

## ENVIRONMENT

SMAA Developments Limited  
Throckmorton Wider Site  
Throckmorton  
Noise Summary Note

June 2020

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## 1. INTRODUCTION

- 1.1 The report aims to provide a review of the noise constraints for a proposed mixed-use development in Throckmorton, to inform the preparation of the masterplan for the scheme, and the overall site suitability for the proposed uses from a noise perspective.
- 1.2 The following is based on a walkover of the site, undertaken in January 2020, which included short-term noise monitoring of the surrounding roads.
- 1.3 A list of key recommendations is presented at the end of **Section 4**.

### Aims

- 1.4 This note provides the results of the constraints review and recommendations for further survey and assessment work required to support any future planning application. In addition, the note aims to provide an indication of potential mitigation that may be required.

### Methodology

- 1.5 This note is based on the following, which have been undertaken to identify constraints from a noise perspective;
  - A review of available OS Mapping and aerial imagery;
  - Defra Noise Mapping, where the required data is available;
  - A site walkover to identify noise sources, undertaken in January 2020; and
  - Short-term baseline noise monitoring of the roads within the vicinity of the site.
- 1.6 No consultation has been undertaken with Wychavon District Council, and the following is intended to support the ongoing development of the masterplan. However, consideration has been made to the local planning policy.

### Planning Policies

- 1.7 Notwithstanding the above, it should be noted that The South Worcestershire Development Plan<sup>1</sup> is a joint plan that provides the context and planning policies for the housing and environment in all three South Worcestershire councils (Malvern Hills, Worcester and Wychavon).
- 1.8 Planning decisions by these Local Planning Authorities and the Government's Planning Inspectorate must be taken in accordance with the Development Plan unless material considerations indicate otherwise.
- 1.9 With regards to noise, Policy SWDP 13: 'Effective Use of Land', within the 'Housing' section of the document stipulates that '*Higher densities area can lead to land uses and their*

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<sup>1</sup> The Adopted South Worcestershire Development Plan (SWDP), Published 2016

*occupiers being in closer proximity, which could generate adverse impacts such as noise' (amongst others).*

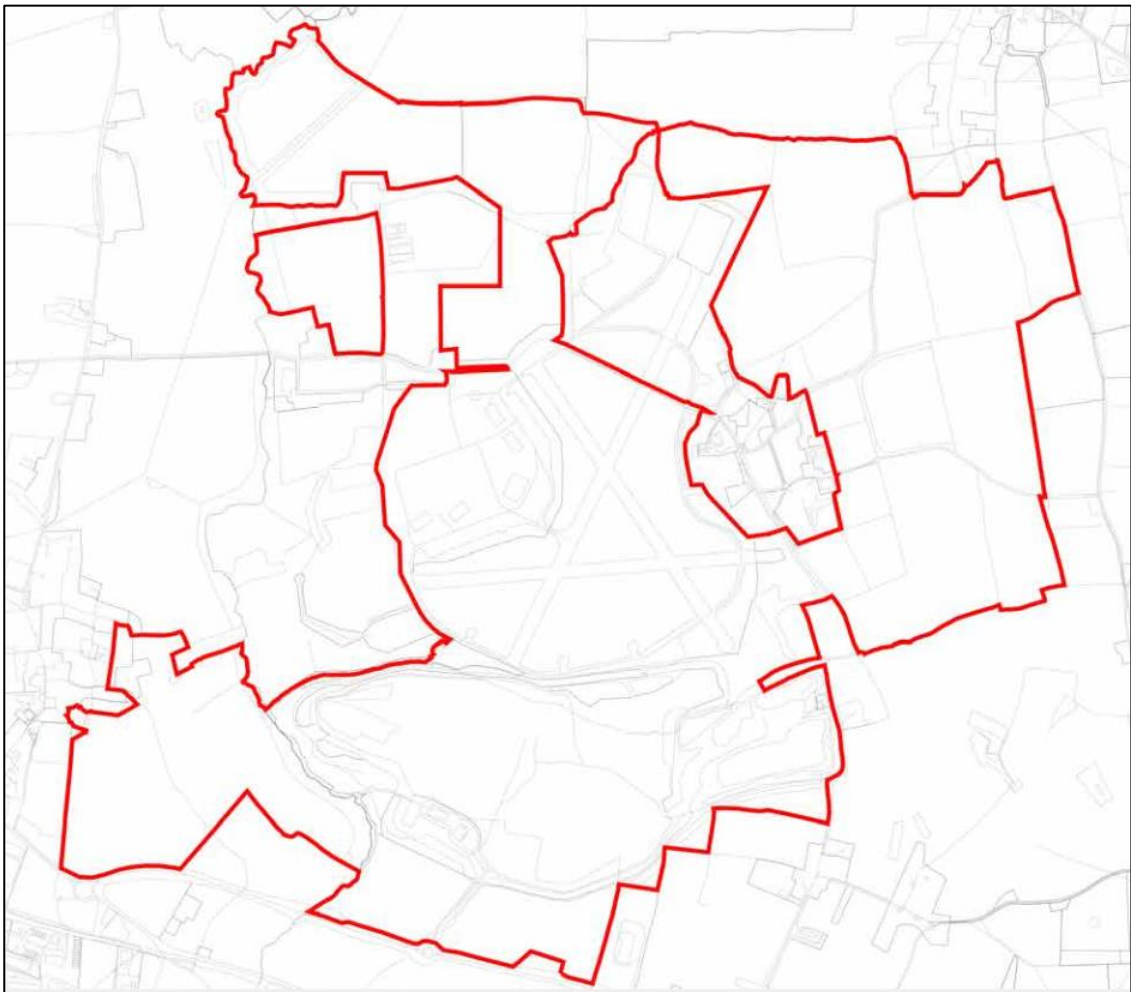
- 1.10 In addition, Policy SWDP 31: '*Pollution and Land Instability*' within the same document Development proposals must be designed in order to avoid any significant adverse impacts from pollution, including cumulative ones, in the form of chemical, dust, light, noise, fumes, smell, vibration, all of which can have detrimental impacts on the environment and the quality of life.

