# Rosefield Solar Farm

## **Environmental Statement**

Volume 4
Appendix 13.3: Operational Noise Assessment
Details

EN010158/APP/6.4 September 2025 Rosefield Energyfarm Limited APFP Regulation 5(2)(a)
Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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#### 1. Introduction

#### 1.1. Purpose of the Report

1.1.1. This Operational Noise Assessment Appendix has been prepared on behalf of Rosefield Energyfarm Limited ('the Applicant') to present the likely significant effects on noise and vibration in relation to the Development Consent Order (DCO) application for the construction, operation (including maintenance) and decommissioning of Rosefield Solar Farm (hereafter referred to as the 'Proposed Development').

#### 1.2. The Order Limits

1.2.1. The extent of the Order Limits are shown in Location, Order Limits and Grid Coordinate Plans [EN010158/APP/2.1] and the Proposed Development is described in full in ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1] and shown spatially on the Works Plans [EN010158/APP/2.3].

#### 1.3. The Proposed Development

- 1.3.1. The Proposed Development comprises the construction, operation (including maintenance), and decommissioning of solar photovoltaic ('PV') development and energy storage, together with associated infrastructure and an underground cable connection to the National Grid East Claydon Substation.
- 1.3.2. The Proposed Development would include a generating station with a total exporting capacity exceeding 50 megawatts ('MW').
- 1.3.3. The location of the Proposed Development is shown on ES Volume 3, Figure 1.1: Location Plan [EN010158/APP/6.3] and described in ES Volume 1, Chapter 2: Location of the Proposed Development [EN010158/APP/6.1]. The Proposed Development would be located within the Order Limits (the land shown on the Works Plans [EN010158/APP/2.3] within which the Proposed Development can be carried out). The Order Limits plan is provided as ES Volume 3, Figure 1.2: Order Limits [EN010158/APP/6.3]. Land within the Order Limits is known as the 'Site'.
- 1.3.4. The principal components of the Proposed Development include:
  - Solar PV development consisting of:
    - Ground mounted Solar PV generating station. The generating station would include Solar PV modules and mounting structures; and



- Balance of Solar System (BoSS) which comprises: Inverters;
   Transformers; Switchgear; Combiner Boxes; acoustic barriers and cabling.
- A project substation (the 'Rosefield Substation') compound comprising: Transformers; Switchgear; reactive power compensation bays; disconnectors; circuit breakers; busbars; control equipment; lightning surge arrestors; building(s) including office, control, functions, material storage, material laydown areas and welfare facilities; firewalls; fencing and acoustic barriers; a security cabin; parking as well as wider monitoring, maintenance and emergency equipment;
- A Main Collector Compound and two Satellite Collector Compounds comprising: Switchgear; Transformers; ancillary equipment; operation and maintenance and welfare facilities; material storage; material laydown areas; fencing and acoustic barriers; and security cabins;
- Battery Energy Storage System (BESS) compound comprising: batteries and associated Inverters; Transformers; Switchgear, ancillary equipment and their containers; office, control and welfare buildings; fencing and acoustic barriers; monitoring, maintenance and emergency systems; air conditioning; electrical cables; fire safety infrastructure; operation (including maintenance) security facilities; material storage; and material laydown areas;
- Interconnecting Cabling Corridor(s) to connect the Solar PV modules and the BESS to the Satellite and Main Collector Compounds to the Rosefield Substation;
- A Grid Connection Cable Corridor to connect the Rosefield Substation to the National Grid East Claydon Substation via 400kV cabling;
- Ancillary infrastructure works comprising: boundary treatment; security
  equipment; lighting; fencing; landscaping; internal access tracks; works
  to facilitate vehicular access; earthing devices; earthworks; surface
  water management; utility connections and diversions; and any other
  works identified as necessary to enable the Proposed Development;
- Green and blue infrastructure, recreation and amenity works comprising: landscaping; habitat management; biodiversity enhancement; the creation of three permissive footpaths; and works to permanently divert four PRoW Footpaths in five instances;
- Site-wide operational monitoring and security equipment; and
- Highways infrastructure improvements and safety works comprising: minor junction improvement works; road widening; passing places; and works to facilitate vehicular access to the Site.



