15:00	42.4	43.3	40.8	49.7	
02:15	15:00	42.2	43.4	40.7	48.8	
02:30	15:00	39.7	41.1	37.8	45.1	
02:45	15:00	40.0	41.4	37.8	46.2	
03:00	15:00	40.5	42.0	37.9	46.2	
03:15	15:00	41.1	42.5	39.1	46.4	
03:30	15:00	42.5	43.7	41.0	47.3	
03:45	15:00	42.7	44.3	40.6	50.4	
04:00	15:00	41.5	43.5	38.7	47.6	
04:15	15:00	42.2	43.3	40.8	50.1	
04:30	15:00	42.2	43.8	40.3	48.2	
04:45	15:00	41.8	43.3	39.9	46.9	
05:00	15:00	42.5	43.9	40.5	47.2	
05:15	15:00	44.7	46.5	42.1	50.2	
05:30	15:00	45.0	46.6	42.9	51.3	
05:45	15:00	44.7	46.2	42.6	51.1	
06:00	15:00	45.1	47.0	42.7	58.8	
06:15	15:00	46.5	47.8	44.0	65.6	
06:30	15:00	46.9	48.5	44.8	56.7	
06:45	15:00	47.7	49.6	45.1	59.1	
Average 2300-0700		42.5	44.0	40.3	44-66	
Average 0700-2300		50.4	52.9	44.0	43-82	

## Noise Survey Results

Date: Sunday 25th September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 25**

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**

Instrumentation: Cirrus Real Time Analyser (G066350)

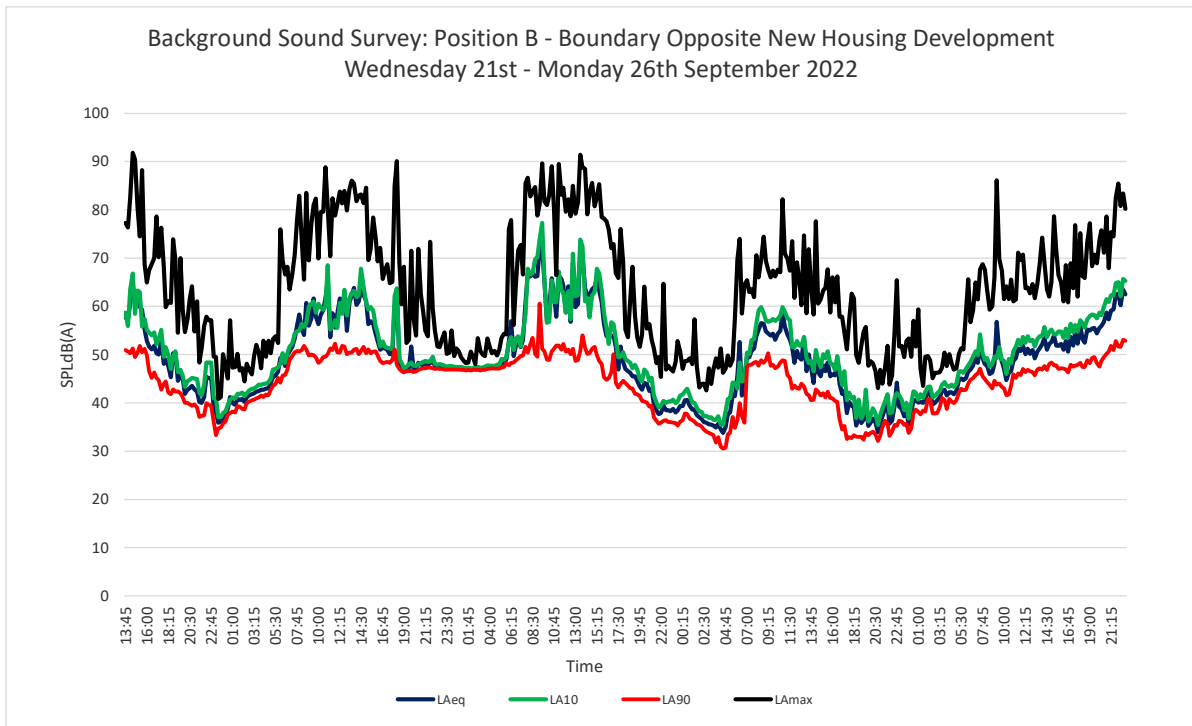
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	49.7	50.7	45.8	64.9	
07:15	15:00	48.3	49.9	46.1	61.4	
07:30	15:00	52.1	54.2	47.1	67.7	
07:45	15:00	49.2	50.3	45.5	68.7	
08:00	15:00	48.0	48.9	44.9	67.6	
08:15	15:00	47.7	49.3	44.3	63.4	
08:30	15:00	46.0	47.5	43.7	59.3	
08:45	15:00	46.3	48.0	43.0	60.0	
09:00	15:00	48.1	49.6	44.6	66.0	
09:15	15:00	56.8	49.2	43.8	86.1	
09:30	15:00	50.5	51.5	44.0	69.8	
09:45	15:00	48.6	49.0	43.3	67.5	
10:00	15:00	47.0	48.7	43.0	61.5	
10:15	15:00	44.7	46.0	41.6	64.2	
10:30	15:00	46.2	49.1	41.7	61.5	
10:45	15:00	46.6	48.2	43.6	65.5	
11:00	15:00	48.7	50.7	45.9	61.0	
11:15	15:00	49.3	51.7	45.2	61.4	
11:30	15:00	51.3	53.1	46.1	71.1	
11:45	15:00	50.8	52.0	45.8	69.6	
12:00	15:00	51.9	53.7	47.0	70.7	
12:15	15:00	50.1	52.5	46.4	63.7	
12:30	15:00	51.2	53.8	46.8	63.9	
12:45	15:00	50.2	52.8	46.6	62.7	
13:00	15:00	50.9	53.1	46.4	64.6	
13:15	15:00	49.2	51.7	45.7	61.7	
13:30	15:00	50.6	53.2	46.9	64.7	
13:45	15:00	51.3	53.8	47.2	68.6	
14:00	15:00	52.1	53.8	46.9	74.2	
14:15	15:00	53.5	55.7	47.6	69.1	
14:30	15:00	51.0	53.6	46.8	63.6	
14:45	15:00	52.2	54.7	48.0	62.0	
<b>Average 0700-1500</b>		<b>50.4</b>	<b>51.8</b>	<b>45.6</b>	<b>59-86</b>	

## Noise Survey Results

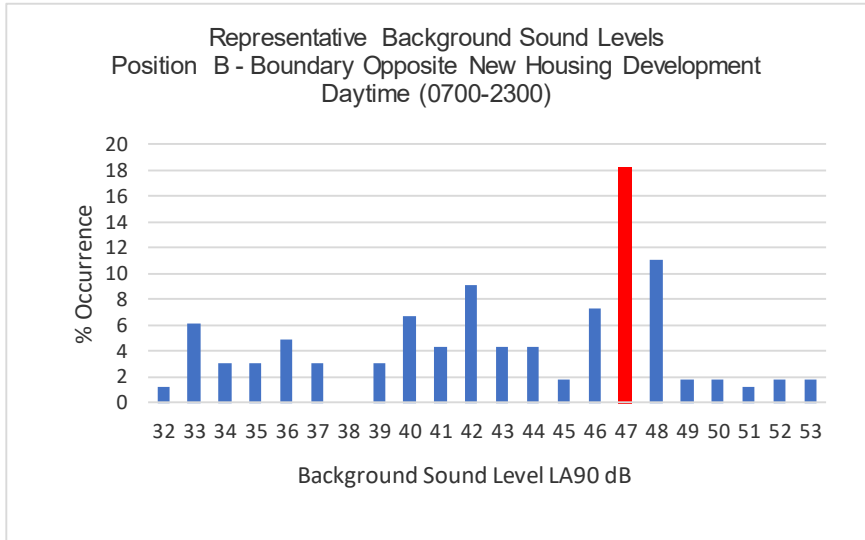
Date: Sunday 25th September 2022 **TABLE 26**  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position B - Boundary Opposite New Housing Development**  
 Instrumentation: Cirrus Real Time Analyser (G066350)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	52.6	55.2	48.4	65.1	
15:15	15:00	53.9	54.2	47.8	78.7	
15:30	15:00	51.9	54.2	47.8	71.6	
15:45	15:00	51.8	54.8	47.0	66.5	
16:00	15:00	52.2	54.8	47.2	65.0	
16:15	15:00	51.0	53.5	47.1	61.0	
16:30	15:00	52.8	55.4	46.9	68.5	
16:45	15:00	50.6	53.5	46.3	60.8	
17:00	15:00	53.7	56.4	47.9	68.9	
17:15	15:00	51.9	54.6	47.5	63.7	
17:30	15:00	54.6	56.1	47.7	76.8	
17:45	15:00	52.3	54.8	47.9	62.0	
18:00	15:00	56.2	57.1	48.3	75.2	
18:15	15:00	53.2	56.5	47.4	66.3	
18:30	15:00	52.5	55.6	47.4	65.9	
18:45	15:00	55.2	57.3	48.8	73.3	
19:00	15:00	55.0	58.0	48.2	77.2	
19:15	15:00	55.4	58.3	49.3	68.3	
19:30	15:00	55.5	58.2	49.5	70.7	
19:45	15:00	54.4	57.5	48.2	68.9	
20:00	15:00	55.5	58.7	47.5	73.7	
20:15	15:00	55.9	58.2	48.7	75.8	
20:30	15:00	56.8	59.9	49.5	71.1	
20:45	15:00	58.7	61.5	50.2	78.6	
21:00	15:00	57.3	60.9	50.6	67.9	
21:15	15:00	59.1	62.3	51.8	75.3	
21:30	15:00	59.4	62.3	50.9	74.5	
21:45	15:00	62.4	64.8	52.8	82.5	
22:00	15:00	62.6	65.0	51.7	85.4	
22:15	15:00	60.2	62.1	51.6	80.8	
22:30	15:00	63.4	65.7	53.1	83.4	
22:45	15:00	62.5	65.3	52.9	80.2	
<b>Average 1500-2300</b>		<b>57.3</b>	<b>59.9</b>	<b>49.4</b>	<b>61-85</b>	
<b>Average 0700-2300</b>		<b>55.1</b>	<b>57.5</b>	<b>47.9</b>	<b>59-86</b>	
<b>Overall Average</b>		<b>45.1</b>	<b>45.5</b>	<b>43</b>	<b>41-78</b>	
<b>Overall Average</b>		<b>58.6</b>	<b>60.5</b>	<b>48.1</b>	<b>43-92</b>	
<b>Average 0700-2300</b>		<b>52.1</b>	<b>54.2</b>	<b>45.5</b>	<b>43-90</b>	<b>No Construction Noise</b>



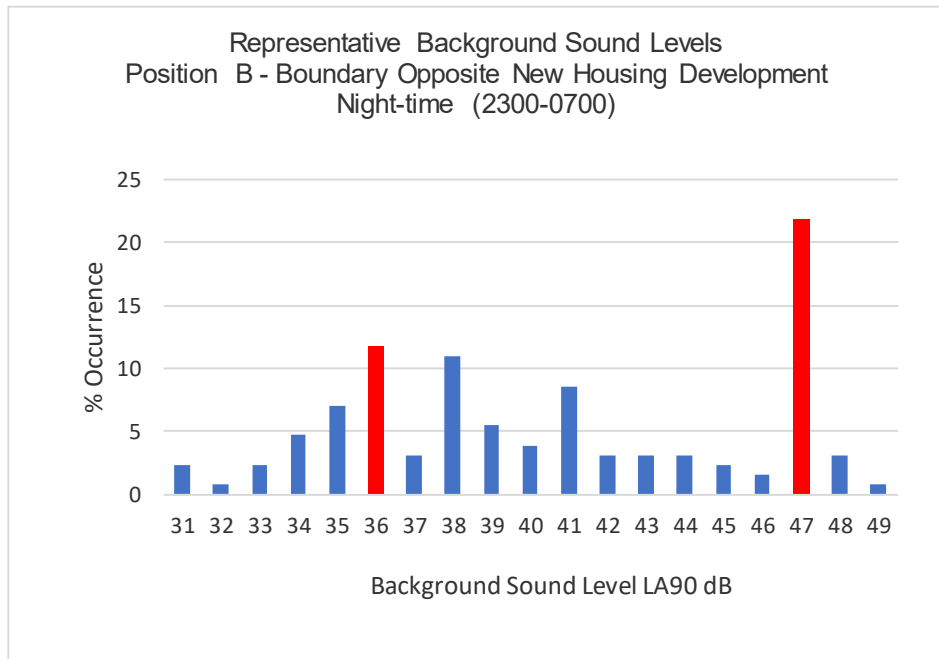
**LA90 % Occurrence**

32	1.2
33	6.1
34	3.0
35	3.0
36	4.9
37	3.0
38	0.0
39	3.0
40	6.7
41	4.3
42	9.1
43	4.3
44	4.3
45	1.8
46	7.3
<b>47</b>	<b>18.3</b>
48	11.0
49	1.8
50	1.8
51	1.2
52	1.8
53	1.8