### **Standard Guidance**

- 1.11 The following constraints advice has been undertaken in accordance with the following guidance's;
- National Planning Policy Framework (NPPF);
  - Noise Policy Statement for England (NPSE);
  - Planning Practice Guidance (PPG);
  - WHO 1999 Guidelines for Community Noise;
  - BS8233:2014 Guidance of Sound Insulation and Noise Reduction for Buildings; and,
  - BS4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound.

## 2. SITE DESCRIPTION

- 2.1 The proposed site is located around Throckmorton Airfield, and comprises a number of parcels of land. The wider site currently comprises a mixture of open land, existing commercial/industrial uses and existing residential dwellings. The redline boundary is shown below in **Figure 1.1**.



**Figure 1.1 – Red Line Boundary**

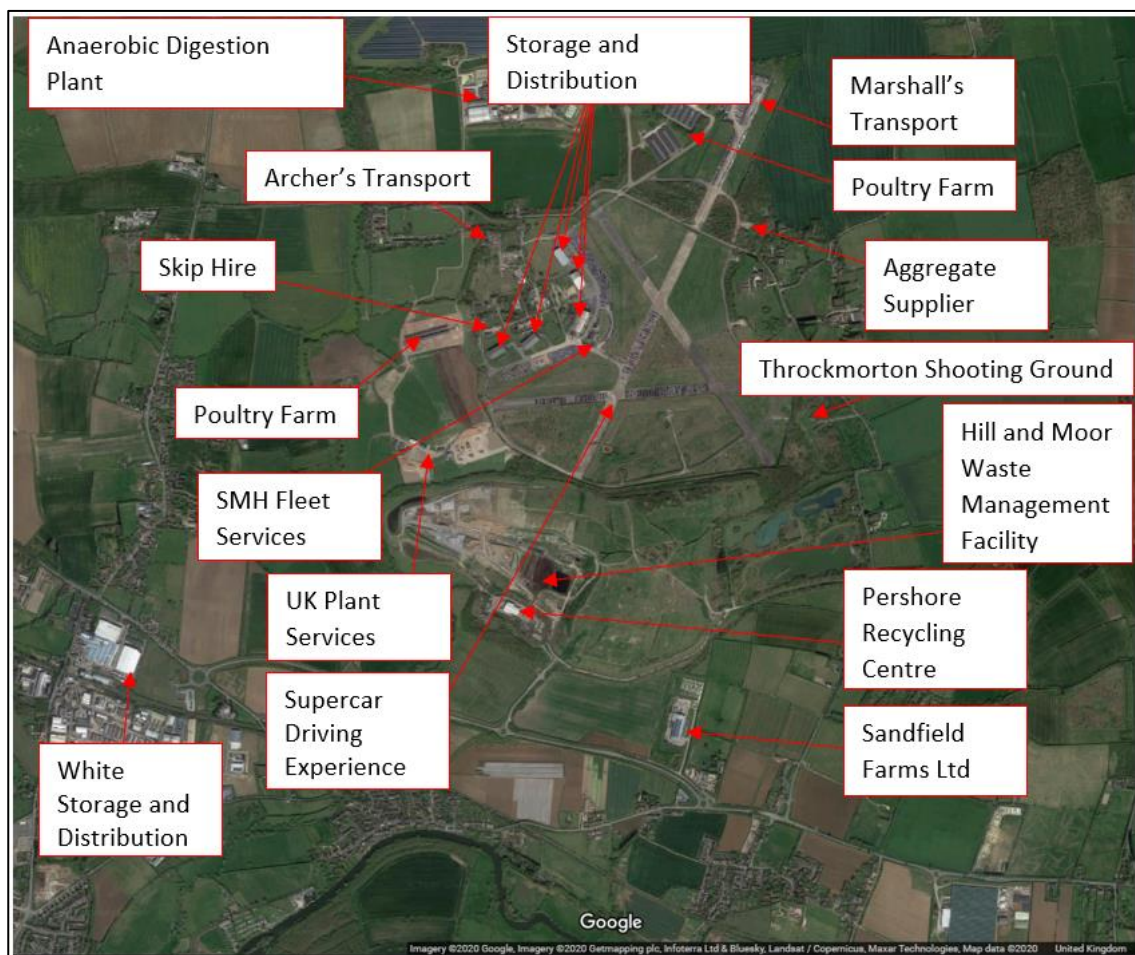
- 2.2 To the north of the airfield lies Long Lane with an existing poultry farm, transport business, and industrial uses beyond. To the east of the airfield, there is Throckmorton Road, an aggregate supplier and Throckmorton shooting ground. To the south of the airfield, there is Pershore Recycling Centre, Sandfield Farms with the A44 beyond. To the south west of the airfield, lies SMH Fleet Services, UK Plant Services and the premises of a supercar driving experience. To the west of the airfield, there is an existing poultry farm. There are also a number of existing commercial/industrial uses associated with the existing airfield.
- 2.3 There are a number of existing residential receptors including isolated dwellings and small clusters of houses surrounding the site.