## 2. Operational Noise Assessment Details

#### 2.1. Noise Model Settings

- 2.1.1. The predicted noise emissions generated by the operation of the converter station have been calculated at the surrounding noise sensitive receptors using the computational noise modelling software SoundPLAN (v9.1). The modelling software calculates industrial noise in accordance with the methodology set out in BS ISO 9613-2:2024.
- 2.1.2. The BS ISO 9613-2 method predicts noise levels under meteorological conditions favourable to noise propagation from the sound source to the receptor, downwind propagation or equivalently, propagation under a moderate ground-based temperature inversion as commonly occurs at night.
- 2.1.3. The modelling parameters used have been detailed in **Table 2.1**.

Table 2.1: Modelling parameters

| Item                      | Setting  |
|---------------------------|--|
| Algorithm                 | BS ISO 9613-2:2024   |
|                           | Ground absorption has been set based on local conditions as derived from aerial imagery and noise survey.  |
| Ground absorption         | Agricultural land, grassland, vegetation, G=1.0).  |
|                           | Gravel hardstanding areas around main equipment installations, G=0.5.  |
|                           | 10 degrees Celsius;  |
| Meteorological conditions | 70% humidity; and  |
|                           | Wind from source to receiver.  |
| Receptor height           | Ground Floor level set at 1.5m above external ground level.  |
|                           | First Floor level set at 4m above external ground level.   |
| Façade Corrections        | Predictions are at 1 metre from a given façade, in free-<br>field conditions. No façade corrections have been<br>applied.  |
| Site layout               | Indicative site layout based on ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3] that will be subject to amendments and refinement as part of the detailed design. |
|                           |  |



| Item    | Setting  |
|---------|--|
| Terrain | Lidar data from Defra with a 5m resolution has been imported into the model. |

#### 2.2. Data Sources

2.2.1. **Table 2.2** details the data sources used in the operational noise model. Data sources have been provided by the Applicant.

Table 2.2: Operational phase noise emissions

| Equipment                         | Quantity  | Noise level  | Notes   |
|-----------------------------------|-----------|--|---|
| BESS                              |           |  |   |
| BESS<br>generic<br>containers     | 500       | 65 dB(A) at 1m distance (from the relevant kit).   | Noise emitting from one side and one end. Noise emitting faces orientated inwards.                        |
| BESS<br>transformers              | 51        | Varying depending on unit surface:  59 dB(A) at 1m (front) 52 dB(A) at 1m (right) 71 dB(A) at 1m (back) 61 dB(A) at 1m (left) 62 dB(A) at 1m (top) | Noise emitting from all sides of unit, orientated with the front of the containing facing the north-east. |
| BESS<br>auxiliary<br>transformers | 12        | 40 dB(A) at 1m   | Noise emitting from all sides of unit – 2.4m x 2.5m x 4.0m (LxWxH).                                       |
| Main Collect                      | or Compou | ınd  |   |
| Auxiliary<br>transformers         | 12        | 40 dB(A) at 1m   | Noise emitting from all sides of unit – 2.4m x 2.5m x 4.0m (LxWxH).                                       |
| Satellite Coll                    | ector Com | pound  |   |
| Main<br>transformer               | 1         | 75 dB(A) at 1m   | Noise emitting from all sides of unit - 6.72m x 2.74m x 4.65m (LxWxH).                                    |



| Equipment                      | Quantity | Noise level  | Notes  |  |  |  |  |
|--------------------------------|----------|--|--|--|--|--|--|
| Auxiliary transformers         | 1        | 40 dB(A) at 1m   | Noise emitting from all sides of unit – 2.4m x 2.5m x 4.0m (LxWxH).  |  |  |  |  |
| Rosefield Substation           |          |  |  |  |  |  |  |
| Main<br>transformers           | Up to 7  | 75 dB(A) at 1m   | Noise emitting from all sides of unit - 6.72m x 2.74m x 4.65m (LxWxH).   |  |  |  |  |
| Solar PV mo                    | dules    |  |  |  |  |  |  |
| Central inverters/ITS stations | 27       | 57 dB(A) at 10m<br>per single station<br>60 dB(A) at 10m<br>per double station | 27 central inverter/ITS stations distributed across 24 fields. Each of the 27 stations includes one or two inverters, each emitting 57 dB(A) at 10m. |  |  |  |  |
| String<br>Inverters            | 83       | 75 dB(A) at 1m   | Distributed across five fields within Parcel 1 and Parcel 3.   |  |  |  |  |

#### 2.3. Plant Locations

2.3.1. Table 2.3 details the locations of the above noise emitting equipment used in the operational noise model. Locations of the equipment are based on ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3] and secured in the Works Plans [EN010158/APP/2.3].

