
Bumpers Farm Battery Storage, Phase 2
on behalf of Harmony Energy
Ecological Assessment Report



Document Control				
Project Name:		Bumpers Farm Battery Storage, Phase 2		
Project Number:		Harmo-011-1498		
Report Title:		Ecological Assessment Report		
Issue	Date	Notes	Prepared	Reviewed
V1	14/10/2021	Draft for Client Review	L Pimlott <i>MSc, MCIEM</i> Z Hinchcliffe <i>MRes</i> <i>BSc (Hons.)</i>	J Stephens <i>BSc (Hons.)</i>
V2	19/10/2021	Revision 1	Z Hinchcliffe <i>MRes</i> <i>BSc (Hons.)</i>	J Stephens <i>BSc (Hons.)</i>

This report has been prepared in accordance with the terms and conditions of appointment [on request]. Avian Ecology Ltd. (6839201) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

CONTENTS

1	INTRODUCTION	1
1.2	Site Overview.....	1
1.3	Scope of Assessment	1
1.4	Legislative Framework, Planning Policy and Guidance	1
1.5	European Protected Species (EPS) Policies.....	3
2	METHODOLOGY	4
2.1	Desk Study	4
2.2	Extended Habitat Survey.....	4
2.3	Great Crested Newt Survey.....	5
3	BASELINE	23
3.1	Designated Sites for Nature Conservation	23
3.2	Priority Habitats – Existing Records.....	24
3.3	Ancient and irreplaceable habitats	24
3.4	Extended Habitat Survey.....	25
	Protected and Notable Species	25
3.5	Invasive Non-native Species.....	30
4	ASSESSMENT	31
4.1	Overview.....	31
4.2	Designated Sites for Nature Conservation	31
4.3	Ancient and Irreplaceable Habitats.....	31
4.4	Habitats	31
4.1	Biodiversity Net Gain	32
4.2	Protected and Notable Species	33

5 SUMMARY - ECOLOGY PRIORITY MATRIX 34

FIGURES

Figure 1: Site Location Plan

Figure 2: Statutory Designated Sites Plan

Figure 3: Non-statutory Designated Sites Plan

Figure 4: Phase 1 Habitat Plan

APPENDICES

Appendix 1: Site Photographs

Appendix 2: BMERC Local Records

Appendix 3: Reasonable Avoidance Measures Method Statement

Appendix 4: Biodiversity Management Plan (BMP)

Appendix 5: Biodiversity Net Gain (BNG)

1 INTRODUCTION

1.1.1 Avian Ecology Ltd. was commissioned by Harmony Energy to undertake an Ecological Assessment in relation to a proposed battery storage development located on land at Ilmer in Buckinghamshire (the Site).

1.1.2 The proposed development includes the construction, at least 40-year operation and subsequent decommissioning of a battery storage facility, with a capacity of 5MW, plus associated infrastructure as illustrated on the *Soft Landscape Plan (Revision B)* and *Detailed Soft Landscape*. The battery storage facility will be served by an existing access track to the east; however, a temporary new access track will be required to the north, joining the A4129, during construction.

1.2 Site Overview

1.2.1 The Site as illustrated by the red-line application boundary shown on **Figure 1** is approximately 2.73ha, located adjacent to the east of the operational Bumpers Farm Solar Farm at approximate central grid reference SP 76809 06183.

1.2.2 The Site comprises an area of poor semi-improved grassland and arable farmland with nearby hedgerows, trees and ditches. A small block of woodland lies 60m to the east with a railway line to the south and the A4129 to the north.

1.2.3 In the wider context the Site is surrounded by further extensive areas of arable and pastoral farmland and urban settlements.

1.3 Scope of Assessment

1.3.1 The objectives of the Ecological Assessment presented within this Report are to:

- Identify the proximity of any designated sites for nature conservation interest and provide an assessment of any potential effects the proposed development may have on these;
- Provide baseline information on the current habitats and ecological features both within the Site and immediate surrounding area;
- Identify the presence or potential presence of any protected species or habitats and provide an assessment of any potential effects the proposed development may have on these; and,
- Provide recommendations for further pre-construction checks and / or mitigation measures, if required.

1.3.2 The Assessment has comprised a desk study review of existing ecological and ornithological information for the Site and surrounding area, together with an extended Phase 1 habitat survey.

1.4 Legislative Framework, Planning Policy and Guidance

1.4.1 During the preparation of this report, 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.

International
<ul style="list-style-type: none">• Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (hereafter referred to as the ‘the Ramsar Convention’¹;• Convention on the Conservation of European Wildlife and Natural Habitats 1979 (hereafter referred to as the ‘the Bern Convention’²; and,• UNESCO convention on the protection of the World Cultural and Natural Heritage (1972)³.
National
<ul style="list-style-type: none">• The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019⁴;• The ‘Conservation of Habitats and Species Regulations 2017 (as amended);• The Wildlife and Countryside Act 1981 (as amended);• The Environment Bill 2020 (currently being processed through the House of Commons)⁵;• Countryside and Rights of Way Act 2000;• The Invasive Alien Species (Enforcement and Permitting) Order 2019⁶;• Infrastructure Act 2015;• Protection of Badgers Act 1992;• Hedgerow Regulations 1997;• The Wild Mammals (Protection) Act 1996;• Natural Environment and Rural Communities (NERC) Act (2006);• The National Planning Policy Framework (NPPF, 2021)⁷;• ‘Birds of Conservation Concern 4’ (Eaton <i>et al.</i>, 2015)⁸;• The United Kingdom Biodiversity Action Plan (UK BAP);• BS 42020:2013 Biodiversity – Code of Practice for Planning and Development;• BS 8683:2021 - Process for designing and implementing Biodiversity Net Gain. Specification; and,• Biodiversity Net Gain. Good practice principles for development⁹.
Local
<ul style="list-style-type: none">• Buckinghamshire & Milton Keynes Biodiversity Action Plan¹⁰; and,• Aylesbury Vale District Local Plan¹¹.

¹ <https://www.ramsar.org/>

² <https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/104>

³ <https://whc.unesco.org/en/convention/>

⁴ <https://www.legislation.gov.uk/uksi/2019/579/contents/made>

⁵ <https://services.parliament.uk/Bills/2019-21/environment.html>

⁶ <https://www.legislation.gov.uk/uksi/2019/527/introduction/made>

⁷ <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

⁸ Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, 108, pp708-746.

⁹ <https://cieem.net/resource/biodiversity-net-gain-good-practice-principles-for-development-a-practical-guide/>

¹⁰ <https://bucksmknep.co.uk/projects/forward-to-2020-biodiversity-action/>

- 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 and British Standard 8683:2021 Process for designing and implementing Biodiversity Net Gain specification.

1.5 European Protected Species (EPS) Policies

- 1.5.1 European Protected Species (EPS), such as bats and otters *Lutra lutra*, receive full protection under The Conservation of Species and Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019 (the Habitats 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 December 2016 Natural England officially introduced the four licensing policies throughout England¹².
- 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 legal framework now applies to 'local populations' of EPS and not individuals/site populations.

¹¹ <https://www.aylesburyvaledc.gov.uk/section/adopted-aylesbury-vale-district-local-plan-avdlp>

¹² <https://www.gov.uk/government/news/new-licensing-policies-great-for-wildlife-great-for-business>

- 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.

2 METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was undertaken to identify existing information on the presence of designated sites for nature conservation, protected and notable species and habitats within proximity to the Site as follows:

- Non-statutory designated sites for nature conservation within 2km of the Site;
- Statutory designated sites for nature conservation, within 5km of the Site for national sites and extended to 10km for international sites; and,
- Existing records of protected and notable faunal species, within 2km of the Site, from within the last ten years (see **Appendix 1**).

2.1.2 The following key sources were consulted:

- Natural England and Joint Nature Conservation Committee (JNCC) websites;
- The Multi Agency Geographic Information for the Countryside (MAGIC) website; and,
- Buckinghamshire and Milton Keynes Environmental Record Centre (BMERC).

2.1.3 Reference was also made to Ordnance Survey 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 Habitat Survey

2.2.1 An extended habitat survey of the Site was undertaken on 21st June 2021 by S. Turner MSc a suitably qualified ecologist and botanist.

2.2.2 The survey followed UK industry standard JNCC Phase 1 Habitat Methodology (JNCC, 2010¹³) and UK Habitat Classification Use Manual (V1.1) (UKHab, 2020¹⁴) with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM), Technical Guidance Series *Guidelines for Preliminary Ecological Appraisal – Version 2* (CIEEM, 2017¹⁵).

2.2.3 The survey area comprised all areas within the Site, with additional notes made on any habitats of interest immediately adjacent to the Site.

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

¹³ <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf>

¹⁴ Butcher, B., Carey, P., Edmonds, R., Norton, L., and Treweek, J. (2020). The UK Habitat Classification User Manual Version 1.1 at www.ukhab.org

¹⁵ CIEEM (2017) Guidelines for Preliminary Ecological Appraisal – Second Edition - <https://cieem.net/resource/guidance-on-preliminary-ecological-appraisal-gpea/>

- 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.