**LA90 % Occurrence**

31	2.3
32	0.8
33	2.3
34	4.7
35	7.0
<b>36</b>	<b>11.7</b>
37	3.1
38	10.9
39	5.5
40	3.9
41	8.6
42	3.1
43	3.1
44	3.1
45	2.3
46	1.6
<b>47</b>	<b>21.9</b>
48	3.1
49	0.8



## Noise Survey Results

Date: Wednesday 21st September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 27**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
14:15	15:00	59.6	61.9	48.2	82.3	Construction Works Noise & Ambient
14:30	15:00	56.6	60.3	47.9	71.8	
14:45	15:00	56.8	60.8	46.7	71.3	
15:00	15:00	57.0	60.7	47.8	73.4	
15:15	15:00	57.2	61.2	49.4	72.2	
15:30	15:00	60.2	62.6	48.8	88.0	
15:45	15:00	59.1	62.7	46.3	70.8	
16:00	15:00	59.6	63.6	47.7	73.6	
16:15	15:00	60.8	65.2	45.0	74.5	
16:30	15:00	57.8	61.9	44.2	72.6	
16:45	15:00	59.8	63.6	47.0	77.8	
17:00	15:00	57.3	62.2	45.3	68.6	
17:15	15:00	57.8	61.6	44.4	79.4	
17:30	15:00	57.7	62.6	44.5	70.1	
17:45	15:00	57.1	61.7	46.3	72.1	
18:00	15:00	59.2	63.5	48.1	69.1	
18:15	15:00	56.3	59.6	45.5	73.9	Baseline Levels
18:30	15:00	55.2	59.4	46.0	69.6	
18:45	15:00	57.2	61.5	45.5	74.8	
19:00	15:00	54.0	57.6	45.6	70.3	
19:15	15:00	53.2	56.2	44.9	67.3	
19:30	15:00	53.7	56.7	45.5	67.9	
19:45	15:00	54.0	57.0	43.1	74.8	
20:00	15:00	51.8	53.7	41.3	68.4	
20:15	15:00	48.5	50.2	40.7	67.0	
20:30	15:00	58.9	55.9	41.7	87.1	
20:45	15:00	51.6	52.9	41.2	72.0	
21:00	15:00	51.1	52.7	40.4	69.1	
21:15	15:00	53.2	54.4	39.3	71.9	
21:30	15:00	48.5	46.3	39.4	66.8	
21:45	15:00	49.5	48.4	37.6	68.6	
22:00	15:00	51.7	46.2	37.3	76.0	
22:15	15:00	48.0	49.5	41.3	68.0	
22:30	15:00	46.8	46.5	40.5	66.9	
22:45	15:00	51.6	48.6	39.7	81.7	
Average 1415-2300		56.5	59.9	45.2	67-88	
<b>Average 1815-2300</b>		<b>53.5</b>	<b>55.6</b>	<b>42.7</b>	<b>67-87</b>	<b>No Construction Noise</b>



## Noise Survey Results

Date: Wednesday 21st - Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 28**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	41.2	42.1	36.0	60.8	
23:15	15:00	43.3	40.3	36.2	68.5	
23:30	15:00	41.7	40.9	35.2	64.2	
23:45	15:00	40.0	41.3	35.5	46.5	
00:00	15:00	39.9	41.1	35.3	45.5	
00:15	15:00	41.1	41.8	35.8	57.0	
00:30	15:00	42.5	42.5	36.8	62.4	
00:45	15:00	45.3	43.0	37.1	69.8	
01:00	15:00	45.4	43.3	37.6	65.7	
01:15	15:00	42.3	43.5	37.5	54.2	
01:30	15:00	45.5	44.5	38.1	65.9	
01:45	15:00	43.2	44.7	38.5	49.3	
02:00	15:00	44.5	45.3	38.7	61.0	
02:15	15:00	43.1	44.4	38.5	50.9	
02:30	15:00	42.7	43.8	38.3	48.9	
02:45	15:00	44.0	44.8	38.6	59.8	
03:00	15:00	44.8	44.6	38.6	65.8	
03:15	15:00	43.4	44.9	38.5	49.1	
03:30	15:00	43.4	44.7	38.8	49.9	
03:45	15:00	45.3	45.8	39.0	64.3	
04:00	15:00	44.7	45.5	39.1	60.5	
04:15	15:00	46.6	46.1	39.3	66.3	
04:30	15:00	45.7	45.5	39.5	63.1	
04:45	15:00	46.3	46.1	39.4	66.9	
05:00	15:00	48.1	47.2	40.1	66.9	
05:15	15:00	53.4	55.9	43.9	74.9	
05:30	15:00	54.7	58.0	44.2	73.2	
05:45	15:00	54.0	57.9	44.5	67.9	
06:00	15:00	54.4	59.0	44.0	69.4	
06:15	15:00	55.1	58.6	45.3	71.9	
06:30	15:00	54.4	57.6	45.8	70.4	
06:45	15:00	55.7	59.7	46.7	70.5	
Average 2300-0700		49.2	52.2	40.7	46-75	
Average 1415-2300		56.5	59.9	45.2	67-88	

## Noise Survey Results

Date: Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 29**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	54.9	59.0	47.2	68.7	Construction Works Noise & Ambient
07:15	15:00	56.7	60.2	48.1	73.4	
07:30	15:00	59.1	63.0	51.0	73.9	
07:45	15:00	59.9	62.8	53.7	74.8	
08:00	15:00	57.7	61.6	50.7	72.6	
08:15	15:00	62.3	66.4	50.4	77.4	
08:30	15:00	63.2	67.3	49.6	74.2	
08:45	15:00	60.2	64.0	51.5	75.4	
09:00	15:00	58.3	62.4	48.3	73.0	
09:15	15:00	57.0	60.8	47.5	72.5	
09:30	15:00	60.0	61.8	47.8	85.8	
09:45	15:00	57.3	60.9	49.0	74.2	
10:00	15:00	55.3	59.4	45.5	68.8	
10:15	15:00	54.2	58.1	45.9	70.5	
10:30	15:00	57.3	59.9	47.4	80.6	
10:45	15:00	57.0	60.9	49.5	71.9	
11:00	15:00	56.5	60.3	48.8	68.9	
11:15	15:00	59.0	62.0	53.7	71.2	
11:30	15:00	60.8	63.6	55.1	76.2	
11:45	15:00	60.9	63.0	56.9	74.9	
12:00	15:00	60.4	63.8	54.4	79.3	
12:15	15:00	60.6	63.8	53.9	77.7	
12:30	15:00	61.3	64.7	54.9	83.8	
12:45	15:00	60.5	64.6	52.2	81.5	
13:00	15:00	58.5	62.9	50.0	76.1	
13:15	15:00	59.3	63.3	50.5	75.5	
13:30	15:00	58.0	62.1	49.4	70.0	
13:45	15:00	60.1	63.1	51.4	83.8	
14:00	15:00	58.9	62.1	53.4	74.2	
14:15	15:00	57.3	60.2	49.1	70.0	
14:30	15:00	58.4	62.2	51.1	74.2	
14:45	15:00	59.6	63.2	52.9	73.3	
Average 0700-1500		59.2	62.3	50.7	69-86	

## Noise Survey Results

Date: Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 30**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	59.0	62.6	49.0	72.4	Construction Works Noise & Ambient
15:15	15:00	60.1	64.1	51.2	77.8	
15:30	15:00	60.8	64.9	51.1	72.9	
15:45	15:00	58.5	62.5	50.3	72.1	
16:00	15:00	61.4	65.3	53.3	73.5	
16:15	15:00	60.6	64.6	50.8	76.1	
16:30	15:00	59.8	64.4	48.4	73.7	
16:45	15:00	58.0	62.8	46.4	71.3	
17:00	15:00	66.5	65.1	47.3	97.0	
17:15	15:00	60.9	64.7	48.3	80.8	
17:30	15:00	58.2	62.6	47.4	71.8	
17:45	15:00	59.4	63.8	49.7	75.2	
18:00	15:00	62.4	66.2	55.1	79.5	
18:15	15:00	60.1	64.0	46.8	79.6	Baseline
18:30	15:00	58.2	62.7	41.3	75.7	
18:45	15:00	58.1	62.8	38.5	73.2	
19:00	15:00	56.8	61.2	38.5	73.3	
19:15	15:00	56.8	60.8	39.0	76.6	
19:30	15:00	54.1	57.1	38.8	70.2	
19:45	15:00	55.9	60.2	40.3	69.9	
20:00	15:00	55.0	58.0	36.1	76.0	
20:15	15:00	51.2	52.1	35.2	69.5	
20:30	15:00	53.1	57.1	35.9	69.6	
20:45	15:00	54.0	57.7	36.3	70.9	
21:00	15:00	52.1	54.1	36.2	70.7	
21:15	15:00	47.5	45.3	34.9	68.9	
21:30	15:00	51.8	53.6	34.4	70.5	
21:45	15:00	51.7	54.0	34.3	69.4	
22:00	15:00	48.3	47.8	33.7	68.1	
22:15	15:00	42.5	37.8	32.6	67.2	
22:30	15:00	45.7	37.8	32.7	69.5	
22:45	15:00	43.5	36.7	32.5	68.3	
Average 1500-2300		58.4	61.7	47.0	67-97	
<b>Average 1815-2300</b>		<b>54.6</b>	<b>58.3</b>	<b>38.6</b>	<b>67-97</b>	<b>No Construction Noise</b>

### Noise Survey Results

Date: Thursday 22nd - Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 31**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	46.5	41.0	35.0	66.1	
23:15	15:00	37.3	38.9	34.5	54.4	
23:30	15:00	35.5	36.4	34.3	46.0	
23:45	15:00	36.3	37.3	34.7	49.3	
00:00	15:00	37.3	38.7	34.6	47.9	
00:15	15:00	35.8	36.6	34.6	43.8	
00:30	15:00	35.0	35.7	34.1	42.1	
00:45	15:00	40.8	36.0	33.9	59.8	
01:00	15:00	43.8	35.7	33.5	67.8	
01:15	15:00	44.2	35.8	33.9	66.1	
01:30	15:00	35.1	35.6	34.4	43.2	
01:45	15:00	41.9	38.1	35.6	61.4	
02:00	15:00	34.7	35.3	33.9	48.3	
02:15	15:00	34.9	35.7	33.7	50.8	
02:30	15:00	36.0	36.3	33.4	54.7	
02:45	15:00	48.9	38.1	33.8	70.7	
03:00	15:00	46.1	37.3	32.9	67.9	
03:15	15:00	34.9	35.7	33.6	48.6	
03:30	15:00	45.3	39.2	34.3	67.3	
03:45	15:00	50.2	42.4	36.2	72.5	
04:00	15:00	51.5	46.5	36.3	69.1	
04:15	15:00	50.2	43.5	34.9	69.1	
04:30	15:00	46.2	37.0	34.1	68.6	
04:45	15:00	52.0	46.2	34.4	69.9	
05:00	15:00	51.0	47.9	35.3	68.5	
05:15	15:00	56.3	58.7	36.7	69.9	
05:30	15:00	55.6	60.0	39.6	72.3	
05:45	15:00	55.6	60.0	39.7	69.6	
06:00	15:00	55.5	59.8	39.7	70.2	
06:15	15:00	57.2	60.1	42.6	72.7	
06:30	15:00	58.0	61.9	42.9	73.4	
06:45	15:00	58.8	63.4	42.6	74.3	
Average 2300-0700		51.3	54.3	36.9	42-74	
Average 0700-2300		58.8	62.2	49.8	67-97	

## Noise Survey Results

Date: Friday 23rd September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire

TABLE 32

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position C - 10m Bourne Road**

Instrumentation: Cirrus 171B Real Time Analyser (G056142)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	57.7	62.1	43.5	72.7	Construction Works Noise & Ambient
07:15	15:00	57.2	62.1	46.8	71.1	
07:30	15:00	58.3	62.6	48.4	74.6	
07:45	15:00	59.5	63.8	49.5	71.6	
08:00	15:00	60.1	63.5	54.9	73.9	
08:15	15:00	59.9	63.6	50.6	73.1	
08:30	15:00	59.3	63.0	49.5	75.0	
08:45	15:00	61.0	65.0	53.6	71.9	
09:00	15:00	58.7	62.9	48.6	74.6	
09:15	15:00	60.6	63.4	53.8	76.0	
09:30	15:00	59.7	62.9	54.3	72.3	
09:45	15:00	58.7	62.0	46.5	78.9	
10:00	15:00	58.2	62.8	45.3	74.4	
10:15	15:00	56.6	60.7	42.4	73.5	
10:30	15:00	56.7	60.9	42.4	70.8	
10:45	15:00	57.9	61.8	43.9	75.6	
11:00	15:00	59.9	63.0	49.8	81.1	
11:15	15:00	57.9	61.7	48.0	71.2	
11:30	15:00	59.0	62.7	44.7	74.6	
11:45	15:00	59.9	63.3	53.9	75.2	
12:00	15:00	62.6	65.5	45.6	80.4	
12:15	15:00	60.0	63.6	48.2	79.2	
12:30	15:00	58.9	62.8	49.4	72.5	
12:45	15:00	59.2	63.0	48.0	73.6	
13:00	15:00	58.1	62.4	43.3	72.3	
13:15	15:00	56.9	61.8	43.1	69.9	
13:30	15:00	57.9	62.1	43.5	72.6	
13:45	15:00	56.3	61.0	45.8	69.6	
14:00	15:00	56.5	61.2	43.3	73.0	
14:15	15:00	58.1	61.3	42.5	83.7	
14:30	15:00	55.8	59.0	43.9	75.6	
14:45	15:00	56.6	61.0	44.1	75.1	
Average 0700-1500		58.8	62.6	49.0	70-84	

