P19-2022

29th September 2022

Gareth Elliott (Planning Development Officer)
Melton Borough Council
Burton Street,
Melton Mowbray,
LE13 1GH.

Dear Gareth Elliott,

Supplementary Environmental Information (SEI) Note for the Full Planning Application for the Construction of a Solar Farm together with all Associated Work, Equipment and Necessary Infrastructure on land within the Belvoir Estate, Grantham, NG32 1PE (Reference: 22/00537/FUL)

1.1. JBM Solar Project 10 Ltd ("the Applicant") submitted an application for Full Planning Application for the Construction of a Solar Farm together with all Associated Work, Equipment and Necessary Infrastructure on land within the Belvoir Estate, Grantham, NG32 1PE ("the Application Site") validated for consideration by Melton Borough Council (MBC) on the 1st April 2022. A request for an EIA Screening Opinion was submitted to MBC in January 2021 determining the proposal constituted an EIA development and would need to be accompanied by an Environmental Impact Assessment. A comprehensive Environmental Statement (ES) report prepared by Pegasus Group accompanied the submitted application (hereafter known as the "2022 ES").

1.2. The submitted planning application is still pending consideration. Following the statutory consultation period, the Applicant, has considered comments provided by the public and statutory consultees and has made modifications to the proposals in response to representations made by third parties and through discussion with the LPA since the planning application was submitted. In particular, this SEI note addresses comments received from Natural England (NE) (correspondence dated 30th May 2022,) in relation to the Muston Meadows Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR). The proposed changes relate primarily to the central- eastern fields of the solar farm with a reduction in solar pv panels through the removal of a field within close proximity to Muston Meadows SSSI/NNR. The modifications to the overall Site layout have been provided by the Applicant voluntarily as opposed to a request for Further Information and Evidence under Regulation 25 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

1.3. The changes to the proposals include:

- removal of 7.63 acreage of solar pv panelled area to the east and red line boundary amended curtailing the boundary edge of reduced area. The entire Site area is now reduced to approximately 99.95ha;
- area proposed for complimentary species and diverse grassland habitat located on land adjacent to Muston Meadows SSSI/NNR has been extended by 0.62ha;
- swale realignment as per the indicative Drainage Strategy submitted in the 2022 ES – (ES Volume 2 Appendix 4.1- Flood Risk Assessment, Appendix C- Proposed Drainage Strategy); and
- minor transport amendments (including internal track arrangements, access, gates and compound) detailed further in the submitted Construction Traffic Management Plan Addendum (August 2022) addressing comments received within the consultation response dated 26th May 2022 provided by Leicestershire County Council highway officers. To note, Transport and Access matters sit outside of the EIA process for this Proposed Development, and therefore are not further detailed within this SEI.

1.4. This Supplementary Environmental Information (SEI) Note to the ES has been prepared considering the following plan:

- P19-2022_10Q Site Layout and Landscape Strategy (hereafter knows as "Revision Q Site Layout and Landscape Strategy").

1.5. A review of the Revision Q Site Layout and Landscape Strategy plan (**Appendix 1**) has been undertaken by the EIA project team and consultants who have contributed to the preparation of the 2022 ES, to determine if any further information is needed to be provided due to scheme amendments, and whether these amendments have altered the reasoned conclusions made on the likely significant effects of the development in the submitted 2022 ES. Within this SEI note, a list of environmental disciplines of which an associated chapter was prepared for the 2022 ES, have provided an update if any material changes to the 2022 ES conclusions have arisen associated with Revision Q Site Layout and Landscape Strategy plan. In addition, a note has been added under chapters where no assessment or update is deemed necessary and therefore scoped out of this SEI Note. Consequently, this document should be read in conjunction with the original 2022 ES. To note, there are no requirements within the EIA Regulations as to the format and content of SEI.

2. Landscape and Visual

2.1. In terms of the visual assessment, there is a direct view of the site at viewpoint 3 experienced by users of byway F85b/4. PRoW receptors at this viewpoint were assessed within the LVIA ES chapter (2022) at year 1 and during construction (temporary) as experiencing a medium magnitude of change, resulting in possible major (significant) effects because of the high sensitivity of the PRoW receptor. By

year 15 and eventual decommissioning, the effects were reduced to moderate with mitigation proposals in place. Despite the redline being pulled back, with the Proposed Development in place, there would still be a noticeable change to the view during construction and at year 1, this is due to the direct and open nature of the view. Therefore, the previously assessed effects during construction, at years 1 and 15, and decommissioning, would remain the same (representing a worst-case scenario).

2.2. Although a Residential Amenity Study was not part of the scope of the ES (202S) and effects from properties were not directly assessed, pulling back the redline and proposed development from Muston is likely to improve any potential effects to visual amenity of residential receptors west of Woolsthorpe Lane.

2.3. No further additional information is required as part of this SEI to support Chapter 2 of the 2022 ES. The conclusions of the Landscape and Visual Chapter remain unaltered.

3. Cultural Heritage and Archaeology

3.1. No additional information is required as part of this SEI to support Chapter 3 of the 2022 ES. The conclusions of the Cultural Heritage and Archaeology Chapter remain unaltered.

4. Flood Risk and Hydrology

4.1. No additional information is required as part of this SEI to support Chapter 4 of the 2022 ES. The conclusions of the Flood Risk and Hydrology Chapter remain unaltered.

5. Ecology

5.1. A Further Information Report accompanied with updated ecology survey reports, Biodiversity Management Plan (BMP), Biodiversity Net Gain (BNG) Metric Spreadsheet and Construction Environment Management Plan (CEMP) has been commissioned in response to comments received from NE (correspondence dated 30th May 2022) in relation to the Muston Meadows SSSI/ NNR. The Further Information Report is found at **Appendix 2**.

5.2. The Further Information Report draws upon baseline data as detailed within the Biodiversity Chapter, which was collected during 2019/2020. Baseline ecological and ornithological conditions remain unchanged and are detailed and illustrated in the Biodiversity Chapter, associated technical appendices and figures. Findings within this Report are considered to be the same as the Biodiversity Chapter for both construction and operation, except for the following receptors:

Statutory Designated Sites

5.3. A buffer zone of between 11.2m and 19.5m will be adopted between the adjacent Muston Meadows SSSI/NNR and the perimeter fence of the Site. Construction of the solar panels themselves are sited further away still, between 14.5m and 27.2m. The development will have no direct impacts on any statutory designated site and indirect effects such as dust creation etc. are discussed in more detail within the CEMP. Potential effects upon the Muston Meadows SSSI/NNR as a result of construction of the Proposed Development will therefore be **negligible** and **not significant** and which is unchanged from the original conclusions of the Biodiversity Chapter within the 2022 ES.

5.4. Habitat enhancement measures within the Site, including creation of grassland adjacent to Muston Meadows, either through natural regeneration and/or using green hay/seed from a donor site will complement the statutory designated site and potentially expand the range of the locally important Green Winged Orchid. In addition, new ponds/wet scrapes as well as the installation of log piles, insect hotels and hibernacula could benefit populations of GCN present within Muston Meadows. The cessation of agricultural practices through the creation of a relatively undisturbed grassland could also be of benefit in the wider landscape. As a result, it is considered that the operation of the solar farm will have a **minor positive** effect on statutory designated sites, and which is unchanged from the original conclusions of the Biodiversity Chapter within the 2022 ES.

Amphibians

5.5. Three dry ponds are present within the Site and a GCN eDNA survey of pond P2 in the wider area returned a negative result. However, GCN are listed within the citation of Muston Meadows SSSI, and they are therefore considered to be present in the wider area. Construction phase effects (in the absence of suitable mitigation measures) may occur as a result of inadvertent killing or injury to individual GCN, if present in terrestrial habitat, within the working zone. The risk of this occurring is considered to be low, as the works will be temporary and are almost entirely confined to habitat of limited value to GCN (arable with limited foraging or refuge opportunities), with more favourable habitat that GCN are more likely to utilise (field boundary features etc.) largely retained and protected with buffer zones. However, sections of hedgerows and field margins will be impacted by the works, which have greater value. As a precaution, works will proceed under RAMs, which will ensure the protection of individual GCN which may be potentially using the Site and ensure legislative compliance. It is therefore considered that construction of the development will result in **negligible** magnitude impact on a receptor of Local value which would have a **negligibl**e effect on local populations of this species and is **not significant** and this is unchanged from the conclusions of the Biodiversity Chapter on the 2022 ES.

5.5.1. During the operational phase there would be no additional habitat loss (and hence loss of potential terrestrial foraging or shelter) over and above that assessed and

discussed under Construction Effects in the Further Information Report. New grassland, pond/wet scrape and hedgerow habitat as well as hibernacula, insect hotels and log piles, once established, will provide enhanced habitats which will be suitable for amphibians, if present. In particular, GCN will benefit from enhanced potential breeding, refuge, foraging and dispersal opportunities across the Site, compared to existing agricultural land. As a result, operational effects of the Proposed Development on reptiles and amphibians such as GCN including the population within SSSI/NNR, once new planting and habitat creation has established they are assessed to result in a **low positive** magnitude impact and a **minor positive** effect which is **not significant**, and which is unchanged from the original conclusions of the Biodiversity Chapter within the 2022 ES.

Biodiversity Net Gain

5.6. The Defra Metric 3.1 has been used to calculate biodiversity net gain (BNG) for the Site and which demonstrates that the Proposed Development will result in a significant BNG with +142.30% for habitats and +10.24% for hedgerows. BNG will be achieved through the proposed landscape and planting and habitat creation as set out in Revision Q Site Layout and Landscape Strategy, along with long term management as part of the BMP. Further enhancements that cannot be quantified through the Metric include new bat and bird boxes, refuge features, hibernacula, insect hotels, beehives and log piles.

6. Glint and Glare

6.1. No additional information is required at part of this SEI to support Chapter 6 of the 2022 ES. The conclusions of the Glint and Glare Chapter remain unaltered.

7. Noise

7.1. No additional information is required at part of this SEI to support Chapter 7 of the 2022 ES. The conclusions of the Noise Chapter remain unaltered.

8. Agricultural Resources

8.1. No additional information is required at part of this SEI to support Chapter 8 of the 2022 ES. The conclusions of the Agricultural Resources Chapter remain unaltered.

8.2. In conclusion, this SEI Note provides an update to the 2022 ES after modifications have been made to the proposals in response to consultation feedback during the determination period of the live planning application. This SEI note includes a revised Site Layout and Landscape Strategy (Revision Q), and update to the Ecology ES chapter addressing changes made to the proposal and Natural England consultation

comments. All other ES chapters require no further additional information and the text within the 2022 ES remains accurate.

8.3. Overall, this SEI demonstrated that there are no overriding environmental constraints which would preclude the Proposed Development. The design of the Proposed Development has taken account of the likely significant environmental effects and where necessary, mitigation measures form an integral part of the Proposed Development to ensure that the environment is suitably protected.

Yours sincerely,

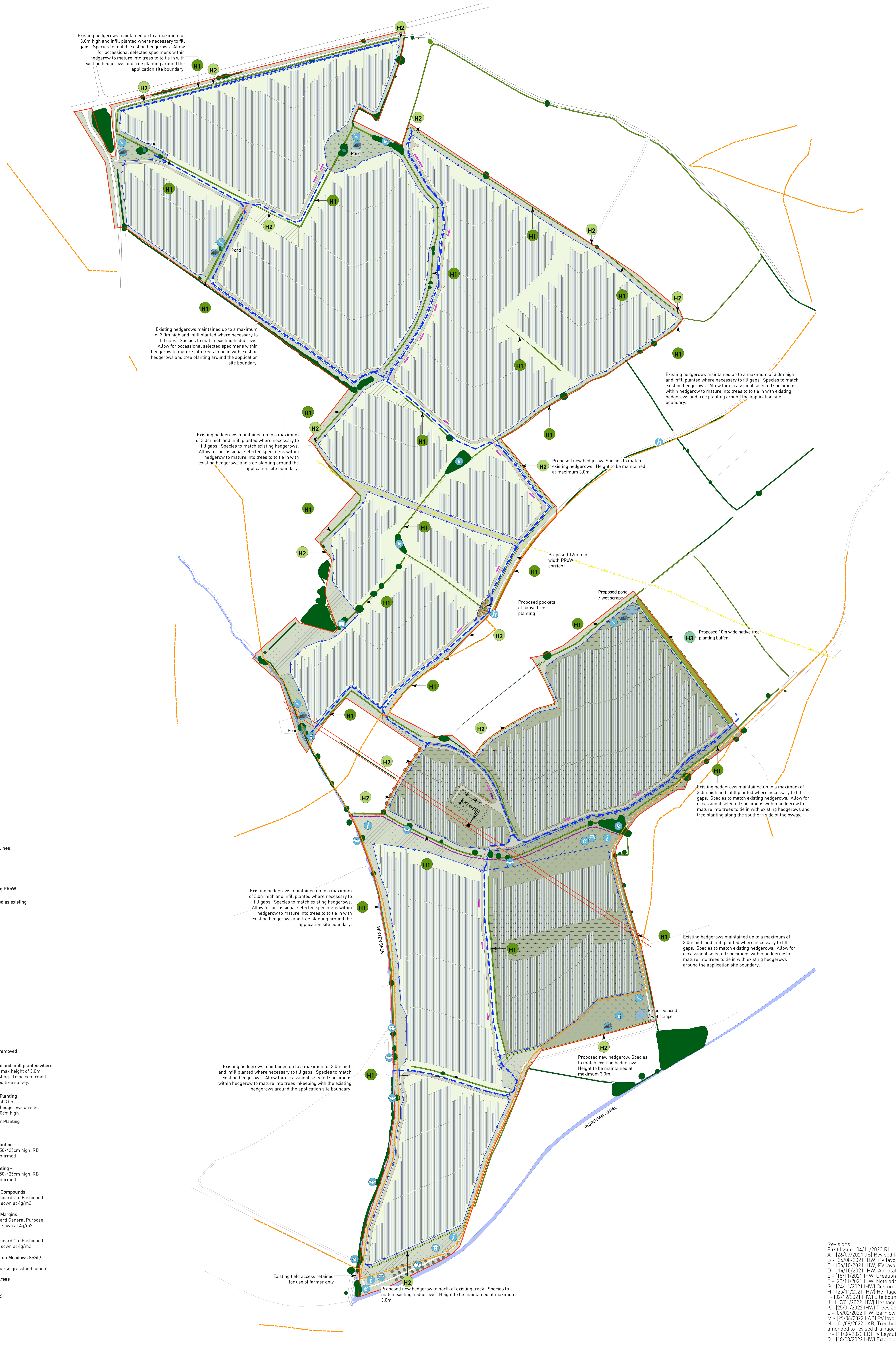
Hannah Tidd

Environmental Planner
hannah.tidd@pegasusgroup.co.uk

Enc:

- Appendix 1: Revision Q Site Layout and Landscape Strategy;
- Appendix 2: Ecology- Further Information Report;

Appendix 1: Revision Q Site Layout and Landscape Strategy



KEY

CONSTRAINTS

- Site Boundary
- Existing Overhead Power Lines
- Existing Gas Line
- Public Right of Way
- Permissive footpath linking PRoW
- Existing vegetation retained as existing

HARD LANDSCAPE PROPOSALS

- Security Fence
- Temporary Compound
- Solar Panel Modules
- Access Road
- Inverter
- Spare Containers
- Customer Switchgear

SOFT LANDSCAPE PROPOSALS

- Swales
- Existing hedgerows to be removed
- H1 **Existing hedgerow retained and infill planted where necessary** - maintained at max height of 3.0m. Infill species to match existing. To be confirmed following receipt of detailed tree survey.
- H2 **Proposed New Hedgerow Planting** Maintained at max height of 3.0m. Species to match existing hedgerows on site. BR Transplant stock, 60-80cm high
- H3 **Proposed Native Tree Buffer Planting**
- **Proposed Orchard Tree Planting -** 12-14, Heavy Standards, 350-425cm high, RB. Proposed species to be confirmed
- **Proposed Native Tree Planting -** 12-14, Heavy Standards, 350-425cm high, RB. Proposed species to be confirmed
- **Grazing Seed Mix to Panel Compounds** e.g. Emorsgate EG26 – Standard Old Fashioned Grazing Mixture or similar sown at 4g/m2
- **Meadow Seed Mix to Field Margins** e.g. Emorsgate EM2 Standard General Purpose Meadow Mixture or similar sown at 4g/m2
- **Tussocky Grass Mix** e.g. Emorsgate EG26 – Standard Old Fashioned Grazing Mixture or similar sown at 4g/m2
- **Grassland adjacent to Muston Meadows SSSI / NNR** Complimentary species diverse grassland habitat
- **Suitable Skylark Nesting Areas**

ECOLOGICAL ENHANCEMENT PROPOSALS

- Bird Boxes
- Bat Boxes
- Barn Owl Boxes
- Hibernaculas
- Log Piles
- Heritage Interpretation Boards
- Information Boards
- Insect Hotels
- Education Areas
- Picnic Areas
- Community Orchard
- Beehives
- Existing and proposed ponds/wet scrapes

Revisions:
First Issue- 04/11/2020 RL
A - (26/03/2021 JS) Revised layout and planting
B - (26/08/2021 IHW) PV layout updated, tree belt added to eastern boundary
C - (06/10/2021 IHW) PV layout updated, ecological enhancements added
D - (14/10/2021 IHW) Annotations amended following review
E - (18/11/2021 IHW) Creation of 12m min width PRoW corridor along central parcel
F - (23/11/2021 IHW) Note added to southern access point
G - (24/11/2021 IHW) Customer Switchgear and Spare Containers indicated
H - (25/11/2021 IHW) Heritage Interpretation Boards added
I - (02/12/2021 IHW) Site boundary corrected
J - (17/01/2022 IHW) Heritage Interpretation Boards relocated
K - (25/01/2022 IHW) Trees added to proposed hedgerow adjacent to substation
L - (04/02/2022 IHW) Barn owl boxes added
M - (29/06/2022 LAB) PV layout updated
N - (01/08/2022 LAB) Tree belt added, red line amended to eastern boundary and layout amended to revised drainage
P - (11/08/2022 LD) PV Layout updated
Q - (18/08/2022 IHW) Extent of grasslands amended

Site Layout & Landscape Strategy
Belvoir Estate Solar Farm

Client: JBM Solar Projects Ltd

DRWG No: **P19-2022_10** REV: **Q**

Drawn by : LD Approved by: IHW

Date: 18/08/2022

Scale: 1:2500 @ A0

Pegasus Design

DESIGN | ENVIRONMENT | PLANNING | ECONOMICS | HERITAGE

Appendix 2: Ecology- Further Information Report

Belvoir Solar Farm

on behalf of JBM Solar Project 10 Ltd.

Further Information Report

avian ecology

Document Control				
Project Name:	Belvoir Solar Farm			
Project Number:	Pegas-075-1270			
Report Title:	Further Information Report			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
V1	09/09/2022	Draft	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*
V2	20/09/2022	Final	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*

CONTENTS

Appendix 5.6: Great Crested Newt Presence /Absence eDNA Report

Appendix 5.7: Biodiversity Management Plan

Appendix 5.8: Biodiversity Net Gain Metric Spreadsheet

Appendix 5.9: Construction Environment Management Plan

1 INTRODUCTION

1.1.1 Avian Ecology Ltd. was commissioned in 2020 by JBM Solar Projects 10 Ltd. to undertake baseline ecological and ornithological studies and impact assessment in relation to the Belvoir Solar Farm application (the Proposed Development submitted to Leicestershire County Council (Planning Ref. 22/00537/FUL) and presented within Chapter 5: 'Biodiversity' (the 'Biodiversity Chapter') of the Belvoir Solar Farm Environmental Statement.

1.1.2 The Biodiversity Chapter was informed by the following baseline studies; a desk study, an extended phase 1 habitat survey, preliminary bat roost (PRA) survey, great crested newt (GCN) *Triturus cristatus* environmental-DNA (eDNA) surveys, breeding bird survey, wintering bird surveys, badger *Meles meles* survey. A biodiversity net gain (BNG) calculation was also undertaken for the Proposed Development and presented as part of the Biodiversity Chapter.

1.1.3 Since submission to planning, the Site layout and landscape plan have been updated to remove approximately 3ha of solar panels in the east of the Site, in response to consultation with Bottesford Parish Council, and as shown on the updated **Site Layout and Landscape Plan; P19-2022-10_Q** (dated 18th August 2022).

1.1.4 This Further Information Report, has subsequently been prepared in response to these updates and and to reflect comments received from Natural England (NE) (correspondence dated 30th May 2022, NE Ref. 392576; **Annex A**) in relation to the Muston Meadows Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR).

2 BASELINE CONDITIONS

2.1.1 The Report draws upon baseline data as detailed within the Biodiversity Chapter, which was collected during 2019/2020. Baseline ecological and ornithological conditions remain unchanged and are detailed and illustrated in the Biodiversity Chapter, associated technical appendices and figures.

2.1.2 Methodologies for the surveys and Biodiversity Chapter, are set out within the Appendices of this Report and section 5.2 of the Biodiversity Chapter. Zones of Influence also remain the same to those within the Biodiversity Chapter, section 5.3.

2.1.3 The following sections and updated technical appendices, are however provided to summarise and reflect changes in the Site boundary and Proposed Development layout:

- Statutory Designated Sites for Nature Conservation;
- Great Crested Newt (Amphibians);
- Biodiversity Net Gain;
- Appendix 5.2: Habitats and Species Baseline Report;
- Appendix 5.3: Winter Bird Survey Report;
- Appendix 5.4: Breeding Bird Survey Report;
- Appendix 5.5: Confidential Badger Report;
- Appendix 5.6: Great Crested Newt Presence/Absence eDNA Report;
- Appendix 5.7: Biodiversity Management Plan;

- Appendix 5.8: Biodiversity Net Gain Metric Spreadsheet; and,
- Appendix 5.9: Construction Environment Management Plan.

2.2 Designated Sites for Nature Conservation

2.2.1 Designated sites remain unchanged from those described within the Biodiversity Chapter.

2.3 Habitats

2.3.1 The amended Proposed Development layout has reduced the Site area, with the removal of approximately 3ha of arable field along the eastern boundary. Field boundary features such as hedgerows, a dry ditch and scattered trees as well as pond P2, in this area will no longer be impacted by the work as they are now situated outside of the Site boundary.

2.3.2 No other habitats will be affected by the amended Proposed Development layout.

2.4 Protected and Notable Species

2.4.1 The baseline information regarding species has been updated and is presented within Appendices 5.1 to 5.9, to reflect changes in the Site boundary and Proposed Development Layout.

2.4.2 No additional protected and/or notable species will be affected by the proposed development.

3 UPDATED ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

3.1.1 The Biodiversity Chapter provides an assessment of potential effects from the Proposed Development upon ecological and ornithological features. The conclusions of the assessment presented within the Biodiversity Chapter are unchanged following an update to the Site boundary and layout of the Proposed Development and no significant effects upon any ecological or ornithological feature will occur.

3.1.2 Clarity is however provided on the following features and in response to the consultation response received from Natural England;

- Statutory Designated Sites for Nature Conservation; and
- Great crested newt.

3.1.3 On the basis of a change in the Site boundary and layout Biodiversity Net Gain assessment for the Proposed Development has also been updated. This is presented in Appendix 5.8 and summarised in Section 3.4.

3.2 Statutory Designated Sites for Nature Conservation

3.2.1 The Muston Meadows Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR) are located immediately adjacent to the east of the Site as shown on **Figure 5.2.2** in **Appendix 5.2**. These sites are both designated for their neutral clay grassland habitat interests, including large populations of green winged orchids *Orchis morio*. Great crested newts *Triturus cristatus* are also noted as being present in ponds within the statutory designated sites.

Construction

3.2.2 During construction, perimeter fencing will be erected to maintain a buffer of between 11.2m and 19.5m from the Site and the Muston Meadows SSSI/NNR. In addition, solar panel construction will be set back further, between 14.5m and 27.2m, as shown on **Figure A,** which shows these measurements in relation to the Site Layout and Landscape Plan.

3.2.3 This will ensure habitats within the SSSI/NNR will not be directly impacted by the construction of the Proposed Development.

Figure A. Buffer measurements, adjacent to Muston Meadows SSSI/NNR.

3.2.4 Indirect effects, such as temporary dust creation and pollution events are assessed within the Biodiversity Chapter, together with outline pollution control measures. These measures are further detailed within Appendix 5.9: Construction and Environmental Management Plan (CEMP), and which will ensure no indirect effects on nearby designated sites.

3.2.5 Potential effects upon the Muston Meadows SSSI/NNR as a result of construction of the Proposed Development will therefore be **negligible** and **not significant** and which is unchanged from the conclusions of the Biodiversity Chapter.

Operation

3.2.6 In response to comments received from NE (Annex A), the areas adjacent to the SSSI/NNR, including two new fields to the north, will either be left to naturally regenerate over time or if possible, these areas be lain with green hay or seeds provided from nearby donor sites within the SSSI. This will encourage the development of habitats with local provenance. However, the provision of green hay or seeds depends upon their availability and will be subject to further consultation with landowners/managers/NE.

3.2.7 Management for these adjacent areas as well as the remainder of the Site is set out within the Biodiversity Management Plan (BMP) and includes measures such as low intensity sheep grazing.

3.2.8 The solar farm will be relatively undisturbed except for the occasional maintenance visit. Day to day management practices, such as cleaning of the solar panels are discussed within the CEMP (Appendix 5.9, and which will ensure no indirect effects on the Muston Meadows SSSI/NNR.

3.2.9 Over time and with natural regeneration, it is considered that the grassland adjacent to Muston Meadows SSSI/NNR will develop into neutral grassland with the potential for colonisation of green winged orchids and use by GCN.

3.2.10 As a result, it is considered that the operation of the solar farm will have a **minor positive** effect on statutory designated sites.

Decommissioning

3.2.11 The assessment conclusions presented within the Biodiversity Chapter in relation to the decommissioning of the Proposed Development, are unchanged.

3.3 Great Crested Newt

3.3.1 The Site is considered to be largely unsuitable for GCN (and other amphibians) with suitable habitats restricted only to hedgerow bases and associated field margins. Ponds within the Site were found to be dry during surveys and therefore considered to be permanently dry. A GCN survey of one pond, P2 in the wider area found GCN to be likely absent, however GCN are noted within the citation, as being present in ponds within the adjacent Muston Meadows SSSI/NNR.

Construction

3.3.2 Construction phase effects (in the absence of suitable mitigation measures) may occur as a result of inadvertent killing or injury to individual GCN if present in terrestrial habitat within the working zone. The risk of this occurring is considered to be low, as the works will be temporary and are almost entirely confined to habitat of limited value to GCN (arable with limited foraging or refuge opportunities), with more favourable habitat that GCN are more likely to utilise (field boundary features etc.) largely retained and protected with buffer zones.