Limitations of Survey

- 2.2.6 An extended 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).
- 2.2.7 The extended habitat survey visit was undertaken in June 2021 and therefore inside the optimal period for botanical surveys (approximately April to September).

2.3 Great Crested Newt Survey

- 2.3.1 There are no ponds onsite. Nine ponds were identified within 250m of the Site during a review of aerial imagery and ordnance mapping.
- 2.3.2 No contact could be made with landowners of five of these ponds (ponds 1, 2, 3, 8 and 9) in order to gain access for the survey. Pond 6 was surrounded by dense bankside scrub and could not be viewed sufficiently or accessed to complete the survey. Pond 7 was found to be dry and therefore was excluded from the survey.
- 2.3.3 Ponds 4 and 5 were assessed for their suitability to support great crested newt *Triturus cristatus* using the Habitat Suitability Index (HSI) Assessment methodology as developed by Oldham *et al.* (2000¹⁶) and as detailed within ARG UK guidance (ARG UK, 2010¹⁷).
- 2.3.4 Ponds 4 and 5 were also subject to an environmental DNA (eDNA) survey sampling to determine the presence or likely absence of great crested newts.

HSI

- 2.3.5 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. 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.
- 2.3.6 Final scores relate to pond suitability for great crested newt and range from 'poor' to 'excellent'.

eDNA

- 2.3.7 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

¹⁶ 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.

¹⁷ ARG UK (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

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.*, 2014a¹⁸). The technique for determining presence/absence of GCN uses Polymerase Chain Reaction (PCR) laboratory techniques to detect the species eDNA within water samples.

- 2.3.8 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).
- 2.3.9 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

- 2.3.10 Ponds 4 and 5 were sampled on 21st June 2021 by S. Turner MSc, a licensed surveyor trained in eDNA sampling (2016-26625-CLS-CLS).
- 2.3.11 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.
- 2.3.12 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

- 2.3.13 Laboratory analysis was undertaken by SureScreen Scientifics:

SureScreen Scientifics Division Ltd,
Morley Retreat,
Church Lane,
Morley,
Derbyshire,
DE7 6DE
Tel: +44 (0)1332 292003
Email: scientific@surescreen.com

- 2.3.14 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.
- 2.3.15 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.
- 2.3.16 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

¹⁸ 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.

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.

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

Limitations of Survey

- 2.3.18 No contact could be made with landowners of five of these ponds (ponds 1, 2, 3, 8 and 9) in order to gain access for the survey, however ponds located close to the Site, pond 4 was surveyed as well as a range of ponds within the wider geographic area to provide a confidence of sample survey effort
- 2.3.19 Pond 6 was not subject to survey due to dense bankside scrub which prevented access.
- 2.3.20 Pond 7 was found to be dry and therefore was excluded from the assessment. Additionally, both ponds were located south of the adjacent railway which acts as a significant barrier for amphibians.

3 BASELINE

3.1 Designated Sites for Nature Conservation

Statutory Designated Sites

- 3.1.1 This Section should be read with reference to **Figure 2**.
- 3.1.2 A summary of statutory designated wildlife sites of national importance within 5km and international importance within 10km of the Site is provided in **Table 3.1**.
- 3.1.3 The Site is not located within or adjacent to any statutory designated wildlife sites. The Site lies within the Impact Risk Zone (IRZ) for Chinnor Hill Site of Special Scientific Interest (SSSI), 4.53km to the south; however, battery storage schemes are not listed on the qualifying criteria whereby the Local Planning Authority (LPA) would be required to consult with Natural England.

Table 3.1: Statutory designated sites.

Site Name	Distance and Direction from Site	Reason for Designation
Chilterns Area of Outstanding Natural Beauty (AONB) ¹⁹	3.57km south	Woodland, chalk grassland and stream habitats and red kite <i>Milvus milvus</i> .
Snakemoor Local Nature Reserve (LNR) ²⁰	4.19km north west	Rich floral diversity.
Chinnor Hill SSSI ²¹	4.53km south	Species-rich calcareous grassland and mixed scrub communities including juniper <i>Juniperus communis</i> scrub which supports a distinct invertebrate assemblage. Diverse flora and bird populations.
Chilterns Beechwoods Special Area of Conservation (SAC) ²²	5.33km south east	Semi-natural dry grasslands and scrubland, beech <i>Fagus sylvatica</i> forests and stag beetle <i>Lucanus cervus</i> .
Aston Rowant SAC	9.26km south west	Juniper scrub and beech forests.

Non-statutory Designated Sites

- 3.1.4 This Section should be read with reference to **Figure 3**.
- 3.1.5 A review of the data provided by BMERC confirms that the Site is not located within any non-statutory designated sites for nature conservation. Five Local Wildlife Sites (LWS) were identified within 2km of the Site. Details of these non-statutory designations are provided in **Table 3.2**.

¹⁹ <https://www.chilternsaonb.org/>

²⁰ <https://designatedsites.naturalengland.org.uk/SiteLNRDetail.aspx?SiteCode=L1083174&SiteName=snakemoor&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=>

²¹ <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1001692&SiteName=chinnor&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=>

Table 3.2: Non-statutory designated sites.

Site Name	Distance and Direction from Site	Reason for Designation
Longwick Green Lane LWS ²³	860m east	Corridor linking areas of unimproved grassland and hedgerows.
Lydebrook Mill Meadows, Longwick-Cum-Ilmer Local Wildlife Site (LWS) ²⁴	1.16km south	Flood meadows which support a range of wildlife.
Small Wood Near Aston Sandford LWS ²⁵	1.22km north	Woodland with several Ancient Woodland Indicators (AWI) and a range of fauna.
Thame Valley Biodiversity Opportunity Area ²⁶	1.32km west	Lowland wood-pasture & parkland and floodplain grazing marsh.
Railway Cuttings Biological Notification Site ²⁷	1.7km south	Neutral grassland.

3.2 Priority Habitats – Existing Records

- 3.2.1 In review of MAGIC and of the data provided by BMERC, four priority habitats listed under Section 41 of the NERC Act/UK Biodiversity Action Plan and the Buckinghamshire & Milton Keynes Biodiversity Action Plan were identified within 2km of the Site.
- 3.2.2 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.

Table 3.3: Priority habitats – existing records.

Priority Habitat Name	Designation	Distance from Site
Hedgerows	NERC S41, UKBAP, LBAP	Adjacent to Site
Deciduous woodland	NERC S41, UKBAP, LBAP	190m north east
Traditional orchard	NERC S41, UKBAP, LBAP	1.12km north east
Lowland meadows	NERC S41, UKBAP, LBAP	1.26km south west

Key

NERC S41: Natural Environment and Rural Communities (NERC) Act (2006)

UKBAP: UK Biodiversity Action Plan Priority Habitat

LBAP: Buckinghamshire & Milton Keynes Biodiversity Action Plan habitat

3.3 Ancient and irreplaceable habitats

- 3.3.1 No records of ancient woodland as included on the Ancient Woodland Inventory or ancient or veteran trees as included on the Ancient Tree Inventory²⁸ are identified within 500m of the Site.

²³ Citation provided by BMERC

²⁴ Citation provided by BMERC

²⁵ Citation provided by BMERC

²⁶ http://www.buckinghamshirepartnership.co.uk/media/1022733/thame_valley_boa_statement_dec%202010.pdf

²⁷ Citation provided by BMERC

3.4 Extended Habitat Survey

3.4.1 This section should be read in conjunction with the Habitat Plan presented as **Figure 4** and photographs presented in **Appendix 2**.

3.4.2 The Site occupies an area of land totalling 2.49ha, set within an agricultural landscape. Habitats recorded within the Site are considered to be typical of dominant habitats within the wider landscape.

3.4.3 The proposed battery storage area lies within poor semi-improved grassland. An existing access track serving Bumpers Solar Farm extends south east from this area, along the railway track to Ilmer Lane. A proposed temporary access track, required for construction, extends northwards from the proposed battery storage area, through arable cereal crop with adjacent hedgerows, trees and ditches.

Poor Semi-improved Grassland

3.4.4 Rank poor semi-improved grassland, containing red fescue *Festuca rubra*, soft brome *Bromus hordeaceus*, smooth meadow-grass *Poa pratensis*, Yorkshire fog *Dactylis glomerata* and creeping thistle *Cirsium arvense* (TN4, see **Figure 4**).

Trees

3.4.5 A line of trees (TN1, see **Figure 4**) which comprises semi-mature elm *Ulmus procera*, hazel *Corylus avellana* and ash *Fraxinus excelsior*.

Ditch

3.4.6 A deep-sided ditch with slow-flowing shallow water (30-50cm) (TN2, see **Figure 4**). A hedgerow extends along the northern side of the ditch but the southern earth bank is dominated by grass and tall ruderal vegetation. Vegetation within the channel included floating sweet-grass *Glyceria fluitans*, water mint *Mentha aquatica*, yellow flag iris *Iris pseudacorus* and great willowherb *Epilobium hirsutum*.

