

BULLHOUSE MILL SOLAR, MILLHOUSE GREEN

Ecological Impact Assessment

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1.0 Introduction

1.1 Background

SLR Consulting Ltd was instructed by Brown & Co LLP to undertake an ecological survey of land to the south of Lee Lane, Millhouse Green, South Yorkshire, S36 9NN (approximate central OS grid reference SE 21078 03096).

The results have been used to prepare an Ecological Impact Assessment (EcIA) to inform a planning application for the installation of solar arrays.

The scope of the survey approach was discussed and agreed in advance with Mrs Katie Lawrence, the Planning Ecologist at Barnsley Borough Council.

1.2 Site Description

The application site (herein referred to as the 'Site') consists of a circa 0.2ha area of modified grassland which forms part of a sheep grazed field, bordered by a line of trees to the southeast, open field to the northeast and southwest, and adjacent to a drystone wall, located to the northwest.

1.3 Details of the Proposed Development

The proposed installation (refer to Appendix 1) comprises six solar arrays and an associated underground grid connection.

The Site will remain unfenced, allowing sheep to continue to graze beneath and around the arrays. Ecological enhancements include the installation of bird and bat boxes in trees to the northeast and southeast of the Site, and planting of native understory shrubs, within A 0.02ha line of trees to the southeast of the Site, which is already being managed to benefit wildlife.

The abovementioned enhancements will thereby enhance the biodiversity value of the Site, creating roosting habitat for birds and bats, as well as enhancing the available foraging habitat for birds.

1.4 Purpose of this Report

The purpose of this report is:

- To describe the baseline data collection and assessment methodologies used;
- To summarise the baseline ecological conditions and identify any important receptors (if present);
- To set out the mitigation and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects (if relevant); and
- To describe proposed enhancement measures.

2.0 Relevant Legislation and Planning Policy

2.1 Relevant Legislation ¹

2.1.1 Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into English law, making it an offence to deliberately capture, kill or disturb ²wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). From 1st January 2021, the 2017 Regulations are one of the pieces of domestic law that transposed the land and marine aspects of the Directive. Most of the changes involved transferring functions from the European Commission to the appropriate authorities in England and Wales, all other processes or terms in the 2017 Regulations remain unchanged and existing guidance is still relevant.

2.1.2 Wildlife & Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act (CROW) 2000 and the Natural Environment and Rural Communities Act (NERC) 2006, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act;
- Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act;
- Intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection;
- Pick or uproot any wild plant listed under Schedule 8 of the Act; or
- Plant or cause to grow in the wild any plant species listed under Schedule 9 of the Act.

2.1.3 Protection of Badgers Act 1992

The Protection of Badgers Act 1992 makes it illegal to kill, injure or take a badger or to intentionally or recklessly interfere with a badger sett. Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

¹ Please note that the summary of relevant legislation provided here is intended for general guidance only. The original legislation should be consulted for definitive information

² Disturbance, as defined by the Conservation of Habitats and Species Regulations 2010, includes in particular any action which impairs the ability of animals to survive, breed, rear their young, hibernate or migrate (where relevant); or which affects significantly the local distribution or abundance of the species.

2.1.4 Natural Environment & Rural Communities (NERC) Act 2006

The NERC Act 2006 places a duty on authorities to have due regard for biodiversity and nature conservation during the course of their operations. Section 41 of the Act requires the publication of a list of habitats and species publish which are of principal importance for the purpose of conserving biodiversity. The Section 41 list is used to guide authorities in implementing their duty to have regard to the conservation of biodiversity.

2.2 Relevant Planning Policy

2.2.1 National Planning Policy

The National Planning Policy Framework (NPPF, 2021)³ sets out guidance for local planning authorities and decision-makers on how to apply planning policies when drawing up plans and making decisions about planning applications. Along with Government Circular 06/05⁴, the broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system are set out. Specific policies relating to habitats and biodiversity are set out in paragraphs 131, 174 and 179-182 of the NPPF.