3.3.3 The risk of direct impacts on individual animals or indirectly through habitat loss or disturbance affecting individuals or the local population through displacement or loss of habitat for foraging or shelter is considered to be limited as a result. No long term habitat severance or fragmentation effects will occur during the (temporary) construction phase that could adversely affect the favourable conservation status of local GCN populations including Muston Meadows SSSI/NNR population.

3.3.4 The potential for short-term disturbance or inadvertent harm to individual animals during the construction phase has been considered, in particular where works occur in proximity to the SSSI/NNR and ponds in the wider area that were not surveyed. The risk is however assessed to be low, when taking into account the following:

- The construction lies within agriculturally managed land of negligible/low value to GCN who favour higher suitability habitat located outside the Proposed Development footprint;
- As a precaution, works within higher value habitat (hedgerow removal and field margins) will be carried out under a Reasonable Avoidance Measures Method Statement (RAMS) presented within the CEMP (Appendix 5.9) to ensure that any individual GCN which may be present within the Site will be protected during construction works; and,
- No ponds will be lost or damaged as a result of the construction and operation of the Proposed Development.

3.3.5 Potential effects therefore relate to groundworks within a defined short time period, within areas of negligible/low value to GCN. With the implementation of the RAMS the construction of the Proposed Development is therefore not considered to have the potential for adverse effects on the favourable conservation status of local GCN populations including Muston Meadows SSSI/NNR population.

3.3.6 It is therefore considered that construction of the development will result in **negligible** magnitude impact on a receptor of **Local** value which would have a **negligible** effect on local populations of this species and is **not significant** and this is unchanged from the conclusions of the Biodiversity Chapter.

Operational

3.3.7 During the operational phase there would be no additional habitat loss (and hence loss of potential terrestrial foraging or shelter) over and above that assessed and discussed under Construction Effects. Total land take for solar farm developments is typically low (less than 5% footprint on the ground). The operation phase will have no habitat loss effects on neighbouring habitats and any amphibian populations they may support. There will be no operational effects on off-site ponds in the wider area.

3.3.8 New grassland, pond/wet scrape and hedgerow habitat as well as hibernacula, insect hotels and log piles, once established, will provide enhanced habitats which will be suitable for amphibians, if present. In particular, GCN will benefit from enhanced potential breeding, refuge, foraging and dispersal opportunities across the Site, compared to existing agricultural land.

3.3.9 Habitats on Site will be managed throughout the operational life of the Proposed Development to maintain their habitat interest (i.e to maintain botanically diverse grassland and hedgerows) in accordance with the BMP.

3.3.10 As a result, operational effects of the Proposed Development on reptiles and amphibians such as GCN including the population within SSSI/NNR, once new planting and habitat creation has established are assessed to result in a **low positive** magnitude impact and a **minor positive** effect which is **not significant.**

3.3.11 Solar farms operate with little intervention of disturbance required, limited to occasional maintenance visits.

3.3.12 Indirect impacts on GCN from maintenance visits such as panel cleaning is discussed in detail within the CEMP (**Appendix 5.9**). The ecological impacts of cleaning and other maintenance visits are considered to be **negligible** and **not significant** and likely to be less disruptive than ongoing normal farming operations.

Decommissioning

3.3.13 The assessment conclusions presented within the Biodiversity Chapter in relation to the decommissioning of the Proposed Development, are unchanged.

3.4 Biodiversity Net Gain

3.4.1 A Biodiversity Net Gain (BNG) Assessment has been undertaken for the Proposed Development and was presented as part of the Biodiversity Chapter (**Section 5.6**). The assessment considers land take, habitat creation and any biodiversity enhancements that will accompany the Proposed Development and is assessed using the Defra Metric Biodiversity Net Gain Calculator (version 3.1)[1]. The assessment

[1] http://publications.naturalengland.org.uk/publication/6049804846366720

adopts precautionary assumptions in relation to build area, cropping and grassland quality, and which demonstrates an overall net gain in biodiversity units.

3.4.2 The assessment has been updated to reflect the change in Site boundary and Proposed Development layout. The assessment is presented in Appendix 5.8 and summarised below.

3.4.3 BNG will be achieved through the proposed landscape and planting and habitat creation as set out in the Landscape Strategy, along with long term management as part of the BMP. Further enhancements that cannot be quantified through the Metric include new bat and bird boxes, refuge features, hibernacula, insect hotels, bee hives and log piles.

Area Habitats

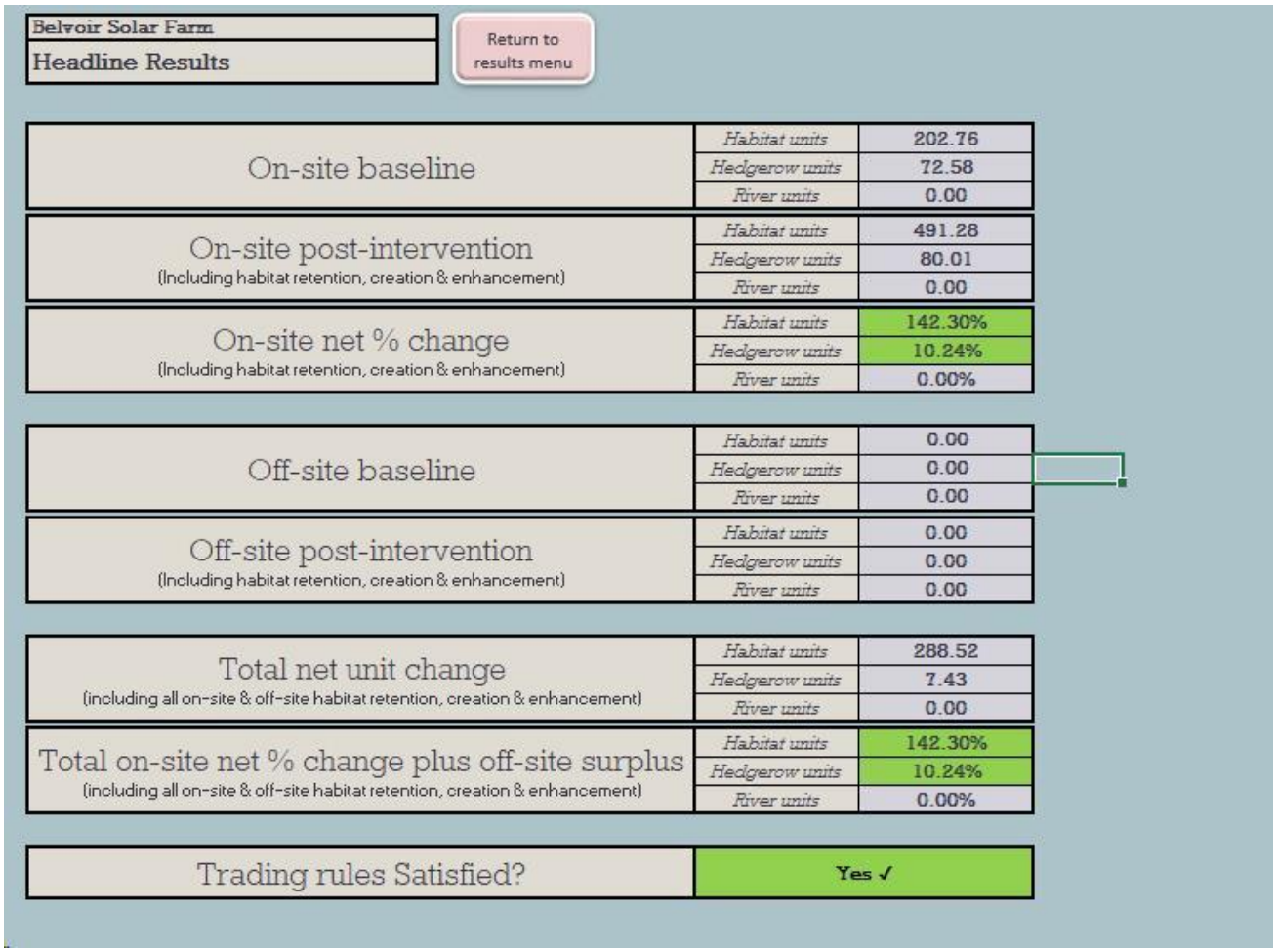
3.4.4 The Application Site total 99.95ha, the majority of which consists of arable cropland. Small areas of land include broadleaved woodland and tall ruderal habitats, making up 0.29ha and 0.3ha, respectively. Ponds within the Site make up an additional 0.01ha. Baseline habitats within the Site total 202.76 biodiversity units.

3.4.5 Broadleaf woodland and ponds, totaling 2.4 biodiversity units, will be retained throughout the construction and operation of the Proposed Development, resulting in a total loss of 200.36 biodiversity units.

3.4.6 Habitat creation will include the sowing of grassland, of which 59.42ha will be under the solar panels, 10.93ha species diverse meadow planting and 24.74ha of natural regeneration/hay grassland adjacent to the SSSI/NNR and which totals 487.47 biodiversity units.

3.4.7 Woodland screen planting and pond creation will result in a further 0.94 biodiversity units and 0.47 biodiversity units, respectively.

3.4.8 Habitat creation as part of the Proposed Development will therefore result in a total of 488.88 units and a significant BNG of +142.30% in habitat units.



Belvoir Solar Farm Headline Results	Return to results menu	
On-site baseline	*Habitat units*	202.76
	Hedgerow units	72.58
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	491.28
	Hedgerow units	80.01
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	142.30%
	Hedgerow units	10.24%
	River units	0.00%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	288.52
	Hedgerow units	7.43
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	142.30%
	Hedgerow units	10.24%
	River units	0.00%
Trading rules Satisfied?	Yes ✓	

Figure B. Headline Results of Metric 3.1

4 SUMMARY

4.1.1 The change of the Site boundary, to reduce the size of the Site as well as comments from Natural England have been addressed herein.

4.1.2 Findings within this Report are considered to be the same as the Biodiversity Chapter for both construction and operation, except for the following receptors:

- Statutory Designated Sites;
- Amphibians; and
- Biodiversity Net Gain.

Statutory Designated Sites

4.1.3 A buffer zone of between 11.2m and 19.5m will be adopted between the adjacent Muston Meadows SSSI/NNR and the perimeter fence of the Site. Construction of the solar panels themselves are sited further still, between 14.5m and 27.2m. The development will have no direct impacts on any statutory designated site and indirect effects such as dust creation etc are discussed in more detail within the CEMP.

4.1.4 Habitat enhancement measures within the Site, including creation of grassland adjacent to Muston Meadows, either through natural regeneration and/or using green hay/seed from a donor site will

complement the statutory designated site and potentially expand the range of the locally important green winged orchid. In addition, new ponds/wet scrapes as well as the installation of log piles, insect hotels and hibernacula could benefit populations of GCN present within Muston Meadows. The cessation of agricultural practices through the creation of a relatively undisturbed grassland could also be of benefit in the wider landscape.

Amphibians

4.1.5 Three dry ponds are present within the Site and a GCN eDNA survey of pond P2 in the wider area returned a negative result. However, GCN are listed within the citation of Muston Meadows SSSI and they are therefore considered to be present in the wider area.

4.1.6 Works are concentrated within habitats which are largely unsuitable for GCN, such as arable. However, sections of hedgerows and field margins will be impacted by the works, which have greater value. As a precaution, works will proceed under RAMs, which will ensure the protection of individual GCN which may be potentially using the Site and ensure legislative compliance.

4.1.7 Habitat enhancement upon completion, including the creation of new ponds/wet scrapes, species diverse grassland, log piles, insect hotels and hibernacula will benefit any GCN populations that may be present.

Biodiversity Net Gain

4.1.8 The Defra Metric 3.1 has been used to calculate biodiversity net gain for the Site and which demonstrates that the Proposed Development will result in a significant BNG with +142.30% for habitats and +10.24% for hedgerows.

Annex A; Natural England Consultation Response; 30th May 2022

Date: 30 May 2022
Our ref: 392576
Your ref: 22/00537/FUL

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Melton Borough Council

BY EMAIL ONLY

Dear Gareth Elliott

Planning consultation: Construction of a Solar Farm together with associated work, equipment and infrastructure.
Location: Fields OS 6700 6722 And 5200, Muston Lane, Easthorpe

Thank you for your consultation on the above dated 05 May 2022 which was received by Natural England on 05 May 2022.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

SUMMARY OF NATURAL ENGLAND'S ADVICE

NO OBJECTION - SUBJECT TO APPROPRIATE MITIGATION BEING SECURED

We consider that without appropriate mitigation the application could:

- damage or destroy the interest features for which Muston Meadows Site of Special Scientific Interest has been notified.

In order to mitigate these adverse effects and make the development acceptable, the following mitigation measures are required / or the following mitigation options should be secured:

- Additional buffering to the SSSI

Natural England's further advice on designated sites/landscapes and advice on other natural environment issues is set out below.

Further advice on mitigation

Natural England welcome the general consciousness of the SSSI adjacent to the SSSI, however, we consider that a larger 'buffer' area alongside the SSSI should be implemented to ensure no impacts occur to the interest features of the SSSI.

The activities during construction and maintenance of the panels have the potential to cause adverse impacts via dust creation, sediment runoff, pollution events (i.e. oils/fuels). We note the 11m buffer which is described within the EIA, but would want to see a larger buffer area alongside the SSSI, both during construction and for the lifetime of the development.

We would also like to note that the SSSI citation includes GCN as an interest feature, thus, any impacts to the GCN population would constitute an adverse impact to the SSSI. The field margins and edges of the development site may be used as terrestrial habitat by GCN; we believe this further indicates the need for larger buffering alongside the SSSI.

We would like to see a *further* buffer area of at least 10m along the boundary of the SSSI. This buffer area would not only help to prevent any impacts, but would provide a significant benefit for the SSSI. Where the buffer, along with the entirety of the development site, is maintained appropriately, species from the SSSI are likely to establish in these areas and create a high quality extension to the SSSI. In time, this area may be suitable for inclusion in an official extension to the Muston Meadows NNR.

Other advice

In addition, Natural England would advise on the following issues.

Landscape Strategy

Natural England welcome the intention to create high quality grassland/meadow habitats across the development site, and do not consider the current proposals would cause harm to the SSSI. However, we consider this development to provide a rare opportunity to take the route of natural regeneration. We note that the natural regeneration route may give rise to less biodiversity credits through the Biodiversity Metric, however, the development is currently indicating a gain in well over the expected amount; natural regeneration, in the long term, may provide better opportunities for Nature.

The presence of Muston Meadows SSSI adjacent to the site means there is a natural seed source directly adjacent, which, if given the chance, would likely colonise the development site; over time, create high quality species rich habitat akin to the SSSI itself. The Green Winged Orchids present on the SSSI would be unlikely to colonise the development site should it be sown with a plethora of different species; extending the range of the Orchid would be a huge win for local biodiversity.

We note two parcels of the development site have been shown on the landscape masterplan to be ‘Complimentary species diverse grassland habitat’. We are unable to find detail of what this comprises and would like to take this opportunity to state that these areas would be best suited to natural regeneration, due to their proximity to the SSSI. We would also ask that the parcel directly north of the SSSI be included within this ‘Complimentary species diverse grassland habitat’, or better yet, natural regeneration.

Natural England would be happy to organise a meeting with the applicant to discuss the possibility of taking a more natural regeneration route across the site, or just in the adjoining land parcels, to secure the best opportunities for nature. Should the applicant wish to discuss this further, I would be happy for them to get in contact with me.

Biodiversity Management Plan

We have reviewed the Biodiversity Management plan, and once again, do not consider that any harm will come to the SSSI as a result of it, however, we do have the following comments:

- 3.1.1 states security fencing will be erected around the site, we would recommend that this fencing should be permeable by mammals, to prevent cutting off their access to the site; thus enhancing the biodiversity value.
- 4.1.9 states a grazing mix will be sown beneath panels, to be grazed by sheep. We welcome the intention to use low intensity grazing to manage the site, however, we note that Native sheep will graze the natural regeneration of the site; that there is not necessarily a need to seed these areas.
- 4.1.15 states that if there is an abundance of annual or perennial weeds, herbicide will be

used. We would like to not that arable weeds can often be highly beneficial to biodiversity and should not be removed where possible.
- 4.1.25 states that bark will be imported to the site. We note this bark may contain non-native/non-local species and/or pests. We recommend care being taken to ensure an appropriate bark substrate is used, to prevent any such issues.
- 5.1.2 states that small area of bare ground will be tolerated. We welcome this and would like to see small areas of bare ground created where they are not present naturally, to achieve the benefits described.
- 5.1.4 states a number of harmful weeds will be removed. We note that these weeds are still useful for biodiversity. We recognise that where sheep will graze the site this may cause some issues, however, would like to see these species left in situ in the borders and areas which are not being used for grazing.
- 5.2.2 states that all dead wood will be removed. We would like to see deadwood left on the site, as it is very important for biodiversity.
- 6.3 – We would like to welcome the inclusion of contingency measures.

Biodiversity Net Gain

Natural England would like to welcome the use of the Biodiversity Metric 3.0, which showed a clear gain of 15.78% in hedgerow units and 173.38% in habitat units.

Protected Species

For advice on protected species, please see Natural England's Standing Advice.

District Level Licencing for Great Crested Newts

Natural England note that the development lies within an area which has an active District Level Licensing scheme. Where a licence may be required for great crested newt, DLL provides a quicker, simpler licensing approach. Some advantages of the DLL scheme include:

- **Speed**: On average, obtaining a DLL brings a time saving of 77 days compared to mitigation licencing.
- **Simplicity**: DLL does not require extensive on-site survey or mitigation measures by the developer, hence the licencing process is much more streamlined than mitigation licencing.
- **Efficiency of conservation**: 85% of the developer's investment goes directly towards habitat creation/restoration, compared to approximately 16% under mitigation licencing.

Please see this link for further information on how to join a district level licensing scheme to manage great crested newt (GCN) populations if you are developing land in certain parts of England.

Best and Most Versatile Agricultural Land

From the documents accompanying the consultation we consider this application falls outside the scope of the Development Management Procedure Order (as amended) consultation arrangements, as the proposed development would not appear to lead to the loss of over 20 ha 'best and most versatile' (BMV) agricultural land.

For this reason, we do not propose to make any detailed comments in relation to agricultural land quality and soils, although sustainable soil management should aim to minimise risks to the ecosystem services which soils provide, through appropriate site design / masterplan / Green Infrastructure. In addition, impacts to soil are less likely as the solar panels would be secured to the ground by steel piles with limited soil disturbance and could be removed in the future with no permanent loss of agricultural land quality likely to occur, provided the appropriate soil management is employed and the development is undertaken to high standards

Natural England would advise that any grant of planning permission should be made subject to conditions to safeguard soil resources, including the provision of soil resource information in line

with the Defra guidance Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.

Further guidance is available in The British Society of Soil Science Guidance Note Benefitting from Soil Management in Development and Construction which we recommend is followed in order to safeguard soil resources as part of the overall sustainability of the development.

If, however, you consider the proposal has significant implications for further loss of BMV agricultural land, we would be pleased to discuss the matter further.

Further general advice on consideration of protected species and other natural environment issues is provided at Annex A.

Please note that if your authority is minded to grant planning permission contrary to the advice in this letter, you are required under Section 28I (6) of the Wildlife and Countryside Act 1981 (as amended) to notify Natural England of the permission, the terms on which it is proposed to grant it and how, if at all, your authority has taken account of Natural England's advice. You must also allow a further period of 21 days before the operation can commence.

Should the developer wish to discuss the detail of measures to mitigate the effects described above with Natural England, we recommend that they seek advice through our Discretionary Advice Service.

If you have any queries relating to the advice in this letter please contact me on Click here to enter text..

State whether we need to be consulted on discharge of conditions or obligations. Choose an item.. *(only use second option where there are very specific issues we need to see again).*

Should the proposal change, please consult us again.

Yours Choose an item.

Click here to enter text.
Click here to enter text.

APPENDIX 5.1 ECOLOGICAL IMPACT ASSESSMENT METHODOLOGY

5.1 INTRODUCTION

5.1.1 The ecological impact assessment (EcIA) contained in this Chapter has been undertaken with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) guidance[1] and the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended). It focuses on those activities that could potentially generate significant environmental effects on ecological receptors.

5.1.2 Ecological Impact Assessment (EcIA) is defined within the CIEEM guidelines as **'a process of identifying, quantifying and evaluating the potential effects of development related or other proposed actions on habitats, species and ecosystems'**. The CIEEM guidelines stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological receptors that are sufficiently widespread, unthreatened and resilient to impacts of the proposed development. As such, the assessment considers effects upon designated sites and ecological receptors which are considered important on the basis of relevant guidance and professional judgement.

5.1.3 Where ecological receptors are not considered sufficiently important as to warrant a detailed assessment, or where they would not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment. Mitigation measures for such receptors may however, still be outlined as appropriate to reduce and/or avoid any potentially adverse effects or to ensure legislative compliance

5.1.4 The assessment includes the following stages:

- determination and evaluation of important/sensitive ecological receptors;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures; and,
- identification of appropriate compensation measures to offset significant residual effects.

5.1.5 For the purpose of the assessment, the terms 'impacts' and 'effects' are referred to in accordance with the definitions set out in the CIEEM Guidelines as follows:

- Impact: Actions resulting in changes to an ecological feature, for example, removing a hedgerow;
- Effect: Outcome to an ecological feature from an impact, for example, the changes experienced by the local population of a species arising from the loss of the hedgerow.

5.2 ZONES OF INFLUENCE

5.2.1 The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposal and associated activities. The zones of influence that extend beyond the direct land-take required for

[1] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester

the proposed development have been identified based upon the nature of the completed project and the construction activities to be undertaken, informed by the consultation and Scoping process and current CIEEM and Natural England guidance where available. The zone of influence will therefore vary for different ecological features depending on their sensitivity to an environmental change. The zones of influence were used to establish the scope of baseline ecological surveys and the extent of survey area and desk study.

5.2.2 Zones of influence for the Site and the Proposed Development that have been considered are as follows:

5.3 SIGNIFICANT EFFECTS

5.3.1 Ecological Impact Assessment (EcIA) is defined within the CIEEM guidelines as **'a process of identifying, quantifying and evaluating the potential effects of development related or other proposed actions on habitats, species and ecosystems'**

5.3.2 The EIA Regulations[2] require the description of the **'likely significant environmental effects of the proposed development on the environment'** (Regulation 18(3)(b)).

5.3.3 To determine the overall significance of each ecological effect, judgements on the sensitivity of the receptor(s) and the magnitude of impact from the Proposed Development are considered together in order to determine whether or not an effect is likely to be significant. This involves a combination of quantitative and qualitative assessment and the application of professional judgement.

5.3.4 For the purposes of this assessment, effects are categorised as significant or not significant in line with the EIA Regulations. The assessment considers effects at different geographic scales i.e. where effects may be discernible at a local scale but are not considered significant in the context of the EIA Regulations. For the purpose of the assessment, moderate and major effects are deemed to be 'significant' in EIA terms unless stated otherwise.

5.3.5 A 'significant effect' is considered to be an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.

5.3.6 CIEEM guidelines on ecological impact assessment note that:

'A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.'

5.3.7 For ease of reference **Table A5.1** below sets out adapted CIEEM terminology which also shows the equivalent EIA terms as used in Chapter 5: Biodiversity.

Table A5.1: EIA regulations and CIEEM Terminolgy.

Effect	Significance	CIEEM Definition
Substantial or Moderate	Significant	Positive effect on ecological

[2] Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

beneficial		integrity or conservation status at a County, National or International geographic scale
Minor Beneficial	Not significant	Positive effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only
Negligible or Neutral	Not significant or neutral	No discernible or significant on ecological integrity or conservation status (e.g. species or habitat).
Minor Adverse	Not significant	Adverse effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only.
Moderate or Substantial Adverse	Significant	Adverse effect on ecological integrity or conservation status at a County, National or International geographic scale.

5.4 ASSESSMENT

5.4.1 The Proposed Development has been assessed as having a lifetime of 40 years for the purpose of this assessment and ecological effects have been described in terms of their duration as short, medium term and long-term as follows:

- Short-term effects are defined as 0-3 years;
- Medium terms effects are defined as 3-15 years;
- Long term effects are defined as > 15 years

5.4.2 The ecological impact assessment includes:

- An evaluation of identified important ecological features and potential receptors; faunal species, habitats and vegetation (as appropriate) on an international, national and regional basis;
- A description and evaluation of the potential effects of the Proposed Development on statutory and non-statutory sites designated for nature conservation;
- A description and evaluation of the potential effects of the Proposed Development on species and habitats;
- Mitigation measures implemented to address any identified significant adverse effects;
- An assessment of cumulative effects;
- Identification of any residual effects after mitigation; and
- Identification of opportunities for biodiversity enhancement.

5.4.3 For the purposes of this assessment the importance or sensitivity of an ecological feature is considered within the context of a defined geographical area, ranging from International (high value) to Site (low/negligible), as detailed in **Table A5.2**.

Table A5.2: Value/ Sensitivity Assessment

Value or Sensitivity of Receptor /	**Definition examples**

Geographic Scale of Importance	
High - International / European	Greater than a UK scale, typically valued at a European level such as internationally designated sites (Special Protection Areas (SPA), Special Areas of Conservation (SAC) and/ or Ramsar sites) or proposed/ candidate site (pSPA or cSAC), large area of a habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of the larger whole, large population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) or species listed in Annex IV of the Habitats Directive.
High - National (UK)	UK: A nationally designated site (e.g. Site of Special Scientific Interest) or a discrete area which meets the selection criteria for national designation. An area of a priority habitat listed under Section 41 (England) of the Natural Environment and Rural Communities Act 2006 which constitutes a significant proportion of the UK resource of that habitat. A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / Biodiversity List and priority species listed under Section 41 (England) of the Natural Environment and Rural Communities Act 2006, and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Medium Regional / County	Locally designated sites (Local Nature Reserves, County or Local Wildlife Sites). Areas of priority habitat which constitutes a significant proportion of the County's resource of that habitat. A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / priority species and priority species listed under Section 41 (England) of the Natural Environment and Rural Communities Act 2006, and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Low - Local	Local area around the Proposed Development. For example areas of priority habitat which are not large enough to meet the criteria for County value, or small but sustainable

	populations of a protected or notable species
Low/Negligible - Site	Considered within the context of the Site only.