Tall Ruderal Vegetation

3.4.7 Dense tall ruderal vegetation comprising willowherb species *Epilobium spp.*, spear thistle *Cirsium vulgare*, creeping thistle, prickly sow-thistle *Sonchus asper*, nettle *Urtica dioica* and scattered scrub including bramble *Rubus fruticosus* and sycamore *Acer pseudoplatanus*.

Hedgerows

3.4.8 Hedgerows in the Site (H1 to H6, see **Figure 4**) are predominantly hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* with occasional trees including mature oak *Quercus robur* and ash. Some are managed but all are intact, tall and bushy.

Protected and Notable Species

Flora


3.4.9 No protected plant species records were returned within 2km of the Site in the data search and none were recorded during the Phase 1 habitat survey.

²⁸ <https://ati.woodlandtrust.org.uk/>

Amphibians

- 3.4.10 Records of great crested newt and common toad *Bufo bufo* were returned within 2km of the Site in the data search. The closest great crested newt record is 880m to the north east with the closest common toad being located 1.6km from the Site.
- 3.4.11 A review of MAGIC identified four great crested newt class licence returns and three records of great crested newt presence (from pond surveys undertaken between 2017 and 2019) within 2km of the Site. The closest of these is immediately to the south of the railway which runs adjacent to the Site.
- 3.4.12 Of the nine ponds were identified within 250m of the Site, only two (ponds 4 and 5) could be accessed for the great crested newt survey, details of which are provided in **Table 3.4**. HSI assessment results for these two ponds are provided in **Table 3.5**. eDNA results for ponds 4 and 5 are provided in **Table 3.6** with the laboratory results included in **Appendix 3**.

Table 3.4: Pond Descriptions

Pond Ref	Description	Photograph
4	Small pond surrounded by tall unmown grassland. Trees around pond edges had been felled.	 A photograph showing a small, shallow pond in a natural setting. The pond is surrounded by tall, green grasses and some trees. The sky is overcast and grey. The water in the pond is dark and still.

5	Small pond surrounded by tall unmown grass and tall ruderal vegetation both on the banks and in the water.	
---	--	--

Table 3.5: HSI survey results

Suitability Indices	P4	P5
SI1 – Location	A	A
SI2 – Pond area	225m ²	300m ²
SI3 – Pond drying	Rarely dries	Sometimes dries
SI4 – Water quality	Moderate	Moderate
SI5 – Shade	40%	40%
SI6 – Fowl	Absent	Absent
SI7 – Fish	Absent	Absent
SI8 – Ponds	14	13
SI9 – Terrestrial habitat	Good	Good
SI10 – Macrophytes	10%	40%
HSI	0.77	0.77
Suitability	Good	Good

Table 3.6: eDNA survey results

Pond	Sample Ref.	Inhibition Check	Degradation Check	Sample Integrity Score	Result
P4	6914	Pass	Pass	Pass	Negative (0/12)
P5	6920	Pass	Pass	Pass	Positive (12/12)

3.4.13 The hedgerows, ponds and ditches with surrounding scrub and tall ruderal vegetation, as well as the railway, do provide opportunities for amphibians to forage, breed, seek shelter and hibernate. However, the poor semi-improved grassland and arable habitats have limited suitability for these species.

Reptiles

3.4.14 No reptile records were returned for within 2km of the Site in the data search.

3.4.15 The hedgerows, ponds and ditches with surrounding scrub and tall ruderal vegetation, as well as the railway, do provide opportunities for reptiles to forage, breed, seek shelter and hibernate. However, opportunities for basking are limited due to the absence of rocks or exposed ground with full exposure to the sun. However, the poor semi-improved grassland and arable habitats have limited suitability for these species.

Badger

3.4.16 No records of badger *Meles meles* were returned by BMERC within 2km of the Site.

3.4.17 No signs of badger were recorded within the Site. No setts, prints, latrines or snuffle holes were observed. The grassland may provide opportunities for foraging but habitat for sett excavation is limited with the exception of hedgerow bases at the periphery of the Site.

Bats

3.4.18 Numerous bat records were returned for within 2km of the Site in the data search. Species included common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii* and noctule *Nyctalus noctula* as well as an unidentified bat species for which droppings were found.

3.4.19 A review of the MAGIC identified no Natural England protected species licence for bats within 2km of the Site.

Roosting Bats

3.4.20 There are no built structures within the Site. A mature ash tree within hedgerow H3 (TN3; see Figure 4) was assessed to have low suitability for roosting bats.

Foraging and Commuting Bats

3.4.21 Habitats within the Site are considered to most closely fit the description for land of 'low' interest for foraging bats in accordance with Bat Conservation Trust (BCT) guidance²⁹, with isolated and small areas of woodland habitat and hedgerows in the wider landscape.

²⁹ Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition).

3.4.22 The poor semi-improved grassland and arable habitats have limited suitability for these species. The railway may provide a valuable commuting route for bats.

Hazel Dormouse

3.4.23 No hazel dormouse *Muscardinus avellanarius* records were returned within 2km of the Site by BMERC.

3.4.24 The woodland and hedgerows within the wider landscape could be suitable for dormouse. However, these areas are not extensive nor are they well connected to high quality areas.

Otter

3.4.25 No otter *Lutra lutra* records were returned within 2km of the Site by BMERC.

3.4.26 No evidence of otter was found on the Site during the survey. There are no watercourses on the Site. The ditch present holds only shallow water and is likely to regularly dry out. This is unsuitable for fish but could support amphibians which could provide a foraging resource for otter. The habitats present on the Site are considered to be unsuitable for holt creation.

Water Vole

3.4.27 No records of water vole *Arvicola amphibius* were returned within 2km of the Site by BMERC.

3.4.28 No evidence of water vole was found on the Site during the survey. There are no watercourses on the Site. The ditch present holds only shallow water and are likely to regularly dry out. However, the dense grasses and tall ruderal vegetation could provide opportunities for water vole to forage and the steep banks could support water vole burrows.

Birds

3.4.29 Numerous bird records were returned in the data search from within 2km of the Site. This includes red kite, peregrine *Falco peregrinus*, redwing *Turdus iliacus*, fieldfare *Turdus pilaris* and barn owl *Tyto alba* which are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Both redwing and fieldfare are rare breeders in the UK and all records refer to passage and wintering birds where both species are considered common within the UK.

3.4.30 A review of the MAGIC shows that the Site is not allocated as an Important Bird Area nor for any specific ornithological interest. Due to the location of the Site and the small size of the fields present in the locality it is not envisaged that the Site presents opportunities for significant wintering bird populations. Therefore, wintering birds are not considered further within this assessment.

3.4.31 The poor semi-improved grassland, hedgerows and trees may be used by an assemblage of common and widespread breeding birds typical of farmed, lowland landscapes.

Other Notable Species

3.4.32 One record of Western hedgehog *Erinaceus europaeus* was returned by BMERC within 2km of the Site.

3.4.33 The grassland and hedgerows could provide opportunities for hedgehog to forage or seek refuge.

3.4.34 The data search by BMERC identified that the Site lies on the northern edge of a B-Line. B-Lines are a series of insect pathways along which Buglife are restoring and creating a series of wildflower-rich habitat stepping stones.

- 3.4.35 Invertebrate records returned within 2km of the Site by BMERC include small heath *Coenonympha pamphilus*, white-letter hairstreak *Satyrium w-album* and Essex skipper *Thymelicus lineola*.
- 3.4.36 Habitats within the Site and immediately surrounding the area are not considered suitable for any large or notable invertebrate assemblages. The vegetation present within the Site could provide foodplants for invertebrates including small heath and Essex skipper which favour grasses and for white-letter hairstreak which relies on elm.

3.5 Invasive Non-native Species

- 3.5.1 No notable invasive non-native species records were returned in the data search within 2km of the Site and none were identified on the Site during the habitat survey.

4 ASSESSMENT

4.1 Overview

- 4.1.1 This section seeks to identify the potential for effects to occur on habitats and protected and notable species which could be considered as reasonably likely to occur, as a result of the proposed development. The Site's proximity to statutory and non-statutory designated sites and potential effects on their qualifying interests is discussed. Measures are proposed for the protection of sensitive habitats and species throughout the construction phase of development and recommendations are made for further pre-construction surveys and mitigation, if required.
- 4.1.2 This section also introduces opportunities for post-development habitat enhancement as part of the proposed project for the benefit of local biodiversity.

4.2 Designated Sites for Nature Conservation

Statutory Designated Sites

- 4.2.1 The Site is not located within or adjacent to any statutory designated wildlife sites. The Site lies within the Impact Risk Zone (IRZ) for Chinner Hill SSSI, 2.8km to the north east; however, battery storage schemes are not listed on the qualifying criteria whereby the LPA would be required to consult with Natural England.
- 4.2.2 There are five statutory designated sites within 10km of the Site. The closest of these is Chilterns AONB located 3.57km away, designated for landscape rather than habitat or species conservation. These designations are considered to be of sufficient distance that no impacts are anticipated.
- 4.2.3 Standard measures to ensure runoff control and pollution prevention will be implemented during the construction of the proposed development; these measures will further minimise the likelihood of any pollution effects on these statutory designated sites.