### 3. PRIMARY CONSTRAINTS

- 3.1 A site walkover has been undertaken to identify the noise sources surrounding the site. In addition, a short-term baseline noise survey has been undertaken to measure noise from road traffic, to allow road traffic noise to be predicted across the site.
- 3.2 It is unclear at this stage which sources will remain and which will be removed as part of the proposals. Therefore, for the purpose of this constraints assessment, it has been assumed that all identified sources could remain in the future.

#### Identified Noise Sources and Observations

- 3.3 **Figure 3.1** below details the industrial/commercial noise sources in the vicinity of the proposed development identified during the baseline noise survey.



**Figure 3.1 – Industrial/Commercial Noise Sources in the Vicinity of the Site**

#### Northern Area of the Site

- 3.4 Noise levels in the northern part of the site, adjacent to the northern boundary of Throckmorton Industrial Park, were noted to be quieter than the southern and central parts of the site. Occasional gunshots associated with the shooting ground were perceived to be audible, together with occasional banging. There was underlying fixed

plant noise, which it is assumed was associated with the industrial park or the operations at the waste management facility.

- 3.5 HGV movements were noted along Long Lane from the identified haulage and transportation premises.
- 3.6 During a site walkover in the area of the Poultry Farm, a delivery of animal feed was being undertaken in the vicinity of the sheds. This was a noisy process which was clearly audible against the residual environment.
- 3.7 Onsite observations indicate that there are forklift trucks operating within the premises of Marshall's Transport. These generally have associated alarms, such as reversing beepers, which can be tonal in nature and out of character with the existing noise climate. Furthermore, there will be vehicle movements associated with the premises, although these were not observed during the site walkover. Some form of mitigation is likely to be required to protect the future amenity of any proposed residential receptors in the vicinity of the premises.
- 3.8 Observations undertaken in the vicinity of the anaerobic digestion plant, indicates that it does not generate any significant noise. However, during the site walkover, HGV movements on Long Lane were significant, and therefore this masked any HGV/plant movements at the digestion plant site itself. Therefore, some form of mitigation is likely to be required to protect the future amenity of any proposed residential receptors in the vicinity of the site.
- 3.9 Supercar Driving Experience, which is in the northernmost part of the site also has the potential to cause a significant noise impact, depending on the location of the nearest proposed residential dwellings.

#### Central Area of the Site

- 3.10 In the centre of the site towards the Waste Management Facility, the noise environment was dominated by the movement of waste and use of heavy machinery at the Hill and Moor Waste Management Facility. Some of the operations/machinery which were noted to generate high noise levels are labelled on **Figure 1-2**. Occasional bangs could also be heard which subjectively sounded like gunshots, which were presumed to be coming from Throckmorton Shooting Ground, which practices Clay Pigeon Shooting.



**Figure 3-2: Operations at Hill and Moor Waste Management Facility**

Southern Area of the Site

- 3.11 In the southern portion of the site, onsite observations indicate that the noise environment is dominated by road traffic noise from the A44, which was consistently busy throughout the survey period.
- 3.12 Noise levels generated by the Waste Management Facility were noted to vary considerably based on the operations being undertaken and the location of the equipment in relation to the large bunds on the site. The waste management facility is operated between;
- 08:00 and 18:00 Monday to Friday; and
  - 09:00 and 13:30 on Sunday.
- 3.13 It is understood that operations take place in the western area of the landfill site.

Existing Airfield (Unused)

- 3.14 It was not possible to access the existing airfield to undertake any observations. Therefore, the following is based on a review of aerial photography and available information. Some of the sources associated with the industrial park are 24-hour and

therefore a night-time noise survey should be undertaken as part of the noise impact assessment.

- 3.15 There are a number of existing commercial uses on the existing airfield. These will need to be considered individually within the noise assessment. A review of available mapping indicates that the majority of this is related to vehicle storage, therefore it has been assumed that the dominant sources of noise are likely to be from vehicle movements. Consideration should be given to localised barriers and/or standoffs between the source and any noise sensitive uses.
- 3.16 There is a plant hire company to the west of the existing airfield. Review of available aerial mapping indicates that there may be a demonstration area associated with the premises, which could generate noise. Therefore, any masterplan should consider localised acoustic barriers and/or standoffs between the source and any noise sensitive uses.
- 3.17 There are a number of smaller commercial farms within the redline boundary. Although noise from farms is generally not considered to be significant, where commercial operations, such as milking, processing, refrigeration etc are present, this will need to be considered. The masterplan should make provision for localised acoustic barriers, where commercial operations are present.
- 3.18 Given the number of potentially significant industrial/commercial noise sources identified and the uncertainty regarding the location of any proposed noise sensitive receptors, it is not possible to survey at worst-case locations with regards to industrial/commercial noise at this stage. However, measurements of the road traffic noise from the road network surrounding the site were undertaken, as detailed in the following section.