5.4.4 Effects on ecological features have been assessed based upon the interaction between the importance, or sensitivity, of the feature and the magnitude of change it is likely to experience. In accordance with the CIEEM guidelines (2018), an EcIA need only assess in detail, impacts upon important ecological features i.e. those that are considered important and potentially affected. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable. Where ecological features are not considered important enough to warrant further consideration, or where they will not be significantly affected, these are scoped out of the assessment presented here, and justification for exclusion is provided.

5.4.5 Relevant European, national and local guidance from governments and specialist organisations has been referred to in order to determine the importance (or 'sensitivity') of ecological features. Importance has also been determined using professional judgement and taking account of the results of baseline surveys and the functional role of features within the context of the geographical area.

5.4.6 Importance does not necessarily relate solely to the level of legal protection that a feature receives and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

5.4.7 Once identified, potential impacts are described making reference to the following characteristics as appropriate: positive or negative, extent, magnitude, duration, timing, frequency, and, reversibility. The judgements on magnitude may need to be adjusted (either up or down) to reflect the duration of the change (i.e. short, medium or long term) and whether it is potentially reversible. The assessment also identifies areas where no change is anticipated and the resulting effect is described as **'not discernible'** or **'none'**.

5.4.8 Ecological effects are described as far as possible and where available information allows in terms of the parameters detailed in **Table A5.3**

5.4.9 Magnitude of effect, based on the effects that the Proposed Development would have upon the resource/receptor, is considered within the range of high, medium, low, negligible. Consideration is given to scale, duration of impact/effect, and extent of Proposed Development with reference to the definitions in **Table A5.3**. The assessment considers how existing baseline conditions may change over time, as for example the baseline conditions could alter through operational land use, in the form of differing management and natural growth or succession of habitats.

Table A5.3 Environmental Parameters

Environmental Parameter	Description
Magnitude	The 'size' or amount of an effect is referred to as the magnitude and is determined on a quantitative basis where possible supported by professional judgement.
Extent	The area over which an effect occurs. The magnitude and extent of an effect may be synonymous
Duration	The time over which an effect is expected to last prior to the recovery or

	replacement of the ecological receptor. This can be considered in terms of life cycles of species or regeneration of habitats. The duration may be longer than the duration of an activity
Reversibility	Reversible (or temporary) effects are those that occur during the lifetime of the development and where spontaneous recovery or mitigation allows recovery within a reasonable timescale. Permanent effects are those which cannot be recreated within the proposed development or there is no reasonable chance that actions can be undertaken to reverse it.
Timing and Frequency	The timing of effects in relation to important seasonal and/or life cycle constraints. The frequency with which activities and simultaneous effects would take place can be an important determinant.

5.4.10 The assessment of effects is based upon the assessments of magnitude of effects and sensitivity of the resource/receptor to come to a professional judgement of how important this effect is. The magnitude of change effected on ecological receptors is described as set out in **Table A5.4**. The likelihood or probability that an effect will occur is addressed as far as possible based on available information. Whilst it is reasonably straightforward to identify effects that are certain to occur, or conversely will not occur, it is generally more difficult to assign a quantified level to occurrences defined as likely, unlikely or highly unlikely. In these circumstances, professional judgement has been used, with reasoning supported by available evidence

Table A5.4: Magnitude of Impact/Change

Magnitude	Criteria
High	The change may negatively or positively affect the conservation status of a site or species population, in terms of the coherence of its ecological structure and function, that sustains the habitat, complex of habitats and/or the population levels of species of interest.
Moderate	Conservation status of a site or species population will not be negatively or positively affected, but some element of the functioning of the site or population might be affected and the change to the site/ population is likely to be significant in terms of its ability to sustain some part of itself in the long term.
Low	Neither of the above applies, but some minor negative or positive change is evident on a temporary basis, or the change affects extent of habitat or individuals of a species abundant in the local area.
Negligible	No observable effect in either direction

5.4.11 For an effect to be significant, the ecological integrity or conservation status of a sensitive feature must be influenced in some way. It may be that the effect is substantial in magnitude or scale, irreversible, has a long-term effect, or coincides with a critical period in a species' life-cycle. Where uncertainty or limitations exist, this is acknowledged.

5.4.12 It is recognized that discernible effects can also occur at a local geographic scale which are not sufficiently severe to be assessed as 'significant' in accordance with the EIA approach, and do not require specific mitigation, but nonetheless merit discussion. In the interest of completeness these effects are discussed in Chapter 5: Biodiversity in relation to general construction good practices to be adopted to avoid or minimise low-level or minor disruption to local features, including for example standard pollution prevention and control measures.

Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd.

Habitats & Species Baseline Report

avian ecology

Document Control				
Project Name:	Belvoir Solar Farm			
Project Number:	Pegas-075-1270			
Report Title:	Habitats & Species Baseline Report			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
V1	09/11/2020	Draft	Z. Hinchcliffe *MRes*	F. Tarry *BSc MCIEEM*
V2	11/11/2021	Updated with new site boundary	S. Turner MSc MCIEEM	B. Walker *MSc MCIEEM*
V3	09/09/2022	Updated– any amendments from previous version marked in red	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc(Hons) ACIEEM*

CONTENTS

FIGURES

ANNEXES

1 INTRODUCTION

1.1 Background

1.1.1 This report provides baseline ecological information on land associated with the proposed solar development on land north of Belvoir, Leicestershire, henceforth referred to as 'the Site', as illustrated on the Site Location Plan (**Figure 5.2.1**) and Phase 1 habitat Plan (**Figure 5.2.4**).

1.1.2 The objectives of this report are:

- Provide baseline information on the current habitats and ecological features both within the Site and immediate surrounding area;
- Identify the proximity of any designated sites for nature conservation interest; and,
- Identify the presence or potential presence of any protected species or habitats.

1.1.3 The report is informed by a desktop study, an extended Phase 1 habitat survey, breeding bird surveys, wintering bird surveys and great crested newt *Triturus cristatus* environmental-DNA (eDNA) surveys.

1.2 Site Overview

1.2.1 The Site comprises agricultural land with a combined area of approximately 99.95ha, located to the west of the village Muston, Leicestershire.

1.2.2 Habitats within the Site comprise of arable land and small pockets of broad-leaved woodland with field boundary features including hedges, ditches and scattered trees. A number of ponds are present within the Site, the majority of which were dry.

1.2.3 These habitats are also reflected in the wider area, with additional habitats including improved grassland, pastoral farmland, small pockets of mixed semi-natural woodland and farm buildings.

1.2.4 In addition, the Site is located immediately adjacent to Muston Meadows Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR) grassland, located to the south east of the Site.

1.2.5 The Site location is shown in **Figure 5.2.1.**

1.3 Site Proposals

1.3.1 The proposals include the construction of a solar farm together with all associated works, equipment and ancillary infrastructure.

1.4 Legislative Framework, Planning Policy and Guidance

1.4.1 Reference has been made to the following key pieces of legislation, planning policy and guidance listed in **Table 1.1** below.

Table 1.1: Key legislation, planning policy and guidance.

European
• Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (hereafter referred to as the 'Ramsar Convention);
• Convention on the Conservation of European Wildlife and Natural Habitats 1979 (hereafter referred to as the 'Bern Convention); and,

• UNESCO convention on the protection of the World Cultural and Natural Heritage (1972).
National
• The 'Conservation of Habitats and Species Regulations 2017 (as amended)'. • The Conservation of Habitats and Species (Amendment)(EU Exit) Regulations 2019; • The Environment Act 2021; • The Wildlife and Countryside Act 1981 (as amended); • Countryside and Rights of Way Act 2000; • Infrastructure Act 2015; • Protection of Badgers Act 1992; • Hedgerow Regulations 1997; • Natural Environment and Rural Communities (NERC) Act (2006); • The National Planning Policy Framework 2 (NPPF2, 2021)[1]; • 'Birds of Conservation Concern 4' (Studley *et al., 2021*)[2]; • The United Kingdom Biodiversity Action Plan (UK BAP); • The Bat Conservation Trust - *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.).* (Collins *et al.*, 2016[3]); • BS 42020:2013 Biodiversity – Code of Practice for Planning and Development and, • Biodiversity Net Gain. Good practice principles for development[4].
Local
• Leicester, Leicestershire and Rutland Biodiversity Action Plan[5]

1.4.2 The 'UK Post-2010 Biodiversity Framework' succeeds the UK Biodiversity Action Plan (UK BAP) and 'Conserving Biodiversity – the UK Approach'. The lists of priority species and habitats agreed under UK BAP still form the basis of much biodiversity work and are therefore considered within this report in the context of the objectives of the Biodiversity Framework. BAPs identify habitats and species of nature conservation priority on a UK (UK BAP) and Local (LBAP) scale. UK BAPs formed the basis for statutory lists of priority species and habitats in England under Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006, and so are also relevant in the context of this legislation.

1.4.3 This report is provided in accordance with the provisions of *British Standard 42020:2013 Biodiversity: Code of practice for planning and development*.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004408/NPPF_JULY_2021.pdf

[2] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, pp. 723-747.

[3] Collins *et al.* (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd edition, BCT: London

[4] https://cieem.net/resource/biodiversity-net-gain-good-practice-principles-for-development-a-practical-guide/

[5] https://www.lrwt.org.uk/about-us/caring-wild-places/biodiversity-action-plan

1.5 European Protected Species (EPS) Policies

1.5.1 European Protected Species (EPS), such as bats, great crested newts and otters *Lutra lutra*, receive full protection under the 'Habitat Regulations'. This makes it an offence to:

- deliberately capture, injure or kill any EPS;
- to deliberately disturb them; and,
- to damage or destroy a breeding site or resting place.

1.5.2 In addition, the Wildlife and Countryside Act 1981 (as amended) makes it an offence to intentionally or recklessly disturb a EPS while it is occupying a structure or place which it uses for shelter or protection, or to obstruct access to any structure or place the species uses for shelter or protection.

1.5.3 Natural England is the primary enforcing body of the Habitat Regulations and therefore responsible for implementation and compliance in England. In February 2016 Natural England published '*Wildlife licensing: comment on new policies for European protected species licence'*[6]*.* Natural England sought (on DEFRA's behalf) wide ranging views on whether four new policies could be permitted under licence to benefit EPS whilst improving flexibility for development. Following from this consultation period, in December 2016 Natural England officially introduced the four licensing policies throughout England[7].

1.5.4 The four policies seek to achieve better outcomes for EPS and reduce unnecessary costs, delays and uncertainty that can be inherent in the current standard EPS licensing system. The policies are summarised as follows:

- **Policy 1;** provides greater flexibility in exclusion and relocation activities, where there is investment in habitat provision;
- **Policy 2;** provides greater flexibility in the location of compensatory habitat;
- **Policy 3;** provides greater flexibility on exclusion measures where this will allow EPS to use temporary habitat; and,
- **Policy 4;** provides a reduced survey effort in circumstances where the impacts of development can be confidently predicted.

1.5.5 The four policies have been designed to have a net benefit for EPS by improving populations overall and not just protecting individuals within development sites. Most notably Natural England now recognises that the Habitats Regulations 2017 (as amended) legal framework now applies to 'local populations' of EPS and not individuals/site populations.

1.5.6 Where the four policies are considered relevant to the application they are discussed within the corresponding assessment of effects sections for EPS which could potentially occur on or close to the proposed development.

[6] https://www.gov.uk/government/consultations/wildlife-licensing-comment-on-NEw-policies-for-european-protected-species-licences

[7] https://www.gov.uk/government/NEws/NEw-licensing-policies-great-for-wildlife-great-for-business

2 METHODOLOGY

2.1 Desktop Study

2.1.1 A desktop study was undertaken to identify any known existing features or species of ecological importance within the study area (as defined below).

2.1.2 The desk study included a review of relevant policy and guidance and sought to identify any statutory designated sites for nature conservation through a review of the Natural England Designated Sites View[8], JNCC[9] and Multi Agency Geographic Information for the Countryside (MAGIC)[10] websites. A 2km search radius surrounding the Site boundary was adopted for all statutory designated sites, extending to 10km for International protected sites. The locations of statutory designated sites are provided in **Figure 5.2.2**.

2.1.3 The MAGIC website also includes details of granted European Protected Species (EPS) licence applications. A 2km search radius around Site boundary was adopted for EPS licences.

2.1.4 Biological record data on non-statutory designated sites and records of protected and notable species was requested from Leicestershire and Rutland Environmental Records Centre (LRERC) and Lincolnshire Environmental Records Centre (LERC) with the latter accommodating a section of the search radius of the desk study to the east. A 5km search radius was used from central grid reference SK8217637326. The locations of all non-statutory designated sites located within 2km of the Site are provided in **Figure 5.2.3**.

2.1.5 Reference was also made to Ordnance Survey (OS) maps of the wider area and online aerial images (www.google.co.uk/maps) in order to determine any features of nature conservation interest in the wider area.

2.2 Extended Phase 1 Habitat Survey

2.2.1 An Extended Phase 1 habitat walkover survey of the Site was undertaken on 12th and 13th May 2020 by Z. Hinchcliffe *MRes*, a competent and experienced field ecologist. The survey followed UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010),with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM), Technical Guidance Series *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

2.2.2 The survey provided an update to an earlier habitat survey undertaken in January 2020 by Grassroots Ecology and overall findings are presented as combined information here for ease of reference.

2.2.3 The extent of the Site is detailed in **Figure 5.2.1**, habitats located within the redline boundary of the Site is provided in **Figure 5.2.4**.

2.2.4 Habitats were mapped and described using a series of 'target notes' (TNs).

2.2.5 The survey was extended to include the additional recording of specific features indicating the presence, or likely presence, of protected species, invasive species and other species of conservation significance.

[8] https://designatedsites.naturalengland.org.uk/
[9] http://jncc.defra.gov.uk/
[10] https://magic.defra.gov.uk/MagicMap.aspx

2.3 Bird Surveys

Wintering Bird Surveys

2.3.1 A series of wintering bird surveys were undertaken in winter 2019-2020. See **Appendix 5.3; Winter Bird Survey Report** for further details.

2.3.2 The objective of the surveys was to determine the importance of the Site and immediate surrounding environment for waterbird species/assemblages and therefore provide information to determine whether the Site is used as supporting habitat / functionally linked land by species which form a qualifying interest feature of nearby statutory designated sites. Surveys therefore concentrated particularly on waterbird species, however all notable species (or notable congregations of commonly occurring species) were recorded in order to provide a robust understanding of the wintering bird assemblage within and surrounding the Application Site.

2.3.3 Four visits were completed, between December 2019 and March 2020. During each visit, the observer used a combination of public rights of way, roads and pre-consented access to private land to ensure as much land was viewed as possible. An extended buffer of 250m from the site boundary was surveyed to gauge the use of birds within the Site this is referred to as the 'wider survey area'. Target species were recorded based on their conservation status and known likelihood for impact by solar farm developments.

Breeding Bird Surveys

2.3.4 Detailed breeding bird methodologies and full results are presented as **Appendix 5.4**; **Breeding Bird Survey Report**.

2.3.5 Breeding Bird Survey (BBS) was undertaken between May and July 2020. The methodology employed was based-upon a scaled-down version of the British Trust for Ornithology (BTO) Common Bird Census (CBC) technique, as detailed in Gilbert *et al*. (1998)[11]. All bird registrations were recorded on suitably scaled field maps using standard BTO species codes and behaviour notations (such as signing, carrying food, active nest etc). The approximate location of bird territories within the Site were determined using standard territory mapping techniques to identify and isolate areas within which birds consistently displayed breeding bird behaviours (following Gilbert *et al.* 1998).

2.3.6 For the purposes of the assessment, although the estimated number of territories for all species is provided, only the breeding territories of notable species are mapped, given these are the most relevant species to the assessment. Notable species consist of Birds of Conservation Concern (BoCC) 'amber' and 'red' list species (Stanbury et al. 2021), Annex 1/Schedule 1 raptors and owls and Local Biodiversity Action Plan (LBAP) species.

2.4 Great Crested Newt Presence/Absence Surveys (eDNA)

2.4.1 Ponds within the Site and within 250m of its boundaries were identified from aerial imagery and OS mapping. Accessible ponds, located within the Site and the wider area, were visited and assessed for their suitability to support great crested newt. The assessment followed the Habitat Suitability Index (HSI) assessment methodology as developed by Oldham *et al.* (2000)[12] and as detailed within ARG UK guidance Note 5 (ARG UK, 2010[13]. The results of the HSI assessment can be used to provide a useful

[12] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143-155.

[13] ARG UK (2010) ARG UK Advice Note 5; Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

indication of newt presence and help assess any likely impacts of a development, but do not represent a substitute for full surveys.

2.4.2 Following this, a single pond (pond P2) was surveyed for great crested newt presence/absence using the environmental DNA (eDNA) method. Other on-site ponds (P8-P10) were found to be dry in May and June 2020. Full methodologies and results are provided in **Appendix 5.6**;**Great Crested Newt Survey Report** .

2.5 Limitations of Survey

2.5.1 An Extended Phase 1 habitat survey does not constitute a detailed botanical survey or faunal species list or provide a full protected species survey but, enables competent ecologists to ascertain an understanding of the ecology of the site in order to:

- Broadly identify the nature conservation value of a site and assess the significance of any potential impacts on habitat/species recorded; and/or,
- Confirm the need and extent of any additional specific ecological surveys that are required to identify the true nature conservation value of a site (if any).

2.5.2 The Extended Phase 1 habitat survey visit was undertaken in May 2020 and therefore within the optimal period for botanical surveys (approximately April to September).

2.5.3 All other surveys undertaken within the Site, were carried out in adherence to accepted guidance documents and at the appropriate times of the year.

3 BASELINE

3.1 Designated and Sites for Nature Conservation

Statutory Designated Sites

3.1.1 A review of the MAGIC website confirmed that the Site does not form part of any statutory designated site for nature conservation. The search identified three statutory designated sites located within a 2km radius of the Site boundary and a further three Sites of Special Scientific Interest (SSSI) within 5km, as summarised in **Table 3.1** below and shown on **Figure 5.2.2**.

3.1.2 No internationally designated sites are present within 10km of the Site boundary.

3.1.3 The Site is located immediately adjacent to Muston Meadows SSSI and is located within the SSSI Impact Risk Zone (IRZ) for the designation. It meets the qualifying criteria of 'all planning applications except householder applications' and as a result, the Local Planning Authority (LPA) would be required to consult with Natural England regarding potential effects.

Table 3.1: Statutory designated sites for nature conservation.

Site name and Designation	Distance and direction	Details
Muston Meadow SSSI	Immediately Adjacent to the Site	The site contains some of the best remaining examples of neutral clay grasslands in the Midlands and has been accepted for inclusion within the 'Nature Conservation Review'. The site contains a very large population of green-winged orchid *Orchis morio.* Additional interest is provided by the field ponds which support a population of great-crested newt.
Muston Meadows NNR	Immediately Adjacent to the Site	Muston Meadows is one of the finest lowland meadows in England. The meadows are rich in plant life, with 33 types of grass and over 100 other species of flowering plant. The reserve is most notable for its colony of over 10,000 green-winged orchids.
Debdale Meadow, Muston SSSI	1.7km north east	A traditionally managed unimproved neutral grassland meadow considered to be very rare in this area of lowland England.
Briery Wood Heronry, Belvoir SSSI	2.8km south	The site contains the largest grey heron *Ardea cinerea* heronry in Leicestershire.
Grantham Canal SSSI	2.8km south west	The site includes some of the best areas of open water and associated marginal habitats in Leicestershire, and is representative of slow river vegetation communities in central and eastern England.
Allington Meadows SSSI	4.7km north east	This site is an outstanding example of traditionally-managed grassland, supporting plant communities typical of alluvial, calcareous clay and loam soils. Such grassland communities are now rare in the East Midlands as they are particularly vulnerable to agricultural improvement.

Non-statutory Designated Sites

3.1.4 A review of the data provided by LRERC confirms that the Site is not located within any non-statutory designated site for nature conservation. Two Local Wildlife Site (LWS) lies within a 2km radius of the Site boundaries, as shown in **Figure 5.2.3** and described in **Table 3.2** below.

Table 3.2: Non-statutory Designated Sites

Site name	Distance and direction	Details
Grantham Canal and Banks LWS	600m east	Canal with scrub and neutral grassland. Also noted as having a large population of invasive non-native water fern *Azolla filiculoides*
Cliff Wood LWS	1.1km east	Mixed woodland, the majority of which is replanted ancient woodland with the exception of the northern most section. Streams and deadwood are also noted as being within the LWS.

3.2 Desktop Study - Priority Habitats

3.2.1 Six habitats of Principal Importance (also known as priority habitats) under Section 41 of the NERC Act/UK Biodiversity Action Plan and five Leicestershire and Rutland Biodiversity Action Plan habitat were identified within 2km of the Site.

3.2.2 The MAGIC website, OS maps and the Leicestershire and Rutland Biodiversity Action Plan provided no records of priority habitats within the Site boundaries.

3.2.3 Information on priority habitats within 2km of the Site is presented in **Table 3.3** below. Where numerous records of a particular habitat were recorded, only the closest record to the Site has been provided, in order to provide context for the Site and surrounding area. The priority habitats recorded within the Site itself are ponds and hedgerows.

Table 3.3: Priority Habitats

Priority habitat name	Designation	Distance from site
Hedgerows	NERC S.41, UKBAP, LBAP	Within the Site
Lowland meadows	NERC S.41, UKBAP, LBAP	Immediately adjacent
Ponds	NERC S.41, UKBAP, LBAP	30m west
Deciduous woodland	NERC S.41, UKBAP, LBAP	30m south east
Traditional orchards	NERC S.41, UKBAP	350m east
Wood-pasture and Parkland	NERC S.41, UKBAP, LBAP	1.4km south

Key

NERC S.41: Natural Environment and Rural Communities (NERC) Act (2006)

UKBAP: UK Biodiversity Action Plan Priority Habitat

LBAP: Leicester, Leicestershire & Rutland Biodiversity Action Plan priority habitat

3.3 Habitats

3.3.1 This section should be read in conjunction with the Phase 1 Habitat Plan presented as **Figure 5.2.4,** Target Notes (TNs) presented in **Table 3.4** and photographs presented in **Annex 1**.

3.3.2 The Site occupies land totalling approximately 99.95ha, set within a rural landscape. Habitats within the Site predominantly comprised arable fields; linear features are present including hedgerows with trees as well as wet and dry ditches. A dirt track runs along the northern boundary of the Site.

3.3.3 The dominant arable farmland mainly comprised oil seed rape *Brassica sp* and wheat *Triticum sp* at the time of survey. Field boundaries generally comprised narrow strips (less than 5m wide) of semi-improved grassland dominated by Yorkshire fog *Holcus lanatus,* black medic *Medicago lupulina*, *Taraxacum* species, cow parsley *Anthriscus sylvestris*, cowslip *Primula veris*, ribwort plantain *Plantago lanceolata*, cleavers *Galium aparine*, barren brome *Bromus sterilis*, false oat grass *Arrhenatherum elatius*, common bent *Agrostis capilliaris*, common nettle *Urtica dioica*, meadow foxtail *Alopecurus pratensis*, upright hedge parsley *Torilis japonica* and common hogweed *Heracleum sphondylium*.

3.3.4 The majority of field boundaries were lined with species-poor hedgerows dominated by hawthorn *Crataegus monogyna*, with additional dogwood *Cornus sanguinea*, ash *Fraxinus excelsior*, elder *Sambucus nigra*, field maple *Acer campestre*, apple *Malus sylvestris* and blackthorn *Prunus spinosa.*

3.3.5 Several wet and dry ditches across the Site had areas of tall ruderals (e.g. TN8) including great willowherb *Epilobium hirsutum*, red clover *Trifolium pratense*, forget-me-not *Myosotis sp*, cow parsley, common hogweed, bramble *Rubus fruticosus Agg.*, common nettle and blue tansy *Phacelia tanacetifolia*

3.3.6 Wet ditches across the Site are generally sediment-bedded with occasional areas of more rocky/spoil beds. Aquatic and marginal vegetation noted included false water-cress *Apium nodiflorum*, great willowherb, meadowsweet *Filipendula ulmaria* and rosebay willowherb *Chamaenerion angustifolium.*

3.3.7 The disused Grantham Canal is located a few metres south of the far southern boundary of the site. The water appears mostly static and is overgrown with reed *Phragmites australis* and bulrush *Typha latifoli*a on the southern bank. There is a hawthorn dominated hedge along the northern bank.

3.3.8 There are three ponds located within the Site, however at the time of survey all three of them were dry. A further eight potential ponds were identified during the desk study within a 250m buffer of the Site one of which, P2 was accessed during the surveys. Due to site boundary changes in the intervening time, pond P1 is no longer within 250m of the Site.

3.3.9 Habitats recorded within the Site are considered to be typical of dominant habitats within the wider landscape.

Table 3.4: Target Notes

Target Note	Comment
TN1	Hawthorn *Crataegus monogyna*-dominated intact hedgerow with sections of planted hawthorns (identified by plastic tube coverings). Additionally, hedgerow consisting of field maple *Acer campestris*, ash *Fraxinus excelsior*, elder *Sambucus nigra*, hazel *Corylus avellana*, dogwood *Cornus sanguinea* and guelder rose *Viburnum opulus*. Hedgerow measures 1.5x2m.
TN2	Mature pedunculate oak *Quercus robur* along intact hedgerow. 10m tall, thick ivy covering and several areas of damaged/lifted bark on trunk suggesting poor health and potential for partial cavity. Moderate Bat Roost Potential (BRP).
TN3	Broadleaved copse dominated by hawthorn, hazel and ash surrounded by dry ditch on all sides.

Target Note	Comment
TN4	Mature ash *Fraxinus excelsior* at edge of semi-natural woodland copse (ash-dominated). 12m tall, broken limbs and partially hollow trunk in moderate foraging habitat. High BRP.
TN5	Mature ash along Site western with broken trunk with large hollow cavity. Several obvious entrances into trunk and other voids present. High BRP.
TN6	Tall ruderals, likely sown along dry ditch dominated by *Phacelia* with additional cleavers *Galium aparine*, cock's-foot *Dactylis glomerata*. Red clover *Trifolium pratense*.

3.4 Protected and Notable Species

Birds

3.4.1 Bird records within provided by LRERC comprised of a suite of species typical of the habitats and region. These included thirty-seven species that are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), priority species listed on the UK Biodiversity Action Plan (UKBAP), species listed as a priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, red or amber listed 'Birds of Conservation Concern'[14] and Leicestershire and Rutland Biodiversity Action Plan Species.

Wintering Birds

3.4.2 During the wintering bird surveys, no primary 'target' species (defined typically as waterfowl or other species using large open fields in winter that may be displaced due to the proposed development) were recorded within the survey area as defined in **Appendix 5.3**.

3.4.3 Target species; Mute swan *Cygnus olor*, mallard *Anas platyrhynchos* and coot *Fulica atra* were recorded outside of the Site within the wider survey area in small numbers along the Grantham Canal in January and March.