Non-statutory Designated Sites

- 4.2.4 The Site does not form part of any non-statutory designated site for nature conservation. Five non-statutory designations were identified within 2km of the Site. The closest of these is 880m away and these designations are considered to be of sufficient distance that no impacts are anticipated.
- 4.2.5 Standard measures to ensure runoff control and pollution prevention will be implemented during the construction of the proposed development; these measures will further minimise the likelihood of any pollution effects on these non-statutory designated sites.

4.3 Ancient and Irreplaceable Habitats

- 4.3.1 No ancient or irreplaceable habitats were located within 500m of the Site, and there are no pathways by which impacts could occur.

4.4 Habitats

- 4.4.1 The proposed development has been designed to avoid the hedgerows and woodland parcel within and along Site boundaries and immediately surrounding the Site in so far as has been possible. A vegetation buffer will be maintained between these features and the construction zone in line with BS 5837:2012 *Trees in relation to design, demolition and construction*.

- 4.4.2 The proposed battery storage facility will result in the permanent loss of poor semi-improved grassland. This habitat has low ecological value and is prevalent within the wider landscape and therefore, impacts as a result of this loss are envisaged to be negligible.
- 4.4.3 The proposed temporary construction access track to the north will result in the temporary loss of arable land which will be reinstated upon completion. The track will utilise existing field accesses and hedgerow gaps insofar as is possible. Removal of trees will be avoided but removal of some small sections of hedgerow (maximum 10m wide) will be required. Upon completion of construction this track will be removed and like-for-like replacement hedgerow planting will be provided.
- 4.4.4 The proposed access track will also cross the wet ditch and this will be done via a culvert crossing which will be removed upon completion of construction.
- 4.4.5 Standard measures to ensure runoff control and pollution prevention will be implemented during the construction of the proposed development; these measures will safeguard retained habitats within and surrounding the Site and the species they support.
- 4.4.6 Opportunities have been sought for biodiversity enhancement within the Site as part of the proposed development, in order to provide an overall biodiversity net-gain; in line with National Planning Policy Framework 2 (2019) and BS42020 – *A Code of Practice for Biodiversity in Planning and Development*.
- 4.4.7 Biodiversity enhancement measures proposed as part of the proposed development and which are illustrated in *Soft Landscape Plan (Revision B)* consist of:
- The creation of approximately 0.04ha of native species-rich scrub is proposed within the Site;
 - The planting of 45 standalone standard trees of native species; and,
 - Approximately 530m of new native species-rich hedgerows.
 - The enhancement of 0.425ha of existing poor semi-improved/modified grassland into species-rich structured grassland
- 4.4.8 It is considered that a significant benefit to wildlife within the Site will be achieved through the addition of further native hedgerow and scrub planting which will also create and enhance potentially important wildlife corridors within and around the Site, improving the functionality of habitats for birds, mammals, amphibians, reptiles and invertebrates locally.
- 4.4.9 Additionally, habitats located within the same poor semi-improved grassland field as the Site, although outside of the Site boundary will be subject to off-site habitat compensation enhancement through the sowing of a species rich grassland mix and subsequent management to create 0.579ha of species-rich structured grassland
- 4.4.10 Biodiversity mitigation and enhancement measures are described further in the Biodiversity Management Plan (BMP), provided as **Appendix 4**, which describes ongoing management and monitoring for the lifetime of the development.

4.1 Biodiversity Net Gain

- 4.1.1 The habitat creation and associated biodiversity net gain that will accompany the proposed development has been assessed using the Defra Biodiversity Net Gain Calculator Metric (version 3.0). Whilst there is a net loss of -16.40% of habitat units within the Site, there is a substantial gain of 238.75% of hedgerow units within the Site. The inclusion of off-site habitat enhancement will increase the overall net gain calculation of the development to 13.15% to achieve an overall increase in biodiversity as a result of the habitat proposals. Details of the BNG calculation is summarised in **Appendix 5**. The full calculation is provided as a separate Excel spreadsheet.

4.2 Protected and Notable Species

Amphibians

- 4.2.1 Great crested newts and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). The Act and Regulations make it an offence to kill, injure or take a great crested newt; damage, destroy or obstruct access to any place that a great crested newt uses for shelter or protection; and intentionally or recklessly disturb a great crested newt while it is occupying a structure or place that it uses for shelter or protection.
- 4.2.2 The great crested newt and common toad are listed as a species of principal importance within Section 41 of the NERC Act and both species are also listed as a priority species within the Buckinghamshire and Milton Keynes Biodiversity Action Plan and therefore, are also of material consideration within the planning process.
- 4.2.3 The presence of great crested newts has been confirmed within Pond 5 approximately 180m to the west of the Site.
- 4.2.4 The arable farmland and poor semi-improved grassland offer limited opportunities for amphibians (foraging/ hibernation), however, field boundary features, such as hedgerows and ditches and their banksides potentially provide suitable foraging habitat and cover for amphibians.
- 4.2.5 The implementation of buffers and standard good practice measures to ensure runoff control and pollution prevention during the construction of the proposed development will safeguard nearby ponds, ditches and any amphibians present.
- 4.2.6 The proposed temporary access track will result in the removal of short sections of hedgerow (up to 10m) and will also require the installation of a culvert crossing over the wet ditch. Given these works are temporary and habitats will be reinstated, the loss of habitat will be inconsequential to local amphibian populations. However, any amphibians present in these areas are at risk of killing or injury during these works.
- 4.2.7 In order to avoid and minimise and risk of harm to amphibians through construction a series of Reasonable Avoidance Measures (RAMs) will be implemented during construction, as presented in **Appendix 3**. If a great crested newt is found, all works must stop and a European Protected Species Mitigation licence must be granted from Natural England before works can proceed.
- 4.2.8 Linear enhancements including species-rich hedgerows will increase suitable terrestrial habitat for amphibians and reptiles within the Site as well as increase the habitat connectivity of commuting populations of amphibians. The onsite creation of scrub also provides suitable foraging habitat for amphibians.

Reptiles

- 4.2.9 Widespread reptile species namely the common lizard *Zootoca vivipara*, slow-worm, grass snake *Natrix natrix* and adder *Vipera berus* are protected against killing, injuring and sale under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). These species are also listed as priority species under Section 41 of the NERC Act 2006 and Buckinghamshire and Milton Keynes Biodiversity Action Plan and therefore, are also of material consideration within the planning process.
- 4.2.10 The hedgerows, ponds and ditches with surrounding scrub and tall ruderal vegetation, as well as the railway, do provide opportunities for reptiles to forage, breed, seek shelter and hibernate. However, the Site is not well connected to other areas of more suitable reptile habitat and basking

opportunities are also limited. For this reason, it is considered unlikely that the Site would support significant populations of reptiles.

- 4.2.11 The proposed temporary access track will result in the removal of short sections of hedgerow (up to 10m) and will also require the installation of a culvert crossing over the wet ditch. Given these works are temporary and habitats will be reinstated, the loss of habitat will be inconsequential to local reptile populations. However, any reptiles present in these areas are at risk of killing or injury during these works.
- 4.2.12 In order to avoid and minimise and risk of harm to reptiles through construction a series of RAMs will be implemented during construction, as presented in **Appendix 6**.
- 4.2.13 Linear enhancements including species-rich hedgerows will increase suitable foraging habitat for reptiles within the Site as well as increase the habitat connectivity of commuting populations of reptiles. The onsite creation of scrub also provides suitable foraging and breeding habitat for reptiles.

Badger

- 4.2.14 Badgers and their setts are protected under the Protection of Badgers Act 1992. Under the Act it is an offence to: wilfully kill, injure, take, possess or cruelly ill-treat a badger; to attempt to do so: or, intentionally or recklessly interfere with a sett.
- 4.2.15 Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett. It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or destroyed.
- 4.2.16 Badgers are also listed as a priority species under Buckinghamshire and Milton Keynes Biodiversity Action Plan and therefore, are also of material consideration within the planning process.
- 4.2.17 Where an activity is likely to result in an offence under the Protection of Badgers Act 1992 a licence from Natural England is required.
- 4.2.18 No evidence of badger was identified during the habitat survey, although this species could be present in the locality.
- 4.2.19 During construction excavations and trenches will be minimal and these will be back-filled or covered overnight to prevent badger (or other animal) entrapment.
- 4.2.20 Badgers are highly mobile throughout their range and therefore a pre-construction inspection of the Site will be undertaken to identify any new sett creation that may have occurred during the intervening period between the initial survey and the start of construction.