Paragraph 131 states that:

“Trees make an important contribution to the character and quality of urban environments and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users”

Paragraph 174 d of the NPPF states that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

- *Minimising impacts on, and providing net gains for, biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.”*

Furthermore, Paragraph 175 states that plans should:

“...take a strategic approach to minimising and enhancing networks of habitats and green infrastructure, and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries”.

Paragraph 179 states that:

“To protect and enhance biodiversity and geodiversity, plans should:

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*

³ Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework. July 2021.

⁴ Office of the Deputy Prime Minister (2005). Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System. ODPM Circular 06/2005.

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.”

Paragraph 180 goes on to state:

“When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.”*

Paragraphs 181-182 relate to European sites (referred to as habitats sites) and state:

“The following should be given the same protection as habitats sites:

- a) potential Special Protection Areas and possible Special Areas of Conservation;*
- b) listed or proposed Ramsar sites; and*
- c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.”

2.2.2 Local Planning Policy

The Barnsley Local Plan⁵ was adopted in January of 2019 and is used to guide planning decisions. Relevant passages are as follows: -

Policy BIO1 Biodiversity and Geodiversity

“Development will be expected to conserve and enhance the biodiversity and geological features of the borough by:

⁵ Barnsley Metropolitan Borough Council (2019). Local Plan. <https://www.barnsley.gov.uk/media/17249/local-plan-adopted.pdf>

- *Protecting and improving habitats, species, sites of ecological value and sites of geological value with particular regard to designated wildlife and geological sites of international, national and local significance, ancient woodland and species and habitats of principal importance identified via Section 41 of the Natural Environment & Rural Communities Act 2006 (for list of the species and habitats of principal importance) and in the Barnsley Biodiversity Action Plan;*
- *Maximising biodiversity and geodiversity opportunities in and around new developments;*
- *Conserving and enhancing the form, local character and distinctiveness of the boroughs natural assets such as the river corridors of the Don, the Dearne and Dove as natural floodplains and important strategic wildlife corridors;*
- *Proposals will be expected to have followed the national mitigation hierarchy (avoid, mitigate, compensate) which is used to evaluate the impacts of a development on biodiversity interest;*
- *Protecting ancient and veteran trees where identified; and*
- *Encouraging provision of biodiversity enhancements.*

Development which may harm a biodiversity or geological feature or habitat, including ancient woodland and aged or veteran trees found outside ancient woodland, will not be permitted unless effective mitigation and/or compensatory measures can be ensured.

Development which adversely effects a European Site will not be permitted unless there is no alternative option and there are imperative reasons of overriding public interest (IROPI)."

2.2.3 Barnsley Biodiversity Action Plan

The Barnsley Biodiversity Action Plan⁶ was adopted in 2010 and contains Species Action Plans for the following priority species/ species groups of relevance to the Site: hedgehog (*Erinaceus europaeus*), bats, grey partridge (*Perdix perdix*), kestrel (*Falco tinnunculus*), lapwing (*Vanellus vanellus*), barn owl (*Tyto alba*), skylark (*Alauda arvensis*), tree sparrow (*Passer montanus*), and twite (*Carduelis flavirostris*).

⁶ Barnsley Biodiversity Trust (2009). Barnsley Biodiversity Action Plan.
<http://barnsleybiodiversity.org.uk/Barnsley%20BAP%20II%20adopted%202010.pdf>

3.0 Methodology

3.1 Scope, Approach and Personnel

The Site was subject to a UK Habitat survey in February 2023 to collect sufficient baseline data to inform this Ecological Impact Assessment (EclA).

The scope of this EclA, i.e. the collection of baseline data, evaluation of ecological receptors, and assessment of impacts, follows guidelines set out by the Chartered Institute of Ecology and Environmental Management⁷ and references therein. Ecological features considered within the impact assessment include designated sites, habitats, protected species and relevant species of principal importance for nature conservation.

The fieldwork was undertaken by Mr Aaron Bailey, Assistant Ecologist with SLR Consulting on the 13th of February 2022. Mr Bailey is a competent botanist and has experience in protected species surveys. Mr Bailey was accompanied by Ms Julia Kozłowska, Senior Ecologist with SLR Consulting during the fieldwork. Ms Kozłowska is a competent botanist experienced in undertaking Ecological Impact Assessments, a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (QCIEEM) and holder of a Class 1 survey licence for great crested newts.