Table 2.3: Equipment locations

| Project element                   | Location   |  |  |  |  |
|-----------------------------------|--|--|--|--|--|
| BESS                              | Fields D8 and D9 in Parcel 2.  |  |  |  |  |
| Rosefield Substation              | Across Fields E11 and E20 in Parcel 3.   |  |  |  |  |
| Balance of Solar<br>System (BoSS) | 27 central inverter/ITS stations distributed across 24 fields in Parcels 1, 2 and 3: |  |  |  |  |
|                                   | <ul> <li>Field B1 – 1 inverter station (2 inverters);</li> </ul>                     |  |  |  |  |
|                                   | <ul> <li>Field B11 – 1 inverter station (2 inverters);</li> </ul>                    |  |  |  |  |
|                                   | <ul> <li>Field B12 – 1 inverter station (1 inverters);</li> </ul>                    |  |  |  |  |
|                                   | <ul> <li>Field B13 – 1 inverter station (2 inverters);</li> </ul>                    |  |  |  |  |
|                                   | <ul> <li>Field B14 – 1 inverter station (2 inverters);</li> </ul>                    |  |  |  |  |
|                                   | <ul> <li>Field B18 – 1 inverter station (2 inverters);</li> </ul>                    |  |  |  |  |
|                                   | <ul> <li>Field B20 – 2 inverter stations (4 inverters);</li> </ul>                   |  |  |  |  |



### Project element Location Field B21 – 1 inverter station (2 inverters); Field B22 – 1 inverter station (2 inverters); Field B23(S) – 1 inverter station (2 inverters); Field B4 – 1 inverter station (2 inverters); Field B7 – 1 inverter station (2 inverters); Field D7 – 1 inverter station (2 inverters); Field D10 – 1 inverter station (2 inverters); Field D11 – 1 inverter station (2 inverters); Field D12 – 1 inverter station (2 inverters); Field D13 – 1 inverter station (2 inverters); Field D16 – 1 inverter station (2 inverters); Field D17 – 1 inverter stations (2 inverters); Field D19 – 1 inverter station (2 inverters); Field D26 – 1 inverter station (2 inverters); • Field D28 – 2 inverter stations (4 inverters); Field D45 – 1 inverter station (2 inverters); Field E23 – 2 inverter stations (3 inverters). 83 string inverters across the following locations in Parcels 1 and 3: Field B8; Field B10; Field B16; Field E21; and, Field E10. **Main Collector** Field E21 Compound Satellite Collector Two Satellite Collector Compounds located at the Compounds following locations:

Field B23 (South) in Parcel 1; and,

Field D17 in Parcel 2.



#### Model Results

#### 3.1. Without Additional Mitigation

3.1.1. The results of the operational phase modelling, accounting for the cumulative impact of all operational phase plant items running concurrently without additional mitigation, are as shown in **Table 3.1** and **Table 3.2**.

#### 3.2. With Additional Mitigation

- 3.2.1. Following the introduction of additional mitigation measures, the results of the operational phase modelling, accounting for the cumulative impact of all operational phase plant items running concurrently, are shown in **Table 3.3** and **Table 3.4**.
- 3.2.2. A **low** magnitude of impact upon **high** sensitive receptors would result in a long-term minor adverse residual effect, which is considered to be **not significant**.



Table 3.1: Derivation of Rating Level (without additional mitigation)