Bats

- 4.2.21 All species of British bat are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Bats are further protected under the Conservation of Habitats and Species Regulations 2017 (as amended).
- 4.2.22 The Act and Regulations make it an offence to:
- Kill, injure or take any wild bat;
 - Damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection;
- or,

- Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection.
- 4.2.23 Seven bat species in the UK are also listed as species of principal importance for the purpose of conserving biodiversity under Section 41 of the NERC Act 2006. All UK bat species are also listed as a priority species within the Buckinghamshire and Milton Keynes Biodiversity Action Plan and therefore, are also of material consideration within the planning process.
- 4.2.24 No built structures are present within the Site and trees will be retained and protected within the proposed development. Therefore, no impacts to roosting bats are anticipated.
- 4.2.25 The habitats within the Site, largely comprising grassland and arable habitats provide little foraging interest for bats. The proposed development has been designated to avoid impacts to woodland as well as to hedgerows insofar as possible.
- 4.2.26 The proposed temporary access track will result in the removal of short sections of hedgerow (up to 10m). Given these works are temporary and hedgerows will be reinstated, the loss of habitat will be inconsequential to local bat populations for foraging or commuting.
- 4.2.27 The construction of the proposed development will primarily be undertaken during daylight hours. Any temporary lighting where required will be temporary and focused on working areas within open fields and therefore away from nearby woodland. As such temporary lighting, if required, is unlikely to affect bat foraging patterns.
- 4.2.28 During operation the battery storage facility will not be lit, apart from very limited emergency lighting at, for example, the Site entrance for occasional maintenance visits. Any lighting installed will be directed away from nearby woodland and boundary features with in accordance with Lighting in the UK, Bats and the Built Environment Series, Bat Conservation Trust and Institute for Lighting Engineers³⁰.
- 4.2.29 The creation of linear habitats within the Site including species-rich hedgerows and the planting of trees will create foraging and commuting habitat for bats considered more ecologically beneficial than existing open poor semi-improved/managed grassland.

Hazel Dormouse

- 4.2.30 Hazel dormouse are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); they receive further protection under the Conservation of Habitats and Species Regulations 2017 (as amended). The Act and Regulations make it an offence to:
- Deliberately capture, injure or kill a hazel dormouse
 - Damage or destroy a breeding site or resting place
 - Deliberately disturb a hazel dormouse, particularly in a way which is likely to:
 - a) to impair their ability to survive, breed or reproduce, rear or nurture young, and;
 - b) to affect significantly the local distribution or abundance of the species.
- 4.2.31 Hazel Dormouse is also listed under Section 41 of the NERC Act 2006 and within Buckinghamshire and Milton Keynes Biodiversity Action Plan and is therefore a material consideration within the planning process.

³⁰ Institution of Lighting Professionals & the Bat Conservation Trust. (2018). *Guidance Note 08/18: Bats and artificial lighting in the UK Bats and the Built Environment series* (Accessed on 03/03/2020)

4.2.32 The proposed temporary access track will result in the removal of short sections of hedgerow (up to 10m). Given these works are temporary and habitats will be reinstated, the loss of habitat will be inconsequential to local dormouse populations. However, any hazel dormouse present in these areas are at risk of killing or injury during these works.

4.2.33 In order to avoid and minimise and risk of harm to hazel dormouse during hedgerow removal a series of RAMs will be implemented during construction, as presented in **Appendix 3**.

Otter

4.2.34 Otters are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); they receive further protection under the Conservation of Habitats and Species Regulations 2017 (as amended). The Act and Regulations make it an offence to:

- Deliberately capture, injure or kill an otter
- Damage or destroy a breeding site or resting place
- Deliberately disturb an otter, particularly in a way which is likely to:
 - a) to impair their ability to survive, breed or reproduce, rear or nurture young, and;
 - b) to affect significantly the local distribution or abundance of the species.

4.2.35 Otter is also listed under Section 41 of the NERC Act 2006 and within Buckinghamshire and Milton Keynes Biodiversity Action Plan and is therefore a material consideration within the planning process.

4.2.36 No evidence of otter was noted during the habitat survey and this species is considered unlikely to occur on the Site due to an absence of suitable habitat. Therefore, no impacts are envisaged on otter as a result of the proposed development.

Water Vole

4.2.37 Water voles are protected in England under the provisions of the Wildlife and Countryside Act 1981 (as amended). The species is listed on Schedule 5 of the Act and is protected under Section 9, which makes it an offence to:

- Intentionally kill, take or injure a water vole;
- Possess or control any live or dead water vole or any part or derivative;
- Intentionally or recklessly damage or destroy a water vole's place of shelter or protection;
- Intentionally or recklessly disturb a water vole while it is occupying a structure or place which it uses for shelter or protection; or,
- Intentionally or recklessly obstruct access to a water vole's place of shelter or protection.

4.2.38 The Act also prohibits the selling, offering of sale, or possessing or transporting for the purposes of sale, any live or dead water vole, or any part or derivative, or advertising any of these for buying or selling, however this is irrelevant in relation to this report.

4.2.39 It is generally agreed that a place of shelter or protection used by water voles includes a network of activity burrows and/or any nests that have been constructed within the burrow system or above ground amongst dense vegetation.

- 4.2.40 Water vole is also listed within Buckinghamshire and Milton Keynes Biodiversity Action Plan and is therefore a material consideration within the planning process.
- 4.2.41 The proposed temporary access track will require the installation of a culvert crossing over the wet ditch. Given these works are temporary and habitats will be reinstated, the loss of habitat will be inconsequential to local water vole populations. However, any water voles present in these areas are at risk of killing or injury during these works.
- 4.2.42 In order to avoid and minimise and risk of harm to water voles through construction of the ditch crossing a series of RAMs will be implemented during construction, as presented in **Appendix 3**.
- 4.2.43 The implementation of standard pollution prevention measures will protect this ditch and any water voles in the vicinity. Therefore, impacts to water vole are considered to be minimal.

Birds

- 4.2.44 All wild birds, their nests, eggs and dependent young are, with few exceptions, protected under the Wildlife and Countryside Act 1981 (as amended). Additional protected is also afforded to those species listed on Schedule 1 of the Act, with regards to disturbance at or around their nest sites.
- 4.2.45 The grassland, hedgerows and trees could provide opportunities for breeding birds. The loss of the onsite grassland is unlikely to significantly impact local bird populations but could result in disturbance whilst nesting.
- 4.2.46 In order to avoid impacts on nesting birds and to ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended), it is recommended that construction and any associated vegetation removal takes place outside of the bird breeding season (March-August inclusive). If vegetation works are necessary during the breeding season any suitable nesting habitat to be affected by works; including agricultural cropland habitats, 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 offence will occur under the legislation.
- 4.2.47 The creation of c530m of hedgerows, 0.04 hectares of structured native scrub and the planting of 45 standard native trees will increase the long term breeding potential habitat for breeding birds associated with field boundary habitats.

Other Species

- 4.2.48 The hedgerow habitats located within the Site may also be utilised by Western hedgehog (a priority species listed on Section 41 of the NERC Act 2006 and under Buckinghamshire and Milton Keynes Biodiversity Action Plan) as part of a wider population. Hedgerow losses will be minimised and hedgerows will be re-instated where possible. The loss of the grassland and arable habitats is unlikely to local hedgehog populations.
- 4.2.49 Security fencing located around the Site perimeter will have sufficient gaps positioned at several locations along the base of fences in order to allow Western hedgehog to continue to use the habitats on Site during the operational period. The measures outlined for badger, regarding excavation covers, and for amphibians and reptiles, in relation to the RAMs, will also benefit hedgehog.
- 4.2.50 The loss of grassland and arable habitat is unlikely to significantly affect local invertebrate populations due to the prevalence of such habitats locally.

Invasive Non-native Species

- 4.2.51 No species invasive non-native species listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) were recorded on Site during the Extended Phase 1 habitat survey. It is an offence to plant or otherwise cause such species to grow in the wild. This includes allowing the species to grow/spread, spreading the species or transferring polluted ground material from one area to another.
- 4.2.52 These species and soil containing these species are also classed as controlled waste and as such must be disposed of safely at a licensed landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991.
- 4.2.53 Should any invasive species encountered on Site prior to or during construction, the advice of a suitably qualified ecologist should be sought and the appropriate measures taken.

5 SUMMARY - ECOLOGY PRIORITY MATRIX

5.1.1 An Ecological Assessment was undertaken for the proposed battery storage development at Ilmer in Buckinghamshire.

5.1.2 **Table 5.1** summarises the ecological constraints and opportunities associated with the development, and makes recommendations for pre-construction survey work and/or mitigation measures as required.