### Noise Survey Results

Date: Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 33**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations	
15:00	15:00	57.5	61.9	45.2	72.9	Construction Works Noise & Ambient	
15:15	15:00	56.5	61.2	45.4	71.3		
15:30	15:00	58.5	62.7	45.9	75.2		
15:45	15:00	57.9	62.1	44.5	72.6		
16:00	15:00	57.3	61.7	43.8	73.1		
16:15	15:00	56.6	61.1	42.9	72.4		
16:30	15:00	58.9	62.8	44.3	80.1		
16:45	15:00	57.9	62.5	43.8	71.5		
17:00	15:00	55.8	60.9	41.7	69.9		
17:15	15:00	57.1	60.3	42.0	82.9		
17:30	15:00	61.1	62.7	42.3	84.4		
17:45	15:00	58.9	62.6	43.0	79.4		
18:00	15:00	59.2	64.0	43.6	75.4		Construction works stops
18:15	15:00	54.9	59.3	41.9	68.5		Baseline
18:30	15:00	53.0	55.7	40.8	69.7		
18:45	15:00	54.9	59.3	41.3	70.0		
19:00	15:00	54.5	58.1	40.8	78.9		
19:15	15:00	55.0	54.3	39.8	79.0		
19:30	15:00	52.6	55.2	38.5	70.3		
19:45	15:00	51.2	52.3	37.5	71.5		
20:00	15:00	48.7	48.1	35.6	68.8		
20:15	15:00	48.1	45.7	36.8	70.3		
20:30	15:00	50.4	48.4	36.9	72.5		
20:45	15:00	47.5	42.0	35.4	70.9		
21:00	15:00	46.9	43.3	34.5	66.6		
21:15	15:00	48.3	40.7	32.0	72.5		
21:30	15:00	51.1	43.7	31.4	79.7		
21:45	15:00	44.5	39.2	31.3	66.2		
22:00	15:00	46.0	39.7	31.6	67.0		
22:15	15:00	45.5	38.0	31.3	69.0		
22:30	15:00	41.7	35.9	31.8	64.2		
22:45	15:00	49.5	39.7	30.8	74.6		
Average 1500-2300		55.3	58.9	41.2	64-84		
Average 1815-2300		51.1	52.9	37.4	64-80	No Construction Noise	

### Noise Survey Results

Date: Friday 23rd - Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 34**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	42.8	40.8	35.2	66.1	
23:15	15:00	49.6	40.7	34.9	74.5	
23:30	15:00	44.0	39.1	34.9	64.2	
23:45	15:00	42.1	38.6	35.2	66.9	
00:00	15:00	46.3	41.8	36.3	67.9	
00:15	15:00	46.5	44.5	36.1	67.9	
00:30	15:00	45.4	44.2	37.5	57.2	
00:45	15:00	45.0	42.3	36.9	66.9	
01:00	15:00	42.8	39.6	36.4	67.6	
01:15	15:00	43.2	42.7	35.3	62.6	
01:30	15:00	43.8	37.4	35.1	69.7	
01:45	15:00	40.6	37.4	34.8	66.8	
02:00	15:00	41.5	36.6	34.2	66.4	
02:15	15:00	41.2	36.6	33.8	53.7	
02:30	15:00	38.6	35.4	33.3	52.2	
02:45	15:00	39.5	34.9	33.6	55.5	
03:00	15:00	37.8	34.4	33.1	58.2	
03:15	15:00	39.6	35.8	32.9	56.0	
03:30	15:00	41.1	37.0	33.0	64.4	
03:45	15:00	42.9	39.3	32.7	68.2	
04:00	15:00	41.7	40.4	36.1	58.3	
04:15	15:00	43.3	40.2	35.7	64.0	
04:30	15:00	42.6	43.3	36.1	64.5	
04:45	15:00	44.4	45.2	32.1	67.0	
05:00	15:00	43.8	42.7	34.6	64.8	
05:15	15:00	50.1	51.3	35.8	68.2	
05:30	15:00	53.0	54.3	36.8	67.4	
05:45	15:00	52.1	54.2	35.5	69.8	
06:00	15:00	52.7	55.3	35.9	69.1	
06:15	15:00	55.2	58.4	38.4	73.2	
06:30	15:00	54.5	58.3	37.3	71.8	
06:45	15:00	54.0	57.1	37.3	69.1	
Average 2300-0700		48.1	49.9	35.4	43-85	
Average 0700-2300		17.5	17.8	16.5	64-84	

## Noise Survey Results

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 35**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	51.7	54.2	36.9	75.3	Baseline
07:15	15:00	52.4	53.8	38.6	70.1	
07:30	15:00	52.0	53.6	38.5	69.6	
07:45	15:00	54.4	56.0	38.4	75.1	
08:00	15:00	55.6	58.8	48.7	72.3	Construction Works Noise & Ambient
08:15	15:00	55.3	58.6	48.0	70.3	
08:30	15:00	57.8	62.0	48.1	70.3	
08:45	15:00	57.9	62.0	49.2	70.8	
09:00	15:00	55.3	59.2	46.6	69.5	
09:15	15:00	57.3	61.3	47.4	70.9	
09:30	15:00	58.1	61.6	51.4	75.7	
09:45	15:00	60.2	62.8	52.2	84.4	
10:00	15:00	58.0	61.8	51.4	74.5	
10:15	15:00	57.6	61.9	47.8	75.2	
10:30	15:00	56.0	59.7	46.5	73.5	
10:45	15:00	56.6	60.8	47.1	69.3	
11:00	15:00	57.2	60.9	48.8	72.5	
11:15	15:00	54.3	57.8	47.1	68.5	
11:30	15:00	55.7	59.5	47.5	68.6	
11:45	15:00	54.7	58.5	45.5	69.3	
12:00	15:00	54.4	58.2	44.9	73.1	
12:15	15:00	56.8	58.8	41.7	85.4	
12:30	15:00	54.3	58.8	41.9	68.9	
12:45	15:00	54.9	59.6	41.6	68.5	
13:00	15:00	54.9	58.8	41.0	71.1	
13:15	15:00	53.2	57.1	38.7	69.2	Baseline
13:30	15:00	53.5	57.5	38.9	70.1	
13:45	15:00	54.7	56.3	38.8	84.5	
14:00	15:00	51.8	53.7	38.6	71.2	
14:15	15:00	51.9	53.6	40.1	69.8	
14:30	15:00	52.6	54.3	40.5	69.5	
14:45	15:00	54.3	55.5	38.9	78.4	
Average 0700-1500		55.7	58.3	44.1	69-85	
<b>Average 0700-1500</b>		<b>53</b>	<b>55.2</b>	<b>38.8</b>	<b>70-85</b>	<b>No Construction</b>



**Noise Survey Results**

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 36**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	54.3	57.8	39.6	72.4	
15:15	15:00	56.1	58.4	40.0	79.5	
15:30	15:00	53.2	57.2	39.7	70.2	
15:45	15:00	52.9	54.8	37.0	70.5	
16:00	15:00	54.7	58.2	38.4	72.2	
16:15	15:00	51.6	54.2	37.3	69.5	
16:30	15:00	54.0	58.9	39.5	68.8	
16:45	15:00	53.7	58.0	38.8	68.8	
17:00	15:00	54.1	57.5	35.7	71.7	
17:15	15:00	54.8	58.6	37.1	72.5	
17:30	15:00	53.1	54.6	35.2	72.3	
17:45	15:00	52.1	55.1	34.5	70.6	
18:00	15:00	56.8	61.5	33.9	72.8	
18:15	15:00	54.5	57.2	34.0	73.3	
18:30	15:00	51.5	53.8	36.2	67.3	
18:45	15:00	54.2	57.3	37.7	74.5	
19:00	15:00	49.8	50.0	37.2	69.7	
19:15	15:00	49.8	51.9	37.8	67.7	
19:30	15:00	51.9	53.4	38.9	74.6	
19:45	15:00	44.8	42.1	37.7	65.0	
20:00	15:00	46.4	46.3	39.8	66.1	
20:15	15:00	52.9	48.7	39.0	80.3	
20:30	15:00	47.7	45.7	36.6	67.0	
20:45	15:00	49.2	47.9	36.1	67.7	
21:00	15:00	45.8	43.1	35.5	66.6	
21:15	15:00	47.6	47.9	38.4	63.3	
21:30	15:00	47.1	47.6	39.1	64.3	
21:45	15:00	52.1	48.3	37.7	78.8	
22:00	15:00	48.2	46.8	36.9	68.1	
22:15	15:00	48.9	46.9	37.9	69.1	
22:30	15:00	51.0	47.7	39.0	73.1	
22:45	15:00	54.4	52.0	38.2	75.2	
<b>Average 1500-2300</b>		<b>52.5</b>	<b>55.0</b>	<b>37.8</b>	<b>63-80</b>	

### Noise Survey Results

Date: Saturday 24th - Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 37**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	49.6	44.4	37.1	74.6	
23:15	15:00	47.1	46.3	37.3	67.4	
23:30	15:00	45.8	45.4	37.2	68.3	
23:45	15:00	44.7	44.6	37.6	67.5	
00:00	15:00	44.8	42.9	33.6	68.4	
00:15	15:00	45.7	46.0	35.0	64.3	
00:30	15:00	45.5	45.7	37.4	64.2	
00:45	15:00	48.8	45.4	38.6	67.2	
01:00	15:00	44.1	43.8	38.3	65.1	
01:15	15:00	44.0	44.4	38.3	61.4	
01:30	15:00	43.5	44.5	36.6	66.2	
01:45	15:00	46.7	43.2	37.7	69.3	
02:00	15:00	47.0	43.2	37.0	68.6	
02:15	15:00	42.5	42.7	37.1	62.3	
02:30	15:00	41.0	41.9	36.9	47.8	
02:45	15:00	42.6	41.9	36.7	65.1	
03:00	15:00	41.3	42.2	37.1	46.5	
03:15	15:00	42.2	43.4	37.8	49.3	
03:30	15:00	41.4	42.8	36.9	46.0	
03:45	15:00	44.3	45.0	38.1	63.4	
04:00	15:00	49.5	44.5	36.7	69.0	
04:15	15:00	42.9	44.4	37.9	53.5	
04:30	15:00	47.4	45.5	39.0	69.3	
04:45	15:00	43.9	45.0	39.5	48.6	
05:00	15:00	47.3	45.8	39.6	65.7	
05:15	15:00	51.0	49.6	39.7	72.1	
05:30	15:00	53.6	56.6	41.6	68.6	
05:45	15:00	54.2	57.3	41.2	71.6	
06:00	15:00	54.0	54.9	44.1	69.6	
06:15	15:00	52.3	53.0	44.4	68.7	
06:30	15:00	55.4	58.4	45.6	70.8	
06:45	15:00	54.2	56.2	44.9	71.0	
Average 2300-0700		49.0	50.2	39.7	46-72	
Average 0700-2300		54.3	57.5	43.8	60-85	

## Noise Survey Results

Date: Sunday 25th September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire

TABLE 38

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position C - 10m Bourne Road**

Instrumentation: Cirrus 171B Real Time Analyser (G056142)