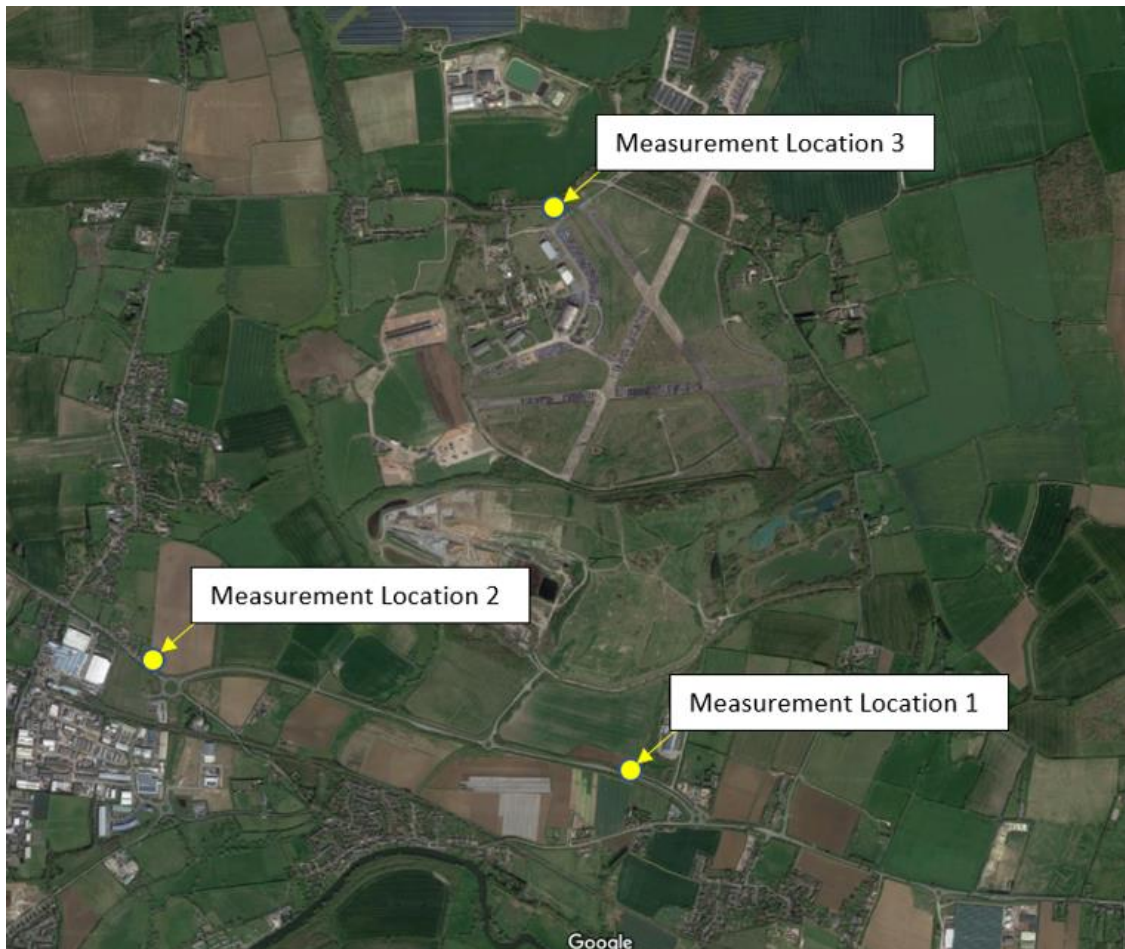
#### Surrounding area

- 3.19 There are a number of small businesses surrounding the site, particularly farm buildings which have associated outbuildings, digestors and/or grain dryers. It is considered that localised mitigation, such as acoustic barriers, may be required to reduce noise levels to within acceptable levels. For existing businesses south of the A44, it is considered that noise from the road will dominate the noise levels during the daytime. Consideration will need to be given to any existing noise sources during the night-time. However, it is considered likely that noise from road traffic on the A44 will determine the extent of any mitigation in this area.

#### **Baseline Noise Survey**

- 3.20 The measurement locations adopted during the survey are labelled in **Figure 3.3** below. Details of monitoring undertaken at each location are provided below and overleaf.





#### Measurement Location 1

- 3.21 Measurement Location 1 was adjacent to the southern site boundary and was adopted to determine noise levels from the A44 to the south of the site.
- 3.22 Monitoring at Measurement Location 1 was undertaken between 13:15 and 16:15 on 29th January 2020, to allow road traffic noise levels to be determined in accordance with the shortened measurement procedure from CRTN. The microphone was in free-field conditions at a height of circa. 3 m above local ground level, to raise the microphone to approximately 1.5 m above the level of the A44, which was raised above the surrounding ground. The horizontal distance from the microphone to the kerb edge was approximately 11 m.
- 3.23 The measurement location had a clear line of site to the A44 and the noise environment at Measurement Location 1 was dominated by road traffic noise from the A44.

#### Measurement Location 2

- 3.24 Measurement Location 2 was adjacent to the southern site boundary and was adopted to determine noise levels from the A44 to the south of the site.

- 3.25 Monitoring at Measurement Location 2 was undertaken between 13:12 and 16:12 on 31st January 2020, to allow road traffic noise levels to be determined in accordance with the shortened measurement procedure from CRTN. The microphone was in free-field conditions at a height of circa. 1.5 m above local ground level. The horizontal distance from the microphone to the kerb edge was approximately 7 m.
- 3.26 The measurement position had a clear line of site to the A44 and the noise environment at Measurement Location 2 was dominated by road traffic noise from the A44.