Table 5.1: Ecological Constraints and Opportunities

Feature		Details
Statutory and Non-statutory designated sites for Nature Conservation	Constraints & Opportunities	a. There are several statutory and non-statutory designations within influencing distance of the Site; however, it is not anticipated that there will be any detrimental impacts on these designations as a result of the proposed development due to the consideration of ecological constraints during the design process and the proposed measures outlined to protect and enhance biodiversity within the Site.
	Protection Measures	b. Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard statutory and non-statutory designated sites. No indirect effects are therefore anticipated on statutory or non-statutory designated sites in the wider area.
Habitats & Flora	Constraints & Opportunities	c. The main habitats within the development footprint are scrub, semi-improved grassland and short ephemeral, which are widespread and generally of low value to wildlife. d. Habitat enhancement measures are proposed as part of the development and will serve to enhance the development for local biodiversity. Enhancement measures include the planting of hedgerow screening and creation of newly planted hedgerows and scrub creation.
	Protection Measures	e. Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard retained terrestrial habitats within the Site and the wider environment.
Reptiles and amphibians	Constraints & Opportunities	f. The loss of dense scrub and grassland from the Site is unlikely to significantly impact local reptile and amphibian populations given the lack of connectivity to other suitable habitats in the area. g. Newly created linear hedgerow habitats and scrub will provide terrestrial foraging and hibernation habitat for reptiles and amphibians.
	Legislative Compliance – WCA**	h. Reasonable Avoidance Measures (RAMs) will be implemented to minimise risk of harm to individual animals.
Badgers	Constraints & Opportunities	i. No evidence of badgers was found on the Site but this species could be present within the locality.
	Legislative Compliance – PBA****	j. A pre-construction inspection of the Site for badger will be undertaken to identify any newly created setts. k. No trenches or excavations will be left open overnight; these will be back-filled or covered to avoid entrapment of badgers during construction.
Bats	Constraints & Opportunities	l. No roosting habitat was identified on the Site. Limited foraging opportunities are present with the adjacent woodland and Buck Beck offering more suitable habitat. m. The proposed development also provides positive measures for bats, through the enhancement of hedgerows, creation of hedgerows and scrubland within the Site.

Feature		Details
	Legislative Compliance – WCA**, HR***	n. Any lighting required during construction and/or operation of the solar farm should be directed away from woodland and Buck Beck (further information is provided in Lighting in the UK, Bats and the Built Environment Series, Bat Conservation Trust and Institute for Lighting Engineers).
Hazel Dormouse	Constraints & Opportunities	o. The dominant arable farmland and poor semi-improved grassland habitat within the Site is considered to have negligible potential to support the species, however, the boundary features (tree line/hedgerows and associated habitats) offer hazel dormice potentially suitable foraging/hibernation habitat. p. Habitat loss as a result of the proposed development will likely mainly involve the development of land currently used as arable farmland, with likely retention of boundary features (hedgerows/woodland) and associated habitats; therefore, the habitats suitable for the species will largely be retained and effects on these features will be negligible. q. One 10m section of hedgerow and one 10m section of line of trees will be required for removal.
	Legislative Compliance – WCA**, HR***	r. A series of RAMs will likely be sufficient to avoid significant impacts on any local hazel dormouse populations and individual dormice potentially present. RAMs are presented in Appendix 3 .
Otter and Water Vole	Constraints & Opportunities	s. No records of water voles or otter were returned within 2km of the Site and the Site provides no suitable breeding habitat to otter and the 10m section of watercourse located along the construction access track is not considered suitable for otter. t. Water voles are not considered likely to be present within the Site.
	Legislative Compliance – WCA**, HR***	u. Although no records of water voles were returned within 2km of the Site, reasonable avoidance measures will be adhered to during temporary culverting works to ensure no harm occurs to any potential population of water voles. v. Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard Buck Beck and any associated habitats and species.
Birds	Constraints & Opportunities	w. The dense scrub on the Site and the adjacent woodland provide some suitable nesting habitat and may support breeding birds typical of the locality, including some of local conservation concern species. x. The proposed development also provides positive measures for breeding birds, through enhancement and maintenance of hedgerows, trees and scrubland.
	Legislative Compliance – WCA**	y. Removal of nesting bird habitats should be undertaken outside of the bird breeding season (01 March to 31 August inclusive). If vegetation works are necessary during the breeding season, suitable nesting habitat should be searched by a suitably experienced ecologist prior to works commencing. Only when the ecologist is satisfied that no offence will occur under the legislation will works be permitted to proceed.
Other Species	Constraints & Opportunities	z. The dense scrub and adjacent woodland may be utilised by Western hedgehog. aa. Security fencing located around the Site perimeter will have sufficient gaps positioned at several locations along the base of fences in order to allow Western hedgehog to continue to use the habitats on Site during the operational period. bb. The measures outlined for badgers and reptiles will also be of benefit to hedgehog. cc. Planting of hedgerows and scrub will also benefit hedgehogs and brown hare.
Invasive Non-native Species	Constraints & Opportunities	dd. No invasive non-native plant species listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) were recorded on Site.
	Legislative Compliance –	ee. Should any invasive species encountered on Site prior to or during construction, the advice of a suitably qualified ecologist should be sought and the appropriate measures

Feature		Details
	WCA**	taken.