The EclA report has been written by Mr Aaron Bailey, reviewed by Ms Kozłowska, and approved by Mr Gary Oliver, Principal Ecologist with SLR Consulting. Mr Oliver is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and is a Chartered Environmentalist (SocEnv), with over 27 years' relevant experience within ecological consultancy. He is a competent ornithologist and botanist, holds a Class 2 survey licence for great crested newt (also a Registered Consultant under the Low Impact GCN Class Licence), as well as a Class 2 survey licence for bats.

3.1.1 Desk Study

An internet-based desk study was undertaken, whereby the Multi-Agency Geographic Information for the Countryside (MAGIC) website⁸ was searched for statutory designated sites (such as Sites of Special Scientific Interest (SSSI)), both for the Site itself and land within a 2km radius. This search was undertaken on the 14th of February 2023. Information about local non-statutory sites within a 2km radius was sourced from the Barnsley Biodiversity Trust⁹ on the same date.

The project is a low impact, small-scale development which does not have an impact on any hedgerows, trees or waterbodies. Therefore, it was not necessary to obtain Local Environmental Records Centre (LERC) data as part of the desk study, in accordance with CIEEM guidelines^{7,10}.

3.1.2 UK Habitat Survey

The survey was conducted on a cloudy, dry day, with a light breeze and an ambient temperature of 5°C.

⁷ CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

⁸ <http://magic.gov.uk>

⁹ <http://barnsleybiodiversity.org.uk/localsites.html>

¹⁰ CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal*. 2nd Ed. Chartered Institute of Ecology and Environmental Management, Winchester

The Site was surveyed to identify the broad habitat types present in accordance with the UK Habitat Survey (UKHab) methodology¹¹. The methodology was extended to include searches for features of interest, such as notable or protected species of flora and fauna, as well as habitats capable of supporting such species.

The UK Habitat Classification (UKHab) system comprises a principal hierarchy (the Primary Habitats) which involves the identification of broad habitats and Priority habitats.

In addition, plant species listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*) were searched for.

3.1.3 Fauna

The suitability of the Site to support protected or notable species, including foraging and roosting bats, reptiles, badger (*Meles meles*), great crested newt (*Triturus cristatus*), and breeding birds, was assessed and field evidence of such species/ groups was searched for.

3.2 Limitations

3.2.1 Desk Study

Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

3.2.2 Accessibility and Survey Timing

The Site, and immediate surrounding area, were fully accessible, and whilst the survey was undertaken at sub-optimal time of year (February) the range of habitats present are common and widespread, allowing a robust assessment of their ecological importance to be made. As such, no survey limitations apply.

3.3 Assessment Methodology

The CIEEM Guidelines for Ecological Impact Assessment in the UK (henceforth referred to as the CIEEM guidelines)¹² form the basis of the impact assessment presented in this report.

3.3.1 Determining Importance

In accordance with the CIEEM guidelines only ecological receptors (habitats, species, ecosystems and their functions/ processes), which are considered to be important and potentially affected by the project should be subject to detailed assessment. It is not necessary to conduct detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable, although these can be included in the assessment in order to demonstrate ecological enhancements, for example.

¹¹ <https://ukhab.org>

¹² Chartered Institute of Ecology and Environmental Management (CIEEM) (2019) *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland version 1.1*
<https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf>

Ecological features are considered within a defined geographical context. For this project, the following geographic frame of reference is used:

1. International;
2. National (i.e. UK);
3. Regional (i.e. Yorkshire and the Humber);
4. County (i.e. South Yorkshire); and
5. Local (i.e. 2km).

For designated sites, importance should reflect the geographical context of the designation. For example, a Site of Special Scientific Interest (SSSI) would normally be considered nationally important.