### Measurement Location 3

- 3.27 Measurement Location 3 was adjacent to Long Lane on the northern boundary of Throckmorton Industrial Park and was adopted to determine noise levels from Long Lane.
- 3.28 Monitoring at Measurement Location 3 was undertaken between 14:00 and † 17:00 on 29th January 2020, to allow road traffic noise levels to be determined in accordance with the shortened measurement procedure from CRTN. The microphone was in free-field conditions at a height of circa. 1.5 m above local ground level. The horizontal distance from the microphone to the kerb edge was approximately 5 m.
- 3.29 The measurement position had a clear line of site to Long Lane and the dominant noise source at Measurement Location 3 was the occasional passage of vehicles along Long Lane, with low level industrial/commercial noise and natural sounds dominant between passbys.

### **Measurement Equipment**

- 3.30 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3.1**. Equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meters, pre-amplifiers and microphones were calibrated to traceable standards within the 24 months prior to the measurements. The portable calibrators were calibrated within the 12 months preceding the date of the survey.

**Table 3.1: Noise Measurement Equipment**

Position	Item	Make and Model	Serial Number	Calibration Due Date
1 and 2	Sound Level Meter	Svantek 971	80342	March 2020
	Pre-Amplifier	Svantek SV18	59531	
	Microphone	ACO Pacific 7052E	71576	
3	Sound Level Meter	Svantek 971	60745	January 2021
	Pre-Amplifier	Svantek SV18	64535	

Position	Item	Make and Model	Serial Number	Calibration Due Date
	Microphone	ACO Pacific 7052E	66815	
1-3	Calibrator	Svantek SV33A	90275	April 2020

### Meteorological Conditions

- 3.31 Weather conditions during the survey were conducive for environmental noise monitoring; it being dry with low wind speeds.

### Measurement Results

- 3.32 A summary of measured noise levels at Measurement Locations 1 to 3 are presented in **Tables 3.2 to 3.7**. Full results are provided in **Appendix A**.

**Table 3.2 – Summary of measured sound pressure levels at Measurement Location 1**

Start Date and Time	Sound Pressure Level		
	dB LAeq,1h	dB LA90,1h	dB LA10,1h
29/01/2020 13:15	67	56	69
29/01/2020 14:15	67	59	69
29/01/2020 15:15	67	58	69
13:15	-	-	69 LA10,3h <sup>1</sup>
06:00 – 00:00	-	-	68 LA10,18h <sup>2</sup>
07:00 – 23:00	66 LAeq,16h <sup>3</sup>	-	-
23:00 – 07:00	57 LAeq,8h <sup>4</sup>	-	-

<sup>1</sup> Arithmetic average of three consecutive LA10,1hr measurements in accordance with CRTN.  
<sup>2</sup> LA10,3hr – 1 dB based on guidance from CRTN.  
<sup>3</sup> LA10,18hr – 2 dB based on guidance from BS 8233.  
<sup>4</sup> 0.9 x LA10,18hr – 3.77 dB based on TRL guidance.

**Table 3.3 – Summary of measured octave band sound pressure levels at Measurement Location 1**

Period	Octave Band Sound Pressure Levels (Leq dB)								dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
13:15 – 16:15	68	66	65	63	65	59	50	45	67

**Table 3.4 – Summary of measured sound pressure levels at Measurement Location 2**

Start Date and Time	dB		
	LAeq,1h	LA90,1h	LA10,1h
31/01/2020 13:12	68	51	71
31/01/2020 14:12	68	52	71
31/01/2020 15:12	68	52	72
13:12	-	-	71 LA10,3h <sup>1</sup>
06:00 – 00:00	-	-	70 LA10,18h <sup>2</sup>
07:00 – 23:00	68 LAeq,16h <sup>3</sup>	-	-
23:00 – 07:00	59 LAeq,8h <sup>4</sup>	-	-

<sup>1</sup> Arithmetic average of three consecutive LA10,1hr measurements in accordance with CRTN.  
<sup>2</sup> LA10,3hr – 1 dB based on guidance from CRTN.  
<sup>3</sup> LA10,18hr – 2 dB based on guidance from BS 8233.  
<sup>4</sup> 0.9 x LA10,18hr – 3.77 dB based on TRL guidance.

**Table 3.5 – Summary of measured octave band sound pressure levels at Measurement Location 2**

Period	Octave Band Sound Pressure Levels (Leq dB)								dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
13:12 – 16:12	70	63	61	62	65	61	52	46	68

**Table 3.6 – Summary of measured sound pressure levels at Measurement Location 3**

Start Date and Time	dB		
	LAeq,1h	LA90,1h	LA10,1h
29/01/2020 14:00	59	39	62
29/01/2020 15:00	60	40	63
29/01/2020 16:00	61	41	65
14:00	-	-	63 LA10,3h <sup>1</sup>
06:00 – 00:00	-	-	62 LA10,18h <sup>2</sup>
07:00 – 23:00	60 LAeq,16h <sup>3</sup>	-	-
23:00 – 07:00	52 LAeq,8h <sup>4</sup>	-	-

<sup>1</sup> Arithmetic average of three consecutive LA10,1hr measurements in accordance with CRTN.  
<sup>2</sup> LA10,3hr – 1 dB based on guidance from CRTN.  
<sup>3</sup> LA10,18hr – 2 dB based on guidance from BS 8233.  
<sup>4</sup> 0.9 x LA10,18hr – 3.77 dB based on TRL guidance.