Legislative Compliance Key

* The Hedgerows Regulations 1997

**Wildlife & Countryside Act 1981 (as amended)

***The Conservation of Habitats and Species Regulations 2017 (as amended)

****Protection of Badgers Act 1992

FIGURES

Figure 1: Site Location Plan

Figure 2: Statutory Designated Sites Plan

Figure 3: Non-statutory Designated Sites Plan

Figure 4: Habitat Survey Plan

Figure 1: Site Location Plan

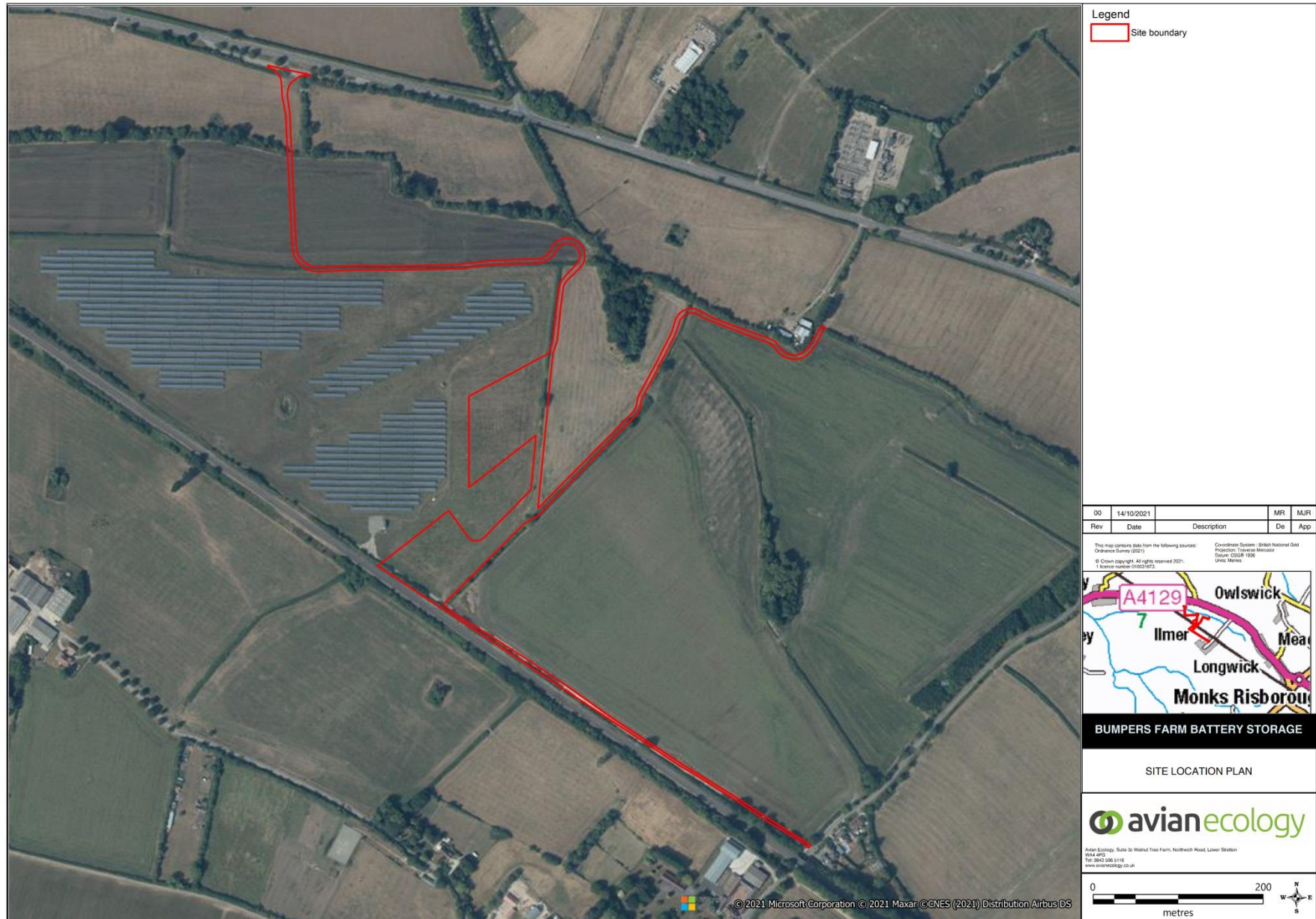


Figure 2: Statutory Designated Sites Plan

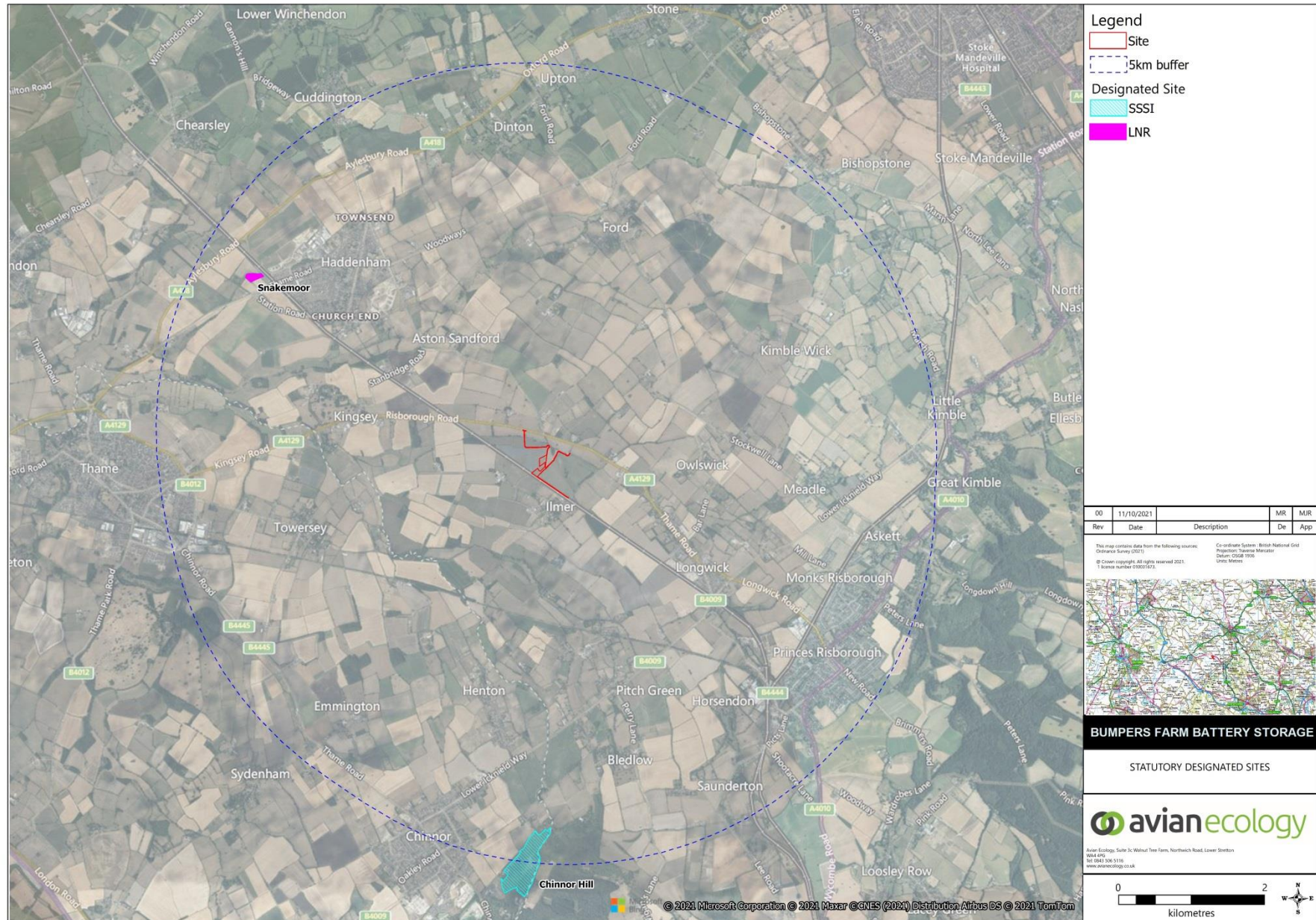


Figure 3: Non-statutory Designated Sites Plan

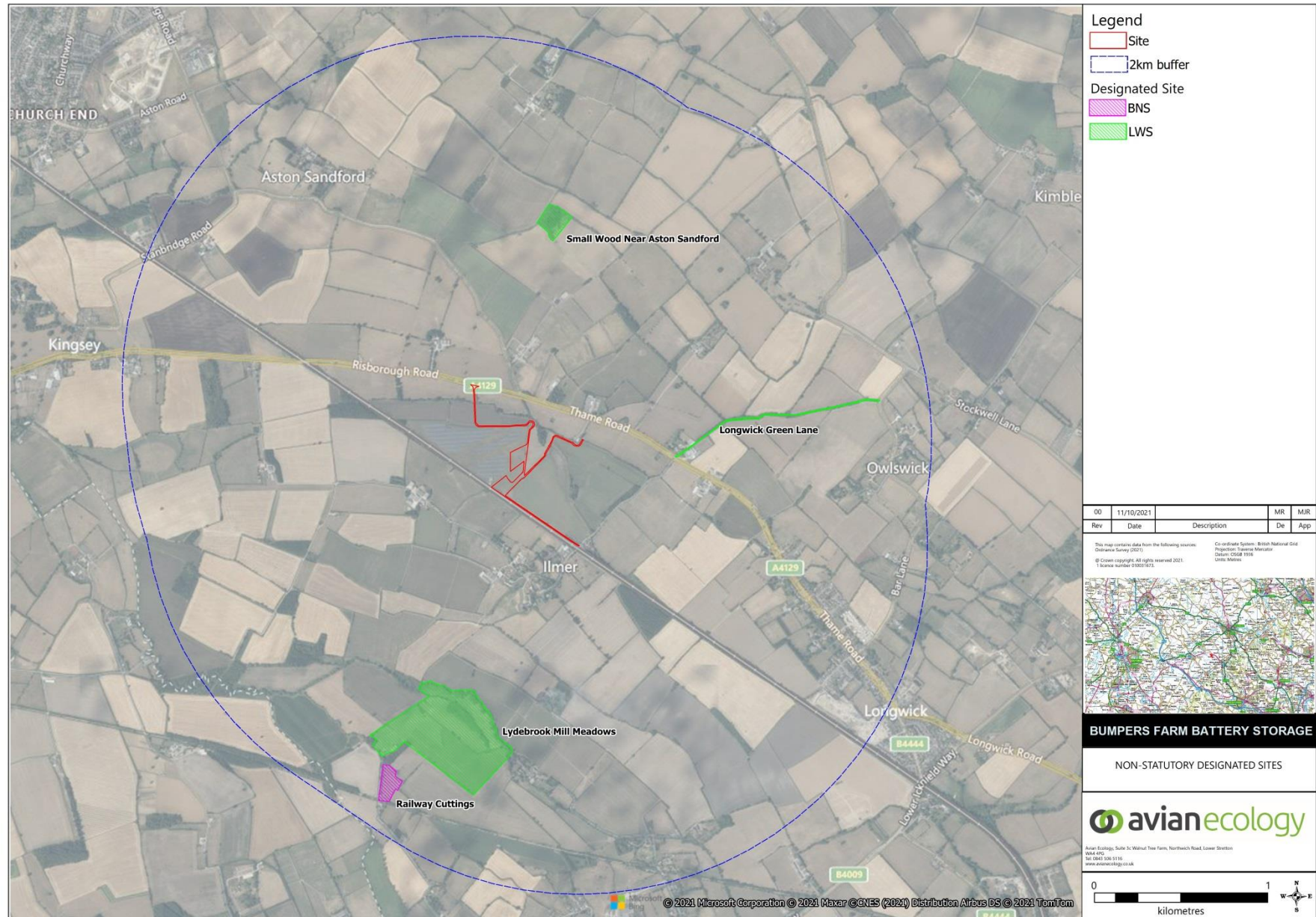
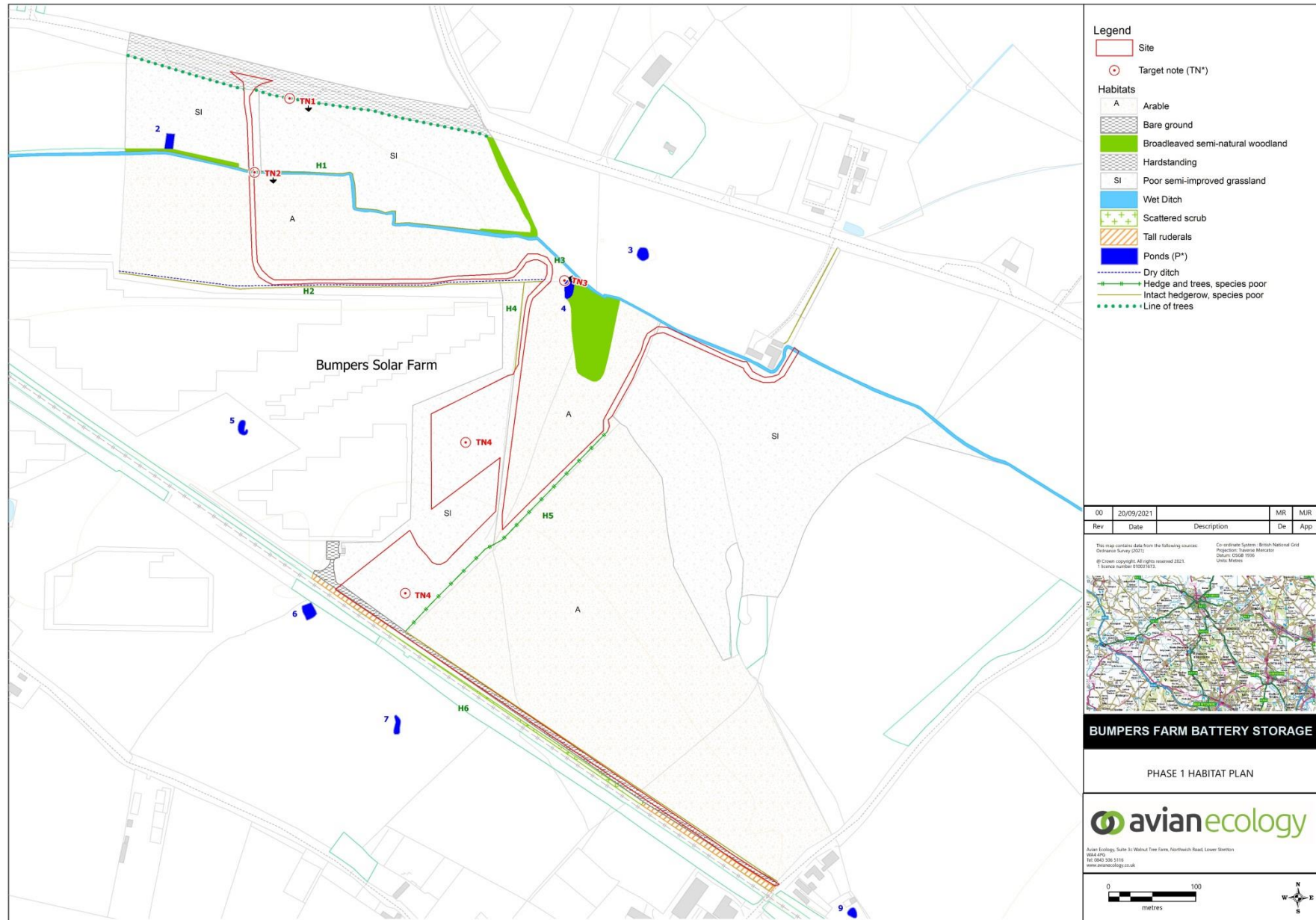