In accordance with CIEEM guidelines, the value of habitats has been measured against published selection criteria where available. Examples of relevant criteria include Annex 1 of the Habitats Directive, descriptions of priority habitats¹³, e.g. those included in Section 41 of NERC Act 2006, Local Wildlife Site Criteria, and Habitat Action Plans (HAPs) contained within the Local Biodiversity Action Plan.

In assigning a level of value to a species, it is necessary to consider its distribution and status. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive), and UK priority species, e.g. Section 41 species and Birds of Conservation Concern¹⁴.

For the purposes of this assessment, ecological features of Local importance or greater and/ or subject to legal protection have been subject to detailed assessment. Effects on other ecological features are considered unlikely to be significant in legal or policy terms.

3.3.2 Impact Assessment

The impact assessment process involves the following steps:

6. identifying and characterising impacts;
7. incorporating measures to avoid and mitigate (reduce) these impacts;
8. assessing the significance of any residual effects after mitigation;
9. identifying appropriate compensation measures to offset significant residual effects (if required); and
10. identifying opportunities for ecological enhancement.

Both direct and indirect impacts are considered. Direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action which affects ecological resources through effects on an intermediary ecosystem, process or feature, e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of marshy grassland.

For the purposes of this assessment, in accordance with CIEEM guidelines, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features or

¹³ i.e. Priority habitats and species as listed in the UK and devolved administrations, as listed: <http://jncc.defra.gov.uk/page-5705>

¹⁴ Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021) *Birds of Conservation Concern 5: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, 114.

receptors’.

3.3.3 Avoidance, Mitigation, Compensation and Enhancement

A sequential process has been adopted to avoid, mitigate and compensate for ecological impacts. This is often referred to as the ‘mitigation hierarchy’ (i.e. avoid, mitigate, compensate, enhance).

It is important for the EclA to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

11. Avoidance is used where an impact has been avoided e.g. through changes in scheme design;
12. Mitigation refers to measures which reduce or remedy a specific negative impact *in situ*;
13. Compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
14. Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

4.0 Results

4.1 Statutory and Non-Statutory Protected Areas

4.1.1 Statutory Designated Sites

The Site and does not contain and does not lie within 2km of any statutory sites.

4.1.2 Non-Statutory Designated Sites

The Site itself does not contain any non-statutory designated sites, however two such sites lie, at least partially, within a 2km radius of the Site. Both are Local Wildlife Sites (LWS). Details of these sites are provided in Table 4-1 below.

The LWS all lie a sufficient distance from the Site, and do not have strong habitat links with the Site, such that they do not have scope to be affected by the proposals; they have therefore been excluded from further discussion.

Table 4-1 Non-Statutory Designated Areas within 2km of the Site

Grid Ref.	Site Name and Status	Reason for Designation	Distance from Site ¹⁵
SE221018	Hartcliff Hill, LWS	Citation not available	1.4 km southeast
SE222048	Royd Moor Reservoir, LWS	Citation not available	1.8km northeast

4.2 Habitats

The 'UKHab' habitats present on the Site are illustrated in Drawing 1 and described below.

4.2.1 Modified grassland with Scattered rushes (g4, 14)

The 'core' of the Site comprises modified grassland, grazed by sheep at certain times of year (Plates 1 and 2). The sward height was varied at the time of survey but contained few grass species, namely cock's-foot (*Dactylis glomerata*), red fescue (*Festuca rubra*), common bent (*Agrostis capillaris*), common couch (*Elymus repens*) and timothy (*Phleum pratense*). Also present were scattered tussocks of soft rush (*Juncus effusus*).

Occasional common herb and forb species were present, including broad-leaved dock (*Rumex obtusifolius*), sorrel (*Rumex acetosa*), creeping buttercup (*Ranunculus repens*), spear thistle (*Cirsium vulgare*), creeping thistle (*Cirsium arvense*), nettle (*Urtica dioica*), daisy (*Bellis perennis*), and dandelion (*Taraxacum sp.*).

The grassland alongside the footpath on the southwest side contains a taller sward with a greater prevalence of nettle and dock.

¹⁵ At closest point to Site boundary, measured 'as the crow flies'.