3.4.4 Overall, the wintering bird surveys, desk study and evaluation of the Site suggest that although they are present in the wider area, the Site and surrounding fields are used by very low numbers of target species and do not provide an important foraging or roosting resource for non-breeding waterfowl.

3.4.5 Full details regarding the wintering bird surveys are provided in **Appendix 5.3: Winter Bird Survey Results.**

Breeding Birds

3.4.6 Overall, breeding species comprised species typical of arable farmland habitats with species of conservation concern including Red List species;, skylark *Alauda arvensis*, yellowhammer *Emberiza citrinella* and linnet *Linaria cannabina* and grey partridge and Amber List species; dunnock *Prunella modularis,* quail *Coturnix coturnix*, song thrush *Turdus philomelos*, wren *Troglodytes troglodytes* and reed bunting *Emberiza schoeniclus*.

[14] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, pp. 723-747.

3.4.7 Species breeding density is generally very low and with the exception of skylark and yellowhammer, most species are confined to field boundary habitats including hedgerows and pockets of woodland.

3.4.8 Full details regarding the breeding bird surveys are provided in **Appendix 5.4: Breeding Bird Survey Report.**

Bats

3.4.9 The data search returned 162 bat records of eight bat species, namely brown long-eared *Plecotus auritus* (20 records), Natterer's *Myotis nattereri* (1), Daubenton's *Myotis daubentonii* (2), noctule *Nyctalus noctula* (8), common pipistrelle *Pipistrellus pipistrellus* (51) soprano pipistrelle *Pipistrellus pygmaeus* (28), barbastelle *Barbastella barbastellus* (1) and a further 50 records not assigned to species level.

3.4.10 Results from a search of MAGIC show one EPS licences (2015-1548-EPS-BDX) in relation to bats within 2km, granted in 2015 for a roost of soprano pipistrelle, located approximately 1.2km north of the Site.

Roosting Bats

3.4.11 During the Extended Phase 1 habitat survey, three mature trees (**TN2, 4 & 5** as shown in **Table 3.4 and Figure 5.2.4**) were noted as having suitable bat roost features. All other trees noted within the Site were categorised as having negligible or low bat roost potential and all were confined to field boundary habitats.

Foraging and Commuting Bats

3.4.12 Habitats within the Site were considered to most closely fit the description for land of 'moderate' interest for foraging bats in accordance with BCT guidance, with continuous habitat connected to the wider landscape that could be used for commuting and foraging.

3.4.13 Linear features within and around the Site such as hedgerows and ditches are considered to offer the most favourable habitats for foraging / commuting bats as do the ponds (and surrounding habitats) and woodland areas present within and immediately adjacent to the Site as well as in the wider area.

Badger

3.4.14 Badgers are discussed separately in confidential **Appendix 5.5**.

Otter

3.4.15 The data search returned no records of otter *Lutra lutra* within the 2km search area.

3.4.16 Several drainage ditches are present along field boundaries, however all ditches were found to be shallow or dry during the survey, providing very limited foraging opportunities. However, when wet, the ditches may provide connectivity to canal and river networks in the wider environment, including the adjacent Grantham Canal. Otters could potentially use ditches within the Site to travel along the interconnected drainage network and utilise habitats along these riparian corridors. The Site is dominated by arable fields which provide negligible habitat suitability for otters and any suitable habitat found within the Site is confined to the drainage ditches.

3.4.17 No signs of otter were found during surveys, and no potential holts were encountered.

Water Vole

3.4.1 LRERC returned no records of water vole *Arvicola amphibius* within 2km of the Site from within the last 30 years.

3.4.2 Several drainage ditches are present along field boundaries, however all ditches were found to be shallow or dry during the survey, providing low/moderate habitat suitability for the species. However, the ditches may provide connectivity to canal and river networks in the wider environment, including the adjacent Grantham Canal which is well vegetated with banks comprising of a combination of earth and metal pilings. The Site is dominated by arable fields which provide negligible habitat suitability for water voles and any suitable habitat found within the Site is confined to the drainage ditches.

Amphibians

3.4.3 The data search returned no records of great crested newt or other amphibian species within 2km of the Site and a review of MAGIC showed no EPS licences granted for great crested newt within 2km.

3.4.4 An Ecological Constraints Opportunities Plan (ref: 1276) supplied by Grassroots Ecology references ponds **P1 and P3** (shown on **Figure 5.2.5**) as having a known population of great crested newt. Additionally, the citation for Muston Meadows SSSI, located adjacent to the Site, references the field ponds within the SSSI as a feature of interest due to the presence of great crested newt.

3.4.5 A negative eDNA result was returned for P2, indicating great crested newt absence. The survey methodology and results are provided in full in **Appendix 5.6**.

3.4.6 There are three ponds on Site, all of which were found to be dry during surveys and had clearly been dry for some time. Additionally, there are a further seven ponds located within 250m of the Site, one of which P2 was accessed and holding water during the survey. The remaining six ponds were not accessed.

3.4.7 The Grantham Canal adjacent to the Site was considered unsuitable for supporting great crested newt. Despite the canal being disused, it is a relatively large waterbody with potentially some flow in the water, also it was noted to have a high waterbird population and is likely to be stocked with fish.

3.4.8 The dominant arable habitat on Site provides sub-optimal amphibian terrestrial habitat, with more suitable habitat restricted to field boundary features such as hedgerows and ditches. Due to the dry/very shallow and ephemeral nature of the ditches within and adjacent to the Site, these are considered unsuitable for breeding great crested newts.

Reptiles

3.4.9 The data search returned no records of reptiles within 2km of the Site.

3.4.10 The Site is dominated by arable land, which is considered to be of a negligible value for reptile species, however, the field boundary habitats such as hedgerows and ditches do provide limited habitats for foraging/hibernation purposes. These boundary habitats also provide connectivity around the Site and into the wider area, including the discussed Grantham Canal SSSI.

Other Notable Species

3.4.11 Two records were returned for brown hare *Lepus europaeus* within 2km of the Site. In addition, several brown hare were observed during the Extended Phase 1 survey.

3.4.12 Brown hare and western hedgehog *Erinaceus europaeus* could potentially utilise the woodland and field boundary features such as hedegrows.

3.4.13 No other protected or notable species were observed or are considered likely to occur within or immediately surrounding the Site.

3.5 Invasive Non-native Species

3.5.1 One record of an invasive non-native species, American mink *Neovision vision* was returned by LRERC within 2km of the Site.

3.5.2 No invasive non-native species were encountered during any of the surveys on Site.

FIGURES

Figure 5.2.1: Site Location Plan

Figure 5.2.2: Statutory Designated Sites Plan

Figure 5.2.3: Non-statutory Designated Sites Plan

Figure 5.2.4: Phase 1 Habitat Plan

Figure 5.2.5: Pond Location Plan

Figure 5.2.1: Site Location Plan

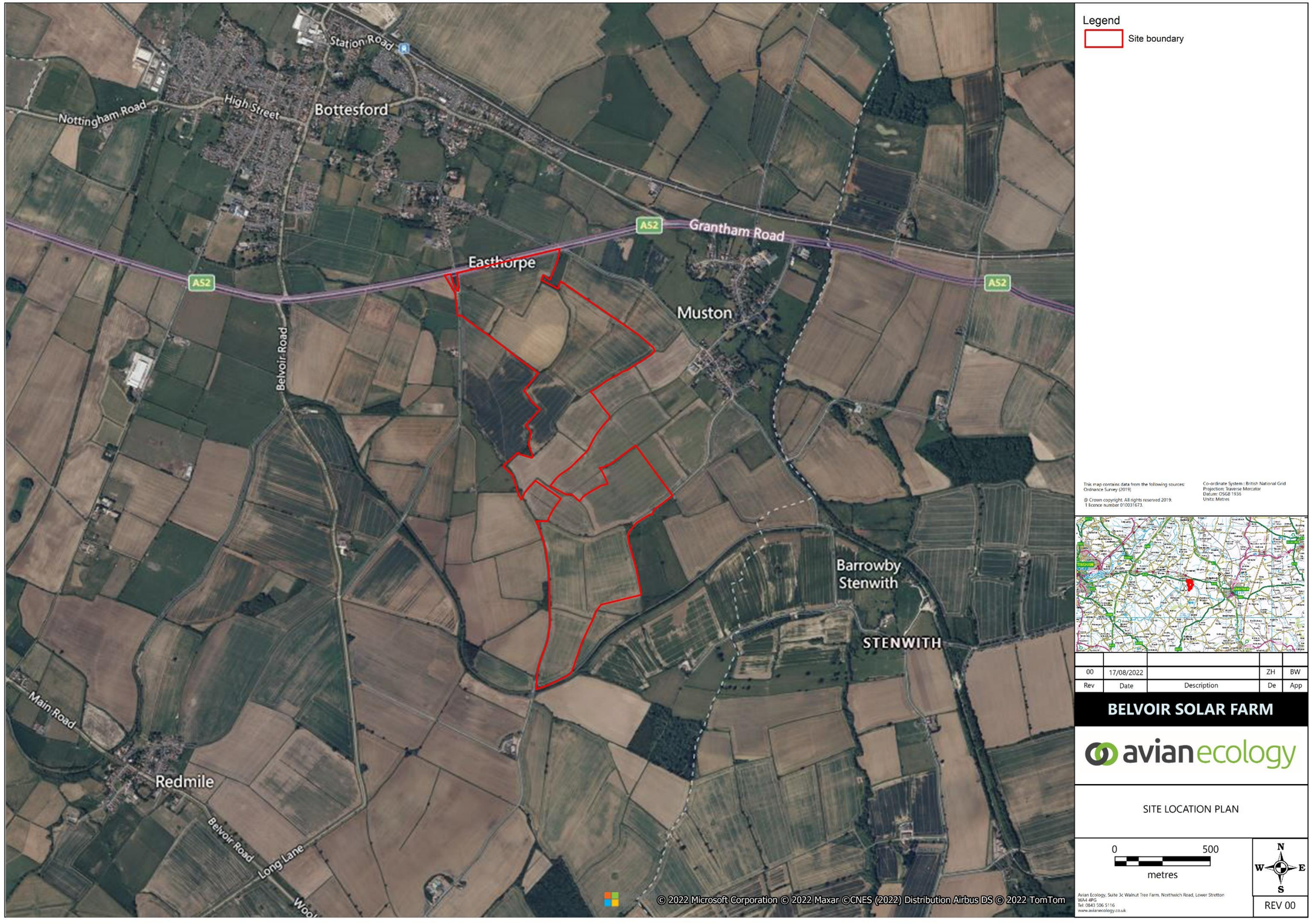


Figure 5.2.2: Statutory Designated Site Plan

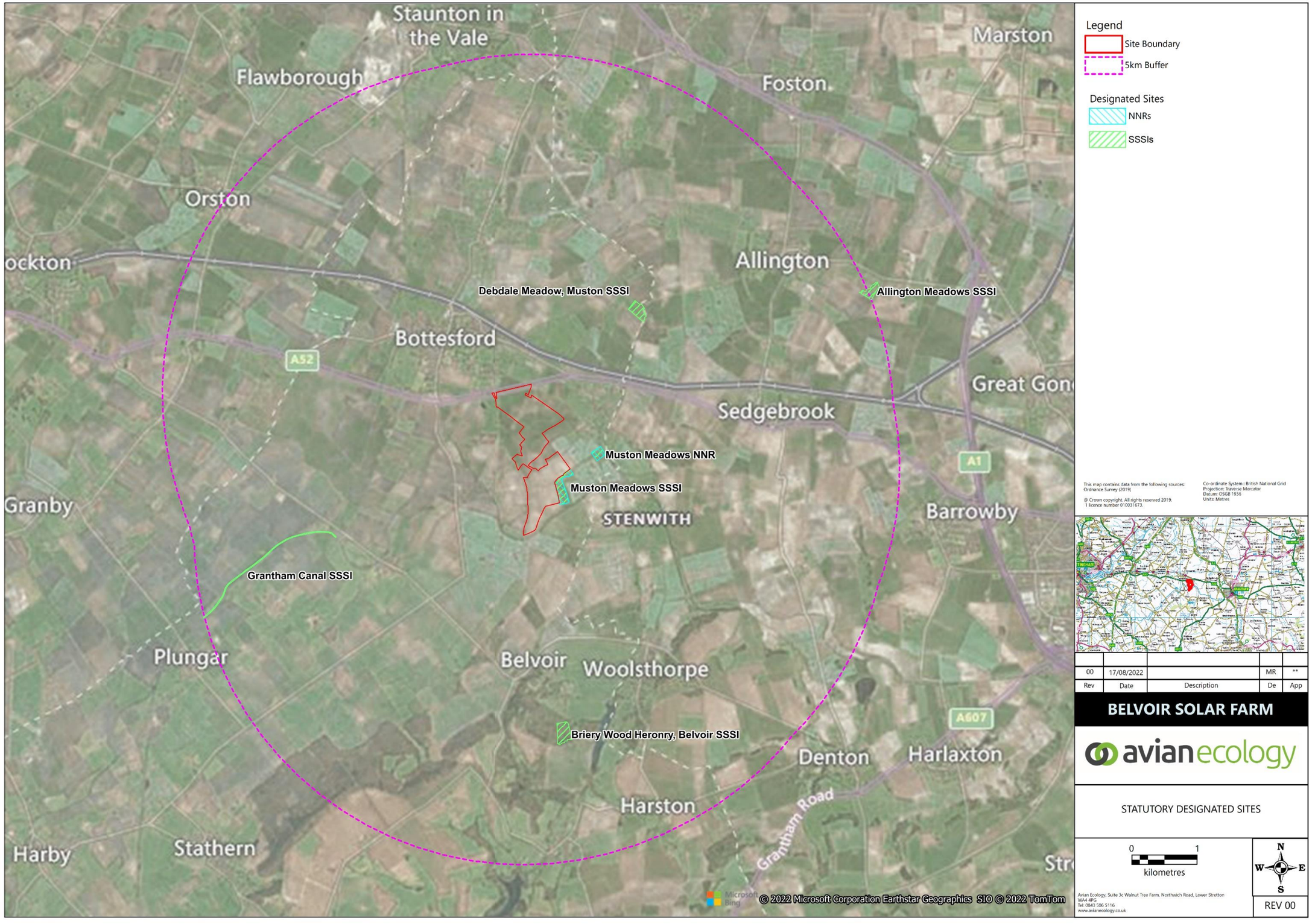


Figure 5.2.3: Non-statutory Designated Site Plan

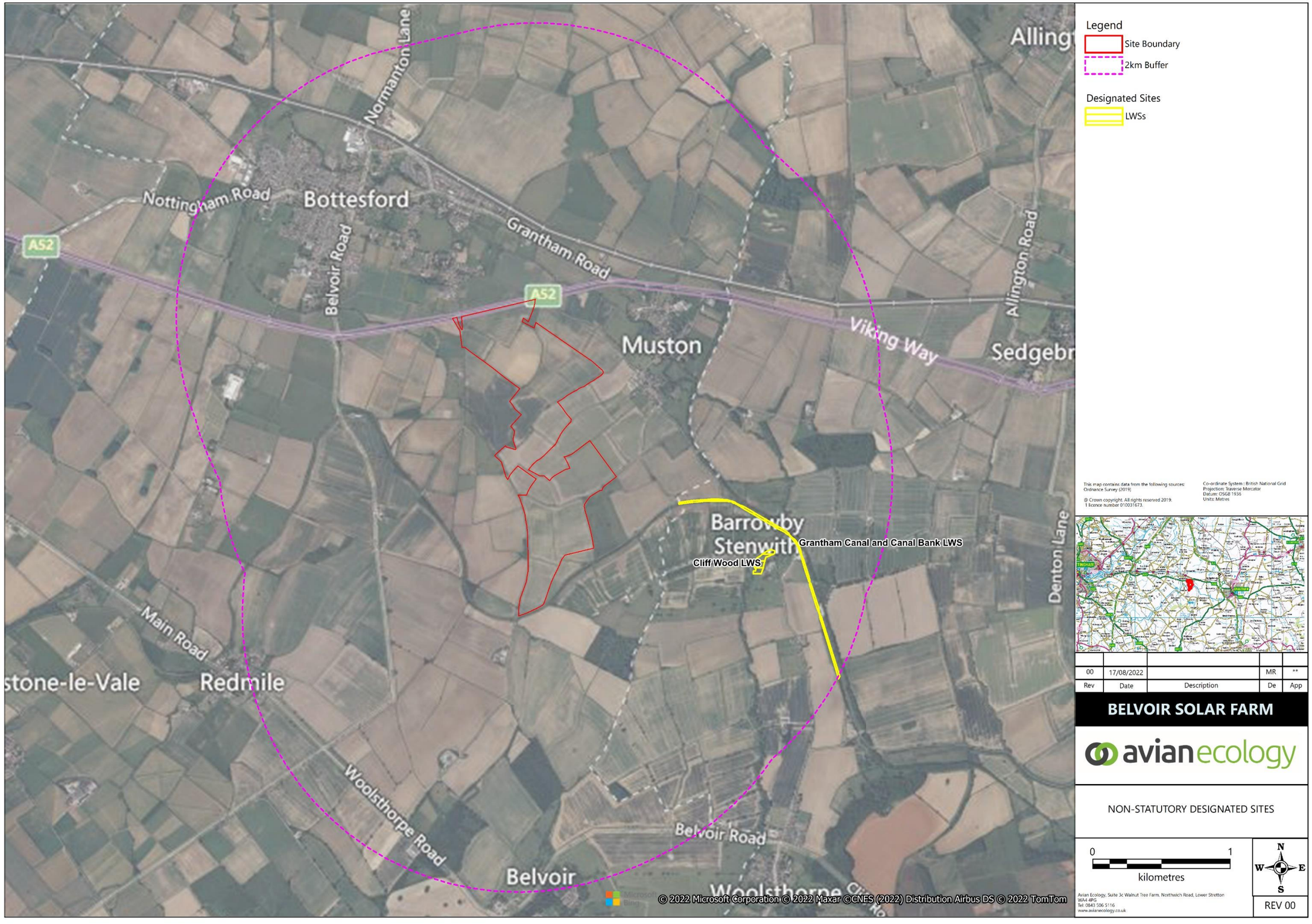


Figure 5.2.4: Phase 1 Habitat Plan

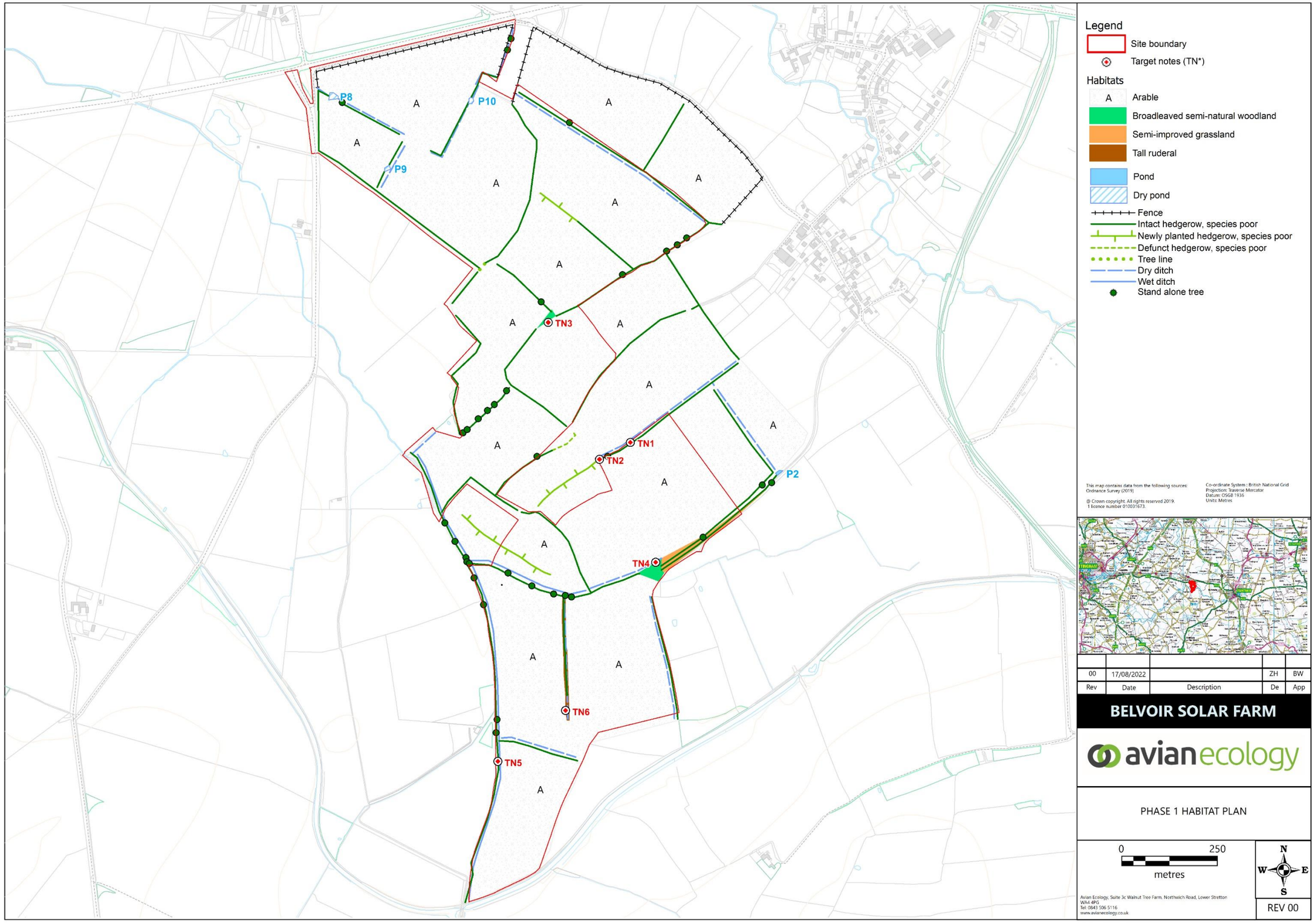
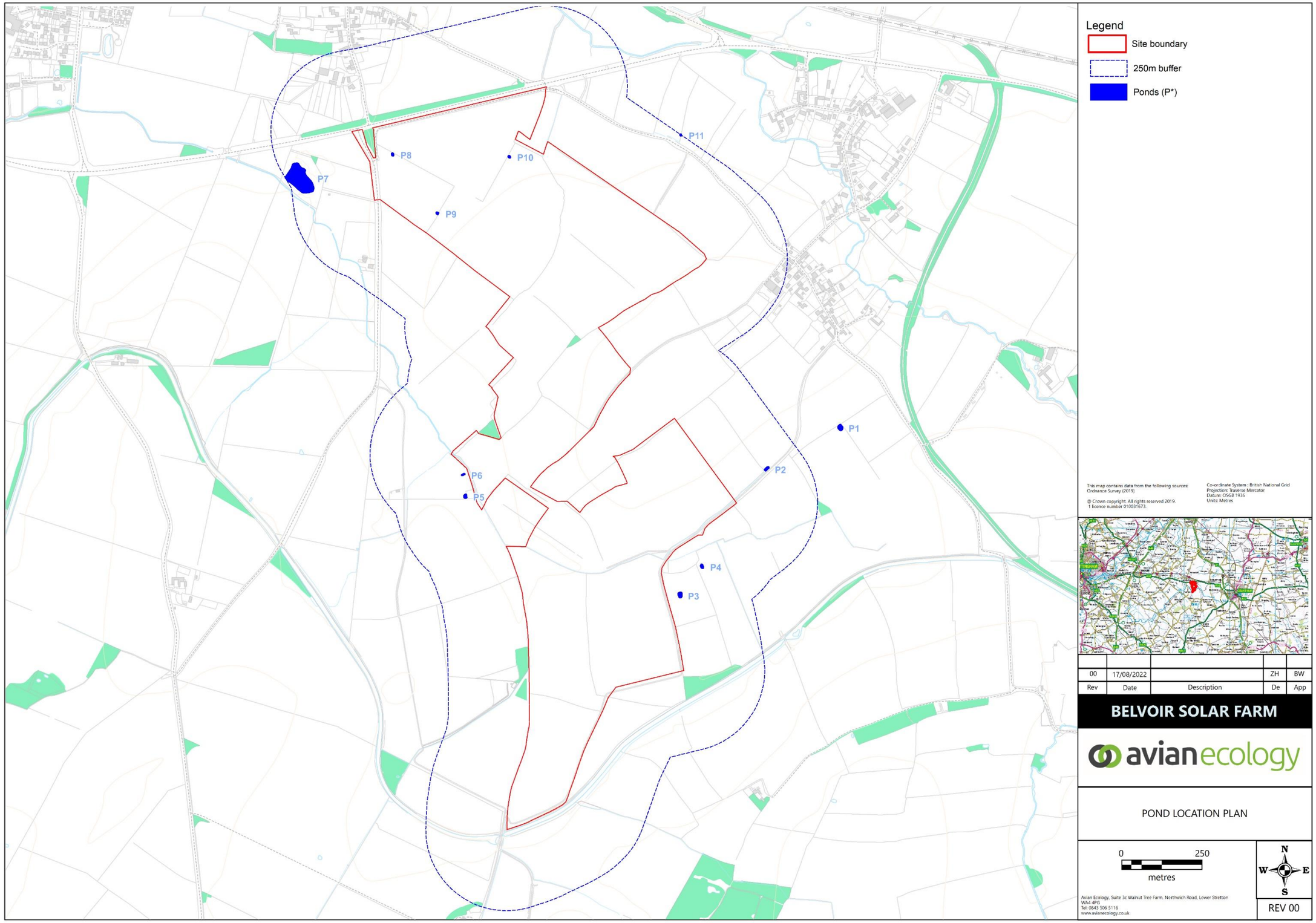


Figure 5.2.5: Pond Location Plan



ANNEX 1

Photographs

Plate	Description
	**Photo 1**: Example of arable field dominating the Site
	**Photo 2**: Another example of arable field dominating the Site.
	**Photo 3:** Boundary hedgerow and dry ditch

	**Photo 4:** Example of pre-existing field access.
	**Photo 5**: Wet ditch running along the western boundary.

	**Photo 6:** TN2 – Mature pedunculate oak *Quercus robur* along field boundary.
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	**Photo 8:** Tree lined-mature hedgerow.
	**Photo 9:** Hedgerow
	**Photo 10**: P2 – The wet pond in the wider area.