**Table 3.7 – Summary of measured octave band sound pressure levels at Measurement Location 3**

Period	Octave Band Sound Pressure Levels ( $L_{eq}$ dB)								dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
14:00 – 17:00	64	60	58	54	57	53	45	41	60

### Masterplan Review

- 3.33 The draft masterplan prepared by Zebra Architects has been reviewed. The draft masterplan indicates that there will be a number of sensitive uses proposed for the central airfield area including residential, retail, community facilities, education and office uses. Proposed uses for the wider site include residential, light industrial, office and commercial uses.

#### Throckmorton Airfield

- 3.34 Residential areas are proposed in the southern part of the airfield. Due to the proximity of the landfill to the south of these areas, it would be beneficial to consider placing employment uses adjacent to the landfill with residential areas behind. Consideration would need to be given to the types of employment uses, as any noise generating sources would need to be considered at proposed noise sensitive receptors. However, it is considered that with careful consideration to the end uses and the layout of the site, adverse impacts are unlikely to occur.

#### A44 Corridor

- 3.35 The draft masterplan indicates that employment uses will be located near to the A44 corridor. A glazing and ventilation may be required to ensure that recommended internal noise levels are achieved at proposed office receptors, and any noise generating uses will need to be considered at nearby receptors, located to the west.

#### Throckmorton East

- 3.36 As previously stated, it is difficult to determine which noise sources are remaining as part of the proposals, however the majority of this area appears to be located away from any significant sources. Consideration will need to be given to noise from Marshall's Transport and the shooting ground (if applicable), and localised mitigation measures such as standoffs may be required. Consideration should also be given to the orientation of any of the surrounding proposed employment uses.

#### Tilsford

- 3.37 The draft masterplan indicates that the proposed employment is located away from any nearby existing receptors, with the exception of the western plot. Therefore, mitigation may be required to reduce any noise at the receptor. As this area is located away from any road traffic sources, the ambient noise levels are likely to be low,

particularly at night. Furthermore, the proposals will introduce residential receptors close to some of the proposed employment plots. Careful consideration will need to be given to the final layout of both the residential and employment elements, and where possible, separation distances should be introduced.

## Preliminary Assessment of Road Traffic

### Office Receptors

3.38 **Table 4.1** shows the predicted noise levels at example office receptors on the Site, assuming a 10m standoff from the A44 and Long Lane.

**Table 4.1: Summary of assessment for example office receptors on the A44 and Long Lane,  $L_{Aeq,T}$  dB**

Example dwelling location	Time period	Parameter	Scenario	External levels	Criteria	Reduction needed to meet criterion
A44 (ML1 and ML2)	Daytime 16-hour (07:00 – 23:00)	$L_{Aeq,16h}$	Internal Offices	67 <sup>1</sup>	40	27
Long Lane (ML3)				58 <sup>1</sup>	40	18

<sup>1</sup> Calculated using the methodology found within CRTN.

3.39 **Table 4.1** shows that, during the daytime for future office receptors adjacent to the A44, the building façade overlooking the road would need to provide up to 27dB of attenuation to external noise levels. For future office receptors adjacent to Long Lane, the building façade overlooking the road would need to provide up to 18dB of attenuation.

3.40 A partially opened window typically provides approximately 15 dB of attenuation from external free-field levels to internal levels, therefore it is considered that offices at these locations would need windows to be closed and an alternative source of ventilation to be provided.

### Residential Receptors

3.41 **Table 4.2** shows the predicted noise levels at example dwellings on the Site, assuming a 10m standoff from Long Lane.

**Table 4.2: Summary of assessment for example dwellings on Long Lane,  $L_{Aeq,T}$  dB**

Example dwelling location	Time period	Parameter	Scenario	External levels	Criteria	Reduction needed to meet criterion
Long Lane (ML3)	Daytime 16-hour (07:00 – 23:00)	$L_{Aeq,16h}$	Internal habitable rooms	58 <sup>1</sup>	35	23
			Gardens	58 <sup>1</sup>	50-55	3 - 8
	Night-time 8-hour (23:00 – 07:00)	$L_{Aeq,8h}$	Bedrooms	50 <sup>1</sup>	30	20
				$L_{AF,max}$	79 <sup>2</sup>	45

<sup>1</sup> Calculated using the methodology found within CRTN.  
<sup>2</sup> Highest measured daytime max level

- 3.42 **Table 4.2** shows that, during the daytime and night-time for future dwellings adjacent to the A44, the building façade overlooking the road would need to provide between 20 and 34 dB of attenuation to external noise levels, dependant on the period.
- 3.43 A partially opened window typically provides approximately 15 dB of attenuation from external free-field levels to internal levels, therefore it is considered that dwellings located near to Long Lane would need windows to be closed and an alternative source of ventilation to be provided.
- 3.44 For gardens facing directly onto Long Lane, a sound reduction of 3dB would be required to achieve the 55 dB upper guideline value in accordance with BS8233:2014. This is a marginal exceedance.
- 3.45 It should be noted that further away from the A44 and Long Lane, the mitigation requirements would reduce, due to distance attenuation and from acoustic screening provided by the development itself. Therefore, it is considered that the internal and external noise levels will be achieved across the majority of the Site without any mitigation in place, when considering noise from road traffic.

## 4. RECOMMENDED MITIGATION

- 4.1 Given the noise levels in the vicinity of the A44 and Long Lane, and the surrounding commercial/ some of the existing uses in the area, noise is likely to influence the emerging masterplan.

### Road Noise

#### Office Receptors

- 4.2 The recommended internal noise levels for offices in between 35 and 40dB  $L_{Aeq,T}$ , stated in BS8233:2014.