The modified grassland was assessed as being 'good' condition due to meeting all required criteria, as specified in the Habitat Condition Assessment guidelines¹⁶.

Being a modified grassland field with low species diversity, the 'core' of the Site, and the modified grassland through which the grid connection will run, are assessed as having less than less than Local importance. This habitat has therefore been omitted from further assessment.



Plate 1: Tall grasses and ruderals, which form the southwest edge of the Site. Photograph facing northwest.



Plate 2: Short grasses and scattered rushes, which form the majority of the Site. Photograph facing northwest.

¹⁶ Natural England (2022). Habitat Condition Assessment Sheets with Instructions.

4.2.2 Line of trees (w1g6)

A line of trees is present at the furthest southeast extent of the proposed grid connection, comprising young to semi-mature Scots pine (*Pinus sylvestris*), pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) and blackthorn (*Prunus spinosa*). There are three trees which overhang the area of the Site boundary but which are not growing within it *per se*.

Part of the line of trees immediately to the southeast of the siting of the solar arrays contains a small 'wildlife area' which currently contains two invertebrate hotels.

Hedgerows and lines of trees constitute a priority habitat type, and due to the potential of the proposals to enhance the 'wildlife area' within the line of trees, this part of the line of trees has been discussed further, in Section 5.



Plate 3: Line of trees at the southeast limit of the Site's grid connection route. Photograph facing southeast.

4.3 Protected and Notable Species

4.3.1 Roosting and Foraging Bats

None of the trees within the Site's line of trees contained potential bat roosting features. Whilst the 'core' of the Site comprises modified grassland of low intrinsic value for foraging bats, the boundary line of trees does have potential to be used by foraging and commuting bats.

Overall, the Site is assessed as having less than local importance for bats, however, due to the potential of the proposals to improve the Site for roosting, bats have been subject to further assessment.

4.3.2 Badger

No evidence of badger was recorded within the Site, or close to its boundaries, during the ecological walkover survey, and therefore this species does not have scope to be affected and has been omitted from further assessment.

4.3.3 Otter and Water Vole

No evidence of water vole (*Arvicola amphibius*) or otter (*Lutra lutra*) were recorded within the Site, or close to its boundaries, during the ecological walkover survey. The Site also does not contain, or lie immediately proximate, to any watercourses. Therefore, these species have been omitted from further assessment.

4.3.4 Amphibians (including Great Crested Newt)

The Site does not contain any ponds and therefore is incapable of supporting breeding amphibians. No ponds were noted to occur in close proximity to the Site, and therefore this group has been omitted from further assessment.

4.3.5 Reptiles

The Site, comprising a short, grazed modified grassland field, has no appreciable potential to support reptiles in its current form and, as a result, it has been assessed as having less than local importance for reptiles. Therefore, this group has been omitted from further assessment.

4.3.6 Nesting Birds

Bird species recorded on Site during the ecological walkover survey were represented by a limited range of common birds, namely great tit (*Parus major*), long-tailed tit (*Aegithalos caudatus*), goldfinch (*Carduelis carduelis*), robin (*Erithacus rubecula*), wren (*Troglodytes troglodytes*), jackdaw (*Corvus monedula*), pheasant (*Phasianus colchicus*), and collared dove (*Streptopelia decaocto*).

No birds typical of open field habitats, including lapwing (*Vanellus vanellus*) and skylark (*Alauda arvensis*) were recorded on Site during the visit.

Overall, the Site is assessed as having less than local importance for nesting birds, though given their legal protection, and the potential for the proposals to enhance the area for nesting and foraging birds, nesting birds have been subject to further assessment.

4.4 Summary of Important Ecological Receptors

Ecological receptors assessed as having local importance or greater, as well as legally protected species and/or habitats, which could potentially be affected by an unmitigated scheme are summarised in Table 4-2. Certain receptors with less than local importance have also been listed, where specific enhancements have been proposed to benefit them.