	**Photo 11:** P8- a dry pond on Site.
	**Photo 12:** P9 - a dry pond on Site.

Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd

Wintering Bird Survey Report 2019-2020

avian ecology

Document Control				
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V1	08/04/2020	Draft for Client Approval	Z. Hinchcliffe *MRes*	C. Bonnington *DPhil MSc BSc (Hons.) MCIEEM*
V2	11/11/2021	Updated with new site boundary	S. Turner MSc *MCIEEM*	B. Walker *MSC MCIEEM*
V3	09/09/2022	Updated– any amendments from previous version marked in red	Z. Hinchcliffe *MRes*	N. Robinson *MSc BSc (Hons) ACIEEM*

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1 INTRODUCTION

1.1.1 Avian Ecology Ltd. was commissioned by JBM Solar Projects 10 Ltd (hereafter 'JBM Solar' to undertake wintering bird surveys in relation to a proposed solar farm development, to the west of the village Muston, Lincolnshire (termed 'the Site'). The final layout has since been updated and is reflected within this report.

1.1.2 This report presents the results of wintering bird surveys undertaken by Avian Ecology during February and March 2020 across potentially suitable habitats within the Site and the surrounding fields. This report also considers information gathered from winter bird surveys carried out by Grassroots Ecology[1] earlier in the winter period (December 2019 and January 2020).

1.1.3 No statutory designated sites are located on Site; however Muston Meadows Site of Special Scientific Interest (SSSI) is located immediately adjacent to the south-east of the Site. There are no Statutory Designated Sites with qualifying interest for migratory bird species within 15km of the Site.

2 METHODOLOGY

2.1 Grassroots Ecology Wintering Bird Surveys

2.1.1 This report considers information gathered from winter bird surveys carried out by Grassroots Ecology between December 2019 and January 2020. It should be noted that the survey area of Grassroots Ecology covered a preliminary Site boundary appropriate at the time of the survey, and which included several additional fields that have since been removed from Site. See **Annex 1**.

2.1.2 Grassroots Ecology undertook two wintering bird surveys on 5th December 2019 and 30th January 2020. All surveys were carried out by Dr. R Holmes (RH). The full report by Grassroots Ecology is presented in **Annex 1**.

2.1.3 For the purposes of this report, only those species regarded as Target Species recorded during these surveys are considered. The definition of Target Species is provided in **Section 2.2.**

2.2 Avian Ecology Wintering Bird Surveys

2.2.1 Wintering bird surveys were undertaken by Avian Ecology on the 25th February 2020 and 10th March 2020.

2.2.2 The survey area comprised of the habitats within the preliminary Site boundary and Wider Survey Area defined as the fields surrounding the preliminary Site within a buffer 600m. This has since been updated to reflect the current Site boundary, henceforth referred to as the 'Site', as shown in **Figure 5.3.1**.

2.2.3 A total of two visits were completed with 'walk-over' surveys adopting the 'look-see' methodology (Gilbert *et al.* 1998[2]), observing each field, walking the boundaries, and stopping at intervals and scanning the fields for Target Species, with binoculars. All Target Species heard or seen were recorded onto basemaps. The number of Secondary Species was tallied during the survey, although no attempt to map these species was made.

[2] Gilbert G, Gibbons D.W. and Evans J. (1998) *Bird Monitoring Methods*. RSPB Sandy.

2.2.4 Target Species recorded during the survey were wetland bird species, principally waders, waterfowl and gulls, and Annex 1[3]/Schedule 1[4] raptors. Secondary Species consisted of non-Annex 1/Schedule 1 raptors and owl, notable flocks of non-wetland Birds of Conservation Concern (BoCC Amber and Red List Species (Eaton *et al.* 2015 updated with Stanbury *et al.* (2021)[5]) and Leicestershire and Rutland Biodiversity Action Plan species (LBAP)[6].

2.2.5 All surveys were undertaken during daylight hours in weather conditions conducive to bird surveys.

2.2.6 Survey visits were undertaken by Z. Hinchcliffe MRes (ZH) and or A. Morley BSc (AM), both experienced ornithologists.

2.2.7 Winter walk-over survey effort completed by Grassroots Ecology and Avian Ecology is summarised in **Table 2.1**. Detailed survey effort is presented in **Annex 1** and **2**.

Table 2.1: Winter walk-over survey effort.

Survey Visit	Date	Surveyor	Start Time (24hrs)	End Time (24hrs)	Survey Conditions
*1**	*05/12/19*	*RH*	-	-	*Information not provided*
*2**	*30/01/20*	*RH*	-	-	*Information not provided*
3	25/02/2020	ZH/AM	12:15	14:30	Dry, clear, gentle breeze. Good visibility.
4	10/03/2020	ZH	09:40	12:15	Dry, clear, fresh breeze. Good visibility.

*Surveys carried out by Grassroots Ecology

Limitations to survey

2.2.8 Survey methodology carried out by Grassroots Ecology only surveyed within the redline boundary with additional observations along the Grantham Canal to the south of the Site. Typically surveys use a 600m buffer from the Site as a Wider Survey Area because 600m is considered the maximum distance at which species included as Target Species have been known to be disturbed.

2.2.9 Wintering bird surveys are generally undertaken between October and March, for example at locations where there is a likelihood of high levels of bird use by species associated with a designated site such as a Special Protection Area (SPA). However, due to the late commission of the surveys, wintering bird surveys were only undertaken between January and March 2020. This was not considered to be a significant constraint on the ornithological assessment due to very low numbers of Target and Secondary Species recorded and because the Site is not within 15km of any international designated site or within 5km of any nationally designated site; which have migratory and/or wintering wetland birds as qualifying species.

[3] https://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm

[4] https://www.rspb.org.uk/birds-and-wildlife/advice/wildlife-and-the-law/wildlife-and-countryside-act/schedules/

[5] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747

[6] https://www.lrwt.org.uk/sites/default/files/2020-01/space_for_wildlife__llrbap_2016-26_part_1.pdf

2.2.10 At the time of survey, BoCC Red and Amber Listed species were listed under Eaton *et al*. (2005)[7] so species that were previously not listed as red or amber species may have been observed but not recorded or recorded with limited detail. For example wren *Troglodytes troglodytes* and woodpigeon *Columba palumbus* were observed during the Grassroots surveys but no further details were recorded. However, most species previously listed as non-BoCC species would be listed as secondary species and as a result, this isnot considered to be a significant limiting factor.

3 RESULTS

3.1 Grassroots Ecology Survey Results

3.1.1 The surveys by Grassroots Ecology recorded no Target Species and six Secondary Species, within the survey area as summarised in **Table 3.1**. Survey results along the Grantham Canal, outside the Site in the Grassroots Wider Survey Area are presented in **Table 3.2.**

3.1.2 Detailed locations of bird records can be found in the Grassroots Ecology survey report in **Annex 1**.

3.1.3 Only fields containing Target and Secondary Species are shown; all other fields had no Target or Secondary species recorded.

Table 3.1: Grassroots Ecology - Winter 'walk-over' survey results – Grassroots 'extended' Site boundary

Species	**Survey visit**		**Conservation Status**
	1	**2**	
No Target Species			
Secondary Species			
Grey partridge *Perdix perdix*	-	1	NERC S.41, BoCC - Red
Woodpigeon *Columba palumbus*	Present		BoCC - Amber
Skylark *Alauda arvensis*	1	12	NERC S.41, BoCC - Red
Wren *Troglodytes troglodytes*	Present		BoCC – Amber
Dunnock *Prunella modularis*	8	3	NERC S.41, BoCC - Amber
Song thrush *Turdus philomelos*	-	14	NERC S.41, BoCC - Amber
Fieldfare *Turdus pilaris*	-	86	S1, BoCC- Red
Meadow pipit *Anthus pratensis*	51	14	BoCC - Amber

'-' means that the species was not recorded during that visit.

Conservation Status

S1 - Birds listed on Schedule 1 of the Wildlife and Countryside Act

NERC S 41 - Species listed on Section 41 of the NERC Act (2006)

BoCC – Species listed on the Birds of Conservation Concern 5

[7] Eaton MA, Aebischer NJ., Brown AF., Hearn R., Lock L., Musgrove AJ., Noble DG., Stroud D. and Gregory R.D (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 108, pp 708–746.

Table 3.2 – Grassroots Ecology - Winter walk-over survey results – Grassroots Wider Survey Area

Species	**Survey visit**		**Conservation Status**
	1	**2**	
Target Species			
Mute swan *Cygnus olor*	**-**	**3**	**BoCC - Amber**
Mallard *Anas platyrhynchus*	**-**	**1**	**BoCC - Amber**
Coot *Fulica atra*	**-**	**1**	**-**
Secondary Species			
Skylark	1	-	NERC S.41, BoCC - Red
Dunnock	-	1	NERC S.41, BoCC - Amber
Redwing *Turdus illicaus*	2	-	S1, BoCC- Red
Song thrush	4	-	NERC S.41, BoCC - Amber
Fieldfare	5	24	S1, BoCC- Red
Mistle thrush *Turdus viscivorus*	1	1	BoCC - Red
Meadow pipit	3	-	BoCC - Amber

Target species recorded in bold
'-' means that the species was not recorded during that visit.

Conservation Status

S1 - Birds listed on Schedule 1 of the Wildlife and Countryside Act

NERC S 41 - Species listed on Section 41 of the NERC Act (2006)

BoCC – Species listed on the Birds of Conservation Concern 5

3.2 Avian Ecology Survey Results

3.2.1 The Site supported no Target Species, and five Secondary Species (skylark, starling *Sturnus vulgaris*, fieldfare, redwing and yellowhammer *Emberiza citrinella*). Results for within the Site are summarised in **Table 3.3.**

3.2.2 Only one Target Species (mute swan) was recorded within the Wider Survey Area, along with six Secondary Species (kestrel *Falco tinninculus,* skylark, dunnock, starling, redwing and yellowhammer). Results for within the Wider Survey Area are summarised in **Table 3.4**.

3.2.3 Detailed locations of bird observations are presented in **Figure 5.3.2**.

3.2.4 Only fields containing Target and Secondary Species are shown; all other fields had no Target or Secondary species recorded.

Table 3.3: Winter walk-over survey results – The Site.

Field Number	**Species**	**Survey Visits**		**Conservation Status**
		3	**4**	
No Target Species				

Secondary Species:				
1	Redwing	-	5	S1, BoCC- Red
	Fieldfare	-	34	S1, BoCC- Red
	Starling	-	2	NERC S.41, BoCC - Red
2	Redwing	4	-	S1, BoCC- Red
3	Fieldfare	55	-	S1, BoCC- Red
	Skylark	1	-	NERC S.41, BoCC - Red
16	Skylark	1	-	NERC S.41, BoCC - Red
18	Yellowhammer	3	-	NERC S.41, BoCC - Red
19	Fieldfare	40	-	S1, BoCC- Red

Target species recorded in bold

'-' means that the species was not recorded during that visit.

Conservation Status

S1 - Birds listed on Schedule 1 of the Wildlife and Countryside Act

NERC S.41 - Species listed on Section 41 of the NERC Act (2006)

BoCC – Species listed on the Birds of Conservation Concern 5

Table 3.4: Winter walk-over survey results - Wider Survey Area

Field Number	Species	Survey Visits		Conservation Status
		3	4	
Target Species				
85	**Mute swan**	**-**	**2**	**BoCC - Amber**
Secondary Species:				
17	Skylark	1	1	NERC S.41, BoCC - Red
22	Yellowhammer	-	1	NERC S.41, BoCC - Red
23	Skylark	-	2	NERC S.41, BoCC - Red
52	Dunnock	-	1	NERC S.41, BoCC - Amber
58	Starling	-	21	NERC S.41, BoCC - Red
84	Kestrel *Falco tinnunculus*	1	-	BoCC - Amber
	Dunnock	-	3	NERC S.41, BoCC - Amber
99	Kestrel	-	1	BoCC - Amber
100	Kestrel	1	-	BoCC - Amber

102	Redwing	7	-	S1, BoCC- Red

Target species recorded in bold
'-' means that the species was not recorded during that visit.

Conservation Status

S1 - Birds listed on Schedule 1 of the Wildlife and Countryside Act

NERC S.41 - Species listed on Section 41 of the NERC Act (2006)

BoCC – Species listed on the Birds of Conservation Concern 5

Figure 5.3.1: Site and Wider Survey Area

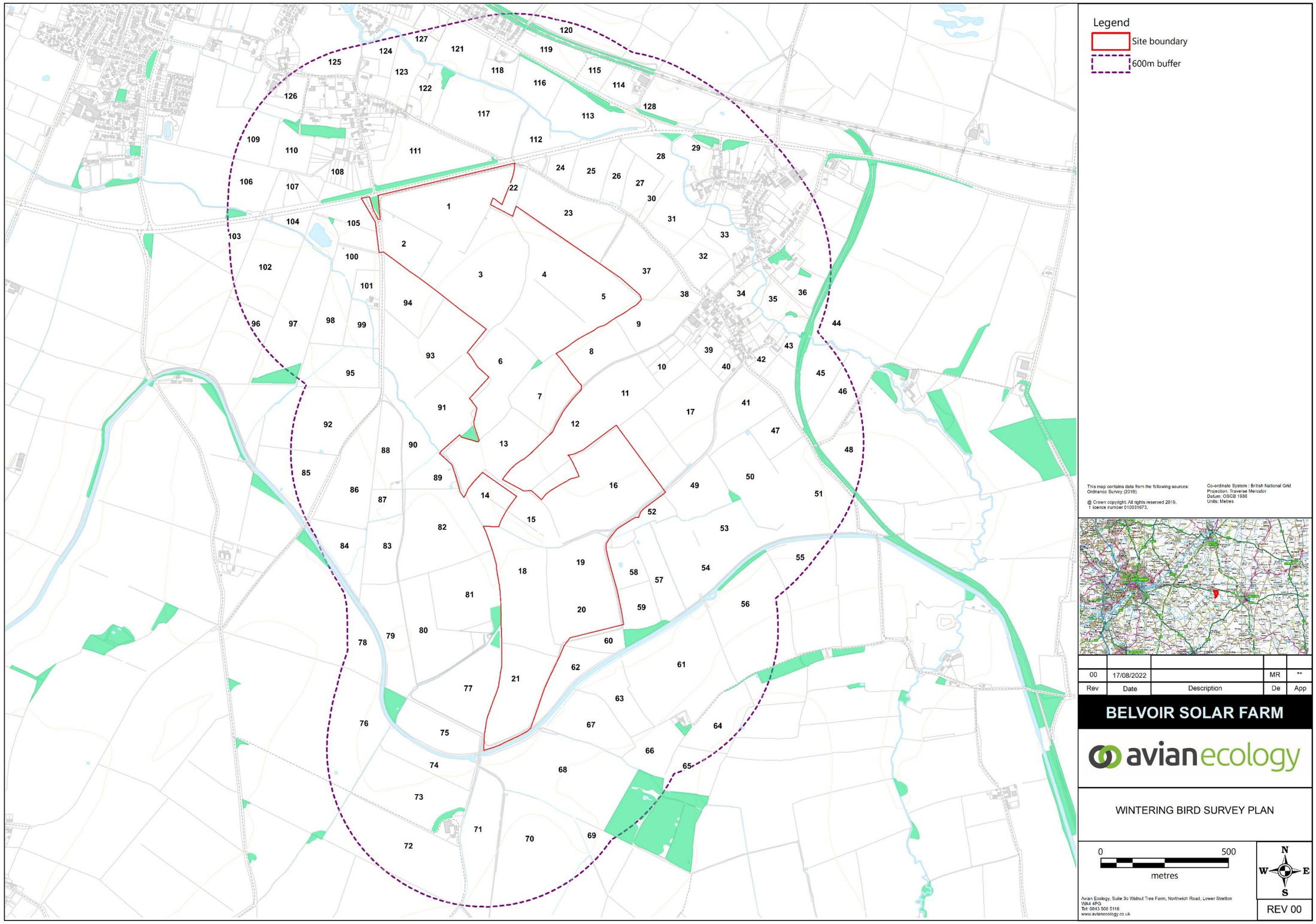
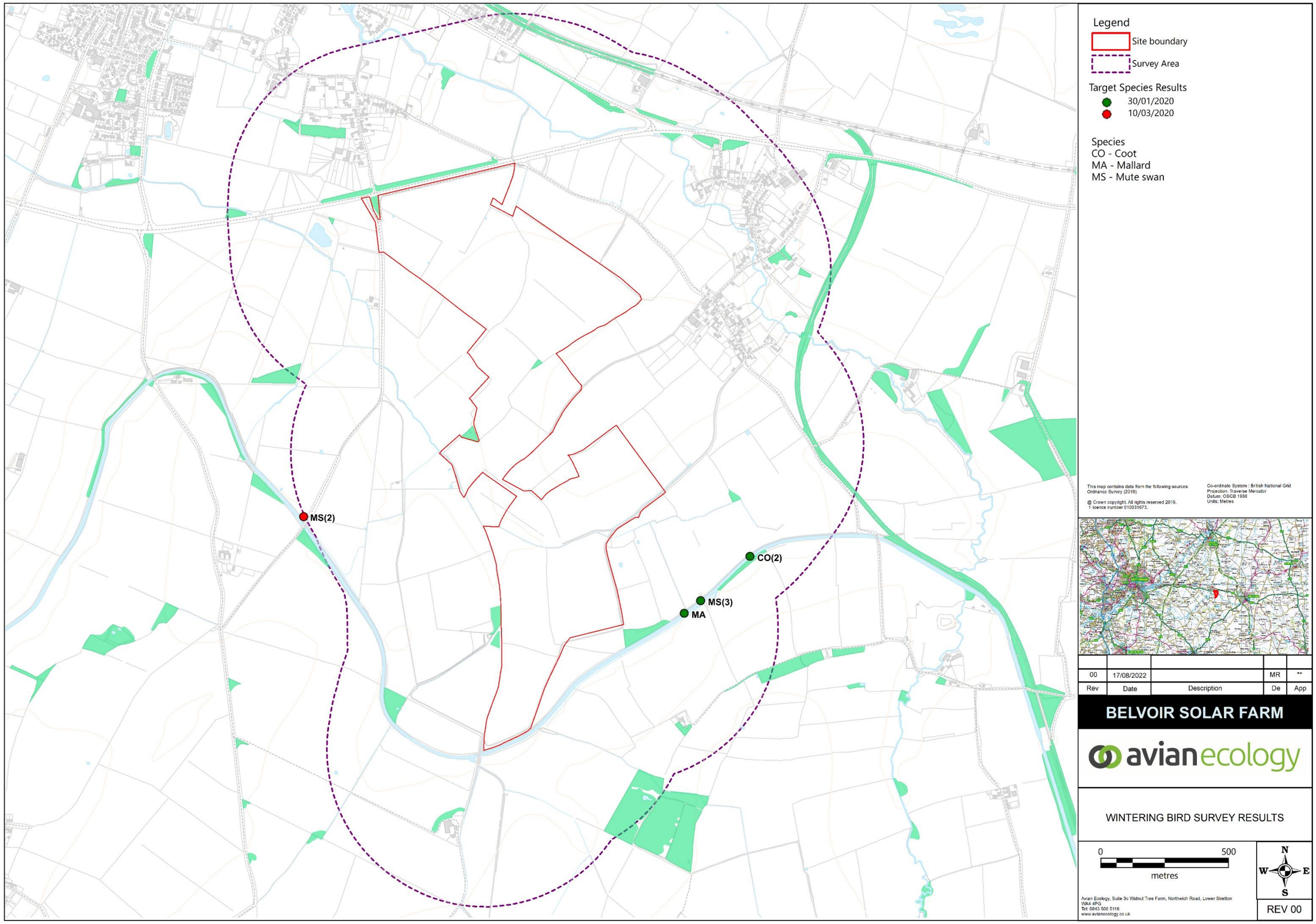


Figure 5.3.2: Wintering Bird Survey Results



ANNEX 1

GRASSROOTS ECOLOGY SURVEY

ANNEX 2

AVIAN ECOLOGY WINTERING BIRD SURVEY EFFORT

ANNEX 2: WINTERING BIRD SURVEY EFFORT

Date	Surveyor	Start Time (24hrs)	Finish Time (24hrs)	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow	Temperature (°C)
25/02/2020	ZH AM	12:15	14:30	3	W	0	2	2	2	0	0	6
10/03/2020	ZH	09:40	12:15	2	W	0	7	2	2	0	0	13

Weather Conditions Key

Wind Speed		W-Direction	Rain		Cloud Cover		Cloud Height	
Calm	0	Use 16 point Compass	None	0	In eighths e.g.	3/8	<150m	0
Light air	1		Drizzle/Mist	1			150-500m	1
Light breeze	2	N	Light showers	2			>500m	2
Mod. breeze	4	NNE	Heavy rain	4				
Fresh breeze	5	NE						
Strong breeze	6	ENE						
Mod. gale	7	E	**Visibility**		**Snow**		**Frost**	
Fresh gale	8	Etc	Poor	0	None	0	None	0
Strong gale	9		< 1km	1	On site	1	Ground	1
Whole gale	10		>1km	2	High ground	2	All day	3
Storm	11							

Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd

Breeding Bird Survey Report - 2020

avian ecology

Document Control				
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V1	14/10/2020	Draft for Client Approval	A. Morley *BSc*	Dr C Bonnington *DPhil MSc BSc (Hons.) MCIEEM*
V2	11/11/2021	Updated with new site boundary	S. Turner *MSc MCIEEM*	B. Walker *MSc MCIEEM*
V3	15/09/2022	Updated– any amendments from previous version marked in red	A. Hulme *BSc*	N. Robinson *MSc BSc (Hons.) ACIEEM*

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FIGURES

ANNEXES

1 INTRODUCTION

1.1 Project Background

1.1.1 Avian Ecology Ltd. was commissioned by JBM Solar Projects 10 Ltd to undertake breeding bird surveys in relation to a proposed solar farm development, on land to the west of the village Muston, Lincolnshire (termed 'the Site'). The final Site boundary and Proposed Development layout has since been updated and is reflected within this report (termed 'the Site').

1.1.2 The objectives of this report are:

- Provide baseline information on the current breeding ornithological features within the Site; and,
- Identify the presence of notable breeding bird species within the Site.

1.1.3 Only common bird species names are referred to within the main text of this Appendix. **Annex 1** provides a summary of all bird species recorded during the surveys. Both common and species names together with a summary of their conservation status as relevant is provided.

1.2 Site Overview

1.2.1 The dominant habitats within the Site are arable and improved grassland with some broad-leaved woodland, species-poor hedgerows and scattered trees within field boundary hedgerows. No statutory designated sites for migratory bird species Site; however Muston Meadows Site of Special Scientific Interest (SSSI) which is located immediately adjacent to the south-east of the Site is designated for its botanical interest. There are no Statutory Designated Sites with qualifying interest for migratory bird species within 15km of the Site.

2 METHODOLOGY

2.1 Breeding Bird Survey

2.1.1 A Breeding bird survey was undertaken monthly between May and July 2020 (total of three surveys). All three surveys were carried out from dawn and finished by 10:30hrs and were carried out in conditions conducive for breeding bird surveys (avoiding heavy rain and strong winds).

2.1.2 The survey area for the breeding bird survey comprised a preliminary Site boundary, and adjoining habitats within 100m of this (termed 'the Survey Area'). Only Notable Species were recorded within the extended 100m buffer. The Study Area is shown in **Figure 5.4.1**.

2.1.3 Breeding bird surveys were undertaken by A. Morley (BSc) and Z. Hinchcliffe MRes who are both experienced ornithologists. Survey effort is summarised in**Table 2.1** with further details presented in **Annex 2**.

2.1.4 The methodology employed was based upon a scaled-down version of the British Trust for Ornithology (BTO) Common Bird Census (CBC) technique, as detailed in Gilbert *et al*. (1998[1]). All bird registrations were recorded on suitably scaled field maps using standard BTO species codes and behaviour notations (such as singing, carrying food, active nest). The approximate locations of bird territories within the Site were determined using standard territory mapping techniques to identify and Records of birds just visiting the Site (e.g. gulls feeding in fields) and birds flying over the Site were also made and the records of these summarised, however these have been discounted from further analysis,

given they are not breeding within the Site and are therefore not considered relevant to the assessment.

Table 2.1: Breeding bird survey effort.

Date	Start time (24hrs)	End time (24hrs)	Sunrise times (24hrs)	Survey conditions
14/05/2020	07:23	10:10	05:10	South westerly breeze (2 on Beaufort Scale), cloudy with sunny spells, good visibility.
09/06/20202	07:15	10:30	04:45	South westerly gentle breeze (1 on Beaufort Scale), overcast, dry. Good visibility.
16/07/2020	06:45	10:20	05:03	Moderate westerly breeze (2 on Beaufort Scale), overcast but very warm at 15°C and dry, good visibility.

Limitations

2.1.5 Access was permitted to all parts of the 'Survey Area during all surveys and as such no access limitations were experienced.

2.1.6 Surveys were carried out in May, June and July with no surveys undertaken in April. Given the habitats present it is predicted that early breeding birds that use these habitats, would have been recorded during this survey, so the omission of an April survey is not considered a material limitation to the objectives of the survey.

3 RESULTS

3.1.1 The breeding bird assemblage recorded within the Site is representative of farmland habitats. Nine breeding Notable Species were recorded within the Survey Area, consisting of five Amber List species (quail, song thrush, wren, reed bunting and dunnock) ,and four Red List species (skylark, linnet, grey partridge and yellowhammer). Of these, three are also species listed as rare and most threatened species under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) (yellowhammer, grey partridge and linnet). Furthermore, five species are also Lincolnshire Biodiversity Action Plan (LBAP)[2] species (grey partridge, skylark, yellowhammer, reed bunting and linnet). The number of breeding territories of these species were typically low (≤4 territories), with skylark (10 territories within Site) and yellowhammer (9 territories within Site).

3.1.2 The Notable Species breeding assemblage (which included dunnock, reed bunting and yellowhammer) was typically associated with vegetation along field boundaries within the Survey Area, principally hedgerows, scrub, tree-lines and woodland habitats.

3.1.3 Ground-nesting Notable Species which use open fields onsite and within the 100m buffer consisted of skylark (10 territories within the Site) and quail (1 territory within the buffer).

3.1.4 All breeding species recorded along with an estimated number of territories are detailed within **Table 3.1**. Those species in **bold** are considered Notable Species.

3.1.5 For the purposes of the assessment, although the estimated number of breeding territories for all species is provided only the breeding territories of Notable Species are mapped, given these are the most relevant species to the assessment. Notable Species consist of Birds of Conservation Concern

[2] http://www.southkesteven.gov.uk/CHttpHandler.ashx?id=7371&p=0 [Accessed 22/08/2022].

(BoCC Amber and Red List Species (updated since V2 to reflect current guidance; Stanbury *et al.* 2021[3]) and Annex 1/Schedule 1 raptors and owls.