- 4.3 **Table 4.1** provides an indication of the likely glazing requirements for offices located closest to the A44 and Long Lane, assuming a mechanical ventilation strategy, to ensure the recommended noise levels are achieved.

**Table 4.1: Indication of typical glazing and ventilation requirements for proposed offices located closest to the A44 and Long Lane**

Road Source	Indicative glazing requirement (pane/airgap/pane, mm)	$R_w + C_{tr}$
A44	4mm/(6-16mm)/4mm	25
Long Lane	4mm/(6-16mm)/4mm	25

#### Residential Receptors

##### *Daytime noise levels in gardens*

- 4.4 The upper target noise levels for outdoor living areas in BS8233:2014 is 55 dB  $L_{Aeq,16h}$ . The predicted noise level at 10 metres from the A44 and Long Lane exceeds the criteria.
- 4.5 To reduce the noise impact in the nearest proposed gardens to within acceptable limits the following options are available:
- Design the development site such that the buildings provide a noise barrier to the garden areas;
  - Incorporate a standoff between the road and proposed dwellings;
  - Provide noise barriers around the perimeters of the gardens; or
  - Install an acoustic barrier along the perimeter of the development site.
- 4.6 Adopting one of the above design approaches should result in suitable daytime noise levels in gardens being achieved, provided the approaches are implemented effectively.

##### *Internal noise levels in habitable rooms*

- 4.7 The recommended internal noise levels for living areas is 35dB  $L_{Aeq,16h}$  during the daytime and 30dB  $L_{Aeq,8h}$  and 45dB  $L_{A, \max}$  during the night-time, as stated in BS8233:2014.
- 4.8 **Table 4.2** provides an indication of the likely glazing and ventilation requirements for dwellings at 10m from Long Lane, for all internal criteria to be met, assuming that habitable rooms would be on the facades facing the road. The requirements are driven by the criterion which requires the largest sound reduction.



**Table 4.2: Indication of typical glazing and ventilation requirements for proposed dwellings at 10m from Long Lane (no acoustic fencing)**

Indicative distance from Long Lane (m)	Indicative glazing requirement (pane/airgap/pane, mm)	$R_w + C_{tr}$	Typical ventilation requirement	$D_{n,e,w} + C_{tr}$
10	9mm/12mm/12mm	38	Passive attenuated in-wall ventilator	44

- 1.1 Should an acoustic barrier be included for outdoor living areas located closest to Long Lane, it would be likely to reduce the glazing and ventilation requirements for dwellings closest to the road as well as reducing external noise levels in gardens.
- 1.2 It is likely that, with the presence of buildings on site, the sound insulation requirements for dwellings further into the site would be considerably reduced due to screening from the development itself, and that for large sections of the development, standard double glazing (4mm pane/12mm airgap/4mm pane) and open windows would be sufficient.

### Existing Commercial Uses

#### Marshalls Transport and Supercar Driving Experience

- 4.9 Given the noise sources associated with Marshalls Transport and Supercar Driving Experience, it is recommended that a standoff should be incorporated between the business and any proposed residential dwellings. Alternatively, significant boundary mitigation may be required.
- 4.10 Where possible, proposed employment uses could be located between the premises of Marshalls Transport and proposed sensitive uses.

#### Throckmorton Shooting Ground

- 4.11 Any masterplan will need to consider the potential noise impact from the shooting ground. This is difficult to mitigate, due to the nature of the noise. Therefore, it is recommended that provision is made for a stand-off between the shooting ground and any proposed sensitive receptors within the development of the masterplan.

#### Hill and Moor Waster Management Landfill

- 4.12 The landfill has the potential to give rise to significant noise levels, which were noted to vary significantly due to the operations being undertaken. However, it is understood that the majority of the operations are undertaken in the western area of the landfill site. This is located away from the proposed residential and employment areas proposed as part of this scheme. Furthermore, it is understood that the landfill will be fully restored prior to the development being occupied. Should this not be the case, a standoff between the landfill will likely be required should any noise sensitive uses be proposed in this area.

### Biomethane Plant

- 4.13 Although onsite observations indicate that the biomethane plant does not generate any significant noise, it is considered that noise associated with operations, such as HGV movements, loading/unloading operations have the potential to generate significant levels of noise. It is understood that employment uses are proposed in this area, and it is recommended that these remain unchanged.

### Poultry Farm

- 4.14 Due to the potential for HGV deliveries to the poultry farm, it is recommended that employment uses are proposed for this area, as shown on the draft masterplan.

## **Proposed Employment Uses**

- 4.15 At this stage, there is no information available regarding the proposed end use of the employment areas. Any noise generating uses associated with the proposed commercial elements will need to be considered at proposed and existing noise sensitive uses. Where possible, noisy operations should be located away from existing and proposed sensitive uses. Careful consideration should be given to the orientation of any commercial buildings, with any noise generating uses placed on the screened side of the buildings. Commercial uses, such as offices, could also be utilised to provide screening from the existing commercial/industrial sources, to reduce noise levels at proposed noise sensitive uses.