| Ref | Name                            | Specific Sound<br>Level, dB Las, T | Character<br>Correction, dB | Rating Level,<br>dB L <sub>AR, Tr</sub> | Representative level, dB | background sound |
|-----|---------------------------------|------------------------------------|-----------------------------|---|--------------------------|------------------|
|     |                                 |                                    |                             |   | Daytime                  | Night-time       |
| R1  | Beachfield                      | 18                                 | 3                           | 21                                      | 33                       | 29               |
| R2  | Bernwood Farm                   | 34                                 | 3                           | 37                                      | 29                       | 30               |
| R3  | Orchard Way, Botolph<br>Claydon | 29                                 | 3                           | 32                                      | 29                       | 30               |
| R4  | Botyl Rd, Botolph Claydon       | 31                                 | 3                           | 34                                      | 29                       | 30               |
| R5  | Brickhill Way, Calvert          | 26                                 | 3                           | 29                                      | 34                       | 30               |
| R6  | Calvert Cottages                | 31                                 | 3                           | 34                                      | 34                       | 30               |
| R7  | Catherine Cottages              | 35                                 | 3                           | 38                                      | 31                       | 23               |
| R8  | Catherine Farm                  | 31                                 | 3                           | 34                                      | 29                       | 25               |
| R9  | Clayton Rd                      | 29                                 | 3                           | 32                                      | 29                       | 24               |
| R10 | Dry Leys Farmhouse              | 23                                 | 3                           | 26                                      | 36                       | 29               |
| R11 | Finmere Hill House              | 22                                 | 3                           | 25                                      | 33                       | 29               |
| R12 | Hogshaw Farm                    | 34                                 | 3                           | 37                                      | 29                       | 24               |
| R13 | Knowlhill Farm                  | 27                                 | 3                           | 30                                      | 32                       | 30               |
| R14 | Lower Farm                      | 29                                 | 3                           | 32                                      | 29                       | 24               |
| R15 | Muxwell Farm                    | 26                                 | 3                           | 29                                      | 29                       | 27               |
| R16 | Pond Farm                       | 32                                 | 3                           | 35                                      | 29                       | 25               |



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| Ref | Name                         | Specific Sound<br>Level, dB Las, t | Character<br>Correction, dB | Rating Level,<br>dB L <sub>AR, Tr</sub> | Representative background soullevel, dB |            |
|-----|------------------------------|------------------------------------|-----------------------------|---|---|------------|
|     |                              |                                    |                             |   | Daytime                                 | Night-time |
| R17 | The Old Dairy, Pond Farm     | 32                                 | 3                           | 35                                      | 29                                      | 25         |
| R18 | Sion Hill Farm               | 38                                 | 2                           | 40                                      | 32                                      | 30         |
| R19 | Woodland Barn                | 18                                 | 3                           | 21                                      | 36                                      | 29         |
| R20 | Borshaw Farm                 | 34                                 | 2                           | 36                                      | 29                                      | 24         |
| R21 | Brackley Ln, Calvert (A)     | 27                                 | 3                           | 30                                      | 34                                      | 30         |
| R22 | Brackley Ln, Calvert (B)     | 26                                 | 3                           | 29                                      | 34                                      | 30         |
| R23 | Red Kit View, Calvert        | 27                                 | 3                           | 30                                      | 34                                      | 30         |
| R24 | Blackmore Hill Farm Cottages | 34                                 | 3                           | 37                                      | 31                                      | 23         |
| R25 | Woodlands Farm Fishery       | 18                                 | 3                           | 21                                      | 33                                      | 29         |
| R26 | Claydon House                | 25                                 | 3                           | 28                                      | 31                                      | 23         |
| R27 | Middle Farm                  | 18                                 | 3                           | 21                                      | 36                                      | 29         |
| R28 | Granborough                  | 25                                 | 2                           | 27                                      | 32                                      | 30         |
| R29 | East Claydon                 | 26                                 | 2                           | 28                                      | 32                                      | 30         |



Table 3.2: Derivation of Impact Magnitude (without additional mitigation)

| Ref | Name                   | Period     | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative background sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|------------------------|------------|--|---|--|---|-----------------------------------|
| R1  | Beachfield             | Daytime    | 21   | 33  | -12  | -24   | Negligible                        |
|     |                        | Night-time | 21   | 29  | -8   | -14   | Negligible                        |
| R2  | Bernwood Farm          | Daytime    | 37   | 29  | 8  | -8  | Low                               |
|     |                        | Night-time | 37   | 30  | 7  | 2   | Medium                            |
| R3  | Orchard Way, Botolph   | Daytime    | 32   | 29  | 3  | -13   | Negligible                        |
|     | Claydon                | Night-time | 32   | 30  | 2  | -3  | Low                               |
| R4  | Botyl Rd, Botolph      | Daytime    | 34   | 29  | 5  | -11   | Negligible                        |
|     | Claydon                | Night-time | 34   | 30  | 4  | -1  | Low                               |
| R5  | Brickhill Way, Calvert | Daytime    | 29   | 34  | -5   | -16   | Negligible                        |
|     |                        | Night-time | 29   | 30  | -1   | -6  | Negligible                        |
| R6  | Calvert Cottages       | Daytime    | 34   | 34  | 0  | -11   | Negligible                        |
|     |                        | Night-time | 34   | 30  | 4  | -1  | Low                               |
| R7  | Catherine Cottages     | Daytime    | 38   | 31  | 7  | -7  | Low                               |
|     |                        | Night-time | 38   | 23  | 15   | 3   | Medium                            |
| R8  | Catherine Farm         | Daytime    | 34   | 31  | 3  | -11   | Negligible                        |
|     |                        | Night-time | 34   | 23  | 11   | -1  | Low                               |
|     |                        |            |  |   |  |   |                                   |