3.1.6 The indicative locations of the territories of Notable Species are provided in **Figure 5.4.1**.

Table 3.1: Breeding bird survey results.

Common name	Estimated number of territories within the Site (additional territories within the Survey Area)	Comments
Quail	**0 (1)**	**Two males singing in arable crop fields.**
Grey Partridge	**1**	**Present in the northern area of the Site.**
Blue Tit	2	Associated with vegetation along field boundaries, some individuals observed carrying food.
Great Tit	3	Associated with hedgerows and trees along field boundaries.
Skylark	**10**	**Singing males in suitable breeding habitat (open fields across the Site).**
Blackcap	2	Singing males associated with vegetation along field boundaries, mainly hedgerows and trees.
Chiffchaff	7	Singing males associated with vegetation along field boundaries.
Sedge Warbler	1	Single male singing along southern boundary.
Whitethroat	7	Singing males within hedgerows and along field boundaries.
Song Thrush	**1**	**Singing males within hedgerows and along field boundaries.**
Blackbird	4	Associated with field boundaries and hedgerows.
Blackcap	2	Associated with field boundaries and hedgerows.
Chaffinch	5	Associated with field boundaries and hedgerows.
Carrion crow	1	Associated with field boundaries and hedgerows.
Wren	**4**	**Associated with vegetation along field boundaries and hedgerows.**
Robin	2	Associated with vegetation along field boundaries.
Dunnock	**4**	**Associated with vegetation along field boundaries.**
Reed Bunting	**2 (1)**	**Associated with hedgerows and boundary vegetation of the Site.**

[3] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, pp. 723-747

Linnet	**2 (1)**	**Associated with arable crop.**
Yellowhammer	**9**	**Singing males within hedgerows and along field boundaries.**

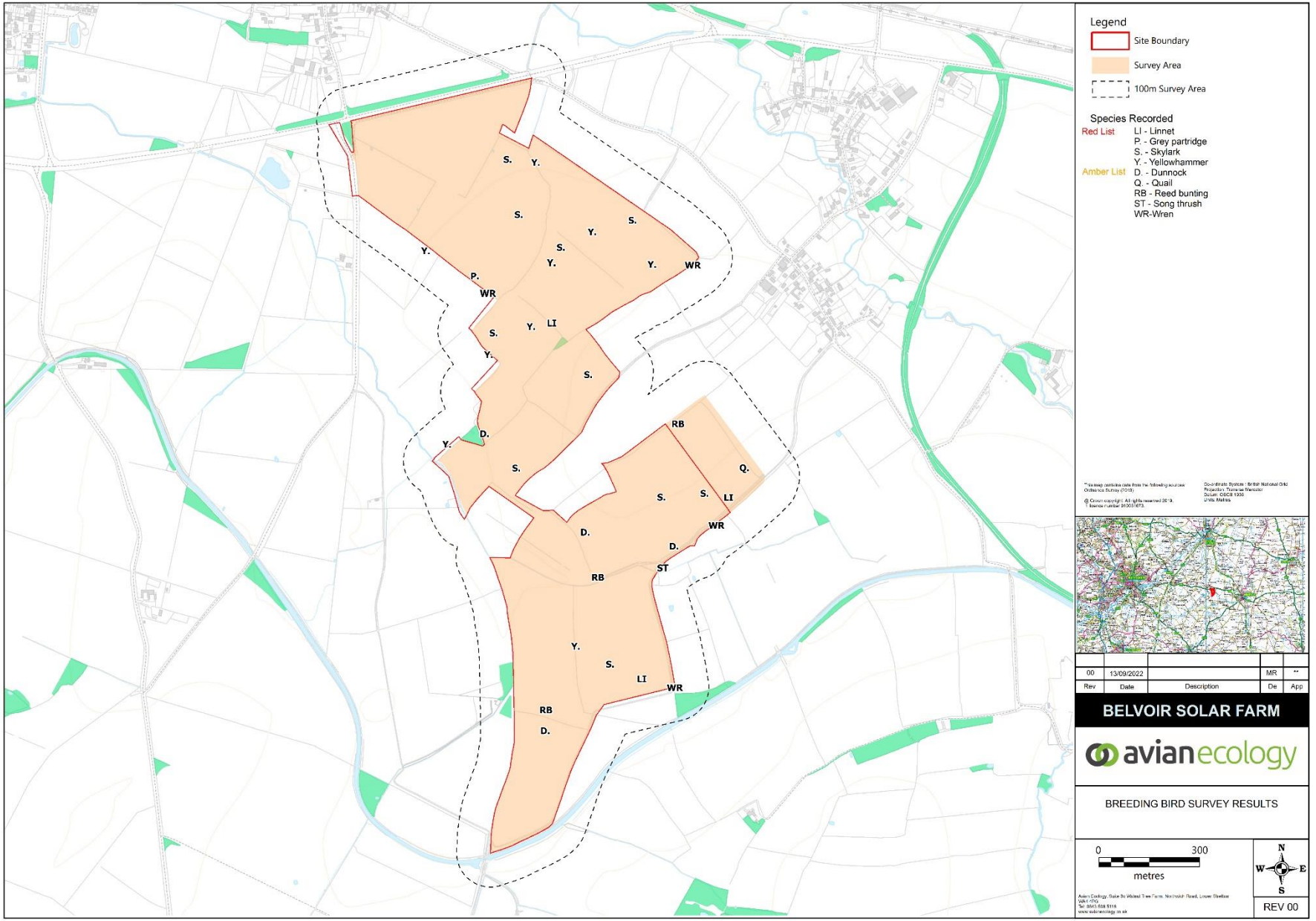
3.1.7 During the surveys a small number of species were recorded which were not considered as breeding within the Survey Area. These consisted of species flying over the Survey Area only (red kite, buzzard and kestrel), and those considered only visiting the Survey Area to feed (meadow pipit, pied wagtail, magpie, greylag goose, starling, carrion crow, goldfinch, woodpigeon, jackdaw, lapwing, collared dove, swallow, swift, stock dove and meadow pipit)[4].

4 CONCLUSION

4.1.1 The updated Site and immediately surrounding land support a breeding bird assemblage indicative of farmland habitats. Most breeding species (including Notable Species) were associated with the field boundary vegetation (such as hedgerows, trees and woodland). Ground-nesting notable species which use open ground recorded were skylark (estimated 10 breeding territories within the Site) and quail (estimated 1 territory within the buffer). Notable Species were recorded in modest numbers with breeding territories typically ≤4 within the Site, with skylark (10 territories) and yellowhammer (9 territories) being the only exceptions.

[4] This was based on a number of factors including the number and gender of birds recorded (e.g. only one record of one female during the survey period), unsuitability of habitats onsite for breeding of some species, and movement of birds from Site to a suspected nest site offsite.

Figure 5.4.1: Breeding Bird Survey Results



ANNEX 1. BIRD SPECIES SUMMARY

Table A1-1 provides a list of bird species recorded during the breeding bird surveys. Both common and species names are presented along with a summary of each species conservation status using the following abbreviations:

- Annex 1 – species listed on Annex 1 of the EU Birds Directive as threatened;
- S1- species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended – species listed on this Schedule, but are provided more protection from harassment;
- BoCC - BoCCs as listed by leading bird conservation organisations in the UK, including the RSPB and BTO. Red and Amber categories are given (Eaton *et al*., 2015);
- NERC S41 - species listed as rare and most threatened on the NERC Act (2006); and,
- LBAP – species on the Lincolnshire Local Biodiversity Action Plan.

Table A1-1: Summary of bird species.

Common name	Species name	Conservation status
Greylag Goose	Anser anser	BoCC – Amber
Carrion crow	*Corvus corone*	-
Blackcap	*Sylvia atricapilla*	-
Starling	*Sturnus vulgaris*	BoCC – Red, NERC S41, LBAP
Goldfinch	*Carduelis carduelis*	-
Woodpigeon	*Columba palumbus*	-
Reed Bunting	*Emberiza schoeniclus*	BoCC – Amber
Song Thrush	*Turdus philomelos*	BoCC – Red, NERC,
Blackbird	*Turdus merula*	-
Grey Partridge	*Perdix perdix*	BoCC – Red, NERC S41, LBAP
Kestrel	*Falco tinnunculus*	BoCC – Amber
Blue Tit	*Cyanistes caeruleus*	-
Skylark	*Alauda arvensis*	BoCC – Red, NERC S41, LBAP
Great tit	*Parus major*	-
Dunnock	*Prunella modularis*	BoCC – Amber, NERC S41
Wren	*Troglodytes troglodytes*	-
Robin	*Erithacus rubecula*	-
Whitethroat	*Sylvia communis*	-
Yellowhammer	*Emberiza citrinella*	BoCC – Red, NERC S41, LBAP
Quail	*Citurnix coturnix*	BoCC – Amber
Chiffchaff	*Phylloscopus collybita*	-
Sedge warbler	*Acrocephalus schoenobaenus*	-

Common name	Species name	Conservation status
Linnet	*Linaria cannabina*	BoCC – Red, NERC S41, LBAP
Pied Wagtail	*Motacilla alba*	-
Jackdaw	*Corvus Monedula*	-
Red Kite	*Milvus milvus*	BoCC – Red, NERC S41, LBAP, Annex 1, Sch1
Magpie	*Pica pica*	-
Lapwing	*Vanellus vanellus*	BoCC – Red, NERC S41, LBAP
Collard Dove	*Streptopelia decaocto*	-
Swallow	*Hirundo rustica*	-
Swift	*Apus apus*	BoCC – Amber
Stock Dove	*Columba oenas*	BoCC – Amber
Meadow Pipit	*Anthus pratensis*	BoCC – Amber
Chaffinch	*Fringilla coelebs*	-

ANNEX 2: BREEDING BIRD SURVEY EFFORT

Date	Surveyor	Start Time (24 hrs)	End time (24 hrs)	Wind Speed	Wind Direction	Rain	Cloud Height	Cloud Cover	Visibility	Frost	Snow	Temperature (°C)
13/05/2020	ZH	07:23	10:10	2	South West	0	2	8	2	0	0	7°C
09/06/2020	AM	07:15	10:30	2	South West	0	2	6	2	0	0	10°C
16/07/2020	AM	06:45	10:20	4	West	0	2	8	2	0	0	15°C

Wind Speed		W-Direction	Rain		Cloud Cover		Cloud Height	
Calm	0	Use 16 point Compass	None	0	In eighths e.g.	3/8	<150m	0
Light air	1		Drizzle/Mist	1			150-500m	1
Light breeze	2	N	Light showers	2			>500m	2
Mod. breeze	4	NNE	Heavy rain	4				
Fresh breeze	5	NE						
Strong breeze	6	ENE						
Mod. gale	7	E	**Visibility**		**Snow**		**Frost**	
Fresh gale	8	Etc	Poor	0	None	0	None	0
Strong gale	9		< 1km	1	On site	1	Ground	1
Whole gale	10		>1km	2	High ground	2	All day	3
Storm	11							

Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd

Great Crested Newt Presence or Absence (eDNA) Survey Report

avian ecology

Document Control				
Project Name:	Belvoir Solar Farm			
Project Ref.:	Pegas-075-1270			
Report Title:	Great Crested Newt Presence or Absence (eDNA) Survey Report			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
V1	08/07/2020	Draft	B. Walker *MSc GradCIEEM*	U. Maginn *MSc MCIEEM*
V2	11/11/2021	Pond plan updated with new red line	S. Turner *MCIEEM*	B. Walker *MSc MCIEEM*
V3	09/09/2022	Updated– any amendments from previous version marked in red	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*

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FIGURES

ANNEXES

1 INTRODUCTION

1.1 Background

1.1.1 Avian Ecology Ltd. was commissioned by JBM Solar to undertake a great crested newt (GCN) *Triturus cristatus* environmental DNA (eDNA) survey in relation to a the pproposed solar energy development on land to the west of the village Muston, Leicestershire, henceforth referred to as 'the Site', as illustrated on **Figure 5.6.1.**

1.1.2 This report subsequently provides detailed survey methodology and survey results updated to reflect a change in Site boundary and Proposed Development layout.

1.2 Survey Area

1.2.1 Ponds were identified form aerial images and OS maps on or within 250m of the preliminary Site boundary and which encompasses the updated Site boundary and areas within 250m.

1.2.2 Due to the low impact of solar energy developments on GCN habitats, and reflecting guidance published by Natural England, ponds beyond 250m from updated Site boundary were not considered.

1.2.3 Ponds subject to assessment are identified on **Figure 5.6.1**.

2 METHODOLOGY

2.1.1 In 2020, 11 ponds were identified for survey on the basis of the preliminary Site boundary, through a review of OS and aerial mapping.

2.1.2 One pond, P1 located within approximately 250m of the preliminary Site boundary, is now no longer located within 250m of the updated Site boundary. Pond P1 is therefore no longer considered in relation to the Proposed Development.

2.1.3 Of the other ten ponds, only three are present within the updated Site boundary(Ponds P8, P9 and P10), and which were found to be dry during the Extended Phase 1 Habitat Survey undertaken in May 2020 and eDNA survey in June 2020.

2.1.4 One pond within the study area was accessed and subject to survey, pond P2 as shown on **Figure 5.6.1.**

2.1.5 The pond was assessed for its suitability to support GCN using the Habitat Suitability Index (HSI) Assessment methodology as developed by Oldham *et al.* (2000[1]) and as detailed within ARG UK guidance (ARG UK, 2010[2]). This pond was also subject to eDNA survey sampling to determine the presence or likely absence of GCN.

2.2 HSI

2.2.1 The HSI assessment involves the measurement of ten different indices which, when combined, have been found to provide a good indication of the general suitability of ponds for great crested newts.

[1] Oldham R.S., Keeble J., Swan M.J.S. and Jeffcote M. (2000) Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal, 10(4), pp. 143-155.

[2] ARG UK (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

Each of the indices is scored (between 0.01-1) using a series of graphs and figures within the guidance notes (ARG UK, 2010). These scores are then used to calculate an overall Habitat Suitability Score for each pond.

2.2.2 Final scores relate to pond suitability for great crested newt and range from 'poor' to 'excellent'.

2.3 eDNA

2.3.1 Environmental DNA (eDNA) is nuclear or mitochondrial DNA that is released from an organism into the environment. Sources of eDNA include secreted faeces, mucous, gametes, shed skin and carcasses. In aquatic environments, eDNA is diluted and distributed in the water where it persists for 7–21 days, depending on the conditions (Biggs *et al*., 2014a[3]). The technique for determining presence/absence of GCN uses Polymerase Chain Reaction (PCR) laboratory techniques to detect the species eDNA within water samples.

2.3.2 Recent research by the Department for Environment Food and Rural Affairs (Defra) Project WC1067, concludes that the sampling of waterbodies collecting eDNA appears to be a highly effective method for determining whether great crested newts are present or absent during the breeding season, even where eDNA is present in very low concentrations (Biggs *et al.,* 2014).

2.3.3 Natural England accepts the use of environmental DNA surveys as evidence of presence or absence of GCN, provided samples are taken when newts are likely to be present (this depends on location and conditions like the weather). Natural England will only accept eDNA survey results undertaken between mid-April and 30th June, in strict accordance with the published technical advice note, by suitably trained, experienced and licensed GCN surveyors.

Field Sampling Technique

2.3.4 The pond was sampled on 22nd June 2020. Samples were collected by Mr A. Hulme (NE Licence No. 2018-33563-CLS-CLS) and Mr. A. Morley (NE Licence No. 2020-44980-CLS-CLS).

2.3.5 The protocol for sampling followed that outlined within the technical advice note for field and laboratory sampling of great crested newts (Biggs *et al*., 2014), which required the collection of 20 x 30ml subsamples from each pond, spaced as evenly as possible around the pond margin.

2.3.6 Each sample was then placed within a Whirl-Pak bag and shaken for 10 seconds, before a 15ml sample was pipetted from the bag and placed in a specimen tube for laboratory analysis. Following collection, samples were refrigerated prior to laboratory dispatch.

Laboratory Analysis

2.3.7 Laboratory analysis was undertaken by SureScreen Scientifics:

SureScreen Scientifics Division Ltd,
Morley Retreat,
Church Lane,
Morley,
Derbyshire,
DE7 6DE

[3] Biggs J., Ewald N., Valentini A., Gaboriaud C, Griffiths R.A., Foster J., Wilkinson J., Arnett A., Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

Tel: +44 (0)1332 292003
Email: scientifics@surescreen.com

2.3.8 The laboratory follows the analysis methodology outlined within the Defra Project WC1067 (Biggs *et al*., 2014) using the q-PCR test conducted in two phases.

2.3.9 The sample first goes through an extraction process to acquire as much eDNA as possible to produce a pooled sample. The pooled sample is then tested via 1-PCR.

2.3.10 Each pooled sample is replicated 12 times to ensure results are accurate. If one of the twelve replicates tests positive the sample is declared positive. The sample is only declared negative if no replicates show amplification. Inhibition and degradation checks are also carried out on each sample using a known DNA marker. Results of these quality control tests are recorded with each sample.

2.3.11 Samples are tested in a clean room and the different phases of testing are kept separate to reduce any risk of cross contamination.

3 RESULTS

3.1.1 The summary of the HSI and eDNA survey results are summarised in **Table 3.1** and **Table 3.2**.

3.2 HSI

3.2.1 The habitat suitability of the pond P2 was determined as good. Its a small oval shaped pond at the corner of a large arable field. At the time of the survey, there were areas of open water with reedmace *Typha latifolia* present within the water body. Marginal vegetation consisted of rushes *Juncus sp*, sedges, flag iris *Iris pseudacorus* and water mint *Mentha aquatica*. Water at the time of the survey was deep at the centre but evidence of drying was seen on the banks of the pond. The water was turbid and algal bloom was also present.

Table 3.1: eDNA survey results.

Suitability Indices	**P2**
SI1 – Location	1.00
SI2 – Pond area	0.2
SI3 – Pond drying	1.00
SI4 – Water quality	0.33
SI5 –Shade	1.00
SI6 – Fowl	1.00
SI7 – Fish	1.00
SI8 – Ponds	1.00
SI9 – Terrestrial habitat	0.67
SI10 – Macrophytes	1.00

HSI	0.73
Suitability	**Good**

3.3 eDNA

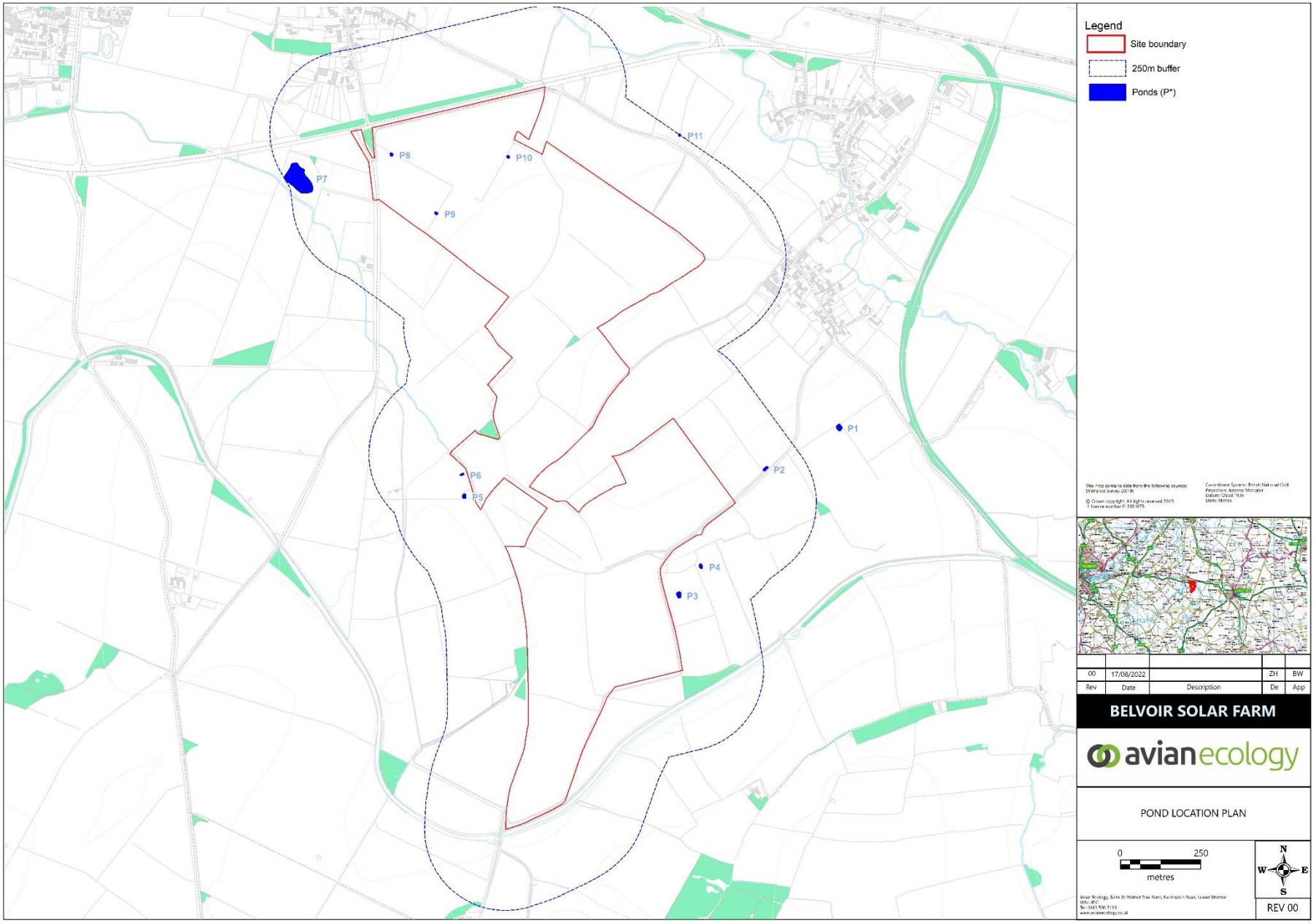
3.3.1 Pond 2 returned a **Negative** result for the presence of GCN as summarised in **Table 3.2**. The laboratory report is reproduced in **Annex 1**.

Table 3.2: eDNA survey results.

Pond	Sample Ref.	Inhibition Check	Degradation Check	Sample Integrity Score	Result
P2	1750	Pass	Pass	Pass	Negative 0/12

Figure 5.6.1:

Pond Location Plan


Legend
Site boundary
250m buffer
Ponds (P*)
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
00
17/08/2022
ZH
BW
Rev
Date
Description
De
App
BELVOIR SOLAR FARM
avianecology
POND LOCATION PLAN
0
250
metres
N
W
E
S
REV 00

Annex 1 – e-DNA Laboratory Results

SureScreen Scientifics

Folio No: E7943
Report No: 1
Purchase Order: AE-20-107
Client: AVIAN ECOLOGY
Contact: Beth Walker

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 23/06/2020
Date Reported: 29/06/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1750	Pond 2 Belvior		Pass	Pass	Pass	Negative	0

[redacted]

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Sarah Evans

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd

Biodiversity Management Plan

avian ecology

Document Control				
Project Name:	Belvoir Solar Farm			
Project Number:	Pegas-075-1270			
Report Title:	Biodiversity Management Plan			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
V1	24/11/2021	Draft	J. Stevens *BSc (Hons)*	U. Maginn *MSc MCIEEM*
V2	29/11/2021	Final	J. Stevens *BSc (Hons)*	U Maginn *MSc MCIEEM*
V3	03/02/2022	Updated Final	B Walker *MSc MCIEEM*	J. Stevens *BSc (Hons)*
V4	09/09/2022	Updated– any amendments from previous version marked in red	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*
V5	20/09/2022	Final	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*

CONTENTS

1 INTRODUCTION

1.1.1 This Biodiversity Management Plan (BMP) sets out habitat protection and enhancement measures for a proposed solar farm and associated infrastructure on land to the north of Belvoir, Leicestershire, henceforth referred to as 'the Site'. This document also details ecological management practices to be adopted with the aim of developing and maintaining wildlife habitats to provide a net gain for local biodiversity. It is considered the implementation of this BMP will allow the Site to achieve the objectives stated within the biodiversity net gain assessment.

1.1.2 Habitats within the Site comprise of arable land and small pockets of broad-leaved woodland with field boundary features including hedges, ditches and scattered trees. A number of ponds are present within the Site, the majority of which were dry.

1.1.3 These habitat are also reflected in the wider area, with additional habitats including improved grassland, pastoral farmland, small pockets of mixed semi-natural woodland and farm buildings.,

1.1.4 The site-specific approach provided within this report provides recommendations for long-term management of the land (over a period of at least 30 years) to conserve and improve landscape habitat connectivity with the wider landscape for wildlife through protecting and enhancing potentially important wildlife corridors and habitats. This will contribute to the establishment of coherent ecological networks, supporting the biodiversity net-gain targets of the National Planning Policy Framework (2021).

1.2 Implementation of the BMP

1.2.1 The implementation of the BMP will be the responsibility of the Developer of the Site, working in conjunction with the landowners ("Owners") and/or appointed management organisation.

1.2.2 All works associated with the implementation of the BMP will be undertaken by experienced contractors and / or under the watch of a suitably qualified (and where required, licenced) ecologist.

1.2.3 The Developer shall be responsible for the cost of implementing the BMP including the cost of carrying out any management, monitoring, or other such activities.

2 ECOLOGICAL BASELINE

2.1.1 This Biodiversity Management Plan should be read in conjunction with the Drawing No. P19-2022_10Q Landscape Strategy. Detailed descriptions of habitats and species can be found in the Belvoir Solar Farm Environmental Statement (ES), Chapter 5: Biodiversity, and associated appendices as well as the Further Information Report.

2.1.2 The Site is not located within any statutory or non-statutory designated site, however Muston Meadows Site of Special Scientific Interest (SSSI) and the overlapping Muston Meadows National Nature Reserve (NNR) is located immediately adjacent to the Site. Four more SSSI are located within 5km of the Site. In addition, two local wildlife sites (LWS) are located within 2km of the Site, the nearest being Grantham Canal and Banks LWS located 600m east of the Site.

2.1.3 Pre-development the Site consists predominantly of arable fields. Hedgerows are present as field boundaries throughout. There are three ponds located within the Site, these were dry during the surveys and considered to be dry for much of the year. The arable land forming the majority of the Site is considered to be of low ecological value. The boundary hedgerows and blocks of trees are of higher value and are likely to provide shelter, foraging and commuting habitat for a range of species typical of the local area.

3 ECOLOGICAL MITIGATION MEASURES

3.1 Designated Sites and Habitats

3.1.1 Adjacent habitats, including those within Muston Meadows SSSI and NNR, will be protected by perimeter security fencing which will be erected first to maintain a minimum 11m buffer and prevent the encroachment of construction works beyond the Site boundary. Gaps or mammal gates will be installed at suitable intervals and locations along the perimeter fence line to allow small mammals and other species free movement between the Site and the adjacent SSSI and NNR.