Figure 4: Habitat Plan



APPENDIX 1

Notable Species Records - BMERC

Notable Species Records within 2km of the Site			
Common Name	Scientific Name	Conservation Status	No. of Records
Barn owl	<i>Tyto alba</i>	S1, LBAP	1
Bat	<i>Chiroptera</i>	Annex IV, S5, LBAP	2
Common toad	<i>Bufo bufo</i>	NERC S41, UKHAB, LBAP	1
Cuckoo	<i>Cuculus canorus</i>	NERC S41, UKHAB, Bocc-Red, LBAP	2
Dunnock	<i>Prunella modularis</i>	NERC S41, UKHAB, Bocc-Amber, LBAP	1
Fieldfare	<i>Turdus pilaris</i>	S1, Bocc-Red	1
Great crested newt	<i>Triturus cristatus</i>	Annex IV, S5, NERC S41, UKHAB, LBAP	2
Grey partridge	<i>Perdix perdix</i>	NERC S41, UKHAB, Bocc-Red, LBAP	1
Hedgehog	<i>Erinaceus europaeus</i>	NERC S41, UKHAB, LBAP	1
Kestrel	<i>Falco tinnunculus</i>	Bocc-Amber, LBAP	1
Lapwing	<i>Vanellus vanellus</i>	NERC S41, UKHAB, Bocc-Red, LBAP	1
Linnet	<i>Linaria cannabina</i>	NERC S41, UKHAB, Bocc-Red, LBAP	1
Meadow pipit	<i>Anthus pratensis</i>	Bocc-Amber, LBAP	1
Mistle thrush	<i>Turdus viscivorus</i>	Bocc-Red, LBAP	2
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	Annex IV, S5, LBAP	1
Noctule bat	<i>Nyctalus noctula</i>	Annex IV, S5, NERC S41, UKHAB, LBAP	1
Peregrine	<i>Falco peregrinus</i>	S1, LBAP	1
Pipistrelle	<i>Pipistrellus pipistrellus</i>	Annex IV, S5, LBAP	1
Red Kite	<i>Milvus milvus</i>	S1, Bocc-Amber, LBAP	1
Redwing	<i>Turdus iliacus</i>	S1, Bocc-Red	1
Reed bunting	<i>Emberiza schoeniclus</i>	NERC S41, UKHAB, Bocc-Amber, LBAP	1
Skylark	<i>Alauda arvensis</i>	NERC S41, UKHAB, Bocc-Red	2
Small heath	<i>Coenonympha pamphilus</i>	NERC S41, UKHAB, LBAP	3
Snipe	<i>Gallinago gallinago</i>	Bocc-Amber, LBAP	1
Song thrush	<i>Turdus philomelos</i>	NERC S41, UKHAB, Bocc-Red, LBAP	1
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Annex IV, S5, NERC S41, UKHAB, LBAP	1
Starling	<i>Sturnus vulgaris</i>	NERC S41, UKHAB, Bocc-Red, LBAP	1
Teal	<i>Anas crecca</i>	Bocc-Amber, LBAP	1
White-letter hairstreak	<i>Satyrrium w-album</i>	S5, LBAP	1
Willow warbler	<i>Phylloscopus trochilus</i>	Bocc-Amber, LBAP	1
Yellowhammer	<i>Emberiza citrinella</i>	NERC S41, UKHAB, Bocc-Red, LBAP	2

Key:

Annex 1: Birds Directive Annex 1

Annex IV: Habitats Directive Annex IV (implemented by Conservation (Natural Habitats &c.) Regulations 1994)

S1: Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)
S5: Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)
S8: Schedule 8 of the Wildlife and Countryside Act 1981 (as amended)
PBA Protection of Badgers Act (1992)
NERC S41: Section 41 of the Natural Environment and Rural Communities Act (2006)
UKBAP: United Kingdom Biodiversity Action Plan species
LBAP: Buckinghamshire and Milton Keynes Biodiversity Action Plan species
BoCC -Red: Birds of Conservation Concern 4 – Red listed species
BoCC -Amber: Birds of Conservation Concern 4 – Amber listed species
INNS: Invasive Non-native Species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)

APPENDIX 2
Site Photographs

Plate	Description
 A dense, tall hedgerow with a thick canopy of green leaves and some bare branches, situated in a rural landscape.	<p>Photograph 1: Hedgerow - H1</p>
 A hedgerow with a mix of green shrubs and tall grasses in the foreground, viewed from a low angle.	<p>Photograph 2: Hedgerow - H2</p>
 A hedgerow running alongside a field, with tall grasses in the foreground and a dirt path visible on the left.	<p>Photograph 3: Hedgerow - H6</p>
 A long, straight hedgerow bordering a gravel path, with a clear view of the path leading into the distance.	<p>Photograph 4: Hedgerow - H7</p>



Photograph 5: TN1 – Line of trees



Photograph 6: TN2 – Wet Ditch



Photograph 7: TN4 – Poor semi-improved grassland

APPENDIX 3

Reasonable Avoidance Measures (RAMs)

Reasonable Avoidance Measures (RAMs)

Method Statement Objectives

1. Any development related activities on the Site, such as vegetation clearance or excavations in areas of suitable habitat (hedgerows, ditches and trees) for amphibians, reptiles, hazel dormouse, water vole and hedgehogs may potentially affect these species. As a result, safeguards must be implemented to protect these species and the Method Statement below details measures to be implemented to ensure these objectives are achieved. If these measures are followed then no impacts are likely to occur.

Method Statement

2. This Method Statement should be followed for the construction of the temporary access road within the Site, which may affect the surrounding terrestrial habitat, to ensure legal compliance and to ensure the objectives are achieved.
3. 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 amphibian and reptile species, hazel dormouse and hedgehog to occur on-site, what to look out for and what to do in the event that animal is found.
 - Works to be carried out within hedgerow, tree and ditch habitats on Site should only commence after a careful visual inspection has determined that no animals are present. Vegetation should be reduced (by hand strimmer or similar hand tools) 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.
 - Should any trenches and excavations be required, an escape route for animals that enter the trench must be provided, especially if left open overnight. Ramps should be no greater than 45 degrees in angle. Ideally, any holes 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.

If a great crested newt or a hazel dormouse is found, work must stop immediately and contact should be made with a suitably experienced ecologist to discuss potential licensing requirements.

If any other amphibians, reptiles, water vole or hedgehog are found, work must stop immediately and until the animal has moved away from the works area, if this is not possible contact should be made with a suitably experienced ecologist.

Appendix 4
Biodiversity Management Plan (BMP)

APPENDIX 5
Biodiversity Net Gain (BNG)