| Ref | Name               | Period     | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|--------------------|------------|--|---|--|---|-----------------------------------|
| R9  | Clayton Rd         | Daytime    | 32   | 29  | 3  | -13   | Negligible                        |
|     |                    | Night-time | 32   | 24  | 8  | -3  | Low                               |
| R10 | Dry Leys Farmhouse | Daytime    | 26   | 36  | -10  | -19   | Negligible                        |
|     |                    | Night-time | 26   | 29  | -3   | -9  | Negligible                        |
| R11 | Finmere Hill House | Daytime    | 25   | 33  | -8   | -20   | Negligible                        |
|     |                    | Night-time | 25   | 29  | -4   | -10   | Low                               |
| R12 | Hogshaw Farm       | Daytime    | 37   | 29  | 8  | -8  | Low                               |
|     |                    | Night-time | 37   | 24  | 13   | 2   | Medium                            |
| R13 | Knowlhill Farm     | Daytime    | 30   | 32  | -2   | -15   | Negligible                        |
|     |                    | Night-time | 30   | 30  | 0  | -5  | Negligible                        |
| R14 | Lower Farm         | Daytime    | 32   | 29  | 3  | -13   | Negligible                        |
|     |                    | Night-time | 32   | 24  | 8  | -3  | Low                               |
| R15 | Muxwell Farm       | Daytime    | 29   | 29  | 0  | -16   | Negligible                        |
|     |                    | Night-time | 29   | 27  | 2  | -6  | Negligible                        |
| R16 | Pond Farm          | Daytime    | 35   | 29  | 6  | -10   | Negligible                        |
|     |                    | Night-time | 35   | 25  | 10   | 0   | Low                               |
| R17 |                    | Daytime    | 35   | 29  | 6  | -10   | Negligible                        |



| Ref | Name                        | Period     | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> [1] | Magnitude<br>Criterion<br>Reached |
|-----|-----------------------------|------------|--|---|--|--|-----------------------------------|
|     | The Old Dairy, Pond<br>Farm | Night-time | 35   | 25  | 10   | 0  | Low                               |
| R18 | Sion Hill Farm              | Daytime    | 40   | 32  | 8  | -5   | Low                               |
|     |                             | Night-time | 40   | 30  | 10   | 5  | Medium                            |
| R19 | Woodland Barn               | Daytime    | 21   | 36  | -15  | -24  | Negligible                        |
|     |                             | Night-time | 21   | 29  | -8   | -14  | Negligible                        |
| R20 | Borshaw Farm                | Daytime    | 36   | 29  | 7  | -9   | Low                               |
|     |                             | Night-time | 36   | 24  | 12   | 1  | Medium                            |
| R21 | Brackley Ln, Calvert        | Daytime    | 30   | 34  | -4   | -15  | Negligible                        |
|     | (A)                         | Night-time | 30   | 30  | 0  | -5   | Negligible                        |
| R22 | Brackley Ln, Calvert        | Daytime    | 29   | 34  | -5   | -16  | Negligible                        |
|     | (B)                         | Night-time | 29   | 30  | -1   | -6   | Negligible                        |
| R23 | Red Kit View, Calvert       | Daytime    | 30   | 34  | -4   | -15  | Low                               |
|     |                             | Night-time | 30   | 30  | 0  | -5   | Negligible                        |
| R24 | Blackmore Hill Farm         | Daytime    | 37   | 31  | 6  | -8   | Low                               |
|     | Cottages                    | Night-time | 37   | 23  | 14   | 2  | Medium                            |
| R25 |                             | Daytime    | 21   | 33  | -12  | -24  | Negligible                        |