3.1.1 Areas adjacent to the SSSI/NNR will be managed to encourage the regeneration of the area to neutral grassland including green winged orchids *Orchis morio* which are listed within the citation of the SSSI. As an alternative, if possible, these areas will include green hay or seeds provided from nearby donor sites within the SSSI, to encourage the development of habitats with local provenance. The provision of green hay or seeds depends upon their availability and will be subject to further consultation with landowners/managers and Natural England (NE).

3.1.2 If local provenance seed mixes are used, yellow rattle *Rhinanthus minor* will be included in the seed mixes as this species is known to parasitise grass species, thereby impairing the vigour of the grass growth and providing more opportunities for wildflower species to establish on land previously used for agriculture.

3.1.3 Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard retained habitats within and surrounding the Site.

3.1.4 Hedgerows will be retained on Site and along with mature trees and woodland around the construction area, will be protected in-line with BS 5837:2012 *Trees in relation to design, demolition and construction*.

3.1.5 The Site will not be routinely lit during either construction or operation; any lighting employed will be designed to maintain dark corridors around the Site and avoid illumination of the designated sites.

3.1.6 There will be clear delineation of working areas and access routes for vehicles entering the Site and instructions on these will be given to all site construction staff, delivery drivers and subcontractors.

3.2 Birds

3.2.1 Vegetation removal and ground clearance will be undertaken outside of the bird breeding season (March-August inclusive) if possible. If vegetation works are necessary during the breeding season any suitable nesting habitat to be affected by works should be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no nests/young will be impacted and there is no risk of an offence under the relevant legislation.

3.3 Badger

3.3.1 A pre-construction badger survey will be undertaken prior to works commencing to check for active or any newly constructed setts (between the initial baseline survey and the construction start date) within at least 30m of construction areas. The ecologist will advise the Site Manager on any requirements to ensure legislative requirements, such as maintaining buffer/exclusion zones.

3.3.2 If baseline conditions have altered and disturbance to badgers or their setts is considered likely during the proposed works, one or both of the following options will be incorporated:

- Construction working methods will be amended to avoid disturbance, or development design will be amended to avoid works which may impact upon badgers and their setts (e.g. alteration of the configuration of panels and/or fencing); and/or,

- A development licence will be obtained from Natural England before construction commences.

3.3.3 Any deep excavations or trenches created during construction will be backfilled or covered overnight to prevent animal entrapment.

3.4 Bats

3.4.1 Protection of all mature trees, hedgerows and woodland on and adjacent to the Site or along access routes will safeguard potential roost sites and maintain foraging and commuting opportunities. Construction works will stand off from hedgerows and trees in accordance with the Site Layout Plan and in line with BS 5837:2012 *Trees in relation to design, demolition and construction*, thereby protecting habitats likely to be used by bats.

3.4.2 If any trees are required to be impacted suitable checks for roosting bats by a licensed ecologist will be undertaken in advance of any removal. If bats are confirmed to be roosting within any tree to be impacted by proposed works, the data gathered would be used to inform potential design amendments avoid impacts or, failing that support a licence application with suitable mitigation measures to Natural England to destroy/disturb the bat roost.

3.4.3 In order to protect foraging / commuting bats, lighting required during construction and/or operation of the solar array facility will be used in a sensitive manner and directed away from field boundary habitats and habitats bordering the Site. This will be achieved in a number of ways, including the use of low-level lighting and use of hoods and careful selection of lighting (further information is provided in BCT guidance (2009) *Bats and Lighting in the UK: Bats and the Built Environment Series*[1]).

3.5 Amphibians and Reptiles

3.5.1 As a precautionary measure, Reasonable Avoidance Measures (RAMs) will be implemented during the construction phase to safeguard animals during works if minor removal of suitable habitat is required, namely removal of immature hedgerow section or clearance of grassland around arable field margins.

4 ECOLOGICAL ENHANCEMENT MEASURES

4.1 Habitat Creation

4.1.1 Management practices are proposed that will enhance the Site for the benefit of local wildlife. The design and long-term management of the land seeks to maintain and improve functionality through protecting and enhancing potentially important wildlife corridors i.e. through creation, enhancement and maintenance of native species hedgerows within and around the Site. The Landscape Strategy sets out the landscape planting and maintenance specifications.

4.1.2 All planting stock supplied shall be healthy and viable and comply with BS 3936: Parts 1 to 10 as relevant, and BS 4043, the National Plant Specification, published by the Horticultural Trades Association (HTA) as appropriate. Supplying nurseries will be registered under the HTA Nursery

[1] Bat Conservation Trust. (2009). *Bats and Lighting in the UK: Bats and the Built Environment Series.* available at: http://www.bats.org.uk/data/files/bats_and_lighting_in_the_uk__final_version_version_3_may_09.pdf

Certification Scheme. All plants will be packed and transported in accordance with the Code and Practice for Plant Handling as produced by Committee for Plant Supply and Establishment (CPSE).

4.1.3 All seeding shall be carried out in accordance with BS 4428:1989 Code of Practice for general landscape operations (excluding hard surfaces), or the most up to date and current British Standard and in accordance with seed supplier's technical advice.

4.1.4 It is advised that herbicides are not used on Site and where possible, arable weeds are retained. However, if the use of herbicides cannot be avoided, such as for the removal of injurious weeds within grazed areas (please refer to paragraph 5.1.4), the herbicide handbook (English Nature, 2003[2]) provides guidance on appropriate herbicide use in relation to nature conservation works.

4.1.5 Planting will not be carried out when the ground is waterlogged, frost bound or during periods of cold drying winds.

4.1.6 All bare-root planting stock will be kept covered until actually planted in order to minimise water-loss and prevent the roots from drying out. Bare root stock shall be planted while dormant (November-April) or alternatively cell or container grown stock shall be used.

Grass Seeding

4.1.7 Following construction of the solar panels and associated infrastructure, all areas of bare earth within the site, including those areas in between temporary protective fencing and existing landscape features, will be sown with grass and meadow seed as specified in the Landscape Strategy.

4.1.8 Between the security fencing and existing/proposed hedgerows a species rich grass and wildflower mix would be sown, such as the Emorsgate EM2 Standard General Purpose Meadow Mixture or similar.

4.1.9 In areas surrounding the solar panels and within the security fence line a seed mix suitable for low intensity sheep grazing, such as the Emorsgate EG26 Special Old Fashioned Grazing Mix or similar, will be sown.

4.1.1 Land adjacent to Muston Meadows SSSI/NNR will either be left for natural regeneration or laid with green hay or seeds provided from nearby donor sites within the SSSI to encourage the development of habitats with local provenance, primarily neutral grassland with green winger orchids.

4.1.2 Mixes shall be sown in accordance with suppliers' instructions and the Landscape Strategy and also in line the elements below.

<u>Ground Preparation</u>

4.1.3 Following the installation of the array, reinstatement works should include the removal of all stones and other debris to ensure the ground is suitable for use with mowers.

4.1.4 Subsequent to the last crop being removed, no fertilizer will be added to the arable land on the site.

4.1.5 Construction activities requiring heavy machinery will only take place during periods of dry weather, in order to avoid churning and damaging the soil.

4.1.6 Prior to seeding, the ground will be harrowed and rolled, using a tine harrow in order to avoid damaging underground wiring. However, if there are any areas which have suffered high soil compaction, for instance due to heavy machinery being deployed, these will be harrowed using a disc harrow to ensure the soil structure is suitable for subsequent sowing. If such a requirement arises to

[2] English Nature (2003) *Herbicide handbook. Guidance on the use of herbicides on nature conservation sites*

harrow with discs, caution should be exercised to ensure newly installed underground services are not damaged during harrowing.

4.1.7 Where possible, arable weeds should be retained, and the use of herbicide restricted during ground preparation.

Seeding

4.1.8 All seeding will take place ideally in mid-spring or late summer to mid-autumn. Seed will be sown in the first year following completion of underground wiring, and be broadcast by machine (fertiliser spreader, slug pellet applicator, grass seed box) and rolled where possible. The gaps between strings of panels are to be wide enough to accommodate a tractor travelling between them for harrowing, sowing and rolling purposes. In areas where a machine is unable to access, such as far underneath panels, seeding in these areas should be broadcast by hand. Seeds can be mixed with a substrate such as sand or sawdust for ease of broadcasting.

4.1.9 Sowing rate is recommended by the manufacturer as 4g per square metre or 40kg/hectare for both mixes.

Hedgerow Planting

4.1.10 Approximately 1.18km of new mixed native species hedgerow planting will be undertaken including the gapping up of existing hedgerows. Native hedgerow species have been chosen to be typical of the local area, incorporating species observed during the baseline ecology surveys where appropriate. Species included within the hedgerow will match those already present within the Site and are listed in the Landscape Strategy.

Ground Preparation

4.1.11 Where necessary, existing weeds will ideally be manually removed by hand weeding and where this is not possible a suitable herbicide as specified within the herbicide handbook (English Nature, 2003) will be used as a last resort.

4.1.12 All extraneous matter such as plastic, wood, metal and stones greater than 50mm diameter will be removed from site to a registered waste disposal facility.

Planting

4.1.13 Hedgerows will be planted in a double staggered row at 5 plants per linear metre, unless specified otherwise in the landscaping proposals.

4.1.14 The exact timing of the proposed hedgerow planting will be dependent on the ground conditions, but bare-root planting should ideally take place between the months of December-February inclusive. It is expected that ground conditions and climate will allow for earlier planting (i.e. before January), and this will allow the plants more time to establish a network of feeder roots before the onset of spring. Planting should avoid freezing and water-logged conditions.

4.1.15 Planting slots shall be made using a planting spade and shall be dug 450mm wide x 450mm depth. Plant notches should be T, L- shaped or straight, using spades of a design suitable for this purpose. The planting notches must be vertical and deep enough for the roots to hang freely, with the transplant being planted so that the root collar is exactly level with the ground surface. The notch must then be closed, and the soil will be well firmed round the roots in line with the guidelines as set out in BS 4428 (1989).

4.1.16 All plants will be watered in at the end of each day of planting/or as required. After planting a 50mm layer of approved and biosecure compost fine bark (nominal size 1-10mm) shall be spread along the hedge trench to 1m wide or spread around the pit of each woodland plant at 1m wide.

4.1.17 All hedgerow planting stock will be protected from rabbit damage using rabbit proof fencing or individual spirals/shrub guards supported with canes or stakes as advised by the manufacturer. Any spiral/shrub guards used that are not biodegradable, will be removed approximately three years after planting or once established.

Woodland Planting

4.1.18 Woodland screen planting is proposed along north western boundary of the Site as shown on the Landscape Strategy. This planting will be approximately 10m wide and with a total area of 0.2ha.

Ground Preparation

4.1.19 If the formation level is compacted it will be ripped through before topsoiling.

4.1.20 Where necessary, existing weeds will ideally be manually removed by hand weeding and where this is not possible a suitable herbicide as specified within the herbicide handbook (English Nature, 2003) will be used as a last resort.

4.1.21 Trees/shrubs are to be placed into pits that will accommodate the roots comfortably, with approximately 75mm space outside the extent of the roots.

4.1.22 The bottom and sides shall be forked to break up the subsoil. All extraneous matter such as plastic, wood, metal and stones greater than half brick size will be removed from site.

4.1.23 Topsoil is to be stored in accordance with British Standards or other guidance current at the time of planting. Imported topsoil (if used) to conform to requirements of British Standards or other guidance current at the time of planting.

Planting

4.1.24 The exact timing of the proposed planting will be dependent on the ground conditions, but planting should ideally take place between the months of December and February inclusive, this will allow the plants more time to establish a network of feeder roots before the onset of spring. Planting should avoid freezing and waterlogged conditions.

4.1.25 Trees/shrubs are to be placed into the pits and backfilled with local topsoil previously stripped from the Site. A general-purpose slow release fertiliser (at the rate of 75gm/m2) and Tree Planting and Mulching Compost (at the rate of 20litres/m2) are to be incorporated into the top 150mm of topsoil during backfilling. Where tree pits are more than 300mm deep, backfilled material shall be consolidated / firmed in 150mm layers. Additional topsoil will be imported onto the site if topsoil stripping operations do not provide sufficient topsoil for the entire tree planting.

4.1.26 Trees shall be well firmed-in and secured with stakes, proprietary rubber tree ties and spacers as below.

4.1.27 All select standard trees will be held so that movement at the root collar is minimised until new roots have developed to anchor the tree. Therefore, low staking (75mm diameter x 1.5m length) will be used and attached to the tree at approximately 1200mm above ground level. Stakes will be driven 300mm into undisturbed ground of the bottom of the tree pit before planting the tree, taking care to avoid underground services and cables. The trees will be staked using proprietary rubber ties and must be firmly fixed with a spacing device used to prevent chafing against the tree.

4.1.28 All trees will be protected from grazing damage by the fitting of approved tree guards. If the bushiness of the tree prevents the use of standard tree guards, then an alternative design of guard shall be used in agreement with the project landscape architect. Composted bark mulch will be spread to a depth of 75mm in a 1m diameter circle around all individual trees, ensuring that desirable groundcover plants (where present) are not buried.

4.1.29 All trees/shrubs shall be watered in at the end of each day of planting.

4.2 Wildlife enhancements

Birds

4.2.1 Additional bird nesting provision will be made through the inclusion of a minimum of seven bird boxes, including two owl boxes erected on mature and semi-mature trees located around the Site.

4.2.2 Bird boxes should ideally be installed in the autumn (September to November) following the cessation of construction works, by the appointed contractor under advice of the suitably competent ecologist. Boxes should be erected at an appropriate height of between 1 to 5 metres. Boxes should be angled so that they face away from the prevailing wind or in a semi sheltered environment. Positioning within or close to hedgerows will increase chances of occupation. Bird boxes will be suitable for a variety of farmland bird species.

4.2.3 Two owl boxes should be erected in line with the Barn Owl Trusts guidelines[3] and be sited over 1km from major roads. They should also be angled away from the prevailing wind, ideally to the south east to also avoid direct heat at the hottest time of the day.

Bats

4.2.4 Additional bat roost provision will be made through the inclusion of a minimum of ten bat roost boxes on mature and semi-mature trees along the Sites northern, western and eastern boundaries. Boxes will be erected in suitable habitats (i.e., along boundary features), at an appropriate height (ideally above 4m in height) and with clear flight paths to utilise the Site boundary features. Boxes should be exposed to sun for at least part of the day and so erected on a south facing aspect. It is often appropriate to erect multiple boxes on the same tree at slightly different heights and aspects to create a variety of microclimates. Minor pruning may be required to ensure a clear drop zone below newly installed bat boxes. Bat boxes will be installed in line with the suppliers' instructions and as advised by an ecologist.

Amphibians and Reptiles

4.2.5 A total of six log piles and six purpose built hibernacula will be constructed at the peripheries of the Application Site. This will provide enhanced shelter and overwintering refuge for amphibians and reptiles if present.

Invertebrates

4.2.6 Two 'insect hotels' will be constructed and placed in species rich grassland around the peripheries of the site to provide additional enhancements for invertebrates utilising the Application Site. These, along with beehives proposed to be located on Site will benefit pollinators and invertebrate diversity.

[3] https://www.barnowltrust.org.uk/barn-owl-nestbox/owl-boxes-for-trees/

5 HABITAT MANAGEMENT

5.1 Grassland

5.1.1 The grassland around the Site will be managed to provide a varied habitat structure providing nesting opportunities for birds and nectar, pollen and shelter for invertebrates, amphibians, reptiles and small mammals. Taller wildflower and tussock grassland vegetation will be encouraged to develop along the base of hedgerows at the boundaries to provide additional dispersal, foraging and shelter opportunities for wildlife.

5.1.2 Occasional small bare patches at the margins of the Site, either naturally arising or created in the course of management will be tolerated and allowed to remain. These increase micro-topographic diversity and variety of ground conditions which can be essential for the life-cycle of many invertebrate species and also may potentially be utilised by some bird species for nesting and feeding purposes. These small areas also provide periodic disturbed ground conditions necessary to develop and maintain diverse grasses and wildflower communities.

Initial Management

5.1.3 Grassland management will be carried out in accordance with the seed supplier's technical advice during the establishment phase. Most of the sown meadow species are perennial and will be slow to germinate and grow and will not usually flower in the first growing season. There will often be a vigorous initial growth and a flush of annual weeds during the first season. This should be managed across all of the seeded areas by regular topping and mowing throughout the first year at regular intervals. Regular cutting to establish the grassland will take place during Year 1 after seeding and possibly also in Year 2 if growth is particularly vigorous on the ex-arable land. Initially, in the first year following sowing, checks will be made to assess and control annual weeds. Problem perennial weeds will be controlled by hand pulling or if necessary careful targeted application of a non-residual herbicide by way of spot spraying with a knapsack (low pressure to avoid spray drift), or weed wiping (no herbicide application within the vicinity of ditches and watercourses) herbicide application may be used in April, June and August. Alternatively, annual weeds can be managed by topping and mowing prior to setting seed which will encourage lateral development of the grasses. Any topping undertaken between April and July should be no lower than 200mm to prevent harm to any ground nesting birds.

5.1.4 Specific attention should be paid to the potential presence of the following five injurious (harmful) weeds: common ragwort (*Senecio jacobaea*), spear thistle (*Cirsium vulgare*), creeping thistle (*Cirsium arvense*) curled dock (*Rumex crispus*) and broad-leaved dock (*Rumex obtusifolius*); which are all listed within the Weeds Act 1959. These species should be removed from the grassland areas which will be sheep grazed prior to enhancement works commencing[4] [5].

5.1.5 In the unlikely event that the grassland / meadow planting fails, and the area of bare ground is greater than 10%, these areas will be re-seeded, whilst still accommodating small areas of bare ground.

5.1.6 If the mixture is autumn sown or contains yellow rattle a high spring cut to between 70-100mm will be undertaken around April with no further mowing until mid-July.

[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/525269/pb9840-cop-ragwort-rev.pdf

[5] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69296/pb7190-harmful-weed-control.pdf

Subsequent years

5.1.7 Following seeding and establishment of a robust sward, grassland will be managed by rotational low-intensity grazing in accordance with the landowners' requirements, either rotating sheep within the site through control with stock proof fencing or through rotational grazing using nearby fields and removing sheep from parts of the site to encourage plants to flower and set seed.

5.1.8 Ideally, it is best to aim for a stocking rate just sufficient to maintain a varied structure, rather than the maximum that the grassland can support. Grazing density guidance herbicide u(per the table below) is based on medium sized sheep (e.g. 60kg). It is important to constantly monitor the Site to ensure the grassland is not under or over grazed and stock density and duration altered accordingly. The stocking density should be reduced in wet periods or in conditions when poaching would lead to a break-up of the sward and colonisation by aggressive weed species.

Table 5.1: An indicative guide to stocking levels for lowland grassland (number of sheep per hectare). Adapted from the Lowland Grassland Management Handbook produced by Natural England.

Number of grazing weeks per year	Neutral Grassland (sheep per ha)
16	12.5
20	10
24	8
36	5.5
52	4

5.1.9 The following indicators will be used to review and amend stocking densities:

- An increase in the amount of uneaten grass, the accumulation of litter, an increase in vigorous rank and unpalatable grasses, and a reduction in low growing herbs: indicates stocking density is too low (need to increase density).

- A reduction in density/diversity of plants, excessive poaching, weed invasion and the development of bare patches: indicates stocking density is too high (need to reduce density).

5.1.10 Herbicides will be avoided wherever possible, but if necessary to control pernicious weeds, applications to control weeds should be undertaken immediately after sheep have been removed from a grazing area.

5.1.11 The areas will be subject to intermittent grazing by sheep between approximately September and January, where conditions allow. Moderate trampling will expose ground for colonisation by annuals the next spring; however, heavy trampling can lead to ground poaching and infestations by weed species that will be detrimental to the Site. During the spring and summer (March to August), sheep will be removed or stocking density reduced to allow summer flowering plants to set seed. Grazing will be carefully monitored in the winter period in order to prevent excessive compaction of wet earth.

5.1.12 Cutting of any un-grazed areas will be in accordance with measures outlined for species rich grassland below.

Species Rich Grassland

5.1.13 The meadow and grassland adjacent to the SSSI shall be mown under differing regimes for Year 1 after seeding and subsequent years, as detailed below.

5.1.14 Mowing will only take place during periods of dry weather to ensure that no waterlogged ground is damaged by machinery.

5.1.15 The grassland will not be improved by chemical fertilizer or slurry, and nutrient levels in the soil should be encouraged to reduce over time.

5.1.16 Where possible, cut material should remain on Site for three to five days following the cut to allow seeds to disperse, and then either removed from site or a proportion placed on habitat piles within field margins.

Year 1/Establishment period

5.1.17 Newly seeded grassland/natural regeneration or local provenance hay/seed mix areas will be subject to regular cutting to a height of between 40mm and 60mm, with arisings removed during the first year of establishment in order to prevent annual weeds from establishing.

5.1.18 This shall constitute a cut 6-8 weeks after sowing and then every month thereafter between May and September. The frequency of cutting will be increased should annual weeds establish.

5.1.19 If the mixture is autumn sown or contains yellow rattle a high spring cut to no lower than 100mm will be undertaken around April with no further mowing until mid-July.

Subsequent years

5.1.20 The management of the established meadow grassland will take a flexible approach and the exact dates will be dependent upon weather conditions. A phased (rotational) cutting regime is recommended (i.e. ideally the entire area should not be cut at the same time) in order to allow for more varied structured grassland.

5.1.21 There may be circumstances when an additional selective summer cut is required to prevent vegetation obscuring panels, in such cases cuts should reduce sward height to no lower 200mm to avoid impacts on nesting birds and should be confined to areas close to panels where growth is causing shading. Other areas should be left uncut.

5.1.22 Cuttings should remain on-site for three to five days following the cut to allow seeds to disperse, and then be removed in order to remove nutrients and promote the development of a species-rich sward and a small proportion placed on habitat piles located within field margins.

5.1.23 Meadow grassland and grassland adjacent to the SSSI will be cut only occasionally once established, with a high cut every year or couple of years to prevent scrub encroachment or excessive grass growth. No cutting will take place through the summer to allow the seeds of the later flowering species to fall prior to the cut. Cutting can be undertaken on a flexible basis with the aim to allow a tussocky species diverse edge habitat to establish with little active management required. Cutting should adopt a systematic method (i.e. working outwards towards the boundary features); this will allow fauna to temporarily and safely vacate the area.

5.1.24 The management will take a flexible approach and the exact dates will be dependent upon weather conditions. A phased (rotational) cutting regime is recommended (i.e., ideally the entire area should not be cut at the same time) in order to allow a more varied structured grassland.

5.2 Hedgerows

Existing Hedgerows

5.2.1 Existing hedgerows shall be left to grow with minimal selective thinning and maintained to a height as specified in the Landscape Strategy.

5.2.2 During establishment, dead, dying and diseased wood is to be replaced with stock of a similar size and species by the appointed contractor at their own cost. If the failure of the plant is due to disease and the disease is considered likely to re-occur, then an alternative native species of local provenance may be used as a replacement. Planting should ideally be undertaken between the months of December and February. Dead wood should be left on site, either in situ or as part of a brash pile, to benefit wildlife in the area.

5.2.3 Hedgerows across the whole site are to be cut on a rotational basis, i.e. not all hedgerows in the same year. This will maintain a resource of flowering and fruiting plants across the site, create nesting and foraging habitat for wildlife, and prevent hedgerows becoming leggy. Existing trees within hedgerows will be left to grow naturally and not cut. These will be clearly marked to ensure that they are not cut back during hedgerow trimming/maintenance works.

5.2.4 Established hedgerows will be cut between late September and February and no cutting or trimming is to be undertaken during the breeding bird season (1st March to 31st August inclusive).

5.2.5 Ground flora will be cut at the base of hedges on a flexible 2-3 year rotation to 150mm height, with arisings removed. This is to maximise the value of the habitat for overwintering and foraging insects and prevent scrub establishment.

New and infill Hedgerows

5.2.6 All canes, spirals or guards shall be regularly checked and adjusted or replaced as required. Bases of all hedges are to be kept weed-free during the first three years. After the first three years the ground flora is to be allowed to develop naturally in order to contribute to the wildlife value of the hedgerow and managed as an existing hedgerow.

5.2.7 Any litter accumulated around hedgerow bases is to be cleared at the same time as weed control operations.

5.2.8 All hedge lines shall be regularly watered in times of drought to field capacity and shall receive an application of slow-release fertiliser for the first three years.

5.2.9 Plants will remain upright and adjusted during treatment of weeds. Rabbit protection will be retained/replaced until the end of the establishment period no longer needed, all guards will be removed from Site and disposed of. This is to be checked annually.

5.2.10 All hedges shall be allowed to grow up to approximately 3m high or as specified in the Landscape Strategy and will be maintained at this height. Any plants that fail to thrive shall be replaced with stock to the original specification.

5.2.11 Annual inspection is to be undertaken in September to replace dead/diseased plants at the end of each growing season and to be replaced within the first five years after planting. Pruning will be undertaken to promote healthy growth, where required, between late September – February to avoid bird breeding season.

5.2.12 Bark mulch is to be topped up annually or as required, to maintain 50mm deep layer, until the plants have established.

5.2.13 Once new and infill sections of hedgerows have established, management operations are to reflect those as set out for existing hedgerows.

5.3 Woodland

Woodland Planting

5.3.1 During the establishment period all dead, dying or diseased trees/shrubs will be replaced with specimens of similar size and species by the appointed contractor. Dead wood should be left on site, either in situ or as part of a brash pile, to benefit wildlife in the area. If the failure of the plant is due to disease and the disease is considered likely to re-occur, then an alternative native species of local provenance may be used as a replacement with agreement form the LPA. The exact timing of the planting of replacement trees is dependent on the ground conditions; however, planting should take place between the months of December and February inclusive, this will allow the plants more time to establish a network of feeder roots before the onset of spring.

5.3.2 During the establishment period weeds around the base of each tree will be removed within a 1m to 1.5m radius, using approved hand-weeding or if necessary, herbicide treatment (applications in April, June and August). The herbicide handbook (English Nature, 2003) provides guidance on appropriate herbicide use in relation to nature conservation works. Where used, herbicides will be sprayed in appropriate weather conditions, to avoid affecting adjacent habitats.

5.3.3 Tree guards and stakes will also be checked and replaced where necessary and removed once trees are sufficiently established that they are no longer required.