Calibration: 94dB

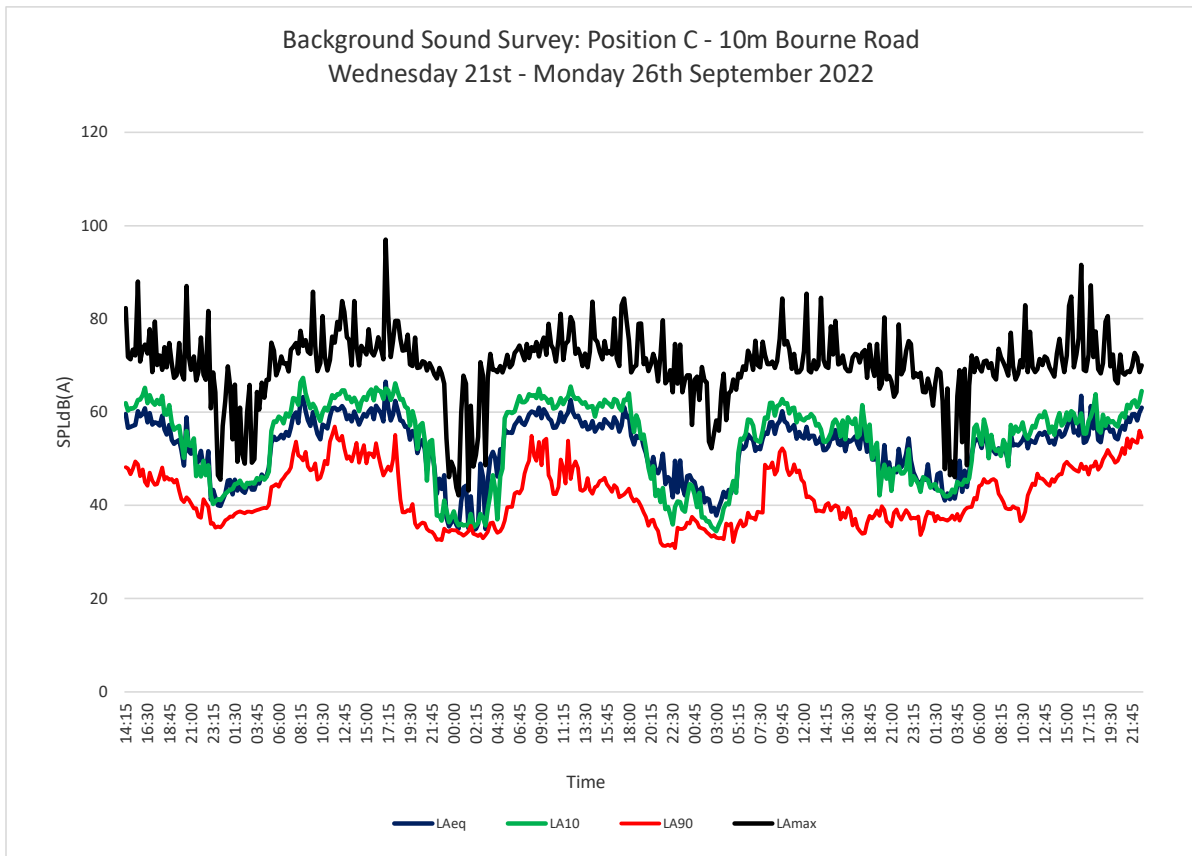
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	51.3	50.1	44.9	69.5	
07:15	15:00	53.2	55.1	45.4	70.5	
07:30	15:00	51.7	52.4	45.6	67.7	
07:45	15:00	51.0	51.7	45.2	67.0	
08:00	15:00	52.2	52.0	42.5	73.6	
08:15	15:00	50.9	50.6	41.7	71.8	
08:30	15:00	52.7	54.0	40.7	70.6	
08:45	15:00	51.6	52.9	39.4	69.5	
09:00	15:00	49.2	48.4	39.2	67.8	
09:15	15:00	55.4	57.2	39.2	77.0	
09:30	15:00	52.8	55.3	39.8	69.9	
09:45	15:00	53.0	56.9	39.4	67.0	
10:00	15:00	52.8	55.8	39.3	68.2	
10:15	15:00	53.3	56.4	36.6	71.1	
10:30	15:00	54.0	57.8	37.1	69.6	
10:45	15:00	55.3	55.2	38.6	82.9	
11:00	15:00	52.2	54.3	42.1	68.6	
11:15	15:00	54.0	55.4	43.3	77.2	
11:30	15:00	53.7	57.0	44.7	69.6	
11:45	15:00	53.4	56.7	44.3	68.6	
12:00	15:00	54.8	58.4	46.8	69.2	
12:15	15:00	55.5	59.3	45.8	71.4	
12:30	15:00	55.1	58.9	45.7	70.1	
12:45	15:00	55.7	60.1	45.2	71.9	
13:00	15:00	55.0	58.5	44.6	71.5	
13:15	15:00	53.4	55.6	44.2	69.6	
13:30	15:00	53.9	56.9	45.6	68.6	
13:45	15:00	53.0	55.1	45.0	67.6	
14:00	15:00	55.2	58.1	46.0	72.6	
14:15	15:00	55.9	59.8	46.7	75.7	
14:30	15:00	54.7	57.1	46.7	71.8	
14:45	15:00	55.2	57.8	48.7	68.6	
<b>Average 0700-1500</b>		<b>53.7</b>	<b>56.4</b>	<b>44.1</b>	<b>67-83</b>	

## Noise Survey Results

Date: Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position C - 10m Bourne Road**  
 Instrumentation: Cirrus 171B Real Time Analyser (G056142)  
 Calibration: 94dB

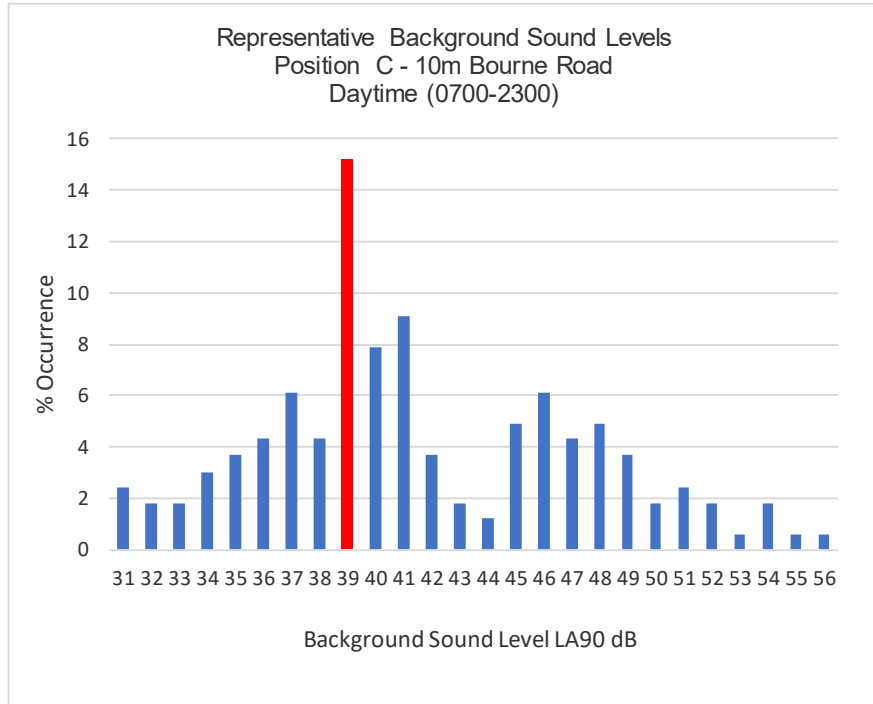
TABLE 39

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	56.7	59.9	49.3	72.1	
15:15	15:00	58.2	58.3	48.7	82.8	
15:30	15:00	59.6	60.2	48.3	84.8	
15:45	15:00	55.6	59.7	47.8	69.6	
16:00	15:00	56.0	57.6	47.4	72.4	
16:15	15:00	55.0	58.1	47.2	75.9	
16:30	15:00	63.5	59.7	48.9	91.6	
16:45	15:00	53.4	55.4	47.8	69.1	
17:00	15:00	53.7	55.4	48.3	68.8	
17:15	15:00	55.1	58.1	46.6	72.3	
17:30	15:00	61.3	59.0	48.4	87.2	
17:45	15:00	56.5	60.8	48.3	71.8	
18:00	15:00	59.7	63.8	49.4	77.3	
18:15	15:00	54.0	56.2	47.6	69.2	
18:30	15:00	53.5	55.6	48.4	68.3	
18:45	15:00	56.4	59.4	49.8	70.5	
19:00	15:00	56.6	57.0	50.8	79.4	
19:15	15:00	57.1	58.7	51.9	80.6	
19:30	15:00	55.8	57.8	50.8	69.8	
19:45	15:00	56.2	58.1	50.1	72.4	
20:00	15:00	54.5	57.3	49.1	66.9	
20:15	15:00	54.2	56.9	49.5	66.2	
20:30	15:00	56.2	59.0	50.8	72.4	
20:45	15:00	57.0	59.7	52.3	68.4	
21:00	15:00	56.2	58.8	51.0	68.0	
21:15	15:00	58.9	61.6	54.4	68.7	
21:30	15:00	57.9	60.8	52.3	68.6	
21:45	15:00	59.5	62.1	54.2	69.8	
22:00	15:00	59.6	62.5	53.7	72.7	
22:15	15:00	58.2	61.1	53.4	71.7	
22:30	15:00	59.9	62.3	56.0	68.6	
22:45	15:00	60.9	64.5	54.6	70.0	
<b>Average 1500-2300</b>		<b>57.8</b>	<b>59.8</b>	<b>50.9</b>	<b>66-92</b>	
<b>Average 0700-2300</b>		<b>56.2</b>	<b>58.4</b>	<b>48.7</b>	<b>66-92</b>	
<b>Overall Average</b>		<b>49.6</b>	<b>52</b>	<b>38.7</b>	<b>42-85</b>	
<b>Overall Average</b>		<b>56.9</b>	<b>60.2</b>	<b>47.6</b>	<b>60-97</b>	
<b>Average 0700-2300</b>		<b>54.5</b>	<b>57</b>	<b>45.4</b>	<b>63-97</b>	<b>No Construction Noise</b>



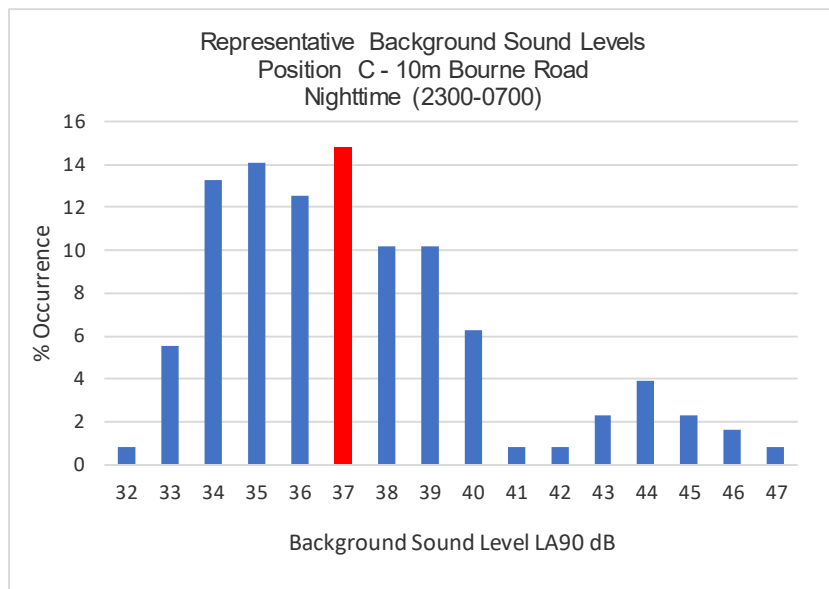
**LA90 % Occurrence**

31	2.4
32	1.8
33	1.8
34	3.0
35	3.7
36	4.3
37	6.1
38	4.3
<b>39</b>	<b>15.2</b>
40	7.9
41	9.1
42	3.7
43	1.8
44	1.2
45	4.9
46	6.1
47	4.3
48	4.9
49	3.7
50	1.8
51	2.4
52	1.8
53	0.6
54	1.8
55	0.6
56	0.6



**LA90 % Occurrence**

32	0.8
33	5.5
34	13.3
35	14.1
36	12.5
<b>37</b>	<b>14.8</b>
38	10.2
39	10.2
40	6.3
41	0.8
42	0.8
43	2.3
44	3.9
45	2.3
46	1.6
47	0.8



## Noise Survey Results

Date: Wednesday 21st September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

**TABLE 40**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
14:45	15:00	58.0	61.7	46.4	81.1	Construction Works Noise & Ambient
15:00	15:00	56.8	60.5	47.7	75.1	
15:15	15:00	57.2	60.9	48.3	69.5	
15:30	15:00	59.4	62.9	49.0	80.3	
15:45	15:00	58.0	61.4	47.4	70.0	
16:00	15:00	58.1	61.7	47.5	71.6	
16:15	15:00	59.4	62.4	45.2	80.2	
16:30	15:00	57.6	61.6	45.2	69.4	
16:45	15:00	60.6	63.9	47.2	80.7	
17:00	15:00	57.3	61.9	45.8	69.0	
17:15	15:00	57.8	60.9	44.2	79.7	
17:30	15:00	57.2	61.3	44.6	79.7	
17:45	15:00	57.0	61.0	46.0	68.3	
18:00	15:00	58.8	63.1	47.5	72.4	
18:15	15:00	56.1	59.8	44.2	74.8	Baseline Levels
18:30	15:00	55.8	60.0	44.5	76.4	
18:45	15:00	57.1	60.4	44.5	73.9	
19:00	15:00	54.2	57.9	44.0	69.9	
19:15	15:00	53.0	57.1	43.4	68.0	
19:30	15:00	53.3	57.1	44.1	68.2	
19:45	15:00	54.4	58.5	41.5	72.3	
20:00	15:00	51.4	53.9	39.5	69.7	
20:15	15:00	48.3	49.4	39.7	66.2	
20:30	15:00	60.1	57.0	40.8	90.9	
20:45	15:00	51.1	53.4	40.1	67.0	
21:00	15:00	51.1	53.8	40.3	67.0	
21:15	15:00	52.3	56.0	38.6	67.2	
21:30	15:00	49.2	47.1	38.5	67.1	
21:45	15:00	48.9	48.2	36.6	66.7	
22:00	15:00	50.7	48.0	37.0	72.5	
22:15	15:00	48.2	50.7	40.3	66.2	
22:30	15:00	48.0	50.5	40.2	67.0	
22:45	15:00	50.8	50.0	39.5	80.4	
Average 1445-2300		56.1	59.4	44.5	66-91	
<b>Average 1815-2300</b>		<b>53.6</b>	<b>56</b>	<b>41.6</b>	<b>66-91</b>	<b>No Construction Noise</b>