| Ref | Name                      | Period     | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|---------------------------|------------|--|---|--|---|-----------------------------------|
|     | Woodlands Farm<br>Fishery | Night-time | 21   | 29  | -8   | -14   | Negligible                        |
| R26 | Claydon House             | Daytime    | 28   | 31  | -3   | -17   | Negligible                        |
|     |                           | Night-time | 28   | 23  | 5  | -7  | Negligible                        |
| R27 | Middle Farm               | Daytime    | 21   | 36  | -15  | -24   | Negligible                        |
|     |                           | Night-time | 21   | 29  | -8   | -14   | Negligible                        |
| R28 | Granborough               | Daytime    | 27   | 32  | -5   | -18   | Negligible                        |
|     |                           | Night-time | 27   | 30  | -3   | -8  | Negligible                        |
| R29 | East Claydon              | Daytime    | 28   | 32  | -4   | -17   | Negligible                        |
|     |                           | Night-time | 28   | 30  | -2   | -7  | Negligible                        |

#### Notes:

<sup>&</sup>lt;sup>1.</sup> LOAEL aligned with the low impact criteria i.e. 40 dB L<sub>Ar</sub> daytime, 35 dB L<sub>Ar</sub> night-time.



Table 3.3: Derivation of Rating Level (with additional mitigation)

| Ref | Name                            | Specific Sound<br>Level, dB Las, t | Character<br>Correction, dB | Rating Level,<br>dB L <sub>AR, Tr</sub> | Representative level, dB | e background sound |
|-----|---------------------------------|------------------------------------|-----------------------------|---|--------------------------|--------------------|
|     |                                 |                                    |                             |   | Daytime                  | Night-time         |
| R1  | Beachfield                      | 16                                 | 3                           | 19                                      | 33                       | 29                 |
| R2  | Bernwood Farm                   | 32                                 | 3                           | 35                                      | 29                       | 30                 |
| R3  | Orchard Way, Botolph<br>Claydon | 25                                 | 3                           | 28                                      | 29                       | 30                 |
| R4  | Botyl Rd, Botolph Claydon       | 30                                 | 3                           | 33                                      | 29                       | 30                 |
| R5  | Brickhill Way, Calvert          | 23                                 | 3                           | 26                                      | 34                       | 30                 |
| R6  | Calvert Cottages                | 27                                 | 3                           | 30                                      | 34                       | 30                 |
| R7  | Catherine Cottages              | 29                                 | 3                           | 32                                      | 31                       | 23                 |
| R8  | Catherine Farm                  | 24                                 | 3                           | 27                                      | 29                       | 25                 |
| R9  | Clayton Rd                      | 27                                 | 3                           | 30                                      | 29                       | 24                 |
| R10 | Dry Leys Farmhouse              | 18                                 | 3                           | 21                                      | 36                       | 29                 |
| R11 | Finmere Hill House              | 20                                 | 3                           | 23                                      | 33                       | 29                 |
| R12 | Hogshaw Farm                    | 32                                 | 3                           | 35                                      | 29                       | 24                 |
| R13 | Knowlhill Farm                  | 25                                 | 3                           | 28                                      | 32                       | 30                 |
| R14 | Lower Farm                      | 28                                 | 3                           | 31                                      | 29                       | 24                 |
| R15 | Muxwell Farm                    | 22                                 | 3                           | 25                                      | 29                       | 27                 |
| R16 | Pond Farm                       | 29                                 | 3                           | 32                                      | 29                       | 25                 |
|     |                                 |                                    |                             |   |                          |                    |