## **Recommendations**

- 4.16 In summary, the key design input from a noise perspective is as follows:
- Consider relocating residential areas further away from the premises of Supercar Driving Experience, Marshalls Transport and the Poultry Farm. Employment uses could be located near to the premises to provide screening to the residential areas. (further monitoring required)
  - Incorporate a buffer/stand-off between Long Lane and the build line of the residential areas to reduce the extent of required mitigation.
  - Incorporate a stand-off between proposed residential areas and Throckmorton Shooting ground.
  - For employment uses in the south western area of the site, consider placing service yard areas and fixed plant items on the screened side of the buildings, away from existing receptors.
  - Should the landfill site be operational in the future, consider relocating residential areas further away from the landfill site.
- 4.17 Further noise monitoring is recommended of the existing commercial/industrial uses associated with the wider site.

- 4.18 Acoustic design of the site layout should be considered as part of the ongoing masterplan process.
- 4.19 It is recommended that further monitoring and assessment is undertaken during the planning stage once further information is known.

## **APPENDIX A: Full Survey Results**

**Table A1: Results from Measurement Location 1**

Start Time & Date	Period (T)	dB LAeq,T	dB LAFmax	dB LA10,T	dB LA90,T	Sound Pressure Levels (dB Leq,T) per Octave Band (Hz)							
						63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
29/01/2020 13:15	15-mins	66	80	68	58	69	66	64	62	64	58	48	43
29/01/2020 13:30	15-mins	67	77	69	57	68	66	64	62	65	58	49	43
29/01/2020 13:45	15-mins	66	78	69	55	68	65	64	62	64	58	48	43
29/01/2020 14:00	15-mins	67	75	69	57	67	65	65	62	64	58	49	43
29/01/2020 14:15	15-mins	67	90	69	58	67	64	63	61	65	58	48	42
29/01/2020 14:30	15-mins	68	79	69	59	69	69	66	63	65	60	53	51
29/01/2020 14:45	15-mins	68	75	70	59	69	66	65	63	65	59	50	44
29/01/2020 15:00	15-mins	67	80	69	59	67	64	64	62	65	59	49	42
29/01/2020 15:15	15-mins	67	77	69	58	68	65	64	62	64	58	49	44
29/01/2020 15:30	15-mins	67	92	69	59	67	64	64	62	65	58	50	46
29/01/2020 15:45	15-mins	68	76	69	56	69	68	68	66	64	58	50	47
29/01/2020 16:00	15-mins	68	77	70	59	69	65	64	62	65	59	50	44

**Table A2: Results from Measurement Location 2**

Start Time & Date	Period (T)	dB LAeq,T	dB LAFmax	dB LA10,T	dB LA90,T	Sound Pressure Levels (dB Leq,T) per Octave Band (Hz)							
						63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
31/01/2020 13:12	15-mins	68	84	71	50	69	62	61	62	65	60	52	46
31/01/2020 13:27	15-mins	67	81	71	51	69	62	61	62	64	60	52	46
31/01/2020 13:42	15-mins	68	83	71	51	70	62	61	62	65	60	52	48
31/01/2020 13:57	15-mins	68	88	71	50	71	65	62	63	65	60	52	45

Start Time & Date	Period (T)	dB LAeq,T	dB LAFmax	dB LA10,T	dB LA90,T	Sound Pressure Levels (dB Leq,T) per Octave Band (Hz)							
						63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
31/01/2020 14:12	15-mins	68	82	72	52	72	64	61	62	65	60	52	46
31/01/2020 14:27	15-mins	68	89	71	51	69	62	61	62	65	61	55	49
31/01/2020 14:42	15-mins	68	81	71	52	72	62	60	62	65	61	52	46
31/01/2020 14:57	15-mins	68	90	72	53	70	62	61	63	65	61	52	46
31/01/2020 15:12	15-mins	68	82	72	51	69	62	61	63	65	61	52	45
31/01/2020 15:27	15-mins	68	85	72	52	70	63	61	62	65	61	52	45
31/01/2020 15:42	15-mins	68	88	72	53	70	63	61	63	65	61	52	47
31/01/2020 15:57	15-mins	68	79	71	52	70	62	60	62	65	61	51	44

**Table A3: Results from Measurement Location 3**

Start Time & Date	Period (T)	dB LAeq,T	dB LAFmax	dB LA10,T	dB LA90,T	Sound Pressure Levels (dB Leq,T) per Octave Band (Hz)							
						63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
29/01/2020 14:00	15-mins	59	84	63	39	63	60	55	51	55	52	48	49
29/01/2020 14:15	15-mins	58	76	62	39	64	55	52	51	56	51	42	36
29/01/2020 14:30	15-mins	60	79	63	38	63	60	58	54	56	53	43	37
29/01/2020 14:45	15-mins	58	77	60	38	62	58	54	52	55	51	42	35
29/01/2020 15:00	15-mins	61	83	63	41	65	63	63	56	57	54	45	38
29/01/2020 15:15	15-mins	60	85	61	40	60	58	58	56	57	52	44	40
29/01/2020 15:30	15-mins	60	80	63	41	64	61	58	55	57	53	45	42
29/01/2020 15:45	15-mins	60	76	64	41	63	56	54	53	57	53	44	39

Start Time & Date	Period (T)	dB LAeq,T	dB LAFmax	dB LA10,T	dB LA90,T	Sound Pressure Levels (dB Leq,T) per Octave Band (Hz)							
						63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
29/01/2020 16:00	15-mins	62	79	66	41	66	62	59	56	59	55	47	39
29/01/2020 16:15	15-mins	60	77	64	41	64	59	57	54	57	53	44	37
29/01/2020 16:30	15-mins	60	80	64	41	63	59	54	53	57	53	43	37
29/01/2020 16:45	15-mins	61	79	65	41	65	62	58	55	57	54	45	39