## Noise Survey Results

Date: Wednesday 21st - Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 41**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	42.5	44.4	36.5	60.3	
23:15	15:00	43.2	43.9	35.3	63.4	
23:30	15:00	41.3	39.9	36.9	63.3	
23:45	15:00	38.8	40.2	37.2	50.5	
00:00	15:00	38.3	39.5	36.9	46.3	
00:15	15:00	40.3	41.6	38.1	53.7	
00:30	15:00	43.2	42.6	38.8	66.3	
00:45	15:00	44.2	43.2	39.5	65.3	
01:00	15:00	45.1	43.7	40.0	63.4	
01:15	15:00	43.5	45.5	40.0	61.2	
01:30	15:00	45.6	45.4	40.7	64.6	
01:45	15:00	44.4	46.5	41.3	60.4	
02:00	15:00	45.7	48.2	41.6	60.0	
02:15	15:00	43.5	45.4	41.0	55.4	
02:30	15:00	43.3	44.9	41.3	53.8	
02:45	15:00	45.0	46.7	41.8	61.7	
03:00	15:00	45.5	46.2	41.7	65.8	
03:15	15:00	45.3	47.4	41.8	63.0	
03:30	15:00	44.7	47.0	42.1	54.3	
03:45	15:00	45.3	46.8	42.0	61.2	
04:00	15:00	45.0	46.7	42.1	57.5	
04:15	15:00	46.9	47.6	42.6	64.8	
04:30	15:00	46.8	49.0	42.9	59.0	
04:45	15:00	47.0	49.1	42.5	65.2	
05:00	15:00	48.3	50.3	43.1	65.2	
05:15	15:00	53.0	57.3	44.2	67.5	
05:30	15:00	53.6	57.9	44.6	68.5	
05:45	15:00	53.7	58.3	45.0	66.5	
06:00	15:00	53.5	58.5	44.3	65.5	
06:15	15:00	54.6	58.6	45.7	69.7	
06:30	15:00	53.5	57.1	45.8	68.2	
06:45	15:00	55.3	58.7	46.6	70.4	
Average 2300-0700		48.8	52.3	42.2	46-70	
Average 1445-2300		56.1	59.4	44.5	66-91	



## Noise Survey Results

Date: Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 42**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	55.3	58.5	47.3	71.4	Construction Works Noise & Ambient
07:15	15:00	56.4	59.7	49.4	73.3	
07:30	15:00	58.7	62.4	51.5	71.1	
07:45	15:00	58.9	62.0	52.8	70.8	
08:00	15:00	57.6	61.0	50.3	71.8	
08:15	15:00	58.3	61.1	50.9	73.2	
08:30	15:00	59.0	62.3	48.9	80.0	
08:45	15:00	60.2	64.3	50.3	73.3	
09:00	15:00	57.3	61.2	48.3	69.6	
09:15	15:00	56.1	59.0	47.0	72.0	
09:30	15:00	63.4	61.5	47.2	90.9	
09:45	15:00	56.9	60.6	47.7	72.7	
10:00	15:00	55.1	59.1	45.2	71.2	
10:15	15:00	55.0	58.6	45.0	72.4	
10:30	15:00	57.6	60.0	47.6	76.6	
10:45	15:00	56.9	60.7	48.6	72.6	
11:00	15:00	56.7	60.9	47.9	69.4	
11:15	15:00	59.1	62.5	51.7	76.8	
11:30	15:00	61.1	64.3	55.0	75.0	
11:45	15:00	61.6	63.9	56.7	78.8	
12:00	15:00	60.7	63.8	55.3	76.7	
12:15	15:00	61.3	64.2	55.4	76.3	
12:30	15:00	62.0	64.8	56.4	75.2	
12:45	15:00	60.8	64.5	53.0	74.1	
13:00	15:00	59.0	62.8	49.3	77.1	
13:15	15:00	59.9	64.0	50.4	73.7	
13:30	15:00	58.1	62.0	48.8	72.0	
13:45	15:00	59.7	63.0	51.3	76.3	
14:00	15:00	58.2	61.2	50.0	74.1	
14:15	15:00	56.6	60.7	47.7	71.8	
14:30	15:00	57.3	60.8	48.7	74.1	
14:45	15:00	62.3	65.7	51.8	81.8	
Average 0700-1500		59.2	61.9	50.2	69-91	

## Noise Survey Results

Date: Thursday 22nd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

**TABLE 43**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	58.3	62.3	48.7	74.7	Construction Works Noise & Ambient
15:15	15:00	60.4	64.0	52.7	79.6	
15:30	15:00	60.3	64.5	49.6	72.2	
15:45	15:00	58.2	62.1	49.6	71.7	
16:00	15:00	60.5	64.1	51.8	71.6	
16:15	15:00	60.3	64.5	50.7	71.8	
16:30	15:00	59.4	63.9	47.3	72.0	
16:45	15:00	57.7	61.9	45.6	71.1	
17:00	15:00	60.3	63.8	46.5	78.8	
17:15	15:00	60.5	64.2	47.4	76.5	
17:30	15:00	57.3	61.7	46.2	71.7	
17:45	15:00	59.5	64.2	48.1	72.5	
18:00	15:00	63.1	66.2	55.9	77.6	
18:15	15:00	60.5	64.6	46.2	73.4	Baseline
18:30	15:00	58.4	63.4	42.0	71.6	
18:45	15:00	58.4	63.2	39.2	73.8	
19:00	15:00	57.8	62.9	38.7	72.4	
19:15	15:00	57.3	62.4	39.4	71.2	
19:30	15:00	55.6	60.5	38.3	70.4	
19:45	15:00	57.3	62.3	39.3	71.1	
20:00	15:00	59.1	59.8	36.8	89.3	
20:15	15:00	52.0	54.5	36.7	70.4	
20:30	15:00	54.5	59.3	38.2	70.3	
20:45	15:00	54.2	58.5	38.5	70.8	
21:00	15:00	52.9	54.9	38.7	71.6	
21:15	15:00	48.8	47.1	37.8	69.2	
21:30	15:00	52.8	54.5	37.5	72.0	
21:45	15:00	52.1	54.4	37.6	70.7	
22:00	15:00	48.6	48.9	37.0	69.9	
22:15	15:00	43.6	41.3	36.2	67.9	
22:30	15:00	49.3	40.8	36.0	73.6	
22:45	15:00	44.1	39.8	35.4	67.2	
Average 1500-2300		57.8	61.8	46.8	67-89	
<b>Average 1815-2300</b>		<b>55.5</b>	<b>59.6</b>	<b>39.3</b>	<b>67-89</b>	<b>No Construction Noise</b>

## Noise Survey Results

Date: Thursday 22nd - Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 44**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	46.1	40.3	34.7	67.4	
23:15	15:00	36.7	38.2	34.5	47.2	
23:30	15:00	35.5	36.7	33.9	44.1	
23:45	15:00	36.7	38.0	34.7	49.3	
00:00	15:00	36.4	37.9	34.4	46.2	
00:15	15:00	36.2	37.5	34.6	45.3	
00:30	15:00	34.8	35.7	33.6	41.5	
00:45	15:00	40.8	36.2	33.0	65.3	
01:00	15:00	41.6	35.5	32.3	66.7	
01:15	15:00	39.7	35.1	32.4	60.8	
01:30	15:00	33.2	34.5	32.0	41.6	
01:45	15:00	38.4	36.4	32.7	59.4	
02:00	15:00	32.2	33.5	30.9	39.1	
02:15	15:00	32.5	33.9	31.1	39.3	
02:30	15:00	32.6	34.1	31.0	42.3	
02:45	15:00	45.7	37.3	32.0	67.0	
03:00	15:00	40.8	35.4	31.0	62.6	
03:15	15:00	33.6	34.6	31.8	43.2	
03:30	15:00	40.9	38.6	33.0	62.4	
03:45	15:00	44.7	39.8	33.9	66.5	
04:00	15:00	46.9	45.4	33.9	65.2	
04:15	15:00	46.5	42.8	33.1	67.3	
04:30	15:00	42.2	35.2	32.3	65.3	
04:45	15:00	48.6	45.6	33.0	70.9	
05:00	15:00	46.3	45.9	33.8	62.8	
05:15	15:00	51.8	56.8	35.7	66.4	
05:30	15:00	54.1	59.2	39.8	67.7	
05:45	15:00	54.0	58.9	40.4	67.8	
06:00	15:00	54.5	59.9	39.6	67.7	
06:15	15:00	55.3	60.3	43.2	71.8	
06:30	15:00	55.4	59.7	42.7	70.9	
06:45	15:00	58.1	61.8	43.4	77.0	
Average 2300-0700		49.2	53.2	36.5	39-77	
Average 0700-2300		58.6	62.0	49.7	67-91	

## Noise Survey Results

Date: Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 45**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	56.8	60.5	44.3	74.5	Construction Works Noise & Ambient
07:15	15:00	57.0	60.7	49.4	69.9	
07:30	15:00	58.8	62.0	49.6	73.8	
07:45	15:00	59.0	62.4	49.9	72.9	
08:00	15:00	58.8	62.3	51.0	71.7	
08:15	15:00	59.6	63.3	50.5	75.8	
08:30	15:00	59.8	64.0	48.6	72.9	
08:45	15:00	61.3	65.4	52.4	74.2	
09:00	15:00	59.4	63.3	50.1	73.8	
09:15	15:00	58.5	61.9	50.8	72.9	
09:30	15:00	57.6	60.9	50.4	75.7	
09:45	15:00	58.5	61.9	47.9	77.2	
10:00	15:00	57.7	62.1	46.3	73.1	
10:15	15:00	56.6	59.9	42.8	80.2	
10:30	15:00	57.7	61.3	46.0	79.4	
10:45	15:00	58.9	61.2	47.0	80.8	
11:00	15:00	59.3	63.0	50.8	75.3	
11:15	15:00	58.0	61.5	49.6	80.5	
11:30	15:00	59.5	61.4	48.3	84.4	
11:45	15:00	58.0	61.6	50.6	69.9	
12:00	15:00	61.4	63.6	47.9	88.0	
12:15	15:00	59.3	62.2	49.3	83.9	
12:30	15:00	58.6	62.1	49.3	78.8	
12:45	15:00	58.6	62.2	48.4	75.0	
13:00	15:00	58.3	61.4	45.7	81.9	
13:15	15:00	58.4	62.0	46.3	76.7	
13:30	15:00	59.2	61.8	46.7	83.0	
13:45	15:00	57.8	60.7	48.9	81.3	
14:00	15:00	57.4	60.6	45.4	83.9	
14:15	15:00	56.6	61.1	44.7	70.1	
14:30	15:00	56.0	59.7	45.8	70.3	
14:45	15:00	57.2	61.1	47.1	79.4	
Average 0700-1500		58.6	62.0	48.7	70-88	

## Noise Survey Results

Date: Friday 23rd September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

**TABLE 46**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	58.2	62.3	48.2	71.8	Construction Works Noise & Ambient
15:15	15:00	57.8	61.1	47.5	84.0	
15:30	15:00	60.1	63.5	48.3	81.3	
15:45	15:00	59.5	62.8	47.4	80.3	
16:00	15:00	58.6	61.0	47.7	80.2	
16:15	15:00	56.9	61.2	46.0	73.6	
16:30	15:00	60.3	63.7	48.0	79.5	
16:45	15:00	58.5	62.6	46.4	75.9	
17:00	15:00	55.9	60.5	44.3	68.5	
17:15	15:00	56.5	60.9	45.6	70.4	
17:30	15:00	59.7	62.7	45.3	80.1	
17:45	15:00	59.3	63.2	45.8	80.2	
18:00	15:00	59.6	63.4	47.2	74.1	
18:15	15:00	55.7	60.5	44.6	68.7	Baseline
18:30	15:00	53.5	57.8	43.6	70.5	
18:45	15:00	55.2	59.8	44.2	68.7	
19:00	15:00	55.9	60.3	44.0	71.2	
19:15	15:00	56.0	56.6	43.2	76.4	
19:30	15:00	54.4	57.0	42.6	76.1	
19:45	15:00	52.6	55.6	41.6	69.5	
20:00	15:00	49.9	51.2	40.0	68.4	
20:15	15:00	50.1	50.8	40.0	67.3	
20:30	15:00	52.4	51.8	41.3	73.7	
20:45	15:00	48.8	48.1	39.1	68.1	
21:00	15:00	48.6	49.9	39.0	65.5	
21:15	15:00	49.4	45.0	36.5	74.6	
21:30	15:00	49.3	46.3	36.1	68.1	
21:45	15:00	45.6	41.7	35.3	65.3	
22:00	15:00	48.0	42.8	35.4	70.1	
22:15	15:00	46.1	43.8	35.4	65.4	
22:30	15:00	44.7	43.3	35.7	66.1	
22:45	15:00	47.9	41.8	34.9	68.9	
Average 1500-2300		56.0	59.4	44.3	65-84	
<b>Average 1815-2300</b>		<b>52.1</b>	<b>54.8</b>	<b>40.8</b>	<b>65-76</b>	<b>No Construction Noise</b>