| Ref | Name                         | Specific Sound<br>Level, dB Las, t | Character<br>Correction, dB | Rating Level,<br>dB L <sub>AR, Tr</sub> | Representative background sound level, dB |            |
|-----|------------------------------|------------------------------------|-----------------------------|---|---|------------|
|     |                              |                                    |                             |   | Daytime                                   | Night-time |
| R17 | The Old Dairy, Pond Farm     | 29                                 | 3                           | 32                                      | 29  | 25         |
| R18 | Sion Hill Farm               | 30                                 | 2                           | 32                                      | 32  | 30         |
| R19 | Woodland Barn                | 14                                 | 3                           | 17                                      | 36  | 29         |
| R20 | Borshaw Farm                 | 32                                 | 2                           | 34                                      | 29  | 24         |
| R21 | Brackley Ln, Calvert (A)     | 25                                 | 3                           | 28                                      | 34  | 30         |
| R22 | Brackley Ln, Calvert (B)     | 23                                 | 3                           | 26                                      | 34  | 30         |
| R23 | Red Kit View, Calvert        | 25                                 | 3                           | 28                                      | 34  | 30         |
| R24 | Blackmore Hill Farm Cottages | 28                                 | 3                           | 31                                      | 31  | 23         |
| R25 | Woodlands Farm Fishery       | 14                                 | 3                           | 17                                      | 33  | 29         |
| R26 | Claydon House                | 21                                 | 3                           | 24                                      | 31  | 23         |
| R27 | Middle Farm                  | 14                                 | 3                           | 17                                      | 36  | 29         |
| R28 | Granborough                  | 22                                 | 2                           | 24                                      | 32  | 30         |
| R29 | East Claydon                 | 23                                 | 2                           | 25                                      | 32  | 30         |



Table 3.4: Derivation of Impact Magnitude (with additional mitigation)

| Ref | Name                            | Period         | Rating<br>Level, dB<br>Lar, Tr | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|---------------------------------|----------------|--------------------------------|---|--|---|-----------------------------------|
| R1  | Beachfield                      | Daytime        | 19                             | 33  | -14  | -26   | Negligible                        |
|     |                                 | Night-<br>time | 19                             | 29  | -10  | -16   | Negligible                        |
| R2  | Bernwood Farm                   | Daytime        | 35                             | 29  | 6  | -10   | Negligible                        |
|     |                                 | Night-<br>time | 35                             | 30  | 5  | 0   | Low                               |
| R3  | Orchard Way,<br>Botolph Claydon | Daytime        | 28                             | 29  | -1   | -17   | Negligible                        |
|     |                                 | Night-<br>time | 28                             | 30  | -2   | -7  | Negligible                        |
| R4  | Botyl Rd, Botolph               | Daytime        | 33                             | 29  | 4  | -12   | Negligible                        |
|     | Claydon                         | Night-<br>time | 33                             | 30  | 3  | -2  | Low                               |
| R5  | Brickhill Way, Calvert          | Daytime        | 26                             | 34  | -8   | -19   | Negligible                        |
|     |                                 | Night-<br>time | 26                             | 30  | -4   | -9  | Negligible                        |
| R6  | Calvert Cottages                | Daytime        | 30                             | 34  | -4   | -15   | Negligible                        |
|     |                                 | Night-<br>time | 30                             | 30  | 0  | -5  | Negligible                        |



| Ref | Name               | Period         | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|--------------------|----------------|--|---|--|---|-----------------------------------|
| R7  | Catherine Cottages | Daytime        | 32   | 31  | 1  | -13   | Negligible                        |
|     |                    | Night-<br>time | 32   | 23  | 9  | -3  | Low                               |
| R8  | Catherine Farm     | Daytime        | 27   | 31  | -4   | -18   | Negligible                        |
|     |                    | Night-<br>time | 27   | 23  | 4  | -8  | Negligible                        |
| R9  | Clayton Rd         | Daytime        | 30   | 29  | 1  | -15   | Negligible                        |
|     |                    | Night-<br>time | 30   | 24  | 6  | -5  | Negligible                        |
| R10 | Dry Leys Farmhouse | Daytime        | 21   | 36  | -15  | -24   | Negligible                        |
|     |                    | Night-<br>time | 21   | 29  | -8   | -14   | Negligible                        |
| R11 | Finmere Hill House | Daytime        | 23   | 33  | -10  | -22   | Negligible                        |
|     |                    | Night-<br>time | 23   | 29  | -6   | -12   | Negligible                        |
| R12 | Hogshaw Farm       | Daytime        | 35   | 29  | 6  | -10   | Negligible                        |
|     |                    | Night-<br>time | 35   | 24  | 11   | 0   | Low                               |
| R13 | Knowlhill Farm     | Daytime        | 28   | 32  | -4   | -17   | Negligible                        |