Table 4-2 Summary of Important Ecological Features Subject to Detailed Assessment

Important Ecological Receptor	Scale at which Feature is Important	Comments on Legal Status and/ or Importance
Line of trees	Local	Lines of trees constitute a Priority Habitat. Hedgerows and lines of trees have intrinsic value and are likely to act as wildlife corridors.
Bats	Less than Local	European and UK protected species (Habitats Directive and Wildlife and Countryside Act 1981 (as amended)). Proposals include measures designed to improve the Site for roosting bats.
Nesting birds	Less than Local	Whilst the Site has potential to support a limited number of ground-nesting species, such as skylark and lapwing, and passerine species within the boundary line of trees, overall, it does not have scope to support a nesting bird assemblage of importance. Native birds, and the nests, eggs and young of native birds, are protected against killing and injury/ damage and destruction under the Wildlife and Countryside Act 1981 (as amended). Proposals include measures designed to improve the Site for foraging and nesting birds.

5.0 Assessment of Effects, including Mitigation Measures and Proposed Biodiversity Enhancements

5.1 Embedded Mitigation and Best Practice

The following 'embedded mitigation' has been incorporated to avoid or minimise negative ecological effects:

- Retention of trees - The digging of a trench will pass between the trees with no trees due to be removed;
- Retention of turf - The overlying turf layer above the proposed grid connection route will be carefully removed and placed to one side whilst the trench is being dug in which to place the cables; the turf will be replaced once the trench has been backfilled. This will retain the existing grassland and allow any impacted areas to re-establish quickly; and
- The Site will remain unfenced to access for wildlife.

Habitat enhancement measures shall involve native scrub understory planting and the erection of bird and bat boxes on trees.

The following precautionary 'best practice' measures shall be adopted during installation works:

- Trenches should, if possible, be back-filled the same day. If this is not feasible, any trenches/ excavations left open overnight shall be provided with a *circa* 45° sloping end or ramp to provide fauna that may fall in a means of escape; and
- Any open pipes over 120mm in diameter shall be capped off at night to prevent fauna from entering.

Taking the above into account, the potential impacts of the proposed installation are outlined in the following sections.

5.2 Habitats

The existing grassland on-Site will be retained and, given that the Site shall remain unfenced, the current management of sheep grazing will continue.

The 'wildlife area' within the line of trees immediately southeast of the Site, shall be enhanced with the planting of shade tolerant, berry rich understory shrub species as specified in Table 5-1, which will strengthen this habitat and provide foraging opportunities for birds.

The proposed understory planting area is separated from the sheep grazed field by existing fencing, which will protect the saplings from damage by sheep.

Table 5-1: Understory planting species composition

Understory planting species composition	
Total of 10 plants with no more than three of one species to ensure diversity.	
<ul style="list-style-type: none">• Holly (<i>Ilex aquifolium</i>)• Yew (<i>Taxus baccata</i>)• Blackthorn (<i>Prunus spinosa</i>)	<ul style="list-style-type: none">• Hawthorn (<i>Crataegus monogyna</i>)• Guelder rose (<i>Viburnum opulus</i>)

Overall, the net impact upon the existing habitats is predicted to be positive, with a minor enhancement to the line of trees, due to the understory planting.

5.3 Species

5.3.1 Roosting and Foraging Bats

Two bat boxes (Table 5-1) shall be erected within the belt of trees to the northeast of the Site.

Overall, the net impact upon roosting bats is predicted to be slightly positive.

Table 5-1: Bat box specification

Bat box	Mounting Instructions
<p>2 x Large Multi Chamber WoodStone Bat Box (or similar)</p>  <p>Available from https://www.nhbs.com/large-multi-chamber-woodstone-bat-box</p>	<ul style="list-style-type: none"> • Attached to sufficiently wide tree trunk or pole so that it doesn't swing or rotate excessively in the wind; • On south, southeast or southwest facing aspects <u>only</u>; • As high as possible, at a minimum height of 3m; and • With a clear flight path in front of the box.

5.3.2 Nesting Birds

Two bird boxes (Tables 5-2) shall be erected on trees within the small 'wildlife area', located in the line of trees to the southeast of the Site. This area will be further enhanced for nesting and foraging birds, through the planting of berry rich understory shrubs, as previously described. One of the boxes shall be a deep nesting box, which is ideal for robin and wren, and one shall be a 32mm hole fronted box, ideal for great tit, to suit species recorded at the Site.