## Noise Survey Results

Date: Friday 23rd - Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 47**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	43.5	40.8	35.1	67.5	
23:15	15:00	49.8	43.5	34.9	71.9	
23:30	15:00	44.8	42.3	34.9	62.8	
23:45	15:00	42.8	41.6	34.8	62.4	
00:00	15:00	48.8	47.2	36.1	71.4	
00:15	15:00	48.1	48.2	36.3	68.7	
00:30	15:00	44.0	47.3	37.4	59.3	
00:45	15:00	46.0	47.4	36.4	64.7	
01:00	15:00	44.7	45.5	36.2	64.8	
01:15	15:00	44.7	40.4	34.5	65.4	
01:30	15:00	39.1	39.3	34.2	59.9	
01:45	15:00	41.9	39.7	34.4	66.8	
02:00	15:00	43.2	39.1	33.8	65.4	
02:15	15:00	36.8	39.0	33.4	52.3	
02:30	15:00	34.6	35.8	32.7	49.8	
02:45	15:00	35.2	36.9	32.9	45.8	
03:00	15:00	34.4	35.8	32.7	42.4	
03:15	15:00	34.4	36.2	32.1	43.4	
03:30	15:00	40.4	37.2	32.3	63.5	
03:45	15:00	41.9	37.5	31.2	65.9	
04:00	15:00	43.7	40.5	34.2	65.2	
04:15	15:00	38.6	34.8	30.9	58.9	
04:30	15:00	40.6	35.3	30.4	62.3	
04:45	15:00	43.2	38.9	30.7	62.8	
05:00	15:00	45.2	42.0	33.3	63.0	
05:15	15:00	49.3	52.0	33.6	65.4	
05:30	15:00	52.6	57.6	38.7	64.9	
05:45	15:00	50.6	55.5	36.9	68.5	
06:00	15:00	52.2	56.8	38.0	66.6	
06:15	15:00	54.3	59.7	39.6	69.3	
06:30	15:00	53.7	58.5	38.3	69.1	
06:45	15:00	53.6	58.5	37.5	66.8	
Average 2300-0700		47.7	51.3	35.3	42-72	
Average 0700-2300		57.5	60.9	47.0	65-88	

## Noise Survey Results

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 48**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	48.2	50.9	37.8	61.9	Baseline
07:15	15:00	52.2	55.6	39.5	68.8	
07:30	15:00	52.5	55.9	40.6	67.1	
07:45	15:00	54.3	57.8	41.4	70.3	
08:00	15:00	56.2	60.2	48.7	72.7	Construction Works Noise & Ambient
08:15	15:00	57.3	61.2	48.2	71.2	
08:30	15:00	59.1	63.4	49.7	72.4	
08:45	15:00	57.6	61.6	49.3	72.2	
09:00	15:00	55.8	59.4	47.7	72.2	
09:15	15:00	57.8	62.1	48.9	72.3	
09:30	15:00	58.2	61.9	50.9	71.2	
09:45	15:00	57.3	60.4	51.7	71.4	
10:00	15:00	56.2	59.3	50.2	67.9	
10:15	15:00	54.8	58.0	48.2	67.8	
10:30	15:00	55.1	57.4	48.0	77.3	
10:45	15:00	56.5	59.5	47.9	74.0	
11:00	15:00	55.7	58.9	49.6	68.0	
11:15	15:00	53.8	57.1	47.7	67.2	
11:30	15:00	56.1	59.5	48.6	74.8	
11:45	15:00	54.7	58.5	46.4	66.7	
12:00	15:00	54.3	58.3	45.9	67.1	
12:15	15:00	55.8	59.7	44.9	72.4	
12:30	15:00	56.2	60.0	45.1	76.9	
12:45	15:00	55.1	59.5	45.7	69.8	
13:00	15:00	54.3	58.3	44.8	69.0	
13:15	15:00	54.9	58.8	43.4	70.5	Baseline
13:30	15:00	53.5	57.9	42.5	68.9	
13:45	15:00	54.2	58.8	44.1	67.0	
14:00	15:00	52.5	56.4	42.7	67.3	
14:15	15:00	53.1	56.9	44.0	68.1	
14:30	15:00	53.5	57.1	44.4	66.9	
14:45	15:00	54.6	58.0	43.3	70.0	
Average 0700-1500		55.4	58.7	46.0	62-77	
<b>Average 0700-1500</b>		<b>53.3</b>	<b>57.1</b>	<b>42.5</b>	<b>62-71</b>	<b>No Construction</b>

## Noise Survey Results

Date: Saturday 24th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

**TABLE 49**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	53.4	57.9	42.9	68.1	
15:15	15:00	55.5	59.3	42.9	69.4	
15:30	15:00	53.1	57.5	42.3	70.0	
15:45	15:00	55.6	57.8	40.6	79.2	
16:00	15:00	56.3	58.9	41.8	88.0	
16:15	15:00	52.5	56.7	41.0	67.7	
16:30	15:00	54.1	58.6	42.5	78.3	
16:45	15:00	53.7	58.3	40.3	67.9	
17:00	15:00	54.4	58.8	38.7	70.5	
17:15	15:00	57.7	58.7	39.2	82.0	
17:30	15:00	52.8	57.7	36.6	69.5	
17:45	15:00	51.8	55.5	36.2	74.6	
18:00	15:00	56.2	61.3	36.2	73.0	
18:15	15:00	61.6	60.0	36.2	86.7	
18:30	15:00	53.6	57.9	37.4	71.1	
18:45	15:00	53.6	58.2	38.6	69.9	
19:00	15:00	50.5	52.6	38.3	69.2	
19:15	15:00	51.3	53.1	39.2	71.2	
19:30	15:00	52.6	56.0	39.9	73.2	
19:45	15:00	46.5	44.0	38.6	66.2	
20:00	15:00	47.7	48.8	40.2	65.3	
20:15	15:00	52.0	49.9	39.3	70.8	
20:30	15:00	48.7	47.8	39.7	66.5	
20:45	15:00	48.9	48.9	38.7	67.8	
21:00	15:00	46.7	46.4	38.3	65.9	
21:15	15:00	47.0	47.1	39.5	63.7	
21:30	15:00	45.5	44.3	40.2	64.0	
21:45	15:00	48.1	49.0	39.3	67.5	
22:00	15:00	48.8	48.7	39.0	68.9	
22:15	15:00	49.0	49.3	39.0	66.4	
22:30	15:00	49.9	49.5	39.9	71.0	
22:45	15:00	59.1	55.7	39.3	84.4	
<b>Average 1500-2300</b>		<b>53.9</b>	<b>56.1</b>	<b>39.8</b>	<b>64-88</b>	



## Noise Survey Results

Date: Saturday 24th - Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 50**  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	44.7	44.7	39.2	64.3	
23:15	15:00	47.3	48.0	39.3	66.3	
23:30	15:00	45.7	43.5	39.2	66.5	
23:45	15:00	45.0	45.6	38.9	66.4	
00:00	15:00	45.4	43.3	37.4	66.9	
00:15	15:00	48.2	51.0	38.7	68.7	
00:30	15:00	46.0	47.4	39.9	68.6	
00:45	15:00	48.3	47.3	39.4	64.9	
01:00	15:00	43.4	41.7	39.1	67.3	
01:15	15:00	42.6	42.7	39.3	57.4	
01:30	15:00	42.2	41.1	38.2	64.8	
01:45	15:00	45.9	42.6	39.7	66.5	
02:00	15:00	47.1	43.4	40.2	70.4	
02:15	15:00	41.6	42.6	40.4	46.2	
02:30	15:00	41.8	41.5	38.3	64.0	
02:45	15:00	40.1	40.9	38.9	47.3	
03:00	15:00	39.9	41.2	38.1	45.6	
03:15	15:00	40.5	42.3	38.6	49.9	
03:30	15:00	40.9	42.3	38.9	45.9	
03:45	15:00	43.8	44.6	41.1	60.1	
04:00	15:00	49.2	45.1	39.1	69.3	
04:15	15:00	41.6	43.1	39.7	46.5	
04:30	15:00	46.5	43.9	40.6	69.2	
04:45	15:00	42.3	43.6	40.7	47.8	
05:00	15:00	45.8	44.3	40.8	61.0	
05:15	15:00	50.5	53.1	41.6	65.5	
05:30	15:00	52.1	57.4	42.8	64.5	
05:45	15:00	53.1	57.6	42.1	69.1	
06:00	15:00	52.4	56.8	41.9	66.4	
06:15	15:00	51.8	55.1	43.3	68.3	
06:30	15:00	54.8	59.9	43.9	74.0	
06:45	15:00	53.5	57.8	44.7	67.7	
Average 2300-0700		48.2	51.4	40.5	46-74	
Average 0700-2300		54.7	57.9	44.8	62-88	

## Noise Survey Results

Date: Sunday 25th September 2022

Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 51**

Client: Sesona Ltd

Project: Thornton Energy Recovery Centre (TERC)

Data: **Baseline Sound Survey: Position D - Butts Road**

Instrumentation: Cirrus 171A Real Time Analyser (G061253)

Calibration: 94dB

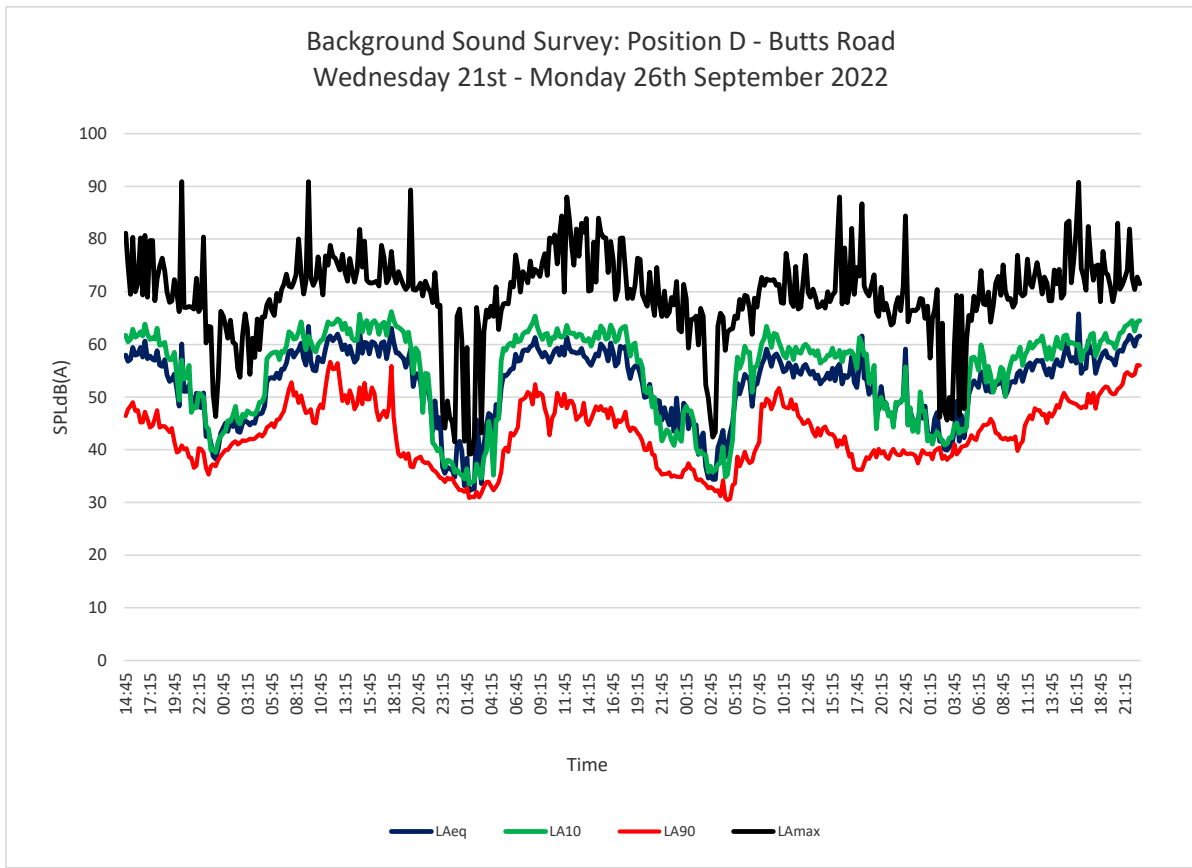
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
07:00	15:00	51.2	52.8	44.7	67.5	
07:15	15:00	52.2	55.8	44.9	69.9	
07:30	15:00	51.0	54.1	45.9	64.2	
07:45	15:00	51.1	50.9	45.1	67.3	
08:00	15:00	52.4	53.0	43.2	71.6	
08:15	15:00	52.5	53.2	43.0	72.9	
08:30	15:00	53.1	55.6	42.2	69.3	
08:45	15:00	52.2	55.2	42.0	75.1	
09:00	15:00	50.2	50.1	42.3	70.1	
09:15	15:00	51.3	54.2	41.9	68.5	
09:30	15:00	52.8	56.2	42.2	68.7	
09:45	15:00	53.0	57.7	42.0	67.1	
10:00	15:00	52.8	57.3	42.5	67.9	
10:15	15:00	54.5	58.0	39.8	76.9	
10:30	15:00	55.0	59.5	41.0	69.8	
10:45	15:00	53.0	56.0	41.6	69.2	
11:00	15:00	54.6	58.0	44.6	69.6	
11:15	15:00	56.0	58.8	45.6	76.2	
11:30	15:00	56.5	60.4	46.5	71.5	
11:45	15:00	55.1	59.3	45.8	70.8	
12:00	15:00	56.4	59.9	47.9	73.3	
12:15	15:00	57.0	60.6	47.5	75.5	
12:30	15:00	56.8	60.6	47.5	72.9	
12:45	15:00	57.0	61.6	46.6	69.6	
13:00	15:00	55.5	59.6	46.8	72.8	
13:15	15:00	54.2	57.2	45.1	71.6	
13:30	15:00	55.4	59.4	47.0	68.3	
13:45	15:00	53.8	57.2	46.3	68.3	
14:00	15:00	56.0	59.3	47.1	74.1	
14:15	15:00	57.1	61.4	48.5	71.5	
14:30	15:00	56.1	59.6	48.0	74.2	
14:45	15:00	55.9	59.2	49.5	68.8	
<b>Average 0700-1500</b>		<b>54.5</b>	<b>58.1</b>	<b>45.5</b>	<b>64-77</b>	