| Ref | Name                                 | Period         | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|--------------------------------------|----------------|--|---|--|---|-----------------------------------|
|     |                                      | Night-<br>time | 28   | 30  | -2   | -7  | Negligible                        |
| R14 | Lower Farm                           | Daytime        | 31   | 29  | 2  | -14   | Negligible                        |
|     |                                      | Night-<br>time | 31   | 24  | 7  | -4  | Low                               |
| R15 | Muxwell Farm                         | Daytime        | 25   | 29  | -4   | -20   | Negligible                        |
|     |                                      | Night-<br>time | 25   | 27  | -2   | -10   | Negligible                        |
| R16 | Pond Farm                            | Daytime        | 32   | 29  | 3  | -13   | Negligible                        |
|     |                                      | Night-<br>time | 32   | 25  | 7  | -3  | Low                               |
| R17 | <b>7</b> The Old Dairy, Pond<br>Farm | Daytime        | 32   | 29  | 3  | -13   | Negligible                        |
|     |                                      | Night-<br>time | 32   | 25  | 7  | -3  | Low                               |
| R18 | Sion Hill Farm                       | Daytime        | 32   | 32  | 0  | -13   | Negligible                        |
|     |                                      | Night-<br>time | 32   | 30  | 2  | -3  | Low                               |
| R19 | Woodland Barn                        | Daytime        | 17   | 36  | -19  | -28   | Negligible                        |



| Ref | Name                            | Period                    | Rating<br>Level, dB<br>L <sub>AR, Tr</sub> | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|---------------------------------|---------------------------|--|---|--|---|-----------------------------------|
|     |                                 | Night-<br>time            | 17   | 29  | -12  | -18   | Negligible                        |
| R20 | Borshaw Farm                    | Daytime<br>Night-<br>time | 34<br>34                                   | 29<br>24  | 5<br>10  | -11<br>-1   | Negligible<br>Low                 |
| R21 | Brackley Ln, Calvert<br>(A)     | Daytime<br>Night-<br>time | 28<br>28                                   | 34<br>30  | -6<br>-2   | -17<br>-7   | Negligible<br>Negligible          |
| R22 | Brackley Ln, Calvert<br>(B)     | Daytime<br>Night-<br>time | 26<br>26                                   | 34<br>30  | -8<br>-4   | -19<br>-9   | Negligible<br>Negligible          |
| R23 | Red Kit View, Calvert           | Daytime<br>Night-<br>time | 28<br>28                                   | 34<br>30  | -6<br>-2   | -17<br>-7   | Negligible<br>Negligible          |
| R24 | Blackmore Hill Farm<br>Cottages | Daytime<br>Night-<br>time | 31<br>31                                   | 31<br>23  | 0 8  | -14<br>-4   | Negligible<br>Low                 |
| R25 |                                 | Daytime                   | 17   | 33  | -16  | -28   | Negligible                        |



| Ref | Name                      | Period         | Rating<br>Level, dB<br>Lar, Tr | Representative<br>background<br>sound level, dB | Exceedance<br>above<br>representative<br>background<br>sound level, dB | Exceedance<br>above LOAEL<br>criteria, dB<br>L <sub>Ar,T</sub> <sup>[1]</sup> | Magnitude<br>Criterion<br>Reached |
|-----|---------------------------|----------------|--------------------------------|---|--|---|-----------------------------------|
|     | Woodlands Farm<br>Fishery | Night-<br>time | 17                             | 29  | -12  | -18   | Negligible                        |
| R26 | Claydon House             | Daytime        | 24                             | 31  | -7   | -21   | Negligible                        |
|     |                           | Night-<br>time | 24                             | 23  | 1  | -11   | Negligible                        |
| R27 | Middle Farm               | Daytime        | 17                             | 36  | -19  | -28   | Negligible                        |
|     |                           | Night-<br>time | 17                             | 29  | -12  | -18   | Negligible                        |
| R28 | Granborough               | Daytime        | 24                             | 32  | -8   | -21   | Negligible                        |
|     |                           | Night-<br>time | 24                             | 30  | -6   | -11   | Negligible                        |
| R29 | East Claydon              | Daytime        | 25                             | 32  | -7   | -20   | Negligible                        |
|     |                           | Night-<br>time | 25                             | 30  | -5   | -10   | Negligible                        |

#### Notes:

<sup>&</sup>lt;sup>1.</sup> LOAEL aligned with the low impact criteria i.e. 40 dB L<sub>Ar</sub> daytime, 35 dB L<sub>Ar</sub> night-time.



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