To avoid the potential killing/ injury of birds and damage/ destruction of their nests, vegetation removal work shall take place outside of the main bird breeding season (which broadly extends between March and August inclusive) or immediately following a search for active nests undertaken by a suitably qualified ecologist.

Overall, the net impact upon nesting birds is predicted to be slightly positive.

Table 5-2: Integrated bird box specification

Bat box	Mounting Instructions
<p>1 x 1B Schwegler Nest Box (32mm Hole) (or similar)</p>  <p>Available from https://www.nhbs.com/1b-schwegler-nest-box in a brown or green finish</p>	<ul style="list-style-type: none"> • Attached to sufficiently wide tree trunk or pole so that it doesn't swing or rotate excessively in the wind; • On east, southeast, or northeast facing aspects <u>only</u>; • As high as possible, at a minimum height of 3m (minimum of 2m if in a fenced off area which cannot be disturbed by people or livestock); and • With a clear flight path in front of the box.
<p>1 x 1N Schwegler Deep Nest Box (or similar)</p>  <p>Available from https://www.nhbs.com/1n-schwegler-deep-nest-box</p>	<ul style="list-style-type: none"> • Attached to sufficiently wide tree trunk or pole so that it doesn't swing or rotate excessively in the wind; • On east, southeast, or northeast facing aspects <u>only</u>; • As high as possible, at a minimum height of 3m (minimum of 2m if in a fenced off area which cannot be disturbed by people or livestock); and • With a clear flight path in front of the box.

6.0 Summary of Ecological Effects

The overall net impact of the scheme upon receptors of ecological importance, and those of less than local importance which are due to benefit from the proposals, is illustrated in Table 6.1 below, along with the precautions that will be taken to ensure legal compliance with respect to legally protected species.

Table 6-1: Net Impact Upon Important Ecological Features (including Site Enhancement)

Important Ecological Receptor	Scale at which Feature is Important	Overall Net Impact
Line of trees	Local	Strengthening of 'wildlife area' which forms part of the line of trees. Minor positive impact.
Bats	Less than Local	Installation of bat boxes shall enhance the Site for roosting bats. Minor positive impact at less than local level.
Nesting birds	Less than Local	Installation of bird boxes and the planting of berry rich woodland understory within the 'wildlife area' shall enhance the Site for a range of foraging and nesting birds. Minor positive impact at less than local level. To avoid the potential killing/ injury of birds and damage/ destruction of their nests, vegetation removal work shall take place outside of the main bird breeding season (which broadly extends between March and August inclusive) or immediately following a search for active nests undertaken by a suitably qualified ecologist.