5.4 Habitat Piles

5.4.1 A small proportion of wood (including dead wood) and grass removed during habitat management or other work operations can be added to the log pile refuge features as shown on the Landscape Strategy. These habitat piles will provide valuable invertebrate habitat and shelter for other species including small mammals/amphibians/reptiles. These should be placed in the same locations each year.

6 ECOLOGICAL MONITORING AND CONTINGENCY

6.1 Timings

6.1.1 The development of the biodiversity interest of the Site will be monitored over time by a suitably experienced ecologist. A walkover survey will be undertaken on years 1, 3 and 5 and 10. This will involve an inspection of the grassland, hedgerows and trees to ensure that they are being managed in a manner suitable for the enhancement of wildlife interest.

6.1.2 In addition, a habitat survey and condition assessment of the site will be undertaken to ensure created habitats are achieving their target condition as stated in the biodiversity metric calculations.

6.1.3 The management plan will be amended, if necessary, based on the monitoring recommendations.

6.2 Monitoring Criteria

6.2.1 Habitats will be monitored in accordance with the criteria set out with the Biodiversity Metric 3.1 Technical Supplement[6]. Habitats are expected to achieve the conditions set out within the Biodiversity Metric 3.0 Calculation Tool submitted with the original application and summarised below.

[6] Biodiversity Metric 3.0 – Technical Supplement.
http://publications.naturalengland.org.uk/publication/6049804846366720

Table 6.1: Expected condition of newly created habitats within the Site

Habitat type	Biodiversity metric 3.0 habitat type	Target condition	Time to achieve target condition (years)
Main body of grassland under and around solar panels	Modified grassland	Good	7
Meadow grassland	Other neutral grassland	Moderate	10
Woodland planting	Other woodland; broadleaved	Moderate	15
Ponds/ scrapes	Ponds (Non-Priority Habitat)	Moderate	3
Hedgerow	Native species rich hedgerow	Good	12

6.2.2 If inspected habitats are not meeting the description for the particular habitat type, are not achieving the target condition, or appear unlikely to achieve it, a suitably qualified ecologist will be consulted to determine appropriate changes to the management to enable to the proposed habitat type and/ or target condition to be achieved. Suggestions for management changes are outlined in the contingency measures section below, however the exact requirements will be dependent on the cause and extent of any failure.

6.2.3 If it is considered it is not possible to achieve either the proposed habitat type or target condition, the management regime and/or biodiversity calculator will be revised, rectification steps taken, and any additional contingency measures implemented as appropriate.

6.3 Contingency Measures

6.3.1 If the monitoring outlined above identifies that a habitat is not meeting the target condition, or is not meeting the description for the proposed habitat type, the following contingency measures may be employed:

Grasslands

Absence of herbs/ high cover of bare ground

6.3.2 If the herb layer is not establishing, or there are large areas of bare ground it may be appropriate to re-seed/oversow the area to maintain the desired species mix. This should be done using a suitable mix and following the methodology outline in the habitat creation section above. It may be necessary to create batches of bare soil to act as a seed bed prior to seeding.

Area is over-grazed

6.3.3 Should the area become over grazed, as will be indicated by poaching, bare ground, lack of species diversity and a uniform and short grass sward, it may be appropriate to reduce the grazing density. This could be achieved either through the removal of animals or by grazing for a shorter period each year with fewer stock.

Grasses are over-dominant

6.3.4 Should rank grasses become over-dominant the grazing intensity may need to be increased. This could be achieved either through the introduction of more animals or grazing for an extended period.

6.3.5 Alternatively, it may be appropriate to introduce yellow rattle to the grassland area by over-sowing. This plant parasitises grasses, reducing their competitive ability.

Nutrient levels too high

6.3.6 It is recognised that arable land can be high in nutrients, resulting in lack of species diversity and indicated by the dominance of a small number of competitive species (e.g., nettles, spear thistle, white clover, coarse grasses). The grassland is therefore expected to take some years to settle into a diverse community. Management and regular review of the grazing and cutting regimes (with removal of arisings) will over time gradually reduce nutrient levels. Cut and collect involves waiting for plants to reach a substantial height before mowing and then removing all arisings form the Site. Any nutrients taken in by the plants during growth will therefore be removed from the site. This method may take a number of years to be effective.

7 INDICATIVE MANAGEMENT SCHEDULE

7.1.1 The following management programme shows possible months in which habitat creation and management activities should be undertaken. Note that this schedule should be seen as a guide only and management should be informed by conditions on the Site and any changes to the management regime should be agreed with a suitably qualified ecologist

Initial Habitat Enhancement Year 1

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 1												
Grassland creation (*recommended)			✓*	✓*	✓	✓	✓	✓	✓			
Hedgerow and tree/shrub planting	✓	✓										✓*
Installation of bird nest and bat roost boxes	✓	✓							✓	✓	✓	✓

Habitat Management Year 2

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 2												
Initial management of grassland / meadows areas (targeted herbicide treatment of perennial weeds or cutting/topping where necessary)				✓		✓		✓				
Herbicide treatment or hand-weeding of hedgerow planting bed and surrounding planted trees				✓		✓		✓				
Trimming of new hedgerows	✓	✓								✓	✓	✓

Ongoing Annual Management

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 3 onwards												

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grassland cutting		✓						✓	✓			
Sheep gazing	✓	✓							✓	✓	✓	✓
Herbicide treatment or hand-weeding of hedgerow planting bed and surrounding planted trees (establishment period first five years)				✓		✓		✓				
Trimming of new hedgerows (up to year 3 and established)	✓	✓								✓	✓	✓
Established hedgerows cut on a 2 or 3 year cycle (no more than 1/3 cut in any one year).	✓	✓									✓	✓

Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd

Construction Environmental Management Plan

avian ecology

Document Control				
Project Name:	Belvoir Solar Farm			
Project Number:	Pegas-075-1270			
Report Title:	Construction Environmental Management Plan			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
V1	09/09/2022	Draft	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*
V2	20/09/2022	Final	B. Walker *MSc MCIEEM*	N. Robinson *MSc BSc (Hons) ACIEEM*

CONTENTS

1 INTRODUCTION

1.1 Background

1.1.1 Planning approval is being sought for the development of a solar park on land to the north of Belvoir, Leicestershire, henceforth referred to as 'the Site'. The development comprised the construction of a solar farm together with all associated works, equipment and ancillary infrastructure.

1.1.2 This Construction Environmental Management Plan (CEMP) provides the management framework required for the planning and implementation of construction activities in accordance with the biodiversity commitments. Its purpose is to set out suitable measures to avoid the risk of adverse impacts on sensitive ecological receptors and ensure legal compliance in relation to protected habitats and species. It describes the checking and monitoring that will be implemented to ensure works are being undertaken in accordance with these requirements, together with measures to ensure that appropriate corrective actions or mitigation measures are taken where necessary.

1.1.3 The Site Manager and all site personnel will be responsible for the implementation of the CEMP once finalised and will comply with all conditions of the planning permission and the relevant provisions contained in the reports submitted in accordance with those conditions. The CEMP will be monitored regularly throughout the works.

1.1.4 This CEMP is to be read in conjunction with the Landscape and Ecology Management Plan (LEMP), Landscape Plan and Ecological Assessment Report (EAR) for the consented development.

2 PROPOSED WORKS

2.1.1 The development requires the use of chemicals, equipment, tools and concrete /hardstanding and also requires washing down of tools, equipment and work surfaces that might contain contaminants. Suitable mitigation and protection measures will be implemented to ensure no impacts are associated with these tasks for construction.

2.1.2 It is anticipated that construction will comprise the creation of:

- Solar array and associated infrastructure
- Battery storage compound and associated infrastructure
- Temporary compound to include;
    - Portable buildings to be used as offices, welfare and toilet facilities;
    - Containerised storage areas;
    - Parking for construction and worker vehicles;
    - Temporary hardstanding;
    - Temporary gated compound; and,
    - Wheel washing facilities.

2.2 General Site Management

2.2.1 The Site Manager will be responsible for protecting project personnel and the general public during the construction works. These responsibilities will include relevant safeguards in relation to wildlife

and ecology as set out within this CEMP and accompanying Biodiversity Management Plan (BMP) (**Appendix 5.7**).

2.2.2 Appropriate induction training will be given to all persons visiting and working on the Site and the Contractor and any subcontractors will fully comply with the site rules.

2.2.3 All standard safety procedures as laid down in the appropriate guidelines for the type of work will be adhered to at all times. To prevent vandalism and accidental harm to people and wildlife, the Site and associated plant and machinery will be secured during non-working hours. In addition, the Site will have a 24 hour a day security presence at the key access points to deter any criminal activity.

2.2.4 The Site Manager will ensure that measures are in place to allow all vehicles to safely enter and exit the Site. All loading and unloading of HGVs will be undertaken within the works/Site boundary. Upon exit, all lorries will be fully sheeted and pass through a wheel washing installation prior to departure.

2.2.5 On completion of construction works, all plant, surplus materials, rubbish and temporary works will be removed and the Site left in a clean, safe and tidy condition.

2.2.6 All necessary and reasonable measures will be taken to minimise fire risk and comply with the requirements of the local fire authority. Open fires are prohibited at all times and there will be no burning of rubbish on Site.

2.3 Communication of Construction Environmental Management Plan

2.3.1 The Site Manager will manage and co-ordinate on-site environmental activities and act as a point of contact for local residents to ensure that any concerns are resolved quickly and efficiently. The Site Manager will be responsible for inductions and briefing all staff and visitors; meeting environmental and ecological obligations; resolving, reporting and monitoring any environmental incidents; and ensuring waste management procedures are followed.

2.3.2 The requirements of the CEMP and other environmental responsibilities will be communicated to employees and sub-contractors by:

- Site Induction;
- Risk Assessment & Method Statements for works likely to pose environmental issues;
- Toolbox talks; and,
- Environmental Monitoring and reporting (by site team).

2.3.3 All environmental incidents will be reported and recorded and a full investigation will be completed where appropriate, and corrective action applied. Records will be kept for all environmental occurrences including but not restricted to potential hazards, near misses, incidents; and complaints.

2.4 Noise and Vibration (Construction Works)

2.4.1 During construction activities, noise and vibration will be minimised wherever possible. Manufacturers' recommendations with regards to vibration levels from machinery shall be adhered to. All plant will be properly maintained and contractors will comply with the terms laid down in the approved Code of Practice Order 2015 and BS 5228: Part 1: *Noise Control on Construction and Open Sites*.

2.4.2 All plant and machinery in use shall be properly silenced and maintained in accordance with the manufacturers' instructions.

2.4.3 The following actions will be implemented to manage noise levels:

- Noise rating of equipment will inform equipment selection (where it is necessary to use equipment with high noise levels, mitigation measures will be adopted; e.g. limited times of operations);
- All plant and equipment will be suitably sited, operated and serviced in order to minimise noise and vibration;
- All plant will be turned off when not in use.

2.5 Air Quality

2.5.1 With the exception of vehicular movements on Site and associated construction machinery, there are no construction processes that have emissions to air. However, during ground works there is potential for dust to be generated (at a local level) due to small scale excavation and storage of soils, laying of gravel for the temporary construction compound and movement of vehicles and plant around the Site.

2.5.2 Wheel washing facilities will be provided by means of a pressurised hose attached to a bowser or water tank and located close to the Site access. All operatives exiting the Site in vehicles will be required to use the wheel cleaning facilities to remove dirt and mud that has accumulated on the vehicle by cleaning the wheels and underside of the vehicle. Signage will be provided directing vehicle operatives to use the facilities and appropriate methods (such as silt traps and cut off drains) will be used as necessary ensure that any contaminants within washwater does not enter the environment or overflow back into the Site or onto neighbouring land, in particular neighbouring designated sites.

2.6 Water Quality and Drainage

2.6.1 During construction, the Contractors will implement working methods to protect surface water and groundwater resources (and associated habitats and species) from pollution, in line with current guidance and good practice.

2.6.2 Construction traffic and underground cable laying within the solar farm will no be permitted within a 10m buffer zone of drainage ditches.

2.6.3 Waste storage and concrete washout areas will be designated to minimise areas prone to contamination. Where there is increased risk of contained spillage additional precautions will be taken. Fuels, lubricants and chemical will be stored in accordance with the appropriate Environment Agency Environmental Management Guidance with an impermeable base and suitable bunding to prevent discharge.

2.6.4 All works will be undertaken in a manner to ensure that existing watercourses and drainage are not polluted, dirtied or obstructed during the construction period.

2.6.5 If any pollution occurs, then the Site Manager shall advise the Environment Agency and the Local Planning Authority immediately and take prompt action to minimise the impact and prevent re-occurrence. A common cause of pollution from sites is through vandalism. Therefore, the Contractor shall ensure that Site is adequately protected by the provision of secure fences, locked accesses and security where possible.

2.6.6 The measures adopted during the proposed works will include (but not limited to):

- Waste storage and concrete washout areas to be designated to minimise areas prone to contamination;

- Silt traps and settlement ponds will be constructed as required to intercept run-off where necessary;
- Fuels, lubricants and chemicals will be stored in a secure place containing an impermeable base and suitable bunding in accordance with current legislation;
- Generators, pumps and similar plant will be placed on drip-trays to prevent contamination by oil;
- Any re-fueling will take place more than 50m away from existing waterbodies;
- The construction of the drainage system will be phased;
- Spill kits will be available on Site, in close proximity to any fuel storage tanks or bowsers, to ensure that any accidental spillage can be promptly dealt with;
- The site will be secured at all times and staff will be trained and made aware of the actions to take in the event of a spillage of potential contaminants. Emergency procedures to be implemented in the event of a spillage or leakage of any polluting material such as fuel, oil or silt-laden drainage will be in place on Site and cleaned up and disposed of correctly;
- Public roads and accesses will be regularly maintained and cleaned so they are kept free from deposits in order to prevent silt, oil or other materials entering any drain or watercourse;
- Any lorry wheel cleaning facilities shall be securely constructed; overflow and effluent will be contained for proper treatment and disposal;
- Dewatering activities will discharge to settlement tanks prior to discharge to a surface water sewer to minimise risk of sedimentation to downstream watercourses; and,
- The groundwater inflow into any deep excavation will be managed to minimise the volume of inflow (and therefore the volume of water requiring removal).

2.6.7 The site once constructed will contain impermeable surfaces and structures (inverter substations, battery storage containers and batter auxiliary equipment container). The implementation of surface water drainage systems will incorporate pollution control measures.

2.6.8 Surface water runoff and drainage management measures form part of the embedded design with measures to prevent silt-laden or polluted runoff during construction or operation of the solar farm. These measures are described separately but in summary include:

- Seeding and vegetation establishment to prevent soil runoff, prior to start on site;
- Phasing of construction to minimise compaction of the soil during the works;
- Installation of permeable tracks;
- Constructed using low ground pressure equipment off the tracks, and establishing access rules to minimising repeat trafficking of routes; and,
- Daily monitoring of watercourses to identify any issues relating to runoff and silt to allow immediate contingency control measures to be set in place.

2.6.9 It is noted that current agricultural practices across the Site present their own risk to adjacent watercourses and other habitats in relation to soils and surface water runoff, with regular ploughing, use of heavy agricultural machinery and periods when soils are exposed and devoid of vegetation cover. Construction disturbance relating to the solar farm will be temporary and not dissimilar to existing levels resulting from agricultural practices. Once complete, the Site will maintain permanent grassland cover and will no longer be subject to regular soil disturbance or compaction from machinery and hence there will be no significant effects on adjacent habitats or the species they support.

2.6.10 Foul water from the development including that from cleaning and wash down will be discharged to an onsite foul water sewer system and the relevant consents sought from Anglian Water.

2.7 Wildlife and Biodiversity

2.7.1 The Environmental Statement; Biodiversity Chapter and BMP shall be followed to protect wildlife and biodiversity to ensure that construction activities do not harm protected species or their habitats and to ensure compliance with legislation, as listed within **Section 1.4** of **Appendix 5.2**.

Designated Sites and Habitats

2.7.2 The closest statutory designated site is Muston Meadows Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR), which lies adjacent to the Site.

2.7.3 Habitats within the Site are considered to be of low ecological value in relation to the local landscape, and primarily include arable with modified grassland field margins. Habitats of greater ecological value such as field boundary hedgerows and trees will be largely retained and protected during works.

2.7.4 No impacts are anticipated due to the low impact/temporary nature of the construction activities proposed, in conjunction with implementation of suggested protection measures, are thought to significantly reduce the likelihood of any direct or indirect impacts on the aforementioned designated sites.

2.7.5 Timed, sectional works, limiting disturbance across the Site at any given time will also be implemented. The Site will not be routinely lit during either construction or operation; any lighting employed will be designed to maintain dark corridors around the Site and avoid illumination of the designated sites.

2.7.6 Additional protections relating to habitats include implementing tree protection measures in line with BS 5837:2012: Trees in relation to design, demolition and construction. The development has been designed to avoid woodland/tree removal, with any necessary habitat removal to be compensated for upon the completion of construction, helping to safeguard retained terrestrial habitats within the Site, and within the surrounding environment.

2.7.7 There will also be clear delineation of working areas and access routes for vehicles entering the Site and instructions on these will be given to all site construction staff, delivery drivers and subcontractors.

2.7.8 During the operation of the solar farm over time, dirt and dust can accumulate on the glass surface of the module, reducing its power output. Periodic cleaning of PV modules where required will be undertaken with a soft brush and using soft, clean water. No chemicals are required.

2.7.9 Standard measures to ensure runoff control and pollution prevention will be implemented site-wide; these measures will safeguard on-site ditches and boundary habitats as well as off-site land and associated habitats and species.

Birds

2.7.10 The majority of the habitats found within the Site are considered to be of low value to a small number of common and widespread breeding birds only, with few ground-nesting species considered to be likely to breed within vegetation along field boundaries, principally hedgerows and trees.

2.7.11 Site clearance works should be undertaken outside of the breeding bird season in so far as reasonably practical. The breeding bird season is generally considered to be 1st March to 31st August inclusive. Where this cannot be avoided, a suitably experienced ecologist will be appointed to undertake a pre-site clearance survey to identify the presence of any wild bird nests being built or in use (including

those of ground nesting birds such as skylarks *Alauda arvensis*). Only once the appointed ecologist is satisfied that an offence under Part 1 of the Wildlife and Countryside Act 1981 (as amended) will not occur, may works proceed.

2.7.12 If a nesting species is identified, suitable work exclusion zone will be established around nest site where required, in line with best practice guidance and in consultation with the advising ecologist.

2.7.13 During operation, disturbance will be minimal and limited to intermittent maintenance activities. However, it is recommended that the cleaning of panels is undertaken outside of the breeding bird season in so far as reasonably practical to minimise disturbance to nesting birds.

Bats

2.7.14 The Site is considered to be of moderate habitat suitability for bats in regards to foraging and commuting, given the Site's predominantly arable habitat classification.

2.7.15 Protection of woodlands, hedgerows and mature trees on and adjacent to the Site will safeguard potential roost sites and maintain foraging and commuting opportunities.

2.7.16 Minimal lighting is required during construction and/or operation of the solar farm, but any required will be employed in a sensitive manner and directed away from field boundary habitats to maintain bat foraging and commuting routes as dark corridors. This will be achieved in line with Bat Conservation Trust guidance (2018) Bats and Lighting in the UK: Bats and the Built Environment Series).

Badger

2.7.17 A pre-construction badger *Meles meles* survey will be undertaken immediately prior to works commencing to check for active or any newly constructed setts (between the initial baseline survey and the construction start date) within at least 30m of construction areas.

2.7.18 If baseline conditions have altered and significant disturbance to badgers or their setts is considered likely during the proposed works, one or both of the following options will be incorporated:

- The development design will be amended to avoid works which may impact upon badgers and their setts (e.g. alteration of the configuration of panels and/or fencing); and/or,
- A disturbance licence will be obtained from Natural England before construction commences.

Amphibians

2.7.19 Three ponds are present on Site, all of which were found to be dry during surveys and appeared to be dry for some time. Additionally, a further eight pond are located within 250m of the Site, one of which pond P2 was accessed and surveyed for great crested newts (GCN). The remaining seven ponds were not accessed. Surveys found GCN to be likely absent from pond P2.

2.7.20 GCN are considered to be present in the wider area, with reference to the species within the citation for Muston Meadows SSSI. In addition, an Ecological Constraints Opportunities Plan (ref: 1276) supplied by Grassroots Ecology references ponds P1 and P3 (shown on **Figure 5.2.5** in **Appendix 5.2**) as having a known population of GCN.

2.7.21 Grantham Canal is considered to be unsuitable for supporting GCN, due to the high waterbird population, likely fish population and large size and potential flow of the disused canal.

2.7.22 The arable fields are considered to be of low value amphibians, however the field boundary features such as hedgerows and dry ditches are considered to offer more suitable terrestrial habitat for amphibians if present, providing foraging, refuge and commuting opportunities.

2.7.23 As a precautionary measure, Reasonable Avoidance Measures are required during the construction phase to avoid adverse effects on great crested newt and other amphibian species (if present) and to ensure works can be undertaken within the applicable legislation. The RAMS includes a 'tool box talk' information leaflet to minimise risk of accidental harm. The RAMs can be found in **Annex 1**.

2.7.24 Neighbouring terrestrial habitat will not be directly or indirectly affected by the development with perimeter fencing and pollution prevention measures in place.

Reptiles

2.7.25 The arable fields are considered to be of low value to reptiles, however the field boundary features such as hedgerows and dry ditches are considered to offer more suitable habitat for reptiles if present, providing foraging, refuge and commuting opportunities.

2.7.26 A Reasonable Avoidance Measures (RAMs) has been created to avoid impacts on individual reptiles (and other wildlife) potentially present, see **Annex 1**.

2.7.27 Neighbouring terrestrial habitat will not be directly or indirectly affected by the development with perimeter fencing and pollution prevention measures in place.

Water vole & otter

2.7.28 No signs of water vole or otters were recorded during surveys. However, ditches and suitable terrestrial habitat is present on Site, although the majority of which is considered to be of low value due to be dry or extremely shallow.

2.7.29 The proposed development works will adopt a stand-off buffer of 5m from the banks of the watercourses/ditches ensuring connectivity is maintained and no impacts to either species (if present).

2.7.30 Standard good practice measures will be employed to ensure runoff control and pollution prevention to protect aquatic/bankside habitats both on Site and in the wider ditch network.

<u>Good Practice to be Employed</u>

2.7.31 Site staff will be briefed at induction on the requirements in regard to the environmental good practice on Site including the protection of retained vegetation. Briefings and training will be repeated as required for new starters on site and/or refreshed through Toolbox Talks or similar when Site conditions or special measures are changed or updated.

2.7.32 Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard the nearby watercourses and wetland features and associated habitats and species.

2.8 Materials and Waste

2.8.1 Materials supplied and used on Site will be recorded, with surplus materials reused or recycled where possible. Material that cannot be reused or recycled will be disposed of in accordance with current legislation. Construction waste generated is expected to be restricted to normal construction wastes which will be sorted and either recycled or disposed of offsite to an appropriately licensed landfill by the Contractor.

2.8.2 Waste management will be in compliance with the Environmental Protection Act 1990 and in accordance with the 'Waste Management - A Duty of Care - A Code of Practice'.

2.8.3 Welfare facilities will be self-contained with all discharge of waste water to sealed tanks which will be regularly emptied off-site in an authorised manner. All other waste will be collected in skips and removed from Site at appropriate intervals to an authorised site.

2.8.4 For waste materials that do arise as a consequence of the works, the following measures will be adopted:

- All waste streams will be segregated;
- All waste will be stored safely and securely to prevent damage to health, or escape into the environment. Consideration will be given to prevent the theft of waste, acts of vandalism and scavenging by animals. Separate containers for different waste will be labelled to avoid confusion;
- Waste Management (Duty of Care) training for nominated site operatives;
- Nominated person(s) on Site for the signing-off of Waste Transfer Notes;
- Records of waste transfer will be maintained up to date and easily retrievable in order that waste officers from the Environment Agency can inspect them at any time; and,
- Rubbish will be removed regularly and the Site will be kept clean and tidy.

Annex 1; Reasonable Avoidance Measures (RAMs) Method Statement

The following Method Statement outlines suitable measures to be implemented during construction works associated with the proposed solar development at Belvoir (the Site), to avoid the disturbance, injury or killing of amphibians including GCN and individual reptiles including common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus*.

These RAMs relate to small scale removal of hedgerow habitat for access involving a few metres of vegetation and should not be employed for larger scale or extensive scrub woodland or hedgerow habitat removal. Minor or short term destructive or disturbance works (e.g. grid connection, cable laying, ground mountings, construction of substations) will also follow this Method Statement to ensure legal compliance and to ensure the objectives are achieved.

Although amphibians and reptiles are considered unlikely to be present other than as occasional individuals, as a precautionary measure these RAMs will be used to guide works.

Amphibians, Reptiles

Summary of Method Statement

Vegetation clearance works may include removal of small areas of hedgerow as well as grasslands greater than 15cm in height will be supervised by a suitably licensed ecologist and/or accredited agent.

Method Statement

This Method Statement should be followed for the construction works and associated minor short term destructive habitat clearance works within the Site in order to ensure legal compliance and to ensure the objectives are achieved.

The following measures will be adopted throughout the construction period of the proposed development:

- Site operatives will be informed by 'tool box' talk of the potential for protected species to occur on-site, what to look out for and what to do in the event that animal is found.

- Vegetation clearance works should only commence after a careful visual inspection by an Ecological Clerk of Works (ECoW) has determined that no animals are present. Vegetation should be reduced (by hand strimmer) to a height of c.150mm prior to ground works commencing to aid visual searches and encourage individuals to temporarily move away from the working areas.

- The proposed timing of the works associated with hedgerows should avoid the hibernation period (November to February inclusive) in order to prevent disturbance to hibernating animals.

- Trenches and excavations should include an escape route for animals that might enter the trench, especially if left open overnight. Ramps should be no greater than 45 degrees in angle and can include wooden planks or ramped earth. Ideally, any excavations open for a prolonged period should be covered.

- All excavations left open overnight or longer should be checked for animals prior to the continuation of works or infilling.

- Any excavated material stored overnight should be searched prior to being used as infill.

- Any brash cut down from the Site should be placed in piles within the set aside habitat area, to create additional hibernacula for both amphibian and reptile species.

Should a great crested newt, reptile or other notable species (or signs of) be found at any point during construction, works within suitable habitat and/or potentially disturbing works in close proximity to the animal must cease immediately and the ECoW will advise on the appropriate actions, including applying for a licence, if required.

Other amphibians found during the visual inspection will be placed away from the development works in the wider area comprising of terrestrial habitats which will not be impacted by the proposed works and has excellent connectivity with surrounding terrestrial habitats.