## Noise Survey Results

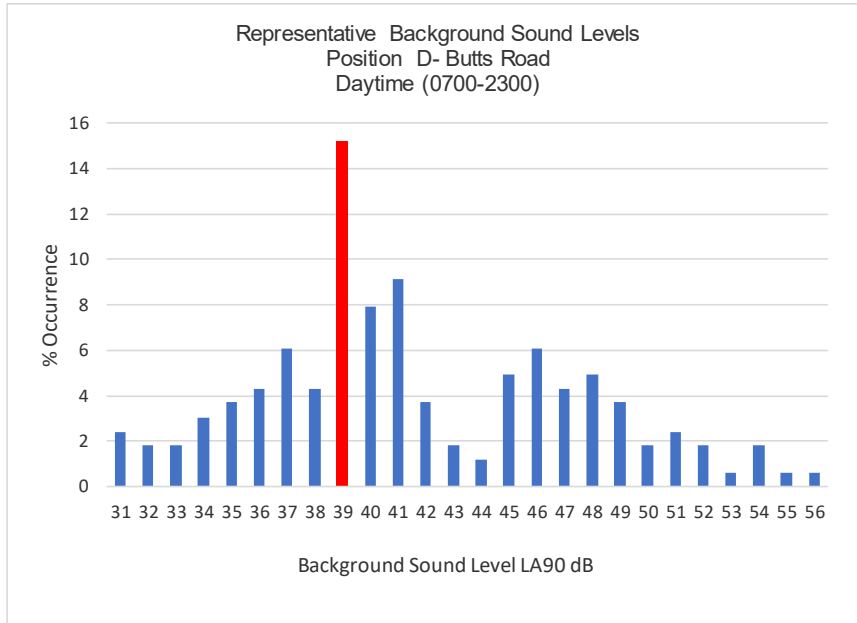
Date: Sunday 25th September 2022  
 Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire  
 Client: Sesona Ltd  
 Project: Thornton Energy Recovery Centre (TERC)  
 Data: **Baseline Sound Survey: Position D - Butts Road**  
 Instrumentation: Cirrus 171A Real Time Analyser (G061253)  
 Calibration: 94dB

TABLE 52

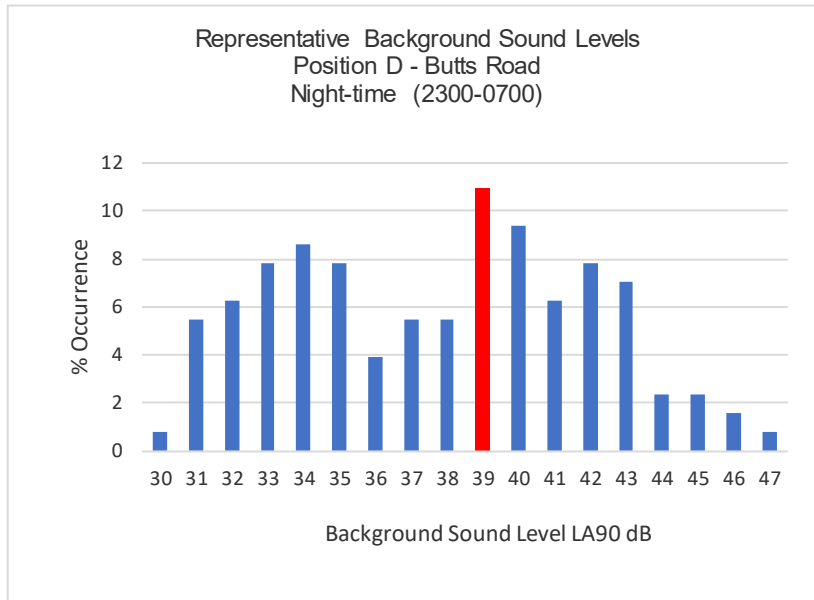
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	58.0	61.6	50.8	69.6	
15:15	15:00	60.2	61.8	49.9	83.0	
15:30	15:00	58.0	60.1	49.2	83.4	
15:45	15:00	56.8	60.4	49.0	71.7	
16:00	15:00	57.5	60.2	48.8	75.5	
16:15	15:00	56.4	59.8	48.7	81.5	
16:30	15:00	65.8	60.0	48.2	90.8	
16:45	15:00	54.5	56.9	47.9	74.4	
17:00	15:00	55.4	58.5	48.2	73.0	
17:15	15:00	55.5	59.1	48.0	70.3	
17:30	15:00	60.7	60.2	50.6	82.4	
17:45	15:00	58.4	61.9	48.9	75.9	
18:00	15:00	58.6	62.1	50.8	72.2	
18:15	15:00	54.5	57.8	47.8	74.9	
18:30	15:00	56.2	59.0	50.2	75.1	
18:45	15:00	57.3	60.6	50.8	68.1	
19:00	15:00	58.4	61.0	51.5	77.6	
19:15	15:00	58.8	62.1	52.0	73.6	
19:30	15:00	57.5	60.5	51.9	73.2	
19:45	15:00	57.4	60.4	50.9	71.0	
20:00	15:00	57.0	60.2	50.5	68.1	
20:15	15:00	56.1	59.2	50.6	70.2	
20:30	15:00	58.5	60.8	51.5	83.0	
20:45	15:00	58.9	62.2	51.8	70.5	
21:00	15:00	58.7	62.3	52.4	71.4	
21:15	15:00	60.2	63.4	54.4	72.8	
21:30	15:00	60.7	63.7	54.7	74.1	
21:45	15:00	61.7	64.0	54.3	81.9	
22:00	15:00	61.0	64.5	54.0	72.6	
22:15	15:00	59.7	62.5	54.3	70.4	
22:30	15:00	61.3	64.3	56.1	72.8	
22:45	15:00	61.6	64.5	56.0	71.5	
<b>Average 1500-2300</b>		<b>59.2</b>	<b>61.5</b>	<b>51.7</b>	<b>68-91</b>	
<b>Average 0700-2300</b>		<b>57.4</b>	<b>60.1</b>	<b>49.6</b>	<b>64-91</b>	
<b>Overall Average</b>		<b>48.5</b>	<b>52.1</b>	<b>39.5</b>	<b>39-77</b>	
<b>Overall Average</b>		<b>57.1</b>	<b>60.4</b>	<b>47.9</b>	<b>62-91</b>	
<b>Average 0700-2300</b>		<b>55.6</b>	<b>58.5</b>	<b>46.3</b>	<b>62-91</b>	<b>No Construction Noise</b>



LA90	% Occurrence
35	3.0
36	4.2
37	4.9
38	4.9
<b>39</b>	<b>12.8</b>
40	11.0
41	4.3
42	7.3
43	7.9
44	5.5
45	4.9
46	3.0
47	3.0
48	5.5
49	3.7
50	1.8
51	4.3
52	3.7
53	0.0
54	2.4
55	0.6
56	1.2



LA90	% Occurrence
30	0.8
31	5.5
32	6.3
33	7.8
34	8.6
35	7.8
36	3.9
37	5.5
38	5.5
<b>39</b>	<b>10.9</b>
40	9.4
41	6.3
42	7.8
43	7.0
44	2.3
45	2.3
46	1.6
47	0.8



## **APPENDIX 3**

### **SITE OPERATIONAL NOISE LEVELS & MITIGATION MEASURES**

### Assumed Noise Levels for Site Plant & Cladding Performance (including noise mitigation measures)

Plant Type or Area	Treatment (Cladding Performance Rw) dB	Sound Power (SWL) Sound Pressure Level (SPL) at roof/walls	Assumed % Operating Time	Period of Operation
RDF Reception	Cladding/concrete Rw 44 (walls & roof)	80-85 (SPL)	100	Daytime
Boiler Room	Cladding Rw 39 (walls & roof)	85 (SPL)	100	Daytime/Night-time
Fan Stack (top)	High Performance Silencer	84 (SWL)	100	Daytime/Night-time
Flue Gas Treatment	Cladding 39 (walls & roof)	85 (SPL)	100	Daytime/Night-time
Turbine Hall	Cladding 39 (walls & roof)	95 (SPL)	100	Daytime/Night-time
Transformer	Enclosed	84 (SWL)	100	Daytime/Night-time
Skylights	Double or Triple glazed to Rw 35dB	80-95	100	Daytime/Night-time
HGV	-	103 (SWL)	5 per hour (day) each way	Daytime
Ventilation louvres	Western/Northern/Southern Facades louvres limited to 64dB LAeq @ 1m Eastern façade louvres to 70dB LAeq @ 1m	As above relevant to room	100	Daytime/Night-time
RDF Reception Doors	Doors (auto action type) Rw 10dB	-	100	Daytime
Turbine Access Doors	Turbine Acoustic Door Rw 24dB	-	100	Daytime/Night-time
Workshop & Switchgear Access Doors	Insulated roller doors Rw 18dB	-	100	Daytime/Night-time
All other doors	Doors minimum Rw 12dB	-	100	Daytime/Night-time
Mobile Plant	Fitted with non-tonal reversing alarms	-	Variable	Daytime/Night-time
Air Cooled Condenser Fans	Design selection of fans	91 (SWL) 8 fans – max overall 100 (SWL)	100	Daytime/Night-time
Any external plant (e.g. air conditioning plant)	Designed not to exceed 65dB @ 3m LAeq Located at southern end of Turbine Hall	-	100	Daytime/Night-time
Noise Character (i.e. tonal, impulsivity and intermittency)	Design of plant to ensure no perceptible noise character at NSRs	-	100	Daytime/Night-time

## **APPENDIX 4**

### **NOISE MODEL SETTINGS & MAPPING RESULTS**



## INPUT DATA FOR ISO 9613 CALCS

### ***Noise Prediction Model***

There are a number of empirical or semi-empirical sound propagation models in common use. One of these is ISO9613-2 which is the International Standard used to predict noise propagation.

The noise levels produced by the TERC plant at each of the nearest sensitive receptors has been calculated using a computer model, which is based on ISO 9613, Acoustics – Attenuation of Sound During Propagation Outdoors [1996]. The propagation model described in Part 2 of the standard provides a method for predicting sound pressure levels.

The computer model utilises octave band frequency data of the noise source to assess and predict the noise contribution with the Site in full operation.

The ISO propagation model provides a method for calculating the sound pressure level at a specific position by taking the sound power level radiating from the building facades in frequency bands and subtracting a number of attenuation factors according to the following:

Predicted sound pressure level =

$$LW + D - A_{geo} - A_{gr} - A_{bar} - A_{misc}$$

The prediction modelling uses octave band frequency sound power level data calculated in different wall and roof areas of the TERC plant and corrects the level for the following additional propagation factors and attenuation:

#### **Octave band frequency spectra:**

Based on empirical noise measurements recorded at a similar site in the UK when under load conditions. The noise levels at specific face positions are provided below that have been used for the noise model.

#### **D – Directivity Factor**

**The Directivity Index will depend on the radiating surface and whether it is located in free space, at junction of two surfaces or more and the correction factor changes accordingly. Directivity factor is generally = 2.**

#### **A<sub>geo</sub> - Geometrical Divergence**

The geometrical divergence of sound waves accounts for the spherical spreading in the free field from a point source resulting in attenuation depending on distance, which relates to the following correction:

$$A_{geo} = 20 \times \log (d) + 11 \text{ [where } d = \text{distance from the noise source]}$$

**Receiver height assumed = Daytime = 1.5m, Night-time = 4.0m above ground level**

#### **A<sub>atm</sub> - Atmospheric Absorption**

When sound energy propagates through the atmosphere it is attenuated as a result of the conversion of the sound energy into heat. The attenuation is dependent upon the relative humidity and the temperature of the air through which the sound energy is travelling. The attenuation is also dependent upon the frequency content of the sound energy with higher levels of attenuation towards higher frequencies.

The attenuation therefore depends upon the distance from the sound source and according to ISO9613 is calculated according to the following formula:

$$A_{\text{atm}} = d \times a \quad [\text{Where } d = \text{distance from the source} \\ a = \text{atmospheric absorption coefficient in dB/m}]$$

From ISO9613 Part 1 [1996] I have used values of 'a' corresponding to a temperature of 10°C and a relative humidity of 70%. This will give an indication of the lowest likely atmospheric attenuation as examples worked at 20deg C and -5deg C indicate a reduction of around -0.5dB(A) on those values calculated. The values for each one-third octave band are given below in table 1.