DRAWING 1

UK Habitat Survey Results

424.064751.00001 Millhouse Green Solar UK Habitat Classification



NOTES

Basemap provided by client. Drawing ref. Site Plan

LEGEND

Site Boundary

UK Habitat Classification

g4, 14 - modified grassland, scattered rushes

w1g6 - line of trees

u1 - built-up areas and gardens

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DRAWING 1

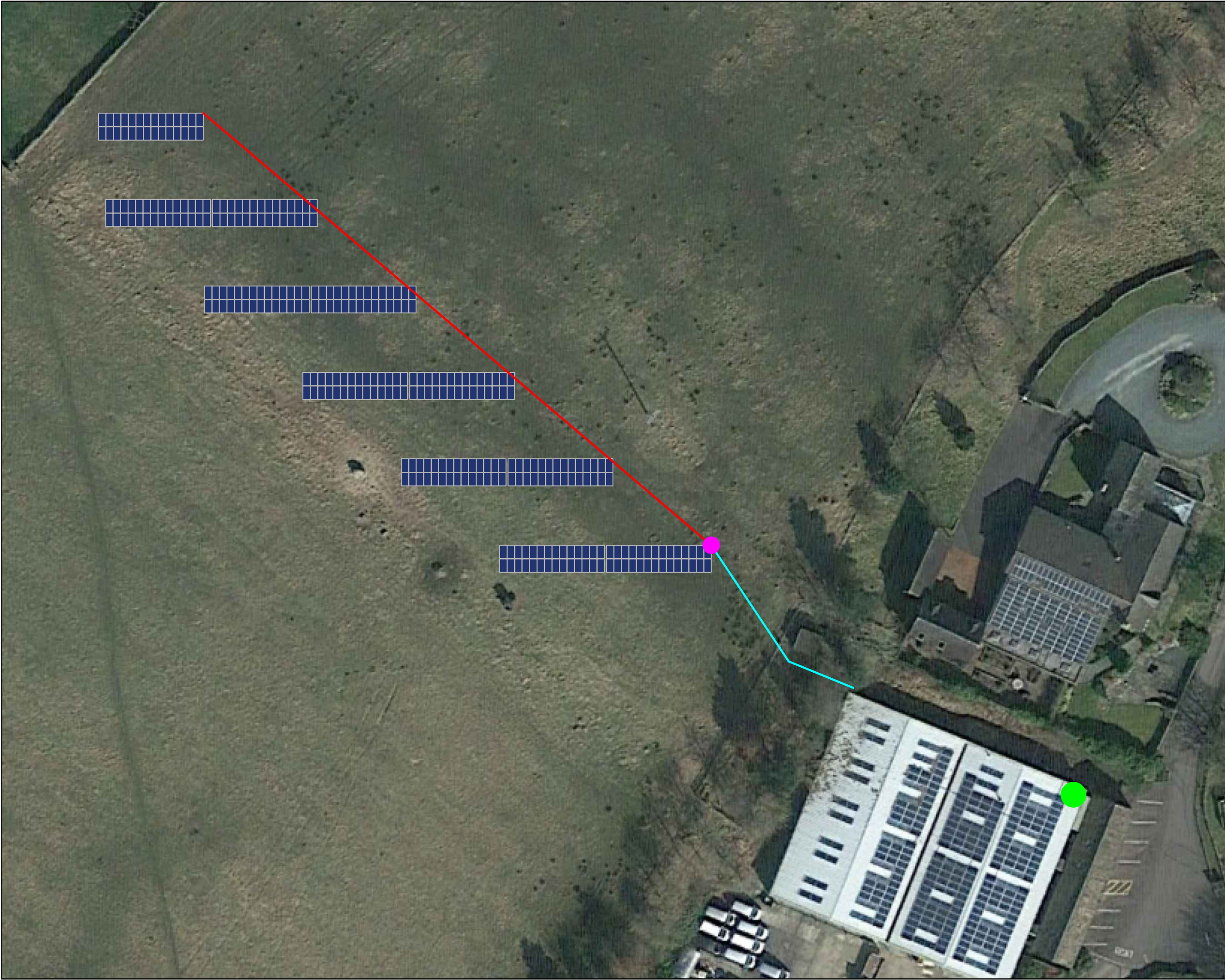
Scale1:600 @ A4

DateFEBRUARY 2023

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APPENDIX 1

Proposed Site Layout



PROJECT NOTES

Height to Panels: 600 mm
Panel Pitch: 25°

● Point of Connection
● Inverter Location
— AC Trench
— DC Trench

0 5 10m

REV	DATE	COMMENTS	BY
1	13/12/2022	Initial Layout	MP
2	-	-	-
3	-	-	-
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-

Total Install Capacity:
308 x 455W = 140.14kWp

SYSTEM INFORMATION

Equipment	Manufacturer	Model
Module	JA	JAM72S20 455/MR
Inverter	Huawei	1 x 100KTL 1 x 20KTL
Mounting System	Alumero	Landscape 2.2

Client	Booth Brothers		
Address	Bullhouse Mill House, Lee Lane, Millhouse Green, Penistone, S36 9NN		
Drawing	Equipment Layout		
Drawn by:	MP	Checked by:	DO
Scale	1 : 500 @ A3		
Drawing No:	Q52363_006		
Status	Proposed		

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APPENDIX 2

Site Plan



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