**Table 1: Atmospheric absorption attenuation based on temperature of 10°C and a relative humidity of 70%**

<b>Third Octave Band Centre Frequency (Hz)</b>	<b>50</b>	<b>63</b>	<b>80</b>	<b>100</b>	<b>125</b>	<b>160</b>	<b>200</b>	<b>250</b>
<b>Atmospheric Absorption Coefficient (dB/km)</b>	0.0785	0.122	0.186	0.28	0.411	0.584	0.797	1.04
<b>Third Octave Band Centre Frequency (Hz)</b>	<b>315</b>	<b>400</b>	<b>500</b>	<b>630</b>	<b>800</b>	<b>1k</b>	<b>1.25k</b>	<b>1.6k</b>
<b>Atmospheric Absorption Coefficient (dB/km)</b>	1.31	1.6	1.93	2.33	2.87	3.66	4.86	6.73
<b>Third Octave Band Centre Frequency (Hz)</b>	<b>2k</b>	<b>2.5k</b>	<b>3.15k</b>	<b>4k</b>	<b>5k</b>	<b>6.3k</b>	<b>8k</b>	<b>10k</b>
<b>Atmospheric Absorption Coefficient (dB/km)</b>	9.66	14.3	21.5	32.8	50.2	76.9	117	175

### **A<sub>gr</sub> – Ground Effect**

#### **Ground Effect for Calcs**

G = 0.5 (mixed ground absorption)

The ground effect is a result of the interference of sound reflected by the ground which interferes with the direct sound propagating from the noise source to the receiver. The prediction of the ground effects is relatively complex and is dependent upon a number of factors including ground conditions, source height, receiver height and the propagation height between the source and receiver. The ground conditions are described according to a variable 'G' which varies between 0 for 'hard' ground and 1 for 'soft' ground. Hard ground refers to paving, concrete and any sites with low porosity. Soft ground refers to grassland, trees or other vegetation. I have assumed a ground factor of G = 0.5 to represent a mixed ground absorption to NSR as intervening ground is generally formed mainly by a mixture of vacant undeveloped land and local business premises and is therefore appropriate. I have taken the source height as being the height of the relevant section of building and a receiver height of 1.5m for daytime and 4m for night-time operations.

### **A<sub>bar</sub> – Barrier Attenuation**

When there is a solid barrier between any noise source and the receiver position the noise level will be reduced. The level of attenuation resulting will depend upon the barrier position, barrier size, receiver position and frequency content relative to the noise source. For the purpose of these calculations, we have included local screening from existing industrial buildings adjacent to the Site as these provide some minor attenuation, which needs to be taken into account.

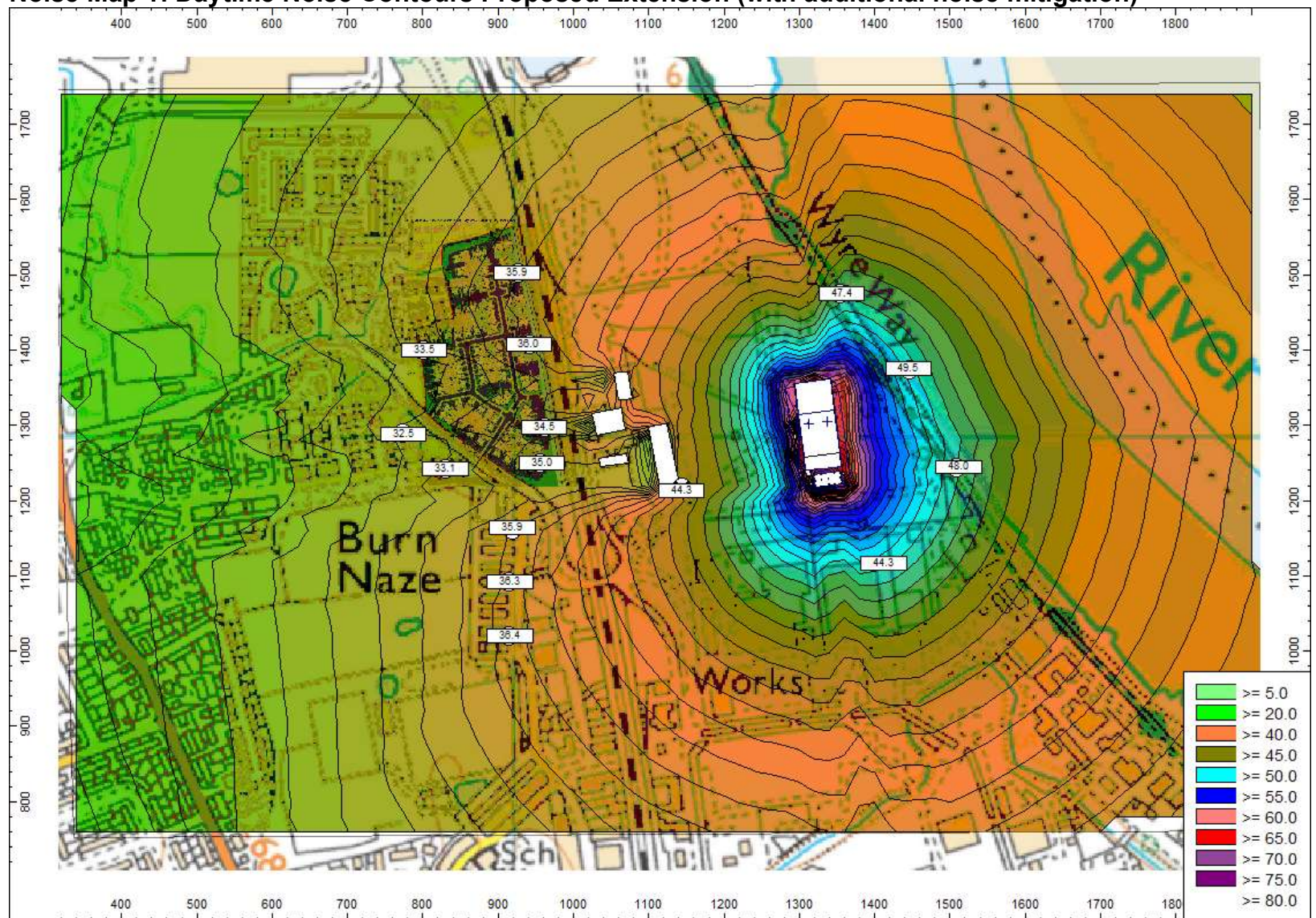
### **A<sub>misc</sub> – Miscellaneous Other Effects**

This additional attenuation effect described in ISO9613 allows for the effects of propagation through foliage. I have not taken account of any such effects and in my expert opinion they are unlikely to significantly reduce noise levels below those predicted.

### **Mobile Plant Noise Sources**

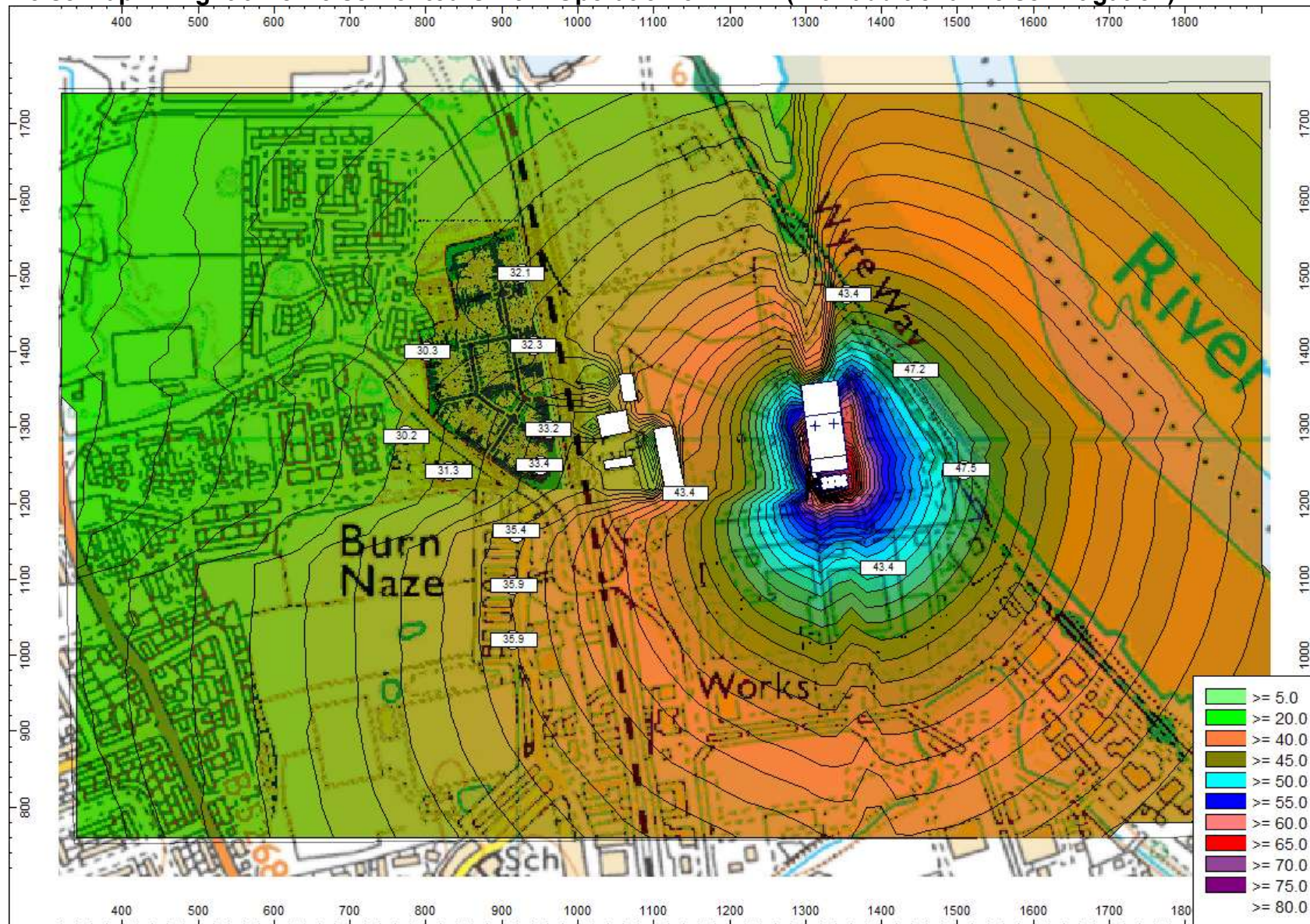
The noise model allows for HGV movement around the Site (based on a line source). These are accounted for during the daytime operating period based on 5 HGV movements in and out per hour for Proposed TERC facility.

### Noise Map 1: Daytime Noise Contours Proposed Extension (with additional noise mitigation)





### Noise Map 2: Night-time Noise Contours from Operation of TERC (with additional noise mitigation)



## **APPENDIX 5**

### **CONSULTANT'S EXPERIENCE & QUALIFICATIONS**

## **Principal Consultant: Dean Robert Kettlewell - MSc MIOA MAE I.Eng (Director & Principal Acoustic Consultant)**

### **Précis**

As Director and Principle Acoustic Consultant with Noise & Vibration Consultants Ltd, Dean has over 35 years background experience in a wide range of issues relating to environmental, industrial and commercial noise and vibration assessment. He currently manages corporate and unit specific contracts for:

- Environmental Noise Impact Assessments
- Industrial Noise Assessment and Control
- Planning Issues for Residential and Commercial Development
- Noise at Work Regulations Assessments
- Building Acoustics and Sound Insulation Tests
- Expert Witness representation for Planning Appeals
- Integrated Pollution Prevention and Control (IPPC) Applications
- Wind Farm Noise Impact Assessments
- Entertainment Noise Assessment and Control
- Architectural Acoustics
- Specialist knowledge in the Design of Noise Control Systems
- Ground borne vibration measurement and assessment
- Assessment of Environmental & Industrial Noise Nuisance
- Project Management of Noise Control Systems

### **Relevant Work Experience**

<b>Director &amp; Principal Consultant</b> - Noise & Vibration Consultants Ltd	2001- to date
<b>Senior Acoustic Consultant</b> - Vibrock Limited	1998 - 2001
<b>Associate &amp; Principal Acoustic Consultant</b> - John Savidge & Associates	1994 - 1998
<b>Technical Manager</b> – LBJ Limited (Noise Control Division)	1990 - 1994
<b>Technical Engineer/ Technical Manager (1988)</b> - Vibac (Noise Control) Ltd	1982 - 1990

### **Qualifications and Education**

M.Sc. Applied Acoustics (Derby University – Distinction)  
HNC Electrical & Electronic Engineering  
IOA Diploma in Acoustics & Noise Control  
IOA Certificate in Law and Administration  
Certificate of Competence in Workplace Noise Assessment  
Certificate of Competence in Ground Vibration Monitoring

**Affiliations:**  
Member of Institute of Acoustics (MIOA)  
Member of Academy of Experts (MAE)  
Member of Association of Noise Consultants (ANC)  
Incorporated Engineer (I.Eng)

